TEST REPORT

Applicant:	SHENZHEN WLINK TECHNOLOGY CO., LIMITED
Address of Applicant:	319,YiBen Electronic Business Building, NO.1063 ChaGuang Road, XiLi, NanShan District, ShenZhen, China
Manufacturer/ Factory:	SHENZHEN WLINK TECHNOLOGY CO., LIMITED
Address of Manufacturer/ Factory:	319,YiBen Electronic Business Building, NO.1063 ChaGuang Road, XiLi, NanShan District, ShenZhen, China

Equipment Under Test (EUT)

Product Name:	Industrial 3G/4G Cellular Router
Model No.:	WL-G500
Applicable standards:	EN 55032:2015 EN 55024:2010/A1:2015 EN 61000-3-2:2014 EN 61000-3-3:2013
Date of sample receipt:	May 27, 2017
Date of Test:	May 27-June 23, 2017
Date of report issued:	June 28, 2017
Test Result :	PASS *

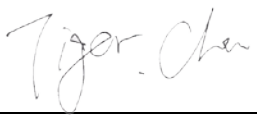
* In the configuration tested, the EUT complied with the standards specified above.

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EC Directives. The protection requirements with respect to electromagnetic compatibility contained in Directive 2014/30/EU are considered.

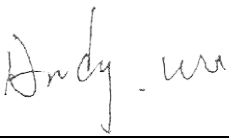
Robinson Lo
Laboratory Manager

2 Version

Version No.	*Date*	*Description*
00	*June 28,2017*	*Original*

Prepared By:  ***Date:*** June 28, 2017

Project Engineer

Check By:  ***Date:*** June 28, 2017

Reviewer

3 Contents

4 Test Summary

Test item	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission	EN 55032	EN 55032	Class B	Pass
Conducted Emission	EN 55032	EN 55032	Class B	Pass
Harmonic Emission	EN 61000-3-2	EN 61000-3-2	N/A	N/A
Flicker Emission	EN 61000-3-3	EN 61000-3-3	Clause 5	Pass
Electrostatic discharge	EN 55024	EN 61000-4-2	Contact ±2,±4 kV Air ±2,±4,±8 kV	Pass
Radio-frequency electromagnetic field Amplitude modulated	EN 55024	EN 61000-4-3	3V/m 80%, 1kHz, AM	Pass
Electrical fast transients	EN 55024	EN 61000-4-4	AC ± 1.0kV	Pass
Surges	EN 55024	EN 61000-4-5	±1kV D.M ±2kV C.M	Pass
Radio-frequency continuous conducted	EN 55024	EN 61000-4-6	3Vrms (emf), 80%, 1kHz Amp. Mod.	Pass
Voltage dips and Voltage interruptions	EN 55024	EN 61000-4-11	0 % U_T* for 0.5per 0 % U_T* for 250per 70 % U_T* for 25per	Pass

Remark:

1. *Pass: Comply with the essential requirements in the standard.*
2. *N/A: not applicable*
3. *U_T: the nominal supply voltage; D.M: Differential Mode; C.M: Common Mode.*

5 General Information

5.1 General Description of EUT

Product Name:	Industrial 3G/4G Cellular Router
Model No.:	WL-G500
Power Supply:	Adapter Model:RD1201500-C55-1OG INPUT: AC 100-240V,50/60Hz,0.6A Max OUTPUT: DC 12V1.5A

5.2 Test mode and Test voltage

Test mode:	
LAN mode	Keep the EUT in Ping ID status by lan port.
Test voltage:	
AC 230V/50Hz	

5.3 Description of Support Units

Manufacturer	Description	Model	Serial Number
Apple	PC	A1278	C1MN99ERDTY3
DELL	KEYBOARD	SK-8115	N/A
DELL	MOUSE	MOC5UO	N/A

5.4 Deviation from Standards

None.

5.5 Abnormalities from Standard Conditions

None.

5.6 Monitoring of EUT for All Immunity Test

Visual:	Monitor the screen.
Audio:	Monitor the sound.

5.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **FCC —Registration No.: 600491**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fuly described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 600491, June 22, 2016

● **Industry Canada (IC) —Registration No.: 9079A-2**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. Has been

Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, August 15, 2016.

5.8 Test Location

RI test was performed at:
SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch E&E Lab, No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057.
All other tests were performed at:
Global United Technology Services Co., Ltd. Address: No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102 Tel: 0755-27798480 Fax: 0755-27798960

6 Test Instruments List

Radiated Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July. 03 2015	July. 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June. 29 2016	June. 28 2017
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 29 2016	June. 28 2017
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June. 29 2016	June. 28 2017
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 29 2016	June. 28 2017
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 29 2016	June. 28 2017
9	Coaxial Cable	GTS	N/A	GTS211	June. 29 2016	June. 28 2017
10	Coaxial cable	GTS	N/A	GTS210	June. 29 2016	June. 28 2017
11	Coaxial Cable	GTS	N/A	GTS212	June. 29 2016	June. 28 2017
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 29 2016	June. 28 2017
13	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	June. 29 2016	June. 28 2017
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 29 2016	June. 28 2017
15	Band filter	Amindeon	82346	GTS219	June. 29 2016	June. 28 2017
16	Constant temperature and humidity box	Oregon Scientific	BA-888	GTS248	June. 29 2016	June. 28 2017
17	D.C. Power Supply	Instek	PS-3030	GTS232	June. 29 2016	June. 28 2017
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS588	June. 29 2016	June. 28 2017
19	Splitter	Agilent	11636B	GTS237	June. 29 2016	June. 28 2017

Conducted Emission						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.16 2014	May.15 2019
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 29 2016	June. 28 2017
3	Pulse Limiter	R&S	ESH3-Z2	GTS224	June. 29 2016	June. 28 2017
4	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 29 2016	June. 28 2017
5	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June. 29 2016	June. 28 2017
6	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Thermo meter	KTJ	TA328	GTS233	June. 29 2016	June. 28 2017
9	ISN	EMTEST	FCC-TLISN-T8-02	GTS563	June. 29 2016	June. 28 2017

EFT, Surge, Voltage dips and Interruption:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	EMTEST system	EMTEST	UCS500N	GTS239	June. 29 2016	June. 28 2017
2	Thermo meter	KTJ	TA328	GTS233	June. 29 2016	June. 28 2017
3	capacitive Clamp	EMTEST	HFK	GTS557	June. 29 2016	June. 28 2017

ESD:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	ESD Simulator	KIKUSUI	KES4021A	GTS242	June. 29 2016	June. 28 2017
2	Thermo meter	KTJ	TA328	GTS243	June. 29 2016	June. 28 2017

Harmonic/ Flicker:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	HARMONIC/FLICKER ANALYZER	KIKUSUI	KHA1000	GTS235	June. 29 2016	June. 28 2017
2	AC POWER SUPPLY	KIKUSUI	PCR4000LE	GTS236	June. 29 2016	June. 28 2017
3	LINE IMPEDANCE NETWORK	KIKUSUI	LIN1020JF	GTS237	June. 29 2016	June. 28 2017
4	Thermo meter	KTJ	TA328	GTS256	June. 29 2016	June. 28 2017

Conducted Immunity:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Signal Generator	SCHLODER	CDG-6000-25	GTS553	June. 29 2016	June. 28 2017
2	CDN	SCHLODER	CDN-M2+3	GTS554	June. 29 2016	June. 28 2017
3	EM-Clapm	SCHLODER	EMCL-20	GTS555	June. 29 2016	June. 28 2017
4	ATT	SCHLODER	ATT-6DB-100	GTS556	June. 29 2016	June. 28 2017

