

# **Test Report**

**Report No.:** MTi231110014-04E1

**Date of issue:** 2024-04-17

**Applicant:** Shenzhen Xusheng Acoustic Technology Co., Ltd

**Product:** FIND MY

Model(s): WS Finder, F-006, F-6

FCC ID: 2BFQT-WSFINDER

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



# Instructions

- 1. This test report shall not be partially reproduced without the written consent of the laboratory.
- 2. The test results in this test report are only responsible for the samples submitted
- 3. This test report is invalid without the seal and signature of the laboratory.
- 4. This test report is invalid if transferred, altered, or tampered with in any form without authorization.
- 5. Any objection to this test report shall be submitted to the laboratory within 15 days from the date of receipt of the report.

Address: Headquarters: Microtest Hi-tech Building, Zone 2, Xinxing Industrial Park, Fuzhou Avenue, Bao'an District, Shenzhen, China.

Tel: (86-755)88850135 Fax: (86-755) 88850136 Web: www.mtitest.cn E-mail: mti@51mti.com



# **Table of contents**

1	Gen	eral Description	5
	1.1 1.2 1.3 1.4 1.5	Description of the EUT  Description of test modes  Environmental Conditions  Description of support units  Measurement uncertainty	5 
2	Sum	nmary of Test Result	8
3	Test	t Facilities and accreditations	g
	3.1	Test laboratory	g
4	List	of test equipment	10
5		luation Results (Evaluation)	
	5.1	Antenna requirement	11
6	Rad	io Spectrum Matter Test Results (RF)	12
	6.1 6.2 6.3 6.4 6.5 6.6 6.7	Occupied Bandwidth	13 14 15 16
Ph	otogr	raphs of the test setup	32
Ph	otogr	raphs of the EUT	33
Аp	pend	lix A: DTS Bandwidth	34
Аp	pend	lix B: Maximum conducted output power	36
Аp	pend	lix C: Maximum power spectral density	38
Аp	pend	lix D: Band edge measurements	40
Аp	pend	lix E: Conducted Spurious Emission	41
Δn	nend	lix F: Duty Cycle	44



	Test Result Certification				
Applicant:	Shenzhen Xusheng Acoustic Technology Co., Ltd				
Address:	303, Building A, No. 6 Huanping Road, Gaoqiao Community, Pingdi Street, Longgang District, Shenzhen				
Manufacturer:	Shenzhen Xusheng Acoustic Technology Co., Ltd				
Address:	303, Building A, No. 6 Huanping Road, Gaoqiao Community, Pingdi Street, Longgang District, Shenzhen				
Factory:	Shenzhen Xusheng Acoustic Technology Co., Ltd				
Address:	303, Building A, No. 6 Huanping Road, Gaoqiao Community, Pingdi Street, Longgang District, Shenzhen				
Product description					
Product name:	FIND MY				
Trademark:	WS				
Model name:	WS Finder				
Series Model(s):	F-006, F-6				
Standards:	47 CFR Part 15.247				
Test Method:	ANSI C63.10-2013 KDB 558074 D01 15.247 Meas Guidance v05r02				
Date of Test					
Date of test:	2024-03-27 to 2024-04-07				
Test result:	Pass				

Test Engineer :	:	letter.lan.
		(Letter Lan)
Reviewed By :	:	Dowid. Cel
		(David Lee)
Approved By :	:	leor chen
		(Leon Chen)



## 1 General Description

## 1.1 Description of the EUT

Product name:	FIND MY
Model name:	WS Finder
Series Model(s):	F-006, F-6
Model difference:	All the models are the same circuit and module, except the model name.
Electrical rating:	Input: 3Vdc Battery: 3.7Vdc 210mAh
Accessories:	N/A
Hardware version:	V1.0
Software version:	1.0.2
Test sample(s) number:	MTi231110014-04S1001
RF specification	
Bluetooth version:	V5.0
Operating frequency range:	2402MHz to 2480MHz
Channel number:	40
Modulation type:	GFSK
Antenna(s) type:	ceramic antenna
Antenna(s) gain:	2.36 dBi
1.2 Description of toot	

## 1.2 Description of test modes

No.	Emission test modes
Mode1	TX mode (GFSK-1M)

## 1.2.1 Operation channel list

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

Address: Headquarters: Microtest Hi-tech Building, Zone 2, Xinxing Industrial Park, Fuzhou Avenue, Bao'an District, Shenzhen, China. Tel: (86-755)88850135 Fax: (86-755)88850136 Web: www.mtitest.cn E-mail: mti@51mti.com



**Test Channel List** 

Operation Band: 2400-2483.5 MHz

Bandwidth	Lowest Channel (LCH)	Middle Channel (MCH)	Highest Channel (HCH)
(MHz)	(MHz)	(MHz)	(MHz)
2	2402	2440	2480

Note: The test software provided by manufacturer is used to control EUT for working in engineering mode, that enables selectable channel, and capable of continuous transmitting mode.

#### Test Software: FCC/CE/BQB test instruction 2.1

For power setting, refer to below table.

Mode	2402MHz	2440MHz	2480MHz
1M	default	default	default



## 1.3 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15°C ~ 35°C
Humidity:	20% RH ~ 75% RH
Atmospheric pressure:	98 kPa ~ 101 kPa

## 1.4 Description of support units

Support equipment list							
Description Model Serial No. Manufacturer							
1	1	1	1				
Support cable list	Support cable list						
Description	Length (m)	From	То				
/	1	1	1				

## 1.5 Measurement uncertainty

Measurement	Uncertainty
Occupied channel bandwidth	±3 %
RF output power, conducted	±1 dB
Power Spectral Density, conducted	±1 dB
Unwanted Emissions, conducted	±1 dB
Radiated spurious emissions (above 1GHz)	±5.3dB
Radiated spurious emissions (9kHz~30MHz)	±4.3dB
Radiated spurious emissions (30MHz~1GHz)	±4.7dB
Temperature	±1 °C
Humidity	± 5 %

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Address: Headquarters: Microtest Hi-tech Building, Zone 2, Xinxing Industrial Park, Fuzhou Avenue, Bao'an District, Shenzhen, China.

