

TEST REPORT

Product Name : 4K AndroidTV Set Top Box
Brand Mark : Claro
Model No. : DV8935
FCC ID : 2AW68-C8935
Report Number : BLA-EMC-202209-A5503
Date of Sample Receipt : 2022/9/23
Date of Test : 2022/10/16 to 2022/11/14
Date of Issue : 2022/11/30
Test Standard : 47 CFR Part 15, Subpart C 15.247
ANSI C63.10-2013
Test Result : Pass

Prepared for:

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Date:

2022/11/30



REPORT REVISE RECORD

Version No.	Date	Description
00	2022/11/30	Original

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1 TEST summary

Test item	Test Requirement	Test Method	Class/Severity	Result
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10-2013 Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
Conducted Band Edges Measurement	47 CFR Part 15, Subpart C 15.247	ANSI C63.10-2013 Section 7.8.8 & Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass
Radiated Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10-2013 Section 6.4,6.5,6.6	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass
Antenna Requirement	47 CFR Part 15, Subpart C 15.247	N/A	47 CFR Part 15, Subpart C 15.203 & 15.247(c)	Pass
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart C 15.247	ANSI C63.10-2013 Section 6.10.5	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass
Conducted Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10-2013 Section 7.8.6 & Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass
Power Spectrum Density	47 CFR Part 15, Subpart C 15.247	ANSI C63.10-2013 Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass
Conducted Peak Output Power	47 CFR Part 15, Subpart C 15.247	ANSI C63.10-2013 Section 7.8.5	47 CFR Part 15, Subpart C 15.247(b)(3)	Pass
Minimum 6dB Bandwidth	47 CFR Part 15, Subpart C 15.247	ANSI C63.10-2013 Section 11.8.1	47 CFR Part 15, Subpart C 15.247a(2)	Pass

2 General information

Applicant	Shenzhen SDMC Technology Co.,Ltd.
Address	Room 1022, Floor 10, Building A, Customs Building, No. 2, Xin'an 3rd Road, Dalang Community, Xin'an Street, Bao'an District, Shenzhen,
Manufacturer	Shenzhen SDMC Technology Co.,Ltd.
Address	Room 1022, Floor 10, Building A, Customs Building, No. 2, Xin'an 3rd Road, Dalang Community, Xin'an Street, Bao'an District, Shenzhen,
Product Name	4K AndroidTV Set Top Box
Test Model No.	DV8935

3 General description of E.U.T.

Hardware Version	V1	
Software Version	Android 10	
Operation Frequency:	2402MHz-2480MHz	
Modulation Type:	GFSK	
Data Rate	1Mbps; 2Mbps	
Channel Spacing:	2MHz	
Number of Channels:	40	
Antenna Type:	PCB Antenna	
Antenna Gain:	1.7dBi (Provided by antenna specification)	
EUT accessories:	High speed HDMI cable with Ethernet	Cable length ,1.8m
	Wireless remote control	WH191209B/ROH
	AC adapter 1#	Model: DCT12W120100US-A0 Input: 100-240V~50/60Hz 0.3A,Output: 12V=1A
	AC adapter 2#	Model: TPQ-368D120100UW01 Input: 100-240V~50/60Hz 0.4A,Output: 12V=1A

4 Test environment

Environment	Temperature	Voltage
Normal	25°C	DC 12V

5 Test mode

TEST MODE	TEST MODE DESCRIPTION
TX	Keep the EUT in transmitting mode
Remark: only the data of the worst mode would be recorded in this report. For Radiated emission, 1Mbps and 2Mbps mode all have been tested, only worse case 1Mbps mode is reported.	

6 MEASUREMENT UNCERTAINTY

Parameter	Expanded Uncertainty (Confidence of 95%)
Radiated Emission(9kHz-30MHz)	±4.34dB
Radiated Emission(30Mz-1000MHz)	±4.24dB
Radiated Emission(1GHz-18GHz)	±4.68dB
AC Power Line Conducted Emission(150kHz-30MHz)	±3.45dB

7 Description of SUPPORT unit

Device Type	Manufacturer	Model Name	Serial No.	Remark
PC	HASEE	K610D	N/A	N/A
U Disk	laboratory	N/A	N/A	N/A
Fiber optic cable	laboratory	N/A	N/A	N/A
TF Card	laboratory	N/A	N/A	N/A
Loudspeaker	laboratory	N/A	N/A	N/A

8 Laboratory Location

All tests were performed at:
BlueAsia Technical Services(Shenzhen) Co., Ltd.
No.41, South of Beihuan Road, Shangwu Community, Shiyan Subdistrict, Bao'an District,
Shenzhen,Guangdong ,China
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673
No tests were sub-contracted.

9 Test instruments list

Test Equipment Of Radiated Spurious Emissions					
Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Chamber 1	SKET	966	N/A	2020/11/10	2023/11/9
Chamber 2	SKET	966	N/A	2021/07/20	2024/07/19
Spectrum	R&S	FSP40	100817	2022/09/15	2023/09/14
Receiver	R&S	ESR7	101199	2022/09/15	2023/09/14
Receiver	R&S	ESPI7	101477	2022/07/16	2023/07/15
broadband Antenna	Schwarzbeck	VULB9168	00836 P:00227	2022/09/15	2023/09/14
Horn Antenna	Schwarzbeck	BBHA9120D	01892 P:00331	2022/09/13	2025/09/12
Amplifier	SKET	LNPA_30M01G-30	SK2021060801	2022/07/16	2023/07/15
Amplifier	SKET	PA-000318G-45	N/A	2022/09/13	2023/09/12
Amplifier	SKET	LNPA_18G40G-50	SK2022071301	2022/07/14	2023/07/13
Filter group	SKET	2.4G/5G Filter group r	N/A	2022/07/16	2023/07/15
EMI software	EZ	EZ-EMC	EEMC-3A1	N/A	N/A
Loop antenna	SCHNARZBECK	FMZB1519B	00102	2022/9/14	2025/9/13
Controller	SKET	N/A	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-02	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-03	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-01	N/A	N/A	N/A

Test Equipment Of Conducted Emissions at AC Power Line (150kHz-30MHz)					
Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Shield room	SKET	833	N/A	2020/11/25	2023/11/24
Receiver	R&S	ESPI3	101082	2022/09/14	2023/09/13
LISN	R&S	ENV216	3560.6550.15	2022/09/14	2023/09/13
LISN	AT	AT166-2	AKK1806000003	2022/09/14	2023/09/13
ISN	TESEQ	ISNT8-cat6	53580	2022/09/14	2023/09/13
Single-channel vehicle artificial power network	Schwarzbeck	NNBM 8124	01045	2022/08/17	2023/08/16
Single-channel vehicle artificial power network	Schwarzbeck	NNBM 8124	01075	2022/08/17	2023/08/16
EMI software	EZ	EZ-EMC	EEMC-3A1	N/A	N/A

Test Equipment Of RF Conducted Test					
Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Spectrum	R&S	FSP40	100817	2022/09/15	2023/09/14
Spectrum	Agilent	N9020A	MY49100060	2022/09/07	2023/09/06
Spectrum	KEYSIGHT	N9030A	MY52350152	2022/07/01	2023/06/30
Spectrum	KEYSIGHT	N9010A	MY54330814	2022/07/01	2023/06/30
Signal Generator	Agilent	N5182A	MY47420955	2022/09/07	2023/09/06
Signal Generator	Agilent	E8257D	MY44320250	2022/07/01	2023/06/30
Signal Generator	Agilent	N5181A	MY46240904	2022/08/02	2023/08/01
Signal Generator	R&S	CMW500	132429	2022/09/07	2023/09/06
BluetoothTester	Anritsu	MT8852B	06262047872	2022/09/07	2023/09/06
Power probe	DARE	RPR3006W	14I00889SN042	2022/09/07	2023/09/06
DCPowersupply	zhaoxin	KXN-305D	20K305D1221363	2022/09/14	2023/09/13
DCPowersupply	zhaoxin	RXN-1505D	19R1505D050168	2022/09/14	2023/09/13
2.4GHz/5GHz RF Test software	MTS	MTS 8310	Version 2.0.0.0	N/A	N/A

10 Conducted Emissions at AC Power Line (150kHz-30MHz)

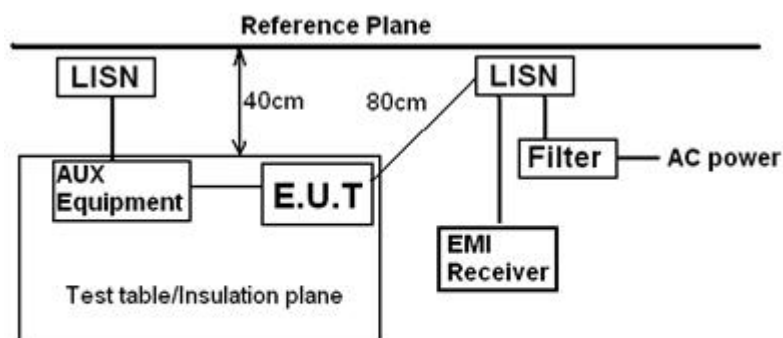
Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10-2013 Section 6.2
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Charlie
Temperature	25°C
Humidity	60%

10.1 LIMITS

Frequency of emission(MHz)	Conducted limit(dB μ V)	
	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.

10.2 BLOCK DIAGRAM OF TEST SETUP



Remark:
E.U.T: Equipment Under Test
LISN: Line Impedance Stabilization Network
Test table height=0.8m

10.3 PROCEDURE

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50H + 5ohm linear impedance. The power cables of all other units of the EUT

were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.

3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,

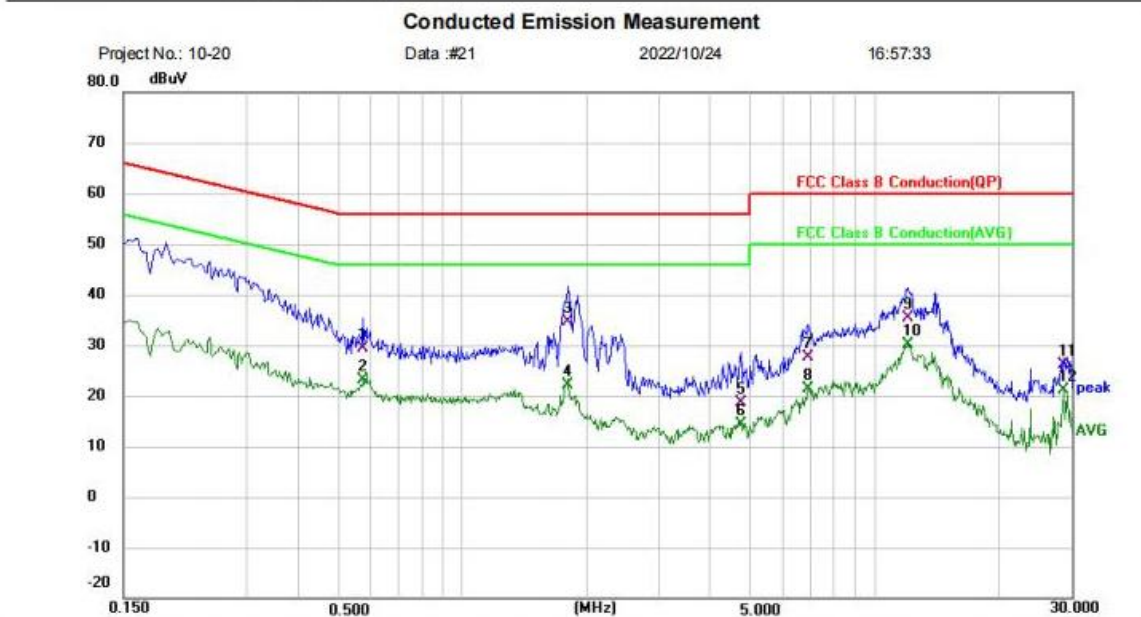
4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.

5) 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.

Remark: $LISN = Read\ Level + Cable\ Loss + LISN\ Factor$

10.4 TEST Data

[TestMode: TX]; [Line: Nutral];[Power:AC120V/60Hz]



Site: Phase: **N** Temperature: (C)

Limit: FCC Class B Conduction(QP) Power: Humidity: %RH

EUT: 4K AndroidTV Set Top Box

M/N: DV8935

Mode: BLE TX mode

Note:

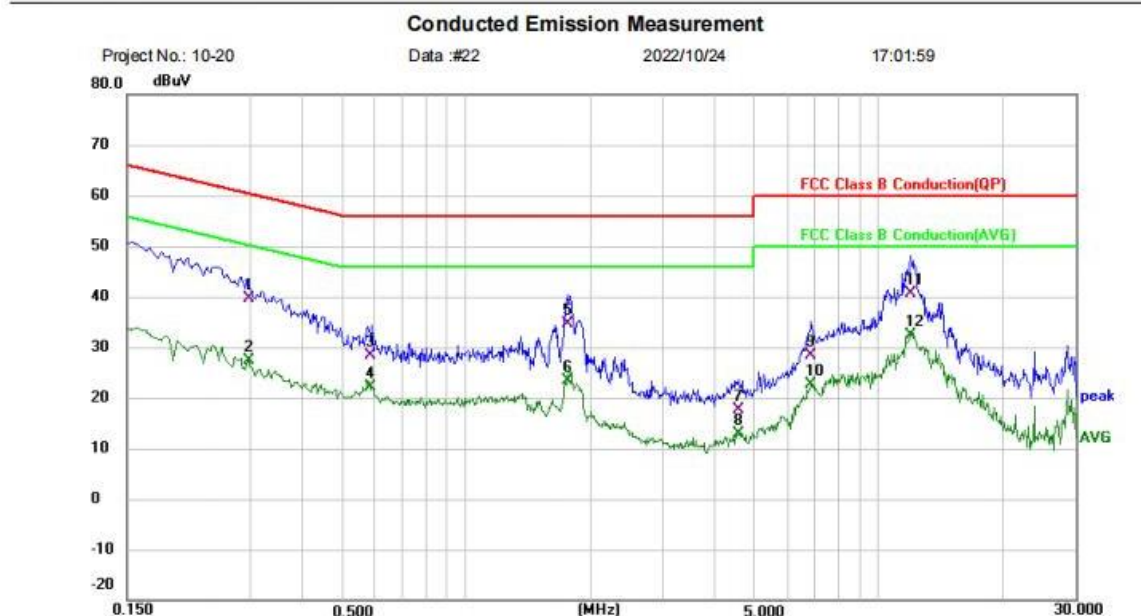
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.5740	19.25	10.04	29.29	56.00	-26.71	QP	
2		0.5740	13.02	10.04	23.06	46.00	-22.94	AVG	
3		1.8020	24.62	10.09	34.71	56.00	-21.29	QP	
4		1.8020	12.06	10.09	22.15	46.00	-23.85	AVG	
5		4.7460	8.73	9.84	18.57	56.00	-37.43	QP	
6		4.7460	4.43	9.84	14.27	46.00	-31.73	AVG	
7		6.8860	17.65	9.87	27.52	60.00	-32.48	QP	
8		6.8860	11.42	9.87	21.29	50.00	-28.71	AVG	
9		12.0060	25.29	10.00	35.29	60.00	-24.71	QP	
10	*	12.0060	20.13	10.00	30.13	50.00	-19.87	AVG	
11		28.6860	16.10	9.96	26.06	60.00	-33.94	QP	
12		28.6860	11.07	9.96	21.03	50.00	-28.97	AVG	

*:Maximum data x:Over limit !:over margin

(Reference Only)

Test Result: Pass

[TestMode: TX]; [Line: Line];[Power:AC120V/60Hz]



Site: Phase: **L1** Temperature: (C)

Limit: FCC Class B Conduction(QP) Power: Humidity: %RH

EUT: 4K AndroidTV Set Top Box

M/N: DV8935

Mode: BLE TX mode

Note:

No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.2940	29.52	10.07	39.59	60.41	-20.82	QP	
2	0.2940	17.37	10.07	27.44	50.41	-22.97	AVG	
3	0.5899	18.42	10.08	28.50	56.00	-27.50	QP	
4	0.5899	12.15	10.08	22.23	46.00	-23.77	AVG	
5	1.7580	24.48	10.26	34.74	56.00	-21.26	QP	
6	1.7580	13.04	10.26	23.30	46.00	-22.70	AVG	
7	4.5540	7.50	10.05	17.55	56.00	-38.45	QP	
8	4.5540	2.83	10.05	12.88	46.00	-33.12	AVG	
9	6.8620	18.37	10.07	28.44	60.00	-31.56	QP	
10	6.8620	12.55	10.07	22.62	50.00	-27.38	AVG	
11	11.9700	30.65	10.08	40.73	60.00	-19.27	QP	
12 *	11.9700	22.39	10.08	32.47	50.00	-17.53	AVG	

*:Maximum data x:Over limit !:over margin

(Reference Only)

Test Result: Pass

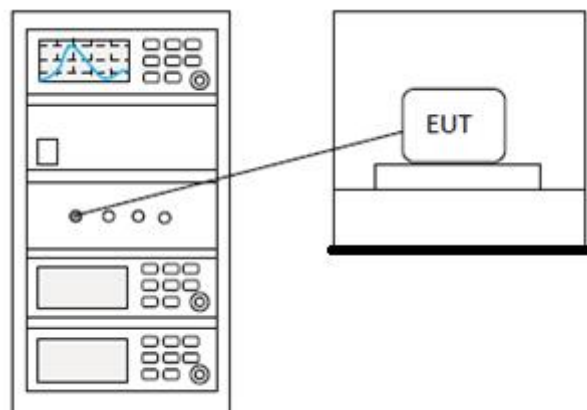
11 Conducted Band Edges Measurement

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10-2013 Section 7.8.8 & Section 11.13.3.2
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Charlie
Temperature	25°C
Humidity	60%

11.1 LIMITS

Limit:	<p>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)).</p>
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11.2 BLOCK DIAGRAM OF TEST SETUP



