FCC PART 15C
TEST REPORT
No. I19N00846-BLE

For

Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd

smartphone

Model Name: cp3648A

With

Hardware Version: P1

Software Version: 9.0.002.P1.190609.cp3648A

FCC ID: R38YLCP3648A

Issued Date: 2019-07-03

Designation Number: CN1210

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of SAICT.

Test Laboratory:

Shenzhen Academy of Information and Communications Technology

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I19N00846-BLE	Rev.0	1st edition	2019-07-03

CONTENTS

1. Test Laboratory

1.1. Testing Location

Location: Shenzhen Academy of Information and Communications Technology
Address: Building G, Shenzhen International Innovation Center, No.1006 Shennan Road, Futian District, Shenzhen, Guangdong Province ,China
Postal Code: 518026
Telephone: +86(0)755-33322000
Fax: +86(0)755-33322001

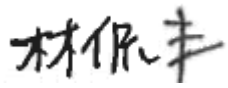
1.2. Testing Environment

Normal Temperature: 15-35℃
Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2019-05-30
Testing End Date: 2019-06-25

1.4. Signature



Lin Kanfeng
(Prepared this test report)

Tang Weisheng
(Reviewed this test report)

Zhang Bojun
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
Address /Post:	Building B, Boton Science Park, Chaguang Road, Xili Town, Nanshan District, Shenzhen
Contact:	Yentl Chen
Email:	chenyanting@yulong.com
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2.2. Manufacturer Information

Company Name:	Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
Address /Post:	Building B, Boton Science Park, Chaguang Road, Xili Town, Nanshan District, Shenzhen
Contact:	Yentl Chen
Email:	chenyanting@yulong.com
Tel.:	+86 15927320221
Fax:	/

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	smartphone
Model Name	cp3648A
Market Name	/
Frequency Range	2400MHz~2483.5MHz
Type of Modulation	GFSK
Number of Channels	40
Antenna Type	Integrated
Antenna Gain	-0.51dBi
Power Supply	3.85V DC by Battery
FCC ID	R38YLCP3648A
Condition of EUT as received	No abnormality in appearance

Note: Components list, please refer to documents of the manufacturer.

3.2. Internal Identification of EUT

EUT ID*	IMEI	HW Version	SW Version	Receive Date
EUT1	990013500007328	P1	9.0.002.P1.190609.cp3648A	2019-05-30

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE

AE ID*	Description	Mode	Manufacturer
AE1	Battery	Li-ion Polymer	Tianjin Lishen
AE2	Battery	Li-ion Polymer	Zhuhai Coslight
AE3	Charger	RD0501000-USBA-18MG	Shenzhen Ruide
AE4	Charger	618045	Shenzhen Kosun

*AE ID: is used to identify the test sample in the lab internally.

3.4. General Description

The Equipment under Test (EUT) is a model of smartphone with integrated antenna and battery.
It consists of normal options: travel charger, USB cable and Phone.
Manual and specifications of the EUT were provided to fulfil the test.
Samples undergoing test were selected by the client.

4. Reference Documents

4.1. Documents supplied by applicant

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part15	FCC CFR 47, Part 15, Subpart C: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.247 Operation within the bands 902–928MHz, 2400–2483.5 MHz, and 5725–5850 MHz	2017
ANSI C63.10	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	2013

5. Test Results

5.1. Summary of Test Results

No	Test cases	Sub-clause of Part 15C	Verdict
0	Antenna Requirement	15.203	**P**
1	Maximum Peak Output Power	15.247 (b)	**P**
2	Peak Power Spectral Density	15.247 (e)	**P**
3	Occupied 6dB Bandwidth	15.247 (a)	**P**
4	Band Edges Compliance	15.247 (d)	**P**
5	Transmitter Spurious Emission - Conducted	15.247 (d)	**P**
6	Transmitter Spurious Emission - Radiated	15.247, 15.205, 15.209	**P**
7	AC Power line Conducted Emission	15.107, 15.207	**P**

See **ANNEX A** for details.

5.2. Statements

SAICT has evaluated the test cases requested by the applicant/manufacturer as listed in section 5.1 of this report, for the EUT specified in section 3, according to the standards or reference documents listed in section 4.2.

5.3. Terms used in the result table

Terms used in Verdict column

P	Pass
NA	Not Available
F	Fail

Abbreviations

AC	Alternating Current
AFH	Adaptive Frequency Hopping
BW	Band Width
E.I.R.P.	equivalent isotropic radiated power
ISM	Industrial, Scientific and Medical
R&TTE	Radio and Telecommunications Terminal Equipment
RF	Radio Frequency
Tx	Transmitter

5.4. Laboratory Environment

Semi-anechoic chamber

Temperature	Min. = 15 ˚C, Max. = 35 ˚C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014 MHz - 1 MHz, > 60 dB; 1 MHz - 1000 MHz, > 90 dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4 Ω
Normalised site attenuation (NSA)	< ±4 dB, 3m/10m distance, from 30 to 1000 MHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz

Shielded room

Temperature	Min. = 15 ˚C, Max. = 35 ˚C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014 MHz - 1 MHz, > 60 dB; 1 MHz - 1000 MHz, > 90 dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4 Ω

Fully-anechoic chamber

Temperature	Min. = 15 ˚C, Max. = 35 ˚C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014 MHz - 1MHz, > 60dB; 1 MHz - 1000 MHz, > 90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4 Ω
Voltage Standing Wave Ratio (VSWR)	≤ 6 dB, from 1 to 18 GHz, 3m distance

6. Test Facilities Utilized

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Date	Calibration Period
1	Vector Signal Analyzer	FSV40	100903	Rohde & Schwarz	2020-01-16	1 year
2	Power Sensor	U2021XA	MY55430013	Agilent	2020-01-16	1 year
3	Data Acquisiton	U2531A	TW55443507	Agilent	/	/

Radiated emission test system

NO.	Equipment	Model	Serial Number	Manufacturer	Calibration Date	Calibration Period
1	LISN	ESH2-Z5	100196	R&S	2020-01-03	1 year
2	Test Receiver	ESCI	100701	R&S	2019-08-07	1 year
3	Loop Antenna	HLA6120	35779	TESEQ	2022-05-01	3 year
4	BiLog Antenna	VULB9163	9163 329	Schwarzbeck	2020-02-17	3 year
5	Horn Antenna	3117	00066585	ETS-Lindgren	2022-03-04	3 year
6	Test Receiver	ESR7	101675	R&S	2019-07-19	1 year
7	Spectrum Analyzer	FSP 40	100378	R&S	2019-12-13	1 year
8	Chamber	FACT5-2.0	4166	ETS-Lindgren	2021-05-12	3 year
9	Antenna	QSH-SL-18-26-S-20	17013	Q-par	2020-01-15	3 year
10	Antenna	QSH-SL-26-40-K-20	17014	Q-par	2020-01-11	3 year

Test software

No.	Equipment	Manufacturer	Version
1	TechMgr Software	CAICT	2.1.1
2	EMC32	Rohde & Schwarz	8.53.0
3	EMC32	Rohde & Schwarz	10.01.00

EUT is engineering software provided by the customer to control the transmitting signal.
The EUT was programmed to be in continuously transmitting mode.

Anechoic chamber

Fully anechoic chamber by ETS-Lindgren

7. Measurement Uncertainty

Test Name	Uncertainty	
1. RF Output Power - Conducted	±1.32dB	
2.Power Spectral Density - Conducted	±2.32dB	
3.Occupied channel bandwidth - Conducted	±66Hz	
4 Transmitter Spurious Emission - Conducted	30MHz≤f≤1GHz	±1.41dB
	1GHz≤f≤7GHz	±1.92dB
	7GHz≤f≤13GHz	±2.31dB
	13GHz≤f≤26GHz	±2.61dB
5. Transmitter Spurious Emission - Radiated	9kHz≤f≤30MHz	±1.84dB
	30MHz≤f≤1GHz	±4.90dB
	1GHz≤f≤18GHz	±5.12dB
	18GHz≤f≤40GHz	±4.66dB
6. AC Power line Conducted Emission	150kHz≤f≤30MHz	±3.10dB

ANNEX A: Detailed Test Results

A.0 Antenna requirement

Measurement Limit:

Standard	Requirement
FCC CRF Part 15.203	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

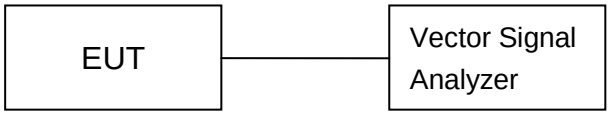
Conclusion: The Directional gains of antenna used for transmitting is -0.51dBi. The RF transmitter uses an integrate antenna without connector.

A.1 Test Configuration

A.1.1 Conducted Measurements

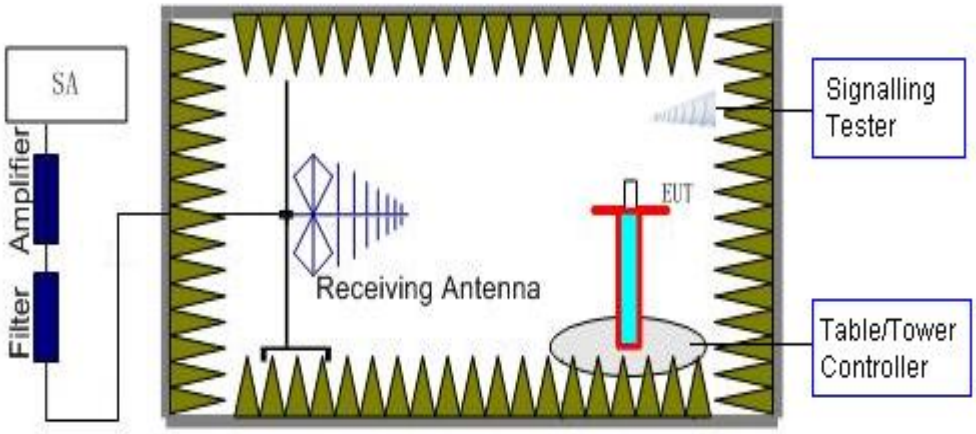
The measurement is made according to ANSI C63.10.

1). Connect the EUT to the test system correctly.
2). Set the EUT to the required work mode.
3). Set the EUT to the required channel.
4). Set the spectrum analyzer to start measurement.
5). Record the values.



A.1.2 Radiated Measurements

Test setup: EUT was placed on a 1.5 meter high non-conductive table at a 3 meter test distance from the receive antenna. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT and adjusting the receiving antenna polarization.



A.2 Maximum Peak Output Power

Method of Measurement: See ANSI C63.10-clause 11.9.1.3

The maximum peak conducted output power may be measured using a broadband peak RF power meter.

Measurement Limit:

Standard	Limit (dBm)
FCC 47 CRF Part 15.247(b)	< 30

Measurement Results:

LE-1M

Mode	Frequency (MHz)	Peak Conducted Output Power (dBm)	Conclusion
GFSK	2402 (CH0)	-7.93	**P**
	2440 (CH19)	-6.93	**P**
	2480 (CH39)	-7.38	**P**

Conclusion: Pass

A.3 Peak Power Spectral Density

Method of Measurement: See ANSI C63.10-clause 11.10.2

Measurement Limit:

Standard	Limit
FCC 47 CRF Part 15.247(e)	< 8 dBm/3 kHz

Measurement Results:

LE-1M

Mode	Frequency (MHz)	Peak Power Spectral Density (dBm)		Conclusion
GFSK	2402 (CH0)	Fig.1	-22.77	**P**
	2440 (CH19)	Fig.2	-21.75	**P**
	2480 (CH39)	Fig.3	-22.19	**P**

See below for test graphs.

