



TEST REPORT

No. I20N02988-BLE

Guangdong OPPO Mobile Telecommunications Corp., Ltd.

Mobile Phone

Model Name: CPH2205

with

Hardware Version: 11

Software Version: ColorOS V11.1

FCC ID: R9C-CPH2205

Issued Date: 2021-01-11

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.

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CONTENTS

1. SUMMARY OF TEST REPORT.....	3
1.1. TEST ITEMS.....	3
1.2. TEST STANDARDS	3
1.3. TEST RESULT	3
1.4. TESTING LOCATION	3
1.5. PROJECT DATA	3
1.6. SIGNATURE	3
2. CLIENT INFORMATION.....	4
2.1. APPLICANT INFORMATION	4
2.2. MANUFACTURER INFORMATION	4
3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE)	5
3.1. ABOUT EUT	5
3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST	5
3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST	5
3.4. GENERAL DESCRIPTION.....	5
4. REFERENCE DOCUMENTS.....	6
4.1. DOCUMENTS SUPPLIED BY APPLICANT	6
4.2. REFERENCE DOCUMENTS FOR TESTING.....	6
5. TEST RESULTS	7
5.1. TESTING ENVIRONMENT.....	7
5.2. TEST RESULTS	7
5.3. STATEMENTS.....	7
6. TEST EQUIPMENTS UTILIZED	8
7. LABORATORY ENVIRONMENT	9
8. MEASUREMENT UNCERTAINTY	10
ANNEX A: DETAILED TEST RESULTS.....	11
A.0 ANTENNA REQUIREMENT	11
A.1 MAXIMUM PEAK OUTPUT POWER	12
A.2 PEAK POWER SPECTRAL DENSITY	13
A.3 6dB BANDWIDTH.....	17
A.4 BAND EDGES COMPLIANCE	21
A.5 TRANSMITTER SPURIOUS EMISSION - CONDUCTED	24
A.6 TRANSMITTER SPURIOUS EMISSION - RADIATED	36
A.7 AC POWER LINE CONDUCTED EMISSION	49

1. Summary of Test Report

1.1. Test Items

Description	Mobile Phone
Model Name	CPH2205
Applicant's name	Guangdong OPPO Mobile Telecommunications Corp., Ltd.
Manufacturer's Name	Guangdong OPPO Mobile Telecommunications Corp., Ltd.

1.2. Test Standards

FCC Part15-2019; ANSI C63.10-2013

1.3. Test Result

Pass

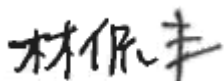
1.4. Testing Location

Address: Building G, Shenzhen International Innovation Center, No.1006 Shennan Road, Futian District, Shenzhen, Guangdong, P. R. China

1.5. Project data

Testing Start Date: 2020-11-23
Testing End Date: 2020-12-14

1.6. 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: Guangdong OPPO Mobile Telecommunications Corp., Ltd.
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City, Guangdong, China
Contact Person Mei XiLi
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Fax: /

2.2. Manufacturer Information

Company Name: Guangdong OPPO Mobile Telecommunications Corp., Ltd.
Address: NO.18 HaiBin Road, Wusha village, Chang An Town, DongGuan
City, Guangdong, China
Contact Person Mei XiLi
E-Mail meixili@oppo.com
Telephone: (86)76986076999
Fax: /

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

3.1. About EUT

Description	Mobile Phone
Model Name	CPH2205
Frequency Range	2400MHz~2483.5MHz
Type of Modulation	GFSK
Number of Channels	40
Antenna Type	Integrated
Antenna Gain	-3dBi
Power Supply	3.85V DC by Battery
FCC ID	R9C-CPH2205
Condition of EUT as received	No abnormality in appearance

3.2. Internal Identification of EUT used during the test

EUT ID*	IMEI	HW Version	SW Version	Receive Date
EUT1	866811050019317	11	ColorOS V11.1	2020-11-23
EUT2	866811050019119	11	ColorOS V11.1	2020-11-23

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

3.3. Internal Identification of AE used during the test

AE ID*	Description	SN
AE1	Battery	/
AE2	Charger	/

*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 Mobile Phone with integrated antenna and battery.

It consists of normal options: Lithium Battery and Charger.

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	2019
ANSI C63.10	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	2013

5. Test Results

5.1. Testing Environment

Normal Temperature: 15~35°C

Relative Humidity: 20~75%

5.2. 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	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.

5.3. Statements

SAICT has evaluated the test cases requested by the applicant/manufacture as listed in section 5.2 of this report, for the EUT specified in section 3, according to the standards or reference documents listed in section 4.2.

6. Test Equipments Utilized

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Date	Calibration Period
1	Vector Signal Analyzer	FSV40	100903	Rohde & Schwarz	2021-01-15	1 year
2	Power Sensor	U2021XA	MY55430013	Agilent	2021-01-15	1 year
3	Data Acquisition	U2531A	TW55443507	Agilent	/	/

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Date	Calibration Period
1	LISN	ESH2-Z5	100196	R&S	2022-01-01	1 year
2	Test Receiver	ESCI	100701	R&S	2021-08-05	1 year
3	Loop Antenna	HLA6120	35779	TESEQ	2022-05-01	3 year
4	BiLog Antenna	VULB9163	9163 329	Schwarzbeck	2021-02-16	3 year
5	Horn Antenna	3117	00066585	ETS-Lindgren	2022-03-04	3 year
6	Test Receiver	ESR7	101675	R&S	2021-07-17	1 year
7	Spectrum Analyzer	FSP 40	100378	R&S	2021-12-11	1 year
8	Chamber	FACT5-2.0	4166	ETS-Lindgren	2021-05-12	3 year
9	Antenna	QSH-SL-1 8-26-S-20	17013	Q-par	2021-01-14	3 year
10	Antenna	QSH-SL-2 6-40-K-20	17014	Q-par	2024-01-09	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. Laboratory Environment

Semi-anechoic chamber

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz> 60 dB; 1MHz-18000MHz>90 dB
Electrical insulation	> 2M Ω
Ground system resistance	< 4 Ω
Normalised site attenuation (NSA)	< ± 4 dB, 3 m distance, from 30 to 1000 MHz

Shielded room

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

Fully-anechoic chamber

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz> 60 dB; 1MHz-18000MHz>90 dB
Electrical insulation	> 2M Ω
Ground system resistance	< 4 Ω
Voltage Standing Wave Ratio (VSWR)	≤ 6 dB, from 1 to 18 GHz, 3 m distance
Uniformity of field strength	Between 0 and 6 dB, from 80 to 6000 MHz

8. Measurement Uncertainty

Test Name	Uncertainty ($k=2$)	
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	$30\text{MHz} \leq f \leq 1\text{GHz}$	1.41dB
	$1\text{GHz} \leq f \leq 7\text{GHz}$	1.92dB
	$7\text{GHz} \leq f \leq 13\text{GHz}$	2.31dB
	$13\text{GHz} \leq f \leq 26\text{GHz}$	2.61dB
5. Transmitter Spurious Emission - Radiated	$9\text{kHz} \leq f \leq 30\text{MHz}$	1.70dB
	$30\text{MHz} \leq f \leq 1\text{GHz}$	4.90dB
	$1\text{GHz} \leq f \leq 18\text{GHz}$	4.60dB
	$18\text{GHz} \leq f \leq 40\text{GHz}$	4.10dB
6. AC Power line Conducted Emission	$150\text{kHz} \leq f \leq 30\text{MHz}$	3.00dB

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 -3dBi. The RF transmitter uses an integrate antenna without connector.

**A.1 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)	E.I.R.P Limit (dBm)
FCC CRF Part 15.247 (b)	< 30	< 36

Measurement Results:**LE-1M**

Mode	Frequency (MHz)	Peak Conducted Output Power (dBm)	E.I.R.P (dBm)	Conclusion
GFSK	2402 (CH0)	5.77	2.77	P
	2440 (CH19)	6.66	3.66	P
	2480 (CH39)	5.43	2.43	P

LE-2M

Mode	Frequency (MHz)	Peak Conducted Output Power (dBm)	E.I.R.P (dBm)	Conclusion
GFSK	2402 (CH0)	5.80	2.80	P
	2440 (CH19)	6.67	3.67	P
	2480 (CH39)	5.45	2.45	P

Conclusion: Pass

A.2 Peak Power Spectral Density

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

Measurement Limit:

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

Measurement Results:

Mode	Frequency (MHz)	Peak Power Spectral Density (dBm)	Conclusion
LE-1M	2402 (CH0)	Fig.1	P
	2440 (CH19)	Fig.2	P
	2480 (CH39)	Fig.3	P
LE-2M	2402 (CH0)	Fig.4	P
	2440 (CH19)	Fig.5	P
	2480 (CH39)	Fig.6	P

See below for test graphs.

