EMC 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:	SHENZHEN WLINK TECHNOLOGY CO.,LIMITED
Address of Manufacturer:	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-R210
Applicable standards:	ETSI EN 301 489-1 V2.2.0 (2017-03) Draft ETSI EN 301 489-17 V3.2.0 (2017-03) Draft ETSI EN 301 489-52 V1.1.0 (2016-11) Draft EN 55032:2015 EN 55024:2010/A1:2015 EN 61000-3-2:2014 EN 61000-3-3:2013
Date of sample receipt:	May 25, 2017
Date of Test:	May 25, 2017 – June 15, 2017
Date of report issue:	June 15, 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 2014/53/EU are considered.

Robinson Lo
Laboratory Manager

2 Version

Version No.	Date	Description
00	*June 15, 2017*	*Original* *Remark: All of the radio reports refers to 1-5805/13-156-04, 1-5805/13-156-05 and 1-5805/13-156-06.*

Prepared By: Bill. Yuan ***Date:*** *June 15, 2017*

Project Engineer

Check By: Andy. Wu ***Date:*** *June 15, 2017*

Reviewer

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4 Test Summary

EMI Test				
Test Item	Test Requirement	Test Method	Application	Result
Radiated Emission	ETSI EN 301 489-17 ETSI EN 301 489-52 EN 55032	ETSI EN301 489-1 EN 55032	Enclosure	Pass
Conducted Emission	ETSI EN 301 489-17 ETSI EN 301 489-52	ETSI EN301 489-1	AC port	Pass
Harmonic Current Emissions	ETSI EN 301 489-17 ETSI EN 301 489-52 EN 61000-3-2	ETSI EN301 489-1 EN 61000-3-2	AC port	N/A
Voltage Fluctuations and Flicker	ETSI EN 301 489-17 ETSI EN 301 489-52 EN 61000-3-3	ETSI EN301 489-1 EN 61000-3-3	AC port	Pass
EMS Test				
ESD (Electrostatic Discharge)	ETSI EN 301 489-17 ETSI EN 301 489-52 EN 55024	EN 61000-4-2	Enclosure	Pass
Radiated Immunity, 80MHz to 2.7 GHz	ETSI EN 301 489-17 ETSI EN 301 489-52 EN 55024	EN 61000-4-3	Enclosure	Pass
EFT (Electrical Fast Transients	ETSI EN 301 489-17 ETSI EN 301 489-52 EN 55024	EN 61000-4-4	AC port	Pass
Surge Immunity	ETSI EN 301 489-17 ETSI EN 301 489-52 EN 55024	EN 61000-4-5	AC port	Pass
Injected Currents 150kHz to 80MHz	ETSI EN 301 489-17 ETSI EN 301 489-52 EN 55024	EN 61000-4-6	AC port	Pass
Voltage Dips and Interruptions	ETSI EN 301 489-17 ETSI EN 301 489-52 EN 55024	EN 61000-4-11	AC port	Pass

Remark:
Pass: The EUT complies with the essential requirements in the standard.
N/A: not applicable.

5 General Information

5.1 General Description of EUT

Product Name:	Industrial 3G/4G Cellular Router
Model No.:	WL-R210
Operation Frequency:	UTRA-FDD: BAND 1, BAND 2, BAND 5, BAND 8 E-UTRA: BAND 1, BAND 3, BAND 7, BAND 8, BAND 20 GSM: GSM900; GSM1800. WIFI: 2412MHz ~ 2472MHz
Modulation Type:	UTRA-FDD & E-UTRA: QPSK, 16QAM GSM: GMSK WIFI: DSSS, OFDM
Antenna Type:	External Antenna
Antenna Gain:	UTRA-FDD & E-UTRA:2dBi WIFI:2dBi
Power Supply:	Model No.: TS-A018-120015AZ Input: AC 100-240V, 50/60Hz, 0.6A Output: DC 12V, 1.5A

5.2 Operating Modes

Operating mode	Detail description
WiFi mode	Keep the EUT in charging and play internet information by wifi network.
Traffic mode (GSM)	Link+Adapter (The EUT shall be commanded to operate at maximum transmit power.)
Traffic mode (UTRA-FDD)	Link+Adapter (The EUT shall be commanded to operate at maximum transmit power.)
Idle mode (UTRA-FDD)	Idle+Adapter (The EUT was registered in the mentioned band.)
Traffic mode (E-UTRA)	Link+Adapter (The EUT shall be commanded to operate at maximum transmit power.)
Idle mode (E-UTRA)	Idle+Adapter (The EUT was registered in the mentioned band.)
LAN mode	Keep the EUT ping to internet via the LAN port

5.3 Description of Support Units

None.

5.4 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.

5.5 Test Location

RI test was performed at:
China Shenzhen Academy of Metrology and Quality Inspection, Metrology and Quality Inspection building, Central Section of LongZhu Road, Nan Shan, Shenzhen, China.
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 Tel: 0755-27798480 Fax: 0755-27798960

5.6 Deviation from Standards

None.

5.7 Abnormalities from Standard Conditions

None.

5.8 Other Information Requested by the Customer

None.

6 Equipment Used during Test

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	Universal radio communication tester	Rohde & Schwarz	CMU200	GTS235	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	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 29 2016	June 28 2017
4	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June. 29 2016	June 28 2017
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	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

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	ATT	SCHLODER	ATT-6DB-100	GTS556	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

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	GTS238	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	Signal Generator	Rohde & Schwarz	SMT03	100059	Jan. 16 2017	Jan. 15 2018
2	Power Amplifier	AR	150W1000	300999	Jan. 16 2017	Jan. 15 2018
3	Power Amplifier	AR	25S1G4AM1	305993	Jan. 16 2017	Jan. 15 2018
4	Power Amplifier	AR	150A220M6	305965	Jan. 16 2017	Jan. 15 2018
5	Broadband antenna	CHASE	CBL6111C	2576	Jan. 16 2017	Jan. 15 2018
6	Horn Antenna	AR	AT4002A	2783	Jan. 16 2017	Jan. 15 2018

General used equipment:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-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 EMC Requirements Specification in ETSI EN 301 489-17/ EN 301 489-52 / EN55032

7.1 EMI (Emission)

7.1.1 Radiated Emission

Test Requirement:	ETSI EN 301 489-17/-52;EN55032
Test Method:	ETSI EN 301 489-1,EN55032and EN55016-2-3
Test Frequency Range:	30MHz to 6GHz
Test site:	Measurement Distance: 3m

Receiver setup:

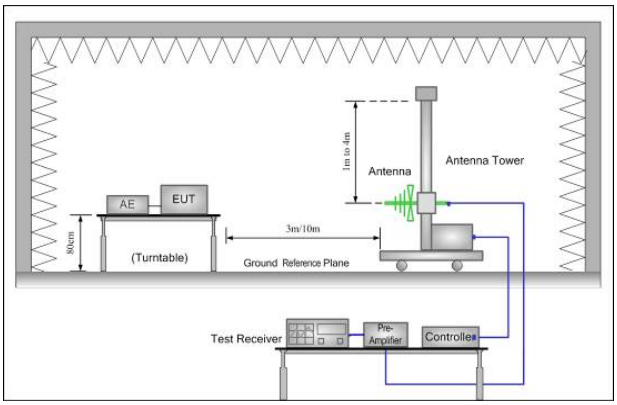
Frequency	Detector	RBW	VBW	Remark
30MHz-1GHz	Quasi-peak	100kHz	300kHz	Quasi-peak Value
Above 1GHz	Peak	1MHz	3MHz	Peak Value
	AV	1MHz	3MHz	Average Value

Limit:

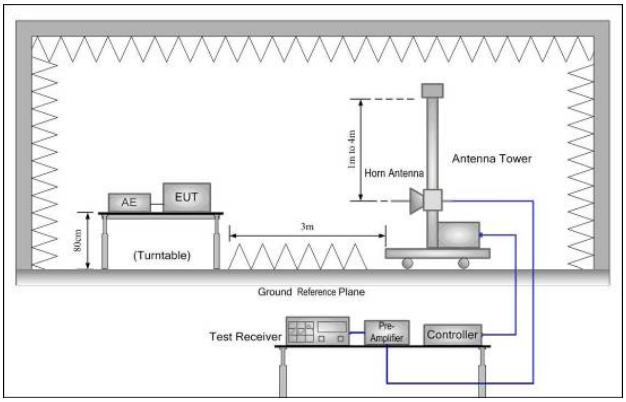
Frequency	Limit (dBuV/m @3m)	Remark
30MHz-230MHz	40.00	Quasi-peak Value
230MHz-1GHz	47.00	Quasi-peak Value
1GHz-3GHz	50.00	Average Value
	70.00	Peak Value
3GHz-6GHz	54.00	Average Value
	74.00	Peak Value

Test setup:

Below 1GHz



Above 1GHz



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.:	50%	Press.:	1 010mbar
Measurement Record:						Uncertainty: ± 4.5dB
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details.					
Test results:	Pass					

Remark:
1. Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Measurement Data

Below 1GHz

GSM Mode

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarity
109.03	49.27	14.35	1.27	29.64	35.25	40.00	-4.75	Vertical
159.23	53.80	10.64	1.62	29.37	36.69	40.00	-3.31	Vertical
265.68	55.91	14.26	2.20	29.76	42.61	47.00	-4.39	Vertical
407.52	44.71	17.22	2.89	29.48	35.34	47.00	-11.66	Vertical
601.43	45.15	20.46	3.73	29.30	40.04	47.00	-6.96	Vertical
875.25	44.54	22.87	4.76	29.12	43.05	47.00	-3.95	Vertical
56.99	43.87	14.89	0.84	29.94	29.66	40.00	-10.34	Horizontal
120.70	51.11	12.38	1.37	29.56	35.30	40.00	-4.70	Horizontal
212.27	50.34	12.93	1.91	29.32	35.86	40.00	-4.14	Horizontal
267.55	55.03	14.30	2.21	29.77	41.77	47.00	-5.23	Horizontal
601.43	44.45	20.46	3.73	29.30	39.34	47.00	-7.66	Horizontal
875.25	43.16	22.87	4.76	29.12	41.67	47.00	-5.33	Horizontal

WIFI Mode

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarity
44.12	48.30	15.56	0.71	30.02	34.55	40.00	-5.45	Vertical
53.69	48.26	15.07	0.81	29.97	34.17	40.00	-5.83	Vertical
122.83	52.61	12.00	1.38	29.55	36.44	40.00	-3.56	Vertical
161.47	54.37	10.72	1.64	29.35	37.38	40.00	-2.62	Vertical
261.06	55.62	14.09	2.18	29.73	42.16	47.00	-4.84	Vertical
601.43	45.42	20.46	3.73	29.30	40.31	47.00	-6.69	Vertical
44.43	36.29	15.55	0.71	30.02	22.53	40.00	-17.47	Horizontal
89.59	42.56	13.76	1.11	29.75	27.68	40.00	-12.32	Horizontal
123.27	53.85	12.00	1.38	29.55	37.68	40.00	-2.32	Horizontal
234.17	52.27	13.83	2.04	29.52	38.62	47.00	-8.38	Horizontal
261.98	53.39	14.13	2.18	29.74	39.96	47.00	-7.04	Horizontal
875.25	44.90	22.87	4.76	29.12	43.41	47.00	-3.59	Horizontal

UTRA-FDD Mode

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarity
47.99	48.60	15.36	0.75	30.01	34.70	40.00	-5.30	Vertical
62.21	45.71	13.77	0.88	29.91	30.45	40.00	-9.55	Vertical
153.74	54.56	10.42	1.59	29.39	37.18	40.00	-2.82	Vertical
205.68	52.39	12.74	1.88	29.26	37.75	40.00	-2.25	Vertical
750.11	37.83	21.43	4.28	29.20	34.34	47.00	-12.66	Vertical
900.15	40.46	23.09	4.85	29.10	39.30	47.00	-7.70	Vertical
56.59	42.53	14.91	0.83	29.95	28.32	40.00	-11.68	Horizontal
62.21	41.03	13.77	0.88	29.91	25.77	40.00	-14.23	Horizontal
161.47	49.54	10.72	1.64	29.35	32.55	40.00	-7.45	Horizontal
204.96	51.84	12.74	1.87	29.26	37.19	40.00	-2.81	Horizontal
336.04	45.01	15.99	2.55	29.80	33.75	47.00	-13.25	Horizontal
744.87	36.43	21.39	4.26	29.20	32.88	47.00	-14.12	Horizontal

