FCC RF Test Report

APPLICANT : Motorola Mobility LLC EQUIPMENT : Mobile Cellular Phone

BRAND NAME : Motorola

MODEL NAME : XT2513-1, XT2513-2, XT2513-3, XT2513V

FCC ID : IHDT56AT9

STANDARD : FCC Part 15 Subpart C §15.247

CLASSIFICATION : (DTS) Digital Transmission System

TEST DATE(S) : Sep. 05, 2024 ~ Sep. 19, 2024

We, Sporton International Inc. (Shenzhen), would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Shenzhen), the test report shall not be reproduced except in full.

JasonJia

Approved by: Jason Jia





Report No.: FR482618B

Sporton International Inc. (ShenZhen)

1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055

People's Republic of China

Sporton International Inc. (ShenZhen)

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number : 1 of 27
Report Issued Date : Oct. 11, 2024
Report Version : Rev. 01

TABLE OF CONTENTS

RE'	VISIO	N HISTORY	3
SU	MMAF	RY OF TEST RESULT	4
1	GEN	ERAL DESCRIPTION	5
	1.1	Applicant	5
	1.2	Manufacturer	5
	1.3	Product Feature of Equipment Under Test	5
	1.4	Product Specification of Equipment Under Test	5
	1.5	Modification of EUT	6
	1.6	Testing Location	6
	1.7	Test Software	6
	1.8	Applicable Standards	7
	1.9	Specification of Accessory	7
2	TEST	T CONFIGURATION OF EQUIPMENT UNDER TEST	8
	2.1	Carrier Frequency Channel	8
	2.2	Test Mode	9
	2.3	Connection Diagram of Test System	10
	2.4	Support Unit used in test configuration and system	
	2.5	EUT Operation Test Setup	11
	2.6	Measurement Results Explanation Example	
3	TEST	T RESULT	
	3.1	6dB and 99% Bandwidth Measurement	
	3.2	Output Power Measurement	13
	3.3	Power Spectral Density Measurement	16
	3.4	Conducted Band Edges and Spurious Emission Measurement	17
	3.5	Radiated Band Edges and Spurious Emission Measurement	
	3.6	AC Conducted Emission Measurement	
	3.7	Antenna Requirements	
4		OF MEASURING EQUIPMENT	
5	MEA	SUREMENT UNCERTAINTY	27
		DIX A. CONDUCTED TEST RESULTS	
		DIX B. AC CONDUCTED EMISSION TEST RESULT	
		DIX C. RADIATED SPURIOUS EMISSION	
		DIX D. DUTY CYCLE PLOTS	
AP	PEND	DIX E. SETUP PHOTOGRAPHS	

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number : 2 of 27
Report Issued Date : Oct. 11, 2024
Report Version : Rev. 01

Report No. : FR482618B

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR482618B	Rev. 01	Initial issue of report	Oct. 11, 2024

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number : 3 of 27
Report Issued Date : Oct. 11, 2024
Report Version : Rev. 01

Report No. : FR482618B

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	≥ 0.5MHz	Pass	-
3.1	-	99% Bandwidth	-	Report only	-
3.2	15.247(b)(3)	Peak Output Power	≤ 30dBm	Pass	-
3.3	15.247(e)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
3.4	15.247(d)	Conducted Band Edges and Spurious Emission	≤ 20dBc	Pass	-
3.5	15.247(d)	Radiated Band Edges and Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 12.00 dB at 2496.81 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 9.21 dB at 0.53 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	15.203 & 15.247(b)	Pass	-

Conformity Assessment Condition:

- The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or
 in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of
 non-compliance that may potentially occur if measurement uncertainty is taken into account.
- 2. The measurement uncertainty please refer to each test result in the section "Measurement Uncertainty"

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

Sporton International Inc. (ShenZhen)

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number : 4 of 27
Report Issued Date : Oct. 11, 2024
Report Version : Rev. 01

Report Template No.: BU5-FR15CBT4.0 Version 2.0

Report No.: FR482618B

1 General Description

1.1 Applicant

Motorola Mobility LLC

222 W, Merchandise Mart Plaza, Chicago IL 60654 USA

1.2 Manufacturer

Motorola Mobility LLC

222 W, Merchandise Mart Plaza, Chicago IL 60654 USA

1.3 Product Feature of Equipment Under Test

Product Feature					
Equipment	Mobile Cellular Phone				
Brand Name	Motorola				
Model Name	XT2513-1, XT2513-2, XT2513-3, XT2513V				
FCC ID	IHDT56AT9				
IMEI Code	Conducted: 352291420070137/352291420070145 Conduction: 352291420056433/352291420056441 Radiation: 352291420055674/352291420055682				
HW Version	DVT2				
SW Version	VVK35.48				
EUT Stage	Identical Prototype				

Report No.: FR482618B

Remark:

- **1.** The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
- 2. There are four models, the four models are for different markets and no other difference.

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification				
Tx/Rx Frequency Range	2402 MHz ~ 2480 MHz			
Number of Channels	40			
Carrier Frequency of Each Channel	40 Channel(37 hopping + 3 advertising channel)			
	BLE 1Mbps: 10.62 dBm (0.0115 W)			
Maximum Output Power to Antenna	BLE 2Mbps: 11.43 dBm (0.0139 W)			
Maximum Output Power to Antenna	BLE 125Kbps: 10.68 dBm (0.0117 W)			
	BLE 500Kbps: 10.59 dBm (0.0115 W)			
00% Occupied Randwidth	BLE 125Kbps:1.050MHz			
99% Occupied Bandwidth	BLE 2Mbps:2.059MHz			
Antenna Type / Gain	PIFA Antenna type with gain -4.5 dBi			
Type of Modulation	Bluetooth LE : GFSK			

Note:

- **1.** For BLE 1Mbps & 125Kbps & 500Kbps mode, the whole testing has assessed BLE 125Kps mode by referring to the higher conducted power.
- 2. The device supports frequency range of Bluetooth LE data rate 2Mbps is 2404MHz ~ 2478MHz.

 Sporton International Inc. (ShenZhen)
 Page Number
 : 5 of 27

 TEL: +86-755-8637-9589
 Report Issued Date
 : Oct. 11, 2024

 FAX: +86-755-8637-9595
 Report Version
 : Rev. 01

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Testing Location

Sporton International Inc. (ShenZhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Report No.: FR482618B

Test Firm	Sporton International Inc. (ShenZhen)						
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595						
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.				
	CO01-SZ TH01-SZ	CN1256	421272				

Test Firm	Sporton International Inc. (ShenZhen)				
Test Site Location 101, 1st Floor, Block B, Buildi Community, Fuyong Street, B Province 518103 People's Re TEL: +86-755-86066985		et, Baoan District, Shenzhe			
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.		
	03CH03-SZ	CN1256	421272		

1.7 Test Software

I	ltem	Site	Manufacturer	Name	Version
	1.	03CH03-SZ	AUDIX	E3	6.2009-8-24
	2.	CO01-SZ	AUDIX	E3	6.120613b

 Sporton International Inc. (ShenZhen)
 Page Number
 : 6 of 27

 TEL: +86-755-8637-9589
 Report Issued Date
 : Oct. 11, 2024

 FAX: +86-755-8637-9595
 Report Version
 : Rev. 01

1.8 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

Report No.: FR482618B

- 47 CFR Part 15 Subpart C §15.247
- FCC KDB 558074 D01 15.247 Meas Guidance v05r02
- ANSI C63.10-2013

Remark:

- All test items were verified and recorded according to the standards and without any deviation during the test.
- 2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

1.9 Specification of Accessory

Specification of Accessory						
AC Adapter 1	Brand Name	Motorola(AOHAI)	Model Name	MC-201L		
AC Adapter 2	Brand Name	Motorola(Salcomp)	Model Name	MC-201L		
USB Cable 1	Brand Name	Motorola(WASHIN)	Model Name	HX-TL-04		
USB Cable 2	Brand Name	Motorola(SAIBAO)	Model Name	STN-A131A		
USB Cable 3	Brand Name	Motorola(WASHIN)	Model Name	HX-TL-07		
USB Cable 4	Brand Name	Motorola(SAIBAO)	Model Name	STN-A132A		
Battery 1	Brand Name	Motorola(CosMX)	Model Name	RA50		
Battery 2	Brand Name	Motorola(ATL)	Model Name	RA50		

 Sporton International Inc. (ShenZhen)
 Page Number
 : 7 of 27

 TEL: +86-755-8637-9589
 Report Issued Date
 : Oct. 11, 2024

 FAX: +86-755-8637-9595
 Report Version
 : Rev. 01

2 Test Configuration of Equipment Under Test

2.1 Carrier Frequency Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
	0	2402	21	2444
	1	2404	22	2446
	2	2406	23	2448
	3	2408	24	2450
	4	2410	25	2452
	5	2412	26	2454
	6	2414	27	2456
	7	2416	28	2458
	8	2418	29	2460
	9	2420	30	2462
2400-2483.5 MHz	10	2422	31	2464
	11	2424	32	2466
	12	2426	33	2468
	13	2428	34	2470
	14	2430	35	2472
	15	2432	36	2474
	16	2434	37	2476
	17	2436	38	2478
	18	2438	39	2480
	19	2440	-	-
	20	2442	-	-

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number : 8 of 27
Report Issued Date : Oct. 11, 2024
Report Version : Rev. 01

Report No.: FR482618B

2.2 **Test Mode**

- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Z plane) were recorded in this report.
- b. AC power line Conducted Emission was tested under maximum output power.

The following summary table is showing all test modes to demonstrate in compliance with the standard.

	Summary table of Test Cases					
Toot Itam	Data Rate / Modulation					
Test Item	Bluetooth – LE / GFSK					
	Mode 1: Bluetooth Tx CH00_2402 MHz_BLE 125Kbps					
	Mode 2: Bluetooth Tx CH19_2440 MHz_BLE 125Kbps					
Conducted	Mode 3: Bluetooth Tx CH39_2480 MHz_BLE 125Kbps					
TCs	Mode 4: Bluetooth Tx CH01_2404 MHz_BLE 2Mbps					
	Mode 5: Bluetooth Tx CH19_2440 MHz_BLE 2Mbps					
	Mode 6: Bluetooth Tx CH38_2478 MHz_BLE 2Mbps					
	Mode 1: Bluetooth Tx CH00_2402 MHz_BLE 125Kbps					
Radiated	Mode 2: Bluetooth Tx CH19_2440 MHz_BLE 125Kbps					
	Mode 3: Bluetooth Tx CH39_2480 MHz_BLE 125Kbps					
TCs	Mode 4: Bluetooth Tx CH01_2404 MHz_BLE 2Mbps					
	Mode 5: Bluetooth Tx CH38_2478 MHz_BLE 2Mbps					
AC Made 4. COM 050 Idla v Bloots of Liela v Adorston 4. LICE Cobla v Bottom 4.						
Conducted	Mode 1: GSM 850 Idle + Bluetooth Link + Adapter 1 + USB Cable + Battery 1 +					
Emission	Earphone					
Remark: For	Radiated Test Cases, The tests were performed with Adapter 1, Earphone and USB					

Cable1.

