

# EMC TEST REPORT

**Applicant:** SHENZHEN WLINK TECHNOLOGY CO., LTD.

**Address of Applicant:** 2A, F5 Building, TCL International E City, No.1001  
Zhongshanyuan Rd., Nanshan Dist., Shenzhen, 518052, China

**Manufacturer:** SHENZHEN WLINK TECHNOLOGY CO., LTD.

**Address of Manufacturer:** 2A, F5 Building, TCL International E City, No.1001  
Zhongshanyuan Rd., Nanshan Dist., Shenzhen, 518052, China

**Equipment Under Test (EUT)**

Product Name: Industrial 3G/4G Cellular Router

Model No.: WL-R210

**Applicable standards:** ETSI EN 301 489-1 V2.2.3 (2019-11)  
ETSI EN 301 489-17 V3.2.4 (2020-09)  
Draft ETSI EN 301 489-52 V1.1.2 (2020-12)  
EN 55032:2015+A11:2020  
EN 55035:2017+A11:2020  
EN 61000-3-2:2014  
EN 61000-3-3:2013

**Date of sample receipt:** September 27, 2021

**Date of Test:** September 28, 2021-October 09, 2021

**Date of report issue:** October 09, 2021

**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.



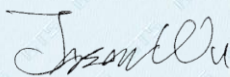
**Robinson Luo**  
**Laboratory Manager**

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## 2 Version

Report No.	Version No.	Date	Description
GTS201903000054E01	00	March 11, 2019	Original
GTS202109000200E01	01	October 09, 2021	Change adapter, address of applicant/ manufacturer; Add telecommunication port; Delete factory; Update the version of standards.

Prepared By:

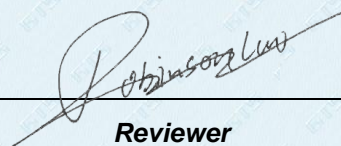


Date:

October 09, 2021

Project Engineer

Check By:



Date:

October 09, 2021

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 EN 55032	ETSI EN301 489-1 EN 55032	AC port	Pass
Conducted Emission	ETSI EN 301 489-17 ETSI EN 301 489-52 EN 55032	ETSI EN301 489-1 EN 55032	Telecommuni cation 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 61000-3-2	AC port	Pass
EMS Test				
ESD (Electrostatic Discharge)	ETSI EN 301 489-17 ETSI EN 301 489-52 EN 55035	EN 61000-4-2	Enclosure	Pass
Radio frequency electromagnetic field (80 MHz to 6 000 MHz)	ETSI EN 301 489-17 ETSI EN 301 489-52 EN 55035	EN 61000-4-3	Enclosure	Pass
EFT (Electrical Fast Transients)	ETSI EN 301 489-17 ETSI EN 301 489-52 EN 55035	EN 61000-4-4	AC port	Pass
EFT (Electrical Fast Transients)	ETSI EN 301 489-17 ETSI EN 301 489-52 EN 55035	EN 61000-4-4	Telecommuni cation port	Pass
Surge Immunity	ETSI EN 301 489-17 ETSI EN 301 489-52 EN 55035	EN 61000-4-5	AC port	Pass
Surge Immunity	ETSI EN 301 489-17 ETSI EN 301 489-52 EN 55035	EN 61000-4-5	Telecommuni cation port	Pass
Radio frequency, common mode	ETSI EN 301 489-17 ETSI EN 301 489-52 EN 55035	EN 61000-4-6	AC port	Pass
Radio frequency, common mode	ETSI EN 301 489-17 ETSI EN 301 489-52 EN 55035	EN 61000-4-6	Telecommuni cation port	Pass
Voltage Dips and Interruptions	ETSI EN 301 489-17 ETSI EN 301 489-52 EN 55035	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:	Adapter: Model No.: SAW20-120-1500GD Input: AC 100-240V, 50/60Hz, 0.6A Output: DC 12.0V, 1.5A, 18.0W

## 5.2 Operating Modes

Operating mode	Detail description
Wi-Fi mode:	Keep the EUT in play internet information by Wi-Fi 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.
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## 5.4 Test Facility

<p>The test facility is recognized, certified, or accredited by the following organizations:</p> <ul style="list-style-type: none"> <li>● <b>FCC—Registration No.: 381383</b> Designation Number: CN5029 Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files.</li> <li>● <b>IC —Registration No.: 9079A</b> CAB identifier: CN0091 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</li> <li>● <b>NVLAP (LAB CODE:600179-0)</b> Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).</li> </ul>
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## 5.5 Test Location

RI test was performed at:
SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch, 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. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102 Tel: 0755-27798480 Fax: 0755-27798960

## 5.6 Deviation from Standards

None.
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## 5.7 Abnormalities from Standard Conditions

None.
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## 5.8 Other Information Requested by the Customer

None.
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## 5.9 Monitoring of EUT for All Immunity Test

Visual:	Monitored the light and work status of the EUT
Audio:	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. 02 2020	July. 01 2025
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. 24 2021	June. 23 2022
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 24 2021	June. 23 2022
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 24 2021	June. 23 2022
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 24 2021	June. 23 2022
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 24 2021	June. 23 2022
9	Coaxial Cable	GTS	N/A	GTS211	June. 24 2021	June. 23 2022
10	Coaxial cable	GTS	N/A	GTS210	June. 24 2021	June. 23 2022
11	Coaxial Cable	GTS	N/A	GTS212	June. 24 2021	June. 23 2022
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 24 2021	June. 23 2022
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 24 2021	June. 23 2022
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 24 2021	June. 23 2022
15	Band filter	Amindeon	82346	GTS219	June. 24 2021	June. 23 2022
16	Power Meter	Anritsu	ML2495A	GTS540	June. 24 2021	June. 23 2022
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 24 2021	June. 23 2022
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 24 2021	June. 23 2022
19	Splitter	Agilent	11636B	GTS237	June. 24 2021	June. 23 2022
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 24 2021	June. 23 2022
21	Breitband hornantenne	SCHWARZBECK	BBHA 9170	GTS579	Oct. 18 2020	Oct. 17 2021
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 18 2020	Oct. 17 2021
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 18 2020	Oct. 17 2021
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June. 24 2021	June. 23 2022



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.15 2019	May.14 2022
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 24 2021	June. 23 2022
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 24 2021	June. 23 2022
4	ENV216 2-L-V-NETZNACHB.DE	ROHDE&SCHWARZ	ENV216	GTS226	June. 24 2021	June. 23 2022
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. 24 2021	June. 23 2022
8	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	June. 24 2021	June. 23 2022
9	ISN	SCHWARZBECK	NTFM 8158	GTS565	June. 24 2021	June. 23 2022
10	High voltage probe	SCHWARZBECK	TK9420	GTS537	July. 09 2021	July. 08 2022

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. 24 2021	June. 23 2022
2	Thermo meter	KTJ	TA328	GTS243	June. 24 2021	June. 23 2022

Conducted Immunity						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Signal Generator	ROHDE & SCHWARZ	SMB 100A	GTS553	June. 24 2021	June. 23 2022
2	CDN	LionCEL	CDN-M3-16	GTS554	June. 24 2021	June. 23 2022
3	CDN	CYBERTEK	EM 5070	GTS559	June. 24 2021	June. 23 2022
4	Power amplifier	rflight	NTWPA-00010475	GTS555	June. 24 2021	June. 23 2022
5	ATT	SUNWAVE	SJ-50-06DB	GTS556	June. 24 2021	June. 23 2022
6	Clamp	SCHAFFNER	KEMZ 801	GTS558	June. 24 2021	June. 23 2022

Harmonic/ Flicker						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Power Analyzer H/F	EMTEST	DPA500	GTS235	June. 24 2021	June. 23 2022
2	AC POWER SUPPLY	EMTEST	ACS500	GTS236	June. 24 2021	June. 23 2022
3	Thermo meter	KTJ	TA328	GTS256	June. 24 2021	June. 23 2022

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. 24 2021	June. 23 2022
2	Clamp	EMTEST	HFK	GTS557	June. 24 2021	June. 23 2022
3	Thermo meter	KTJ	TA328	GTS238	June. 24 2021	June. 23 2022

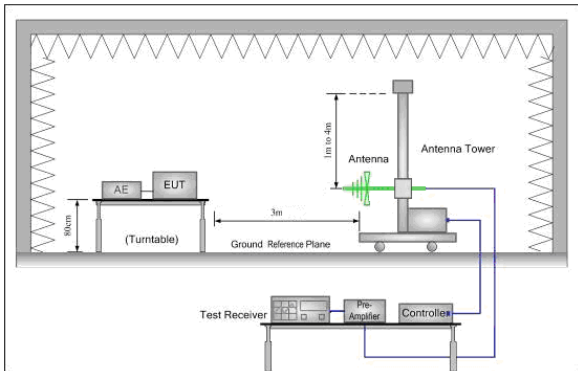
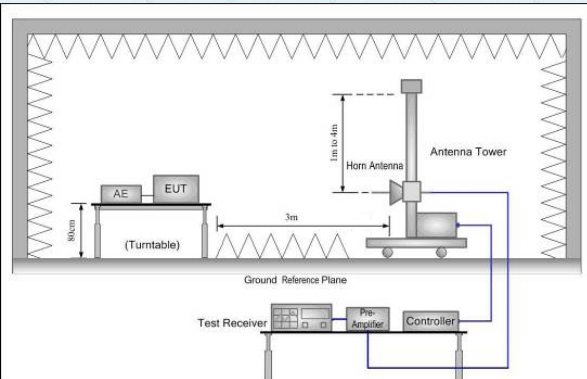
Radiated Immunity						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Fully-Anechoic Chamber 2	Chang Zhou Zhong Shuo	854	SEM001-05	May. 09 2020	May. 08 2025
2	Power Sensor	Rohde & Schwarz	NRP-Z91	SEM009-09	March. 31 2021	March. 30 2022
3	Stacked Log.-Per.- Broadband Antenna (70MHz-10GHz)	Schwarzbeck	STLP 9129	SEM003-25	N/A	N/A
4	Signal Generator (9kHz-6GHz)	Rohde & Schwarz	SMB100A	SEM006-11	March. 31 2021	March. 30 2022
5	Broadband Amplifier (80MHz-1GHz)	Rohde & Schwarz	BBA150-BC250	SEM005-12	Sep. 22 2021	Sep. 21 2022
6	Broadband Amplifier(800MHz- 3GHz)	Rohde & Schwarz	BBA150-D110	SEM005-13	March. 31 2021	March. 30 2022
7	Broadband Amplifier(2.5GHz- 6GHz)	Rohde & Schwarz	BBA150-E60	SEM005-16	April. 10 2021	April. 09 2022
8	Measurement Software	Rohde & Schwarz	EMC32 V9.25.00	N/A	N/A	N/A

