

Report No.: ZR/2021/5004003

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FCC TEST REPORT

Application No.: ZR/2021/50040

Applicant: Great Talent Technology Limited

Address of Applicant 35F, HBC HuiLong Center Building-II Minzhi Street, Longhua, Shenzhen, P.R.

China

Manufacturer: Great Talent Technology Limited

Address of Manufacturer 35F, HBC HuiLong Center Building-II Minzhi Street, Longhua, Shenzhen, P.R.

China

EUT Description: smart phone Model No.: U696CL Trade Mark: **UMX**

FCC ID: 2ALZM-U696CL

Standards: 47 CFR FCC Part 2, Subpart J

47 CFR Part 15, Subpart C

Date of Receipt: 2021/7/2

Date of Test: 2021/7/2 to 2021/7/23

Date of Issue: 2021/8/3 **Test Result:** PASS *

In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Authorized Signature:

Derek Yang Wireless Laboratory Manager





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1 Version

Revision Record					
Version	Chapter	Date	Modifier	Remark	
01		2021-08-03		Original	

Authorized for issue by:	
Prepared By	Dee.Zheng
	(Dee Zheng) / Engineer
Checked By	John Hong
	(Jim Huang) / Reviewer





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2 **Test Summary**

			Toot		Toot
Test Item	Test Requirement	Test Method	Test Result	Result	Test Lab*
AC Power Line Conducted Emission	15.207	ANSI C63.10 2013	Clause 4.2	PASS	В
Conducted Output Power	15.247 (b)(3)	ANSI C63.10 2013	Clause 4.3	PASS	Α
DTS (6 dB) Bandwidth	15.247 (a)(2)	ANSI C63.10 2013	Clause 4.4	PASS	Α
Power Spectral Density	15.247 (e)	ANSI C63.10 2013	Clause 4.5	PASS	Α
Band-edge for RF Conducted Emissions	15.247(d)	ANSI C63.10 2013	Clause 4.6	PASS	Α
RF Conducted Spurious Emissions	15.247(d)	ANSI C63.10 2013	Clause 4.7	PASS	Α
Radiated Spurious Emissions	15.205/15.209	ANSI C63.10 2013	Clause 4.8	PASS	В
Restricted bands around fundamental frequency (Radiated Emission)	15.205/15.209	ANSI C63.10 2013	Clause 4.9	PASS	В

Remark: All test were performed by Lab A and B.

Lab A SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch Lab B SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD.





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General Information 3

3.1 Details of Client

Applicant:	Great Talent Technology Limited		
Address of Applicant	35F,HBC HuiLong Center Building-II Minzhi Street,Longhua, Shenzhen, P.R. China		
Manufacturer:	Great Talent Technology Limited		
Address of Manufacturer	35F,HBC HuiLong Center Building-II Minzhi Street,Longhua, Shenzhen, P.R. China		

3.2 Test Location

Lab A:

Company:	SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch	
Address: No. 1 Workshop, M-10, Middle section, Science & Technology Pa		
Post code:	518057	
Test engineer:	Dee Zheng,Swing Hu,Jack Huang	

Lab B:

Company: SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO.,	
Address: 1/F, Unit D, Building 1, Kanghong Orange Technology Park, No.13 3rd Road, Fengdong New City, Xi'an, Shaanxi China	
Post code:	710086
Test engineer:	Leah Chen,Ken Liu,Andy Yao





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3.3 Test Facility

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

Lab A:

A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

VCCI

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• FCC -Designation Number: CN1178

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

Lab B:

A2LA (Certificate No. 4854.01)

SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4854.01.

FCC-Designation Number: CN1271.





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3.4 General Description of EUT

EUT Description:	smart phone	
Model No.:	U696CL	
Trade Mark:	UMX	
Hardware Version:	U696CL_V1.0	
Software Version:	UMX_U696CL_V11.01.01.01.061711	
Operation Frequency:	2400MHz~2483.5MHz fc = 2402 MHz + N * 2 MHz, where: -fc = "Operating Frequency" in MHz, -N = "Channel Number" with the range from 0 to 39.	
Bluetooth version:	Bluetooth V4.2	
Modulation Type:	GFSK	
Number of Channel:	40	
Sample Type:	☐ Portable Device, ☐ Module	
Antenna Type:	☐ External, ⊠ Integrated	
Antenna Gain:	2.01dBi	

Remark: According to the client, the EUT doesn't support the rates of 2Mbps.





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

Remark:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency	
The Lowest channel(CH0)	2402MHz	
The Middle channel(CH19)	2440MHz	
The Highest channel(CH39)	2480MHz	

3.5 Test Environment

Operating Environment:		
Temperature:	25.0 °C	
Humidity:	50 % RH	
Atmospheric Pressure:	101.30 KPa	

3.6 Description of Support Units

The EUT has been tested independent unit.



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Test results and Measurement Data 4

4.1 Antenna Requirement

Standard requirement: 47 CFR Part 15C Section 15.203 /247(c)

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:

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.

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2.01dBi.



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4.2 AC Power Line Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207			
Test Method:	ANSI C63.10: 2013			
Test Frequency Range:	150kHz to 30MHz			
Limit:	Fraguency range (MHz)	Limit (dBuV)		
	Frequency range (MHz)	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 log	arithm of the frequency.		
Test Procedure:	 The mains terminal disturbance voltage test was conducted in a shielded room. The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω 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. 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. 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 bounda unit under test and bonded to a ground reference plane fo mounted on top of the ground reference plane. This distance was the closest points of the LISN 1 and the EUT. All other units of 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 each all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.			



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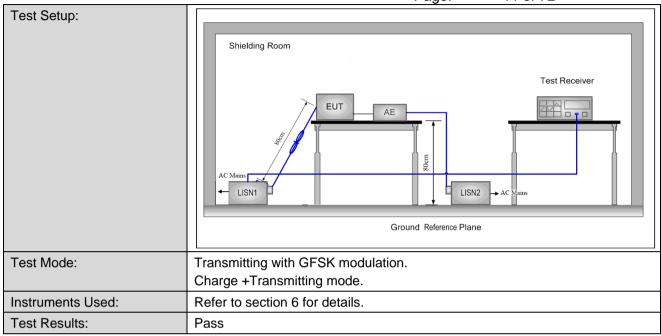
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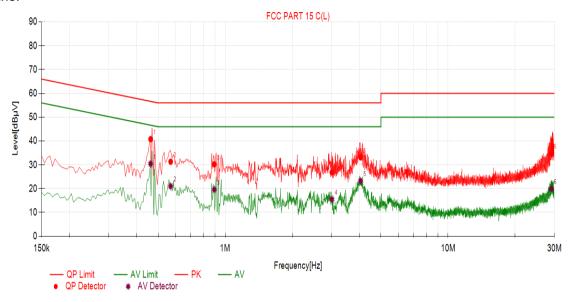
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Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Live Line:



Final Data List											
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]			
1	0.4627	10.15	40.79	56.64	15.85	30.46	46.64	24.59			
2	0.5693	10.16	31.31	56.00	24.69	21.04	46.00	16.71			
3	0.8938	10.18	30.22	56.00	25.78	19.60	46.00	27.34			
4	3.0120	10.04	26.80	56.00	29.20	15.53	46.00	26.67			
5	4.0504	9.81	33.11	56.00	22.89	23.25	46.00	20.00			
6	29.0426	13.89	34.79	60.00	25.21	19.96	50.00	29.60			