Tel: (86-755)88850135 Fax: (86-755) 88850136 Web: www.mtitest.cn E-mail: mti@51mti.com



# 2 Summary of Test Result

No.	Item	Requirement	Result
1	Antenna requirement	47 CFR 15.203	Pass
2	Occupied Bandwidth	47 CFR 15.247(a)(2)	Pass
3	Maximum Conducted Output Power	47 CFR 15.247(b)(3)	Pass
4	Power Spectral Density	47 CFR 15.247(e)	Pass
5	RF conducted spurious emissions and band edge measurement	47 CFR 15.247(d), 15.209, 15.205	Pass
6	Band edge emissions (Radiated)	47 CFR 15.247(d), 15.209, 15.205	Pass
7	Radiated emissions (below 1GHz)	47 CFR 15.247(d), 15.209, 15.205	Pass
8	Radiated emissions (above 1GHz)	47 CFR 15.247(d), 15.209, 15.205	Pass



## 3 Test Facilities and accreditations

## 3.1 Test laboratory

Test laboratory:	Shenzhen Microtest Co., Ltd.
Test site location:	101, No.7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Telephone:	(86-755)88850135
Fax:	(86-755)88850136
CNAS Registration No.:	CNAS L5868
FCC Registration No.:	448573
IC Registration No.:	21760
CABID:	CN0093



# 4 List of test equipment

Fauinment	Manufacturor	Model	Sorial No	Cal data	Cal. Due		
Equipment				Cai. Gate	Cal. Due		
Occupied Bandwidth  Maximum Conducted Output Power							
Wideband Radio Communication Tester	Rohde&schwarz	CMW500	149155	2023-04-26	2024-04-25		
ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2023-04-25	2024-04-24		
PXA Signal Analyzer	Agilent	N9030A	MY51350296	2023-04-25	2024-04-24		
Synthesized Sweeper	Agilent	83752A	3610A01957	2023-04-25	2024-04-24		
MXA Signal Analyzer	Agilent	N9020A	MY50143483	2023-04-26	2024-04-25		
RF Control Unit	Tonscend	JS0806-1	19D8060152	2023-04-26	2024-04-25		
Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2023-05-05	2024-05-04		
ESG Vector Signal Generator	Agilent	N5182A	MY50143762	2023-04-25	2024-04-24		
DC Power Supply	Agilent	E3632A	MY40027695	2023-05-05	2024-05-04		
EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2023-04-26	2024-04-25		
Double Ridged Broadband Horn Antenna	schwarabeck	BBHA 9120 D	2278	2023-06-17	2025-06-16		
Amplifier	Agilent	8449B	3008A01120	2023-06-26	2024-06-25		
Multi-device Controller	TuoPu	TPMDC	1	2023-05-04	2024-05-03		
MXA signal analyzer	Agilent	N9020A	MY54440859	2023-06-01	2024-05-31		
	Emissions in freq	uency bands (be	elow 1GHz)				
EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2023-04-26	2024-04-25		
TRILOG Broadband Antenna	schwarabeck	VULB 9163	9163-1338	2023-06-11	2025-06-10		
Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00066	2023-06-11	2025-06-10		
Amplifier	Hewlett-Packard	8447F	3113A06184	2023-04-25	2024-04-24		
Multi-device Controller	TuoPu	TPMDC	1	2023-05-04	2024-05-03		
	Equipment  Wideband Radio Communication Tester ESG Series Analog Ssignal Generator PXA Signal Analyzer  Synthesized Sweeper  MXA Signal Analyzer  RF Control Unit Band Reject Filter Group ESG Vector Signal Generator DC Power Supply  EMI Test Receiver  Double Ridged Broadband Horn Antenna Amplifier  Multi-device Controller  MXA signal analyzer  EMI Test Receiver TRILOG Broadband Antenna  Active Loop Antenna  Amplifier	Equipment Emissions in non-Occu, Maximum Co-Power Wideband Radio Communication Tester ESG Series Analog Ssignal Generator PXA Signal Analyzer Agilent Synthesized Sweeper Agilent MXA Signal Analyzer Agilent RF Control Unit Tonscend Band Reject Filter Group Tonscend ESG Vector Signal Generator DC Power Supply Agilent  Band edge Emissions in frequence Schwarz  Double Ridged Broadband Horn Antenna Agilent MITi-device Controller TuoPu MXA signal analyzer Agilent EMI Test Receiver Rohde&schwarz  Duble Ridged Broadband Horn Antenna Agilent Multi-device Controller TuoPu MXA signal analyzer Agilent Emissions in frequence EMI Test Receiver Rohde&schwarz  TRILOG Broadband Antenna Schwarabeck Active Loop Antenna Schwarzbeck  Amplifier Hewlett-Packard	Equipment Bemissions in non-restricted frequency Occupied Bandwidth Maximum Conducted Output Power Spectral Density Power Supply Agilent Pay Power Supply Power	Equipment Emissions in non-restricted frequency bands Occupied Bandwidth Maximum Conducted Output Power Power Spectral Density  Wideband Radio Communication Tester ESG Series Analog Ssignal Generator Agilent Bandwidth N9030A MY51350296  Synthesized Sweeper Agilent N9020A MY50143483  RF Control Unit Tonscend JS0806-1 19D8060152  Band Reject Filter Group Tonscend JS0806-F 19D8060160  ESG Vector Signal Generator Agilent N5182A MY50143762  DC Power Supply Agilent Band edge emissions (Radiated) Emissions in frequency bands (above 1GHz)  EMI Test Receiver Rohde&schwarz ESCI7 101166  Broadband Horn Antenna Schwarabeck BBHA 9120 D 2278  Amplifier Agilent N9020A MY54440859  Emissions in frequency bands (below 1GHz)  EMI Test Receiver Rohde&schwarz ESCI7 101166  Trill OG Broadband Antenna Schwarabeck VULB 9163 9163-1338  Active Loop Antenna Schwarabeck FMZB 1519 B 00066  Amplifier Hewlett-Packard 8447F 3113A06184	Equipment         Manufacturer         Model         Serial No.         Cal. date           Emissions in non-restricted frequency bands Occupied Bandwidth Maximum Conducted Output Power Power Spectral Density           Wideband Radio Communication Tester ESG Series Analog Ssignal Generator         Rohde&schwarz         CMW500         149155         2023-04-26           ESG Series Analog Ssignal Generator         Agilent         E4421B         GB40051240         2023-04-25           PXA Signal Analyzer         Agilent         N9030A         MY51350296         2023-04-25           Synthesized Sweeper         Agilent         83752A         3610A01957         2023-04-25           MXA Signal Analyzer         Agilent         N9020A         MY50143483         2023-04-26           RF Control Unit         Tonscend         JS0806-1         19D8060152         2023-04-26           Band Reject Filter Group         Tonscend         JS0806-F         19D8060160         2023-05-05           ESG Vector Signal Generator         Agilent         N5182A         MY50143762         2023-05-05           DC Power Supply         Agilent         E3632A         MY40027695         2023-05-05           EMI Test Receiver         Rohde&schwarz         ESCI7         101166         2023-06-26           Double Ridged		