Conclusion: PASS

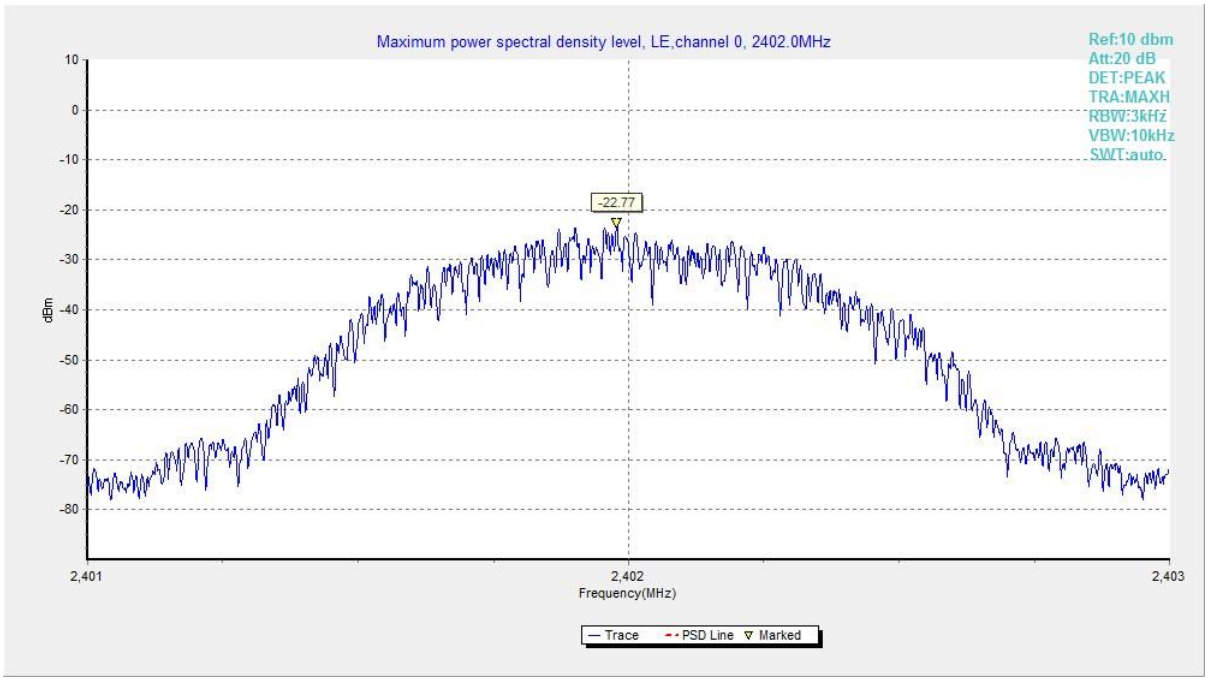


Fig.1 Power Spectral Density (Ch 0), 1M

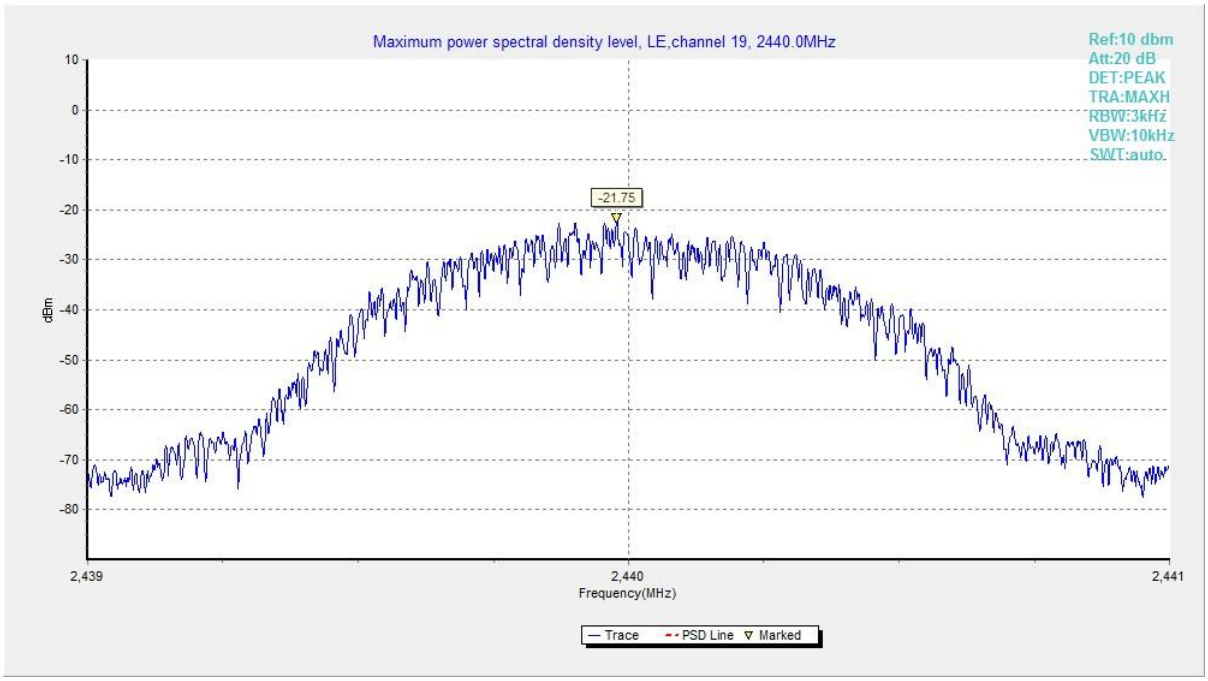


Fig.2 Power Spectral Density (Ch 19), 1M

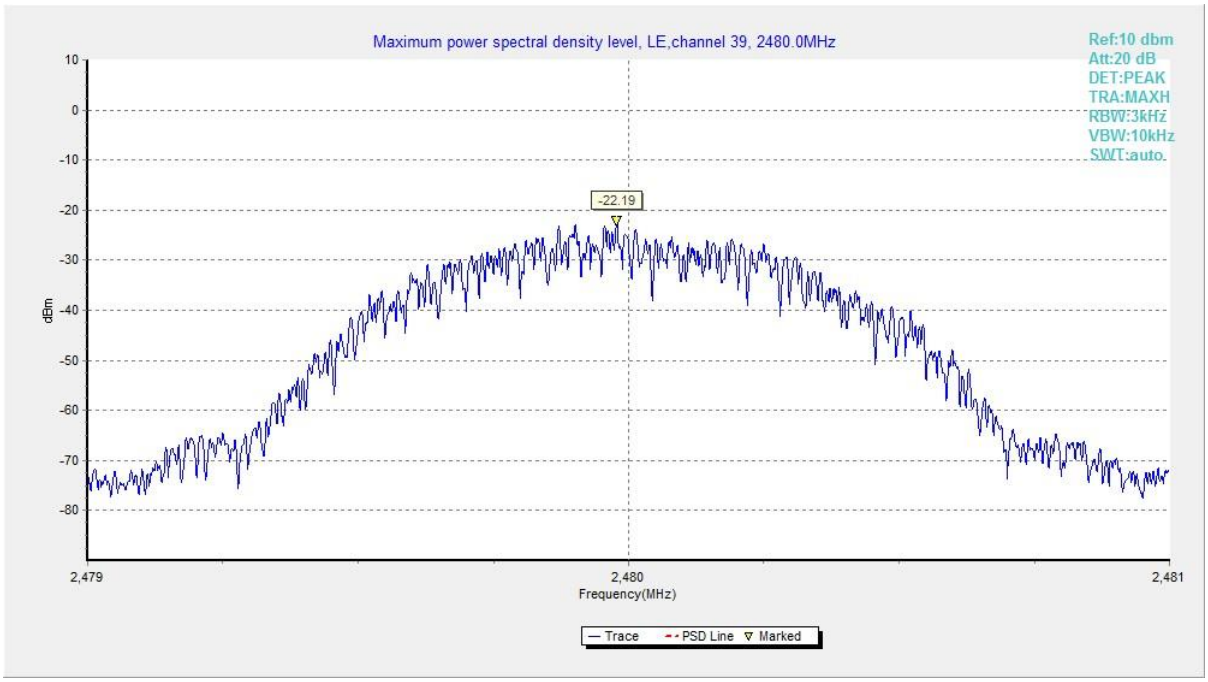


Fig.3 Power Spectral Density (Ch 39), 1M

A.4 6dB Bandwidth

Measurement Limit:

Standard	Limit (kHz)
FCC 47 CFR Part 15.247(a)	≥ 500

Measurement Result:

LE-1M

Mode	Frequency (MHz)	Test Results (kHz)		Conclusion
GFSK	2402 (CH0)	Fig.4	647.00	**P**
	2440 (CH19)	Fig.5	647.50	**P**
	2480 (CH39)	Fig.6	647.00	**P**

See below for test graphs.

Conclusion: PASS

Fig.4 6dB Bandwidth (Ch 0), 1M

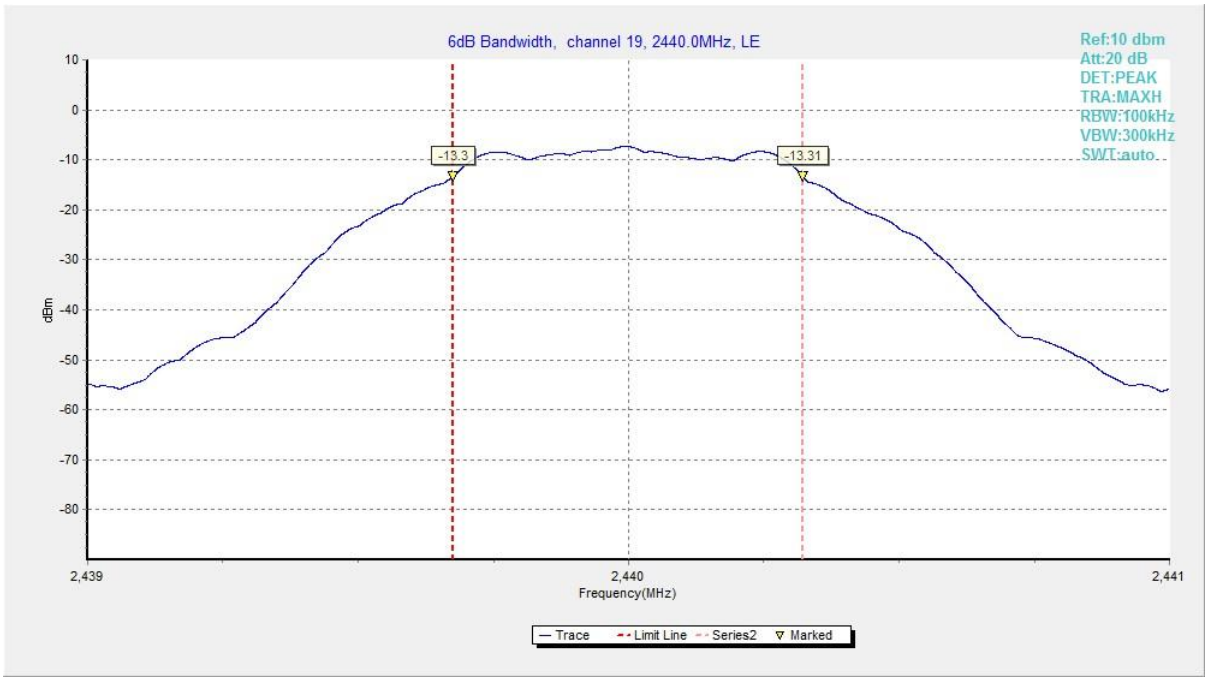


Fig.5 6dB Bandwidth (Ch 19), 1M

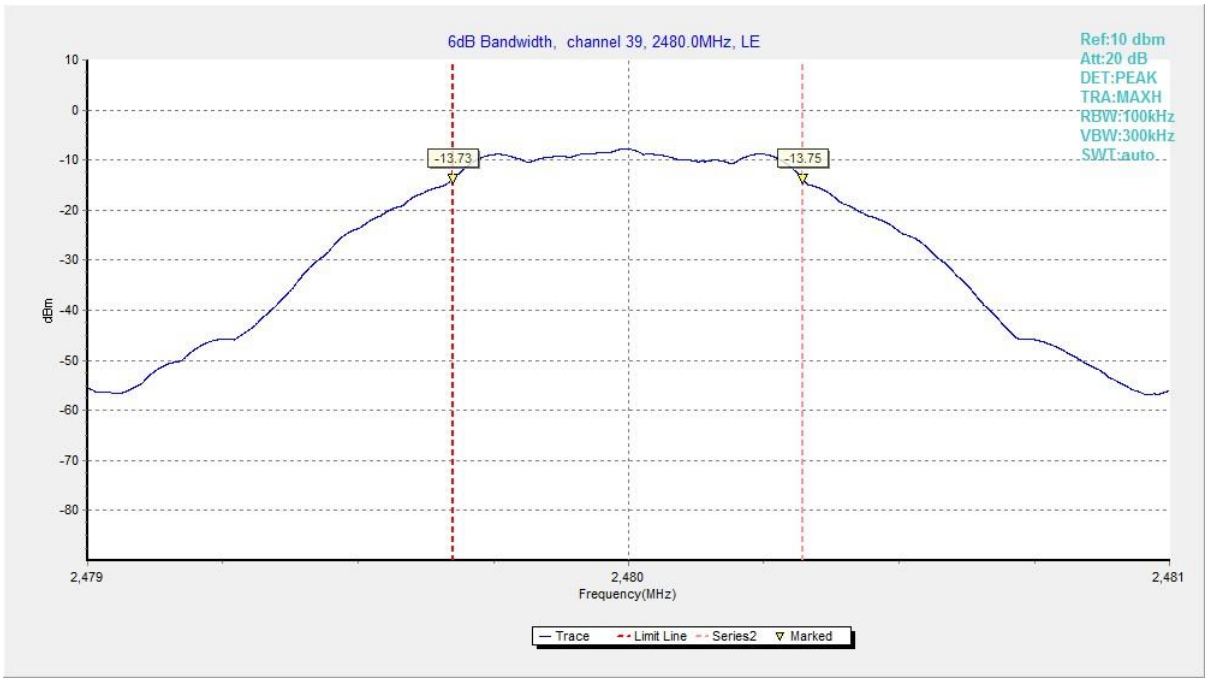


Fig.6 6dB Bandwidth (Ch 39), 1M

A.5 Band Edges Compliance

Measurement Limit:

Standard	Limit (dB)
FCC 47 CFR Part 15.247 (d)	> 20

Measurement Result:

LE-1M

Mode	Frequency (MHz)	Test Results		Conclusion
GFSK	2402(CH0)	Fig.7	56.27	**P**
	2480(CH39)	Fig.8	57.47	**P**

See below for test graphs.

