FCC REPORT
(BLE)

Applicant:	PAX Technology Limited
Address of Applicant:	Room 2416, 24/F., Sun Hung Kai Centre, 30 Harbour Road, Wanchai, Hong Kong

Equipment Under Test (EUT)

Product Name:	Integrated Smart Terminal
Model No.:	E600Mini
Trade mark:	PAX
FCC ID:	V5PE600MINI
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.247
Date of sample receipt:	03 Nov., 2021
Date of Test:	04 Nov., to 14 Dec., 2021
Date of report issued:	15 Dec., 2021
Test Result:	PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Bruce Zhang
Laboratory Manager

2 Version

Version No.	Date	Description
00	*15 Dec., 2021*	*Original*

Tested by: Mike.ou ***Date:*** *15 Dec., 2021*

Test Engineer

Reviewed by: Winner Zhang ***Date:*** *15 Dec., 2021*

Project Engineer

3 Contents

Page

4 Test Summary

Test Items	Section in CFR 47	Result
Antenna requirement	15.203 & 15.247 (b)	Pass
AC Power Line Conducted Emission	15.207	Pass
Conducted Peak Output Power	15.247 (b)(3)	Pass
6dB Emission Bandwidth 99% Occupied Bandwidth	15.247 (a)(2)	Pass
Power Spectral Density	15.247 (e)	Pass
Band Edge	15.247 (d)	Pass
Spurious Emission	15.205 15.209	Pass

Remark:

1. *Pass: The EUT complies with the essential requirements in the standard.*
2. *N/A: Not Applicable.*
3. *The cable insertion loss used by "RF Output Power" and other conduction measurement items is 0.5dB (provided by the customer).*

Test Method:	*ANSI C63.10-2013* *KDB 558074 D01 15.247 Meas Guidance v05r02*

5 General Information

5.1 Client Information

Applicant:	PAX Technology Limited
Address:	Room 2416, 24/F., Sun Hung Kai Centre, 30 Harbour Road, Wanchai, Hong Kong
Manufacturer:	PAX Computer Technology (Shenzhen) Co., Ltd.
Address:	4/F, No.3 Building, Software Park, Second Central Science-Tech Road, High-Tech industrial Park, Shenzhen, Guangdong, P.R.C.

5.2 General Description of E.U.T.

Product Name:	Integrated Smart Terminal
Model No.:	E600Mini
Operation Frequency:	2402-2480 MHz
Channel numbers:	40
Channel separation:	2 MHz
Modulation technology:	GFSK
Data speed :	1Mbps & 2Mbps
Antenna Type:	Internal Antenna
Antenna gain:	1.5 dBi
Power supply:	Rechargeable Li-ion Battery DC3.8V, 6100mAh
AC adapter:	Model: TPD-71A120150UU01 Input: AC100-240V, 50/60Hz, 0.6A Output: DC 3.6-6.0V, 3.0A, 18.0W DC 6.0-9.0V, 2.0A, 18.0W DC 9.0-12.0V, 1.5A, 18.0W
Test Sample Condition:	The test samples were provided in good working order with no visible defects.

Operation Frequency each of channel

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

Note:
In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test. Channel No. 0, 20 & 39 were selected as Lowest, Middle and Highest channel.

5.3 Test environment and mode

Operating Environment:	
Temperature:	24.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010 mbar
Test mode:	
Transmitting mode	Keep the EUT in continuous transmitting with modulation
Radiated Emission: The sample was placed 0.8m (below 1GHz)/1.5m (above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. Duty cycle setting during the transmission is 100% with maximum power setting for all modulations.	

5.4 Description of Support Units

The EUT has been tested as an independent unit.

5.5 Measurement Uncertainty

Parameter	Expanded Uncertainty (Confidence of 95%)
Conducted Emission (9kHz ~ 150KHz) for V-AMN	3.11 dB
Conducted Emission (150kHz ~ 30MHz) for V-AMN	2.62 dB
Radiated Emission (30MHz ~ 1GHz) for 3m SAC	4.45 dB
Radiated Emission (1GHz ~ 18GHz) for 3m SAC	5.34 dB
Radiated Emission (18GHz ~ 40GHz) for 3m SAC	5.34 dB

5.6 Additions to, deviations, or exclusions from the method

No

5.7 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC - Designation No.: CN1211**

JianYan Testing Group Shenzhen Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

- **ISED – CAB identifier.: CN0021**

The 3m Semi-anechoic chamber and 10m Semi-anechoic chamber of JianYan Testing Group Shenzhen Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

- **CNAS - Registration No.: CNAS L15527**

JianYan Testing Group Shenzhen Co., Ltd. is accredited to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L15527.

- **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: https://portal.a2la.org/scopepdf/4346-01.pdf

5.8 Laboratory Location

JianYan Testing Group Shenzhen Co., Ltd.
Address: No.101, Building 8, Innovation Wisdom Port, No.155 Hongtian Road, Huangpu Community, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, People's Republic of China.
Tel: +86-755-23118282, Fax: +86-755-23116366
Email: info-JYTee@lets.com, Website: http://www.ccis-cb.com

5.9 Test Instruments list

Radiated Emission:					
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date (mm-dd-yy)**	**Cal. Due date (mm-dd-yy)**
3m SAC	ETS	RFD-100	Q1984	04-14-2021	04-13-2024
BiConiLog Antenna	SCHWARZBECK	VULB9163	9163-1246	03-07-2021	03-06-2022
Biconical Antenna	SCHWARZBECK	VUBA 9117	9117#359	06-17-2021	06-17-2022
Horn Antenna	SCHWARZBECK	BBHA9120D	912D-916	03-07-2021	03-06-2022
Broad-Band Horn Antenna	SCHWARZBECK	BBHA9170	1067	04-02-2021	04-01-2022
Broad-Band Horn Antenna	SCHWARZBECK	BBHA9170	1068	04-02-2021	04-01-2022
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-03-2021	03-02-2022
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-03-2021	03-02-2022
Spectrum analyzer	Keysight	N9010B	MY60240202	10-27-2021	10-26-2022
Low Pre-amplifier	SCHWARZBECK	BBV9743B	00305	03-07-2021	03-06-2022
High Pre-amplifier	SKET	LNPA_0118G-50	MF280208233	03-07-2021	03-06-2022
Cable	Qualwave	JYT3M-1G-NN-8M	JYT3M-1	03-07-2021	03-06-2022
Cable	Qualwave	JYT3M-18G-NN-8M	JYT3M-2	03-07-2021	03-06-2022
Cable	Qualwave	JYT3M-1G-BB-5M	JYT3M-3	03-07-2021	03-06-2022
Cable	Bost	JYT3M-40G-SS-8M	JYT3M-4	04-02-2021	04-01-2022
EMI Test Software	Tonscend	TS+	Version:3.0.0.1		

Conducted Emission:					
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date (mm-dd-yy)**	**Cal. Due date (mm-dd-yy)**
EMI Test Receiver	Rohde & Schwarz	ESCI 3	101189	03-03-2021	03-02-2022
LISN	Rohde & Schwarz	ENV432	101602	04-06-2021	04-05-2022
LISN	Rohde & Schwarz	ESH3-Z5	843862/010	06-18-2020	06-17-2022
RF Switch	TOP PRECISION	RSU0301	N/A	03-03-2021	03-02-2022
Cable	Bost	JYTCE-1G-NN-2M	JYTCE-1	03-03-2021	03-02-2022
Cable	Bost	JYTCE-1G-BN-3M	JYTCE-2	03-03-2021	03-02-2022
EMI Test Software	AUDIX	E3	Version: 6.110919b		

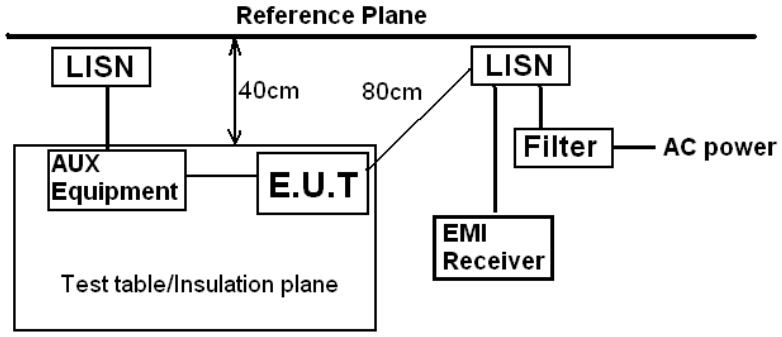
Conducted method:					
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date (mm-dd-yy)**	**Cal. Due date (mm-dd-yy)**
Spectrum Analyzer	Keysight	N9010B	MY60240202	10-27-2021	10-26-2022
Vector Signal Generator	Keysight	N5182B	MY59101009	10-27-2021	10-26-2022
Analog Signal Generator	Keysight	N5173B	MY59100765	10-27-2021	10-26-2022
Power Detector Box	MWRF-test	MW100-PSB	MW201020JYT	11-19-2021	11-18-2022
Simulated Station	Rohde & Schwarz	CMW270	102335	10-27-2021	10-26-2022
RF Control Box	MWRF-test	MW100-RFCB	MW200927JYT	N/A	N/A
PDU	MWRF-test	XY-G10	N/A	N/A	N/A
DC Power Supply	Keysight	E3642A	MY60296194	11-27-2020	11-26-2023
Temperature Humidity Chamber	Deli	8840	N/A	03-08-2021	03-07-2022
Test Software	MWRF-tes	MTS 8310	Version: 2.0.0.0		

6 Test results and Measurement Data

6.1 Antenna requirement:

Standard requirement:	FCC Part 15 C Section 15.203 /247(b)
15.203 requirement: 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, 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. 15.247(b) (4) requirement: (4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.	
E.U.T Antenna:	
The BLE antenna is an internal antenna which cannot replace by end-user, the best-case gain of the antenna is 1.5dBi.	

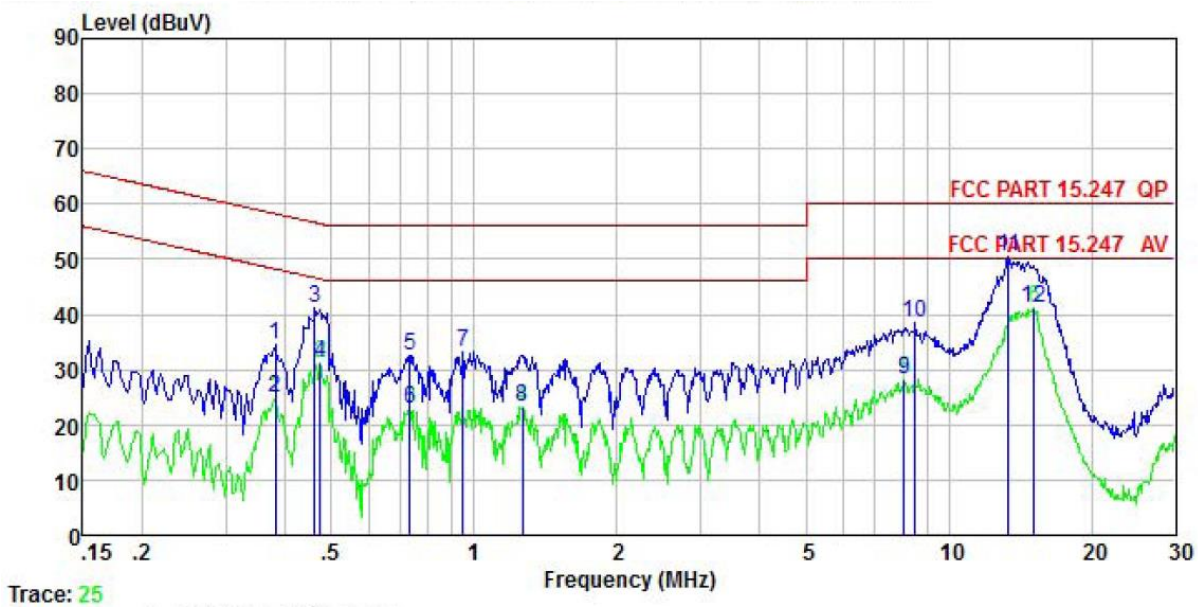
6.2 Conducted Emission

<table>
<tr><td>Test Requirement:</td><td colspan="3">FCC Part 15 C Section 15.207</td></tr>
<tr><td>Test Frequency Range:</td><td colspan="3">150 kHz to 30 MHz</td></tr>
<tr><td>Class / Severity:</td><td colspan="3">Class B</td></tr>
<tr><td>Receiver setup:</td><td colspan="3">RBW=9kHz, VBW=30kHz</td></tr>
<tr><td rowspan="6">Limit:</td><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBuV)</td></tr>
<tr><td>Quasi-peak</td><td>Average</td></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
<tr><td colspan="3">* Decreases with the logarithm of the frequency.</td></tr>
<tr><td>Test procedure:</td><td colspan="3">1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.), which provides a 50ohm/50uH coupling impedance for the measuring equipment.
2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).
3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10(latest version) on conducted measurement.</td></tr>
<tr><td>Test setup:</td><td colspan="3"> 

Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m</td></tr>
<tr><td>Test Instruments:</td><td colspan="3">Refer to section 5.9 for details</td></tr>
<tr><td>Test mode:</td><td colspan="3">Refer to section 5.3 for details</td></tr>
<tr><td>Test results:</td><td colspan="3">Passed</td></tr>
</table>

Measurement Data:

Product name:	Integrated Smart Terminal	Product model:	E600Mini
Test by:	Mike	Test mode:	BLE Tx mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Line
Test voltage:	AC 120 V/60 Hz	Environment:	Temp.: 22.5℃ Humi.: 55%

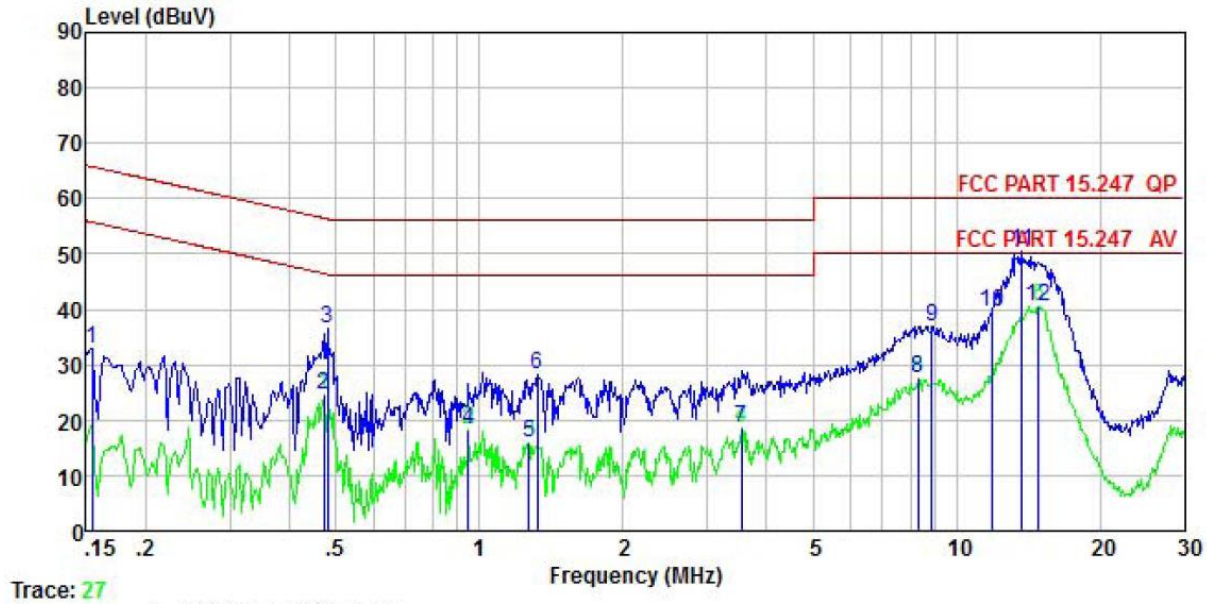


	Freq	Read Level	LISN Factor	Aux Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.381	23.90	10.27	0.31	0.03	34.51	58.25	-23.74	QP
2	0.381	14.31	10.27	0.31	0.03	24.92	48.25	-23.33	Average
3	0.461	31.06	10.29	-0.06	0.03	41.32	56.67	-15.35	QP
4	0.474	21.09	10.29	-0.18	0.03	31.23	46.45	-15.22	Average
5	0.731	22.54	10.30	-0.30	0.03	32.57	56.00	-23.43	QP
6	0.731	12.78	10.30	-0.30	0.03	22.81	46.00	-23.19	Average
7	0.948	22.45	10.32	0.32	0.05	33.14	56.00	-22.86	QP
8	1.262	12.77	10.32	0.20	0.10	23.39	46.00	-22.61	Average
9	8.062	15.98	10.53	1.57	0.10	28.18	50.00	-21.82	Average
10	8.501	26.12	10.55	1.67	0.11	38.45	60.00	-21.55	QP
11	13.337	36.64	10.72	3.11	0.11	50.58	60.00	-9.42	QP
12	15.146	26.68	10.77	3.53	0.14	41.12	50.00	-8.88	Average

Notes:

1. *An initial pre-scan was performed on the line and neutral lines with peak detector.*
2. *Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.*
3. *Final Level =Receiver Read level + LISN Factor + Aux Factor + Cable Loss.*

Product name:	Integrated Smart Terminal	Product model:	E600Mini
Test by:	Mike	Test mode:	BLE Tx mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Neutral
Test voltage:	AC 120 V/60 Hz	Environment:	Temp.: 22.5℃ Humi.: 55%