E-UTRA Mode

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarity
88.65	47.80	13.47	1.10	29.75	32.62	40.00	-7.38	Vertical
112.92	48.35	13.73	1.30	29.61	33.77	40.00	-6.23	Vertical
244.23	55.27	14.08	2.09	29.59	41.85	47.00	-5.15	Vertical
360.45	44.91	16.43	2.67	29.69	34.32	47.00	-12.68	Vertical
432.55	38.70	17.53	3.01	29.43	29.81	47.00	-17.19	Vertical
875.25	38.03	22.87	4.76	29.12	36.54	47.00	-10.46	Vertical
68.15	40.81	11.34	0.93	29.87	23.21	40.00	-16.79	Horizontal
180.02	47.67	11.68	1.74	29.27	31.82	40.00	-8.18	Horizontal
283.98	51.38	14.75	2.29	29.90	38.52	47.00	-8.48	Horizontal
360.45	43.82	16.43	2.67	29.69	33.23	47.00	-13.77	Horizontal
432.55	41.08	17.53	3.01	29.43	32.19	47.00	-14.81	Horizontal
601.43	40.41	20.46	3.73	29.30	35.30	47.00	-11.70	Horizontal

Above 1GHz

GSM Mode

Peak measurement

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarity
1200.00	41.94	25.34	4.47	33.10	38.65	70.00	-31.35	Vertical
2415.00	40.31	27.55	5.41	33.99	39.28	70.00	-30.72	Vertical
3365.00	39.33	28.51	6.70	32.91	41.63	74.00	-32.37	Vertical
4340.00	35.33	30.88	8.19	31.86	42.54	74.00	-31.46	Vertical
4865.00	35.09	31.83	8.64	32.11	43.45	74.00	-30.55	Vertical
5075.00	34.50	32.02	8.87	32.22	43.17	74.00	-30.83	Vertical
1210.00	42.08	25.39	4.47	33.10	38.84	70.00	-31.16	Horizontal
2570.00	39.78	27.71	5.56	33.82	39.23	70.00	-30.77	Horizontal
3215.00	39.47	28.68	6.39	33.08	41.46	74.00	-32.54	Horizontal
4290.00	35.51	30.65	8.15	31.84	42.47	74.00	-31.53	Horizontal
4740.00	35.04	31.70	8.54	32.06	43.22	74.00	-30.78	Horizontal
5905.00	32.13	32.78	10.06	32.18	42.79	74.00	-31.21	Horizontal

WIFI Mode

Peak measurement

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarity
1225.00	41.73	25.45	4.49	33.13	38.54	70.00	-31.46	Vertical
2160.00	40.32	27.62	5.14	34.29	38.79	70.00	-31.21	Vertical
3210.00	40.26	28.68	6.39	33.08	42.25	74.00	-31.75	Vertical
3890.00	37.62	29.50	7.68	32.31	42.49	74.00	-31.51	Vertical
4740.00	35.12	31.70	8.54	32.06	43.30	74.00	-30.70	Vertical
5705.00	32.57	32.50	9.79	32.30	42.56	74.00	-31.44	Vertical
1195.00	41.65	25.33	4.46	33.07	38.37	70.00	-31.63	Horizontal
2165.00	40.16	27.67	5.15	34.27	38.71	70.00	-31.29	Horizontal
3195.00	39.26	28.73	6.35	33.10	41.24	74.00	-32.76	Horizontal
3590.00	39.50	29.12	7.13	32.66	43.09	74.00	-30.91	Horizontal
4690.00	35.07	31.65	8.51	32.03	43.20	74.00	-30.80	Horizontal
5670.00	32.67	32.44	9.74	32.33	42.52	74.00	-31.48	Horizontal

UTRA-FDD Mode
Peak measurement

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarity
1395.00	40.75	25.59	4.61	33.42	37.53	70.00	-32.47	Vertical
2285.00	39.92	27.99	5.28	34.13	39.06	70.00	-30.94	Vertical
3365.00	39.85	28.51	6.70	32.91	42.15	74.00	-31.85	Vertical
4295.00	34.89	30.71	8.15	31.84	41.91	74.00	-32.09	Vertical
4915.00	34.83	31.89	8.69	32.14	43.27	74.00	-30.73	Vertical
5640.00	32.66	32.36	9.70	32.35	42.37	74.00	-31.63	Vertical
1420.00	42.08	25.49	4.63	33.47	38.73	70.00	-31.27	Horizontal
2610.00	39.78	27.84	5.59	33.76	39.45	70.00	-30.55	Horizontal
3340.00	39.19	28.43	6.64	32.93	41.33	74.00	-32.67	Horizontal
4020.00	37.32	29.73	7.88	32.15	42.78	74.00	-31.22	Horizontal
5055.00	34.03	32.00	8.85	32.21	42.67	74.00	-31.33	Horizontal
5835.00	31.91	32.70	9.97	32.23	42.35	74.00	-31.65	Horizontal

E-UTRA Mode
Peak measurement

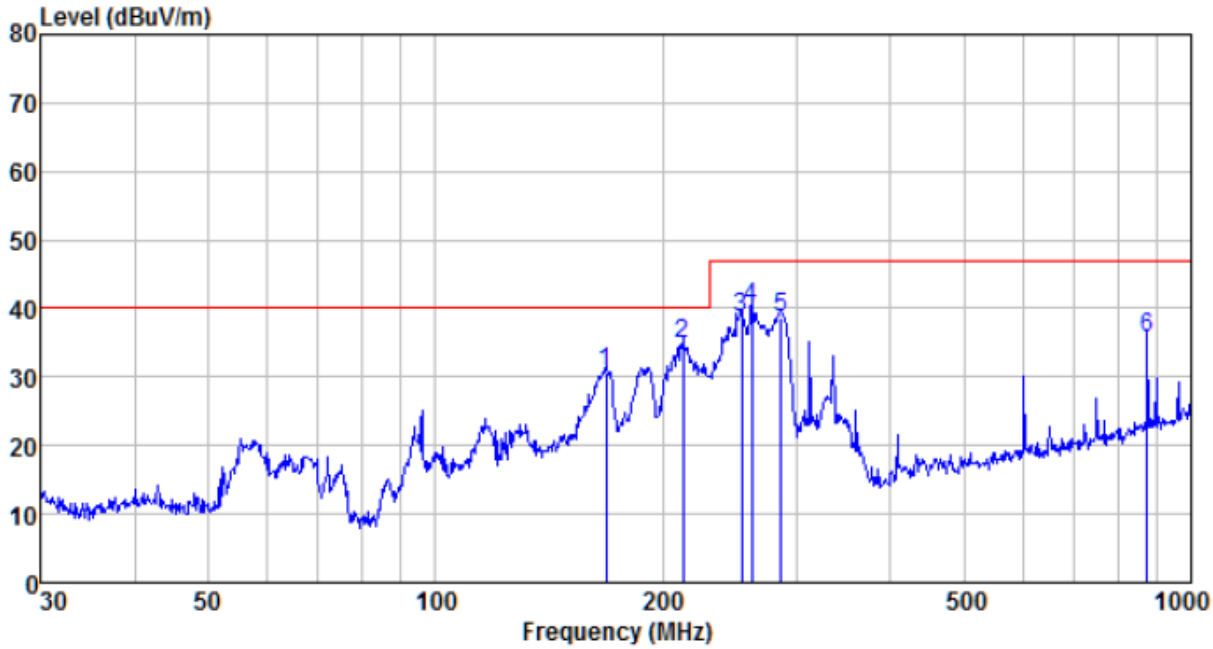
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarity
1615.00	41.35	24.95	4.75	33.79	37.26	70.00	-32.74	Vertical
1990.00	41.08	26.08	4.95	34.43	37.68	70.00	-32.32	Vertical
2790.00	39.06	28.40	5.75	33.57	39.64	70.00	-30.36	Vertical
3560.00	37.94	29.09	7.07	32.67	41.43	74.00	-32.57	Vertical
5120.00	33.82	32.05	8.94	32.24	42.57	74.00	-31.43	Vertical
5825.00	32.13	32.68	9.97	32.23	42.55	74.00	-31.45	Vertical
1565.00	40.39	25.05	4.72	33.71	36.45	70.00	-33.55	Horizontal
2405.00	39.62	27.57	5.40	33.99	38.60	70.00	-31.40	Horizontal
2995.00	38.94	28.46	5.92	33.33	39.99	70.00	-30.01	Horizontal
3890.00	36.97	29.50	7.68	32.31	41.84	74.00	-32.16	Horizontal
4295.00	34.84	30.71	8.15	31.84	41.86	74.00	-32.14	Horizontal
5470.00	33.27	31.92	9.47	32.41	42.25	74.00	-31.75	Horizontal

Remark:
1. The EUT was test at 3m in field chamber.
2. If the average limit is met when using a Peak detector, the EUT shall be deemed to meet both peak and average limits. And measurement with the average detector is unnecessary.

LAN Mode:

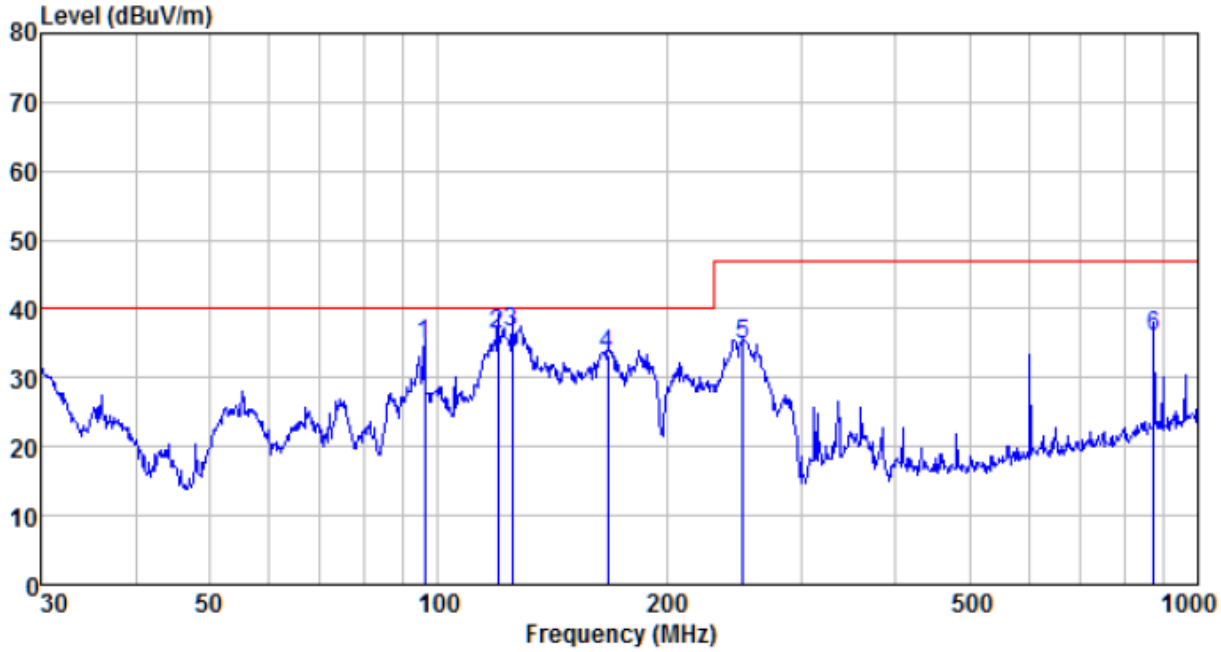
Below 1GHz:

Horizontal:



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
168.414	47.38	10.92	1.68	29.32	30.66	40.00	-9.34	QP
212.270	49.26	12.93	1.91	29.32	34.78	40.00	-5.22	QP
253.837	52.22	14.06	2.14	29.67	38.75	47.00	-8.25	QP
261.975	53.63	14.13	2.18	29.74	40.20	47.00	-6.80	QP
286.982	51.39	14.81	2.30	29.92	38.58	47.00	-8.42	QP
875.247	37.31	22.87	4.76	29.12	35.82	47.00	-11.18	QP