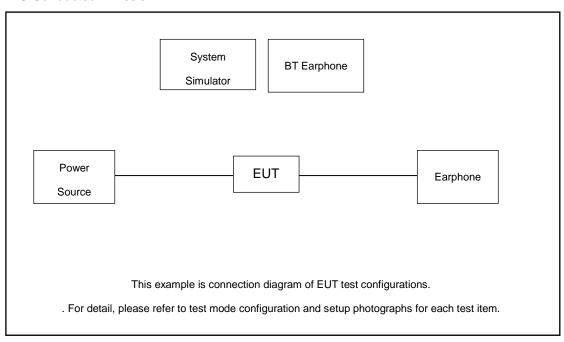
TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9

Page Number : 9 of 27 Report Issued Date: Oct. 11, 2024 : Rev. 01 Report Version

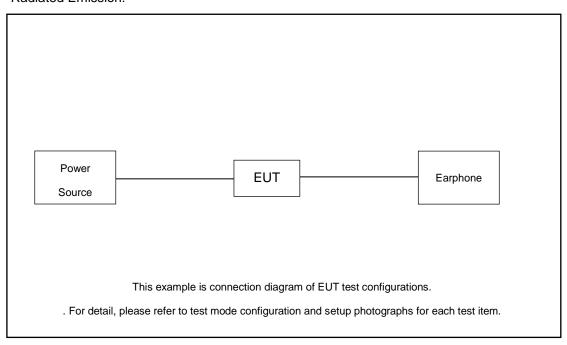
Report No.: FR482618B

2.3 Connection Diagram of Test System

AC Conducted Emission:



Radiated Emission:



TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number : 10 of 27
Report Issued Date : Oct. 11, 2024
Report Version : Rev. 01

Report No.: FR482618B

2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded,1.8m
2.	Earphone	apple	N/A	N/A	N/A	N/A
3.	Bluetooth Earphone	Samsung	EO-MG900	PYAHS-107W	N/A	N/A

Report No.: FR482618B

2.5 EUT Operation Test Setup

For BLE function, the engineering test program was provided and enabled to make EUT continuous transmit.

For AC power line conducted emissions, the EUT was set to connect with the Bluetooth Earphone under large package sizes transmission.

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 2.12 dB and 10dB attenuator.

$$Offset(dB) = RF \ cable \ loss(dB) + attenuator \ factor(dB).$$

= 2.12 + 10 = 12.12 dB)

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

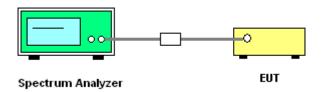
3.1.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.1.3 Test Procedures

- 1. The testing follows ANSI C63.10-2013 clause 11.8
- 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- 4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
- 5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1% to 5% of the 99% OBW and the VBW is set to 3 times of the RBW.
- 6. Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A.

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number : 12 of 27
Report Issued Date : Oct. 11, 2024
Report Version : Rev. 01

Report No.: FR482618B

3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

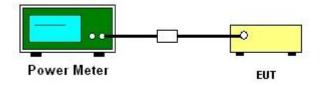
3.2.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.2.3 Test Procedures

- The testing follows the Measurement Procedure of ANSI C63.10-2013 clause 11.9.1.3 PKPM1
 Peak power meter or ANSI C63.10-2013 clause 11.9.2.3.1 Method AVGPM method.
- 2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- 4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number : 13 of 27
Report Issued Date : Oct. 11, 2024
Report Version : Rev. 01

Report No.: FR482618B

3.2.5 Test Result of Peak Output Power

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak Conducted Power (dBm)	Power Setting	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	125kbps	1	0	2402	10.22	8.00	30.00	-4.50	5.72	36.00	Pass
BLE	125kbps	1	19	2440	10.01	8.00	30.00	-4.50	5.51	36.00	Pass
BLE	125kbps	1	39	2480	10.68	8.00	30.00	-4.50	6.18	36.00	Pass

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak Conducted Power (dBm)	Power Setting	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	500kbps	1	0	2402	10.18	8.00	30.00	-4.50	5.68	36.00	Pass
BLE	500kbps	1	19	2440	9.86	8.00	30.00	-4.50	5.36	36.00	Pass
BLE	500kbps	1	39	2480	10.59	8.00	30.00	-4.50	6.09	36.00	Pass

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak Conducted Power (dBm)	Power Setting	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	1Mbps	1	0	2402	10.19	8.00	30.00	-4.50	5.69	36.00	Pass
BLE	1Mbps	1	19	2440	9.87	8.00	30.00	-4.50	5.37	36.00	Pass
BLE	1Mbps	1	39	2480	10.62	8.00	30.00	-4.50	6.12	36.00	Pass

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak Conducted Power (dBm)	Power Setting	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	2Mbps	1	1	2404	10.97	NV-8	30.00	-4.50	6.47	36.00	Pass
BLE	2Mbps	1	19	2440	10.48	NV-8	30.00	-4.50	5.98	36.00	Pass
BLE	2Mbps	1	38	2478	11.43	NV-8	30.00	-4.50	6.93	36.00	Pass

Sporton International Inc. (ShenZhen)

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number : 14 of 27
Report Issued Date : Oct. 11, 2024
Report Version : Rev. 01

Report No. : FR482618B

3.2.6 Test Result of Average Output Power (Reporting Only)

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	Power Setting	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	125kbps	1	0	2402	0.83	9.70	8.00	30.00	-4.50	5.20	36.00	Pass
BLE	125kbps	1	19	2440	0.83	9.90	8.00	30.00	-4.50	5.40	36.00	Pass
BLE	125kbps	1	39	2480	0.83	10.50	8.00	30.00	-4.50	6.00	36.00	Pass

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	Power Setting	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	500kbps	1	0	2402	2.49	9.50	8.00	30.00	-4.50	5.00	36.00	Pass
BLE	500kbps	1	19	2440	2.49	9.70	8.00	30.00	-4.50	5.20	36.00	Pass
BLE	500kbps	1	39	2480	2.49	10.40	8.00	30.00	-4.50	5.90	36.00	Pass

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	Power Setting	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	1Mbps	1	0	2402	2.14	9.50	8.00	30.00	-4.50	5.00	36.00	Pass
BLE	1Mbps	1	19	2440	2.14	9.70	8.00	30.00	-4.50	5.20	36.00	Pass
BLE	1Mbps	1	39	2480	2.14	10.30	8.00	30.00	-4.50	5.80	36.00	Pass

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	Power Setting	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	2Mbps	1	1	2404	5.04	10.50	NV-8	30.00	-4.50	6.00	36.00	Pass
BLE	2Mbps	1	19	2440	5.04	10.00	NV-8	30.00	-4.50	5.50	36.00	Pass
BLE	2Mbps	1	38	2478	5.04	10.70	NV-8	30.00	-4.50	6.20	36.00	Pass

Sporton International Inc. (ShenZhen)

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number : 15 of 27
Report Issued Date : Oct. 11, 2024
Report Version : Rev. 01

Report No.: FR482618B

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

3.3.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.3.3 Test Procedures

- The testing follows Measurement Procedure of ANSI C63.10-2013 clause 11.10.2 Method PKPSD.
- 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- 4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
- 5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
- 6. Measure and record the results in the test report.
- 7. The Measured power density (dBm)/ 100kHz is a reference level and used as 20dBc down limit line for Conducted Band Edges and Conducted Spurious Emission.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

Sporton International Inc. (ShenZhen)

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number : 16 of 27
Report Issued Date : Oct. 11, 2024
Report Version : Rev. 01

Report No.: FR482618B

3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission

All harmonics/spurious must be at least 20 dB down from the highest emission level within the authorized band.

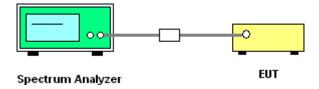
3.4.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

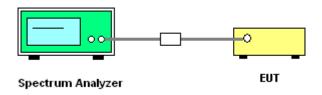
3.4.3 Test Procedure

- 1. The testing follows ANSI C63.10-2013 clause 11.13
- 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- 4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
- 5. Measure and record the results in the test report.
- 6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup



3.4.5 Test Result of Conducted Band Edges Plots



Sporton International Inc. (ShenZhen)

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number : 17 of 27
Report Issued Date : Oct. 11, 2024
Report Version : Rev. 01

Report No.: FR482618B

3.4.6 Test Result of Power Spectral Density

Please refer to Appendix A.

3.4.7 Test Result of Conducted Spurious Emission Plots

Please refer to Appendix A.

Sporton International Inc. (ShenZhen)

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number : 18 of 27
Report Issued Date : Oct. 11, 2024
Report Version : Rev. 01

Report Template No.: BU5-FR15CBT4.0 Version 2.0

Report No.: FR482618B

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

Frequency	Field Strength	Measurement Distance
(MHz)	(microvolts/meter)	(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

3.5.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

Sporton International Inc. (ShenZhen)

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number : 19 of 27
Report Issued Date : Oct. 11, 2024
Report Version : Rev. 01

Report No.: FR482618B

3.5.3 Test Procedures

- 1. The testing follows ANSI C63.10-2013 clause 11.11 & 11.12
- 2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.

Report No.: FR482618B

- 3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
- 4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
- 5. Corrected Reading: Antenna Factor + Cable Loss + Read Level Preamp Factor = Level
- 6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
- 7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than peak limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- 8. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \ge 1$ GHz for peak measurement. For average measurement:
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

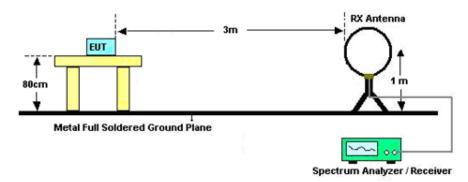
 Sporton International Inc. (ShenZhen)
 Page Number
 : 20 of 27

 TEL: +86-755-8637-9589
 Report Issued Date
 : Oct. 11, 2024

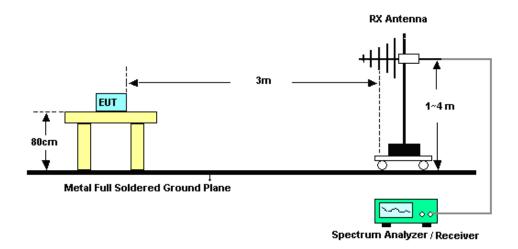
 FAX: +86-755-8637-9595
 Report Version
 : Rev. 01

3.5.4 Test Setup

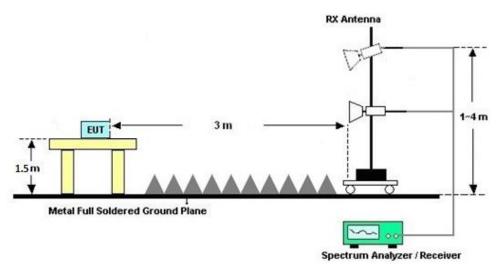
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



Sporton International Inc. (ShenZhen)

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number : 21 of 27
Report Issued Date : Oct. 11, 2024
Report Version : Rev. 01

Report No.: FR482618B

3.5.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

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

Report No.: FR482618B

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

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C.

3.5.7 Duty Cycle

Please refer to Appendix D.

3.5.8 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic or 40GHz, whichever is lower)

Please refer to Appendix C.

Sporton International Inc. (ShenZhen)
TEL: +86-755-8637-9589

FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number : 22 of 27
Report Issued Date : Oct. 11, 2024
Report Version : Rev. 01

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Eroquency of emission (MHz)	Conducted	limit (dΒμV)
Frequency of emission (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 logarithm of the frequency.