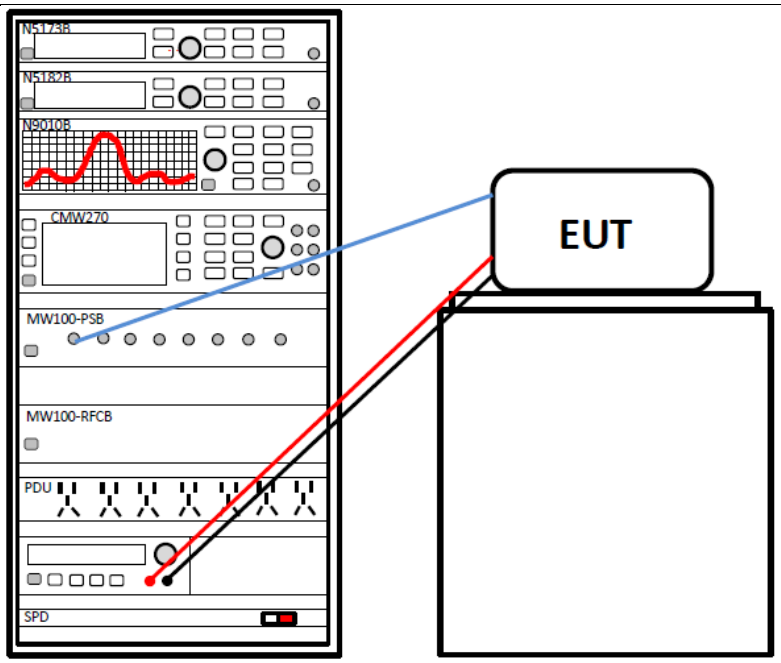


	Freq	Read Level	LISN Factor	Aux Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.154	22.80	10.19	0.01	0.01	33.01	65.78	-32.77	QP
2	0.471	14.09	10.28	0.01	0.03	24.41	46.49	-22.08	Average
3	0.481	26.15	10.28	0.02	0.03	36.48	56.32	-19.84	QP
4	0.948	7.87	10.31	0.07	0.05	18.30	46.00	-27.70	Average
5	1.269	5.33	10.31	0.11	0.10	15.85	46.00	-30.15	Average
6	1.324	17.75	10.31	0.12	0.11	28.29	56.00	-27.71	QP
7	3.547	7.57	10.36	0.43	0.08	18.44	46.00	-27.56	Average
8	8.323	15.85	10.53	1.11	0.10	27.59	50.00	-22.41	Average
9	8.869	25.13	10.55	1.21	0.11	37.00	60.00	-23.00	QP
10	11.870	26.77	10.65	2.12	0.10	39.64	60.00	-20.36	QP
11	13.695	37.07	10.70	2.71	0.12	50.60	60.00	-9.40	QP
12	14.828	26.56	10.72	3.05	0.14	40.47	50.00	-9.53	Average

Notes:

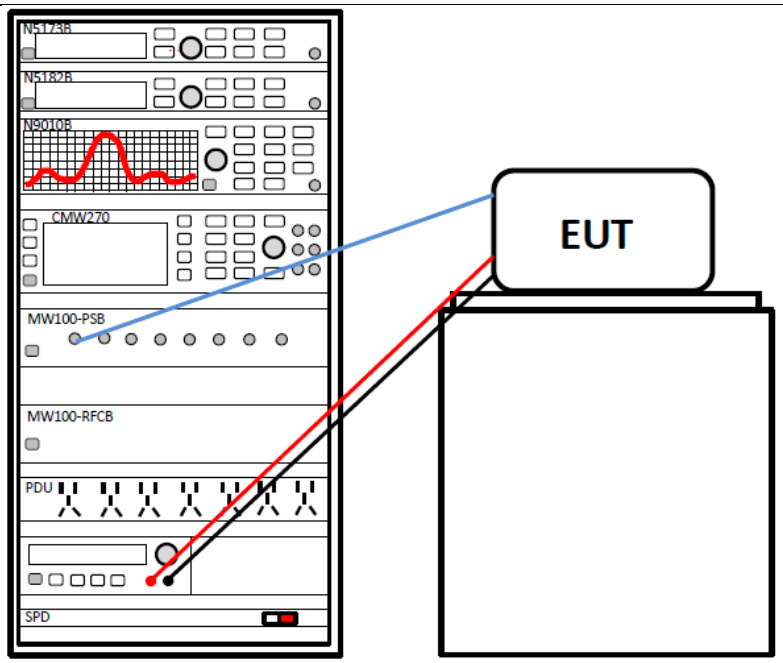
1. *An initial pre-scan was performed on the line and neutral lines with peak detector.*
2. *Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.*
3. *Final Level = Receiver Read level + LISN Factor + Aux Factor + Cable Loss.*

6.3 Conducted Output Power

Test Requirement:	FCC Part 15 C Section 15.247 (b)(3)
Limit:	30dBm
Test setup:	
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

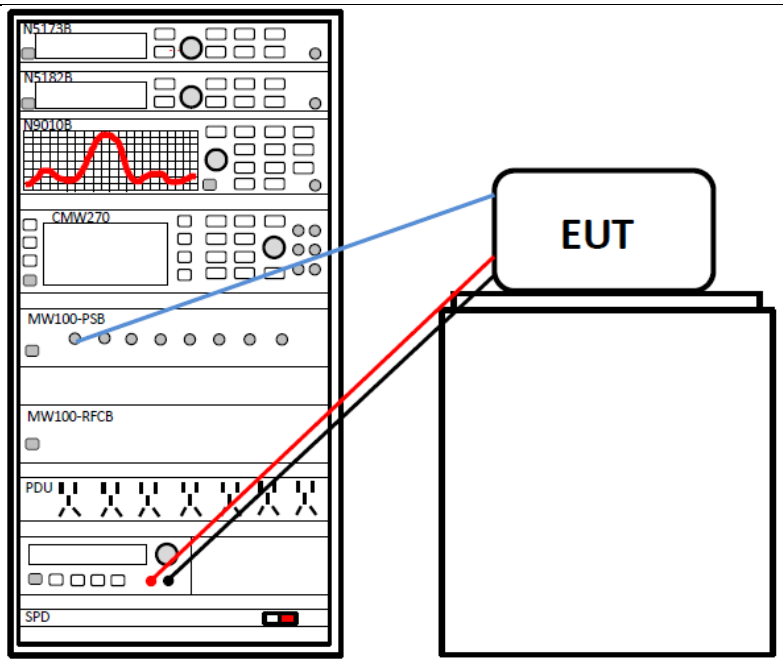
Measurement Data:
See to Appendix A.1 (1M PHY)
See to Appendix B.1 (2M PHY)
See to Appendix C.1 (Coded PHY, S=2)
See to Appendix D.1 (Coded PHY, S=8)

6.4 Occupy Bandwidth

Test Requirement:	FCC Part 15 C Section 15.247 (a)(2)
Limit:	>500kHz
Test setup:	
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:
See to Appendix A.2 and A.3 (1M PHY).
See to Appendix B.2 and B.3 (2M PHY).
See to Appendix C.2 and C.3 (Coded PHY, S=2).
See to Appendix D.2 and D.3 (Coded PHY, S=8).

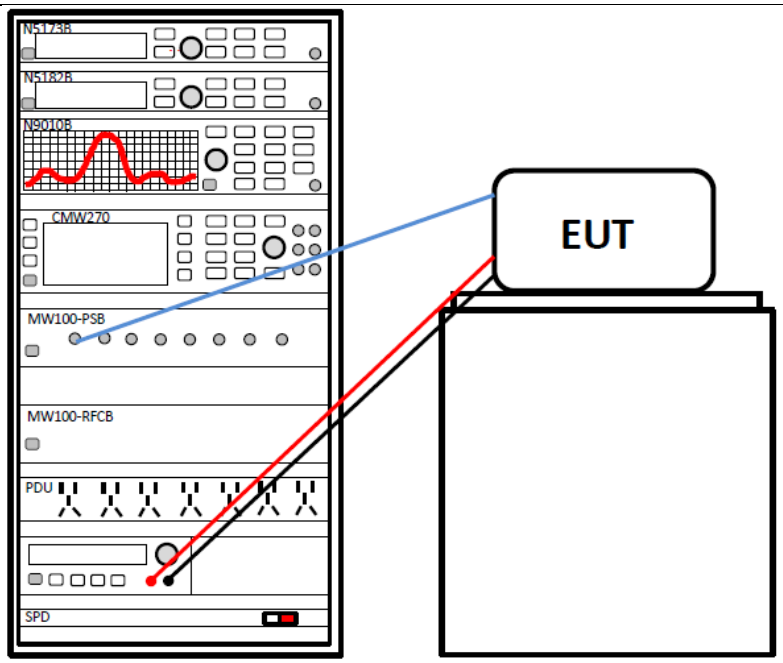
6.5 Power Spectral Density

Test Requirement:	FCC Part 15 C Section 15.247 (e)
Limit:	8 dBm/3kHz
Test setup:	
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:
See to Appendix A.4 (1M PHY).
See to Appendix B.4 (2M PHY).
See to Appendix C.4 (Coded PHY, S=2).
See to Appendix D.4 (Coded PHY, S=8).

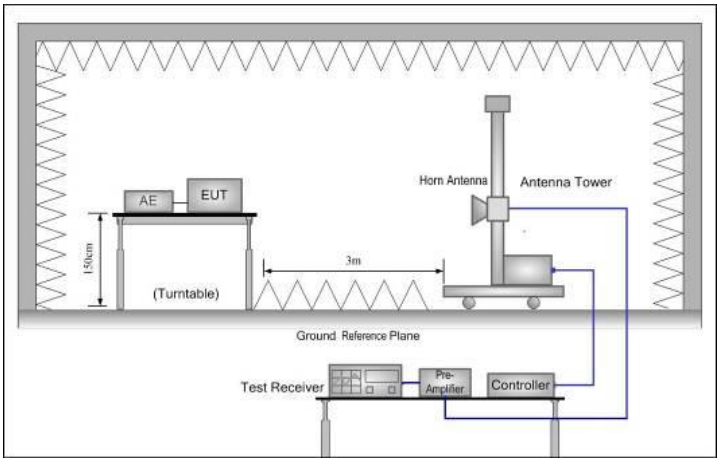
6.6 Band Edge

6.6.1 Conducted Emission Method

Test Requirement:	FCC Part 15 C Section 15.247 (d)
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.
Test setup:	
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

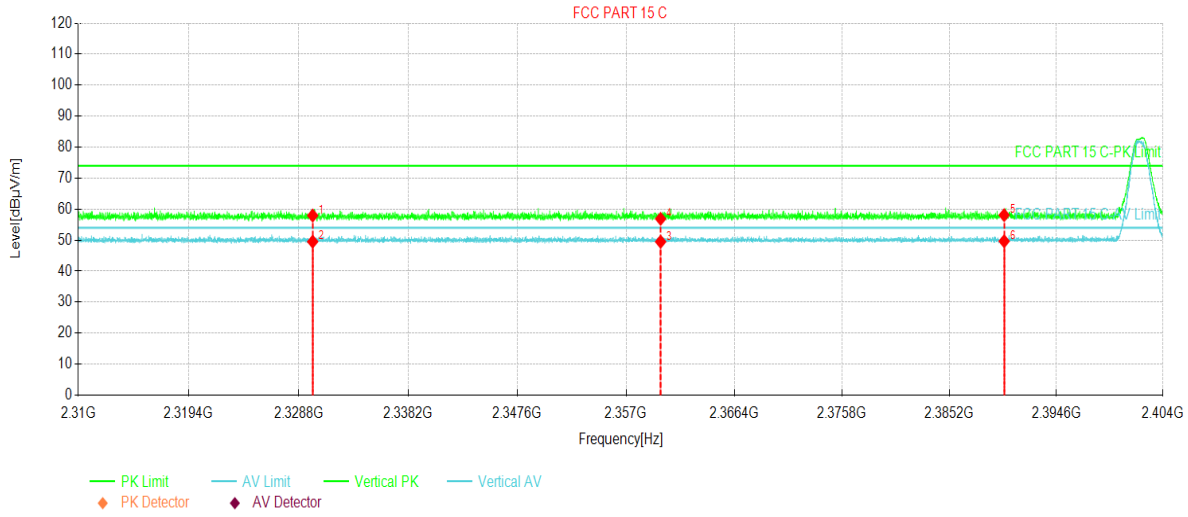
Measurement Data:
See to Appendix A.5 (1M PHY).
See to Appendix B.5 (2M PHY).
See to Appendix C.5 (Coded PHY, S=2).
See to Appendix D.5 (Coded PHY, S=8).

6.6.2 Radiated Emission Method

<table>
<tr><td>Test Requirement:</td><td>FCC Part 15 C Section 15.205 and 15.209</td></tr>
<tr><td>Test Frequency Range:</td><td>2310 MHz to 2390 MHz and 2483.5MHz to 2500 MHz</td></tr>
<tr><td>Test Distance:</td><td>3m</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>RMS</td><td>1MHz</td><td>3MHz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>54.00</td><td>Average Value</td></tr>
<tr><td>74.00</td><td>Peak Value</td></tr>
</table>
</td></tr>
<tr><td>Test Procedure:</td><td>1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height 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.
4. 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 rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</td></tr>
<tr><td>Test setup:</td><td> 
</td></tr>
<tr><td>Test Instruments:</td><td>Refer to section 5.9 for details</td></tr>
<tr><td>Test mode:</td><td>Refer to section 5.3 for details</td></tr>
<tr><td>Test results:</td><td>Passed</td></tr>
</table>

PHY: 1MHz

Product Name:	Integrated Smart Terminal	Product Model:	E600Mini
Test By:	Mike	Test mode:	BLE Tx mode
Test Channel:	Lowest channel	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz	Environment:	Temp.: 24℃ Humi.: 57%

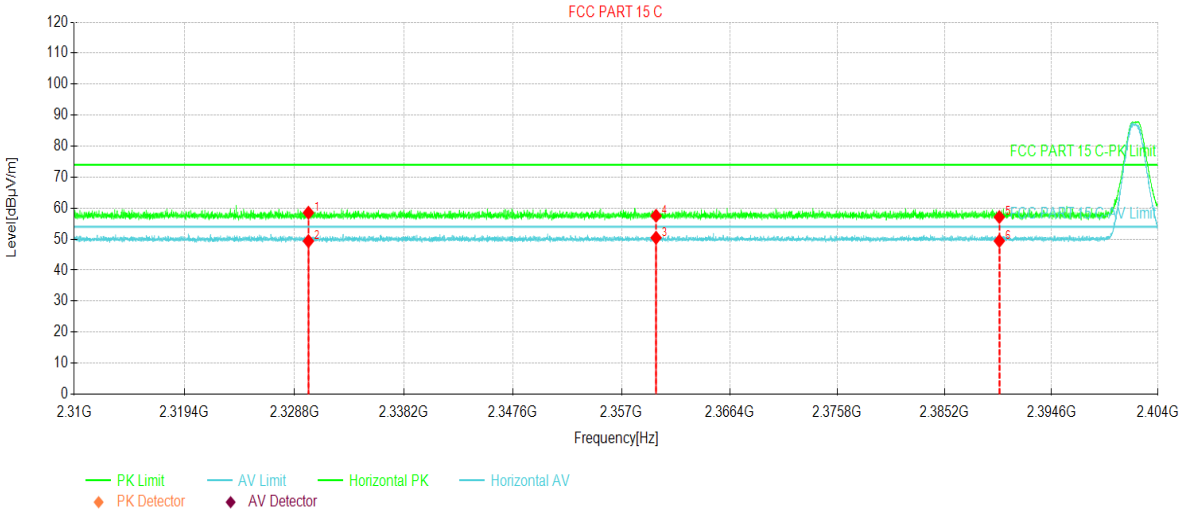


NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	2330.00	22.53	57.94	35.41	74.00	16.06	PK	Vertical
2	2330.00	14.11	49.52	35.41	54.00	4.48	AV	Vertical
3	2360.00	13.85	49.48	35.63	54.00	4.52	AV	Vertical
4	2360.00	21.25	56.88	35.63	74.00	17.12	PK	Vertical
5	2390.00	22.23	58.07	35.84	74.00	15.93	PK	Vertical
6	2390.00	13.83	49.67	35.84	54.00	4.33	AV	Vertical

Remark:

1. *Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).*
2. *The emission levels of other frequencies are lower than the limit 20dB and not show in test report.*

Product Name:	Integrated Smart Terminal	Product Model:	E600Mini
Test By:	Mike	Test mode:	BLE Tx mode
Test Channel:	Lowest channel	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz	Environment:	Temp.: 24℃ Humi.: 57%

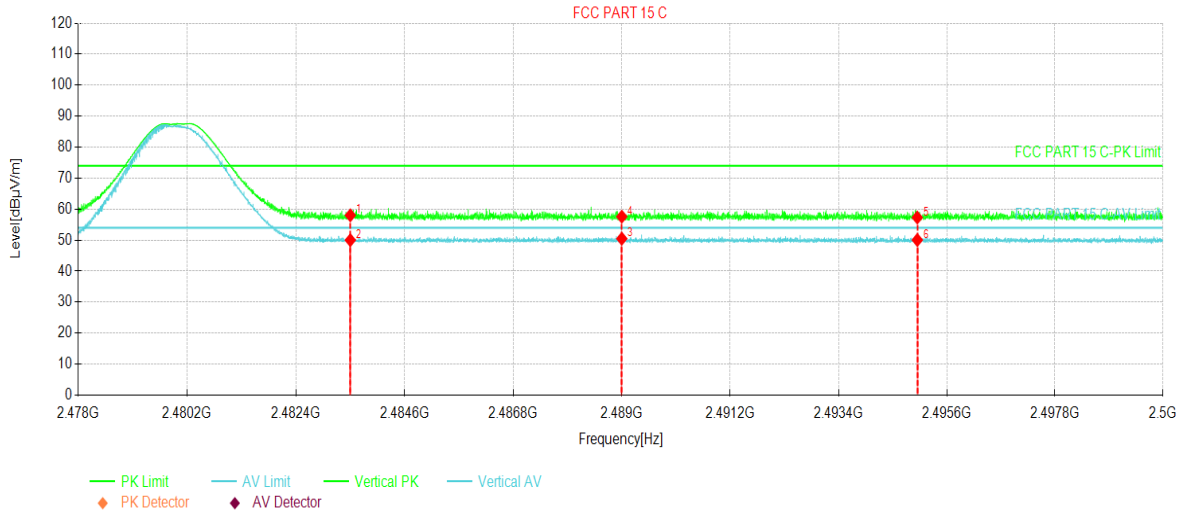


NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	2330.00	23.12	58.53	35.41	74.00	15.47	PK	Horizontal
2	2330.00	13.98	49.39	35.41	54.00	4.61	AV	Horizontal
3	2360.00	14.81	50.44	35.63	54.00	3.56	AV	Horizontal
4	2360.00	21.92	57.55	35.63	74.00	16.45	PK	Horizontal
5	2390.00	21.29	57.13	35.84	74.00	16.87	PK	Horizontal
6	2390.00	13.58	49.42	35.84	54.00	4.58	AV	Horizontal

