Test Report

Report No.:	MTi211123023-01E1
Date of issue:	Apr. 13, 2022
Applicant:	Cherub Technology Co., Ltd
Product name:	2.4GHz Wireless Vlog System
Model(s):	B-10 Vlog
FCC ID:	2AOAA-B-10VLOG

Shenzhen Microtest Co., Ltd.
http://www.mtitest.com

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TEST RESULT CERTIFICATION	
Applicant's name:	Cherub Technology Co., Ltd
Address:	Room507, Block 1, Nanhai E-Cool, No. 6 Xinghua Road, Shekou, Nanshan District, Shenzhen City, Guangdong Province, China, 518067
Manufacturer's Name:	Cherub Technology Co., Ltd
Address:	Room507, Block 1, Nanhai E-Cool, No. 6 Xinghua Road, Shekou, Nanshan District, Shenzhen City, Guangdong Province, China, 518067
Factory's Name :	Cherub Technology Co., Ltd (Zhuhai High-tech Park)
Address:	No.10, Keji No.9Rd, Tangjiawan Town, Zhuhai National Hi-tech Industrial Development Zone, Zhuhai City, Guangdong Province, China, 519080
Product description	
Product name	2.4GHz Wireless Vlog System
Trademark	NUX
Model Name	B-10 Vlog
Serial Model	N/A
Standards	FCC Part 15.249
Test procedure	ANSI C63.10-2013
Date of Test	
Date (s) of performance of tests ..... :	2022-03-02 ~2022-04-13
Test Result ..... :	Pass

Testing Engineer : Danny Xu

(Danny Xu)

Technical Manager : Leon Chen

(Leon Chen)

Authorized Signatory : Tom Xue

(Tom Xue)

1 General description

1.1 Feature of equipment under test (EUT)

Equipment:	2.4GHz Wireless Vlog System
Model Name:	B-10 Vlog
Serial Model:	N/A
Model Difference:	N/A
Operation Frequency:	2404-2479MHz
Modulation Type:	GFSK
Antenna Type:	PCB antenna
Antenna Gain:	TX: PCB antenna (Antenna Gain: A1:2.93dBi, A2: 2.55dBi)
Max. Field Strength:	98.32dBuV/m
Power Source:	TX: Input: DC 5V 100mA RX: Input: DC 5V
Battery:	TX: DC 3.7V 400mAh RX: DC 3.7V 400mAh
Hardware version:	V1.0
Software version:	V1.0

1.2 Operation channel list

Channel	Frequency(MHz)	Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	2404	9	2434	17	2462
2	2408	10	2437	18	2465
3	2412	11	2441	19	2469
4	2416	12	2444	20	2472
5	2420	13	2448	21	2476
6	2424	14	2451	22	2479
7	2428	15	2455		
8	2431	16	2458		

1.3 Test Frequency Channel

Channel	Frequency(MHz)
Low	2404
Middle	2441
High	2479

1.4 EUT operation mode

During testing, RF test program provided by the manufacture to control the Tx operation followed the test requirement.

1.5 Ancillary equipment list

Equipment	Model	S/N	Manufacturer
Adapter	XY-PQ018E1	/	Dongguan Xu Yuan Electronic Technology Co., Ltd
Mobile phone	S9+	/	SAMSUNG
Mobile phone	P30 PRO	/	HUAWEI

2 Summary of Test Result

Test procedures according to the technical standards:

Item	FCC Part No.	Description of Test	Result
1	FCC Part15.203	Antenna Requirement	Pass
2	FCC Part15.207	AC power line conducted emission	N/A
5	FCC Part15.249(d)	Radiated spurious emission	Pass
4	FCC Part 15.215	20dB and 99% Bandwidth	Pass

3 Test Facilities and Accreditations

3.1 Test laboratory

Test Laboratory	Shenzhen Microtest Co., Ltd
Location	101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao' an District, Shenzhen, Guangdong, China.
FCC Registration No.	448573

3.2 Environmental conditions

Temperature:	15ºC~35ºC
Humidity	20%~75%
Atmospheric pressure	98kPa~101kPa

3.3 Measurement uncertainty

The reported uncertainty of measurement y ± U，where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2，providing a level of confidence of approximately 95 %

RF frequency	1 x 10-7
RF power, conducted	± 1 dB
Conducted emission(150kHz~30MHz)	± 2.5 dB
Radiated emission(30MHz~1GHz)	± 4.2 dB
Radiated emission (above 1GHz)	± 4.3 dB
Temperature	±1 degree
Humidity	± 5 %

3.4 Test software

Software Name	Manufacturer	Model	Version
Bluetooth and WiFi Test System	Shenzhen JS tonscend co,.ltd	JS1120-3	2.5.77.0418

