EMC Test Report

Applicant	:	EDIMAX TECHNOLOGY CO., LTD.
Applicant Address	:	No.278, Xinhu 1st Rd., Neihu Dist., Taipei City, Taiwan
Product Type	:	11ac Wireless Dual-Band Selectable USB Adapter
Trade Name	:	EDIMAX
Model Number	:	EW-7822UNC, EW-7822ULC
Applicable Standard	:	ETSI EN 301 489-1 V2.2.0 (03-2017) ETSI EN 301 489-17 V3.2.0 (03-2017)
Receive Date	:	Aug. 16, 2016
Test Period	:	Aug. 30, 2016 ~ Apr. 21, 2017
Issue Date	:	Jul. 10, 2017

Issue by

A Test Lab Techno Corp.
No. 140-1, Changan Street, Bade District,
Taoyuan City 33465, Taiwan (R.O.C)
Tel：+886-3-2710188 / Fax：+886-3-2710190

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Revision History

Rev.	Issue Date	Revisions	Revised By
00	Apr. 26, 2017	Initial Issue	Tobey Cheng
01	Jun. 20, 2017	Revised report information.	Tobey Cheng
02	Jun. 26, 2017	Revised report information.	Tobey Cheng
03	Jul 10, 2017	Revised report information.	Tobey Cheng

Verification of Compliance

Issued Date: Jul 10, 2017

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Applicant Address	:	No.278, Xinhu 1st Rd., Neihu Dist., Taipei City, Taiwan
Product Type	:	11ac Wireless Dual-Band Selectable USB Adapter
Trade Name	:	EDIMAX
Model Number	:	EW-7822UNC, EW-7822ULC
EUT Rated Voltage	:	DC 5.0V
Test Voltage	:	100 Vac / 50 Hz , 230 Vac / 50 Hz
Applicable Standard	:	ETSI EN 301 489-1 V2.2.0 (03-2017) ETSI EN 301 489-17 V3.2.0 (03-2017)
Test Result	:	Complied
Performing Lab.	:	A Test Lab Techno Corp. No. 140-1, Changan Street, Bade District, Taoyuan City 33465, Taiwan (R.O.C) Tel：+886-3-2710188 / Fax：+886-3-2710190 http://www.atl-lab.com.tw/e-index.htm

The above equipment has been tested by A Test Lab Techno Corp., and found compliance with the requirements set forth in the RED Directive 2014/53/EU technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved By	: Misty Wu	Reviewed By	: Terry Liao
(Manager)	(Misty Wu)	(Testing Engineer)	(Terry Liao)

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1 General Information

1.1. Summary of Test Result

Emission			
Standard	Item	Result	Remark
EN 55032: 2012/AC:2013	Conducted Emission	PASS	Meet Class B limit
EN 55032: 2012/AC:2013	Radiated Emission	PASS	Meet Class B limit
EN 61000-3-2: 2014	Harmonic Current Emissions	N/A	The device power does not from AC source
EN 61000-3-3: 2013	Voltage Fluctuations & Flicker	N/A	The device power does not from AC source

Immunity			
Standard	Item	Result	Remark
EN 61000-4-2: 2009	ESD	PASS	Meets the requirements of Criterion B
EN 61000-4-3: 2006 +A1:2008 +A2:2010	RS	PASS	Meets the requirements of Criterion A
EN 61000-4-4: 2012	EFT	N/A	The device power supply from system
EN 61000-4-5: 2014	Surge	N/A	The device power supply from system
EN 61000-4-6: 2014	CS	N/A	The device power supply from system
EN 61000-4-11: 2004	Voltage Dips & Voltage Variations	N/A	The device power does not from AC source

The test results of this report relate only to the tested sample(s) identified in this report. Manufacturer or whom it may concern should recognize the pass or fail of the test result.

1.2. Measurement Uncertainty

Test Item		Frequency Range	Uncertainty (dB)
Conducted Emission	AC Power Port	9kHz ~ 150kHz	2.7
		150kHz ~ 30MHz	2.7
	Telecommunication Port	150kHz ~ 30MHz	3.6

Test Item	Test Site	Frequency Range		Uncertainty (dB)
Radiated Emission	TE06	30MHz ~ 1000MHz	Horizontal	5.6
			Vertical	6.0
	TE01	1000MHz ~ 6000MHz		5.2
	TE09	1000MHz ~ 6000MHz		4.9
Note: The Vertical and Horizontal measurement uncertainty of 1GHz to 6GHz is evaluated and choose which polarity is worst value.				

Test Item		Uncertainty
Harmonic Current Emission		36 mA/A
Voltage Fluctuations And Flicker		4.4 mV/V
Electrostatic Discharge	Voltage	0.86 %
	Current	2.5 %
	Timing	6.0 %
Radiated Susceptibility		3.2 dB
Electrical Fast Transient/Burst		2 %
Surge	Voltage	3%
	Current	3%
	Timing	3%
Conducted Susceptibility	CDN	3.8 dB
	EM Clamp/Direct Injection	2.8 dB
Voltage Dips and Interruption	Voltage	1.004 %
	Timing	1.004 %

2 EUT Description

Applicant	EDIMAX TECHNOLOGY CO., LTD. No.278, Xinhu 1st Rd., Neihu Dist., Taipei City, Taiwan
Manufacturer	EDIMAX TECHNOLOGY CO., LTD. No.278, Xinhu 1st Rd., Neihu Dist., Taipei City, Taiwan
Product type	11ac Wireless Dual-Band Selectable USB Adapter
Trade name	EDIMAX
Model number	EW-7822UNC, EW-7822ULC
Models different description	Those model numbers differ from each other in selling region.

I/O port description：

I/O Port Types	Q'TY	Test Description
1). USB Port	1	Connected to Notebook

3 Test Methodology

3.1. Decision of Test Mode

3.1.1. The following test mode(s) were scanned during the preliminary test:

Pre-Test Mode
Mode 1: Idle mode
Mode 2: Wi-Fi link mode (AC 100V, 50Hz)
Mode 3: Wi-Fi link mode (AC 230V, 50Hz)

3.1.2. After the preliminary scan, the following test mode was found to produce the highest emission level.

Final Test Mode			
EMI	Conducted Emission		Mode 2 / Mode 3
	Radiated Emission	Below 1GHz	Mode 2 / Mode 3
		Above 1GHz	Mode 2 / Mode 3
	Harmonic Current Emissions		N/A
	Voltage Fluctuations & Flicker		N/A
EMS	ESD		Mode 3
	RS		Mode 3
	EFT		N/A
	Surge		N/A
	CS		N/A
	Voltage Dips & Voltage Variations		N/A

Then, the above highest emission mode of the configuration of the EUT and cable was chosen for all final test items.

3.2. EUT Exercise Software

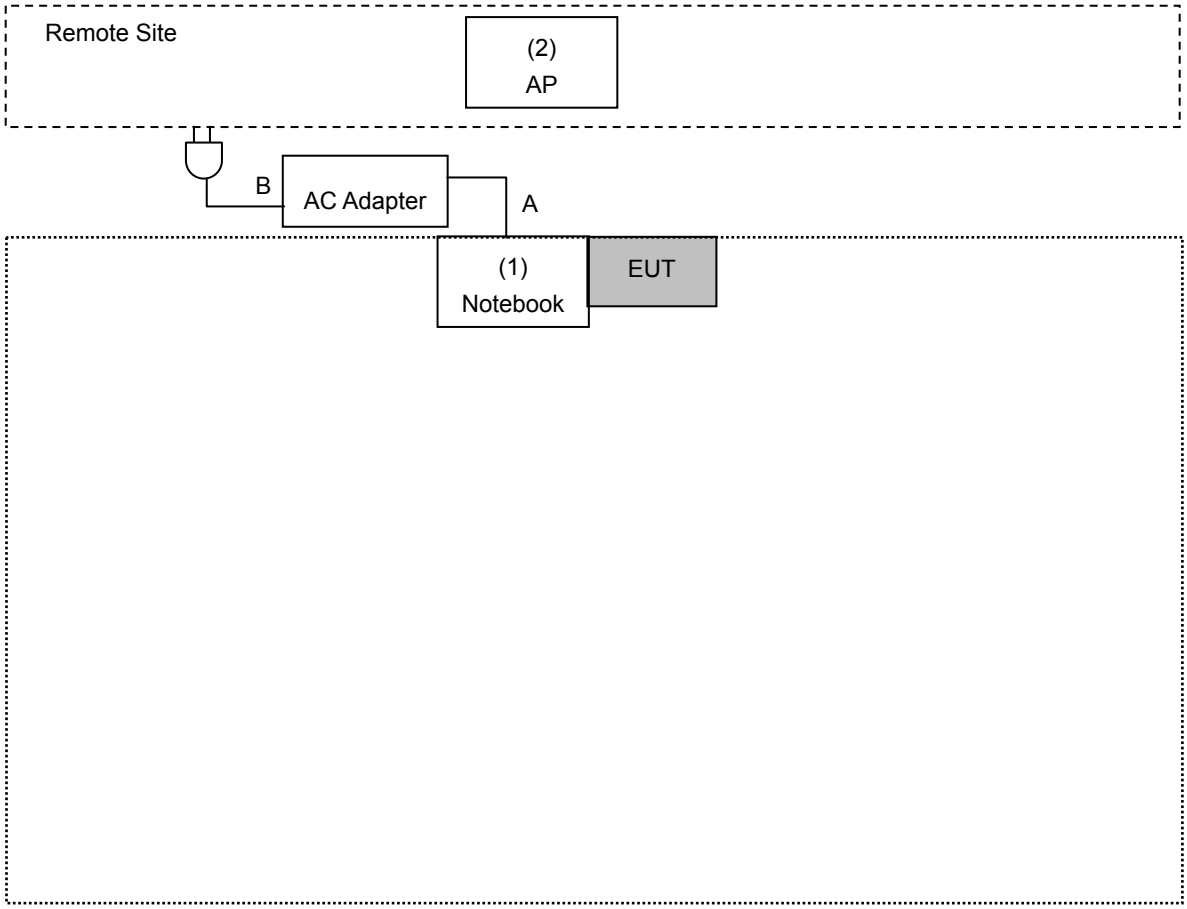
Mode 2 / Mode 3

1	Setup the EUT and simulators as shown on 3.3.
2	Turn on the power of all equipment.
3	Notebook link to AP by EUT.
4	Data will be communicated between Notebook and AP through EUT.
5	Start to test and get the worst reading.

Measurement Software			
No.	Description	Software	Version
1	Conducted Emission	EZ EMC	ATL-ITC-3A1-1
2	Radiated Emission _ Below 1GHz	EZ EMC	ATL-03A1-1
3	Radiated Emission _ Above 1GHz	EZ EMC	ATL-03A1
4	RS	EMC-RS	2.0.1.2

3.3. Configuration of Test System Details

Mode 2 / Mode 3



Signal Cable Type		Signal Cable Description
A	DC Power Cable	Non-Shielded, 1.8m
B	AC Power Cable	Non-Shielded, 1.8m

Devices Description					
Product		Manufacturer	Model Number	Serial Number	Power Cord
1	Notebook	DELL	LAPTITU	25627158361	Non-Shielded, 1.8m
2	AP	ASUS	MSQ-RTAC66U	D1IAGG000126	Non-Shielded, 1.8m

3.4. Test Site Environment

Items	Test Item	Required (IEC 60068-1)	Actual
Temperature (°C)	Conducted Emission	15-35	26.0
Humidity (%RH)		25-75	60.0
Barometric pressure (mbar)		860-1060	950
Temperature (°C)	Radiated Emission	15-35	26.0
Humidity (%RH)		25-75	60.0
Barometric pressure (mbar)		860-1060	950
Temperature (°C)	ESD	15-35	20.7
Humidity (%RH)		30-60	53.8
Barometric pressure (mbar)		860-1060	950
Temperature (°C)	RS	--	20.6
Humidity (%RH)		--	50.8
Barometric pressure (mbar)		--	950

4 Measurement Procedure

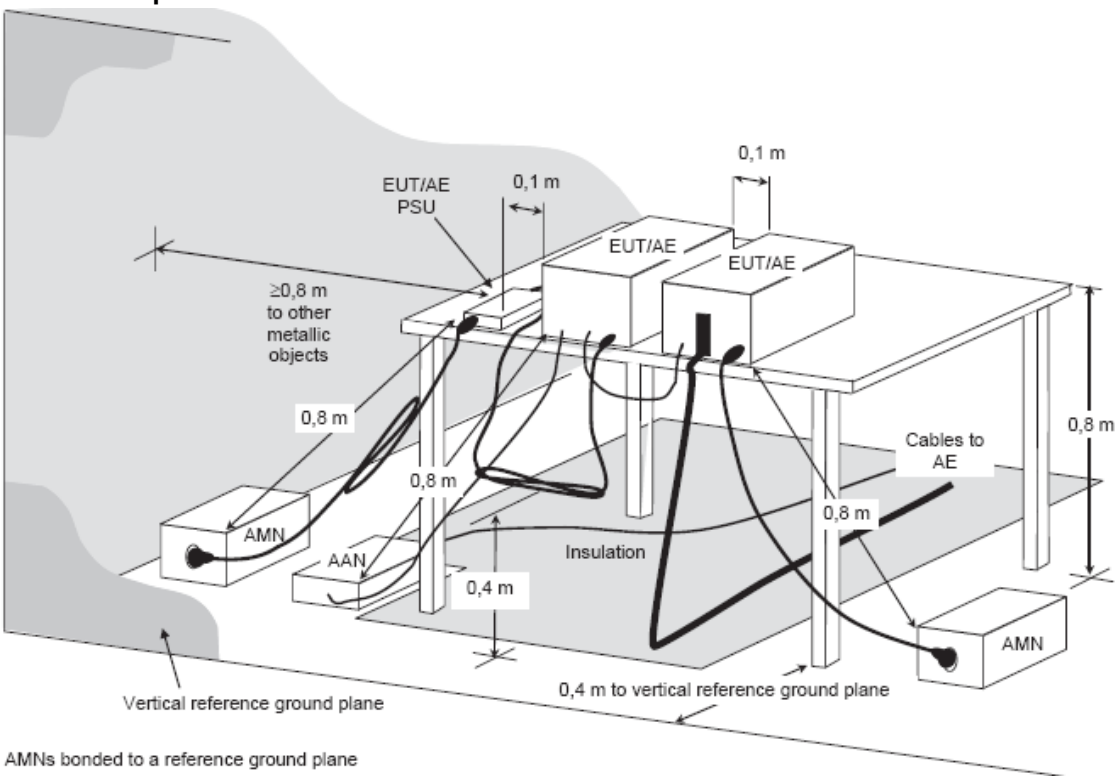
4.1. Conducted Emission

■ **Test Instruments**

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
Test Receiver	R&S	ESCI	100367	05/31/2016	1 year
LISN	R&S	ENV216	101040	03/22/2017	1 year
LISN	R&S	ENV216	101041	03/15/2017	1 year
Test Site	ATL	TE02	TE02	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

■ **Test Setup**



■ **Test Procedure**

A.C. Mains Conducted Interference

Procedure of Preliminary Test

The EUT and support equipment, if needed, were set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per EN 55032 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane, which has a less than 15 cm non-conductive covering to insulate the EUT from the ground plane.