## 5 Evaluation Results (Evaluation)

## 5.1 Antenna requirement

#### 5.1.1 Conclusion:

The antenna of the EUT is permanently attached.
The EUT complies with the requirement of FCC PART 15.203.



# 6 Radio Spectrum Matter Test Results (RF)

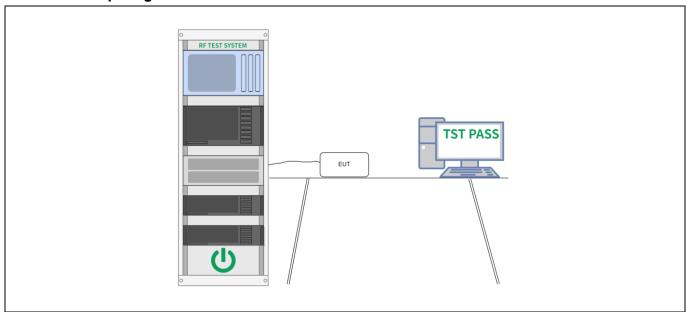
## 6.1 Occupied Bandwidth

Test Requirement:	47 CFR 15.247(a)(2)				
Test Limit:	Refer to 47 CFR 15.247(a)(2), Systems using digital modulation techniques may operate in the 902-928 MHz, and 2400-2483.5 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.				
Test Method:	ANSI C63.10-2013, section 11.8 KDB 558074 D01 15.247 Meas Guidance v05r02				
Procedure:	<ul> <li>a) Set RBW = 100 kHz.</li> <li>b) Set the VBW &gt;= [3 × RBW].</li> <li>c) Detector = peak.</li> <li>d) Trace mode = max hold.</li> <li>e) Sweep = auto couple.</li> <li>f) Allow the trace to stabilize.</li> <li>g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.</li> </ul>				

## 6.1.1 E.U.T. Operation:

Operating Environment:						
Temperature:	Temperature: 19.7 °C Humidity: 37.1 % Atmospheric Pressure: 101 kPa					
Pre test mode:	Pre test mode: Mode1					
Final test mode: Mode1						

## 6.1.2 Test Setup Diagram:



## 6.1.3 Test Data:



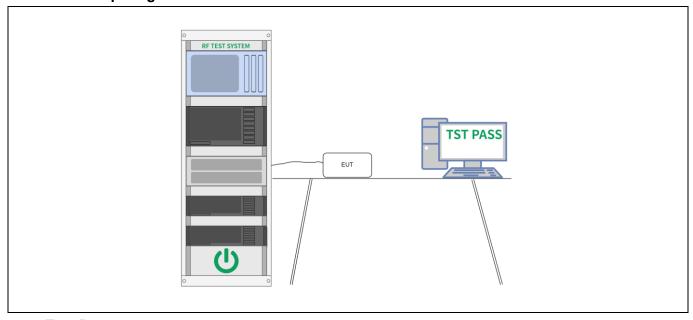
## 6.2 Maximum Conducted Output Power

Test Requirement:	47 CFR 15.247(b)(3)
Test Limit:	Refer to 47 CFR 15.247(b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.
Test Method:	ANSI C63.10-2013, section 11.9.1 KDB 558074 D01 15.247 Meas Guidance v05r02
Procedure:	ANSI C63.10-2013, section 11.9.1 Maximum peak conducted output power

## 6.2.1 E.U.T. Operation:

Operating Environment:						
Temperature:	Temperature: 19.7 °C Humidity: 37.1 % Atmospheric Pressure: 101 kPa					
Pre test mode:	Pre test mode: Mode1					
Final test mode: Mode1						

## 6.2.2 Test Setup Diagram:



#### 6.2.3 Test Data:



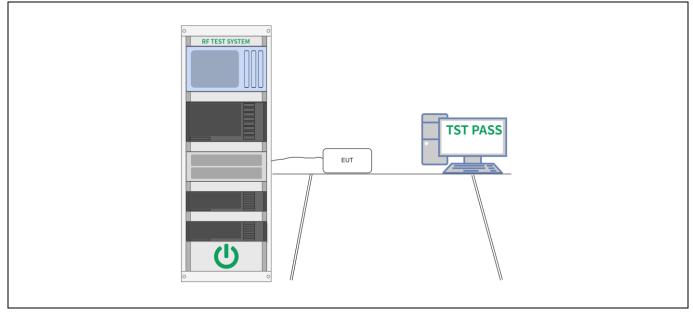
## 6.3 Power Spectral Density

Test Requirement:	47 CFR 15.247(e)
Test Limit:	Refer to 47 CFR 15.247(e), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.
Test Method:	ANSI C63.10-2013, section 11.10 KDB 558074 D01 15.247 Meas Guidance v05r02
Procedure:	ANSI C63.10-2013, section 11.10, Maximum power spectral density level in the fundamental emission

