TEST REPORT

No. I21N00360-BLE

for

unitech Electronics Co., Ltd.

Wearable Computer

Model Name: WD200

with

Hardware Version: DVT2

Software Version: v117-0

FCC ID: HLEWD200BTNF

Issued Date: 2021-03-29

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:

SAICT, Shenzhen Academy of Information and Communications Technology

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CONTENTS

1. Summary of Test Report

1.1. Test Items

Description	Wearable Computer
Model Name	WD200
Applicant's name	unitech Electronics Co., Ltd.
Manufacturer's Name	unitech Electronics Co., Ltd.

1.2. Test Standards

FCC Part15-2019; ANSI C63.10-2013

1.3. Test Result

Pass

Please refer to "5.2. Test Results"

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:	2021-02-16
Testing End Date:	2021-03-26

1.6. Signature

Lin Zechuang

(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:	unitech Electronics Co., Ltd.
Address:	5F., No. 136, Ln. 235, Baoqiao Rd., Xindian Dist., New Taipei City 231, Taiwan, China
Contact Person	Ben Chiang
E-Mail	BenC@tw.ute.com
Telephone:	886-2-8912-1122
Fax:	/

2.2. Manufacturer Information

Company Name:	unitech Electronics Co., Ltd.
Address:	5F., No. 136, Ln. 235, Baoqiao Rd., Xindian Dist., New Taipei City 231, Taiwan, China
Contact Person	Ben Chiang
E-Mail	BenC@tw.ute.com
Telephone:	886-2-8912-1122
Fax:	/

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

3.1. About EUT

Description	Wearable Computer
Model Name	WD200
Frequency Range	2400MHz~2483.5MHz
Type of Modulation	GFSK
Number of Channels	40
Antenna Type	Integrated
Antenna Gain	0.88dBi
Power Supply	3.85V DC by Battery
FCC ID	HLEWD200BTNF
Condition of EUT as received	No abnormality in appearance

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of Shenzhen Academy of Information and Communications Technology.

3.2. Internal Identification of EUT used during the test

EUT ID*	IMEI	HW Version	SW Version	Receive Date
UT04aa	950105210046	DVT2	v117-0	2021-02-07
UT05aa	950104210109	DVT2	v117-0	2021-02-05
UT06aa	950104210038	DVT2	v117-0	2021-02-05

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

UT04aa is used for conduction test, UT05aa is used for radiation test, and UT06aa is used for AC Power line Conducted Emission test.

3.3. Internal Identification of AE used during the test

AE ID*	Description	AE ID*
AE1	Battery	/
AE2	Charger	/
AE3	Data Cable	/

AE1

Model	206546G
Manufacturer	Sichuan iGreen Technology Co.,Ltd
Capacity	2050mAh
Nominal Voltage	3.85V

AE2

Model	S018BYV1200150
Manufacturer	Ten Pao Industrial Co., Ltd

AE3

Model	USB 3.0 A T0 C 1M
Manufacturer	JHEN VEI ELECTRONIC CO., LTD.

*AE ID: is used to identify the test sample in the lab internally. AE2: just for testing.

3.4. General Description

The Equipment under Test (EUT) is a model of Wearable Computer with integrated antenna and battery.
It consists of normal options: Lithium Battery and USB Cable.
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 Part 15	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/manufacturer 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 Due date	Calibration Period
1	Vector Signal Analyzer	FSV40	100903	Rohde & Schwarz	2021-12-30	1 year
2	Power Sensor	U2021XA	MY55430013	Agilent	2022-01-13	1 year
3	Data Acquisiton	U2531A	TW55443507	Agilent	/	/
4	Test Receiver	ESCI	100701	Rohde & Schwarz	2021-08-09	1 year
5	LISN	ENV216	102067	Rohde & Schwarz	2021-07-16	1 year

Radiated test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date	Calibration Period
1	Loop Antenna	HLA6120	35779	TESEQ	2022-04-25	3 years
2	BiLog Antenna	3142E	00224831	ETS-Lindgren	2021-05-17	3 years
3	Horn Antenna	3117	00066577	ETS-Lindgren	2022-04-02	3 years
4	Horn Antenna	QSH-SL-18-26-S-20	17013	Q-par	2023-01-06	3 years
5	Horn Antenna	QSH-SL-8-26-40-K-20	17014	Q-par	2023-01-06	3 years
6	Test Receiver	ESR7	101676	Rohde & Schwarz	2021-11-25	1 year
7	Spectrum Analyser	FSV40	101192	Rohde & Schwarz	2022-01-13	1 year
8	Chamber	FACT3-2.0	1285	ETS-Lindgren	2021-07-19	2 years

Test software

No.	Equipment	Manufacturer	Version
1	TechMgr Software	CAICT	2.1.1
2	EMC32	Rohde & Schwarz	10.50.40

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. = 20 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz> 60 dB; 1MHz-18000MHz>90 dB
Electrical insulation	> 2MΩ
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	> 2MΩ
Ground system resistance	< 4 Ω

Fully-anechoic chamber

Temperature	Min. = 15 ˚C, Max. = 35 ˚C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz> 60 dB; 1MHz-18000MHz>90 dB
Electrical insulation	> 2MΩ
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	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	1.74dB
	30MHz≤f<1GHz	4.84dB
	1GHz≤f<18GHz	4.68dB
	18GHz≤f≤40GHz	3.76dB
6. AC Power line Conducted Emission	150kHz≤f≤30MHz	3.00dB

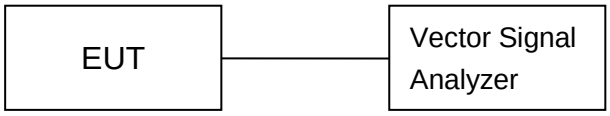
ANNEX A: Detailed Test Results

Test Configuration

The measurement is made according to ANSI C63.10.

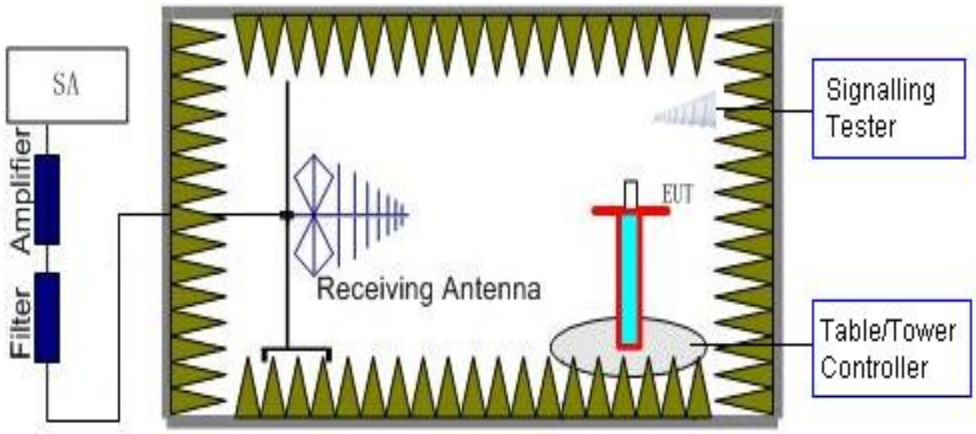
1) Conducted Measurements

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.



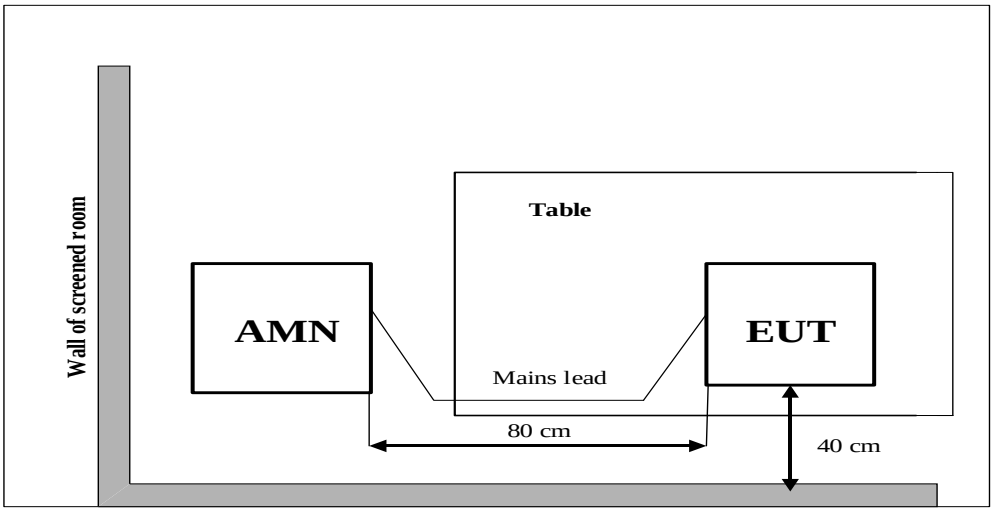
2) Radiated Measurements

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.



3) AC Power line Conducted Emission Measurement

For Bluetooth LE, the EUT is working under test mode. The EUT is commanded to operate at maximum transmitting power.



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 0.88 dBi.
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)
FCC 47 CRF Part 15.247(b)	< 30

Measurement Results:

Mode	Frequency (MHz)	RF output power (dBm)	Conclusion
LE 1M	2402(CH0)	4.13	**P**
	2440(CH19)	3.63	**P**
	2480(CH39)	5.42	**P**
LE 2M	2402(CH0)	4.31	**P**
	2440(CH19)	3.61	**P**
	2480(CH39)	5.56	**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 47 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	-10.60	**P**
	2440(CH19)	Fig.2	-10.99	**P**
	2480(CH39)	Fig.3	-9.36	**P**
LE 2M	2402(CH0)	Fig.4	-14.69	**P**
	2440(CH19)	Fig.5	-15.46	**P**
	2480(CH39)	Fig.6	-13.43	**P**