Remark:

1. *Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).*
2. *The emission levels of other frequencies are lower than the limit 20dB and not show in test report.*

Product Name:	Integrated Smart Terminal	Product Model:	E600Mini
Test By:	Mike	Test mode:	BLE Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz	Environment:	Temp.: 24℃ Humi.: 57%

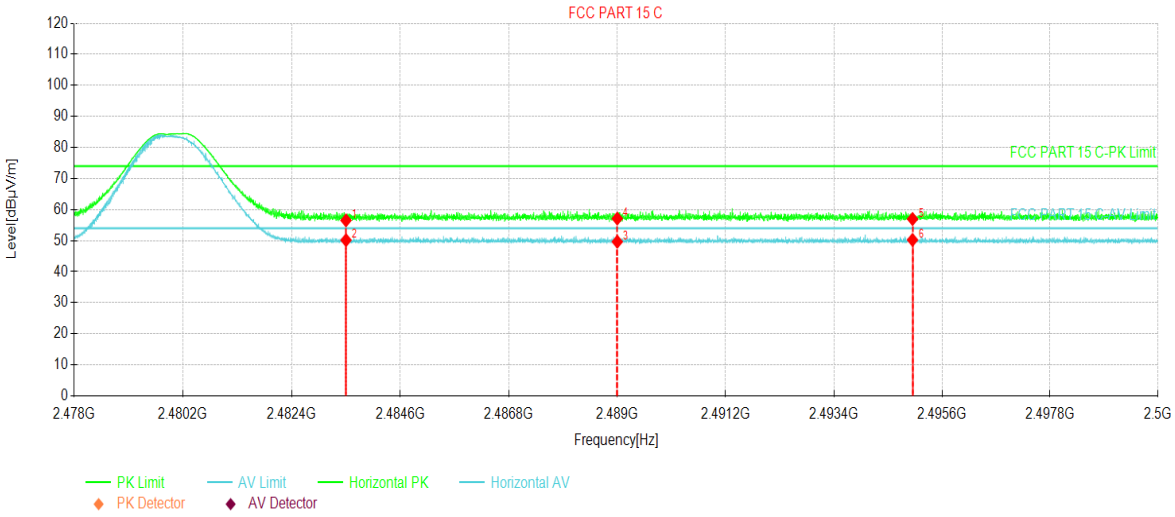


NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	2483.50	22.29	58.01	35.72	74.00	15.99	PK	Vertical
2	2483.50	14.28	50.00	35.72	54.00	4.00	AV	Vertical
3	2489.00	14.77	50.48	35.71	54.00	3.52	AV	Vertical
4	2489.00	21.87	57.58	35.71	74.00	16.42	PK	Vertical
5	2495.00	21.61	57.30	35.69	74.00	16.70	PK	Vertical
6	2495.00	14.37	50.06	35.69	54.00	3.94	AV	Vertical

Remark:

1. *Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).*
2. *The emission levels of other frequencies are lower than the limit 20dB and not show in test report.*

Product Name:	Integrated Smart Terminal	Product Model:	E600Mini
Test By:	Mike	Test mode:	BLE Tx mode
Test Channel:	Highest channel	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz	Environment:	Temp: 24℃ Humi: 57%



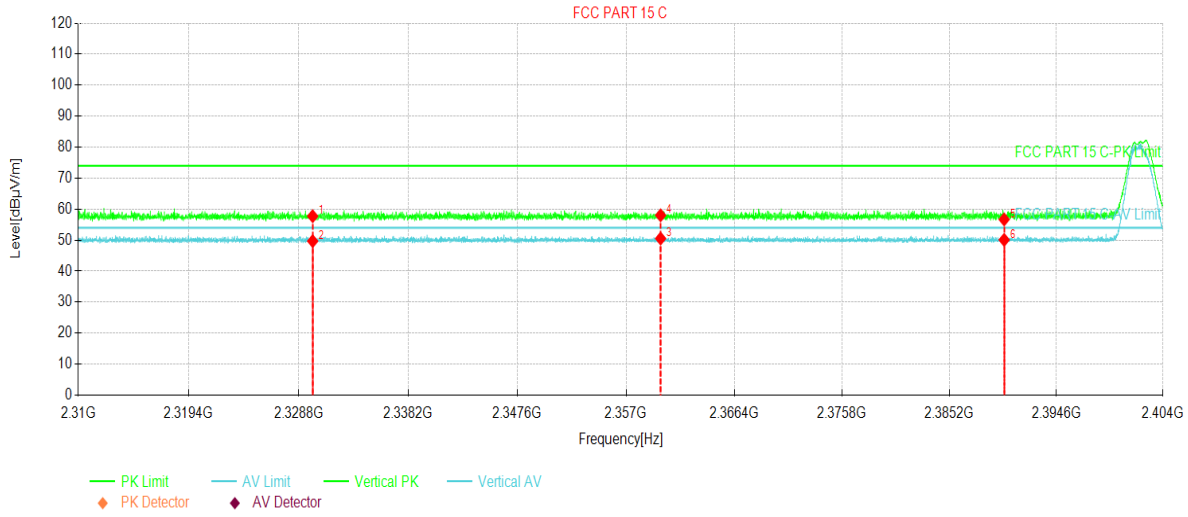
NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	2483.50	20.79	56.51	35.72	74.00	17.49	PK	Horizontal
2	2483.50	14.43	50.15	35.72	54.00	3.85	AV	Horizontal
3	2489.00	13.94	49.65	35.71	54.00	4.35	AV	Horizontal
4	2489.00	21.40	57.11	35.71	74.00	16.89	PK	Horizontal
5	2495.00	21.26	56.95	35.69	74.00	17.05	PK	Horizontal
6	2495.00	14.54	50.23	35.69	54.00	3.77	AV	Horizontal

Remark:

1. *Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).*
2. *The emission levels of other frequencies are lower than the limit 20dB and not show in test report.*

PHY: 2MHz

Product Name:	Integrated Smart Terminal	Product Model:	E600Mini
Test By:	Mike	Test mode:	BLE Tx mode
Test Channel:	Lowest channel	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz	Environment:	Temp.: 24℃ Humi.: 57%

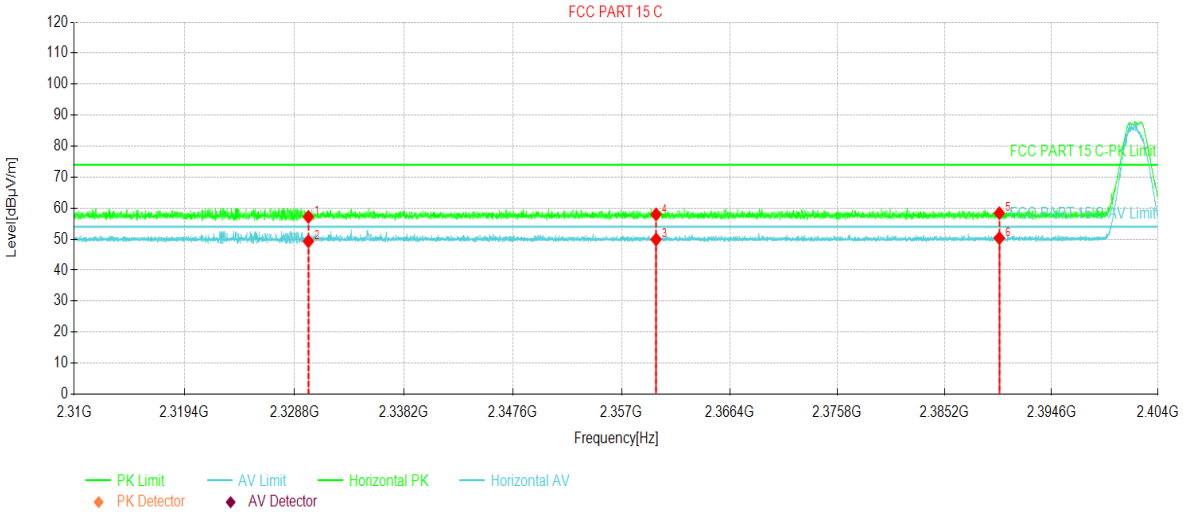


NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	2330.00	22.32	57.73	35.41	74.00	16.27	PK	Vertical
2	2330.00	14.28	49.69	35.41	54.00	4.31	AV	Vertical
3	2360.00	14.89	50.52	35.63	54.00	3.48	AV	Vertical
4	2360.00	22.38	58.01	35.63	74.00	15.99	PK	Vertical
5	2390.00	20.85	56.69	35.84	74.00	17.31	PK	Vertical
6	2390.00	14.25	50.09	35.84	54.00	3.91	AV	Vertical

Remark:

1. *Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).*
2. *The emission levels of other frequencies are lower than the limit 20dB and not show in test report.*

Product Name:	Integrated Smart Terminal	Product Model:	E600Mini
Test By:	Mike	Test mode:	BLE Tx mode
Test Channel:	Lowest channel	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz	Environment:	Temp.: 24℃ Humi.: 57%

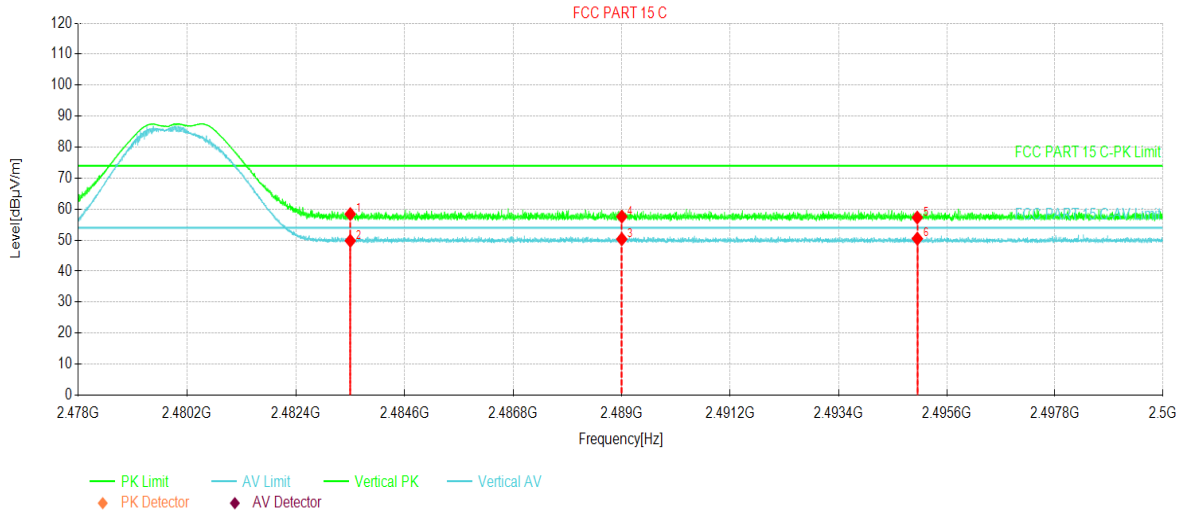


NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	2330.00	21.77	57.18	35.41	74.00	16.82	PK	Horizontal
2	2330.00	13.90	49.31	35.41	54.00	4.69	AV	Horizontal
3	2360.00	14.26	49.89	35.63	54.00	4.11	AV	Horizontal
4	2360.00	22.34	57.97	35.63	74.00	16.03	PK	Horizontal
5	2390.00	22.55	58.39	35.84	74.00	15.61	PK	Horizontal
6	2390.00	14.48	50.32	35.84	54.00	3.68	AV	Horizontal

Remark:

1. *Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).*
2. *The emission levels of other frequencies are lower than the limit 20dB and not show in test report.*

Product Name:	Integrated Smart Terminal	Product Model:	E600Mini
Test By:	Mike	Test mode:	BLE Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz	Environment:	Temp.: 24℃ Humi.: 57%

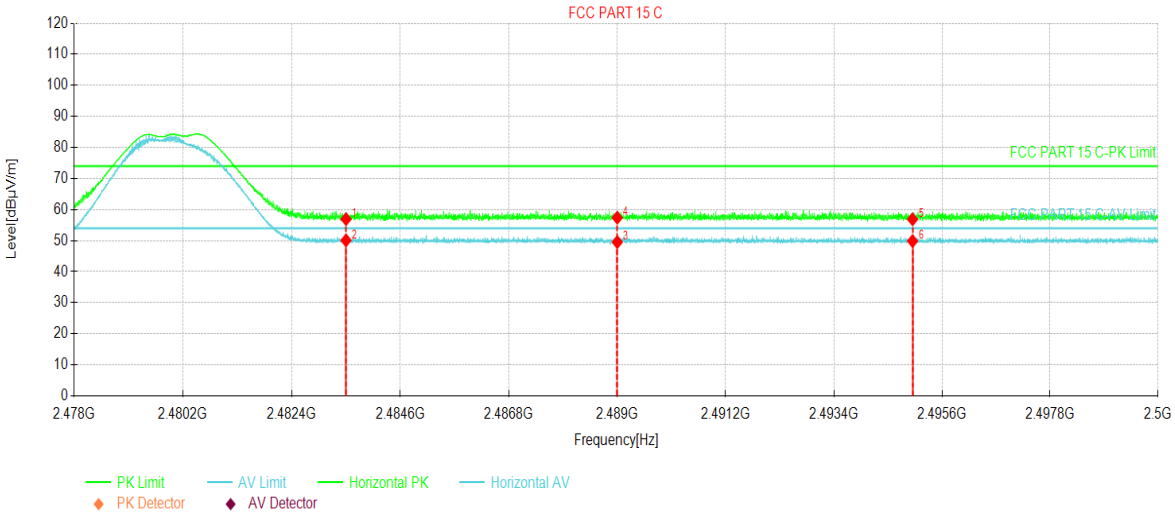


NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	2483.50	22.69	58.41	35.72	74.00	15.59	PK	Vertical
2	2483.50	14.07	49.79	35.72	54.00	4.21	AV	Vertical
3	2489.00	14.62	50.33	35.71	54.00	3.67	AV	Vertical
4	2489.00	21.89	57.60	35.71	74.00	16.40	PK	Vertical
5	2495.00	21.60	57.29	35.69	74.00	16.71	PK	Vertical
6	2495.00	14.79	50.48	35.69	54.00	3.52	AV	Vertical

Remark:

1. *Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).*
2. *The emission levels of other frequencies are lower than the limit 20dB and not show in test report.*

Product Name:	Integrated Smart Terminal	Product Model:	E600Mini
Test By:	Mike	Test mode:	BLE Tx mode
Test Channel:	Highest channel	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz	Environment:	Temp.: 24℃ Humi.: 57%



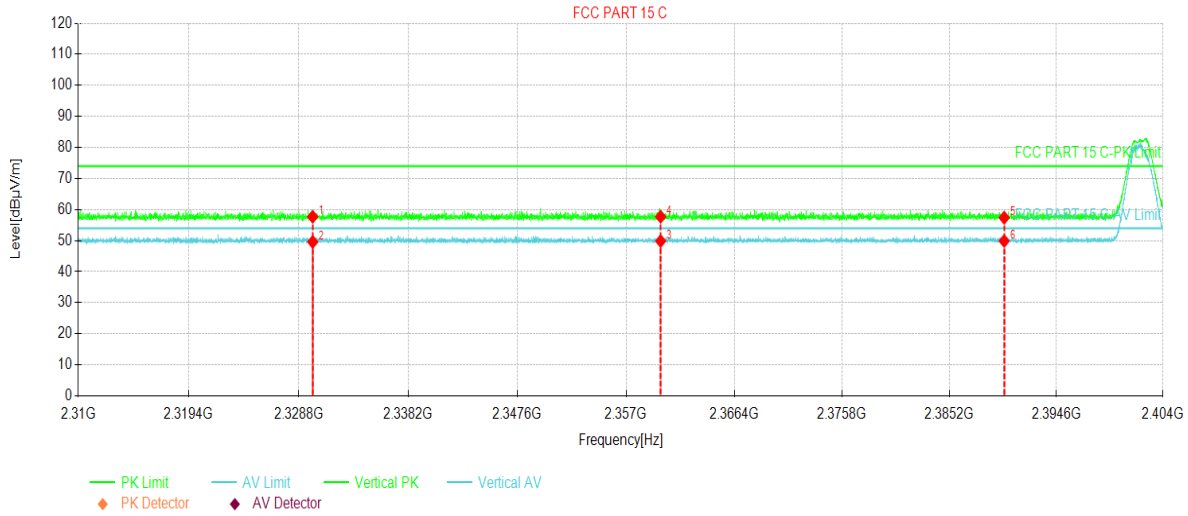
NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	2483.50	21.22	56.94	35.72	74.00	17.06	PK	Horizontal
2	2483.50	14.36	50.08	35.72	54.00	3.92	AV	Horizontal
3	2489.00	13.82	49.53	35.71	54.00	4.47	AV	Horizontal
4	2489.00	21.68	57.39	35.71	74.00	16.61	PK	Horizontal
5	2495.00	21.18	56.87	35.69	74.00	17.13	PK	Horizontal
6	2495.00	14.17	49.86	35.69	54.00	4.14	AV	Horizontal

Remark:

1. *Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).*
2. *The emission levels of other frequencies are lower than the limit 20dB and not show in test report.*

Coded PHY, S=2

Product Name:	Integrated Smart Terminal	Product Model:	E600Mini
Test By:	Mike	Test mode:	BLE Tx mode
Test Channel:	Lowest channel	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz	Environment:	Temp.: 24℃ Humi.: 57%