3.6.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.6.3 Test Procedures

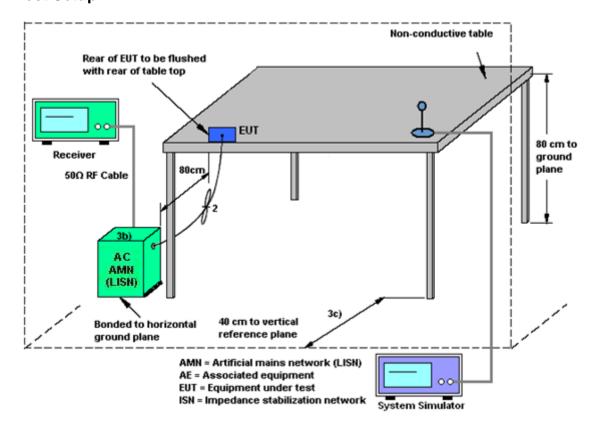
- 1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- 2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- 3. All the support units are connecting to the other LISN.
- 4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- 5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
- 6. Both sides of AC line were checked for maximum conducted interference.
- 7. The frequency range from 150 kHz to 30 MHz was searched.
- Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

Sporton International Inc. (ShenZhen) TEL: +86-755-8637-9589

FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number : 23 of 27
Report Issued Date : Oct. 11, 2024
Report Version : Rev. 01

Report No.: FR482618B

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

Sporton International Inc. (ShenZhen)

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number : 24 of 27
Report Issued Date : Oct. 11, 2024
Report Version : Rev. 01

Report No.: FR482618B

3.7 Antenna Requirements

3.7.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. 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 rule.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

Sporton International Inc. (ShenZhen)

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number : 25 of 27
Report Issued Date : Oct. 11, 2024
Report Version : Rev. 01

Report Template No.: BU5-FR15CBT4.0 Version 2.0

Report No.: FR482618B

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver&SA	KEYSIGHT	N9038A	MY544500 83	20Hz~8.4GHz	Apr. 09, 2024	Sep. 13, 2024~ Sep. 19, 2024	Apr. 08, 2025	Radiation (03CH03-SZ)
EXA Spectrum Anaiyzer	KEYSIGHT	N9010A	MY551502 46	10Hz~44GHz;	Apr. 09, 2024	Sep. 13, 2024~ Sep. 19, 2024	Apr. 08, 2025	Radiation (03CH03-SZ)
Loop Antenna	R&S	HFH2-Z2E	101141	9kHz~30MHz	Dec. 29, 2023	Sep. 13, 2024~ Sep. 19, 2024	Dec. 28, 2024	Radiation (03CH03-SZ)
Bilog Antenna	TeseQ	CBL6112D	35408	30MHz-2GHz	Aug. 20, 2023	Sep. 13, 2024~ Sep. 19, 2024	Aug. 19, 2025	Radiation (03CH03-SZ)
Double Ridge Horn Antenna	SCHWARZBE CK	BBHA9120D	9120D-135 5	1GHz~18GHz	Apr. 09, 2024	Sep. 13, 2024~ Sep. 19, 2024	Apr. 08, 2025	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	TTA1840-35- HG	1871923	18GHz~40GHz	Jul. 03, 2024	Sep. 13, 2024~ Sep. 19, 2024	Jul.02, 2025	Radiation (03CH03-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18Ghz-40GHz	Apr. 09, 2024	Sep. 13, 2024~ Sep. 19, 2024	Apr. 08, 2025	Radiation (03CH03-SZ)
Amplifier	Burgeon	BPA-530	102211	0.01Hz ~3000MHz	Oct. 18, 2023	Sep. 13, 2024~ Sep. 19, 2024	Oct. 17, 2024	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	AMF-7D-0010 1800-30-10P- R	1943528	1GHz~18GHz	Oct. 18, 2023	Sep. 13, 2024~ Sep. 19, 2024	Oct. 17, 2024	Radiation (03CH03-SZ)
Amplifier	Agilent Technologies	83017A	MY395013 02	500MHz~26.5G Hz	Dec. 27, 2023	Sep. 13, 2024~ Sep. 19, 2024	Dec. 26, 2024	Radiation (03CH03-SZ)
AC Power Source	Chroma	61601	616010002 729	N/A	Oct. 18, 2023	Sep. 13, 2024~ Sep. 19, 2024	Oct. 17, 2024	Radiation (03CH03-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Sep. 13, 2024~ Sep. 19, 2024	NCR	Radiation (03CH03-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Sep. 13, 2024~ Sep. 19, 2024	NCR	Radiation (03CH03-SZ)
EMI Receiver	R&S	ESR7	101630	9kHz~7GHz;	Jul. 04, 2024	Sep. 05, 2024	Jul. 03, 2025	Conduction (CO01-SZ)
AC LISN	R&S	ENV216	100063	9kHz~30MHz	Jul. 04, 2024	Sep. 05, 2024	Jul. 03, 2025	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Oct. 16, 2023	Sep. 05, 2024	Oct. 15, 2024	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000 891	100Vac~250Vac	Aug. 14, 2024	Sep. 05, 2024	Aug. 13, 2025	Conduction (CO01-SZ)
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	Apr. 09, 2024	Sep. 07, 2024	Apr. 08, 2025	Conducted (TH01-SZ)
Power Sensor	Anritsu	MA24440A	11707	50MHz-40GHz	Dec. 27, 2023	Sep. 07, 2024	Dec. 26, 2024	Conducted (TH01-SZ)
Thermo meter	Anymetre	JR593	#7	- 10℃ ~ 50℃ 10%RH~99%R H	Apr. 09, 2024	Sep. 07, 2024	Apr. 08, 2025	Conducted (TH01-SZ)

NCR: No Calibration Required

Sporton International Inc. (ShenZhen)

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number : 26 of 27
Report Issued Date : Oct. 11, 2024
Report Version : Rev. 01

Report No.: FR482618B

5 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.10-2013. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of Conducted Measurement

Test Item	Uncertainty
Conducted Spurious Emission & Bandedge	±1.34 dB
Occupied Channel Bandwidth	±0.012 MHz
Conducted Power	±1.34 dB
Conducted Power Spectral Density	±1.32 dB
Frequency	±1.3 Hz

<u>Uncertainty of AC Conducted Emission Measurement (0.15 MHz ~ 30 MHz)</u>

Measuring Uncertainty for a Level of Confidence	2.5 dB		
of 95% (U = 2Uc(y))	2.5 uB		

Uncertainty of Radiated Emission Measurement (9 KHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence	5.0 dB	
of 95% (U = 2Uc(y))	5.0 dB	

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence	
	5.0 dB
of 95% (U = 2Uc(y))	

<u>Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)</u>

Measuring Uncertainty for a Level of Confidence	40.10
of 95% (U = 2Uc(y))	4.9 dB

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence	5.0 dB	
of 95% (U = 2Uc(y))	5.0 dB	

----- THE END -----

Sporton International Inc. (ShenZhen)

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number : 27 of 27
Report Issued Date : Oct. 11, 2024
Report Version : Rev. 01

Report No.: FR482618B

Appendix A. Conducted Test Results

Sporton International Inc. (ShenZhen)

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number

: A1 of A1

Report No.: FR482618B



Report No. : FR482618B

Ambient Condition: $\underline{24\text{--}26}$ °C, $\underline{45\text{--}65}$ %RH

According Standard: ■Part15C

Test Date: 2024-9-7 Test Engineer: Jason Zhang

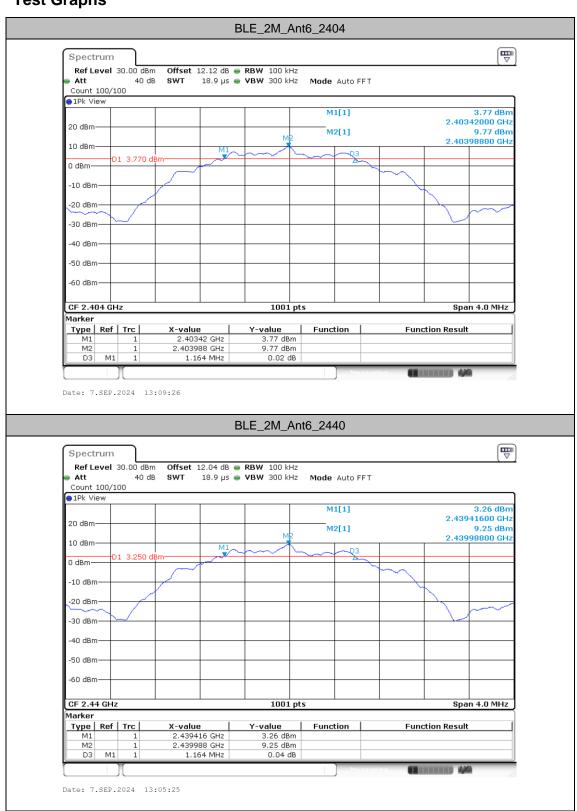
DTS Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
		2404	1.16	2403.42	2404.58	0.5	PASS
BLE_2M	Ant6	2440	1.16	2439.42	2440.58	0.5	PASS
		2478	1.16	2477.42	2478.58	0.5	PASS
	Ant6	2402	0.69	2401.66	2402.34	0.5	PASS
BLE_125K		2440	0.69	2439.65	2440.34	0.5	PASS
		2480	0.69	2479.65	2480.34	0.5	PASS

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9

Test Graphs



TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 : A2 of A26

Report No.: FR482618B



TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 : A3 of A26

Report No. : FR482618B



TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 : A4 of A26

Report No. : FR482618B

Occupied Channel Bandwidth

Test Result

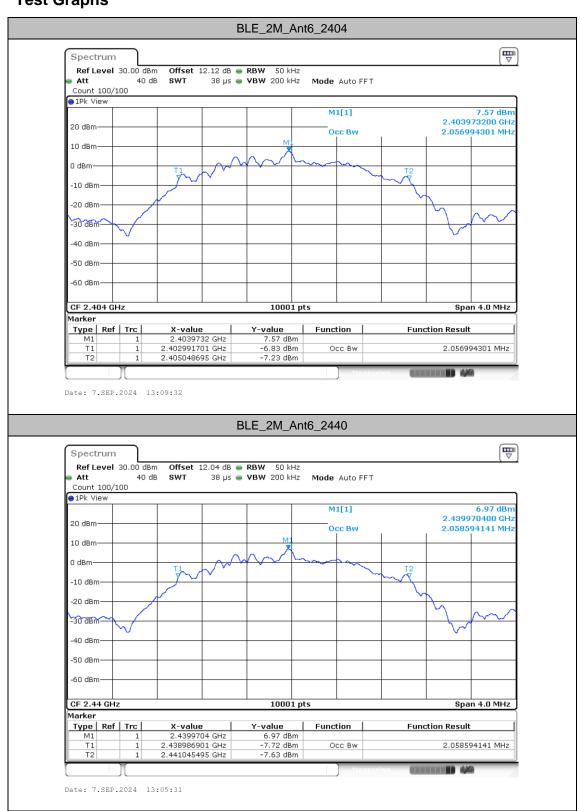
TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]
		2404	2.057	2402.9917	2405.0487
BLE_2M	Ant6	2440	2.059	2438.9869	2441.0455
		2478	2.056	2476.9881	2479.0443
	Ant6	2402	1.049	2401.4745	2402.5235
BLE_125K		2440	1.05	2439.4729	2440.5227
		2480	1.049	2479.4725	2480.5215

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number

: A5 of A26

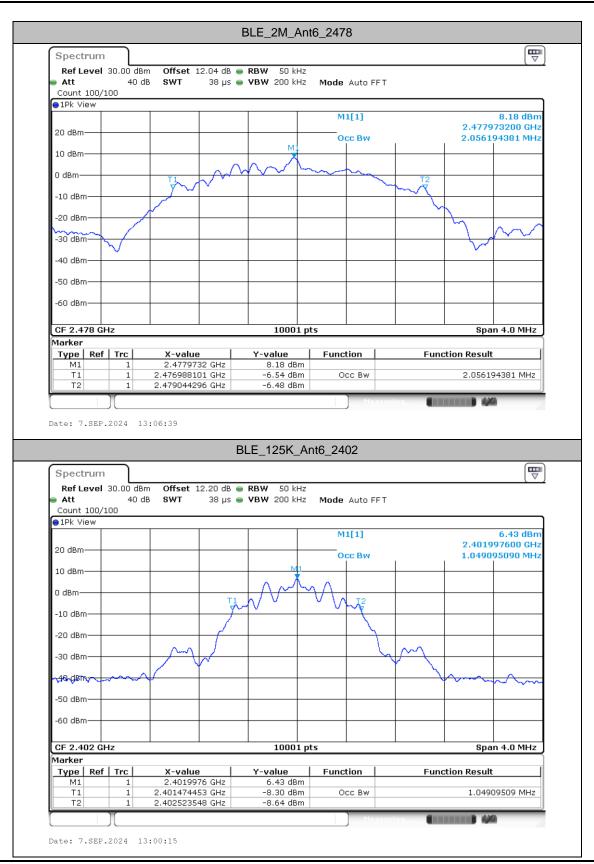
Report No.: FR482618B

Test Graphs



TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 : A6 of A26

Report No.: FR482618B



TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 **Report No. : FR482618B**



TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 **Report No. : FR482618B**

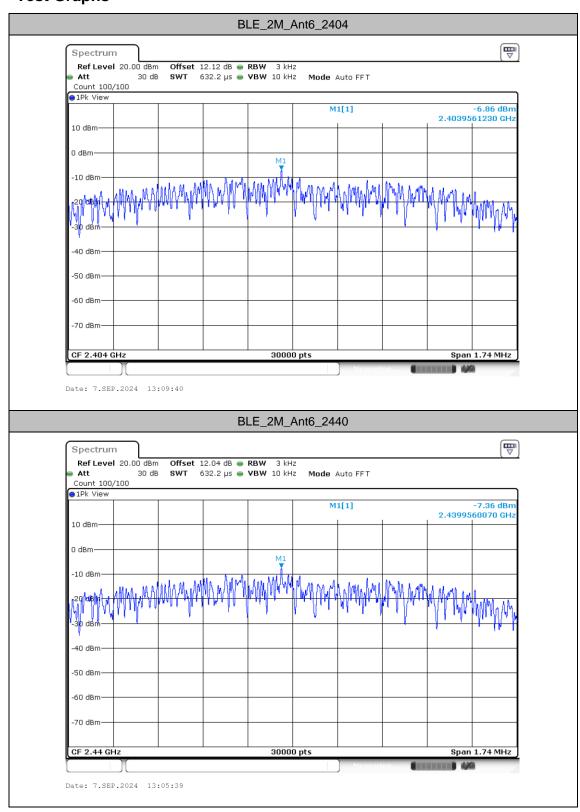
Maximum power spectral density

Test Result

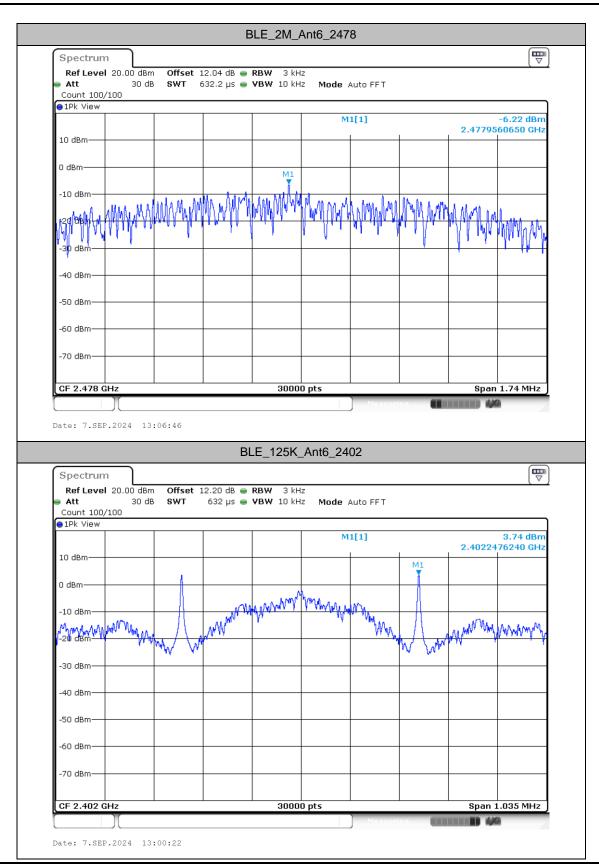
TestMode	Antenna	Freq(MHz)	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
		2404	-6.86	≤8.00	PASS
BLE_2M	Ant6	2440	-7.36	≤8.00	PASS
		2478	-6.22	≤8.00	PASS
BLE_125K	Ant6	2402	3.74	≤8.00	PASS
		2440	3.67	≤8.00	PASS
		2480	4.51	≤8.00	PASS

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 : A9 of A26

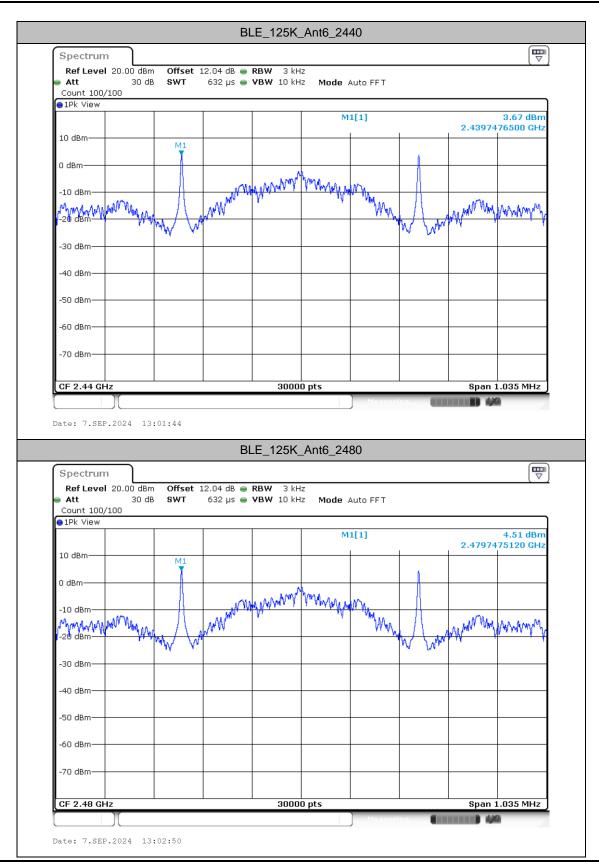
Test Graphs



TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9



Page Number : A11 of A26



Page Number : A12 of A26

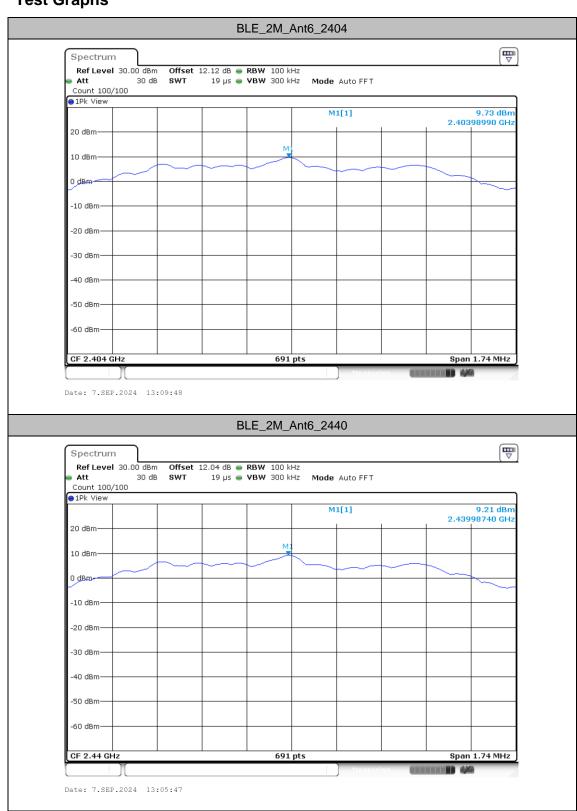
Reference level measurement

Test Result

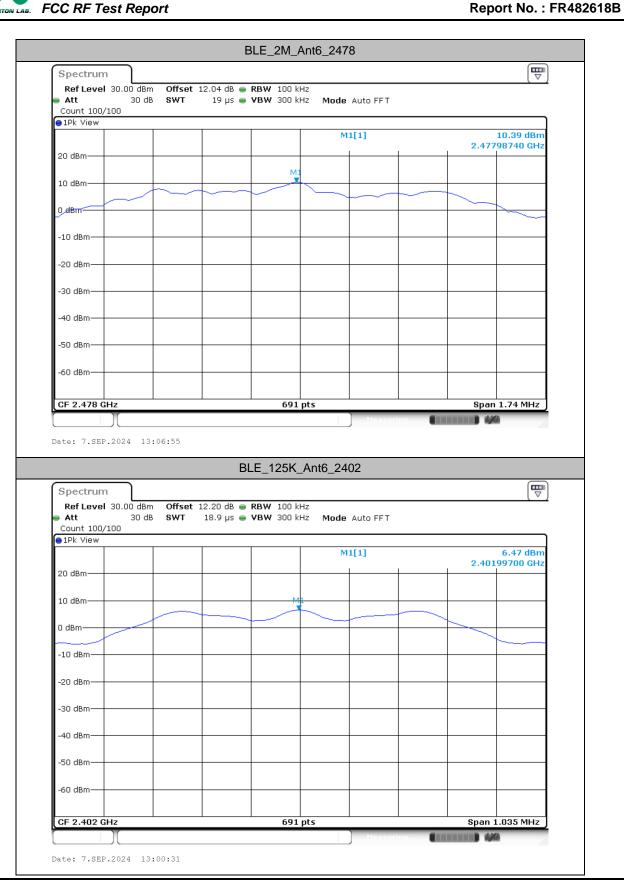
TestMode	Antenna	Freq(MHz)	Max.Point[MHz]	Result[dBm/100KHz]
		2404	2403.99	9.73
BLE_2M	Ant6	2440	2439.99	9.21
		2478	2477.99	10.39
BLE_125K	K Ant6	2402	2402.00	6.47
		2440	2440.00	6.38
		2480	2480.00	7.19

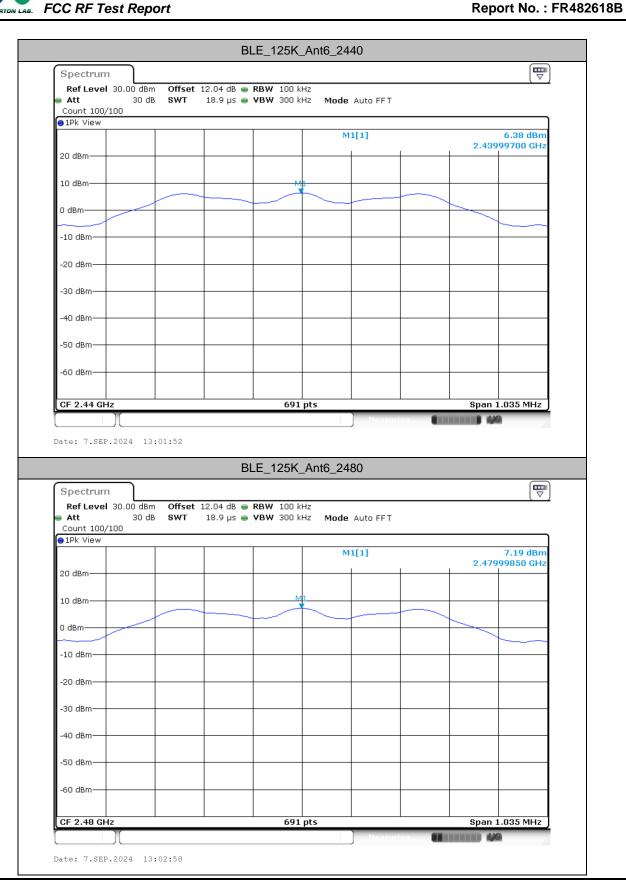
TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9

