FCC&ISED
RF Test Report

Product Name: Smart Phone

Model Number: ELE-L04

Report No.: SYBH(Z-RF)20181115007001-2006
FCC ID：QISELE-L04
IC: 6369A-ELEL04

Autheorized	APPROVED (Lab Manager)	PREPARED (Test Engineer)
BY	He Hao	Zhou Bing bo
DATE	2018-12-25	2018-12-25

Reliability Laboratory of Huawei Technologies Co., Ltd.

(Global Cmpliance and Testing Center of Huawei Technologies Co., Ltd)

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※ ※ Notice ※ ※

1. The Reliability Laboratory of Huawei Technologies Co., Ltd has passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01
2. The Laboratory of Sporton International (Shenzhen) Inc has passed the accreditation by National Voluntary Laboratory Accreditation Program (NVLAP). The NVLAP LAB CODE is 600156-0.
3. The Reliability Laboratory of Huawei Technologies Co., Ltd has been recognized by the US Federal Communications Commission (FCC) to perform compliance testing subject to the Commission's Certification rules. The Designation Number is CN1173, and the Test Firm Registration Number is 294140.
4. The Laboratory of Sporton International (Shenzhen) Inc has been recognized by the US Federal Communications Commission (FCC) to perform compliance testing subject to the Commission's Certification rules. The Designation Number is CN5019, and the Test Firm Registration Number is 577730.
5. The Reliability Laboratory of Huawei Technologies Co., Ltd has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 6369A-1.
6. The Reliability Laboratory of Huawei Technologies Co., Ltd is also named “Global Compliance and Testing Center of Huawei Technologies Co., Ltd”, the both names have coexisted since 2009.
7. The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
8. The test report is invalid if there is any evidence of erasure and/or falsification.
9. The test report is only valid for the test samples.
10. Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

MODIFICATION RECORD

No.	Report No	Modification Description
1	SYBH(Z-RF)20181115007001	First release.

DECLARATION

Type	Description
Multiple Models Applications	☒ The present report applies to single model. ☐ The present report applies to several models. The practical measurements are performed with the model. Note:The present report only presents the worst test case of all modes, see relevant test results for detailed.

1 Table of contents

2 General Information

1.1 Test standard/s

Applied Rules :	47 CFR FCC Part 02 47 CFR FCC Part 15 Subpart C (15.225) ISED RSS-Gen (Issue 5, April 2018) ISED RSS-210 (Issue 9, August 2016)

1.2 Test Environment

Temperature :	TN	15 to 30	°C during room temperature tests	
Ambient Relative Humidity:	20 to 85 %			
Atmospheric Pressure:	Not applicable			
Power supply :	VL VN VH	3.6 3.82 4.35	V V V	DC by Battery

NOTE 1: 1) VN= nominal voltage, VL= low extreme test voltage, VH= High extreme test voltage;

TN= normal temperature, TL= low extreme test temperature, TH= High extreme test temperature.

NOTE 2: The values used in the test report may be stringent than the declared.

1.3 Test Laboratories

Test Location 1 :	RELIABILITY LABORATORY OF HUAWEI TECHNOLOGIES CO., LTD.
Address of Test Location 1 :	No.2 New City Avenue Songshan Lake Sci. &Tech. Industry Park, Dongguan, Guangdong, P.R.C
Sub-contracted Test Location 1 :	Sporton International (Shenzhen) Inc.
Address of Sub-contracted Test Location 1 :	No.3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P.R.China

1.4 Applicant and Manufacturer

Company Name :	HUAWEI TECHNOLOGIES CO., LTD
Address :	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

1.5 Application details

Date of Receipt Sample:	2018-11-22
Start of test:	2018-11-22
End of test:	2018-12-25

3 Summary

FCC Rule No.	ISED Rule No.	Test Description	Test Limit	Test Condition	Test Result	Reference	Testing location
TRANSMITTER MODE							
15.225 (a)	RSS-210, B6(a)	In-Band Emissions	15,848µV/m @ 30m 13.553 – 13.567 MHz	RADIATED	Pass	Section 5.2	Sub-contracted Test Location 1
2.1049	RSS-Gen, 6.7	Bandwidth	N/A		Pass	Section 5.1	Location 1
15.225(b)	RSS-210, B6(b)	In-Band Emissions	334µV/m @ 30m 13.410 – 13.553 MHz 13.567 – 13.710 MHz		Pass	Section 5.2	Sub-contracted Test Location 1
15.225(c)	RSS-210, B6(c)	In-Band Emissions	106µV/m @ 30m 13.110 – 13.410 MHz 13.710 – 14.010 MHz		Pass	Section 5.2	Sub-contracted Test Location 1
15.225(d) 15.209	RSS-210, B6(d)	Out-of-Band Emissions	FCC: Emissions outside of the specified band (13.110 – 14.010 MHz) must meet the radiated limits detailed in 15.209 ISED: Emissions outside of the specified band (13.110 – 14.010 MHz) must meet the radiated limits detailed in RSS-Gen 8.9		Pass	Section 5.3	Sub-contracted Test Location 1
15.225(e)	RSS-210, B6(d)	Frequency Stability Tolerance	± 0.01% of Operating Frequency	Temperature Chamber	Pass	Section 5.4	Location 1
15.207	RSS-Gen, 8.8	AC Conducted Emissions 150kHz – 30MHz	FCC: < FCC 15.207 limits ISED: < RSS-Gen, 8.8 limits.	LINE CONDUCTED	Pass	Section 5.5	Location 1
NOTE: The transmitter has an integral PCB loop antenna that is enclosed within the housing of the EUT and meets the requirements of FCC 15.203							

4 Product Description

4.1 Product Information

4.1.1 General Description

ELE-L04 is subscriber equipment in the GSM/WCDMA/LTE system. The GSM frequency band includes GSM850 and GSM900 and DCS1800 and PCS1900.The UMTS frequency band is B1 and B2 and B4 and B5 and B6 and B8 and B19. The ELE-L04 LTE frequency band is B1 and B2 and B3 and B4 and B5 and B6 and B7 and B8 and B9 and B12 and B17 and B18 and B19 and B20 and B26 and B28 and B34 and B38 and B39 and B40 and B41 and B66. The ELE-L04 LTE frequency band for intra-band carrier aggregation uplink operation band is CA_1C and CA_3C and CA_7C and CA_38C and CA_39C and CA_41C. The Mobile Phone implements such functions as RF signal receiving/transmitting LTE/HSPA/UMTS and GSM/GPRS/EDGE protocol processing, voice, video MMS service, GPS, AGPS and WIFI etc. Externally it provides one micro SD card interface, earphone port (to provide voice service) and one SIM card interface. ELE-L04 is single SIM smart phone. It also provides Bluetooth module to synchronize data between a PC and the phone, or to use the built-in modem of the phone to access the Internet with a PC, or to exchange data with other Bluetooth devices.

Note: Only NFC test data included in this report.

4.2 EUT Identity

NOTE: Unless otherwise noted in the report, the functional boards installed in the units shall be selected from the below list, but not means all the functional boards listed below shall be installed in one unit.