4 List of test equipment

Equipment No.	Equipment Name	Manufacturer	Model	Serial No.	Calibration date	Due date
MTI-E043	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2021/06/02	2022/06/01
MTI-E044	TRILOG Broadband Antenna	schwarabeck	VULB 9163	9163-1338	2021/05/30	2023/05/29
MTI-E047	Amplifier	Hewlett-Packard	8447F	3113A06150	2021/06/02	2022/06/01
MTI-E089	ESG Vector Signal Generator	Agilent	N5182A	MY49060455	2021/06/02	2022/06/01
MTI-E058	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2021/06/02	2022/06/01
MTI-E062	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2021/06/02	2022/06/01
MTI-E066	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2021/06/02	2022/06/01
MTI-E078	Synthesized Sweeper	Agilent	83752A	3610A01957	2021/06/02	2022/06/01
MTI-E079	DC Power Supply	Agilent	E3632A	MY40027695	2021/06/02	2022/06/01
MTI-E045	Double Ridged Broadband Horn Antenna	schwarabeck	BBHA 9120D	9120D-2278	2021/05/30	2023/05/29
MTI-E021	EMI Test Receiver	Rohde&schwarz	ESCS30	100210	2021/06/02	2022/06/01
MTI-E022	Pulse Limiter	Schwarzbeck	VSTD 9561-F	00679	2021/06/02	2022/06/01
MTI-E023	Artificial mains network	Schwarzbeck	NSLK 8127	NSLK 8127 #841	2021/06/02	2022/06/01
MTI-E046	Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00044	2021/05/30	2023/05/29
MTI-E048	Amplifier	Agilent	8449B	3008A02400	2021/06/02	2022/06/01
MTI-E072	Thermometer Clock Humidity Monitor	-	HTC-1	/	2021/06/02	2022/06/01
Note: the calibration interval of the above test instruments is 12 or 24 months and the calibrations are traceable to international system unit (SI).						

5 Test Result

5.1 Antenna requirement

5.1.1 Standard requirement

FCC PART 15.203;

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

5.1.2 EUT Antenna

The antenna is a PCB antenna, which was permanently affixed to the device and un-replaced, complies with 15.203. In addition, the maximum antenna gain is TX: PCB antenna (Antenna Gain: ATN 1=2.93dBi, ATN 2=2.55dBi), RX: PCB antenna (Antenna Gain: ATN 1=2.94dBi, ATN 2=2.45dBi)dBi.

5.2 AC power line conducted emission

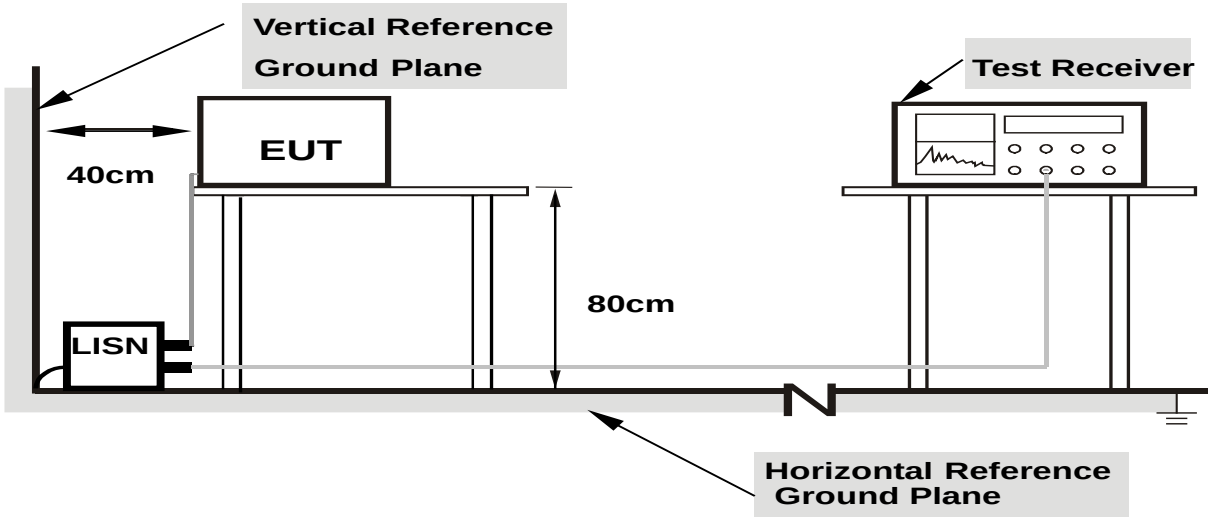
5.2.1 Limits

FCC §15.207;

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50μH/50Ω line impedance stabilization network (LISN).

Frequency (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 note2	56 - 46 note2
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00
Note1: The tighter limit applies at the band edges. Note2: The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.		

5.2.2 Test setup



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

5.2.3 Test procedure

a. EUT Operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

b. The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

c. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment's powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

d. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

e. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

f. LISN at least 80 cm from nearest part of EUT chassis.

For the actual test configuration, please refer to the related Item –EUT Test Photos.

5.2.4 Test results

Note: The device is a DC power supply and does not apply to conducted emissions.

5.3 Radiated spurious emission

5.3.1 Limit

FCC PART 15.249(a);

Except as provided in paragraph (a) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Frequency (MHz)	Field Strength of Fundamental (mV/m)	Field Strength of Harmonics (μV/m)
902-928	50	500
2400-2483.5	50	500
5725-5875	50	500

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
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

5.3.2 Test method

a) The EUT is placed on a turntable, which is 0.8m above ground plane for test frequency range blew 1GHz, and 1.5m above ground plane for test frequency range above 1GHz.

b) EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.

c) Use the following spectrum analyser settings:

1) Span = wide enough to fully capture the emission being measured

2) RBW = 1 MHz for f ≥ 1GHz, 100 kHz for f < 1 GHz

3) VBW ≥ RBW, Sweep = auto

4) Detector function = peak

5) Trace = max hold

d) Follow the guidelines in ANSI C63.4-2014 with respect to maximizing the emission by rotating the EUT, adjusting the measurement antenna height and polarization, etc. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, submit this data. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

e) The peak level, once corrected, must comply with the limit specified in Section 15.209. Set the RBW = 1MHz, VBW = 10Hz, Detector = PK for AV value, while maintaining all of the other instrument settings.