Test Graphs



TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 : A14 of A26





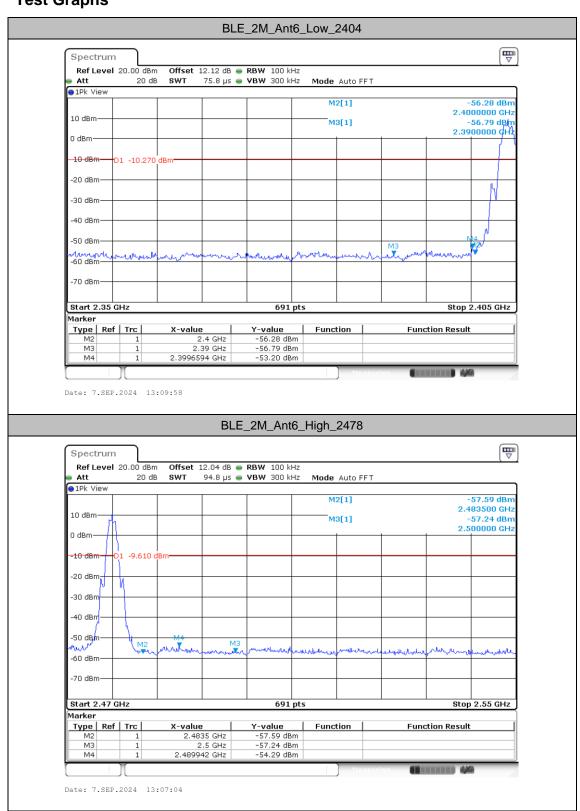
Band edge measurements

Test Result

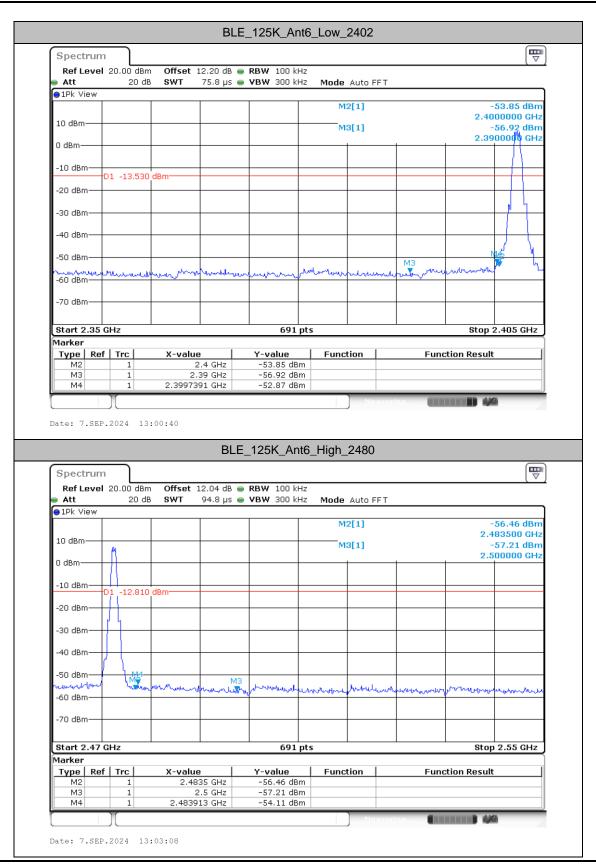
TestMo	Anten	ChNa	Freq(M	RefLevel[dBm/10	Result[dBm/100	Limit[dBm/100	Verdi
de	na	me	Hz)	0KHz]	KHz]	KHz]	ct
DIE OM	A ntG	Low	2404	9.73	-53.2	≤-10.27	PASS
BLE_2M Ant6	Anto	High	2478	10.39	-54.29	≤-9.61	PASS
BLE_12	A = 4C	Low	2402	6.47	-52.87	≤-13.53	PASS
5K	Ant6	High	2480	7.19	-54.11	≤-12.81	PASS

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number : A17 of A26

Test Graphs



TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9



: A19 of A26

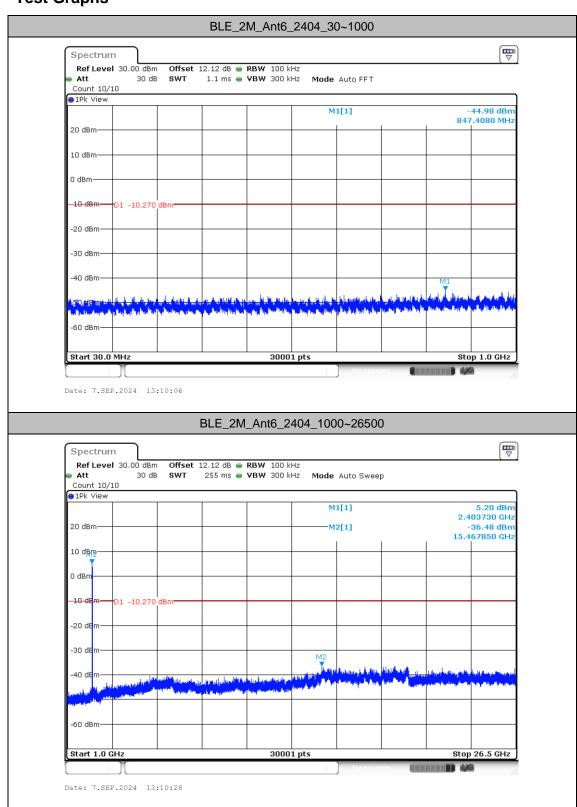
Conducted Spurious Emission

Test Result

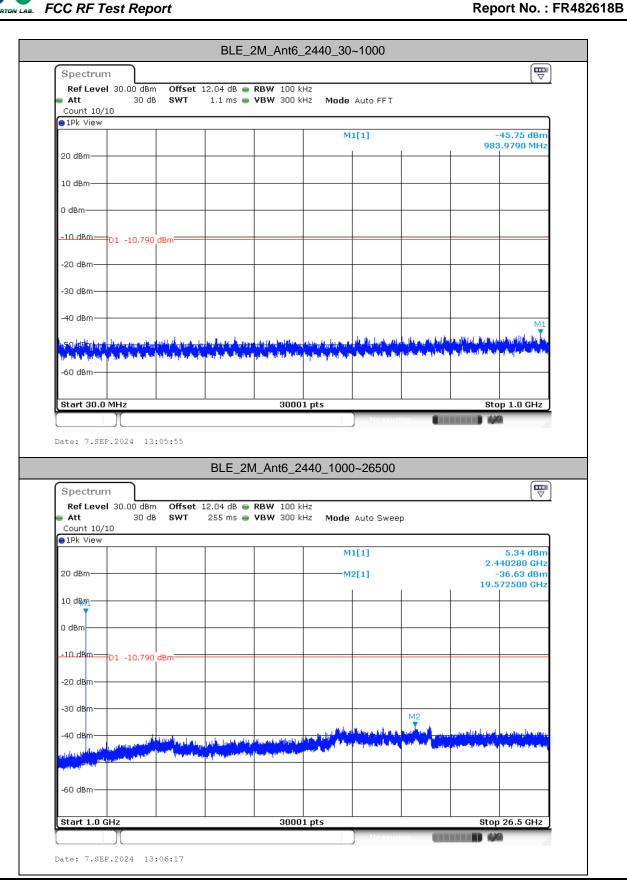
TestMode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm/100KHz]	Result [dBm/100KHz]	Limit [dBm/100KHz]	Verdict
		2404	30~1000	9.73	-44.98	≤-10.27	PASS
		2404	1000~26500	9.73	-36.48	≤-10.27	PASS
DIE OM	Ant6	2440	30~1000	9.21	-45.75	≤-10.79	PASS
BLE_2M	Anto	2440	1000~26500	9.21	-36.63	≤-10.79	PASS
		2478	30~1000	10.39	-45.93	≤-9.61	PASS
			1000~26500	10.39	-36.8	≤-9.61	PASS
		2402	30~1000	6.47	-45.39	≤-13.53	PASS
			1000~26500	6.47	-36.08	≤-13.53	PASS
DI E 105V	Ant6	2440	30~1000	6.38	-45.81	≤-13.62	PASS
BLE_125K	Anto	2440	1000~26500	6.38	-36.48	≤-13.62	PASS
		2490	30~1000	7.19	-46.22	≤-12.81	PASS
		2480	1000~26500	7.19	-35.52	≤-12.81	PASS

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number : A20 of A26

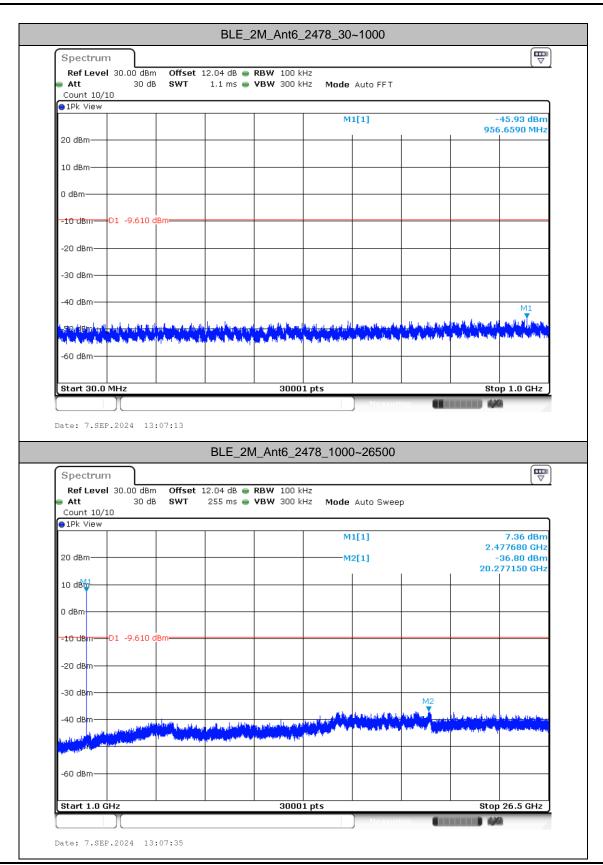
Test Graphs



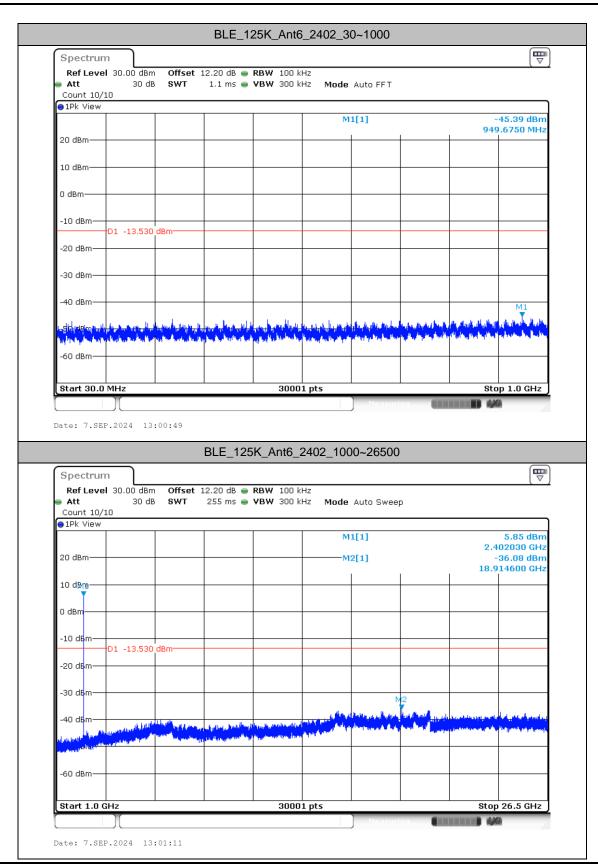
TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9



