

FCC RF Test Report

(Bluetooth)

Applicant: PAX Technology Limited

Address of Applicant: Room 2416, 24/F., Sun Hung Kai Centre, 30 Harbour, Hong Kong

Equipment Under Test (EUT)

Product Name: Smart Kiosk

Model No.: SK300

Trade mark: PAX

FCC ID: V5PSK300

Applicable standards: FCC CFR Title 47 Part 15C (§15.247)

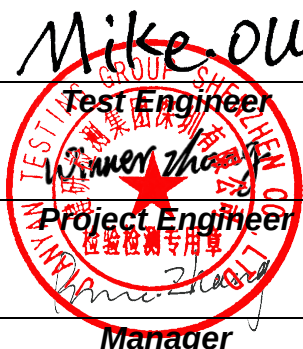
Date of sample receipt: 24 Jan., 2022

Date of Test: 25 Jan., to 03 Mar., 2022

Date of report issued: 04 Mar., 2022

Test Result: PASS

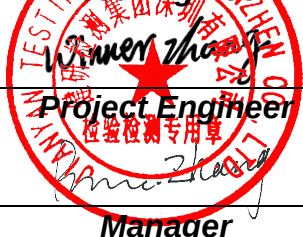
Tested by:


Mike OU
Test Engineer

Date:

04 Mar., 2022

Reviewed by:


Wenwen Zhang
Project Engineer

Date:

04 Mar., 2022

Approved by:


Mike OU
Manager

Date:

04 Mar., 2022

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in above the application standard version. Test results reported herein relate only to the item(s) tested.

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2 Version

Version No.	Date	Description
00	04 Mar., 2022	Original

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4 General Information

4.1 Client Information

Applicant:	PAX Technology Limited
Address:	Room 2416, 24/F., Sun Hung Kai Centre, 30 Harbour, Hong Kong
Manufacturer:	PAX Computer Technology (Shenzhen) Co., Ltd.
Address:	401 and 402, Building 3, Shenzhen Software Park, Nanshan District, Shenzhen City, Guangdong Province, P.R.C

4.2 General Description of E.U.T.

Product Name:	Smart Kiosk
Model No.:	SK300
Operation Frequency:	2402 MHz - 2480 MHz
Transfer rate:	1/2/3 Mbits/s
Number of channel:	79
Modulation type:	GFSK, $\pi/4$ -DQPSK, 8DPSK
Modulation technology:	FHSS
Antenna Type:	Internal Antenna
Antenna gain:	1.5 dBi
AC adapter:	Model: G065A1-240002700 Input: AC100-240V, 50/60Hz, 1.5A Output: DC 24.0V, 2.7A
Test Sample Condition:	The test samples were provided in good working order with no visible defects.

4.3 Test Mode and Test Environment

Test Modes:	
Non-hopping mode:	Keep the EUT in continuous transmitting mode.
Hopping mode:	Keep the EUT in hopping mode.
Remark: For AC power line conducted emission and radiated spurious emission, pre-scan GFSK, $\pi/4$ -DQPSK, 8DPSK Modulation mode, found GFSK was worse case mode. The report only reflects the test data of worst mode.	
Operating Environment:	
Temperature:	15°C ~ 35°C
Humidity:	20 % ~ 75 % RH
Atmospheric Pressure:	1010 mbar

4.4 Description of Support Units

The EUT has been tested as an independent unit.

4.5 Measurement Uncertainty

Parameter	Expanded Uncertainty (Confidence of 95%(U = 2Uc(y)))
Conducted Emission for LISN (9kHz ~ 150kHz)	±3.11 dB
Conducted Emission for LISN (150kHz ~ 30MHz)	±2.62 dB
Radiated Emission (30MHz ~ 1GHz) (3m SAC)	±4.45 dB
Radiated Emission (1GHz ~ 18GHz) (3m SAC)	±5.34 dB
Radiated Emission (18GHz ~ 40GHz) (3m SAC)	±5.34 dB
Note: All the measurement uncertainty value were shown with a coverage k=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.	

4.6 Additions to, Deviations, or Exclusions From the Method

No

4.7 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
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4.8 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://jyt.lets.com

4.9 Test Instruments list

Radiated Emission(3m SAC):					
Test Equipment	Manufacturer	Model No.	Manage No.	Cal.Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
3m SAC	ETS	9m*6m*6m	WXJ001-1	01-19-2021	01-18-2024
BiConiLog Antenna	Schwarzbeck	VULB9163	WXJ002	03-03-2021	03-02-2022
				02-17-2022	02-16-2023
Biconical Antenna	Schwarzbeck	VUBA9117	WXJ002-1	06-20-2021	06-19-2022
Horn Antenna	Schwarzbeck	BBHA9120D	WXJ002-2	03-03-2021	03-02-2022
				02-17-2022	02-16-2023
Horn Antenna	Schwarzbeck	BBHA9120D	WXJ002-3	06-18-2021	06-17-2022
Pre-amplifier (30MHz ~ 1GHz)	Schwarzbeck	BBV9743B	WXG001-7	03-07-2021	03-06-2022
				02-17-2022	02-16-2023
Pre-amplifier (1GHz ~ 18GHz)	SKET	LNPA_0118G-50	WXG001-3	03-07-2021	03-06-2022
				02-17-2022	02-16-2023
Pre-amplifier (18GHz ~ 40GHz)	RF System	TRLA-180400G45B	WXG001-9	03-07-2021	03-06-2022
				02-17-2022	02-16-2023
EMI Test Receiver	Rohde & Schwarz	ESRP7	WXJ003-1	03-03-2021	03-02-2022
				02-17-2022	02-16-2023
Spectrum Analyzer	KEYSIGHT	N9010B	WXJ004-2	11-27-2021	11-26-2022
Coaxial Cable (30MHz ~ 1GHz)	JYTSZ	JYT3M-1G-NN-8M	WXG001-4	03-07-2021	03-06-2022
				02-17-2022	02-16-2023
Coaxial Cable (1GHz ~ 18GHz)	JYTSZ	JYT3M-18G-NN-8M	WXG001-5	03-07-2021	03-06-2022
				02-17-2022	02-16-2023
Coaxial Cable (18GHz ~ 40GHz)	JYTSZ	JYT3M-40G-SS-8M	WXG001-7	03-07-2021	03-06-2022
				02-17-2022	02-16-2023
Band Reject Filter Group	Tonscend	JS0806-F	WXJ089	N/A	
Test Software	Tonscend	TS+	Version: 3.0.0.1		

Conducted Emission:					
Test Equipment	Manufacturer	Model No.	Manage No.	Cal.Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
EMI Test Receiver	Rohde & Schwarz	ESCI 3	WXJ003	03-03-2021	03-02-2022
				02-17-2022	02-16-2023
RF Switch	TOP PRECISION	RSU0301	WXG003	03-03-2021	03-02-2022
				02-17-2022	02-16-2023
LISN	Schwarzbeck	NSLK 8127	QCJ001-13	03-18-2021	03-17-2022
				02-17-2022	02-16-2023
LISN	Rohde & Schwarz	ESH3-Z5	WXJ005-1	06-18-2021	06-17-2022
LISN Coaxial Cable (9kHz ~ 30MHz)	JYTSZ	JYTCE-1G-NN-2M	WXG003-1	03-03-2021	03-02-2022
				02-17-2022	02-16-2023
Test Software	AUDIX	E3	Version: 6.110919b		

Conducted Method:					
Test Equipment	Manufacturer	Model No.	Manage No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
Spectrum Analyzer	Keysight	N9010B	WXJ004-3	10-25-2021	10-24-2022
Vector Signal Generator	Keysight	N5182B	WXJ006-6	10-25-2021	10-24-2022
Signal Generator	Keysight	N5173B	WXJ006-4	10-25-2021	10-24-2022
Wireless Connectivity Tester	Rohde & Schwarz	CMW270	WXJ008-7	10-25-2021	10-24-2022
DC Power Supply	Keysight	E3642A	WXJ025-2	10-25-2021	10-24-2022
Temperature Humidity Chamber	HONG ZHI	CZ-A-80D	WXJ032-3	03-19-2021	03-18-2022
Power Detector Box	MWRFTTEST	MW100-PSB	WXJ007-4	10-25-2021	10-24-2022
RF Control Unit	MWRFTTEST	MW100-RFCB	WXG006	N/A	
Test Software	MWRFTTEST	MTS 8310	Version: 2.0.0.0		

5 Measurement setup and procedure

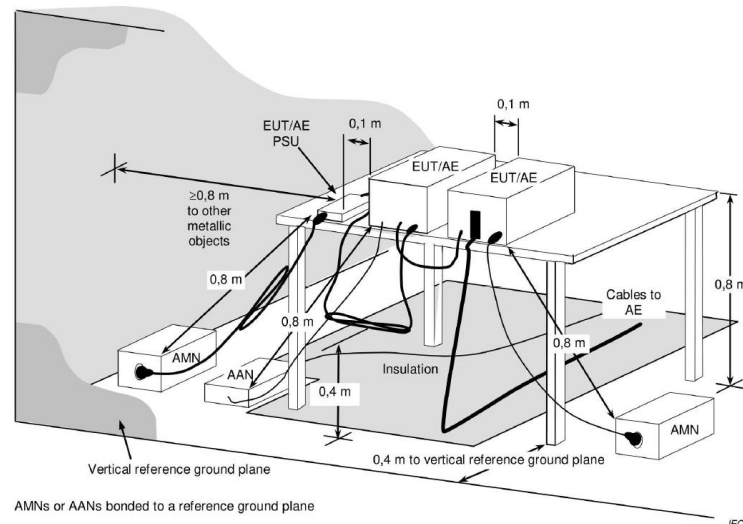
5.1 Test channel

According to ANSI C63.10-2013 chapter 5.6.1 Table 4 requirement, select lowest channel, middle channel, and highest channel in the frequency range in which device operates for testing. The detailed frequency points are as follows:

Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
0	2402	39	2441	78	2480

5.2 Test setup

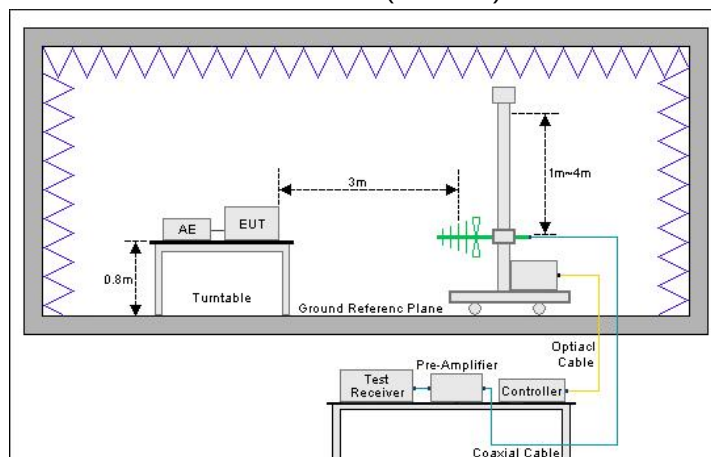
1) Conducted emission measurement:



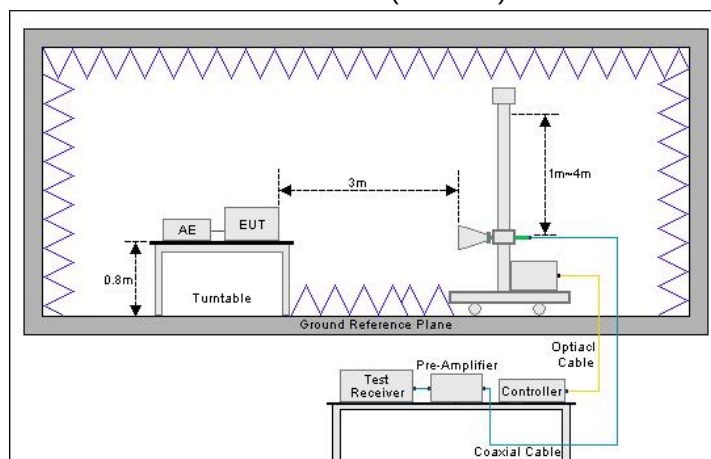
Note: The 0.8 m distance specified between EUT/AE/PSU and AMN/AAN, is applicable only to the EUT being measured. If the device is AE then it shall be >0.8 m.

2) Radiated emission measurement:

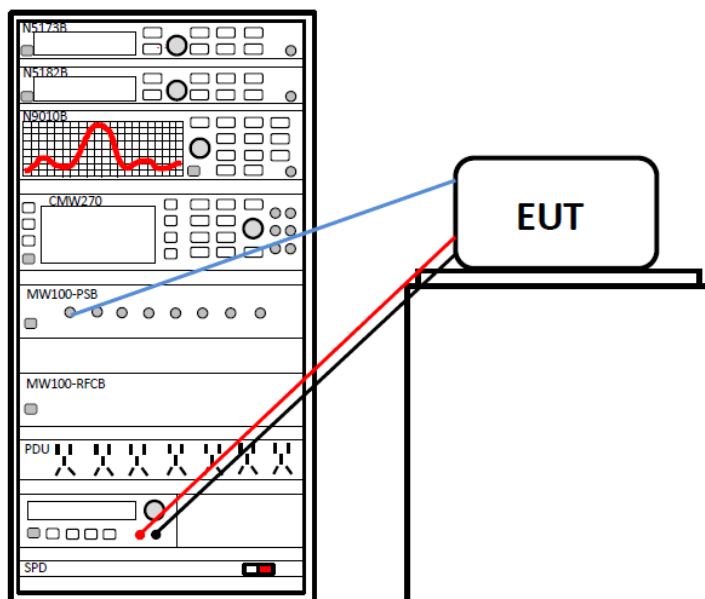
Below 1GHz (3m SAC)



Above 1GHz (3m SAC)



3) Conducted test method



5.3 Test procedure

Test method	Test step
Conducted emission	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This 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 on conducted measurement.
Radiated emission	For below 1GHz: 1. The EUT was placed on the tabletop of a rotating table 0.8 m the ground at a 3 m semi anechoic chamber. The measurement distance from the EUT to the receiving antenna is 3 m. 2. EUT works in each mode of operation that needs to be tested, and having the EUT continuously working, respectively on 3 axis (X, Y & Z) and considered typical configuration to obtain worst position. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations. 3. Open the test software to control the test antenna and test turntable. Perform the test, save the test results, and export the test data. For above 1GHz: 1. The EUT was placed on the tabletop of a rotating table 1.5 m the ground at a 3 m fully anechoic room. The measurement distance from the EUT to the receiving antenna is 3 m. 2. EUT works in each mode of operation that needs to be tested, and having the EUT continuously working, respectively on 3 axis (X, Y & Z) and considered typical configuration to obtain worst position. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations. 3. Open the test software to control the test antenna and test turntable. Perform the test, save the test results, and export the test data.
Conducted test method	1. The Bluetooth antenna port of EUT was connected to the test port of the test system through an RF cable. 2. The EUT is keeping in continuous transmission mode and tested in all modulation modes. 3. Open the test software, prepare a test plan, and control the system through the software. After the test is completed, the test report is exported through the test software.