## 6.3.1 E.U.T. Operation:

Operating Environment:						
Temperature:	Temperature: 19.7 °C Humidity: 37.1 % Atmospheric Pressure: 101 kPa					
Pre test mode:	Pre test mode: Mode1					
Final test mode: Mode1						

## 6.3.2 Test Setup Diagram:



## 6.3.3 Test Data:



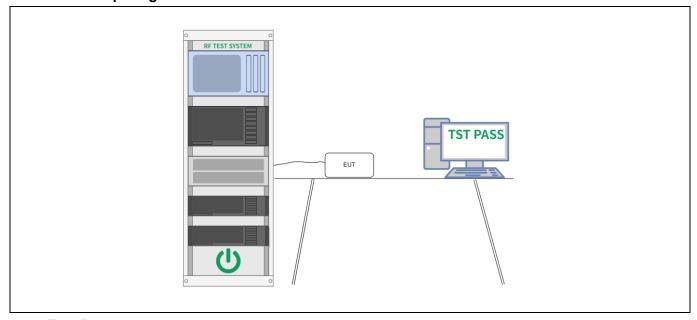
## 6.4 RF conducted spurious emissions and band edge measurement

Test Requirement:	47 CFR 15.247(d), 15.209, 15.205
Test Limit:	Refer to 47 CFR 15.247(d), In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required.
Test Method:	ANSI C63.10-2013 section 11.11 KDB 558074 D01 15.247 Meas Guidance v05r02
Procedure:	ANSI C63.10-2013 Section 11.11.1, Section 11.11.2, Section 11.11.3

## 6.4.1 E.U.T. Operation:

Operating Environment:						
Temperature:	Temperature: 19.7 °C Humidity: 37.1 % Atmospheric Pressure: 101 kPa					
Pre test mode:	Pre test mode: Mode1					
Final test mode: Mode1						

## 6.4.2 Test Setup Diagram:



#### 6.4.3 Test Data:



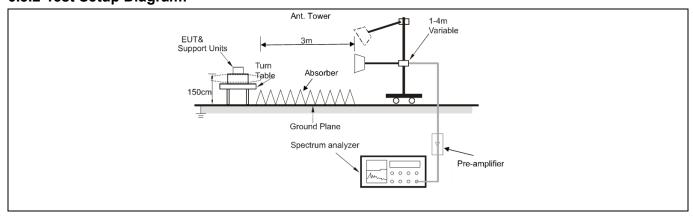
## 6.5 Band edge emissions (Radiated)

Test Requirement:	Refer to 47 CFR 15.247(d), In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)).`					
Test Limit:	Frequency (MHz)	Field strength (microvolts/meter)	Measuremen t distance (meters)			
	0.009-0.490	2400/F(kHz)	300			
	0.490-1.705	24000/F(kHz)	30			
	1.705-30.0	30	30			
	30-88	100 **	3			
	88-216	150 **	3			
	216-960	200 **	3			
	Above 960	500	3			
	** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241. In the emission table above, the tighter limit applies at the band edges. The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.					
Test Method:	ANSI C63.10-2013 section 6.10 KDB 558074 D01 15.247 Meas Guidance v05r02					
Procedure:	ANSI C63.10-2013 section 6.10.5.2					

## 6.5.1 E.U.T. Operation:

Operating Envi	ronment:					
Temperature:	19.7 °C		Humidity:	37.1 %	Atmospheric Pressure:	101 kPa
Pre test mode:		Mode	e1			
Final test mode	e:	Mode	e1			
Note:						
The amplitude reported.	of spurio	us em	issions whic	ch are attenuat	ed more than 20 dB belov	v the limits are not

## 6.5.2 Test Setup Diagram:



Address: Headquarters: Microtest Hi-tech Building, Zone 2, Xinxing Industrial Park, Fuzhou Avenue, Bao'an District, Shenzhen, China. Tel: (86-755)88850135 Fax: (86-755) 88850136 Web: www.mtitest.cn E-mail: mti@51mti.com



## 6.5.3 Test Data:

ode1 /	Polar	rization: Horizo	ontal / CH: L					
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detecto
1		2483.500	76.60	-12.44	64.16	74.00	-9.84	peak
2	*	2483.500	63.18	-12.44	50.74	54.00	-3.26	AVG
3		2500.000	63.48	-12.35	51.13	74.00	-22.87	peak
4		2500.000	45.01	-12.35	32.66	54.00	-21.34	AVG



No	. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		2483.500	69.07	-12.44	56.63	74.00	-17.37	peak
2	*	2483.500	60.36	-12.44	47.92	54.00	-6.08	AVG
3		2500.000	56.76	-12.35	44.41	74.00	-29.59	peak
4		2500.000	42.43	-12.35	30.08	54.00	-23.92	AVG



MHz         dBuV         dB         dBuV/m         dBuV/m         dB         Detector           1         2310.000         55.83         -12.83         43.00         74.00         -31.00         peak           2         2310.000         42.65         -12.83         29.82         54.00         -24.18         AVG           3         2390.000         59.73         -12.42         47.31         74.00         -26.69         peak           4         * 2390.000         48.39         -12.42         35.97         54.00         -18.03         AVG	No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
2 2310.000 42.65 -12.83 29.82 54.00 -24.18 AVG 3 2390.000 59.73 -12.42 47.31 74.00 -26.69 peak			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
3 2390.000 59.73 -12.42 47.31 74.00 -26.69 peak	1		2310.000	55.83	-12.83	43.00	74.00	-31.00	peak
The state of the s	2		2310.000	42.65	-12.83	29.82	54.00	-24.18	AVG
4 * 2390.000 48.39 -12.42 35.97 54.00 -18.03 AVG	3		2390.000	59.73	-12.42	47.31	74.00	-26.69	peak
	4	*	2390.000	48.39	-12.42	35.97	54.00	-18.03	AVG



MHz dBuV dB dBuV/m dBuV/m dB Dete	
	ector
1 2310.000 59.07 -12.83 46.24 74.00 -27.76 pe	ak
2 2310.000 42.68 -12.83 29.85 54.00 -24.15 A	/G
3 2390.000 66.72 -12.42 54.30 74.00 -19.70 pe	ak
4 * 2390.000 53.50 -12.42 41.08 54.00 -12.92 A	/G



