RADIO TEST REPORT

Product	:	Wi-Fi 6E BT M.2 Module
Model Name	:	WNFQ-268AXI(BT)
Series Model	:	WNFQ-268AX(BT)
FCC ID	:	RYK-WNFQ268AXBT
Test Regulation	:	FCC 47 CFR Part 15 Subpart C (Section 15.247)
Received Date	:	2021/9/3
Test Date	:	2021/9/6 ~ 2021/11/10
Issued Date	:	2022/1/21
Applicant	:	SparkLAN Communications, Inc. 8F., No.257, Sec. 2, Tiding Blvd., Neihu District, Taipei City 11493, Taiwan (R.O.C.)
Issued By	:	Underwriters Laboratories Taiwan Co., Ltd. Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Testing Laboratory
3398

The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report are responsible of the test sample(s) provided by the client only and are not to be used to indicate applicability to other similar products.

REVISION HISTORY

Original Test Report No.: 4790042400-US-R5-V0

Rev.	Test report No.	Date	Page revised	Contents
Original	4790042400-US-R5-V0	2022/1/21	-	Initial issue

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1. Attestation of Test Results

APPLICANT:	SparkLAN Communications, Inc. 8F., No.257, Sec. 2, Tiding Blvd., Neihu District, Taipei City 11493, Taiwan (R.O.C.)
MANUFACTURER:	SparkLAN Communications, Inc. 8F., No.257, Sec. 2, Tiding Blvd., Neihu District, Taipei City 11493, Taiwan (R.O.C.)
EUT DESCRIPTION:	Wi-Fi 6E BT M.2 Module
BRAND:	SparkLAN
MODEL:	WNFQ-268AXI(BT)
SERIES MODEL:	WNFQ-268AX(BT)
SAMPLE STAGE:	Engineering Verification Test sample
DATE of TESTED:	2021/9/6 ~ 2021/11/10

APPLICABLE STANDARDS	
STANDARD	**Test Results**
FCC 47 CFR PART 15 Subpart C (Section 15.247)	PASS

Underwriters Laboratories Taiwan Co., Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by Underwriters Laboratories Taiwan Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Underwriters Laboratories Taiwan Co., Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Underwriters Laboratories Taiwan Co., Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Prepared By:

Sally Lu Date : 2022/1/21
Project Handler

Approved and Authorized By:

Waternil Guan Date : 2022/1/21
Engineer

2. Summary of Test Results

Summary of Test Results		
FCC Clause	**Test Items**	**Result**
15.247(a)(2)	6dB Bandwidth	PASS
15.247(b)	Conducted Output Power	PASS
15.247(e)	Power Spectral Density	PASS
15.247(d)	Antenna Port Emission	PASS
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS
15.207	AC Power Conducted Emission	PASS
15.203	Antenna Requirement	PASS

3. Test Methodology and Reference Procedures

The tests documented in this report were performed in accordance with 47 CFR FCC Part 2, KDB558074 D01 Meas Guidance v05r02, KDB414788 D01 Radiated Test Site v01r01, ANSI C63.10-2013.

4. Facilities and Accreditation

Test Location	Underwriters Laboratories Taiwan Co., Ltd.
Address	Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan
Accreditation Certificate	Underwriters Laboratories Taiwan Co., Ltd. is accredited by TAF, Laboratory Code 3398.

5. Measurement Uncertainty

For statement of conformity, accuracy method (Section 8.2.4 and 8.2.5 of ISO Guide 98-4) was applied as decision rule for measurement in this test report.

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor k=2.

Measurement	Frequency	Uncertainty
Conducted disturbance at mains terminals ports	150kHz ~ 30MHz	±3.1 dB
RF Conducted	9 kHz - 40GHz	±1.9 dB
Radiated disturbance below 30MHz	9 kHz - 30 MHz	±1.9 dB
Radiated disturbance below 1 GHz	30MHz ~ 1GHz	±5.4 dB
Radiated disturbance above 1 GHz	1GHz ~ 40GHz	±4.7 dB

6. Equipment under Test

6.1. Description of EUT

Product	Wi-Fi 6E BT M.2 Module
Brand Name	SparkLAN
Model Name	WNFQ-268AXI(BT)
Series Model	WNFQ-268AX(BT)
Operating Frequency	2402MHz ~ 2480MHz
Modulation	GFSK
Transfer Rate	Up to 2 Mbps
Number of Channel	40
Maximum Output Power	5.92 dBm
Normal Voltage	3.3 Vdc
S/N	21765J2100036
Sample ID	4158081

Note:

1. The models difference table as below:

Model	Difference
WNFQ-268AXI(BT)	WNFQ-268AXI(BT) Operating Temp -40~+75; WNFQ-268AX(BT) Operating Temp -10~+65 In addition, the sample has A-E key and E key versions. Only the golden finger is different.
WNFQ-268AX(BT)	

*Except above change, there is no change to technical construction that is included circuit diagram, PCB Layout, components and component layout, all electrical construction, and mechanical construction.

2. The EUT contains following accessory devices:

Product	Brand	Model	Description
Antenna 1	SparkLAN	AD-500AX	-
Antenna 2	SparkLAN	AD-501AX	-
Antenna 3	SparkLAN	AD-502AX	-
Antenna 4	SparkLAN	AD-503AX	-
Antenna 5	JOHANSON	2450AD18A6050	-
Antenna 6	SparkLAN	AD-504AX	-
Antenna 7	SparkLAN	AD-505AX	-

3. The above EUT information is declared by manufacturer and for more detailed features description, please refer the manufacturer's or user's manual.

6.2. Channel List

40 channels are provided to this EUT:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

6.3. Test Condition

Test Item	Test Site No.	Environmental Condition	Input Power	Test Date	Tested by
Antenna Port Conducted Measurement	SR4	23~26°C/ 60~65%RH	3.3Vdc	2021/09/06~ 2021/11/10	Mike Cai
Radiated Spurious Emission	966-2	23~26°C/ 60~65%RH	3.3Vdc	2021/09/06~ 2021/11/10	Mike Cai
AC power Line Conducted Emission	SR1	23~26°C/ 60~65%RH	3.3Vdc	2021/09/16~ 2021/11/10	Mike Cai

FCC Test Firm Registration Number: 498077

6.4. Description of Available Antennas

Ant. No.	Transmitter Circuit	Brand Name	Model Name	Ant. Type	Frequency Band (MHz)	Maximum Gain (dBi)	Remark
1	Chain (0)+(1)	SparkLAN	AD-500AX	Dipole	2400~2483	2.65	RP-SMA
					5150~5250	4.35	
					5250~5350	4.35	
					5470~5725	4.35	
					5725~5850	4.81	
					5925~6425	4.98	
					6425~6525	4.85	
					6525~6875	4.79	
					6875~7125	4.82	
2	Chain (0)+(1)	SparkLAN	AD-501AX	Dipole	2400~2483	3.7	RP-SMA
					5150~5850	5	
					5925~7125	5	
3	Chain (0)+(1)	SparkLAN	AD-502AX	PIFA	2400~2483	3.5	IPEX
					5150~5850	5	
					5925~7125	3.9	
4	Chain (0)+(1)	SparkLAN	AD-503AX	Dipole	2400~2483	3.7	RP-SMA
					5150~5850	5	
					5925~7125	5	
5	Chain (0)+(1)	JOHANSON	2450AD18A6050	CHIP	2400~2483	2	NA
					5150~5850	1.5	
					5925~7125	2.7	
6	Chain (0)+(1)	SparkLAN	AD-504AX	Dipole	2400~2483	2.67	I-PEX
					5150~5250	4.35	
					5250~5350	3.83	
					5470~5725	4.7	
					5725~5850	4.87	
					5925~6425	4.91	
					6425~6525	4.85	
					6525~6875	4.94	
					6875~7125	4.94	
7	Chain (0)+(1)	SparkLAN	AD-505AX	Dipole	2400~2483	2.67	I-PEX
					5150~5250	4.35	
					5250~5350	3.83	
					5470~5725	4.7	
					5725~5850	4.87	
					5925~6425	4.91	
					6425~6525	4.85	
					6525~6875	4.94	
					6875~7125	4.94	

Note: The above antenna information was provided from customer and for more detailed features description, please refer the manufacturer's specification or user's manual.

6.5. Test Mode Applicability and Tested Channel Detail

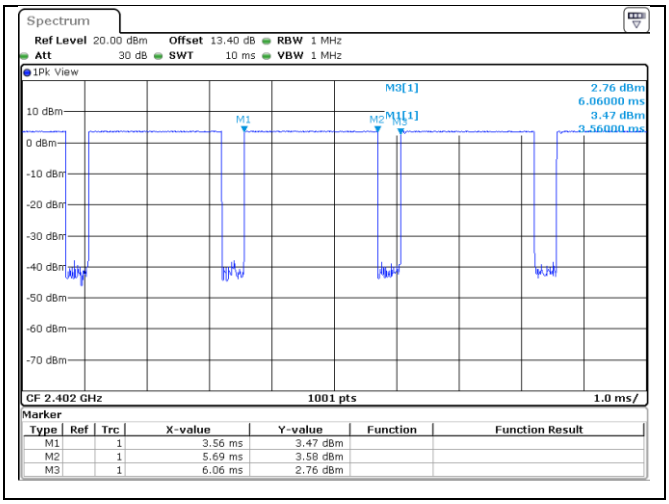
- The fundamental of the dipole antenna was investigated in two orthogonal (lay and stand), it was determined that stand mode was worst-case. Therefore, all final radiated testing was performed with the dipole antenna in stand mode.
- For AC power line conducted emissions, the pre-scan has been determined by AC power 120Vac/60Hz (worst case)
- The antennas AD-501AX, AD-503AX has the highest gain, the following conducted tests are all carried out using this antenna gain.
- For radiated tests, following Radiated versus Conducted Measurements Guidance, radiated emissions measurements test was done with 50ohm terminator on antenna port.
- For Antenna Port Conducted Measurement, this item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel), parallel and perpendicular are the worst orientations, therefore testing was performed on these two orientations only.
- For below 1 GHz radiated emission and AC power line conducted emission have performed all modes of operation were investigated and the worst-case emissions are reported.
- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Test Item	Modulation Type	Available Channel	Test Channel	Data Rate
Radiated Emissions	GFSK	0 to 39	0,19,39	1 Mbps
	GFSK			2 Mbps
Radiated Emissions (Below 1GHz)	GFSK	0 to 39	39	1 Mbps
	GFSK		39	2 Mbps
AC Power Line Conducted Emission	GFSK	0 to 39	39	1 Mbps
	GFSK		39	2 Mbps
Antenna Port Conducted Measurement	GFSK	0 to 39	0,19,39	1 Mbps
	GFSK			2 Mbps
Conducted Emissions	GFSK	0 to 39	0,19,39	1 Mbps
	GFSK			2 Mbps
Conducted Emissions (Below 1GHz)	GFSK	0 to 39	39	1 Mbps
	GFSK		39	2 Mbps

6.6. Duty cycle

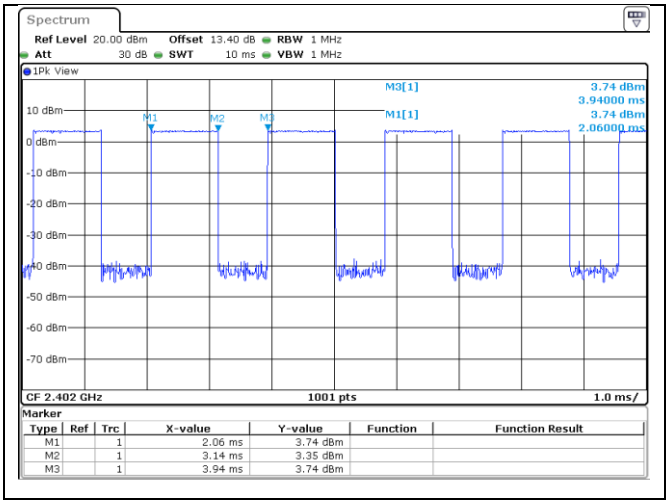
BT LE_1Mbps

Duty cycle = 2.13/2.5 = 0.852%, Duty factor(dB) = 10 * log(1/0.852) = 0.7



BT LE_2Mbps

Duty cycle = 1.08/1.88 = 0.574%, Duty factor(dB) = 10 * log(1/0.574) = 2.41



7. Test Equipment

Test Equipment List					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date**	**Expired date**
Radiated Spurious Emission					
Spectrum Analyzer	Keysight	N9010A	MY56070827	2020/11/11	2021/11/10
EMI Test Receiver	Rohde & Schwarz	ESR7	101754	2020/12/11	2021/12/10
Loop Antenna	ETS lindgren	6502	00213440	2020/12/25	2021/12/24
Trilog-Broadband Antenna with 5dB Attenuator	Schwarzbeck & EMCI	VULB 9168 & N-6-05	774 & AT-N0538	2021/1/13	2022/1/12
Horn Antenna (1-18 GHz)	Schwarzbeck	BBHA 9120 D	01690	2020/12/30	2021/12/29
Horn Antenna (18-40 GHz)	Schwarzbeck	BBHA 9170	781	2020/12/30	2021/12/29
Preamplifier (30-1000 MHz)	EMCI	EMC330E	980405	2021/6/8	2022/6/7
Preamplifier (1-18 GHz)	EMCI	EMC051835BE	980406	2021/2/3	2022/2/2
Preamplifier (18-40GHz)	EMCI	EMC184040SEE	980426	2021/5/19	2022/5/18
Cables	Hanyitek	K1K50-UP0264-K1K50-2500	170214-4 & 170425-2	2021/1/22	2022/1/21
Cables	Hanyitek	K1K50-UP0264-K1K50-2500	170214-1 & 170214-2	2021/1/22	2022/1/21

