TEST REPORT

No.I23N00692-BLE

for

Spectralink Corporation

Wifi/BT Phone

Model Name: Versity 9740

with

Hardware Version: DVT

Software Version: vSL25

FCC ID: IYG97XX

IC:2128B-97XX

Issued Date: 2023-07-26

Designation Number: CN1210

ISED Assigned Code: 23289

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

Building G, Shenzhen International Innovation Center, No.1006 Shennan Road, Futian District, Shenzhen, Guangdong, P. R. China 518000.

Tel:+86(0)755-33322000, Fax:+86(0)755-33322001

Email: yewu@caict.ac.cn. www.saict.ac.cn

REPORT HISTORY

Report Number	Revision	Description	Issue Date
I23N00642-BLE	Rev.0	1st edition	2023-07-26

Note: the latest revision of the test report supersedes all previous versions.

CONTENTS

1. Summary of Test Report

1.1. Test Items

Description	Wifi/BT Phone
Model Name	Versity 9740
Applicant's name	Spectralink Corporation
Manufacturer's Name	Spectralink Corporation

1.2. Test Standards

FCC Part15-2021; ANSI C63.10-2013; RSS-247 Issue 2; RSS-Gen Issue 5 A2.

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 518000

1.5. Project data

Testing Start Date:	2023-04-21
Testing End Date:	2023-07-04

1.6. Signature

Lin Kanfeng
(Prepared this test report)

An Ran
(Reviewed this test report)

Zhang Bojun
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	Spectralink Corporation
Address:	2560 55th Street Boulder CO 80301 USA
Contact Person:	Andrew Jackson
E-Mail:	andrew.jackson@spectralink.com
Telephone:	/
FAX:	+1 (303) 441-7618

2.2. Manufacturer Information

Company Name:	Spectralink Corporation
Address:	2560 55th Street Boulder CO 80301 USA
Contact Person:	Andrew Jackson
E-Mail:	andrew.jackson@spectralink.com
Telephone:	/
FAX:	+1 (303) 441-7618

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

3.1. About EUT

Description	Wifi/BT Phone
Model Name	Versity 9740
Frequency Range	2400MHz~2483.5MHz
Equipment type	Bluetooth® Low Energy
Type of Modulation	GFSK
RF PHY	LE 1M/2M
Number of Channels	40
Antenna Type	Integrated
Antenna Gain	ANT(Qualcomm)=0.43dBi, ANT(Nordic)=-0.81dBi
Power Supply	3.85V DC by Battery
FCC ID	IYG97XX
IC	2128B-97XX
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*	SN or IMEI	HW Version	SW Version	Date of Receipt
UT02aa	MHNE03BQKGG000G	DVT	vSL25	2023-04-21
UT14aa	MHNE04BBHHG000S	DVT	vSL25	2023-05-05

*EUT ID: is used to identify the test sample in the lab internally.
*UT02aa is used for Conduction test; UT14aa is used for radiation test and AC Power line Conducted Emission test.

3.3. Internal Identification of AE used during the test

AE No.	Description	AE ID*
AE1	Battery	/
AE2	Charger	Aa01
AE3	USB Cable	Ca01a

AE1-1

Model	BLI0000100
Manufacturer	Ningbo Veken Bat tery Co., Ltd.
Capacity	3020mAh
Nominal Voltage	3.85V

AE1-2

Model	351038P
Manufacturer	Chongqing VDL Electronics Co., Ltd.
Capacity	95mAh

Nominal Voltage	3.7V

AE2

Model	IN-CA-310Q
Manufacturer	Shenzhen Inno Vision Industrial Co., Ltd.

*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 Versity 9740 with integrated antenna and battery. It consists of normal options: Battery and Cable. It contains two Bluetooth modules（Qualcomm and Nordic module）, both of which have their own RF ports, and Nordic module only supports LE. Manual and specifications of the EUT were provided to fulfil the test. Samples undergoing test were selected by the client.

According to the customer's description, Versity9740 is a variant product of Versity9753.

The main difference between them is the antenna type and mechanical shell, which does not affect the conduction test. All conduction results were from the initial model, and the radiation part has been retested and updated in this report. The initial model report number is I23N00642-BLE.

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	2021
ANSI C63.10	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	2013
RSS-247	Spectrum Management and Telecommunications Radio Standards Specification Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices	Issue 2 February, 2017
RSS-Gen	Spectrum Management and Telecommunications Radio Standards Specification General Requirements for Compliance of Radio Apparatus	Issue 5 A2 February, 2021

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	Sub-clause of IC	Verdict
0	Antenna Requirement	15.203	/	**P**
1	Maximum Peak Output Power	15.247 (b)	RSS-247 section 5.4	**P**
2	Peak Power Spectral Density	15.247 (e)	RSS-247 section 5.2	**P**
3	6dB Bandwidth	15.247 (a)	RSS-247 section 5.2	**P**
4	Band Edges Compliance	15.247 (d)	RSS-247 section 5.5	**P**
5	Transmitter Spurious Emission - Conducted	15.247 (d)	RSS-247 section 5.5/ RSS-Gen section 6.13	**P**
6	Transmitter Spurious Emission - Radiated	15.247, 15.205, 15.209	RSS-247 section 5.5/ RSS-Gen section 6.13	**P**
7	AC Power line Conducted Emission	15.107, 15.207	RSS-Gen section 8.8	**P**
8	99% Occupied Bandwidth	/	RSS-Gen section 6.7	**/**

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.

Disclaimer:

A. After confirmation with the customer, the sample information provided by the customer may affect the validity of the measurement results in this report, and the impact and consequences arising therefrom shall be borne by the customer.

B. The samples in this report are provided by the customer, and the test results are only applicable to the samples received.

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	2023-12-28	1 year
2	Power Sensor	U2021XA	MY55430013	Keysight	2023-12-28	1 year
3	Data Acquisition	U2531A	TW55443507	Keysight	/	/
4	Shielding Room	S81	CT000986-1344	ETS-Lindgren	2026-09-12	5 years

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date	Calibration Period
1	Test Receiver	ESR7	101676	Rohde & Schwarz	2023-11-23	1 year
2	BiLog Antenna	3142E	0224831	ETS-Lindgren	2024-05-27	3 years
3	Horn Antenna	3117	00066577	ETS-Lindgren	2025-04-17	3 years
4	Anechoic Chamber	FACT3-2.0	1285	ETS-Lindgren	2025-05-28	2 years
5	Spectrum Analyzer	FSV40	101192	Rohde & Schwarz	2024-01-11	1 year
6	Loop Antenna	HLA6120	35779	TESEQ	2025-05-12	3 years
7	Horn Antenna	QSH-SL-18-26-S-20	17013	Q-par	2026-02-01	3 years
8	Test Receiver	ESCI	100702	Rohde & Schwarz	2024-01-11	1 year
9	LISN	ENV216	102067	Rohde & Schwarz	2023-09-06	1 year

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

Shielded room

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	> 2 MΩ
Ground system resistance	< 4 Ω

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	> 2 MΩ
Ground system resistance	< 4 Ω
Normalised site attenuation (NSA)	< ±4 dB, 3 m distance, from 30 to 1000 MHz
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. Maximum Peak Output Power	1.32dB	
2. Peak Power Spectral Density	1.32dB	
3. 6dB Bandwidth	4.56kHz	
4. Band Edges Compliance	1.92dB	
5. Transmitter Spurious Emission - Conducted	30MHz≤f<1GHz	1.41dB
	1GHz≤f<7GHz	1.92dB
	7GHz≤f<13GHz	2.31dB
	13GHz≤f≤26GHz	2.61dB
6. Transmitter Spurious Emission - Radiated	9kHz≤f<30MHz	1.70dB
	30MHz≤f<1GHz	4.80dB
	1GHz≤f<18GHz	4.62dB
	18GHz≤f≤40GHz	2.36dB
7. AC Power line Conducted Emission	150kHz≤f≤30MHz	2.68dB

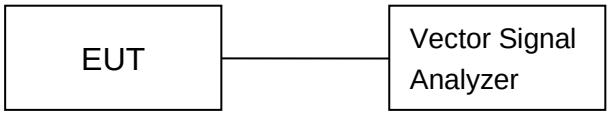
ANNEX A: Detailed Test Results

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.

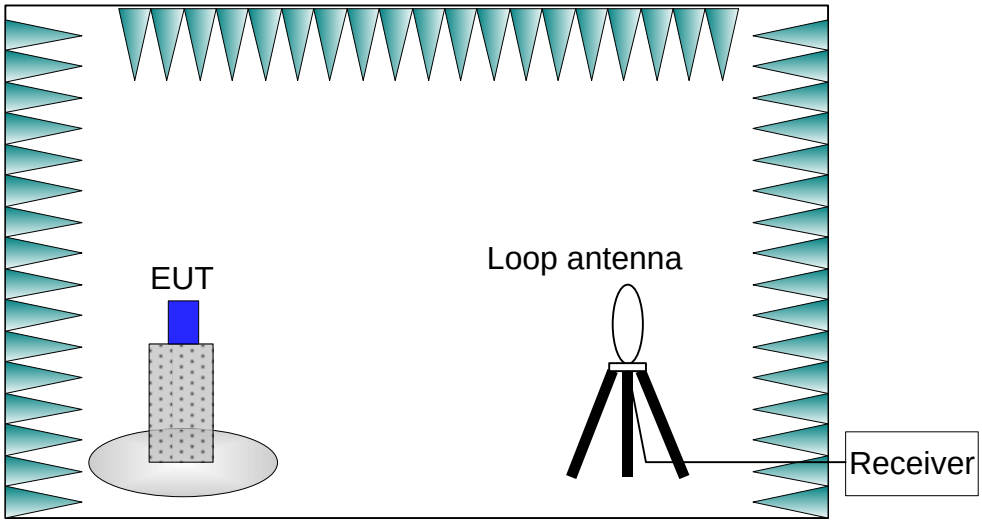


2) Radiated Measurements

Test setup:

9kHz-30MHz：

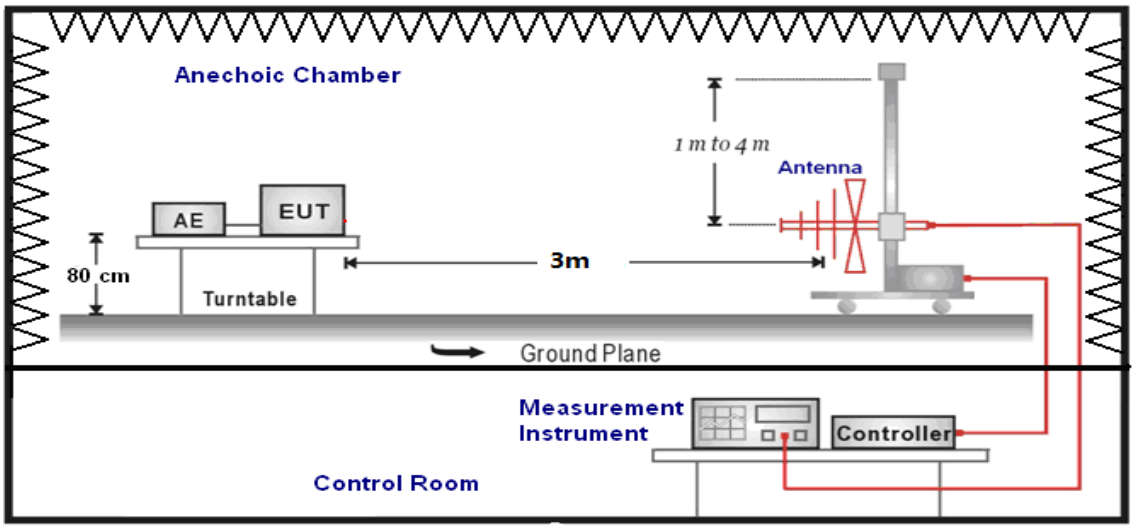
The EUT are measured in a anechoic chamber. The EUT is placed on a non-conductive stand of 80cm high, and at a measurement distance of 3m from the receiving antenna. The center of the receiving loop antenna is 1.0 meter above the ground. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT and adjusting the receiver antenna polarization.



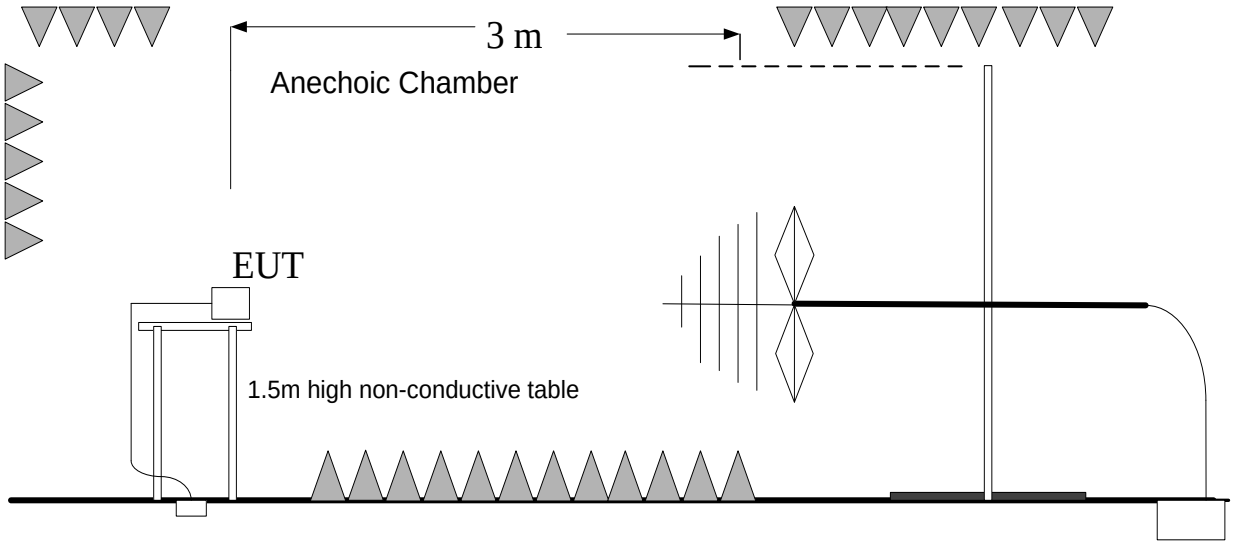
30MHz-26.5GHz:

The EUT are measured in a anechoic chamber. The EUT is placed on a non-conductive stand of 80cm high, and at a measurement distance of 3m from the receiving antenna. The center of the receiving antenna is 1.0 meter to 4.0 meter above the ground. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT and adjusting the receiver antenna polarization.

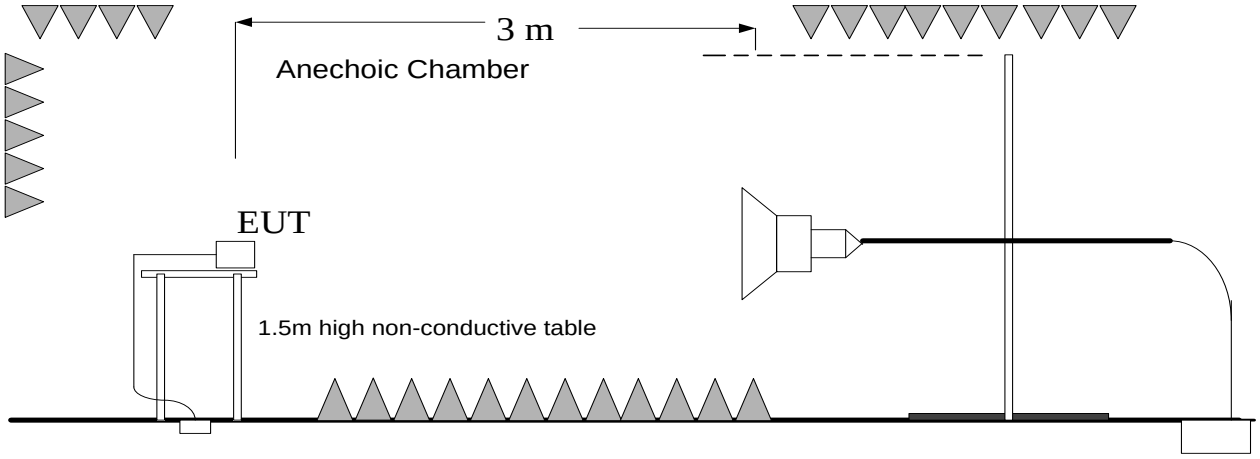
30MHz-1GHz:



1GHz-3GHz:

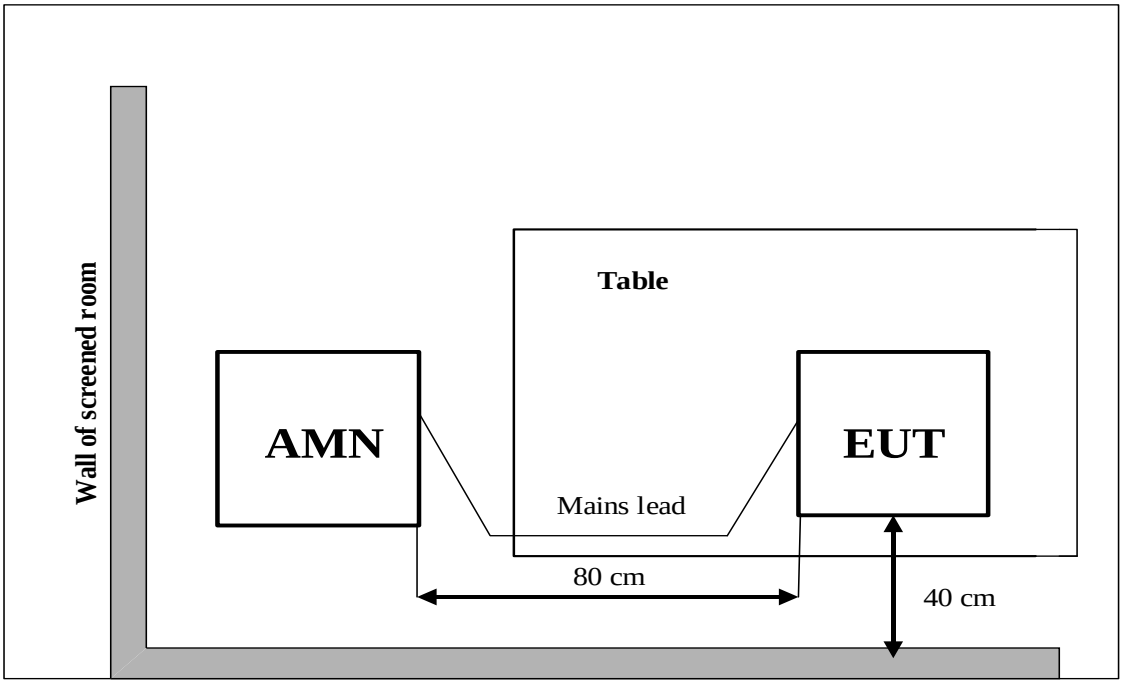


3GHz-26.5GHz:



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 ANT(Qualcomm)=0.43dBi, ANT(Nordic)=-0.81dBi. 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 47 CRF Part 15.247(b) & RSS-247 section 5.4	< 30	< 36

Measurement Results:

Qualcomm module:

Mode	Frequency (MHz)	Peak Output Power (dBm)	E.I.R.P（dBm）	Conclusion
LE-1M	2402 (CH0)	6.54	6.97	**P**
	2440 (CH19)	7.48	7.91	**P**
	2480 (CH39)	6.24	6.67	**P**
LE-2M	2402 (CH0)	6.49	6.92	**P**
	2440 (CH19)	7.32	7.75	**P**
	2480 (CH39)	6.18	6.61	**P**

Nordic module:

Mode	Frequency (MHz)	Peak Output Power (dBm)	E.I.R.P（dBm）	Conclusion
LE-1M	2402 (CH0)	7.65	6.84	**P**
	2440 (CH19)	7.66	6.85	**P**
	2480 (CH39)	7.78	6.97	**P**

Note: E.I.R.P value = Conducted values (with conducted samples) + Antenna Gain.

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) & RSS-247 section 5.2	< 8 dBm/3 kHz

Measurement Results:

Qualcomm module:

Mode	Frequency (MHz)	Peak Power Spectral Density (dBm)	Conclusion
LE-1M	2402 (CH0)	-9.98	**P**
	2440 (CH19)	-9.11	**P**
	2480 (CH39)	-10.31	**P**
LE-2M	2402 (CH0)	-12.84	**P**
	2440 (CH19)	-11.91	**P**
	2480 (CH39)	-13.18	**P**

Nordic module:

Mode	Frequency (MHz)	Peak Power Spectral Density (dBm)	Conclusion
LE-1M	2402 (CH0)	-10.52	**P**
	2440 (CH19)	-11.25	**P**
	2480 (CH39)	-11.00	**P**

See below for test graphs.