5.3.3 Test Result

Below 30MHz

EUT：	2.4GHz Wireless Vlog System	Model name. ：	B-10 Vlog
Pressure：	1010 hPa	Test voltage：	Power by battery
Test mode：	TX	Polarization :	--

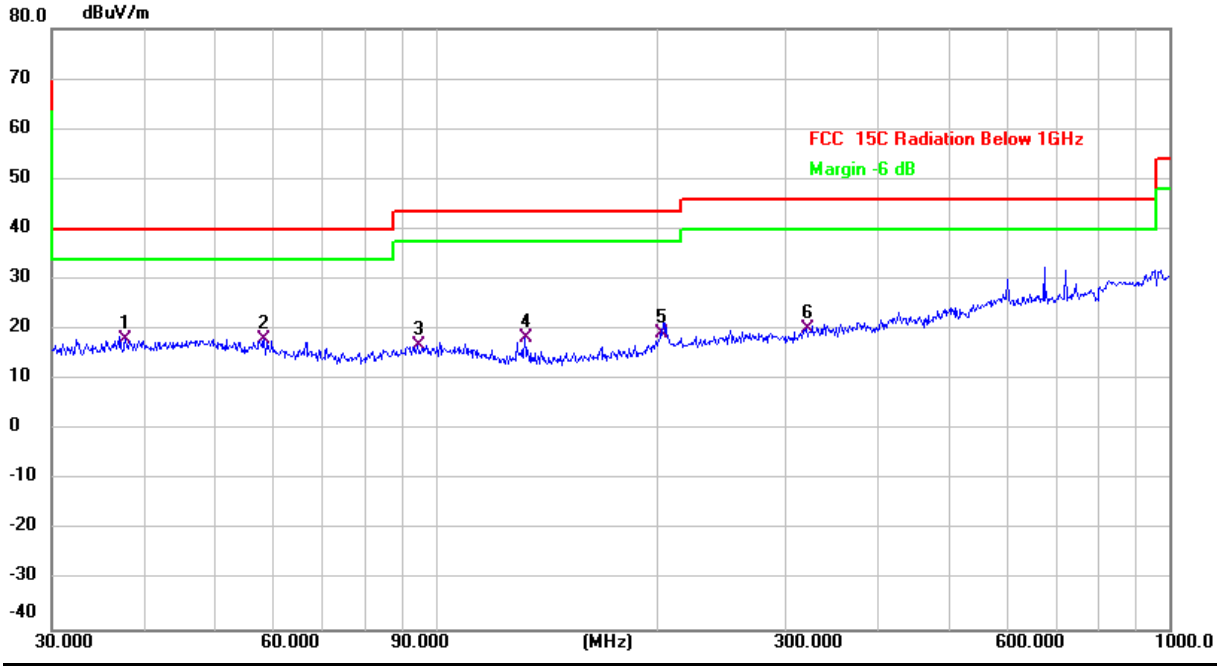
Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	Pass
--	--	--	--	Pass

Note:

1. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
2. Distance extrapolation factor =40 log (specific distance/test distance)(dB);
3. Limit line = specific limits (dBuV) + distance extrapolation factor.

30MHz-1GHz
ANT 1:

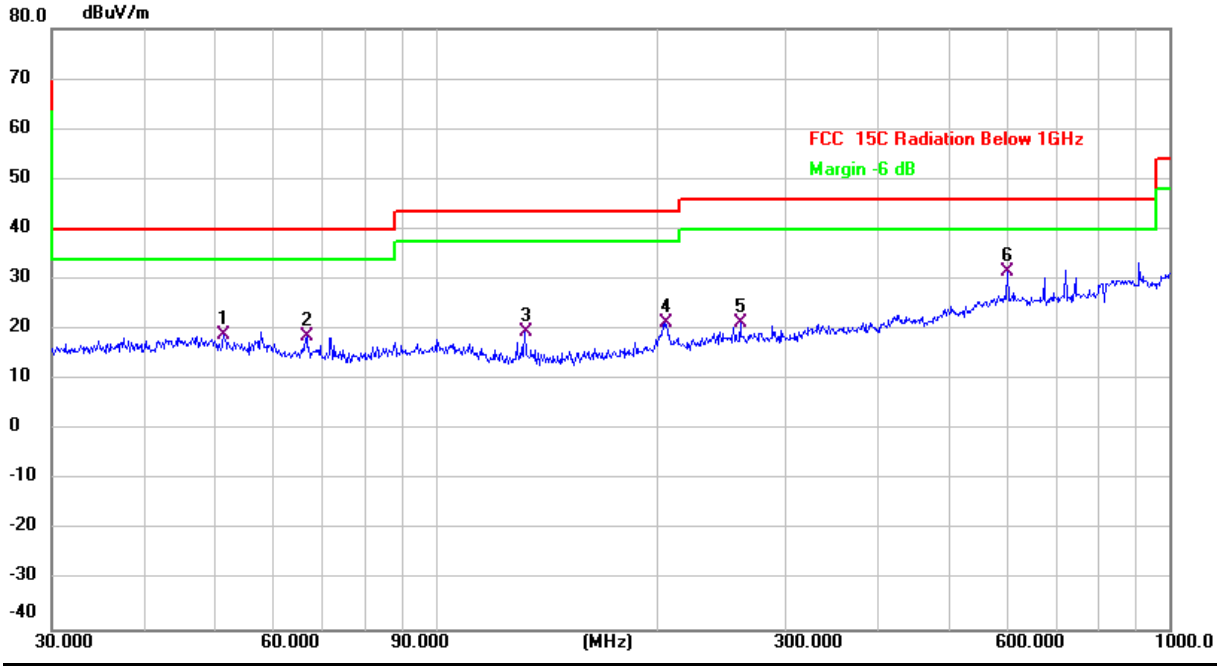
EUT:	2.4GHz Wireless Vlog System	Model Name:	B-10 Vlog
Pressure:	101kPa	Polarization:	Horizontal
Test voltage:	Power by battery	Test Mode:	TX-2479MHz