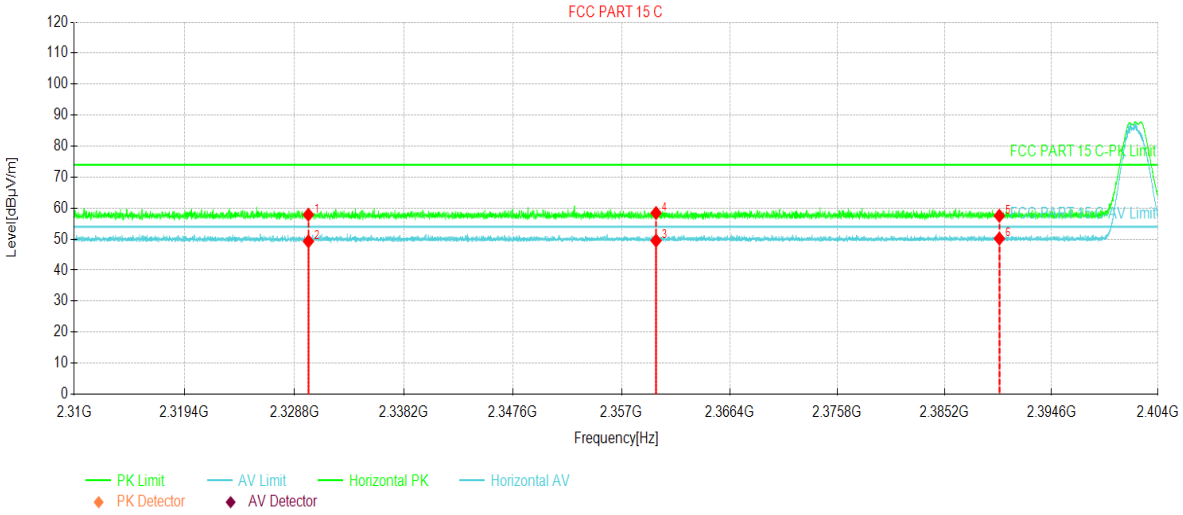


NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	2330.00	22.28	57.69	35.41	74.00	16.31	PK	Vertical
2	2330.00	14.17	49.58	35.41	54.00	4.42	AV	Vertical
3	2360.00	14.23	49.86	35.63	54.00	4.14	AV	Vertical
4	2360.00	22.07	57.70	35.63	74.00	16.30	PK	Vertical
5	2390.00	21.54	57.38	35.84	74.00	16.62	PK	Vertical
6	2390.00	14.04	49.88	35.84	54.00	4.12	AV	Vertical

Remark:

1. *Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).*
2. *The emission levels of other frequencies are lower than the limit 20dB and not show in test report.*

Product Name:	Integrated Smart Terminal	Product Model:	E600Mini
Test By:	Mike	Test mode:	BLE Tx mode
Test Channel:	Lowest channel	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz	Environment:	Temp.: 24℃ Humi.: 57%

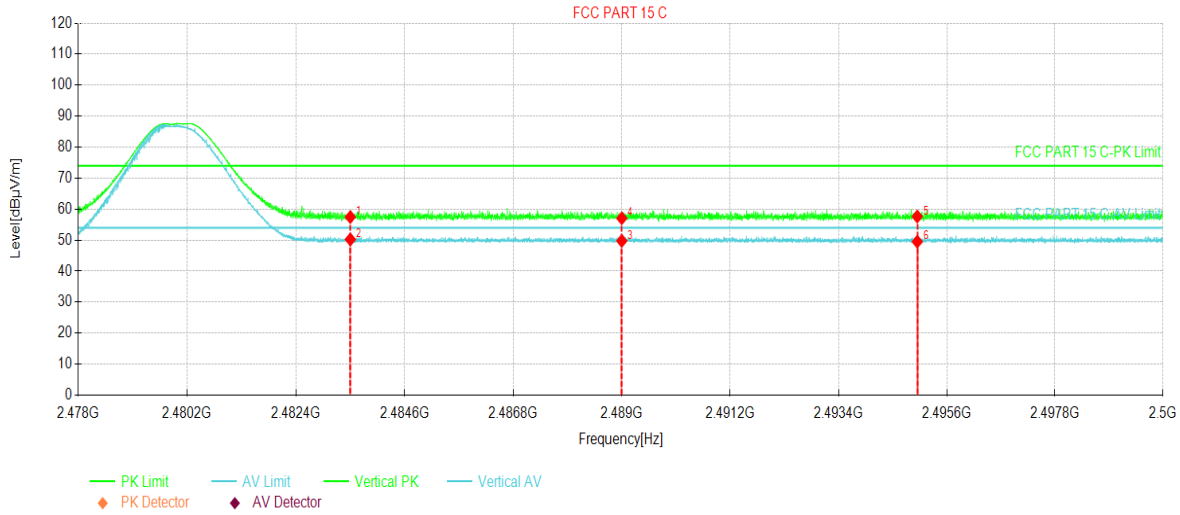


NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	2330.00	22.47	57.88	35.41	74.00	16.12	PK	Horizontal
2	2330.00	13.89	49.30	35.41	54.00	4.70	AV	Horizontal
3	2360.00	13.89	49.52	35.63	54.00	4.48	AV	Horizontal
4	2360.00	22.79	58.42	35.63	74.00	15.58	PK	Horizontal
5	2390.00	21.71	57.55	35.84	74.00	16.45	PK	Horizontal
6	2390.00	14.35	50.19	35.84	54.00	3.81	AV	Horizontal

Remark:

1. *Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).*
2. *The emission levels of other frequencies are lower than the limit 20dB and not show in test report.*

Product Name:	Integrated Smart Terminal	Product Model:	E600Mini
Test By:	Mike	Test mode:	BLE Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz	Environment:	Temp.: 24℃ Humi.: 57%

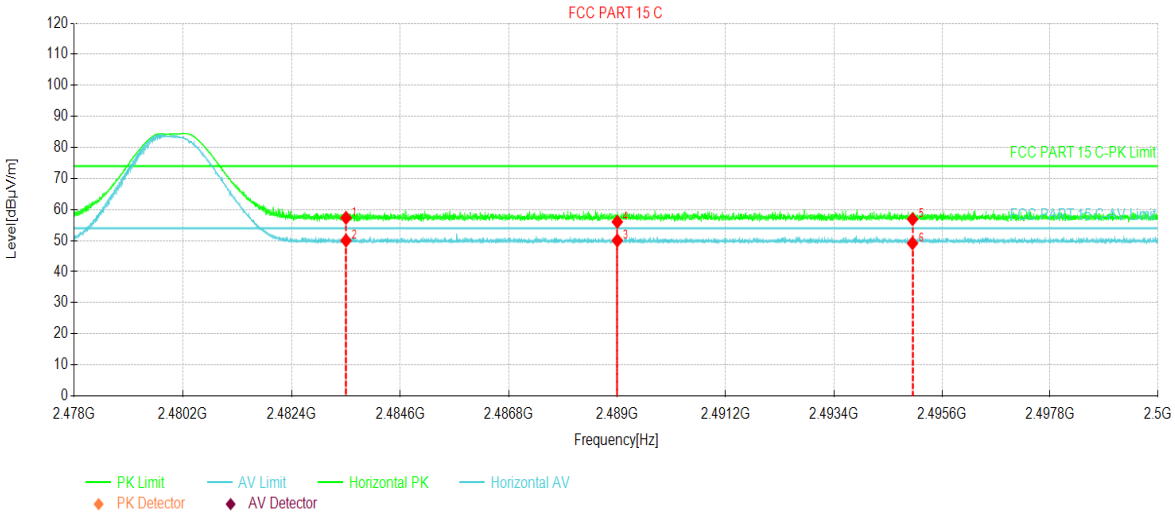


NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	2483.50	21.74	57.46	35.72	74.00	16.54	PK	Vertical
2	2483.50	14.51	50.23	35.72	54.00	3.77	AV	Vertical
3	2489.00	14.06	49.77	35.71	54.00	4.23	AV	Vertical
4	2489.00	21.36	57.07	35.71	74.00	16.93	PK	Vertical
5	2495.00	21.95	57.64	35.69	74.00	16.36	PK	Vertical
6	2495.00	13.83	49.52	35.69	54.00	4.48	AV	Vertical

Remark:

1. *Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).*
2. *The emission levels of other frequencies are lower than the limit 20dB and not show in test report.*

Product Name:	Integrated Smart Terminal	Product Model:	E600Mini
Test By:	Mike	Test mode:	BLE Tx mode
Test Channel:	Highest channel	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz	Environment:	Temp.: 24℃ Humi.: 57%



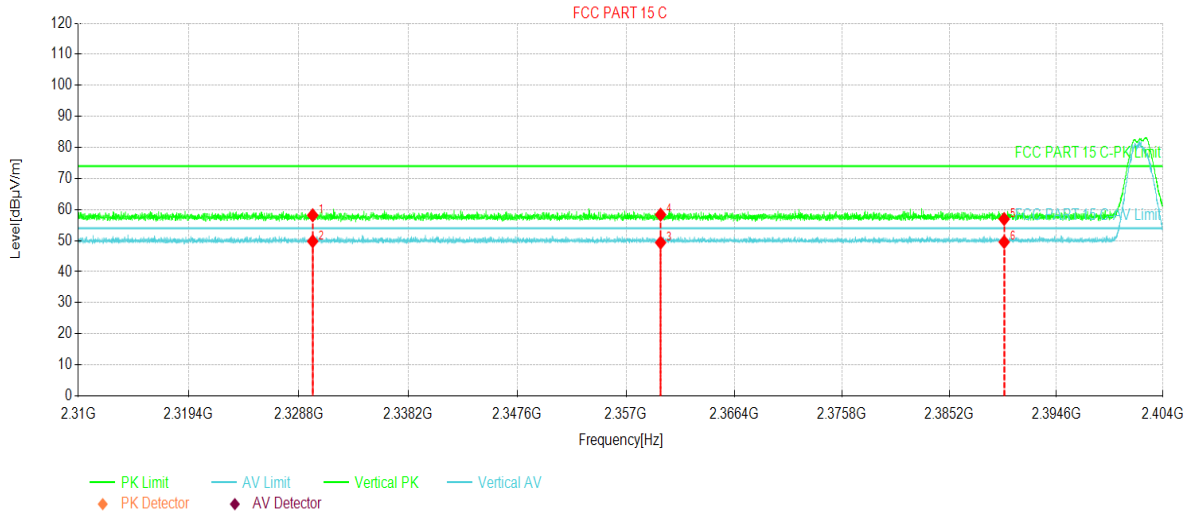
NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	2483.50	21.61	57.33	35.72	74.00	16.67	PK	Horizontal
2	2483.50	14.31	50.03	35.72	54.00	3.97	AV	Horizontal
3	2489.00	14.33	50.04	35.71	54.00	3.96	AV	Horizontal
4	2489.00	20.32	56.03	35.71	74.00	17.97	PK	Horizontal
5	2495.00	21.22	56.91	35.69	74.00	17.09	PK	Horizontal
6	2495.00	13.44	49.13	35.69	54.00	4.87	AV	Horizontal

Remark:

1. *Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).*
2. *The emission levels of other frequencies are lower than the limit 20dB and not show in test report.*

Coded PHY, S=8

Product Name:	Integrated Smart Terminal	**Product Model:**	E600Mini
Test By:	Mike	**Test mode:**	BLE Tx mode
Test Channel:	Lowest channel	**Polarization:**	Vertical
Test Voltage:	AC 120V/60Hz	**Environment:**	Temp.: 24℃ Humi.: 57%

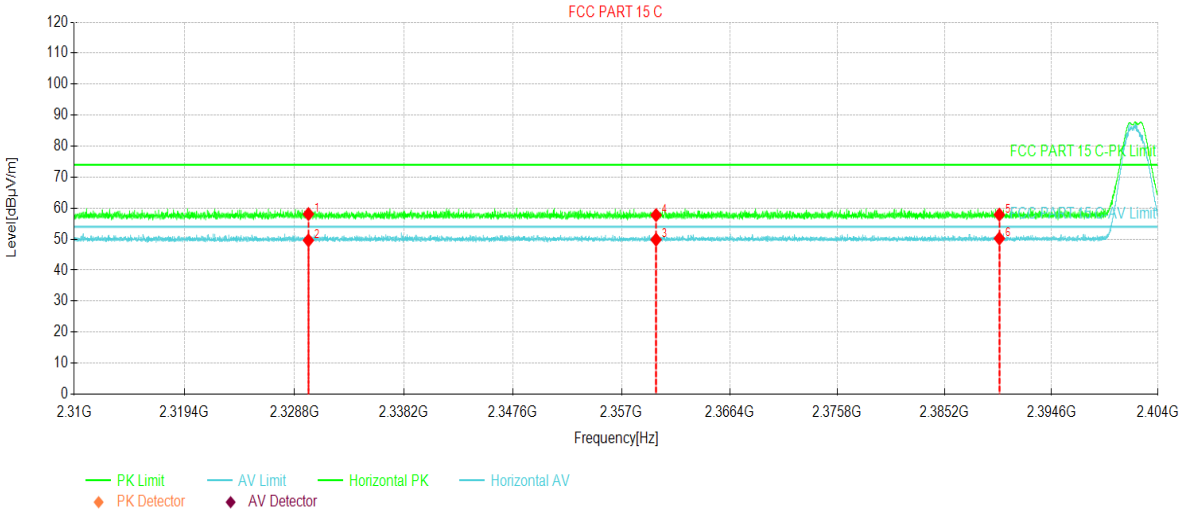


NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	2330.00	22.76	58.17	35.41	74.00	15.83	PK	Vertical
2	2330.00	14.37	49.78	35.41	54.00	4.22	AV	Vertical
3	2360.00	13.74	49.37	35.63	54.00	4.63	AV	Vertical
4	2360.00	22.73	58.36	35.63	74.00	15.64	PK	Vertical
5	2390.00	21.12	56.96	35.84	74.00	17.04	PK	Vertical
6	2390.00	13.71	49.55	35.84	54.00	4.45	AV	Vertical

Remark:

1. *Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).*
2. *The emission levels of other frequencies are lower than the limit 20dB and not show in test report.*

Product Name:	Integrated Smart Terminal	Product Model:	E600Mini
Test By:	Mike	Test mode:	BLE Tx mode
Test Channel:	Lowest channel	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz	Environment:	Temp.: 24℃ Humi.: 57%

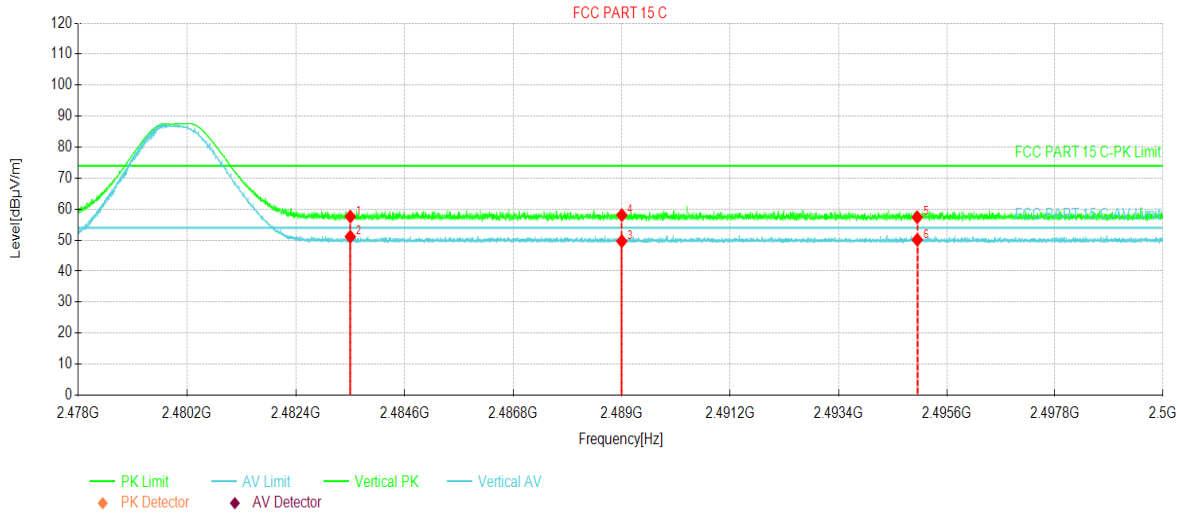


NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	2330.00	22.68	58.09	35.41	74.00	15.91	PK	Horizontal
2	2330.00	14.20	49.61	35.41	54.00	4.39	AV	Horizontal
3	2360.00	14.20	49.83	35.63	54.00	4.17	AV	Horizontal
4	2360.00	22.13	57.76	35.63	74.00	16.24	PK	Horizontal
5	2390.00	22.06	57.90	35.84	74.00	16.10	PK	Horizontal
6	2390.00	14.37	50.21	35.84	54.00	3.79	AV	Horizontal

Remark:

1. *Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).*
2. *The emission levels of other frequencies are lower than the limit 20dB and not show in test report.*

Product Name:	Integrated Smart Terminal	Product Model:	E600Mini
Test By:	Mike	Test mode:	BLE Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz	Environment:	Temp.: 24℃ Humi.: 57%

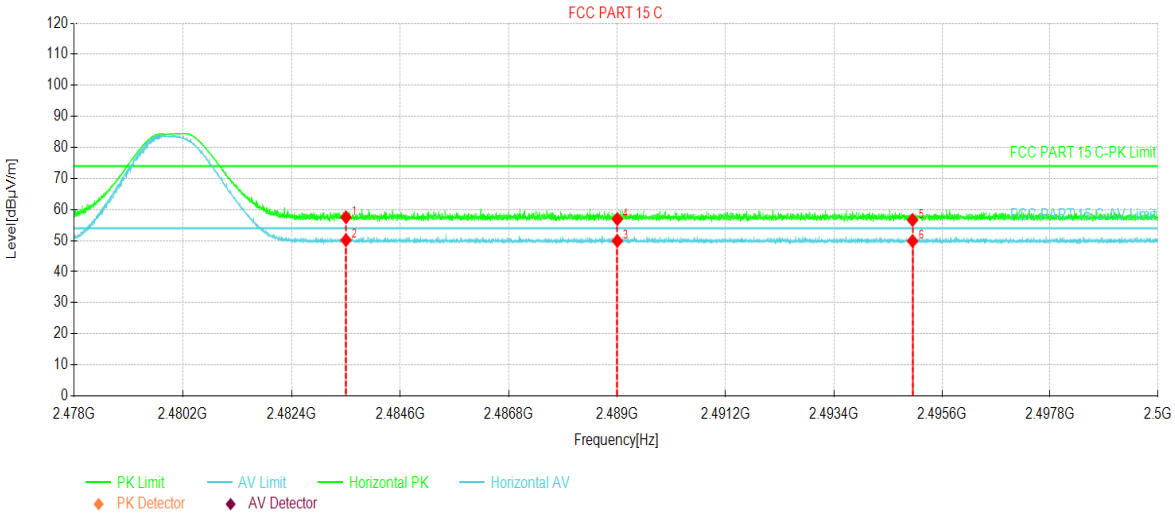


NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	2483.50	21.88	57.60	35.72	74.00	16.40	PK	Vertical
2	2483.50	15.40	51.12	35.72	54.00	2.88	AV	Vertical
3	2489.00	13.95	49.66	35.71	54.00	4.34	AV	Vertical
4	2489.00	22.35	58.06	35.71	74.00	15.94	PK	Vertical
5	2495.00	21.68	57.37	35.69	74.00	16.63	PK	Vertical
6	2495.00	14.43	50.12	35.69	54.00	3.88	AV	Vertical