11.3 TEST Data

Pass: Please Refer To Appendix: Appendix 1 For Details

12 Radiated Spurious Emissions

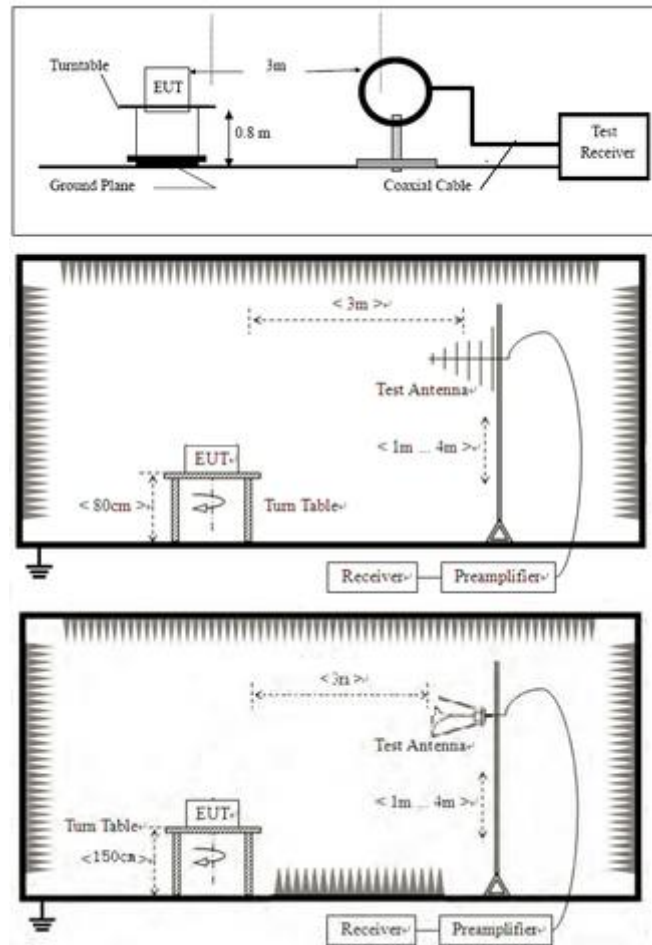
Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10-2013 Section 6.4,6.5,6.6
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Charlie
Temperature	25℃
Humidity	60%

12.1 LIMITS

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

12.2 BLOCK DIAGRAM OF TEST SETUP



12.3 PROCEDURE

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 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.
- 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB 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 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

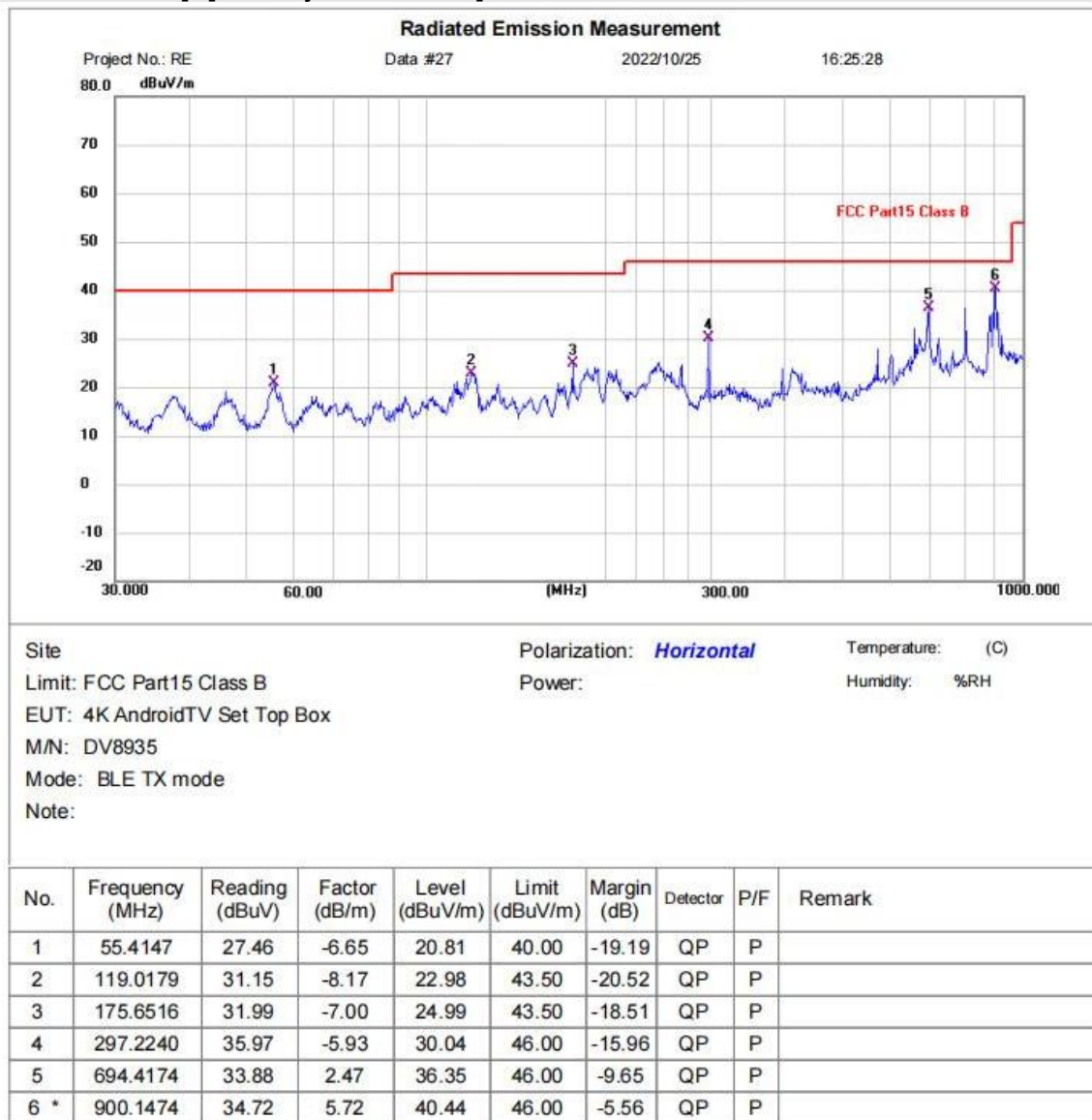
Remark:

- 1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor
- 3) Scan from 9kHz to 25GHz, the disturbance above 18GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. Fundamental frequency is blocked by filter, and only spurious emission is shown.
- 4) For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

12.4 TEST Data

Below 1GHz

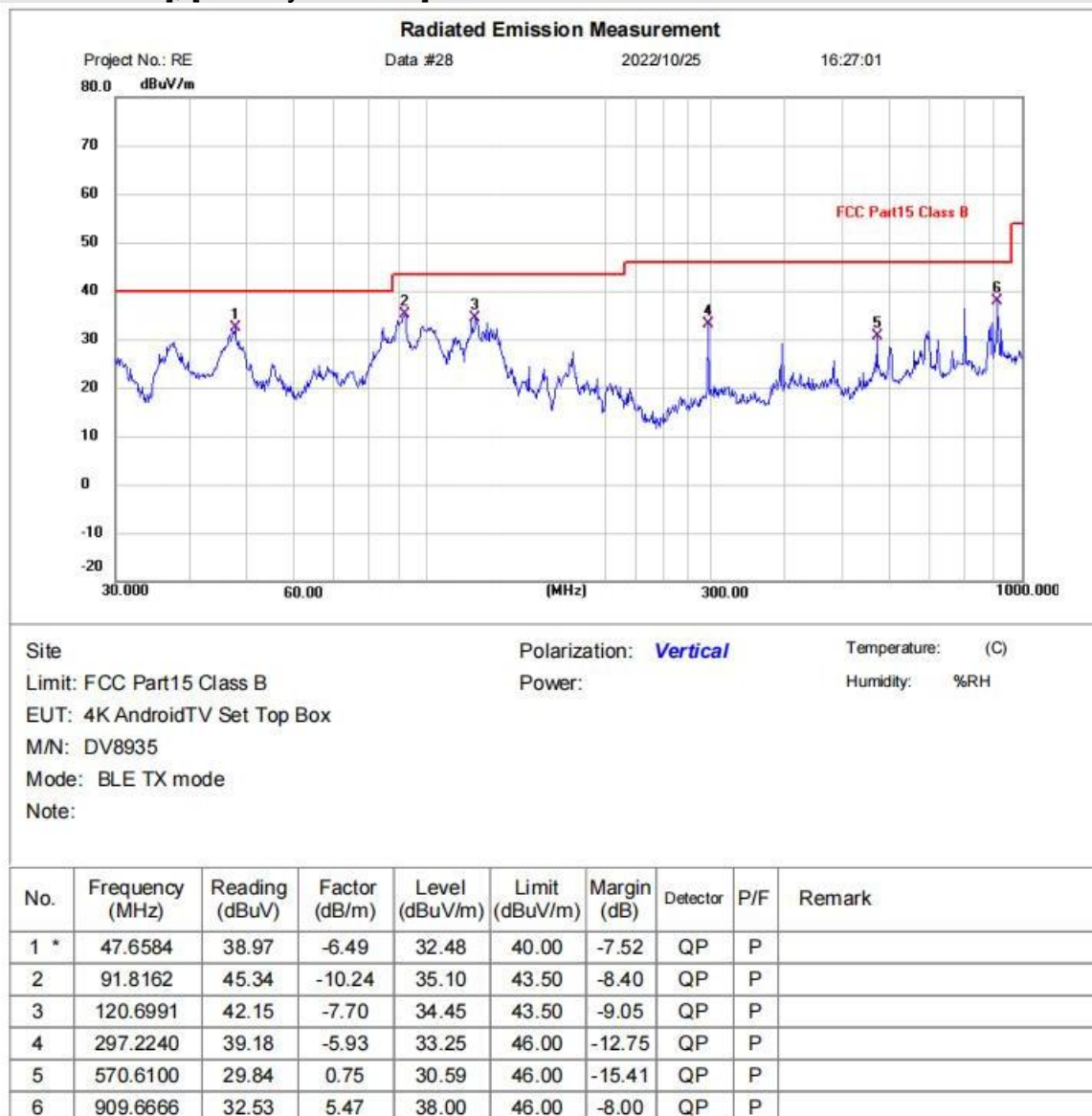
[TestMode: TX]; [Polarity: Horizontal]



*:Maximum data x:Over limit !:over margin

Test Result: Pass

[TestMode: TX]; [Polarity: Vertical]



*:Maximum data x:Over limit !:over margin

Test Result: Pass

[TestMode: TX low channel]; [Polarity: Horizontal]

Radiated Emission Measurement

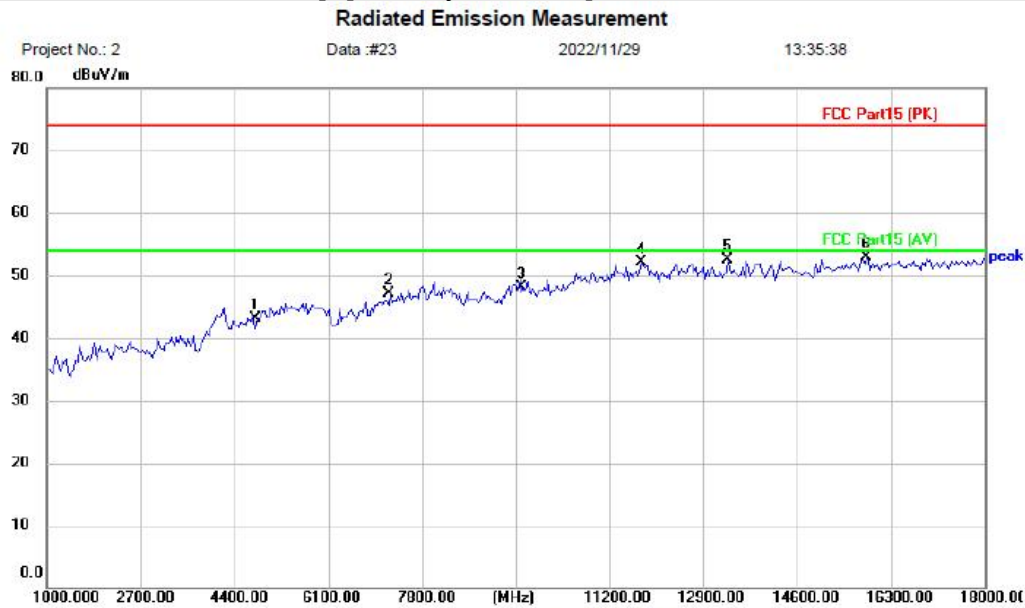


Site: Polarization: **Horizontal** Temperature: (C)
Limit: FCC Part15 (PK) Power: Humidity: %RH
EUT: 4K AndroidTV Set Top Box
M/N: DV8935
Mode: BT-TX-L
Note:

No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	4804.000	38.55	4.05	42.60	74.00	-31.40	peak	
2	7206.000	38.15	7.93	46.08	74.00	-27.92	peak	
3	9608.000	37.29	10.90	48.19	74.00	-25.81	peak	
4 *	11336.000	39.03	13.60	52.63	74.00	-21.37	peak	
5	14090.000	35.68	15.45	51.13	74.00	-22.87	peak	
6	15960.000	37.20	15.43	52.63	74.00	-21.37	peak	

Test Result: Pass

[TestMode: TX low channel]; [Polarity: Vertical]

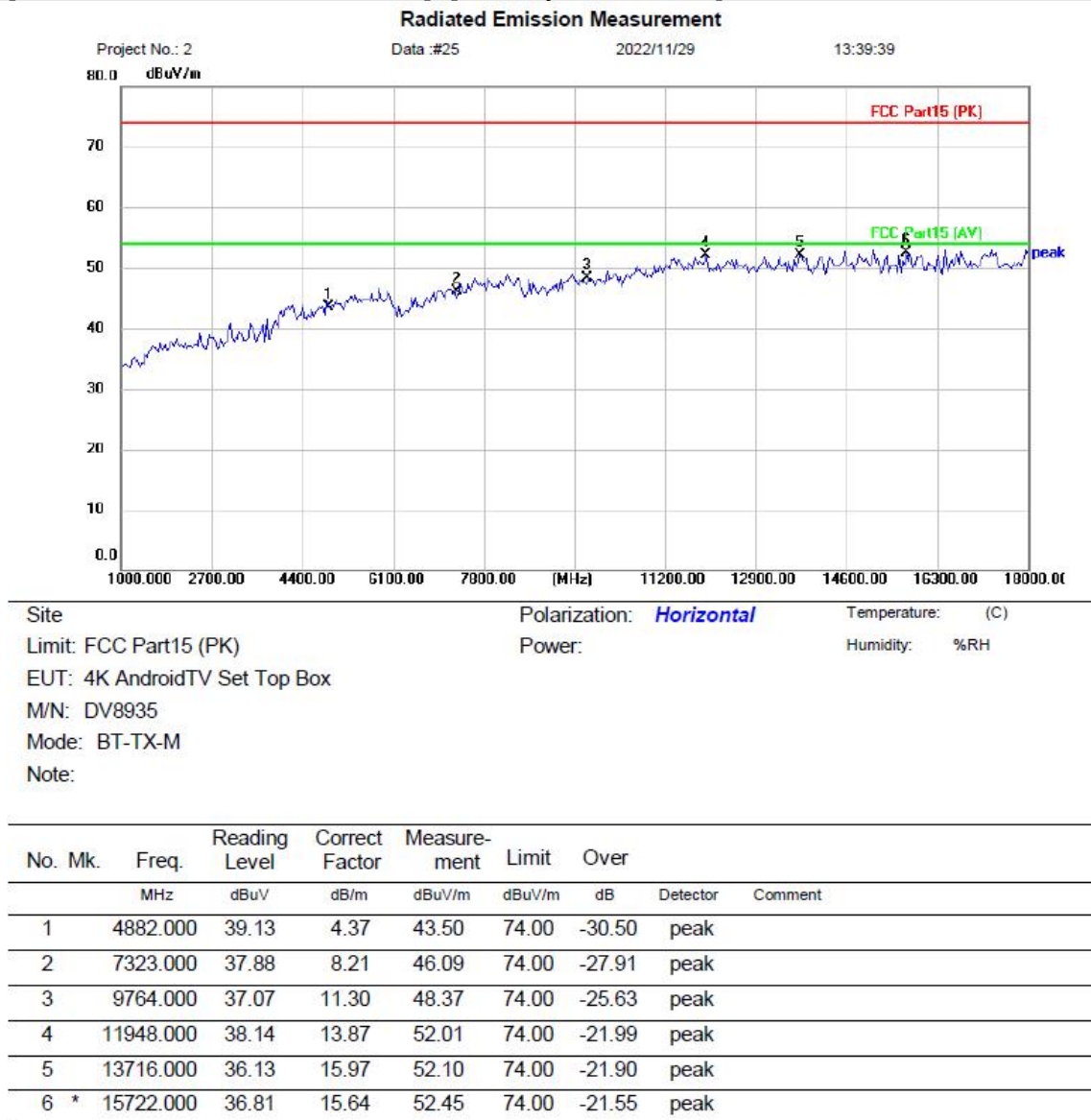


Site: Polarization: **Vertical** Temperature: (C)
Limit: FCC Part15 (PK) Power: Humidity: %RH
EUT: 4K AndroidTV Set Top Box
M/N: DV8935
Mode: BT-TX-L
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1		4804.000	38.97	4.05	43.02	74.00	-30.98	peak	
2		7206.000	39.24	7.93	47.17	74.00	-26.83	peak	
3		9608.000	37.12	10.90	48.02	74.00	-25.98	peak	
4		11778.000	38.25	13.80	52.05	74.00	-21.95	peak	
5		13342.000	34.80	17.77	52.57	74.00	-21.43	peak	
6	*	15858.000	37.46	15.52	52.98	74.00	-21.02	peak	

Test Result: Pass

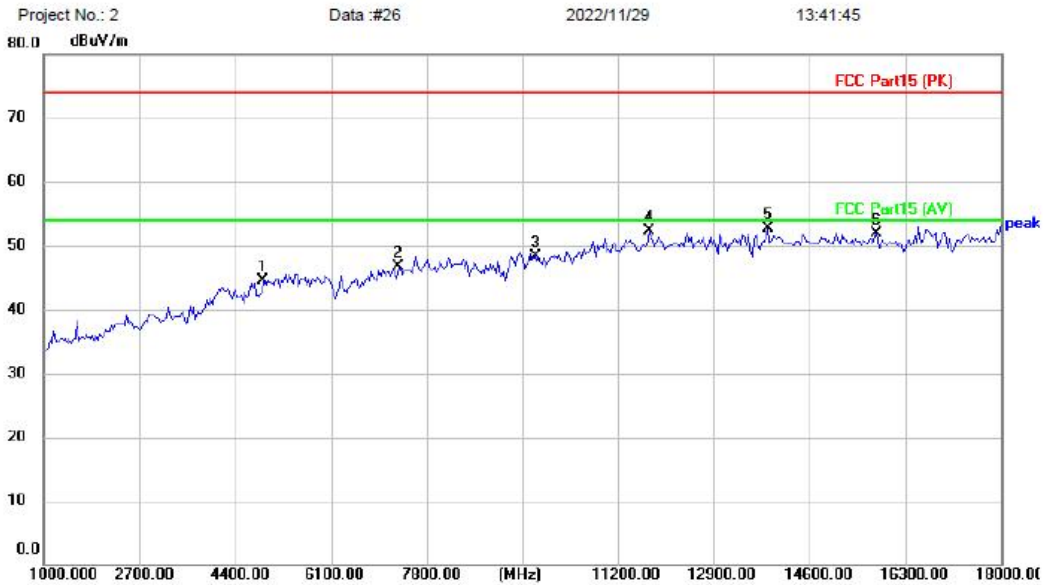
[TestMode: TX middle channel]; [Polarity: Horizontal]



