



EMC TEST REPORT

Applicant TP-LINK TECHNOLOGIES CO., LTD.
FCC ID TE7C5MAXV1
Brand TP-LINK
Product NEFFOS C5 MAX FDD-LTE SMART PHONE
Model TP702C
Report No. RXA1602-0019EMC01R1
Issue Date May 18, 2016

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC Code CFR47 Part15B (2015)/ ANSI C63.4 (2014)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Wei Liu

Reviewed by: Wei Liu

Guangchang Fan

Approved by: Guangchang Fan



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Summary of measurement results

Number	Test Case	Clause in FCC Rules	Conclusion
1	Radiated Emission	15.109, ANSI C63.4-2014	PASS
2	Conducted Emission	15.107, ANSI C63.4-2014	PASS
Test Date: March 3, 2016 ~ March 8, 2016			

1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of TA technology (shanghai) co., Ltd). The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above. This report must not be used by the client to claim product certification, approval, or endorsement by CNAS or any government agencies.

1.2 Test facility

CNAS (accreditation number: L2264)

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

FCC (recognition number is 428261)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

IC (recognition number is 8510A)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

VCCI (recognition number is C-4595, T-2154, R-4113, G-766)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.



1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China
City: Shanghai
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Country: P. R. China
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Website: <http://www.ta-shanghai.com>
E-mail: xukai@ta-shanghai.com

2 General Description of Equipment under Test

2.1 Client Information

Applicant	TP-LINK TECHNOLOGIES CO., LTD.
Applicant address	Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China
Manufacturer	TP-LINK TECHNOLOGIES CO., LTD.
Manufacturer address	Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China

2.2 General information

EUT Description	
Device Type:	Portable Device
Product Name:	NEFFOS C5 MAX FDD-LTE SMART PHONE
Model Number:	TP702C
HW Version:	AL1520_MB_PCB_V2.0
SW Version:	H10S100D03B20160128R1004
IMEI:	SIM 1: 868983020043400 SIM 2: 868983020044416
Antenna Type:	Internal Antenna
Used Host Product:	PC: Model: DELL E6430(SN : 32RKWW1)
Test Mode:	Transfer Data Mode
EUT Accessory	
Adapter	Manufacturer: TP-LINK TECHNOLOGIES CO.,LTD. Model: N050200-2B3
Battery	Manufacturer: DongGuan Amperex Technology Co., Ltd Model: NBL-44A3045 Power Rating: DC 3.8V, 3045mAh, Li-ion
USB Cable	Manufacturer: TP-LINK TECHNOLOGIES CO.,LTD. 100cm Cable,
Remark: The information of the EUT is declared by the manufacturer. Please refer to the specifications or user manual for details.	



2.3 Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards

FCC Code CFR47 Part15B (2015)

ANSI C63.4 (2014)

3 Test Case Results

3.1 Radiated Emission

Ambient condition

Temperature	Relative humidity	Pressure
24°C~26°C	45%~50%	102.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table 0.8m above the horizontal metal reference ground plane. The distance between EUT and receive antenna should be 3 meters. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.4-2014. Sweep the whole frequency band through the range from 30MHz to the 5th harmonic of the carrier. During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum of radiated signal level.

The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing. During the test, the EUT is worked at maximum output power.

Set the spectrum analyzer in the following:

Below 1GHz:

RBW=100 kHz / VBW=300 kHz / Sweep=AUTO

Above 1GHz:

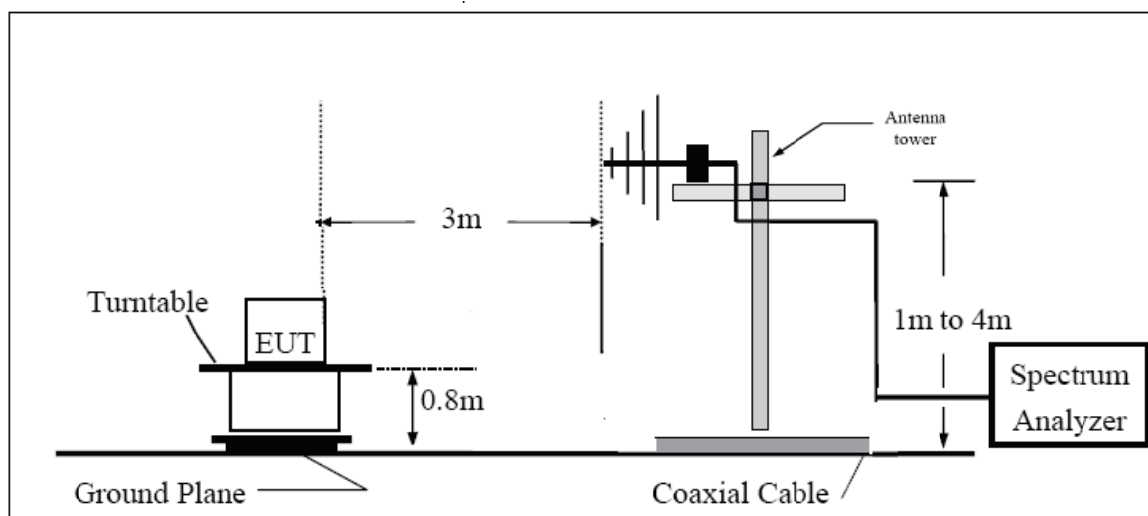
(a) PEAK: RBW=1MHz VBW=3MHz/ Sweep=AUTO

(b) AVERAGE: RBW=1MHz / VBW=3MHz / Sweep=AUTO

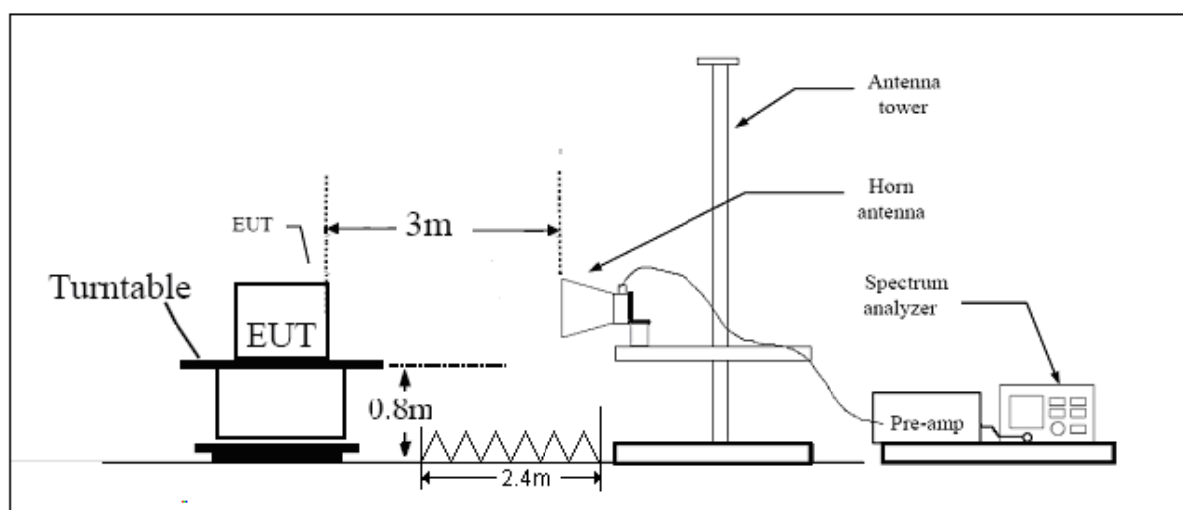
During the test, EUT is connected to a laptop via a USB cable in the case of Transfer Data mode. The EUT is used as the peripheral equipment of the PC. The data is transferred from EUT to PC; PC is connected to server via a long LAN cable.

Test Setup

Below 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

Antenna Tower meets ANSI C63.4 requirements for measurements above 1 GHz by keeping the antenna aimed at the EUT during the antenna's ascent/ descent along the antenna mast.

Limits

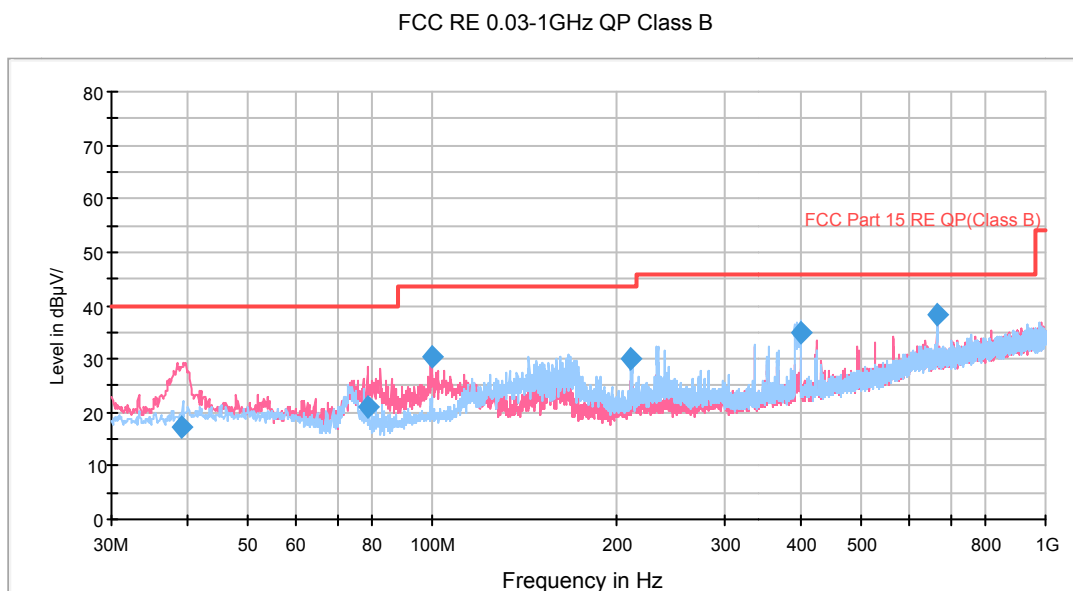
Frequency (MHz)	Field Strength (dB μ V/m)	Detector
30 -88	40.0	Quasi-peak
88-216	43.5	Quasi-peak
216 – 960	46.0	Quasi-peak
960-1000	54.0	Quasi-peak
1000-5 th harmonic of the highest frequency or 40GHz, which is lower	54 74	Average Peak