4.2.1 Board

Board		
Description	Software version	Hardware version
Main Board	5.0.1.34 (SP1C792E8R1P7)	HL1ELLEM

4.2.2 Sub-Assembly

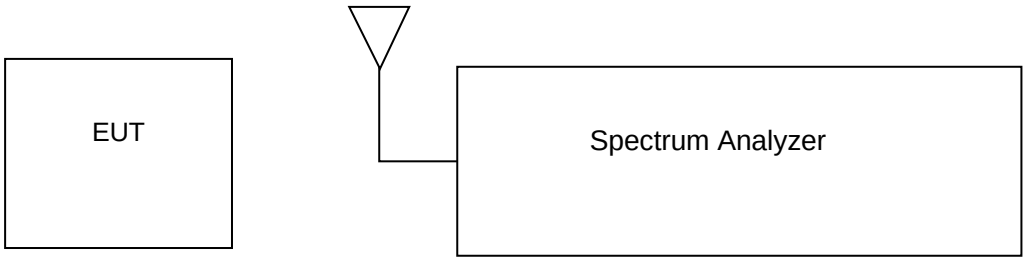
Sub-Assembly			
Sub-Assembly Name	Model	Manufacturer	Description
Adapter	HW-050450B00	Huawei Technologies Co.,Ltd.	Input Voltage:100V-240V~50/60Hz, 0.75A Output Voltage: 5V ⎓ 2A OR4.5V ⎓ 5A OR 5V ⎓ 4.5A
Adapter	HW-050450E00	Huawei Technologies Co.,Ltd.	Input Voltage:100V-240V~50/60Hz, 0.75A Output Voltage: 5V ⎓ 2A OR4.5V ⎓ 5A OR 5V ⎓ 4.5A
Adapter	HW-050450U00	Huawei Technologies Co.,Ltd.	Input Voltage:100V-240V~50/60Hz, 0.75A Output Voltage: 5V ⎓ 2A OR4.5V ⎓ 5A OR 5V ⎓ 4.5A
Adapter	HW-050450A00	Huawei Technologies Co.,Ltd.	Input Voltage:100V-240V~50/60Hz, 0.75A Output Voltage: 5V ⎓ 2A OR4.5V ⎓ 5A OR 5V ⎓ 4.5A
Adapter	HW-050450E01	Huawei Technologies Co.,Ltd.	Input Voltage:100V-240V~50/60Hz, 0.75A Output Voltage: 5V ⎓ 2A OR4.5V ⎓ 5A OR 5V ⎓ 4.5A
Adapter	HW-050450A01	Huawei Technologies Co.,Ltd.	Input Voltage:100V-240V~50/60Hz, 0.75A Output Voltage: 5V ⎓ 2A OR4.5V ⎓ 5A OR 5V ⎓ 4.5A
Li-ion Polymer Battery	HB436380ECW	Huawei Technologies Co.,Ltd.	Rated capacity: 3550mAh Nominal Voltage: +3.85V Charging Voltage: +4.43V

5 Test Results

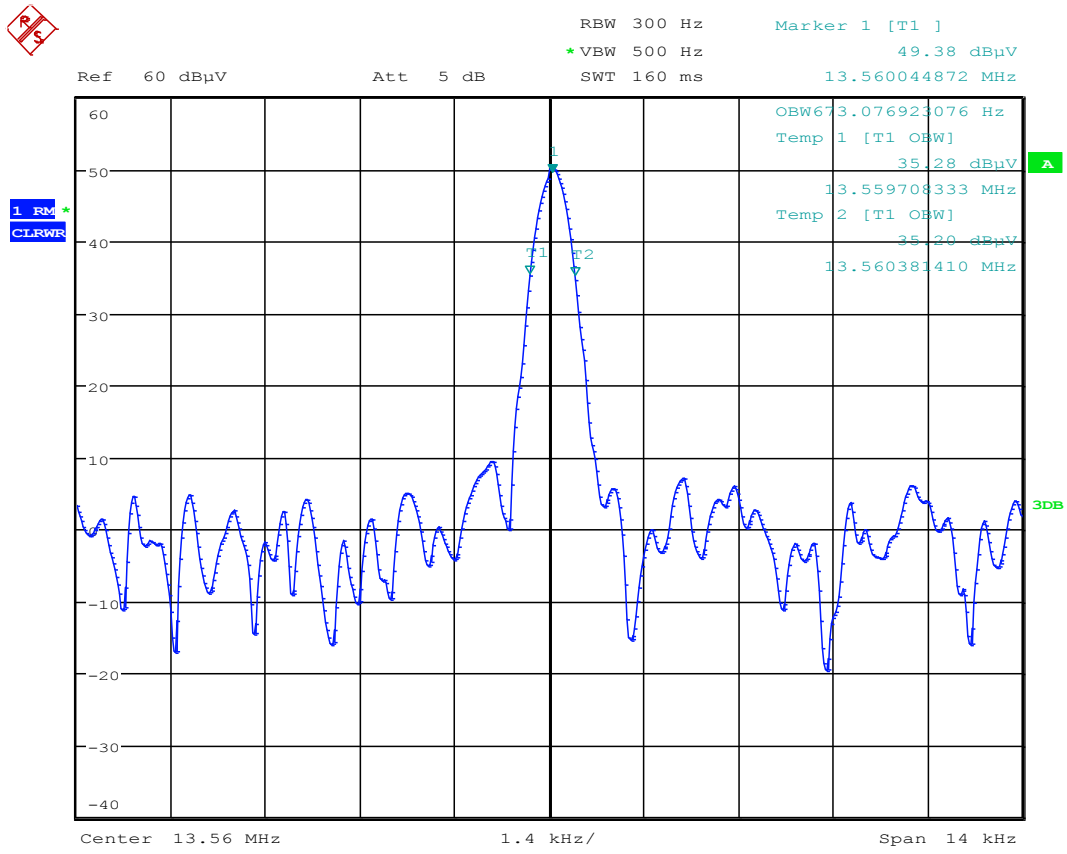
5.1 Bandwidth Measurement

The 99% emission bandwidth is measured with a spectrum analyzer connected via a receive antenna placed near the EUT while the EUT is operating in transmission mode.

5.1.1 Test Setup



5.1.2 Test Result



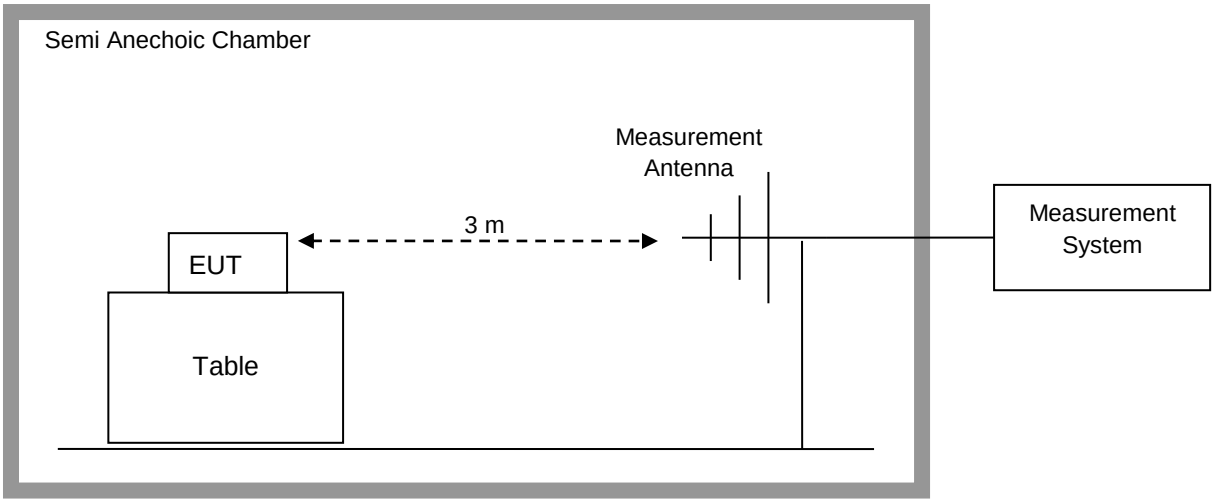
Date: 17.DEC.2018 11:38:33

Test Environment	OBW (Hz)	FL@OBW (MHz)	FH@OBW (MHz)	Verdict
TN/VN	673.077	13.559708333	13.560381410	PASS

The result of the measurement is passed.

