CE EMC TEST REPORT

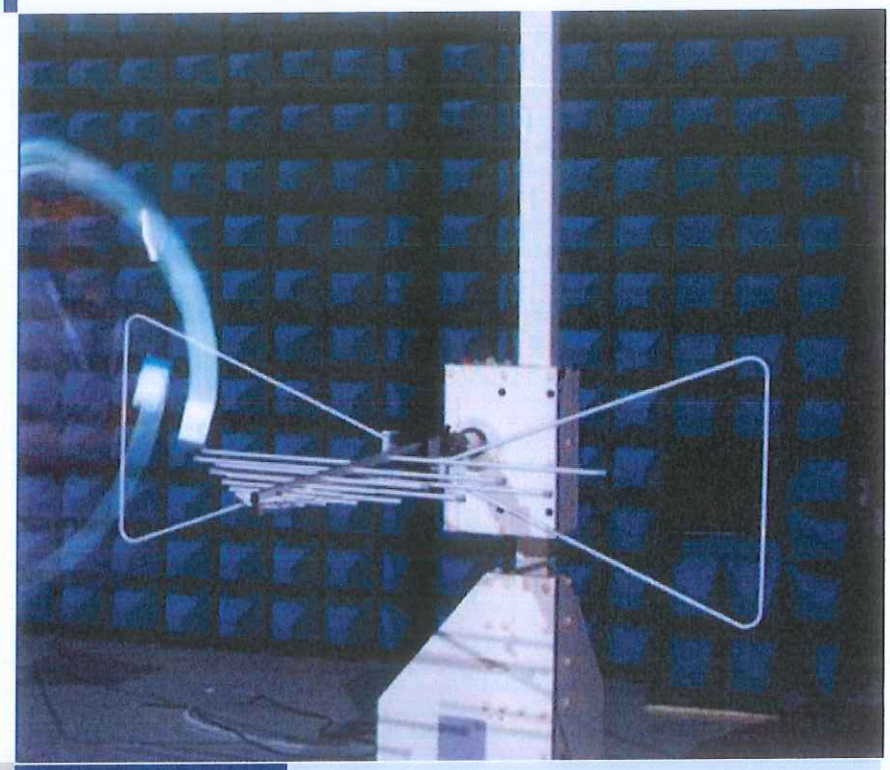
ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

FOR

AC1200 Wireless Dual Band Router

ISSUED TO
TP-Link Technologies Co., Ltd.

Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China



Report No.:	BL-SZ1760077-402
EUT Type:	AC1200 Wireless Dual Band Router
Model Name:	Archer C50
Brand Name:	tp-link
Test Standard:	EN 55032: 2012/AC: 2013 EN 55024: 2010 EN 61000-3-2: 2014 EN 61000-3-3: 2013
Test Conclusion:	Pass
Test Date:	Jun. 08, 2017 ~ Jun. 13, 2017
Date of Issue:	Aug. 02, 2017

Tested by: Xia Long
Xia Long
(Engineer)
Date: Aug. 02. 2017

Approved by:
Wei Yanquan
(Cheif Engineer)
Date: Aug. 02. 2017

Block B, 1st FL,Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong, P. R. China 518055
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Revision History

Version	Issue Date	Revisions Content
Rev. 01	Jul. 20, 2017	Initial Issue
Rev. 02	Aug. 02, 2017	Increase the test date of all test items in ANNEX A TEST RESULTS and supplement the 4.4 Test Configurations in details

TABLE OF CONTENTS

1 GENERAL INFORMATION

1.1 Identification of the Testing Laboratory

Company Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100
Fax Number	+86 755 6182 4271

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A-1. The laboratory has been listed by US Federal Communications Commission to perform electromagnetic emission measurements. The recognition numbers of test site are 832625. The laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6791.
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

1.3 Laboratory Condition

Ambient Temperature	20 to 25℃
Ambient Relative Humidity	45% - 55%
Ambient Pressure	100 kPa - 102 kPa

1.4 Announce

(1) The test report reference to the report template version v1.3.

(2) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.

(3) The test report is invalid if there is any evidence and/or falsification.

(4) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.

(5) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.

(6) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	TP-Link Technologies Co., Ltd.
Address	Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China

2.2 Manufacturer Information

Manufacturer	TP-Link Technologies Co., Ltd.
Address	Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China

2.3 Factory Information

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

EUT Type		AC1200 Wireless Dual Band Router
Model Name Under Test		Archer C50
Series Model Name		N/A
Description of Model name differentiation		N/A
Hardware Version		N/A
Software Version		N/A
Network and Wireless connectivity		WIFI
Interfaces present on the EUT	AC Ports	From mains to AC power adapter
	DC Ports	From power supply to EUT, the DC port cable length is less than 3m.
	I/O Ports	No I/O Ports.
	Telecom Ports	RJ45.

2.5 Ancillary Equipment

Ancillary Equipment 1	Adapter 1	
	Brand Name	TP-Link
	Model No.	T090085-2C1 (EU) Note
	Serial No.	N/A
	Rated Input	100-240 V~, 300 mA, 50/60 Hz
	Rated Output	9 V⎓, 850 mA
Ancillary Equipment 2	Adapter 2	
	Brand Name	TP-Link
	Model No.	T090085-2D1(UK) Note
	Serial No.	N/A
	Rated Input	100-240 V~, 300 mA, 50/60 Hz
	Rated Output	9 V⎓, 850 mA
Ancillary Equipment 3	Adapter 3	
	Brand Name	TP-Link
	Model No.	T090085-2E1(AU) Note
	Serial No.	N/A
	Rated Input	100-240 V~, 300 mA, 50/60 Hz
	Rated Output	9 V⎓, 850 mA
Note: The adapter are same with electrical parameters and internal circuit structure, only differ in model name and adapter plug, T090085-2C1 (EU Plug) as the main for tested in this report.		

2.6 Technical Information

Note: Not application.

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	EN 55032: 2012/AC: 2013	Electromagnetic compatibility of multimedia equipment — Emission requirements
2	EN 55024: 2010	Information technology equipment----Immunity characteristics ----Limits and methods of measurement
3	EN 61000-3-2: 2014	Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current <= 16 A per phase).
4	EN 61000-3-3: 2013	Electromagnetic Compatibility (EMC)– Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low – voltage supply systems, for equipment with rated current ≤16 A per phase and not subject to conditional connection.

3.2 Verdict

No.	Base Standard	Description		Test Verdict	Result	Remark
Emission						
1	EN 55032	Radiated Emission	Below 1 GHz	Pass	ANNEX A.1	--
			Above 1 GHz	Pass		Note 1
2	EN 55032	Conducted Emission	Mains terminals	Pass	ANNEX A.2	--
			Asymmetric mode	Pass	ANNEX A.3	Note 2
			Differential voltage	N/A	ANNEX A.4	Note 3
3	EN 61000-3-2	Harmonic Current Emissions		N/A	ANNEX A.5	Note 4
4	EN 61000-3-3	Voltage Fluctuations & Flicker		Pass	ANNEX A.6	--
Immunity						
5	IEC 61000-4-2	Electrostatic Discharge Immunity		Pass	ANNEX A.7	--
6	IEC 61000-4-3	Radiated RF Electromagnetic Field Immunity		Pass	ANNEX A.8	--
7	IEC 61000-4-4	Electrical Fast Transient/Burst Immunity	AC Ports	Pass	ANNEX A.9	--
			DC Ports	N/A		
			Telecom Ports	Pass		
8	IEC 61000-4-5	Surge Immunity	AC Ports	Pass	ANNEX A.10	--
			DC Ports	N/A		--
			Telecom Ports	Pass		--
9	IEC 61000-4-6	Immunity to Conducted Disturbances Induced by RF Fields	AC Ports	Pass	ANNEX A.11	--
			DC Ports	N/A		--
			Telecom Ports	Pass		--
10	IEC 61000-4-8	Power-frequency magnetic field		N/A	ANNEX A.12	Note 5
11	IEC 61000-4-11	Voltage Dips and Short Interruptions Immunity		Pass	ANNEX A.13	--

Note 1: The highest frequency of the internal sources of the EUT is above 108 MHz, the measurement shall be made above 1 GHz.
Note 2: For cables longer than 3 m only.
Note 3: For Class B broadcasting receiver only.
Note 4: There is no need for Harmonics test to be performed on this product (rated power is less than 75 W) in accordance with EN 61000-3-2: 2014.
For further details, please refer to Clause 7 of EN 61000-3-2: 2014 which states:
“For the following categories of equipment, limits are not specified in this edition of the standard: - equipment with a rated power of 75 W or less, other than lighting equipment.”
Note 5: The EUT not containing devices susceptible to magnetic fields, so this test item is not applicable.

3.3 Test Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement	Value
Conducted emissions (9 kHz-30 MHz)	3.23 dB
Radiated emissions (30 MHz-1 GHz)	4.30 dB
Radiated emissions (1 GHz-18 GHz)	4.81 dB
Radiated emissions (18 GHz-40 GHz)	5.71 dB

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

Environment Parameter	Selected Values During Tests			
	Temperature	Voltage	Relative Humidity	Ambient Pressure
Normal Temperature, Normal Voltage (NTNV)	23°C~26°C	AC 230 V/50 Hz	50%-55%	100 to 102 kPa

4.2 Test Equipment

Radiated Emission Test For Frequency Below 1 GHz						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2016.07.05	2017.07.04	☒
Test Antenna-Bi-Log	SCHWARZBECK	VULB 9163	9163-977	2016.07.19	2018.07.18	☒
Test Antenna-Horn	SCHWARZBECK	BBHA 9120D	9120D-1600	2016.07.12	2018.07.11	☐
Anechoic Chamber	EMC Electronic Co., Ltd	20.10*11.60 *7.35m	N/A	2016.08.09	2018.08.08	☒

Radiated Emission Test For Frequency Above 1 GHz						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
EMI Receiver	KEYSIGHT	N9038A	MY53220118	2016.09.09	2017.09.08	☒
Test Antenna-Bi-Log	SCHWARZBECK	VULB 9163	9163-624	2015.07.22	2017.07.21	☐
Test Antenna-Horn	SCHWARZBECK	BBHA 9120D	9120D-1148	2015.07.22	2017.07.21	☒
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2017.02.21	2019.02.20	☒

Conducted disturbance Test						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2016.07.05	2017.07.04	☒
LISN	SCHWARZBECK	NSLK 8127	8127-687	2016.07.05	2017.07.04	☒
LISN	SCHWARZBECK	NNLK 8129	8129-462	2016.09.14	2017.09.13	☐
AMN	SCHWARZBECK	NNBM8124	8124-509	2016.07.05	2017.07.04	☐
AMN	SCHWARZBECK	NNBM8124	8124-510	2016.07.05	2017.07.04	☐
ISN	TESEQ	ISN T800	34449	2016.07.05	2017.07.04	☒
Shielded Enclosure	ChangNing	CN-130701	130703	N/A	N/A	☒

Voltage Fluctuations & Flicker and Harmonic Current Emissions Test						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
HARMONICS,FLICKER&POWER ANALYSER	LAPLACE INSTRUMENTS	AC2000A	377954	2016.11.08	2017.11.07	☒
AC TESTING POWER SOURCE	EVERFINE	DPS1030	Y120984CJ7 331115	2016.11.11	2017.11.10	☒

Electrostatic Discharge Immunity Test						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
ESD Test System	SCHLODER	SESD 30000	206253	2016.07.05	2017.07.04	☒

Radiated RF Electromagnetic Field Immunity Test						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2017.02.21	2019.02.20	☒
Signal Generator	ROHDE&SCHWARZ	SMB100A	177746	2016.07.13	2017.07.12	☒
Power Amplifier	OPHIR RF	5225F	1037	2017.02.17	2018.02.16	☒
Power Amplifier	OPHIR RF	5273F	1016	2017.02.17	2018.02.16	☒
Power Meter	Agilent	E4419B	GB40201833	2016.11.25	2017.11.24	☒
Directional Coupler	Werlantone	C5982-10	109275	N/A	N/A	☒
Directional Coupler	Werlantone	CHP-273E	S00801z-01	N/A	N/A	☒
Feld Strength Meter	Narda	EP601	511WX51129	2017.02.23	2018.02.22	☒
Test Antenna-Bi-Log	SCHWARZBECK	VULB 9163	9163-624	2015.07.22	2017.07.21	☒
Test Antenna-Horn	SCHWARZBECK	BBHA 9120D	9120D-1148	2015.07.22	2017.07.21	☒
Mouth Simulator	B&K	4227	2423931	2016.11.15	2017.11.14	☐
Sound Calibrator	B&K	4231	2430337	2016.11.09	2017.11.08	☐
Sound Level Meter	B&K	NL-20	00844023	2016.11.11	2017.11.10	☐
Ear Simulator	B&K	4185	2409449	2016.11.15	2017.11.14	☐
Ear Simulator	B&K	4195	2418189	2016.11.15	2017.11.14	☐
Audio analyzer	B&K	UPL 16	100129	2016.11.08	2017.11.07	☐

