



EMC TEST REPORT

Applicant Huawei Technologies Co., Ltd.
FCC ID QISVIE-L09
Product Smart Phone
Model VIE-L09
Report No. RHA1602-0013EMC01
Issue Date April 11, 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

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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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E-mail: xukai@ta-shanghai.com

2 General Description of Equipment under Test

2.1 Client Information

Applicant	Huawei Technologies Co., Ltd.
Applicant address	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129 P.R.China
Manufacturer	Huawei Technologies Co., Ltd.
Manufacturer address	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129 P.R.China

2.2 General information

EUT Description	
Device Type:	Portable Device
Product Name:	Smart Phone
Model Number:	VIE-L09
HW Version:	HL1AVIENNAM
SW Version:	A169-L09C900B071
IMEI:	004401725654723
Antenna Type:	Internal Antenna
Used Host Product:	PC: Model: DELL E6430(SN : 32RKWW1)
Test Mode:	Transfer Data Mode
EUT Accessory	
Adapter 1	Manufacturer: HUIZHOU BYD ELECTRONIC CO.,. LTD. Model: HW-059200UHQ Input power: -100V-240V-5V/9V 2A Output power: 5V/9V DC2A
Adapter 2	Manufacturer: Salcomp (Shenzhen)Co.,Ltd Model: HW-059200UHQ Input power: -100V-240V-5V/9V 2A Output power: 5V/9V DC2A
Battery 1	Manufacturer: Sunwoda Electronic Co., LTD Model: HB376883ECW



Battery 2	Manufacturer: Desay Battery Co., Ltd. Model: HB376883ECW
Battery 3	Manufacturer: SCUD (FUJIAN) Electronics Co., Ltd Model: HB376883ECW
USB Cable 1	Manufacturer: FOXCONN INTERCONNECT TECHNOLOGY LIMITED. Model: CUDU01B-HC212-EH, 100cm Cable
USB Cable 2	Manufacturer: LUXSHARE-ICT Co., Ltd. Model: L99UC001-CS-H, 100cm Cable
USB Cable 3	Manufacturer: Chang Shu Honglin Technology Co., Ltd. Model: 130-26988, 100cm Cable
<p>Remark: 1. The information of the EUT is declared by the manufacturer. Please refer to the specifications or user manual for details.</p> <p>2. There is more than one USB cable/ Adapter/ Battery, each one should be applied throughout the compliance test respectively, and however, only the worst case (USB cable 1/ Adapter 1/ Battery 1) will be recorded in this report.</p>	



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 spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. During the test, EUT is connected to a laptop via a SD card I/O port. 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 USB cable.

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:

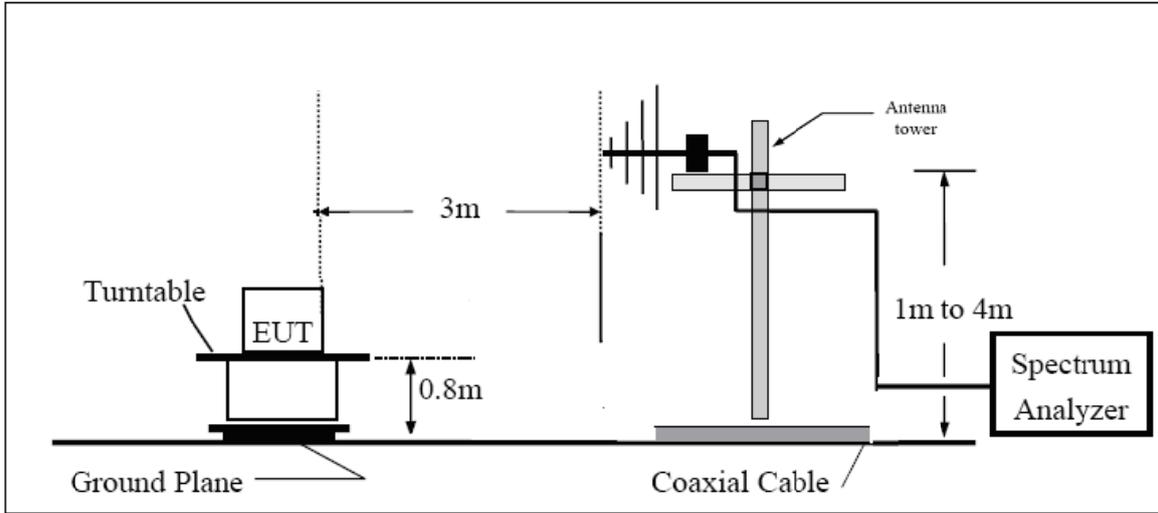
(a) PEAK: RBW=1MHz VBW=3MHz/ Sweep=AUTO

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

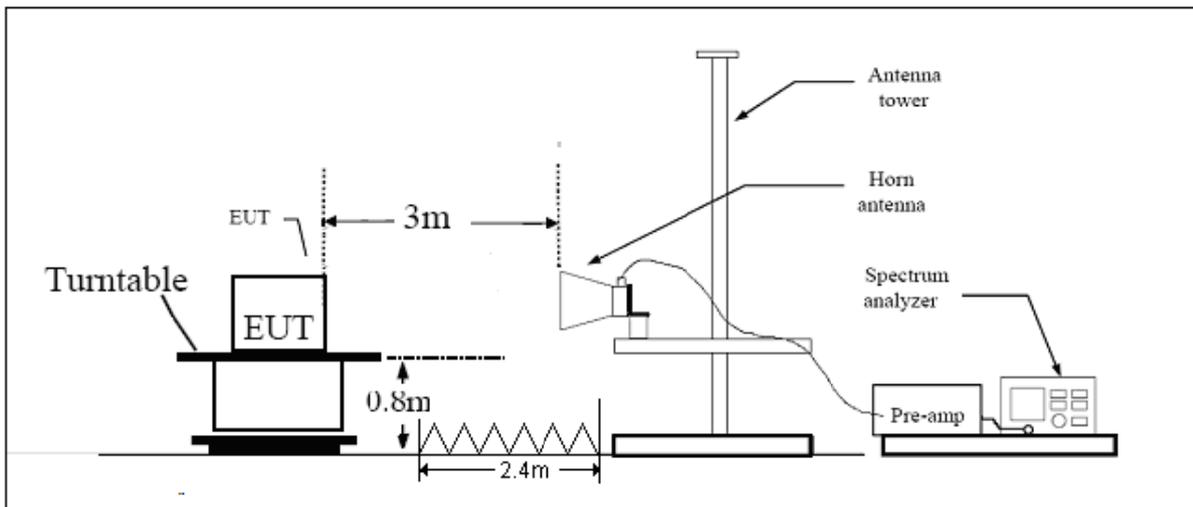
The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X axis) and the worst case was recorded.