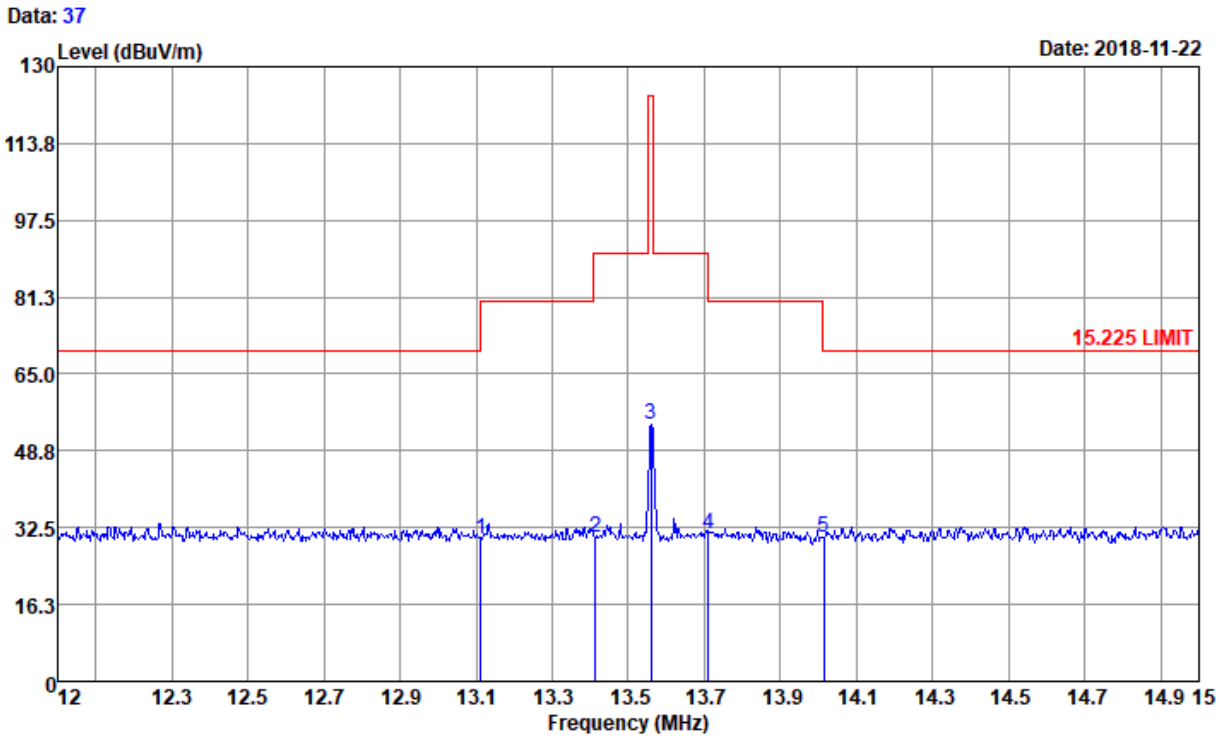
5.2 In-Band Radiated Spurious Emission Measurements

5.2.1 Test Setup



Measurement parameters	
Detector:	Quasi Peak
Sweep time:	-/-
Resolution bandwidth:	10 kHz
Video bandwidth:	10 kHz
Span:	-/-
Trace-Mode:	Max Hold

5.2.2 Test Result



Site : 03CH01-SZ
Condition : 15.225 LIMIT 3m LOOP ANT_1806 VERTICAL
: RBW:10.000KHz VBW:10.000KHz
FCC : A

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	13.11	29.89	-50.62	80.51	10.71	19.18	0.00	0.00	Peak
2	13.41	30.48	-59.99	90.47	11.36	19.12	0.00	0.00	Peak
3	13.56	54.24	-69.76	124.00	35.15	19.09	0.00	0.00	Peak
4	13.71	31.18	-49.33	80.51	12.12	19.06	0.00	0.00	Peak
5 pp	14.01	30.25	-39.75	70.00	11.25	19.00	0.00	0.00	Peak

NOTES:

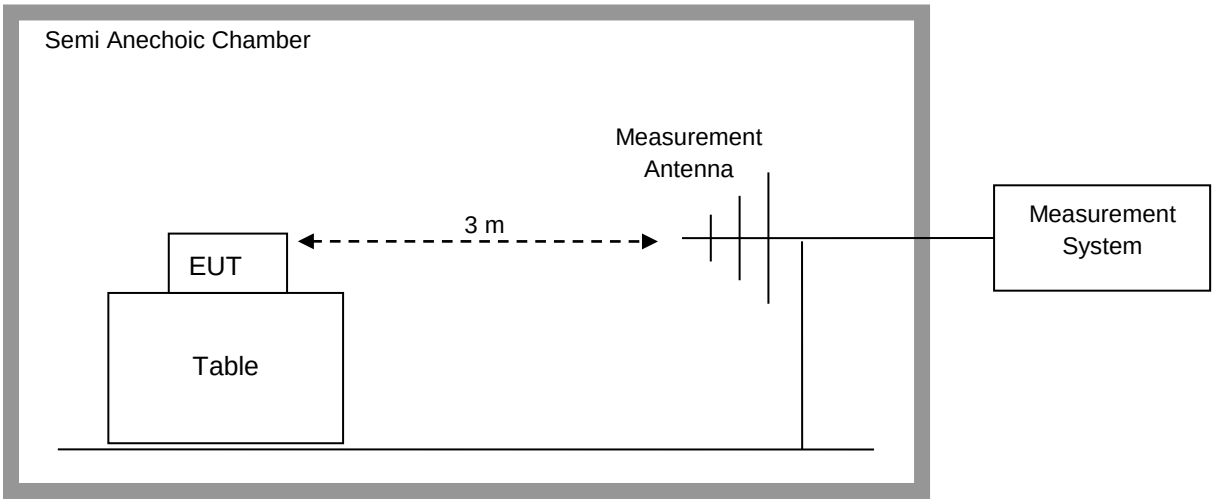
1. All measurements were performed using a loop antenna. The antenna was positioned in three orthogonal positions (X front, Y side, Z top) and the position with the highest emission level was recorded.
2. Measurements were performed at 3m and the data was extrapolated to the specified measurement distance of 30m using the square of an inverse linear distance extrapolation factor (40 dB/decade) as specified in §15.31(f)(2). Extrapolation Factor = 20 log10(30/3)2 = 40dB
3. All measurements were recorded using a spectrum analyzer employing a quasi-peak detector.
4. Level =Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain). The

reading level is calculated by software which is not shown in the sheet.

The result of the measurement is passed.

