D&M
D&M Holdings Inc.
Quality Assurance Division
2-1 Nisshin-cho, Kawasaki-ku, Kawasaki-shi, Kanagawa, 210-8569 Japan
Tel : +81-44-670-2665 Fax : +81-44-670-2697

Provision of information on the compliance of combinations of radio equipment and software

General Information:

Report Date:	25-Jul-17	Report No.:	DM-Radio17018
Manufacturer:	D&M Holdings Inc.		
Address:	2-1 Nisshin-cho, Kawasaki-ku, Kawasaki-shi, Kanagawa, 210-8569, Japan		
Factory	ANAM ELECTRONICS VIETNAM CO.,LTD		
Address:	Dong Van II Industrial Zone, Duy Tien District Ha Nam Province, Viet Nam		
Model Tested:	AVR-X4400H		
Appliance Type	Integrated Network AV Receiver		
Brand Name:	DENON		
Country of Origin:	Vietnam		

Radio Specification:

Type	Frequency Range	Max.RF Power(Limit)	Test result of RF Power
Bluetooth	2402~2480 MHz	20dBm	7.80dBm
WLAN(2.4GHz)	2400~2483.5 MHz	20dBm	19.45dBm
5GHz Radio	5150~5250 MHz	23dBm	22.49dBm
	5250~5350 MHz	23dBm	22.49dBm
	5470~5725 MHz	30dBm	22.49dBm

※This radio equipment restricted to indoor use only.

Technical document: Test Report No. ER581110-01AA, ER581110-01AB, ER581110-01AC, ER581110-01AD, EY581110-01

Software version information:

Main	0201706230407 or later	A.PLD:	72.05 or later
Main FBL	00.30 or later	V.PLD:	68.03 or later
DSP1:	10.00 or later	GUI:	00100006 or later
DSP2:	11.03 or later	LEGO:	1.406.140 or later
DSP3:	12.00 or later		
DSP4:	13.01 or later		

※There is no change in the performance of Safety, EMC and Radio by version update.

Checked by: Akihiro Yoshida

Approved by: Jun Sakurai

Jun Sakurai, Director
Quality Assurance Dep.
D&M Holdings Inc.

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Test Report for Energy-related Products (ErP) EU Regulation No.1275/2008 and its frame work directive 2009/125/EC including amendment 801/2013

General Information:

Report Date:	25-Jul-17	Report No.:	DM-ERP17018
Manufacturer:	D&M Holdings Inc.		
Factory	ANAM ELECTRONICS VIETNAM CO.,LTD		
Model Tested:	AVR-X4400H		
Appliance Type	Integrated Network AV Receiver		
Brand Name:	DENON		
Country of Origin:	Vietnam		
Test Method:	EN50564:2011 : Electrical and electronic household and office equipment Measurement of low power consumption (IEC 62301:2011 (Modified))		
Product Type	Type C		

Test Results:

Date Tested:	22-Jun-17	Ambient Temperature:	25 °C
Power Supply:	230V~ / 50,60Hz	THD:	≤2%

Operating Condition (Refer to the user's manual)	Description of the mode select	Measured power consumption (Watts)
Off mode	-	N/A
Initial Standby mode	ECO Standby	0.178
Max. consumed Standby mode if any	CEC Standby	0.521
Max. consumed Network Standby mode if any	-	N/A *1
Other function than Off/Standby modes if any	RS-232C Standby	0.434
Power management function	Yes	
Functional time of power management	15min	

Complied with ErP from 7 January, 2013 (≤0.5W & Power Management)	Yes
Complied with ErP from 1 January, 2017 (≤8W: HiNA, ≤3W: Other Network)	N/A *1

*1: This model doesn't have Network Standby mode.
Because it's inappropriate for this model's intended use.

Test Equipment (Power Meter):

Manufacturer	Model No.	Control No.	Calibration Due
Yokogawa	WT310	1F039	30 June, 2018

Test Notes:

Measurement uncertainty:	≤2%
Power measurement resolution:	0.001W

Tested by: Hideki Baba

Approved by:

Jun Sakurai, Director
Quality Assurance Dep.
D&M Holdings Inc.

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Test Report for Restriction of Hazardous Substances (RoHS)
EU Directive 2011/65/EU

General Information:

Report Date:	25-Jul-17	Report No.:	DM-RoHS17018
Manufacturer:	D&M Holdings Inc.		
Address:	2-1 Nisshin-cho, Kawasaki-ku, Kawasaki-shi, Kanagawa, 210-8569, Japan		
Factory	ANAM ELECTRONICS VIETNAM CO.,LTD		
Address:	Dong Van II Industrial Zone, Duy Tien District Ha Nam Province, Viet Nam		
Model Tested:	AVR-X4400H		
Appliance Type	Integrated Network AV Receiver		
Brand Name:	DENON		
Country of Origin:	Vietnam		
Harmonised Standards:	EN 50581:2012 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances		

Test Results: For more detail, refer to the attached parts list.

Date Reported:	24-Jul-17		
Substance	Limit (%)	Containing substances	Judgment
Lead	0.1	Yes*1	Pass
Mercury	0.1	ND*2	Pass
Cadmium	0.01	ND*2	Pass
Hexavalent chromium	0.1	ND*2	Pass
Polybrominated biphenyls (PBB)	0.1	ND*2	Pass
Polybrominated diphenyl ethers (PBDE)	0.1	ND*2	Pass

*1: These are included to only those parts defined as exemption in ANNEX Ⅲ.
*2: ND = Not Detected

Checked by: Akihiro Yoshida

Approved by:

Jun Sakurai, Director
Quality Assurance Dep.
D&M Holdings Inc.

DENON

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Phone: +81-44-670-2665 Fax: +81-44-670-2697

DM-CE17018

EU Declaration of Conformity

We, D&M Holdings Inc., declare under our sole responsibility that the product;

Brand name: **DENON**

Product: **Integrated Network AV Receiver**

Model: **AVR-X4400H**

following the provisions of EC/EU directives and EC regulation as follows;

RE: ***2014/53/EU***
LV: ***2014/35/EU***
EMC: ***2014/30/EU***
RoHS: ***2011/65/EU***
ErP: ***EC regulation 1275/2008 and its frame work directive 2009/125/EC including amendment 801/2013***

to which this declaration relates is in conformity with the following standards for

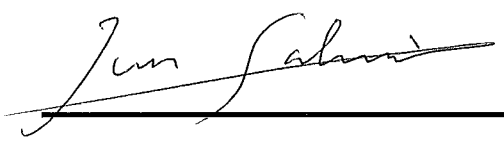
* Standards applied

Safety: ***EN60065:2014***
EMC: ***EN55032:2015***
EN55020:2007+A11:2011
EN55024:2010
EN61000-3-2:2014
EN61000-3-3:2013
EN301489-1 V2.1.1
EN301489-17 V3.1.1
Radio: ***EN300328 V2.1.1***
EN301893 V2.1.1
EN303345 V1.1.7
Health: ***EN62311:2008***
ErP: ***EN50564:2011***
RoHS: ***EN50581:2012***

CE Mark first affixed in 2017

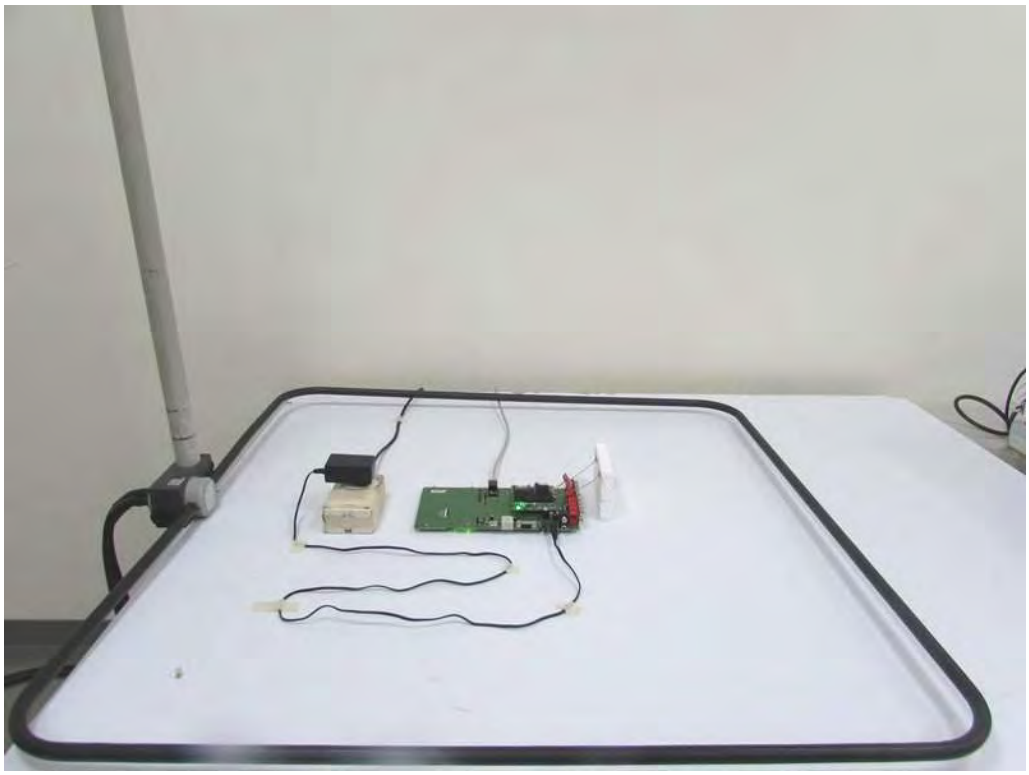
Manufacturer: D&M Holdings Inc.
Address : 2-1 Nisshin-cho, Kawasaki-ku, Kawasaki-shi, Kanagawa, 210-8569 Japan

Responsible: Jun Sakurai
Director, Quality Assurance Dep.
Date: 25-July-2017

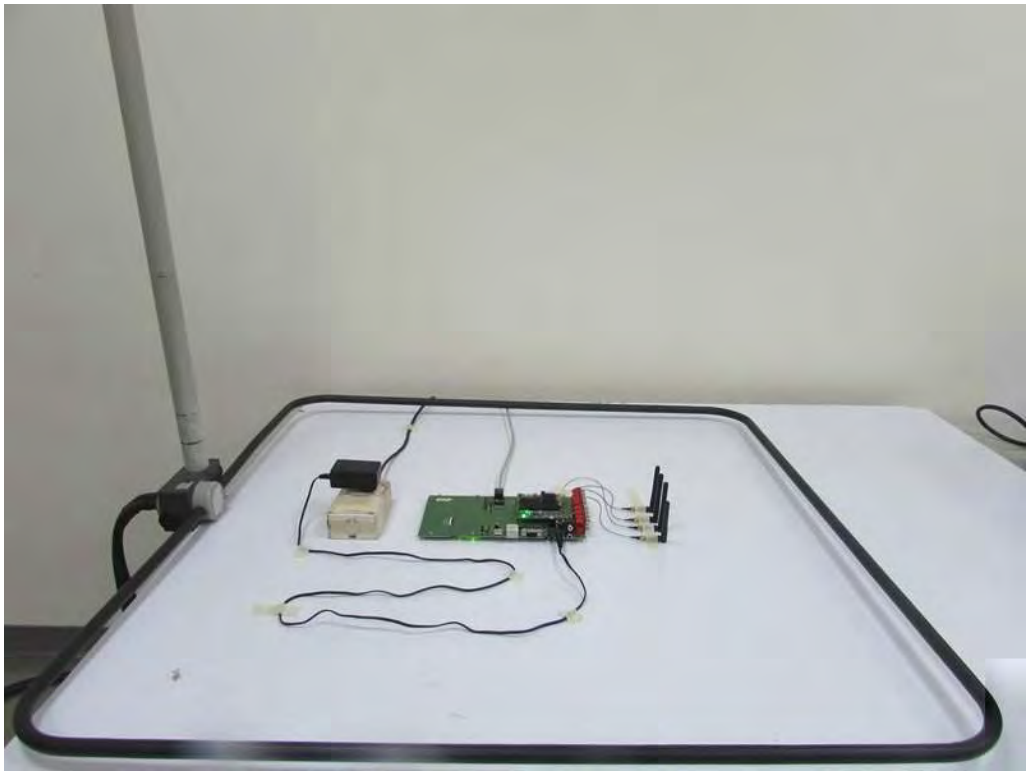


5. Photographs of MF Immunity Test Configuration

Test Mode: Mode 1, Mode 2

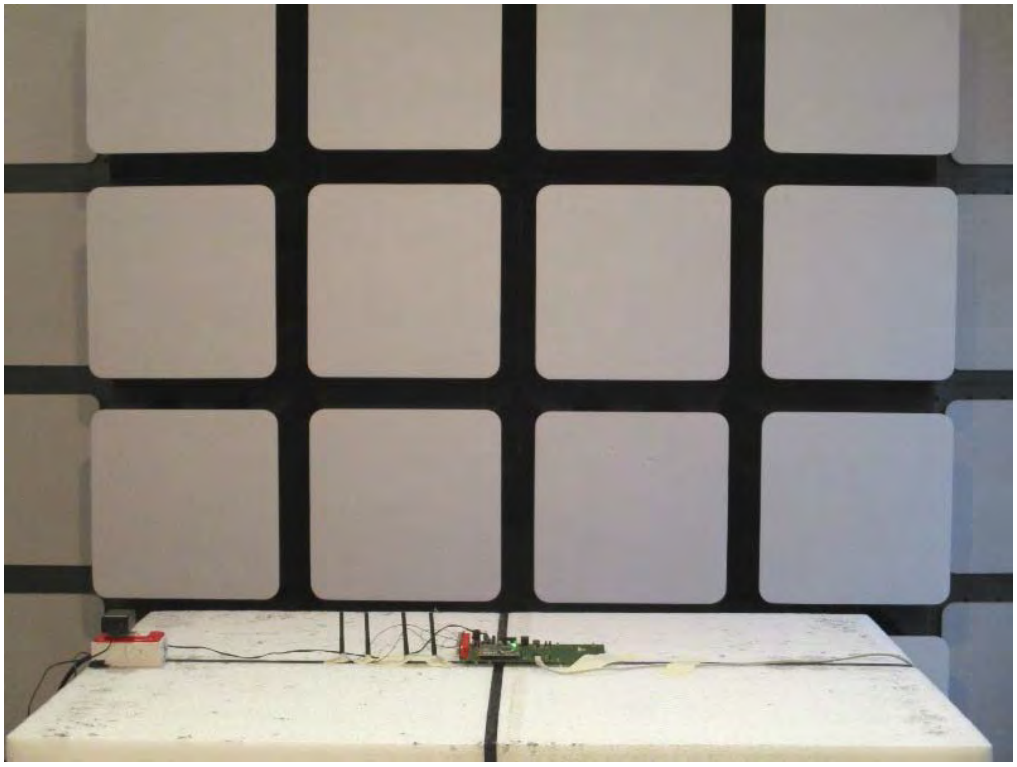


Test Mode: Mode 3, Mode 4

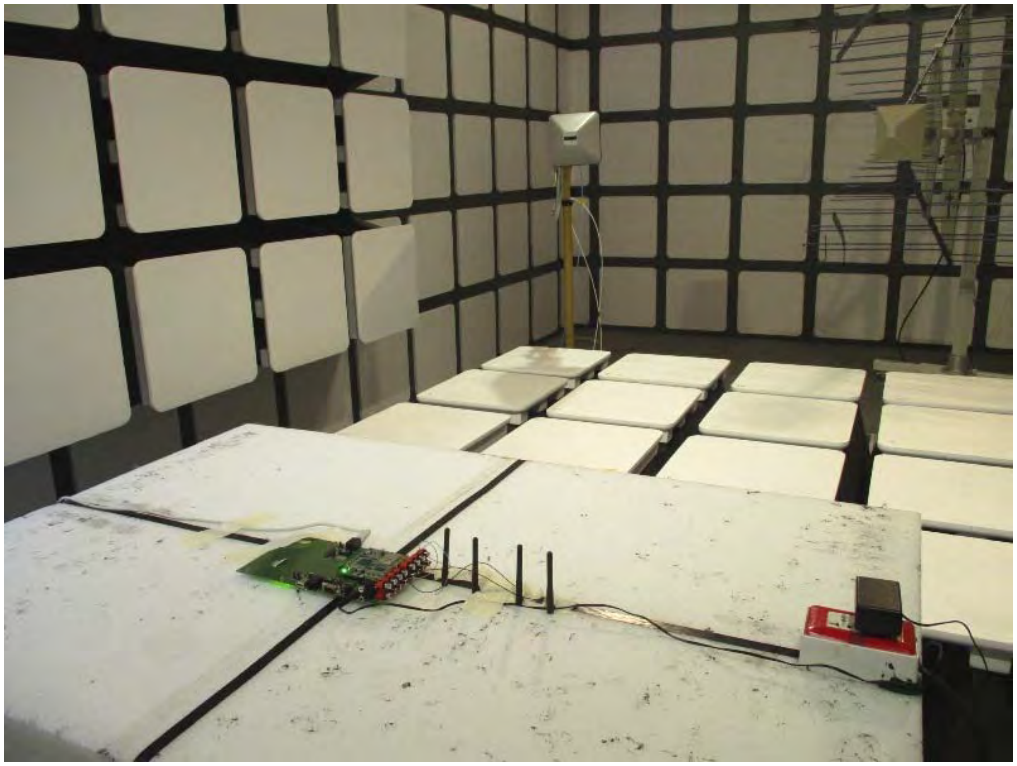


Test Mode: Mode 3, Mode 4

FRONT VIEW



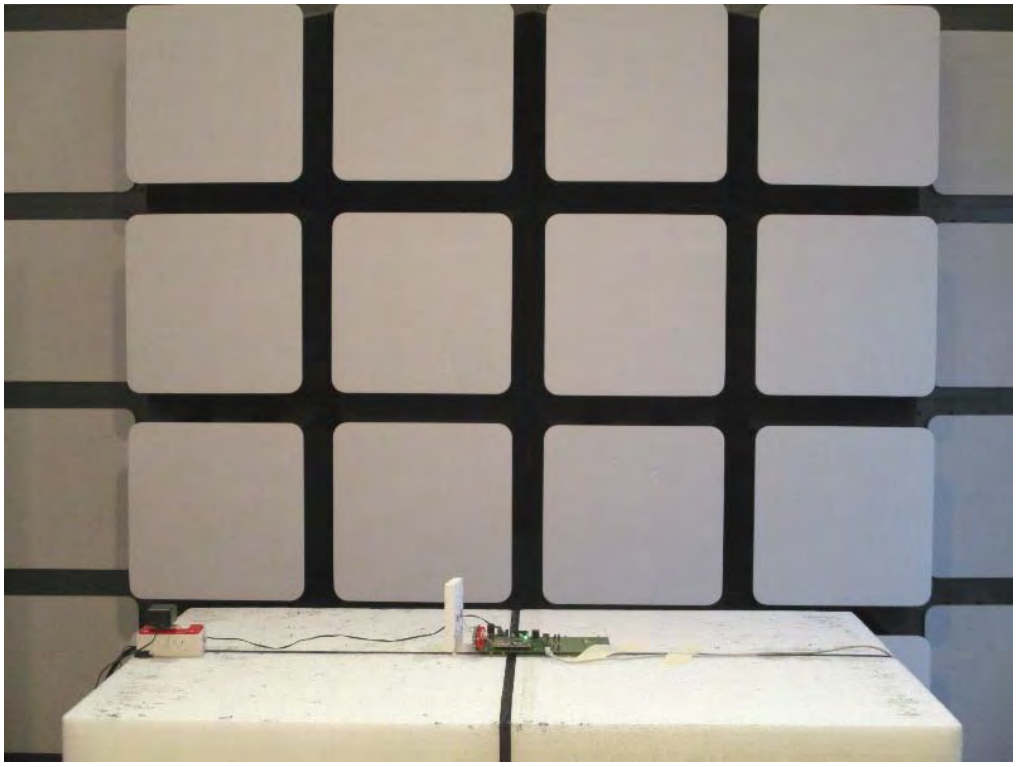
REAR VIEW



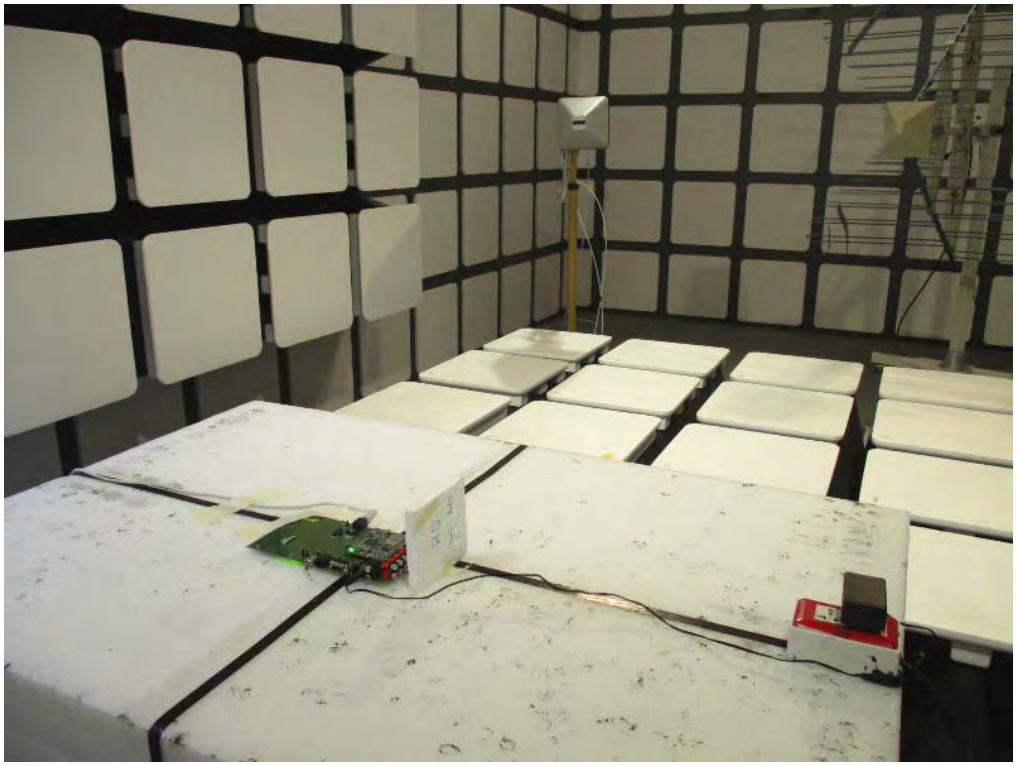
For 1,000 MHz to 6,000 MHz:

Test Mode: Mode 1, Mode 2

FRONT VIEW

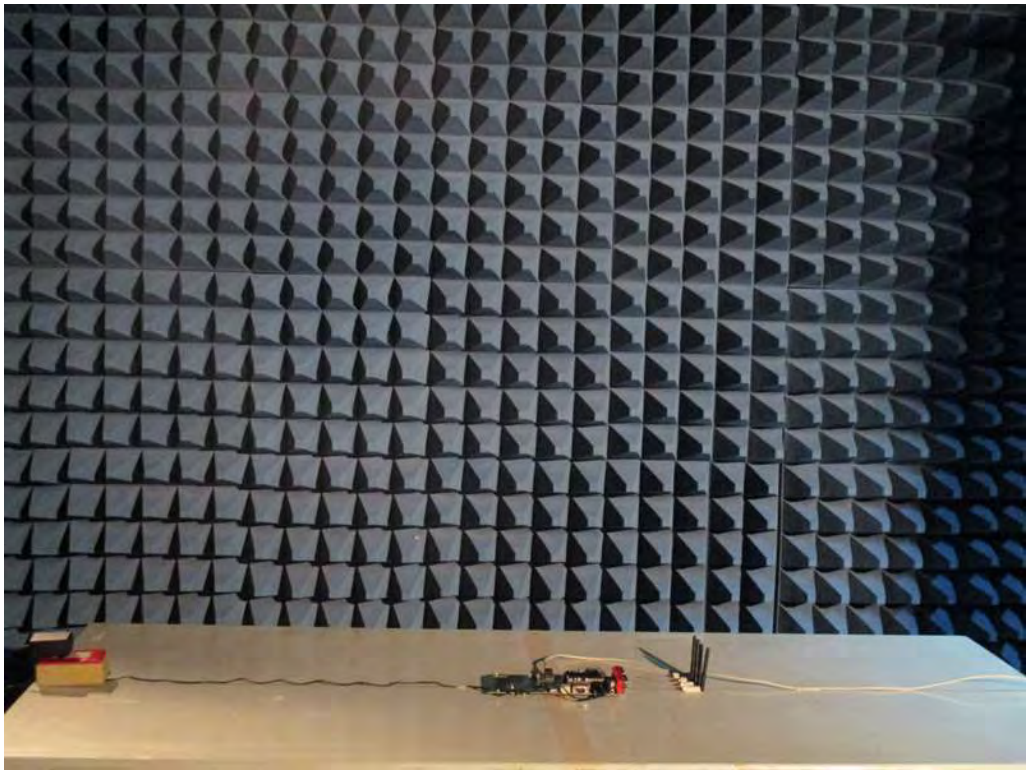


REAR VIEW

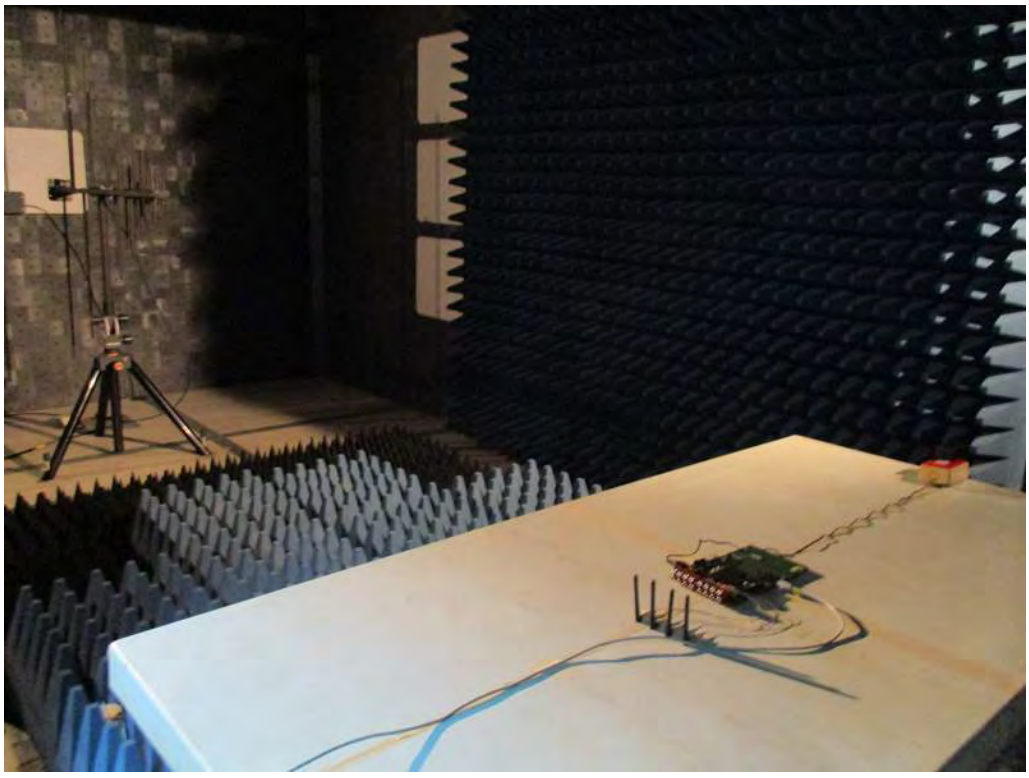


Test Mode: Mode 3, Mode 4

FRONT VIEW



REAR VIEW

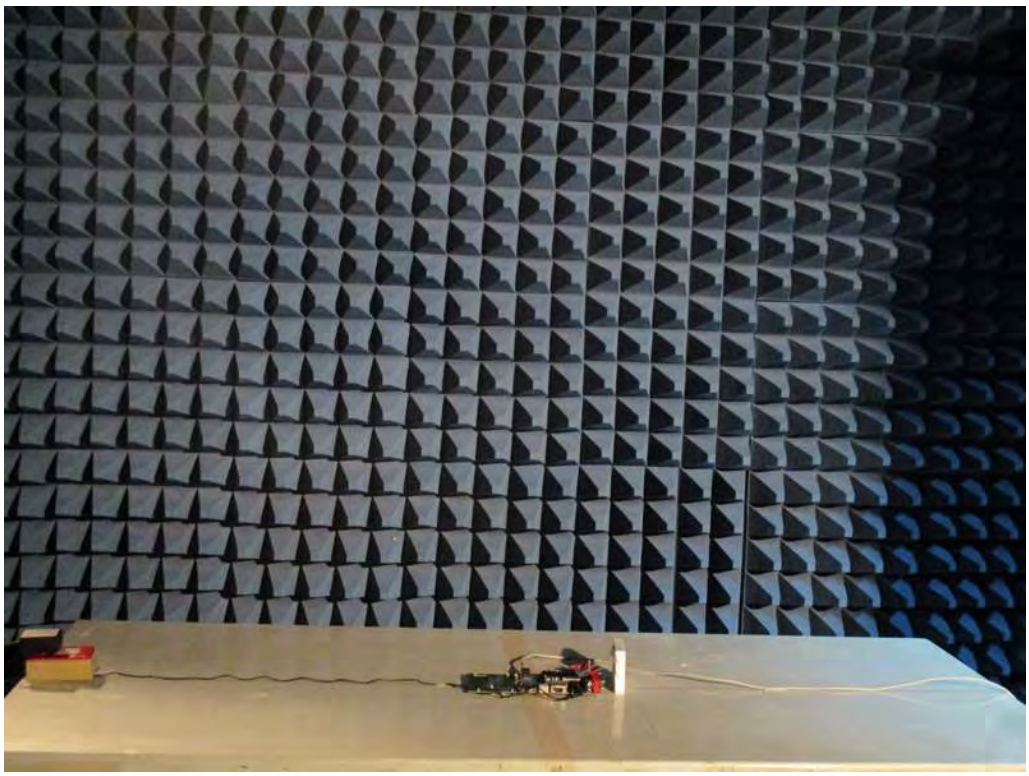


4. Photographs of RS Immunity Test Configuration

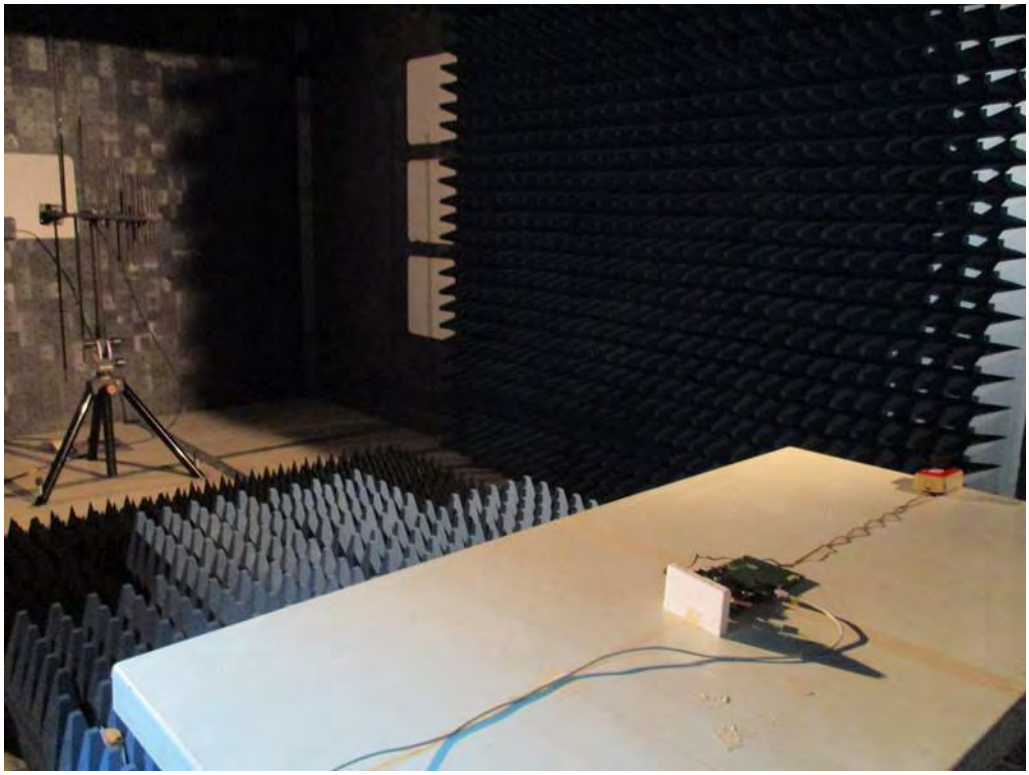
For 80 MHz to 1,000 MHz:

Test Mode: Mode 1, Mode 2

FRONT VIEW

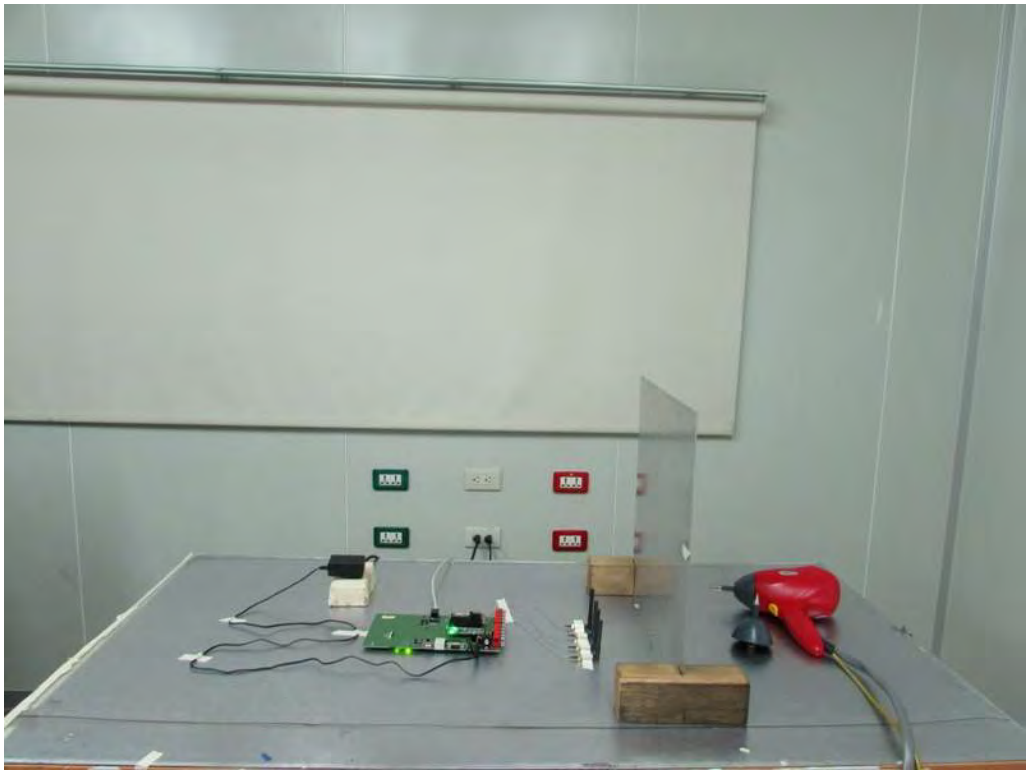


REAR VIEW

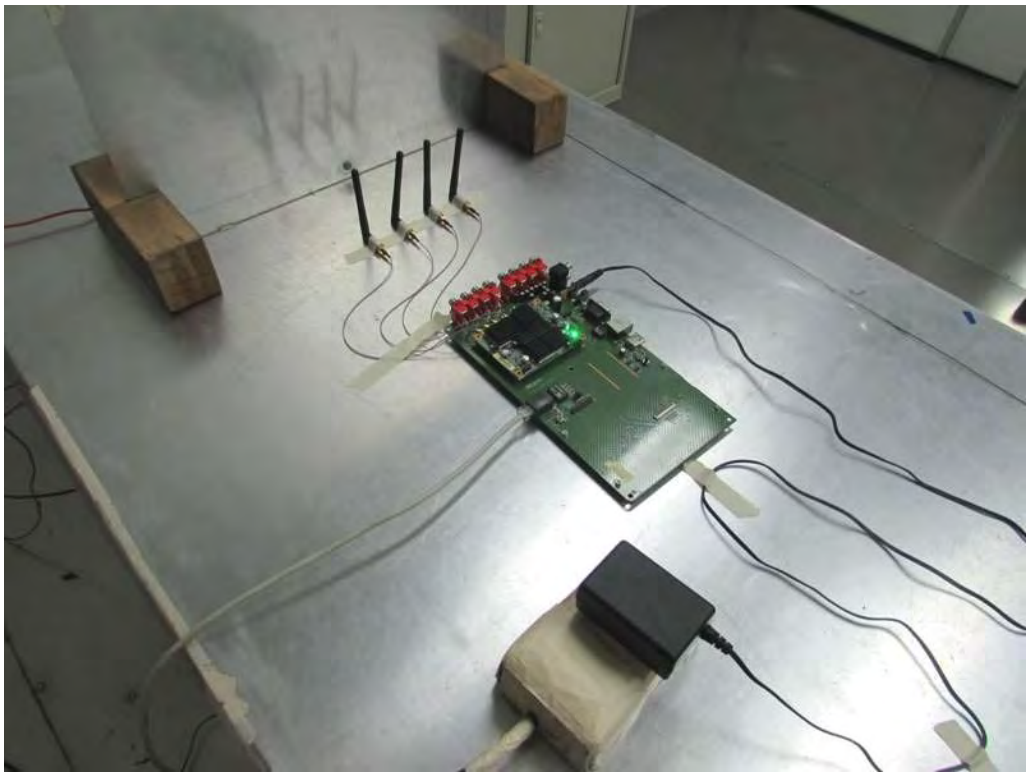


Test Mode: Mode 3, Mode 4

FRONT VIEW



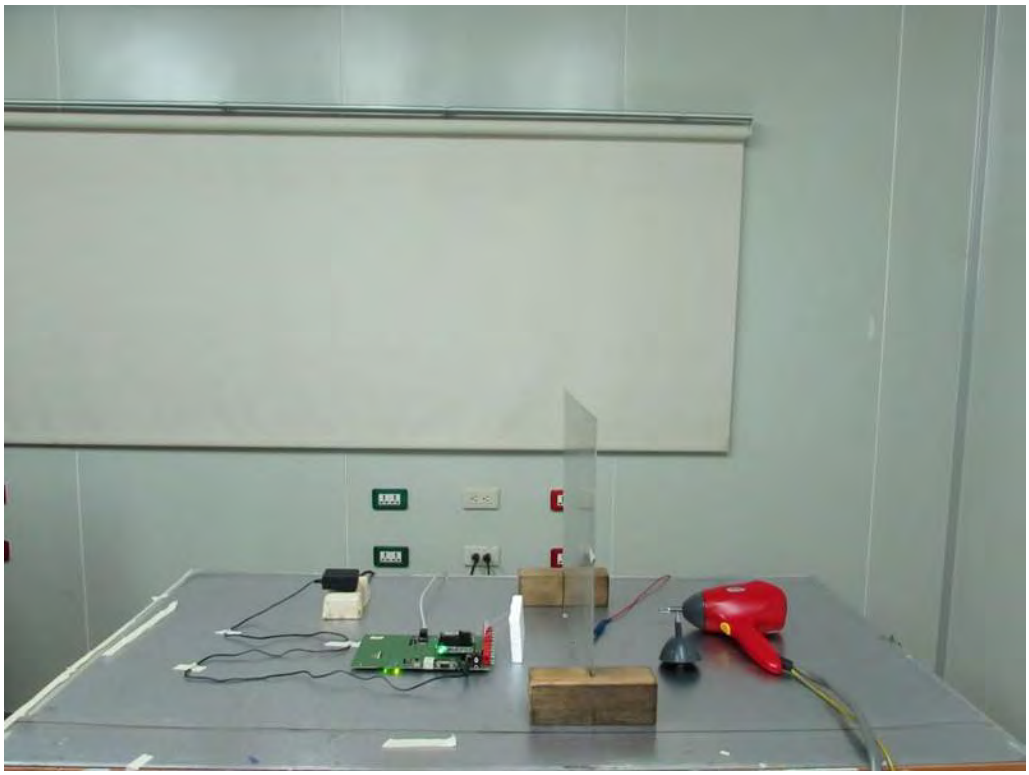
REAR VIEW



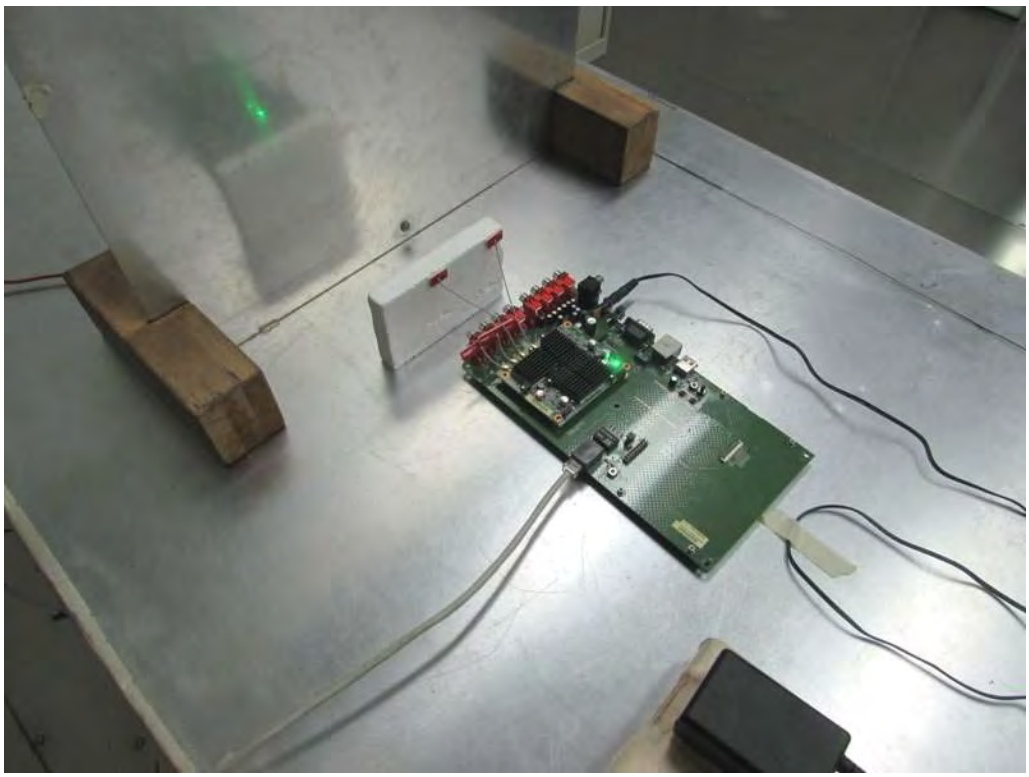
3. Photographs of ESD Immunity Test Configuration

Test Mode: Mode 1, Mode 2

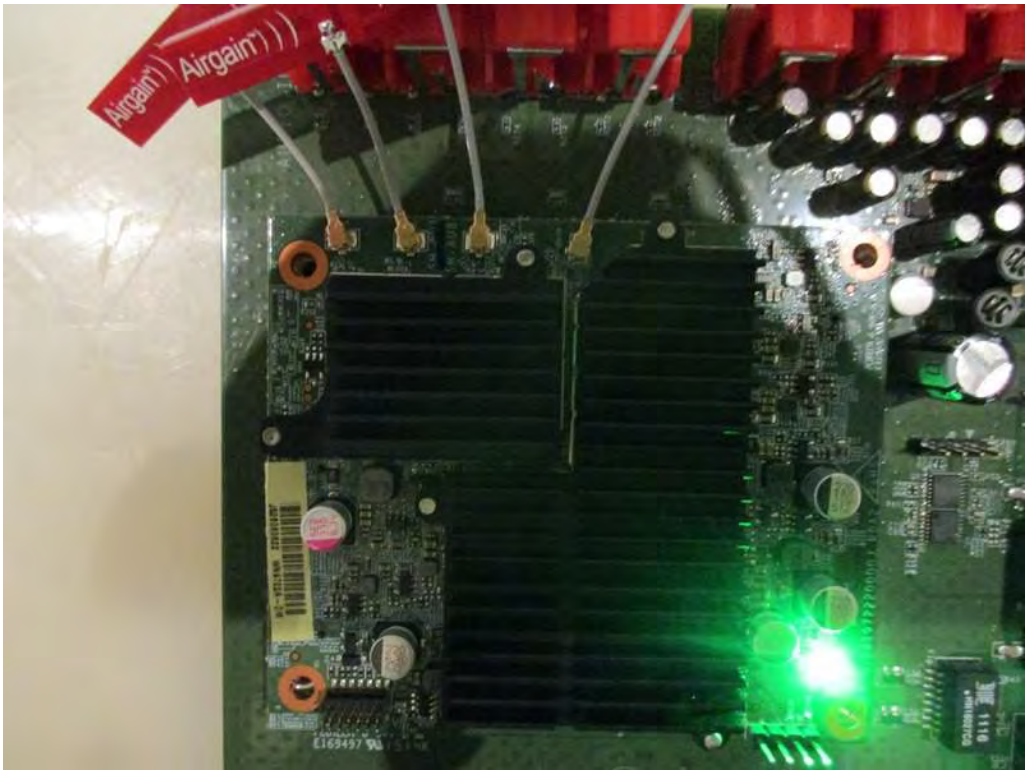
FRONT VIEW



REAR VIEW



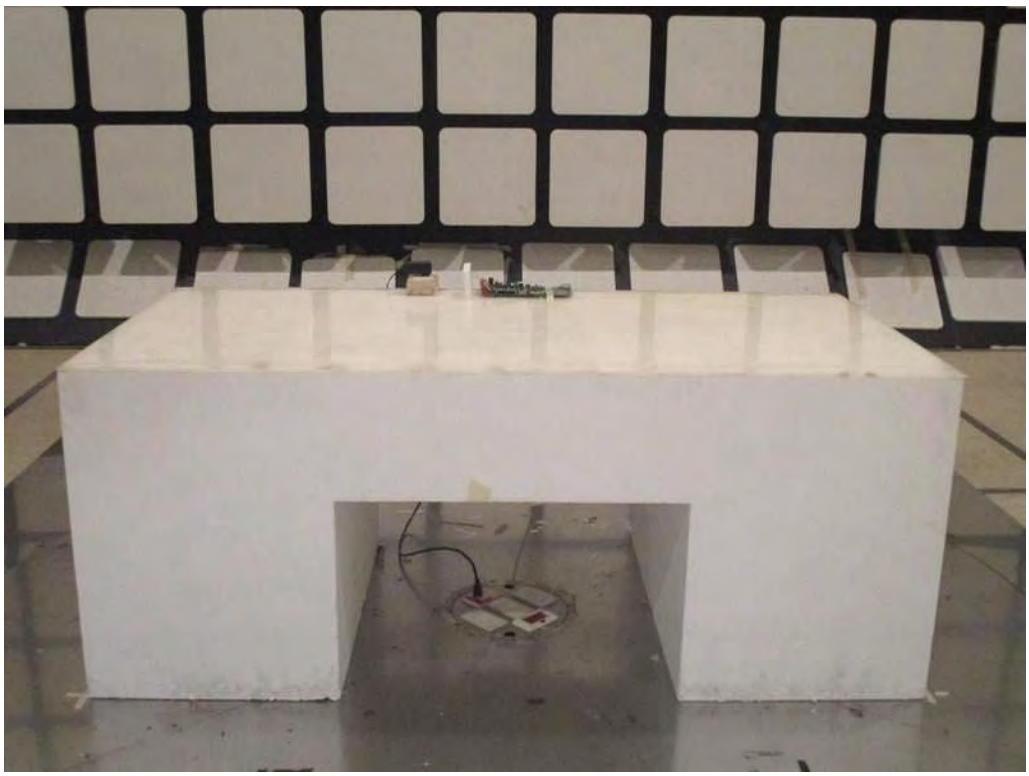
CLOSE-UP VIEW



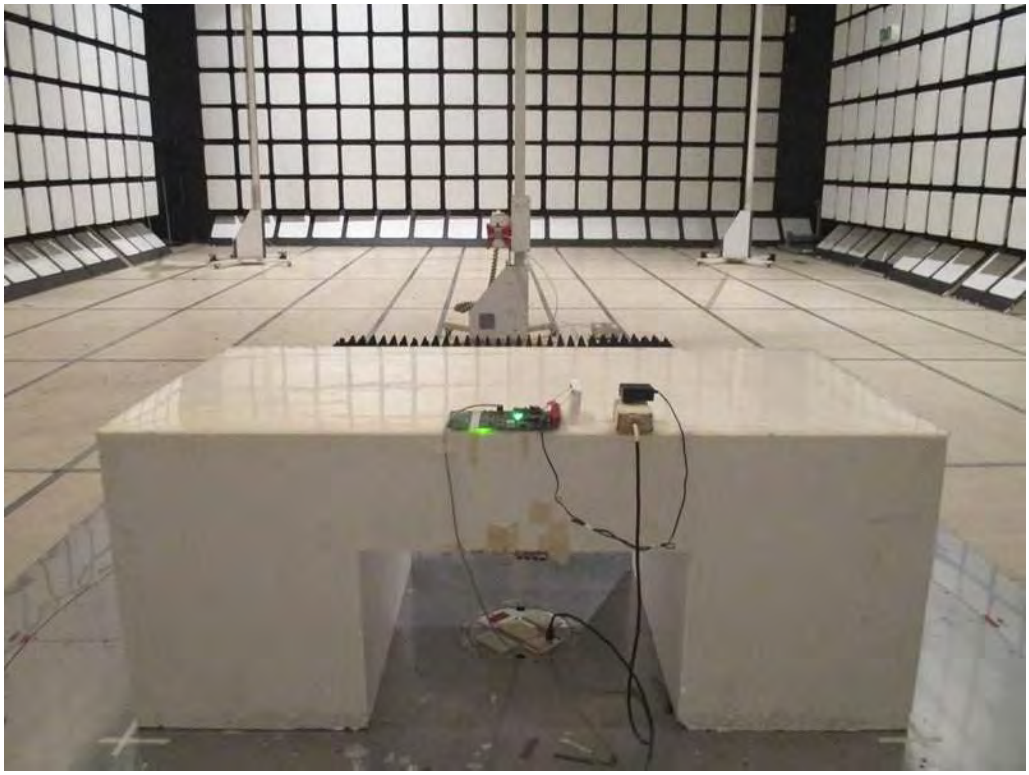
Applicable Standard: EN 55022:2010/AC:2011, CISPR 22 ed.6:2008/I-SH 1:2009/I-SH 2:2010/I-SH 3:2012 and AS/NZS CISPR 22:2009/Amdt 1:2010

Test Mode: Mode 3

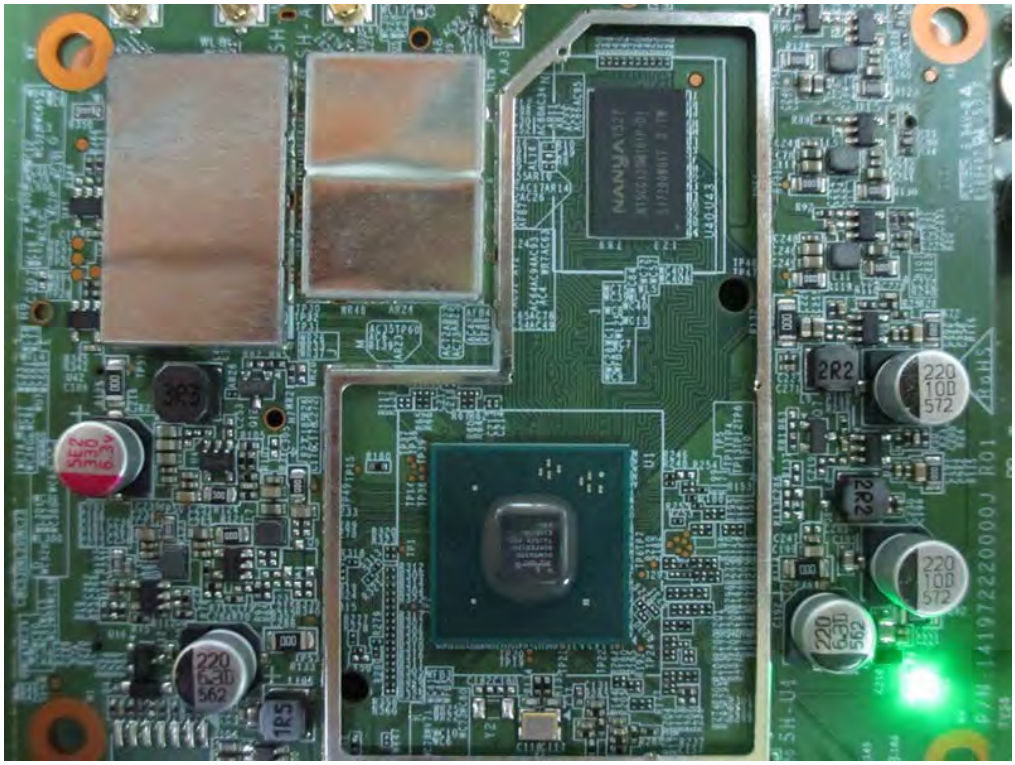
FRONT VIEW



REAR VIEW



CLOSE-UP VIEW

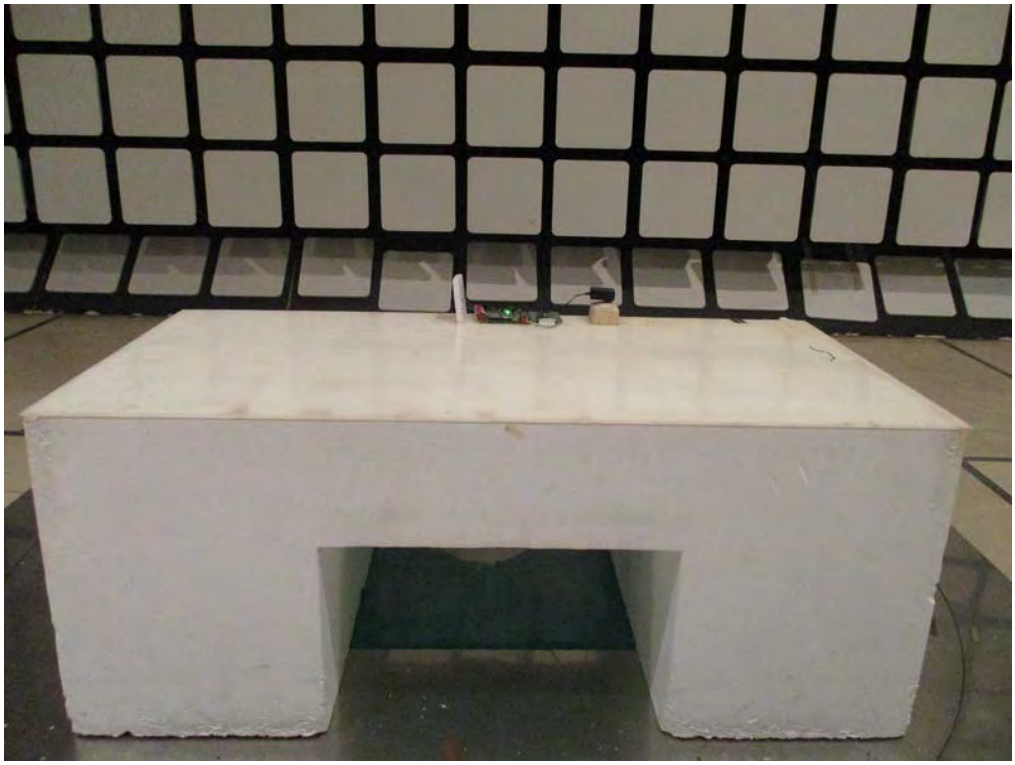


Test Configuration: Above 1GHz

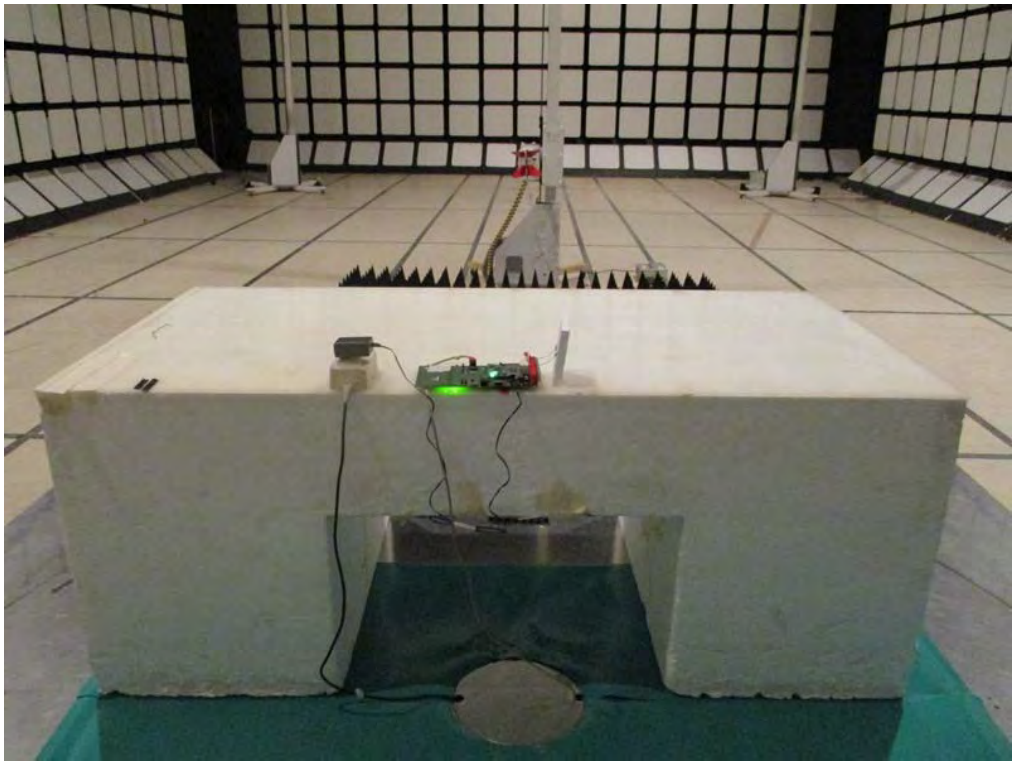
Applicable Standard: EN 301 489-1 V2.1.1 (2017-02), EN 55032:2012/AC:2013, CISPR 32:2012 and AS/NZS CISPR 32:2013

Test Mode: Mode 2

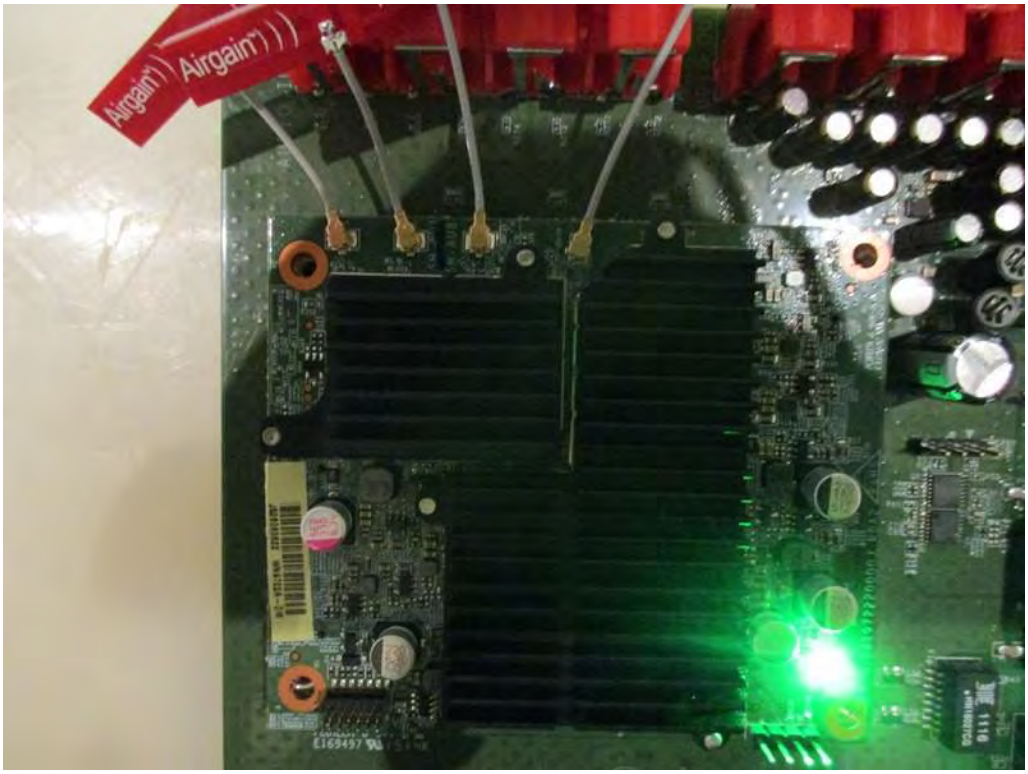
FRONT VIEW



REAR VIEW



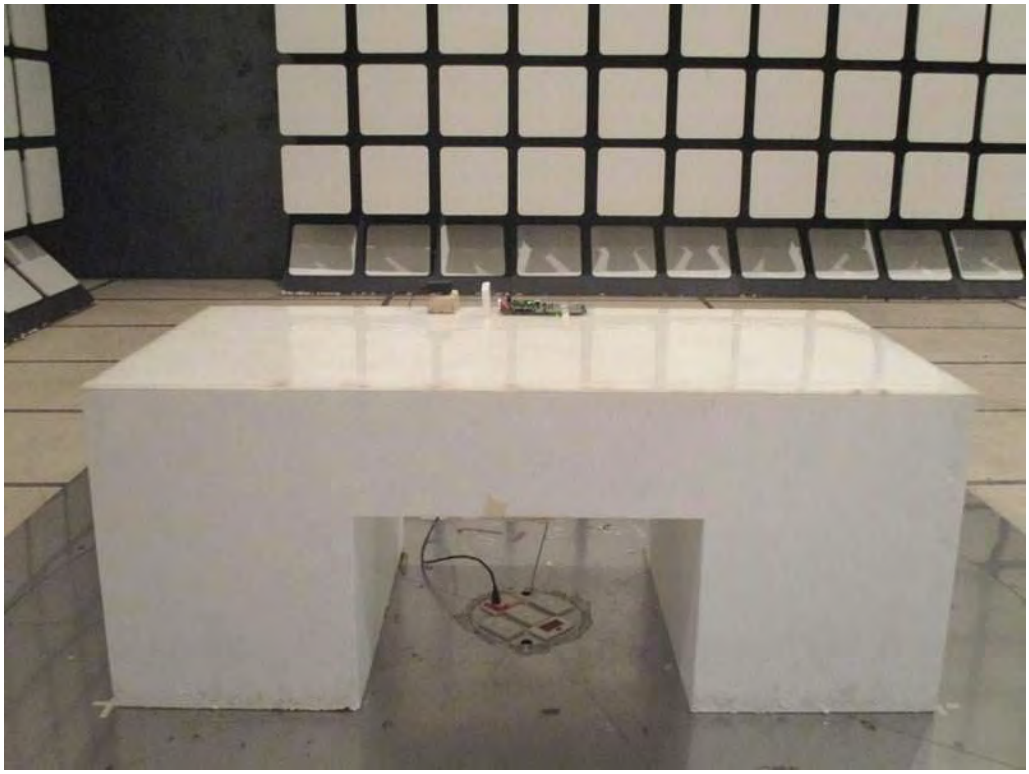
CLOSE-UP VIEW



Applicable Standard: EN 55022:2010/AC:2011, CISPR 22 ed.6:2008/I-SH 1:2009/I-SH 2:2010/I-SH 3:2012 and AS/NZS CISPR 22:2009/Amdt 1:2010

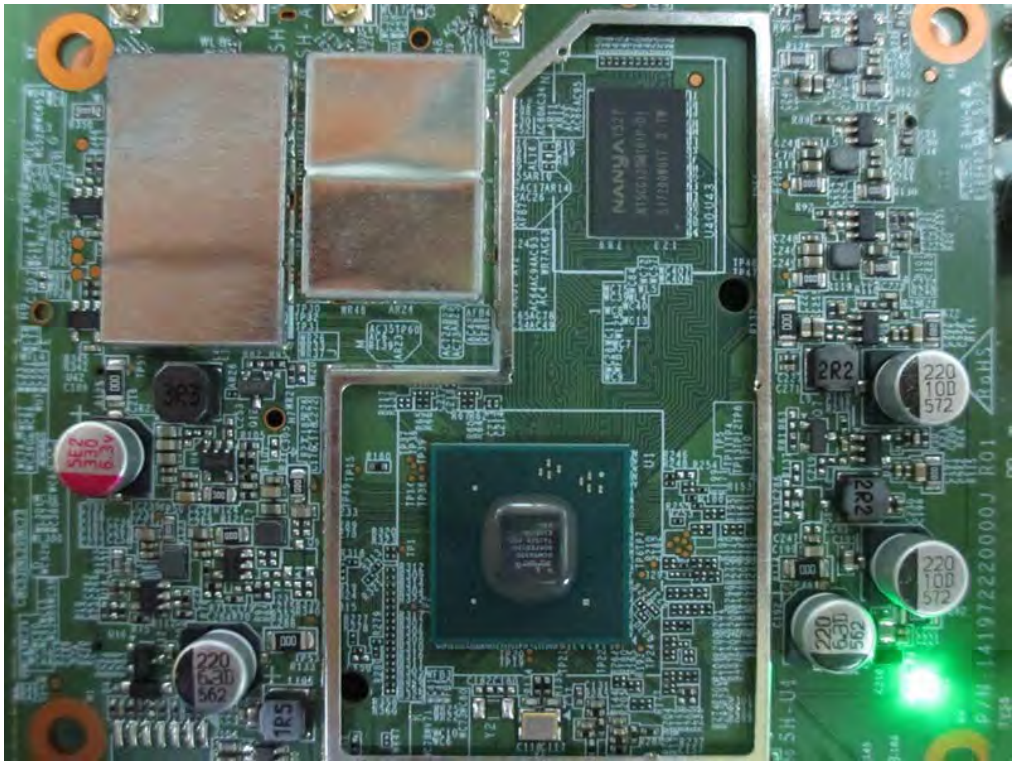
Test Mode: Mode 3

FRONT VIEW



REAR VIEW

CLOSE-UP VIEW



2. Photographs of Radiated Emissions Test Configuration

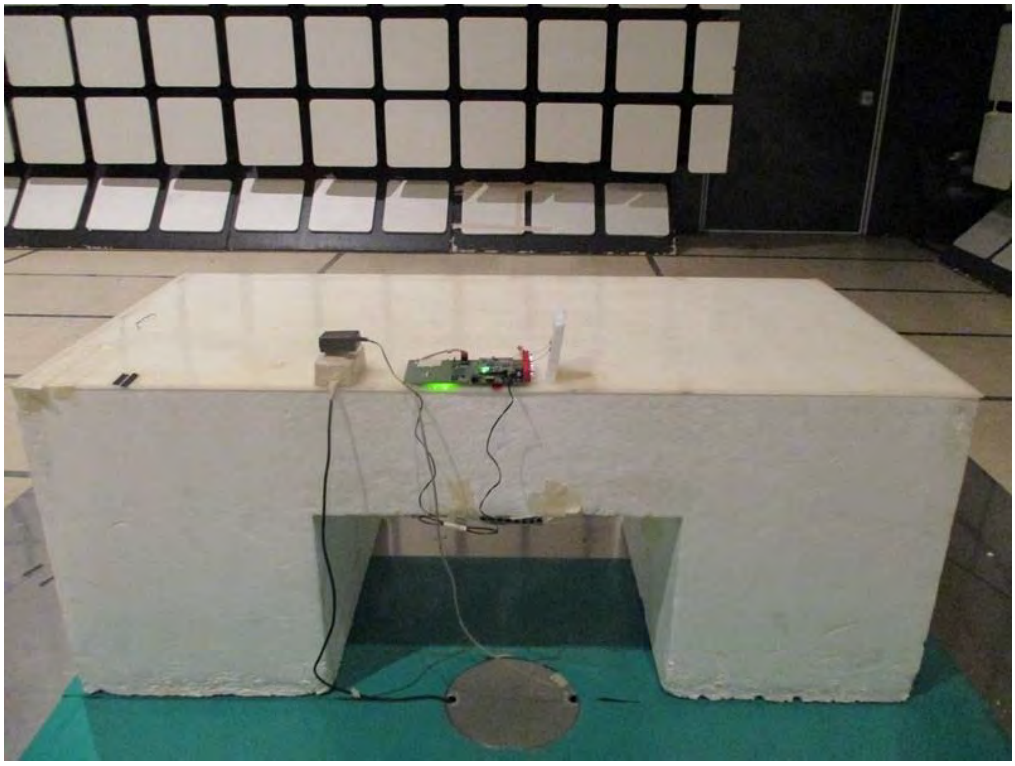
Test Configuration: 30MHz~1GHz

Applicable Standard: EN 301 489-1 V2.1.1 (2017-02), EN 55032:2012/AC:2013, CISPR 32:2012 and AS/NZS CISPR 32:2013