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		37.8121	26.30	-8.15	18.15	40.00	-21.85	QP
2	*	58.4074	27.40	-9.21	18.19	40.00	-21.81	QP
3		94.4284	25.61	-8.72	16.89	43.50	-26.61	QP
4		132.2206	29.19	-10.81	18.38	43.50	-25.12	QP
5		202.8104	26.89	-7.57	19.32	43.50	-24.18	QP
6		319.9370	25.06	-4.78	20.28	46.00	-25.72	QP

ANT 1:

EUT:	2.4GHz Wireless Vlog System	Model Name:	B-10 Vlog
Pressure:	101kPa	Polarization:	Vertical
Test voltage:	Power by battery	Test Mode:	TX-2479MHz



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		51.4807	26.87	-7.92	18.95	40.00	-21.05	QP
2		66.7325	28.54	-9.84	18.70	40.00	-21.30	QP
3		132.2206	30.44	-10.81	19.63	43.50	-23.87	QP
4		205.6751	28.74	-7.50	21.24	43.50	-22.26	QP
5		260.1444	27.02	-5.75	21.27	46.00	-24.73	QP
6	*	601.4265	31.35	0.14	31.49	46.00	-14.51	QP

Note:

1. Emission Level = Meter Reading + Factor, Margin= Emission Level- Limit, Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. The three modulated high, medium and low channels have been tested. The report only shows the worst mode. The worst mode is CH22.

ANT 1:
1GHz-26.5GHz:

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
GFSK - 2404 MHz TX mode							
4808	42.12	1.53	43.65	74	-30.35	Peak	V
4808	35.83	1.53	37.36	54	-16.64	AVG	V
7212	40.47	5.46	45.93	74	-28.07	Peak	V
7212	34.46	5.46	39.92	54	-14.08	AVG	V
9616	43.19	6.33	49.52	74	-24.48	Peak	V
9616	33.36	6.33	39.69	54	-14.31	AVG	V
4808	45.16	1.53	46.69	74	-27.31	Peak	H
4808	38.91	1.53	40.44	54	-13.56	AVG	H
7212	39.76	5.46	45.22	74	-28.78	Peak	H
7212	33.9	5.46	39.36	54	-14.64	AVG	H
9616	43.12	6.33	49.45	74	-24.55	Peak	H
9616	33.32	6.33	39.65	54	-14.35	AVG	H
GFSK - 2441 MHz TX mode							
4882	40.92	1.68	42.6	74	-31.4	Peak	V
4882	34.68	1.68	36.36	54	-17.64	AVG	V
7323	40.29	5.45	45.74	74	-28.26	Peak	V
7323	34.19	5.45	39.64	54	-14.36	AVG	V
9764	42.33	6.37	48.7	74	-25.3	Peak	V
9764	36.19	6.37	42.56	54	-11.44	AVG	V
4882	43.41	1.68	45.09	74	-28.91	Peak	H
4882	37.35	1.68	39.03	54	-14.97	AVG	H
7323	39.7	5.45	45.15	74	-28.85	Peak	H
7323	33.68	5.45	39.13	54	-14.87	AVG	H
9764	41.68	6.37	48.05	74	-25.95	Peak	H
9764	35.65	6.37	42.02	54	-11.98	AVG	H