Remark:

1. *Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).*
2. *The emission levels of other frequencies are lower than the limit 20dB and not show in test report.*

Product Name:	Integrated Smart Terminal	Product Model:	E600Mini
Test By:	Mike	Test mode:	BLE Tx mode
Test Channel:	Highest channel	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz	Environment:	Temp.: 24℃ Humi.: 57%



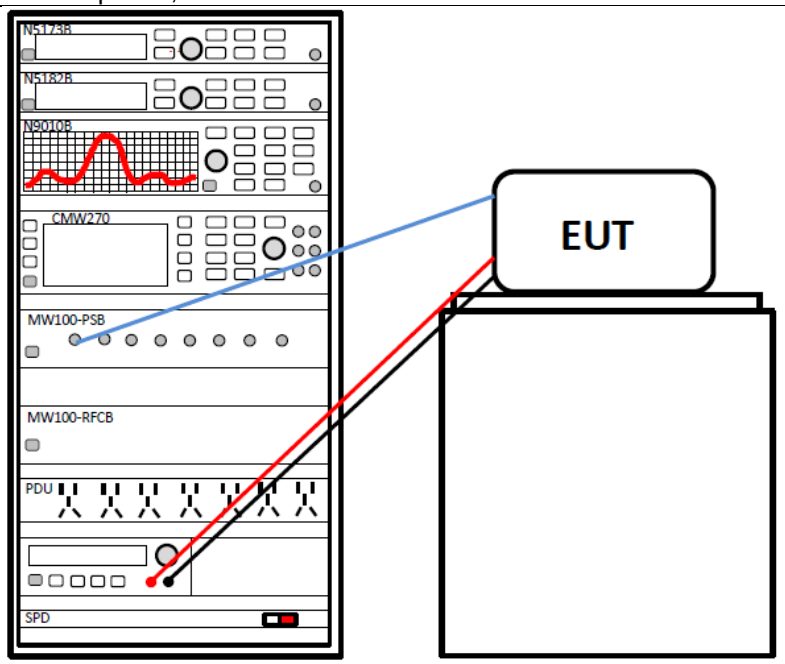
NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	2483.50	21.80	57.52	35.72	74.00	16.48	PK	Horizontal
2	2483.50	14.44	50.16	35.72	54.00	3.84	AV	Horizontal
3	2489.00	14.19	49.90	35.71	54.00	4.10	AV	Horizontal
4	2489.00	21.23	56.94	35.71	74.00	17.06	PK	Horizontal
5	2495.00	20.95	56.64	35.69	74.00	17.36	PK	Horizontal
6	2495.00	14.16	49.85	35.69	54.00	4.15	AV	Horizontal

Remark:

1. *Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).*
2. *The emission levels of other frequencies are lower than the limit 20dB and not show in test report.*

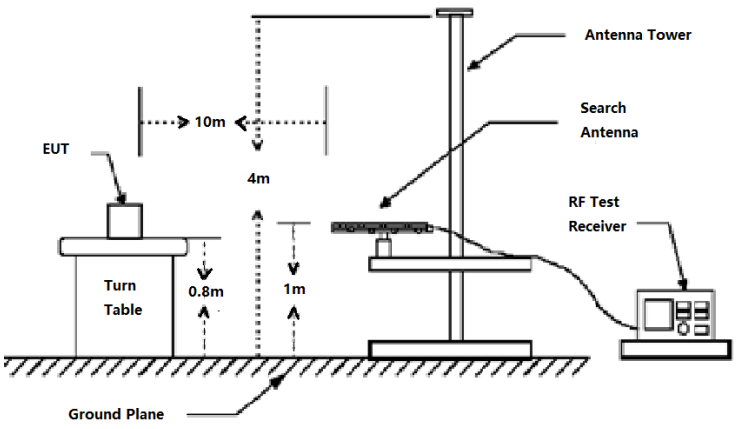
6.7 Spurious Emission

6.7.1 Conducted Emission Method

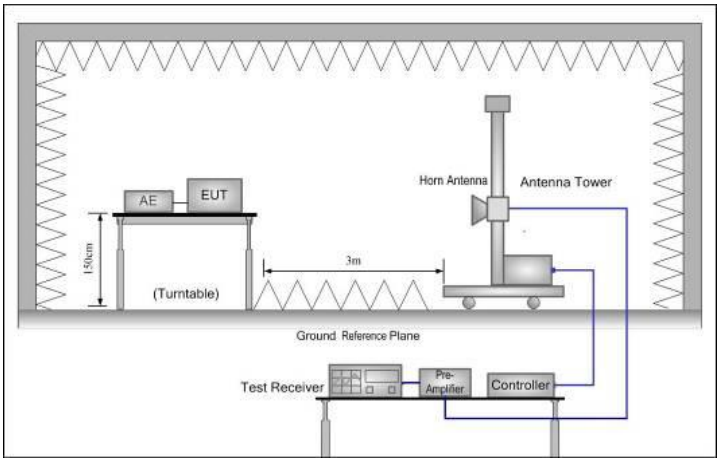
Test Requirement:	FCC Part 15 C Section 15.247 (d)
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:
See to Appendix A.6 (1M PHY).
See to Appendix B.6 (2M PHY).
See to Appendix C.6 (Coded PHY, S=2).
See to Appendix D.6 (Coded PHY, S=8).

6.7.2 Radiated Emission Method

<table>
<tr><td>Test Requirement:</td><td colspan="5">FCC Part 15 C Section 15.205 and 15.209</td></tr>
<tr><td>Test Frequency Range:</td><td colspan="5">9kHz to 25GHz</td></tr>
<tr><td>Test Distance:</td><td colspan="5">3m or 10m</td></tr>
<tr><td>Receiver setup:</td><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr>
<tr><td></td><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td></td><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td></td><td>RMS</td><td>1MHz</td><td>3MHz</td><td>Average Value</td></tr>
<tr><td>Limit:</td><td colspan="2">Frequency</td><td colspan="2">Limit (dBuV/m @10m)</td><td>Remark</td></tr>
<tr><td></td><td colspan="2">30MHz-88MHz</td><td colspan="2">30.0</td><td>Quasi-peak Value</td></tr>
<tr><td></td><td colspan="2">88MHz-216MHz</td><td colspan="2">33.5</td><td>Quasi-peak Value</td></tr>
<tr><td></td><td colspan="2">216MHz-960MHz</td><td colspan="2">36.0</td><td>Quasi-peak Value</td></tr>
<tr><td></td><td colspan="2">960MHz-1GHz</td><td colspan="2">44.0</td><td>Quasi-peak Value</td></tr>
<tr><td></td><td colspan="2">Frequency</td><td colspan="2">Limit (dBuV/m @3m)</td><td>Remark</td></tr>
<tr><td></td><td colspan="2" rowspan="2">Above 1GHz</td><td colspan="2">54.0</td><td>Average Value</td></tr>
<tr><td></td><td colspan="2">74.0</td><td>Peak Value</td></tr>
<tr><td>Test Procedure:</td><td colspan="5">1. The EUT was placed on the top of a rotating table 0.8m(below 1GHz)/1.5m(above 1GHz) above the ground at a 3 meter chamber(above 1GHz). The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters(above 1GHz) away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height 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.
4. 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 rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</td></tr>
<tr><td>Test setup:</td><td colspan="5">Below 1GHz
 

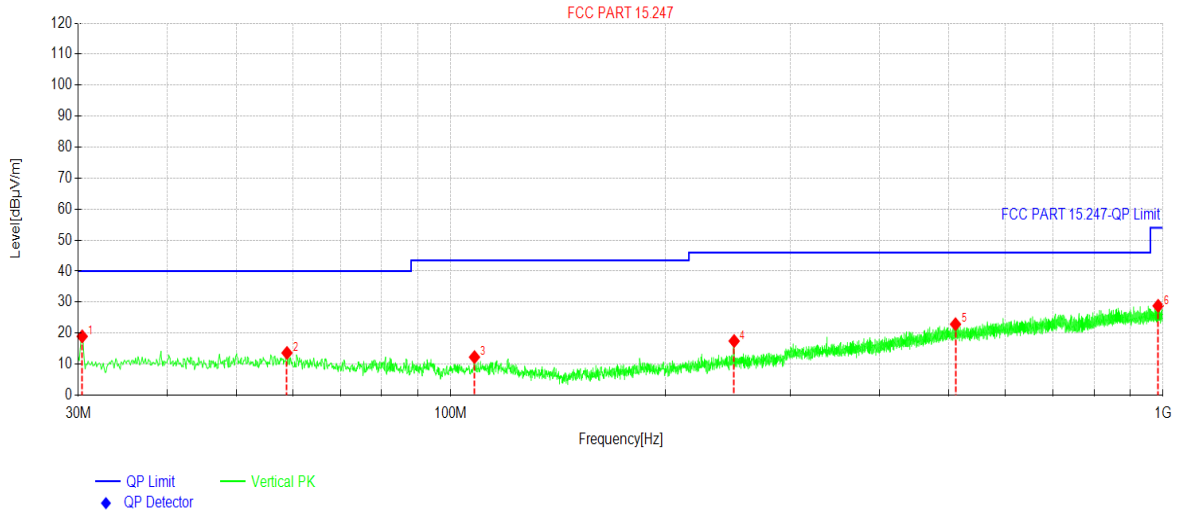
Above 1GHz</td></tr>
</table>

	
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed
Remark:	1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis is the worst case. 2. 9 kHz to 30MHz is lower than the limit 20dB, so only shows the data of above 30MHz in this report.

Measurement Data (worst case):

Below 1GHz:

Product Name:	Integrated Smart Terminal	**Product Model:**	E600Mini
Test By:	Mike	**Test mode:**	BLE Tx mode
Test Frequency:	30 MHz ~ 1 GHz	**Polarization:**	Vertical
Test Voltage:	AC 120V/60Hz	**Environment:**	Temp.: 24℃ Humi.: 57%

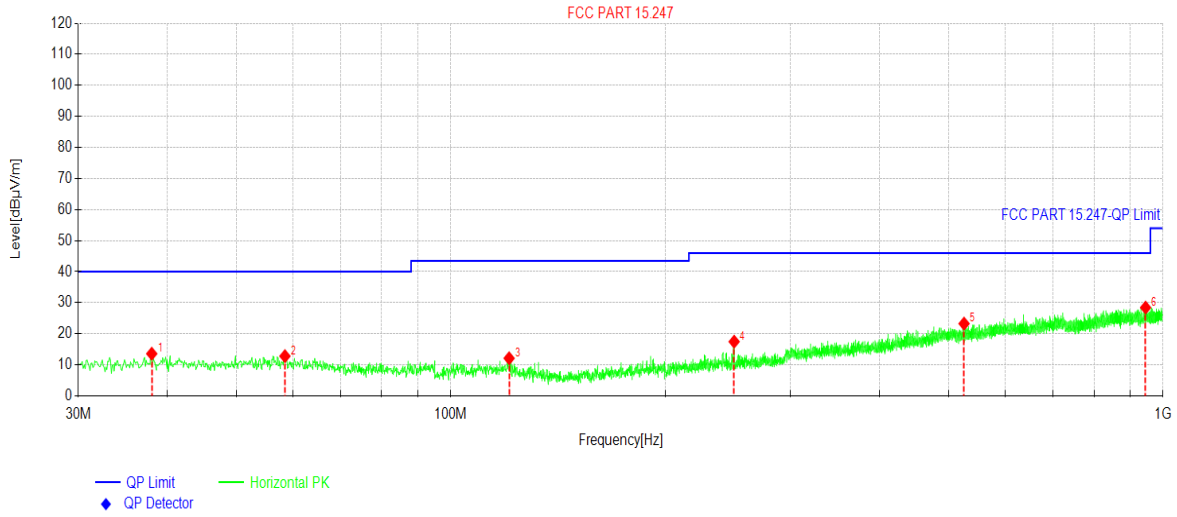


NO.	Freq. [MHz]	Reading[dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	30.3880	35.02	18.95	-16.07	40.00	21.05	PK	Vertical
2	58.9089	28.54	13.61	-14.93	40.00	26.39	PK	Vertical
3	107.995	28.19	12.25	-15.94	43.50	31.25	PK	Vertical
4	250.018	31.23	17.44	-13.79	46.00	28.56	PK	Vertical
5	511.362	29.73	22.86	-6.87	46.00	23.14	PK	Vertical
6	984.381	29.60	28.79	-0.81	54.00	25.21	PK	Vertical

Remark:

1. *Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).*
2. *The emission levels of other frequencies are lower than the limit 20dB and not show in test report.*

Product Name:	Integrated Smart Terminal	Product Model:	E600Mini
Test By:	Mike	Test mode:	BLE Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz	Environment:	Temp.: 24℃ Humi.: 57%



NO.	Freq. [MHz]	Reading[dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	38.0518	28.24	13.57	-14.67	40.00	26.43	PK	Horizontal
2	58.5209	27.68	12.78	-14.90	40.00	27.22	PK	Horizontal
3	120.801	28.25	12.11	-16.14	43.50	31.39	PK	Horizontal
4	250.018	31.26	17.47	-13.79	46.00	28.53	PK	Horizontal
5	525.719	30.15	23.26	-6.89	46.00	22.74	PK	Horizontal
6	945.286	29.53	28.43	-1.10	46.00	17.57	PK	Horizontal

Remark:

1. *Final Level = Receiver Read level + Factor(Antenna Factor + Cable Loss – Preamplifier Factor).*
2. *The emission levels of other frequencies are lower than the limit 20dB and not show in test report.*

Above 1GHz

PHY: 1MHz

Test channel: Lowest channel						
Detector: Peak Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization
4804.00	54.11	-9.60	44.51	74.00	29.49	Vertical
4804.00	55.21	-9.60	45.61	74.00	28.39	Horizontal
Detector: Average Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization
4804.00	46.91	-9.60	37.31	54.00	16.69	Vertical
4804.00	46.67	-9.60	37.07	54.00	16.93	Horizontal
Test channel: Middle channel						
Detector: Peak Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization
4884.00	54.26	-9.04	45.22	74.00	28.78	Vertical
4884.00	55.27	-9.04	46.23	74.00	27.77	Horizontal
Detector: Average Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization
4884.00	46.88	-9.04	37.84	54.00	16.16	Vertical
4884.00	46.22	-9.04	37.18	54.00	16.82	Horizontal
Test channel: Highest channel						
Detector: Peak Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization
4960.00	53.78	-8.45	45.33	74.00	28.67	Vertical
4960.00	54.98	-8.45	46.53	74.00	27.47	Horizontal
Detector: Average Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization
4960.00	47.01	-8.45	38.56	54.00	15.44	Vertical
4960.00	46.24	-8.45	37.79	54.00	16.21	Horizontal

Remark:

1. Final Level =Receiver Read level + Factor.

2. The emission levels of other frequencies are lower than the limit 20dB and not show in test report.

PHY: 2MHz

Test channel: Lowest channel						
Detector: Peak Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization
4804.00	55.53	-9.60	45.93	74.00	28.07	Vertical
4804.00	54.59	-9.60	44.99	74.00	29.01	Horizontal
Detector: Average Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization
4804.00	47.52	-9.60	37.92	54.00	16.08	Vertical
4804.00	48.16	-9.60	38.56	54.00	15.44	Horizontal
Test channel: Middle channel						
Detector: Peak Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization
4884.00	55.43	-9.04	46.39	74.00	27.61	Vertical
4884.00	54.96	-9.04	45.92	74.00	28.08	Horizontal
Detector: Average Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization
4884.00	47.92	-9.04	38.88	54.00	15.12	Vertical
4884.00	48.36	-9.04	39.32	54.00	14.68	Horizontal
Test channel: Highest channel						
Detector: Peak Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization
4960.00	55.60	-8.45	47.15	74.00	26.85	Vertical
4960.00	54.44	-8.45	45.99	74.00	28.01	Horizontal
Detector: Average Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization
4960.00	47.09	-8.45	38.64	54.00	15.36	Vertical
4960.00	48.01	-8.45	39.56	54.00	14.44	Horizontal

Remark:

1. Final Level =Receiver Read level + Factor.

2. *The emission levels of other frequencies are lower than the limit 20dB and not show in test report.*

Coded PHY, S=2

Test channel: Lowest channel						
Detector: Peak Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization
4804.00	54.61	-9.60	45.01	74.00	28.99	Vertical
4804.00	55.08	-9.60	45.48	74.00	28.52	Horizontal
Detector: Average Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization
4804.00	47.75	-9.60	38.15	54.00	15.85	Vertical
4804.00	47.21	-9.60	37.61	54.00	16.39	Horizontal
Test channel: Middle channel						
Detector: Peak Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization
4884.00	54.71	-9.04	45.67	74.00	28.33	Vertical
4884.00	54.97	-9.04	45.93	74.00	28.07	Horizontal
Detector: Average Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization
4884.00	48.19	-9.04	39.15	54.00	14.85	Vertical
4884.00	46.98	-9.04	37.94	54.00	16.06	Horizontal
Test channel: Highest channel						
Detector: Peak Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization
4960.00	54.26	-8.45	45.81	74.00	28.19	Vertical
4960.00	55.49	-8.45	47.04	74.00	26.96	Horizontal
Detector: Average Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization
4960.00	47.48	-8.45	39.03	54.00	14.97	Vertical
4960.00	46.81	-8.45	38.36	54.00	15.64	Horizontal