All I/O cables were positioned to simulate typical actual usage as per EN 55032.

The EUT installed by AC main power, through a Line Impedance Stabilization Network (LISN), which was supplied power source and was grounded to the ground plane.

All support equipment power by a second LISN.

The test program of the EUT was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.
The Receiver scanned from 150kHz to 30MHz for emissions in each of the test modes.
During the above scans, the emissions were maximized by cable manipulation.
The test mode(s) described in Item 3.1 were scanned during the preliminary test.
After the preliminary scan, we found the test mode described in Item 3.1 producing the highest emission level.
The worst configuration of EUT and cable of the above highest emission level were recorded for reference of the final test.

Procedure of Final Test

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.
A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.
The test data of the worst-case condition(s) was recorded.
Cables connecting to AE located outside the measurement area shall drop directly to, but be insulated from, the RGP shall be used thickness of the insulation and shall not be more than 150 mm. However, cables which would normally be bonded to ground should be bonded to the RGP in accordance with normal practice or the manufacturer's recommendation

Telecommunication Port Conducted Interference

Selecting ISN for unscreened cable and screened cable to make measurement and Current probe for coaxial cable.
The port of the EUT was connected to the remote side support equipment through the ISN/Current Probe and communication in normal condition.
Making a overall range scan by using the test receiver controlled by controller and record at least six highest emissions for showing in the test report.
Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.
In case of measuring on the screened cable, the current limit shall be applied; otherwise the voltage limit should be applied.

4.2. Radiated Emission

■ **Test Instruments**

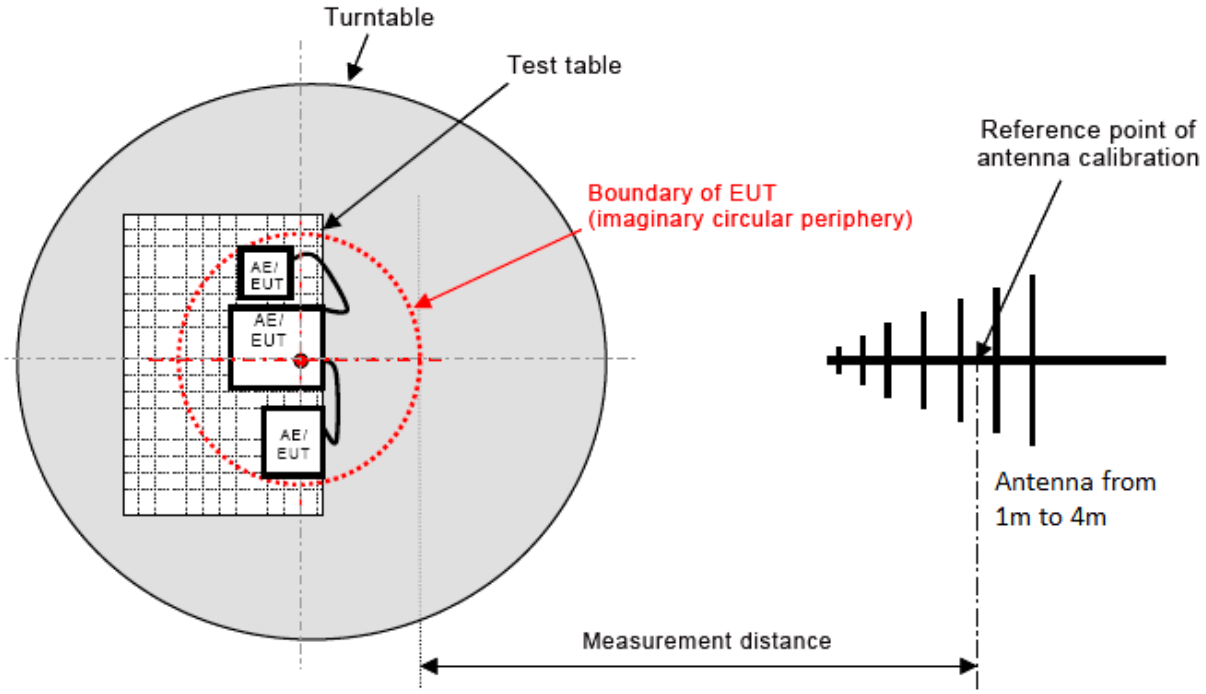
10 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
Amplifier	EMCI	EMC9135	980298	02/09/2017	1 year
Amplifier	EMCI	EMC9135	980299	02/17/2017	1 year
Test Receiver	R&S	ESCI	100722	10/28/2016	1 year
Test Receiver	R&S	ESCI	101000	12/12/2016	1 year
Broadband Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	670	02/13/2017	1 year
Broadband Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	671	03/01/2017	1 year
Test Site	ATL	TE06	TE06	10/30/2016	1 year

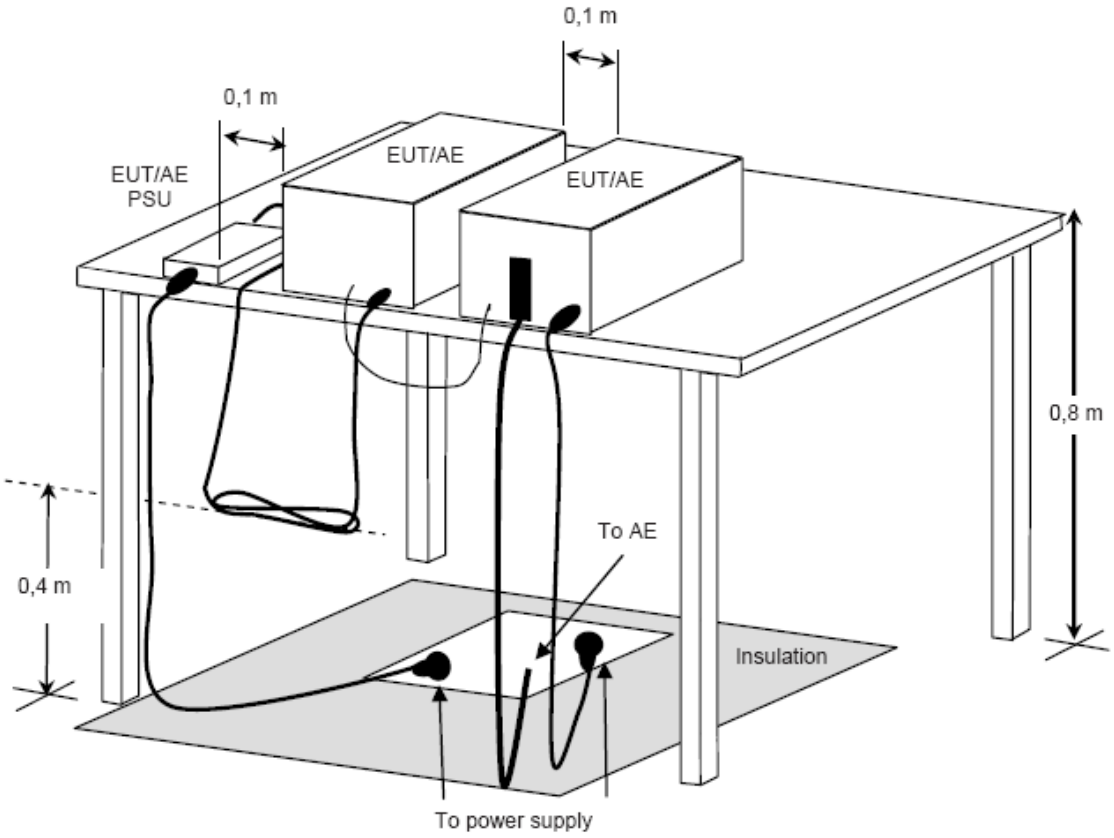
3 Meter Chamber (966-A)					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
RF Pre-selector	Agilent	N9039A	MY46520256	04/05/2017	1 year
Spectrum Analyzer	Agilent	E4446A	MY46180578	04/05/2017	1 year
Pre Amplifier	Agilent	8447D	2944A11119	01/12/2017	1 year
Pre Amplifier	EMCI	EMC012645SE	980289	01/16/2017	1 year
Pre Amplifier	EMCI	EMC2654045	980028	08/15/2016	1 year
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/06/2016	1 year
Broadband Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	416	10/13/2016	1 year
Test Site	ATL	TE01	TE01	02/20/2017	1 year

Note: N.C.R. = No Calibration Request.

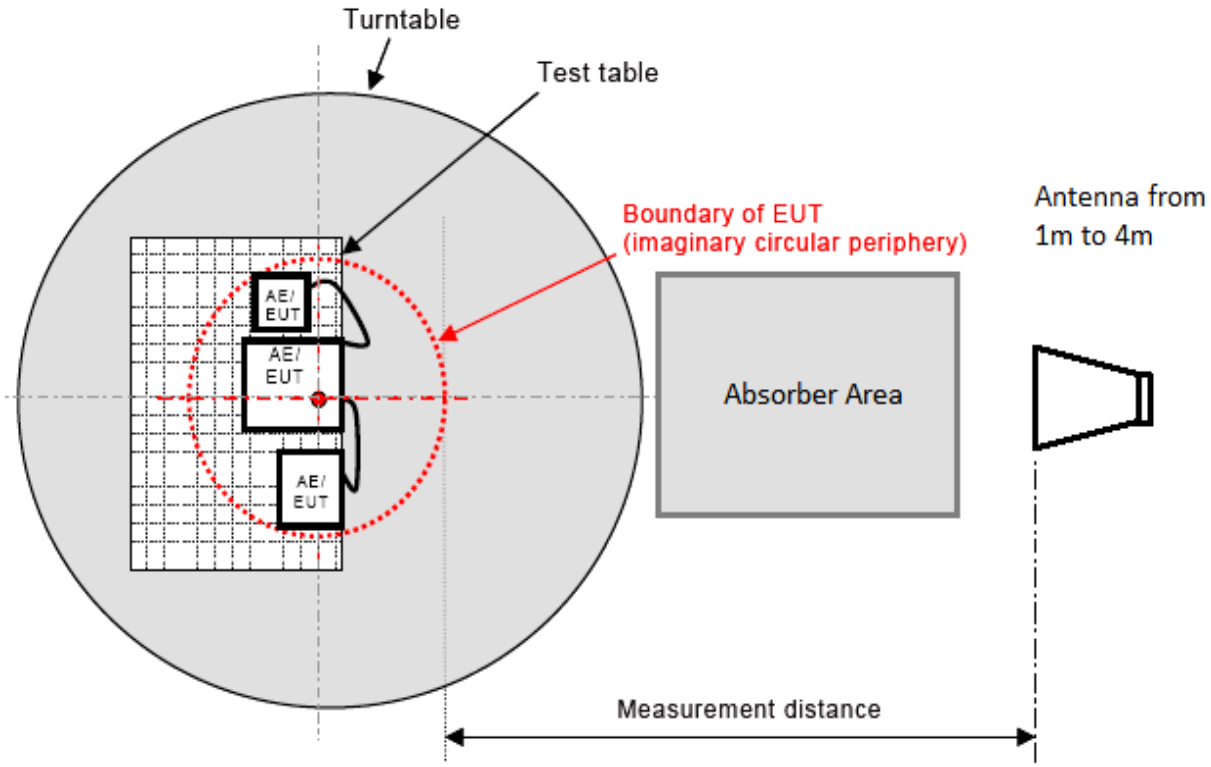
■ **Test Setup**

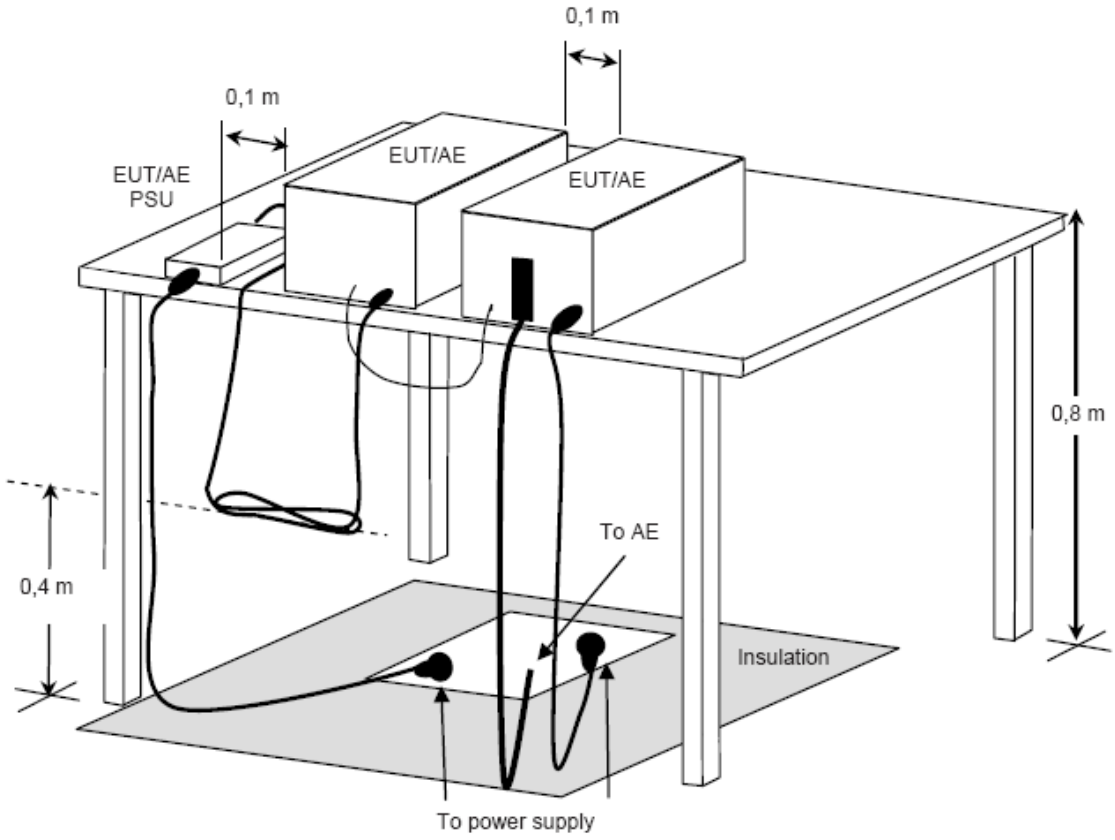
Below 1GHz





Above 1GHz


Turntable
Test table
Boundary of EUT
(imaginary circular periphery)
Antenna from
1m to 4m
AE/
EUT
AE/
EUT
AE/
EUT
Absorber Area
Measurement distance


0,1 m
0,1 m
EUT/AE
PSU
EUT/AE
EUT/AE
0,8 m
0,4 m
To AE
Insulation
To power supply

■ Test Procedure

Procedure of Preliminary Test

The equipment was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane. When the EUT is a floor standing equipment, it is placed on the ground plane which has a less than 150 mm non-conductive covering to insulate the EUT from the ground plane.