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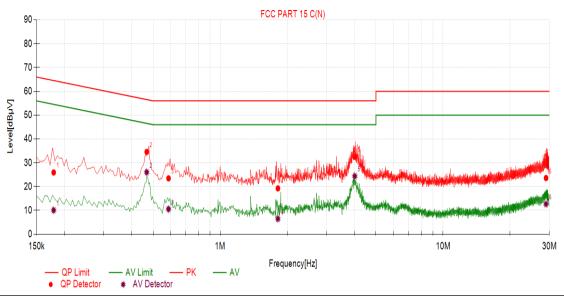
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Neutral Line:



Final	Final Data List											
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]				
1	0.1790	10.12	25.94	64.53	38.59	10.08	54.53	24.59				
2	0.4682	10.15	34.58	56.55	21.97	26.05	46.55	16.71				
3	0.5865	10.16	23.47	56.00	32.53	10.56	46.00	27.34				
4	1.8156	10.17	19.26	56.00	36.74	6.49	46.00	26.67				
5	4.0181	9.82	32.56	56.00	23.44	24.38	46.00	20.00				
6	28.9864	13.90	23.61	60.00	36.39	12.70	50.00	29.60				

Remark:

- 1. The following Quasi-Peak and Average measurements were performed on the EUT:
- 2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.



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4.3 Duty Cycle

The detailed test data see: Appendix

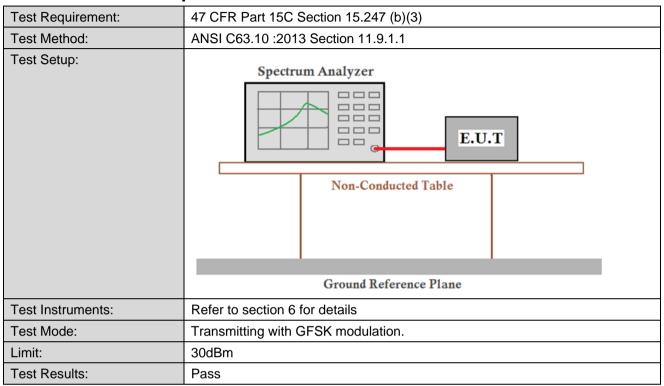




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4.4 Conducted Output Power



The detailed test data see: Appendix

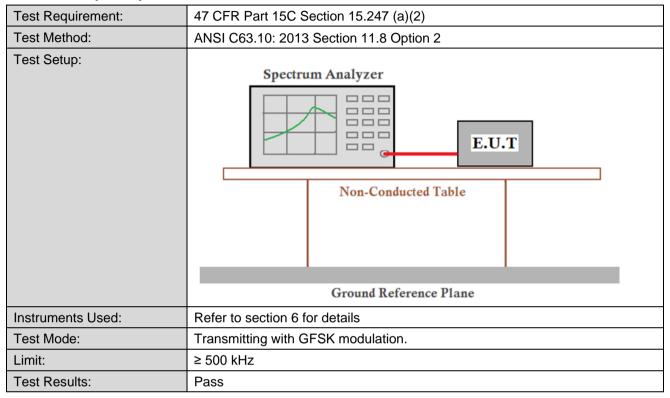




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4.5 DTS (6 dB) Bandwidth



The detailed test data see: Appendix

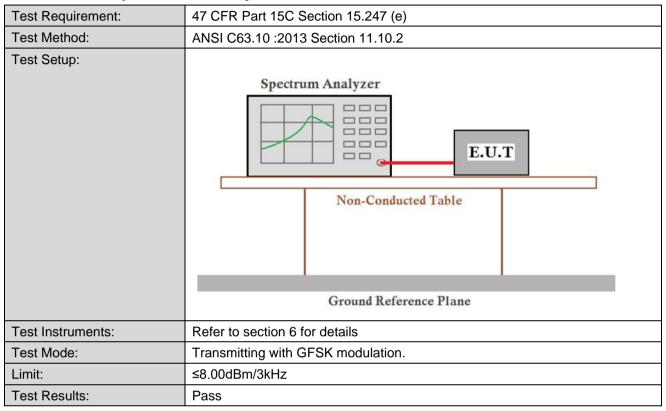




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4.6 Power Spectral Density



The detailed test data see: Appendix

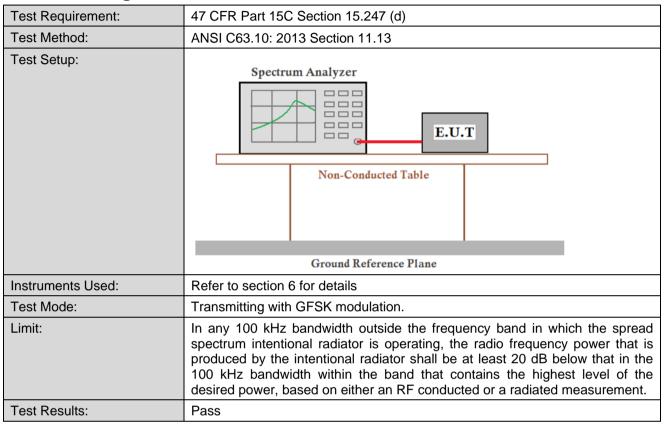




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4.7 Band-edge for RF Conducted Emissions



The detailed test data see: Appendix

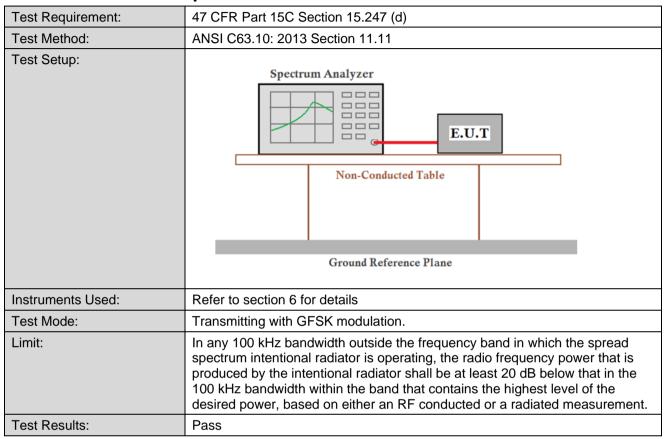




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4.8 RF Conducted Spurious Emissions



The detailed test data see: Appendix





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4.9 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section	n 15.209 and 15.20	05					
Test Method:	ANSI C63.10 :2013 Sect	ion 11.12						
Test Site:	Measurement Distance:	3m (Semi-Anechoi	ic Chamber)					
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark			
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak			
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average			
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak			
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak			
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average			
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak			
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak			
	Above 1GHz	Peak	1MHz	3MHz	Peak			
	Above 1GHz	10Hz	Average					
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)			
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300			
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30			
	1.705MHz-30MHz	30	-	-	30			
	30MHz-88MHz	100	40.0	Quasi-peak	3			
	88MHz-216MHz	150	43.5	Quasi-peak	3			
	216MHz-960MHz	200	46.0	Quasi-peak	3			
	960MHz-1GHz	500	54.0	Quasi-peak	3			
	Above 1GHz	500	54.0	Average	3			
Remark: 15.35(b),Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.								



