

Product Name: Smart Phone PMN: Smart Phone	Report No:ITEZA2-202400339RF1
For FCC ID Model: Blade GT, Blade GT Ultra, Blade GT Play, Blade GT Pro, Blade GT Max, Blade10 Play, Blade10 Max 5G For ISED HVIN: Blade GT	Security Classification: Open
Version: V1.0	Total Page:62

# **TIRT Testing Report**

Prepared By:	Checked By:	Approved By:	shnology Sea
Aaron Long	Stone Tang	Joky Wang	STORT TE
Aaron long	Stone Tang	Lopy Wany	Shenzhen &



# **Radio Test Report**

**FCC ID: 2AX4YBLADEGT** 

**IC: 33167-BLADEGT** 

According to

47 CFR FCC Part 15, Subpart C(Section 15.247)

RSS-247 Issue 3, RSS-Gen Issue 5

ANSI C63.10:2013

Applicant:	Shenzhen DOOGEE Hengtong Technology CO.,LTD	
FCC ID Address:	B, 2/F, Building A4, Silicon Valley Power Digital Industrial Park, No. 22,	
FCC ID Address.	Longhua New District, Shenzhen, China	
	B, 2/F, Building A4, Silicon Valley Power Digital Industrial Park, No. 22, Dafu	
IC Address	Industrial Zone, Guanlan Aobei Community, Guanlan Street, Longhua New	
	District, Shenzhen, Guangdong China	
Manufacturer:	Shenzhen DOOGEE Hengtong Technology CO.,LTD	
Address:	B, 2/F, Building A4, Silicon Valley Power Digital Industrial Park, No. 22,	
Address.	Longhua New District, Shenzhen, China	
Sample No:	1000046260	
Product Name:	Smart Phone	
PMN:	Smart Phone	
Brand Name:	DOOGEE	
For FCC ID	Blade GT, Blade GT Ultra, Blade GT Play, Blade GT Pro, Blade GT Max,	
Model No.:	Blade10 Play, Blade10 Max 5G	
For ISED HVIN	Blade GT	
Test No.:	Blade GT	

Date of Receipt:	2024/09/11
Date of Test:	2024/09/11~2024/11/19
Issued Date:	2024/12/02
Testing Lab:	TIRT

**Note:** This report shall not be reproduced except in full, without the written approval of Beijing TIRT Technology Service Co.,Ltd Shenzhen.Laboratory.

This document may be altered or revised by Beijing TIRT Technology Service Co.,Ltd Shenzhen.

Laboratory.Personnel only, and shall be noted in the revision section of the document. The test results of this report relate only to the tested sample identified in this report.



Table of Contents	Page
REPORT ISSUED HISTORY	6
1 . SUMMARY OF TEST RESULTS	7
1.1 TEST FACILITY	8
1.2 MEASUREMENT UNCERTAINTY	8
1.3 TEST ENVIRONMENT CONDITIONS	9
2. GENERAL INFORMATION	10
2.1 GENERAL DESCRIPTION OF EUT	10
2.2 DESCRIPTION OF TEST MODES	11
2.3 PARAMETERS OF TEST SOFTWARE	12
2.4. ACCESSORIES OF DEVICE (EUT)	12
2.5 BLOCKDIAGRAMSHOWINGTHECONFIGURATIONOFSYSTEMTESTED	12
2.6 SUPPORT UNITS	12
3 .AC POWER LINE CONDUCTED EMISSIONS	13
3.1 LIMIT	13
3.2 TEST PROCEDURE	13
3.3 DEVIATIONFROMTESTSTANDARD	13
3.4 TESTSETUP	14
3.5 EUT OPERATING CONDITIONS	14
3.6 TEST RESULTS	14
4 . RADIATED EMISSIONS	15
4.1 LIMIT	15
4.2 TEST PROCEDURE	18
4.3 DEVIATIONFROMTESTSTANDARD	19
4.4 TESTSETUP	19
4.5 EUT OPERATING CONDITIONS	21
4.6 TEST RESULT- 9KHZ TO 30MHZ	21
4.7 TEST RESULT- 30MHZ TO 1000MHZ	21
4.8 TEST RESULT- ABOVE 1000MHZ	21
5 .BANDWIDTH	22
5.1 LIMIT	22
5.2 TEST PROCEDURE	22
5.3 DEVIATION FROM STANDARD	22
5.4 TEST SETUP	22



Table of Contents	Page
5.5 EUT OPERATION CONDITIONS	22
5.6 TESTRESULTS	22
6 .MAXIMUM OUTPUT POWER	23
6.1 LIMIT	23
6.2 TEST PROCEDURE	23
6.3 DEVIATION FROM STANDARD	23
6.4 TEST SETUP	23
6.5 EUT OPERATION CONDITIONS	23
6.6 TESTRESULTS	23
CONDUCTED SPURIOUS EMISSION	24
7.1 LIMIT	24
7.2 TEST PROCEDURE	24
7.3 DEVIATION FROM STANDARD	24
7.4 TEST SETUP	24
7.5 EUT OPERATION CONDITIONS	24
7.6 TEST RESULTS	24
3 .POWER SPECTRAL DENSITY	25
8.1 LIMIT	25
8.2 TEST PROCEDURE	25
8.3 DEVIATION FROM STANDARD	25
8.4 TEST SETUP	25
8.5 EUT OPERATION CONDITIONS	25
8.6 TEST RESULTS	25
D. ANTENNA REQUIREMENT	26
9.1STANDARD REQUIREMENT	26
9.2ANTENNA CONNECTED CONSTRUCTION	26
9.3RESULTS	26
10. MEASUREMENT INSTRUMENTS LIST	27
11. PHOTOS OF TEST SETUP	28
12. PHOTOS OF EUT	28
APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS	29
APPENDIX B - RADIATED EMISSION -9 KHZ TO 30 MHZ	31
APPENDIX C - RADIATED EMISSION-30 MHZ TO 1000 MHZ	32



Table of Contents	Page
APPENDIX D - RADIATED EMISSION - ABOVE 1000 MHZ	34
APPENDIX E - BANDWIDTH	36
APPENDIX F - MAXIMUM OUTPUT POWER	42
APPENDIX G - CONDUCTED SPURIOUS EMISSION	45
APPENDIX H- POWER SPECTRAL DENSITY	56
APPENDIX I DUTY CYCLE	59



#### **REPORT ISSUED HISTORY**

Report No.	Version	Description	Issued Date	Note
ITEZA2-202400339RF1	V1.0	Original Report.	2024.12.02	Valid



#### 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC CFR Title 47, Part 15, Subpart C RSS-247 Issue 3, RSS-Gen Issue 5						
Standard(s) Section	Section Test Item Test Result Judgment Remark					
FCC Part 15: 15.207 RSS-GEN(8.8),	AC Power Line Conducted	APPENDIX A	PASS			
ANSI C63.10 :2013	Emissions					
15.247(d) 15.205(a) 15.209(a) RSS-Gen(8.9), RSS-247(5.5)	Radiated Emissions	APPENDIX B APPENDIX C APPENDIX D	PASS			
ANSI C63.10 :2013						
FCC PART 15:15.247(a)(2) RSS-247(5.2 a), ANSI C63.10 :2013	Bandwidth	APPENDIX E	PASS			
15.247(b)(3) RSS-247(5.4 d) ANSI C63.10 :2013	Maximum Output Power	APPENDIX F	PASS			
15.247(d) RSS-Gen(8.9), RSS-247(5.5) ANSI C63.10 :2013	Conducted Spurious Emission& Band Edge Emission	APPENDIX G	PASS			
FCC PART 15:15.247(e) RSS-247(5.2 b), ANSI C63.10 :2013	Power Spectral Density	APPENDIX H	PASS			
FCC Part 15: 15.203 RSS-GEN(6.8)	Antenna Requirement		PASS	Note(5)		

#### Note:

- (1) N/A denotes test is not applicable to this device.
- (2) P is an abbreviation for Pass.
- (3) F is an abbreviation for Fail.
- (4) Conclusion determination rules of this report: Unless there are clear provisions on measurement uncertainty in the standard or customer requirements, decision by actual test data without considering measurement uncertainty.
- (5) The device what use a permanently attached antenna were considered sufficient to comply with the provisions of 15.203 and FCC Part 15: 15.203 and RSS-GEN(6.8)



#### 1.1 TEST FACILITY

Company:	Beijing TIRT Technology Service Co.,Ltd Shenzhen
Address:	104 Building C, Xinmingsheng Industrial Park No.132, Zhangge Old Village East Zone, Zhangge Community, Fucheng Street, Longhua District, Shenzhen, Guangdong, P. R. China
CNAS Registration Number:	CNAS L14158
A2LA Registration Number:	6049.01
FCC Accredited Lab.Designation Number:	CN1366
FCC Test Firm Registration Number:	820690
CAB identifier	CN0159
Company Number	31418
Telephone:	+86-0755-27087573

#### 1.2 MEASUREMENT UNCERTAINTY

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))
The measurement uncertainty as below table:

Uncertainty	
Parameter	Uncertainty
Occupied Channel Bandwidth	±142.12 KHz
RF power conducted	±0.74 dB
RF power radiated	±3.25dB
Spurious emissions, conducted	±1.78dB
Spurious emissions, radiated (30MHz~1GHz)	±4.6dB
Spurious emissions, radiated (1GHz ~ 18GHz)	±4.9dB
Conduction Emissions(150kHz~30MHz)	±3.1 dB
Humidity	±4.6%
Temprature	±0.7°C
Time	+1.25%

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.