6 Test Results

6.1 Summary

6.1.1 Clause and data summary

Test Items	FCC Part Section(s)	Test Data	Result
Antenna Requirement	15.203 15.247 (b)(4)	See Section 6.2	Pass
AC Power Line Conducted Emission	15.207	See Section 6.3	Pass
Conducted Peak Output Power	15.247 (b)(1)	Appendix – BT	Pass
20dB Occupied Bandwidth	15.247 (a)(1)	Appendix – BT	Pass
Carrier Frequencies Separation	15.247 (a)(1)	Appendix – BT	Pass
Hopping Channel Number	5.247 (a)(1)(iii)	Appendix – BT	Pass
Dwell Time	15.247 (a)(1)(iii)	Appendix – BT	Pass
Pseudorandom Frequency Hopping Sequence	15.247 (a)(1)	See Section 6.4	Pass
Band Edge (Conducted Method)	15.247 (d)	Appendix – BT	Pass
Band Edge (Radiated Method)	15.205 15.209	See Section 6.5	Pass
Spurious Emission (Conducted Method)	15.247(d)	Appendix – BT	Pass
Spurious Emission (Radiated Method)		See Section 6.6	Pass
Remark: 1. Pass: The EUT complies with the essential requirements in the standard. 2. 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		

6.1.2 Test Limit

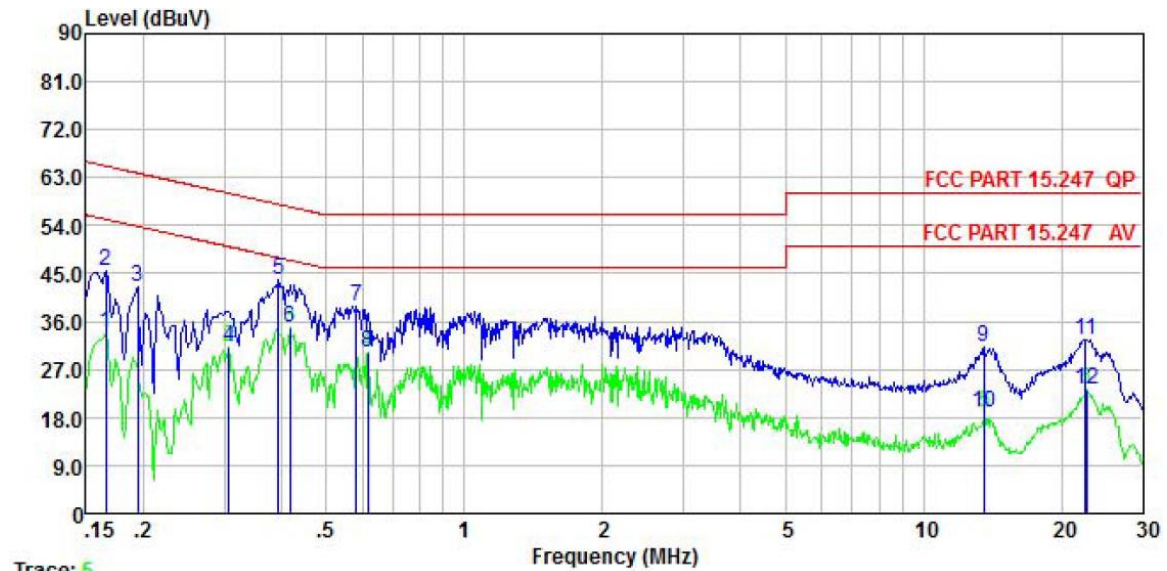
Items	Limit																							
AC Power Line Conducted Emission	<table><tr><th>Frequency range (MHz)</th><th colspan="2">Limit (dBuV)</th></tr><tr><td></td><th>Quasi-peak</th><th>Average</th></tr><tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr><tr><td>0.5-5</td><td>56</td><td>46</td></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></table>	Frequency range (MHz)	Limit (dBuV)			Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50	* Decreases with the logarithm of the frequency.							
Frequency range (MHz)	Limit (dBuV)																							
	Quasi-peak	Average																						
0.15-0.5	66 to 56*	56 to 46*																						
0.5-5	56	46																						
5-30	60	50																						
* Decreases with the logarithm of the frequency.																								
Conducted Peak Output Power	For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.																							
20dB Occupied Bandwidth	Within authorization band																							
Carrier Frequencies Separation	a) 0.025MHz or the 20dB bandwidth (whichever is greater). b) 0.025MHz or two-thirds of the 20dB bandwidth (whichever is greater).																							
Hopping Channel Number	At least 15 channels.																							
Dwell Time	Not be greater than 0.4 seconds.																							
Conducted Band Edge and Conducted Spurious Emission	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. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).																							
Radiated Band Edge	<table><tr><th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></tr><tr><td rowspan="2">Above 1GHz</td><td>54.0</td><td>Average Value</td></tr><tr><td>74.0</td><td>Peak Value</td></tr></table>	Frequency	Limit (dBuV/m @3m)	Remark	Above 1GHz	54.0	Average Value	74.0	Peak Value															
Frequency	Limit (dBuV/m @3m)	Remark																						
Above 1GHz	54.0	Average Value																						
	74.0	Peak Value																						
Radiated Spurious Emission	Below 1GHz (Measurement distance for 3 m): <table><tr><th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></tr><tr><td>30MHz-88MHz</td><td>40.0</td><td>Quasi-peak Value</td></tr><tr><td>88MHz-216MHz</td><td>43.5</td><td>Quasi-peak Value</td></tr><tr><td>216MHz-960MHz</td><td>46.0</td><td>Quasi-peak Value</td></tr><tr><td>960MHz-1GHz</td><td>54.0</td><td>Quasi-peak Value</td></tr></table> Above 1GHz (Measurement distance for 3 m): <table><tr><th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></tr><tr><td rowspan="2">Above 1GHz</td><td>54.0</td><td>Average Value</td></tr><tr><td>74.0</td><td>Peak Value</td></tr></table>	Frequency	Limit (dBuV/m @3m)	Remark	30MHz-88MHz	40.0	Quasi-peak Value	88MHz-216MHz	43.5	Quasi-peak Value	216MHz-960MHz	46.0	Quasi-peak Value	960MHz-1GHz	54.0	Quasi-peak Value	Frequency	Limit (dBuV/m @3m)	Remark	Above 1GHz	54.0	Average Value	74.0	Peak Value
Frequency	Limit (dBuV/m @3m)	Remark																						
30MHz-88MHz	40.0	Quasi-peak Value																						
88MHz-216MHz	43.5	Quasi-peak Value																						
216MHz-960MHz	46.0	Quasi-peak Value																						
960MHz-1GHz	54.0	Quasi-peak Value																						
Frequency	Limit (dBuV/m @3m)	Remark																						
Above 1GHz	54.0	Average Value																						
	74.0	Peak Value																						

6.2 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 Bluetooth antenna is an Internal antenna which permanently attached, and the best case gain of the antenna is 1.5dBi. See product internal photos for details.	

6.3 Conducted Emissions

Product name:	Smart Kiosk	Product model:	SK300
Test by:	Mike	Test mode:	BT Tx mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Line
Test voltage:	AC 120 V/60 Hz		

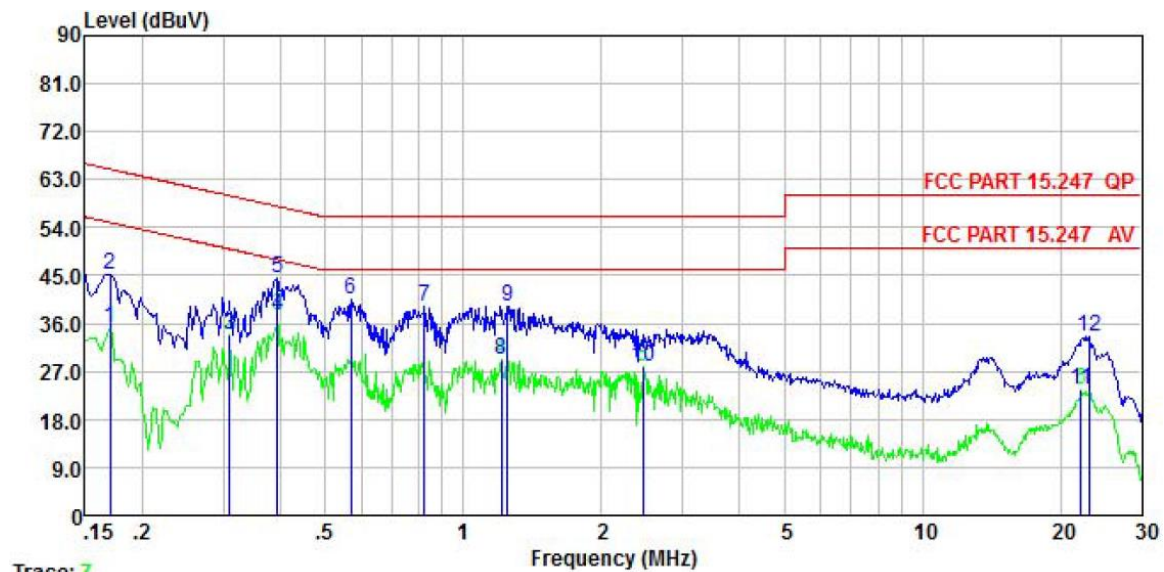


	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.166	33.74	0.04	0.01	33.79	55.16	-21.37	Average
2	0.166	45.52	0.04	0.01	45.57	65.16	-19.59	QP
3	0.194	42.40	0.04	0.03	42.47	63.84	-21.37	QP
4	0.307	31.04	0.04	0.03	31.11	50.06	-18.95	Average
5	0.393	43.80	0.04	0.04	43.88	57.99	-14.11	QP
6	0.417	34.76	0.04	0.04	34.84	47.51	-12.67	Average
7	0.582	38.81	0.04	0.02	38.87	56.00	-17.13	QP
8	0.617	30.24	0.04	0.02	30.30	46.00	-15.70	Average
9	13.551	30.84	0.25	0.12	31.21	60.00	-28.79	QP
10	13.623	18.69	0.26	0.12	19.07	50.00	-30.93	Average
11	22.535	32.17	0.34	0.16	32.67	60.00	-27.33	QP
12	22.655	22.72	0.34	0.16	23.22	50.00	-26.78	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 + Cable Loss.

Product name:	Smart Kiosk	Product model:	SK300
Test by:	Mike	Test mode:	BT Tx mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Neutral
Test voltage:	AC 120 V/60 Hz		

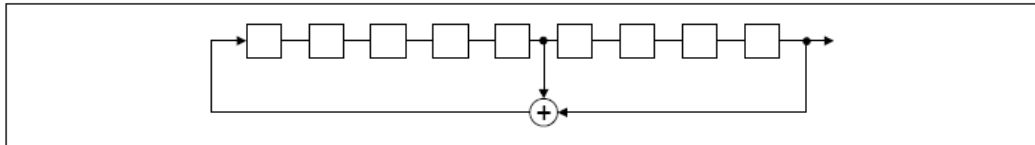


	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.170	35.29	0.05	0.01	35.35	54.94	-19.59	Average
2	0.170	45.02	0.05	0.01	45.08	64.94	-19.86	QP
3	0.310	33.75	0.04	0.03	33.82	49.97	-16.15	Average
4	0.393	37.46	0.04	0.04	37.54	47.99	-10.45	Average
5	0.393	44.54	0.04	0.04	44.62	57.99	-13.37	QP
6	0.570	40.35	0.04	0.02	40.41	56.00	-15.59	QP
7	0.822	39.26	0.04	0.03	39.33	56.00	-16.67	QP
8	1.210	29.16	0.05	0.09	29.30	46.00	-16.70	Average
9	1.249	39.17	0.05	0.10	39.32	56.00	-16.68	QP
10	2.461	27.60	0.07	0.14	27.81	46.00	-18.19	Average
11	22.180	22.96	0.33	0.16	23.45	50.00	-26.55	Average
12	23.018	33.09	0.33	0.16	33.58	60.00	-26.42	QP

Notes:

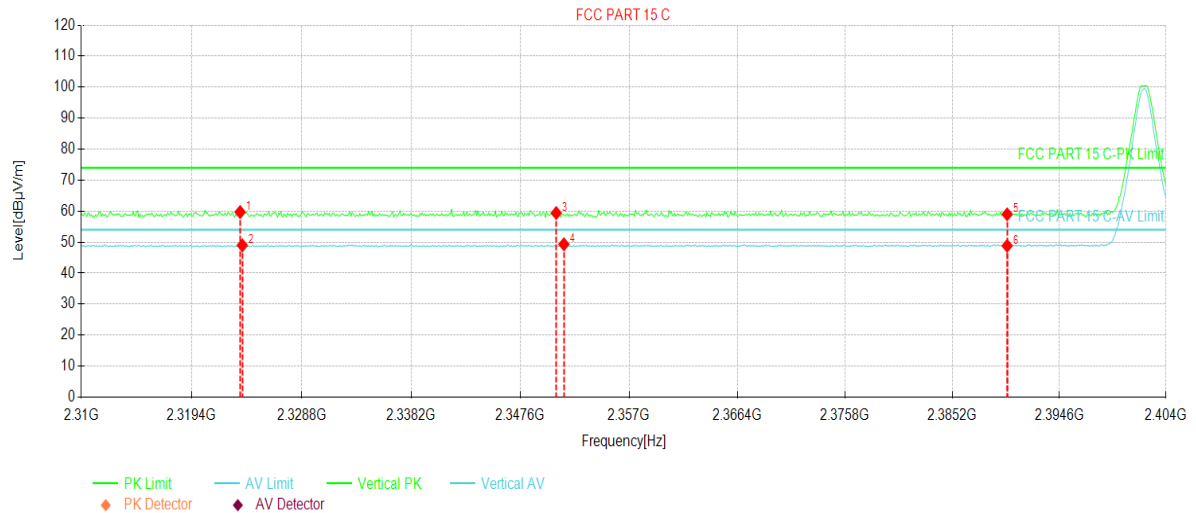
1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

6.4 Pseudorandom Frequency Hopping Sequence

Test Requirement:	FCC Part 15 C Section 15.247 (a)(1) requirement:																										
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively. Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudorandom ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.																											
EUT Pseudorandom Frequency Hopping Sequence																											
The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONES; i.e. the shift register is initialized with nine ones. • Number of shift register stages: 9 • Length of pseudo-random sequence: $2^9 - 1 = 511$ bits • Longest sequence of zeros: 8 (non-inverted signal)																											
 <i>Linear Feedback Shift Register for Generation of the PRBS sequence</i> An example of Pseudorandom Frequency Hopping Sequence as follow: <table><tr><td style="width: 15%;">0</td><td style="width: 15%;">2</td><td style="width: 15%;">4</td><td style="width: 15%;">6</td><td style="width: 15%;"></td><td style="width: 15%;">62</td><td style="width: 15%;">64</td><td style="width: 15%;">78</td><td style="width: 15%;">1</td><td style="width: 15%;"></td><td style="width: 15%;">73</td><td style="width: 15%;">75</td><td style="width: 15%;">77</td></tr><tr><td style="height: 40px;"></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>		0	2	4	6		62	64	78	1		73	75	77													
0	2	4	6		62	64	78	1		73	75	77															
Each frequency used equally on the average by each transmitter. The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.																											

6.5 Band Edge (Radiated Method)

Product Name:	Smart Kiosk	Product Model:	SK300
Test By:	Mike	Test mode:	DH1 Tx mode
Test Channel:	Lowest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz		

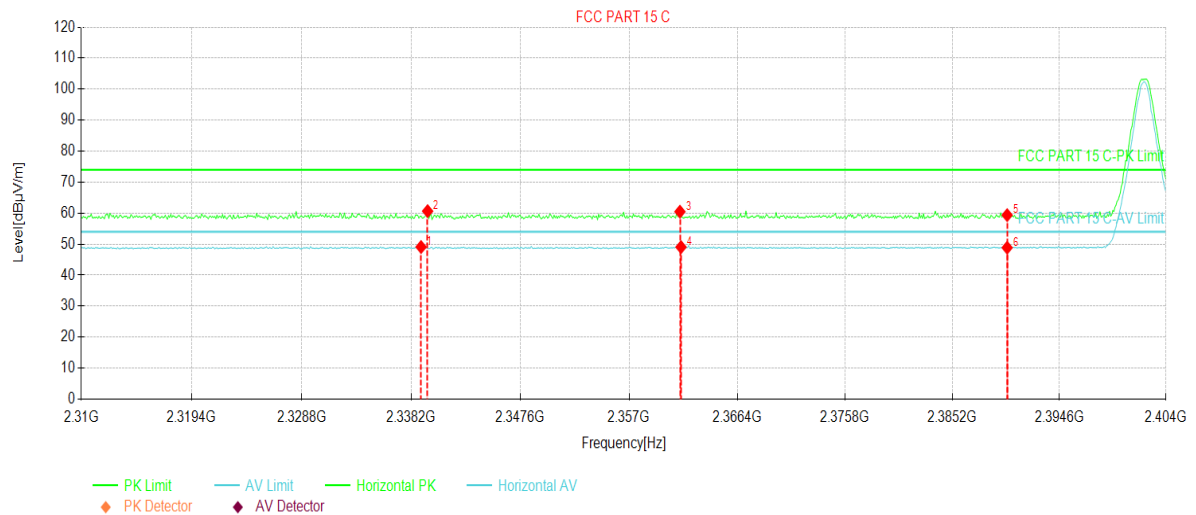


NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	2323.53	24.36	59.73	35.37	74.00	14.27	PK	Vertical
2	2323.72	13.61	48.98	35.37	54.00	5.02	AV	Vertical
3	2350.70	23.84	59.40	35.56	74.00	14.60	PK	Vertical
4	2351.36	13.75	49.31	35.56	54.00	4.69	AV	Vertical
5	2390.00	23.14	58.98	35.84	74.00	15.02	PK	Vertical
6	2390.00	12.97	48.81	35.84	54.00	5.19	AV	Vertical

Remark:

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

Product Name:	Smart Kiosk	Product Model:	SK300
Test By:	Mike	Test mode:	DH1 Tx mode
Test Channel:	Lowest channel	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz		

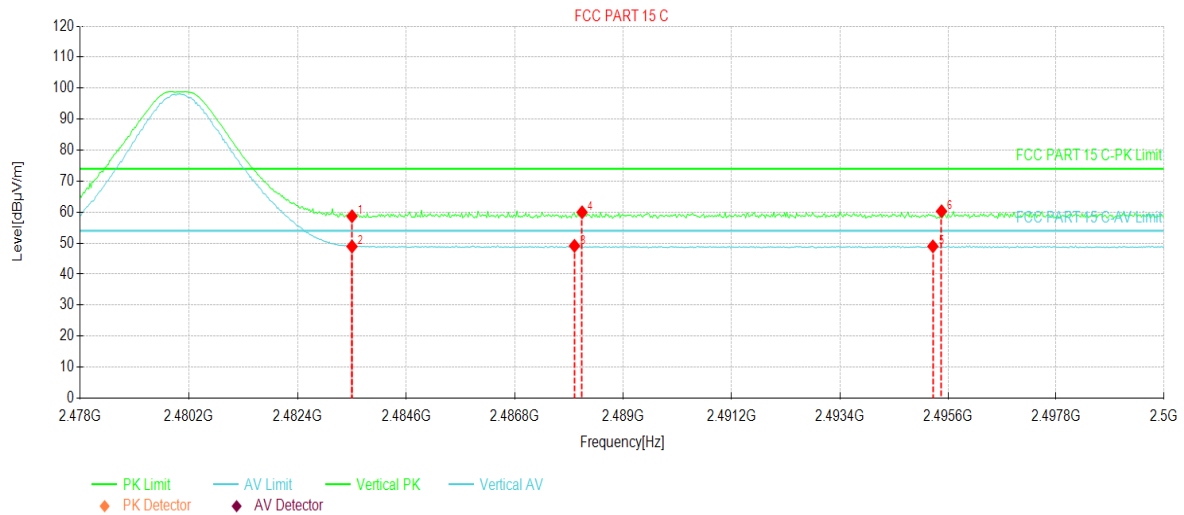


NO.	Freq. [MHz]	Reading [dBuV/m]	Level [dBuV/m]	Factor [dB]	Limit [dBuV/m]	Margin [dB]	Trace	Polarity
1	2339.04	13.60	49.08	35.48	54.00	4.92	AV	Horizontal
2	2339.61	25.17	60.65	35.48	74.00	13.35	PK	Horizontal
3	2361.41	24.84	60.48	35.64	74.00	13.52	PK	Horizontal
4	2361.51	13.41	49.05	35.64	54.00	4.95	AV	Horizontal
5	2390.00	23.53	59.37	35.84	74.00	14.63	PK	Horizontal
6	2390.00	13.02	48.86	35.84	54.00	5.14	AV	Horizontal

Remark:

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

Product Name:	Smart Kiosk	Product Model:	SK300
Test By:	Mike	Test mode:	DH1 Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz		

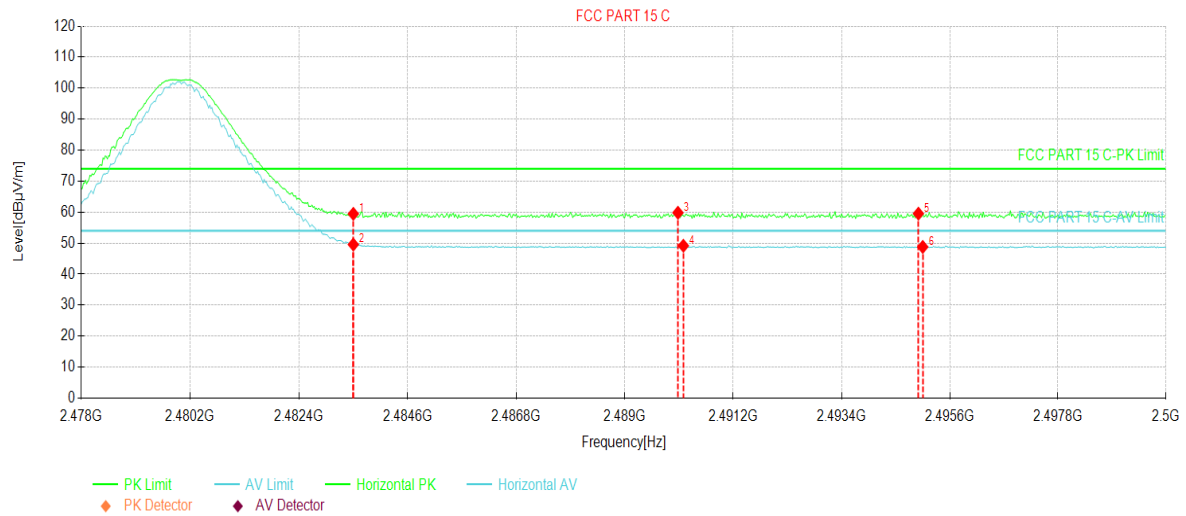


NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	2483.50	22.95	58.67	35.72	74.00	15.33	PK	Vertical
2	2483.50	13.21	48.93	35.72	54.00	5.07	AV	Vertical
3	2488.01	13.42	49.13	35.71	54.00	4.87	AV	Vertical
4	2488.16	24.25	59.96	35.71	74.00	14.04	PK	Vertical
5	2495.29	13.27	48.96	35.69	54.00	5.04	AV	Vertical
6	2495.46	24.59	60.28	35.69	74.00	13.72	PK	Vertical

Remark:

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

Product Name:	Smart Kiosk	Product Model:	SK300
Test By:	Mike	Test mode:	DH1 Tx mode
Test Channel:	Highest channel	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz		



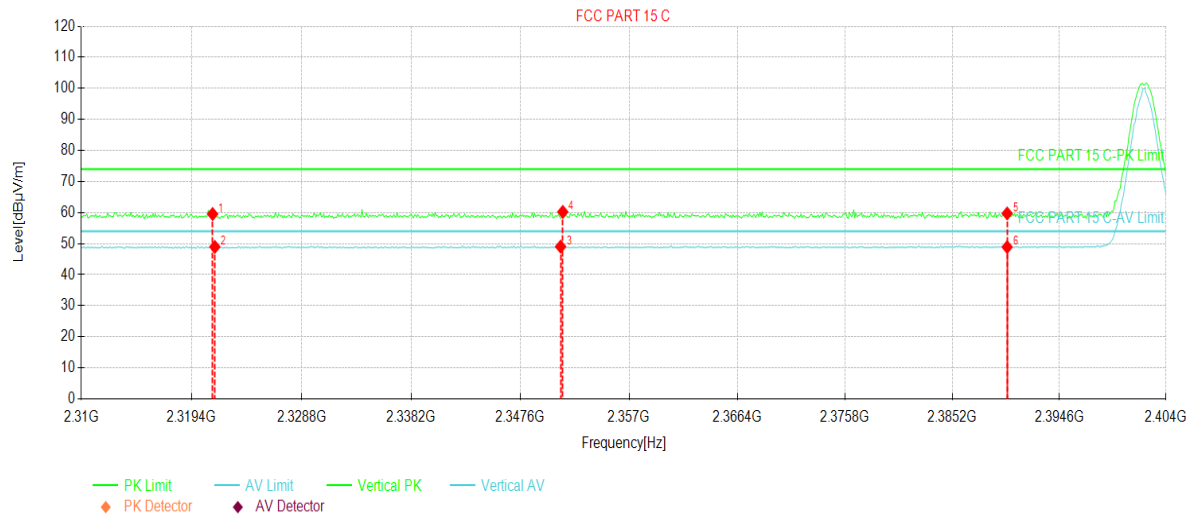
NO.	Freq. [MHz]	Reading [dBuV/m]	Level [dBuV/m]	Factor [dB]	Limit [dBuV/m]	Margin [dB]	Trace	Polarity
1	2483.50	23.74	59.46	35.72	74.00	14.54	PK	Horizontal
2	2483.50	13.84	49.56	35.72	54.00	4.44	AV	Horizontal
3	2490.07	24.11	59.81	35.70	74.00	14.19	PK	Horizontal
4	2490.18	13.46	49.16	35.70	54.00	4.84	AV	Horizontal
5	2494.96	23.83	59.52	35.69	74.00	14.48	PK	Horizontal
6	2495.05	13.09	48.78	35.69	54.00	5.22	AV	Horizontal

