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Report Reference No	TRE1808004301	R/C: 42598				
FCC ID	2AMIL-FM6812					
Applicant's name:	Foneric Electronics Co.,Ltd					
Address	201,Floor 2,No.2 Building,Foxda Industrial Zone, Northern Lanzhu Road,Pingshan					
Nanufacturer	Foneric Electronics Co.,Ltd					
Address:	201,Floor 2,No.2 Building,Fo Northern Lanzhu Road,Pings					
Test item description	Bluetooth headphones					
rade Mark:	PALOVUE					
Nodel/Type reference:	Earflow Wireless					
isted Model(s)	-					
Standard :	FCC CFR Title 47 Part 15 S	ubpart C Section 15.247				
Date of receipt of test sample	Aug.09,2018					
Date of testing	Aug.09,2018 ~ Aug.23,2018					
Date of issue	Aug.23,2018					
Result:	PASS					
Compiled by Position+Printed name+Signature):	File administrators Yueming	u Yuoming.li				
Supervised by Position+Printed name+Signature):	Project Engineer Jerry Zhao	Jerry sha				
<pre>opproved by Position+Printed name+Signature):</pre>	RF Manager Hans Hu	Homsty				
esting Laboratory Name	Shenzhen Huatongwei Inte	rnational Inspection Co., Ltd.				
Address	: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China					

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The test report merely correspond to the test sample.

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1. TEST STANDARDS AND REPORT VERSION

1.1. Test Standards

The tests were performed according to following standards:

<u>FCC Rules Part 15.247:</u> 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 Devicese

1.2. Report version

Version No.	Date of issue	Description
N/A	2018-08-23	Original

2. TEST DESCRIPTION

Test Item	Section in CFR 47	Result	Test Engineer
Antenna Requirement	15.203/15.247 (c)	PASS	Xiaokang Tan
AC Power Line Conducted Emissions	15.207	PASS	Tony Duan
Conducted Peak Output Power	15.247 (b)(1)	PASS	Xiaokang Tan
20 dB Bandwidth	15.247 (a)(1)	PASS	Xiaokang Tan
Carrier Frequencies Separation	15.247 (a)(1)	PASS	Xiaokang Tan
Hopping Channel Number	15.247 (a)(1)	PASS	Xiaokang Tan
Dwell Time	15.247 (a)(1)	PASS	Xiaokang Tan
Pseudorandom Frequency Hopping Sequence	15.247(b)(4)	PASS	Xiaokang Tan
Restricted band	15.247(d)/15.205	PASS	Xiaokang Tan
Radiated Emissions	15.247(d)/15.209	PASS	Jiuru Pan

Note: The measurement uncertainty is not included in the test result.

3. <u>SUMMARY</u>

3.1. Client Information

Applicant:	Foneric Electronics Co.,Ltd	
Address:	201,Floor 2,No.2 Building,Foxda Industrial Zone, Northern Lanzhu Road,Pingshan	
Manufacturer: Foneric Electronics Co.,Ltd		
Address:	201,Floor 2,No.2 Building,Foxda Industrial Zone, Northern Lanzhu Road,Pingshan	

3.2. Product Description

Name of EUT:	Bluetooth headphones	
Trade Mark:	PALOVUE	
Model No.:	Earflow Wireless	
Listed Model(s):	-	
IMEI:	-	
Power supply:	DC 3.7V from battery	
Adapter information:	-	
Hardware version:	V02	
Software version:	V1.1	
Bluetooth		
Version:	Supported BT5.0+EDR	
Modulation:	GFSK, π/4DQPSK, 8DPSK	
Operation frequency:	2402MHz~2480MHz	
Channel number:	79	
Channel separation:	1MHz	
Antenna type:	PCB	
Antenna gain:	0dBi	

3.3. Operation state

Test frequency list

According to section 15.31(m), regards to the operating frequency range over 10 MHz, must select three channel which were tested. the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, please see the above gray bottom.

Channel	Frequency (MHz)
00	2402
01	2403
:	:
39	2441
:	:
77	2479
78	2480

> TEST MODE

For RF test items:

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 instrument under large package sizes transmission.

For Radiated suprious emissions test item:

The engineering test program was provided and enabled to make EUT continuous transmit. The EUT in each of three orthogonal axis emissions had been tested ,but only the worst case (X axis) data recorded in the report.

3.4. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- supplied by the manufacturer
- supplied by the lab

/	1	Manufacturer:	/
	·	Model No.:	/
1	1	Manufacturer:	/
	1	Model No.:	/

3.5. Modifications

No modifications were implemented to meet testing criteria.

4. TEST ENVIRONMENT

4.1. Address of the test laboratory

Laboratory: Shenzhen Huatongwei International Inspection Co., Ltd. Address: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

4.2. Test Facility

CNAS-Lab Code: L1225

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 3902.01

Shenzhen Huatongwei International Inspection 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: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 762235

Shenzhen Huatongwei International Inspection 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.

IC-Registration No.:5377B-1

Two 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No.: 5377B-1.

ACA

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

4.3. Environmental conditions

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

Temperature:	15~35°C
Relative Humidity:	30~60 %
Air Pressure:	950~1050mba

4.4. 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 in calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2" and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd. quality system according to 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.

Here after the best measurement capability for Shenzhen Huatongwei International Inspection Co., Ltd. is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.57 dB	(1)
Transmitter power Radiated	2.20 dB	(1)
Conducted spurious emissions 9kHz~40GHz	1.60 dB	(1)
Radiated spurious emissions 9kHz~40GHz	2.20 dB	(1)
Conducted Emissions 9kHz~30MHz	3.39 dB	(1)
Radiated Emissions 30~1000MHz	4.24 dB	(1)
Radiated Emissions 1~18GHz	5.16 dB	(1)
Radiated Emissions 18~40GHz	5.54 dB	(1)
Occupied Bandwidth		(1)

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

Conducted Emissions Last Cal. Next Cal. Test Item Manufacturer Model No. Serial No. Equipment (mm-dd-yy) (mm-dd-yy) EMI Test R&S ESCI 101247 11/11/2017 11/10/2018 1 Receiver 2 **Artificial Mains** SCHWARZBECK NNLK 8121 573 11/11/2017 11/10/2018 2-Line V-3 R&S ESH3-Z5 100049 11/11/2017 11/10/2018 Network **Pulse Limiter** 4 R&S ESH3-Z2 101488 11/11/2017 11/10/2018 RF 5 Connection HUBER+SUHNER EF400 N/A 11/21/2017 11/20/2018 Cable 6 **Test Software** R&S ES-K1 N/A N/A N/A

Radiat	Radiated Emissions						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. (mm-dd-yy)	Next Cal. (mm-dd-yy)	
1	Semi- Anechoic Chamber	Albatross projects	SAC-3m-01	C11121	10/16/2016	10/15/2019	
2	EMI Test Receiver	R&S	ESCI	100900	11/11/2017	11/10/2018	
3	Loop Antenna	R&S	HFH2-Z2	100020	11/20/2017	11/19/2020	
4	Ultra- Broadband Antenna	SCHWARZBECK	VULB9163	538	4/5/2017	4/4/2020	
5	Horn Antenna	SCHWARZBECK	9120D	1011	3/27/2017	3/26/2020	
6	Broadband Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170 472	3/27/2017	3/26/2020	
7	Pre-amplifier	SCHWARZBECK	BBV 9743	9743-0022	10/18/2017	10/17/2018	
8	Broadband Pre-amplifier	SCHWARZBECK	BBV 9718	9718-248	10/18/2017	10/17/2018	
9	Spectrum Analyzer	R&S	FSP40	100597	11/11/2017	11/10/2018	
10	RF Connection Cable	HUBER+SUHNE R	RE-7-FL	N/A	11/21/2017	11/20/2018	
11	RF Connection Cable	HUBER+SUHNE R	RE-7-FH	N/A	11/21/2017	11/20/2018	
12	Test Software	Audix	E3	N/A	N/A	N/A	
13	Test Software	R&S	ES-K1	N/A	N/A	N/A	
14	Turntable	Maturo Germany	TT2.0-1T	N/A	N/A	N/A	
15	Antenna Mast	Maturo Germany	CAM-4.0-P-12	N/A	N/A	N/A	

4.5. Equipments Used during the Test

RF Con	RF Conducted Test							
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. (mm-dd-yy)	Next Cal. (mm-dd-yy)		
1	Spectrum Analyzer	R&S	FSV40	100048	11/11/2017	11/10/2018		
2	EXA Signal Analyzer	Agilent	N9020A	184247	9/22/2017	9/21/2018		
3	OSP	R&S	OSP120	101317	N/A	N/A		

5. TEST CONDITIONS AND RESULTS

5.1. Antenna requirement

<u>Requirement</u>

FCC CFR Title 47 Part 15 Subpart C 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. The use of a permanently attached antenna or of anantenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

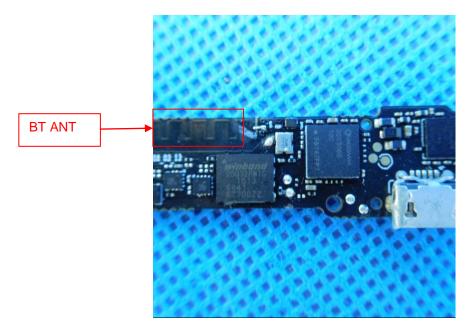
FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):

(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

Test Result:

☑ Passed □ Not Applicable

The directional gain of the antenna less than 6 dBi, please refer to the below antenna photo.



5.2. Conducted Emissions (AC Main)

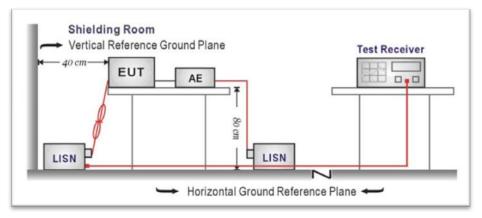
<u>LIMIT</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.207

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

* Decreases with the logarithm of the frequency.

TEST CONFIGURATION



TEST PROCEDURE

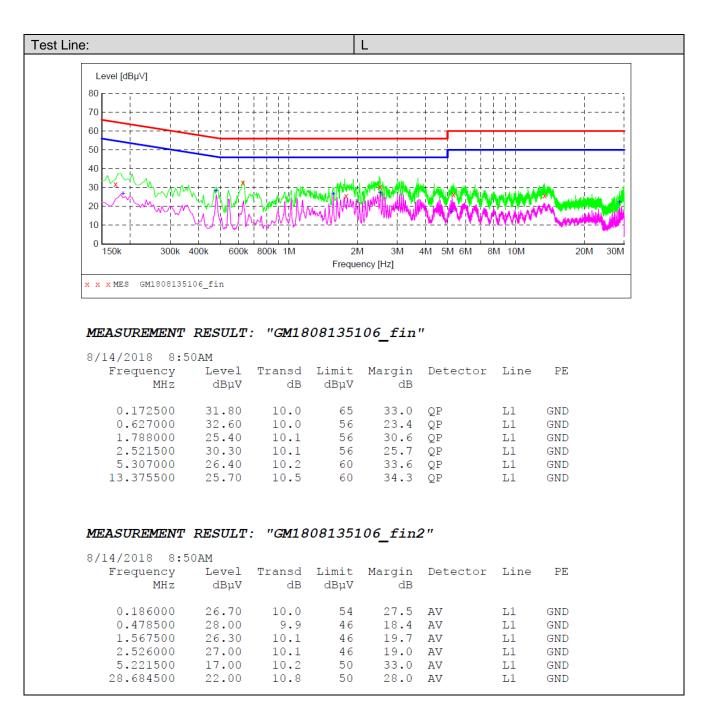
- 1. The EUT was setup according to ANSI C63.10:2013 requirements.
- 2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
- 3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment.
- 4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
- 5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
- 6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
- 7. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
- 8. During the above scans, the emissions were maximized by cable manipulation.

