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CNAS L3163

CE EMC Test Report

Project No.	:	2403G103
Equipment	:	Smart Video Phone
Brand Name	:	XONTEL
Test Model	:	XT-50G
Series Model	:	N/A
Applicant	:	XonTel Technology Trd. Co. W.L.L
Address	:	Office 21 - Justice Tower - Ali Al Salem St. - Qibla - Kuwait City - State Of Kuwait
Manufacturer	:	XonTel Technology Trd. Co. W.L.L
Address	:	Office 21 - Justice Tower - Ali Al Salem St. - Qibla - Kuwait City - State Of Kuwait
Date of Receipt	:	Aug. 13, 2021
Date of Test	:	Aug. 16, 2021 ~ Dec. 04, 2021
Issued Date	:	May 06, 2024
Report Version	:	R00
Test Sample	:	Engineering Sample No.: DG20210816160
Standard(s)	:	ETSI EN 301 489-1 V2.2.3 (2019-11) *ETSI EN 301 489-17 V3.2.4 (2020-09)

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.(Dongguan).

*ETSI EN 301 489-17 V3.2.4 (2020-09) is not authorized within the scope of CNAS.

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Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. BTL assumes no responsibility for the data provided by the customer, any statements, inferences or generalizations drawn by the customer or others from the reports issued by BTL.

The report must not be used by the client to claim product certification, approval, or endorsement by CNAS.

This report is the confidential property of the client. As a mutual protection to the clients, the public and ourselves, the test report shall not be reproduced, except in full, without our written approval.

BTL's laboratory quality assurance procedures are in compliance with the ISO/IEC 17025: 2017 requirements, and accredited by the conformity assessment authorities listed in this test report.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.
Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.

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REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-ETSE-1-2403G103	R00	This is a copy report which referencing test data are provided from test report (BTL-ETSE-1-2108C114). The device is identical to the original one recorded in the referencing report. 1. The brand name, model name, applicant and manufacturer information are changed. 2. Removed the factory information. 3. Removed the Mfr/Brand information of support units. Other are kept the same.	May 06, 2024	Valid

Remark: For the original report (BTL-ETSE-1-2108C114), the test data, data evaluation, and equipment configuration contained was accredited by the Authority of A2LA according to the ISO/IEC 17025 quality assessment standard and technical standard(s).

1. SUMMARY OF TEST RESULTS

Emission EN 301 489-1 / EN 301 489-17			
Ref Standard(s)	Test Item		Result
EN 55032:2015+A11:2020	Radiated emissions up to 1 GHz		PASS
	Radiated emissions above 1 GHz		PASS
	Conducted emissions AC mains power port		PASS
	Conducted emissions DC power port		N/A
	Asymmetric mode conducted emissions	AAN	PASS
		Current Probe	N/A
		CP+CVP	N/A
EN IEC 61000-3-2:2019	Harmonic current		PASS
EN 61000-3-3:2013+A1:2019	Voltage fluctuations (Flicker)		PASS

Immunity EN 301 489-1 / EN 301 489-17		
Ref Standard(s)	Test Item	Result
EN 61000-4-2:2009	ESD	PASS
EN IEC 61000-4-3:2020	RS	PASS
EN 61000-4-4:2012	EFT	PASS
EN 61000-4-5:2014+A1:2017	Surge	PASS
EN 61000-4-6:2014+AC:2015	CS	PASS
EN IEC 61000-4-11:2020	Dips	PASS

NOTE:

(1) “N/A” denotes test is not applicable to this device.

1.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No.3, Jinshagang 1st Road, Dalang, Dongguan, Guangdong, China.

1.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. The BTL measurement uncertainty is less than the CISPR 16-4-2 U_{cispr} requirement.

The reported uncertainty of measurement **y** ± ***U***, where expanded uncertainty ***U*** is based on a standard uncertainty multiplied by a coverage factor of **k=2**, providing a level of confidence of approximately **95**%.

A. Radiated emissions up to 1 GHz measurement:

Test Site	Method	Measurement Frequency Range	Ant. H / V	*U*,(dB)
DG-CB01 (3m)	CISPR	30MHz ~ 200MHz	V	4.62
		30MHz ~ 200MHz	H	3.58
		200MHz ~ 1,000MHz	V	4.44
		200MHz ~ 1,000MHz	H	4.36

B. Radiated emissions above 1 GHz measurement:

Test Site	Method	Measurement Frequency Range	*U*,(dB)
DG-CB01 (3m)	CISPR	1GHz ~ 6GHz	3.72

C. Conducted emissions AC mains power port measurement:

Test Site	Method	Measurement Frequency Range	*U*,(dB)
DG-C02	CISPR	150kHz ~ 30MHz	2.60

D. Asymmetric mode conducted emissions measurement:

Test Site	Method	Test Item	*U*,(dB)
DG-C02	CISPR	AAN Cat.5 LCL = 65 ... 50 dB	3.86

E. Harmonic current / Voltage fluctuations (Flicker) measurement:

Test Site	Method	Item	*U* (%)
DG-C01	EN IEC 61000-3-2	Current	0.593
	EN 61000-3-3	Voltage	0.595

F. Immunity Measurement:

Test Site	Method	Item	*U*
DG-SR02	EN 61000-4-2	Rise time tr	6.30%
		Peak current Ip	6.70%
		Current at 30 ns	6.40%
		Current at 60 ns	6.90%
DG-CB05	EN IEC 61000-4-3 (80MHz~6GHz)	Electromagnetic field immunity test	2.00dB
		PER or FER measurement, test set-up for RS (WLAN 2.4G&5G, BT)	2.08dB
DG-SR05	EN 61000-4-4	Peak voltage (VP)	3.8%
		Rise time (tr)	4.4%
		Pulse width(tw)	4.2%
		Pulse Freq.(kHz)	0.7%
		Burst Duration(ms)	1.5%
		Burst Period(ms)	1.4%
		Peak voltage (VP)-with clamp	3.7%
		Rise time (tr) -with clamp	4.4%
		Pulse width(tw) -with clamp	4.4%
DG-SR05/ DG-SR01	EN 61000-4-5	Open-Circuit Output Voltage (1.2/50us)	4.0%
		Open circuit front time (1.2/50us)	6.2%
		Open circuit time of half value (1.2/50us)	4.8%
DG-CB06	EN 61000-4-6 (150kHz-80MHz)	CDN	1.32dB
		EM clamp	3.14dB
		PER or FER measurement, test set-up for CS (WLAN 2.4G&5G, BT)	1.44dB
DG-SR05	EN IEC 61000-4-11	DIP Amplitude	3.6%
		DIP Time Event	4.0%

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Tested By
Radiated emissions up to 1 GHz	25°C	60%	Sparrow Liu
Radiated emissions above 1 GHz	25°C	60%	Sparrow Liu
Conducted emissions AC mains power port	25°C	53%	Aries Tang
Asymmetric mode conducted emissions	25°C	53%	Aries Tang
Harmonic current	25°C	55%	Max Tan
Voltage fluctuations (Flicker)	25°C	55%	Max Tan

Test Item	Temperature	Humidity	Pressure	Tested By
ESD	22°C	45%	1012hPa	Tohru Cong
RS	23°C	45%	/	Hunter Xu
EFT	23°C	46%	/	Richard Zhang
Surge	23°C	46%	/	Richard Zhang
CS	23°C	48%	/	Peppa Zhang
Dips	23°C	46%	/	Richard Zhang

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Smart Video Phone
Brand Name	XONTEL
Test Model	XT-50G
Series Model	N/A
Model Difference(s)	N/A
Power Source	1# DC voltage supplied from AC adapter. Model: F18L16-120150SPAV (EU) Model: F18L18-120150SPAB (UK) 2# Supplied from PoE.
Power Rating	1# I/P: 100-240V~ 50/60Hz 0.6A O/P: 12.0V ⎓ 1.5A 2# DC 48V
Connecting I/O Port(s)	1* DC port 1* PC port 1* LAN port 1* Headphone port 1* Handset port 1* USB port
Classification of EUT	Class B
Intended Operating Frequency(Fo)	2402-2480MHz, 2412-2472MHz, 5150-5250MHz
Highest Internal Frequency(Fx)	5250MHz

Note:
1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	HANDSET+2.4G WIFI+video+BT
Mode 2	HANDSFREE+5G WIFI+video+BT
Mode 3	RJ9 Earphone+5G WIFI+video+BT
Mode 4	LAN 100M/bps
Mode 5	LAN 10M/bps
Mode 6	PC PORT 100M/bps
Mode 7	PC PORT 10M/bps

For Radiated emissions up to 1 GHz test	
Final Test Mode	Description
Mode 2	HANDSFREE+5G WIFI+video+BT

For Radiated emissions Above 1 GHz test	
Final Test Mode	Description
Mode 2	HANDSFREE+5G WIFI+video+BT

For Conducted emissions AC mains power port test	
Final Test Mode	Description
Mode 3	RJ9 Earphone+5G WIFI+video+BT

For Asymmetric mode conducted emissions test	
Final Test Mode	Description
Mode 4	LAN 100M/bps
Mode 5	LAN 10M/bps
Mode 6	PC PORT 100M/bps
Mode 7	PC PORT 10M/bps

For Harmonic current & Voltage fluctuations (Flicker) Test	
Final Test Mode	Description
Mode 3	RJ9 Earphone+5G WIFI+video+BT

For Immunity Test	
Final Test Mode	Description
Mode 1	HANDSET+2.4G WIFI+video+BT
Mode 2	HANDSFREE+5G WIFI+video+BT
Mode 3	RJ9 Earphone+5G WIFI+video+BT

Note:

1. For EMI test: Adapter supply evaluated Mode 1-Mode 3, the worst case is Mode 2 for radiated emissions, Mode 3 for conducted emissions and PoE supply evaluated the worst mode. Only the worst case is recorded.
2. The product supports BT&2.4G&5G WIFI function.
   The frequency exemption are 2400-2483.5MHz, 5150-5250MHz.
3. Radiated emission above 1GHz tested with 2.4G&5G filter.

2.3 EUT OPERATING CONDITIONS

The EUT exercise program used during radiated and/or conducted emission measurement was designed to exercise the various system components in a manner similar to a typical use.
The standard test signals and output signal as following:

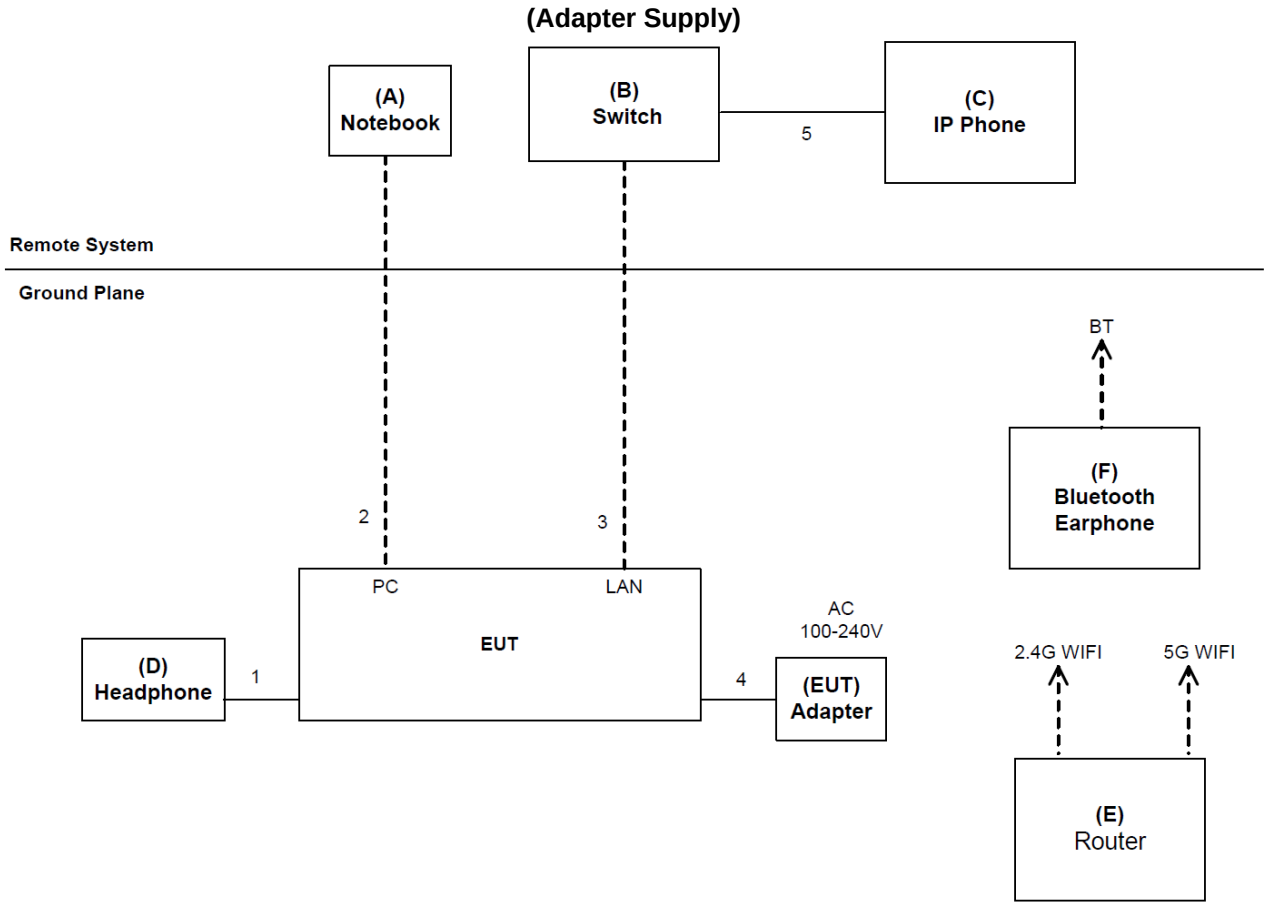
Adapter Supply:

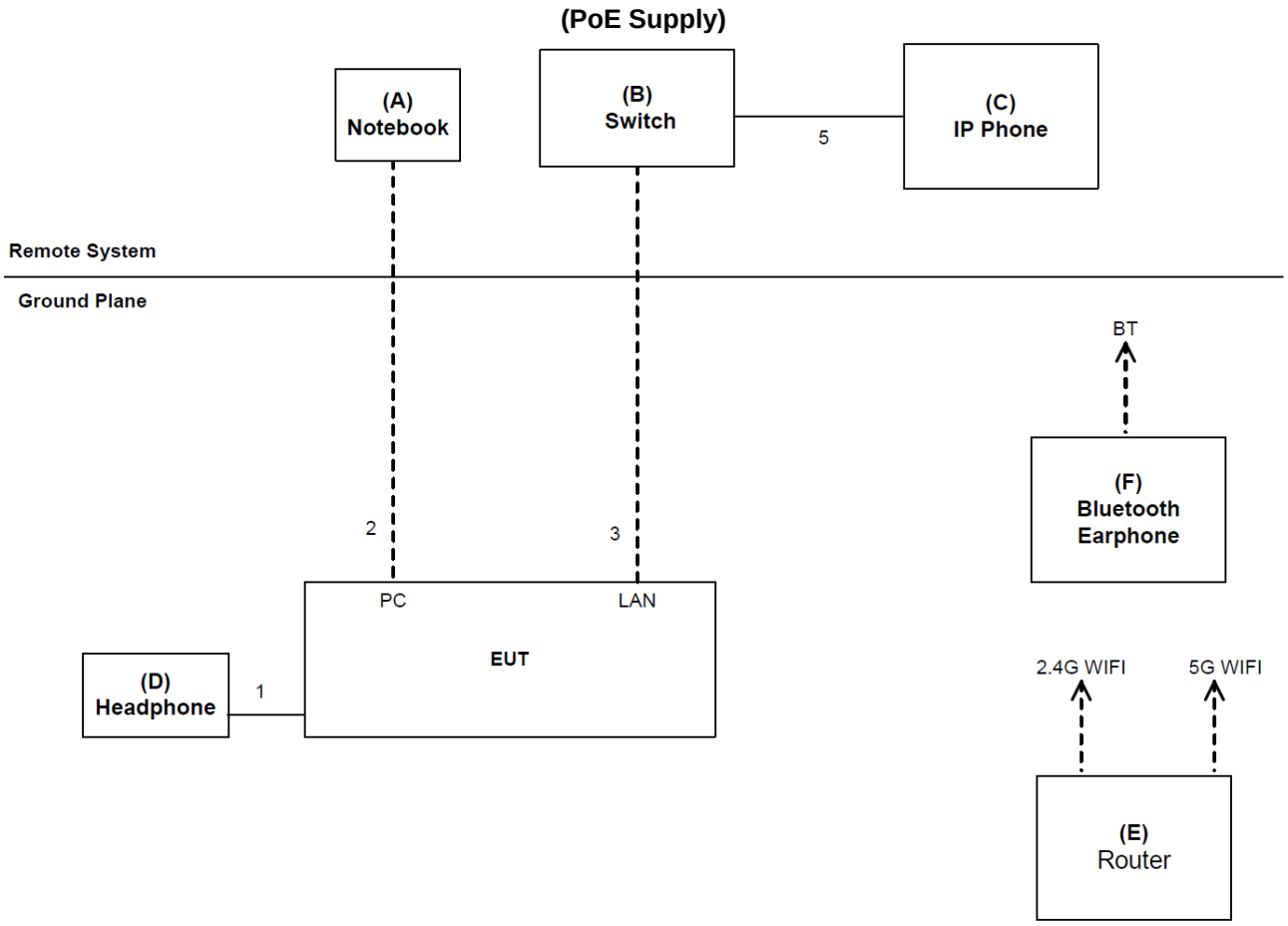
1. EUT connected to Notebook via RJ45 Cable.
2. EUT connected to Switch via RJ45 Cable.
3. Switch connected to IP Phone via RJ45 Cable.
4. EUT connected to Headphone via RJ9 Cable.
5. EUT connected to Bluetooth Earphone via BT.
6. EUT connected to Router via 2.4G WIFI and 5G WIFI.
7. EUT connected to Adapter via DC Cable.

PoE Supply:

1. EUT connected to Notebook via RJ45 Cable.
2. EUT connected to Switch via RJ45 Cable.
3. Switch connected to IP Phone via RJ45 Cable.
4. EUT connected to Headphone via RJ9 Cable.
5. EUT connected to Bluetooth Earphone via BT.
6. EUT connected to Router via 2.4G WIFI and 5G WIFI.

2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED





2.5 DESCRIPTION OF SUPPORT UNITS

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

Item	Equipment	Model/Type No.	Series No.
A	Notebook	G40	YB09261386
B	Switch	DGS-1008P	N/A
C	IP Phone	V67	N/A
D	Headphone	A310QD	N/A
E	Router	HG255s	Q4TS17726906091
F	Bluetooth Earphone	M9	N/A

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	RJ9 Cable	NO	NO	1m
2	RJ45 Cable	NO	NO	10m
3	RJ45 Cable	NO	NO	10m
4	DC Cable	NO	NO	1.5m
5	RJ45 Cable	NO	NO	1.2m

3. EMC EMISSION TEST

3.1 RADIATED EMISSIONS UP TO 1 GHZ

3.1.1 LIMITS

Class B equipment up to 1 GHz

Frequency Range MHz	Measurement			Class B limits dB(μV/m)
	Facility	Distance m	Detector type/ bandwidth	
30 - 230	SAC	3	Quasi peak / 120 kHz	40
230 - 1000				47

Notes:

(1) The limit for radiated test was performed according to as following: EN 55032

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

(4) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)
Margin Level = Measurement Value - Limit Value

3.1.2 TEST PROCEDURE

a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz).

b. The height of the equipment or of the substitution antenna shall be 0.8 m, the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

c. The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

d. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn‘t perform.
(below 1GHz)

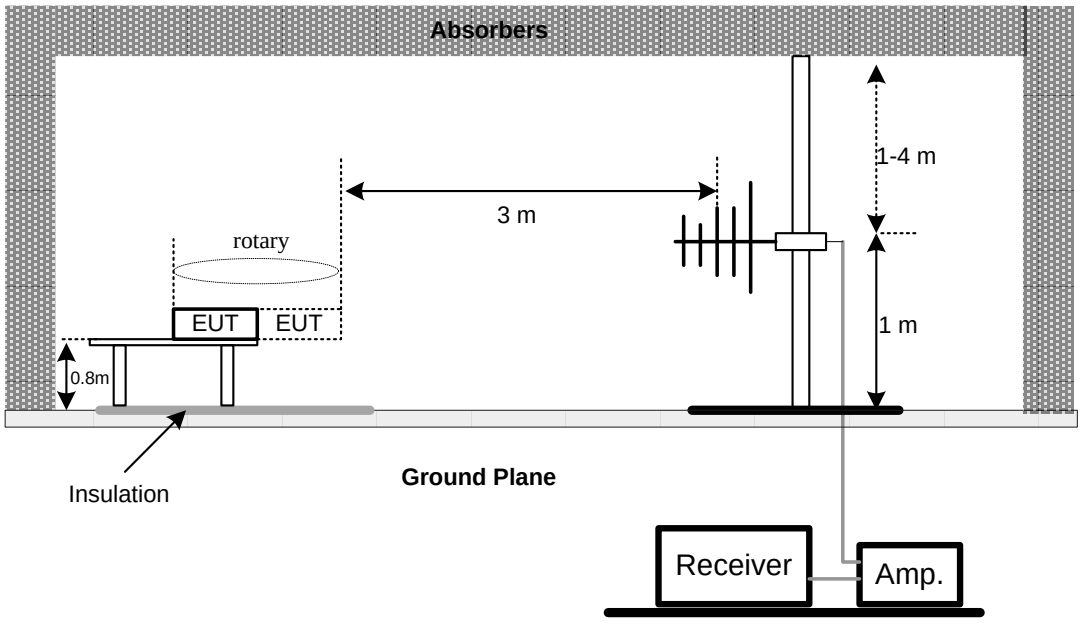
e. For the actual test configuration, please refer to the related Item - Block Diagram of system tested.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation.