Conclusion: PASS

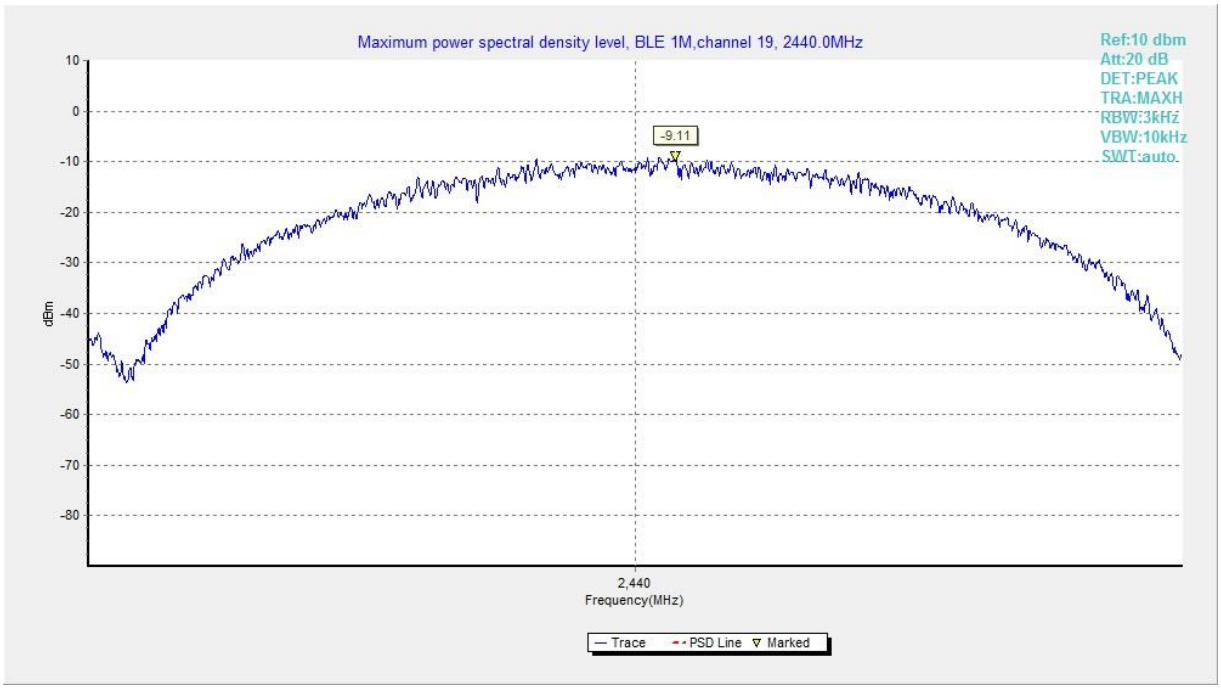


Fig.1 Power Spectral Density (Ch 19), LE 1M

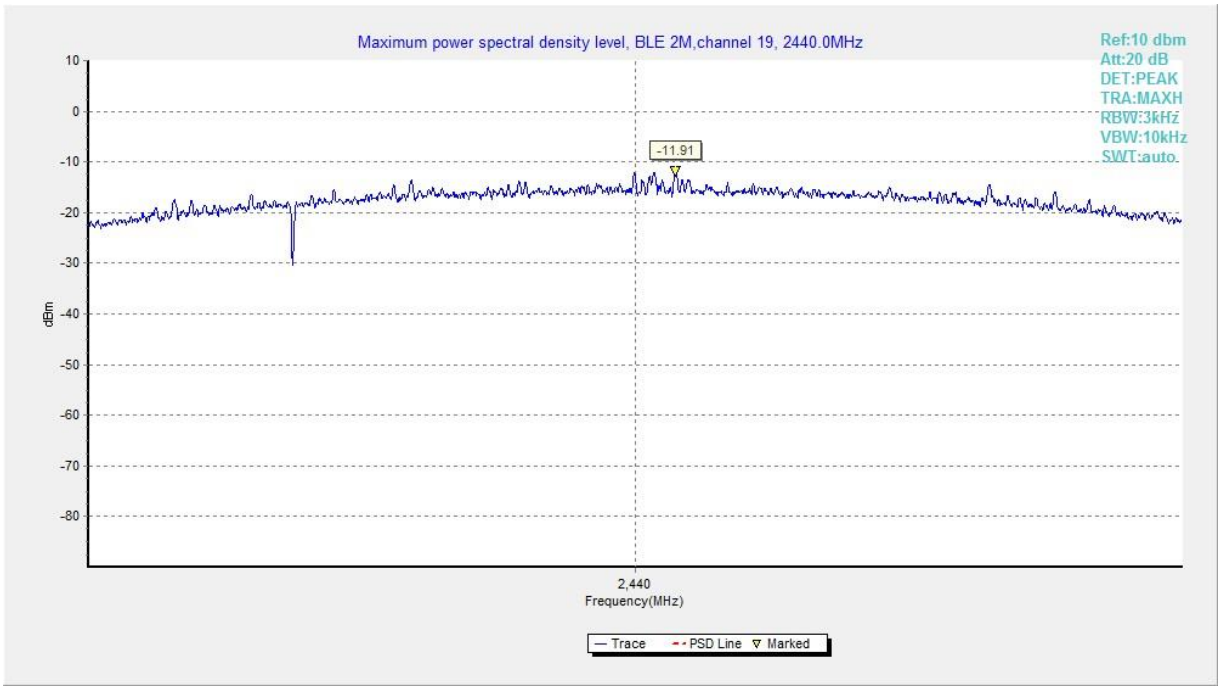


Fig.2 Power Spectral Density (Ch 19), LE 2M

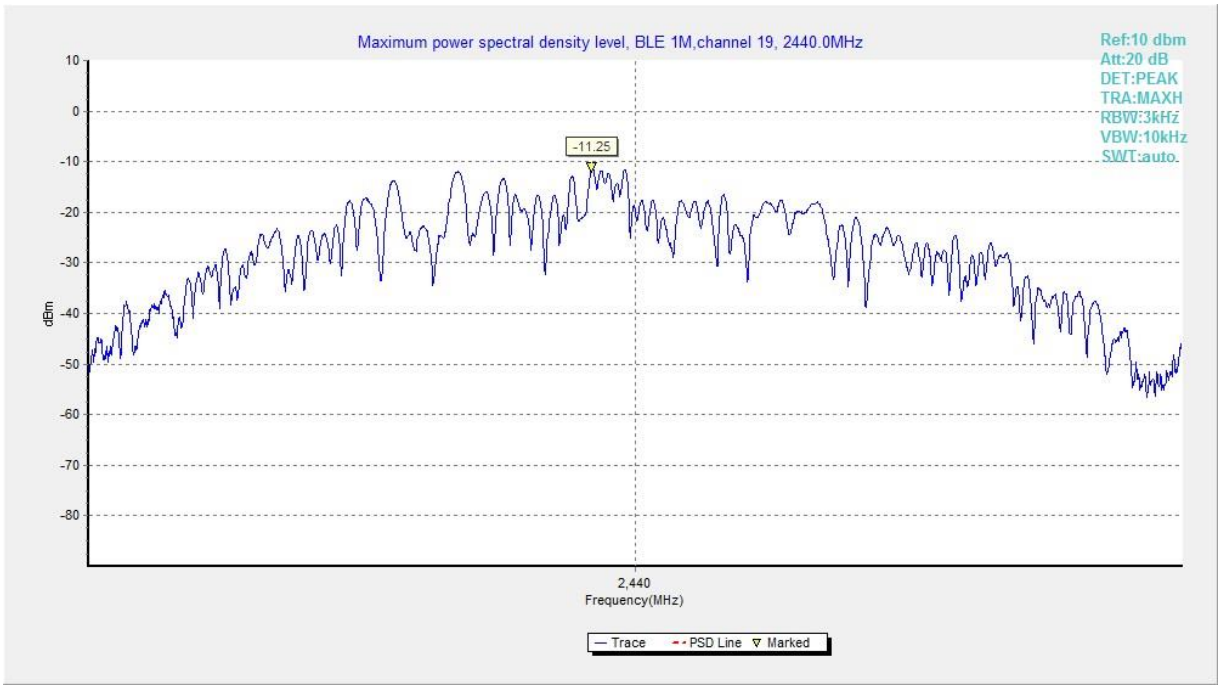


Fig.3 Power Spectral Density (Ch 19), LE 1M

A.3 6dB Bandwidth

Method of Measurement: See ANSI C63.10-clause 11.8.2

Measurement Limit:

Standard	Limit (kHz)
FCC 47 CFR Part 15.247 (a) & RSS-247 section 5.2	≥ 500

Measurement Result:

Qualcomm module:

Mode	Frequency (MHz)	6dB Bandwidth (kHz)	Conclusion
LE-1M	2402 (CH0)	663.50	**P**
	2440 (CH19)	667.00	**P**
	2480 (CH39)	667.00	**P**
LE-2M	2402 (CH0)	1157.00	**P**
	2440 (CH19)	1163.50	**P**
	2480 (CH39)	1160.00	**P**

Nordic module:

Mode	Frequency (MHz)	6dB Bandwidth (kHz)	Conclusion
LE-1M	2402 (CH0)	687.00	**P**
	2440 (CH19)	686.00	**P**
	2480 (CH39)	685.50	**P**

See below for test graphs.

Conclusion: PASS

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

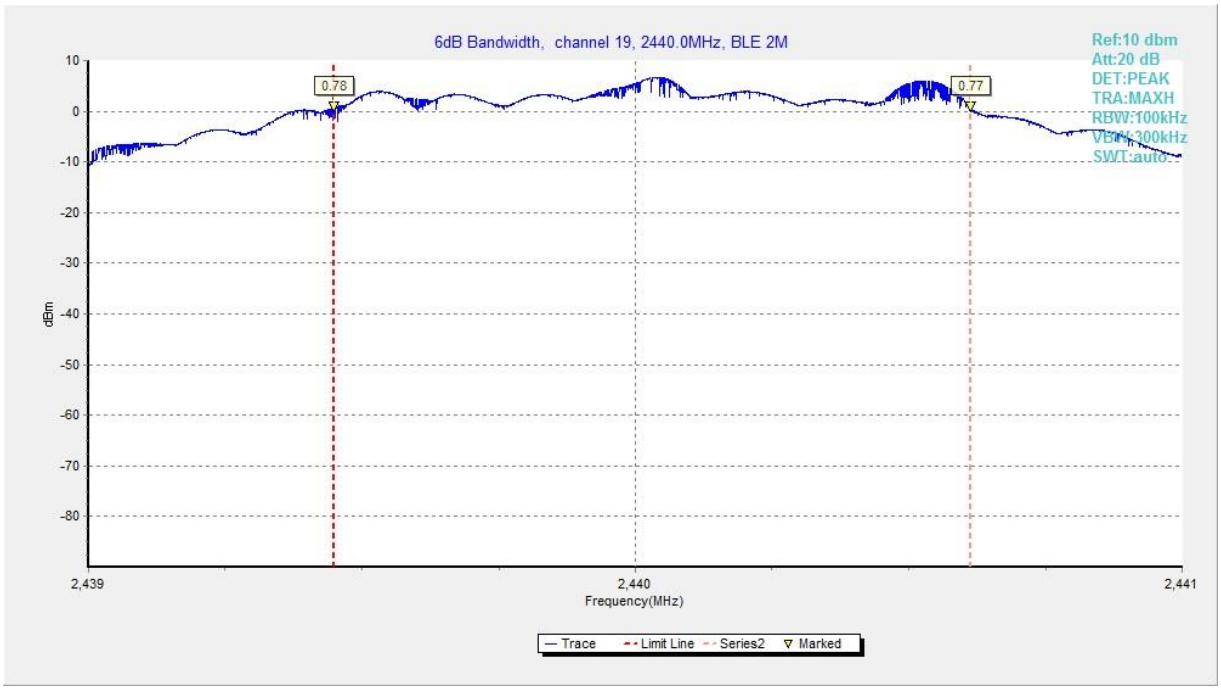


Fig.2 6dB Bandwidth (Ch 19), LE 2M

Fig.3 6dB Bandwidth (Ch 19), LE 1M

A.4 Band Edges Compliance

Method of Measurement: See ANSI C63.10-clause 11.13.3.2

Measurement Limit:

Standard	Limit (dB)
FCC 47 CFR Part 15.247 (d) & RSS-247 section 5.5	> 20

Measurement Result:

Qualcomm module:

Mode	Frequency (MHz)	Band Edges (kHz)	Conclusion
LE-1M	2402 (CH0)	61.97	**P**
	2480 (CH39)	64.52	**P**
LE-2M	2402 (CH0)	44.17	**P**
	2480 (CH39)	57.44	**P**

Nordic module:

Mode	Frequency (MHz)	Band Edges (kHz)	Conclusion
LE-1M	2402 (CH0)	53.72	**P**
	2480 (CH39)	56.69	**P**

See below for test graphs.

Conclusion: Pass

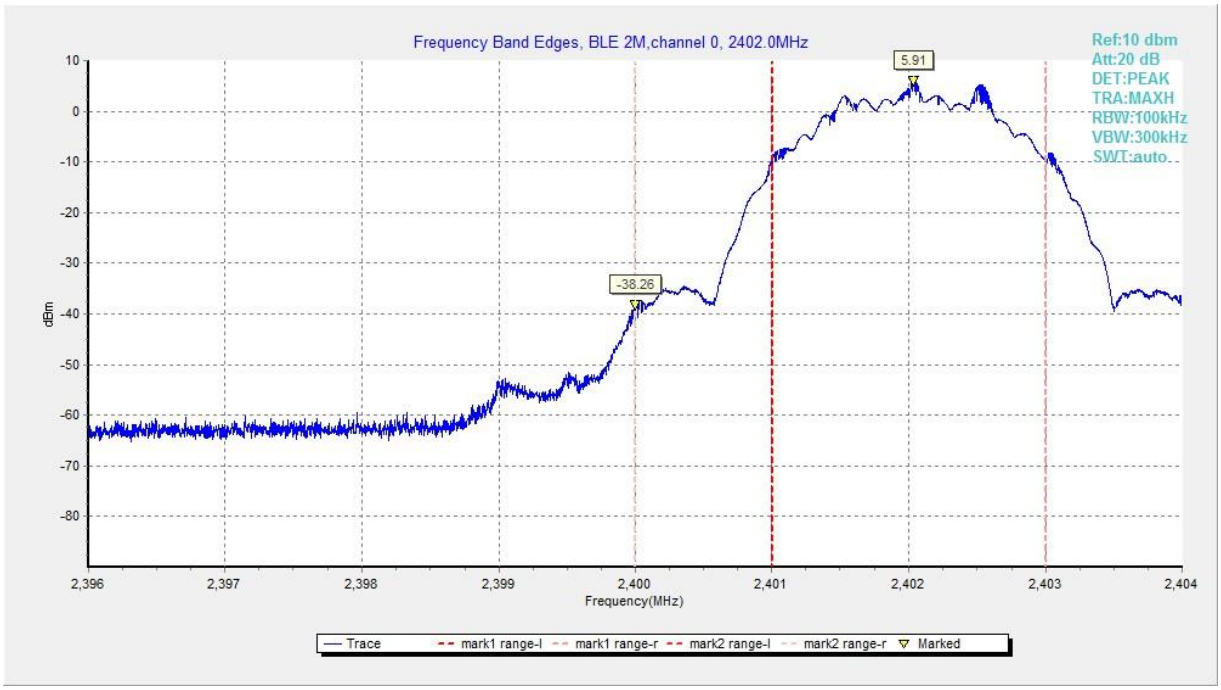


Fig.1 Band Edges (Ch 0), LE 2M

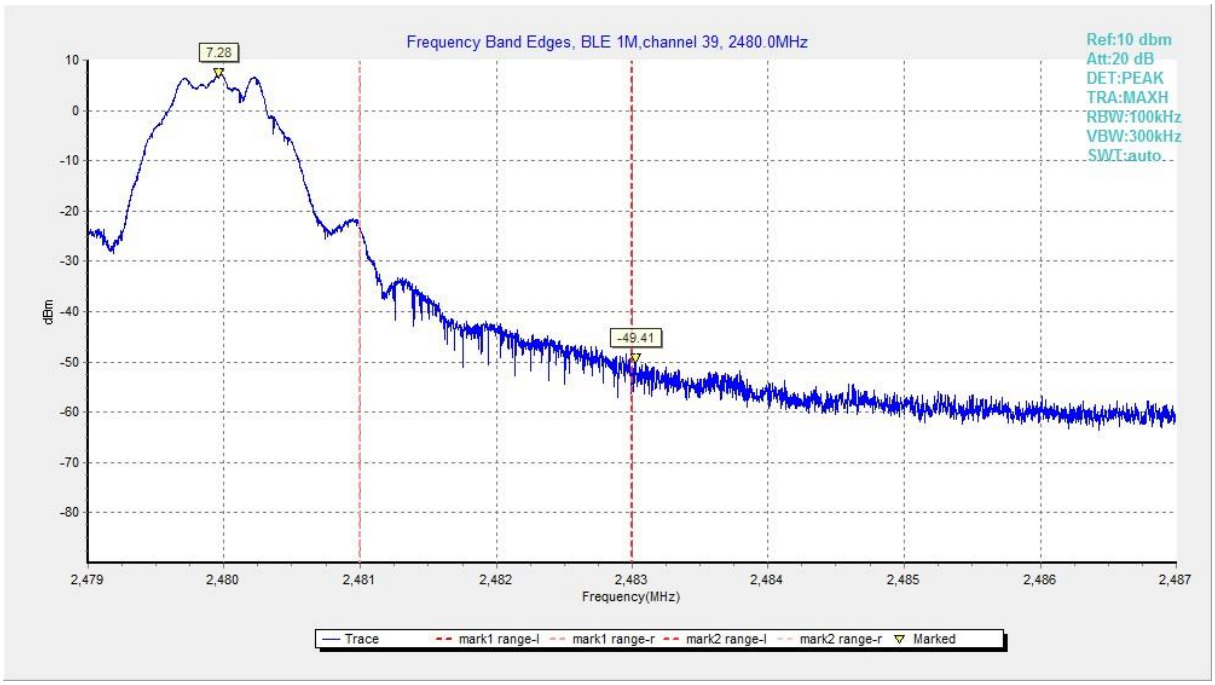


Fig.2 Band Edges (Ch 39), LE 1M

A.5 Transmitter Spurious Emission - Conducted

Method of Measurement: See ANSI C63.10-clause 11.11.2&11.11.3

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247 (d) & RSS-247 section 5.5/RSS-Gen section 6.13	20dB below peak output power in 100kHz bandwidth

Measurement Results:

Qualcomm module:

Mode	Frequency (MHz)	Frequency Range	Test Results	Conclusion
LE-1M	2402 (CH0)	1 GHz ~ 3 GHz	Fig.1	P
		3 GHz ~ 10 GHz	Fig.2	P
	2440 (CH19)	1 GHz ~ 3 GHz	Fig.3	P
		3 GHz ~ 10 GHz	Fig.4	P
	2480 (CH39)	1 GHz ~ 3 GHz	Fig.5	P
		3 GHz ~ 10 GHz	Fig.6	P
	All channels	30 MHz ~ 1 GHz	Fig.7	P
		10 GHz ~ 26 GHz	Fig.8	P
LE-2M	2402 (CH0)	1 GHz ~ 3 GHz	Fig.9	P
		3 GHz ~ 10 GHz	Fig.10	P
	2440 (CH19)	1 GHz ~ 3 GHz	Fig.11	P
		3 GHz ~ 10 GHz	Fig.12	P
	2480 (CH39)	1 GHz ~ 3 GHz	Fig.13	P
		3 GHz ~ 10 GHz	Fig.14	P
	All channels	30 MHz ~ 1 GHz	Fig.15	P
		10 GHz ~ 26 GHz	Fig.16	P

Nordic module:

Mode	Frequency (MHz)	Frequency Range	Test Results	Conclusion
LE-1M	2402 (CH0)	1 GHz ~ 3 GHz	Fig.17	P
		3 GHz ~ 10 GHz	Fig.18	P
	2440 (CH19)	1 GHz ~ 3 GHz	Fig.19	P
		3 GHz ~ 10 GHz	Fig.20	P
	2480 (CH39)	1 GHz ~ 3 GHz	Fig.21	P
		3 GHz ~ 10 GHz	Fig.22	P
	All channels	30 MHz ~ 1 GHz	Fig.23	P
		10 GHz ~ 26 GHz	Fig.24	P

See below for test graphs.