Support equipment, if needed, was placed as per EN 55032.

All I/O cables were positioned to simulate typical usage as per EN 55032.

The EUT received AC power source from the outlet socket under the turntable. All support equipment power received from another socket under the turntable.

The antenna was placed at 3 or 10 meter away from the EUT as stated in EN 55032 Annex C.2.2.4 Figure C.1 and Annex D Table D.1. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.

The Analyzer / Receiver quickly scanned from 30MHz to 6GHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level (For Below 1GHz) and keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response (For Above 1GHz).

The test mode(s) described in Item 3.1 were scanned during the preliminary test:

After the preliminary scan, we found the test mode described in Item 3.1 producing the highest emission level.

The worst configuration of EUT and cable, antenna position, polarization and turntable position of the above highest emission levels were recorded for the final test.

Procedure of Final Test

EUT and support equipment were set up on the turntable as per the configuration with highest emission level in the preliminary test.

The Analyzer / Receiver scanned from 30MHz to 6000MHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

Recording at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and Q.P. (For Below 1GHz) or Peak/Average (For Above 1GHz) reading is presented.

Cables connecting to AE located outside the measurement area shall drop directly to, but be insulated from, the RGP (or turntable where applicable), and then be routed directly to the place where they leave the test site. The thickness of the insulation shall not be more than 150 mm. However, cables which would normally be bonded to ground should be bonded to the RGP in accordance with normal practice or the manufacturer's recommendation

The test data of the worst-case condition(s) was recorded.

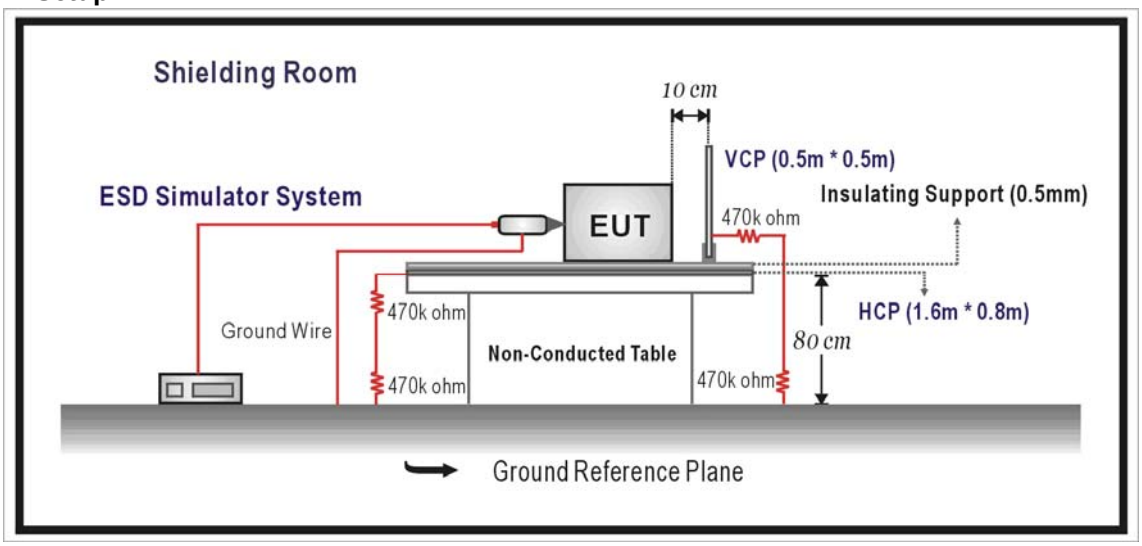
4.3. Electrostatic Discharge (ESD)

■ **Test Instrument**

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
Discharge Gun	Noiseken	ESS-2002	ESS05Y4736	05/16/2016	1 year
0.8m Height Wooden Table	N/A	N/A	N/A	N.C.R.	-----
Test Site	ATL	TE04	TE04	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

■ **Setup**



■ Test Procedure

The discharges shall be applied in two ways:

a) Contact discharges to the conductive surfaces and coupling planes:
The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. One of the test points shall be subjected to at least 50 indirect discharges to the center of the front edge of the Horizontal Coupling Plane (HCP). The remaining three test points shall each receive at least 50 direct contact discharges. If no direct contact test point be available, then at least 200 indirect discharges shall be applied in the indirect mode. Test shall be performed at a maximum repetition rate of one discharge per second.

b) Air discharges at slots and apertures and insulating surfaces:
On those parts of the EUT where it is not possible to perform contact discharge testing, the equipment should be investigated to identify user accessible points where breakdown may occur. Such points are tested using the air discharge method. This investigation should be restricted to those area normally handled by the user. A minimum of 10 single air discharges shall be applied to the selected test point for each such area.

The basic test procedure was in accordance with EN 61000-4-2:

a) The EUT was located 0.1 m minimum from all side of the HCP (dimensions 1.6m x 0.8m).

b) The support units were located another table 30 cm away from the EUT, but direct support unit was/were located at same location as EUT on the HCP and keep at a distance of 10 cm with EUT.

c) The time interval between two successive single discharges was at least 1 second.

d) Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.

e) Air discharges were applied with the round discharge tip of the discharge electrode approaching the EUT as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator was removed from the EUT and re-triggered for a new single discharge. The test was repeated until all discharges were complete.

f) At least ten single discharges (in the most sensitive polarity) were applied at the front edge of each HCP opposite the center point of each unit of the EUT and 0.1 meters from the front of the EUT. The long axis of the discharge electrode was in the plane of the HCP and perpendicular to its front edge during the discharge.

g) At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the Vertical Coupling Plane (VCP) in sufficiently different positions that the four faces of the EUT were completely illuminated. The VCP (dimensions 0.5m x 0.5m) was placed vertically to and 0.1 meters from the EUT.

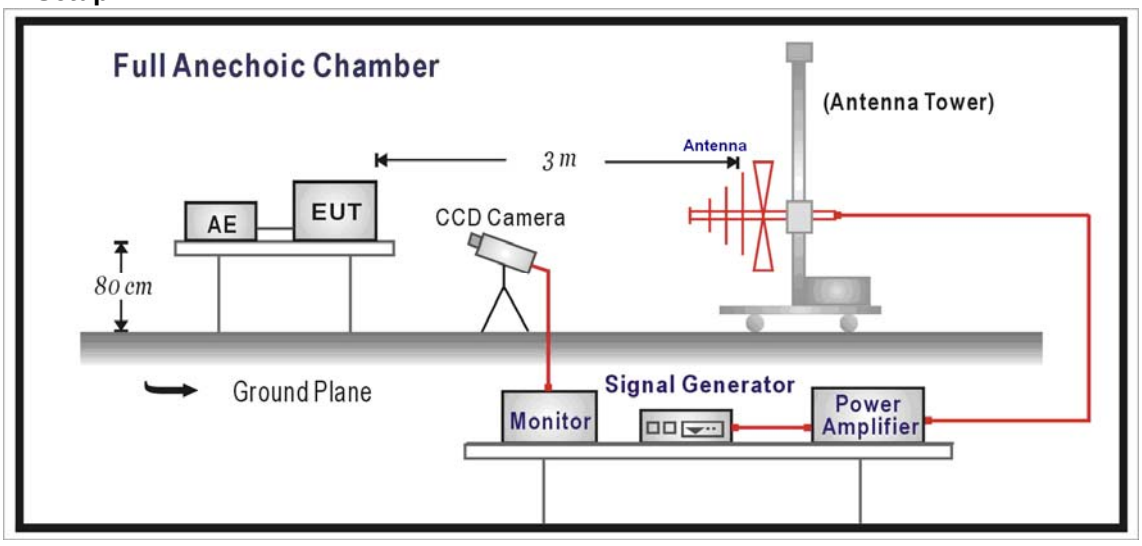
4.4. Radiated Electromagnetic Field (RS)

■ **Test Instrument**

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
SMB 100A SIGNAL GENERATOR	R&S	SMB100A	100724	03/11/2016	1 year
NRP-Z91 POWER SENSOR	R&S	NRP-Z91	100611	07/06/2016	1 year
NRP-Z91 POWER SENSOR	R&S	NRP-Z91	100613	07/06/2016	1 year
NRP POWER METER	R&S	NRP	101591	07/18/2016	1 year
Solid State Power Amplifier	R&K	GA020M102-5454F	830140	N.C.R.	-----
Direction Coupler	WERLATONE	C8686-714	109646	N.C.R.	-----
Signal Generator Module	R&S	SM300 Module	102209	N.C.R.	-----
Broad-Band Horn Antenna	Schwarzbeck Mess-Elektronik	BBHA 9120	BBHA 9120 E388	N.C.R.	-----
Test Site	ATL	TE07	888009	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

■ **Setup**



■ Test Procedure

The test procedure was in accordance with EN 61000-4-3

a) The testing was performed in a fully anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.

b) The frequency range is swept from 80-6000 MHz, with the signal 80% amplitude modulated with a 1kHz sine-wave. The rate of sweep did not exceed 1.5 x 10^{-3} decade/s, where the frequency range is swept incrementally, the step size was 1% of preceding frequency value.

c) The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.

d) The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

5 Test Results

5.1. Conducted Emission

■ **Limit**

AC mains power input/output ports limit：

EN 55032				
Frequency (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

Note: (1) The lower limit shall apply at the transition frequencies.

(2) The limit decreases in line with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

DC power input/output ports limit：

Frequency (MHz)	Quasi-peak (dBuV)	Average (dBuV)
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

Telecommunication port limits:

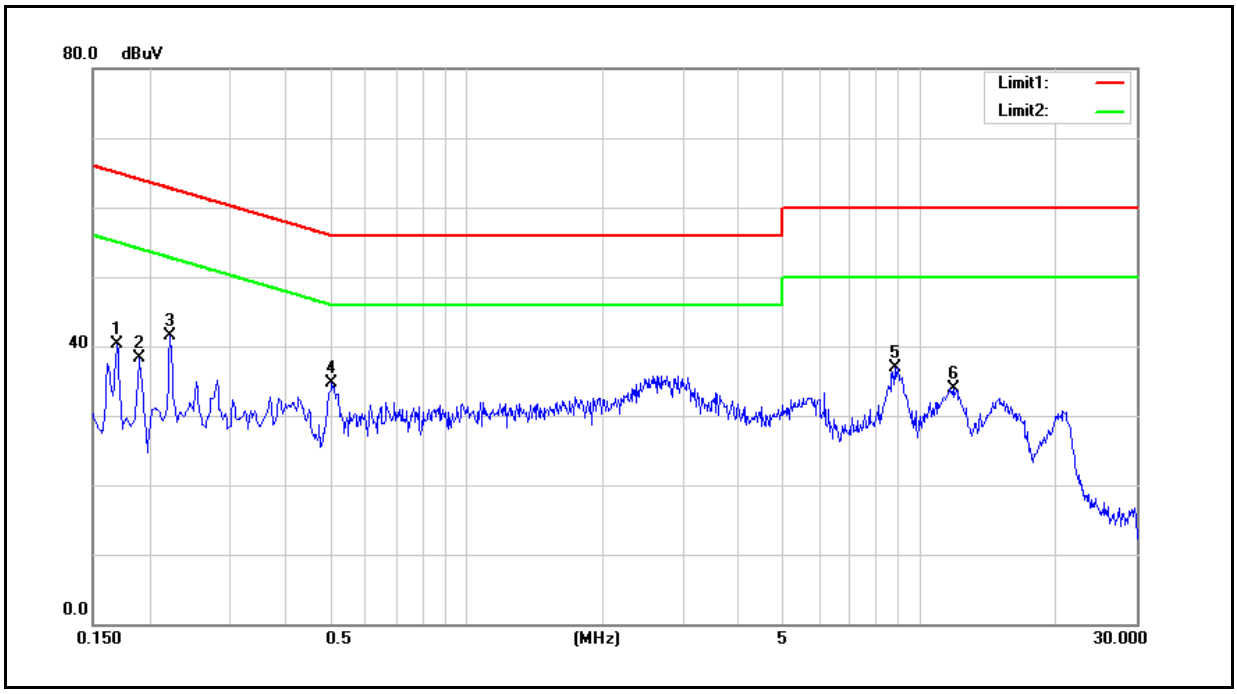
EN 55032								
Requirement (MHz)	Class A Equipment				Class B Equipment			
	Voltage Limit (dBμV)		Current Limit (dBμA)		Voltage Limit (dBμV)		Current Limit (dBμA)	
	QP	Avg.	QP	Avg.	QP	Avg.	QP	Avg.
0.15 to 0.50	97 to 87	84 to 74	53 to 43	40 to 30	84 to 74	74 to 64	40 to 30	30 to 20
0.50 to 30	87	74	43	30	74	64	30	20