5.3 Radiated Spurious Emission Measurements, Out-of-Band

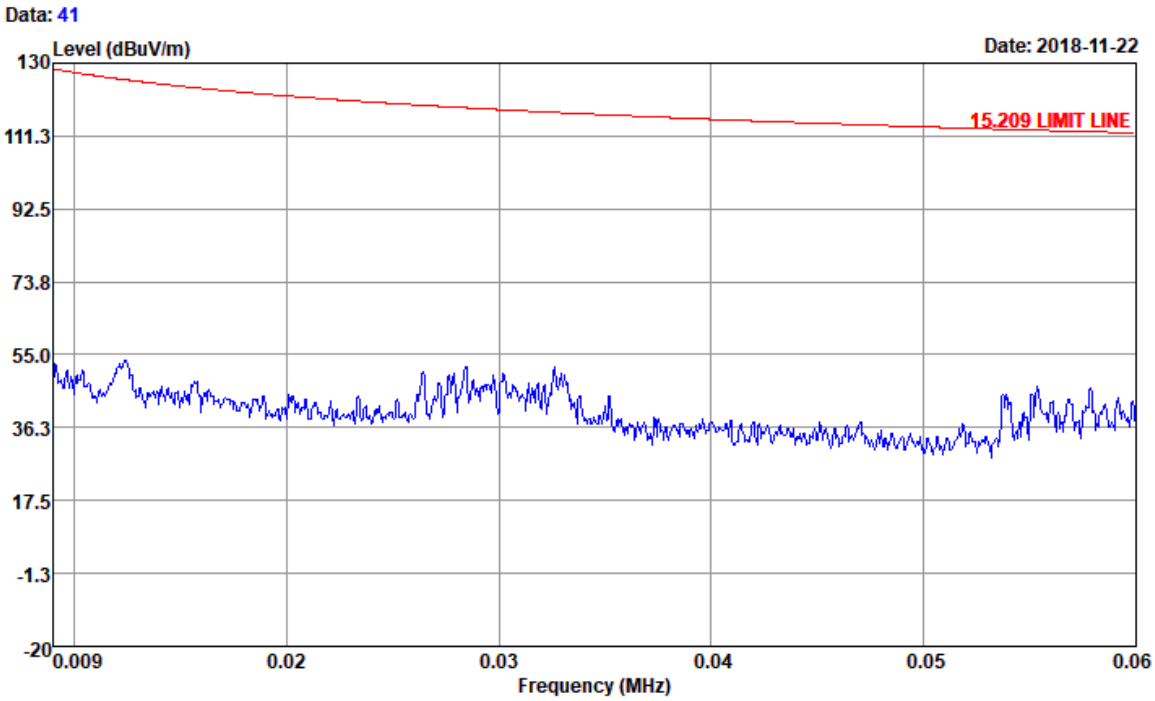
5.3.1 Test Setup



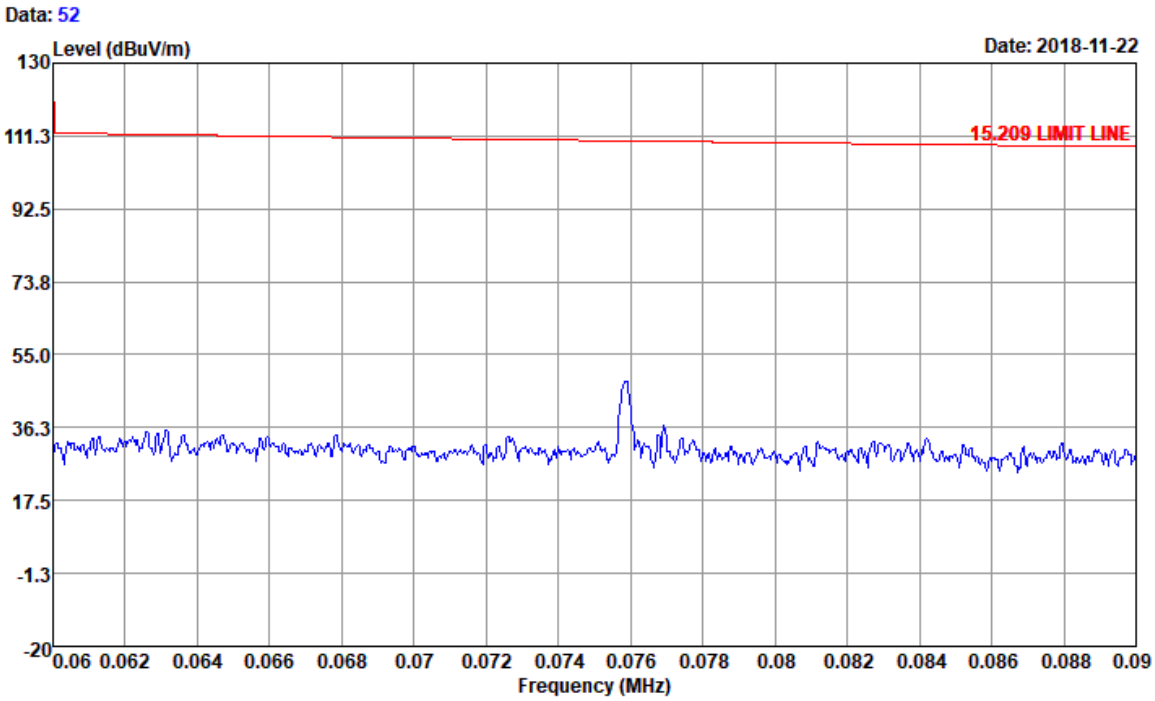
Measurement parameters	
Detector:	Quasi Peak
Sweep time:	Auto
Resolution bandwidth:	9 kHz – 150 kHz: 200 Hz 150 kHz – 30 MHz: 9 kHz 30 MHz – 1000 MHz: 100 kHz
Video bandwidth:	9 kHz – 150 kHz: 200 Hz 150 kHz – 30 MHz: 9 kHz 30 MHz – 1000 MHz: 100 kHz
Span:	See Plots
Trace-Mode:	Max Hold