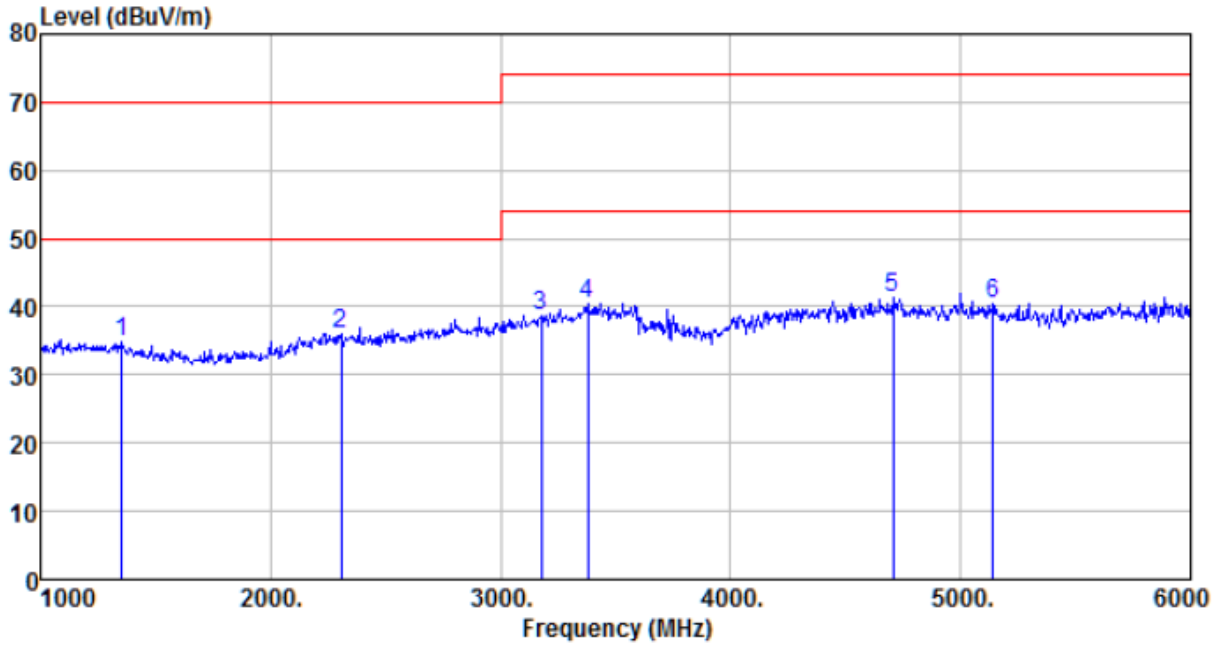
Vertical:



Freq	Reading level	Antenna factor	Cable loss	Preamp factor	level	Limit level	Over limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV	dBuV/m	dB	
96.099	48.50	14.90	1.16	29.72	34.84	40.00	-5.16	QP
119.856	51.96	12.48	1.36	29.57	36.23	40.00	-3.77	QP
125.007	53.08	11.70	1.40	29.54	36.64	40.00	-3.36	QP
167.237	50.28	10.87	1.67	29.33	33.49	40.00	-6.51	QP
252.063	48.36	14.07	2.14	29.66	34.91	47.00	-12.09	QP
875.247	37.52	22.87	4.76	29.12	36.03	47.00	-10.97	QP

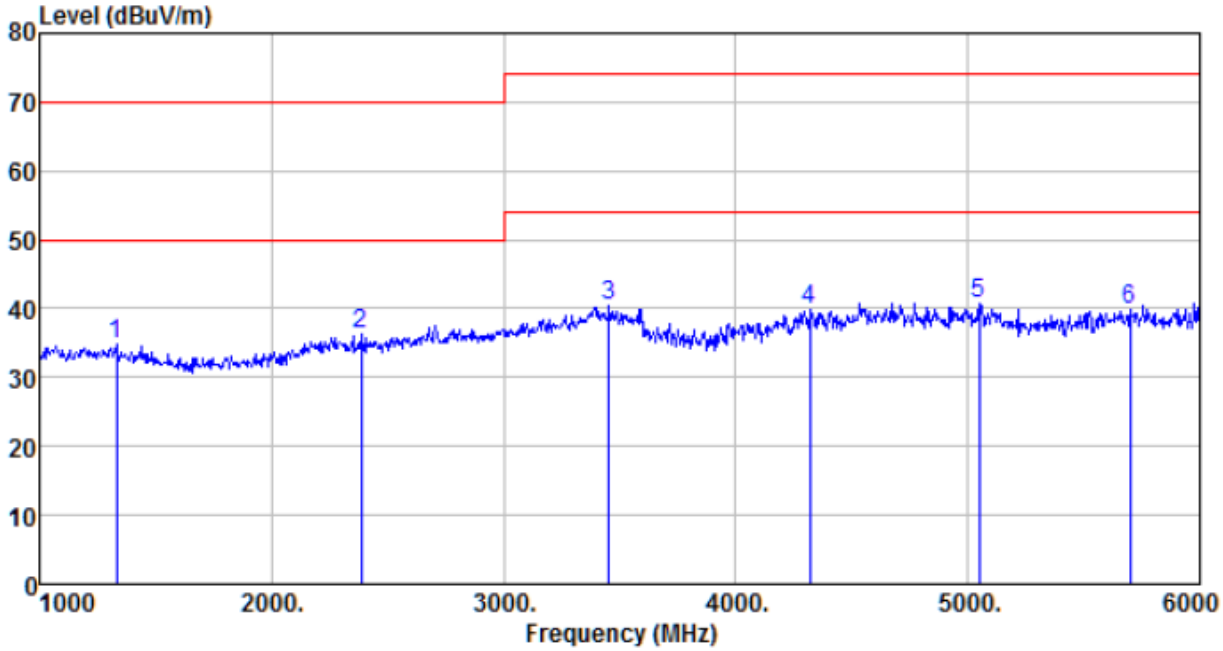
Above 1GHz:

Horizontal:



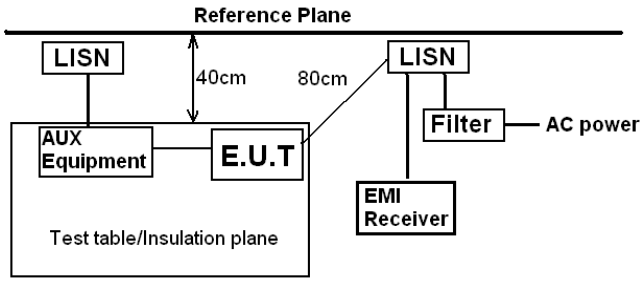
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
1355.000	37.87	25.70	4.58	33.36	34.79	70.00	-35.21	Peak
2305.000	37.00	27.94	5.30	34.11	36.13	70.00	-33.87	Peak
3175.000	36.76	28.79	6.31	33.12	38.74	74.00	-35.26	Peak
3380.000	38.21	28.54	6.72	32.89	40.58	74.00	-33.42	Peak
4705.000	33.05	31.66	8.52	32.04	41.19	74.00	-32.81	Peak
5140.000	31.76	32.06	8.97	32.26	40.53	74.00	-33.47	Peak

Vertical:



Freq	Reading level	Antenna factor	Cable loss	Preamp factor	level	Limit level	Over limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV	dBuV/m	dB	
1330.000	38.03	25.68	4.57	33.30	34.98	70.00	-35.02	Peak
2385.000	37.27	27.61	5.38	34.03	36.23	70.00	-33.77	Peak
3455.000	37.57	28.84	6.88	32.81	40.48	74.00	-33.52	Peak
4320.000	32.77	30.77	8.17	31.85	39.86	74.00	-34.14	Peak
5050.000	32.18	32.00	8.83	32.21	40.80	74.00	-33.20	Peak
5700.000	29.98	32.50	9.79	32.31	39.96	74.00	-34.04	Peak

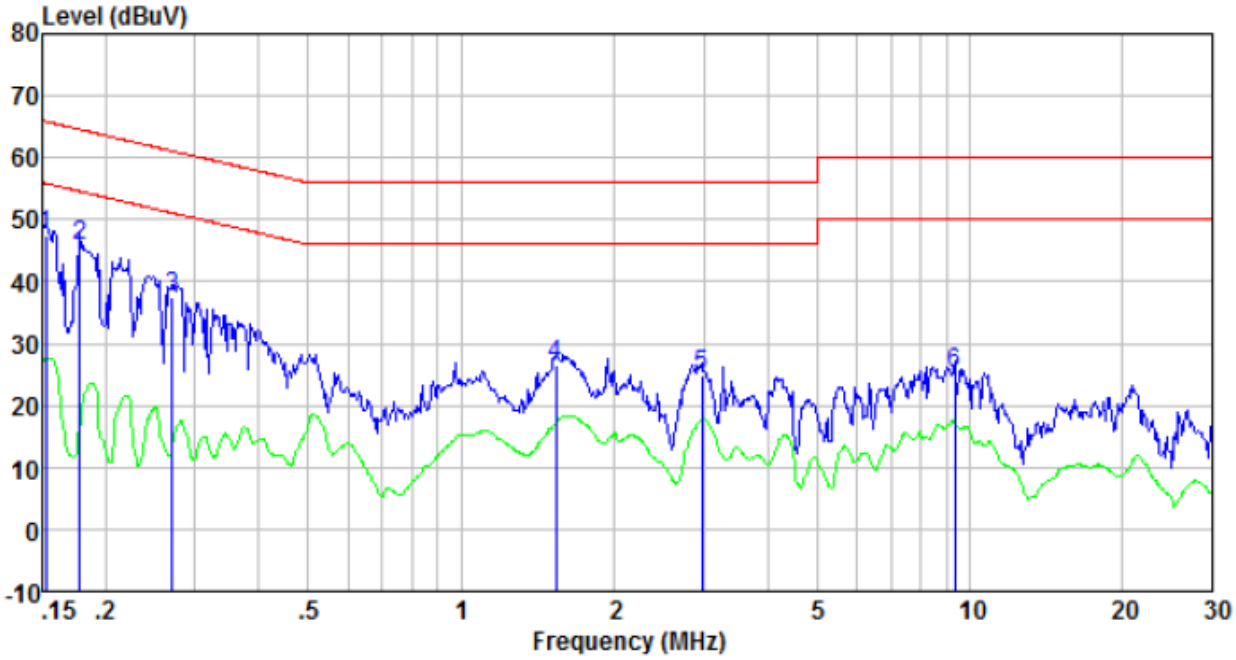
7.1.2 Conducted Emissions

Test Requirement:	ETSI EN 301 489-17/-52;EN55032
Test Method:	ETSI EN 301 489-1 ;EN55032
Test Frequency Range:	150kHz to 30MHz
Class / Severity:	Class B
Receiver setup:	RBW=9kHz, VBW=30kHz
Limit:	Frequency range (MHz) / Limit (dBuV): 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(L.I.S.N.). 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 EN55022 Class B on conducted measurement.
Test Instruments:	Temp.: 24 °C | Humid.: 51% | Press.: 1 010mbar
Measurement Record:	Uncertainty: ± 3.45dB
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