Limits for conducted emissions of equipment intended to be used in telecommunication centres only:

Frequency (MHz)	Quasi-peak (dBuV)	Average (dBuV)
0.15 - 0.5	79	66
0.50 - 30.0	73	60

■ Test Result

Test Standard:	EN 55032	Power Line:	L1
Test Mode:	Mode 2	Test Power:	AC 100V/50Hz
Description:			

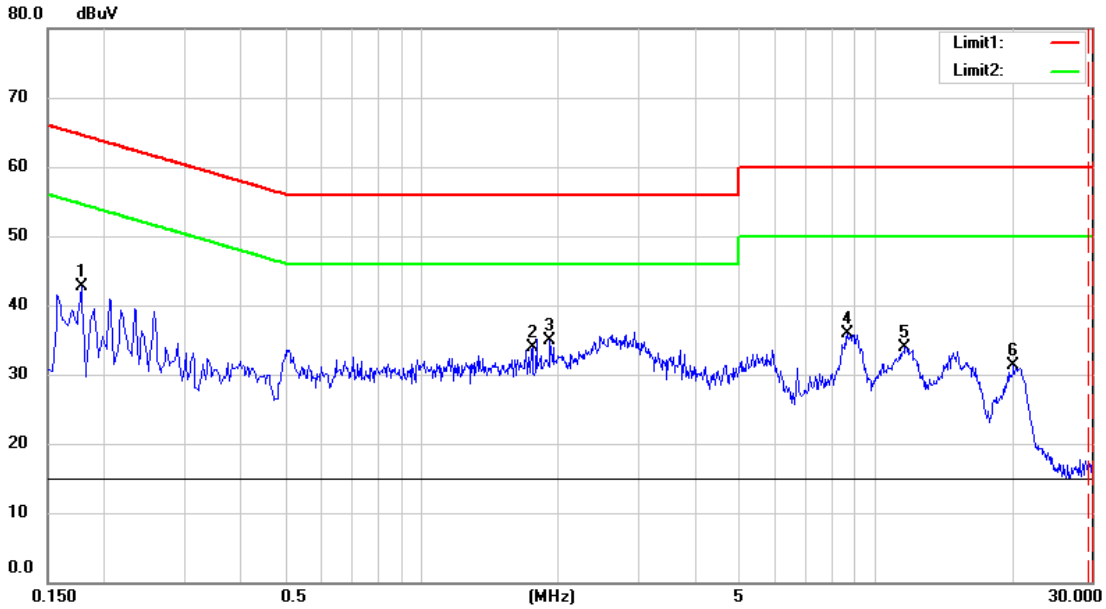


No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1700	29.77	15.58	9.54	39.31	25.12	64.96	54.96	-25.65	-29.84	Pass
2	0.1900	26.04	15.01	9.53	35.57	24.54	64.04	54.04	-28.47	-29.50	Pass
3	0.2220	23.64	14.84	9.53	33.17	24.37	62.74	52.74	-29.57	-28.37	Pass
4	0.5060	22.30	17.55	9.55	31.85	27.10	56.00	46.00	-24.15	-18.90	Pass
5	8.7820	22.46	17.11	9.82	32.28	26.93	60.00	50.00	-27.72	-23.07	Pass
6	11.8100	19.99	14.76	9.86	29.85	24.62	60.00	50.00	-30.15	-25.38	Pass

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

Test Standard:	EN 55032	Power Line:	N
Test Mode:	Mode 2	Test Power:	AC 100V/50Hz
Description:			

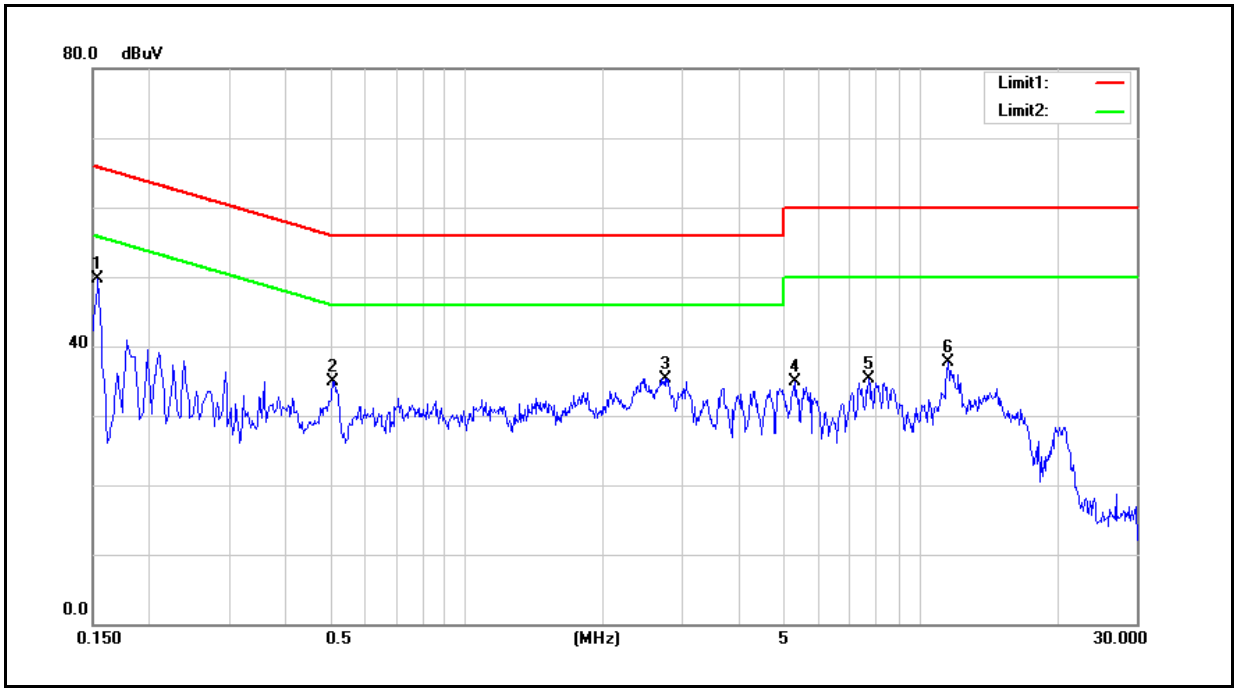


No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1780	27.73	15.60	9.63	37.36	25.23	64.58	54.58	-27.22	-29.35	Pass
2	1.7460	19.29	14.77	9.72	29.01	24.49	56.00	46.00	-26.99	-21.51	Pass
3	1.9260	19.84	15.28	9.73	29.57	25.01	56.00	46.00	-26.43	-20.99	Pass
4	8.6980	22.04	16.43	9.93	31.97	26.36	60.00	50.00	-28.03	-23.64	Pass
5	11.6780	19.73	14.65	10.01	29.74	24.66	60.00	50.00	-30.26	-25.34	Pass
6	20.1700	16.22	11.31	10.20	26.42	21.51	60.00	50.00	-33.58	-28.49	Pass

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

Test Standard:	EN 55032	Power Line:	L1
Test Mode:	Mode 3	Test Power:	AC 230V/50Hz
Description:			

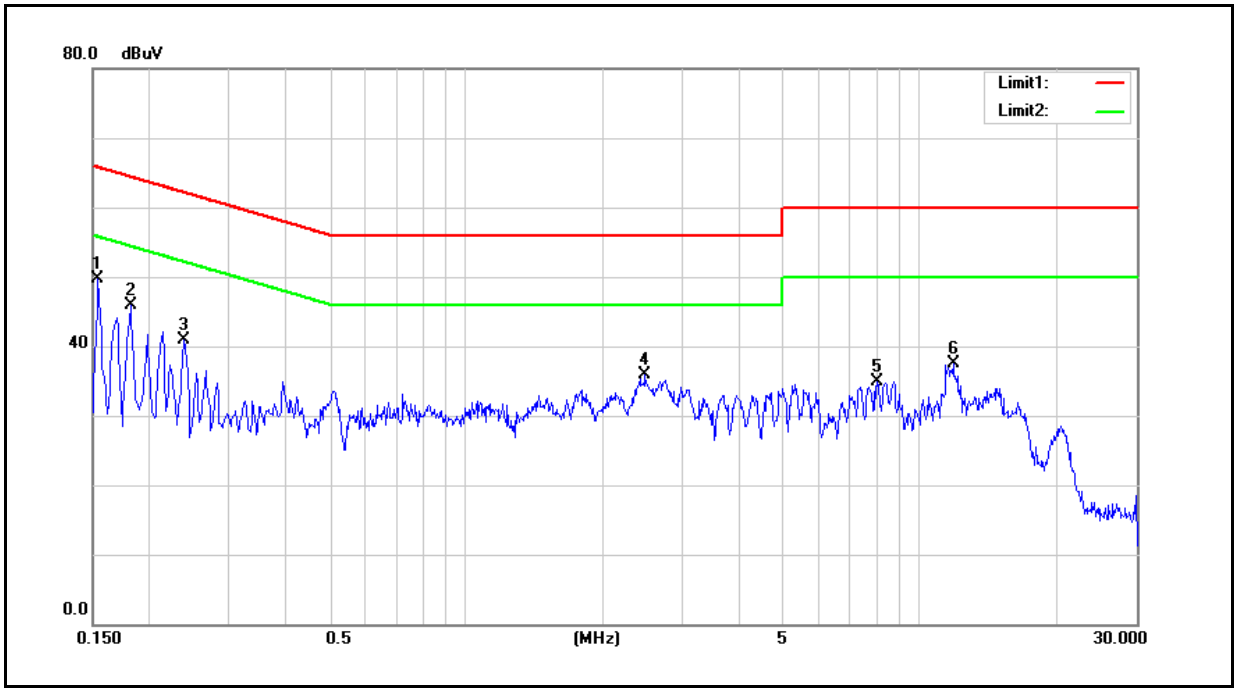


No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1540	32.31	16.89	9.54	41.85	26.43	65.78	55.78	-23.93	-29.35	Pass
2	0.5100	21.23	16.80	9.55	30.78	26.35	56.00	46.00	-25.22	-19.65	Pass
3	2.7500	22.27	17.62	9.66	31.93	27.28	56.00	46.00	-24.07	-18.72	Pass
4	5.2900	21.02	16.07	9.73	30.75	25.80	60.00	50.00	-29.25	-24.20	Pass
5	7.7060	21.03	16.43	9.79	30.82	26.22	60.00	50.00	-29.18	-23.78	Pass
6	11.5500	22.43	17.22	9.86	32.29	27.08	60.00	50.00	-27.71	-22.92	Pass

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

Test Standard:	EN 55032	Power Line:	N
Test Mode:	Mode 3	Test Power:	AC 230V/50Hz
Description:			



No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.1540	32.27	16.65	9.63	41.90	26.28	65.78	55.78	-23.88	-29.50	Pass
2	0.1820	29.19	15.57	9.63	38.82	25.20	64.39	54.39	-25.57	-29.19	Pass
3	0.2380	23.47	14.69	9.63	33.10	24.32	62.17	52.17	-29.07	-27.85	Pass
4	2.4820	22.20	17.99	9.74	31.94	27.73	56.00	46.00	-24.06	-18.27	Pass
5	8.0580	21.01	16.19	9.91	30.92	26.10	60.00	50.00	-29.08	-23.90	Pass
6	11.8540	22.47	17.53	10.02	32.49	27.55	60.00	50.00	-27.51	-22.45	Pass

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

5.2. Radiated Emission

■ **Limit**

Frequency (MHz)	dBuV/m (Distance 10m)	
	Class A	Class B
30 ~ 230	40	30
230 ~ 1000	47	37

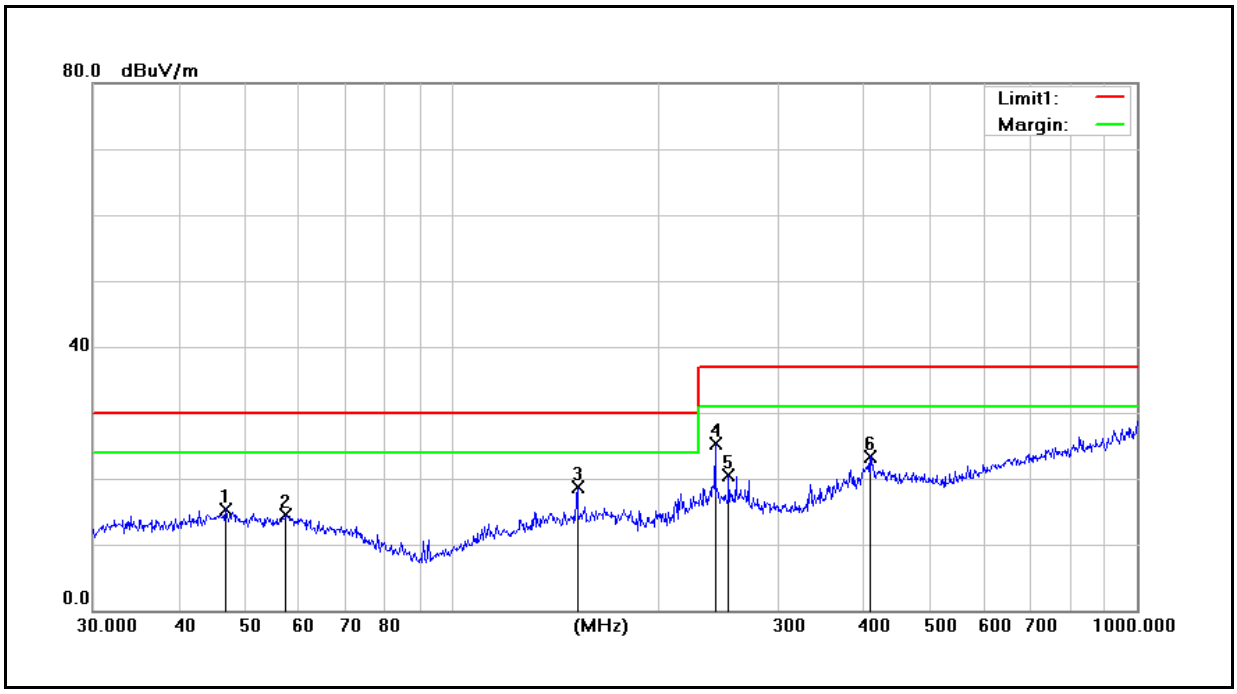
Note: The lower limit shall apply at the transition frequencies.