Conclusion: Pass

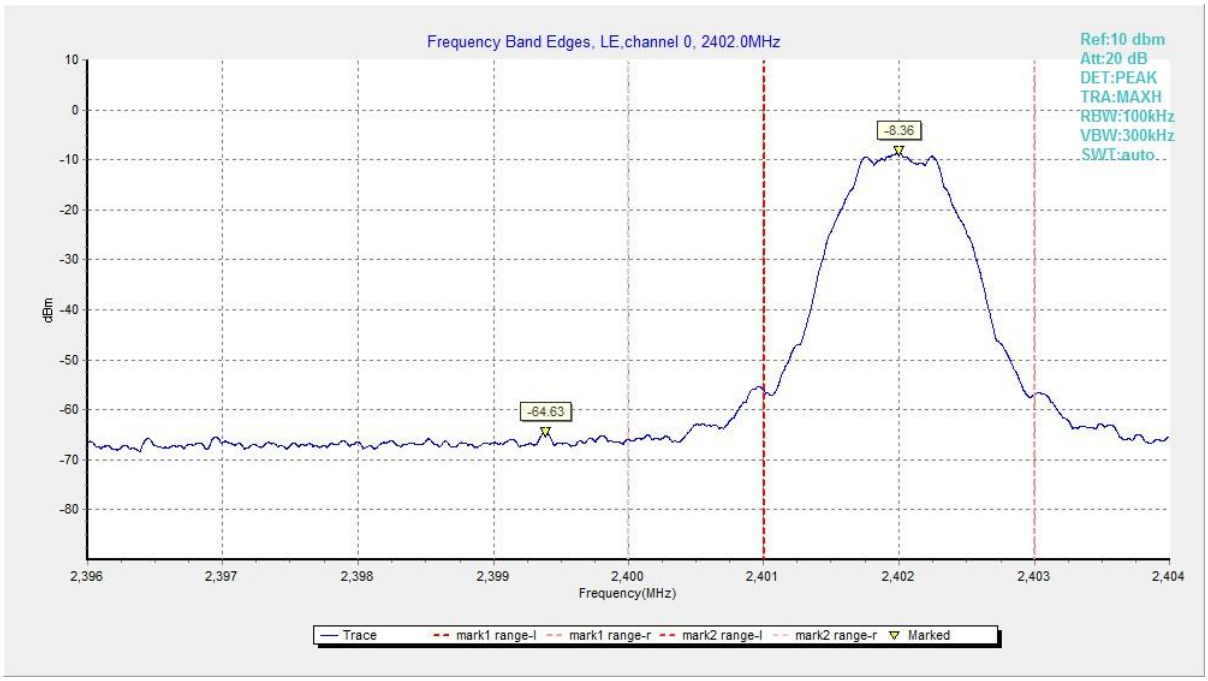


Fig.7 Band Edges (Ch 0), 1M

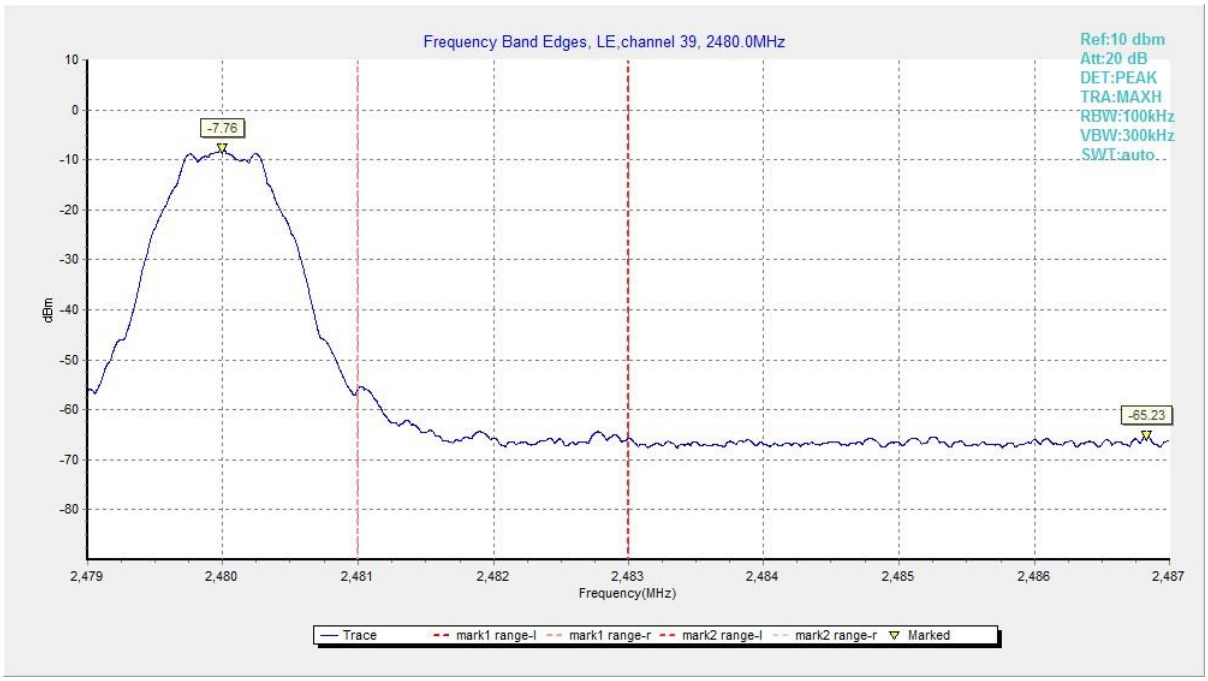


Fig.8 Band Edges (Ch 39), 1M

A.6 Transmitter Spurious Emission - Conducted

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247 (d)	20dB below peak output power in 100 kHz bandwidth

Measurement Results:

LE-1M

MODE	Channel	Frequency Range	Test Results	Conclusion
GFSK	0	2.402 GHz	Fig.9	**P**
		1GHz -3GHz	Fig.10	**P**
		3GHz-10GHz	Fig.11	**P**
	19	2.440 GHz	Fig.12	**P**
		1GHz -3GHz	Fig.13	**P**
		3GHz-10GHz	Fig.14	**P**
	39	2.480 GHz	Fig.15	**P**
		1GHz -3GHz	Fig.16	**P**
		3GHz-10GHz	Fig.17	**P**
	All channels	30MHz-1GHz	Fig.18	**P**
		10GHz-26GHz	Fig.19	**P**

See below for test graphs.