Page Number : A22 of A26



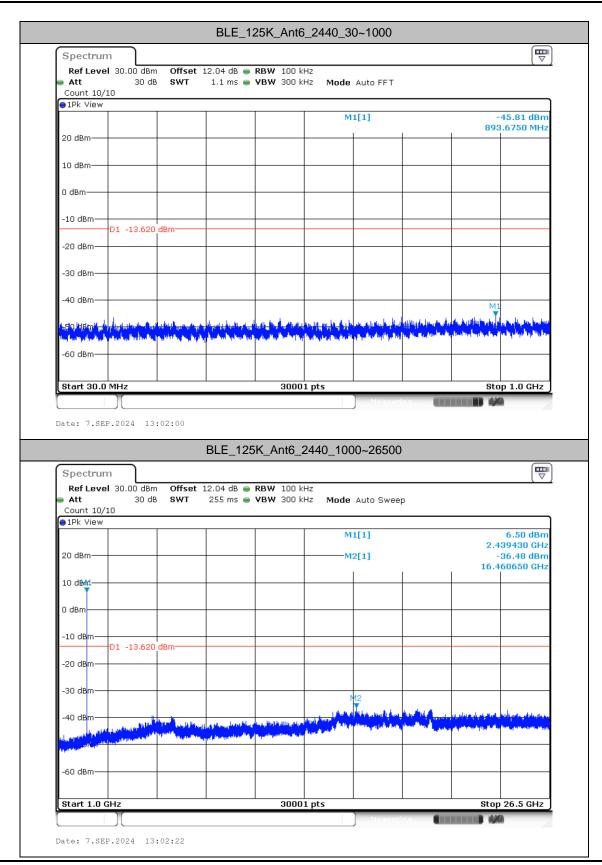
: A23 of A26



Sporton International Inc. (ShenZhen)

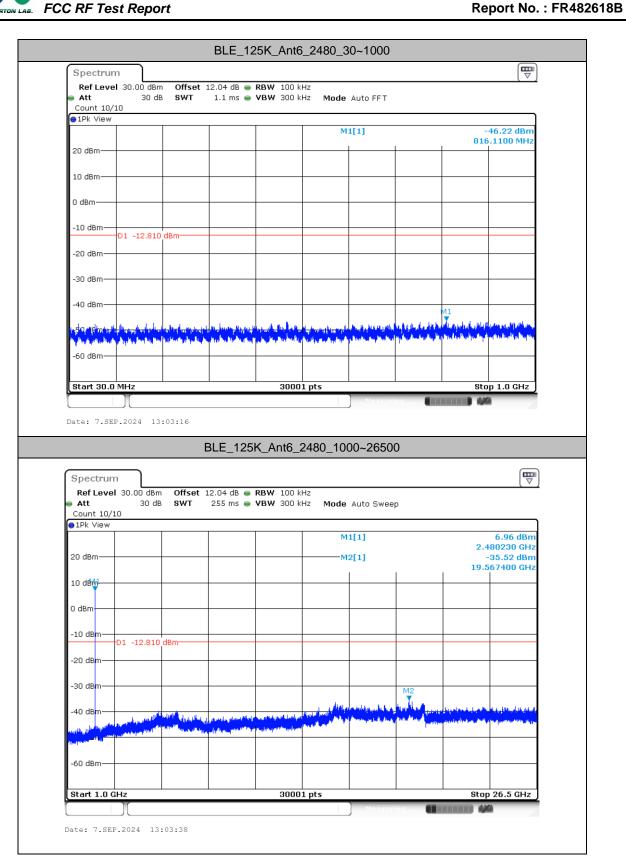
TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number

: A24 of A26



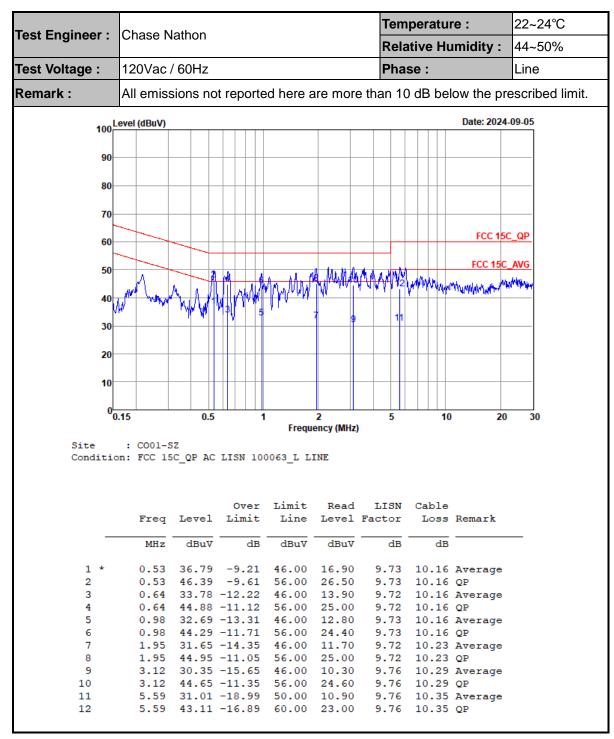
Sporton International Inc. (ShenZhen)

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number : A25 of A26



: A26 of A26

Appendix B. AC Conducted Emission Test Results



TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9

Temperature: 22~24°C Test Engineer: Chase Nathon Relative Humidity: 44~50% Test Voltage: 120Vac / 60Hz Phase: Neutral Remark: All emissions not reported here are more than 10 dB below the prescribed limit. 100 Level (dBuV) Date: 2024-09-05 90 80 70 FCC 15C_QP 60 50 40 30 20 10 0.15 Frequency (MHz) : CO01-SZ Condition: FCC 15C QP AC LISN 100063 N NEUTRAL

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBu∀	dBuV	dB	dB	
1	0.54	30.09	-15.91	46.00	10.20	9.73	10.16	Average
2	0.54	43.09	-12.91	56.00	23.20	9.73	10.16	QP
3	0.65	31.29	-14.71	46.00	11.40	9.73	10.16	Average
4 *	0.65	44.99	-11.01	56.00	25.10	9.73	10.16	QP
5	0.98	30.95	-15.05	46.00	11.10	9.69	10.16	Average
6	0.98	43.45	-12.55	56.00	23.60	9.69	10.16	QP
7	3.14	26.92	-19.08	46.00	6.90	9.73	10.29	Average
8	3.14	43.92	-12.08	56.00	23.90	9.73	10.29	QP
9	4.45	27.75	-18.25	46.00	7.69	9.72	10.34	Average
10	4.45	41.75	-14.25	56.00	21.69	9.72	10.34	QP
11	5.68	31.49	-18.51	50.00	11.40	9.73	10.36	Average
12	5.68	44.39	-15.61	60.00	24.30	9.73	10.36	QP

Note:

- 1. Level($dB\mu V$) = Read Level($dB\mu V$) + LISN Factor(dB) + Cable Loss(dB)
- 2. Over Limit(dB) = Level(dB μ V) Limit Line(dB μ V)

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9

Appendix C. Radiated Spurious Emission Test Data

Test Engineer :	Reid Huang	Relative Humidity :	48~49%	
		Temperature :	24-25°C	

Radiated Spurious Emission Test Modes

Mode	Band (MHz)	Antenna	Modulation	Channel	Frequency	Data Rate	RU	Remark
Mode 1	2400-2483.5	6	Bluetooth-LE	00	2402	125kbps	-	-
Mode 2	2400-2483.5	6	Bluetooth-LE	19	2440	125kbps	-	-
Mode 3	2400-2483.5	6	Bluetooth-LE	39	2480	125kbps	-	-
Mode 4	2400-2483.5	6	Bluetooth-LE	01	2404	2Mbps	-	
Mode 5	2400-2483.5	6	Bluetooth-LE	38	2478	2Mbps	-	-
Mode 6	2400-2483.5	6	Bluetooth-LE	38	2478	2Mbps	-	LF

Summary of each worse mode

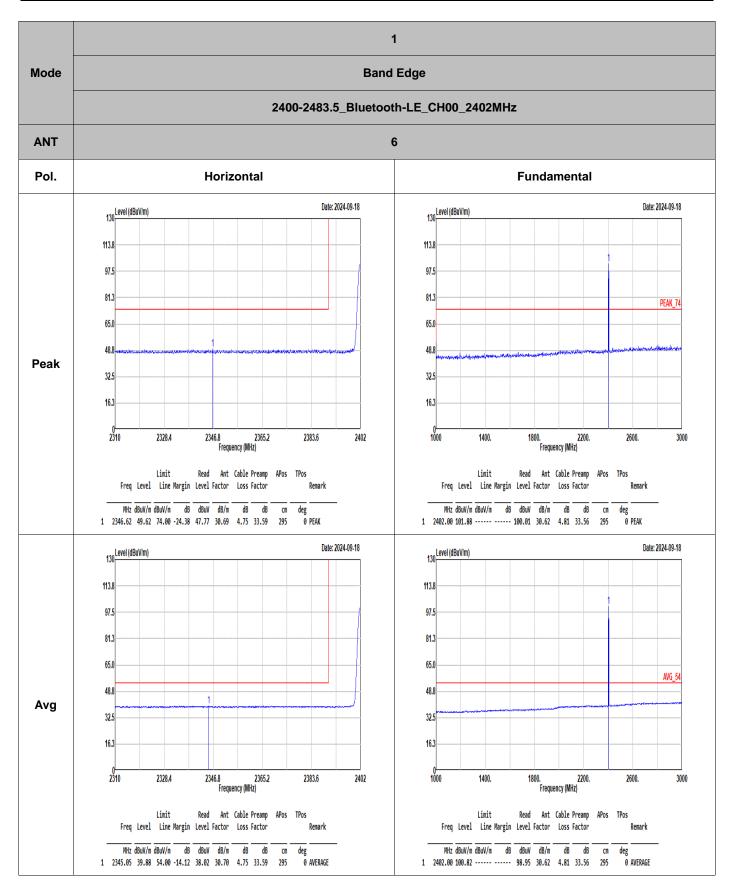
Mode	Modulation	Ch.	Freq. (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol.	Peak Avg.	Result	Remark
1	Bluetooth-LE	00	2345.05	39.88	54.00	-14.12	Н	AVERAGE	Pass	Band Edge
1	Bluetooth-LE	00	4804.00	43.77	74.00	-30.23	V	Peak	Pass	Harmonic
2	Bluetooth-LE	19	-	-	-	-	-	-	-	Band Edge
2	Bluetooth-LE	19	7320.00	44.55	74.00	-29.45	Н	Peak	Pass	Harmonic
3	Bluetooth-LE	39	2483.52	41.34	54.00	-12.66	Н	AVERAGE	Pass	Band Edge
3	Bluetooth-LE	39	4960.00	43.96	74.00	-30.04	V	Peak	Pass	Harmonic
4	Bluetooth-LE	01	2385.20	41.58	54.00	-12.42	V	AVERAGE	Pass	Band Edge
4	Bluetooth-LE	01	-	-	-	-	-	-	-	Harmonic
5	Bluetooth-LE	38	2496.81	42.00	54.00	-12.00	V	AVERAGE	Pass	Band Edge
5	Bluetooth-LE	38	4956.00	43.84	74.00	-30.16	V	Peak	Pass	Harmonic
6	Bluetooth-LE	38	806.97	30.80	46.00	-15.20	V	Peak	Pass	LF

Sporton International Inc. (ShenZhen)