Frequency (MHz)	dBuV/m (Distance 3m)			
	Class A		Class B	
	Average	Peak	Average	Peak
1000 ~ 3000	56	76	50	70
3000 ~ 6000	60	80	54	74

Note: The lower limit shall apply at the transition frequencies.

■ Test Result

Test Standard:	EN 55032	Test Distance:	10m
Test Mode:	Mode 2	Test Power:	AC 100V/50Hz
Measurement Range:	30MHz~1GHz	Ant.Polar.:	Horizontal

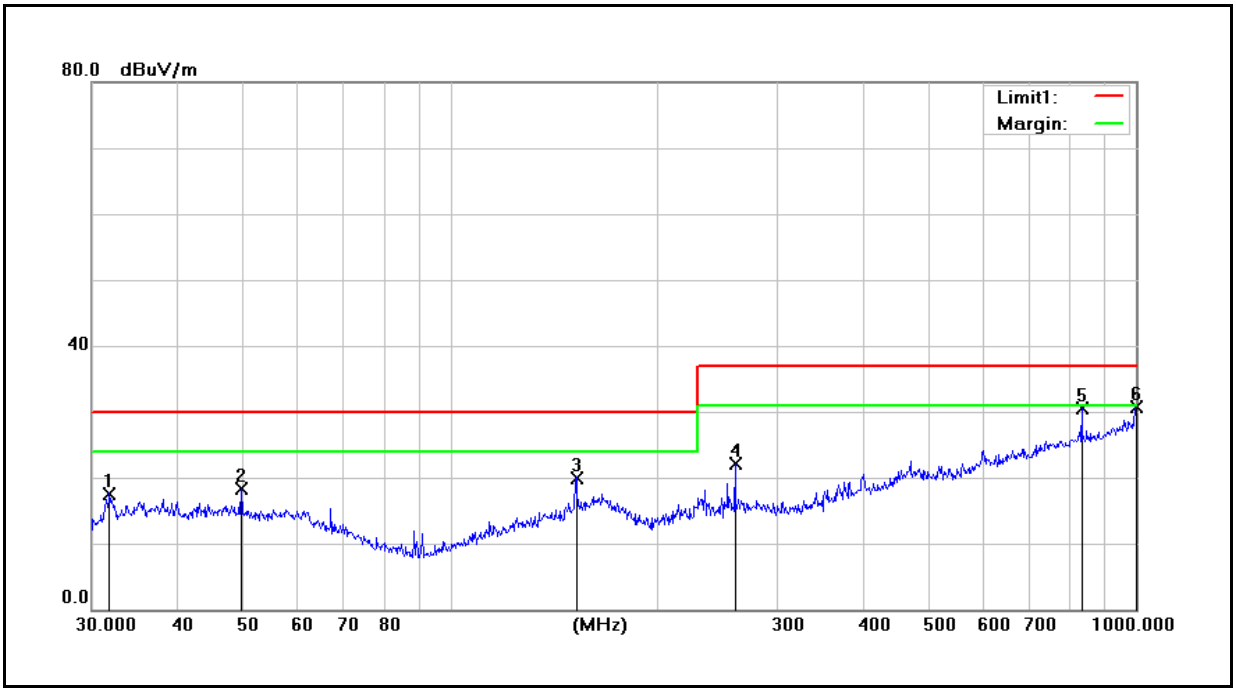


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	46.8303	31.95	-16.55	15.40	30.00	-14.60	400	258	QP
2	57.3923	31.45	-16.95	14.50	30.00	-15.50	400	151	QP
3	152.6641	34.52	-15.82	18.70	30.00	-11.30	400	93	QP
4	242.5253	42.30	-17.00	25.30	37.00	-11.70	400	106	QP
5	253.8367	37.15	-16.65	20.50	37.00	-16.50	300	0	QP
6	407.5145	35.72	-12.32	23.40	37.00	-13.60	200	46	QP

Note: 1. Result (dBuV/m) = Correction factor (dB/m) + Reading(dBuV).

2. Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Test Standard:	EN 55032	Test Distance:	10m
Test Mode:	Mode 2	Test Power:	AC 100V/50Hz
Measurement Range:	30MHz~1GHz	Ant.Polar.:	Vertical

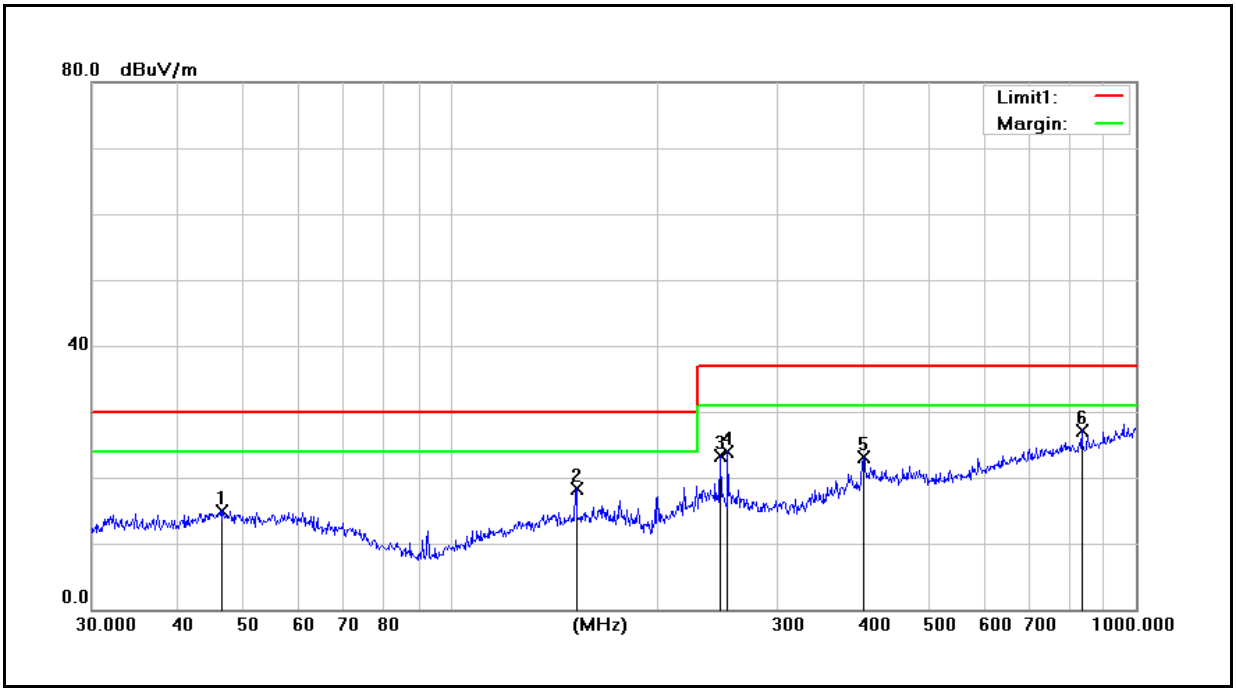


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	31.8427	34.99	-17.39	17.60	30.00	-12.40	100	187	QP
2	49.5328	33.86	-15.56	18.30	30.00	-11.70	100	0	QP
3	152.6641	34.61	-14.61	20.00	30.00	-10.00	101	0	QP
4	260.1444	37.20	-15.10	22.10	37.00	-14.90	157	0	QP
5	833.3171	32.80	-2.30	30.50	37.00	-6.50	201	360	QP
6	1000.0000	30.66	0.14	30.80	37.00	-6.20	200	195	QP

Note: 1. Result (dBuV/m) = Correction factor (dB/m) + Reading(dBuV).

2. Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Test Standard:	EN 55032	Test Distance:	10m
Test Mode:	Mode 3	Test Power:	AC 230V/50Hz
Measurement Range:	30MHz~1GHz	Ant.Polar.:	Horizontal

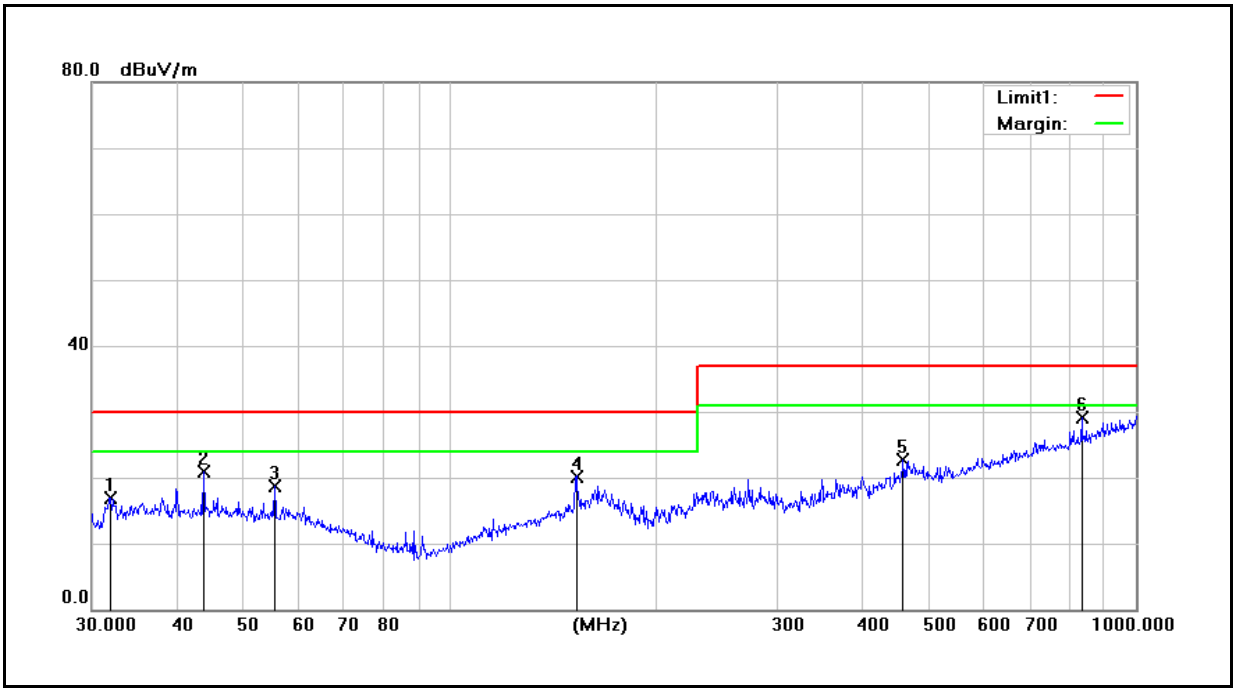


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	46.5030	31.57	-16.57	15.00	30.00	-15.00	300	1	QP
2	152.6641	34.12	-15.82	18.30	30.00	-11.70	400	60	QP
3	247.6820	40.13	-16.83	23.30	37.00	-13.70	400	64	QP
4	253.8367	40.65	-16.65	24.00	37.00	-13.00	400	159	QP
5	400.4320	35.72	-12.52	23.20	37.00	-13.80	200	95	QP
6	833.3171	32.45	-5.25	27.20	37.00	-9.80	400	87	QP

Note: 1. Result (dBuV/m) = Correction factor (dB/m) + Reading(dBuV).

2. Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Test Standard:	EN 55032	Test Distance:	10m
Test Mode:	Mode 3	Test Power:	AC 230V/50Hz
Measurement Range:	30MHz~1GHz	Ant.Polar.:	Vertical

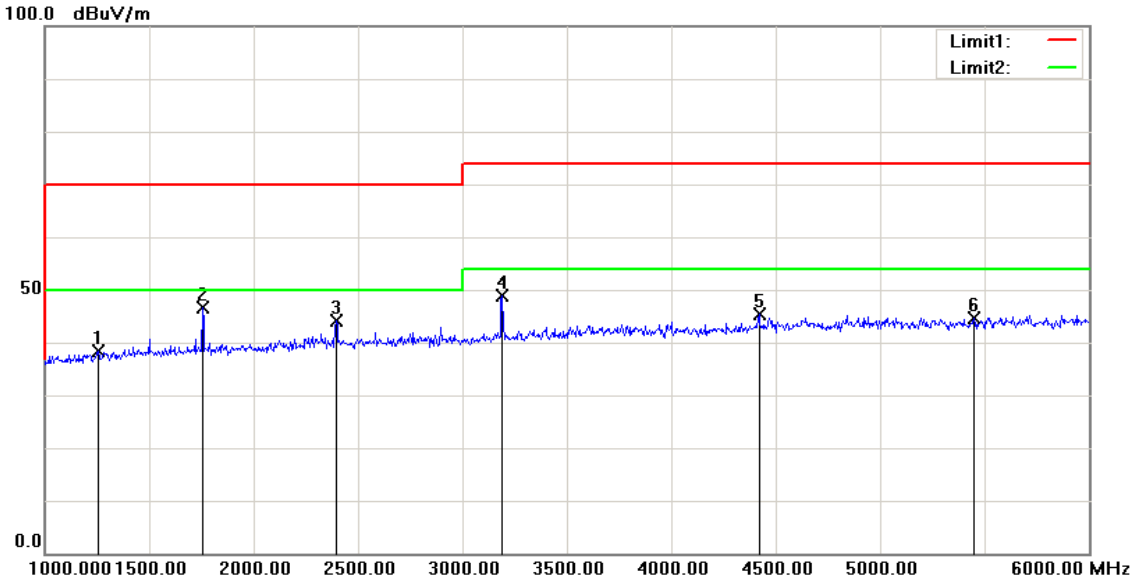


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	31.9546	34.28	-17.38	16.90	30.00	-13.10	100	0	QP
2	43.6584	36.86	-15.96	20.90	30.00	-9.10	300	2	QP
3	55.4147	34.51	-15.81	18.70	30.00	-11.30	301	0	QP
4	152.6641	34.81	-14.61	20.20	30.00	-9.80	100	109	QP
5	457.5073	31.49	-8.79	22.70	37.00	-14.30	400	115	QP
6	833.3171	31.40	-2.30	29.10	37.00	-7.90	240	360	QP

Note: 1. Result (dBuV/m) = Correction factor (dB/m) + Reading(dBuV).

2. Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Test Standard:	EN 55032	Test Distance:	3m
Test Mode:	Mode 2	Test Power:	AC 100V/50Hz
Measurement Range:	1GHz~6GHz	Ant.Polar.:	Horizontal

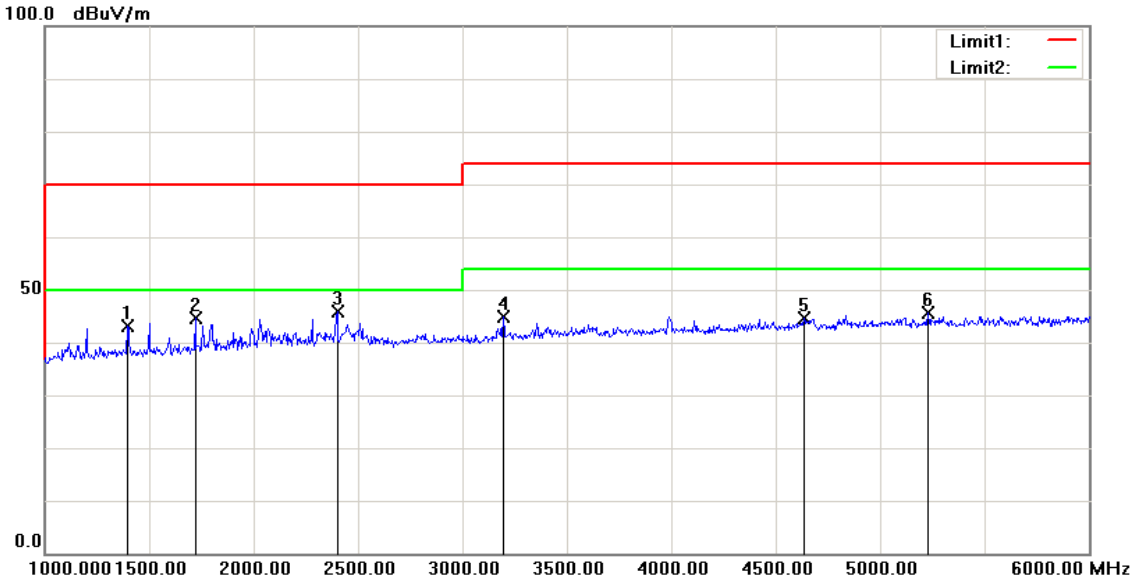


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	1255.000	56.99	-18.60	38.39	70.00	-31.61	114	247	peak
2	1755.000	63.03	-16.32	46.71	70.00	-23.29	100	62	peak
3	2395.000	58.13	-13.91	44.22	70.00	-25.78	100	244	peak
4	3190.000	60.51	-11.59	48.92	74.00	-25.08	100	157	peak
5	4420.000	53.59	-8.29	45.30	74.00	-28.70	100	306	peak
6	5450.000	50.73	-6.14	44.59	74.00	-29.41	100	59	peak

Note: 1. Result (dBuV/m) = Correction factor (dB/m) + Reading(dBuV).

2. Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Test Standard:	EN 55032	Test Distance:	3m
Test Mode:	Mode 2	Test Power:	AC 100V/50Hz
Measurement Range:	1GHz~6GHz	Ant.Polar.:	Vertical

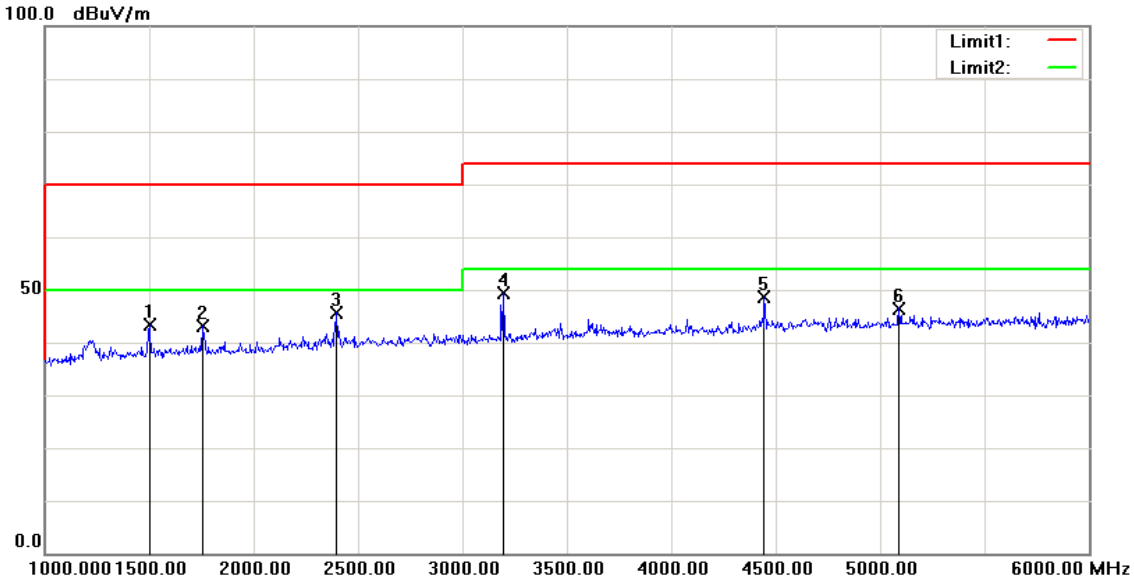


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	1395.000	60.90	-17.77	43.13	70.00	-26.87	100	229	peak
2	1720.000	61.14	-16.44	44.70	70.00	-25.30	100	47	peak
3	2400.000	59.85	-13.90	45.95	70.00	-24.05	100	62	peak
4	3195.000	56.46	-11.57	44.89	74.00	-29.11	100	318	peak
5	4635.000	52.32	-7.67	44.65	74.00	-29.35	100	27	peak
6	5230.000	51.97	-6.35	45.62	74.00	-28.38	120	166	peak

Note: 1. Result (dBuV/m) = Correction factor (dB/m) + Reading(dBuV).

2. Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Test Standard:	EN 55032	Test Distance:	3m
Test Mode:	Mode 3	Test Power:	AC 230V/50Hz
Measurement Range:	1GHz~6GHz	Ant.Polar.:	Horizontal

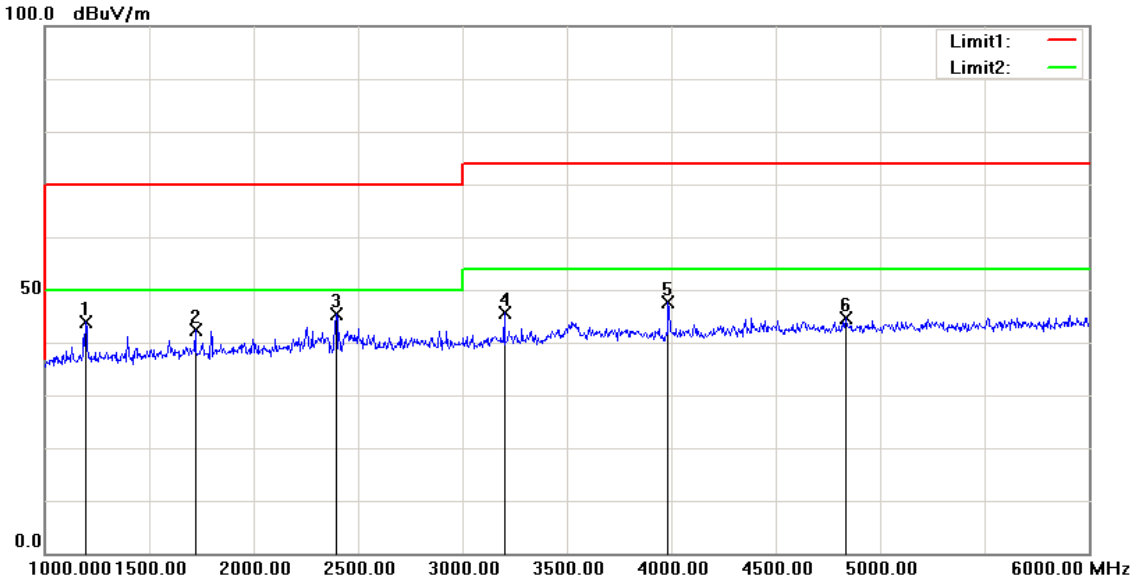


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	1500.000	60.41	-17.14	43.27	70.00	-26.73	200	266	peak
2	1755.000	59.48	-16.32	43.16	70.00	-26.84	100	71	peak
3	2395.000	59.52	-13.91	45.61	70.00	-24.39	100	305	peak
4	3195.000	60.85	-11.57	49.28	74.00	-24.72	100	253	peak
5	4445.000	56.79	-8.22	48.57	74.00	-25.43	120	342	peak
6	5090.000	52.98	-6.48	46.50	74.00	-27.50	100	186	peak

Note: 1. Result (dBuV/m) = Correction factor (dB/m) + Reading(dBuV).

2. Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

Test Standard:	EN 55032	Test Distance:	3m
Test Mode:	Mode 3	Test Power:	AC 230V/50Hz
Measurement Range:	1GHz~6GHz	Ant.Polar.:	Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	1195.000	62.84	-18.96	43.88	70.00	-26.12	100	55	peak
2	1720.000	58.71	-16.44	42.27	70.00	-27.73	100	162	peak
3	2395.000	59.38	-13.91	45.47	70.00	-24.53	100	83	peak
4	3200.000	57.26	-11.54	45.72	74.00	-28.28	100	331	peak
5	3985.000	57.01	-9.41	47.60	74.00	-26.40	100	6	peak
6	4835.000	51.76	-7.06	44.70	74.00	-29.30	100	185	peak

Note: 1. Result (dBuV/m) = Correction factor (dB/m) + Reading(dBuV).

2. Correction factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-Amplifier gain (dB).

5.3. Electrostatic Discharge (ESD)

■ Test Specification

EN 61000-4-2			
Environmental Phenomena	Units	Test Specification	Performance Criterion
Enclosure Port			
Electrostatic Discharge	kV (Charge Voltage)	±8 Air Discharge ±4 Contact Discharge	B

■ Test Result

Model Number	EW-7822UNC		
Test Item	Electrostatic Discharge		
Test Mode	Mode 3		
Date of Test	2016/08/30	Test Site	TE04

Air Discharge										
Test Points	Test Levels						Results			
	± 2 kV	Performance Criterion	± 4 kV	Performance Criterion	± 8 kV	Performance Criterion	Pass	Fail	Observation
USB Port	☒	☒A ☐B	☒	☒A ☐B	☒	☒A ☐B	☒	☐	---
Contact Discharge										
Test Points	Test Levels						Results			
	± 2 kV	Performance Criterion	± 4 kV	Performance Criterion	± 8 kV	Performance Criterion	Pass	Fail	Observation
---	☐	☐A ☐B	☐	☐A ☐B	☐	☐A ☐B	☐	☐	---

For the tested points to EUT, please refer to attached page.
(Blue arrow mark for Air Discharge and red arrow mark for Contact Discharge)

Discharge To Horizontal Coupling Plane								
Side of EUT	Test Levels				Results			
	± 2 kV	± 4 kV	± 6 kV	± 8 kV	Pass	Fail	Performance Criterion	Observation
Front	☒	☒	☐	☐	☒	☐	☒A ☐B	---
Back	☒	☒	☐	☐	☒	☐	☒A ☐B	---
Left	☒	☒	☐	☐	☒	☐	☒A ☐B	---
Right	☒	☒	☐	☐	☒	☐	☒A ☐B	---

Discharge To Vertical Coupling Plane								
Side of EUT	Test Levels				Results			
	± 2 kV	± 4 kV	± 6 kV	± 8 kV	Pass	Fail	Performance Criterion	Observation
Front	☒	☒	☐	☐	☒	☐	☒A ☐B	---
Back	☒	☒	☐	☐	☒	☐	☒A ☐B	---
Left	☒	☒	☐	☐	☒	☐	☒A ☐B	---
Right	☒	☒	☐	☐	☒	☐	☒A ☐B	---

Note 1: Criterion A: There was no change compared with initial operation during the test.

5.4. Radiated Electromagnetic Field (RS)

■ Test Specification

EN 61000-4-3			
Environmental Phenomena	Units	Test Specification	Performance Criterion
Enclosure Port			
Test Frequency Range RF Electromagnetic Field Amplitude Modulated	MHz V/m (Un-modulated, rms) % AM (1kHz)	80-6000 3 80	A

EUT tested in accordance with the specifications given by the standard of EN 61000-4-3.

Step : 1%

Step time : 3 Second

■ Test Result

Model Number	EW-7822UNC					
Test Item	Radiated Susceptibility					
Test Mode	Mode 3					
Date of Test	2017/04/21				Test Site	TE07
Min. level of Performance	Bluetooth	EUT link to Bluetooth headphones, engineer should be observed, the Data loss or not when active Bluetooth function.				
Frequency (MHz)	Polarity	Azimuth	Field Strength (V/m)	Performance Criterion	Test Result	Observation
80 ~ 6000	H / V	0	3	☒A ☐B	PASS	---
80 ~ 6000	H / V	90	3	☒A ☐B	PASS	---
80 ~ 6000	H / V	180	3	☒A ☐B	PASS	---
80 ~ 6000	H / V	270	3	☒A ☐B	PASS	---

Note 1: The testing performed is from lowest level up to the highest level as required by standard, but only highest level is shown on the report.