Radiated Immunity:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial NO.**	**Cal.Date (mm-dd-yy)**	**Cal.Due Date (mm-dd-yy)**
1	Fully-Anechoic Chamber 2	Chang Zhou Zhong Shuo	854	SEM001-05	2014-06-10	2017-06-10
2	Power Sensor	Rohde & Schwarz	NRP-Z91	SEM009-08	2017-04-24	2018-04-24
3	Power Sensor	Rohde & Schwarz	NRP-Z91	SEM009-09	2017-04-24	2018-04-24
4	Log-periodic Antenna (0.07-3GHz)	Schwarzbeck	VUSLP9111E	SEM003-17	N/A	N/A
5	Signal Generator	Rohde & Schwarz	SMB100A	SEM006-11	2017-04-24	2018-04-24
6	Broadband Amplifier (80MHz-1GHz)	Rohde & Schwarz	BBA150-BC250	SEM005-12	2016-10-09	2017-10-09
7	Broadband Amplifier (800MHz-3GHz)	Rohde & Schwarz	BBA150-D110	SEM005-13	2016-10-09	2017-10-09
8	Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	SEM010-01	2016-10-09	2017-10-09
9	Universal Radio Communication Tester	Rohde & Schwarz	CMW 500	SEM010-03	2016-04-25	2017-04-25
10	Audio Analyzer	Rohde & Schwarz	UPV	SEM008-03	2016-10-09	2017-10-09
11	Conditioning Amplifier	Brüel & Kjaer	2690-OS2	SEM005-10	2017-04-24	2018-04-24

General used equipment:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (dd-mm-yy)**	**Cal.Due date (dd-mm-yy)**
1	Humidity/ Temperature Indicator	Shanghai	ZJ1-2B	GTS243	June.29 2016	June. 28 2017
2	Barometer	ChangChun	DYM3	GTS255	June. 29 2016	June. 28 2017

7 Emission Test Results

7.1 Radiated Emission

<table>
<tr><td>Test Requirement:</td><td>EN 55032</td></tr>
<tr><td>Test Method:</td><td>EN 55032</td></tr>
<tr><td>Test Frequency Range:</td><td>30MHz to 6GHz</td></tr>
<tr><td>Class / Severity:</td><td>Class B</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Value</th></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120KHz</td><td>300KHz</td><td>Quasi-peak</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak</td></tr>
<tr><td>AV</td><td>1MHz</td><td>3MHz</td><td>Average</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th>Frequency</th><th>Limit (dBµV/m @3m)</th><th>Value</th></tr>
<tr><td>30MHz-230MHz</td><td>40.00</td><td>Quasi-peak</td></tr>
<tr><td>230MHz-1GHz</td><td>47.00</td><td>Quasi-peak</td></tr>
<tr><td>1GHz-3GHz</td><td>70.00</td><td>Peak</td></tr>
<tr><td>1GHz-3GHz</td><td>50.00</td><td>Average</td></tr>
<tr><td>3GHz-6GHz</td><td>74.00</td><td>Peak</td></tr>
<tr><td>3GHz-6GHz</td><td>54.00</td><td>Average</td></tr>
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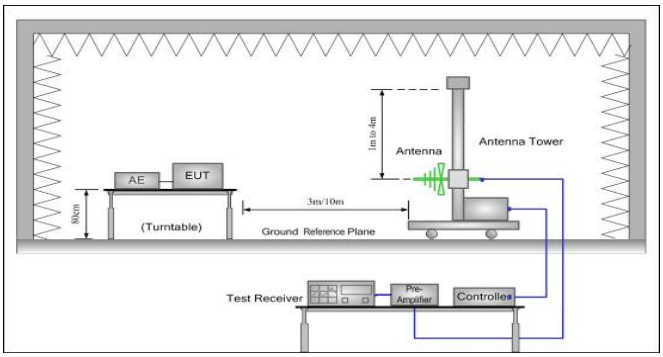
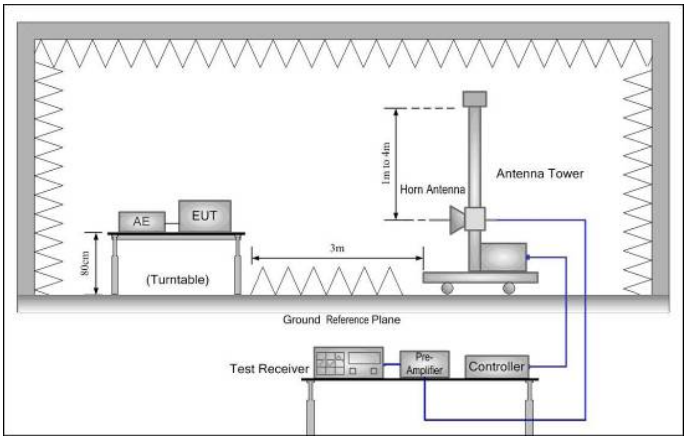
</td></tr>
<tr><td>Test setup:</td><td>Below 1GHz:
 

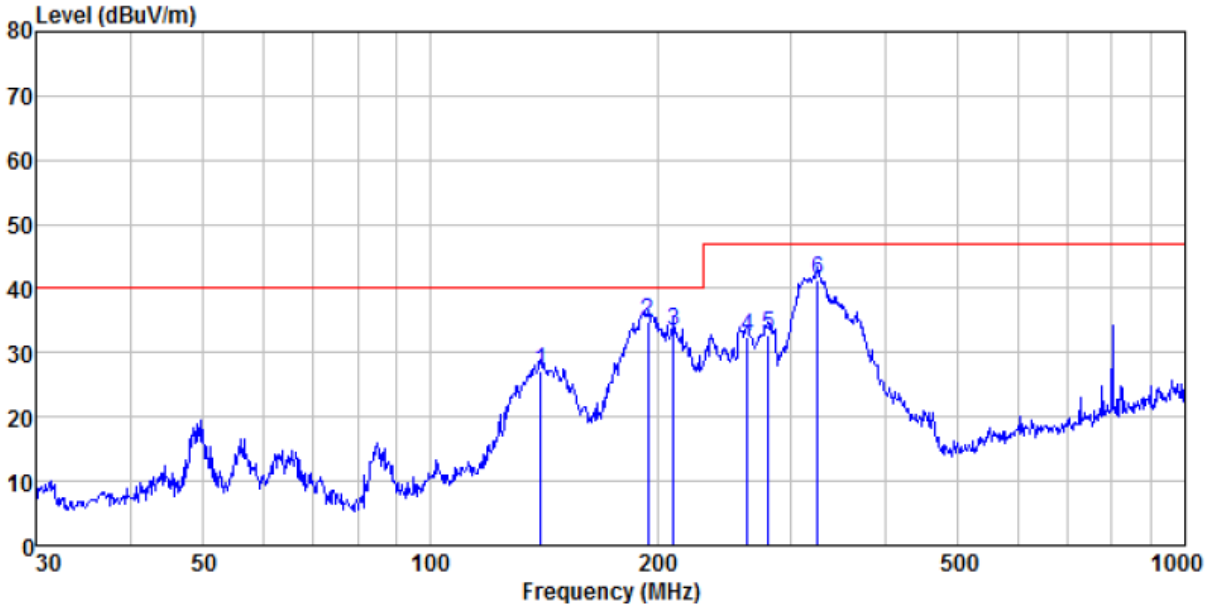
Above 1GHz:
 

</td></tr>
</table>

Test Procedure:	**From 30MHz to 1GHz:** 1. The radiated emissions test was conducted in a semi-anechoic chamber. 2. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation. 3. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT. 4. The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization. **Above 1GHz:** 1. The radiated emissions test was conducted in a fully-anechoic chamber. 2. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation. 3. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emission spectrum plots of the EUT. 4. The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.				
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1 012mbar
Measurement Record:					Uncertainty: ± 4.50dB	
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details.					
Test results:	Pass					