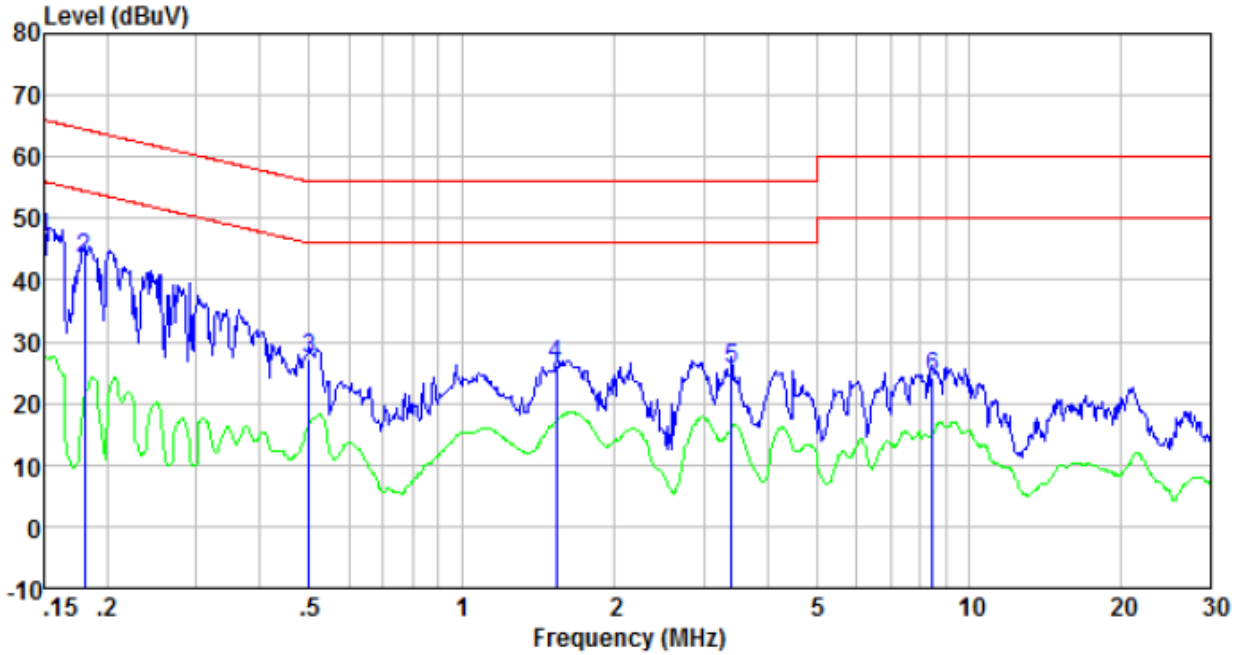
GSM Mode

Line:



Freq MHz	Reading level dBuV	lISN/ISN factor dB	Cable loss dB	level dBuV	Limit level dBuV	Over limit dB	Remark
0.15	47.15	0.15	0.12	47.42	65.87	-18.45	QP
0.18	45.36	0.14	0.13	45.63	64.59	-18.96	QP
0.27	37.24	0.11	0.11	37.46	61.12	-23.66	QP
1.54	26.26	0.12	0.14	26.52	56.00	-29.48	QP
2.98	24.61	0.15	0.15	24.91	56.00	-31.09	QP
9.35	24.85	0.29	0.19	25.33	60.00	-34.67	QP

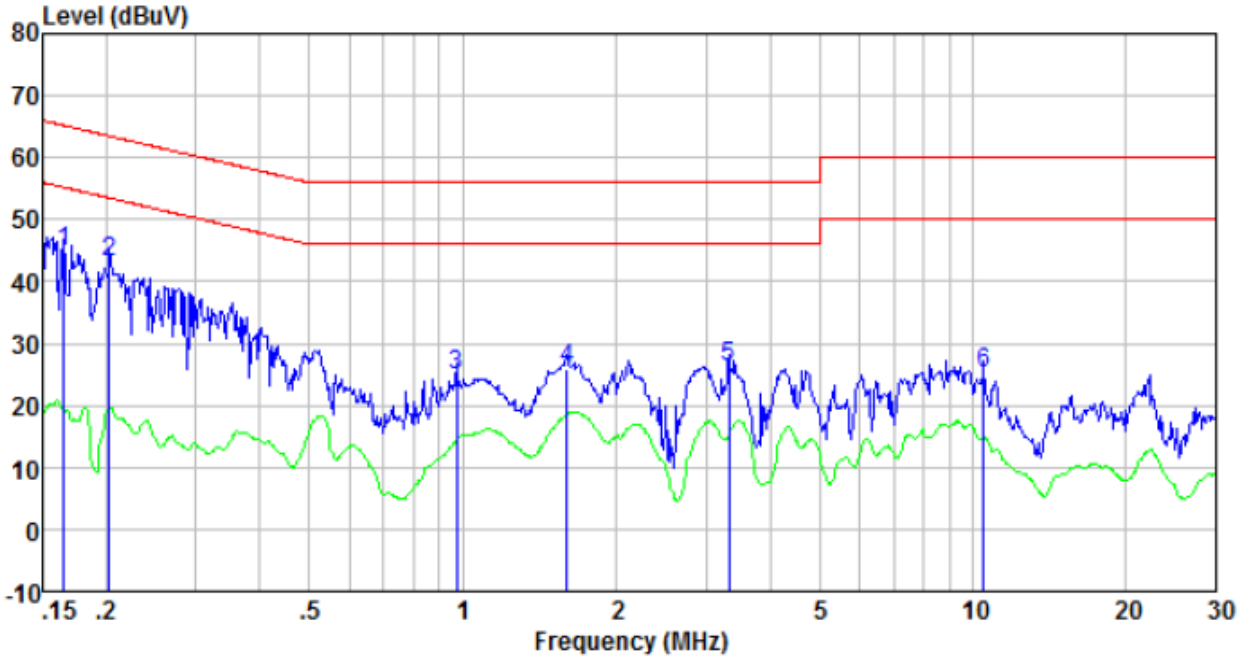
Neutral:



Freq	Reading level	lISN/ISN factor	Cable loss	level	Limit level	Over limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.15	46.59	0.07	0.12	46.78	66.00	-19.22	QP
0.18	43.19	0.07	0.13	43.39	64.46	-21.07	QP
0.50	27.10	0.06	0.11	27.27	56.01	-28.74	QP
1.54	26.08	0.09	0.14	26.31	56.00	-29.69	QP
3.40	25.19	0.13	0.15	25.47	56.00	-30.53	QP
8.46	23.91	0.20	0.18	24.29	60.00	-35.71	QP

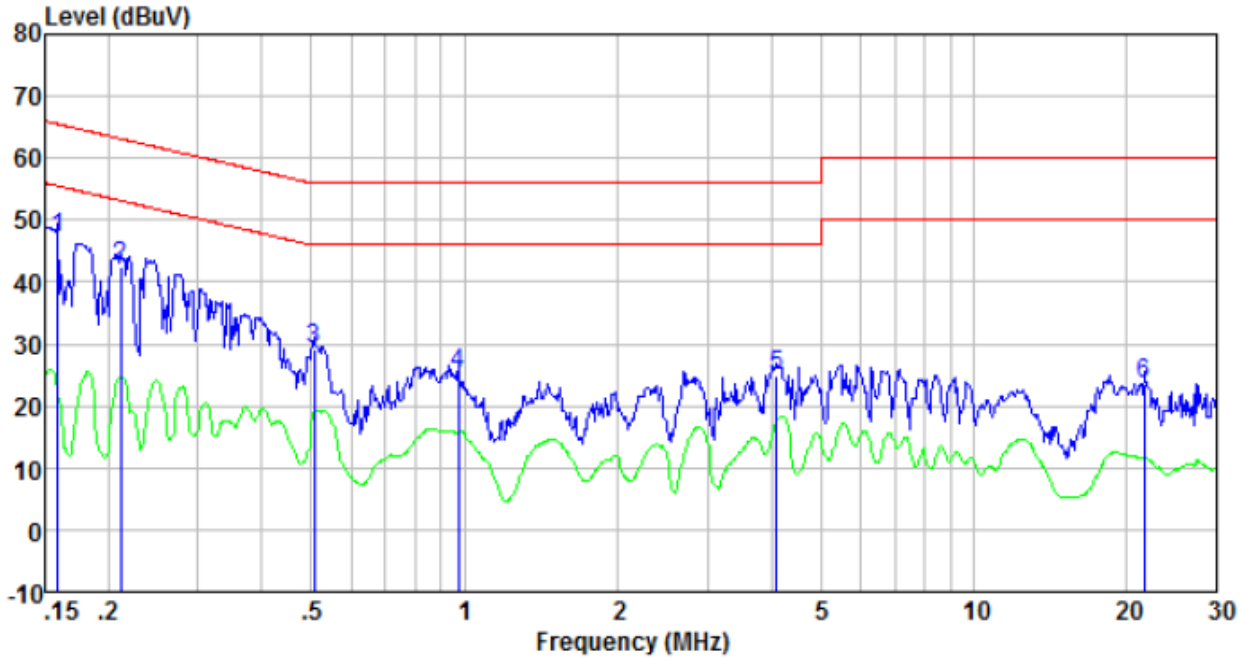
WIFI Mode

Line:



Freq	Reading level	lISN/ISN factor	Cable loss	level	Limit level	Over limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.17	44.48	0.15	0.12	44.75	65.21	-20.46	QP
0.20	42.88	0.14	0.13	43.15	63.49	-20.34	QP
0.97	24.75	0.14	0.13	25.02	56.00	-30.98	QP
1.60	25.77	0.12	0.14	26.03	56.00	-29.97	QP
3.33	26.00	0.18	0.15	26.33	56.00	-29.67	QP
10.51	24.66	0.31	0.19	25.16	60.00	-34.84	QP

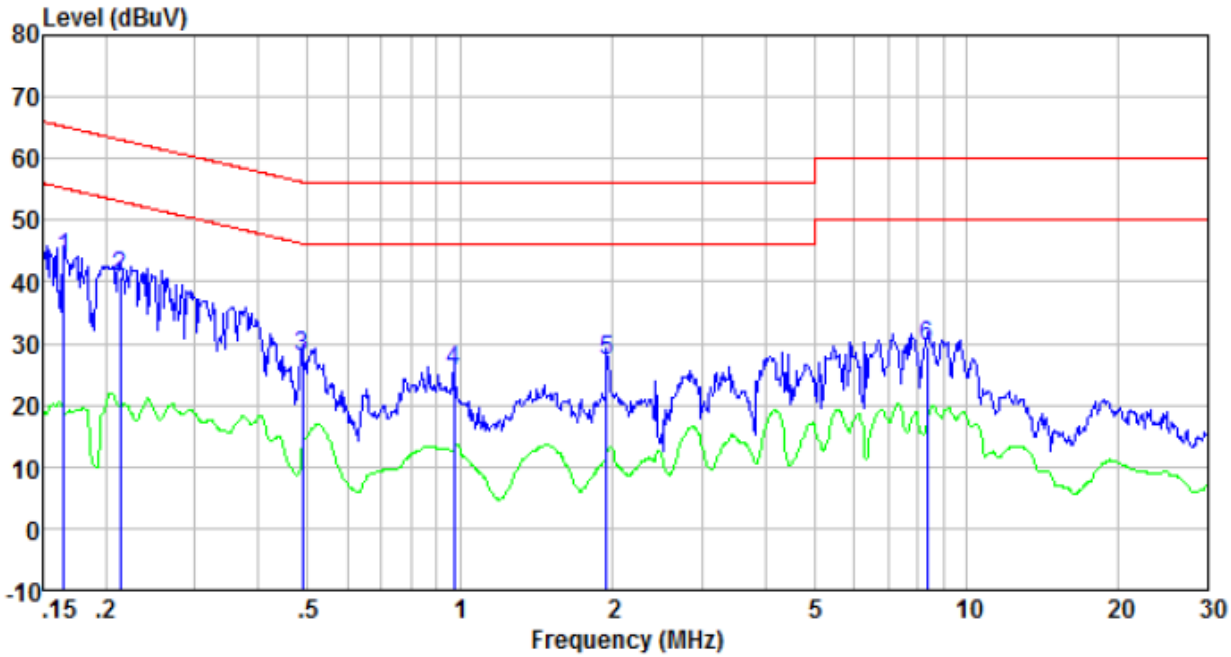
Neutral:



Freq	Reading level	lISN/ISN factor	Cable loss	level	Limit level	Over limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.16	47.09	0.07	0.12	47.28	65.52	-18.24	QP
0.21	42.16	0.07	0.13	42.36	63.14	-20.78	QP
0.51	28.89	0.06	0.11	29.06	56.00	-26.94	QP
0.97	24.94	0.07	0.13	25.14	56.00	-30.86	QP
4.09	24.52	0.14	0.15	24.81	56.00	-31.19	QP
21.60	22.78	0.69	0.22	23.69	60.00	-36.31	QP