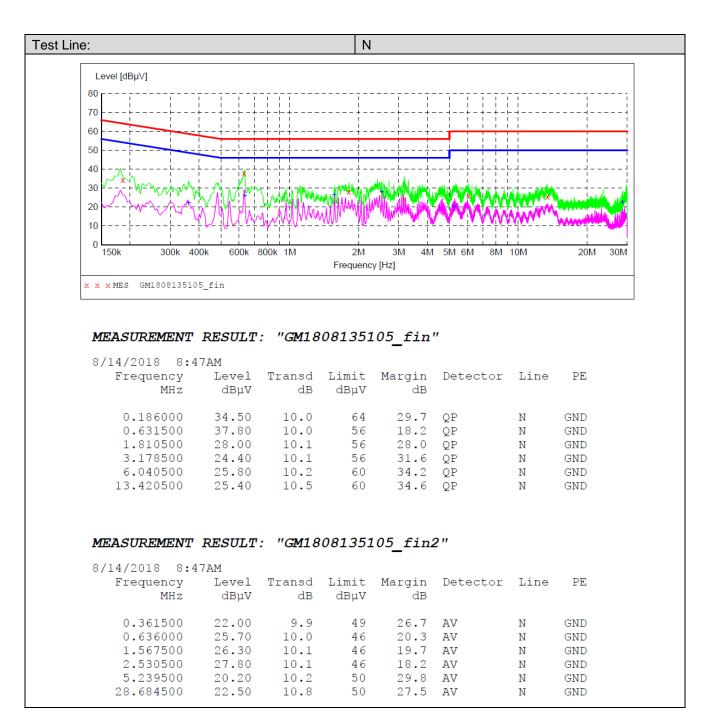
TEST RESULTS

☑ Passed □ Not Applicable

Note:

- 1) Transd= Cable lose + Pulse Limiter Factor + Artificial Mains Factor
- 2) Margin= Limit Level



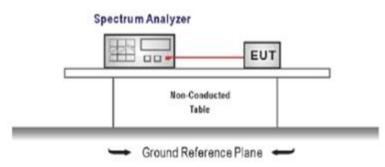


5.3. Conducted Peak Output Power

<u>LIMIT</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(1): For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 nonoverlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

TEST CONFIGURATION



TEST PROCEDURE

- 1. The transmitter output was connected to the spectrum analyzer through an attenuator, the pathloss was compensated to the results for each measurement.
- 2. Set to the maximum power setting and enable the EUT transmit continuously
- Use the following spectrum analyzer settings: Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel RBW≥ the 20 dB bandwidth of the emission being measured, VBW≥RBW Sweep = auto, Detector function = peak, Trace = max hold
- 4. Measure and record the results in the test report.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

☑ Passed □ Not Applicable

Modulation type	Channel	Output power (dBm)	Limit (dBm)	Result
	00	3.88		
GFSK	39	3.80	≤ 30.00	Pass
	78	4.31		
	00	1.63		
π/4DQPSK	39	2.12	≤ 21.00	Pass
	78	2.29		
	00	2.00		
8DPSK	39	2.81	≤ 21.00	Pass
	78	2.77		

Modulation Type	CESK
Modulation Type:	GFSK
	Spectrum 🕎
	RefLevel 20.00 dBm Offset 1.00 dB RBW 1 MHz Att 30 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep
	Count 500/500
	M1[1] 3.88 dBm
	10 dBm
	0 dBm
	-10 dBm
	-20 dBm
CH00	
	-30 dBm
	1997dBm
	-50 dBm
	-60 dBm
	-70 dBm
	CF 2.402 CHz 691 pts Span 5.0 MHz
	Spectrum 🕎
	RefLevel 20.00 dBm Offset 1.00 dB 🖷 RBW 1 MHz
	■ Att 30 dB SWT 1 ms ■ VBW 3 MHz Mode Auto Sweep Count 500/500
	1Pk View
	M1[1] 3.80 dBm 2.44081910 GHz
	10 dBm-
	0 dBm
	-10 dBm
01100	-20 dBm
CH39	-30 dBm
	-40 dBm
	-50 dBm
	-60 dBm
	-70 dBm
	CF 2.441 GHz 691 pts Span 5.0 MHz
	UP 2.1112 UP 2 UP 1 1 UP 2 UP 1 UP 2 UP 1 UP 2 UP 1 UP 2 UP 2
	Spectrum 🕎
	RefLevel 20.00 dBm Offset 1.00 dB RBW 1 MHz Att 30 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep
	Caunt 500/500
	M1[1] 4.31 dBm
	10 dBm M1 M1
	0 d8m
	-10 dBm
	-20 dBm
CH78	
	~30 dBm
	-40 d8m
	-50 dBm-
	-60 dBm
	-70 dBm
	CF 2.48 GHz 691 pts Span 5.0 MHz
	Measuring

odulation Type:	π/4DQPSK
	Spectrum 🕎
	Ref Level 20.00 dBm Offset 1.00 dB Ref RBW 2 MHz
	Count 500/500
	●1Pk View M1[1] 1.63 dBm
	10 d8m 2.40183360 GHz
	M <u>I</u>
	0 dBm
	-10 dBm
	-20 dBm
CH00	-30 dBm
	-40 dBm-
	-50 dBm
	-60 dBm
	-70 dem
	CF 2.402 GHz 691 pts Span 5.0 MHz
	Measuring (REFEREND) 4/9
	Spectrum 🕎
	Ref Level 20.00 dBm Offset 1.00 dB RBW 2 MHz Att 30 dB SWT 1 ms VBW 5 MHz Mode Auto Sweep
	Count 500/500 Count 500/500 PJPK View
	M1[1] 2.12 dBm
	10 dBm
	-10-d8m
<u>CU 120</u>	-20 dBm
CH39	-30 dBm-
	-40 d8m
	-50 dam-
	-60 d8m-
	-70 dBm-
	CF 2.441 GHz 691 pts Span 5.0 MHz
	Spectrum RefLevel 20.00 dBm Offset 1.00 dB ● RBW 2 MHz
	Att 30 dB SWT 1 ms VBW 5 MHz Mode Auto Sweep Count 500/500
	1Pk View
	M1[1] 2.29 dBm 2.47987700 GHz
	10 d8m M1
	0 dBm
CH78	-10.dBm
	-20 dBm
	-30 dBm
	-40 dBm-
	-50 dBm
	-60 dBm
	-70 dBm
	CF 2.48 GHz 691 pts Span 5.0 MHz

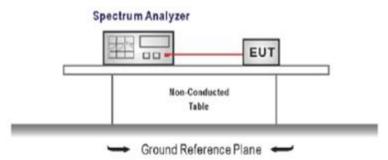
Modulation Type:	8DPSK
	Spectrum (♥
	Ref Level 20.00 dBm Offset 1.00 dB ● RBW 2 MHz ● Att 30 dB SWT 1 ms ● VBW 5 MHz Mode Auto Sweep Count 500/500 1 ms ● VBW 5 MHz Mode Auto Sweep ● It View 1 ms ● VBW 5 MHz Mode Auto Sweep
	10 dBm
	0 dBm
	-10 dbm
CH00	-30 dBm-
	-40 dBm
	-60 dBm
	-70 dBm
	CF 2.402 GHz 691 pts Span 5.0 MHz
	Spectrum Image: Constraint of the sector of t
	Count 500/500 P1Pk View M1[1] 2.81 dBm 2.44095660 GHz
	-10.dem
CH39	-20 dBm
	-40 dBm
	-50 dBm
	-70 dBm-
	CF 2.441 GHz 691 pts Span 5.0 MHz
	Spectrum 🕎
	Ref Level 20.00 Offset 1.00 dt RBW 2 MHz Att 30 30 SWT 1 ms VBW 5 MHz Mode Auto Sweep Count 500/500 EVEN 5 MHz Mode Auto Sweep Count 500/500 EVEN F Mode Auto Sweep F Auto Sweep F Auto Sweep F Auto Sweep F
CH78	10 dBm MI[1] 2.77 dBm 2.47994210 GHz
	0 dBm
	-10-48m-
	-30 dBm
	-40 d8m
	-60 d8m
	-70 dBm CF 2.48 GHz 691 pts Span 5.0 MHz
	CF 2-89 GHZ 692 pts spar su viriz)

5.4. 20 dB Bandwidth

<u>LIMIT</u>

N/A

TEST CONFIGURATION



TEST PROCEDURE

- 1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
- 2. Set to the maximum power setting and enable the EUT transmit continuously
- 3. Use the following spectrum analyzer settings:

Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel RBW \ge 1% of the 20 dB bandwidth, VBW \ge RBW

Sweep = auto, Detector function = peak, Trace = max hold

4. Measure and record the results in the test report.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

🛛 Passed

Not Applicable

Modulation type	Channel	20 dB Bandwidth (MHz)	Limit (MHz)	Result
	00	0.93		
GFSK	39	0.93	-	Pass
	78	0.93		
	00	1.24		
π/4DQPSK	39	1.24	-	Pass
	78	1.24		
	00	1.26		
8DPSK	39	1.26	-	Pass
	78	1.26		

Iodulation Type:	GFSK
	Spectrum 🕎
	RefLevel 20.00 dBm Offset 1.00 dB ■ RBW 10 kHz ■ Att 30 dB SWT 189.6 µs ■ VBW 30 kHz Mode Auto FFT
	_Count 500/500
	●1Pk View M1[1] -21.97 dBm
	10 dBm 2.40154000 GHz 2.4015200 GHz 2.4000 GHz
	0 dBm M2 2.40204750 GHz
	0 dBm 2.40209750 GHz
	-20 dBm D1 -21.950 dBm A J
CH00	
	-50 dBpr A Man
	460 dBm
	-70 dBm
	CF 2.402 GHz 1001 pts Span 2.5 MHz Marker
	Type Ref Trc X-value Y-value Function Function Result M1 1 2.40154 GHz -21.97 dBm
	M2 1 2.4020475 GHz -1.95 dBm D3 M1 1 925.0 kHz -0.91 dB
	Spectrum
	Att 30 dB SWT 189.6 µs VBW 30 kHz Mode Auto FFT
	Count 500/500 Plk View
	10 dBm
	M2[1] - 2.20 gBm
	-10 dBm
	0 dBm -10 dBm -20 dBm 01 -22.203 dBm -22 dBm 01 -22.203 dBm -20 dBm
CH39	-30 dBm 01 -22 203 dBm 01 -22 200 dB
CH39	40 dBm / Mm d Mm / Mm / Mm / Mm / Mm / Mm / M
	-50 dBm
	-60 dBm
	-70 dBm-
	CF 2.441 GHz 1001 pts Span 2.5 MHz
	Marker Type Ref Trc X-value Y-value Function Function Result
	MI 1 2.4405375 GHz -22.55 dBm M2 1 2.4410475 GHz -2.20 dBm
	D3 M1 1 925.0 kHz 0.21 dB
	Measuring (Children) 🚧
	Spectrum 🕎
	Ref Level 20.00 dBm Offset 1.00 dB 👄 RBW 10 kHz
	Att 30 dB SWT 189.6 μs VBW 30 kHz Mode Auto FFT Count 500/500
	●1Pk View M1[1] -21.71 dBm
	10 dBm 2.47954000 GHz M2[1] -1.70 dBm
	0 dBm M2 2.48004750 GHz
	-10 dBm
	-20 dBm
CH78	-30 dBm
	with the second s
	-50 dam
	-70 dBm-
	CF 2.48 GHz 1001 pts Span 2.5 MHz Marker
	Type Ref Trc X-value Y-value Function Function Result
	M1 1 2.47954 GHz -21.71 dBm M2 1 2.4800475 GHz -1.70 dBm
	D3 M1 1 925.0 kHz -1.17 dB

