

# **TEST REPORT**

#### **FCC PART 15.247**

Report Reference No.: CTL2503262194-WF01

Compiled by: (position+printed name+signature)

Happy Guo (File administrators)

Tested by: ( position+printed name+signature)

Yapeng Jin (Test Engineer)

Approved by: ( position+printed name+signature)

Ivan Xie (Manager)



Product Name...... Vehicle fault tester

Model/Type reference..... FX6000

List Model(s) FX6100 · DS300 lite · DS310 lite

Trade Mark..... Ancel

FCC ID...... 2ASC7FX6X00

Applicant's name...... OBDSPACE TECHNOLOGY CO, LTD

Shenzhen City, China

Test Firm...... Shenzhen CTL Testing Technology Co., Ltd.

Address of Test Firm...... Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road,

Nanshan District, Shenzhen, China 518055

Test specification....:

Standard...... FCC Part 15.247: Operation within the bands 902-928 MHz,

2400-2483.5 MHz and 5725-5850 MHz.

TRF Originator...... Shenzhen CTL Testing Technology Co., Ltd.

Master TRF...... Dated 2011-01

Date of receipt of test item..........: Mar 28, 2025

**Date of Test Date**...... Mar 31, 2025 - Apr. 21, 2025

Date of Issue...... Apr. 25, 2025

Result Pass

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# **TEST REPORT**

Test Report No. : CTL2503262194-WF01	Apr. 25, 2025 Date of issue
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Equipment under Test : Vehicle fault tester

Sample No : CTL2503262194

Model /Type : FX6000

Listed Models : FX6100, DS300 lite, DS310 lite

Applicant : OBDSPACE TECHNOLOGY CO,.LTD

Address : Room D03, Building A, No.973, MinZhi Avenue LongHua

district, Shenzhen City, China

Manufacturer : OBDSPACE TECHNOLOGY CO,.LTD

Address : Room D03, Building A, No.973, MinZhi Avenue LongHua

district, Shenzhen City, China

Test result	Pass *
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<sup>\*</sup>In the configuration tested, the EUT complied with the standards specified page 5.

The test results presented in this report relate only to the object tested.

This report shall not be reproduced, except in full, without the written approval of the issuing testing laboratory.

# \*\* Modified History \*\*

Revisions	Description	Issued Data	Report No.	Remark
Version 1.0	Initial Test Report Release	2025-04-25	CTL2503262194-WF01	Tracy Qi
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## 1. SUMMARY

## 1.1. TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

ANSI C63.10: 2013: American National Standard for Testing Unlicensed Wireless Devices

KDB 558074 D01 v05r02: KDB558074 D01 15.247 Meas Guidance v05r02

## 1.2. Test Description

FCC PART 15.247		
FCC Part 15.207	AC Power Conducted Emission	PASS
FCC Part 15.247(a)(1)(i)	20dB Bandwidth	PASS
FCC Part 15.247(d)	Spurious RF Conducted Emission	PASS
FCC Part 15.247(b)	Maximum Peak Output Power	PASS
FCC Part 15.247(a)	Pseudorandom Frequency Hopping Sequence	PASS
FCC Part 15.247(a)(1)(iii)	Number of hopping frequency& Time of Occupancy	PASS
FCC Part 15.247(a)(1)	Frequency Separation	PASS
FCC Part 15.205/15.209	Radiated Emissions	PASS
FCC Part 15.247(d)	Band Edge Compliance of RF Emission	PASS
FCC Part 15.203/15.247 (b)	Antenna Requirement	PASS

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### 1.3. Test Facility

#### 1.3.1 Address of the test laboratory

Shenzhen CTL Testing Technology Co.,Ltd.

Zone A, 1st Floor, Warehouse 2, Baisha Logistics Company, No. 3011 Shahe West Road, Nanshan District, Shenzhen

There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.10 and CISPR 32/EN 55032 requirements.

#### 1.3.2 Laboratory accreditation

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

CNAS-Lab Code: L7497

Shenzhen CTL Testing Technology Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

#### A2LA-Lab Cert. No. 4343.01

Shenzhen CTL Testing Technology Co., Ltd, EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

IC Registration No.: 9618B

**CAB identifier: CN0041** 

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements with Registration No.: 9618B on Jan. 22, 2019.

FCC-Registration No.: 399832

**Designation No.: CN1216** 

Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 399832, December 08, 2017.

## 1.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods — Part 4: Uncertainty in EMC Measurements" and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CTL laboratory is reported:

Test	Measurement Uncertainty	Notes
Transmitter power Radiated	±2.20 dB	(1)
Radiated Emission9KHz~30MHz	±3.66dB	(1)
Radiated Emission 30~1000MHz	±4.10dB	(1)
Radiated Emission Above 1GHz	±4.32dB	(1)
20dB Emission Bandwidth	±1.9%	(1)
Carrier Frequency Separation	±1.9%	(1)

Maximum Power Spectral Density Level	±0.98 dB	(1)
Number of Hopping Channel	±1.9%	(1)
Time of Occupancy	±0.11%	(1)
Max Peak Conducted Output Power	±0.98 dB	(1)
Band-edge Spurious Emission	±1.21dB	(1)
	9kHz-7GHz:±1.09dB	
Conducted RF Spurious Emission	7GHz-26.5GHz: ±	(1)
	3.27dB	

<sup>(1)</sup> This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

## 1.5. Auxiliary test equipment information

Manufacturer	Description	Model	Serial Number
Huawei	SuperCharge	HW-100225C00	HC78E2N4121901

## 2. GENERAL INFORMATION

## 2.1. Environmental conditions

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

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

## 2.2. General Description of EUT

Product Name:	Vehicle fault tester	
Model/Type reference:	FX6000	
Power supply:	DC 3.8V from battery	
Working voltage:	DC 9-18V	
Bluetooth:		
Version:	Supported BR/EDR	
Modulation:	GFSK, π/4DQPSK, 8DPSK	
Operation frequency:	2402MHz to 2480MHz	
Channel number:	79	
Channel separation:	1MHz	
Antenna type:	FPC Antenna	
Antenna gain:	2.75dBi	

Note1: For more details, please refer to the user's manual of the EUT.

Note2: Antenna gain provided by the applicant.