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	KTJ	TA328	GTS243	June. 24 2021	June. 23 2022
2	Barometer	ChangChun	DYM3	GTS255	June. 24 2021	June. 23 2022

## 7 EMC Requirements Specification in ETSI EN 301 489-17/-52, EN 55032

### 7.1 EMI (Emission)

#### 7.1.1 Radiated Emission

Test Requirement:	ETSI EN 301 489-17/-52, EN 55032				
Test Method:	ETSI EN 301 489-1 and EN 55032				
Test Frequency Range:	30MHz to 6GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	120kHz	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:	<p>■ <b>From 30MHz to 1GHz:</b></p> <ol style="list-style-type: none"> <li>1. The radiated emissions test was conducted in a semi-anechoic chamber.</li> <li>2. The tabletop EUT was placed upon a non-metallic table 0.1m 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.</li> <li>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.</li> <li>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.</li> </ol> <p>■ <b>Above 1GHz:</b></p> <ol style="list-style-type: none"> <li>1. The radiated emissions test was conducted in a fully-anechoic chamber.</li> <li>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.</li> <li>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.</li> <li>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.</li> </ol>
Test environment:	Temp.: 25 °C Humid.: 50% Press.: 1 010mbar
Measurement Record:	Uncertainty: 3.8039dB (30MHz-200MHz) 3.9679dB (200MHz-1GHz) 4.29dB (1GHz-18GHz)
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details, only show the worst case.
Test results:	Pass

**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
71.83	58.68	10.22	0.96	36.46	33.40	40.00	-6.60	Vertical
95.76	60.91	8.83	1.16	36.69	34.21	40.00	-5.79	Vertical
119.86	57.90	10.98	1.36	36.88	33.36	40.00	-6.64	Vertical
158.67	54.08	12.77	1.62	37.13	31.34	40.00	-8.66	Vertical
182.56	54.41	10.68	1.75	37.25	29.59	40.00	-10.41	Vertical
263.82	54.67	11.26	2.19	37.39	30.73	47.00	-16.27	Vertical
95.76	58.88	8.83	1.16	36.69	32.18	40.00	-7.82	Horizontal
119.86	53.03	10.98	1.36	36.88	28.49	40.00	-11.51	Horizontal
141.33	50.14	12.12	1.51	37.02	26.75	40.00	-13.25	Horizontal
195.82	57.90	9.48	1.82	37.31	31.89	40.00	-8.11	Horizontal
360.45	49.32	13.82	2.67	37.48	28.33	47.00	-18.67	Horizontal
962.16	37.03	23.98	5.09	37.54	28.56	47.00	-18.44	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
71.83	58.82	10.22	0.96	36.46	33.54	40.00	-6.46	Vertical
95.76	60.81	8.83	1.16	36.69	34.11	40.00	-5.89	Vertical
119.86	58.73	10.98	1.36	36.88	34.19	40.00	-5.81	Vertical
161.47	54.12	12.71	1.64	37.14	31.33	40.00	-8.67	Vertical
263.82	53.53	11.26	2.19	37.39	29.59	47.00	-17.41	Vertical
336.04	49.10	13.30	2.55	37.46	27.49	47.00	-19.51	Vertical
95.76	58.62	8.83	1.16	36.69	31.92	40.00	-8.08	Horizontal
119.86	52.46	10.98	1.36	36.88	27.92	40.00	-12.08	Horizontal
191.75	58.87	9.73	1.80	37.29	33.11	40.00	-6.89	Horizontal
360.45	48.45	13.82	2.67	37.48	27.46	47.00	-19.54	Horizontal
647.39	37.06	19.91	3.91	37.58	23.30	47.00	-23.70	Horizontal
962.16	38.62	23.98	5.09	37.54	30.15	47.00	-16.85	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
71.83	58.63	10.22	0.96	36.46	33.35	40.00	-6.65	Vertical
95.76	58.95	8.83	1.16	36.69	32.25	40.00	-7.75	Vertical
119.86	58.20	10.98	1.36	36.88	33.66	40.00	-6.34	Vertical
167.82	54.00	12.52	1.67	37.18	31.01	40.00	-8.99	Vertical
263.82	47.85	11.26	2.19	37.39	23.91	47.00	-23.09	Vertical
360.45	45.38	13.82	2.67	37.48	24.39	47.00	-22.61	Vertical
95.76	58.50	8.83	1.16	36.69	31.80	40.00	-8.20	Horizontal
119.86	52.28	10.98	1.36	36.88	27.74	40.00	-12.26	Horizontal
167.82	51.43	12.52	1.67	37.18	28.44	40.00	-11.56	Horizontal
193.10	57.70	9.64	1.81	37.30	31.85	40.00	-8.15	Horizontal
360.45	48.78	13.82	2.67	37.48	27.79	47.00	-19.21	Horizontal
962.16	38.32	23.98	5.09	37.54	29.85	47.00	-17.15	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
71.83	58.20	10.22	0.96	36.46	32.92	40.00	-7.08	Vertical
95.76	60.13	8.83	1.16	36.69	33.43	40.00	-6.57	Vertical
119.86	58.80	10.98	1.36	36.88	34.26	40.00	-5.74	Vertical
160.35	51.54	12.75	1.63	37.14	28.78	40.00	-11.22	Vertical
312.18	47.68	12.75	2.42	37.43	25.42	47.00	-21.58	Vertical
962.16	33.57	23.98	5.09	37.54	25.10	47.00	-21.90	Vertical
95.76	58.65	8.83	1.16	36.69	31.95	40.00	-8.05	Horizontal
119.86	52.12	10.98	1.36	36.88	27.58	40.00	-12.42	Horizontal
140.84	50.67	12.08	1.51	37.02	27.24	40.00	-12.76	Horizontal
191.75	57.81	9.73	1.80	37.29	32.05	40.00	-7.95	Horizontal
360.45	48.75	13.82	2.67	37.48	27.76	47.00	-19.24	Horizontal
962.16	37.30	23.98	5.09	37.54	28.83	47.00	-18.17	Horizontal



## LAN 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
71.83	58.84	10.22	0.96	36.46	33.56	40.00	-6.44	Vertical
95.76	58.39	8.83	1.16	36.69	31.69	40.00	-8.31	Vertical
119.86	57.34	10.98	1.36	36.88	32.80	40.00	-7.20	Vertical
159.23	55.98	12.76	1.62	37.13	33.23	40.00	-6.77	Vertical
263.82	53.68	11.26	2.19	37.39	29.74	47.00	-17.26	Vertical
312.18	49.26	12.75	2.42	37.43	27.00	47.00	-20.00	Vertical
95.76	58.15	8.83	1.16	36.69	31.45	40.00	-8.55	Horizontal
119.86	51.34	10.98	1.36	36.88	26.80	40.00	-13.20	Horizontal
185.79	53.43	10.31	1.77	37.27	28.24	40.00	-11.76	Horizontal
194.45	58.32	9.56	1.81	37.31	32.38	40.00	-7.62	Horizontal
360.45	48.27	13.82	2.67	37.48	27.28	47.00	-19.72	Horizontal
962.16	36.08	23.98	5.09	37.54	27.61	47.00	-19.39	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)	Preamplifier 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

## LAN Mode

### Peak measurement

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarity
1370.00	35.56	25.64	4.60	33.39	32.41	70.00	-37.59	Vertical
2376.00	35.94	27.65	5.36	34.03	34.92	70.00	-35.08	Vertical
3177.00	35.05	28.73	6.35	33.10	37.03	74.00	-36.97	Vertical
3735.00	31.45	29.30	7.44	32.46	35.73	74.00	-38.27	Vertical
4715.00	31.80	31.66	8.52	32.04	39.94	74.00	-34.06	Vertical
5718.00	28.98	32.50	9.81	32.30	38.99	74.00	-35.01	Vertical
1301.00	37.12	25.63	4.54	33.27	34.02	70.00	-35.98	Horizontal
2299.00	36.19	27.97	5.28	34.13	35.31	70.00	-34.69	Horizontal
3325.00	36.17	28.39	6.60	32.97	38.19	74.00	-35.81	Horizontal
4450.00	30.74	31.23	8.30	31.91	38.36	74.00	-35.64	Horizontal
5349.00	28.70	31.73	9.29	32.36	37.36	74.00	-36.64	Horizontal
5896.00	28.63	32.76	10.06	32.19	39.26	74.00	-34.74	Horizontal

### Notes:

1. The EUT was test at 3m in field chamber.
2. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
3. The emission levels of other frequencies are very lower than the limit and not show in test report.
4. 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.



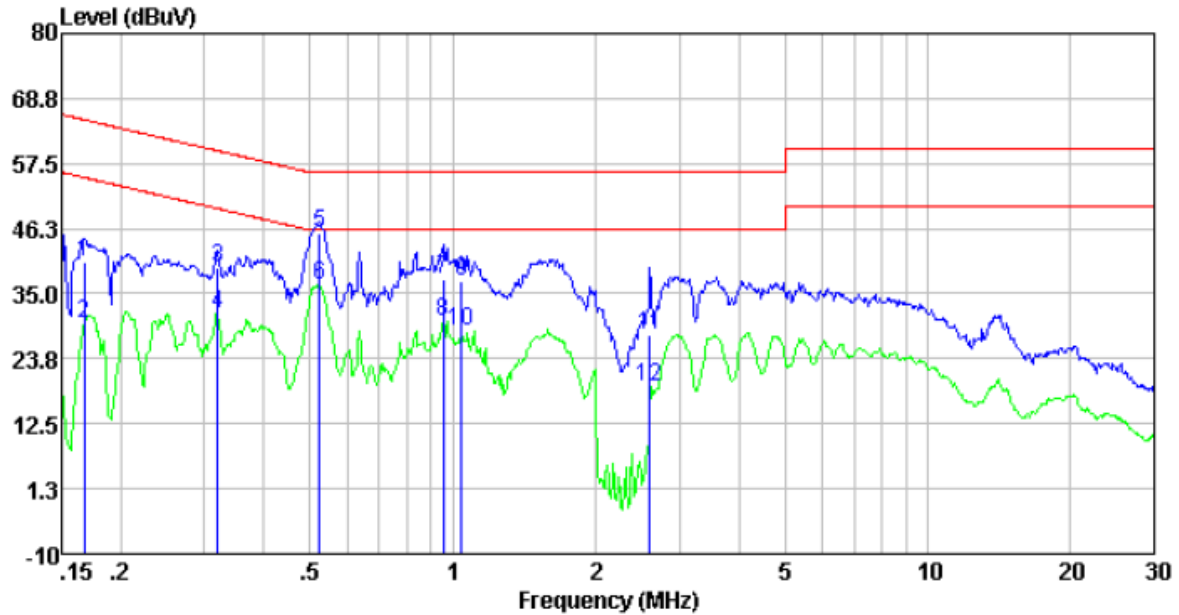
### 7.1.2 Conducted Emissions(AC port)

