



EMC TEST REPORT

Applicant Huawei Technologies Co., Ltd.
FCC ID QISLYO-L02
Product Smart Phone
Model HUAWEI LYO-L02
Report No. RHA1606-0039EMC01R1
Issue Date June 16, 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



中国认可
国际互认
检测
TESTING
CNAS L2264

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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: June 8, 2016~ June 13, 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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Fax: +86-021-50791141/2/3-8000
Website: <http://www.ta-shanghai.com>
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:	HUAWEI LYO-L02		
HW Version:	Ver.A		
SW Version:	LYO-L02C000B009		
IMEI:	869325021672697		
Antenna Type:	Internal Antenna		
Used Host Product:	PC: Model: DELL E6430(SN : 32RKWW1)		
Test Mode:	Transfer Data Mode		
Frequency:		TX:	RX:
	GSM850:	824MHz ~ 849MHz	869MHz ~ 894MHz
	GSM1900:	1850MHz ~ 1910MHz	1930MHz ~ 1990MHz
	WCDMA Band V:	824MHz ~ 849MHz	869MHz ~ 894MHz
	LTE Band 5:	824MHz ~ 849MHz	869MHz ~ 894MHz
	LTE Band 7:	2500MHz ~ 2570MHz	2620MHz ~ 2690MHz
	Bluetooth:	2400MHz ~ 2480MHz	2400MHz ~ 2480MHz
	WIFI:	2402MHz ~ 2472MHz	2402MHz ~ 2472MHz
EUT Accessory			



Battery 1	Manufacturer: Sunwoda electronic Co., Ltd Model: HB4342A1RBC Power Rating: DC 3.8V, 2200mAh, Li-ion
Battery 2	Manufacturer: Scud (Fujian) Electronics Co., Ltd Model: HB4342A1RBC Power Rating: DC 3.8V, 2200mAh, Li-ion
Adapter 1	Manufacturer: Huizhou BYD Electronic CO.,LTD Model: HW-050100B01
Adapter 2	Manufacturer: Huizhou BYD Electronic CO.,LTD Model: HW-050100E01
Adapter 3	Manufacturer: SHENZHEN HUNTKEY ELECTRIC CO., LTD Model: HW-050100B01
Adapter 4	Manufacturer: SHENZHEN HUNTKEY ELECTRIC CO., LTD Model: HW-050100E01
Adapter 5	Manufacturer: Dongguan Phitek Electronics Co.,Ltd Model: HW-050100B01
Adapter 6	Manufacturer: Dongguan Phitek Electronics Co.,Ltd Model: HW-050100E01
USB Cable	100cm Cable, Shielded,
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

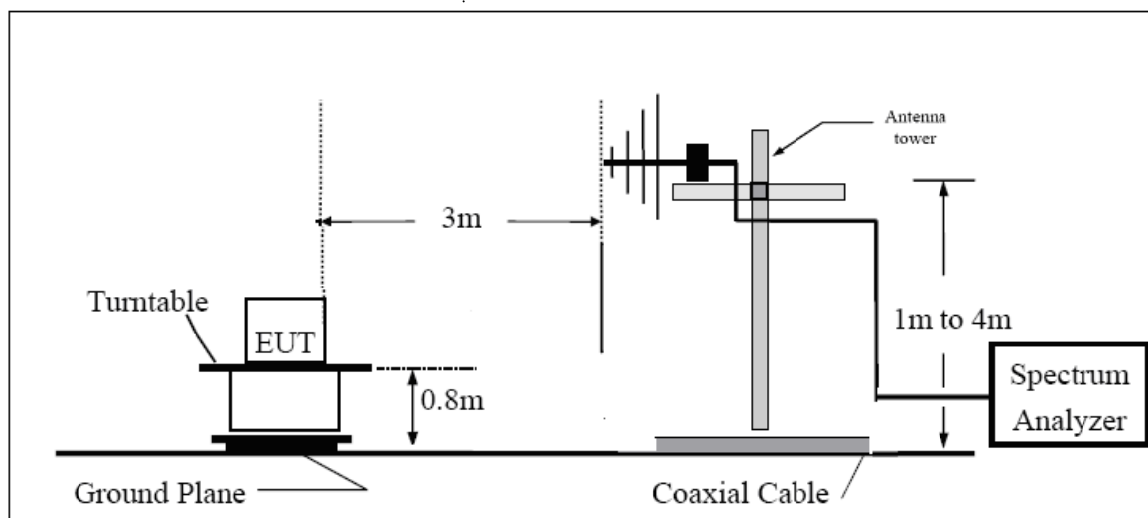
(b) AVERAGE: RBW=1MHz / VBW=3MHz / Sweep=AUTO

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.