Conclusion: PASS

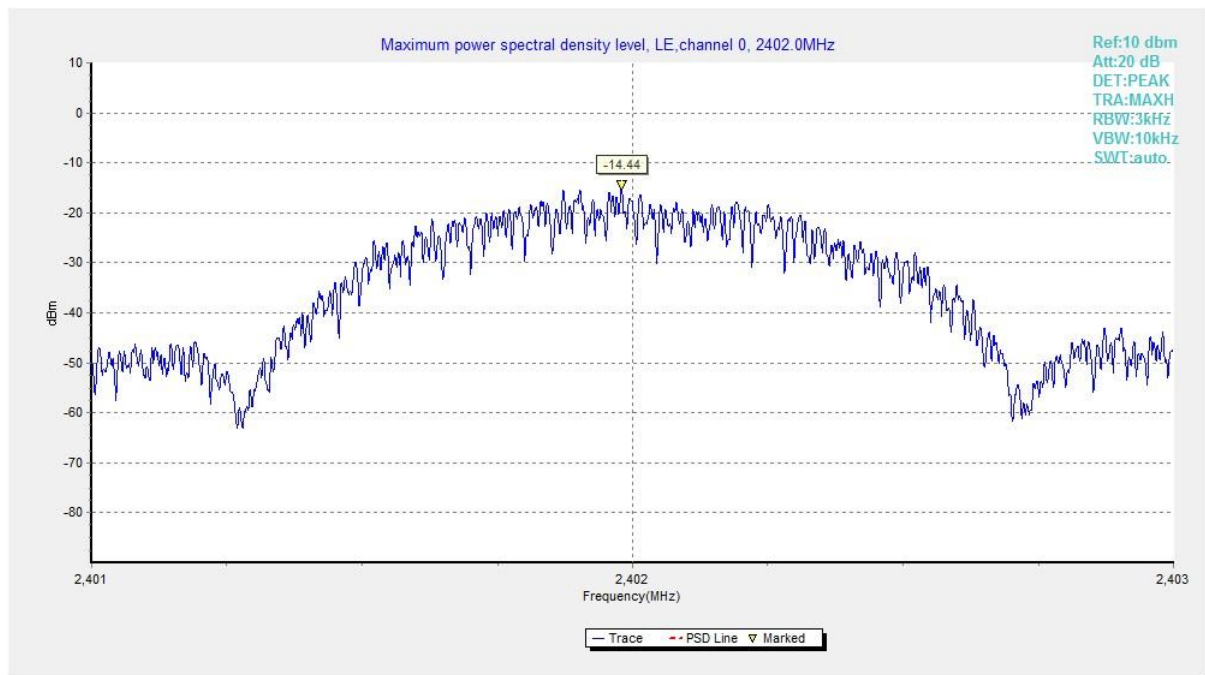


Fig.1 Power Spectral Density (Ch 0), LE 1M

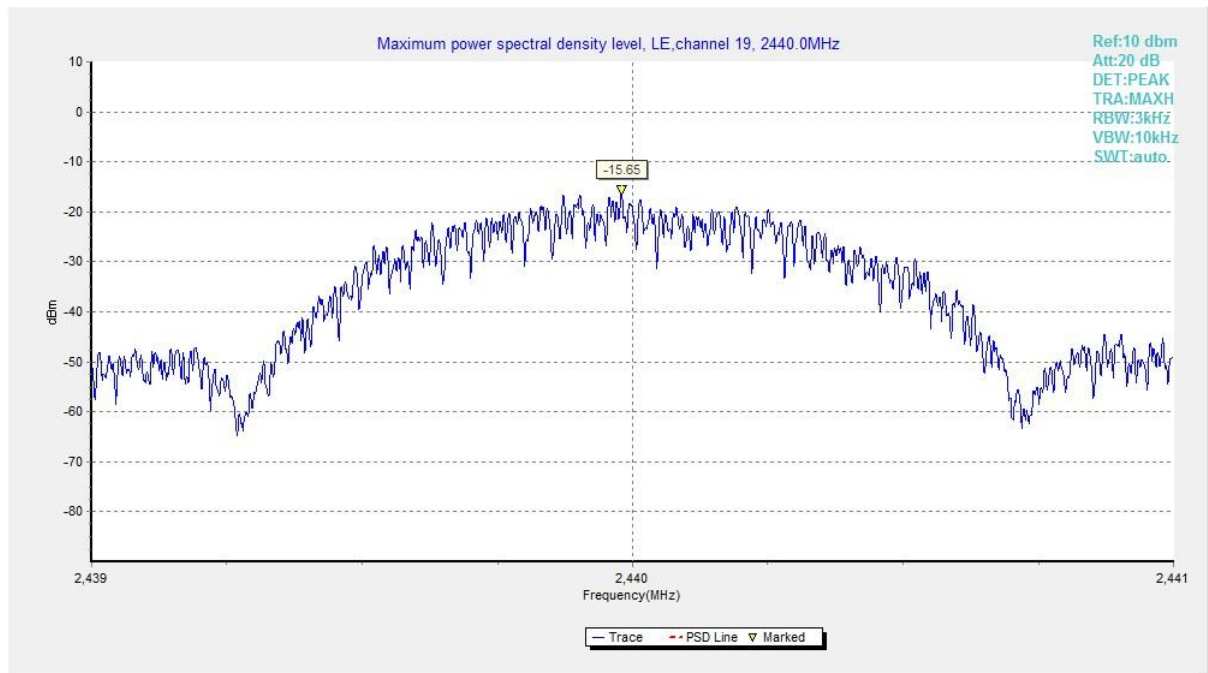


Fig.2 Power Spectral Density (Ch 19), LE 1M

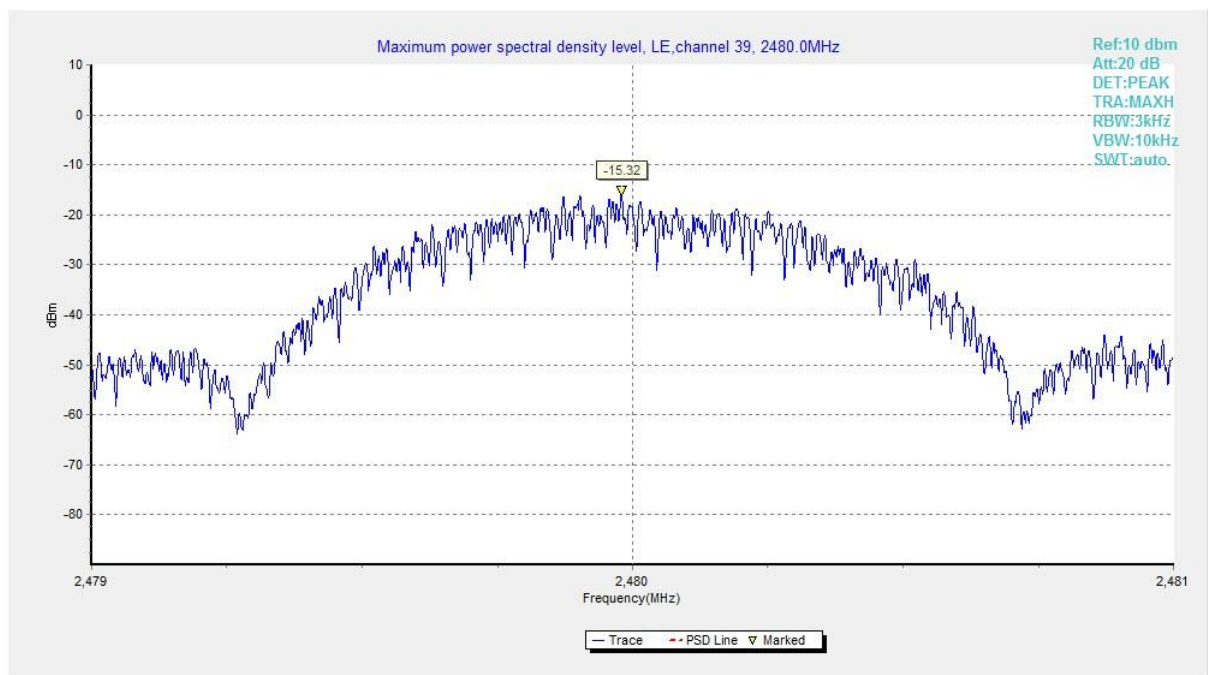


Fig.3 Power Spectral Density (Ch 39), LE 1M

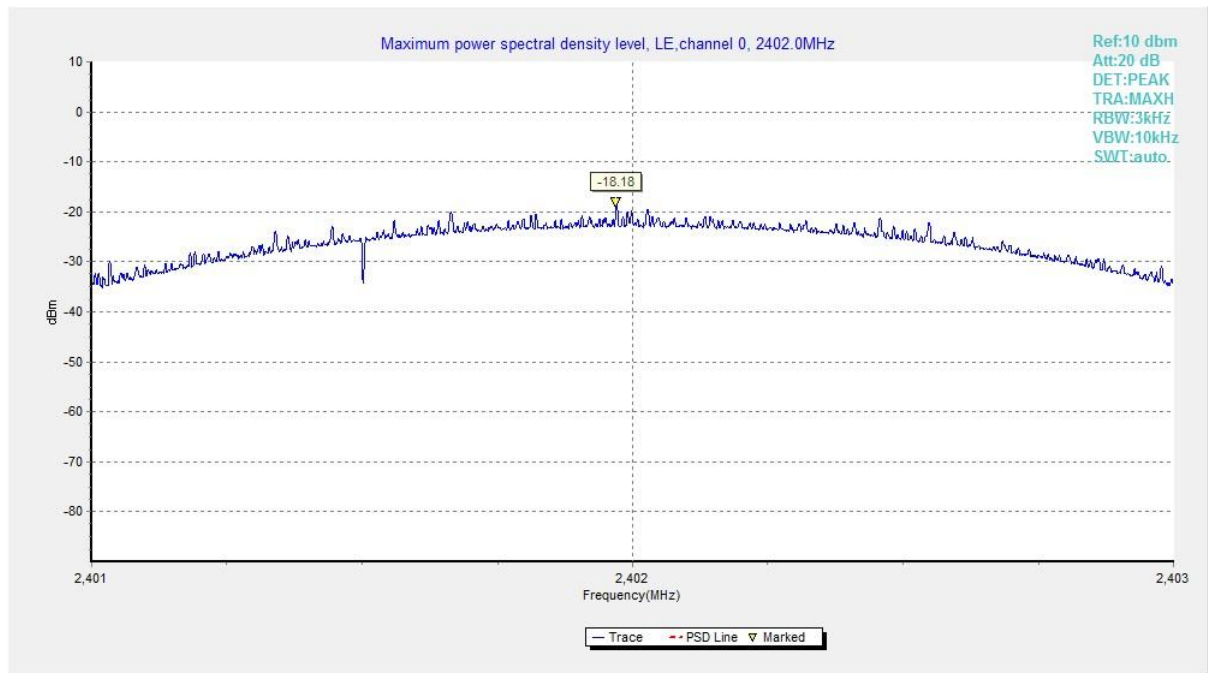


Fig.4 Power Spectral Density (Ch 0), LE 2M

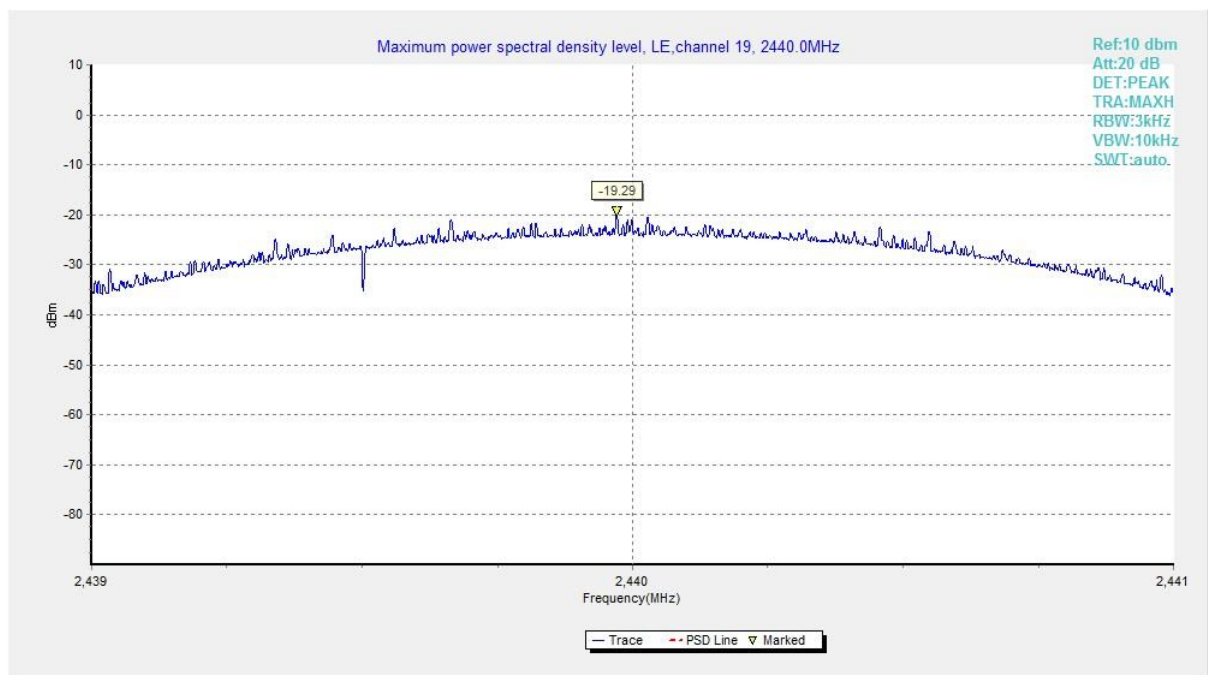


Fig.5 Power Spectral Density (Ch 19), LE 2M

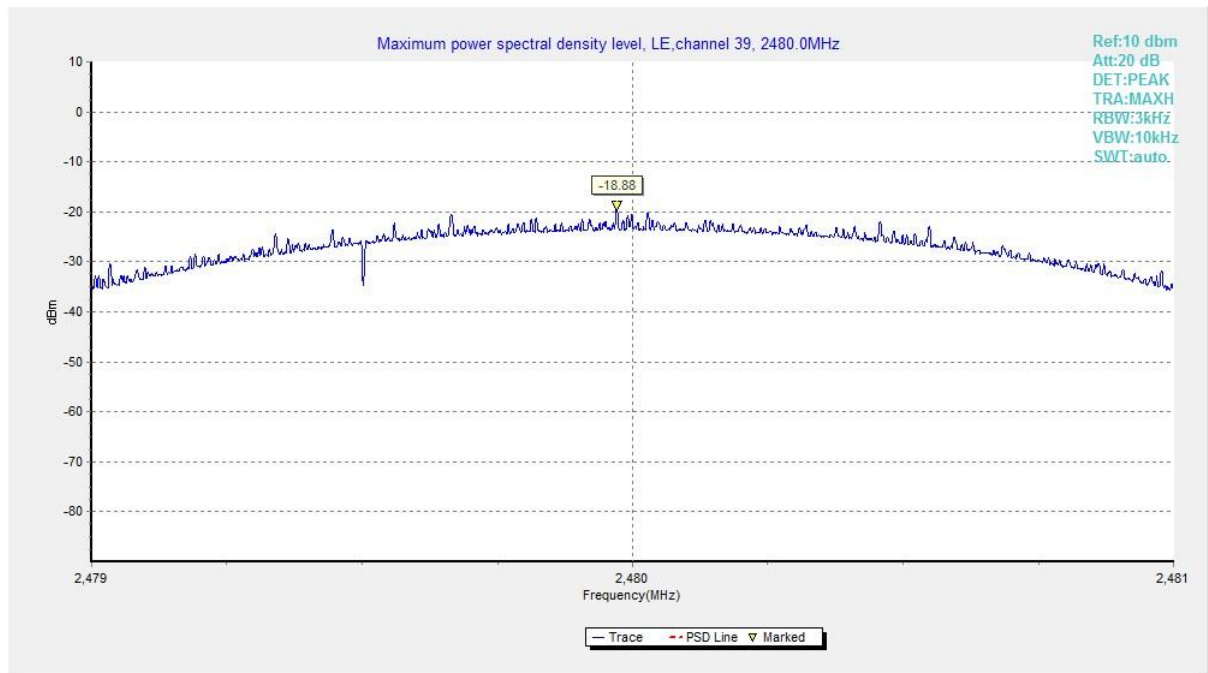


Fig.6 Power Spectral Density (Ch 39), LE 2M

A.3 6dB Bandwidth

Measurement Limit:

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

Measurement Result:

Mode	Frequency (MHz)	Test Results (kHz)		Conclusion
LE-1M	2402 (CH0)	Fig.7	683.50	P
	2440 (CH19)	Fig.8	687.50	P
	2480 (CH39)	Fig.9	689.50	P
LE-2M	2402 (CH0)	Fig.10	1155.50	P
	2440 (CH19)	Fig.11	1157.50	P
	2480 (CH39)	Fig.12	1156.50	P

See below for test graphs.

Conclusion: PASS



Fig.7 6dB Bandwidth (Ch 0), LE 1M



Fig.8 6dB Bandwidth (Ch 19), LE 1M



Fig.9 6dB Bandwidth (Ch 39), LE 1M

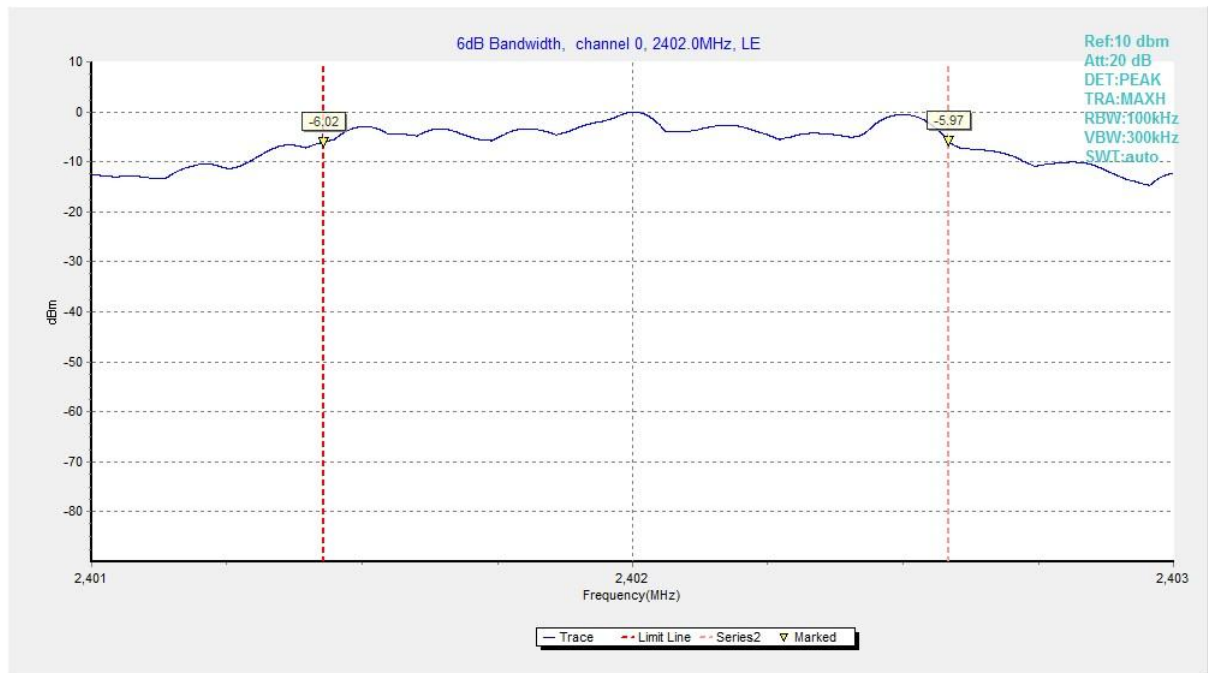


Fig.10 6dB Bandwidth (Ch 0), LE 2M

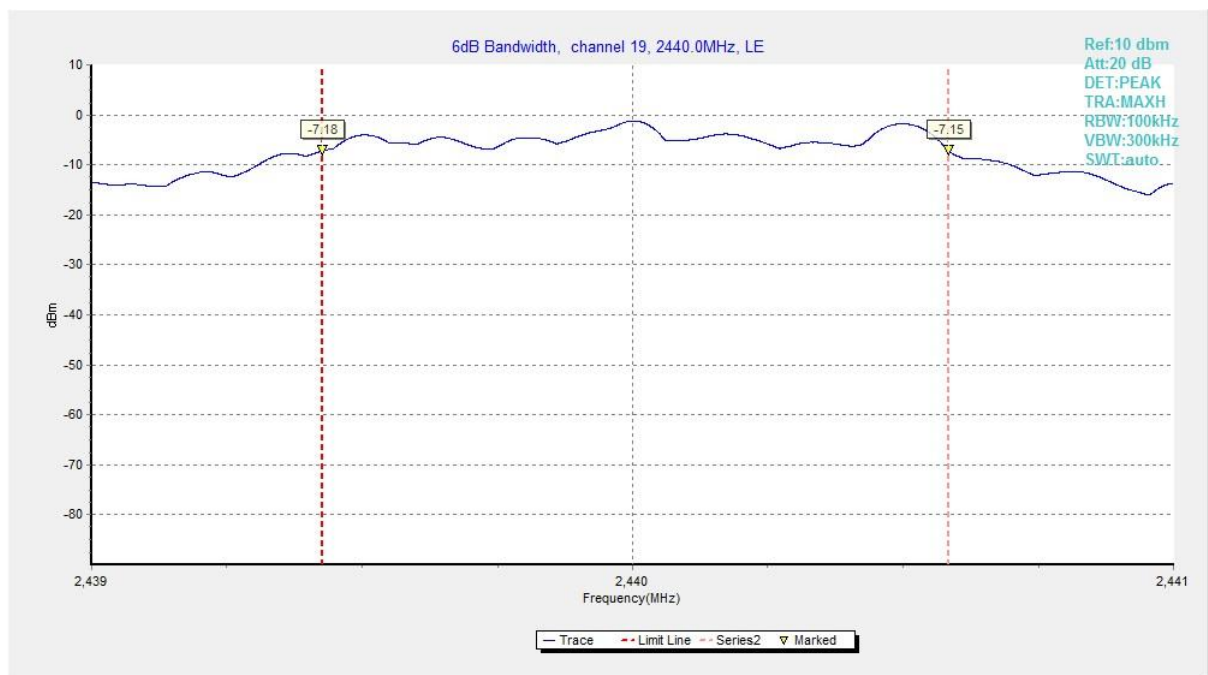


Fig.11 6dB Bandwidth (Ch 19), LE 2M

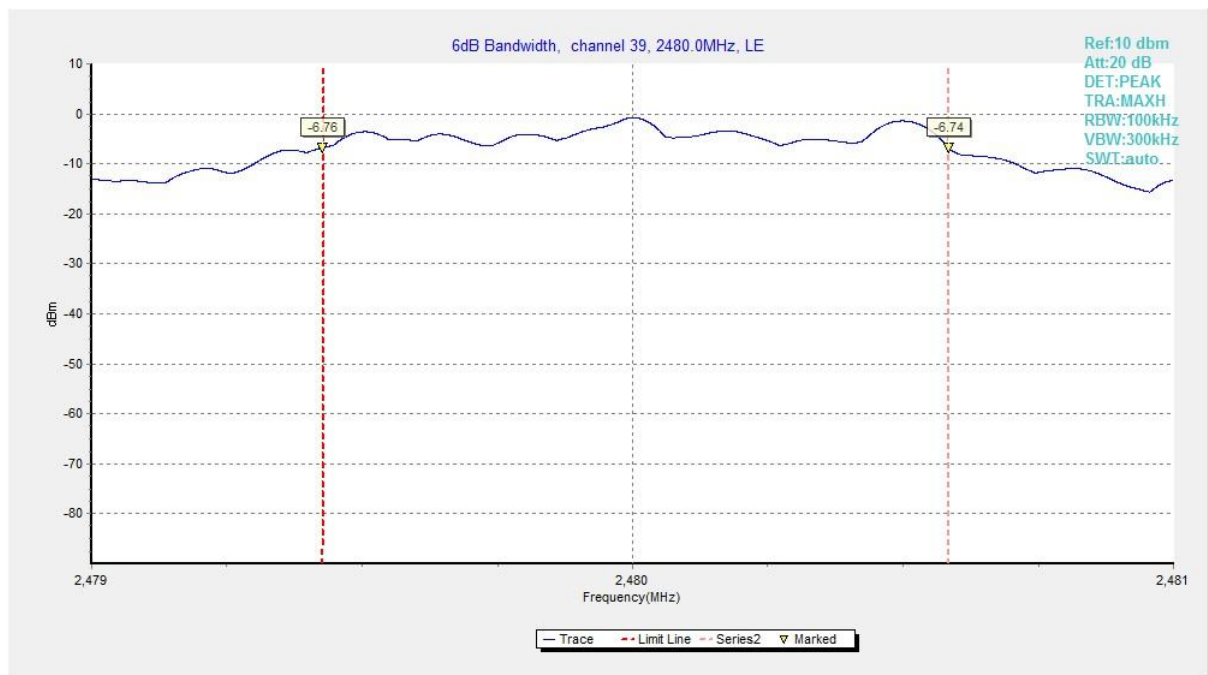


Fig.12 6dB Bandwidth (Ch 39), LE 2M

A.4 Band Edges Compliance

Measurement Limit:

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

Measurement Result:

Mode	Frequency (MHz)	Test Results (dB)		Conclusion
LE-1M	2402 (CH0)	Fig.13	57.37	P
	2480 (CH39)	Fig.14	60.73	P
LE-2M	2402 (CH0)	Fig.15	30.46	P
	2480 (CH39)	Fig.16	56.01	P

See below for test graphs.