Test Equipment List					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date**	**Expired date**
Antenna Port Conducted Measurement					
Spectrum Analyzer	Rohde & Schwarz	FSV40	101490	2021/9/7	2022/9/6
Pulse Power Sensor	Anritsu	MA2411B	1531202	2020/12/21	2021/12/20
Power Meter	Anritsu	ML2495A	1645002	2020/12/21	2021/12/20
AC power Line Conducted Emission					
EMI Test Receiver	Rohde & Schwarz	ESR7	101753	2020/11/17	2021/11/16
Two-Line V-Network	Rohde & Schwarz	ENV216	102136	2021/8/30	2022/8/29
Impuls-Begrenzer Pulse Limiter	Rohde & Schwarz	ESH3-Z2	102219-Qt	2021/8/26	2022/8/25
Cables	TITAN	CFD200	T0732ACFD20 020A300-1	2021/3/2	2022/3/1

UL Software		
Description	**Name**	**Version**
Radiated measurement	e3	6.191211 (V6)
Conducted measurement	RF Conducted Test Tools	ver 2.4.0.620b
AC power Line Conducted Emission	EZ_EMC	UL-3A1.2

8. Description of Test Setup

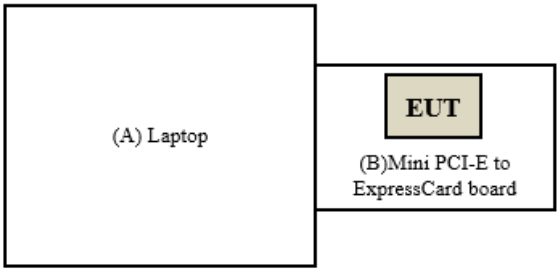
Support Equipment

ID	Equipment	Brand Name	Model Name	S/N	Remark
A	Laptop	Lenovo	E6430	2MMN3X1	Provide by lab
B	Mini PCI-E to ExpressCard board	SparkLAN	Card-01	001	N/A

Test Setup

Controlled using a bespoke application (QRCT_Version 4.0.00185.0) on a test Notebook. The application was used to enable a continuous transmission mode and to select the test channels, data rates, modulation schemes and power setting as required.

Setup Diagram for Test



Under Table

Remote Site

9. Test Results

9.1. 6dB Bandwidth

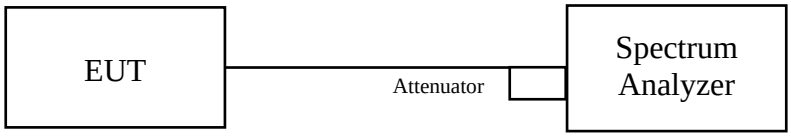
Requirements

The minimum 6 dB bandwidth shall be at least 500 kHz.

Test procedure

a. Set resolution bandwidth (RBW) = 100kHz
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test Setup



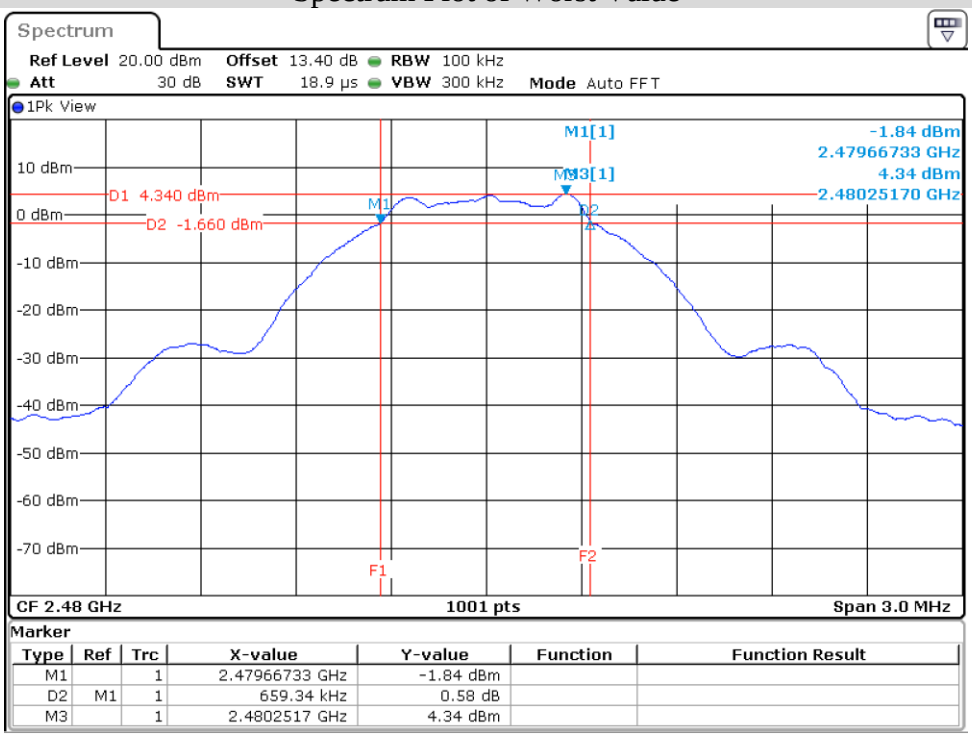
The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

Test Data

BT LE_1Mbps

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
0	2402	0.66	0.5	PASS
19	2440	0.66	0.5	PASS
39	2480	0.66	0.5	PASS

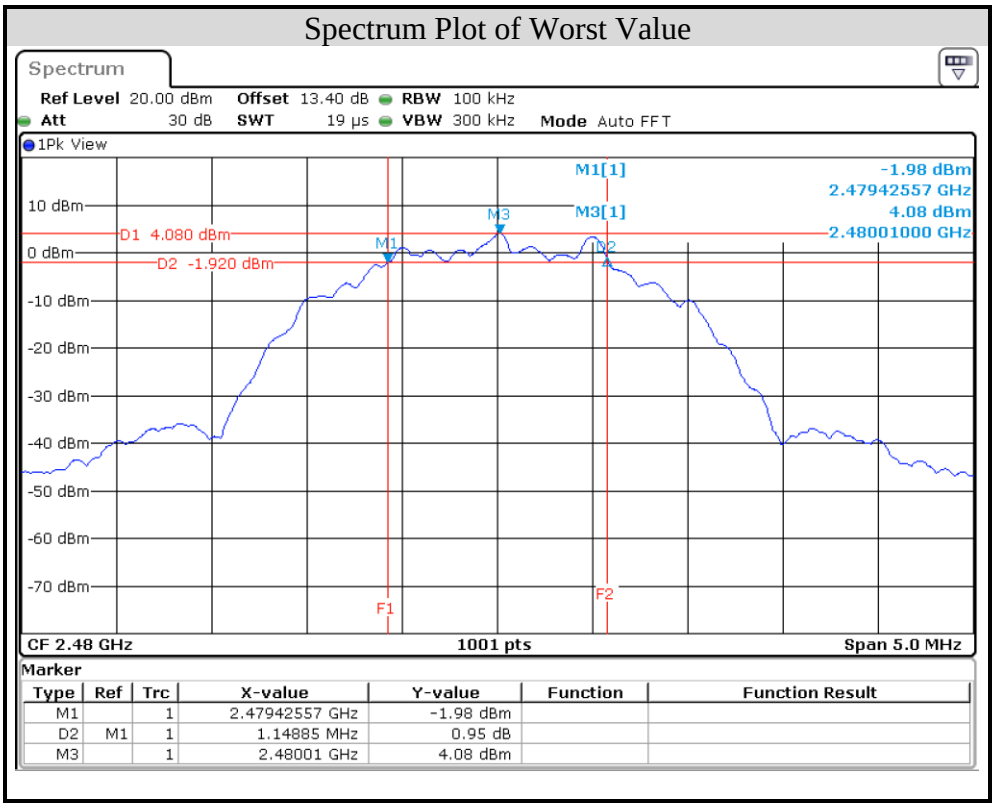
Spectrum Plot of Worst Value



BT LE_2Mbps

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
0	2402	1.15	0.5	PASS
19	2440	1.15	0.5	PASS
39	2480	1.15	0.5	PASS

Spectrum Plot of Worst Value



9.2. Conducted Output Power

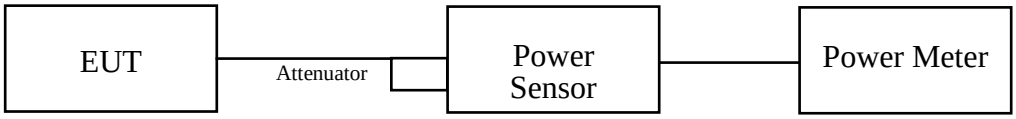
Requirements

For systems using digital modulation in the 2400-2483.5 MHz bands: 1 Watt.

Test Procedure

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

Test Setup



The loss between RF output port of the EUT and the input port of the Power Meter has been taken into consideration.

Test Data

Peak Power

BT LE_1Mbps

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
0	2402	3.214	5.07	30	PASS
19	2440	3.656	5.63	30	PASS
39	2480	3.656	5.63	30	PASS

BT LE_2Mbps

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
0	2402	3.334	5.23	30	PASS
19	2440	3.819	5.82	30	PASS
39	2480	3.908	5.92	30	PASS

Average Power (Reference Only)

BT LE_1Mbps

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	3.034	4.82
19	2440	3.459	5.39
39	2480	3.516	5.46

BT LE_2Mbps

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	3.041	4.83
19	2440	3.443	5.37
39	2480	3.499	5.44

9.3. Power Spectral Density

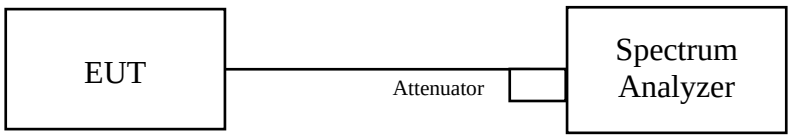
Requirements

The Maximum of Power Spectral Density Measurement is 8dBm in any 3 kHz.

Test procedure

a. Set analyzer center frequency to DTS channel center frequency.
b. Set the span to 1.5 times the DTS bandwidth.
c. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
d. Set the VBW ≥ 3 × RBW.
e. Detector = peak.
f. Sweep time = auto couple.
g. Trace mode = max hold.
h. Allow trace to fully stabilize.
i. Use the peak marker function to determine the maximum amplitude level within the RBW.

Test Setup



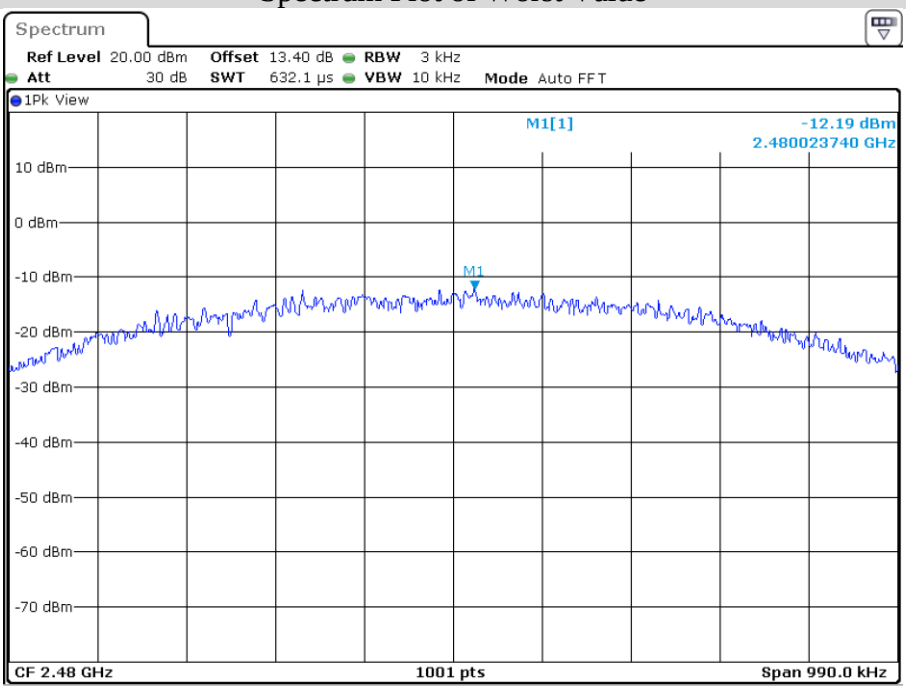
The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

Test Data

BT LE_1Mbps

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	2402	-12.80	8	PASS
19	2440	-12.29	8	PASS
39	2480	-12.19	8	PASS