#### 1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Test Voltage	Tested By
AC Power Line Conducted Emissions	24.5°C	50%	DC 9V from	Aaron Long
AC Fower Line Conducted Emissions	24.5 C	30 /6	adapter	Aaron Long
			DC 3.87V from	
Radiated Emissions-9 kHz to 30 MHz	24.5°C	50%	battery or DC 9V	Aaron Long
			from adapter	
			DC 3.87V from	
Radiated Emissions-30 MHz to 1000 MHz	24°C	53%	battery or DC 9V	Aaron Long
			from adapter	
De l'ata I Faciacia de Alaca 4000 MII	0000	500/	DC 3.87V from	A 1
Radiated Emissions-Above 1000 MHz	26°C	53%	battery or DC 9V from adapter	Aaron Long
			DC 3.87V from	
Bandwidth	25°C	56%	battery or DC 9V	Aaron Long
			from adapter	
Marina a Cata a Barana	0.400	F 40/	AC 120V/60Hz	A 1
Maximum Output Power	24°C	54%	from Adapter	Aaron Long
			DC 3.87V from	
ConductedSpurious Emission	25°C	62%	battery or DC 9V	Aaron Long
			from adapter	
			DC 3.87V from	
Power Spectral Density	26°C	60%	battery or DC 9V	Aaron Long
			from adapter	



#### 2. GENERAL INFORMATION

# 2.1 GENERAL DESCRIPTION OF EUT

Equipment	Smart Phone
Brand Name	DOOGEE
Test Model	Blade GT
For FCC ID	Blade GT, Blade GT Ultra, Blade GT Play, Blade GT Pro, Blade GT Max,
Model No.:	Blade10 Play, Blade10 Max 5G
PMN	Smart Phone
For ISED HVIN	Blade GT
For FCC ID	There is no difference except the name of the model
Model Difference(s)	There is no difference except the flame of the model
Software Version	DOOGEE-Blade_GT-EEA-Android14.0-20240830
Hardware Version//FVIN	M163-MUB-V2
Power Rating	DC 3.87V from battery or DC 9V from adapter
Operation Frequency	2402 MHz ~ 2480 MHz
Modulation Type	GFSK
Bit Rate of Transmitter	1Mbps, 2Mbps
Max. Output Power	1Mbps: -2.55dBm (0.000556W)

#### Note

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.



#### 2.2 DESCRIPTION OF TEST MODES

The test software was used to control EUT work in Continuous TX mode, and select test channel, wireless mode

Tested mode, channel, and data rate information		
Mode Channel Frequency (MHz)		
	Low :CH00	2402
GFSK (1M/2M)	Middle: CH19	2440
	High: CH39	2480

#### Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	20	2442
01	2404	21	2444
02	2406	22	2446
03	2408	23	2448
04	2410	24	2450
05	2412	25	2452
06	2414	26	2454
07	2416	27	2456
08	2418	28	2458
09	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

#### Table for Filed Antenna:

Ant.	Manufactured	Model Name	Antenna Type	Connector	Gain (dBi)
1	Shenzhen 3Good Wireless Communication Co.,LTD.	M24C	PIFA	N/A	1.54

Note: Antenna information is provided by applicant.
The antenna is for testing and fixation purposes.



#### 2.3 PARAMETERS OF TEST SOFTWARE

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

Test Software Version	Debug Engineering mode		
Frequency (MHz)	2402 2440 2480		
1Mbps, 2 Mbps	default default default		

#### 2.4. ACCESSORIES OF DEVICE (EUT)

Accessories : AC Adapter

Manufacturer : Shenzhen Theone Electronic CO.,Ltd

Model : TP182C-US

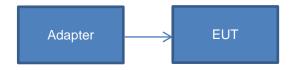
Input: AC100-240V~ 50/60Hz 0.5A Max

Output USB-A: 5.0V=3.0A 15.0W; 9.0V=2.0A 18.0W,

Ratings : 12.0V=1.5A 18.0W;

Power:18.0W Max

#### 2.5 BLOCKDIAGRAMSHOWINGTHECONFIGURATIONOFSYSTEMTESTED



#### 2.6 SUPPORT UNITS

No.	Description	Manufacturer	Model	Note
1	N/A	N/A	N/A	N/A



#### 3.AC POWER LINE CONDUCTED EMISSIONS

#### 3.1LIMIT

Fraguency of Emission (MHz)	Limit (dBµV)		
Frequency of Emission (MHz)	Quasi-peak	Average	
0.15 -0.5	66 to 56*	56 to 46*	
0.5-5.0	56	6	
5.0 -30.0	60	50	

#### Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

#### **3.2TEST PROCEDURE**

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipmentpowered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the groundplane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item -EUT Test Photos.

The following table is the setting of the receiver:

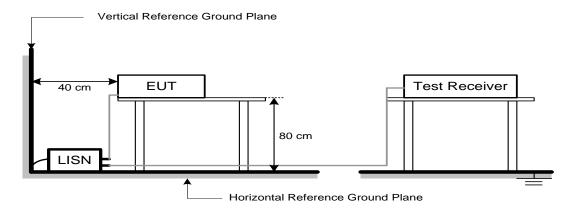
Receiver Parameters	Setting
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

#### 3.3DEVIATIONFROMTESTSTANDARD

No deviation.



#### 3.4TESTSETUP



The LISN edge is arranged parallel to the edge of the test table

The vertical conducting plane or wall of an RF-shielded (screened) room shall be located 40 cm to the rear of the EUT

#### 3.5EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion -GFSK (1M/2M) mode, The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

#### 3.6 TEST RESULTS

Please refer to the APPENDIX-A



#### 4. RADIATED EMISSIONS

#### **4.1LIMIT**

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

15.205 Restricted frequency band

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

RSS-GEN Restricted frequency band

Table 7 – Restricted frequency bands <sup>Note 1</sup>			
MHz	MHz	GHz	
0.090 - 0.110	149.9 - 150.05	9.0 - 9.2	
0.495 - 0.505	156.52475 - 156.52525	9.3 - 9.5	
2.1735 - 2.1905	156.7 - 156.9	10.6 - 12.7	
3.020 - 3.026	162.0125 - 167.17	13.25 - 13.4	
4.125 - 4.128	167.72 - 173.2	14.47 - 14.5	
4.17725 - 4.17775	240 – 285	15.35 - 16.2	
4.20725 - 4.20775	322 - 335.4	17.7 - 21.4	
5.677 - 5.683	399.9 - 410	22.01 - 23.12	
6.215 - 6.218	608 - 614	23.6 - 24.0	
6.26775 - 6.26825	960 - 1427	31.2 - 31.8	
6.31175 - 6.31225	1435 - 1626.5	36.43 - 36.5	
8.291 - 8.294	1645.5 - 1646.5	Above 38.6	



8.362 - 8.366	1660 - 1710	
8.37625 - 8.38675	1718.8 - 1722.2	
8.41425 - 8.41475	2200 - 2300	
12.29 - 12.293	2310 - 2390	
12.51975 - 12.52025	2483.5 - 2500	
12.57675 - 12.57725	2655 - 2900	
13.36 - 13.41	3260 – 3267	
16.42 - 16.423	3332 - 3339	
16.69475 - 16.69525	3345.8 - 3358	
16.80425 - 16.80475	3500 - 4400	
25.5 - 25.67	4500 - 5150	
37.5 - 38.25	5350 - 5460	
73 - 74.6	7250 - 7750	
74.8 - 75.2	8025 – 8500	
108 – 138		

Note 1: Certain frequency bands listed in table 7 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSS.

#### 15.209 Limit

FREQUE	NCY	DISTANCE	FIELD STRENGTHS LIMIT	
MHz		Meters	μV/m	dB(μV)/m
0.009-0.49	00	300	2400/F(KHz)	/
0.490-1.70	)5	30	24000/F(KHz)	/
1.705-30		30	30	29.5
30 ~	- 88	3	100	40.0
88 ~	216	3	150	43.5
216 ~	960	3	200 46.0	
960 ~	1000	3	500 54.0	
Above	1000	3	74.0 dB(μV).	
Above	1000	3	54.0 dB(μV)/n	n (Average)

Note: The peak limit is 20 dB higher than the average limit



Table 5 – General field strength limits at frequencies above 30 MHz		
Frequency (MHz)	Field strength (µV/m at 3 m)	
30 – 88	100	
88 – 216	150	
216 – 960	200	
Above 960	500	

Table 6 – General field strength limits at frequencies below 30 MHz		
Frequency	Magnetic field strength (H-Field) (μA/m)	Measurement distance (m)
9 - 490 kHz <sup>Note</sup> 1	6.37/F (F in kHz)	300
490 - 1705 kHz	63.7/F (F in kHz)	30
1.705 - 30 MHz	0.08	30

Note 1: The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.



#### **4.2TEST PROCEDURE**

- a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
- c. The height of the equipment or of the substitution antenna shall be 0.8m or 1.5m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
- e. The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1GHz.
- f. The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- g. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform. (below 1GHz)
- h. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform. (above 1GHz)
- i. For the actual test configuration, please refer to the related Item -EUT Test Photos.

The following table is the setting of the receiver:

Spectrum Parameters	Setting
Start ~ Stop Frequency	9 kHz~150 kHz for RBW 200 Hz
Start ~ Stop Frequency	0.15 MHz~30 MHz for RBW 9 kHz
Start ~ Stop Frequency	30 MHz~1000 MHz for RBW 100 kHz

Spectrum Parameters	Setting
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW	1MHz / 3MHz for PK value
(Emission in restricted band)	1MHz / 1/THz for AVG value

Spectrum Parameters	Setting
Start ~ Stop Frequency	9 kHz~90 kHz for PK/AVG detector
Start ~ Stop Frequency	90 kHz~110 kHz for QP detector
Start ~ Stop Frequency	110 kHz~490 kHz for PK/AVG detector
Start ~ Stop Frequency	490 kHz~30 MHz for QP detector
Start ~ Stop Frequency	30MHz~1000MHz for QP detector
Start ~ Stop Frequency	1 GHz~26.5GHz for PK/AVG detector

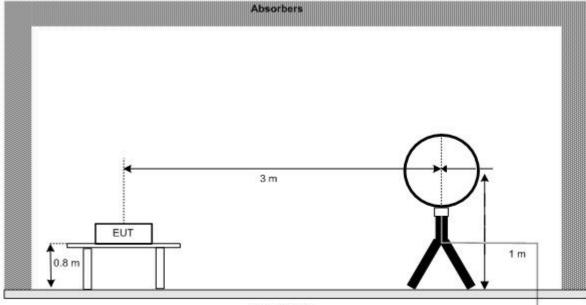


#### 4.3DEVIATIONFROMTESTSTANDARD

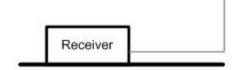
No deviation.