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

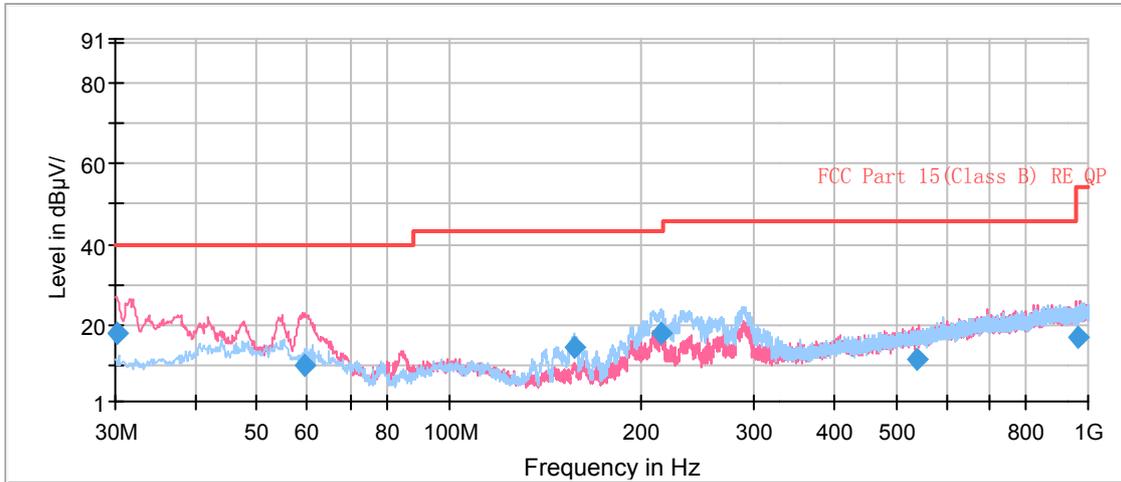
Measurement Uncertainty

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.
 The signal beyond the limit is carrier.

RE 30M-1GHz QP

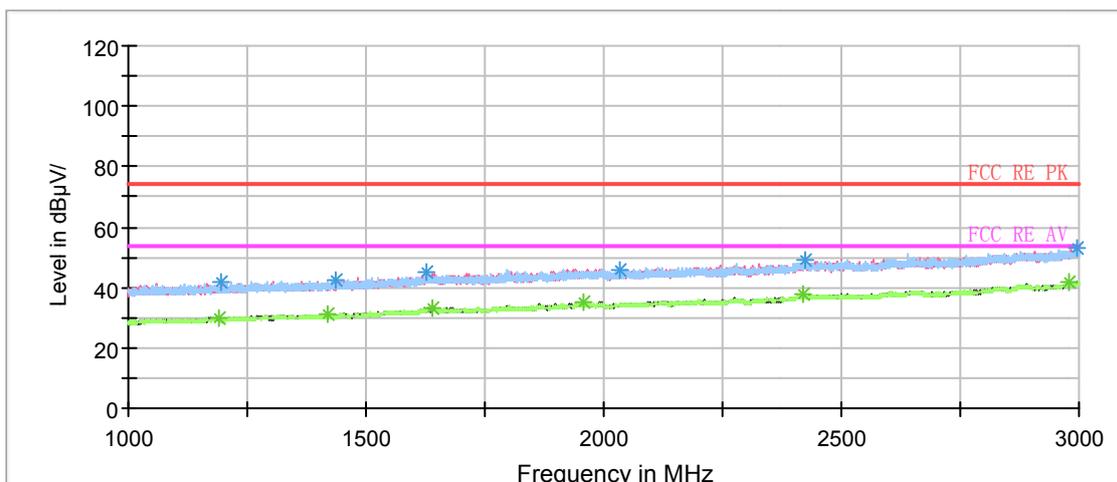


Radiated Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
30.125947	17.7	40.1	101.0	V	0.0	-22.4	22.3	40.0
59.234144	9.7	32.7	100.0	V	300.0	-23.0	30.3	40.0
156.873538	14.3	43.3	127.0	H	76.0	-29.0	29.2	43.5
214.886000	17.9	43.5	104.0	H	287.0	-25.6	25.6	43.5
540.641750	11.5	29.8	124.0	V	82.0	-18.3	34.5	46.0
961.944750	16.9	29.7	127.0	V	104.0	-12.8	37.1	54.0