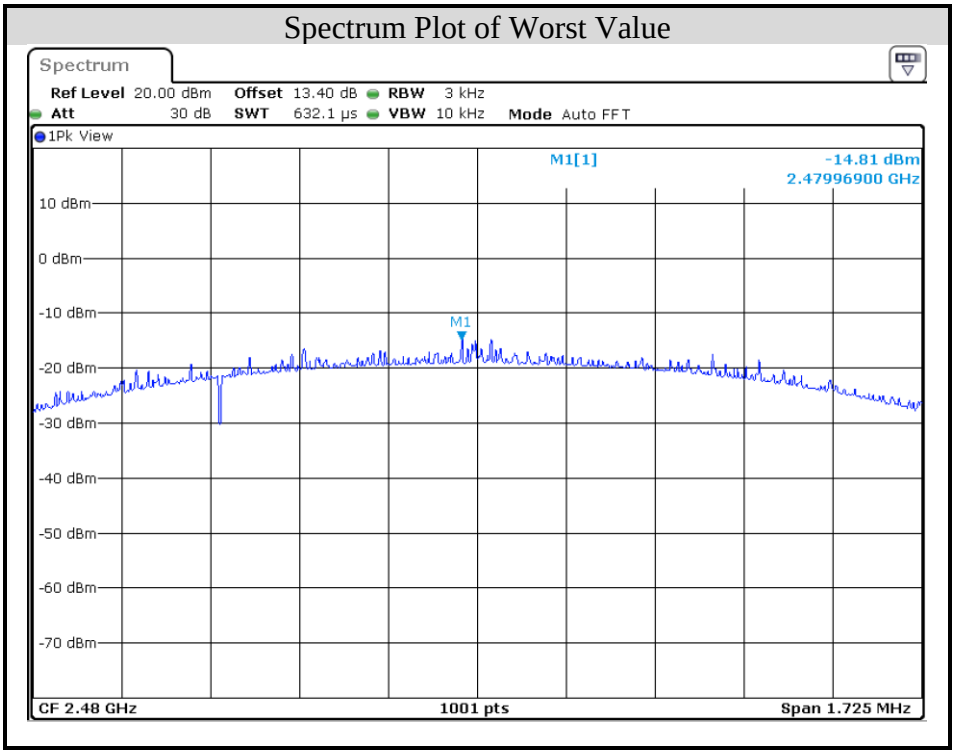
Spectrum Plot of Worst Value



BT LE_2Mbps

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	2402	-15.35	8	PASS
19	2440	-14.86	8	PASS
39	2480	-14.81	8	PASS

Spectrum Plot of Worst Value



9.4. Conducted Out of Band Emission

Requirements

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b) (3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209 (a) is not required.

Test procedure

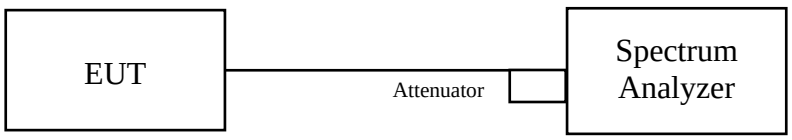
Measurement Procedure REF

a. Set the RBW = 100 kHz.
b. Set the VBW ≥ 300 kHz.
c. Set the span to 1.5 times the DTS bandwidth.
d. Detector = peak.
e. Sweep time = auto couple.
f. Trace mode = max hold.
g. Allow trace to fully stabilize.
h. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

Measurement Procedure OOBE

a. Set RBW = 100 kHz.
b. Set VBW ≥ 300 kHz.
c. Detector = peak.
d. Sweep = auto couple.
e. Trace Mode = max hold.
f. Allow trace to fully stabilize.
g. Use the peak marker function to determine the maximum amplitude level.

Test Setup

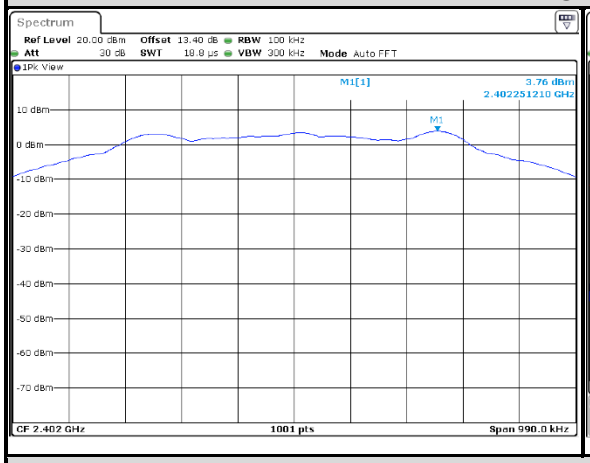


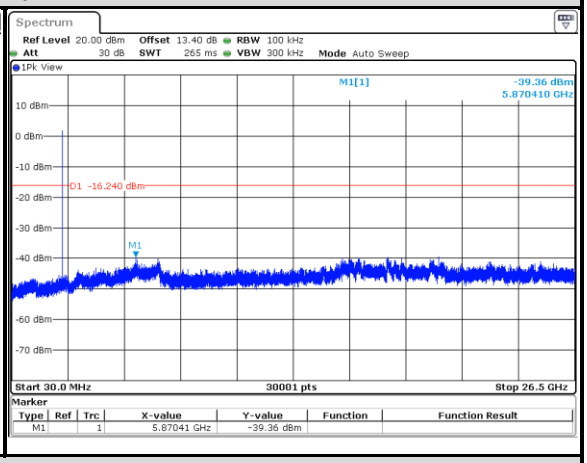
The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