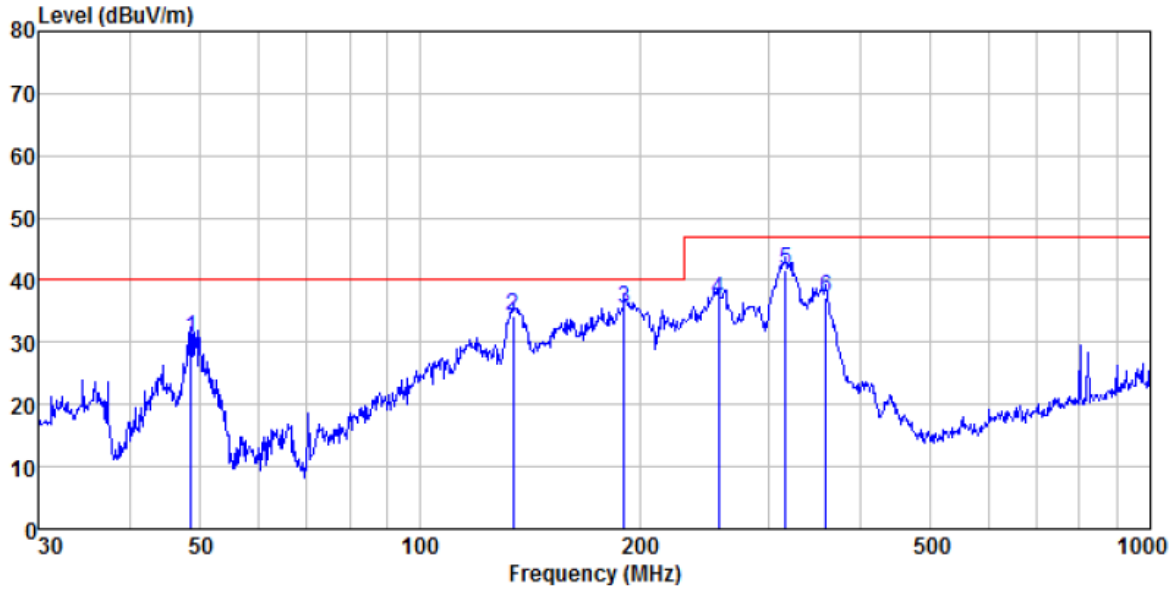
Measurement Data

Below 1GHz:
Horizontal:



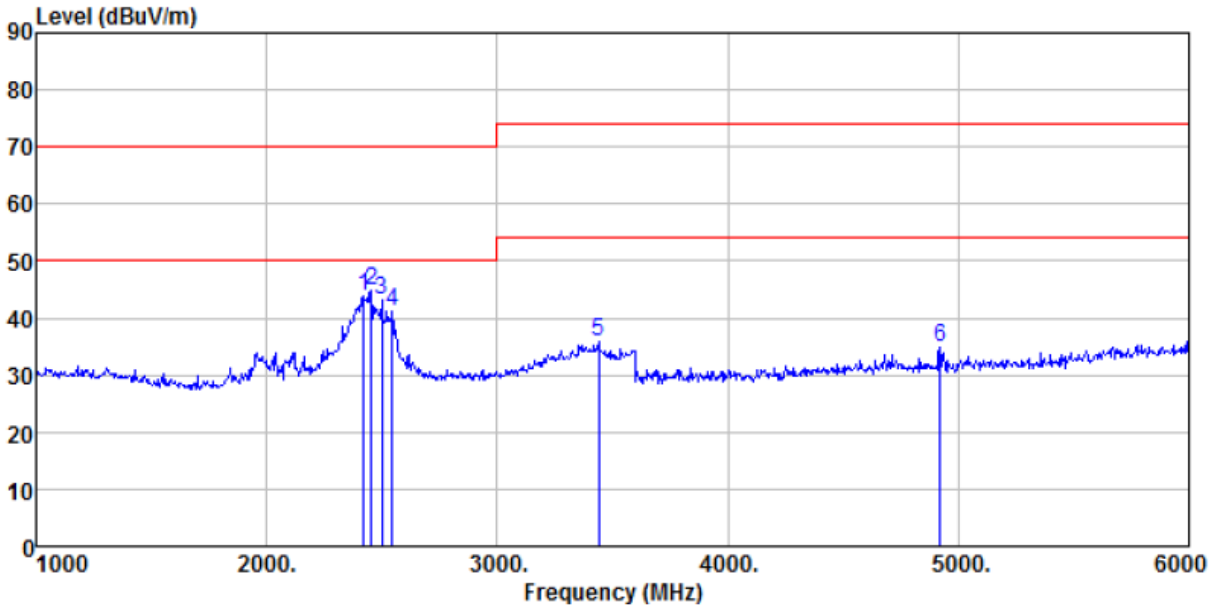
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
139.851	47.86	7.30	1.50	29.65	27.01	40.00	-12.99	QP
194.453	52.47	9.87	1.81	29.42	34.73	40.00	-5.27	QP
210.048	50.26	10.59	1.90	29.47	33.28	40.00	-6.72	QP
262.896	47.86	12.24	2.19	29.91	32.38	47.00	-14.62	QP
280.024	47.75	12.82	2.27	30.03	32.81	47.00	-14.19	QP
325.596	54.90	14.03	2.49	30.04	41.38	47.00	-5.62	QP

Vertical:



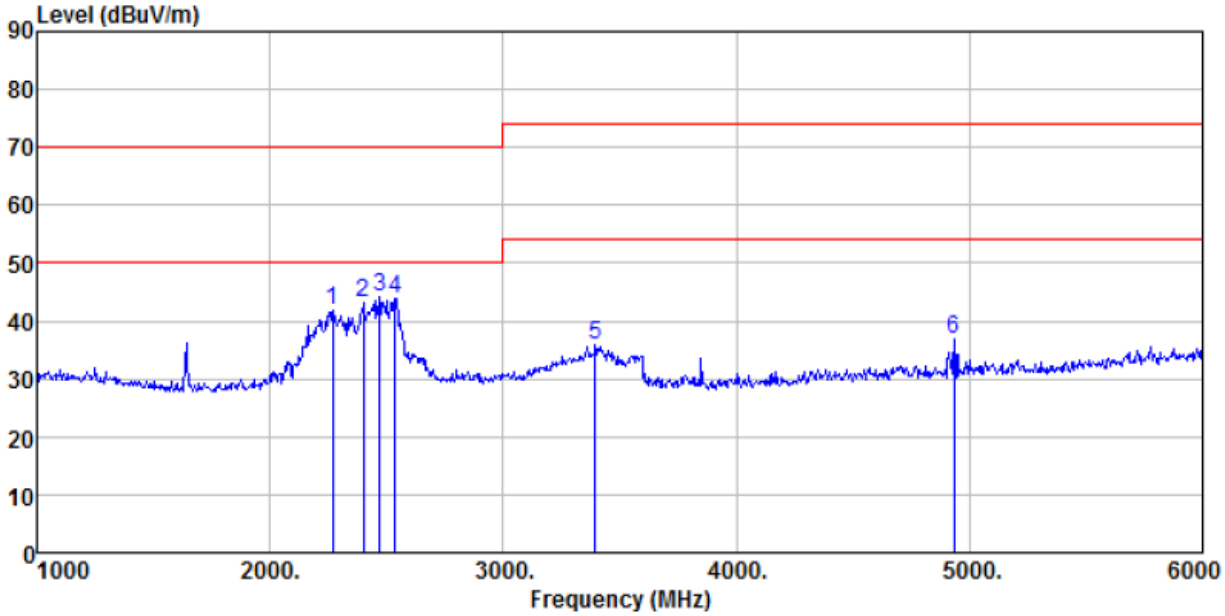
Freq	Reading level	Antenna factor	Cable loss	Preamp factor	level	Limit level	Over limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
48.502	47.68	12.23	0.76	30.10	30.57	40.00	-9.43	QP
134.088	54.56	7.83	1.47	29.66	34.20	40.00	-5.80	QP
190.405	53.53	9.70	1.79	29.45	35.57	40.00	-4.43	QP
256.521	52.43	12.04	2.16	29.84	36.79	47.00	-10.21	QP
316.589	55.42	13.79	2.45	30.09	41.57	47.00	-5.43	QP
359.186	49.79	14.68	2.67	29.84	37.30	47.00	-9.70	QP

Above 1GHz:
Horizontal:



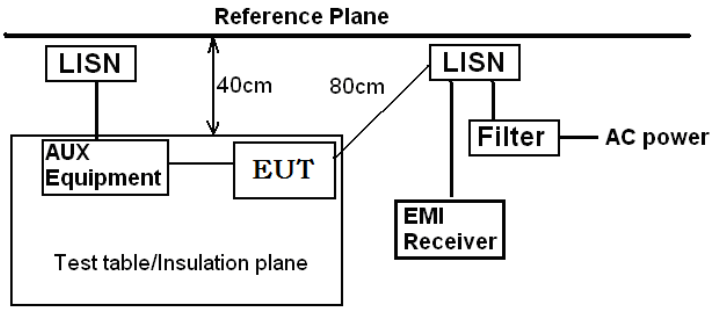
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2420.000	47.74	27.54	5.41	36.74	43.95	70.00	-26.05	Peak
2455.000	48.79	27.47	5.45	36.77	44.94	70.00	-25.06	Peak
2500.000	46.79	27.55	5.49	36.79	43.04	70.00	-26.96	Peak
2545.000	44.96	27.61	5.53	36.83	41.27	70.00	-28.73	Peak
3440.000	37.48	28.76	6.84	37.33	35.75	74.00	-38.25	Peak
4920.000	31.92	31.89	8.69	37.69	34.81	74.00	-39.19	Peak

Vertical:



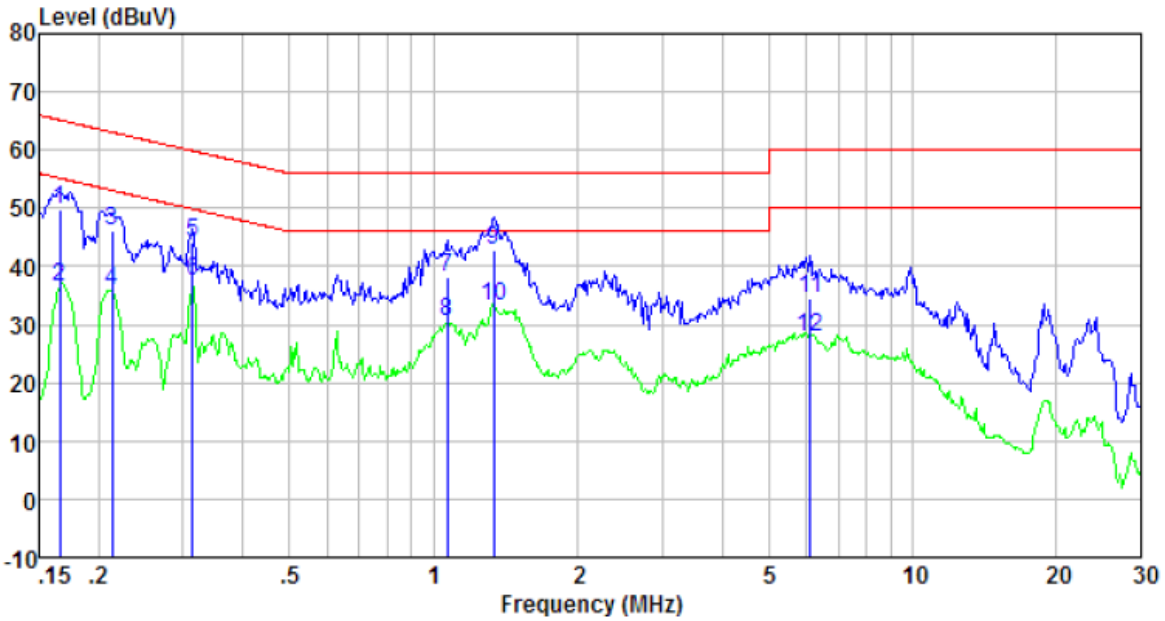
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2270.000	45.23	28.00	5.26	36.62	41.87	70.00	-28.13	Peak
2400.000	46.89	27.58	5.39	36.71	43.15	70.00	-26.85	Peak
2470.000	47.97	27.50	5.46	36.77	44.16	70.00	-25.84	Peak
2535.000	47.51	27.60	5.52	36.82	43.81	70.00	-26.19	Peak
3395.000	37.67	28.60	6.76	37.32	35.71	74.00	-38.29	Peak
4935.000	33.82	31.90	8.70	37.69	36.73	74.00	-37.27	Peak

7.2 Conducted Emission

Test Requirement:	EN 55032
Test Method:	EN 55032
Test Frequency Range:	150kHz to 30MHz
Class / Severity:	Class B
Receiver setup:	RBW=9kHz, VBW=30kHz
Limit:	Frequency range (MHz) / Limit (dBµV): Quasi-peak / Average 0.15-0.5: 66 to 56* / 56 to 46* 0.5-5: 56 / 46 5-30: 60 / 50 * Decreases with the logarithm of the frequency.
Test setup:	 *Remark:* *E.U.T: Equipment Under Test* *LISN: Line Impedence Stabilization Network* *Test table height=0.8m*
Test procedure:	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network(LISN). The provide a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to EN55032 Class B on conducted measurement.
Test environment:	Temp.: 24 °C / Humid.: 51% / Press.: 1012mbar
Measurement Record:	Uncertainty: ±3.45dB
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.2 for details.
Test results:	Pass

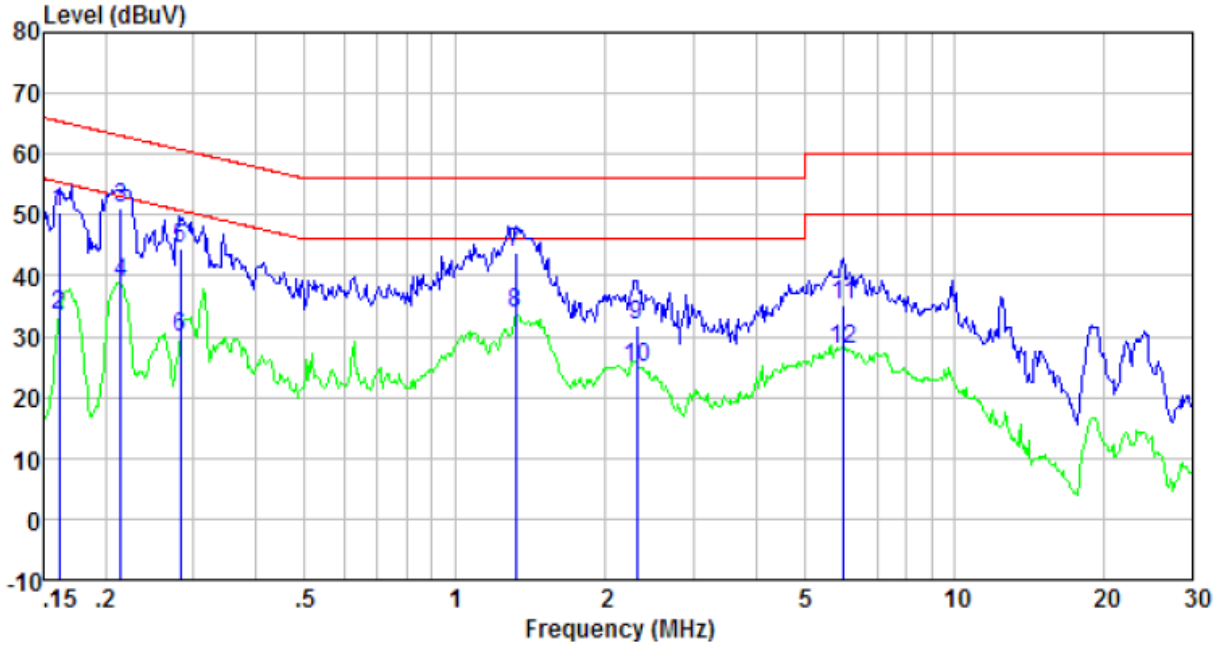
Measurement Data

Test mode:	LAN mode	Phase Polarity:	Line



Freq MHz	Reading level dBuV	lISN/ISN factor dB	Cable loss dB	level dBuV	Limit level dBuV	Over limit dB	Remark
0.166	49.25	0.41	0.12	49.78	65.16	-15.38	QP
0.166	36.09	0.41	0.12	36.62	55.16	-18.54	Average
0.213	45.68	0.41	0.13	46.22	63.10	-16.88	QP
0.213	35.26	0.41	0.13	35.80	53.10	-17.30	Average
0.313	43.59	0.42	0.10	44.11	59.88	-15.77	QP
0.313	37.04	0.42	0.10	37.56	49.88	-12.32	Average
1.065	37.93	0.21	0.13	38.27	56.00	-17.73	QP
1.065	30.17	0.21	0.13	30.51	46.00	-15.49	Average
1.338	42.62	0.21	0.13	42.96	56.00	-13.04	QP
1.338	32.88	0.21	0.13	33.22	46.00	-12.78	Average
6.121	34.16	0.21	0.16	34.53	60.00	-25.47	QP
6.121	27.56	0.21	0.16	27.93	50.00	-22.07	Average