- 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-3GHz PK+AV

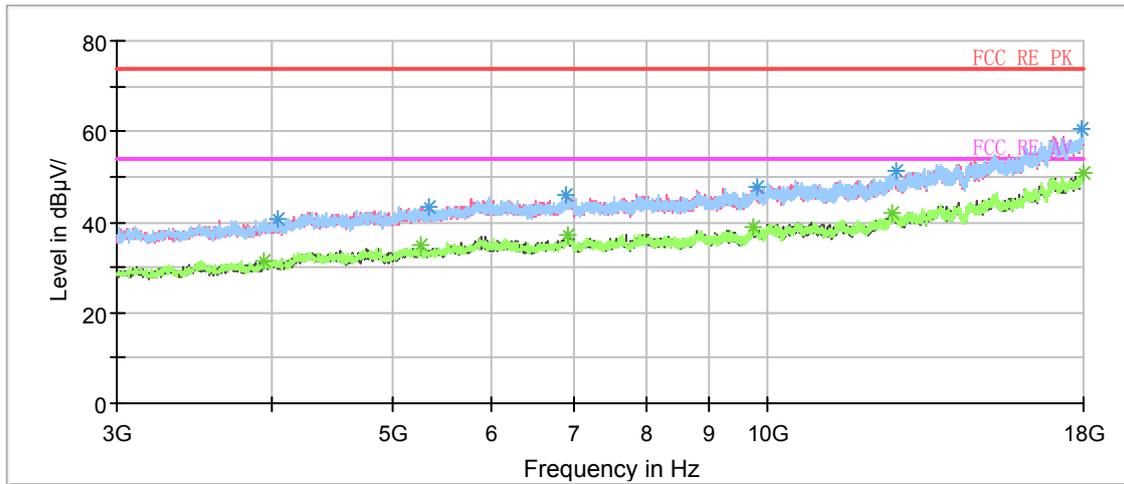


Radiated Emission from 1GHz to 3GHz

Frequency (MHz)	Peak (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1193.750000	41.7	49.9	102.0	H	28.0	-8.2	32.3	74
1436.500000	42.3	49.2	102.0	H	0.0	-6.9	31.7	74
1629.000000	44.8	49.5	102.0	H	159.0	-4.7	29.2	74
2032.250000	46.1	49.5	102.0	V	269.0	-3.4	27.9	74
2424.000000	48.9	49.4	102.0	H	136.0	-0.5	25.1	74
2994.750000	53.0	55.3	102.0	V	229.0	-2.3	21.0	74

Frequency (MHz)	Average (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1190.000000	29.8	38.0	102.0	H	62.0	-8.2	24.2	54
1421.000000	30.9	37.8	102.0	H	56.0	-6.9	23.1	54
1638.250000	33.3	38.0	102.0	V	129.0	-4.7	20.7	54
1957.000000	35.1	38.5	102.0	V	157.0	-3.4	18.9	54
2421.500000	37.5	38.0	102.0	H	0.0	-0.5	16.5	54
2978.250000	41.6	43.8	102.0	V	194.0	-2.2	12.4	54

RE 3-18GHz PK+AV

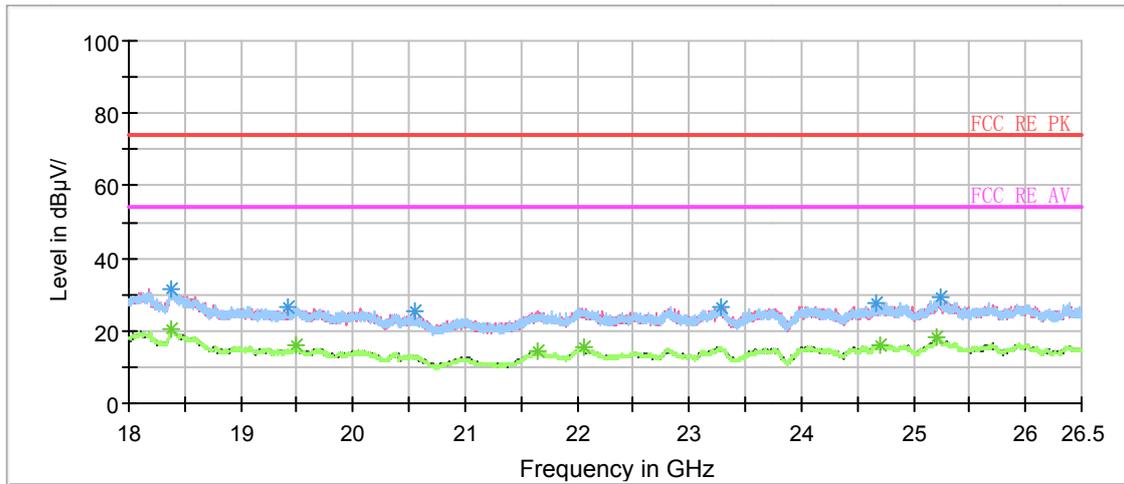


Radiated Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4040.625000	40.8	41.4	102.0	V	358.0	-0.6	33.2	74
5358.750000	43.4	47.1	102.0	V	0.0	-3.7	30.6	74
6901.875000	46.1	53.1	102.0	V	0.0	-7.0	27.9	74
9819.375000	47.6	59.7	102.0	H	94.0	-12.1	26.4	74
12705.000000	51.1	66.2	102.0	H	0.0	-15.1	22.9	74
17958.750000	60.4	85.3	102.0	H	215.0	-24.9	13.6	74