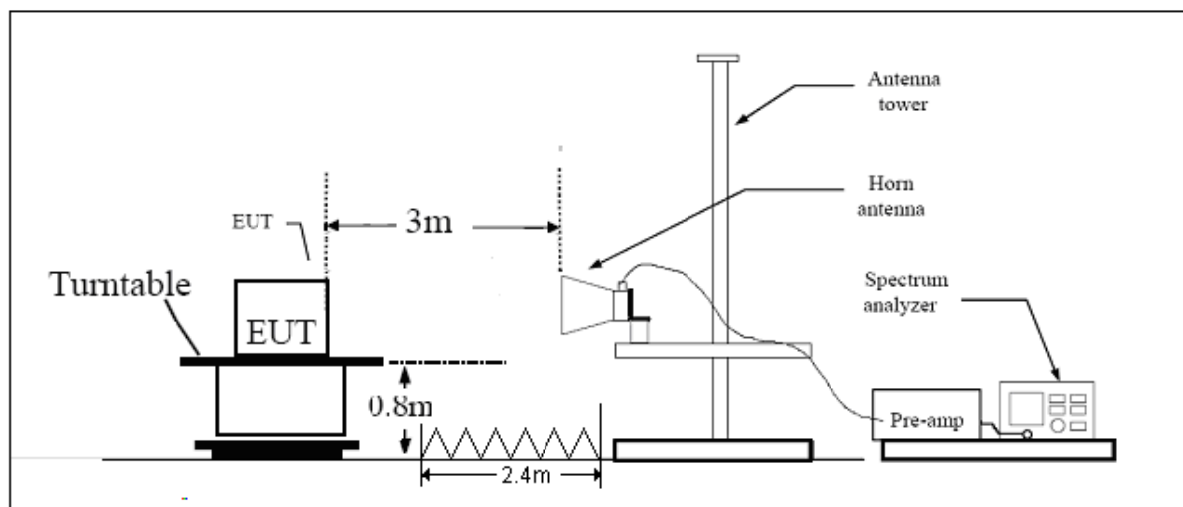
Test Setup

30MHz -1GHz

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.

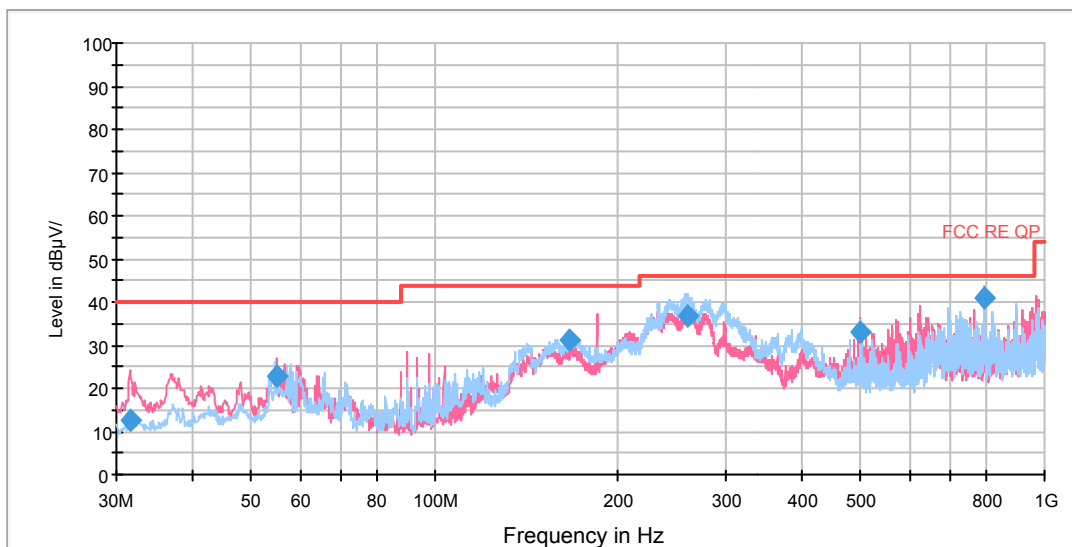
Test Results

Sweep from 9 kHz to 30MHz and 18GHz to 26.5GHz, the emissions more than 20 dB below the permissible value are not reported.