Remark:

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

$\pi/4$ -DQPSK mode

Product Name:	Smart Kiosk	Product Model:	SK300
Test By:	Mike	Test mode:	2DH1 Tx mode
Test Channel:	Lowest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz		

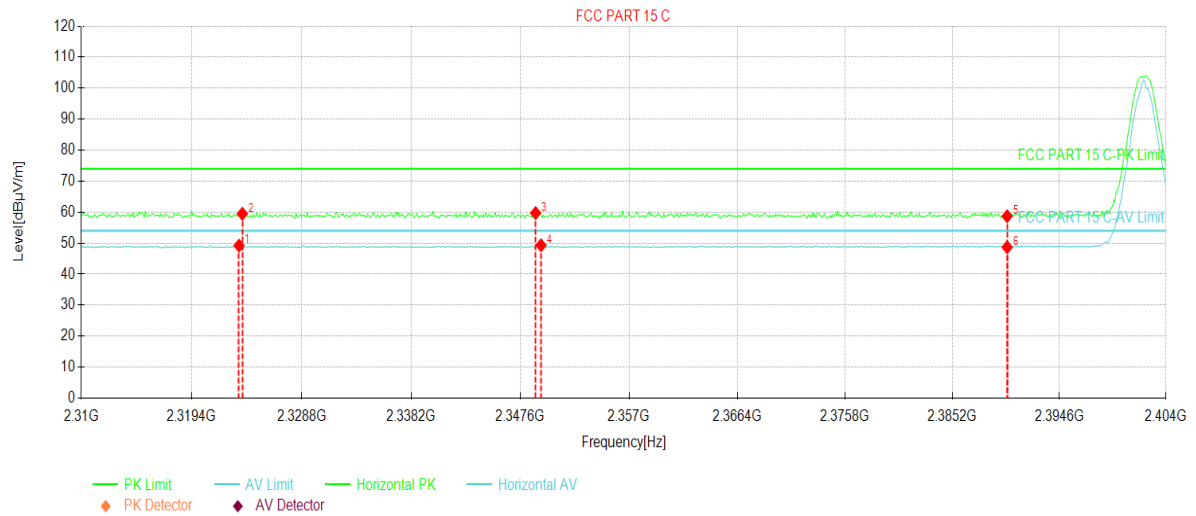


NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	2321.18	24.18	59.53	35.35	74.00	14.47	PK	Vertical
2	2321.37	13.61	48.96	35.35	54.00	5.04	AV	Vertical
3	2351.07	13.47	49.03	35.56	54.00	4.97	AV	Vertical
4	2351.26	24.66	60.22	35.56	74.00	13.78	PK	Vertical
5	2390.00	23.88	59.72	35.84	74.00	14.28	PK	Vertical
6	2390.00	13.06	48.90	35.84	54.00	5.10	AV	Vertical

Remark:

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

Product Name:	Smart Kiosk	Product Model:	SK300
Test By:	Mike	Test mode:	2DH1 Tx mode
Test Channel:	Lowest channel	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz		

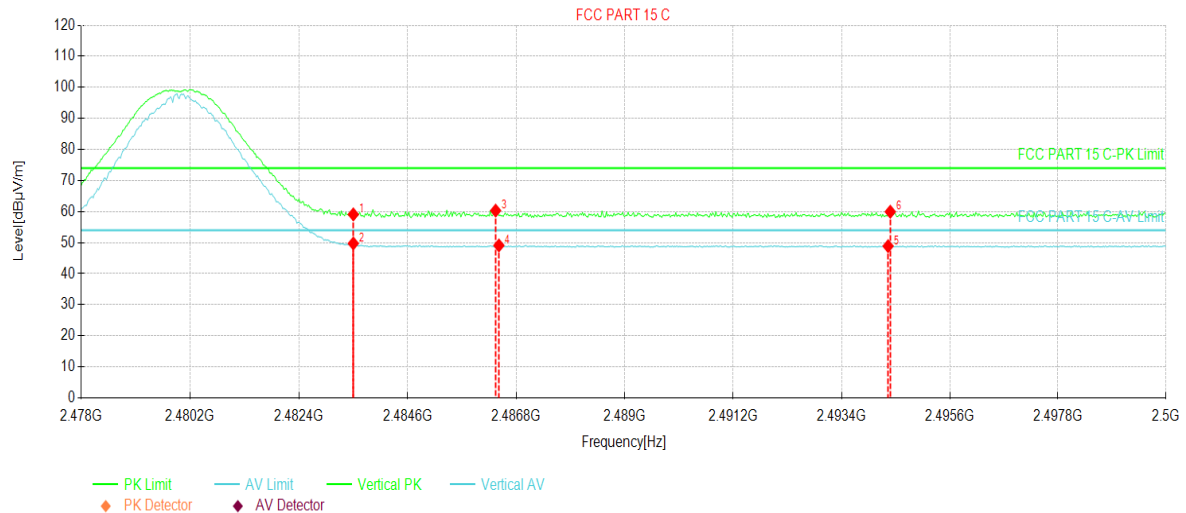


NO.	Freq. [MHz]	Reading [dBuV/m]	Level [dBuV/m]	Factor [dB]	Limit [dBuV/m]	Margin [dB]	Trace	Polarity
1	2323.44	13.84	49.21	35.37	54.00	4.79	AV	Horizontal
2	2323.72	24.11	59.48	35.37	74.00	14.52	PK	Horizontal
3	2348.91	24.18	59.73	35.55	74.00	14.27	PK	Horizontal
4	2349.38	13.77	49.32	35.55	54.00	4.68	AV	Horizontal
5	2390.00	22.84	58.68	35.84	74.00	15.32	PK	Horizontal
6	2390.00	12.85	48.69	35.84	54.00	5.31	AV	Horizontal

Remark:

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

Product Name:	Smart Kiosk	Product Model:	SK300
Test By:	Mike	Test mode:	2DH1 Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz		

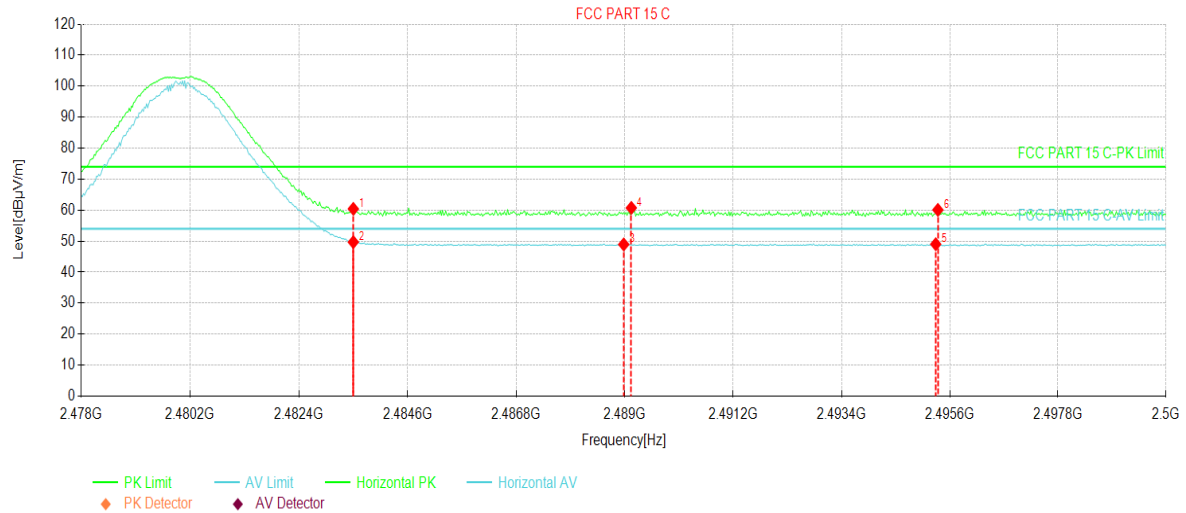


NO.	Freq. [MHz]	Reading [dBuV/m]	Level [dBuV/m]	Factor [dB]	Limit [dBuV/m]	Margin [dB]	Trace	Polarity
1	2483.50	23.36	59.08	35.72	74.00	14.92	PK	Vertical
2	2483.50	14.01	49.73	35.72	54.00	4.27	AV	Vertical
3	2486.38	24.61	60.32	35.71	74.00	13.68	PK	Vertical
4	2486.44	13.38	49.09	35.71	54.00	4.91	AV	Vertical
5	2494.34	13.18	48.87	35.69	54.00	5.13	AV	Vertical
6	2494.39	24.25	59.94	35.69	74.00	14.06	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:	Smart Kiosk	Product Model:	SK300
Test By:	Mike	Test mode:	2DH1 Tx mode
Test Channel:	Highest channel	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz		



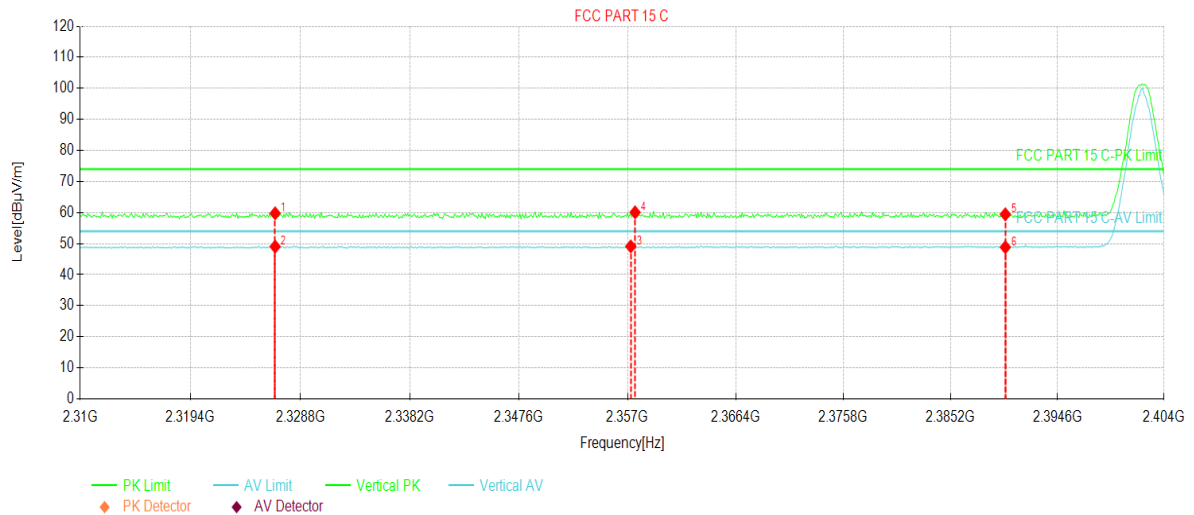
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	2483.50	24.70	60.42	35.72	74.00	13.58	PK	Horizontal
2	2483.50	13.97	49.69	35.72	54.00	4.31	AV	Horizontal
3	2488.97	13.22	48.93	35.71	54.00	5.07	AV	Horizontal
4	2489.13	25.04	60.74	35.70	74.00	13.26	PK	Horizontal
5	2495.31	13.32	49.01	35.69	54.00	4.99	AV	Horizontal
6	2495.35	24.39	60.08	35.69	74.00	13.92	PK	Horizontal

Remark:

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

8DPSK mode

Product Name:	Smart Kiosk	Product Model:	SK300
Test By:	Mike	Test mode:	3DH1 Tx mode
Test Channel:	Lowest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz		

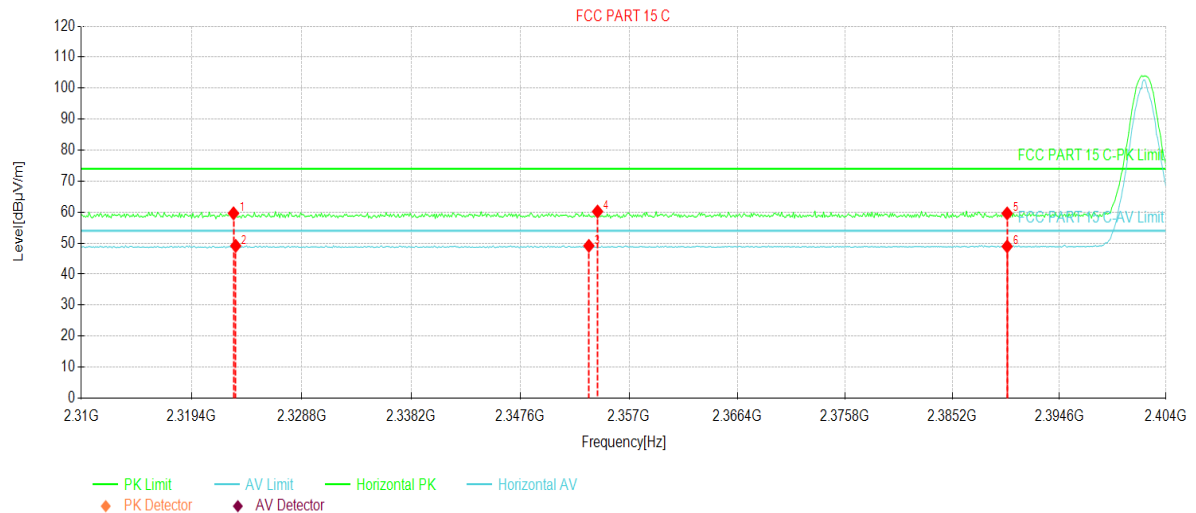


NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	2326.63	24.37	59.76	35.39	74.00	14.24	PK	Vertical
2	2326.63	13.65	49.04	35.39	54.00	4.96	AV	Vertical
3	2357.28	13.50	49.11	35.61	54.00	4.89	AV	Vertical
4	2357.65	24.46	60.07	35.61	74.00	13.93	PK	Vertical
5	2390.00	23.58	59.42	35.84	74.00	14.58	PK	Vertical
6	2390.00	12.99	48.83	35.84	54.00	5.17	AV	Vertical