5.3.2 Test Result

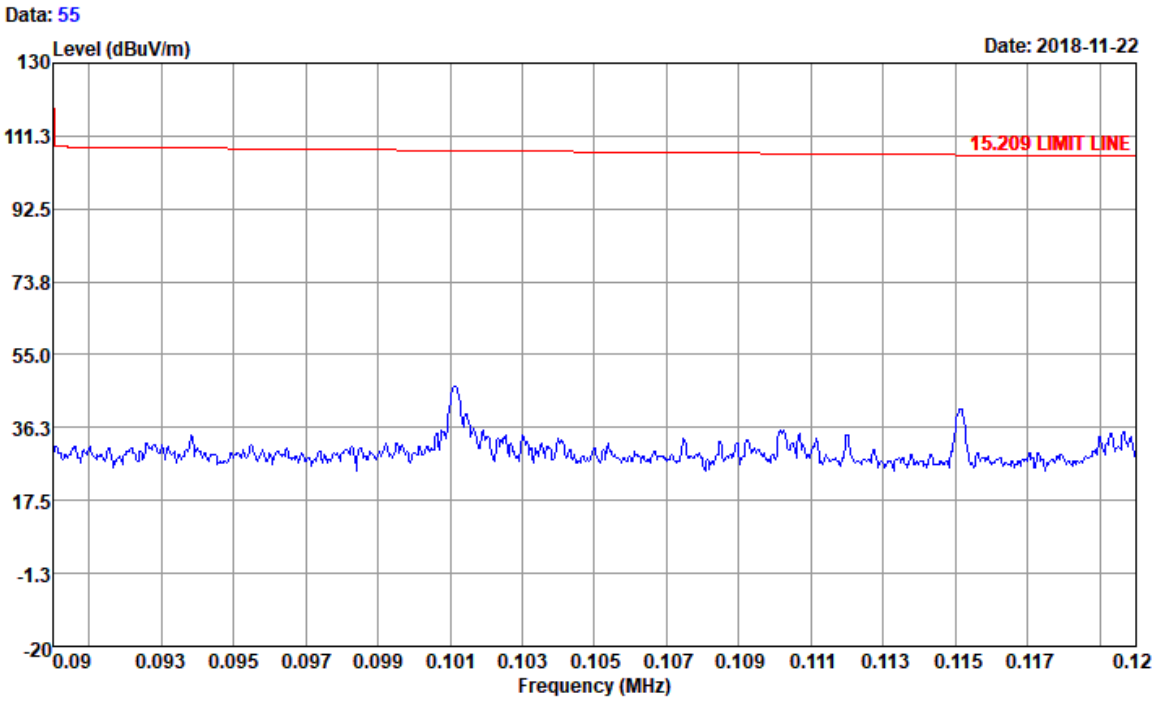
9k~30MHz



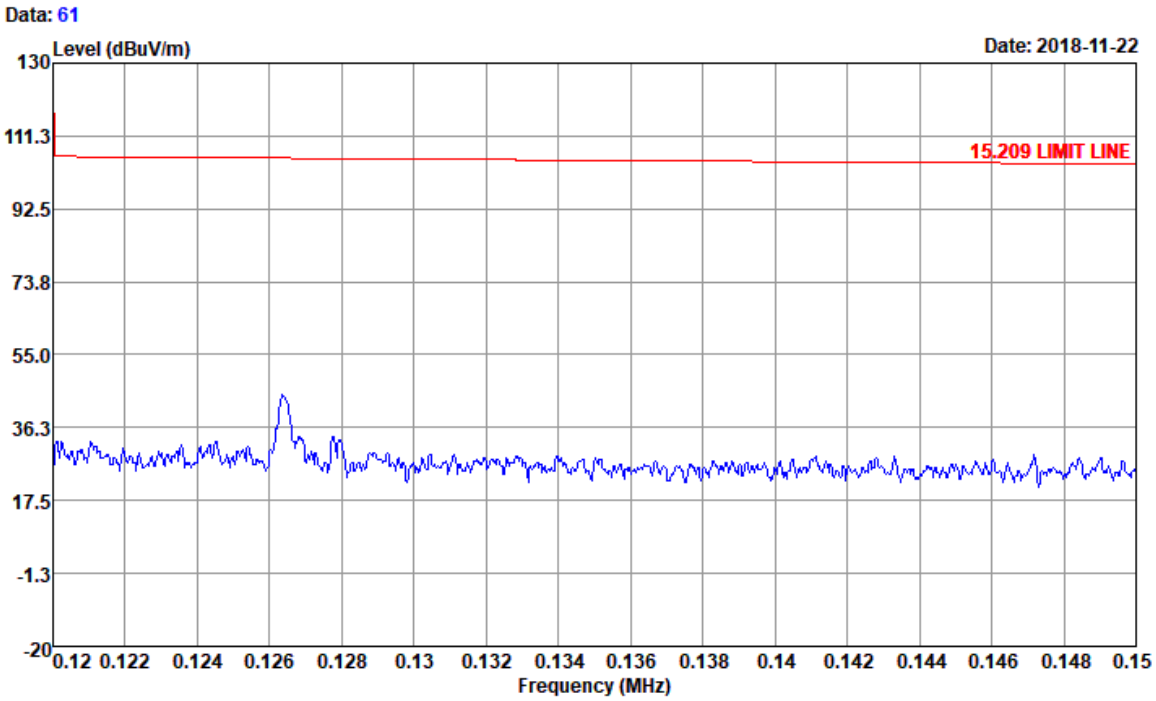
Site : 03CH01-SZ
Condition : 15.209 LIMIT LINE 3m LOOP ANT_1806 HORIZONTAL
: RBW:0.200KHz VBW:0.600KHz
FCC :



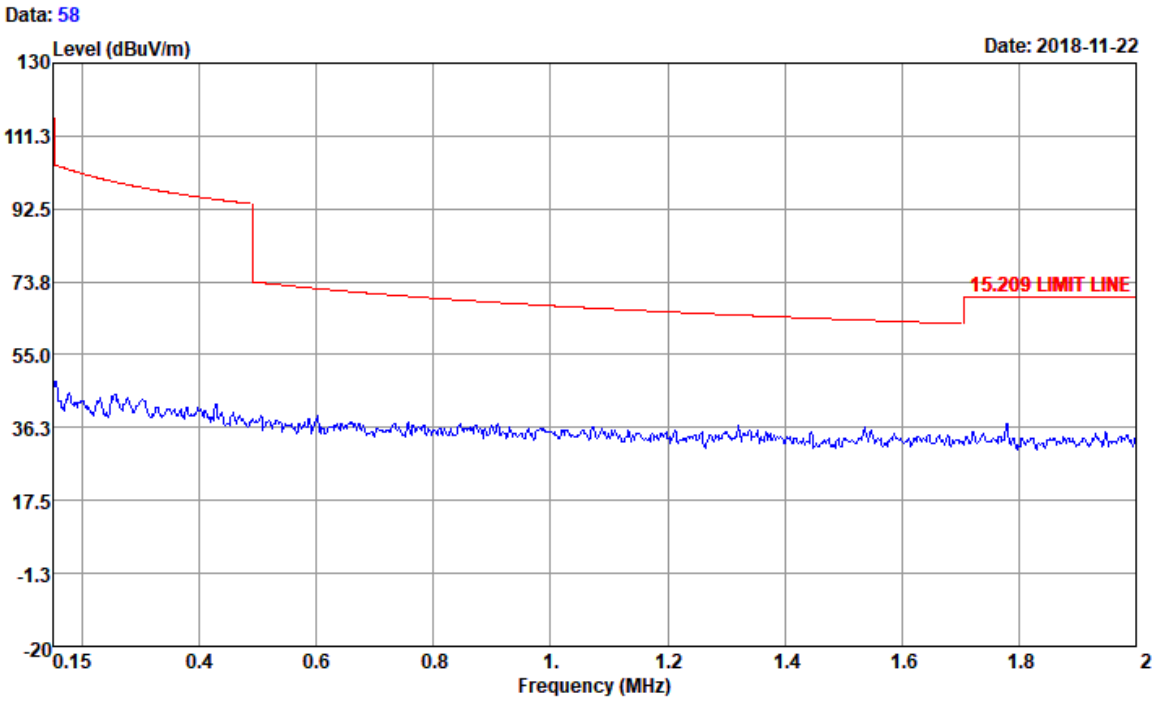
Site : 03CH01-SZ
Condition : 15.209 LIMIT LINE 3m LOOP ANT_1806 HORIZONTAL
: RBW:0.200KHz VBW:0.600KHz
FCC :



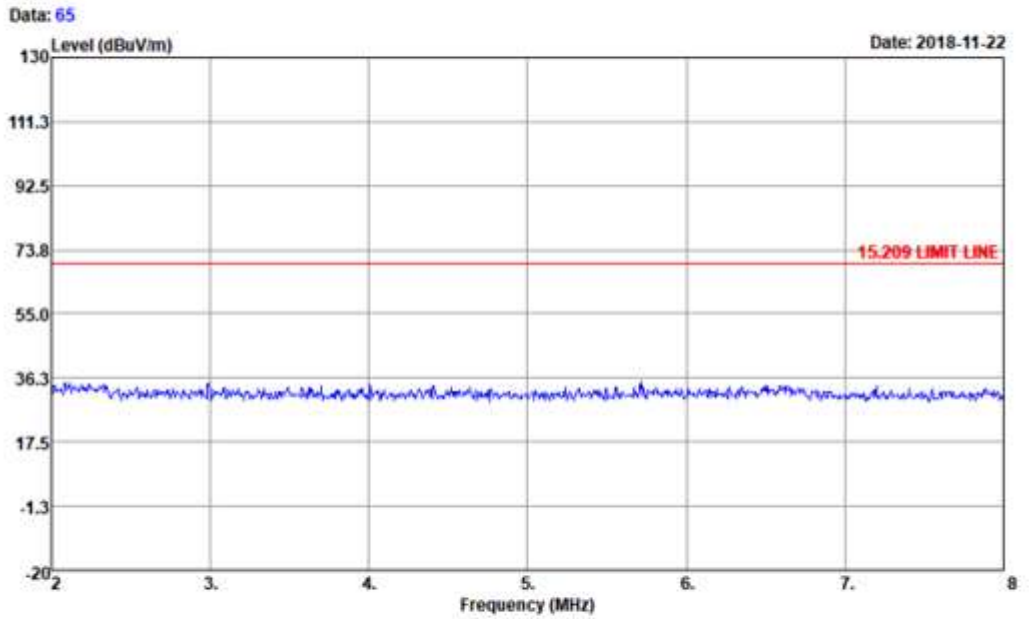
Site : 03CH01-SZ
Condition : 15.209 LIMIT LINE 3m LOOP ANT_1806 HORIZONTAL
: RBW:0.200KHz VBW:0.600KHz
FCC :