#### 4.4TESTSETUP

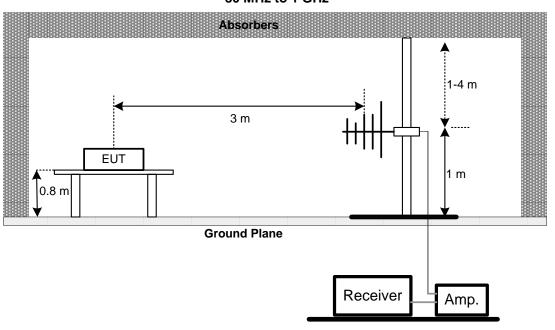
#### 9 kHz to 30 MHz



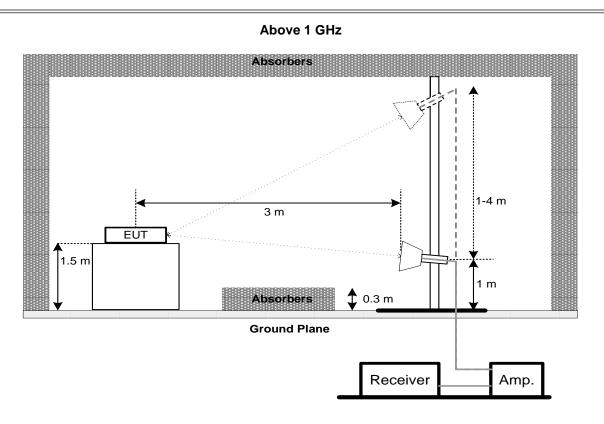
**Ground Plane** 



#### 30 MHz to 1 GHz









#### **4.5EUT OPERATING CONDITIONS**

The EUT was programmed to be in continuously transmitting mode.

#### 4.6 TEST RESULT- 9kHz TO 30MHz

Please refer to the APPENDIX-B

#### Remark:

- (1) Distance extrapolation factor = 40 log (specific distance / test distance) (dB).
- (2) Limit line = specific limits (dBuV) + distance extrapolation factor.

#### 4.7 TEST RESULT- 30MHz TO 1000MHz

Please refer to the APPENDIX-C

#### 4.8 TEST RESULT- ABOVE 1000MHz

Please refer to the APPENDIX-D

#### Remark:

(1) No limit: This is fundamental signal, the judgment is not applicable. For fundamental signal judgment was referred to Peak output test.



#### **5.BANDWIDTH**

#### 5.1LIMIT

Section	Test Item	Limit
FCC 15.247(a)(2)	6dB Bandwidth	>= 500 kHz
RSS-247(5.2 a)	99% Emission Bandwidth	-

#### **5.2TEST PROCEDURE**

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. The following table is the setting of the spectrum analyzer:

#### For 6 dB Bandwidth:

Setting	
> Measurement Bandwidth	
100 kHz	
300kHz	
Peak	
Max Hold	
Auto	

#### For 99% Emission Bandwidth:

Spectrum Parameters	Setting
Span Frequency	Between 1.5 times and 5.0 times the OBW
RBW	50kHz
VBW	200kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

c. Compute the trace by integrating the spectrum, finally, maxhold displays the View

#### **5.3DEVIATION FROM STANDARD**

No deviation.

#### **5.4TEST SETUP**

EUT	SPECTRUM
	ANALYZER

#### **5.5EUT OPERATION CONDITIONS**

The EUT was programmed to be in continuously transmitting mode.

#### **5.6TESTRESULTS**

Please refer to the APPENDIX-E



#### **6.MAXIMUM OUTPUT POWER**

#### 6.1LIMIT

Section	Test Item	Limit
FCC 15.247(b)(3) RSS-247(5.4 d)	Maximum Output Power	1.0000 watt or 30.00dBm

#### **6.2TEST PROCEDURE**

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. The following table is the setting of the spectrum analyzer:

Spectrum Parameters	Setting
Span Frequency	≥ 3×RBW
RBW	2 MHz
VBW	5 MHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

c. Compute the trace by integrating the spectrum, finally, maxhold displays the View

#### **6.3DEVIATION FROM STANDARD**

No deviation.

#### **6.4TEST SETUP**

EUT	SPECTRUM
	ANALYZER

#### **6.5EUT OPERATION CONDITIONS**

The EUT was programmed to be in continuously transmitting mode.

#### **6.6TESTRESULTS**

Please refer to the APPENDIX-F



#### 7.CONDUCTED SPURIOUS EMISSION

#### 7.1LIMIT

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak Output Power limits. If the transmitter complies with the Output Power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. Please refer section RSS-GEN&15.247.

#### 7.2TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. The following table is the setting of the spectrum analyzer:

Spectrum Parameters	Setting			
Start Frequency	30 MHz			
Stop Frequency	26.5 GHz			
RBW	100 kHz			
VBW	300 kHz			
Detector	Peak			
Trace	Max Hold			
Sweep Time	Auto			

c. Compute the trace by integrating the spectrum, finally, maxhold displays the View

#### 7.3DEVIATION FROM STANDARD

No deviation.

#### 7.4TEST SETUP

EUT	•	SPECTRUM
		ANALYZER

#### 7.5EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

#### 7.6 TEST RESULTS

Please refer to the APPENDIX-G



#### **8.POWER SPECTRAL DENSITY**

#### **8.1LIMIT**

Section	Test Item	Limit
FCC 15.247(e) RSS-247(5.2 b)	Power Spectral Density	8 dBm (in any 3 kHz)

#### **8.2TEST PROCEDURE**

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. The following table is the setting of the spectrum analyzer:

Spectrum Parameters	Setting			
Span Frequency	2 MHz (1 Mbps) / 4 MHz (2 Mbps)			
RBW	3 kHz			
VBW	10 kHz			
Detector	Peak			
Trace	Max Hold			
Sweep Time	Auto			

c. Compute the trace by integrating the spectrum, finally, maxhold displays the View

#### 8.3DEVIATION FROM STANDARD

No deviation.

#### **8.4TEST SETUP**

EUT	SPECTRUM
	ANALYZER

#### **8.5EUT OPERATION CONDITIONS**

The EUT was programmed to be in continuously transmitting mode.

#### **8.6 TEST RESULTS**

Please refer to the APPENDIX-H



#### 9. ANTENNA REQUIREMENT

#### 9.1STANDARD 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 shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard

# antenna jack or electrical connector is prohibited. 9.2ANTENNA CONNECTED CONSTRUCTION The antenna connector is unique antenna and no consideration of replacement. Please see EUT photo for details. 9.3RESULTS The EUT antenna is PIFA antenna. It complies with the standard requirement.



### 10. MEASUREMENT INSTRUMENTS LIST

Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI Receiver	EMI Receiver Rohde&Schwarz		YH-TIRT-SAC-966 -20220911	2024/01/05	2025/01/04
Integral Antenna	Schwarzbeck	VULB 9163	01314	2022.12.11	2024.12.10
Integral Antenna	Rohde&Schwarz	HF907	RSM2991424	2022.12.11	2024.12.10
Preamplifier	Emtrace	RP01A	'02017	2024/01/05	2025/01/04
Preamplifier	Schwarzbeck	BBV9744	00143	2024/01/05	2025/01/04
Loop Antenna	ZHINAN	ZN30900A	12024	2024/01/05	2025/01/04
Horn Antenna	Schwarzbeck	BBHA9170	00956	2024/01/05	2025/01/04
RF Cable	/	LMR400UF-NMNM-7. 0M	/	2024/01/05	2025/01/04
RF Cable	/	SFT2050PUR-NMNM -7.0M	/	2024/01/05	2025/01/04
EMI Receiver	Rohde&Schwarz	ESR7	1316.3003K07-10 2611-mk	2024/11/02	2025/11/01
LISN	Rohde&Schwarz	ENV216	3560.655.12-1029 15-Bp	2024/11/02	2025/11/01
RF Cable	\	SFT2050PUR-NMNM -2.0M	\	2024/01/05	2025/01/04
Spectrum analyzer ROHDE&SCHWARZ		FSU26	200732	2024/01/05	2025/01/04
Spectrum analyzer	ROHDE&SCHWARZ	FSV40-N	101722	2024/01/05	2025/01/04
Filter	HEWLETT PACKARD	JS0806-F	19K8060209	2024/01/05	2025/01/04



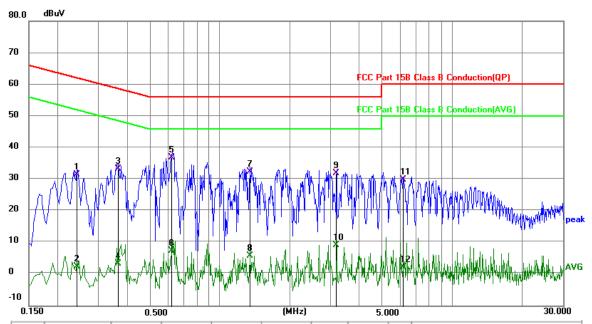
<ul> <li>11. PHOTOS OF TEST SETUP Reference to the appendix I Test Setup Photo for details.</li> <li>12. PHOTOS OF EUT Reference to the appendix II external photos and appendix III internal photos for details.</li> </ul>									