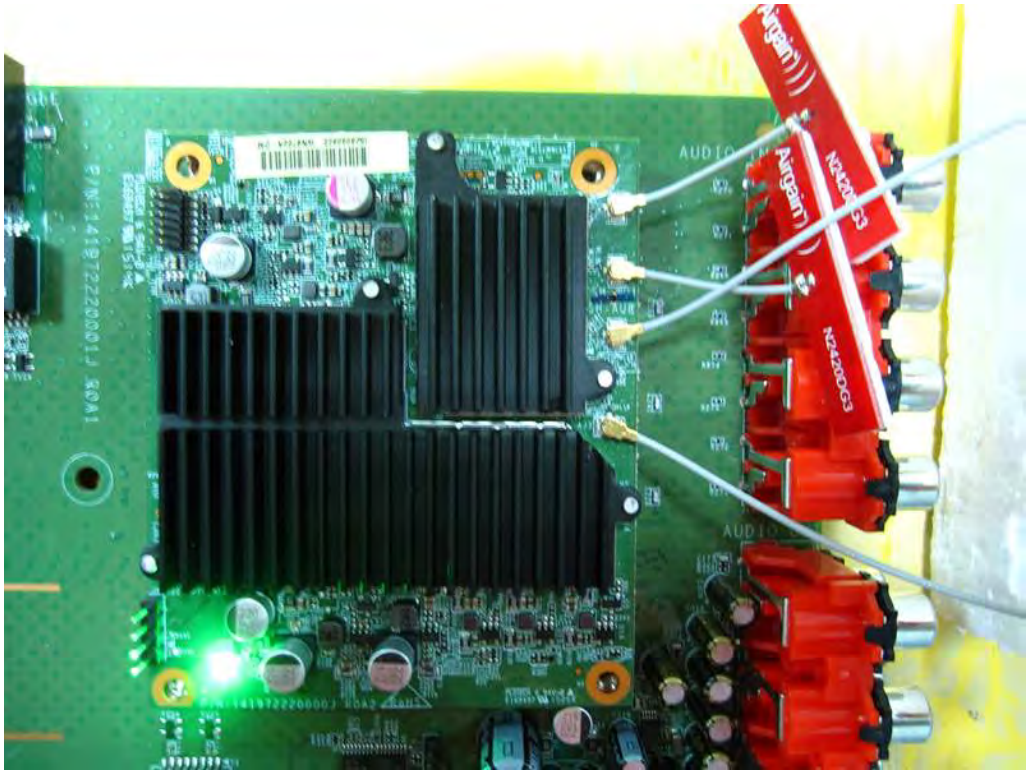
Test Mode: Mode 2

FRONT VIEW

REAR VIEW



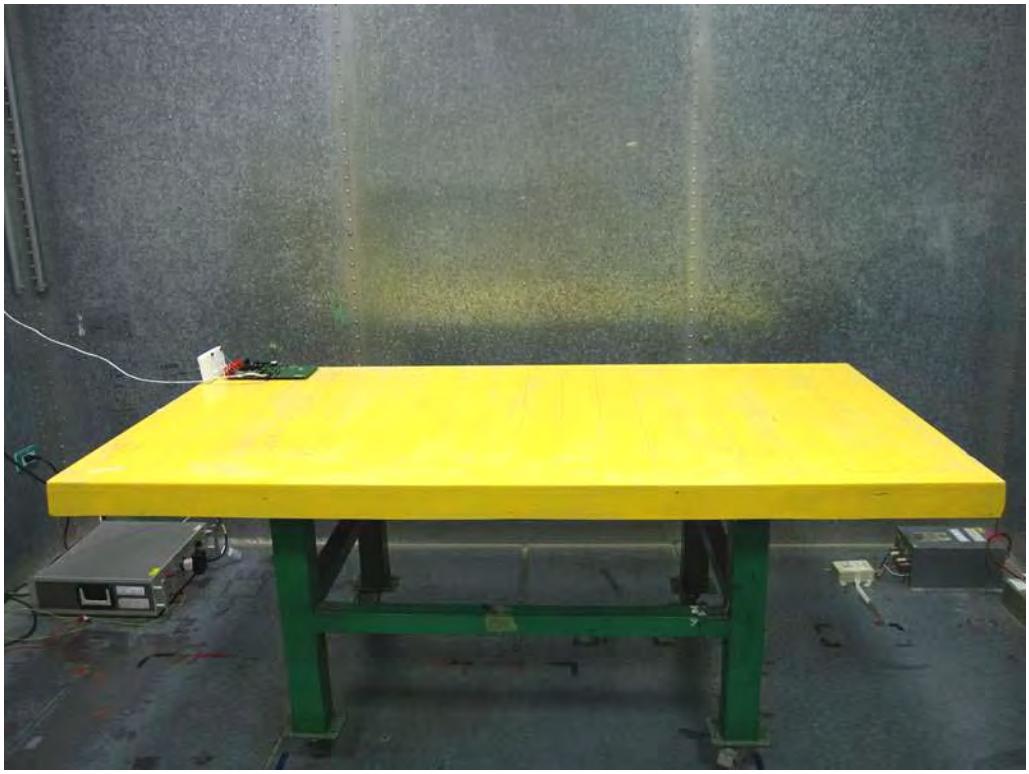
CLOSE-UP VIEW



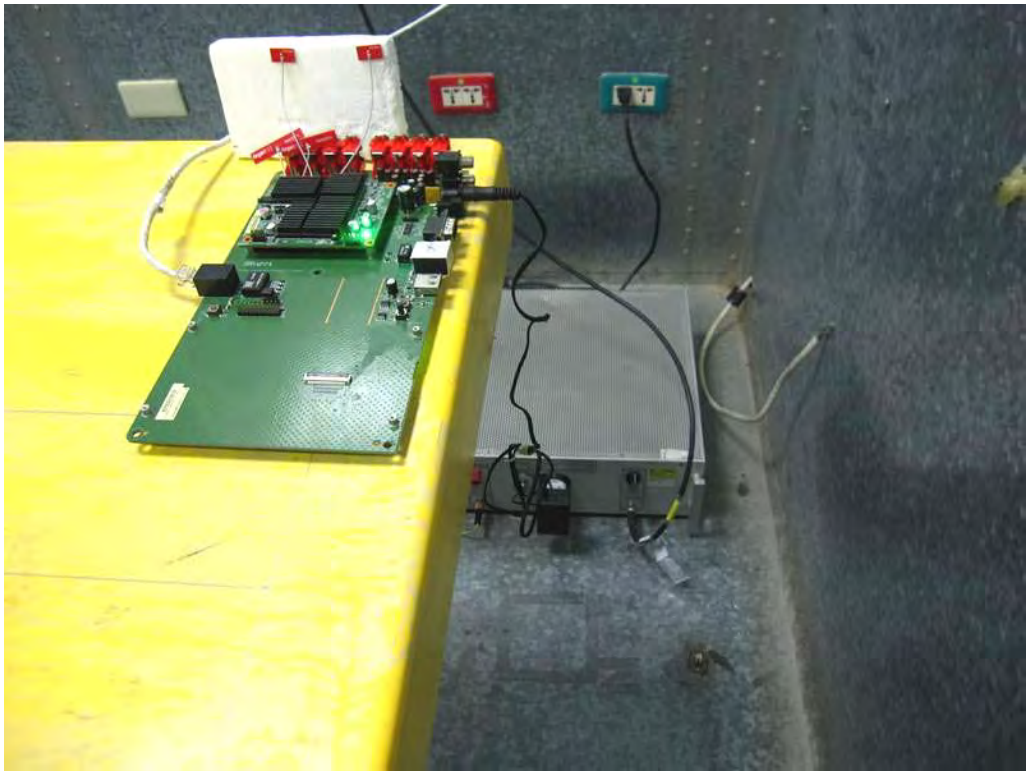
Applicable Standard: EN 55022:2010/AC:2011, CISPR 22 ed.6:2008/I-SH 1:2009/I-SH 2:2010/I-SH 3:2012 and AS/NZS CISPR 22:2009/Amdt 1:2010

Test Mode: Mode 2

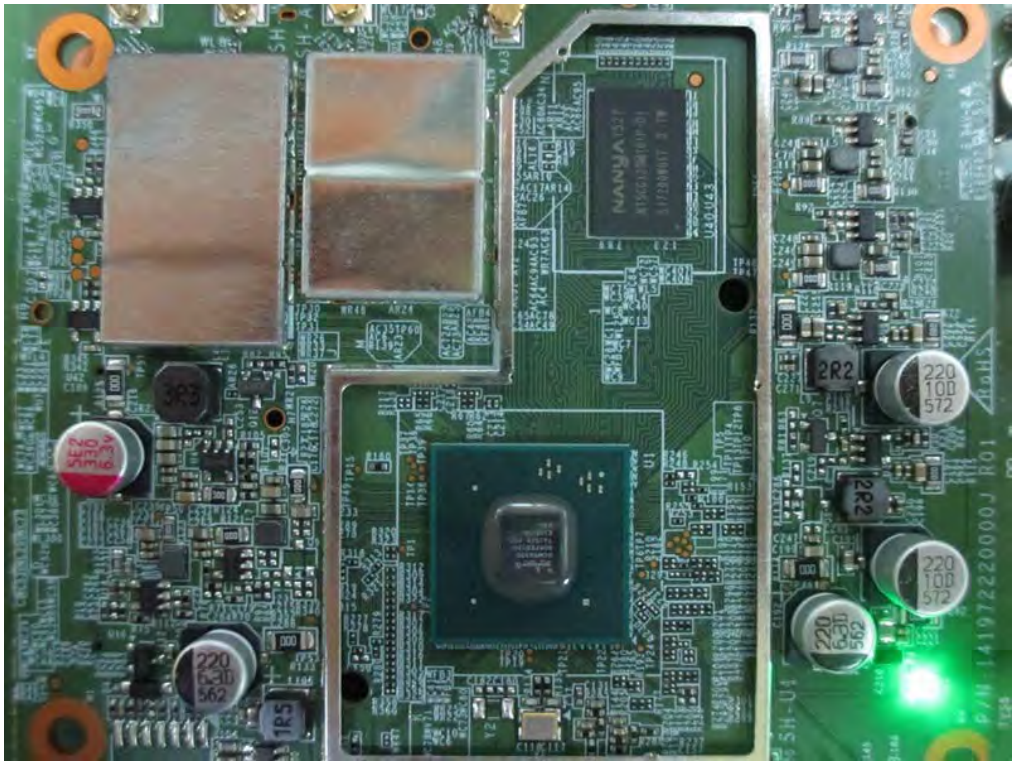
FRONT VIEW



REAR VIEW



CLOSE-UP VIEW

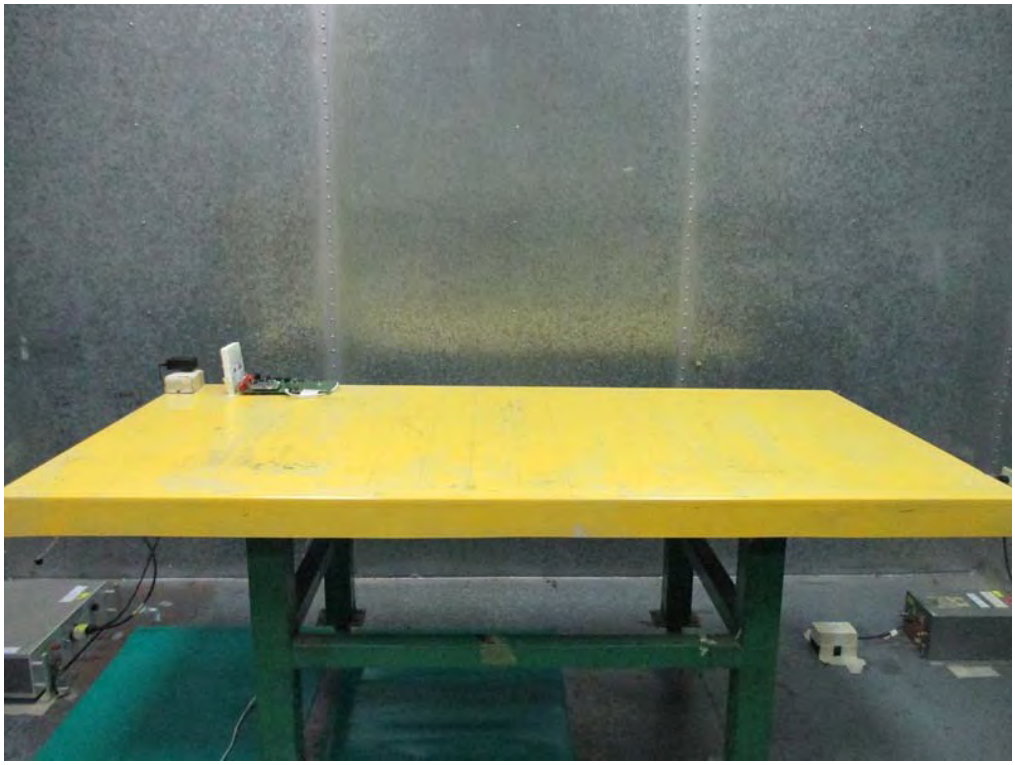


1. Photographs of Conducted Emissions Test Configuration

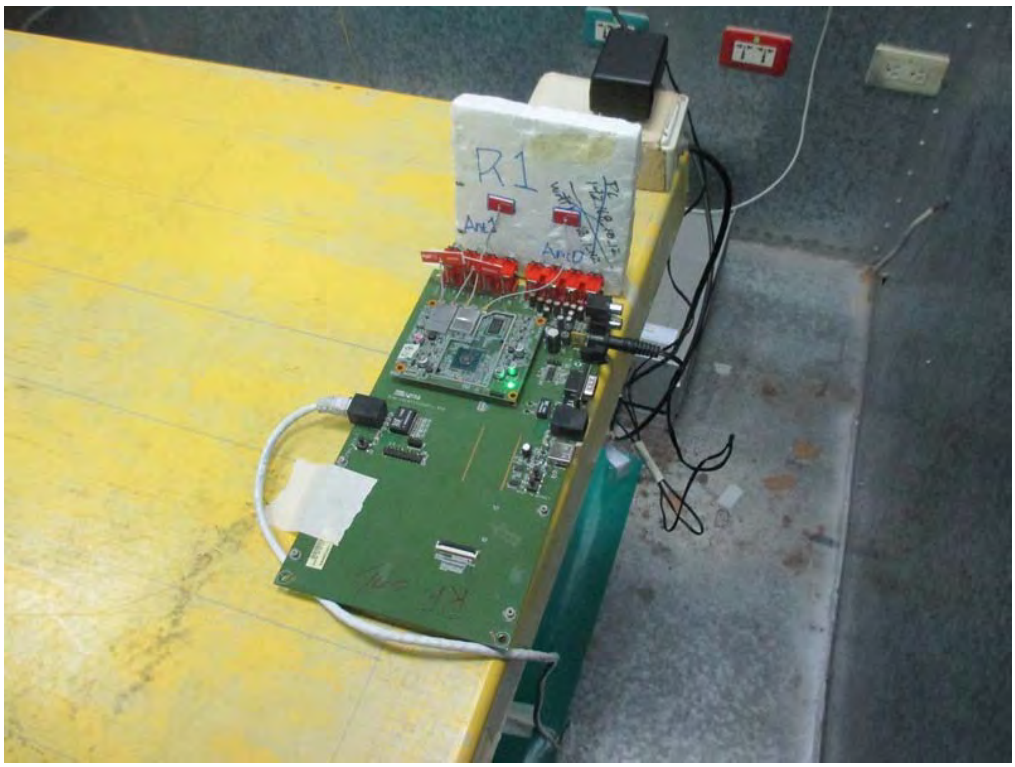
Applicable Standard: EN 301 489-1 V2.1.1 (2017-02), EN 55032:2012/AC:2013, CISPR 32:2012 and AS/NZS CISPR 32:2013

Test Mode: Mode 1

FRONT VIEW



REAR VIEW

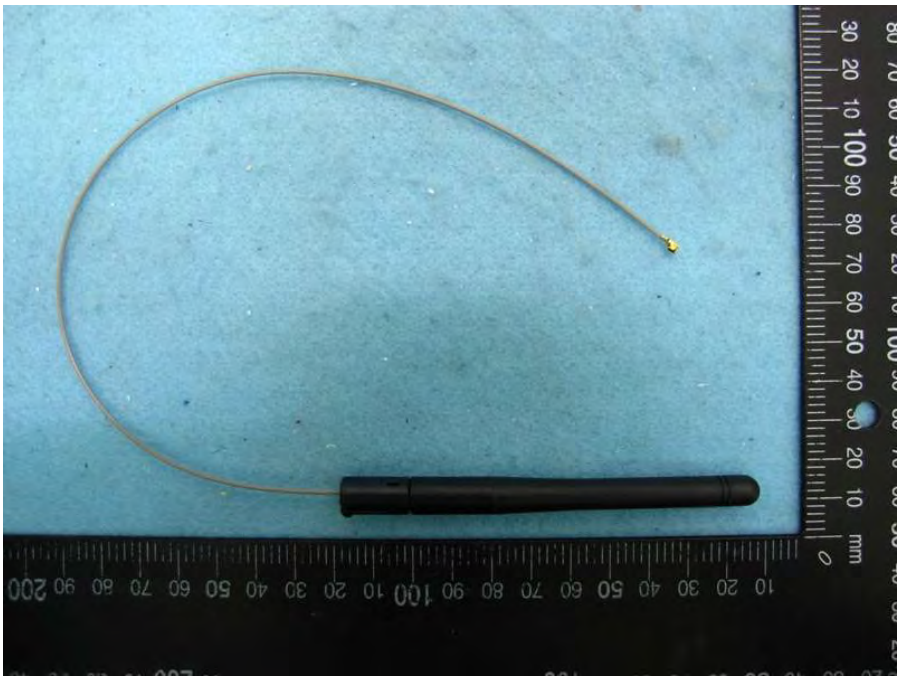


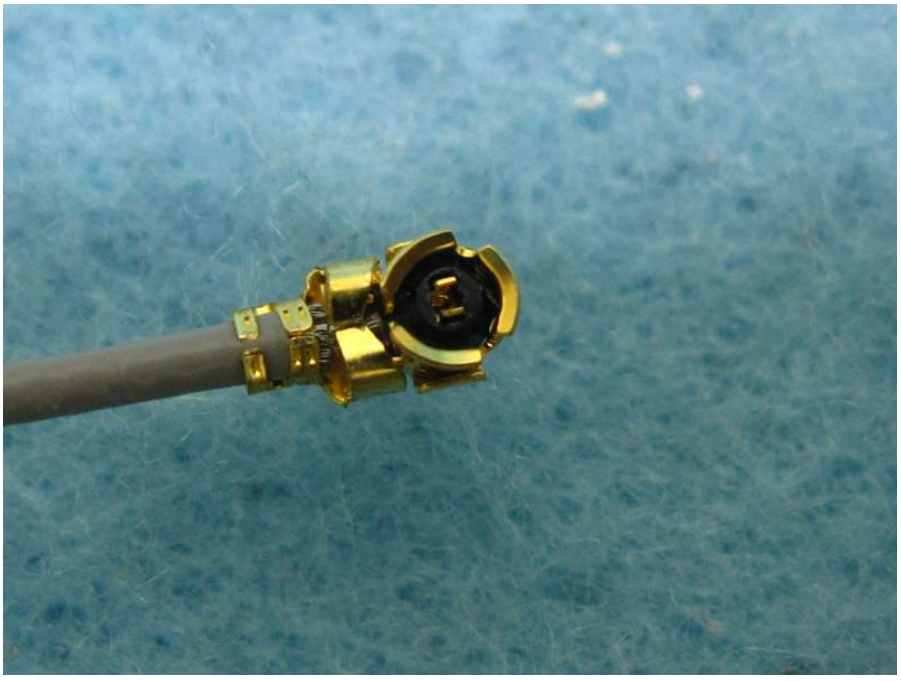
Appendix B. Test Photos

Set 11 antenna

Model No.:

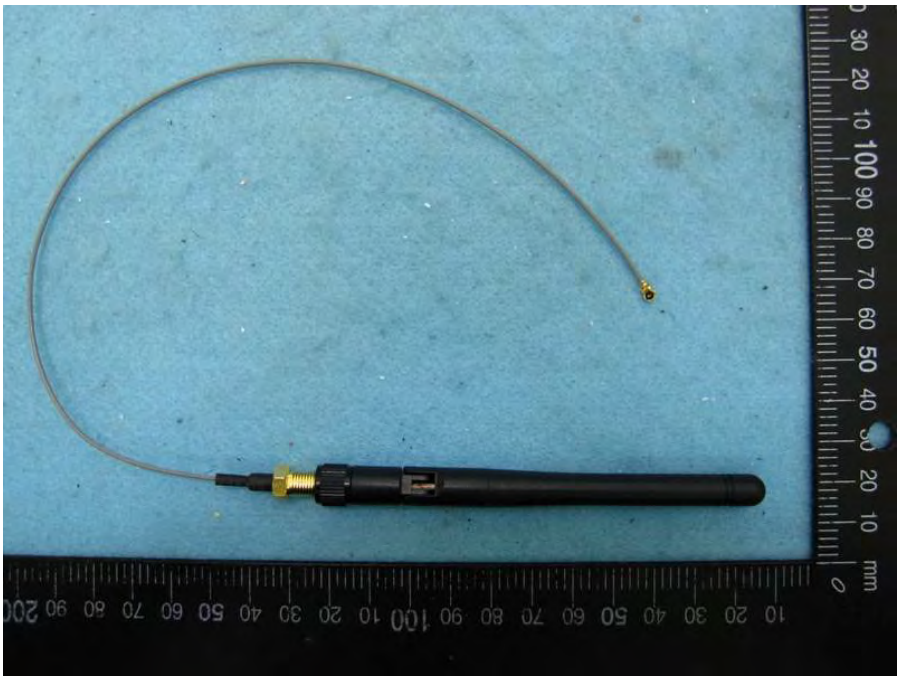
WN9722A-DM-300mm

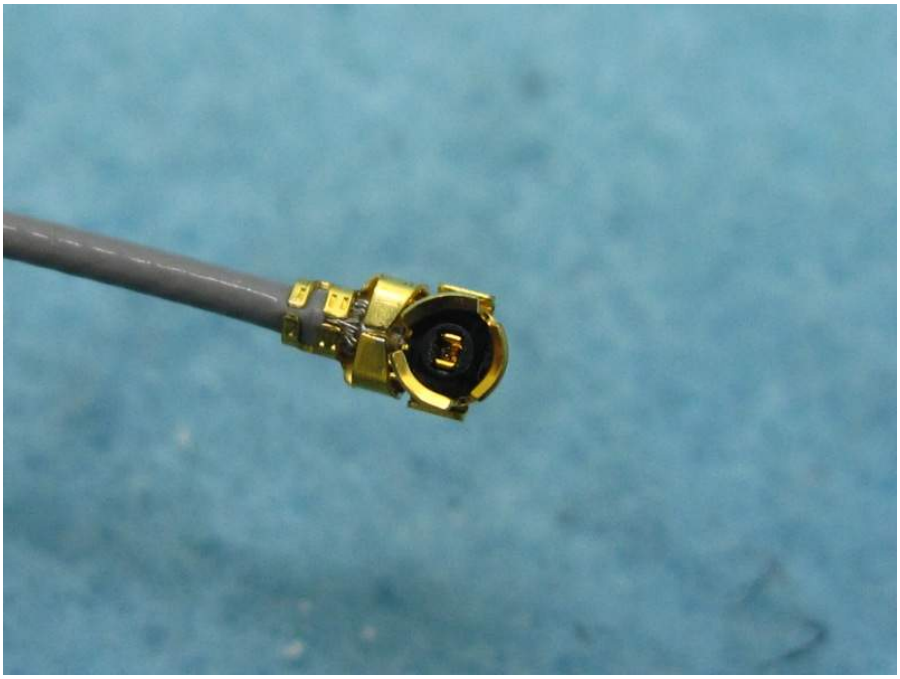


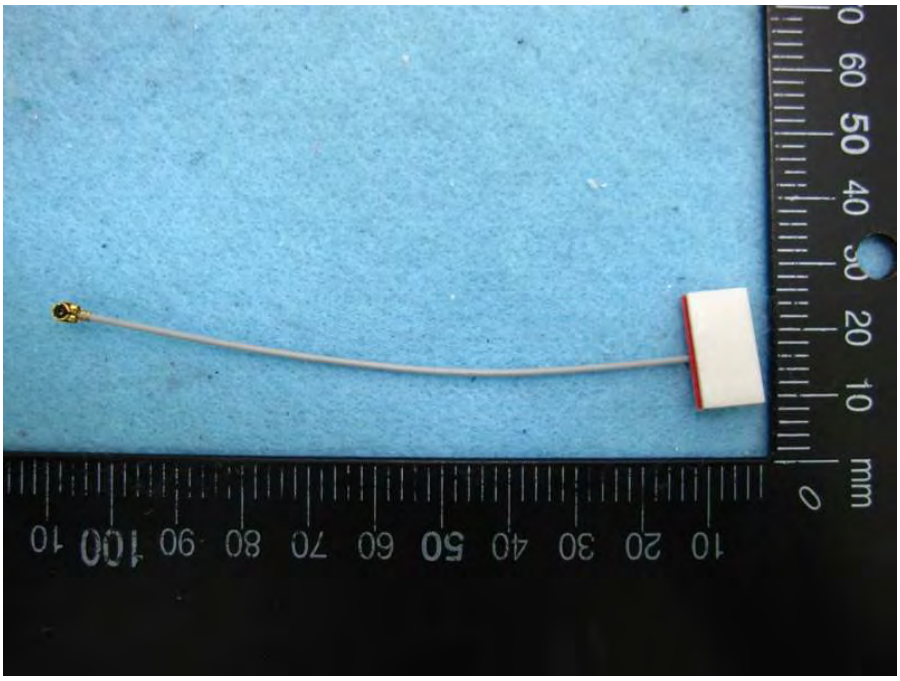


Set 10 antenna

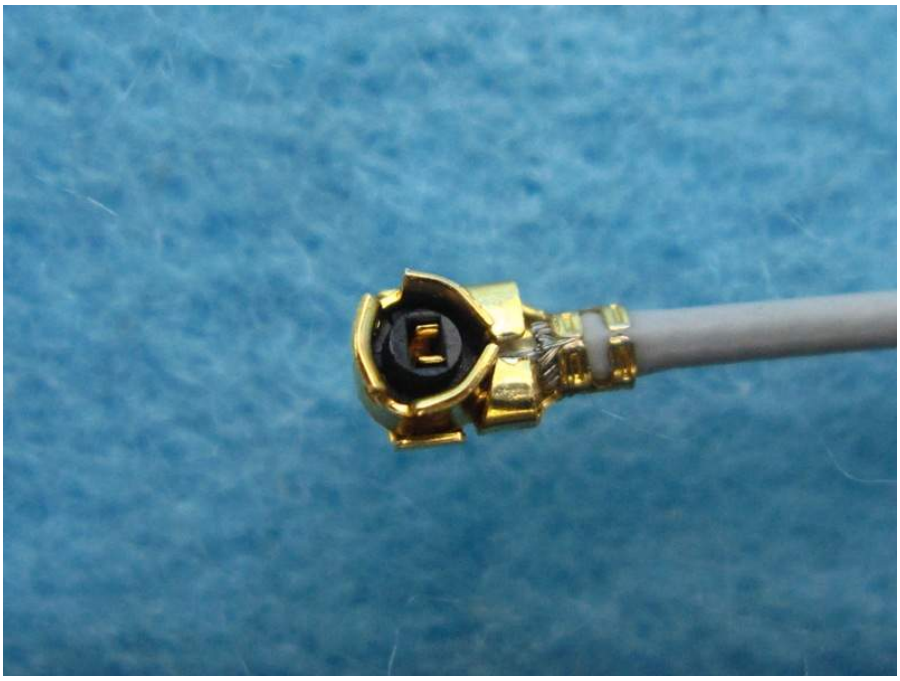
Model No.: WN9722A-DM







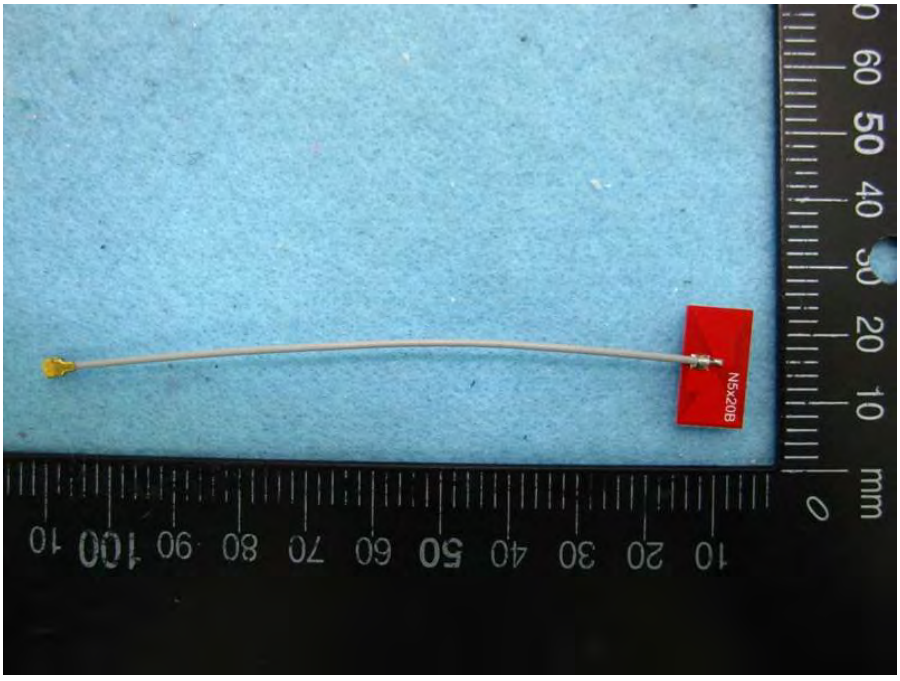
SPORTON International Inc.
TEL : 886-3-327-3456
FAX : 886-3-327-0973



Set 8 antenna

P/N:

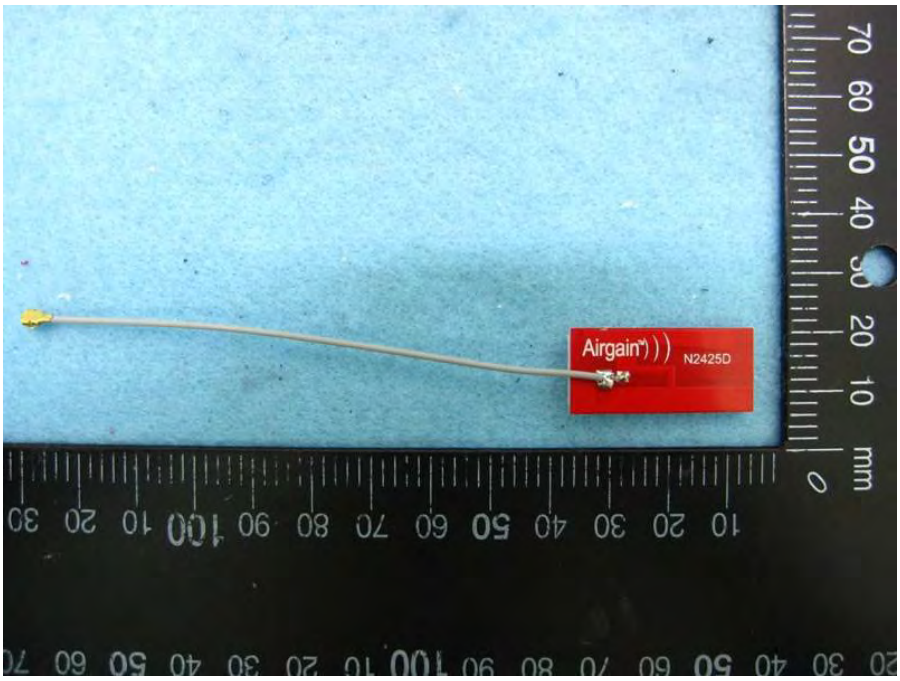
N5X20B-T2L-PK1-G100U

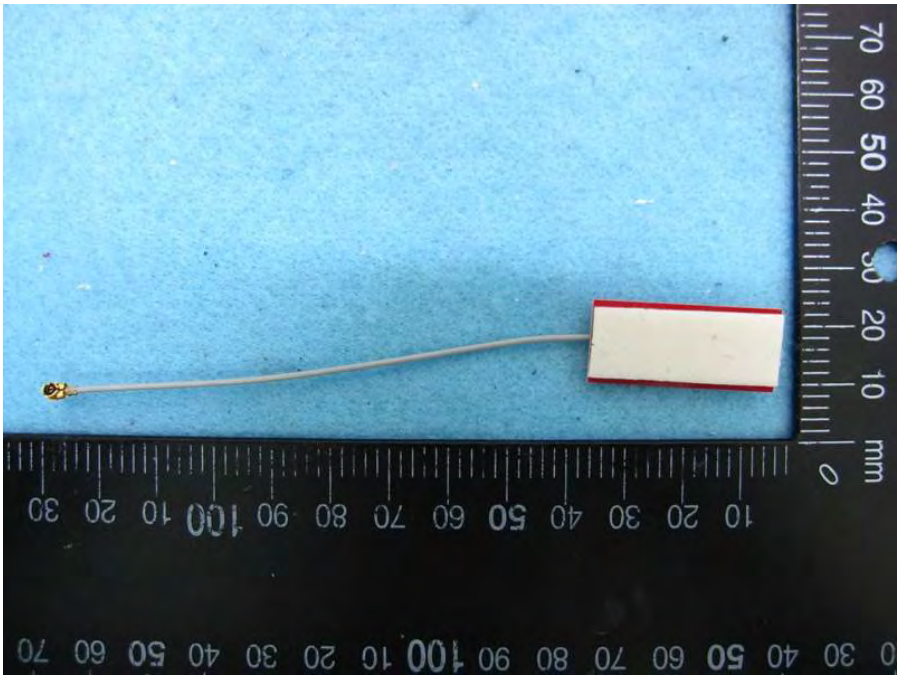


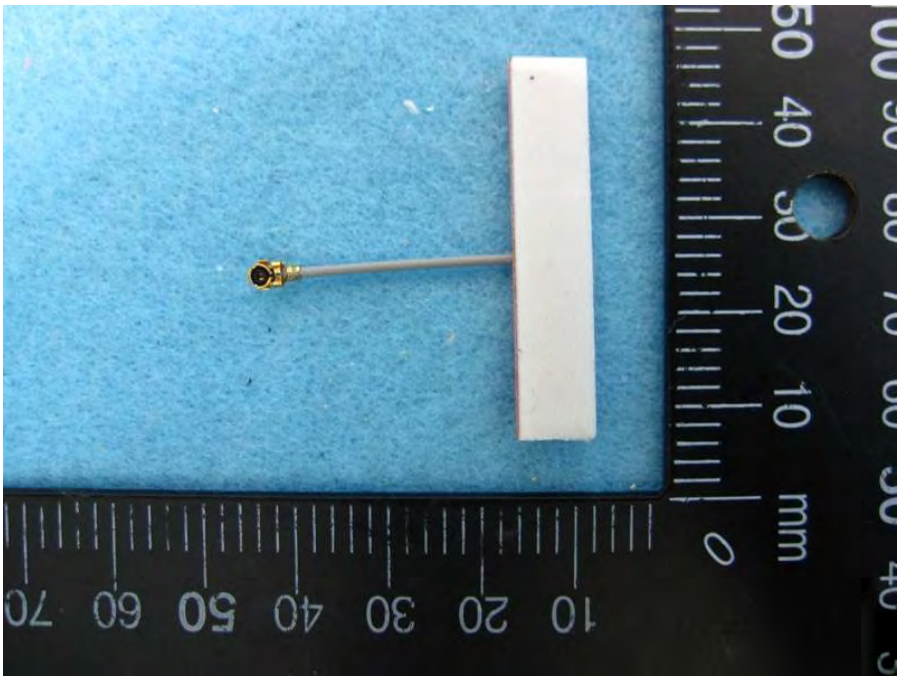
Set 5 antenna

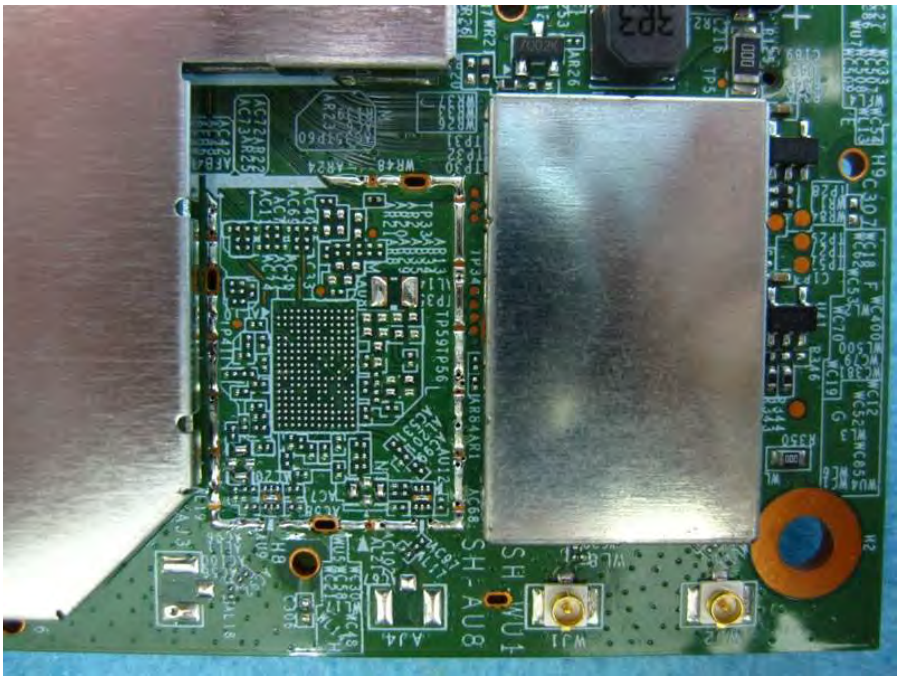
P/N:

N2425D-T2R-PK1-G150U





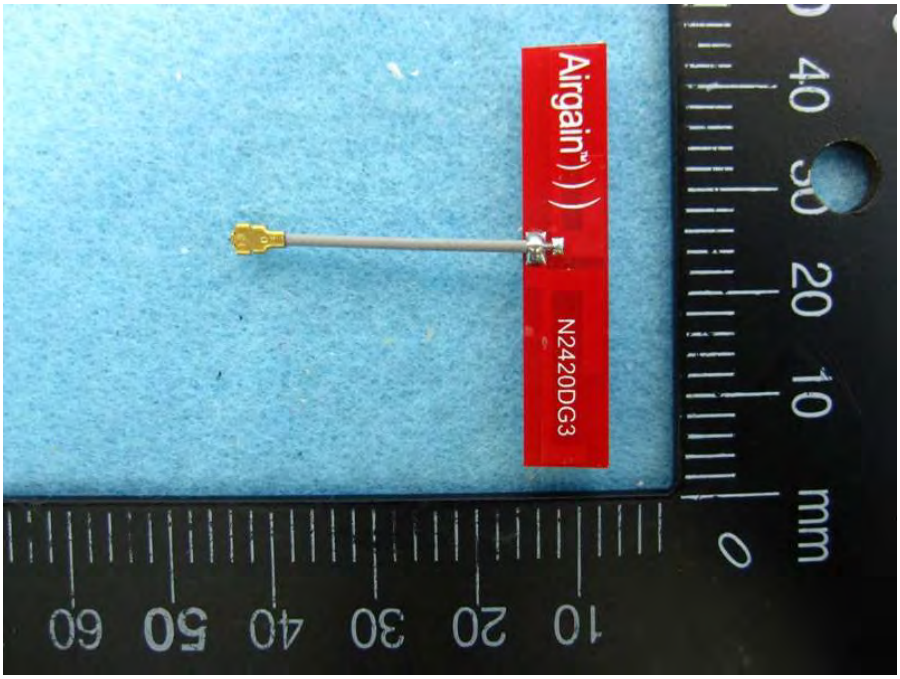

mm

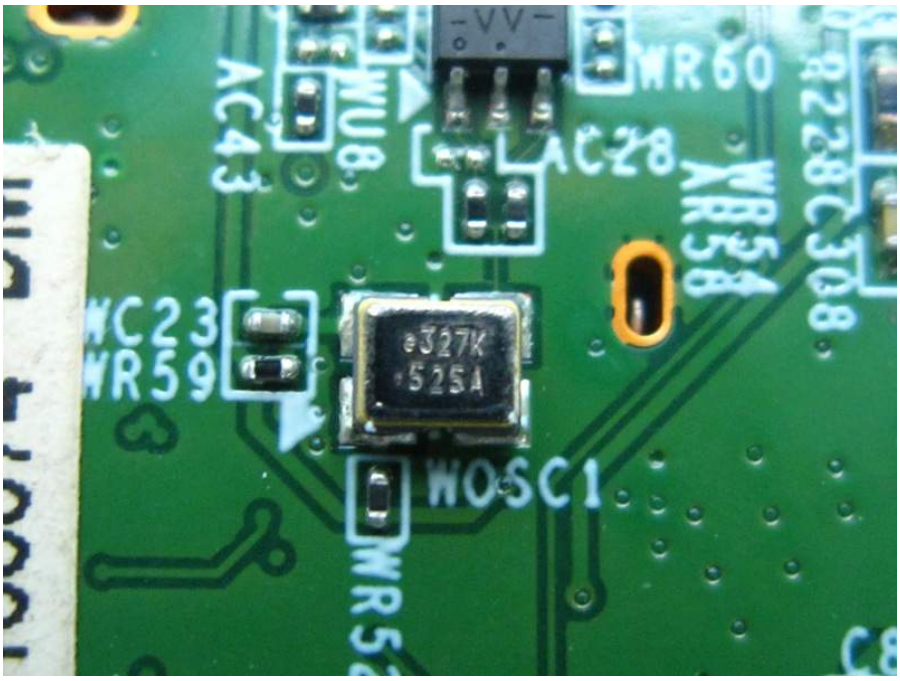


Set 1 antenna

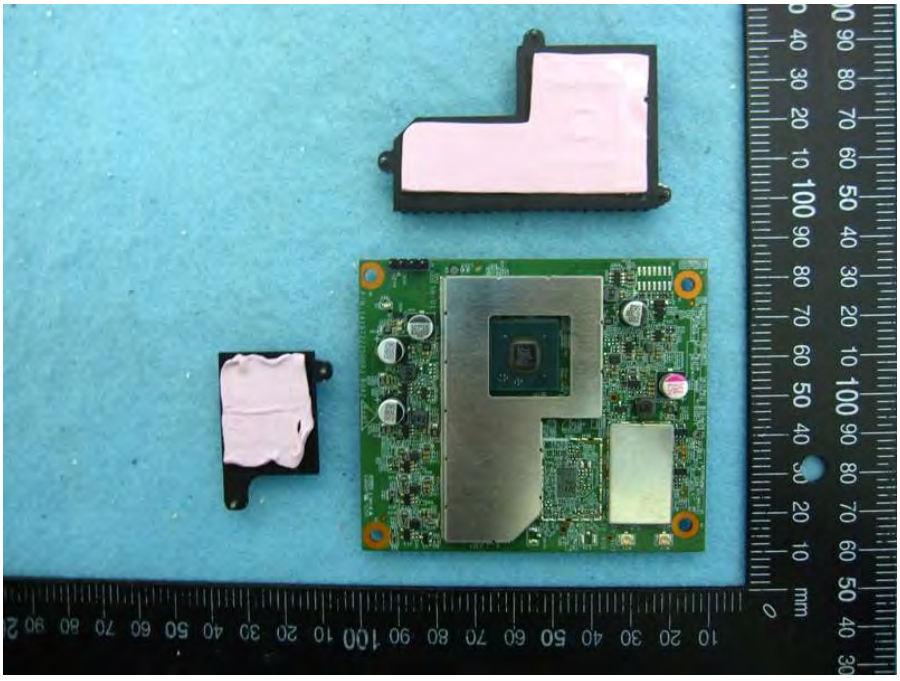
P/N:

N2420DG3-T2L-PK1-G30U




WR60
R228C308
AC28
WR54
WR58
AC43
WU8
WC23
WR59
e327K
525A
WOSC1
WR52

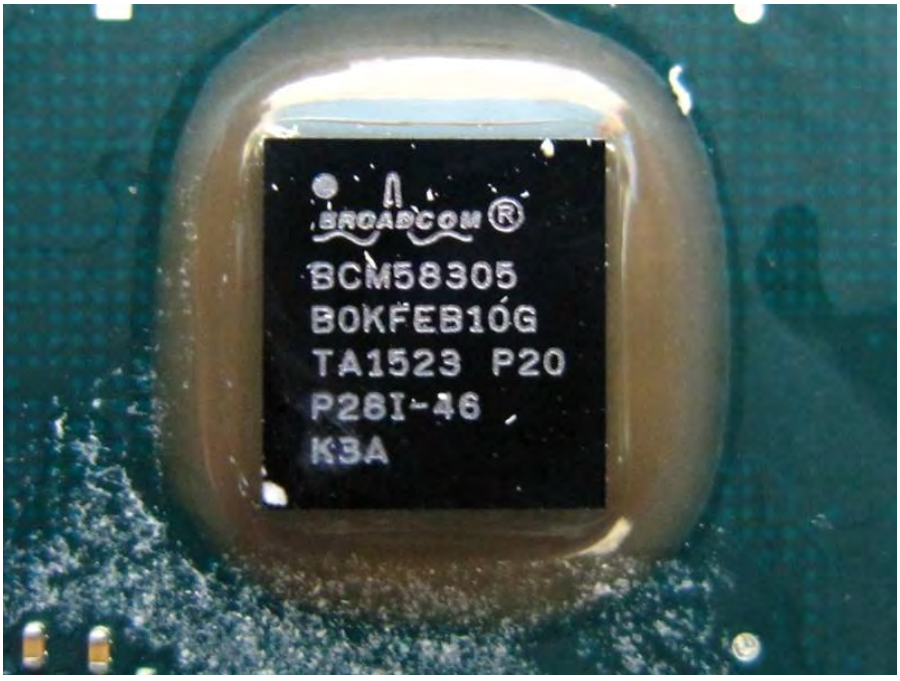
Radio: R0

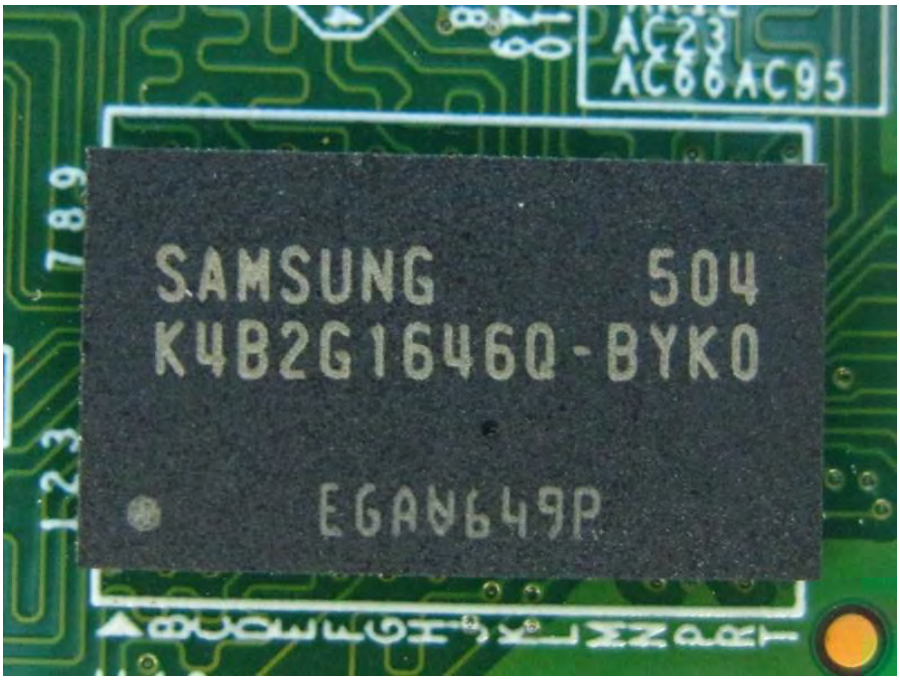


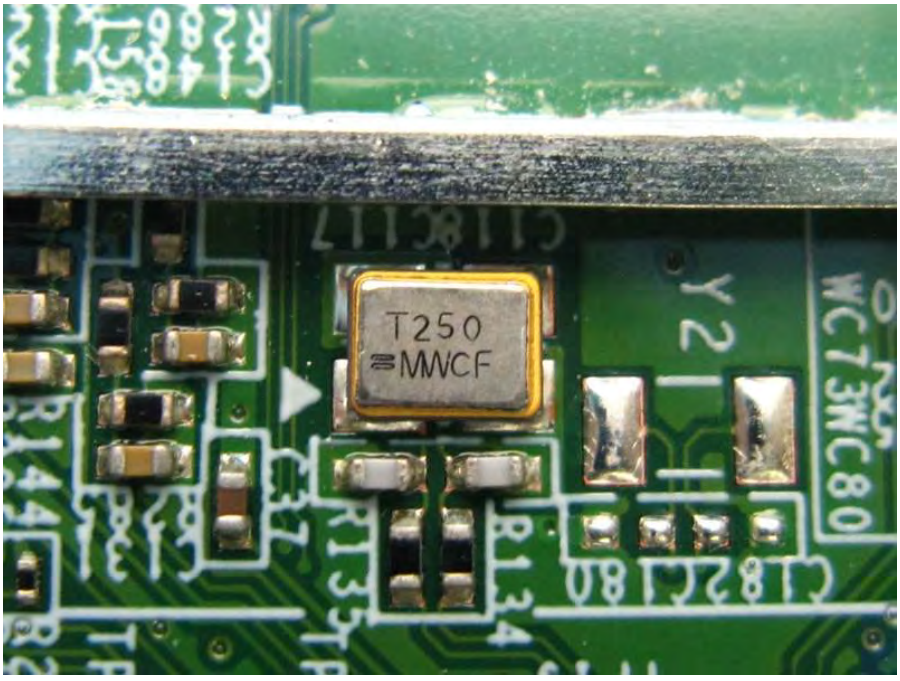
WN9722A-DM
U6 MAIN
V01.01 5669

CPU: 1.25G

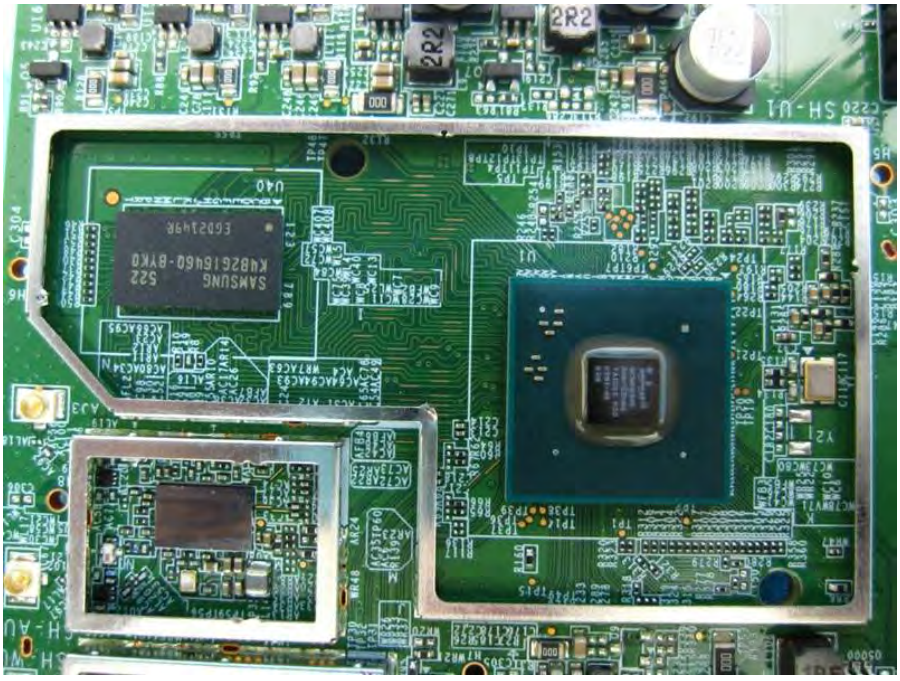
CPU: 1G

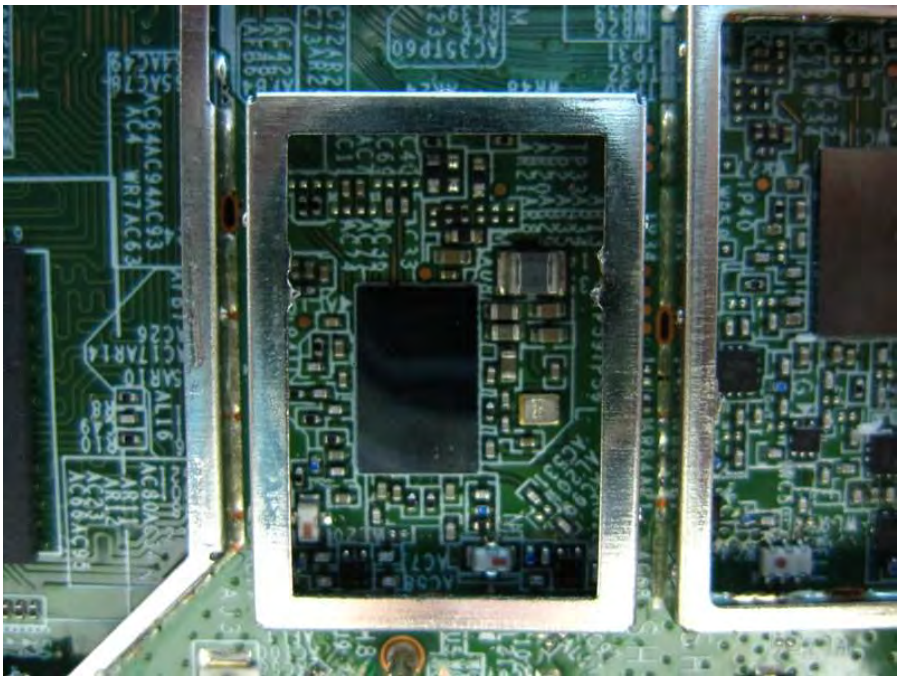


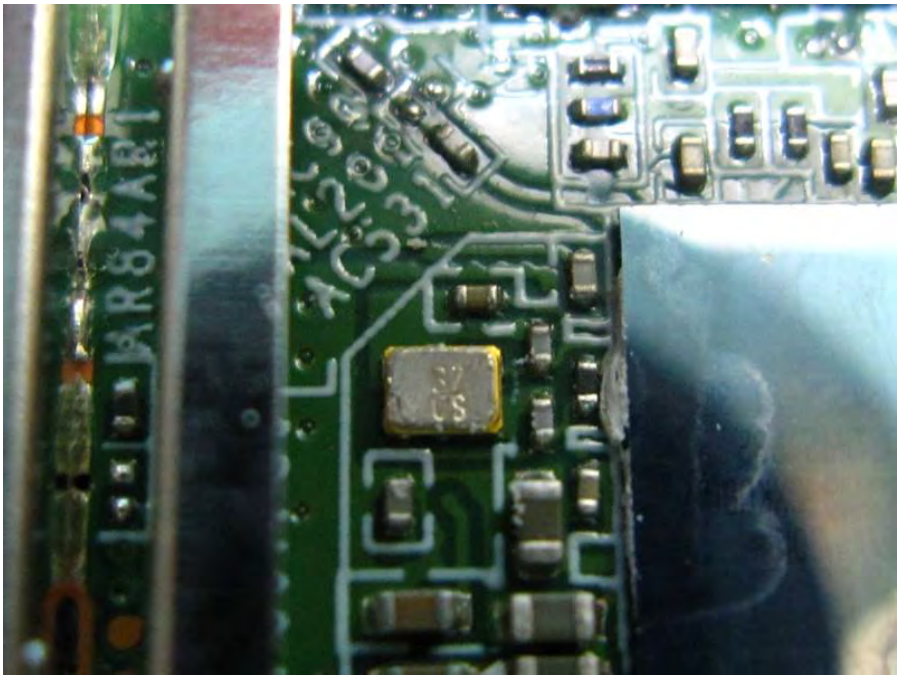

AC23
AC66AC95
SAMSUNG 504
K4B2G1646Q-BYK0
EGAN649P

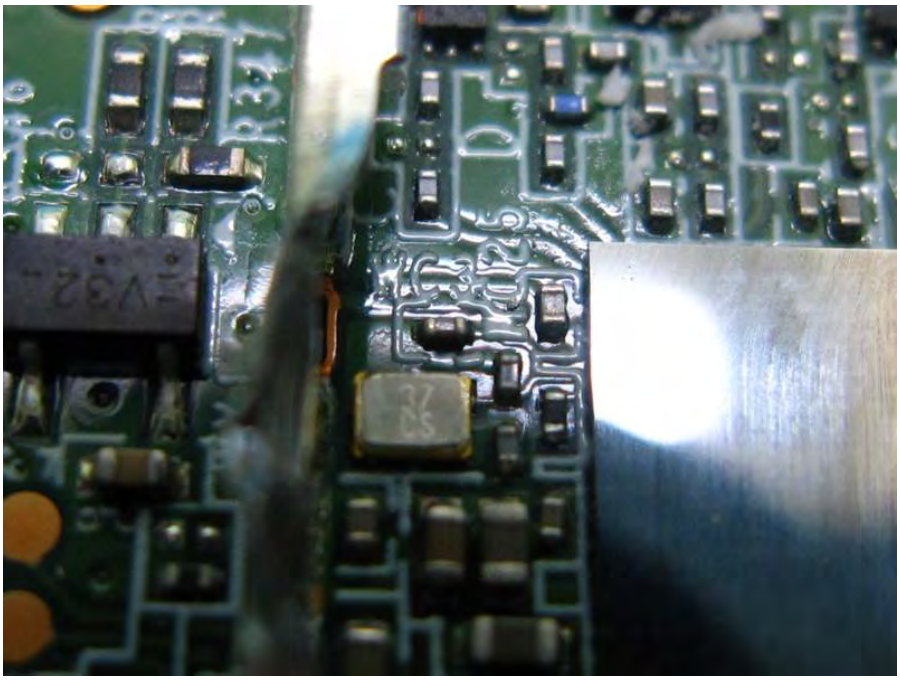

T250
MMCF
Y2
WC73WC80

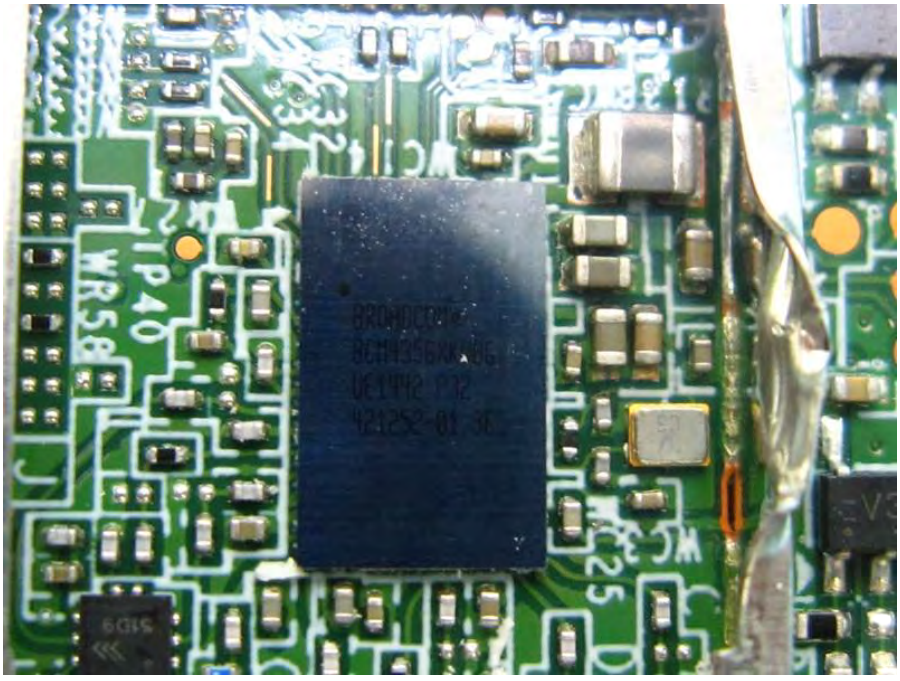
BROADCOM
BCM4335EKKUBG

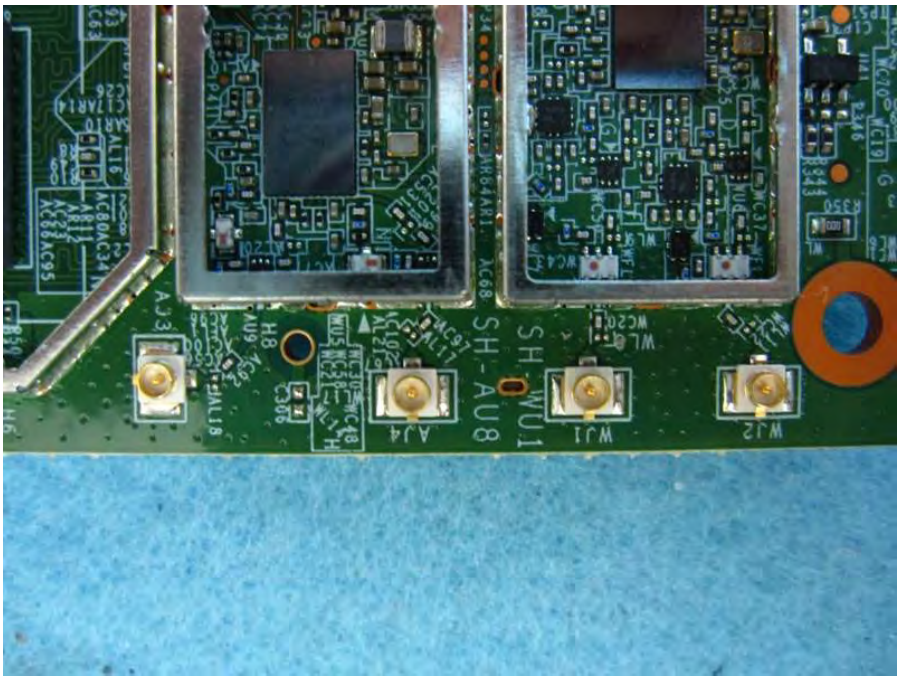

SAMSUNG
K4B2G1646Q-BYK0
2R2

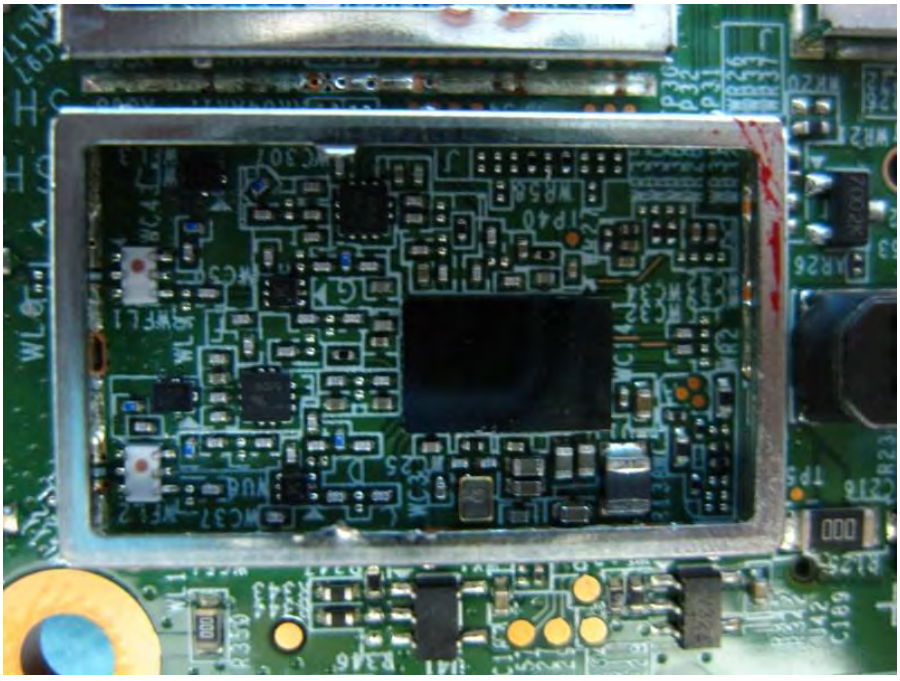


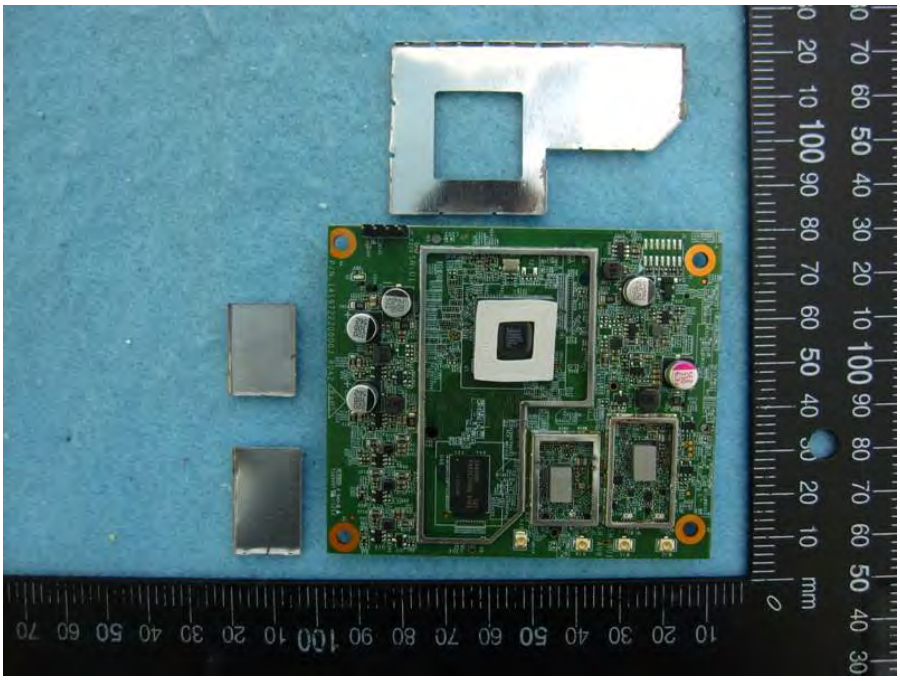


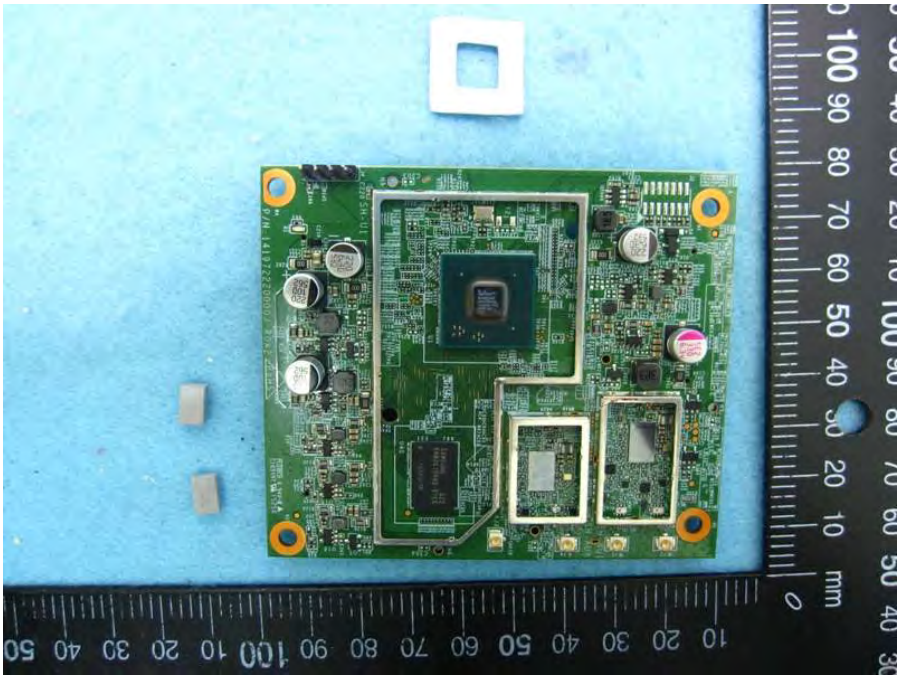


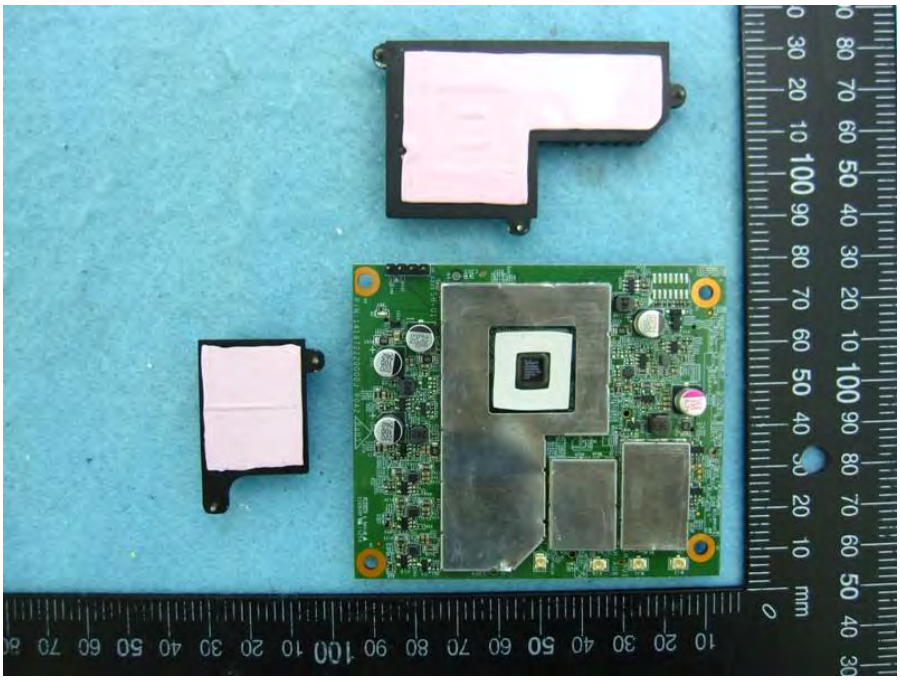


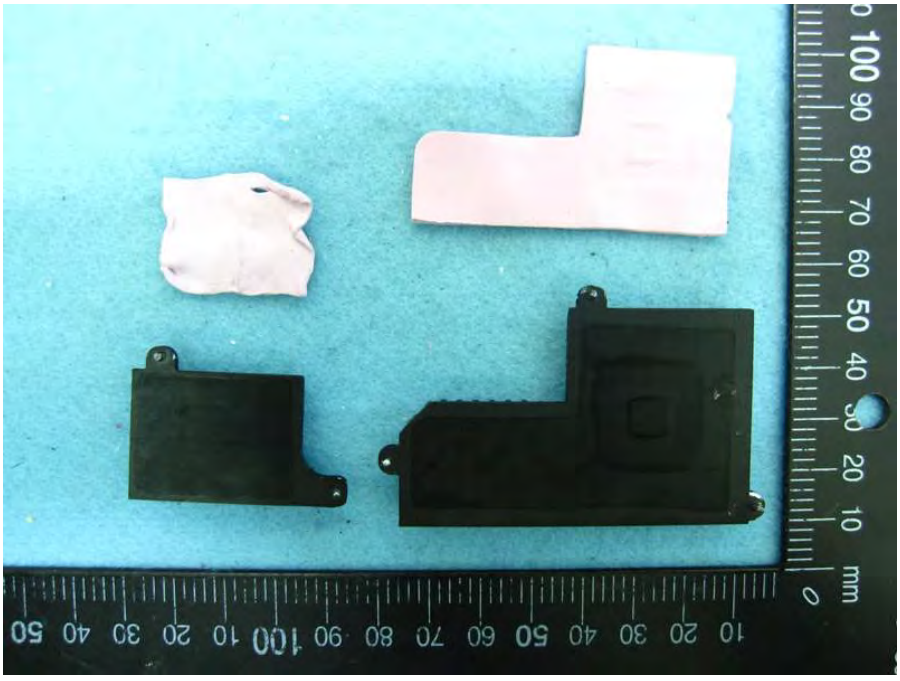




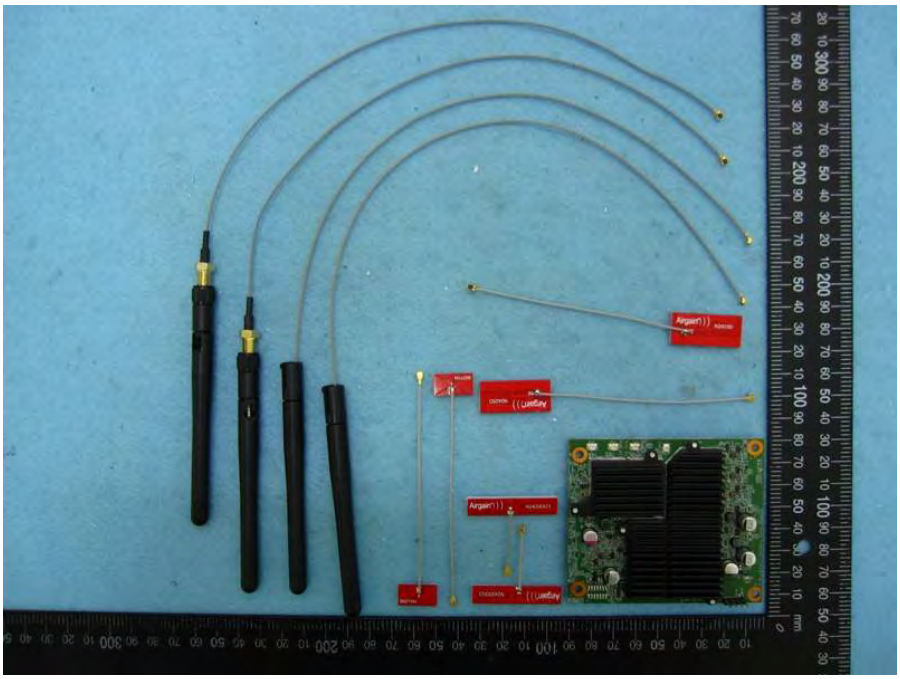




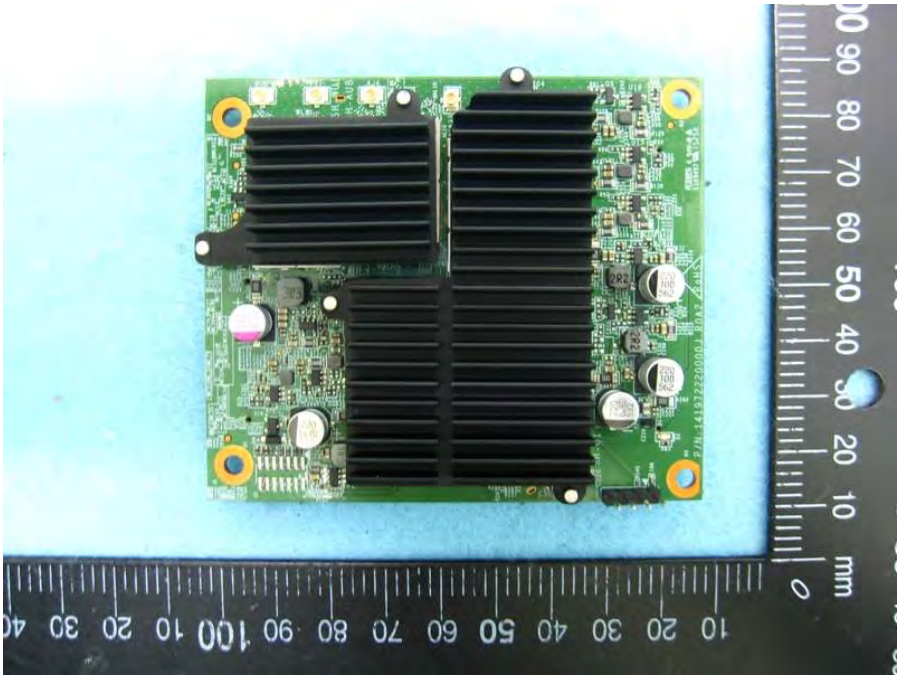




APPENDIX A. Photographs of EUT



Radio: R0 + R1



Power Frequency Magnetic Field Immunity

AC Current Accuracy Check

Freq.(Hz)	Range (A)	Standard (A)	Reading (A)	Uncertainty (%)
50	0~10	1.003	1	0.3
50	0~10	3.002	3	0.3
50	0~10	5.006	5	0.3
50	0~10	10.008	10	0.3
50	10~125	9.92	10	0.3
50	10~125	30.01	30	0.3
50	10~125	50.08	50	0.3
50	10~125	100.2	100	0.3
60	0~10	0.989	1	0.3
60	0~10	2.985	3	0.3
60	0~10	4.988	5	0.3
60	0~10	9.982	10	0.3
60	10~125	9.89	10	0.3
60	10~125	29.92	30	0.3
60	10~125	49.93	50	0.3
60	10~125	100.03	100	0.3

Magnetic Measurement Check：(@50Hz)

Range (A)	Standard (A/m)	Reading (A)	Uncertainty (%)
0~10	1	1.0	1
0~10	3	3.2	1
0~10	10	10.8	1
10~125	10	11.1	1
10~125	30	33.1	1
10~125	100	109.8	1

It has been demonstrated that the PFMF the specified requirements in the standard with at least a 95% confidence.

For 1,000 MHz to 6,000 MHz:

Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y))	5.31

Radio Frequency Electromagnetic Field Immunity (RS)
For 80 MHz to 1,000 MHz:
IMS

Frequency 10MHz Output Check	
Standard	Reading
10 MHz	9,999,985.8 Hz

Frequency Accuracy/offset：1.4E-07
Frequency Stability：5E-09/1.0S
Uncertainty: 4.0E-06

Gain Flatness Measurement (For 80 MHz to 1 GHz Amp.)		
Freq. (MHz)	Reading (dB)	Expected (dB)
80.0	62.6	> 54
100.0	62.4	> 54
200.0	61.6	> 54
300.0	62.0	> 54
400.0	58.8	> 54
500.0	60.4	> 54
600.0	58.4	> 54
700.0	58.8	> 54
800.0	59.3	> 54
900.0	58.3	> 54
1000.0	55.8	> 54

Gain Flatness Measurement (For 1 GHz to 3 GHz Amp.)		
Freq. (GHz)	Reading (dB)	Expected (dB)
0.8	47.6	> 40
1.0	48.0	> 40
1.5	47.9	> 40
2.0	47.8	> 40
2.5	46.4	> 40
3.0	46.3	> 40

VSWR Measurement (input port)		
Freq. (MHz)	Actual (dB)	Hige Range (dB)
80.0	1.7	< 2.00
100.0	1.5	< 2.00
200.0	1.6	< 2.00
300.0	1.5	< 2.00
400.0	1.5	< 2.00
500.0	1.4	< 2.00
600.0	1.4	< 2.00
700.0	1.4	< 2.00
800.0	1.4	< 2.00
900.0	1.5	< 2.00
1000.0	1.4	< 2.00

Power Linearly Measurement								
Freq. (MHz)	Reading (Watts)	Standard (Watts)	Freq. (MHz)	Reading (Watts)	Standard (Watts)	Freq. (MHz)	Reading (Watts)	Standard (Watts)
80.0	20.0	23.2	200.0	200.0	226.9	800.0	100.0	97.7
80.0	50.0	63.9	200.0	250.0	279.7	800.0	150.0	147.2
80.0	100.0	122.4	500.0	20.0	21.3	800.0	200.0	196.1
80.0	150.0	173.4	500.0	50.0	52.6	800.0	250.0	244.9
80.0	200.0	234.7	500.0	100.0	103.8	1000.0	20.0	16.5
80.0	250.0	302.2	500.0	150.0	155.4	1000.0	50.0	45.2
200.0	20.0	22.4	500.0	200.0	206.8	1000.0	100.0	87.3
200.0	50.0	58.3	500.0	250.0	258.1	1000.0	150.0	131.9
200.0	100.0	107.6	800.0	20.0	19.1	1000.0	200.0	175.9
200.0	150.0	166.7	800.0	50.0	48.6	1000.0	250.0	220.0

Standard Power Measurement					
For 80 MHz to 1 GHz			For 800 MHz to 3 GHz		
Freq.	Expected (WATTS)	Standard (WATTS)	Freq.	Expected (WATTS)	Standard (WATTS)
80.0	> 250	348.0	0.8	> 30	30.3
100.0	> 250	335.0	1.0	> 30	34.2
200.0	> 250	340.0	1.5	> 30	39.9
300.0	> 250	329.0	2.0	> 30	36.7
400.0	> 250	324.0	2.5	> 30	34.0
500.0	> 250	282.0	3.0	> 30	34.3
600.0	> 250	318.0			
700.0	> 250	329.0			
800.0	> 250	306.0			
900.0	> 250	294.0			
1000.0	> 250	271.0			

Uncertainty: 3%

It has been demonstrated that the RS generator meets the specified requirements in the standard with at least a 95% confidence.

Negative Discharge Voltage

Standard Parameters					Calculated Range		
Indicated Voltage (kV)	Polarity	Tolerance (%)	Max. (kV)	Min. (kV)	Calibration (kV)	Max. (kV)	Min. (kV)
2	Positive	15.0	2.3	1.7	2.0	2.0	2.0
	Negative	15.0	2.3	1.7	2.1	2.6	2.6
4	Positive	15.0	4.6	3.4	4.0	4.0	4.0
	Negative	15.0	4.6	3.4	4.1	4.1	4.1
6	Positive	15.0	6.9	5.1	6.0	6.0	6.0
	Negative	15.0	6.9	5.1	6.1	6.1	6.1
8	Positive	15.0	9.2	6.8	8.0	8.0	7.9
	Negative	15.0	9.2	6.8	8.1	8.1	8.1
15	Positive	15.0	17.3	12.8	15.2	15.2	15.2
	Negative	15.0	17.3	12.8	14.9	14.9	14.9

It has been demonstrated that the ESD generator meets the specified requirements in the standard with at least a 95% confidence.

Immunity Test Measurement Uncertainty

Electrostatic Discharge Immunity (ESD)

Negative Discharge Current

From Standard					From calibration certificate					
2kV	First Peak Current	Current at 30ns	Current at 60ns		Measured First Peak Current	1st Peak Worst case **+5%**	Measured Current at 30ns	30ns Worst case **+5%**	Measured Current at 60ns	60ns Worst case **+5%**
Nominal	7.5	4.0	2.0	Positive	6.9	7.2	3.6	3.8	1.9	2.0
Min.	6.4	2.8	1.4	Negative	7.3	7.7	3.7	3.9	1.9	2.0
Max.	8.6	5.2	2.6	Min.		6.4		2.8		1.4
Tolerance in %	0.2	0.3	0.3	Max.		8.6		5.2		2.6

4kV	First Peak Current	Current at 30ns	Current at 60ns		Measured First Peak Current	1st Peak Worst case **+5%**	Measured Current at 30ns	30ns Worst case **+5%**	Measured Current at 60ns	60ns Worst case **+5%**
Nominal	15.0	8.0	4.0	Positive	14.4	15.1	7.6	7.9	3.8	4.0
Min.	12.8	5.6	2.8	Negative	14.1	14.8	7.4	7.8	4.0	4.2
Max.	17.3	10.4	5.2	Min.		12.8		5.6		2.8
Tolerance in %	0.2	0.3	0.3	Max.		17.3		10.4		5.2

6kV	First Peak Current	Current at 30ns	Current at 60ns		Measured First Peak Current	1st Peak Worst case **-5%**	Measured Current at 30ns	30ns Worst case **+5%**	Measured Current at 60ns	60ns Worst case **+5%**
Nominal	22.5	12.0	6.0	Positive	21.2	22.2	11.2	11.7	5.8	6.1
Min.	19.1	8.4	4.2	Negative	20.7	21.7	11.1	11.7	6.0	6.2
Max.	25.9	15.6	7.8	Min.		19.1		8.4		4.2
Tolerance in %	0.2	0.3	0.3	Max.		25.9		15.6		7.8

8kV	First Peak Current	Current at 30ns	Current at 60ns		Measured First Peak Current	1st Peak Worst case **-5%**	Measured Current at 30ns	30ns Worst case **+5%**	Measured Current at 60ns	60ns Worst case **+5%**
Nominal	30.0	16.0	8.0	Positive	27.8	29.1	14.7	15.4	7.6	8.0
Min.	25.5	11.2	5.6	Negative	28.4	29.8	15.0	15.7	7.8	8.1
Max.	34.5	20.8	10.4	Min.		25.5		11.2		5.6
Tolerance in %	0.2	0.3	0.3	Max.		34.5		20.8		10.4

12. Uncertainty of Test Site

Test Items	Uncertainty	Remark
Conducted Emissions	3.2 dB	Confidence levels of 95%
Radiated Emissions below 1GHz	4.0 dB	Confidence levels of 95%
Radiated Emissions above 1GHz	4.7 dB	Confidence levels of 95%

<EMS>

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
ESD Simulator	Teseq QG	NSG 437	314	Air: 0 kV ~ 30 kV, Contact: 0 kV ~ 30kV	Mar. 23, 2015	ESD
Integrated Measurement System	R&S	IMS	100002	9kHz ~ 3GHz	Apr. 24, 2015	RS
Average Power Sensor	R&S	NRP-Z91	101117	9kHz ~ 6GHz	Mar. 24, 2015	RS
RF Power Amplifier	AR	250W1000A	0323202	80MHz ~1GHz, 250W	May 06, 2015	RS
Log-Periodic Antenna	AR	AT1080	0323130	80MHz ~ 1GHz	N.C.R.	RS
Software	R&S	EMC32	5.20.1	-	N.C.R.	RS
Antenna	SCHWARZBECK MESS-ELEKTRONIK	STLP 9149	9149-274	0.7GHz ~ 9GHz	N/A	RS05-HY
Amplifier	A. R.	100S1G6	0348138	1GHz~6GHz	Jun. 17, 2016	RS05-HY
INTEGRATED MEASUREMENT SYSTEM	Rohde & Schwarz	IMS	RS05-HY	80MHz~6GHz	Apr. 21, 2016	RS05-HY
Power Sensor	Rohde & Schwarz	NRP-Z91	102724	9kHz~6GHz	Oct. 03, 2016	RS05-HY
Power Sensor	Rohde & Schwarz	NRP-Z91	102725	9kHz~6GHz	Oct. 03, 2016	RS05-HY
Signal Generator	Rohde & Schwarz	SMB 100A	108749	9kHz~6GHz	Oct. 04, 2016	RS05-HY
Field Sensor	A. R.	FL7006	0343231	100kHz~6GHz	Aug. 09, 2016	RS05-HY
Magnetic field Immunity Loop	FCC	F-1000-4-8/9/10-L-1AM	04014,04017	30A//CONTINUOUS, 100A/2Hrs, 230A/30SEC	Jul. 29, 2015	Magnetic

※ Calibration Interval of instruments listed above is one year.

※ N.C.R. means Non-Calibration required.

Log Antenna	Schwarzbeck	VUSLP 9111	247	200MHz ~ 1GHz	May 26, 2016	Radiation (10CH01-CB)
EMI Test Receiver	Rohde&Schwarz	ESCI	100186	9kHz ~ 3GHz	Jul. 14, 2015	Radiation (10CH01-CB)
EMI Test Receiver	Rohde&Schwarz	ESCI	100186	9kHz ~ 3GHz	Jul. 07, 2016	Radiation (10CH01-CB)
Spectrum Analyzer	Rohde&Schwarz	FSV30	101026	9kHz ~ 30GHz	Dec. 01, 2014	Radiation (10CH01-CB)
Spectrum Analyzer	Rohde&Schwarz	FSV30	101026	9kHz ~ 30GHz	Jan. 03, 2017	Radiation (10CH01-CB)
Horn Antenna	ESCO	3117	00081283	1GHz ~ 18GHz	Nov. 20, 2014	Radiation (10CH01-CB)
Horn Antenna	ESCO	3117	00081283	1GHz ~ 18GHz	Nov. 29, 2016	Radiation (10CH01-CB)
Amplifier	Agilent	8449B	3008A02660	1GHz ~ 26.5GHz	May 25, 2015	Radiation (10CH01-CB)
Amplifier	Agilent	8449B	3008A02660	1GHz ~ 26.5GHz	May 23, 2016	Radiation (10CH01-CB)
CABLE(1~40G)	Woken	SUCOFLEX 104	-	1GHz ~ 40GHz	Dec. 04, 2014	Radiation (10CH01-CB)
CABLE(1~40G)	Woken	SUCOFLEX 104	-	1GHz ~ 40GHz	Nov. 30, 2016	Radiation (10CH01-CB)
Software	Audix	E3	6.120210d	-	N.C.R.	Radiation (10CH01-CB)

※ Calibration Interval of instruments listed above is one year.

※ N.C.R. means Non-Calibration required.

11. List of Measuring Equipment Used

<EMI>

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMI Test Receiver	R&S	ESCS 30	100355	9kHz ~ 2.75GHz	Apr. 22, 2015	Conduction (CO01-CB)
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.45GHz	Jan. 23, 2017	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Dec. 02, 2014	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Dec. 14, 2016	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Dec. 02, 2014	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Dec. 21, 2016	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150kHz ~ 30MHz	Dec. 03, 2014	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150kHz ~ 30MHz	May 24, 2016	Conduction (CO01-CB)
Software	Audix	E3	5.410e	-	N.C.R.	Conduction (CO01-CB)
10m Semi Anechoic Chamber	TDK	SAC-10M	10CH01-CB	30MHz~40GHz 10m	Jun. 22, 2015	Radiation (10CH01-CB)
10m Semi Anechoic Chamber	TDK	NSA	10CH01-CB	30MHz~1GHz 10m	Mar. 30, 2016	Radiation (10CH01-CB)
10m Semi Anechoic Chamber	TDK	VSWR	10CH01-CB	1GHz ~40GHz 3m	Mar. 30, 2016	Radiation (10CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10783	9kHz ~ 1.3GHz	Mar. 23, 2015	Radiation (10CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10783	9kHz ~ 1.3GHz	Mar. 24, 2016	Radiation (10CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10784	9kHz ~ 1.3GHz	Mar. 04, 2015	Radiation (10CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10784	9kHz ~ 1.3GHz	Mar. 09, 2016	Radiation (10CH01-CB)
Low Cable	Woken	SUCOFLEX 104	-	25MHz ~ 1GHz	Dec. 01, 2014	Radiation (10CH01-CB)
Low Cable	Woken	SUCOFLEX 104	-	25MHz ~ 1GHz	Nov. 30, 2016	Radiation (10CH01-CB)
High Cable	Woken	SUCOFLEX 104	-	25MHz ~ 1GHz	Dec. 01, 2014	Radiation (10CH01-CB)
High Cable	Woken	SUCOFLEX 104	-	25MHz ~ 1GHz	Nov. 30, 2016	Radiation (10CH01-CB)
Biconical Antenna	Schwarzbeck	VHBB 9124	324	30MHz ~ 200MHz	Mar. 30, 2015	Radiation (10CH01-CB)
Biconical Antenna	Schwarzbeck	VHBB 9124	324	30MHz ~ 200MHz	Apr. 20, 2016	Radiation (10CH01-CB)
Log Antenna	Schwarzbeck	VUSLP 9111	247	200MHz ~ 1GHz	Apr. 23, 2015	Radiation (10CH01-CB)

10.4. Test Result

Temperature	23℃	**Humidity**	57%
Pressure	99 kPa	**Test Engineer**	Ryo Fan
Test Mode	Mode 1~Mode 4	**Test Date**	Aug. 31, 2015
Standard	Required Criteria A		
Test Standard	EN 55024:2010 CISPR 24:2010		
Test Recorded	There was no abnormal situation during the test compared with initial operation.		

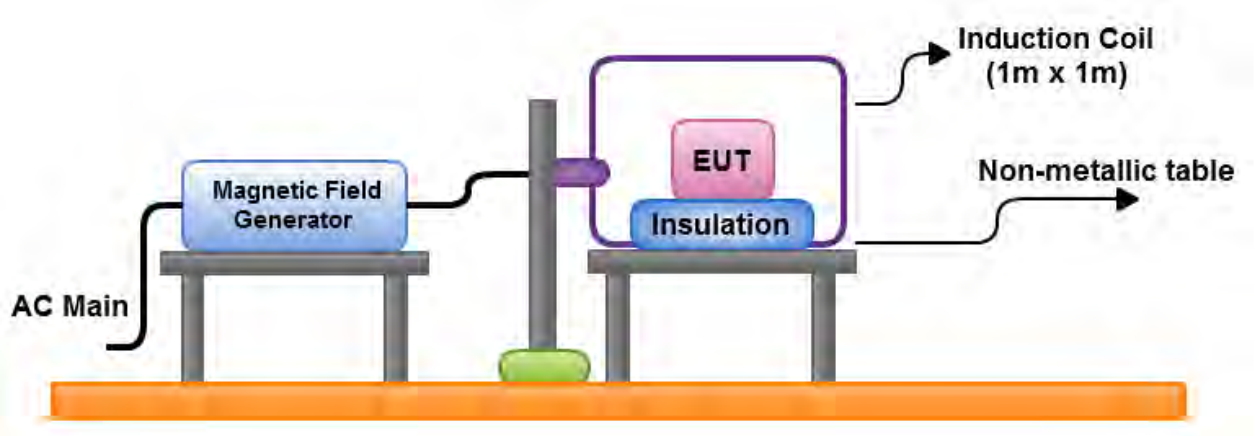
Power Frequency Magnetic Field	Testing duration	Coil Orientation	Performance Criteria
50 Hz, 1 A/m	1.0 Min	X-axis	A
50 Hz, 1 A/m	1.0 Min	Y-axis	A
50 Hz, 1 A/m	1.0 Min	Z-axis	A

10. Power Frequency Magnetic Field Immunity Tests

10.1. Test Specification

Reference Standard	IEC 61000-4-8
Frequency Range	50 Hz
Field Strength	1 A/m
Observation type	1 min
Inductance Coil	1 m x 1 m

10.2. Test Setup



10.3. Test Procedure

a. The equipment is configured and connected to satisfy its functional requirements.

b. The power supply, input and output circuits shall be connected to the sources of power supply, control and signal.

c. The cables supplied or recommended by the equipment manufacturer shall be used. 1 meter of all cables used shall be exposed to the magnetic field.

Temperature	23℃	**Humidity**	57%
Pressure	99 kPa	**Test Engineer**	Hank Yang
Test Mode	Mode 1~Mode 4	**Test Date**	Aug. 27, 2015
Standard	Required Criteria A		
Test Standard	EN 55024:2010 CISPR 24:2010		
Test Recorded	There was no abnormal situation during the test compared with initial operation.		

Frequency Range MHz	Field V/m	Antenna Polarization	EUT Face Exposed	Performance Criteria
80~1,000	3	Vertical	Front/Back/Right/Left	A
80~1,000	3	Horizontal	Front/Back/Right/Left	A

9.4. Test Result

Temperature	23℃	**Humidity**	57%
Pressure	99 kPa	**Test Engineer**	Hank Yang
Test Mode	Mode 1~Mode 4	**Test Date**	Aug. 27, 2015
Standard	Required Criteria A		
Test Standard	EN 301 489-1 V2.1.1 (2017-02) EN 301 489-17 V3.1.1 (2017-02)		
Test Recorded	There was no abnormal situation during the test compared with initial operation.		

Frequency Range MHz	Field V/m	Antenna Polarization	EUT Face Exposed	Performance Criteria
80~1,000	3	Vertical	Front/Back/Right/Left	A
80~1,000	3	Horizontal	Front/Back/Right/Left	A

Temperature	21℃	**Humidity**	65%
Pressure	101.2 kPa	**Test Engineer**	Kane Liu
Test Mode	Mode 1~Mode 4	**Test Date**	Feb. 14, 2017
Standard	Required Criteria A		
Test Standard	EN 301 489-1 V2.1.1 (2017-02) EN 301 489-17 V3.1.1 (2017-02)		
Test Recorded	There was no abnormal situation during the test compared with initial operation.		

Frequency Range MHz	Field V/m	Antenna Polarization	EUT Face Exposed	Performance Criteria
1,000~6,000	3	Vertical	Front/Back/Right/Left	A
1,000~6,000	3	Horizontal	Front/Back/Right/Left	A

9.3. Test Procedure

a. The equipment to be tested is placed in the center of the enclosure on a wooden table. The equipment is then connected to power and signal leads according to pertinent installation instructions.

b. The bilog antenna which is enabling the complete frequency range of 80 MHz - 1,000 MHz / 1,000 MHz - 6,000 MHz is placed 3m away from the equipment. The required field strength is determined by placing the field strength meter(s) on top of or directly alongside the equipment under test and monitoring the field strength meter via a remote field strength indicator outside the enclosure while adjusting the continuous-wave to the applicable antennae.

c. The test is normally performed with the generating antenna facing each of four sides of the EUT. The polarization of the field generated by the broadband (bilog) antenna necessitates testing each position twice, once with the antenna positioned vertically and again with the antenna positioned horizontally.

d. At each of the above conditions, the frequency range is swept 80 MHz - 6,000 MHz, pausing to adjust the R.F. signal level or to switch oscillators and antenna. The rate of sweep is in the order of $1.5*10^{-3}$ decades/s. The sensitive frequencies or frequencies of dominant interest may be discretely analyzed.

e. If need to use the exclusion band, for deferent equipment should be reference as below:

The exclusion band for 2.4 GHz equipment was from 2280 MHz to 2603.5 MHz.

The exclusion band for 5 GHz equipment was from 4880 MHz to 5995 MHz.

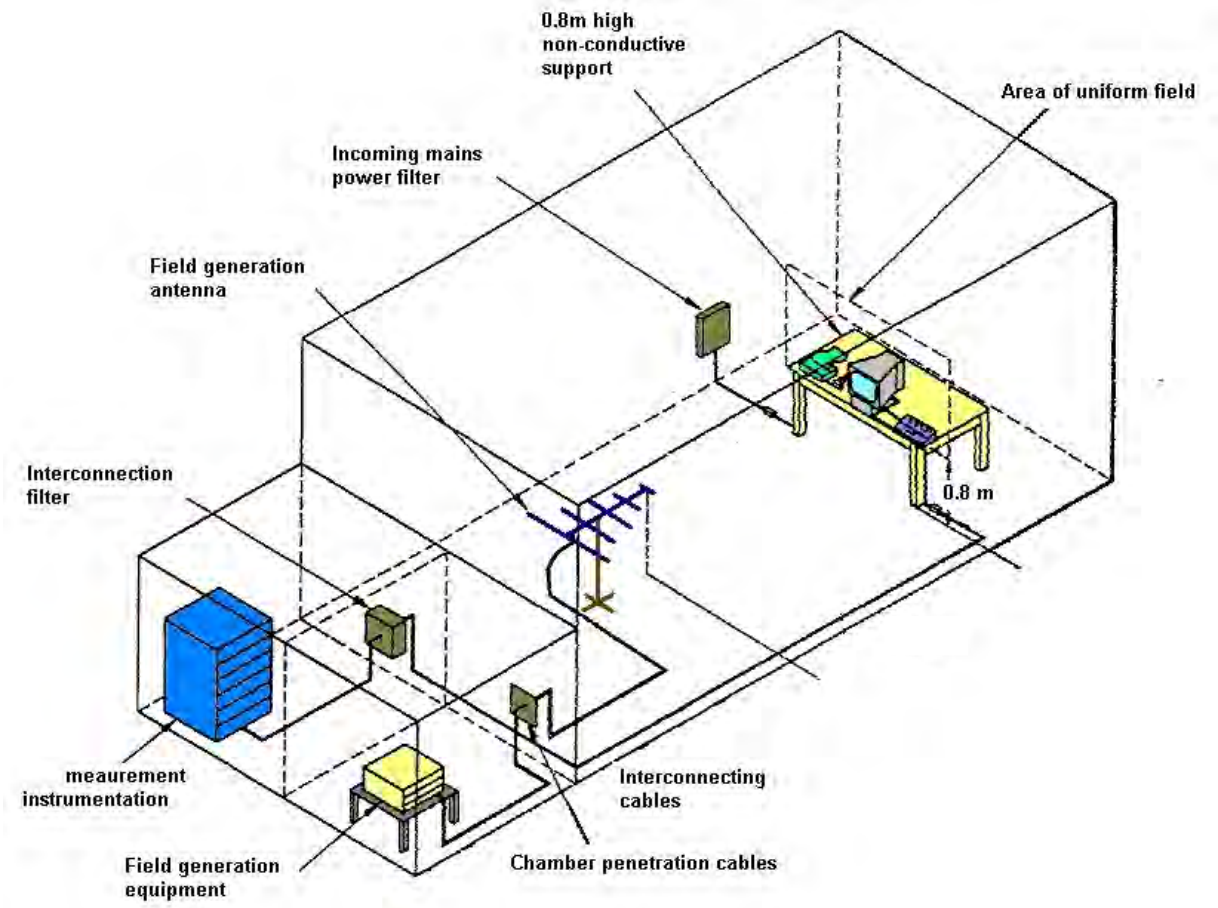
The exclusion band for 5.8 GHz equipment was from 5455 MHz to 5800 MHz.

9. Radio Frequency Electromagnetic Field Immunity Test (RS)

9.1. Test Specification

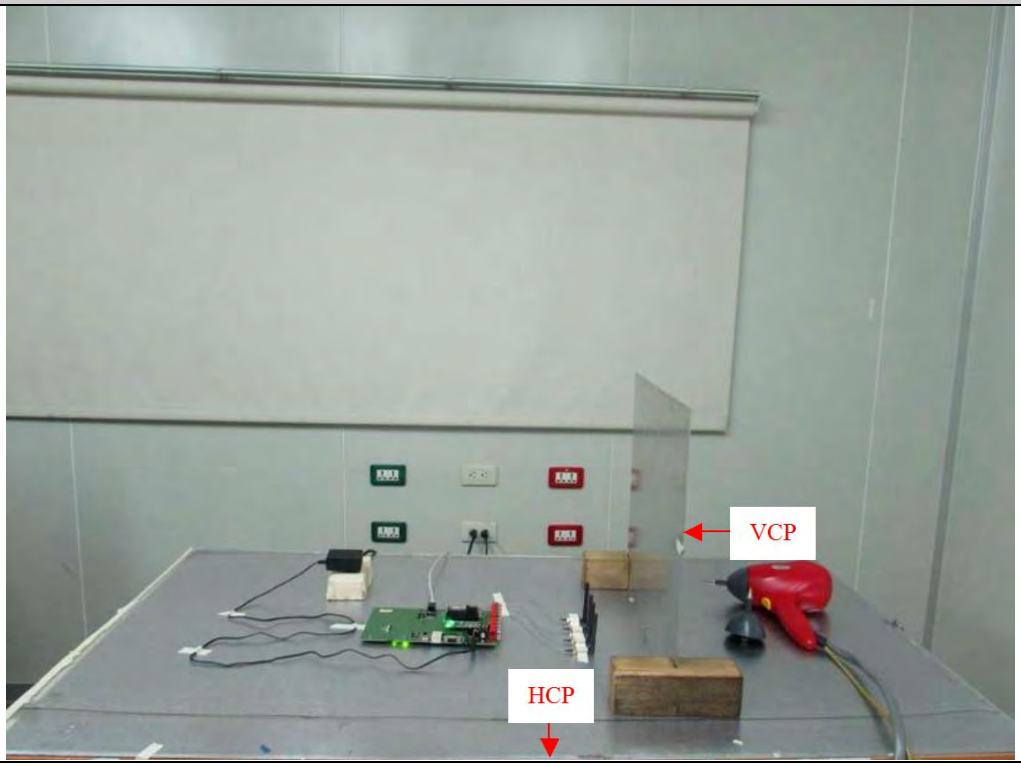
Reference Standard	EN 61000-4-3 / IEC 61000-4-3
Frequency Range	For EN 301 489-1: 80 MHz to 6,000 MHz
	For EN 55024/CISPR 24: 80 MHz to 1,000 MHz
Field Strength	3 V/m (un-modulated, r.m.s) 80% AM (1 kHz)
Frequency Step	1 %
Dwell Time	2.9 sec
Antenna Polarity	Vertical / Horizontal

9.2. Test Setup



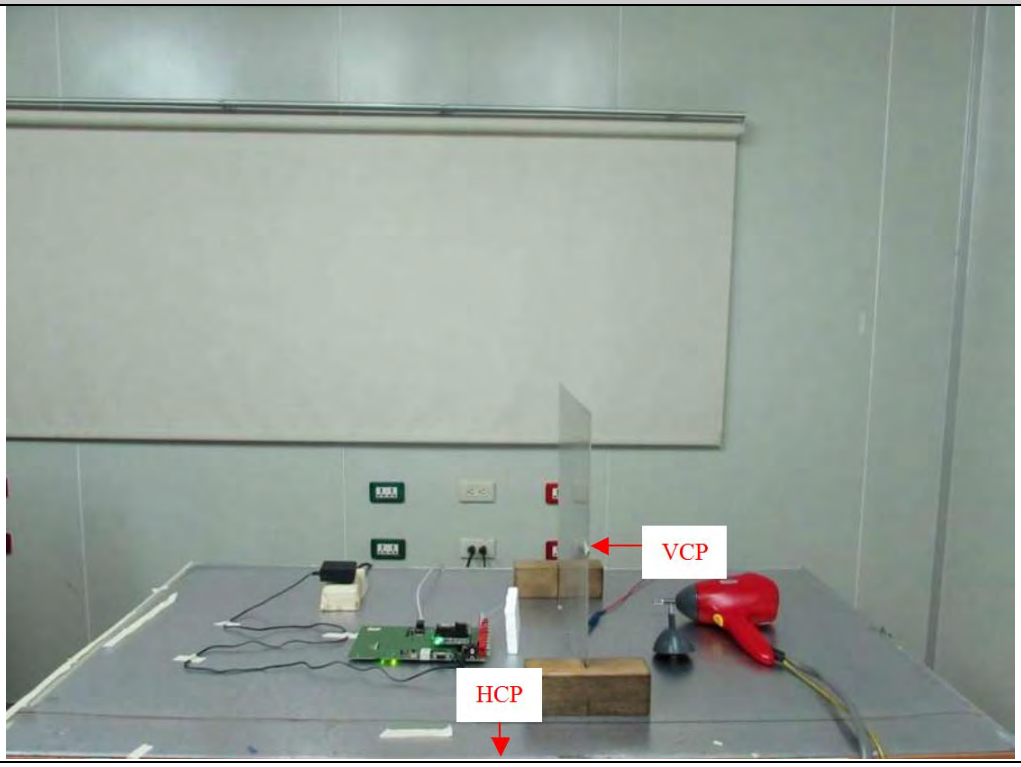
The procedure defined in this part requires the generation of electromagnetic fields within which the test sample is placed and its operation observed. To generate fields that are useful for simulation of actual (field) conditions may require significant antenna drive power and the resultant high field strength levels.

Test Mode: Mode 3~Mode 4

Test Points for HCP/VCP	
Air Discharge (BLUE color) Contact Discharge (RED color)	

8.6. Photographs of Electrostatic Discharge Immunity Test

Test Mode: Mode 1~Mode 2

Test Points for HCP/VCP	
Air Discharge (BLUE color) Contact Discharge (RED color)	

8.5. Test Result

Temperature	22℃	**Humidity**	49%
Pressure	99 kPa	**Test Engineer**	Ryo Fan
Test Mode	Mode 1~Mode 4	**Test Date**	Aug. 28, 2015
Standard	Required Criteria B		
Test Standard	EN 301 489-1 V2.1.1 (2017-02) EN 301 489-17 V3.1.1 (2017-02) EN 55024:2010 CISPR 24:2010		
Test Recorded	There was no abnormal situation during the test compared with initial operation.		

Indirect Application：

Coupling Plan	Coupling Side	Test Voltage (kV)	Performance Criteria
HCP	Front / Rear / Right / Left	± 2, 4	A
VCP	Front / Rear / Right / Left	± 2, 4	A

8.4. ESD Test Procedure

a. In the case of air discharge testing the climatic conditions shall be within the following ranges:
   - ambient temperature: 15°C to 35°C;
   - relative humidity : 30% to 60%;
   - atmospheric pressure : 86 kPa (860 mbar) to 106 kPa (1060 mbar).

b. Test programs and software shall be chosen so as to exercise all normal modes of operation of the EUT.

   The use of special exercising software is encouraged, but permitted only where it can be shown that the EUT is being comprehensively exercised.

c. The test voltage shall be increased from the minimum to the selected test severity level, in order to determine any threshold of failure. The final severity level should not exceed the product specification value in order to avoid damage to the equipment.

d. For the time interval between successive single discharges an initial value of one second is recommended. Longer intervals may be necessary to determine whether a system failure has occurred.

e. In the case of contact discharges, the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

f. In the case of painted surface covering a conducting substrate, the following procedure shall be adopted:
   - If the coating is not declared to be an insulating coating by the equipment manufacturer, then the pointed tip of the generator shall penetrate the coating so as to make contact with the conducting substrate.
   - Coating declared as insulating by the manufacturer shall only be submitted to the air discharge.
   - The contact discharge test shall not be applied to such surfaces.

g. In the case of air discharges, the round discharge tip of the discharge electrode shall be approached as fast as possible (without causing mechanical damage) to touch the EUT . After each discharge, the ESD generator (discharge electrode) shall be removed from the EUT. The generator is then retriggered for a new single discharge. This procedure shall be repeated until the discharges are completed. In the case of an air discharge test, the discharge switch, which is used for contact discharge, shall be closed.

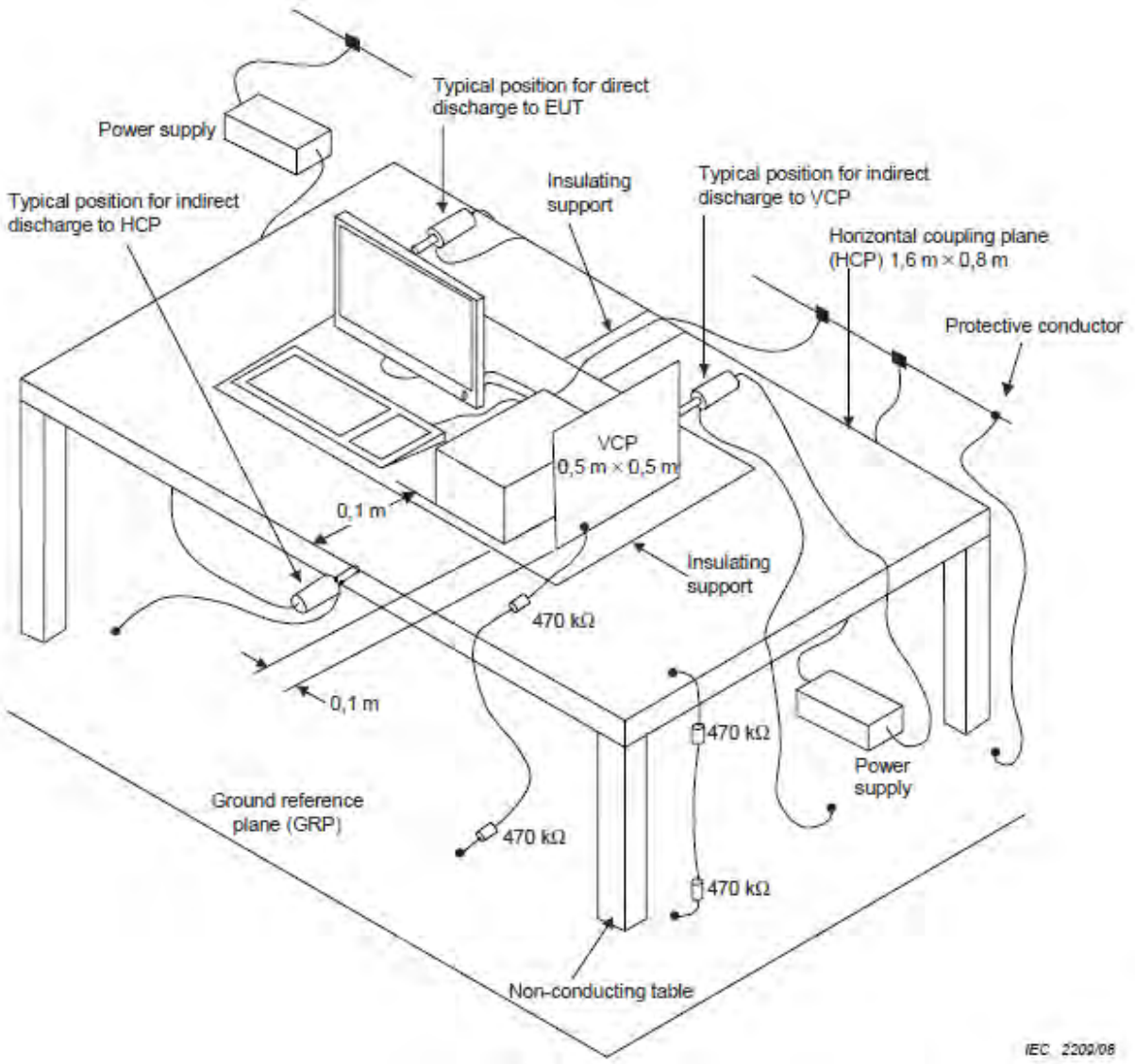
8.3. Test Setup for Tests Performed in Laboratory

A ground reference plane was provided on the floor of the test site. It was a metallic sheet (copper or aluminum) of 0.25 mm, minimum thickness; other metallic may be used but they shall have at least 0.65 mm thickness. In the SPORTON EMC LAB., we provided 1 mm thickness aluminum ground reference plane or 1 mm thickness stainless steel ground reference plane. The minimum size of the ground reference plane is 1 m x 1 m, the exact size depending on the dimensions of the EUT. It was connected to the protective grounding system.

The EUT was arranged and connected according to its functional requirements. A distance of 1m minimum was provided between the EUT and the wall of the lab. and any other metallic structure. In cases where this length exceeds the length necessary to apply the discharges to the selected points, the excess length shall, where possible, be placed non-inductively off the ground reference plane and shall not come closer than 0.2m to other conductive parts in the test setup.

Where the EUT is installed on a metal table, the table was connected to the reference plane via a cable with a 470k ohm resister located at each end, to prevent a build-up of charge. The test setup was consist a wooden table, 0.8m high, standing on the ground reference plane. A HCP, 1.6 m x 0.8 m, was placed on the table. The EUT and cables was isolated from the HCP by an insulating support 0.5 mm thick. The VCP size, 0.5 m x 0.5 m.

8.2. Test Setup



The test setup consists of the test generator, EUT and auxiliary instrumentation necessary to perform DIRECT and INDIRECT application of discharges to the EUT as applicable, in the follow manner:

a. CONTACT DISCHARGE to the conductive surfaces and to coupling plane;

b. AIR DISCHARGE at insulating surfaces.

The preferred test method is that of type tests performed in laboratories and the only accepted method of demonstrating conformance with this standard. The EUT was arranged as closely as possible to arrangement in final installed conditions.

8. Electrostatic Discharge Immunity Test (ESD)

8.1. Test Specification

Reference Standard	EN 61000-4-2 / IEC 61000-4-2	
Discharge Impedance	330 ohm / 150 pF	
Contact Discharge	± 2, 4 kV	
Rise Time	0.8 ns +/-25 %	
Current at 30 ns	+/- 30 %	
Current at 60 ns	+/- 30 %	
Polarity	Positive / Negative	
Number of Discharge	For EN 301 489-1	Contact Discharge 20 times at each test point
	For EN 55024/CISPR 24	Contact Discharge 50 times at each test point
Single Discharge Mode	1 discharge per 1s	

For EN 55024/CISPR 24

According to Clause 7.1 of EN 55024 standard, the following describes the general performance criteria.

Criterion A (Note 1)	During and after the test the EUT shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a minimum performance level specified by the manufacturer when the EUT is used as intended.
Criterion B (Note 2)	During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test. After the test, the equipment shall continue to operate as intended without operator intervention. For xDSL Terminal equipment: During the test shall not cause the system to lose the established connection or retrain. At the cessation of the test, the system shall operate in the condition established prior to the application of the test without user intervention.
Criterion C	Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

Note 1：No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

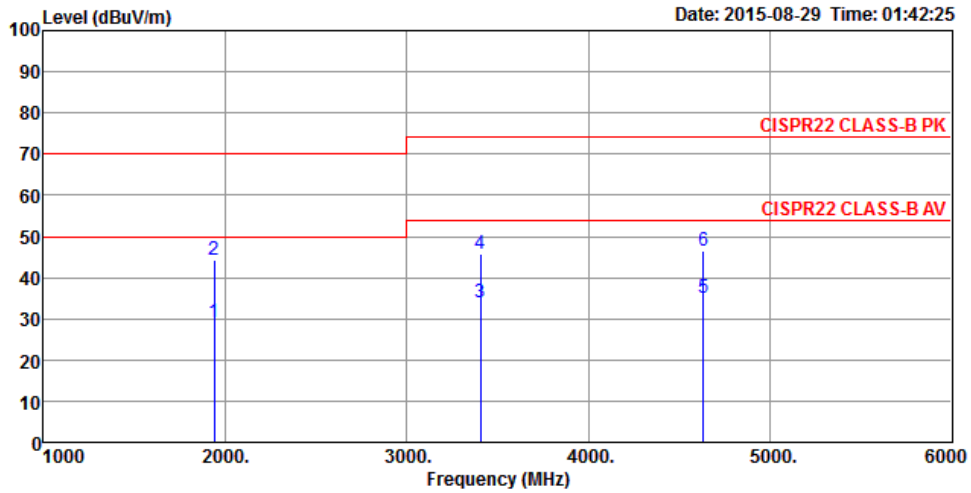
Note 2：After the application of the phenomenon below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is allowed. However, no change of operating state if stored data is allowed to persist after the test. If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

7. General Performance Criteria Description of Immunity Test

For EN 301 489-1

CT / CR (Criterion A)	**Performance criteria for continuous phenomena applied to transmitters and receivers** During and after the test, the apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level specified by the manufacturer when the apparatus is used as intended. In some cases this permissible performance level may be replaced by a permissible loss of performance. During the test the EUT shall not unintentionally transmit or change its actual operating state and stored data.
TT / TR (Criterion B)	**Performance criteria for transient phenomena applied to transmitters and receivers** After the test, the apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level specified by the manufacturer, when the apparatus is used as intended. In some cases this permissible performance level may be replaced by a permissible loss of performance.
TT / TR (Criterion C)	**Only for voltage interruption** **Performance criteria for transient phenomena applied to transmitters and receivers** In the case where the equipment is powered solely from the AC mains supply (without the use of a parallel battery back-up) volatile user data may have been lost and if applicable the communication link need not to be maintained and lost functions should be recoverable by user or operator.

Horizontal 1,000 MHz to 6,000 MHz

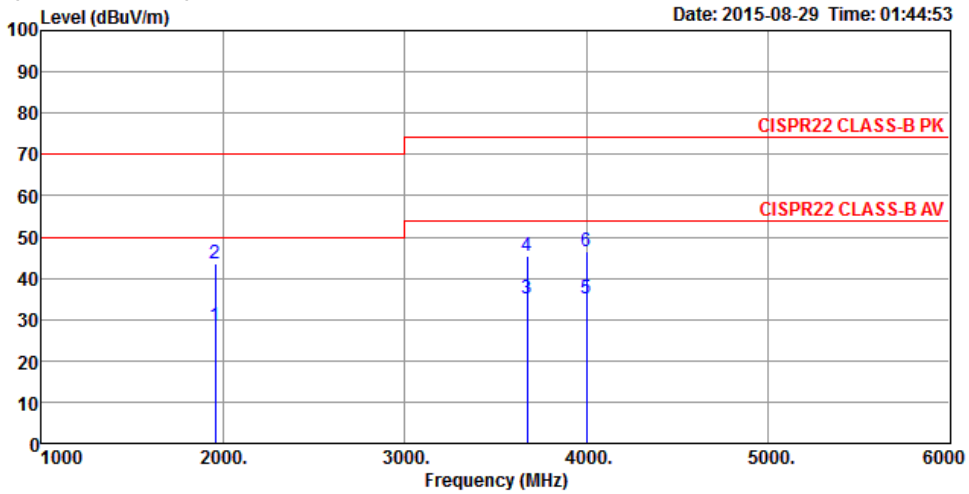


	Freq	Level	Limit Line	Over Limit	Read Level	Preamp Factor	Antenna Factor	Cable Loss	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	1940.00	29.15	50.00	-20.85	27.54	35.90	31.17	6.34	Average	100	295	HORIZONTAL
2	1940.00	44.11	70.00	-25.89	42.50	35.90	31.17	6.34	Peak	100	295	HORIZONTAL
3	3405.00	34.06	54.00	-19.94	29.08	36.36	32.94	8.40	Average	100	81	HORIZONTAL
4	3405.00	45.59	74.00	-28.41	40.61	36.36	32.94	8.40	Peak	100	81	HORIZONTAL
5	4635.00	35.00	54.00	-19.00	27.38	36.40	34.16	9.86	Average	100	126	HORIZONTAL
6	4635.00	46.60	74.00	-27.40	38.98	36.40	34.16	9.86	Peak	100	126	HORIZONTAL

Applicable Standard	EN 55022:2010/AC:2011, CISPR 22 ed.6:2008/I-SH 1:2009/I-SH 2:2010/I-SH 3:2012 and AS/NZS CISPR 22:2009/Amdt 1:2010		
Temperature	24℃	Humidity	62%
Test Engineer	Edison Lin	Frequency Range	1,000 MHz to 6,000 MHz
Test Mode	Mode 3		

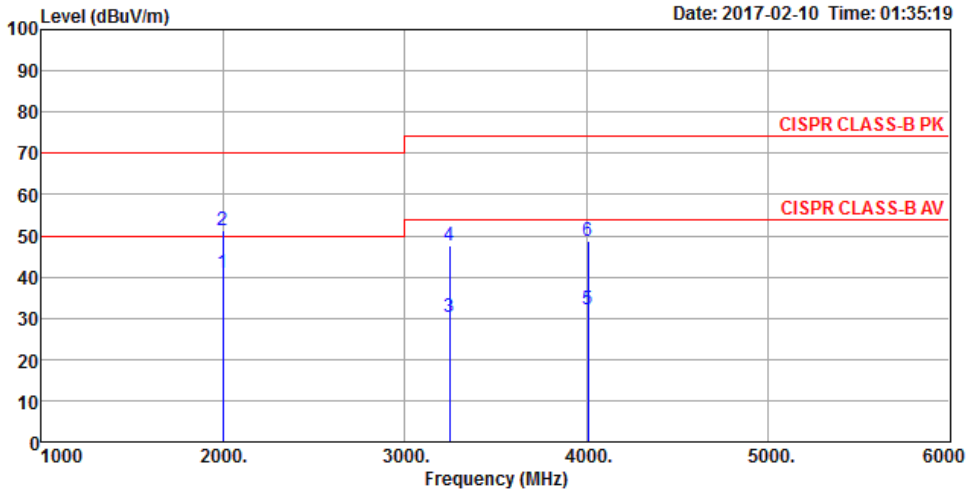
- Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
- Margin = - Limit + (Read Level + Antenna Factor + Cable Loss - Preamp Factor)
- The test was passed at the minimum margin that marked by the frame in the following test record

Vertical 1,000 MHz to 6,000 MHz



	Freq	Level	Limit Line	Over Limit	Read Level	Preamp Factor	Antenna Factor	Cable Loss	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	1955.00	28.33	50.00	-21.67	26.59	35.90	31.30	6.34	Average	100	360	VERTICAL
2	1955.00	43.48	70.00	-26.52	41.74	35.90	31.30	6.34	Peak	100	360	VERTICAL
3	3675.00	34.87	54.00	-19.13	29.32	36.33	33.11	8.77	Average	100	8	VERTICAL
4	3675.00	45.29	74.00	-28.71	39.74	36.33	33.11	8.77	Peak	100	8	VERTICAL
5	4000.00	35.02	54.00	-18.98	28.58	36.27	33.50	9.21	Average	100	245	VERTICAL
6	4000.00	46.64	74.00	-27.36	40.20	36.27	33.50	9.21	Peak	100	245	VERTICAL

Horizontal 1,000 MHz to 6,000 MHz



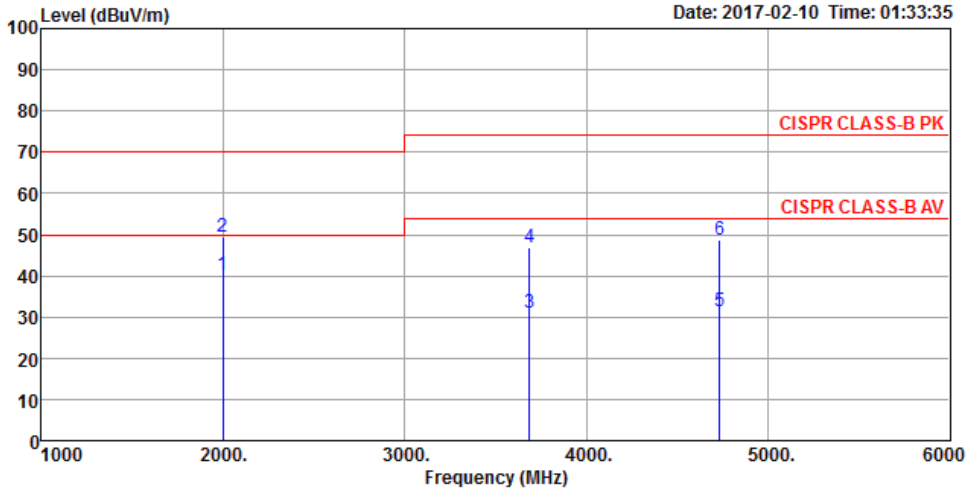
	Freq	Level	Limit Line	Over Limit	Read Level	Preamp Factor	Antenna Factor	Cable Loss	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2000.00	40.81	50.00	-9.19	35.82	35.89	31.20	9.68	Average	100	93	HORIZONTAL
2	2000.00	51.12	70.00	-18.88	46.13	35.89	31.20	9.68	Peak	100	93	HORIZONTAL
3	3245.00	30.10	54.00	-23.90	23.06	36.35	33.00	10.39	Average	100	56	HORIZONTAL
4	3245.00	47.68	74.00	-26.32	40.64	36.35	33.00	10.39	Peak	100	56	HORIZONTAL
5	4010.00	32.03	54.00	-21.97	23.54	36.27	33.52	11.24	Average	100	1	HORIZONTAL
6	4010.00	48.61	74.00	-25.39	40.12	36.27	33.52	11.24	Peak	100	1	HORIZONTAL

6.6. Test Result of Radiated Emission above 1 GHz

Applicable Standard	EN 301 489-1 V2.1.1 (2017-02), EN 55032:2012/AC:2013, CISPR 32:2012 and AS/NZS CISPR 32:2013		
Temperature	22℃	Humidity	58%
Test Engineer	Hank Yang	Frequency Range	1,000 MHz to 6,000 MHz
Test Mode	Mode 2		

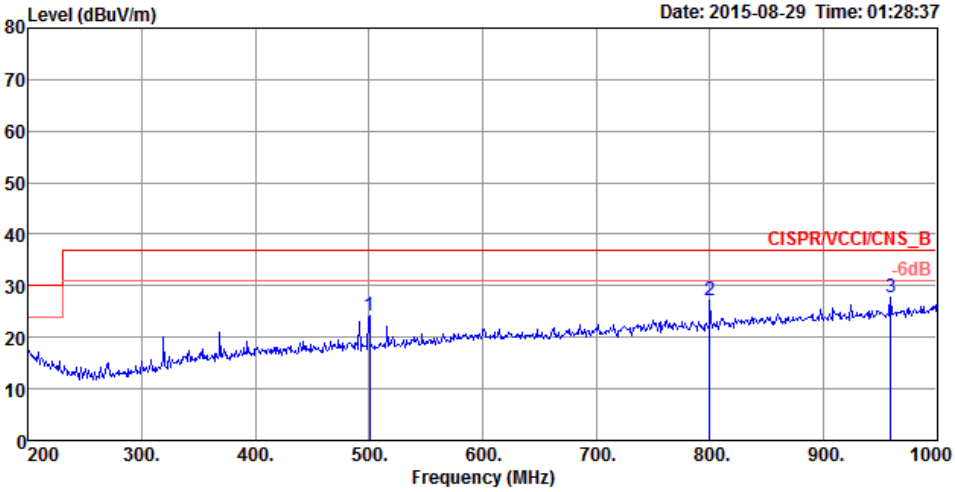
- Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
- Margin = - Limit + (Read Level + Antenna Factor + Cable Loss - Preamp Factor)
- The test was passed at the minimum margin that marked by the frame in the following test record

Vertical 1,000 MHz to 6,000 MHz



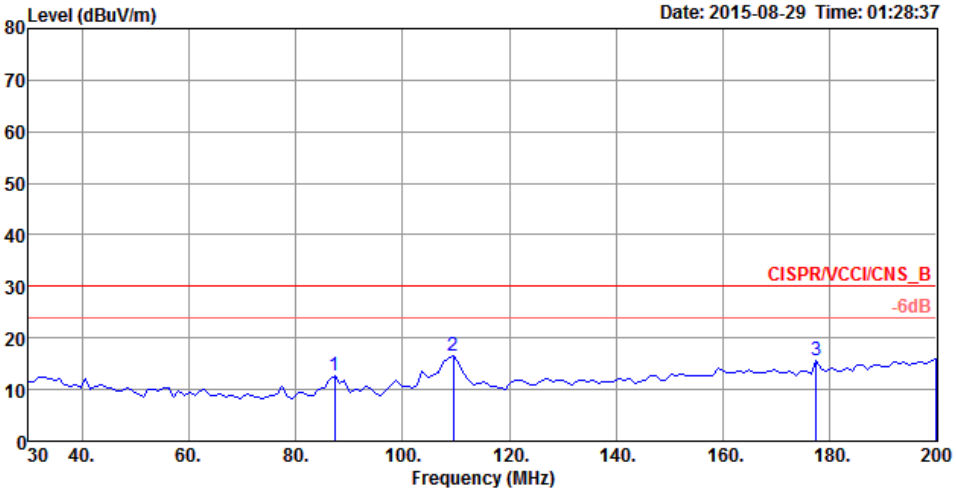
	Freq	Level	Limit Line	Over Limit	Read Level	Preamp Factor	Antenna Factor	Cable Loss	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2000.00	40.07	50.00	-9.93	35.08	35.89	31.20	9.68	Average	100	68	VERTICAL
2	2000.00	49.29	70.00	-20.71	44.30	35.89	31.20	9.68	Peak	100	68	VERTICAL
3	3685.00	31.05	54.00	-22.95	23.69	36.33	33.13	10.56	Average	100	74	VERTICAL
4	3685.00	46.75	74.00	-27.25	39.39	36.33	33.13	10.56	Peak	100	74	VERTICAL
5	4735.00	31.32	54.00	-22.68	21.46	36.39	34.14	12.11	Average	100	161	VERTICAL
6	4735.00	48.67	74.00	-25.33	38.81	36.39	34.14	12.11	Peak	100	161	VERTICAL