See below for test graphs.
Conclusion: PASS

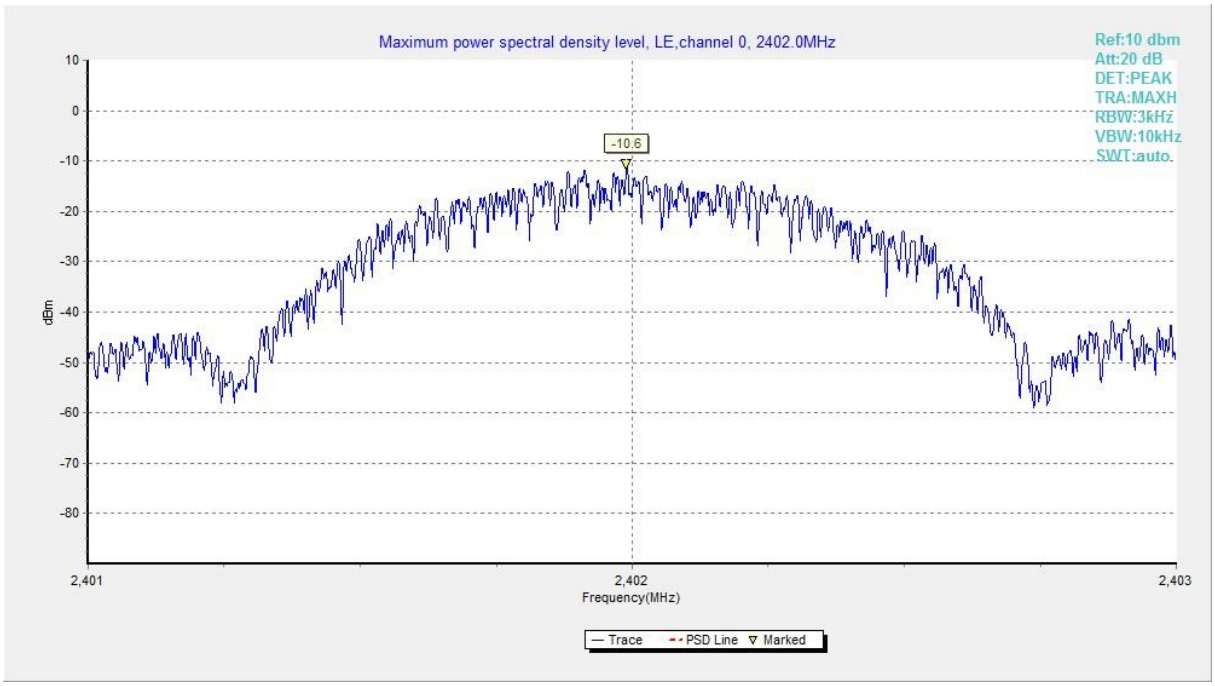


Fig.1 Power Spectral Density (Ch 0), LE 1M

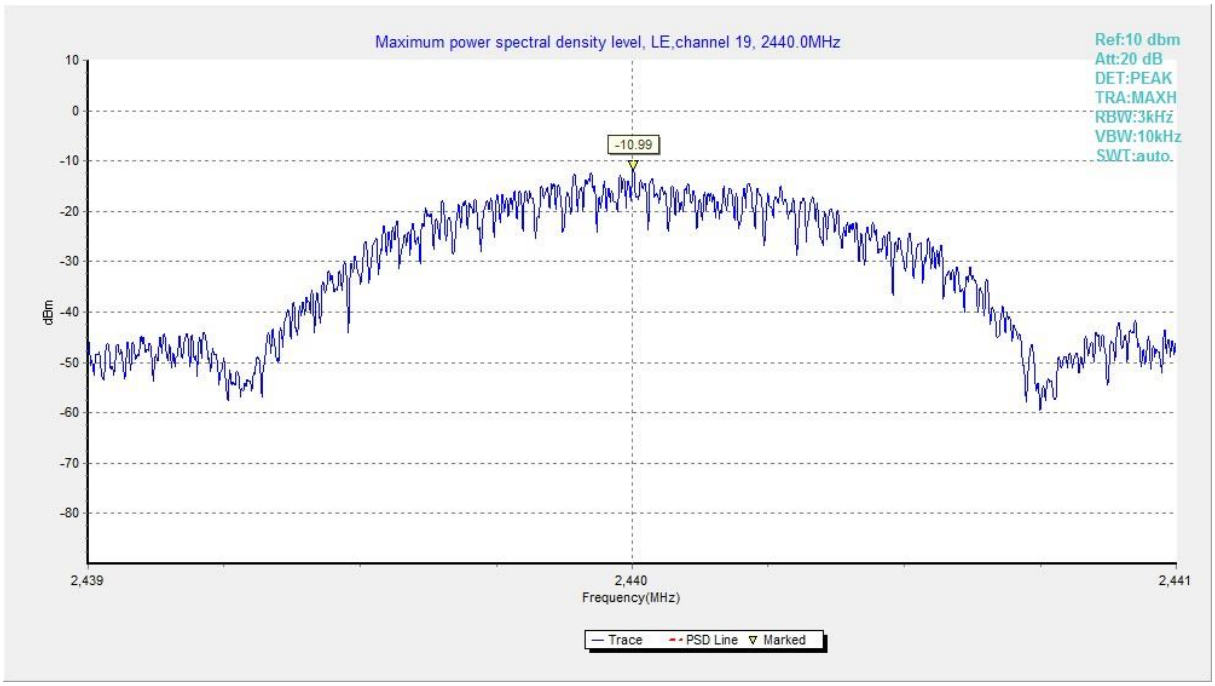


Fig.2 Power Spectral Density (Ch 19), LE 1M

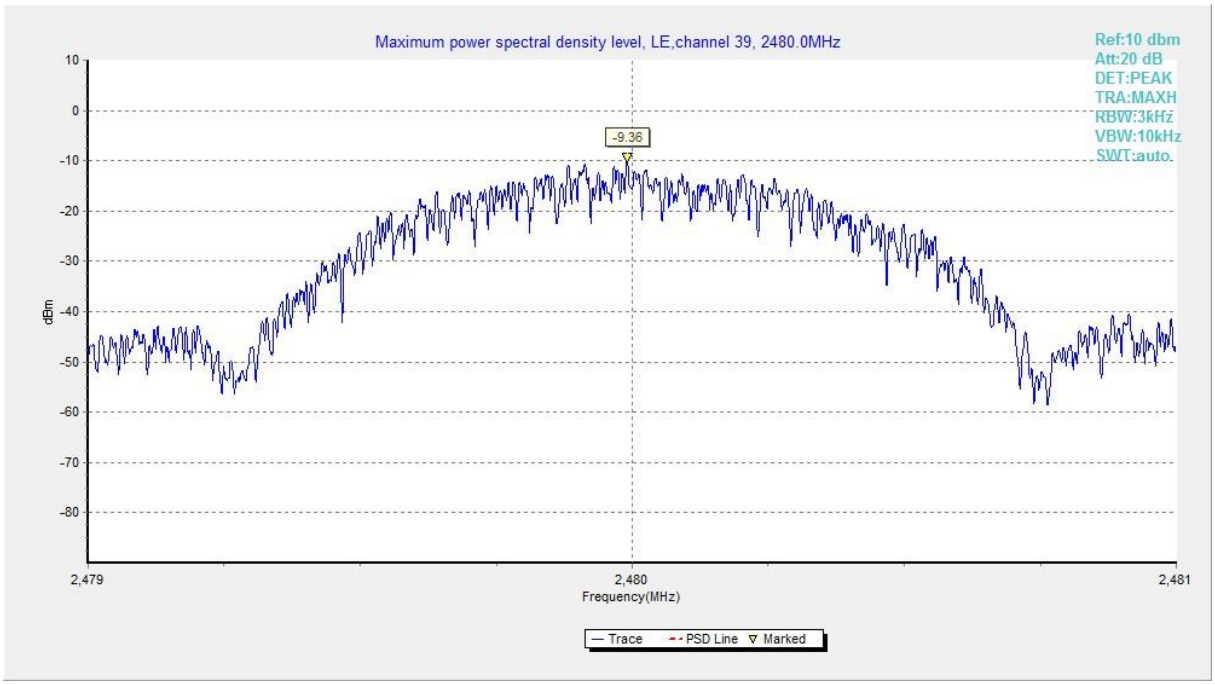


Fig.3 Power Spectral Density (Ch 39), LE 1M

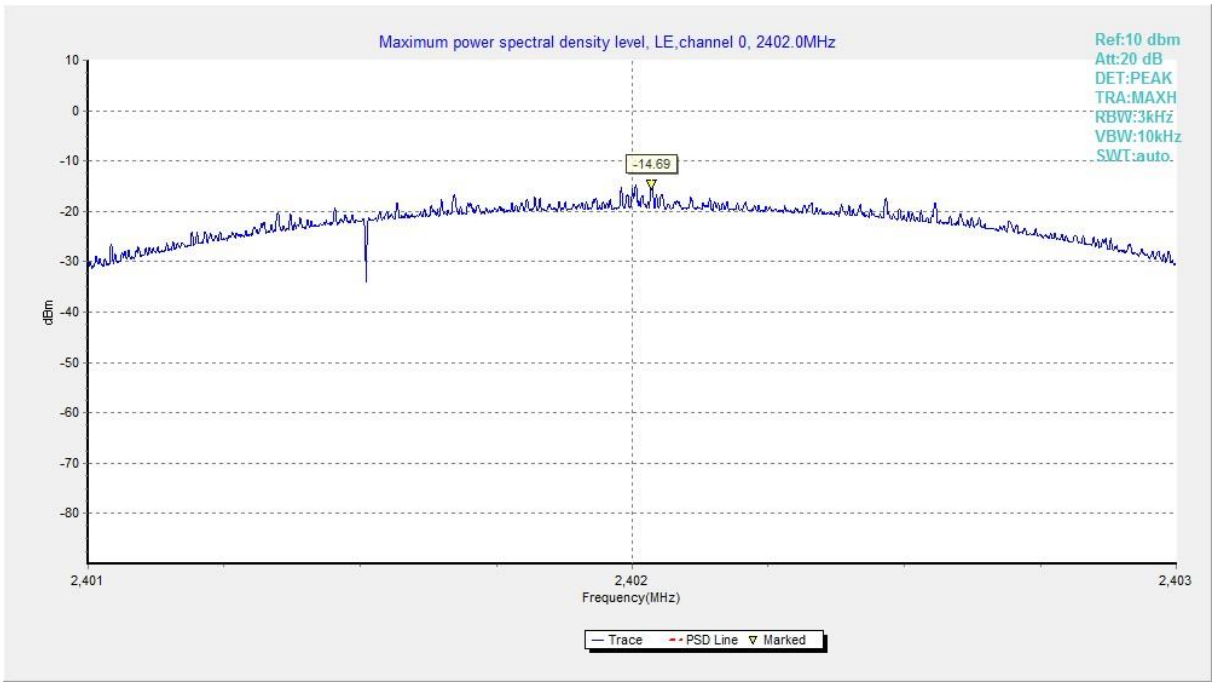


Fig.4 Power Spectral Density (Ch 0), LE 2M

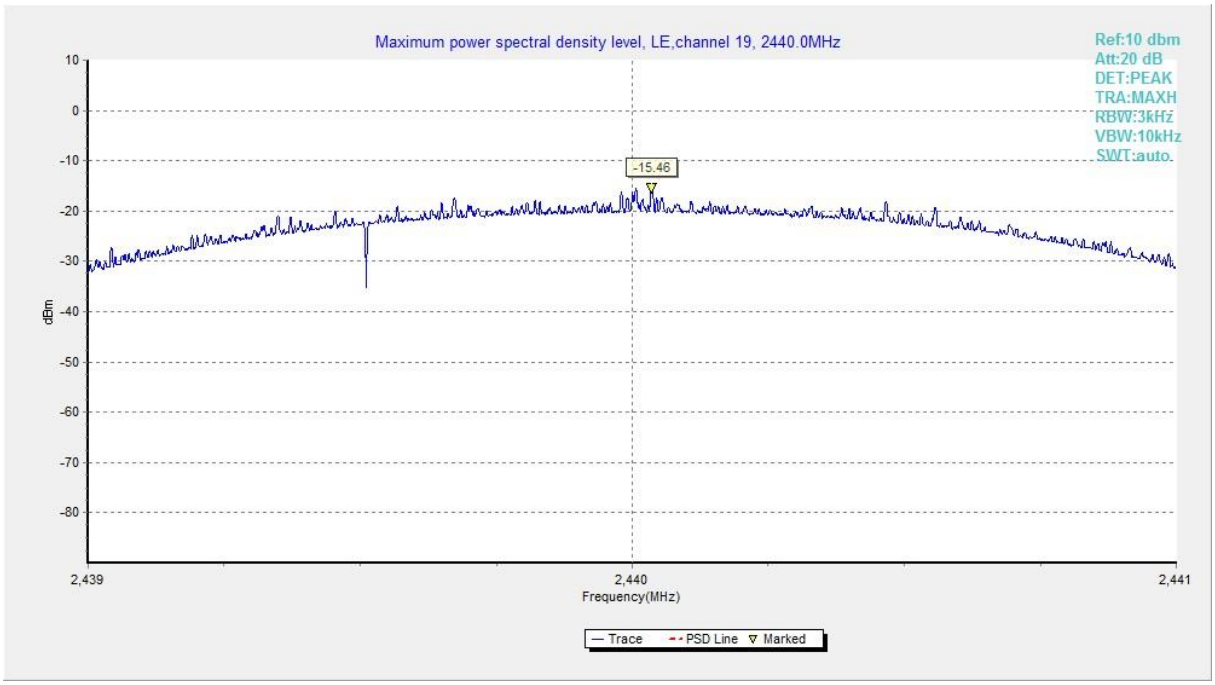


Fig.5 Power Spectral Density (Ch 19), LE 2M

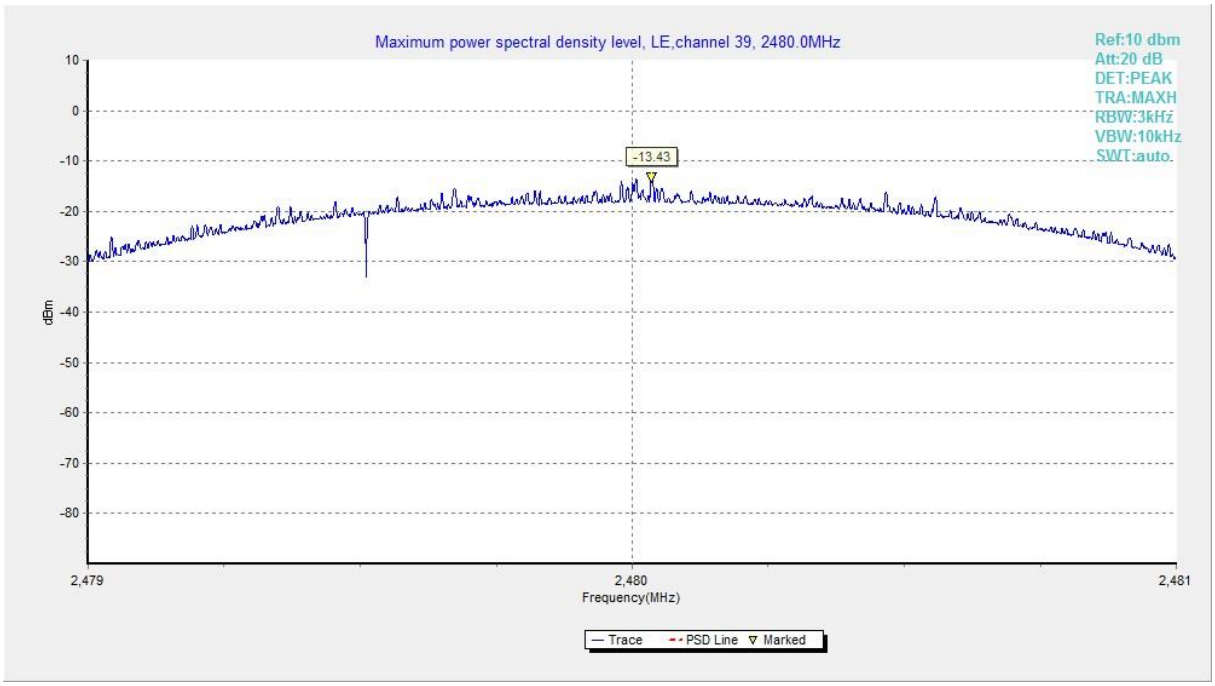


Fig.6 Power Spectral Density (Ch 39), LE 2M

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	664.50	**P**
	2440(CH19)	Fig.8	669.00	**P**
	2480(CH39)	Fig.9	663.50	**P**
LE 2M	2402(CH0)	Fig.10	1135.50	**P**
	2440(CH19)	Fig.11	1139.00	**P**
	2480(CH39)	Fig.12	1137.00	**P**