Test Result: Pass

[TestMode: TX middle channel]; [Polarity: Vertical]

Radiated Emission Measurement

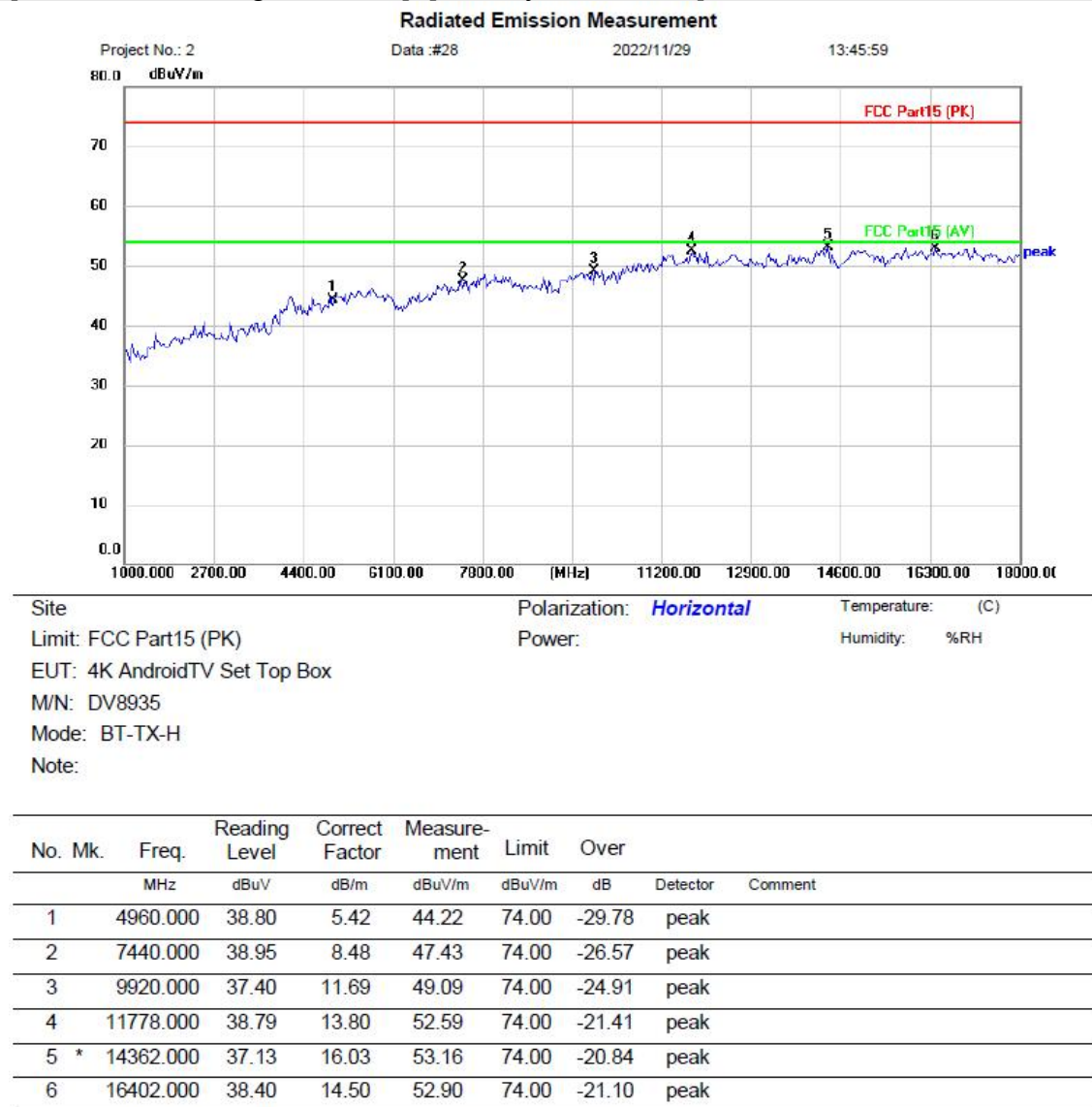


Site: Polarization: **Vertical** Temperature: (C)
Limit: FCC Part15 (PK) Power: Humidity: %RH
EUT: 4K AndroidTV Set Top Box
M/N: DV8935
Mode: BT-TX-M
Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4882.000	40.20	4.37	44.57	74.00	-29.43	peak	
2		7323.000	38.47	8.21	46.68	74.00	-27.32	peak	
3		9764.000	37.05	11.30	48.35	74.00	-25.65	peak	
4		11744.000	38.51	13.78	52.29	74.00	-21.71	peak	
5	*	13852.000	37.14	15.51	52.65	74.00	-21.35	peak	
6		15790.000	36.30	15.58	51.88	74.00	-22.12	peak	

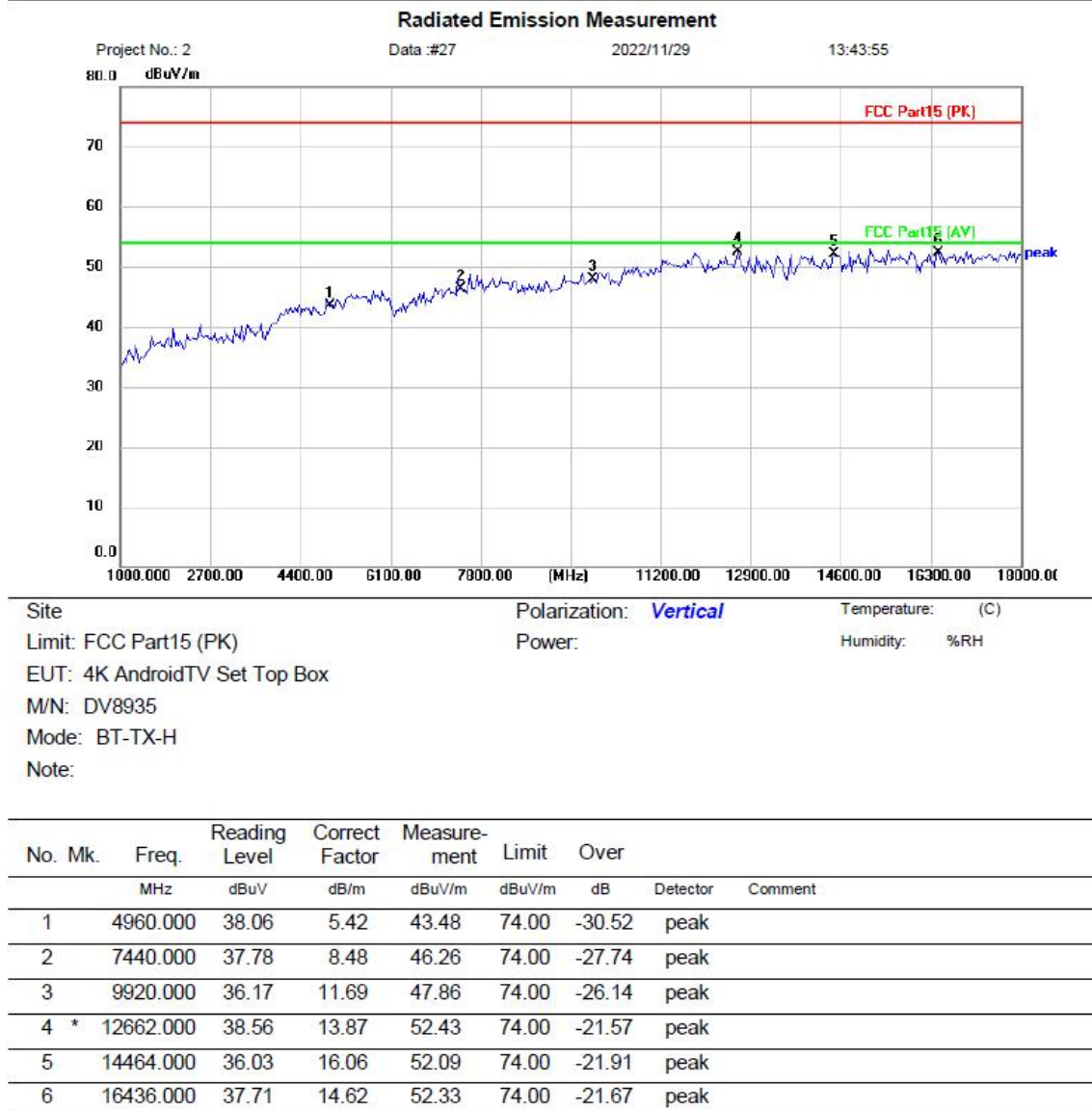
Test Result: Pass

[TestMode: TX High channel]; [Polarity: Horizontal]



Test Result: Pass

[TestMode: TX High channel]; [Polarity: Vertical]



Test Result: Pass

13 Antenna Requirement

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	N/A

13.1 Conclusion

Standard 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 an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 1.7dBi.

14 Radiated Emissions which fall in the restricted bands

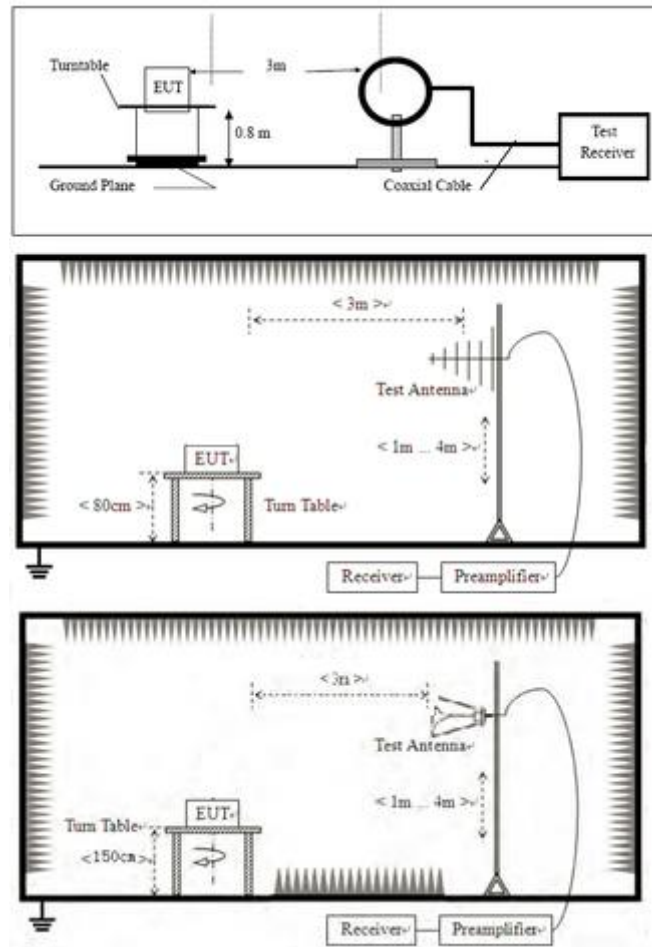
Test Standard	47 CFR Part 15, Subpart C 15.247 47 CFR Part 15, Subpart C 15.205 47 CFR Part 15, Subpart C 15.209
Test Method	ANSI C63.10-2013 Section 6.10.5
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Charlie
Temperature	25℃
Humidity	60%

14.1 LIMITS

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

14.2 BLOCK DIAGRAM OF TEST SETUP



14.3 PROCEDURE

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 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.
- 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB 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 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
j. Repeat above procedures until all frequencies measured was complete.

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

§15.205 Restricted bands of operation.

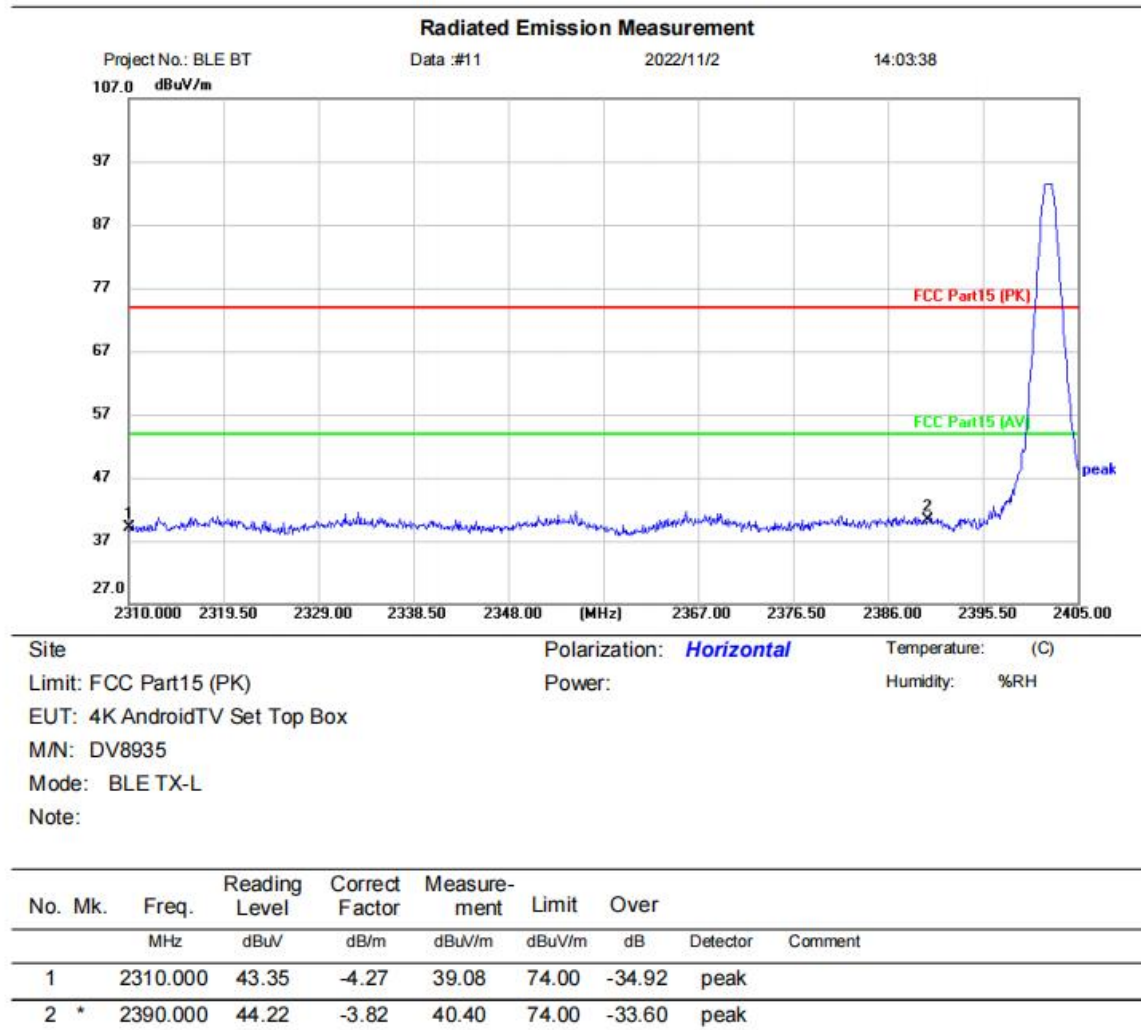
(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(²)
13.36-13.41			

(b) Except as provided in paragraphs (d) and (e) of this section, the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

14.4 TEST Data

[TestMode: TX low channel]; [Polarity: Horizontal]

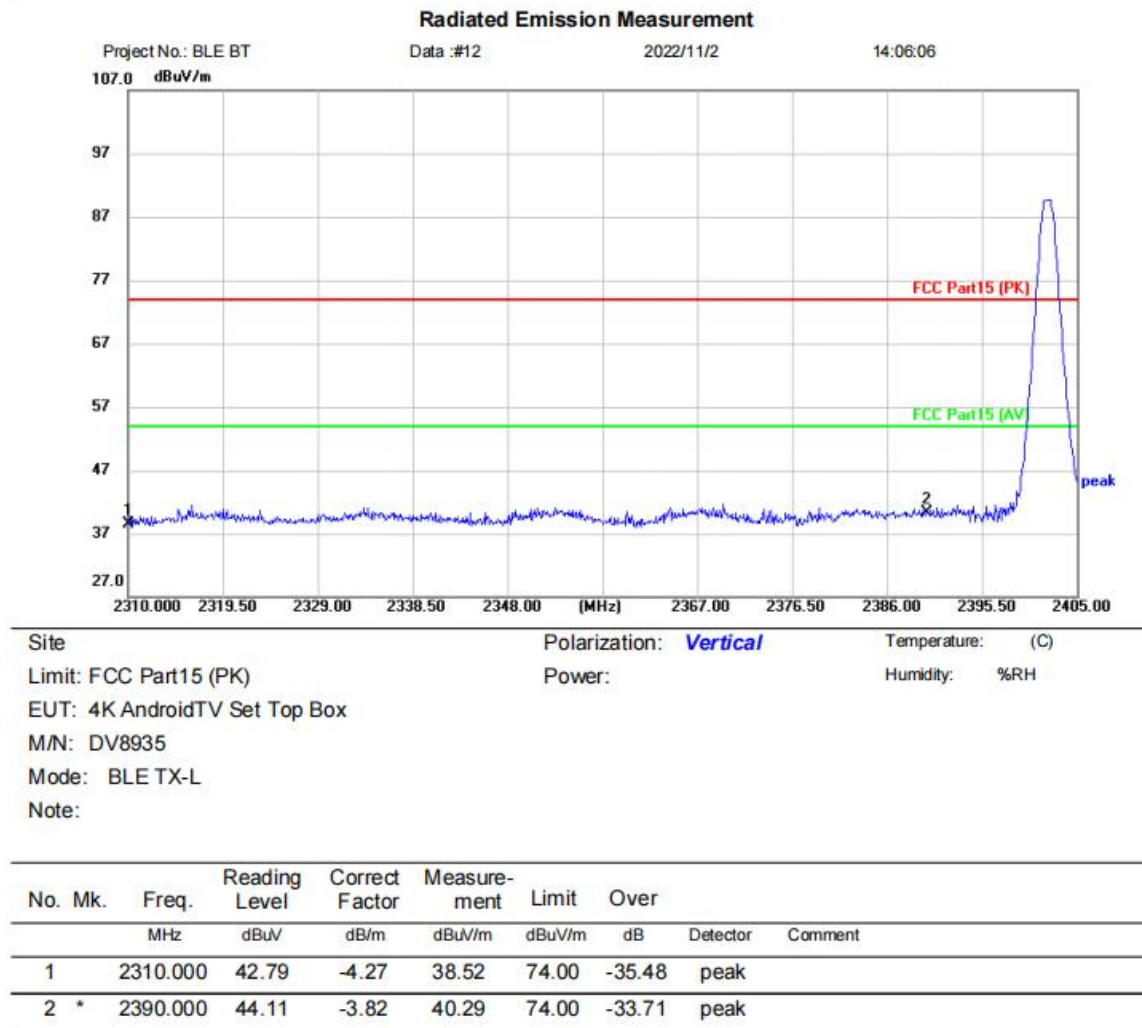


*:Maximum data x:Over limit !:over margin

(Reference Only)