Remark:

1. Final Level =Receiver Read level + Factor.

2. *The emission levels of other frequencies are lower than the limit 20dB and not show in test report.*

Coded PHY, S=8

Test channel: Lowest channel						
Detector: Peak Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization
4804.00	55.38	-9.60	45.78	74.00	28.22	Vertical
4804.00	54.86	-9.60	45.26	74.00	28.74	Horizontal
Detector: Average Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization
4804.00	47.36	-9.60	37.76	54.00	16.24	Vertical
4804.00	46.55	-9.60	36.95	54.00	17.05	Horizontal
Test channel: Middle channel						
Detector: Peak Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization
4884.00	55.60	-9.04	46.56	74.00	27.44	Vertical
4884.00	55.02	-9.04	45.98	74.00	28.02	Horizontal
Detector: Average Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization
4884.00	47.76	-9.04	38.72	54.00	15.28	Vertical
4884.00	46.38	-9.04	37.34	54.00	16.66	Horizontal
Test channel: Highest channel						
Detector: Peak Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization
4960.00	55.87	-8.45	47.42	74.00	26.58	Vertical
4960.00	55.13	-8.45	46.68	74.00	27.32	Horizontal
Detector: Average Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization
4960.00	47.77	-8.45	39.32	54.00	14.68	Vertical
4960.00	46.85	-8.45	38.40	54.00	15.60	Horizontal

Remark:

1. Final Level =Receiver Read level + Factor.

2. *The emission levels of other frequencies are lower than the limit 20dB and not show in test report.*

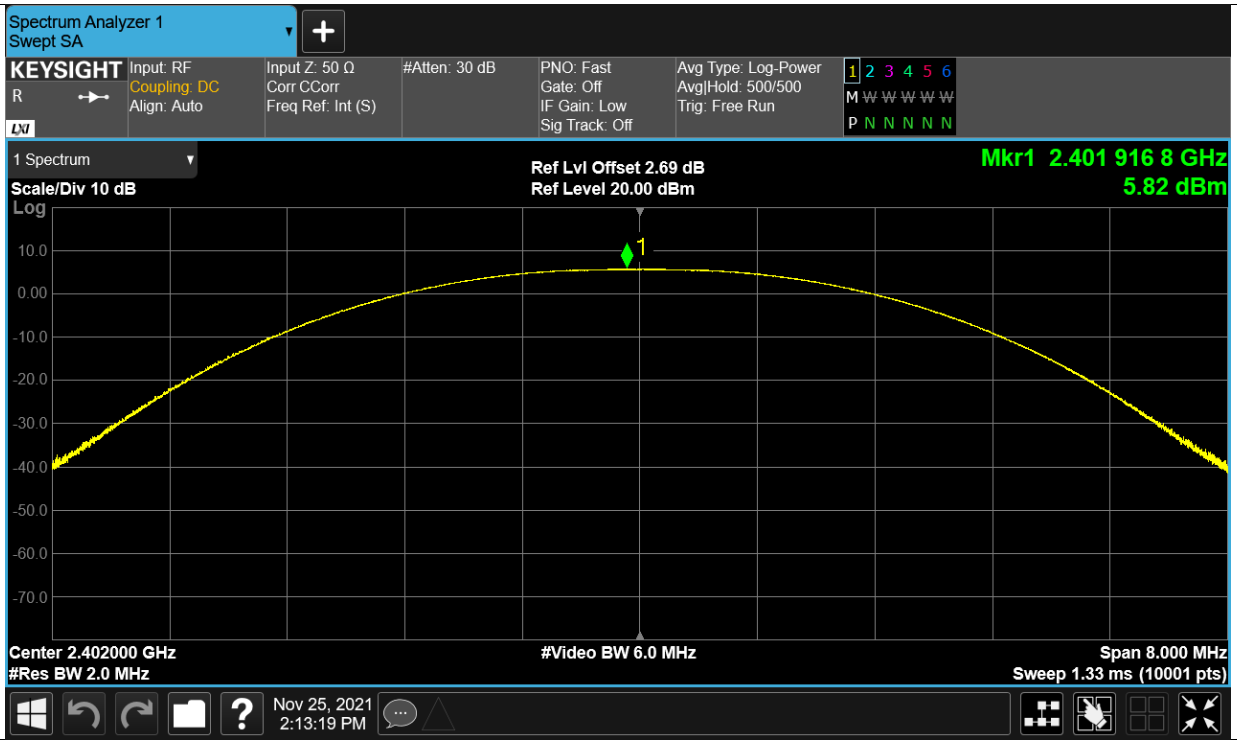
Appendix A (1M PHY)

A.1 Maximum Conducted Output Power

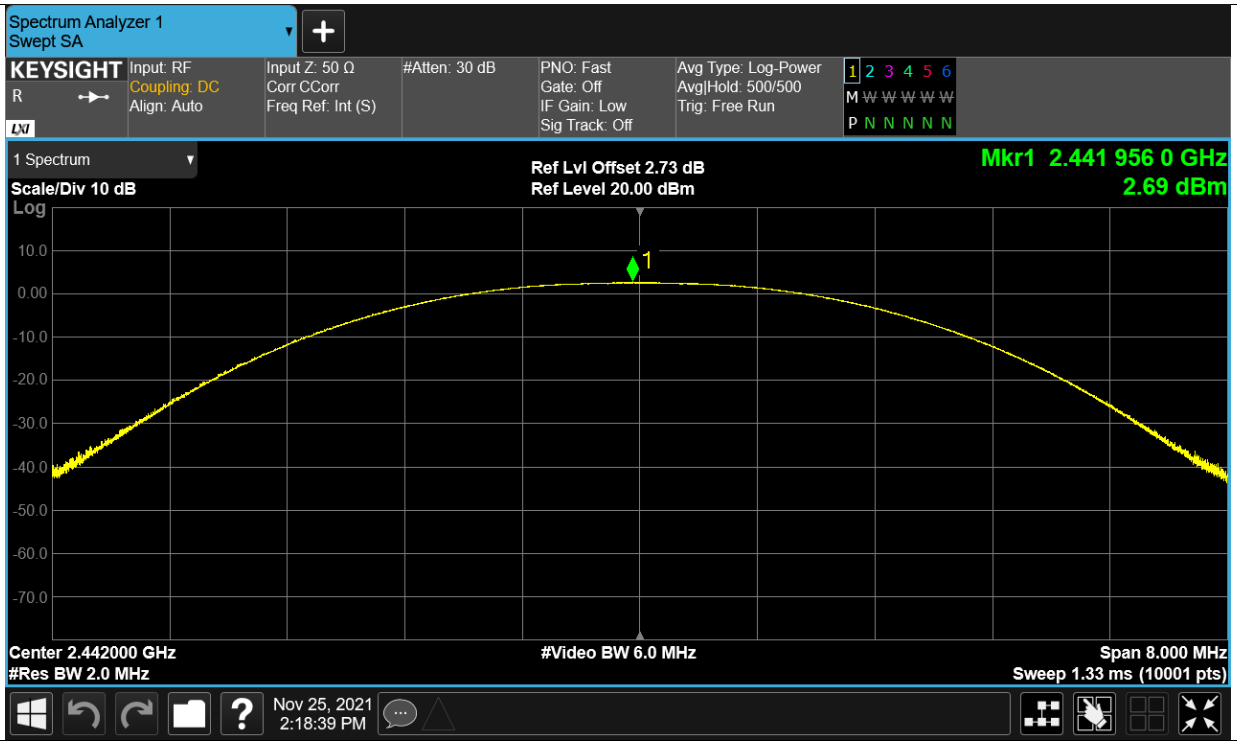
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE	2402	Ant1	5.822	0	5.822	30	Pass
NVNT	BLE	2442	Ant1	2.687	0	2.687	30	Pass
NVNT	BLE	2480	Ant1	1.771	0	1.771	30	Pass

Test Graphs

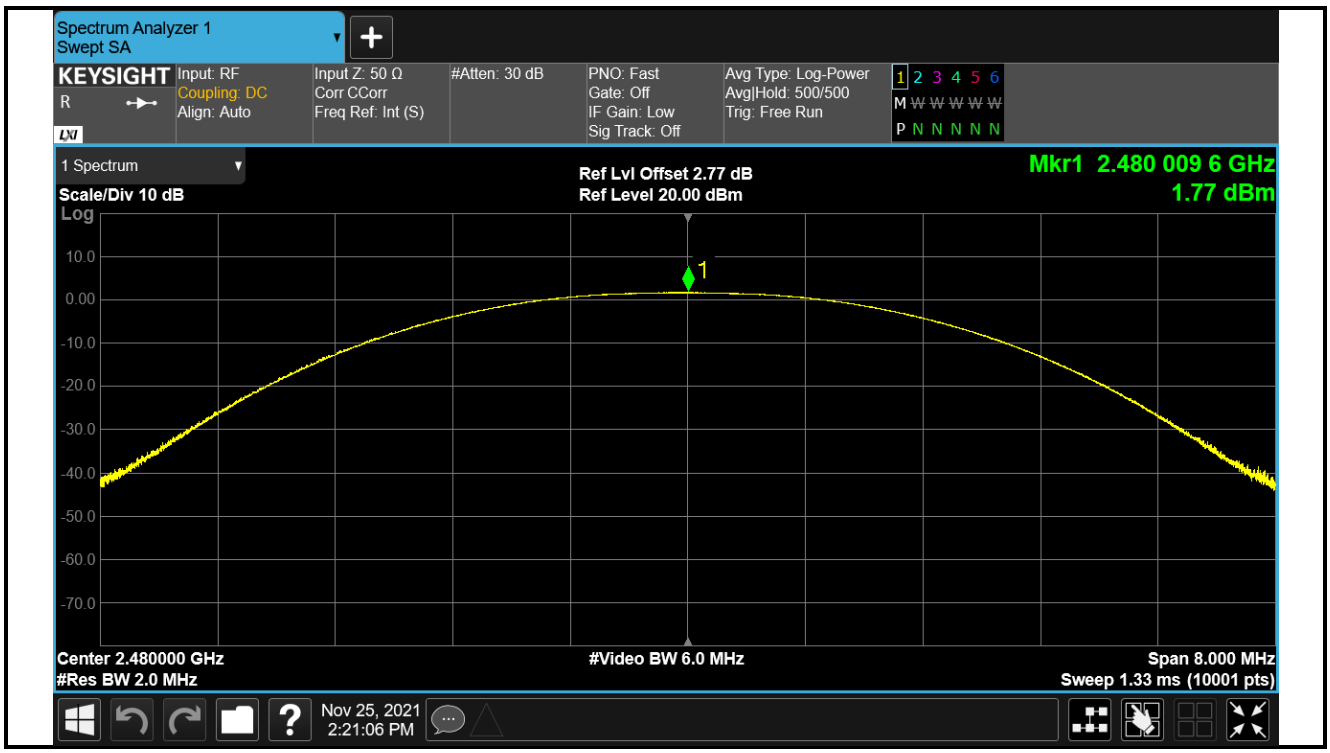
Power NVNT BLE 2402MHz Ant1



Power NVNT BLE 2442MHz Ant1



Power NVNT BLE 2480MHz Ant1


Spectrum Analyzer 1
Swept SA
KEYSIGHT
Input: RF
Coupling: DC
Align: Auto
Input Z: 50 Ω
Corr CCorr
Freq Ref: Int (S)
#Atten: 30 dB
PNO: Fast
Gate: Off
IF Gain: Low
Sig Track: Off
Avg Type: Log-Power
Avg|Hold: 500/500
Trig: Free Run
1 Spectrum
Scale/Div 10 dB
Log
Ref Lvl Offset 2.77 dB
Ref Level 20.00 dBm
Mkr1 2.480 009 6 GHz
1.77 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center 2.480000 GHz
#Res BW 2.0 MHz
#Video BW 6.0 MHz
Span 8.000 MHz
Sweep 1.33 ms (10001 pts)
Nov 25, 2021
2:21:06 PM

A.2 -6dB Bandwidth

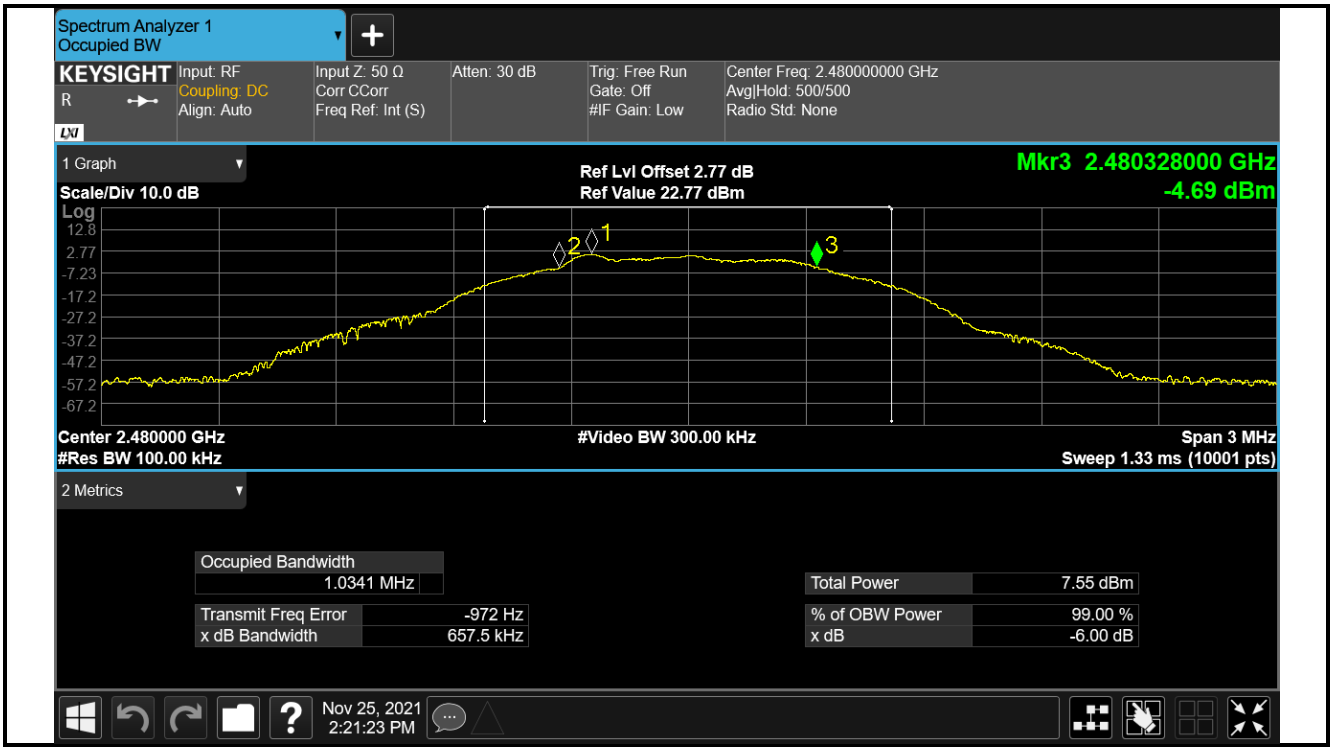
Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE	2402	Ant1	0.66	0.5	Pass
NVNT	BLE	2442	Ant1	0.658	0.5	Pass
NVNT	BLE	2480	Ant1	0.658	0.5	Pass

Test Graphs

-6dB Bandwidth NVNT BLE 2402MHz Ant1

-6dB Bandwidth NVNT BLE 2442MHz Ant1

-6dB Bandwidth NVNT BLE 2480MHz Ant1


Spectrum Analyzer 1
Occupied BW
KEYSIGHT
Input: RF
Coupling: DC
Align: Auto
Input Z: 50 Ω
Corr CCorr
Freq Ref: Int (S)
Atten: 30 dB
Trig: Free Run
Gate: Off
#IF Gain: Low
Center Freq: 2.480000000 GHz
Avg|Hold: 500/500
Radio Std: None
1 Graph
Ref Lvl Offset 2.77 dB
Ref Value 22.77 dBm
Mkr3 2.480328000 GHz
-4.69 dBm
Scale/Div 10.0 dB
Log
12.8
2.77
-7.23
-17.2
-27.2
-37.2
-47.2
-57.2
-67.2
Center 2.480000 GHz
#Res BW 100.00 kHz
#Video BW 300.00 kHz
Span 3 MHz
Sweep 1.33 ms (10001 pts)
2 Metrics
Occupied Bandwidth
1.0341 MHz
Transmit Freq Error -972 Hz
x dB Bandwidth 657.5 kHz
Total Power 7.55 dBm
% of OBW Power 99.00 %
x dB -6.00 dB
Nov 25, 2021
2:21:23 PM

A.3 Occupied Channel Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	BLE	2402	Ant1	1.020650309
NVNT	BLE	2442	Ant1	1.027608431
NVNT	BLE	2480	Ant1	1.017808267