Conclusion: Pass

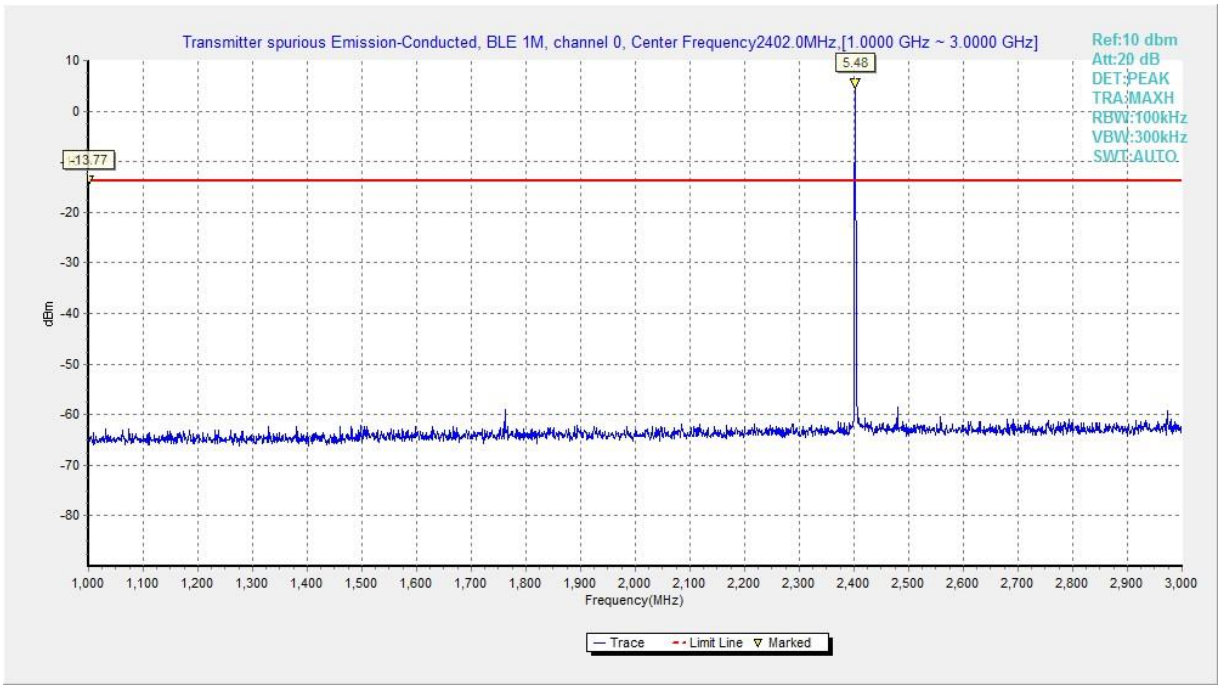


Fig.1 Conducted Spurious Emission (Ch0, 1 GHz-3 GHz), LE 1M

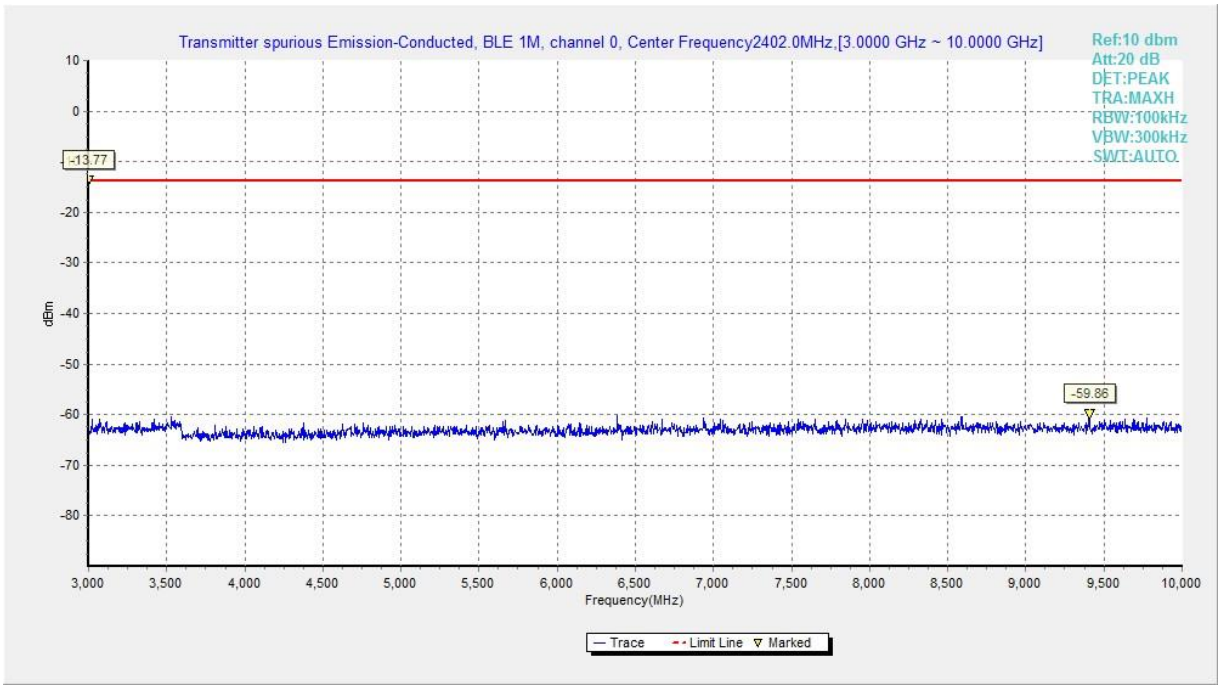


Fig.2 Conducted Spurious Emission (Ch0, 3 GHz-10 GHz), LE 1M

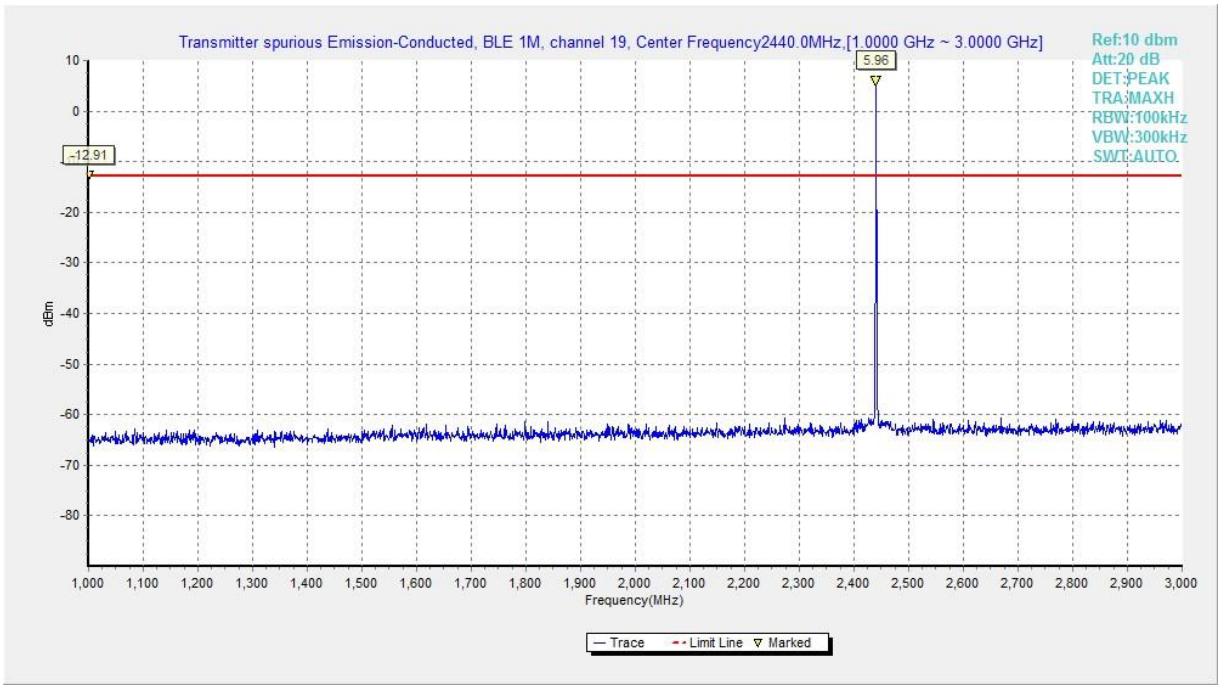


Fig.3 Conducted Spurious Emission (Ch19, 1 GHz-3 GHz), LE 1M

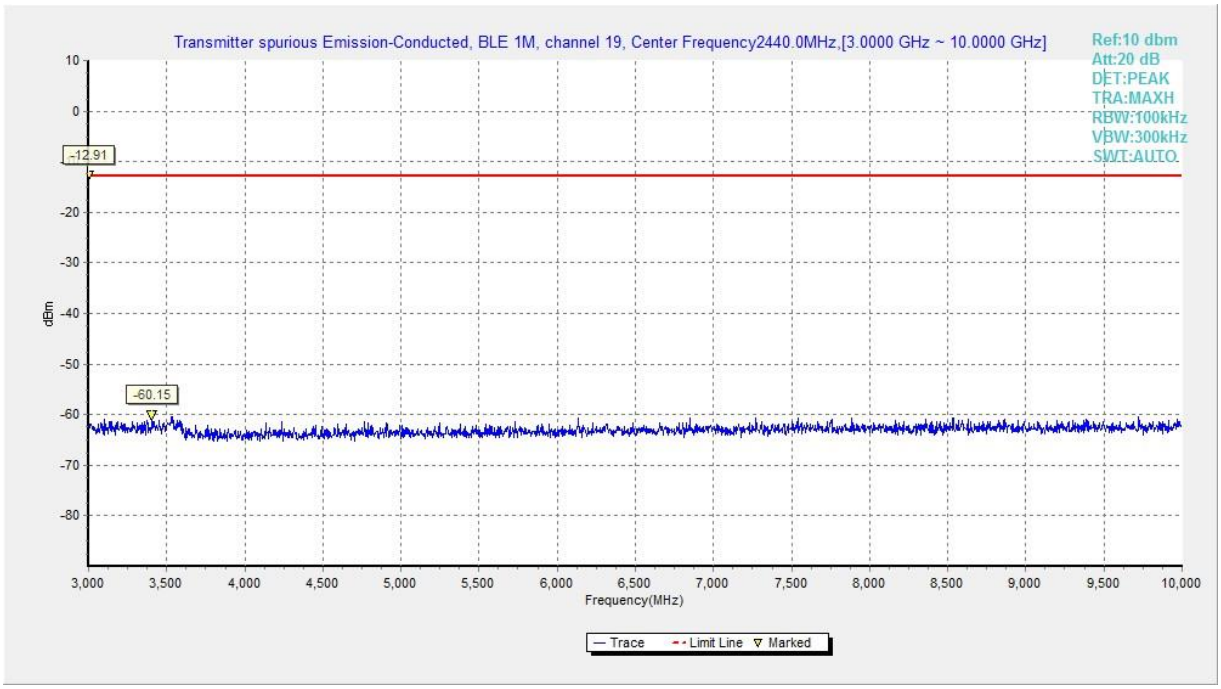


Fig.4 Conducted Spurious Emission (Ch19, 3 GHz-10 GHz), LE 1M

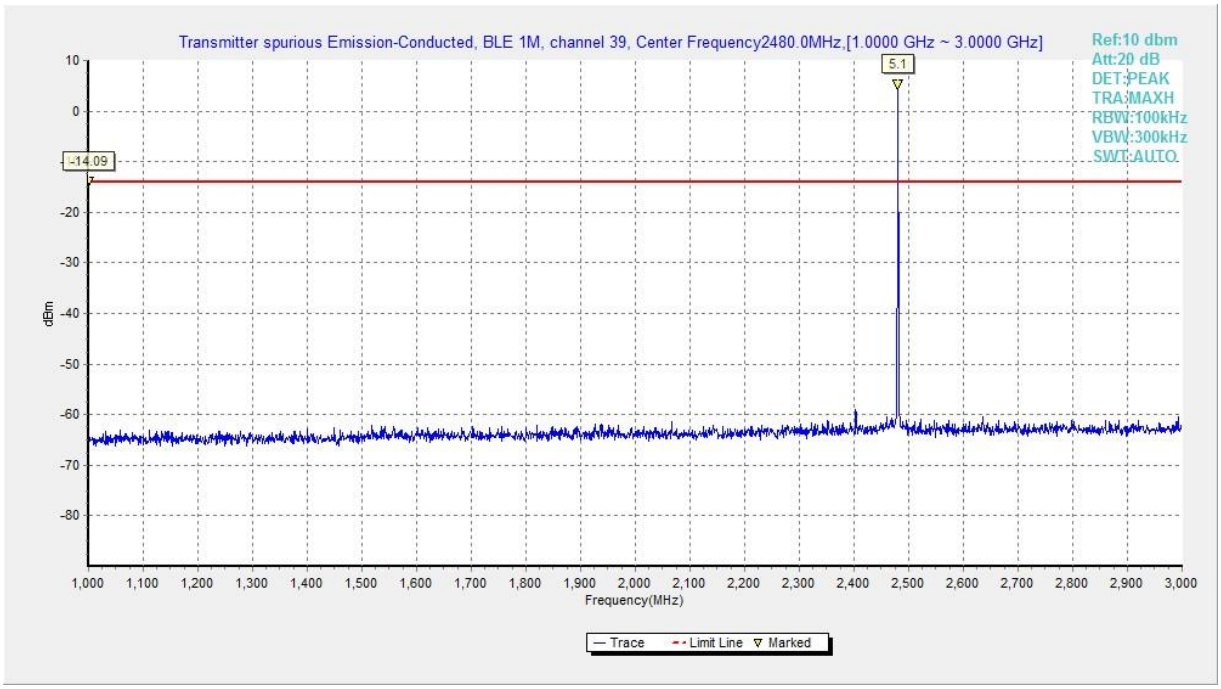


Fig.5 Conducted Spurious Emission (Ch39, 1 GHz-3 GHz), LE 1M

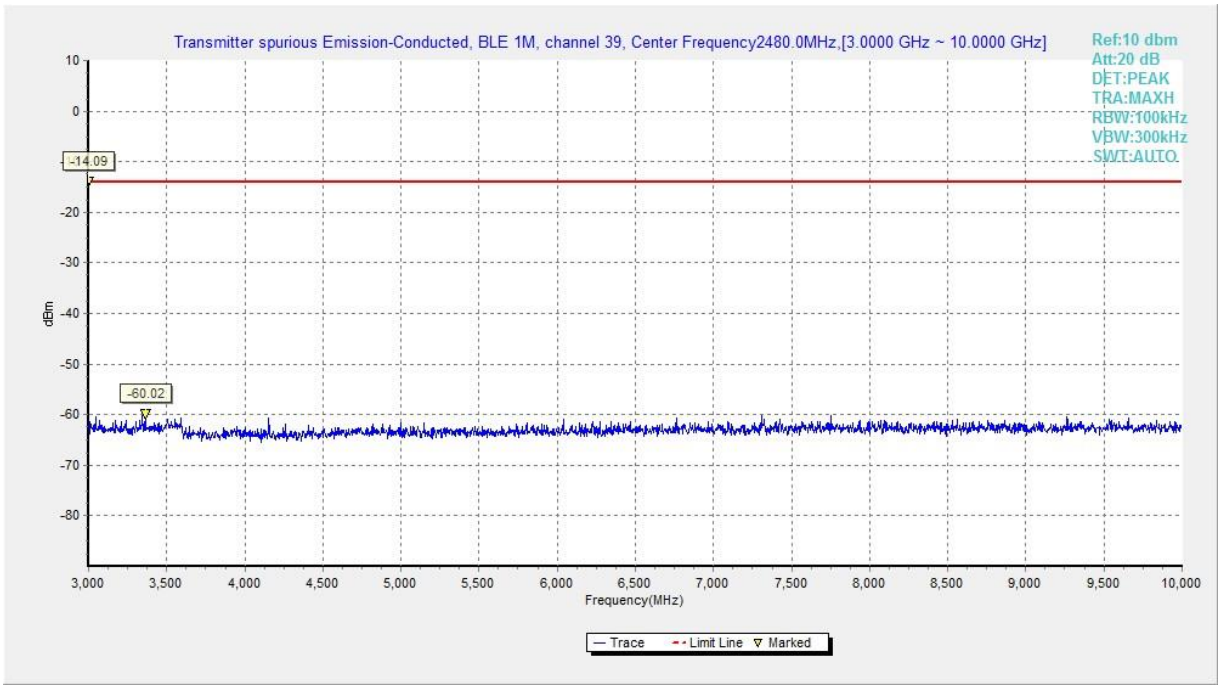


Fig.6 Conducted Spurious Emission (Ch39, 3 GHz-10 GHz), LE 1M

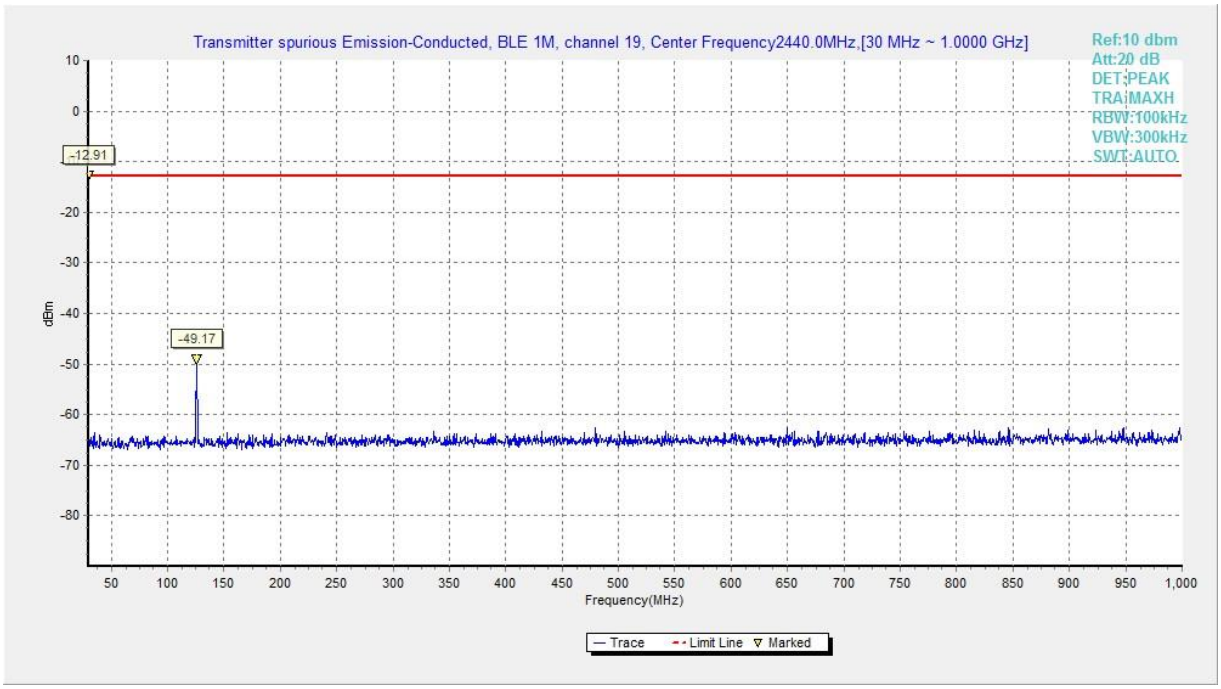


Fig.7 Conducted Spurious Emission (All channels, 30 MHz-1 GHz), LE 1M

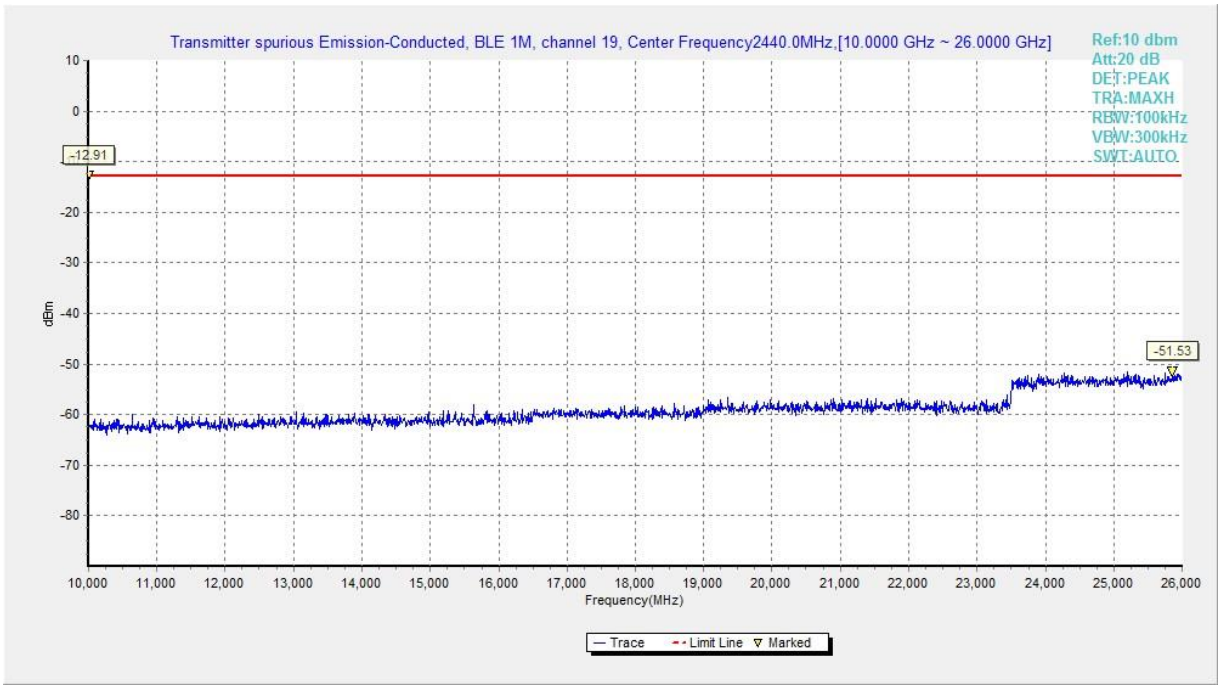


Fig.8 Conducted Spurious Emission (All channels, 10 GHz-26 GHz), LE 1M

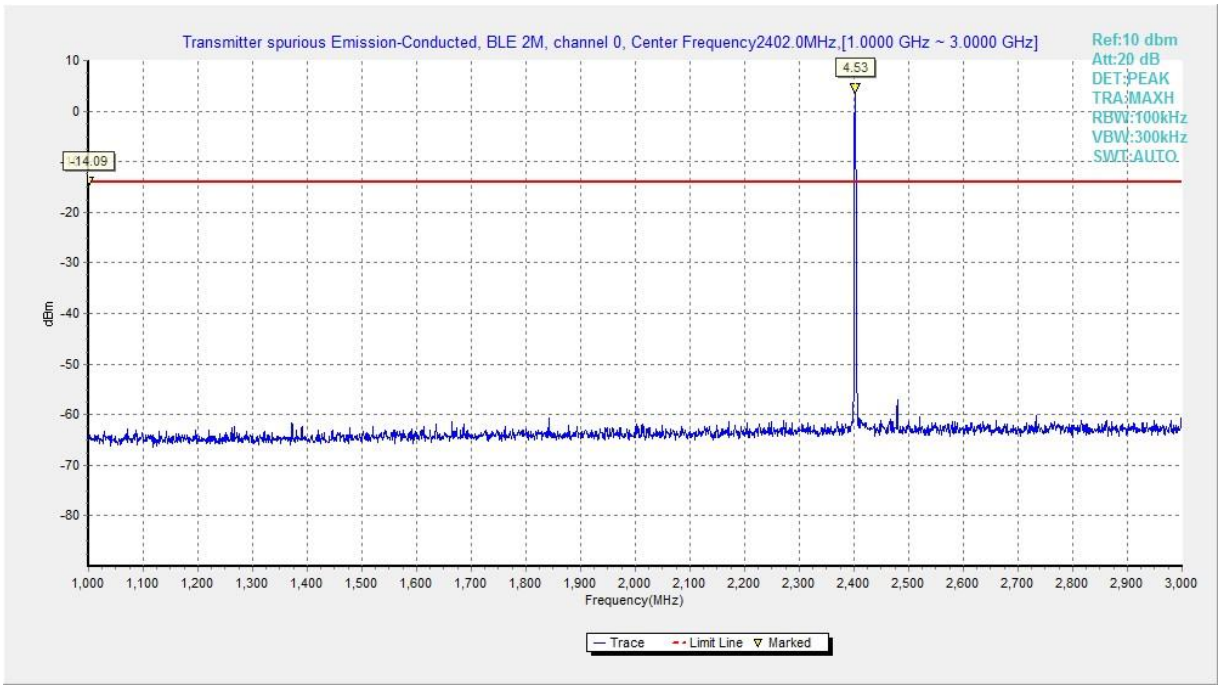


Fig.9 Conducted Spurious Emission (Ch0, 1 GHz-3 GHz), LE 2M

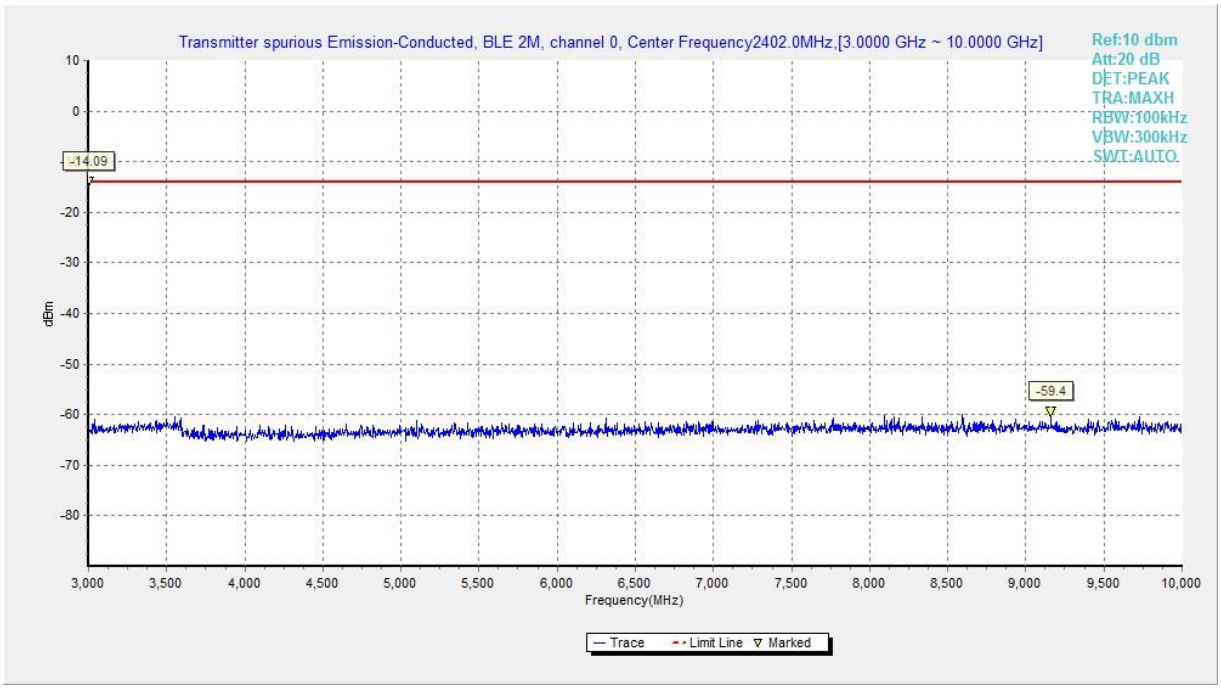


Fig.10 Conducted Spurious Emission (Ch0, 3 GHz-10 GHz), LE 2M

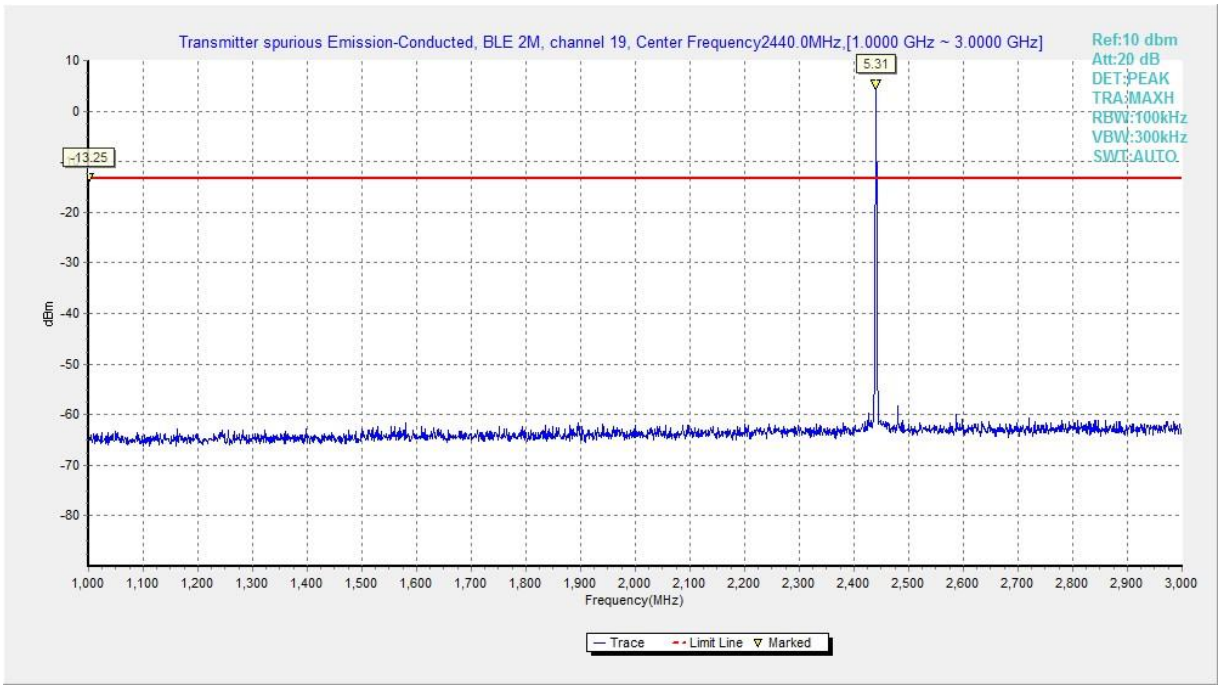


Fig.11 Conducted Spurious Emission (Ch19, 1 GHz-3 GHz), LE 2M

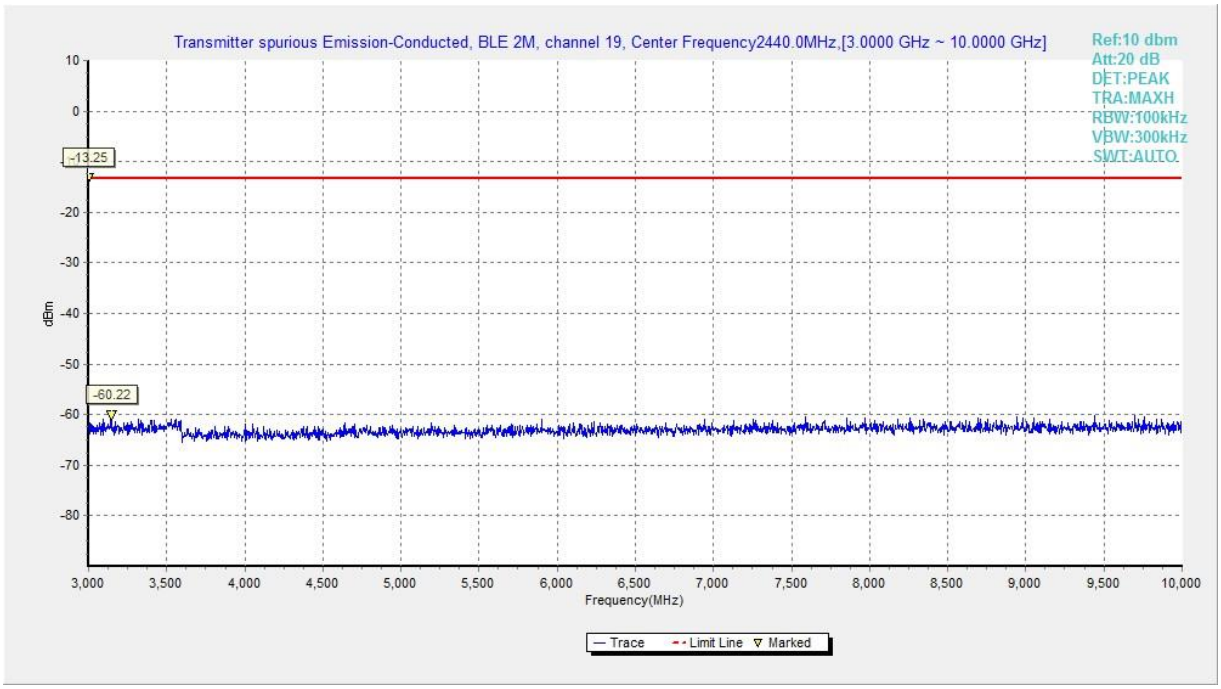


Fig.12 Conducted Spurious Emission (Ch19, 3 GHz-10 GHz), LE 2M

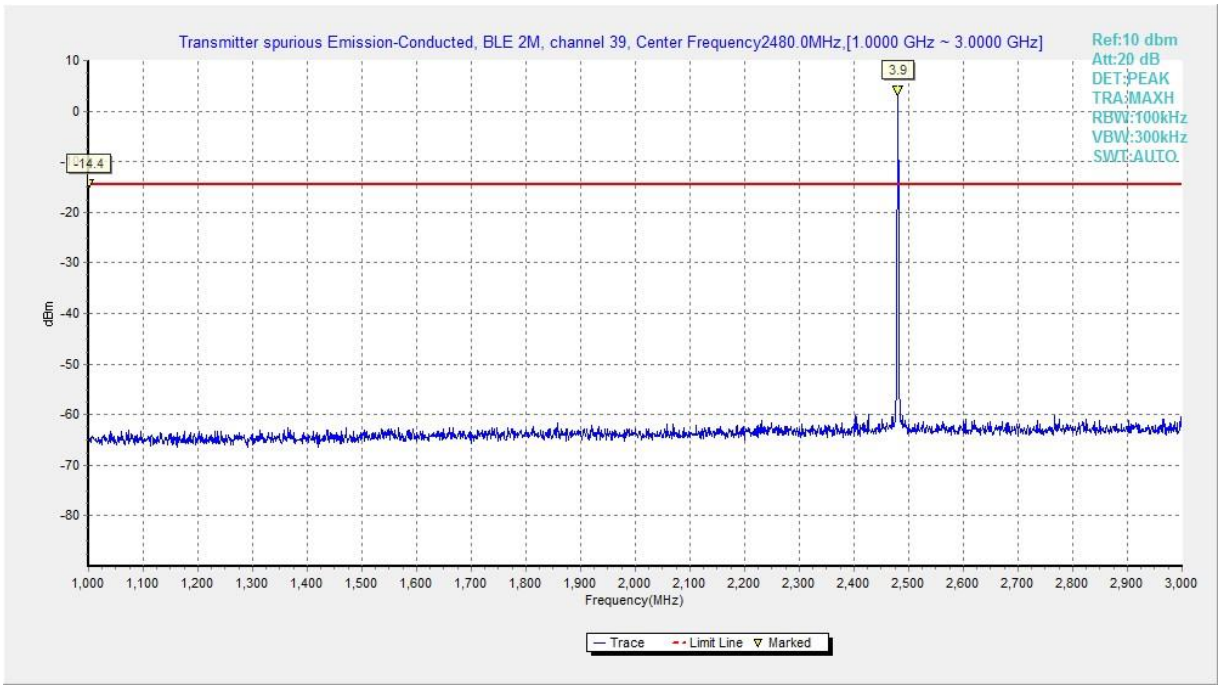


Fig.13 Conducted Spurious Emission (Ch39, 1 GHz-3 GHz), LE 2M

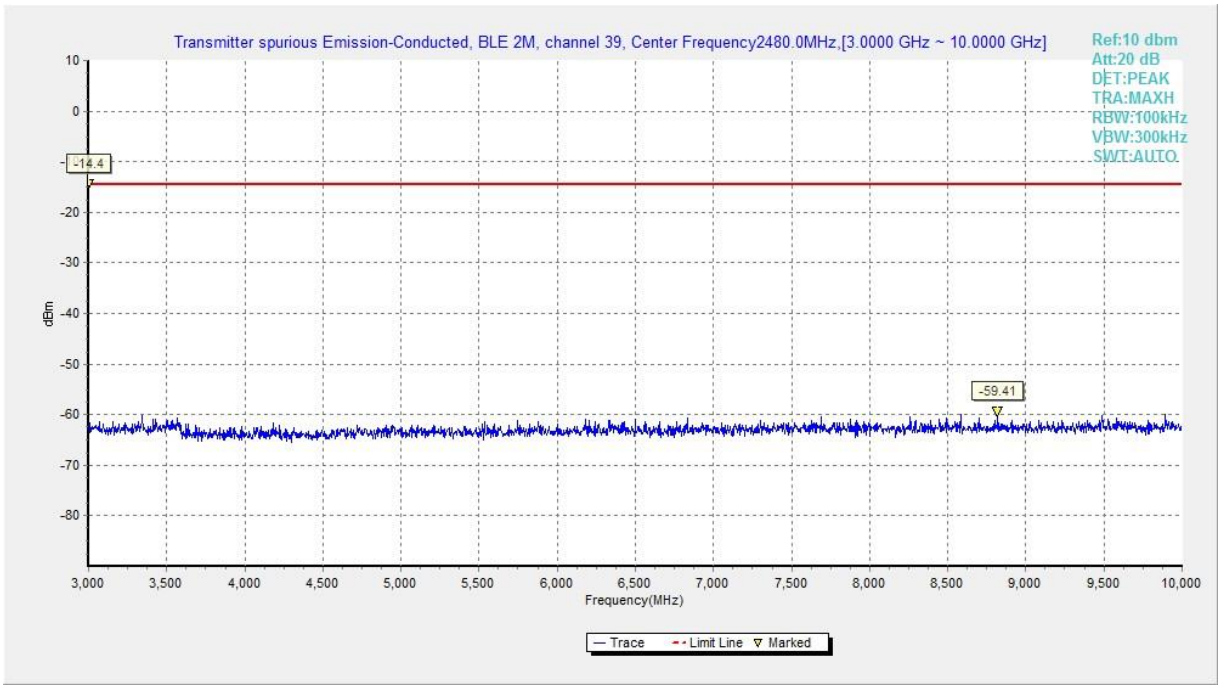


Fig.14 Conducted Spurious Emission (Ch39, 3 GHz-10 GHz), LE 2M

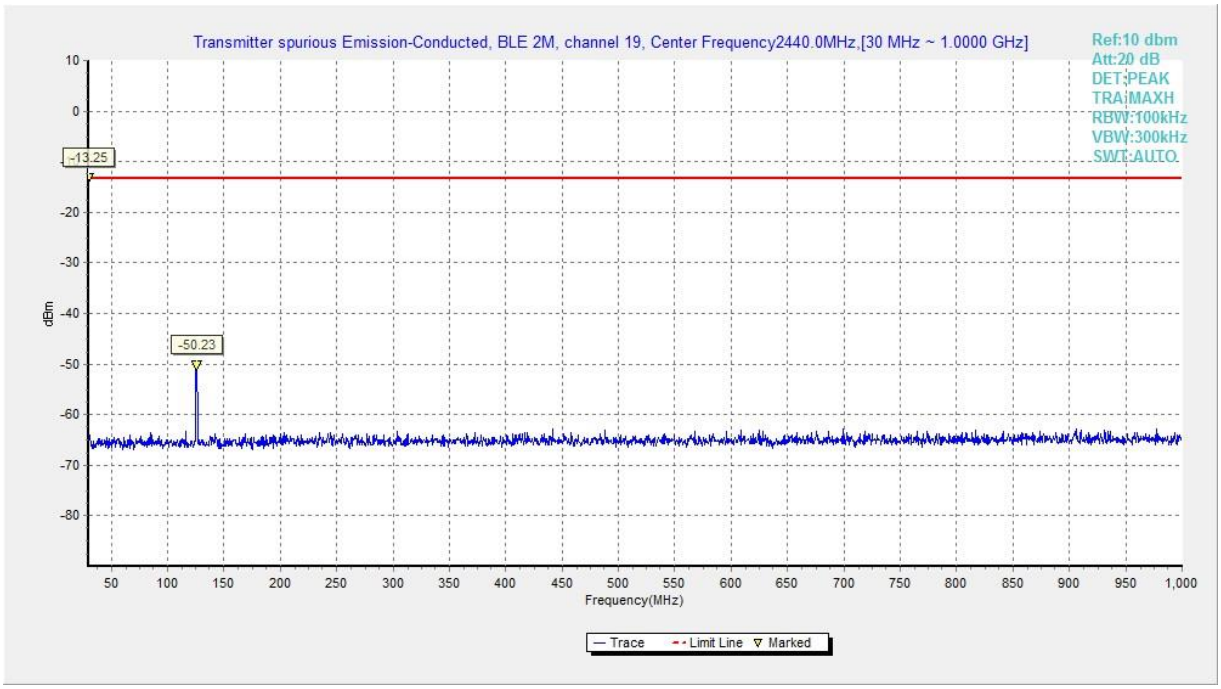


Fig.15 Conducted Spurious Emission (All channels, 30 MHz-1 GHz), LE 2M

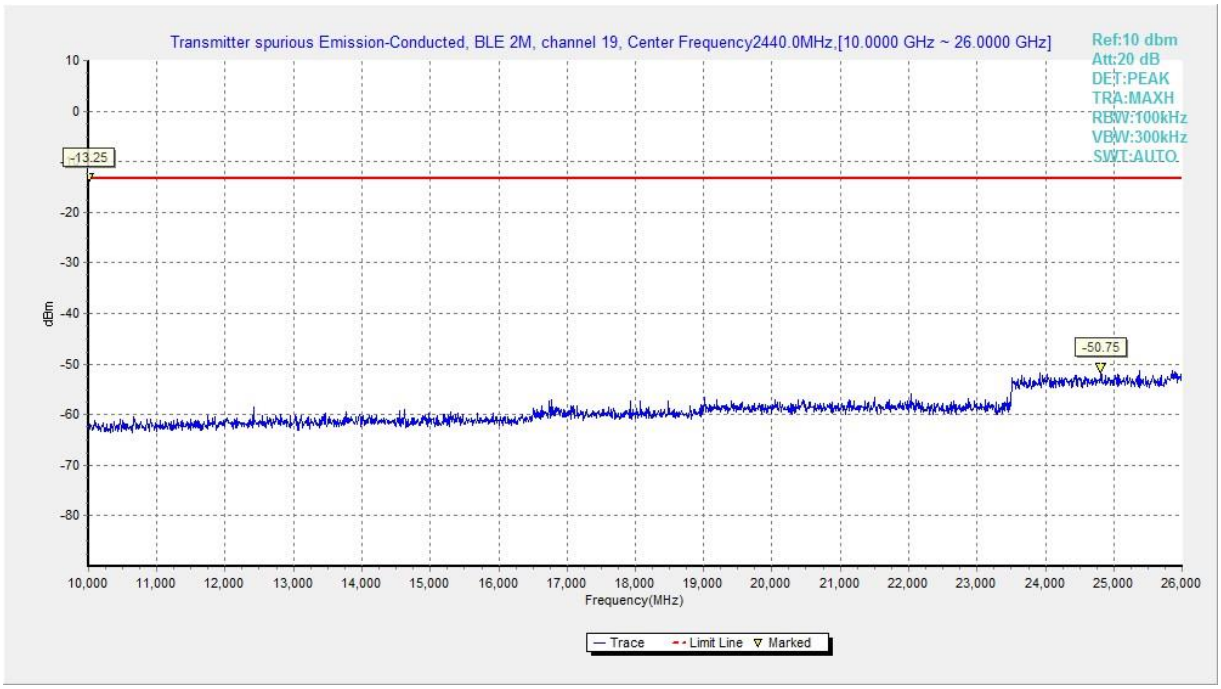


Fig.16 Conducted Spurious Emission (All channels, 10 GHz-26 GHz), LE 2M

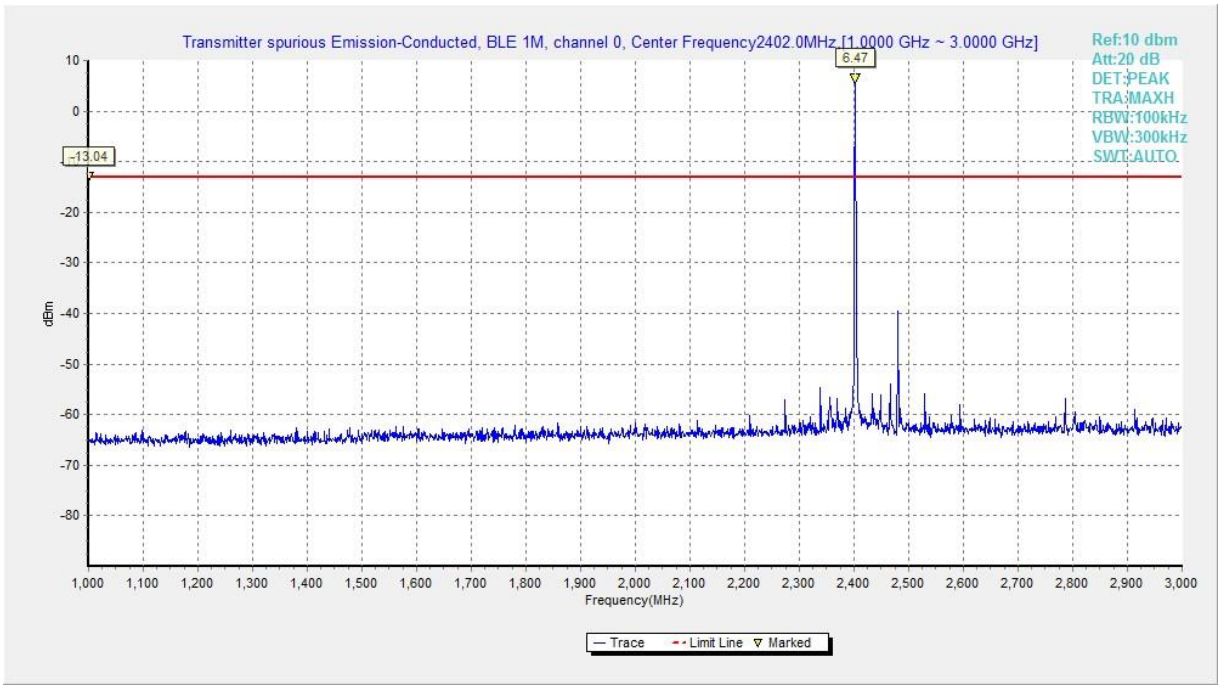


Fig.17 Conducted Spurious Emission (Ch0, 1 GHz-3 GHz), LE 1M

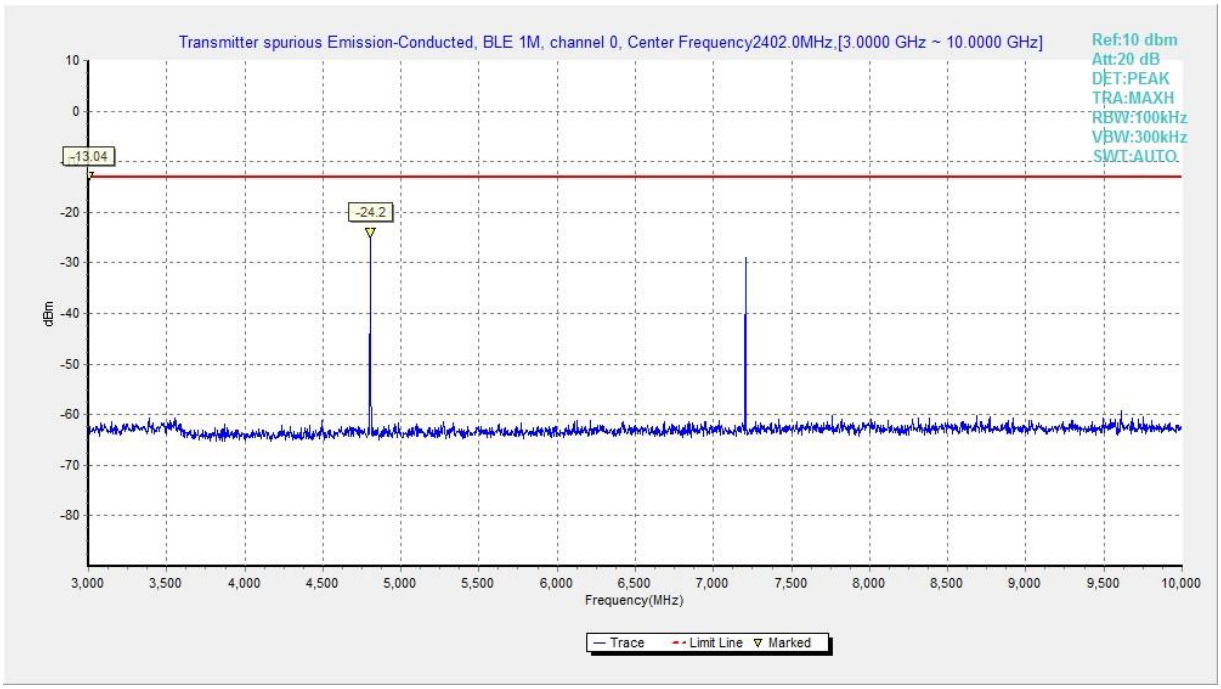


Fig.18 Conducted Spurious Emission (Ch0, 3 GHz-10 GHz), LE 1M