Electrical Fast Transient/Burst Immunity Test						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
EFT Test System	HTEC	HEFT 51	1331011	2016.07.05	2017.07.04	☒
EFT coupling network	HTEC	ECDN 51	150601	2016.07.05	2017.07.04	☒
EFT clamp	TESEQ	CDN 3425	25164	2016.07.05	2017.07.04	☒

Transients and Surges Test						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
SURGE Generator (AC Ports)	HTEC	HCWG 70	151601	2016.07.05	2017.07.04	☒
SURGE coupling network (AC Ports)	HTEC	SCDN303P7	151602	2016.07.05	2017.07.04	☒
SURGE Generator (Telecom Ports)	HTEC	HCOMB 70	143806	2016.07.05	2017.07.04	☒
SURGE coupling network (Telecom Ports)	HTEC	TCOMB-4	143807	2016.07.05	2017.07.04	☒

Immunity to Conducted Disturbances Induced by RF Fields						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
CONDUCTED DISTURBANCES TEST SYSTEM	Schloder GmbH	CDG 6000	126B1286	2016.07.05	2017.07.04	☒
CDN-M2+3	Schloder GmbH	CDN M2+M3-16	A2210276	2016.07.05	2017.07.04	☒
CDN-M1	Schloder GmbH	CDN-M1	A2010063	2016.11.15	2017.11.14	☐
CDN-M4	Schloder GmbH	CDN-M4	A2610002	2016.11.21	2017.11.20	☐
CDN-M5	Schloder GmbH	CDN-M5	A2560005	2016.11.22	2017.11.21	☐
EM Clamp	Schloder GmbH	CDN-EMCL 20	1456165	2016.07.05	2017.07.04	☒

Voltage Dips and Short Interruptions Immunity Test						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
Voltage Fault Simulating Generator	HTEC	HPFS303P	152301	2016.07.05	2017.07.04	☒
Voltage Fault Coupling Network	HTEC	HV3P30	152302	2016.07.05	2017.07.04	☒

4.3 Test Enclosure list

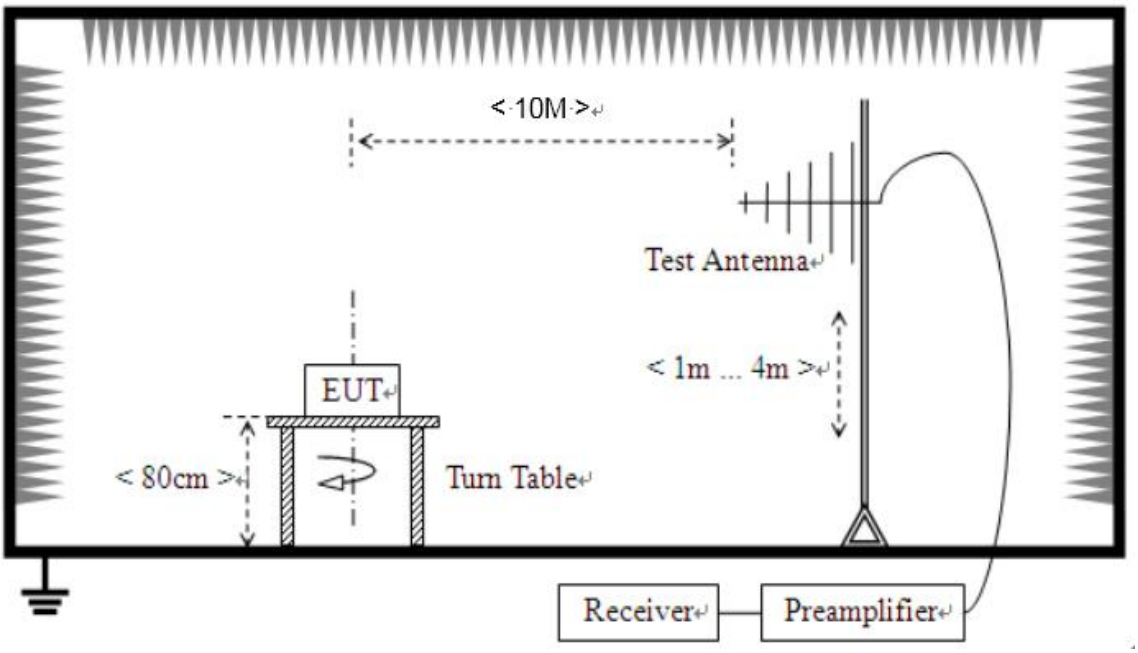
Description	Manufacturer	Model	Serial No.	Length	Description	Use
PC	Dell	015K3N	N/A	N/A	Special Handled	☐
Laptop	Apple	A1465	N/A	N/A	N/A	☒
Printer	HP	DESKJET 1000	N/A	N/A	N/A	☐
Keyboard	Logitech	Y-BP62a	N/A	N/A	N/A	☐
Mouse	Logitech	M100	N/A	N/A	N/A	☐
USB disk	Kingston	N/A	N/A	N/A	N/A	☐
TF Card	Kingston	N/A	N/A	N/A	N/A	☐
VGA Cable	N/A	N/A	N/A	1.5 m	Shielded with core	☐
HDMI Cable	N/A	N/A	N/A	1.5 m	Shielded with core	☐
DVI Cable	N/A	N/A	N/A	1.5 m	Shielded with core	☐
Coaxial video cable	N/A	N/A	N/A	2.0 m	Shielded with core	☐
iPhone	Apple	A1586	N/A	N/A	N/A	☒
Phone	MEIZU	m3 note	N/A	N/A	N/A	☒
Bluetooth Earphone	SAMSUNG	Gear Circle	N/A	N/A	N/A	☐
GPS/GLONASS Vector signal generator	R&S	N5172B EXG	N/A	N/A	N/A	☐
WIFI Router	TP-LINK	TL-WDR7500	N/A	N/A	N/A	☐
Earphone	N/A	OPPO	N/A	1.1 m	N/A	☐
Car Battery	Camel	55530	N/A	N/A	12 V/55 Ah	☐
Artificial load	N/A	N/A	N/A	N/A	2.5 Ω/100 W	☐
Artificial load	N/A	N/A	N/A	N/A	5 Ω/100 W	☐
Electronic Load	ITECH	IT8511	N/A	N/A	N/A	☐
USB Cable	N/A	N/A	N/A	1.5 m	Shielded with core	☐
DC Power Supply	ITECH	IT6863A	600014010687210006	N/A	N/A	☐
LCD Monitor	SAMSUNG	UA32C4000P	N/A	N/A	N/A	☐
LCD Monitor	Dell	U241HB	N/A	N/A	N/A	☐
RJ45 Cable	N/A	N/A	N/A	1.5 m	Shielded with core	☒
Switches	TP-LINK	TL-SG1008PE	N/A	N/A	N/A	☐

4.4 Test Configurations

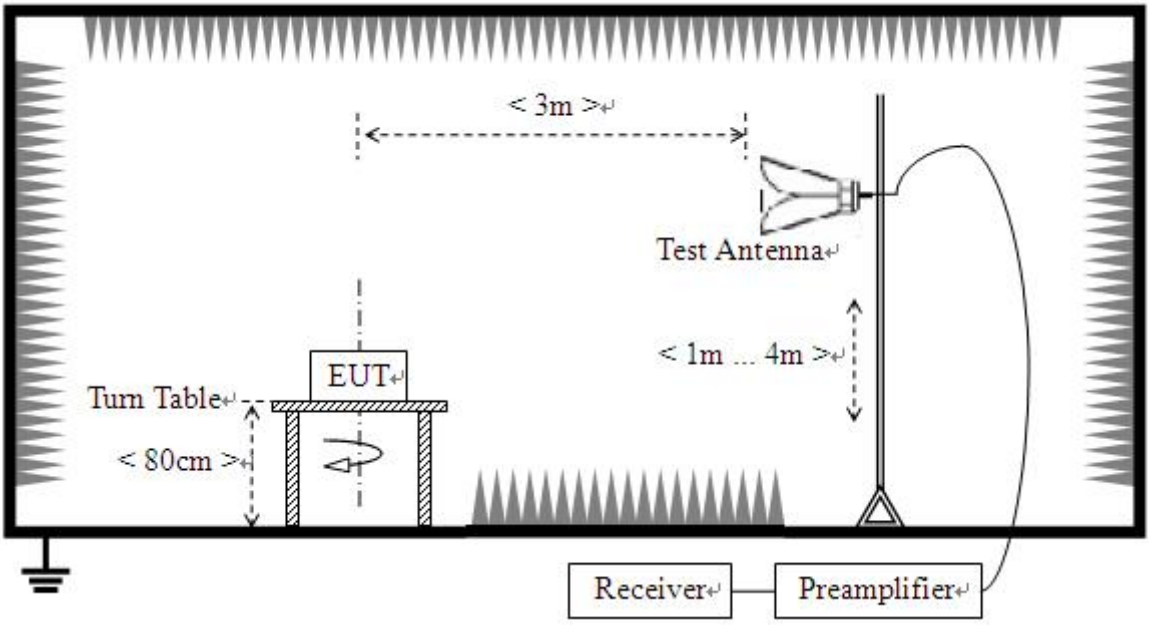
Test Configurations (TC) No.	Description
TC01	The Working Test Mode EUT + Adapter + Laptop + RJ45 Cable + iPhone (2.4G Link) + Phone (5G Link) During the measurement, the EUT is connected with the laptop via a RJ45 cable, the data is transmitting between the EUT and the laptop. The EUT is connected with iPhone by 2.4G link, and the EUT is also connected with Phone by 5G links, both of them are transmitting data with the EUT.

4.5 Test Setups

Test Setup 1

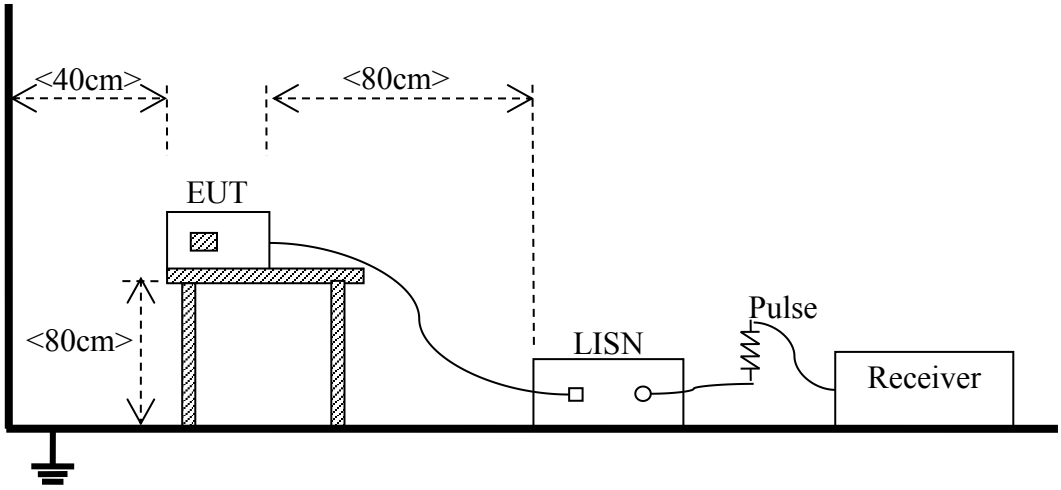


(For Radiated Emission Test (30 MHz-1 GHz))