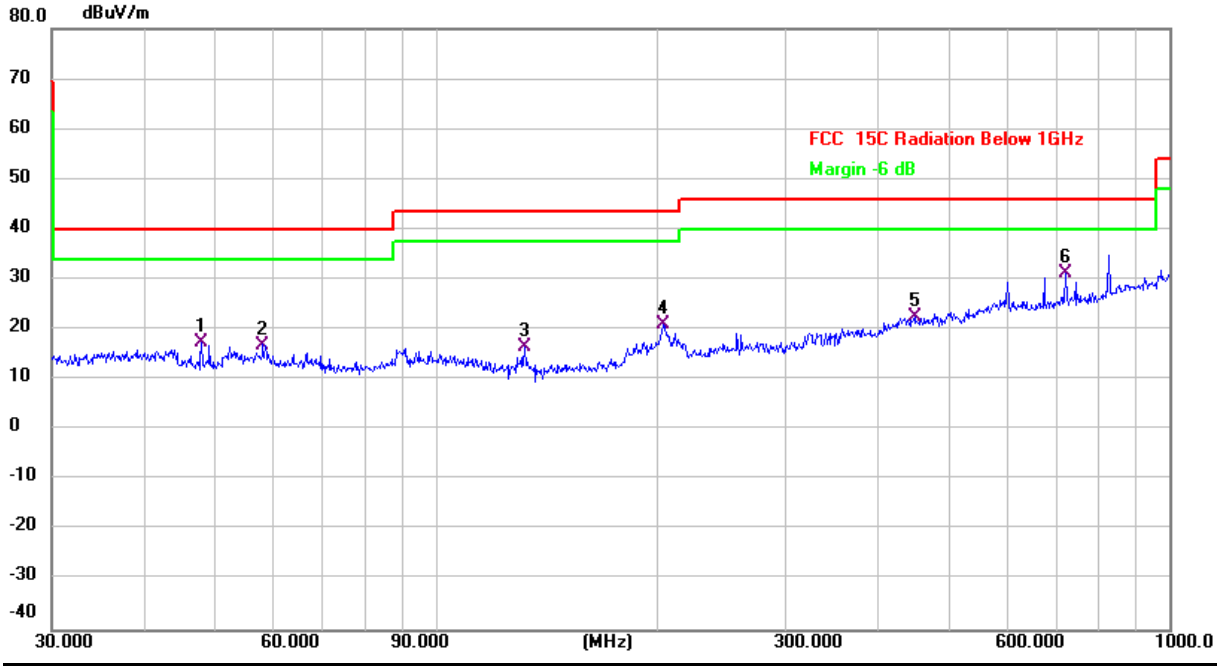
Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
GFSK - 2479 MHz TX mode							
4958	39.43	1.83	41.26	74	-32.74	Peak	V
4958	34.31	1.83	36.14	54	-17.86	AVG	V
7437	39.69	5.43	45.12	74	-28.88	Peak	V
7437	33.72	5.43	39.15	54	-14.85	AVG	V
9916	40.67	6.4	47.07	74	-26.93	Peak	V
9916	35.16	6.4	41.56	54	-12.44	AVG	V
4958	41.35	1.83	43.18	74	-30.82	Peak	H
4958	35.33	1.83	37.16	54	-16.84	AVG	H
7437	39.37	5.43	44.8	74	-29.2	Peak	H
7437	32.85	5.43	38.28	54	-15.72	AVG	H
9916	41.48	6.4	47.88	74	-26.12	Peak	H
9916	35.19	6.4	41.59	54	-12.41	AVG	H

Note:

1. All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).
2. Emission Level= Antenna Factor + Cable Loss + Read Level - Preamp Factor
3. All the modulation modes have been tested, and the worst results are reflected in the report.

30MHz-1GHz
ANT 2:

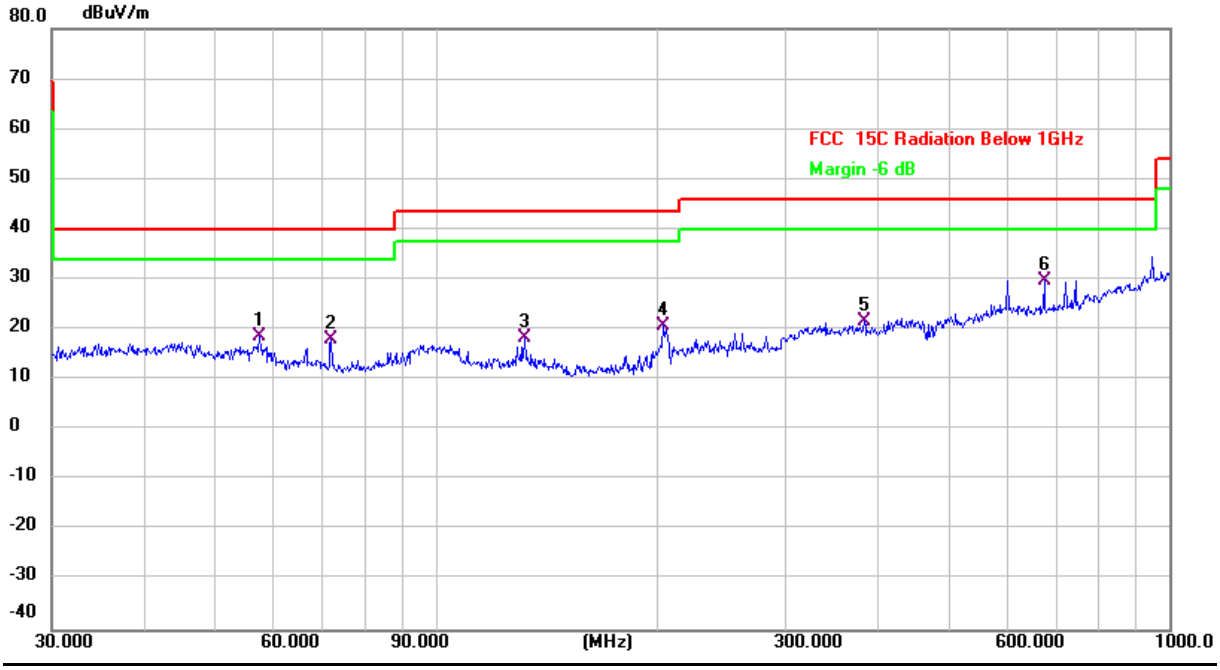
EUT:	2.4GHz Wireless Vlog System	Model Name:	B-10 Vlog
Pressure:	101kPa	Polarization:	Horizontal
Test voltage:	Power by battery	Test Mode:	TX-2441MHz



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		47.9938	24.96	-7.54	17.42	40.00	-22.58	QP
2		58.2028	26.18	-9.18	17.00	40.00	-23.00	QP
3		132.2204	27.26	-10.81	16.45	43.50	-27.05	QP
4		204.2375	28.64	-7.54	21.10	43.50	-22.40	QP
5		449.5557	26.07	-3.51	22.56	46.00	-23.44	QP
6	*	721.7258	30.84	0.35	31.19	46.00	-14.81	QP