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$. $U = 3.92$ dB.

Test Results

The following graphs display the maximum values of horizontal and vertical by software.
For above 1GHz, Blue trace uses the peak detection, Green trace uses the average detection.

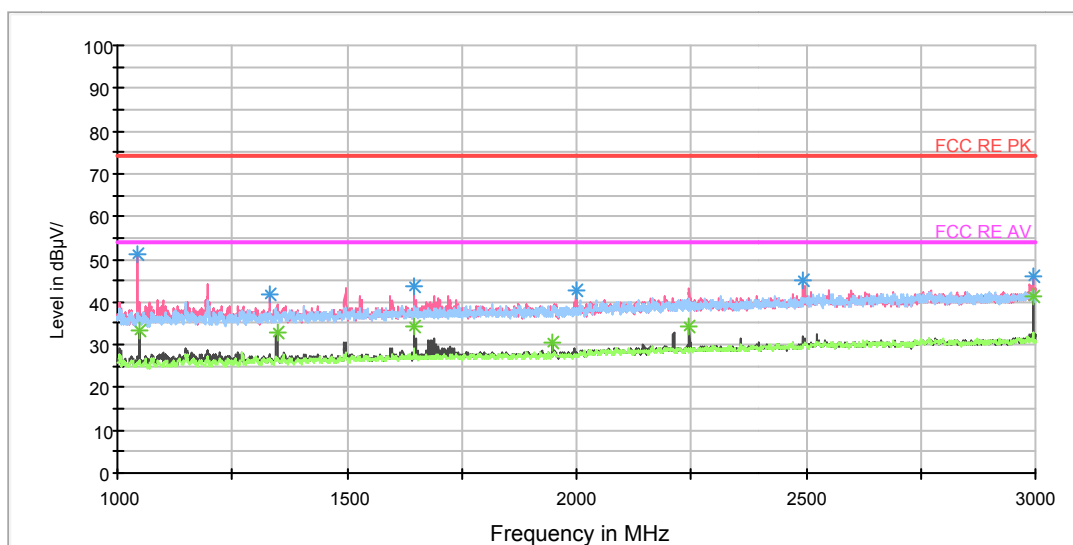


Radiated Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
38.966250	17.3	30.2	100.0	V	312.0	-12.9	22.7	40.0
78.582500	21.0	29.5	125.0	V	297.0	-8.5	19.0	40.0
99.920000	30.4	43.6	100.0	V	315.0	-13.2	13.1	43.5
211.268750	30.2	42.7	125.0	H	97.0	-12.5	13.3	43.5
399.125000	34.8	52.7	100.0	H	46.0	-17.9	11.2	46.0
666.442500	38.4	61.0	125.0	H	63.0	-22.6	7.6	46.0

- Remark:**
1. Quasi-Peak = Reading value + Correction factor
 2. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)
 3. Margin = Limit – Quasi-Peak