Test Data

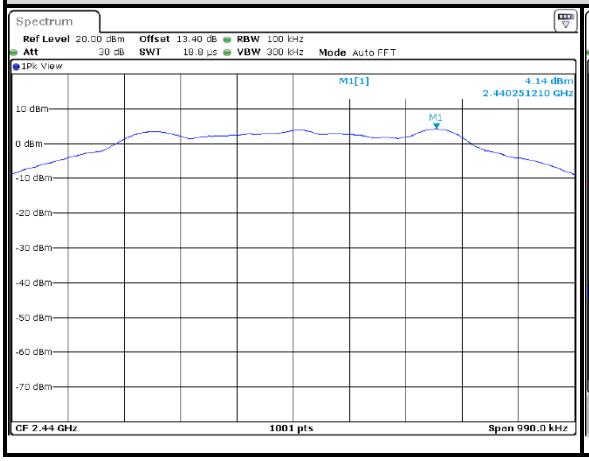
BT LE_1Mbps

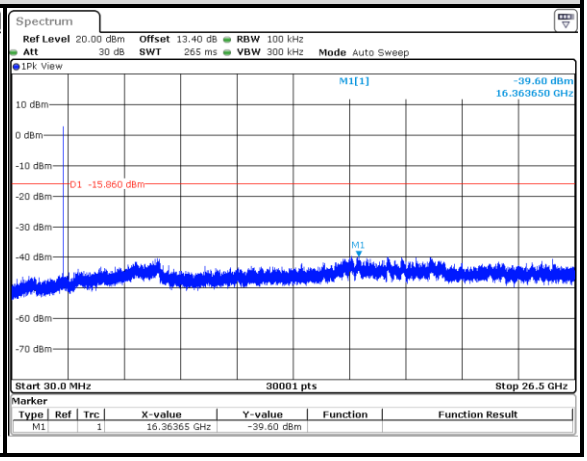
Ch 0



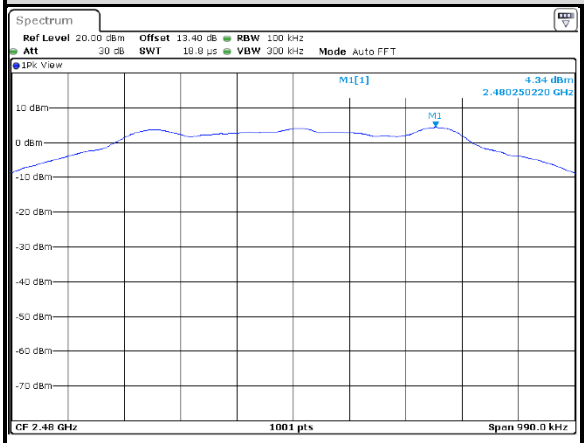


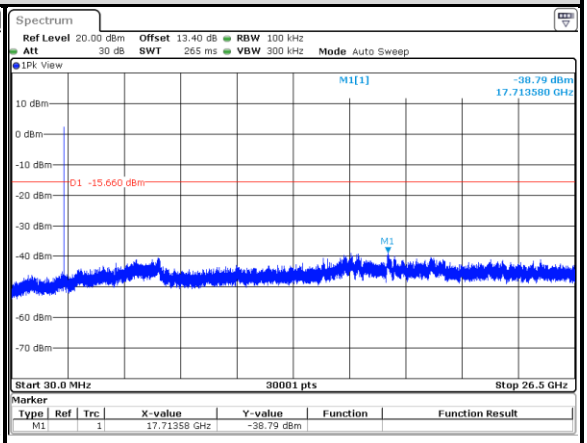
Ch 19



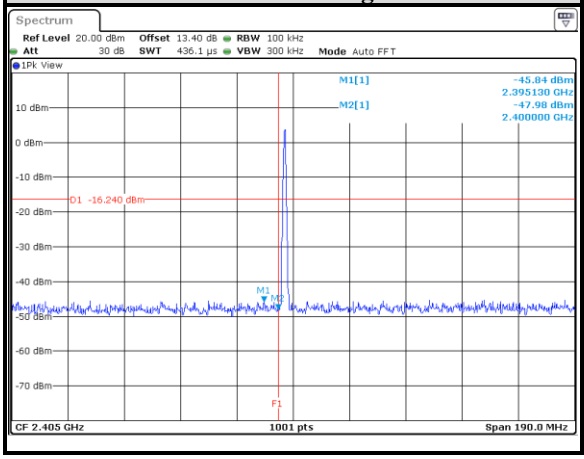


Ch 39

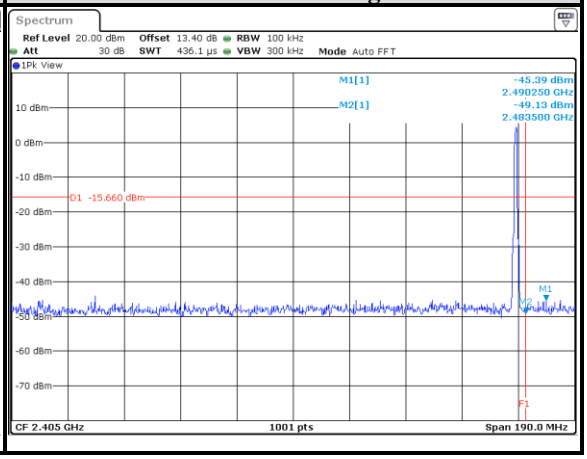




Ch 0 Band Edge

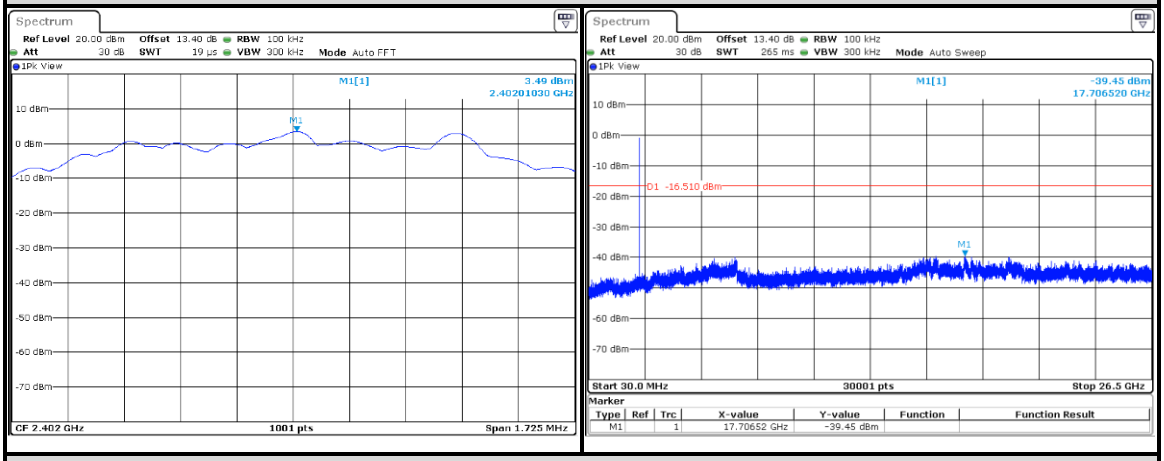


Ch 39 Band Edge

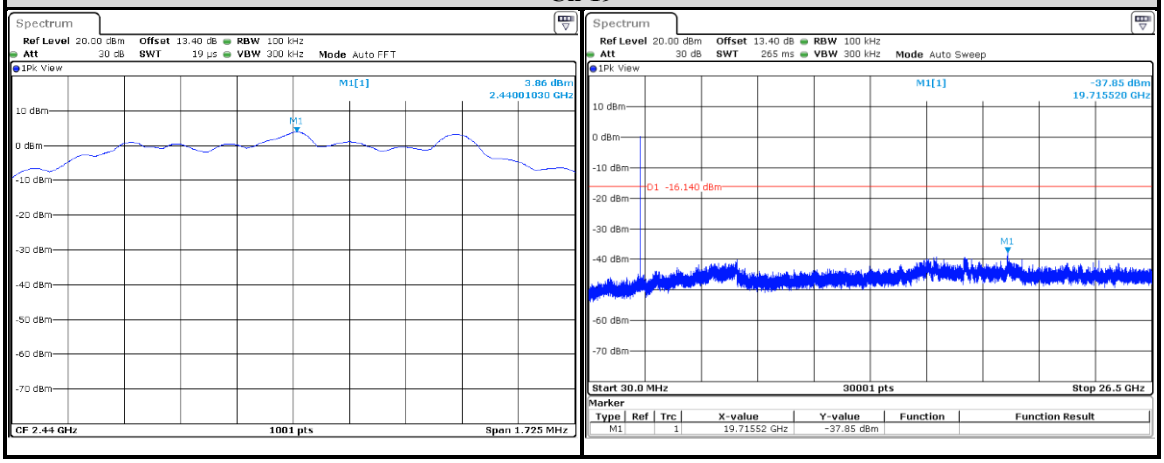


BT LE_2Mbps

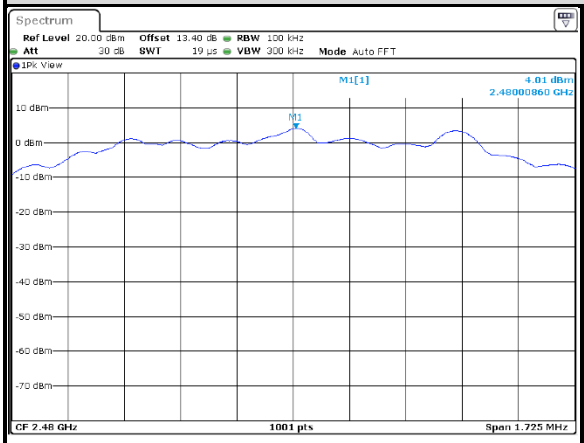
Ch 0

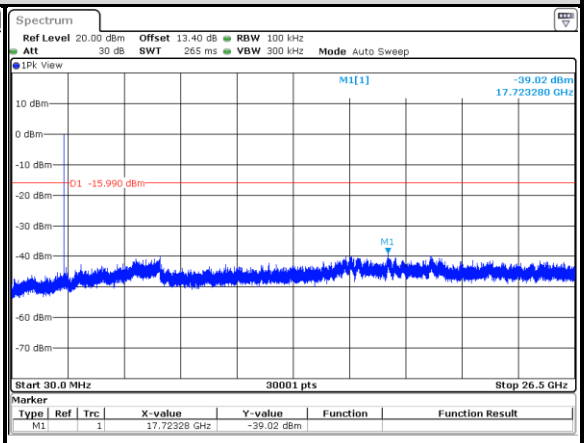


Ch 19

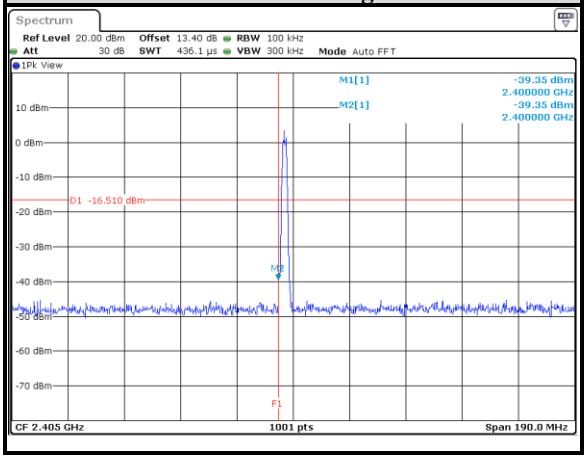


Ch 39

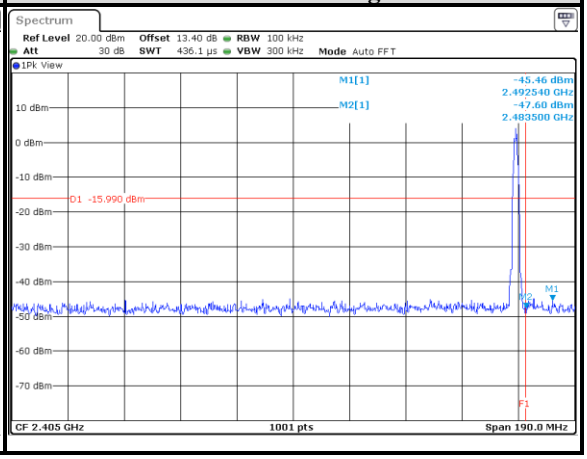




Ch 0 Band Edge



Ch 39 Band Edge



9.5. Radiated Spurious Emission

Requirements

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

Frequency(MHz)	Field strength (microvolts/meter)	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

NOTE:
1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

Test Procedures

Following FCC KDB 558074 D01 DTS Meas. Guidance :
Radiated versus Conducted Measurements.
The unwanted emission limits in both the restricted and non-restricted bands are based on antenna-port conducted measurements in conjunction with cabinet emissions tests are permitted to demonstrate compliance.
The following steps was performed:

a. Cabinet emissions measurements. Radiated measurement was performed to ensure that cabinet emissions are below the emission limits. For the cabinet-emission measurements the antenna was replaced by a termination matching the nominal impedance of the antenna.
b. Conducted tests was performed using equipment that matches the nominal impedance of the antenna assembly used with the EUT
c. EIRP calculation. A value representative of an upper bound on out-of-band antenna gain (in dBi) shall be added to the measured antenna-port conducted emission power to compute EIRP within the specified measurement bandwidth. (For emissions in the restricted bands, additional calculations are required to convert EIRP to field strength at the specified distance.) The upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands or 2 dBi, whichever is greater
d. EIRP adjustments for multiple outputs. (Follow the procedures specified in FCC KDB Publication 662911)

For Radiated Emission

[For 9 kHz ~ 30 MHz]

e. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
f. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
g. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
h. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
i. For measurement below 30MHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

[For above 30 MHz]

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
f. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

a. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
b. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
c. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.

Configuration	Average	
	RBW	VBW
BT LE_1Mbps	1 MHz	510Hz
BT LE_2Mbps	1 MHz	1kHz

Note:

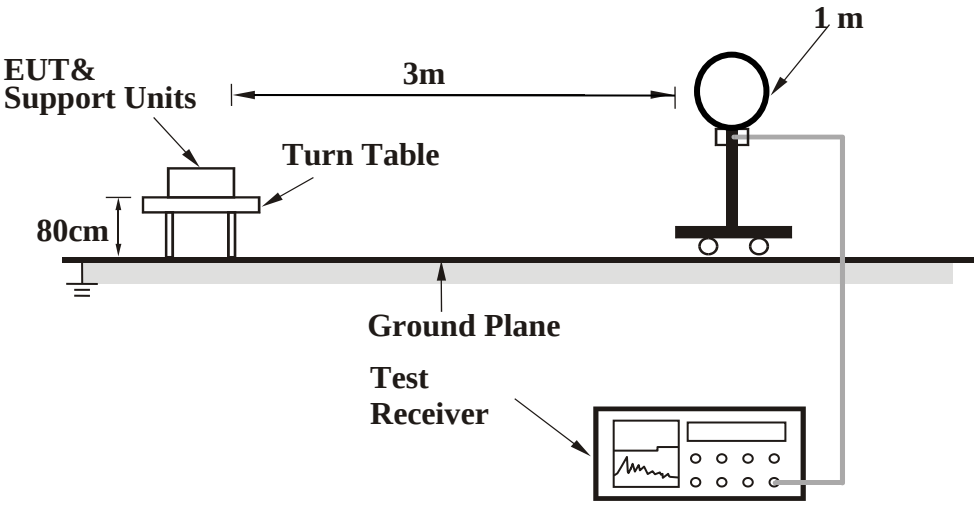
- The BT-LE-1M Duty cycle = (2.13/2.5)*100% = 85.2 <98%, so video bandwidth is 1/2.13 = 0.469 kHz. Therefore VBW configuration is 510Hz for testing.
- The BT-LE-2M Duty cycle = (1.08/1.88)*100% = 57.447 <98%, so video bandwidth is 1/1.08 = 0.926 kHz. Therefore VBW configuration is 1kHz for testing.
- Refer to section 6.6 for duty cycle.

d. All modes of operation were investigated (includes all external accessories) and the worst-case emissions are reported, the other emission levels were low against the limit.
e. Test data of Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
f. Test data of Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
g. Test data of Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
h. Test data of Notation "@" = Fundamental Frequency
i. Test data of Notation " * " = The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.

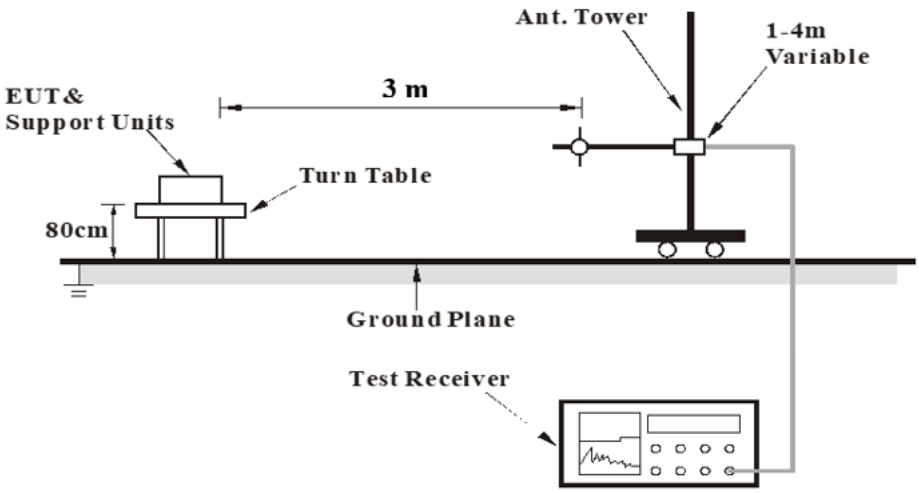
Test Setup

For Radiated Test Method:

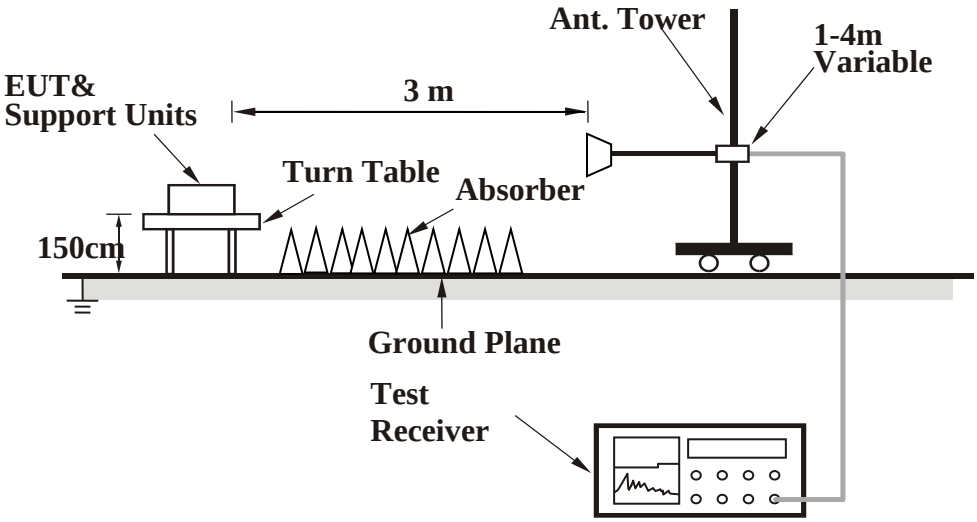
<Frequency Range 9 kHz ~ 30 MHz>



<Frequency Range 30 MHz ~ 1 GHz >

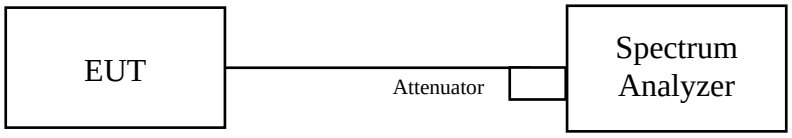


<Frequency Range above 1 GHz>



For the actual test configuration, please refer to the Setup Configurations.