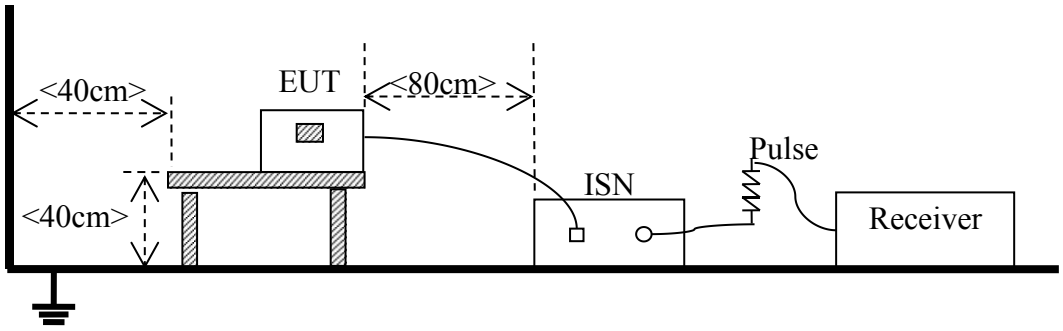
(For Radiated Emission Test (above 1 GHz))

Test Setup 2



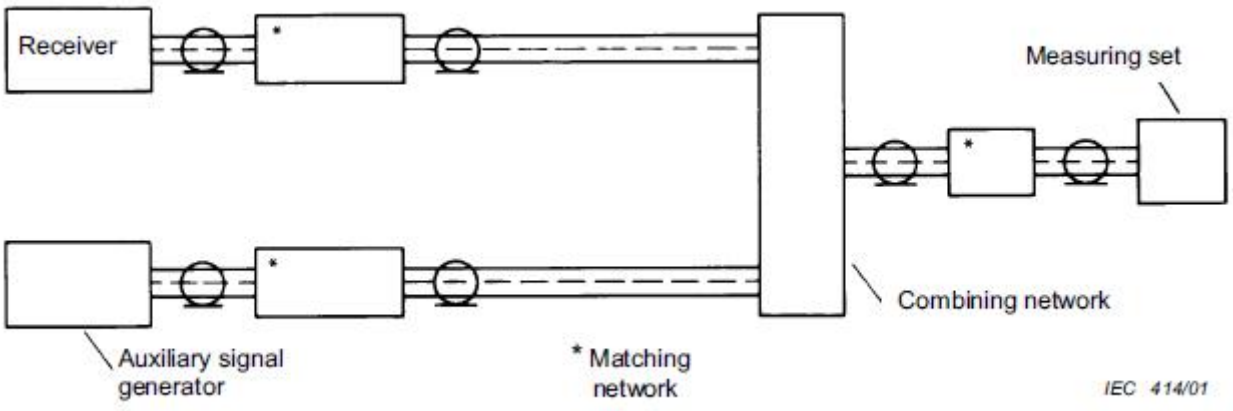
(For Conducted disturbance voltage at mains terminals Test)

Test Setup 3



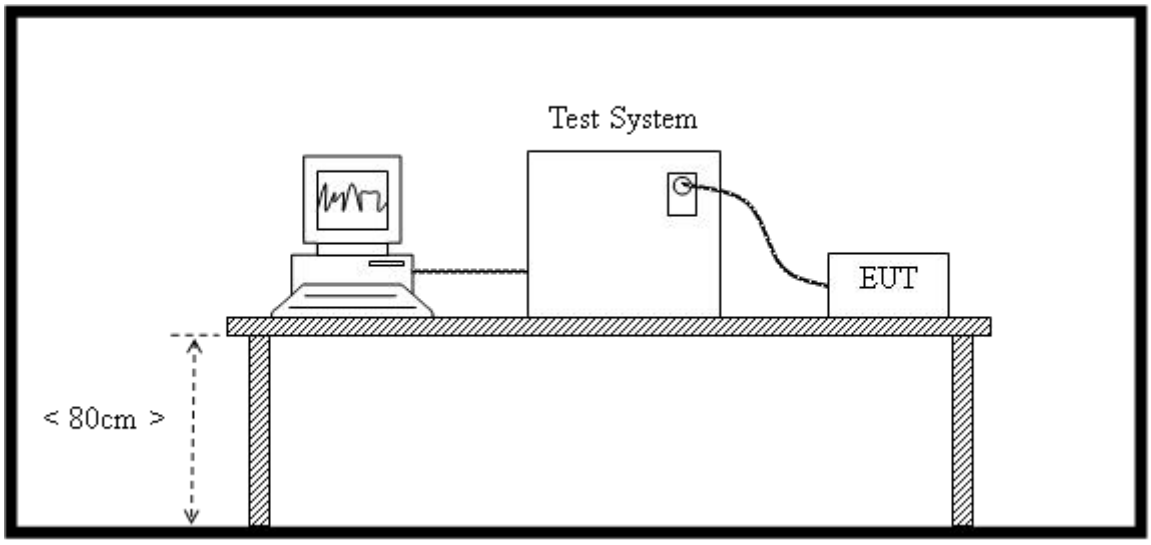
(For Conducted disturbance for asymmetric mode Test)

Test Setup 4



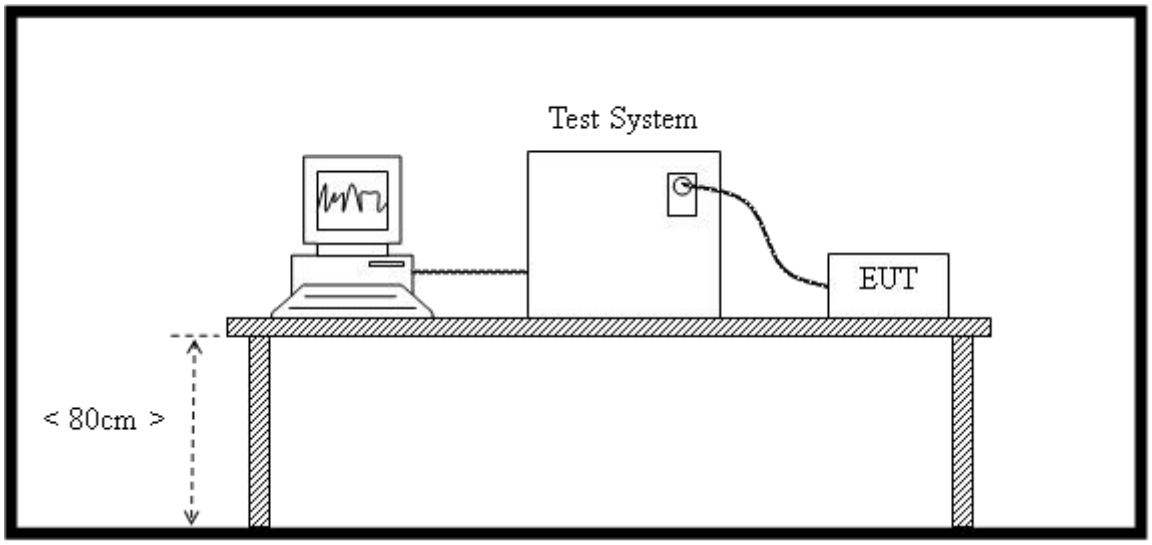
(For Conducted differential voltage emission (TV/FM broadcast receiver tuner ports))

Test Setup 5



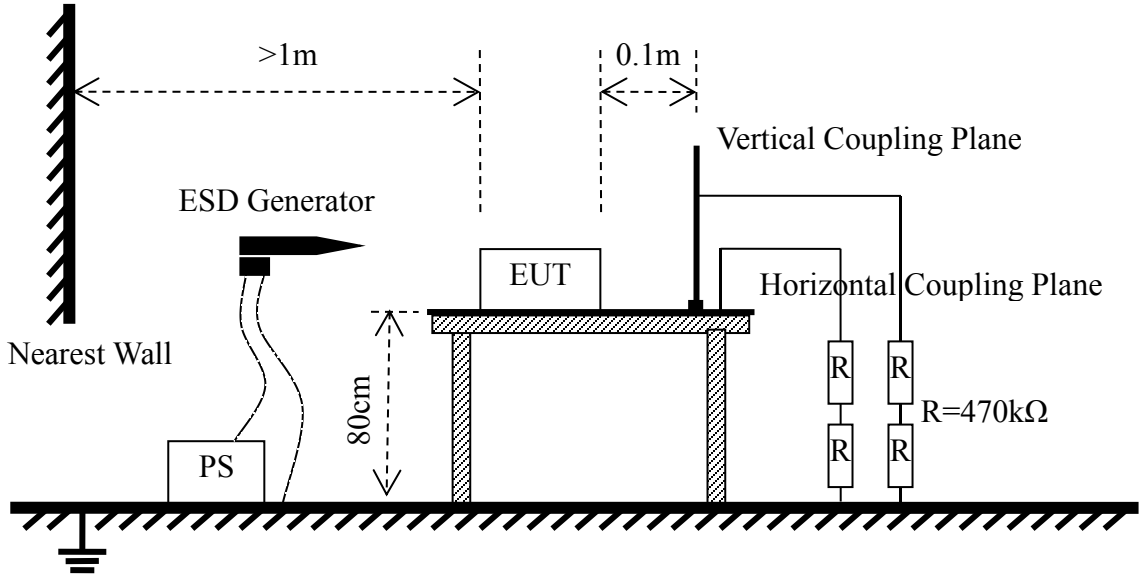
(For Harmonic Current Emissions Measurement Test)

Test Setup 6



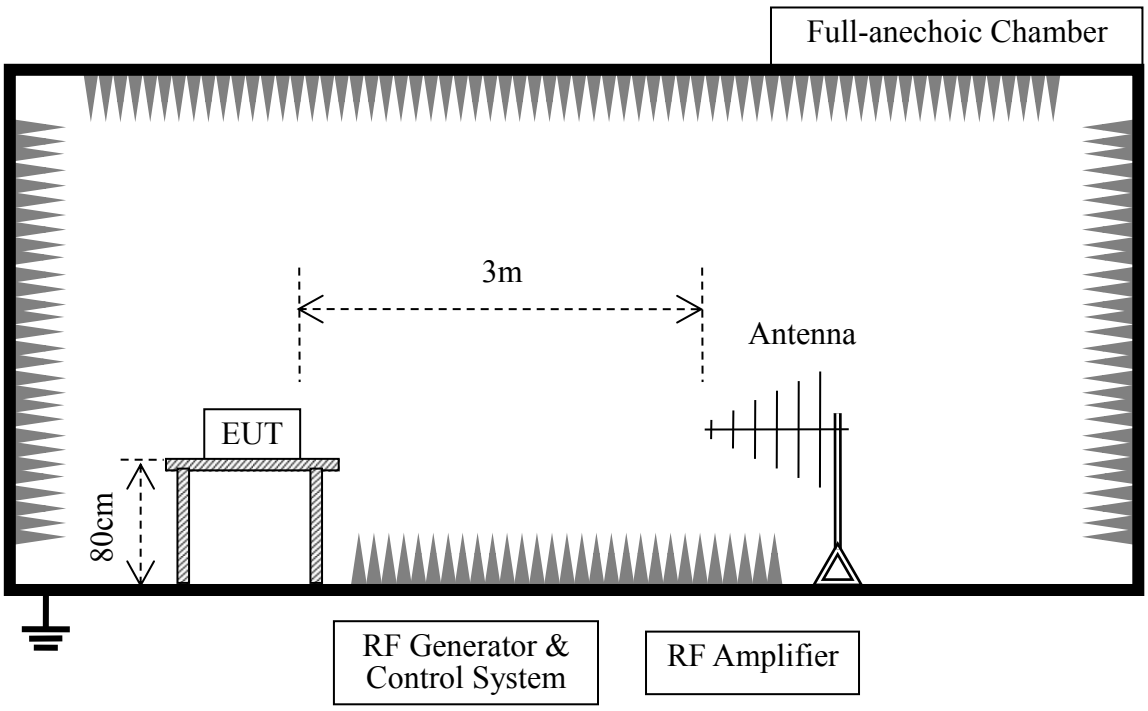
(For Voltage Fluctuations and Flicker Measurement Test)