Conclusion: Pass

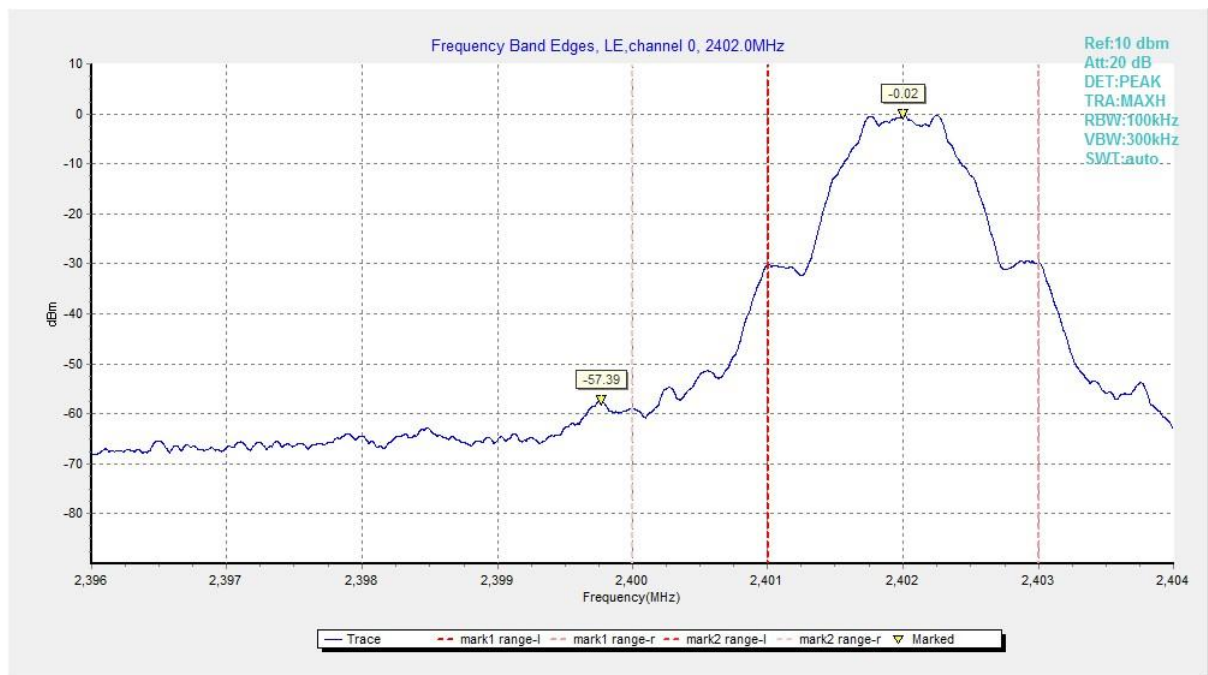


Fig.13 Band Edges (Ch 0), LE 1M

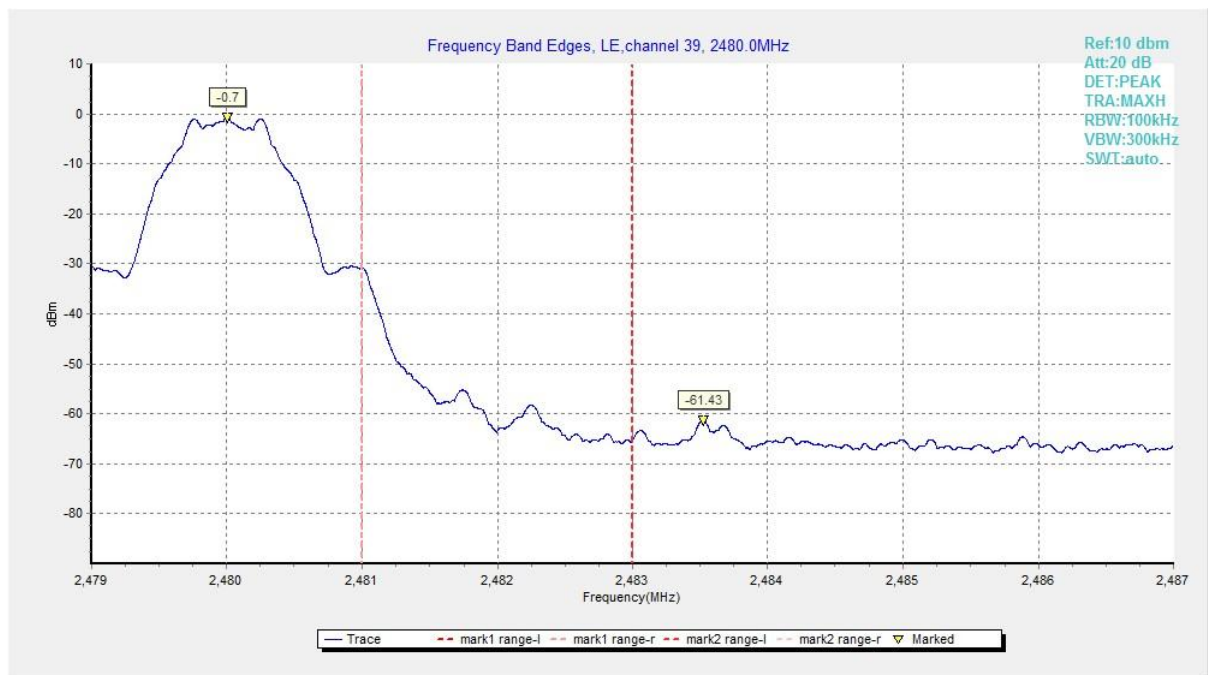


Fig.14 Band Edges (Ch 39), LE 1M

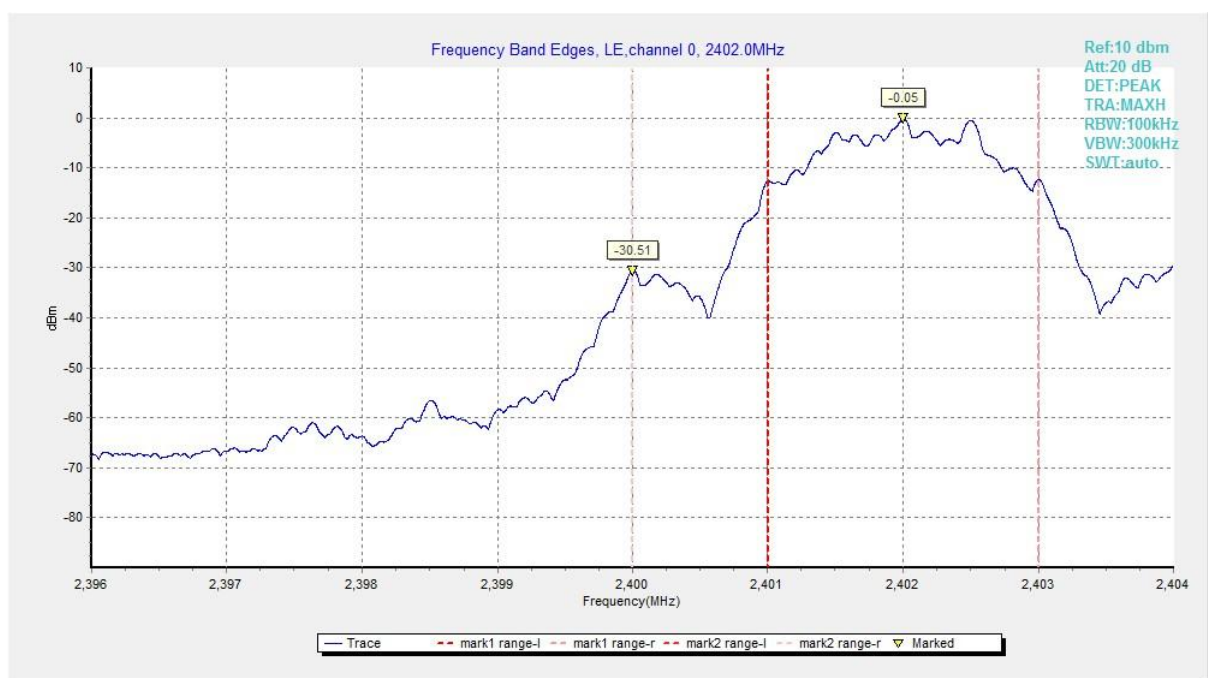


Fig.15 Band Edges (Ch 0), LE 2M

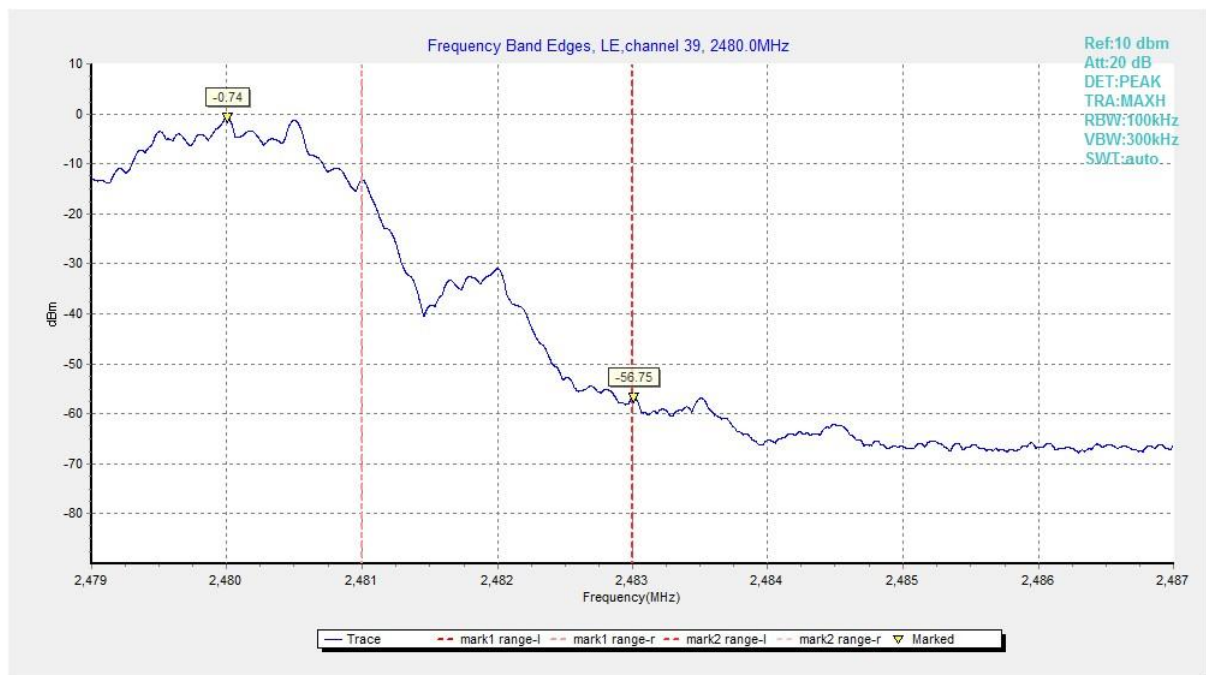


Fig.16 Band Edges (Ch 39), LE 2M

A.5 Transmitter Spurious Emission - Conducted

Measurement Limit:

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

Measurement Results:

MODE	Channel	Frequency Range	Test Results	Conclusion
LE-1M	0	2.402 GHz	Fig.17	P
		1 GHz ~ 3 GHz	Fig.18	P
		3 GHz ~ 10 GHz	Fig.19	P
	19	2.440 GHz	Fig.20	P
		1 GHz ~ 3 GHz	Fig.21	P
		3 GHz ~ 10 GHz	Fig.22	P
	39	2.480 GHz	Fig.23	P
		1 GHz ~ 3 GHz	Fig.24	P
		3 GHz ~ 10 GHz	Fig.25	P
	All channels	30 MHz ~ 1 GHz	Fig.26	P
		10 GHz ~ 26 GHz	Fig.27	P
LE-2M	0	2.402 GHz	Fig.28	P
		1 GHz ~ 3 GHz	Fig.29	P
		3 GHz ~ 10 GHz	Fig.30	P
	19	2.440 GHz	Fig.31	P
		1 GHz ~ 3 GHz	Fig.32	P
		3 GHz ~ 10 GHz	Fig.33	P
	39	2.480 GHz	Fig.34	P
		1 GHz ~ 3 GHz	Fig.35	P
		3 GHz ~ 10 GHz	Fig.36	P
	All channels	30 MHz ~ 1 GHz	Fig.37	P
		10 GHz ~ 26 GHz	Fig.38	P

See below for test graphs.

