

Report No.: ZR/2021/4002103

Page: 1 of 93

FCC TEST REPORT

Application No.: ZR/2021/40021 Applicant: HMD Global Oy

Address of Applicant Bertel Jungin aukio 9, 02600 Espoo, Finland

Manufacturer: HMD Global Oy

Address of Manufacturer Bertel Jungin aukio 9, 02600 Espoo, Finland

EUT Description: smart phone Model No.: N1374DL **Trade Mark:** Nokia

FCC ID: 2AJOTTA-1374

47 CFR FCC Part 2, Subpart J Standards:

47 CFR Part 15, Subpart C

Date of Receipt: 2021/4/25

Date of Test: 2021/4/25 to 2021/5/28

Date of Issue: 2021/5/28 **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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Report No.: ZR/2021/4002103

Page: 2 of 93

Version

Revision Record						
Version Chapter Date Modifier Remark						
01		2021-05-28		Original		

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





Report No.: ZR/2021/4002103

3 of 93 Page:

2 **Test Summary**

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.





Report No.: ZR/2021/4002103

Page: 4 of 93

Contents

1	Versio	n	2
2	Test S	ummary	3
3	Gener	al Information	5
	3.1	Details of Client	5
	3.2	Test Location	5
	3.3	Test Facility	6
	3.4	General Description of EUT	7
	3.5	Test Environment	8
	3.6	Description of Support Units	8
4	Test re	esults and Measurement Data	9
	4.1	Antenna Requirement	9
	4.2	AC Power Line Conducted Emissions	10
	4.3	Duty Cycle	14
	4.4	Conducted Output Power	14
	4.5	DTS (6 dB) Bandwidth	15
	4.6	Power Spectral Density	16
	4.7	Band-edge for RF Conducted Emissions	16
	4.8	RF Conducted Spurious Emissions	18
	4.9	Radiated Spurious Emissions	19
	4.10	Restricted bands around fundamental frequency	22
5	Measu	rement Uncertainty (95% confidence levels, k=2)	24
6	Equipr	nent List	25
7	Photo	graphs - EUT Constructional Details	27





Report No.: ZR/2021/4002103

5 of 93 Page:

3 **General Information**

3.1 Details of Client

Applicant:	HMD Global Oy
Address of Applicant	Bertel Jungin aukio 9, 02600 Espoo, Finland
Manufacturer:	HMD Global Oy
Address of Manufacturer	Bertel Jungin aukio 9, 02600 Espoo, Finland

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 Park, Shenzhen, Guangdong, China		
Post code:	518057	
Test engineer:	Dee Zheng,Swing Hu,Habit Zeng	

Lab B:

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





Report No.: ZR/2021/4002103

6 of 93 Page:

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.





Report No.: ZR/2021/4002103

7 of 93 Page:

3.4 General Description of EUT

EUT Description:	smart phone	
Model No.:	N1374DL	
Trade Mark:	Nokia	
Hardware Version:	V1.0	
Software Version:	02US_0_029	
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 V5.1	
Modulation Type:	GFSK	
Number of Channel:	40	
Sample Type: ☑ Portable Device, ☐ Module		
Antenna Type:	☐ External, ⊠ Integrated	
Antenna Gain:	-2.3dBi(ANT10)	

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



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Report No.: ZR/2021/4002103

8 of 93 Page:

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.





Report No.: ZR/2021/4002103

9 of 93 Page:

4 **Test results and Measurement Data**

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 -2.3dBi.



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Report No.: ZR/2021/4002103

Page: 10 of 93

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:	Fraguenov rango (MUz)	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:	1) The mains terminal or room.	listurbance 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 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. 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 			



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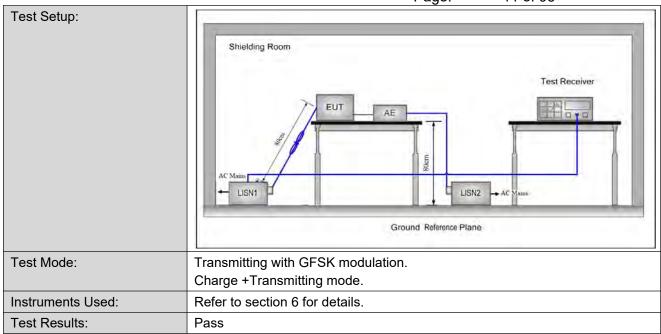
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Page: 11 of 93





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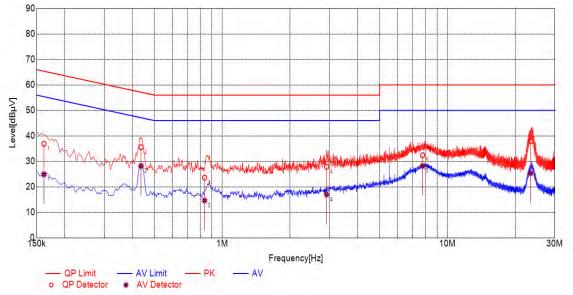
12 of 93 Page:

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 Da	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	0.1617	10.10	36.89	65.38	28.49	24.88	55.38	30.50	
2	0.4364	10.10	35.54	57.13	21.59	28.18	47.13	18.95	
3	0.8355	10.10	23.58	56.00	32.42	14.66	46.00	31.34	
4	2.9101	10.10	27.82	56.00	28.18	16.98	46.00	29.02	
5	7.7605	10.10	32.42	60.00	27.58	28.21	50.00	21.79	
6	23.4275	10.11	37.85	60.00	22.15	25.32	50.00	24.68	



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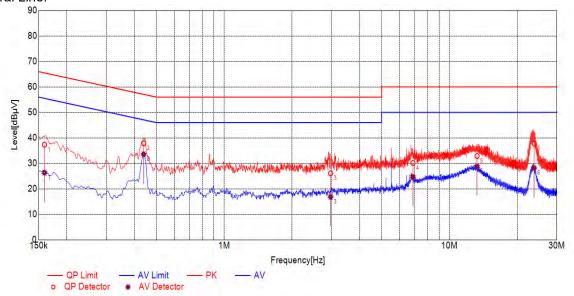
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Report No.: ZR/2021/4002103

Page: 13 of 93

Neutral Line:



Final Da	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	0.1594	10.10	37.32	65.49	28.17	26.34	55.49	29.15	
2	0.4392	10.10	37.87	57.08	19.21	33.59	47.08	13.49	
3	2.9685	10.10	26.09	56.00	29.91	16.87	46.00	29.13	
4	6.8841	10.10	30.19	60.00	29.81	24.71	50.00	25.29	
5	13.2658	10.11	32.89	60.00	27.11	28.85	50.00	21.15	
6	23.7878	10.11	37.76	60.00	22.24	28.16	50.00	21.84	

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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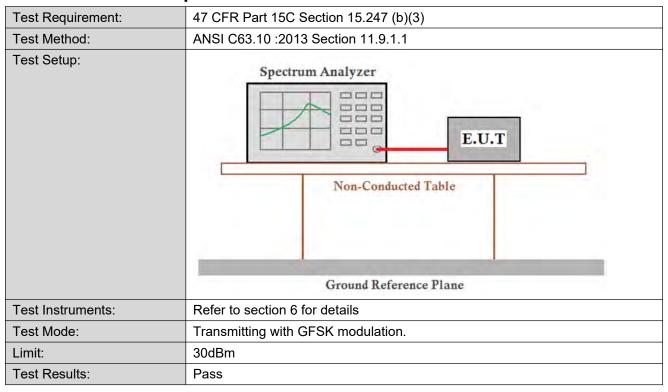
Report No.: ZR/2021/4002103

14 of 93 Page:

4.3 Duty Cycle

The detailed test data see: Appendix

4.4 Conducted Output Power



The detailed test data see: Appendix

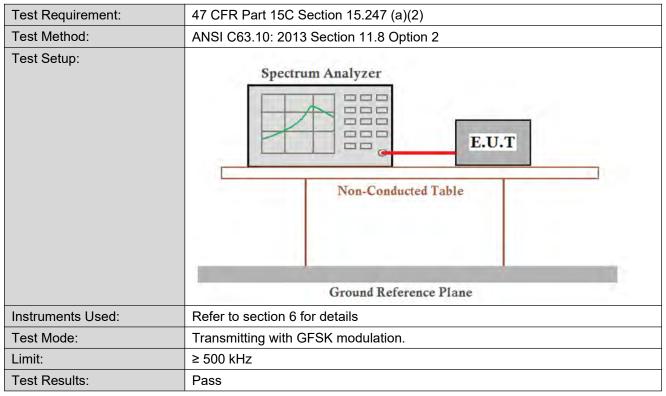




Report No.: ZR/2021/4002103

15 of 93 Page:

4.5 DTS (6 dB) Bandwidth



The detailed test data see: Appendix

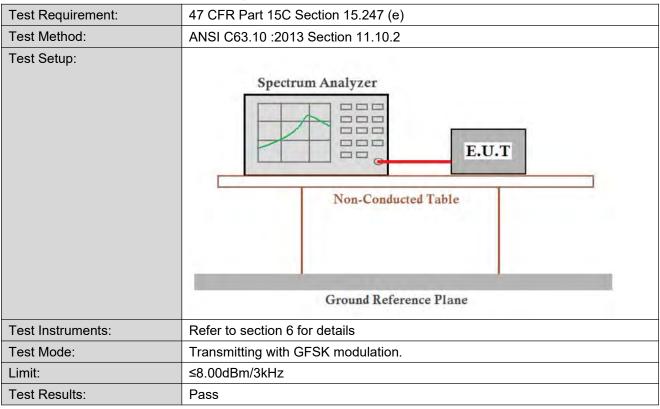




Report No.: ZR/2021/4002103

16 of 93 Page:

4.6 Power Spectral Density



The detailed test data see: Appendix

4.7 Band-edge for RF Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013 Section 11.13
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table
	Ground Reference Plane
Instruments Used:	Refer to section 6 for details



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Report No.: ZR/2021/4002103

Page: 17 of 93

Test Mode:	Transmitting with GFSK modulation.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test Results:	Pass

The detailed test data see: Appendix

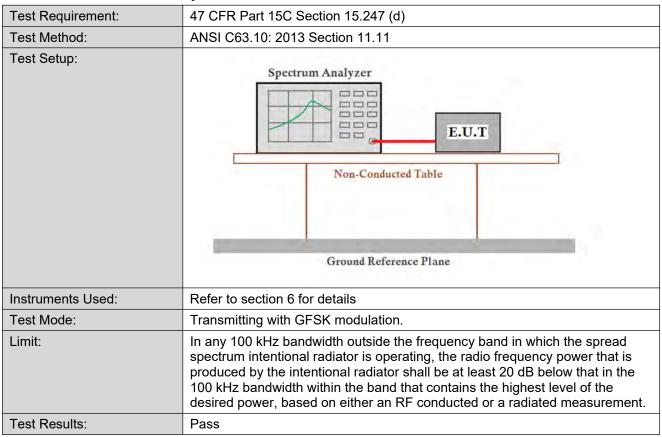




Report No.: ZR/2021/4002103

18 of 93 Page:

4.8 RF Conducted Spurious Emissions



The detailed test data see: **Appendix**





Report No.: ZR/2021/4002103

Page: 19 of 93

4.9 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205						
Test Method:	ANSI C63.10 :2013 Section 11.12						
Test Site:	Measurement Distance: 3m (Semi-Anechoic 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 IGHZ	Peak	1MHz	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 frequence emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total pear emission level radiated by the device.					nit		



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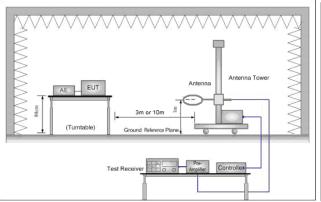
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Report No.: ZR/2021/4002103

20 of 93 Page:

Test Setup:



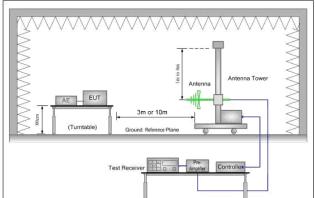


Figure 1. Below 30MHz

Figure 2. 30MHz to 1GHz

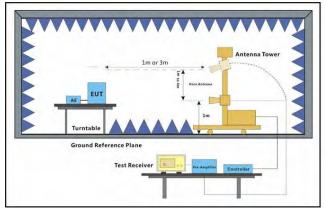


Figure 3. Above 1 GHz

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.
- 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. Use the following spectrum analyzer settings:
 - (1)Span shall wide enough to fully capture the emission being measured;
 - Set RBW=100 kHz for f < 1 GHz, RBW=1MHz for f>1GHz; (2) $VBW \ge RBW$; Sweep = auto;
 - Detector function = peak; Trace = max hold for peak
 - For average measurement: use duty cycle correction factor method per 15.35(c).