See below for test graphs.
Conclusion: PASS

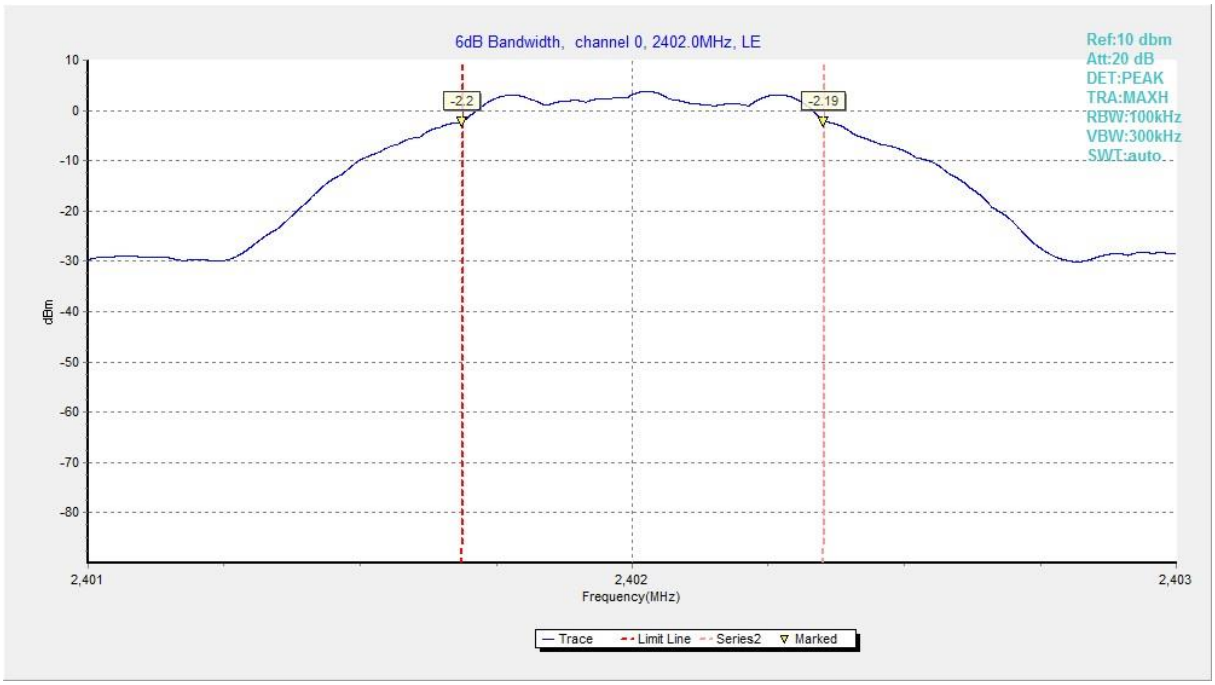


Fig.7 6dB Bandwidth (Ch 0), LE 1M

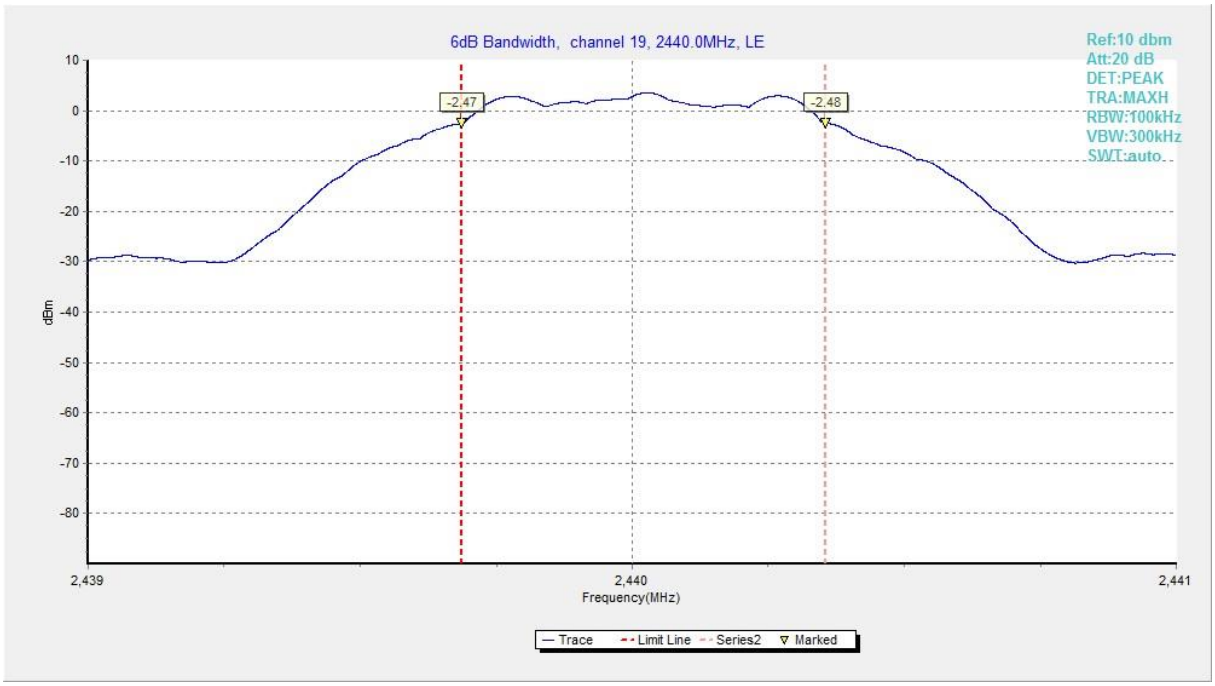


Fig.8 6dB Bandwidth (Ch 19), LE 1M

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

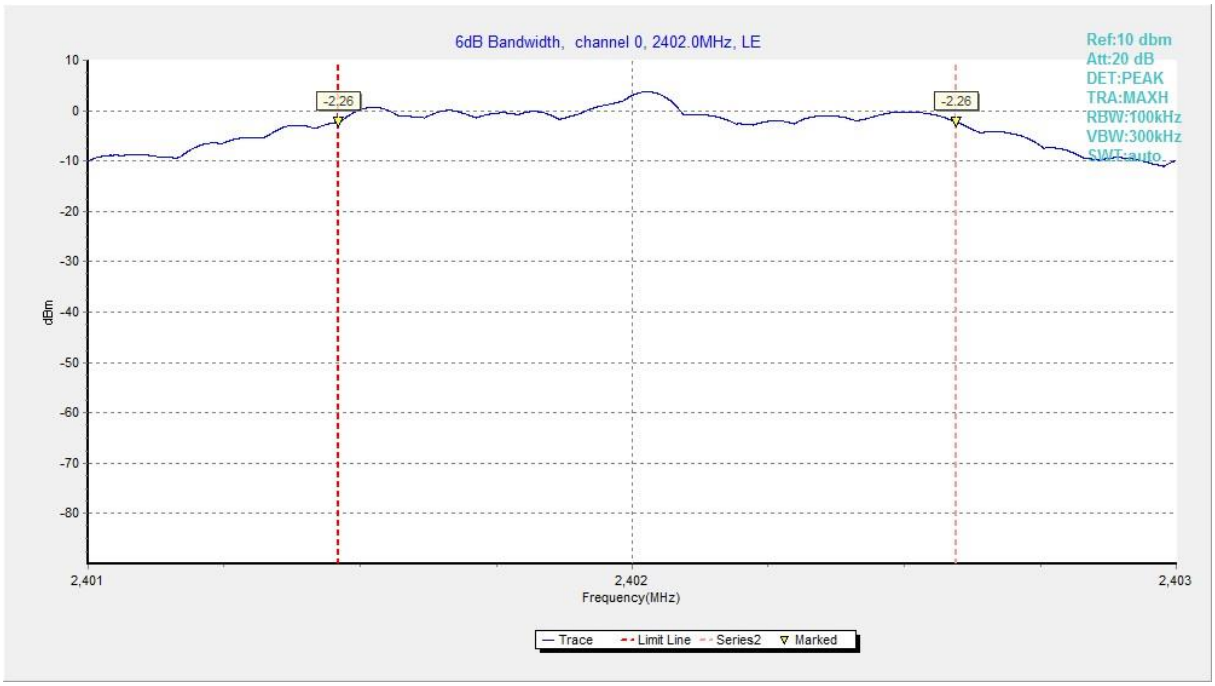


Fig.10 6dB Bandwidth (Ch 0), LE 2M

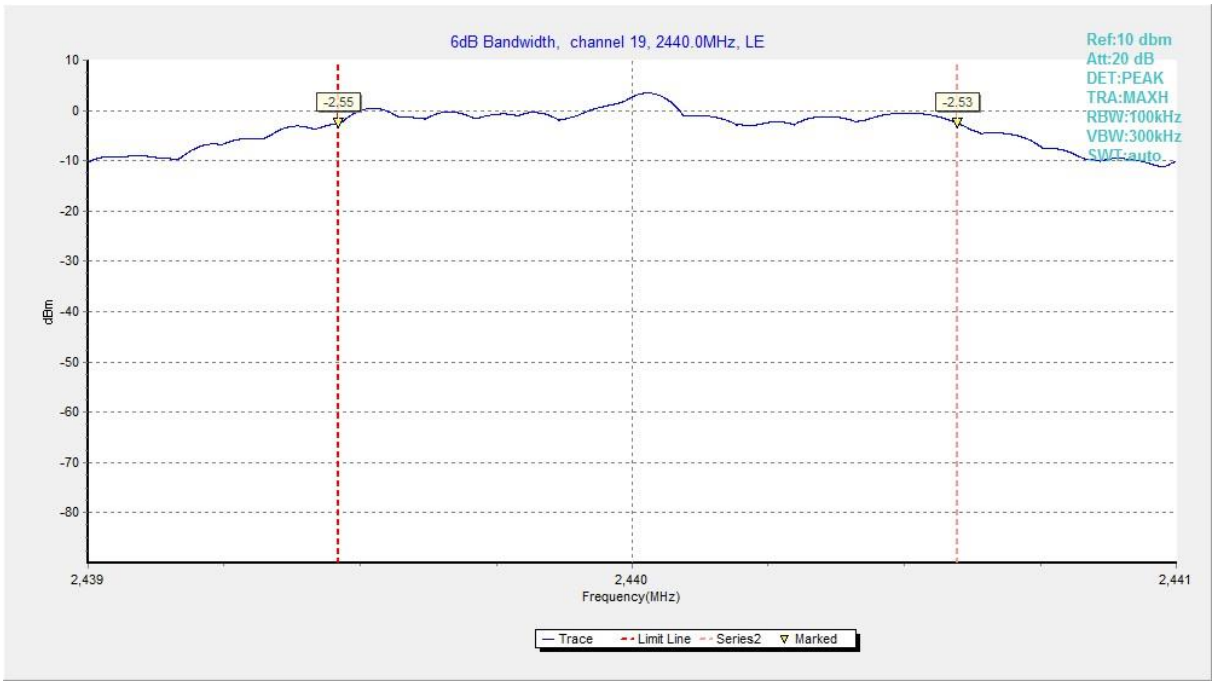


Fig.11 6dB Bandwidth (Ch 19), LE 2M

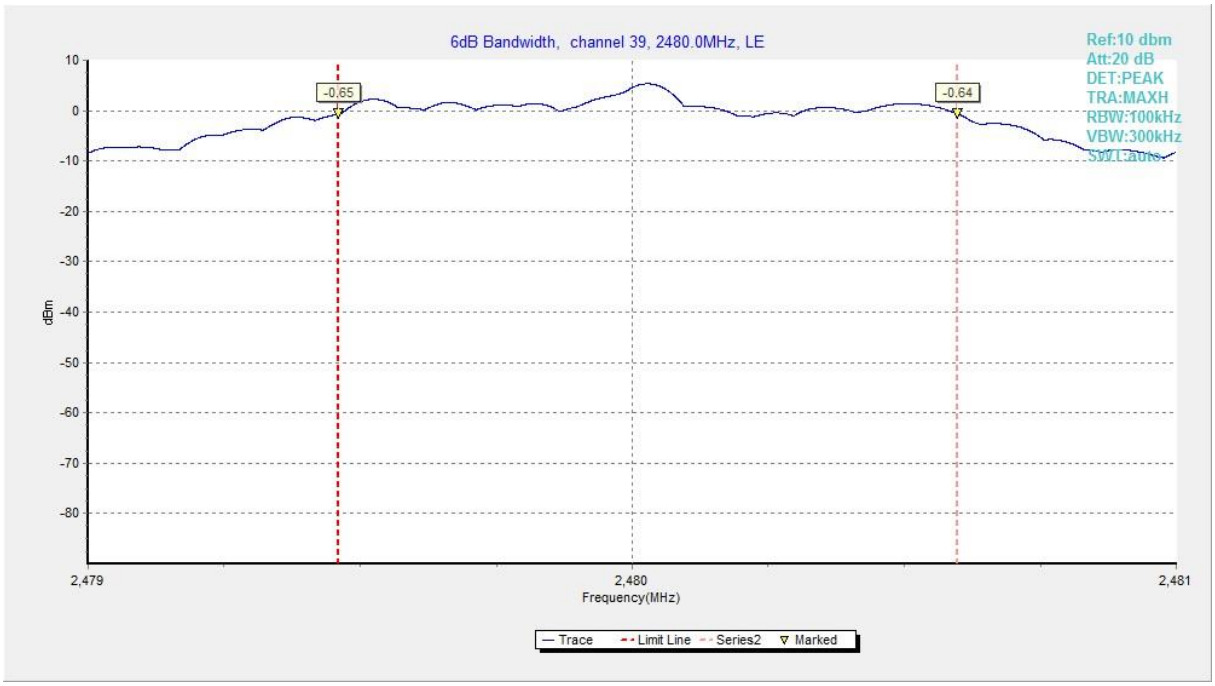


Fig.12 6dB Bandwidth (Ch 39), LE 2M

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 (dBc)		Conclusion
LE 1M	2402(CH0)	Fig.13	55.73	**P**
	2480(CH39)	Fig.14	64.02	**P**
LE 2M	2402(CH0)	Fig.15	45.96	**P**
	2480(CH39)	Fig.16	61.43	**P**

See below for test graphs.

Conclusion: PASS

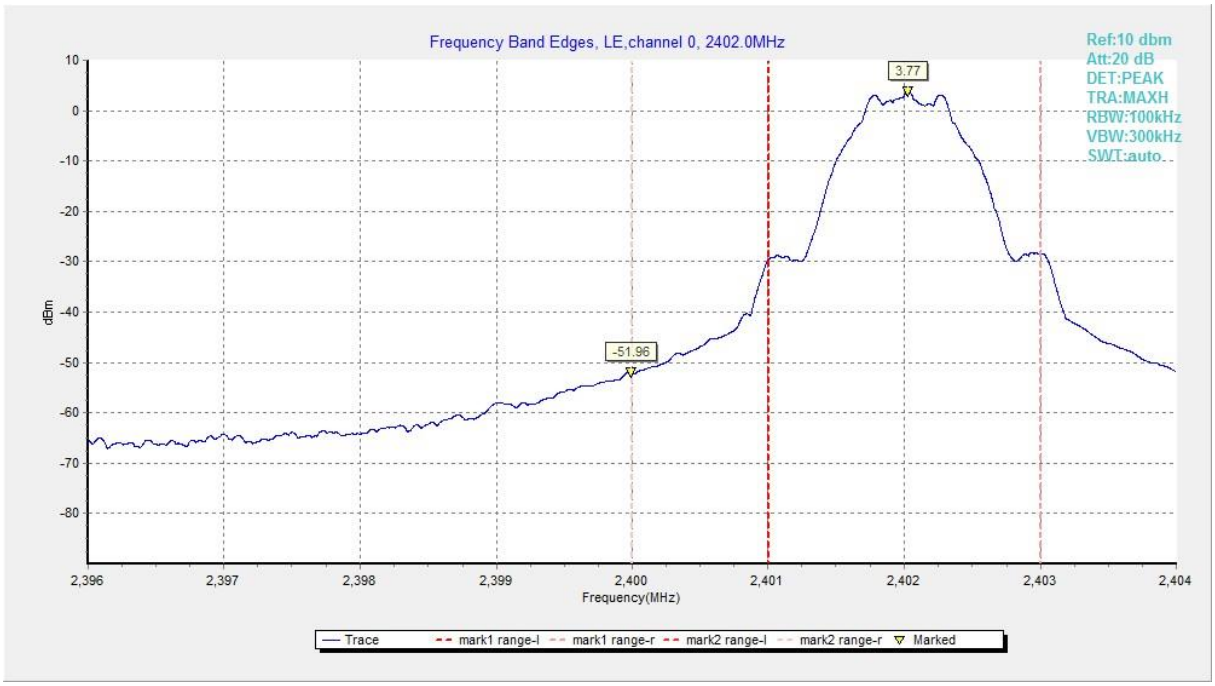


Fig.13 Band Edges (Ch 0), LE 1M

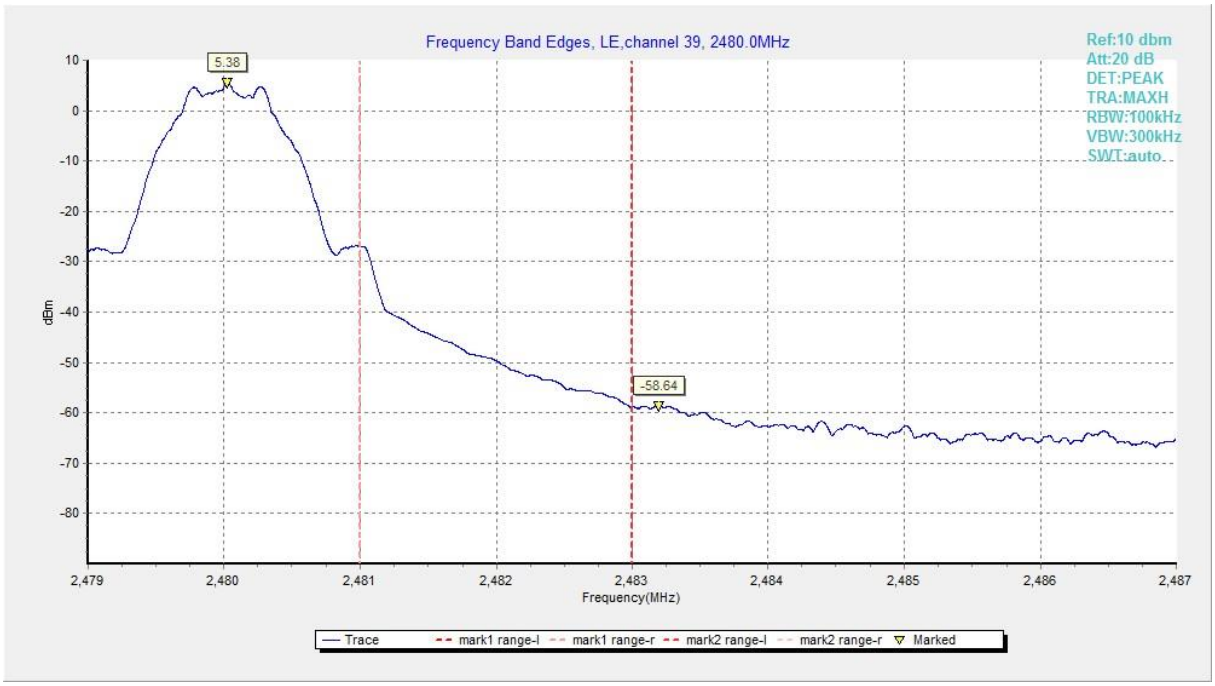


Fig.14 Band Edges (Ch 39), LE 1M

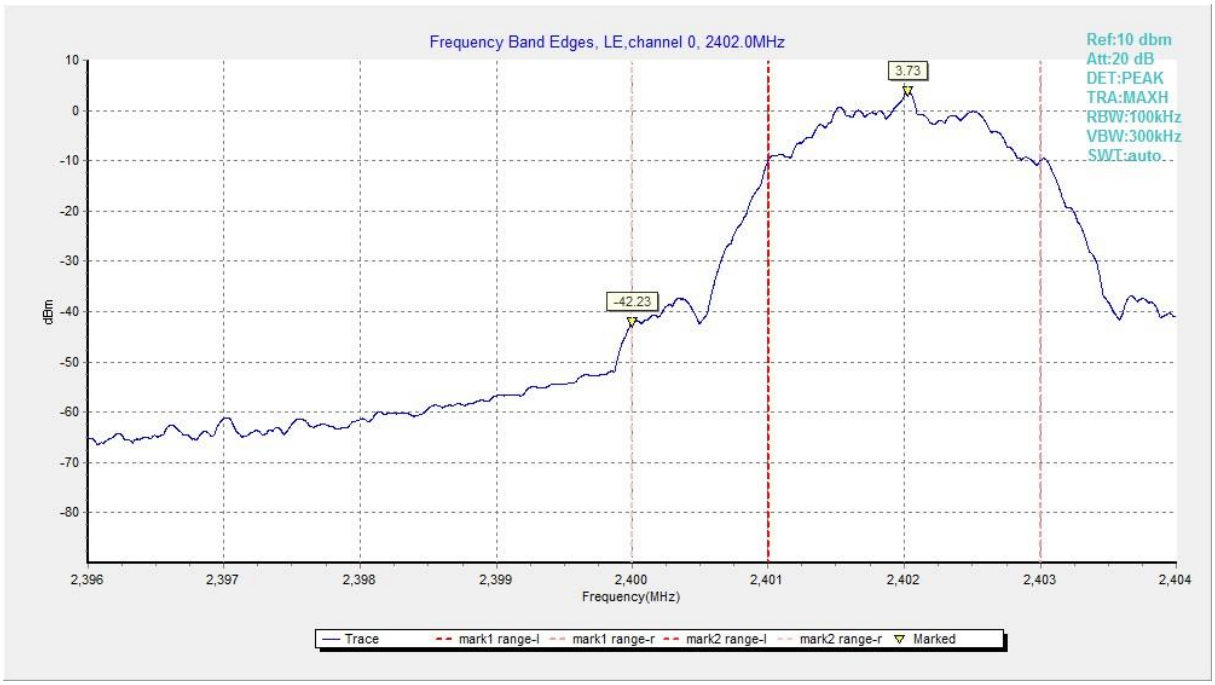


Fig.15 Band Edges (Ch 0), LE 2M

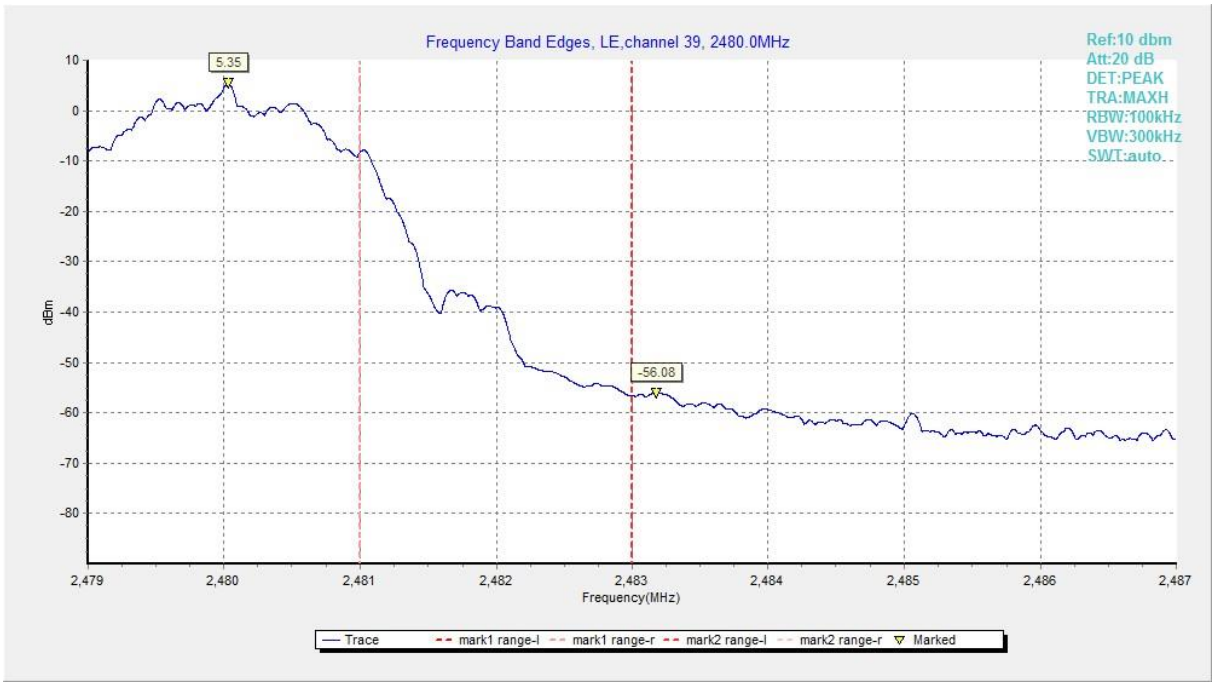


Fig.16 Band Edges (Ch 39), LE 2M

A.5 Transmitter Spurious Emission - Conducted

Measurement Limit:

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

Measurement Results:

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

See below for test graphs.