## 2.3. Description of Test Modes and Test Frequency

The Applicant provides communication tools software to control the EUT for staying in continuous transmitting (Duty Cycle more than 98%) and receiving mode for testing .There are 79 channels provided to the EUT and Channel 00/39/78 were selected to test.

#### **Operation Frequency:**

Channel	Frequency (MHz)
00	2402
01	2403
1 22	2.7
38	2440
39	2441
40	2442
The state of the s	
77	2479
78	2480

Preliminary tests were performed in each mode and packet length of BT, and found worst case as bellow, finally test were conducted at those mode and recorded in this report.

Test Items	Worst case
Conducted Emissions	DH5 Middle channel
Radiated Emissions and Band Edge	DH5
Maximum Conducted Output Power	DH5/2DH5/3DH5
20dB Bandwidth	DH5/2DH5/3DH5
Frequency Separation	DH5/2DH5/3DH5 Middle channel
Number of hopping frequency	DH5/2DH5/3DH5
Time of Occupancy (Dwell Time)	DH1/DH3/DH5 Middle channel 2DH1/2DH3/2DH5 Middle channel 3DH1/3DH3/3DH5 Middle channel
Out-of-band Emissions	DH5/2DH5/3DH5

# 2.4. Equipments Used during the Test

Condu	cted Emission		- 6 1	F Green				
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due		
EMI	Test Receiver	ROHDE & SCHWARZ	ESCI	1166.5950.03	2024/04/30	2025/04/29		
	LISN	R&S	ESH2-Z5	860014/010 2024/04/30 2025/				
	Limitator ROHD SCHW		ESH3-Z2	100408	2024/04/30	2025/04/29		
Softwa	re:	18 1			-45	1		
	Name of	Software:		Version:				
	ES	S-K1			V1.71			

Band Edge					
Manufacturer	Model N	o. Se	rial No.	Calibration Date	Calibration Due Date
Da Ze	ZN30900	)A	1	2024/04/30	2025/04/29
Schwarzbeck	VULB 9168	824		2023/02/13	2026/02/12
Sunol Sciences Corp.	DRH-11	8 AC	062013	2024/11/25	2027/11/24
Ocean Microwave	OBH100 00	269	999002	2024/12/21	2027/12/20
Agilent	8449B	3008	BA02306	2024/04/30	2025/04/29
Brief&Smart	LNA-401	8 21	04197	2024/05/03	2025/05/02
R&S	ESCI	1166	5.5950.03	2024/04/30	2025/04/29
Keysight	N9020A	A MY5	3420874	2024/05/01	2025/04/30
		,		8 B	
Name of Software				Version	
EZ_EMC(Below 1GHz)				V1.1.4.2	
ve 1GHz)				V1.1.4.2	
	Manufacturer Da Ze Schwarzbeck Sunol Sciences Corp. Ocean Microwave Agilent Brief&Smart R&S Keysight  oftware ow 1GHz)	Manufacturer Model N  Da Ze ZN30900  Schwarzbeck VULB 9168  Sunol Sciences Corp.  Ocean Microwave 00  Agilent 8449B  Brief&Smart LNA-401  R&S ESCI  Keysight N9020A	Manufacturer         Model No.         Se           Da Ze         ZN30900A         VULB           Schwarzbeck         VULB         9168           Sunol         DRH-118         A0           Sciences         DRH-118         A0           Corp.         OBH1004         26           Microwave         00         26           Agilent         8449B         3008           Brief&Smart         LNA-4018         21           R&S         ESCI         1166           Keysight         N9020A         MY5           oftware         Ow 1GHz)         10	Manufacturer         Model No.         Serial No.           Da Ze         ZN30900A         /           Schwarzbeck         VULB 9168         824           Sunol Sciences Corp.         DRH-118         A062013           Ocean Microwave         OBH1004 00         26999002           Agilent         8449B         3008A02306           Brief&Smart         LNA-4018         2104197           R&S         ESCI         1166.5950.03           Keysight         N9020A         MY53420874	Manufacturer         Model No.         Serial No.         Calibration Date           Da Ze         ZN30900A         /         2024/04/30           Schwarzbeck         VULB 9168         824         2023/02/13           Sunol Sciences Corp.         DRH-118         A062013         2024/11/25           Ocean Microwave         OBH1004 00         26999002         2024/12/21           Agilent         8449B         3008A02306         2024/04/30           Brief&Smart         LNA-4018         2104197         2024/05/03           R&S         ESCI         1166.5950.03         2024/04/30           Keysight         N9020A         MY53420874         2024/05/01   Oftware  Version  V1.1.4.2

Maximum Peak Output Po				uency Separatior	n & Number of	hopping		
Test Equipment	Manufacturer	Mode	l No.	Serial No.	Calibration Date	Calibration Due Date		
Spectrum Analyzer	Keysight	N90	20A	MY53420874	2024/05/01	2025/04/30		
Temperature/Humidity Meter	Ji Yu	MC501		1	2024/05/04	2025/05/03		
Test Software								
Name of Software Version								
TST-PA	SS			,	V2.0	9.		

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## 2.5. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

## 2.6. Modifications

No modifications were implemented to meet testing criteria.

#### 3. TEST CONDITIONS AND RESULTS

#### 3.1. Conducted Emissions Test

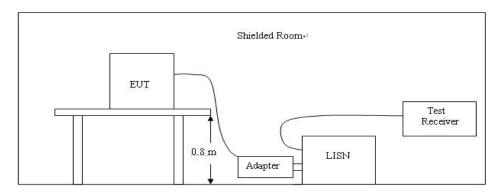
#### **LIMIT**

FCC CFR Title 47 Part 15 Subpart C Section 15.207

Fraguency range (MHz)	Limit (d	dBuV)
Frequency range (MHz)	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

<sup>\*</sup> Decreases with the logarithm of the frequency.