Modulation Type:	π/4DQPSK
	Spectrum 🕎
	RefLevel 20:00 dBm Offset 1:00 dB ■ RBW 30 HH: Att 30 dB SWT 63:1 µs ● VBW 100 kHz Mode Auto FFT Count 500/500
	●1Pk View M1[1] -20.77 dBm
	10 dBm 2.40136500 GHz M2[1] -0.72 dBm
	0 dBm
	-20.dBm p1 -20.719 dBm
01100	-30 dBm
CH00	
	-50 dBm
	-60 dBm
	-70 dBm
	CF 2.402 GHz 1001 pts Span 2.5 MHz
	Marker Type Ref Trc X-value Y-value Function Function Result
	M1 1 2.401365 GHz -20.77 dBm M2 1 2.401995 GHz -0.72 dBm
	D3 M1 1 1.2425 MH2 0.02 dB M1 1 1.2425 MH2 0.02 dB
	Spectrum 🕎
	RefLevel 20.00 dBm Offset 1.00 dB ● RBW 30 kHz ● Att 30 dB SWT 63.1 µs ● VBW 100 kHz Mode Auto FFT
	Caunt 500/500
	M1[1] -20.82 dBm
	M2[1] -0.77 dBm
	-20.d8m D1 -20.774 d8m 7
CH39	
	-50 dBm
	-50 dam
	-70 dBm
	CF 2.441 GHz 1001 pts Span 2.5 MHz Marker
	Type Ref Trc X-value Y-value Function Function Result M1 1 2.4403625 GHz -20.82 dBm -20.82 dBm -
	M2 1 2.440995 GHz -0.77 dBm D3 M1 1 1.235 MHz 0.04 dB
	Measuring
	Spectrum 🕎
	RefLevel 20.00 dBm Offset 1.00 dB 🖷 RBW 30 kHz
	■ Att 30 dB SWT 63.1 µs ● VBW 100 kHz Mode Auto FFT Count 500/500
	PPk View M1[1] -20.58 dBm
	10 dBm 2.47936250 GHz M2[1] -0.52 dBm
	0 dBm
	-20.48m D1 -20.515 dBm
01/70	-30 d8m
CH78	+9.d8m
	-50 d8m
	-60 d8m
	-70 d8m
	CF 2.48 GHz 1001 pts Span 2.5 MHz
	Marker Type Ref Trc X-value Y-value Function Function Result
	M1 1 2.4793625 GHz -20.58 dBm M2 1 2.479995 GHz -0.52 dBm
	D3 M1 1 1.2375 MHz 0.02 dB
	Messaring (Estates)

Iodulation Type:	8DPSK
	Spectrum 🕎
	RefLevel 20.00 dBm Offset 1.00 dB ● RBW 30 kHz ● Att 30 dB SWT 63.1 µs ● VBW 100 kHz Mode Auto FFT
	Count 500/500 ● 1Pk View
	M1[1] -20.97 dBm
	10 dBm 2.40135000 GHz
	0 dBm 2.40199250 GHz
	-10 dBm
	-20.48m D1 -20.838 d8m
	-30 dBm
CH00	
	-50 dBm
	-60 dBm
	-70 dBm
	CF 2.402 GHz 1001 pts Span 2.5 MHz Marker
	Type Ref Trc X-value Y-value Function Function Result M1 1 2.40135 GHz -20.97 dBm -20.97 dBm <td< td=""></td<>
	M2 1 2.4019925 GHz -0.84 dBm D3 M1 1 1.26 MHz 0.09 dB
	Nextoring.
	Spectrum (₩ Ref Level 20.00 dBm Offset 1.00 dB ● RBW 30 kHz
	● Att 30 dB SWT 63.1 µs ● VBW 100 kHz Mode Auto FFT Count 500/500
	● 1Pk View
	10 dBm M1[1] -21.11 dBm 2.44035000 GHz
	0 dBm M2[1] -0.81 dBm M2 2.44099250 CHz
	-20 d8m D1 -20.811 d8m
CH39	-30 dBm
01139	
	-50 dBm
	-60 dBm
	-70 dBm
	CF 2.441 GHz 1001 pts Span 2.5 MHz
	Marker Type Ref Trc X-value Y-value Function Function Result
	M1 1 2.44035 GHz -21.11 dBm M2 1 2.4409925 GHz -0.81 dBm
	D3 M1 1 1.2575 MHz 0.19 dB
	Spectrum
	RefLevel 20.00 dBm Offset 1.00 dB RBW 30 kHz Att 30 dB SWT 63.1 µs VBW 100 kHz Mode Auto FFT
	Count 500/500
	M1[1] -20.76 dBm
	10 dBm 2.47935000 GHz M2[1] -0.56 dBm
	0 dBm 2.47999500 GHz
	-10 dBm
	-20. dem D1 -20.563 dem 2
	-30 dBm
CH78	
	-50 dBm
	-60 dBm-
1	-70 dBm-
	CF 2.48 GHz 1001 pts Span 2.5 MHz Marker
	Marker Type Ref Trc X-value Y-value Function Function Result M1 1 2.47935 GHz -20.76 dBm Function Function Result
	Marker Type Ref Trc X-value Y-value Function Function Result

5.5. Carrier Frequencies Separation

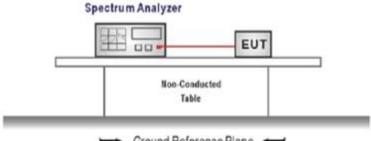
<u>LIMIT</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(1):

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping 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.

TEST CONFIGURATION



- Ground Reference Plane

TEST PROCEDURE

- 1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
- 2. Set to the maximum power setting and enable the EUT transmit continuously
- Use the following spectrum analyzer settings: Span = wide enough to capture the peaks of two adjacent channels RBW ≥ 1% of the span, VBW ≥ RBW Sweep = auto, Detector function = peak, Trace = max hold
- 4. Measure and record the results in the test report.

TEST MODE:

Please refer to the clause 3.3

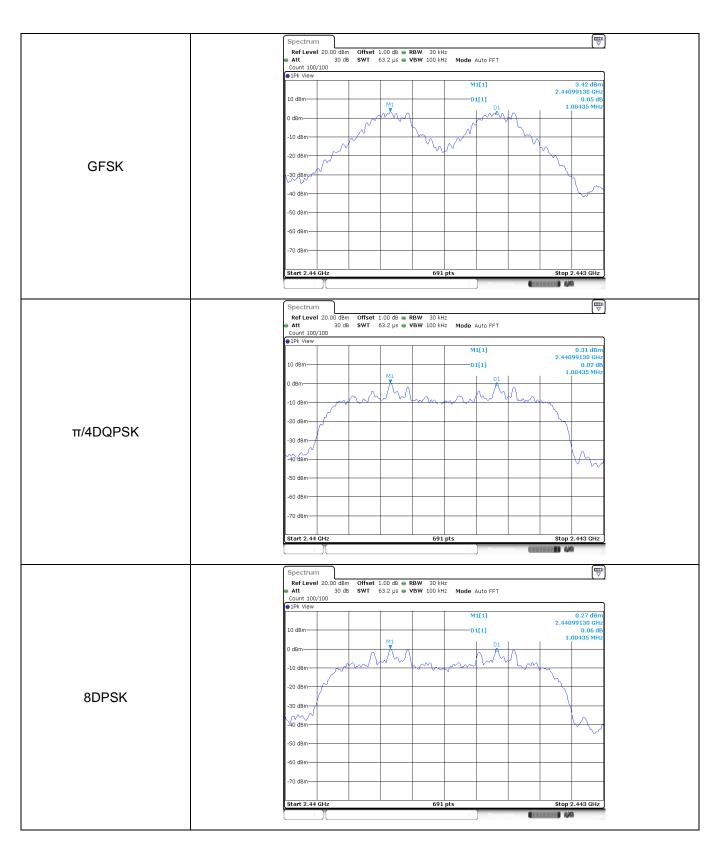
TEST RESULTS

☑ Passed □ Not Applicable

Modulation type	Channel	Carrier Frequencies Separation (MHz)	Limit (MHz) *	Result
GFSK	39	1.00	≥0.93	Pass
π/4DQPSK	39	1.00	≥0.83	Pass
8DPSK	39	1.00	≥0.84	Pass

Note:

*: GFSK limit = The maximum 20 dB Bandwidth for GFSK modulation on the section 5.4. π /4DQPSK limit = 2/3 * The maximum 20 dB Bandwidth for π /4DQPSK modulation on the section 5.4. 8DPSK limit = 2/3 * The maximum 20 dB Bandwidth for 8DPSK modulation on the section 5.4

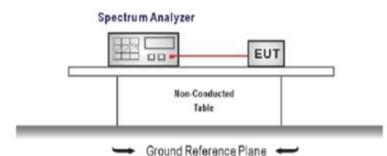


5.6. Hopping Channel Number

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(1):Frequency hopping systems in the 2400–2483.5 MHz band shall use at least **15** channels.