Horizontal 200 MHz to 1,000 MHz



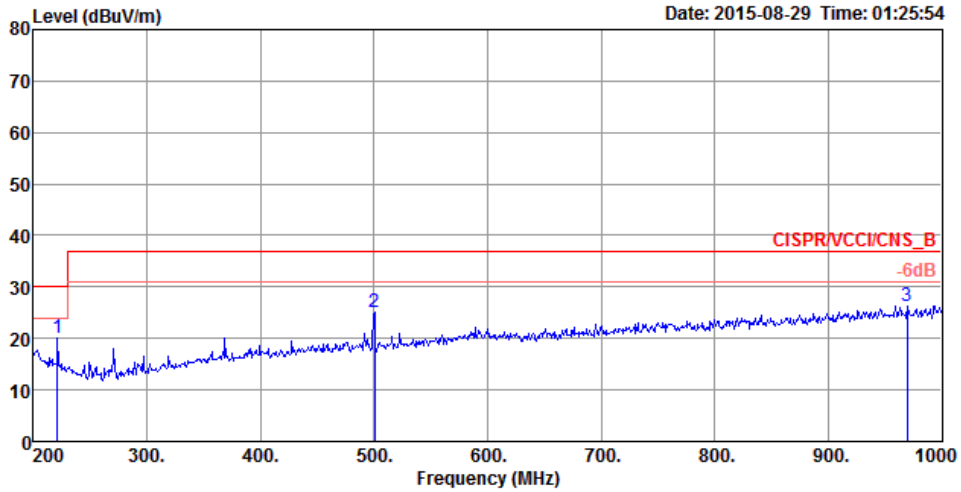
	Freq	Level	Limit Line	Over Limit	Read Level	Preamp Factor	Antenna Factor	Cable Loss	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	500.45	24.23	37.00	-12.77	31.17	28.50	17.61	3.95	Peak	100	191	HORIZONTAL
2	800.18	27.26	37.00	-9.74	29.25	27.84	20.80	5.05	Peak	100	145	HORIZONTAL
3	959.26	27.79	37.00	-9.21	27.20	27.29	22.29	5.59	Peak	100	21	HORIZONTAL

Horizontal 30 MHz to 200 MHz



	Freq	Level	Limit Line	Over Limit	Read Level	Preamp Factor	Antenna Factor	Cable Loss	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	87.23	12.68	30.00	-17.32	29.60	28.50	8.93	2.65	Peak	400	181	HORIZONTAL
2	109.54	16.68	30.00	-13.32	32.28	28.43	9.88	2.95	Peak	400	286	HORIZONTAL
3	177.44	15.61	30.00	-14.39	27.23	28.09	12.70	3.77	Peak	400	149	HORIZONTAL

Vertical 200 MHz to 1,000 MHz

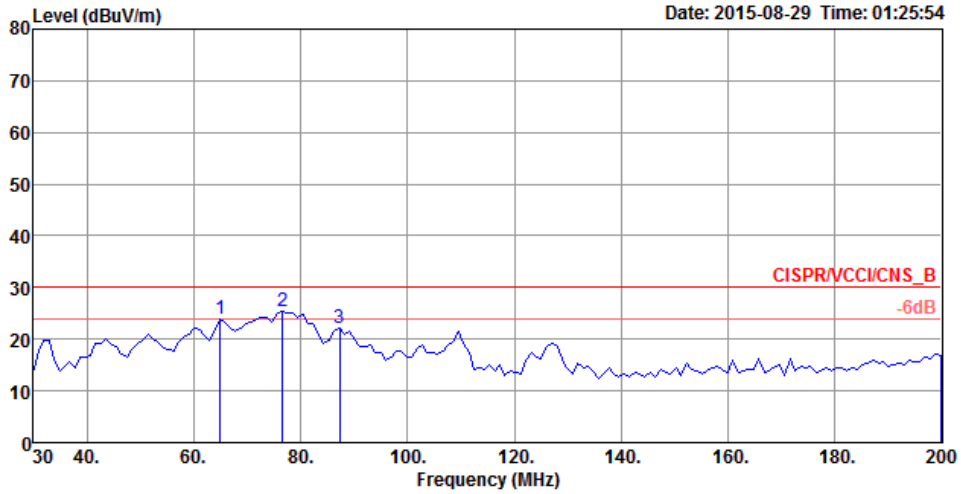


	Freq	Level	Limit Line	Over Limit	Read Level	Preamp Factor	Antenna Factor	Cable Loss	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	221.09	19.97	30.00	-10.03	30.25	27.30	14.38	2.64	Peak	100	248	VERTICAL
2	500.45	24.99	37.00	-12.01	31.93	28.50	17.61	3.95	Peak	100	340	VERTICAL
3	969.93	26.28	37.00	-10.72	25.52	27.25	22.39	5.62	Peak	100	102	VERTICAL

Applicable Standard	EN 55022:2010/AC:2011, CISPR 22 ed.6:2008/I-SH 1:2009/I-SH 2:2010/I-SH 3:2012 and AS/NZS CISPR 22:2009/Amdt 1:2010		
Temperature	24℃	Humidity	62%
Test Engineer	Edison Lin	Frequency Range	30 MHz to 1,000 MHz
Test Mode	Mode 3		

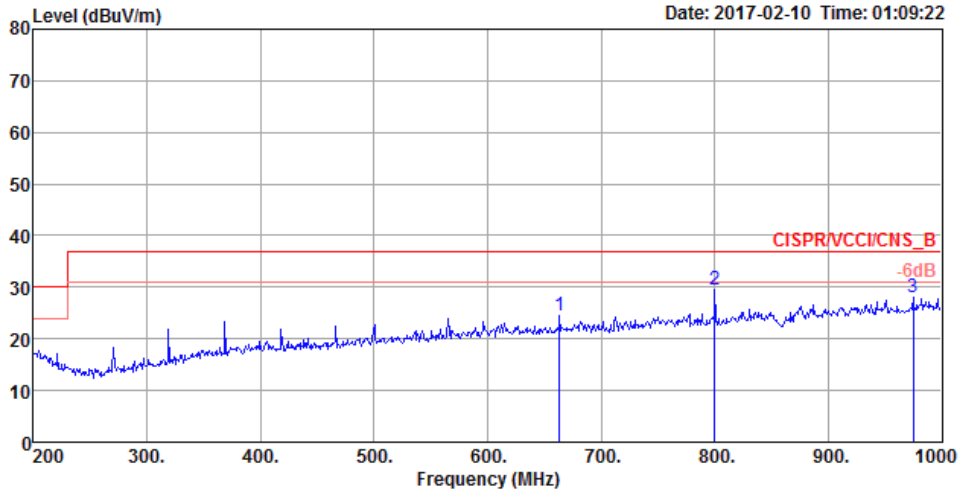
- Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
- Margin = - Limit + (Read Level + Antenna Factor + Cable Loss - Preamp Factor)
- The test was passed at the minimum margin that marked by the frame in the following test record

Vertical 30 MHz to 200 MHz



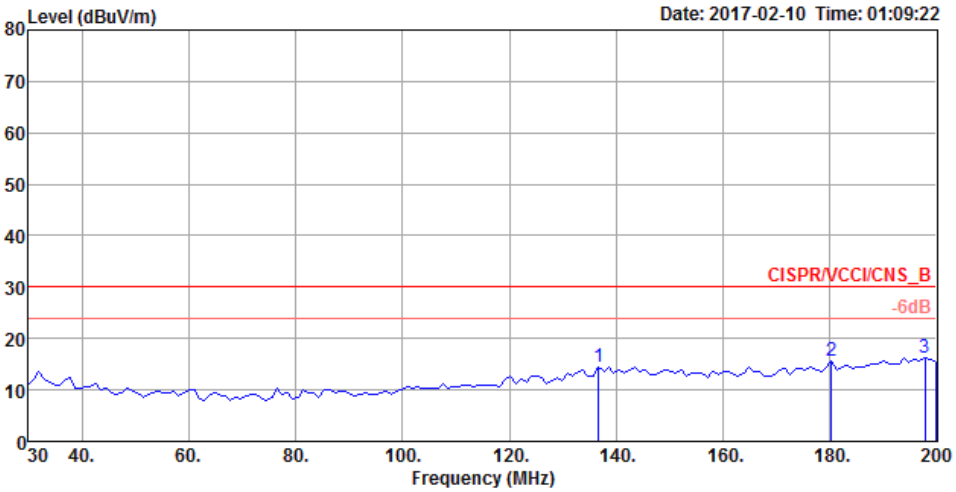
	Freq	Level	Limit Line	Over Limit	Read Level	Preamp Factor	Antenna Factor	Cable Loss	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	64.92	23.92	30.00	-6.08	40.78	28.55	9.40	2.29	Peak	400	247	VERTICAL
2	76.56	25.26	30.00	-4.74	42.23	28.52	9.07	2.48	Peak	100	221	VERTICAL
3	87.23	22.28	30.00	-7.72	39.20	28.50	8.93	2.65	Peak	100	214	VERTICAL

Horizontal 200 MHz to 1,000 MHz



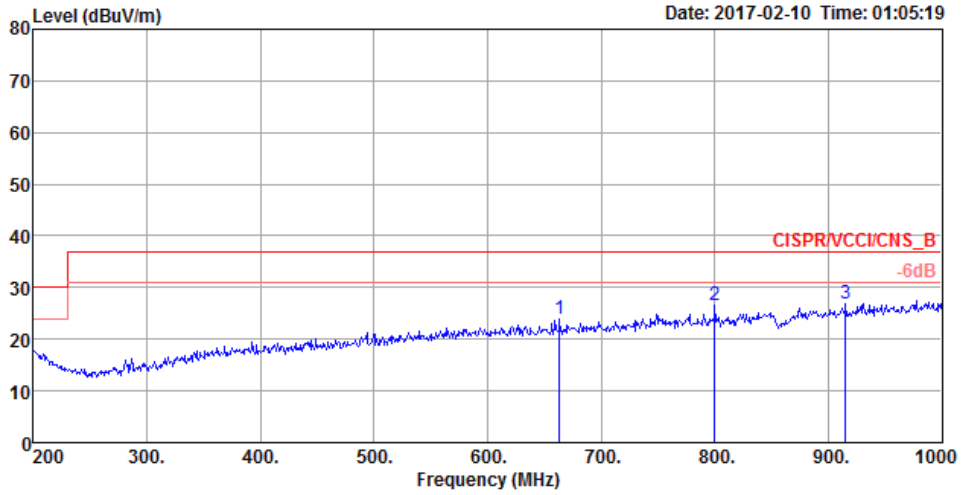
	Freq	Level	Limit Line	Over Limit	Read Level	Preamp Factor	Antenna Factor	Cable Loss	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	663.41	24.44	37.00	-12.56	27.20	28.33	19.43	6.14	Peak	100	72	HORIZONTAL
2	800.18	29.65	37.00	-7.35	30.25	27.89	20.70	6.59	Peak	100	151	HORIZONTAL
3	974.78	28.03	37.00	-8.97	25.50	27.13	22.44	7.22	Peak	300	309	HORIZONTAL

Horizontal 30 MHz to 200 MHz



	Freq	Level	Limit Line	Over Limit	Read Level	Preamp Factor	Antenna Factor	Cable Loss	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	136.70	14.43	30.00	-15.57	27.48	28.29	11.70	3.54	Peak	300	137	HORIZONTAL
2	180.35	15.76	30.00	-14.24	26.47	28.08	13.23	4.14	Peak	200	100	HORIZONTAL
3	197.81	16.18	30.00	-13.82	25.27	27.99	14.59	4.31	Peak	400	261	HORIZONTAL

Vertical 200 MHz to 1,000 MHz



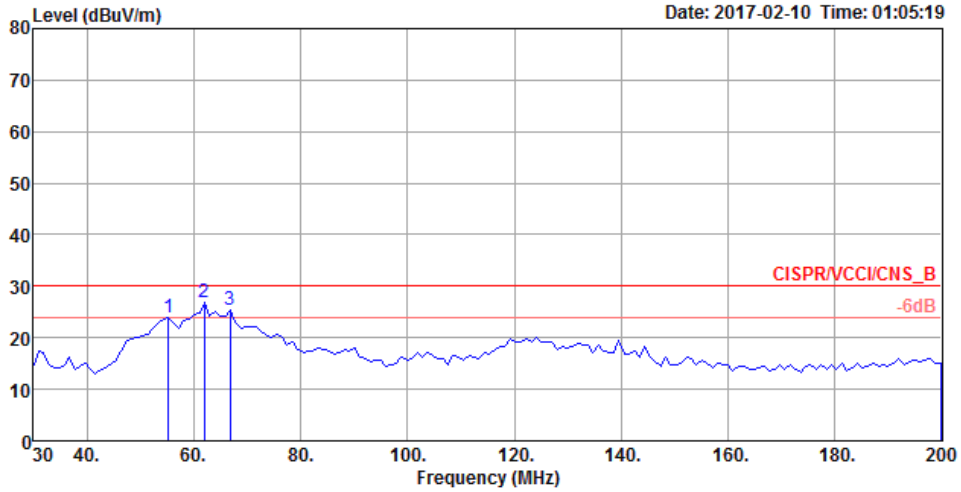
	Freq	Level	Limit Line	Over Limit	Read Level	Preamp Factor	Antenna Factor	Cable Loss	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	663.41	24.02	37.00	-12.98	26.78	28.33	19.43	6.14	Peak	200	323	VERTICAL
2	800.18	26.47	37.00	-10.53	27.07	27.89	20.70	6.59	Peak	200	113	VERTICAL
3	915.61	26.91	37.00	-10.09	25.40	27.39	21.79	7.11	Peak	300	296	VERTICAL

6.5. Test Result of Radiated Emission below 1 GHz

Applicable Standard	EN 301 489-1 V2.1.1 (2017-02), EN 55032:2012/AC:2013, CISPR 32:2012 and AS/NZS CISPR 32:2013		
Temperature	22℃	Humidity	58%
Test Engineer	Hank Yang	Frequency Range	30 MHz to 1,000 MHz
Test Mode	Mode 2		

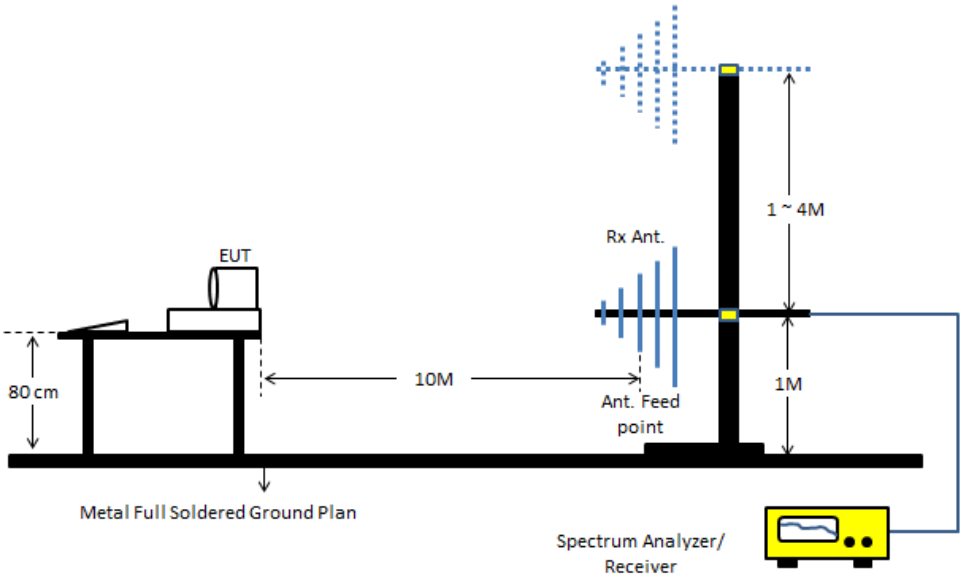
- Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
- Margin = - Limit + (Read Level + Antenna Factor + Cable Loss - Preamp Factor)
- The test was passed at the minimum margin that marked by the frame in the following test record

Vertical 30 MHz to 200 MHz

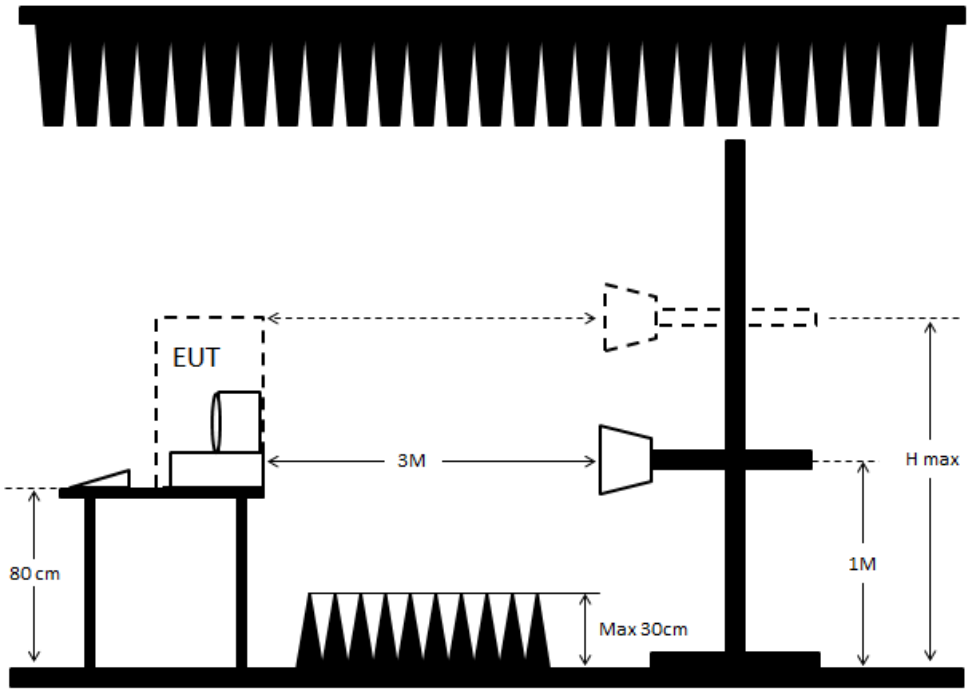


	Freq	Level	Limit Line	Over Limit	Read Level	Preamp Factor	Antenna Factor	Cable Loss	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	55.22	24.03	30.00	-5.97	40.46	28.57	9.94	2.20	Peak	300	12	VERTICAL
2	62.01	26.83	30.00	-3.17	43.52	28.55	9.52	2.34	Peak	300	12	VERTICAL
3	66.86	25.34	30.00	-4.66	42.11	28.54	9.32	2.45	Peak	300	98	VERTICAL

<Below 1 GHz>:

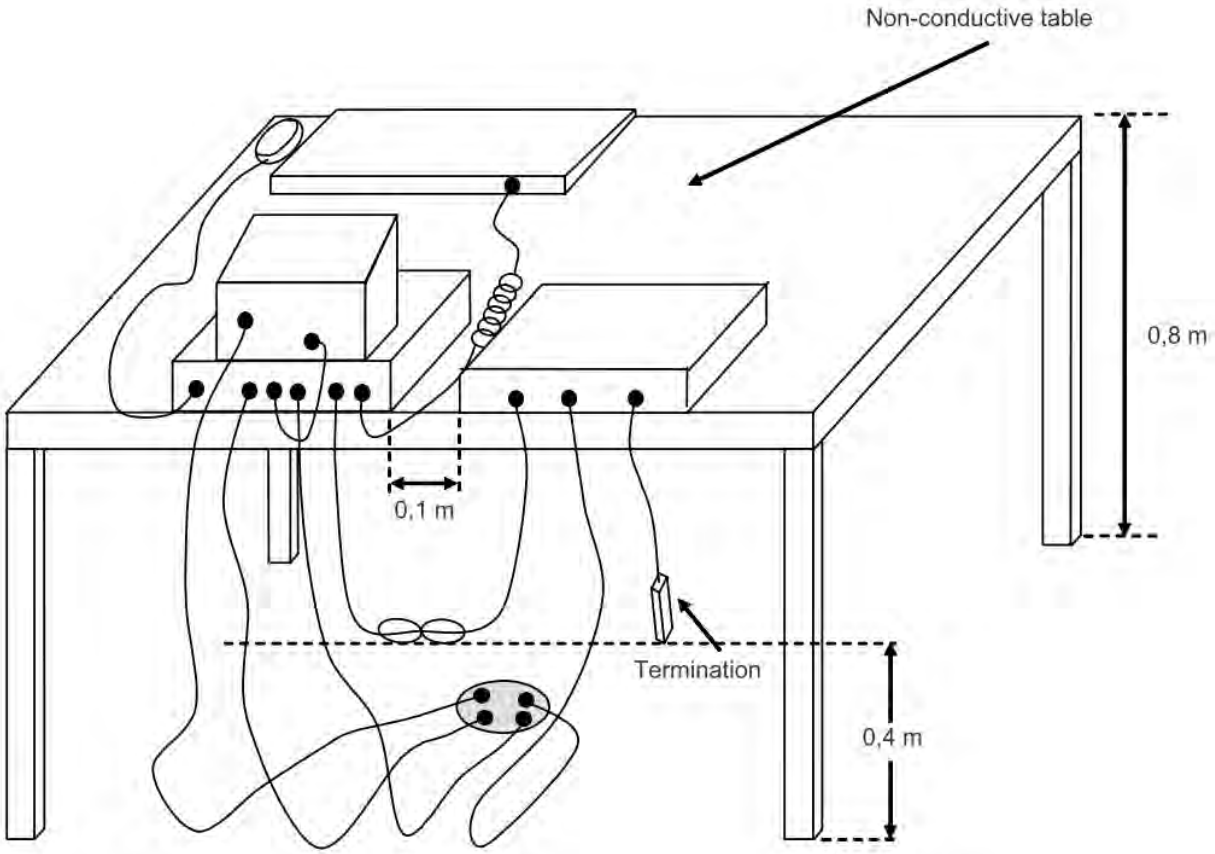


<Above 1 GHz>:



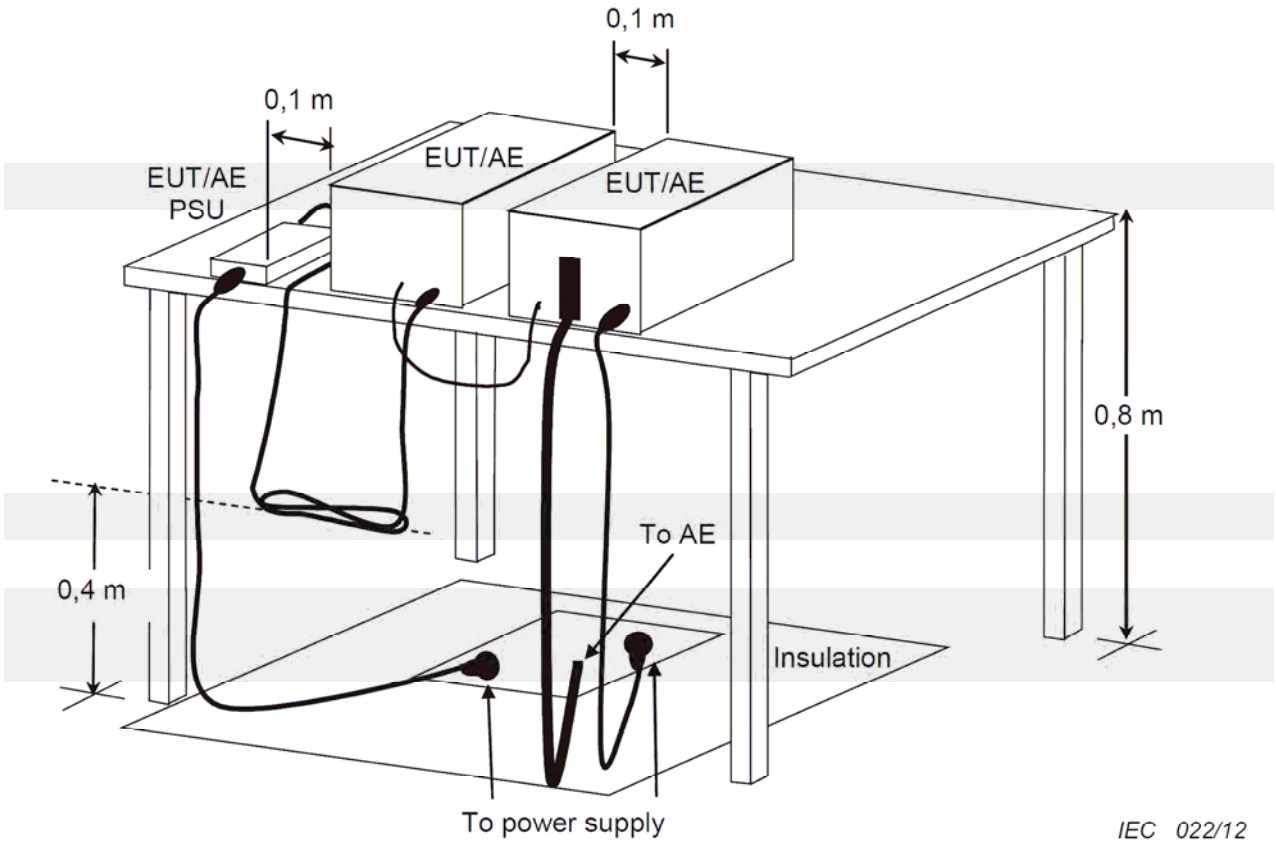
Remark : When EUT height is over 172cm , H max = Top of EUT

Applicable Standard: EN 55022:2010/AC:2011, CISPR 22 ed.6:2008/I-SH 1:2009/I-SH 2:2010/I-SH 3:2012 and AS/NZS CISPR 22:2009/Amdt 1:2010



6.4. Typical Test Setup Layout of Radiated Emission

Applicable Standard: EN 301 489-1 V2.1.1 (2017-02), EN 55032:2012/AC:2013, CISPR 32:2012 and AS/NZS CISPR 32:2013



6.3. Test Procedures

<Below 1 GHz>:

a. The EUT was placed on a rotatable table top 0.8 meter above ground.

b. The EUT was set 10 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.

c. The table was rotated 360 degrees to determine the position of the highest radiation.

d. The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.

e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.

f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.

<Above 1 GHz>:

a. Same test set up as below 1 GHz radiated testing.

b. The EUT was set 3 meters from the interference-receiving antenna which was mounted on the top of a variable height antenna tower.

c. There should be absorber placed between the EUT and Antenna and its located size should let the test site meet CISPR16-1-4 requirement.

d. The table was rotated 360 degrees to determine the position of the highest radiation.

e. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

f. Set the DRG Horn Antenna at 1M height, then run the turn table to get the maximum noise reading from Horizontal and Vertical polarity separately.

g. When EUT locating on the turn-table, and its height is over 172 cm (Antenna's 3dB beam width of 6 GHz is 27°), the DRG Horn Antenna must be raised up and descended down, then turning around the turn-table to get the maximum noise reading of the Horizontal and Vertical polarity separately. Note the maximum raise up height is same as the top of EUT.

h. If emission level of the EUT in peak mode was 20 dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

6.2. Description of Major Test Instruments

6.2.1. 30 MHz ~ 1,000 MHz

Amplifier	Agilent 8447D
RF Gain	25 dB
Signal Input	9 kHz to 1.3 GHz

Spectrum Analyzer	R&S FSV30
Start Frequency	30 MHz
Stop Frequency	1000 MHz
Resolution Bandwidth	120 kHz
Signal Input	9 kHz to 30 GHz

Test Receiver	R&S ESCI
Start Frequency	30 MHz
Stop Frequency	1000 MHz
Resolution Bandwidth	120 kHz
Signal Input	9 kHz to 3 GHz

6.2.2. Above 1 GHz

Amplifier	Agilent 8449B
RF Gain	35 dB
Signal Input	1 GHz to 26.5 GHz

Spectrum Analyzer	R&S FSV30
Start Frequency	1 GHz
Stop Frequency	6 GHz
Resolution Bandwidth	1 MHz
Signal Input	9 kHz to 30 GHz

6. Test of Radiated Emission

6.1. Limit

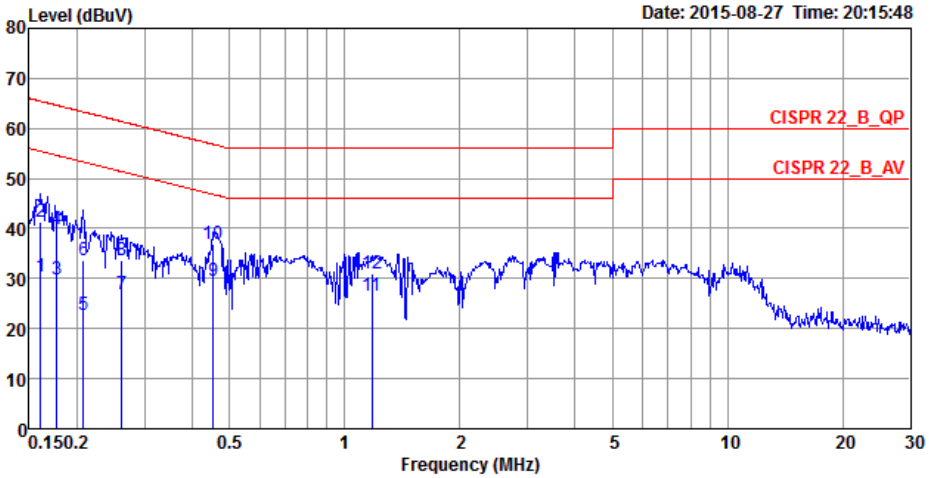
Radiated Emission below 1 GHz test at 10 m:

Frequency (MHz)	QP (dBuV/m)
30~230	30
230~1,000	37

Radiated Emission above 1 GHz test at 3 m:

Frequency (MHz)	PK (dBuV/m)	AV (dBuV/m)
1,000~3,000	70	50
3,000~6,000	74	54

Neutral

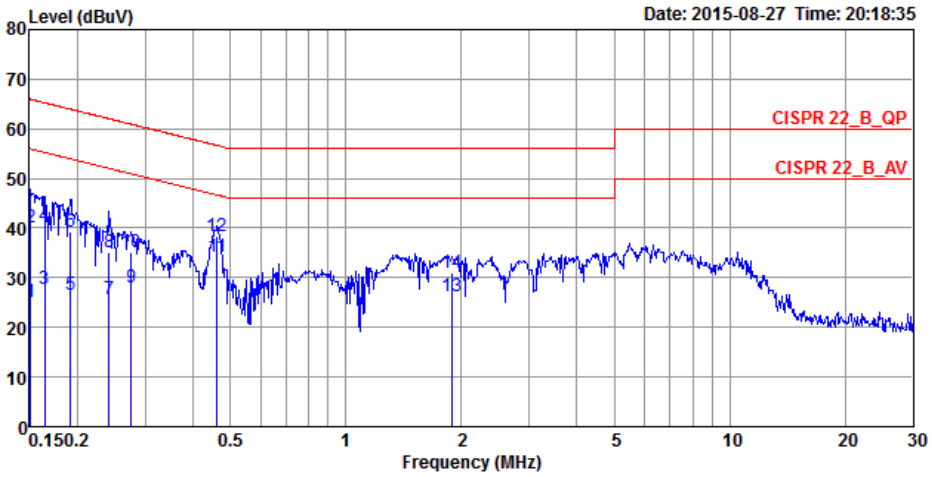


	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1607	30.52	-24.91	55.43	20.72	9.78	0.02	NEUTRAL	Average
2	0.1607	41.42	-24.01	65.43	31.62	9.78	0.02	NEUTRAL	QP
3	0.1768	29.79	-24.85	54.64	19.98	9.79	0.02	NEUTRAL	Average
4	0.1768	39.82	-24.82	64.64	30.01	9.79	0.02	NEUTRAL	QP
5	0.2072	22.71	-30.61	53.32	12.90	9.79	0.02	NEUTRAL	Average
6	0.2072	33.53	-29.79	63.32	23.72	9.79	0.02	NEUTRAL	QP
7	0.2616	26.86	-24.52	51.38	17.04	9.79	0.03	NEUTRAL	Average
8	0.2616	33.68	-27.70	61.38	23.86	9.79	0.03	NEUTRAL	QP
9	0.4539	29.44	-17.36	46.80	19.61	9.79	0.04	NEUTRAL	Average
10	0.4539	36.93	-19.87	56.80	27.10	9.79	0.04	NEUTRAL	QP
11	1.1781	26.52	-19.48	46.00	16.65	9.82	0.05	NEUTRAL	Average
12	1.1781	30.86	-25.14	56.00	20.99	9.82	0.05	NEUTRAL	QP

Applicable Standard	EN 55022:2010/AC:2011, CISPR 22 ed.6:2008/I-SH 1:2009/I-SH 2:2010/I-SH 3:2012 and AS/NZS CISPR 22:2009/Amdt 1:2010		
Temperature	25℃	Humidity	52%
Test Engineer	Kane Liu	Frequency Range	0.15 MHz to 30 MHz
Test Mode	Mode 2		

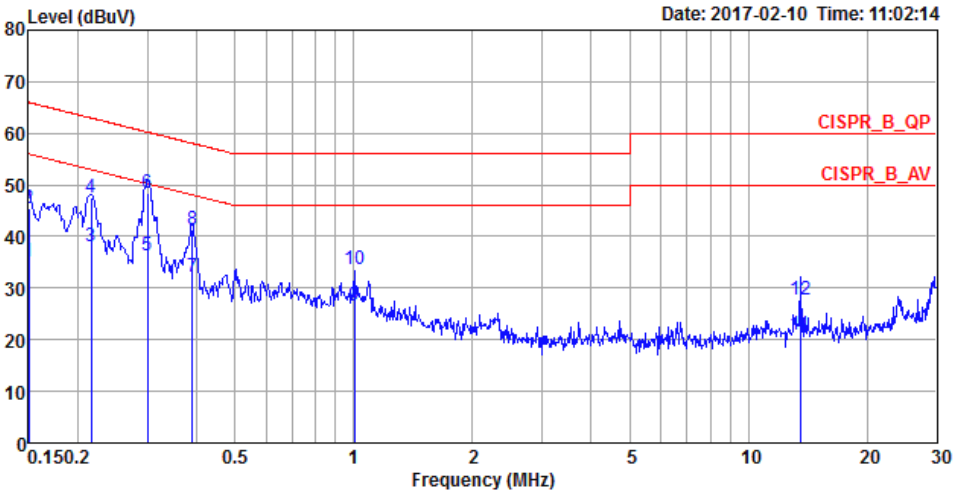
- Corrected Reading (dBuV) = LISN Factor + Cable Loss + Read Level = Level
- Margin = - Limit + (Read Level + LISN Factor + Cable Loss)
- All emissions not reported here are more than 10 dB below the prescribed limit.
- The test was passed at the minimum margin that marked by a frame in the following table

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1508	25.02	-30.94	55.96	15.07	9.93	0.02	LINE	Average
2	0.1508	40.24	-25.72	65.96	30.29	9.93	0.02	LINE	QP
3	0.1641	27.70	-27.55	55.25	17.75	9.93	0.02	LINE	Average
4	0.1641	40.51	-24.74	65.25	30.56	9.93	0.02	LINE	QP
5	0.1914	26.55	-27.43	53.98	16.60	9.93	0.02	LINE	Average
6	0.1914	39.14	-24.84	63.98	29.19	9.93	0.02	LINE	QP
7	0.2416	25.82	-26.22	52.04	15.86	9.93	0.03	LINE	Average
8	0.2416	35.23	-26.81	62.04	25.27	9.93	0.03	LINE	QP
9	0.2759	28.10	-22.84	50.94	18.13	9.93	0.04	LINE	Average
10	0.2759	35.09	-25.85	60.94	25.12	9.93	0.04	LINE	QP
11	0.4612	34.37	-12.30	46.67	24.40	9.93	0.04	LINE	Average
12	0.4612	38.31	-18.36	56.67	28.34	9.93	0.04	LINE	QP
13	1.8979	26.19	-19.81	46.00	16.14	9.99	0.06	LINE	Average
14	1.8979	31.04	-24.96	56.00	20.99	9.99	0.06	LINE	QP

Neutral



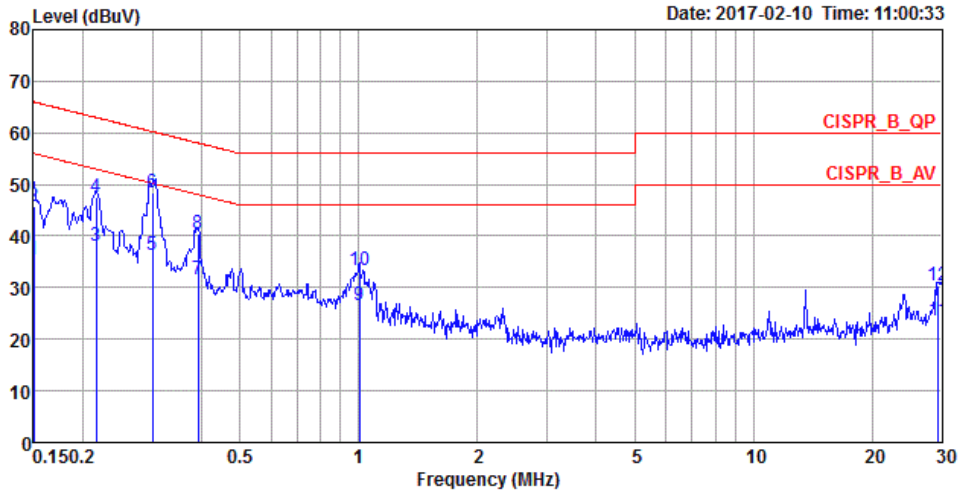
	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1500	35.19	-20.81	56.00	25.01	10.02	0.16	NEUTRAL	Average
2	0.1500	45.51	-20.49	66.00	35.33	10.02	0.16	NEUTRAL	QP
3	0.2162	38.11	-14.85	52.96	28.02	9.92	0.17	NEUTRAL	Average
4	0.2162	47.42	-15.54	62.96	37.33	9.92	0.17	NEUTRAL	QP
5	0.3003	36.17	-14.07	50.24	26.16	9.92	0.09	NEUTRAL	Average
6	0.3003	48.33	-11.91	60.24	38.32	9.92	0.09	NEUTRAL	QP
7	0.3893	32.25	-15.83	48.08	22.31	9.92	0.02	NEUTRAL	Average
8	0.3893	41.30	-16.78	58.08	31.36	9.92	0.02	NEUTRAL	QP
9	1.0050	26.60	-19.40	46.00	15.92	9.94	0.74	NEUTRAL	Average
10	1.0050	33.64	-22.36	56.00	22.96	9.94	0.74	NEUTRAL	QP
11	13.5509	20.99	-29.01	50.00	10.58	10.21	0.20	NEUTRAL	Average
12	13.5509	27.88	-32.12	60.00	17.47	10.21	0.20	NEUTRAL	QP

5.5. Test Result of AC Power Ports

Applicable Standard	EN 301 489-1 V2.1.1 (2017-02), EN 55032:2012/AC:2013, CISPR 32:2012 and AS/NZS CISPR 32:2013		
Temperature	20℃	Humidity	60%
Test Engineer	Deven Huang	Frequency Range	0.15 MHz to 30 MHz
Test Mode	Mode 1		

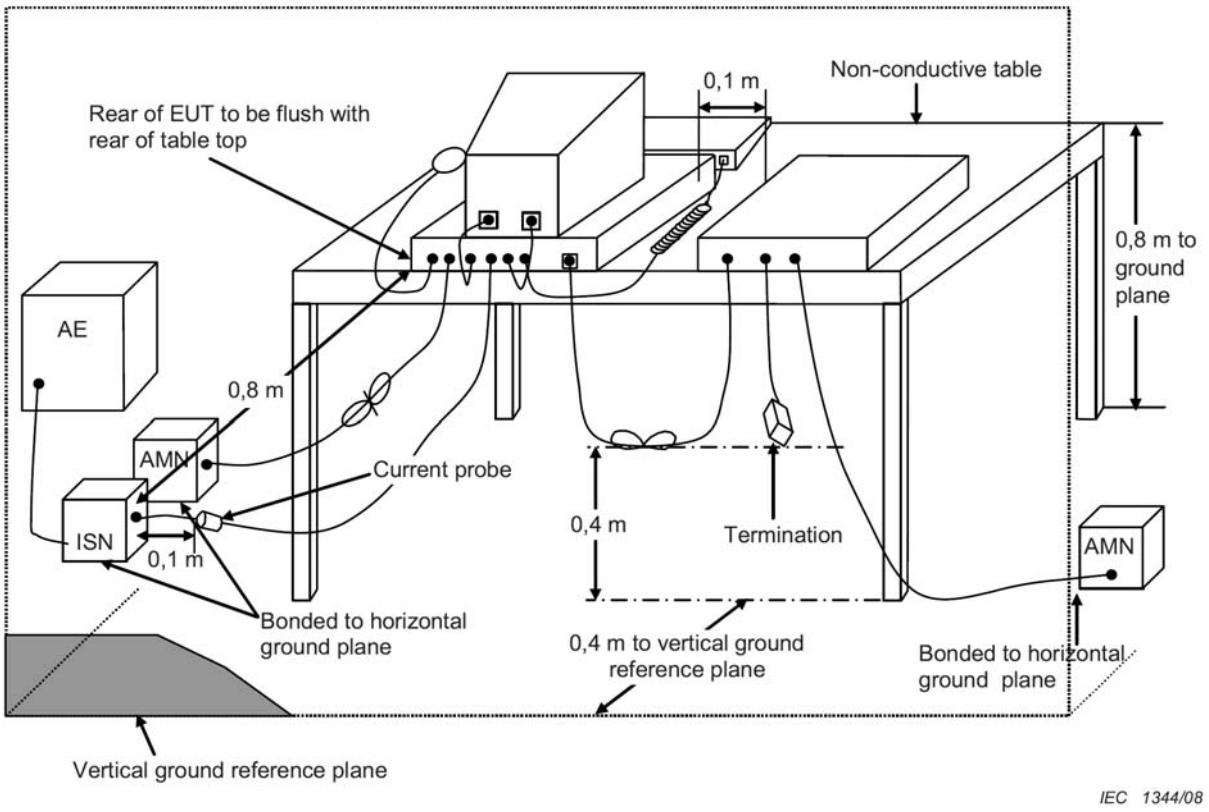
- Corrected Reading (dBuV) = LISN Factor + Cable Loss + Read Level = Level
- Margin = - Limit + (Read Level + LISN Factor + Cable Loss)
- All emissions not reported here are more than 10 dB below the prescribed limit.
- The test was passed at the minimum margin that marked by a frame in the following table

Line



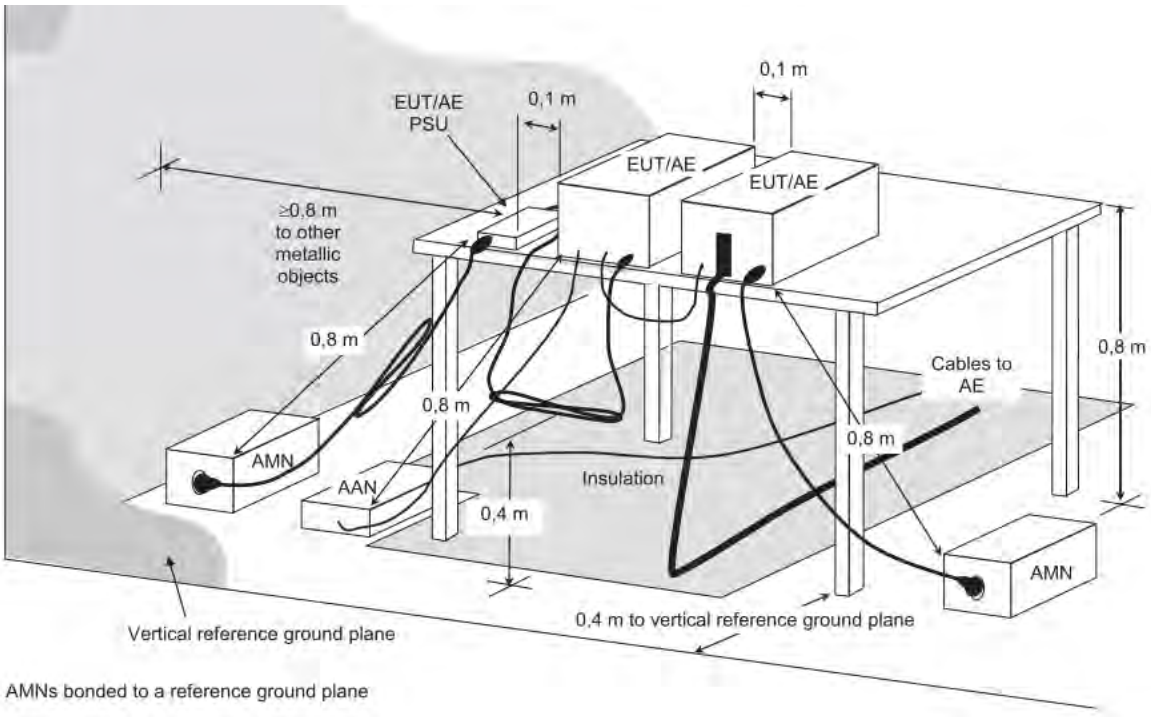
	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1500	35.34	-20.66	56.00	25.16	10.02	0.16	LINE	Average
2	0.1500	45.70	-20.30	66.00	35.52	10.02	0.16	LINE	QP
3	0.2162	38.06	-14.90	52.96	27.97	9.92	0.17	LINE	Average
4	0.2162	47.42	-15.54	62.96	37.33	9.92	0.17	LINE	QP
5	0.3003	36.45	-13.79	50.24	26.44	9.92	0.09	LINE	Average
6	0.3003	48.55	-11.69	60.24	38.54	9.92	0.09	LINE	QP
7	0.3914	31.73	-16.30	48.03	21.79	9.92	0.02	LINE	Average
8	0.3914	40.56	-17.47	58.03	30.62	9.92	0.02	LINE	QP
9	1.0050	26.63	-19.37	46.00	15.95	9.94	0.74	LINE	Average
10	1.0050	33.45	-22.55	56.00	22.77	9.94	0.74	LINE	QP
11	29.3709	23.59	-26.41	50.00	12.73	10.55	0.31	LINE	Average
12	29.3709	30.37	-29.63	60.00	19.51	10.55	0.31	LINE	QP

Applicable Standard: EN 55022:2010/AC:2011, CISPR 22 ed.6:2008/I-SH 1:2009/I-SH 2:2010/I-SH 3:2012 and AS/NZS CISPR 22:2009/Amdt 1:2010



5.4. Typical Test Setup Layout of Conducted Emission

Applicable Standard: EN 301 489-1 V2.1.1 (2017-02), EN 55032:2012/AC:2013, CISPR 32:2012 and AS/NZS CISPR 32:2013



5. Test of Conducted Emission

5.1. Limit

5.1.1. Limit for AC power ports：

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

5.2. Description of Major Test Instruments

Applicable Standard: EN 301 489-1 V2.1.1 (2017-02), EN 55032:2012/AC:2013, CISPR 32:2012 and AS/NZS CISPR 32:2013

Test Receiver	Agilent N9038A
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

Applicable Standard: EN 55022:2010/AC:2011, CISPR 22 ed.6:2008/I-SH 1:2009/I-SH 2:2010/I-SH 3:2012 and AS/NZS CISPR 22:2009/Amdt 1:2010

Test Receiver	R&S ESCS 30
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

5.3. Test Procedures

a. The EUT was placed on a desk 0.8 meters height from the metal ground plane and 0.4 meter from the conducting wall of the shielding room and it was kept at least 0.8 meters from any other grounded conducting surface.
b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
c. All the support units are connect to the other LISN.
d. The LISN provides 50 Ω coupling impedance for the measuring instrument.
e. The CISPR states that a 50 Ω, 50 uH LISN should be used.
f. Both sides of AC line were checked for maximum conducted interference.
g. The frequency range from 150 kHz to 30 MHz was searched.
h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

4.4. Test Distance

Test Items	Test Distance
Radiated emission test below 1 GHz (30 MHz to 1,000 MHz)	10 m
Radiated emission test above 1 GHz (1,000 MHz to 6,000 MHz)	3 m
Radio frequency electromagnetic field immunity test (80 MHz to 6,000 MHz)	3 m

4. General Information of Test

4.1. Test Facility

<EMI>

Test Site Location	:	No.8, Lane 724, Bo-ai St., Jhubei City, Hsinchu County 302, Taiwan, R.O.C.
TEL	:	886-3-656-9065
FAX	:	886-3-656-9085
Test Site No.	:	Conduction: CO01-CB Radiation: 10CH01-CB

<EMS>

For other test items:

Test Site Location	:	No.8, Lane 724, Bo-ai St., Jhubei City, Hsinchu County 302, Taiwan, R.O.C.
TEL	:	886-3-656-9065
FAX	:	886-3-656-9085

For Radio frequency electromagnetic field immunity test (1GHz ~ 6GHz):

Test Site Location	:	No. 58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)
TEL	:	886-3-327-0868

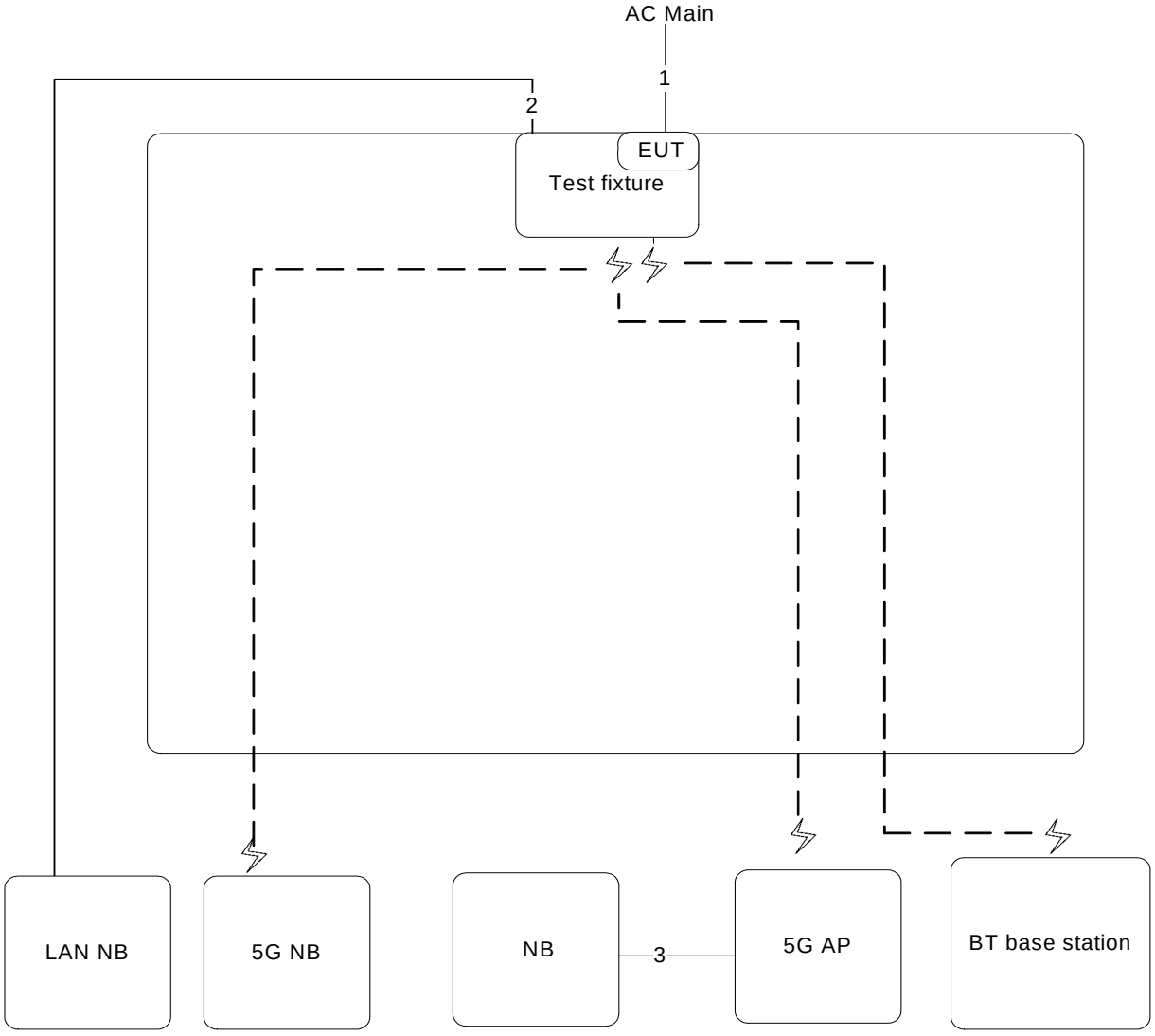
4.2. Test Voltage

Power Type	Test Voltage
AC Power Supply	230 V / 50 Hz

4.3. Frequency Range Investigated

EMI Test Items	Frequency Range
Conducted emission test	150 kHz to 30 MHz
Radiated emission test	30 MHz to 6,000 MHz
EMS Test Items	**Frequency Range**
Radio frequency electromagnetic field immunity test	80 MHz to 6,000 MHz

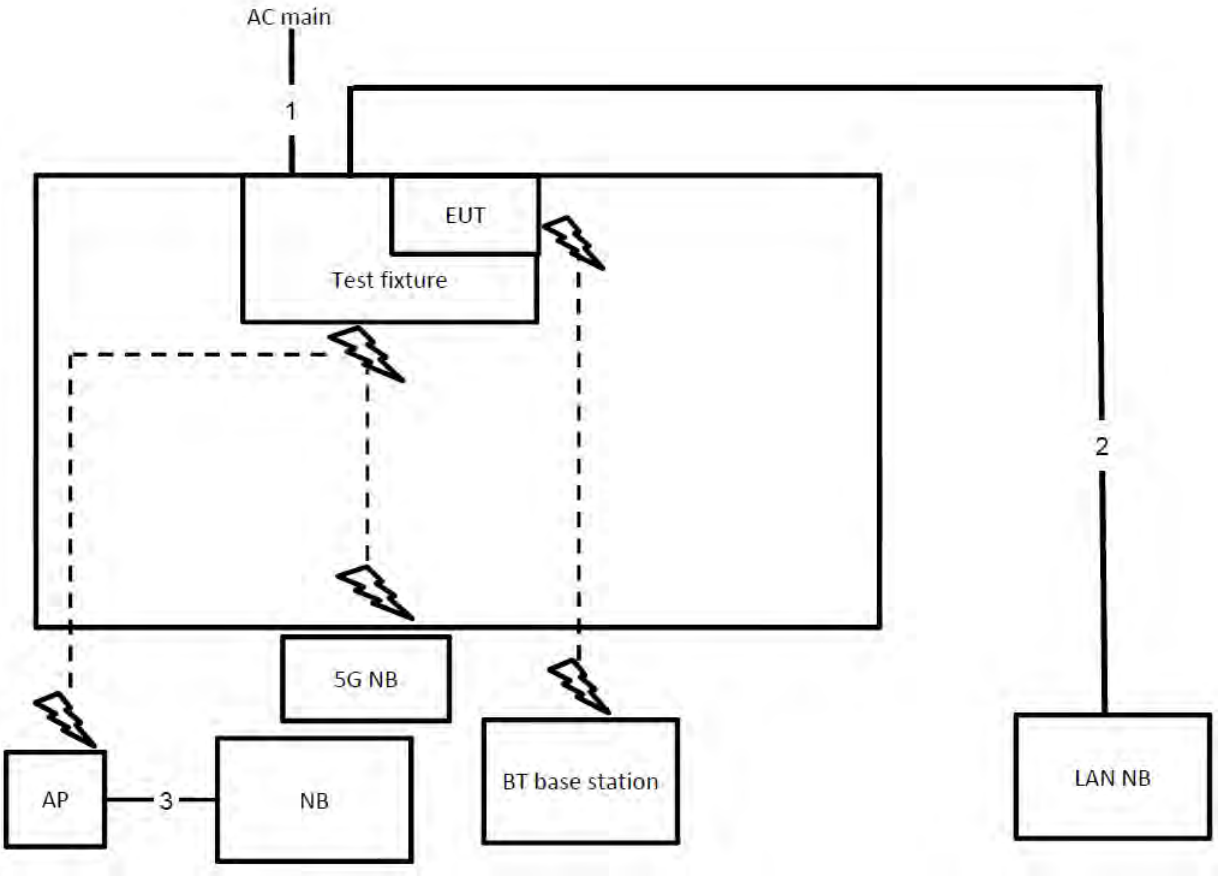
Applicable Standard: EN 55022:2010/AC:2011, CISPR 22 ed.6:2008/I-SH 1:2009/I-SH 2:2010/I-SH 3:2012 and AS/NZS CISPR 22:2009/Amdt 1:2010



Item	Connection	Shielded	Length
1	Power Cable	No	1.5m
2	RJ-45 Cable	No	10m
3	RJ-45 Cable	No	1.5m

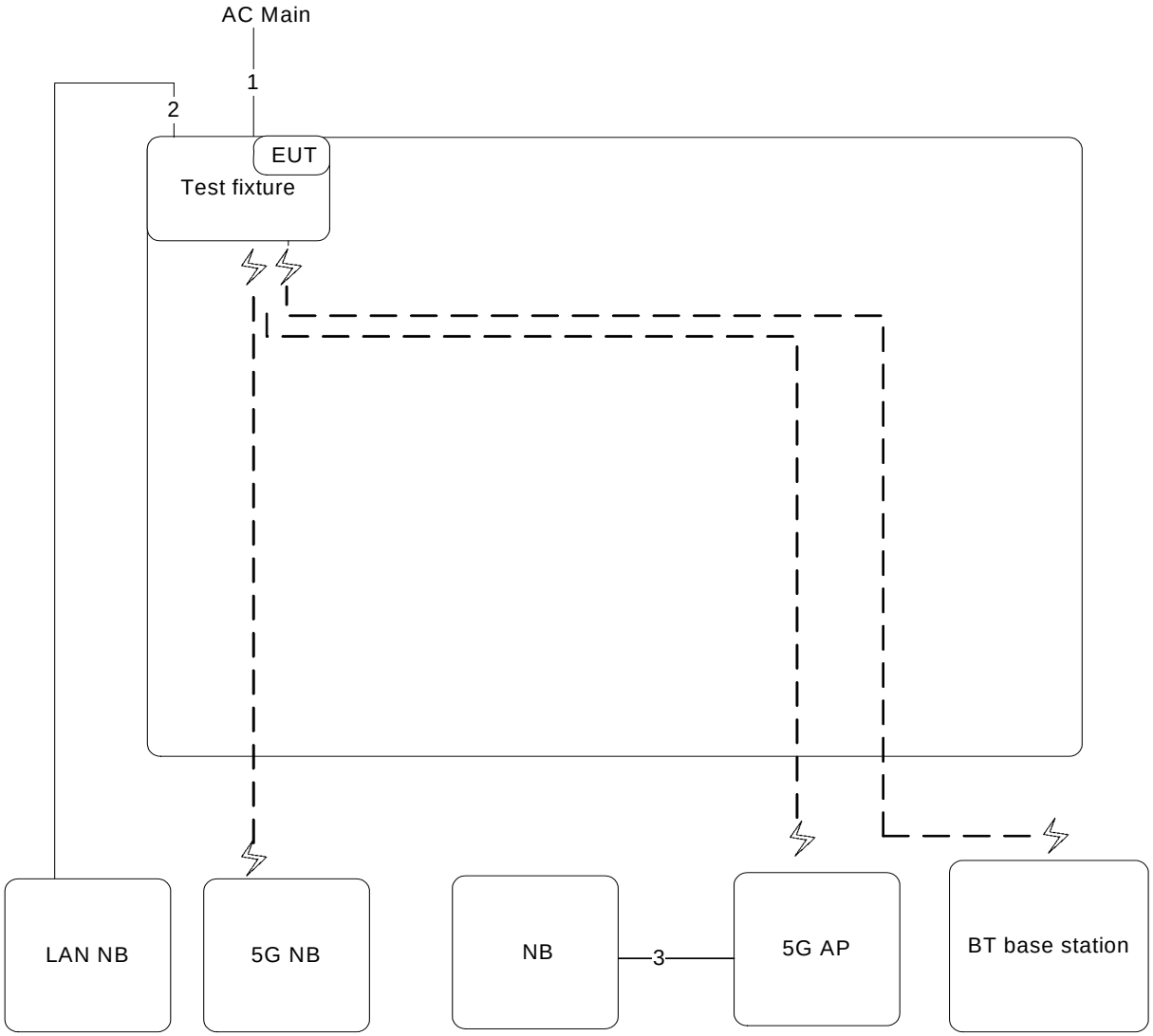
3.4.2. Radiation Emissions Test Configuration

Applicable Standard: EN 301 489-1 V2.1.1 (2017-02), EN 55032:2012/AC:2013, CISPR 32:2012 and AS/NZS CISPR 32:2013



Item	Connection	Shielded	Length
1	Power Cable	No	1.5m
2	RJ-45 Cable	No	10m
3	RJ-45 Cable	No	3m

Applicable Standard: EN 55022:2010/AC:2011, CISPR 22 ed.6:2008/I-SH 1:2009/I-SH 2:2010/I-SH 3:2012 and AS/NZS CISPR 22:2009/Amdt 1:2010

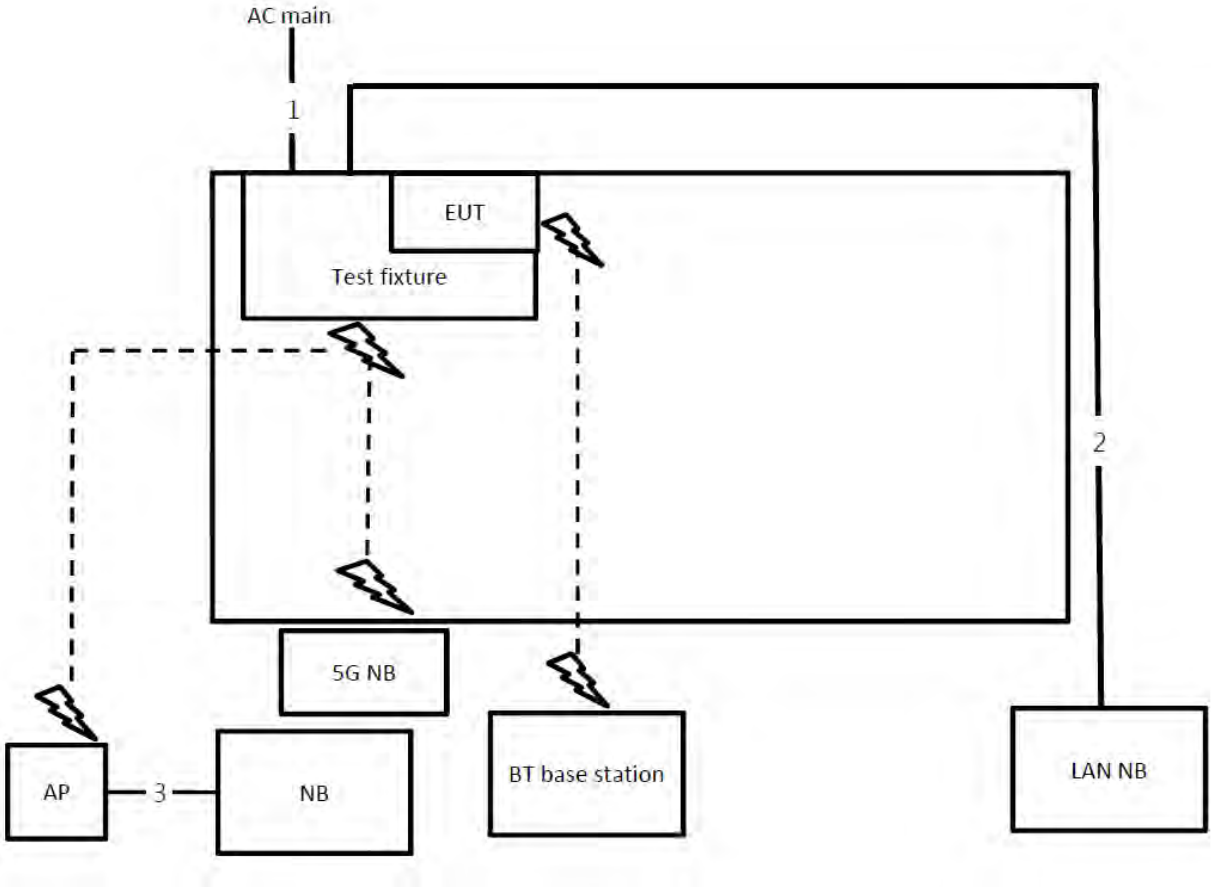


Item	Connection	Shielded	Length
1	Power Cable	No	1.5m
2	RJ-45 Cable	No	10m
3	RJ-45 Cable	No	1.5m

3.4. Connection Diagram of Test System

3.4.1. AC Power Line Conduction Emissions Test Configuration

Applicable Standard: EN 301 489-1 V2.1.1 (2017-02), EN 55032:2012/AC:2013, CISPR 32:2012 and AS/NZS CISPR 32:2013



Item	Connection	Shielded	Length
1	Power Cable	No	1.5m
2	RJ-45 Cable	No	10m
3	RJ-45 Cable	No	3m

3.3. EUT Operation Condition

<EMI>/<EMS>

During the test, the following programs under Win 7 were executed:

The remote notebook executed “Telnet” to link with the EUT and AP by WLAN.

The remote notebook executed "ping.exe" to link with the EUT to maintain the connection by WLAN.

The remote notebook executed “Telnet” to link with the EUT and BT base station by Bluetooth.

Support Unit	Brand	Model	FCC ID
NB*3	DELL	E6430	DoC
Test fixture	Arcadyan	WN9722A-DM Test Jig	N/A

3.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Applicable Standard: EN 301 489-1 V2.1.1 (2017-02), EN 55032:2012/AC:2013, CISPR 32:2012 and AS/NZS CISPR 32:2013

For EMI

Support Unit	Brand	Model	FCC ID
AP Router	Planex	GW-AP54SGX	KA220030603014-1
BT base station	Anritsu	MT8852B	N/A
NB*3	DELL	E6430	DoC
Test fixture	Arcadyan	WN9722A-DM Test Jig	N/A

Applicable Standard: EN 55022:2010/AC:2011, CISPR 22 ed.6:2008/I-SH 1:2009/I-SH 2:2010/I-SH 3:2012 and AS/NZS CISPR 22:2009/Amdt 1:2010

For EMI

Support Unit	Brand	Model	FCC ID
AP Router	Planex	GW-AP54SGX	KA220030603014-1
BT base station	Anritsu	MT8852B	N/A
NB*3	DELL	E4300	DoC
Test fixture	Arcadyan	WN9722A-DM Test Jig	N/A

Applicable Standard: EN 301 489-1 V2.1.1 (2017-02), EN 55024:2010 and CISPR 24:2010

For EMS

For other test items:

Support Unit	Brand	Model	FCC ID
AP Router	Planex	GW-AP54SGX	KA220030603014-1
Anritsu	BT base station	MT8852B	N/A
NB*3	DELL	E4300	DoC
Test fixture	Arcadyan	WN9722A-DM Test Jig	N/A

For Radio frequency electromagnetic field immunity test (1GHz ~ 6GHz):

Support Unit	Brand	Model	FCC ID
AP Router	Planex	GW-AP54SGX	KA220030603014-1
BT base station	Anritsu	MT8852B	N/A

Applicable Standard: EN 301 489-1 V2.1.1 (2017-02), EN 55024:2010 and CISPR 24:2010

ESD、RS、PFMF tests	
Test Mode	Normal Link
1	EUT - Radio: R0 (Bluetooth + 2.4GHz WLAN function) with set 1 antenna + Radio: R1 (5GHz WLAN function) with set 8 antenna
2	EUT - Radio: R0 (Bluetooth + 5GHz WLAN function) with set 1 antenna + Radio: R1 (5GHz WLAN function) with set 8 antenna
3	EUT - Radio: R0 (Bluetooth + 2.4GHz WLAN function) with set 10 antenna + Radio: R1 (5GHz WLAN function) with set 10 antenna
4	EUT - Radio: R0 (Bluetooth + 5GHz WLAN function) with set 10 antenna + Radio: R1 (5GHz WLAN function) with set 10 antenna

Applicable Standard: EN 55022:2010/AC:2011, CISPR 22 ed.6:2008/I-SH 1:2009/I-SH 2:2010/I-SH 3:2012 and AS/NZS CISPR 22:2009/Amdt 1:2010

Conducted Emissions	
Test Mode	Normal Link
1	EUT - Radio: R0 (Bluetooth + 2.4GHz WLAN function) with set 1 antenna + Radio: R1 (5GHz WLAN function) with set 8 antenna
2	EUT - Radio: R0 (Bluetooth + 5GHz WLAN function) with set 1 antenna + Radio: R1 (5GHz WLAN function) with set 8 antenna
Mode 2 has been evaluated to be the worst case among Mode 1~2, thus measurement for Mode 3 will follow this same test mode.	
3	EUT - Radio: R0 (Bluetooth + 5GHz WLAN function) with set 10 antenna + Radio: R1 (5GHz WLAN function) with set 10 antenna
Mode 2 generated the worst test result, so it was recorded in this report.	