ANT 2:

EUT:	2.4GHz Wireless Vlog System	Model Name:	B-10 Vlog
Pressure:	101kPa	Polarization:	Vertical
Test voltage:	Power by battery	Test Mode:	TX-2441MHz



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		57.5938	27.83	-9.06	18.77	40.00	-21.23	QP
2		72.0841	28.03	-10.04	17.99	40.00	-22.01	QP
3		132.2204	29.19	-10.81	18.38	43.50	-25.12	QP
4		204.2375	28.24	-7.54	20.70	43.50	-22.80	QP
5		383.9318	26.09	-4.45	21.64	46.00	-24.36	QP
6	*	675.2078	30.05	-0.28	29.77	46.00	-16.23	QP

Note:

3. Emission Level = Meter Reading + Factor, Margin= Emission Level- Limit, Factor = Antenna Factor + Cable Loss – Pre-amplifier.

4. The three modulated high, medium and low channels have been tested. The report only shows the worst mode. The worst mode is CH11.

ANT 2:
1GHz-26.5GHz:

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
GFSK - 2404 MHz TX mode							
4808	42.33	1.53	43.86	74	-30.14	Peak	V
4808	36.12	1.53	37.65	54	-16.35	AVG	V
7212	40.68	5.46	46.14	74	-27.86	Peak	V
7212	35.13	5.46	40.59	54	-13.41	AVG	V
9616	43.52	6.33	49.85	74	-24.15	Peak	V
9616	33.11	6.33	39.44	54	-14.56	AVG	V
4808	45.39	1.53	46.92	74	-27.08	Peak	H
4808	38.15	1.53	39.68	54	-14.32	AVG	H
7212	39.49	5.46	44.95	74	-29.05	Peak	H
7212	34.11	5.46	39.57	54	-14.43	AVG	H
9616	42.15	6.33	48.48	74	-25.52	Peak	H
9616	34.56	6.33	40.89	54	-13.11	AVG	H
GFSK - 2441 MHz TX mode							
4882	41.26	1.68	42.94	74	-31.06	Peak	V
4882	35.11	1.68	36.79	54	-17.21	AVG	V
7323	41.18	5.45	46.63	74	-27.37	Peak	V
7323	35.68	5.45	41.13	54	-12.87	AVG	V
9764	43.55	6.37	49.92	74	-24.08	Peak	V
9764	36.83	6.37	43.2	54	-10.8	AVG	V
4882	44.52	1.68	46.2	74	-27.8	Peak	H
4882	38.54	1.68	40.22	54	-13.78	AVG	H
7323	40.52	5.45	45.97	74	-28.03	Peak	H
7323	34.52	5.45	39.97	54	-14.03	AVG	H
9764	42.56	6.37	48.93	74	-25.07	Peak	H
9764	36.52	6.37	42.89	54	-11.11	AVG	H

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
GFSK - 2479 MHz TX mode							
4958	40.35	1.83	42.18	74	-31.82	Peak	V
4958	35.45	1.83	37.28	54	-16.72	AVG	V
7437	42.15	5.43	47.58	74	-26.42	Peak	V
7437	35.87	5.43	41.3	54	-12.7	AVG	V
9916	42.89	6.4	49.29	74	-24.71	Peak	V
9916	35.49	6.4	41.89	54	-12.11	AVG	V
4958	43.29	1.83	45.12	74	-28.88	Peak	H
4958	36.82	1.83	38.65	54	-15.35	AVG	H
7437	43.86	5.43	49.29	74	-24.71	Peak	H
7437	37.41	5.43	42.84	54	-11.16	AVG	H
9916	44.65	6.4	51.05	74	-22.95	Peak	H
9916	37.49	6.4	43.89	54	-10.11	AVG	H

5.3.4 Band edge–Field strength of fundamental

ANT 1:

Frequency	Ant. Polarization	Emission level	Limits	Detector	Result
(MHz)	H / V	dBμV/m	dBμV/m		
2404	H	97.31	114	PK	PASS
2404	H	93.40	94	AV	PASS
2404	V	81.45	114	PK	PASS
2404	V	79.27	94	AV	PASS

Frequency	Ant. Polarization	Emission level	Limits	Detector	Result
(MHz)	H / V	dBμV/m	dBμV/m		
2441	H	97.12	114	PK	PASS
2441	H	91.31	94	AV	PASS
2441	V	82.56	114	PK	PASS
2441	V	80.45	94	AV	PASS

Frequency	Ant. Polarization	Emission level	Limits	Detector	Result
(MHz)	H / V	dBμV/m	dBμV/m		
2479	H	98.32	114	PK	PASS
2479	H	93.46	94	AV	PASS
2479	V	84.13	114	PK	PASS
2479	V	82.36	94	AV	PASS

ANT 2:

Frequency	Ant. Polarization	Emission level	Limits	Detector	Result
(MHz)	H / V	dBμV/m	dBμV/m		
2404	H	97.10	114	PK	PASS
2404	H	92.86	94	AV	PASS
2404	V	80.76	114	PK	PASS
2404	V	75.67	94	AV	PASS

Frequency	Ant. Polarization	Emission level	Limits	Detector	Result
(MHz)	H / V	dBμV/m	dBμV/m		
2441	H	96.68	114	PK	PASS
2441	H	90.58	94	AV	PASS
2441	V	81.98	114	PK	PASS
2441	V	76.45	94	AV	PASS