Criterion A: Operate as intended during and after the test

Criterion B: Operate as intended after the test

Criterion C: Loss/Error of function

6 Test Setup Photo

6.1. Conducted Emission

Test Mode:	Mode 2 / Mode 3
Description:	Front View



Description:	Back View



6.2. Radiated Emission

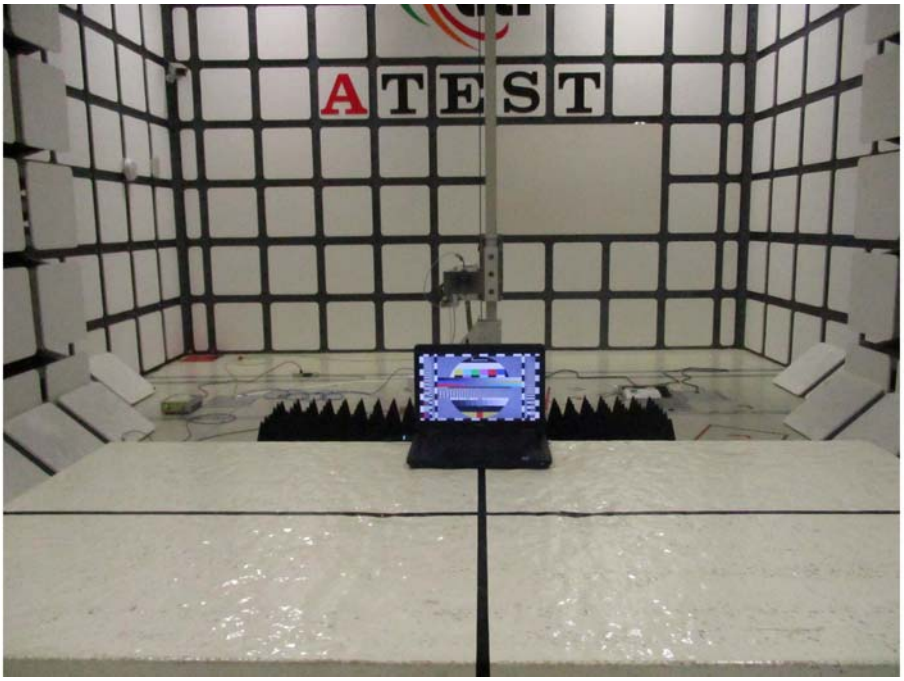
Test Mode:	Mode 2 / Mode 3
Description:	Below 1GHz _ Front View