Test mode:	LAN mode	Phase Polarity:	Neutral



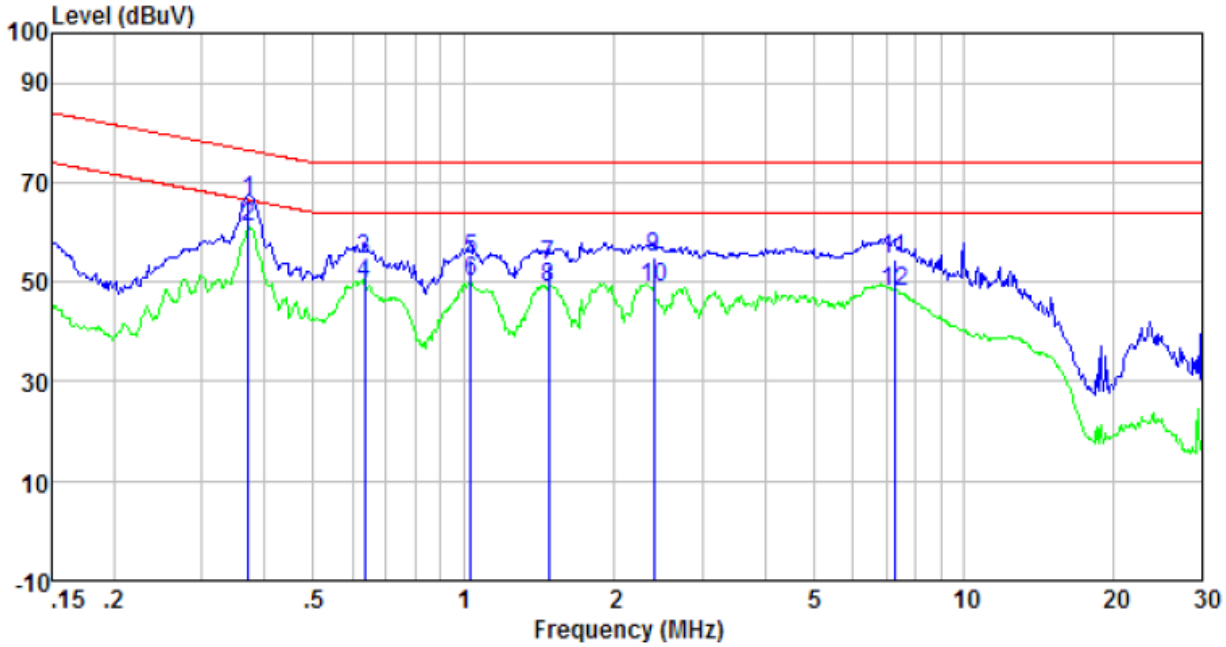
Freq MHz	Reading level dBuV	lISN/ISN factor dB	Cable loss dB	level dBuV	Limit level dBuV	Over limit dB	Remark
0.162	49.94	0.42	0.12	50.48	65.38	-14.90	QP
0.162	33.11	0.42	0.12	33.65	55.38	-21.73	Average
0.214	50.57	0.43	0.13	51.13	63.05	-11.92	QP
0.214	38.26	0.43	0.13	38.82	53.05	-14.23	Average
0.282	43.95	0.44	0.10	44.49	60.76	-16.27	QP
0.282	29.45	0.44	0.10	29.99	50.76	-20.77	Average
1.324	43.58	0.23	0.13	43.94	56.00	-12.06	QP
1.324	33.32	0.23	0.13	33.68	46.00	-12.32	Average
2.309	31.47	0.20	0.15	31.82	56.00	-24.18	QP
2.309	24.66	0.20	0.15	25.01	46.00	-20.99	Average
5.993	34.85	0.21	0.16	35.22	60.00	-24.78	QP
5.993	27.34	0.21	0.16	27.71	50.00	-22.29	Average

Notes:

1. *An initial pre-scan was performed on the live and neutral lines with peak detector.*
2. *Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.*
3. *Final Level =Receiver Read level + LISN Factor + Cable Loss*
4. *If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.*

7.3 Asymmetric mode conducted emissions

Measurement Data



Freq MHz	Reading level dBuV	lISN/ISN factor dB	Cable loss dB	level dBuV	Limit level dBuV	Over limit dB	Remark
0.371	57.02	9.38	0.10	66.50	76.47	-9.97	QP
0.371	51.72	9.38	0.10	61.20	66.47	-5.27	Average
0.634	45.34	9.25	0.13	54.72	74.00	-19.28	QP
0.634	40.17	9.25	0.13	49.55	64.00	-14.45	Average
1.032	45.08	9.20	0.13	54.41	74.00	-19.59	QP
1.032	40.69	9.20	0.13	50.02	64.00	-13.98	Average
1.480	44.06	9.18	0.13	53.37	74.00	-20.63	QP
1.480	39.38	9.18	0.13	48.69	64.00	-15.31	Average
2.396	45.74	9.11	0.15	55.00	74.00	-19.00	QP
2.396	39.49	9.11	0.15	48.75	64.00	-15.25	Average
7.252	45.24	9.00	0.17	54.41	74.00	-19.59	QP
7.252	38.98	9.00	0.17	48.15	64.00	-15.85	Average

7.4 Harmonic Emission

Test Requirement:	EN 61000-3-2
Test Method:	N/A: See Remark Below
Remark	There is no need for Harmonics test to be performed on this product (rated power is less than 75W) in accordance with EN 61000-3-2. For further details, please refer to Clause 7, Note 1 of EN 61000-3-2 which states: "For the following categories of equipment limits are not specified in this edition of the standard. Note 1: Equipment with a rated power of 75W or less, other than lighting equipment."

7.5 Flicker Emission

Test Requirement:	EN 61000-3-3					
Test Method:	EN 61000-3-3					
Class/Severity:	Clause 5 of EN 61000-3-3					
Measurement Time:	10 min					
Detector:	As per EN 61000-3-3					
Test environment:	Temp.:	24 °C	Humid.:	51%	Press.:	1 012mbar
Test Instruments:	Refer to section 6 for details					
Test mode:	Refer to section 5.2 for details					
Test results:	Pass					

Measurement Data

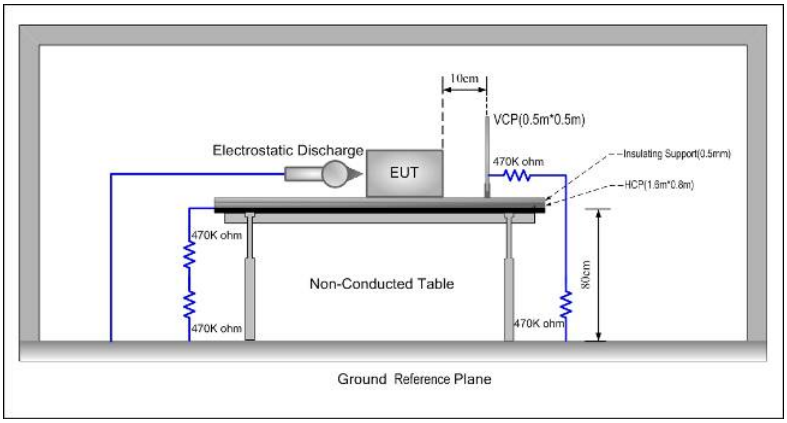
	EUT Values	Limit	Result
Pst	**0.027**	**1.00**	**PASS**
Dc[%]	**0.000**	**3.30**	**PASS**
Dmax[%]	**0.058**	**4.00**	**PASS**
Dt[s]	**0.000**	**0.50**	**PASS**