Conclusion: Pass

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

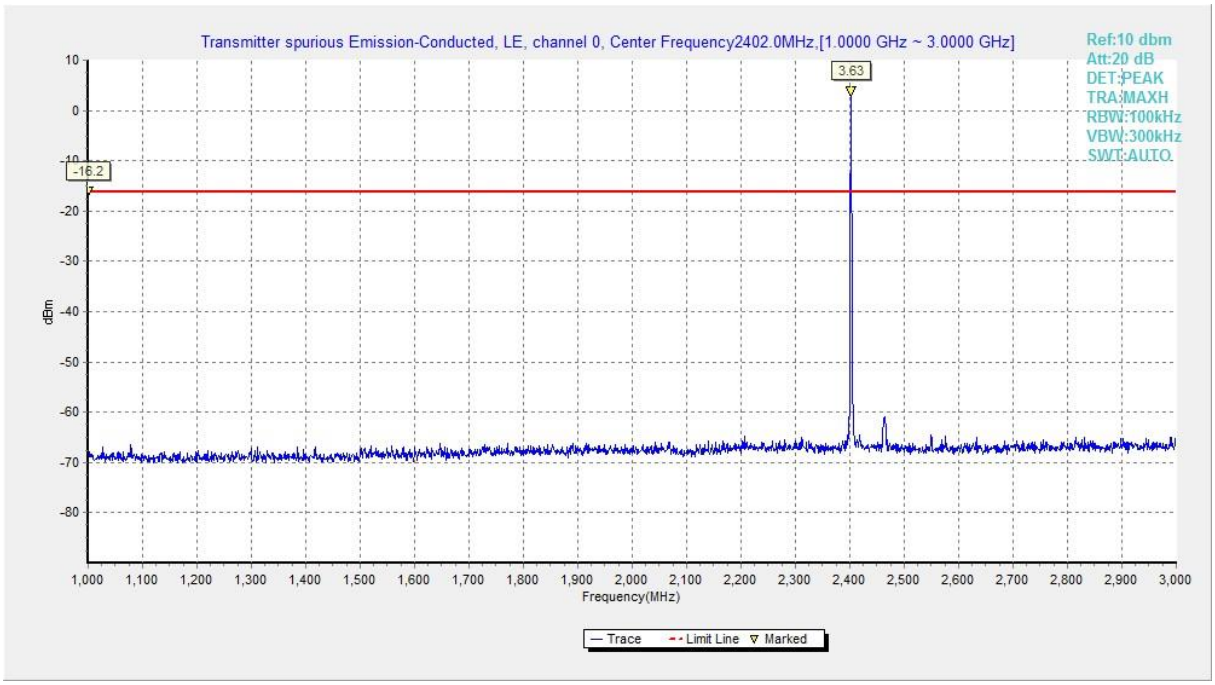


Fig.18 Conducted Spurious Emission (Ch0, 1 GHz-3 GHz), LE 1M

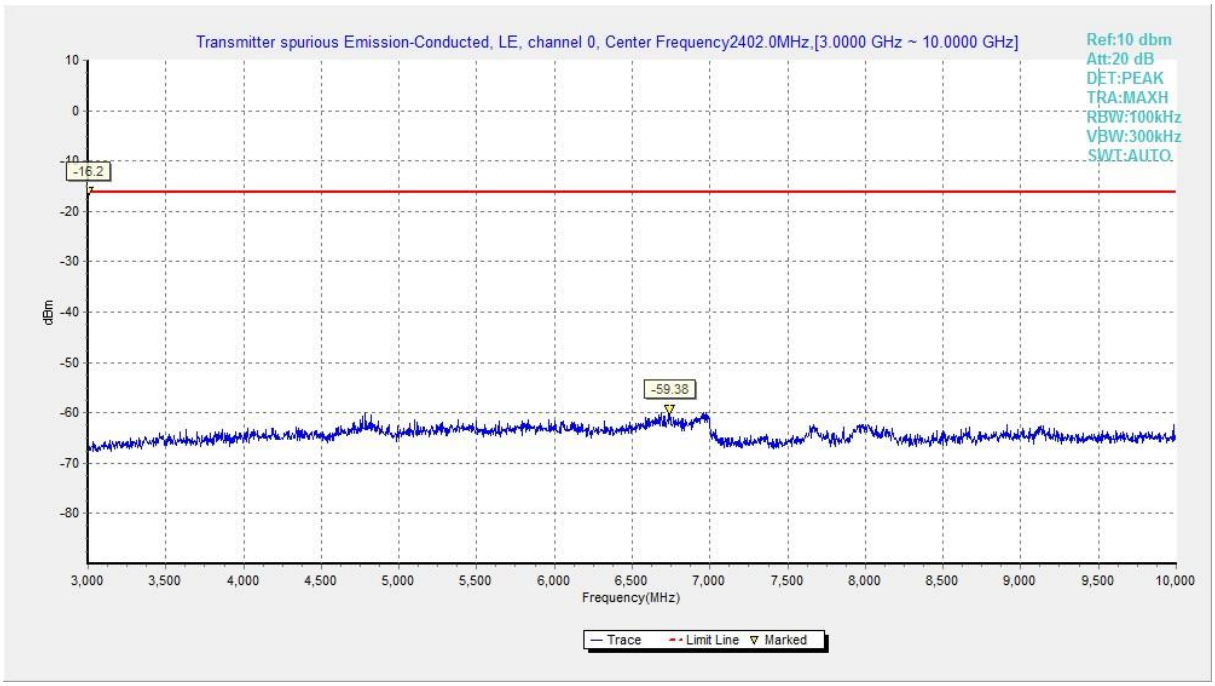


Fig.19 Conducted Spurious Emission (Ch0, 3 GHz-10 GHz), LE 1M

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

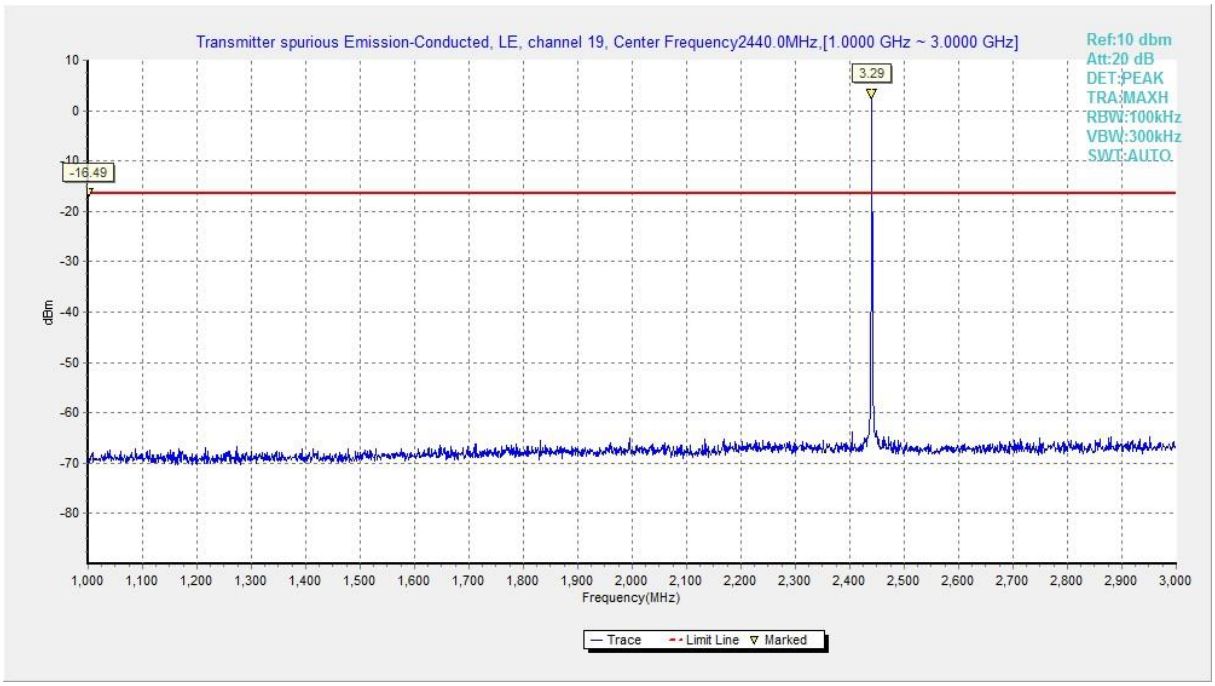


Fig.21 Conducted Spurious Emission (Ch19, 1 GHz-3 GHz), LE 1M

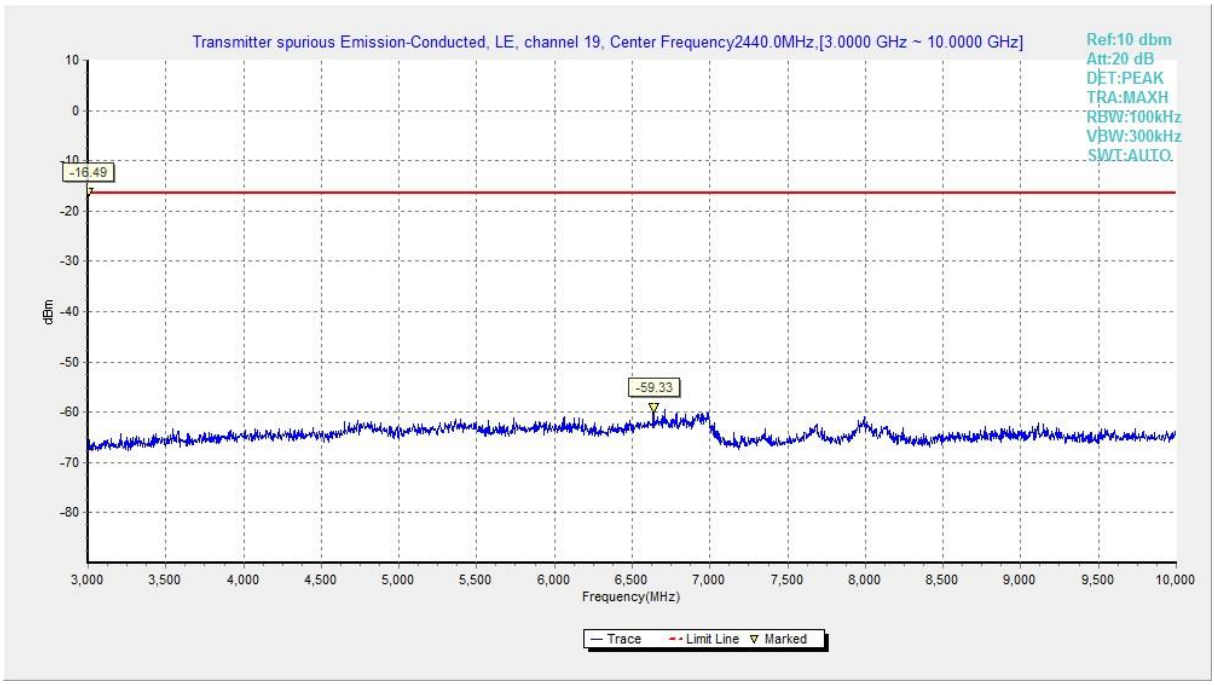


Fig.22 Conducted Spurious Emission (Ch19, 3 GHz-10 GHz), LE 1M

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

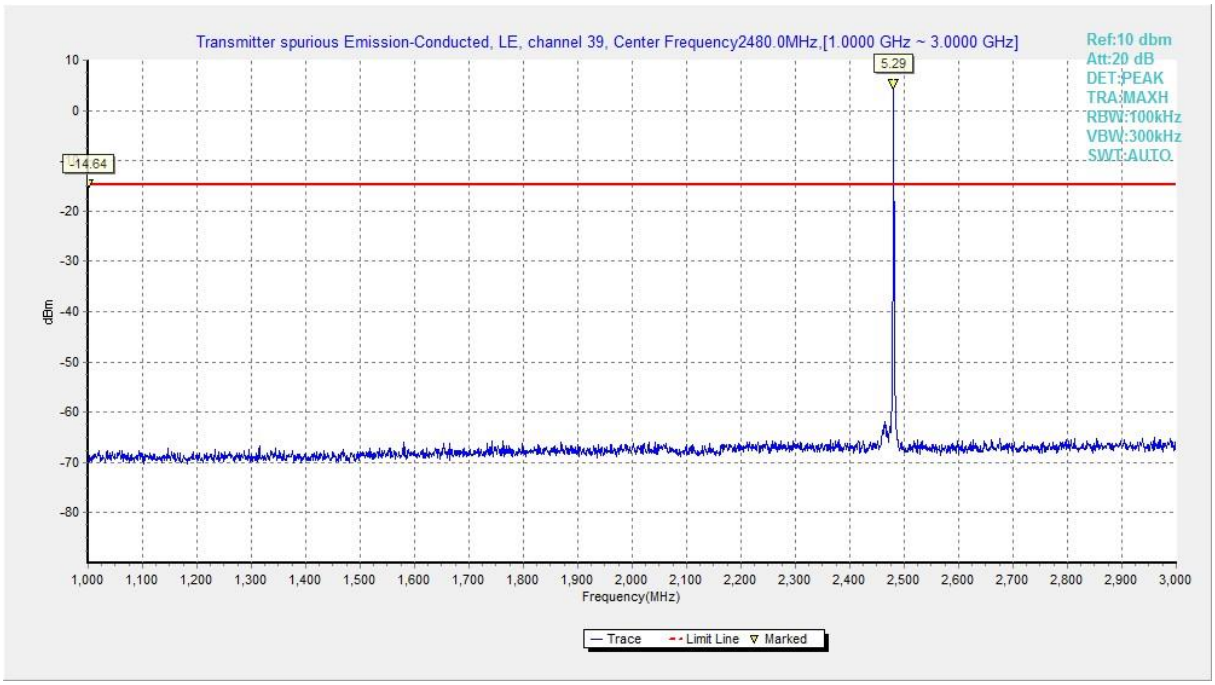


Fig.24 Conducted Spurious Emission (Ch39, 1 GHz-3 GHz), LE 1M

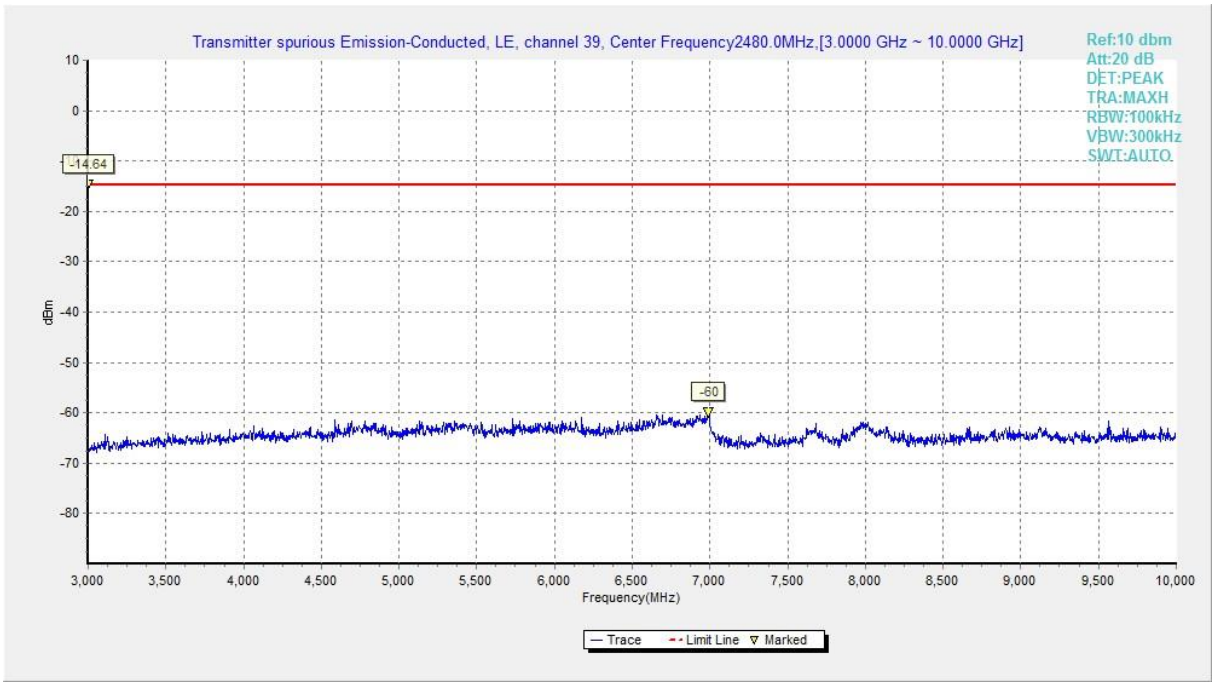


Fig.25 Conducted Spurious Emission (Ch39, 3 GHz-10 GHz), LE 1M

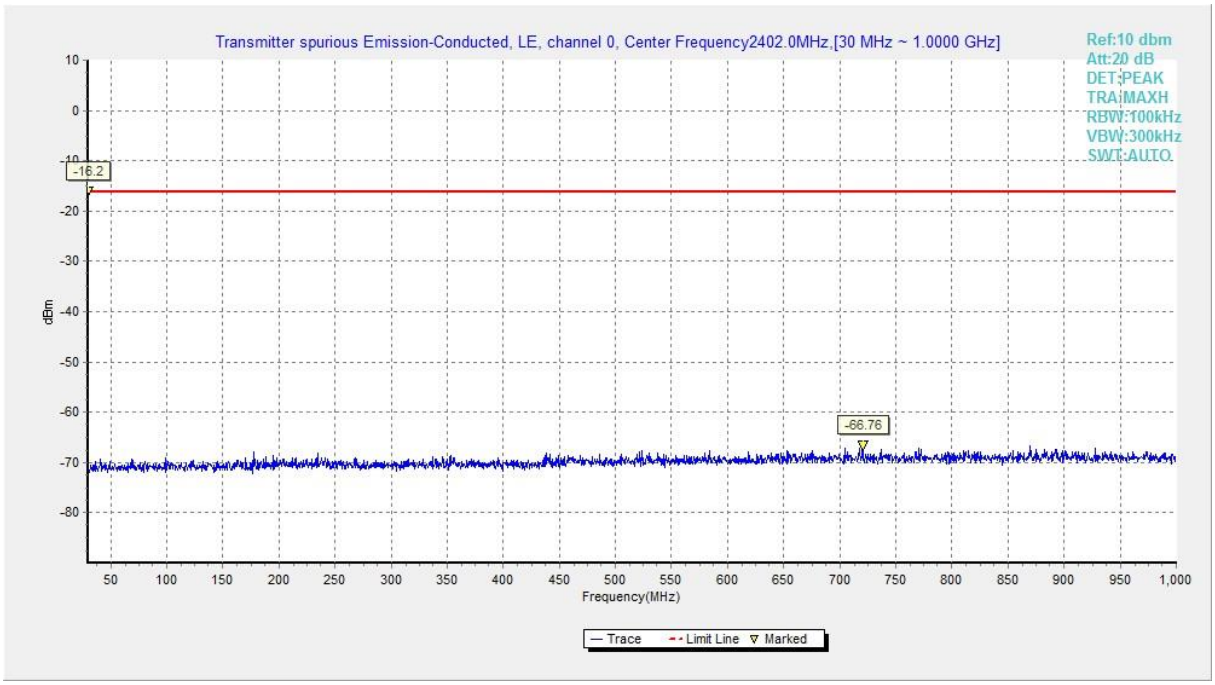


Fig.26 Conducted Spurious Emission (All channels, 30 MHz-1 GHz), LE 1M

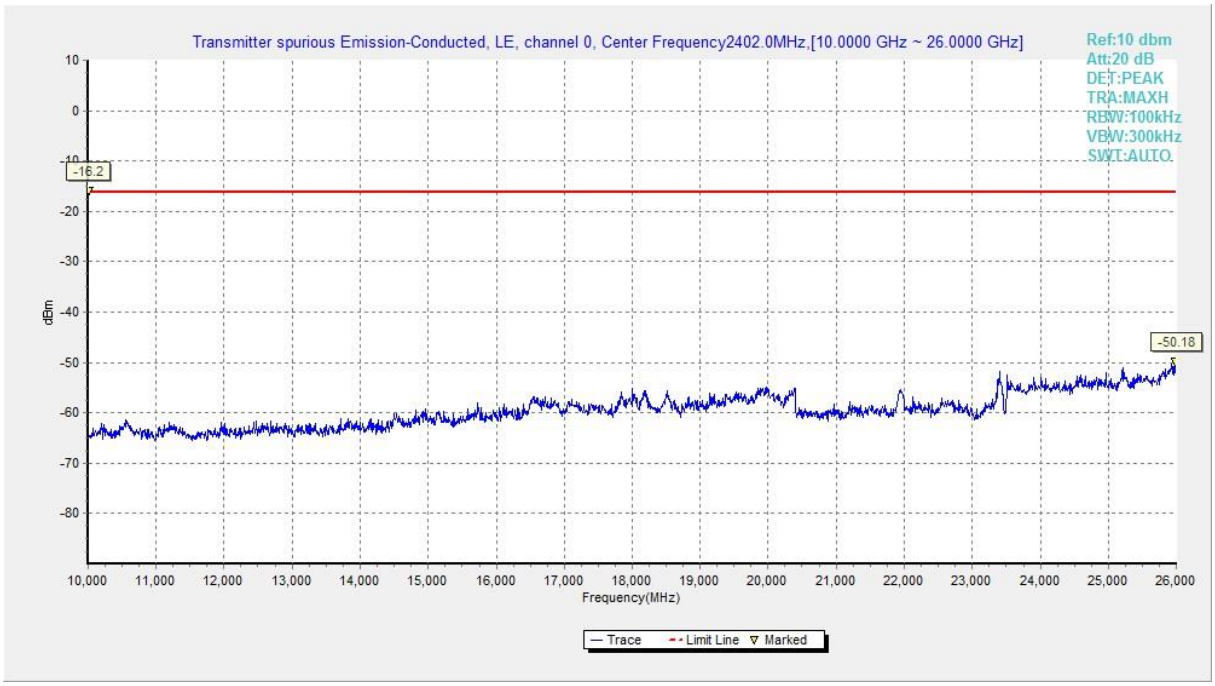


Fig.27 Conducted Spurious Emission (All channels, 10 GHz-26 GHz), LE 1M

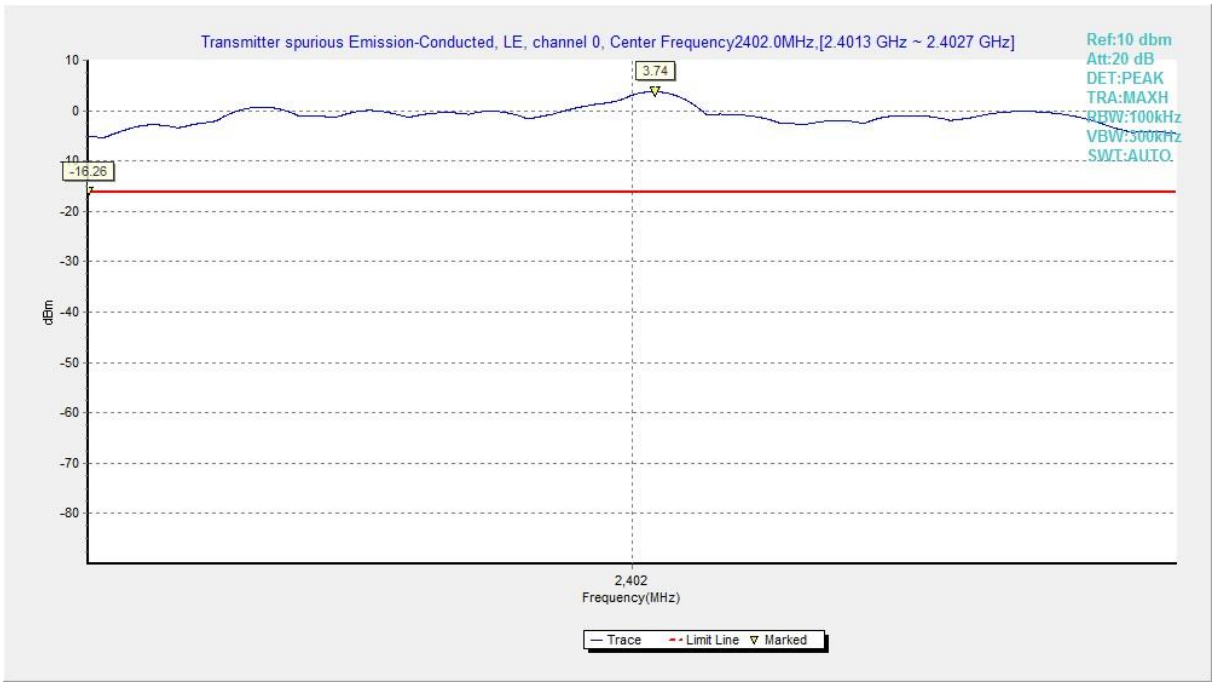


Fig.28 Conducted Spurious Emission (Ch0, Center Frequency), LE 2M

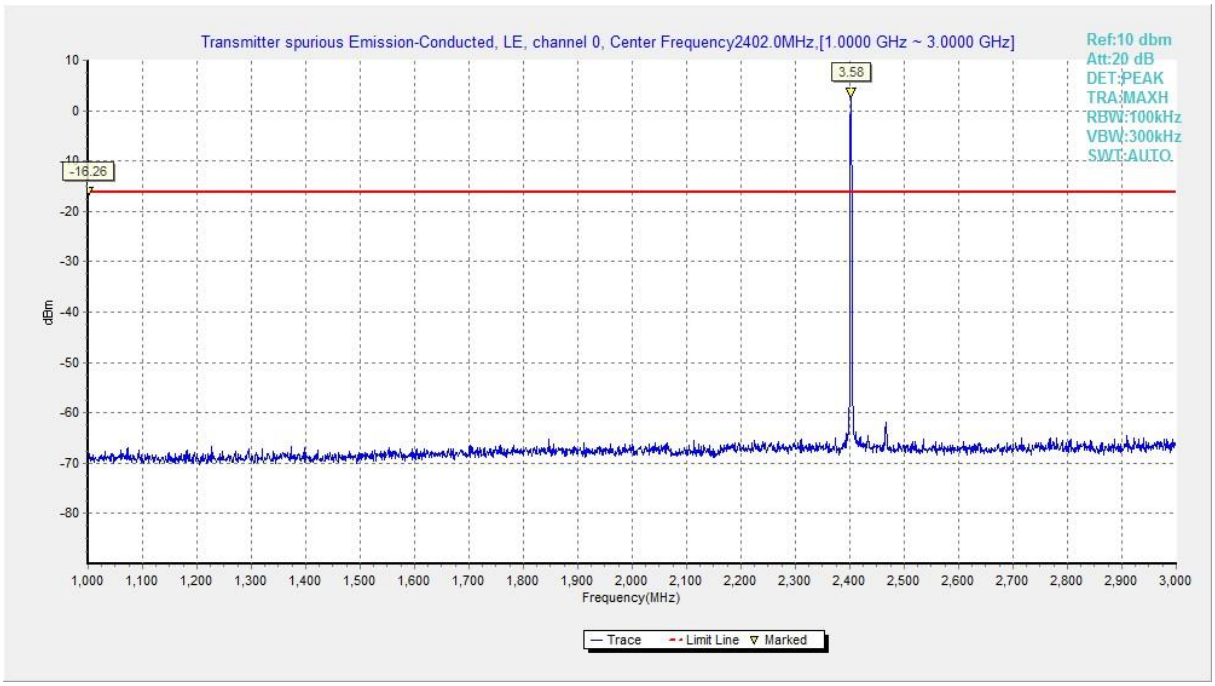


Fig.29 Conducted Spurious Emission (Ch0, 1 GHz-3 GHz), LE 2M

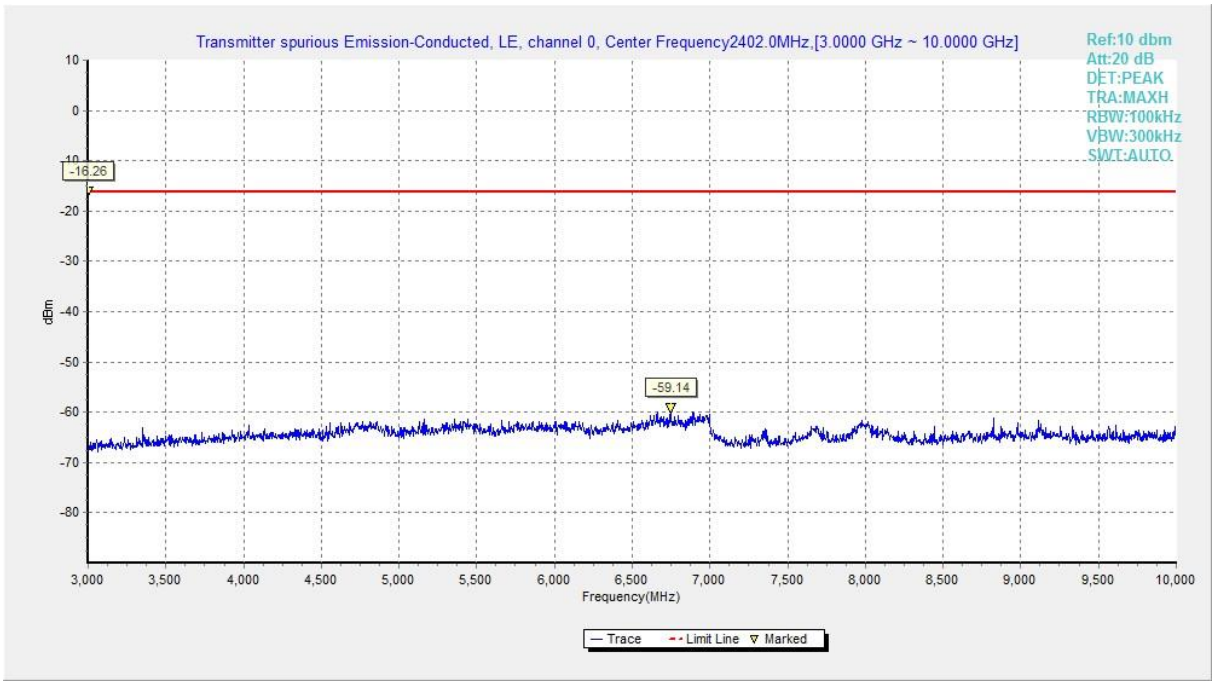


Fig.30 Conducted Spurious Emission (Ch0, 3 GHz-10 GHz), LE 2M

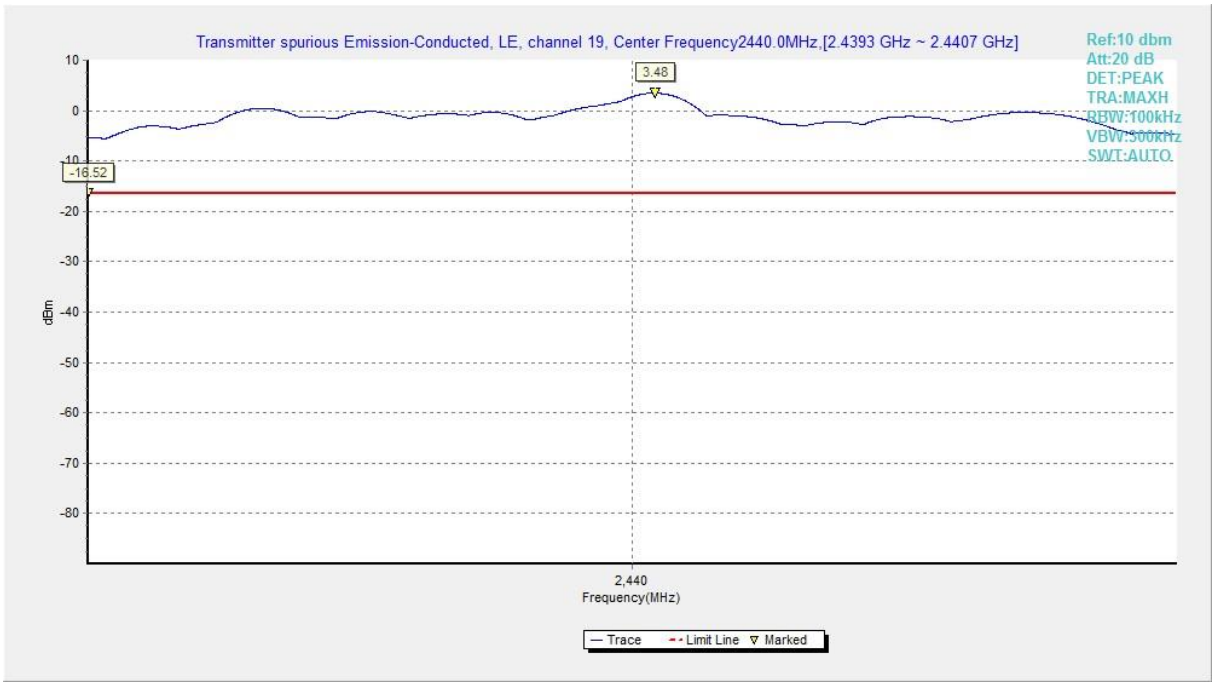


Fig.31 Conducted Spurious Emission (Ch19, Center Frequency), LE 2M

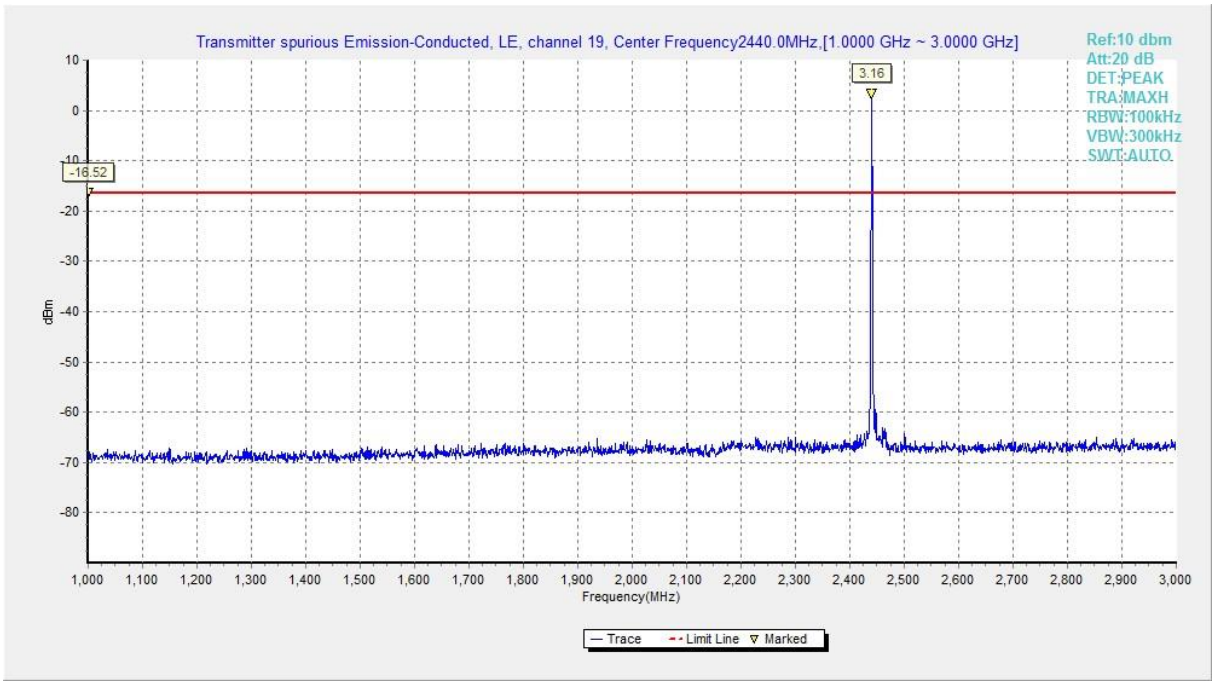


Fig.32 Conducted Spurious Emission (Ch19, 1 GHz-3 GHz), LE 2M

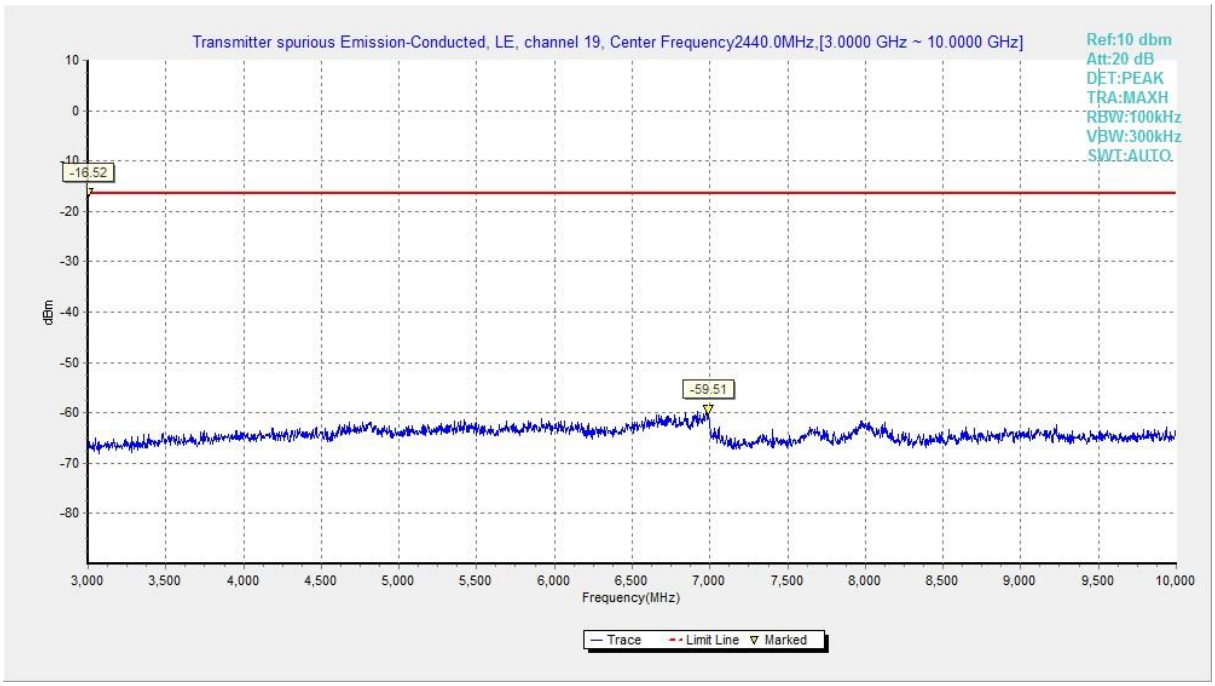


Fig.33 Conducted Spurious Emission (Ch19, 3 GHz-10 GHz), LE 2M

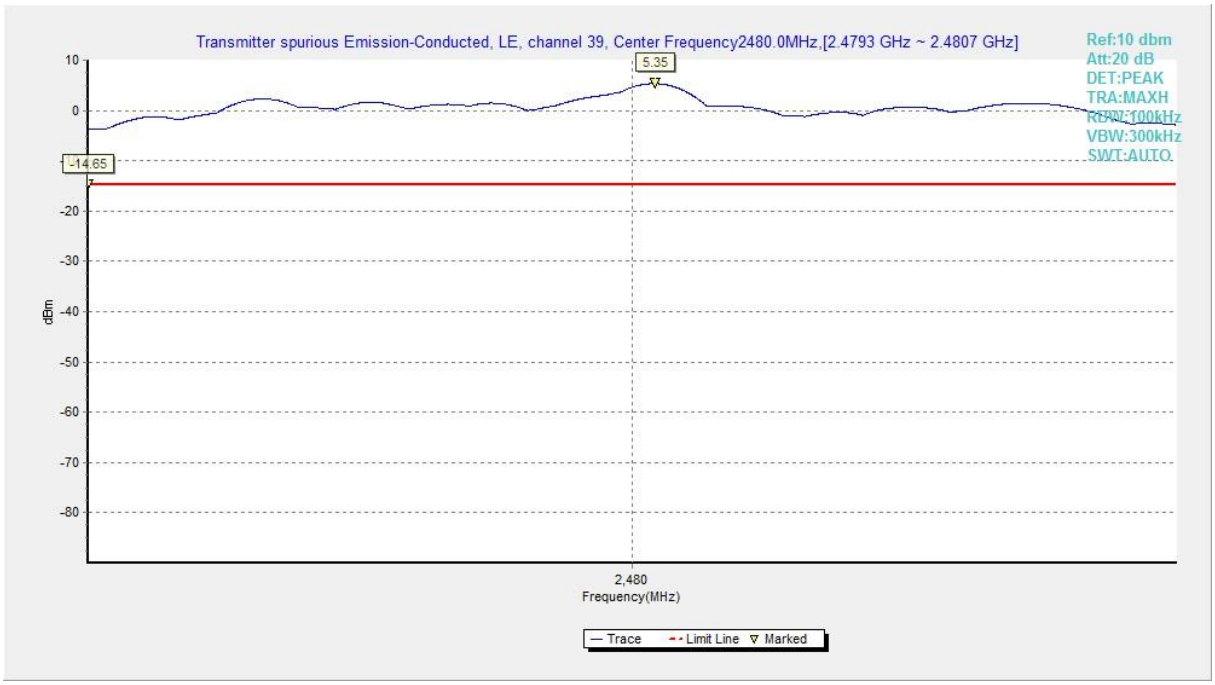


Fig.34 Conducted Spurious Emission (Ch39, Center Frequency), LE 2M

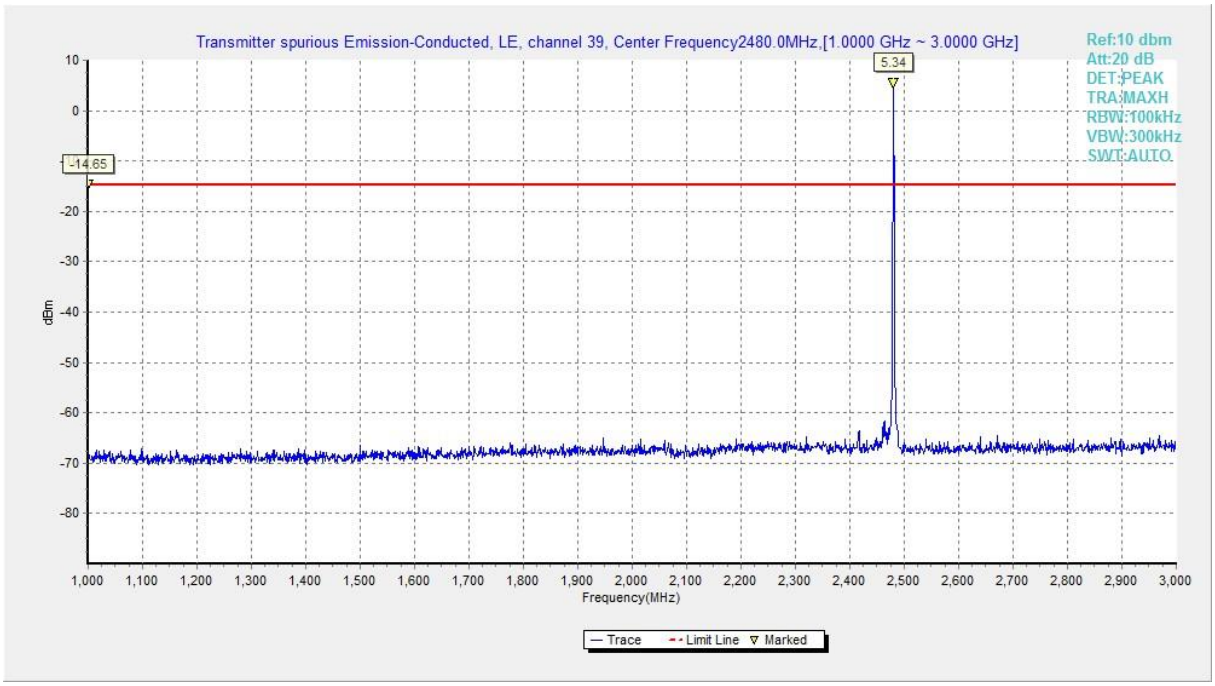


Fig.35 Conducted Spurious Emission (Ch39, 1 GHz-3 GHz), LE 2M

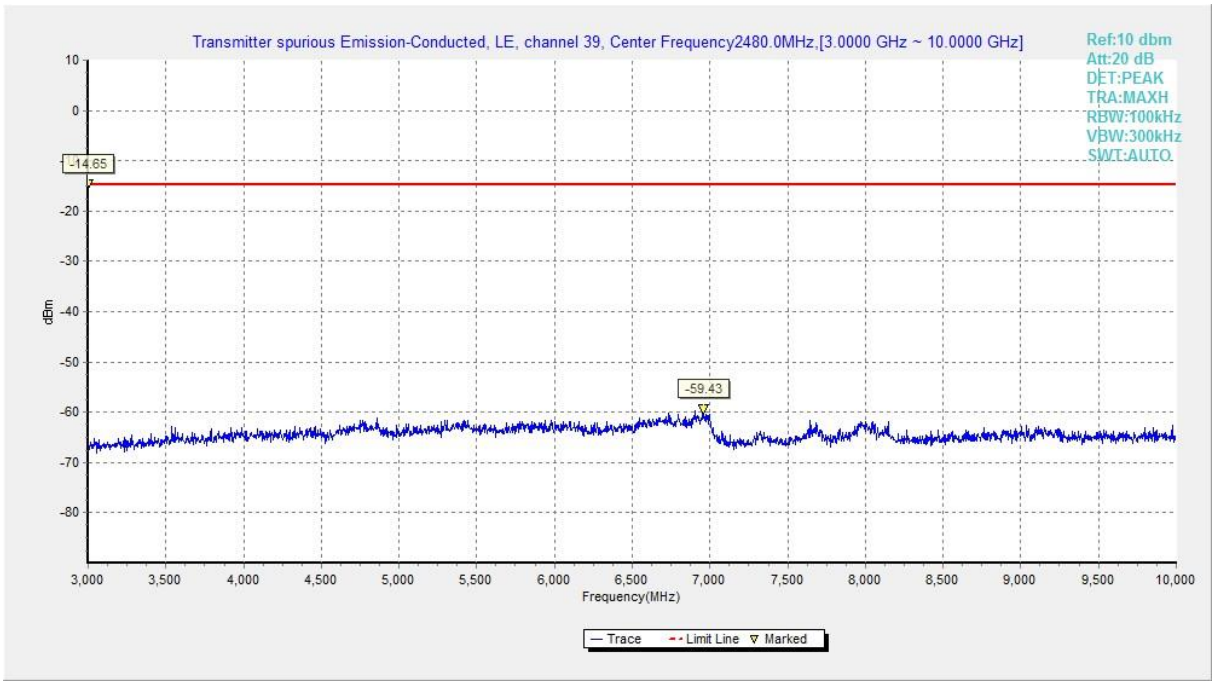


Fig.36 Conducted Spurious Emission (Ch39, 3 GHz-10 GHz), LE 2M

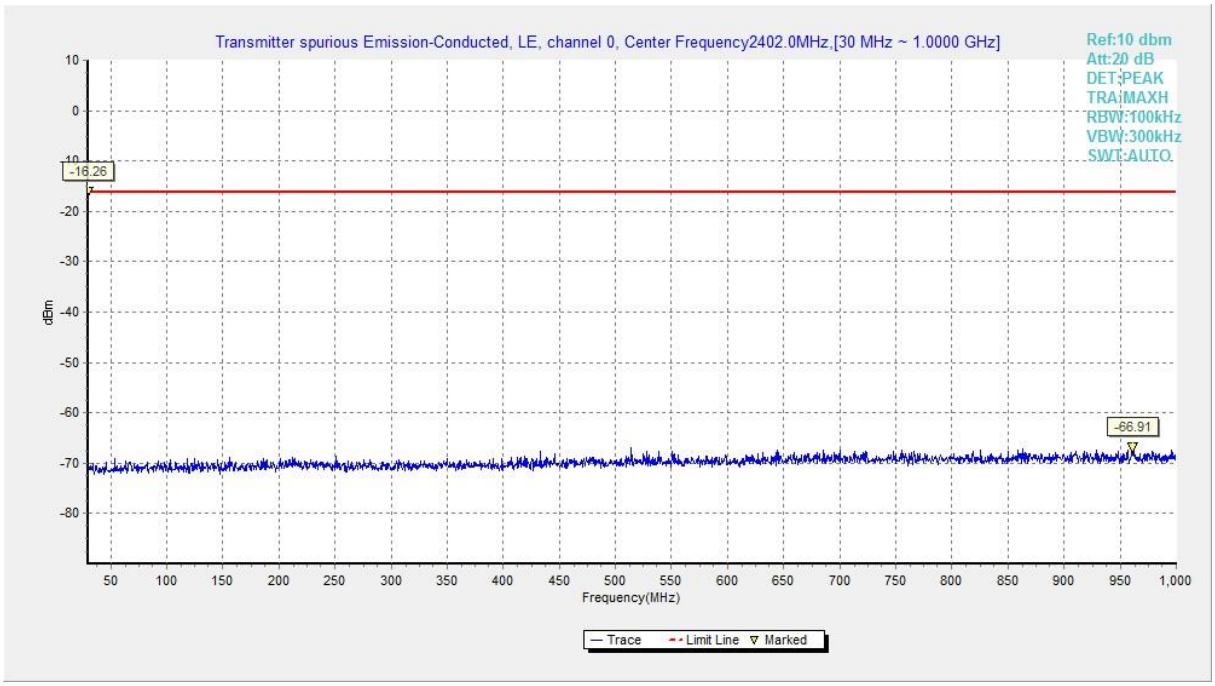


Fig.37 Conducted Spurious Emission (All channels, 30 MHz-1 GHz), LE 2M