TEST CONFIGURATION



TEST PROCEDURE

- 1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
- 2. Set to the maximum power setting and enable the EUT transmit continuously
- Use the following spectrum analyzer settings: Span = the frequency band of operation RBW ≥ 1% of the span, VBW ≥ RBW Sweep = auto, Detector function = peak, Trace = max hold
- 4. Measure and record the results in the test report.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

☑ Passed □ Not Applicable

Modulation type	Channel number	Limit	Result
GFSK	79		
π/4DQPSK	79	≥15.00	Pass
8DPSK	79		

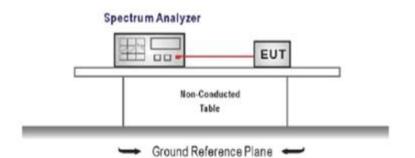
	Spectrum
	Att 30 dB SWT 1 ms VBW 300 kHz Mode Auto Sweep
GFSK	-20 d8m
Gron	-B0 dBm
	40 dBm
	/50 dBm
	-60 d8m
	-70 dBm
	Start 2.4 GHz 691 pts Stop 2.4835 GHz
	Measuring-
	Spectrum
	Ref Level 20.00 dBm Offset 1.00 dB RBW 100 kHz Att 30 dB SWT 1 ms VBW 300 kHz
	● 1Pk View
	10 dBm
	° 1880 Manufamana and a second
	-10 d8m
	-20 dBm
π/4DQPSK	-p0 d8m
	/40 d8m
	-50 dam
	-60 d8m
	-70 dBm
	Start 2.4 GHz 691 pts Stop 2.4835 GHz
	Spectrum Imp Ref Level 20.00 dBm Offset 1.00 dB ● RBW 100 kHz
	Att 30 dB SWT 1 ms AVBW 300 kHz Mode Auto Sweep
	PPk View
	10 dBm
	o Heronomontantantantantantantantantantantantantan
	-10 dBm
	-20 dBm-
8DPSK	-B0 dBm
	-40 dBm-
	-50 dBm
	-60 dBm
	-70 dBm-
	Start 2.4 GHz 691 pts Stop 2.4835 GHz

5.7. Dwell Time

<u>LIMIT</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(1):The average time of occupancy on any channel shall not be greater than 0.4 seconds within a pe-riod of 0.4 seconds multiplied by the number of hopping channels employed.

TEST CONFIGURATION



TEST PROCEDURE

- 1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
- 2. Set to the maximum power setting and enable the EUT transmit continuously
- Use the following spectrum analyzer settings: Span = zero span, centered on a hopping channel, RBW= 1 MHz, VBW ≥ RBW Sweep = as necessary to capture the entire dwell time per hopping channel, Detector function = peak, Trace = max hold
- 4. Measure and record the results in the test report.

TEST MODE:

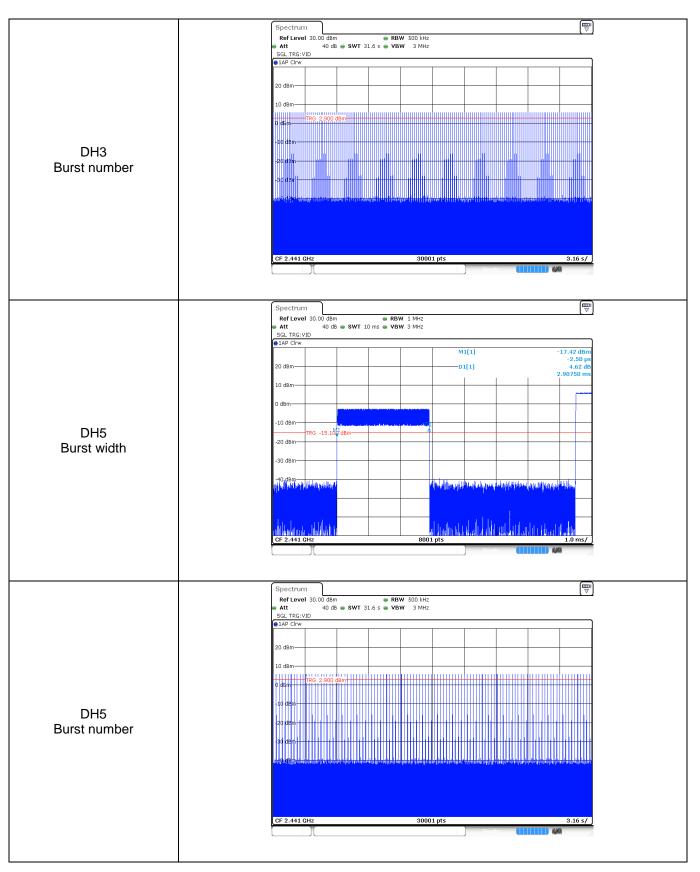
Please refer to the clause 3.3

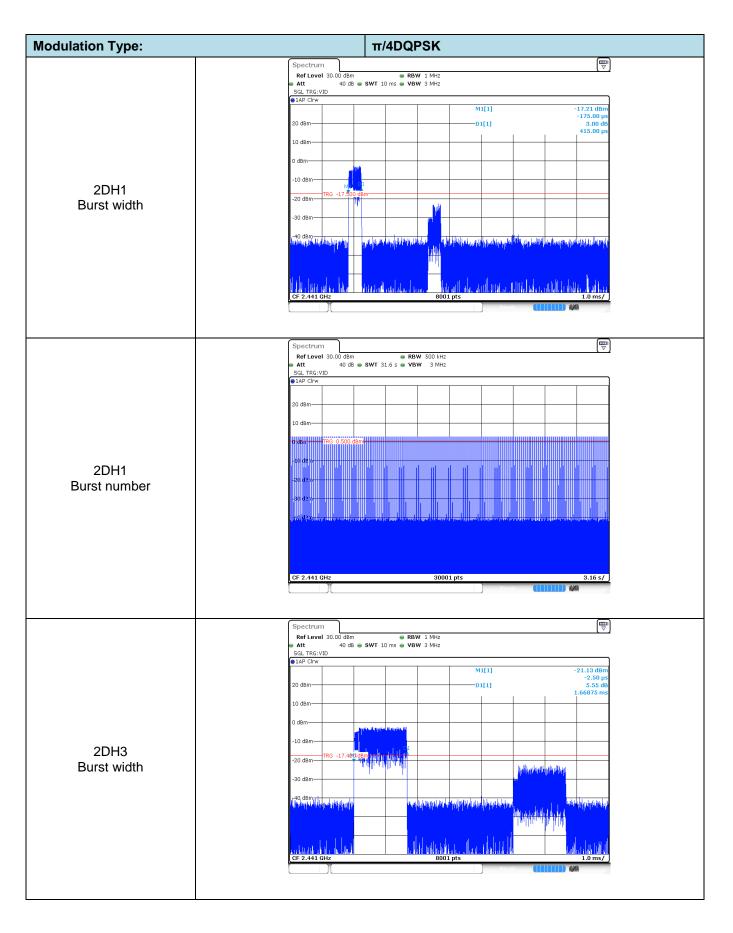
TEST RESULTS

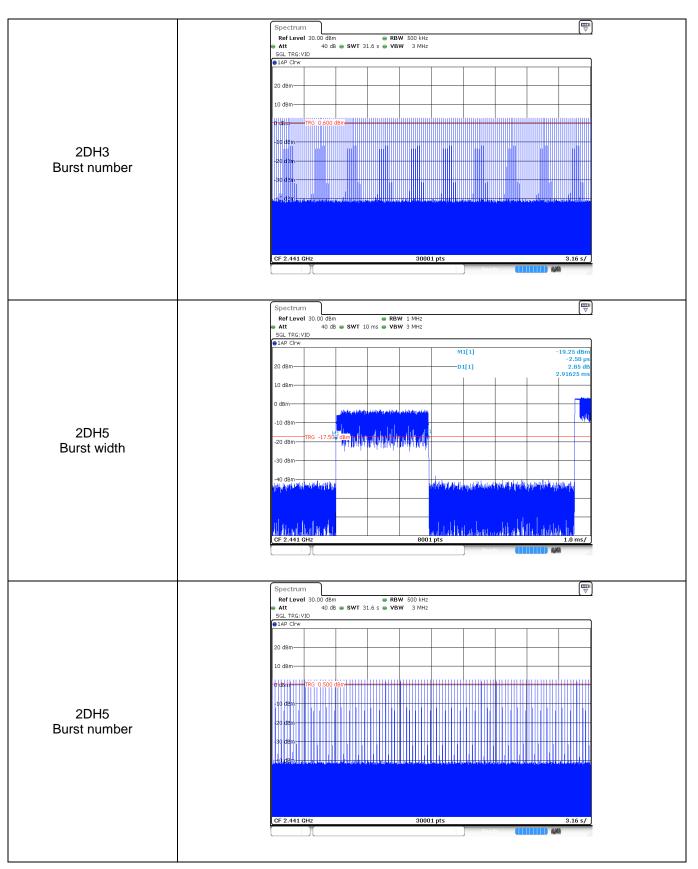
☑ Passed □ Not Applicable

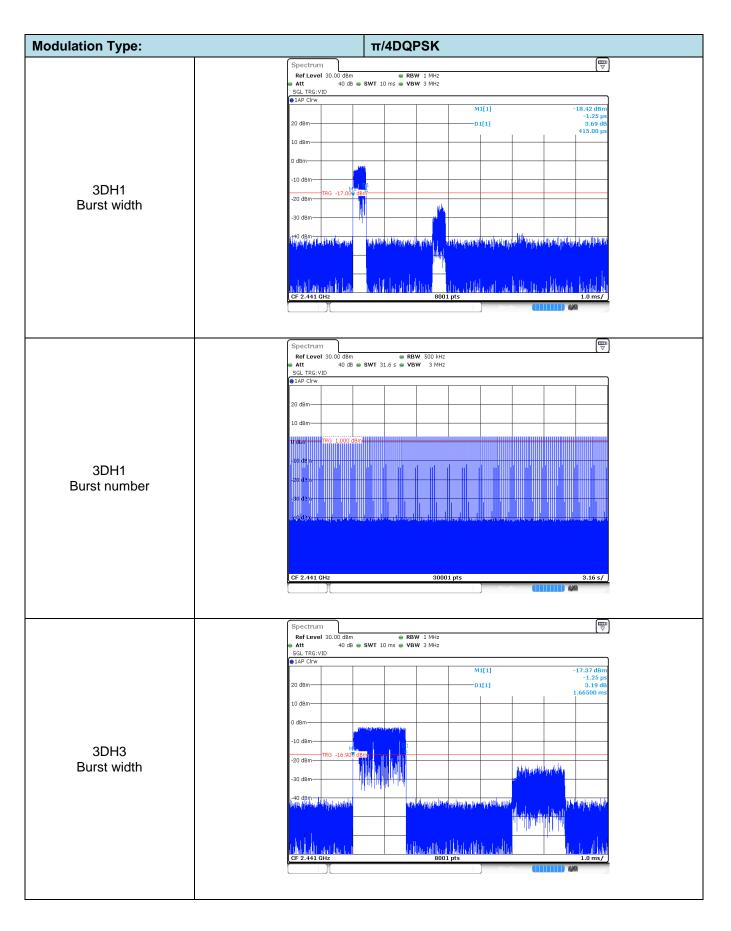
Modulation type	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell time (Second)	Limit (Second)	Result	
	DH1	0.41	320.00	0.13			
GFSK	DH3	1.66	160.00	0.27	≤ 0.40	Pass	
	DH5	2.91	107.00	0.31			
	2DH1	0.42	320.00	0.13			
π/4DQPSK	2DH3	1.67	160.00	0.27	≤ 0.40	Pass	
	2DH5	2.92	107.00	0.31			
	3DH1	0.42	320.00	0.13			
8DPSK	3DH3	1.67	160.00	0.27	≤ 0.40	Pass	
	3DH5	2.92	107.00	0.31			