#### **TEST CONFIGURATION**



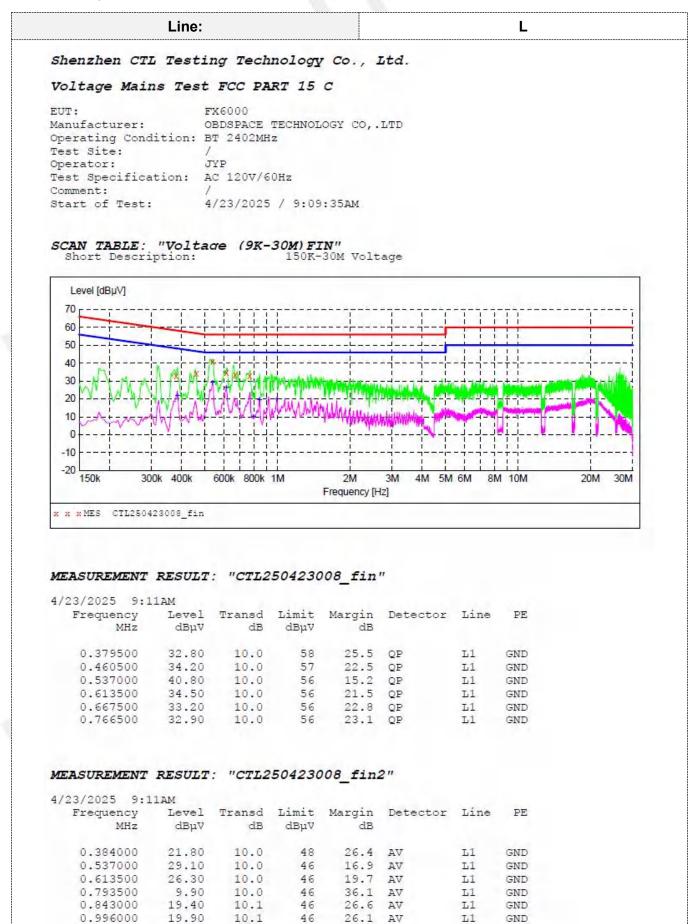
#### **TEST PROCEDURE**

- 1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10:2013.
- 2. Support equipment, if needed, was placed as per ANSI C63.10:2013.
- 3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10:2013.
- 4. The adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5. All support equipments received AC power from a second LISN, if any.
- 6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
- 8. During the above scans, the emissions were maximized by cable manipulation.

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#### **TEST RESULTS**

Remark: All modes of GFSK and Pi/4 DQPSK and 8DPSK were test at Low, Middle, and High channel; only the worst result of GFSK Low Channel was reported as below:



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Line: N

#### Shenzhen CTL Testing Technology Co., Ltd.

#### Voltage Mains Test FCC PART 15 C

EUT: FX6000

Manufacturer: OBDSPACE TECHNOLOGY CO, .LTD

Operating Condition: BT 2402MHz

Test Site: JYP Operator:

Test Specification: AC 120V/60Hz

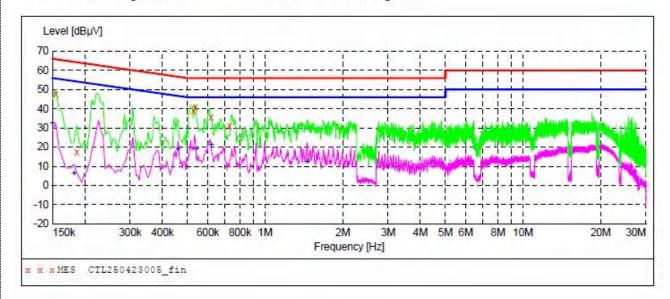
Comment:

Start of Test:

4/23/2025 / 9:01:28AM

#### SCAN TABLE: "Voltage (9K-30M) FIN"

Short Description: 150K-30M Voltage



#### MEASUREMENT RESULT: "CTL250423005 fin"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.154500	47.90	10.0	66	17.9	QP	N	GND
0.186000	17.50	10.0	64	46.7	QP	N	GND
0.528000	38.80	10.0	56	17.2	QP	N	GND
0.537000	40.70	10.0	56	15.3	QP	N	GND
0.618000	35.70	10.0	56	20.3	QP	N	GND
0.726000	30.90	10.0	56	25.1	QP	N	GND

#### MEASUREMENT RESULT: "CTL250423005 fin2"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	32.20	10.0	56	23.8	AV	N	GND
0.181500	6.40	10.0	54	48.0	AV	N	GND
0.460500	18.80	10.0	47	27.9	AV	N	GND
0.541500	18.80	10.0	46	27.2	AV	N	GND
0.618000	21.40	10.0	46	24.6	AV	N	GND
1.455000	12.50	10.1	46	33.5	AV	N	GND

## 3.2. Radiated Emissions and Band Edge

#### **Limit**

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission out of authorized band shall not exceed the following table at a 3 meters measurement distance.

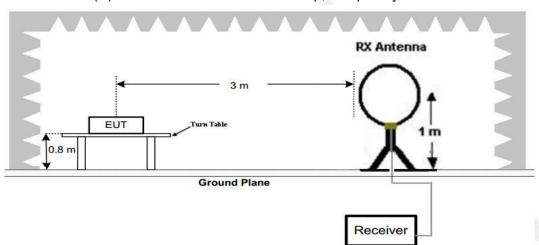
In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Radiated emission limits

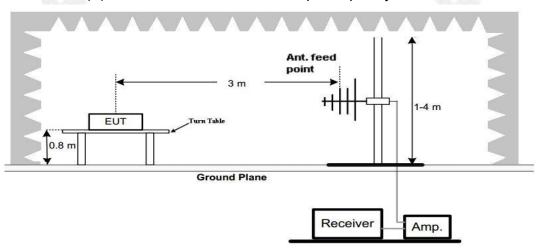
Frequency (MHz)	Distance (Meters)	Radiated (dBµV/m)	Radiated (µV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(30/3)	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

#### **TEST CONFIGURATION**

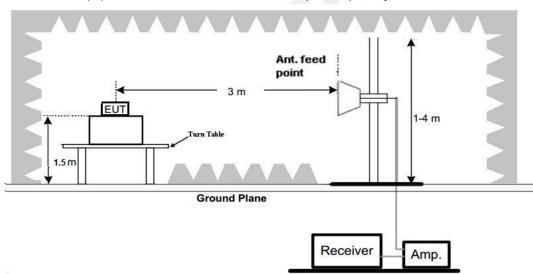
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



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#### (C) Radiated Emission Test Set-Up, Frequency above 1000MHz

#### **Test Procedure**

- Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane, and above 1GHz measurement EUT was placed on a low permittivity and low loss tangent turn table which is 1.5m above ground plane.
- Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0°C to 360°C to acquire the highest emissions from EUT
- 3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 4. Repeat above procedures until all frequency measurements have been completed.
- 5. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement –X, Y, and Z-plane. The X-plane results were found as the worst case and were shown in this report.