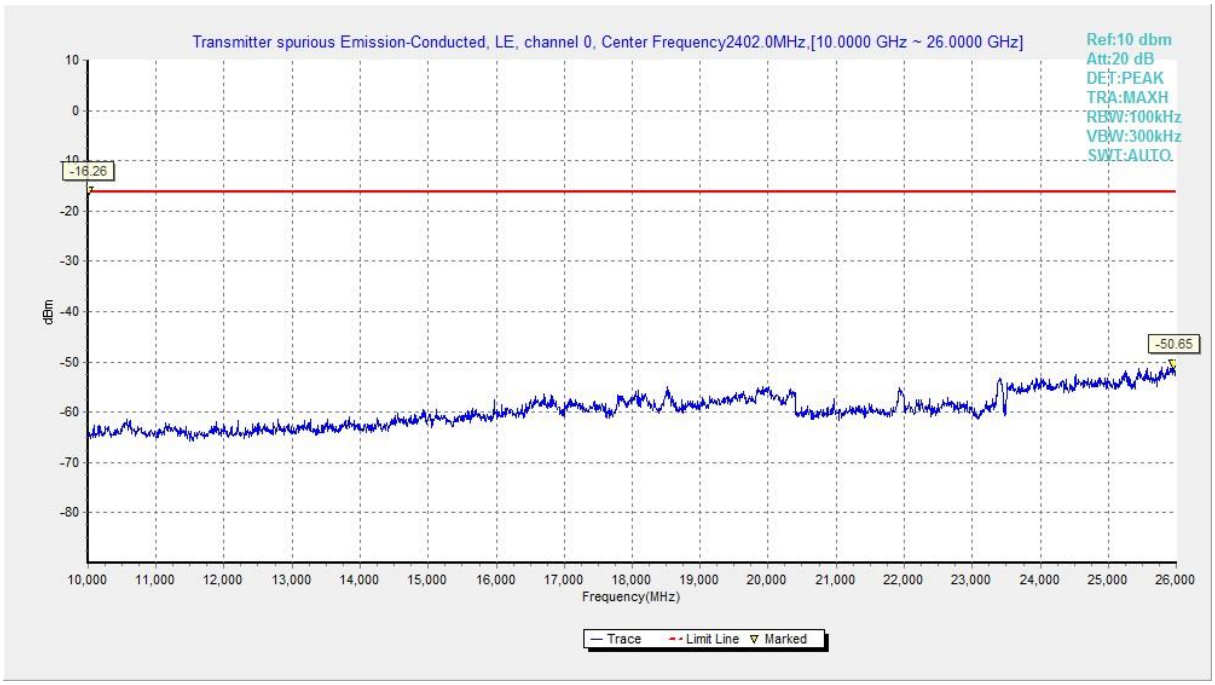


Fig.38 Conducted Spurious Emission (All channels, 10 GHz-26 GHz), LE 2M

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	1 GHz ~18 GHz	Fig.40	**P**
	39	1 GHz ~18 GHz	Fig.41	**P**
	Restricted Band(CH0)	2.38 GHz ~ 2.45 GHz	Fig.42	**P**
	Restricted Band(CH39)	2.45 GHz ~ 2.5 GHz	Fig.43	**P**
	All channels	9 kHz ~30 MHz	Fig.44	**P**
		30 MHz ~1 GHz	Fig.45	**P**
		18 GHz ~ 26.5 GHz	Fig.46	**P**
LE 2M	0	1 GHz ~18 GHz	Fig.47	**P**
	19	1 GHz ~18 GHz	Fig.48	**P**
	39	1 GHz ~18 GHz	Fig.49	**P**
	Restricted Band(CH0)	2.38 GHz ~ 2.45 GHz	Fig.50	**P**
	Restricted Band(CH39)	2.45 GHz ~ 2.5 GHz	Fig.51	**P**
	All channels	9 kHz ~30 MHz	Fig.52	**P**
		30 MHz ~1 GHz	Fig.53	**P**
		18 GHz ~ 26.5 GHz	Fig.54	**P**

Worst Case Result

For LE 1M:

CH0 (1-18GHz)

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)
6175.500000	51.06	74.00	22.94	V	18.9
12421.050000	45.47	74.00	28.53	V	11.4
13376.937500	46.85	74.00	27.15	V	12.6
14362.625000	46.49	74.00	27.51	H	13.0
15675.125000	48.61	74.00	25.39	V	14.1
17394.937500	50.68	74.00	23.32	V	17.0

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)
6196.000000	41.30	54.00	12.70	H	18.9
12394.712500	35.37	54.00	18.63	H	11.4
13383.500000	36.20	54.00	17.80	H	12.6
14491.250000	36.98	54.00	17.02	V	13.0
15751.250000	38.18	54.00	15.82	V	14.4
17261.937500	39.16	54.00	14.84	H	16.9

CH19 (1-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
5432.000000	48.30	74.00	25.70	V	15.2
6190.500000	50.72	74.00	23.28	H	18.9
14501.312500	47.28	74.00	26.72	H	13.0
15585.000000	48.64	74.00	25.36	H	13.7
17031.812500	49.50	74.00	24.50	H	16.7
17946.625000	48.15	74.00	25.85	V	16.5

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
5368.000000	38.33	54.00	15.67	H	15.2
6210.000000	41.07	54.00	12.93	H	18.8
14366.125000	36.22	54.00	17.78	H	13.0
15691.750000	37.49	54.00	16.51	H	14.2
16995.500000	39.09	54.00	14.91	H	16.5
17828.500000	38.51	54.00	15.49	H	16.7

CH39 (1-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
5169.000000	49.06	74.00	24.94	V	14.6
6196.500000	50.40	74.00	23.60	H	18.9
13408.000000	48.22	74.00	25.78	H	12.6
14413.812500	47.51	74.00	26.49	H	13.0
15768.312500	48.24	74.00	25.76	V	14.5