#### **APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS**

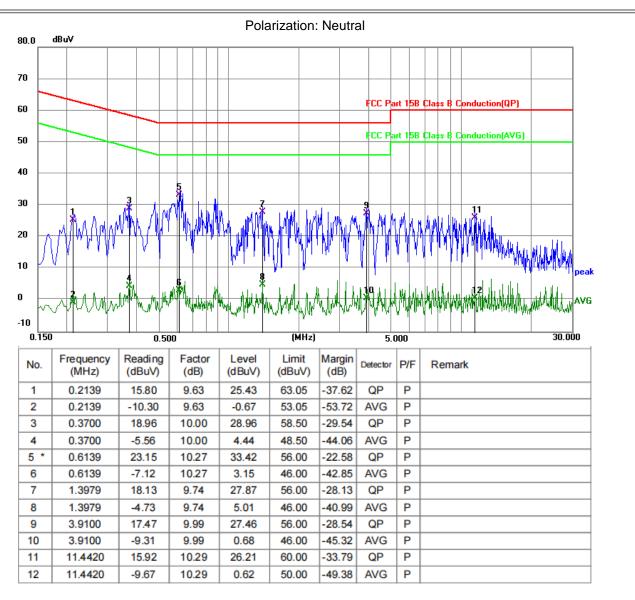
Only show the worst mode: GFSK 1M 2402MHz:





No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.2419	21.88	9.65	31.53	62.03	-30.50	QP	Р	
2	0.2419	-7.06	9.65	2.59	52.03	-49.44	AVG	Р	
3	0.3619	23.19	10.01	33.20	58.68	-25.48	QP	Р	
4	0.3619	-6.66	10.01	3.35	48.68	-45.33	AVG	Р	
5 *	0.6219	26.61	10.30	36.91	56.00	-19.09	QP	Р	
6	0.6219	-2.87	10.30	7.43	46.00	-38.57	AVG	Р	
7	1.3500	22.63	9.78	32.41	56.00	-23.59	QP	Р	
8	1.3500	-3.81	9.78	5.97	46.00	-40.03	AVG	Р	
9	3.1779	21.86	9.99	31.85	56.00	-24.15	QP	Р	
10	3.1779	-0.84	9.99	9.15	46.00	-36.85	AVG	Р	
11	6.1619	19.71	10.23	29.94	60.00	-30.06	QP	Р	
12	6.1619	-7.99	10.23	2.24	50.00	-47.76	AVG	Р	







# **APPENDIX B - RADIATED EMISSION -9 KHZ TO 30 MHZ**

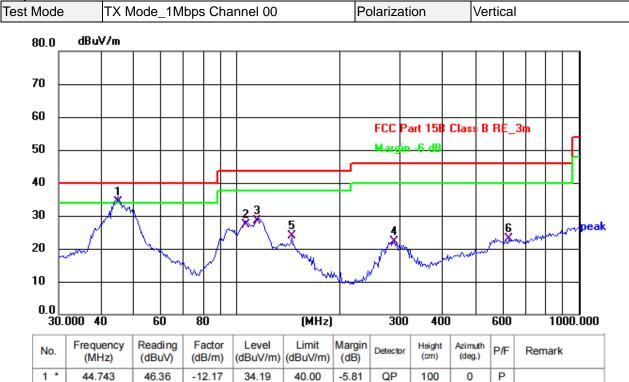
The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.



## **APPENDIX C - RADIATED EMISSION-30 MHZ TO 1000 MHZ**

Only show the worst mode:



43.50

43.50

46.00

43.50

46.00

-16.14

-15.10

-23.93

-19.60

-23.00

QP

QP

QP

QP

QP

100

100

100

100

100

0

0

360

360

360

P

Р

P P

Р

#### **REMARKS:**

2

3

4

5

6

106.013

114.515

289.002

144.335

625.078

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.

42.24

42.58

33.26

35.82

27.38

-14.88

-14.18

-11.19

-11.92

-4.38

27.36

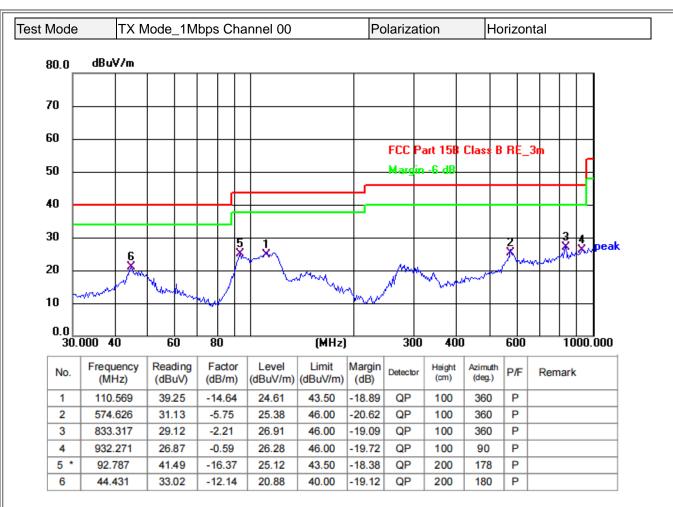
28.40

22.07

23.90

23.00





#### **REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.



# **APPENDIX D - RADIATED EMISSION - ABOVE 1000 MHZ**

Test Result of RADIATED EMISSION-1000MHz TO 25GHz, Only show the worst mode: GFSK 1M

resi	t Mode :	GFSK TX I	I	1				<u> </u>
No.	Freq MHz	Polarity	Reading (dBuV/m)	Correct Factor	Result (dBuV/m)	Limit (dBuV/m)	Margin	Remark
1	4804	V	88.70	-27.05	61.65	74	-12.35	Peak
2	4804	V	69.54	-27.05	42.49	54	-11.51	Avg
3	7206							
4	9608							
5	4804	Н	91.23	-27.05	64.18	74	-9.82	Peak
6	4804	Н	69.31	-27.05	42.26	54	-11.74	Avg
7	7206							
8	9608							
Test	Mode :	GFSK TX I	Vlid					
1	4880	V	91.34	-27.84	63.50	74	-10.50	Peak
2	4880	V	71.00	-27.84	43.16	54	-10.84	Avg
3	7320							
4	9760							
5	4880	Н	90.78	-27.84	62.94	74	-11.06	Peak
6	4880	Н	71.47	-27.84	43.63	54	-10.37	Avg
7	7320							
8	9760							
Test	Mode :	GFSK TX I	High					
1	4960	V	90.33	-28.49	61.84	74	-12.16	Peak
2	4960	V	69.41	-28.49	40.92	54	-13.08	Avg
3	7440							
4	9920							
5	4960	Н	91.28	-28.49	62.79	74	-11.21	Peak
6	4960	Н	69.17	-28.49	40.68	54	-13.32	Avg
7	7440							
8	9920							

Not e:

<sup>1.</sup> Means other frequency and mode comply with standard requirements and at least have 20dB margin.

<sup>2.</sup> Correct Factor=Cable Loss+ Antenna Factor-Amplifier Gain. Result=Reading + Correct Factor. Margin= Result-Limit.



Test Result of Radiated Spurious at Band edges

Only:	Only show the worst mode: GFSK 1M										
		T	est Results			PASS					
		Fred	uency Range		2310MHz~2410MHz						
		-	Test Mode		1Mbps: GFSK TX 2402MHz						
N	Freq	Dolority	Reading	Correct	Result	Limit	Morgin	Remark			
0.	MHz	Polarity	(dBuV/m)	Factor	(dBuV/m)	(dBuV/m)	Margin	Remark			
1	2390	Н	74.78	-21.47	53.31	74.00	-20.69	Peak			
2	2390	Н		-21.47		54.00		Avg			
3	2400	Н	79.04	-26.12	52.92	74.00	-21.08	Peak			
4	2400	Н		-26.12		54.00		Avg			
1	2390	V	74.87	-21.47	53.40	74.00	-20.60	Peak			
2	2390	V		-21.47		54.00		Avg			
3	2400	V	79.25	-26.12	53.13	74.00	-20.87	Peak			
4	2400	V		-26.12		54.00		Avg			
	Т	est Results				PASS					
	Fred	quency Ran	ge		2450MHz~2550MHz						
	-	Test Mode			1Mbps: GFSK TX 2480MHz						
1	2483.5	Н	78.42	-25.29	53.13	74.00	-20.87	Peak			
2	2483.5	Н		-25.29		54.00		Avg			
1	2483.5	V	78.65	-25.29	53.36	74.00	-20.64	Peak			
	1	1			1	1	ı	1			

Note: 1. Means other frequency and mode comply with standard requirements and at least have 20dB margin.

54.00

Avg

-25.29

2. Correct Factor=Cable Loss+ Antenna Factor-Amplifier Gain.

Result=Reading + Correct Factor.

Margin= Result-Limit.

V

2483.5

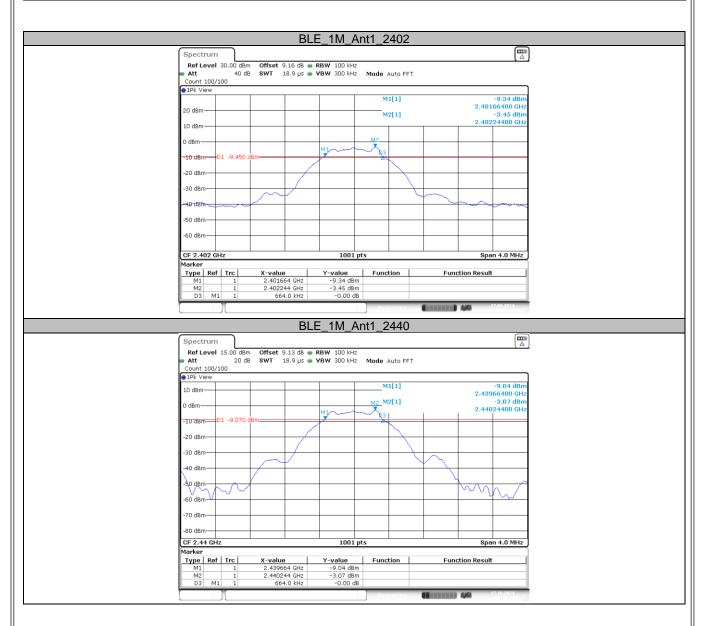
3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.