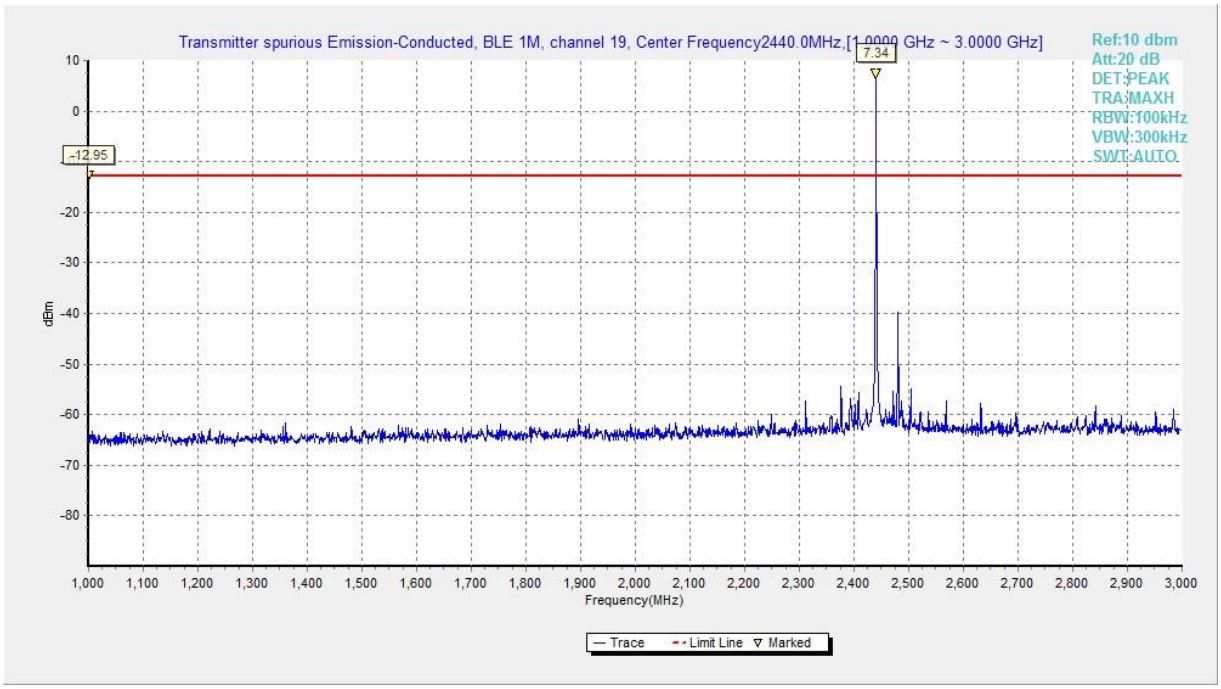


Fig.19 Conducted Spurious Emission (Ch19, 1 GHz-3 GHz), LE 1M

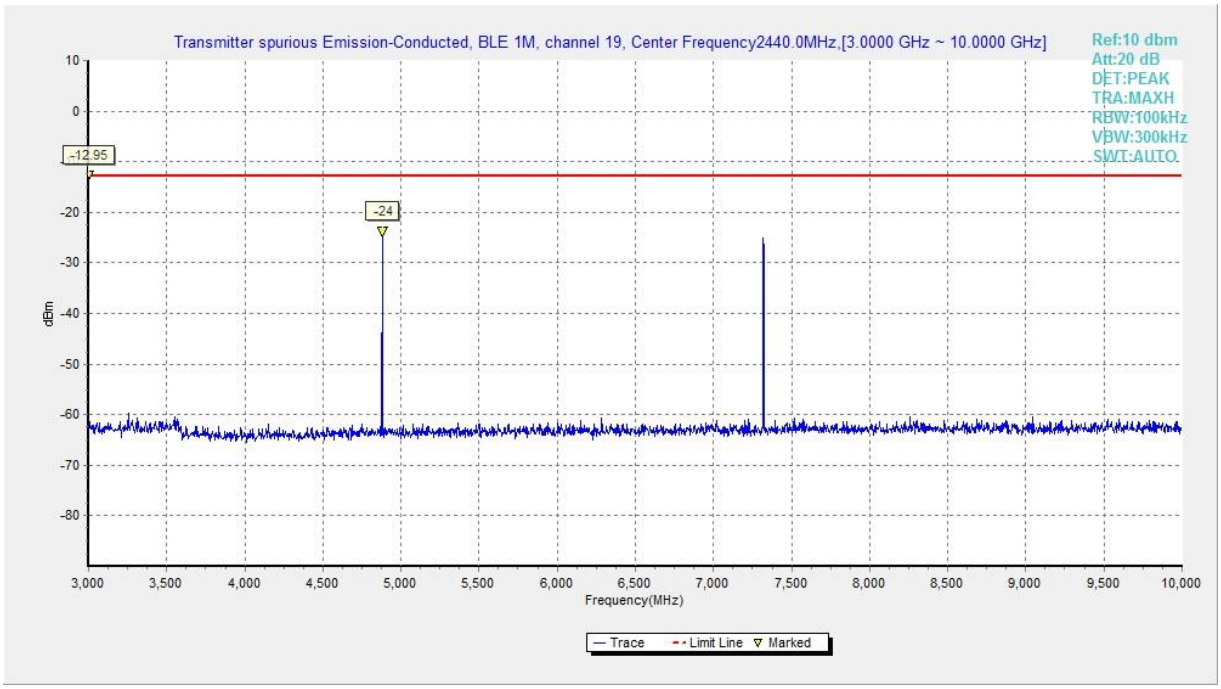


Fig.20 Conducted Spurious Emission (Ch19, 3 GHz-10 GHz), LE 1M

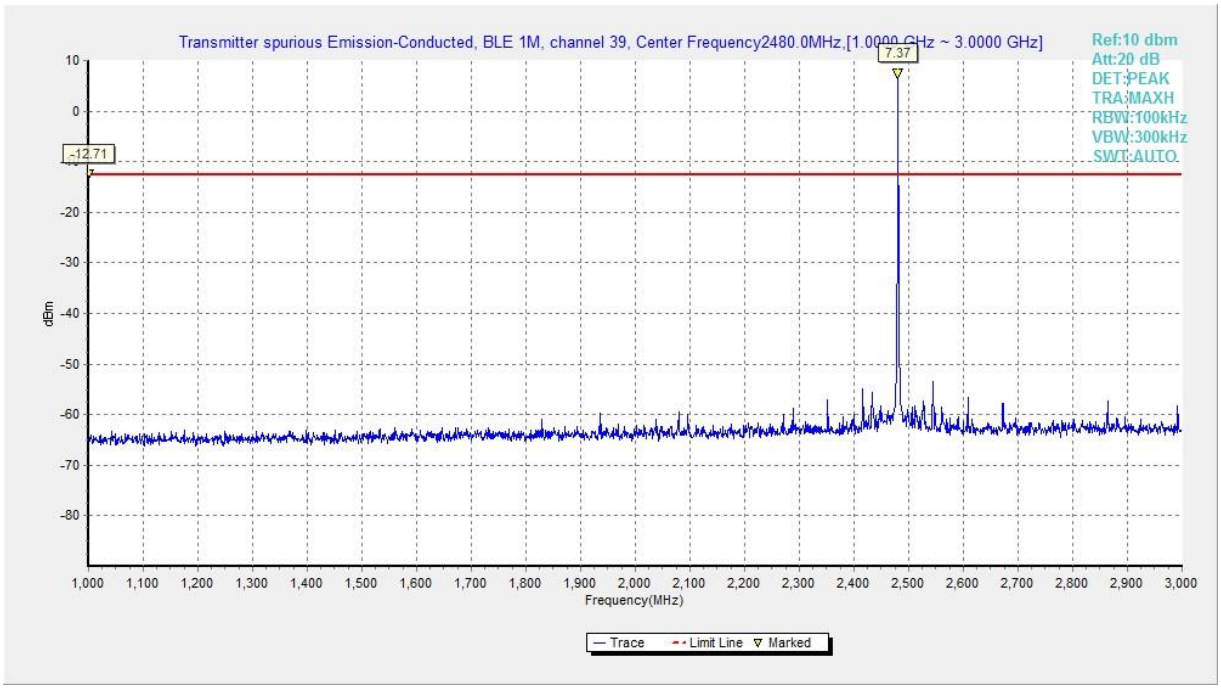


Fig.21 Conducted Spurious Emission (Ch39, 1 GHz-3 GHz), LE 1M

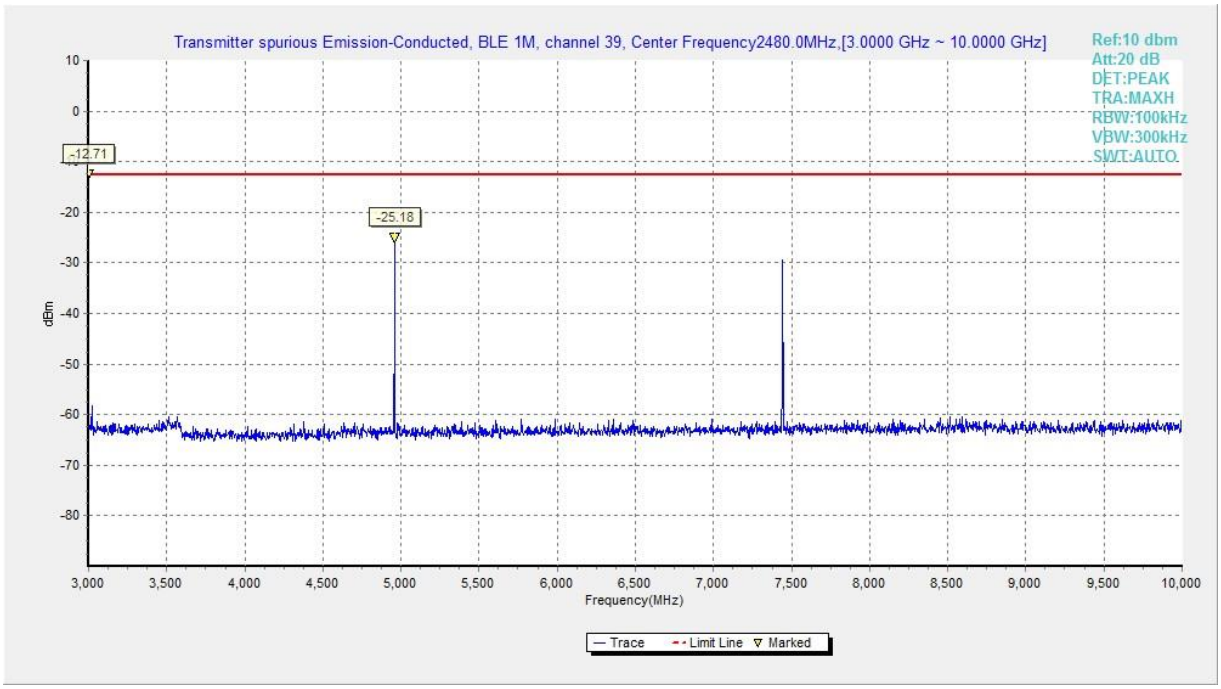


Fig.22 Conducted Spurious Emission (Ch39, 3 GHz-10 GHz), LE 1M

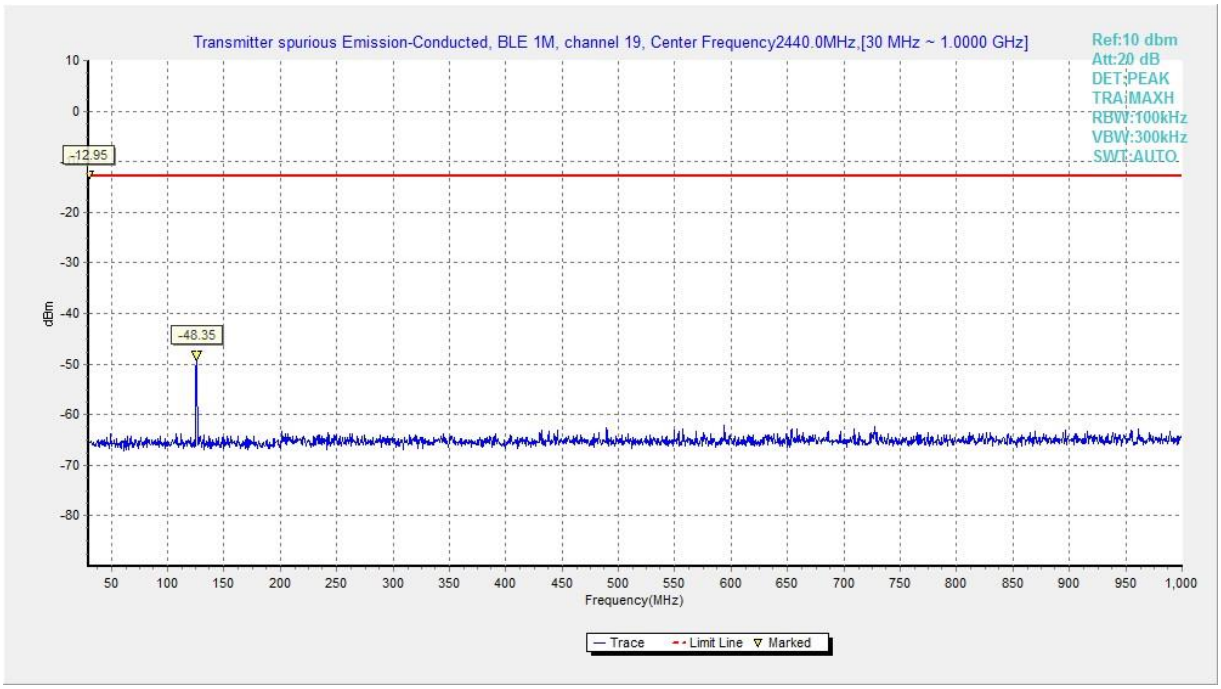


Fig.23 Conducted Spurious Emission (All channels, 30 MHz-1 GHz), LE 1M

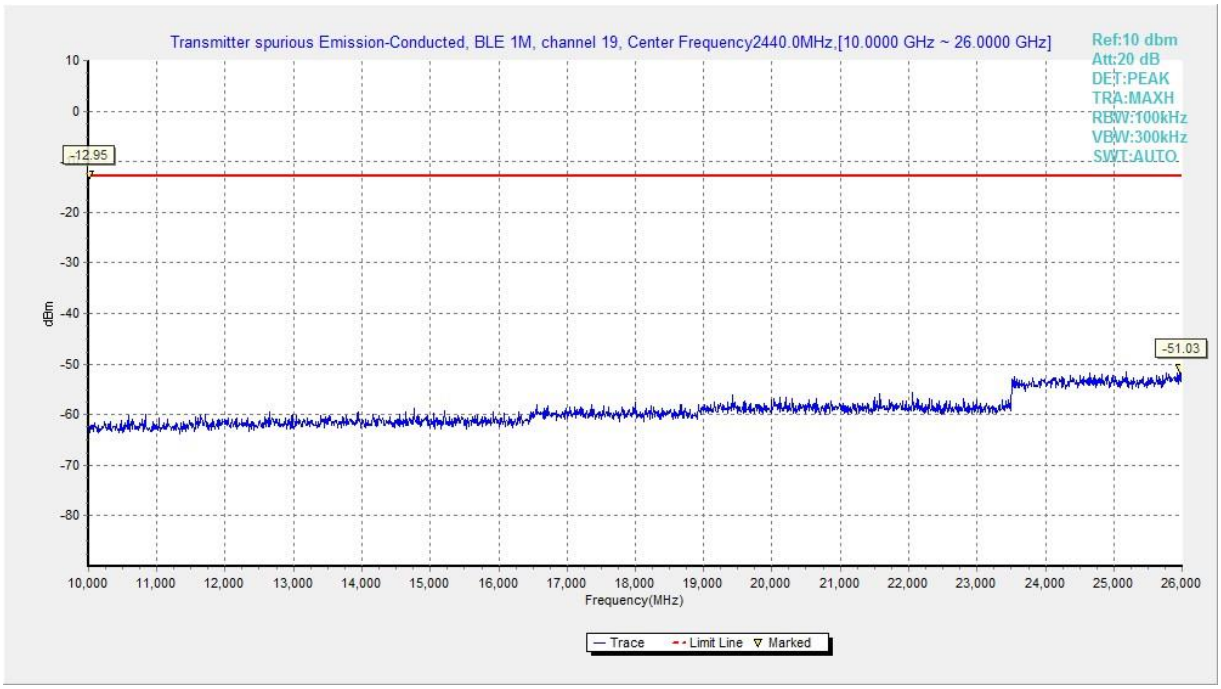


Fig.24 Conducted Spurious Emission (All channels, 10 GHz-26 GHz), LE 1M

A.6 Transmitter Spurious Emission - Radiated

Method of Measurement: See ANSI C63.10-clause 11.11&11.12.

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247, 15.205, 15.209 & RSS-247 section 5.5/RSS-Gen section 6.13	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:

Qualcomm module:

Mode	Frequency (MHz)	Frequency Range	Test Results	Conclusion
LE-1M	2402(CH0)	1 GHz ~ 18 GHz	Fig.1	**P**
	2440(CH19)	9 kHz ~ 30 MHz	Fig.2	**P**
		30 MHz ~ 1 GHz	Fig.3	**P**
		1 GHz ~ 18 GHz	Fig.4	**P**
		18 GHz ~ 26.5 GHz	Fig.5	**P**
	2480(CH39)	1 GHz ~ 18 GHz	Fig.6	**P**
	Restricted Band (CH0)	2.38 GHz ~ 2.45 GHz	Fig.7	**P**
	Restricted Band (CH39)	2.45 GHz ~ 2.5 GHz	Fig.8	**P**
LE-2M	2402(CH0)	1 GHz ~ 18 GHz	Fig.9	**P**
	2440(CH19)	9 kHz ~ 30 MHz	Fig.10	**P**
		30 MHz ~ 1 GHz	Fig.11	**P**
		1 GHz ~ 18 GHz	Fig.12	**P**
		18 GHz ~ 26.5 GHz	Fig.13	**P**
	2480(CH39)	1 GHz ~ 18 GHz	Fig.14	**P**
	Restricted Band (CH0)	2.38 GHz ~ 2.45 GHz	Fig.15	**P**
	Restricted Band (CH39)	2.45 GHz ~ 2.5 GHz	Fig.16	**P**

Nordic module:

Mode	Frequency (MHz)	Frequency Range	Test Results	Conclusion
LE-1M	2402(CH0)	1 GHz ~ 18 GHz	Fig.17	**P**
	2440(CH19)	9 kHz ~ 30 MHz	Fig.18	**P**
		30 MHz ~ 1 GHz	Fig.19	**P**
		1 GHz ~ 18 GHz	Fig.20	**P**
		18 GHz ~ 26.5 GHz	Fig.21	**P**
	2480(CH39)	1 GHz ~ 18 GHz	Fig.22	**P**