17222.125000	49.01	74.00	24.99	V	17.0

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
5165.500000	37.86	54.00	16.14	H	14.6
6226.000000	40.71	54.00	13.29	H	18.6
13467.937500	35.88	54.00	18.12	V	12.5
14383.625000	36.67	54.00	17.33	H	13.0
15796.750000	38.36	54.00	15.64	H	14.6
17343.750000	39.61	54.00	14.39	H	17.0

For LE 2M:

CH0 (1-18GHz)

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)
6194.500000	53.07	74.00	20.93	V	18.9
12449.537500	45.65	74.00	28.35	V	11.4
13485.437500	46.28	74.00	27.72	H	12.5
14521.437500	47.70	74.00	26.30	H	13.0
15616.062500	47.86	74.00	26.14	H	13.8
17222.125000	49.36	74.00	24.64	V	17.0

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)
6200.000000	41.19	54.00	12.81	H	18.8
12436.637500	35.78	54.00	18.22	V	11.4
13458.312500	36.35	54.00	17.65	V	12.5
14538.062500	37.11	54.00	16.89	H	13.0
15799.375000	38.16	54.00	15.84	H	14.6
17210.312500	39.44	54.00	14.56	V	17.0

CH19 (1-18GHz)

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)
5176.500000	48.84	74.00	25.17	H	14.6
6221.500000	50.72	74.00	23.28	H	18.7
13572.937500	47.54	74.00	26.46	V	12.3
14534.125000	47.16	74.00	26.84	H	13.0
15798.937500	48.48	74.00	25.52	H	14.6
17356.000000	50.82	74.00	23.18	V	17.0

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)
5129.000000	38.14	54.00	15.86	V	14.6
6152.000000	40.75	54.00	13.25	V	18.5
13384.812500	36.32	54.00	17.68	H	12.6
14504.375000	36.96	54.00	17.04	H	13.0
15798.062500	38.28	54.00	15.72	V	14.6
17233.937500	39.43	54.00	14.57	H	17.0

CH39 (1-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
4633.500000	47.24	74.00	26.76	H	13.4
6257.000000	51.68	74.00	22.32	H	18.4
13373.875000	46.49	74.00	27.51	H	12.6
14608.500000	46.97	74.00	27.03	H	12.9
15676.437500	47.73	74.00	26.27	H	14.1
17243.125000	49.56	74.00	24.44	V	17.0

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
4622.500000	37.15	54.00	16.85	V	13.4
6253.500000	40.75	54.00	13.25	V	18.4
13438.625000	36.37	54.00	17.63	H	12.6
14602.812500	36.87	54.00	17.13	H	12.9
15812.062500	38.17	54.00	15.83	H	14.7
17157.812500	39.18	54.00	14.82	H	17.1

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.

See below for test graphs.