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 Page Number

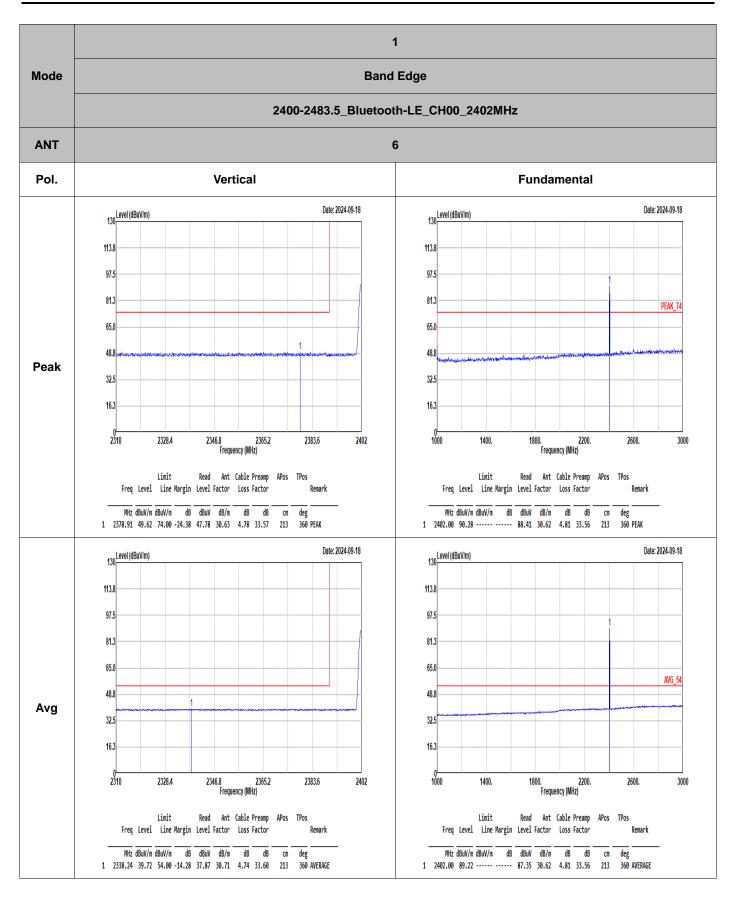
: C1 of C14

Report No.: FR482618B



TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9





1 Mode Harmonic 2400-2483.5_Bluetooth-LE_CH00_2402MHz **ANT** Pol. Horizontal Vertical 140 Level (dBuV/m) 140 Level (dBuV/m) Date: 2024-09-18 Date: 2024-09-18 122.5 122.5 105.0 105.0 87.5 87.5 PEAK_74 70.0 70.0 Peak 52.5 52.5 Avg 35.0 35.0 17.5 17.5 0 3000 3000 9000, 12000. Frequency (MHz) 9000. 12000. Frequency (MHz) 6000. 18000 6000. 18000 Limit Read Ant Cable Preamp APos TPos Limit Read Ant Cable Preamp APos TPos Remark Freq Level Line Margin Level Factor Loss Factor Freq Level Line Margin Level Factor Loss Factor

MHz dBuV/m dBuV/m dB dBuV dB/m dB dB

1 4804.00 40.93 74.00 -33.07 64.18 34.23 7.74 65.22

deg

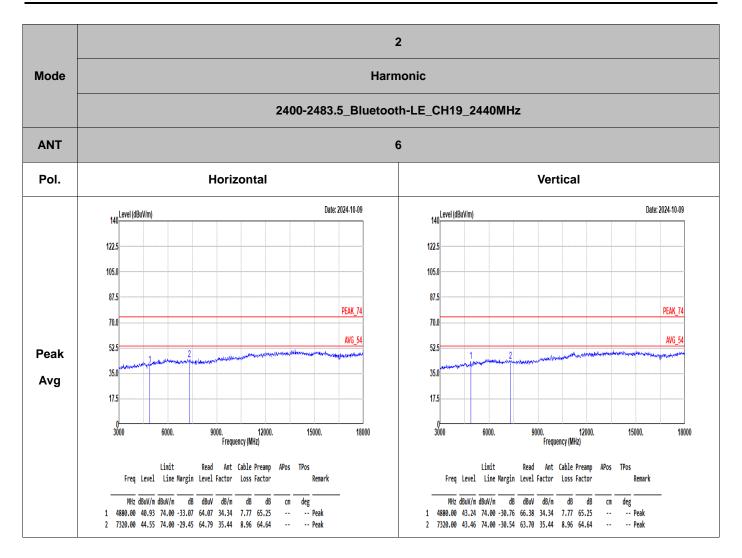
-- Peak

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 MHz dBuV/m dBuV/m

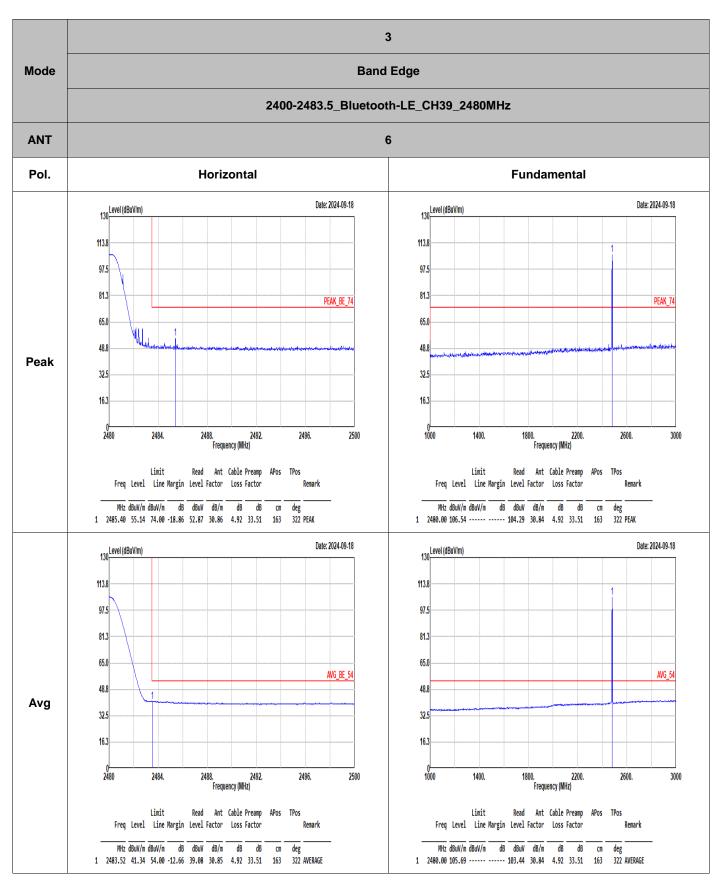
1 4804.00 43.77 74.00 -30.23 67.02 34.23 7.74 65.22

cm deg -- -- Peak

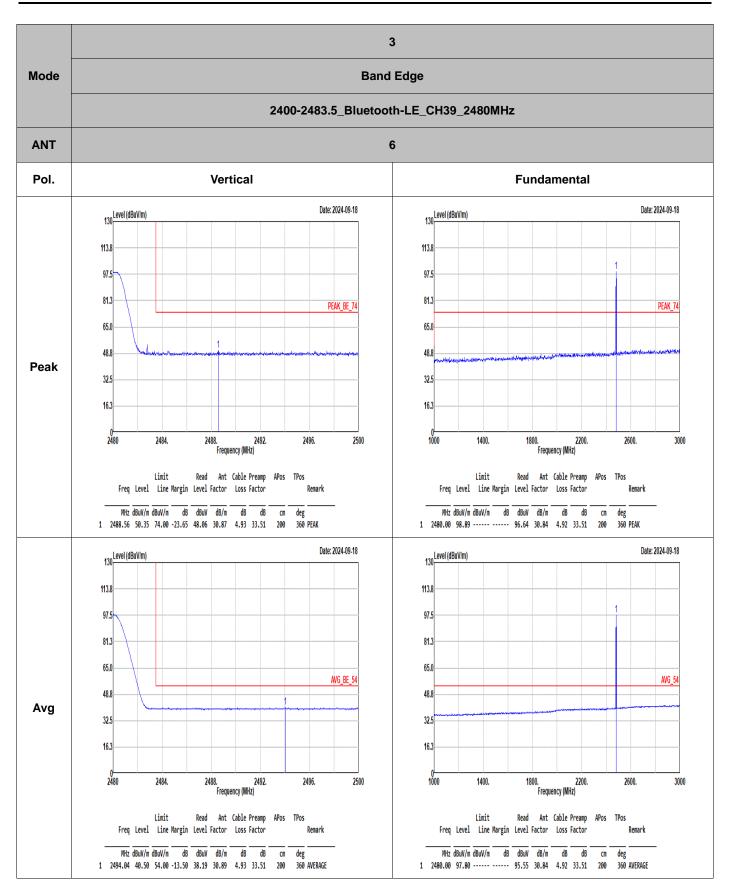
dB dBuV dB/m dB dB







SPORTON LAB. FCC RF Test Report



TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9 : C7 of C14

3 Mode Harmonic 2400-2483.5_Bluetooth-LE_CH39_2480MHz **ANT** Pol. Horizontal Vertical 140 Level (dBuV/m) 140 Level (dBuV/m) Date: 2024-10-09 Date: 2024-10-09 122.5 122.5 105.0 105.0 87.5 87.5 PEAK_74 PEAK_74 70.0 70.0 Peak 35.0 Avg 17.5 17.5 3000 3000 9000. 12000. Frequency (MHz) 6000. 9000. 12000. Frequency (MHz) 15000. 6000. 15000. 18000 18000 Limit Read Ant Cable Preamp APos TPos Limit Read Ant Cable Preamp APos TPos Freq Level Line Margin Level Factor Loss Factor Freq Level Line Margin Level Factor Loss Factor deg deg -- Peak MHz dBuV/m dBuV/m dB dBuV dB/m MHz dBuV/m dBuV/m dB dBuV dB/m dB CM CM

-- Peak

-- Peak

1 4960.00 42.20 74.00 -31.80 65.23 34.45 7.81 65.29

2 7440.00 42.85 74.00 -31.15 62.79 35.41 9.19 64.54

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9

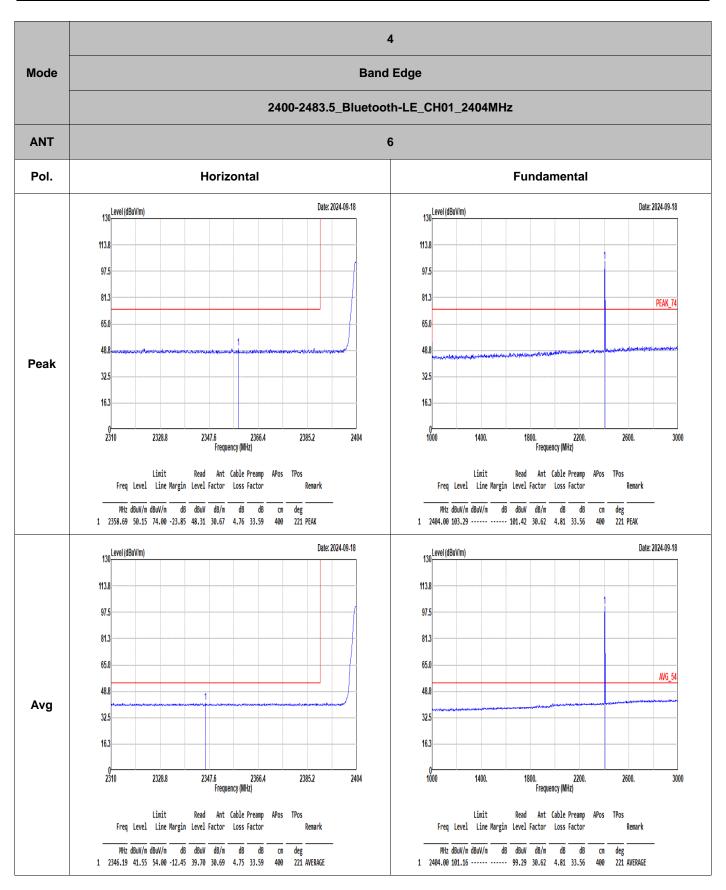
1 4960.00 43.96 74.00 -30.04 66.99 34.45 7.81 65.29