Test Setup 7



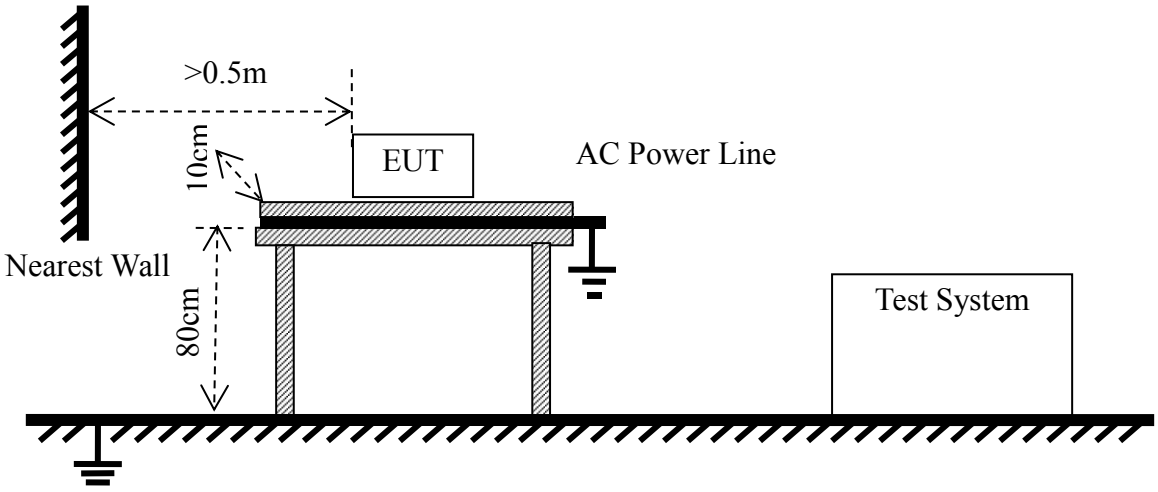
(For Electrostatic Discharge Immunity Test)

Test Setup 8



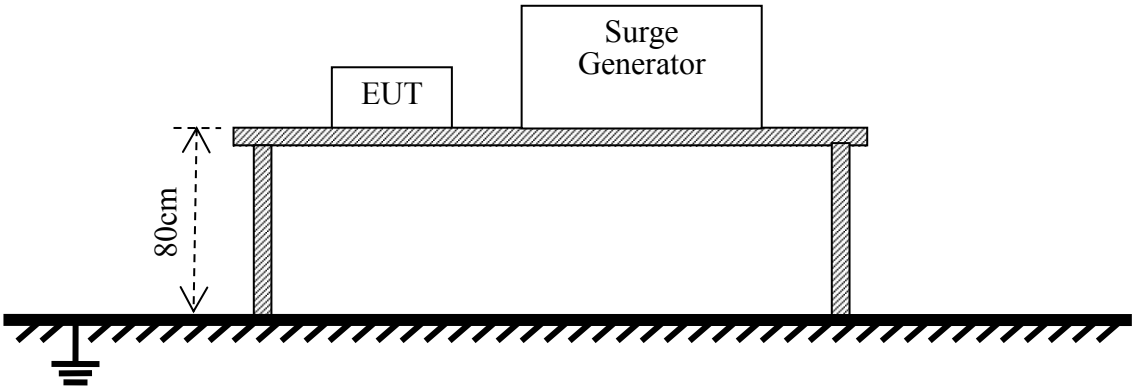
(For Radiated Immunity Test)

Test Setup 9



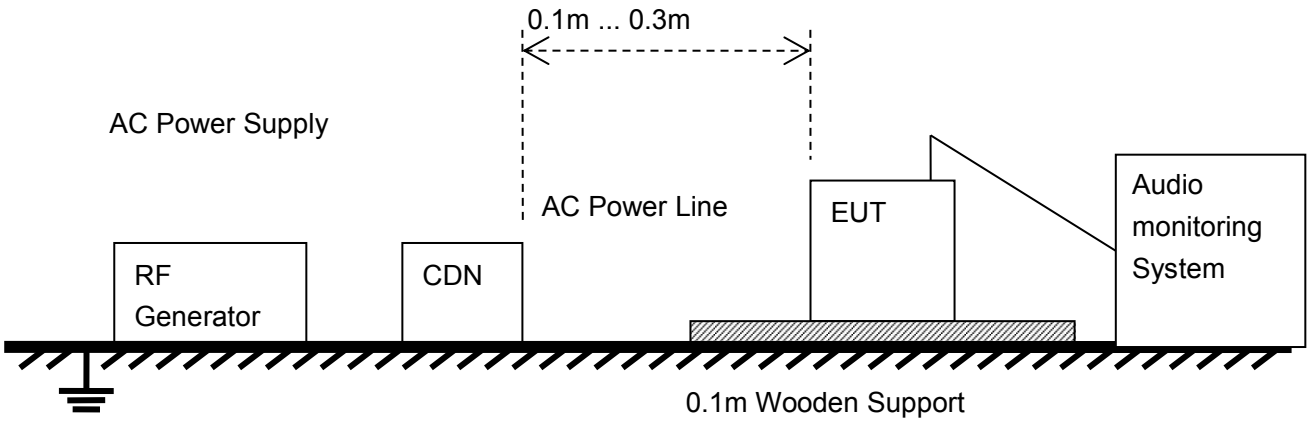
(For Electrical Fast Transient / Burst Immunity Test)

Test Setup 10



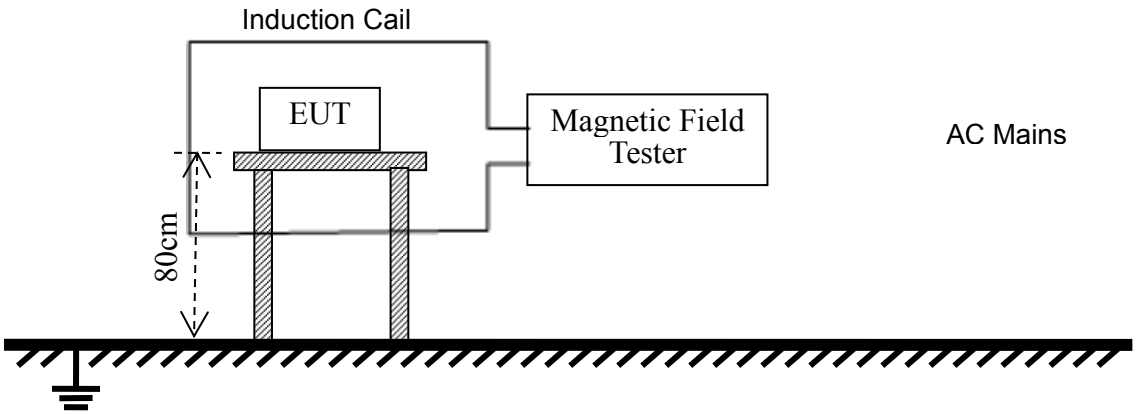
(For Surge Immunity Test)

Test Setup 11



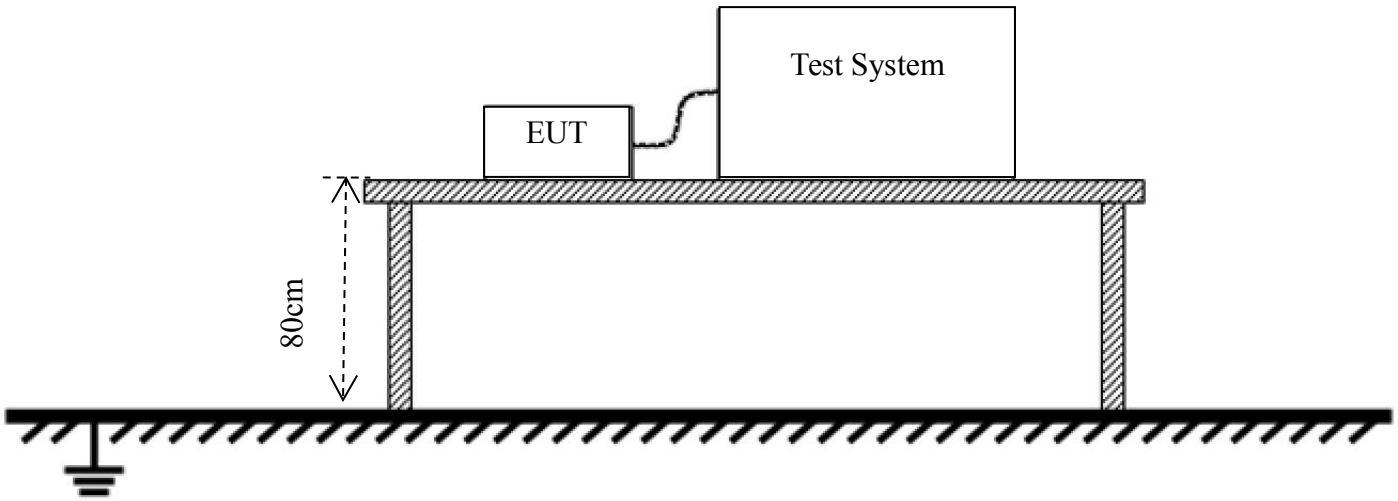
(For Immunity to Conducted Disturbances Induced By RF Fields Test)

Test Setup 12



(Power Frequency Magnetic Fields)

Test Setup 13



(For Voltage Dips and Short Interruptions Immunity Test)

4.6 Test Conditions

Test Case	Test Conditions	
Radiated Emission	Test Env.	NTNV
	Test Setup	Test Setup 1
	Test Configuration	TC01 Note
Conducted Emission	Test Env.	NTNV
	Test Setup	Test Setup 2&3
	Test Configuration	TC01 Note
Voltage Fluctuations & Flicker	Test Env.	ETNV
	Test Setup	Test Setup 5
	Test Configuration	TC01 Note
Electrostatic Discharge Immunity	Test Env.	NTNV
	Test Setup	Test Setup 6
	Test Configuration	TC01 Note
Radiated RF Electromagnetic Field Immunity	Test Env.	NTNV
	Test Setup	Test Setup 7
	Test Configuration	TC01 Note
Electrical Fast Transient/Burst Immunity, AC Port	Test Env.	NTNV
	Test Setup	Test Setup 8
	Test Configuration	TC01 Note
Surge Immunity, AC Ports	Test Env.	NTNV
	Test Setup	Test Setup 10
	Test Configuration	TC01 Note
Immunity to Conducted Disturbances Induced by RF Fields, AC Ports	Test Env.	NTNV
	Test Setup	Test Setup 11
	Test Configuration	TC01 Note
Voltage Dips and Short Interruptions Immunity	Test Env.	NTNV
	Test Setup	Test Setup 12
	Test Configuration	TC01 Note

Note: Based on client request, all normal using modes of the normal function were tested but only the worst test data of the worst mode is reported by this report. The Working Test Mode is the worst mode in this report.

5 TEST ITEMS

5.1 Emission Tests

5.1.1 Radiated Emission

5.1.1.1 Limit

Frequency range (MHz)	Class A (at 10 m)	Class B (at 10 m)
	Quasi-Peak Limit (dBμV/m)	Quasi-Peak Limit (dBμV/m)
30 - 230	40	30
230 - 1000	47	37

Frequency range (MHz)	Class A (at 3 m)		Class B (at 3 m)	
	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)
1000-3000	76	56	70	50
3000-6000	80	60	74	54

Requirements for radiated emissions from FM receivers

Frequency range (MHz)	Measurement		Quasi-Peak Limit (dBμV/m) Fundamental	Quasi-Peak Limit (dBμV/m) Harmonics	Quasi-Peak Limit (dBμV/m) Other
	Facility	Distance (m)			
30-230	OATS/SAC	10	50	42	30
230-300				42	37
300-1000				46	37
30-230	OATS/SAC	3	60	52	40
230-300				52	47
300-1000				56	47

NOTE:

1) The lower limit shall apply at the transition frequency.
2) Additional provisions may be required for cases where interference occurs.

5.1.1.2 Test Setup

Please refer to 4.5 section description of test setup of test setup 1. The photo of test setup please refer to ANNEX B.

5.1.1.3 Test Procedure

An initial pre-scan was performed in the chamber using the EMI Receiver in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by Bi-Log antenna with 2 orthogonal polarities.

5.1.1.4 Test Result

Please refer to ANNEX A.1.