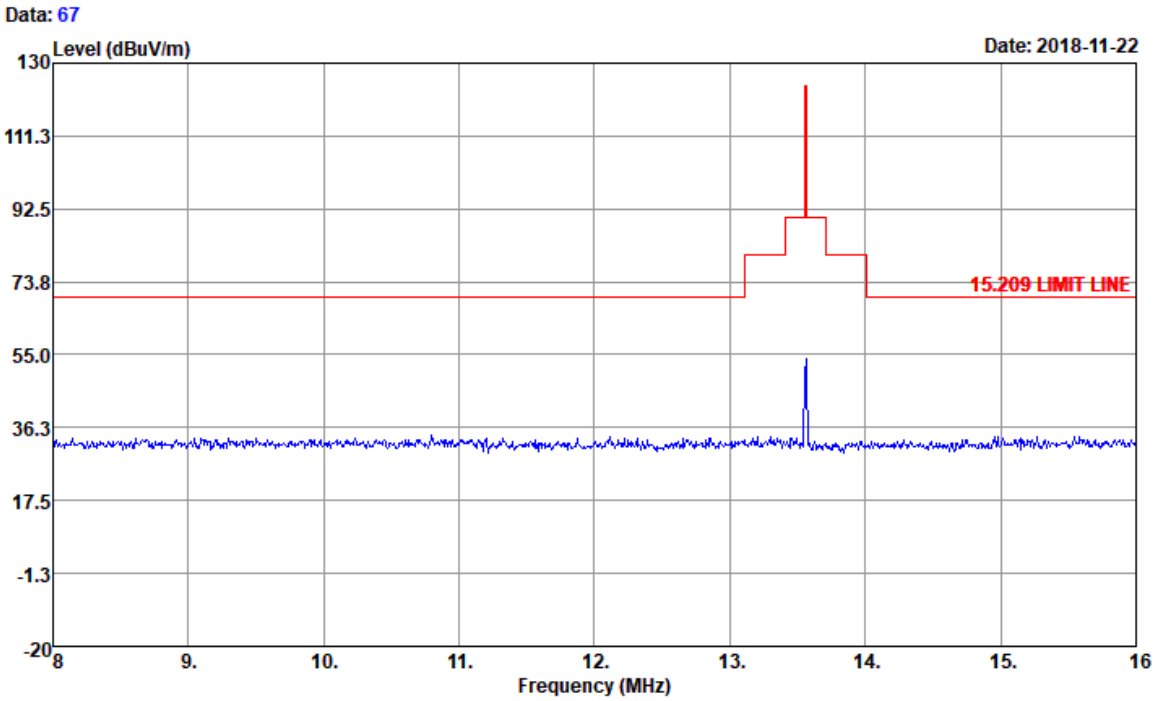
Site : 03CH01-SZ
Condition : 15.209 LIMIT LINE 3m LOOP ANT_1806 HORIZONTAL
: RBW:0.200KHz VBW:0.600KHz
FCC :



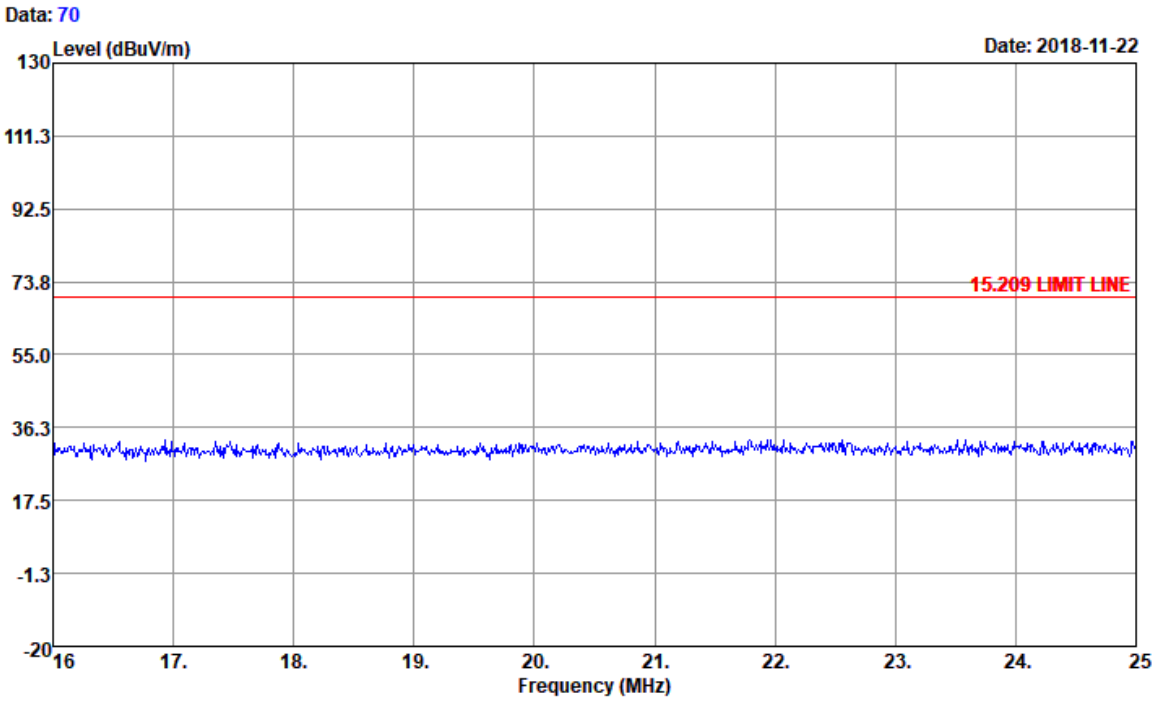
Site : 03CH01-SZ
Condition : 15.209 LIMIT LINE 3m LOOP ANT_1806 HORIZONTAL
: RBW:9.000KHz VBW:27.000KHz
FCC :



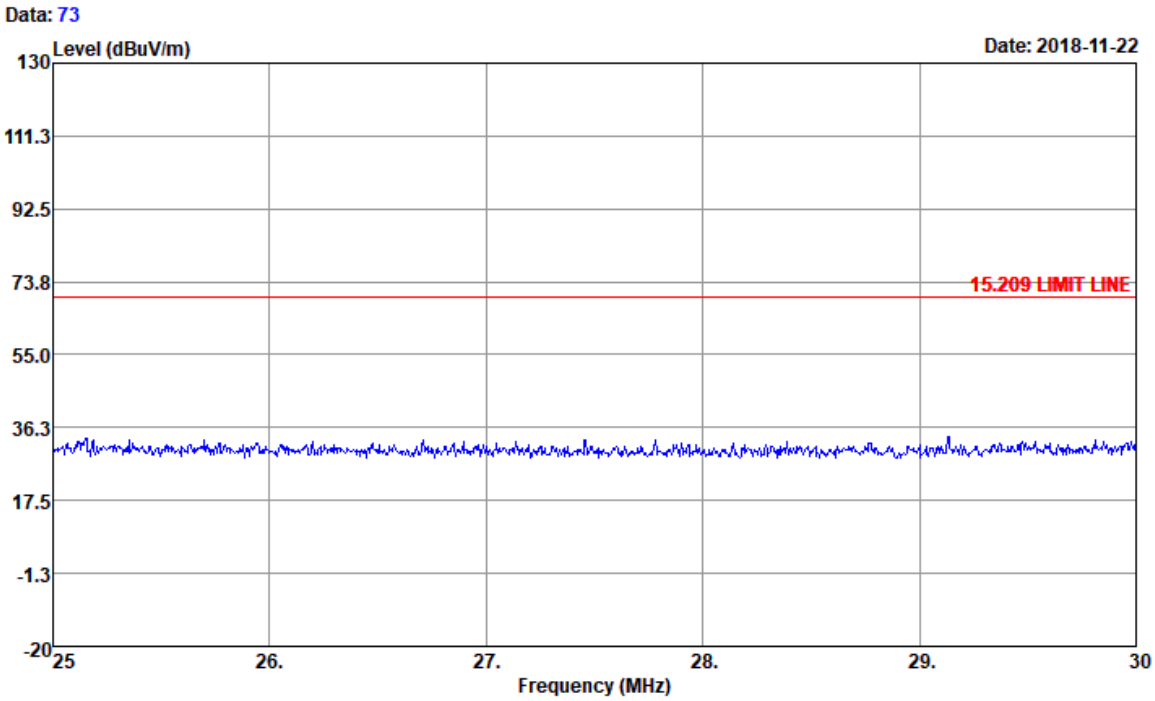
Site : 03CH01-SZ
Condition : 15.209 LIMIT LINE 3m LOOP ANT_1806 HORIZONTAL
: RBW:9.000KHz VBW:27.000KHz
FCC :