Conclusion: Pass

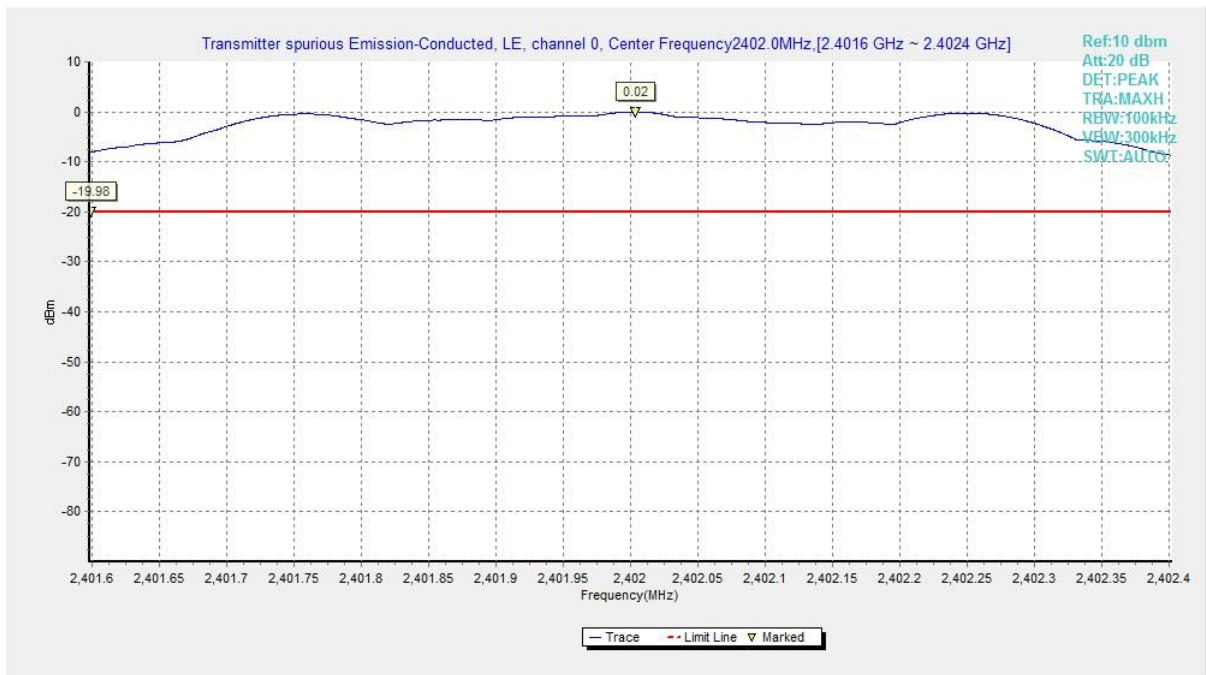


Fig.17 Conducted Spurious Emission (Ch0, Center Frequency), LE 1M

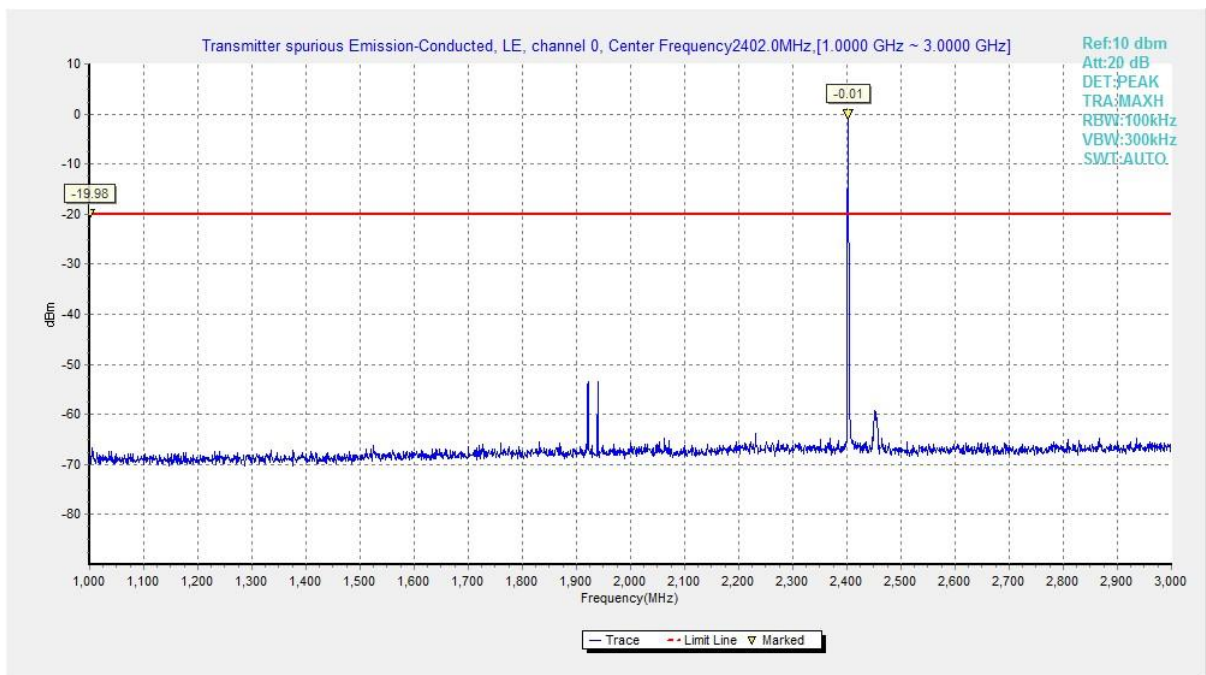


Fig.18 Conducted Spurious Emission (Ch0, 1 GHz-3 GHz), LE 1M

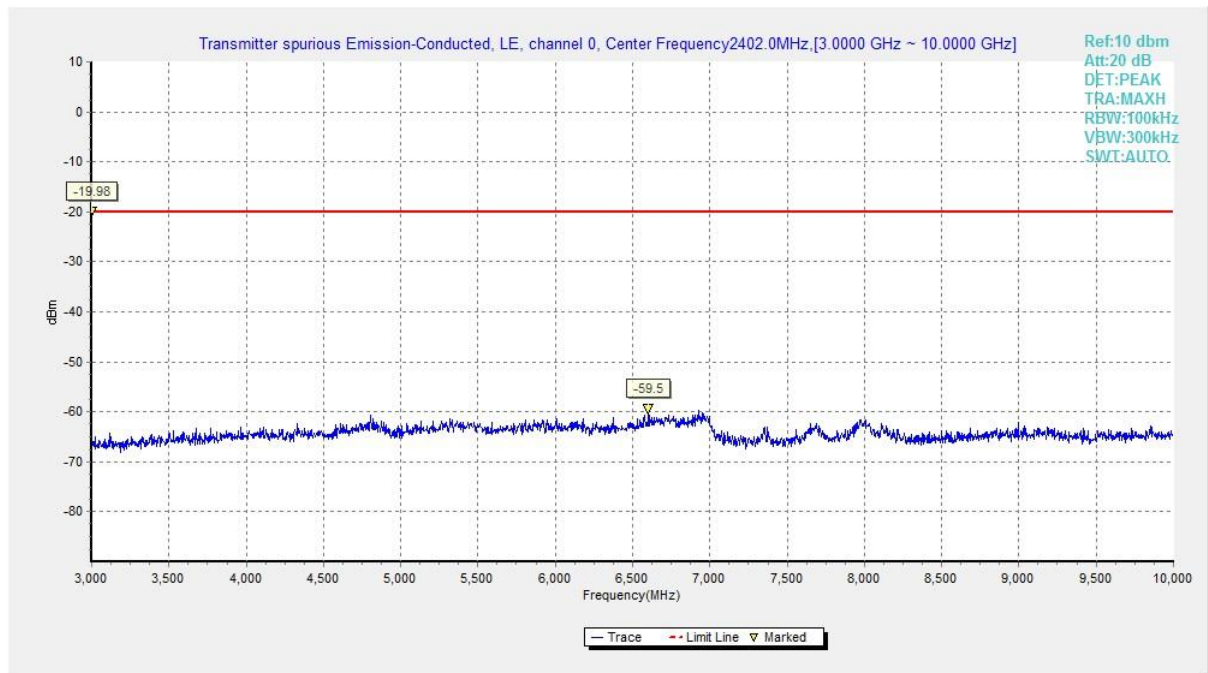


Fig.19 Conducted Spurious Emission (Ch0, 3 GHz-10 GHz), LE 1M

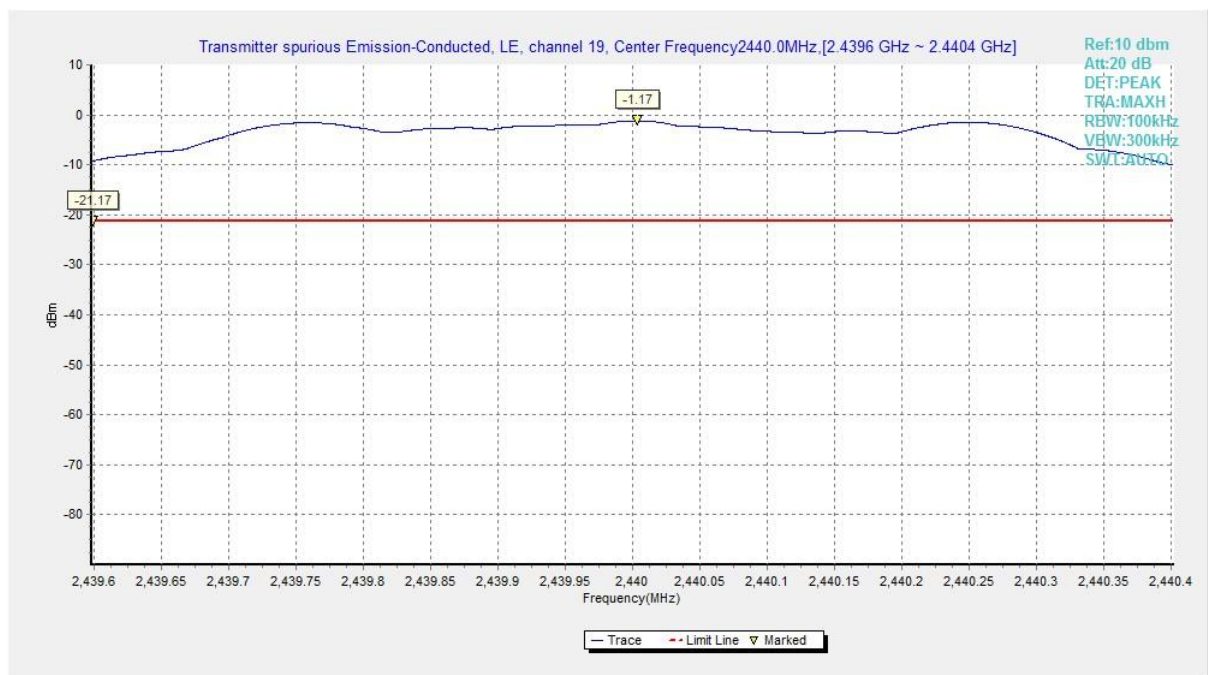


Fig.20 Conducted Spurious Emission (Ch19, Center Frequency), LE 1M

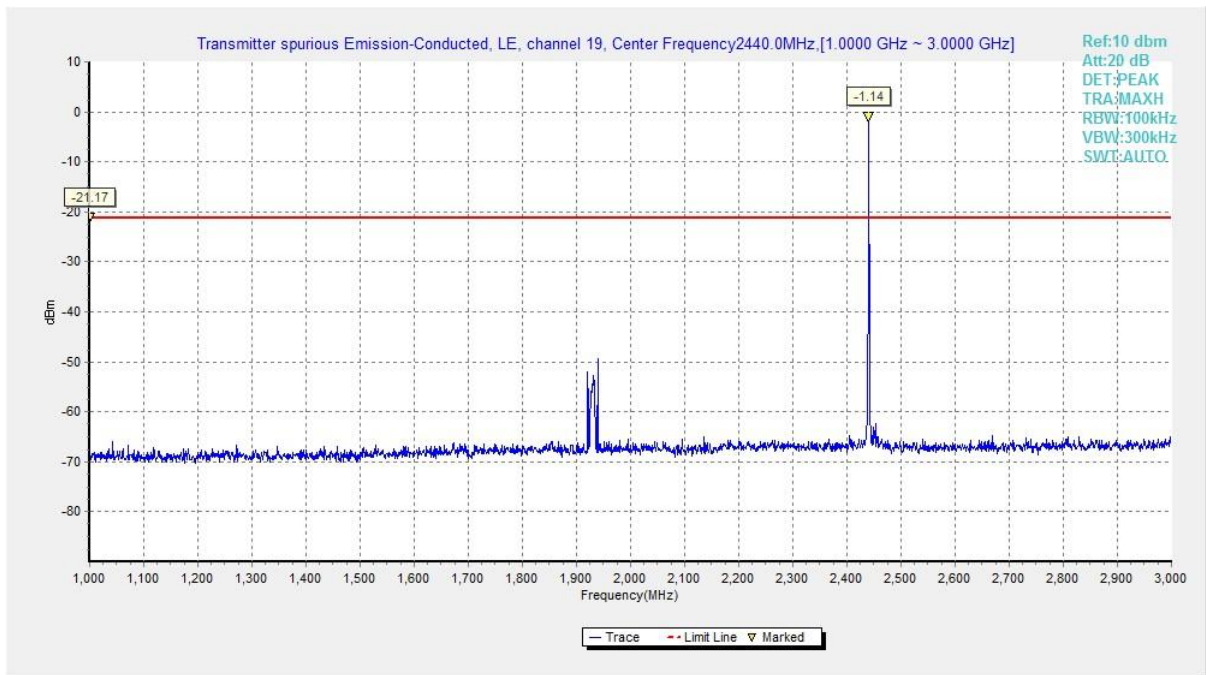


Fig.21 Conducted Spurious Emission (Ch19, 1 GHz-3 GHz), LE 1M

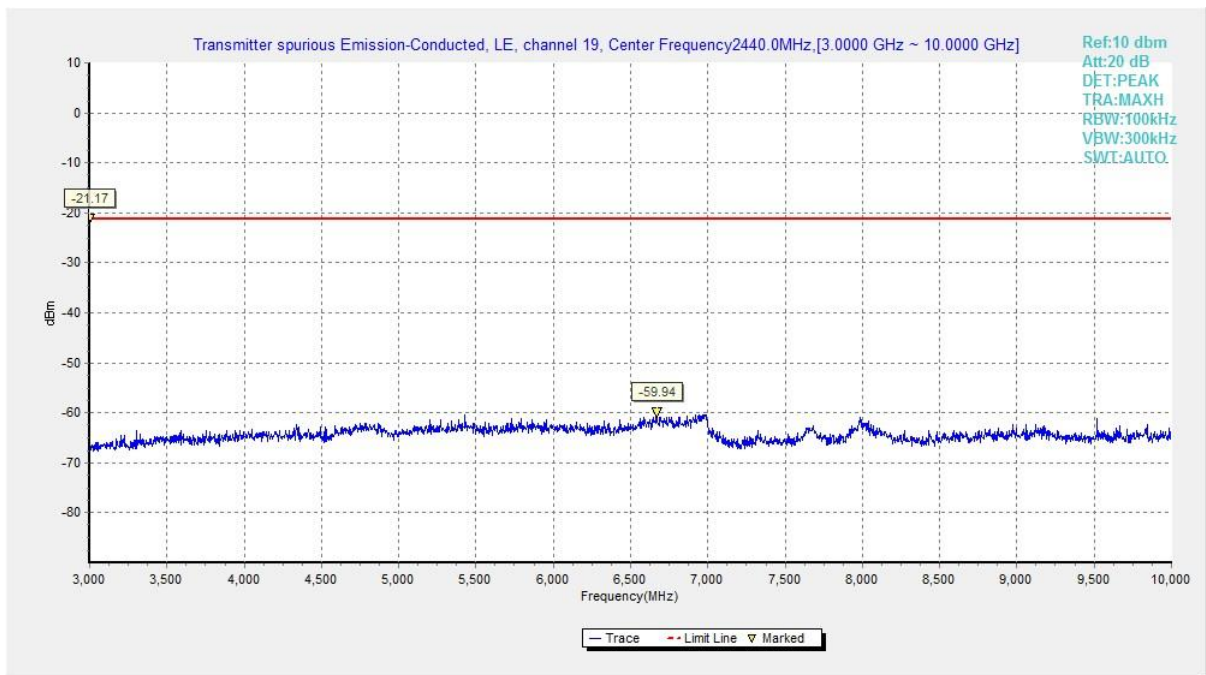


Fig.22 Conducted Spurious Emission (Ch19, 3 GHz-10 GHz), LE 1M

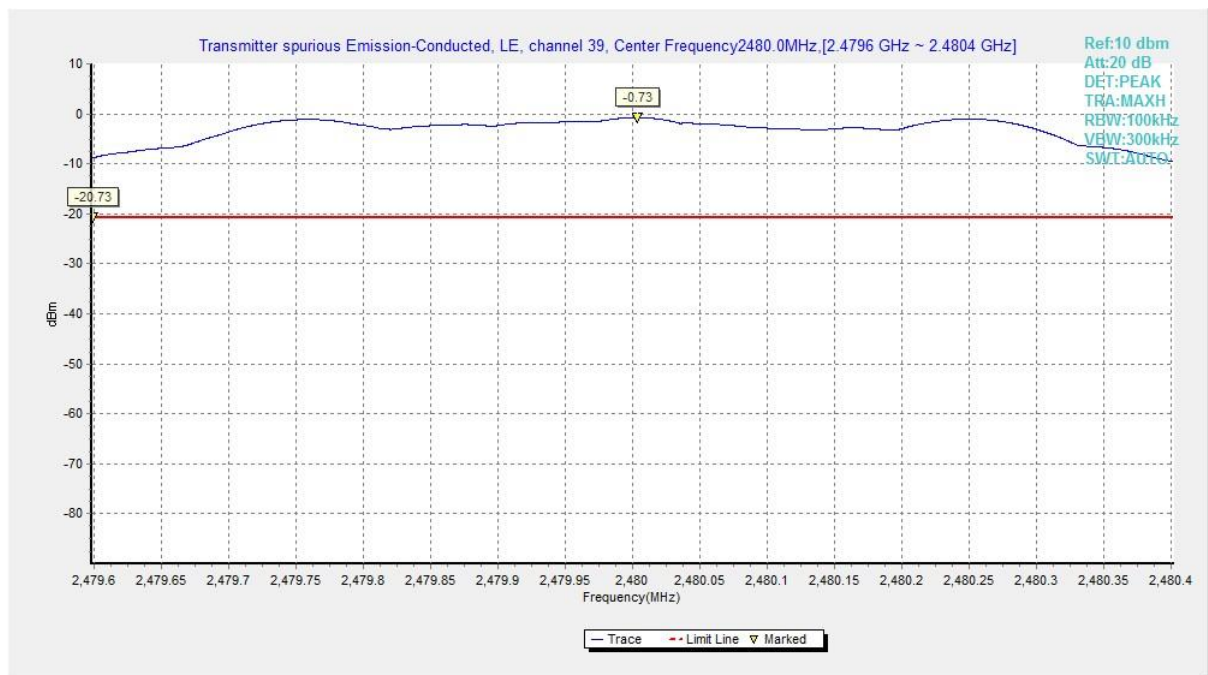


Fig.23 Conducted Spurious Emission (Ch39, Center Frequency), LE 1M

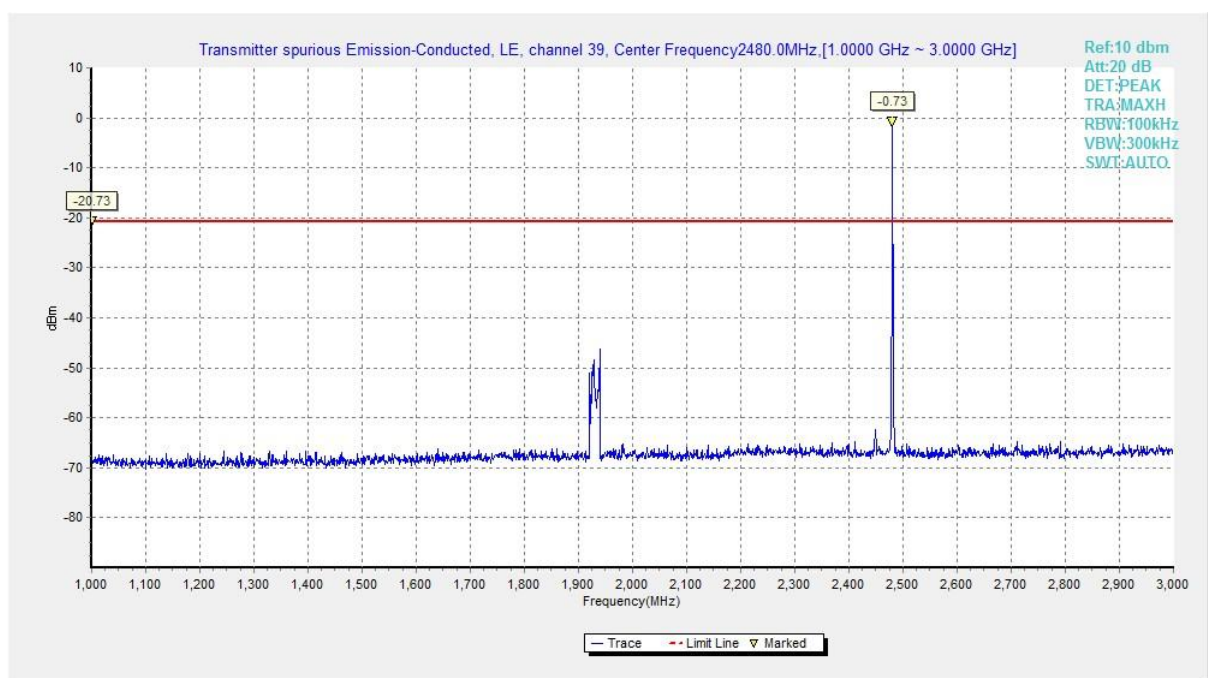


Fig.24 Conducted Spurious Emission (Ch39, 1 GHz-3 GHz), LE 1M

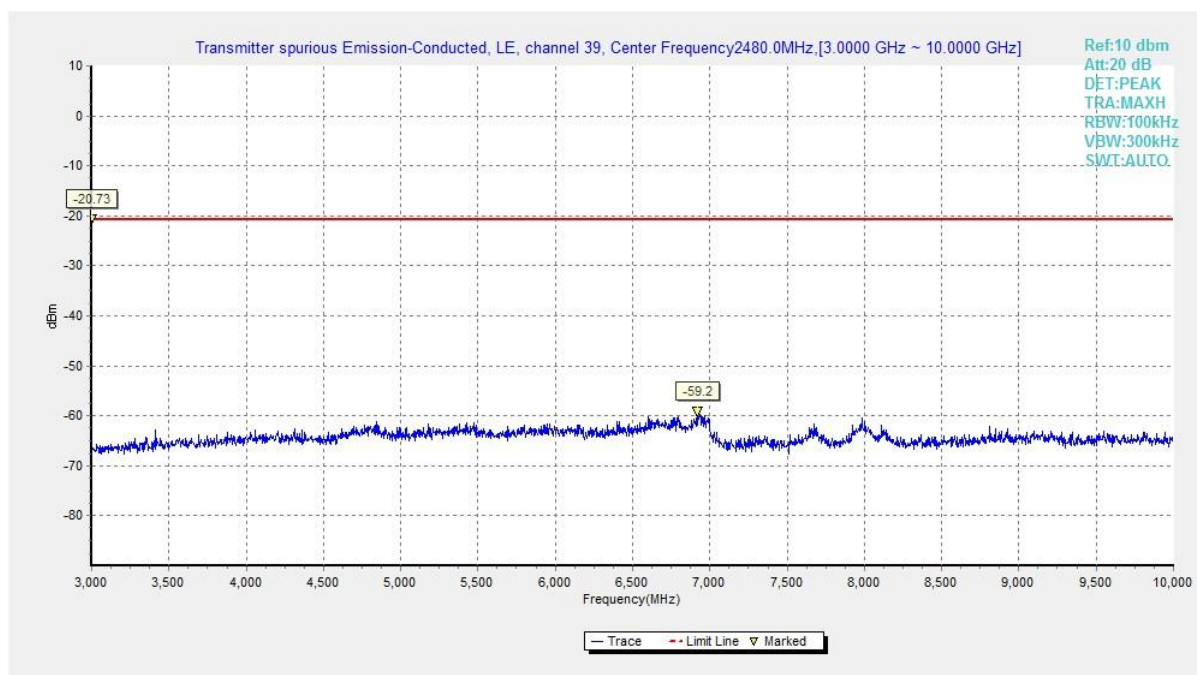


Fig.25 Conducted Spurious Emission (Ch39, 3 GHz-10 GHz), LE 1M

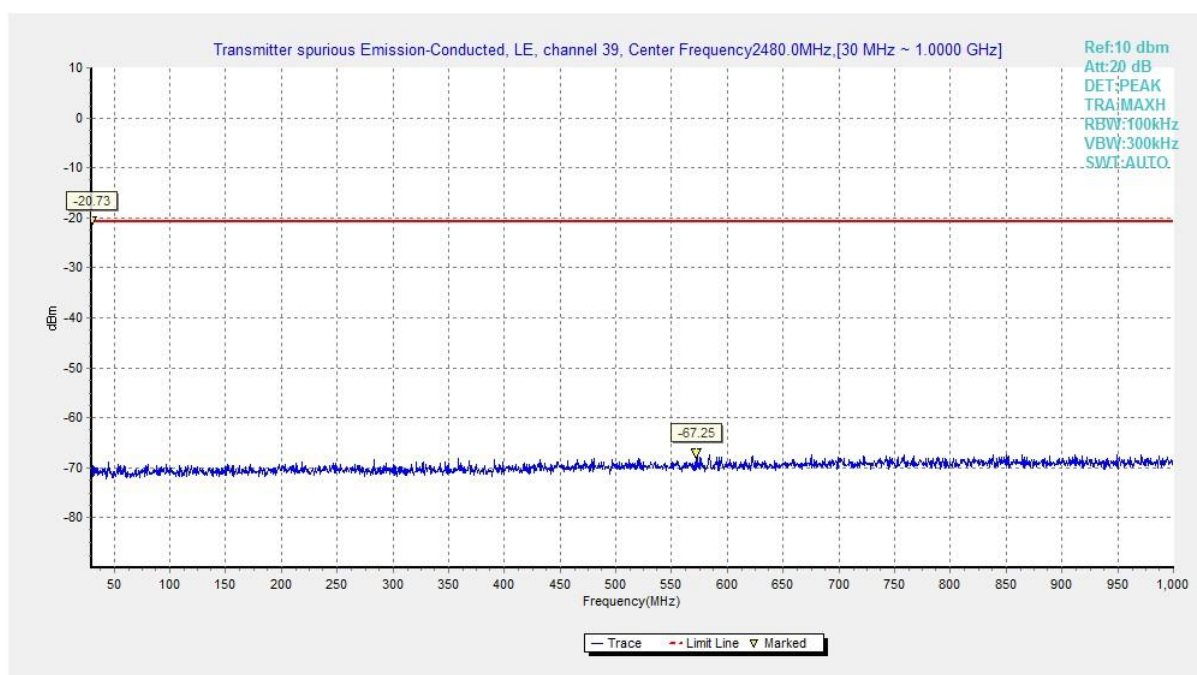


Fig.26 Conducted Spurious Emission (All channels, 30 MHz-1 GHz), LE 1M

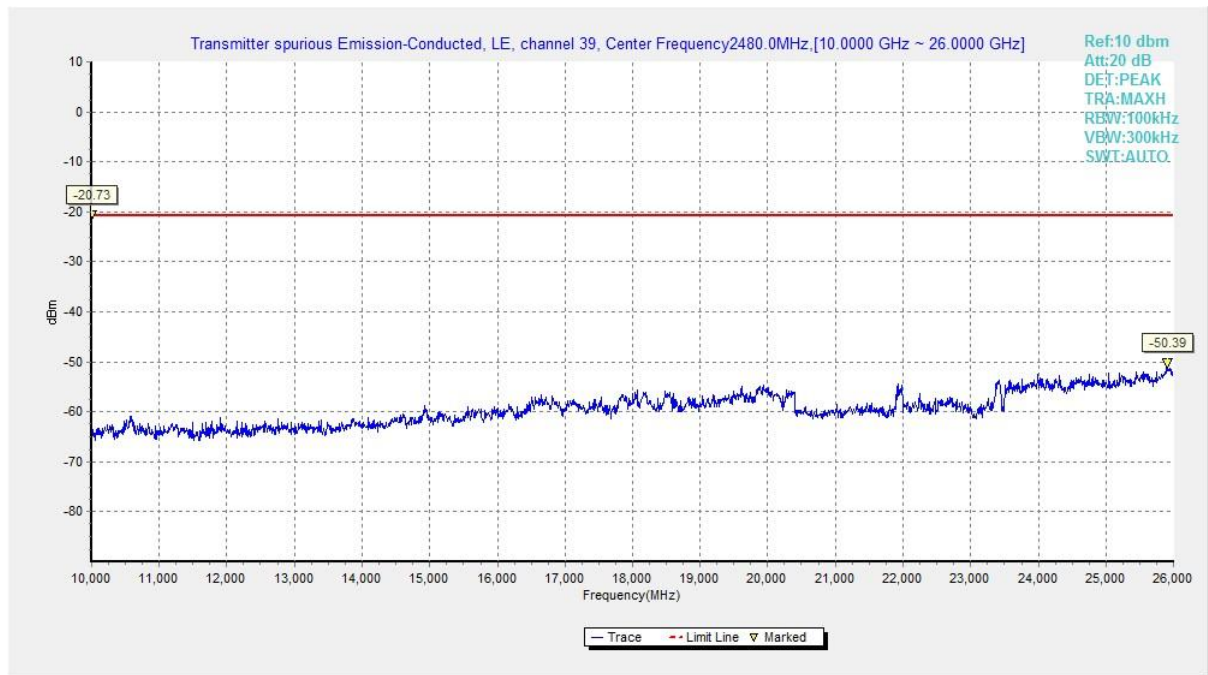


Fig.27 Conducted Spurious Emission (All channels, 10 GHz-26 GHz), LE 1M

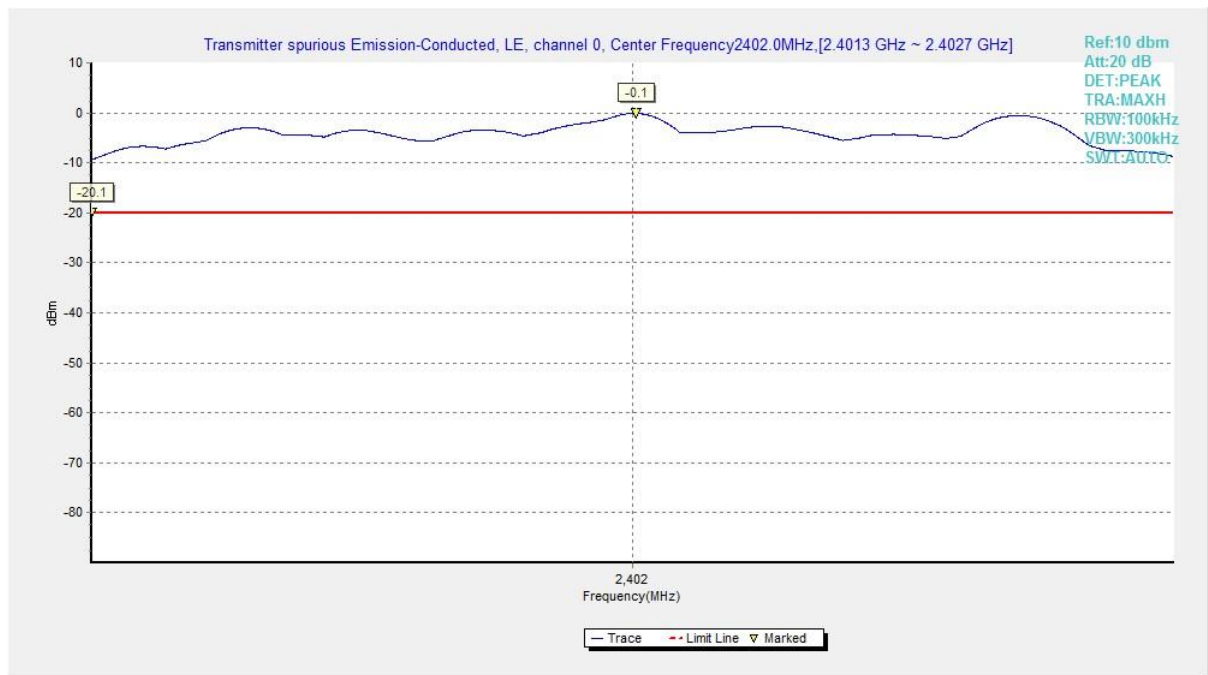


Fig.28 Conducted Spurious Emission (Ch0, Center Frequency), LE 2M

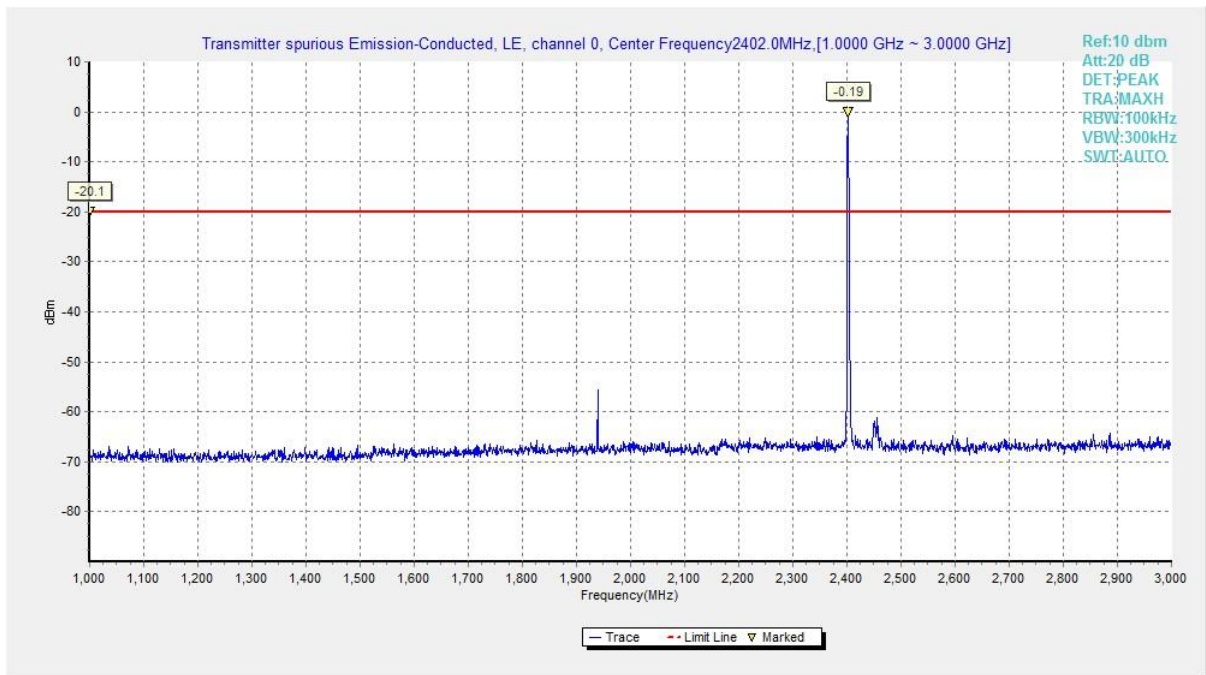


Fig.29 Conducted Spurious Emission (Ch0, 1 GHz-3 GHz), LE 2M

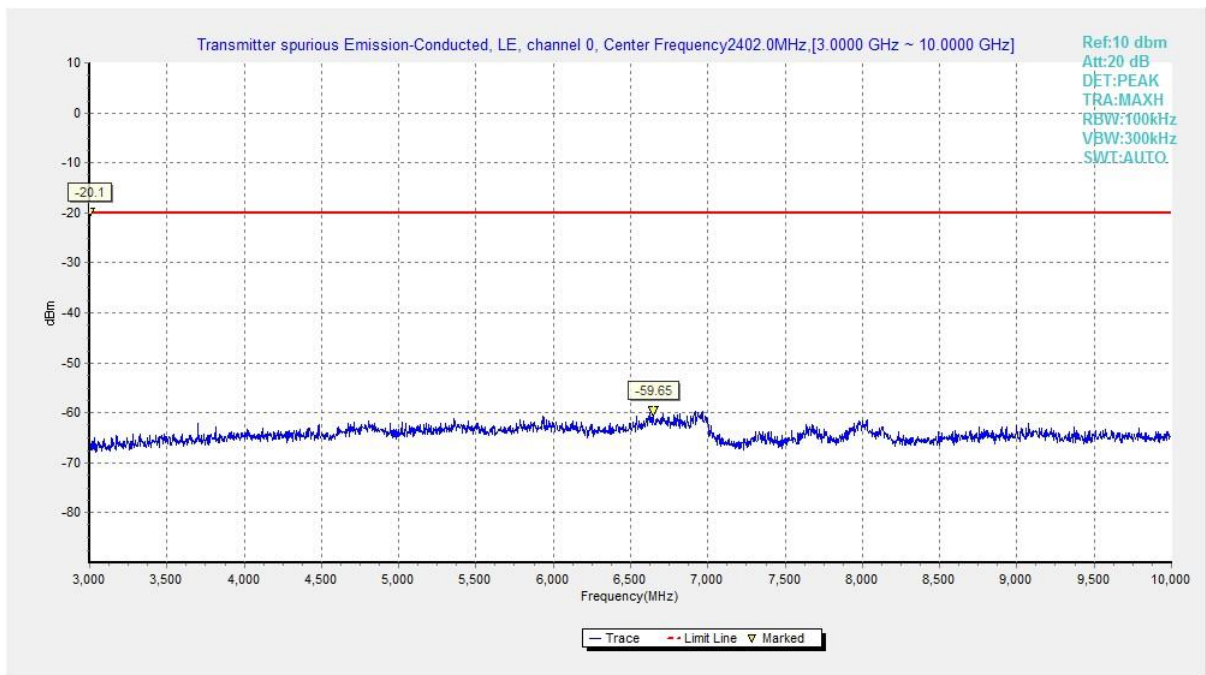


Fig.30 Conducted Spurious Emission (Ch0, 3 GHz-10 GHz), LE 2M

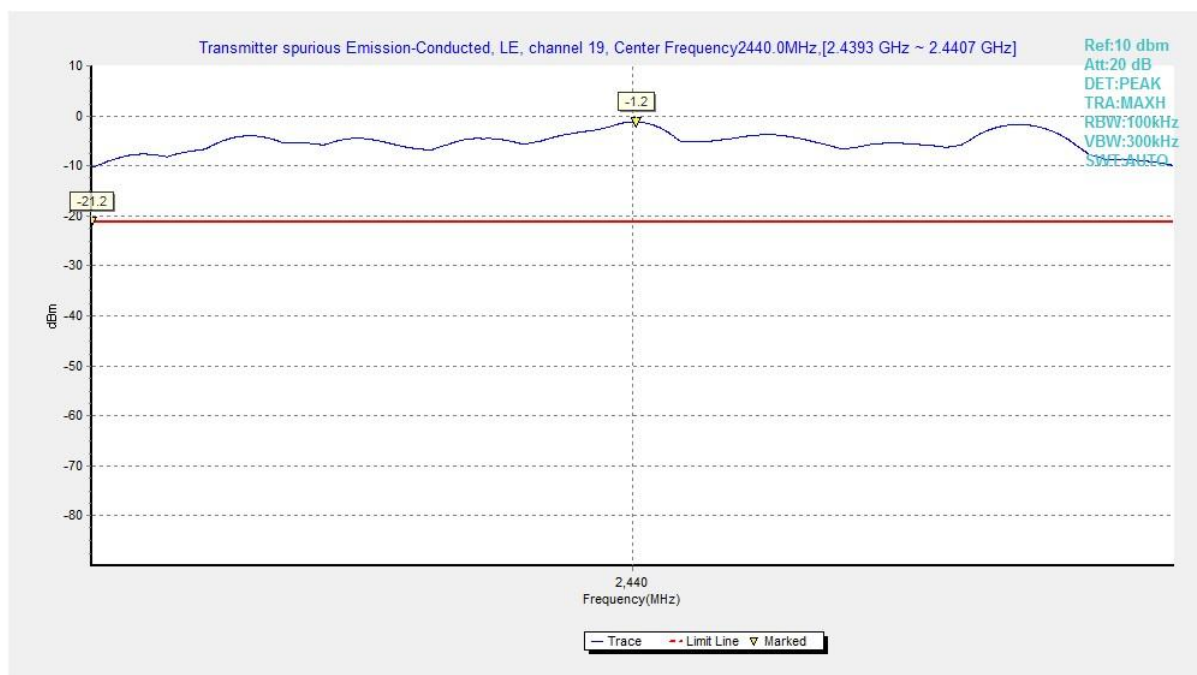


Fig.31 Conducted Spurious Emission (Ch19, Center Frequency), LE 2M

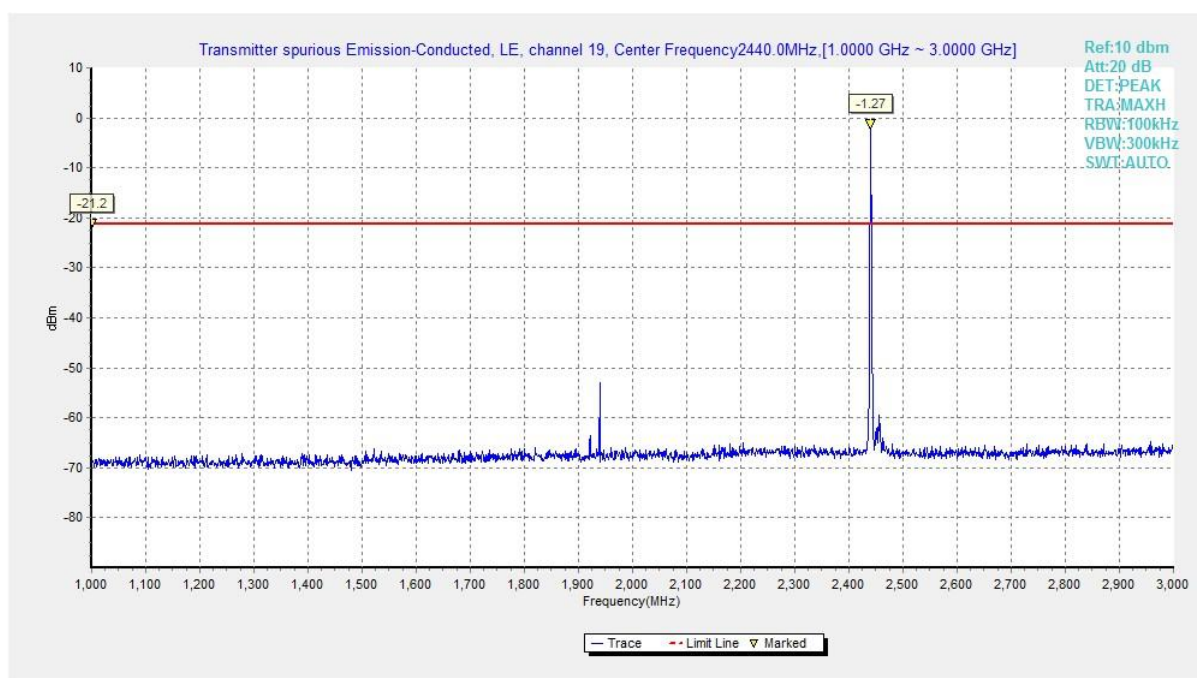


Fig.32 Conducted Spurious Emission (Ch19, 1 GHz-3 GHz), LE 2M

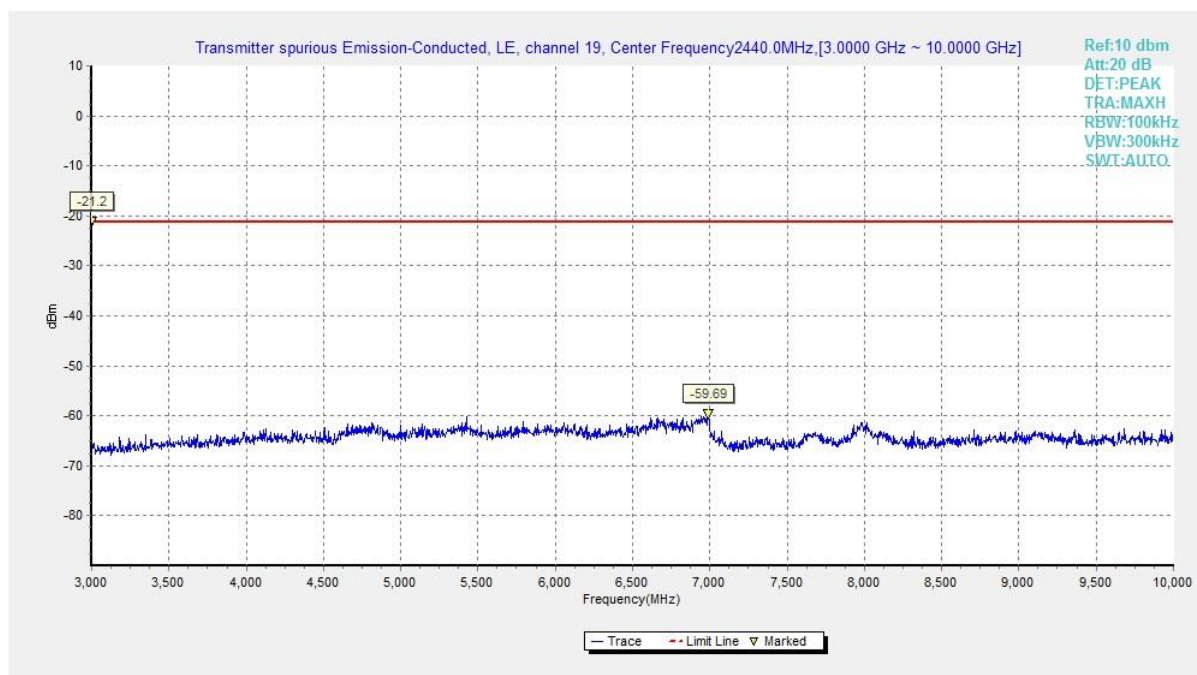


Fig.33 Conducted Spurious Emission (Ch19, 3 GHz-10 GHz), LE 2M

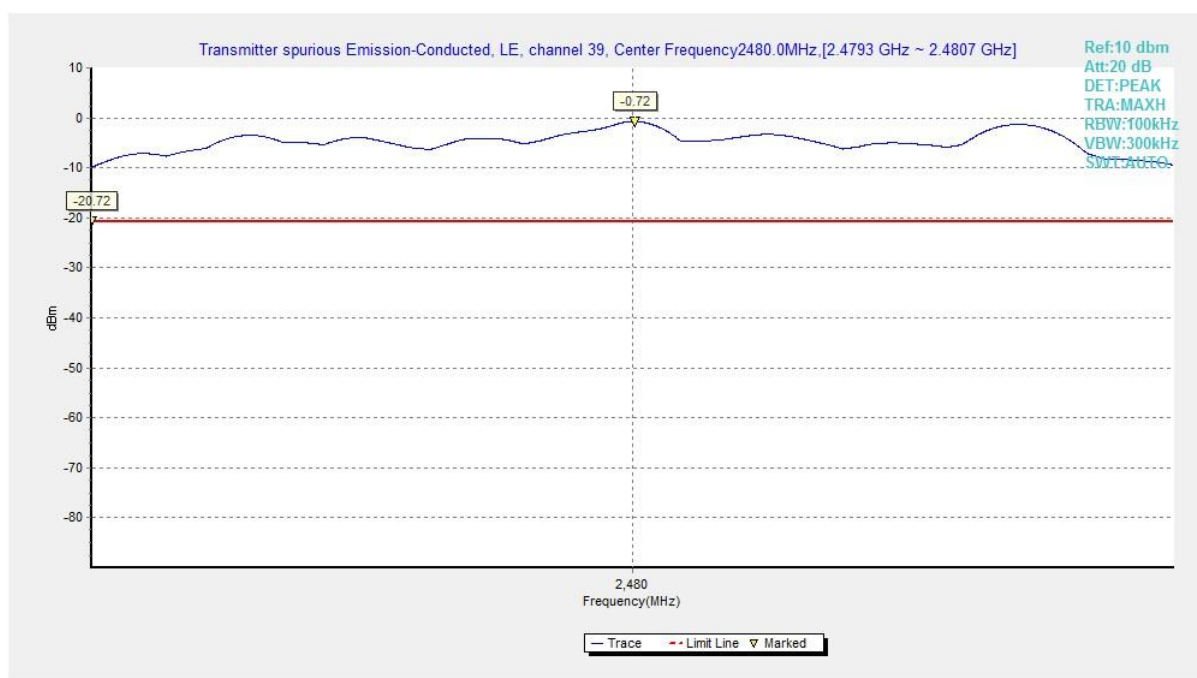


Fig.34 Conducted Spurious Emission (Ch39, Center Frequency), LE 2M

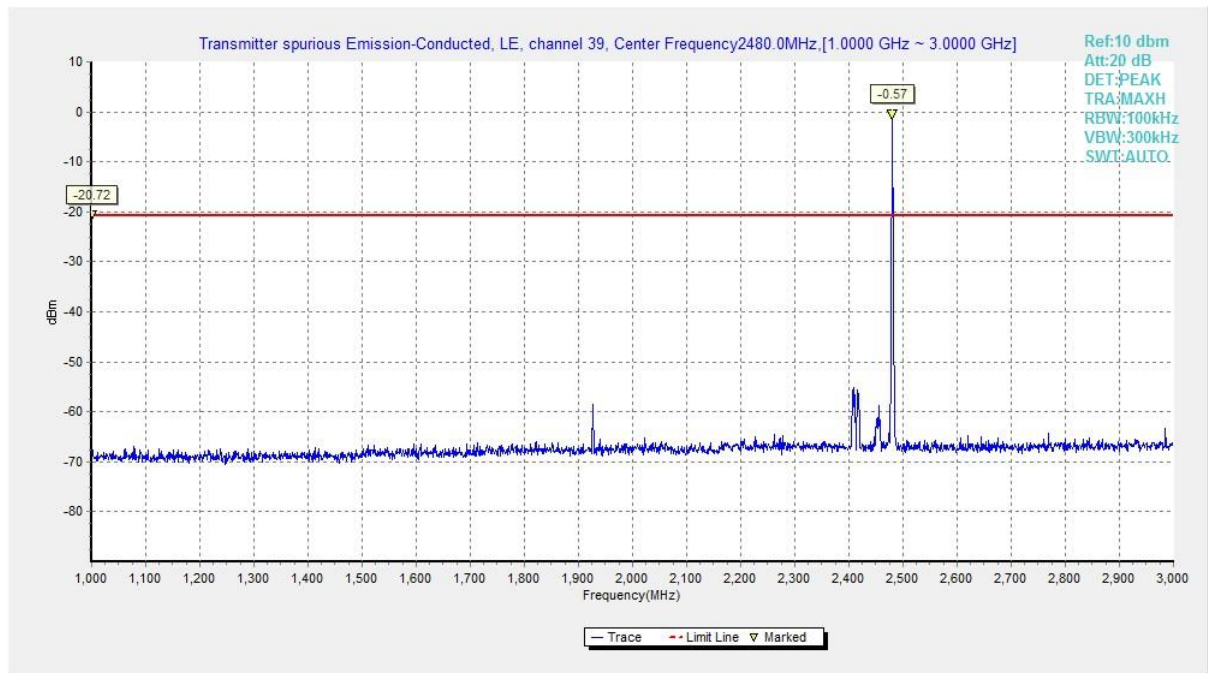


Fig.35 Conducted Spurious Emission (Ch39, 1 GHz-3 GHz), LE 2M

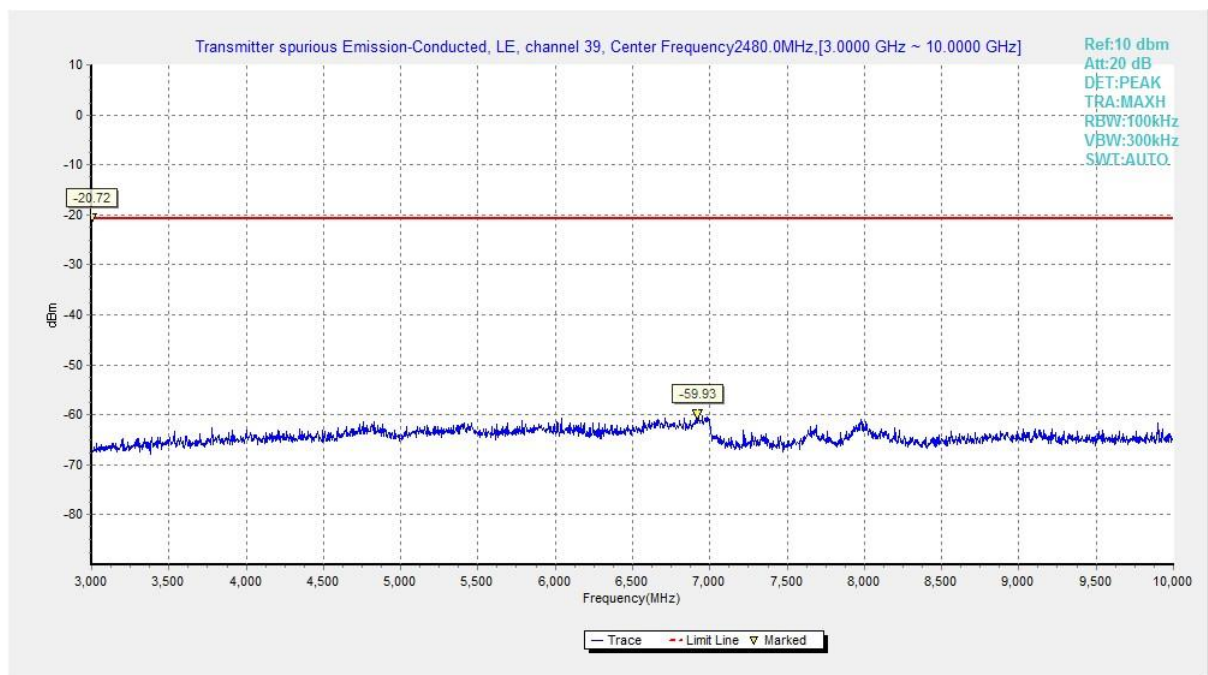


Fig.36 Conducted Spurious Emission (Ch39, 3 GHz-10 GHz), LE 2M

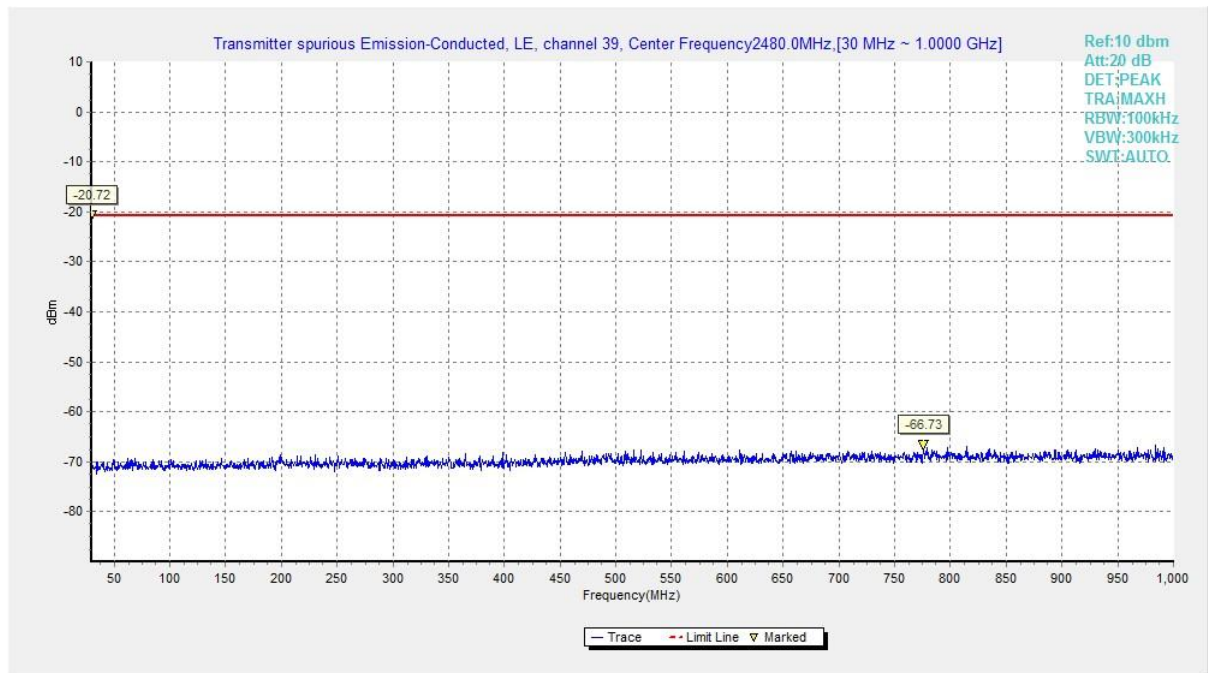