	Restricted Band (CH0)	2.38 GHz ~ 2.45 GHz	Fig.23	**P**
	Restricted Band (CH39)	2.45 GHz ~ 2.5 GHz	Fig.24	**P**

See below for test graphs.

Conclusion: Pass

Worst Case Result

Qualcomm module:

LE-1M CH19 (1-18GHz)

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
7944.428572	44.48	74.00	29.52	H	6.0
9516.428572	45.85	74.00	28.15	H	7.1
10864.285714	47.01	74.00	26.99	H	9.3
12274.285714	48.84	74.00	25.16	H	11.0
14789.571429	49.78	74.00	24.22	H	12.8
16838.142857	54.38	74.00	19.62	V	17.9

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
7944.428572	36.31	54.00	17.69	H	6.0
9516.428572	36.37	54.00	17.63	H	7.1
10864.285714	36.77	54.00	17.23	H	9.3
12274.285714	38.13	54.00	15.87	H	11.0
14789.571429	39.82	54.00	14.18	H	12.8
16838.142857	43.90	54.00	10.10	V	17.9

LE-2M CH19 (1-18GHz)

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
4583.700000	46.89	74.00	27.11	V	4.6
5975.400000	47.36	74.00	26.64	H	4.9
8924.142857	45.52	74.00	28.48	H	6.5
12642.857143	48.09	74.00	25.91	H	11.2
16836.857143	53.50	74.00	20.50	V	17.9
17989.285714	54.54	74.00	19.46	H	19.2

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
4583.700000	34.56	54.00	19.44	V	4.6
5975.400000	35.61	54.00	18.39	H	4.9
8924.142857	34.31	54.00	20.69	H	6.5
12642.857143	36.63	54.00	18.37	H	11.2
16836.857143	41.68	54.00	12.32	V	17.9
17989.285714	42.76	54.00	11.24	H	19.2

Nordic module:

LE-1M CH19 (1-18GHz)

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
4625.700000	46.53	74.00	27.47	V	4.7
7317.857143	45.90	74.00	28.10	H	5.1
11931.857143	47.11	74.00	26.89	H	10.2
14936.142857	50.95	74.00	23.05	V	12.9
17051.142857	54.64	74.00	19.36	V	18.5
17880.857143	54.26	74.00	19.74	H	18.8

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
4625.700000	34.46	54.00	19.54	V	4.7
7317.857143	32.27	54.00	21.73	H	5.1
11931.857143	34.59	54.00	19.41	H	10.2
14936.142857	38.11	54.00	15.89	V	12.9
17051.142857	41.52	54.00	12.48	V	18.5
17880.857143	41.53	54.00	12.47	H	18.8