Radiated Emissions	
Test Mode	Normal Link
1	Place EUT in Y axis - Radio: R0 (Bluetooth + 2.4GHz WLAN function) with set 1 antenna + Radio: R1 (5GHz WLAN function) with set 8 antenna
2	Place EUT in Z axis - Radio: R0 (Bluetooth + 2.4GHz WLAN function) with set 1 antenna + Radio: R1 (5GHz WLAN function) with set 8 antenna
Mode 2 has been evaluated to be the worst case among Mode 1~2, thus measurement for Mode 3 will follow this same test mode.	
3	Place EUT in Z axis - Radio: R0 (Bluetooth + 5GHz WLAN function) with set 1 antenna + Radio: R1 (5GHz WLAN function) with set 8 antenna
Mode 3 has been evaluated to be the worst case among Mode 1~3, thus measurement for Mode 4 will follow this same test mode.	
4	Place EUT in Z axis - Radio: R0 (Bluetooth + 5GHz WLAN function) with set 10 antenna + Radio: R1 (5GHz WLAN function) with set 10 antenna
For Radiated Emission test below 1GHz: Mode 3 generated the worst test result, so it was recorded in this report. For Radiated Emission test above1GHz: Mode 3 generated the worst test result for Radiated emission below 1GHz test, thus the measurement for Radiated emission above 1GHz test will follow this same test configuration.	

3. Test Configuration of Equipment under Test

3.1. Test Mode

Applicable Standard: EN 301 489-1 V2.1.1 (2017-02), EN 55032:2012/AC:2013, CISPR 32:2012 and AS/NZS CISPR 32:2013

Conducted Emissions	
Test Mode	Normal Link
1	EUT - Radio: R0 (Bluetooth + 2.4GHz WLAN function) with set 1 antenna + Radio: R1 (5GHz WLAN function) with set 8 antenna
2	EUT - Radio: R0 (Bluetooth + 5GHz WLAN function) with set 1 antenna + Radio: R1 (5GHz WLAN function) with set 8 antenna
Mode 1 has been evaluated to be the worst case between Mode 1~2, thus measurement for Mode 3 will follow this same test mode.	
3	EUT - Radio: R0 (Bluetooth + 2.4GHz WLAN function) with set 10 antenna + Radio: R1 (5GHz WLAN function) with set 10 antenna
Mode 1 generated the worst test result, so it was recorded in this report.	

Radiated Emissions	
Test Mode	Normal Link
1	Place EUT in Y axis - Radio: R0 (Bluetooth + 2.4GHz WLAN function) with set 1 antenna + Radio: R1 (5GHz WLAN function) with set 8 antenna
2	Place EUT in Z axis - Radio: R0 (Bluetooth + 2.4GHz WLAN function) with set 1 antenna + Radio: R1 (5GHz WLAN function) with set 8 antenna
Mode 2 has been evaluated to be the worst case between Mode 1~2, thus measurement for Mode 3 will follow this same test mode.	
3	Place EUT in Z axis - Radio: R0 (Bluetooth + 5GHz WLAN function) with set 1 antenna + Radio: R1 (5GHz WLAN function) with set 8 antenna
Mode 2 has been evaluated to be the worst case among Mode 1~3, thus measurement for Mode 4 will follow this same test mode.	
4	Place EUT in Z axis - Radio: R0 (Bluetooth + 2.4GHz WLAN function) with set 10 antenna + Radio: R1 (5GHz WLAN function) with set 10 antenna
For Radiated Emission test below 1GHz: Mode 2 generated the worst test result, so it was recorded in this report. For Radiated Emission test above1GHz: Mode 2 generated the worst test result for Radiated emission below 1GHz test, thus the measurement for Radiated emission above 1GHz test will follow this same test configuration.	

5. Table for Filed Antenna:

Radio	Set	Brand	P/N	Type	Connector	Gain (dBi)	
						2.4GHz	5GHz
R0	1	Airgain	N2420DG3-T2L-PK1-G30U	PIFA	I-PEX	3.10	3.66
	2	Airgain	N2420DG3-T2L-PK1-G100U	PIFA	I-PEX	3.10	3.66
	3	Airgain	N2420DG3-T2L-PK1-G600U	PIFA	I-PEX	3.10	3.66
	4	Airgain	N2425D-T2L-PK1-G30U	PIFA	I-PEX	1.90	3.50
	5	Airgain	N2425D-T2R-PK1-G150U	PIFA	I-PEX	1.90	3.50
	6	Airgain	N2425D-T2R-PK1-G30U	PIFA	I-PEX	1.90	3.50
	7	Airgain	N2425D-T2R-PK1-G500U	PIFA	I-PEX	1.90	3.50
R1	8	Airgain	N5X20B-T2L-PK1-G100U	PIFA	I-PEX	-	2.90
	9	Airgain	N5X20B-T2L-PK1-G600U	PIFA	I-PEX	-	2.90
Radio	**Set**	**Brand**	**Model No.**	**Type**	**Connector**	**Gain (dBi)**	
						2.4GHz	**5GHz**
R0/R1	10	Arcadyan	WN9722A-DM	Dipole	I-PEX	2.94	3.19
	11	Arcadyan	WN9722A-DM-300mm	Dipole	I-PEX	2.76	2.63
	12	Arcadyan	WN9722A-DM-500mm	Dipole	I-PEX	1.99	2.59

Note: 1. The EUT has twelve sets of antenna, and each set contains two antennas.
2. For Radio: R0, because set 1~7 are the same type antennas, only the higher gain antennas “set 1” was tested and recorded in the report.
3. For Radio: R1, because set 8~9 are the same type antennas, only the higher gain antennas “set 8” was tested and recorded in the report.
4. For Radio: R0 and R1, because set 10~12 are the same type antennas, only the higher gain antennas “set 10” was tested and recorded in the report.

6. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2. General Description of Equipment under Test

Product Detail	
Equipment Name	HEOS 4.X Platform Module
Model No.	AIOS4.0S, AIOS4.0V, AIOS4.0R, AIOS4.0F
Brand Name	Arcadyan
Power Supply	From host system
Accessories	N/A

2.1. Feature of Equipment under Test

1. The EUT supports 2.4GHz / 5GHz wireless function.
2. The EUT has four model numbers which are identical to each other in all aspects except for the following table:

Model No.	Description
AIOS4.0S	All the models are identical, the difference model for difference model number as marketing strategy.
AIOS4.0V	
AIOS4.0R	
AIOS4.0F	

From the above models, model: AIOS4.0S was selected as representative model for the test and its data was recorded in this report.

3. There are two types of EUT, one is Radio: R0+R1 and the other is Radio: R0 only. Only the most complex mode for Radio: R0+R1 was performed for all the tests and recorded in this report.

4. The EUT has two radios, the information as following table:

Radio	Operate Mode	Function	CPU	Antenna
R0	Slave without radar detection (STA mode)	Bluetooth / 2.4GHz WLAN / 5GHz WLAN band 1~3	1G / 1.25G	Set 1~7, 10~12
R1	Master (AP mode)	5GHz WLAN band 1~3	1G / 1.25G	Set 8~12

Note: CPU 1.25G covers CPU 1G, due to it is the highest CPU speed.

Applicable Standard: EN 55024:2010 and CISPR 24:2010		
Test Standard	**Test Type**	**Pass Criterion**
IEC 61000-4-2:2008	**Electrostatic discharge immunity test** ± 2, 4 kV Contact Discharge Standard Criterion B	A
IEC 61000-4-3:2006/A1:2007/A2:2010	**Radiated immunity test** Frequency Range：80 MHz to 1,000 MHz Amplitude modulated：80 % AM (1 kHz) Electromagnetic field：3 V/m (unmodulated, r.m.s) Standard Criterion A	A
IEC 61000-4-4:2012	**Electrical fast transient / burst immunity test** AC ports 5/50 ns, ± 1 kV, 5 kHz DC ports 5/50 ns, ± 0.5 kV, 5 kHz I/O ports 5/50 ns, ± 0.5 kV, 5 kHz (For xDSL equipment, the repetition frequency is 100 kHz) Standard Criterion B	**Note**
IEC 61000-4-5:2014	**Surge immunity test** AC ports (1.2/50 us)： line to line：± 0.5, 1 kV line to earth：± 0.5, 1, 2 kV DC ports：± 0.5 kV Standard Criterion B Telecommunication/Signal ports： outdoor (1.2/50 us)：± 0.5, 1 kV outdoor (10/700 us)：± 0.5, 1 kV Standard Criterion C	**Note**
IEC 61000-4-6:2013	**Conducted immunity test** Frequency Range：150 kHz to 80 MHz Amplitude modulated：80 % AM (1 kHz) Electromagnetic field：3 V (unmodulated, r.m.s) Standard Criterion A	**Note**
IEC 61000-4-8:2009	**Power frequency magnetic field immunity test** 1 A/m, 50 Hz Standard Criterion A	**A**
IEC 61000-4-11:2004	**Voltage dips, short interruptions and voltage variations immunity tests** 1. >95% reduction 10 ms (0.5 cycles) – Standard Criterion B	**Note**
	2. 30% reduction 500 ms (25 cycles) – Standard Criterion C	**Note**
	3. Interruption >95% reduction 5,000 ms (250 cycles) – Standard Criterion C	**Note**

Note: It was supplied power by host system for EUT; It's not necessary to apply to EFT, Surge, CS and DIP test.

Applicable Standard: EN 301 489-1 V2.1.1 (2017-02)		
Test Standard	**Test Type**	**Pass Criterion**
EN 61000-4-2:2009	**Electrostatic discharge immunity test** ± 2, 4 kV Contact Discharge Standard Criterion B	**A**
EN 61000-4-3:2006/A1:2008/A2:2010	**Radiated immunity test** Frequency Range：80 MHz to 6,000 MHz Amplitude modulated：80 % AM (1 kHz) Electromagnetic field：3 V/m (unmodulated, r.m.s) Standard Criterion A	**A**
EN 61000-4-4:2012	**Electrical fast transient / burst immunity test** AC ports 5/50 ns, ± 1 kV, 5 kHz DC ports 5/50 ns, ± 0.5 kV, 5 kHz I/O ports 5/50 ns, ± 0.5 kV, 5 kHz Standard Criterion B	**Note**
EN 61000-4-5:2014	**Surge immunity test** AC ports (1.2/50 us)： line to line：± 0.5, 1 kV line to earth：± 0.5, 1, 2 kV Telecommunication/Signal ports： indoor (1.2/50 us)：± 0.5 kV outdoor (10/700 us)：± 0.5, 1 kV Standard Criterion B	**Note**
EN 61000-4-6:2014/AC:2015	**Conducted immunity test** Frequency Range：150 kHz to 80 MHz Amplitude modulated：80 % AM (1 kHz) Electromagnetic field：3 V (unmodulated, r.m.s) Standard Criterion A	**Note**
EN 61000-4-11:2004	**Voltage dips, short interruptions and voltage variations immunity tests** 1. Dip 0% residual 10 ms (0.5 cycles) – Standard Criterion B	**Note**
	2. Dip 0% residual 20 ms (1.0 cycles) – Standard Criterion B	**Note**
	3. Dip 70% residual 500 ms (25 cycles) – Standard Criterion B	**Note**
	4. Interruption 0% residual 5000 ms (250 cycles) – Standard Criterion C	**Note**

Note: It was supplied power by host system for EUT; It's not necessary to apply to EFT, Surge, CS and DIP test.

1. Summary of Test Results

After estimating all the combination of every test mode, the result shown as below is the worst case.

The EUT has been tested according to the following specifications.

Applicable Standard: EN 301 489-1 V2.1.1 (2017-02), EN 55032:2012/AC:2013, CISPR 32:2012 and AS/NZS CISPR 32:2013			
Test Standard	**Test Type**	**Result**	**Remarks**
EN 55032:2015, EN 55032:2012/AC:2013, CISPR 32:2012 and AS/NZS CISPR 32:2013	AC Power Port Conducted emission test 150 kHz – 30 MHz	PASS	Meet minimum passing margin is -11.69dB at 0.3003MHz.
	Telecom Port Conducted emission test 150 kHz – 30 MHz	-	Note1
	Radiated emission test 30 MHz – 1,000 MHz @ 10 m 1,000 MHz – 6,000 MHz @ 3 m	PASS	Meet minimum passing margin is -3.17dB at 62.01MHz.
EN 61000-3-2:2014	Harmonic Current emission test	-	Note2
EN 61000-3-3:2013	Voltage Fluctuations and Flicker tests	-	Note2
Applicable Standard: EN 55022:2010/AC:2011, CISPR 22 ed.6:2008/I-SH 1:2009/I-SH 2:2010/I-SH 3:2012 and AS/NZS CISPR 22:2009/Amdt 1:2010			
Test Standard	**Test Type**	**Result**	**Remarks**
EN 55022:2010/AC:2011, CISPR 22 ed.6:2008/I-SH 1:2009/I-SH 2:2010/I-SH 3:2012 and AS/NZS CISPR 22:2009/Amdt 1:2010	AC Power Port Conducted emission test 150 kHz – 30 MHz	PASS	Meet minimum passing margin is -12.30dB at 0.4612MHz.
	Telecom Port Conducted emission test 150 kHz – 30 MHz	-	Note1
	Radiated emission test 30 MHz – 1,000 MHz @ 10 m 1,000 MHz – 6,000 MHz @ 3 m	PASS	Meet minimum passing margin is -4.74dB at 76.56MHz.

Note:

1. The EUT without telecom port, it's not necessary to apply to Telecom Port Conducted emission test.
2. It was supplied power by host system for EUT, it's not necessary to apply to Harmonic Current emission, Voltage Fluctuations and Flicker tests.

Project No: CB10602223

VERIFICATION OF COMPLIANCE

EQUIPMENT NAME	:	HEOS 4.X Platform Module
BRAND NAME	:	Arcadyan
MODEL NO.	:	AIOS4.0S, AIOS4.0V, AIOS4.0R, AIOS4.0F
APPLICANT	:	Arcadyan Technology Corporation
ADDRESS	:	No.8, Sec.2, Guangfu Rd., Hsinchu, 30071 Taiwan
FINAL TESTED DATE	:	Feb. 14, 2017
TEST STANDARD	:	EN 301 489-1 V2.1.1 (2017-02), Class B EN 301 489-17 V3.1.1 (2017-02) EN 55022:2010/AC:2011, Class B EN 55032:2012/AC:2013, Class B EN 55024:2010 CISPR 22 ed.6:2008/I-SH 1:2009/I-SH 2:2010/I-SH 3:2012 CISPR 32:2012 CISPR 24:2010 AS/NZS CISPR 22:2009/Amdt 1:2010, Class B AS/NZS CISPR 32:2013, Class B

I **HEREBY** DECLARE THAT:

The above equipment has been tested by **SPORTON International Inc.** LAB., and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Beck Wu

Beck Wu
SPORTON INTERNATIONAL INC.

History of This Test Report

REPORT NO.	VERSION	ISSUED DATE	Description
EH581110-16	Rev. 01	Feb. 24, 2017	Initial issue of report

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CE EMC TEST REPORT

REPORT NO.	**:**	**EH581110-16**
MODEL NO.	**:**	**AIOS4.0S, AIOS4.0V, AIOS4.0R, AIOS4.0F**
RECEIVED DATE	**:**	**Jul. 22, 2015**
FINAL TESTED DATE	**:**	**Feb. 14, 2017**
ISSUED DATE	**:**	**Feb. 24, 2017**
TEST STANDARD	**:**	**EN 301 489-1 V2.1.1 (2017-02), Class B** **EN 301 489-17 V3.1.1 (2017-02)** **EN 55022:2010/AC:2011, Class B** **EN 55032:2012/AC:2013, Class B** **EN 55024:2010** **CISPR 22 ed.6:2008/I-SH 1:2009/I-SH 2:2010/I-SH 3:2012** **CISPR 32:2012** **CISPR 24:2010** **AS/NZS CISPR 22:2009/Amdt 1:2010, Class B** **AS/NZS CISPR 32:2013, Class B**
APPLICANT	**:**	**Arcadyan Technology Corporation**
ADDRESS	**:**	**No.8, Sec.2, Guangfu Rd., Hsinchu, 30071 Taiwan**
MANUFACTURER	**:**	**Arcadyan Technology Corporation**
ADDRESS	**:**	**No.8, Sec.2, Guangfu Rd., Hsinchu, 30071 Taiwan**
ISSUED BY	**:**	**SPORTON International Inc.**
LAB ADDRESS	**:**	**No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.**

- The test result refers exclusively to the test presented test model / sample.
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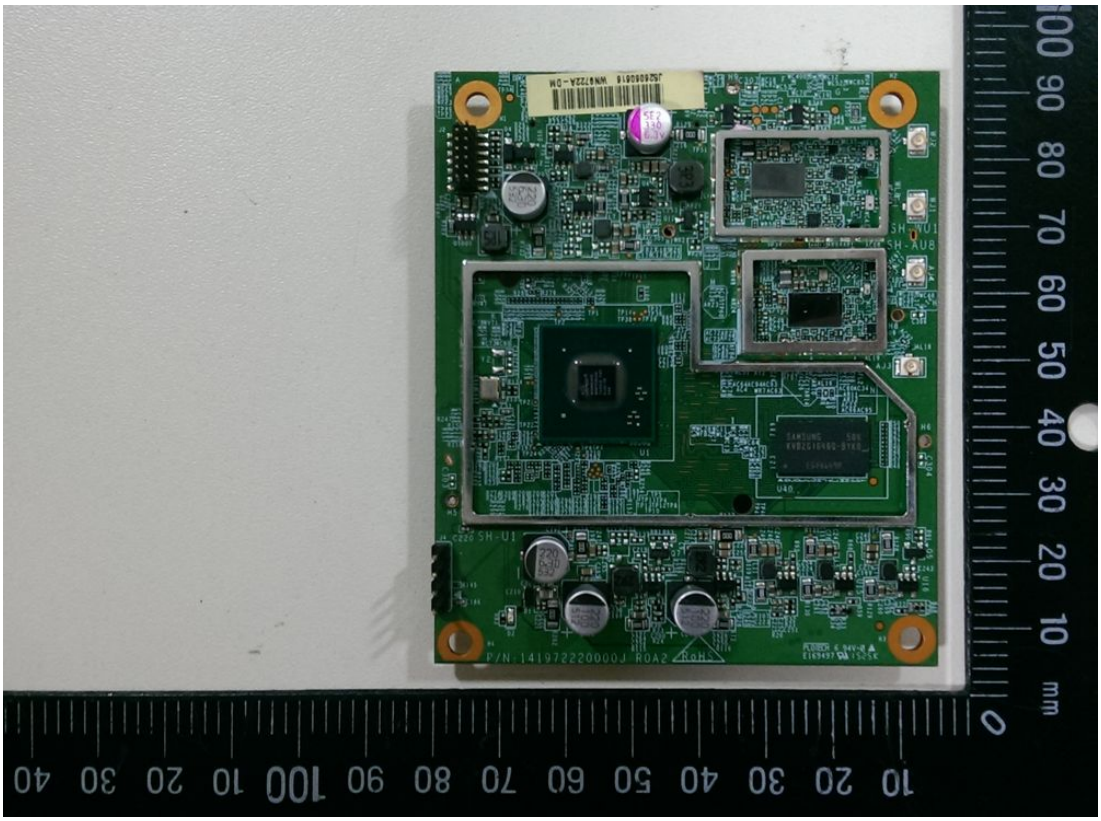
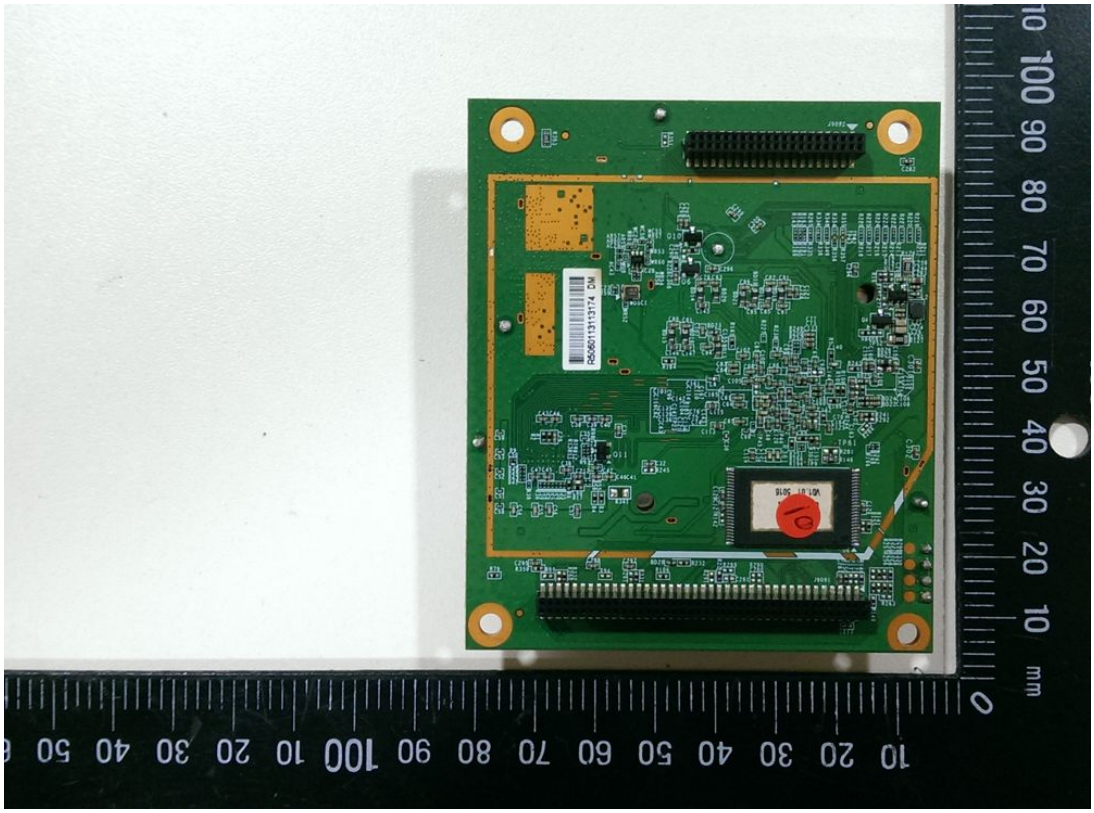
- This test report is only applicable to European Community / Australia and New Zealand.

Photo(s)





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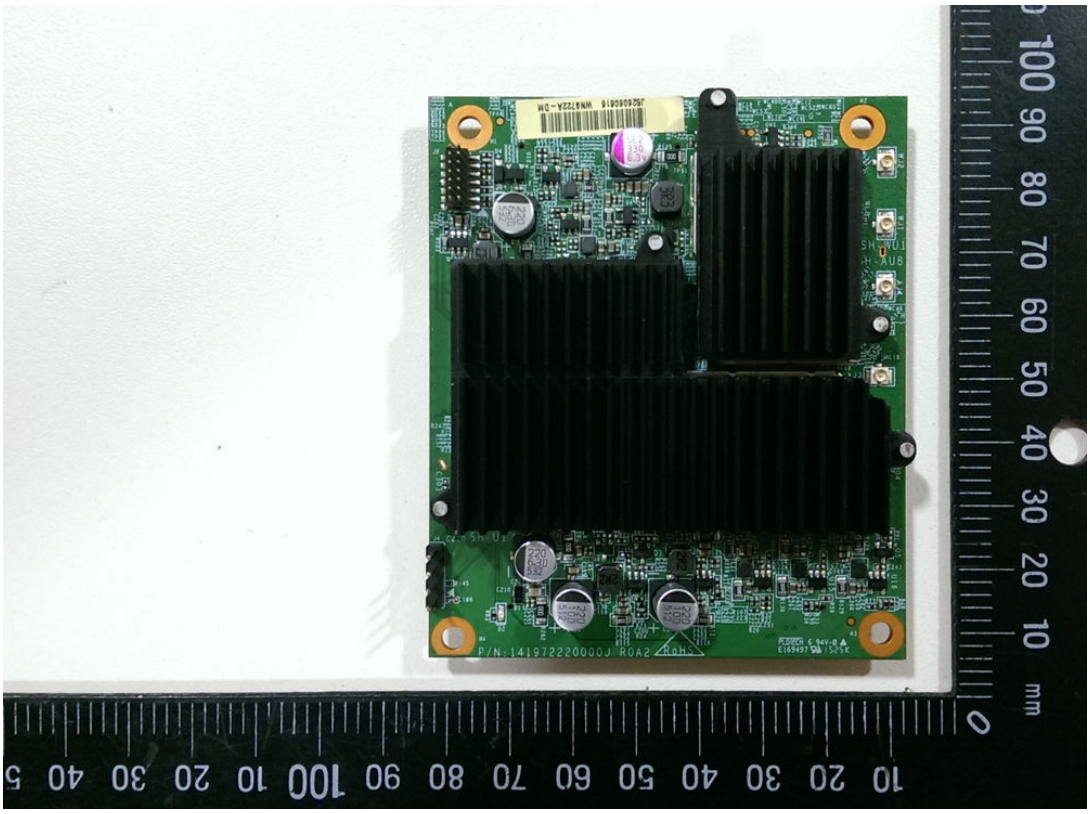

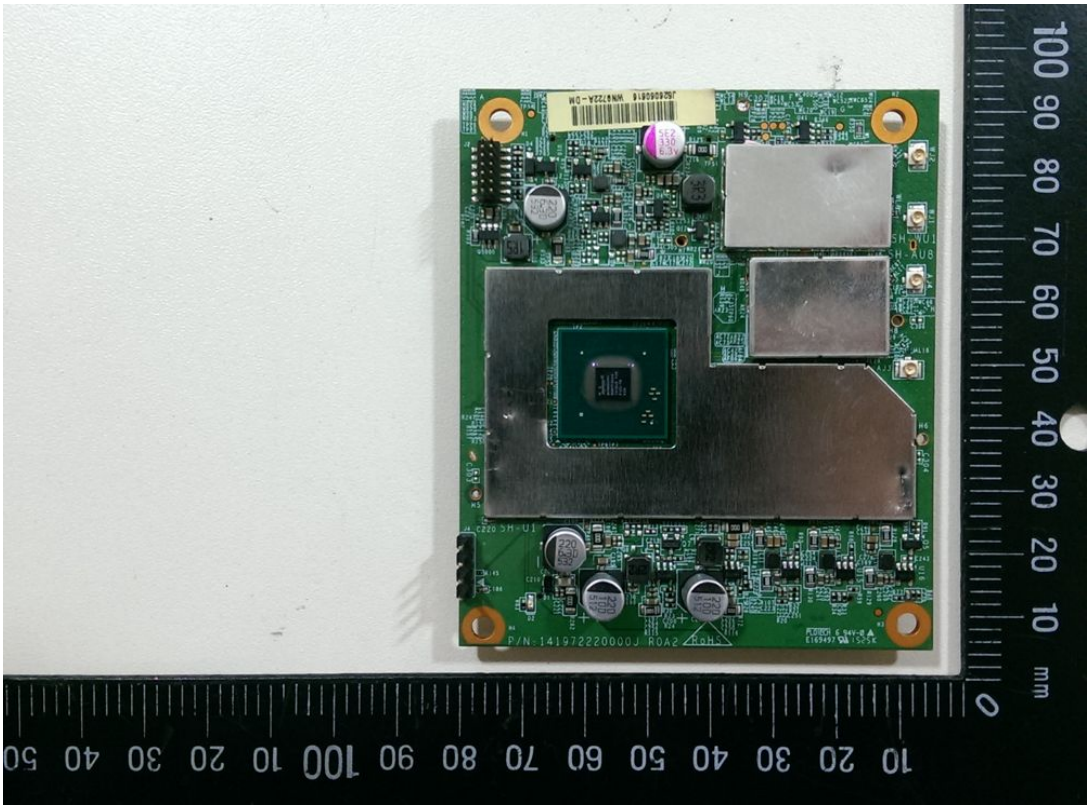

Annex ZD
(informative)

IEC and CENELEC code designations for flexible cords

Type of flexible cord	Code designations	
	IEC	CENELEC
PVC insulated cords		
Flat twin tinsel cord	60227 IEC 41	H03VH-Y
Light polyvinyl chloride sheathed flexible cord	60227 IEC 52	H03VV-F H03VVH2-F
Ordinary polyvinyl chloride sheathed flexible cord	60277 IEC 53	H05VV-F H05VVH2-F
Rubber insulated cords		
Braided cord	60245 IEC 51	H03RT-F
Ordinary tough rubber sheathed flexible cord	60245 IEC 53	H05RR-F
Ordinary polychloroprene sheathed flexible cord	60245 IEC 57	H05RN-F
Heavy polychloroprene sheathed flexible cord	60245 IEC 66	H07RN-F
Cords having high flexibility		
Rubber insulated and sheathed cord	60245 IEC 86	H03RR-H
Rubber insulated, crosslinked PVC sheathed cord	60245 IEC 87	H03RV4-H
Crosslinked PVC insulated and sheathed cord	60245 IEC 88	H03V4V4-H

IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)			
Clause	Requirement + Test	Result - Remark	Verdict
	It is permitted to bridge this insulation with an optocoupler complying with 2.10.5.4 b). It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2. A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions: - the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 60384-14, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in EN 60950-1:2006, 6.2.2.1; - the additional testing shall be performed on all the test specimens as described in EN 60384-14: - the impulse test of 2,5 kV is to be performed before the endurance test in EN 60384-14, in the sequence of tests as described in EN 60384-14.		
6.1.2.2	In **Finland**, **Norway** and **Sweden**, the exclusions are applicable for PERMANENTLY CONNECTED EQUIPMENT, PLUGGABLE EQUIPMENT TYPE B and equipment intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, e.g. in a telecommunication centre, and which has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR and is provided with instructions for the installation of that conductor by a SERVICE PERSON.	No such consideration.	N/A
7.2	In **Finland**, **Norway** and **Sweden**, for requirements see 6.1.2.1 and 6.1.2.2 of this annex. The term TELECOMMUNICATION NETWORK in 6.1.2 being replaced by the term CABLE DISTRIBUTION SYSTEM.	No such consideration.	N/A
7.3 (A11:2009)	In **Norway** and **Sweden**, for requirements see 1.2.13.14 and 1.7.2.1 of this annex.	Same as above.	N/A

IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)			
Clause	Requirement + Test	Result - Remark	Verdict
5.1.7.1	In **Finland**, **Norway** and **Sweden** TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s. are permitted only for the following equipment: • STATIONARY PLUGGABLE EQUIPMENT TYPE A that is intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, for example, in a telecommunication centre; and has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR; and is provided with instructions for the installation of that conductor by a SERVICE PERSON; • STATIONARY PLUGGABLE EQUIPMENT TYPE B; • STATIONARY PERMANENTLY CONNECTED EQUIPMENT.	Not applied for.	N/A
6.1.2.1 (A1:2010)	In **Finland**, **Norway** and **Sweden**, add the following text between the first and second paragraph of the compliance clause: If this insulation is solid, including insulation forming part of a component, it shall at least consist of either - two layers of thin sheet material, each of which shall pass the electric strength test below, or - one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below. Alternatively for components, there is no distance through insulation requirements for the insulation consisting of an insulating compound completely filling the casing, so that CLEARANCES and CREEPAGE DISTANCES do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition - passes the tests and inspection criteria of 2.10.11 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 2.10.10 shall be performed using 1,5 kV), and - is subject to ROUTINE TESTING for electric strength during manufacturing, using a test voltage of 1,5 kV.	No such consideration.	N/A

IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)			
Clause	Requirement + Test	Result - Remark	Verdict
3.2.1.1	In **Ireland**, apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to I.S. 411 by means of that flexible cable or cord and plug, shall be fitted with a 13 A plug in accordance with Statutory Instrument 525:1997 - National Standards Authority of Ireland (section 28) (13 A Plugs and Conversion Adaptors for Domestic Use) Regulations 1997.	Same as above.	N/A
3.2.4	In **Switzerland**, for requirements see 3.2.1.1 of this annex.	Same as above.	N/A
3.2.5.1	In the **United Kingdom**, a power supply cord with conductor of 1,25 mm2 is allowed for equipment with a rated current over 10 A and up to and including 13 A.	Same as above.	N/A
3.3.4	In the **United Kingdom**, the range of conductor sizes of flexible cords to be accepted by terminals for equipment with a RATED CURRENT of over 10 A up to and including 13 A is: • 1,25 mm^2 to 1,5 mm^2 nominal cross-sectional area.	Same as above.	N/A
4.3.6	In the **United Kingdom**, the torque test is performed using a socket outlet complying with BS 1363 part 1:1995, including Amendment 1:1997 and Amendment 2:2003 and the plug part of DIRECT PLUG-IN EQUIPMENT shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16 and 12.17, except that the test of 12.17 is performed at not less than 125 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply.	Not direct plug-in equipment.	N/A
4.3.6	In **Ireland**, DIRECT PLUG-IN EQUIPMENT is known as plug similar devices. Such devices shall comply with Statutory Instrument 526:1997 - National Standards Authority of Ireland (Section 28) (Electrical plugs, plug similar devices and sockets for domestic use) Regulations, 1997.	Same as above.	N/A

IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)			
Clause	Requirement + Test	Result - Remark	Verdict
3.2.1.1 (A2:2013)	In **Denmark**, supply cords of single-phase equipment having a rated current not exceeding 13 A shall be provided with a plug according to DS 60884-2-D1. CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a. If a single-phase equipment having a RATED CURRENT exceeding 13 A or if a poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with the standard sheets DK 6-1a in DS 60884-2-D1 or EN 60309-2. Justification the Heavy Current Regulations, 6c	Same as above.	N/A
3.2.1.1	In **Spain**, supply cords of single-phase equipment having a rated current not exceeding 10 A shall be provided with a plug according to UNE 20315:1994. Supply cords of single-phase equipment having a rated current not exceeding 2,5 A shall be provided with a plug according to UNE-EN 50075:1993. CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules, shall be provided with a plug in accordance with standard UNE 20315:1994. If poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with UNE-EN 60309-2.	Same as above.	N/A
3.2.1.1	In the **United Kingdom**, apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to BS 1363 by means of that flexible cable or cord and plug, shall be fitted with a 'standard plug' in accordance with Statutory Instrument 1768:1994 - The Plugs and Sockets etc. (Safety) Regulations 1994, unless exempted by those regulations. NOTE 'Standard plug' is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.	Same as above.	N/A

IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)			
Clause	Requirement + Test	Result - Remark	Verdict
	SEV 6533-2.1991 Plug Type 11 L+N 250 V, 10 A SEV 6534-2.1991 Plug Type 12 L+N+PE 250 V, 10 A In general, EN 60309 applies for plugs for currents exceeding 10 A. However, a 16 A plug and socket-outlet system is being introduced in Switzerland, the plugs of which are according to the following dimension sheets, published in February 1998: SEV 5932-2.1998: Plug Type 25 , 3L+N+PE 230/400 V, 16 A SEV 5933-2.1998:Plug Type 21, L+N, 250 V, 16A SEV 5934-2.1998: Plug Type 23, L+N+PE 250 V, 16 A		
3.2.1.1	In **Denmark**, supply cords of single-phase equipment having a rated current not exceeding13 A shall be provided with a plug according to the Heavy Current Regulations, Section 107-2-D1. CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a. If poly-phase equipment and single-phase equipment having a RATED CURRENT exceeding 13 A is provided with a supply cord with a plug, this plug shall be in accordance with the Heavy Current Regulations, Section 107-2-D1 or EN 60309-2.	Same as above.	N/A

IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.5 (A2:2013)	In **Denmark**, socket-outlets for providing power to other equipment shall be in accordance with the DS 60884-2-D1:2011. For class I equipment the following Standard Sheets are applicable: DK 1-3a, DK 1-1c, DK 1-1d, DK 1-5a or DK 1-7a, with the exception for STATIONARY EQUIPMENT where the socket-outlets shall be in accordance with Standard Sheet DK 1-1b, DK 1-1c, DK 1-1d or DK 1-5a. Socket outlets intended for providing power to Class II apparatus with a rated current of 2,5 A shall be in accordance with DS 60884-2-D1 standard sheet DKA 1-4a. Other current rating socket outlets shall be in compliance with by DS 60884-2-D1 Standard Sheet DKA 1-3a or DKA 1-3b. Justification the Heavy Current Regulations, 6c	Same as above.	N/A
2.2.4	In **Norway**, for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex.	No such consideration.	N/A
2.3.2	In **Finland**, **Norway** and **Sweden** there are additional requirements for the insulation. See 6.1.2.1 and 6.1.2.2 of this annex.	Same as above.	N/A
2.3.4	In **Norway**, for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex.	Same as above.	N/A
2.6.3.3	In the **United Kingdom**, the current rating of the circuit shall be taken as 13 A, not 16 A.	No such consideration.	N/A
2.7.1	In the **United Kingdom**, to protect against excessive currents and short-circuits in the PRIMARY CIRCUIT of DIRECT PLUG-IN EQUIPMENT, tests according to 5.3 shall be conducted, using an external protective device rated 30 A or 32 A. If these tests fail, suitable protective devices shall be included as integral parts of the DIRECT PLUG-IN EQUIPMENT, so that the requirements of 5.3 are met.	Class III equipment.	N/A
2.10.5.13	In **Finland**, **Norway** and **Sweden**, there are additional requirements for the insulation, see 6.1.2.1 and 6.1.2.2 of this annex.	Not applied for.	N/A
3.2.1.1	In **Switzerland**, supply cords of equipment having a RATED CURRENT not exceeding 10 A shall be provided with a plug complying with SEV 1011 or IEC 60884-1 and one of the following dimension sheets: SEV 6532-2.1991 Plug Type 15 3P+N+PE 250/400 V, 10 A	Class III equipment.	N/A

IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)			
Clause	Requirement + Test	Result - Remark	Verdict
	NOTE In Norway, due to regulation for installations of cable distribution systems, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV r.m.s., 50 Hz or 60 Hz, for 1 min. Translation to Norwegian (the Swedish text will also be accepted in Norway): “Utstyr som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av utstyret til kabel-TV nettet installeres en galvanisk isolator mellom utstyret og kabel- TV nettet.” Translation to Swedish: ”Utrustning som är kopplad till skyddsjord via jordat vägguttag och/eller via annan utrustning och samtidigt är kopplad till kabel-TV nät kan i vissa fall medföra risk för brand. För att undvika detta skall vid anslutning av utrustningen till kabel-TV nät galvanisk isolator finnas mellan utrustningen och kabel-TV nätet.”		
1.7.2.1 (A2:2013)	In **Denmark**, CLASS I PLUGGABLE EQUIPMENT TYPE A intended for connection to other equipment or a network shall, if safety relies on connection to protective earth or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment must be connected to an earthed mains socket-outlet. The marking text in **Denmark** shall be as follows: In **Denmark**: “Apparatets stikprop skal tilsluttes en stikkontakt med jord, som giver forbindelse til stikproppens jord.”		N/A
1.7.5 1.7.5 (A11:2009)	In **Denmark**, socket-outlets for providing power to other equipment shall be in accordance with the Heavy Current Regulations, Section 107-2-D1, Standard Sheet DK 1-3a, DK 1-5a or DK 1-7a, when used on Class I equipment. For STATIONARY EQUIPMENT the socket-outlet shall be in accordance with Standard Sheet DK 1-1b or DK 1-5a. For **CLASS II EQUIPMENT** the socket outlet shall be in accordance with Standard Sheet DKA 1-4a.	No socket-outlets.	N/A

IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.2.1	In **Finland**, **Norway** and **Sweden**, CLASS I PLUGGABLE EQUIPMENT TYPE A intended for connection to other equipment or a network shall, if safety relies on connection to protective earth or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment must be connected to an earthed mains socket-outlet. The marking text in the applicable countries shall be as follows: In **Finland**: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan" In **Norway**: “Apparatet må tilkoples jordet stikkontakt” In **Sweden**: “Apparaten skall anslutas till jordat uttag”	Class III equipment.	N/A
1.7.2.1 (A11:2009)	In **Norway** and **Sweden**, the screen of the cable distribution system is normally not earthed at the entrance of the building and there is normally no equipotential bonding system within the building. Therefore the protective earthing of the building installation need to be isolated from the screen of a cable distribution system. It is however accepted to provide the insulation external to the equipment by an adapter or an interconnection cable with galvanic isolator, which may be provided by e.g. a retailer. The user manual shall then have the following or similar information in Norwegian and Swedish language respectively, depending on in what country the equipment is intended to be used in: “Equipment connected to the protective earthing of the building installation through the mains connection or through other equipment with a connection to protective earthing – and to a cable distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a cable distribution system has therefore to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11).”		

IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)			
Clause	Requirement + Test	Result - Remark	Verdict

ZA	**NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS**	—

ZB ANNEX (normative) SPECIAL NATIONAL CONDITIONS (EN)			
Clause	Requirement + Test	Result - Remark	Verdict
1.2.4.1	In **Denmark**, certain types of Class I appliances (see 3.2.1.1) may be provided with a plug not establishing earthing conditions when inserted into Danish socket-outlets.	Class III equipment.	N/A
1.2.13.14 (A11:2009)	In **Norway** and **Sweden**, for requirements see 1.7.2.1 and 7.3 of this annex.	Not applied for.	N/A
1.5.7.1 (A11:2009)	In **Finland, Norway** and **Sweden**, resistors bridging BASIC INSULATION in CLASS I PLUGGABLE EQUIPMENT TYPE A must comply with the requirements in 1.5.7.1. In addition when a single resistor is used, the resistor must withstand the resistor test in 1.5.7.2.	Class III equipment.	N/A
1.5.8	In **Norway**, due to the IT power system used (see annex V, Figure V.7), capacitors are required to be rated for the applicable line-to-line voltage (230 V).	Class III equipment.	N/A
1.5.9.4	In **Finland**, **Norway** and **Sweden**, the third dashed sentence is applicable only to equipment as defined in 6.1.2.2 of this annex.	Not applied for.	N/A

IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)			
Clause	Requirement + Test	Result - Remark	Verdict
3.2.5.1	Replace "60245 IEC 53" by "H05 RR-F"; "60227 IEC 52" by "H03 VV-F or H03 VVH2-F"; "60227 IEC 53" by "H05 VV-F or H05 VVH2-F2". In Table 3B, replace the first four lines by the following: Up to and including 6 | 0,75 [a] | Over 6 up to and including 10| (0,75) [b] 1,0 | Over 10 up to and including 16| (1,0) [c] 1,5 | In the conditions applicable to Table 3B delete the words "in some countries" in condition [a]. In NOTE 1, applicable to Table 3B, delete the second sentence.	Class III equipment.	N/A
3.2.5.1 (A2:2013)	NOTE Z1 The harmonised code designations corresponding to the IEC cord types are given in Annex ZD	Same as above.	N/A
3.3.4	In Table 3D, delete the fourth line: conductor sizes for 10 to 13 A, and replace with the following: Over 10 up to and including 16 | 1,5 to 2,5 | 1,5 to 4 | Delete the fifth line: conductor sizes for 13 to 16 A	Same as above.	N/A
4.3.13.6 (A1:2010)	Replace the existing NOTE by the following: NOTE Z1 Attention is drawn to: 1999/519/EC: Council Recommendation on the limitation of exposure of the general public to electromagnetic fields 0 Hz to 300 GHz, and 2006/25/EC: Directive on the minimum health and safety requirements regarding the exposure of workers to risks arising from physical agents (artifical optical radiation).	No such consideration.	N/A
	Standards taking into account mentioned Recommendation and Directive which demonstrate compliance with the applicable EU Directive are indicated in the OJEC.	Same as above.	N/A
Annex H	Replace the last paragraph of this annex by: At any point 10 cm from the surface of the OPERATOR ACCESS AREA, the dose rate shall not exceed 1 µSv/h (0,1 mR/h) (see NOTE). Account is taken of the background level. Replace the notes as follows: NOTE These values appear in Directive 96/29/Euratom. Delete NOTE 2.	No ionizing radiation	N/A
Bibliography	Additional EN standards.		—

IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)			
Clause	Requirement + Test	Result - Remark	Verdict
2.7.1	Replace the subclause as follows: Basic requirements To protect against excessive current, short-circuits and earth faults in PRIMARY CIRCUITS, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c): a) except as detailed in b) and c), protective devices necessary to comply with the requirements of 5.3 shall be included as parts of the equipment; b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation;	Class III equipment.	N/A
	c) it is permitted for PLUGGABLE EQUIPMENT TYPE B or PERMANENTLY CONNECTED EQUIPMENT, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions. If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for PLUGGABLE EQUIPMENT TYPE A the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.	Class III equipment.	N/A
2.7.2	This subclause has been declared ‘void’.	Void.	N/A
3.2.3	Delete the NOTE in Table 3A, and delete also in this table the conduit sizes in parentheses.	Class III equipment.	N/A

IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)			
Clause	Requirement + Test	Result - Remark	Verdict
	Zx.4.2 Wired listening devices with digital input With any playing device playing the fixed "programme simulation noise" described in EN 50332-1 (and respecting the digital interface standards, where a digital interface standard exists that specifies the equivalent acoustic level), the acoustic output $L_{Aeq,T}$ of the listening device shall be ≤ 100 dBA. This requirement is applicable in any mode where the headphones can operate, including any available setting (for example built-in volume level control, additional sound feature like equalization, etc.). NOTE An example of a wired listening device with digital input is a USB headphone.	Same as above.	N/A
	Zx.4.3 Wireless listening devices In wireless mode: – with any playing and transmitting device playing the fixed programme simulation noise described in EN 50332-1; and – respecting the wireless transmission standards, where an air interface standard exists that specifies the equivalent acoustic level; and – with volume and sound settings in the listening device (for example built-in volume level control, additional sound feature like equalization, etc.) set to the combination of positions that maximize the measured acoustic output for the abovementioned programme simulation noise, the acoustic output $L_{Aeq,T}$ of the listening device shall be ≤ 100 dBA. NOTE An example of a wireless listening device is a Bluetooth headphone.	Same as above.	N/A
	Zx.5 Measurement methods Measurements shall be made in accordance with EN 50332-1 or EN 50332-2 as applicable. Unless stated otherwise, the time interval T shall be 30 s. NOTE Test method for wireless equipment provided without listening device should be defined.	Same as above.	N/A

IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)			
Clause	Requirement + Test	Result - Remark	Verdict
	Zx.3 Warning The warning shall be placed on the equipment, or on the packaging, or in the instruction manual and shall consist of the following: – the symbol of Figure 1 with a minimum height of 5 mm; and – the following wording, or similar: "To prevent possible hearing damage, do not listen at high volume levels for long periods." **Figure 1 – Warning label (IEC 60417-6044)** Alternatively, the entire warning may be given through the equipment display during use, when the user is asked to acknowledge activation of the higher level.	Same as above.	N/A
	Zx.4 Requirements for listening devices (headphones and earphones)		N/A
	Zx.4.1 Wired listening devices with analogue input With 94 dBA sound pressure output $L_{Aeq,T}$, the input voltage of the fixed "programme simulation noise" described in EN 50332-2 shall be ≥ 75 mV. This requirement is applicable in any mode where the headphones can operate (active or passive), including any available setting (for example built-in volume level control). NOTE The values of 94 dBA – 75 mV correspond with 85dBA – 27 mV and 100 dBA – 150 mV.	Same as above.	N/A

IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)			
Clause	Requirement + Test	Result - Remark	Verdict
	c) provide a means to actively inform the user of the increased sound pressure when the equipment is operated with an acoustic output exceeding those mentioned above. Any means used shall be acknowledged by the user before activating a mode of operation which allows for an acoustic output exceeding those mentioned above. The acknowledgement does not need to be repeated more than once every 20 h of cumulative listening time; and NOTE 2 Examples of means include visual or audible signals. Action from the user is always required. NOTE 3 The 20 h listening time is the accumulative listening time, independent how often and how long the personal music player has been switched off. d) have a warning as specified in Zx.3; and e) not exceed the following: 1) equipment provided as a package (player with Its listening device), the acoustic output shall be ≤ 100 dBA measured while playing the fixed “programme simulation noise” described in EN 50332-1; and 2) a personal music player provided with an analogue electrical output socket for a listening device, the electrical output shall be ≤ 150 mV measured as described in EN 50332-2, while playing the fixed “programme simulation noise” described in EN 50332-1. For music where the average sound pressure (long term $L_{Aeq,T}$) measured over the duration of the song is lower than the average produced by the programme simulation noise, the warning does not need to be given as long as the average sound pressure of the song is below the basic limit of 85 dBA. In this case T becomes the duration of the song. NOTE 4 Classical music typically has an average sound pressure (long term $L_{Aeq,T}$) which is much lower than the average programme simulation noise. Therefore, if the player is capable to analyse the song and compare it with the programme simulation noise, the warning does not need to be given as long as the average sound pressure of the song is below the basic limit of 85 dBA. For example, if the player is set with the programme simulation noise to 85 dBA, but the average music level of the song is only 65 dBA, there is no need to give a warning or ask an acknowledgement as long as the average sound level of the song is not above the basic limit of 85 dBA.	Same as above.	N/A

IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)			
Clause	Requirement + Test	Result - Remark	Verdict
	– analogue personal music players (personal music players without any kind of digital processing of the sound signal) that are brought to the market before the end of 2015. NOTE 4 This exemption has been allowed because this technology is falling out of use and it is expected that within a few years it will no longer exist. This exemption will not be extended to other technologies. For equipment which is clearly designed or intended for use by young children, the limits of EN 71-1 apply.	Same as above.	N/A
	Zx.2 Equipment requirements No safety provision is required for equipment that complies with the following: – equipment provided as a package (personal music player with its listening device), where the acoustic output $L_{Aeq,T}$ is ≤ 85 dBA measured while playing the fixed "programme simulation noise" as described in EN 50332-1; and – a personal music player provided with an analogue electrical output socket for a listening device, where the electrical output is ≤ 27 mV measured as described in EN 50332-2, while playing the fixed "programme simulation noise" as described in EN 50332-1. NOTE 1 Wherever the term acoustic output is used in this clause, the 30 s A-weighted equivalent sound pressure level $L_{Aeq,T}$ is meant. See also Zx.5 and Annex Zx. All other equipment shall: a) protect the user from unintentional acoustic outputs exceeding those mentioned above; and b) have a standard acoustic output level not exceeding those mentioned above, and automatically return to an output level not exceeding those mentioned above when the power is switched off; and	Same as above.	N/A

IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)			
Clause	Requirement + Test	Result - Remark	Verdict
	Zx.1 General This sub-clause specifies requirements for protection against excessive sound pressure from personal music players that are closely coupled to the ear. It also specifies requirements for earphones and headphones intended for use with personal music players. A personal music player is a portable equipment for personal use, that: – is designed to allow the user to listen to recorded or broadcast sound or video; and – primarily uses headphones or earphones that can be worn in or on or around the ears; and – allows the user to walk around while in use. NOTE 1 Examples are hand-held or body-worn portable CD players, MP3 audio players, mobile phones with MP3 type features, PDA's or similar equipment. A personal music player and earphones or headphones intended to be used with personal music players shall comply with the requirements of this sub-clause. The requirements in this sub-clause are valid for music or video mode only. The requirements do not apply: – while the personal music player is connected to an external amplifier; or – while the headphones or earphones are not used. NOTE 2 An external amplifier is an amplifier which is not part of the personal music player or the listening device, but which is intended to play the music as a standalone music player. The requirements do not apply to: – hearing aid equipment and professional equipment; NOTE 3 Professional equipment is equipment sold through special sales channels. All products sold through normal electronics stores are considered not to be professional equipment.	Not such equipment.	N/A

IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.2.1 (A12.2011)	In EN 60950-1:2006/A12:2011 Delete NOTE Z1 and the addition for Portable Sound System. Add the following clause and annex to the existing standard and amendments.	Same as above.	N/A
	Zx Protection against excessive sound pressure from personal music players		N/A

IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)			
Clause	Requirement + Test	Result - Remark	Verdict
General (A2:2013)	Delete all the "country" notes in the reference document (IEC 60950-1:2005/A2:2013) according to the following list: 2.7.1 Note * 2.10.3.1 Note 2 6.2.2. Note * Note of secretary: Text of Common Modification remains unchanged.		P
1.1.1 (A1:2010)	**Replace** the text of NOTE 3 by the following. NOTE 3 The requirements of EN 60065 may also be used to meet safety requirements for multimedia equipment. See IEC Guide 112, Guide on the safety of multimedia equipment. For television sets EN 60065 applies.		P
1.3.Z1	Add the following subclause: 1.3.Z1 Exposure to excessive sound pressure The apparatus shall be so designed and constructed as to present no danger when used for its intended purpose, either in normal operating conditions or under fault conditions, particularly providing protection against exposure to excessive sound pressures from headphones or earphones. NOTE Z1 A new method of measurement is described in EN 50332-1, Sound system equipment: Headphones and earphones associated with portable audio equipment - Maximum sound pressure level measurement methodology and limit considerations - Part 1: General method for "one package equipment", and in EN 50332-2, Sound system equipment: Headphones and earphones associated with portable audio equipment - Maximum sound pressure level measurement methodology and limit considerations - Part 2: Guidelines to associate sets with headphones coming from different manufacturers.	Not such equipment.	N/A
(A12:2011)	In EN 60950-1:2006/A12:2011 Delete the addition of 1.3.Z1 / EN 60950-1:2006 Delete the definition 1.2.3.Z1 / EN 60950-1:2006 /A1:2010		N/A
1.5.1 (Added info*)	Add the following NOTE: NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2002/95/EC. New Directive 2011/65/11 *		N/A
1.7.2.1 (A1:2010)	In addition, for a PORTABLE SOUND SYSTEM, the instructions shall include a warning that excessive sound pressure from earphones and headphones can cause hearing loss.	Not such equipment.	N/A

ATTACHMENT TO TEST REPORT **EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES** Information technology equipment – Safety – Part 1: General requirements
Differences according to.....: EN 60950-1:2006/A11:2009/A1:2010/A12:2011/A2:2013

EN 60950-1:2006/A11:2009/A1:2010/A12:2011/A2:2013 – CENELEC COMMON MODIFICATIONS

IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)			
Clause	Requirement + Test	Result - Remark	Verdict
	Clauses, subclauses, notes, tables and figures which are additional to those in IEC60950-1 and it´s amendmets are prefixed “Z”		
Contents (A2:2013)	Add the following annexes: Annex ZA (normative) Normative references to international publications with their corresponding European publications Annex ZB (normative) Special national conditions Annex ZD (informative) IEC and CENELEC code designations for flexible cords		P
General	Delete all the “country” notes in the reference document (IEC 60950-1:2005) according to the following list: 1.4.8 Note 2; 1.5.1 Note 2 & 3; 1.5.7.1 Note 1.5.8 Note 2; 1.5.9.4 Note; 1.7.2.1 Note 4, 5 & 6 2.2.3 Note; 2.2.4 Note; 2.3.2 Note 2.3.2.1 Note 2; 2.3.4 Note 2; 2.6.3.3 Note 2 & 3 2.7.1 Note; 2.10.3.2 Note 2; 2.10.5.13 Note 3 3.2.1.1 Note; 3.2.4 Note 3.; 2.5.1 Note 2 4.3.6 Note 1 & 2; 4.7 Note 4; 4.7.2.2 Note 4.7.3.1 Note 2; 5.1.7.1 Note 3 & 4; 5.3.7 Note 1 6 Note 2 & 5; 6.1.2.1 Note 2; 6.1.2.2 Note 6.2.2 Note; 6.2.2.1 Note 2; 6.2.2.2 Note 7.1 Note 3; 7.2 Note; 7.3 Note 1 & 2 G.2.1 Note 2; Annex H Note 2		P
General (A1:2010)	Delete all the “country” notes in the reference document (IEC 60950-1:2005/A1:2010) according to the following list: 1.5.7.1 Note; 6.1.2.1 Note 2 6.2.2.1 Note 2; EE.3 Note		P
General (A2:2013)	Delete all the “country” notes in the reference document (IEC 60950-1:2005/A2:2013) according to the following list: 2.7.1 Note *; 2.10.3.1 Note 2 6.2.2. Note * Note of secretary: Text of Common Modification remains unchanged.		P

Loc.	Tested insulation	Working voltage peak / V (2.10.2)	Working voltage rms / V (2.10.2)	Required electric strength (5.2)	Required clearance / mm (2.10.3)	Required creepage distance / mm (2.10.4)	Required distance thr. insul. (2.10.5)
Loc.	Tested insulation			Test voltage/ V	Measured clearance / mm	Measured creepage dist./ mm	Measured distance thr. insul. / mm; number of layers
Supplementary information:							

C.2	**TABLE: transformers**	N/A
Transformer Mfr.:		
Transformer Type:		
Bobbin:		
Primary/input pins.....:		
Secondary/output pins .....:		
Material (manufacturer, type, ratings).....:		
Thickness (mm).....:		

M.2	**TABLE: Criteria for telephone ringing signals (European method)**								N/A
Condition	I_{DC} (mA)	I_P (mA)	I_{PP} (mA)	t_1 (ms)	t_2 (ms)	I_{TS1} (mA)	Limit (mA)	I_{TS2} (mA)	Limit (mA)
Supplementary information:									

Supplementary information:		

4.7	TABLE: Resistance to fire				P
Part	Manufacturer of material	Type of material	Thickness (mm)	Flammability class	Evidence
PCB	Interchangeable	Interchangeable	--	Min. V-1	1)
Supplementary information:					
1) See appended table 1.5.1 for details.					

5.1	TABLE: touch current measurement			N/A
Measured between:	Measured (mA)	Limit (mA)	Comments/conditions	
Supplementary information:				
Test voltage: Overall capacity:				

5.2	TABLE: Electric strength tests, impulse tests and voltage surge tests			N/A
Test voltage applied between:	Voltage shape (AC, DC, impulse, surge)	Test voltage (V)	Breakdown Yes / No	
Supplementary information:				

5.3	TABLE: Fault condition tests						P
	Ambient temperature (°C) ..... :				25°C, if no others states		—
	Power source for EUT: Manufacturer, model/type, output rating ..... :				--		—
Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation	
U3, pin 3 to pin 4 short	Short	5Vdc	10min	--	--	No damaged, no hazard.	
Supplementary information:							
In fault column: s-c=short-circuited, o-c=open-circuited, o-l= overload							

C.2	TABLE: transformers	N/A

	Supply voltage (V) ..... :	DC 5 V	—
	Ambient T_{min} (°C) ..... :	--	—
	Ambient T_{max} (°C) ..... :	--	—

Maximum measured temperature T of part/at::	T (°C)	Allowed T_{max} (°C)
PCB near U1	86.1	105
PCB near C209	81.8	105
L6 coil	80.0	105
L9 coil	82.7	105
PCB near U1	81.5	105
PCB near U40	83.5	105
PCB near U8	70.8	105
L4 coil	70.7	105
PCB near Q5000	86.2	105
PCB near U6	84.3	105
Tamb	24.8	--
Tma	70.0	--

Supplementary information:

Temperature T of winding:	t_1 (°C)	R_1 (Ω)	t_2 (°C)	R_2 (Ω)	T (°C)	Allowed T_{max} (°C)	Insulation class

Supplementary information:

1) The temperatures were measured under worst case normal mode defined in 1.2.2.1 and as described in 1.6.2 at voltages as above.
2) The maximum ambient temperature (Tma) permitted by the manufacturer's specification is 70°C.
3) All values for T (°C) are re-calculated from Tamb respectively.

4.5.5	**TABLE: Ball pressure test of thermoplastic parts**		N/A
	Allowed impression diameter (mm) ..... :	≤ 2 mm	—

Part	Test temperature (°C)	Impression diameter (mm)

Supplementary information:

4.6.1, 4.6.2	**Table: Enclosure opening measurements**	N/A
Location	Size (mm)	Comments

Is it possible to install the battery in a reverse polarity position?		

	Non-rechargeable batteries			Rechargeable batteries					
	Discharging		Un-intentional charging	Charging		Discharging		Reversed charging	
	Meas. current	Manuf. Specs.		Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.
Max. current during normal condition									
Max. current during fault condition									

Test results:		Verdict
- Chemical leaks		
- Explosion of the battery		
- Emission of flame or expulsion of molten metal		
- Electric strength tests of equipment after completion of tests		
Supplementary information:		

4.3.8	**TABLE: Batteries**	N/A

Battery category .....: (Lithium, NiMh, NiCad, Lithium Ion …)
Manufacturer .....:
Type / model .....:
Voltage .....:
Capacity .....: mAh
Tested and Certified by (incl. Ref. No.) .....:
Circuit protection diagram:

MARKINGS AND INSTRUCTIONS (1.7.13)	
Location of replaceable battery	N/A
Language(s) ……..:	N/A
Close to the battery ……..:	N/A
In the servicing instructions ……..:	N/A
In the operating instructions ……..:	N/A

4.5	**TABLE: Thermal requirements**	P

Note: Measured Uoc (V) with all load circuits disconnected: See below.						
Components	Sample No.	Uoc (V)	I_{sc} (A)		VA	
			Meas.	Limit	Meas.	Limit
Supplementary information:						
Sc=Short circuit, Oc=Open circuit						

2.6.3.4	**TABLE: Resistance of earthing measurement**	N/A
Location	Resistance measured (mΩ)	Comments
Supplementary information:		

2.10.2	**Table: working voltage measurement**		N/A
Location	RMS voltage (V)	Peak voltage (V)	Comments
Supplementary information:			
Test voltage:			

2.10.3 and 2.10.4	**TABLE: Clearance and creepage distance measurements**						N/A
Clearance (cl) and creepage distance (cr) at/of/between:	U peak (V)	U r.m.s. (V)	Required cl (mm)	cl (mm)	Required cr (mm)	cr (mm)	
Supplementary information:							

2.10.5	**TABLE: Distance through insulation measurements**					N/A
Distance through insulation (DTI) at/of:	U peak (V)	U rms (V)	Test voltage (V)	Required DTI (mm)	DTI (mm)	
Supplementary information:						

4.3.8	**TABLE: Batteries**	N/A
The tests of 4.3.8 are applicable only when appropriate battery data is not available		

2.1.1.5 c) 2)	TABLE: stored energy	N/A

Capacitance C (µF)	Voltage U (V)	Energy E (J)
Supplementary information:		

2.1.1.7	TABLE: Discharge test			N/A

Condition	τ calculated (s)	τ measured (s)	t u→ 0V (s)	Comments
Supplementary information:				
Test voltage: Overall capacity: Discharge resistor:				

2.2	TABLE: evaluation of voltage limiting components in SELV circuits	N/A

Component (measured between)	max. voltage (V) (normal operation)		Voltage Limiting Components
	V peak	V d.c.	

Fault test performed on voltage limiting components	Voltage measured (V) in SELV circuits (V peak or V d.c.)
Supplementary information:	
Test voltage:	

2.4.2	TABLE: Limited current circuit measurement	N/A

Location	Voltage (V)	Current (mA)	Freq. (Hz)	Limit (mA)	Comments
Supplementary information:					

2.5	TABLE: limited power sources	N/A

Circuit output tested: See below.

1.5.1	TABLE: List of critical components				P
Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard	Mark(s) of conformity [1)]
PCB	Interchangeable	Interchangeable	V-1 or better, min. 105°C	UL 796	UL
Supplementary information:					
1) Provided evidence ensures the agreed level of compliance.					