Conclusion: Pass

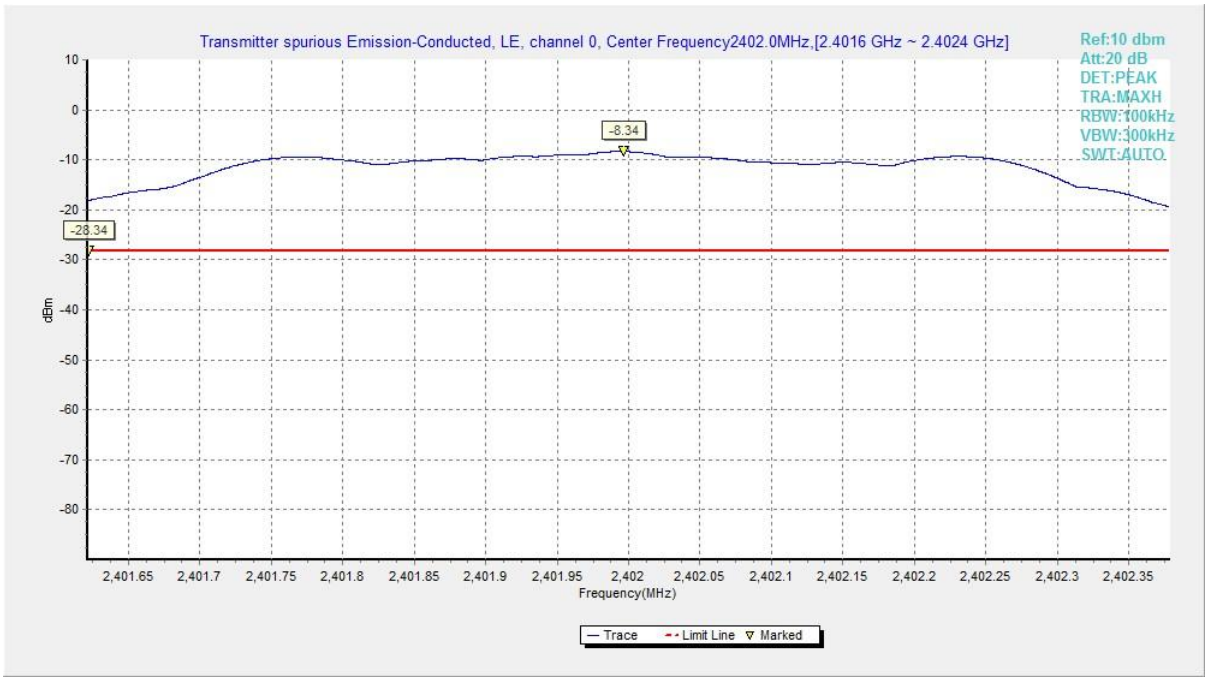


Fig.9 Conducted Spurious Emission (Ch0, Center Frequency), 1M

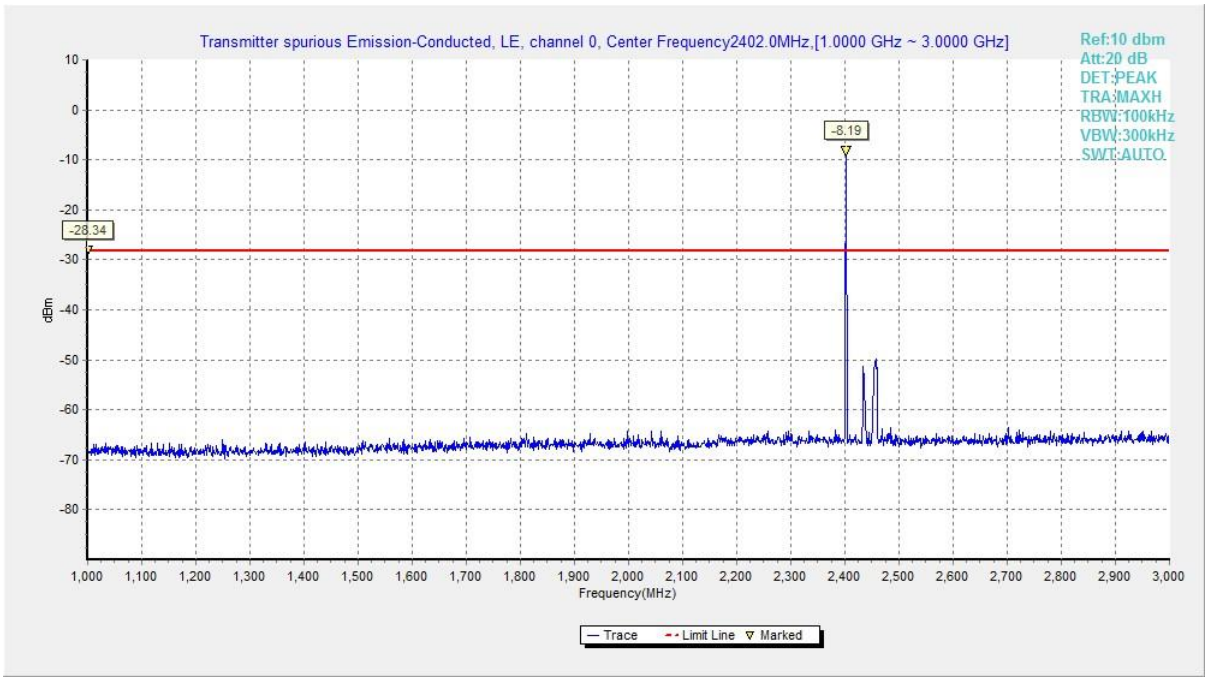


Fig.10 Conducted Spurious Emission (Ch0, 1 GHz-3 GHz), 1M

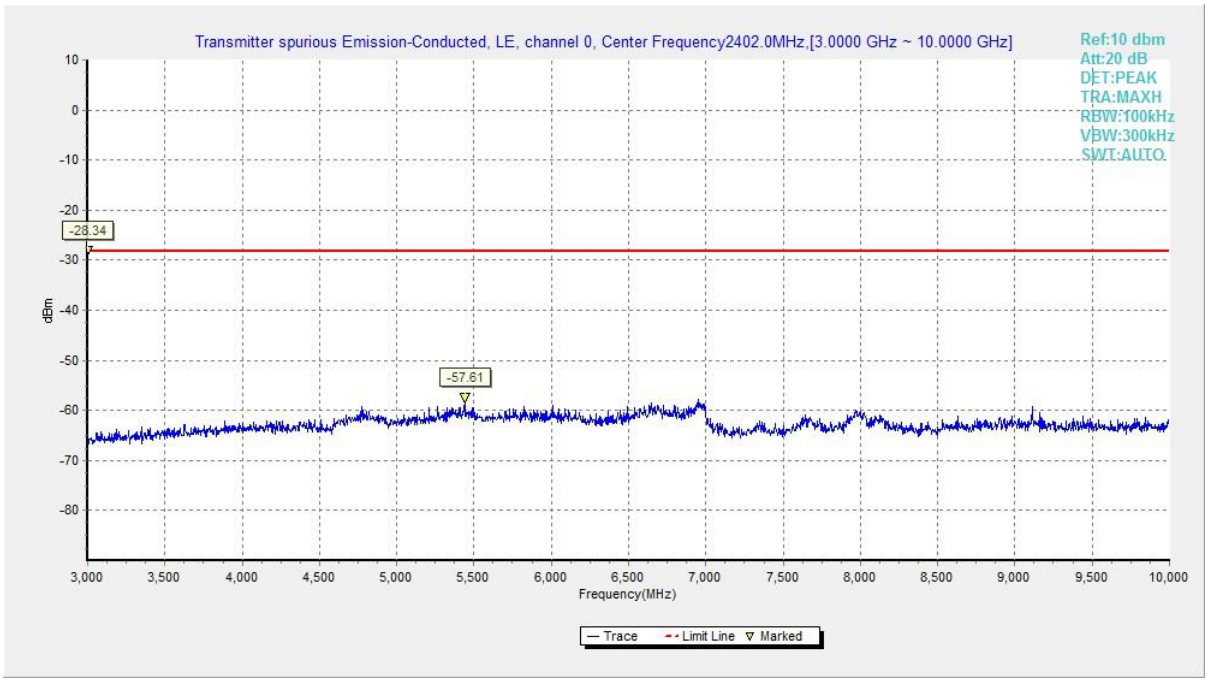


Fig.11 Conducted Spurious Emission (Ch0, 3 GHz-10 GHz), 1M

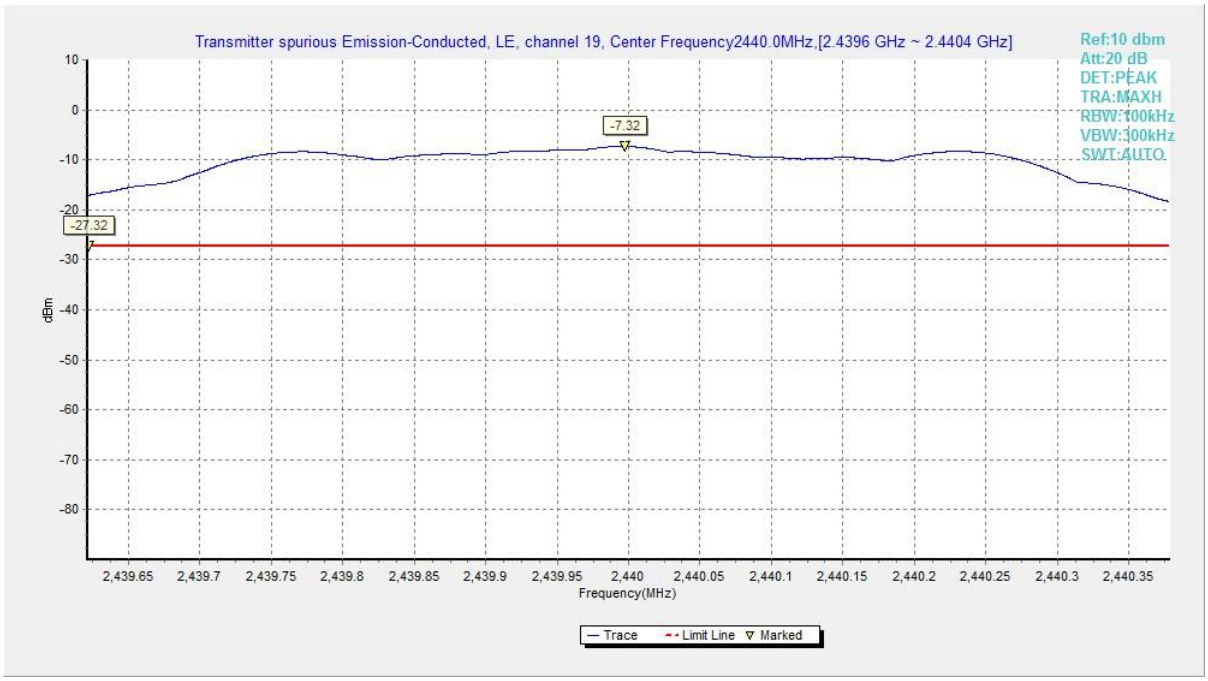


Fig.12 Conducted Spurious Emission (Ch19, Center Frequency), 1M

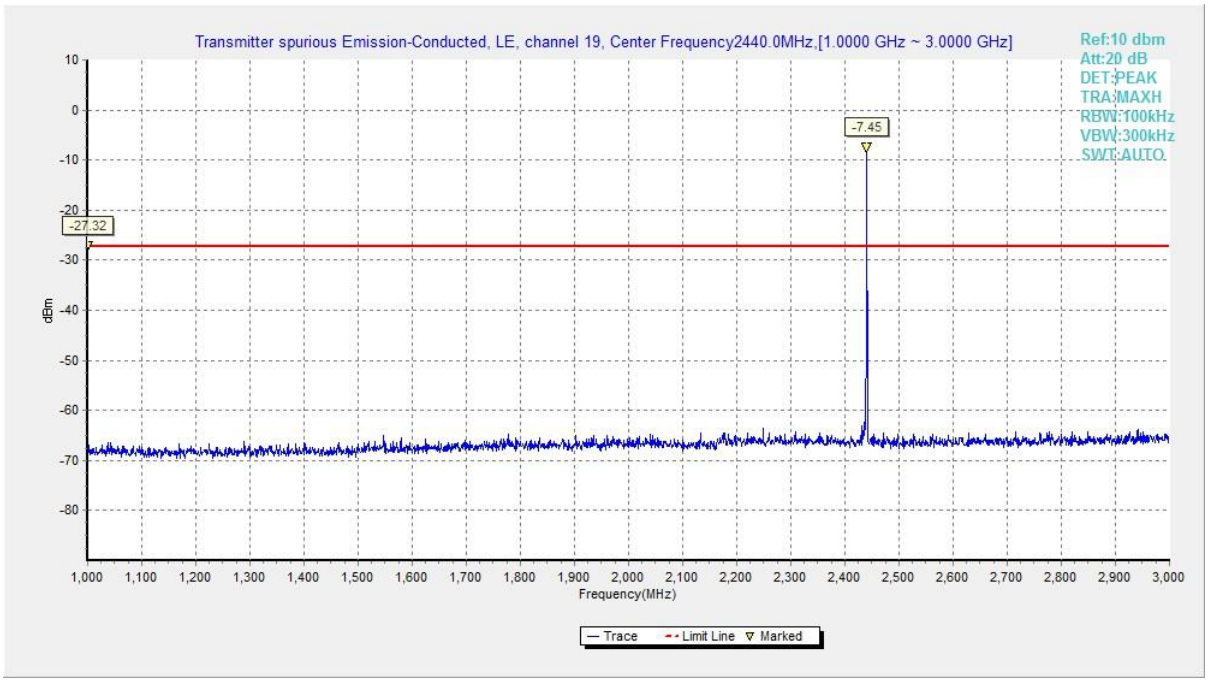


Fig.13 Conducted Spurious Emission (Ch19, 1 GHz-3 GHz), 1M

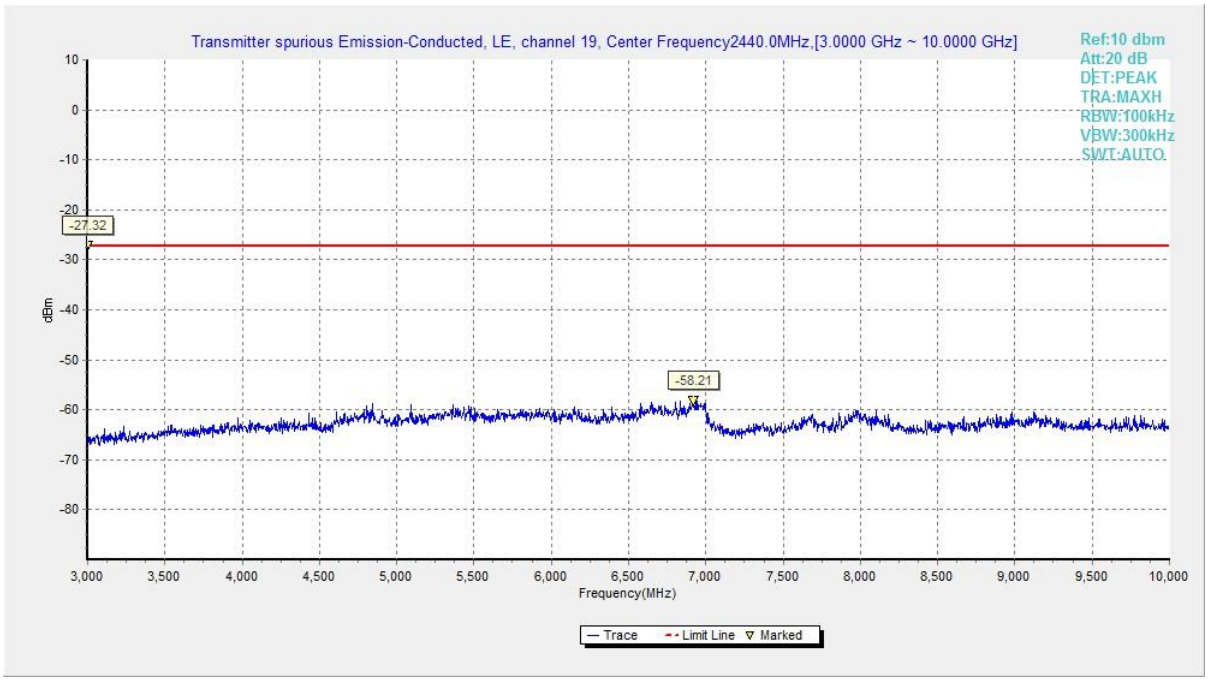


Fig.14 Conducted Spurious Emission (Ch19, 3 GHz-10 GHz), 1M

Fig.15 Conducted Spurious Emission (Ch39, Center Frequency), 1M

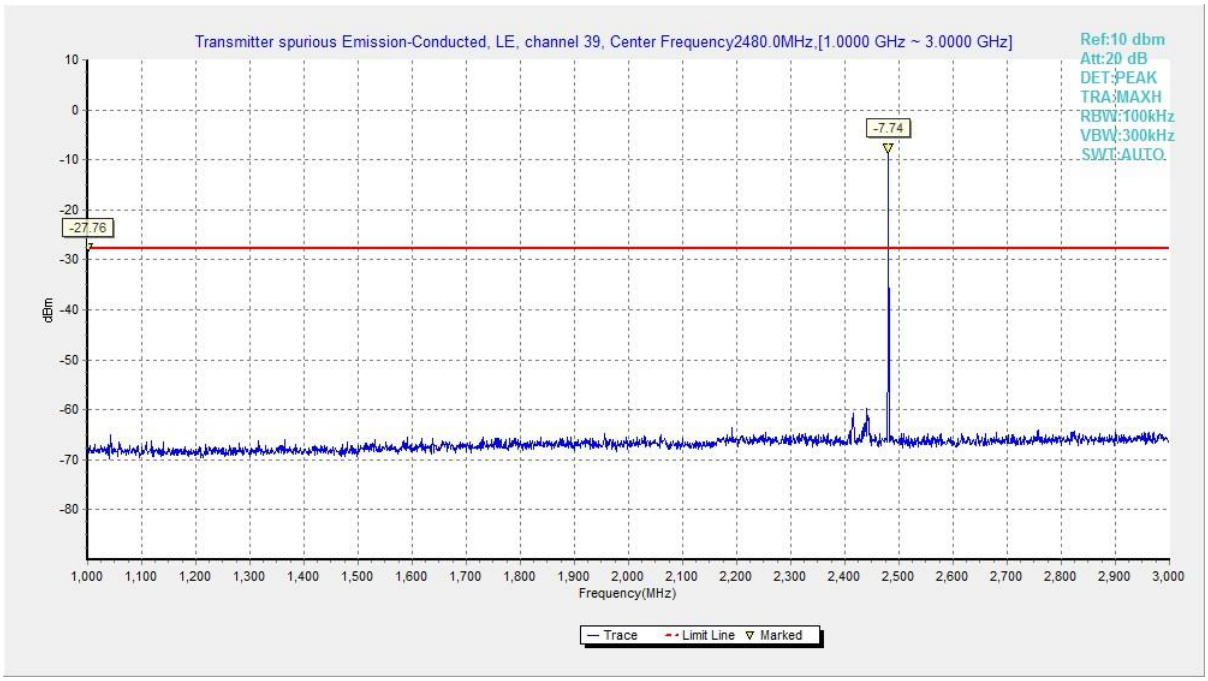


Fig.16 Conducted Spurious Emission (Ch39, 1 GHz-3 GHz), 1M

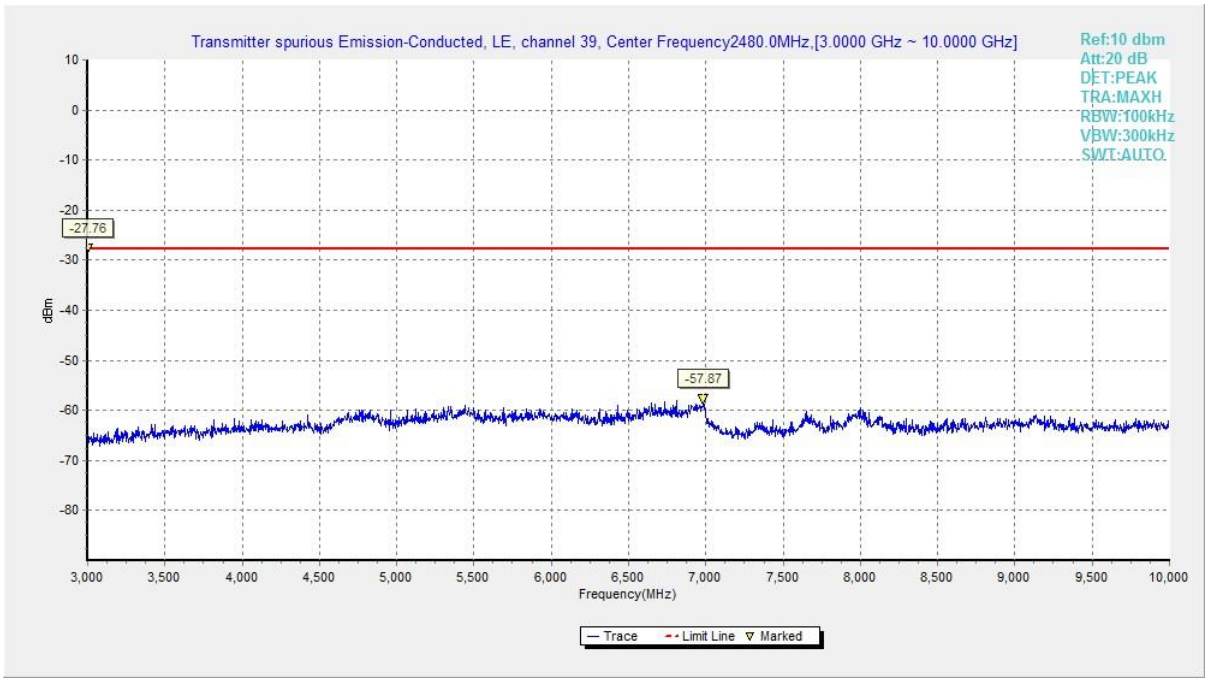


Fig.17 Conducted Spurious Emission (Ch39, 3 GHz-10 GHz), 1M

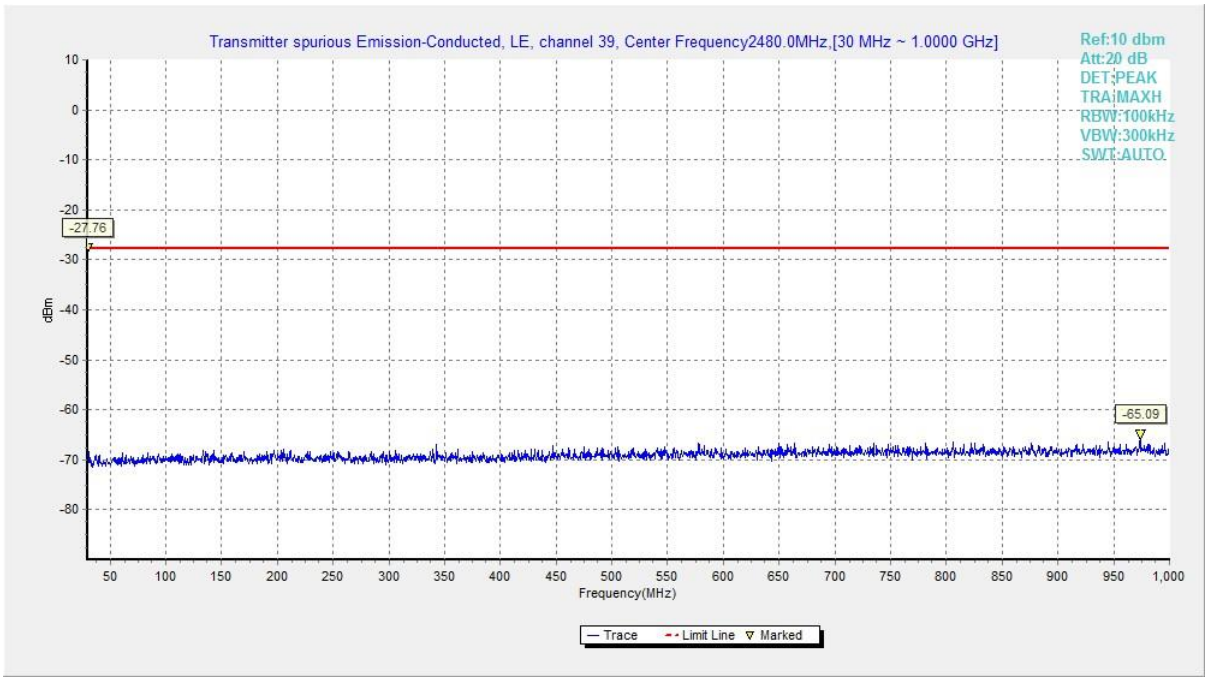


Fig.18 Conducted Spurious Emission (All channels, 30 MHz-1 GHz), 1M

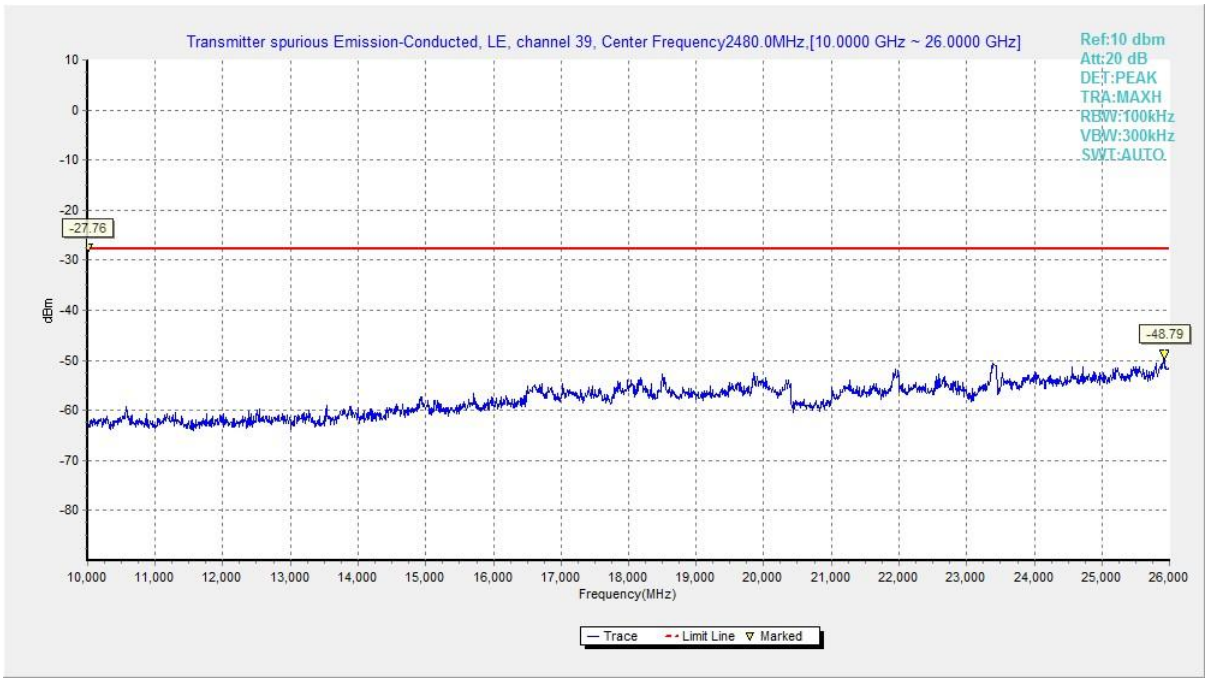


Fig.19 Conducted Spurious Emission (All channels, 10 GHz-26 GHz), 1M

A.7 Transmitter Spurious Emission - Radiated

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247, 15.205, 15.209	20dB below peak output power

In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

Limit in restricted band:

Frequency of emission (MHz)	Field strength(μV/m)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Condition:

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	120kHz/300kHz	5
1000-4000	1MHz/3MHz	15
4000-18000	1MHz/3MHz	40
18000-26500	1MHz/3MHz	20

Note: According to the performance evaluation, the radiated emission margin of EUT is over 20dB in the band from 9kHz to 30MHz. Therefore, the measurement starts from 30MHz to tenth harmonic. The measurement results include the horizontal polarization and vertical polarization measurements.

Measurement Results:

LE-1M

Mode	Channel	Frequency Range	Test Results	Conclusion
GFSK	0	1 GHz ~ 3 GHz	Fig.20	**P**
		3 GHz ~ 18 GHz	Fig.21	**P**
	19	9 kHz ~ 30 MHz	Fig.22	**P**
		30 MHz ~ 1 GHz	Fig.23	**P**
		1 GHz ~ 3 GHz	Fig.24	**P**
		3 GHz ~ 18 GHz	Fig.25	**P**
		18 GHz ~ 26.5 GHz	Fig.26	**P**
	39	1 GHz ~ 3 GHz	Fig.27	**P**