Duty cycle = On time/100 milliseconds



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Report No.: ZR/2021/4002103

21 of 93 Page:

	On time = N 1 *L 1 +N 2 *L 2 ++N n-1 *LN n-1 +N n *L n				
	Where N 1 is number of type 1 pulses, L 1 is length of type 1 pulses, etc.				
	Average Emission Level = Peak Emission Level + 20*log(Duty cycle)				
	f. 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.				
	g. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.				
	h. 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.				
	i. Test the EUT in the lowest channel, the middle channel ,the Highest channel.				
	j. 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.				
	k. 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,				
	For below 1GHz part, through pre-scan, the worst case is the lowest channel. Only the worst case is recorded in the report.				
Instruments Used:	Refer to section 6 for details				
Test Results:	Pass				



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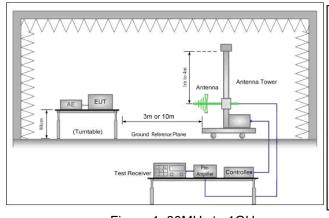


Report No.: ZR/2021/4002103

22 of 93 Page:

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 Section	ANSI C63.10: 2013 Section 11.12						
Test Site:	Measurement Distance: 3n	n (Semi-Anechoic Chamb	per)					
Limit:	imit: Frequency Limit (dBuV/m) Re							
	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 4015	54.0	Average Value					
	Above IGHZ	Above 1GHz 74.0 Peak Value						
Test Setup:								



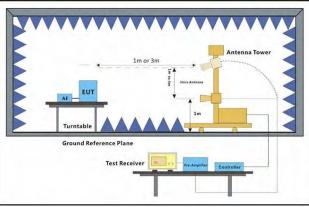


Figure 1. 30MHz to 1GHz

Figure 2. Above 1 GHz



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Report No.: ZR/2021/4002103

23 of 93 Page:

	9			
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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Report No.: ZR/2021/4002103

Page: 24 of 93

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 Unc				
1	Conduction Emission	± 3.0dB (150kHz to 30MHz)			
		± 4.8dB (Below 1GHz)			
2	Dedicted Emission	± 4.8dB (1GHz to 6GHz)			
2	Radiated Emission	± 4.5dB (6GHz to 18GHz)			
		± 5.02dB (Above 18GHz)			





Report No.: ZR/2021/4002103

Page: 25 of 93

Equipment List

		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	2021/4/14	2022/4/13
DC Power Supply	Rohde & Schwarz	HMP2020	W009-08	2020/7/15	2021/7/15
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2020/7/14	2021/7/13
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	HTC-1	W006-17	2021/4/14	2022/4/13

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		





Report No.: ZR/2021/4002103

Page: 26 of 93

		RSE Test Syste	em		
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



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27 of 93 Page:

7 **Photographs - EUT Constructional Details**

Refer to Appendix A Setup Photos.



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Report No.: ZR/2021/4002103

28 of 93 Page:

Appendix



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Report No.: ZR/2021/4002103

Page: 29 of 93

Radiated Spurious Emission

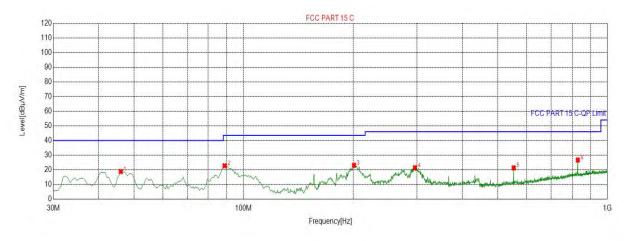
Radiated Emission below 1GHz

Charge + Transmitting BLE 1M

Test Graph

Project Information								
EUT:		Model:	BLE_1M					
SN:		Voltage:						
Mode:		State:						
Environment:	Temp: 25°C; Humi:60%	Engineer:						
Remark:								
Test Standard:								

Test Graph



QP Detector

Suspected List

Suspe	Suspected List										
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Dolority			
NO.	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	Polarity			
1	46.0130	18.86	-21.40	40.00	21.14	271	278	Horizontal			
2	88.7144	22.76	-24.85	43.50	20.74	184	267	Horizontal			
3	201.290	23.11	-22.41	43.50	20.39	165	224	Horizontal			
4	295.913	21.45	-19.43	46.00	24.55	187	64	Horizontal			
5	553.091	21.33	-13.03	46.00	24.67	165	267	Horizontal			
6	829.679	26.69	-8.70	46.00	19.31	184	296	Horizontal			



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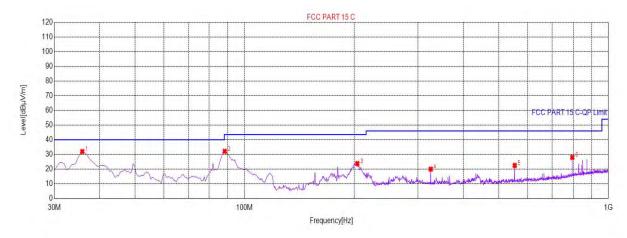
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Page: 30 of 93

Test Report

Project Information								
EUT:		Model:	BLE_1M					
SN:		Voltage:						
Mode:		State:						
Environment:	Temp: 25°C; Humi:60%	Engineer:						
Remark:								
Test Standard:								

Test Graph



QP Detector

Suspected List

Suspe	Suspected List											
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Dolority				
NO.	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	Polarity				
1	35.8229	31.96	-23.68	40.00	8.04	252	2	Vertical				
2	88.2291	32.10	-24.99	43.50	11.40	271	95	Vertical				
3	204.202	23.77	-22.20	43.50	19.73	265	32	Vertical				
4	325.027	19.99	-18.50	46.00	26.01	271	245	Vertical				
5	553.091	22.50	-13.03	46.00	23.50	298	49	Vertical				
6	796.198	28.02	-9.12	46.00	17.98	241	213	Vertical				

Final Data List



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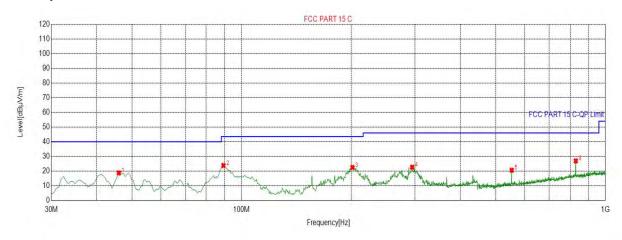
Report No.: ZR/2021/4002103

Page: 31 of 93

Test Report

Project Information								
EUT:		Model:	BLE_2M					
SN:		Voltage:						
Mode:		State:						
Environment:	Temp: 25°C; Humi:60%	Engineer:						
Remark:								
Test Standard:								

Test Graph



QP Detector

Suspected List

Suspected List										
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Dolority		
	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	Polarity		
1	46.0130	18.77	-21.40	40.00	21.23	252	222	Horizontal		
2	89.1996	23.84	-24.71	43.50	19.66	274	257	Horizontal		
3	201.775	22.53	-22.38	43.50	20.97	187	215	Horizontal		
4	294.457	22.69	-19.44	46.00	23.31	195	59	Horizontal		
5	553.091	20.61	-13.03	46.00	25.39	164	289	Horizontal		
6	829.679	26.98	-8.70	46.00	19.02	185	293	Horizontal		

Final Data List



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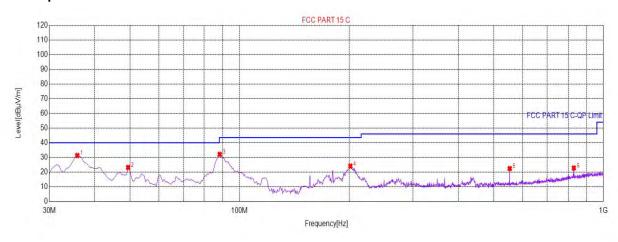
Report No.: ZR/2021/4002103

Page: 32 of 93

Test Report

Project Information									
EUT:		Model:	BLE_2M						
SN:		Voltage:							
Mode:		State:							
Environment:	Temp: 25°C; Humi:60%	Engineer:							
Remark:									
Test Standard:									

Test Graph



QP Detector

Suspected List

Suspected List										
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Dolority		
	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	Polarity		
1	35.8229	31.32	-23.68	40.00	8.68	285	332	Vertical		
2	49.4097	23.19	-21.37	40.00	16.81	274	360	Vertical		
3	88.2291	32.10	-24.99	43.50	11.40	269	88	Vertical		
4	201.775	24.11	-22.38	43.50	19.39	248	226	Vertical		
5	553.091	22.42	-13.03	46.00	23.58	184	53	Vertical		
6	829.679	22.83	-8.70	46.00	23.17	257	145	Vertical		

Final Data List



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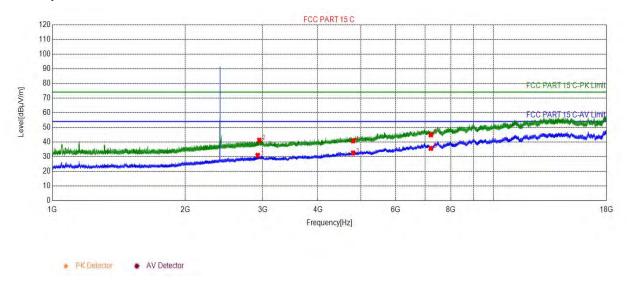
Report No.: ZR/2021/4002103

Page: 33 of 93

Transmitter Emission above 1GHz

BLE1M_Channel CH0

Test Graph



Suspected List

Suspe	Suspected List										
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Polarity			
NO.	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	Polarity			
1	2920.99	30.87	10.40	54.00	23.13	215	97	Horizontal			
2	2945.19	41.22	10.54	74.00	32.78	210	274	Horizontal			
3	4804.00	32.53	-15.41	54.00	21.47	236	126	Horizontal			
4	4804.00	40.78	-15.41	74.00	33.22	214	344	Horizontal			
5	7206.00	44.86	-8.59	74.00	29.14	225	271	Horizontal			
6	7206.00	35.67	-8.59	54.00	18.33	247	199	Horizontal			

Final Data List



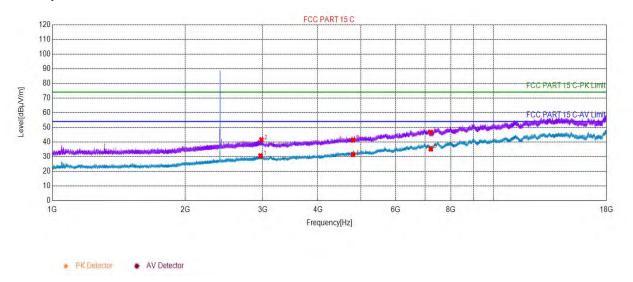


Report No.: ZR/2021/4002103

Page: 34 of 93

BLE1M Channel CH0

Test Graph



Suspected List

Susp	Suspected List										
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Dolority			
	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	Polarity			
1	2964.69	30.58	10.43	54.00	23.42	214	312	Vertical			
2	2977.59	41.48	10.49	74.00	32.52	223	299	Vertical			
3	4804.00	41.29	-15.41	74.00	32.71	253	129	Vertical			
4	4804.00	31.54	-15.41	54.00	22.46	241	230	Vertical			
5	7206.00	35.22	-8.59	54.00	18.78	226	172	Vertical			
6	7206.00	46.64	-8.59	74.00	27.36	238	70	Vertical			