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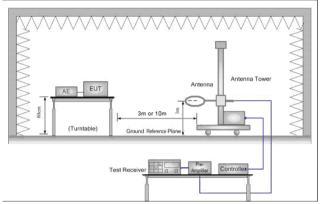
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Test Setup:



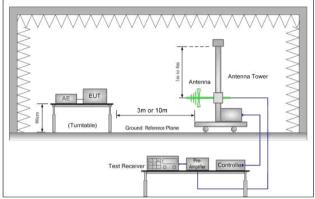


Figure 1. Below 30MHz

Figure 2. 30MHz to 1GHz

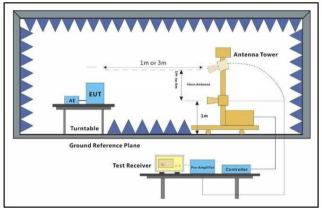


Figure 3. Above 1 GHz

Test 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 camber. 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 semi-anechoic camber. 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.
- e. 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



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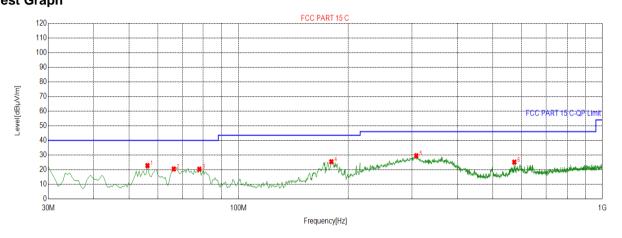




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4.9.1 **Radiated Emission below 1GHz Charge + Transmitting** 4.9.1.1 **Test Graph**



QP Detector

Suspe	Suspected List												
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity					
1	56.2031	22.80	-22.14	40.00	17.20	241	42	Horizontal					
2	66.3932	20.48	-23.23	40.00	19.52	257	0	Horizontal					
3	78.0390	20.35	-24.44	40.00	19.65	259	345	Horizontal					
4	179.940	25.47	-23.58	43.50	18.03	271	358	Horizontal					
5	308.044	29.54	-18.53	46.00	16.46	258	53	Horizontal					
6	572.986	25.14	-12.88	46.00	20.86	263	83	Horizontal					

Final Data List

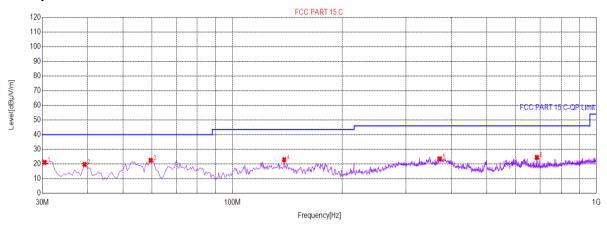




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Test Graph



QP Detector

Susp	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	30.4852	21.07	-23.92	40.00	18.93	198	84	Vertical				
2	39.2196	19.63	-22.99	40.00	20.37	174	164	Vertical				
3	59.5998	22.48	-22.24	40.00	17.52	162	318	Vertical				
4	138.694	22.88	-24.30	43.50	20.62	241	330	Vertical				
5	371.610	23.52	-17.57	46.00	22.48	258	50	Vertical				
6	686.533	24.41	-12.23	46.00	21.59	325	192	Vertical				

Final Data List



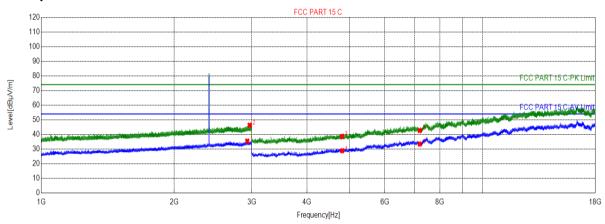


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4.9.2 **Transmitter Emission above 1GHz** BLE_1M_Channel 0

Test Graph



★ PK Detector	*	AV Detector
---------------	---	-------------

Suspe	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	2929.2965	35.49	8.00	54.00	18.51	187	173	Horizontal				
2	2965.2983	46.29	7.80	74.00	27.71	169	85	Horizontal				
3	4804.0000	38.60	-18.29	74.00	35.40	188	259	Horizontal				
4	4804.0000	28.87	-18.29	54.00	25.13	168	99	Horizontal				
5	7206.0000	33.43	-10.65	54.00	20.57	175	303	Horizontal				
6	7206.0000	42.65	-10.65	74.00	31.35	192	230	Horizontal				

Final Data List



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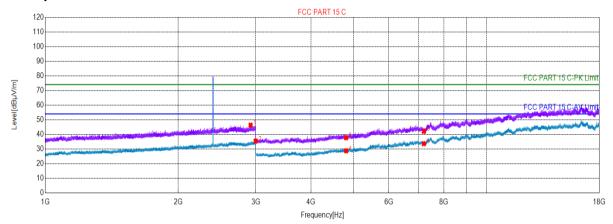


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BLE 1M Channel 0

Test Graph



 PK Detector * AV Detector

Suspe	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	2919.3960	46.30	7.85	74.00	27.70	225	300	Vertical				
2	2996.0998	35.41	8.01	54.00	18.59	281	47	Vertical				
3	4804.0000	37.72	-18.29	74.00	36.28	257	273	Vertical				
4	4804.0000	28.79	-18.29	54.00	25.21	263	85	Vertical				
5	7206.0000	33.67	-10.65	54.00	20.33	284	201	Vertical				
6	7206.0000	42.08	-10.65	74.00	31.92	259	331	Vertical				

Final Data List



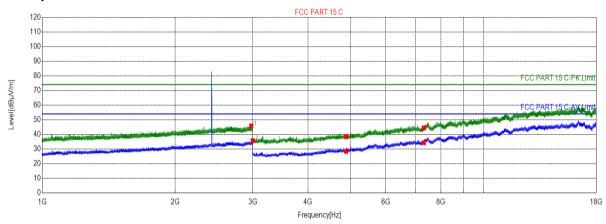


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BLE 1M Channel 19

Test Graph



Suspe	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	2973.9987	45.77	7.78	74.00	28.23	178	236	Horizontal				
2	2997.1999	35.65	8.05	54.00	18.35	165	358	Horizontal				
3	4880.0000	28.47	-18.00	54.00	25.53	199	288	Horizontal				
4	4880.0000	38.36	-18.00	74.00	35.64	175	230	Horizontal				
5	7320.0000	44.43	-10.51	74.00	29.57	169	358	Horizontal				
6	7320.0000	34.33	-10.51	54.00	19.67	187	70	Horizontal				