## 6.6 Radiated emissions (below 1GHz)

Test Requirement:	restricted bands, as defin	d), In addition, radiated emissi ned in § 15.205(a), must also o specified in § 15.209(a)(see §	comply with the
Test Limit:	Frequency (MHz)	Field strength (microvolts/meter)	Measuremen t distance (meters)
	0.009-0.490	2400/F(kHz)	300
	0.490-1.705	24000/F(kHz)	30
	1.705-30.0	30	30
	30-88	100 **	3
	88-216	150 **	3
	216-960	200 **	3
	Above 960	500	3
	intentional radiators oper frequency bands 54-72 M However, operation within sections of this part, e.g., In the emission table about The emission limits show employing a CISPR quasikHz, 110–490 kHz and all three bands are based or	ove, the tighter limit applies at t in in the above table are based si-peak detector except for the bove 1000 MHz. Radiated emi in measurements employing ar	not be located in the z or 470-806 MHz. rmitted under other the band edges. d on measurements frequency bands 9–90 ission limits in these
Test Method:	ANSI C63.10-2013 section KDB 558074 D01 15.247		
Procedure:	ANSI C63.10-2013 section	on 6.6.4	

## 6.6.1 E.U.T. Operation:

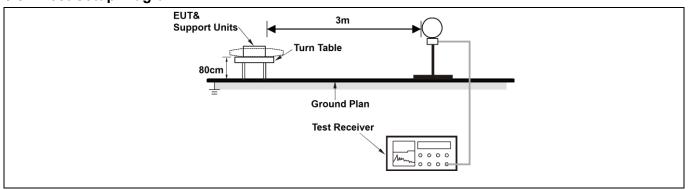
Operating Envi	ronment:					
Temperature: 19.7 °C			Humidity:	37.1 %	Atmospheric Pressure:	101 kPa
Pre test mode:		Mode	e1			
Final test mode	e:	Mode	e1			
Noto:						

#### Note

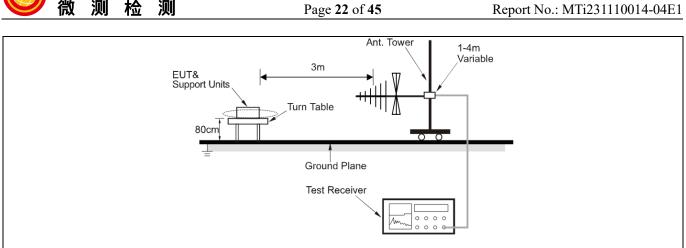
The amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported.

All modes of operation of the EUT were investigated, and only the worst-case results are reported. There were no emissions found below 30MHz within 20dB of the limit.

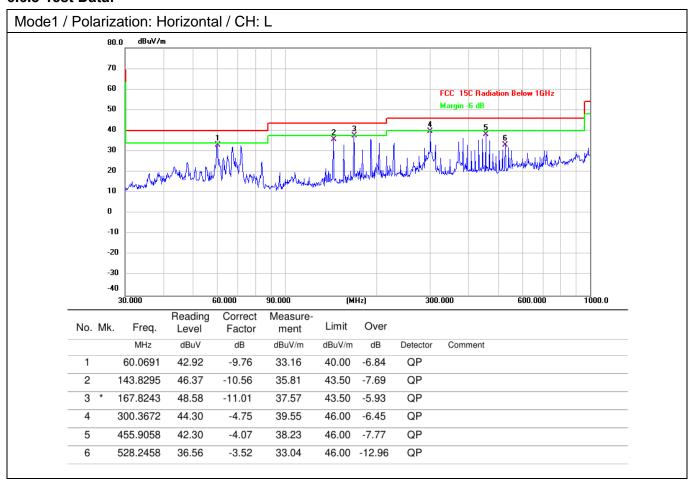
## 6.6.2 Test Setup Diagram:



Address: Headquarters: Microtest Hi-tech Building, Zone 2, Xinxing Industrial Park, Fuzhou Avenue, Bao'an District, Shenzhen, China. Tel: (86-755)88850135 Fax: (86-755) 88850136 Web: www.mtitest.cn E-mail: mti@51mti.com



#### 6.6.3 Test Data:



204.2377

300.3672

455.9058

4

5

6

43.81

43.75

40.45

-7.58

-4.75

-4.07

36.23

39.00

36.38

43.50

46.00

46.00

-7.27

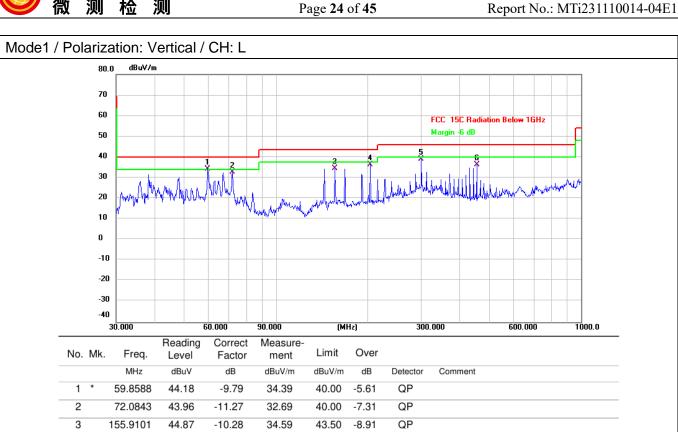
-7.00

-9.62

QP

QP

QP





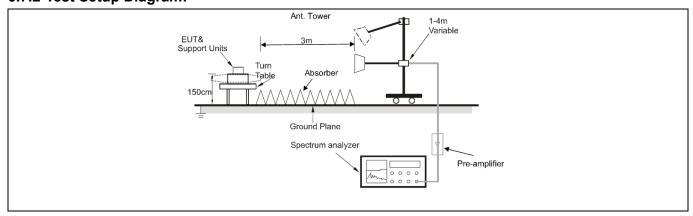
## 6.7 Radiated emissions (above 1GHz)