Frequency (MHz)	Average (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
3939.375000	31.6	31.7	102.0	H	56.0	-0.1	22.4	54
5272.500000	34.8	38.5	102.0	H	186.0	-3.7	19.2	54
6926.250000	37.0	43.8	102.0	V	204.0	-6.8	17.0	54
9755.625000	39.1	50.8	102.0	H	228.0	-11.7	14.9	54
12645.000000	42.1	57.0	102.0	V	160.0	-14.9	11.9	54
18000.000000	50.9	76.3	102.0	V	57.0	-25.4	3.1	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)
18382.500000	31.7	36.5	V	0.0	-4.8	42.3	74
19422.687500	26.5	34.3	V	349.0	-7.8	47.5	74
20555.312500	25.3	33.4	V	242.0	-8.1	48.7	74
23283.812500	26.4	33.5	H	0.0	-7.1	47.6	74
24666.125000	27.4	34.5	H	16.0	-7.1	46.6	74
25237.750000	29.1	35.2	H	109.0	-6.1	44.9	74

Frequency (MHz)	Average (dBuV/m)	Reading value (dBuV/m)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18382.500000	20.3	25.1	H	41.0	-4.8	33.7	54
19492.812500	15.8	23.4	V	44.0	-7.6	38.2	54
21648.625000	14.5	23.7	H	195.0	-9.2	39.5	54
22057.687500	15.5	23.6	H	58.0	-8.1	38.5	54
24700.125000	16.2	22.9	H	83.0	-6.7	37.8	54
25210.125000	18.1	24.4	H	195.0	-6.3	35.9	54

3.2 Conducted Emission

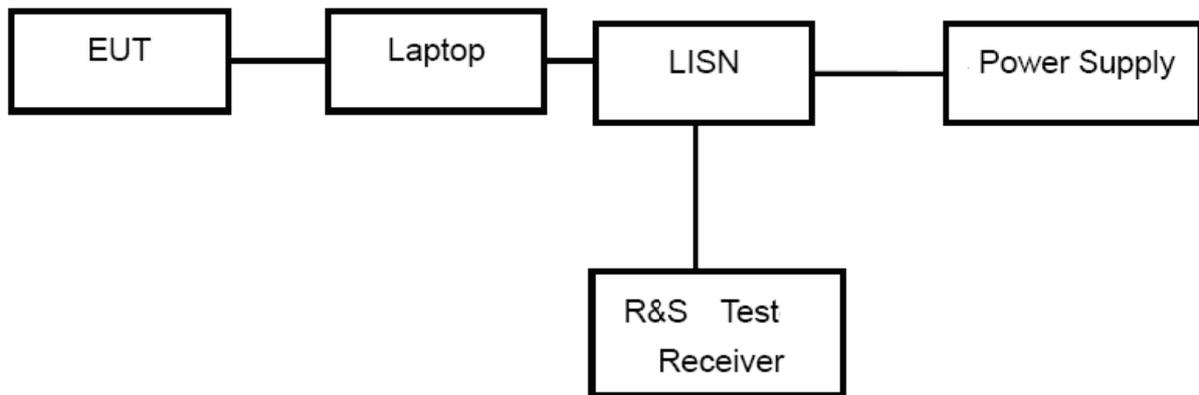
Ambient condition

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 SD card I/O port. The EUT is used as the peripheral equipment of the PC.