3.1.4 TEST SETUP

UP TO 1 GHZ



3.1.5 MEASUREMENT DISTANCE

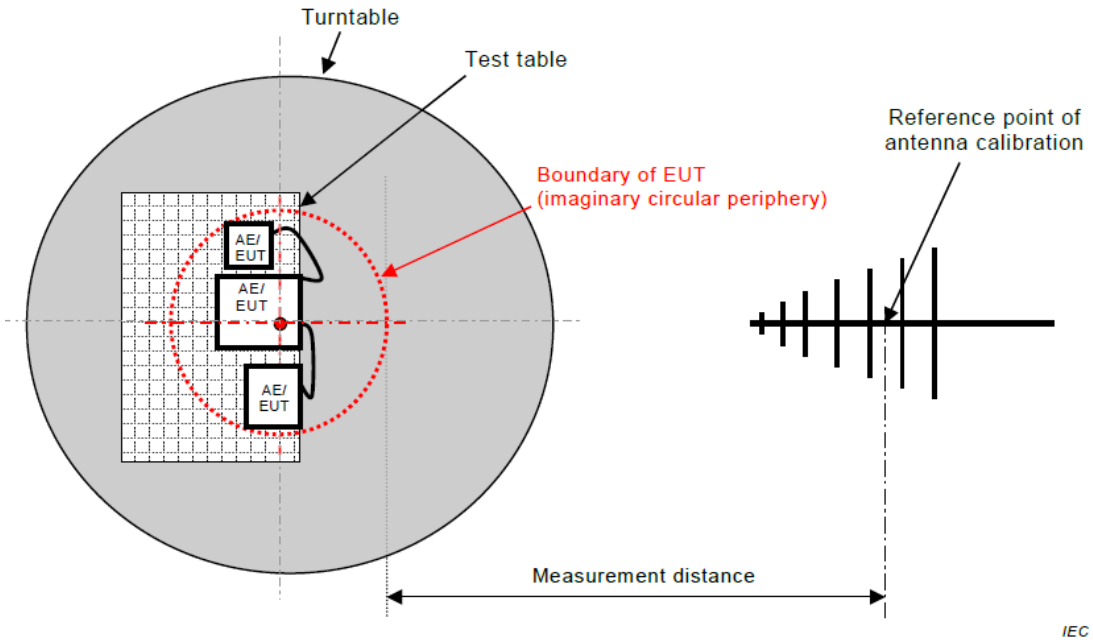


Figure C.1 – Measurement distance

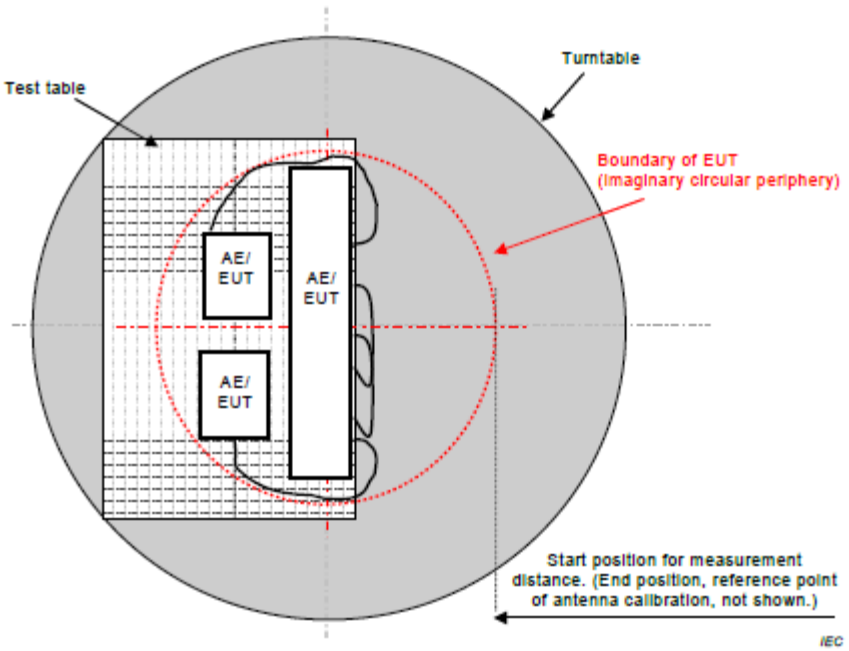


Figure C.2 – Boundary of EUT, Local AE and associated cabling

3.1.6 TEST RESULTS (UP TO 1 GHZ)

Please refer to the Appendix A.

3.2 RADIATED EMISSIONS ABOVE 1 GHZ

3.2.1 LIMITS

Class B equipment above 1 GHz

Frequency Range MHz	Measurement			Class B limits dB(μV/m)
	Facility	Distance m	Detector type/bandwidth	
1000 - 3000	FSOATS	3	Average / 1 MHz	50
3000 - 6000				54
1000 - 3000			Peak / 1 MHz	70
3000 - 6000				74

Notes:

(1) The limit for radiated test was performed according to as following: EN 55032

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

(4) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)
Margin Level = Measurement Value - Limit Value

Required highest frequency for radiated measurement

Highest internal frequency (F_x)	Highest measured frequency
$F_x \leq 108$ MHz	1 GHz
$108 < F_x \leq 500$ MHz	2 GHz
$500 < F_x \leq 1000$ MHz	5 GHz
$F_x > 1$ GHz	5 x F_x up to a maximum of 6 GHz

3.2.2 TEST PROCEDURE

a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz).

b. The height of the equipment or of the substitution antenna shall be 0.8 m, the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

c. The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

d. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn‘t perform. (above 1GHz)

e. For the actual test configuration, please refer to the related Item - Block Diagram of system tested.

f. For transmitters:
The frequencies on which the transmitter part of the EUT is intended to operate shall be excluded from radiated emission measurements when performed in transmit mode of operation.

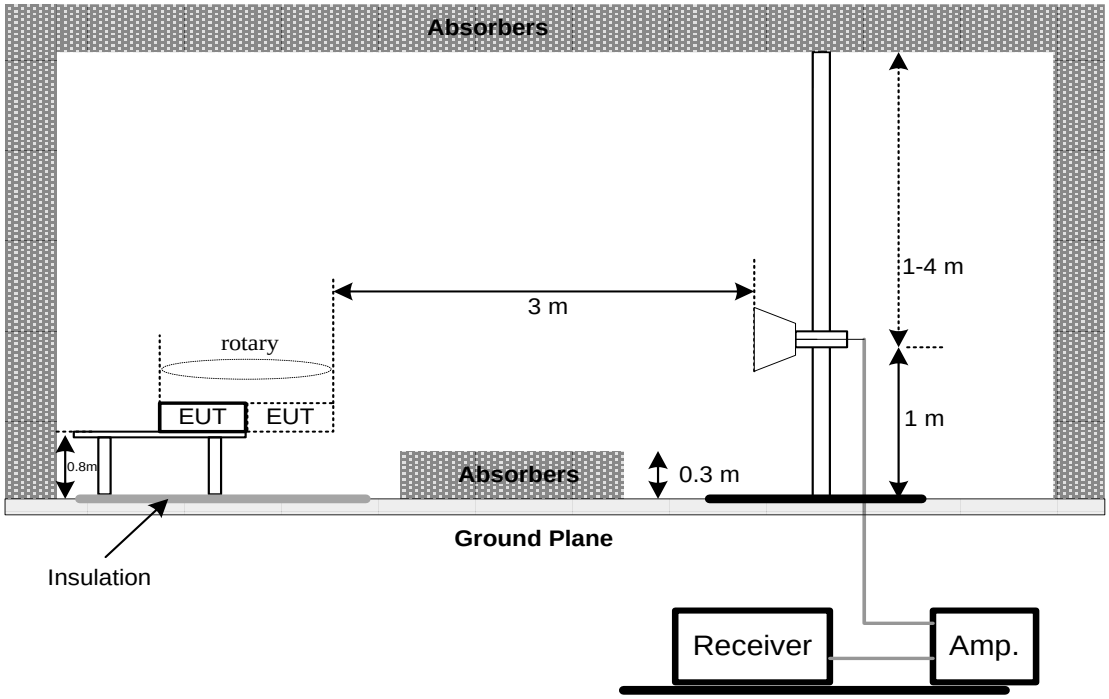
g. For receivers:
There shall be no frequency exclusion band applied to emission measurements of the receiver part of transceivers or the stand alone receiver under test, and/or associated ancillary equipment.

3.2.3 DEVIATION FROM TEST STANDARD

No deviation

3.2.4 TEST SETUP

ABOVE 1 GHZ



3.2.5 MEASUREMENT DISTANCE

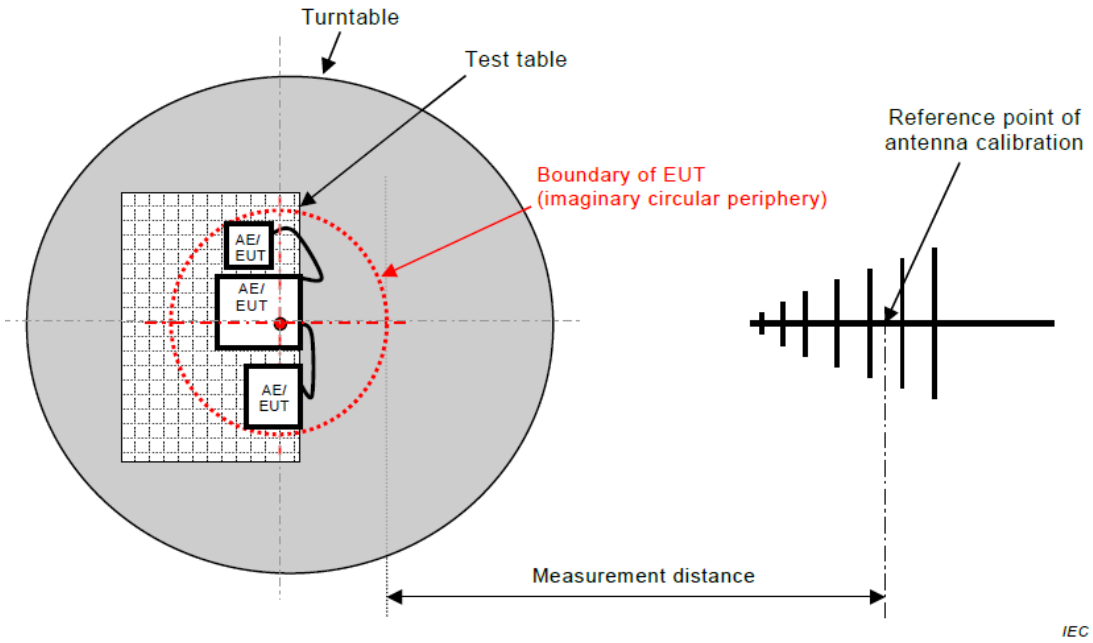


Figure C.1 – Measurement distance

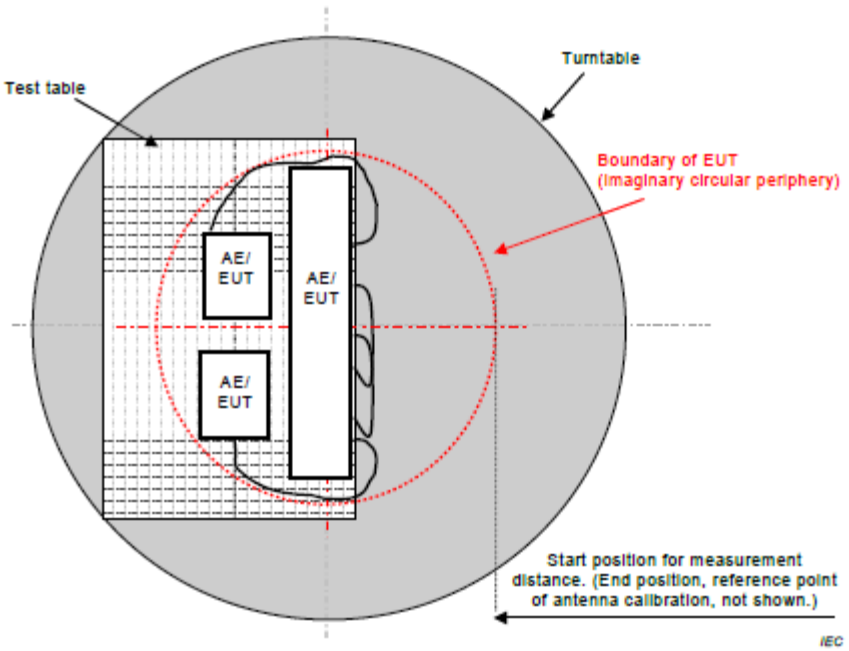


Figure C.2 – Boundary of EUT, Local AE and associated cabling

3.2.6 TEST RESULTS (ABOVE 1 GHZ)

Please refer to the Appendix B.

3.3 CONDUCTED EMISSION MEASUREMENT AT AC MAINS POWER PORTS

3.3.1 LIMITS

Requirements for conducted emissions from AC mains power ports of Class B equipment

Frequency Range MHz	Coupling Device	Detector Type / bandwidth	Class B Limits (dB(μV))
0.15 - 0.5	AMN	Quasi Peak / 9 kHz	66-56
0.5 - 5			56
5 - 30			60
0.15 - 0.5	AMN	Average / 9 kHz	56-46
0.5 - 5			46
5 - 30			50

NOTE:
(1) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use)
Margin Level = Measurement Value – Limit Value

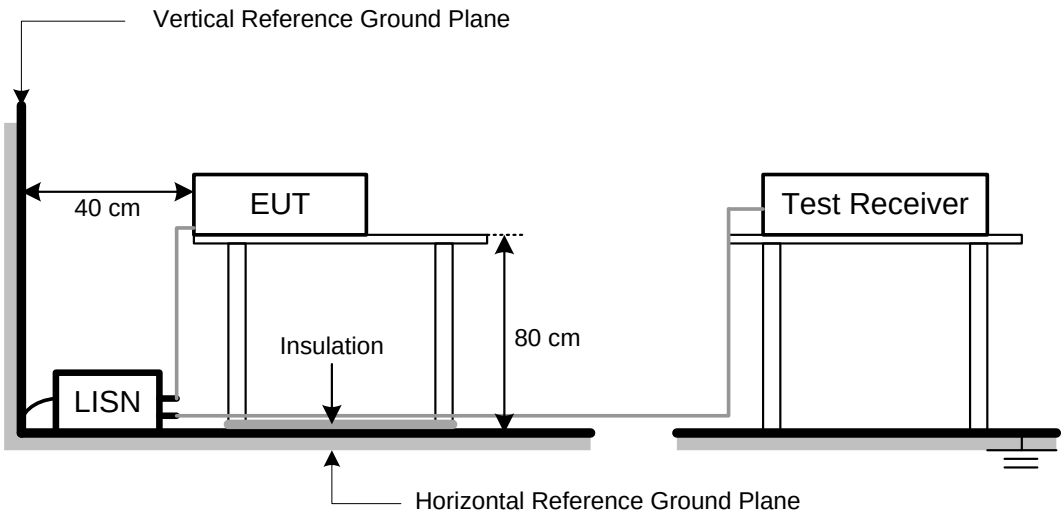
3.3.2 TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.3.3 DEVIATION FROM TEST STANDARD

No deviation

3.3.4 TEST SETUP



3.3.5 TEST RESULTS

Please refer to the Appendix C.

3.4 ASYMMETRIC MODE CONDUCTED EMISSIONS TEST

3.4.1 LIMITS

Requirements for asymmetric mode conducted emissions from Class B equipment

Frequency Range MHz	Coupling device	Detector type / Bandwidth	Class B voltage limits dB(μV)	Class B current limits dB(μA)
0.15 - 0.5	AAN	Quasi Peak / 9 kHz	84 - 74	n/a
0.5 - 30			74	
0.15 - 0.5	AAN	Average / 9 kHz	74 - 64	
0.5 - 30			64	

NOTE:
(1) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use)
Margin Level = Measurement Value – Limit Value

3.4.2 TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. For the actual test configuration, please refer to the related Item –EUT Test Photos.
e. **AAN** at least 80 cm from nearest part of EUT chassis.

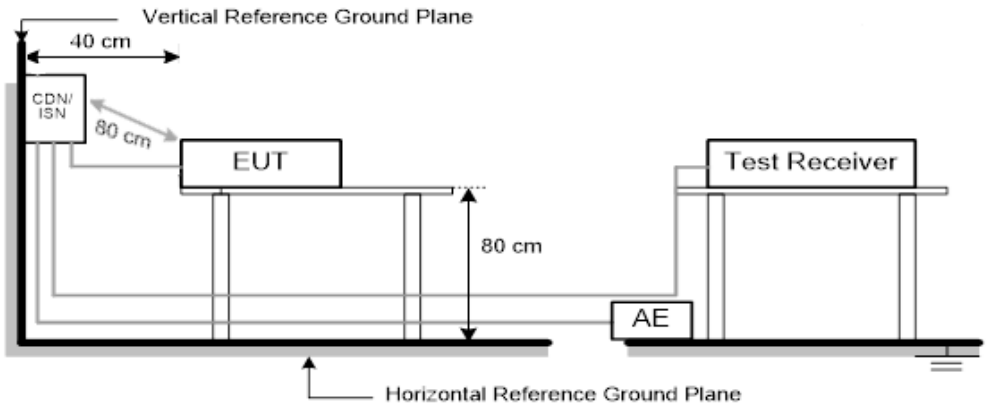
NOTE:
1. The communication function of EUT was executed and AAN was connected between EUT and associated equipment and the AAN was connected directly to reference ground plane.
Measure the voltage at the measurement port of the AAN
Correct the measured voltage by adding the AAN voltage division factor
Compare the corrected voltage with the limit**.**

3.4.3 DEVIATION FROM TEST STANDARD

No deviation

3.4.4 TEST SETUP

a) Cable Type: Balanced Unscreened, Screened or Coaxial



3.4.5 TEST RESULTS

Please refer to the Appendix D.

3.5 HARMONIC CURRENT EMISSIONS TEST

3.5.1 LIMITS

The power consumption is less than 75W, there is no limit applied.

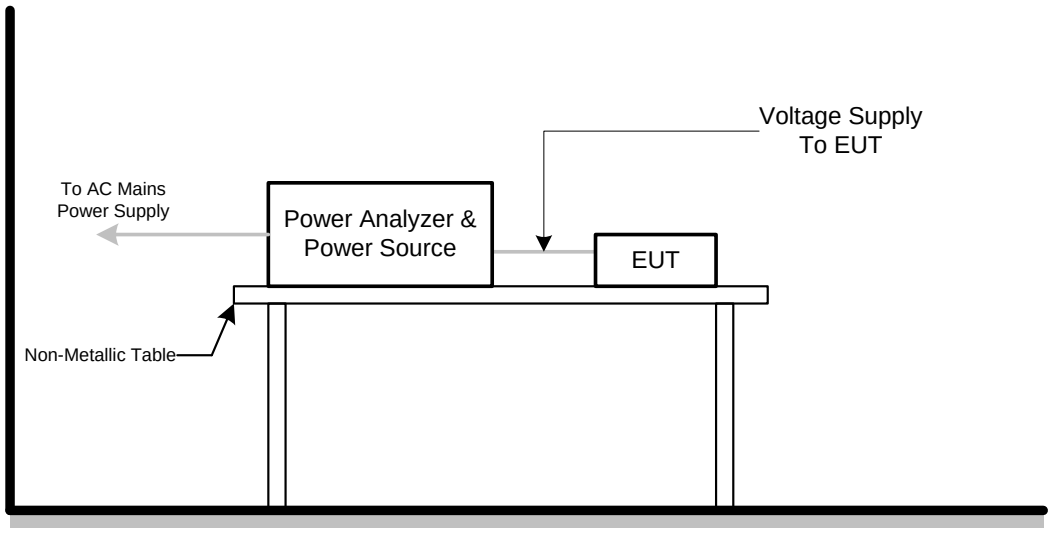
3.5.2 TEST PROCEDURE

a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions.
b. The classification of EUT is according to of EN IEC 61000-3-2. The EUT is classified as Class A.
c. 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 time necessary for the EUT to be exercised.

3.5.3 DEVIATION FROM TEST STANDARD

No deviation

3.5.4 TEST SETUP



3.5.5 TEST RESULTS

Please refer to the Appendix E.

3.6 VOLTAGE FLUCTUATIONS AND FLICKER

3.6.1 LIMITS OF VOLTAGE FLUCTUATIONS AND FLICKER

Tests	Limits	Descriptions
	EN 61000-3-3	
Pst	≤ 1.0, Tp= 10 min.	Short Term Flicker Indicator
Plt	≤ 0.65, Tp=2 hr.	Long Term Flicker Indicator
dc	≤ 3.3%	Relative Steady-State V-Change
dmax	≤ 4%	Maximum Relative V-change
d (t)	≤ 500 ms	Relative V-change characteristic

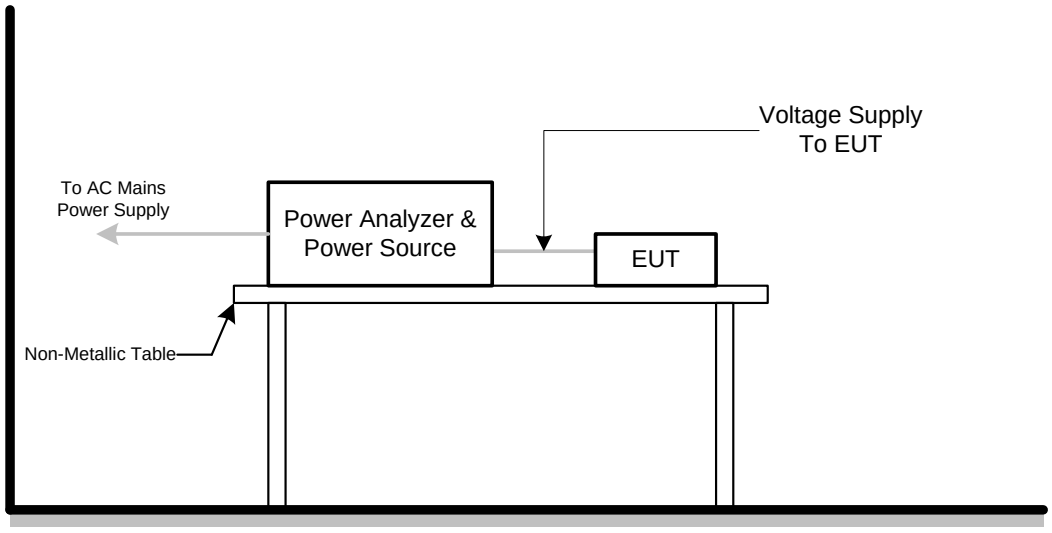
3.6.2 TEST PROCEDURE

a. Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in EN 61000-3-3 depend on which standard adopted for compliance measurement.
b. All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

3.6.3 DEVIATION FROM TEST STANDARD

No deviation

3.6.4 TEST SETUP



3.6.5 TEST RESULTS

Please refer to the Appendix F.

4. EMC IMMUNITY TEST

4.1 STANDARD COMPLIANCE/SEVERITY LEVEL/CRITERIA

Equipment operating in locations other than telecommunication centres			
Test Standard No.	Test Specification Level	Test Mode Test Port	Performance Criteria
Electrostatic discharge EN 61000-4-2 (ESD)	± 8 kV air discharge ± 4 kV contact discharge	Direct Mode	B
	± 4 kV HCP discharge ± 4 kV VCP discharge	Indirect Mode	B
Radio frequency electromagnetic Field EN IEC 61000-4-3 (RS)	80 MHz to 6000 MHz 3 V/m (unmodulated, r.m.s), 1000 Hz or 400 Hz, 80%, AM modulated **(NOTE 1)**	Enclosure	A
Fast transients, common mode EN 61000-4-4 (EFT)	± 1 kV(peak) 5/50 ns Tr/Th 5 kHz Repetition Frequency	AC mains power port	B
	±0.5 kV(peak) 5/50ns Tr/Th 5 kHz Repetition Frequency	DC power port **(NOTE 2)**	B
	± 0.5 kV(peak) 5/50 ns Tr/Th 5 kHz Repetition Frequency	Signal port, Wired network port, Control port **(NOTE 2)**	B
Surges, line to line and line to Ground EN 61000-4-5 (Surge)	±1 kV(5P/5N) 1.2/50(8/20) Tr/Th us **(line to line)**	AC mains power port	B
	± 2 kV(5P/5N) 1.2/50(8/20) Tr/Th us **(line to earth or ground)**		B
	±1 kV (5P/5N) 10/700 (5/320)Tr/Th us **(symmetrically operated line to ground)**	wired network ports **(NOTE 3)**	B
	±0.5 kV (5P/5N) 1.2/50(8/20) Tr/Th us **(non-symmetrically line to line)**		
	±1 kV (5P/5N) 1.2/50(8/20) Tr/Th us **(non-symmetrically line to ground, or shield to ground)**		
	±0.5 kV (5P/5N) 1.2/50(8/20) Tr/Th us **(line to ground, or shield to ground)**	wired network ports **(NOTE 4)**	B

Radio frequency, common mode EN 61000-4-6 (CS)	0.15 MHz to 80 MHz 3 V (unmodulated, r.m.s), 1000 Hz or 400 Hz, 80%, AM Modulated 150Ω source impedance **(NOTE 1)**	AC Power Port	A
	0.15 MHz to 80 MHz 3 V (unmodulated, r.m.s), 1000 Hz or 400 Hz, 80%, AM Modulated 150Ω source impedance **(NOTE 1)**	DC Power Port **(NOTE 2)**	A
	0.15 MHz to 80 MHz 3V (unmodulated, r.m.s), 1000 Hz or 400 Hz, 80%, AM Modulated 150Ω source impedance **(NOTE 1)**	signal ports, wired network ports, control ports **(NOTE 2)**	A
Voltage dips and interruptions EN IEC 61000-4-11 (Dips)	Voltage dips: 0 % residual voltage for 0,5 cycle 0 % residual voltage for 1 cycle 70 % residual voltage for 25 cycles (at 50 Hz) Voltage interruptions: 0 % residual voltage for 250 cycles (at 50 Hz)	AC Power Port	B B C C

NOTE:

(1) If the wanted signal is modulated at 1 000 Hz, then an audio signal of 400 Hz shall be used.