Final Data List



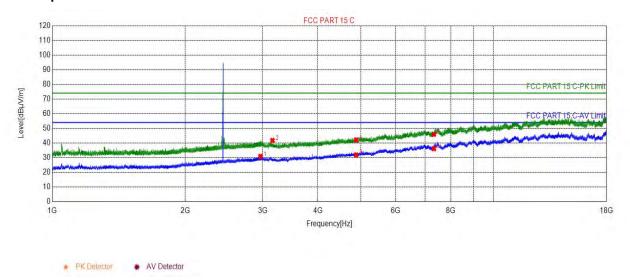


Report No.: ZR/2021/4002103

Page: 35 of 93

BLE1M Channel CH19

Test Graph



Suspected List

Susp	Suspected List										
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Dolority			
NO.	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	Polarity			
1	2962.69	30.83	10.47	54.00	23.17	278	98	Horizontal			
2	3153.60	41.75	-20.58	74.00	32.25	216	187	Horizontal			
3	4880.00	31.90	-15.07	54.00	22.10	236	274	Horizontal			
4	4880.00	42.10	-15.07	74.00	31.90	259	143	Horizontal			
5	7320.00	45.97	-8.63	74.00	28.03	187	231	Horizontal			
6	7320.00	36.11	-8.63	54.00	17.89	194	260	Horizontal			

Final Data List



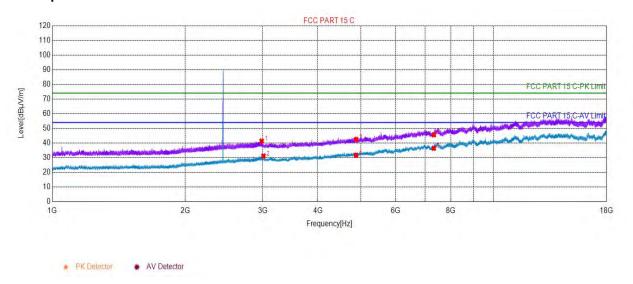


Report No.: ZR/2021/4002103

Page: 36 of 93

BLE1M Channel CH19

Test Graph



Suspected List

Suspected List								
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Polarity
	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	
1	2980.89	41.32	10.54	74.00	32.68	177	97	Vertical
2	3010.20	31.10	-21.16	54.00	22.90	196	216	Vertical
3	4880.00	42.48	-15.07	74.00	31.52	185	245	Vertical
4	4880.00	31.73	-15.07	54.00	22.27	163	245	Vertical
5	7320.00	36.41	-8.63	54.00	17.59	174	128	Vertical
6	7320.00	45.60	-8.63	74.00	28.40	215	55	Vertical

Final Data List



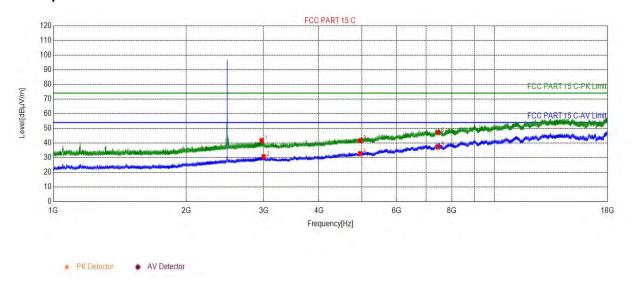


Report No.: ZR/2021/4002103

37 of 93 Page:

BLE1M Channel CH39

Test Graph



Suspected List

Suspe	Suspected List										
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Polarity			
NO.	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	1 Glaffity			
1	2965.59	41.66	10.41	74.00	32.34	214	149	Horizontal			
2	2996.89	30.66	10.71	54.00	23.34	226	358	Horizontal			
3	4960.00	41.53	-14.40	74.00	32.47	238	244	Horizontal			
4	4960.00	32.79	-14.40	54.00	21.21	278	13	Horizontal			
5	7440.00	37.22	-7.31	54.00	16.78	255	157	Horizontal			
6	7440.00	47.04	-7.31	74.00	26.96	234	113	Horizontal			

Final Data List



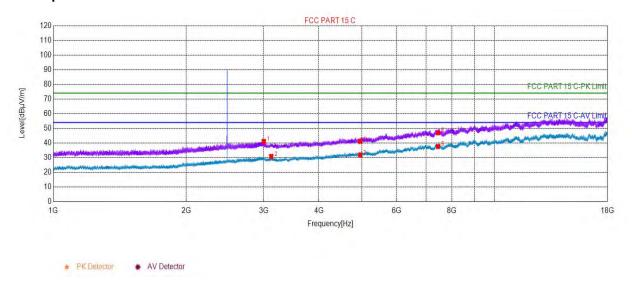


Report No.: ZR/2021/4002103

Page: 38 of 93

BLE1M Channel CH39

Test Graph



Suspected List

Susp	Suspected List										
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Polarity			
NO.	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	1 Olanty			
1	2999.40	41.14	10.79	74.00	32.86	214	44	Vertical			
2	3117.00	30.87	-21.07	54.00	23.13	203	201	Vertical			
3	4960.00	31.86	-14.40	54.00	22.14	227	156	Vertical			
4	4960.00	41.05	-14.40	74.00	32.95	265	201	Vertical			
5	7440.00	46.92	-7.31	74.00	27.08	287	317	Vertical			
6	7440.00	37.56	-7.31	54.00	16.44	240	201	Vertical			

Final Data List



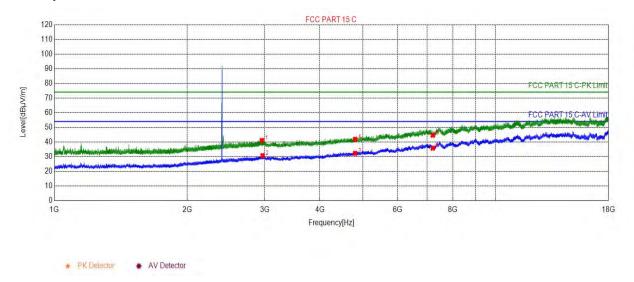


Report No.: ZR/2021/4002103

Page: 39 of 93

BLE2M Channel CH0

Test Graph



Suspected List

Suspe	Suspected List										
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Polarity			
NO.	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	Folanty			
1	2954.69	41.04	10.54	74.00	32.96	187	278	Horizontal			
2	2964.79	30.73	10.43	54.00	23.27	165	239	Horizontal			
3	4804.00	32.30	-15.41	54.00	21.70	191	244	Horizontal			
4	4804.00	41.86	-15.41	74.00	32.14	174	185	Horizontal			
5	7206.00	44.64	-8.59	74.00	29.36	152	229	Horizontal			
6	7206.00	35.88	-8.59	54.00	18.12	177	215	Horizontal			

Final Data List



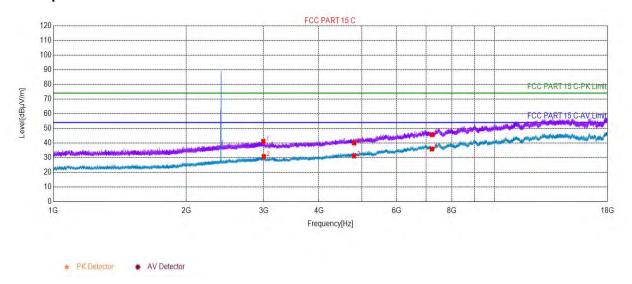


Report No.: ZR/2021/4002103

Page: 40 of 93

BLE2M Channel CH0

Test Graph



Suspected List

Suspected List										
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Polarity		
NO.	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	1 Glanty		
1	2991.79	41.13	10.55	74.00	32.87	278	72	Vertical		
2	2999.60	30.76	10.80	54.00	23.24	219	160	Vertical		
3	4804.00	31.18	-15.41	54.00	22.82	234	3	Vertical		
4	4804.00	40.02	-15.41	74.00	33.98	198	160	Vertical		
5	7206.00	45.78	-8.59	74.00	28.22	175	246	Vertical		
6	7206.00	35.93	-8.59	54.00	18.07	166	73	Vertical		

Final Data List



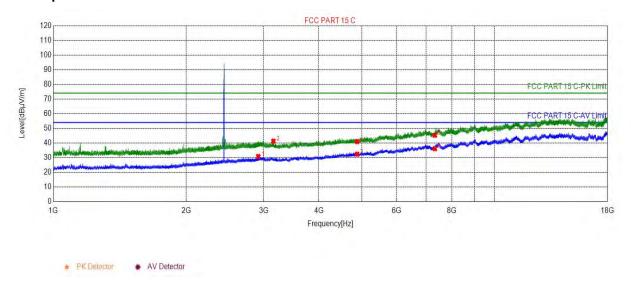


Report No.: ZR/2021/4002103

41 of 93 Page:

BLE2M Channel CH19

Test Graph



Suspected List

Suspe	Suspected List										
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Polarity			
NO.	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	rolanty			
1	2913.99	30.83	10.29	54.00	23.17	198	272	Horizontal			
2	3153.00	41.27	-20.57	74.00	32.73	174	17	Horizontal			
3	4880.00	32.37	-15.07	54.00	21.63	165	348	Horizontal			
4	4880.00	40.97	-15.07	74.00	33.03	245	229	Horizontal			
5	7320.00	45.27	-8.63	74.00	28.73	223	122	Horizontal			
6	7320.00	36.12	-8.63	54.00	17.88	209	244	Horizontal			

Final Data List



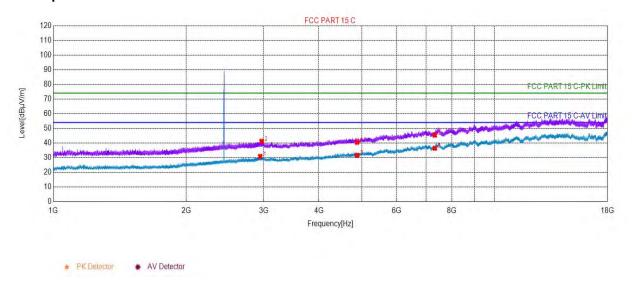


Report No.: ZR/2021/4002103

Page: 42 of 93

BLE2M Channel CH19

Test Graph



Suspected List

Susp	Suspected List										
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Polarity			
NO.	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	1 Olanty			
1	2943.59	30.81	10.53	54.00	23.19	214	312	Vertical			
2	2964.69	41.17	10.43	74.00	32.83	256	312	Vertical			
3	4880.00	31.64	-15.07	54.00	22.36	239	72	Vertical			
4	4880.00	40.50	-15.07	74.00	33.50	175	115	Vertical			
5	7320.00	45.39	-8.63	74.00	28.61	189	173	Vertical			
6	7320.00	36.43	-8.63	54.00	17.57	191	86	Vertical			