For Conducted Test Method:



The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

Test Data

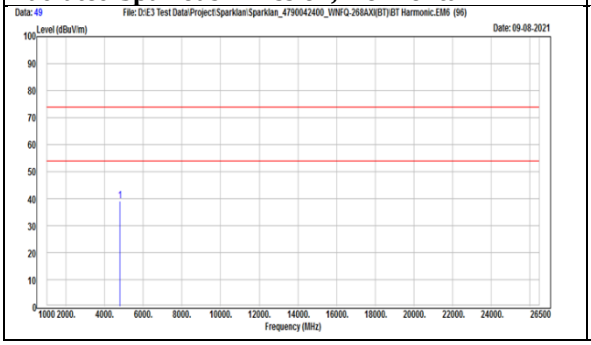
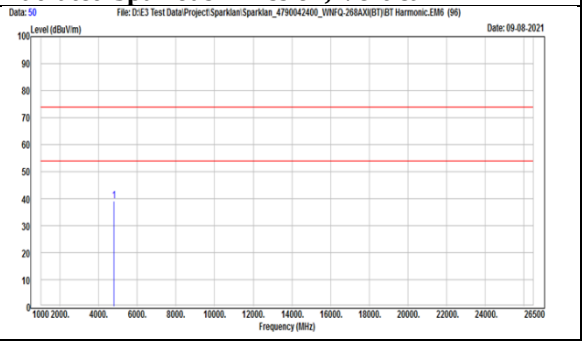
Radiated method

The level of unwanted emissions was measured when radiated by the cabinet or structure of the equipment with the antenna connector(s) terminated by a specified load (cabinet radiation)

Above 1 GHz

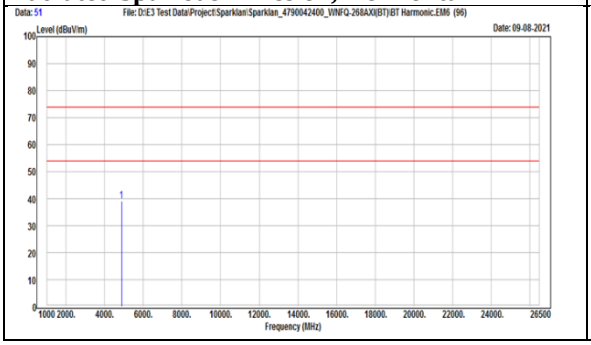
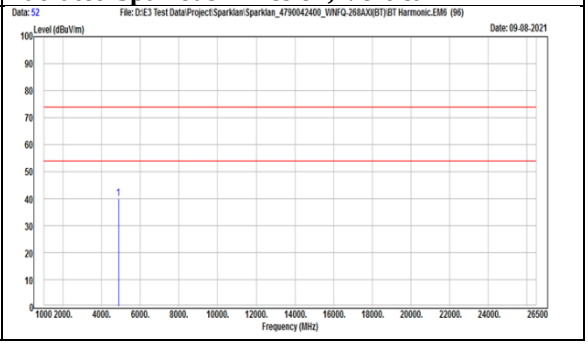
Mode	BT-LE-1Mbps	Channel	0

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal	*	4804	36.63	2.46	39.09	74	-34.91	PK
Vertical	*	4804	36.55	2.46	39.01	74	-34.99	PK

TX, BT-LE-1Mbps (Ch 0) Radiated Spurious Emission, Horizontal	TX, BT-LE-1Mbps (Ch 0) Radiated Spurious Emission, Vertical
	

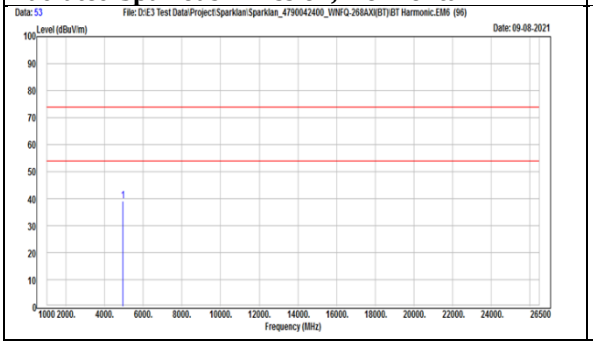
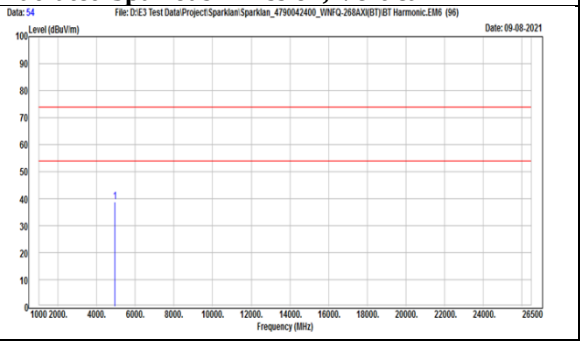
Mode	BT-LE-1Mbps	Channel	19

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal	*	4880	36.56	2.66	39.22	74	-34.78	PK
Vertical	*	4880	37.27	2.66	39.93	74	-34.07	PK

TX, BT-LE-1Mbps (Ch 19) Radiated Spurious Emission, Horizontal	TX, BT-LE-1Mbps (Ch 19) Radiated Spurious Emission, Vertical
	

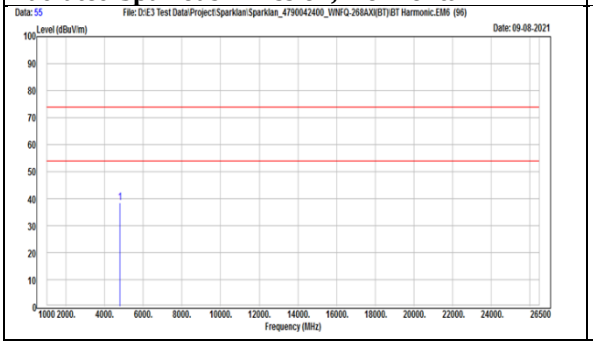
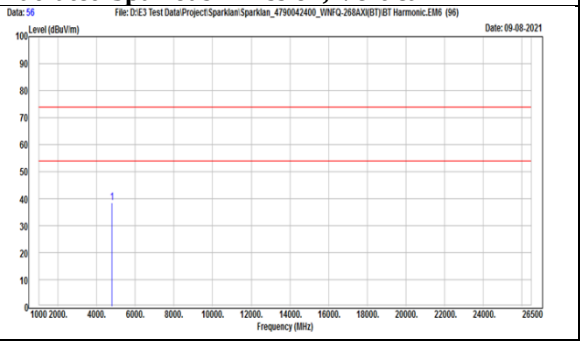
Mode	BT-LE-1Mbps	Channel	39

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal	*	4960	36.4	2.62	39.02	74	-34.98	PK
Vertical	*	4960	36.15	2.62	38.77	74	-35.23	PK

TX, BT-LE-1Mbps (Ch 39) Radiated Spurious Emission, Horizontal	TX, BT-LE-1Mbps (Ch 39) Radiated Spurious Emission, Vertical
	

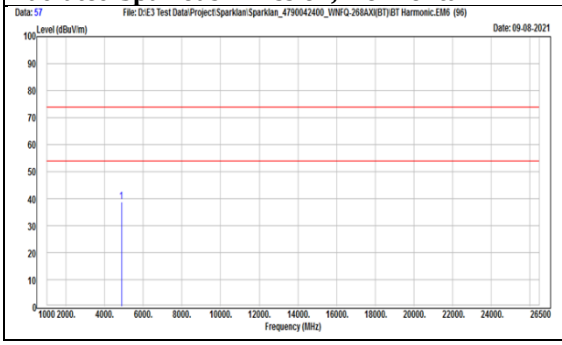
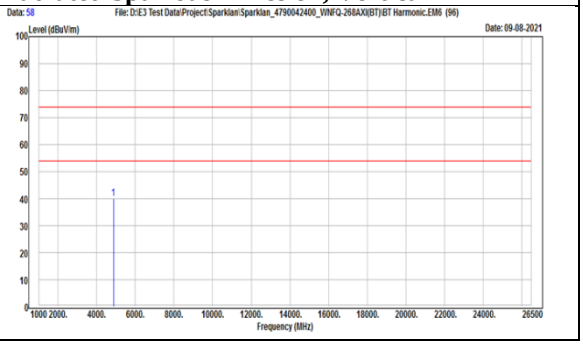
Mode	BT-LE-2Mbps	Channel	0

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal	*	4804	36.18	2.46	38.64	74	-35.36	PK
Vertical	*	4804	36.02	2.46	38.48	74	-35.52	PK

TX, BT-LE-2Mbps (Ch 0) Radiated Spurious Emission, Horizontal	TX, BT-LE-2Mbps (Ch 0) Radiated Spurious Emission, Vertical
	

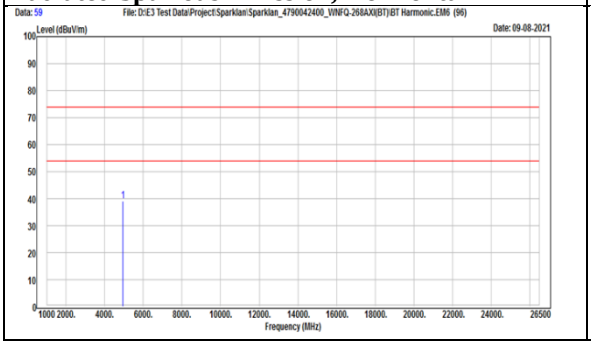
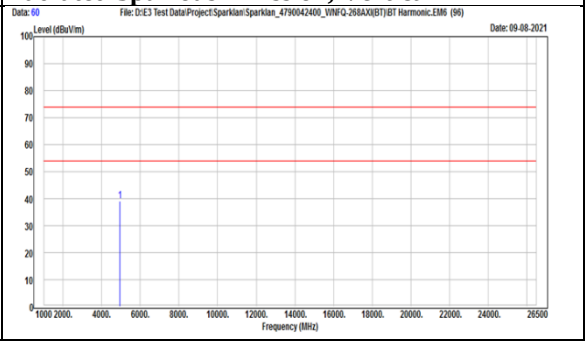
Mode	BT-LE-2Mbps	Channel	19

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal	*	4880	35.98	2.66	38.64	74	-35.36	PK
Vertical	*	4880	37.48	2.66	40.14	74	-33.86	PK

TX, BT-LE-2Mbps (Ch 19) Radiated Spurious Emission, Horizontal	TX, BT-LE-2Mbps (Ch 19) Radiated Spurious Emission, Vertical
	

Mode	BT-LE-2Mbps	Channel	39

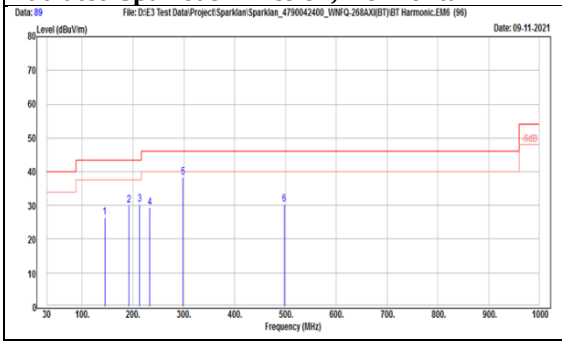
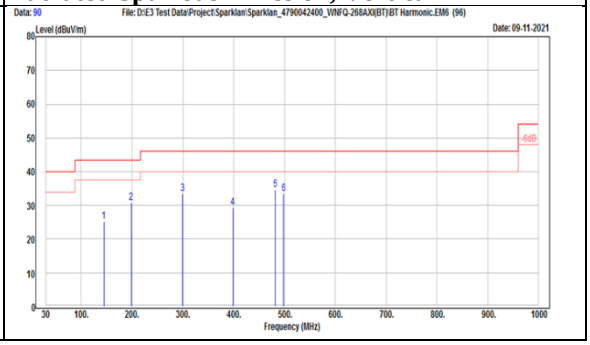
Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal	*	4960	36.49	2.62	39.11	74	-34.89	PK
Vertical	*	4960	36.61	2.62	39.23	74	-34.77	PK

TX, BT-LE-2Mbps (Ch 39) Radiated Spurious Emission, Horizontal	TX, BT-LE-2Mbps (Ch 39) Radiated Spurious Emission, Vertical
	

Below 1 GHz

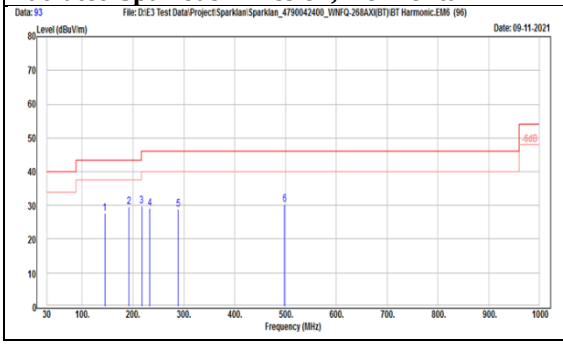
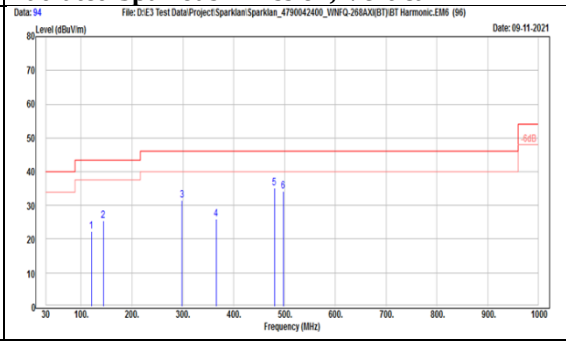
Mode	BT-LE-1Mbps	Channel	19

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		144.46	38.15	-11.81	26.34	43.5	-17.16	PK
		191.99	43.23	-13.26	29.97	43.5	-13.53	PK
		213.33	43.72	-13.44	30.28	43.5	-13.22	PK
		232.73	41.73	-12.4	29.33	46	-16.67	PK
		298.69	48.39	-9.99	38.4	46	-7.6	PK
		497.54	35.18	-4.79	30.39	46	-15.61	PK
Vertical		144.46	36.92	-11.81	25.11	43.5	-18.39	PK
		198.78	44.66	-13.9	30.76	43.5	-12.74	PK
		299.66	43.38	-9.94	33.44	46	-12.56	PK
		398.6	36.34	-7.06	29.28	46	-16.72	PK
		482.02	39.86	-5.1	34.76	46	-11.24	PK
		498.51	38.25	-4.79	33.46	46	-12.54	PK

TX, BT-LE-1Mbps (Ch 19) Radiated Spurious Emission, Horizontal	TX, BT-LE-1Mbps (Ch 19) Radiated Spurious Emission, Vertical
	

Mode	BT-LE-2Mbps	Channel	19

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		144.46	39.47	-11.81	27.66	43.5	-15.84	PK
		191.99	42.89	-13.26	29.63	43.5	-13.87	PK
		217.21	43.21	-13.31	29.9	46	-16.1	PK
		232.73	41.5	-12.4	29.1	46	-16.9	PK
		288.99	39.23	-10.31	28.92	46	-17.08	PK
		498.51	35.21	-4.79	30.42	46	-15.58	PK
Vertical		120.21	36.6	-14.3	22.3	43.5	-21.2	PK
		143.49	37.34	-11.81	25.53	43.5	-17.97	PK
		298.69	41.49	-9.99	31.5	46	-14.5	PK
		365.62	34.01	-7.98	26.03	46	-19.97	PK
		480.08	40.28	-5.19	35.09	46	-10.91	PK
		497.54	38.99	-4.79	34.2	46	-11.8	PK

TX, BT-LE-2Mbps (Ch 19) Radiated Spurious Emission, Horizontal	TX, BT-LE-2Mbps (Ch 19) Radiated Spurious Emission, Vertical
	

Conducted method

The level of unwanted emissions was measured as their power in a specified load (conducted spurious emissions).