Test Result: Pass

[TestMode:TX low channel]; [Polarity: Vertical]

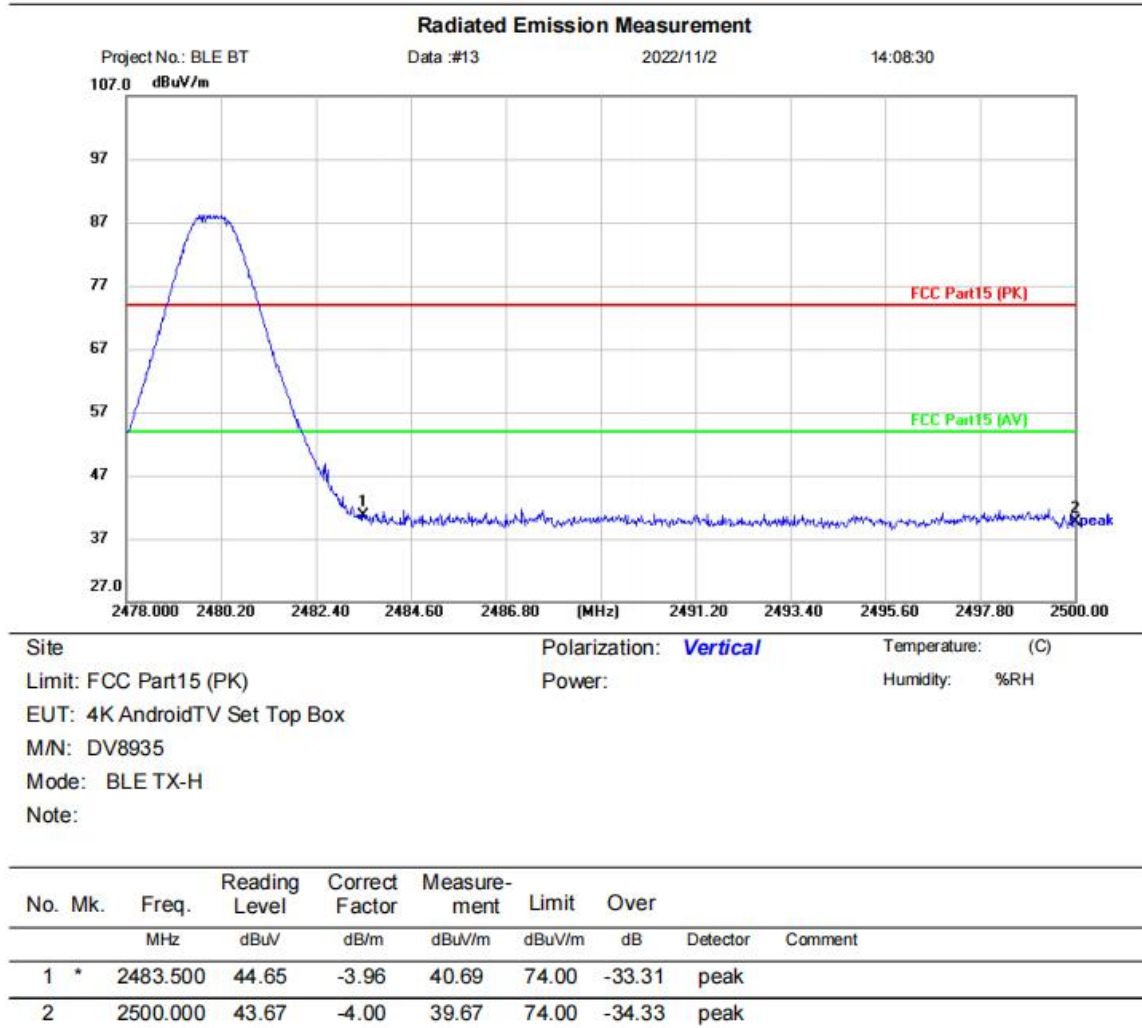


*:Maximum data x:Over limit !:over margin

(Reference Only)

Test Result: Pass

[TestMode: TX High channel]; [Polarity: Vertical]

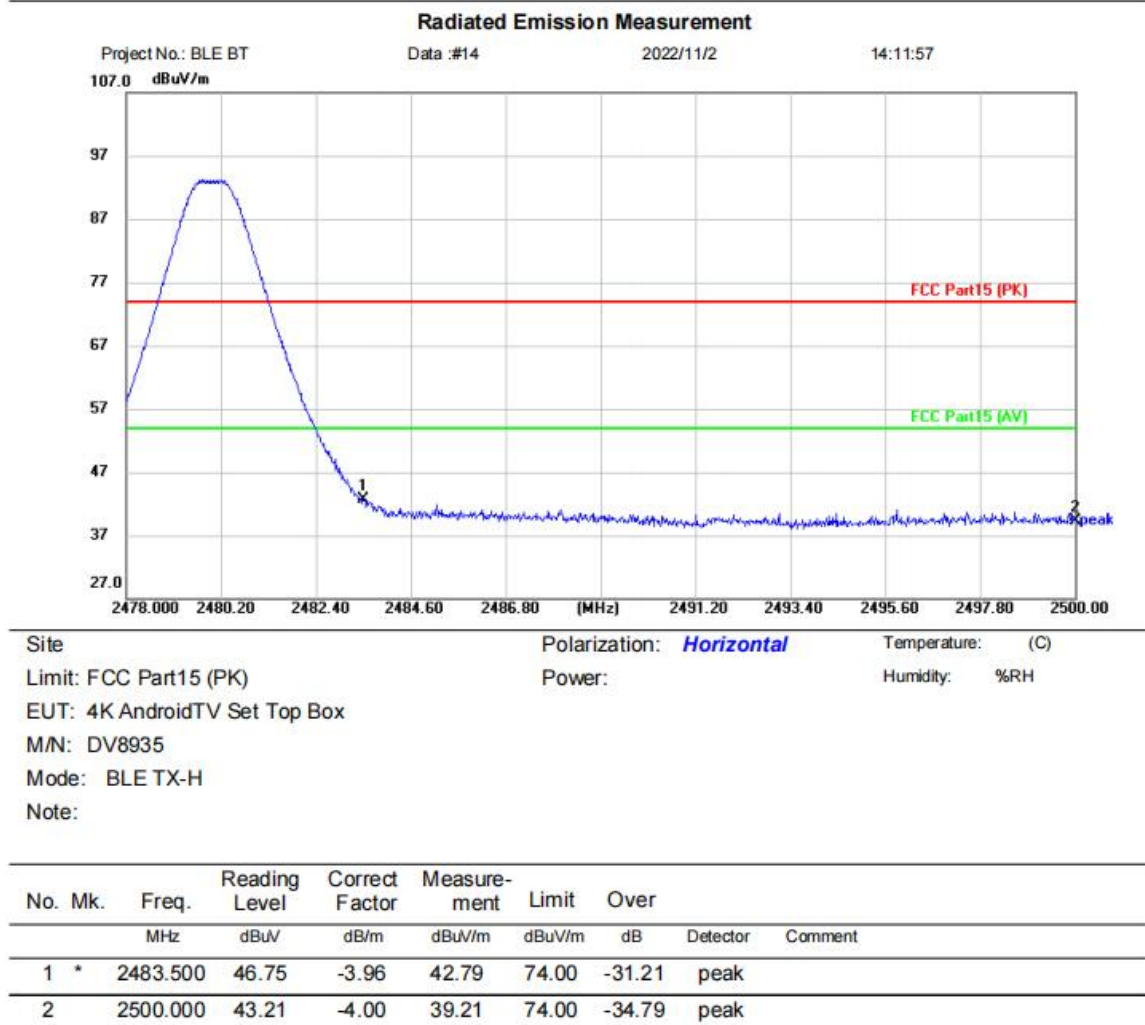


*:Maximum data x:Over limit !:over margin

(Reference Only)

Test Result: Pass

[TestMode:TX High channel]; [Polarity: Horizontal]



*:Maximum data x:Over limit !:over margin

(Reference Only)

Test Result: Pass

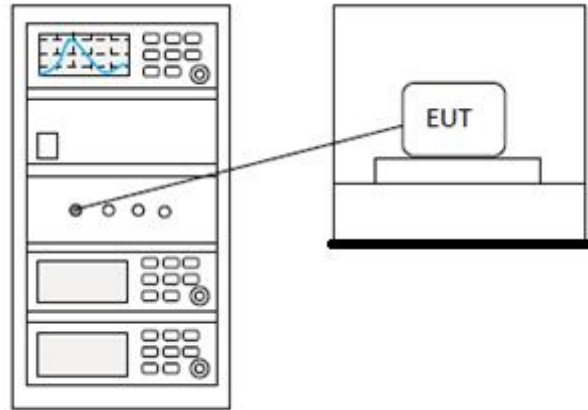
15 Conducted Spurious Emissions

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10-2013 Section 7.8.6 & Section 11.11
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Charlie
Temperature	25°C
Humidity	60%

15.1 LIMITS

Limit:	<p>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)).</p>
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15.2 BLOCK DIAGRAM OF TEST SETUP



15.3 TEST Data

Pass: Please Refer To Appendix: Appendix 1 For Details

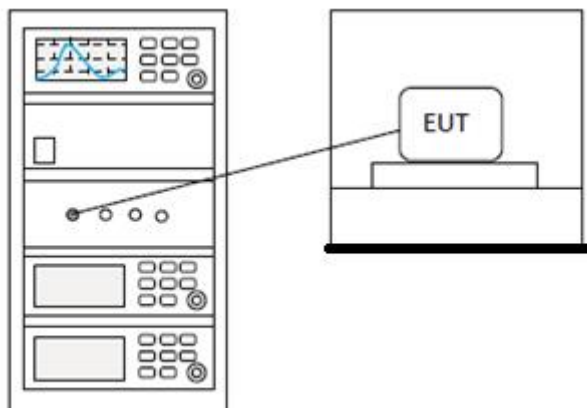
16 Power Spectrum Density

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10-2013 Section 11.10.2
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Charlie
Temperature	25°C
Humidity	60%

16.1 LIMITS

Limit:	$\leq 8\text{dBm}$ in any 3 kHz band during any time interval of continuous transmission
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16.2 BLOCK DIAGRAM OF TEST SETUP



16.3 TEST Data

Pass: Please Refer To Appendix: Appendix 1 For Details

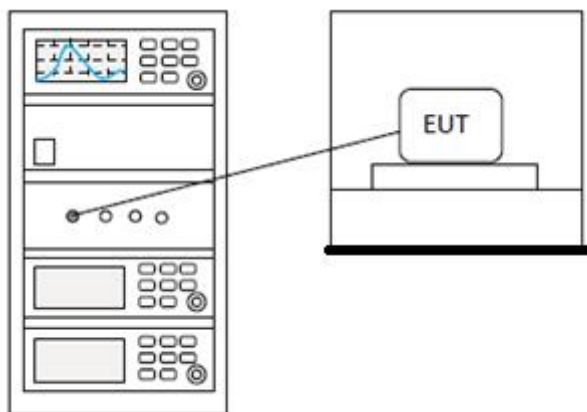
17 Conducted Peak Output Power

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10-2013 Section 7.8.5
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Charlie
Temperature	25℃
Humidity	60%

17.1 LIMITS

Frequency range(MHz)	Output power of the intentional radiator(watt)
902-928	1 for ≥ 50 hopping channels
	0.25 for $25 \leq$ hopping channels < 50
	1 for digital modulation
2400-2483.5	1 for ≥ 75 non-overlapping hopping channels
	0.125 for all other frequency hopping systems
	1 for digital modulation
5725-5850	1 for frequency hopping systems and digital modulation

17.2 BLOCK DIAGRAM OF TEST SETUP



17.3 TEST Data

Pass: Please Refer To Appendix: Appendix 1 For Details

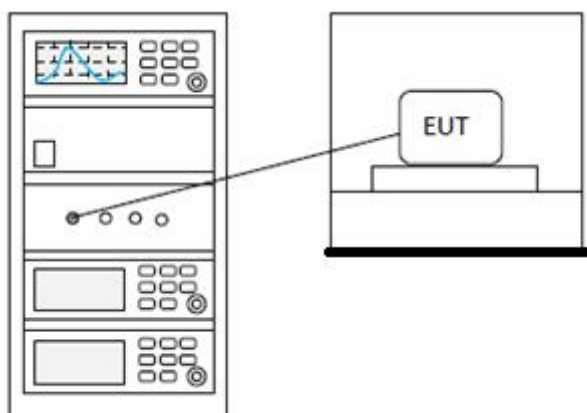
18 Minimum 6dB Bandwidth

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10-2013 Section 11.8.1
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Charlie
Temperature	25℃
Humidity	60%

18.1 LIMITS

Limit:	≥500 kHz
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18.2 BLOCK DIAGRAM OF TEST SETUP



18.3 TEST Data

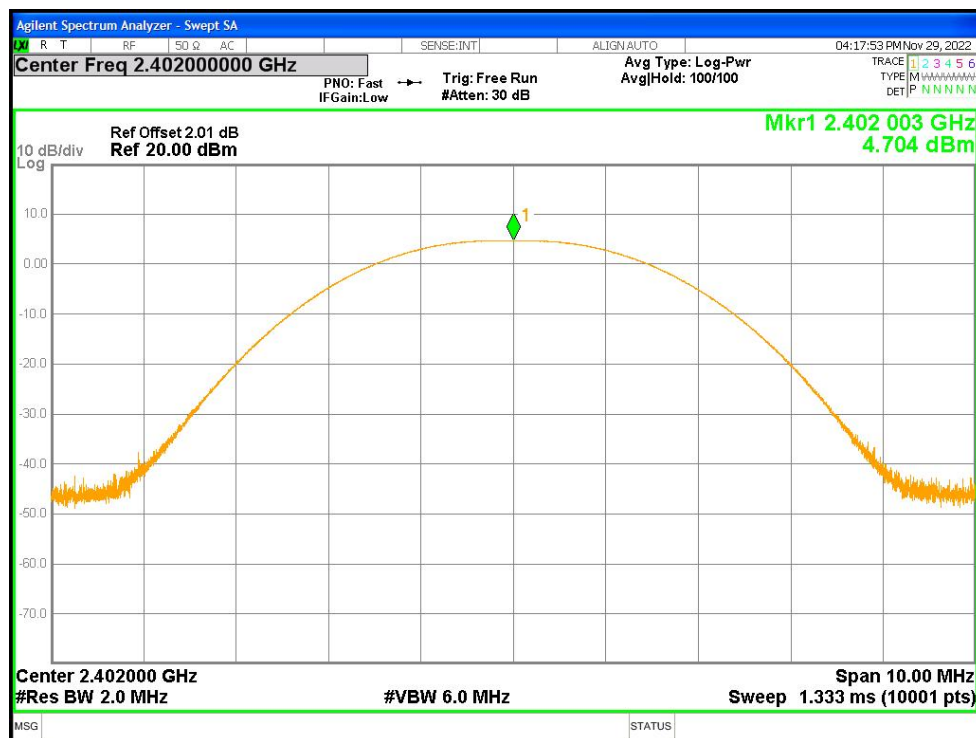
Pass: Please Refer To Appendix: Appendix 1 For Details

19 Appendix 1

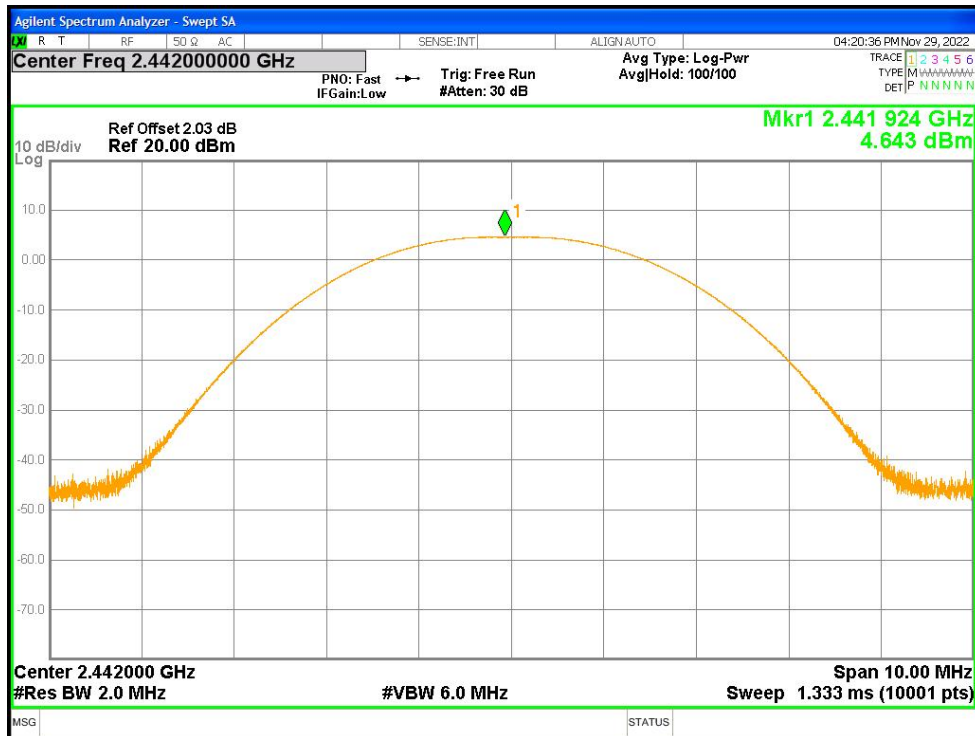
19.1 Maximum Conducted Output Power

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1M	2402	Ant1	4.704	0	4.704	30	Pass
NVNT	BLE 1M	2442	Ant1	4.643	0	4.643	30	Pass
NVNT	BLE 1M	2480	Ant1	5.18	0	5.180	30	Pass
NVNT	BLE 2M	2402	Ant1	4.782	0	4.782	30	Pass
NVNT	BLE 2M	2442	Ant1	3.782	0	3.782	30	Pass
NVNT	BLE 2M	2480	Ant1	4.787	0	4.787	30	Pass