5.1.2 Conducted disturbance voltage at mains terminals

5.1.2.1 Test Limit

Frequency range (MHz)	Class A		Class B	
	Quasi-peak (dBμV)	Average (dBμV)	Quasi-peak (dBμV)	Average (dBμV)
0.15 - 0.50	79	66	66-56	56-46
0.50 - 5	73	60	56	46
5 - 30	73	60	60	50

NOTE:

1) The lower limit shall apply at the band edges.
2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50 MHz.

5.1.2.2 Test Setup

Please refer to 4.5 section description of test setup of test setup 2. The photo of test setup please refer to ANNEX B.

5.1.2.3 Test Procedure

The EUT is connected to the power mains through a LISN which provides 50 Ω/50 μH of coupling impedance for the measuring instrument. The test frequency range is from 150 kHz to 30 MHz. The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels that are more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed.

5.1.2.4 Test Result

Please refer to ANNEX A.2.

5.1.3 Conducted disturbance for asymmetric mode

5.1.3.1 Test Limit

Frequency range (MHz)	Class A		Class B	
	Quasi-peak (dBμV)	Average (dBμV)	Quasi-peak (dBμV)	Average (dBμV)
0.15 - 0.50	97-87	84-74	84-74	74-64
0.50 - 30	87	74	74	64

NOTE:

1) The lower limit shall apply at the band edges.
2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50 MHz.

5.1.3.2 Test Setup

Please refer to 4.5 section description of test setup of test setup 3. The photo of test setup please refer to ANNEX B.

5.1.3.3 Test Procedure

Measurement of common mode (asymmetric mode) current or voltage emissions at wired network ports for attachment of unscreened balanced pairs shall be performed with the wired network port connected by a cable to an AAN. The AAN shall define the common mode termination impedance seen by the wired network port during the emission measurements.

The voltage division factor shall be added to the measured voltage measured by the receiver directly at the voltage measurement port of the AAN and the result compared with the voltage limits as applicable.

5.1.3.4 Test Result

Please refer to ANNEX A.3.

5.1.4 Conducted differential voltage emission

5.1.4.1 Test Limit

Applicability	Frequency range (MHz)	Differential voltage limit @75Ω(dBuV)		
		Local Oscillator Fundamental	Local Oscillator Harmonics	Other
Television receivers; video recorders; PC TV broadcast receiver tuner cards; Digital audio receivers	30 to 950	46	46	46
	950 to 2150	54	54	46
Tuner units (not the LNB) for satellite signal reception	950 to 2150	54	54	46
FM audio receivers and PC tuner cards	30 to 300	54	50	46
	300 to 1000	54	52	46
FM car radios	30 to 300	66	59	46
	300 to 1000	66	52	46
RF modulator output ports connect to TV broadcast receiver tuner ports	30 to 950	76	46	46
	950 to 2150	N/A	54	46

5.1.4.2 Test Setup

Please refer to 4.5 section description of test setup of test setup 4. The photo of test setup please refer to ANNEX B.

5.1.4.3 Test Procedure

1. The impedance as seen from the TV/FM broadcast receiver tuner port of the EUT shall be equal to the nominal antenna input impedance for which the port has been designed. The EUT shall be tuned to the wanted signal from the AE (signal generator). The emission level shall be measured across the relevant frequency range taking into account the attenuation between the EUT TV/FM broadcast receiver tuner port and the measurement device.

2. The RF modulator output port of the EUT is connected to the input of the measuring device by means of a coaxial cable and a matching network (if necessary). The characteristic impedance of the cable shall be equal to the nominal output impedance of the EUT. The EUT shall produce an RF carrier modulated by a video signal defined. The RF output level shall be obtained by adding the insertion loss of the matching network to the indication of the measuring device (tuned to the video carrier frequency and its harmonics).

5.1.4.4 Test Result

Please refer to ANNEX A.4.

5.1.5 Harmonic Current Emissions

5.1.5.1 Limit

Limits for Class A equipment				Limits for Class D equipment		
odd harmonic		Even harmonics		Harmonic order (n)	Maximum permissible harmonic current per watt mA/W	Maximum permissible harmonic current A
Harmonic order (n)	Maximum permissible harmonic current A	Harmonic order (n)	Maximum permissible harmonic current A			
3	2.30	2	1.08	3	3.4	2.30
5	1.14	4	0.43	5	1.9	1.14
7	0.77	6	0.30	7	1.0	0.77
9	0.40	8≤n≤40	0.23X8/n	9	0.5	0.40
11	0.33			11	0.35	0.33
13	0.21			15≤n≤39	3.85/n	0.15X15/n
15≤n≤39	0.15X15/n					

Note: For Class B equipment, the harmonics of the input current shall not exceed the values given in Table "limits for Class A equipment" multiplied by a factor of 1,5.

For the purpose of harmonic current limitation, equipment is classified as follows: (Note: Class C equipment requirement not include in this standard.)

Class A:

- balanced three-phase equipment;
- household appliances, excluding equipment identified as class D;
- tools, excluding portable tools;
- dimmers for incandescent lamps;
- audio equipment.

Equipment not specified in one of the three other classes shall be considered as class A equipment.

Class B:

- portable tools;
- arc welding equipment which is not professional equipment.

Class C:

- lighting equipment.

Class D:

Equipment having a specified power according to 6.2.2 less than or equal to 600 W, of the following types:

- personal computers and personal computer monitors;
- television receivers.

5.1.5.2 Test Setup

Please refer to 4.5 section description of test setup of test setup 5. The photo of test setup please refer to ANNEX B.

5.1.5.3 Test Procedure

The EUT is placed on the top of a wooden table 0.8m above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.

The correspondent test program of test instrument to measure the current harmonics emanated from EUT is

chosen. The measure time shall be not less than the necessary for the EUT to be exercised.

5.1.5.4 Test Result

Please refer to ANNEX A.5.

5.1.6 Voltage Fluctuations and Flicker Measurement

5.1.6.1 Limit

Test Item	Limit	Note
Pst	1.0	Short-term flicker indicator
Plt	0.65	Long-term flicker indicator
Tdt	0.5	Maximum time that dt exceeds 3%
dmax (%)	4%	Maximum relative voltage change
dc (%)	3.3%	Relative steady-state voltage change

5.1.6.2 Test Setup

Please refer to 4.5 section description of test setup of test setup 6. The photo of test setup please refer to ANNEX B.

5.1.6.3 Test Procedure

During the Flicker measurement, the measure time shall include that part of whole operation changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours. The test specifications refer the next table.

No.	Specification	Value
1	Test Frequency	50 Hz
2	Test Voltage	230 VAC
3	Waveform	Sine
4	Test Time	10 minutes for Pst; 2 hours for Plt

5.1.6.4 Test Result

Please refer to ANNEX A.6.

5.2 Immunity Tests

5.2.1 Test Performance Criteria for Immunity Test

5.2.1.1 General Performance Criteria

Type	Description
Criterion A	The equipment shall continue to operate as intended during the test. No change of actual operating state (for example change of channel) is allowed as a result of the application of the test. Multifunction equipment shall for each function meet the relevant requirements. Evaluation is carried out for audio and video functions. The equipment is supposed to operate as intended if the criteria of 4.1.1.1 and/or 4.1.1.2 are fulfilled.
Criterion B	The equipment shall continue to operate as intended after the test. No loss of function is allowed after the test when the apparatus is used as intended, but failures which are recovered automatically but which cause temporary delay in processing, are permissible. No change of actual operating state for example change of channel or stored data and settings is allowed as a result of the application of the test. During the test, degradation of performance is allowed.

5.2.1.2 Performance Criteria of Evaluation of audio quality and Evaluation of picture quality

Refer to EN 55020 subclasses 4.1.1.1 and 4.1.1.2 for the performance criteria of Evaluation of audio quality and Evaluation of picture quality.

Evaluation of audio quality

Unless otherwise specified in this standard, the criterion of compliance with the requirement is a wanted to unwanted audio signal ratio of ≥40 dB at a wanted audio signal level of 50 mW, or at another audio signal level specified by the manufacturer.

If the S/N ratio is less than 43 dB, the performance criterion for audio assessment is the actual S/N ratio minus 3 dB.

In this case, at the beginning of the audio quality evaluation the actual S/N ratio is measured and noted in the test report as reference value.

For AM sound receivers the criterion is ≥26 dB at 50 mW.

For AM and FM car radios and for broadcast receiver cards for computers the criterion is ≥26 dB at 500 mW.

Evaluation of picture quality

In the evaluation of picture interference the wanted test signal produces a standard picture (in the case of video tape equipment on the screen of the test-tv-set) and the unwanted signal produces a degradation of the picture. The degradation may be in a number of forms, such as a superposed pattern, disturbance of synchronization, geometrical distortion, loss of picture contrast, of colour, etc.

The criterion of compliance with the requirement is just perceptible degradation by observation of the picture. The screen shall be observed under normal viewing conditions (brightness 15 lx to 20 lx), at a viewing distance of six times the height of the screen.

The picture quality can also be evaluated by using objective measurement methods.

In the case of video tape equipment the test criteria relate to the picture, assessed on a test-tv-set, which is connected to the video output terminal of the equipment.

5.2.2 Electrostatic Discharge Immunity

5.2.2.1 Test Specification

Specification	Value
Basic Standard	IEC 61000-4-2
Discharge Impedance	330 Ohm / 150 pF
Discharge Voltage	Air Discharge: 2 kV, 4 kV, 8 kV; Contact Discharge: 2 kV, 4 kV
Polarity	Positive / Negative
Number of Discharge	Minimum 20 times at each test point
Discharge Mode	Single discharge
Discharge Period	1 second minimum

5.2.2.2 Test Setup

Please refer to 4.5 section description of test setup of test setup 7. The photo of test setup please refer to ANNEX B.

5.2.2.3 Test Procedure

1. Electrostatic discharges are applied only to those points and surfaces of the EUT that are accessible to users during normal operation.

2. The test is performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.

3. The time interval between two successive single discharges is at least 1 second.

4. The ESD generator is held perpendicularly to the surface to which the discharge is applied and the return cable is at least 0.2 meters from the EUT.

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

6. Air discharges are 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 is removed from the EUT and re-triggered for a new single discharge. The test is repeated until all discharges were completed.

7. At least ten single discharges (in the most sensitive polarity) are applied to the Horizontal Coupling Plane at points on each side of the EUT. The ESD generator is positioned vertically at a distance of 0.1 meters from the EUT with the discharge electrode touching the HCP.

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

5.2.2.4 Test Result

Please refer to ANNEX A.7.

5.2.3 Radiated RF Electromagnetic Field Immunity

5.2.3.1 Test Specification

Specification	Value
Basic Standard	IEC 61000-4-3
Frequency Range	80 MHz to 1000 MHz
Field Strength	1 V/m, 3 V/m (unmodulated, r.m.s)
Modulation	1 kHz sine wave, 80%, AM modulation
Frequency Step	1% of fundamental
Polarity of Antenna	Horizontal and Vertical
Test Distance	3 m
Antenna Height	1.5 m
Dwell Time	2 seconds

5.2.3.2 Test Setup

Please refer to 4.5 section description of test setup of test setup 8. The photo of test setup please refer to ANNEX B.

5.2.3.3 Test Procedure

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

2. The test signal is 80% amplitude modulated with a 1 kHz sine wave.

3. The frequency range is swept from 80 MHz to 1000 MHz with the exception of the exclusion band for transmitters, receivers and duplex transceivers. The rate of sweep does not exceed 1.5*10-3 decade/s. Where the frequency range is swept incrementally, the step size is 1% of fundamental.

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

5. The field strength level is 3 V/m.

6. The test is performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides, but only the worst side data is reported in this report.

5.2.3.4 Test Result

Please refer to ANNEX A.8.

5.2.4 Electrical Fast Transient / Burst Immunity

5.2.4.1 Test Specification

Specification	Value
Basic Standard	IEC 61000-4-4
Test Voltage	AC Power Port: 1 kV.
Polarity	Positive / Negative
Impulse Frequency	5 kHz
Impulse Wave Shape	5/50 ns
Burst Duration	15 ms
Burst Period	300 ms
Test Duration	> 1min

5.2.4.2 Test Setup

Please refer to 4.5 section description of test setup of test setup 9. The photo of test setup please refer to ANNEX B.