Fig.37 Conducted Spurious Emission (All channels, 30 MHz-1 GHz), LE 2M

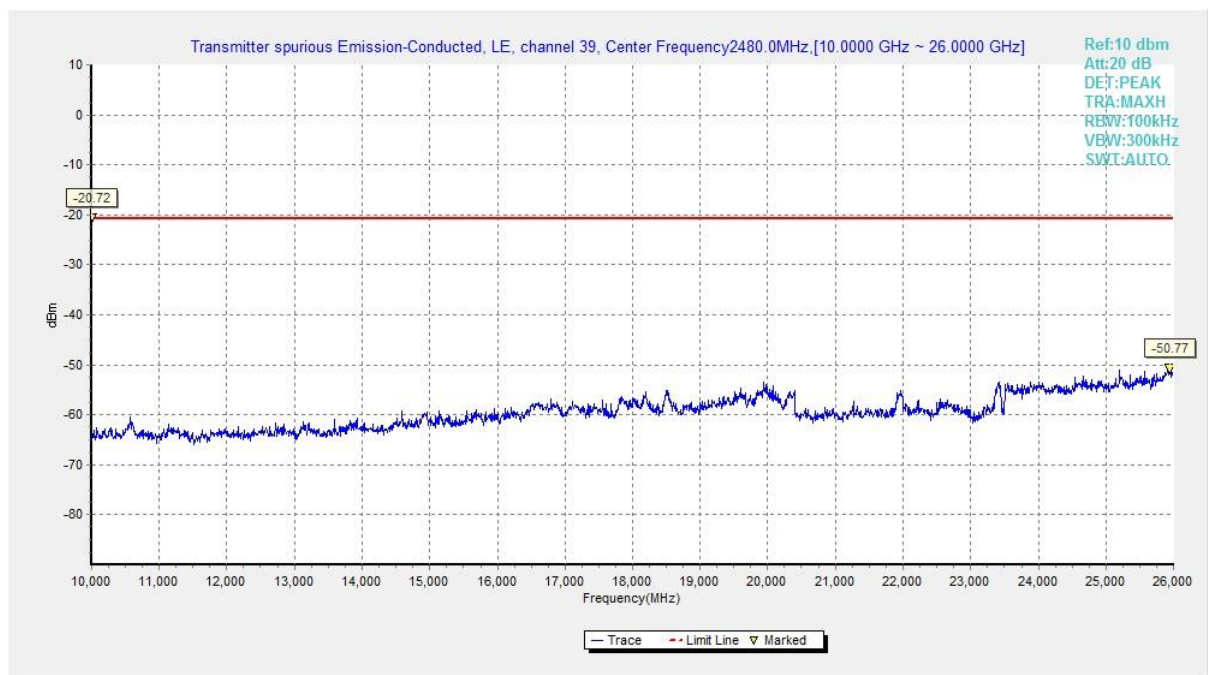


Fig.38 Conducted Spurious Emission (All channels, 10 GHz-26 GHz), LE 2M

A.6 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:

Mode	Channel	Frequency Range	Test Results	Conclusion
LE-1M	0	1 GHz ~ 18 GHz	Fig.39	P
	19	9 kHz ~ 30 MHz	Fig.40	P
		30 MHz ~ 1 GHz	Fig.41	P
		1 GHz ~ 18 GHz	Fig.42	P
		18 GHz ~ 26.5 GHz	Fig.43	P
	39	1 GHz ~ 18 GHz	Fig.44	P
	Restricted Band(CH0)	2.38 GHz ~ 2.45 GHz	Fig.45	P
	Restricted Band(CH39)	2.45 GHz ~ 2.5 GHz	Fig.46	P
LE-2M	0	1 GHz ~ 18 GHz	Fig.47	P
	19	9 kHz ~ 30 MHz	Fig.48	P
		30 MHz ~ 1 GHz	Fig.49	P
		1 GHz ~ 18 GHz	Fig.50	P
		18 GHz ~ 26.5 GHz	Fig.51	P
	39	1 GHz ~ 18 GHz	Fig.52	P
	Restricted Band(CH0)	2.38 GHz ~ 2.45 GHz	Fig.53	P
	Restricted Band(CH39)	2.45 GHz ~ 2.5 GHz	Fig.54	P

See below for test graphs.

Conclusion: Pass

LE-1M
GFSK CH0 (1-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
4803.750000	41.24	74.00	32.76	H	0.2
14200.000000	47.05	74.00	26.95	V	8.4
15198.000000	49.01	74.00	24.99	V	9.8
15864.400000	49.88	74.00	24.12	V	10.5
16548.000000	51.16	74.00	22.84	V	13.6
16942.400000	51.29	74.00	22.71	V	14.2

Frequency (MHz)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
4803.750000	32.93	54.00	21.07	H	0.2
14200.000000	36.78	54.00	17.22	V	8.4
15198.000000	38.74	54.00	15.26	V	9.8
15864.400000	39.57	54.00	14.43	V	10.5
16548.000000	41.07	54.00	12.93	V	13.6
16942.400000	40.90	54.00	13.10	V	14.2

GFSK CH19 (1-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
9476.800000	43.76	74.00	30.24	V	4.2
10391.200000	45.48	74.00	28.52	V	5.8
12252.000000	46.18	74.00	27.82	V	7.8
12846.000000	47.71	74.00	26.29	V	8.5
15216.800000	48.55	74.00	25.45	H	9.7
17907.600000	51.13	74.00	22.87	V	15.5

Frequency (MHz)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
9476.800000	33.40	54.00	20.60	V	4.2
10391.200000	34.93	54.00	19.07	V	5.8
12252.000000	35.97	54.00	18.03	V	7.8
12846.000000	36.85	54.00	17.15	V	8.5
15216.800000	38.74	54.00	15.26	H	9.7
17907.600000	41.91	54.00	12.09	V	15.5

GFSK CH39 (1-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
9543.600000	45.14	74.00	28.86	V	4.2
10422.000000	45.05	74.00	28.95	V	5.9