Test Requirement:	ETSI EN 301 489-17/-52, EN 55032					
Test Method:	ETSI EN 301 489-1 and EN 55032					
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:	<p>Remark E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>					
Test procedure	<ol style="list-style-type: none"> <li>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.</li> <li>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).</li> <li>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.</li> </ol>					
Test Instruments:	Temp.:	24 °C	Humid.:	51%	Press.:	1 010mbar
Measurement Record:	Uncertainty: 3.44dB					
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details, only show the worst case.					
Test results:	Pass					

## Measurement Data

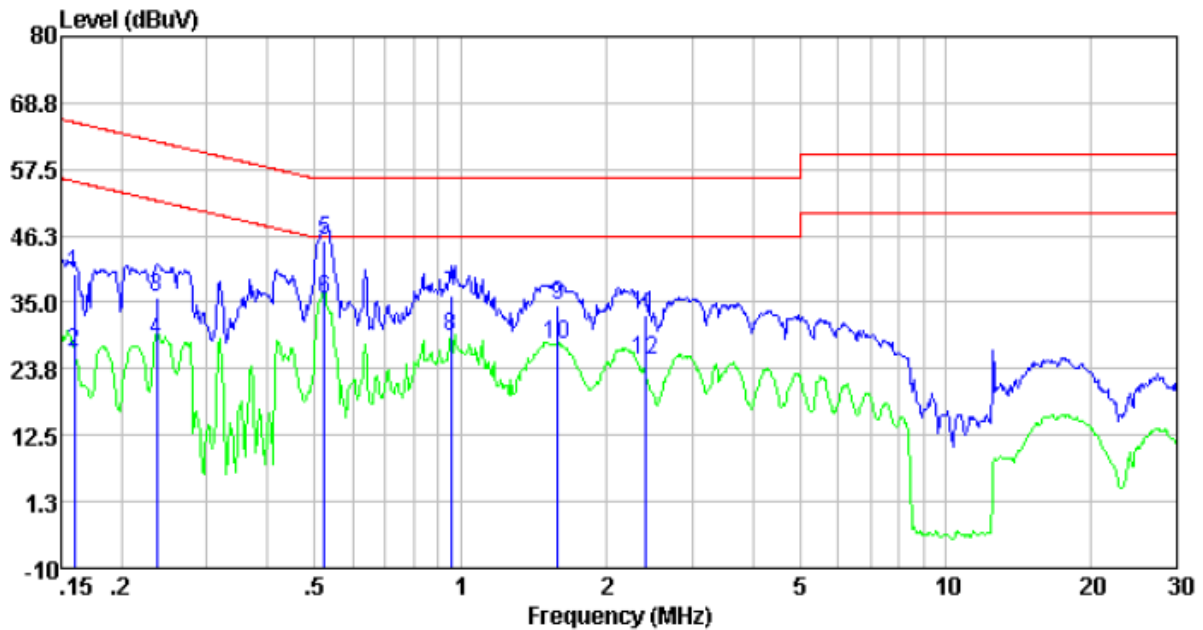
GSM Mode

Line:



Freq MHz	Reading level dBuV	LISN/ISN factor dB	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.17	30.11	10.40	0.01	40.52	65.08	-24.56	QP
0.17	19.52	10.40	0.01	29.93	55.08	-25.15	Average
0.32	28.95	10.39	0.01	39.35	59.71	-20.36	QP
0.32	20.95	10.39	0.01	31.35	49.71	-18.36	Average
0.52	35.30	10.31	0.01	45.62	56.00	-10.38	QP
0.52	26.27	10.31	0.01	36.59	46.00	-9.41	Average
0.95	27.23	10.21	0.03	37.47	56.00	-18.53	QP
0.95	20.08	10.21	0.03	30.32	46.00	-15.68	Average
1.04	27.09	10.20	0.03	37.32	56.00	-18.68	QP
1.04	18.33	10.20	0.03	28.56	46.00	-17.44	Average
2.59	17.65	10.20	0.05	27.90	56.00	-28.10	QP
2.59	8.70	10.20	0.05	18.95	46.00	-27.05	Average

Neutral:

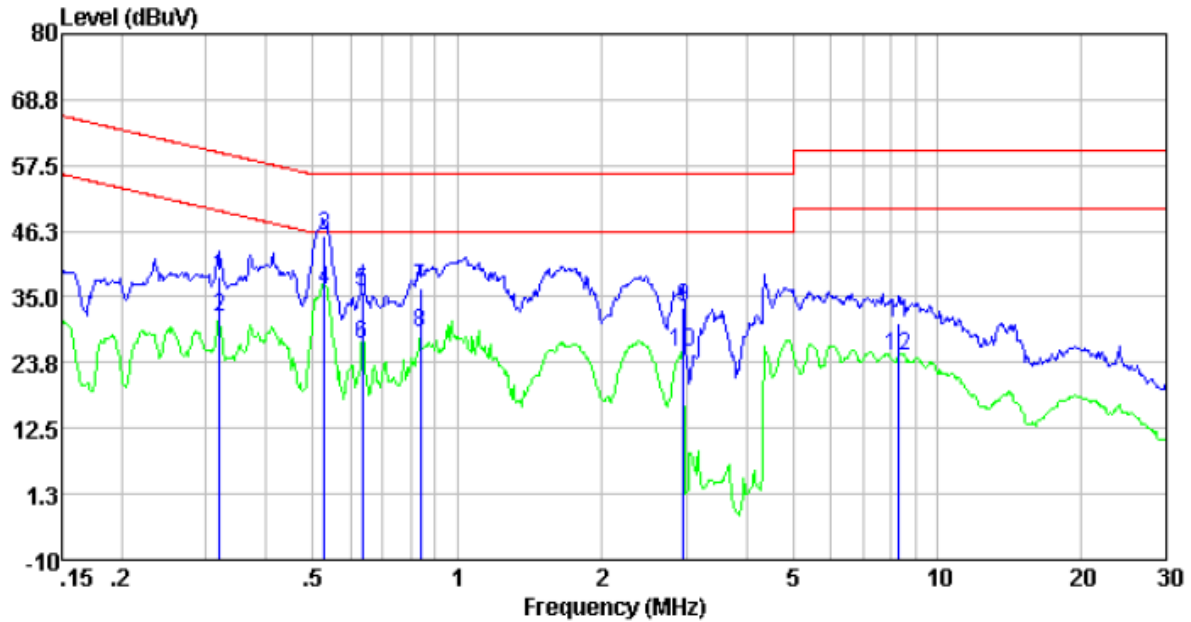


Freq MHz	Reading level dBuV	LISN/ISN factor dB	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.16	29.53	10.40	0.01	39.94	65.47	-25.53	QP
0.16	16.25	10.40	0.01	26.66	55.47	-28.81	Average
0.24	25.43	10.40	0.01	35.84	62.22	-26.38	QP
0.24	18.27	10.40	0.01	28.68	52.22	-23.54	Average
0.52	35.25	10.31	0.01	45.57	56.00	-10.43	QP
0.52	25.13	10.31	0.01	35.45	46.00	-10.55	Average
0.95	26.02	10.21	0.03	36.26	56.00	-19.74	QP
0.95	18.89	10.21	0.03	29.13	46.00	-16.87	Average
1.59	24.16	10.20	0.04	34.40	56.00	-21.60	QP
1.59	17.66	10.20	0.04	27.90	46.00	-18.10	Average
2.40	22.59	10.20	0.05	32.84	56.00	-23.16	QP
2.40	15.10	10.20	0.05	25.35	46.00	-20.65	Average



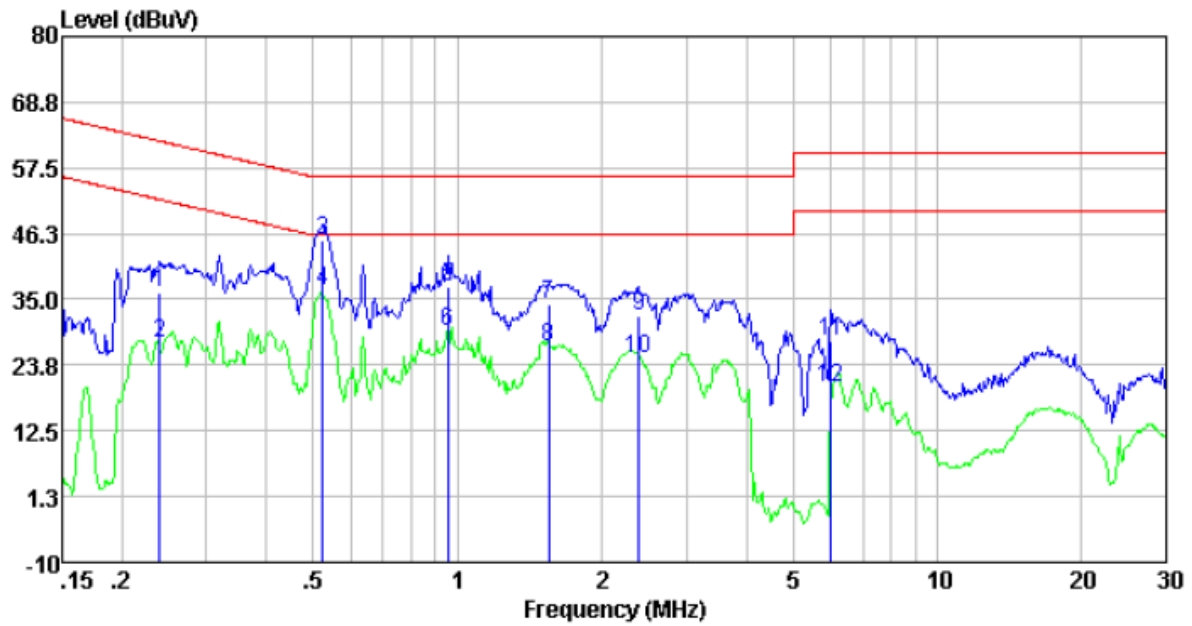
WIFI Mode

Line:



Freq MHz	Reading level dBuV	LISN/ISN factor dB	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.32	28.14	10.39	0.01	38.54	59.71	-21.17	QP
0.32	20.99	10.39	0.01	31.39	49.71	-18.32	Average
0.53	35.18	10.31	0.01	45.50	56.00	-10.50	QP
0.53	25.74	10.31	0.01	36.06	46.00	-9.94	Average
0.63	25.48	10.28	0.02	35.78	56.00	-20.22	QP
0.63	16.64	10.28	0.02	26.94	46.00	-19.06	Average
0.84	26.09	10.23	0.03	36.35	56.00	-19.65	QP
0.84	18.66	10.23	0.03	28.92	46.00	-17.08	Average
2.96	22.98	10.20	0.05	33.23	56.00	-22.77	QP
2.96	15.43	10.20	0.05	25.68	46.00	-20.32	Average
8.32	20.29	10.20	0.10	30.59	60.00	-29.41	QP
8.32	14.57	10.20	0.10	24.87	50.00	-25.13	Average

Neutral:

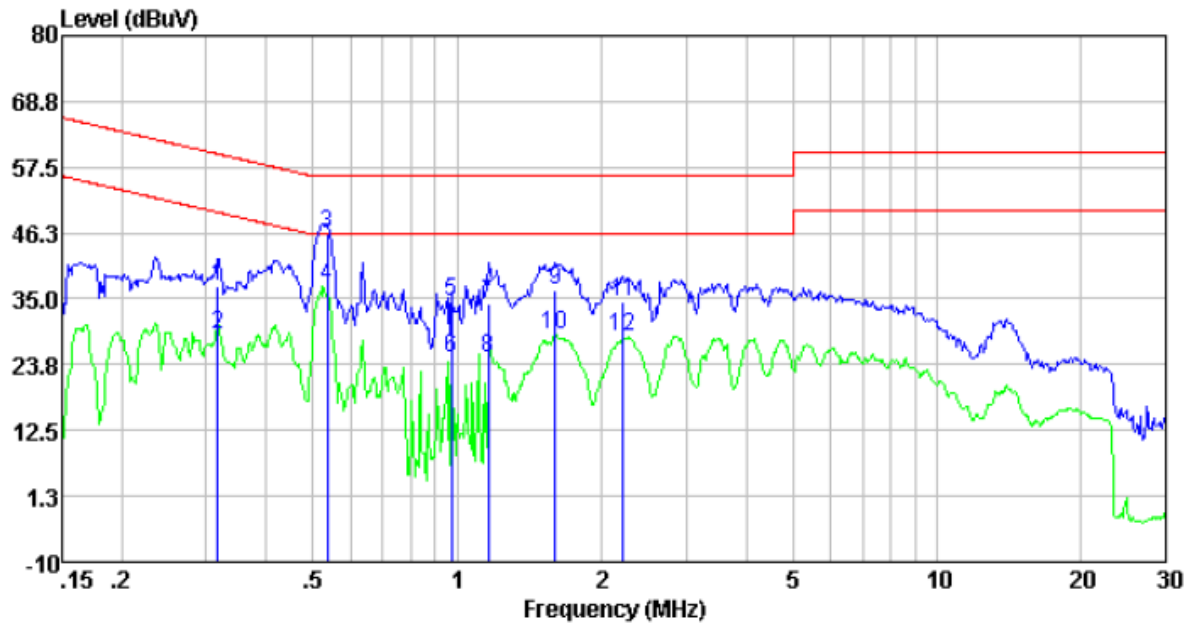


Freq MHz	Reading level dBuV	LISM/ISM factor dB	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.24	25.84	10.40	0.01	36.25	62.13	-25.88	QP
0.24	16.96	10.40	0.01	27.37	52.13	-24.76	Average
0.52	34.97	10.31	0.01	45.29	56.00	-10.71	QP
0.52	26.11	10.31	0.01	36.43	46.00	-9.57	Average
0.95	26.80	10.21	0.03	37.04	56.00	-18.96	QP
0.95	19.21	10.21	0.03	29.45	46.00	-16.55	Average
1.55	23.93	10.20	0.04	34.17	56.00	-21.83	QP
1.55	16.54	10.20	0.04	26.78	46.00	-19.22	Average
2.38	21.95	10.20	0.05	32.20	56.00	-23.80	QP
2.38	14.55	10.20	0.05	24.80	46.00	-21.20	Average
5.99	17.74	10.20	0.08	28.02	60.00	-31.98	QP
5.99	9.49	10.20	0.08	19.77	50.00	-30.23	Average

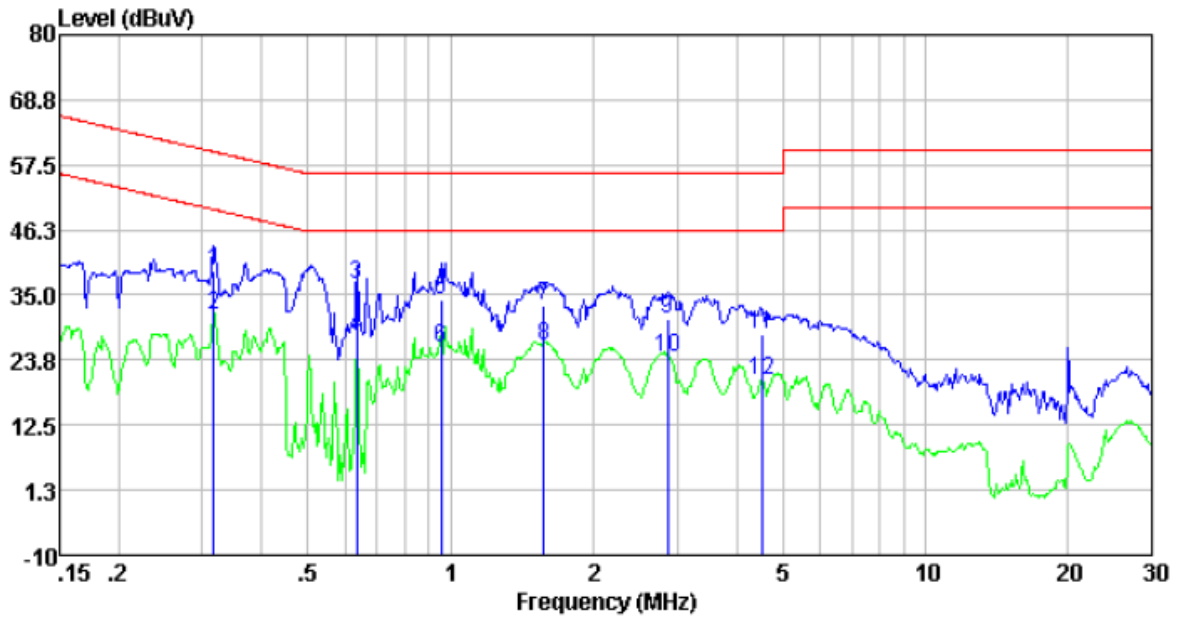


UTRA-FDD Mode

Line:



Neutral:

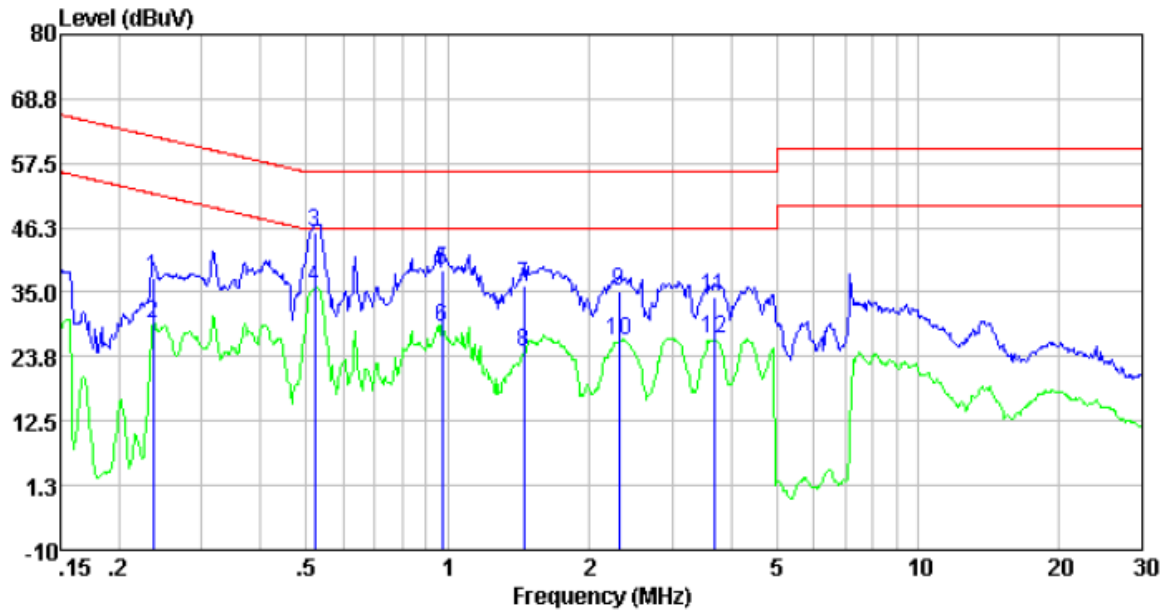


Freq MHz	Reading level dBuV	LISN/ISN factor dB	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.32	28.66	10.39	0.01	39.06	59.80	-20.74	QP
0.32	21.17	10.39	0.01	31.57	49.80	-18.23	Average
0.63	26.57	10.28	0.02	36.87	56.00	-19.13	QP
0.63	17.70	10.28	0.02	28.00	46.00	-18.00	Average
0.95	24.04	10.21	0.03	34.28	56.00	-21.72	QP
0.95	15.56	10.21	0.03	25.80	46.00	-20.20	Average
1.57	22.81	10.20	0.04	33.05	56.00	-22.95	QP
1.57	15.95	10.20	0.04	26.19	46.00	-19.81	Average
2.87	20.66	10.20	0.05	30.91	56.00	-25.09	QP
2.87	14.01	10.20	0.05	24.26	46.00	-21.74	Average
4.53	18.02	10.20	0.06	28.28	56.00	-27.72	QP
4.53	9.84	10.20	0.06	20.10	46.00	-25.90	Average