Remark:

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

Product Name:	Smart Kiosk	Product Model:	SK300
Test By:	Mike	Test mode:	3DH1 Tx mode
Test Channel:	Lowest channel	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz		

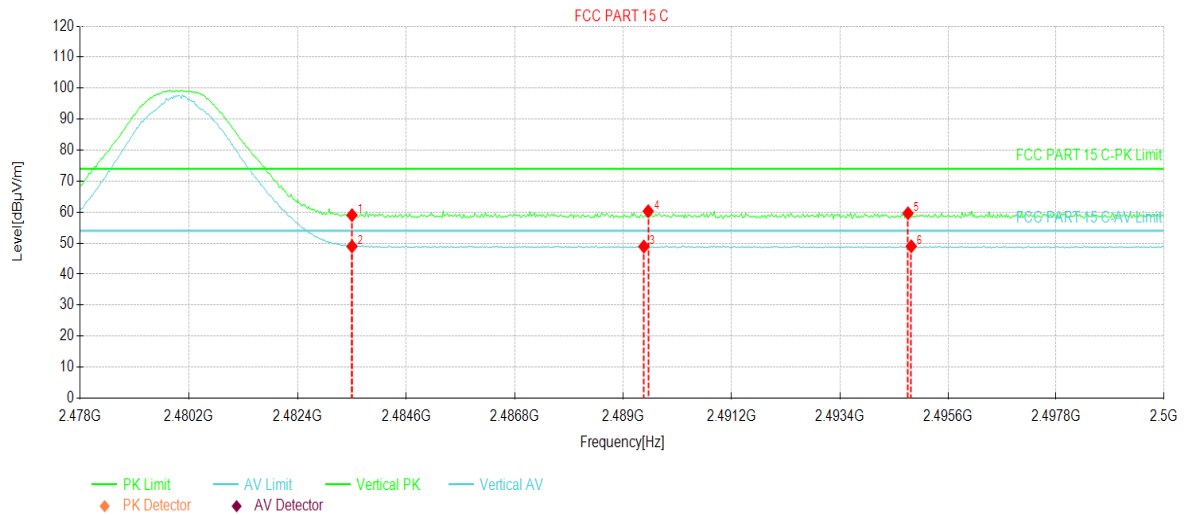


NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	2322.97	24.27	59.63	35.36	74.00	14.37	PK	Horizontal
2	2323.16	13.77	49.13	35.36	54.00	4.87	AV	Horizontal
3	2353.52	13.55	49.13	35.58	54.00	4.87	AV	Horizontal
4	2354.27	24.62	60.21	35.59	74.00	13.79	PK	Horizontal
5	2390.00	23.74	59.58	35.84	74.00	14.42	PK	Horizontal
6	2390.00	13.10	48.94	35.84	54.00	5.06	AV	Horizontal

Remark:

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

Product Name:	Smart Kiosk	Product Model:	SK300
Test By:	Mike	Test mode:	3DH1 Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	AC 120/60Hz		

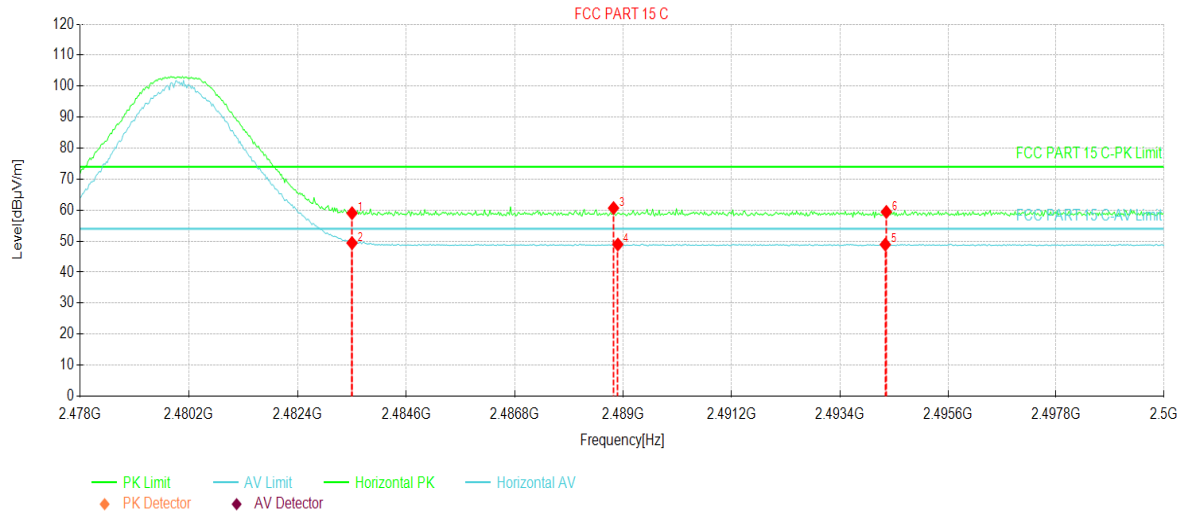


NO.	Freq. [MHz]	Reading [dBuV/m]	Level [dBuV/m]	Factor [dB]	Limit [dBuV/m]	Margin [dB]	Trace	Polarity
1	2483.50	23.31	59.03	35.72	74.00	14.97	PK	Vertical
2	2483.50	13.23	48.95	35.72	54.00	5.05	AV	Vertical
3	2489.41	13.20	48.90	35.70	54.00	5.10	AV	Vertical
4	2489.50	24.60	60.30	35.70	74.00	13.70	PK	Vertical
5	2494.78	23.95	59.64	35.69	74.00	14.36	PK	Vertical
6	2494.85	13.30	48.99	35.69	54.00	5.01	AV	Vertical

Remark:

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

Product Name:	Smart Kiosk	Product Model:	SK300
Test By:	Mike	Test mode:	3DH1 Tx mode
Test Channel:	Highest channel	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz		



NO.	Freq. [MHz]	Reading [dBuV/m]	Level [dBuV/m]	Factor [dB]	Limit [dBuV/m]	Margin [dB]	Trace	Polarity
1	2483.50	23.30	59.02	35.72	74.00	14.98	PK	Horizontal
2	2483.50	13.67	49.39	35.72	54.00	4.61	AV	Horizontal
3	2488.80	24.97	60.68	35.71	74.00	13.32	PK	Horizontal
4	2488.89	13.22	48.93	35.71	54.00	5.07	AV	Horizontal
5	2494.32	13.20	48.89	35.69	54.00	5.11	AV	Horizontal
6	2494.34	23.74	59.43	35.69	74.00	14.57	PK	Horizontal

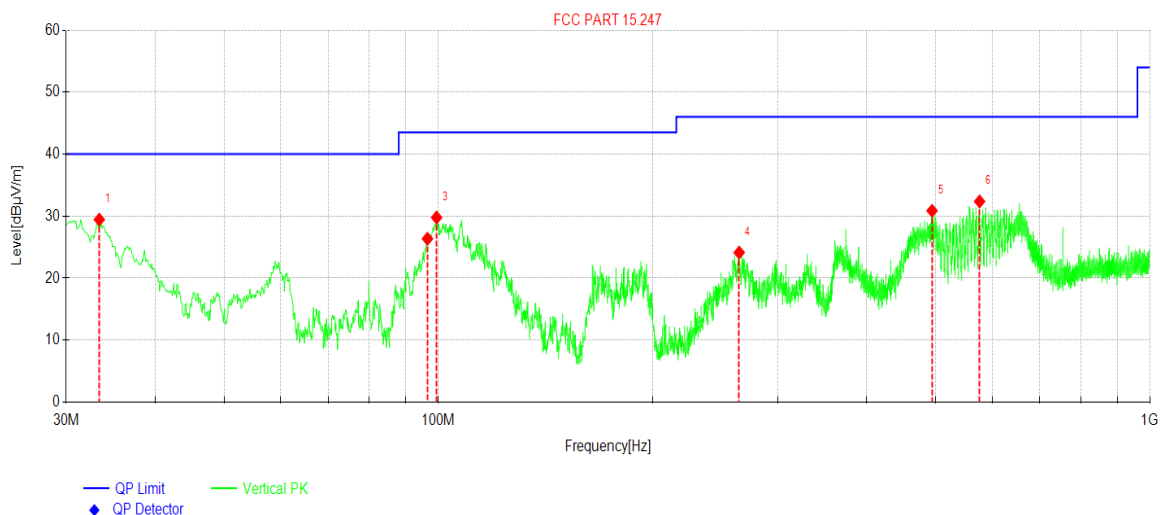
Remark:

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

6.6 Spurious Emission (Radiated Method)

Below 1GHz:

Product Name:	Smart Kiosk	Product Model:	SK300
Test By:	Mike	Test mode:	BT Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Vertical
Test Voltage:	AC 120/60Hz		

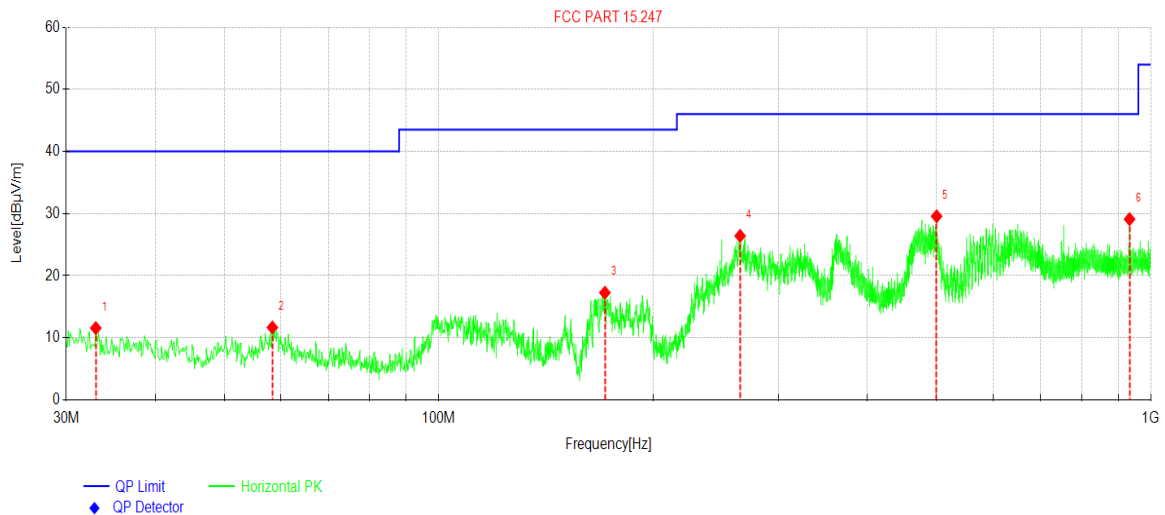


NO.	Freq. [MHz]	Reading[dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	33.3953	44.83	29.45	-15.38	40.00	10.55	PK	Vertical
2	96.5487	43.16	26.35	-16.81	43.50	17.15	PK	Vertical
3	99.4589	46.05	29.78	-16.27	43.50	13.72	PK	Vertical
4	264.666	37.69	24.13	-13.56	46.00	21.87	PK	Vertical
5	493.997	38.05	30.87	-7.18	46.00	15.13	PK	Vertical
6	576.067	38.48	32.38	-6.10	46.00	13.62	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:	Smart Kiosk	Product Model:	SK300
Test By:	Mike	Test mode:	BT Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz		



NO.	Freq. [MHz]	Reading[dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Trace	Polarity
1	33.0073	27.03	11.56	-15.47	40.00	28.44	PK	Horizontal
2	58.4238	26.55	11.66	-14.89	40.00	28.34	PK	Horizontal
3	171.149	34.26	17.26	-17.00	43.50	26.24	PK	Horizontal
4	264.957	39.97	26.41	-13.56	46.00	19.59	PK	Horizontal
5	500.109	36.53	29.57	-6.96	46.00	16.43	PK	Horizontal
6	933.063	30.27	29.10	-1.17	46.00	16.90	PK	Horizontal

Remark:

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

Above 1GHz:

Test channel: Lowest channel						
Detector: Peak Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polarization
4804.00	56.71	-9.60	47.11	74.00	26.89	Vertical
4804.00	56.72	-9.60	47.12	74.00	26.88	Horizontal
Detector: Average Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polarization
4804.00	48.92	-9.60	39.32	54.00	14.68	Vertical
4804.00	48.81	-9.60	39.21	54.00	14.79	Horizontal
Test channel: Middle channel						
Detector: Peak Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polarization
4882.00	56.71	-9.05	47.66	74.00	26.34	Vertical
4882.00	56.84	-9.05	47.79	74.00	26.21	Horizontal
Detector: Average Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polarization
4882.00	48.89	-9.05	39.84	54.00	14.16	Vertical
4882.00	49.17	-9.05	40.12	54.00	13.88	Horizontal
Test channel: Highest channel						
Detector: Peak Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polarization
4960.00	56.53	-8.45	48.08	74.00	25.92	Vertical
4960.00	56.57	-8.45	48.12	74.00	25.88	Horizontal
Detector: Average Value						
Frequency (MHz)	Read Level (dBuV)	Factor(dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polarization
4960.00	48.41	-8.45	39.96	54.00	14.04	Vertical
4960.00	49.09	-8.45	40.64	54.00	13.36	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.						