		3 GHz ~ 18 GHz	Fig.28	**P**
	Restricted Band(CH0)	2.38 GHz ~ 2.45 GHz	Fig.29	**P**
	Restricted Band(CH39)	2.45 GHz ~ 2.5 GHz	Fig.30	**P**

See below for test graphs.

Conclusion: Pass

LE-1M

GFSK CH0 (3-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
9038.500000	42.95	74.00	31.05	V	5.1
10541.500000	44.32	74.00	29.68	H	6.7
11918.000000	45.80	74.00	28.20	H	9.0
14118.000000	46.96	74.00	27.04	H	12.0
15829.500000	48.92	74.00	25.08	V	14.6
16987.000000	50.62	74.00	23.38	V	16.5

Frequency (MHz)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
9038.500000	30.62	54.00	23.38	V	5.1
10541.500000	31.81	54.00	22.19	H	6.7
11918.000000	33.41	54.00	20.59	H	9.0
14118.000000	34.40	54.00	19.60	H	12.0
15829.500000	36.15	54.00	17.85	V	14.6
16987.000000	38.06	54.00	15.94	V	16.5

GFSK CH19 (3-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
8204.000000	43.27	74.00	30.73	H	4.3
9736.000000	44.04	74.00	29.96	V	6.0
11126.000000	44.75	74.00	29.25	H	7.3
12352.000000	45.86	74.00	28.14	V	9.2
14511.000000	48.48	74.00	25.52	V	12.9
17070.000000	50.50	74.00	23.50	V	16.4

Frequency (MHz)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
8204.000000	29.82	54.00	24.18	H	4.3
9736.000000	31.06	54.00	22.94	V	6.0
11126.000000	32.22	54.00	21.78	H	7.3
12352.000000	33.30	54.00	20.70	V	9.2
14511.000000	35.57	54.00	18.43	V	12.9
17070.000000	37.58	54.00	16.42	V	16.4

GFSK CH39 (3-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
8690.000000	43.06	74.00	30.94	H	5.1
9890.500000	44.47	74.00	29.53	H	6.5
11520.500000	45.23	74.00	28.77	H	7.8
12974.000000	46.06	74.00	27.94	H	10.1
15330.000000	48.74	74.00	25.26	H	13.6
16926.500000	50.90	74.00	23.10	V	16.2

Frequency (MHz)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
8690.000000	30.71	54.00	23.29	H	5.1
9890.500000	31.55	54.00	22.45	H	6.5
11520.500000	32.42	54.00	21.58	H	7.8
12974.000000	33.61	54.00	20.39	H	10.1
15330.000000	35.43	54.00	18.57	H	13.6
16926.500000	37.51	54.00	16.49	V	16.2

Note:

A "reference path loss" is established and the A_{Rpl} is the attenuation of “reference path loss”, and Antenna Factor, the gain of the preamplifier, the cable loss. P_{Mea} is the field strength recorded from the instrument.

The measurement results are obtained as described below:

Result = P_{Mea} + Cable Loss + Antenna Factor - Gain of the preamplifier

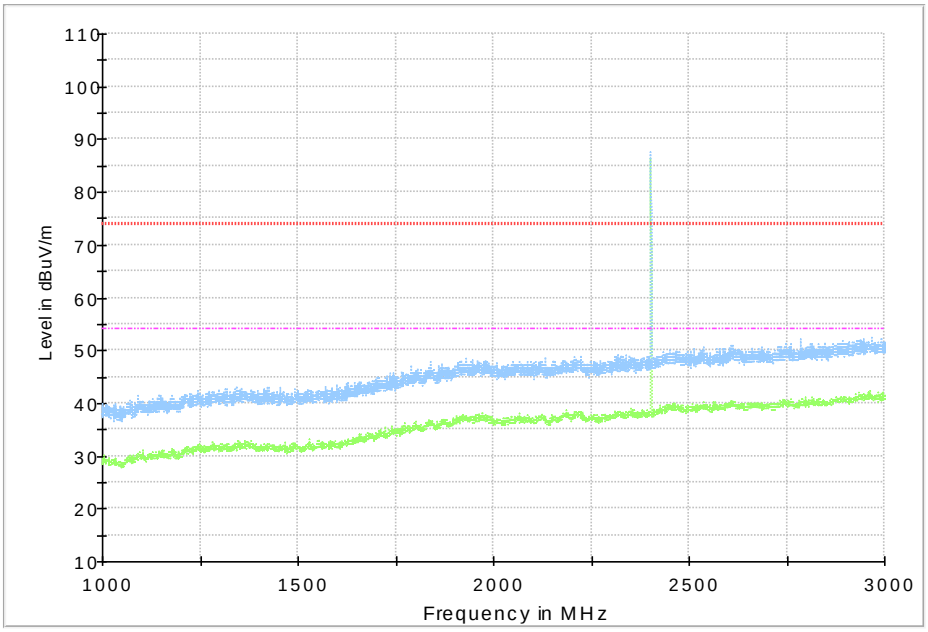


Fig.20 Radiated Spurious Emission (Ch0, 1 GHz - 3 GHz), 1M

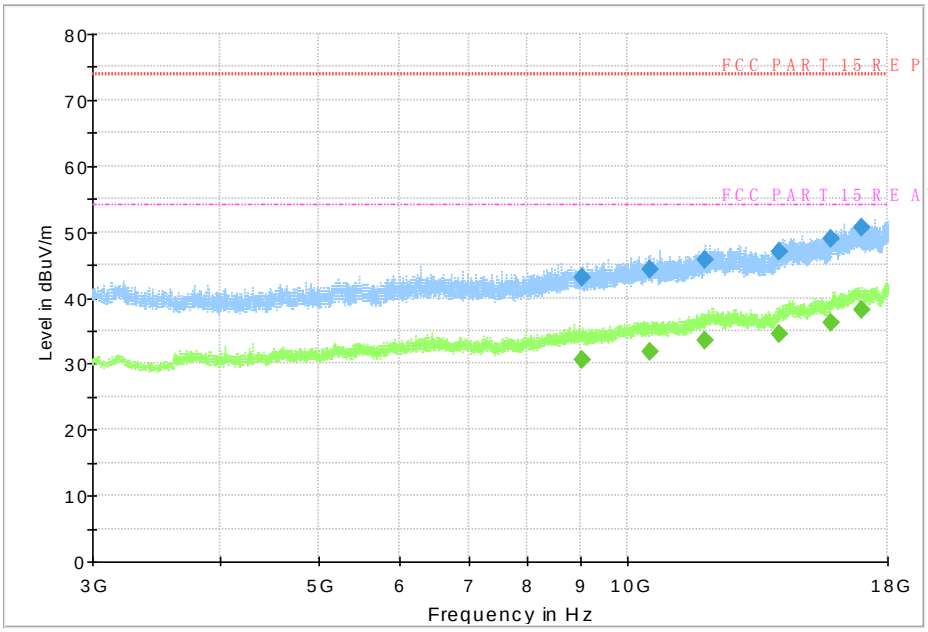


Fig.21 Radiated Spurious Emission (Ch0, 3 GHz - 18 GHz), 1M

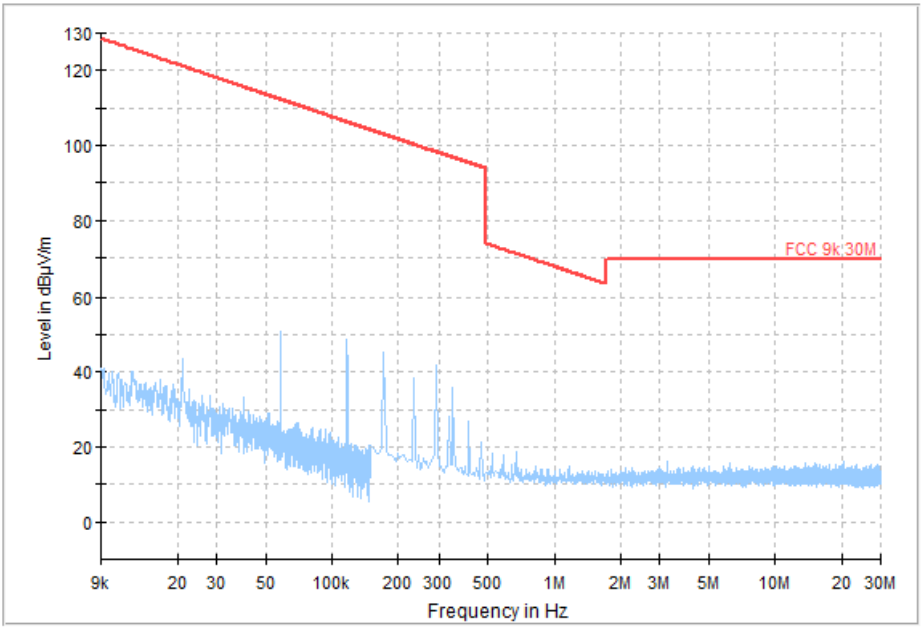


Fig.22 Radiated Spurious Emission (Ch19, 9 kHz - 30 MHz), 1M

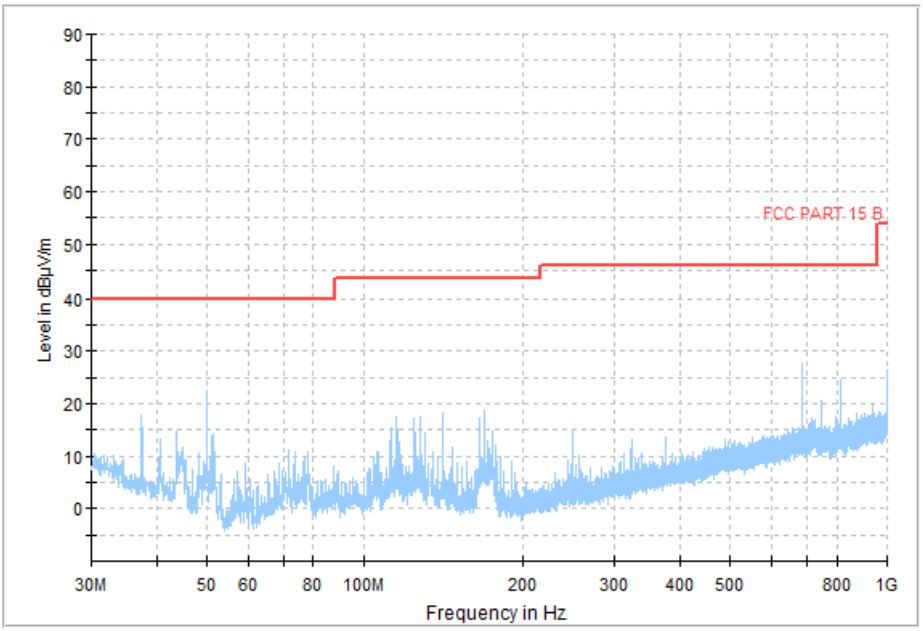


Fig.23 Radiated Spurious Emission (Ch19, 30 MHz - 1 GHz), 1M

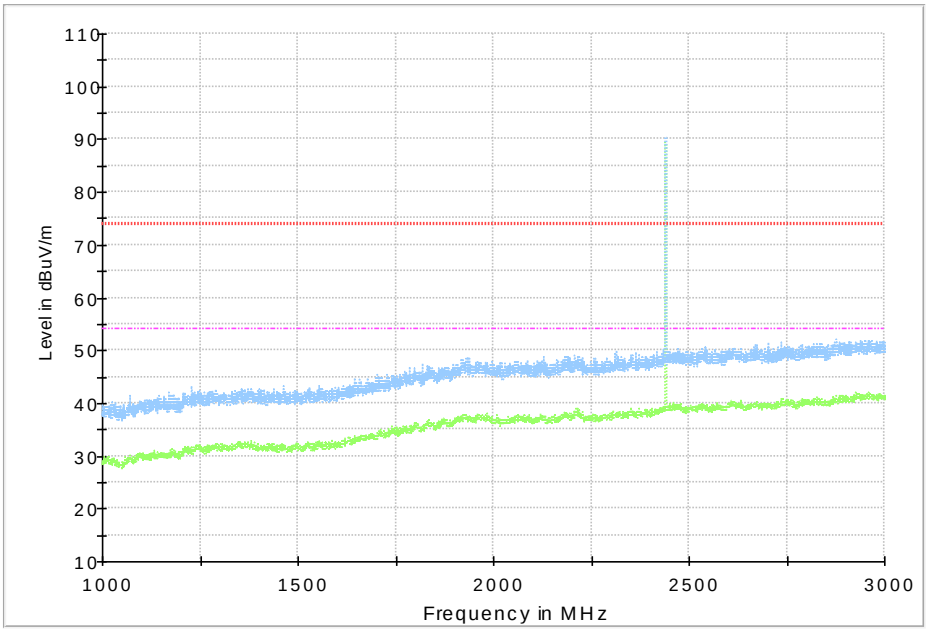


Fig.24 Radiated Spurious Emission (Ch19, 1 GHz - 3 GHz), 1M

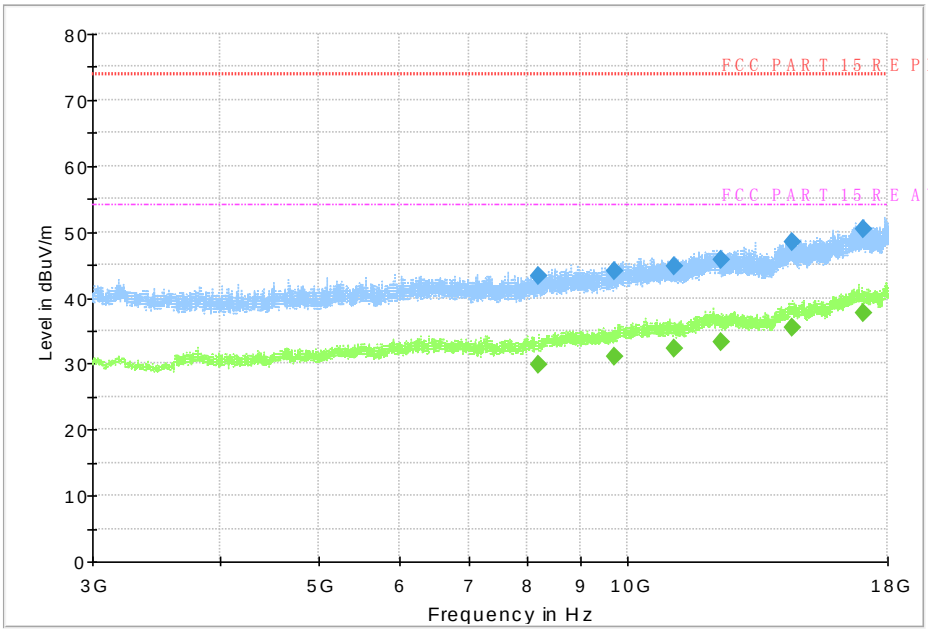


Fig.25 Radiated Spurious Emission (Ch19, 3 GHz - 18 GHz), 1M

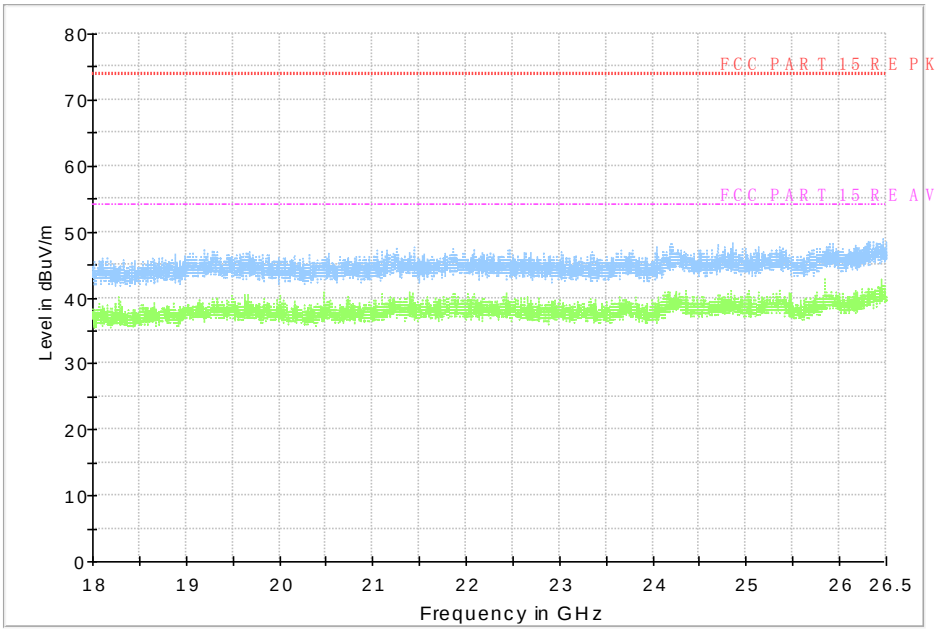


Fig.26 Radiated Spurious Emission (Ch19, 18 GHz - 26.5 GHz), 1M

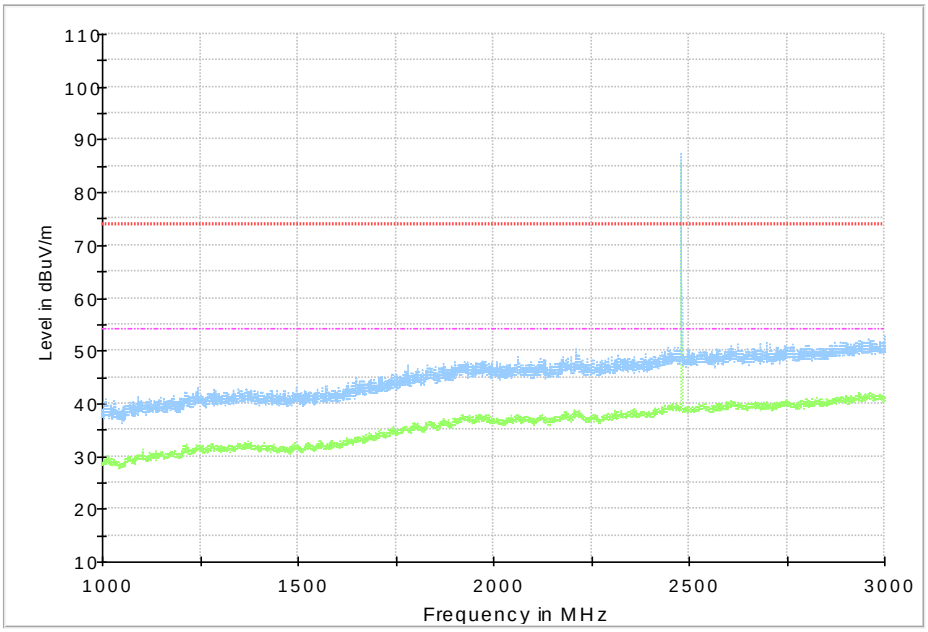


Fig.27 Radiated Spurious Emission (Ch39, 1 GHz - 3 GHz), 1M

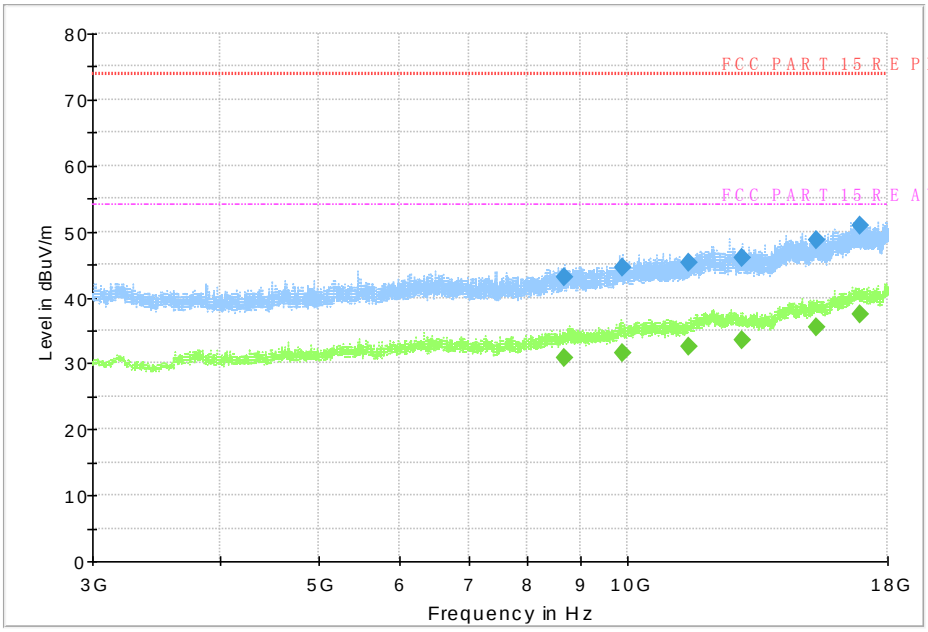


Fig.28 Radiated Spurious Emission (Ch39, 3 GHz - 18 GHz), 1M

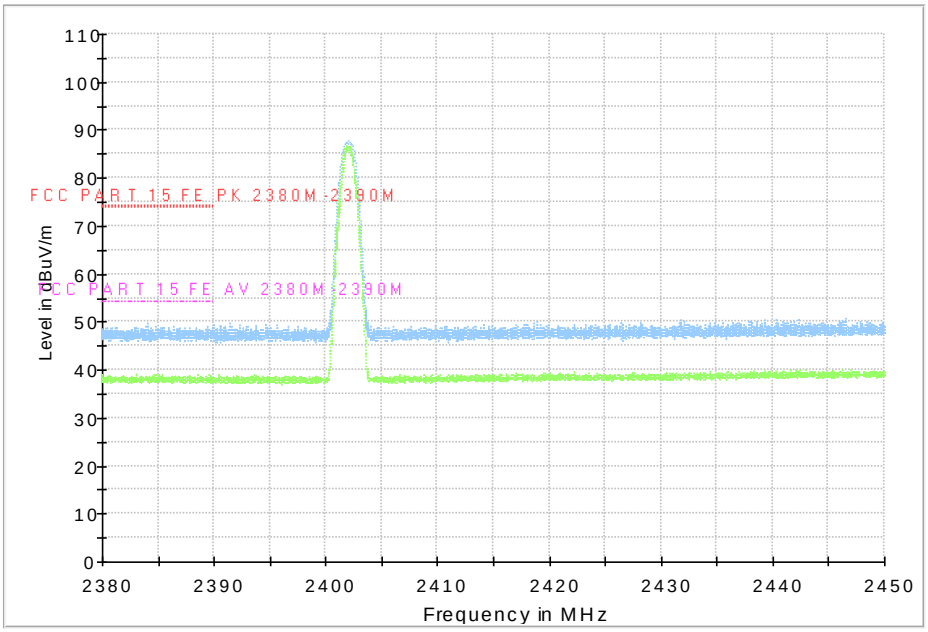


Fig.29 Radiated Band Edges (Ch0, 2380GHz - 2450GHz), 1M

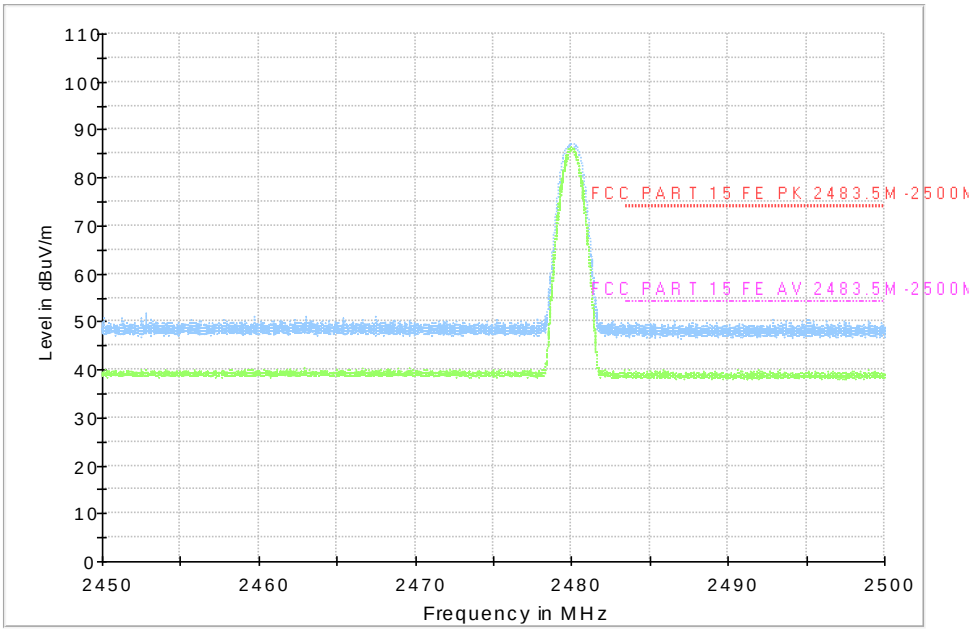


Fig.30 Radiated Band Edges (Ch39, 2450GHz - 2500GHz), 1M

A.8 AC Power line Conducted Emission

Test Condition:

Voltage(V)	Frequency(Hz)
120	60

Measurement Result and limit:

LE-1M

BLE (Quasi-peak Limit) - AE3

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	66 to 56	Fig.31	Fig.32	**P**
0.5 to 5	56			
5 to 30	60			
Note: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

BLE (Average Limit) - AE3

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	56 to 46	Fig.31	Fig.32	**P**
0.5 to 5	46			
5 to 30	50			
Note: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

BLE (Quasi-peak Limit) - AE4

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	66 to 56	Fig.33	Fig.34	**P**
0.5 to 5	56			
5 to 30	60			
Note: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

BLE (Average Limit) - AE4

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	56 to 46	Fig.33	Fig.34	**P**
0.5 to 5	46			
5 to 30	50			
Note: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

Test Condition:

Voltage(V)	Frequency(Hz)
240	60

Measurement Result and limit:

LE-1M

BLE (Quasi-peak Limit) - AE3

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	66 to 56	Fig.35	Fig.36	P
0.5 to 5	56			
5 to 30	60			
Note: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

BLE (Average Limit) - AE3

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	56 to 46	Fig.35	Fig.36	P
0.5 to 5	46			