Frequency	Ant. Polarization	Emission level	Limits	Detector	Result
(MHz)	H / V	dBμV/m	dBμV/m		
2479	H	95.92	114	PK	PASS
2479	H	90.33	94	AV	PASS
2479	V	81.63	114	PK	PASS
2479	V	77.96	94	AV	PASS

5.3.5 Band edge-radiated

ANT1:

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
GFSK – Low band-edge							
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
2310	48.47	-6.6	41.87	74	-32.13	Peak	V
2310	38.16	-6.6	31.56	54	-22.44	AVG	V
2390	47.85	-6.23	41.62	74	-32.38	Peak	V
2390	38.66	-6.23	32.43	54	-21.57	AVG	V
2400	49.13	-6.38	42.75	74	-31.25	Peak	V
2400	41.52	-6.38	35.14	54	-18.86	AVG	V
2310	47.37	-6.6	40.77	74	-33.23	Peak	H
2310.01	38.33	-6.6	31.73	54	-22.27	AVG	H
2390	48.29	-6.23	42.06	74	-31.94	Peak	H
2390.09	38.97	-6.23	32.74	54	-21.26	AVG	H
2400	64.89	-6.38	58.51	74	-15.49	Peak	V
2400	51.81	-6.38	45.43	54	-8.57	AVG	V
GFSK – High band-edge							
2483.5	53.42	-5.79	47.63	74	-26.37	Peak	V
2483.5	40.8	-5.79	35.01	54	-18.99	AVG	V
2500	48.12	-5.72	42.4	74	-31.6	Peak	V
2500	38.64	-5.72	32.92	54	-21.08	AVG	V
2483.5	67.42	-5.79	61.63	74	-12.37	Peak	H
2483.5	51.87	-5.79	46.08	54	-7.92	AVG	H
2500	47.7	-5.72	41.98	74	-32.02	Peak	H
2500	39.16	-5.72	33.44	54	-20.56	AVG	H

ANT2:

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
GFSK – Low band-edge							
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
2310	49.06	-6.6	42.46	74	-31.54	Peak	V
2310	37.99	-6.6	31.39	54	-22.61	AVG	V
2390	47.21	-6.23	40.98	74	-33.02	Peak	V
2390	37.68	-6.23	31.45	54	-22.55	AVG	V
2400	48.87	-6.38	42.49	74	-31.51	Peak	V
2400	39.89	-6.38	33.51	54	-20.49	AVG	V
2310	48.03	-6.6	41.43	74	-32.57	Peak	H
2310	37.62	-6.6	31.02	54	-22.98	AVG	H
2390	47.89	-6.23	41.66	74	-32.34	Peak	H
2390	37.19	-6.23	30.96	54	-23.04	AVG	H
2400	63.02	-6.38	56.64	74	-17.36	Peak	H
2400	51.73	-6.38	45.35	54	-8.65	AVG	H
GFSK – High band-edge							
2483.5	52.16	-5.79	46.37	74	-27.63	Peak	V
2483.5	40.13	-5.79	34.34	54	-19.66	AVG	V
2500	48.65	-5.72	42.93	74	-31.07	Peak	V
2500	38.85	-5.72	33.13	54	-20.87	AVG	V
2483.5	66.38	-5.79	60.59	74	-13.41	Peak	H
2483.5	50.18	-5.79	44.39	54	-9.61	AVG	H
2500	46.84	-5.72	41.12	74	-32.88	Peak	H
2500	39.16	-5.72	33.44	54	-20.56	AVG	H

5.4 20dB and 99% bandwidth

5.4.1 Limits

FCC §15.215(c)

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in § 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

5.4.2 Test method

Use the following spectrum analyzer settings:

For 20 dB bandwidth

Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel

RBW ≥1% of the 20 dB bandwidth

VBW ≥RBW

Sweep = auto

Detector function = peak

Trace = max hold

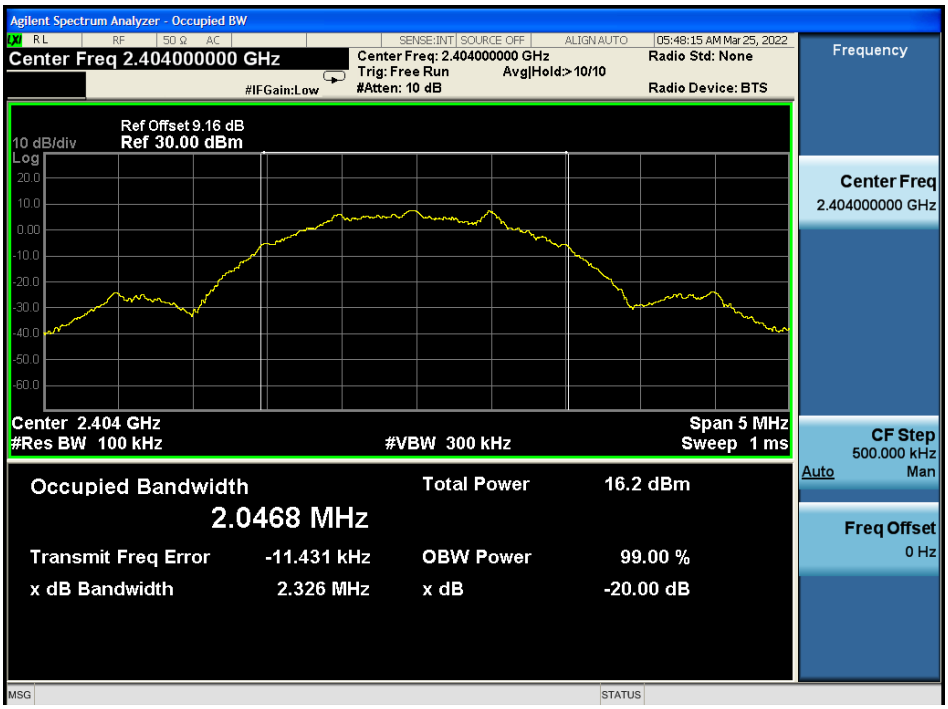
The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth and 99% occupied bandwidth of the emission