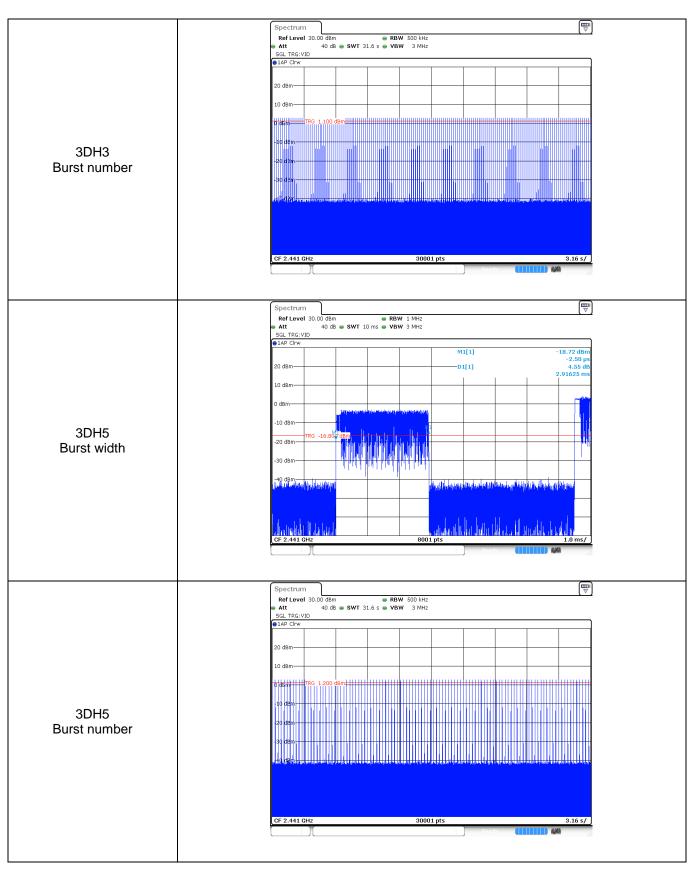
Modulation Type:	GFSK
	Spectrum
DH1 Burst width	Spectrum Image: Construct of the second
DH1 Burst number	Spectrum Image: Control of the second s
DH3 Burst width	Spectrum Image: Construction of the second of the seco











5.8. Pseudorandom Frequency Hopping Sequence

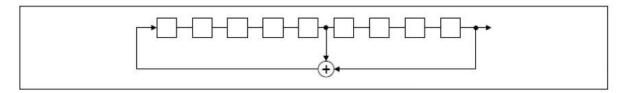
<u>LIMIT</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(1):Frequency hopping systems shall have hopping channel carrier fre-quencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hop-ping channel, whichever is greater. Al-ternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier fre-quencies 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 chan-nel frequencies that are selected at the system hopping rate from a pseudo ran-domly ordered list of hopping fre-quencies. Each frequency must be used equally on the average by each trans-mitter. The system receivers shall have input bandwidths that match the hop-ping channel bandwidths of their cor-responding transmitters and shall shift frequencies in synchronization with the transmitted signals.

TEST RESULTS

The pseudorandom frequency hopping sequence may be generated in a nice-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the friststage. The sequence begins with the frist 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 explame of pseudorandom frequency hopping sequence as follows:

0	2	4	6	62	64	_	78	1	73	75	77
٦				 1			1		 T	Γ	Г
							1	}			L
					}		1	}	1		L
							1		 L		L

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.

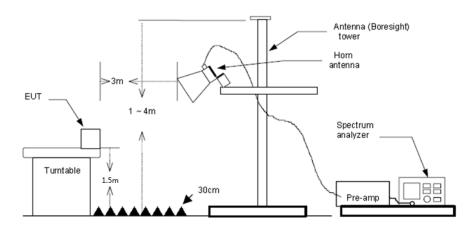
5.9. Restricted band (radiated)

<u>LIMIT</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d):

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, Radiated Emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the Radiated Emissions limits specified in §15.209(a) (see §15.205(c)).

TEST CONFIGURATION



TEST PROCEDURE

- 1. The EUT was setup and tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
- 2. The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
- 3. The EUT waspositioned such that the distance from antenna to the EUT was 3 meters.
- 4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
- The receiver set as follow: RBW=1 MHz, VBW=3 MHz Peak detector for Peak value RBW=1 MHz, VBW=10 Hz Peak detector for Average value.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

☑ Passed □ Not Applicable

Note:

- 1) Final level= Read level + Antenna Factor+ Cable Loss- Preamp Factor
- 2) Have pre-scan all modulation mode, found the GFSK modulation which it was worst case, so only the worst case's data on the test report.
- 3) The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.

Test channel:					CH00						
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value		
2310.00	34.37	28.05	6.62	37.59	31.45	74.00	-42.55	Horizontal	Peak		
2390.03	47.70	27.65	6.75	37.59	44.51	74.00	-29.49	Horizontal	Peak		
2310.00	34.66	28.05	6.62	37.59	31.74	74.00	-42.26	Vertical	Peak		
2390.03	45.46	27.65	6.75	37.59	42.27	74.00	-31.73	Vertical	Peak		
2310.00	29.20	28.05	6.62	37.59	26.28	54.00	-27.72	Horizontal	Average		
2390.03	37.63	27.65	6.75	37.59	34.44	54.00	-19.56	Horizontal	Average		
2310.00	27.26	28.05	6.62	37.59	24.34	54.00	-29.66	Vertical	Average		
2390.03	30.75	27.65	6.75	37.59	27.56	54.00	-26.44	Vertical	Average		

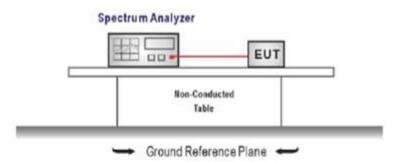
Test chann	el:				CH78						
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value		
2483.50	37.80	27.26	6.83	37.59	34.30	74.00	-39.70	Horizontal	Peak		
2500.00	34.82	27.20	6.84	37.59	31.27	74.00	-42.73	Horizontal	Peak		
2483.50	39.95	27.26	6.83	37.59	36.45	74.00	-37.55	Vertical	Peak		
2500.00	40.18	27.20	6.84	37.59	36.63	74.00	-37.37	Vertical	Peak		
2483.50	30.66	27.26	6.83	37.59	27.16	54.00	-26.84	Horizontal	Average		
2500.00	25.67	27.20	6.84	37.59	22.12	54.00	-31.88	Horizontal	Average		
2483.50	29.99	27.26	6.83	37.59	26.49	54.00	-27.51	Vertical	Average		
2500.00	26.76	27.20	6.84	37.59	23.21	54.00	-30.79	Vertical	Average		

5.10. Band edge and Spurious Emissions (conducted)

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d):In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

TEST CONFIGURATION



TEST PROCEDURE

- 1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
- 2. Set to the maximum power setting and enable the EUT transmit continuously
- Use the following spectrum analyzer settings: RBW = 100 kHz, VBW ≥ RBW, scan up through 10th harmonic. Sweep = auto, Detector function = peak, Trace = max hold
- 4. Measure and record the results in the test report.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

☑ Passed □ Not Applicable

Test Item:	Band edge		Modu	lation t	уре:	GFSK	
	R • A	ectrum ff Level 20.00 dBm t 30 dB int 500/500			: Mode Auto Sweep		
		< Max			M1[1]	2.4021	30 dBm 180 GHz
	0 d -10	m			M2[1]		58 85m 100 6Hz
		dBm D1 -16.700 dB	3m				
CH00 No hopping mode	-50 4	dBm				M3	Ma
	-70	dBm					
		Ref Trc M1 1 M2 1	X-value 2.40218 GHz 2.4 GHz	691) Y-value 3.30 dBr -51.58 dBr	Function n	Stop 2.44 Function Result	15 GHz
		M3 1 M4 1 M5 1	2.39 GHz 2.31 GHz 2.399768 GHz	-58.81 dBr -58.76 dBr -53.55 dBr	n	19 (1999) 19 199	
		ectrum	Offset 1.00 de	BBW 100 Pu-	,		
	- A Co				Mode Auto Sweep		
	10 0 d	IBm			M1[1] M2[1]	2.4042	16 dBm 240 GHZ 65 dBm 300 GHP
		dBm	3m				
CH00	-40	dBm					M82
Hopping mode	4 -60	dBm	unter and the second of the	underson and an and an	harmanaan		N ⁹
	Mar			691		Stop 2.40	D5 GHz
		De Ref Trc M1 1 M2 1 M3 1 M4 1 M5 1	X-value 2.40424 GHz 2.4 GHz 2.39 GHz 2.31 GHz 2.39908 GHz	Y-value 4.16 dBr -51.65 dBr -56.15 dBr -57.24 dBr -52.08 dBr	n n	Function Result	
					Measurin	19 (1999) (1999)	(W)
	R A _ Co	nt 500/500	Offset 1.00 dB SWT 56.9 µs				
		K Max			M1[1] M2[1]	2.47983	20 dBm
	-10 -20	dBm D1 -16.220 dE	3m				
CH78 No hopping mode	-40	dBm					
	-60	dBm V dBm dBm	M2 Man	nanangi nadi	man and called	**************************************	s returning
	Sta	rt 2.478 GHz ker		691		Stop 2	.5 GHz
		De Ref Trc M1 1 M2 1 M3 1 M4 1	X-value 2.479831 GHz 2.4835 GHz 2.5 GHz 2.484058 GHz	Y-value 3.78 dBr -57.20 dBr -60.11 dBr -54.74 dBr	n	Function Result	
					Measurin		

Report No.: TRE1808004301

	Spectrum Ref Level 20.00 dBm Offset 1. Att 30 dB SWT 56 Count 500/500	10 dB — RBW 100 kHz .9 µs — VBW 300 kHz Мос	de Auto FFT	
	1Pk Max			
			M1[1] M2[1]	5.37 dBm 2.4780160 GHz -58.38 dBm 2.4835000 GHz
	-10 dBm D1 -14.630 dBm			
0170	-20 dBm			
CH78 opping mode	-40 dBm			
	-60 dBm	Vyhr.p.r.	non and a second	
	-70 dBm			Stop 2.5 GHz
	Marker	691 pts		Stop 2.5 GHZ
	Type Ref Trc X-value		unction Fun	ction Result
	M1 1 2.478010 M2 1 2.4833 M3 1 2.1			
	M4 1 2.483930			
			Measuring	6/0