12398.800000	46.90	74.00	27.10	V	8.4
14909.600000	48.61	74.00	25.39	V	9.7
16590.400000	52.48	74.00	21.52	V	13.8
17894.400000	51.28	74.00	22.72	V	15.6

Frequency (MHz)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
9543.600000	33.74	54.00	20.26	V	4.2
10422.000000	34.40	54.00	19.60	V	5.9
12398.800000	36.68	54.00	17.32	V	8.4
14909.600000	38.58	54.00	15.42	V	9.7
16590.400000	41.03	54.00	12.97	V	13.8
17894.400000	42.15	54.00	11.85	V	15.6

LE-2M
GFSK CH0 (1-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
9371.200000	44.07	74.00	29.93	H	4.1
10374.000000	45.08	74.00	28.92	H	5.9
11671.600000	46.13	74.00	27.87	V	6.8
15958.400000	48.80	74.00	25.20	V	11.2
17225.200000	51.77	74.00	22.23	H	15.1
17914.400000	52.80	74.00	21.20	H	15.7

Frequency (MHz)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
9371.200000	33.44	54.00	20.56	H	4.1
10374.000000	34.49	54.00	19.51	H	5.9
11671.600000	35.91	54.00	18.09	V	6.8
15958.400000	38.91	54.00	15.09	V	11.2
17225.200000	41.40	54.00	12.60	H	15.1
17914.400000	41.66	54.00	12.34	H	15.7

GFSK CH19 (1-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
9442.800000	44.06	74.00	29.94	V	4.3
10419.200000	45.64	74.00	28.36	H	5.9
12469.200000	46.57	74.00	27.43	V	8.1
14859.200000	48.69	74.00	25.31	V	9.4
16548.400000	51.79	74.00	22.21	V	13.6
17955.200000	52.58	74.00	21.42	V	16.0

Frequency (MHz)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
9442.800000	33.16	54.00	20.84	V	4.3
10419.200000	34.53	54.00	19.47	H	5.9
12469.200000	37.01	54.00	16.99	V	8.1
14859.200000	38.67	54.00	15.33	V	9.4
16548.400000	41.52	54.00	12.48	V	13.6
17955.200000	41.87	54.00	12.13	V	16.0

GFSK CH39 (1-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
9471.200000	45.16	74.00	28.84	V	4.2
10927.200000	45.99	74.00	28.01	H	6.4
12823.600000	47.07	74.00	26.93	V	8.6
15190.800000	49.52	74.00	24.48	H	9.9
16631.200000	51.93	74.00	22.07	V	14.2
17655.200000	51.69	74.00	22.31	V	15.7

Frequency (MHz)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
9471.200000	33.59	54.00	20.41	V	4.2
10927.200000	34.95	54.00	19.05	H	6.4
12823.600000	37.07	54.00	16.93	V	8.6
15190.800000	38.75	54.00	15.25	H	9.9
16631.200000	41.23	54.00	12.77	V	14.2
17655.200000	41.91	54.00	12.09	V	15.7