2 7440.00 43.83 74.00 -30.17 63.77 35.41 9.19 64.54

: C8 of C14

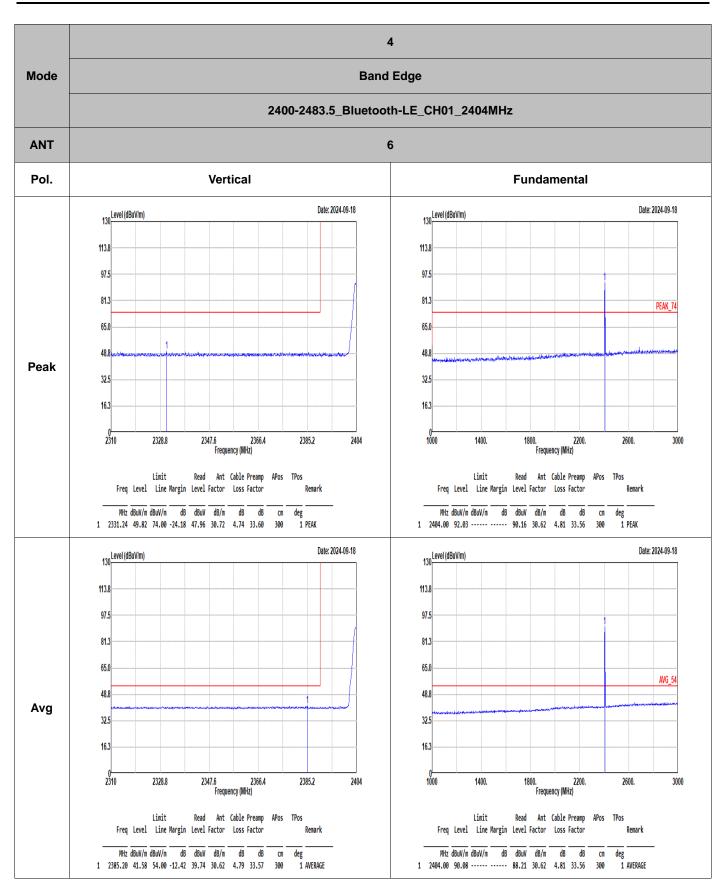
-- Peak

SPORTON LAB. FCC RF Test Report



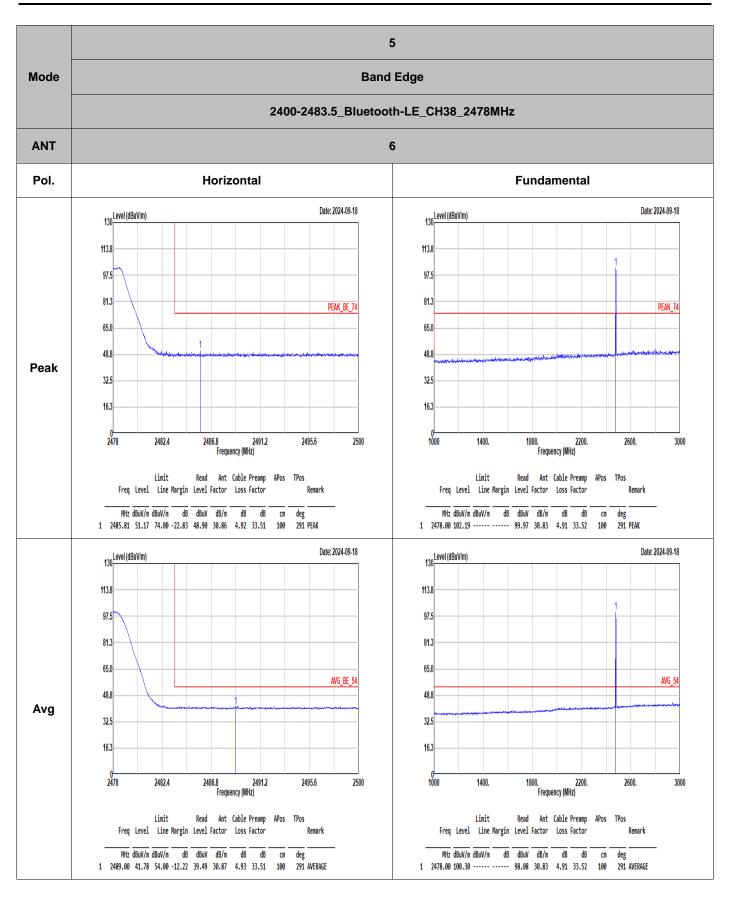
TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9

SPORTON LAB. FCC RF Test Report

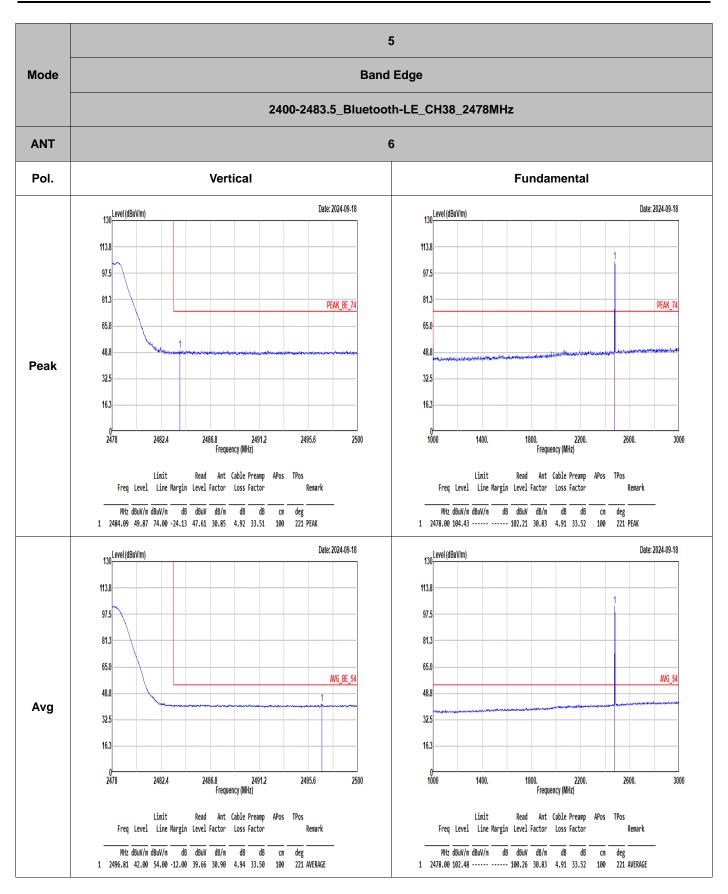


TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9





SPORTON LAB. FCC RF Test Report



TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9

7600.

Limit

Freq Level Line Margin Level Factor Loss Factor

MHz dBuV/m dBuV/m dB dBuV dB/m dB dB

1 4956.00 41.98 74.00 -32.02 65.02 34.44 7.80 65.28

2 7434.00 42.63 74.00 -31.37 62.58 35.41 9.19 64.55

Frequency (MHz)

Read Ant Cable Preamp APos TPos

5 Mode Harmonic 2400-2483.5_Bluetooth-LE_CH38_2478MHz **ANT** Pol. Horizontal Vertical 140 Level (dBuV/m) Date: 2024-09-19 140 Level (dBuV/m) Date: 2024-09-19 122.5 122.5 105.0 87.5 87.5 PEAK_74 PEAK_74 70.0 Peak 35.0 Avg 17.5 17.5 3000 3000

26000

21400.

Remark

-- Peak

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9

21400.

Remark

-- Peak

Frequency (MHz)

Limit

MHz dBuV/m dBuV/m

Freq Level Line Margin Level Factor Loss Factor

1 4956.00 43.84 74.00 -30.16 66.88 34.44 7.80 65.28

2 7434.00 43.71 74.00 -30.29 63.66 35.41 9.19 64.55

dB dBuV dB/m

Read Ant Cable Preamp APos TPos

dB

26000



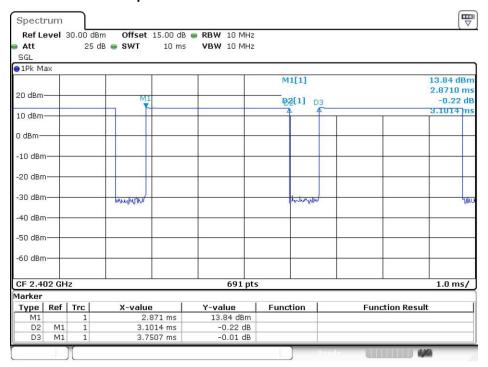
6 LF Mode 2400-2483.5_Bluetooth-LE_CH38_2478MHz **ANT** Pol. Horizontal Vertical Date: 2024-09-13 Date: 2024-09-13 80 Level (dBuV/m) 80 Level (dBuV/m) FCC CLASS-B FCC CLASS-B 70.0 70.0 60.0 60.0 50.0 50.0 40.0 40.0 30.0 30.0 Peak 20.0 224. 418. 612. Frequency (MHz) 224. 418. 612. Frequency (MHz) Limit Read Ant Cable Preamp APos TPos Limit Read Ant Cable Preamp APos TPos Freq Level Line Margin Level Factor Loss Factor Freq Level Line Margin Level Factor Loss Factor deg -- Peak MHz dBuV/m dBuV/m dB dBuV dB/m MHz dBuV/m dBuV/m dB dBuV dB/m deg -- Peak CM 51.34 17.58 40.00 -22.42 32.24 19.58 0.73 34.97 64.92 24.63 40.00 -15.37 40.66 17.95 0.82 34.80 153.19 21.80 43.50 -21.70 36.41 18.80 1.29 34.70 177.44 19.40 43.50 -24.10 35.35 17.34 1.41 34.70 152.22 21.77 43.50 -21.73 36.32 18.86 176.47 21.01 43.50 -22.49 36.91 17.40 1.29 34.70 1.40 34.70 -- Peak -- Peak -- Peak -- Peak 322.94 20.75 46.00 -25.25 33.86 19.63 1.86 34.60 362.71 22.12 46.00 -23.88 34.20 20.52 1.98 34.58 -- Peak 540.22 23.89 46.00 -22.11 31.90 24.03 2.46 34.50 801.15 29.17 46.00 -16.83 32.58 27.86 3.03 34.30 -- Peak -- Peak 536.34 24.64 46.00 -21.36 32.73 23.96 2.45 34.50 806.97 30.80 46.00 -15.20 34.09 27.97 3.04 34.30 -- Peak -- Peak

TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9

Appendix D. Duty Cycle Plots

Band	Duty Cycle(%)	Duty Cycle(%) T(ms)		VBW Setting
Bluetooth LE 125Kbps	82.69	0.310	3.224	10KHZ
Bluetooth LE 2Mbps	31.34	0.197	5.074	10KHZ

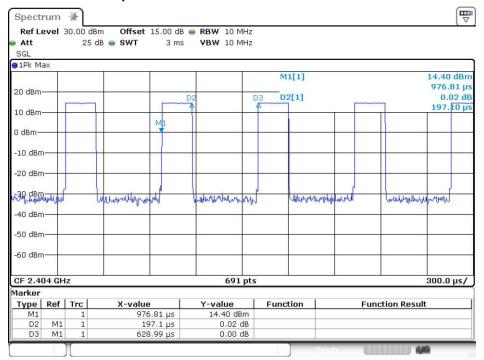
Bluetooth LE 125Kbps



TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9



Bluetooth LE 2Mbps



TEL: +86-755-8637-9589 FAX: +86-755-8637-9595 FCC ID: IHDT56AT9