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

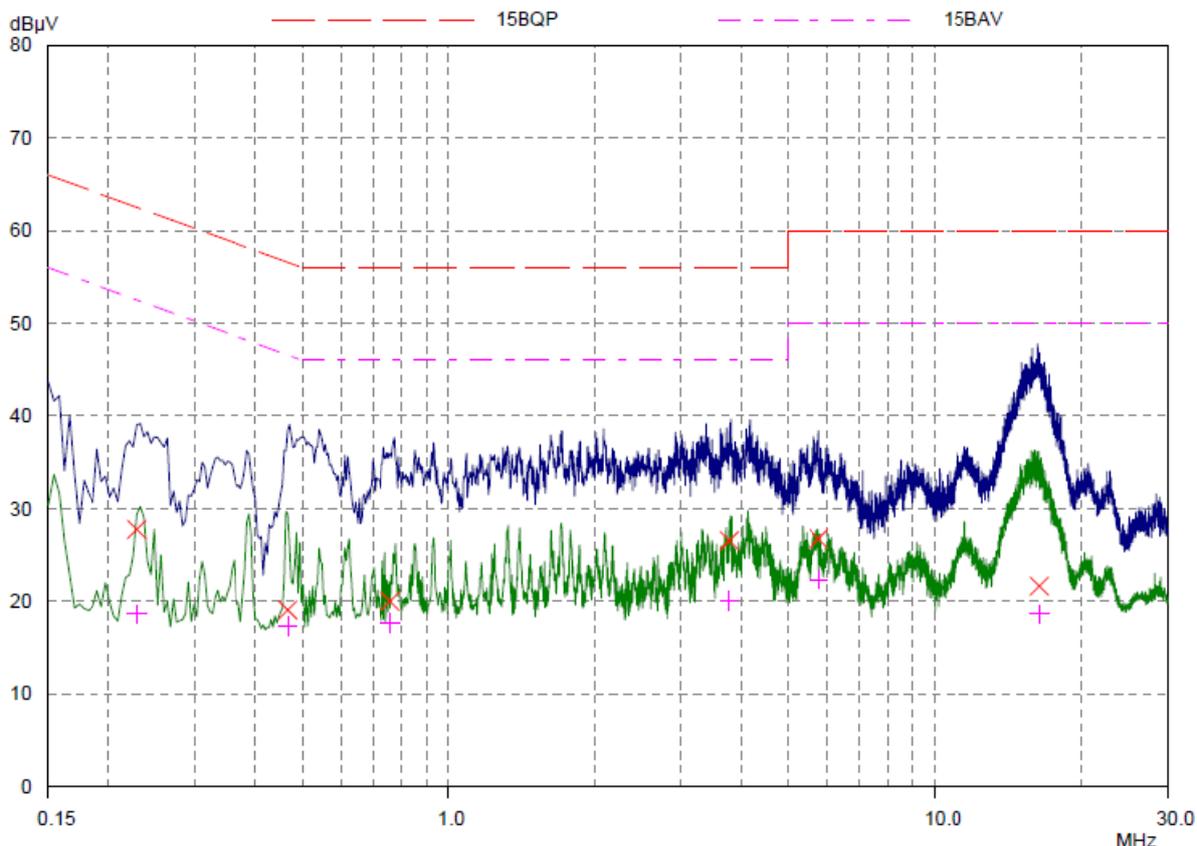
*: Decreases with the logarithm of the frequency.

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.