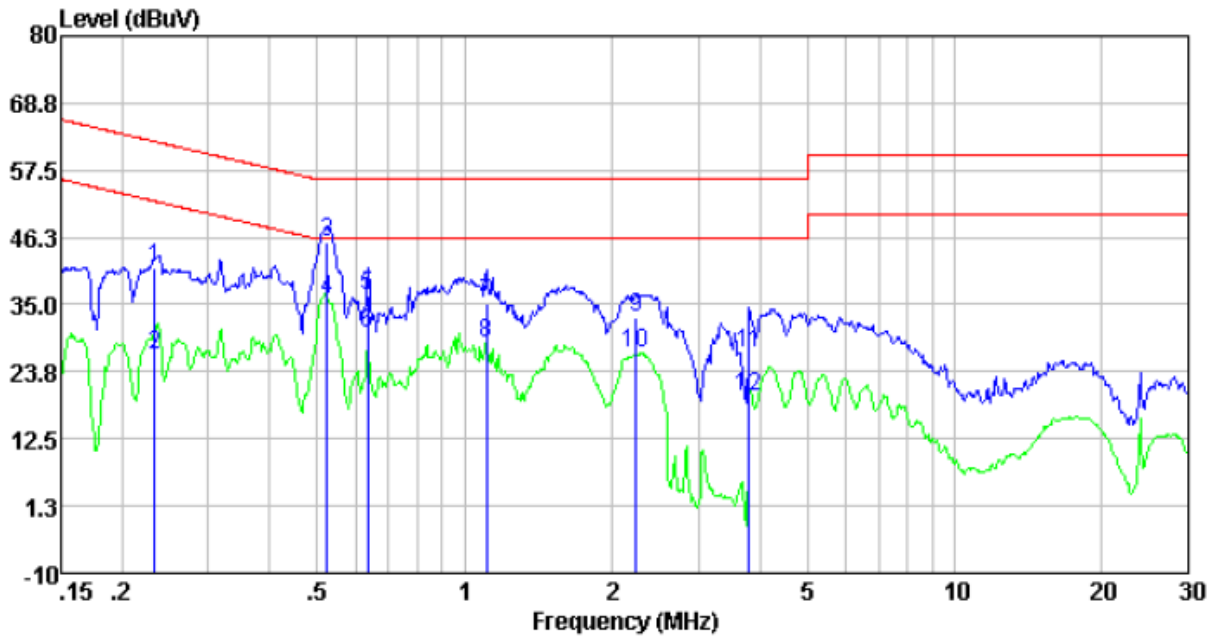
E-UTRA Mode

Line:



Freq MHz	Reading level dBuV	LISN/ISN factor dB	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.24	27.08	10.40	0.01	37.49	62.22	-24.73	QP
0.24	19.17	10.40	0.01	29.58	52.22	-22.64	Average
0.52	35.30	10.31	0.01	45.62	56.00	-10.38	QP
0.52	25.43	10.31	0.01	35.75	46.00	-10.25	Average
0.97	28.70	10.20	0.03	38.93	56.00	-17.07	QP
0.97	18.61	10.20	0.03	28.84	46.00	-17.16	Average
1.45	25.99	10.20	0.04	36.23	56.00	-19.77	QP
1.45	14.30	10.20	0.04	24.54	46.00	-21.46	Average
2.31	24.90	10.20	0.05	35.15	56.00	-20.85	QP
2.31	16.41	10.20	0.05	26.66	46.00	-19.34	Average
3.68	23.96	10.20	0.06	34.22	56.00	-21.78	QP
3.68	16.54	10.20	0.06	26.80	46.00	-19.20	Average

Neutral:

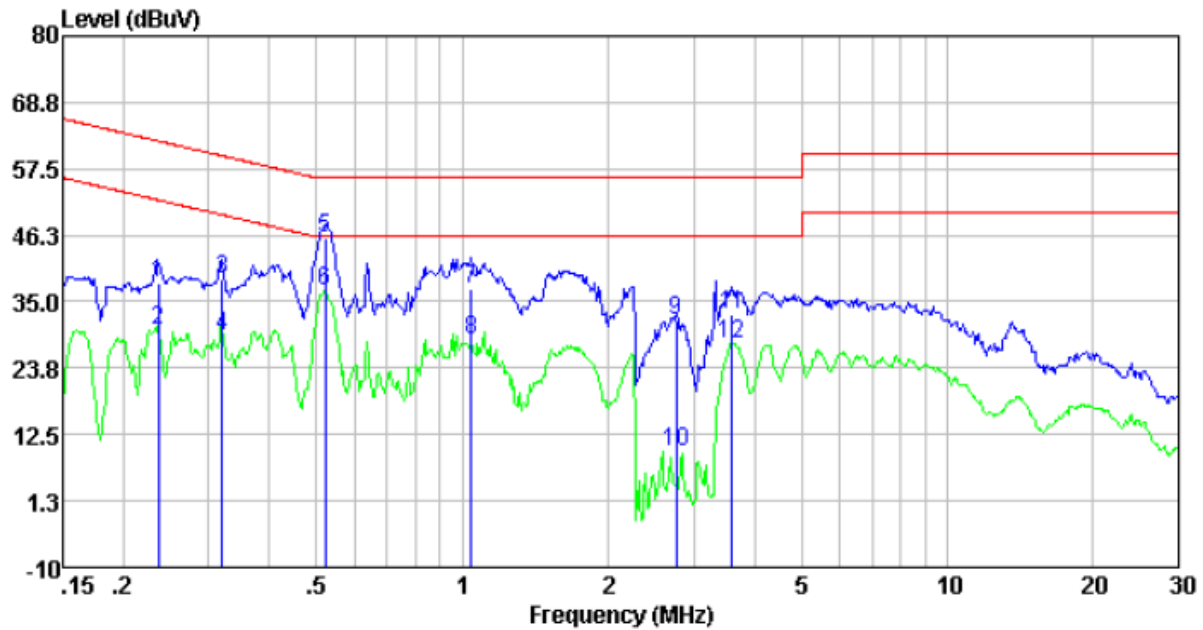


Freq MHz	Reading level dBuV	LISN/ISN factor dB	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.23	30.58	10.40	0.01	40.99	62.35	-21.36	QP
0.23	16.08	10.40	0.01	26.49	52.35	-25.86	Average
0.52	35.13	10.31	0.01	45.45	56.00	-10.55	QP
0.52	25.62	10.31	0.01	35.94	46.00	-10.06	Average
0.63	26.04	10.28	0.02	36.34	56.00	-19.66	QP
0.63	19.93	10.28	0.02	30.23	46.00	-15.77	Average
1.11	24.79	10.20	0.03	35.02	56.00	-20.98	QP
1.11	18.39	10.20	0.03	28.62	46.00	-17.38	Average
2.24	22.65	10.20	0.05	32.90	56.00	-23.10	QP
2.24	16.59	10.20	0.05	26.84	46.00	-19.16	Average
3.80	16.55	10.20	0.06	26.81	56.00	-29.19	QP
3.80	9.24	10.20	0.06	19.50	46.00	-26.50	Average



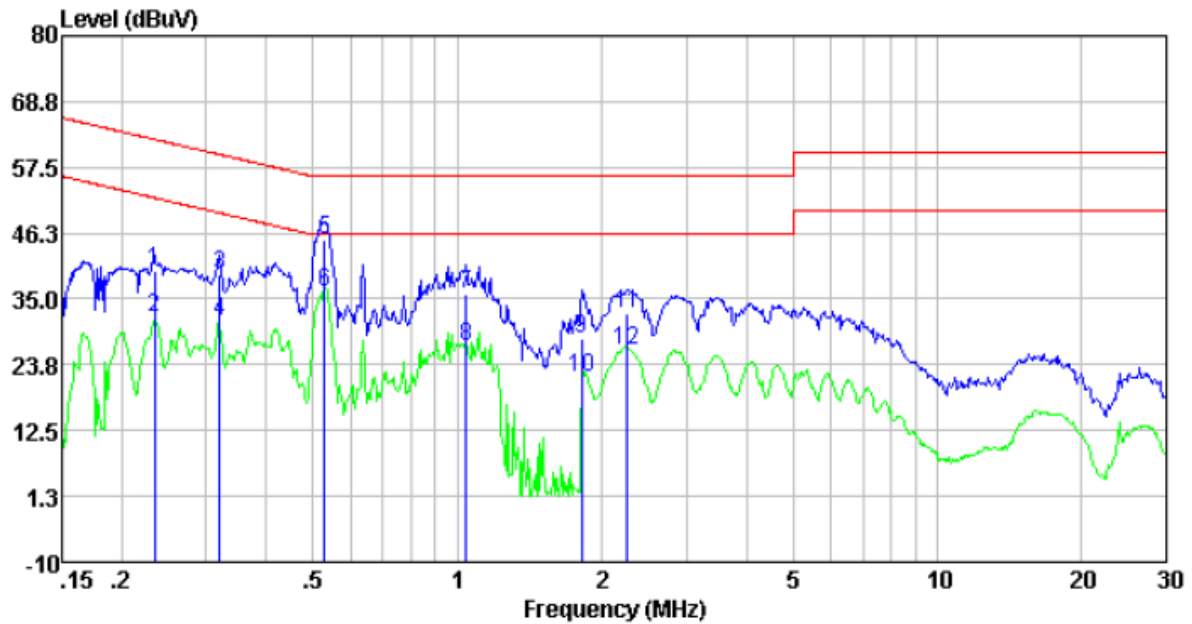
LAN Mode

Line:



Freq MHz	Reading level dBuV	LISM/ISM factor dB	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.24	27.63	10.40	0.01	38.04	62.22	-24.18	QP
0.24	19.71	10.40	0.01	30.12	52.22	-22.10	Average
0.32	28.42	10.39	0.01	38.82	59.71	-20.89	QP
0.32	18.73	10.39	0.01	29.13	49.71	-20.58	Average
0.52	35.35	10.31	0.01	45.67	56.00	-10.33	QP
0.52	26.54	10.31	0.01	36.86	46.00	-9.14	Average
1.04	27.08	10.20	0.03	37.31	56.00	-18.69	QP
1.04	18.26	10.20	0.03	28.49	46.00	-17.51	Average
2.76	21.44	10.20	0.05	31.69	56.00	-24.31	QP
2.76	-0.51	10.20	0.05	9.74	46.00	-36.26	Average
3.60	22.59	10.20	0.06	32.85	56.00	-23.15	QP
3.60	17.57	10.20	0.06	27.83	46.00	-18.17	Average