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.

RE 30M-1GHz QP



Radiated Emission from 30MHz to 1GHz

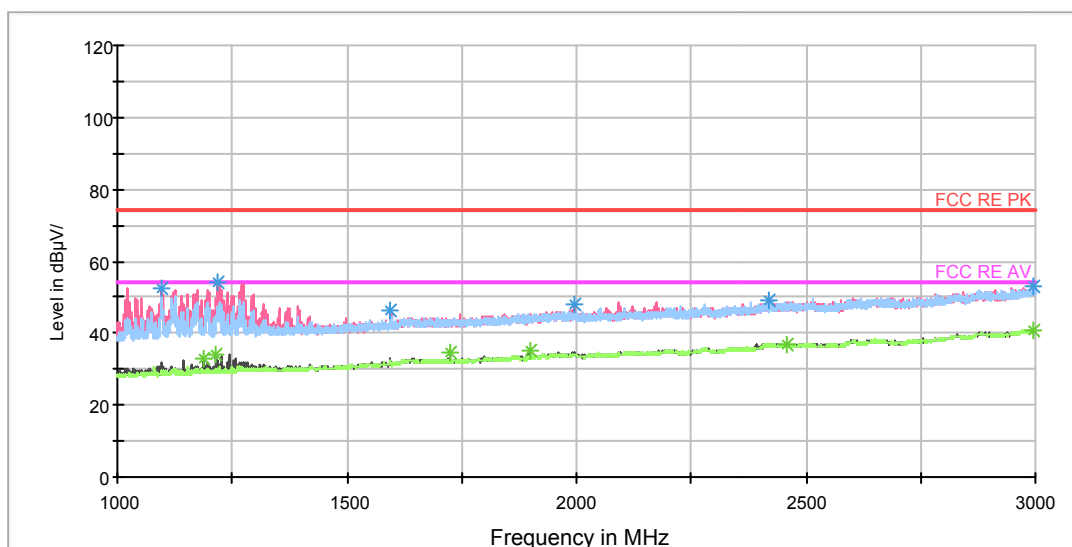
Frequency (MHz)	Quasi-Peak (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
31.537310	12.4	34.9	100.0	V	17.0	-22.5	27.6	40.0
54.959110	22.8	43.9	120.0	V	71.0	-21.1	17.2	40.0
166.267394	31.1	59.4	176.0	H	66.0	-28.3	12.4	43.5
258.997250	36.8	61.6	100.0	H	241.0	-24.8	9.2	46.0
498.857250	32.8	51.8	100.0	V	8.0	-19.0	13.2	46.0
796.645250	41.0	55.8	100.0	H	65.0	-14.8	5.0	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-3GHz PK+AV