Final Data List



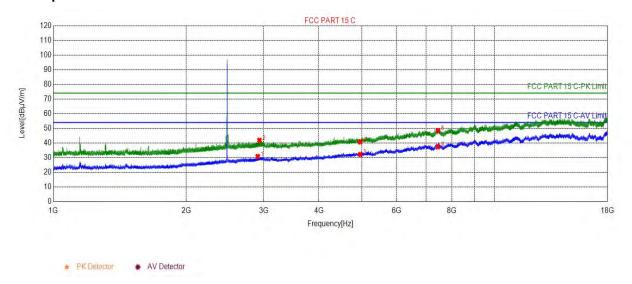


Report No.: ZR/2021/4002103

Page: 43 of 93

BLE2M Channel CH39

Test Graph



Suspected List

Suspe	Suspected List										
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Polarity			
NO.	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	Polarity			
1	2905.69	30.80	10.20	54.00	23.20	198	314	Horizontal			
2	2932.29	41.83	10.54	74.00	32.17	174	223	Horizontal			
3	4960.00	32.20	-14.40	54.00	21.80	215	219	Horizontal			
4	4960.00	40.73	-14.40	74.00	33.27	224	145	Horizontal			
5	7440.00	48.39	-7.31	74.00	25.61	239	337	Horizontal			
6	7440.00	37.36	-7.31	54.00	16.64	222	71	Horizontal			

Final Data List



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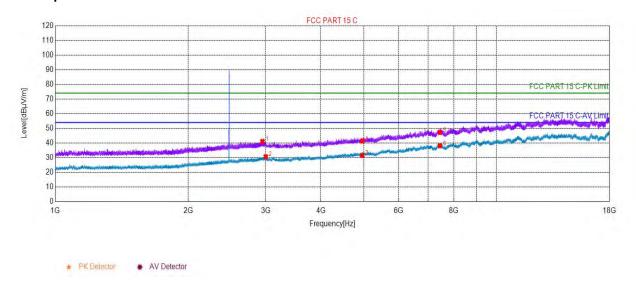


Report No.: ZR/2021/4002103

Page: 44 of 93

BLE2M Channel CH39

Test Graph



Suspected List

Susp	Suspected List										
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Polarity			
NO.	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	1 Olanty			
1	2947.59	41.09	10.55	74.00	32.91	198	33	Vertical			
2	2998.89	30.65	10.77	54.00	23.35	174	274	Vertical			
3	4960.00	31.59	-14.40	54.00	22.41	165	143	Vertical			
4	4960.00	41.36	-14.40	74.00	32.64	145	56	Vertical			
5	7440.00	47.18	-7.31	74.00	26.82	152	157	Vertical			
6	7440.00	38.02	-7.31	54.00	15.98	182	273	Vertical			

Final Data List





Report No.: ZR/2021/4002103

45 of 93 Page:

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 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) As shown in this section, 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. So, only the peak measurements were shown in the report.
- 4) All Modes have been tested, but only the worst case data displayed in this report





Report No.: ZR/2021/4002103

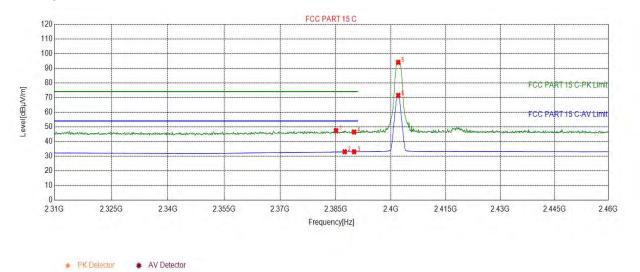
46 of 93 Page:

Restricted bands around fundamental frequency

Test plots

BLE1M_Channel CH0

Test Graph



Suspected List

Suspected List									
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Polarity	
NO.	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	Polarity	
1	2385.11	47.39	9.47	74.00	26.61	178	23	Horizontal	
2	2387.43	33.00	9.53	54.00	21.00	195	125	Horizontal	
3	2390.00	32.99	9.60	54.00	21.01	161	265	Horizontal	
4	2390.00	46.46	9.60	74.00	27.54	157	7	Horizontal	
5	2402.00	93.96	9.87	0.00	-93.96	178	114	Horizontal	
6	2402.00	71.42	9.87	0.00	-71.42	194	78	Horizontal	

Final Data List



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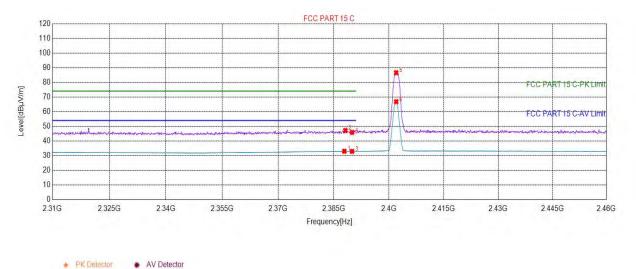


Report No.: ZR/2021/4002103

Page: 47 of 93

BLE1M _ Channel CH0

Test Graph



Suspected List

Suspected List										
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Polarity		
NO.	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	rolanty		
1	2387.88	33.03	9.55	54.00	20.97	241	178	Vertical		
2	2388.18	47.20	9.55	74.00	26.80	236	195	Vertical		
3	2390.00	32.92	9.60	54.00	21.08	278	26	Vertical		
4	2390.00	45.84	9.60	74.00	28.16	269	314	Vertical		
5	2402.00	86.57	9.87	0.00	-86.57	211	147	Vertical		
6	2402.00	66.80	9.87	0.00	-66.80	230	256	Vertical		

Final Data List



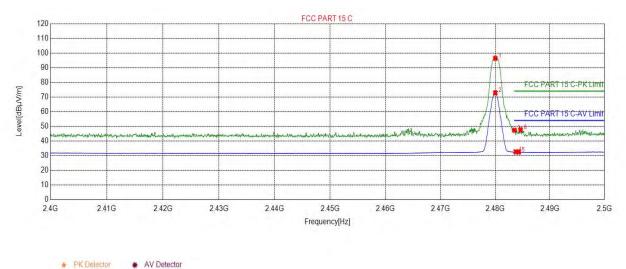


Report No.: ZR/2021/4002103

Page: 48 of 93

BLE1M Channel CH39

Test Graph



Suspected List

Suspe	Suspected List										
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Polarity			
	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	r Gianty			
1	2480.00	96.39	8.47	0.00	-96.39	187	125	Horizontal			
2	2480.00	72.84	8.47	0.00	-72.84	196	78	Horizontal			
3	2483.50	47.36	8.48	74.00	26.64	165	254	Horizontal			
4	2483.74	32.56	8.48	54.00	21.44	174	163	Horizontal			
5	2484.29	32.48	8.49	54.00	21.52	182	302	Horizontal			
6	2484.64	47.75	8.49	74.00	26.25	191	225	Horizontal			

Final Data List



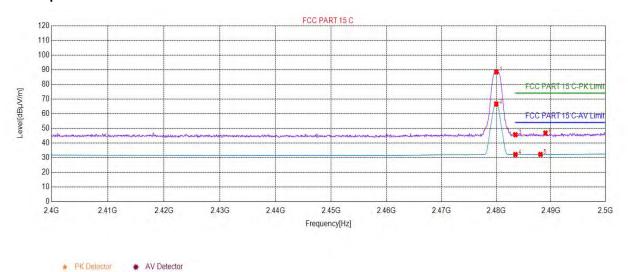


Report No.: ZR/2021/4002103

Page: 49 of 93

BLE1M Channel CH39

Test Graph



Suspected List

Susp	Suspected List										
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Polarity			
NO.	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	1 Olanty			
1	2480.00	88.49	8.47	0.00	-88.49	245	147	Vertical			
2	2480.00	66.59	8.47	0.00	-66.59	178	185	Vertical			
3	2483.50	45.64	8.48	74.00	28.36	195	126	Vertical			
4	2483.50	32.14	8.48	54.00	21.86	236	26	Vertical			
5	2488.09	32.23	8.50	54.00	21.77	316	9	Vertical			
6	2488.99	46.81	8.50	74.00	27.19	228	325	Vertical			

Final Data List



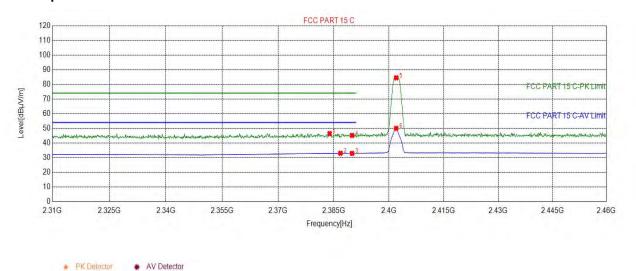


Report No.: ZR/2021/4002103

Page: 50 of 93

BLE2M Channel CH0

Test Graph



Suspected List

Suspe	Suspected List									
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Dolority.		
NO.	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	Polarity		
1	2383.91	46.43	9.44	74.00	27.57	198	78	Horizontal		
2	2386.83	33.03	9.52	54.00	20.97	175	125	Horizontal		
3	2390.00	32.90	9.60	54.00	21.10	165	174	Horizontal		
4	2390.00	45.18	9.60	74.00	28.82	155	265	Horizontal		
5	2402.00	84.44	9.87	0.00	-84.44	167	345	Horizontal		
6	2402.00	49.98	9.87	0.00	-49.98	187	11	Horizontal		

Final Data List



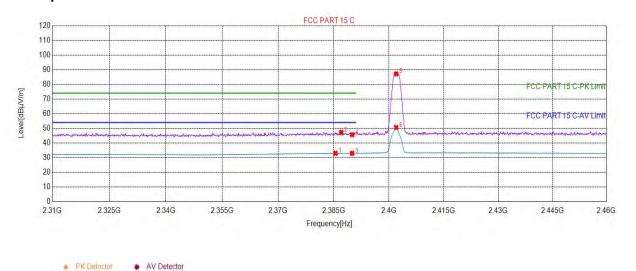


Report No.: ZR/2021/4002103

Page: 51 of 93

BLE2M Channel CH0

Test Graph



Suspected List

Suspected List									
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Dolority.	
NO.	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	Polarity	
1	2385.48	33.03	9.48	54.00	20.97	215	26	Vertical	
2	2387.06	47.25	9.52	74.00	26.75	203	254	Vertical	
3	2390.00	32.99	9.60	54.00	21.01	234	178	Vertical	
4	2390.00	45.67	9.60	74.00	28.33	245	8	Vertical	
5	2402.00	87.16	9.87	0.00	-87.16	258	314	Vertical	
6	2402.00	50.58	9.87	0.00	-50.58	219	187	Vertical	

Final Data List



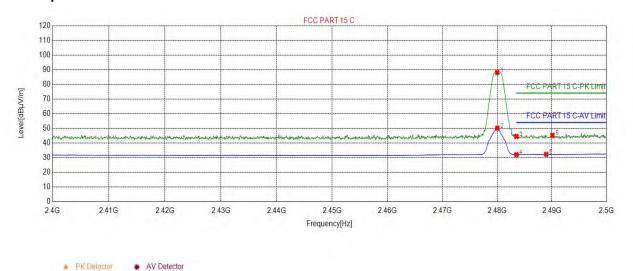


Report No.: ZR/2021/4002103

Page: 52 of 93

BLE2M Channel CH39

Test Graph



Suspected List

Suspected List									
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Dolority	
NO.	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	Polarity	
1	2480.00	88.05	8.47	0.00	-88.05	241	27	Horizontal	
2	2480.00	50.11	8.47	0.00	-50.11	236	256	Horizontal	
3	2483.50	44.47	8.48	74.00	29.53	216	316	Horizontal	
4	2483.50	32.04	8.48	54.00	21.96	254	1	Horizontal	
5	2488.94	32.29	8.50	54.00	21.71	262	156	Horizontal	
6	2490.09	45.30	8.50	74.00	28.70	260	144	Horizontal	

Final Data List



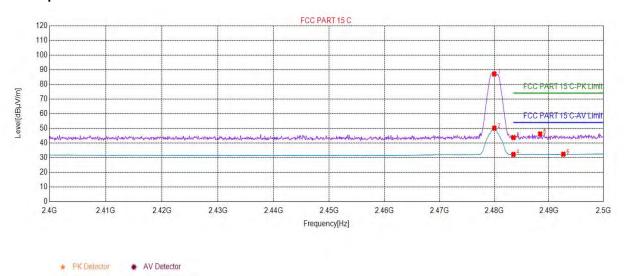


Report No.: ZR/2021/4002103

53 of 93 Page:

BLE2M Channel CH39

Test Graph



Suspected List

Suspected List									
NO.	Freq.	Level	Factor	Limit	Margin	Height	Angle	Dolority	
NO.	[MHz]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	Polarity	
1	2480.00	87.09	8.47	0.00	-87.09	225	158	Vertical	
2	2480.00	50.13	8.47	0.00	-50.13	234	241	Vertical	
3	2483.50	43.73	8.48	74.00	30.27	218	236	Vertical	
4	2483.50	32.21	8.48	54.00	21.79	269	199	Vertical	
5	2488.39	46.16	8.50	74.00	27.84	241	175	Vertical	
6	2492.64	32.34	8.56	54.00	21.66	225	215	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.