Neutral

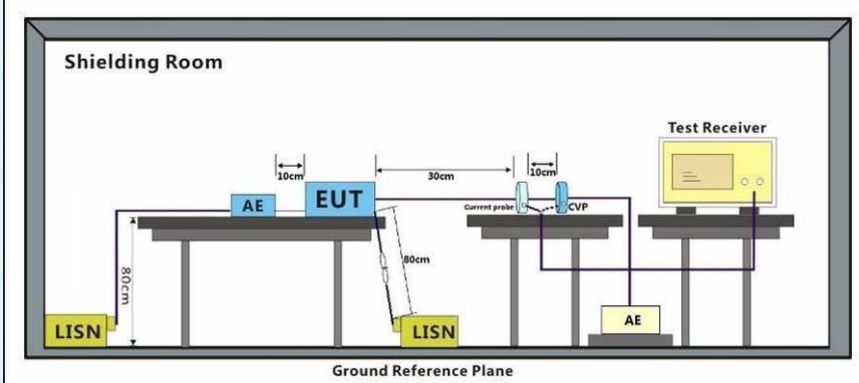
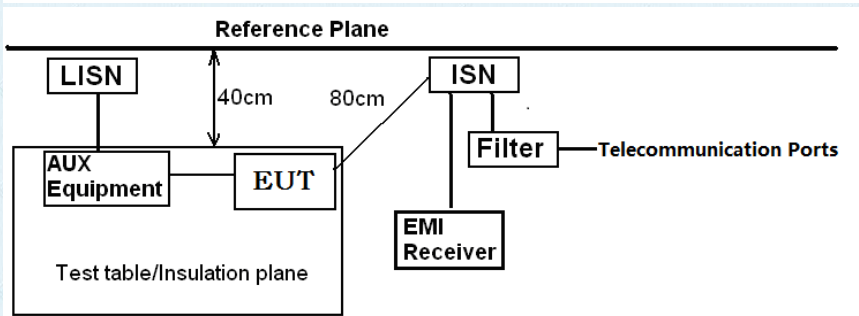


Freq MHz	Reading level dBuV	LISN/ISN factor dB	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.23	29.34	10.40	0.01	39.75	62.30	-22.55	QP
0.23	21.29	10.40	0.01	31.70	52.30	-20.60	Average
0.32	28.72	10.39	0.01	39.12	59.71	-20.59	QP
0.32	20.72	10.39	0.01	31.12	49.71	-18.59	Average
0.53	34.65	10.31	0.01	44.97	56.00	-11.03	QP
0.53	25.92	10.31	0.01	36.24	46.00	-9.76	Average
1.04	25.48	10.20	0.03	35.71	56.00	-20.29	QP
1.04	16.57	10.20	0.03	26.80	46.00	-19.20	Average
1.82	18.10	10.20	0.04	28.34	56.00	-27.66	QP
1.82	11.36	10.20	0.04	21.60	46.00	-24.40	Average
2.26	22.25	10.20	0.05	32.50	56.00	-23.50	QP
2.26	16.11	10.20	0.05	26.36	46.00	-19.64	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

## 7.1.3 Conducted emissions(Telecommunication port)

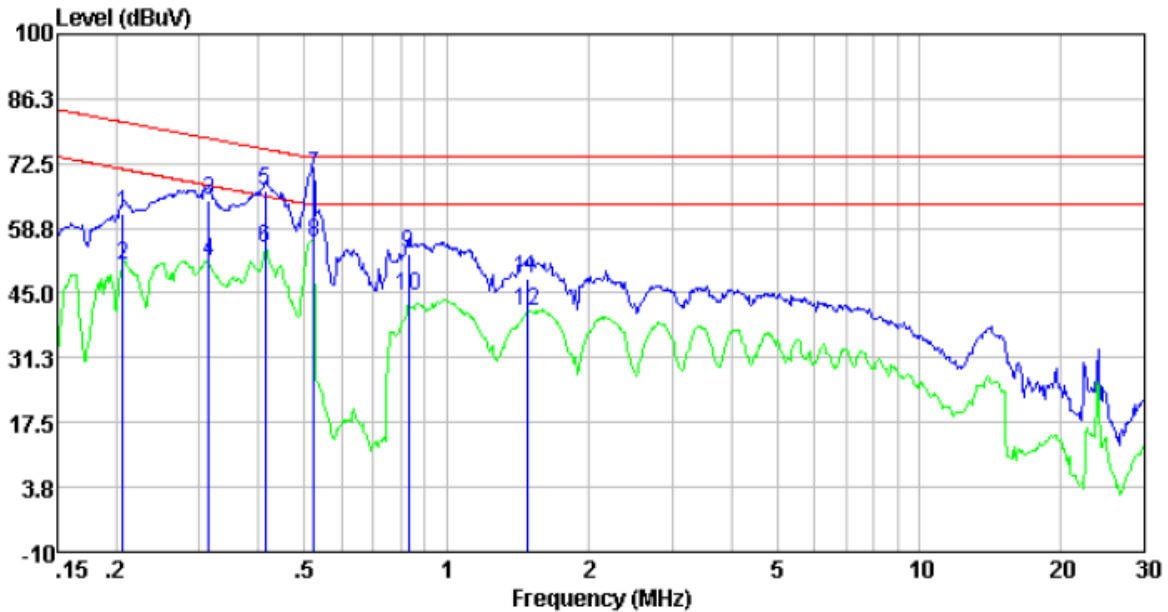
Test Requirement:	ETSI EN 301 489-17/-52, EN 55032																						
Test Method:	ETSI EN 301 489-1 and EN 55032																						
Test Frequency Range:	150kHz to 30MHz																						
Class / Severity:	Class B																						
Detector:	9kHz resolution bandwidth 0.15M to 30MHz																						
Limit:	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th><th colspan="2">Voltage Limits (dB<math>\mu</math>V)</th><th colspan="2">Current Limit (dB<math>\mu</math>A)</th></tr> <tr> <th>Quasi-peak</th><th>Average</th><th>Quasi-peak</th><th>Average</th></tr> </thead> <tbody> <tr> <td>0.15-0.5</td><td>84 to 74*</td><td>74 to 64*</td><td>40 to 30*</td><td>30 to 20*</td></tr> <tr> <td>0.5-30</td><td>74</td><td>64</td><td>30</td><td>20</td></tr> </tbody> </table> <p>* Decreases with the logarithm of the frequency.</p>				Frequency range (MHz)	Voltage Limits (dB $\mu$ V)		Current Limit (dB $\mu$ A)		Quasi-peak	Average	Quasi-peak	Average	0.15-0.5	84 to 74*	74 to 64*	40 to 30*	30 to 20*	0.5-30	74	64	30	20
Frequency range (MHz)	Voltage Limits (dB $\mu$ V)		Current Limit (dB $\mu$ A)																				
	Quasi-peak	Average	Quasi-peak	Average																			
0.15-0.5	84 to 74*	74 to 64*	40 to 30*	30 to 20*																			
0.5-30	74	64	30	20																			
Test setup:	  <p>Remark:  EUT: Equipment Under Test  ISN: Line Impedance Stabilization Network  Test table height=0.8m</p>																						
Remark:	The voltage measured shall be corrected at each frequency of interest as follows: if the current margin with respect to the current limit is $\leq 6$ dB, the actual current margin shall be subtracted from the measured voltage; if the current margin with respect to the current limit is $> 6$ dB, 6 dB shall be subtracted from the measured voltage.																						
Test environment:	Temp.: 24 °C	Humid.: 51%	Press.: 1012mbar																				
Measurement Record:	Uncertainty: 3.44dB																						
Test Instruments:	Refer to section 6 for details																						



Test mode:	Refer to section 5.2 for details only show the worst case.
Test results:	Pass

## Measurement Data

Test mode:	LAN mode
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Freq MHz	Reading level dBuV	LISN/ISN factor dB	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.21	52.16	9.75	0.01	61.92	81.36	-19.44	QP
0.21	41.28	9.75	0.01	51.04	71.36	-20.32	Average
0.31	54.77	9.80	0.01	64.58	77.88	-13.30	QP
0.31	42.05	9.80	0.01	51.86	67.88	-16.02	Average
0.41	56.74	9.80	0.01	66.55	75.59	-9.04	QP
0.41	44.80	9.80	0.01	54.61	65.59	-10.98	Average
0.52	60.23	9.80	0.01	70.04	74.00	-3.96	QP
0.52	45.75	9.80	0.01	55.56	64.00	-8.44	Average
0.83	43.56	9.80	0.03	53.39	74.00	-20.61	QP
0.83	34.72	9.80	0.03	44.55	64.00	-19.45	Average
1.48	38.28	9.74	0.04	48.06	74.00	-25.94	QP
1.48	31.53	9.74	0.04	41.31	64.00	-22.69	Average

Notes: Final Level = Receiver Read level + LISN Factor + Cable Loss

## 7.1.4 Harmonics Test Results

Test Requirement:	ETSI EN 301 489-17/-52, EN 61000-3-2
Test Method:	N/A: See Remark Below
Remark:	<p>There is no need for Harmonics test to be performed on this product (rated power of 75 W or less) in accordance with EN 61000-3-2. For further details, please refer to Clause 7, Note 1 of EN 61000-3-2</p> <p>Which states:</p> <p>“For the following categories of equipment limits are not specified in this edition of the standard.</p> <p>Note 1: Equipment with a rated power of 75W or less, other than lighting equipment.”</p>

## 7.1.5 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

	EUT values	Limit	Result
Pst	0.040	1.00	PASS
Plt	0.041	0.65	PASS
dc [%]	0.004	3.30	PASS
dmax [%]	0.061	4.00	PASS
dt [s]	0.002	0.50	PASS

## 8 Immunity

Performance Criteria of ETSI EN 301 489-1, clause 6	
<b>6.0 Introduction</b>	<p>The performance criteria are used to take a decision on whether a radio equipment passes or fails immunity tests.</p> <p>For the purpose of the present document two categories of performance criteria apply:</p> <ul style="list-style-type: none"> <li>• Performance criteria for continuous phenomena.</li> <li>• Performance criteria for transient phenomena.</li> </ul> <p>NOTE: Normally, the performance criteria depends upon the type of radio equipment and/or its intended application. Thus, the present document only contains general performance criteria commonly used for the assessment of radio equipment.</p>
<b>6.1 Performance criteria for continuous phenomena</b>	<p>During the test, the equipment shall:</p> <ul style="list-style-type: none"> <li>• continue to operate as intended;</li> <li>• not unintentionally transmit;</li> <li>• not unintentionally change its operating state;</li> <li>• not unintentionally change critical stored data.</li> </ul>
<b>6.2 Performance criteria for transient phenomena</b>	<p>For all ports and transient phenomena with the exception described below, the following applies:</p> <ul style="list-style-type: none"> <li>• The application of the transient phenomena shall not result in a change of the mode of operation (e.g. unintended transmission) or the loss of critical stored data.</li> <li>• After application of the transient phenomena, the equipment shall operate as intended.</li> </ul> <p>For surges applied to symmetrically operated wired network ports intended to be connected directly to outdoor lines the following criteria applies:</p> <ul style="list-style-type: none"> <li>• For products with only one symmetrical port intended for connection to outdoor lines, loss of function is allowed, provided the function is self-recoverable, or can be otherwise restored. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.</li> <li>• For products with more than one symmetrical port intended for connection to outdoor lines, loss of function on the port under test is allowed, provided the function is self-recoverable. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.</li> </ul>