(2) If the cables may be longer than 3 m.

(3) Only for directly connected to outdoor cables.

(4) Only for connected to indoor cables (longer than 30 m).

4.2 GENERAL PERFORMANCE CRITERIA

According to **ETSI EN 301 489-17** standard, the general performance criteria as following:

Criteria	During Test	After Test
A	Shall operate as intended. (see note). Shall be no loss of function. Shall be no unintentional transmissions.	Shall operate as intended. Shall be no degradation of performance. Shall be no loss of function. Shall be no loss of critical stored data.
B	May show loss of function.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no loss of critical stored data.
C	May be loss of function.	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no loss of critical stored data.
NOTE: Operate as intended during the test allows a level of degradation in accordance with minimum performance level.		

Minimum performance level

For equipment that supports a PER or FER, the minimum performance level shall be a PER or FER less than or equal to 10 %.
For equipment that does not support a PER or a FER, the minimum performance level shall be no loss of the wireless transmission function needed for the intended use of the equipment.

4.3 ELECTROSTATIC DISCHARGE (ESD)

4.3.1 TEST SPECIFICATION

Test Method:	EN 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Required Performance	B
Discharge Voltage:	Air Discharge: ± 2 kV, ± 4 kV, ± 8 kV Contact Discharge: ± 4 kV
Polarity:	Positive & Negative
Number of Discharge	20 times at each test point
Discharge Mode:	Single Discharge
Discharge Period:	1 second

4.3.2 TEST PROCEDURE

The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

a. The test shall be performed with single discharges. On each pre-selected point at least 10single discharges (in the most sensitive polarity) shall be applied.
NOTE 1 The minimum number of discharges applied is depending on the EUT; for products with synchronized circuits the number of discharges should be larger.
For the time interval between successive single discharges an initial value of 1 s is recommended. Longer intervals may be necessary to determine whether a system failure has occurred.
NOTE 2 The points to which the discharges should be applied may be selected by means of an explor ation carried out at a repetition rate of 20 discharges per second, or more.
Vertical Coupling Plane (VCP):
The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Discharge Electrode touching the coupling plane.
The four faces of the EUT will be performed with electrostatic discharge.
Horizontal Coupling Plane (HCP):
The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.
The four faces of the EUT will be performed with electrostatic discharge.

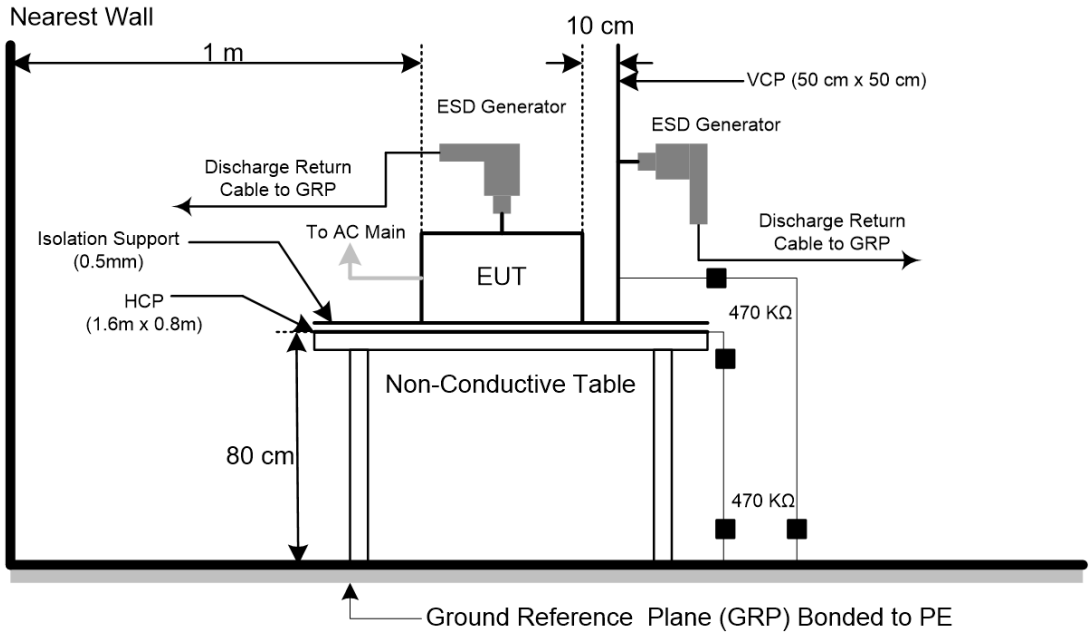
b. Air discharges at insulation surfaces of the EUT.
It was at least ten single discharges with positive and negative at the same selected point.

c. For TABLE-TOP equipment:
The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940k total impedance. The equipment under test was installed in a representative system as described in EN 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

4.3.3 DEVIATION FROM TEST STANDARD

No deviation.

4.3.4 TEST SETUP



4.3.5 TEST RESULTS

Please refer to the Appendix G.

4.4 RADIO FREQUENCY ELECTROMAGNETIC FIELD (RS)

4.4.1 TEST SPECIFICATION

Test Method:	EN IEC 61000-4-3
Required Performance	A
Frequency Range:	80 MHz - 6000 MHz
Field Strength:	3 V/m (unmodulated, r.m.s)
Modulation:	1000 Hz Sine Wave, 80%, AM Modulation
Frequency Step:	1% of the preceding frequency.
Polarity of Antenna:	Horizontal and Vertical
Test Distance:	3 m
Antenna Height:	1.55 m
Dwell Time:	3 seconds

4.4.2 TEST PROCEDURE

The EUT and support equipment are in a fully-anechoic chamber.
The testing distance from antenna to the EUT was 3 meters.
For TABLE-TOP equipment:
The EUT installed in a representative system as described in EN IEC 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.
The other condition as following manner:

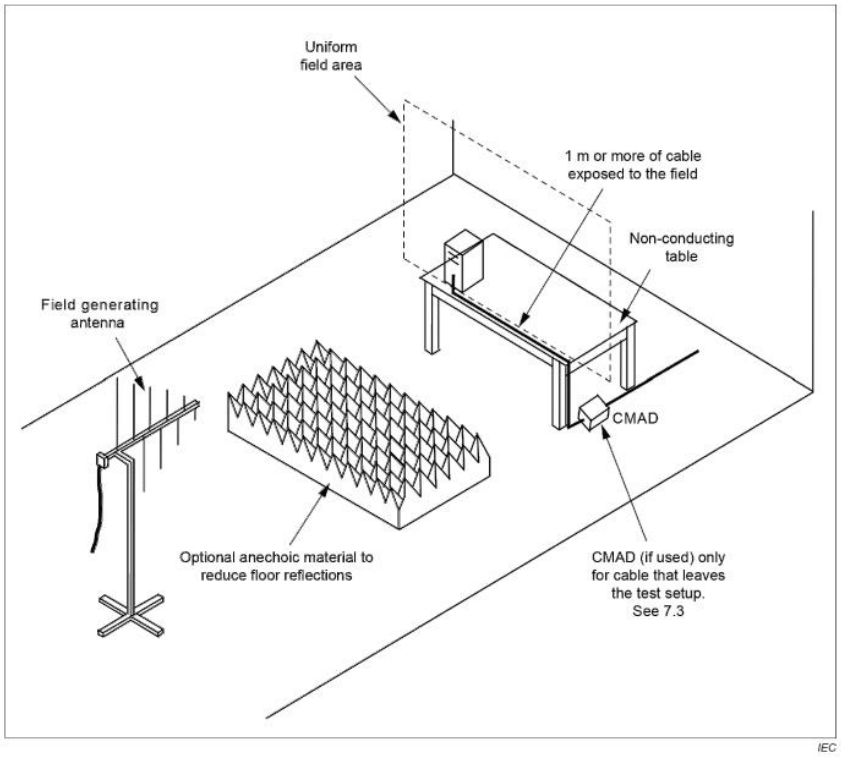
a. The test level shall be 3 V/m (measured unmodulated).
   The test signal shall be amplitude modulated to a depth of 80 % by a sinusoidal audio signal of 1000 Hz.
   The test shall be performed over the frequency range 80 MHz to 6000 MHz.
   For receivers and transmitters the stepped frequency increments shall be 1% frequency increment of the momentary used frequency.
b. The exclusion band of equipment operating in the 2,4 GHz band shall be:
   • Lower limit of exclusion band = lowest allocated band edge frequency -120 MHz
   • Upper limit of exclusion band = highest allocated band edge frequency +120 MHz

   The exclusion band of equipment operating in the 5 GHz Wi-Fi band shall be:
   • Lower limit of exclusion band = lowest allocated band edge frequency -320 MHz
   • Upper limit of exclusion band = highest allocated band edge frequency +320 MHz
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.

4.4.3 DEVIATION FROM TEST STANDARD

No deviation.

4.4.4 TEST SETUP



4.4.5 TEST RESULTS

Please refer to the Appendix H.

4.5 FAST TRANSIENTS, COMMON MODE (EFT)

4.5.1 TEST SPECIFICATION

Test Method:	EN 61000-4-4
Required Performance	B
Test Voltage	AC power port: ±1 kV Signal port, Wired network port, Control port: ±0.5 kV
Polarity:	Positive & Negative
Impulse Frequency:	5 kHz
Impulse Wave shape :	5/50 ns
Burst Duration:	15 ms
Burst Period:	300 ms
Test Duration:	1 min.

4.5.2 TEST PROCEDURE

For TABLE-TOP equipment:
The configuration consisted of a wooden table (0.8m high) standing on the Ground Reference Plane and should be located 0.1 m+/- 0.01m above the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system. A minimum distance of 0.5m was provided between the EUT and the walls of the laboratory or any other metallic structure.
The other condition as following manner:

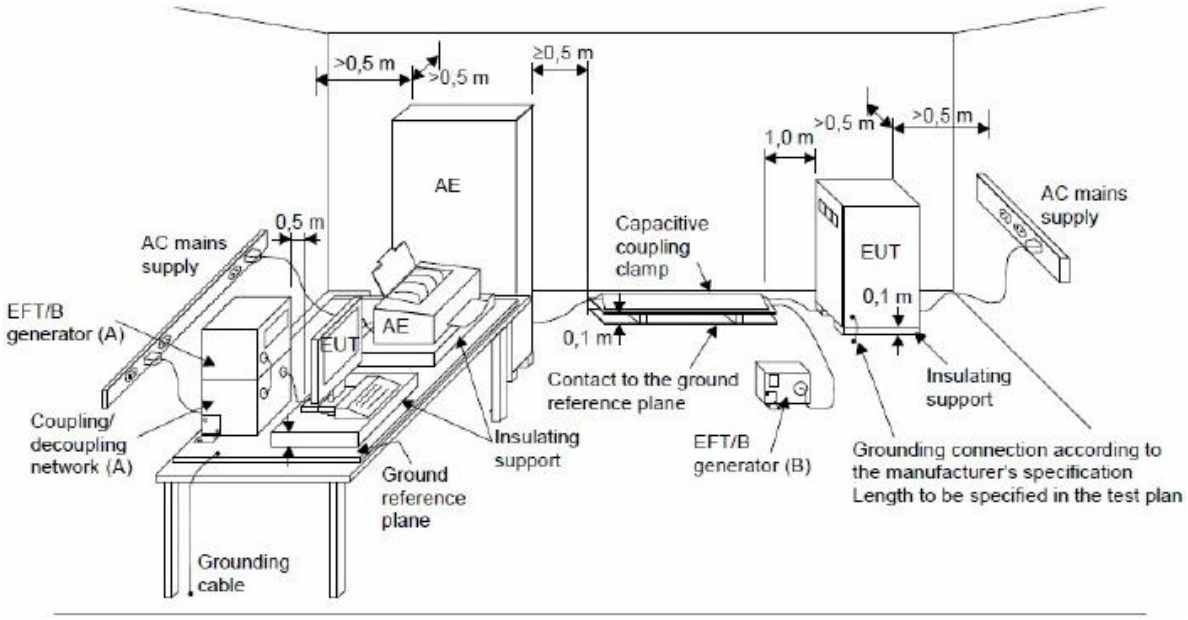
a. Both positive and negative polarity discharges were applied.

b. The duration time of each test sequential was 1 minute

4.5.3 DEVIATION FROM TEST STANDARD

No deviation.

4.5.4 TEST SETUP



4.5.5 TEST RESULTS

Please refer to the Appendix I.

4.6 SURGE IMMUNITY TEST (SURGE)

4.6.1 TEST SPECIFICATION

Test Method:	EN 61000-4-5
Required Performance	B
Wave-Shape:	1.2/50(8/20) Tr/Th μs combination wave
Test Voltage	AC Power Line: ±0.5 kV, ±1 kV Wired network ports: ±0.5 kV
Generator Source Impedance	2 Ω of the low-voltage power supply network. 42 Ω(40Ω+2Ω) between all other signal lines and ground when use 1.2/50(8/20) waveform
Polarity:	5 positive and 5 negative at selected points
Number of Tests & Polarity:	AC Power Port: 0°/90°/180°/270°
Pulse Repetition Rate:	1 time / min.

4.6.2 TEST PROCEDURE

a. For EUT power supply:

The surge is to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks shall be 2meters in length (or shorter).

b. For test applied to unshielded unsymmetrically operated interconnection lines of EUT:

The surge is applied to the lines via the capacitive coupling. The coupling /decoupling networks shall not influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

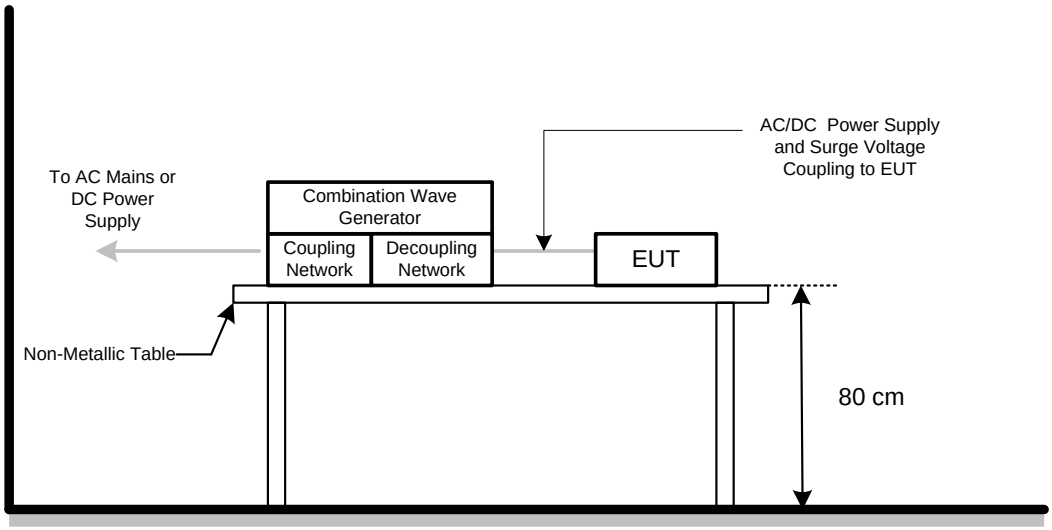
c. For test applied to unshielded symmetrically operated interconnection /telecommunication lines of EUT:

The surge is applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestor cannot be specified. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

4.6.3 DEVIATION FROM TEST STANDARD

No deviation.

4.6.4 TEST SETUP



4.6.5 TEST RESULTS

Please refer to the Appendix J.

4.7 RADIO FREQUENCY, COMMON MODE (CS)

4.7.1 TEST SPECIFICATION

Test Method:	EN 61000-4-6
Required Performance	A
Frequency Range:	0.15 MHz - 80 MHz
Field Strength:	3 V (unmodulated, r.m.s)
Modulation:	1000 Hz Sine Wave, 80%, AM Modulation
Frequency Step:	1% of the preceding frequency value
Dwell Time:	3 seconds

4.7.2 TEST PROCEDURE

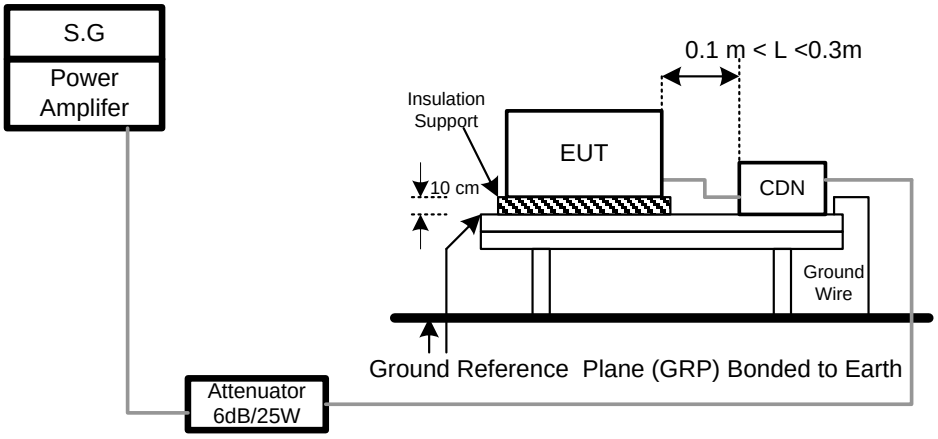
The equipment to be tested is placed on an insulating support of 0.1m height above a reference ground plane. All cables exiting the EUT shall be supported at a height of at least 30 mm above the reference ground plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 meters and 0.3 meters from the projected geometry of the EUT on the ground reference plane.
The other condition as following manner:

a. The test level shall be severity level 2 as given in EN 61000-4-6 corresponding to 3 V (unmodulated, r.m.s). The test signal shall then be amplitude modulated to a depth of 80 % by a sinusoidal audio signal of 1000 Hz.
b. The test shall be performed over the frequency range 150 kHz to 80 MHz with the exception of an exclusion band for transmitters, and for receivers and duplex transceivers.
c. For receivers and transmitters the stepped frequency increments shall be 1 % frequency increment of the momentary frequency in the frequency range 150 kHz to 80 MHz.
d. The injection method to be used shall be selected according to the basic standard EN 61000-4-6.
e. The dwell time of the test phenomena at each frequency shall not be less than the time necessary for the EUT to be exercised and to be able to respond.

4.7.3 DEVIATION FROM TEST STANDARD

No deviation.

4.7.4 TEST SETUP



4.7.5 TEST RESULTS

Please refer to the Appendix K.

4.8 VOLTAGE DIPS AND INTERRUPTIONS (DIPS)

4.8.1 TEST SPECIFICATION

Test Method:	EN IEC 61000-4-11
Required Performance	Voltage dips: B (0 % residual voltage for 0,5 cycle) B (0 % residual voltage for 1 cycle) C (70 % residual voltage for 25 cycles (at 50 Hz)) Voltage interruptions: C (0 % residual voltage for 250 cycles (at 50 Hz))
Interval between Event:	ten seconds
Phase Angle:	0°/180°
Test Cycle:	3 times

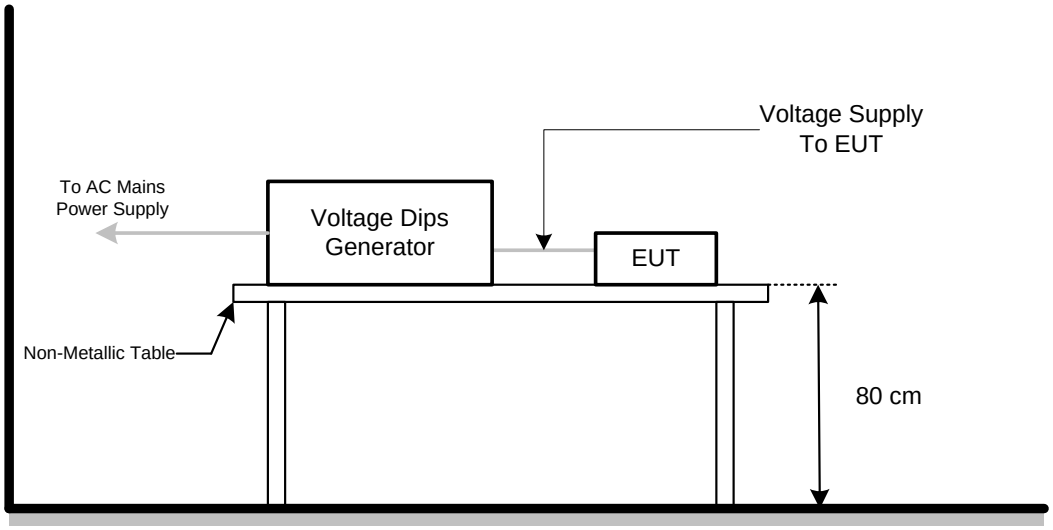
4.8.2 TEST PROCEDURE

The EUT shall be tested for each selected combination of test levels and duration with a sequence of three dips/interruptions with intervals of 10 s minimum (between each test event). Each representative mode of operation shall be tested. Abrupt changes in supply voltage shall occur at zero crossings of the voltage waveform.

4.8.3 DEVIATION FROM TEST STANDARD

No deviation.

4.8.4 TEST SETUP



4.8.5 TEST RESULTS

Please refer to the Appendix L.