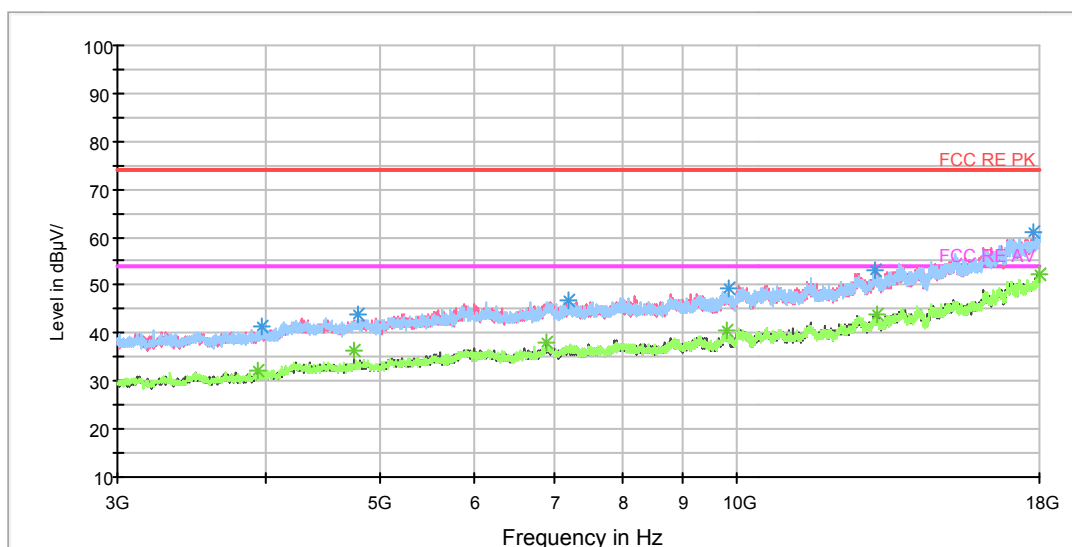


Radiated Emission from 1GHz to 3GHz

Frequency (MHz)	Peak (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1097.000000	52.5	61.4	101.0	V	245.0	-8.9	21.5	74
1218.750000	54.0	61.9	101.0	V	264.0	-7.9	20.0	74
1594.500000	46.2	52.6	101.0	V	0.0	-6.4	27.8	74
1995.750000	47.7	51.0	101.0	V	20.0	-3.3	26.3	74
2419.500000	49.1	49.7	101.0	H	138.0	-0.6	24.9	74
2993.750000	53.2	55.4	201.0	V	92.0	-2.2	20.8	74

Frequency (MHz)	Average (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1188.500000	32.8	41.0	101.0	V	254.0	-8.2	21.2	54
1215.750000	34.2	42.1	101.0	V	264.0	-7.9	19.8	54
1725.250000	34.8	39.8	101.0	V	254.0	-5.0	19.2	54
1897.500000	35.3	39.2	101.0	V	0.0	-3.9	18.7	54
2459.750000	37.1	37.6	101.0	H	55.0	-0.5	16.9	54
2995.750000	41.0	43.3	101.0	V	0.0	-2.3	13.0	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)
3963.750000	41.2	41.4	102.0	H	10.0	-0.2	32.8	74
4790.625000	43.9	46.5	102.0	H	105.0	-2.6	30.1	74
7196.250000	46.9	55.6	202.0	H	195.0	-8.7	27.1	74
9840.000000	49.5	61.4	202.0	H	319.0	-11.9	24.5	74
13053.750000	53.2	69.4	103.0	V	327.0	-16.2	20.8	74
17818.125000	61.1	84.7	103.0	V	87.0	-23.6	12.9	74

Frequency (MHz)	Average (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
3946.875000	32.2	32.3	202.0	V	58.0	-0.1	21.8	54
4749.375000	36.3	38.7	103.0	V	346.0	-2.4	17.7	54
6909.375000	38.2	45.1	202.0	V	58.0	-6.9	15.8	54
9796.875000	40.4	52.6	103.0	V	0.0	-12.2	13.6	54
13136.250000	43.8	59.5	103.0	V	0.0	-15.7	10.2	54
18000.000000	52.2	77.6	202.0	V	169.0	-25.4	1.8	54

3.2 Conducted Emission

Ambient condition

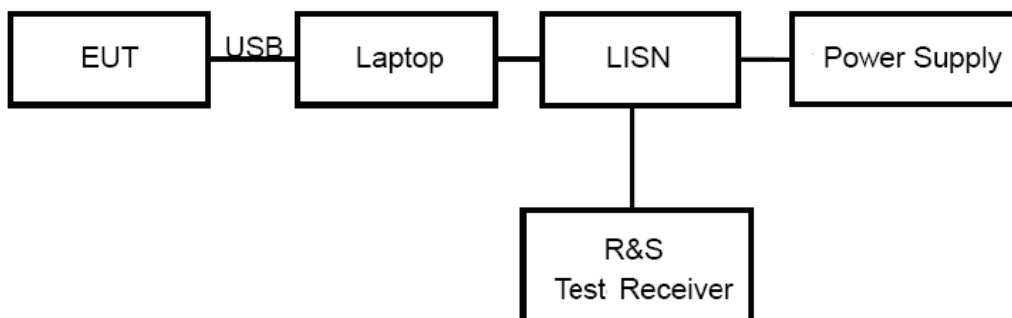
Temperature	Relative humidity	Pressure
24°C ~26°C	50%~55%	102.5kPa