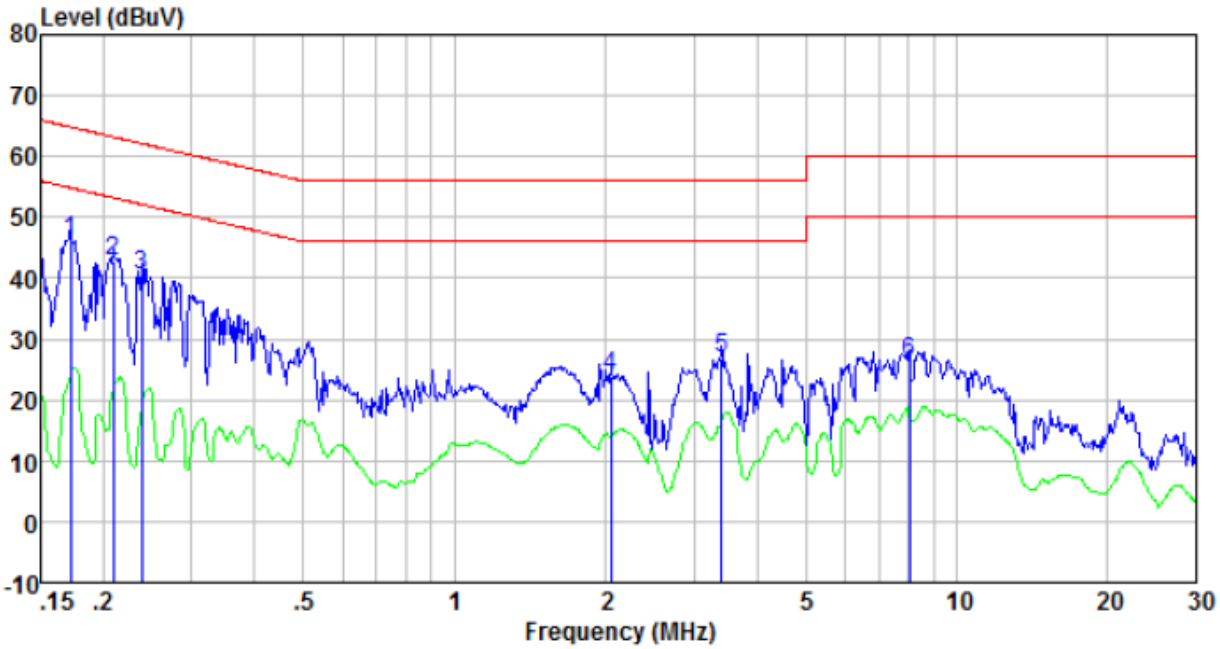
UTRA-FDD Mode

Line:



Freq	Reading level	lISN/ISN factor	Cable loss	level	Limit level	Over limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.17	43.56	0.15	0.12	43.83	65.21	-21.38	QP
0.21	40.72	0.13	0.13	40.98	63.10	-22.12	QP
0.49	27.54	0.12	0.11	27.77	56.19	-28.42	QP
0.97	25.16	0.14	0.13	25.43	56.00	-30.57	QP
1.95	27.00	0.12	0.14	27.26	56.00	-28.74	QP
8.37	29.22	0.28	0.18	29.68	60.00	-30.32	QP

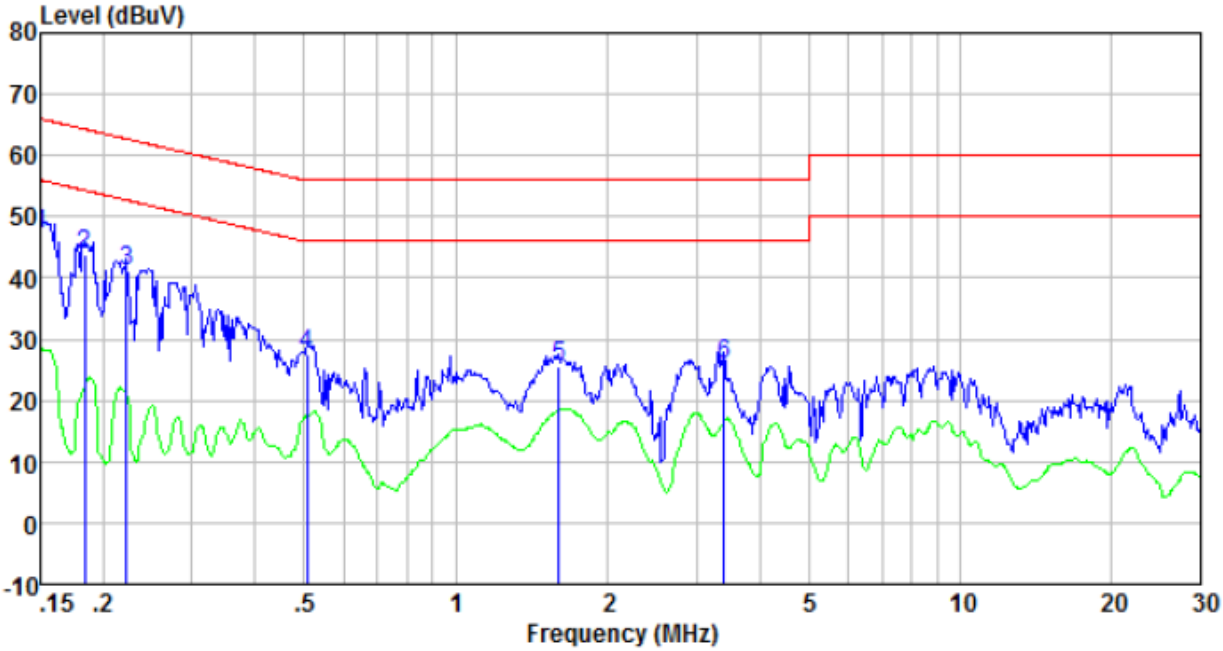
Neutral:



Freq	Reading level	lISN/ISN factor	Cable loss	level	Limit level	Over limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.17	45.90	0.07	0.12	46.09	64.86	-18.77	QP
0.21	42.62	0.07	0.13	42.82	63.23	-20.41	QP
0.24	40.17	0.06	0.12	40.35	62.17	-21.82	QP
2.04	23.79	0.09	0.15	24.03	56.00	-31.97	QP
3.40	26.67	0.13	0.15	26.95	56.00	-29.05	QP
8.06	25.82	0.19	0.18	26.19	60.00	-33.81	QP

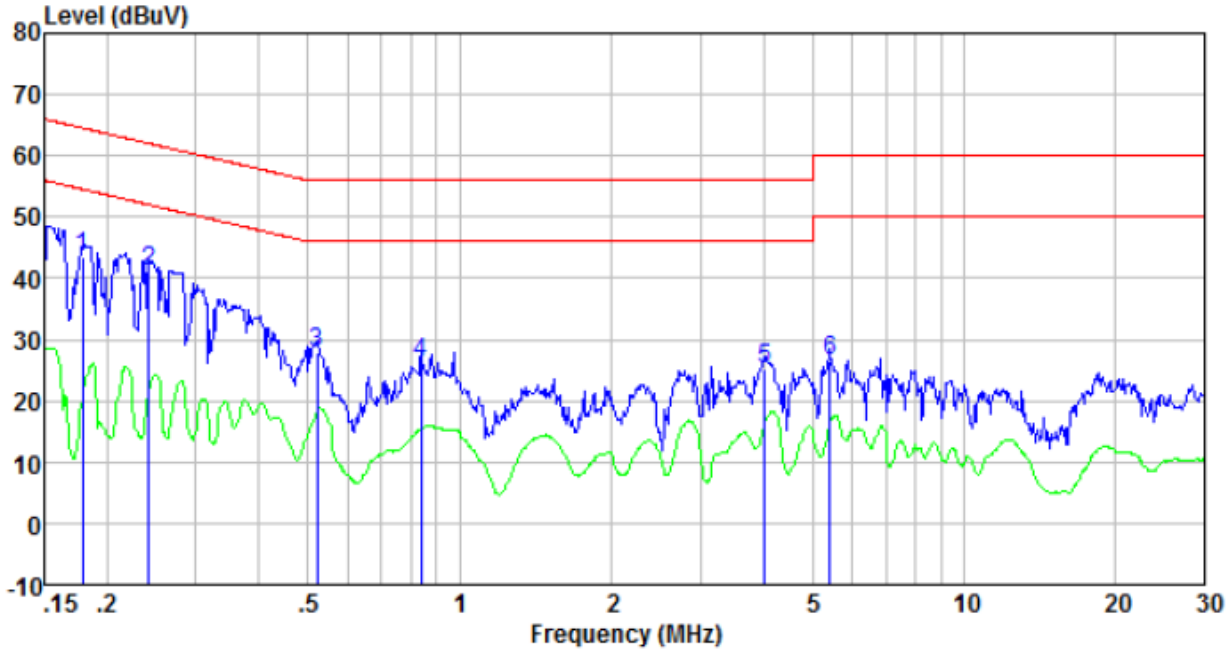
E-UTRA Mode

Line:



Freq MHz	Reading level dBuV	lISN/ISN factor dB	Cable loss dB	level dBuV	Limit level dBuV	Over limit dB	Remark
0.15	46.97	0.15	0.12	47.24	66.00	-18.76	QP
0.18	43.65	0.14	0.13	43.92	64.33	-20.41	QP
0.22	40.92	0.13	0.12	41.17	62.74	-21.57	QP
0.51	27.33	0.12	0.11	27.56	56.00	-28.44	QP
1.60	25.20	0.12	0.14	25.46	56.00	-30.54	QP
3.40	25.61	0.18	0.15	25.94	56.00	-30.06	QP

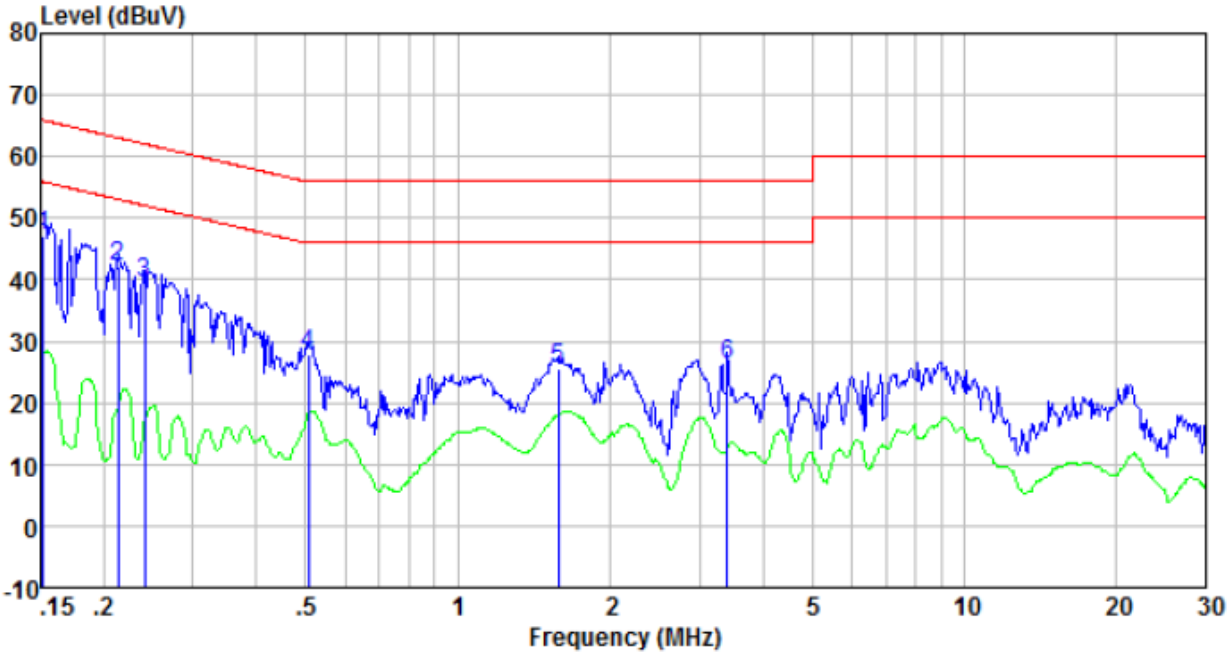
Neutral:



Freq MHz	Reading level dBuV	lISN/ISN factor dB	Cable loss dB	level dBuV	Limit level dBuV	Over limit dB	Remark
0.18	43.23	0.07	0.13	43.43	64.55	-21.12	QP
0.24	40.91	0.06	0.12	41.09	62.04	-20.95	QP
0.52	27.60	0.06	0.11	27.77	56.00	-28.23	QP
0.84	25.99	0.07	0.13	26.19	56.00	-29.81	QP
4.03	24.97	0.14	0.15	25.26	56.00	-30.74	QP
5.42	26.14	0.15	0.15	26.44	60.00	-33.56	QP