Final Data List



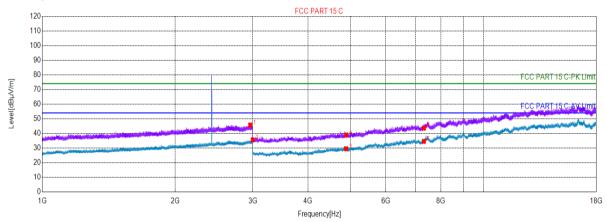


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BLE 1M Channel 19

Test Graph



 PK Detector * AV Detector

Suspe	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	2959.0980	45.72	7.92	74.00	28.28	241	276	Vertical				
2	2997.9999	35.58	8.07	54.00	18.42	258	163	Vertical				
3	4880.0000	29.50	-18.00	54.00	24.50	263	357	Vertical				
4	4880.0000	38.93	-18.00	74.00	35.07	274	26	Vertical				
5	7320.0000	43.61	-10.51	74.00	30.39	259	251	Vertical				
6	7320.0000	34.58	-10.51	54.00	19.42	267	99	Vertical				

Final Data List



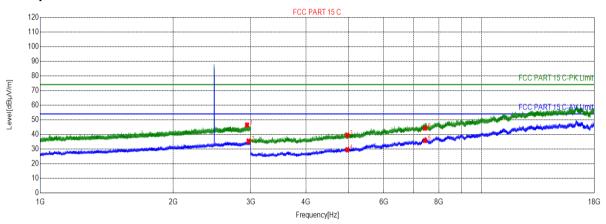


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BLE 1M Channel 39

Test Graph



 PK Detector * AV Detector

Suspe	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	2940.2970	46.43	7.94	74.00	27.57	187	211	Horizontal				
2	2965.3983	35.46	7.80	54.00	18.54	152	274	Horizontal				
3	4960.0000	39.48	-17.38	74.00	34.52	163	185	Horizontal				
4	4960.0000	29.55	-17.38	54.00	24.45	197	142	Horizontal				
5	7440.0000	35.79	-9.00	54.00	18.21	157	84	Horizontal				
6	7440.0000	44.23	-9.00	74.00	29.77	162	357	Horizontal				

Final Data List



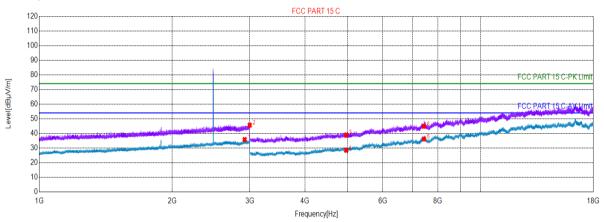


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BLE 1M Channel 39

Test Graph



*	PK Detector	*	AV Detector

Suspe	Suspected List									
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity		
1	2919.9960	35.77	7.85	54.00	18.23	271	27	Vertical		
2	2997.5999	45.63	8.06	74.00	28.37	225	323	Vertical		
3	4960.0000	38.95	-17.38	74.00	35.05	216	58	Vertical		
4	4960.0000	28.49	-17.38	54.00	25.51	271	295	Vertical		
5	7440.0000	36.16	-9.00	54.00	17.84	259	87	Vertical		
6	7440.0000	44.81	-9.00	74.00	29.19	271	265	Vertical		

Final Data List

Remark:

1) 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

2) Scan from 9kHz to 25GHz, the disturbance between 9KHz to 30MHz and 18GHz to 25GHz was very low, and the above harmonics were the highest point could be found when testing, The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

3)All Modes have been tested, but only the worst case data displayed in this report.



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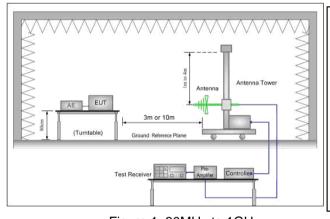


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4.10Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section	47 CFR Part 15C Section 15.209 and 15.205									
Test Method:	ANSI C63.10: 2013 Sectio	ANSI C63.10: 2013 Section 11.12									
Test Site:	Measurement Distance: 3r	Measurement Distance: 3m (Semi-Anechoic Chamber)									
Limit:	Frequency	Limit (dBuV/m)	Remark								
	30MHz-88MHz	40.0	Quasi-peak								
	88MHz-216MHz	43.5	Quasi-peak								
	216MHz-960MHz	46.0	Quasi-peak								
	960MHz-1GHz	54.0	Quasi-peak								
	Above 4CU-	54.0	Average Value								
	Above 1GHZ	Above 1GHz 74.0 Peak Value									
Test Setup:		<u>.</u>									



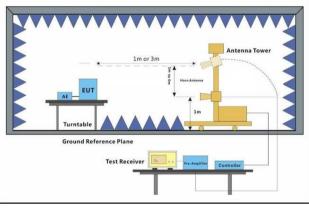


Figure 1. 30MHz to 1GHz

Figure 2. Above 1 GHz



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Test Procedure:	a. 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 camber. The table was rotated 360 degrees to determine the position of the highest radiation.
	b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
	c. 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.
	d. 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.
	e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
	f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
	g. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel
	h. Test the EUT in the lowest 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 worse case.
	j. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Transmitting with GFSK modulation. Charge + Transmitting mode.
Final Test Mode:	Transmitting with GFSK modulation.
	Pretest the EUT at Charge + Transmitting mode.
	Only the worst case is recorded in the report.
Instruments Used:	Refer to section 6 for details
Test Results:	Pass



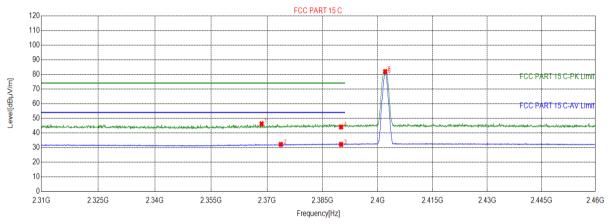


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4.10.1 **Test plots** BLE 1M Channel 0

Test Graph



★ PK Detector AV Detector

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2368.5293	46.19	7.58	74.00	27.81	174	245	Horizontal			
2	2373.7069	32.14	7.71	54.00	21.86	185	235	Horizontal			
3	2390.0000	32.16	8.11	54.00	21.84	162	15	Horizontal			
4	2390.0000	44.04	8.11	74.00	29.96	184	46	Horizontal			
5	2402.0000	81.85	8.35	0.00	-81.85	195	36	Horizontal			
6	2402.0000	80.76	8.35	0.00	-80.76	199	36	Horizontal			

Final Data List



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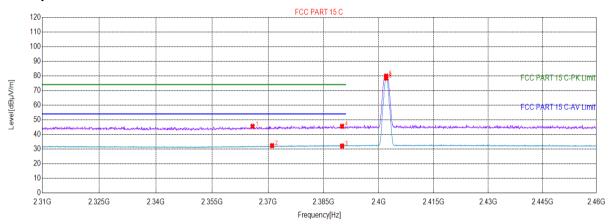


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BLE 1M Channel 0

Test Graph



★ PK Detector * AV Detector

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2365.8279	45.50	7.51	74.00	28.50	224	2	Vertical			
2	2371.0805	32.32	7.64	54.00	21.68	258	290	Vertical			
3	2390.0000	32.08	8.11	54.00	21.92	263	92	Vertical			
4	2390.0000	45.53	8.11	74.00	28.47	271	2	Vertical			
5	2402.0000	79.82	8.35	0.00	-79.82	254	234	Vertical			
6	2402.0000	78.38	8.35	0.00	-78.38	289	241	Vertical			