Performance Criteria of ETSI EN 301 489-17, clause 6		
Criteria	During Test	After Test
<b>A</b>	Shall operate as intended. (see note). Shall be no loss of function. Shall be no unintentional transmissions.	Shall operate as intended. Shall be no degradation of performance. Shall be no loss of function. Shall be no loss of critical stored data.
<b>B</b>	May be loss of function .	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no loss of critical stored data.
<b>C</b>	May be loss of function .	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no loss of critical stored data.
<b>Note:</b>	Operate as intended during the test allows a level of degradation in accordance with clause 6.2.2.	
6.2.2	<p>Minimum performance level</p> <p>For equipment that supports a PER or FER, the minimum performance level shall be a PER or FER less than or equal to 10 %.</p> <p>For equipment that does not support a PER or a FER, the minimum performance level shall be no loss of the wireless transmission function needed for the intended use of the equipment.</p>	
6.3	<p>Performance criteria for Continuous phenomena</p> <p>The performance criteria A shall apply.</p> <p>Where the EUT is a transmitter in standby mode, unintentional transmission shall not occur during the test.</p> <p>Where the EUT is a transceiver in receive mode, unintentional transmission shall not occur during the test.</p>	
6.4	<p>Performance criteria for Transient phenomena</p> <p>The performance criteria B shall apply, except for voltage dips greater than or equal to 100 ms and voltage interruptions of 5 000 ms duration, for which performance criteria C shall apply.</p> <p>Where the EUT is a transmitter in standby mode, unintentional transmission shall not occur as a result of the application of the test.</p> <p>Where the EUT is a transceiver in receive mode, unintentional transmission shall not occur as a result of the application of the test.</p>	

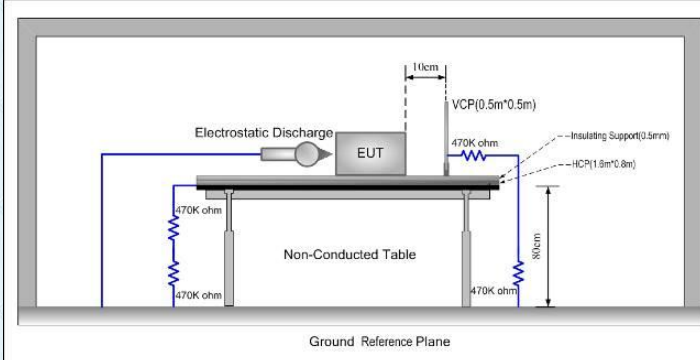
<p><b>Performance Criteria of ETSI EN 301 489-52, clause 6</b></p> <p><b>6.1 Performance criteria for Continuous phenomena</b></p> <p><b>6.1.1 GSM</b></p> <p><b>6.1.1.1 Performance criteria for Continuous phenomena applied to Transmitters (CT)</b></p> <p>During the test, the uplink speech output level shall be at least 35 dB (<math>\pm 3</math> dB) less than the previously recorded reference levels, when measured through an audio band pass filter of width 200 Hz, centred on 1 kHz (audiobreakthrough check).</p> <p>NOTE: When there is a high-level background noise present, the filter bandwidth can be reduced down to a minimum of 40 Hz.</p> <p>At the conclusion of the test, the EUT shall operate as intended with no loss of user control functions or critical stored data, and the communication link shall have been maintained. In addition to confirming the above performance during a call, the test shall also be performed in idle mode, and the transmitter shall not unintentionally operate.</p> <p><b>6.1.1.2 Performance criteria for Continuous phenomena applied to Receivers (CR)</b></p> <p>During the test, the RXQUAL of the downlink shall not exceed the value of three, measured during each individual exposure in the test sequence.</p> <p>During the test, the downlink speech output level shall be at least 35 dB (<math>\pm 3</math> dB) less than the previously recorded reference levels, when measured through an audio band pass filter of width 200 Hz, centred on 1 kHz (audiobreakthrough check).</p> <p>NOTE: When there is a high-level background noise present, the filter bandwidth can be reduced down to a minimum of 40 Hz.</p> <p>At the conclusion of the test, the EUT shall operate as intended with no loss of user control functions or critical stored data, and the communication link shall have been maintained.</p> <p><b>6.1.2 UTRA</b></p> <p>In the data transfer mode, the performance criteria can be one of the following:</p> <ul style="list-style-type: none"> <li>• if the BER (as referred in clause 5.3.1 of ETSI TS 134 109 [4]) is used, it shall not exceed 0,001 during the test sequence;</li> <li>• if the BLER (as referred in ETSI TS 134 109 [4]) is used, it shall not exceed 0,01 during the test sequence.</li> </ul> <p>The BLER calculation shall be based on evaluating the CRC on each transport block. Details are specified in annex C.</p> <p><b>6.1.3 E-UTRA, E-UTRA with LAA, inband or guard band NB-IoT, Standalone NB-IoT</b></p> <p>In data transfer mode, the data throughput of the EUT shall not fall below 95 % of the maximum data throughput. Details are specified in annex C.</p> <p><b>6.1.4 NR</b></p> <p>In data transfer mode, the data throughput of the EUT shall not fall below 95 % of the maximum data throughput. Details are specified in annex C.</p> <p><b>6.2 Performance criteria for Transient phenomena</b></p> <p>At the conclusion of each exposure of the transient phenomena, the EUT shall operate without loss of the communication link.</p> <p>At the conclusion of the total test comprising the series of individual exposures, the EUT shall operate as intended without loss of user control functions or critical stored data.</p> <p>In addition where the EUT supports idle mode it should be verified that the transmitter shall not unintentionally operate when transient phenomena are applied.</p>
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Performance Criteria Description in Clause 8 of EN 55035	
Criterion A:	<p>During and after the test the EUT shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a minimum performance level specified by the manufacturer when the EUT 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 EUT if used as intended.</p>
Criterion B:	<p>After the test, the EUT 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 EUT is used as intended. The performance level may be replaced by a permissible loss of performance.</p> <p>During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test.</p> <p>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 EUT if used as intended.</p>
Criterion C:	<p>During and after testing, a temporary loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls or cycling of the power to the EUT by the user in accordance with the manufacturer's instructions.</p> <p>Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.</p>



## 8.1 Electrostatic Discharge

Test Requirement:	ETSI EN 301 489-17/-52, EN 55035
Test Method:	EN 61000-4-2
Discharge Voltage:	Contact Discharge: $\pm 4\text{kV}$ Air Discharge: $\pm 2\text{kV}$ , $\pm 4\text{kV}$ , $\pm 8\text{kV}$ HCP/VCP: $\pm 4\text{kV}$
Polarity:	Positive & Negative
Number of Discharge:	Contact Discharge: Minimum 10 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:	<p><b>1. Air discharge:</b></p> <p>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</p> <p><b>2. Contact Discharge:</b></p> <p>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.</p> <p><b>3. Indirect discharge for horizontal coupling plane</b></p> <p>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</p>

	discharge. Consideration should be given to exposing all sides of the EUT. <b>4. Indirect discharge for vertical coupling plane</b> 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

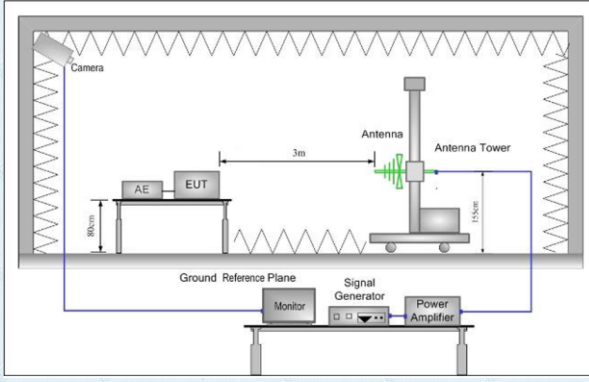
## Measurement Record:

Test points:	I: All metallic parts			
	II: All 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	Edge of the HCP	A	Pass
± 4	VCP	Center of the VCP	A	Pass

Remark:

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

## 8.2 Radio-frequency electromagnetic field Amplitude modulated

Test Requirement:	ETSI EN 301 489-17/-52, EN 55035				
Test Method:	EN 61000-4-3				
Frequency range:	80MHz to 6GHz				
Test Level:	3V/m				
Modulation:	80%, 1kHz Amplitude Modulation				
Performance Criterion:	Criterion A				
Test setup:					
Test Procedure:	<ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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).</li> <li>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.</li> <li>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.</li> <li>6. The test normally was performed with the generating antenna facing each side of the EUT.</li> <li>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.</li> <li>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.</li> </ol>				
Test environment:	Temp.:	25 °C	Humid.:	52%	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:

### ETSI EN 301 489-17/-52:

Frequency	Level	Modulation	Operating Mode	Antenna Polarization	EUT Face	Observations (Performance Criterion)
80 MHz-6 GHz	3 V/m	1 kHz, 80 % Amp. Mod, 1 % increment	All modes	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

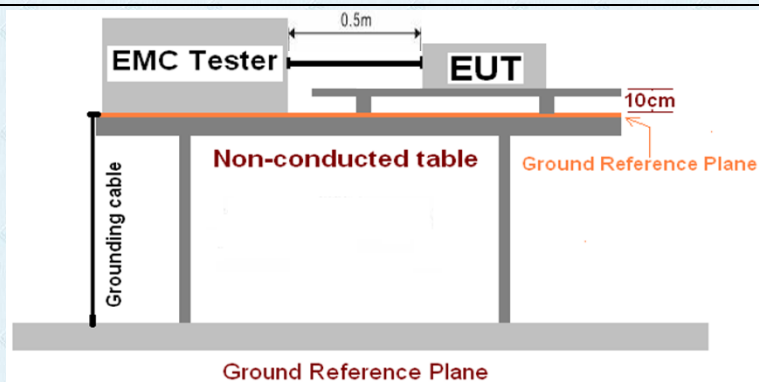
**EN 55035:**

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
1800MHz, 2600MHz 3500MHz 5000MHz	3 V/m	1 kHz, 80 % Amp. Mod, 1 % increment, dwell time=2seconds	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

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

## 8.3 Electrical fast transients

### 8.3.1 AC Port

Test Requirement:	ETSI EN 301 489-17/-52, EN 55035
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:	 <p>The diagram illustrates the test setup for AC Port EFT/B testing. It shows an EMC Tester connected to an EUT (Equipment Under Test) via a coupling device. The EUT is placed on a non-conductive table, which is supported by a wood support. The table is grounded to a ground reference plane. The distance between the EMC Tester and the EUT is 0.5m. The height of the EUT above the ground reference plane is 10cm. A grounding cable is connected to the ground reference plane.</p>
Test Procedure:	<ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> <li>4. The length of power lines between the coupling device and the EUT is 0.5m</li> <li>5. The EUT is connected to the power mains through a coupling device that directly couples the EFT/B interference signal.</li> <li>6. Each of the Line and Neutral conductors is impressed with burst noise for 2 minutes.</li> </ol>
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