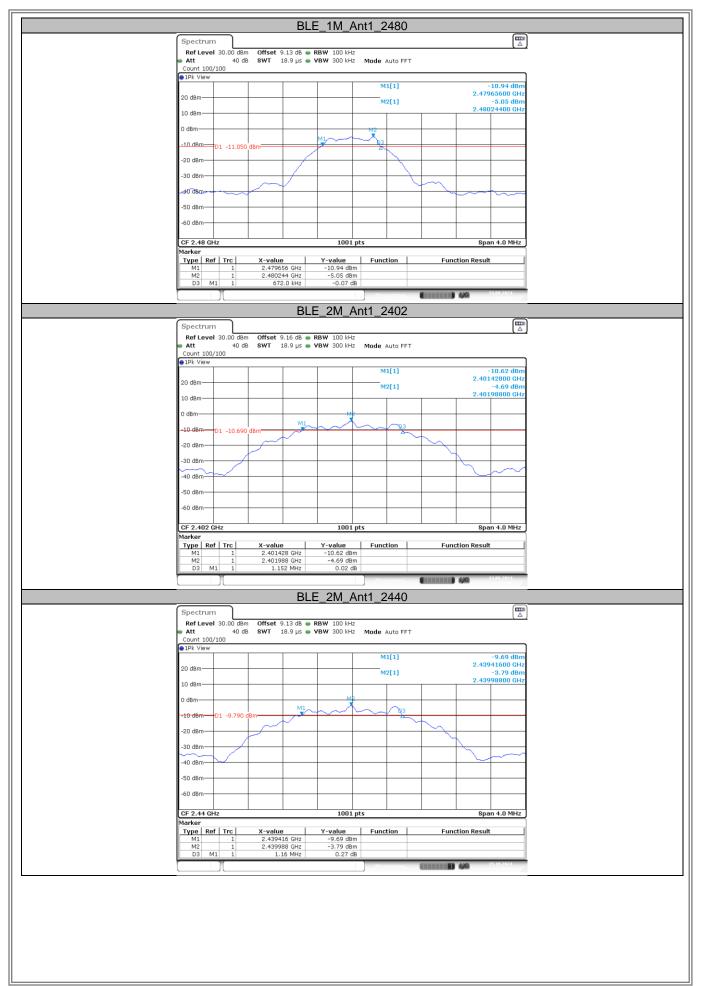
# **APPENDIX E - BANDWIDTH**

#### -6dB Bandwidth

TestMode	Antenna	Freq(MHz)	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M Ant1		2402	0.66	2401.66	2402.33	0.5	PASS
	Ant1	2440	0.66	2439.66	2440.33	0.5	PASS
		2480	0.67	2479.66	2480.33	0.5	PASS
BLE_2M Ant1		2402	1.15	2401.43	2402.58	0.5	PASS
	Ant1	2440	1.16	2439.42	2440.58	0.5	PASS
		2480	1.15	2479.43	2480.58	0.5	PASS









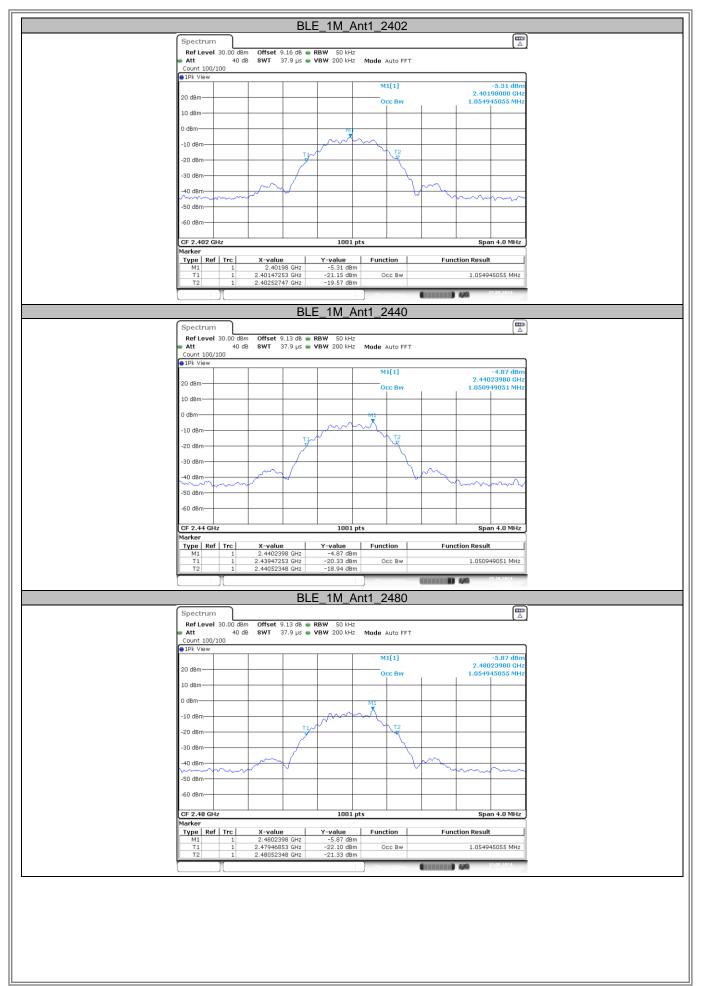




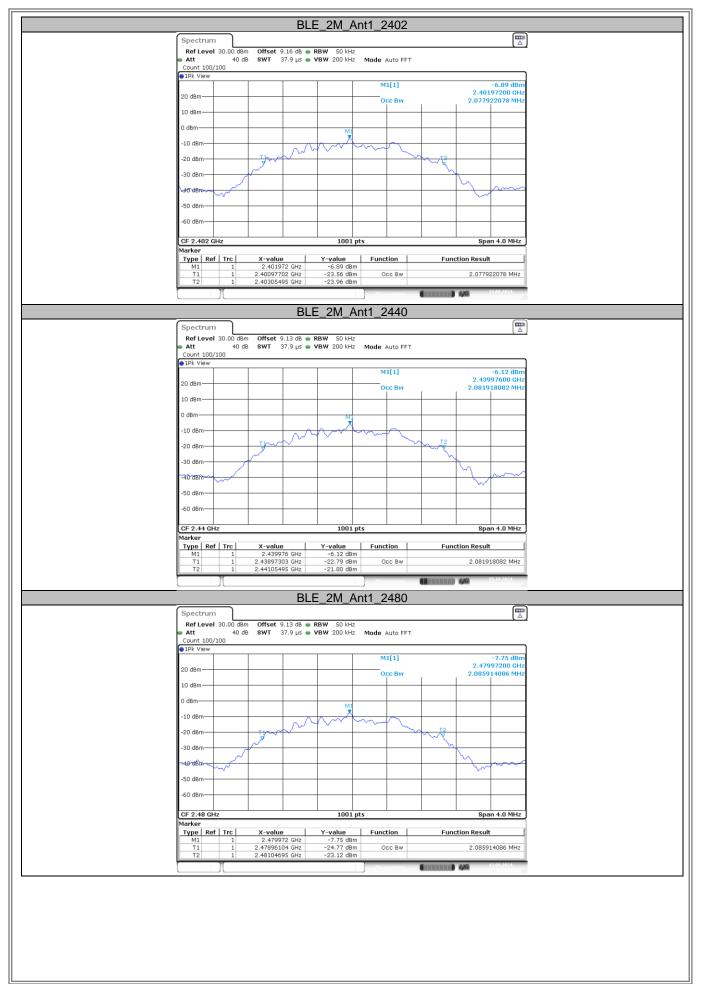
## 99% Occupied Bandwidth

TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
		2402	1.055	2401.4725	2402.5275		
BLE_1M	Ant1	2440	1.051	2439.4725	2440.5235		
		2480	1.055	2479.4685	2480.5235		
		2402	2.078	2400.9770	2403.0549		
BLE_2M	Ant1	2440	2.082	2438.9730	2441.0549		
		2480	2.086	2478.9610	2481.0470		