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

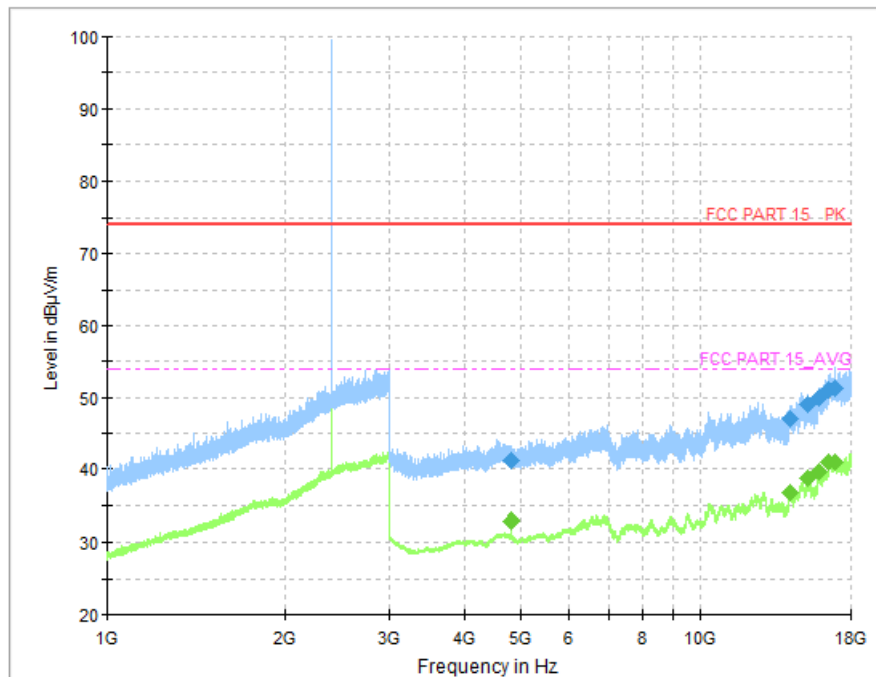


Fig.39 Radiated Spurious Emission (Ch0, 1 GHz - 18 GHz), 1M

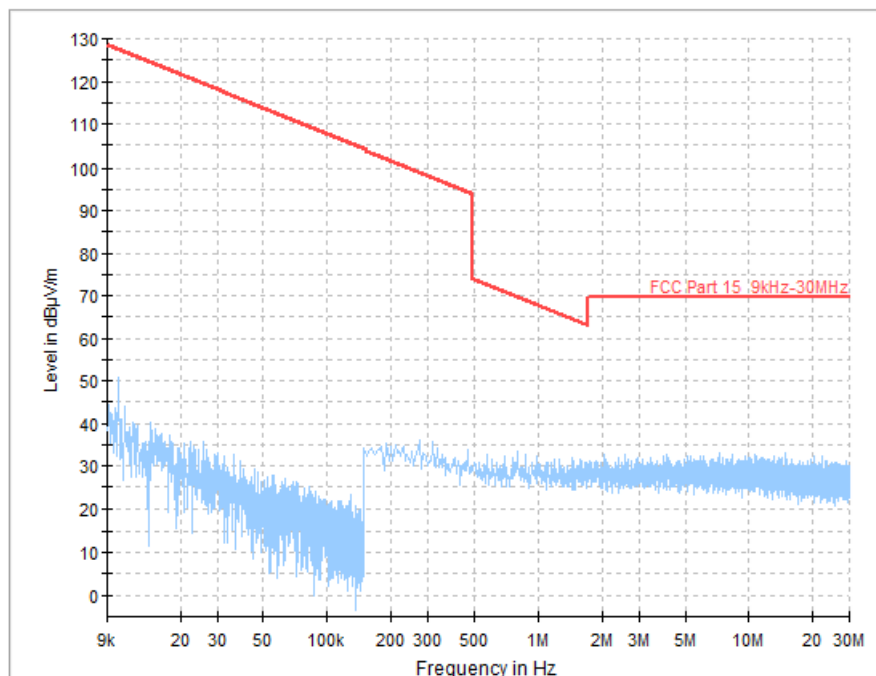


Fig.40 Radiated Spurious Emission (Ch19, 9 kHz - 30 MHz), 1M

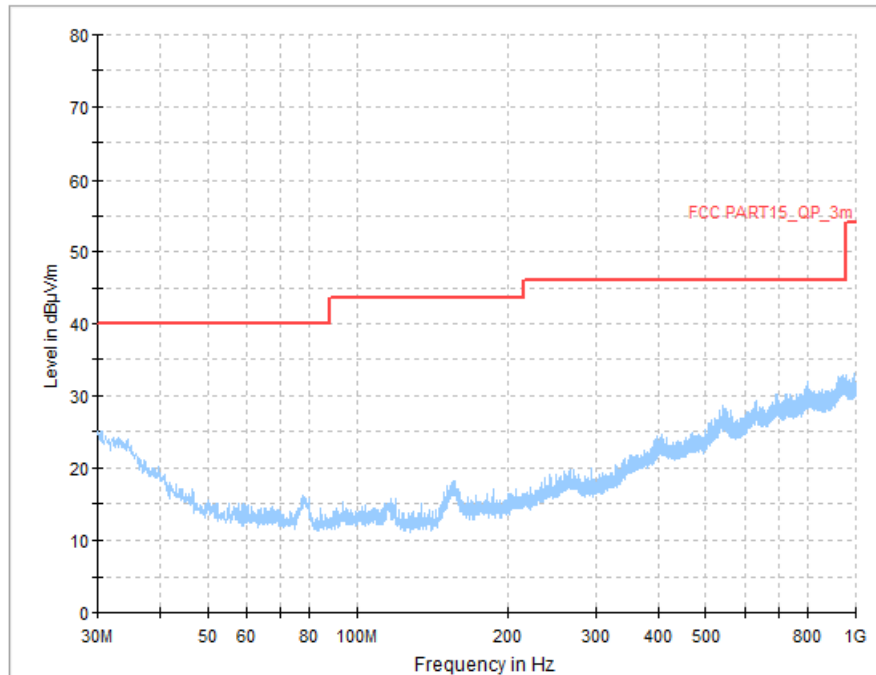


Fig.41 Radiated Spurious Emission (Ch19, 30 MHz - 1 GHz), 1M

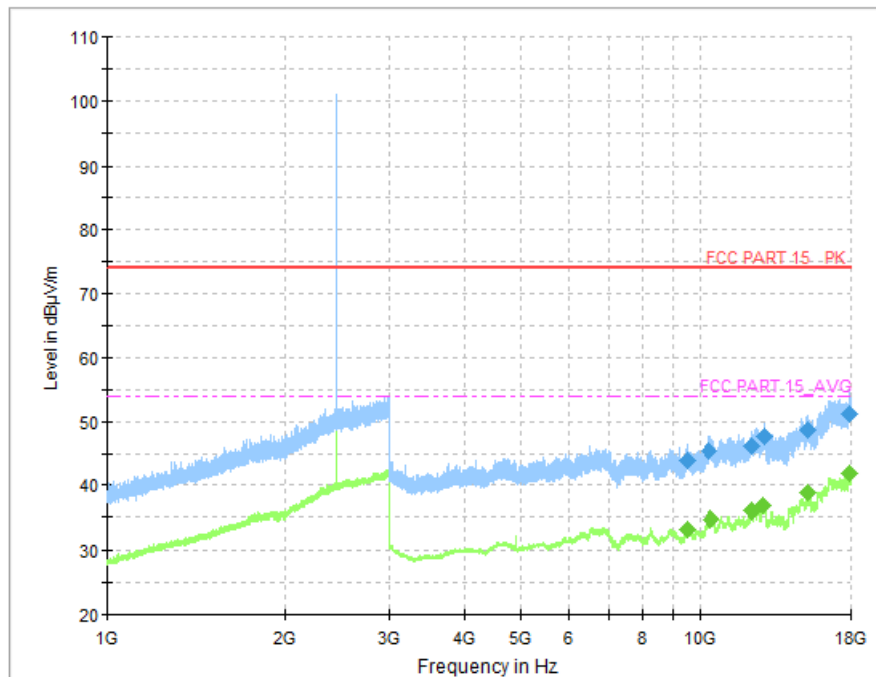


Fig.42 Radiated Spurious Emission (Ch19, 1 GHz - 18 GHz), 1M

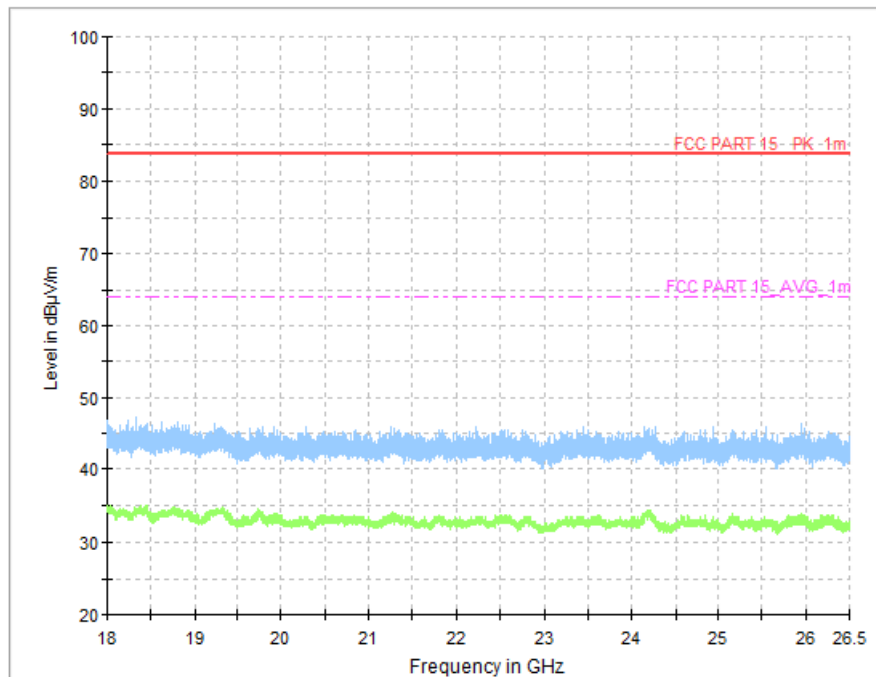


Fig.43 Radiated Spurious Emission (Ch19, 18 GHz - 26.5 GHz), 1M

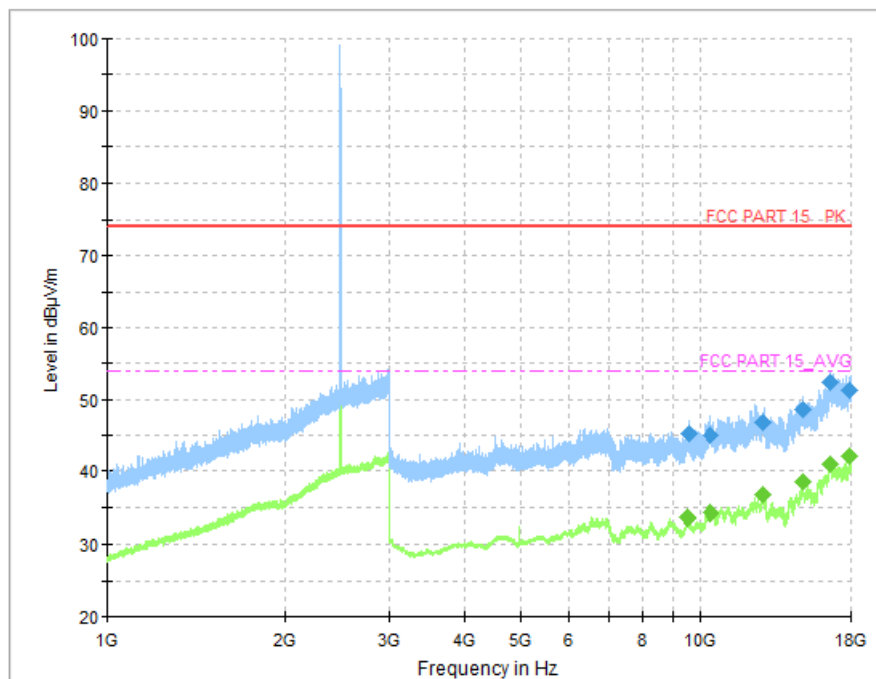


Fig.44 Radiated Spurious Emission (Ch39, 1 GHz - 18 GHz), 1M

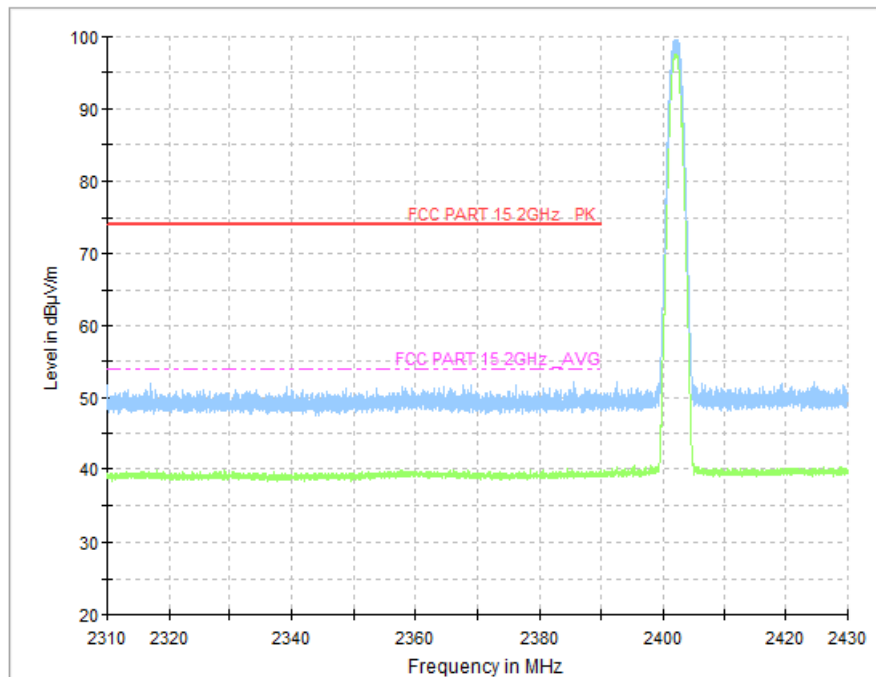


Fig.45 Radiated Band Edges (Ch0, 2380GHz - 2450GHz), 1M

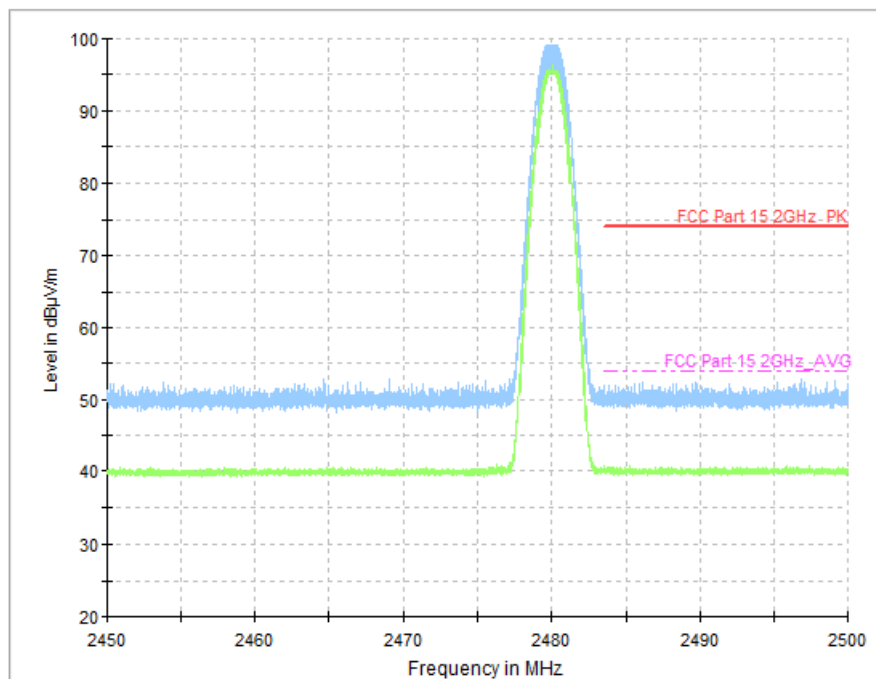


Fig.46 Radiated Band Edges (Ch39, 2450GHz - 2500GHz), 1M

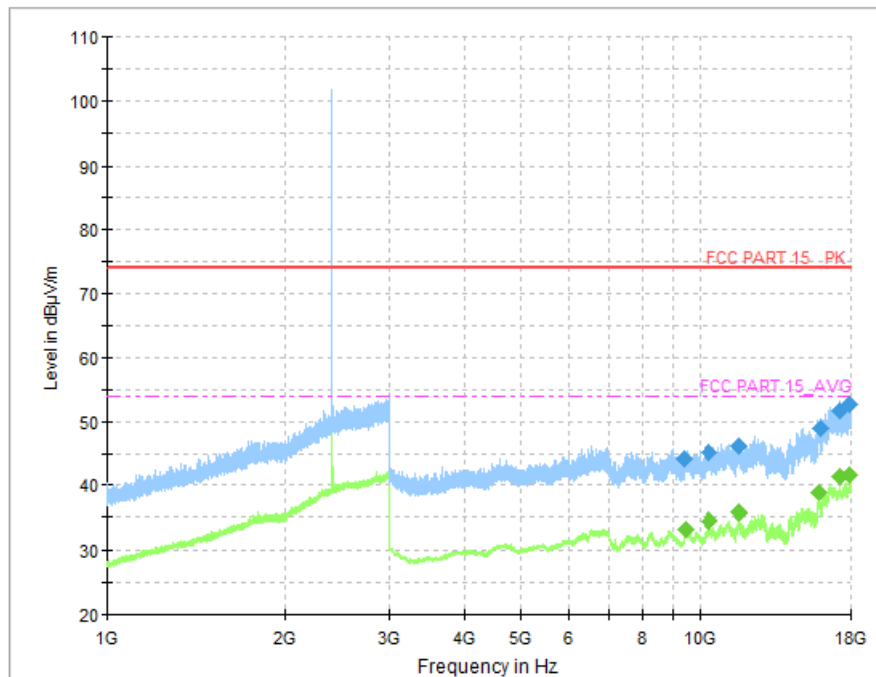


Fig.47 Radiated Spurious Emission (Ch0, 1 GHz - 18 GHz), 2M

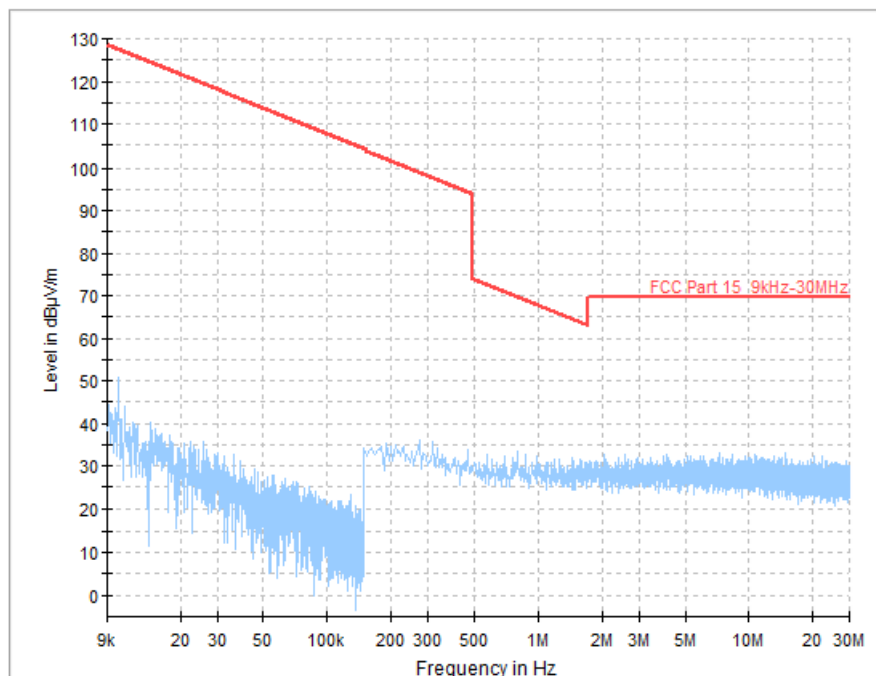


Fig.48 Radiated Spurious Emission (Ch19, 9 kHz - 30 MHz), 2M

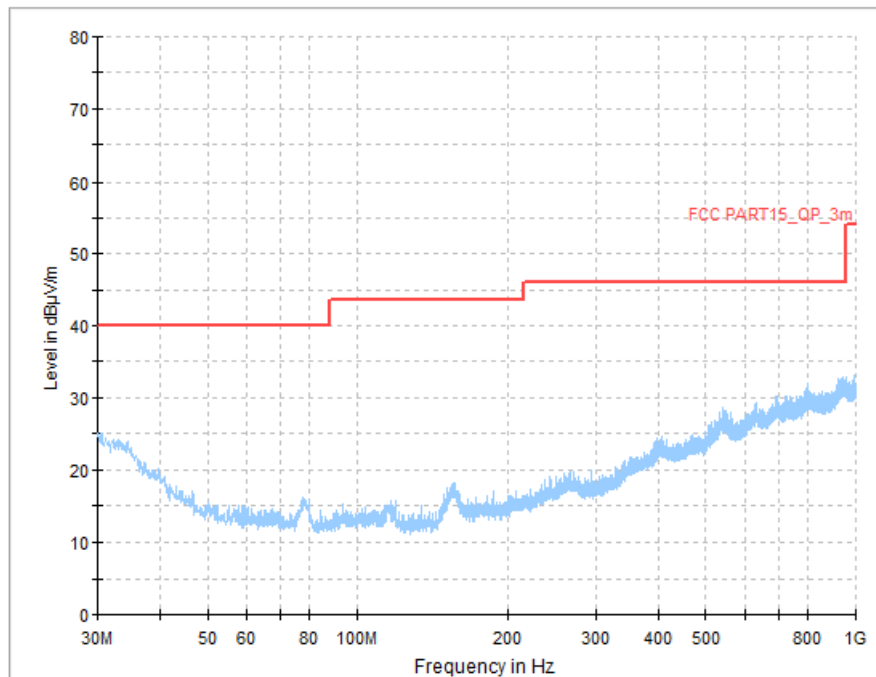


Fig.49 Radiated Spurious Emission (Ch19, 30 MHz - 1 GHz), 2M

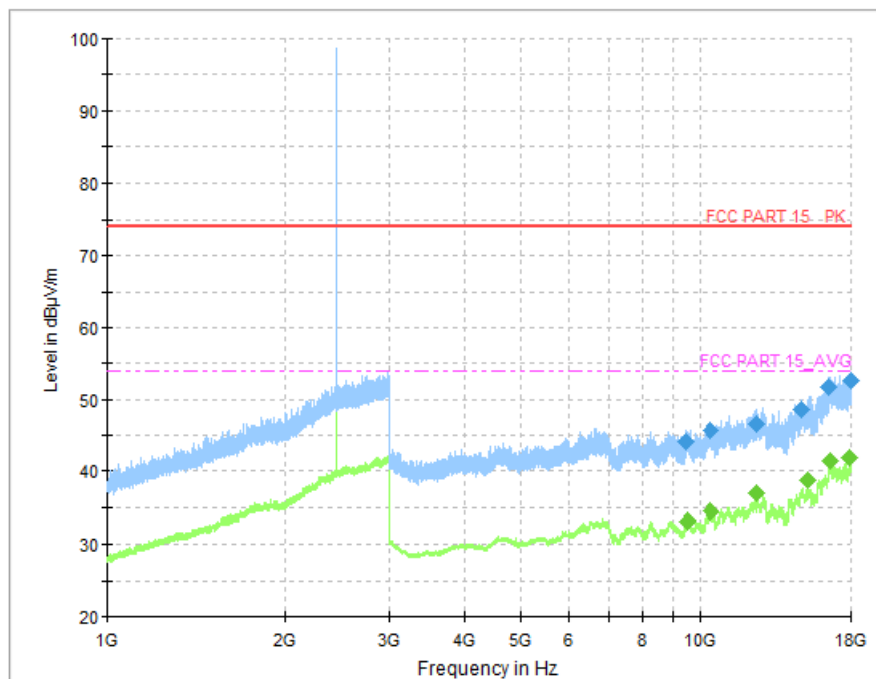


Fig.50 Radiated Spurious Emission (Ch19, 1 GHz - 18 GHz), 2M

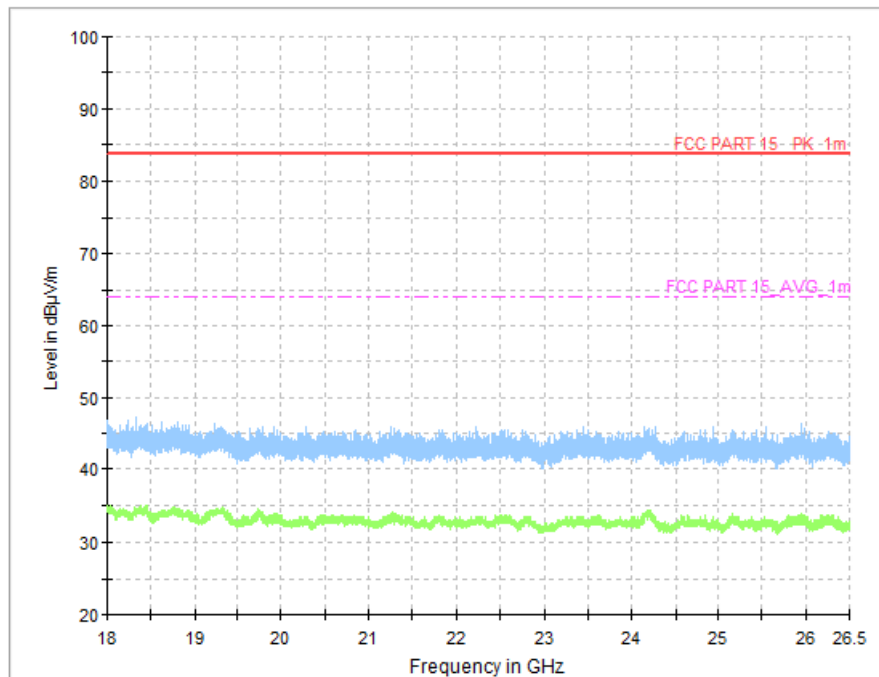


Fig.51 Radiated Spurious Emission (Ch19, 18 GHz - 26.5 GHz), 2M

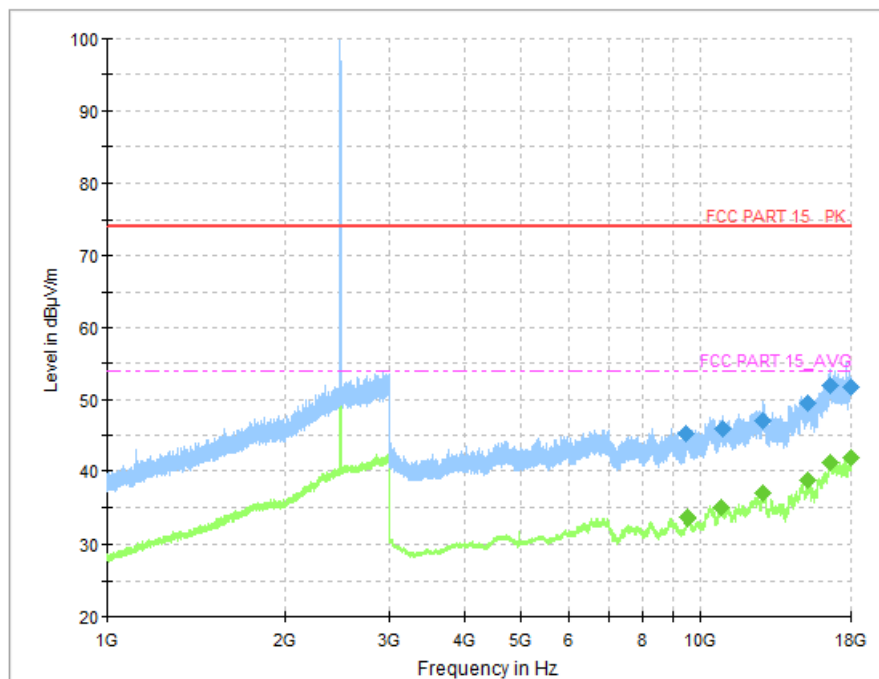


Fig.52 Radiated Spurious Emission (Ch39, 1 GHz - 18 GHz), 2M

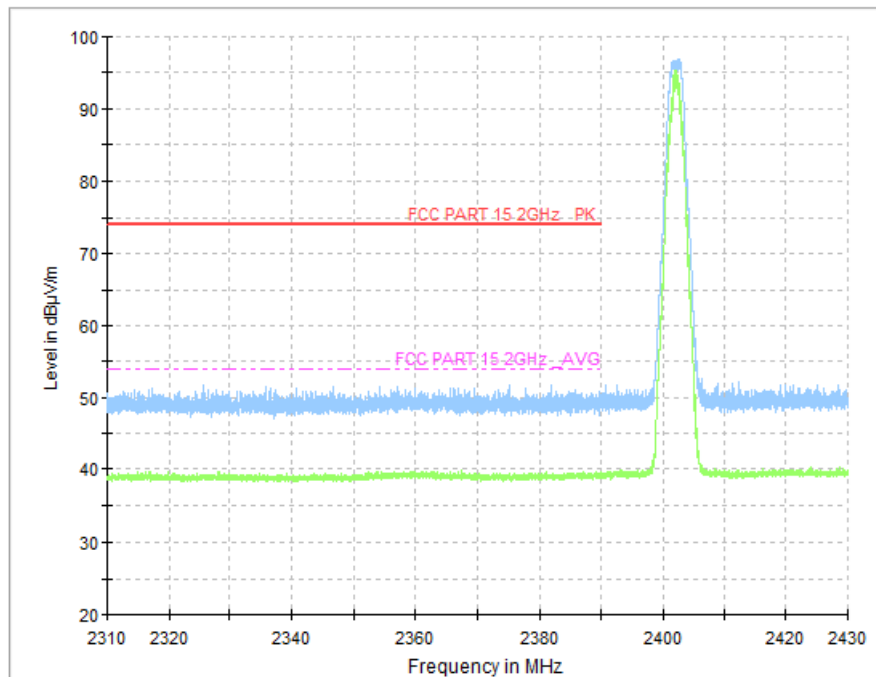


Fig.53 Radiated Band Edges (Ch0, 2380GHz - 2450GHz), 2M

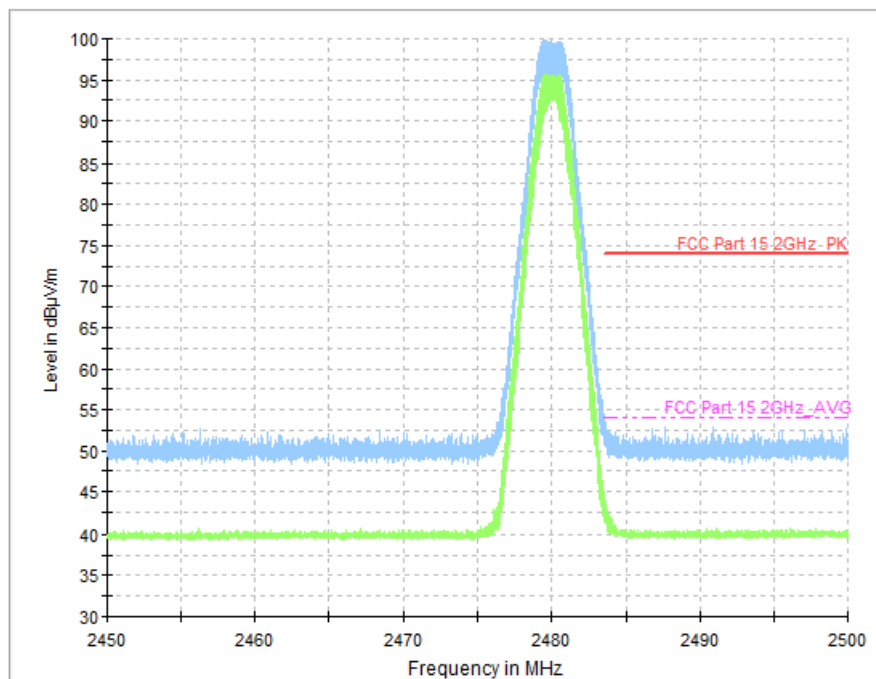


Fig.54 Radiated Band Edges (Ch39, 2450GHz - 2500GHz), 2M

A.7 AC Power line Conducted Emission

Test Condition:

Voltage (V)	Frequency (Hz)
120	60

Measurement Result and limit:

LE-1M

BLE (Quasi-peak Limit) - AE2

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)		Conclusion
		Traffic	Idle	
0.15 to 0.5	66 to 56	Fig.55	Fig.56	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) - AE2

Frequency range (MHz)	Average-peak Limit (dB μ V)	Result (dB μ V)		Conclusion
		Traffic	Idle	
0.15 to 0.5	56 to 46	Fig.55	Fig.56	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.

LE-2M

BLE (Quasi-peak Limit) - AE2

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)		Conclusion
		Traffic	Idle	
0.15 to 0.5	66 to 56	Fig.57	Fig.58	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) - AE2

Frequency range (MHz)	Average-peak Limit (dB μ V)	Result (dB μ V)		Conclusion
		Traffic	Idle	
0.15 to 0.5	56 to 46	Fig.57	Fig.58	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.



No. I20N02988-BLE

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

See below for test graphs.

Conclusion: Pass

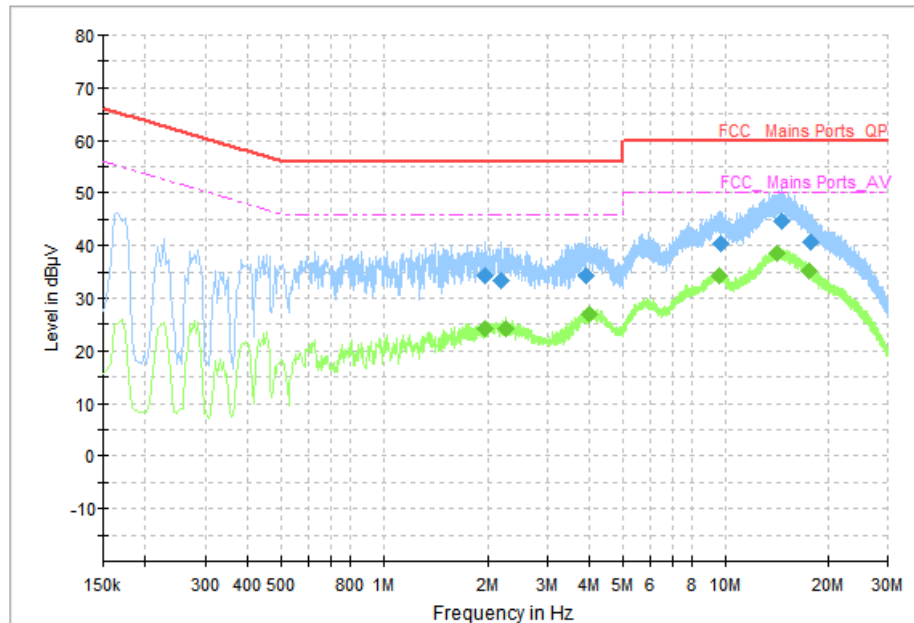


Fig.55 AC Power line Conducted Emission (Traffic, AE2, 120V), 1M