RE 1G-6GHz PK+AV Class B

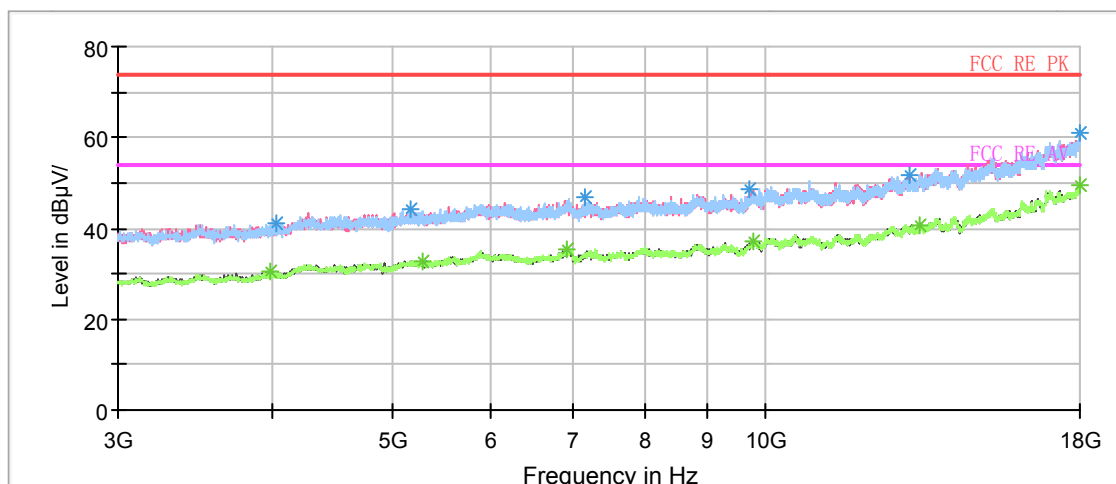


Radiated Emission from 1GHz to 3GHz

Frequency (MHz)	Peak (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1048.000000	39.7	50.9	100.0	V	254.0	-11.2	34.3	74
1347.500000	39.6	49.6	100.0	V	38.0	-10.0	34.4	74
1647.000000	42.9	51.7	100.0	V	355.0	-8.8	31.1	74
1946.500000	38.5	46.5	100.0	V	71.0	-8.0	35.5	74
2246.000000	41.8	48.1	100.0	V	15.0	-6.3	32.2	74
2995.000000	45.8	49.8	100.0	V	104.0	-4.0	28.2	74

Frequency (MHz)	Average (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1042.000000	26.0	37.2	100.0	V	344.0	-11.2	28.0	54
1332.500000	27.7	37.7	100.0	V	329.0	-10.0	26.3	54
1646.500000	32.9	41.7	100.0	V	355.0	-8.8	21.1	54
1998.000000	28.0	35.8	100.0	V	286.0	-7.8	26.0	54
2492.000000	31.9	37.0	100.0	V	3.0	-5.1	22.1	54
2995.500000	38.2	42.2	100.0	V	104.0	-4.0	15.8	54

RE 3-18GHz PK+AV

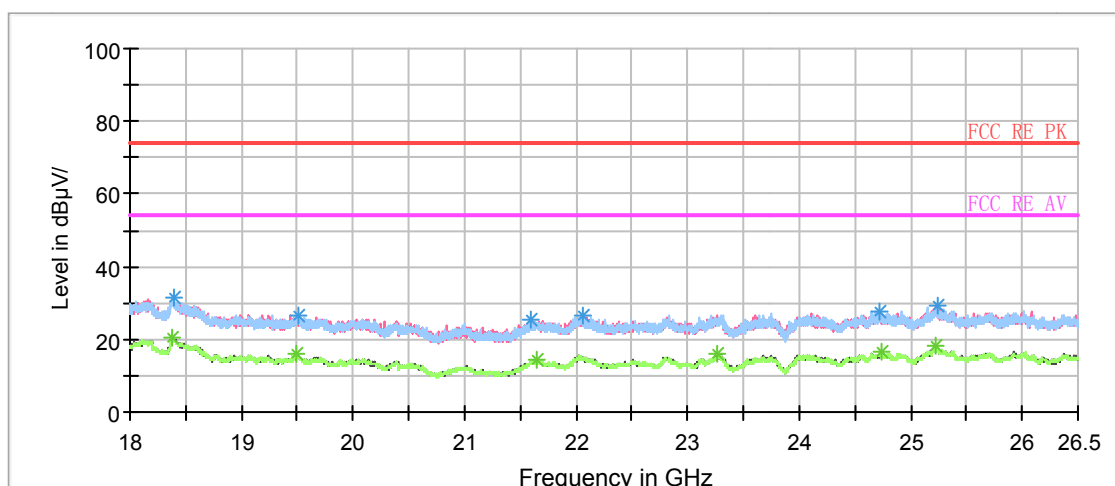


Radiated Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
3988.125000	40.2	40.6	101.0	V	297.0	-0.4	33.8	74
5295.000000	43.7	47.5	101.0	H	158.0	-3.8	30.3	74
6933.750000	44.5	51.3	101.0	H	263.0	-6.8	29.5	74
9800.625000	46.8	59.1	101.0	H	263.0	-12.3	27.2	74
13346.250000	50.2	66.0	101.0	H	0.0	-15.8	23.8	74
17988.750000	59.7	85.0	101.0	H	56.0	-25.3	14.3	74