Test Item:	Band edge		Modu	lation t	ype:	π/4DQP	SK
	Sp R	ectrum af Level 20.00 dBm tt 30 dB unt 500/500	Offset 1.00 dB (• RBW 100 kHz			
	● 11 10	// SUU/SUU k Max //Bm			M1[1] M2[1]	-0.13 2.40204(-38.55 2.40000()GHz ¢∰m
	-20	dBm D1 -20.130 df	Bm			M	
CH00 No hopping mode	-50 #38	dBm	determine	warman	warden	M3	
	stu Mar	dBm rt 2.31 GHz ker pe Ref Trc	X-value	691 p Y-value	Function	Stop 2.405 Function Result	GHz
		M1 1 M2 1 M3 1 M4 1 M5 1	2.40204 GHz 2.4 GHz 2.39 GHz 2.31 GHz 2.399906 GHz	-0.13 dBn -38.55 dBn -58.98 dBn -59.05 dBn -43.48 dBn	n	o	
		ectrum					
	• • 	af Level 20.00 dBm tt 30 dB unt 500/500 k Max			Mode Auto Sweep		<u> </u>
	10	/Bm			M1[1] M2[1]	-0.07 2.404110 -41.26 2.400000) GHz dBm
	-20	dBm D1 -20.070 d8	Bm				
CH00 Hopping mode	-50	dBm dBm dBm	an a	الم المراجع المراجع المراجع الم	han and a sugar and a sugar	M3	
	. Sta Mai	dBm rt 2.31 GHz ker		691 p		Stop 2.405	GHz
		pe Ref Trc M1 1 M2 1 M3 1 M4 1 M5 1	X-value 2.40411 GHz 2.4 GHz 2.39 GHz 2.31 GHz 2.399906 GHz	Y-value -0.07 dBn -41.26 dBn -58.18 dBn -58.47 dBn -46.11 dBn	n	Function Result	
					Measurin	• • • • • • • • • • • • • • • • • • • •	(₩)
	R A Co	ectrum af Level 20.00 dBm tt 30 dB unt 500/500 k Max	Offset 1.00 dB (SWT 56.9 μs (
	10	dBm M1 3m M1			M1[1] M2[1]	0.40 2.479990(-56.79 2.483500() GHz I dBm
<u>∩⊔70</u>	26	dBm D1 -19.600 df	Bm				
CH78 No hopping mode	-50		M2 M4		America and	Maria and a state of a state	N North Contraction
	Sta	dBm		691 g	ots	Stop 2.5	GHz
		ker Trc M1 1 M2 1 M3 1 M4 1	X-value 2.47999 GHz 2.4835 GHz 2.5 GHz 2.4858435 GHz	Y-value 0.40 dBn -56.79 dBn -58.93 dBn -57.06 dBn	n	Function Result	
			2300733 GHZ	S7.00 UBI	Measurin		

Report No.: TRE1808004301

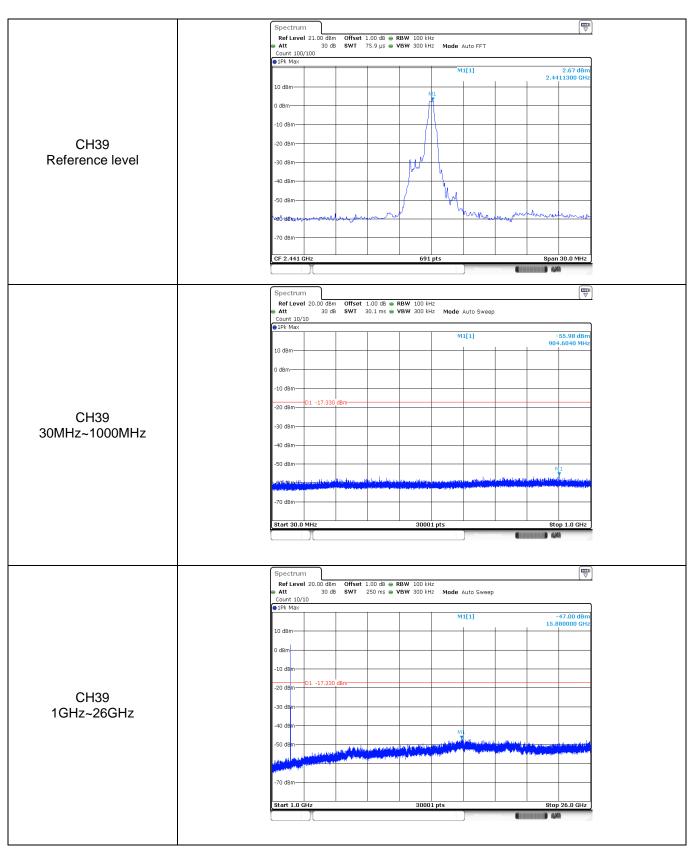
	Spectrum Ref Level 20.00 dBm Offset 1.00 dB Att 30 dB SWT 56.9 µs Count 500/500 9 IPK Max	● RBW 100 kHz ● VBW 300 kHz Mode Auto FF [*]	T
CH78 Hopping mode	10 dBm 10 dBm -10 dBm -20 dBm -30 dBm -40 dBm -40 dBm	M1[1] M2[1]	3.08 dBm 2.4780106 GHz 5-49 dBm 2.4835000 GHz
	Start 2.478 GHz	691 pts	Stop 2.5 GHz
	Marker Type Ref Trc X-value M1 1 2.478016 GHz M2 1 2.4835 GHz M3 1 2.5 GHz M4 1 2.4849826 GHz	Y-value Function 3.08 dBm - -54.91 dBm - -59.19 dBm - -50.39 dBm -	Function Result

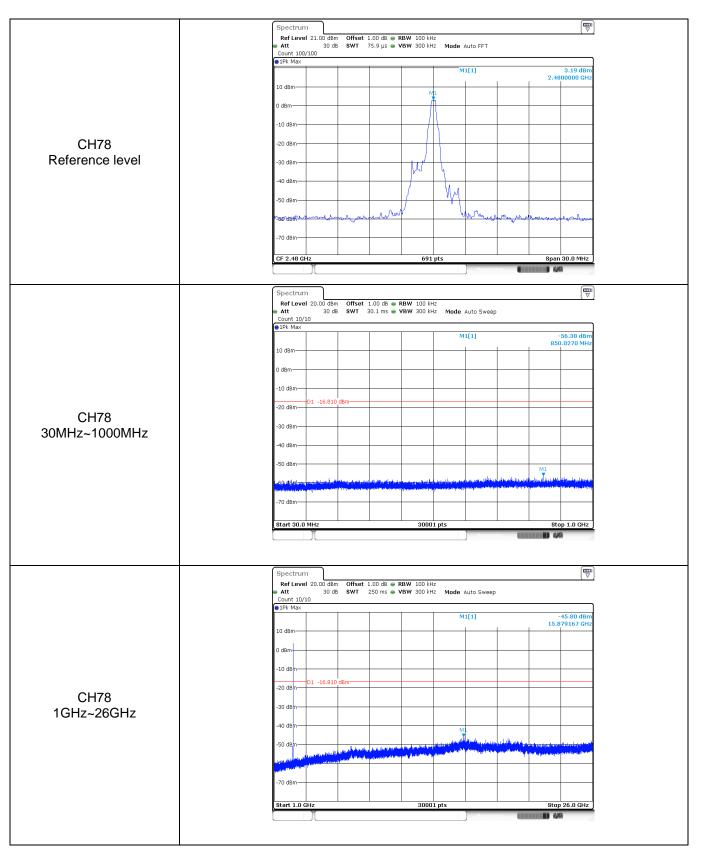
Test Item:	Band edge	Modulation type:	8DPSK
	Spectrum	00 dBm Offset 1.00 dB • RBW 100 kHz 30 dB SWT 1.1 ms • VBW 300 kHz Mode Auto Sw	eep
	Court Sobyson PIPK Max 10 dBm 0 dBm	M1[1] M2[1]	-0.16 dBm 2.401770 GHz -38.01 dệm 2.400000 ¥Hz
	-10 dBm	20.160 dBm	
CH00 No hopping mode	-40 d8m -50 d8m + 50 d8m	unter and the second of the se	M2 M
	-70 dBm Start 2,31 GHz Marker Type Ref T	691 pts	Stop 2.405 GHz
	M1 M2 M3 M4	1 2.40177 GHz -0.16 dBm 1 2.4 GHz -38.01 dBm 1 2.39 GHz -58.31 dBm 1 2.31 GHz -58.41 dBm 1 2.39905 GHz -43.68 dBm	
	Spectrum		
CH00	Ref Level 20. Att Count 500/500 1Pk Max	00 dBm Offset 1.00 dB ● RBW 100 kHz 30 dB SWT 1.1 ms ● VBW 300 kHz Mode Auto Sw	
	10 dBm	M1[1] M2[1]	0.80 dBm 2.404930 GHz -38.83 dBm 2.400000 GHz
		19.200 dBm	
Hopping mode	-50 dBm	Marine Marine Marine Mark Mark Market Market	M3
	Start 2.31 GHz Marker Type Ref T	c X-value Y-value Function	Stop 2.405 GHz
	M1 M2 M3 M4 M5	1 2.40493 GHz 0.80 dBm 1 2.4 GHz -38.83 dBm 1 2.93 GHz -58.87 dBm 1 2.31 GHz -58.25 dBm 1 2.399768 GHz -46.59 dBm	
	Spectrum		
	Ref Level 20. Att Count 500/500 Pk Max	00 dBm Offset 1.00 dB ● RBW 100 kHz 30 dB SWT 56.9 µs ● VBW 300 kHz Mode Auto FF	
	10 dBm 0 dBm	M1(1) M2(1) M2(1)	0.51 dBm 2.4798310 GHz -57,54 dBm 2.4835000 GHz
CH78 No hopping mode	-10 d8m - 20 d8 m-D1 -30 d8m	19.490 dam-	
	-50 dBm	Ma Ma	
	-70 dBm	z 691 pts	Stop 2.5 GHz
	Marker Type Ref T M1 M2 M3 M3 4 M4	C X-value Y-value Function 1 2.479831 GHz 0.51 dBm 1 1 2.4935 GHz -57.54 dBm 1 2.5 GHz -60.84 dBm 1 2.4791701 GHz -57.45 dBm	Function Result
		Me	sueing

Report No.: TRE1808004301

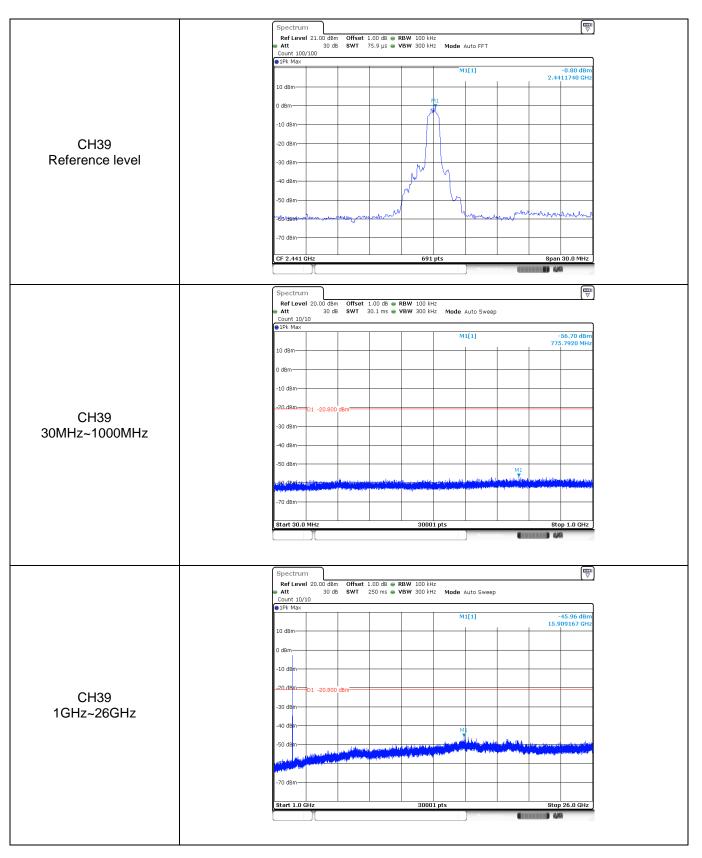
	Spectrum Ref Level 20.00 dBm Offse Att 30 dB SWT Count 500/500	t 1.00 dB 👄 RBW 100 kHz 56.9 µs 👄 VBW 300 kHz	Mode Auto FFT		
CH78 Hoppig mode	-10 dBm -10 dBm -10 dBm -20 dBm -30 dBm -40 dBm	My My My My My My My My My My My My My M	M1[1] M2		3.07 dBm 4781430 GHz -55.48 dBm 4835000 GHz
	Start 2.478 GHz Marker Type Ref Trc X-va	691 pts	Function	Function Resu	top 2.5 GHz
	M1 1 2.4' M2 1 2 M3 1 1	8143 GHz 3.07 dBm 4835 GHz -55.48 dBm 2.5 GHz -58.49 dBm 9826 GHz -49.63 dBm	Meas	oriog	