Conclusion: Pass

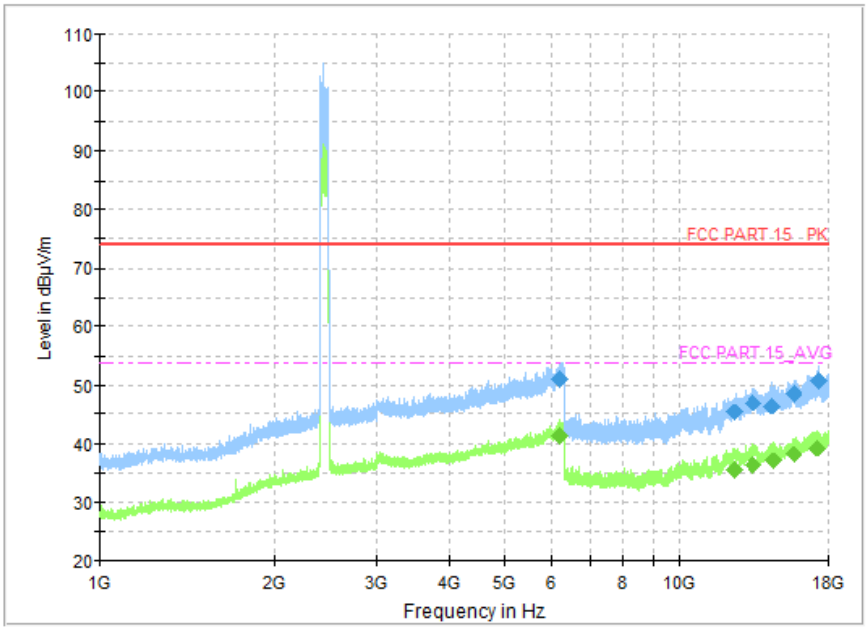


Fig.39 Radiated Spurious Emission (Ch0, 1 GHz ~18 GHz), LE 1M

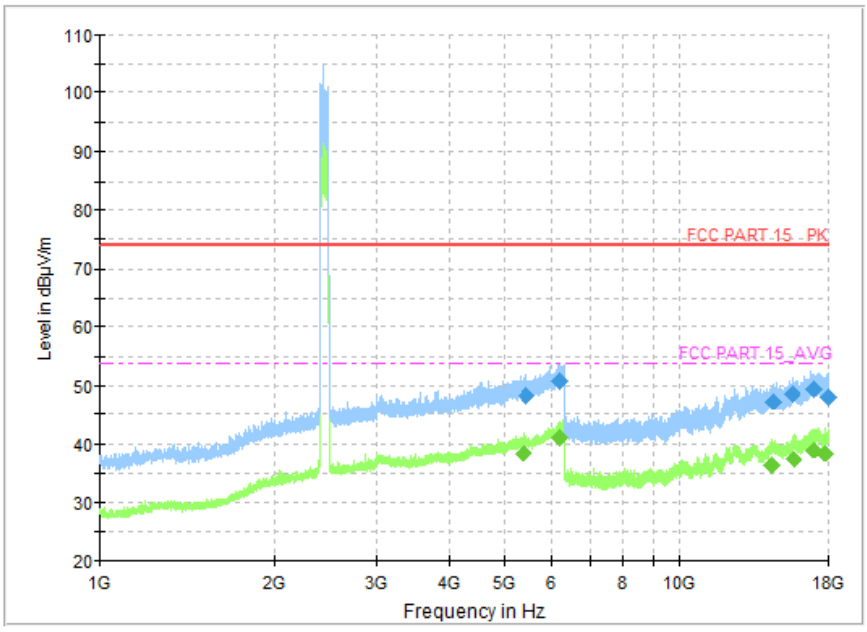


Fig.40 Radiated Spurious Emission (Ch19, 1 GHz ~18 GHz), LE 1M

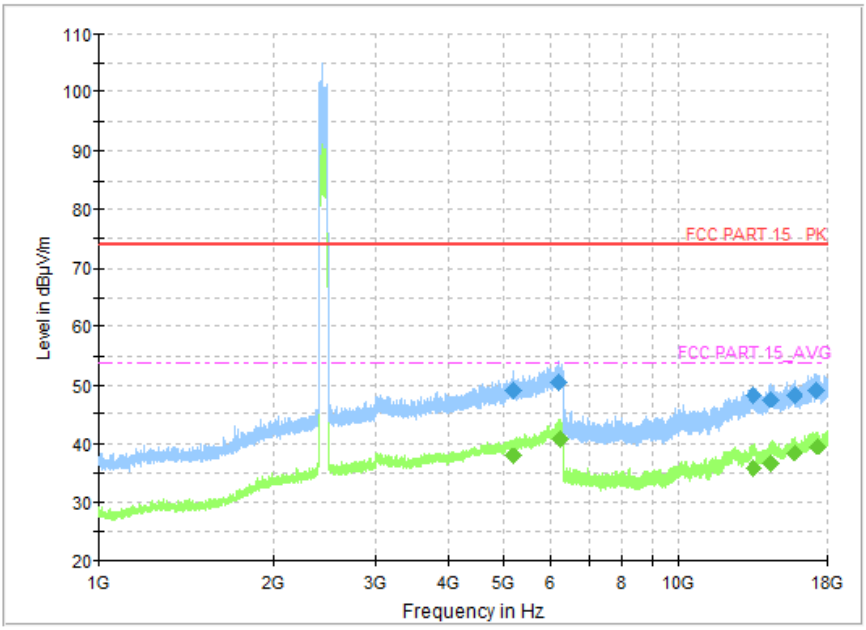


Fig.41 Radiated Spurious Emission (Ch39, 1 GHz ~18 GHz), LE 1M

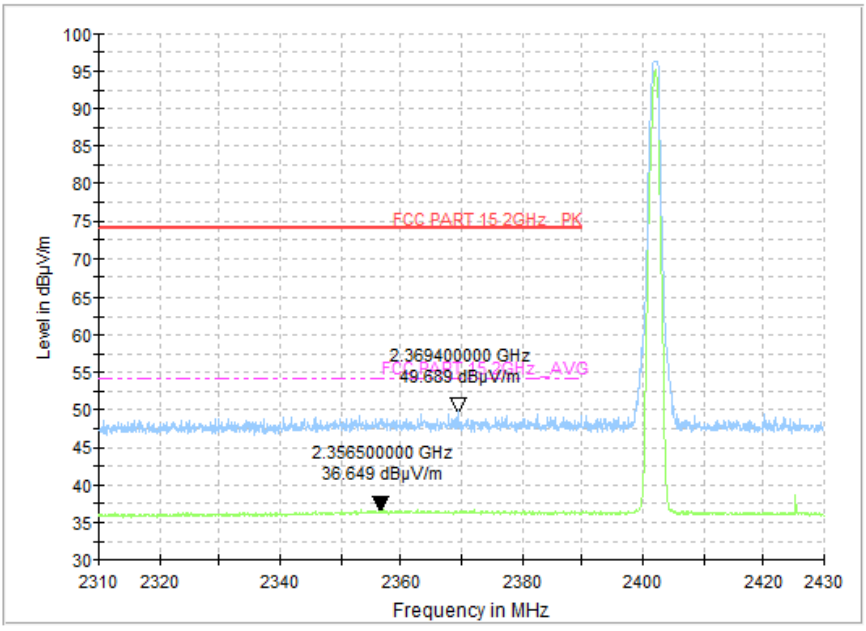


Fig.42 Radiated Band Edges (Ch0, 2380GHz~2450GHz), LE 1M

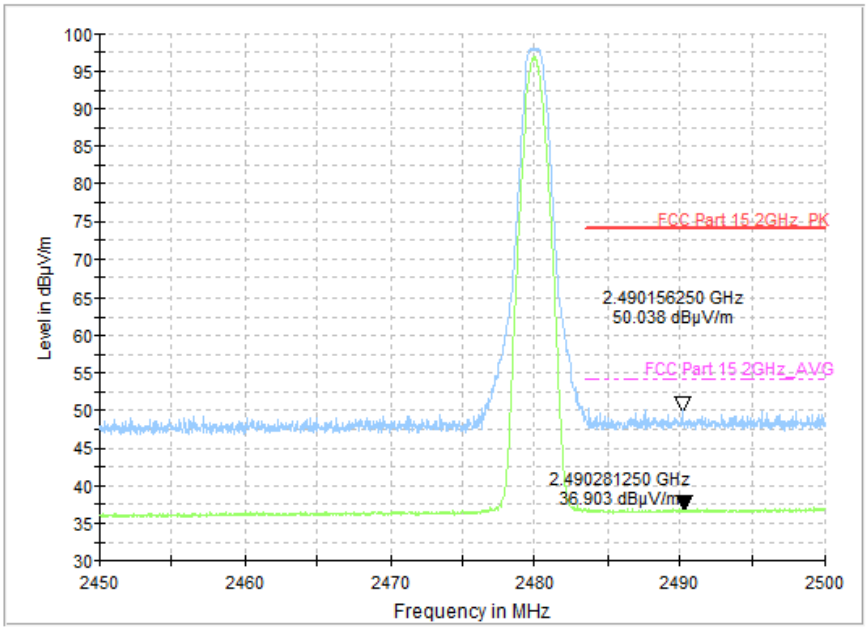


Fig.43 Radiated Band Edges (Ch39, 2450GHz~2500GHz), LE 1M

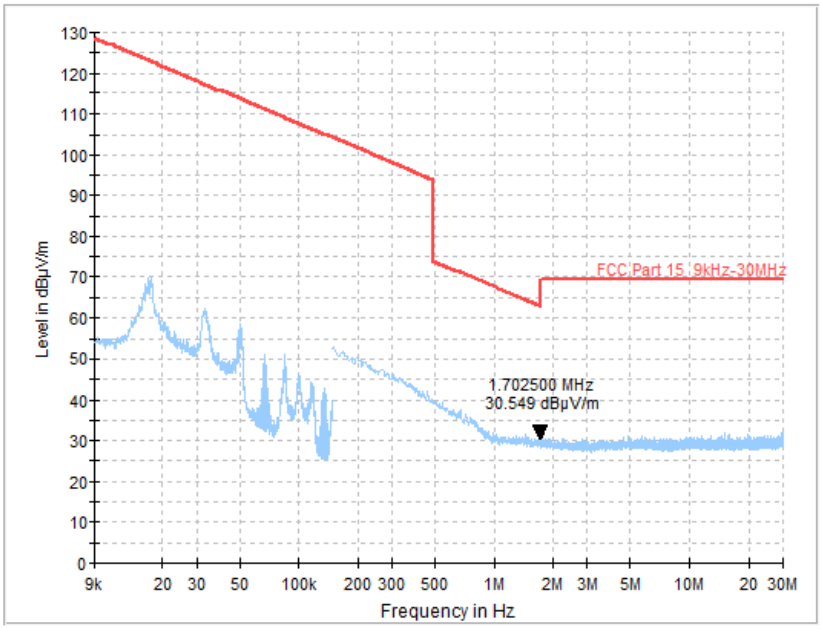


Fig.44 Radiated Spurious Emission (All Channels, 9 kHz-30 MHz), LE 1M

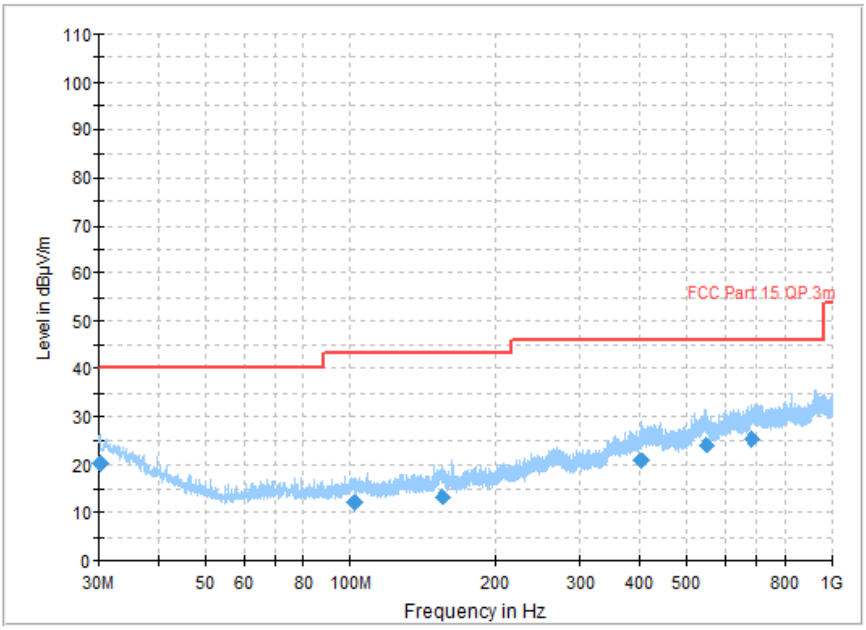


Fig.45 Radiated Spurious Emission (All Channels, 30 MHz-1 GHz), LE 1M

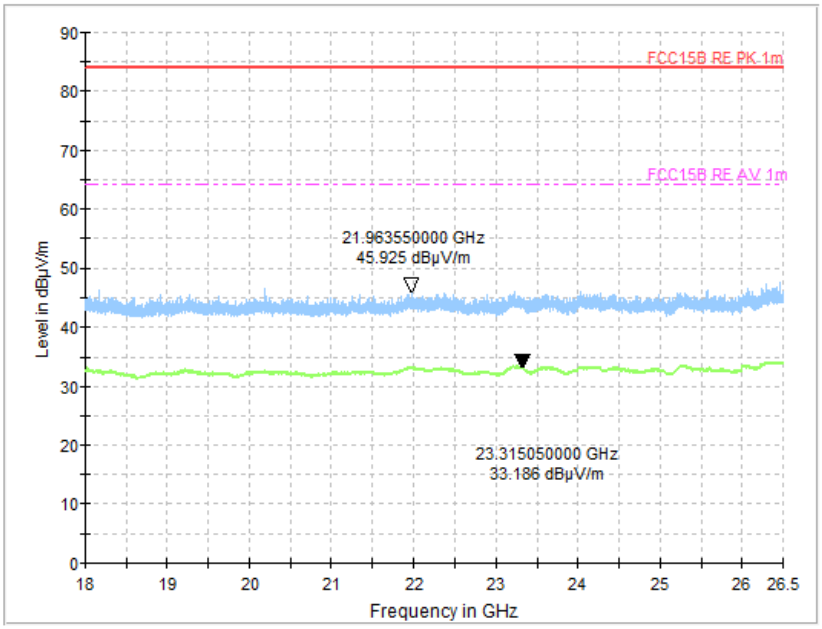


Fig.46 Radiated Spurious Emission (All Channels, 18 GHz-26.5 GHz), LE 1M

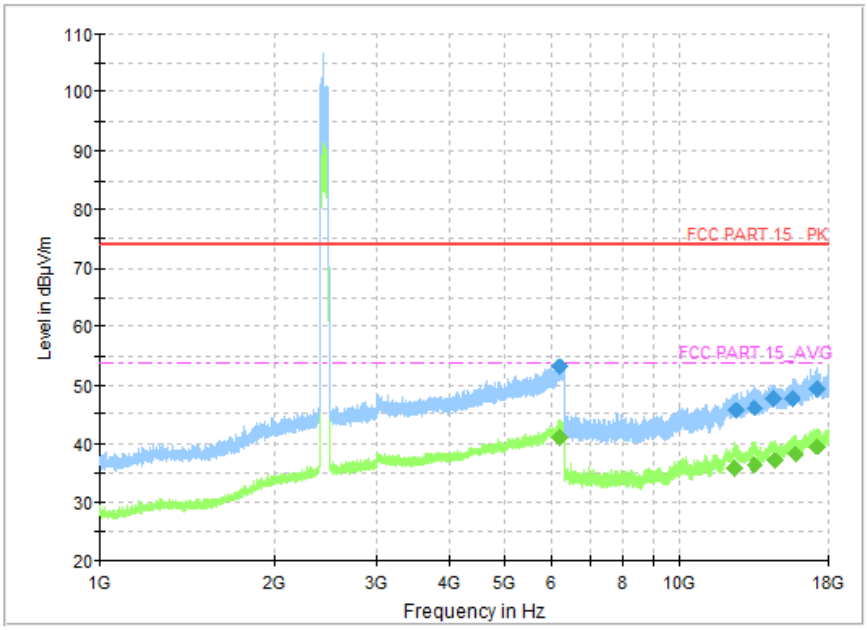


Fig.47 Radiated Spurious Emission (Ch0, 1 GHz ~18 GHz), LE 2M

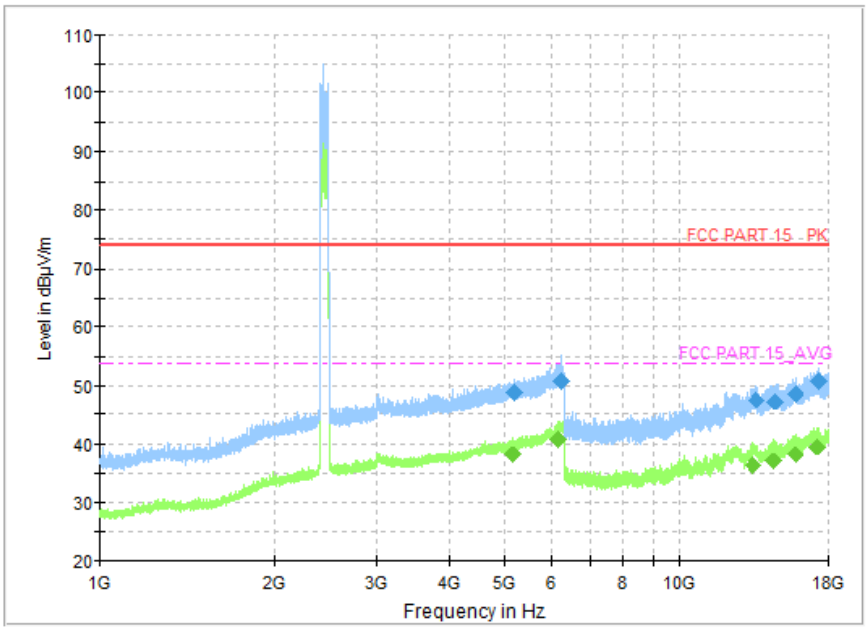


Fig.48 Radiated Spurious Emission (Ch19, 1 GHz ~18 GHz), LE 2M

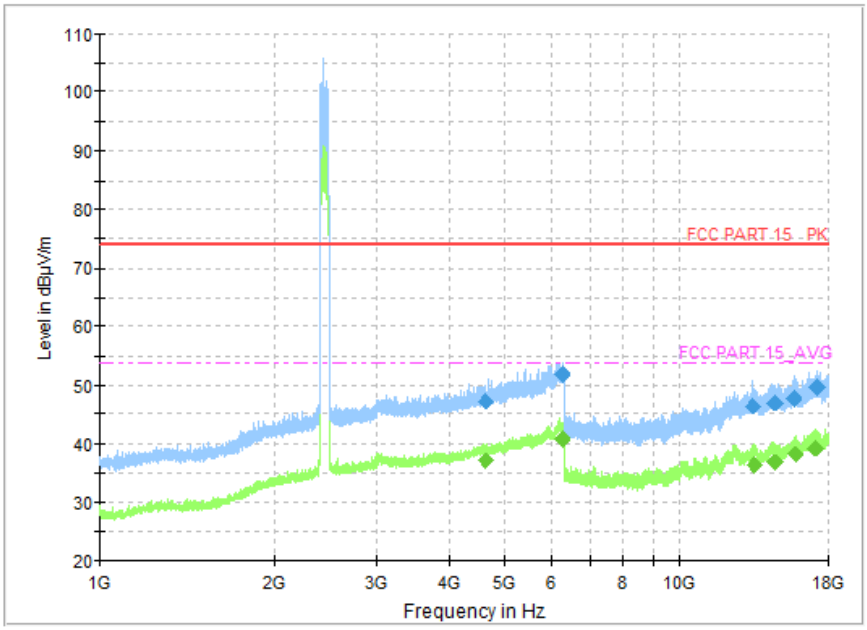


Fig.49 Radiated Spurious Emission (Ch39, 1 GHz ~18 GHz), LE 2M

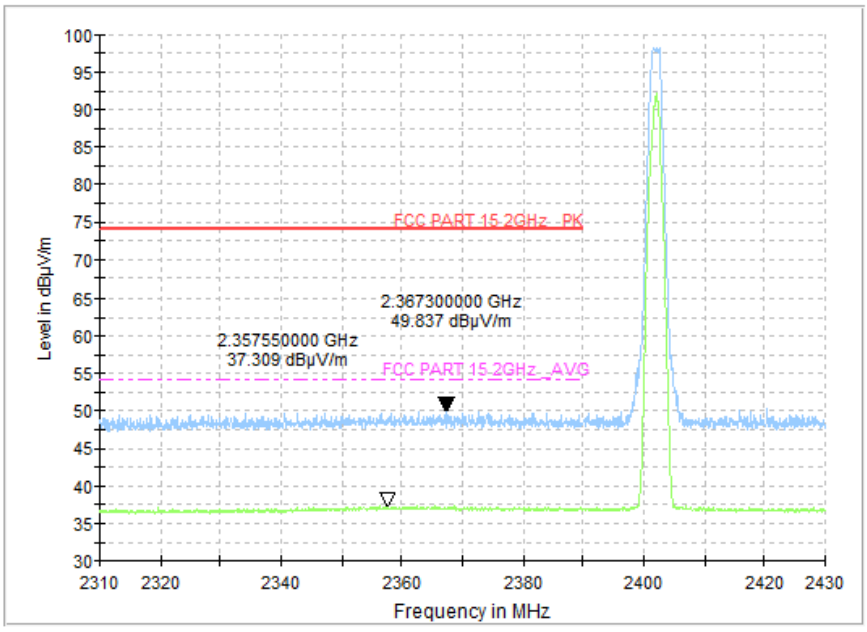


Fig.50 Radiated Band Edges (Ch0, 2380GHz~2450GHz), LE 2M

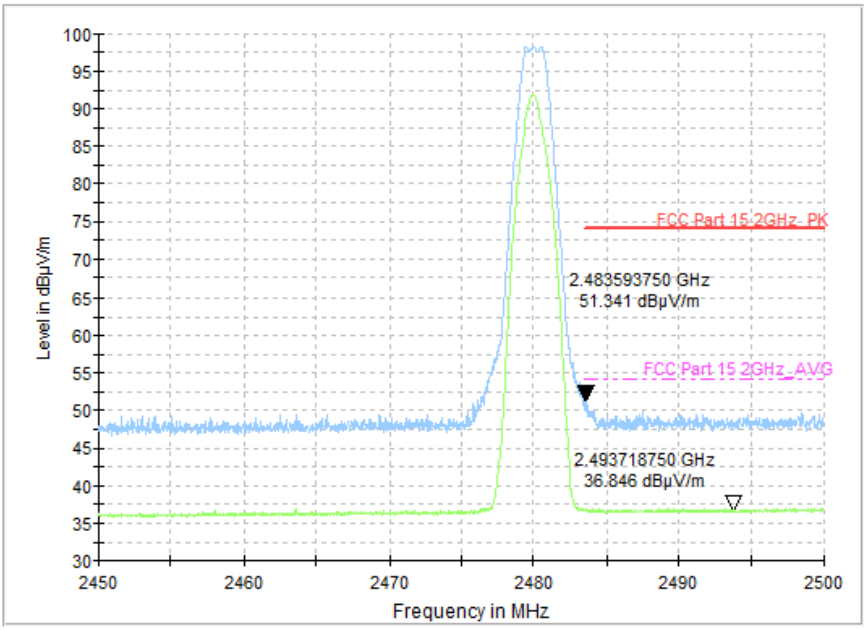


Fig.51 Radiated Band Edges (Ch39, 2450GHz~2500GHz), LE 2M

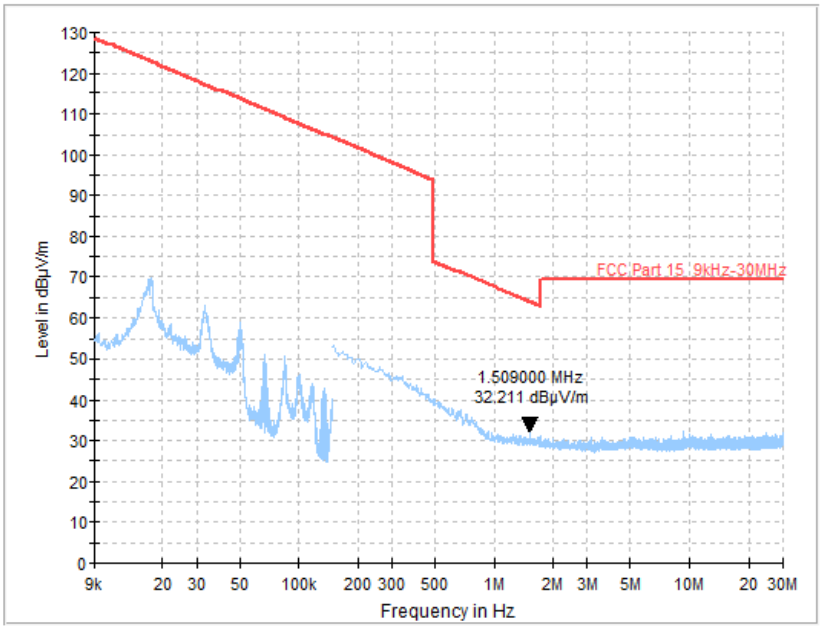


Fig.52 Radiated Spurious Emission (All Channels, 9 kHz-30 MHz), LE 2M

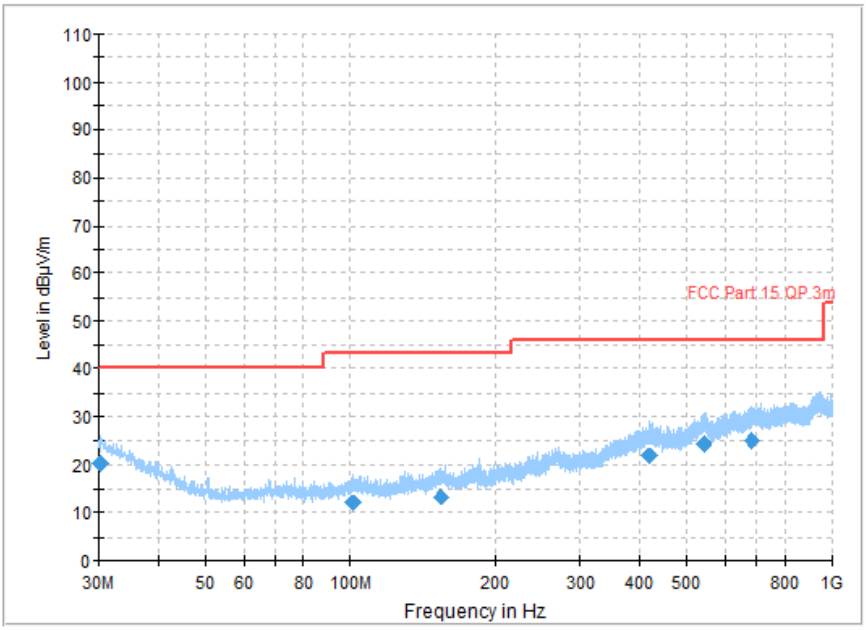


Fig.53 Radiated Spurious Emission (All Channels, 30 MHz-1 GHz), LE 2M

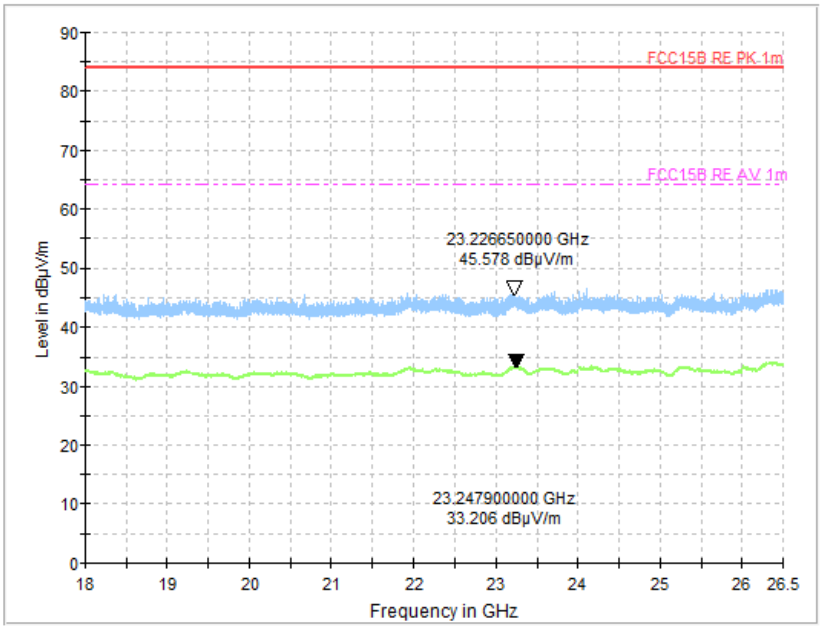


Fig.54 Radiated Spurious Emission (All Channels, 18 GHz-26.5 GHz), LE 2M

A.7 AC Power line Conducted Emission

Test Condition:

Voltage（V）	Frequency（Hz）
120	60

Measurement Result and limit:

LE 1M-AE2, AE3

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average-peak Limit (dBμV)	Result (dBμV)		Conclusion
			Traffic	Idle	
0.15 to 0.5	66 to 56	56 to 46	Fig.55	Fig.56	**P**
0.5 to 5	56	46			
5 to 30	60	50			
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.					

LE 2M-AE2, AE3

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average-peak Limit (dBμV)	Result (dBμV)		Conclusion
			Traffic	Idle	
0.15 to 0.5	66 to 56	56 to 46	Fig.57	Fig.58	**P**
0.5 to 5	56	46			
5 to 30	60	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

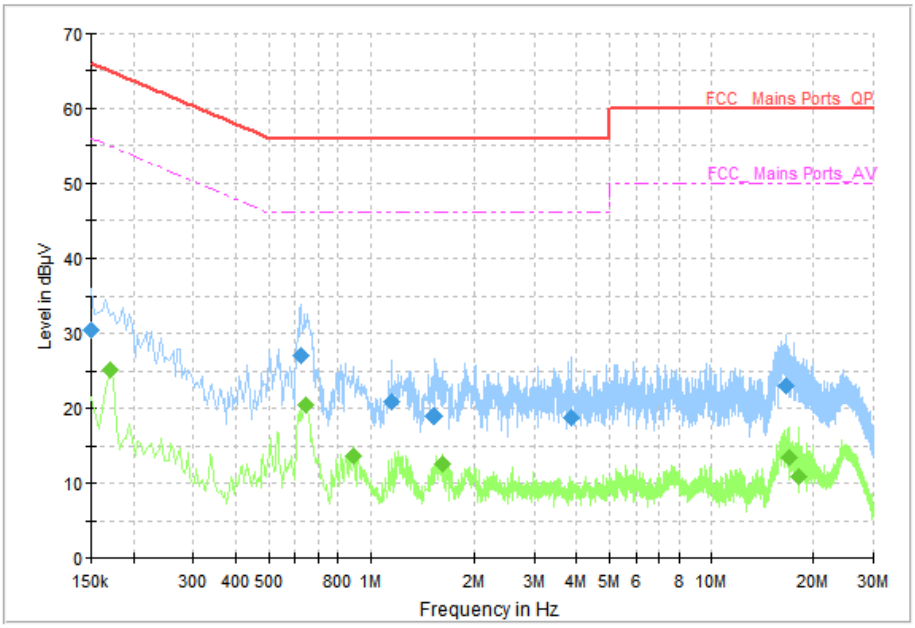