1.5.1	TABLE: Opto Electronic Devices	N/A
Manufacturer.....:		
Type .....:		
Separately tested .....:		
Bridging insulation.....:		
External creepage distance .....:		
Internal creepage distance.....:		
Distance through insulation.....:		
Tested under the following conditions.....:		
Input .....:		
Output .....:		
Supplementary information		

1.6.2	TABLE: Electrical data (in normal conditions)					
U (V)	I (A)	Irated (A)	P (W)	Fuse #	Ifuse (A)	Condition/status
Supplementary information:						

2.1.1.5 c) 1)	TABLE: max. V, A, VA test			
Voltage (rated) (V)	Current (rated) (A)	Voltage (max.) (V)	Current (max.) (A)	VA (max.) (VA)
Supplementary information:				

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

EE	**ANNEX EE, Household and home/office document/media shredders**		N/A
EE.1	General	No such device provided.	N/A
EE.2	Markings and instructions		N/A
	Use of markings or symbols……:		N/A
	Information of user instructions, maintenance and/or servicing instructions……:		N/A
EE.3	Inadvertent reactivation test……:		N/A
EE.4	Disconnection of power to hazardous moving parts:		N/A
	Use of markings or symbols……:		N/A
EE.5	Protection against hazardous moving parts		N/A
	Test with test finger (Figure 2A) ……:		N/A
	Test with wedge probe (Figure EE1 and EE2) ……:		N/A

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
W.2.1	Isolation		N/A
W.2.2	Common return, isolated from earth		N/A
W.2.3	Common return, connected to protective earth		N/A
X	**ANNEX X, MAXIMUM HEATING EFFECT IN TRANSFORMER TESTS (see clause C.1)**		N/A
X.1	Determination of maximum input current		N/A
X.2	Overload test procedure		N/A
Y	**ANNEX Y, ULTRAVIOLET LIGHT CONDITIONING TEST (see 4.3.13.3)**		N/A
Y.1	Test apparatus ..... :		N/A
Y.2	Mounting of test samples ..... :		N/A
Y.3	Carbon-arc light-exposure apparatus ..... :		N/A
Y.4	Xenon-arc light exposure apparatus ..... :		N/A
Z	**ANNEX Z, OVERVOLTAGE CATEGORIES (see 2.10.3.2 and Clause G.2)**		N/A
AA	**ANNEX AA, MANDREL TEST (see 2.10.5.8)**		N/A
BB	**ANNEX BB, CHANGES IN THE SECOND EDITION**		—
CC	**ANNEX CC, Evaluation of integrated circuit (IC) current limiters**		N/A
CC.1	General	No such current limiter provided	N/A
CC.2	Test program 1……..:		N/A
CC.3	Test program 2……..:		N/A
CC.4	Test program 3.....:		N/A
CC.5	Compliance.....:		N/A
DD	**ANNEX DD, Requirements for the mounting means of rack-mounted equipment**		N/A
DD.1	General		N/A
DD.2	Mechanical strength test, variable N……..:		N/A
DD.3	Mechanical strength test, 250N, including end stops……:		N/A
DD.4	Compliance……..:		N/A

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- Preferred climatic categories ..... :		N/A
	- Maximum continuous voltage ..... :		N/A
	- Combination pulse current ..... :		N/A
	Body of the VDR Test according to IEC60695-11-5.....:		N/A
	Body of the VDR. Flammability class of material (min V-1).....:		N/A
R	**ANNEX R, EXAMPLES OF REQUIREMENTS FOR QUALITY CONTROL PROGRAMMES**		N/A
R.1	Minimum separation distances for unpopulated coated printed boards (see 2.10.6.2)		N/A
R.2	Reduced clearances (see 2.10.3)		N/A
S	**ANNEX S, PROCEDURE FOR IMPULSE TESTING (see 6.2.2.3)**		N/A
S.1	Test equipment		N/A
S.2	Test procedure		N/A
S.3	Examples of waveforms during impulse testing		
T	**ANNEX T, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER (see 1.1.2)**		N/A
			—
U	**ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)**		N/A
			—
V	**ANNEX V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1)** *Evaluated in approved external power adaptor.*		N/A
V.1	Introduction		N/A
V.2	TN power distribution systems		N/A
W	**ANNEX W, SUMMATION OF TOUCH CURRENTS**		N/A
W.1	Touch current from electronic circuits		N/A
W.1.1	Floating circuits		N/A
W.1.2	Earthed circuits		N/A
W.2	Interconnection of several equipments		N/A

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
L	**ANNEX L, NORMAL LOAD CONDITIONS FOR SOME TYPES OF ELECTRICAL BUSINESS EQUIPMENT (see 1.2.2.1 and 4.5.2)**		P
L.1	Typewriters		N/A
L.2	Adding machines and cash registers		N/A
L.3	Erasers		N/A
L.4	Pencil sharpeners		N/A
L.5	Duplicators and copy machines		N/A
L.6	Motor-operated files		N/A
L.7	Other business equipment	Maximum normal load is considered as below: Equipment operated with signal transmission continusly.	P
M	**ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)**		N/A
M.1	Introduction		N/A
M.2	Method A		N/A
M.3	Method B		N/A
M.3.1	Ringing signal		N/A
M.3.1.1	Frequency (Hz) ..... :		—
M.3.1.2	Voltage (V) ..... :		—
M.3.1.3	Cadence; time (s), voltage (V) ..... :		—
M.3.1.4	Single fault current (mA) ..... :		—
M.3.2	Tripping device and monitoring voltage ..... :		N/A
M.3.2.1	Conditions for use of a tripping device or a monitoring voltage		N/A
M.3.2.2	Tripping device		N/A
M.3.2.3	Monitoring voltage (V) ..... :		N/A
N	**ANNEX N, IMPULSE TEST GENERATORS (see 1.5.7.2, 1.5.7.3, 2.10.3.9, 6.2.2.1, 7.3.2, 7.4.3 and Clause G.5)**		N/A
N.1	ITU-T impulse test generators		N/A
N.2	IEC 60065 impulse test generator		N/A
P	**ANNEX P, NORMATIVE REFERENCES**		—
Q	**ANNEX Q, Voltage dependent resistors (VDRs) (see 1.5.9.1)**		N/A

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
G.1.2	Summary of the procedure for determining minimum clearances		N/A
G.2	**Determination of mains transient voltage (V)**		N/A
G.2.1	AC mains supply ..... :		N/A
G.2.2	Earthed d.c. mains supplies ..... :		N/A
G.2.3	Unearthed d.c. mains supplies ..... :		N/A
G.2.4	Battery operation ..... :		N/A
G.3	**Determination of telecommunication network transient voltage (V) ..... :**		N/A
G.4	**Determination of required withstand voltage (V)**		N/A
G.4.1	Mains transients and internal repetitive peaks ..... :		N/A
G.4.2	Transients from telecommunication networks ..... :		N/A
G.4.3	Combination of transients		N/A
G.4.4	Transients from cable distribution systems		N/A
G.5	**Measurement of transient voltages (V)**		N/A
	a) Transients from a mains supply		N/A
	For an a.c. mains supply		N/A
	For a d.c. mains supply		N/A
	b) Transients from a telecommunication network		N/A
G.6	**Determination of minimum clearances ..... :**		N/A

H	**ANNEX H, IONIZING RADIATION (see 4.3.13)**		N/A

J	**ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)**		N/A
	Metal(s) used ..... :		—

K	**ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.8)**		N/A
K.1	Making and breaking capacity		N/A
K.2	Thermostat reliability; operating voltage (V) ..... :		N/A
K.3	Thermostat endurance test; operating voltage (V) ..... :		N/A
K.4	Temperature limiter endurance; operating voltage (V) ..... :		N/A
K.5	Thermal cut-out reliability		N/A
K.6	Stability of operation		N/A

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
B.6.4	Electric strength test; test voltage (V) ..... :		N/A
B.7	**Locked-rotor overload test for d.c. motors in secondary circuits**		N/A
B.7.1	General		N/A
B.7.2	Test procedure		N/A
B.7.3	Alternative test procedure		N/A
B.7.4	Electric strength test; test voltage (V) .....:		N/A
B.8	**Test for motors with capacitors**		N/A
B.9	**Test for three-phase motors**		N/A
B.10	**Test for series motors**		N/A
	Operating voltage (V) ..... :		—
C	**ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3)**		N/A
	Position ..... :		—
	Manufacturer ..... :		—
	Type ..... :		—
	Rated values ..... :		—
	Method of protection ..... :		—
C.1	**Overload test**		N/A
C.2	**Insulation**		N/A
	Protection from displacement of windings ..... :		N/A
D	**ANNEX D, MEASURING INSTRUMENTS FOR TOUCH-CURRENT TESTS (see 5.1.4)**		N/A
D.1	**Measuring instrument**		N/A
D.2	**Alternative measuring instrument**		N/A
E	**ANNEX E, TEMPERATURE RISE OF A WINDING (see 1.4.13)**		N/A
F	**ANNEX F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10 and Annex G)**		N/A
G	**ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES**		N/A
G.1	**Clearances**		N/A
G.1.1	General		N/A

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
A.2.3	Mounting of samples ..... :		N/A
A.2.4	Test flame (see IEC 60695-11-4)		N/A
	Flame A, B or C ..... :		—
A.2.5	Test procedure		N/A
A.2.6	Compliance criteria		N/A
	Sample 1 burning time (s)..... :		—
	Sample 2 burning time (s)..... :		—
	Sample 3 burning time (s)..... :		—
A.2.7	Alternative test acc. to IEC 60695-11-5, cl. 5 and 9		N/A
	Sample 1 burning time (s)..... :		—
	Sample 2 burning time (s)..... :		—
	Sample 3 burning time (s)..... :		—
A.3	**Hot flaming oil test (see 4.6.2)**		N/A
A.3.1	Mounting of samples		N/A
A.3.2	Test procedure		N/A
A.3.3	Compliance criterion		N/A

B	**ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2)**		N/A
B.1	**General requirements**		N/A
	Position ..... :		—
	Manufacturer ..... :		—
	Type ..... :		—
	Rated values ..... :		—
B.2	**Test conditions**		N/A
B.3	**Maximum temperatures**		N/A
B.4	**Running overload test**		N/A
B.5	**Locked-rotor overload test**		N/A
	Test duration (days) ..... :		—
	Electric strength test: test voltage (V) ..... :		—
B.6	**Running overload test for d.c. motors in secondary circuits**		N/A
B.6.1	General		N/A
B.6.2	Test procedure		N/A
B.6.3	Alternative test procedure		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Current limiting method ..... :		—
7	**CONNECTION TO CABLE DISTRIBUTION SYSTEMS**		N/A
7.1	**General**		N/A
7.2	Protection of cable distribution system service persons, and users of other equipment connected to the system, from hazardous voltages in the equipment		N/A
7.3	Protection of equipment users from overvoltages on the cable distribution system		N/A
7.4	Insulation between primary circuits and cable distribution systems		N/A
7.4.1	General		N/A
7.4.2	Voltage surge test		N/A
7.4.3	Impulse test		N/A
A	**ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE**		N/A
A.1	**Flammability test for fire enclosures of movable equipment having a total mass exceeding 18 kg, and of stationary equipment (see 4.7.3.2)**		N/A
A.1.1	Samples..... :		—
	Wall thickness (mm)..... :		—
A.1.2	Conditioning of samples; temperature (°C) ..... :		N/A
A.1.3	Mounting of samples ..... :		N/A
A.1.4	Test flame (see IEC 60695-11-3)		N/A
	Flame A, B, C or D ..... :		—
A.1.5	Test procedure		N/A
A.1.6	Compliance criteria		N/A
	Sample 1 burning time (s)..... :		—
	Sample 2 burning time (s)..... :		—
	Sample 3 burning time (s)..... :		—
A.2	**Flammability test for fire enclosures of movable equipment having a total mass not exceeding 18 kg, and for material and components located inside fire enclosures (see 4.7.3.2 and 4.7.3.4)**		N/A
A.2.1	Samples, material..... :		—
	Wall thickness (mm)..... :		—
A.2.2	Conditioning of samples; temperature (°C) ..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.3.1	Protection against overload and abnormal operation	See appended table 5.3	P
5.3.2	Motors	No such component provided.	N/A
5.3.3	Transformers		N/A
5.3.4	Functional insulation .....:	Method c). Test results see appended table 5.3.	P
5.3.5	Electromechanical components		N/A
5.3.6	Audio amplifiers in ITE .....:		N/A
5.3.7	Simulation of faults		N/A
5.3.8	Unattended equipment	None of the listed components provided.	N/A
5.3.9	Compliance criteria for abnormal operating and fault conditions	No fire occurred and no molten metal was emitted. Electric strength test was not required.	P
5.3.9.1	During the tests	Same as above.	P
5.3.9.2	After the tests		N/A
6	**CONNECTION TO TELECOMMUNICATION NETWORKS** *Class III equipment with TNV-1 circuit and cable distribution system. See also sub-clause 2.3.2 and 7.3.*		N/A
6.1	**Protection of telecommunication network service persons, and users of other equipment connected to the network, from hazards in the equipment**		N/A
6.1.1	Protection from hazardous voltages		N/A
6.1.2	Separation of the telecommunication network from earth		N/A
6.1.2.1	Requirements		N/A
	Supply voltage (V) ..... :		—
	Current in the test circuit (mA) ..... :		—
6.1.2.2	Exclusions ..... :		N/A
6.2	**Protection of equipment users from overvoltages on telecommunication networks**		N/A
6.2.1	Separation requirements		N/A
6.2.2	Electric strength test procedure		N/A
6.2.2.1	Impulse test		N/A
6.2.2.2	Steady-state test		N/A
6.2.2.3	Compliance criteria		N/A
6.3	**Protection of the telecommunication wiring system from overheating**		N/A
	Max. output current (A) ..... :		—

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Clause	Requirement + Test	Result - Remark	Verdict
5.1.2.1	Single connection to an a.c. mains supply		N/A
5.1.2.2	Redundant multiple connections to an a.c. mains supply		N/A
5.1.2.3	Simultaneous multiple connections to an a.c. mains supply		N/A
5.1.3	Test circuit		N/A
5.1.4	Application of measuring instrument		N/A
5.1.5	Test procedure		N/A
5.1.6	Test measurements		N/A
	Supply voltage (V) .....:		—
	Measured touch current (mA) .....:		—
	Max. allowed touch current (mA) .....:		—
	Measured protective conductor current (mA) .....:		—
	Max. allowed protective conductor current (mA) ...:		—
5.1.7	Equipment with touch current exceeding 3,5 mA		N/A
5.1.7.1	General .....:		N/A
5.1.7.2	Simultaneous multiple connections to the supply		N/A
5.1.8	Touch currents to telecommunication networks and cable distribution systems and from telecommunication networks		N/A
5.1.8.1	Limitation of the touch current to a telecommunication network or to a cable distribution system		N/A
	Supply voltage (V) .....:		—
	Measured touch current (mA) .....:		—
	Max. allowed touch current (mA) .....:		—
5.1.8.2	Summation of touch currents from telecommunication networks		N/A
	a) EUT with earthed telecommunication ports .....:		N/A
	b) EUT whose telecommunication ports have no reference to protective earth		N/A
5.2	**Electric strength**		N/A
5.2.1	General		N/A
5.2.2	Test procedure		N/A
5.3	**Abnormal operating and fault conditions**		P

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Clause	Requirement + Test	Result - Remark	Verdict
4.6.4.1	Constructional design measures		N/A
	Dimensions (mm) ..... :		—
4.6.4.2	Evaluation measures for larger openings		N/A
4.6.4.3	Use of metallized parts		N/A
4.6.5	Adhesives for constructional purposes		N/A
	Conditioning temperature (°C), time (weeks) ..... :		—
4.7	**Resistance to fire** *Component type equipment. Additional consideration may be necessary in the end-use product.*		P
4.7.1	Reducing the risk of ignition and spread of flame	Use of materials with the required flammability classes.	P
	Method 1, selection and application of components wiring and materials	Method 1 used.	P
	Method 2, application of all of simulated fault condition tests	Same as above.	N/A
4.7.2	Conditions for a fire enclosure	Component type equipment. It should be considered in the end-use product.	N/A
4.7.2.1	Parts requiring a fire enclosure		N/A
4.7.2.2	Parts not requiring a fire enclosure		N/A
4.7.3	Materials		P
4.7.3.1	General	PCB rated accordingly. For details see table 1.5.1.	P
4.7.3.2	Materials for fire enclosures	See sub-clause 4.7.2.	N/A
4.7.3.3	Materials for components and other parts outside fire enclosures	Same as above.	N/A
4.7.3.4	Materials for components and other parts inside fire enclosures	Same as above.	N/A
4.7.3.5	Materials for air filter assemblies	No air filter provided.	N/A
4.7.3.6	Materials used in high-voltage components	No high voltage components provided.	N/A
5	**ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS**		P
5.1	**Touch current and protective conductor current**		N/A
5.1.1	General	Component type equipment. It should be considered in the end-use product.	N/A
5.1.2	Configuration of equipment under test (EUT)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

4.4	**Protection against hazardous moving parts** *No hazard moving parts are employed.*		N/A
4.4.1	General		N/A
4.4.2	Protection in operator access areas ..... :		N/A
	Household and home/office document/media shredders		N/A
4.4.3	Protection in restricted access locations ..... :		N/A
4.4.4	Protection in service access areas		N/A
4.4.5	Protection against moving fan blades		N/A
4.4.5.1	General		N/A
	Not considered to cause pain or injury. a)……..:		N/A
	Is considered to cause pain, not injury. b) ……..:		N/A
	Considered to cause injury. c) ……..:		N/A
4.4.5.2	Protection for users		N/A
	Use of symbol or warning ……..:		N/A
4.4.5.3	Protection for service persons		N/A
	Use of symbol or warning ……..:		N/A

4.5	**Thermal requirements**		P
4.5.1	General	See below.	P
4.5.2	Temperature tests	See appended table 4.5	P
	Normal load condition per Annex L ..... :	See sub-clause 1.6.2	—
4.5.3	Temperature limits for materials	See Annex L	P
4.5.4	Touch temperature limits	See appended table 4.5.	P
4.5.5	Resistance to abnormal heat ..... :		N/A

4.6	**Openings in enclosures** *Component type equipment. It should be considered in the end-use product.*		N/A
4.6.1	Top and side openings		N/A
	Dimensions (mm) ..... :		—
4.6.2	Bottoms of fire enclosures		N/A
	Construction of the bottomm, dimensions (mm) .. :		—
4.6.3	Doors or covers in fire enclosures		N/A
4.6.4	Openings in transportable equipment		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
4.3.4	Securing of parts		N/A
4.3.5	Connection by plugs and sockets		N/A
4.3.6	Direct plug-in equipment		N/A
	Torque ..... :		—
	Compliance with the relevant mains plug standard ..... :		N/A
4.3.7	Heating elements in earthed equipment		N/A
4.3.8	Batteries		N/A
	- Overcharging of a rechargeable battery		N/A
	- Unintentional charging of a non-rechargeable battery		N/A
	- Reverse charging of a rechargeable battery		N/A
	- Excessive discharging rate for any battery		N/A
4.3.9	Oil and grease		N/A
4.3.10	Dust, powders, liquids and gases		N/A
4.3.11	Containers for liquids or gases		N/A
4.3.12	Flammable liquids ..... :		N/A
	Quantity of liquid (l) ..... :		N/A
	Flash point (°C) ..... :		N/A
4.3.13	Radiation		N/A
4.3.13.1	General		N/A
4.3.13.2	Ionizing radiation		N/A
	Measured radiation (pA/kg) ..... :		—
	Measured high-voltage (kV) ..... :		—
	Measured focus voltage (kV) ..... :		—
	CRT markings ..... :		—
4.3.13.3	Effect of ultraviolet (UV) radiation on materials		N/A
	Part, property, retention after test, flammability classification ..... :		N/A
4.3.13.4	Human exposure to ultraviolet (UV) radiation ..... :		N/A
4.3.13.5	Lasers (including laser diodes) and LEDs		N/A
4.3.13.5.1	Lasers (including laser diodes)		—
	Laser class ..... :		—
4.3.13.5.2	Light emitting diodes (LEDs)		N/A
4.3.13.6	Other types ..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
3.5.2	Types of interconnection circuits ..... :	Interconnection circuits of SELV.	P
3.5.3	ELV circuits as interconnection circuits	No ELV interconnection.	N/A
3.5.4	Data ports for additional equipment	Component type equipment. It should be considered in the end-use product.	P
4	**PHYSICAL REQUIREMENTS**		P
4.1	**Stability** *Component type equipment. It should be considered in the end-use product.*		N/A
	Angle of 10°		N/A
	Test force (N) ..... :		N/A
4.2	**Mechanical strength** *Component type equipment. It should be considered in the end-use product.*		N/A
4.2.1	General		N/A
	Rack-mounted equipment.		N/A
4.2.2	Steady force test, 10 N		N/A
4.2.3	Steady force test, 30 N		N/A
4.2.4	Steady force test, 250 N		N/A
4.2.5	Impact test		N/A
	Fall test		N/A
	Swing test		N/A
4.2.6	Drop test; height (mm) ..... :		N/A
4.2.7	Stress relief test		N/A
4.2.8	Cathode ray tubes		N/A
	Picture tube separately certified ..... :		N/A
4.2.9	High pressure lamps		N/A
4.2.10	Wall or ceiling mounted equipment; force (N) ..... :		N/A
4.3	**Design and construction** *Component type equipment. It should be considered in the end-use product.*		N/A
4.3.1	Edges and corners		N/A
4.3.2	Handles and manual controls; force (N) ..... :		N/A
4.3.3	Adjustable controls		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Diameter or minor dimension D (mm); test mass (g) ..... :		—
	Radius of curvature of cord (mm) ..... :		—
3.2.9	Supply wiring space		N/A
3.3	**Wiring terminals for connection of external conductors** *Component type equipment. It should be considered in the end-use product.*		P
3.3.1	Wiring terminals		N/A
3.3.2	Connection of non-detachable power supply cords		N/A
3.3.3	Screw terminals		N/A
3.3.4	Conductor sizes to be connected		N/A
	Rated current (A), cord/cable type, cross-sectional area (mm^2) ..... :		—
3.3.5	Wiring terminal sizes		N/A
	Rated current (A), type, nominal thread diameter (mm) ..... :		—
3.3.6	Wiring terminal design		N/A
3.3.7	Grouping of wiring terminals		N/A
3.3.8	Stranded wire		N/A
3.4	**Disconnection from the mains supply** *Class III equipment. No direct connection to mains supply.*		N/A
3.4.1	General requirement		N/A
3.4.2	Disconnect devices		N/A
3.4.3	Permanently connected equipment		N/A
3.4.4	Parts which remain energized		N/A
3.4.5	Switches in flexible cords		N/A
3.4.6	Number of poles - single-phase and d.c. equipment		N/A
3.4.7	Number of poles - three-phase equipment		N/A
3.4.8	Switches as disconnect devices		N/A
3.4.9	Plugs as disconnect devices		N/A
3.4.10	Interconnected equipment		N/A
3.4.11	Multiple power sources		N/A
3.5	**Interconnection of equipment**		P
3.5.1	General requirements	See below.	P

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Clause	Requirement + Test	Result - Remark	Verdict
3.1	**General** *Component type equipment. It should be considered in the end-use product.*		N/A
3.1.1	Current rating and overcurrent protection		N/A
3.1.2	Protection against mechanical damage		N/A
3.1.3	Securing of internal wiring		N/A
3.1.4	Insulation of conductors		N/A
3.1.5	Beads and ceramic insulators		N/A
3.1.6	Screws for electrical contact pressure		N/A
3.1.7	Insulating materials in electrical connections		N/A
3.1.8	Self-tapping and spaced thread screws		N/A
3.1.9	Termination of conductors		N/A
	10 N pull test		N/A
3.1.10	Sleeving on wiring		N/A
3.2	**Connection to a mains supply** *Class III equipment. No direct connection to mains supply.*		N/A
3.2.1	Means of connection		N/A
3.2.1.1	Connection to an a.c. mains supply		N/A
3.2.1.2	Connection to a d.c. mains supply		N/A
3.2.2	Multiple supply connections		N/A
3.2.3	Permanently connected equipment		N/A
	Number of conductors, diameter of cable and conduits (mm) ..... :		—
3.2.4	Appliance inlets		N/A
3.2.5	Power supply cords		N/A
3.2.5.1	AC power supply cords		N/A
	Type ..... :		—
	Rated current (A), cross-sectional area (mm^2), AWG ..... :		—
3.2.5.2	DC power supply cords		N/A
3.2.6	Cord anchorages and strain relief		N/A
	Mass of equipment (kg), pull (N) ..... :		—
	Longitudinal displacement (mm) ..... :		—
3.2.7	Protection against mechanical damage		N/A
3.2.8	Cord guards		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	a) Basic insulation not under stress .....:		N/A
	b) Basic, supplementary, reinforced insulation .....:		N/A
	c) Compliance with Annex U .....:		N/A
	Two wires in contact inside wound component; angle between 45° and 90° .....:		N/A
2.10.5.13	Wire with solvent-based enamel in wound components		N/A
	Electric strength test		—
	Routine test		N/A
2.10.5.14	Additional insulation in wound components		N/A
	Working voltage .....:		N/A
	- Basic insulation not under stress .....:		N/A
	- Supplementary, reinforced insulation .....:		N/A
2.10.6	Construction of printed boards		N/A
2.10.6.1	Uncoated printed boards		N/A
2.10.6.2	Coated printed boards		N/A
2.10.6.3	Insulation between conductors on the same inner surface of a printed board		N/A
2.10.6.4	Insulation between conductors on different layers of a printed board		N/A
	Distance through insulation		N/A
	Number of insulation layers (pcs) .....:		N/A
2.10.7	Component external terminations		N/A
2.10.8	Tests on coated printed boards and coated components		N/A
2.10.8.1	Sample preparation and preliminary inspection		N/A
2.10.8.2	Thermal conditioning		N/A
2.10.8.3	Electric strength test		N/A
2.10.8.4	Abrasion resistance test		N/A
2.10.9	Thermal cycling		N/A
2.10.10	Test for Pollution Degree 1 environment and insulating compound		N/A
2.10.11	Tests for semiconductor devices and cemented joints		N/A
2.10.12	Enclosed and sealed parts		N/A

3	**WIRING, CONNECTIONS AND SUPPLY**	P

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Clause	Requirement + Test	Result - Remark	Verdict
	d) Battery operation .....:		N/A
2.10.3.3	Clearances in primary circuits		N/A
2.10.3.4	Clearances in secondary circuits		N/A
2.10.3.5	Clearances in circuits having starting pulses		N/A
2.10.3.6	Transients from a.c. mains supply .....:		N/A
2.10.3.7	Transients from d.c. mains supply .....:		N/A
2.10.3.8	Transients from telecommunication networks and cable distribution systems .....:		N/A
2.10.3.9	Measurement of transient voltage levels		N/A
	a) Transients from a mains supply		N/A
	For an a.c. mains supply .....:		N/A
	For a d.c. mains supply .....:		N/A
	b) Transients from a telecommunication network :		N/A
2.10.4	Creepage distances		N/A
2.10.4.1	General		N/A
2.10.4.2	Material group and comparative tracking index		N/A
	CTI tests .....:		—
2.10.4.3	Minimum creepage distances		N/A
2.10.5	Solid insulation		N/A
2.10.5.1	General		N/A
2.10.5.2	Distances through insulation		N/A
2.10.5.3	Insulating compound as solid insulation		N/A
2.10.5.4	Semiconductor devices		N/A
2.10.5.5.	Cemented joints		N/A
2.10.5.6	Thin sheet material – General		N/A
2.10.5.7	Separable thin sheet material		N/A
	Number of layers (pcs) .....:		—
2.10.5.8	Non-separable thin sheet material		N/A
2.10.5.9	Thin sheet material – standard test procedure		N/A
	Electric strength test		—
2.10.5.10	Thin sheet material – alternative test procedure		N/A
	Electric strength test		—
2.10.5.11	Insulation in wound components		N/A
2.10.5.12	Wire in wound components		N/A
	Working voltage .....:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
2.8.8	Mechanical actuators		N/A
2.9	**Electrical insulation**		P
2.9.1	Properties of insulating materials	The unit is supplied from DC connector that provides SELV. Only SELV inside the unit. See sub-clause 2.3.2.	P
2.9.2	Humidity conditioning	No such consideration.	N/A
	Relative humidity (%), temperature (°C) ..... :		—
2.9.3	Grade of insulation	Functional Insulation.	P
2.9.4	Separation from hazardous voltages	See below.	P
	Method(s) used ..... :	Class III equipment, which is separated from hazardous voltage by double/reinforced insulation through external power adaptor.	—
2.10	**Clearances, creepage distances and distances through insulation** *The unit is supplied from DC connector that provides SELV. Only SELV inside the unit.*		P
2.10.1	General	Functional insulation only.	P
2.10.1.1	Frequency .....:		N/A
2.10.1.2	Pollution degrees .....:		N/A
2.10.1.3	Reduced values for functional insulation		N/A
2.10.1.4	Intervening unconnected conductive parts		N/A
2.10.1.5	Insulation with varying dimensions		N/A
2.10.1.6	Special separation requirements		N/A
2.10.1.7	Insulation in circuits generating starting pulses		N/A
2.10.2	Determination of working voltage		N/A
2.10.2.1	General		N/A
2.10.2.2	RMS working voltage		N/A
2.10.2.3	Peak working voltage		N/A
2.10.3	Clearances		N/A
2.10.3.1	General		N/A
2.10.3.2	Mains transient voltages		N/A
	a) AC mains supply .....:		N/A
	b) Earthed d.c. mains supplies .....:		N/A
	c) Unearthed d.c. mains supplies .....:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
2.6.5.2	Components in protective earthing conductors and protective bonding conductors		N/A
2.6.5.3	Disconnection of protective earth		N/A
2.6.5.4	Parts that can be removed by an operator		N/A
2.6.5.5	Parts removed during servicing		N/A
2.6.5.6	Corrosion resistance		N/A
2.6.5.7	Screws for protective bonding		N/A
2.6.5.8	Reliance on telecommunication network or cable distribution system		N/A
2.7	**Overcurrent and earth fault protection in primary circuits** *Component type equipment. It should be considered in the end-use product.*		N/A
2.7.1	Basic requirements		N/A
	Instructions when protection relies on building installation		N/A
2.7.2	Faults not simulated in 5.3.7		N/A
2.7.3	Short-circuit backup protection		N/A
2.7.4	Number and location of protective devices ..... :		N/A
2.7.5	Protection by several devices		N/A
2.7.6	Warning to service personnel ..... :		N/A
2.8	**Safety interlocks** *No such device within this equipment.*		N/A
2.8.1	General principles		N/A
2.8.2	Protection requirements		N/A
2.8.3	Inadvertent reactivation		N/A
2.8.4	Fail-safe operation		N/A
	Protection against extreme hazard		N/A
2.8.5	Moving parts		N/A
2.8.6	Overriding		N/A
2.8.7	Switches, relays and their related circuits		N/A
2.8.7.1	Separation distances for contact gaps and their related circuits (mm) .....:		N/A
2.8.7.2	Overload test		N/A
2.8.7.3	Endurance test		N/A
2.8.7.4	Electric strength test		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	b) Impedance limited output		N/A
	c) Regulating network limited output under normal operating and single fault condition		N/A
	d) Overcurrent protective device limited output		N/A
	Max. output voltage (V), max. output current (A), max. apparent power (VA) ..... :		—
	Current rating of overcurrent protective device (A) .:		—
	Use of integrated circuit (IC) current limiters		—
2.6	**Provisions for earthing and bonding** *Component type equipment. It should be considered in the end-use product.*		N/A
2.6.1	Protective earthing		N/A
2.6.2	Functional earthing		N/A
	Use of symbol for functional earthing .....:		N/A
2.6.3	Protective earthing and protective bonding conductors		N/A
2.6.3.1	General		N/A
2.6.3.2	Size of protective earthing conductors		N/A
	Rated current (A), cross-sectional area (mm^2), AWG ..... :		—
2.6.3.3	Size of protective bonding conductors		N/A
	Rated current (A), cross-sectional area (mm^2), AWG ..... :		—
	Protective current rating (A), cross-sectional area (mm^2), AWG ..... :		—
2.6.3.4	Resistance of earthing conductors and their terminations; resistance (Ω), voltage drop (V), test current (A), duration (min)..... :		N/A
2.6.3.5	Colour of insulation ..... :		N/A
2.6.4	Terminals		N/A
2.6.4.1	General		N/A
2.6.4.2	Protective earthing and bonding terminals		N/A
	Rated current (A), type, nominal thread diameter (mm) ..... :		—
2.6.4.3	Separation of the protective earthing conductor from protective bonding conductors		N/A
2.6.5	Integrity of protective earthing		N/A
2.6.5.1	Interconnection of equipment		N/A

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
2.2.3	Voltages under fault conditions (V) ..... :	Single fault did not cause excessive voltage in accessible SELV circuits. Limits of 71V peak and 120V DC were not exceed and SELV limits not for longer than 0.2 seconds.	P
2.2.4	Connection of SELV circuits to other circuits .....:	See 2.2.2 and 2.2.3. No direct connection between SELV and any primary circuits.	N/A
2.3	**TNV circuits**		N/A
2.3.1	Limits		N/A
	Type of TNV circuits ..... :		—
2.3.2	Separation from other circuits and from accessible parts		N/A
2.3.2.1	General requirements		N/A
2.3.2.2	Protection by basic insulation		N/A
2.3.2.3	Protection by earthing		N/A
2.3.2.4	Protection by other constructions ..... :		N/A
2.3.3	Separation from hazardous voltages		N/A
	Insulation employed ..... :		—
2.3.4	Connection of TNV circuits to other circuits		N/A
	Insulation employed ..... :		—
2.3.5	Test for operating voltages generated externally		N/A
2.4	**Limited current circuits**		N/A
2.4.1	General requirements		N/A
2.4.2	Limit values		N/A
	Frequency (Hz) ..... :		—
	Measured current (mA)..... :		—
	Measured voltage (V)..... :		—
	Measured circuit capacitance (nF or µF) ..... :		—
2.4.3	Connection of limited current circuits to other circuits		N/A
2.5	**Limited power sources** *Component type equipment. It should be considered in the end-use product.*		N/A
	a) Inherently limited output		N/A

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.12	Removable parts	No such consideration.	N/A
1.7.13	Replaceable batteries .....:	No battery provided.	N/A
	Language(s) .....:	Same as above.	—
1.7.14	Equipment for restricted access locations .....:	No restricted access location.	N/A
2	**PROTECTION FROM HAZARDS**		P
2.1	**Protection from electric shock and energy hazards**		N/A
2.1.1	Protection in operator access areas	Component type equipment. It should be considered in the end-use product.	N/A
2.1.1.1	Access to energized parts		N/A
	Test by inspection ..... :		N/A
	Test with test finger (Figure 2A) ..... :		N/A
	Test with test pin (Figure 2B) ..... :		N/A
	Test with test probe (Figure 2C) ..... :		N/A
2.1.1.2	Battery compartments		N/A
2.1.1.3	Access to ELV wiring		N/A
	Working voltage (Vpeak or Vrms); minimum distance through insulation (mm)		—
2.1.1.4	Access to hazardous voltage circuit wiring		N/A
2.1.1.5	Energy hazards ..... :		N/A
2.1.1.6	Manual controls		N/A
2.1.1.7	Discharge of capacitors in equipment		N/A
	Measured voltage (V); time-constant (s)..... :		—
2.1.1.8	Energy hazards – d.c. mains supply		N/A
	a) Capacitor connected to the d.c. mains supply .. :		N/A
	b) Internal battery connected to the d.c. mains supply ..... :		N/A
2.1.1.9	Audio amplifiers ..... :	No audio amplifier provided.	N/A
2.1.2	Protection in service access areas		N/A
2.1.3	Protection in restricted access locations		N/A
2.2	**SELV circuits**		P
2.2.1	General requirements	See below.	P
2.2.2	Voltages under normal conditions (V) ..... :	Between any SELV circuits 42.4V peak or 60VDC are not exceeded.	P

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.2.4	IT power distribution systems	Class III equipment.	N/A
1.7.2.5	Operator access with a tool		N/A
1.7.2.6	Ozone	No ozone produces within this equipment.	N/A
1.7.3	Short duty cycles	Equipment is designed for continuous operation.	N/A
1.7.4	Supply voltage adjustment ..... :	No voltage adjustment device provided.	N/A
	Methods and means of adjustment; reference to installation instructions ..... :	Same as above.	N/A
1.7.5	Power outlets on the equipment ..... :	No outlet provided.	N/A
1.7.6	Fuse identification (marking, special fusing characteristics, cross-reference) ..... :		N/A
1.7.7	Wiring terminals	See below.	N/A
1.7.7.1	Protective earthing and bonding terminals ..... :	Class III equipment.	N/A
1.7.7.2	Terminals for a.c. mains supply conductors	Class III equipment.	N/A
1.7.7.3	Terminals for d.c. mains supply conductors	Class III equipment.	N/A
1.7.8	Controls and indicators	See below.	P
1.7.8.1	Identification, location and marking ..... :	The marking and indication is located that indication of function clearly.	P
1.7.8.2	Colours ..... :	No safety relevant controls or indicators.	N/A
1.7.8.3	Symbols according to IEC 60417.....:	Same as above.	N/A
1.7.8.4	Markings using figures .....:	No indicators for different positions.	N/A
1.7.9	Isolation of multiple power sources .....:	No direct connection to AC mains supply.	N/A
1.7.10	Thermostats and other regulating devices .....:	No thermostats and similar regulating devices intended to be adjusted during installation or in normal use.	N/A
1.7.11	Durability	The label was subjected to the permanence of marking test. The label was rubbed with cloth soaked with water for 15 s and then again for 15 s with the cloth soaked with petroleum spirit. After this test there was no damage to the label. The marking on the label did not fade. There was neither curling nor lifting of the label edge.	P

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6.1	AC power distribution systems	Equipment is not directly connected to the AC mains supply.	N/A
1.6.2	Input current	Component type equipment. It should be considered in the end-use product.	N/A
1.6.3	Voltage limit of hand-held equipment	Component type equipment. It should be considered in the end-use product.	N/A
1.6.4	Neutral conductor	Class III equipment.	N/A
1.7	**Marking and instructions**		P
1.7.1	Power rating and identification markings	See below.	P
1.7.1.1	Power rating marking	Class III equipment. Not directly connected to the mains supply.	N/A
	Multiple mains supply connections.....:		N/A
	Rated voltage(s) or voltage range(s) (V) ..... :		N/A
	Symbol for nature of supply, for d.c. only..... :		N/A
	Rated frequency or rated frequency range (Hz) ... :		N/A
	Rated current (mA or A) ..... :		N/A
1.7.1.2	Identification markings	See below.	P
	Manufacturer's name or trade-mark or identification mark ..... :	Arcadyan	P
	Model identification or type reference ..... :	AIOS4.0S, AIOS4.0V, AIOS4.0R, AIOS4.0F	P
	Symbol for Class II equipment only ..... :	Class III equipment.	N/A
	Other markings and symbols ..... :		N/A
1.7.1.3	Use of graphical symbols		N/A
1.7.2	Safety instructions and marking	See below.	P
1.7.2.1	General	The user's manual contains information for operation, installation, servicing, transport, storage and technical data. The operation guide is provided to the user.	P
1.7.2.2	Disconnect devices	This equipment is not permanently connected equipment or pluggable equipment.	N/A
1.7.2.3	Overcurrent protective device	This equipment is not permanently connected equipment or pluggable equipment B.	N/A

IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1	**GENERAL**		P
1.5	**Components**		P
1.5.1	General	See below.	P
	Comply with IEC 60950-1 or relevant component standard	Components which were found to affect safety aspects comply with the requirements of this standard or with the safety aspects of the relevant IEC/EN component standards. See appended table 1.5.1.	P
1.5.2	Evaluation and testing of components	Components that are certified to IEC and /or national standards are used correctly within their ratings. Components not covered by IEC standards are tested under the conditions present in the equipment.	P
1.5.3	Thermal controls	No thermal control.	N/A
1.5.4	Transformers	No safety transformer provided.	N/A
1.5.5	Interconnecting cables		N/A
1.5.6	Capacitors bridging insulation		N/A
1.5.7	Resistors bridging insulation		N/A
1.5.7.1	Resistors bridging functional, basic or supplementary insulation		N/A
1.5.7.2	Resistors bridging double or reinforced insulation between a.c. mains and other circuits		N/A
1.5.7.3	Resistors bridging double or reinforced insulation between a.c. mains and antenna or coaxial cable		N/A
1.5.8	Components in equipment for IT power systems	Class III equipment.	N/A
1.5.9	Surge suppressors		N/A
1.5.9.1	General		N/A
1.5.9.2	Protection of VDRs		N/A
1.5.9.3	Bridging of functional insulation by a VDR		N/A
1.5.9.4	Bridging of basic insulation by a VDR		N/A
1.5.9.5	Bridging of supplementary, double or reinforced insulation by a VDR		N/A
1.6	**Power interface**		N/A

General remarks:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

Throughout this report a comma or point is used as the decimal separator.

Name and address of factory (ies) ..... : Same as Applicant

General product information:

This equipment, models AIOS4.0S, AIOS4.0V, AIOS4.0R, AIOS4.0F, is a Networking Device which is intended to use within information technology equipment.

This product is considered as component type equipment without enclosure; additional evaluation should be considered in the end-use product.

Models AIOS4.0S, AIOS4.0V, AIOS4.0R, AIOS4.0F are identical except for minor change in SELV circuits without impact in safety.

Other comments:

The product was submitted and tested for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 70°C.

This report has been to reissue, due to following reasons:
1. Change Applicant, Manufacturer and Factory from D&M Holdings to Arcadyan Technology Corporation.

For the above described changes, the following was considered to be necessary:

Modification	Testing	Comments
1	N/A	No any further test is necessary. Based on previously conducted testing, no additional test was deemed necessary in this reissue report.

History of modifications:

Item	Test Report No. / Issue date	Remark
1	T0251507192A/August 28, 2015	Original report

Abbreviations used in the report:

- normal conditions	N.C.	- single fault conditions	S.F.C
- functional insulation	OP	- basic insulation	BI
- double insulation	DI	- supplementary insulation	SI
- between parts of opposite polarity	BOP	- reinforced insulation	RI

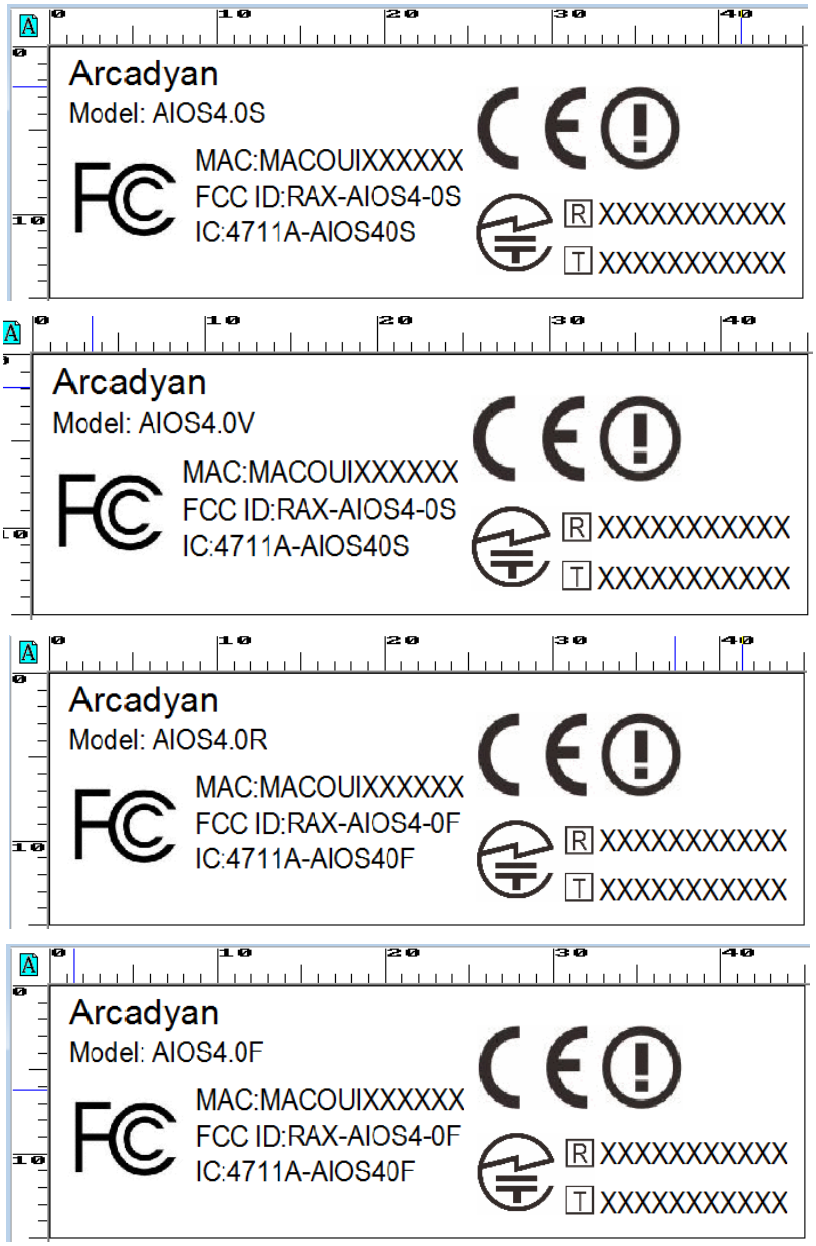
Indicate used abbreviations (if any)

Test item particulars.....:	
Equipment mobility.....:	[] movable [] hand-held [] transportable [] stationary [X] for building-in [] direct plug-in
Connection to the mains .....:	[] pluggable equipment [] type A [] type B [] permanent connection [] detachable power supply cord [] non-detachable power supply cord [X] not directly connected to the mains
Operating condition.....:	[X] continuous [] rated operating / resting time:
Access location .....:	[X] operator accessible [] restricted access location
Over voltage category (OVC) .....:	[] OVC I [] OVC II [] OVC III [] OVC IV [X] other: N/A
Mains supply tolerance (%) or absolute mains supply values .....:	No direct mains connection
Tested for IT power systems .....:	[] Yes [X] No
IT testing, phase-phase voltage (V) .....:	N/A
Class of equipment .....:	[] Class I [] Class II [X] Class III [] Not classified
Considered current rating of protective device as part of the building installlation (A) .....:	N/A
Pollution degree (PD) .....:	[] PD 1 [X] PD 2 [] PD 3
IP protection class .....:	IPX0
Altitude during operation (m) .....:	≤ 2000 m
Altitude of test laboratory (m) .....:	≤ 2000 m
Mass of equipment (kg) .....:	Approx. 0.1 kg
Possible test case verdicts:	
- test case does not apply to the test object .....:	N/A (or N)
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing:	
Date of receipt of test item .....:	July 31, 2015
Date(s) of performance of tests.....:	July 31, 2015 to August 10, 2015

Copy of marking plate

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

(Representative)



TEST REPORT

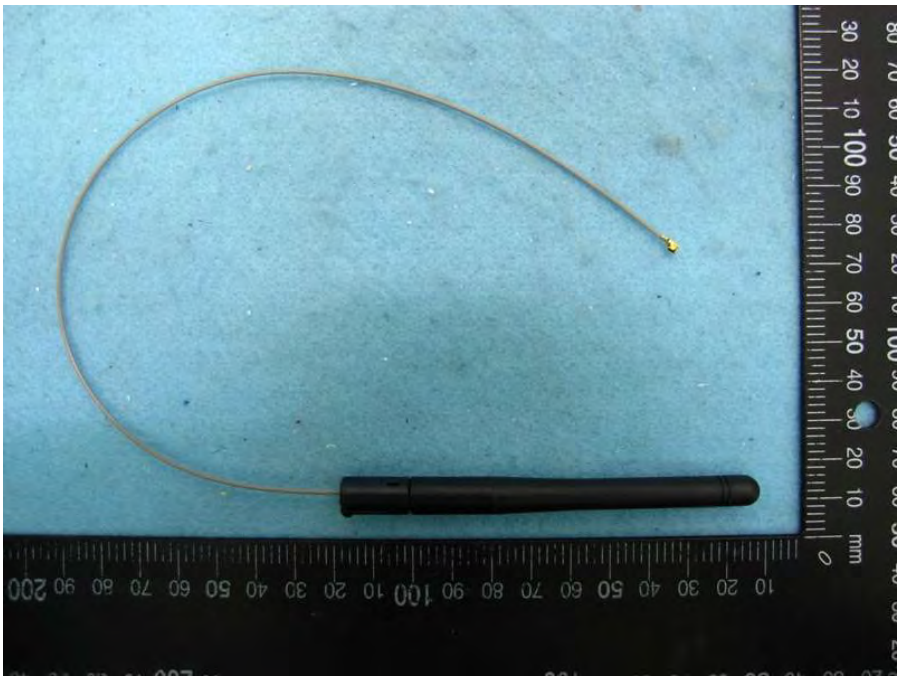
IEC 60950-1: 2005 and/or EN 60950-1:2006
Information technology equipment – Safety –
Part 1: General requirements

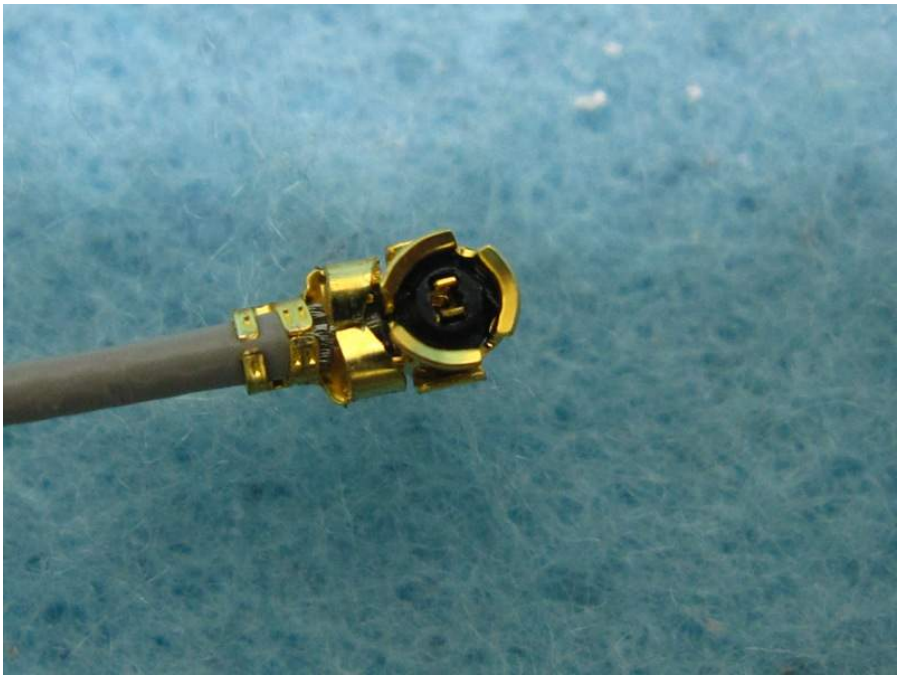
Report Number. ..... :	T0251702105A
Tested by (printed name and signature) ..... :	Jackie Lin .....
Approved by (printed name and signature) ..... :	Sprewell Chien .....
Date of issue ..... :	February 23, 2017
Testing Laboratory..... :	Perfectlink International Corp.
Address ..... :	4F., No. 16-1, Sec. 2, Zhongyang S. Rd., Beitou Dist., Taipei City 112, Taiwan
Applicant's name..... :	Arcadyan Technology Corporation
Address ..... :	No.8, Sec.2, Guangfu Rd.,Hsinchu City 30071, Taiwan, R.O.C.
Test specification:	
Standard..... :	IEC 60950-1:2005 + A1:2009 + A2:2013 and/or EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013
Test procedure ..... :	Service of CE Marking in LVD
Non-standard test method……..:	N/A
Test item description .....:	HEOS 4.X Platform Module
Trade Mark .....:	Arcadyan
Manufacturer.....:	Same as Applicant
Model/Type reference.....:	AIOS4.0S, AIOS4.0V, AIOS4.0R, AIOS4.0F
Ratings.....:	Input: DC 5V / 3A

Set 11 antenna

Model No.:

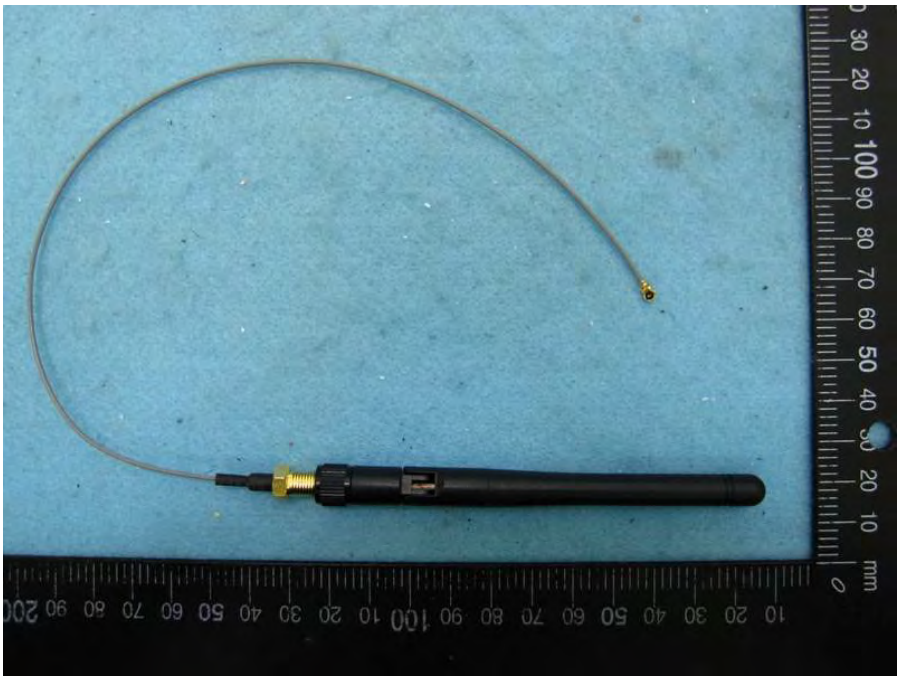
WN9722A-DM-300mm

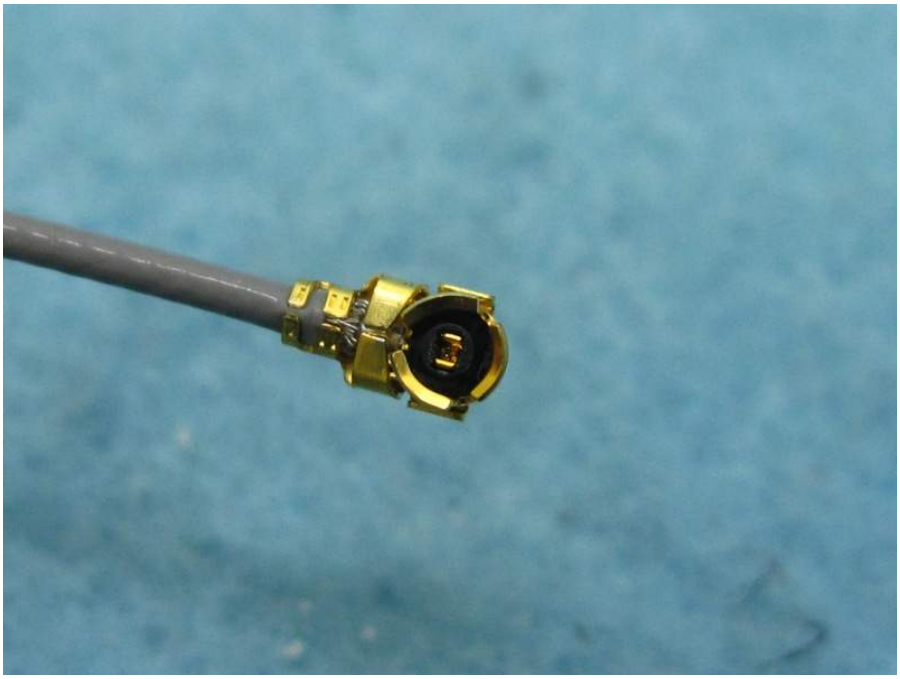


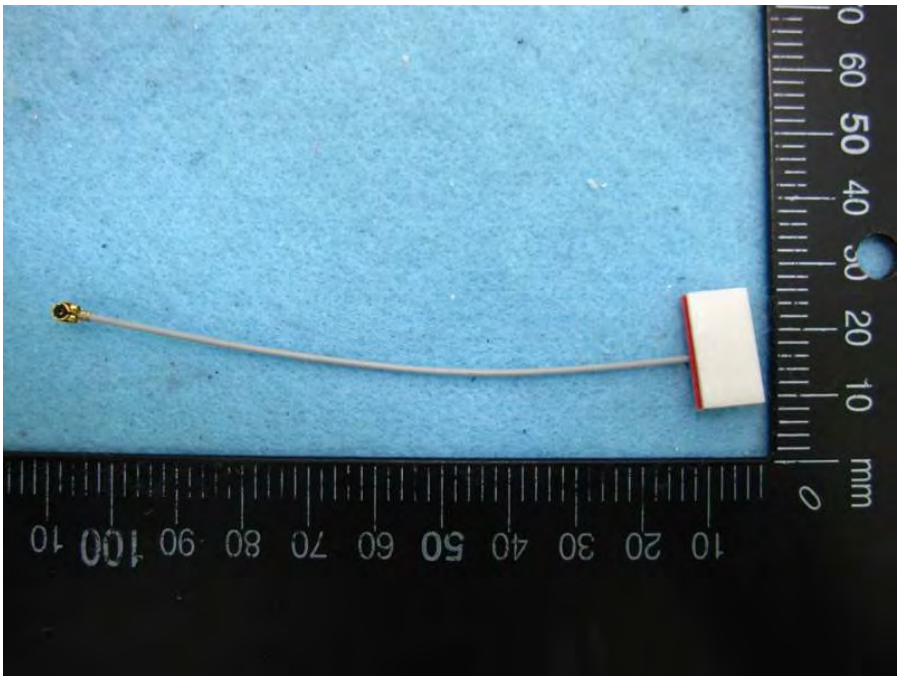


Set 10 antenna

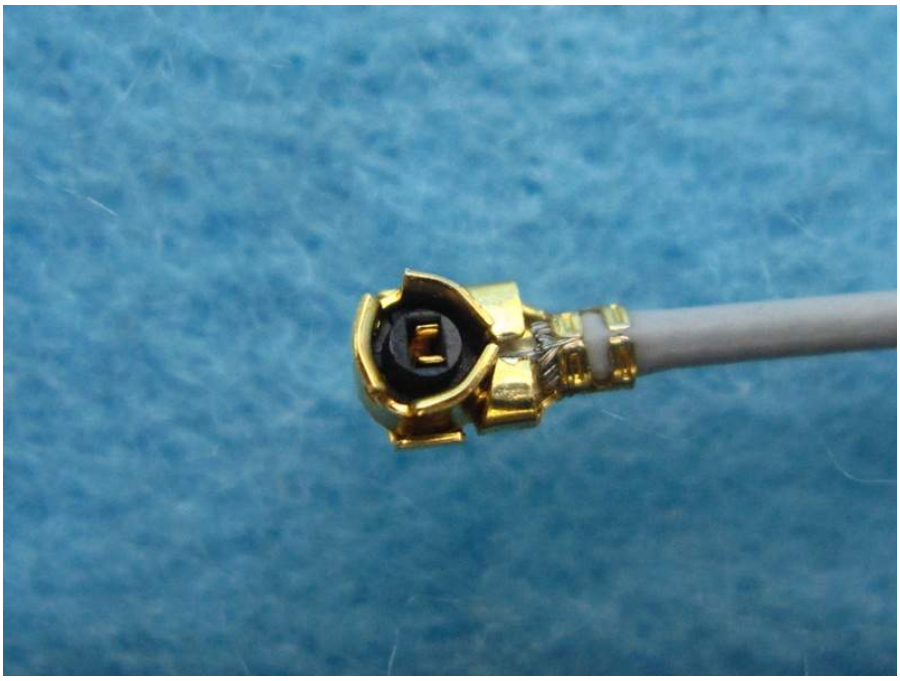
Model No.: WN9722A-DM







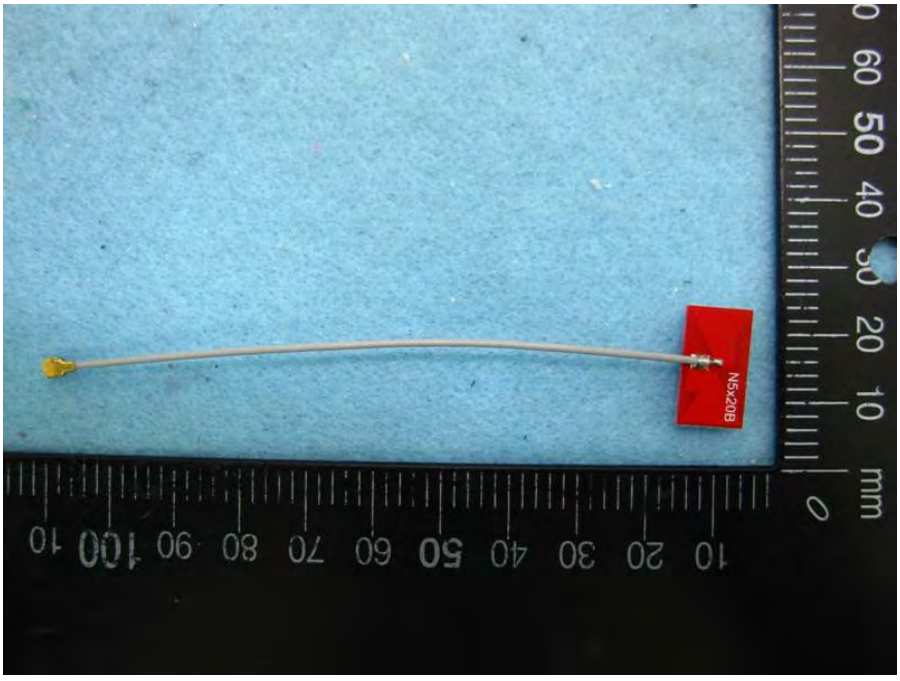
SPORTON International Inc.
TEL : 886-3-327-3456
FAX : 886-3-327-0973



Set 8 antenna

P/N:

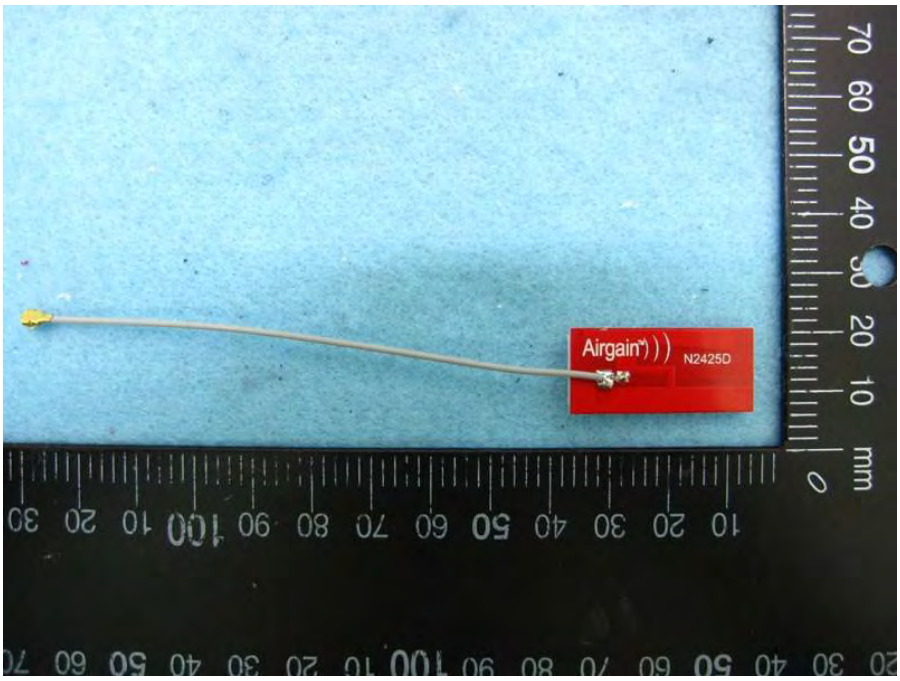
N5X20B-T2L-PK1-G100U

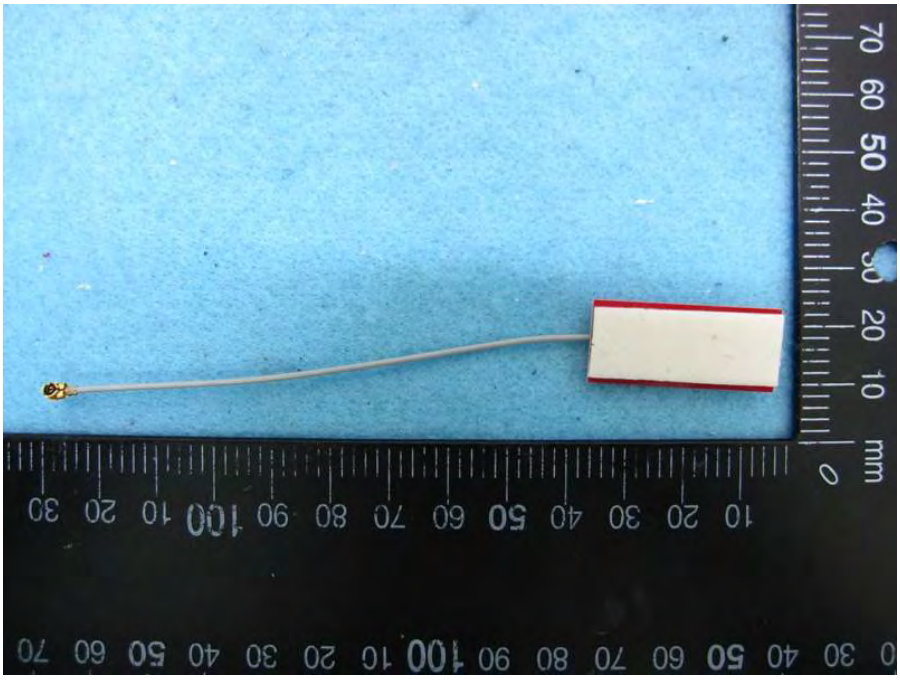


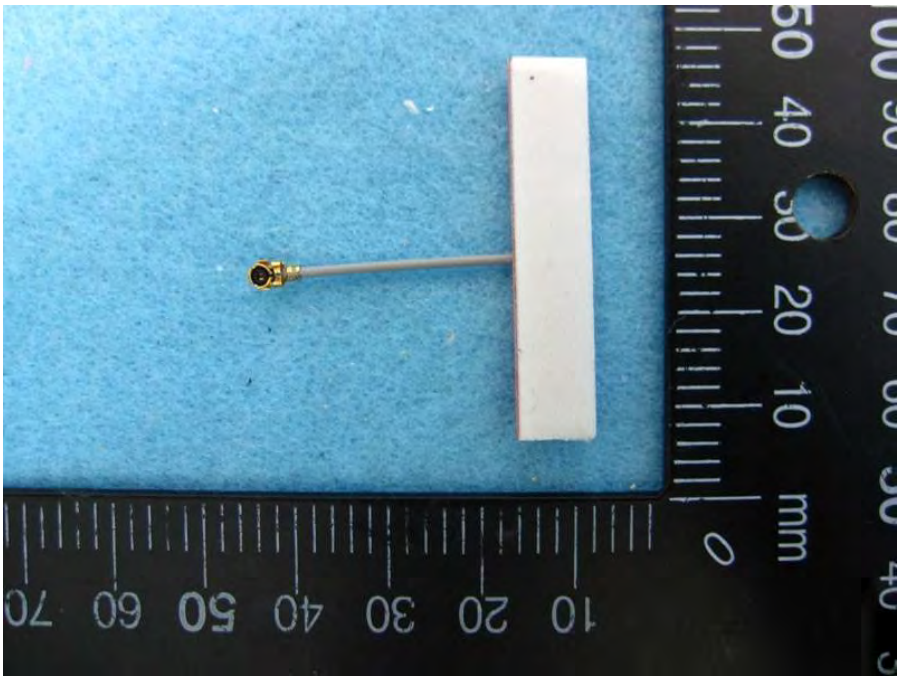
Set 5 antenna

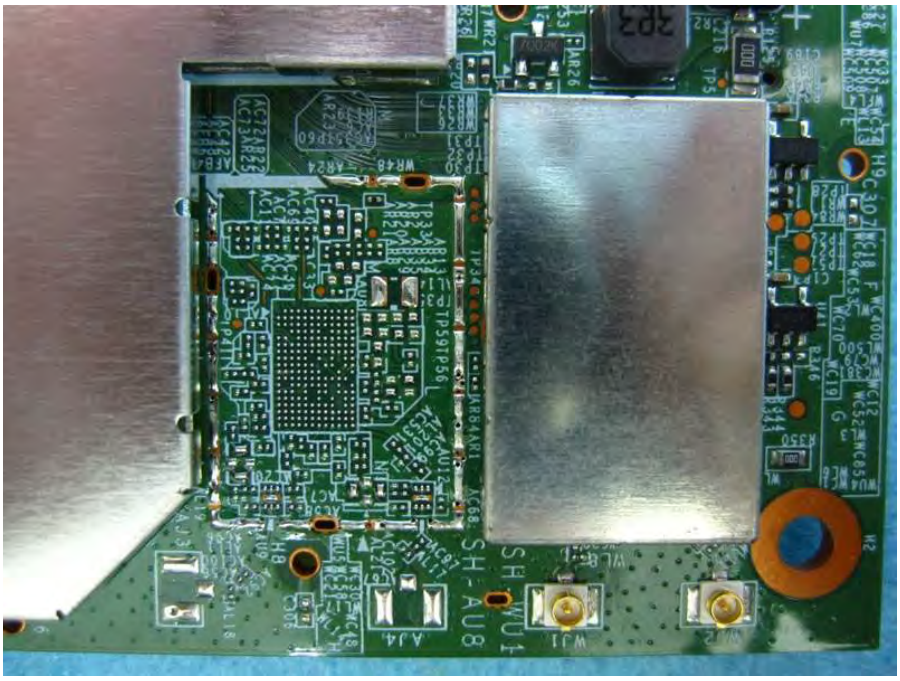
P/N:

N2425D-T2R-PK1-G150U





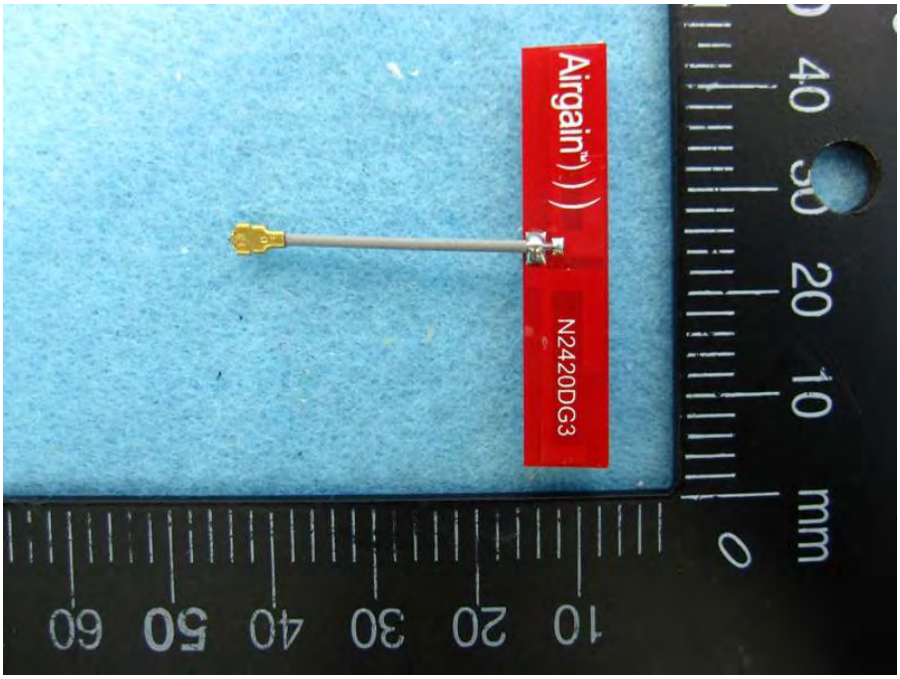

mm

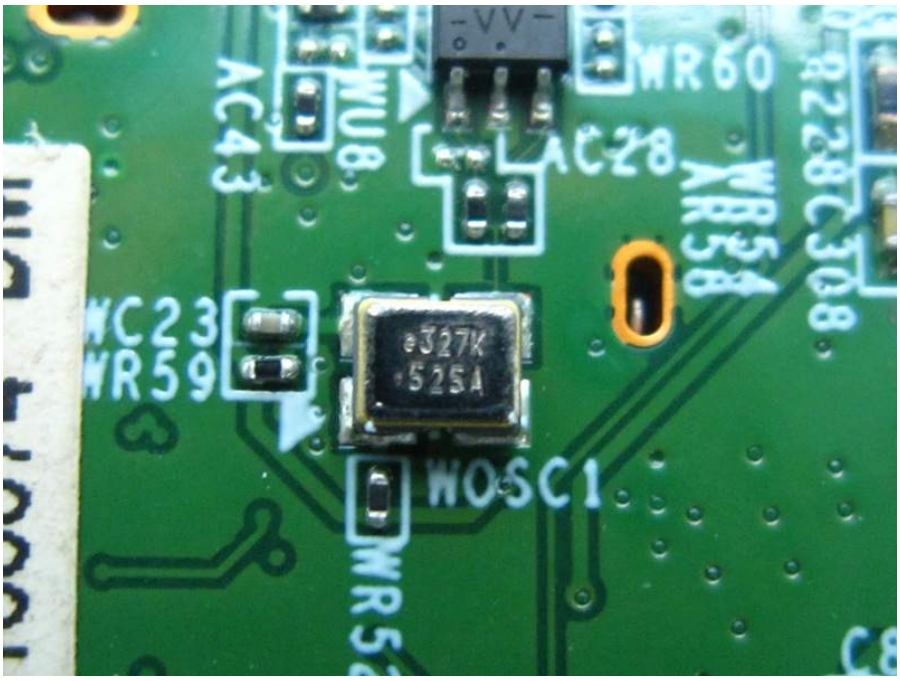


Set 1 antenna

P/N:

N2420DG3-T2L-PK1-G30U

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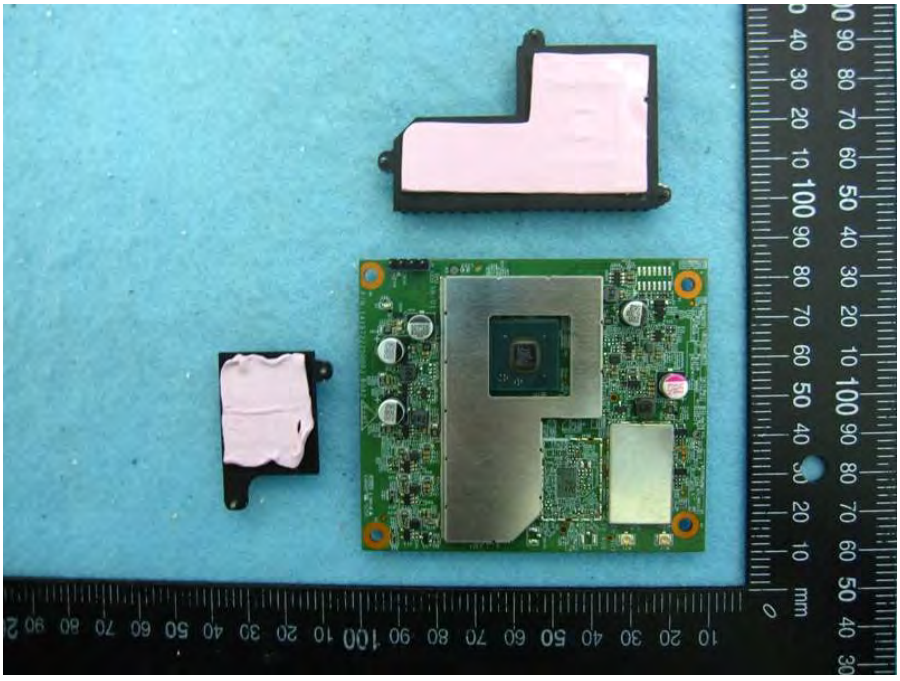
WR54
WR58
AC43
WU8
WC23
WR59
e327K
525A
WOSC1
WR52

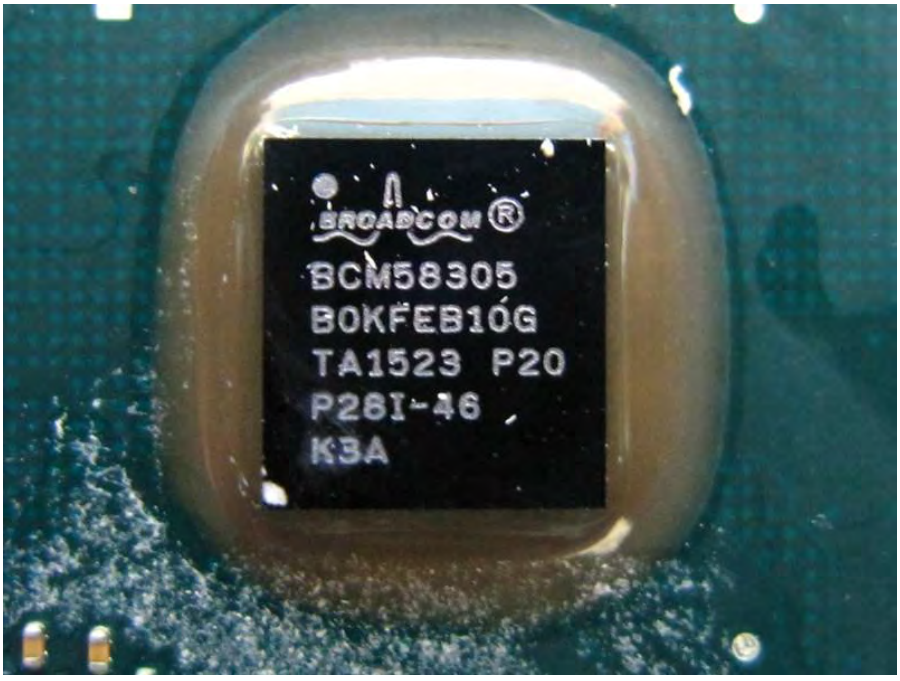
Radio: R0

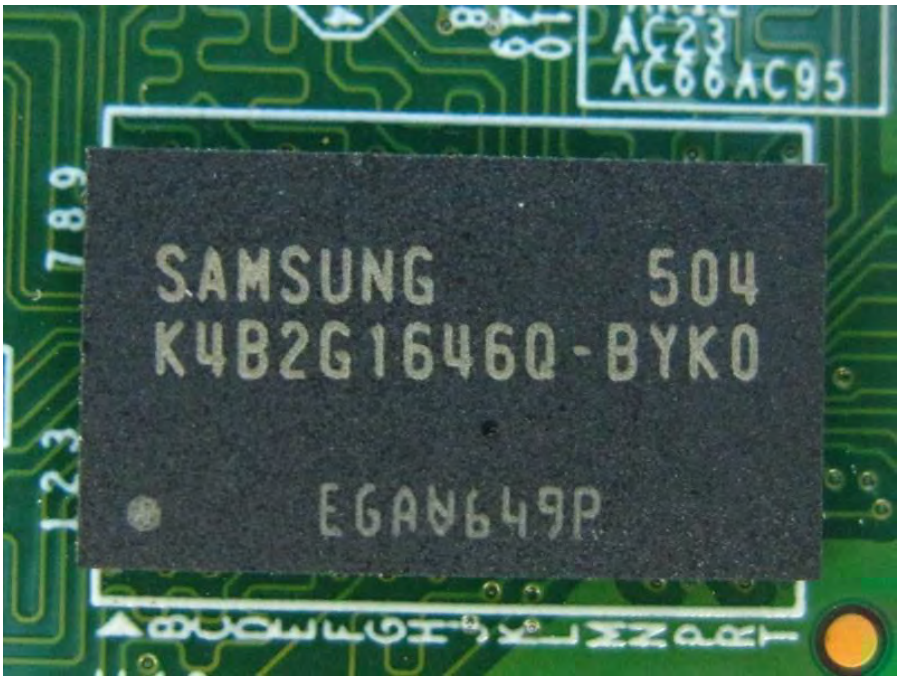


WN9722A-DM
U6 MAIN
V01.01 5669

CPU: 1.25G

CPU: 1G

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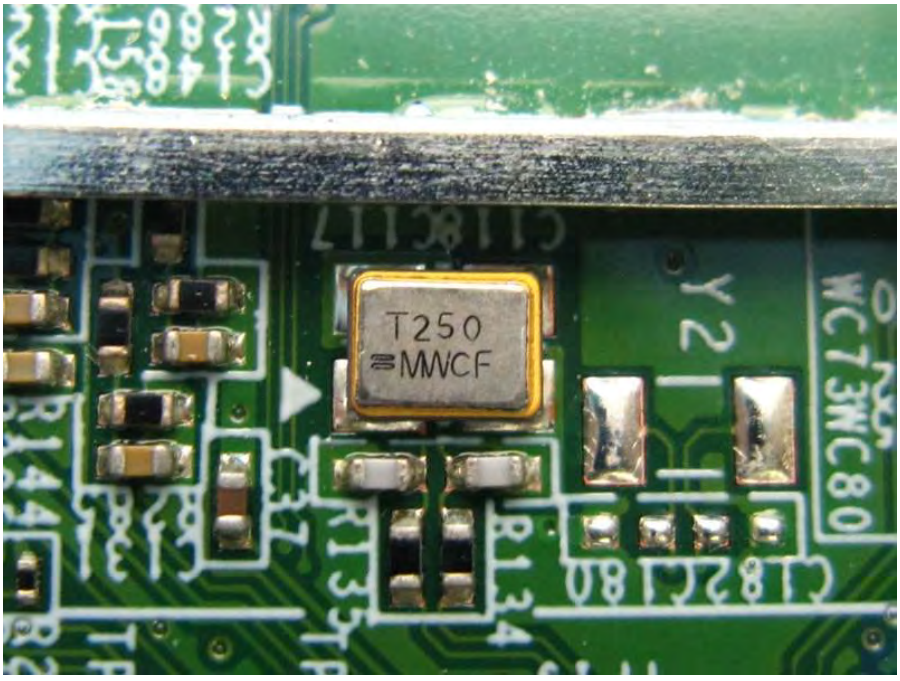
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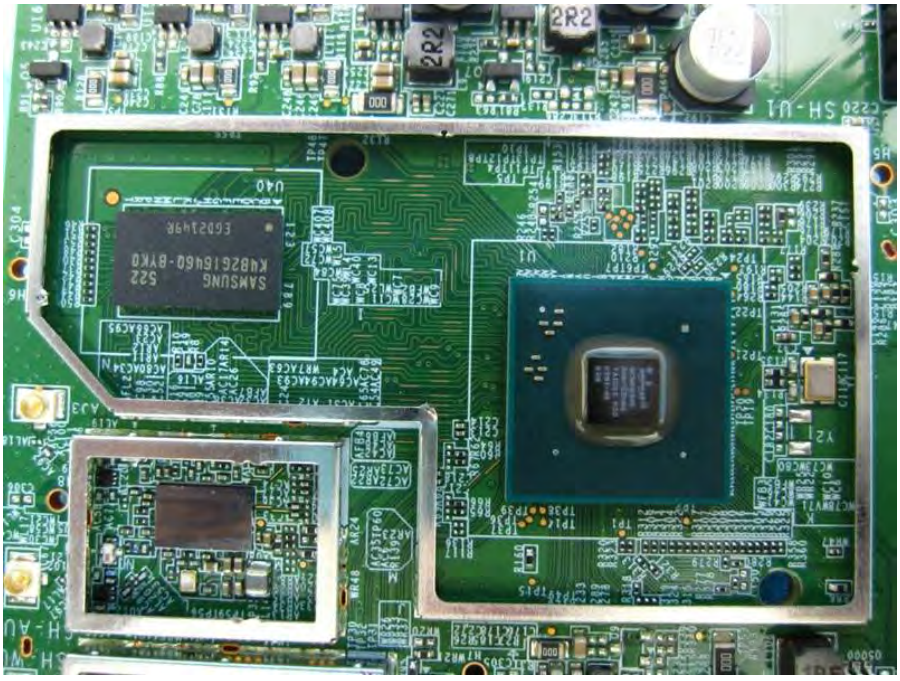
Y2
WC73WC80

BROADCOM
BCM4335EKKUBG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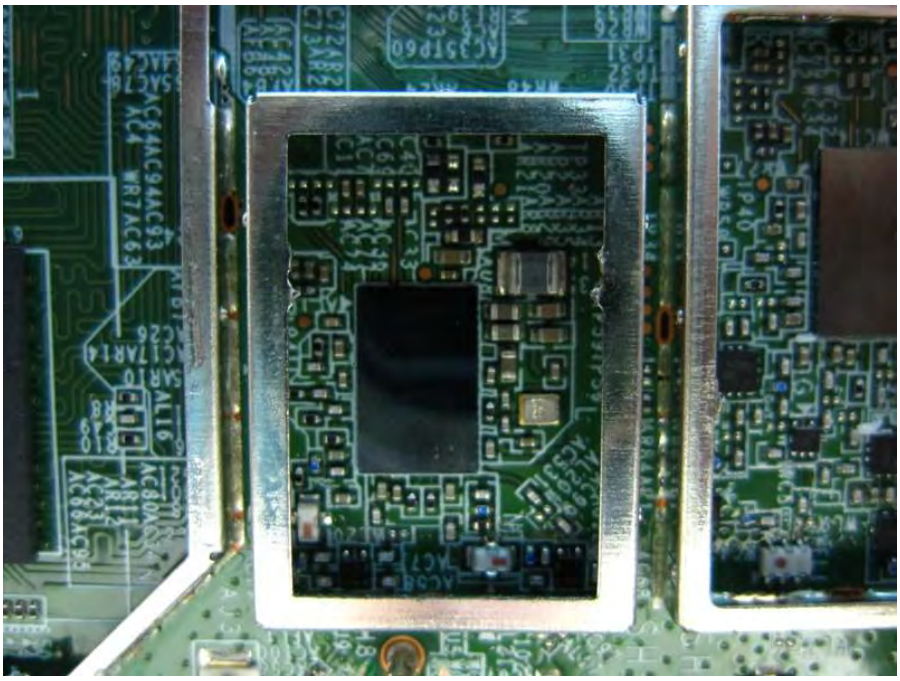
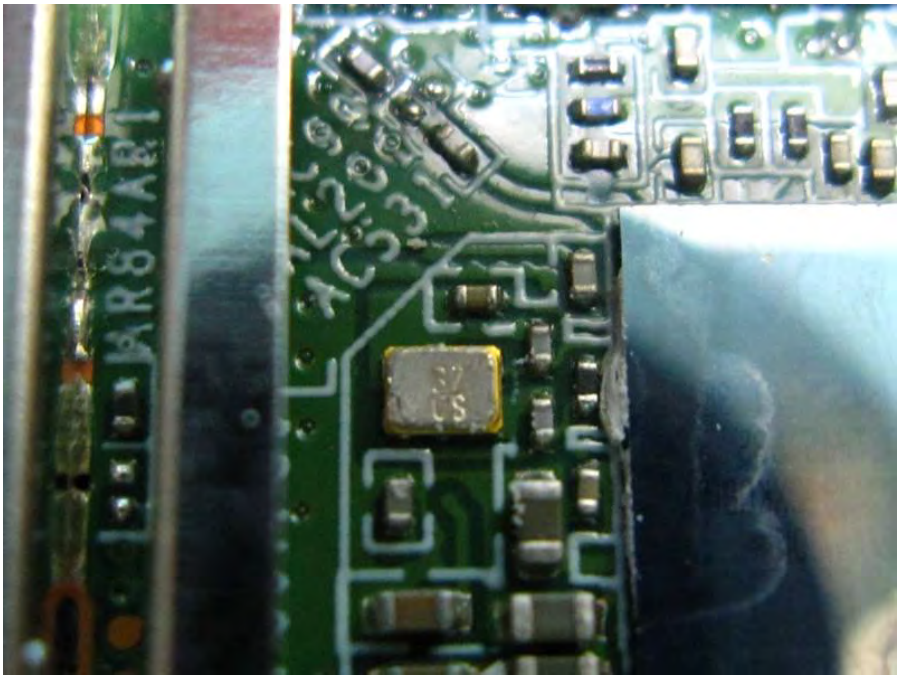
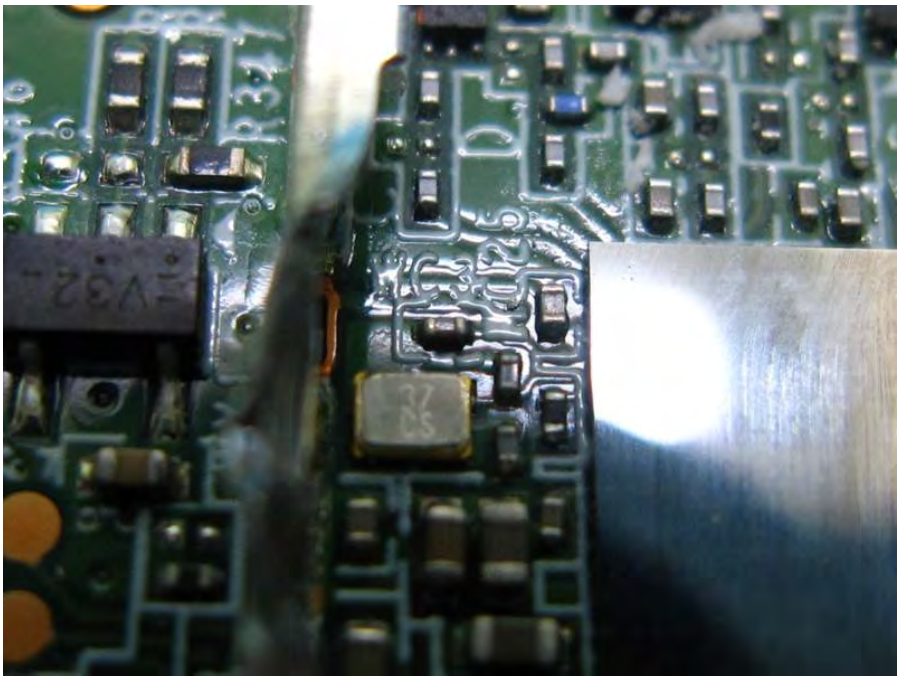
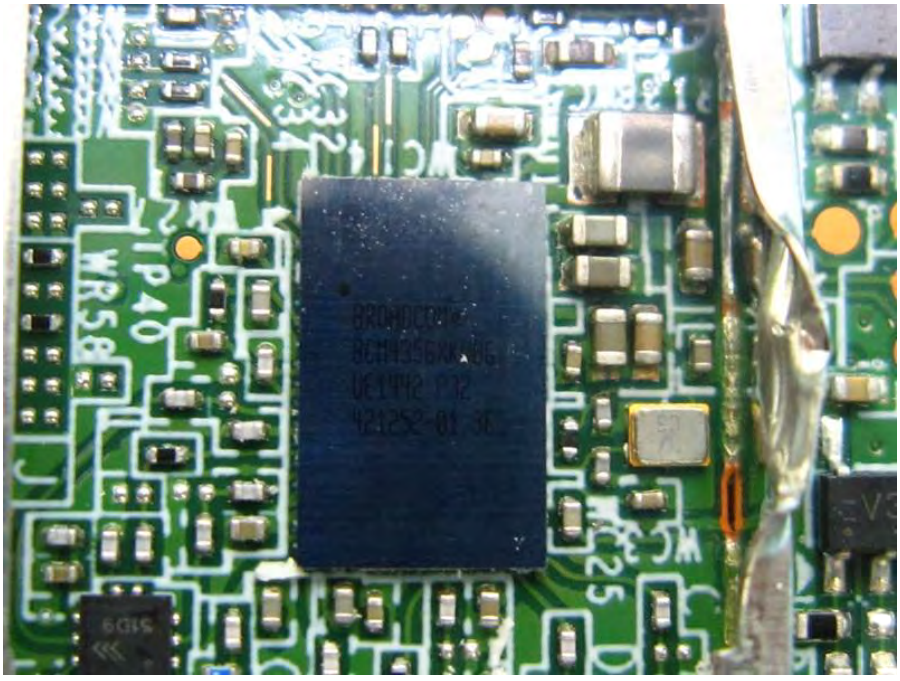
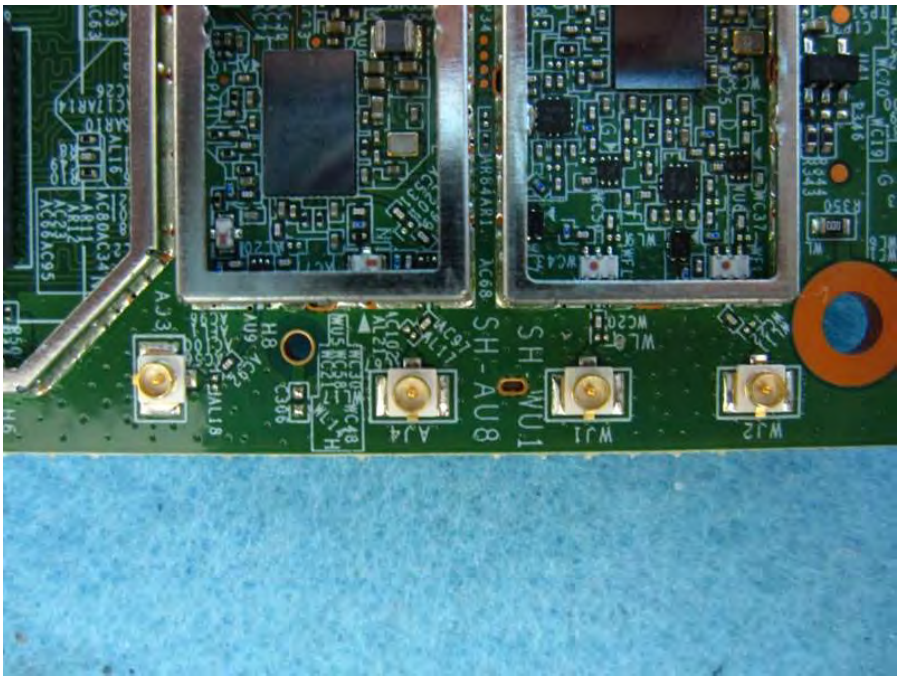
2R2

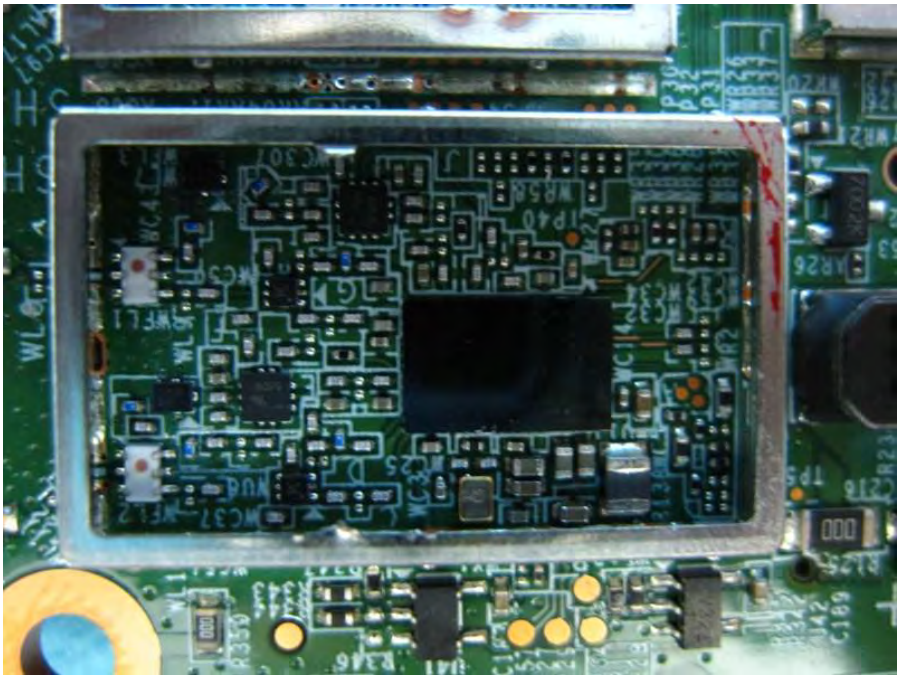


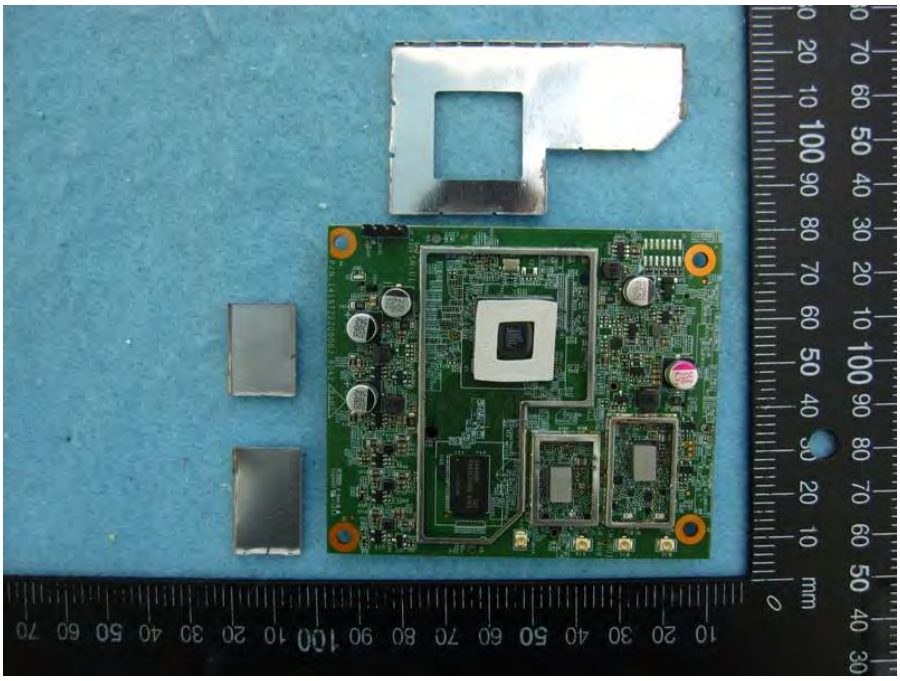


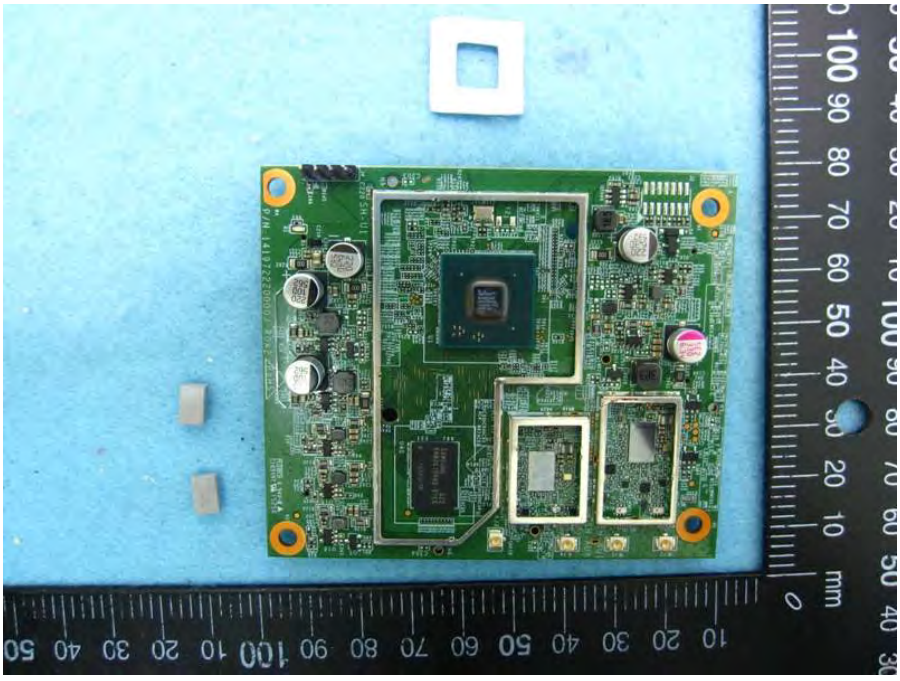


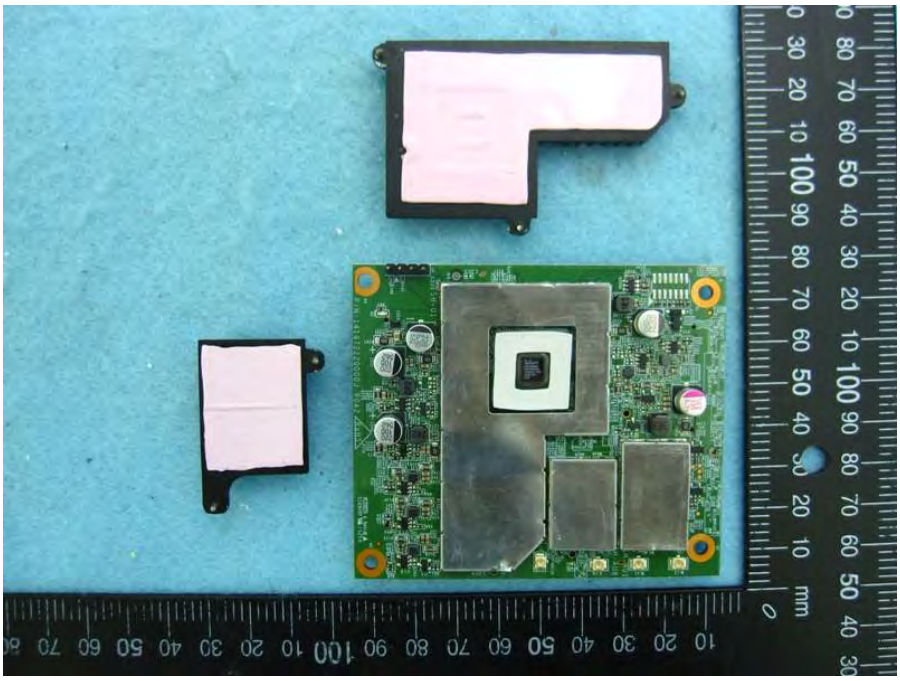


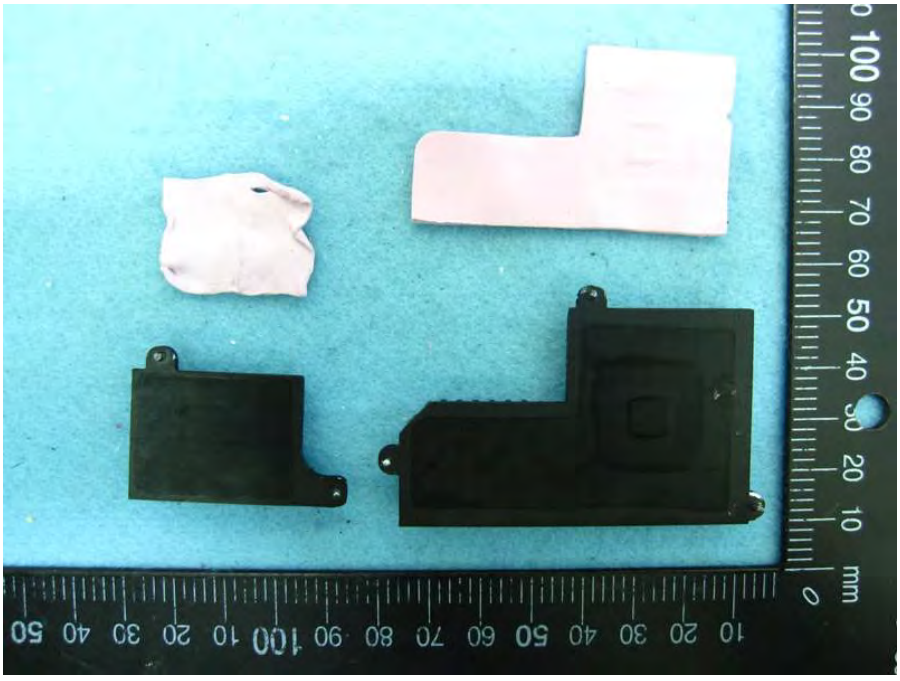




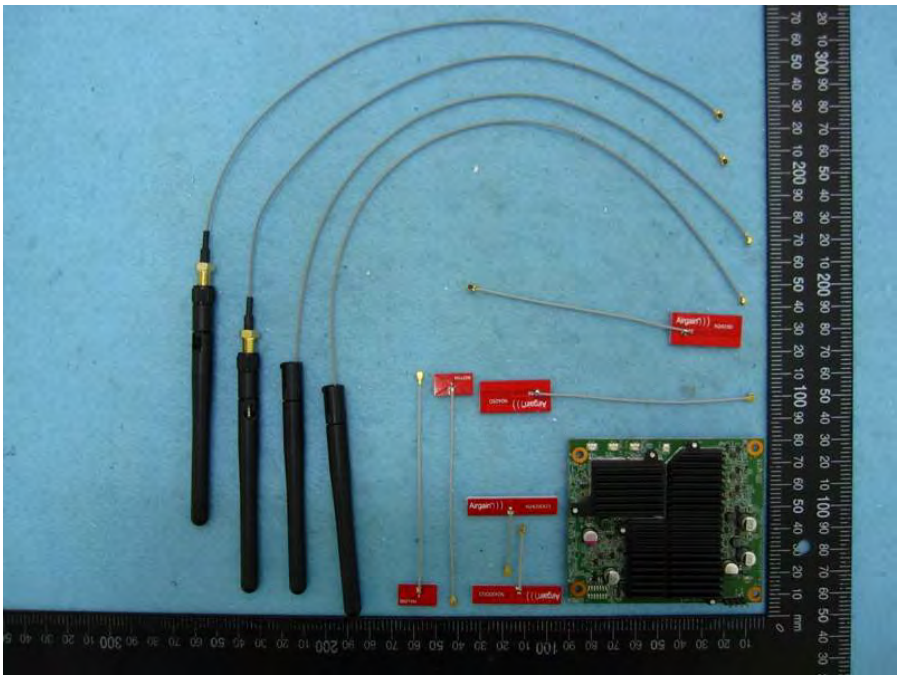




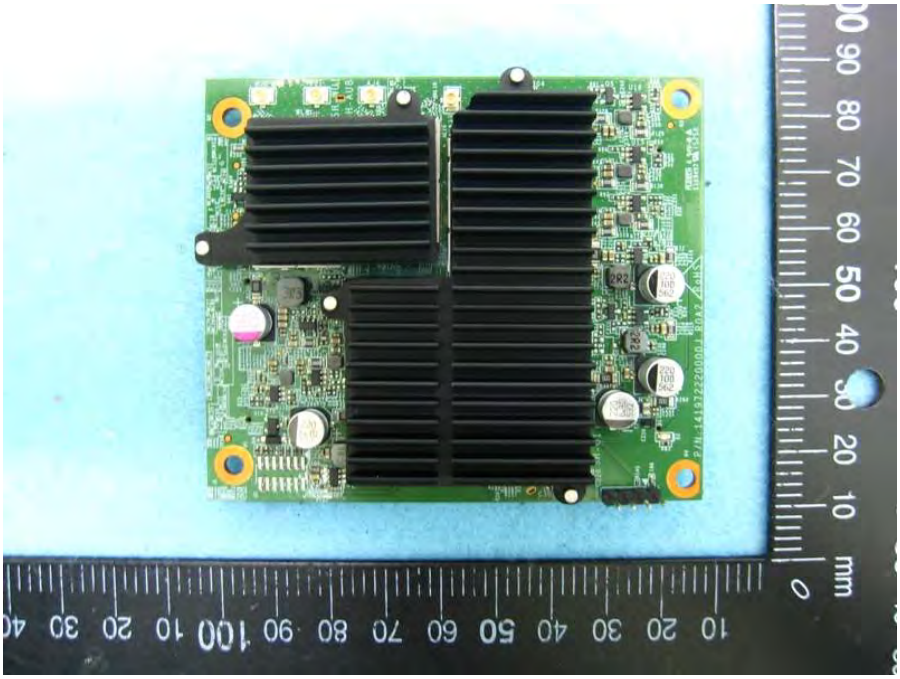




APPENDIX A. Photographs of EUT



Radio: R0 + R1



2.3 EUT Exclusion Level P_{max}

Evaluation Mode	EIRP Power (dBm)	EIRP Power (mW)	Exclusion Level P_{max} (mW)
Bluetooth	7.80	6.0256	20
Result		**Complied**	

Note: For more detailed e.i.r.p. power measurement description, please refer to ER581110-16AB, ER581110-16AC radio test report.

2 Low-power Exclusion Level P_{max}

2.1 Low-power exclusion level P_{max} based on considerations of SAR

Guideline / Standard	SAR limit, SAR_{max} W/kg	Averaging mass, *m* g	P_{max} mW	Exposure tier	Region of body
ICNIRP [1]	2	10	20	General public	Head and trunk
	4	10	40	General public	Limbs
	10	10	100	Occupational	Head and trunk
	20	10	200	Occupational	Limbs
IEEE Std C95.1-1999 [2]	1,6	1	1,6	Uncontrolled environment	Head, trunk, arms, legs
	4	10	40	Uncontrolled environment	Hands, wrists, feet and ankles
	8	1	8	Controlled environment	Head, trunk, arms, legs
	20	10	200	Controlled environment	Hands, wrists, feet and ankles
IEEE Std C95.1-2005 [3]	2	10	20	Action level	Body except extremities and pinnae
	4	10	40	Action level	Extremities and pinnae
	10	10	100	Controlled environment	Body except extremities and pinnae
	20	10	200	Controlled environment	Extremities and pinnae
Note1: Consult the appropriate standard for more information and definitions of terms.					

2.2 P_{max} based on considerations of power density

When power density is the basic restriction, a conservative minimum value for P_{max} can be derived, equal to the power density limit (S) multiplied by the averaging area (a):
P_{max} = S a (A.2)
For example, ICNIRP guidelines [1] provide power density limits of 10 W/m^2 and 50 W/m^2 over the 10 GHz to 300 GHz frequency range for general public and occupational exposures, respectively. The averaging area specified by [1] is 20 cm^2 for both cases. Therefore, Equation (A.2) yields conservative values for P_{max} of 20 mW and 100 mW for general public and occupational exposures, respectively. Other exposure guidelines or standards may be applicable depending on national regulations.

1.4 Basic Restrictions

Restrictions on exposure to time-varying electric, magnetic, and electromagnetic fields which are based directly on established health effects and biological considerations are termed “basic restrictions”. Depending upon the frequency of the field, the physical quantities used to specify these restrictions are specific absorption rate (SAR), and power density.

1.5 Reference Levels

Levels of field strength and currents that can be compared with corresponding measured or calculated values. The reference levels are derived from the basic restrictions using worst-case assumptions about exposure. If the reference levels are met, then the basic restrictions will be complied with, but if the reference levels are exceeded, it does not necessarily mean that the basic restrictions will not be met.

1 General Description

1.1 EUT General Information

RF General Information			
Evaluation Mode	**Frequency Range (MHz)**	**Operating Frequency (MHz)**	**Modulation Type**
Bluetooth	2400-2483.5	2402-2480	BR / EDR: FHSS (GFSK / π/4-DQPSK / 8DPSK) LE: DSSS (GFSK)

1.2 Table for Multiple Listing

The EUT has four model numbers which are identical to each other in all aspects except for the following table:

Model No.	Description
AIOS4.0S	All the models are identical, the difference model for difference model number as marketing strategy.
AIOS4.0V	
AIOS4.0R	
AIOS4.0F	

From the above models, model: AIOS4.0S was selected as representative model for the test and its data was recorded in this report.

1.3 Table for Radio

For Radio: R0+R1

The EUT has two radios, the information as following table:

Radio	Operate Mode	Function	CPU	Antenna
R0	Slave without radar detection (STA mode)	Bluetooth / 2.4GHz WLAN / 5GHz WLAN band 1~3	1G / 1.25G	Set 1~7, 10~12
R1	Master (AP mode)	5GHz WLAN band 1	1G / 1.25G	Set 8~12
Note: CPU 1.25G covers CPU 1G, due to it is the highest CPU speed.				

For Radio: R0 only

The EUT has one radio, the information as following table:

Radio	Operate Mode	Function	CPU	Antenna
R0	Slave without radar detection (STA mode)	Bluetooth / 2.4GHz WLAN / 5GHz WLAN band 1~3	1G / 1.25G	Set 1~7, 10~12
Note: CPU 1.25G covers CPU 1G, due to it is the highest CPU speed.				

Note: There are two types of EUT, one is Radio: R0+R1 and the other is Radio: R0 only. Only the most complex mode for Radio: R0+R1 was performed for all the tests and recorded in this report.

Revision History

Report No.	Version	Description	Issued Date
EA581110-16AB	Rev. 01	Initial issue of report	May 09, 2017

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2.1 Low-power exclusion level P_{max} based on considerations of SAR 6
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APPENDIX A. PHOTOGRAPHS OF EUT ..... A1 ~ A18

CE EMF Test Report

Equipment	:	HEOS 4.X Platform Module
Brand Name	:	Arcadyan
Model No.	:	AIOS4.0S, AIOS4.0V, AIOS4.0R, AIOS4.0F
Standard	:	EN 62479:2010
Applicant	:	Arcadyan Technology Corporation No.8, Sec.2, Guangfu Rd., Hsinchu, 30071 Taiwan
Manufacturer	:	Arcadyan Technology Corporation No.8, Sec.2, Guangfu Rd., Hsinchu, 30071 Taiwan

The product sample received on Jul. 22, 2015 and completely tested on Apr. 06, 2017. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in EN 62479:2010 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

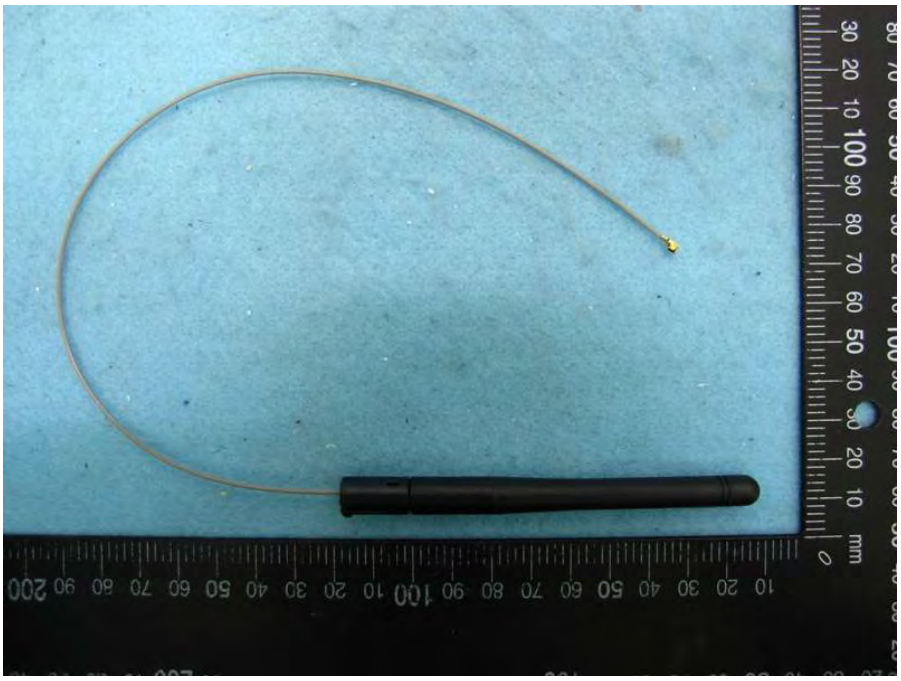
Cliff Chang
SPORTON INTERNATIONAL INC.

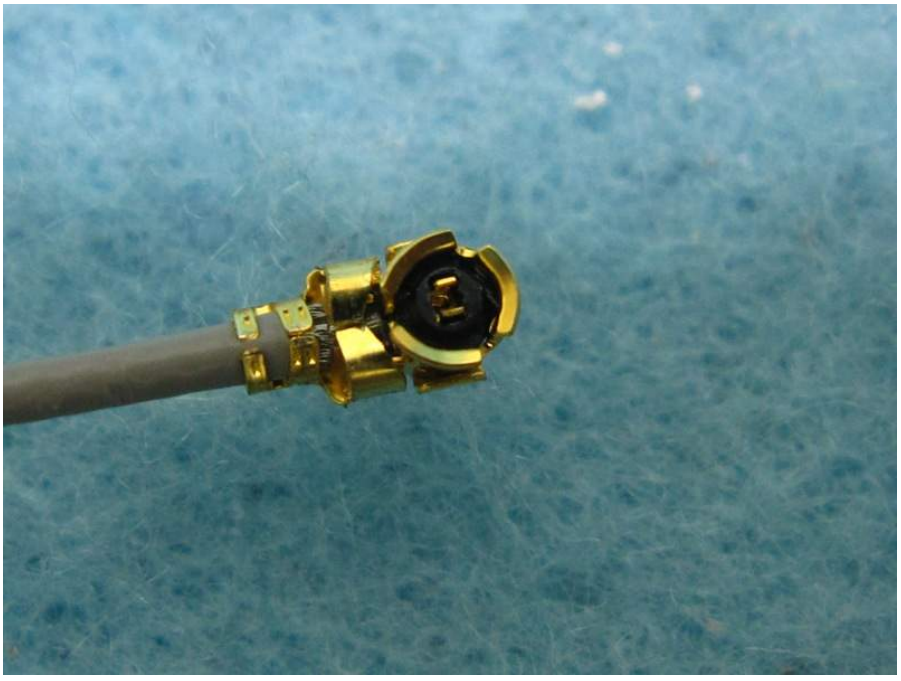
Testing Laboratory
1190

Set 11 antenna

Model No.:

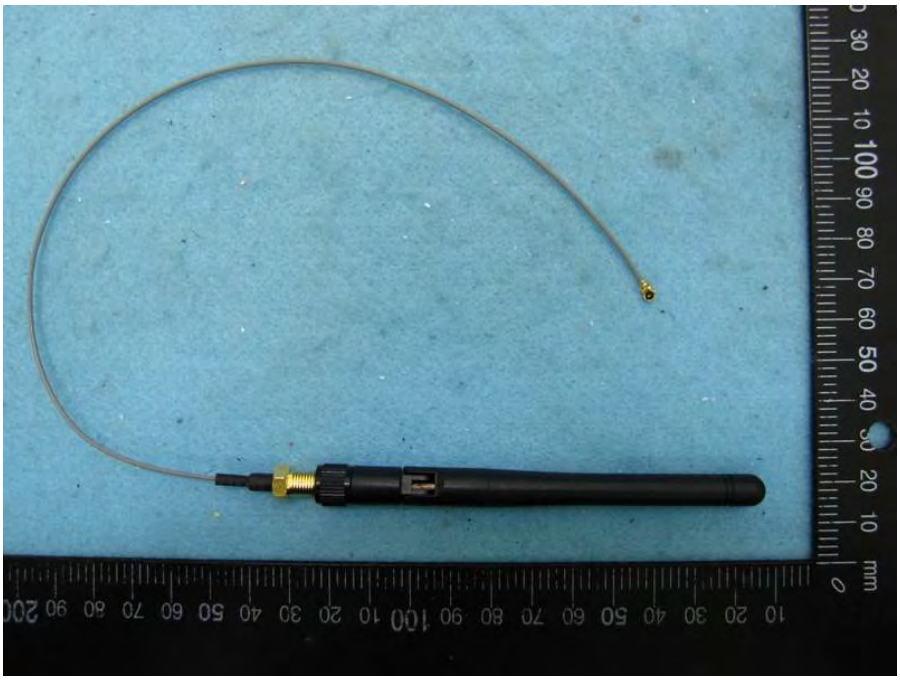
WN9722A-DM-300mm

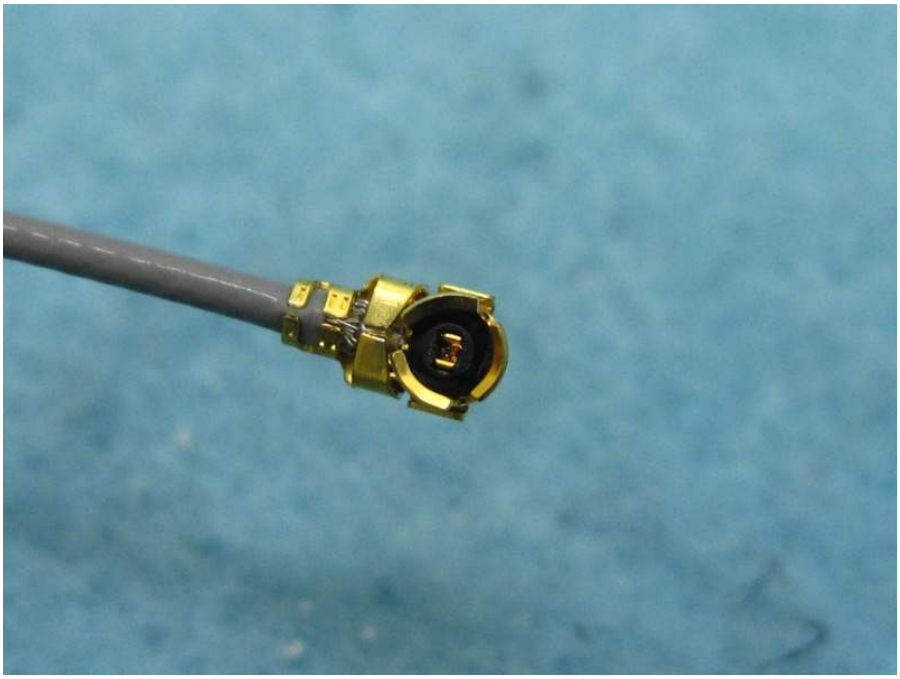


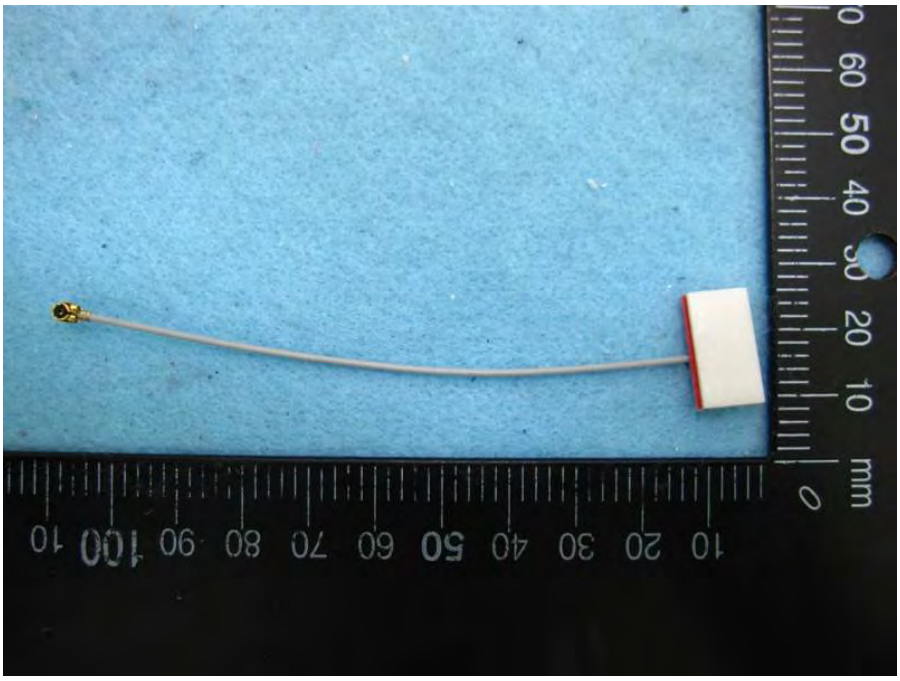


Set 10 antenna

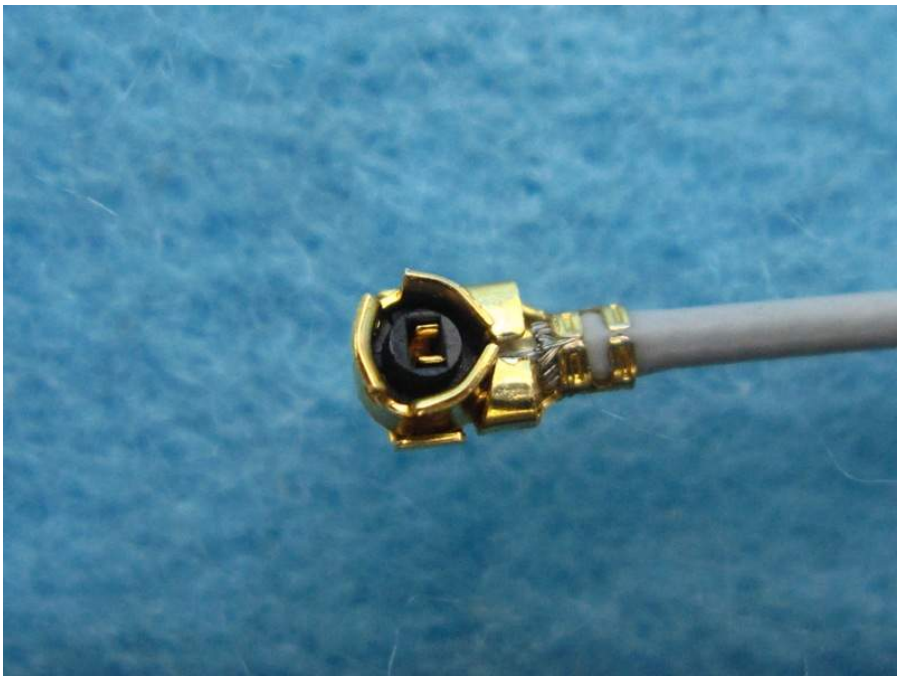
Model No.: WN9722A-DM







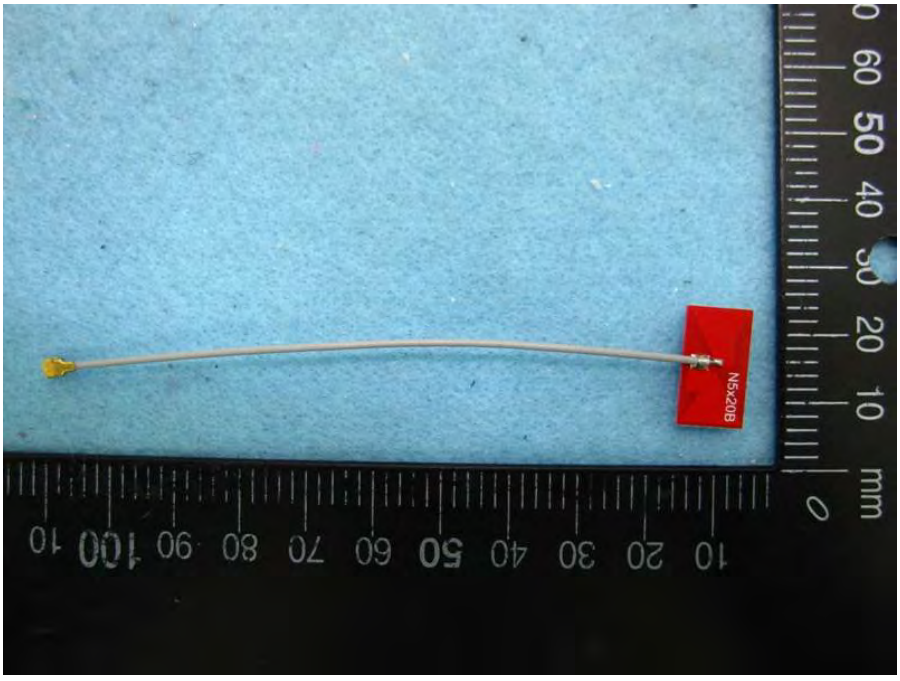
SPORTON International Inc.
TEL : 886-3-327-3456
FAX : 886-3-327-0973



Set 8 antenna

P/N:

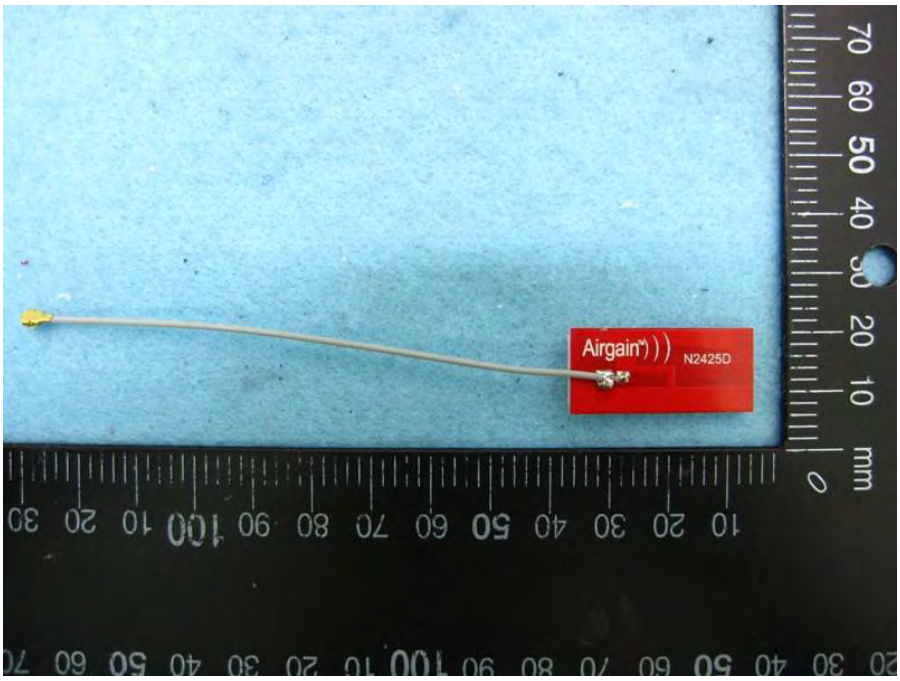
N5X20B-T2L-PK1-G100U

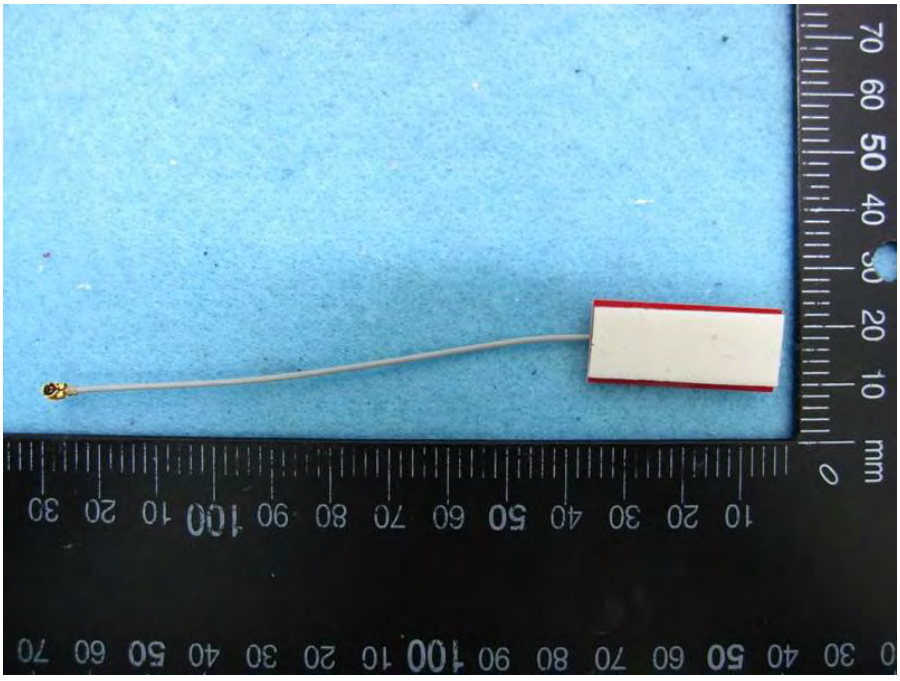


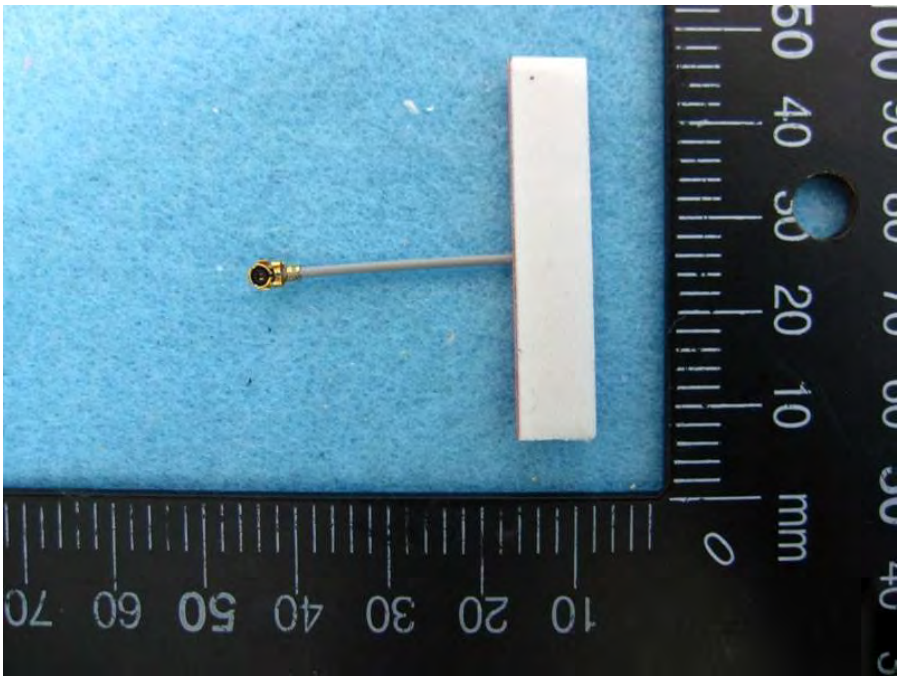
Set 5 antenna

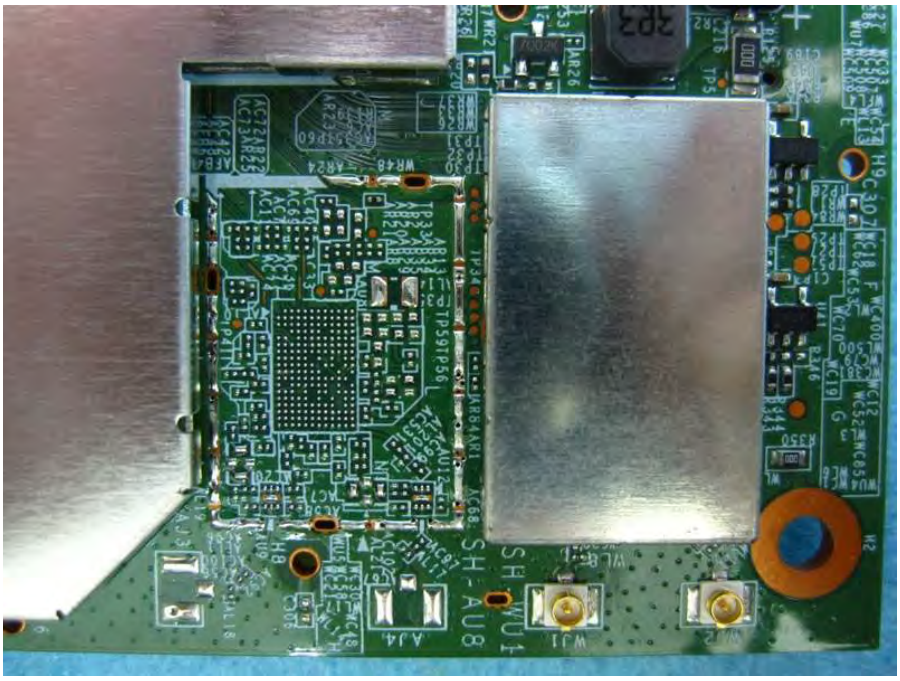
P/N:

N2425D-T2R-PK1-G150U





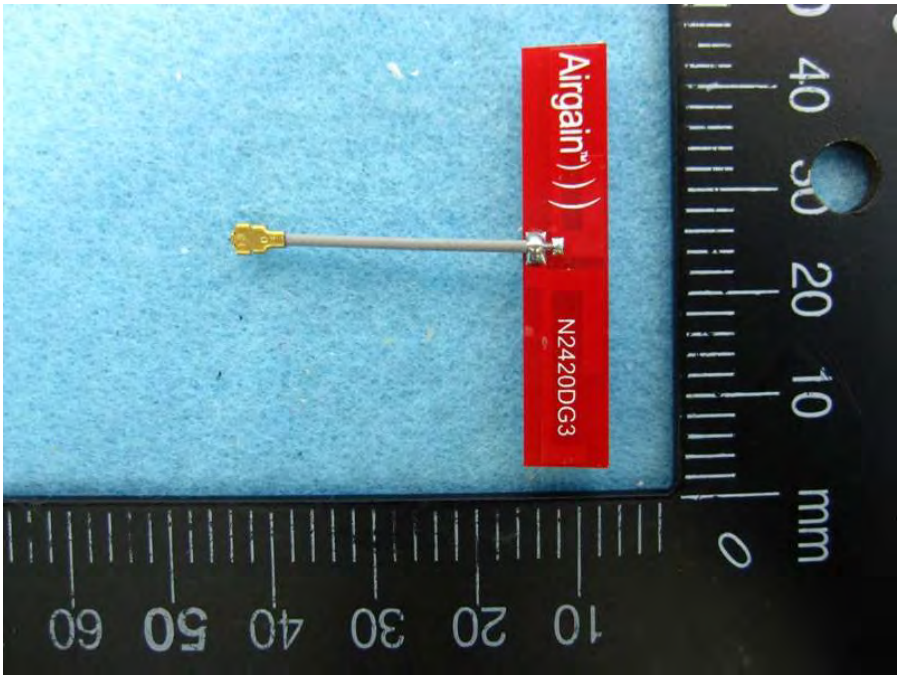

mm

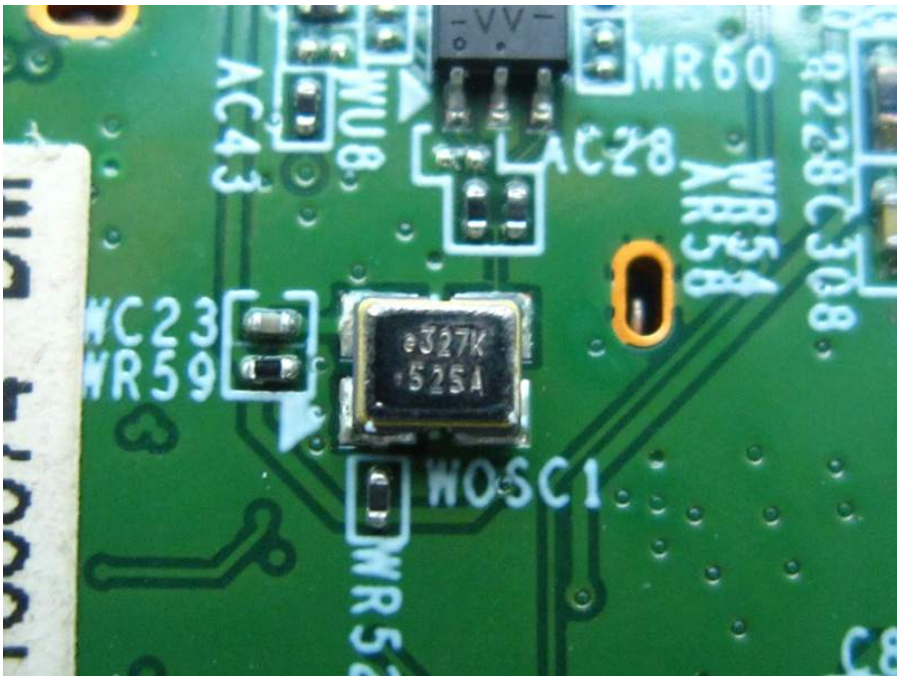


Set 1 antenna

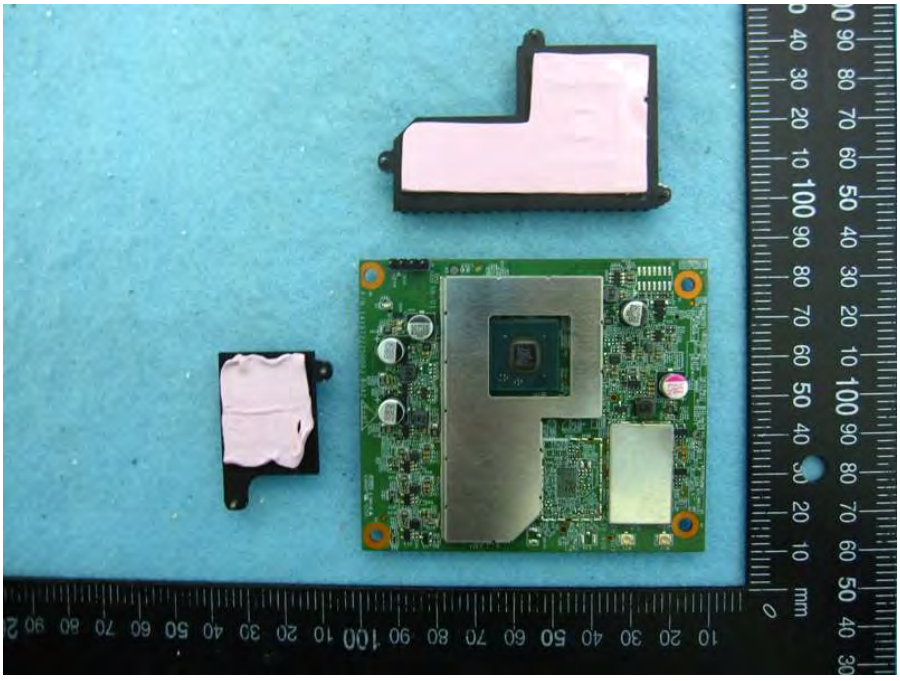
P/N:

N2420DG3-T2L-PK1-G30U




WR60
R228C308
AC28
WR54
WR58
AC43
WU8
WC23
WR59
e327K
525A
WOSC1
WR52

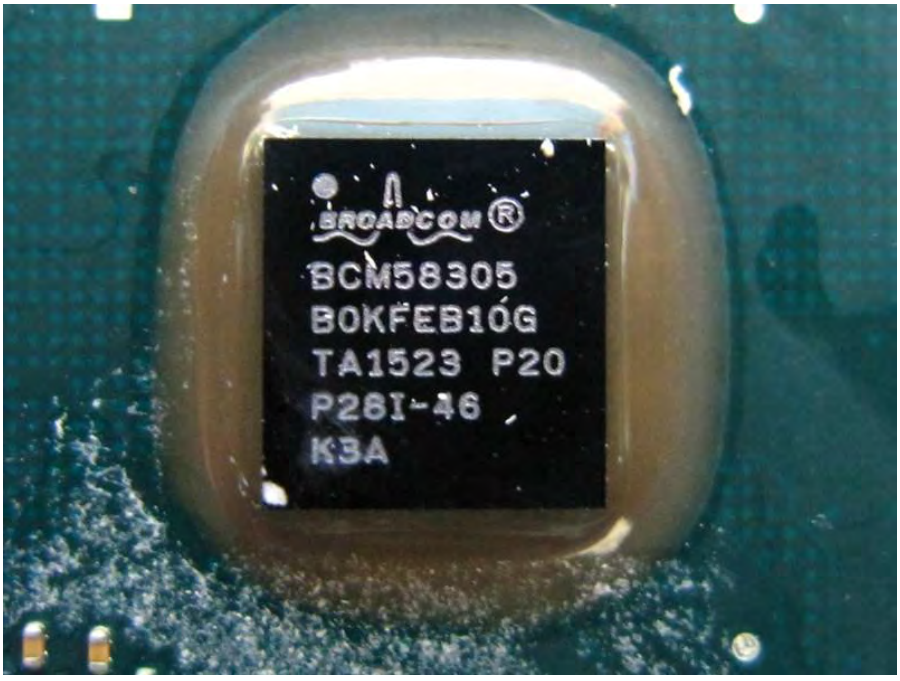
Radio: R0

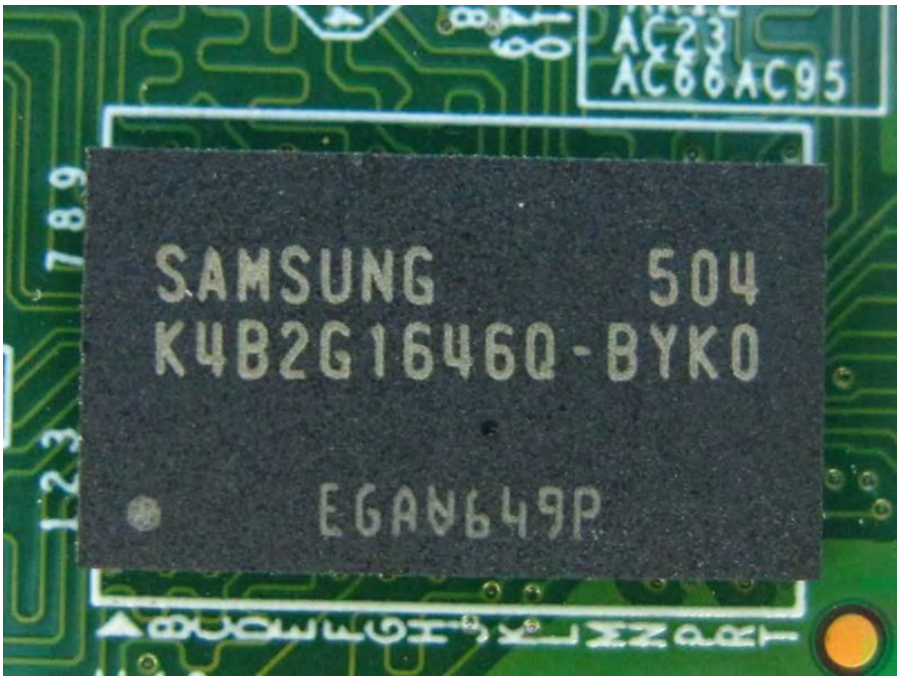


WN9722A-DM
U6 MAIN
V01.01 5669

CPU: 1.25G

CPU: 1G

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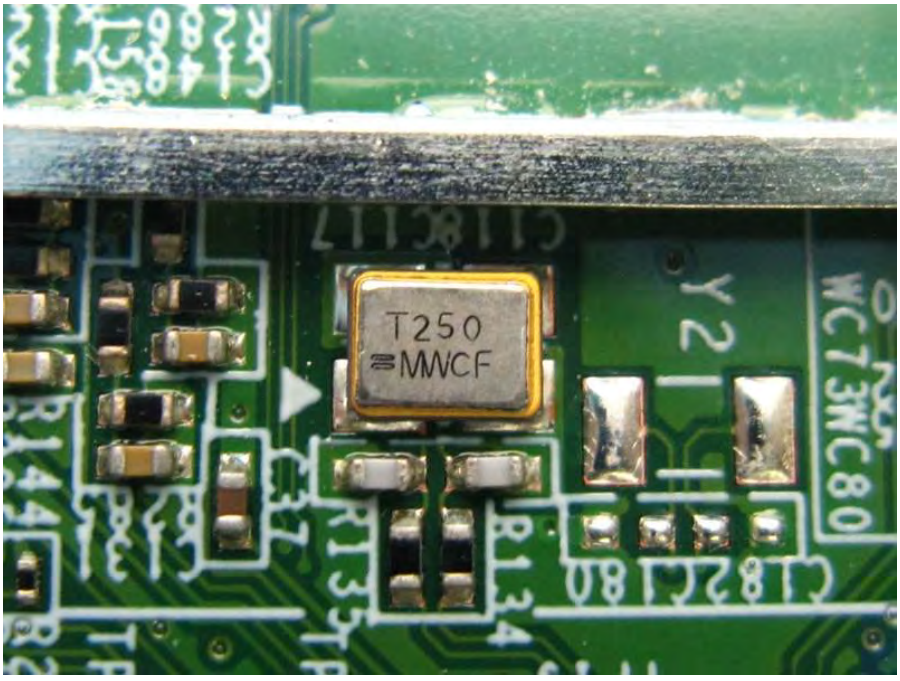
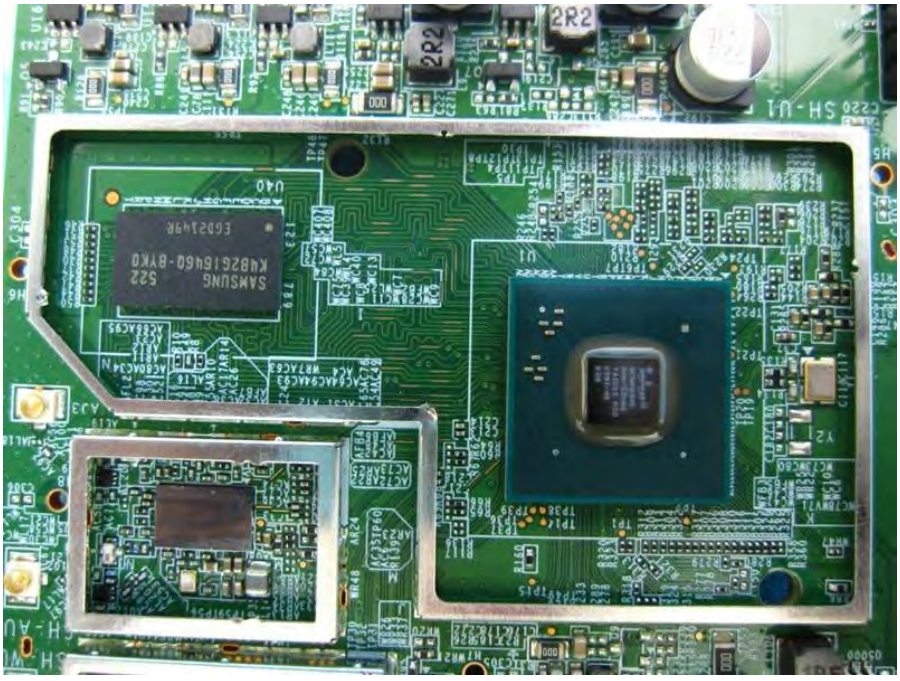

T250
MMCF
Y2
WC73WC80

BROADCOM
BCM4335EKKUBG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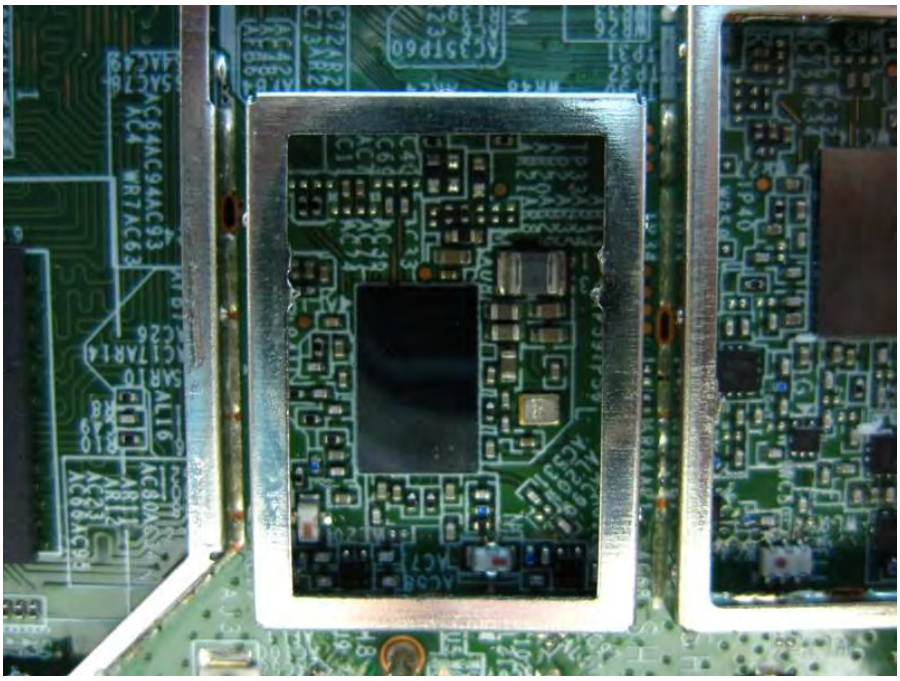
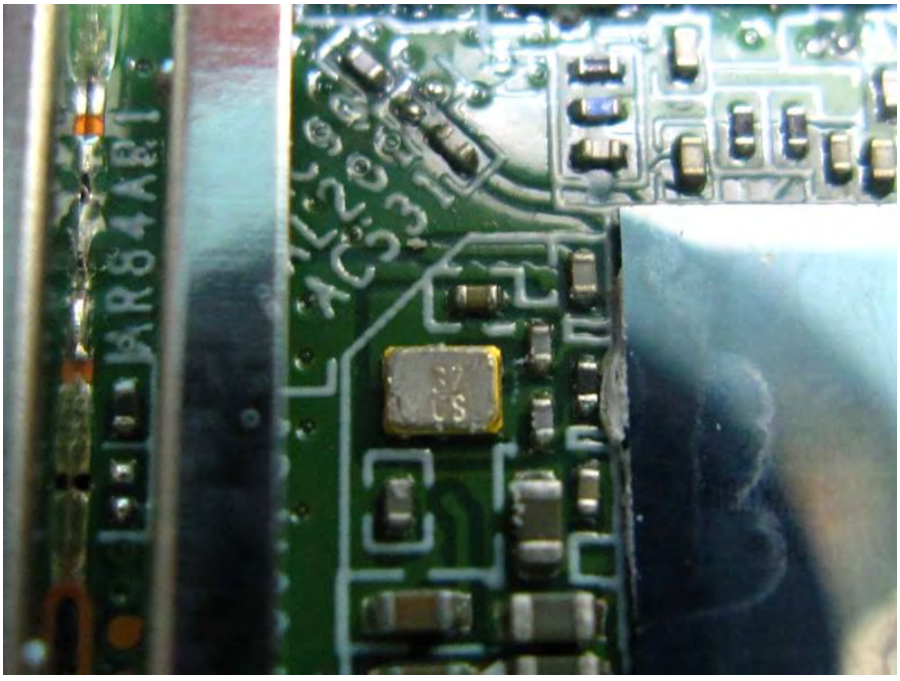
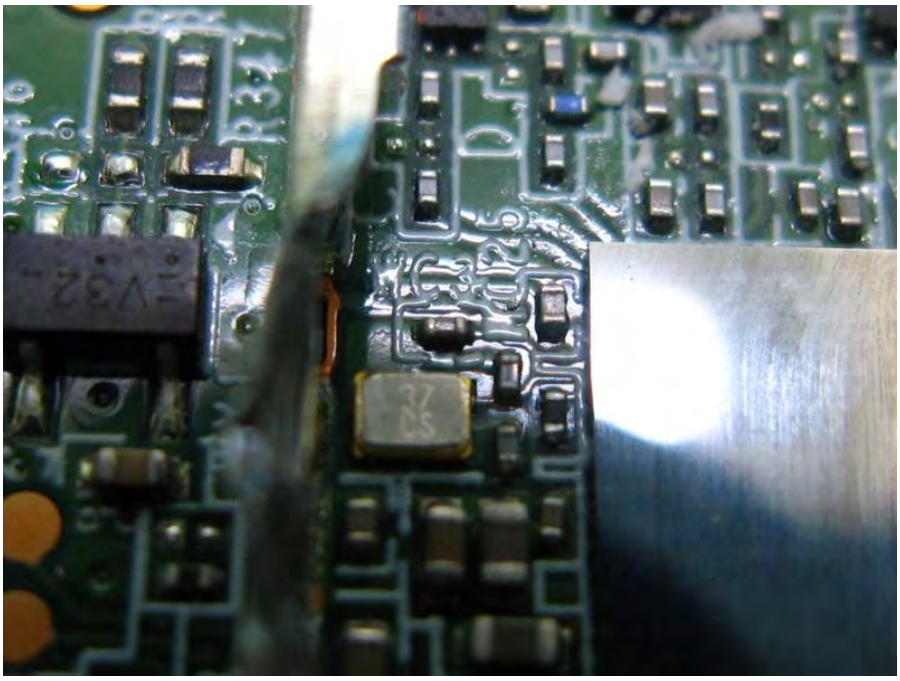
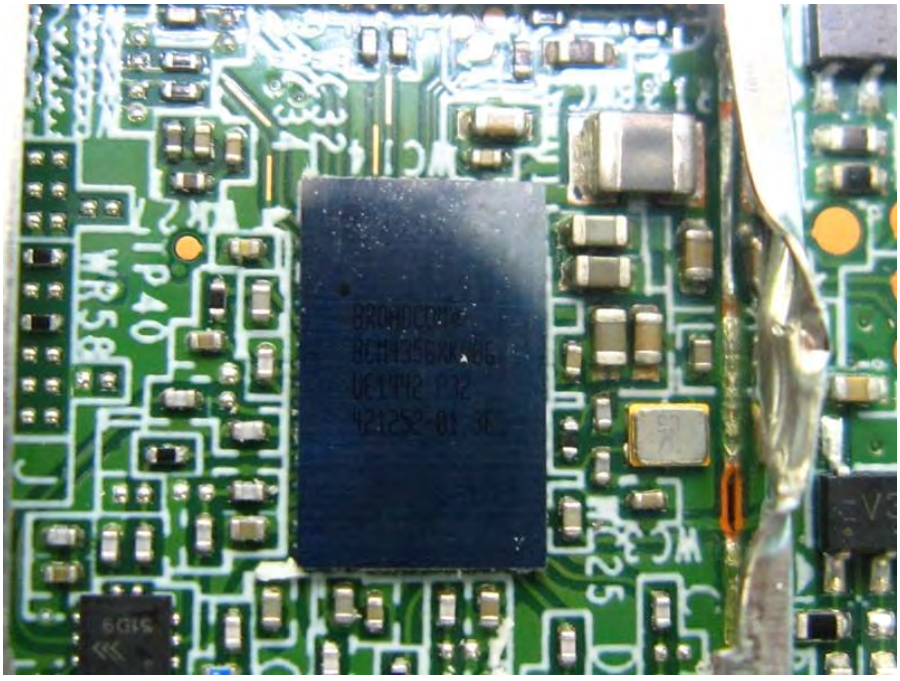
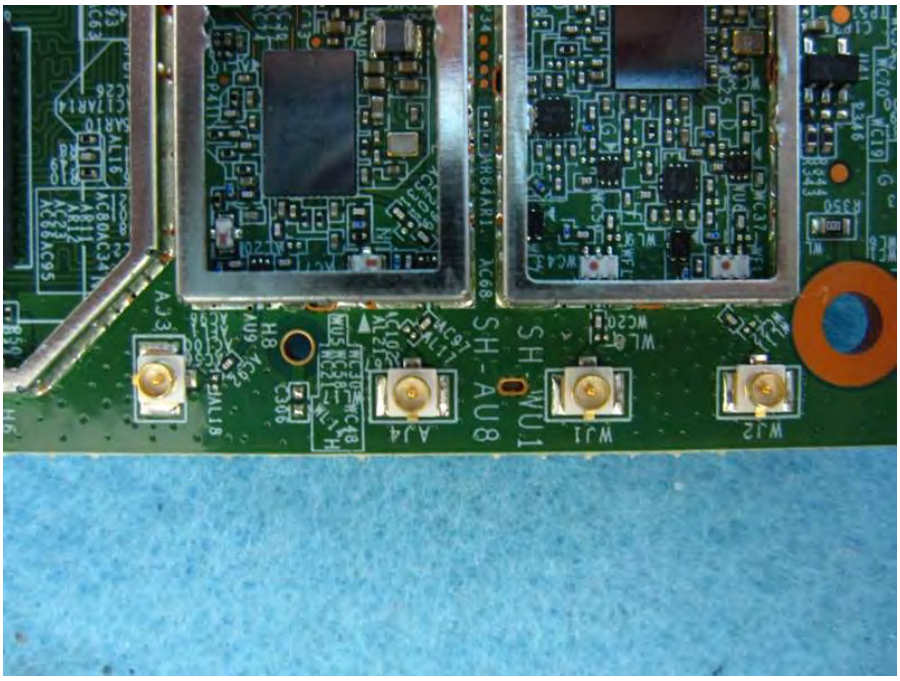
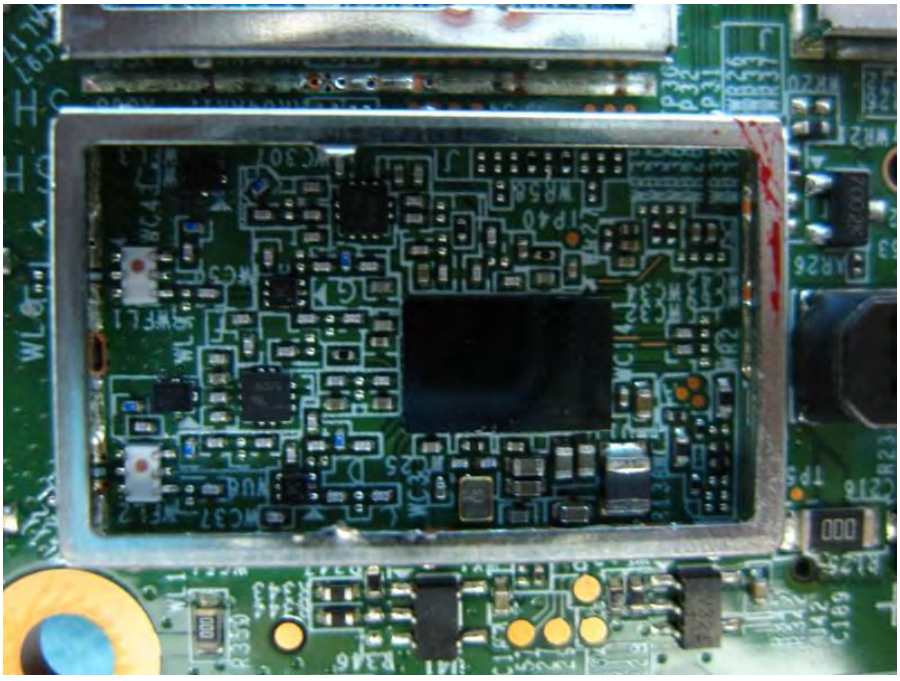


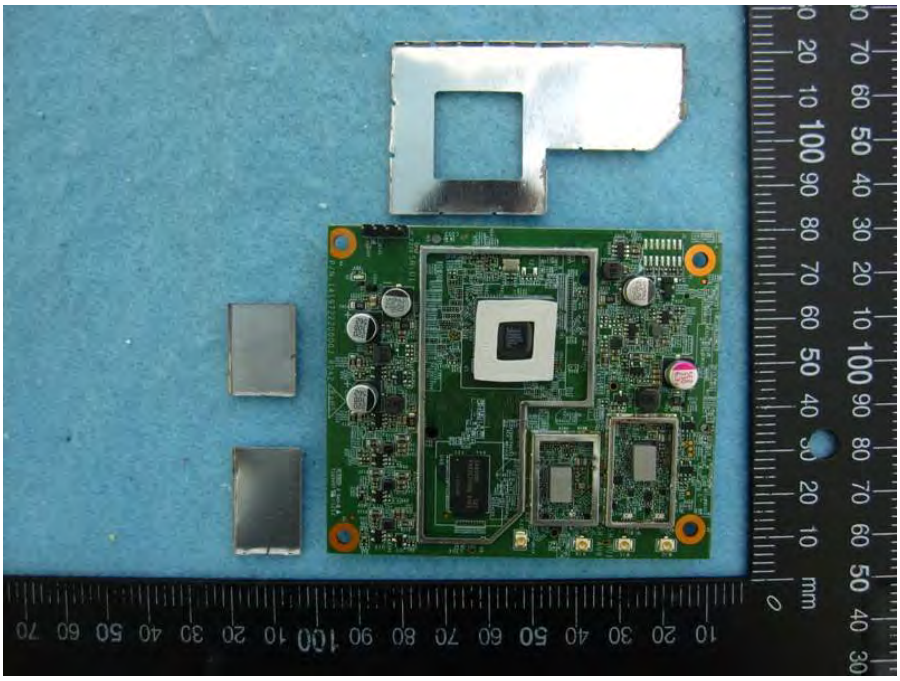


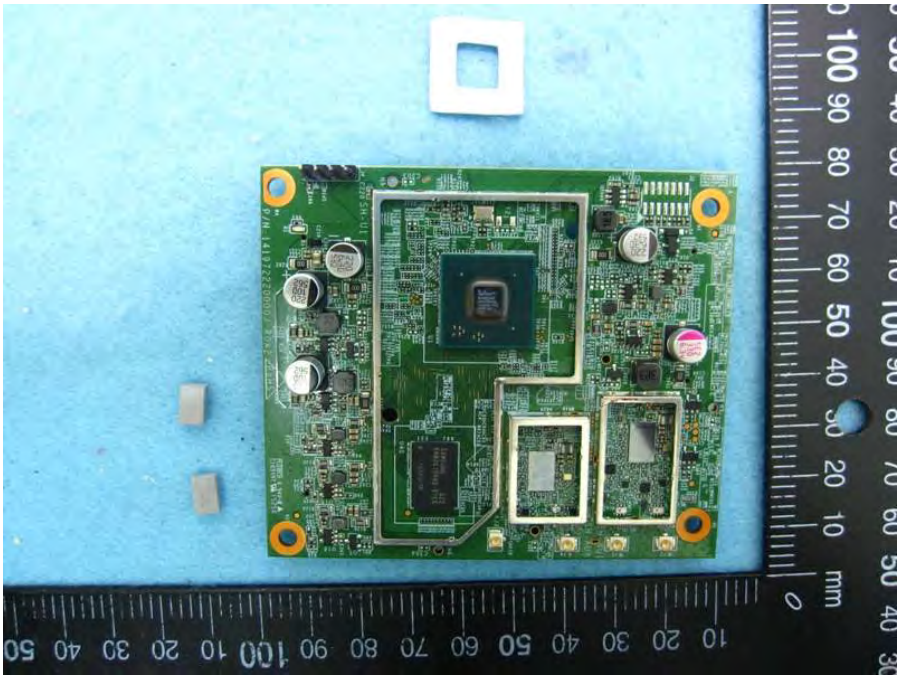


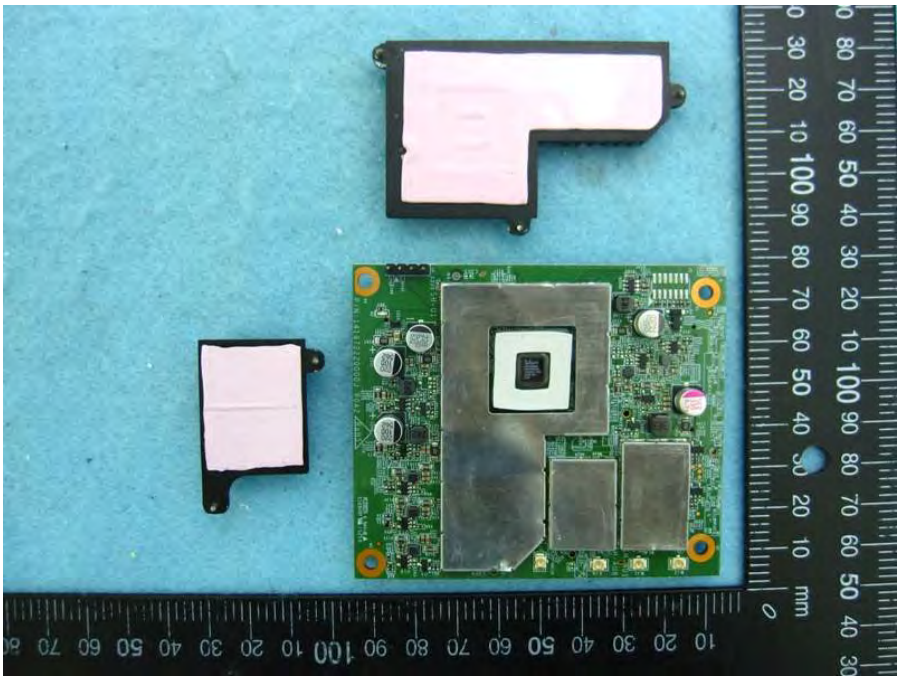


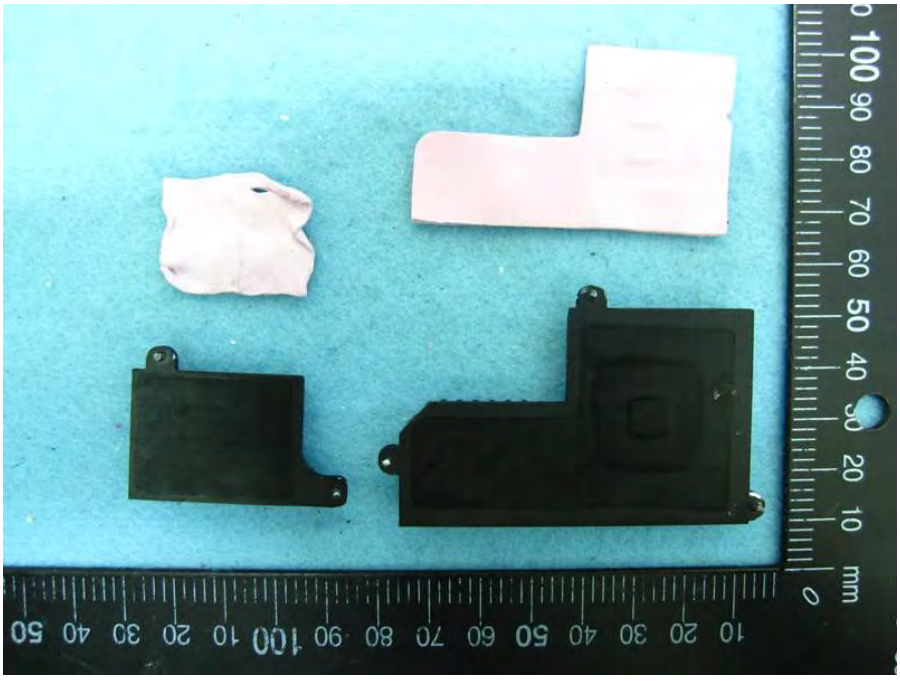




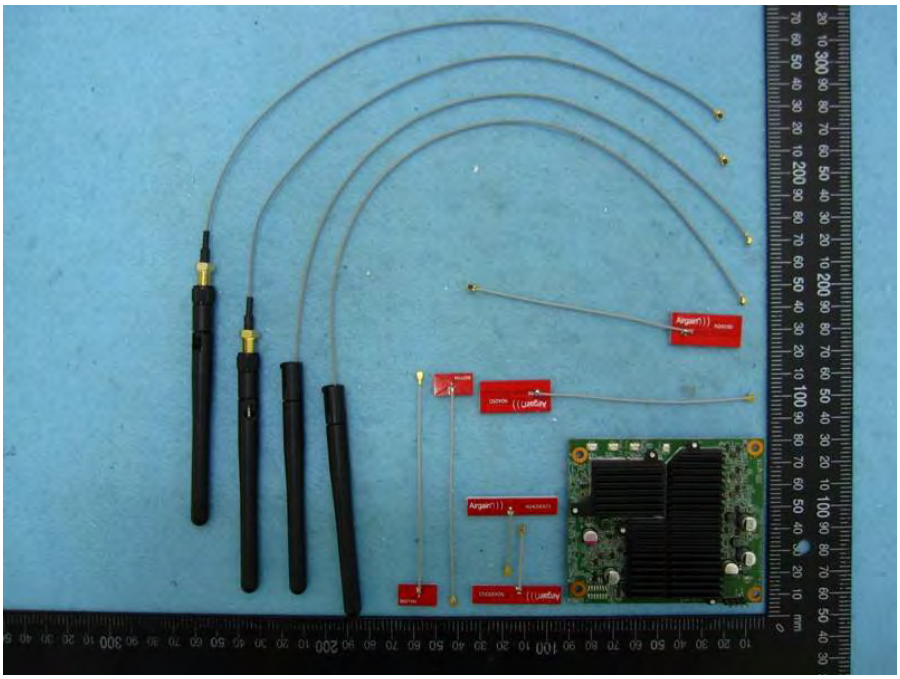




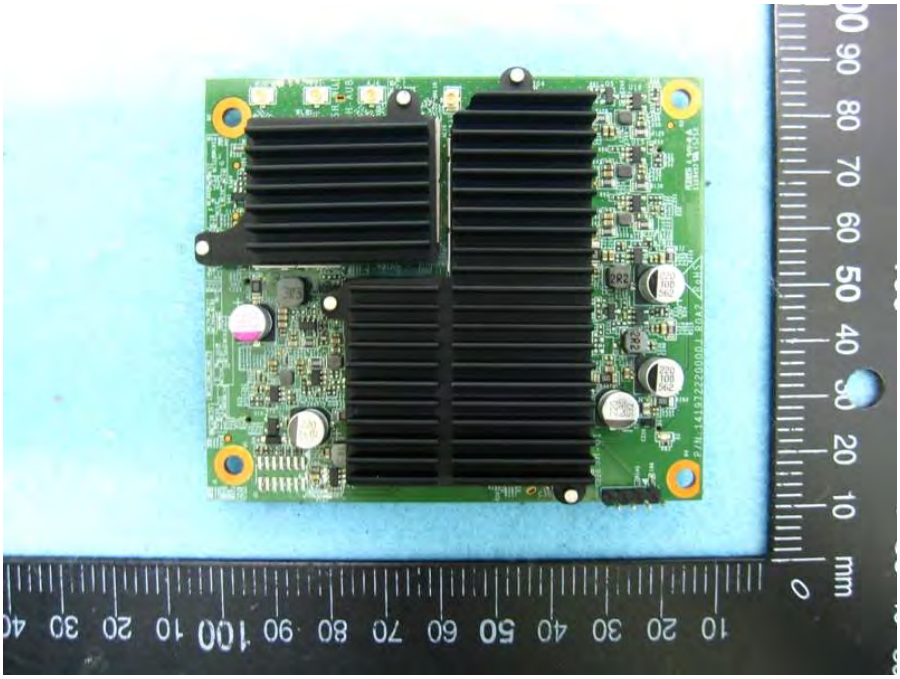




APPENDIX A. Photographs of EUT



Radio: R0 + R1



2.2 Reference Levels Evaluation

Power Density Calculations			
Evaluation Mode		**Maximum E.I.R.P. (dBm)**	**Power Density (W/m^2)**
Radio: R0	2.4GHz WLAN	19.45	0.1753
	5GHz WLAN	22.49	0.3530
	Bluetooth	7.80	0.0120
Radio: R1	5GHz WLAN	22.49	0.3530
Maximum Reference Level Limit (W/m^2)			10
Result			**Complied**

Co-transmitting Power Density Calculations	
Co-transmitting Mode	**Co-transmitting Power density**
1. Radio: R0 (Bluetooth + 2.4GHz WLAN) + Radio: R1 (5GHz WLAN) Mode	0.05402
2. Radio: R0 (Bluetooth + 5GHz WLAN) + Radio: R1 (5GHz WLAN) Mode	0.07179
Co-transmitting Reference Level Limit	1
Result	**Complied**

Note: For more detailed e.i.r.p. power measurement description, please refer to ER581110-16AA, ER581110-16AB, ER581110-16AC, ER581110-16AD radio test report.

2 Assessment Result

2.1 Reference Levels Limits

According to Council Recommendation 99/519/EC Annex III
Reference levels limits for electric, magnetic and electromagnetic fields (0 Hz to 300 GHz)

Frequency range	E-field strength (V/m)	H-field strength (A/m)	B-field (μT)	Equivalent plane wave power density Seq (W/m^2)
0-1 Hz	-	3.2×10^4	4×10^4	-
1-8 Hz	10000	$3.2\times10^4/f^2$	$4\times10^4/f^2$	-
8-25 Hz	10000	4000/f	5000/f	-
0.025-0.8 kHz	250/f	4/f	5/f	-
0.8-3 kHz	250/f	5	6.25	-
3-150 kHz	87	5	6.25	-
0.15-1 MHz	87	0.73/f	0.92/f	-
1-10 MHz	$87/f^{1/2}$	0.73/f	0.92/f	-
10-400 MHz	28	0.073	0.092	2
400-2000 MHz	$1.375\ f^{1/2}$	$0.0037\ f^{1/2}$	$0.0046\ f^{1/2}$	f/200
2-300 GHz	**61**	**0.16**	**0.2**	**10**

1.5 Evaluation Method

Evaluation Method
Far field region, For calculating the field in the far-field region the free space formula: E (V/m) = $\frac{\sqrt{30 \times P \times G}}{d}$ Power Density: Pd (W/m^2) = $\frac{E^2}{377}$ **E** = Electric field (V/m) **P** = RF output power (W) **G** = EUT Antenna numeric gain (numeric) **d** = Separation distance between radiator and human (m) The formula can be changed to **Pd** = $\frac{30 \times P \times G}{377 \times d^2}$
Co-transmitting Evaluation Method
Conclusion: CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1 CPD = Calculation power density LPD = Limit of power density

1.6 Basic Restrictions

Restrictions on exposure to time-varying electric, magnetic, and electromagnetic fields which are based directly on established health effects and biological considerations are termed “basic restrictions”. Depending upon the frequency of the field, the physical quantities used to specify these restrictions are specific absorption rate (SAR), and power density.

1.7 Reference Levels

Levels of field strength and currents that can be compared with corresponding measured or calculated values. The reference levels are derived from the basic restrictions using worst-case assumptions about exposure. If the reference levels are met, then the basic restrictions will be complied with, but if the reference levels are exceeded, it does not necessarily mean that the basic restrictions will not be met.

1.8 Compliance criteria

If the average power emitted by apparatus operating in the frequency range 10 MHz – 300 GHz is less than or equal to 20 mW then the apparatus is deemed to comply with the basic restrictions without testing. The evaluation of power is only valid if it is made with an uncertainty of less than 30 %.

1.2 Table for Multiple Listing

The EUT has four model numbers which are identical to each other in all aspects except for the following table:

Model No.	Description
AIOS4.0S	All the models are identical, the difference model for difference model number as marketing strategy.
AIOS4.0V	
AIOS4.0R	
AIOS4.0F	

From the above models, model: AIOS4.0S was selected as representative model for the test and its data was recorded in this report.

1.3 Table for Radio

For Radio: R0+R1

The EUT has two radios, the information as following table:

Radio	Operate Mode	Function	CPU	Antenna
R0	Slave without radar detection (STA mode)	Bluetooth / 2.4GHz WLAN / 5GHz WLAN band 1~3	1G / 1.25G	Set 1~7, 10~12
R1	Master (AP mode)	5GHz WLAN band 1	1G / 1.25G	Set 8~12
Note: CPU 1.25G covers CPU 1G, due to it is the highest CPU speed.				

For Radio: R0 only

The EUT has one radio, the information as following table:

Radio	Operate Mode	Function	CPU	Antenna
R0	Slave without radar detection (STA mode)	Bluetooth / 2.4GHz WLAN / 5GHz WLAN band 1~3	1G / 1.25G	Set 1~7, 10~12
Note: CPU 1.25G covers CPU 1G, due to it is the highest CPU speed.				

Note: There are two types of EUT, one is Radio: R0+R1 and the other is Radio: R0 only. Only the most complex mode for Radio: R0+R1 was performed for all the tests and recorded in this report.

1.4 Evaluation Distance

Evaluation Distance
Evaluation distance 20cm as a distance between the equipment and the operator or user when it is used normally. The distance used for the assessment had be specified by the manufacturer and be consistent with the intended usage of the equipment.

1 General Description

1.1 EUT General Information

For Radio: R0

RF General Information			
Evaluation Mode	**Frequency Range (MHz)**	**Operating Frequency (MHz)**	**Modulation Type**
2.4GHz WLAN	2400-2483.5	2412-2472	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)
5GHz WLAN	5150-5350 / 5470-5725	5180-5320 / 5500-5700	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Bluetooth	2400-2483.5	2402-2480	BR / EDR: FHSS (GFSK / π/4-DQPSK / 8DPSK) LE: DSSS (GFSK)

For Radio: R1

RF General Information			
Evaluation Mode	**Frequency Range (MHz)**	**Operating Frequency (MHz)**	**Modulation Type**
5GHz WLAN	5150-5250	5180-5240	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)

Multiple Transmitters Condition
Co-location as simultaneously transmitting (co-transmitting) and the evaluation shall be consider that simultaneous transmissions from co-located devices the individual transmitters are evaluated separately. After sum of the individual value (basic restriction / reference level) are measured/calculated also have to under basic restriction / reference level.
Co-transmitting mode: 1. Radio: R0 (Bluetooth + 2.4GHz WLAN) + Radio: R1 (5GHz WLAN) Mode 2. Radio: R0 (Bluetooth + 5GHz WLAN) + Radio: R1 (5GHz WLAN) Mode

Revision History

Report No.	Version	Description	Issued Date
EA581110-16AA	Rev. 01	Initial issue of report	May 09, 2017

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APPENDIX A. PHOTOGRAPHS OF EUT ..... A1 ~ A18

CE EMF Test Report

Equipment	:	HEOS 4.X Platform Module
Brand Name	:	Arcadyan
Model No.	:	AIOS4.0S, AIOS4.0V, AIOS4.0R, AIOS4.0F
Standard	:	EN 62311:2008
Applicant	:	Arcadyan Technology Corporation No.8, Sec.2, Guangfu Rd., Hsinchu, 30071 Taiwan
Manufacturer	:	Arcadyan Technology Corporation No.8, Sec.2, Guangfu Rd., Hsinchu, 30071 Taiwan

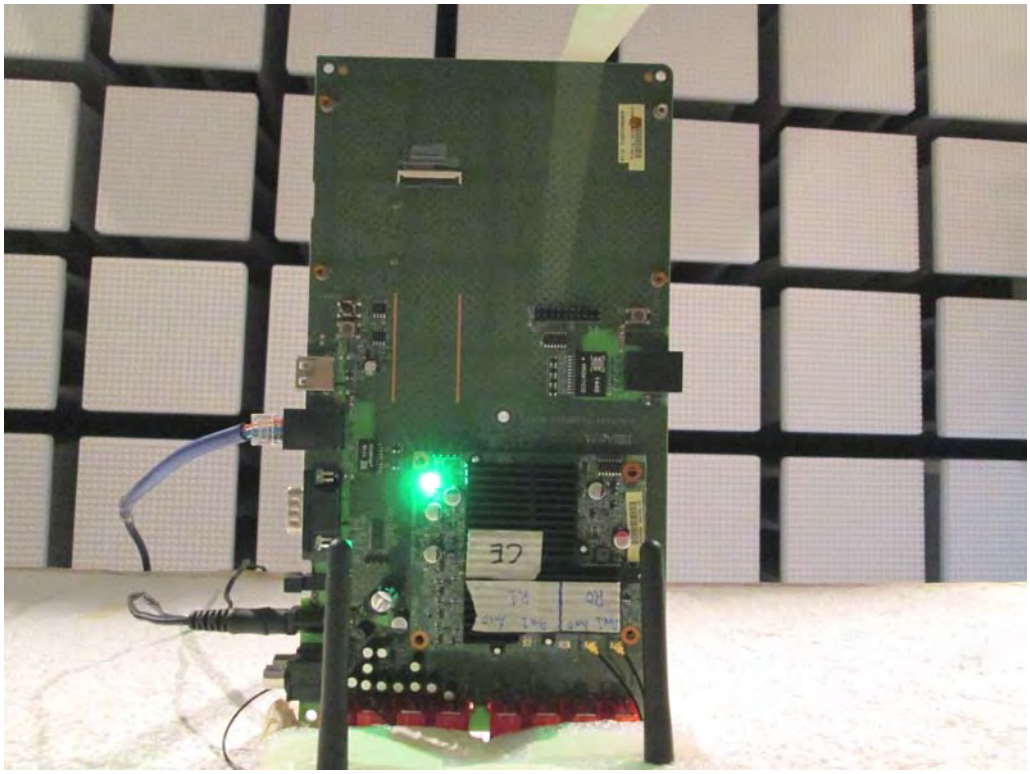
The product sample received on Jul. 22, 2015 and completely tested on Apr. 06, 2017. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in EN 62311:2008 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Cliff Chang
SPORTON INTERNATIONAL INC.

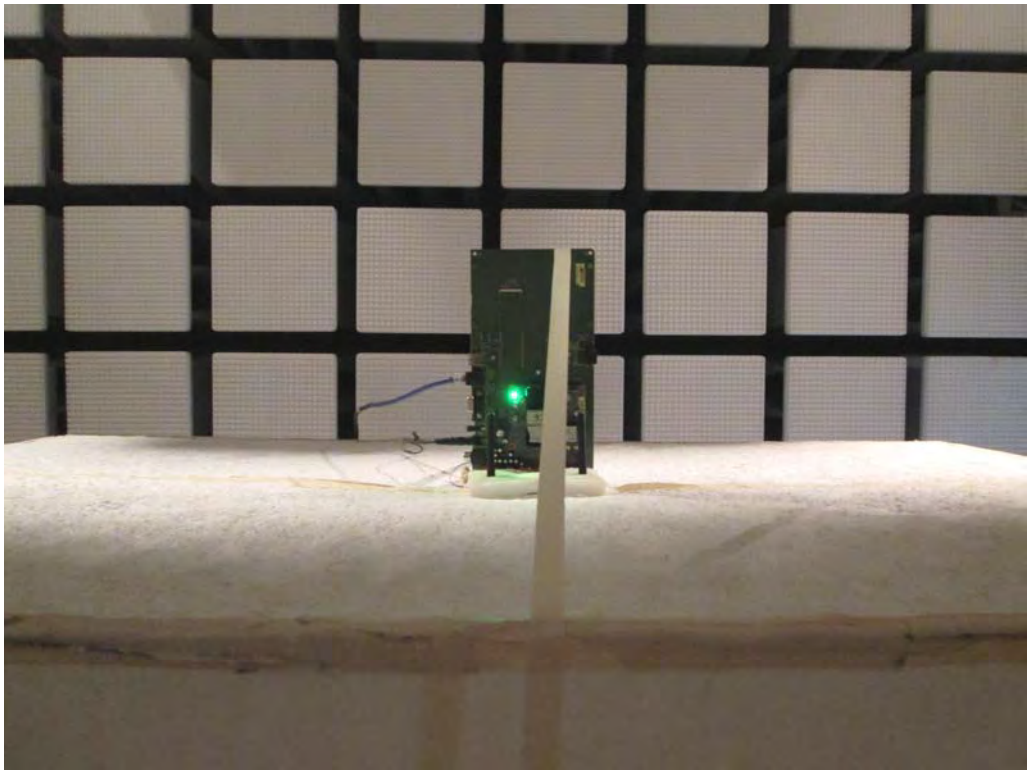
Testing Laboratory
1190

CLOSE-UP VIEW

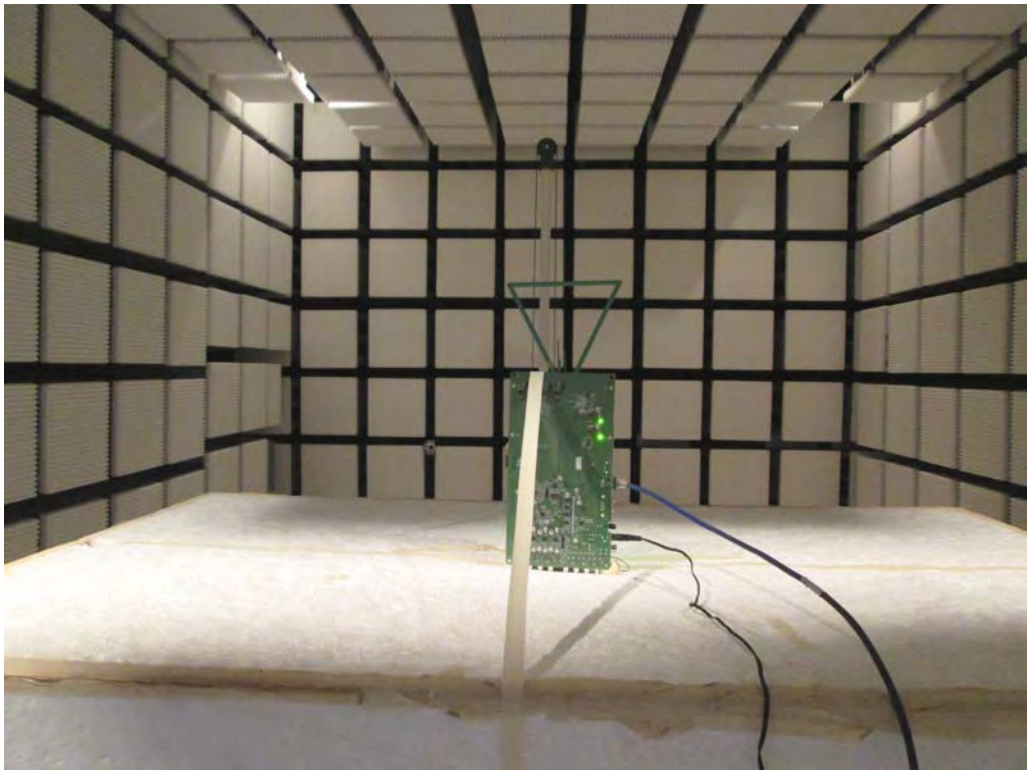


Test Mode: Mode 4

FRONT VIEW



REAR VIEW

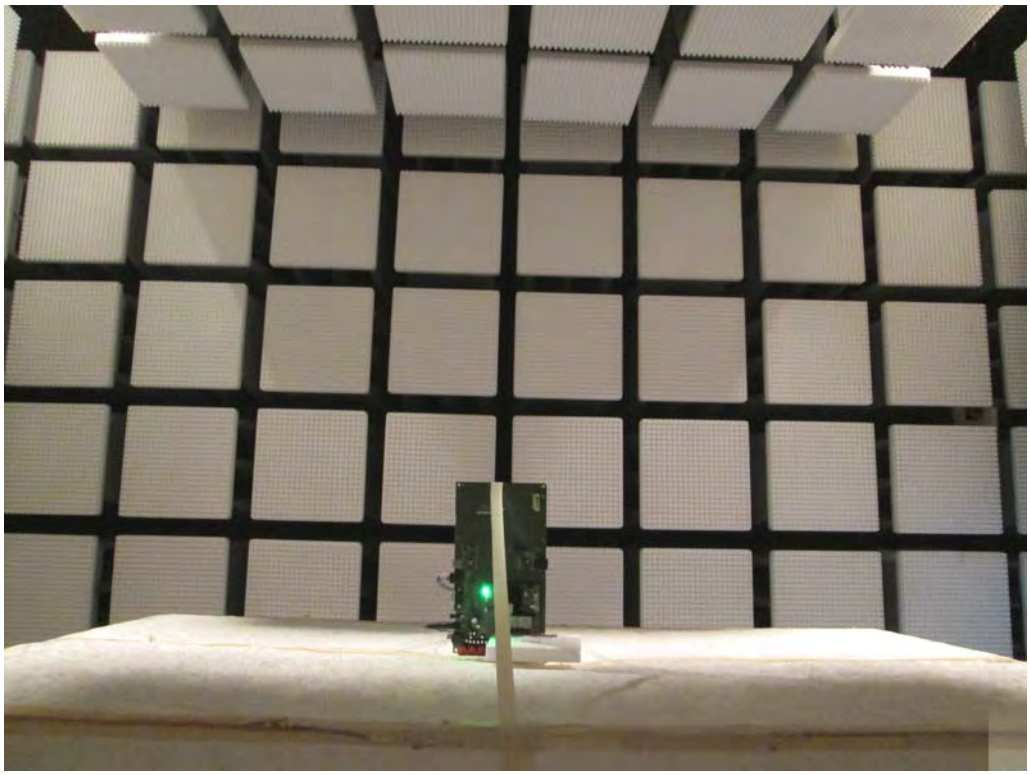


CLOSE-UP VIEW

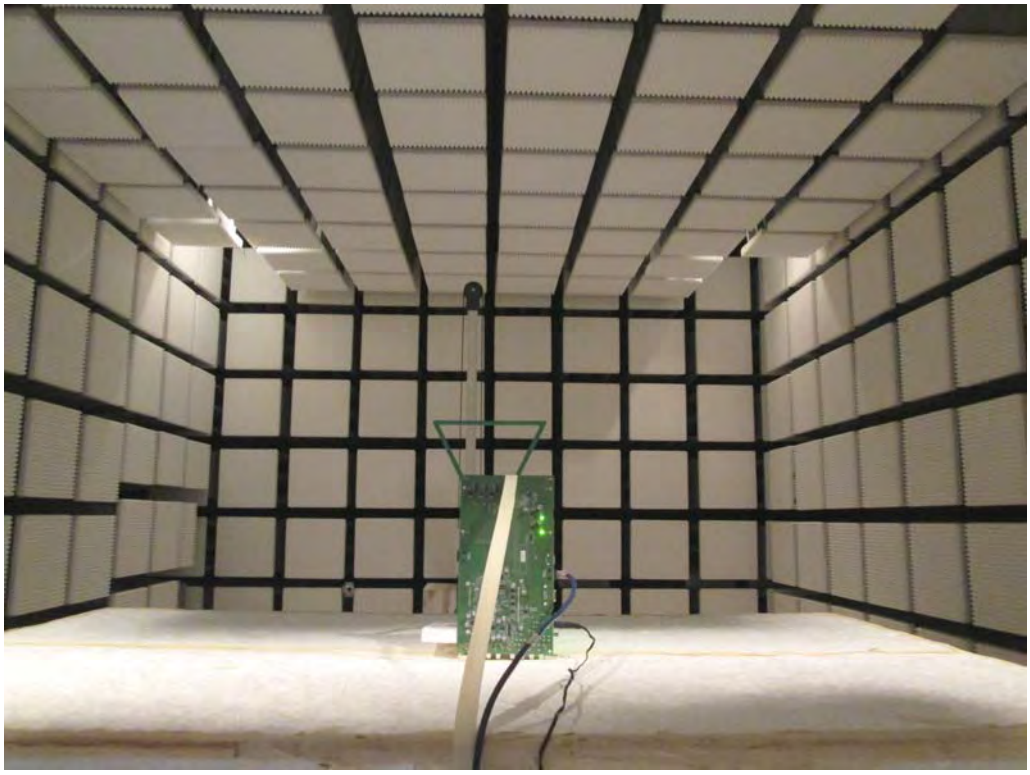
1. Photographs of Test Configuration

Test Mode: Mode 1

FRONT VIEW



REAR VIEW

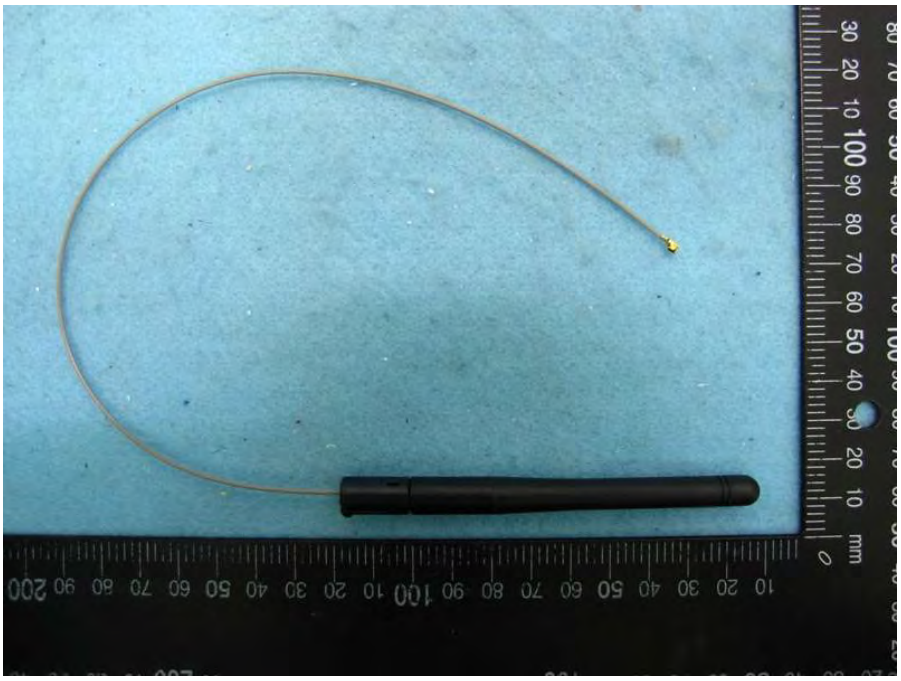


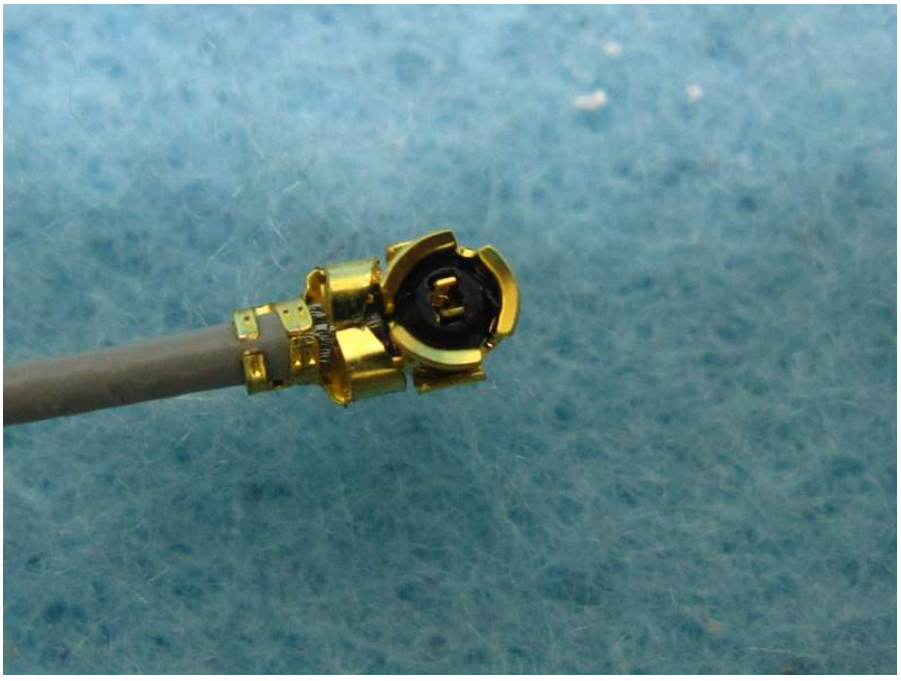
Appendix B. Test Photos

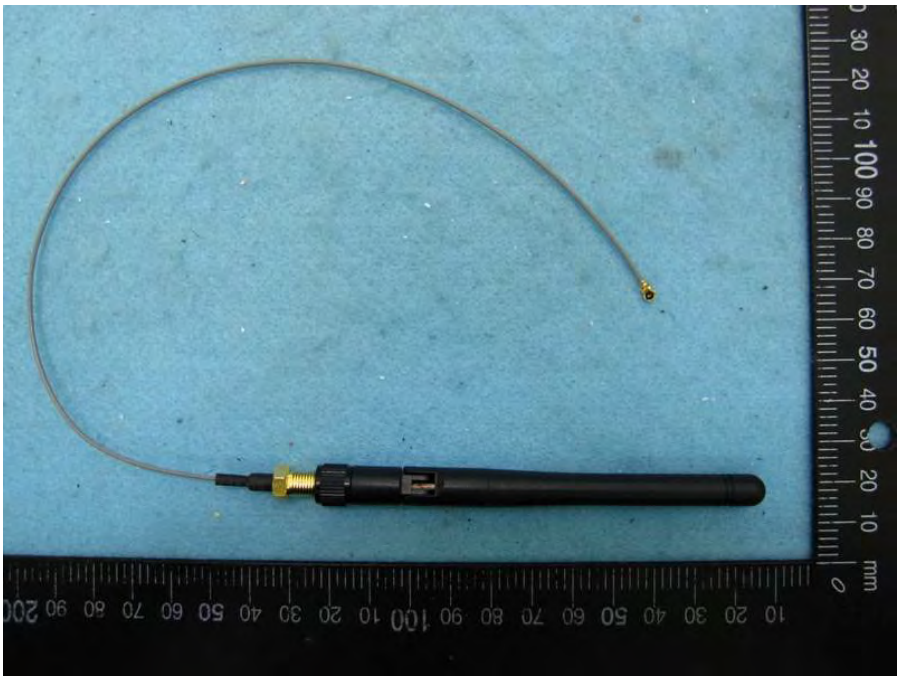
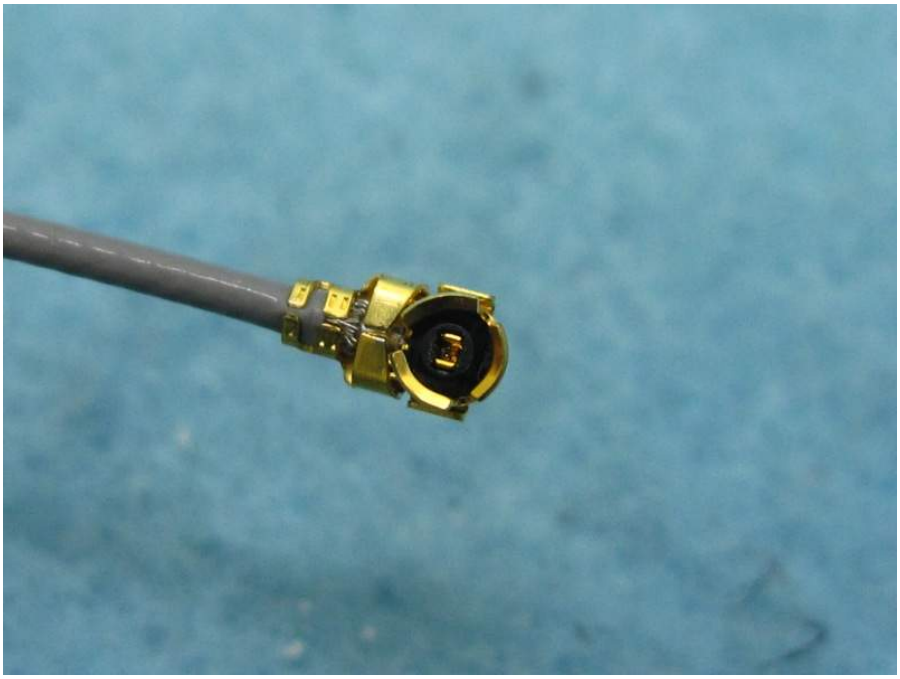
Set 11 antenna

Model No.:

WN9722A-DM-300mm





Set 10 antenna

Model No.: WN9722A-DM