Final Data List



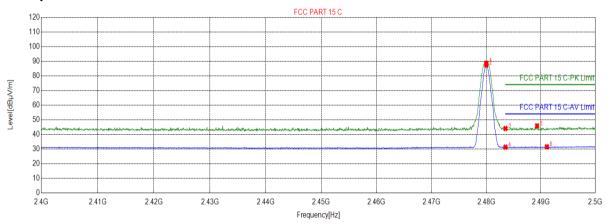


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BLE 1M Channel 39

Test Graph



★ PK Detector * AV Detector

Suspe	Suspected List									
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity		
1	2480.0000	88.59	6.79	0.00	-88.59	187	43	Horizontal		
2	2480.0000	87.43	6.79	0.00	-87.43	165	43	Horizontal		
3	2483.5000	44.03	6.79	74.00	29.97	178	57	Horizontal		
4	2483.5000	31.32	6.79	54.00	22.68	189	43	Horizontal		
5	2489.2946	45.85	6.79	74.00	28.15	178	125	Horizontal		
6	2491.0955	31.55	6.82	54.00	22.45	162	191	Horizontal		

Final Data List



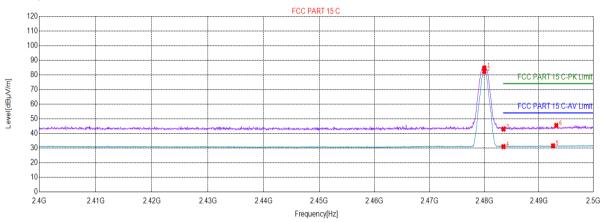


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BLE 1M Channel 39

Test Graph



★ PK Detector * AV Detector

Suspe	Suspected List									
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity		
1	2480.0000	84.64	6.79	0.00	-84.64	350	251	Vertical		
2	2480.0000	82.39	6.79	0.00	-82.39	350	278	Vertical		
3	2483.5000	42.97	6.79	74.00	31.03	350	333	Vertical		
4	2483.5000	30.99	6.79	54.00	23.01	350	193	Vertical		
5	2492.5963	31.56	6.84	54.00	22.44	350	166	Vertical		
6	2493.1966	45.45	6.86	74.00	28.55	350	2	Vertical		

Final Data List

Remark:

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 All Modes have been tested, but only the worst case data displayed in this report.





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Measurement Uncertainty (95% confidence levels, k=2)

Lab A:

No.	Item	Measurement Uncertainty		
1	Total RF power, conducted	±0.41dB		
2	RF power density, conducted	±1.96dB		
3	Spurious emissions, conducted	±0.41dB		
4	Radio Frequency	±7.10 x 10 ⁻⁸		
5	Duty Cycle	±0.49%		
6	Occupied Bandwidth	±0.2%		

Lab B:

No.	Item	Measurement Uncertainty		
1	Conduction Emission	± 3.0dB (150kHz to 30MHz)		
		± 4.8dB (Below 1GHz)		
2	Radiated Emission	± 4.8dB (1GHz to 6GHz)		
2		± 4.5dB (6GHz to 18GHz)		
		± 5.02dB (Above 18GHz)		





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Equipment List

<u> </u>					
		RF conducted			
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
Signal Analyzer	Rohde & Schwarz	FSV	W025-05	2021-04-14	2022-04-13
DC Power Supply	Rohde & Schwarz	HMP2020	W009-08	2020-12-04	2021-12-03
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2020-09-23	2021-09-22
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	HTC-1	W006-17	2021-04-14	2022-04-13

	CE Test System									
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date					
Shielding Room	Brilliant-emc	N/A	XAW03-35-01	2019-09-11	2022-09-10					
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2020-09-11	2021-09-10					
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-04-01	2020-08-04	2021-08-03					
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2020-11-06	2021-11-05					
Measurement Software	Tonscend	TS+ CE V2.5	XAW02-05-02	NCR	NCR					





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		RSE Test Syste	em	39 01 72	
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Semi-Anechoic Chamber	Brilliant-emc	N/A	XAW03-35-01	2019-09-11	2022-09-10
MXA signal analyzer	Keysight	N9020A	XAW01-06-01	2021-04-01	2022-03-31
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2020-09-11	2021-09-10
Receiving antenna (30MHz-3GHz)	Schwarzbeck	VULB 9163	XAW01-09-01	2019-10-13	2021-10-12
Receiving antenna (1GHz~18GHz)	Schwarzbeck	BBHA 9120D	XAW01-09-02	2019-10-13	2021-10-12
Receiving antenna (15GHz~40GHz)	Schwarzbeck	BBHA 9170	XAW01-09-03	2019-10-13	2021-10-12
Directional antenna rack controller	Max-Full	MF-7802BS	XAW03-03-01	NCR	NCR
High-speed antenna rack controller	Max-Full	MF-7802	XAW03-04-01	NCR	NCR
Filter bank	Tonscend	JS0806-F	XAW03-05-01	NCR	NCR
Filter bank	Tonscend	JS0806s	XAW03-05-02	NCR	NCR
Amplifier	Tonscend	TAP00903040	XAW01-41-01	2020-10-26	2021-10-25
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2020-10-26	2021-10-25
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2020-10-27	2021-10-26
Amplifier	Shanghai Steed	YX28980930	XAW01-41-06	2020-10-26	2021-10-25
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2020-11-06	2021-11-05
Measurement Software	Tonscend	TS+ RSE V3.0.0.2	XAW02-05-01	NCR	NCR
Loop Antenna	Schwarzbeck	FMZB 1519B	XAW01-48-02	2021-06-10	2022-06-09



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7 **Photographs - EUT Constructional Details**

Refer to Appendix A Setup Photos.





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Appendix



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DTS Bandwidth

Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
		2402	0.681	2401.652	2402.333	0.5	PASS
BLE_1M	Ant1	2440	0.681	2439.655	2440.336	0.5	PASS
_		2480	0.675	2479.652	2480.327	0.5	PASS