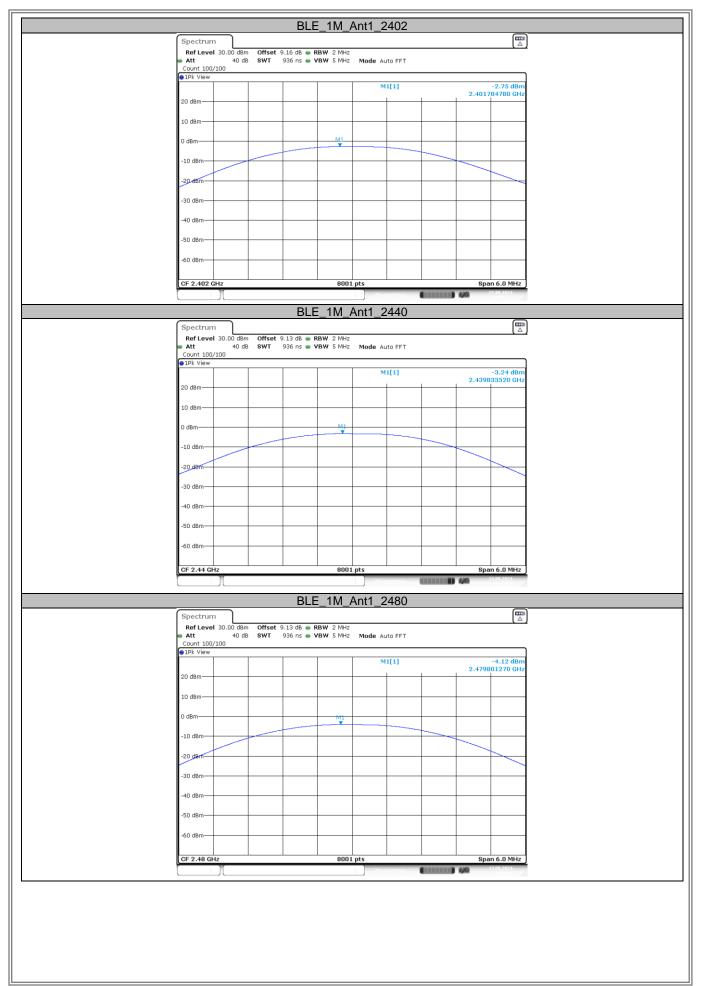




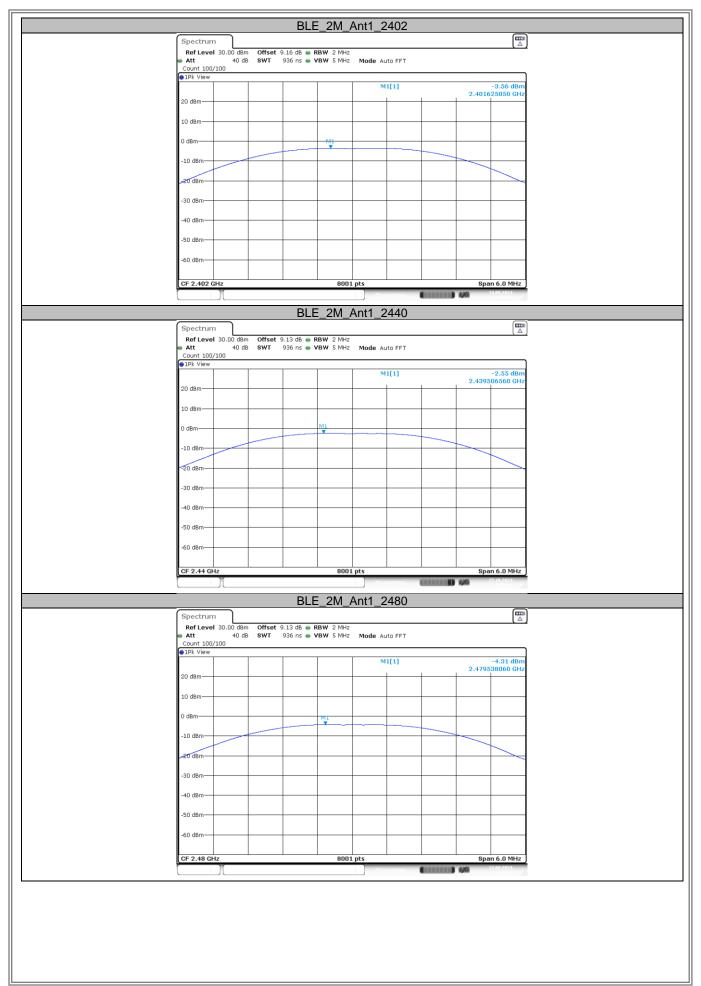
# APPENDIX F - MAXIMUM OUTPUT POWER

TestMode	Antenna	Freq(MHz)	Conducted Peak Powert[dBm]	Conducted Limit[dBm]	EIRP (dBm)	Limit (dBm)	Verdict
		2402	-2.75	≤30	-1.21	36	PASS
BLE_1M	Ant1	2440	-3.24	≤30	-1.70	36	PASS
		2480	-4.12	≤30	-2.58	36	PASS
		2402	-3.56	≤30	-2.02	36	PASS
BLE_2M	Ant1	2440	-2.55	≤30	-1.01	36	PASS
		2480	-4.31	≤30	-2.77	36	PASS









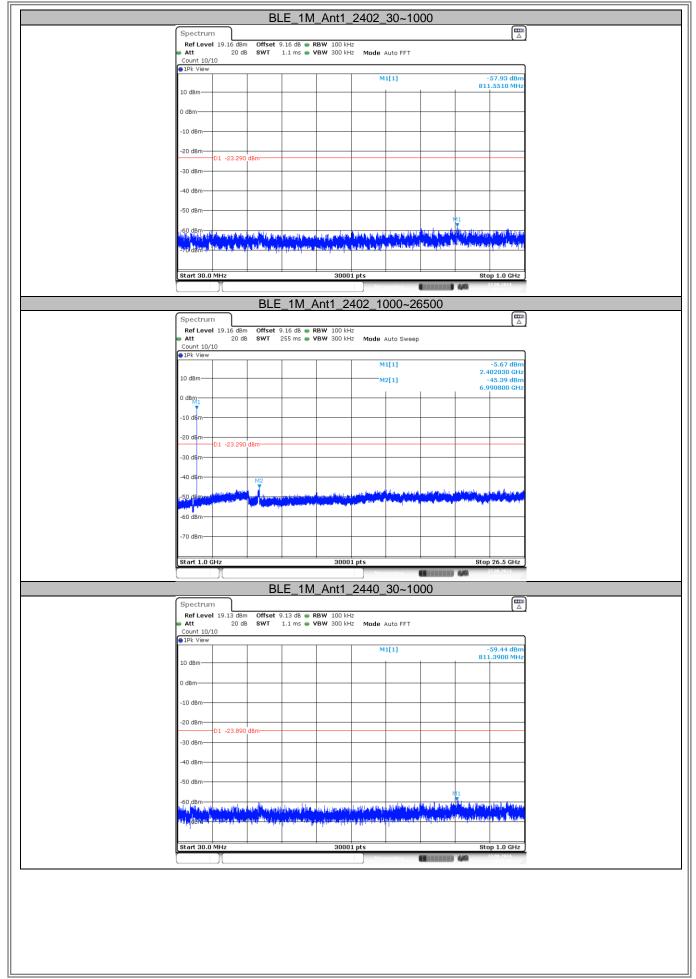


### **APPENDIX G - CONDUCTED SPURIOUS EMISSION**

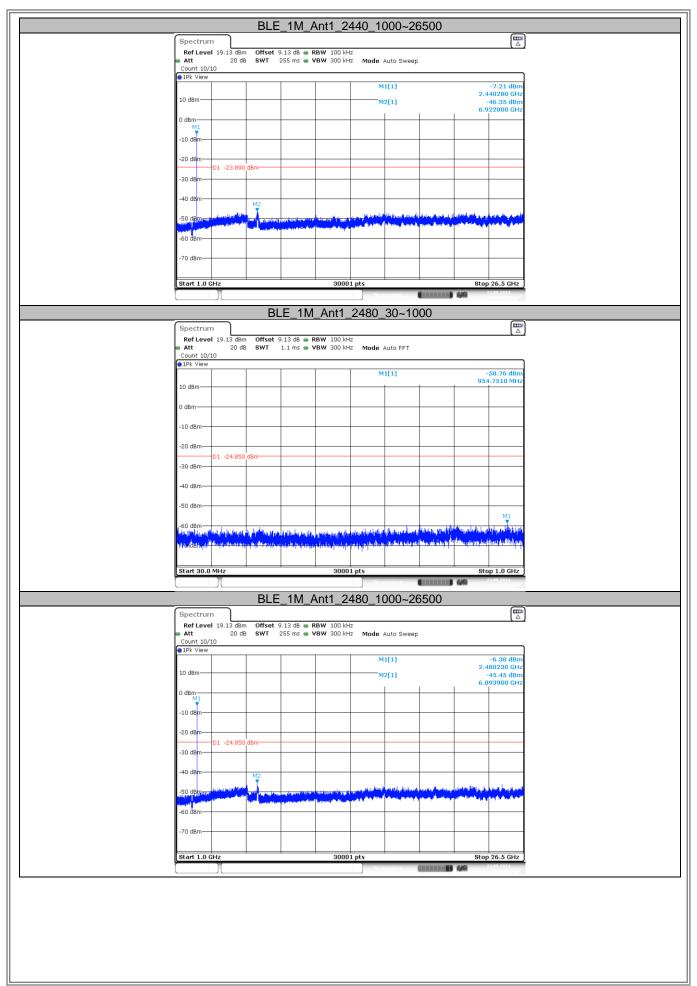
### Spurious Emission

TestMode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
		2402	30~1000	-3.29	-57.93	≤-23.29	PASS
		2402	1000~26500	-3.29	-45.39	≤-23.29	PASS
BLE_1M	Ant1	2440	30~1000	-3.89	-59.44	≤-23.89	PASS
DLE_IIVI			1000~26500	-3.89	-46.35	≤-23.89	PASS
		2480	30~1000	-4.85	-58.76	≤-24.85	PASS
			1000~26500	-4.85	-45.45	≤-24.85	PASS
	Ant1	2402	30~1000	-4.65	-58.97	≤-24.65	PASS
			1000~26500	-4.65	-45.95	≤-24.65	PASS
		2440	30~1000	-3.68	-59	≤-23.68	PASS
BLE_2M		2440	1000~26500	-3.68	-46.18	≤-23.68	PASS
		2400	30~1000	-5.43	-58.88	≤-25.43	PASS
		2480	1000~26500	-5.43	-45.9	≤-25.43	PASS