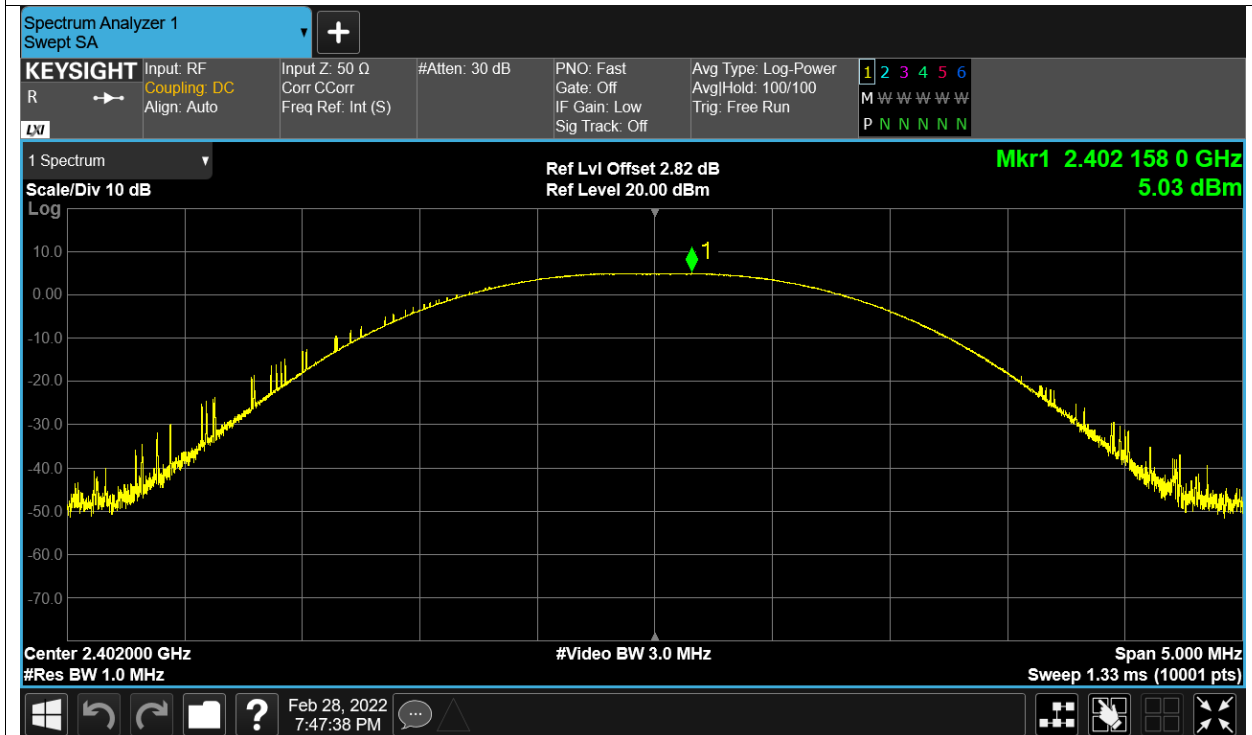
Appendix - BT

Maximum Conducted Output Power

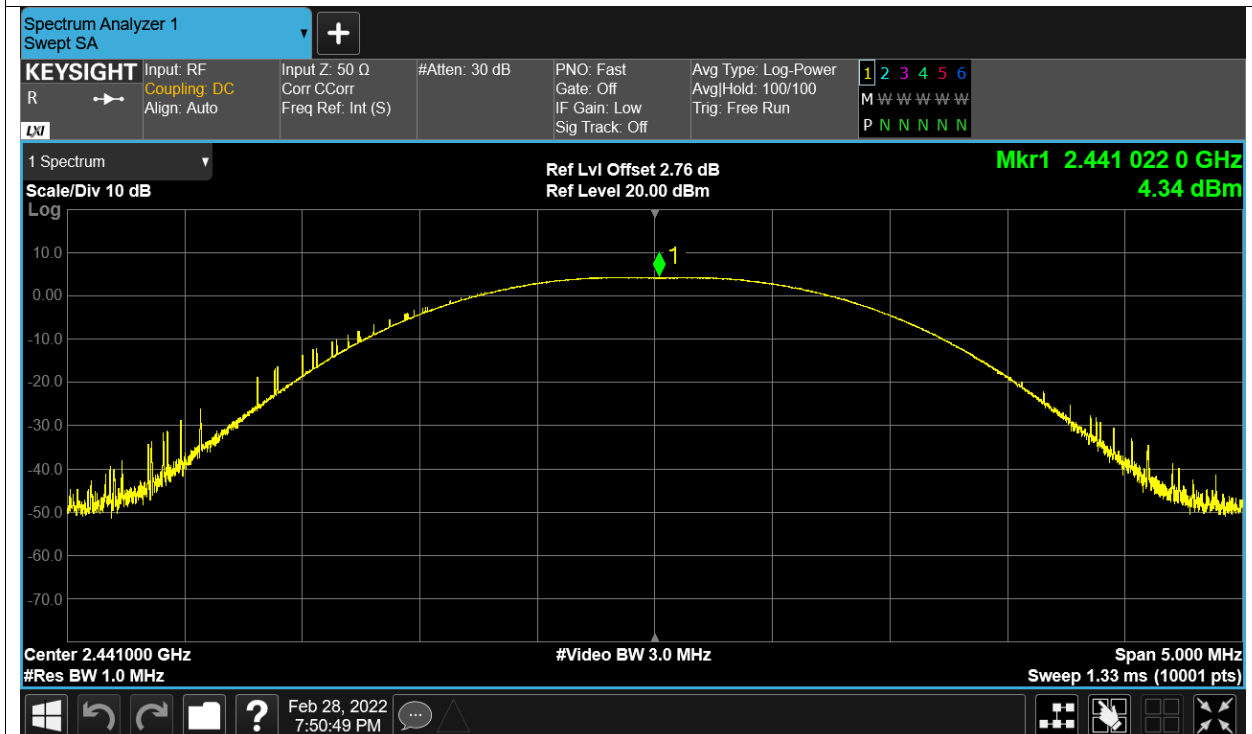
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH1	2402	Ant1	5.033	0	5.033	30	Pass
NVNT	1-DH1	2441	Ant1	4.343	0	4.343	30	Pass
NVNT	1-DH1	2480	Ant1	4.33	0	4.33	30	Pass
NVNT	2-DH1	2402	Ant1	7.374	0	7.374	21	Pass
NVNT	2-DH1	2441	Ant1	5.918	0	5.918	21	Pass
NVNT	2-DH1	2480	Ant1	6.04	0	6.04	21	Pass
NVNT	3-DH1	2402	Ant1	8.108	0	8.108	21	Pass
NVNT	3-DH1	2441	Ant1	6.628	0	6.628	21	Pass
NVNT	3-DH1	2480	Ant1	6.634	0	6.634	21	Pass