8 Immunity Test Results

8.1 Performance Criteria Description in Clause 7 of EN 55024

Criterion A:	The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.
Criterion B:	After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test. If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.
Criterion C:	Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

8.2 Electrostatic discharge

Test Requirement:	EN 55024
Test Method:	EN 61000-4-2
Discharge Voltage:	Contact Discharge: ±4kV Air Discharge: ±2kV, ±4kV, ±8kV HCP/VCP: ±4kV
Polarity:	Positive & Negative
Number of Discharge:	Contact Discharge: Minimum 25 times at each test point, Air Discharge: Minimum 10 times at each test point.
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum
Performance Criterion:	Criterion B
Test setup:	
Test Procedure:	**1. Air discharge:** The test was applied on non-conductive surfaces of EUT. The round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT. After each discharge, the discharge electrode was removed from the EUT. The generator was re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure was repeated until all the air discharge completed **2. Contact Discharge:** The test was applied on conductive surfaces of EUT. the generator was re-triggered for a new single discharge and repeated 25 times for each pre-selected test point. the tip of the discharge electrode was touch the EUT before the discharge switch was operated. **3. Indirect discharge for horizontal coupling plane** At least 10 single discharges shall be applied at the front edge of each HCP opposite the centre point of each unit of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge. Consideration should be given to exposing all sides of the EUT. **4. Indirect discharge for vertical coupling plane** At least 10 single discharges were applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X

	0.5m, was placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges were applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.					
Test environment:	Temp.:	24 °C	Humid.:	51%	Press.:	1 012mbar
Test mode:	Refer to section 6.0 for details					
Test Instruments:	Refer to section 5.2 for details					
Test results:	Pass					

Measurement Record:

Test points:	I: metal covers
	II: seams, ports

Direct discharge

Discharge Voltage (KV)	Type of discharge	Test points	Observations (Performance Criterion)	Result
± 4	Contact	I	B	Pass
± 2, ± 4,± 8	Air	II	B	Pass

Indirect discharge

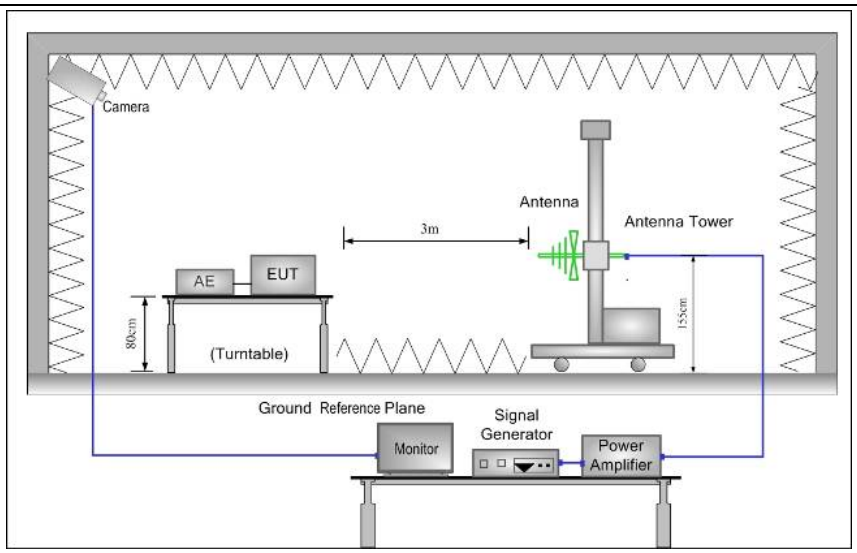
Discharge Voltage (KV)	Type of discharge	Test points	Observation Performance	Result
± 4	HCP-Bottom/Top/ Front/Back/Left/Right	Edge of the HCP	A	Pass
± 4	VCP-Front/Back /Left/Right	Center of the VCP	A	Pass

Remark:

A: Normal performance within the specification limits.

B:During test it may loss some function, after test it can be normal.

8.3 Radio-frequency electromagnetic field Amplitude modulated

Test Requirement:	EN 55024
Test Method:	EN 61000-4-3
Frequency range:	80MHz to 1GHz
Test Level:	3V/m
Modulation:	80%, 1kHz Amplitude Modulation
Performance Criterion:	Criterion A
Test setup:	
Test Procedure:	1. For table-top equipment, the EUT was placed in the chamber on a non-conductive table 0.8m high. For arrangement of floor-standing equipment, the EUT was mounted on a non-conductive support 0.1m above the supporting plane. For human body-mounted equipment, the EUT may be tested in the same manner as table top items. 2. If possible, a minimum of 1 m of cable is exposed to the electromagnetic field. Excess length of cables interconnecting units of the EUT shall be bundled low-inductively in the approximate center of the cable to form a bundle 30 cm to 40 cm in length. 3. The EUT was initially placed with one face coincident with the calibration plane. The EUT face being illuminated was contained within the UFA (Uniform Field Area). 4. The frequency ranges to be considered were swept with the signal modulated and pausing to adjust the RF signal level or to switch oscillators and antennas as necessary.Where the frequency range was swept incrementally, the step size was not exceed 1 % of the preceding frequency value. 5. The dwell time of the amplitude modulated carrier at each frequency was not be less than the time necessary for the EUT to be exercised and to respond, and was not less than 0,5 s. 6. The test normally was performed with the generating antenna facing each side of the EUT. 7. The polarization of the field generated by each antenna necessitates testing each selected side twice, once with the antenna positioned vertically and again with the antenna positioned horizontally.

	8. The EUT was performed in a configuration to actual installation conditions, a video camera and/or a audio monitor were used to monitor the performance of the EUT.					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1 012mbar
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test results:	Pass					

Measurement Record:

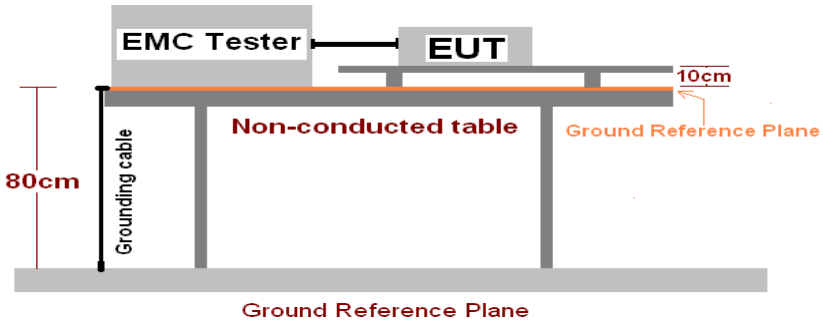
Frequency	Level	Modulation	Antenna Polarization	EUT Face	Observations (Performance Criterion)	Result
80 MHz-1 GHz	3 V/m	1 kHz, 80 % Amp. Mod, 1 % increment, dwell time=3seconds	V	Front	A	Pass
			H		A	Pass
			V	Rear	A	Pass
			H		A	Pass
			V	Left	A	Pass
			H		A	Pass
			V	Right	A	Pass
			H		A	Pass
			V	Top	A	Pass
			H		A	Pass
			V	Bottom	A	Pass
			H		A	Pass

Remark:

A: No degradation in performance of the EUT was observed.