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

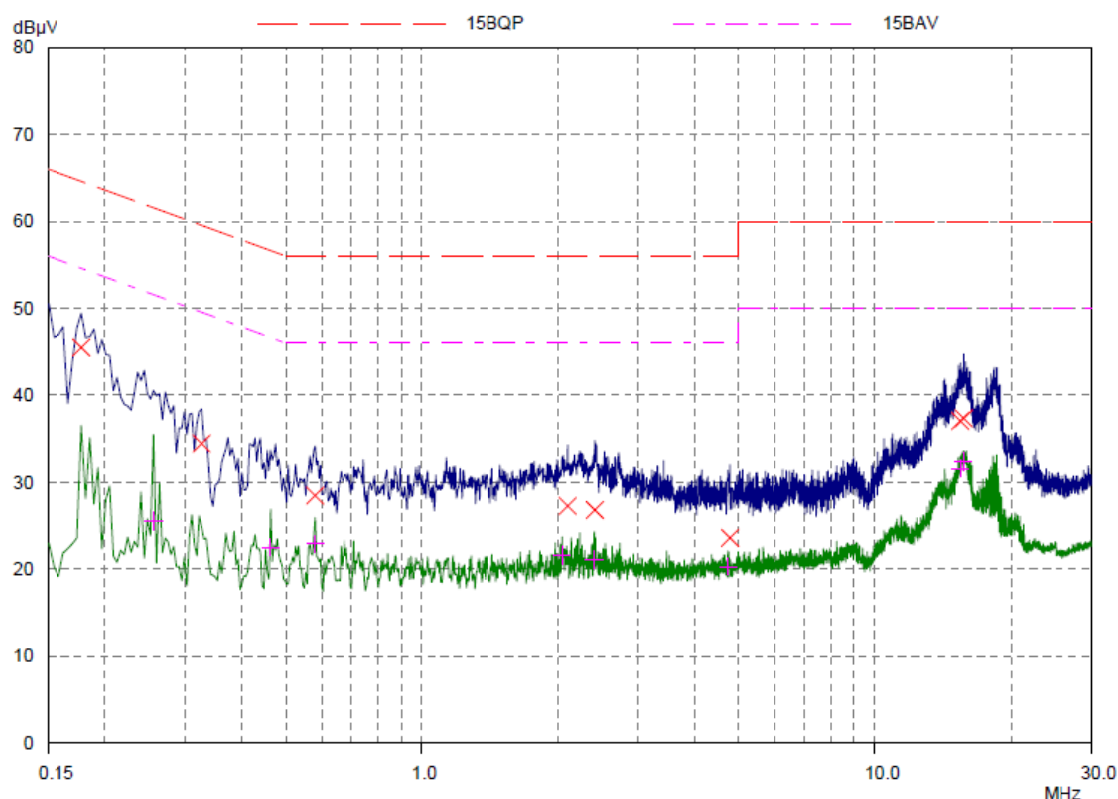
Frequency (MHz)	Conducted Limits(dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46 *
0.5 - 5	56	46
5 - 30	60	50
*: Decreases with the logarithm of the frequency.		

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.