Conducted Measurement Reading value has been considered factor offset during the test, detail information as below:

a. The composite gain will be used when signal support the correlated signal.

(Composite gain = 3.7dBi)

b. In restricted bands below 1000 MHz, add upper bound on ground plane reflection:

For f = 30 – 1000 MHz, add 4.7 dB.

Conducted Measurement correct value is coming across equation for converting the Field Strength to EIRP, detail information as below:

a. The test reading used dBuV, converted by dBm = dBuV–107dB. (Conversions for 50ohm systems)

b. Emission Result (dBuV/m), converted by E (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8 dB.
Where d is the measurement distance, in 3 m.
Where dBm = dBuV–107 dB.
Thus:

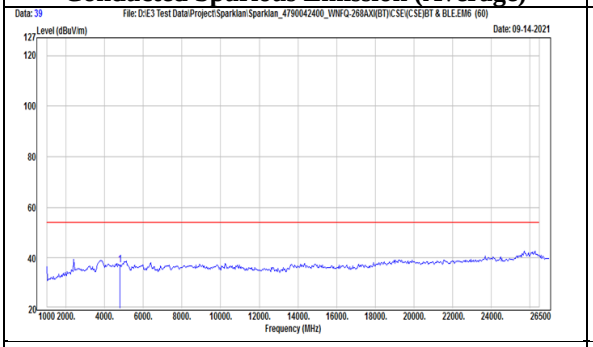
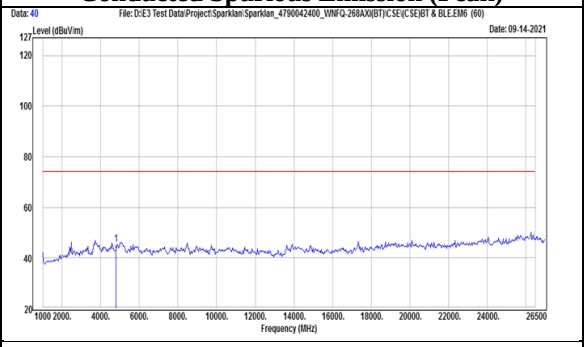
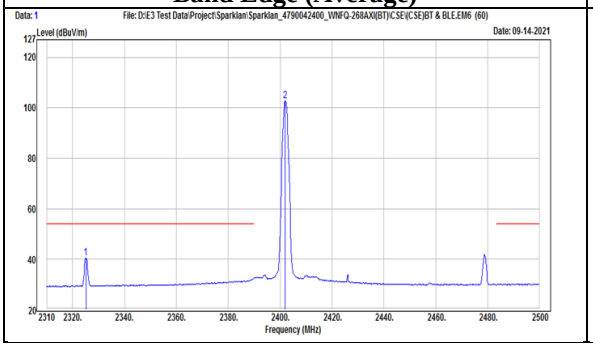
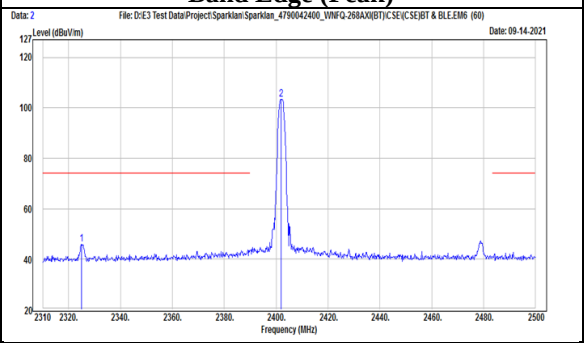
E (dBuV/m) = dBuV–107 – 20log(3) + 104.8
= dBuV–11.74

Correct Factor = –11.74 (dB/m)

Above 1 GHz

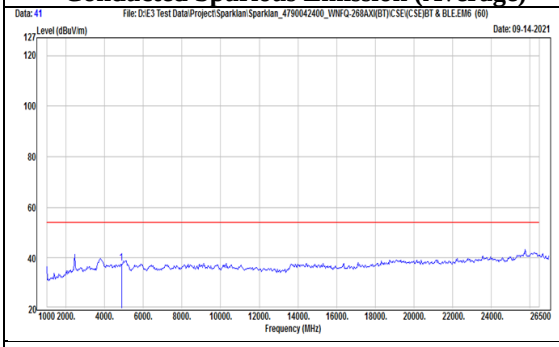
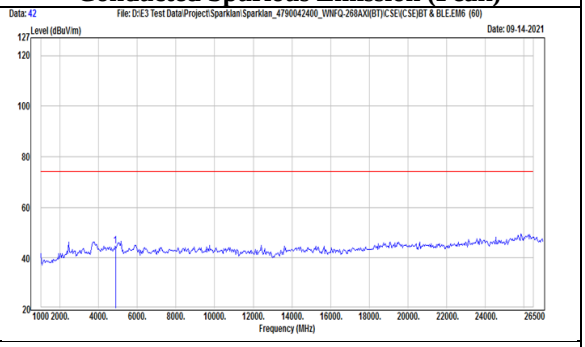
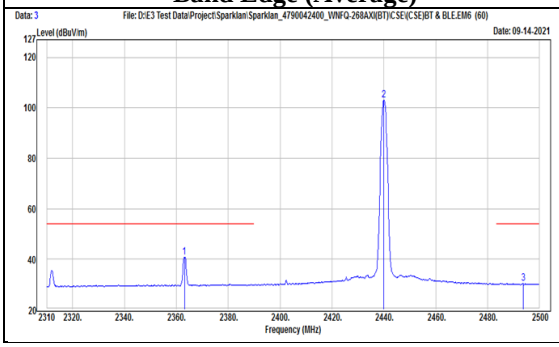
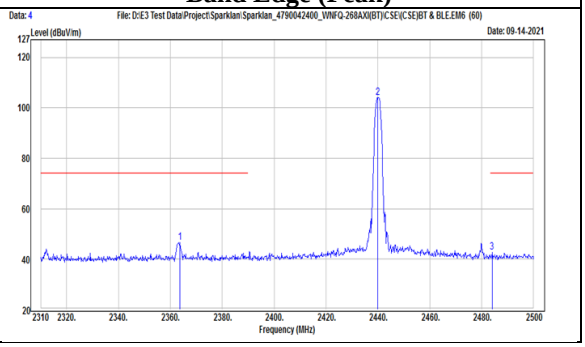
Mode	BLE(1M)	Channel	0

TX Chain	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Chain 0		2325.01	57.54	-11.74	45.8	74	-28.2	PK
		2325.2	52.32	-11.74	40.58	54	-13.42	AVG
	@	2402	115.15	-11.74	103.41	N/A	N/A	PK
	@	2402	114.33	-11.74	102.59	N/A	N/A	AVG
		4804	56.97	-11.74	45.23	74	-28.77	PK
		4804	49.04	-11.74	37.3	54	-16.7	AVG

Tx, BLE(1M) (Ch 0), Chain 0 Conducted Spurious Emission (Average)	Tx, BLE(1M) (Ch 0), Chain 0 Conducted Spurious Emission (Peak)
	
Tx, BLE(1M) (Ch 0), Chain 0 Band Edge (Average)	**Tx, BLE(1M) (Ch 0), Chain 0 Band Edge (Peak)**
	

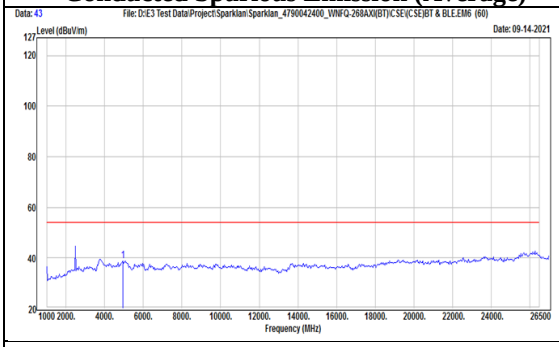
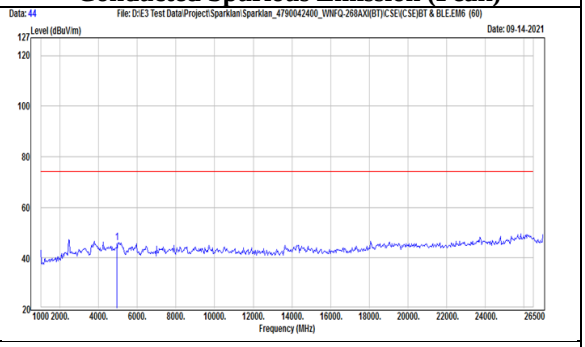
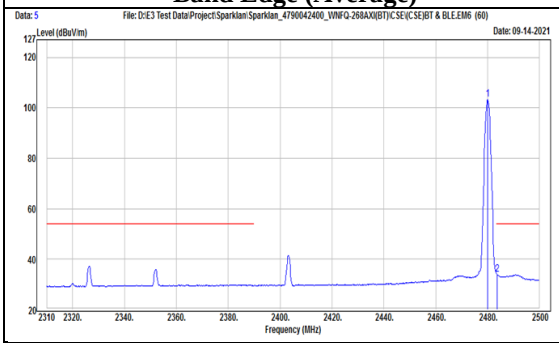
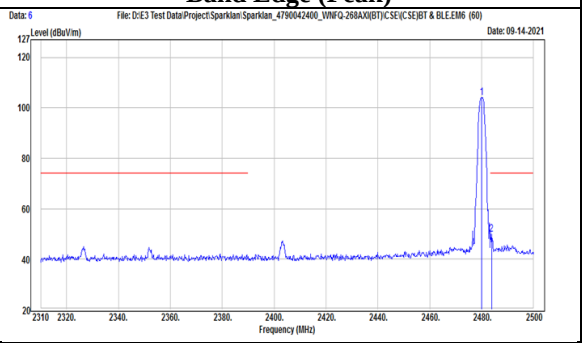
Mode	BLE(1M)	Channel	19

TX Chain	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Chain 0		2363.2	52.63	-11.74	40.89	54	-13.11	AVG
		2363.77	58.44	-11.74	46.7	74	-27.3	PK
	@	2440	115.67	-11.74	103.93	N/A	N/A	PK
	@	2440	114.85	-11.74	103.11	N/A	N/A	AVG
		2484.04	54.45	-11.74	42.71	74	-31.29	PK
		2493.73	42.25	-11.74	30.51	54	-23.49	AVG
		4880	56.51	-11.74	44.77	74	-29.23	PK
		4880	49.42	-11.74	37.68	54	-16.32	AVG

Tx, BLE(1M) (Ch 19), Chain 0 Conducted Spurious Emission (Average)	Tx, BLE(1M) (Ch 19), Chain 0 Conducted Spurious Emission (Peak)
	
Tx, BLE(1M) (Ch 19), Chain 0 Band Edge (Average)	**Tx, BLE(1M) (Ch 19), Chain 0 Band Edge (Peak)**
	

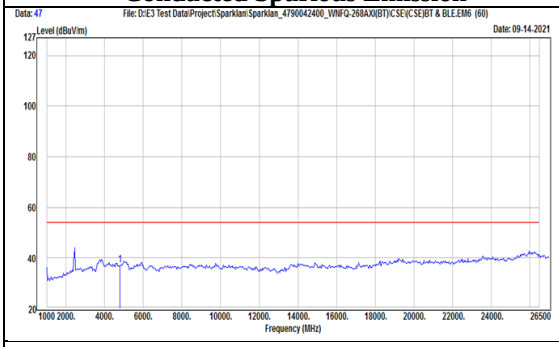
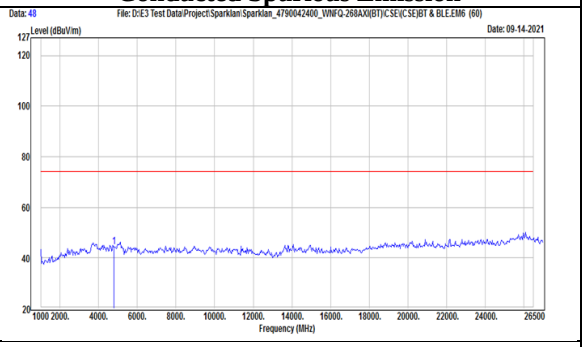
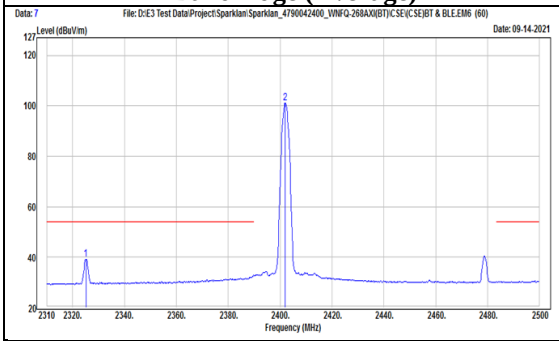
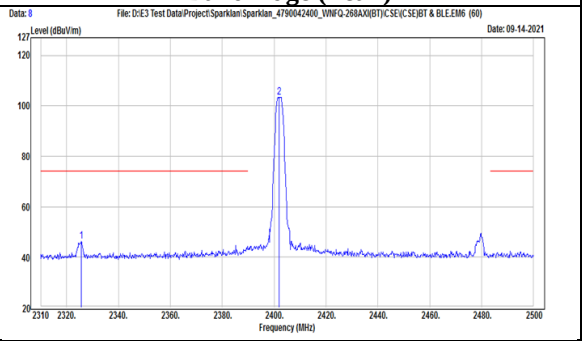
Mode	BLE(1M)	Channel	39