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

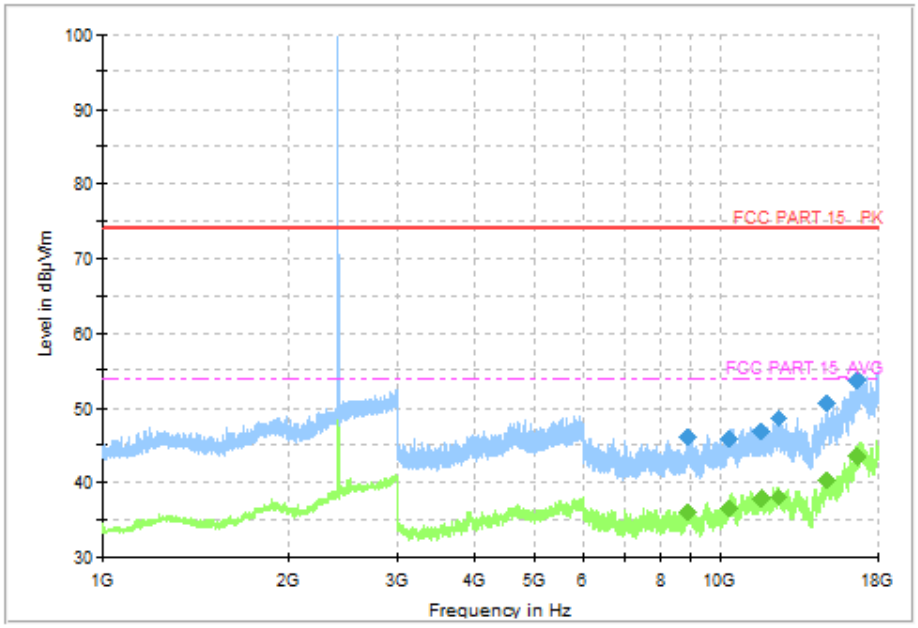


Fig.1 Radiated Spurious Emission (Ch0, 1 GHz - 18 GHz), 1M

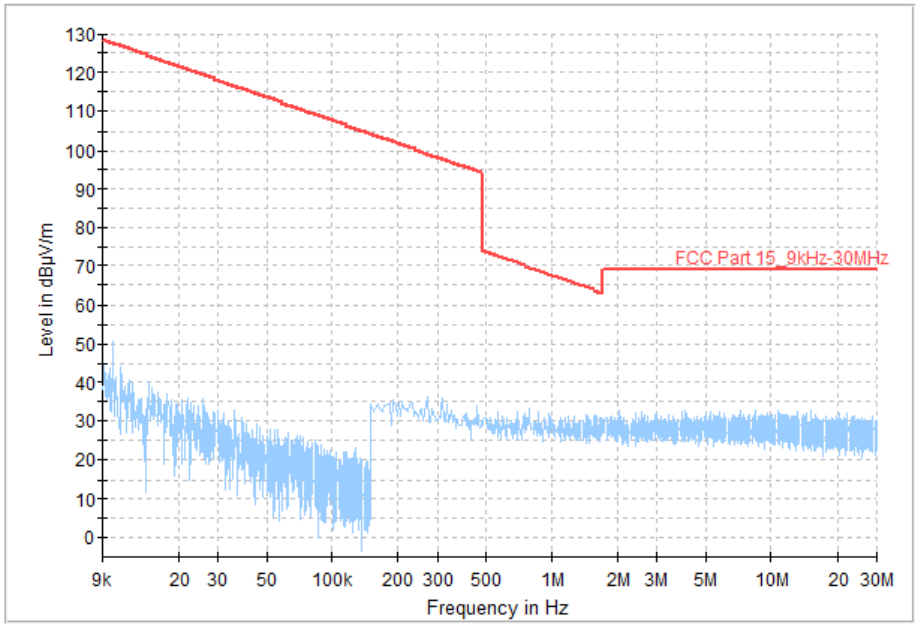


Fig.2 Radiated Spurious Emission (Ch19, 9 kHz - 30 MHz), 1M

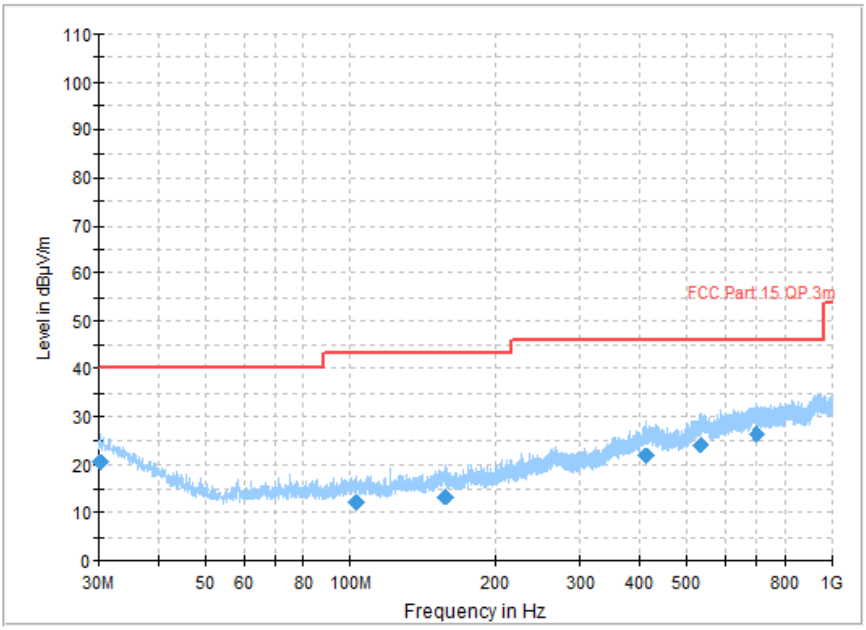


Fig.3 Radiated Spurious Emission (Ch19, 30 MHz - 1 GHz), 1M

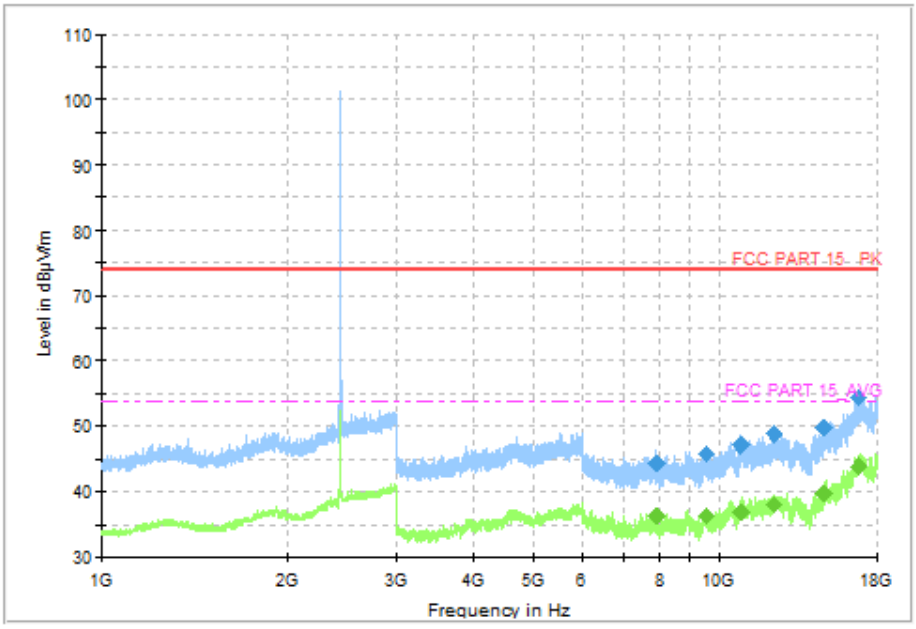


Fig.4 Radiated Spurious Emission (Ch19, 1 GHz - 18 GHz), 1M

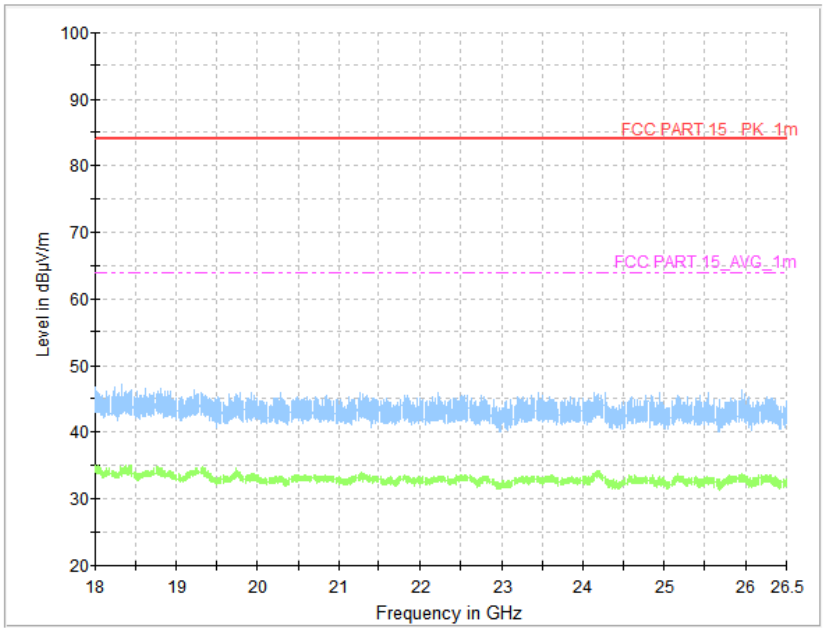


Fig.5 Radiated Spurious Emission (Ch19, 18 GHz - 26.5 GHz), 1M

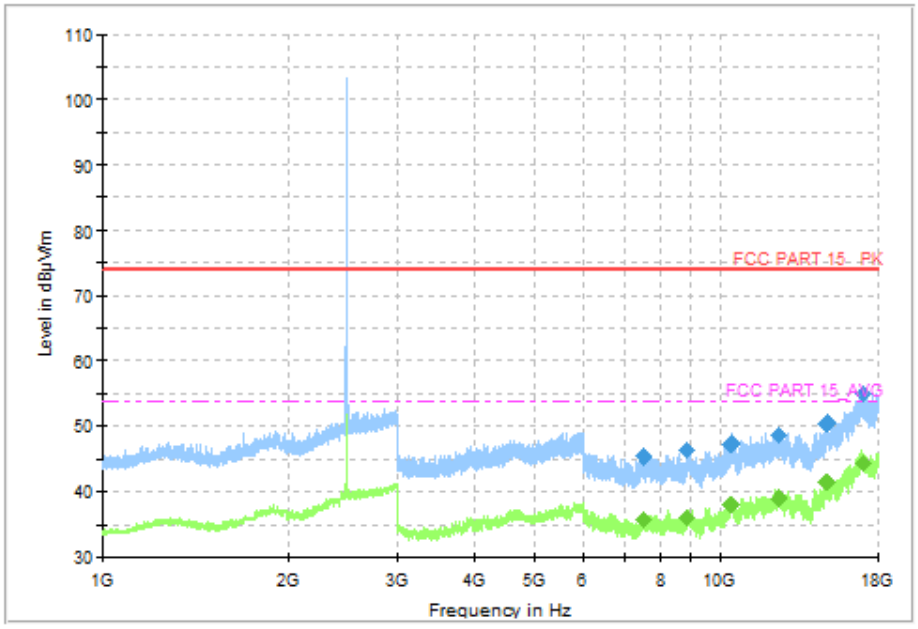


Fig.6 Radiated Spurious Emission (Ch39, 1 GHz - 18 GHz), 1M

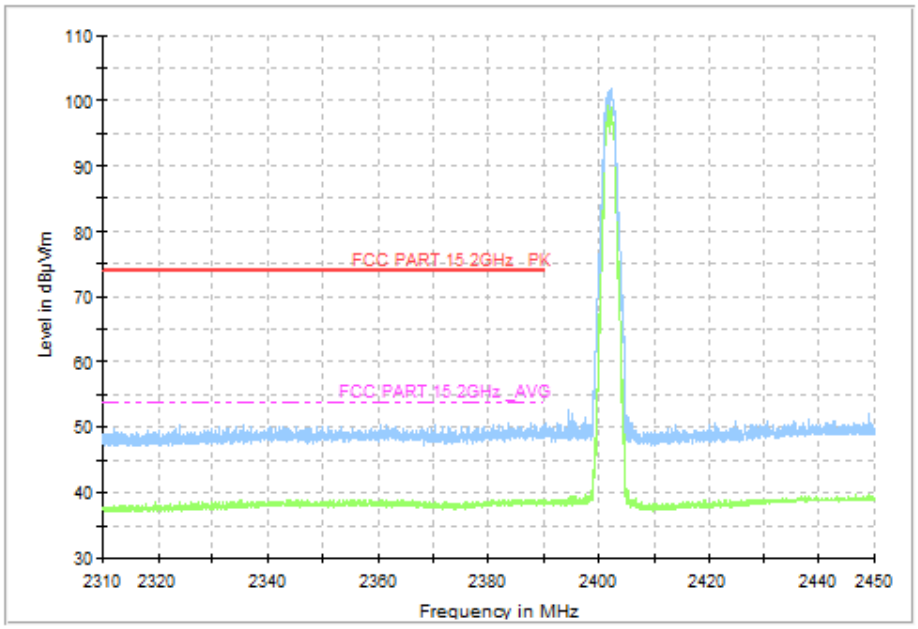


Fig.7 Radiated Band Edges (Ch0, 2.380GHz - 2.450GHz), 1M

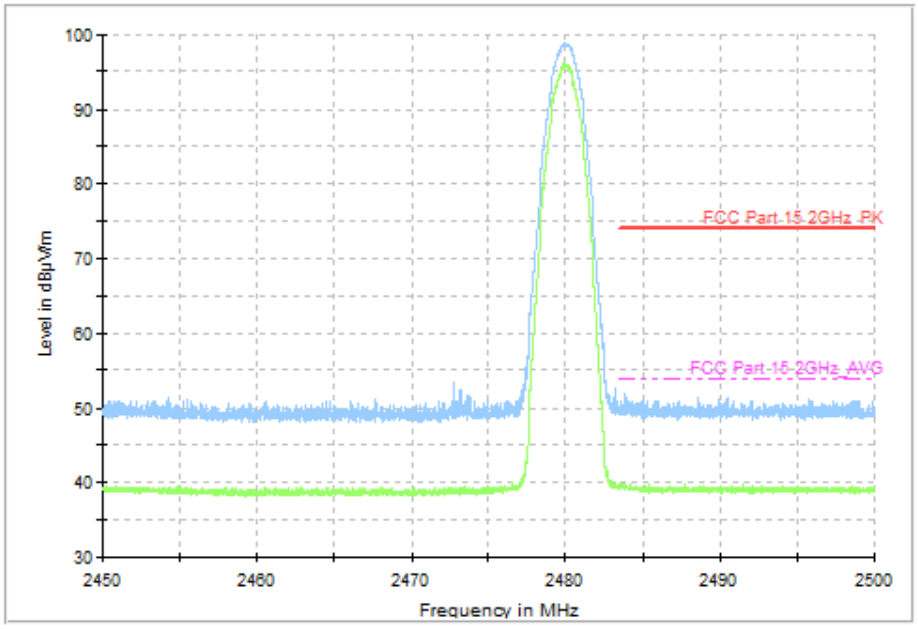


Fig.8 Radiated Band Edges (Ch39, 2.450GHz - 2.500GHz), 1M

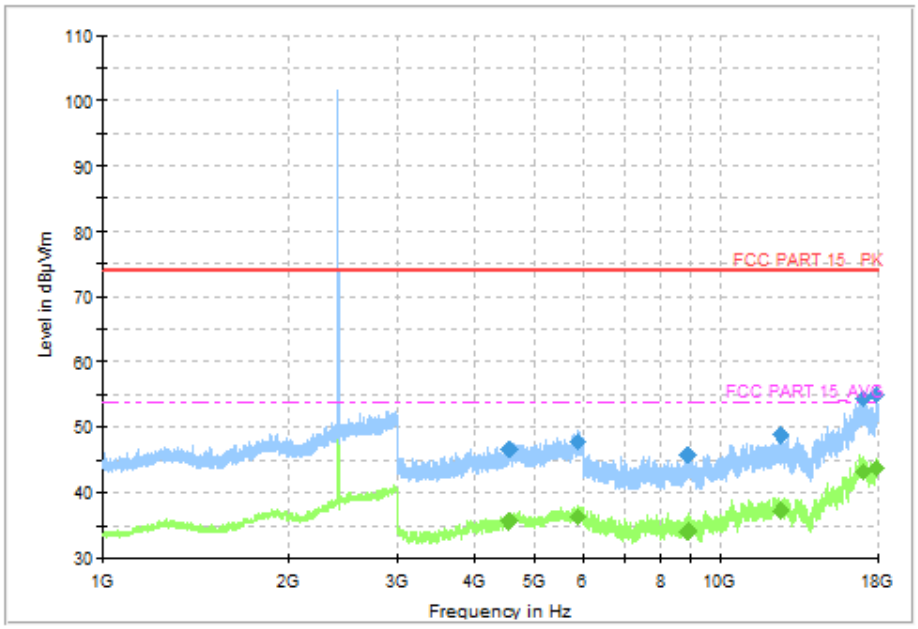


Fig.9 Radiated Spurious Emission (Ch0, 1 GHz - 18 GHz), 2M

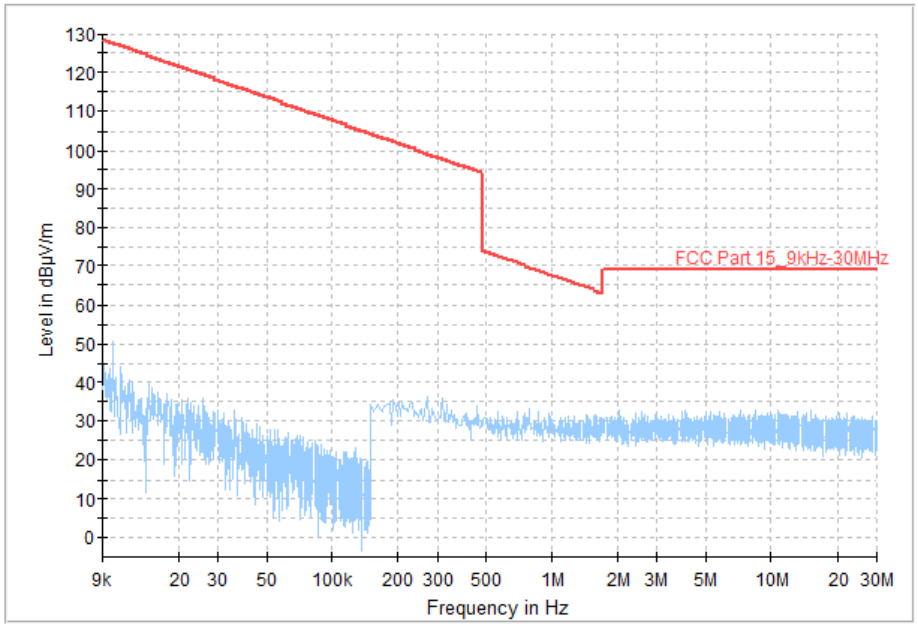


Fig.10 Radiated Spurious Emission (Ch19, 9 kHz - 30 MHz), 2M

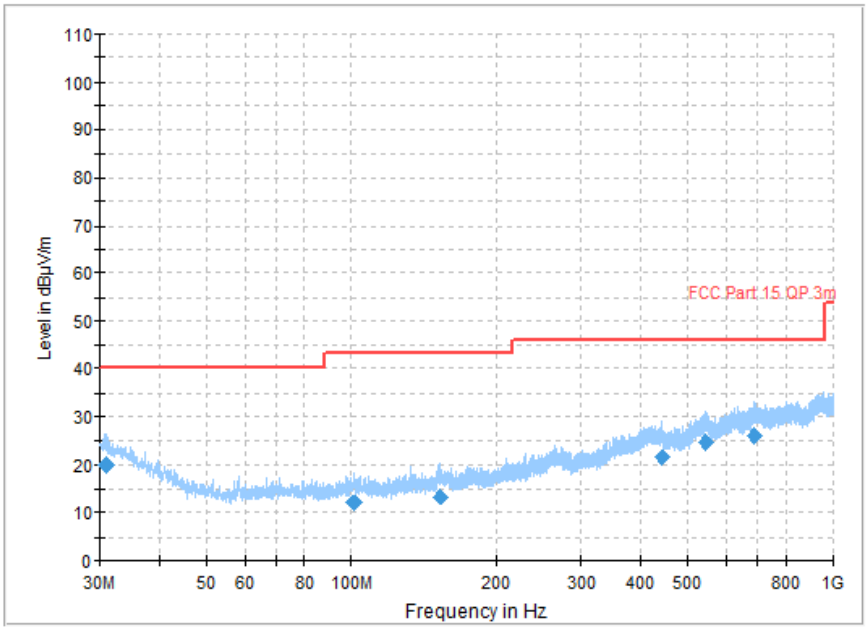


Fig.11 Radiated Spurious Emission (Ch19, 30 MHz - 1 GHz), 2M

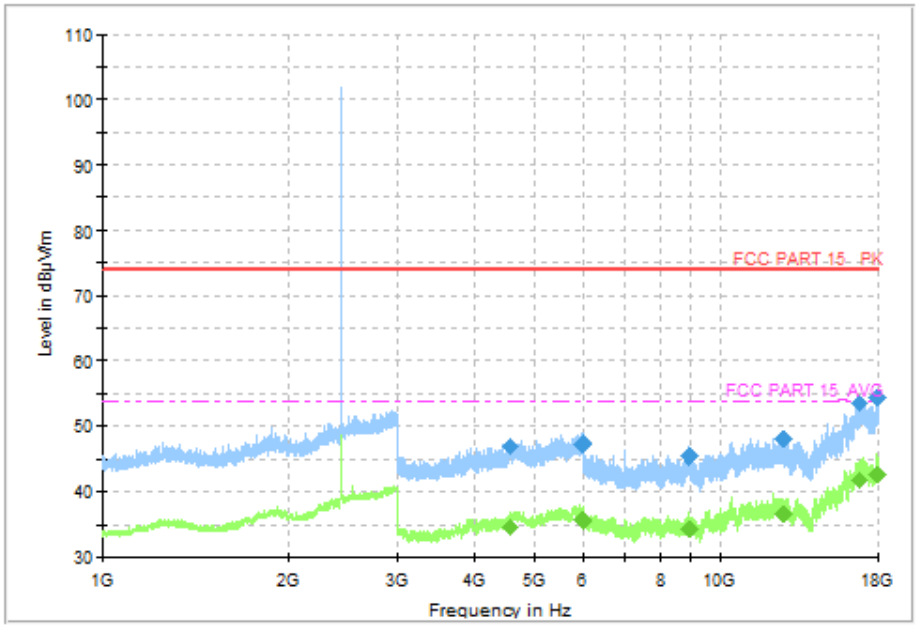


Fig.12 Radiated Spurious Emission (Ch19, 1 GHz - 18 GHz), 2M

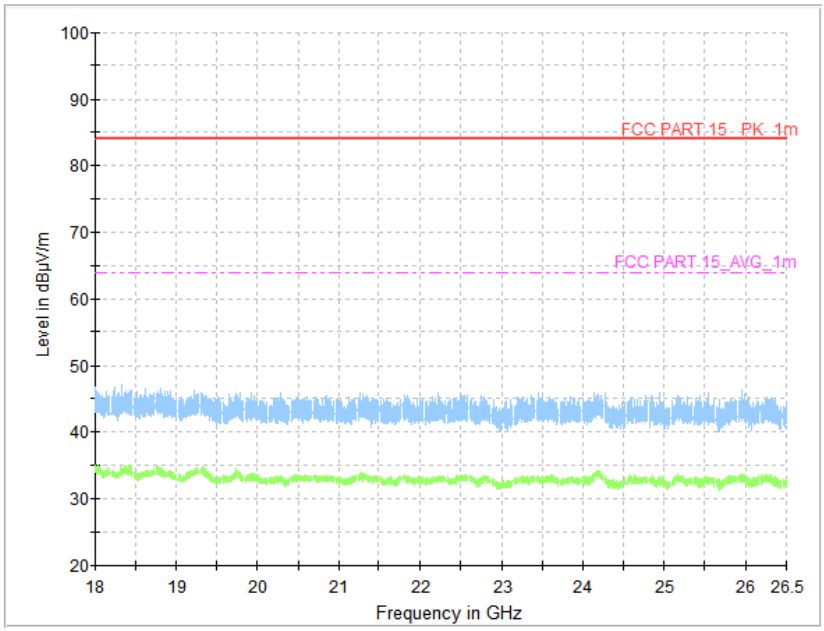


Fig.13 Radiated Spurious Emission (Ch19, 18 GHz - 26.5 GHz), 2M

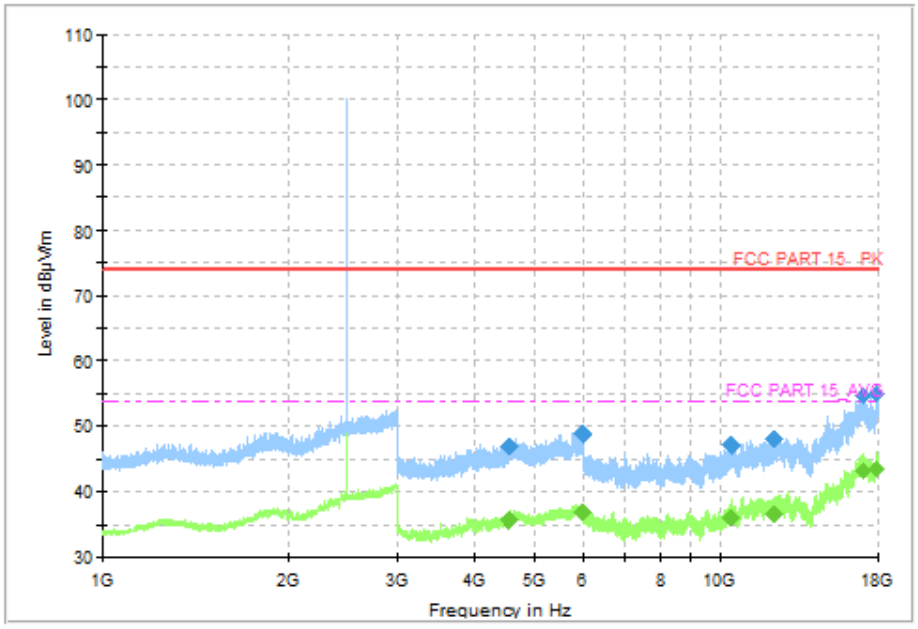


Fig.14 Radiated Spurious Emission (Ch39, 1 GHz - 18 GHz), 2M

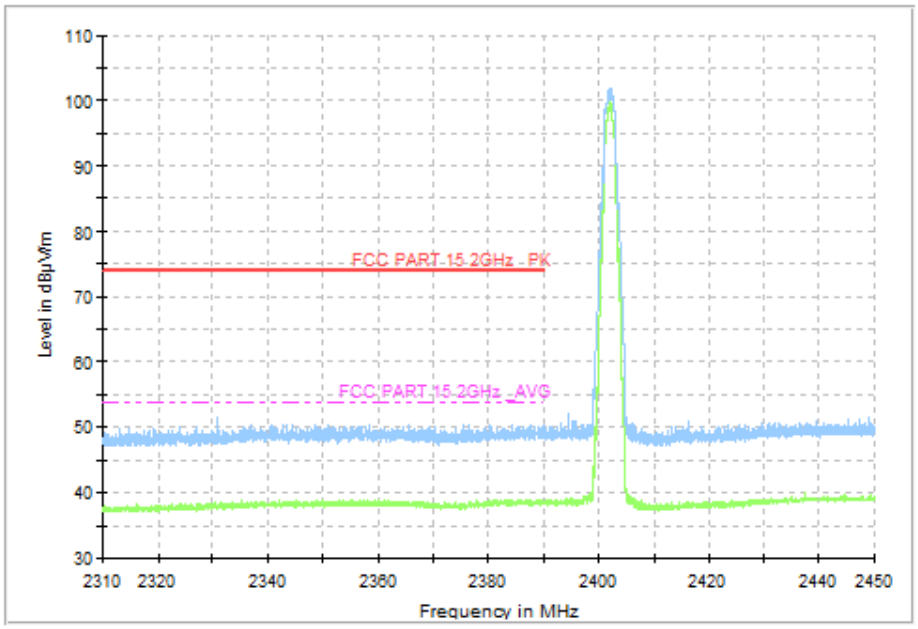


Fig.15 Radiated Band Edges (Ch0, 2.380GHz - 2.450GHz), 2M