Measurement Results: Quasi Peak

Frequency (MHz)	QuasiPeak (dBμV)	Limit (dBμV)	Margin (dB)	Line	Filter	Corr. (dB)
1.970000	34.13	56.00	21.87	L1	ON	10
2.190000	33.31	56.00	22.69	L1	ON	10
3.914000	34.19	56.00	21.81	L1	ON	10
9.678000	40.51	60.00	19.49	L1	ON	10
14.590000	44.50	60.00	15.50	L1	ON	10
17.850000	40.57	60.00	19.43	L1	ON	10

Measurement Results: Average

Frequency (MHz)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Filter	Corr. (dB)
1.962000	24.21	46.00	21.79	L1	ON	10
2.274000	24.12	46.00	21.88	L1	ON	10
3.982000	26.83	46.00	19.17	L1	ON	10
9.614000	34.38	50.00	15.62	L1	ON	10
14.238000	38.44	50.00	11.56	L1	ON	10
17.698000	35.17	50.00	14.83	L1	ON	10

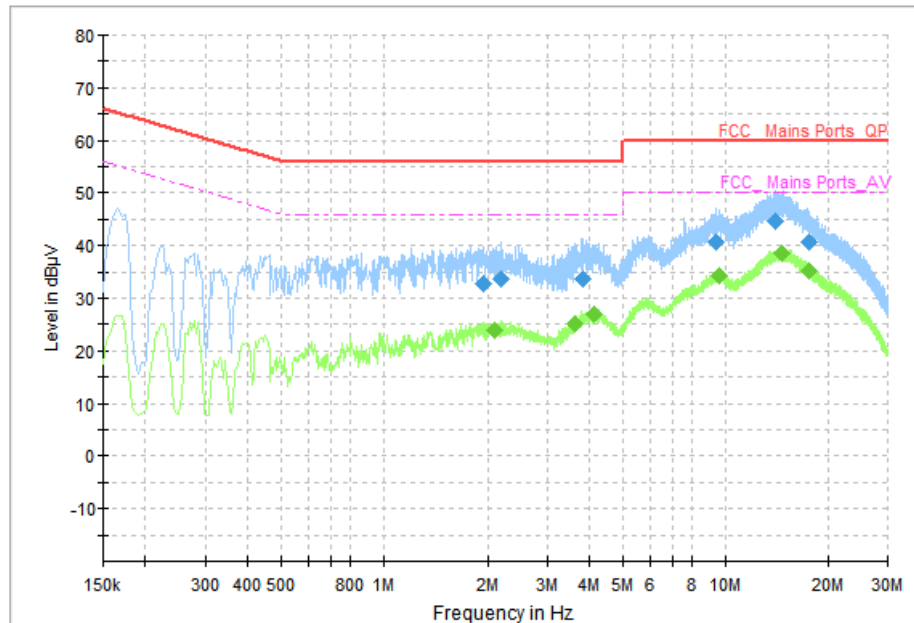


Fig.56 AC Power line Conducted Emission (Idle, AE2, 120V), 1M

Measurement Results: Quasi Peak

Frequency (MHz)	QuasiPeak (dBμV)	Limit (dBμV)	Margin (dB)	Line	Filter	Corr. (dB)
1.946000	32.65	56.00	23.35	N	ON	10
2.186000	33.55	56.00	22.45	L1	ON	10
3.818000	33.66	56.00	22.34	N	ON	10
9.338000	40.64	60.00	19.36	L1	ON	10
14.014000	44.68	60.00	15.32	L1	ON	10
17.678000	40.70	60.00	19.30	L1	ON	10

Measurement Results: Average

Frequency (MHz)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Filter	Corr. (dB)
2.098000	24.05	46.00	21.95	L1	ON	10
3.602000	25.09	46.00	20.91	L1	ON	10
4.094000	26.81	46.00	19.19	L1	ON	10
9.630000	34.39	50.00	15.61	L1	ON	10
14.670000	38.51	50.00	11.49	L1	ON	10
17.674000	35.32	50.00	14.68	L1	ON	10

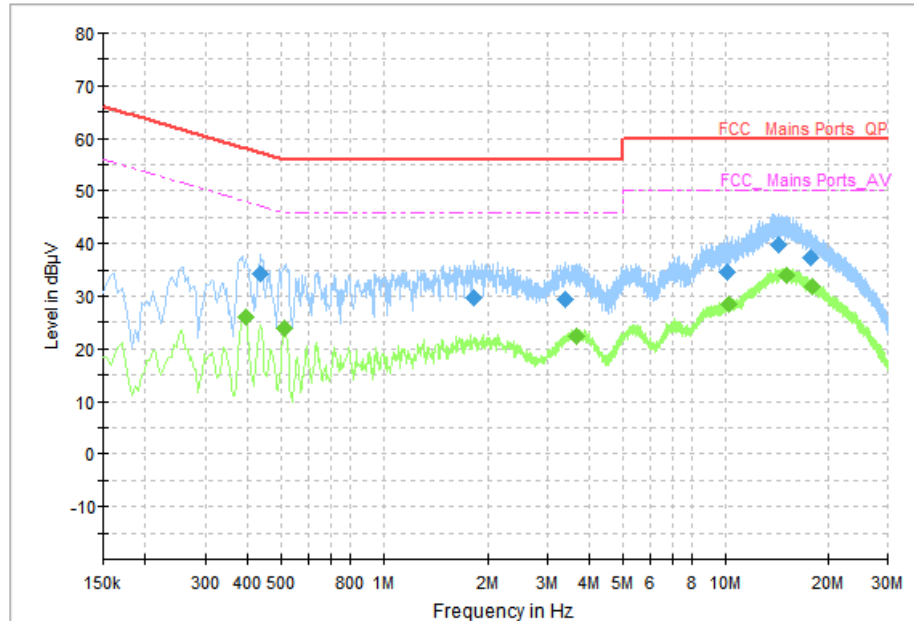


Fig.57 AC Power line Conducted Emission (Traffic, AE2, 120V), 2M

Measurement Results: Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.434000	34.40	57.18	22.78	L1	ON	10
1.818000	29.82	56.00	26.18	L1	ON	10
3.390000	29.30	56.00	26.70	L1	ON	10
10.154000	34.67	60.00	25.33	L1	ON	10
14.330000	39.76	60.00	20.24	L1	ON	10
17.722000	37.26	60.00	22.74	L1	ON	10

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.394000	25.96	47.98	22.02	L1	ON	10
0.514000	23.76	46.00	22.24	N	ON	10
3.646000	22.35	46.00	23.65	L1	ON	10
10.218000	28.35	50.00	21.65	L1	ON	10
15.162000	34.11	50.00	15.89	L1	ON	10
17.970000	31.88	50.00	18.12	L1	ON	10

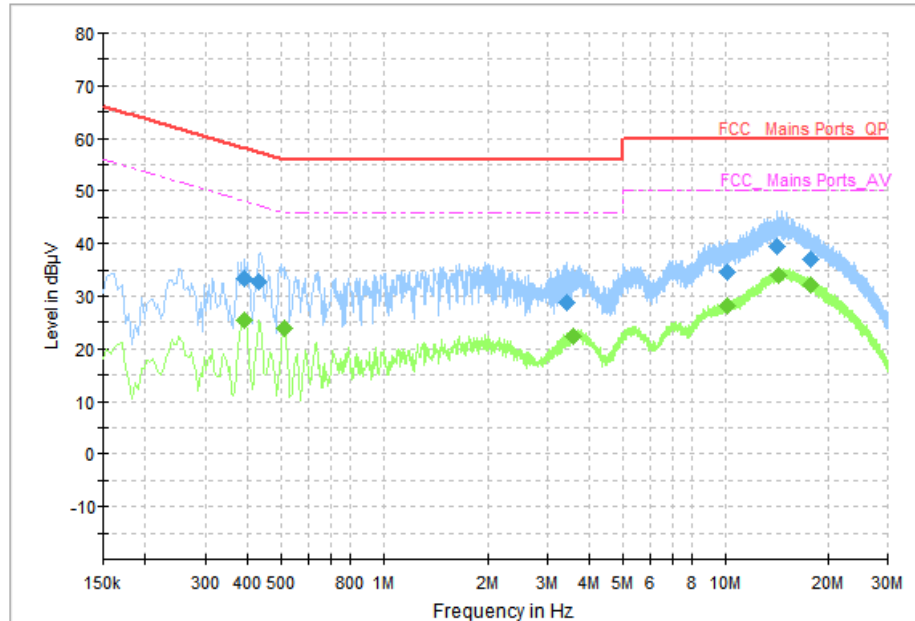


Fig.58 AC Power line Conducted Emission (Idle, AE2, 120V), 2M

Measurement Results: Quasi Peak

Frequency (MHz)	QuasiPeak (dBμV)	Limit (dBμV)	Margin (dB)	Line	Filter	Corr. (dB)
0.390000	33.21	58.06	24.86	L1	ON	10
0.430000	32.76	57.25	24.49	N	ON	10
3.414000	28.76	56.00	27.24	N	ON	10
10.150000	34.58	60.00	25.42	L1	ON	10
14.186000	39.55	60.00	20.45	L1	ON	10
17.910000	37.05	60.00	22.95	L1	ON	10

Measurement Results: Average

Frequency (MHz)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Filter	Corr. (dB)
0.390000	25.57	48.06	22.49	L1	ON	10
0.510000	23.96	46.00	22.05	L1	ON	10
3.554000	22.29	46.00	23.71	L1	ON	10
10.174000	28.13	50.00	21.87	L1	ON	10
14.306000	34.11	50.00	15.89	L1	ON	10
17.762000	32.22	50.00	17.78	L1	ON	10

END OF REPORT