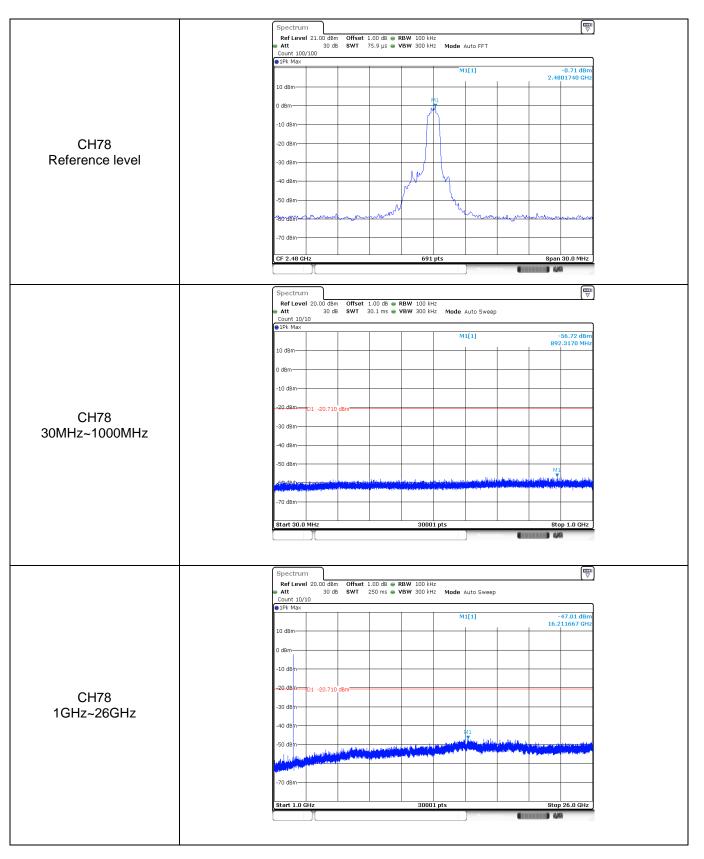
Test Item:	SE	Modulation type: GFSK
		Spectrum Image: Constraint of the sector of th
CH00		-10 dBm
Reference level		-30 dBm
		-70 dBm
		CF 2.402 GHz 691 pts Span 30.0 MHz
		Spectrum Image: Constraint of the sector of th
0 1100		0 dBm
CH00 30MHz~1000MHz		-30 dBm
		-50 dBm - All and a start of the start of th
		Start 30.0 MHz 30001 pts Stort 30.0 MHz
		Spectrum
		Count 10/10
		0 dBm
CH00 1GHz~26GHz		-30 dEm
		-70 dBm Start 1.0 GHz 30001 pts Stop 26.0 GHz



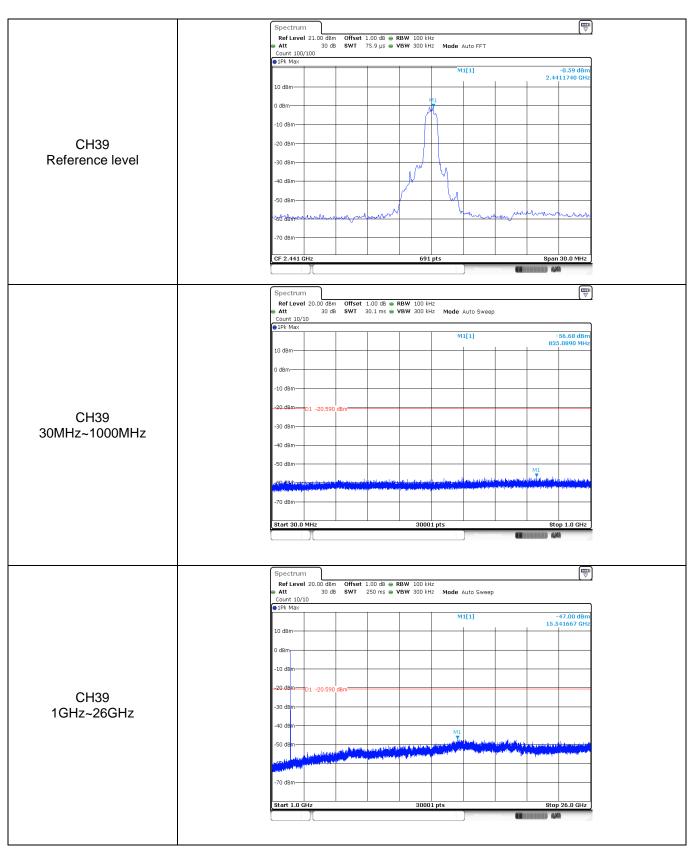


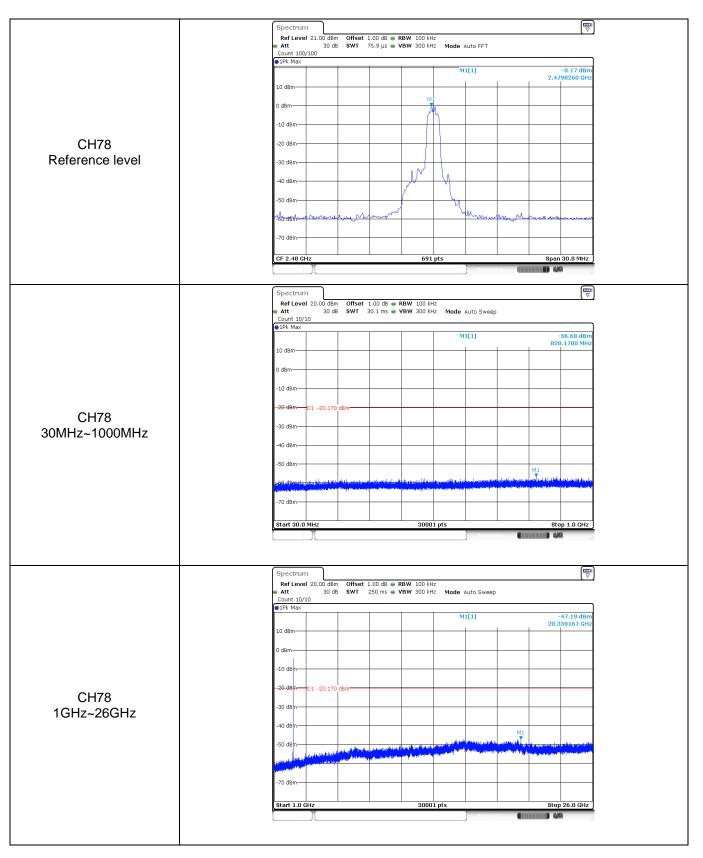
est Item:	SE		Modula	ation typ	e:	π/40	QPSK
		Spectrum					
			Offset 1.00 dB ● SWT 75.9 µs ●	RBW 100 kHz VBW 300 kHz N	ode Auto FFT		
		●1Pk Max			M1[1]		-1.27 dBm
		10 dBm				2.	4021740 GHz
		0 dBm		111			
		-10 dBm		M			
		-20 dBm					
CH00		-30 dBm					
Reference level				w h			
		-40 dBm		N			
		-50 dBm		v	maria		
		~801.48m			- Burnet	and duty and a set of a set	a the construction of the
		-70 dBm					
		CF 2.402 GHz		691 pts	Measurin	Sp.	an 30.0 MHz
		Spectrum					
		Ref Level 20.00 dBm C		RBW 100 kHz VBW 300 kHz N	lode Auto Sween		(*)
		Count 10/10 P1Pk Max					
		10 dBm			M1[1]	1	-56.43 dBm 53.5190 MHz
		0 dBm					
		-10 dBm					
CH00		-20 dBm D1 -21.270 dBm					
30MHz~1000MHz		-30 dBm					+
		-40 dBm					+
		-50 dBm				M1	
		-69.dBm+	filt altigt av attend diesta av				nd difference and plated
		-70 dBm					+
		Start 30.0 MHz		30001 pts			Stop 1.0 GHz
					Measurir	10	4 / 41
		Spectrum Ref Level 20.00 dBm C					
		● Att 30 dB S Count 10/10 ● 1Pk Max	SWT 250 ms 🖷	VBW 300 kHz N	ode Auto Sweep		
		THK MGX			M1[1]	16	-46.76 dBm 6.264167 GHz
		10 dBm					
		0 dBm					+
		-10 dBm					+
CH00		-20 dBmD1 -21.270 dBm					+
1GHz~26GHz		-30 dBm					+
		-40 dBm			M1		
		-50 dBm	Material and the strategies	Langelan and the land	and Time, deares,	lestentia late que encertante que este	and the defense of the ball
		a provide a second s	A Britshell (1997) A Britshell (1997) A Britshell (1997) A Britshell (1997)	- Makanana harana di	and the state of the	aller Martha Aller Andrew Andrew	and an a second s
		-70 dBm					
		Start 1.0 GHz		30001 pts			op 26.0 GHz





est Item:	SE		Modul	ation type):	8DPSK	
		Spectrum	n Offset 1.00 dB 👄	PBW 100 bu-			
				VBW 300 kHz Mod	e Auto FFT		
		● 1Pk Max			M1[1]	-0.5	5 dBm
		10 dBm				2.402174	
				111			
		0 dBm		Mh -			
		-10 dBm					
CH00		-20 dBm					
Reference level		-30 dBm					
		-40 dBm		<u> </u>			
		-50 dBm		\downarrow	<u>+</u>		
		1290,4940000000000000000	montester	A	howworks	man same	40. Ann
		-70 dBm-					
		25.0.000.000					
		CF 2.402 GHz		691 pts	Measuring	Span 30.0	MHZ
		Spectrum					E
		Ref Level 20.00 dBn	n Offset 1.00 dB ● 3 SWT 30.1 ms ●	RBW 100 kHz VBW 300 kHz Mod	ie Auto Sween		<u> </u>
		Count 10/10			- varo oweeh		
					M1[1]	-56.42 718.273	
		10 dBm					
		0 dBm					
		-10 dBm					
		-20 dBm-D1 -20.550	dBm				
CH00		-30 dBm					
30MHz~1000MHz		-40 dBm					
		-50 dBm			11 1 11	و من	. I
		(±60° dB married and the little of	herrettinister frederikere die Gereit. Die bestelltere gereine der die	a la contra de la co La contra de la contr			ang dan sang
		-70 dBm		+ +			
		Start 30.0 MHz		30001 pts		Stop 1.0	GHz
					Measuring	4/0	
	1	Spectrum					
		🕳 Att 30 de	n Offset 1.00 dB 🖷 8 SWT 250 ms 🖷	RBW 100 kHz VBW 300 kHz Mod	e Auto Sweep		
		Count 10/10 Plk Max			MILL		a dD ma
		10 dBm			M1[1]	-46.90 15.91083	
		0 dBm					
		-10 dBm					
CH00		20.dBm	dBm	+ +			
1GHz~26GHz		-30 dBm					_
		-40 dBm		+	ML		
		-50 dBm	الالع فانترجمي ورواجعا فالعراق	Sector Street	Terre and and	where the state of the state	
		يال الجميل وجاريل المحالية المحالية المحالية . معاد معاد محرورة المحالية المحالية المحالية .	a plan at the first of a straight of the strai	in the house of the second second	and a strange of the	NATE OF A DECEMBER OF A DEC	na kindele
		-70 dBm					
		-70 u8m					
		Start 1.0 GHz	· · · · ·	30001 pts	Macanuta	Stop 26.0	GHz
					Measuring		