5.2.4.3 Test Procedure

1. The EUT is tested with 1000 V discharges to the AC power input leads.

2. Both positive and negative polarity discharges are applied.

3. The length of the "hot wire" from the coaxial output of the EFT generator to the terminals on the EUT should not exceed 1m.

4. The duration time of each test sequential is 1 min.

5. The transient / burst waveform is in accordance with IEC 61000-4-4, 5/50 ns.

5.2.4.4 Test Result

Please refer to ANNEX A.9.

5.2.5 Surge Immunity

5.2.5.1 Test Specification

Specification	Value	
Ports class	AC Power Port	Telecom Port
Basic Standard	IEC 61000-4-5	
Waveform	Voltage: 1.2/50 μs	Voltage: 10/700 μs
Test Voltage	line to ground 0.5 kV, 1 kV, 2 kV, line to line 0.5 kV, 1 kV line to ground 0.5 kV, 1 kV, line to line 0.5 kV(Note 1)	0.5 kV, 1 kV(Note 2) 0.5 kV(Note 3)
Polarity	Positive / Negative	
Phase Angle	0°, 90°, 180°, 270°	N/A
Repetition Rate	60 seconds	
Times	5 times per condition	

Note 1: The test level for AC mains ports, in telecommunications centres.
Note 2:The test level for telecommunications ports, intended to be directly connected to the telecommunications network via outdoor cables.
Note 3: The test level for telecommunications ports, intended to be connected to indoor cables (longer than 10 m) or in telecommunications centres.

5.2.5.2 Test Setup

Please refer to 4.5 section description of test setup of test setup 10. The photo of test setup please refer to ANNEX B.

5.2.5.3 Test Procedure

The EUT and the auxiliary equipment are placed on a table of 0.8 m heights above a metal ground reference plane. The size of ground plane is greater than 1m*1m and project beyond the EUT by at least 0.1 m on all sides. The ground plane is connected to the protective earth. The length of power cord between the coupling device and the EUT is less than 2 meters (provided by the manufacturer).

The EUT is connected to the power mains through a coupling device that directly couples the surge interference signal. The surge noise is applied synchronized to the voltage phase at the zero crossing and the peak value of the AC voltage wave (positive and negative).

The surges are applied line to line and line(s) to earth. When testing line to earth the test voltage is applied successively between each of the lines and earth. Set up to the test level specified increased the test voltage. All lower levels including the selected test level are tested. The polarity of each surge level included positive and negative test pulses.

5.2.5.4 Test Result

Please refer to ANNEX A.10.

5.2.6 Immunity to Conducted Disturbances Induced by RF Fields

5.2.6.1 Test Specification

Specification	Value
Basic Standard	IEC 61000-4-6
Frequency Range	0.15 MHz – 80 MHz
Field Strength	1 V rms, 3 V rms (unmodulated, r.m.s)
Modulation	1 kHz sine wave, 80% AM
Frequency Step	1% of fundamental
Coupled Cable	AC Power Line; DC Power Line; Telecom Line

5.2.6.2 Test Setup

Please refer to 4.5 section description of test setup of test setup 11. The photo of test setup please refer to ANNEX B.

5.2.6.3 Test Procedure

The EUT shall be tested within its intended operating and climatic conditions.

The test shall be performed with the test generator connected to each of the coupling and decoupling devices in turn, while the other non-excited RF input ports of the coupling devices are terminated by a 50 Ohm load resistor.

The test signal is 80% amplitude modulated with a 1 kHz sine wave.

The frequency range is swept from 150 kHz to 80 MHz, using the signal level established during the setting process and with a disturbance signal of 80% amplitude. The sweep rate shall not exceed 1.5*10-3 decades/s. The step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value where the frequency is swept incrementally.

The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies such as clock frequencies and harmonics or frequencies of dominant interest, shall be analyzed separately.

Attempts should be made to fully exercise the EUT during test, and to fully interrogate all exercise modes selected for susceptibility.

5.2.6.4 Test Result

Please refer to ANNEX A.11.

5.2.7 Power Frequency Magnetic Fields Immunity

5.2.7.1 Test Specification

Specification	Value
Basic Standard	IEC 61000-4-8
Field Frequency	50/60 Hz
Test Level	1 A/m
Test Duration	5 min

5.2.7.2 Test Setup

Please refer to 4.5 section description of test setup of test setup 12. The photo of test setup please refer to ANNEX B.

5.2.7.3 Test Procedure

The EUT shall be subjected to the test magnetic field by using the induction coil of standard dimensions (1m*1m) and shown in Section 15.1. The induction coil shall then be rotated by 90°in order to expose the EUT to the test field with different orientations.

5.2.7.4 Test Result

Please refer to ANNEX A.12.

5.2.8 Voltage Dips and Short Interruptions Immunity

5.2.8.1 Test Specification

Specification	Value
Basic Standard	IEC 61000-4-11
Voltage Dips	100% reduction: 10 ms; 30% reduction: 500 ms
Voltage Interruptions	100% reduction: 5000 ms
Voltage Phase Angle	0°

5.2.8.2 Test Setup

Please refer to 4.5 section description of test setup of test setup 13. The photo of test setup please refer to ANNEX B.

5.2.8.3 Test Procedure

The power cord is used as supplied by the manufacturer. The EUT was connected to the line output of the Voltage Dips and Interruption Generator.

The EUT is tested for a) 100% voltage dip of supplied voltage with duration of 10 ms; c) 30% voltage dip of supplied voltage and duration 500 ms. Both of the dip tests are carried out for a sequence of three voltage dips with intervals of 10 seconds.

100% voltage interruption of supplied voltage with duration of 5000 ms is followed, which is a sequence of three voltage interruptions with intervals of 10 seconds.

Voltage reductions occur at 0 degrees crossover point of the voltage waveform. The performance of the EUT is checked after the voltage dip or interruption.

5.2.8.4 Test Result

Please refer to ANNEX A.13.

ANNEX A TEST RESULTS

A.1 Radiated Emission

Note 1: The symbol of "--" in the table which means not application.

Note 2: Measurements shall be made with a quasi-peak measuring receiver in the frequency range 30 MHz to 1000 MHz. To reduce the testing time, a peak measuring receiver may be used instead of a quasi-peak measuring receiver. In case of dispute, measurement with a quasi-peak measuring receiver will take precedence.

Note 3: The marked spikes near 2400MHz and 5000MHz with circle should be ignored because they are WIFI carrier frequency.

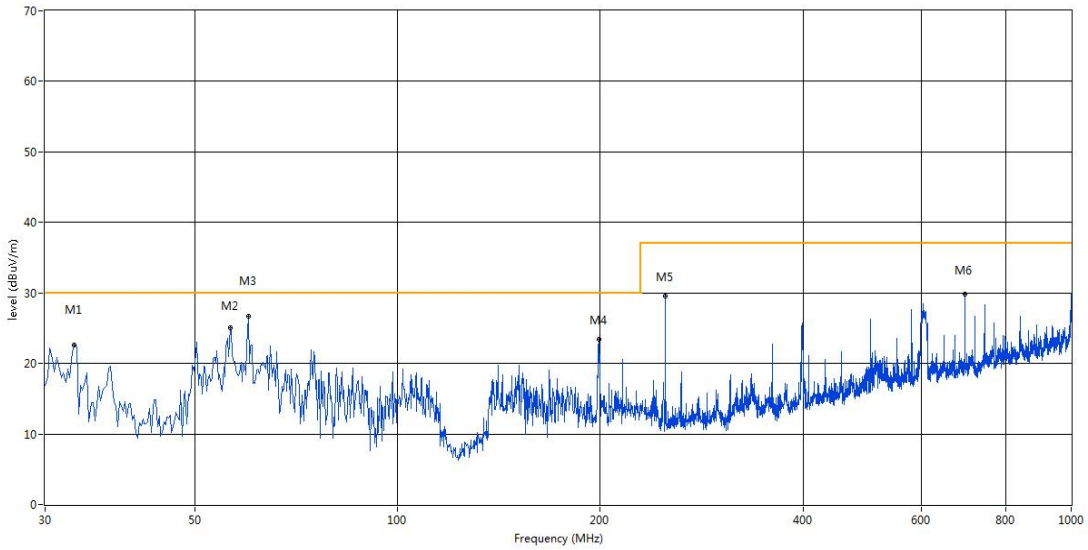
Note 4: Two nominal voltages of 230 V (±10 V) and 110 V (±10 V), using a frequency of 50 Hz or 60 Hz, is normally sufficient for an EUT intended for worldwide use. Voltages and frequencies (such as a nominal 120 VAC, 50/60 Hz and 230 VAC, 50/60 Hz) for which the device is capable of operation. So, The configuration 120 VAC, 60 Hz and 230 VAC, 50 Hz were tested respectively, but only the worst configuration shown here.

Test date	Temperature	humidity	Ambient Pressure
Jun. 08, 2017	23.6	53	101

Test Data and Plots (Below 1 GHz)

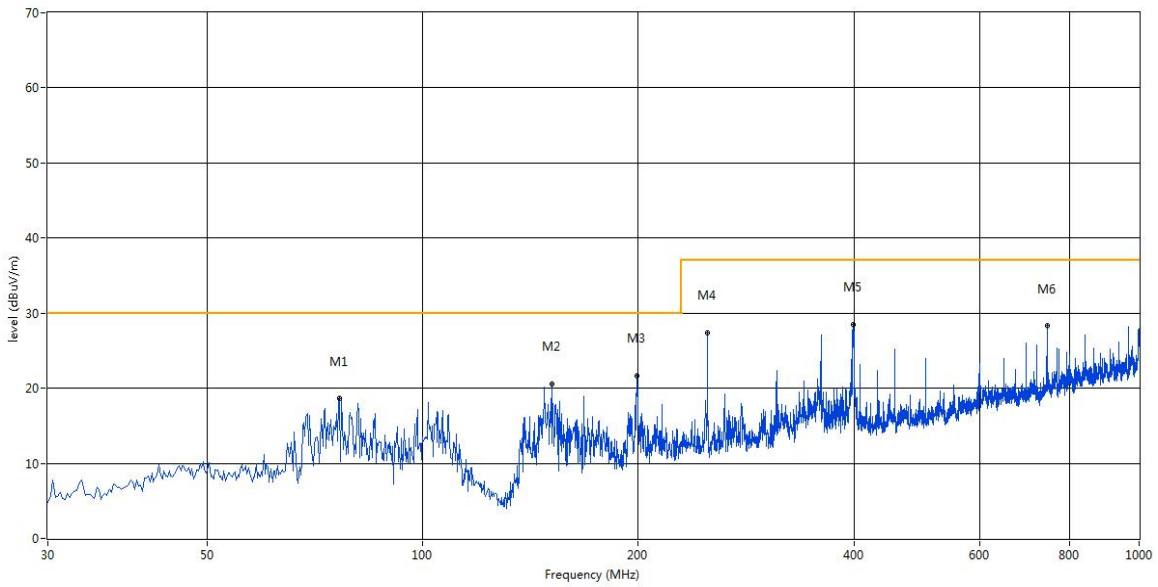
The Working Test Mode (110 V/ 60Hz)

A.1.1 Test Antenna Vertical, 30 MHz – 1 GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	33.152	22.57	-15.93	30.0	7.43	Peak	3.00	100	Vertical	Pass
2	56.426	25.04	-13.97	30.0	4.96	Peak	360.00	300	Vertical	Pass
3	60.062	26.74	-14.63	30.0	3.26	Peak	318.00	100	Vertical	Pass
4	199.223	23.39	-14.19	30.0	6.61	Peak	57.00	100	Vertical	Pass
5	249.893	29.55	-13.00	37.0	7.45	Peak	314.00	100	Vertical	Pass
6	695.981	29.78	-2.96	37.0	7.22	Peak	147.00	300	Vertical	Pass