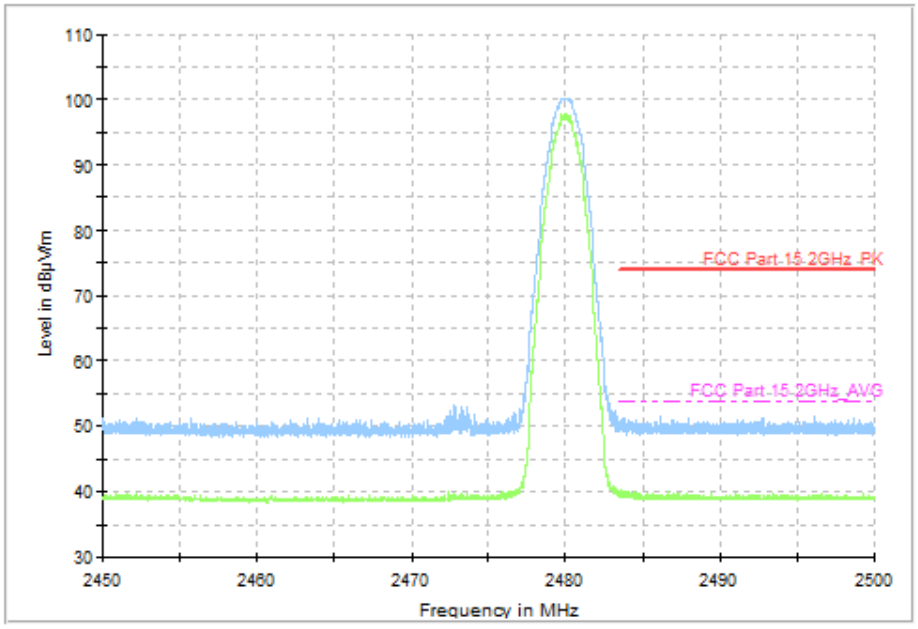


Fig.16 Radiated Band Edges (Ch39, 2.450GHz - 2.500GHz), 2M

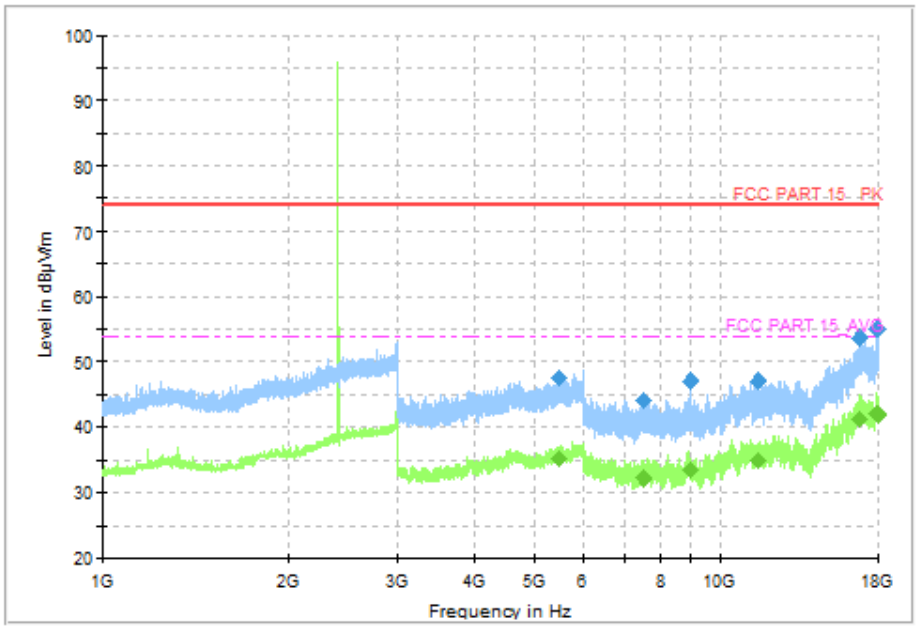


Fig.17 Radiated Spurious Emission (Ch0, 1 GHz - 18 GHz), 1M

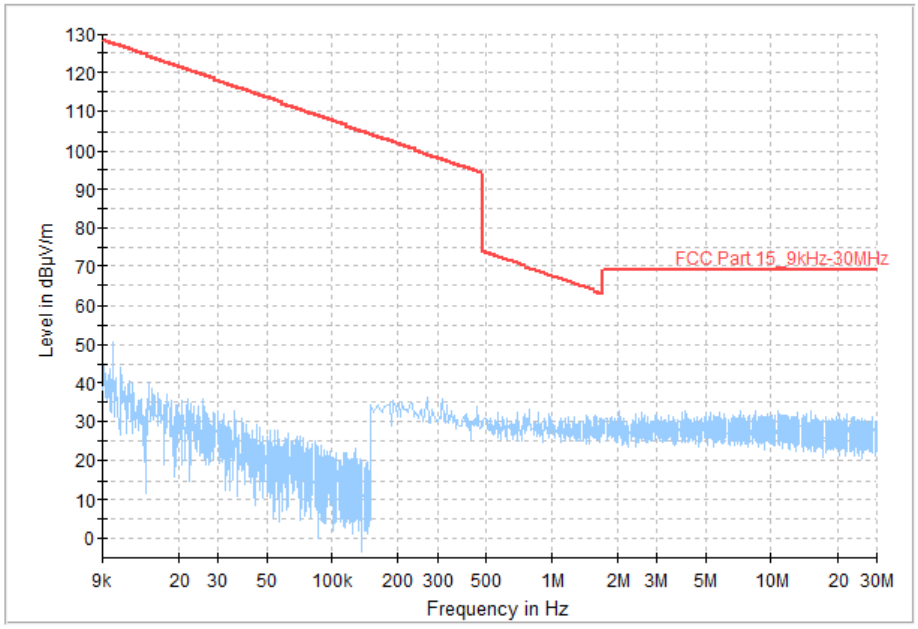


Fig.18 Radiated Spurious Emission (Ch19, 9 kHz - 30 MHz), 1M

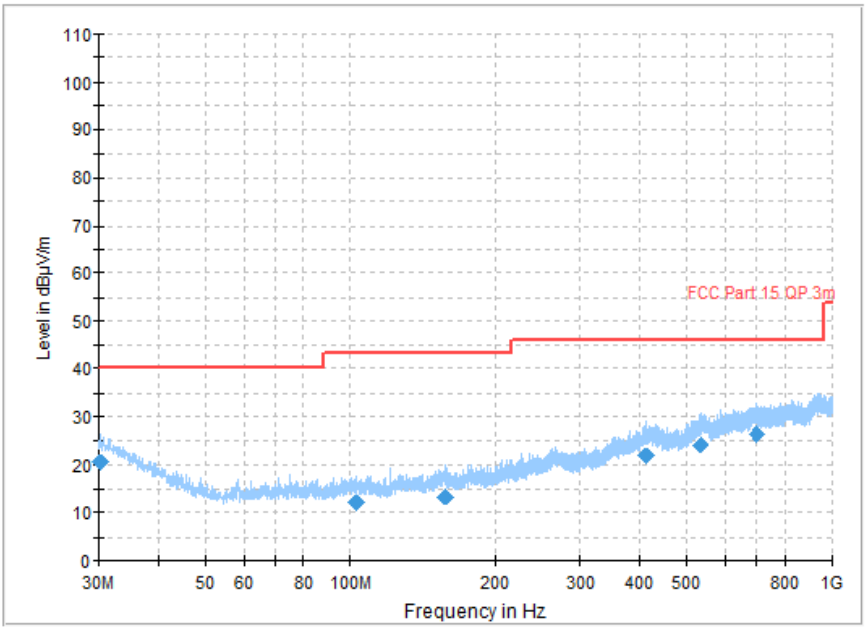


Fig.19 Radiated Spurious Emission (Ch19, 30 MHz - 1 GHz), 1M

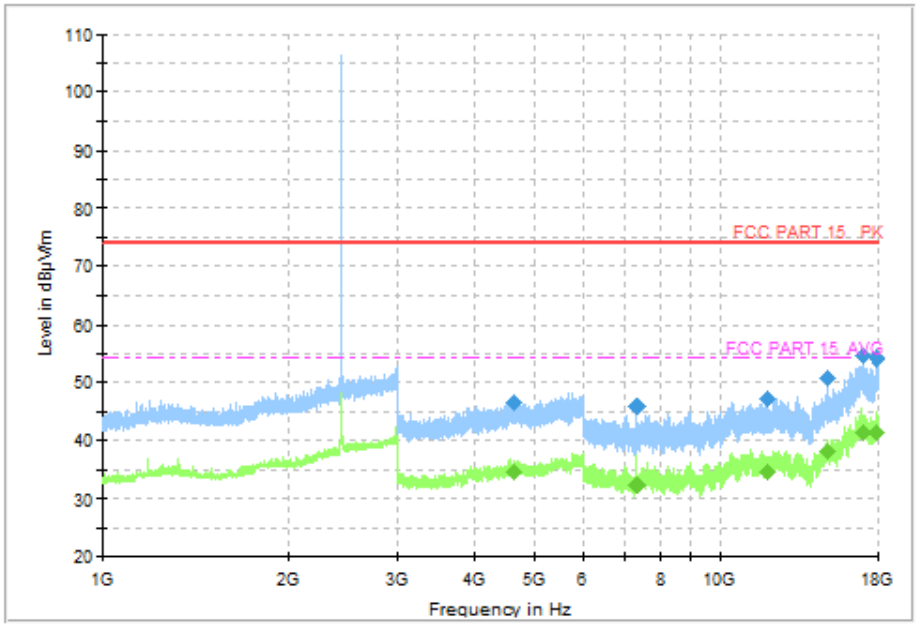


Fig.20 Radiated Spurious Emission (Ch19, 1 GHz - 18 GHz), 1M

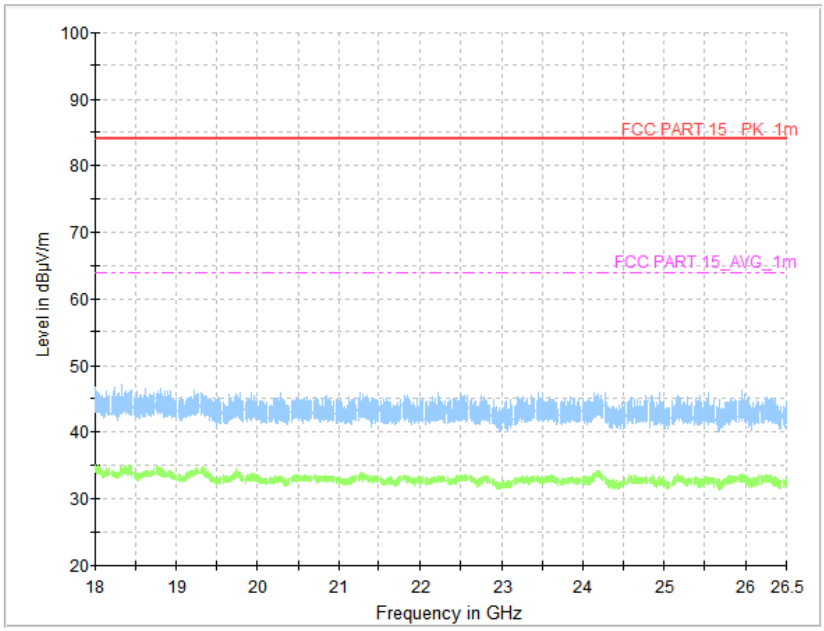


Fig.21 Radiated Spurious Emission (Ch19, 18 GHz - 26.5 GHz), 1M

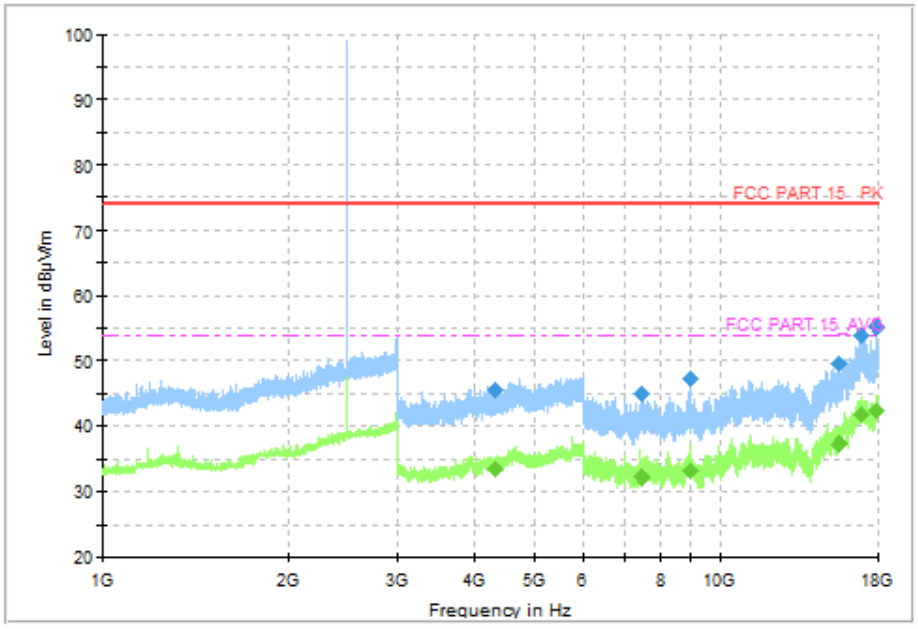


Fig.22 Radiated Spurious Emission (Ch39, 1 GHz - 18 GHz), 1M

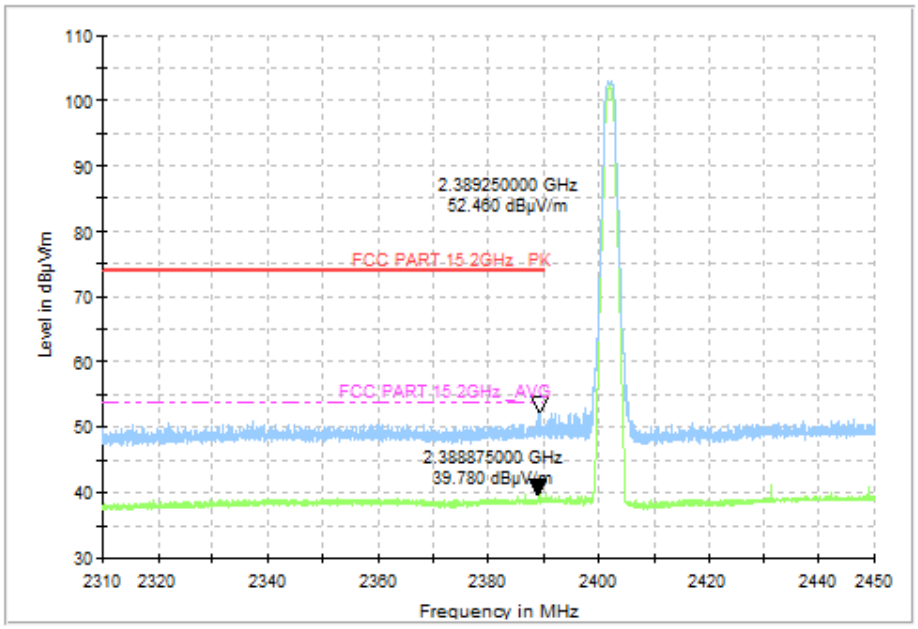


Fig.23 Radiated Band Edges (Ch0, 2.380GHz - 2.450GHz), 1M

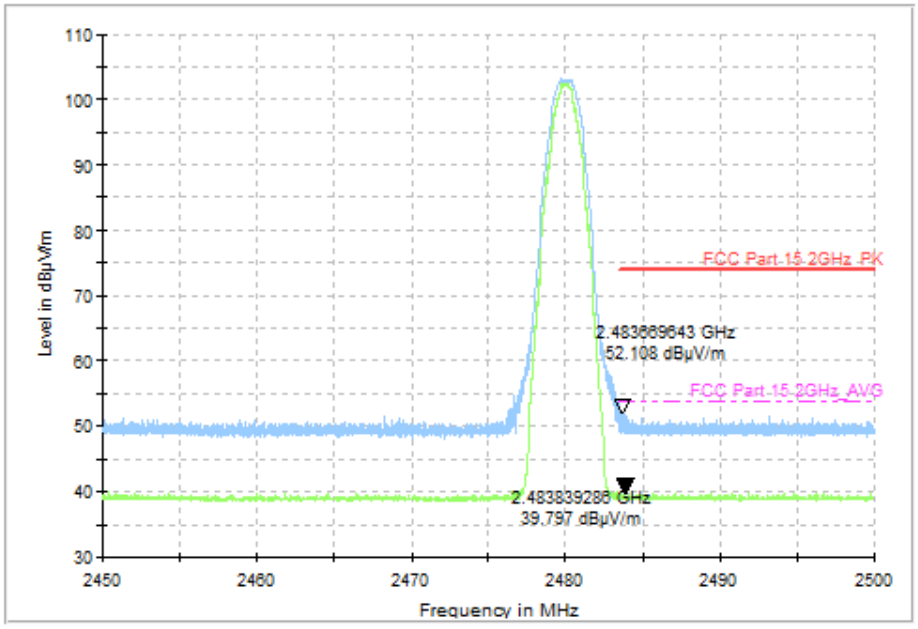


Fig.24 Radiated Band Edges (Ch39, 2.450GHz - 2.500GHz), 1M

A.7 AC Power line Conducted Emission

Method of Measurement: See ANSI C63.10-clause 6.2.

Test Condition:

Voltage (V)	Frequency (Hz)
120	60

Measurement Result and limit:

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.1	Fig.2	**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

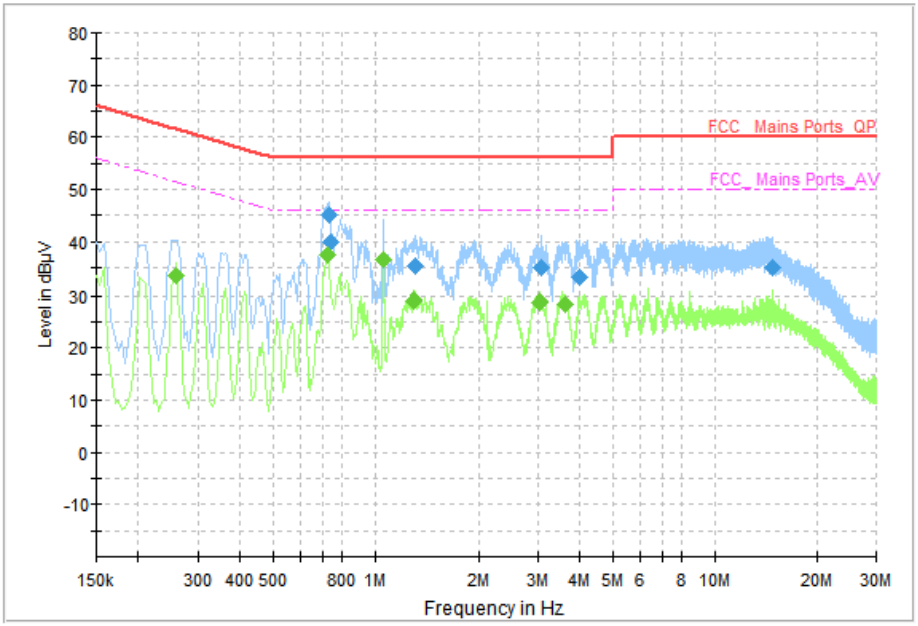


Fig.1 AC Power line Conducted Emission (Traffic, 120V), 1M

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.730000	45.10	56.00	10.90	N	ON	10
0.738000	40.07	56.00	15.93	N	ON	10
1.314000	35.44	56.00	20.56	N	ON	10
3.074000	35.10	56.00	20.90	N	ON	10
3.970000	33.07	56.00	22.93	L1	ON	10
14.822000	34.96	60.00	25.04	N	ON	11