TX Chain	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Chain 0	@	2480	115.71	-11.74	103.97	N/A	N/A	PK
	@	2480	114.91	-11.74	103.17	N/A	N/A	AVG
		2483.66	45.72	-11.74	33.98	54	-20.02	AVG
		2483.85	61.53	-11.74	49.79	74	-24.21	PK
		4960	57.63	-11.74	45.89	74	-28.11	PK
		4960	50.47	-11.74	38.73	54	-15.27	AVG

Tx, BLE(1M) (Ch 39), Chain 0 Conducted Spurious Emission (Average)	Tx, BLE(1M) (Ch 39), Chain 0 Conducted Spurious Emission (Peak)
	
Tx, BLE(1M) (Ch 39), Chain 0 Band Edge (Average)	**Tx, BLE(1M) (Ch 39), Chain 0 Band Edge (Peak)**
	

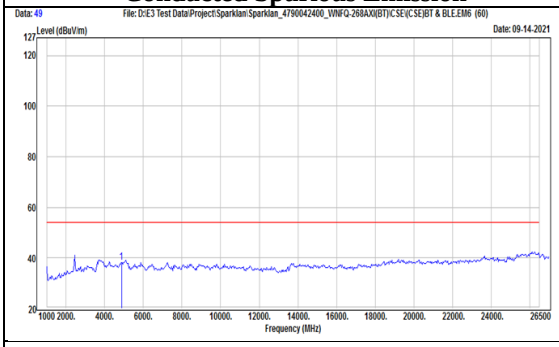
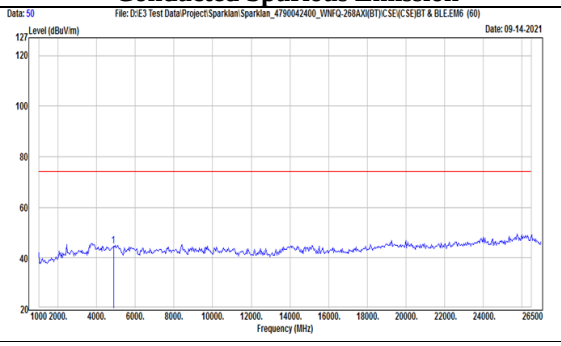
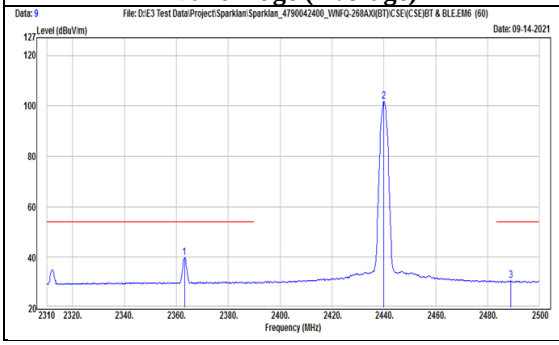
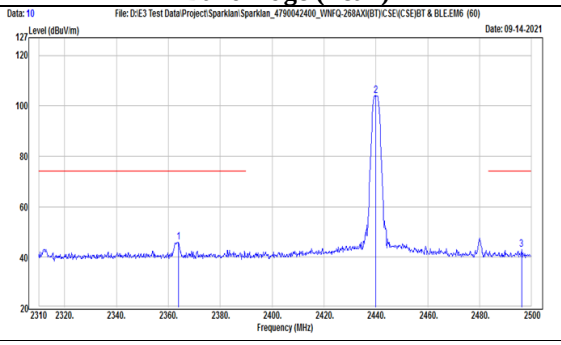
Mode	BLE(2M)	Channel	0

TX Chain	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Chain 0		2325.2	50.97	-11.74	39.23	54	-14.77	AVG
		2325.77	57.97	-11.74	46.23	74	-27.77	PK
	@	2402	115.08	-11.74	103.34	N/A	N/A	PK
	@	2402	112.92	-11.74	101.18	N/A	N/A	AVG
		4804	55.98	-11.74	44.24	74	-29.76	PK
		4804	48.9	-11.74	37.16	54	-16.84	AVG

Tx, BLE(2M) (Ch 0), Chain 0 Conducted Spurious Emission	Tx, BLE(2M) (Ch 0), Chain 0 Conducted Spurious Emission
	
Tx, BLE(2M) (Ch 0), Chain 0 Band Edge (Average)	**Tx, BLE(2M) (Ch 0), Chain 0 Band Edge (Peak)**
	

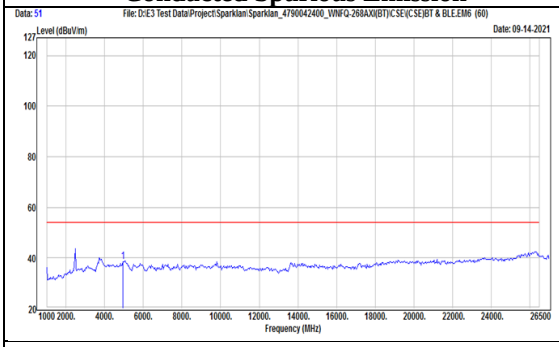
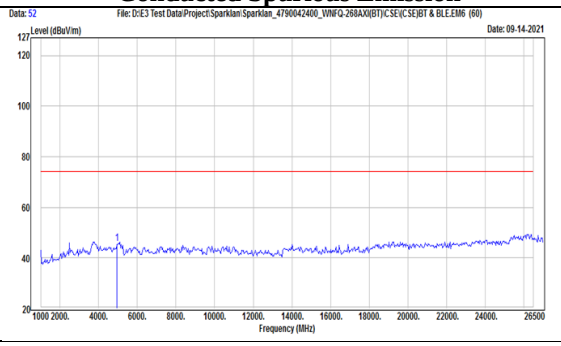
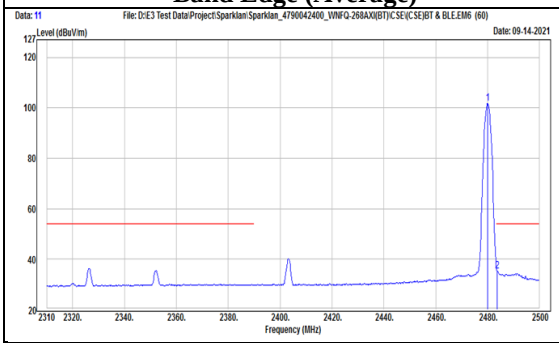
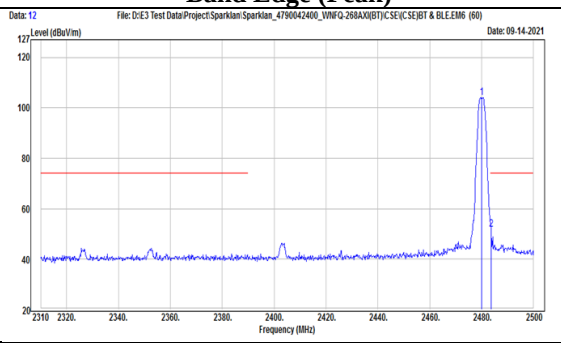
Mode	BLE(2M)	Channel	19

TX Chain	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Chain 0		2363.2	51.46	-11.74	39.72	54	-14.28	AVG
		2363.96	57.81	-11.74	46.07	74	-27.93	PK
	@	2440	115.64	-11.74	103.9	N/A	N/A	PK
	@	2440	113.45	-11.74	101.71	N/A	N/A	AVG
		2488.98	42.29	-11.74	30.55	54	-23.45	AVG
		2496.2	54.72	-11.74	42.98	74	-31.02	PK
		4880	56.43	-11.74	44.69	74	-29.31	PK
		4880	49.93	-11.74	38.19	54	-15.81	AVG

Tx, BLE(2M) (Ch 19), Chain 0 Conducted Spurious Emission	Tx, BLE(2M) (Ch 19), Chain 0 Conducted Spurious Emission
	
Tx, BLE(2M) (Ch 19), Chain 0 Band Edge (Average)	**Tx, BLE(2M) (Ch 19), Chain 0 Band Edge (Peak)**
	

Mode	BLE(2M)	Channel	39

TX Chain	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Chain 0	@	2480	115.66	-11.74	103.92	N/A	N/A	PK
	@	2480	113.47	-11.74	101.73	N/A	N/A	AVG
		2483.66	63.44	-11.74	51.7	74	-22.3	PK
		2483.66	47.06	-11.74	35.32	54	-18.68	AVG
		4960	57.46	-11.74	45.72	74	-28.28	PK
		4960	50.29	-11.74	38.55	54	-15.45	AVG

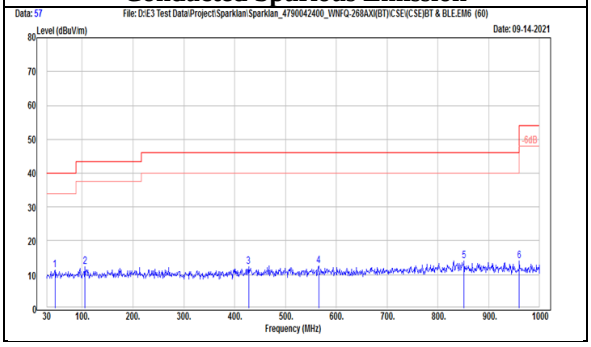
Tx, BLE(2M) (Ch 39), Chain 0 Conducted Spurious Emission	Tx, BLE(2M) (Ch 39), Chain 0 Conducted Spurious Emission
	
Tx, BLE(2M) (Ch 39), Chain 0 Band Edge (Average)	**Tx, BLE(2M) (Ch 39), Chain 0 Band Edge (Peak)**
	

Below 1 GHz

Mode	BLE(1M)	Channel	0

TX Chain	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Chain 0		46.49	18.53	-7.04	11.49	40	-28.51	PK
		105.66	19.44	-7.04	12.4	43.5	-31.1	PK
		427.7	19.46	-7.04	12.42	46	-33.58	PK
		565.44	19.7	-7.04	12.66	46	-33.34	PK
		851.59	21.15	-7.04	14.11	46	-31.89	PK
		960.23	21.04	-7.04	14	54	-40	PK

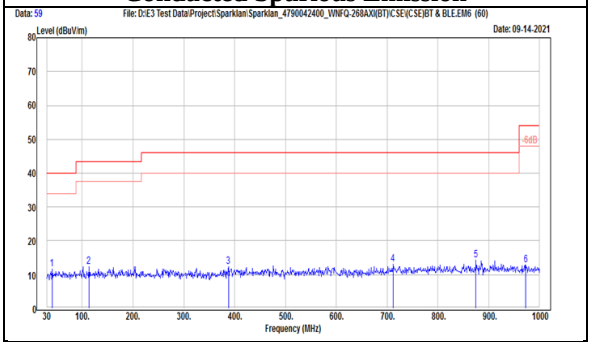
Tx, BLE(1M) (Ch 0), Chain 0
Conducted Spurious Emission



Mode	BLE(2M)	Channel	0

TX Chain	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Chain 0		40.67	18.56	-7.04	11.52	40	-28.48	PK
		113.42	19.43	-7.04	12.39	43.5	-31.11	PK
		387.93	19.46	-7.04	12.42	46	-33.58	PK
		711.91	20.03	-7.04	12.99	46	-33.01	PK
		874.87	21.23	-7.04	14.19	46	-31.81	PK
		972.84	19.88	-7.04	12.84	54	-41.16	PK

Tx, BLE(2M) (Ch 0), Chain 0
Conducted Spurious Emission



9 kHz ~ 30 MHz Data:

For 9 kHz to 30 MHz radiated emission have performed all modes of operation were investigated. The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

No non-compliance noted:

KDB 414788 D01 OATS and Chamber Correlation Justification

- Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

- OATs and chamber correlation testing had been performed and chamber measured test results is the worst case test result.