5. MEASUREMENT INSTRUMENTS LIST

Radiated emission up to 1GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	ETS	3142B	26419	Apr. 14, 2022
2	Amplifier	SONOMA	310N	186128	Feb. 28, 2022
3	MXE EMI Receiver	Keysight	N9038A	MY56400091	Feb. 27, 2022
4	Cable	emci	LMR-400(30MHz-1 GHz)(7m+7m)	N/A	Sep. 23, 2022
5	Controller	ETS-Lindgren	2090	N/A	N/A
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

Radiated emission above 1GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Double-Ridged Waveguide Horn Antennas	ETS-LINDGREN	3117-PA	224991	Apr. 21, 2022
2	MXA Signal Analyzer	Keysight	N9020B	MY57100162	Feb. 28, 2022
3	Cable	MIcable Inc.	B10-01-01-2M	18072745	Jan. 06, 2022
4	Preamplifier	ETS-LINDGREN	3117-PA	224991	Jul. 10, 2022
5	Cable	MIcable Inc.	B10-01-01-15M(10 MHz~26.5GHz)	18047122	Jan. 06, 2022
6	Controller	ETS-Lindgren	2090	N/A	N/A
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
8	Band Reject Filter	Wairrwright Instruments Gmbh	WRCG 2400/2483-2375/25 05-50/10SS	16	Feb. 28, 2022
9	Band Reject Filter	Micro-Tronics	BRC50703-01	7	Feb. 27, 2022

Conducted emission at AC mains power port					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EMI Test Receiver	R&S	ESCI	100382	Feb. 28, 2022
2	LISN	EMCO	3816/2	52765	Feb. 27, 2022
3	TWO-LINE V-NETWORK	R&S	ENV216	101447	Feb. 28, 2022
4	50Ω Terminator	SHX	TF5-3	15041305	Feb. 27, 2022
5	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
6	Cable	N/A	RG223	12m	Mar. 09, 2022

Asymmetric mode conducted emissions					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EMI Test Receiver	R&S	ESCI	100382	Feb. 28, 2022
2	LISN	EMCO	3816/2	52765	Feb. 27, 2022
3	TWO-LINE V-NETWORK	R&S	ENV216	101447	Feb. 28, 2022
4	50Ω Terminator	SHX	TF5-3	15041305	Feb. 27, 2022
5	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
6	Cable	N/A	RG223	12m	Mar. 09, 2022
7	ISN	TESEQ	ISN T800	42838	Jul. 10, 2022

Harmonic current emissions & Voltage fluctuations and flicker					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Harmonics and Flicker Analyzer	California Instruments	PACS-1	72344	Jul. 10, 2022
2	3KVA AC Power source	California Instruments	3001ix	56309	Jul. 10, 2022
3	Measurement Software	California	CTS4.0 Version 4.29	N/A	N/A

Electrostatic discharge					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	ESD Generator	TESEQ AG	NSG 437	450	Dec. 01, 2022

Radio frequency electromagnetic Field					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	EMCO	3142C	66462	Mar. 26, 2022
2	Amplifier	AR	50S1G4A	326720	Feb. 28, 2022
3	Power amplifier	MILMEGA	AS1860-50	1064834	Feb. 28, 2022
4	Microwave Log.-Per. Antenna	Schwarzbeck	STLP 9149	9149-277	Apr. 14, 2022
5	Power amplifier	MILMEGA	80RF1000-250	1064833	Feb. 28, 2022
6	Measurement Software	Farad	(EZ-RS)V2.0.1.3	N/A	N/A
7	MXG Analog Signal Generator	Agilent	N5181A	MY49060710	Jul. 10, 2022

Fast transients, common mode					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Fast Transient Burst Simulator	Prima	EFT61004TA	PR190741004	Jul. 10, 2022
2	EFT	Prima	EFT_Series V1.0.0.0.20180710	N/A	N/A

Surges					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	System mainframe	Schaffner	NSG 2050	200729-619LU	Jul. 10, 2022
2	CDN	EMC PARTNER	CDN-UTP8	40	Feb. 27, 2022
3	Measurement Software	Schaffner	Win 2000 Version V7.10	N/A	N/A
4	Lightning Surge Generator	Prima	SUG61005TB	PR190854067	Jul. 10, 2022
5	Surge	Prima	SUG_Series V1.0.0.7.20190827	N/A	N/A

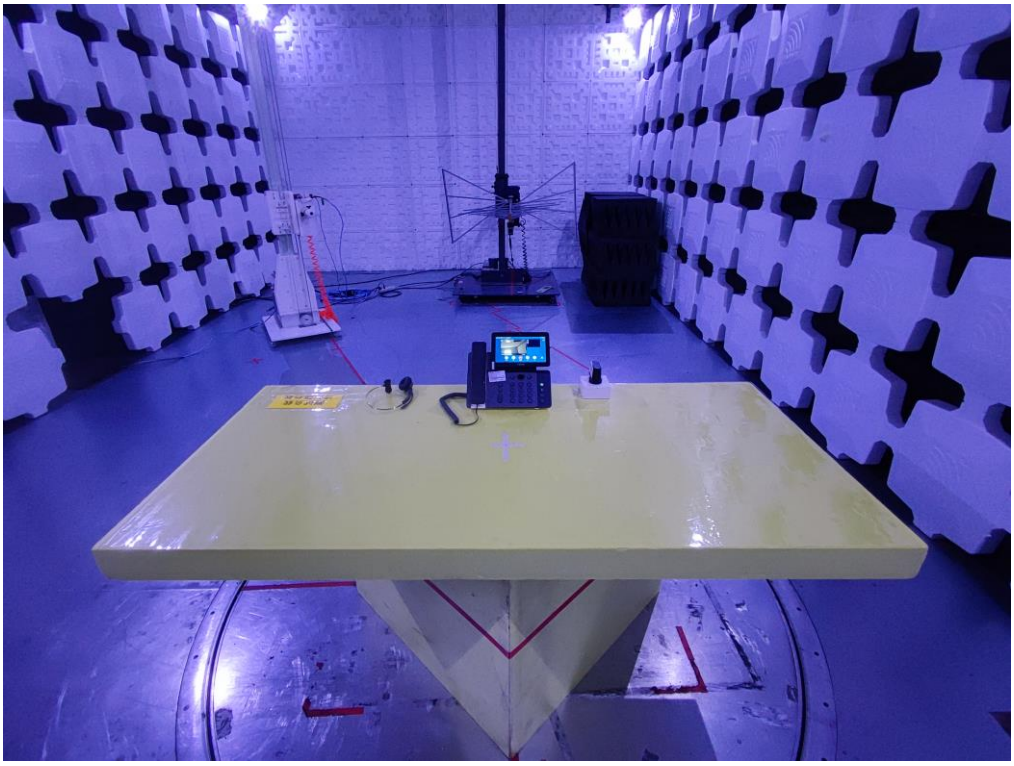
Radio frequency, common mode					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Power CDN	FCC	FCC-801-M2/M3-16 A	100270	Feb. 27, 2022
2	TEST SYSTEM FOR CONDUCTED AND RADIATED IMMUNITY	TESEQ	NSG 4070B	37513	Jul. 10, 2022
3	Coupling Decoupling Network	Teseq GmbH	CDN T8-10	40373	Jul. 10, 2022
4	Measurement Software	Farad	EZ-CS (V2.0.1.4)	N/A	N/A

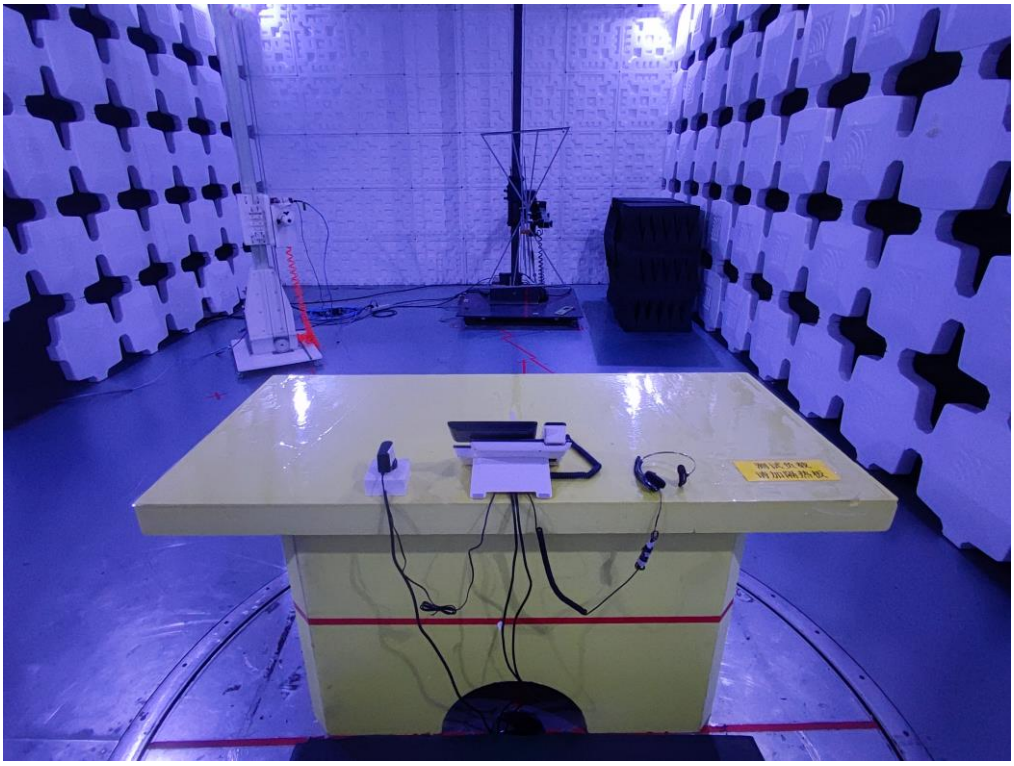
Voltage dips and interruptions					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Cycle Sag Simulator	Prima	DRP61011TA	PR19076452	Dec. 01, 2022
2	Measurement Software	Prima	DRP_Series V1.0.0.3.20190123	N/A	N/A

Remark: “N/A” denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

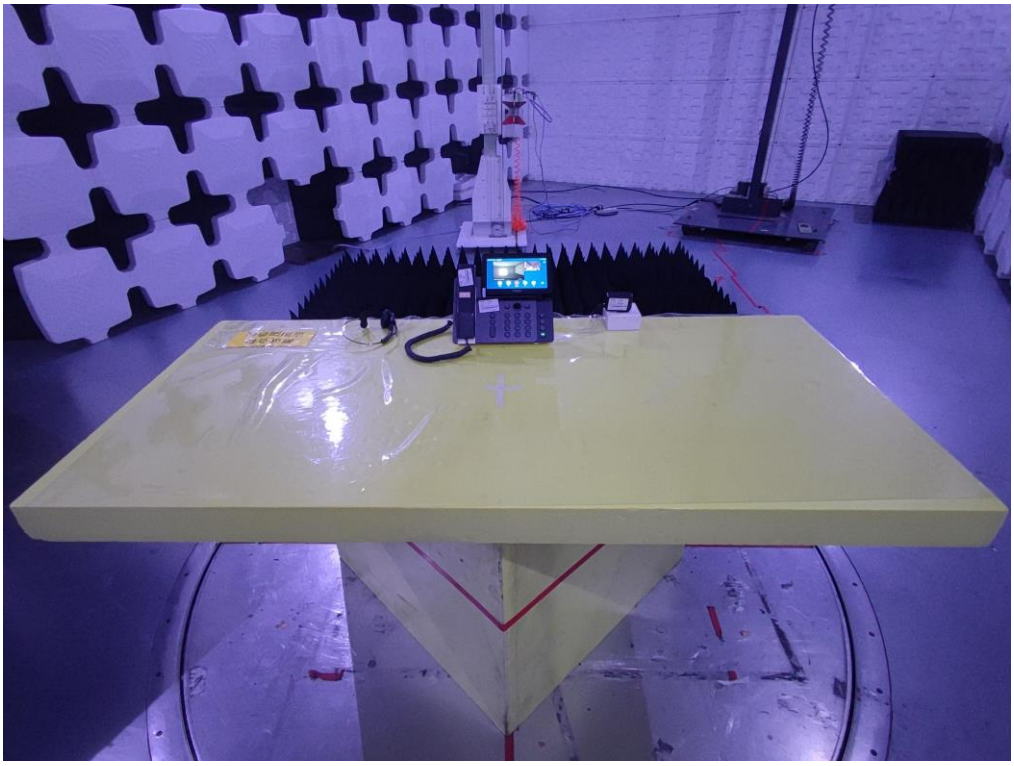
6. EUT TEST PHOTO

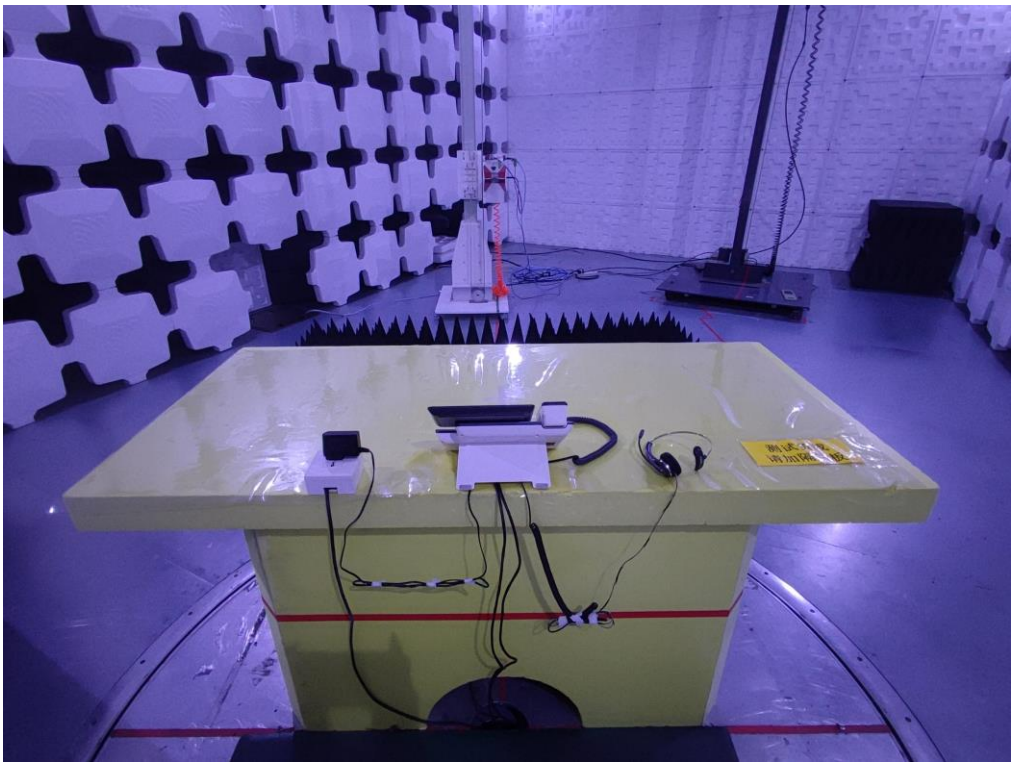
Radiated emissions up to 1 GHz



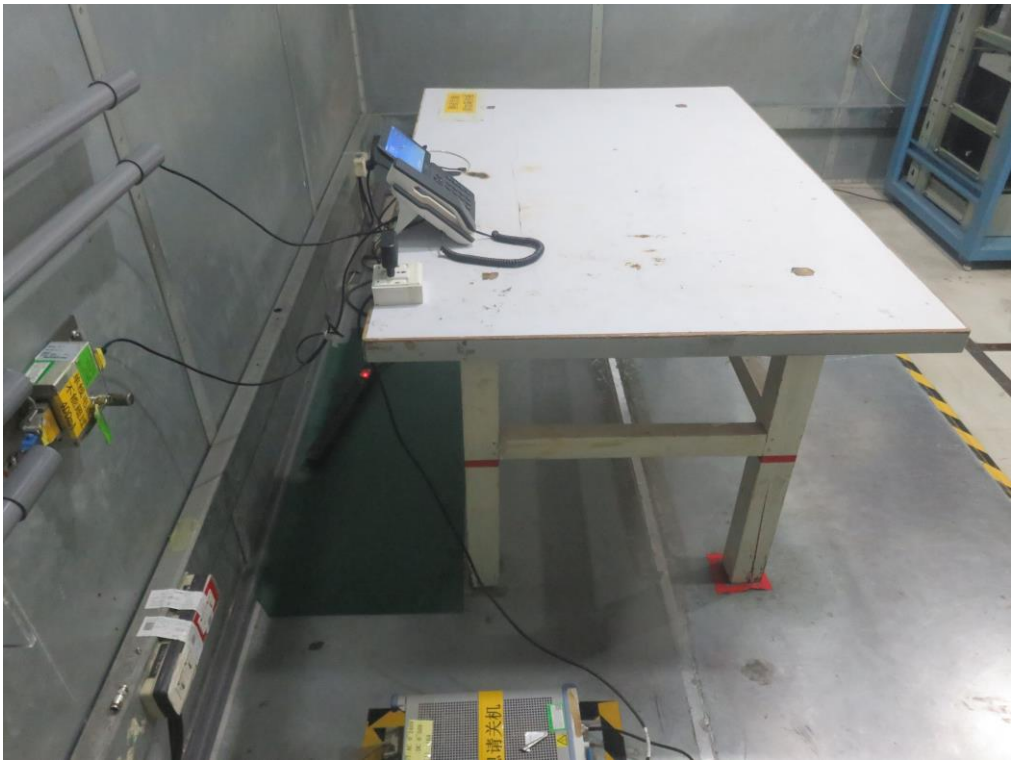


Radiated emissions above 1 GHz

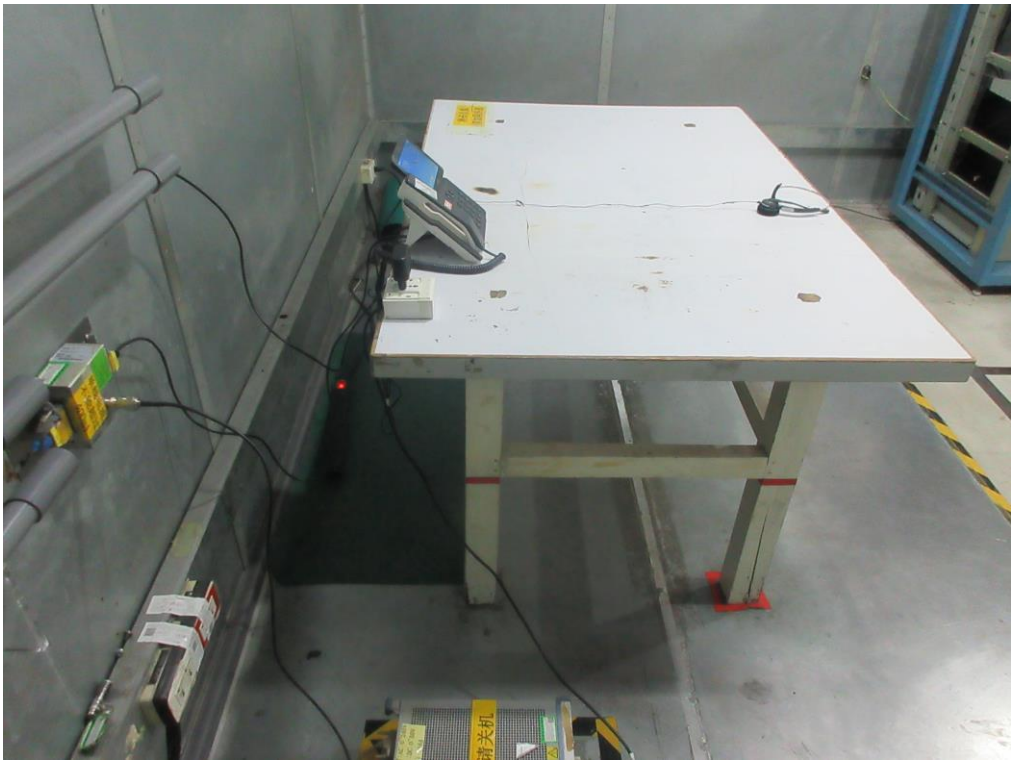




Conducted emissions AC mains power port

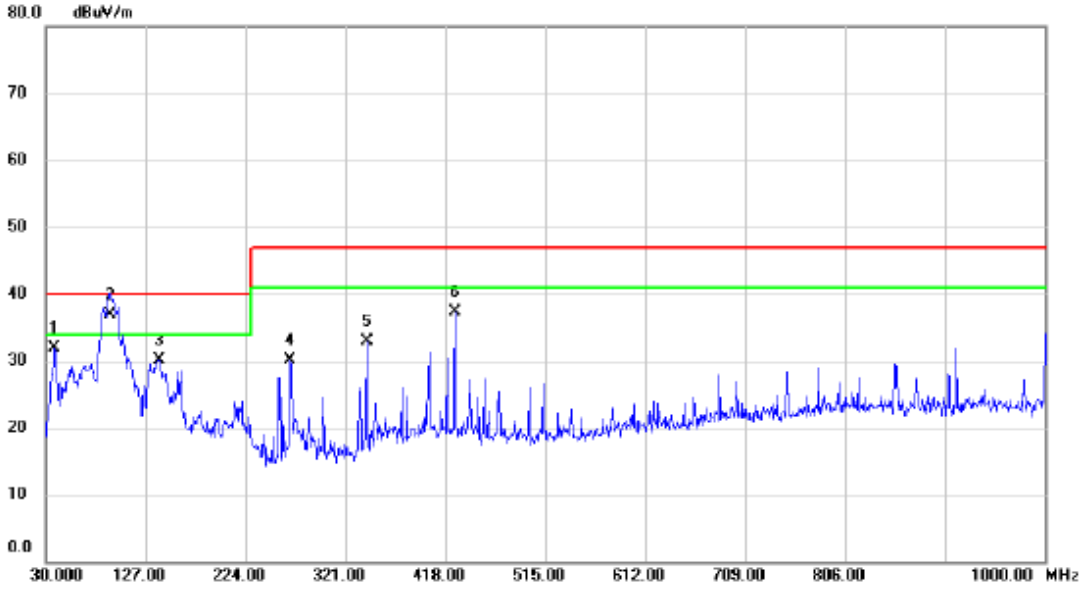


Asymmetric mode conducted emissions



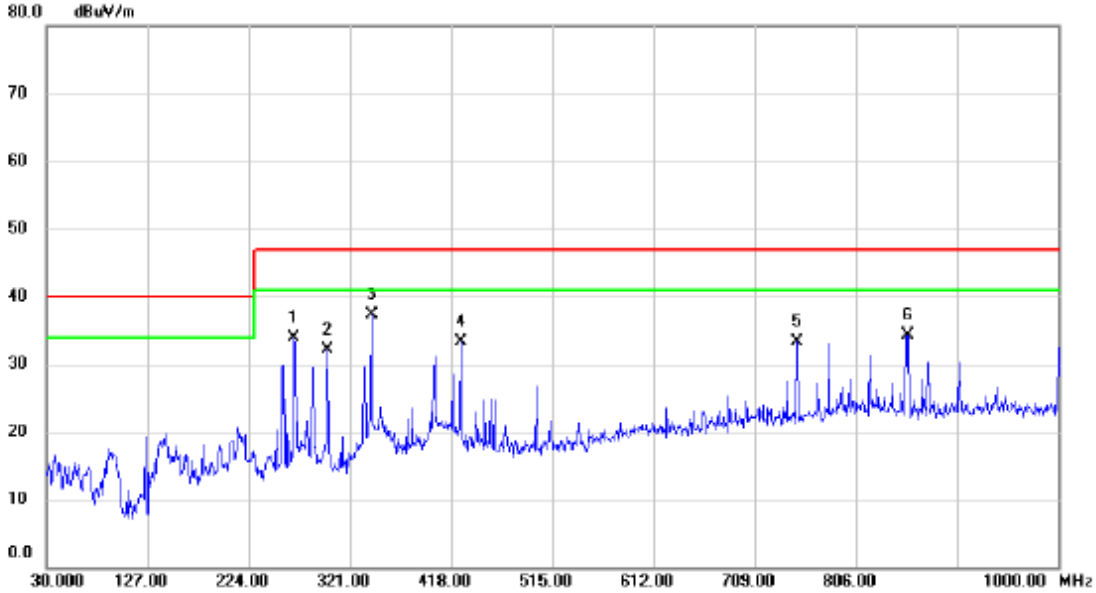
APPENDIX A - RADIATED EMISSION UP TO 1GHZ