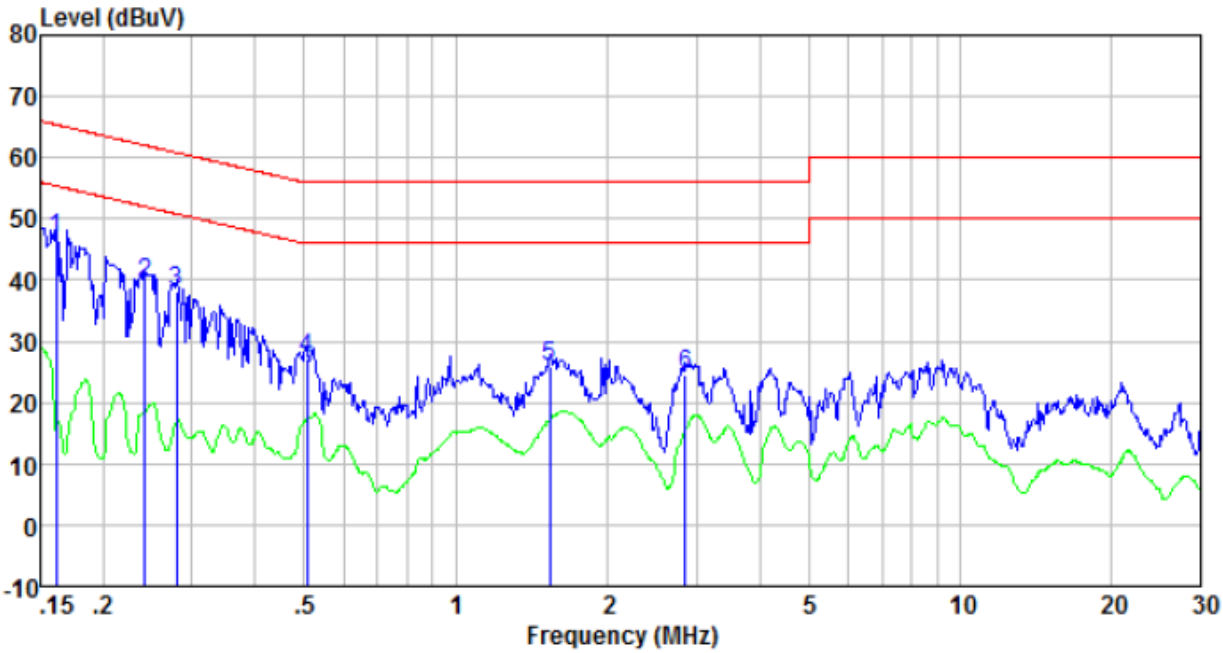
LAN Mode

Line:



Freq	Reading level	lISN/ISN factor	Cable loss	level	Limit level	Over limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.15	46.95	0.15	0.12	47.22	65.91	-18.69	QP
0.21	41.92	0.13	0.13	42.18	63.10	-20.92	QP
0.24	39.26	0.12	0.12	39.50	62.08	-22.58	QP
0.51	27.55	0.12	0.11	27.78	56.00	-28.22	QP
1.58	25.14	0.12	0.14	25.40	56.00	-30.60	QP
3.40	25.92	0.18	0.15	26.25	56.00	-29.75	QP

LAN Mode
Neutral



Freq	Reading level	lISN/ISN factor	Cable loss	level	Limit level	Over limit	Remark
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.16	46.49	0.07	0.12	46.68	65.38	-18.70	QP
0.24	39.20	0.06	0.12	39.38	62.04	-22.66	QP
0.28	37.94	0.06	0.10	38.10	60.85	-22.75	QP
0.51	26.90	0.06	0.11	27.07	56.00	-28.93	QP
1.54	25.76	0.09	0.14	25.99	56.00	-30.01	QP
2.85	24.15	0.11	0.15	24.41	56.00	-31.59	QP

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.

7.1.3 Harmonics Test Results

Test Requirement:	ETSI EN 301 489-17/-52;EN61000-3-2
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."

7.1.4 Flicker Test Results

Test Requirement:	ETSI EN 301 489-17/-52; 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 Instruments:	Temp.:	24 °C	Humid.:	51%	Press.:	1 010mbar
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test results:	Pass					

Measurement Data

Test Data of Voltage Fluctuation and Flicker

Final Test Result	Pass
Nominal Voltage	230 V
Nominal Frequency	50 Hz
Plt Test Duration	601 s
Flicker Margin	10 %
d Measurement Margin	10 %

Segment	Pst	dmax(%)	dc(%)	d(t)>3.3%(ms)	Judge
Limit	1.000	4.000	3.300	500	
Seg. 1	0.010	0.065	0.004	0	Pass

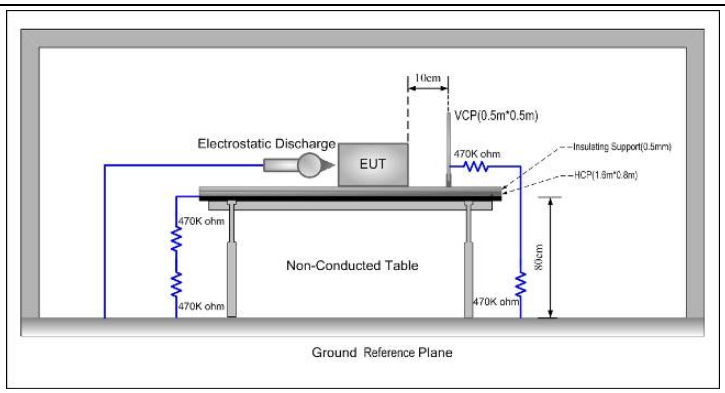
Plt	Value	Judge
Limit	0.650	
Measurement	0.004	Pass

7.2 Immunity

Performance Criteria of ETSI EN 301 489-17/-52, sub clause 6.2 table 1.		
Criteria	**During test**	**After test**
A	Shall operate as intended. May show degradation of performance (see note 1). Shall be no loss of function. Shall be no unintentional transmissions.	Shall operate as intended. Shall be no degradation of performance (see note 2). Shall be no loss of function. Shall be no loss of stored data or user programmable functions.
B	May show loss of function (one or more). May show degradation of performance (see note 1). No unintentional transmissions.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no degradation of performance (see note 2). Shall be no loss of stored data or user programmable functions.
C	May be loss of function (one or more).	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no degradation of performance (see note 2).
NOTE 1: Degradation of performance during the test is understood as a degradation to a level not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended. NOTE 2: No degradation of performance after the test is understood as no degradation below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. After the test no change of actual operating data or user retrievable data is allowed. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.		

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.

7.2.1 Electrostatic Discharge

Test Requirement:	ETSI EN 301 489-17/-52;EN55024
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
Limit:	Criteria B
Test setup:	
Test Procedure:	**Air discharge:** 1. The test was applied on non-conductive surfaces of EUT. 2. The round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT. 3. After each discharge, the discharge electrode was removed from the EUT. 4. The generator was re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. 5. This procedure was repeated until all the air discharge completed **Contact Discharge:** 1. The test was applied on conductive surfaces of EUT. 2. the generator was re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. 3. the tip of the discharge electrode was touch the EUT before the discharge switch was operated. **Indirect discharge for horizontal coupling plane** 1. 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. 2. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge. 3. Consideration should be given to exposing all sides of the EUT.

	Indirect discharge for vertical coupling plane 1. At least 10 single discharges were applied to the center of one vertical edge of the coupling plane. 2. 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. 3. 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 010mbar
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test results:	Pass					

Measurement Record:

Test points:	I: All of the metal part
	II: All of the plastic seams.

Direct discharge

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

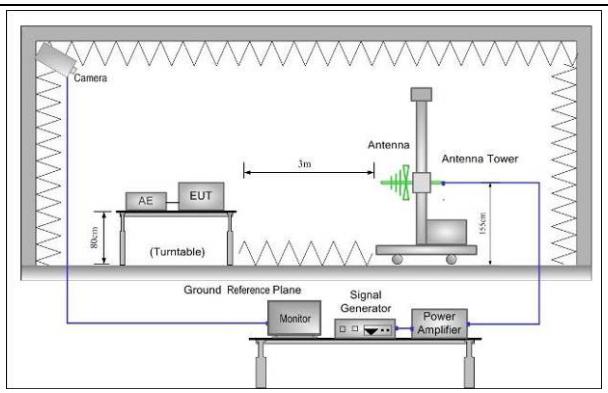
Indirect discharge

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.

7.2.2 Radiated Immunity

Test Requirement:	ETSI EN 301 489-17/-52; EN55024
Test Method:	EN 61000-4-3
Frequency range:	80MHz to 1GHz, 1.0GHz to 6.0GHz
Test Level:	3V/m
Modulation:	80%, 1kHz Amplitude Modulation
Performance Criterion:	Criteria 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 010mbar

Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Record:

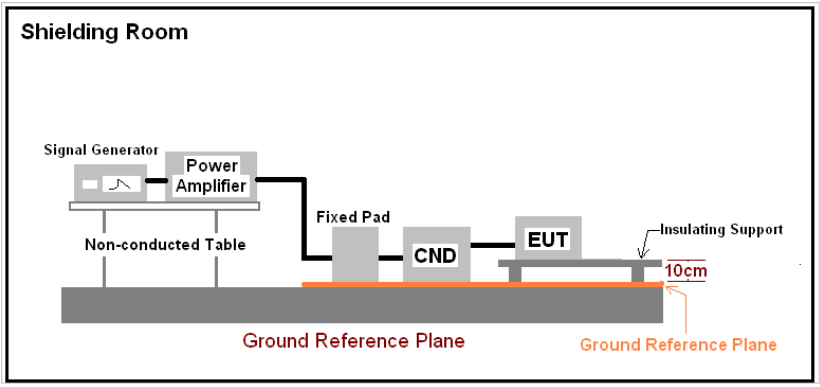
LTE/WIFI/GSM/ UTRA-FDD/LAN Mode:

Frequency	Level	Modulation	Operating Mode	Antenna Polarization	EUT Face	Observations (Performance Criterion)
80 MHz-1 GHz 1.0GHz-6.0GHz	3 V/m	1 kHz, 80 % Amp. Mod, 10 % increment, dwell time=3seconds	Idle mode	V	Front	A
				H		A
				V	Rear	A
				H		A
				V	Left	A
				H		A
				V	Right	A
				H		A
				V	Top	A
				H		A
				V	Bottom	A
				H		A

Remarks:

A: normal performance within the specification limits

7.2.3 Radio frequency common mode

Test Requirement:	ETSI EN 301 489-17/-52; EN55024					
Test Method:	EN 61000-4-6					
Frequency range:	0.15MHz to 80MHz					
Test Level:	3V rms on AC Ports (unmodulated emf into 150 Ω)					
Modulation:	80%, 1kHz Amplitude Modulation					
Performance Criterion:	Criteria A					
Test setup:						
Test Procedure:	1. Let the EUT work in test mode and test it. 2. 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). 3. The disturbance signal described below is injected to EUT through CDN. 4. The EUT operates within its operational mode(s) under intended climatic conditions after power on. 5. The frequency range is swept from 0.150MHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave.The rate of sweep shall not exceed $1.5*10^{-3}$decades/s. Where the frequency is swept incrementally; the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value. 6. Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.					
Test environment:	Temp.:	24 °C	Humid.:	51%	Press.:	1 010mbar
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test results:	Pass					

Measurement Record:

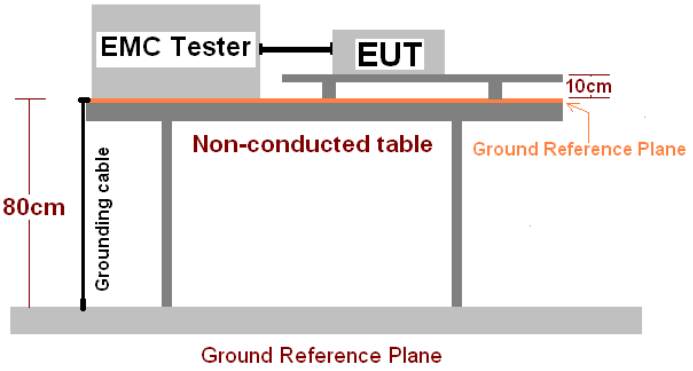
LTE/WIFI/GSM/ UTRA-FDD/LAN Mode:

Frequency	Injected Position	Test Level	Modulation	Step Size	Dwell Time	Observations (Performance Criterion)
150kHz to 80MHz	AC Main	3Vrms	80%, 1kHz Amp. Mod.	1%	2s	A

Remark:

A: Normal performance within the specification limits.