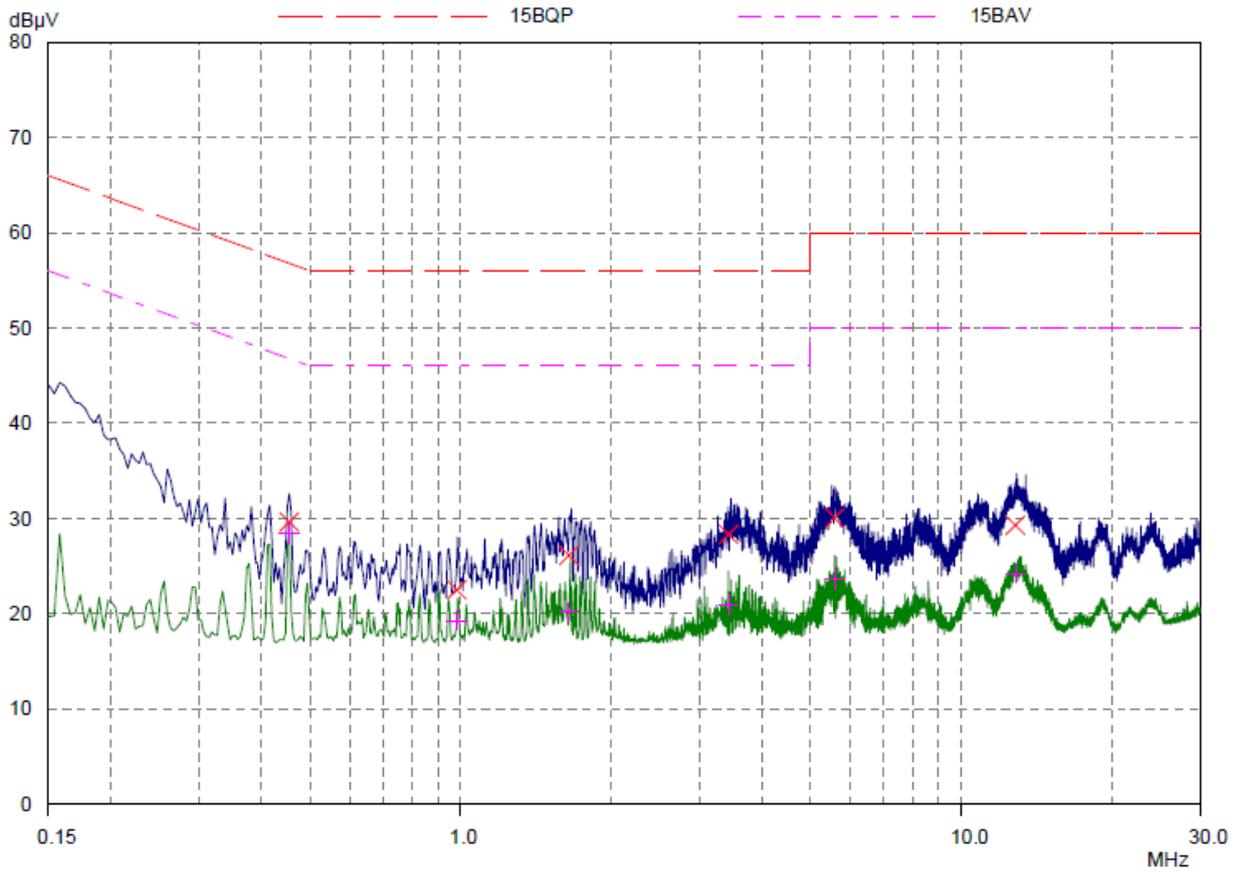
Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -	PE -
0.22812	27.77	62.52	34.75	L1	gnd
0.4664	19.07	56.58	37.51	L1	gnd
0.75937	20.01	56.00	35.99	L1	gnd
3.775	26.55	56.00	29.45	L1	gnd
5.775	26.76	60.00	33.24	L1	gnd
16.42734	21.64	60.00	38.36	L1	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
0.22812	18.61	52.52	33.91	L1	gnd
0.4664	17.31	46.58	29.27	L1	gnd
0.75937	17.64	46.00	28.36	L1	gnd
3.775	20.07	46.00	25.93	L1	gnd
5.775	22.35	50.00	27.65	L1	gnd
16.42734	18.63	50.00	31.37	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
0.45468	29.65	56.79	27.14	N	gnd
0.98203	22.52	56.00	33.48	N	gnd
1.64609	26.13	56.00	29.87	N	gnd
3.42734	28.33	56.00	27.67	N	gnd
5.59921	30.04	60.00	29.96	N	gnd
12.85703	29.29	60.00	30.71	N	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase	PE
0.45468	28.45	46.79	18.34	N	gnd
0.98203	19.27	46.00	26.73	N	gnd
1.64609	20.16	46.00	25.84	N	gnd
3.42734	20.94	46.00	25.06	N	gnd
5.59921	23.66	50.00	26.34	N	gnd
12.85703	24.21	50.00	25.79	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