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.258000	33.51	51.50	17.98	N	ON	10
0.722000	37.48	46.00	8.52	N	ON	10
1.058000	36.47	46.00	9.53	L1	ON	10
1.306000	28.84	46.00	17.16	N	ON	10
3.050000	28.61	46.00	17.39	N	ON	10
3.626000	28.32	46.00	17.68	L1	ON	10

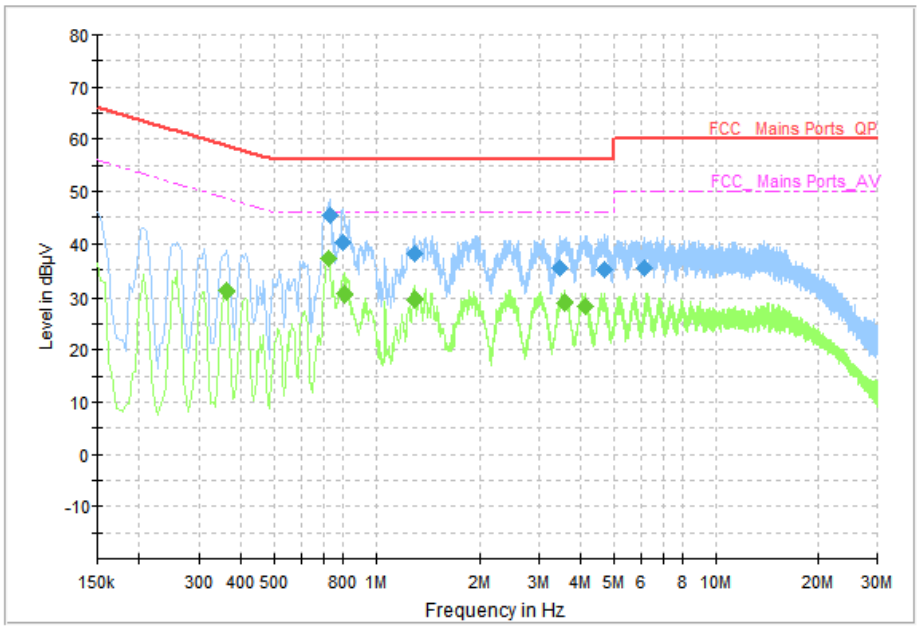


Fig.2 AC Power line Conducted Emission (Idle, 120V), 1M

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.730000	45.51	56.00	10.49	N	ON	10
0.798000	40.11	56.00	15.89	N	ON	10
1.306000	38.08	56.00	17.92	N	ON	10
3.458000	35.36	56.00	20.64	N	ON	10
4.686000	34.94	56.00	21.06	N	ON	10
6.166000	35.41	60.00	24.59	N	ON	10

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.362000	31.08	48.68	17.61	N	ON	10
0.722000	37.18	46.00	8.82	L1	ON	10
0.806000	30.43	46.00	15.57	N	ON	10
1.298000	29.50	46.00	16.50	N	ON	10
3.554000	29.07	46.00	16.93	N	ON	10
4.118000	28.29	46.00	17.71	N	ON	10

A.8 99% Occupied Bandwidth

Measurement Limit:

Standard	Limit
RSS-Gen section 6.7	/

Measurement Result:

Qualcomm module:

Mode	Frequency (MHz)	Test Results (kHz)	Conclusion
LE-1M	2402 (CH0)	1038.00	**P**
	2440 (CH19)	1039.00	**P**
	2480 (CH39)	1038.00	**P**
LE-2M	2402 (CH0)	2007.00	**P**
	2440 (CH19)	2005.00	**P**
	2480 (CH39)	2005.00	**P**

Nordic module:

Mode	Frequency (MHz)	Test Results (kHz)	Conclusion
LE-1M	2402 (CH0)	1044.00	**P**
	2440 (CH19)	1047.00	**P**
	2480 (CH39)	1049.00	**P**

See below for test graphs.

Conclusion: PASS

Fig.1 99% Occupied Bandwidth (Ch 19), LE 1M

Fig.2 99% Occupied Bandwidth (Ch 19), LE 2M

Fig.3 99% Occupied Bandwidth (Ch 19), LE 1M

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