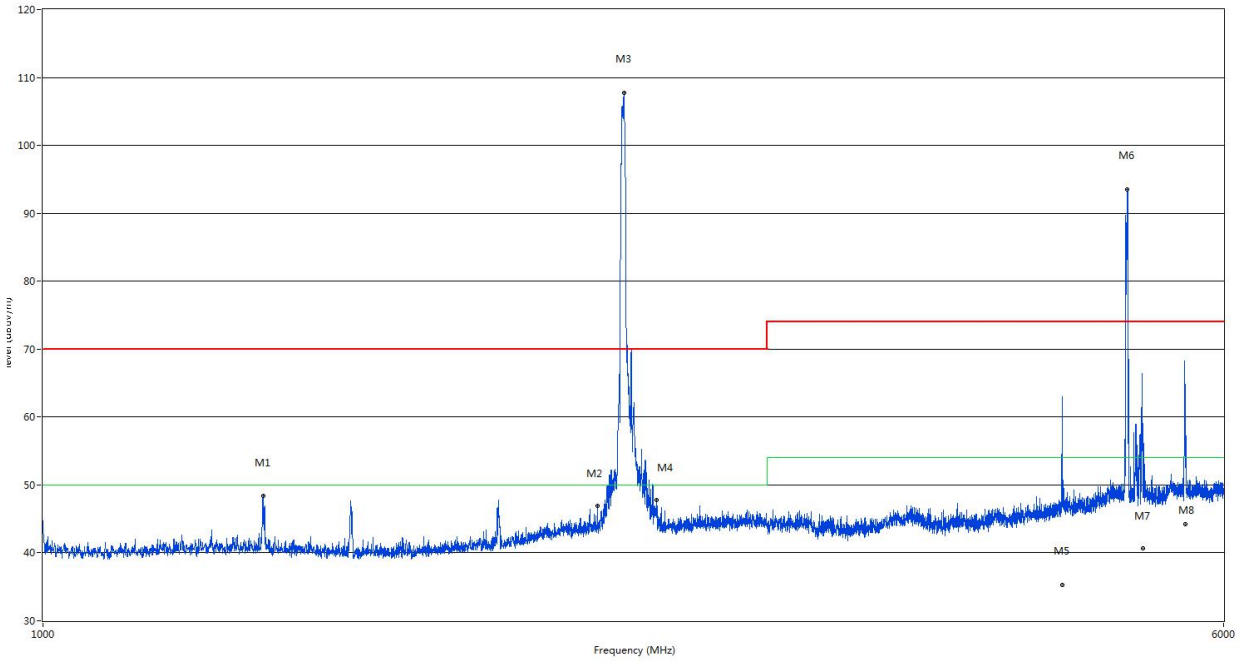
A.1.2 Test Antenna Horizontal, 30 MHz – 1 GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	76.548	18.60	-18.86	30.0	11.40	Peak	12.00	200	Horizontal	Pass
2	151.462	20.57	-17.88	30.0	9.43	Peak	3.00	300	Horizontal	Pass
3	199.465	21.65	-14.17	30.0	8.35	Peak	207.00	300	Horizontal	Pass
4	249.893	27.42	-13.00	37.0	9.58	Peak	27.00	300	Horizontal	Pass
5	399.720	28.47	-8.95	37.0	8.53	Peak	111.00	200	Horizontal	Pass
6	743.984	28.26	-1.99	37.0	8.74	Peak	113.00	100	Horizontal	Pass

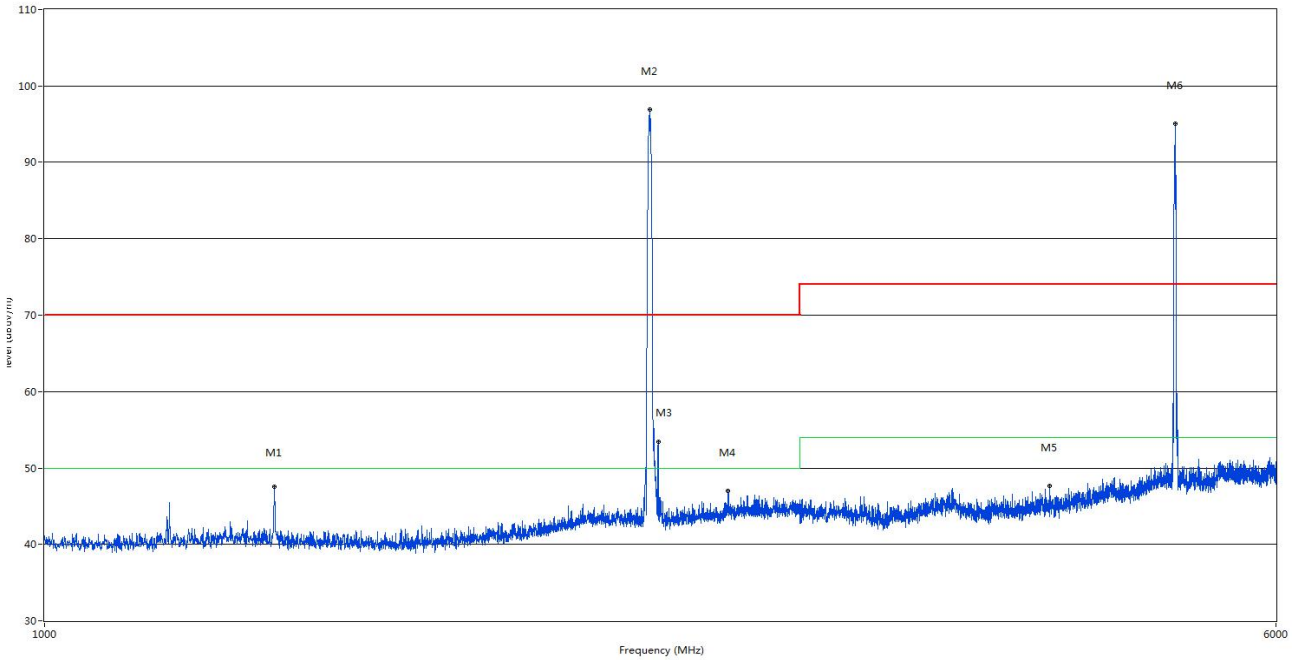
Test Data and Plots (Above 1 GHz)

A.1.3 Test Antenna Vertical, 1 GHz – 6 GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1396.500	48.33	-6.01	70.0	21.67	Peak	360.10	100	Vertical	Pass
2	2321.000	46.97	-2.59	70.0	23.03	Peak	349.30	100	Vertical	Pass
3	2415.500	107.76	-2.56	70.0	-37.76	Peak	131.50	100	Vertical	N/A
4	2536.500	47.73	-2.07	70.0	22.27	Peak	344.40	100	Vertical	Pass
5**	4697.403	35.25	9.88	54.0	18.75	AV	349.10	100	Vertical	Pass
5	4697.403	62.98	9.88	74.0	11.02	Peak	349.10	100	Vertical	Pass
6	5186.250	93.57	10.99	74.0	-19.57	Peak	0.00	100	Vertical	N/A
7**	5301.000	41.65	10.79	54.0	12.35	AV	116.10	100	Vertical	Pass
7	5301.000	66.74	10.79	74.0	7.26	Peak	116.10	100	Vertical	Pass
8**	5655.000	45.68	11.31	54.0	8.32	AV	135.20	100	Vertical	Pass
8	5655.000	68.79	11.31	74.0	5.21	Peak	135.20	100	Vertical	Pass

A.1.4 Test Antenna Horizontal, 1 GHz – 6 GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1397.000	47.53	-6.00	70.0	22.47	Peak	48.50	100	Horizontal	Pass
2	2413.500	96.89	-2.51	70.0	-26.89	Peak	285.70	100	Horizontal	N/A
3	2442.000	53.40	-2.72	70.0	16.60	Peak	43.60	100	Horizontal	N/A
4	2704.500	47.04	-0.67	70.0	22.96	Peak	202.50	100	Horizontal	Pass
5	4317.000	47.63	8.87	74.0	26.37	Peak	33.50	100	Horizontal	Pass
6	5181.000	95.11	11.02	74.0	-21.11	Peak	264.70	100	Horizontal	N/A

A.2 Conducted disturbance voltage at mains terminals Test

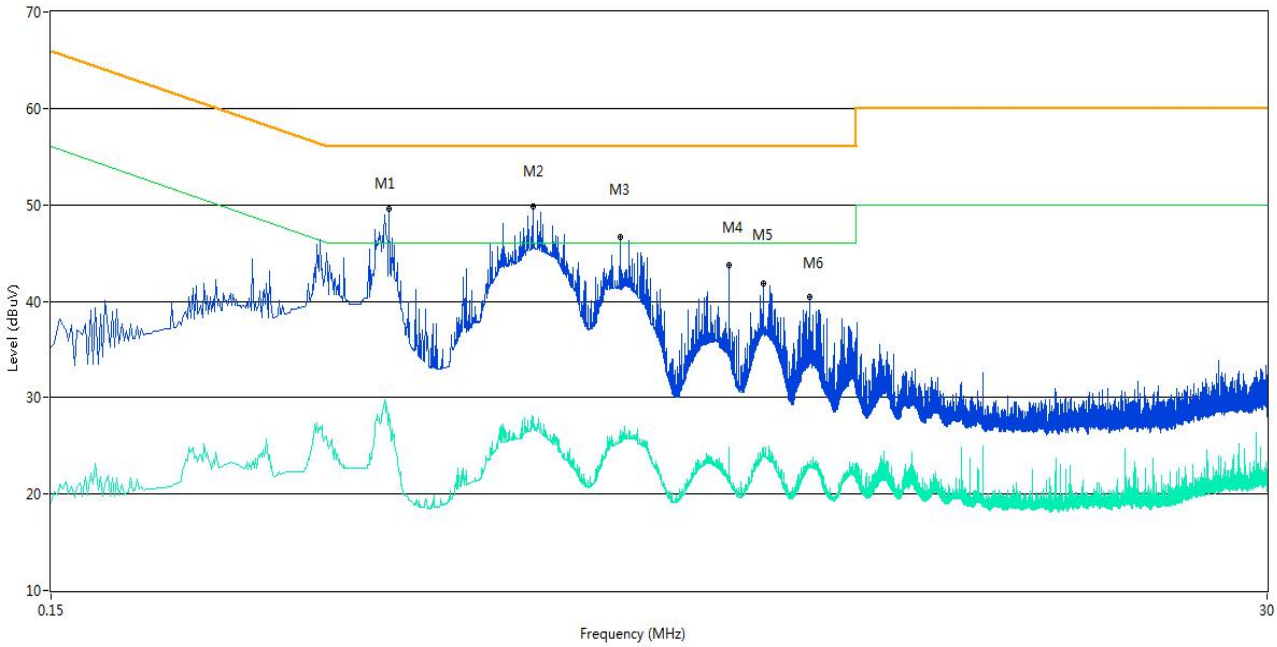
Test date	Temperature	humidity	Ambient Pressure
Jun. 08.2017	24.2	51	101

Note: Two nominal voltages of 230 V (±10 V) and 110 V (±10 V), using a frequency of 50 Hz or 60 Hz, is normally sufficient for an EUT intended for worldwide use. Voltages and frequencies (such as a nominal 120 VAC, 50/60 Hz and 230 VAC, 50/60 Hz) for which the device is capable of operation. So, the configuration 120 VAC, 60 Hz and 230 VAC, 50 Hz were tested respectively, but only the worst configuration shown here.