Site : 03CH01-SZ
Condition : 15.209 LIMIT LINE 3m LOOP ANT_1806 HORIZONTAL
: RBW:9.000KHz VBW:27.000KHz
FCC : B

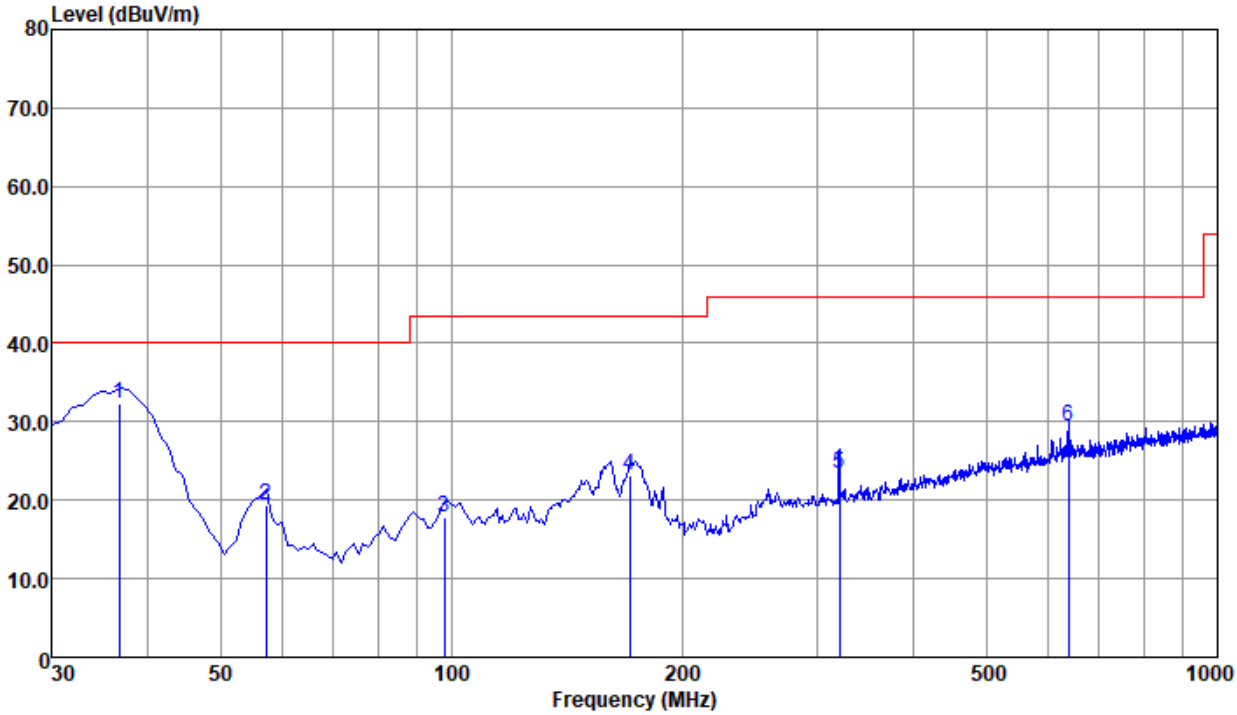


Site : 03CH01-SZ
Condition : 15.209 LIMIT LINE 3m LOOP ANT_1806 HORIZONTAL
: RBW:9.000KHz VBW:27.000KHz
FCC :



Site : 03CH01-SZ
Condition : 15.209 LIMIT LINE 3m LOOP ANT_1806 HORIZONTAL
: RBW:9.000KHz VBW:27.000KHz
FCC :

30M~1GHz



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 pp	36.79	32.34	-7.66	40.00	43.26	20.34	0.34	31.60	QP
2	57.16	19.39	-20.61	40.00	37.58	12.91	0.50	31.60	QP
3	97.90	17.91	-25.59	43.50	32.28	16.30	0.83	31.50	QP
4	170.65	23.14	-20.36	43.50	37.45	15.58	1.43	31.32	QP
5	321.00	23.45	-22.55	46.00	32.72	19.71	2.12	31.10	QP
6	638.19	29.37	-16.63	46.00	32.80	24.65	3.12	31.20	QP

NOTES:

1. All measurements were recorded using a spectrum analyzer employing a quasi-peak detector for emissions below 960MHz.
2. Both Vertical and Horizontal polarities of the receive antenna were evaluated with the worst case emissions being reported. Below 30MHz the Loop antenna was positioned in 3 separate radials.
3. The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
4. The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported.
5. Level =Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain). The reading level is calculated by software which is not shown in the sheet.

The result of the measurement is passed.

5.4 Frequency Stability

5.4.1 Test Setup

The EUT was placed in a Climatic Chamber. A small whip antenna was placed close to the EUT, and connected to the measuring Spectrum Analyzer. Measurement performed without modulation on TX.

5.4.2 Test Result

VOLTAGE (%)	POWER Battery	TEMP (ºC)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100%		-20	13559982	-18	-0.00013274336
100%		-10	13559985	-15	-0.00011061947
100%		0	13560015	15	0.00011061947
100%		10	13560013	13	0.00000958702
100%		20	13560008	8	0.00005899705
100%		30	13560018	18	0.00013274336
100%		40	13560012	12	0.00000884956
100%		50	13559982	-18	-0.00013274336
Battery End Point	3.6	20	13560014	16	0.00017994100
115%	4.35	20	13559987	-13	-0.00000958702

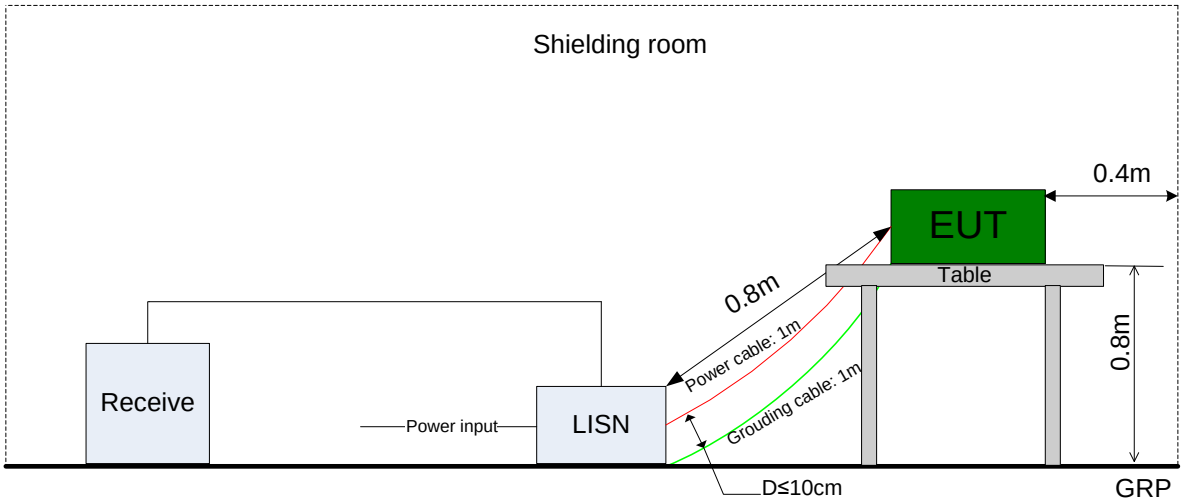
The result of the measurement is passed.