Test Graphs

OBW NVNT BLE 2402MHz Ant1

OBW NVNT BLE 2442MHz Ant1

OBW NVNT BLE 2480MHz Ant1

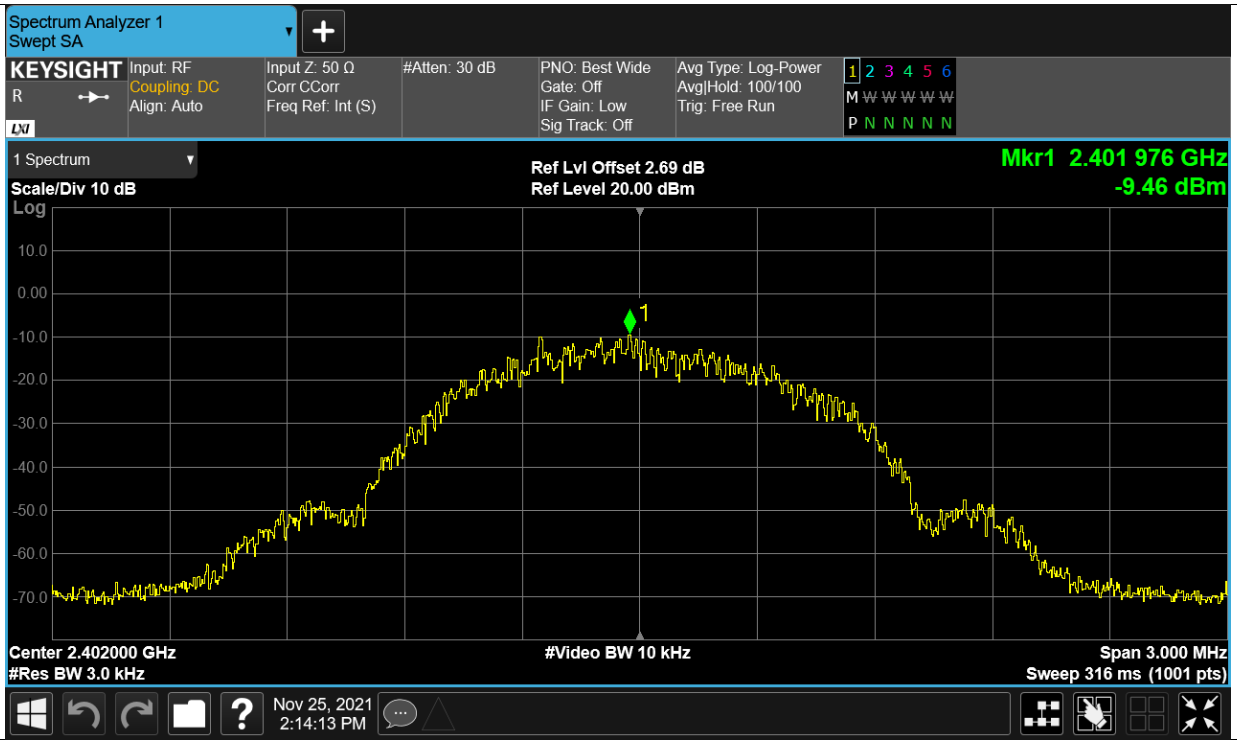

Spectrum Analyzer 1
Occupied BW
KEYSIGHT
Input: RF
Coupling: DC
Align: Auto
Input Z: 50 Ω
Corr CCorr
Freq Ref: Int (S)
Atten: 30 dB
Trig: Free Run
Gate: Off
#IF Gain: Low
Center Freq: 2.480000000 GHz
Avg|Hold: 100/100
Radio Std: None
1 Graph
Ref Lvl Offset 2.77 dB
Ref Value 22.77 dBm
Scale/Div 10.0 dB
Log
12.8
2.77
-7.23
-17.2
-27.2
-37.2
-47.2
-57.2
-67.2
Center 2.480000 GHz
#Res BW 30.000 kHz
#Video BW 100.00 kHz
Span 3 MHz
Sweep 3.33 ms (10001 pts)
2 Metrics
Occupied Bandwidth
1.0178 MHz
Total Power
7.05 dBm
Transmit Freq Error
6.826 kHz
% of OBW Power
99.00 %
x dB Bandwidth
1.246 MHz
x dB
-26.00 dB
Nov 25, 2021
2:21:13 PM

A.4 Maximum Power Spectral Density Level

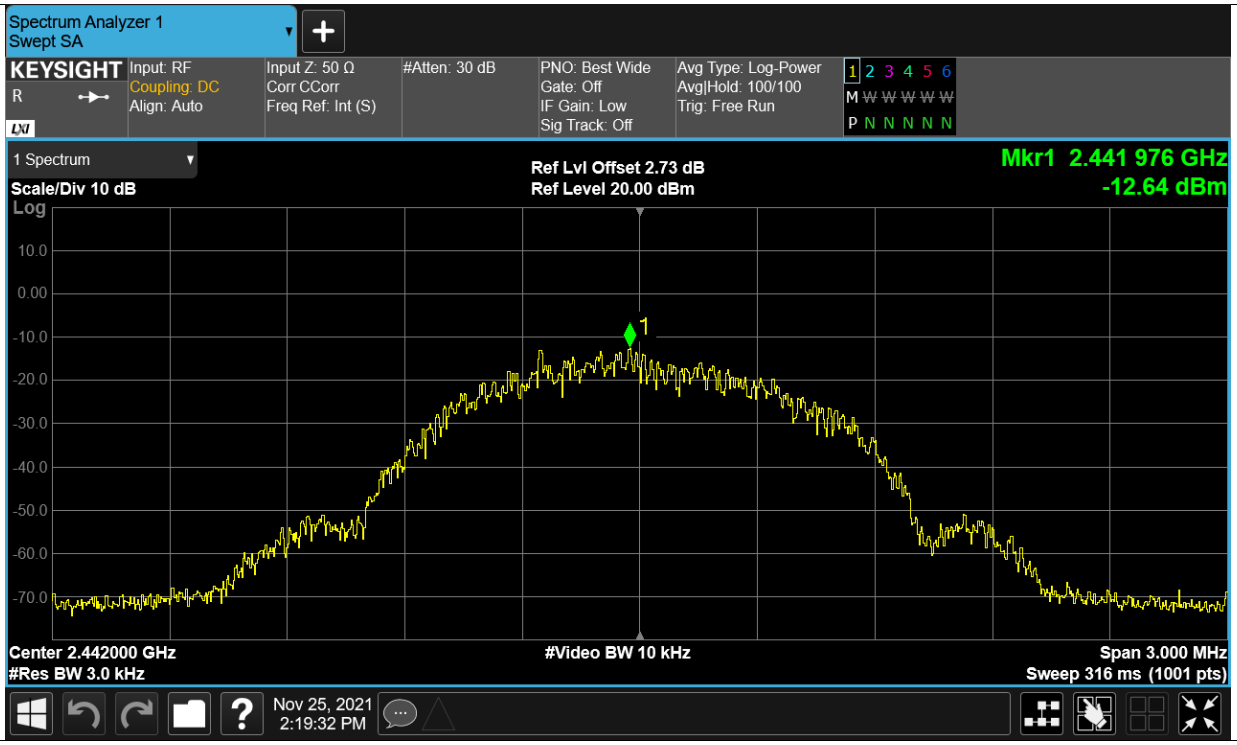
Condition	Mode	Frequency (MHz)	Antenna	Max PSD (dBm)	Limit (dBm)	Verdict
NVNT	BLE	2402	Ant1	-9.459	8	Pass
NVNT	BLE	2442	Ant1	-12.641	8	Pass
NVNT	BLE	2480	Ant1	-13.52	8	Pass

Test Graphs

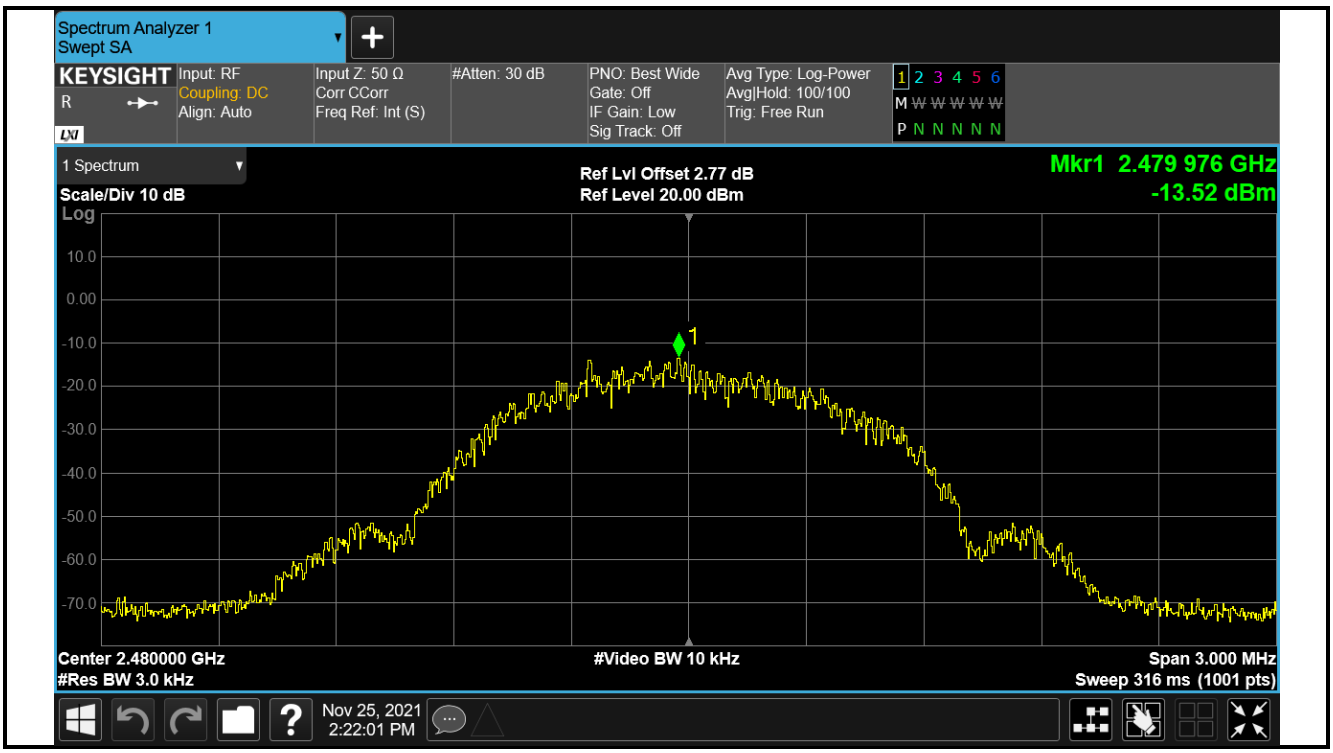
PSD NVNT BLE 2402MHz Ant1



PSD NVNT BLE 2442MHz Ant1



PSD NVNT BLE 2480MHz Ant1

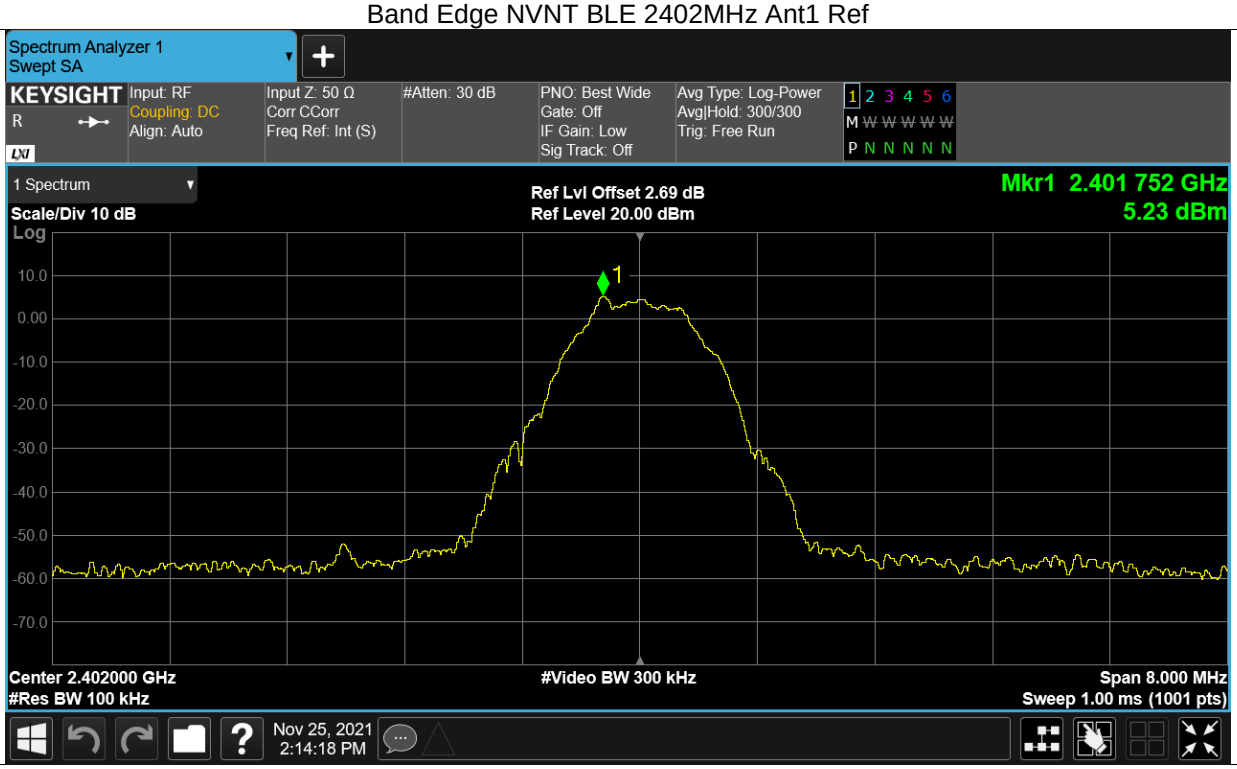

Spectrum Analyzer 1
Swept SA
KEYSIGHT
Input: RF
Coupling: DC
Align: Auto
Input Z: 50 Ω
Corr CCorr
Freq Ref: Int (S)
#Atten: 30 dB
PNO: Best Wide
Gate: Off
IF Gain: Low
Sig Track: Off
Avg Type: Log-Power
Avg|Hold: 100/100
Trig: Free Run
1 Spectrum
Scale/Div 10 dB
Log
Ref Lvl Offset 2.77 dB
Ref Level 20.00 dBm
Mkr1 2.479 976 GHz
-13.52 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center 2.480000 GHz
#Res BW 3.0 kHz
#Video BW 10 kHz
Span 3.000 MHz
Sweep 316 ms (1001 pts)
Nov 25, 2021
2:22:01 PM

A.5 Band Edge

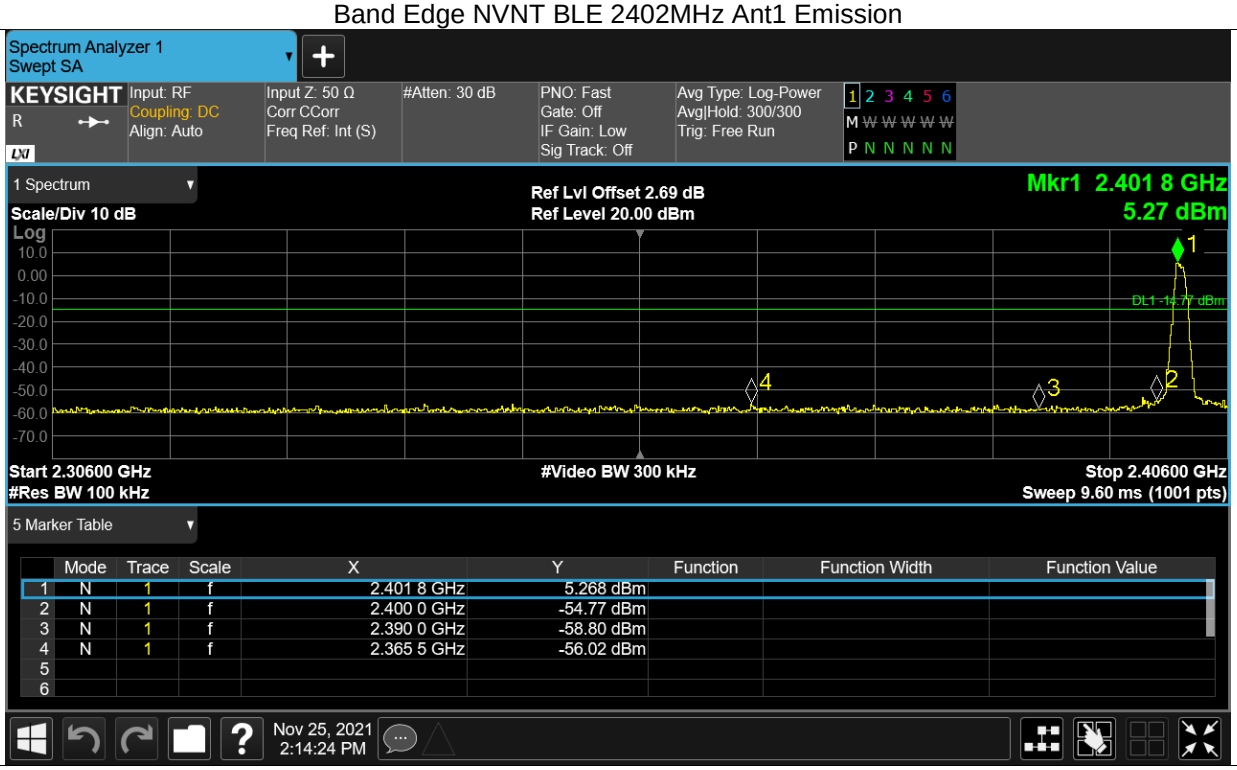
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE	2402	Ant1	-61.25	-20	Pass
NVNT	BLE	2480	Ant1	-57.31	-20	Pass