Test Graphs

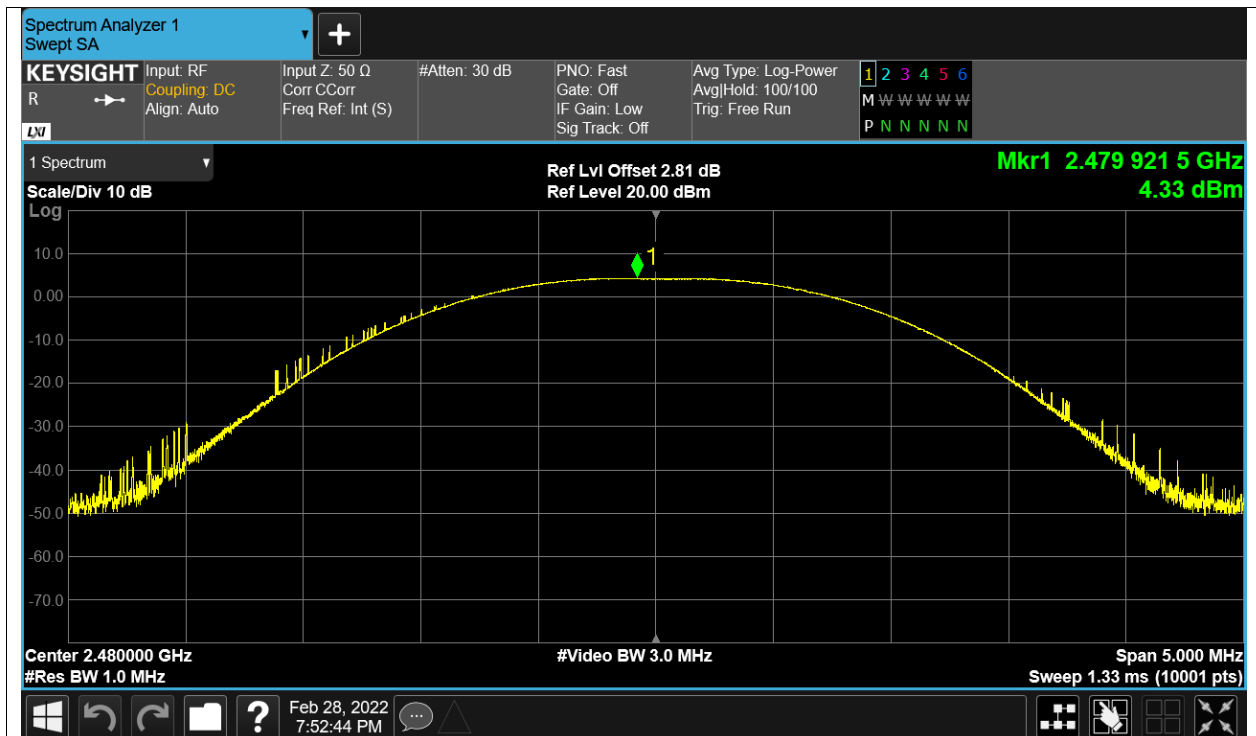
Power NVNT 1-DH1 2402MHz Ant1



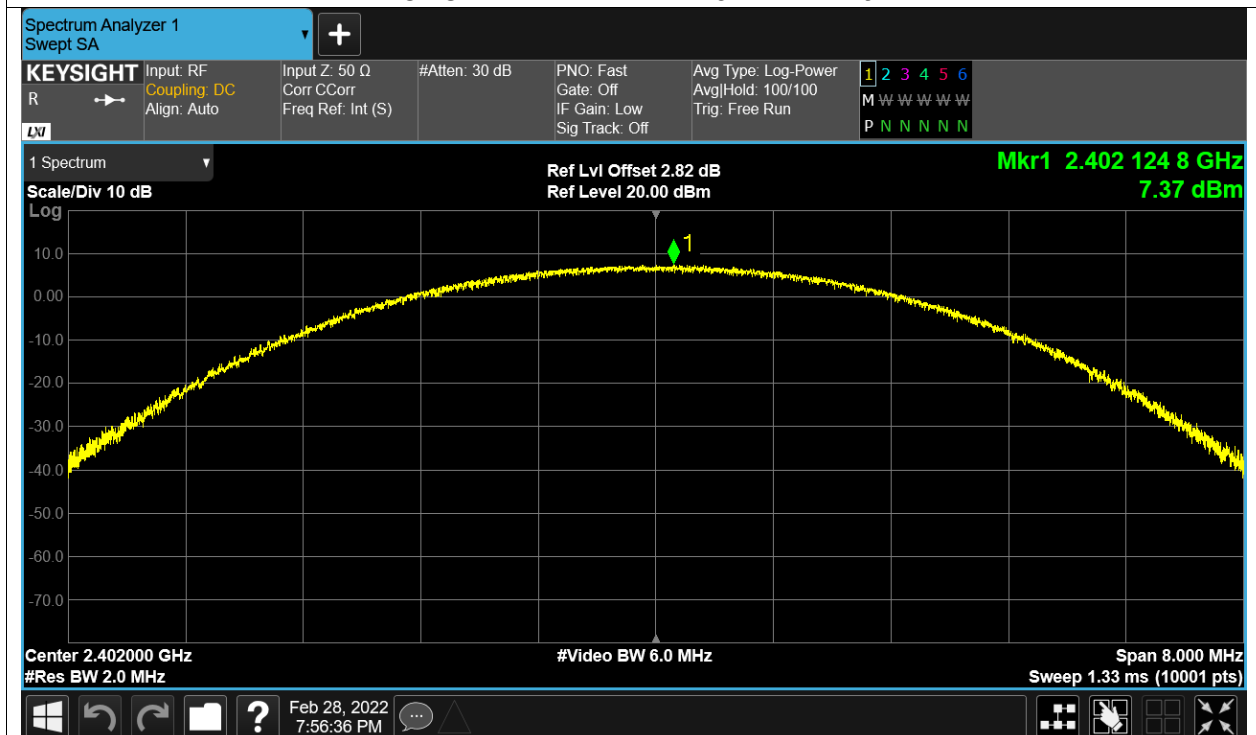
Power NVNT 1-DH1 2441MHz Ant1



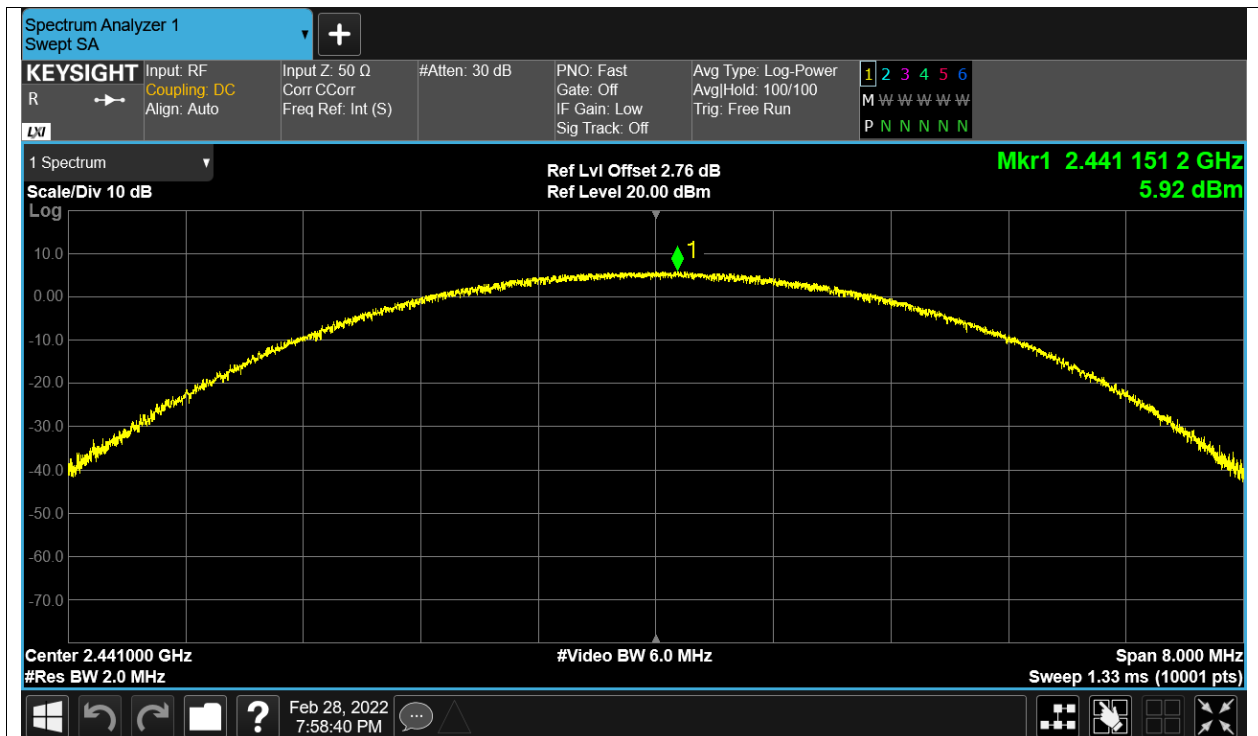
Power NVNT 1-DH1 2480MHz Ant1



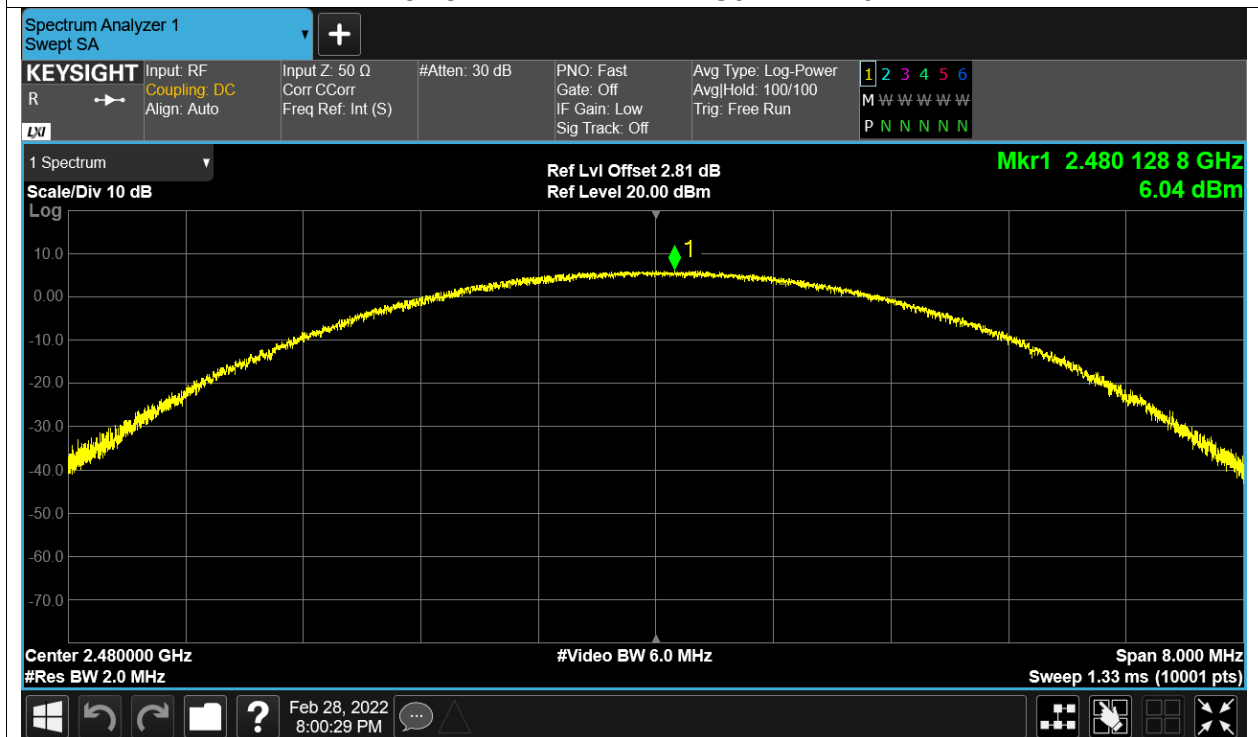
Power NVNT 2-DH1 2402MHz Ant1



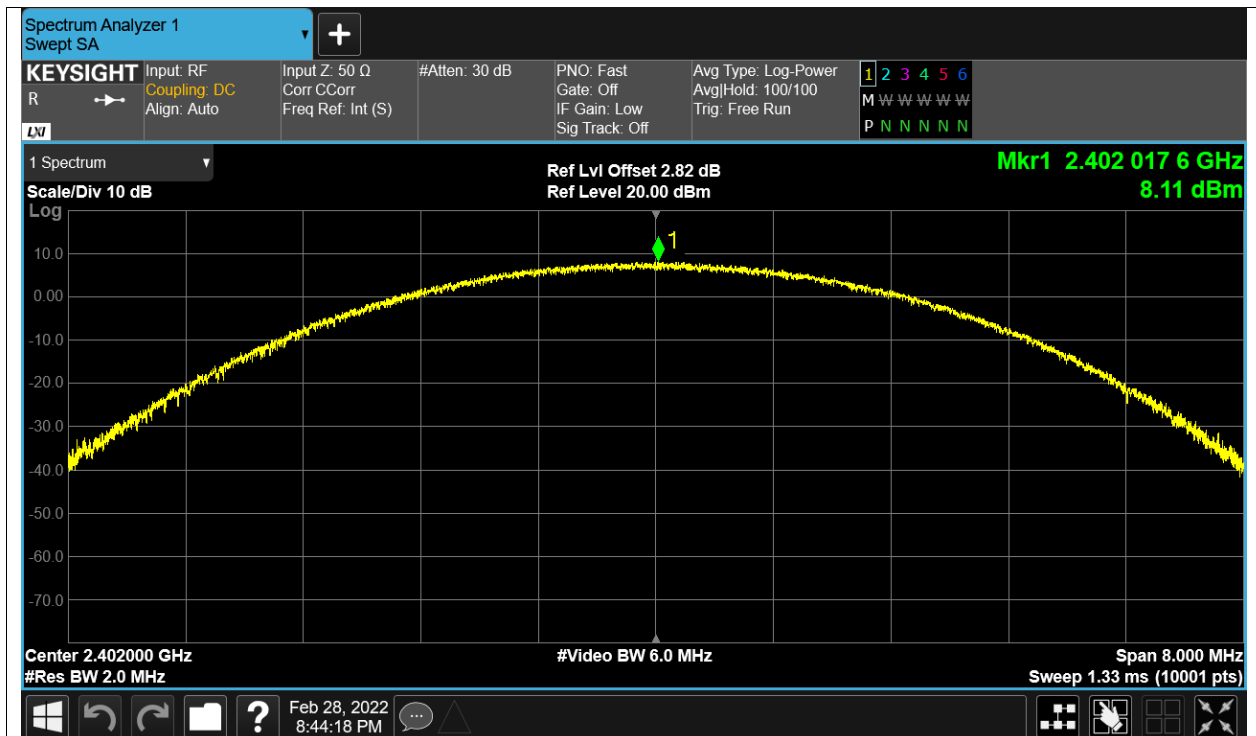
Power NVNT 2-DH1 2441MHz Ant1



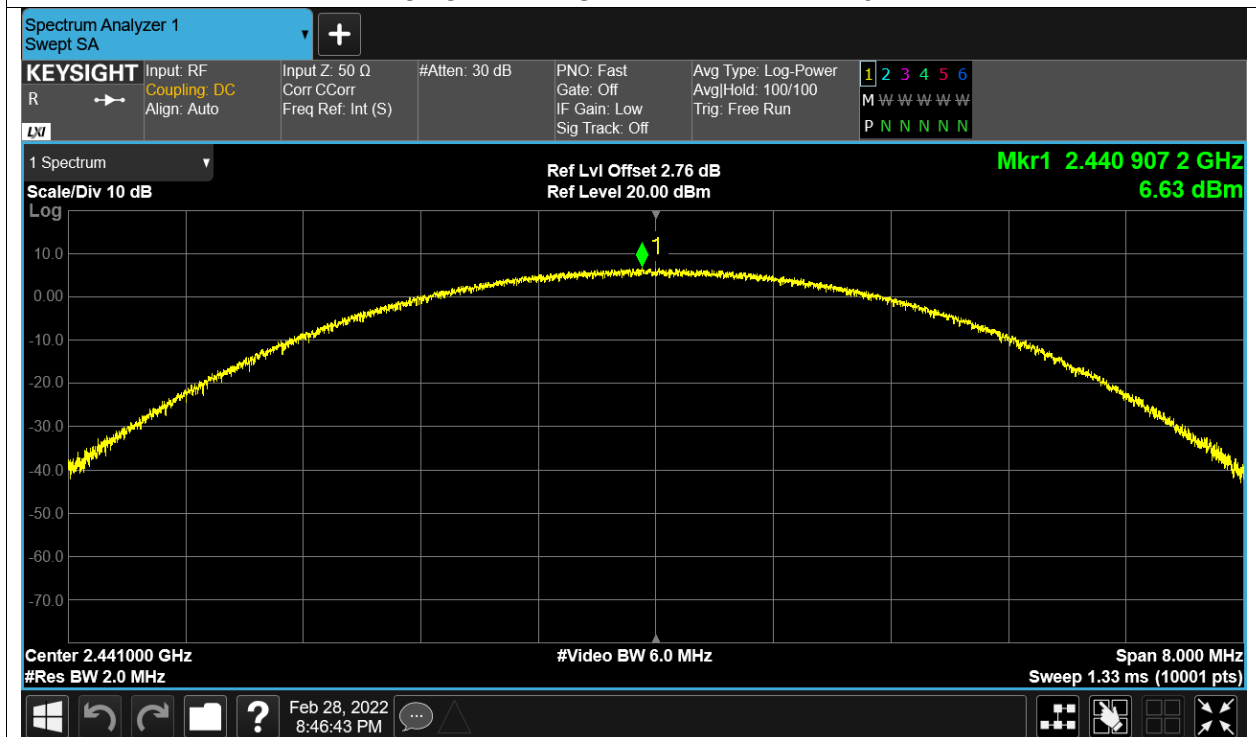
Power NVNT 2-DH1 2480MHz Ant1



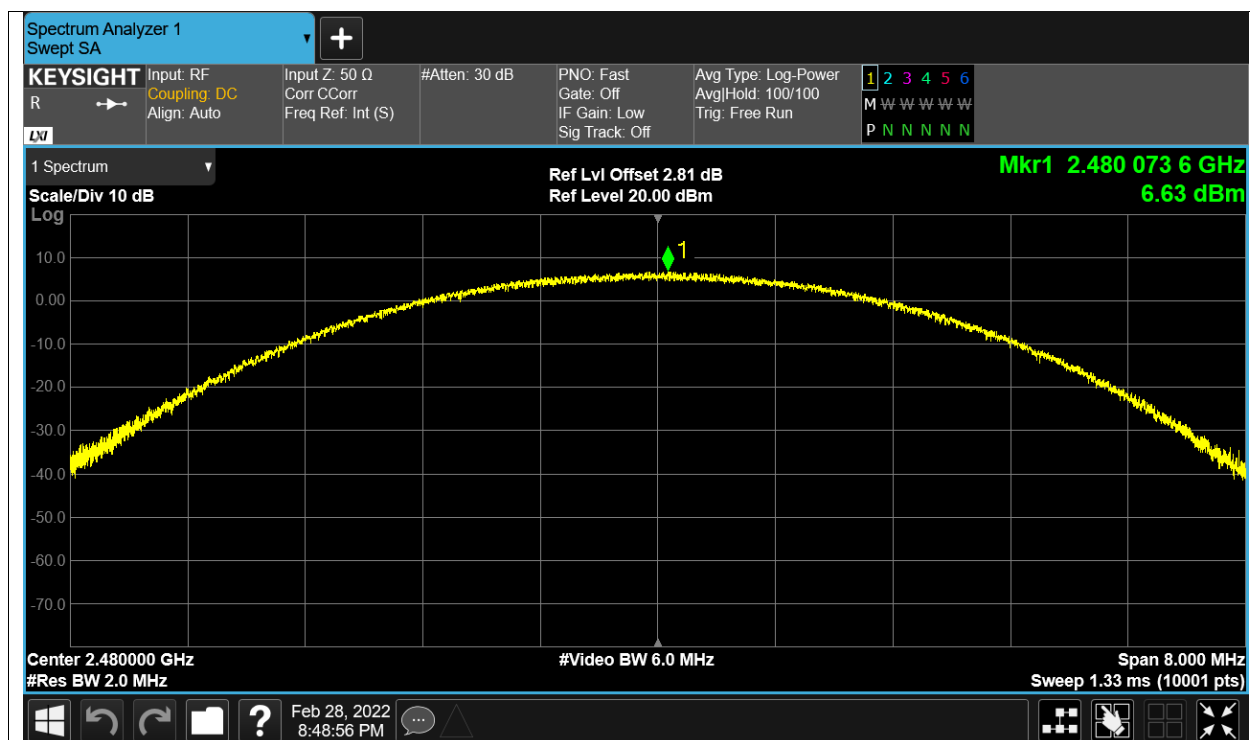
Power NVNT 3-DH1 2402MHz Ant1



Power NVNT 3-DH1 2441MHz Ant1



Power NVNT 3-DH1 2480MHz Ant1

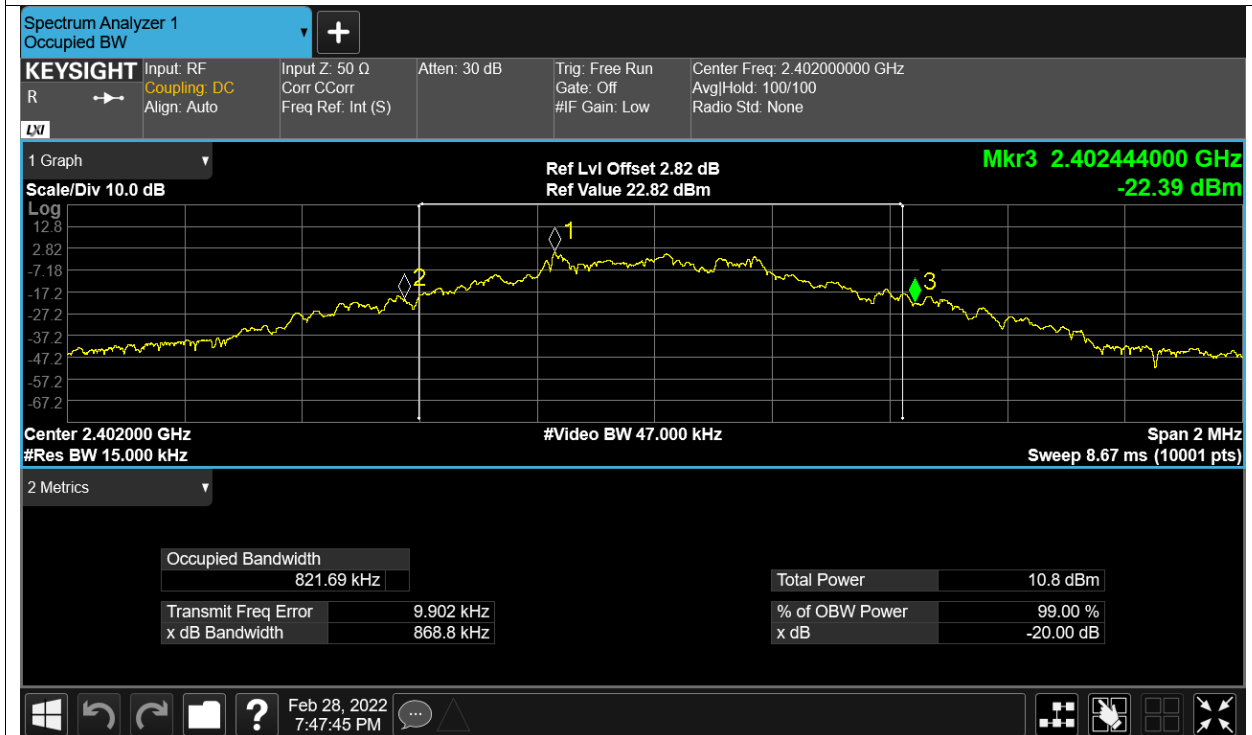


-20dB Bandwidth

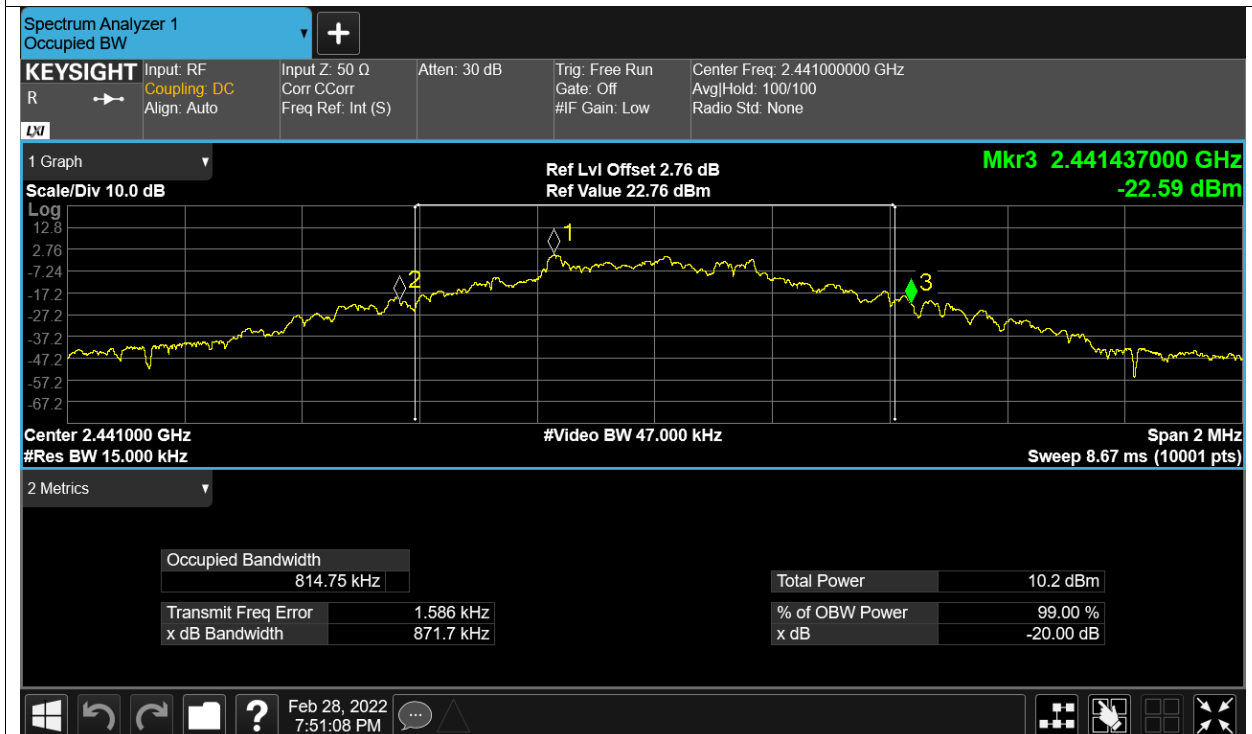