Report No.: ZR/2021/4002103

Page: 54 of 93

DTS Bandwidth Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
		2402	0.672	2401.658	2402.330	0.5	PASS
BLE_1M	Ant10	2440	0.666	2439.661	2440.327	0.5	PASS
		2480	0.672	2479.658	2480.330	0.5	PASS
		2402	1.145	2401.430	2402.575	0.5	PASS
BLE_2M	Ant10	2440	1.145	2439.430	2440.575	0.5	PASS
		2480	1.145	2479.430	2480.575	0.5	PASS

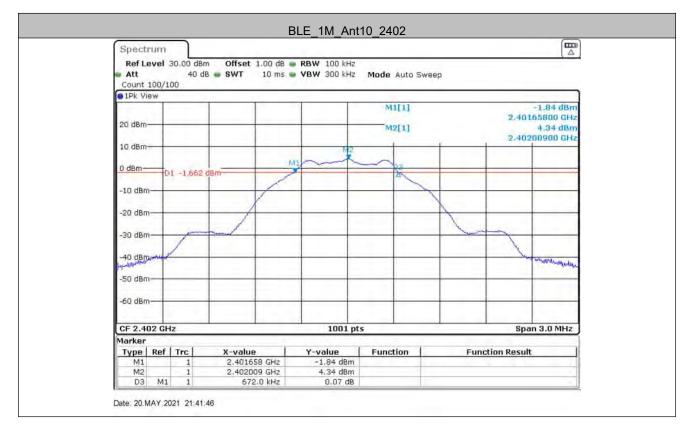




Report No.: ZR/2021/4002103

55 of 93 Page:

Test Graphs





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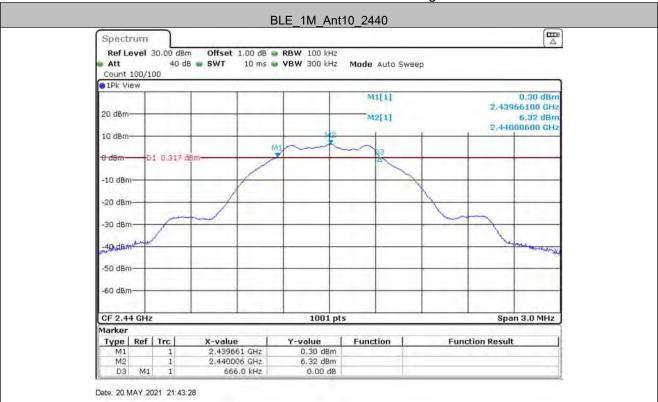
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Report No.: ZR/2021/4002103

Page: 56 of 93



BLE_1M_Ant10_2480 Spectrum Offset 1.00 dB @ RBW 100 kHz Ref Level 30,00 dBm 40 dB 🍅 SWT 10 ms - VBW 300 kHz Att Mode Auto Sweep Count 100/100 1Pk View M1[1] 0.12 dBm 2.47965800 GHz 20 dBm M2[1] 6.04 dBm 2.48000600 GHz 10 dBm D1 0.042 dBn 0 dBm -10 dBm -20 dBm--30 dBm 49 dBm -60 dBm-CF 2.48 GHz 1001 pts Span 3.0 MHz Marker Type | Ref | Trc | X-value Y-value Function **Function Result** 2.479658 GHz -0.12 dBm M2 2.480006 GHz 6.04 dBm D3 M1 672.0 kHz 0.07 dB Date: 20.MAY.2021 21:44:46



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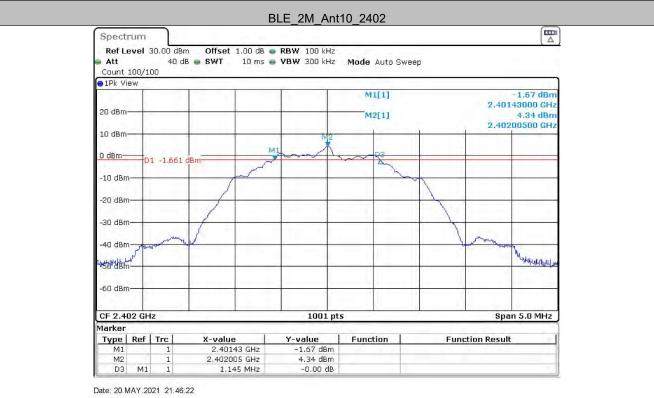
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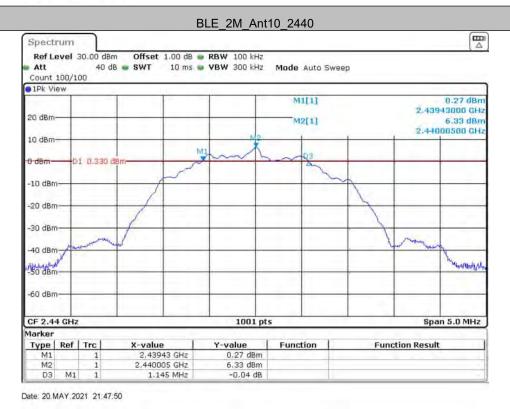
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57 of 93 Page:







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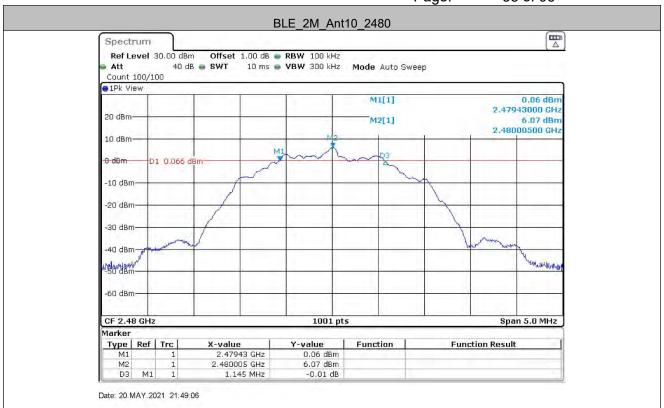
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58 of 93 Page:





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Report No.: ZR/2021/4002103

Page: 59 of 93

Occupied Channel Bandwidth Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
		2402	1.016	2401.497	2402.512		PASS
BLE_1M	Ant10	2440	1.019	2439.497	2440.515		PASS
		2480	1.019	2479.497	2480.515		PASS
		2402	2.023	2400.991	2403.014		PASS
BLE_2M	Ant10	2440	2.023	2438.991	2441.014		PASS
		2480	2.023	2478.991	2481.014		PASS



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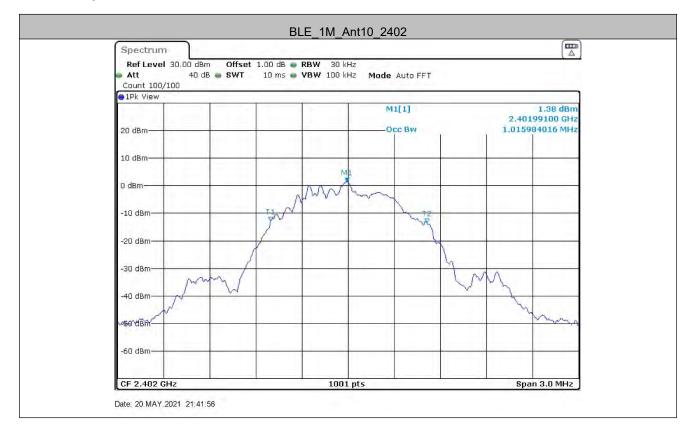
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Report No.: ZR/2021/4002103

60 of 93 Page:

Test Graphs

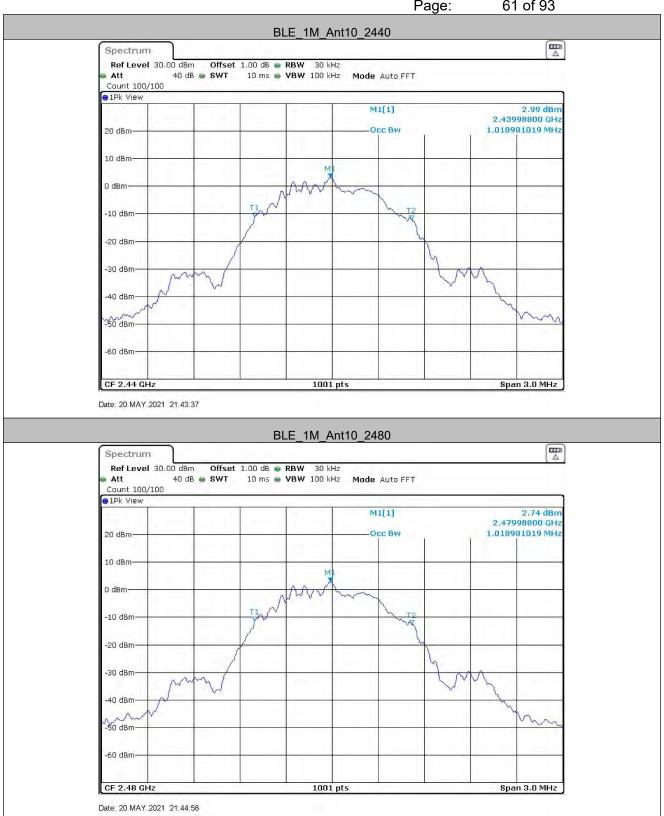






Report No.: ZR/2021/4002103

61 of 93 Page:





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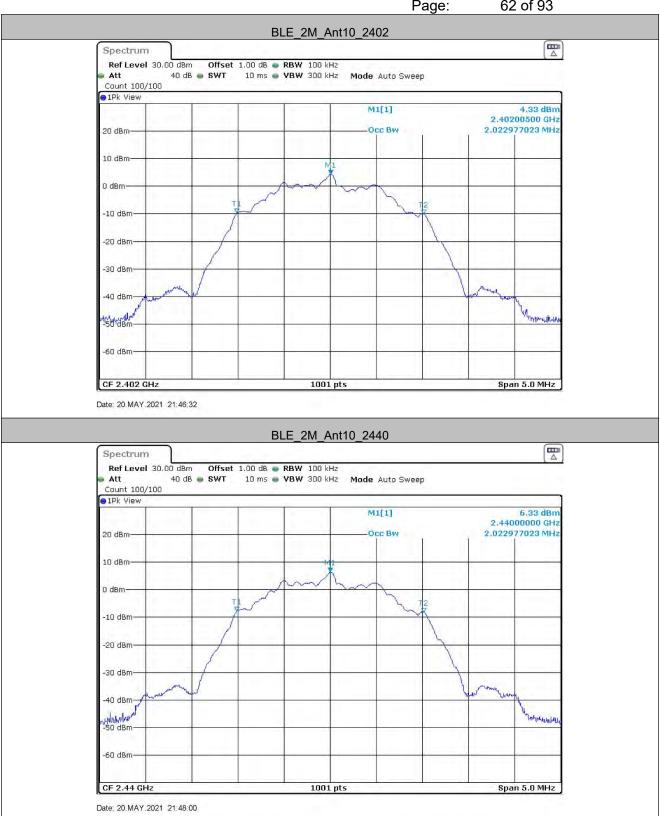
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62 of 93 Page:





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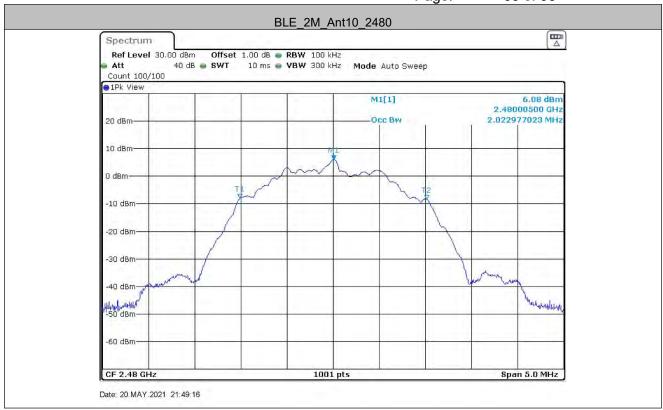
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63 of 93 Page:





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Report No.: ZR/2021/4002103

Page: 64 of 93

Maximum conducted output power **Test Result**

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
		2402	5.32	<=30	PASS
BLE_1M	Ant10	2440	7.36	<=30	PASS
		2480	6.48	<=30	PASS
		2402	5.44	<=30	PASS
BLE_2M	Ant10	2440	7.46	<=30	PASS
		2480	6.6	<=30	PASS



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Report No.: ZR/2021/4002103

65 of 93 Page:

Test Graphs





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67 of 93 Page:





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68 of 93 Page:





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Report No.: ZR/2021/4002103

Page: 69 of 93

Maximum power spectral density Test Result

TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
		2402	-9.86	<=8	PASS
BLE_1M	Ant10	2440	-7.86	<=8	PASS
		2480	-8.84	<=8	PASS
		2402	-12.92	<=8	PASS
BLE_2M	Ant10	2440	-10.85	<=8	PASS
		2480	-11.82	<=8	PASS

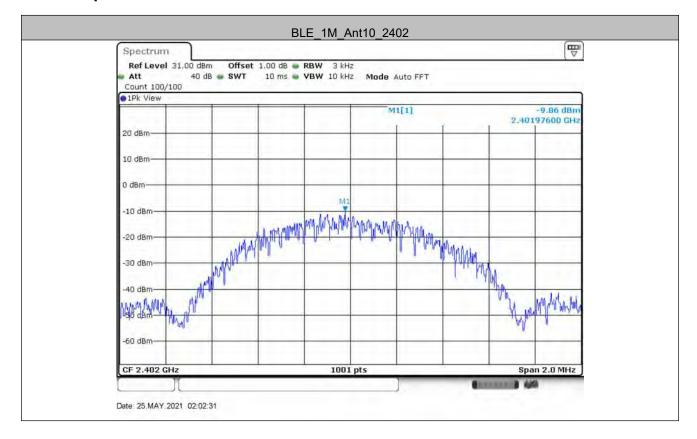




Report No.: ZR/2021/4002103

70 of 93 Page:

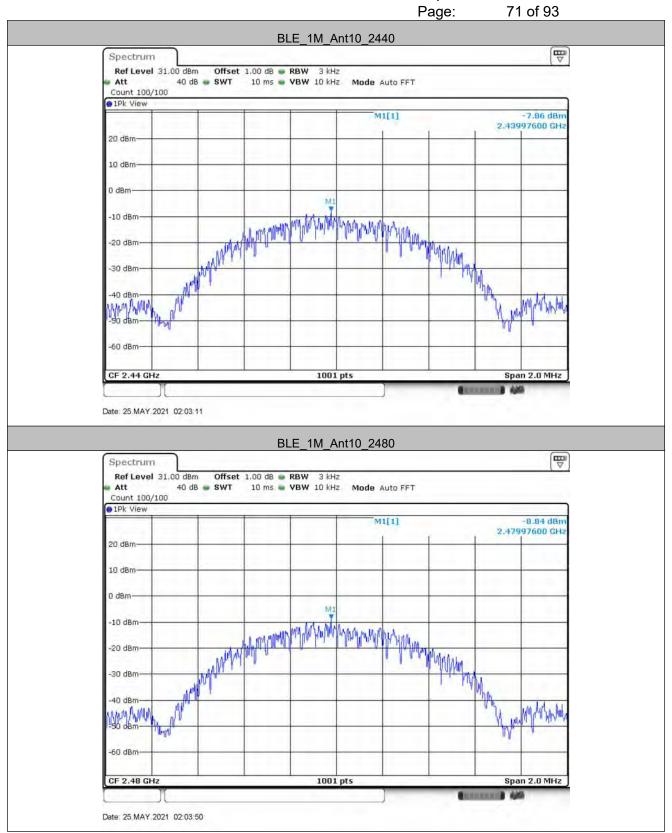
Test Graphs







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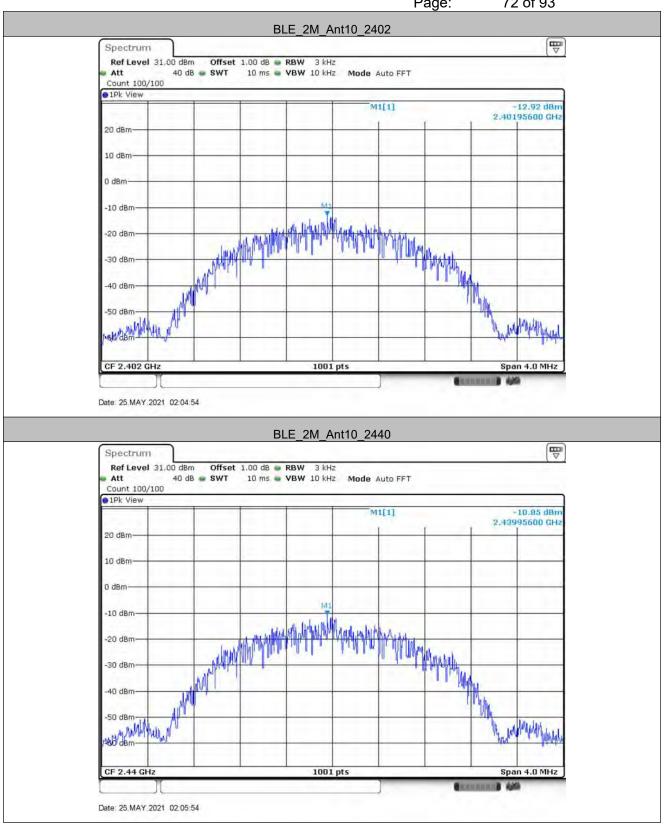
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72 of 93 Page:





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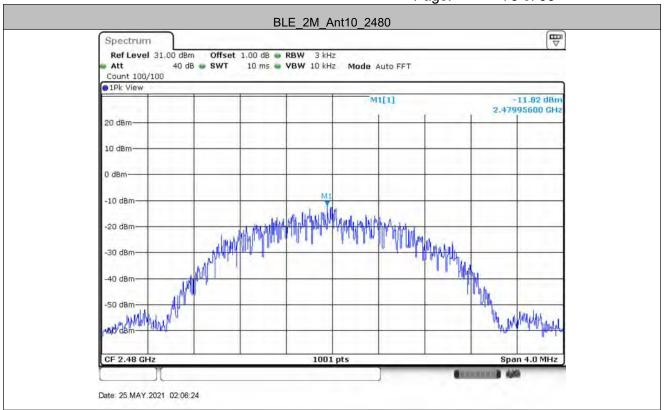
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73 of 93 Page:





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Report No.: ZR/2021/4002103

Page: 74 of 93

Band edge measurements Test Result

Testl	Mode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
			Low	2402	4.82	-51.58	<=-15.18	PASS
BLE	BLE_1M	Ant10	High	2480	5.91	-54.57	<=-14.09	PASS
		Ant10	Low	2402	4.82	-43.17	<=-15.18	PASS
BLE	BLE_2M		High	2480	6.03	-55.86	<=-13.97	PASS



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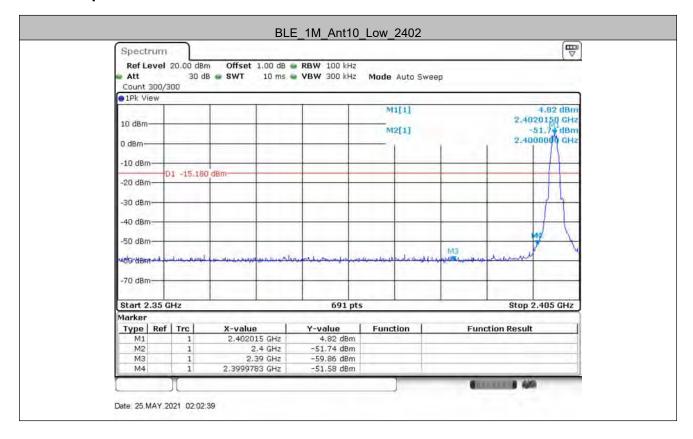
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Report No.: ZR/2021/4002103

75 of 93 Page:

Test Graphs





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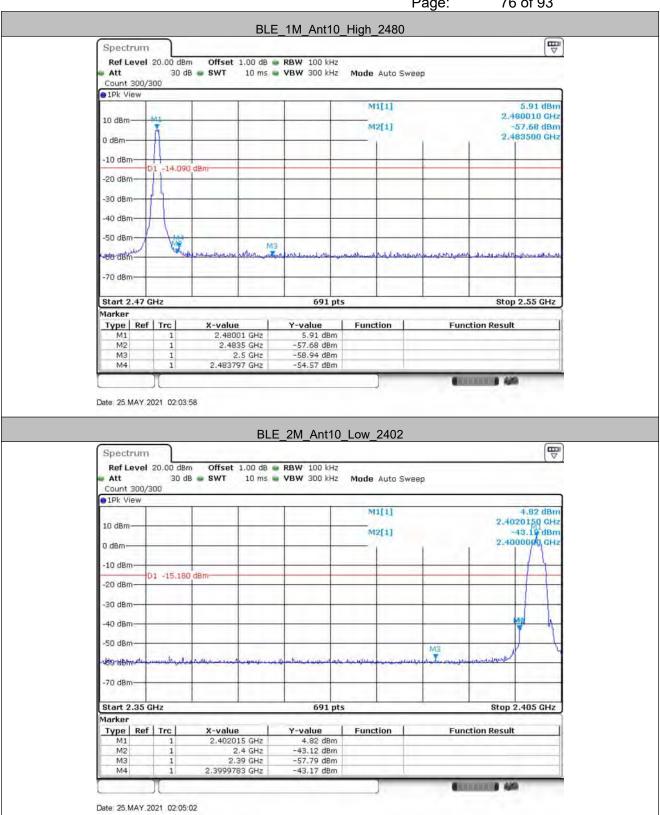
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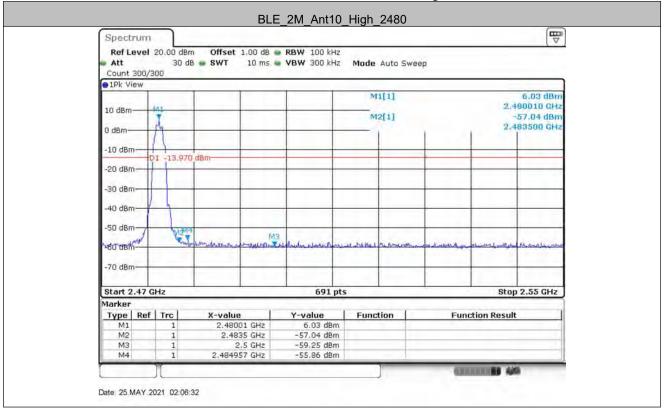
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Report No.: ZR/2021/4002103