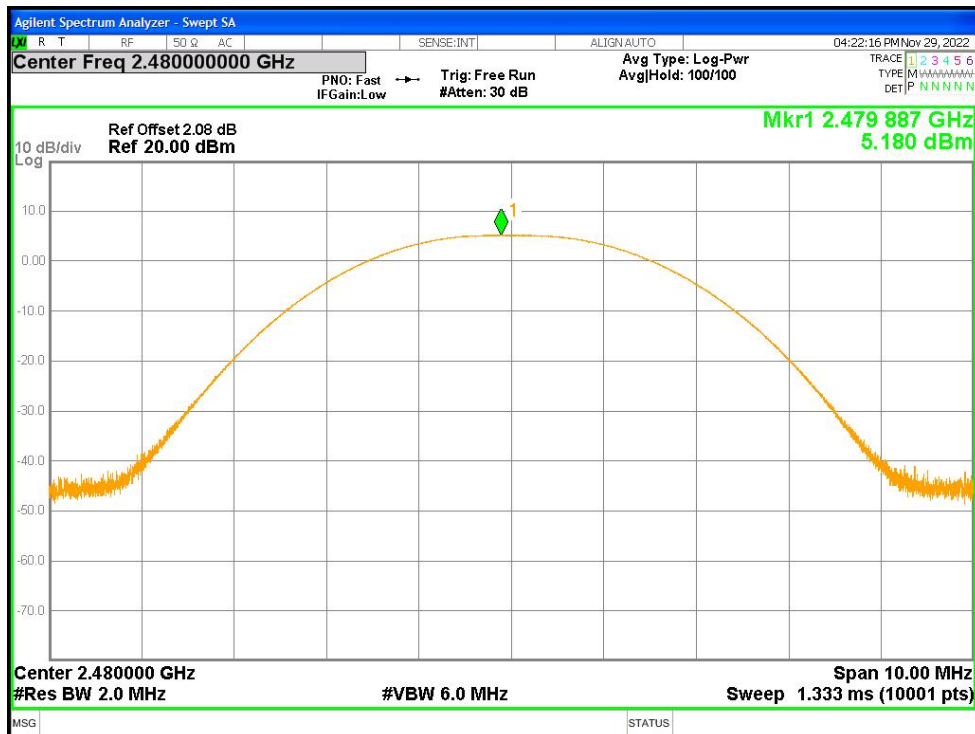
Power NVNT BLE 1M 2402MHz Ant1



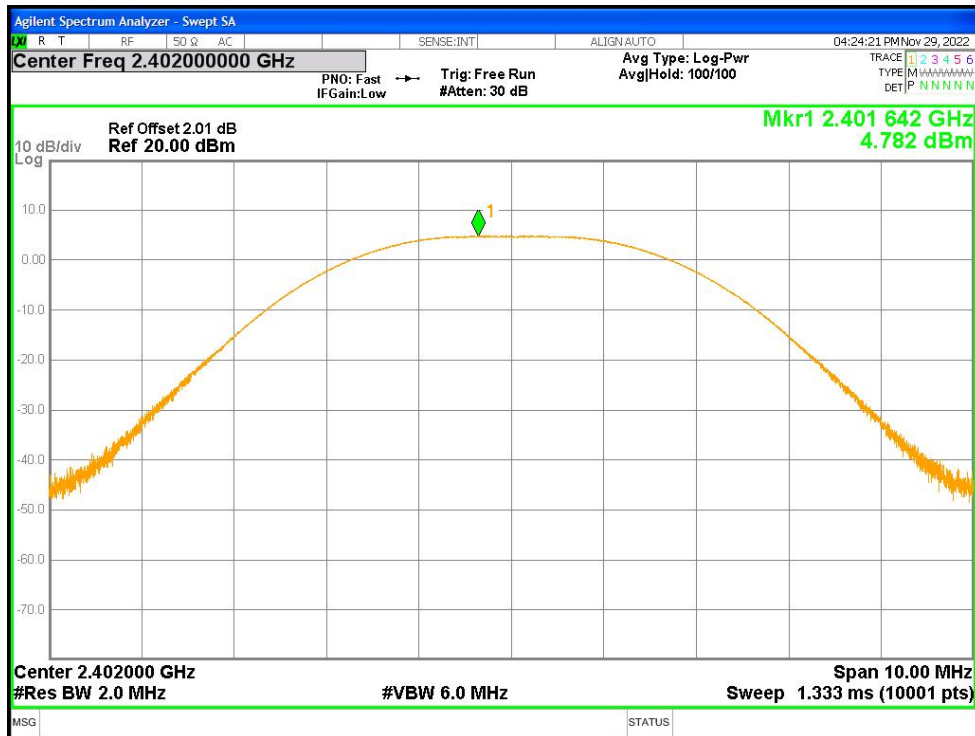
Power NVNT BLE 1M 2442MHz Ant1



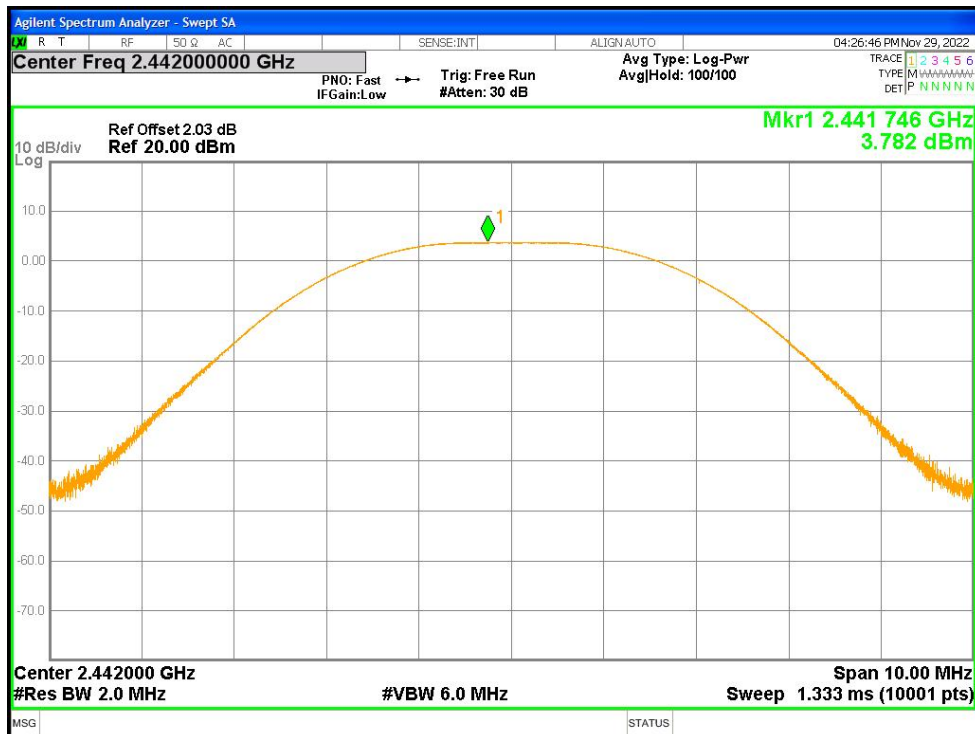
Power NVNT BLE 1M 2480MHz Ant1



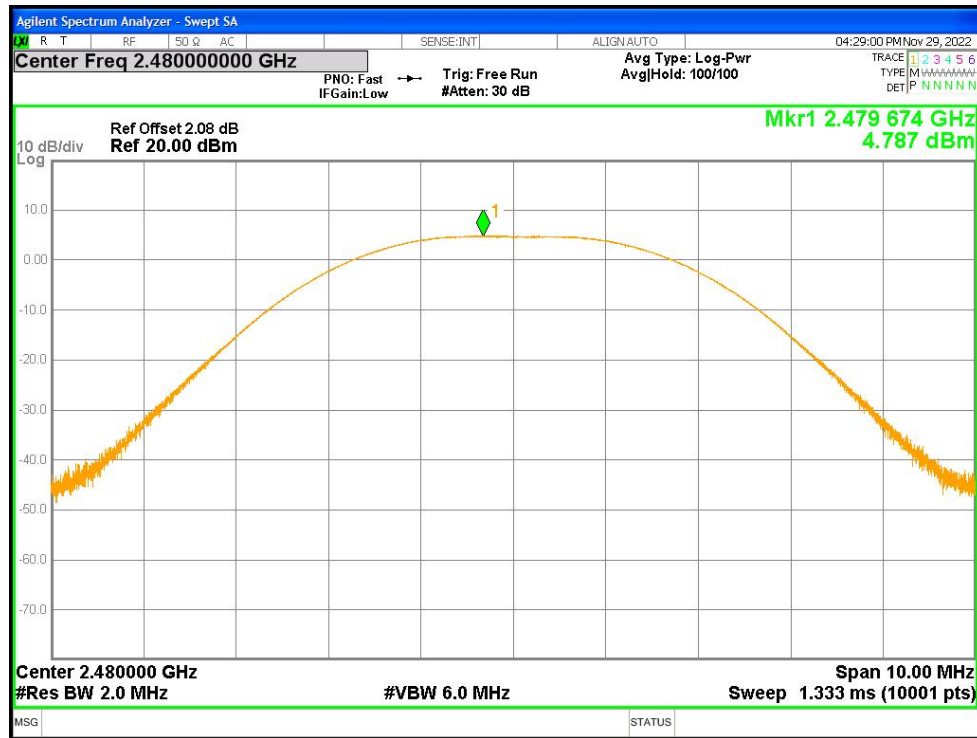
Power NVNT BLE 2M 2402MHz Ant1



Power NVNT BLE 2M 2442MHz Ant1



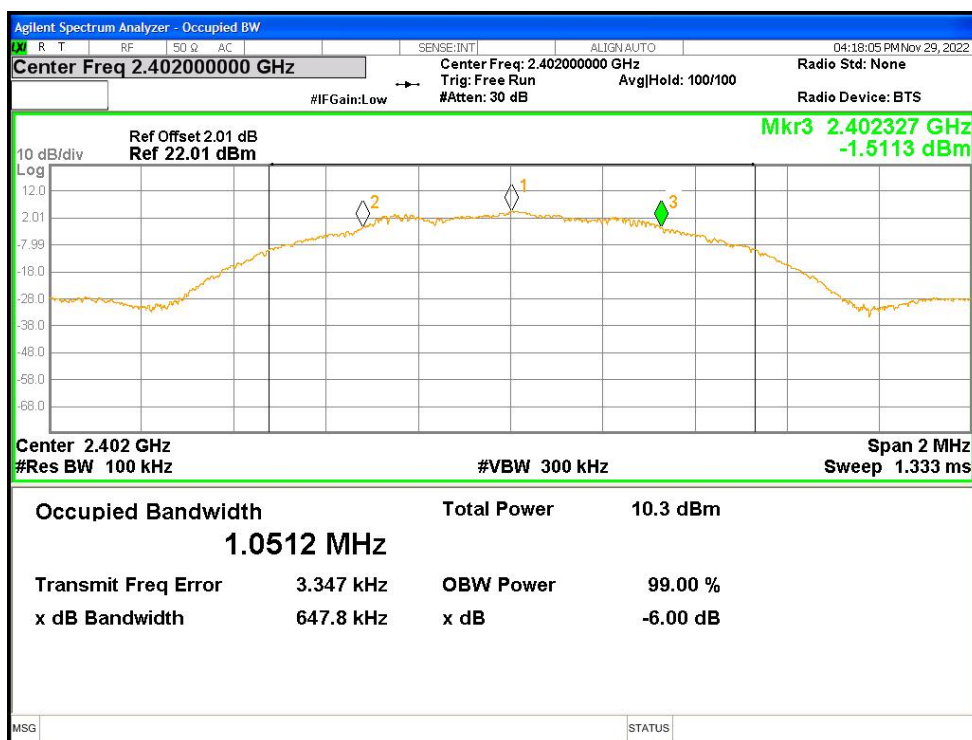
Power NVNT BLE 2M 2480MHz Ant1



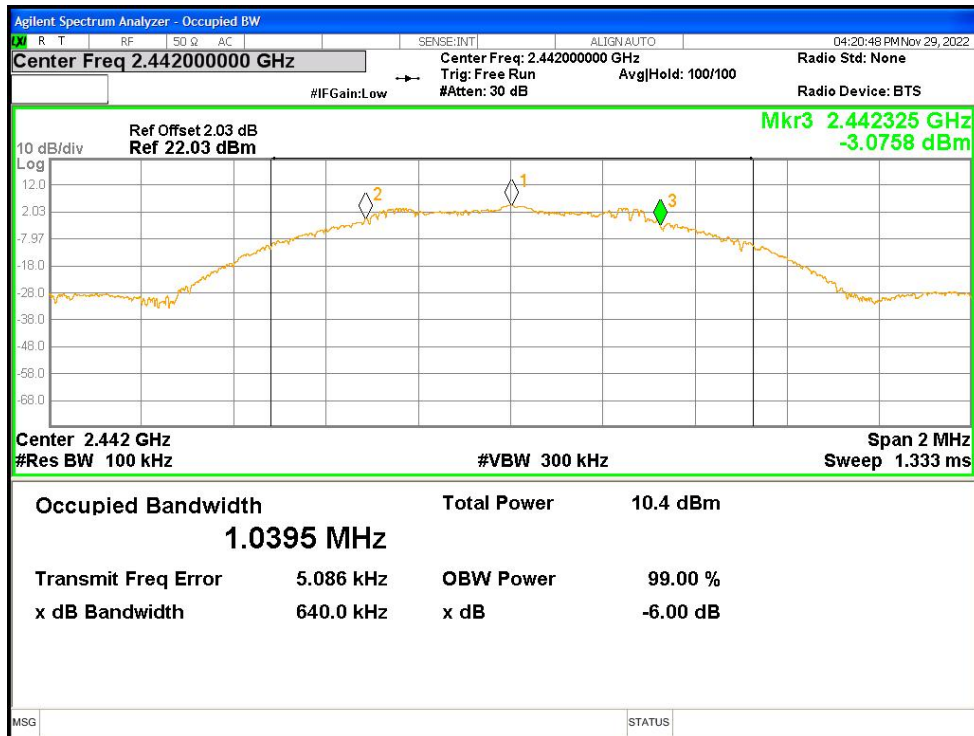
19.2 Minimum 6dB Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE 1M	2402	Ant1	0.648	0.5	Pass
NVNT	BLE 1M	2442	Ant1	0.640	0.5	Pass
NVNT	BLE 1M	2480	Ant1	0.636	0.5	Pass
NVNT	BLE 2M	2402	Ant1	1.106	0.5	Pass
NVNT	BLE 2M	2442	Ant1	0.933	0.5	Pass
NVNT	BLE 2M	2480	Ant1	1.095	0.5	Pass