#### **TEST RESULTS**

#### Remark:

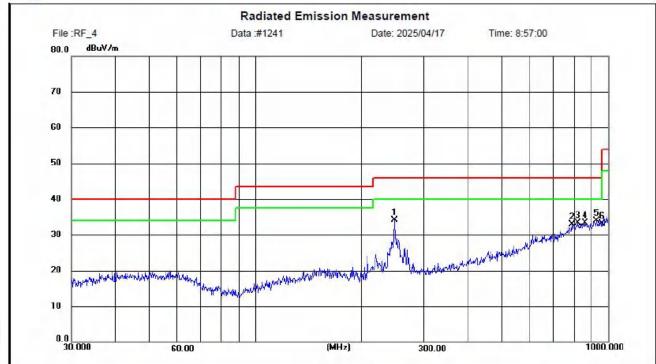
- We measured Radiated Emission at GFSK and π/4 DQPSK mode from 9 KHz to 25GHz and recorded worst case at GFSK DH5 mode..
- 2. For below 1GHz testing recorded worst at GFSK DH5 low channel.
- Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, Found the
  emission level are attenuated 20dB below the limits from 9 kHz to 30MHz, so it does not recorded
  in report.

#### For 30MHz-1GHz

#### Horizontal



Shenzhen CTL Testing Technology Co., Ltd Tel: +86-755-89486194



Site LAB Chamber 2

Limit: FCC Part15 RE-Class C\_30-1000MHz

EUT:

M/N: FX6000

Mode: BT 2402MHz

Note: OBDSPACE TECHNOLOGY CO,.LTD

Polarization: Horizontal Temperature: 25(C)
Power: Humidity: 50 %

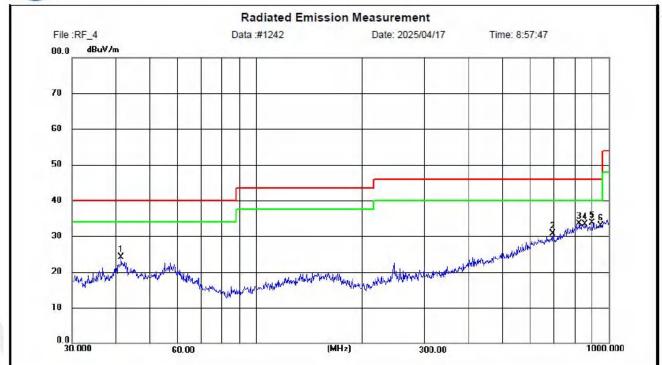
Distance: 3m

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	248.0077	20.86	13.22	34.08	46.00	11.92	peak	100	350	Р	
2	788.5422	7.55	25.39	32.94	46.00	13.06	peak	100	191	Р	
3	819.1930	7.29	25.97	33.26	46.00	12.74	peak	100	0	Р	
4	861.1668	6.84	26.37	33.21	46.00	12.79	peak	100	191	Р	
5	925.7562	7.09	26.90	33.99	46.00	12.01	peak	100	350	Р	
6	960.8980	5.81	27.23	33.04	54.00	20.96	peak	100	15	Р	

#### Vertical



Shenzhen CTL Testing Technology Co., Ltd Tel: +86-755-89486194



Site LAB Chamber 2

Limit: FCC Part15 RE-Class C\_30-1000MHz

EUT:

M/N: FX6000 Mode: BT 2402MHz

Note: OBDSPACE TECHNOLOGY CO,.LTD

Polarization: Vertical

Power:

Distance: 3m

Temperature: 25(C)

Humidity: 50 %

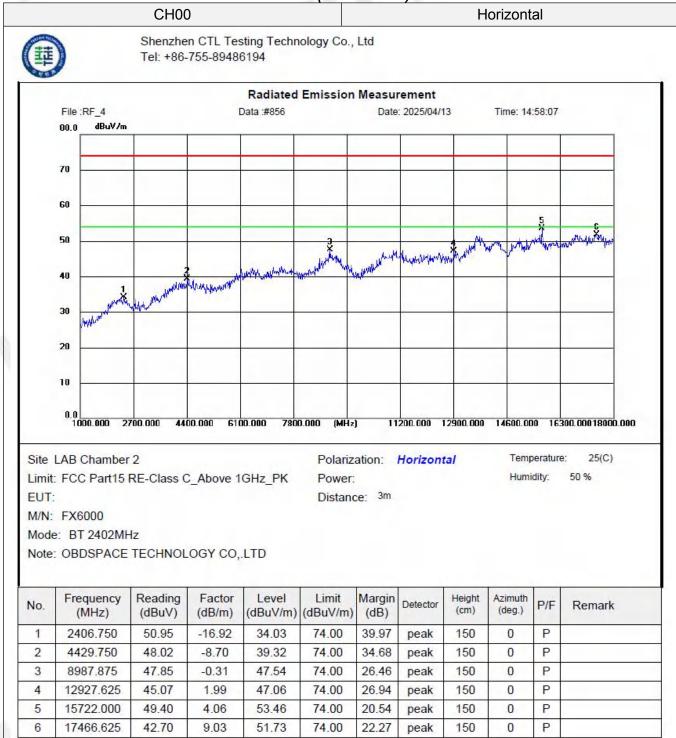
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	41.3308	9.85	14.26	24.11	40.00	15.89	peak	100	10	Р	
2	693.8089	8.00	22.75	30.75	46.00	15.25	peak	100	74	Р	
3	824.9583	7.53	25.88	33.41	46.00	12.59	peak	100	204	Р	
4	855.1485	6.96	26.34	33.30	46.00	12.70	peak	100	268	Р	
5	896.9965	7.27	26.49	33.76	46.00	12.24	peak	100	10	Р	
6	949.5931	5.84	27.11	32.95	46.00	13.05	peak	100	155	Р	

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#### For 1GHz to 25GHz

Note: GFSK and Pi/4 DQPSK and 8DPSK all have been tested, only worse case GFSK is reported.