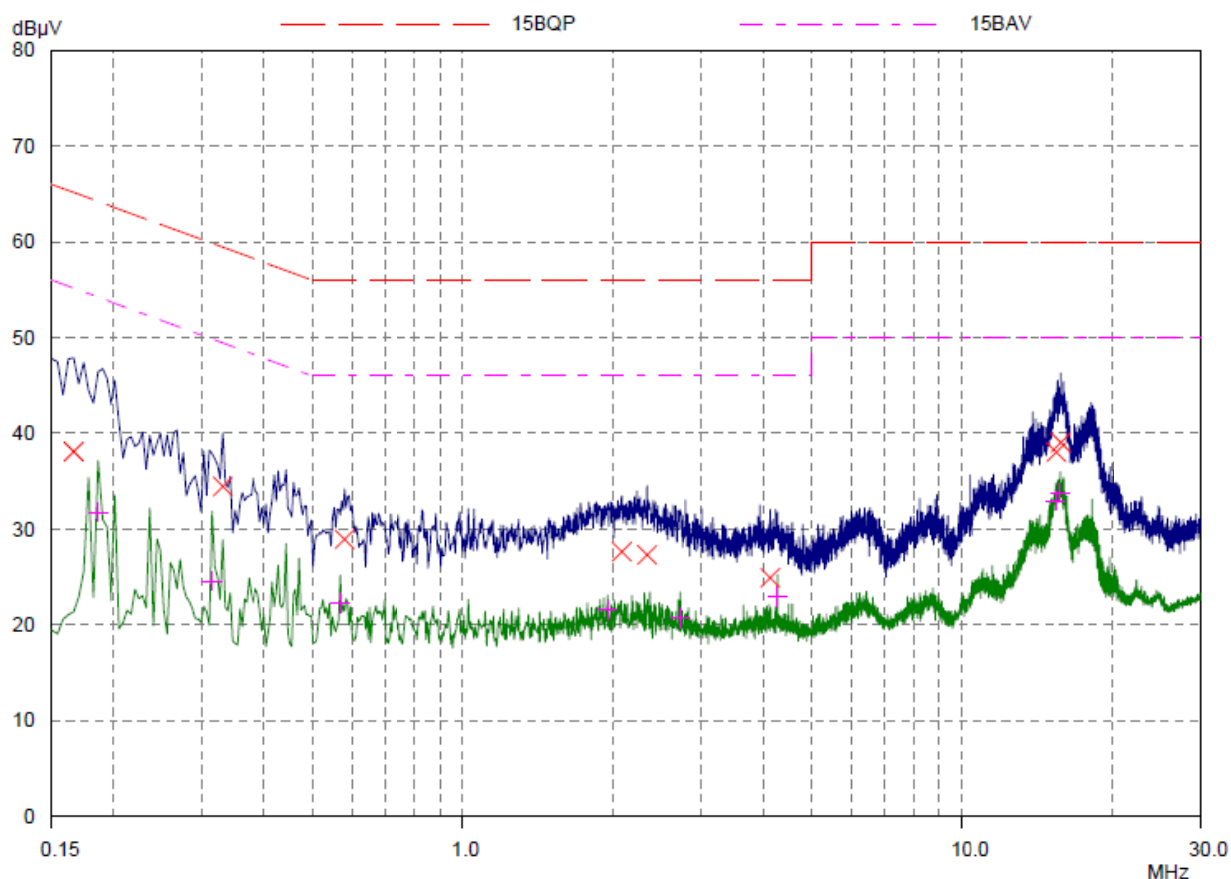
Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -	PE -
0.17734	45.51	64.61	19.10	L1	gnd
0.32578	34.44	59.56	25.12	L1	gnd
0.57968	28.46	56.00	27.54	L1	gnd
2.09531	27.27	56.00	28.73	L1	gnd
2.4039	26.82	56.00	29.18	L1	gnd
4.7789	23.60	56.00	32.40	L1	gnd
15.43906	37.05	60.00	22.95	L1	gnd
15.70078	37.32	60.00	22.68	L1	gnd

Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.25546	25.51	51.58	26.07	L1	gnd
0.4625	22.52	46.65	24.13	L1	gnd
0.57968	22.92	46.00	23.08	L1	gnd
2.0367	21.60	46.00	24.40	L1	gnd
2.39609	21.12	46.00	24.88	L1	gnd
4.73203	20.32	46.00	25.68	L1	gnd
15.41171	31.57	50.00	18.43	L1	gnd
15.65781	32.42	50.00	17.58	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 -
0.16562	38.09	65.18	27.09	N	gnd
0.32968	34.46	59.46	25.00	N	gnd
0.57968	28.96	56.00	27.04	N	gnd
2.07968	27.65	56.00	28.35	N	gnd
2.33359	27.32	56.00	28.68	N	gnd
4.12265	24.92	56.00	31.08	N	gnd
15.4625	38.04	60.00	21.96	N	gnd
15.79062	39.05	60.00	20.95	N	gnd

Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.18515	31.76	54.25	22.49	N	gnd
0.31406	24.57	49.86	25.29	N	gnd
0.56796	22.27	46.00	23.73	N	gnd
1.94687	21.55	46.00	24.45	N	gnd
2.7164	20.74	46.00	25.26	N	gnd
4.26328	22.96	46.00	23.04	N	gnd
15.43515	32.96	50.00	17.04	N	gnd
15.75546	33.83	50.00	16.17	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	2016-05-21	2017-05-20
Signal Analyzer	FSV30	R&S	100815	2015-12-17	2016-12-16
Loop Antenna	FMZB1519	SCHWARZBECK	1519-047	2014-02-29	2017-02-28
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