7.2.4 Electrical Fast Transients

Test Requirement:	ETSI EN 301 489-17/-52;EN55024					
Test Method:	EN 61000-4-4					
Test Level:	1.0kV on AC port					
Polarity:	Positive & Negative					
Repetition Frequency:	5kHz					
Burst Duration:	15ms					
Burst Period:	300ms					
Test Duration:	2 minute per level & polarity					
Performance 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 the signal and power lines between the coupling device and the EUT is 0.5m **Test on Signal Ports, Telecommunication Ports and Control Ports:** 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 on power supply ports:** 1. The EUT is connected to the power mains through a coupling device that directly couples the EFT/B interference signal. 2. Each of the Line and Neutral conductors is impressed with burst noise for 2 minutes.					
Test environment:	Temp.:	26 °C	Humid.:	54%	Press.:	1 010mbar

Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

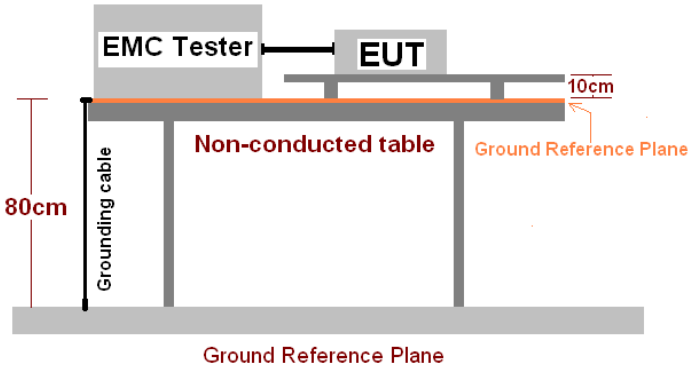
Measurement Record:

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: Normal performance within the specification limits

7.2.5 Surge

Test Requirement:	ETSI EN 301 489-17/-52; EN55024					
Test Method:	ETSI EN 61000-4-5					
Test Level:	±1kV Live to Neutral: Differential mode					
Polarity:	Positive & Negative					
Test Interval:	60s between each surge					
No. of surges:	5 positive, 5 negative at 0°, 90°, 180°, 270°.					
Performance 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 010mbar
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test results:	Pass					

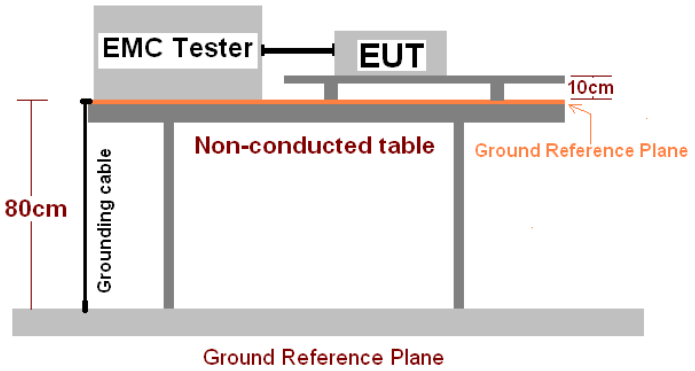
Measurement Record:

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

Remark:

A. Normal performance within the specification limits

7.2.6 Voltage Dip and Voltage Interruptions

Test Requirement:	ETSI EN 301 489-17/-52; EN55024
Test Method:	EN 61000-4-11
Test Level:	0% of VT(Supply Voltage) for 0.5 period 0% of VT(Supply Voltage) for 1.0 period 70% of VT(Supply Voltage) for 25 period 0% of VT(Supply Voltage) for 250 period
No. of Dips / Interruptions:	3 per Level
Performance Criterion:	0% VD, 0.5 period----Performance criterion: B 0% VD, 1 period----Performance criterion: B 70% VD, 25 period----Performance criterion: C 0% 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 010mbar
Test Instruments:	Refer to section 6.0 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 dropout	Time between dropout	Observations (Performance Criterion)
0%	0.5	0°, 90°, 180°, 270°	3	10s	A
0%	1.0	0°, 90°, 180°, 270°	3	10s	A
70%	25	0°, 90°, 180°, 270°	3	10s	A
0%	250	0°, 90°, 180°, 270°	3	10s	B

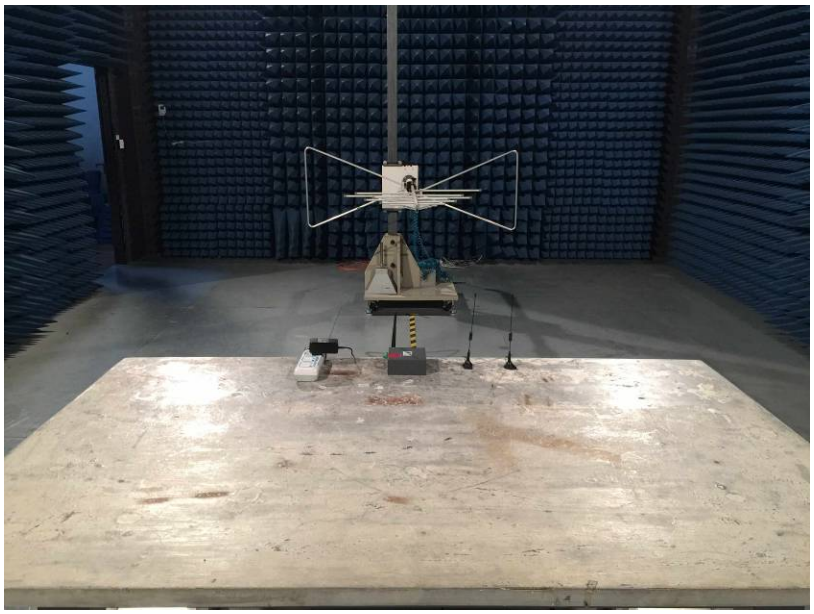
Remark:

A: No loss of function was observed.

B: During the test, the charging stopped, but after the test, the power charger can automatically return to normal