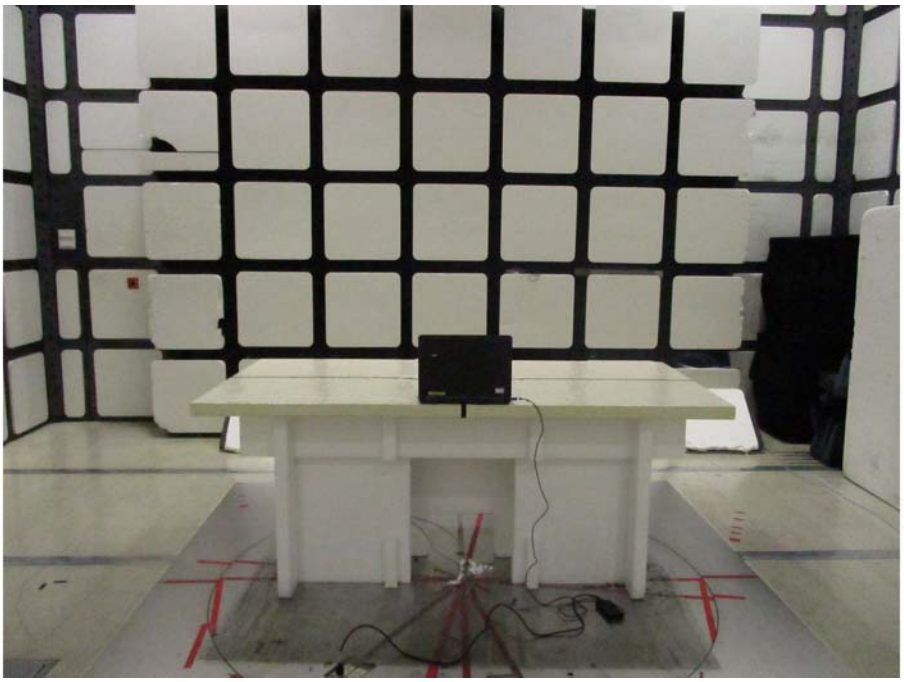
Description:	Below 1GHz _ Back View



Test Mode:	Mode 2 / Mode 3
Description:	Above 1GHz _ Front View



Description: Above 1GHz _ Back View

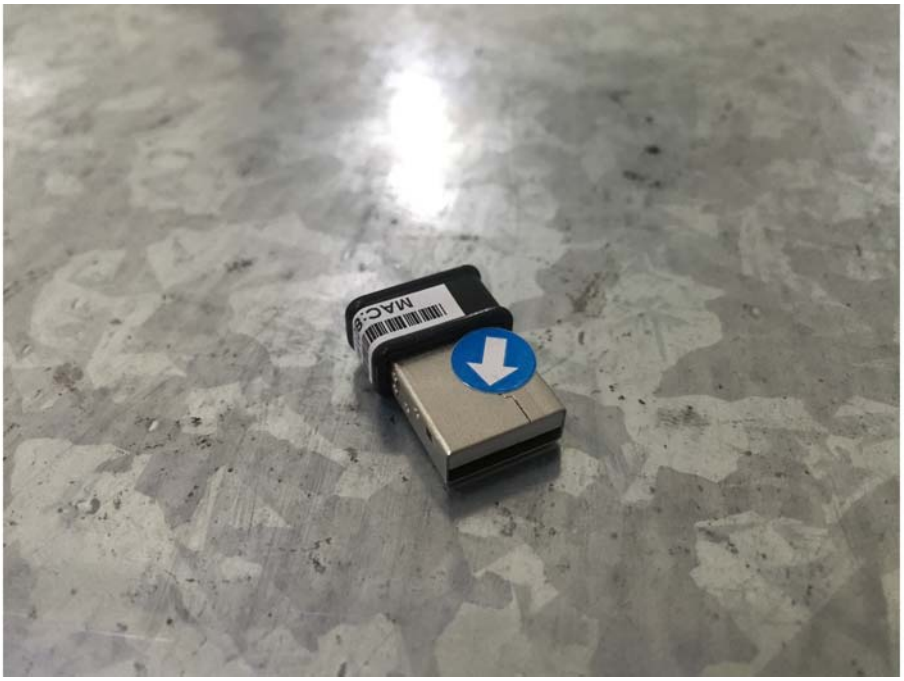


6.3. Electrostatic Discharge (ESD)

Test Mode:	Mode 3
Description:	Front View of ESD Test

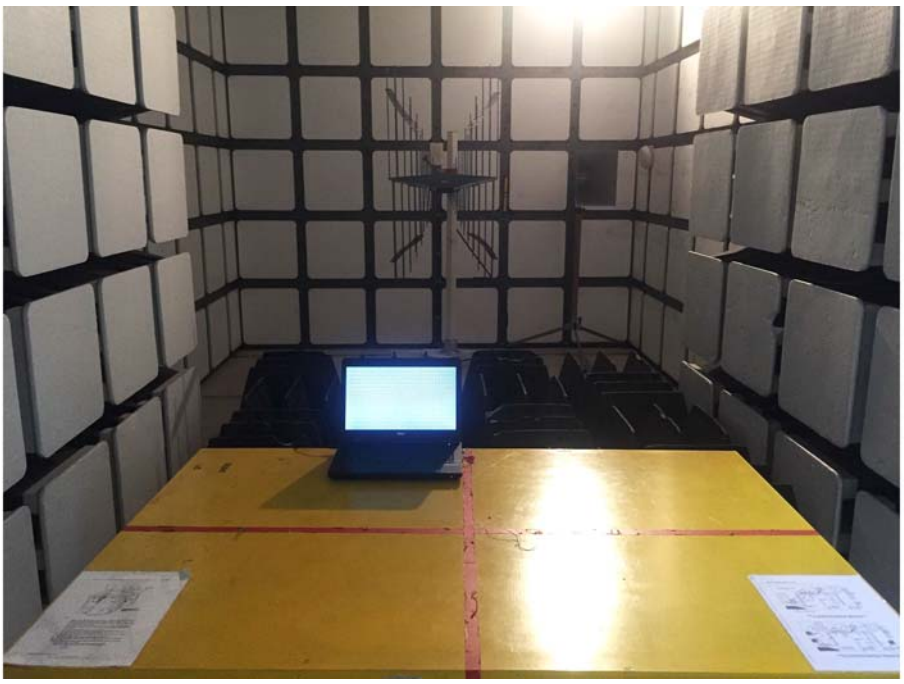


Description:	Close View of ESD Test



6.4. Radiated Electromagnetic Field (RS)

Test Mode:	Mode 3

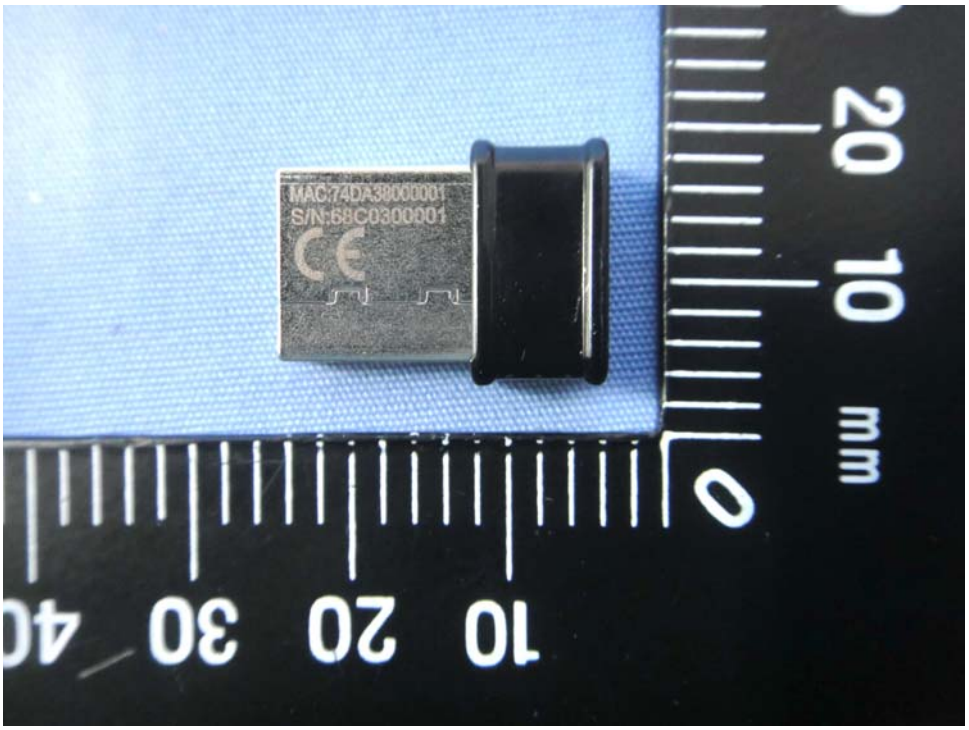


7 EUT Photograph

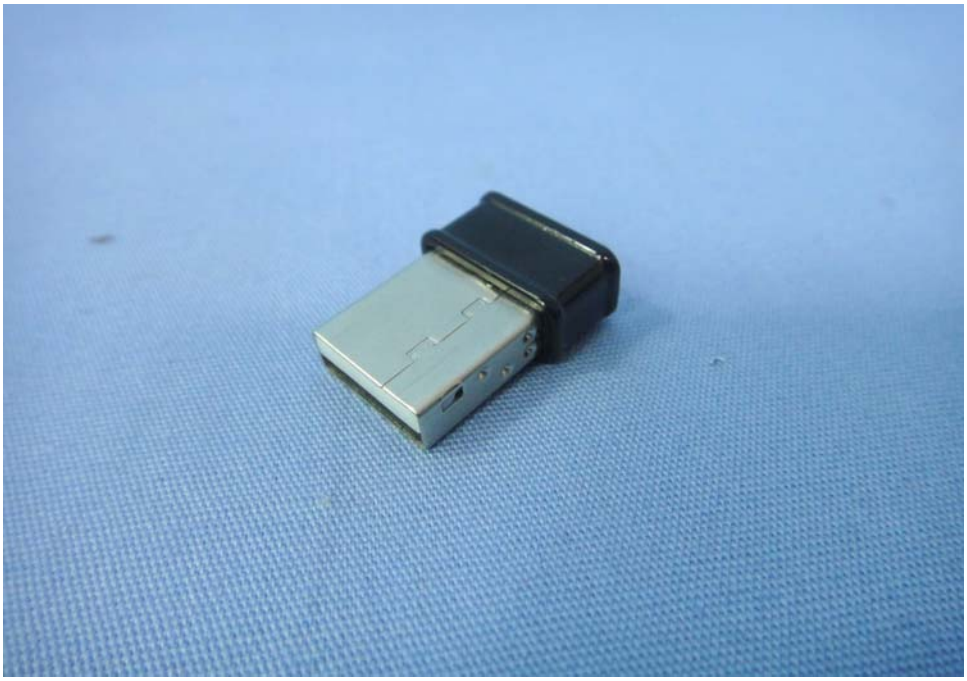
(1) EUT Photo



(2) EUT Photo



(3) EUT Photo



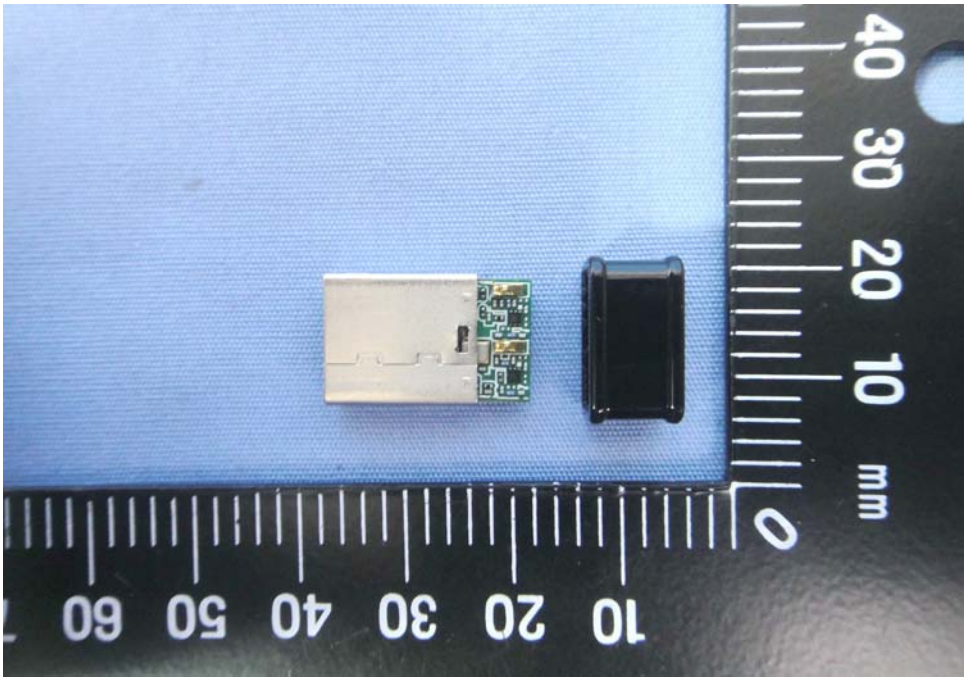
(4) EUT Photo



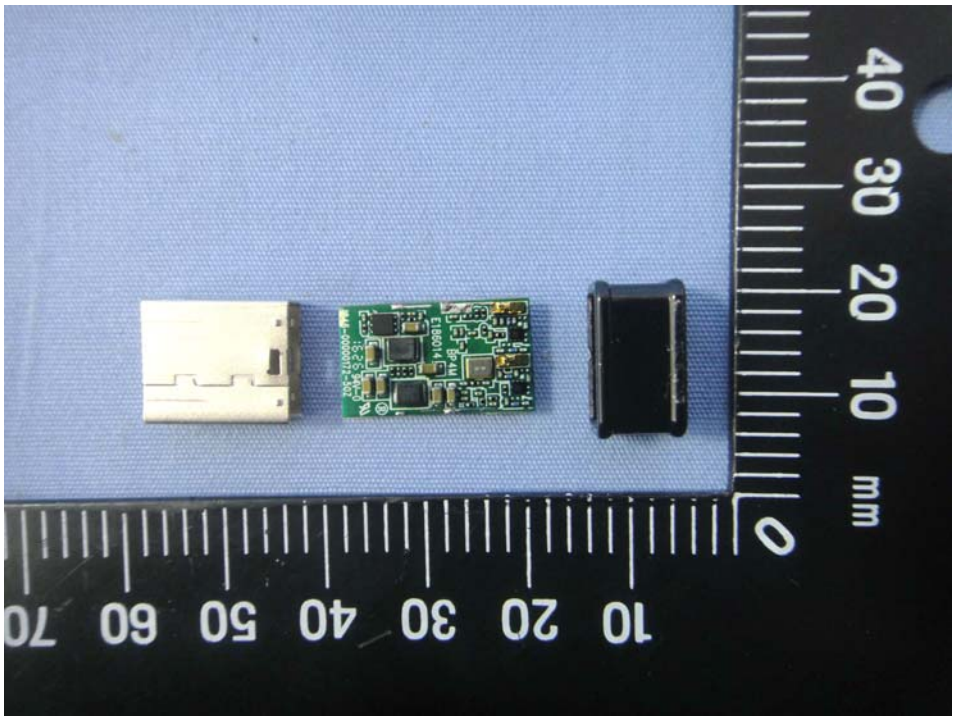
(5) EUT Photo



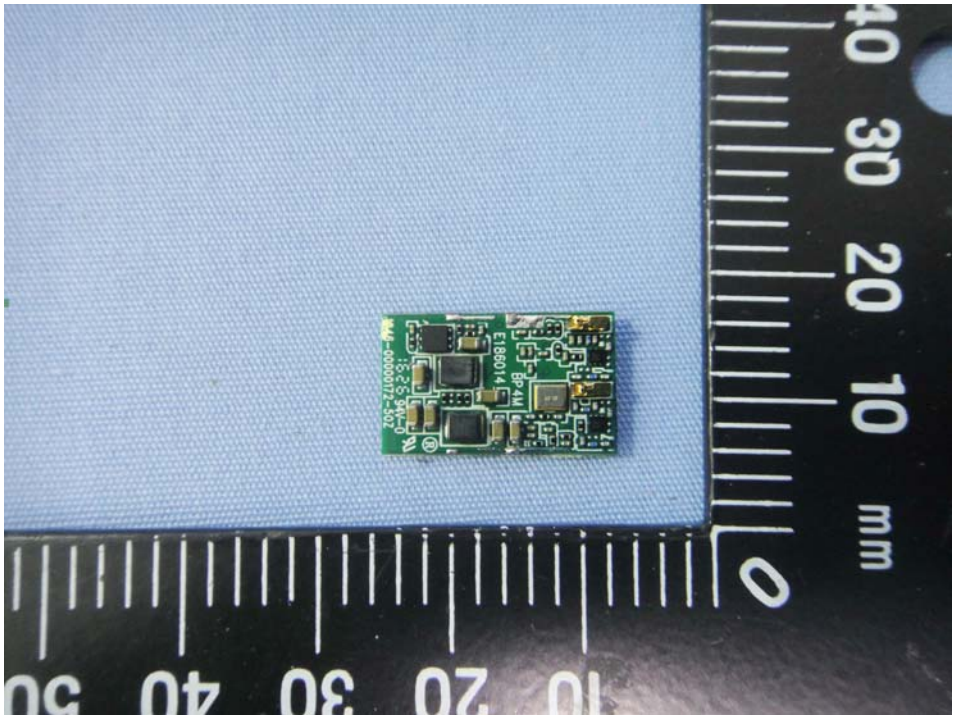
(6) EUT Photo



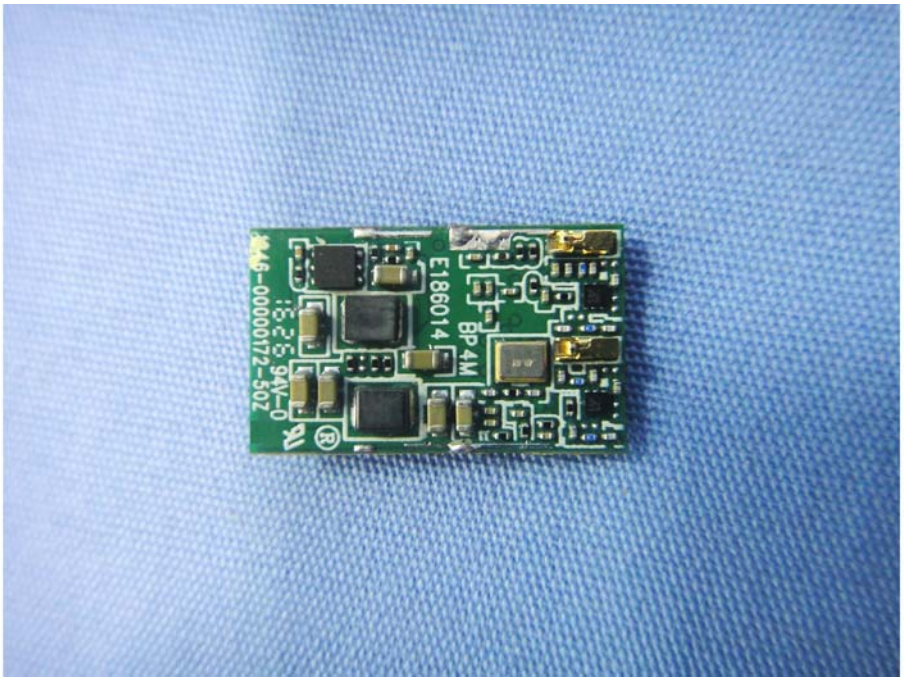
(7) EUT Photo



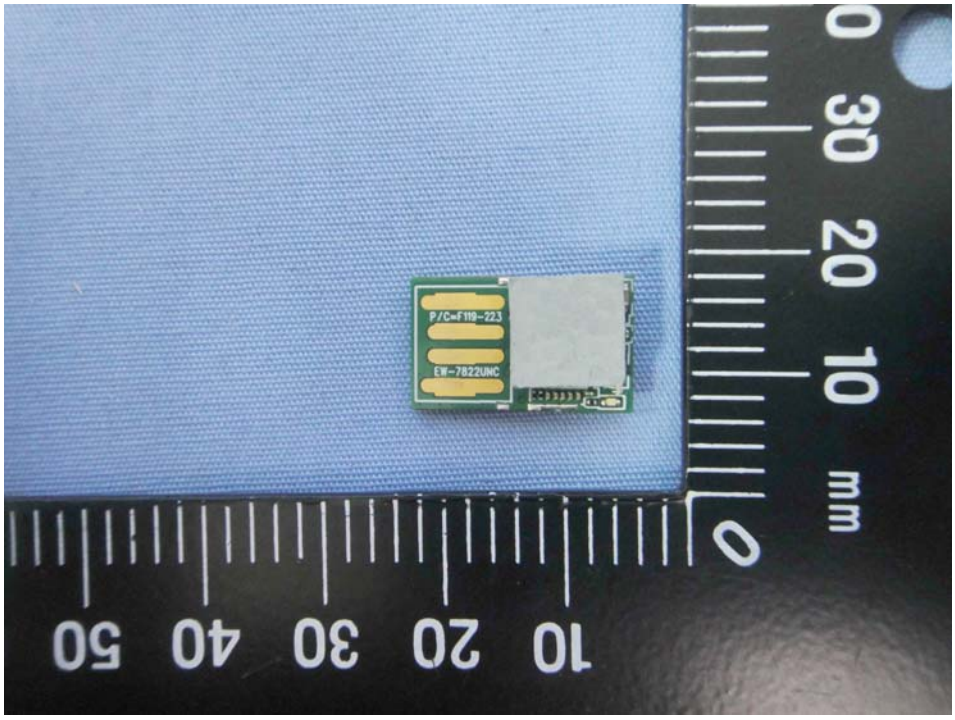
(8) EUT Photo



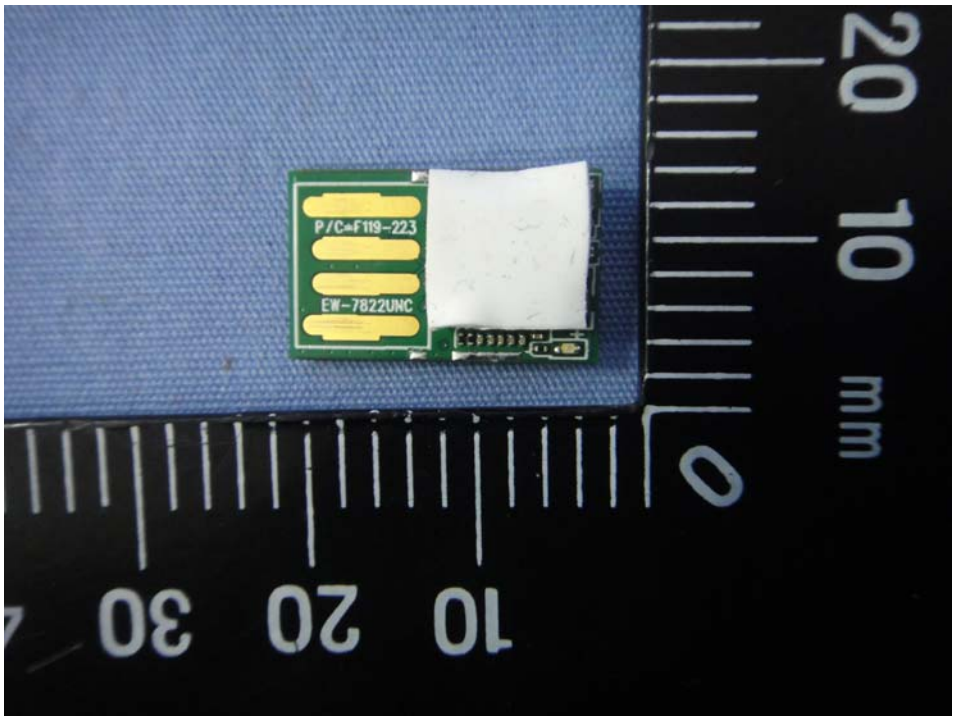
(9) EUT Photo



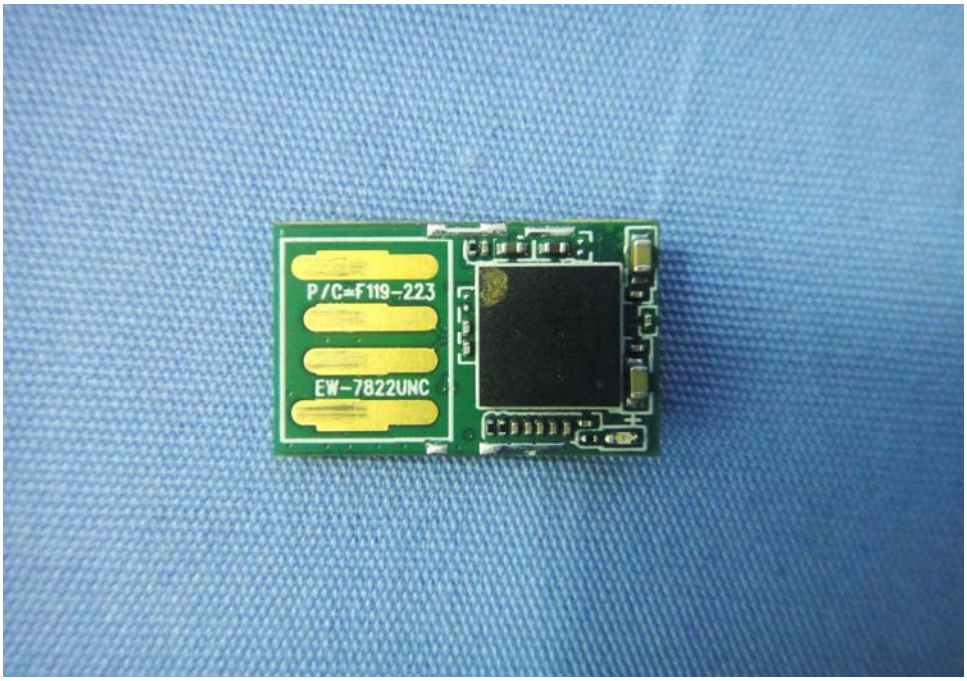
(10)EUT Photo



(11)EUT Photo



(12)EUT Photo



(13)EUT Photo