Test Requirement:		nissions which fall in the rest comply with the radiated em 5(c)).`					
Test Limit:	Frequency (MHz)	Field strength (microvolts/meter)	Measuremen t distance (meters)				
	0.009-0.490	2400/F(kHz)	300				
	0.490-1.705	24000/F(kHz)	30				
	1.705-30.0	30	30				
	30-88	100 **	3				
	88-216	150 **	3				
	216-960	200 **	3				
	Above 960	500	3				
	** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241. In the emission table above, the tighter limit applies at the band edges. The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–9 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.						
Test Method:	ANSI C63.10-2013 sec KDB 558074 D01 15.2	ction 6.6.4 47 Meas Guidance v05r02					
Procedure:	ANSI C63.10-2013 sec	ction 6.6.4					

## 6.7.1 E.U.T. Operation:

Operating Envi	ironment	•				
Temperature:	33 °C		Humidity:	40.1 %	Atmospheric Pressure:	101 kPa
Pre test mode:		Mode	e1			
Final test mode	э:	Mode	e1			
Note: Test freq	uency ar	e from	1GHz to 25	GHz, the an	nplitude of spurious emission	ns which are
attenuated mo	re than 2	0 dB b	elow the lim	nits are not re	eported.	
All modes of o	peration of	of the	EUT were ir	vestigated,	and only the worst-case resu	ults are reported.

## 6.7.2 Test Setup Diagram:



Address: Headquarters: Microtest Hi-tech Building, Zone 2, Xinxing Industrial Park, Fuzhou Avenue, Bao'an District, Shenzhen, China. Tel: (86-755)88850135 Fax: (86-755) 88850136 Web: www.mtitest.cn E-mail: mti@51mti.com



## 6.7.3 Test Data:

١	No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
	1		4804.000	57.95	-7.40	50.55	74.00	-23.45	peak
	2		4804.000	51.65	-7.40	44.25	54.00	-9.75	AVG
	3		7206.000	50.64	0.96	51.60	74.00	-22.40	peak
	4	*	7206.000	44.66	0.96	45.62	54.00	-8.38	AVG
	5		9608.000	48.82	2.16	50.98	74.00	-23.02	peak
	6		9608.000	42.53	2.16	44.69	54.00	-9.31	AVG



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4804.000	53.63	-7.40	46.23	74.00	-27.77	peak
2		4804.000	47.72	-7.40	40.32	54.00	-13.68	AVG
3		7206.000	47.97	0.96	48.93	74.00	-25.07	peak
4		7206.000	41.71	0.96	42.67	54.00	-11.33	AVG
5		9608.000	49.07	2.16	51.23	74.00	-22.77	peak
6	*	9608.000	43.05	2.16	45.21	54.00	-8.79	AVG



Mode1 / Polarization: Horizontal / CH: M Reading Correct Measure-Limit Over No. Mk. Freq. Level Factor ment dBuV dB dBuV/m dΒ MHz dBuV/m Detector 4880.000 -7.4549.35 74.00 -24.65 1 56.80 peak 2 51.10 -7.4543.65 -10.35 AVG 4880.000 54.00 3 7320.000 51.86 0.77 52.63 -21.37 74.00 peak 4 7320.000 45.80 0.77 46.57 54.00 -7.43AVG 5 9760.000 48.30 3.11 51.41 74.00 -22.59peak 9760.000 42.24 45.35 54.00 AVG 6 3.11 -8.65



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4880.000	49.70	-7.45	42.25	74.00	-31.75	peak
2		4880.000	43.97	-7.45	36.52	54.00	-17.48	AVG
3		7320.000	47.77	0.77	48.54	74.00	-25.46	peak
4		7320.000	41.71	0.77	42.48	54.00	-11.52	AVG
5		9760.000	48.61	3.11	51.72	74.00	-22.28	peak
6	*	9760.000	42.51	3.11	45.62	54.00	-8.38	AVG



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		4960.000	52.69	-7.20	45.49	74.00	-28.51	peak
2		4960.000	46.52	-7.20	39.32	54.00	-14.68	AVG
3		7440.000	48.55	0.98	49.53	74.00	-24.47	peak
4		7440.000	42.67	0.98	43.65	54.00	-10.35	AVG
5		9920.000	47.68	3.02	50.70	74.00	-23.30	peak
6	*	9920.000	41.24	3.02	44.26	54.00	-9.74	AVG



1 4960.000 50.08 -7.20 42.88 74.00 -31.12 pea 2 4960.000 43.88 -7.20 36.68 54.00 -17.32 AVG 3 7440.000 46.92 0.98 47.90 74.00 -26.10 pea 4 7440.000 40.50 0.98 41.48 54.00 -12.52 AVG	No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
2 4960.000 43.88 -7.20 36.68 54.00 -17.32 AVG 3 7440.000 46.92 0.98 47.90 74.00 -26.10 pea 4 7440.000 40.50 0.98 41.48 54.00 -12.52 AVG			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
3 7440.000 46.92 0.98 47.90 74.00 -26.10 pea 4 7440.000 40.50 0.98 41.48 54.00 -12.52 AV	1		4960.000	50.08	-7.20	42.88	74.00	-31.12	peak
4 7440.000 40.50 0.98 41.48 54.00 -12.52 AV	2		4960.000	43.88	-7.20	36.68	54.00	-17.32	AVG
	3		7440.000	46.92	0.98	47.90	74.00	-26.10	peak
5 9920.000 47.88 3.02 50.90 74.00 -23.10 pea	4		7440.000	40.50	0.98	41.48	54.00	-12.52	AVG
	5		9920.000	47.88	3.02	50.90	74.00	-23.10	peak
6 * 9920.000 41.15 3.02 44.17 54.00 -9.83 AV	6	*	9920.000	41.15	3.02	44.17	54.00	-9.83	AVG