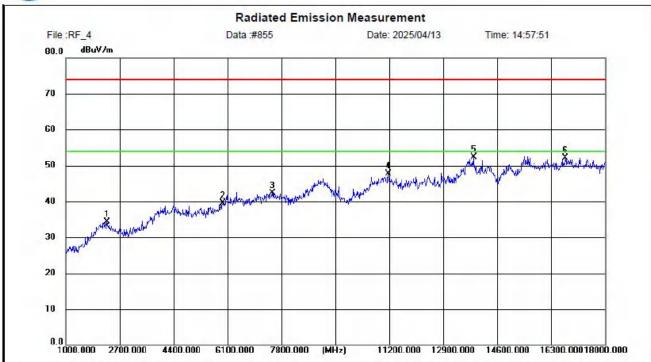
GFSK (above 1GHz)



CH00 Vertical



Shenzhen CTL Testing Technology Co., Ltd Tel: +86-755-89486194



Site LAB Chamber 2 Polarization: Vertical Temperature: 25(C)

Limit: FCC Part15 RE-Class C\_Above 1GHz\_PK Power: Humidity: 50 %

EUT: Distance: 3m

M/N: FX6000 Mode: BT 2402MHz

Note: OBDSPACE TECHNOLOGY CO, LTD

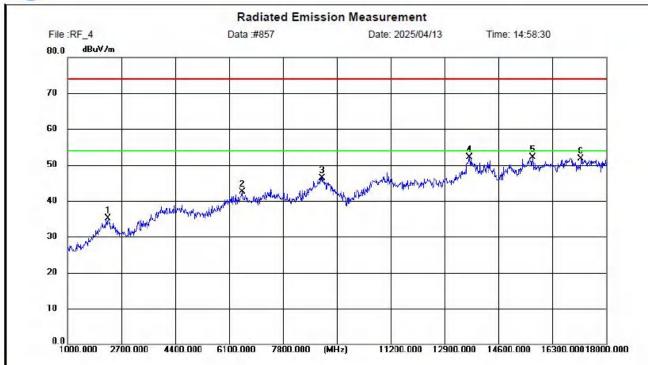
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2309.000	51.56	-17.21	34.35	74.00	39.65	peak	150	0	Р	
2	5953.375	45.25	-5.80	39.45	74.00	34.55	peak	150	0	Р	
3	7523.750	45.00	-2.73	42.27	74.00	31.73	peak	150	0	Р	
4	11176.625	46.86	0.83	47.69	74.00	26.31	peak	150	0	Р	
5	13856.250	48.49	3.76	52.25	74.00	21.75	peak	150	0	Р	
6	16752.625	45.49	6.53	52.02	74.00	21.98	peak	150	0	Р	

50 %

CH39 Horizontal



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Site LAB Chamber 2 Polarization: Horizontal Temperature: 25(C) Humidity:

Power:

EUT: Distance: 3m

M/N: FX6000 Mode: BT 2441MHz

Note: OBDSPACE TECHNOLOGY CO, LTD

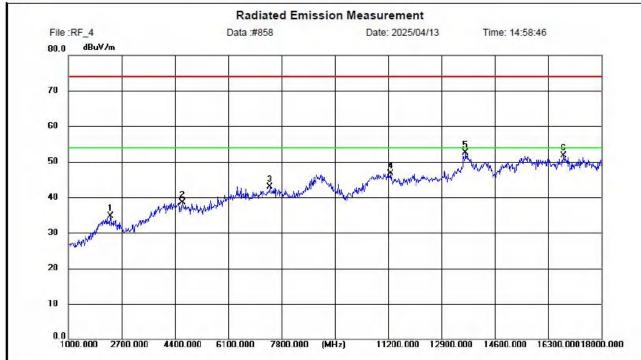
Limit: FCC Part15 RE-Class C\_Above 1GHz\_PK

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	CONTRACTOR OF THE PARTY OF THE	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2285.625	52.34	-17.28	35.06	74.00	38.94	peak	150	0	Р	
2	6516.500	46.83	-4.28	42.55	74.00	31.45	peak	150	0	Р	
3	9047.375	46.58	-0.24	46.34	74.00	27.66	peak	150	0	Р	
4	13682.000	48.15	3.91	52.06	74.00	21.94	peak	150	0	Р	
5	15685.875	48.00	4.01	52.01	74.00	21.99	peak	150	0	Р	
6	17190.375	44.14	7.61	51.75	74.00	22.25	peak	150	0	Р	

CH39 Vertical



Shenzhen CTL Testing Technology Co., Ltd Tel: +86-755-89486194



Site LAB Chamber 2 Polarization: Vertical Temperature: 25(C)
Limit: FCC Part15 RE-Class C\_Above 1GHz\_PK Power: Humidity: 50 %

EUT: Distance: 3m

M/N: FX6000 Mode: BT 2441MHz

Note: OBDSPACE TECHNOLOGY CO,.LTD

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2351.500	51.74	-17.12	34.62	74.00	39.38	peak	150	0	Р	
2	4646.500	46.73	-8.25	38.48	74.00	35.52	peak	150	0	Р	
3	7432.375	45.66	-2.80	42.86	74.00	31.14	peak	150	0	Р	
4	11297.750	45.80	0.81	46.61	74.00	27.39	peak	150	0	Р	
5	13673.500	48.67	3.92	52.59	74.00	21.41	peak	150	0	Р	
6	16799.375	45.15	6.58	51.73	74.00	22.27	peak	150	0	Р	

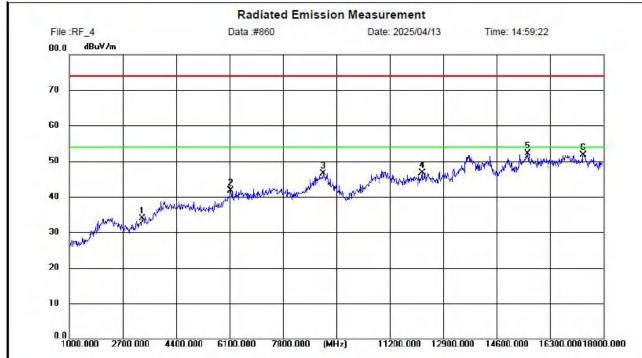
Temperature:

25(C)

**CH78** Horizontal



Shenzhen CTL Testing Technology Co., Ltd Tel: +86-755-89486194



Site LAB Chamber 2 Polarization: Horizontal Limit: FCC Part15 RE-Class C\_Above 1GHz\_PK Humidity:

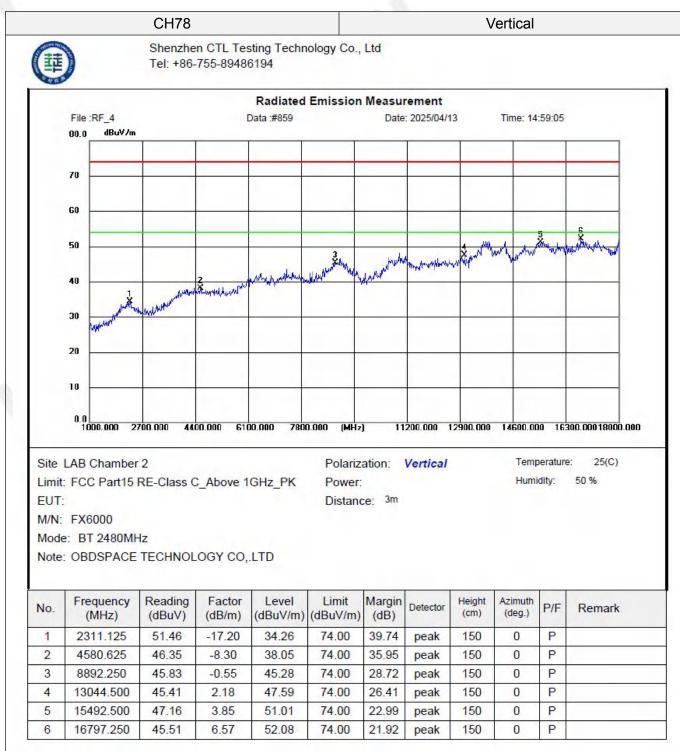
EUT: Distance: 3m

M/N: FX6000 Mode: BT 2480MHz

Note: OBDSPACE TECHNOLOGY CO,.LTD

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	3314.125	46.52	-12.66	33.86	74.00	40.14	peak	150	0	Р	
2	6136.125	46.82	-5.19	41.63	74.00	32.37	peak	150	0	Р	
3	9083.500	46.77	-0.20	46.57	74.00	27.43	peak	150	0	Р	
4	12230.625	44.45	2.21	46.66	74.00	27.34	peak	150	0	Р	
5	15596.625	48.16	3.93	52.09	74.00	21.91	peak	150	0	Р	
6	17368.875	43.14	8.57	51.71	74.00	22.29	peak	150	0	Р	

Power:



#### REMARKS:

- 1.Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
- 2.Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- 3.Margin value = Limit value- Emission level.
- 4.PK detector measurement value is lower than the average limit. Therefore, there is no need to test AV detector measurements.
- 5.RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV
- 6.For fundamental frequency, RBW 3MHz VBW 3MHz Peak detector is for PK Value; RMS detector is for AV value.
- 7.Other emissions are attenuated 20dB below the limits from 9kHz to 30MHz, so it does not recorded in report
- 8.18GHz-26GHz not recorded for no spurious point have a margin of less than 6 dB with respect to the limits.

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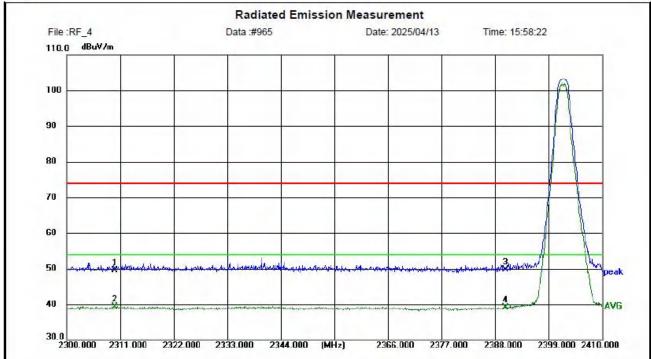
#### Results of Band Edges Test (Radiated)

Note: All modulations have been tested, only worse case GFSK is reported.

CH00 Horizontal



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Site LAB Chamber 2

Polarization: Horizontal

Temperature: 25(C)

Limit: FCC Part 15 C

Power: Humidity: 50 %

EUT:

Distance: 3m

M/N: FX6000

Mode: BT 2402MHz

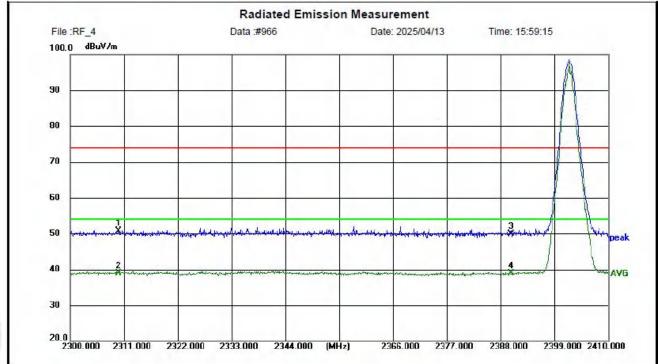
Note: OBDSPACE TECHNOLOGY CO, LTD

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2310.000	39.81	9.69	49.50	74.00	24.50	peak	150	1	Р	
2	2310.000	29.52	9.69	39.21	54.00	14.79	AVG	150	1	Р	
3	2390.000	39.85	9.77	49.62	74.00	24.38	peak	150	259	Р	
4	2390.000	29.40	9.77	39.17	54.00	14.83	AVG	150	259	Р	

CH00 Vertical



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Temperature: 25(C) Site LAB Chamber 2 Polarization: Vertical Humidity: 50 % Limit: FCC Part 15 C Power:

EUT: Distance: 3m

M/N: FX6000 Mode: BT 2402MHz

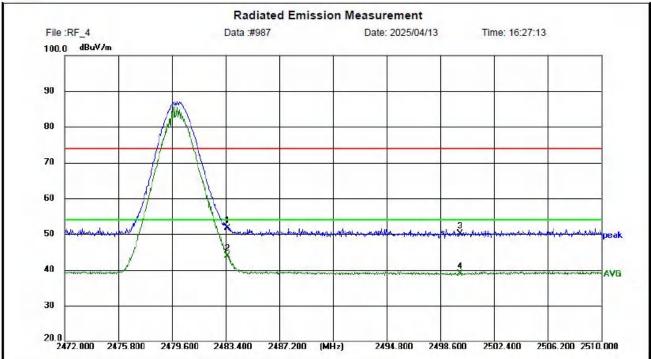
Note: OBDSPACE TECHNOLOGY CO,.LTD

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2310.000	41.08	9.69	50.77	74.00	23.23	peak	150	296	Р	
2	2310.000	29.19	9.69	38.88	54.00	15.12	AVG	150	296	Р	
3	2390.000	40.06	9.77	49.83	74.00	24.17	peak	150	339	Р	
4	2390.000	29.13	9.77	38.90	54.00	15.10	AVG	150	339	Р	

#### CH78 Horizontal



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Site LAB Chamber 2 Polarization: Horizontal Temperature: 25(C)

Limit: FCC Part 15 C Power: Humidity: 50 %

EUT: Distance: 3m

M/N: FX6000 Mode: BT 2480MHz

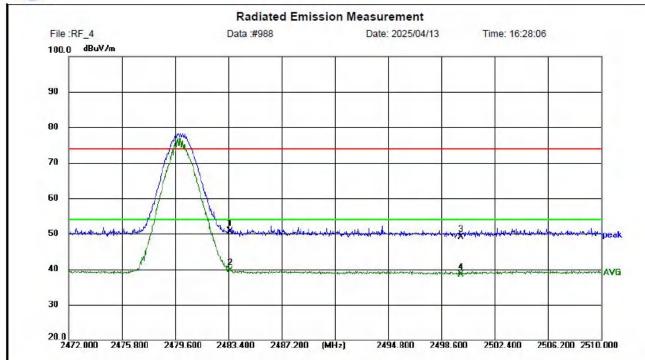
Note: OBDSPACE TECHNOLOGY CO, LTD

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2483.500	41.79	9.93	51.72	74.00	22.28	peak	150	89	Р	
2	2483.500	33.94	9.93	43.87	54.00	10.13	AVG	150	89	Р	
3	2500.000	40.13	10.00	50.13	74.00	23.87	peak	150	360	Р	
4	2500.000	28.81	10.00	38.81	54.00	15.19	AVG	150	360	Р	

#### CH78 Vertical



Shenzhen CTL Testing Technology Co., Ltd Tel: +86-755-89486194



Site LAB Chamber 2 Polarization: Vertical

EUT: Distance: 3m

M/N: FX6000 Mode: BT 2480MHz

Limit: FCC Part 15 C

Note: OBDSPACE TECHNOLOGY CO, LTD

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2483.500	40.78	9.93	50.71	74.00	23.29	peak	150	339	Р	
2	2483.500	29.81	9.93	39.74	54.00	14.26	AVG	150	339	Р	
3	2500.000	39.11	10.00	49.11	74.00	24.89	peak	150	140	Р	
4	2500.000	28.48	10.00	38.48	54.00	15.52	AVG	150	140	Р	

Power:

Temperature:

Humidity:

25(C)

50 %

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## 3.3. Maximum Peak Output Power

#### Limit

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels: 1 watt.

For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

#### **Test Procedure**

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum.

#### **Test Configuration**



#### **Test Results**

Raw data reference to Section 2 of document No. CTL2503262194-WF01\_Appendix of BT.

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#### 3.4. 20dB Bandwidth

#### Limit

For frequency hopping systems operating in the 2400MHz-2483.5MHz no limit for 20dB bandwidth.

#### **Test Procedure**

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30 KHz RBW and 91 KHz VBW.

The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

#### **Test Configuration**



#### **Test Results**

Raw data reference to Section 1 of document No. CTL2503262194-WF01\_Appendix of BT.

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## 3.5. Frequency Separation

#### LIMIT

According to 15.247(a)(1), frequency hopping systems shall have hopping channel carrier frequencies separated by minimum of 25KHz or the 2/3\*20dB bandwidth of the hopping channel, whichever is greater.

#### **TEST PROCEDURE**

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 300 KHz RBW and 300 KHz VBW.

#### **TEST CONFIGURATION**



#### **TEST RESULTS**

Raw data reference to Section 3 of document No. CTL2503262194-WF01\_Appendix of BT.

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## 3.6. Number of hopping frequency

### Limit

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.

#### **Test Procedure**

The transmitter output was connected to the spectrum analyzer through an attenuator. Set spectrum analyzer start 2400MHz to 2483.5MHz with 300 KHz RBW and 300 KHz VBW.

#### **Test Configuration**



#### **Test Results**

Raw data reference to Section 4 of document No. CTL2503262194-WF01\_Appendix of BT.

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## 3.7. Time of Occupancy (Dwell Time)

#### Limit

The average time of occupancy on any channel shall not be greater than 400 milliseconds within a period of 400 milliseconds multiplied by the number of hopping channels employed.

#### **Test Procedure**

The transmitter output was connected to the spectrum analyzer through an attenuator. Set center frequency of spectrum analyzer=operating frequency with 910 KHz RBW and 910 KHz VBW, Span 0Hz.

#### **Test Configuration**



#### **Test Results**

Raw data reference to Section 5 of document No. CTL2503262194-WF01\_Appendix of BT.

#### 3.8. Out-of-band Emissions

#### Limit

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 con-ducted or a radiated measurement, pro-vided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter com-plies 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 Procedure**

Connect the transmitter output to spectrum analyzer using a low loss RF cable, and set the spectrum analyzer to RBW=100 kHz, VBW= 300 kHz, peak detector, and max hold. Measurements utilizing these setting are made of the in-band reference level, bandedge and out-of-band emissions.

#### **Test Configuration**



#### **Test Results**

Raw data reference to Section 6 of document No. CTL2503262194-WF01\_Appendix of BT.