5 to 30	50			
Note: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

BLE (Quasi-peak Limit) - AE4

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	66 to 56	Fig.37	Fig.38	P
0.5 to 5	56			
5 to 30	60			
Note: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

BLE (Average Limit) - AE4

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	56 to 46	Fig.37	Fig.38	P
0.5 to 5	46			
5 to 30	50			
Note: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

Note: The measurement results include the L1 and N measurements.

See below for test graphs.

Conclusion: Pass

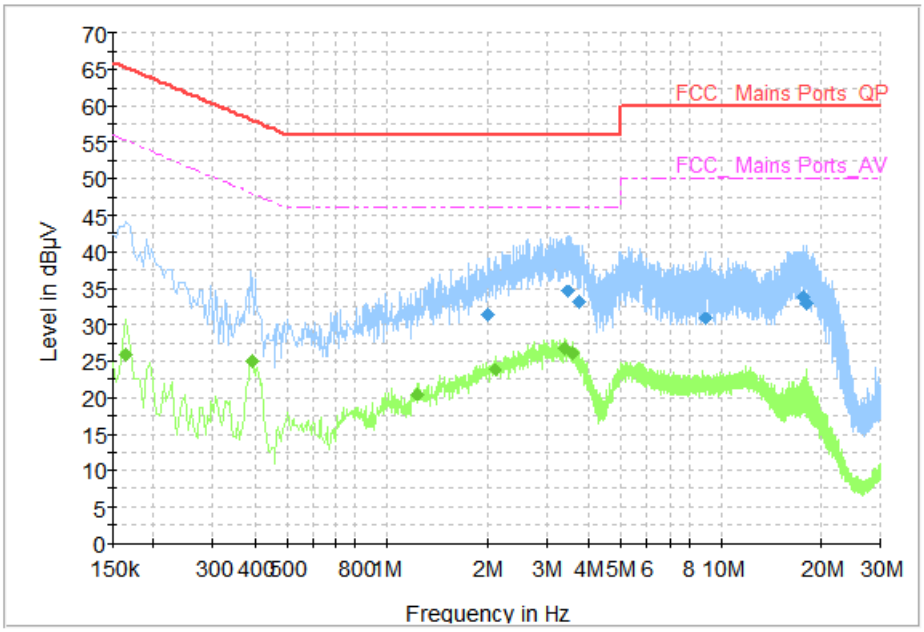


Fig.31 AC Power line Conducted Emission (Traffic, AE3, 120V), 1M

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
1.990000	31.42	56.00	24.58	N	ON	9.7
3.486000	34.60	56.00	21.40	N	ON	9.7
3.742000	33.20	56.00	22.80	N	ON	9.7
8.958000	30.91	60.00	29.09	N	ON	9.8
17.646000	33.77	60.00	26.23	L1	ON	10.1
18.070000	33.03	60.00	26.97	L1	ON	10.1

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.166000	25.92	55.16	29.24	L1	ON	9.7
0.394000	24.97	47.98	23.01	N	ON	9.6
1.234000	20.39	46.00	25.61	L1	ON	9.7
2.110000	23.81	46.00	22.19	L1	ON	9.7
3.382000	26.80	46.00	19.20	L1	ON	9.7
3.610000	26.06	46.00	19.94	L1	ON	9.7

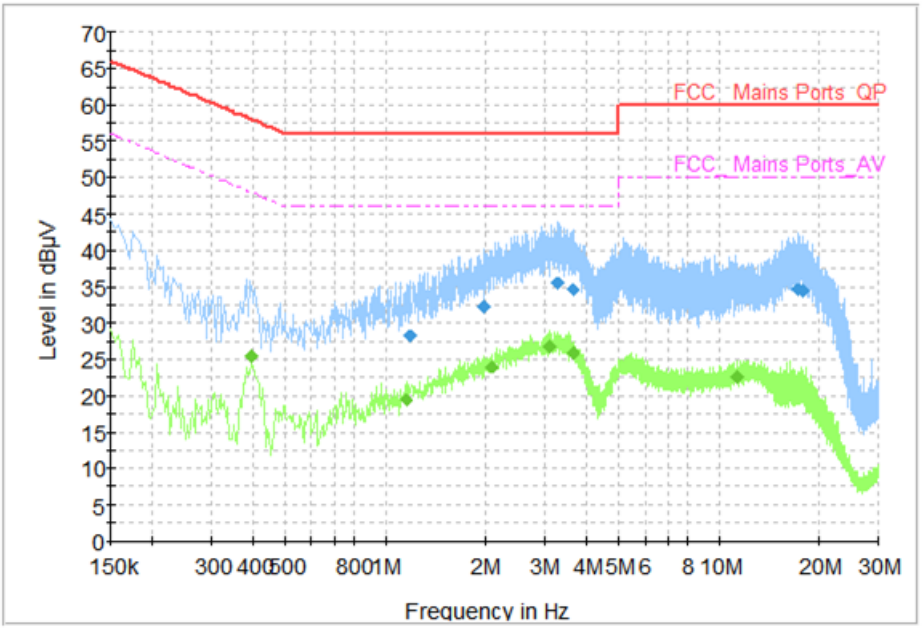


Fig.32 AC Power line Conducted Emission (Idle, AE3, 120V), 1M

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
1.178000	28.18	56.00	27.82	N	ON	9.7
1.974000	32.23	56.00	23.77	N	ON	9.7
3.270000	35.39	56.00	20.61	N	ON	9.7
3.634000	34.64	56.00	21.36	N	ON	9.7
17.222000	34.48	60.00	25.52	L1	ON	10.1
17.850000	34.42	60.00	25.58	L1	ON	10.1

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.394000	25.45	47.98	22.53	N	ON	9.6
1.146000	19.45	46.00	26.55	L1	ON	9.7
2.090000	23.96	46.00	22.04	L1	ON	9.7
3.114000	26.75	46.00	19.25	L1	ON	9.7
3.642000	25.86	46.00	20.14	L1	ON	9.7
11.294000	22.49	50.00	27.51	L1	ON	9.9

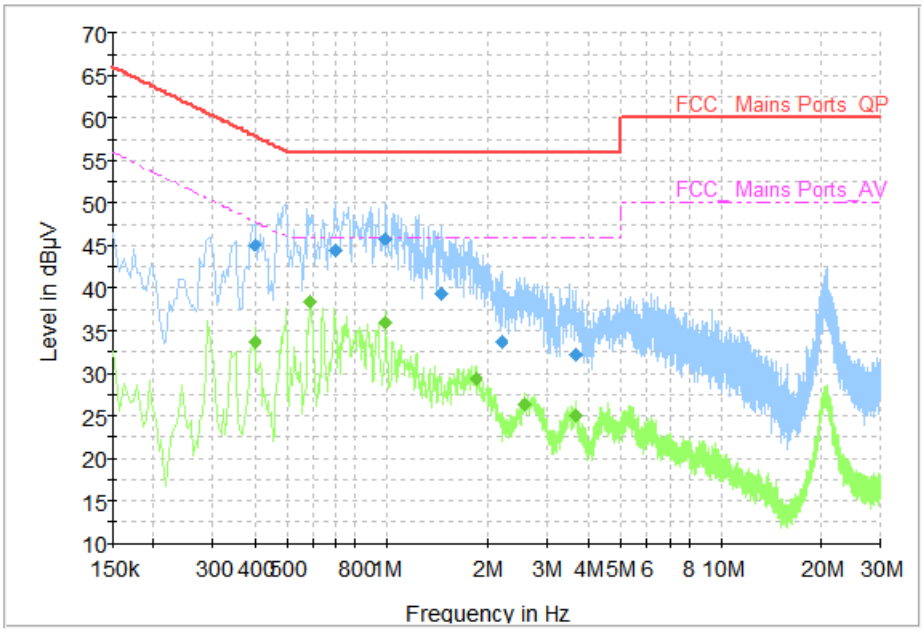


Fig.33 AC Power line Conducted Emission (Traffic, AE4, 120V), 1M

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.402000	45.03	57.81	12.78	L1	ON	9.7
0.702000	44.51	56.00	11.49	L1	ON	9.7
0.990000	45.81	56.00	10.19	L1	ON	9.7
1.446000	39.32	56.00	16.68	L1	ON	9.7
2.190000	33.80	56.00	22.20	L1	ON	9.7
3.662000	32.21	56.00	23.79	L1	ON	9.7

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.402000	33.71	47.81	14.10	L1	ON	9.7
0.586000	38.45	46.00	7.55	L1	ON	9.7
0.990000	36.02	46.00	9.98	L1	ON	9.7
1.834000	29.38	46.00	16.62	L1	ON	9.7
2.582000	26.38	46.00	19.62	L1	ON	9.7
3.666000	24.94	46.00	21.06	L1	ON	9.7