Condition	Mode	Frequency (MHz)	Antenna	-20 dB Bandwidth (MHz)	Limit -20 dB Bandwidth (MHz)	Verdict
NVNT	1-DH1	2402	Ant1	0.869	0	Pass
NVNT	1-DH1	2441	Ant1	0.872	0	Pass
NVNT	1-DH1	2480	Ant1	0.916	0	Pass
NVNT	2-DH1	2402	Ant1	1.251	0	Pass
NVNT	2-DH1	2441	Ant1	1.256	0	Pass
NVNT	2-DH1	2480	Ant1	1.272	0	Pass
NVNT	3-DH1	2402	Ant1	1.22	0	Pass
NVNT	3-DH1	2441	Ant1	1.226	0	Pass
NVNT	3-DH1	2480	Ant1	1.225	0	Pass

Test Graphs

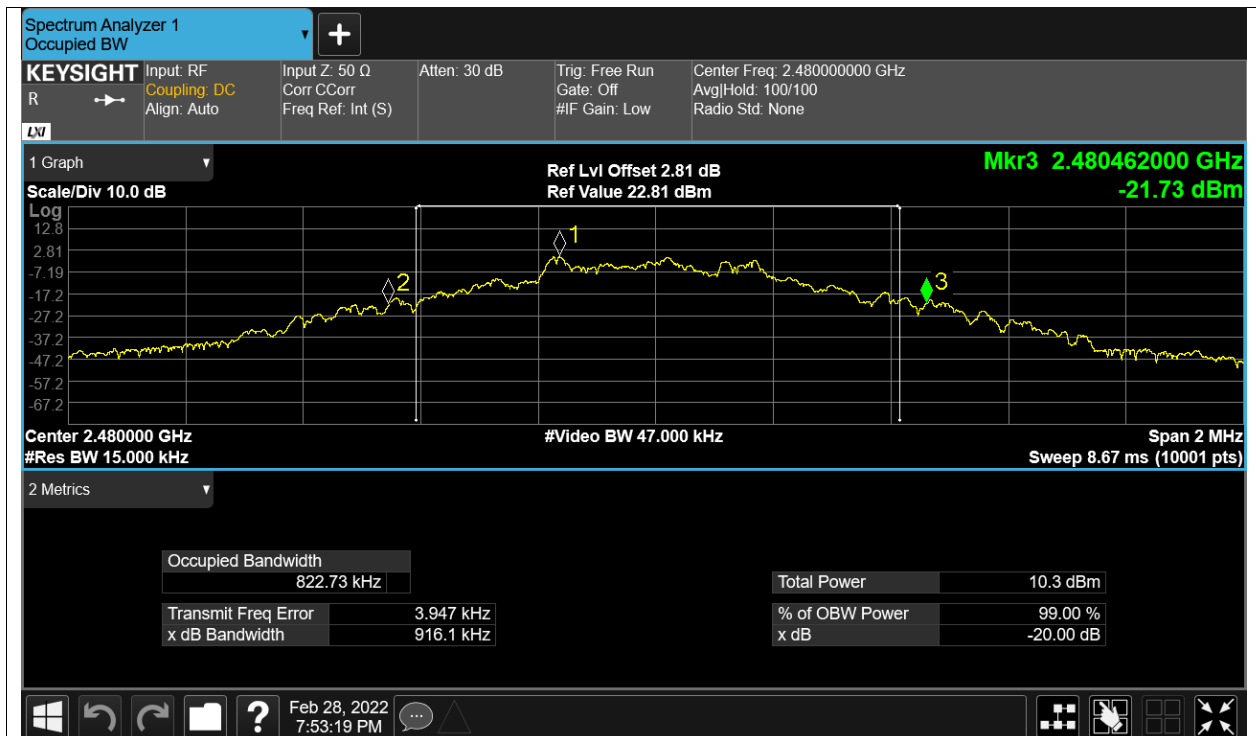
-20dB Bandwidth NVNT 1-DH1 2402MHz Ant1



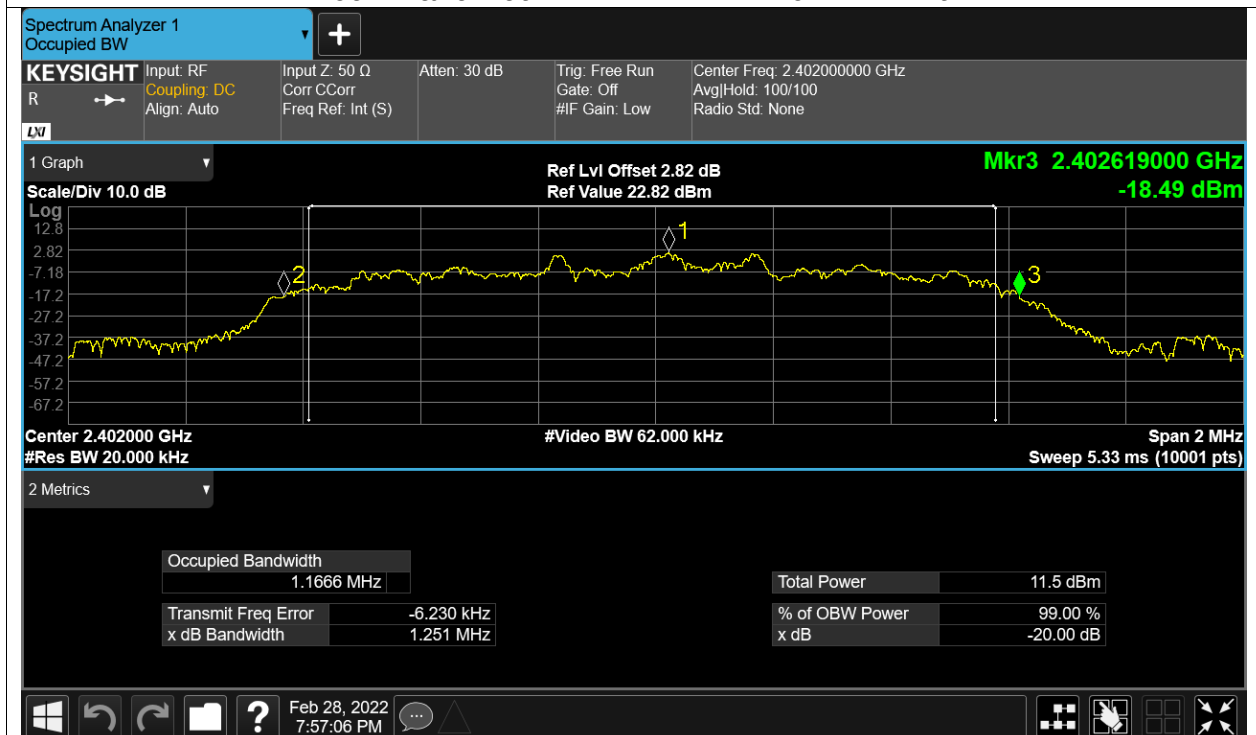
-20dB Bandwidth NVNT 1-DH1 2441MHz Ant1



-20dB Bandwidth NVNT 1-DH1 2480MHz Ant1



-20dB Bandwidth NVNT 2-DH1 2402MHz Ant1



-20dB Bandwidth NVNT 2-DH1 2441MHz Ant1