Test Data and Plots

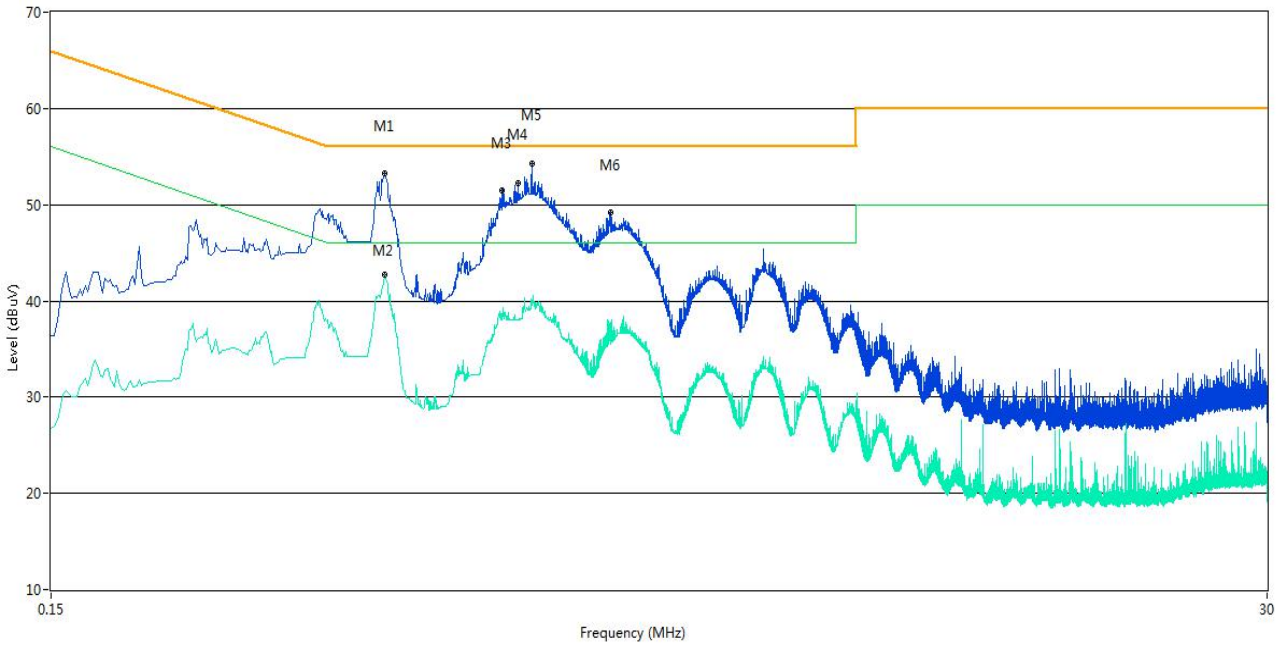
The Working Test Mode (230 V/ 50Hz)

A.2.1 L Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.654	49.6	9.96	56.0	6.40	Peak	L Line	Pass
1**	0.654	28.2	9.96	46.0	17.80	AV	L Line	Pass
2	1.224	49.9	10.29	56.0	6.10	Peak	L Line	Pass
2**	1.224	28.0	10.29	46.0	18.00	AV	L Line	Pass
3	1.792	46.7	10.58	56.0	9.30	Peak	L Line	Pass
3**	1.792	26.6	10.58	46.0	19.40	AV	L Line	Pass
4	2.874	43.7	10.83	56.0	12.30	Peak	L Line	Pass
4**	2.874	24.9	10.83	46.0	21.10	AV	L Line	Pass
5	3.338	41.9	10.80	56.0	14.10	Peak	L Line	Pass
5**	3.338	24.8	10.80	46.0	21.20	AV	L Line	Pass
6	4.084	40.5	10.31	56.0	15.50	Peak	L Line	Pass
6**	4.084	22.7	10.31	46.0	23.30	AV	L Line	Pass

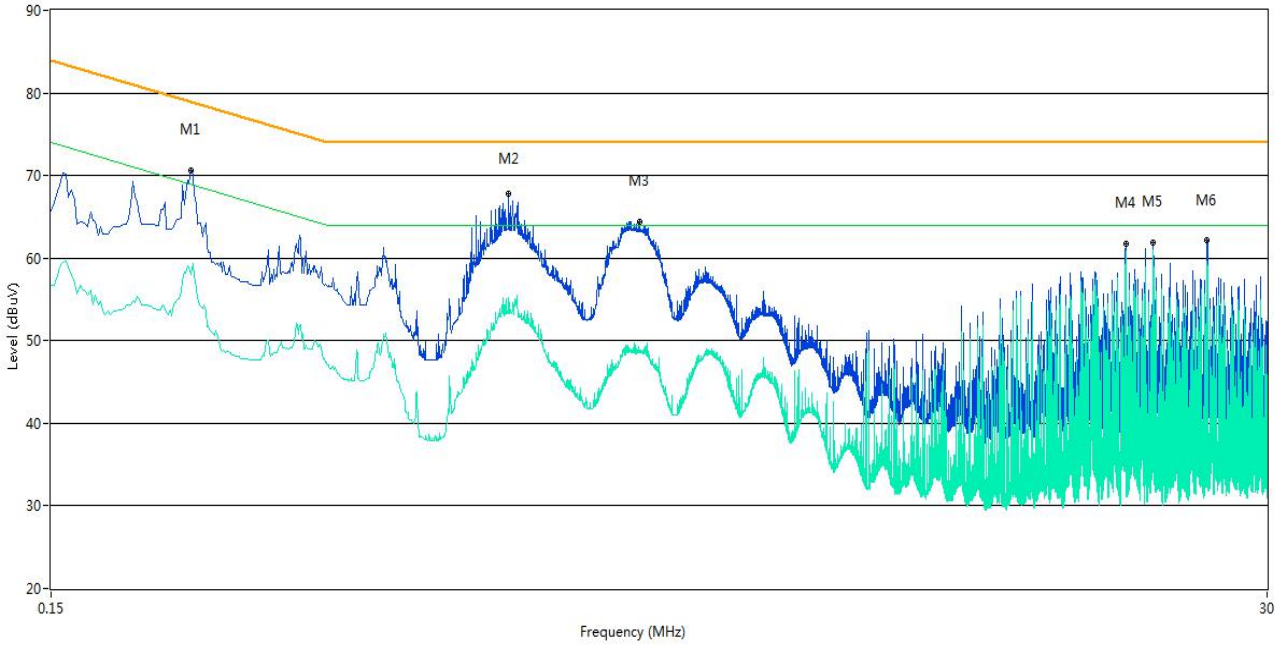
A.2.2 N Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.642	53.66	10.74	56.0	2.34	Peak	N Line	Pass
1*	0.642	50.07	10.74	56.0	5.93	QP	N Line	Pass
1**	0.642	42.63	10.74	46.0	3.37	AV	N Line	Pass
2	0.642	53.2	10.74	56.0	2.80	Peak	N Line	Pass
2**	0.642	42.7	10.74	46.0	3.30	AV	N Line	Pass
3	1.068	51.5	10.35	56.0	4.50	Peak	N Line	Pass
3**	1.068	38.7	10.35	46.0	7.30	AV	N Line	Pass
4	1.146	52.3	9.73	56.0	3.70	Peak	N Line	Pass
4**	1.146	37.5	9.73	46.0	8.50	AV	N Line	Pass
5	1.220	54.75	10.32	56.0	1.25	Peak	N Line	N/A
5*	1.220	48.51	10.32	56.0	7.49	QP	N Line	Pass
5**	1.220	39.98	10.32	46.0	6.02	AV	N Line	Pass
6	1.716	49.2	10.14	56.0	6.80	Peak	N Line	Pass
6**	1.716	37.5	10.14	46.0	8.50	AV	N Line	Pass

A.3 Conducted disturbance for asymmetric mode

Test date	Temperature	humidity	Ambient Pressure
Jun. 08.2017	24.2	51	101



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Verdict
1	0.276	70.7	20.67	78.9	8.20	Peak	Pass
1**	0.276	58.1	20.67	68.9	10.80	AV	Pass
2	1.102	67.8	20.19	74.0	6.20	Peak	Pass
2**	1.102	55.2	20.19	64.0	8.80	AV	Pass
3	1.948	64.4	20.27	74.0	9.60	Peak	Pass
3**	1.948	48.9	20.27	64.0	15.10	AV	Pass
4	16.226	61.7	21.39	74.0	12.30	Peak	Pass
4**	16.226	58.1	21.39	64.0	5.90	AV	Pass
5	18.240	61.8	21.09	74.0	12.20	Peak	Pass
5**	18.240	61.1	21.09	64.0	2.90	AV	Pass
6	23.126	62.2	21.34	74.0	11.80	Peak	Pass
6**	23.126	59.5	21.34	64.0	4.50	AV	Pass

A.4 Conducted differential voltage emission

Note: Not applicable.

A.5 Harmonic Current Emissions

Note: Not applicable.

A.6 Voltage Fluctuations & Flicker

Test date	Temperature	humidity	Ambient Pressure
Jun. 08, 2017	24.6	51	101

Test Parameter	Limit	Measurement Value	Verdict
Pst	1.0	0.006	Pass
Plt	0.65	0.007	Pass
Tdt	0.5	0.10	Pass
dmax (%)	4%	0.15%	Pass
dc (%)	3.3%	0.17%	Pass

A.7 Electrostatic Discharge Immunity

Test date	Temperature	humidity	Ambient Pressure
Jun. 13, 2017	23.9	52	101

Test Points	Discharge Level (kV)	Discharge Mode	Number of Discharge	Verdict
HCP	±2, ±4	Contact	100	Pass
VCP	±2, ±4	Contact	100	Pass
Crack & Shell	±2, ±4, ±8	Air	200	Pass
Adapter	±2, ±4, ±8	Air	40	Pass
Power Key	±2, ±4, ±8	Air	20	Pass
Power Port	±2, ±4, ±8	Air	20	Pass
Indicator	±2, ±4, ±8	Air	100	Pass
WPS Port	±2, ±4, ±8	Air	20	Pass
RJ 45	±2, ±4, ±8	Air	100	Pass
Antenna	±2, ±4, ±8	Air	80	Pass

Note: Performance of the all modes comply with the performance criteria in Criterion B.

A.8 Radio Frequency Electromagnetic Field Immunity

Test date	Temperature	humidity	Ambient Pressure
Jun. 12, 2017	24.6	54	101

Antenna Polarity	Frequency (MHz)	Side	Field Strength (V/m)	Verdict
Vertical	80 – 1000	Front	3	Pass
		Back	3	Pass
		Left	3	Pass
		Right	3	Pass
Horizontal	80 – 1000	Front	3	Pass
		Back	3	Pass
		Left	3	Pass
		Right	3	Pass

Note: Performance of the all modes comply with the performance criteria in Criterion A.

A.9 Electrical Fast Transient/Burst Immunity

Test date	Temperature	humidity	Ambient Pressure
Jun. 11, 2017	24.1	53	101

Test Data (AC Power Port)

Test Point	Polarity	Test Level (kV)	Verdict
L-GND	+ / -	1	Pass
N-GND	+ / -	1	Pass
L + N-GND	+ / -	1	Pass

Test Data (Telecom Port)

Test Point	Polarity	Test Level (kV)	Verdict
RJ45	+ / -	0.5	Pass

Note: Performance of the all modes comply with the performance criteria in Criterion B.

A.10 Surge Immunity

Test date	Temperature	humidity	Ambient Pressure
Jun. 11, 2017	24.8	53	101

Test Data (AC Power Port)

Coupling Line	Polarity	Voltage (kV)	Verdict
L-N	+ / -	0.5, 1	Pass

Test Data (Telecom Port)

Coupling Line	Polarity	Voltage (kV)	Verdict
RJ45	+ / -	0.5	Pass

Note: Performance of the all modes comply with the performance criteria in Criterion B.

A.11 Immunity to Conducted Disturbances Induced by RF Fields

Test date	Temperature	humidity	Ambient Pressure
Jun. 12, 2017	24.7	52	101

Test Data (AC Power Port)

Test Point	Frequency (MHz)	Field Strength (V rms)	Verdict
AC Port	0.15 - 80	3	Pass

Test Data (Telecom Port)

Test Point	Frequency (MHz)	Field Strength (V rms)	Verdict
RJ45	0.15 - 80	3	Pass

Note: Performance of the all modes comply with the performance criteria in Criterion A.

A.12 Power Frequency Magnetic Fields Immunity

Note: Not applicable.

A.13 Voltage Dips and Short Interruptions Immunity

Test date	Temperature	humidity	Ambient Pressure
Jun. 11, 2017	24.5	53	101

Test Mode	Voltage Reduction	Duration (ms)	Times	Interval (sec)	Verdict
Voltage Dips	100%	10	3	10	Pass
	30%	500	3	10	Pass
Voltage Interruptions	100%	5000	3	10	Pass

Note: Voltage Dips 100% Voltage Reduction performance of the all modes comply with the performance criteria in Criterion B. Voltage Dips 30% Voltage Reduction and Voltage Interruptions performance of the all modes comply with the performance criteria in Criterion C.

ANNEX B TEST SETUP PHOTOS

Please refer the document “BL-SZ1760077-AE.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ1760077-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL-SZ1760077-AI.PDF”.

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