Test Graphs

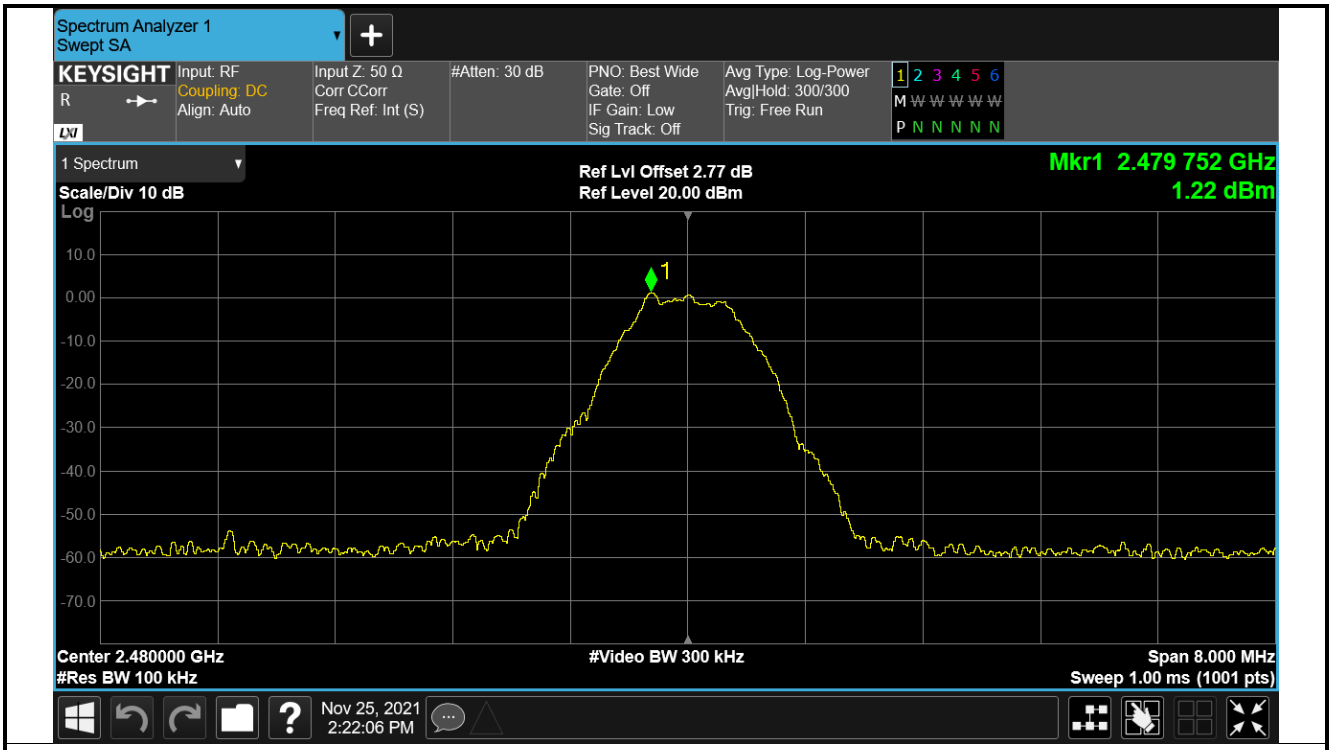
Band Edge NVNT BLE 2402MHz Ant1 Ref



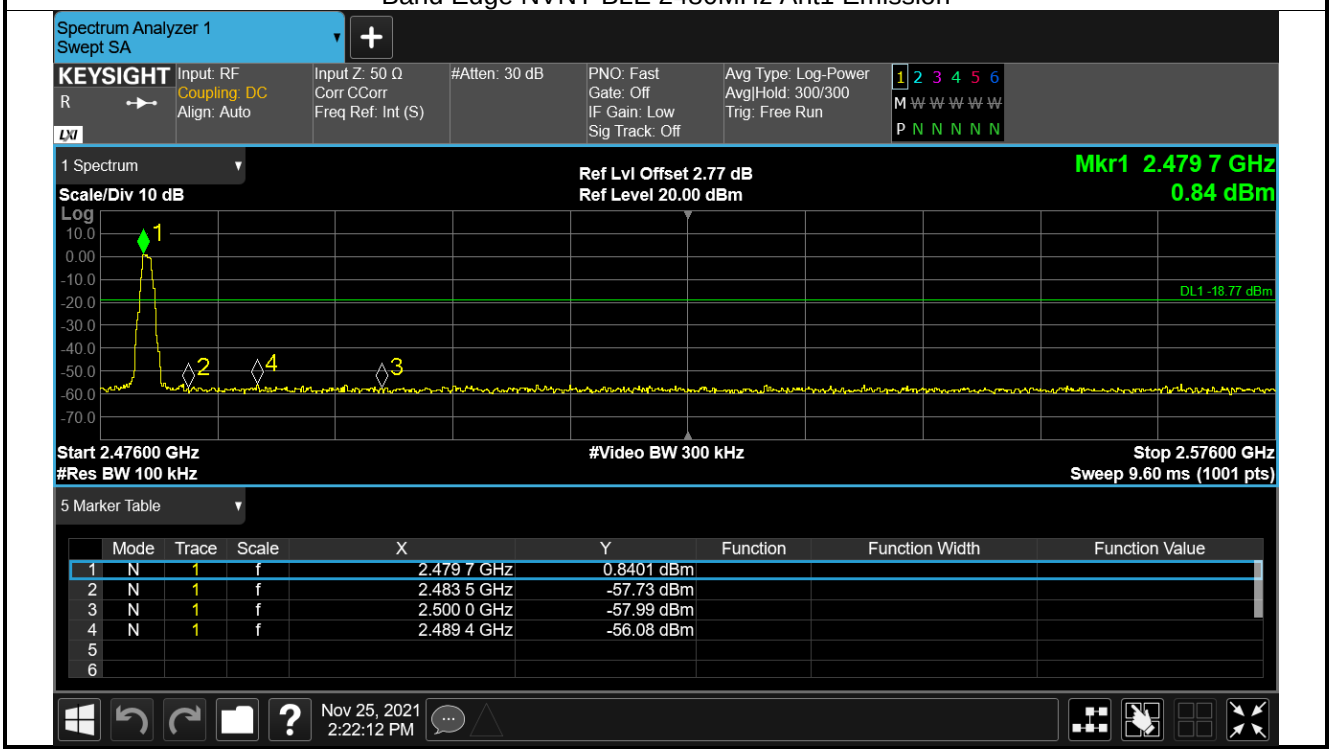
Band Edge NVNT BLE 2402MHz Ant1 Emission



Band Edge NVNT BLE 2480MHz Ant1 Ref



Band Edge NVNT BLE 2480MHz Ant1 Emission

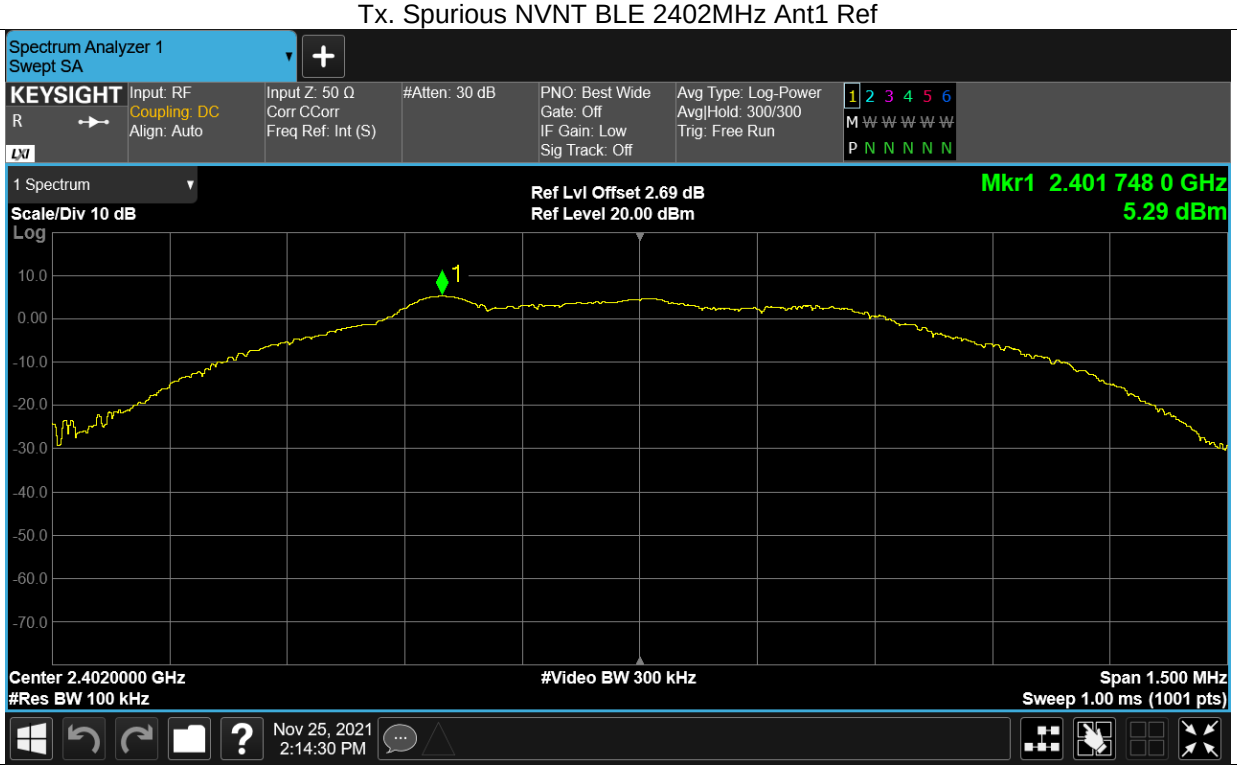


A.6 Conducted RF Spurious Emission

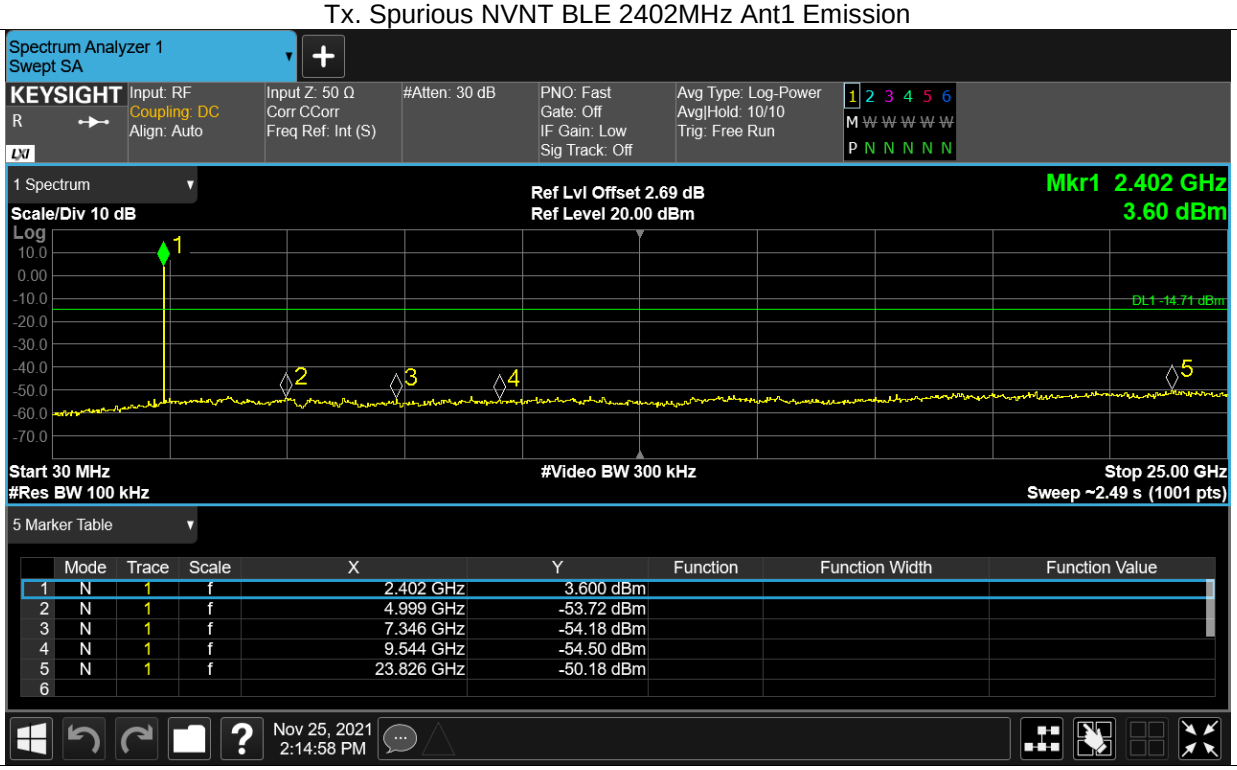
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE	2402	Ant1	-55.47	-20	Pass
NVNT	BLE	2442	Ant1	-51.29	-20	Pass
NVNT	BLE	2480	Ant1	-50.36	-20	Pass

Test Graphs

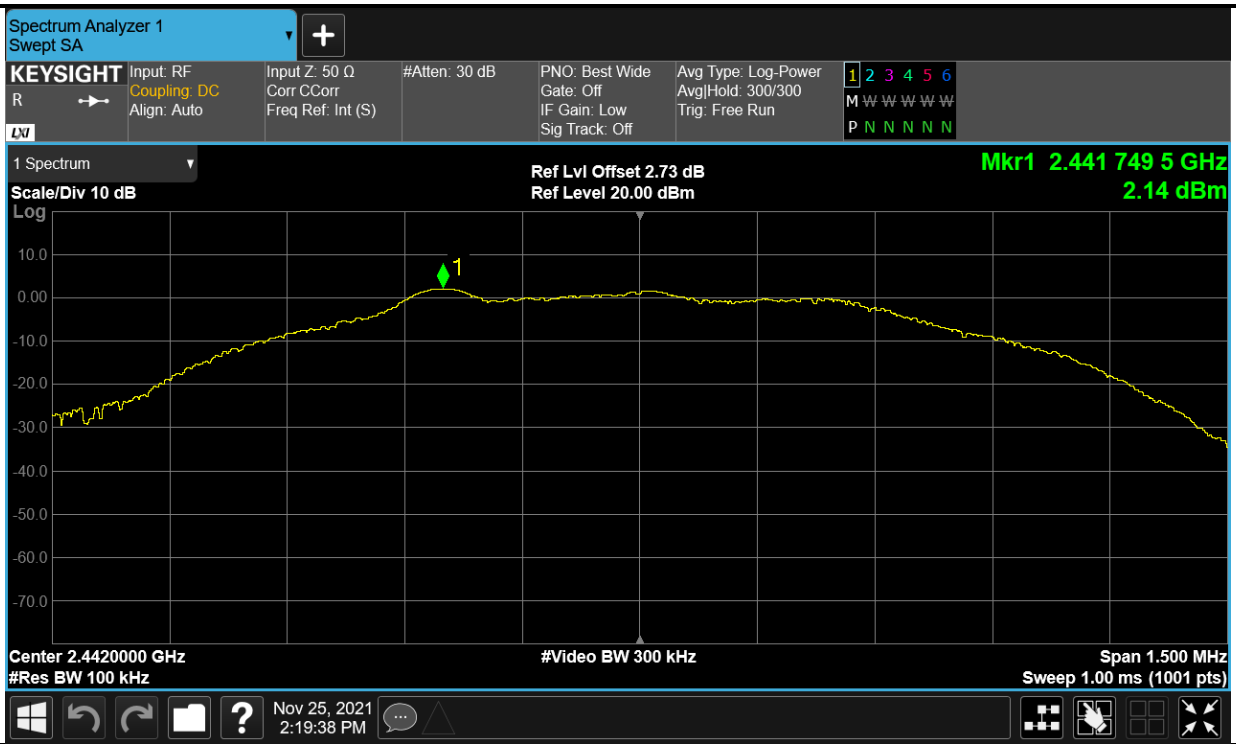
Tx. Spurious NVNT BLE 2402MHz Ant1 Ref



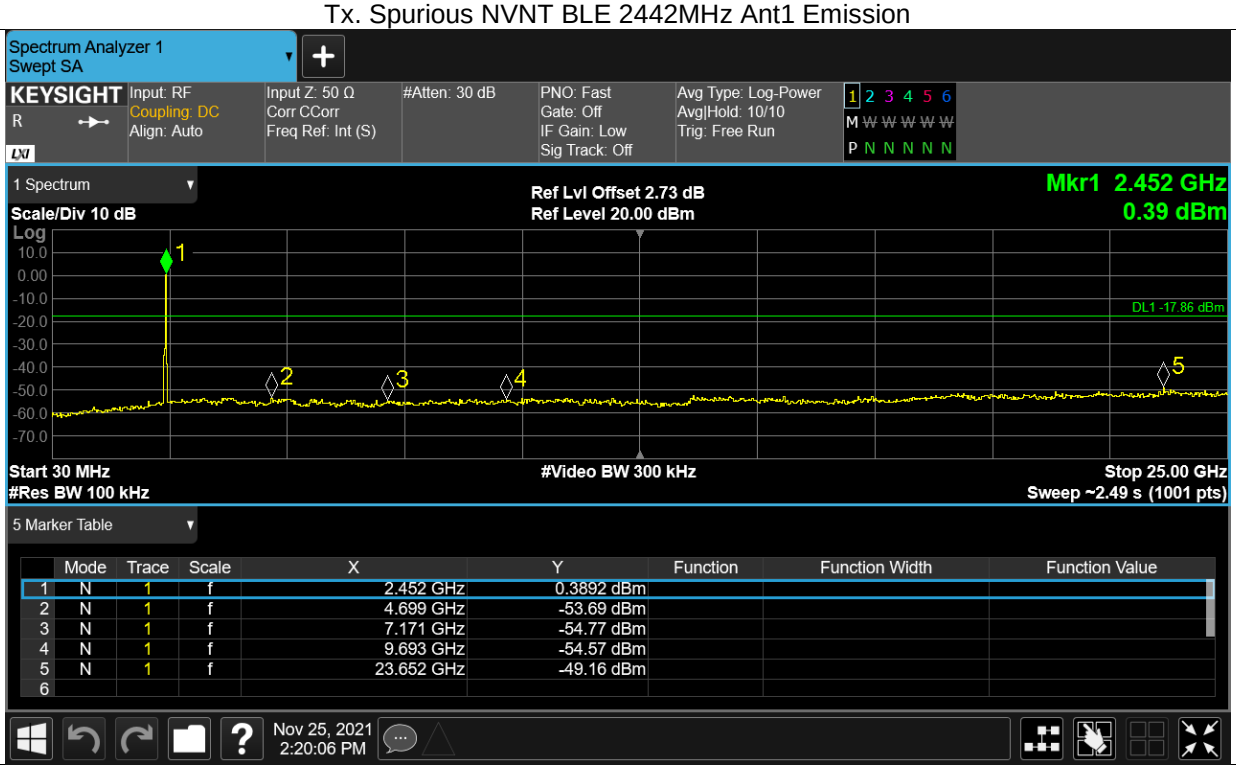
Tx. Spurious NVNT BLE 2402MHz Ant1 Emission



Tx. Spurious NVNT BLE 2442MHz Ant1 Ref



Tx. Spurious NVNT BLE 2442MHz Ant1 Emission



Tx. Spurious NVNT BLE 2480MHz Ant1 Ref