5.4.3 Test result

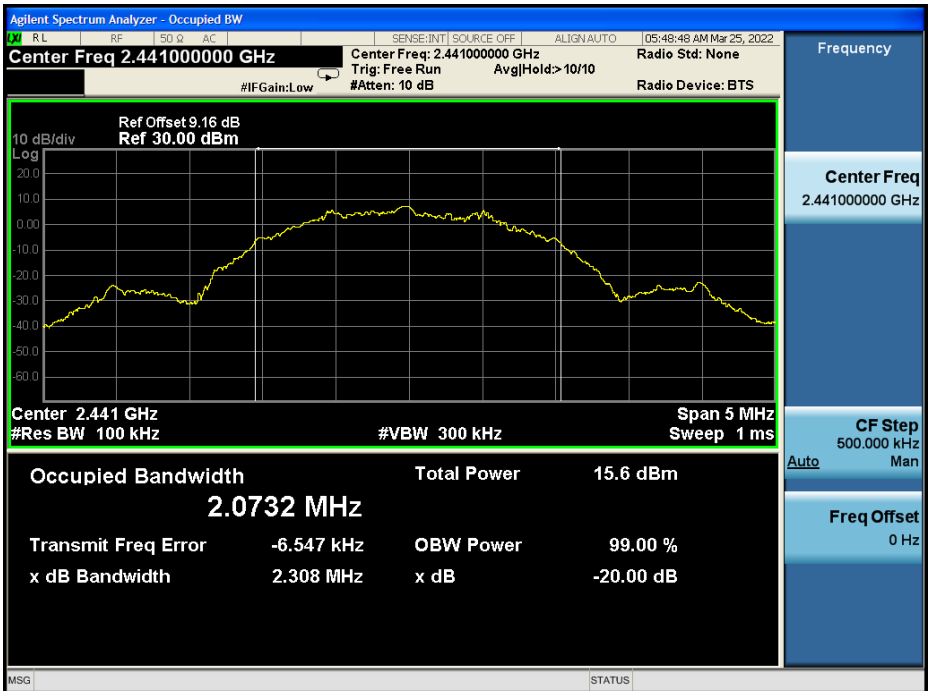
Frequency (MHz)	20dB bandwidth (MHz)	99% bandwidth (MHz)
2404	2.326	2.0468
2441	2.308	2.0732
2479	2.354	2.0837

Test plots

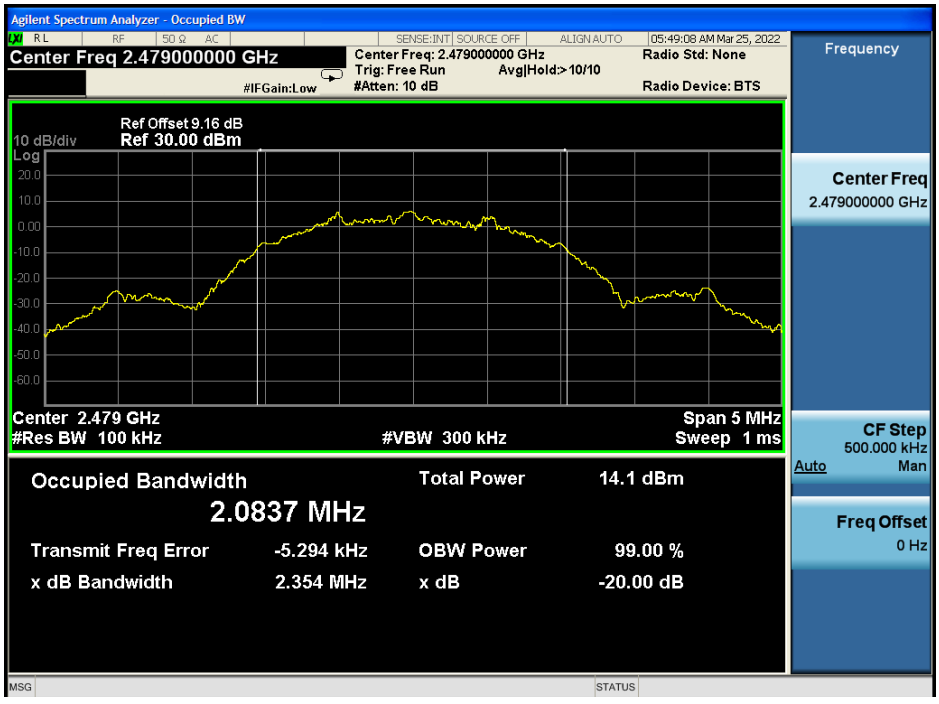
2404MHz



2441MHz



2479MHz



Photographs of the Test Setup

See the APPENDIX – Test setup photos.

Photographs of the EUT

See the APPENDIX 1- EUT PHOTO.

----END OF REPORT----