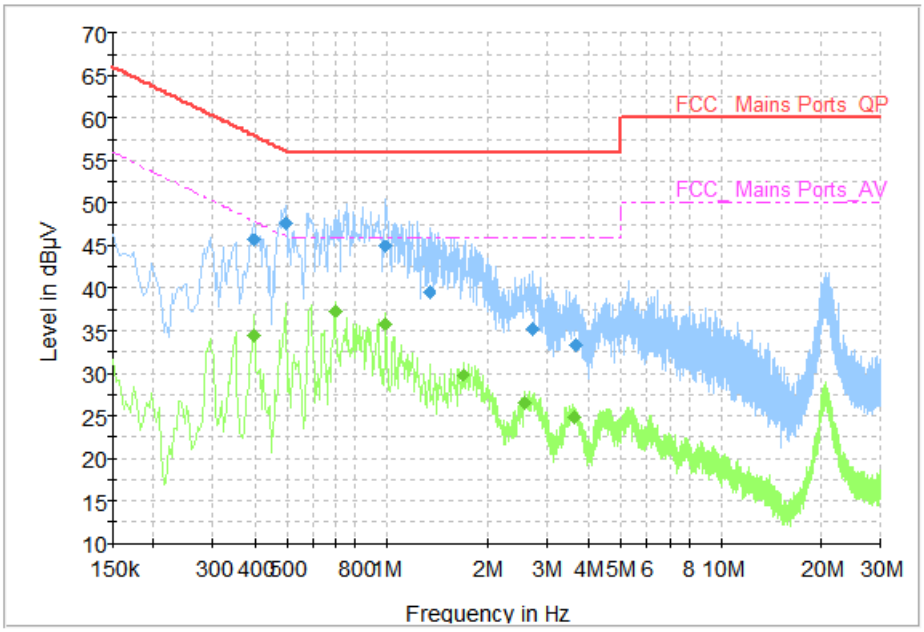


Fig.34 AC Power line Conducted Emission (Idle, AE4, 120V), 1M

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.398000	45.63	57.90	12.26	L1	ON	9.7
0.494000	47.65	56.10	8.45	L1	ON	9.7
0.986000	44.91	56.00	11.09	L1	ON	9.7
1.342000	39.45	56.00	16.55	N	ON	9.7
2.726000	35.31	56.00	20.69	L1	ON	9.7
3.674000	33.20	56.00	22.80	L1	ON	9.7

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.398000	34.46	47.90	13.44	L1	ON	9.7
0.698000	37.34	46.00	8.66	L1	ON	9.7
0.990000	35.78	46.00	10.22	L1	ON	9.7
1.690000	29.85	46.00	16.15	L1	ON	9.7
2.586000	26.47	46.00	19.53	L1	ON	9.7
3.642000	24.84	46.00	21.16	L1	ON	9.7

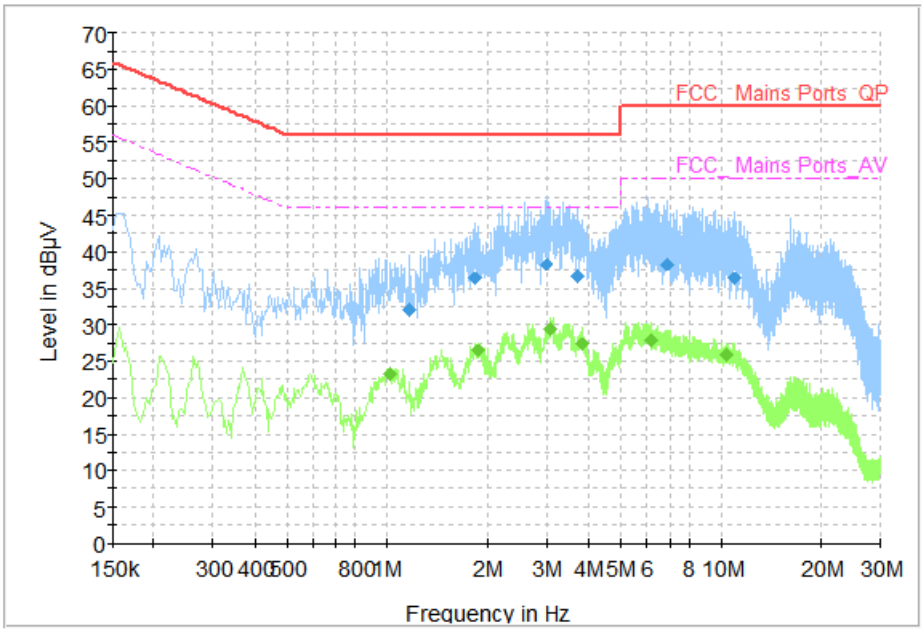


Fig.35 AC Power line Conducted Emission (Traffic, AE3, 240V), 1M

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
1.162000	32.15	56.00	23.85	N	ON	9.7
1.830000	36.24	56.00	19.76	N	ON	9.7
2.990000	38.29	56.00	17.71	N	ON	9.7
3.714000	36.65	56.00	19.35	N	ON	9.7
6.878000	38.21	60.00	21.79	N	ON	9.8
10.886000	36.28	60.00	23.72	N	ON	9.8

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
1.018000	23.31	46.00	22.69	N	ON	9.7
1.878000	26.43	46.00	19.57	L1	ON	9.7
3.074000	29.51	46.00	16.49	L1	ON	9.7
3.854000	27.33	46.00	18.67	L1	ON	9.7
6.194000	27.80	50.00	22.20	N	ON	9.8
10.398000	25.97	50.00	24.03	L1	ON	9.9

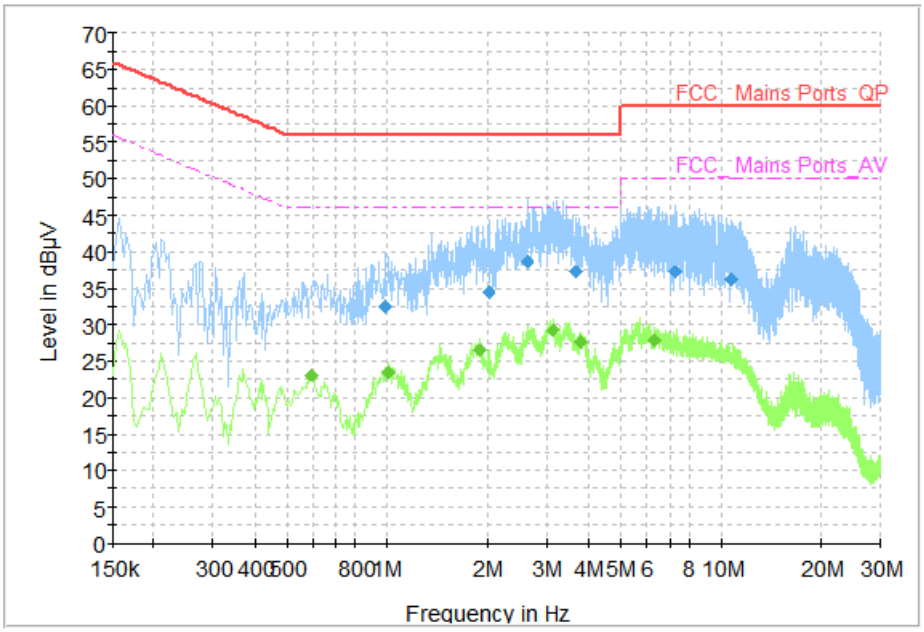


Fig.36 AC Power line Conducted Emission (Idle, AE3, 240V), 1M

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.990000	32.49	56.00	23.51	N	ON	9.7
2.006000	34.38	56.00	21.62	N	ON	9.7
2.634000	38.68	56.00	17.32	N	ON	9.7
3.674000	37.22	56.00	18.78	N	ON	9.7
7.254000	37.18	60.00	22.82	N	ON	9.8
10.778000	36.20	60.00	23.80	N	ON	9.8

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.590000	23.07	46.00	22.93	N	ON	9.7
1.010000	23.53	46.00	22.47	L1	ON	9.7
1.898000	26.37	46.00	19.63	L1	ON	9.7
3.130000	29.31	46.00	16.69	L1	ON	9.7
3.822000	27.64	46.00	18.36	N	ON	9.7
6.294000	27.84	50.00	22.16	N	ON	9.8

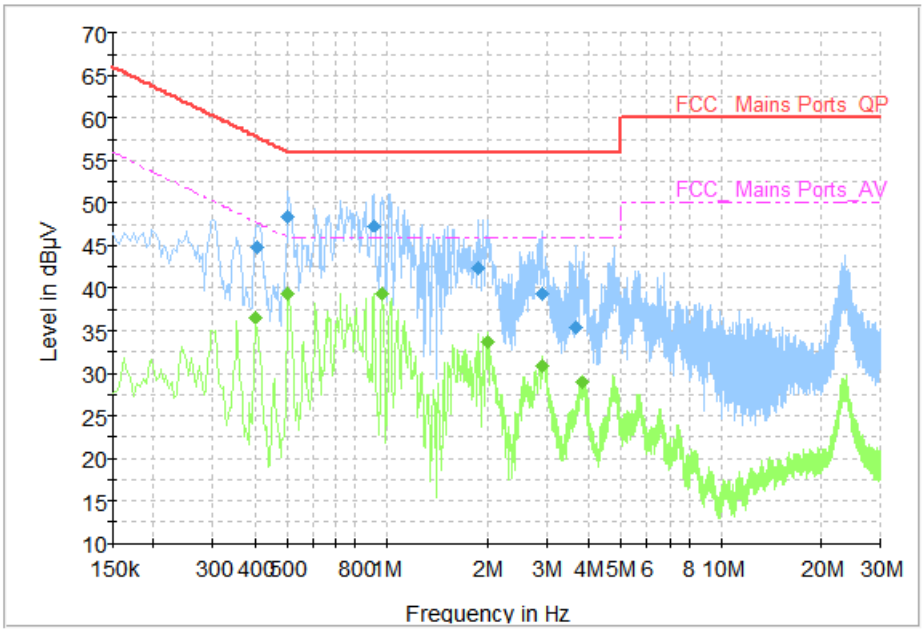


Fig.37 AC Power line Conducted Emission (Traffic, AE4, 240V), 1M

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.410000	44.76	57.65	12.88	L1	ON	9.7
0.506000	48.34	56.00	7.66	L1	ON	9.7
0.914000	47.36	56.00	8.64	L1	ON	9.7
1.870000	42.30	56.00	13.70	L1	ON	9.7
2.914000	39.39	56.00	16.61	L1	ON	9.7
3.682000	35.46	56.00	20.54	L1	ON	9.7

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.406000	36.66	47.73	11.07	L1	ON	9.7
0.506000	39.30	46.00	6.70	L1	ON	9.7
0.966000	39.31	46.00	6.69	L1	ON	9.7
1.990000	33.70	46.00	12.30	L1	ON	9.7
2.914000	30.81	46.00	15.19	L1	ON	9.7
3.842000	28.82	46.00	17.18	L1	ON	9.7

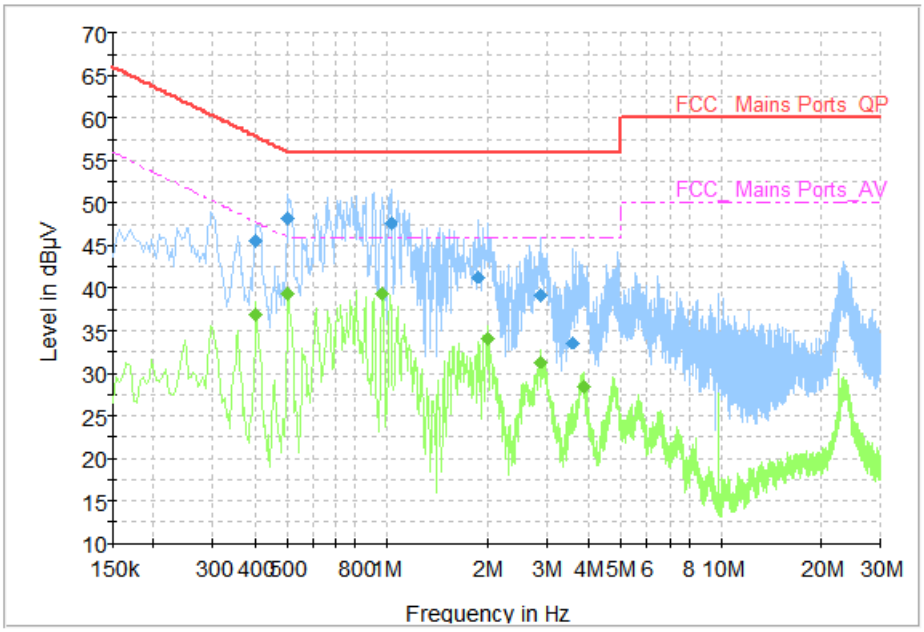


Fig.38 AC Power line Conducted Emission (Idle, AE4, 240V), 1M

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.406000	45.54	57.73	12.19	L1	ON	9.7
0.506000	48.23	56.00	7.77	L1	ON	9.7
1.026000	47.56	56.00	8.44	L1	ON	9.7
1.866000	41.31	56.00	14.69	L1	ON	9.7
2.886000	39.14	56.00	16.86	L1	ON	9.7
3.618000	33.54	56.00	22.46	N	ON	9.7

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.406000	36.85	47.73	10.88	L1	ON	9.7
0.506000	39.25	46.00	6.75	L1	ON	9.7
0.966000	39.29	46.00	6.71	L1	ON	9.7
1.994000	34.07	46.00	11.93	L1	ON	9.7
2.886000	31.28	46.00	14.72	L1	ON	9.7
3.886000	28.44	46.00	17.56	L1	ON	9.7

*****END OF REPORT*****