Test Voltage	AC 230V/50Hz	Polarization	Vertical
Test Mode	Mode 2		



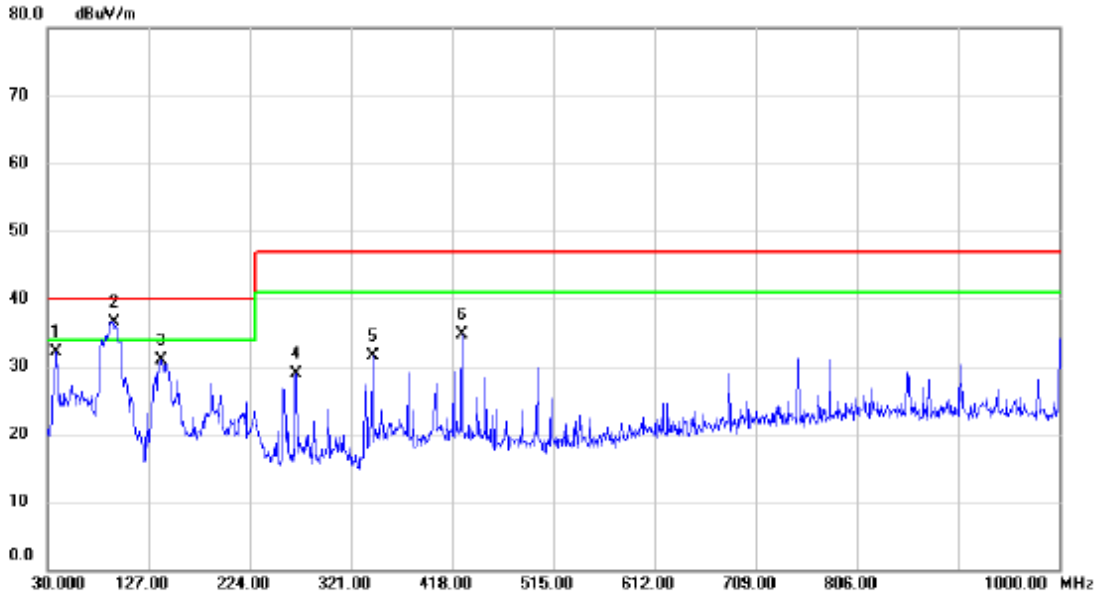
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		38.7300	49.46	-17.62	31.84	40.00	-8.16	QP	
2	*	92.0800	59.40	-22.59	36.81	40.00	-3.19	QP	
3		140.5800	52.66	-22.59	30.07	40.00	-9.93	QP	
4		267.6500	46.78	-16.69	30.09	47.00	-16.91	QP	
5		342.3400	47.14	-14.20	32.94	47.00	-14.06	QP	
6		427.7000	49.07	-11.75	37.32	47.00	-9.68	QP	

Test Voltage	AC 230V/50Hz	Polarization	Horizontal
Test Mode	Mode 2		



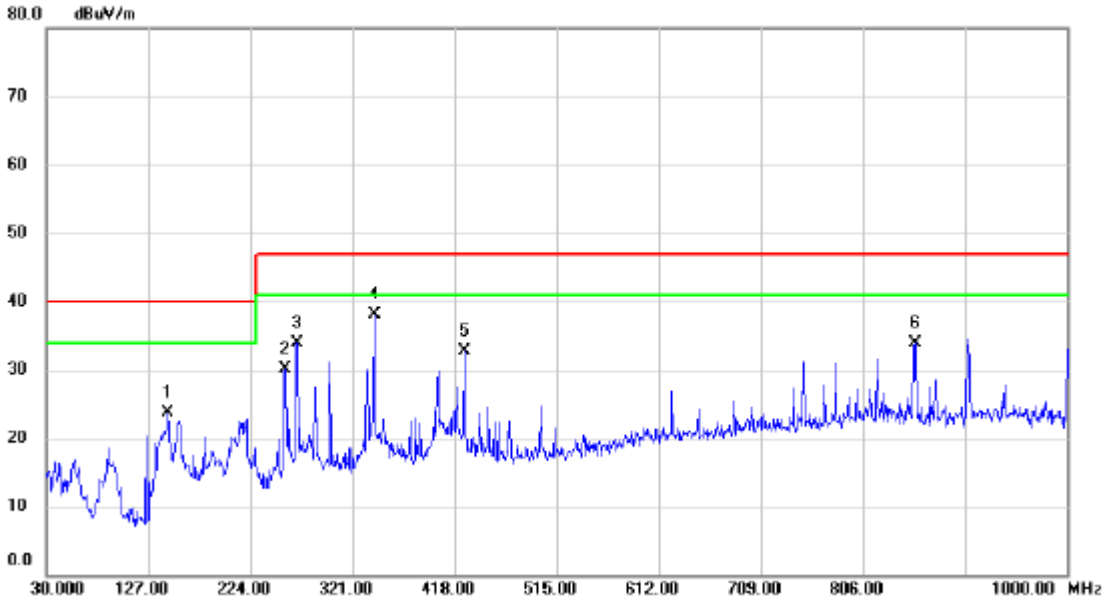
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		267.6500	50.60	-16.69	33.91	47.00	-13.09	QP	
2		299.6600	48.04	-15.98	32.06	47.00	-14.94	QP	
3	*	342.3400	51.51	-14.20	37.31	47.00	-9.69	QP	
4		427.7000	45.05	-11.75	33.30	47.00	-13.70	QP	
5		749.7400	38.78	-5.47	33.31	47.00	-13.69	QP	
6		855.4700	38.56	-4.30	34.26	47.00	-12.74	QP	

Test Voltage	AC 110V/60Hz	Polarization	Vertical
Test Mode	Mode 2		



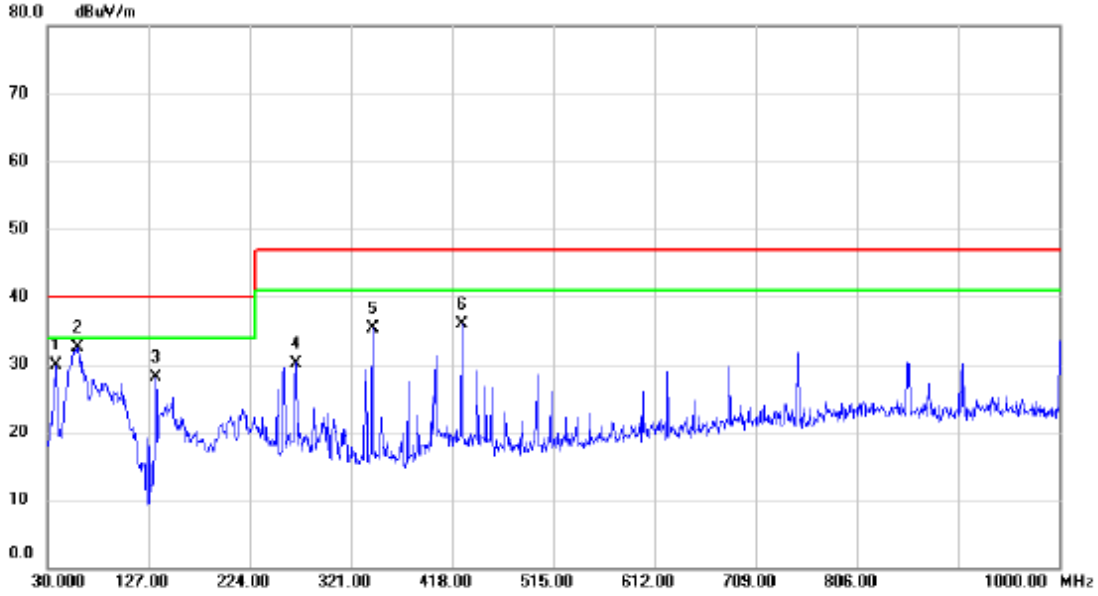
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		37.7600	49.37	-17.22	32.15	40.00	-7.85	QP	
2	*	94.0200	59.01	-22.42	36.59	40.00	-3.41	QP	
3		139.6100	53.67	-22.70	30.97	40.00	-9.03	QP	
4		268.6200	45.52	-16.66	28.86	47.00	-18.14	QP	
5		342.3400	45.61	-14.20	31.41	47.00	-15.59	QP	
6		427.7000	46.49	-11.75	34.74	47.00	-12.26	QP	

Test Voltage	AC 110V/60Hz	Polarization	Horizontal
Test Mode	Mode 2		



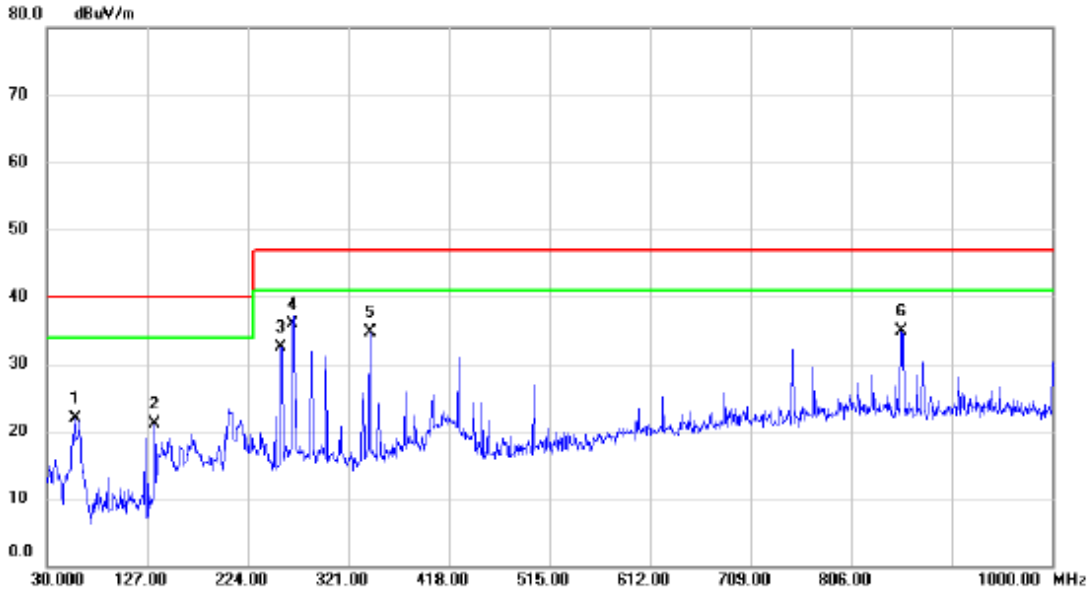
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		145.4300	45.65	-22.03	23.62	40.00	-16.38	QP	
2		256.9800	47.03	-16.92	30.11	47.00	-16.89	QP	
3		268.6200	50.65	-16.66	33.99	47.00	-13.01	QP	
4	*	342.3400	52.27	-14.20	38.07	47.00	-8.93	QP	
5		427.7000	44.45	-11.75	32.70	47.00	-14.30	QP	
6		855.4700	38.22	-4.30	33.92	47.00	-13.08	QP	

Test Voltage	DC 48V	Polarization	Vertical
Test Mode	Mode 2		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		37.7600	47.13	-17.22	29.91	40.00	-10.09	QP	
2	*	59.1000	55.08	-22.51	32.57	40.00	-7.43	QP	
3		133.7900	51.24	-23.11	28.13	40.00	-11.87	QP	
4		268.6200	46.86	-16.66	30.20	47.00	-16.80	QP	
5		342.3400	49.49	-14.20	35.29	47.00	-11.71	QP	
6		427.7000	47.58	-11.75	35.83	47.00	-11.17	QP	

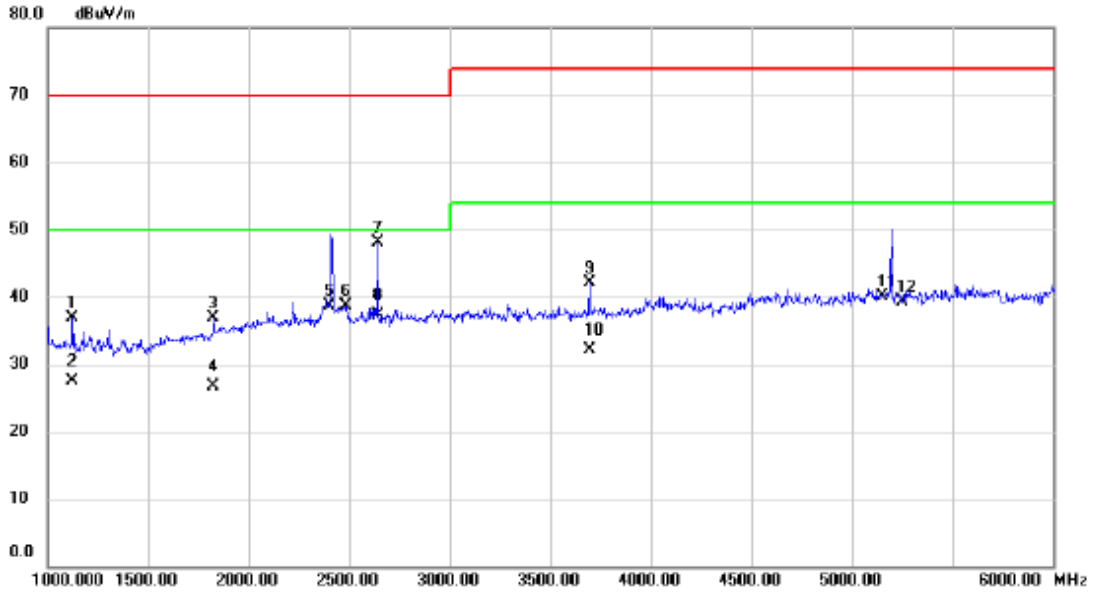
Test Voltage	DC 48V	Polarization	Horizontal
Test Mode	Mode 2		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		57.1600	44.05	-22.20	21.85	40.00	-18.15	QP	
2		133.7900	44.27	-23.11	21.16	40.00	-18.84	QP	
3		256.0100	49.38	-16.94	32.44	47.00	-14.56	QP	
4	*	267.6500	52.52	-16.69	35.83	47.00	-11.17	QP	
5		342.3400	48.97	-14.20	34.77	47.00	-12.23	QP	
6		854.5000	39.29	-4.30	34.99	47.00	-12.01	QP	

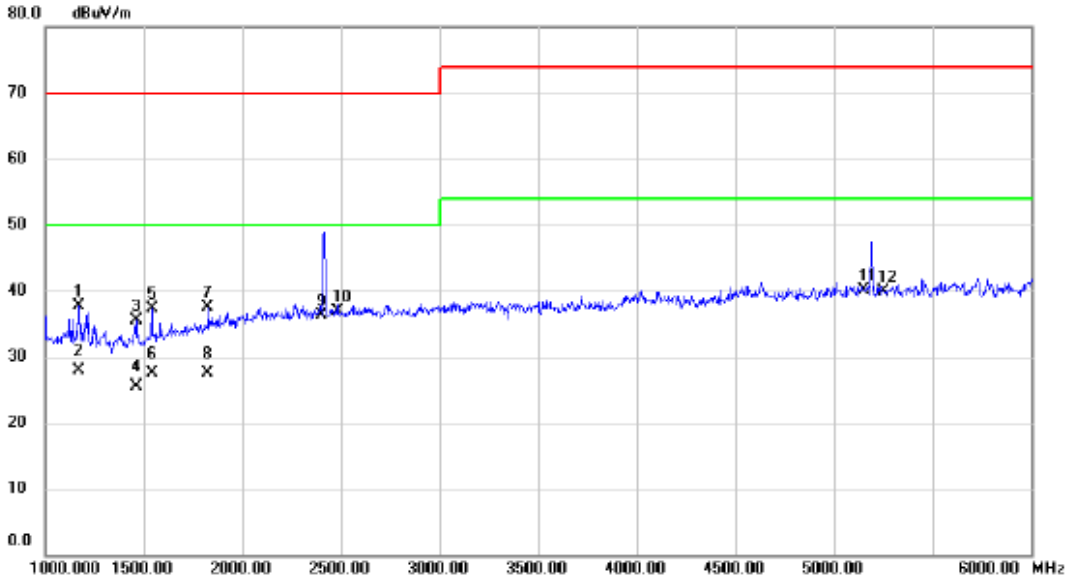
APPENDIX B - RADIATED EMISSION ABOVE 1GHZ

Test Voltage	AC 230V/50Hz	Polarization	Vertical
Test Mode	Mode 2		
Note	BT(2400-2483.5MHz) and 5G WIFI(5150-5250MHz) are intentional transmissions, which are not applicable to the radiation emission requirements in this standard.		



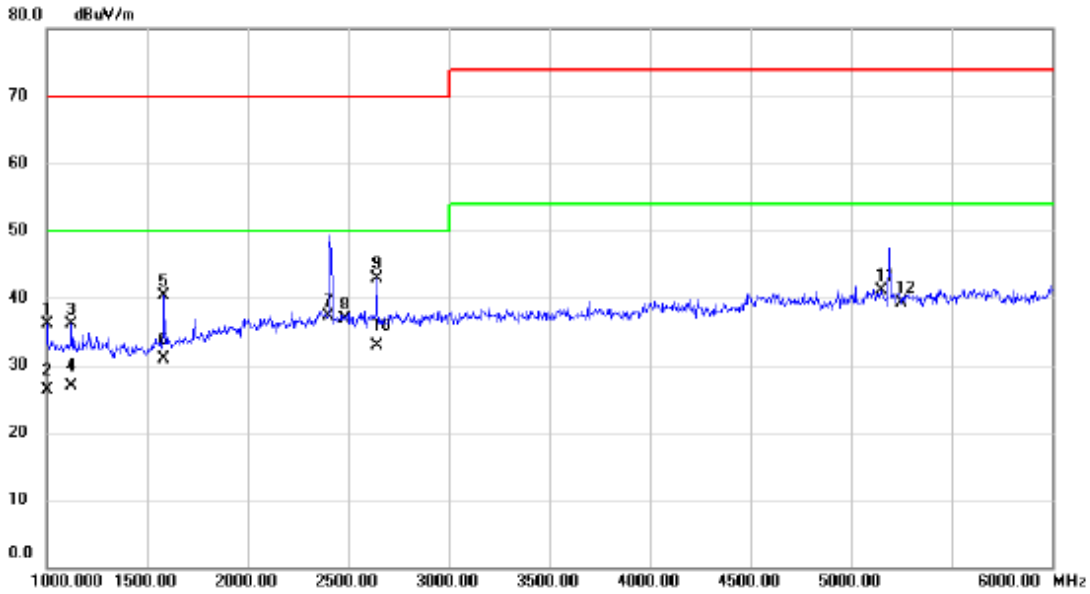
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1125.000	53.31	-16.36	36.95	70.00	-33.05	peak	
2		1125.000	43.96	-16.36	27.60	50.00	-22.40	AVG	
3		1825.000	50.88	-14.05	36.83	70.00	-33.17	peak	
4		1825.000	40.85	-14.05	26.80	50.00	-23.20	AVG	
5		2400.000	50.11	-11.43	38.68	70.00	-31.32	peak	
6		2483.500	50.00	-11.21	38.79	70.00	-31.21	peak	
7		2640.000	58.91	-10.71	48.20	70.00	-21.80	peak	
8	*	2640.000	47.99	-10.71	37.28	50.00	-12.72	AVG	
9		3695.000	49.63	-7.62	42.01	74.00	-31.99	peak	
10		3695.000	39.79	-7.62	32.17	54.00	-21.83	AVG	
11		5150.000	43.93	-3.77	40.16	74.00	-33.84	peak	
12		5250.000	43.03	-3.78	39.25	74.00	-34.75	peak	

Test Voltage	AC 230V/50Hz	Polarization	Horizontal
Test Mode	Mode 2		
Note	BT(2400-2483.5MHz) and 5G WIFI(5150-5250MHz) are intentional transmissions, which are not applicable to the radiation emission requirements in this standard.		



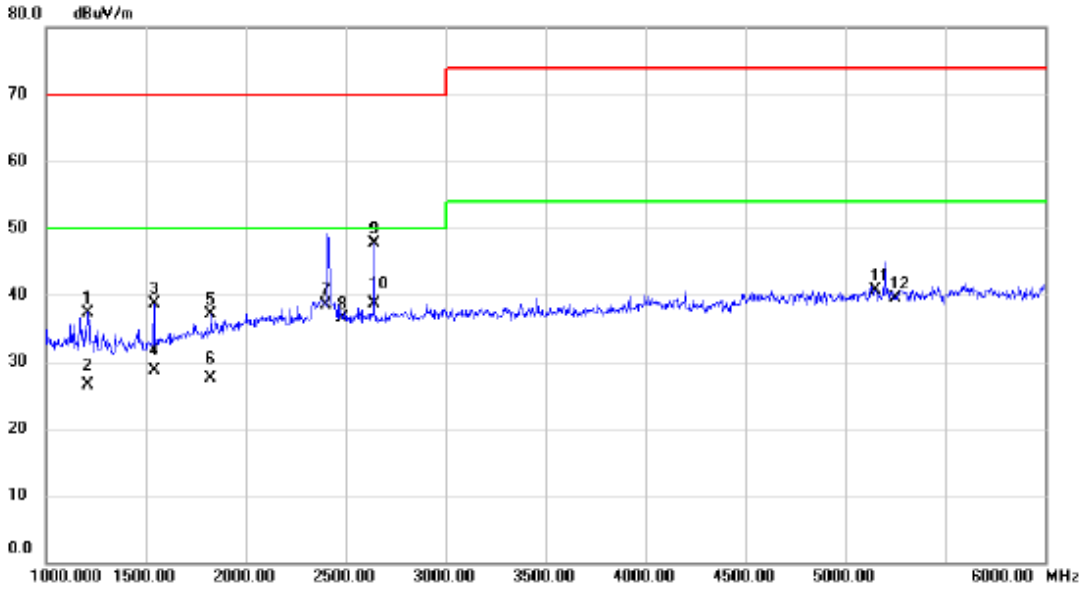
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1170.000	54.05	-16.42	37.63	70.00	-32.37	peak	
2	*	1170.000	44.26	-16.42	27.84	50.00	-22.16	AVG	
3		1460.000	52.42	-16.82	35.60	70.00	-34.40	peak	
4		1460.000	42.26	-16.82	25.44	50.00	-24.56	AVG	
5		1540.000	53.89	-16.52	37.37	70.00	-32.63	peak	
6		1540.000	43.98	-16.52	27.46	50.00	-22.54	AVG	
7		1825.000	51.58	-14.05	37.53	70.00	-32.47	peak	
8		1825.000	41.56	-14.05	27.51	50.00	-22.49	AVG	
9		2400.000	47.81	-11.43	36.38	70.00	-33.62	peak	
10		2483.500	48.02	-11.21	36.81	70.00	-33.19	peak	
11		5150.000	43.85	-3.77	40.08	74.00	-33.92	peak	
12		5250.000	43.70	-3.78	39.92	74.00	-34.08	peak	

Test Voltage	AC 110V/60Hz	Polarization	Vertical
Test Mode	Mode 2		
Note	BT(2400-2483.5MHz) and 5G WIFI(5150-5250MHz) are intentional transmissions, which are not applicable to the radiation emission requirements in this standard.		