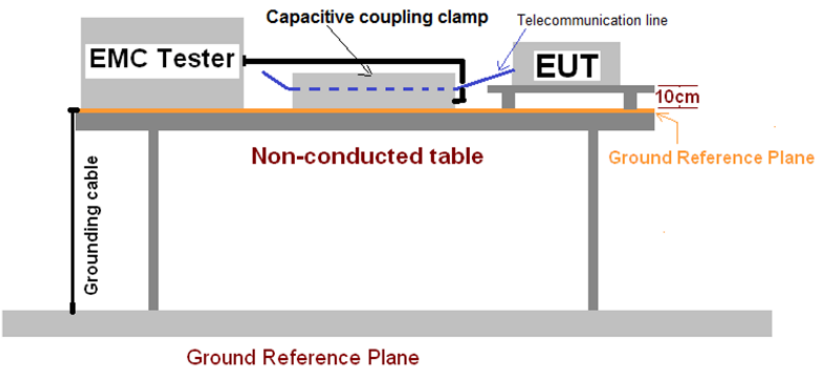
**Measurement Record:**

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

**Remark:**

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

## 8.3.2 Analogue/digital data ports

Test Requirement:	ETSI EN 301 489-17/-52, EN 55035					
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:	<ol style="list-style-type: none"> <li>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.</li> <li>2. The capacitive coupling clamp were placed on the ground reference plane.</li> <li>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.</li> <li>4. The length of the signal lines between the coupling device and the EUT is 0.5m</li> <li>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</li> <li>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.</li> </ol>					
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:**

Test port	Level (kV)	Coupling Direct/Clamp	Observations (Performance Criterion)	Result
analogue/digital data ports	$\pm 0.5$	Clamp	A	Pass

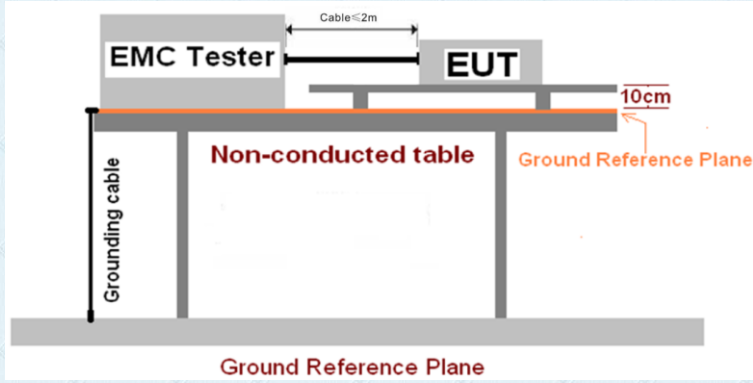
**Remark:**

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



## 8.4 Surges

### 8.4.1 AC ports

Test Requirement:	ETSI EN 301 489-17/-52, EN 55035
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:	 <p>The diagram illustrates the test setup. An EMC Tester and an EUT are positioned on a Non-conducted table. A cable (Cable &lt; 2m) connects the two. A Grounding cable is connected to the table. A Ground Reference Plane is indicated at a height of 10cm from the table surface.</p>
Test Procedure:	<ol style="list-style-type: none"> <li>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.</li> <li>At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are applied during test.</li> <li>Different phase angles are done individually.</li> <li>Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.</li> </ol>
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	$\pm 1$	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.

## 8.4.2 Analogue/digital data ports

Test Requirement:	ETSI EN 301 489-17/-52, EN 55035
Test Method:	EN 61000-4-5
Test Level:	1kV
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:	<ol style="list-style-type: none"> <li>1. For Coupling/decoupling networks mode, provide a 1kV 10/700us voltage surge</li> <li>2. At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are applied during test.</li> <li>3. Different phase angles are done individually.</li> <li>4. Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.</li> </ol>
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 port	Level (kV)	Pulse No	Surge Interval	Observations (Performance Criterion)	Result
analogue/digital data ports	± 1	5	60s	A	Pass

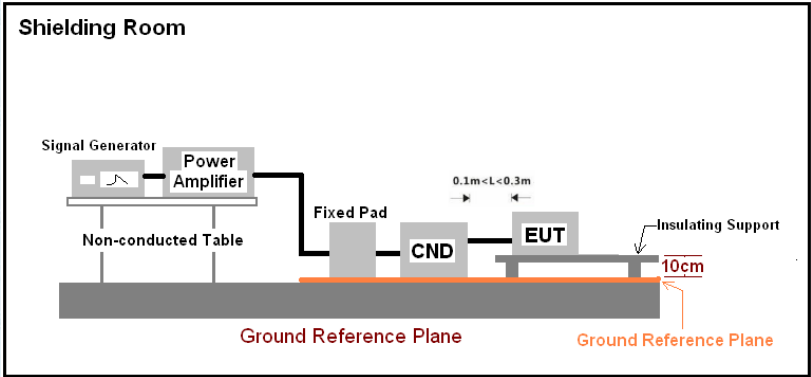
Remark:

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



## 8.5 Radio-frequency continuous conducted

### 8.5.1 AC ports

Test Requirement:	ETSI EN 301 489-17/-52, EN 55035
Test Method:	EN 61000-4-6
Frequency range:	0.15MHz to 80MHz
Test Level:	3V rms on AC Ports (unmodulated emf into 150 $\Omega$ )
Performance Criterion:	Criterion A
Test setup:	
Test Procedure:	<ol style="list-style-type: none"> <li>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).</li> <li>The disturbance signal described below is injected to EUT through CDN.</li> <li>The EUT operates within its operational mode(s) under intended climatic conditions after power on.</li> <li>Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.</li> </ol>
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

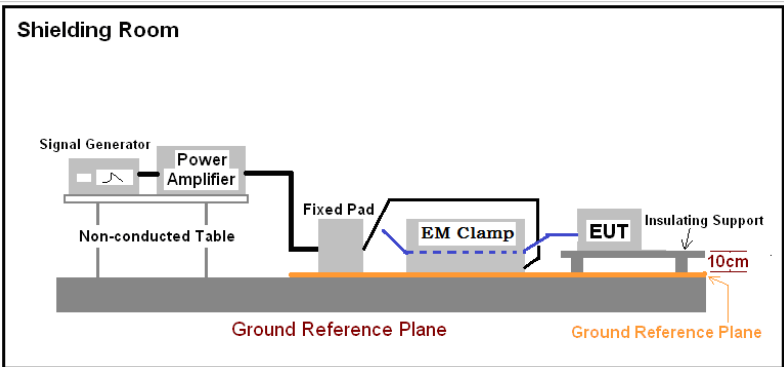
#### Measurement Record:

Level	Injected Position	Modulation	Observations (Performance Criterion)	Result
3 V rms (0.15MHz-10MHz)	CDN	1 kHz, 80 % Amp. Mod, 1 % increment, dwell time=2seconds	A	Pass
3 to 1 V rms (10MHz-30MHz, Lines)				
1 V rms (30MHz-80MHz)				

Remark:

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

## 8.5.2 Analogue/digital data ports

Test Requirement:	ETSI EN 301 489-17/-52, EN 55035
Test Method:	EN 61000-4-6
Frequency range:	0.15MHz to 80MHz
Test Level:	3V rms
Performance Criterion:	Criterion A
Test setup:	
Test Procedure:	<ol style="list-style-type: none"> <li>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).</li> <li>2. The signal line were place in the EM clamp.</li> <li>3. The disturbance signal described below is injected to EUT through EM clamp.</li> <li>4. The EUT operates within its operational mode(s) under intended climatic conditions after power on.</li> <li>5. Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.</li> </ol>
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

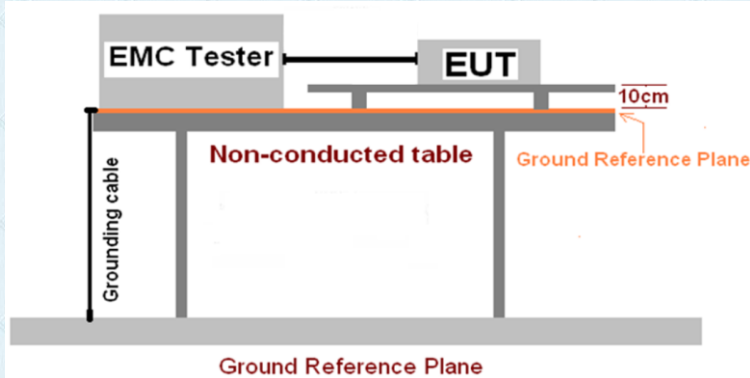
### Measurement Record:

Level	Injected Position	Modulation	Observations (Performance Criterion)	Result
3 V rms (0.15MHz-10MHz)	Clamp	1 kHz, 80 % Amp. Mod, 1 % increment, dwell time=2seconds	A	Pass
3 to 1 V rms (10MHz-30MHz, Lines)				
1 V rms (30MHz-80MHz)				

Remark:

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

## 8.6 Voltage dips and Voltage interruptions

Test Requirement:	ETSI EN 301 489-17/-52, EN 55035
Test Method:	EN 61000-4-11
Test Level:	EN 55035: 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 ETSI EN 301 489-17/-52: 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
Number of Dips / Interruptions:	3 per Level
Performance Criterion:	EN55035: >95% VD, 0.5 period----Performance criterion: B 30% VD, 25 period----Performance criterion: C >95% VI, 250 period----Performance criterion: C ETSI EN 301 489-17/-52: 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:	 <p>The diagram illustrates the test setup. An EMC Tester and an EUT (Equipment Under Test) are placed on a non-conducted table. A grounding cable is connected to the table. A ground reference plane is indicated at a height of 10cm from the table surface.</p>
Test Procedure:	<ol style="list-style-type: none"> <li>The EUT and test generator were setup as shown on above setup photo.</li> <li>The interruptions are introduced at selected phase angles with specified duration.</li> <li>Record any degradation of performance.</li> </ol>
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:**

EN55035:

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	A	Pass
0	250	0°, 90°, 180°, 270°	3	10s	C	Pass

*Remark:*
*A: No degradation in performance of the EUT was observed.*
*C: During the test, the EUT stops work, but after the test, it can be recovered by operator.*
**Measurement Record:**

ETSI EN 301 489-17/-52:

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	C

*Remark:*
*A: No loss of function was observed.*
*C: During the test, the EUT stops work, but after the test, it can be recovered by operator.*

## 9 Test Setup Photo

Reference to the **appendix I** for details.

## 10 EUT Constructional Details

Reference to the **appendix II** for details.

-----End-----