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30m open area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

9.6. AC Power Line Conducted Emission

Requirements

Frequency (MHz)	Conducted limit (dBµV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

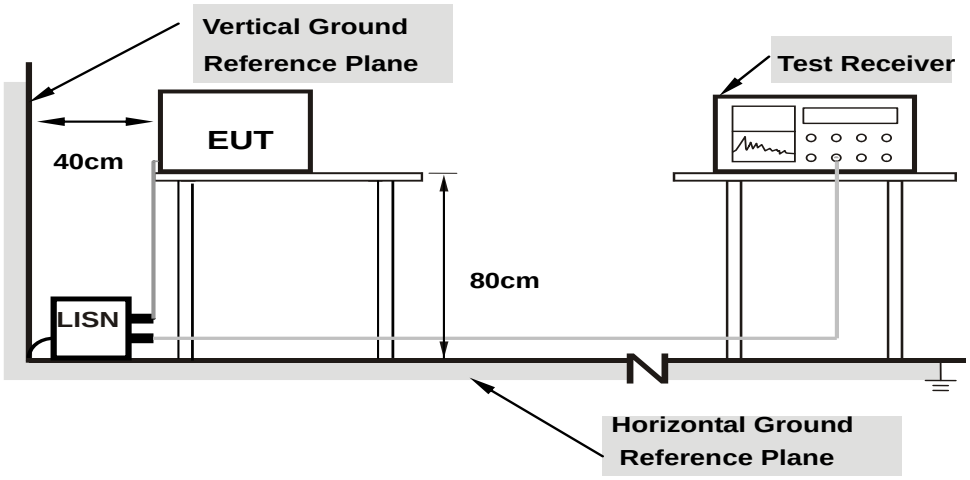
Note:
1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

Test Procedures

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE:
1. The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.
2. All modes of operation were investigated (includes all external accessories) and the worst-case emissions are reported, the other emission levels were low against the limit.
3. Test data of Result value (dBuV) = Reading value (dBuV) + Correction Factor (dB).
4. Test data of Margin(dB) = Result value (dBuV) - Limit value (dBuV).
5. Test data of Correction Factor (dB) = Insertion loss(dB) + Cable loss(dB).

Test Setup



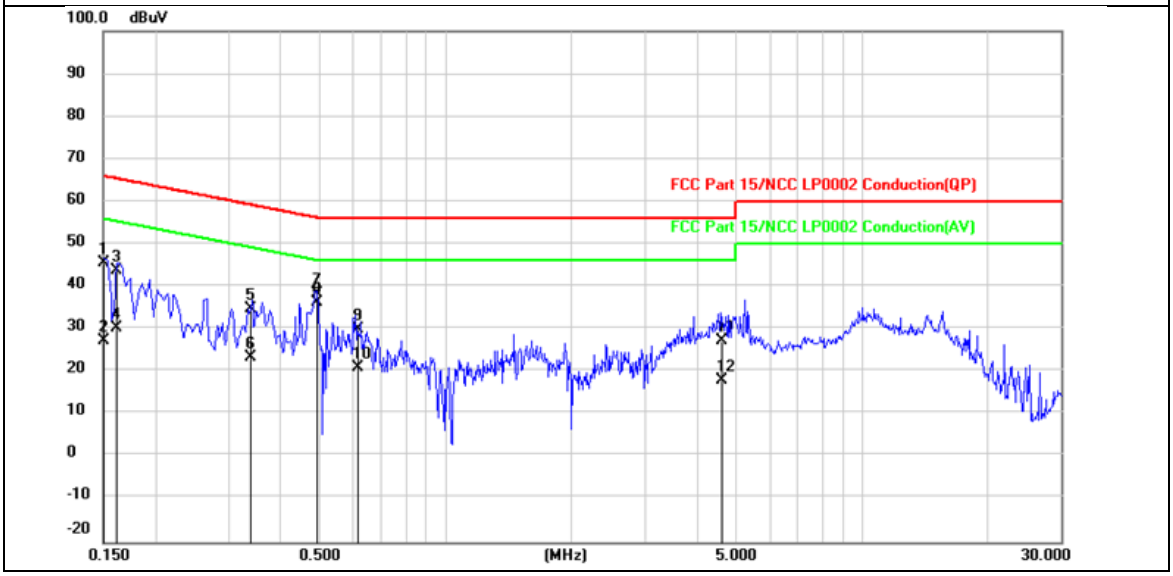
Note: 1.Support units were connected to second LISN.

For the actual test configuration, please refer to the Setup Configurations.

Test Data

Mode	TX_BLE(1M)	Channel	39

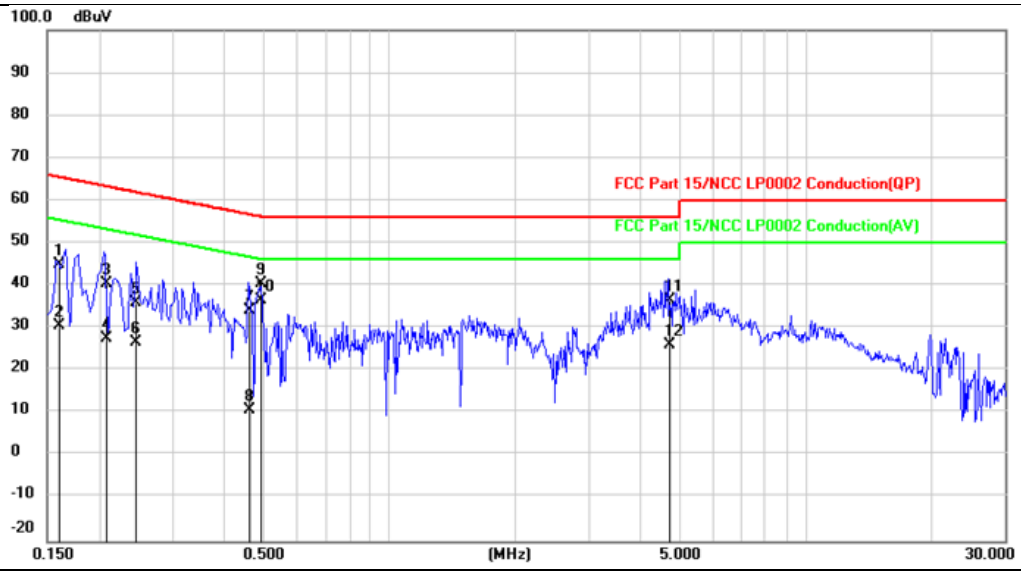
Phase: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1510	45.53	0.08	45.61	65.94	-20.33	QP
2	0.1510	27.30	0.08	27.38	55.94	-28.56	AVG
3	0.1607	43.74	0.08	43.82	65.43	-21.61	QP
4	0.1607	30.08	0.08	30.16	55.43	-25.27	AVG
5	0.3381	34.53	0.09	34.62	59.25	-24.63	QP
6	0.3381	23.22	0.09	23.31	49.25	-25.94	AVG
7	0.4878	38.38	0.09	38.47	56.21	-17.74	QP
8	0.4878	36.27	0.09	36.36	46.21	-9.85	AVG
9	0.6119	29.85	0.09	29.94	56.00	-26.06	QP
10	0.6119	20.78	0.09	20.87	46.00	-25.13	AVG
11	4.6182	27.10	0.22	27.32	56.00	-28.68	QP
12	4.6182	17.84	0.22	18.06	46.00	-27.94	AVG

Mode	TX_BLE(1M)	Channel	39

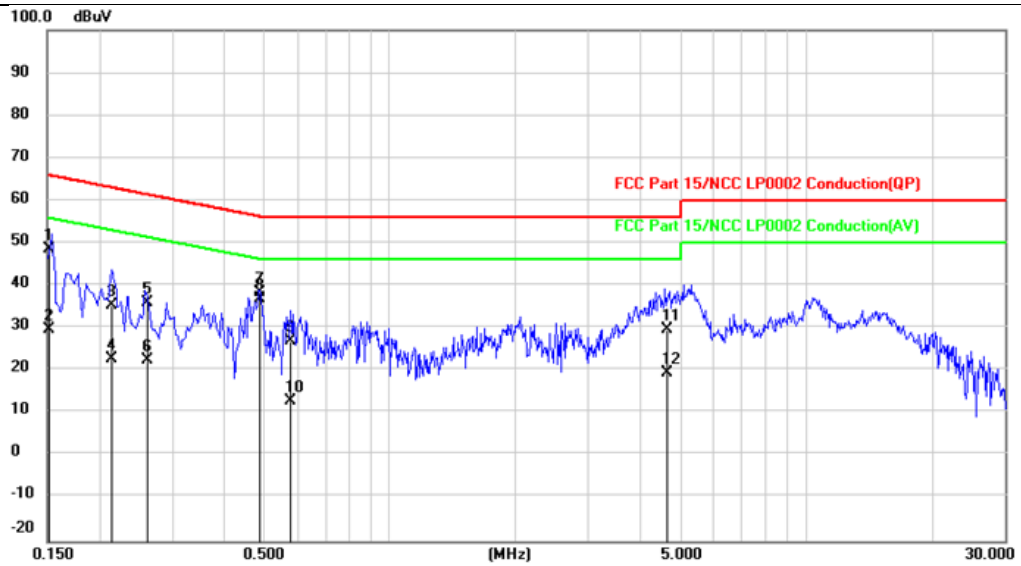
Phase: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1617	44.77	0.06	44.83	65.38	-20.55	QP
2	0.1617	30.44	0.06	30.50	55.38	-24.88	AVG
3	0.2096	40.42	0.07	40.49	63.22	-22.73	QP
4	0.2096	27.43	0.07	27.50	53.22	-25.72	AVG
5	0.2464	35.78	0.07	35.85	61.88	-26.03	QP
6	0.2464	26.60	0.07	26.67	51.88	-25.21	AVG
7	0.4586	34.06	0.08	34.14	56.72	-22.58	QP
8	0.4586	10.79	0.08	10.87	46.72	-35.85	AVG
9	0.4876	40.41	0.08	40.49	56.21	-15.72	QP
10	0.4876	36.59	0.08	36.67	46.21	-9.54	AVG
11	4.7232	36.44	0.21	36.65	56.00	-19.35	QP
12	4.7232	25.79	0.21	26.00	46.00	-20.00	AVG

Mode	TX_BLE(2M)	Channel	39

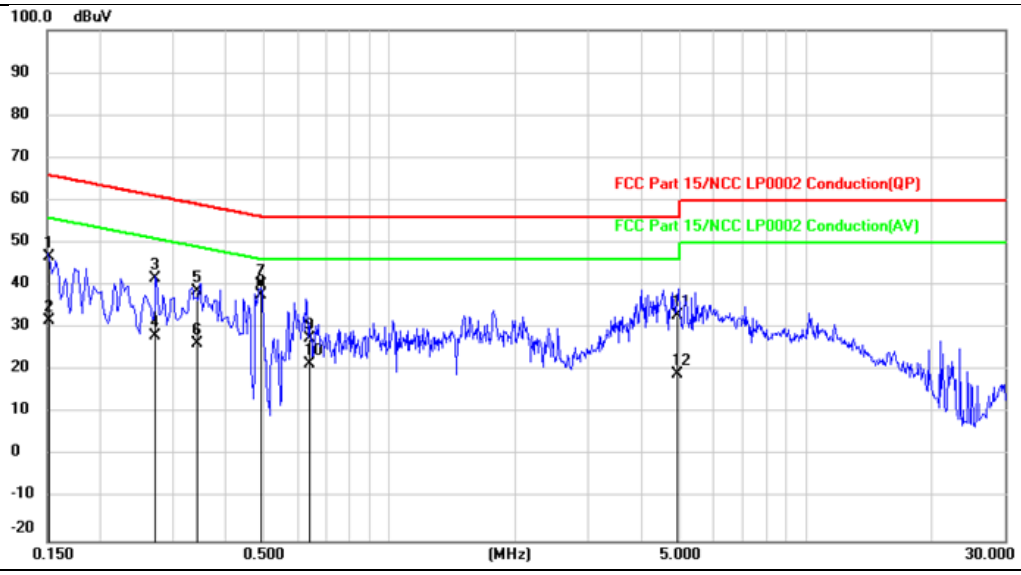
Phase: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1512	48.53	0.08	48.61	65.93	-17.32	QP
2	0.1512	29.51	0.08	29.59	55.93	-26.34	AVG
3	0.2138	35.30	0.08	35.38	63.06	-27.68	QP
4	0.2138	22.57	0.08	22.65	53.06	-30.41	AVG
5	0.2604	35.91	0.08	35.99	61.42	-25.43	QP
6	0.2604	22.48	0.08	22.56	51.42	-28.86	AVG
7	0.4866	38.36	0.09	38.45	56.23	-17.78	QP
8	0.4866	36.81	0.09	36.90	46.23	-9.33	AVG
9	0.5813	26.76	0.09	26.85	56.00	-29.15	QP
10	0.5813	12.72	0.09	12.81	46.00	-33.19	AVG
11	4.6141	29.47	0.22	29.69	56.00	-26.31	QP
12	4.6141	19.28	0.22	19.50	46.00	-26.50	AVG

Mode	TX_BLE(2M)	Channel	39

Phase: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1515	46.63	0.06	46.69	65.92	-19.23	QP
2	0.1515	31.67	0.06	31.73	55.92	-24.19	AVG
3	0.2739	41.56	0.07	41.63	61.00	-19.37	QP
4	0.2739	28.17	0.07	28.24	51.00	-22.76	AVG
5	0.3453	38.45	0.08	38.53	59.07	-20.54	QP
6	0.3453	26.28	0.08	26.36	49.07	-22.71	AVG
7	0.4871	39.99	0.08	40.07	56.22	-16.15	QP
8	0.4871	37.58	0.08	37.66	46.22	-8.56	AVG
9	0.6381	27.58	0.08	27.66	56.00	-28.34	QP
10	0.6381	21.58	0.08	21.66	46.00	-24.34	AVG
11	4.8845	32.65	0.22	32.87	56.00	-23.13	QP
12	4.8845	18.83	0.22	19.05	46.00	-26.95	AVG

END OF REPORT