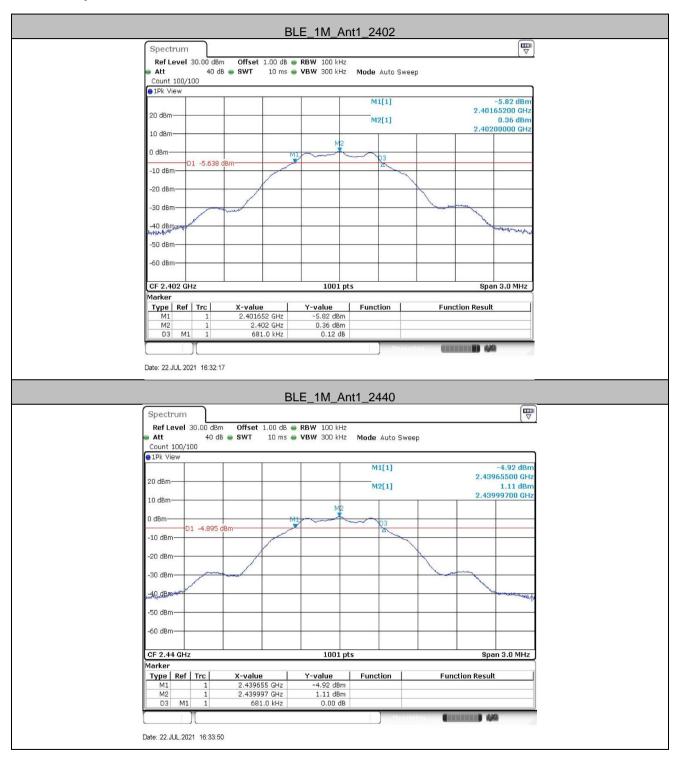




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Test Graphs

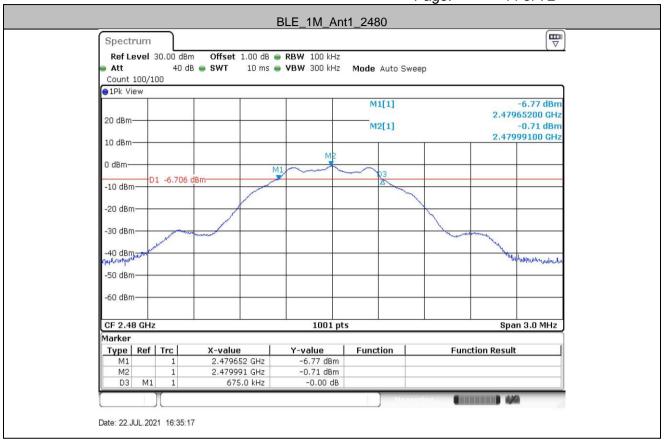






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Occupied Channel Bandwidth Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
		2402	1.064	2401.470	2402.533		PASS
BLE_1M	Ant1	2440	1.064	2439.470	2440.533		PASS
_		2480	1.067	2479.464	2480.530		PASS





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Test Graphs





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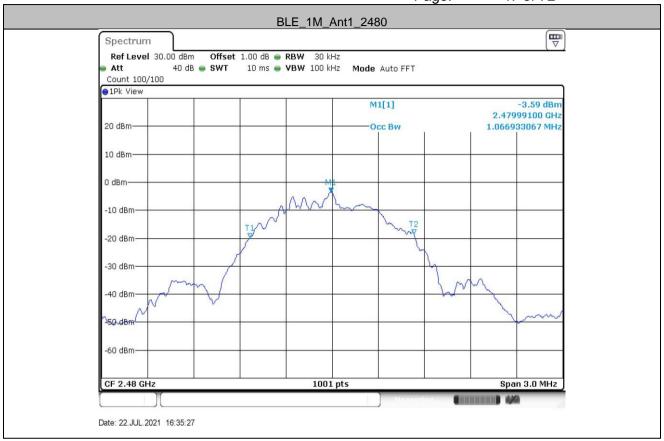
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Maximum conducted output power **Test Result**

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
		2402	0.99	≤30	PASS
BLE_1M	Ant1	2440	1.59	≤30	PASS
		2480	0.12	≤30	PASS

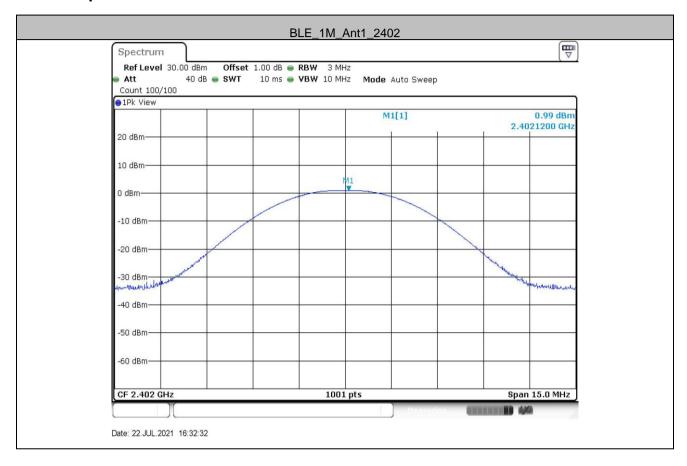




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Maximum power spectral density Test Result

TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
		2402	-14.68	≤8	PASS
BLE_1M	Ant1	2440	-13.83	≤8	PASS
		2480	-15.54	≤8	PASS

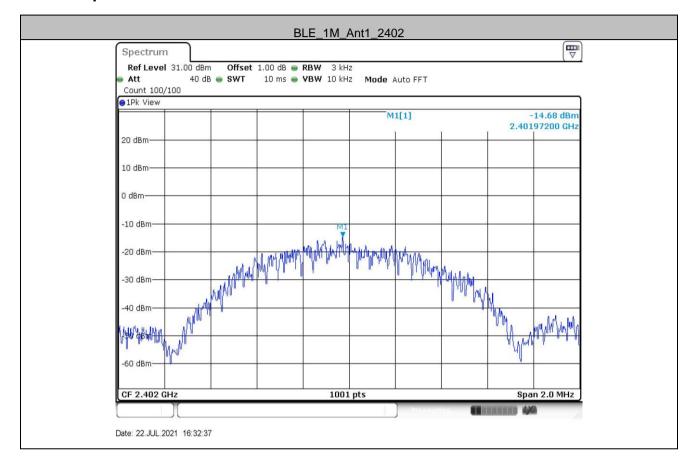




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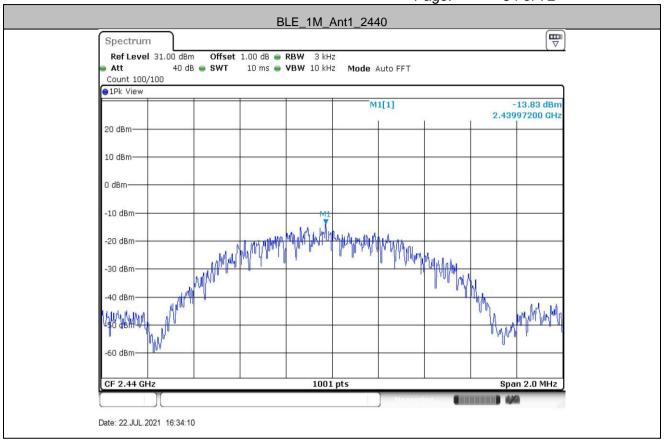






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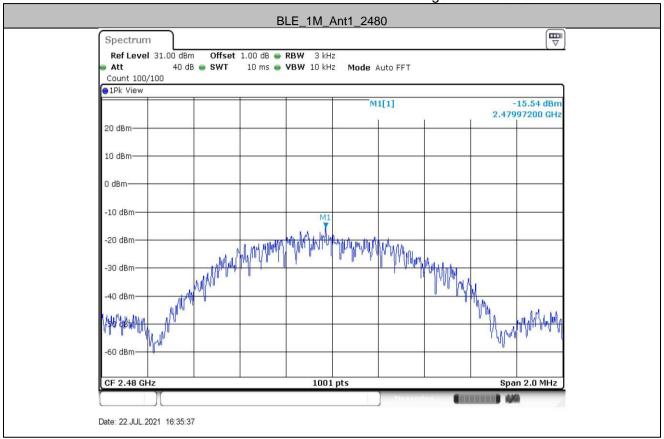






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Band edge measurements

Test Result

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
		Low	2402	0.49	-49.27	≤-19.51	PASS
BLE_1M	Ant1	High	2480	-0.53	-51.08	≤-20.53	PASS