Frequency (MHz)	Average (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
3988.125000	30.4	30.8	101.0	V	297.0	-0.4	23.6	54
5295.000000	32.8	36.6	101.0	H	158.0	-3.8	21.2	54
6933.750000	35.6	42.4	101.0	H	263.0	-6.8	18.4	54
9800.625000	37.2	49.5	101.0	H	263.0	-12.3	16.8	54
13346.250000	40.8	56.6	101.0	H	0.0	-15.8	13.2	54
17988.750000	49.7	75.0	101.0	H	56.0	-25.3	4.3	54

RE 18-26.5GHz PK+AV



Radiated Emission from 18GHz to 26.5GHz

Frequency (MHz)	Peak (dBuV/m)	Reading value (dBuV/m)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18385.687500	30.0	34.8	H	288.0	-4.8	44.0	74
19486.437500	24.4	32.1	V	335.0	-7.7	49.6	74
21640.125000	24.1	33.2	H	109.0	-9.1	49.9	74
23265.750000	26.1	33.4	V	277.0	-7.3	47.9	74
24734.125000	26.5	32.8	V	0.0	-6.3	47.5	74
25218.625000	26.7	32.7	V	98.0	-6.0	47.3	74

Frequency (MHz)	Average (dBuV/m)	Reading value (dBuV/m)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18385.687500	20.2	25.0	H	288.0	-4.8	33.8	54
19486.437500	15.9	23.6	V	335.0	-7.7	38.1	54
21640.125000	14.4	23.5	H	109.0	-9.1	39.6	54
23265.750000	15.8	23.1	V	277.0	-7.3	38.2	54
24734.125000	16.5	22.8	V	0.0	-6.3	37.5	54
25218.625000	18.0	24.0	V	98.0	-6.0	36.0	54

3.2 Conducted Emission

Ambient condition

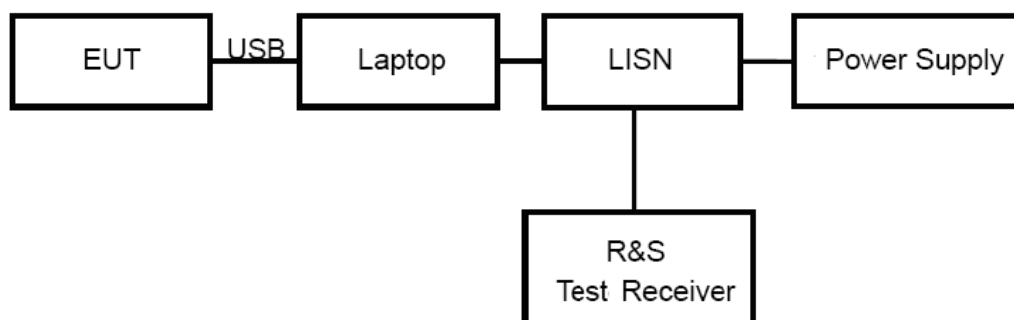
Temperature	Relative humidity	Pressure
24°C ~26°C	50%~55%	102.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table of 80cm height above the horizontal metal reference ground plane. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.4-2014. Connect the AC power line of the EUT to the L.I.S.N. Use EMI receiver to detect the average and Quasi-peak value. RBW is set to 9 kHz, VBW is set to 30kHz. The measurement result should include both L line and N line.

During the test, EUT is connected to a laptop via a USB cable in the case of Transfer Data mode. The EUT is used as the peripheral equipment of the PC. The data is transferred from EUT to PC; PC is connected to server via a long LAN cable.

Test Setup



Note: Power Supply is AC Power source and it is used to change the voltage 120V/60Hz.