Fig.55 AC Power line Conducted Emission (Traffic), LE 1M

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.150000	30.43	66.00	35.57	N	ON	10
0.622000	27.07	56.00	28.93	N	ON	10
1.154000	20.82	56.00	35.18	N	ON	10
1.534000	18.89	56.00	37.11	N	ON	10
3.866000	18.80	56.00	37.20	N	ON	10
16.582000	23.12	60.00	36.88	L1	ON	10

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.170000	25.21	54.96	29.75	N	ON	10
0.642000	20.43	46.00	25.57	N	ON	10
0.894000	13.57	46.00	32.43	N	ON	10
1.610000	12.59	46.00	33.41	N	ON	10
16.862000	13.53	50.00	36.47	L1	ON	10
18.018000	10.95	50.00	39.05	L1	ON	10

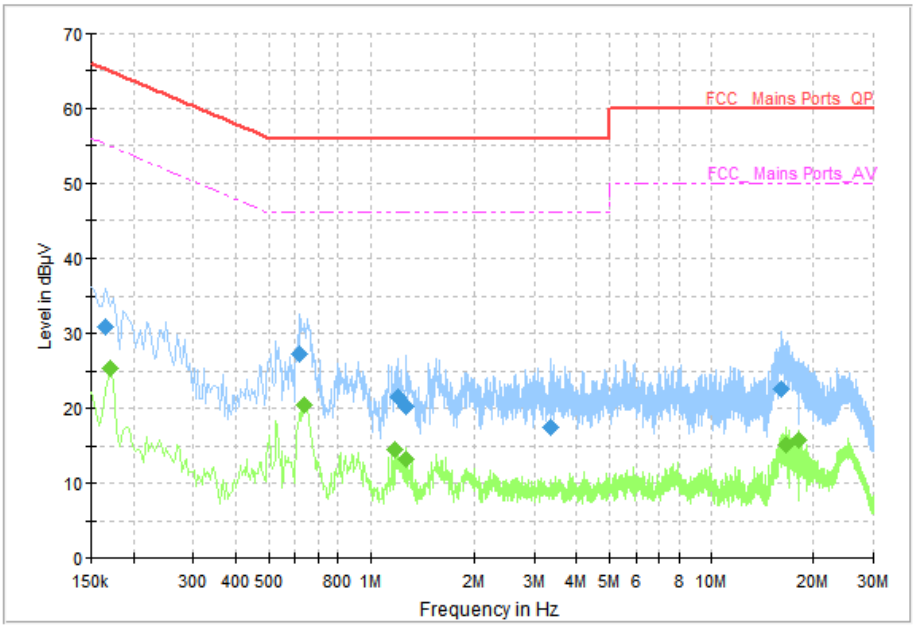


Fig.56 AC Power line Conducted Emission (Idle), LE 1M

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.166000	30.87	65.16	34.29	N	ON	10
0.618000	27.32	56.00	28.68	N	ON	10
1.206000	21.66	56.00	34.34	N	ON	10
1.274000	20.21	56.00	35.79	N	ON	10
3.354000	17.53	56.00	38.47	N	ON	10
15.990000	22.63	60.00	37.37	N	ON	10

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.170000	25.31	54.96	29.65	N	ON	10
0.638000	20.46	46.00	25.54	N	ON	10
1.182000	14.51	46.00	31.49	N	ON	10
1.274000	13.19	46.00	32.81	N	ON	10
16.578000	15.14	50.00	34.86	N	ON	10
18.014000	15.84	50.00	34.16	L1	ON	10

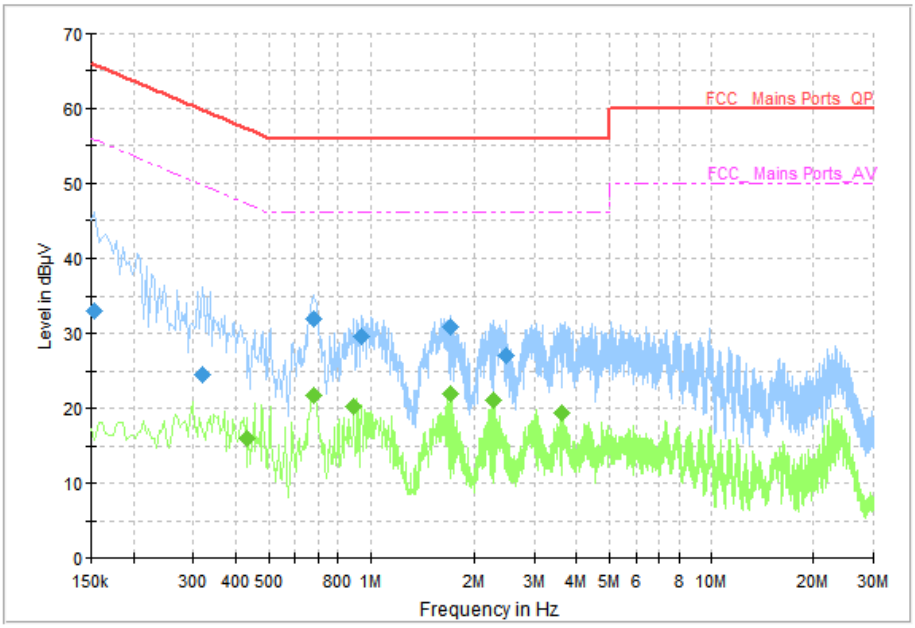


Fig.57 AC Power line Conducted Emission (Traffic), LE 2M

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.154000	33.08	65.78	32.70	N	ON	10
0.318000	24.63	59.76	35.13	N	ON	10
0.682000	32.06	56.00	23.94	N	ON	10
0.938000	29.66	56.00	26.34	N	ON	10
1.694000	30.88	56.00	25.12	N	ON	10
2.494000	27.13	56.00	28.87	N	ON	10

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.430000	16.01	47.25	31.24	N	ON	10
0.682000	21.71	46.00	24.29	N	ON	10
0.890000	20.34	46.00	25.66	N	ON	10
1.694000	22.02	46.00	23.98	N	ON	10
2.278000	21.20	46.00	24.80	N	ON	10
3.618000	19.41	46.00	26.59	N	ON	10

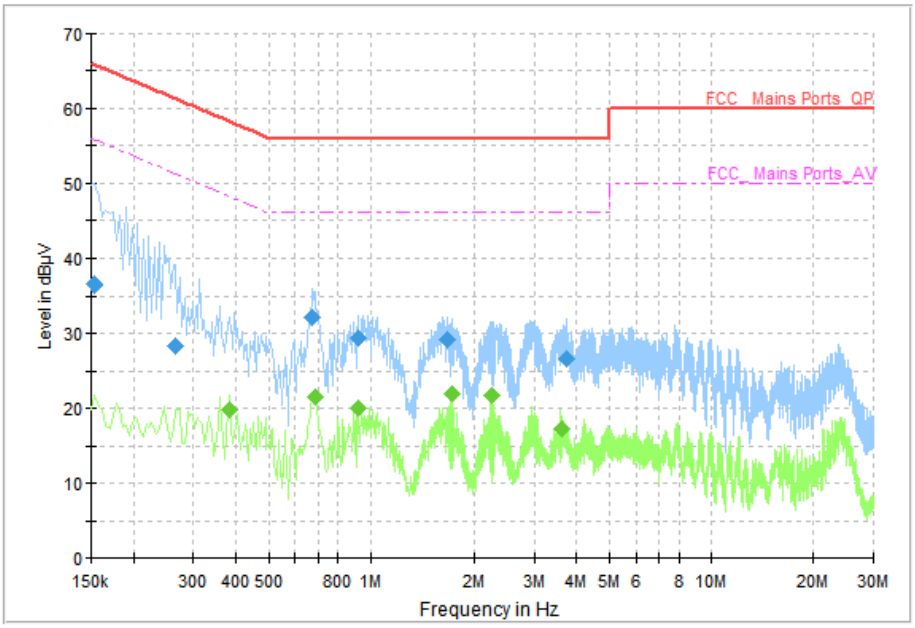


Fig.58 AC Power line Conducted Emission (Idle), LE 2M

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.154000	36.46	65.78	29.32	N	ON	10
0.266000	28.35	61.24	32.89	N	ON	10
0.674000	32.15	56.00	23.85	N	ON	10
0.918000	29.39	56.00	26.61	N	ON	10
1.666000	29.17	56.00	26.83	N	ON	10
3.738000	26.59	56.00	29.41	N	ON	10

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.382000	19.89	48.24	28.35	N	ON	10
0.690000	21.50	46.00	24.50	N	ON	10
0.918000	19.98	46.00	26.02	N	ON	10
1.718000	22.03	46.00	23.97	N	ON	10
2.254000	21.68	46.00	24.32	N	ON	10
3.622000	17.32	46.00	28.68	N	ON	10

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