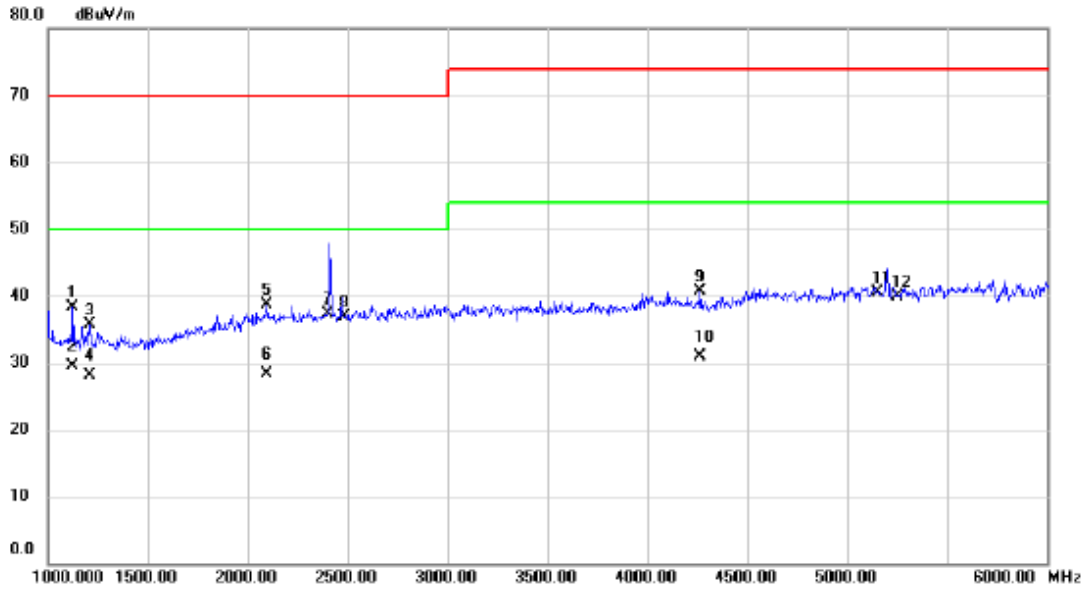
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1000.000	52.36	-16.19	36.17	70.00	-33.83	peak	
2		1000.000	42.58	-16.19	26.39	50.00	-23.61	AVG	
3		1125.000	52.47	-16.36	36.11	70.00	-33.89	peak	
4		1125.000	43.23	-16.36	26.87	50.00	-23.13	AVG	
5		1585.000	56.35	-16.13	40.22	70.00	-29.78	peak	
6		1585.000	46.96	-16.13	30.83	50.00	-19.17	AVG	
7		2400.000	48.80	-11.43	37.37	70.00	-32.63	peak	
8		2483.500	48.18	-11.21	36.97	70.00	-33.03	peak	
9		2640.000	53.67	-10.71	42.96	70.00	-27.04	peak	
10	*	2640.000	43.69	-10.71	32.98	50.00	-17.02	AVG	
11		5150.000	44.80	-3.77	41.03	74.00	-32.97	peak	
12		5250.000	43.09	-3.78	39.31	74.00	-34.69	peak	

Test Voltage	AC 110V/60Hz	Polarization	Horizontal
Test Mode	Mode 2		
Note	BT(2400-2483.5MHz) and 5G WIFI(5150-5250MHz) are intentional transmissions, which are not applicable to the radiation emission requirements in this standard.		



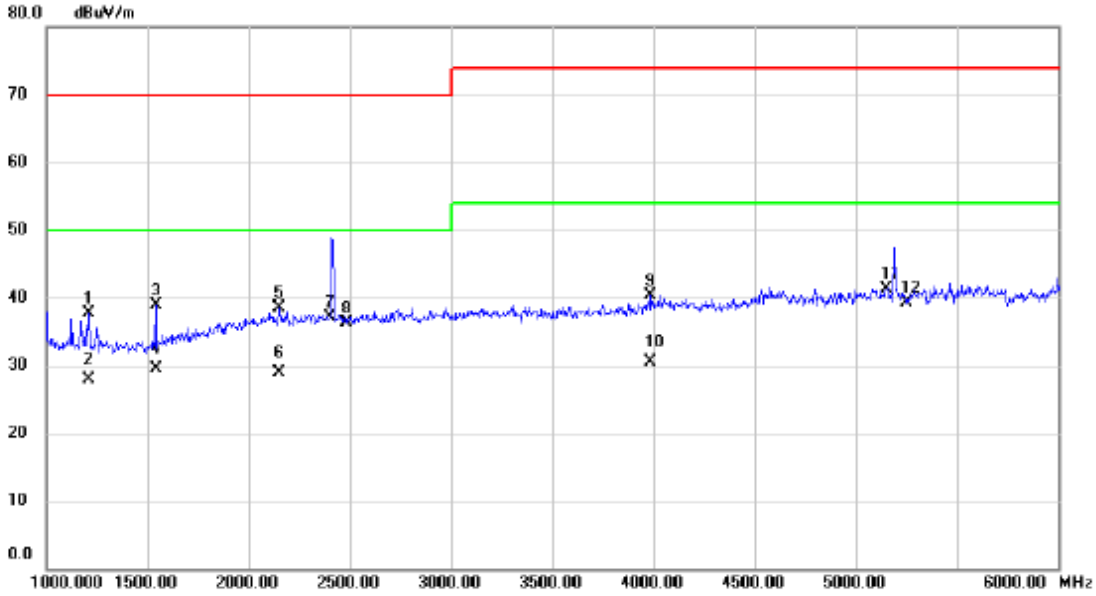
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1210.000	53.88	-16.48	37.40	70.00	-32.60	peak	
2		1210.000	42.96	-16.48	26.48	50.00	-23.52	AVG	
3		1540.000	55.14	-16.52	38.62	70.00	-31.38	peak	
4		1540.000	45.25	-16.52	28.73	50.00	-21.27	AVG	
5		1825.000	51.19	-14.05	37.14	70.00	-32.86	peak	
6		1825.000	41.63	-14.05	27.58	50.00	-22.42	AVG	
7		2400.000	49.91	-11.43	38.48	70.00	-31.52	peak	
8		2483.500	47.77	-11.21	36.56	70.00	-33.44	peak	
9		2640.000	58.47	-10.71	47.76	70.00	-22.24	peak	
10	*	2640.000	49.32	-10.71	38.61	50.00	-11.39	AVG	
11		5150.000	44.42	-3.77	40.65	74.00	-33.35	peak	
12		5250.000	43.32	-3.78	39.54	74.00	-34.46	peak	

Test Voltage	DC 48V	Polarization	Vertical
Test Mode	Mode 2		
Note	BT(2400-2483.5MHz) and 5G WIFI(5150-5250MHz) are intentional transmissions, which are not applicable to the radiation emission requirements in this standard.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1125.000	54.60	-16.36	38.24	70.00	-31.76	peak	
2	*	1125.000	45.86	-16.36	29.50	50.00	-20.50	AVG	
3		1210.000	52.12	-16.48	35.64	70.00	-34.36	peak	
4		1210.000	44.62	-16.48	28.14	50.00	-21.86	AVG	
5		2095.000	51.05	-12.28	38.77	70.00	-31.23	peak	
6		2095.000	40.55	-12.28	28.27	50.00	-21.73	AVG	
7		2400.000	48.67	-11.43	37.24	70.00	-32.76	peak	
8		2483.500	48.19	-11.21	36.98	70.00	-33.02	peak	
9		4265.000	46.44	-5.69	40.75	74.00	-33.25	peak	
10		4265.000	36.56	-5.69	30.87	54.00	-23.13	AVG	
11		5150.000	44.25	-3.77	40.48	74.00	-33.52	peak	
12		5250.000	43.65	-3.78	39.87	74.00	-34.13	peak	

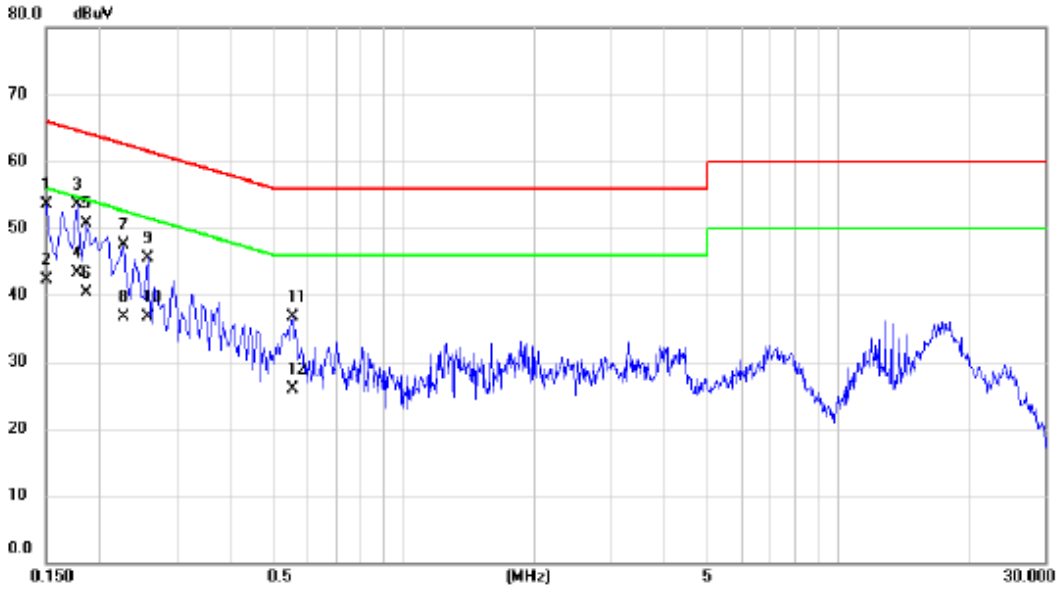
Test Voltage	DC 48V	Polarization	Horizontal
Test Mode	Mode 2		
Note	BT(2400-2483.5MHz) and 5G WIFI(5150-5250MHz) are intentional transmissions, which are not applicable to the radiation emission requirements in this standard.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1210.000	54.11	-16.48	37.63	70.00	-32.37	peak	
2		1210.000	44.38	-16.48	27.90	50.00	-22.10	AVG	
3		1540.000	55.47	-16.52	38.95	70.00	-31.05	peak	
4	*	1540.000	45.96	-16.52	29.44	50.00	-20.56	AVG	
5		2150.000	50.69	-12.12	38.57	70.00	-31.43	peak	
6		2150.000	41.12	-12.12	29.00	50.00	-21.00	AVG	
7		2400.000	48.61	-11.43	37.18	70.00	-32.82	peak	
8		2483.500	47.57	-11.21	36.36	70.00	-33.64	peak	
9		3985.000	46.84	-6.46	40.38	74.00	-33.62	peak	
10		3985.000	36.89	-6.46	30.43	54.00	-23.57	AVG	
11		5150.000	45.15	-3.77	41.38	74.00	-32.62	peak	
12		5250.000	43.11	-3.78	39.33	74.00	-34.67	peak	

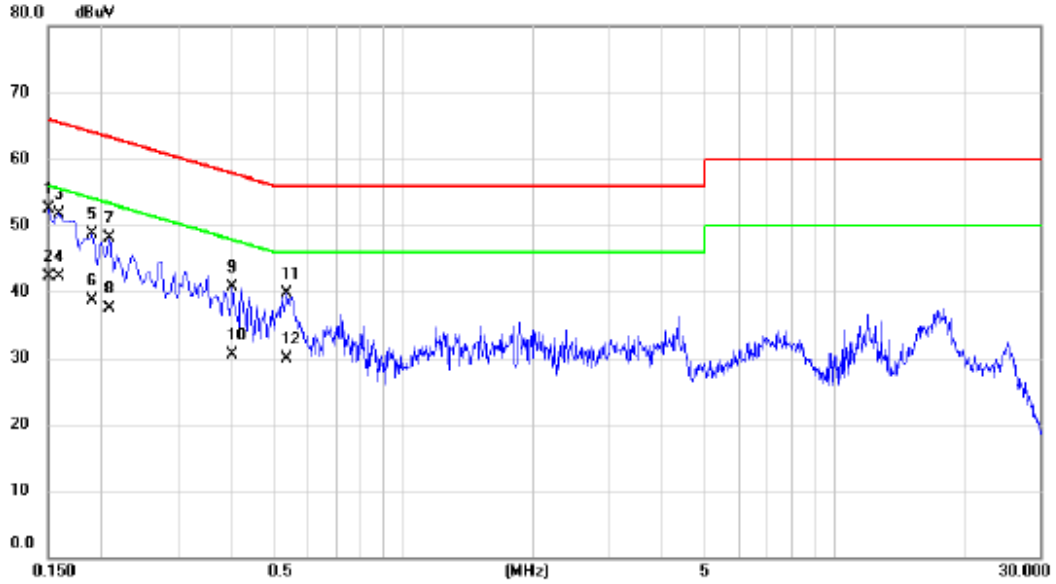
APPENDIX C - CONDUCTED EMISSION AT AC MAINS POWER PORT

Test Voltage	AC 230V/50Hz	Phase	Line
Test Mode	Mode 3		



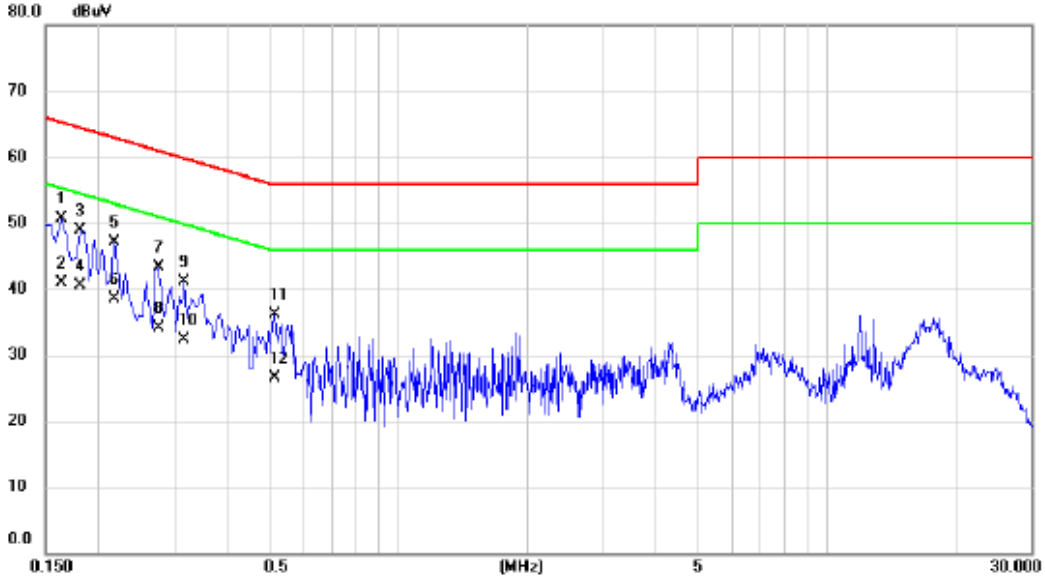
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	43.82	9.67	53.49	66.00	-12.51	QP	
2		0.1500	32.60	9.67	42.27	56.00	-13.73	AVG	
3	*	0.1770	43.64	9.84	53.48	64.63	-11.15	QP	
4		0.1770	33.50	9.84	43.34	54.63	-11.29	AVG	
5		0.1860	40.79	9.86	50.65	64.21	-13.56	QP	
6		0.1860	30.40	9.86	40.26	54.21	-13.95	AVG	
7		0.2265	37.53	9.89	47.42	62.58	-15.16	QP	
8		0.2265	26.90	9.89	36.79	52.58	-15.79	AVG	
9		0.2580	35.73	9.87	45.60	61.50	-15.90	QP	
10		0.2580	26.80	9.87	36.67	51.50	-14.83	AVG	
11		0.5550	26.74	9.94	36.68	56.00	-19.32	QP	
12		0.5550	15.90	9.94	25.84	46.00	-20.16	AVG	

Test Voltage	AC 230V/50Hz	Phase	Neutral
Test Mode	Mode 3		



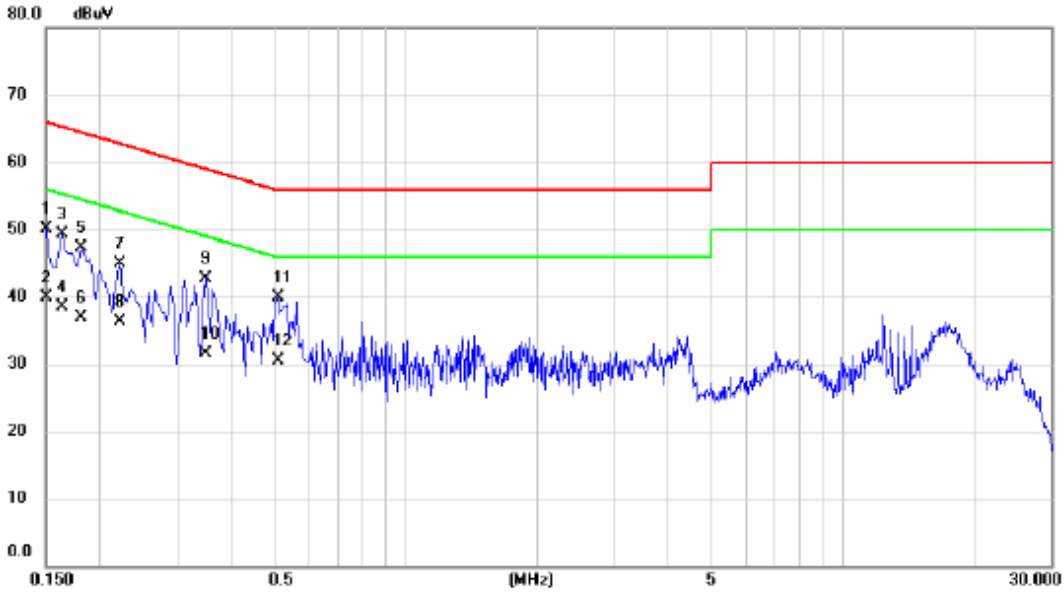
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	42.74	9.74	52.48	66.00	-13.52	QP	
2		0.1500	32.60	9.74	42.34	56.00	-13.66	AVG	
3		0.1598	41.88	9.81	51.69	65.47	-13.78	QP	
4	*	0.1598	32.50	9.81	42.31	55.47	-13.16	AVG	
5		0.1905	38.65	9.98	48.63	64.01	-15.38	QP	
6		0.1905	28.70	9.98	38.68	54.01	-15.33	AVG	
7		0.2085	38.01	10.00	48.01	63.26	-15.25	QP	
8		0.2085	27.60	10.00	37.60	53.26	-15.66	AVG	
9		0.4020	30.67	10.07	40.74	57.81	-17.07	QP	
10		0.4020	20.40	10.07	30.47	47.81	-17.34	AVG	
11		0.5370	29.56	10.13	39.69	56.00	-16.31	QP	
12		0.5370	19.80	10.13	29.93	46.00	-16.07	AVG	

Test Voltage	AC 110V/60Hz	Phase	Line
Test Mode	Mode 3		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1635	40.87	9.77	50.64	65.28	-14.64	QP	
2		0.1635	31.20	9.77	40.97	55.28	-14.31	AVG	
3		0.1815	39.15	9.85	49.00	64.42	-15.42	QP	
4	*	0.1815	30.60	9.85	40.45	54.42	-13.97	AVG	
5		0.2175	37.12	9.90	47.02	62.91	-15.89	QP	
6		0.2175	28.70	9.90	38.60	52.91	-14.31	AVG	
7		0.2760	33.35	9.88	43.23	60.94	-17.71	QP	
8		0.2760	24.30	9.88	34.18	50.94	-16.76	AVG	
9		0.3165	31.20	9.88	41.08	59.80	-18.72	QP	
10		0.3165	22.50	9.88	32.38	49.80	-17.42	AVG	
11		0.5144	26.20	9.93	36.13	56.00	-19.87	QP	
12		0.5144	16.50	9.93	26.43	46.00	-19.57	AVG	

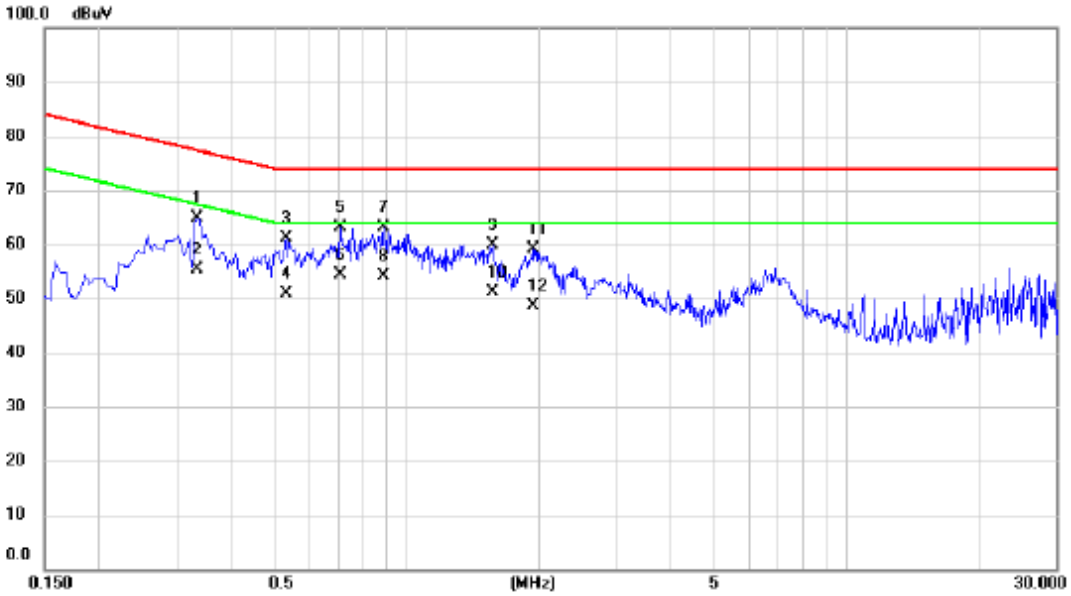
Test Voltage	AC 110V/60Hz	Phase	Neutral
Test Mode	Mode 3		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	40.44	9.74	50.18	66.00	-15.82	QP	
2		0.1500	30.10	9.74	39.84	56.00	-16.16	AVG	
3		0.1635	39.49	9.85	49.34	65.28	-15.94	QP	
4		0.1635	28.70	9.85	38.55	55.28	-16.73	AVG	
5		0.1815	37.33	9.94	47.27	64.42	-17.15	QP	
6		0.1815	26.90	9.94	36.84	54.42	-17.58	AVG	
7		0.2220	34.99	9.99	44.98	62.74	-17.76	QP	
8		0.2220	26.30	9.99	36.29	52.74	-16.45	AVG	
9		0.3480	32.77	10.03	42.80	59.01	-16.21	QP	
10		0.3480	21.50	10.03	31.53	49.01	-17.48	AVG	
11		0.5100	29.71	10.12	39.83	56.00	-16.17	QP	
12	*	0.5100	20.40	10.12	30.52	46.00	-15.48	AVG	