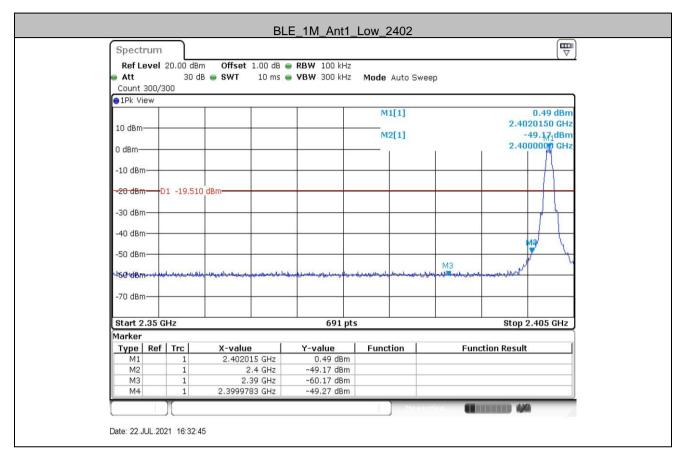




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Test Graphs

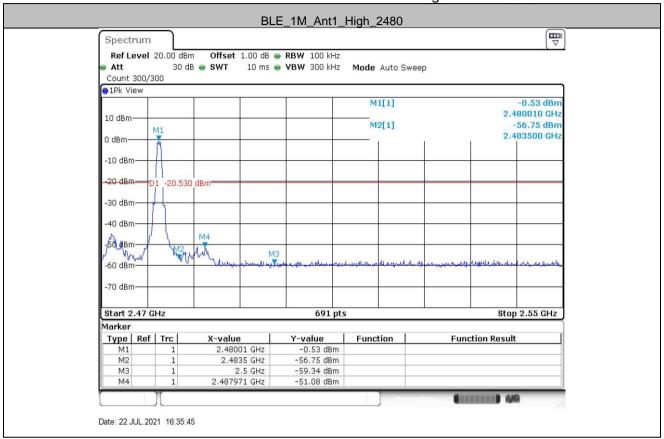






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Conducted Spurious Emission Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
			Reference	0.42	0.42		PASS
		2402	30~1000	0.42	-45.61	≤-19.58	PASS
	Ant1		1000~26500	0.42	-30.87	≤-19.58	PASS
		Ant1 2440	Reference	1.14	1.14		PASS
BLE_1M			30~1000	1.14	-45.44	≤-18.86	PASS
			1000~26500	1.14	-31.15	≤-18.86	PASS
			Reference	-0.61	-0.61		PASS
			30~1000	-0.61	-45.31	≤-20.61	PASS
			1000~26500	-0.61	-30.97	≤-20.61	PASS

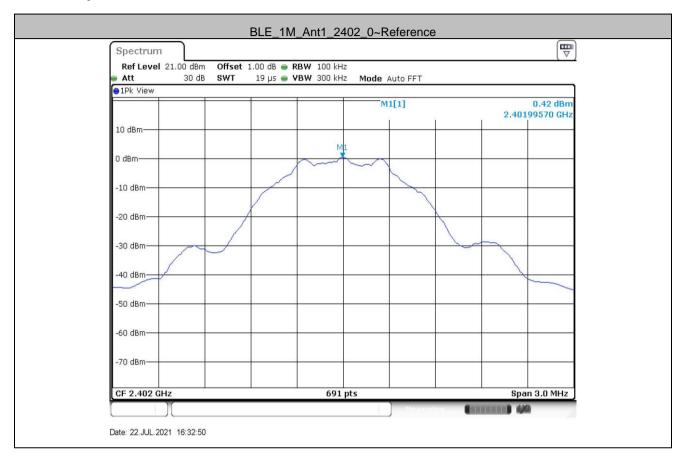




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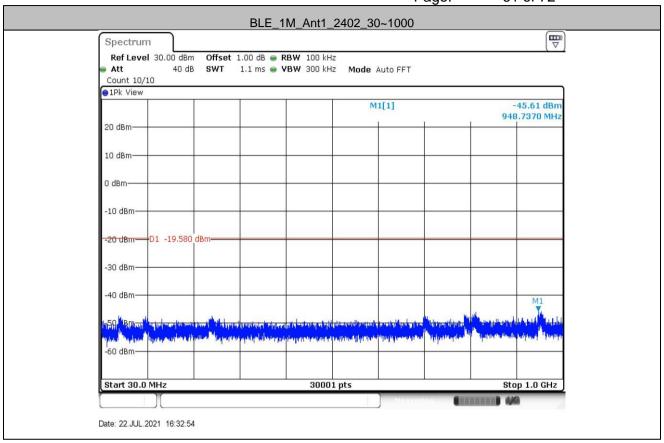






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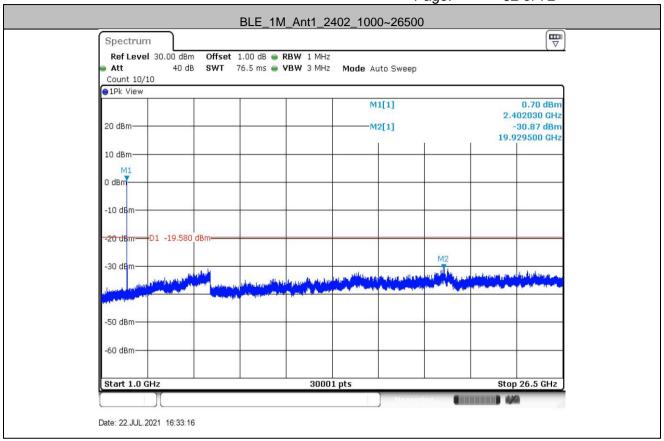






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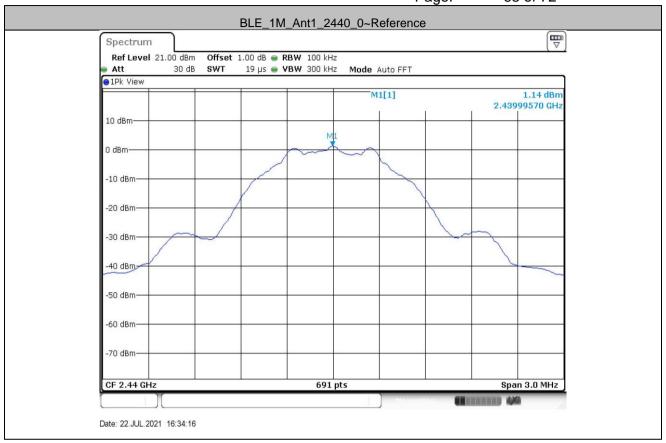






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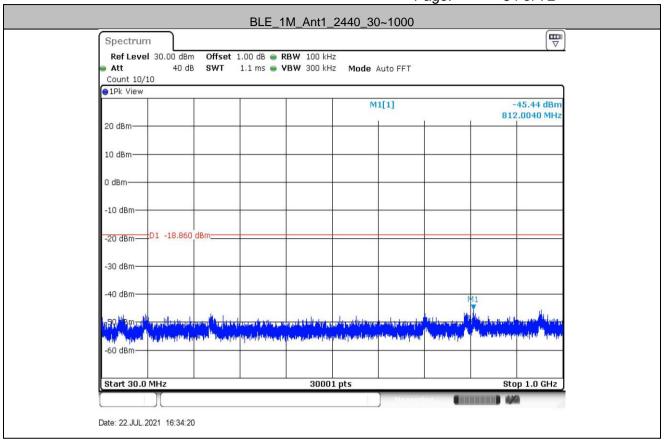