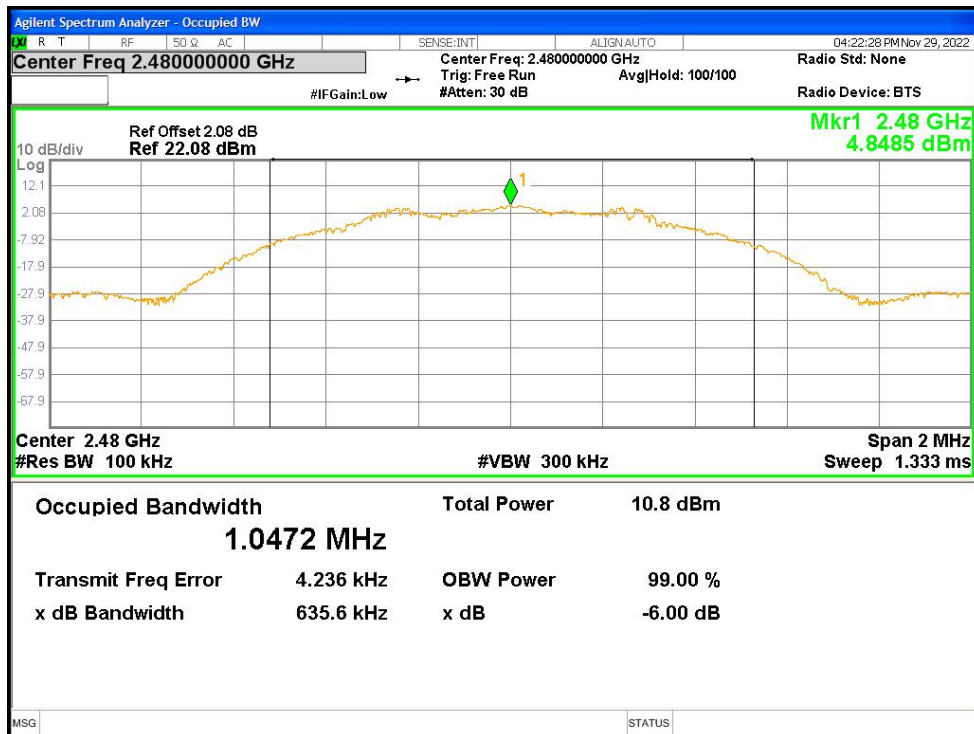
-6dB Bandwidth NVNT BLE 1M 2402MHz Ant1



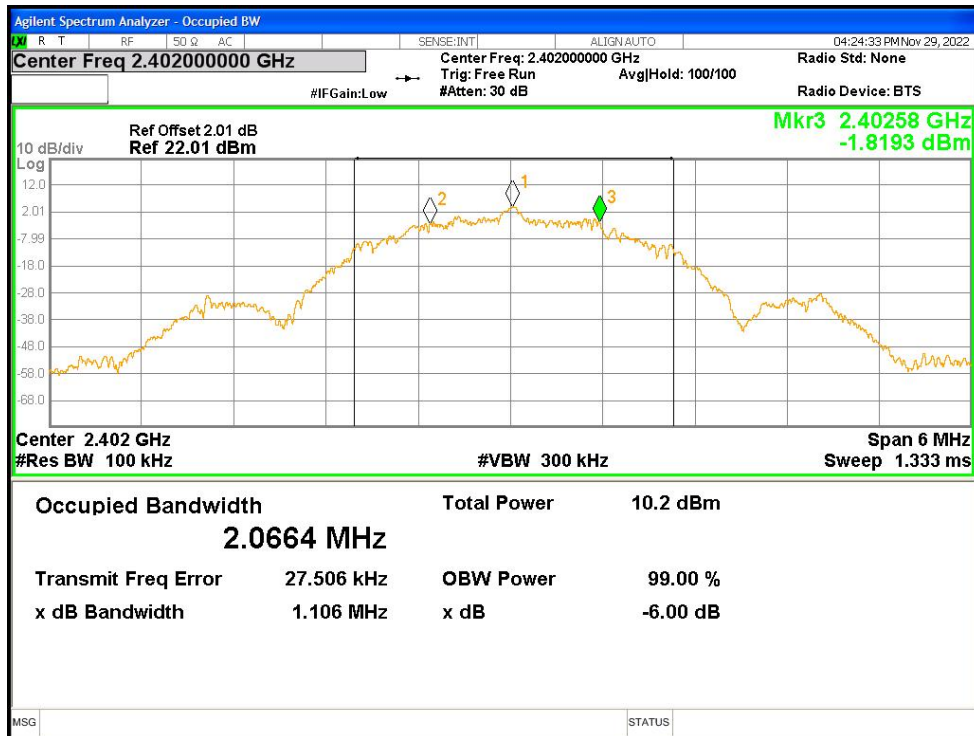
-6dB Bandwidth NVNT BLE 1M 2442MHz Ant1



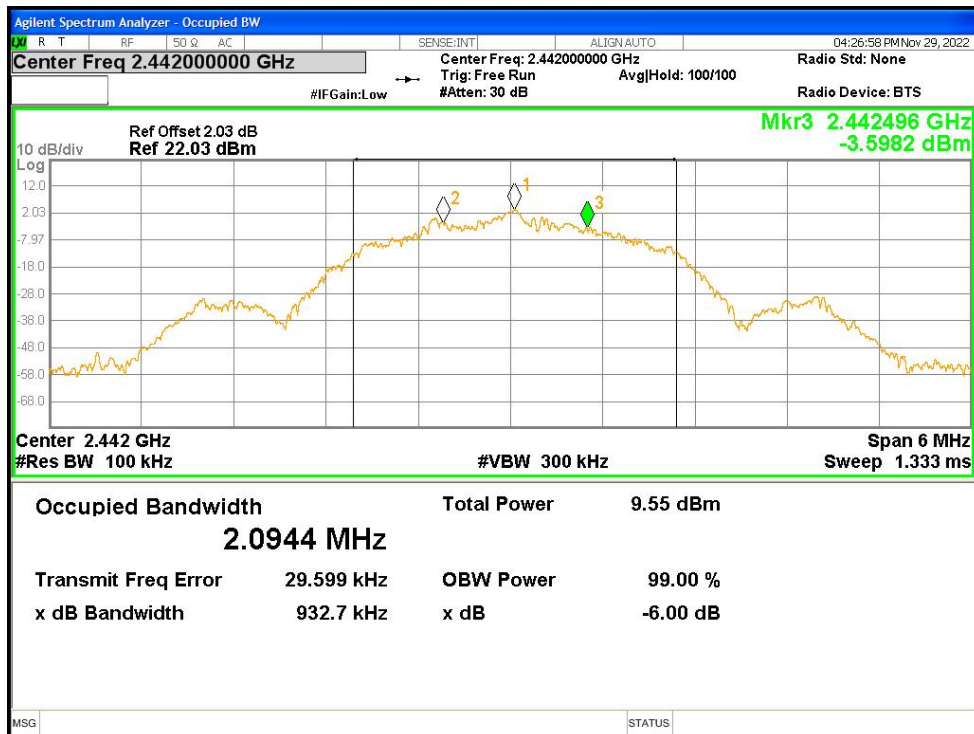
-6dB Bandwidth NVNT BLE 1M 2480MHz Ant1



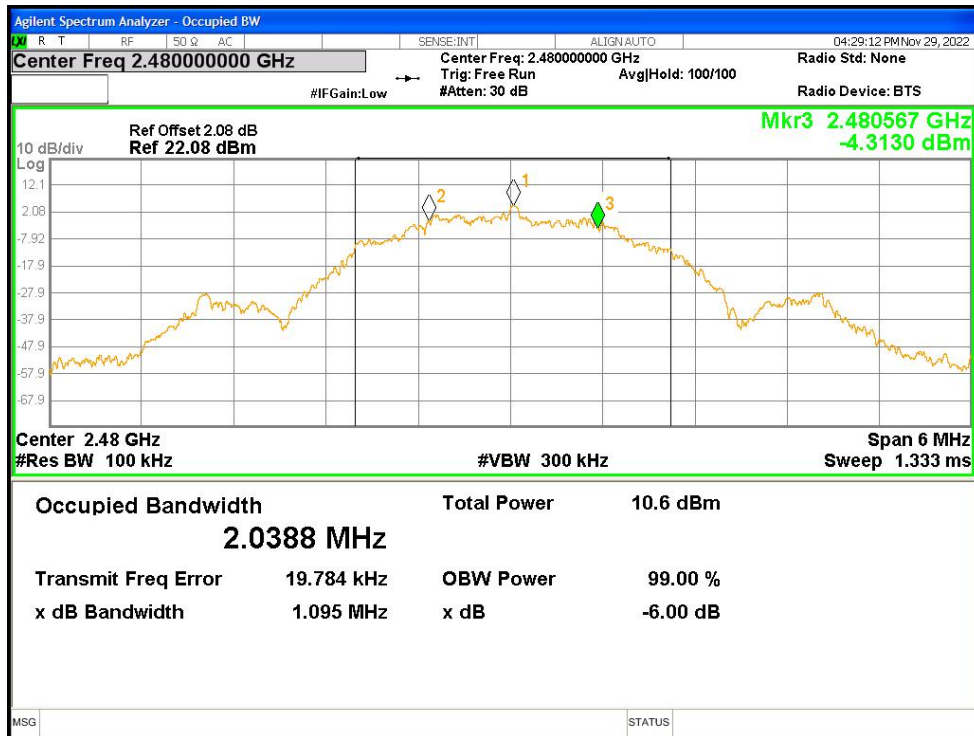
-6dB Bandwidth NVNT BLE 2M 2402MHz Ant1



-6dB Bandwidth NVNT BLE 2M 2442MHz Ant1



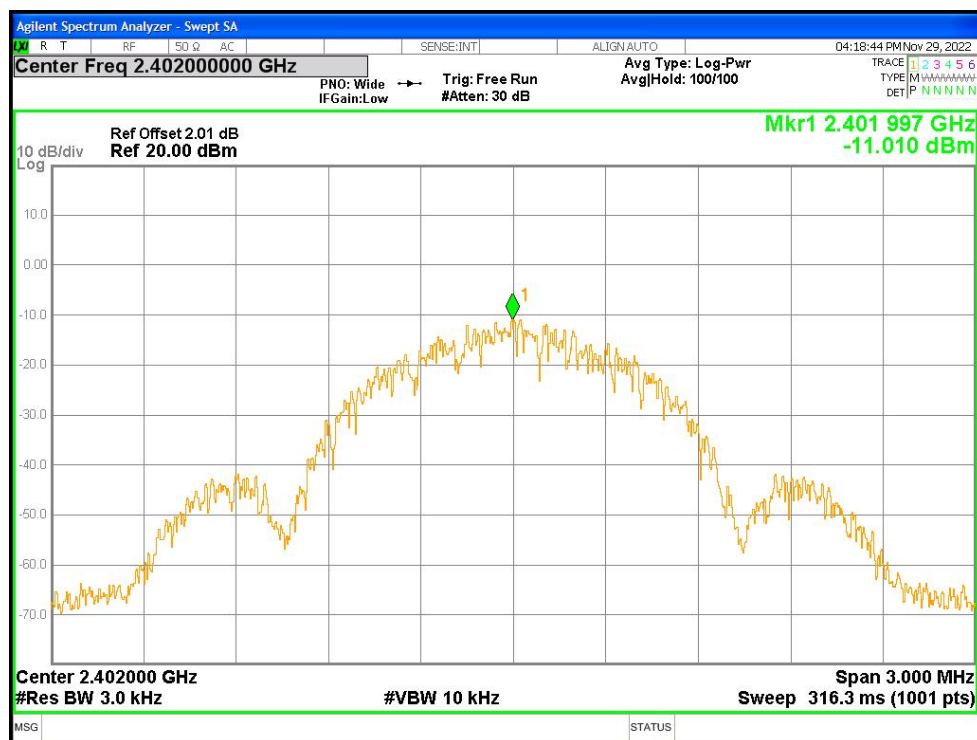
-6dB Bandwidth NVNT BLE 2M 2480MHz Ant1



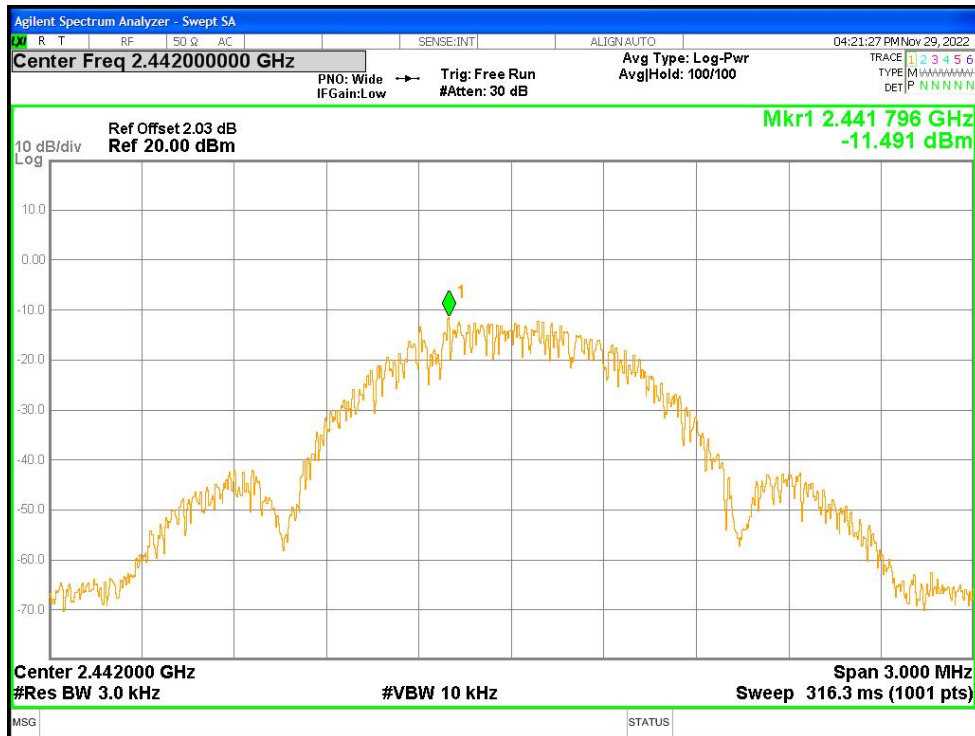
19.3 Maximum Power Spectral Density Level

Condition	Mode	Frequency (MHz)	Antenna	Max PSD (dBm)	Limit (dBm/3kHz)	Verdict
NVNT	BLE 1M	2402	Ant1	-11.010	8	Pass
NVNT	BLE 1M	2442	Ant1	-11.491	8	Pass
NVNT	BLE 1M	2480	Ant1	-8.856	8	Pass
NVNT	BLE 2M	2402	Ant1	-13.590	8	Pass
NVNT	BLE 2M	2442	Ant1	-12.970	8	Pass
NVNT	BLE 2M	2480	Ant1	-12.466	8	Pass