5.5 AC Power Line Conducted Emissions

5.5.1 Test Setup

The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.1 m.



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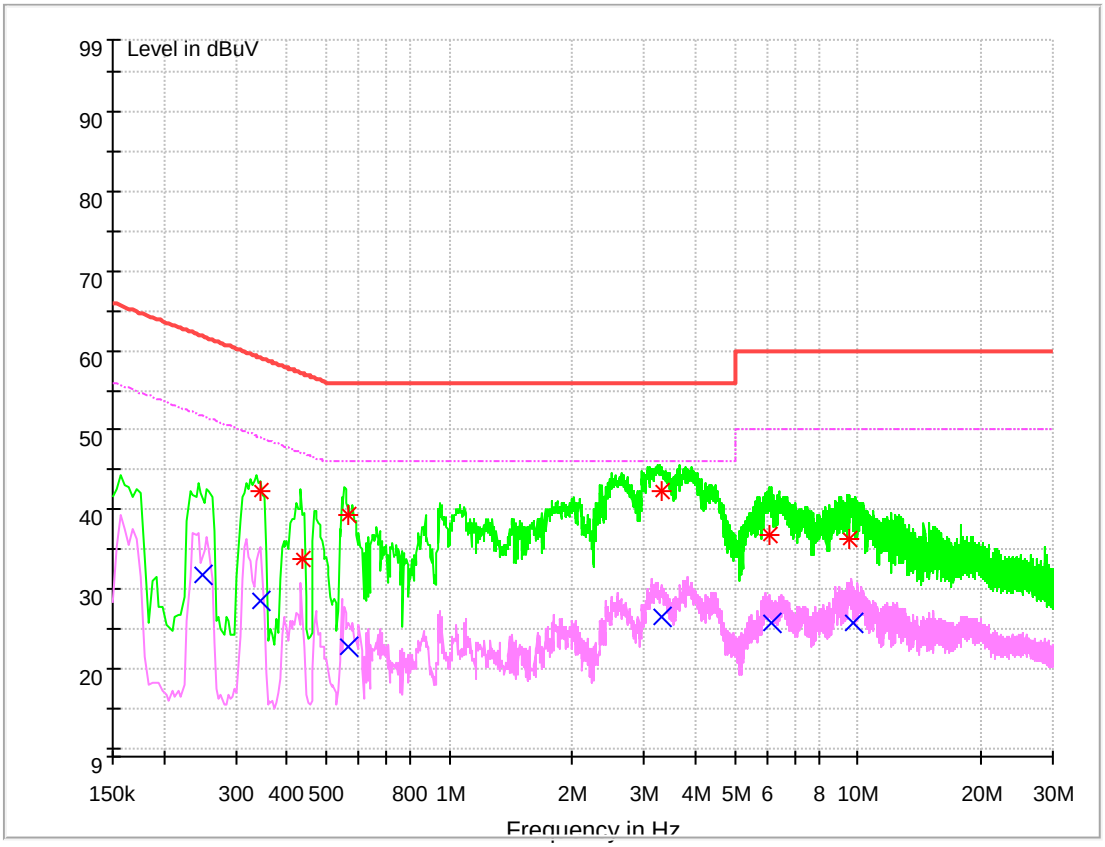
5.5.2 Test Result



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV	Limit dBµV	Transd dB	Margin dB	Line	PE
0.344580	42.34	N	9.7	16.75	59.09	FLO
0.436228	33.78	L1	9.7	23.35	57.13	FLO
0.564266	39.43	L1	9.7	16.57	56.00	FLO
3.305241	42.32	L1	9.7	13.68	56.00	FLO
6.106590	36.85	L1	9.7	23.15	60.00	FLO
9.509814	36.37	L1	9.7	23.63	60.00	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV	Limit dBµV	Transd dB	Margin dB	Line dBµV	PE
0.247562	31.86	L1	9.7	19.98	51.84	FLO
0.344575	28.60	L1	9.7	20.49	49.09	FLO
0.567771	22.89	L1	9.7	23.11	46.00	FLO
3.307960	26.47	L1	9.7	19.53	46.00	FLO
6.123200	25.77	L1	9.7	24.23	50.00	FLO
9.746123	25.70	L1	9.7	24.30	50.00	FLO

Note:

1, Level =Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)

The reading level is calculated by software which is not shown in the sheet.

2, Margin=Limit - Level

The result of the measurement is passed.

6 MAIN TEST INSTRUMENTS

6.1 Test Location 1：

Main Test Equipments(RSE test system)					
Equipment Name	Manufacturer	Model	Serial Number	Cal Date	Cal- Due
Test receiver	R&S	ESU26	100387	2018/1/20	2019/1/19
Spectrum analyzer	R&S	FSU3	200474	2018/1/20	2019/1/19
LOOP Antennas(9kHz-30MHz)	R&S	HFH2-Z2	100262	2017/4/25	2019/4/25
Trilog Broadband Antenna (30M~3GHz)	SCHWARZBECK	VULB 9163	9163-490	2017/3/29	2019/3/29
Trilog Broadband Antenna (30M~3GHz)	SCHWARZBECK	VULB 9163	9163-521	2017/4/9	2019/4/9
Artificial Main Network	R&S	ENV4200	100134	2018/5/8	2019/5/7
Line Impedance Stabilization Network	R&S	ENV216	100382	2018/5/8	2019/5/7
Software Information					
Test Item	Software Name		Manufacturer		Version
RSE	EMC32		R&S		V8.40.0

Main Test Equipments(CE test system)					
Equipment Name	Manufacturer	Model	Serial Number	Cal Date	Cal-Due
Test receiver	R&S	ESCI	101163	2018/01/20	2019/01/19
Line Impedance Stabilization Network	R&S	ENV216	100382	2018/05/08	2019/05/07
Software Information					
Test Item	Software Name		Manufacturer		Version
CE	EMC32		R&S		V9.25.0

6.2 Sub-contracted Test Location 1 :

Sub-contracted Test Location 1 :Main Test Equipments					
Equipment Name	Manufacturer	Model	Serial Number	Cal Date	Cal- Due
EMI Test Receiver&SA	Agilent	N9038A	N9038A	2018/8/30	2019/8/29
Loop Antenna	R&S	HFH2-Z2	HFH2-Z2	2018/5/30	2020/5/29
Bilog Antenna	TeseQ	CBL6112D	CBL6112D	2018/6/5	2019/6/4
LF Amplifier	Burgeon	BPA-530	BPA-530	2018/4/20	2019/4/19
Software Information					
Test Item	Software Name		Manufacturer		Version
RE	E3		AUDIX		6.2009-8-24(sporton)

7 System Measurement Uncertainty

For a 95% confidence level (k = 2), the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:

Test Item		Extended Uncertainty
All Emissions, Radiated	Field Strength [dBμV/m]	For 3 m Chamber: U = 4.8 dB (30 MHz-1 GHz)
AC Power Line Conducted Emissions	Disturbance Voltage[dBμV]	U=2.3 dB

----------The END----------