## Photographs of the test setup

Refer to Appendix - Test Setup Photos



# Photographs of the EUT

Refer to Appendix - EUT Photos



# Appendix

## Appendix A: DTS Bandwidth

Test Result

Test Mode	Antenna	Frequency [MHz]	DTS BW [MHz]	Limit [MHz]	Verdict
BLE_1M	Ant1	2402	0.668	0.5	PASS
		2440	0.632	0.5	PASS
		2480	0.660	0.5	PASS





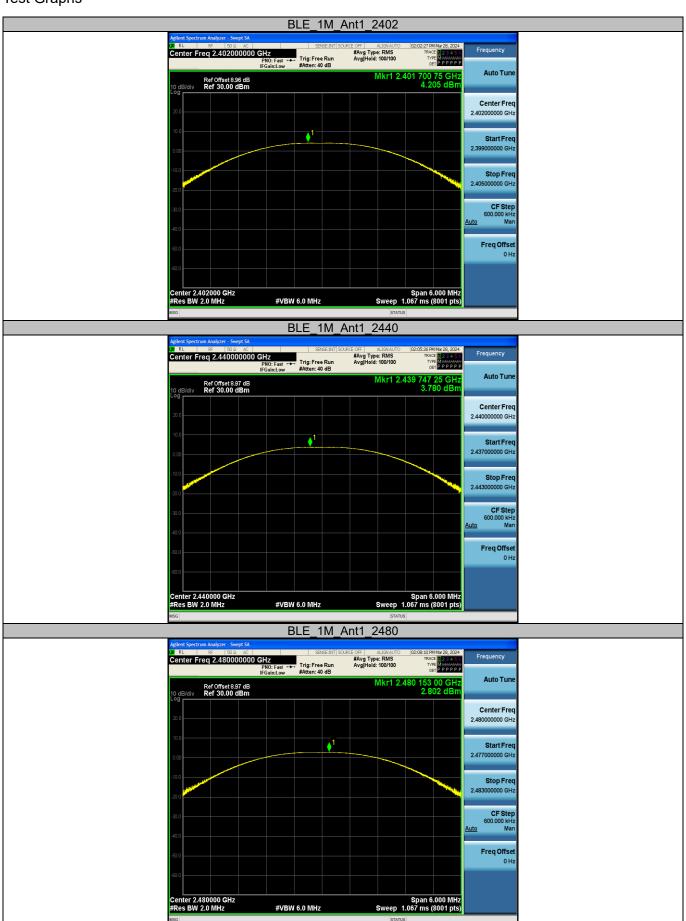


# Appendix B: Maximum conducted output power

## Test Result-Peak

Test Mode	Antenna	Frequency [MHz]	Conducted Peak Power [dBm]	Limit [dBm]	Verdict
		2402	4.21	≤30	PASS
BLE_1M	Ant1	2440	3.78	≤30	PASS
		2480	2.80	≤30	PASS

Page 37 of 45 Report No.: MTi231110014-04E1



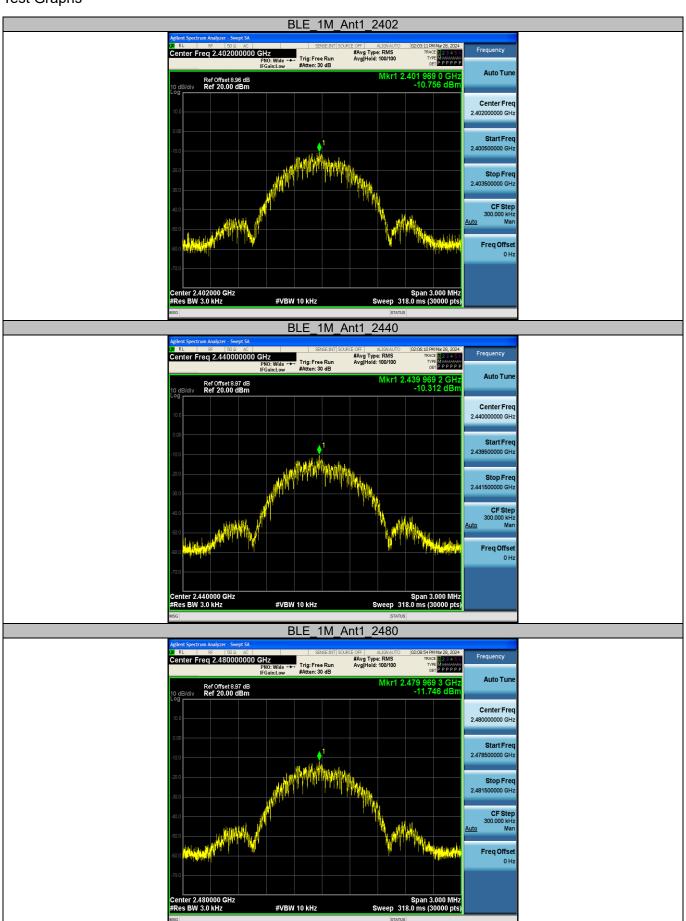


# Appendix C: Maximum power spectral density

## Test Result

Test Mode	Antenna	Frequency [MHz]	Result [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
BLE_1M		2402	-10.76	≤8.00	PASS
	Ant1	2440	-10.31	≤8.00	PASS
	,	2480	-11.75	≤8.00	PASS