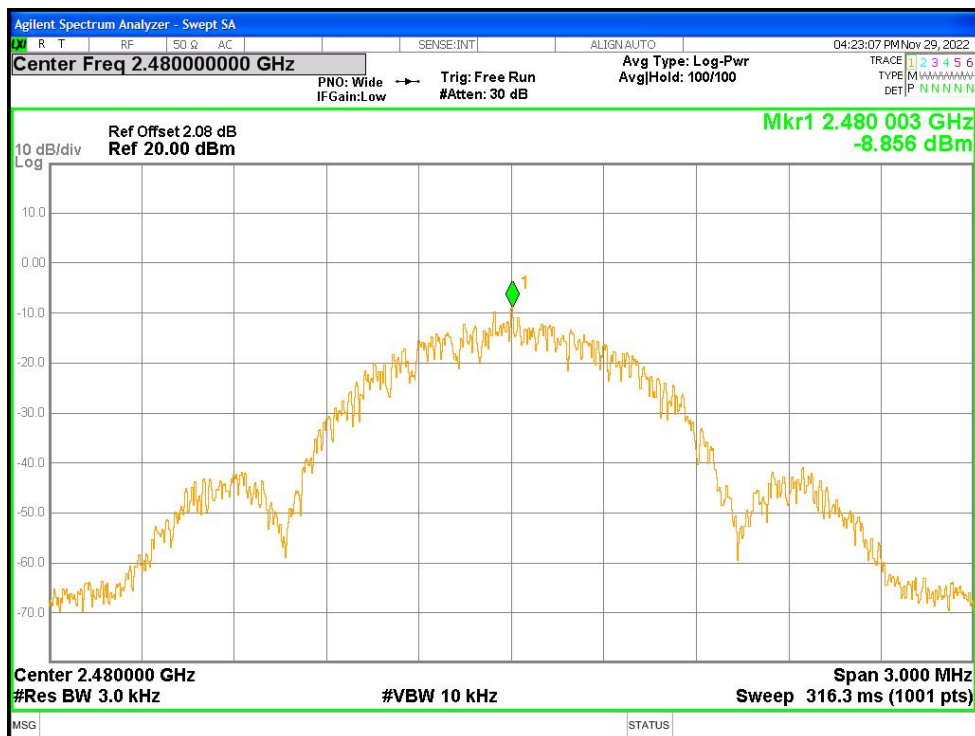
PSD NVNT BLE 1M 2402MHz Ant1



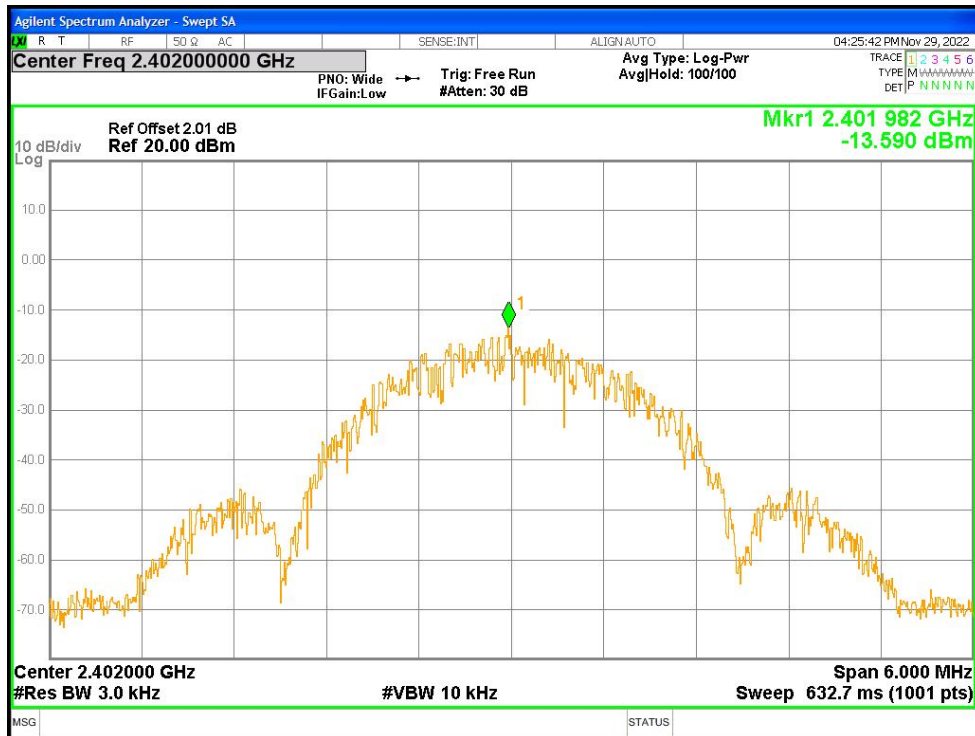
PSD NVNT BLE 1M 2442MHz Ant1



PSD NVNT BLE 1M 2480MHz Ant1



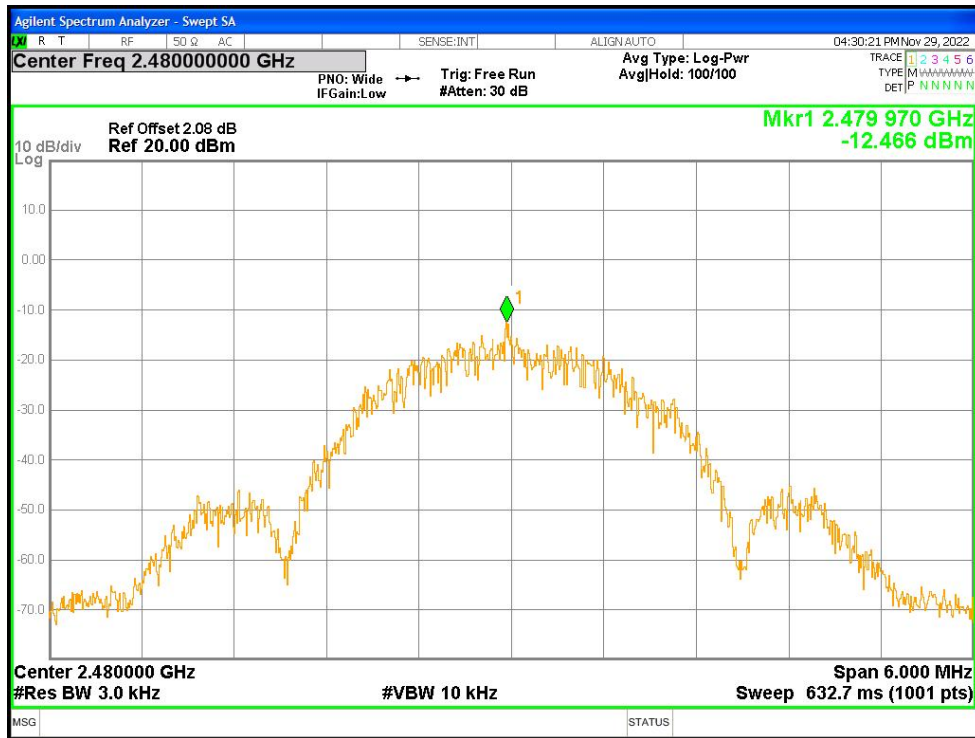
PSD NVNT BLE 2M 2402MHz Ant1



PSD NVNT BLE 2M 2442MHz Ant1



PSD NVNT BLE 2M 2480MHz Ant1



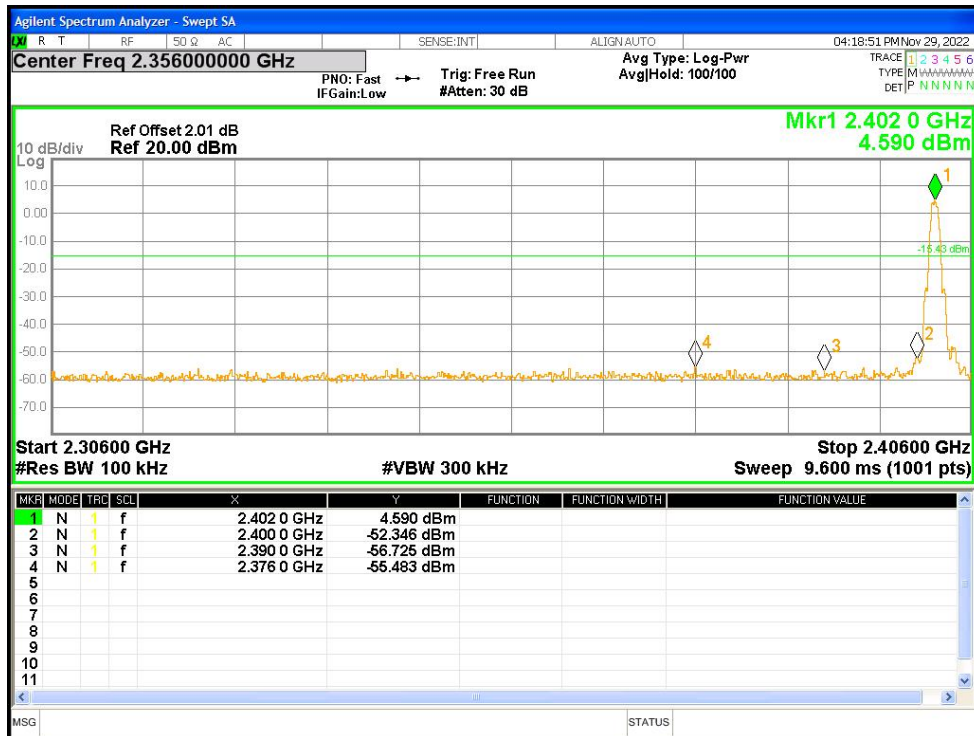
19.4 Band Edge

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant1	-60.05	-20	Pass
NVNT	BLE 1M	2480	Ant1	-60.56	-20	Pass
NVNT	BLE 2M	2402	Ant1	-59.52	-20	Pass
NVNT	BLE 2M	2480	Ant1	-59.84	-20	Pass

Band Edge NVNT BLE 1M 2402MHz Ant1 Ref



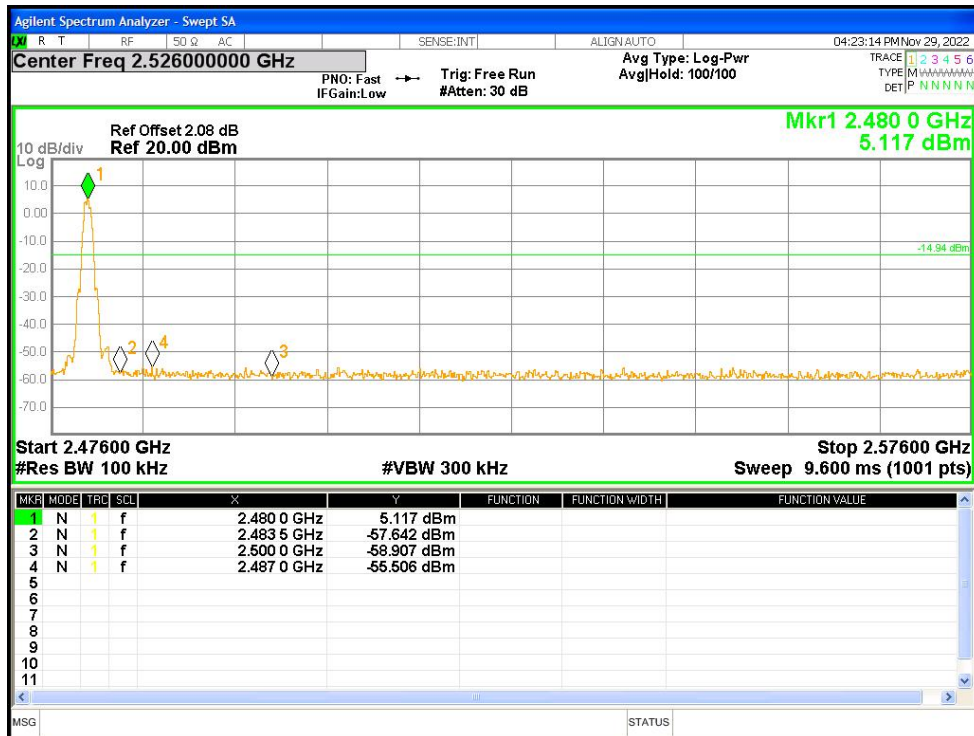
Band Edge NVNT BLE 1M 2402MHz Ant1 Emission



Band Edge NVNT BLE 1M 2480MHz Ant1 Ref



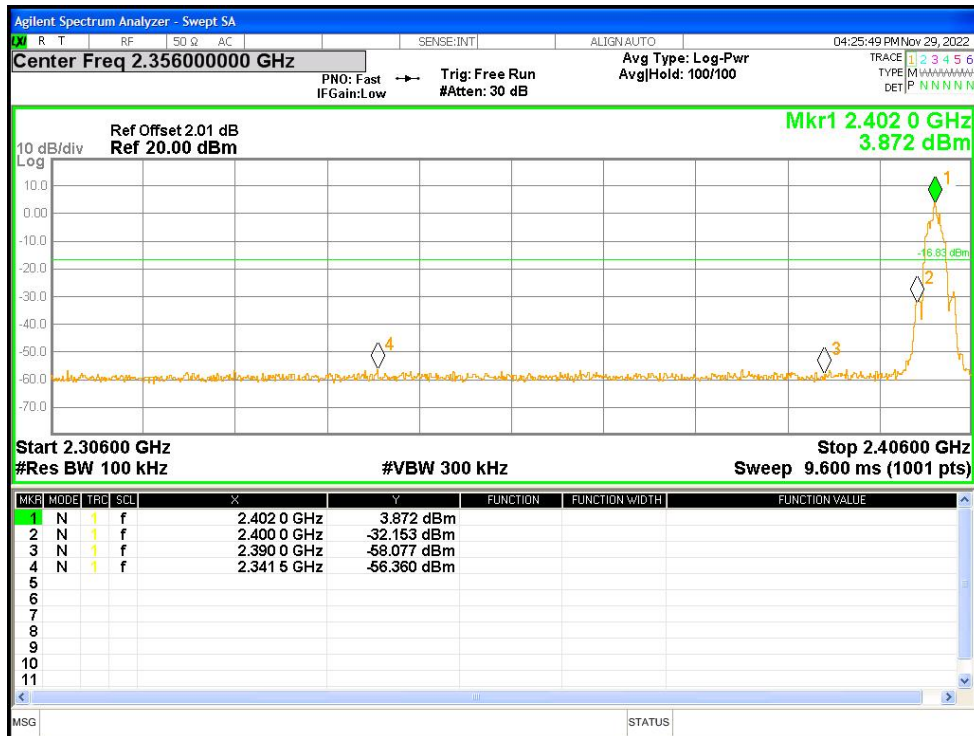
Band Edge NVNT BLE 1M 2480MHz Ant1 Emission



Band Edge NVNT BLE 2M 2402MHz Ant1 Ref



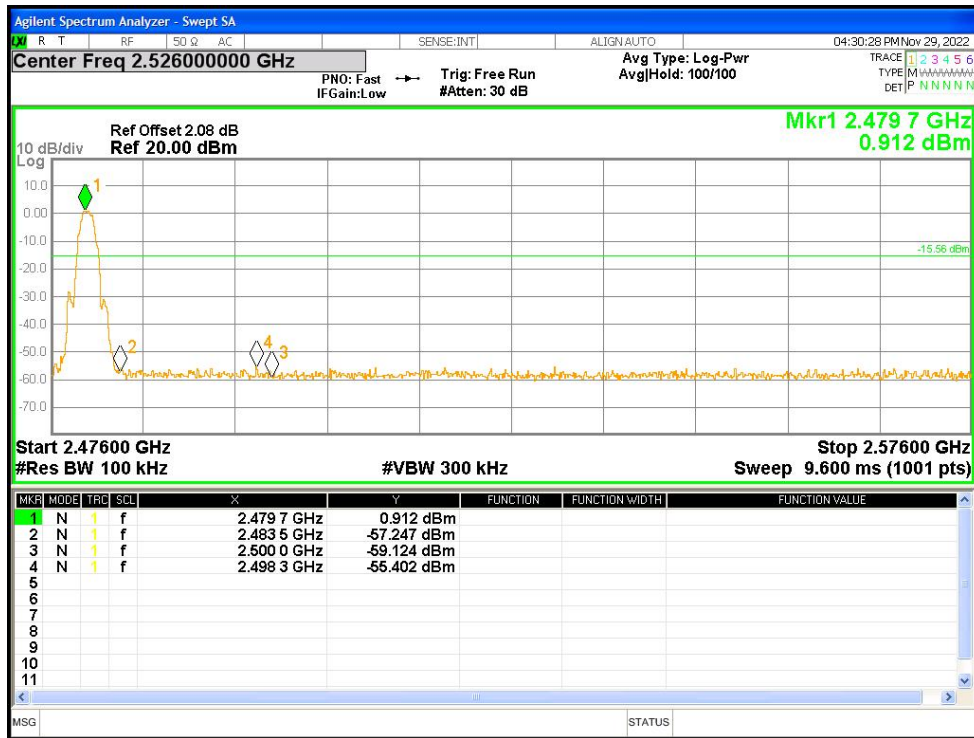
Band Edge NVNT BLE 2M 2402MHz Ant1 Emission



Band Edge NVNT BLE 2M 2480MHz Ant1 Ref



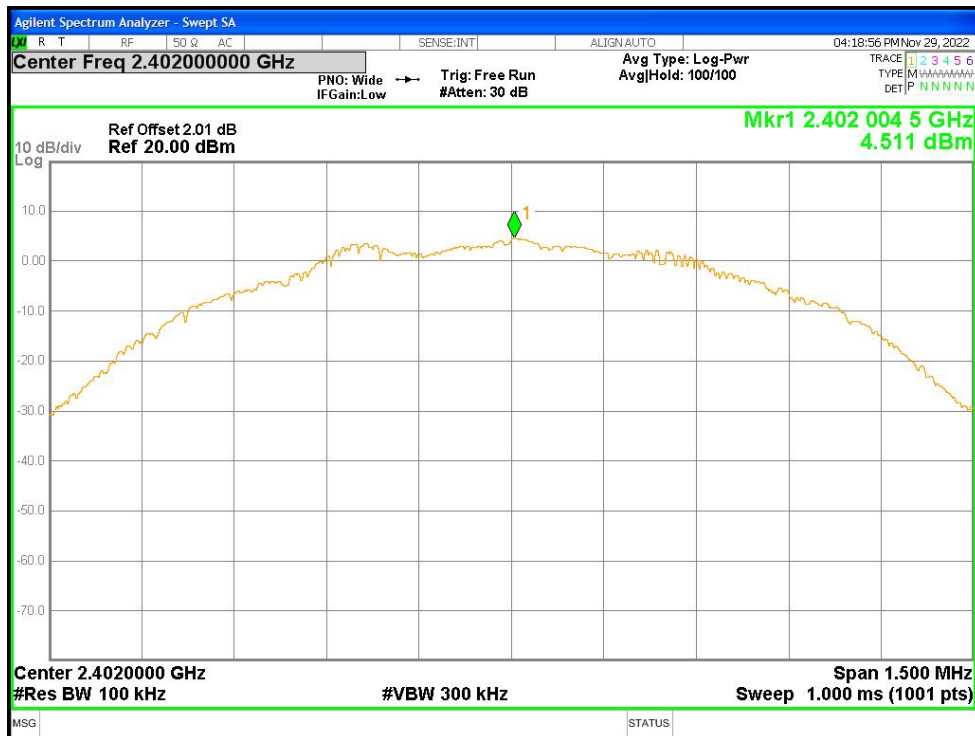
Band Edge NVNT BLE 2M 2480MHz Ant1 Emission



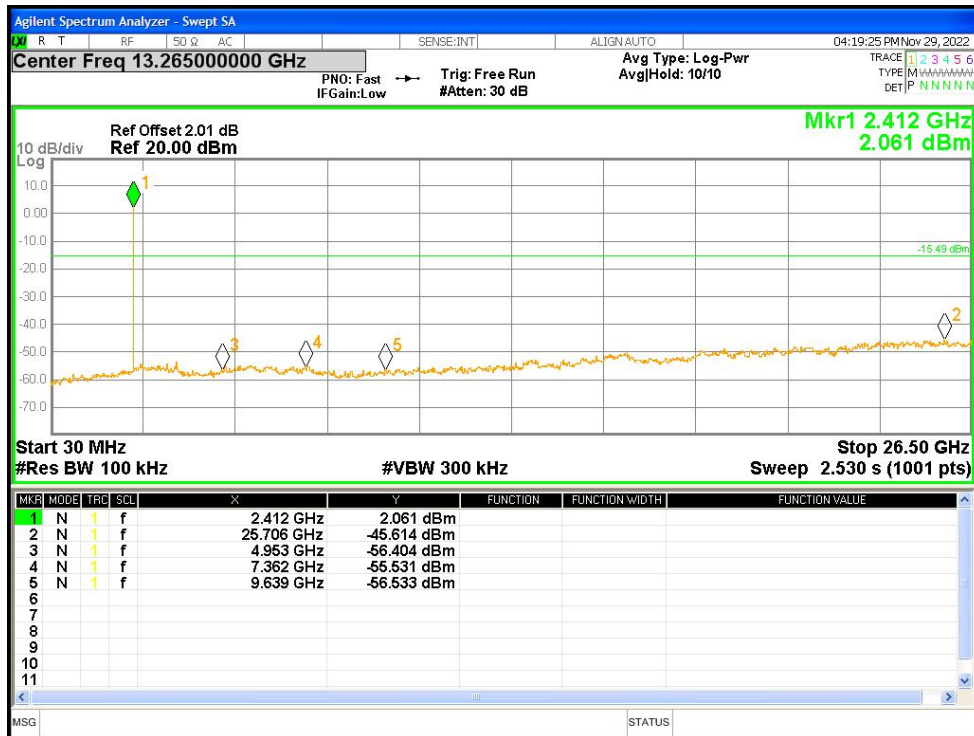
19.5 Conducted RF Spurious Emission

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant1	-50.12	-20	Pass
NVNT	BLE 1M	2442	Ant1	-50.07	-20	Pass
NVNT	BLE 1M	2480	Ant1	-50.15	-20	Pass
NVNT	BLE 2M	2402	Ant1	-49.24	-20	Pass
NVNT	BLE 2M	2442	Ant1	-48.28	-20	Pass
NVNT	BLE 2M	2480	Ant1	-49.22	-20	Pass

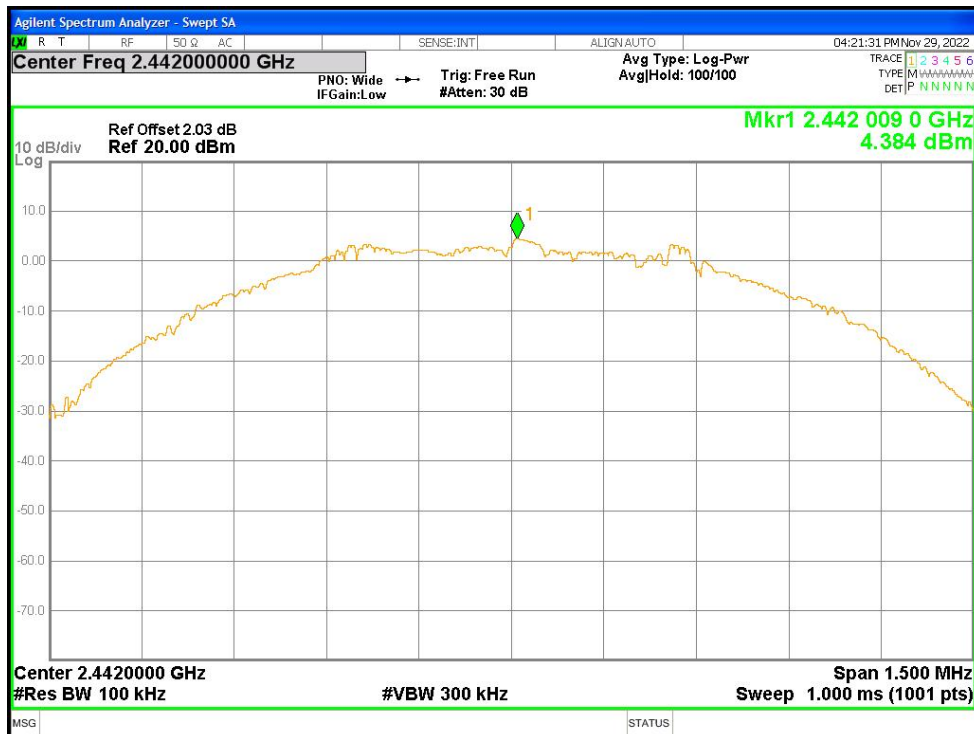
Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Ref