Page: 78 of 93

Conducted Spurious Emission Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
	Ant10	2402	Reference	4.42	4.42		PASS
			30~1000	4.42	-45.21	<=-15.58	PASS
			1000~26500	4.42	-31.04	<=-15.58	PASS
		2440	Reference	6.34	6.34		PASS
BLE_1M			30~1000	6.34	-45.53	<=-13.66	PASS
			1000~26500	6.34	-31.02	<=-13.66	PASS
		2480	Reference	6.03	6.03		PASS
			30~1000	6.03	-45.29	<=-13.97	PASS
			1000~26500	6.03	-31.01	<=-13.97	PASS
	Ant10	2402	Reference	4.43	4.43		PASS
			30~1000	4.43	-44.75	<=-15.57	PASS
			1000~26500	4.43	-31.19	<=-15.57	PASS
		2440	Reference	6.37	6.37		PASS
BLE_2M			30~1000	6.37	-44.35	<=-13.63	PASS
			1000~26500	6.37	-31.31	<=-13.63	PASS
		2480	Reference	6.05	6.05		PASS
			30~1000	6.05	-44.84	<=-13.95	PASS
			1000~26500	6.05	-30.09	<=-13.95	PASS



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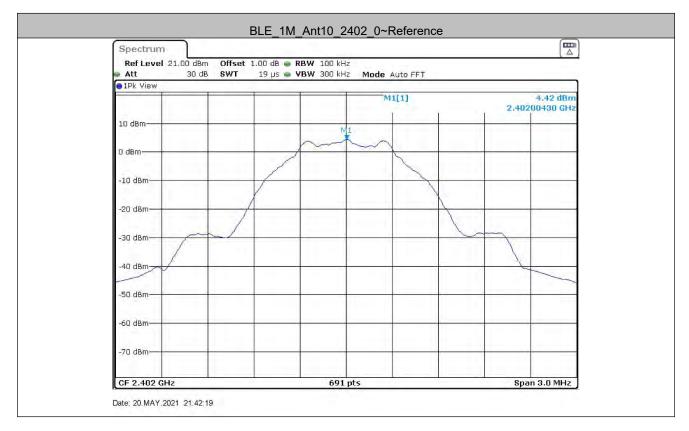
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Report No.: ZR/2021/4002103

79 of 93 Page:

Test Graphs





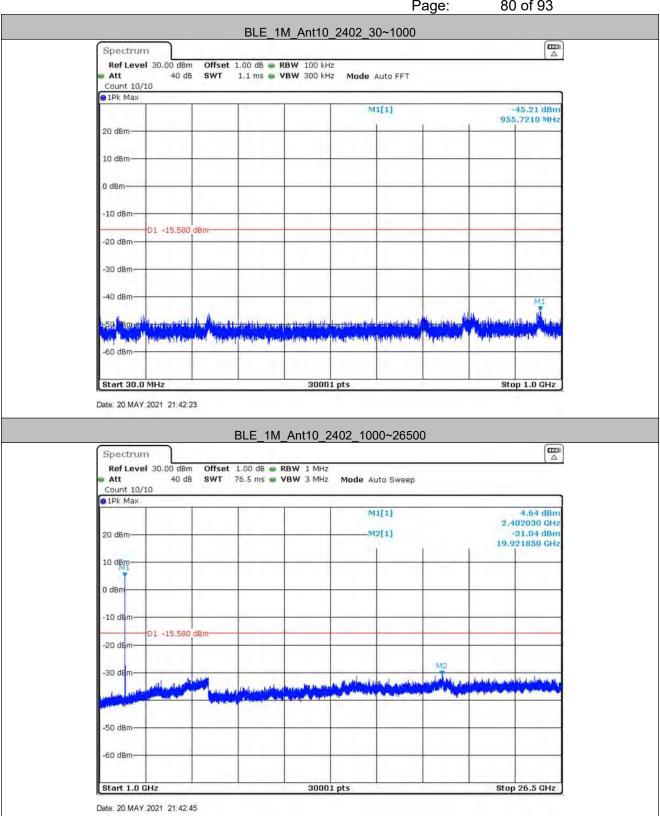
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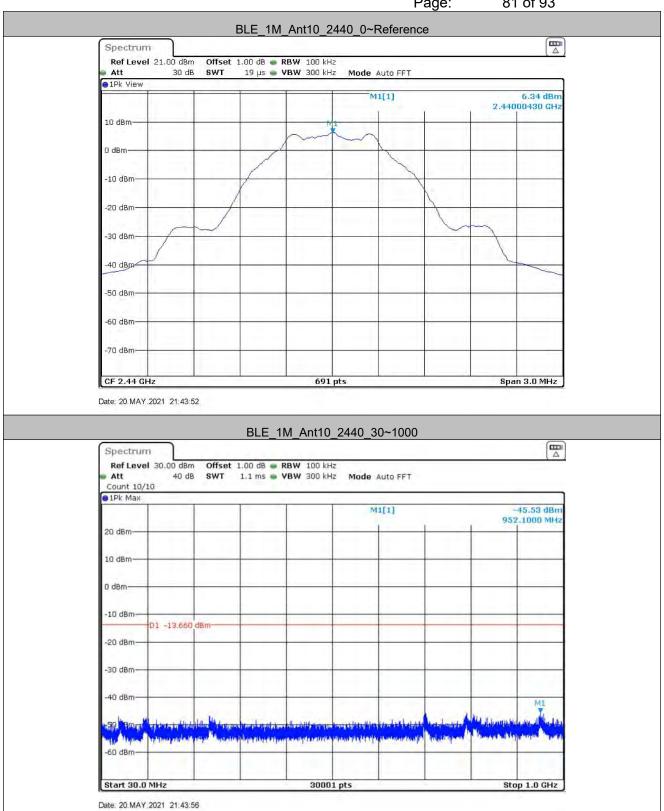
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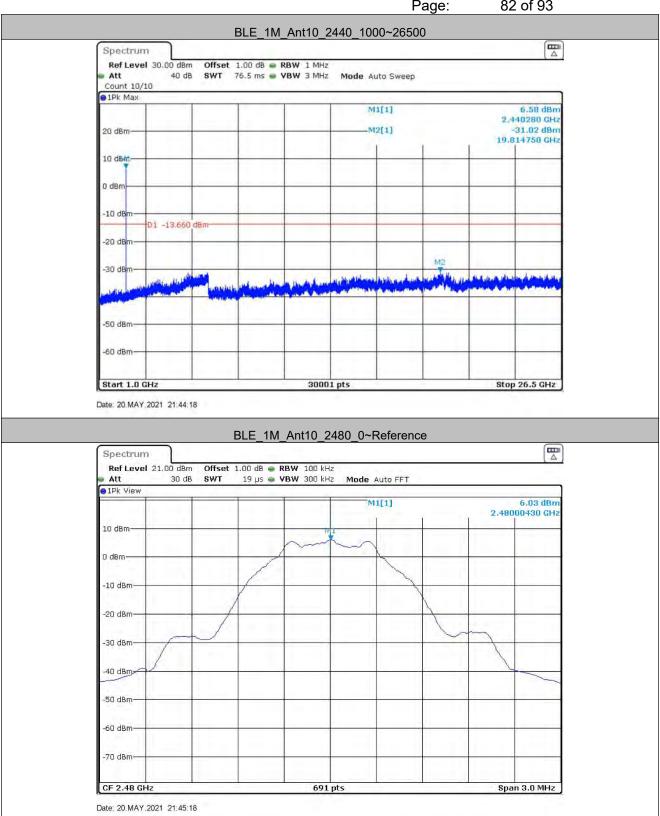
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Report No.: ZR/2021/4002103

82 of 93 Page:





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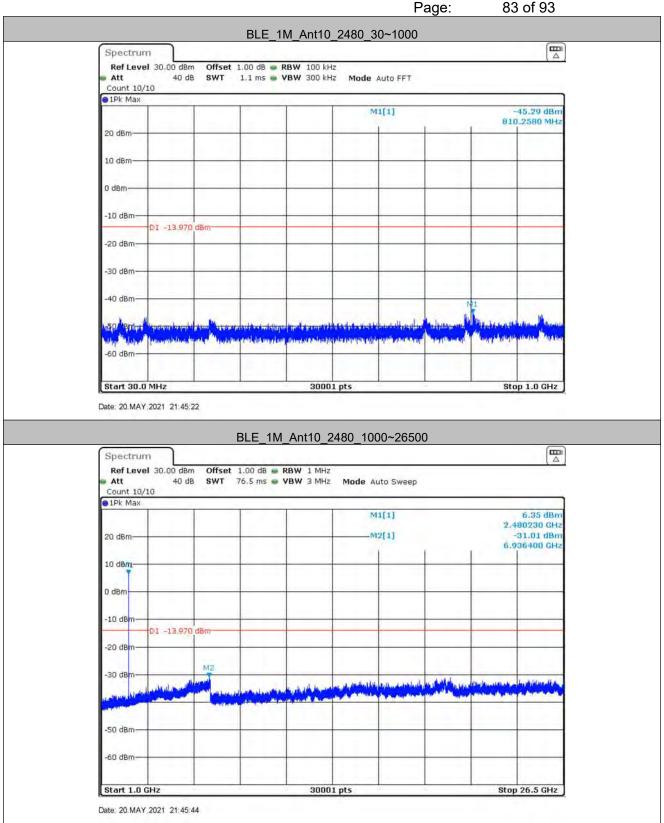
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83 of 93





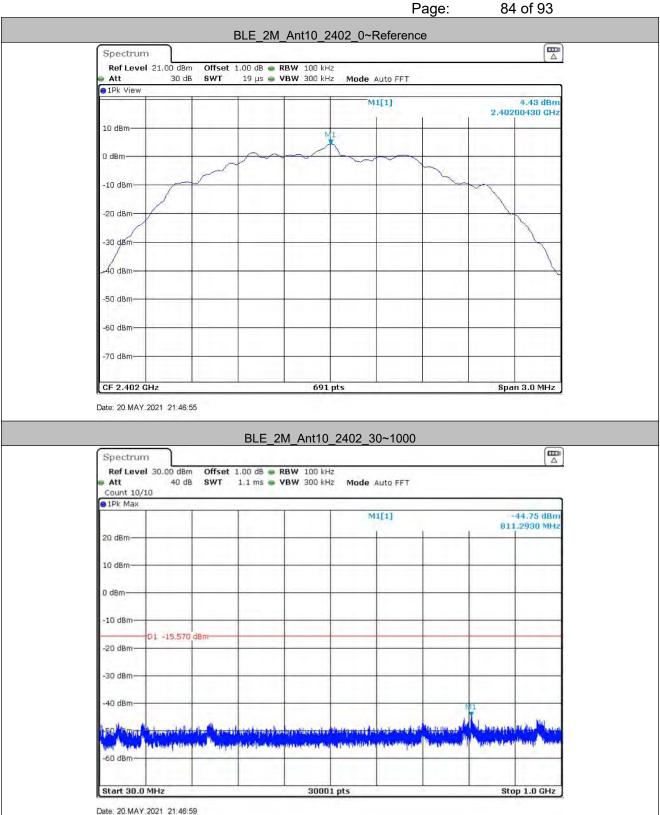
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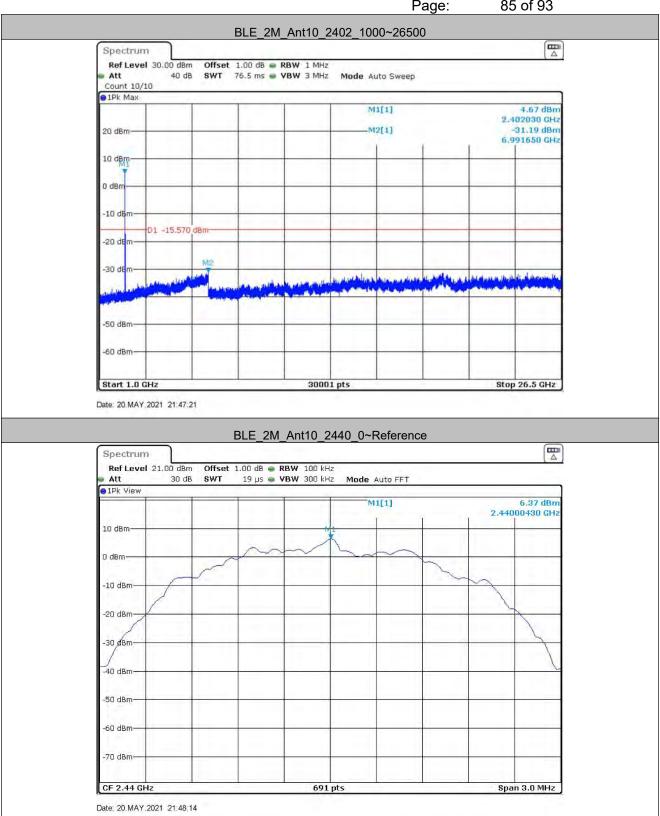
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85 of 93 Page:





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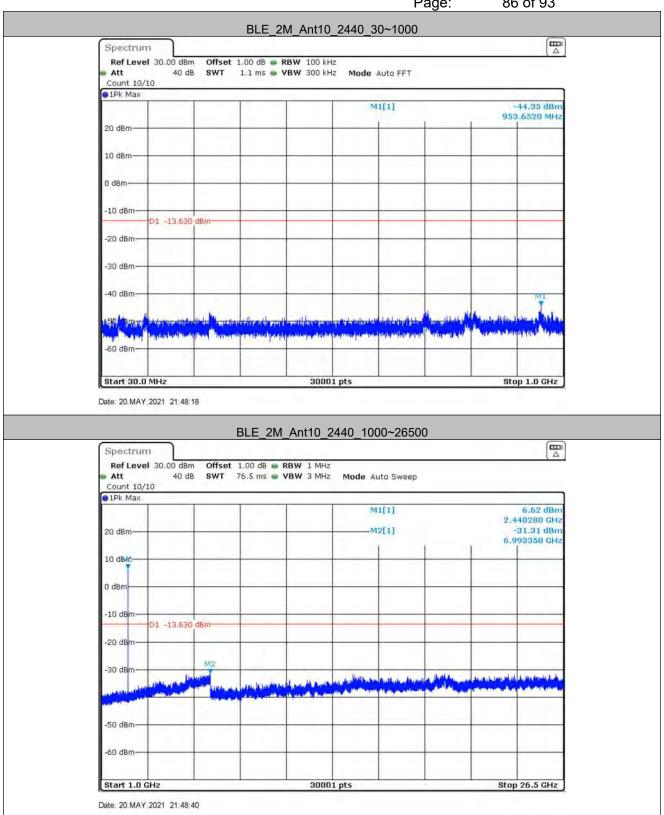
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86 of 93 Page:





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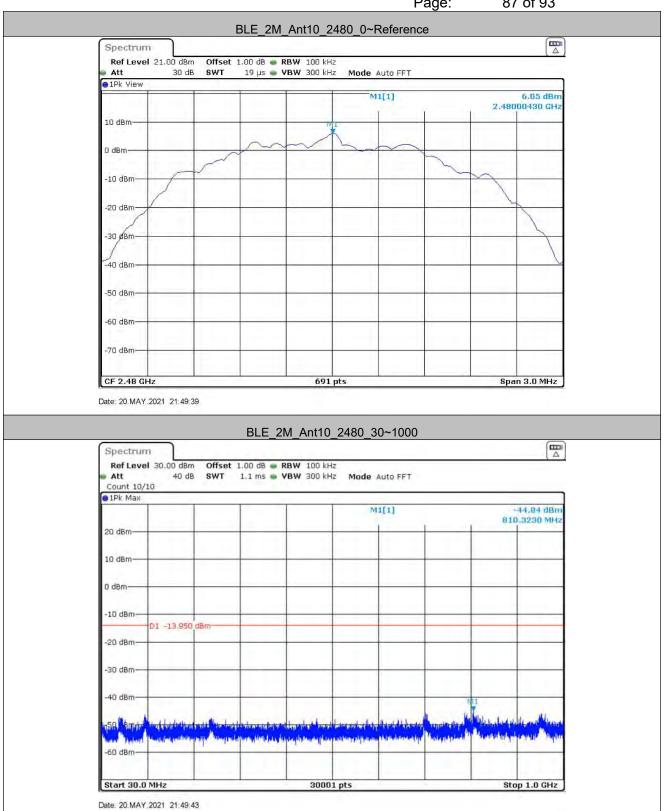
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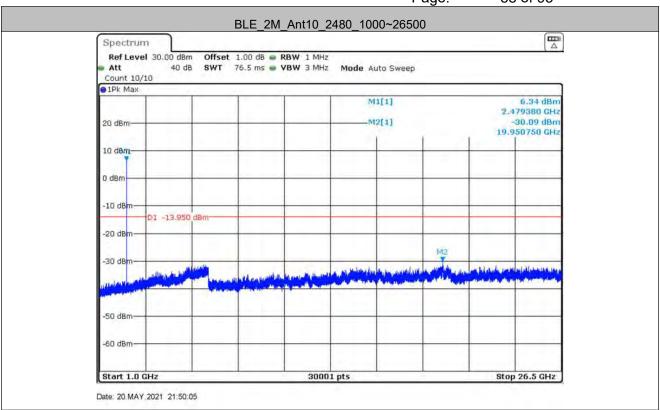
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88 of 93 Page:





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Report No.: ZR/2021/4002103

Page: 89 of 93

Duty Cycle Test Result

TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Limit	Verdict
		2402	0.41	0.62	66.13		PASS
BLE_1M	Ant10	2440	0.41	0.62	66.13		PASS
		2480	0.41	0.62	66.13		PASS
		2402	0.22	0.62	35.48		PASS
BLE_2M	Ant10	2440	0.22	0.62	35.48		PASS
		2480	0.22	0.62	35.48		PASS



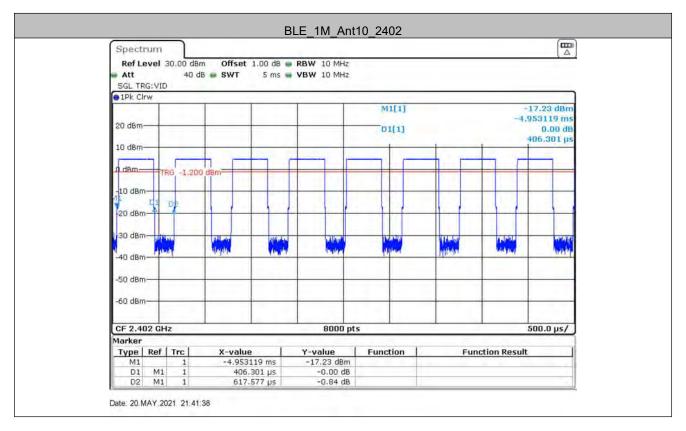
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90 of 93 Page:

Test Graphs





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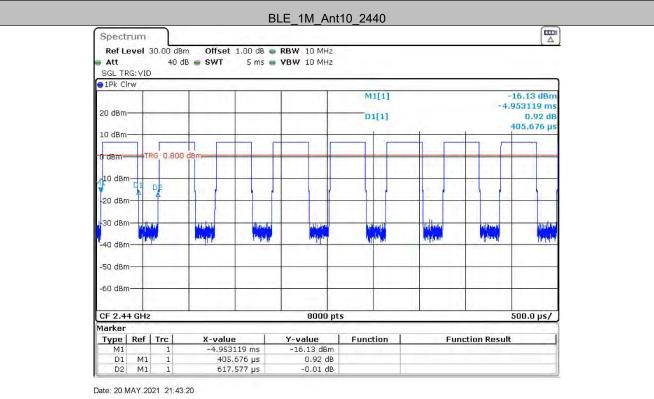
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Report No.: ZR/2021/4002103

91 of 93 Page:



BLE 1M Ant10 2480 Spectrum Ref Level 30,00 dBm Offset 1.00 dB RBW 10 MHz 40 dB . SWT Att 5 ms W VBW 10 MHz SGL TRG: VID 1Pk Clrw M1[1] 15.95 dBn 4.952494 ms 20 dBm D1[1] 0.21 dE 405.676 µs 10 dBm RG 0.600 dBm 10 dBm D 20 dBm 30 dBm 40 dBm -50 dBm -60 dBm-CF 2.48 GHz 8000 pts 500.0 µs/ Marker Type | Ref | Trc | X-value Y-value Function **Function Result** -4.952494 ms -15.95 dBm D1 405.676 µs 0.21 dB D2 616.952 µs -1.04 dB Date: 20.MAY.2021 21:44:38



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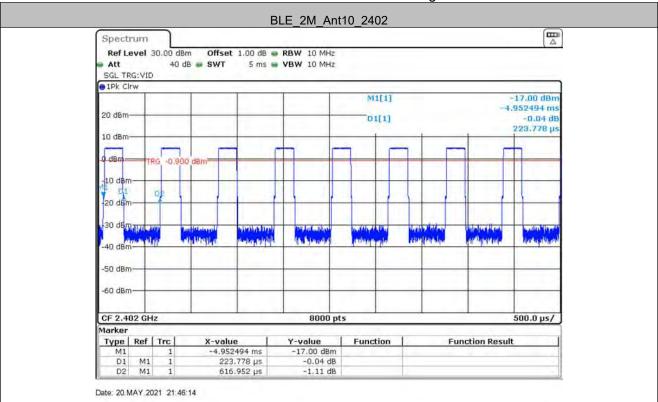
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92 of 93 Page:



BLE 2M Ant10 2440 Spectrum Ref Level 30.00 dBm Offset 1.00 dB RBW 10 MHz 40 dB . SWT 5 ms W VBW 10 MHz Att SGL TRG: VID 1Pk Clrw M1[1] 14.94 dBm 4.952494 ms 20 dBm D1[1] -0.08 dE 223.778 µs 10 dBm der 10 dBn D 20 dBn 30 dBr 40 dBm -50 dBm -60 dBm-CF 2.44 GHz 8000 pts 500.0 µs/ Marker Type | Ref | Trc | X-value Y-value Function **Function Result** -4.952494 ms -14.94 dBm D1 223.778 µs -0.08 dB M1 -0.68 dB Date: 20.MAY.2021 21:47:42



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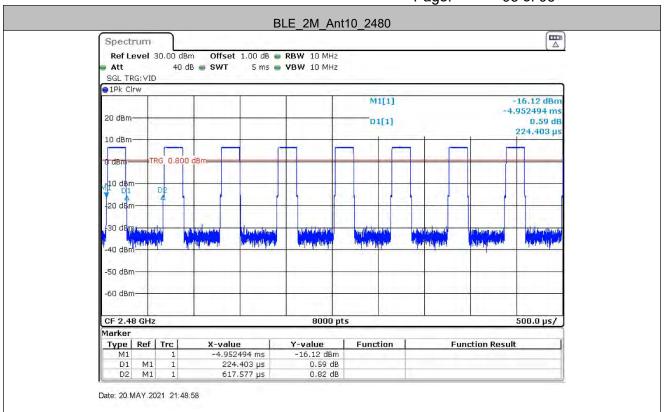
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