### 3.9. Pseudorandom Frequency Hopping Sequence

#### **TEST APPLICABLE**

V1.0

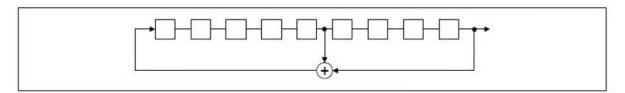
#### For 47 CFR Part 15C section 15.247 (a) (1) requirement:

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hop-ping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hop-ping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

#### **EUT Pseudorandom Frequency Hopping Sequence Requirement**

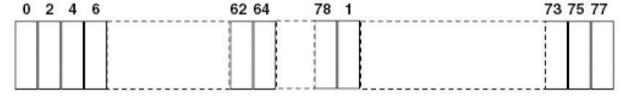
The pseudorandom frequency hopping sequence may be generated in a nice-stage shift register whose 5<sup>th</sup> and 9<sup>th</sup> stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first one of 9 consecutive ones, for example: the shift register is initialized with nine ones.

- Number of shift register stages:9
- Length of pseudo-random sequence:29-1=511 bits
- Longest sequence of zeros:8(non-inverted signal)



Linear Feedback Shift Register for Generation of the PRBS sequence

An example of pseudorandom frequency hopping sequence as follows:



Each frequency used equally one the average by each transmitter.

The system receiver have input bandwidths that match the hopping channel bandwidths of their corresponding transmitter and shift frequencies in synchronization with the transmitted signals.

## 3.10. Antenna Requirement

#### **Standard Applicable**

For intentional device, according to FCC 47 CFR Section 15.203, 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.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

#### Refer to statement below for compliance

The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

#### **Antenna Connected Construction**

The maximum gain of antenna was 2.75dBi.



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## 4. Test Setup Photos of the EUT





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## 5. Photos of the EUT

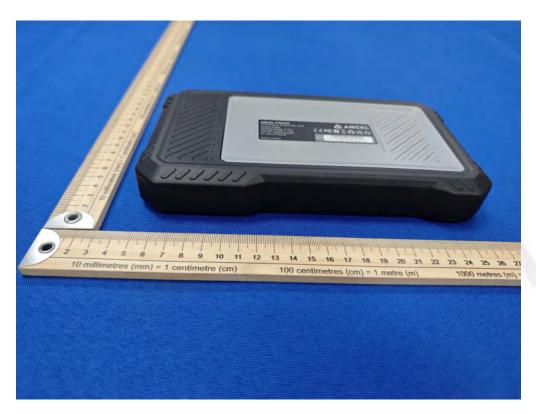
**External Photos of EUT** 













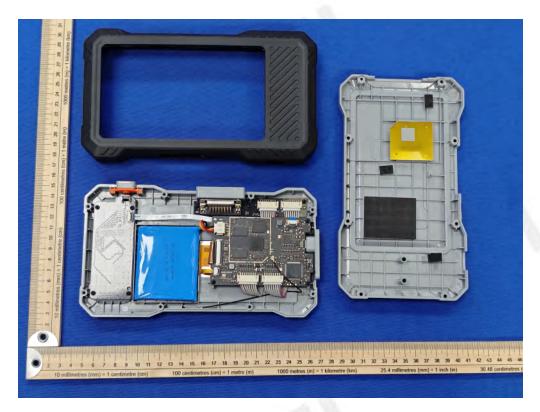
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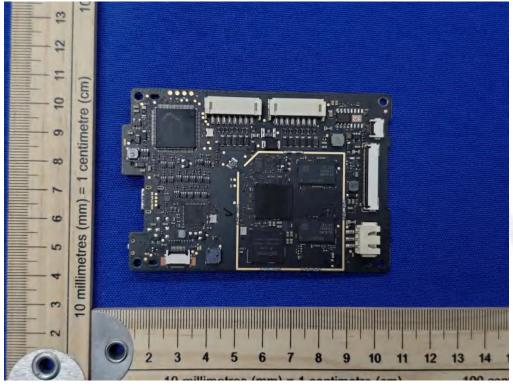
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## Internal Photos of EUT

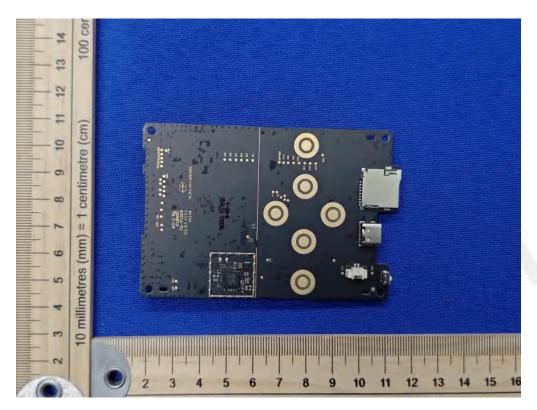


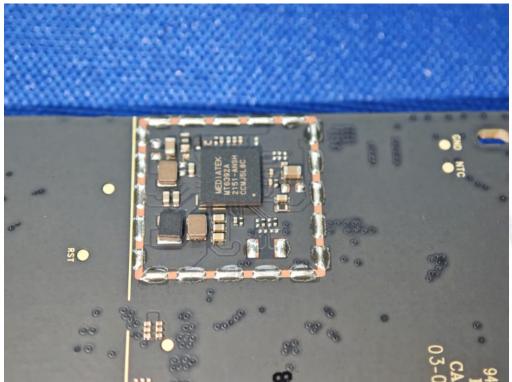




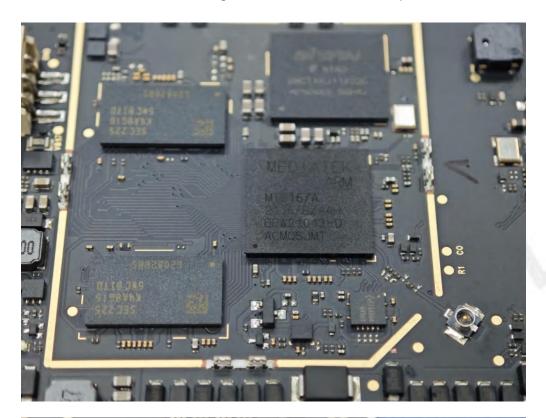


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