Page 39 of 45 Report No.: MTi231110014-04E1



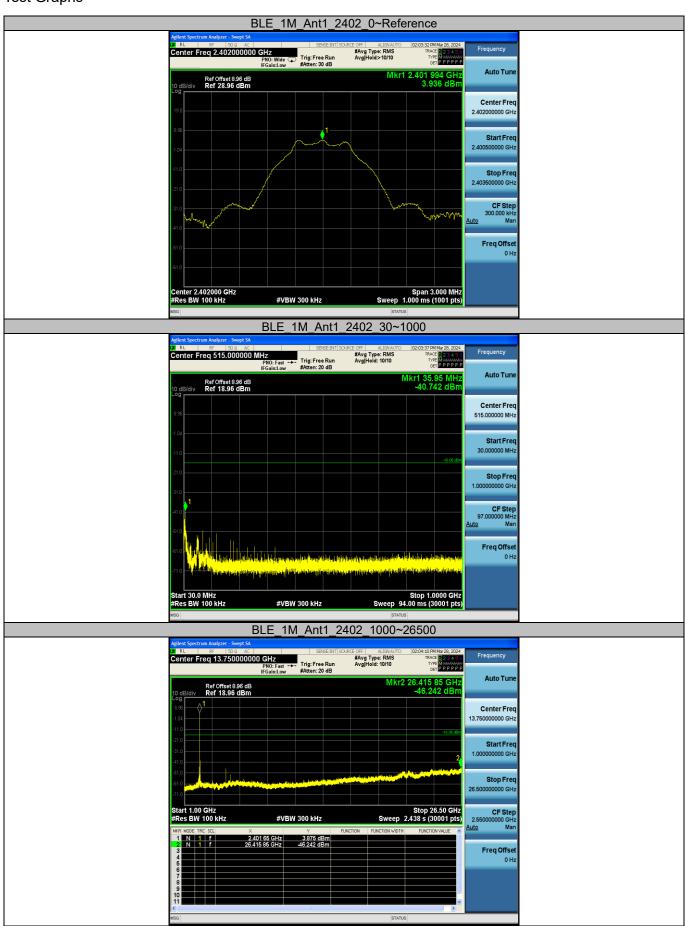


## Appendix D: Band edge measurements

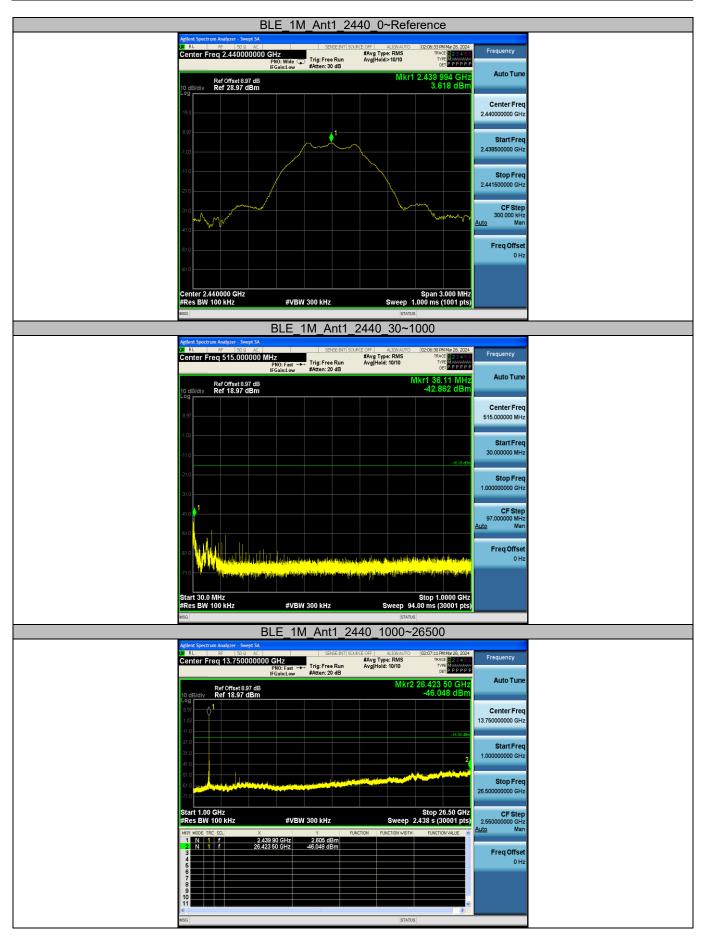


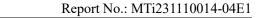


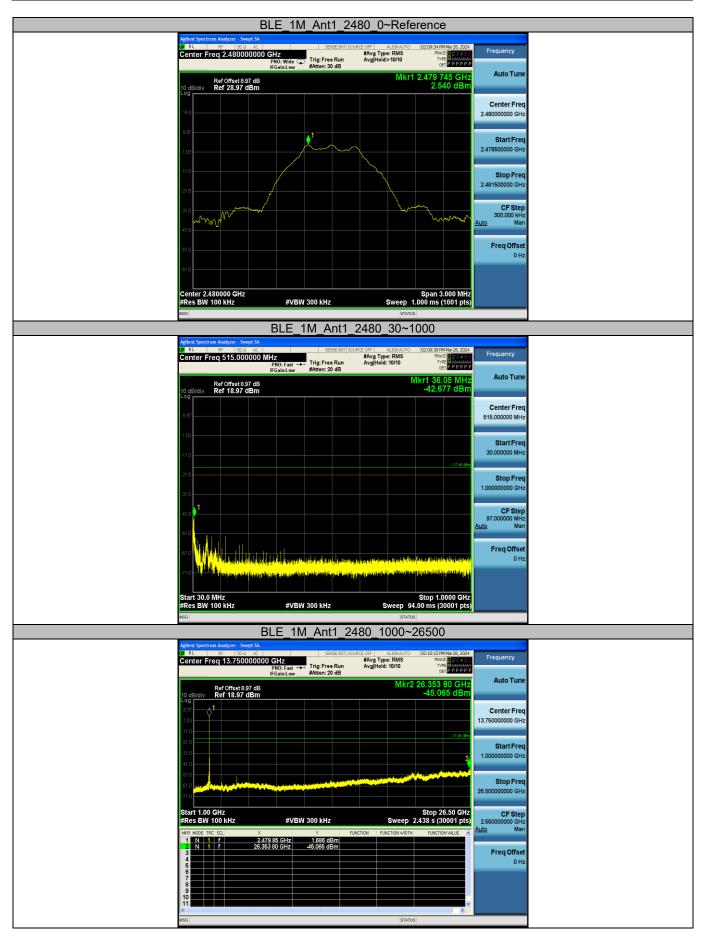
# Appendix E: Conducted Spurious Emission













# **Appendix F: Duty Cycle**

## Test Result

Test Mode	Antenna	Frequency [MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
BLE_1M	Ant1	2402	0.41	1.25	32.80	4.84
		2440	0.42	1.25	33.60	4.74
		2480	0.41	1.25	32.80	4.84