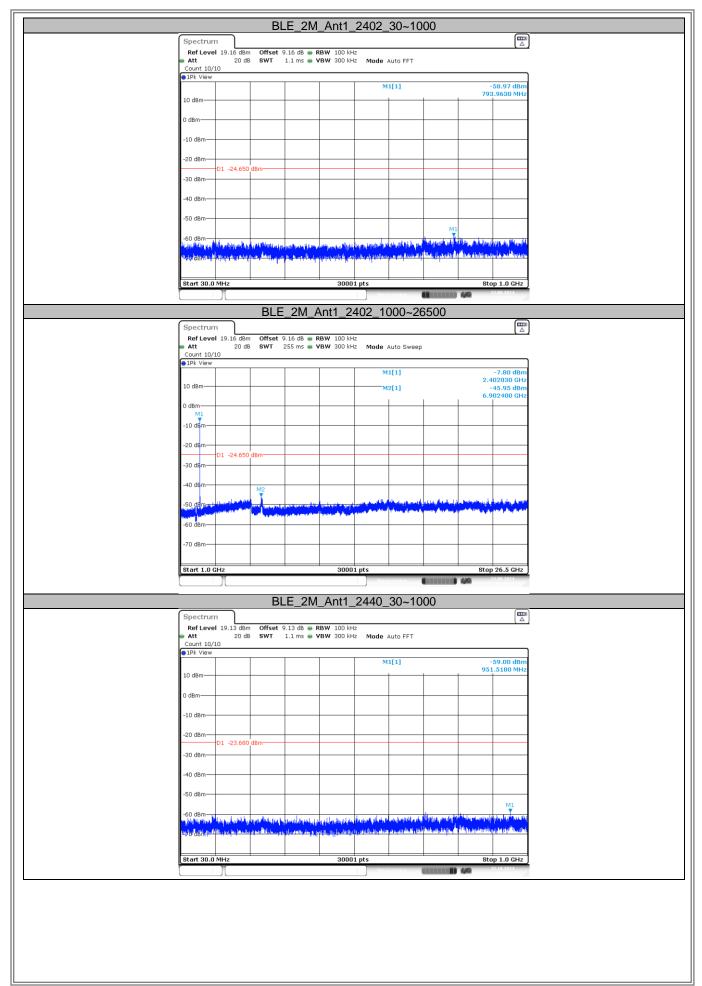




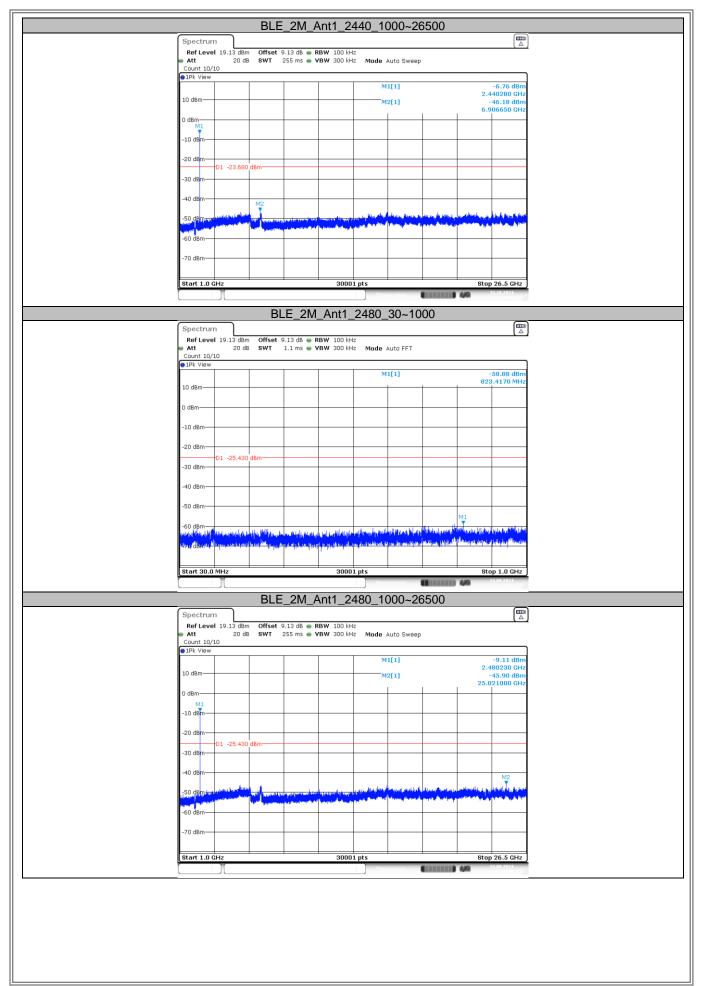






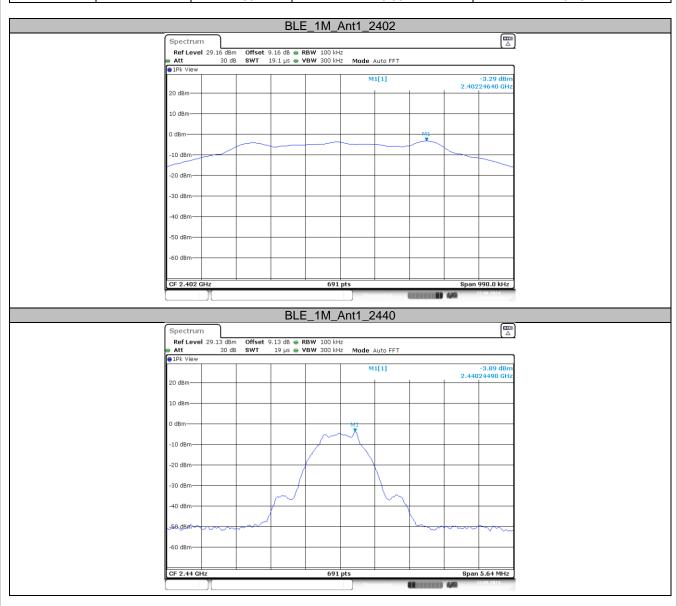




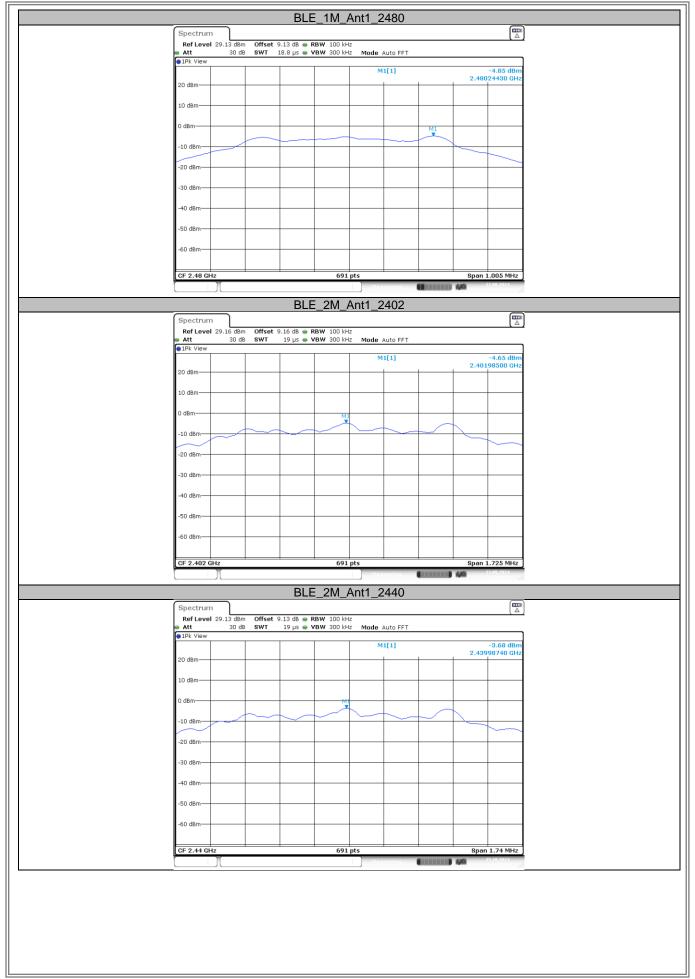




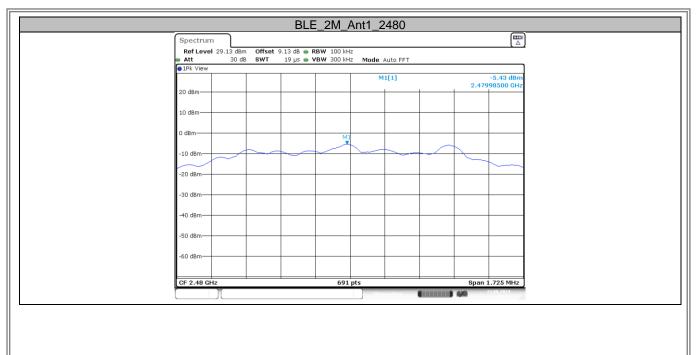
Reference level measurement								
TestMode	Antenna	Freq(MHz)	Max.Point[MHz]	Result[dBm]				
		2402	2402.25	-3.29				
BLE_1M	Ant1	2440	2440.24	-3.89				
		2480	2480.24	-4.85				
		2402	2401.99	-4.65				
BLE_2M	Ant1	2440	2439.99	-3.68				
		2480	2479.99	-5.43				