Limits

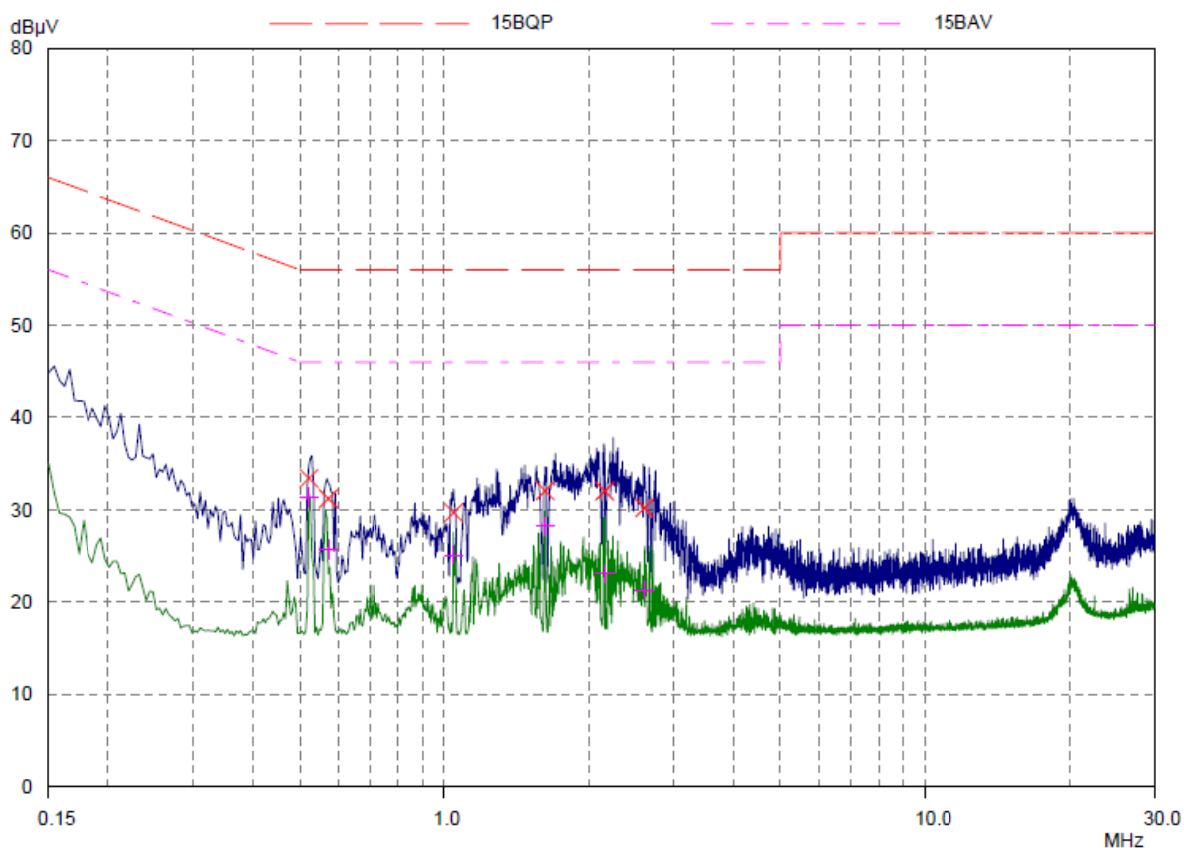
Frequency (MHz)	Conducted Limits(dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46 *
0.5 - 5	56	46
5 - 30	60	50
*: Decreases with the logarithm of the frequency.		

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$. $U = 2.69$ dB.

Test Results

Following plots, Blue trace uses the peak detection; Green trace uses the average detection.



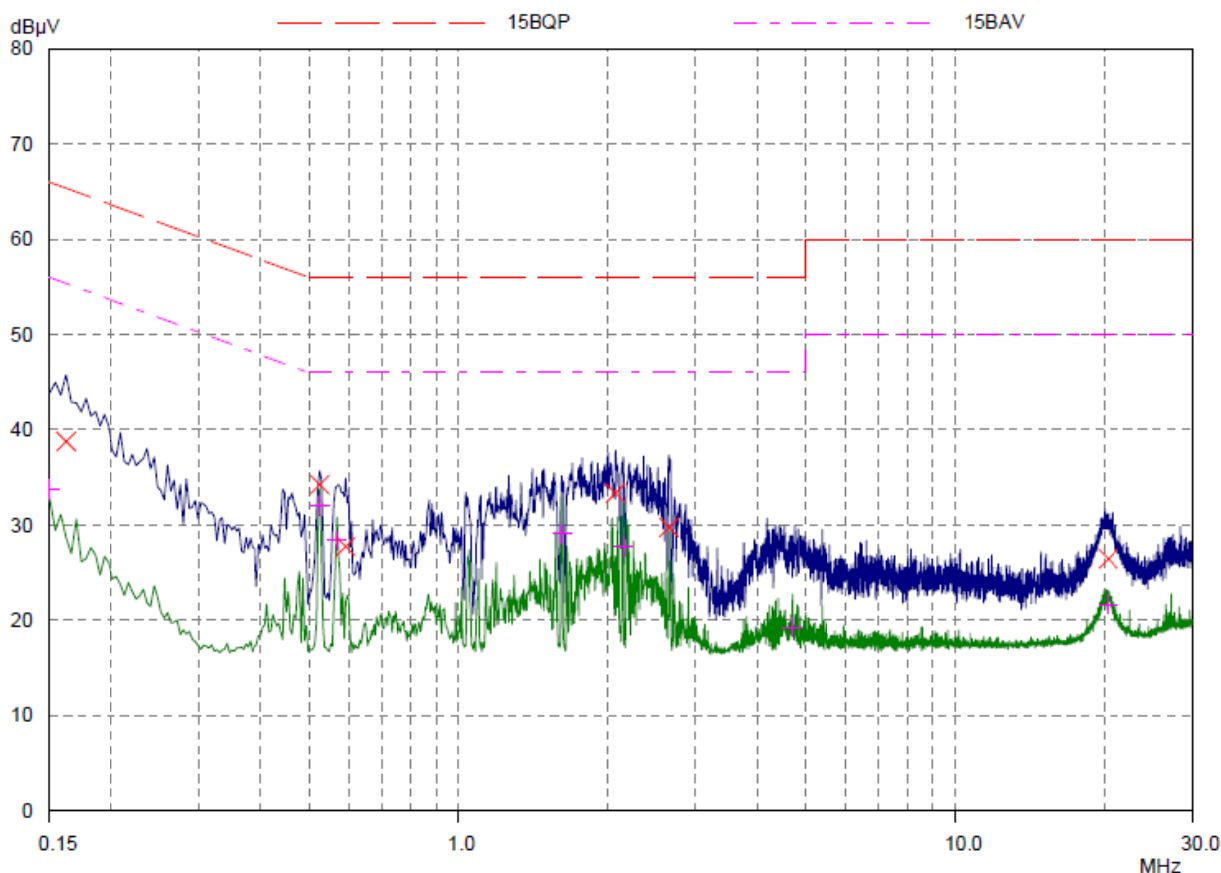
Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -	PE -
0.52109	33.40	56.00	22.60	L1	gnd
0.57187	31.20	56.00	24.80	L1	gnd
1.04453	29.70	56.00	26.30	L1	gnd
1.61875	32.05	56.00	23.95	L1	gnd
2.15	32.02	56.00	23.98	L1	gnd
2.59921	30.21	56.00	25.79	L1	gnd

Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.52109	31.33	46.00	14.67	L1	gnd
0.57187	25.72	46.00	20.28	L1	gnd
1.04453	25.07	46.00	20.93	L1	gnd
1.61875	28.23	46.00	17.77	L1	gnd
2.15	23.09	46.00	22.91	L1	gnd
2.59921	21.32	46.00	24.68	L1	gnd

L line

Conducted Emission from 150 KHz to 30 MHz



Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -	PE -
0.16171	38.77	65.38	26.61	N	gnd
0.525	34.24	56.00	21.76	N	gnd
0.5914	27.74	56.00	28.26	N	gnd
2.07187	33.34	56.00	22.66	N	gnd
2.65	29.75	56.00	26.25	N	gnd
20.36875	26.44	60.00	33.56	N	gnd

Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.15	33.75	56.00	22.25	N	gnd
0.525	32.08	46.00	13.92	N	gnd
0.56796	28.39	46.00	17.61	N	gnd
1.61875	29.05	46.00	16.95	N	gnd
2.14609	27.72	46.00	18.28	N	gnd
4.69296	19.28	46.00	26.72	N	gnd
20.36875	21.67	50.00	28.33	N	gnd

N line

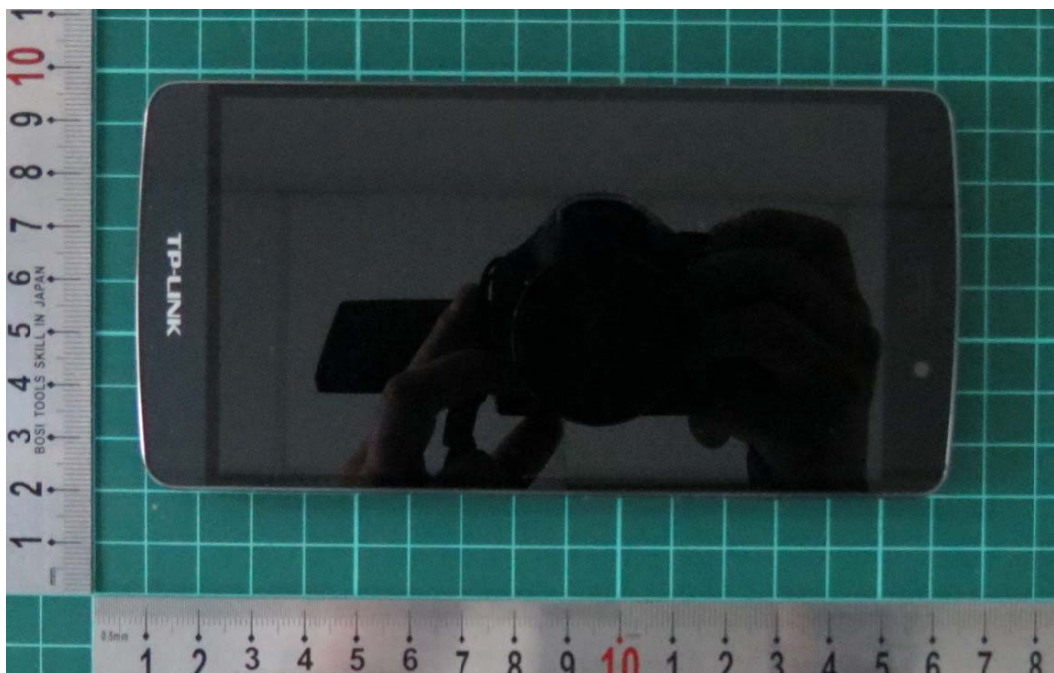
Conducted Emission from 150 KHz to 30 MHz