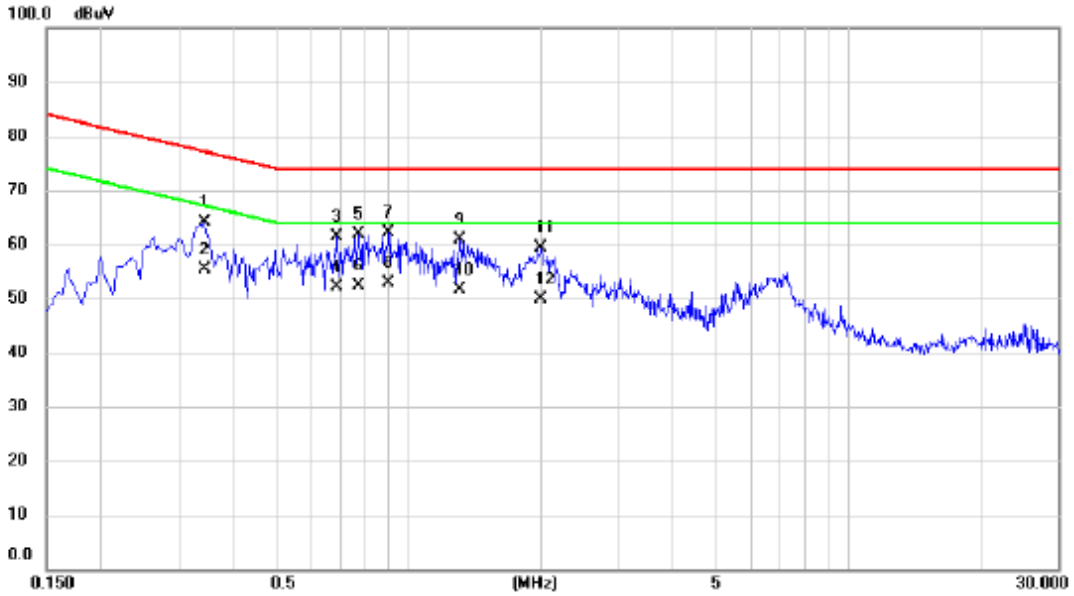
APPENDIX D - ASYMMETRIC MODE CONDUCTED EMISSIONS TEST

Test Voltage	AC 230V/50Hz
Test Mode	Mode 4



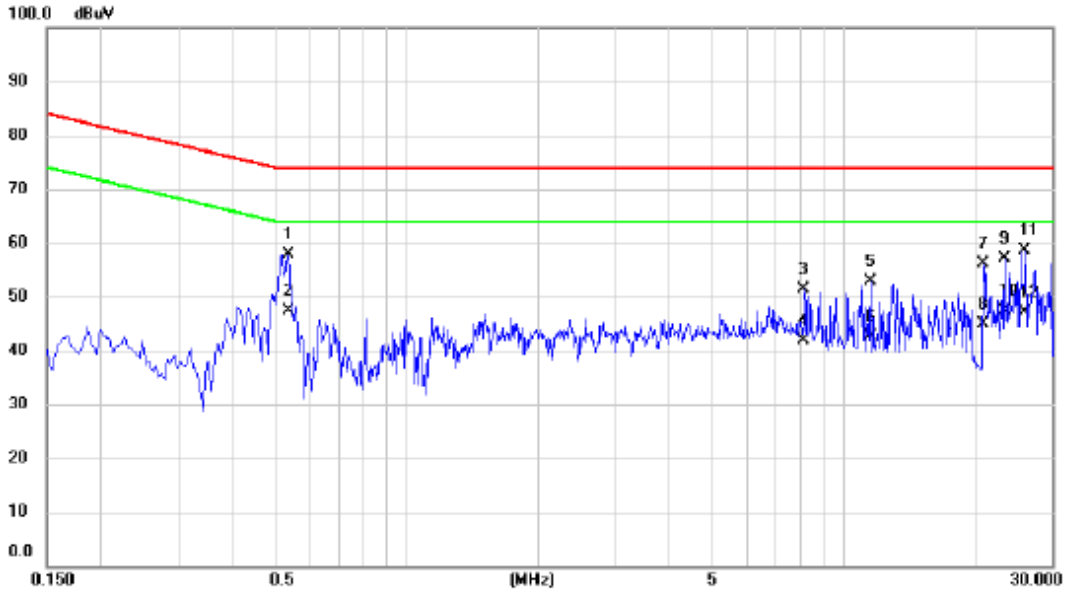
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.3345	55.04	9.83	64.87	77.34	-12.47	QP	
2		0.3345	45.60	9.83	55.43	67.34	-11.91	AVG	
3		0.5325	51.40	9.75	61.15	74.00	-12.85	QP	
4		0.5325	41.20	9.75	50.95	64.00	-13.05	AVG	
5		0.7080	53.26	9.75	63.01	74.00	-10.99	QP	
6	*	0.7080	44.70	9.75	54.45	64.00	-9.55	AVG	
7		0.8880	53.33	9.73	63.06	74.00	-10.94	QP	
8		0.8880	44.50	9.73	54.23	64.00	-9.77	AVG	
9		1.5675	50.08	9.73	59.81	74.00	-14.19	QP	
10		1.5675	41.30	9.73	51.03	64.00	-12.97	AVG	
11		1.9365	49.40	9.74	59.14	74.00	-14.86	QP	
12		1.9365	38.90	9.74	48.64	64.00	-15.36	AVG	

Test Voltage	AC 230V/50Hz
Test Mode	Mode 5



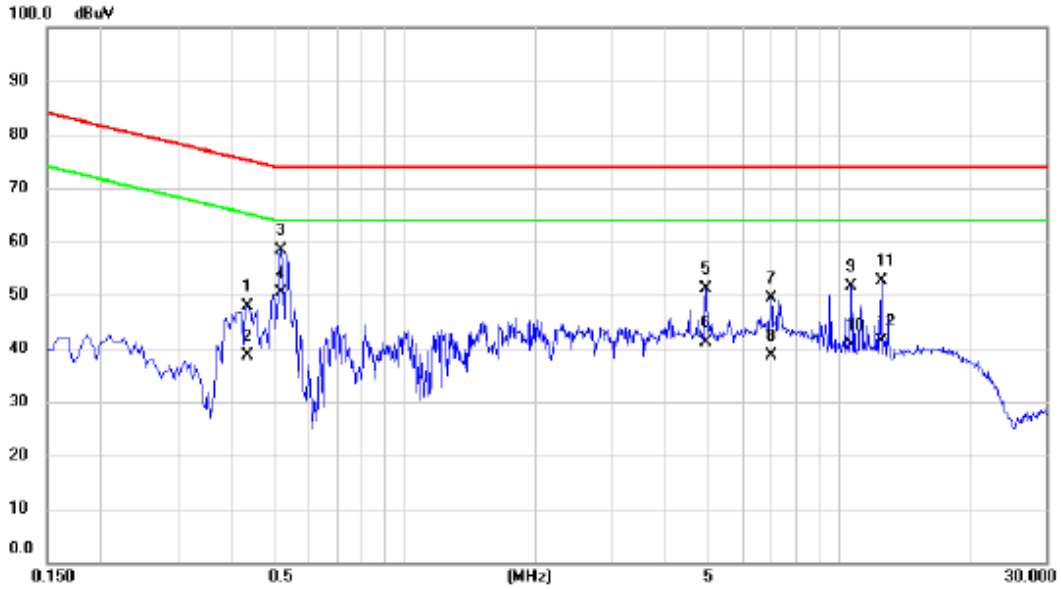
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.3435	54.36	9.83	64.19	77.12	-12.93	QP	
2		0.3435	45.60	9.83	55.43	67.12	-11.69	AVG	
3		0.6855	51.58	9.75	61.33	74.00	-12.67	QP	
4		0.6855	42.30	9.75	52.05	64.00	-11.95	AVG	
5		0.7710	52.03	9.75	61.78	74.00	-12.22	QP	
6		0.7710	42.70	9.75	52.45	64.00	-11.55	AVG	
7		0.9015	52.34	9.73	62.07	74.00	-11.93	QP	
8	*	0.9015	43.10	9.73	52.83	64.00	-11.17	AVG	
9		1.3065	51.13	9.73	60.86	74.00	-13.14	QP	
10		1.3065	41.90	9.73	51.63	64.00	-12.37	AVG	
11		2.0040	49.70	9.74	59.44	74.00	-14.56	QP	
12		2.0040	40.20	9.74	49.94	64.00	-14.06	AVG	

Test Voltage	AC 230V/50Hz
Test Mode	Mode 6



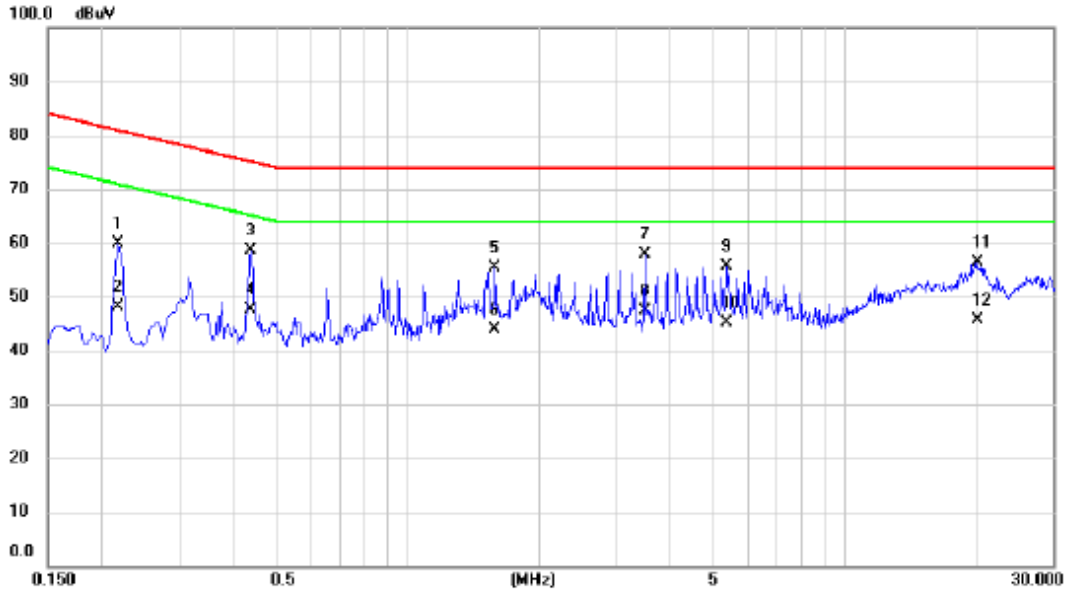
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.5370	48.20	9.75	57.95	74.00	-16.05	QP	
2		0.5370	37.60	9.75	47.35	64.00	-16.65	AVG	
3		8.1195	41.46	9.94	51.40	74.00	-22.60	QP	
4		8.1195	31.90	9.94	41.84	64.00	-22.16	AVG	
5		11.5395	42.84	10.04	52.88	74.00	-21.12	QP	
6		11.5395	32.50	10.04	42.54	64.00	-21.46	AVG	
7		20.8095	45.65	10.36	56.01	74.00	-17.99	QP	
8		20.8095	34.60	10.36	44.96	64.00	-19.04	AVG	
9		23.3295	46.60	10.47	57.07	74.00	-16.93	QP	
10		23.3295	36.80	10.47	47.27	64.00	-16.73	AVG	
11	*	26.0160	47.93	10.59	58.52	74.00	-15.48	QP	
12		26.0160	36.50	10.59	47.09	64.00	-16.91	AVG	

Test Voltage	AC 230V/50Hz
Test Mode	Mode 7



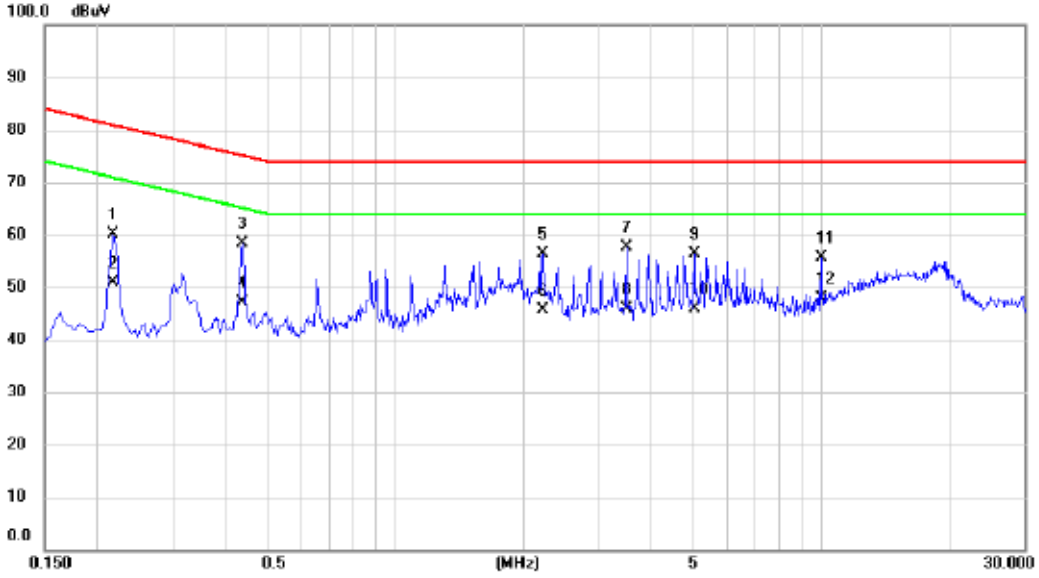
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.4335	38.03	9.79	47.82	75.19	-27.37	QP	
2		0.4335	28.90	9.79	38.69	65.19	-26.50	AVG	
3		0.5190	48.57	9.76	58.33	74.00	-15.67	QP	
4	*	0.5190	40.60	9.76	50.36	64.00	-13.64	AVG	
5		4.9515	41.32	9.83	51.15	74.00	-22.85	QP	
6		4.9515	31.20	9.83	41.03	64.00	-22.97	AVG	
7		6.9675	39.40	9.90	49.30	74.00	-24.70	QP	
8		6.9675	28.70	9.90	38.60	64.00	-25.40	AVG	
9		10.6260	41.52	10.01	51.53	74.00	-22.47	QP	
10		10.6260	30.50	10.01	40.51	64.00	-23.49	AVG	
11		12.5070	42.48	10.07	52.55	74.00	-21.45	QP	
12		12.5070	31.30	10.07	41.37	64.00	-22.63	AVG	

Test Voltage	DC 48V
Test Mode	Mode 4



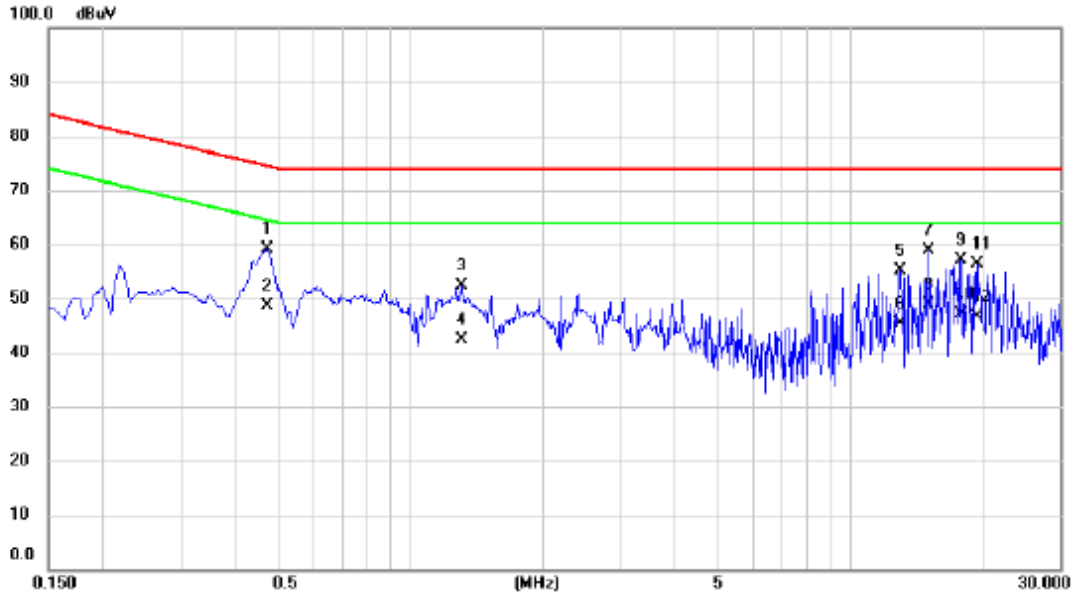
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2175	49.80	10.02	59.82	80.91	-21.09	QP	
2		0.2175	38.20	10.02	48.22	70.91	-22.69	AVG	
3		0.4380	48.77	9.78	58.55	75.10	-16.55	QP	
4		0.4380	37.90	9.78	47.68	65.10	-17.42	AVG	
5		1.5855	45.55	9.74	55.29	74.00	-18.71	QP	
6		1.5855	34.10	9.74	43.84	64.00	-20.16	AVG	
7	*	3.4890	48.15	9.80	57.95	74.00	-16.05	QP	
8		3.4890	37.60	9.80	47.40	64.00	-16.60	AVG	
9		5.3880	45.85	9.84	55.69	74.00	-18.31	QP	
10		5.3880	35.20	9.84	45.04	64.00	-18.96	AVG	
11		20.0625	46.10	10.33	56.43	74.00	-17.57	QP	
12		20.0625	35.20	10.33	45.53	64.00	-18.47	AVG	

Test Voltage	DC 48V
Test Mode	Mode 5



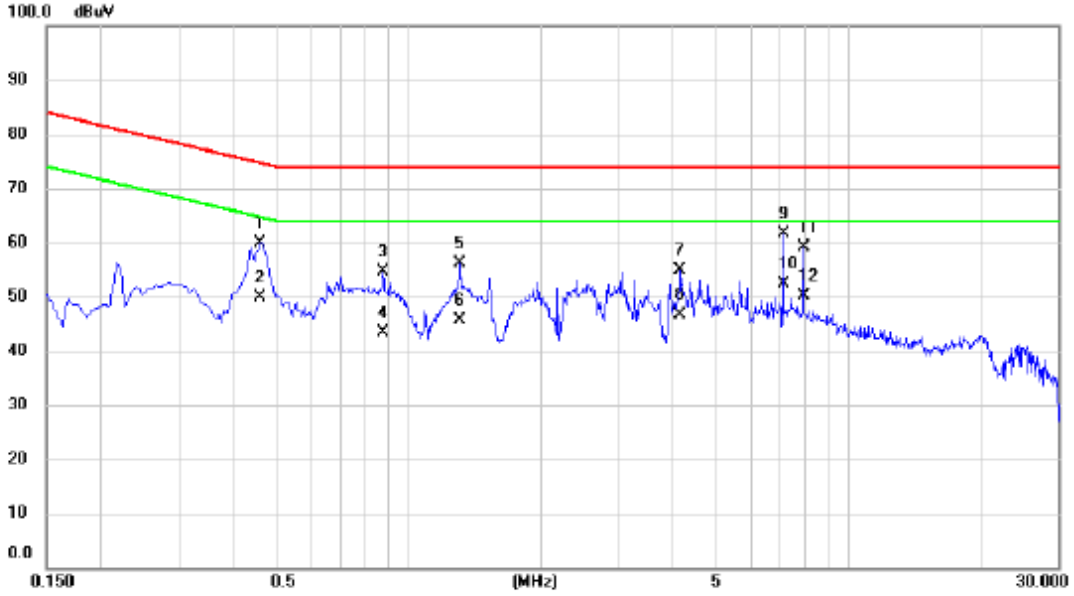
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2175	50.15	10.02	60.17	80.91	-20.74	QP	
2		0.2175	40.90	10.02	50.92	70.91	-19.99	AVG	
3		0.4380	48.63	9.78	58.41	75.10	-16.69	QP	
4		0.4380	37.40	9.78	47.18	65.10	-17.92	AVG	
5		2.2200	46.73	9.76	56.49	74.00	-17.51	QP	
6		2.2200	35.80	9.76	45.56	64.00	-18.44	AVG	
7		3.4890	47.76	9.80	57.56	74.00	-16.44	QP	
8		3.4890	36.20	9.80	46.00	64.00	-18.00	AVG	
9		5.0235	46.55	9.83	56.38	74.00	-17.62	QP	
10		5.0235	36.10	9.83	45.93	64.00	-18.07	AVG	
11		10.0140	45.63	9.99	55.62	74.00	-18.38	QP	
12	*	10.0140	37.90	9.99	47.89	64.00	-16.11	AVG	

Test Voltage	DC 48V
Test Mode	Mode 6



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.4740	49.35	9.77	59.12	74.44	-15.32	QP	
2		0.4740	38.90	9.77	48.67	64.44	-15.77	AVG	
3		1.3110	42.62	9.73	52.35	74.00	-21.65	QP	
4		1.3110	32.60	9.73	42.33	64.00	-21.67	AVG	
5		12.9480	44.95	10.08	55.03	74.00	-18.97	QP	
6		12.9480	35.40	10.08	45.48	64.00	-18.52	AVG	
7	*	15.0225	48.82	10.14	58.96	74.00	-15.04	QP	
8		15.0225	38.70	10.14	48.84	64.00	-15.16	AVG	
9		17.8935	46.81	10.25	57.06	74.00	-16.94	QP	
10		17.8935	36.90	10.25	47.15	64.00	-16.85	AVG	
11		19.3604	45.99	10.31	56.30	74.00	-17.70	QP	
12		19.3604	36.20	10.31	46.51	64.00	-17.49	AVG	

Test Voltage	DC 48V
Test Mode	Mode 7

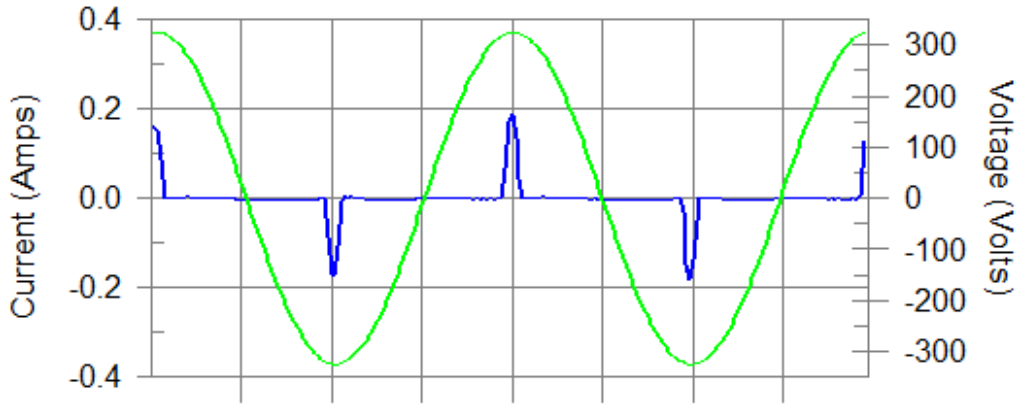


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.4605	50.17	9.78	59.95	74.68	-14.73	QP	
2		0.4605	40.10	9.78	49.88	64.68	-14.80	AVG	
3		0.8745	44.91	9.73	54.64	74.00	-19.36	QP	
4		0.8745	33.60	9.73	43.33	64.00	-20.67	AVG	
5		1.3110	46.40	9.73	56.13	74.00	-17.87	QP	
6		1.3110	35.80	9.73	45.53	64.00	-18.47	AVG	
7		4.1460	45.17	9.81	54.98	74.00	-19.02	QP	
8		4.1460	36.70	9.81	46.51	64.00	-17.49	AVG	
9		7.1115	51.63	9.90	61.53	74.00	-12.47	QP	
10	*	7.1115	42.50	9.90	52.40	64.00	-11.60	AVG	
11		7.8990	49.11	9.94	59.05	74.00	-14.95	QP	
12		7.8990	40.10	9.94	50.04	64.00	-13.96	AVG	