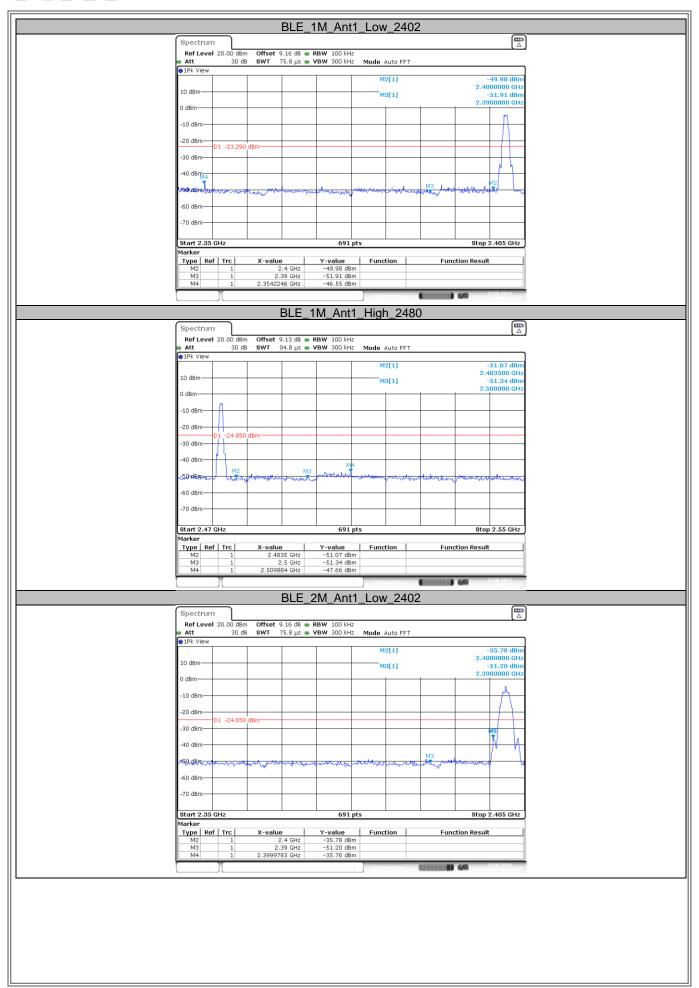




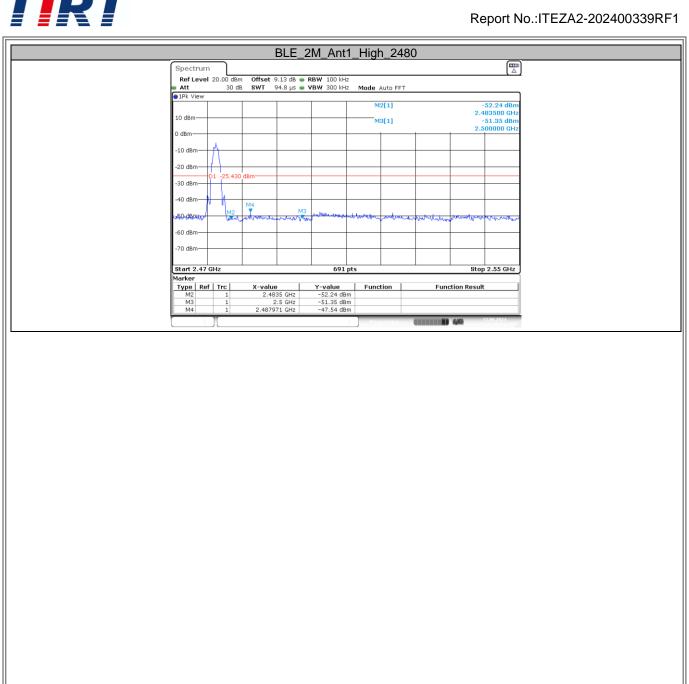


Band edge measurements										
TestMode	Antenna	ChName	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict			
BLE_1M An	Ant1	Low	2402	-3.29	-46.55	≤-23.29	PASS			
	AIILI	High	2480	-4.85	-47.66	≤-24.85	PASS			
BLE_2M A	Ant1	Low	2402	-4.65	-35.76	≤-24.65	PASS			
	Anti	High	2480	-5.43	-47.54	≤-25.43	PASS			







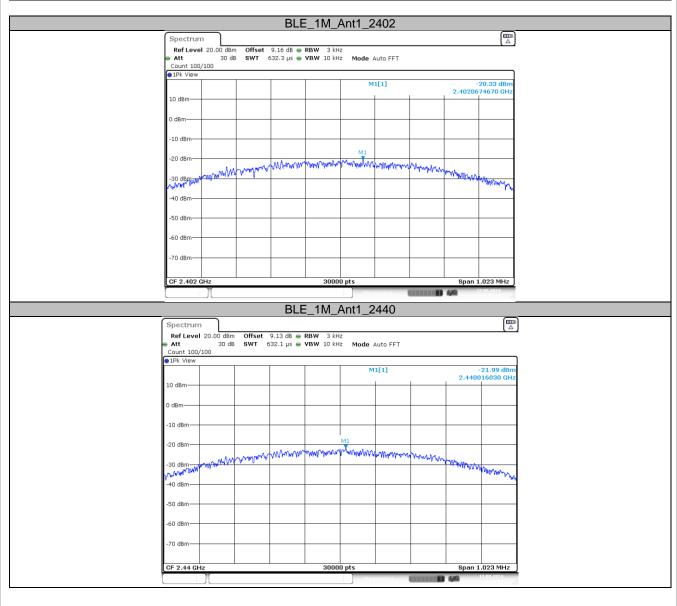




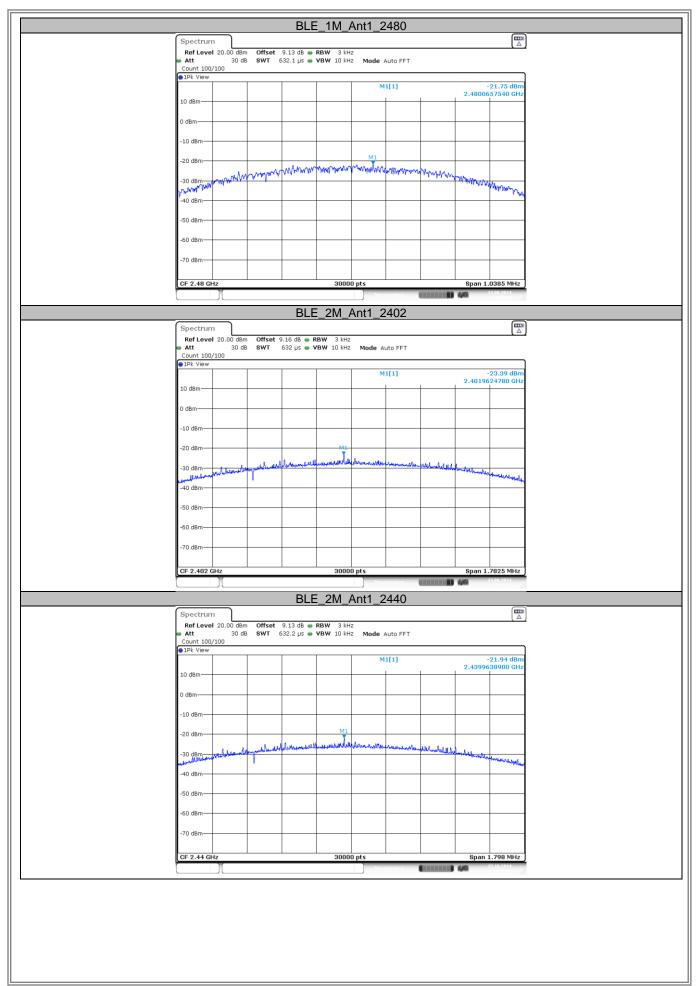
#### **APPENDIX H- POWER SPECTRAL DENSITY**

Power Spectral Density

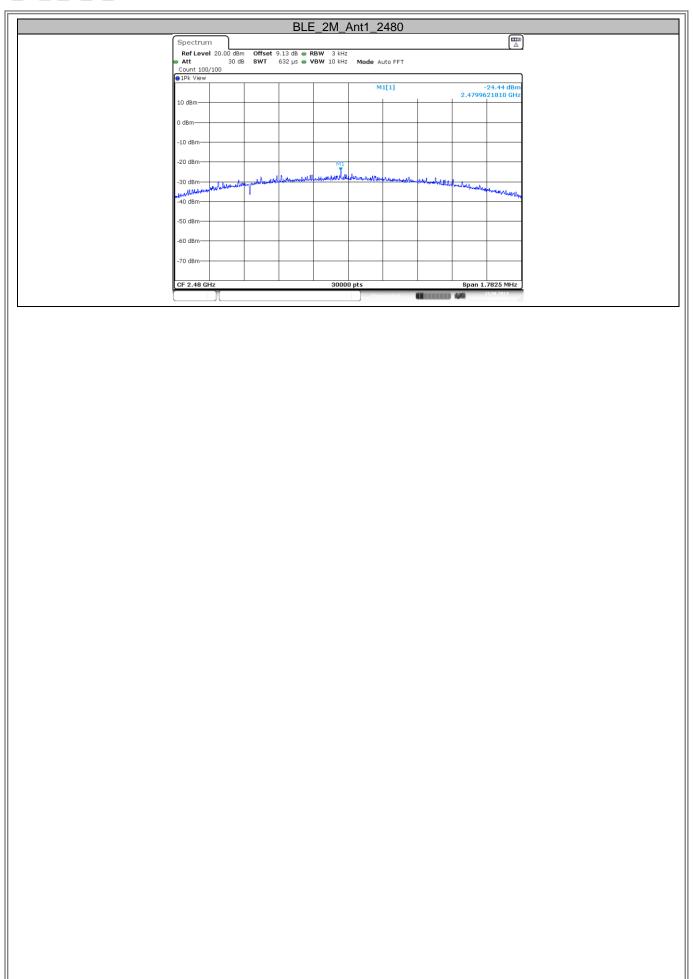
TestMode	Antenna	Freq(MHz)	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
	Ant1	2402	-20.33	≤8.00	PASS
BLE_1M		2440	-21.99	≤8.00	PASS
		2480	-21.75	≤8.00	PASS
BLE_2M	Ant1	2402	-23.39	≤8.00	PASS
		2440	-21.94	≤8.00	PASS
		2480	-24.44	≤8.00	PASS













APPEN	APPENDIX I DUTY CYCLE										
TestMode	Antenna	Freq(MHz)	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	Limit	Verdict		
BLE_1M A		2402	2.13	2.50	0.8520	85.20	0.70				
	Ant1	2440	2.12	2.50	0.8480	84.80	0.72				
		2480	2.13	2.50	0.8520	85.20	0.70				
		2402	1.07	1.88	0.5691	56.91	2.45				
BLE_2M	Ant1	2440	0.29	0.46	0.6304	63.04	2.00				
		2480	1.07	1.88	0.5691	56.91	2.45				