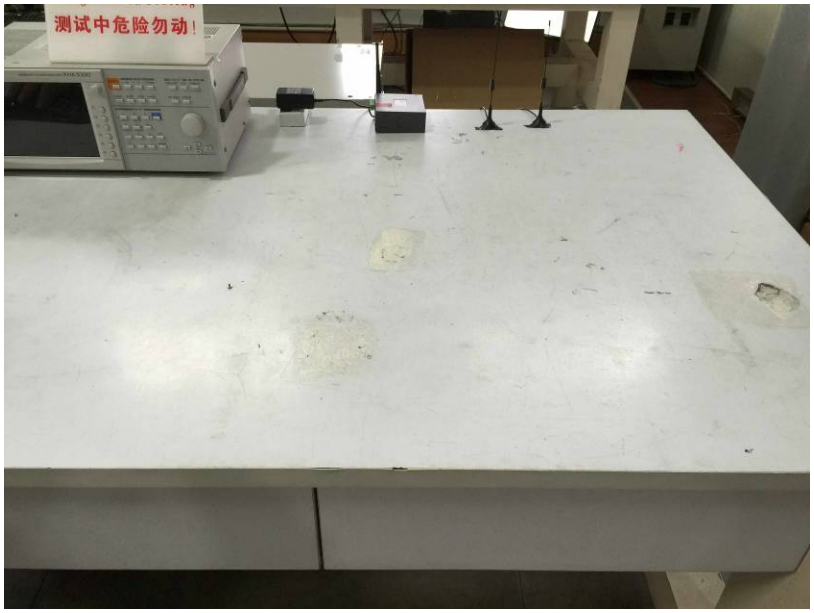
8 Test Setup Photo

Radiated Emission



Conducted Emission

Flicker

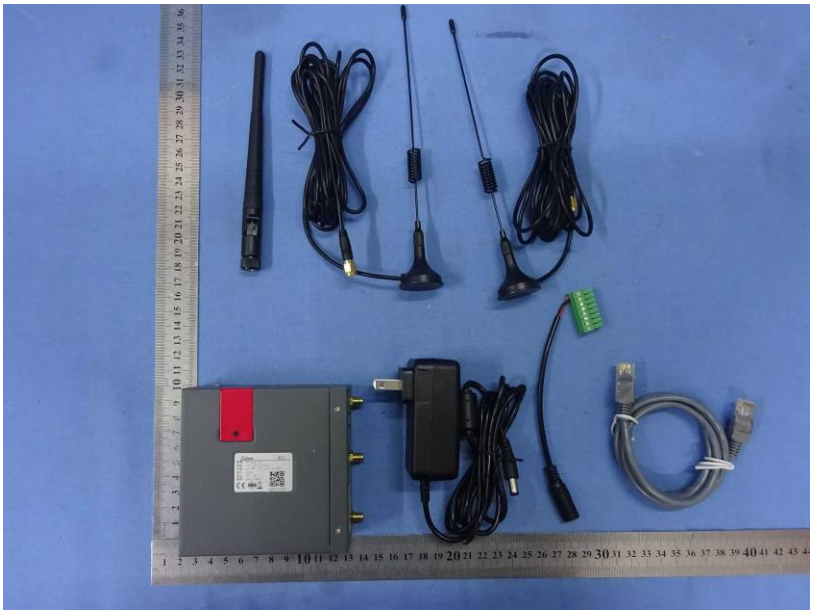


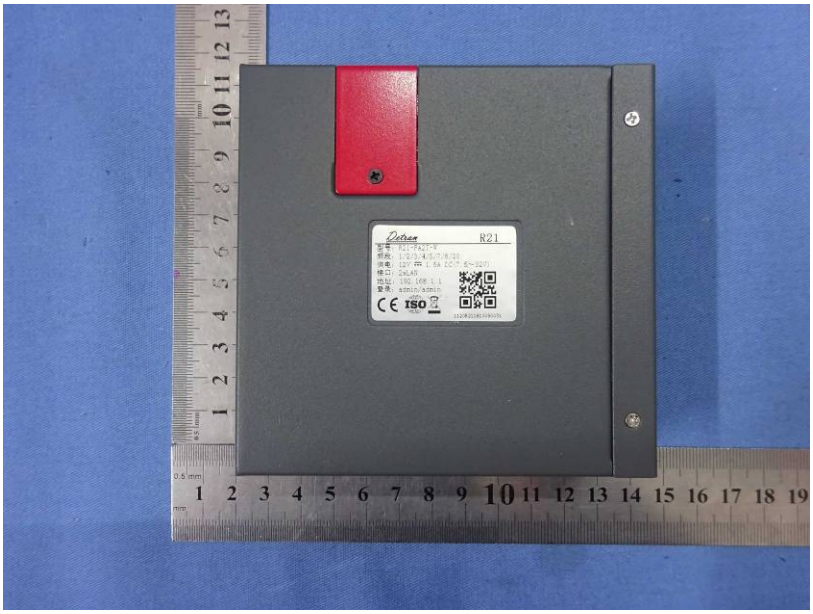
ESD

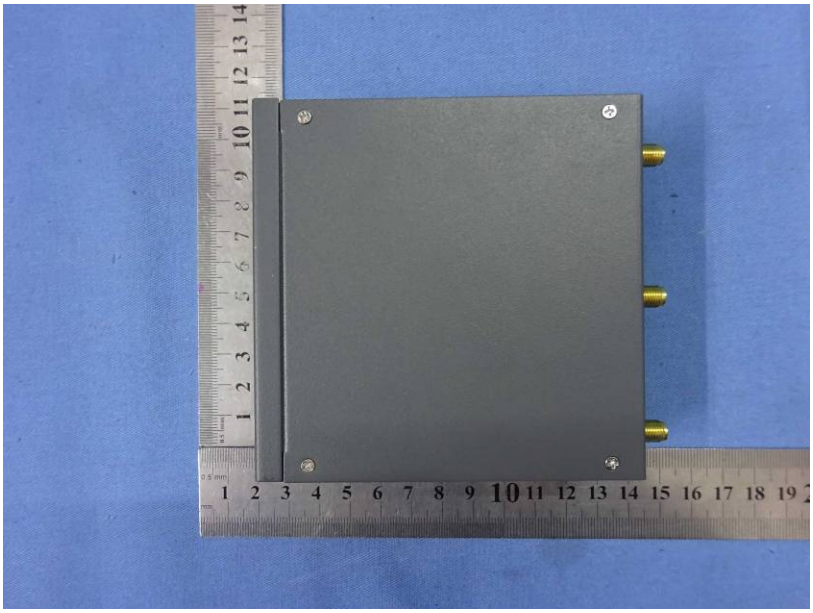
Surges/EFT/V-dips

CS

9 EUT Constructional Details

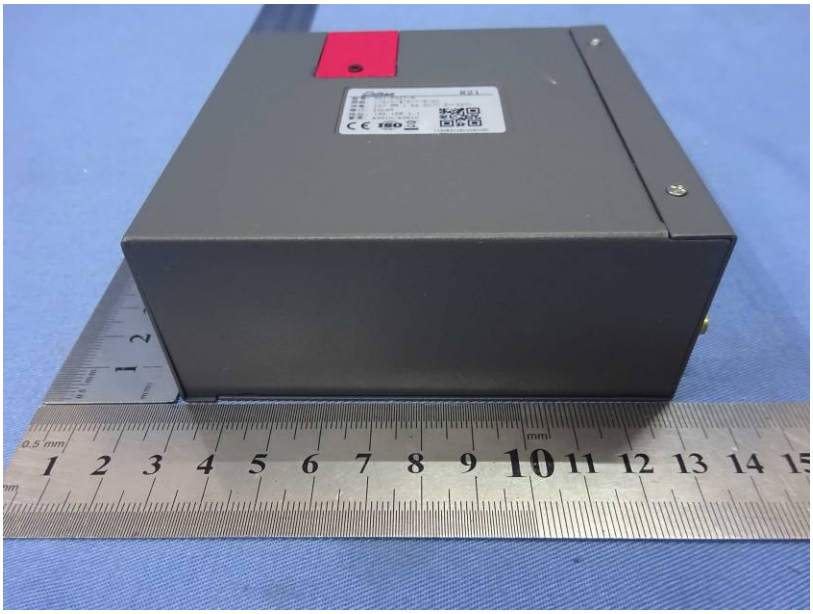


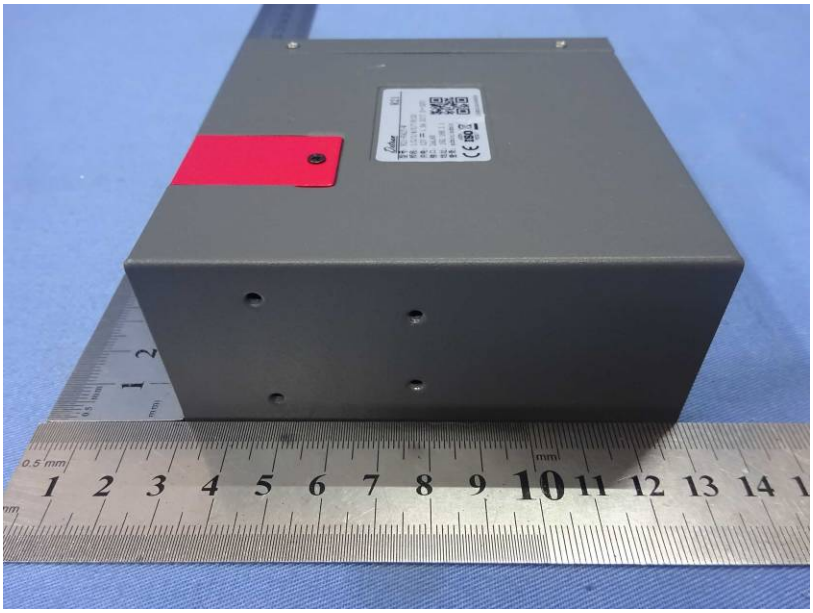


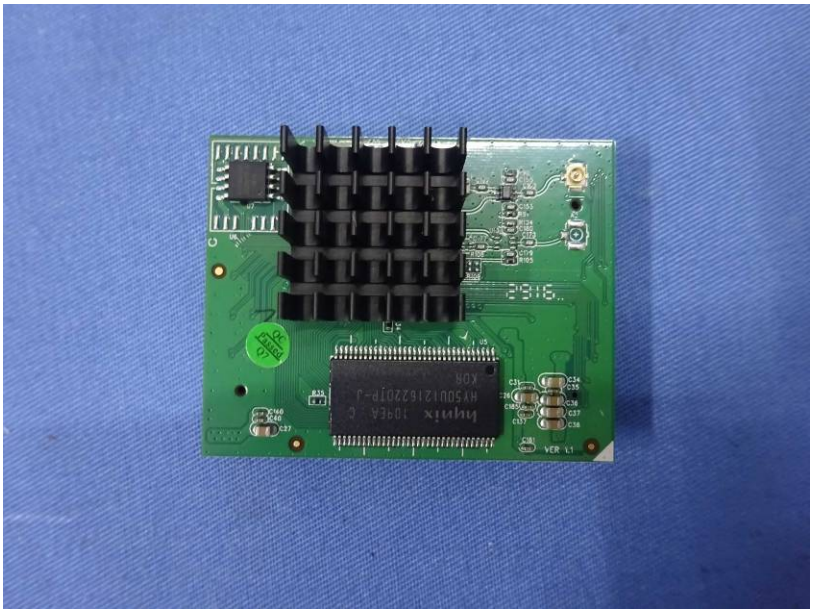


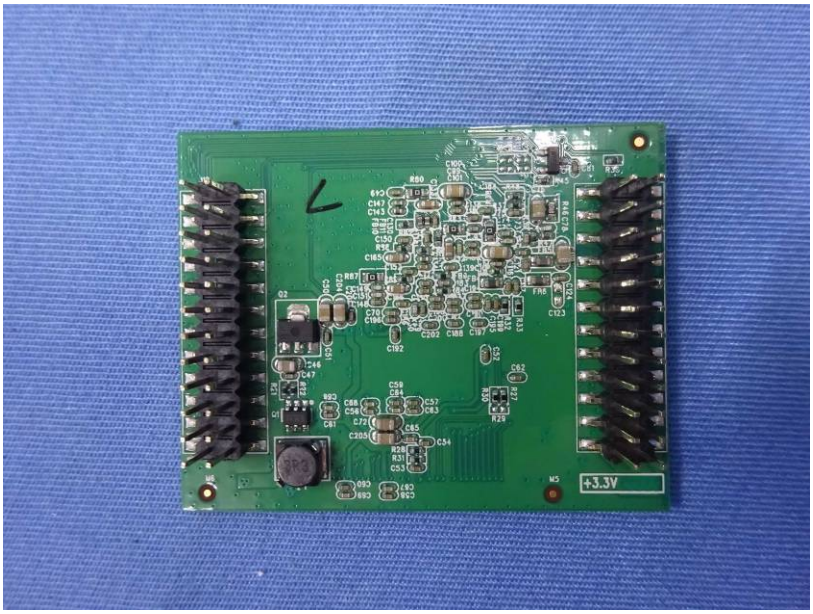

DO
DI-2
DI-1
TXD-B
RXD-A
GND
V-
V+


WAN/LAN
Reset
Console
ERR
WLAN
PWR





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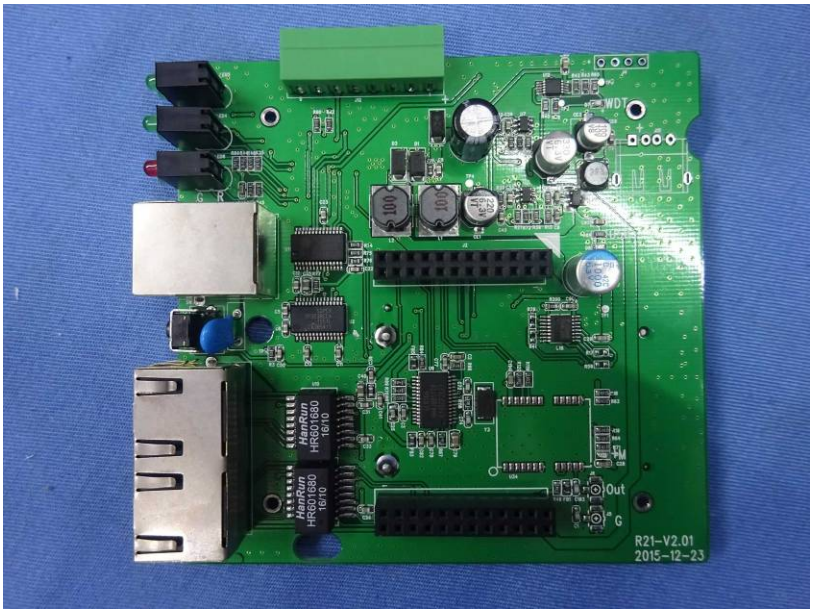
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R21-V2.01
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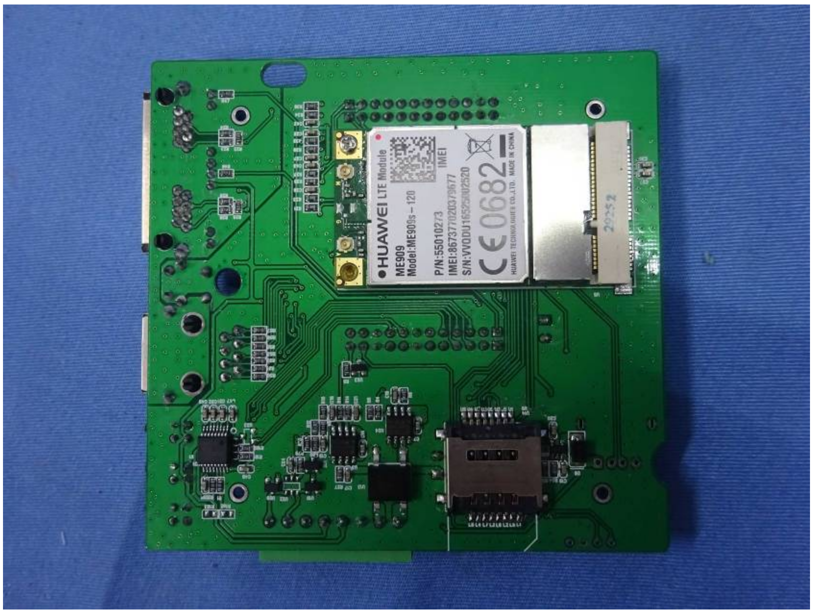

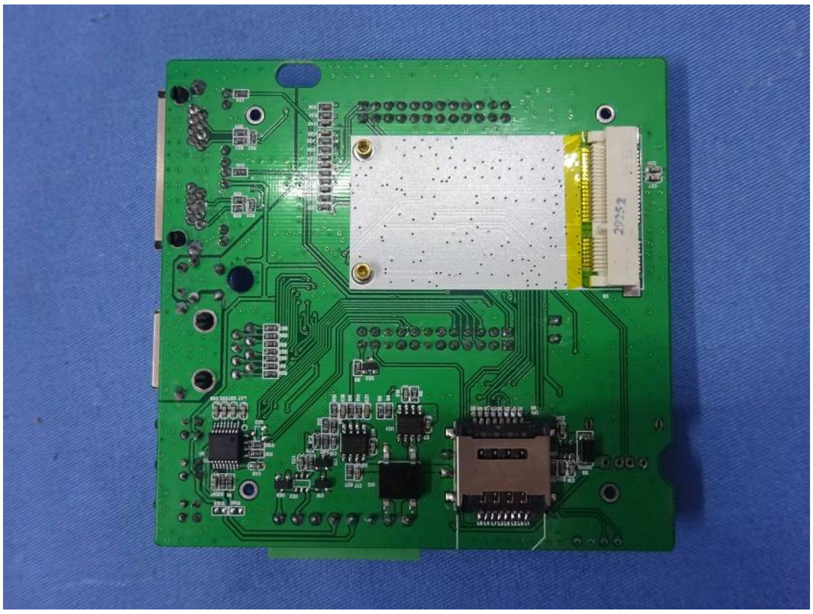

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S/N:VVQDU16525002520
IMEI
CE 0682
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LGA3X3TO PCIE VER .B RF
BAR CODE
10 X 10mm
E243951
04-04


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OUTPUT: 12V 1.5A
LISTED
I.T.E. POWER SUPPLY
E352152
LPS
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------End------