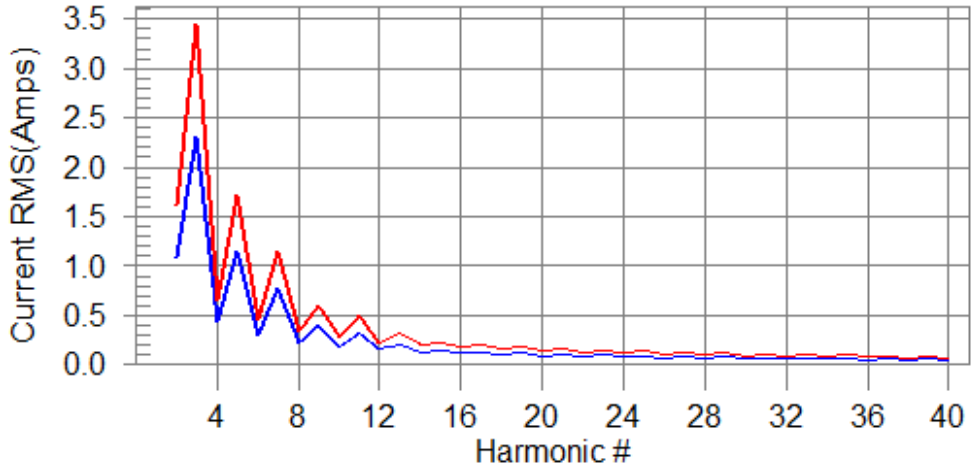
APPENDIX E - HARMONIC CURRENT EMISSION

Harmonics – Class-A	
Test Voltage	AC 230V/50Hz
Test Mode	Mode 3

Current & voltage waveforms



Harmonics and Class A limit line **European Limits**



Test result: Pass Worst harmonics H17-3.5% of 150% limit, H17-5% of 100% limit

Current Test Result Summary (Run time)	
Test Voltage	AC 230V/50Hz
Test Mode	Mode 3

Highest parameter values during test:

V_RMS (Volts):	229.87	Frequency(Hz):	50.00
I_Peak (Amps):	0.193	I_RMS (Amps):	0.033
I_Fund (Amps):	0.012	Crest Factor:	5.850
Power (Watts):	2.8	Power Factor:	0.393

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	N/A	0.001	1.620	N/A	Pass
3	0.011	2.300	0.5	0.012	3.450	0.3	Pass
4	0.001	0.430	N/A	0.001	0.645	N/A	Pass
5	0.010	1.140	0.9	0.011	1.710	0.7	Pass
6	0.001	0.300	N/A	0.001	0.450	N/A	Pass
7	0.010	0.770	1.3	0.011	1.155	0.9	Pass
8	0.000	0.230	N/A	0.000	0.345	N/A	Pass
9	0.009	0.400	2.4	0.010	0.600	1.7	Pass
10	0.000	0.184	N/A	0.000	0.276	N/A	Pass
11	0.009	0.330	2.7	0.010	0.495	1.9	Pass
12	0.000	0.153	N/A	0.000	0.230	N/A	Pass
13	0.008	0.210	3.9	0.009	0.315	2.8	Pass
14	0.000	0.131	N/A	0.000	0.197	N/A	Pass
15	0.007	0.150	5.0	0.008	0.225	3.5	Pass
16	0.000	0.115	N/A	0.000	0.173	N/A	Pass
17	0.007	0.132	5.0	0.007	0.198	3.5	Pass
18	0.000	0.102	N/A	0.000	0.153	N/A	Pass
19	0.006	0.118	4.9	0.006	0.178	3.4	Pass
20	0.000	0.092	N/A	0.000	0.138	N/A	Pass
21	0.005	0.107	N/A	0.005	0.161	N/A	Pass
22	0.000	0.084	N/A	0.000	0.125	N/A	Pass
23	0.004	0.098	N/A	0.004	0.147	N/A	Pass
24	0.000	0.077	N/A	0.000	0.115	N/A	Pass
25	0.003	0.090	N/A	0.003	0.135	N/A	Pass
26	0.000	0.071	N/A	0.000	0.107	N/A	Pass
27	0.003	0.083	N/A	0.003	0.125	N/A	Pass
28	0.000	0.066	N/A	0.000	0.099	N/A	Pass
29	0.002	0.078	N/A	0.002	0.116	N/A	Pass
30	0.000	0.061	N/A	0.000	0.092	N/A	Pass
31	0.001	0.073	N/A	0.001	0.109	N/A	Pass
32	0.000	0.058	N/A	0.000	0.086	N/A	Pass
33	0.001	0.068	N/A	0.001	0.102	N/A	Pass
34	0.000	0.054	N/A	0.000	0.081	N/A	Pass
35	0.001	0.064	N/A	0.001	0.096	N/A	Pass
36	0.000	0.051	N/A	0.000	0.077	N/A	Pass
37	0.000	0.061	N/A	0.001	0.091	N/A	Pass
38	0.000	0.048	N/A	0.000	0.073	N/A	Pass
39	0.001	0.058	N/A	0.001	0.087	N/A	Pass
40	0.000	0.046	N/A	0.000	0.069	N/A	Pass

Voltage Source Verification Data (Run time)	
Test Voltage	AC 230V/50Hz
Test Mode	Mode 3

Highest parameter values during test:

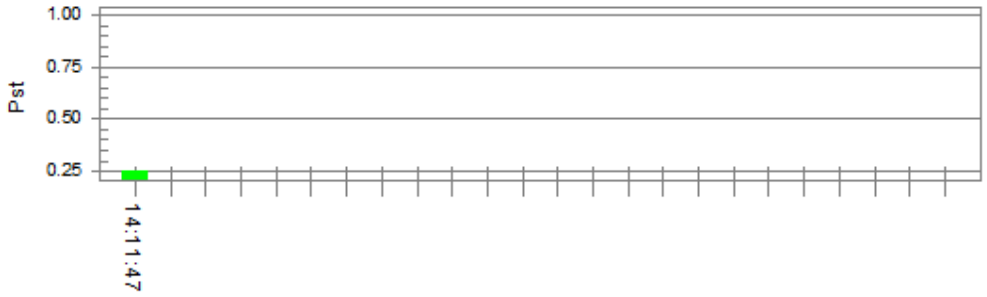
Voltage (Vrms):	229.87	Frequency(Hz):	50.00
I_Peak (Amps):	0.193	I_RMS (Amps):	0.033
I_Fund (Amps):	0.012	Crest Factor:	5.850
Power (Watts):	2.8	Power Factor:	0.393

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.135	0.460	29.30	OK
3	0.513	2.068	24.79	OK
4	0.060	0.460	13.15	OK
5	0.057	0.919	6.25	OK
6	0.034	0.460	7.37	OK
7	0.038	0.689	5.48	OK
8	0.021	0.460	4.64	OK
9	0.038	0.460	8.18	OK
10	0.025	0.460	5.40	OK
11	0.021	0.230	9.13	OK
12	0.016	0.230	7.07	OK
13	0.020	0.230	8.60	OK
14	0.014	0.230	6.28	OK
15	0.013	0.230	5.71	OK
16	0.016	0.230	6.78	OK
17	0.009	0.230	4.05	OK
18	0.012	0.230	5.19	OK
19	0.012	0.230	5.06	OK
20	0.018	0.230	7.62	OK
21	0.013	0.230	5.53	OK
22	0.011	0.230	4.72	OK
23	0.011	0.230	4.67	OK
24	0.005	0.230	2.21	OK
25	0.007	0.230	3.13	OK
26	0.008	0.230	3.52	OK
27	0.007	0.230	3.26	OK
28	0.008	0.230	3.31	OK
29	0.005	0.230	2.07	OK
30	0.005	0.230	2.23	OK
31	0.004	0.230	1.80	OK
32	0.005	0.230	2.26	OK
33	0.007	0.230	2.89	OK
34	0.003	0.230	1.11	OK
35	0.005	0.230	2.32	OK
36	0.003	0.230	1.37	OK
37	0.005	0.230	2.35	OK
38	0.003	0.230	1.21	OK
39	0.004	0.230	1.72	OK
40	0.007	0.230	2.96	OK

APPENDIX F - VOLLTAGE FLUCTUATIONS ANG FLIKER

Test Voltage	AC 230V/50Hz
Test Mode	Mode 3

Pst_1 and limit line **European_Limits**



Plt and limit line

Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.82			
Highest dt (%):		Test limit (%):		
T-max (mS):	0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	0.00	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.248	Test limit:	1.000	Pass
Highest Plt (2 hr. period):	0.108	Test limit:	0.650	Pass

APPENDIX G - ELECTROSTATIC DISCHARGE

Test Voltage	AC 230V/50Hz, DC 48V
Test Mode	Mode 1-Mode 3

Mode	Air Discharge								Contact Discharge					
	2kV		4kV		8kV		- kV		4kV		- kV		- kV	
Location	P	N	P	N	P	N	P	N	P	N	P	N	P	N
1	A	A	A	A	A	A	-	-	B	B	-	-	-	-
2	A	A	A	A	A	A	-	-	-	-	-	-	-	-
3	A	A	A	A	A	A	-	-	-	-	-	-	-	-
4	A	A	A	A	A	A	-	-	-	-	-	-	-	-
5	A	A	A	A	A	A	-	-	-	-	-	-	-	-
6	A	A	A	A	B	B	-	-	-	-	-	-	-	-
7	A	A	A	A	A	A	-	-	-	-	-	-	-	-
8	A	A	A	A	A	A	-	-	-	-	-	-	-	-
9	A	A	A	A	B	B	-	-	-	-	-	-	-	-
10	A	A	A	A	A	A	-	-	-	-	-	-	-	-
11	A	A	A	A	A	A	-	-	-	-	-	-	-	-
12	A	A	A	A	A	A	-	-	-	-	-	-	-	-
13	A	A	A	A	A	A	-	-	-	-	-	-	-	-
Criteria	B						-		B				-	
Result	B						-		B				-	

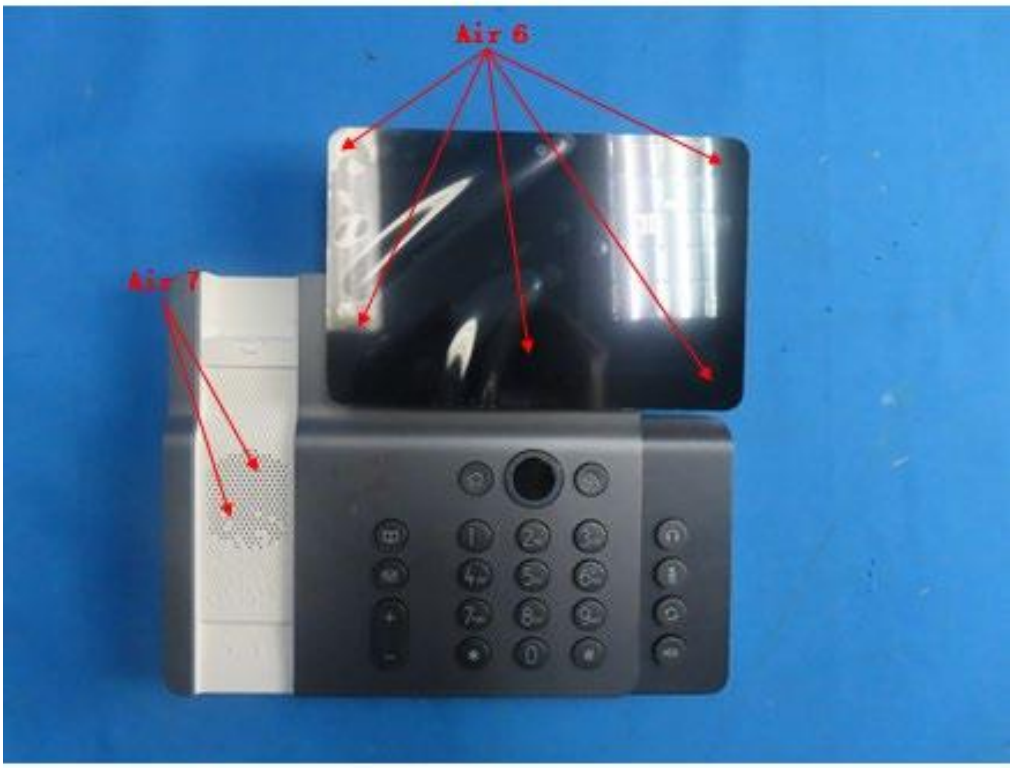
Mode	HCP Contact Discharge						VCP Contact Discharge					
	4kV		- kV		- kV		4kV		- kV		- kV	
Location	P	N	P	N	P	N	P	N	P	N	P	N
Left side	A	A	-	-	-	-	A	A	-	-	-	-
Right side	A	A	-	-	-	-	A	A	-	-	-	-
Front side	A	A	-	-	-	-	A	A	-	-	-	-
Rear side	A	A	-	-	-	-	A	A	-	-	-	-
Criteria	B				-		B				-	
Result	A				-		A				-	

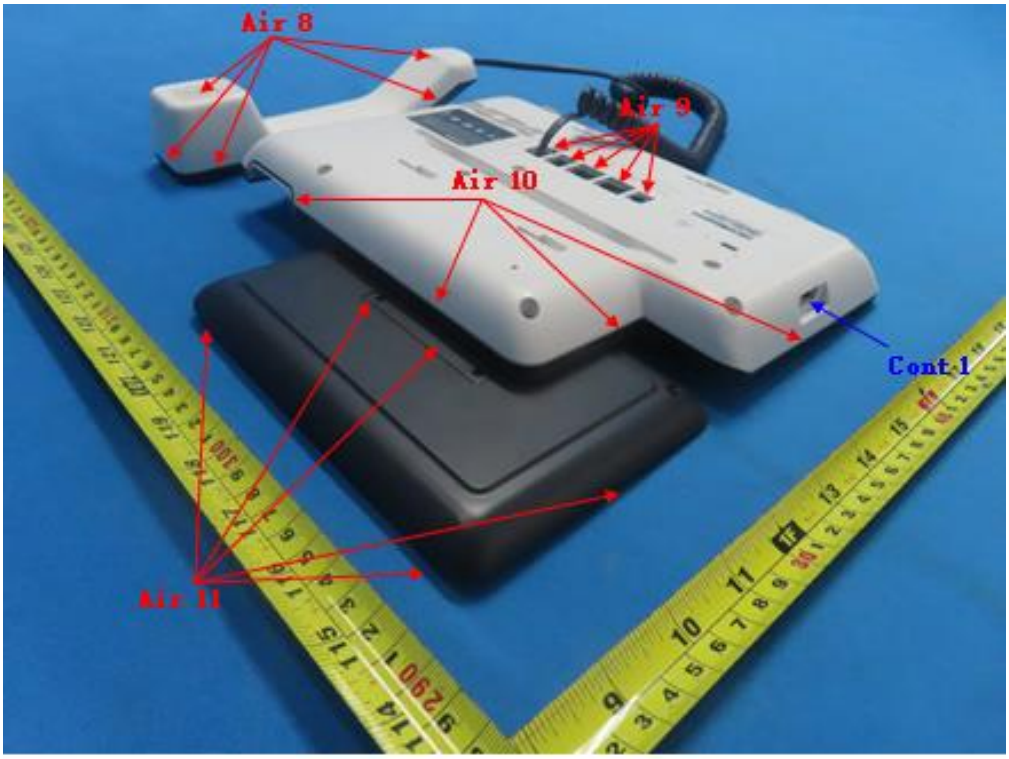
Note:

1) P/N denotes the Positive/Negative polarity of the output voltage.

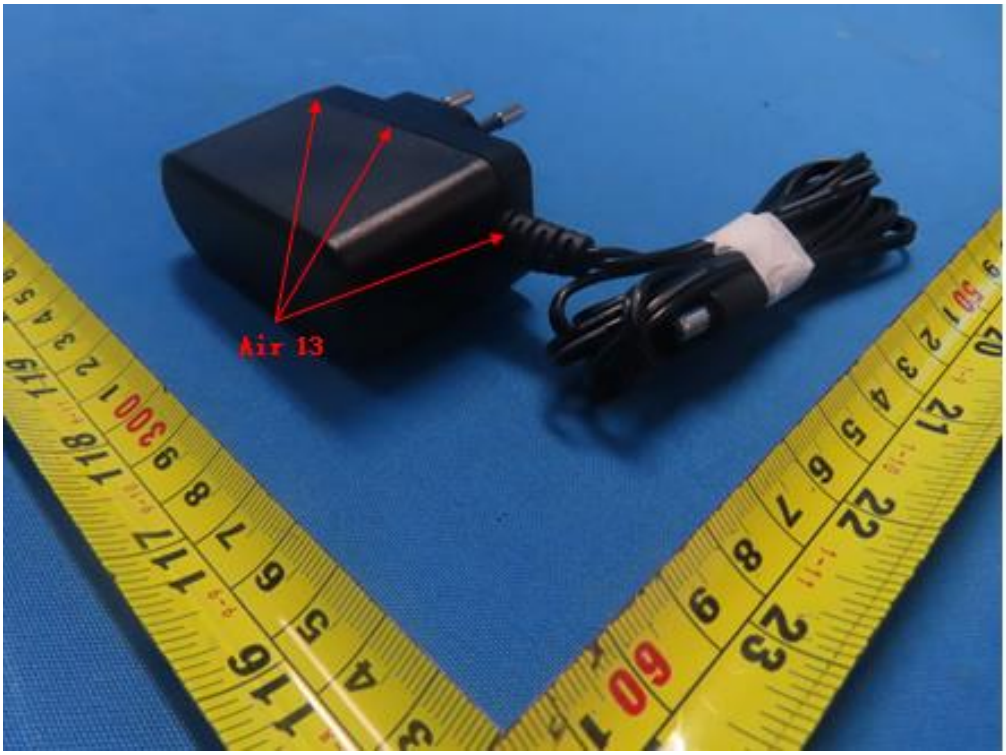
2) N/A - denotes test is not applicable in this test report

PHOTO(S) SHOWN THE LOCATION(S) OF ESD EVALUATED




Air 8
Air 9
Air 10
Cont 1
Air 11


Air 12


Air 13

APPENDIX H - RF ELECTROMAGNETIC FIELD

Test Voltage	AC 230V/50Hz, DC 48V
Test Mode	Mode 1-Mode 3

Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Modulation	Azimuth	Criteria	Results
80 - 1000	V/H	3 V/m	AM Modulated 1000 Hz, 80%	0	A	A
				90		
				180		
				270		
1000 - 3000	V/H	3 V/m	AM Modulated 1000 Hz, 80%	0	A	A
				90		
				180		
				270		
3000 - 6000	V/H	3 V/m	AM Modulated 1000 Hz, 80%	0	A	A
				90		
				180		
				270		

APPENDIX I - FAST TRANSIENTS COMMON MODE

Test Voltage	AC 230V/50Hz
Test Mode	Mode 1-Mode 3

EUT Ports Tested		Polarity	Repetition Frequency	Test Level 1kV	Criterion	Result
AC Power Port	Line (L)	+	5 kHz	B	B	B
		-	5 kHz	B		
	Neutral (N)	+	5 kHz	B	B	B
		-	5 kHz	B		
	L+N	+	5 kHz	B	B	B
		-	5 kHz	B		

EUT Ports Tested		Polarity	Repetition Frequency	Test Level 0.5kV	Criterion	Result
Signal port, Wired network port, Control port	LAN	+	5 kHz	B	B	B
		-	5 kHz	B		
	PC PORT	+	5 kHz	B	B	B
		-	5 kHz	B		

Test Voltage	DC 48V
Test Mode	Mode 1-Mode 3

EUT Ports Tested		Polarity	Repetition Frequency	Test Level 0.5kV	Criterion	Result
Signal port, Wired network port, Control port	LAN	+	5 kHz	B	B	B
		-	5 kHz	B		
	PC PORT	+	5 kHz	B	B	B
		-	5 kHz	B		

APPENDIX J - SURGES

Test Voltage	AC 230V/50Hz
Test Mode	Mode 1-Mode 3

Wave Form EUT Ports Tested		1.2/50(8/20)Tr/Th μs						Criterion	Result
		Polarity	Phase	Voltage					
				0.5kV	1kV	-- kV	-- kV		
AC	L – N	+/-	0°	B	B	-	-	B	B
		+/-	90°	B	B	-	-		
		+/-	180°	B	B	-	-		
		+/-	270°	B	B	-	-		

Wave Form EUT Ports Tested		1.2/50(8/20)Tr/Th μs					Criterion	Result
		Polarity	Voltage					
			0.5kV	1kV	-- kV	-- kV		
Wired network ports	LAN	+/-	B	-	-	-	B	B
	PC PORT	+/-	B	-	-	-	B	B

Test Voltage	DC 48V
Test Mode	Mode 1-Mode 3

Wave Form EUT Ports Tested		1.2/50(8/20)Tr/Th μs					Criterion	Result
		Polarity	Voltage					
			0.5kV	1kV	-- kV	-- kV		
Wired network ports	LAN	+/-	B	-	-	-	B	B
	PC PORT	+/-	B	-	-	-	B	B

APPENDIX K - RADIO FREQUENCY COMMON MODE

Test Voltage	AC 230V/50Hz
Test Mode	Mode 1-Mode 3

Test Ports (Mode)	Freq. Range (MHz)	Field Strength	Modulation	Criteria	Results
Input/ Output AC. Power Port	0.15 --- 80	3 V	AM Modulated 1000 Hz, 80%	A	A
Signal ports, wired network ports, control ports (LAN)	0.15 --- 80			A	A
Signal ports, wired network ports, control ports (PC PORT)	0.15 --- 80			A	A

Test Voltage	DC 48V
Test Mode	Mode 1-Mode 3

Test Ports (Mode)	Freq. Range (MHz)	Field Strength	Modulation	Criteria	Results
Signal ports, wired network ports, control ports (LAN)	0.15 --- 80	3 V	AM Modulated 1000 Hz, 80%	A	A
Signal ports, wired network ports, control ports (PC PORT)	0.15 --- 80			A	A

APPENDIX L - VOLTAGE DIPS AND INTERRUPTIONS

Test Voltage	AC 100V/50Hz, AC 230V/50Hz, AC 240V/50Hz
Test Mode	Mode 1-Mode 3

AC 230V/50Hz				
Item	Residual Voltage	Cycle	Perform Criteria	Results
Voltage dips	0%	0.5	B	A
Voltage dips	0%	1	B	A
Voltage dips	70%	25	C	A
Voltage interruptions	0%	250	C	C

AC 240V/50Hz				
Item	Residual Voltage	Cycle	Perform Criteria	Results
Voltage dips	0%	0.5	B	A
Voltage dips	0%	1	B	A
Voltage dips	70%	25	C	A
Voltage interruptions	0%	250	C	C

AC 100V/50Hz				
Item	Residual Voltage	Cycle	Perform Criteria	Results
Voltage dips	0%	0.5	B	A
Voltage dips	0%	1	B	A
Voltage dips	70%	25	C	A
Voltage interruptions	0%	250	C	C

End of Test Report