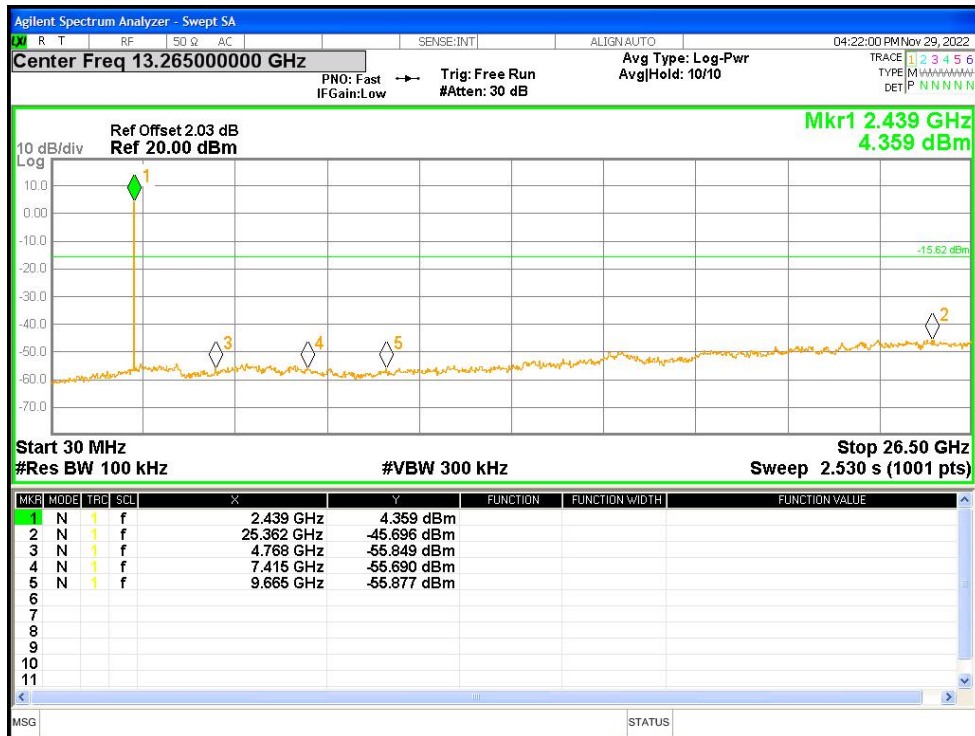
Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Emission



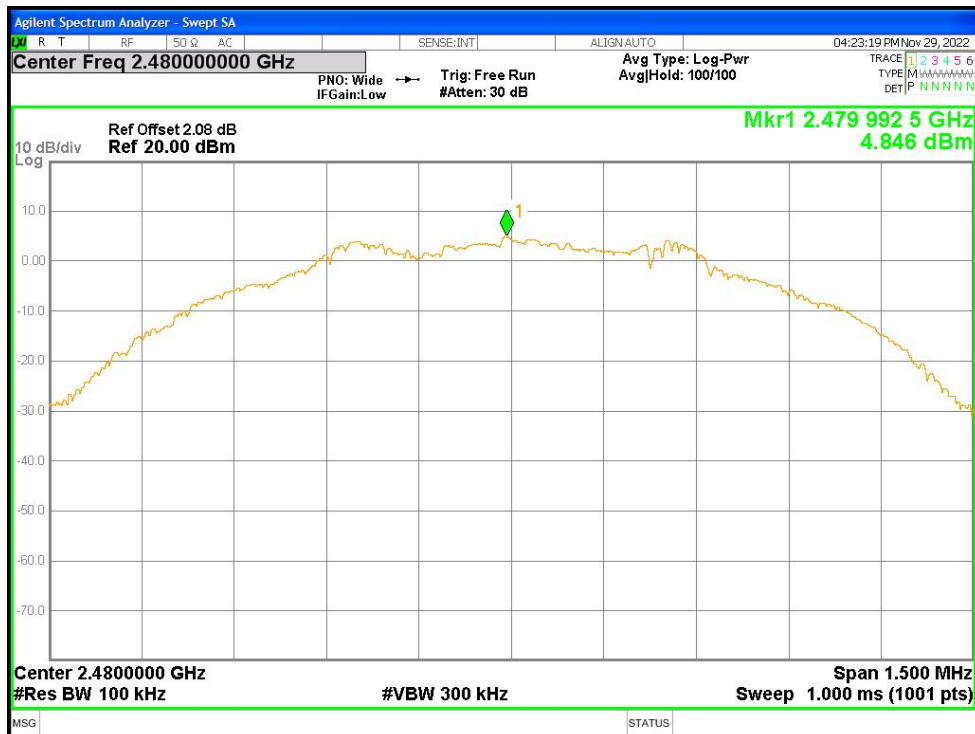
Tx. Spurious NVNT BLE 1M 2442MHz Ant1 Ref



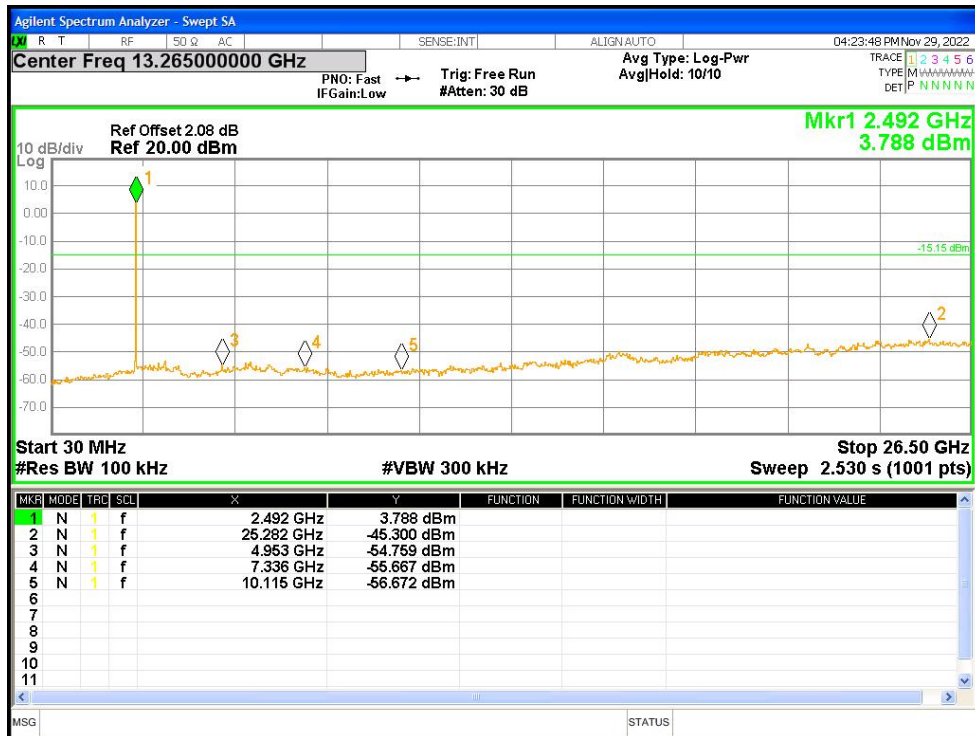
Tx. Spurious NVNT BLE 1M 2442MHz Ant1 Emission



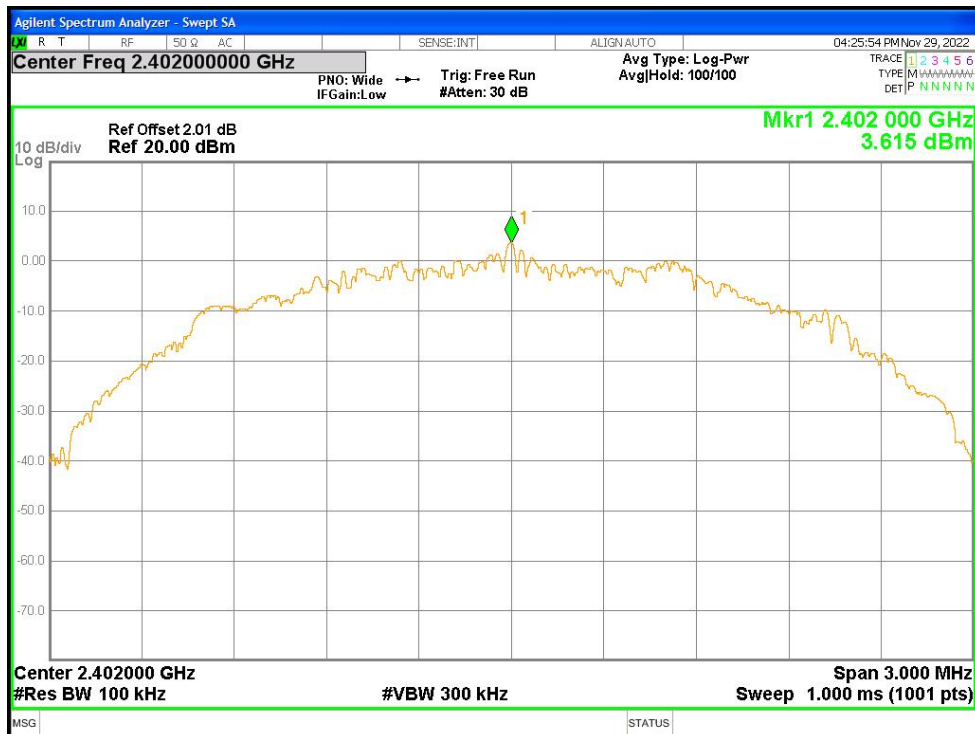
Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Ref



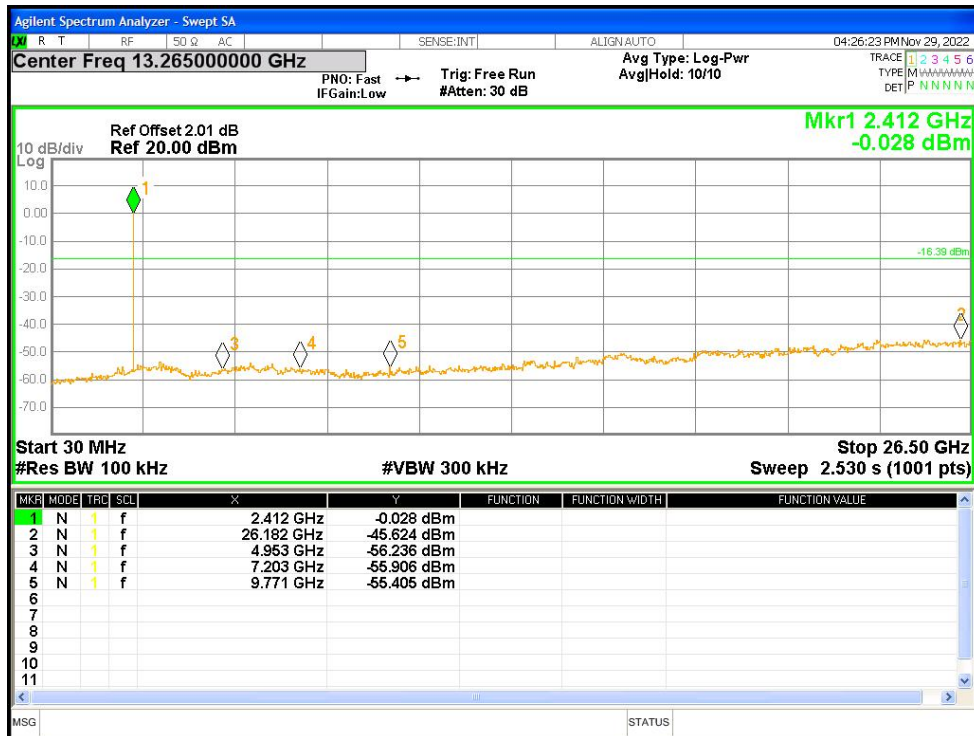
Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Emission



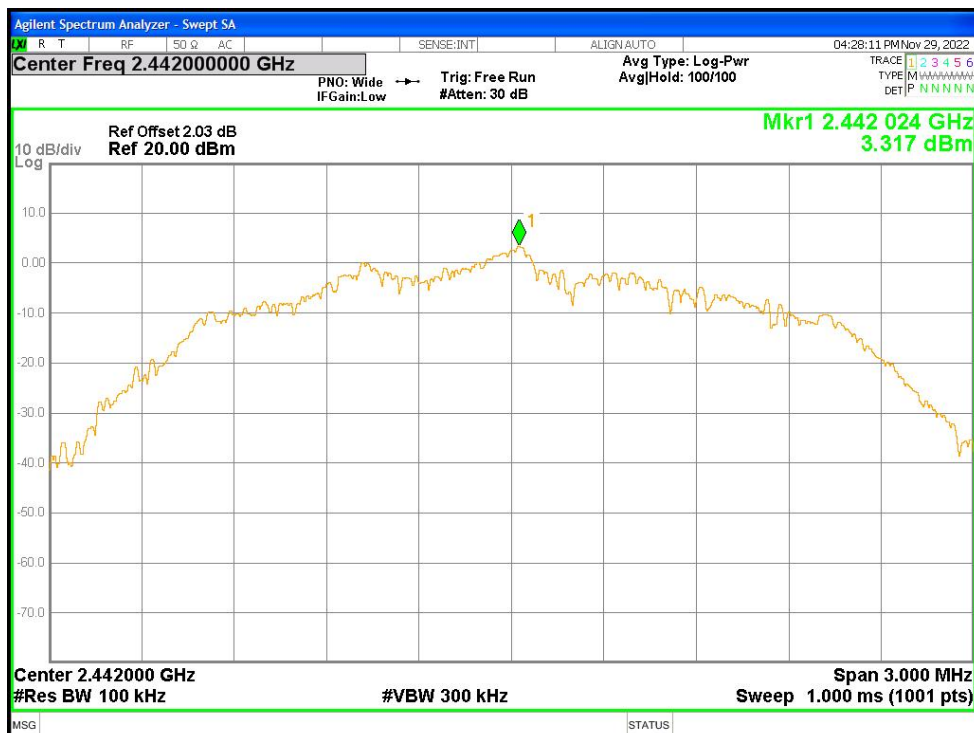
Tx. Spurious NVNT BLE 2M 2402MHz Ant1 Ref



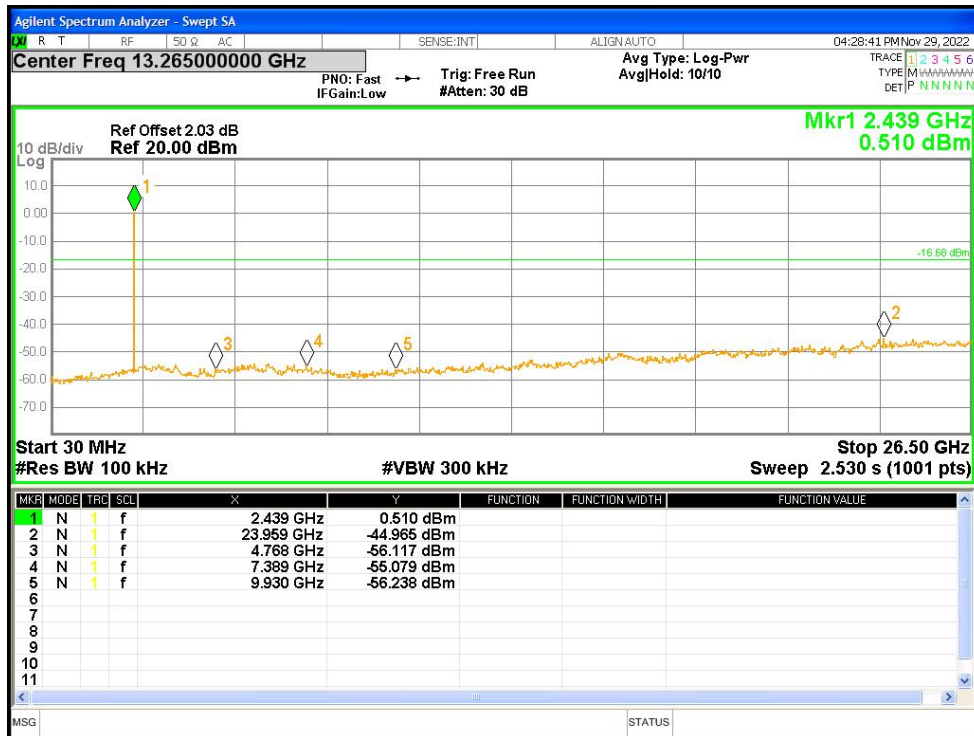
Tx. Spurious NVNT BLE 2M 2402MHz Ant1 Emission



Tx. Spurious NVNT BLE 2M 2442MHz Ant1 Ref



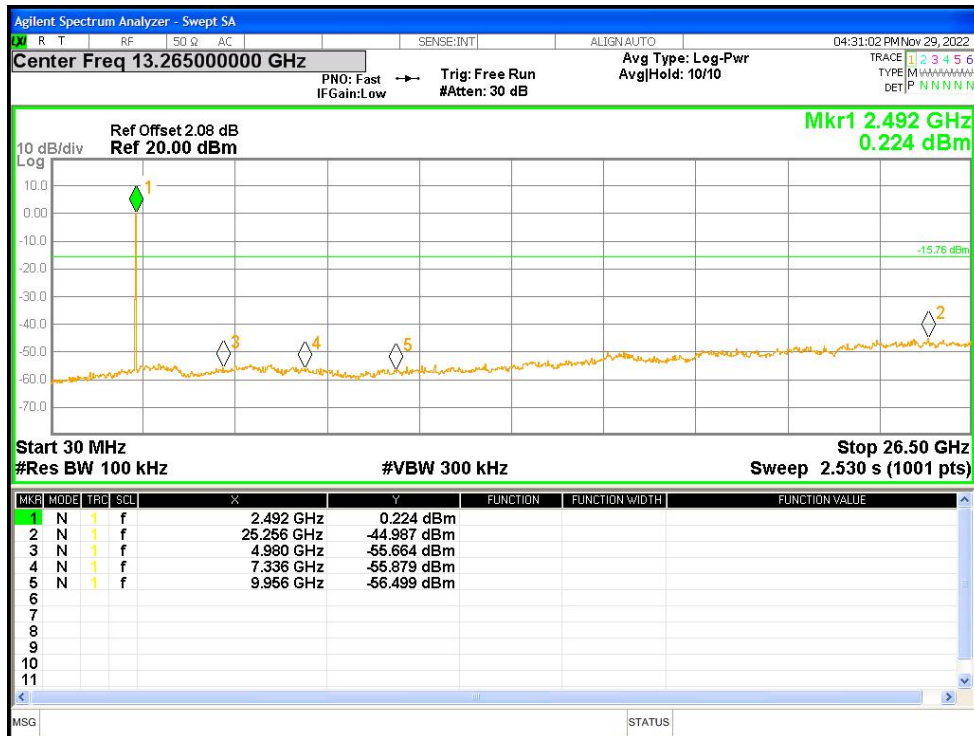
Tx. Spurious NVNT BLE 2M 2442MHz Ant1 Emission



Tx. Spurious NVNT BLE 2M 2480MHz Ant1 Ref



Tx. Spurious NVNT BLE 2M 2480MHz Ant1 Emission



APPENDIX A: PHOTOGRAPHS OF TEST SETUP

Reference to the test Attachment Test photos

APPENDIX B: PHOTOGRAPHS OF EUT

Reference to the test report No. BLA-EMC-202209-A5501

----END OF REPORT----

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