4 Main Test Equipment

Name	Type	Manufacturer	Serial Number	Last Cal.	Cal. Due Date
EMI Test Receiver	ESCI	R&S	100948	2015-05-22	2016-05-21
Signal Analyzer	FSV30	R&S	100815	2015-12-17	2016-12-16
Trilog Antenna	VULB 9163	SCHWARZBECK	9163-201	2014-12-06	2017-12-05
Horn Antenna	HF907	R&S	100126	2014-12-06	2017-12-05
Horn Antenna	3160-09	ETS-Lindgren	00102643	2015-01-30	2018-01-29
EMI Test Receiver	ESCS30	R&S	100138	2015-12-17	2016-12-16
LISN	ENV216	R&S	101171	2013-12-18	2016-12-17
Bore Sight Antenna mast	2171B	ETS	00058752	NA	NA

ANNEX A: The EUT Appearance and Test Configuration

A.1 EUT Appearance



Front Side



Back Side

a:EUT



b: Adapter
Picture 1 EUT

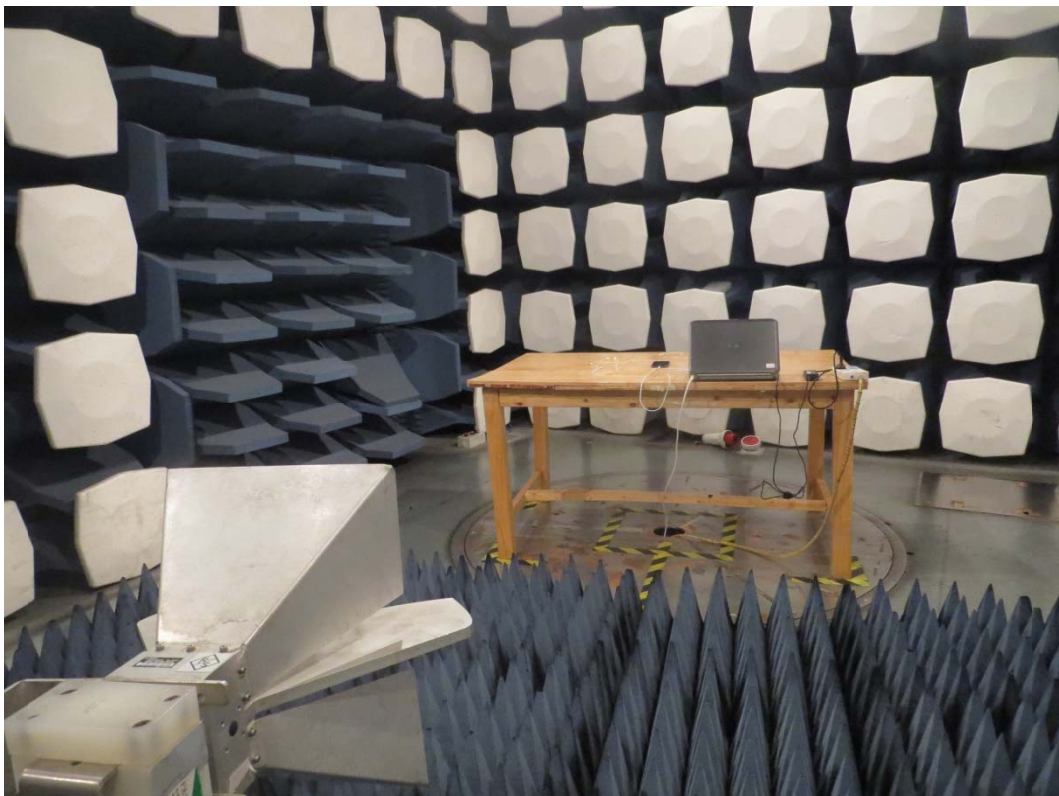
A.2 Test Setup



Picture 2 Conducted Emission Test Setup



a: Below 1GHz



b: Above 1GHz

Picture 3 Radiated Emission Test Setup

A.3 Host Product