8.4 Electrical fast transients

8.4.1AC Port

Test Requirement:	EN 55024
Test Method:	EN 61000-4-4
Test Level:	1.0kV
Polarity:	Positive & Negative
Test signal specification:	Rise time=5ns, Duration time=50ns; Burst Duration=15ms, Burst Period=300ms; Repetition Frequency=5KHz
Test Duration:	2 minute per level & polarity
Performance Criterion:	Criterion B
Test setup:	
Test Procedure:	1. The EUT and its simulators were placed on the ground reference plane and were insulated from it by a wood support 0.1m + 0.01m thick. The ground reference plane was 1m*1m metallic sheet with 0.65mm minimum thickness. 2. This reference ground plane was project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane was more than 0.5m. 3. All cables to the EUT was placed on the wood support, cables not subject to EFT/B was routed as far as possible from the cable under test to minimize the coupling between the cables. 4. The length of power lines between the coupling device and the EUT is 0.5m 5. The EUT is connected to the power mains through a coupling device that directly couples the EFT/B interference signal. 6. Each of the Line and Neutral conductors is impressed with burst noise for 2 minutes.
Test environment:	Temp.: 26 °C | Humid.: 54% | Press.: 1 012mbar
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

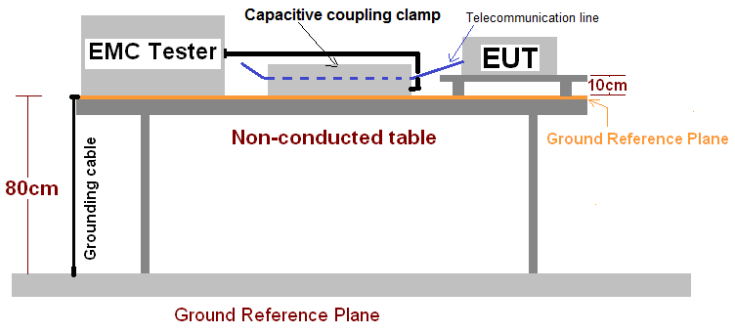
Measurement Record:

Lead under Test	Level (±kV)	Coupling Direct/Clamp	Observations (Performance Criterion)	Result
L	± 1.0	Direct	A	Pass
N	± 1.0	Direct	A	Pass
L-N	± 1.0	Direct	A	Pass

Remark:

A: No degradation in performance of the EUT was observed.

8.4.2 Signal ports and Telecommunication ports

Test Requirement:	EN 55024
Test Method:	EN 61000-4-4
Test Level:	0.5KV
Polarity:	Positive & Negative
Test signal specification:	Rise time=5ns, Duration time=50ns; Burst Duration=15ms, Burst Period=300ms; Repetition Frequency=5KHz
Test Duration:	2 minute per level & polarity
Performance Criterion:	Criterion B
Test setup:	
Test Procedure:	1. The EUT and its simulators were placed on the ground reference plane and were insulated from it by a wood support 0.1m + 0.01m thick. The ground reference plane was 1m*1m metallic sheet with 0.65mm minimum thickness. 2. The capacitive coupling clamp were placed on the ground reference plane. 3. This reference ground plane was project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane was more than 0.5m. 4. The length of the signal lines between the coupling device and the EUT is 0.5m 5. The signal line were place in the campacitive coupling clamp, and the clamp itself shall be closed as much as possible to provide maximum coupling 6. The EFT interference signal is through a coupling clamp device couples to the signal and control lines of the EUT with burst noise for 2 minutes.
Test environment:	Temp.: 26 °C | Humid.: 54% | Press.: 1 012mbar
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Record:

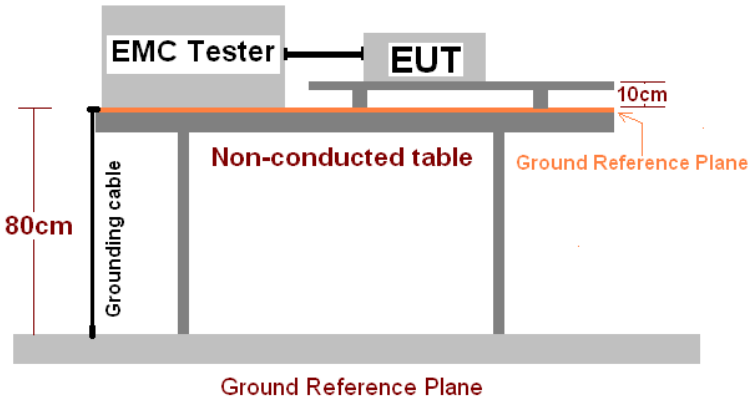
Lead under Test	Level (kV)	Coupling Direct/Clamp	Observations (Performance Criterion)	Result
Signal line	± 0.5	Clamp	A	Pass

Remark:

A: No degradation in performance of the EUT was observed.

8.5 Surges

8.5.1 AC ports

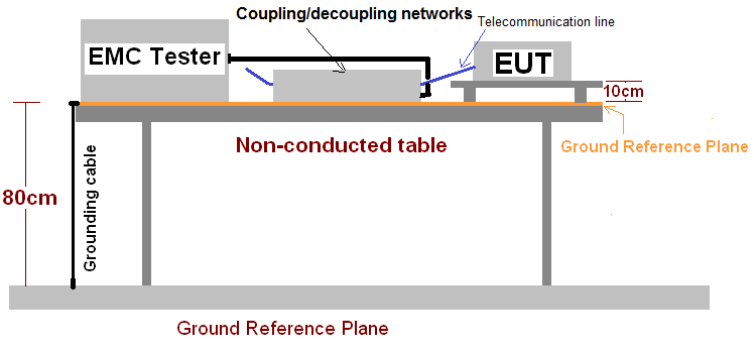
Test Requirement:	EN 55024
Test Method:	EN 61000-4-5
Test Level:	1kV line to line: Differential mode 2kV line to earth: Common mode
Polarity:	Positive & Negative
Generator source impedance:	2Ω (line-line coupling) 12Ω (line-earth coupling)
Test signal specification:	Rise time=1.2us, Duration time=50us; Test Interval: 60s between each surge;
No. of surges:	5 positive, 5 negative at 0°, 90°, 180°, 270°.
Performance Criterion:	Criterion B
Test setup:	
Test Procedure:	1. For line-to-line coupling mode, provide a 1kV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points, and for active line / neutral lines to ground are same except test level is 2kV. 2. At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are applied during test. 3. Different phase angles are done individually. 4. Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.
Test environment:	Temp.: 26 °C | Humid.: 53% | Press.: 1 012mbar
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Record:

Location	Level(kV)	Pulse No	Surge Interval	Phase(deg)	Observations (Performance Criterion)	Result
L-N	± 1	5	60s	0°	A	Pass
				90°	A	Pass
				180°	A	Pass
				270°	A	Pass

Remark:
A: No degradation in performance of the EUT was observed.

8.5.2 Signal ports and Telecommunication ports

Test Requirement:	EN 55024
Test Method:	EN 61000-4-5
Test Level:	1kV Line to earth
Polarity:	Positive & Negative
Generator source impedance:	42Ω (line-earth coupling)
Test signal specification:	Rise time=10us, Duration time=700us; Test Interval: 60s between each surge;
No. of surges:	5 positive, 5 negative
Performance Criterion:	Criterion C
Test setup:	
Test Procedure:	1. For Coupling/decoupling networks mode, provide a 1kV 10/700us voltage surge 2. At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are applied during test. 3. Different phase angles are done individually. 4. Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.
Test environment:	Temp.: 26 °C | Humid.: 53% | Press.: 1 012mbar
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Record:

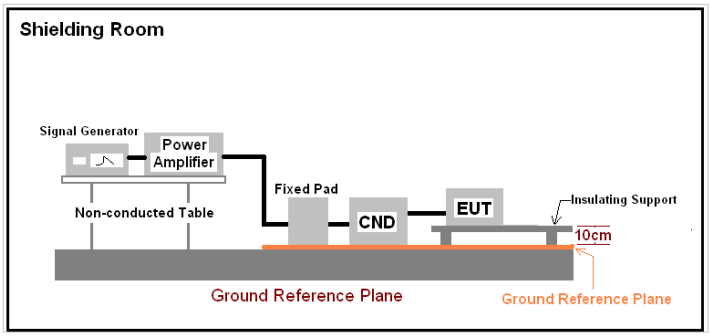
Location	Level(kV)	Pulse No	Surge Interval	Observations (Performance Criterion)	Result
Signal port	± 1	5	60s	A	Pass

Remark:

A: No degradation in performance of the EUT was observed.