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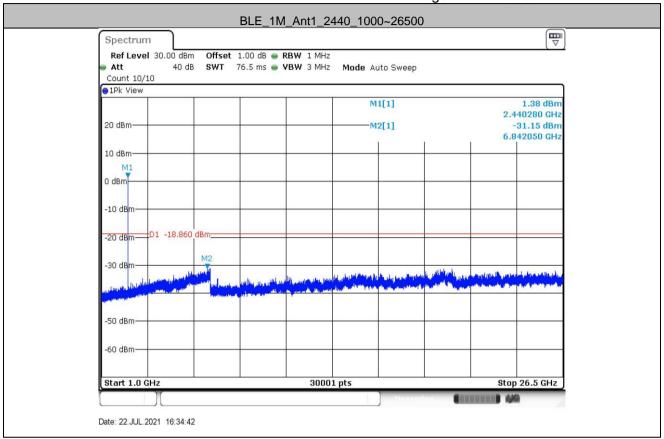






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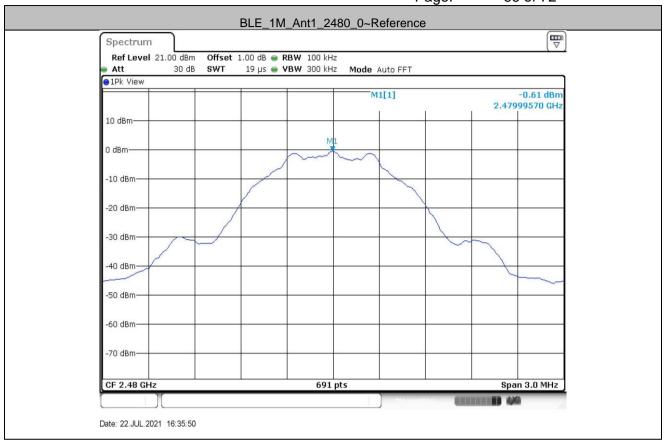






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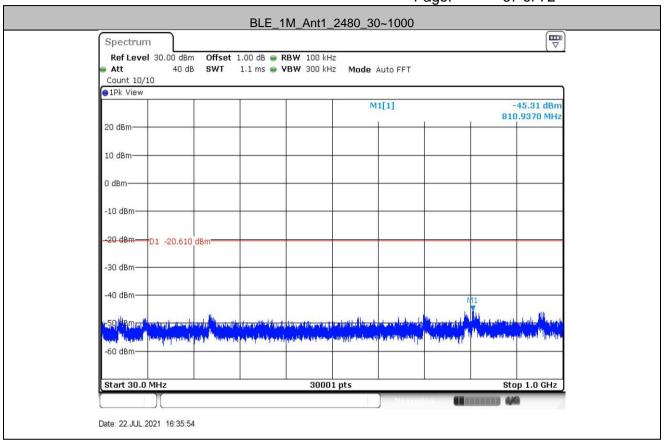






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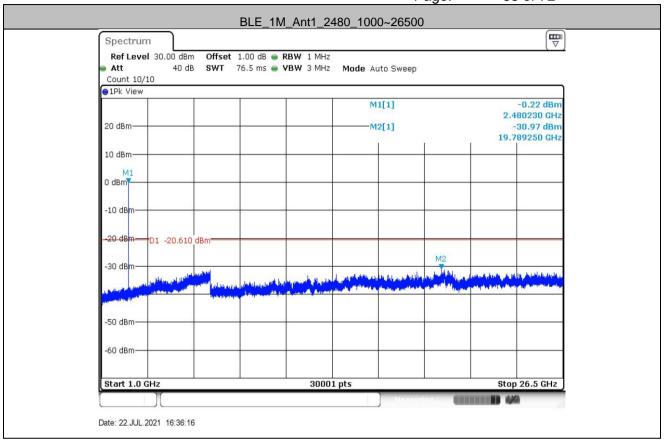






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Duty Cycle Test Result

TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Limit	Verdict
		2402	0.395	0.625	63.2		PASS
BLE_1M	Ant1	2440	0.395	0.625	63.2		PASS
		2480	0.395	0.625	63.2		PASS

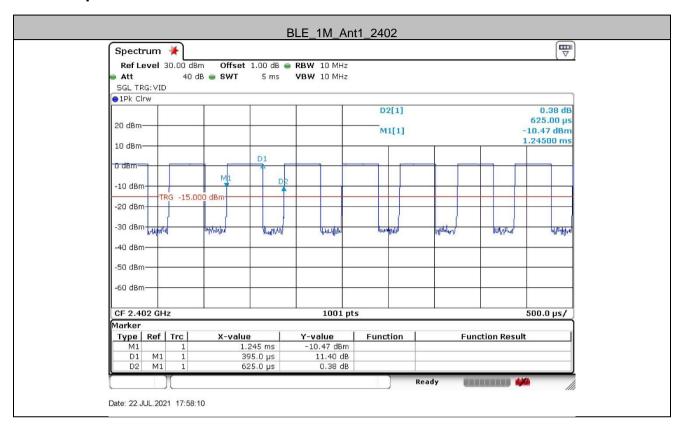




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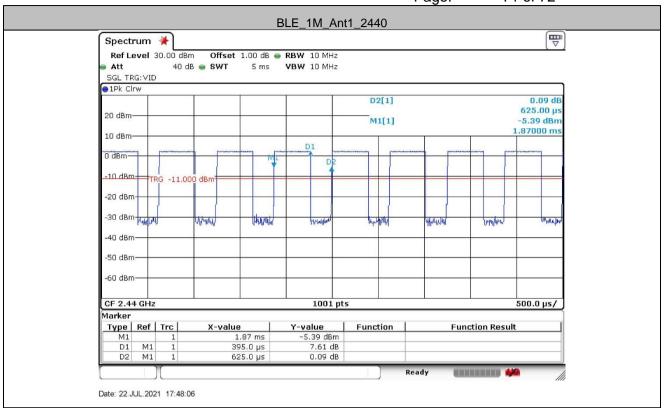






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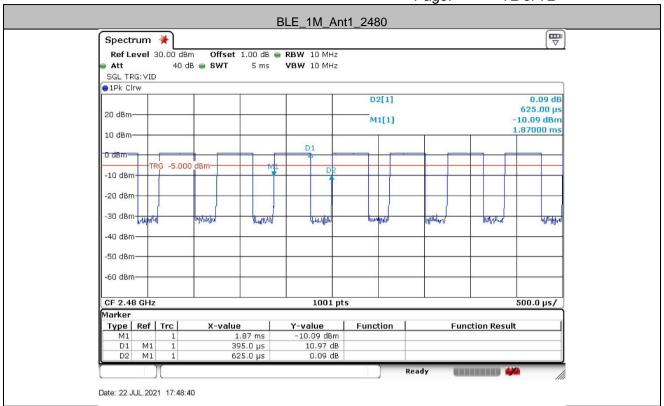






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