8.6 Radio-frequency continuous conducted

8.5.3 AC ports

Test Requirement:	EN 55024
Test Method:	EN 61000-4-6
Frequency range:	0.15MHz to 80MHz
Test Level:	3V rms on AC Ports (unmodulated emf into 150 Ω)
Performance Criterion:	Criterion A
Test setup:	
Test Procedure:	1. The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible). 2. The disturbance signal described below is injected to EUT through CDN. 3. The EUT operates within its operational mode(s) under intended climatic conditions after power on. 4. Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.
Test environment:	Temp.: 24 °C | Humid.: 51% | Press.: 1 012mbar
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

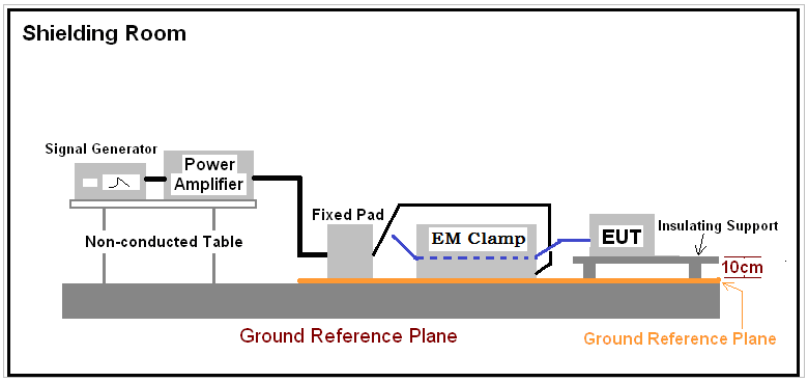
Measurement Record:

Frequency	Injected Position	Level	Modulation	Observations (Performance Criterion)	Result
150kHz to 80MHz	AC Mains	3Vrms	1 kHz, 80 % Amp. Mod, 1 % increment, dwell time=2seconds	A	Pass

Remark:

A: No degradation in performance of the EUT was observed.

8.5.4 Signal ports and Telecommunication ports

Test Requirement:	EN 55024
Test Method:	EN 61000-4-6
Frequency range:	0.15MHz to 80MHz
Test Level:	3V rms
Performance Criterion:	Criterion A
Test setup:	
Test Procedure:	1. The EUT are placed on an insulating support 0.1m high above a ground reference plane. EM Clamp is placed on the ground plane about 0.3m from EUT. Cables between EM clamp and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible). 2. The signal line were place in the EM clamp. 3. The disturbance signal described below is injected to EUT through EM clamp. 4. The EUT operates within its operational mode(s) under intended climatic conditions after power on. 5. Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.
Test environment:	Temp.: 24 °C | Humid.: 51% | Press.: 1 012mbar
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

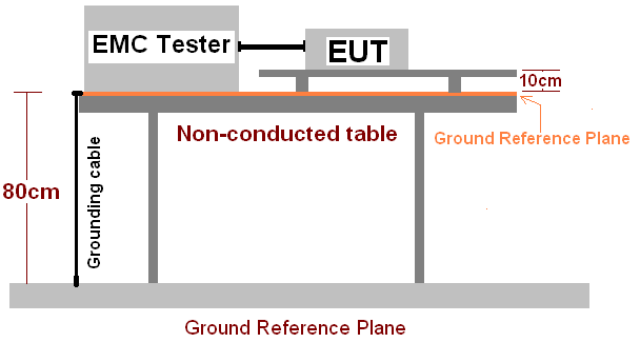
Measurement Record:

Frequency	Injected Position	Level	Modulation	Observations (Performance Criterion)	Result
150kHz to 80MHz	Clamp	3Vrms	1 kHz, 80 % Amp. Mod, 1 % increment, dwell time=2seconds	A	Pass

Remark:

A: No degradation in performance of the EUT was observed.

8.7 Voltage dips and Voltage interruptions

Test Requirement:	EN 55024
Test Method:	EN 61000-4-11
Test Level:	0% of VT(Supply Voltage) for 0.5 period 70% of VT(Supply Voltage) for 25 period 0% of VT(Supply Voltage) for 250 period
Number of Dips / Interruptions:	3 per Level
Performance Criterion:	>95% VD, 0.5 period----Performance criterion: B 30% VD, 25 period----Performance criterion: C >95% VI, 250 period----Performance criterion: C
Test setup:	
Test Procedure:	1. The EUT and test generator were setup as shown on above setup photo. 2. The interruptions are introduced at selected phase angles with specified duration. 3. Record any degradation of performance.
Test environment:	Temp.: 26 °C | Humid.: 53% | Press.: 1 012mbar
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Record:

Test Level % U_T	Duration (Periods)	Phase angle	No. of drop out	Time between dropout	Observations (Performance Criterion)	Result
0	0.5	0°, 90°, 180°, 270°	3	10s	A	Pass
70	25	0°, 90°, 180°, 270°	3	10s	B	Pass
0	250	0°, 90°, 180°, 270°	3	10s	B	Pass

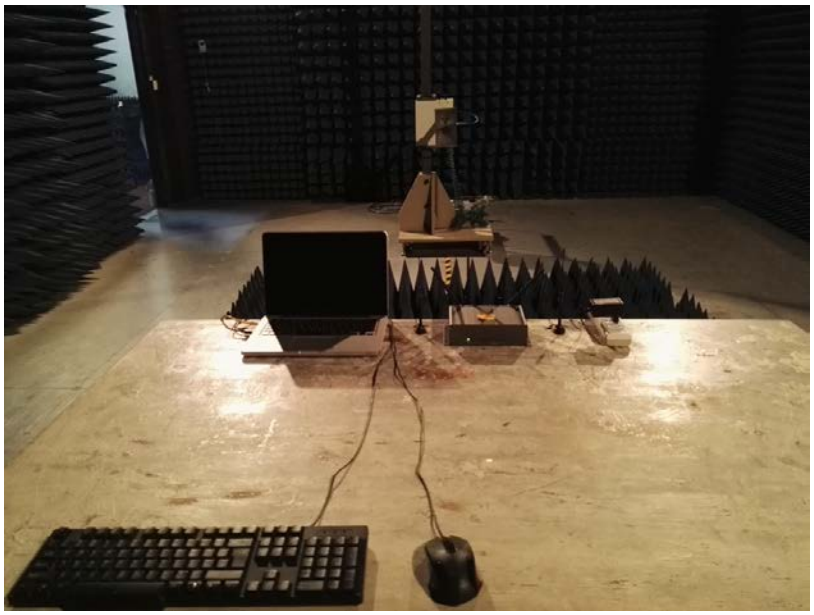
Remark:

A: No degradation in performance of the EUT was observed.

B: During the test, the EUT stopped , but after the test, it can automatically return to normal.

9 Test Setup Photo

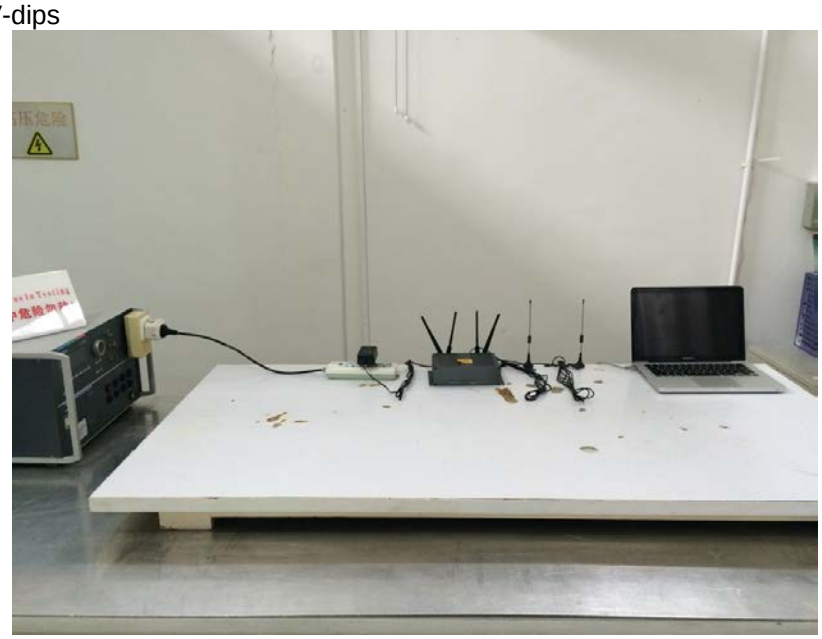
Radiated Emission



Conducted Emission

ESD

Surges/EFT/V-dips



10 EUT Constructional Details

Reference to the test report No. : GTS201705000233E01

------End------