5.11. Spurious Emissions (radiated)

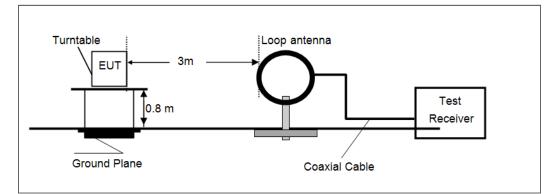
<u>LIMIT</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.209

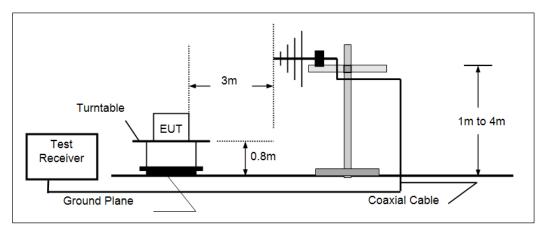
Frequency	Limit (dBuV/m @3m)	Value
30 MHz ~ 88 MHz	40.00	Quasi-peak
88 MHz ~ 216 MHz	43.50	Quasi-peak
216 MHz ~ 960 MHz	46.00	Quasi-peak
960 MHz ~ 1 GHz	54.00	Quasi-peak
Above 1 GHz	54.00	Average
	74.00	Peak

TEST CONFIGURATION

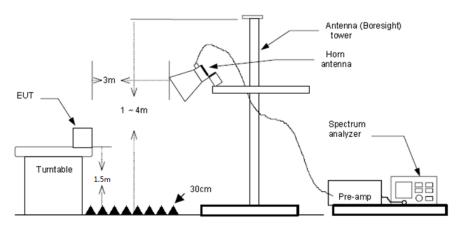
Below 30 MHz



> 30 MHz ~1000 MHz



> Above 1 GHz



TEST PROCEDURE

- 1. The EUT was tested according to ANSI C63.10:2013.
- 2. The EUT is placed on a turn table with 0.8 meter above ground for below 1GHz, 1.5 meter above ground for above 1GHz.
- 3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
- 4. For each suspected emission, 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 to comply with the guidelines.
- 5. Set to the maximum power setting and enable the EUT transmit continuously.
- 6. Use the following spectrum analyzer settings
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Below 1 GHz:

RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold; If the emission level of the EUT measured by the peak detectoris 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

 (3) From 1 GHz to 10th harmonic: RBW=1 MHz, VBW=3 MHz Peak detector for Peak value RBW=1 MHz, VBW=10 Hz Peak detector for Average value.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

☑ Passed □ Not Applicable

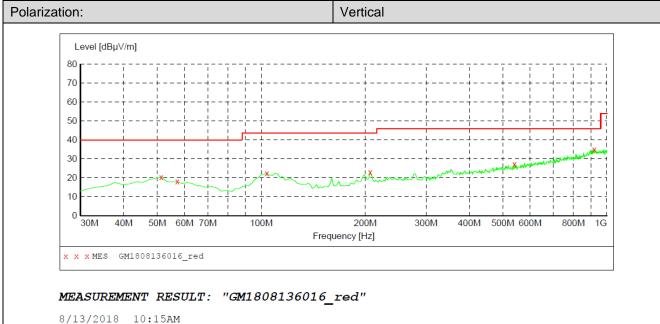
Note:

- 1) Final Level = Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor
- 2) The emission levels of other frequencies are very lower than the limit and not show in test report.
- 3) Below 1 GHz, Have pre-scan all modulation mode, found the GFSK modulation High channel which it was worst case, so only the worst case's data on the test report.
- 4) Above 1 GHz, Have pre-scan all modulation mode, found the GFSK modulation which it was worst case, so only the worst case's data on the test report
- 5) The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.

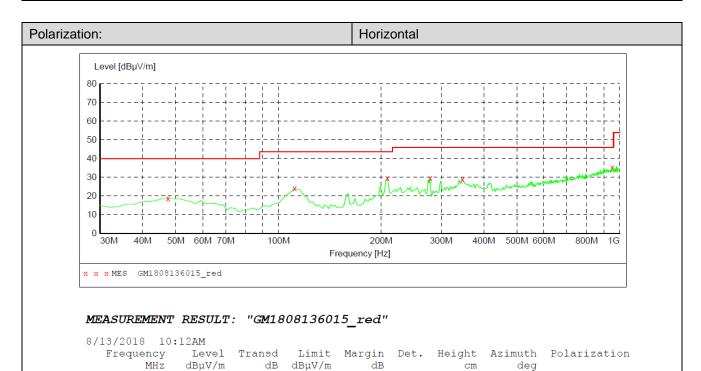
➢ 9 kHz ~ 30 MHz

The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.





Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
51.340000	20.30	-8.8	40.0	19.7	QP	100.0	252.00	VERTICAL
57.160000	18.00	-9.4	40.0	22.0	QP	100.0	92.00	VERTICAL
103.720000	22.40	-10.5	43.5	21.1	QP	100.0	320.00	VERTICAL
206.540000	22.80	-10.5	43.5	20.7	QP	100.0	0.00	VERTICAL
540.220000	27.20	-1.0	46.0	18.8	QP	100.0	0.00	VERTICAL
918.520000	34.80	7.0	46.0	11.2	QP	100.0	53.00	VERTICAL



	1 1		1 1				2	
47.460000	18.60	-8.8	40.0	21.4	QP	100.0	227.00	HORIZONTAL
111.480000	24.00	-11.0	43.5	19.5	QP	100.0	356.00	HORIZONTAL
208.480000	29.50	-10.5	43.5	14.0	QP	100.0	252.00	HORIZONTAL
278.320000	29.50	-7.8	46.0	16.5	QP	100.0	267.00	HORIZONTAL
346.220000	28.90	-5.4	46.0	17.1	QP	100.0	80.00	HORIZONTAL
951.500000	35.20	7.3	46.0	10.8	QP	100.0	159.00	HORIZONTAL

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> 1 GHz ~ 25 GHz

CH00									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
1198.10	49.30	26.29	4.66	37.23	43.02	74.00	-30.98	Vertical	Peak
1795.84	49.82	25.39	5.95	37.40	43.76	74.00	-30.24	Vertical	Peak
4809.50	40.17	31.58	9.55	35.72	45.58	74.00	-28.42	Vertical	Peak
7209.02	33.76	36.21	11.87	33.51	48.33	74.00	-25.67	Vertical	Peak
1593.34	48.19	24.96	5.55	37.18	41.52	74.00	-32.48	Horizontal	Peak
1791.27	46.84	25.38	5.94	37.40	40.76	74.00	-33.24	Horizontal	Peak
4809.50	39.43	31.58	9.55	35.72	44.84	74.00	-29.16	Horizontal	Peak
7961.43	31.90	36.95	12.49	33.07	48.27	74.00	-25.73	Horizontal	Peak

CH39									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
1791.27	49.09	25.38	5.94	37.40	43.01	74.00	-30.99	Vertical	Peak
3184.25	40.27	28.80	7.70	37.41	39.36	74.00	-34.64	Vertical	Peak
4883.52	39.42	31.43	9.59	35.58	44.86	74.00	-29.14	Vertical	Peak
7319.96	33.15	36.30	11.99	33.32	48.12	74.00	-25.88	Vertical	Peak
1395.80	46.46	25.91	4.99	37.12	40.24	74.00	-33.76	Horizontal	Peak
1791.27	43.56	25.38	5.94	37.40	37.48	74.00	-36.52	Horizontal	Peak
4883.52	38.97	31.43	9.59	35.58	44.41	74.00	-29.59	Horizontal	Peak
8792.37	31.45	37.72	13.09	32.98	49.28	74.00	-24.72	Horizontal	Peak

CH78									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
1198.10	50.33	26.29	4.66	37.23	44.05	74.00	-29.95	Vertical	Peak
1795.84	49.44	25.39	5.95	37.40	43.38	74.00	-30.62	Vertical	Peak
4958.68	38.88	31.46	9.64	35.45	44.53	74.00	-29.47	Vertical	Peak
7451.57	34.45	36.20	12.24	33.10	49.79	74.00	-24.21	Vertical	Peak
1198.10	47.76	26.29	4.66	37.23	41.48	74.00	-32.52	Horizontal	Peak
4076.07	34.73	29.85	8.84	36.68	36.74	74.00	-37.26	Horizontal	Peak
4785.08	37.19	31.54	9.53	35.76	42.50	74.00	-31.50	Horizontal	Peak
7451.57	36.00	36.20	12.24	33.10	51.34	74.00	-22.66	Horizontal	Peak

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss - Preamplifier Factor

2. The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.

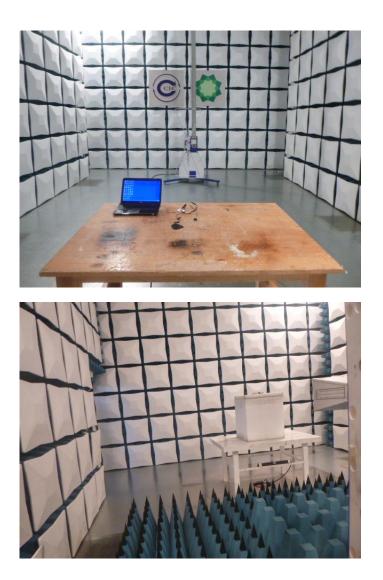
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

6. TEST SETUP PHOTOS

Conducted Emissions (AC Mains)



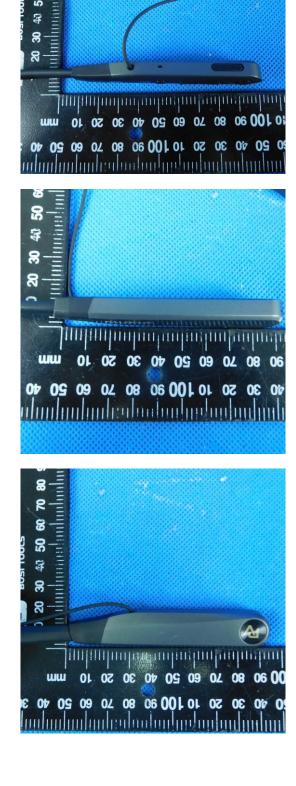
Radiated Emissions



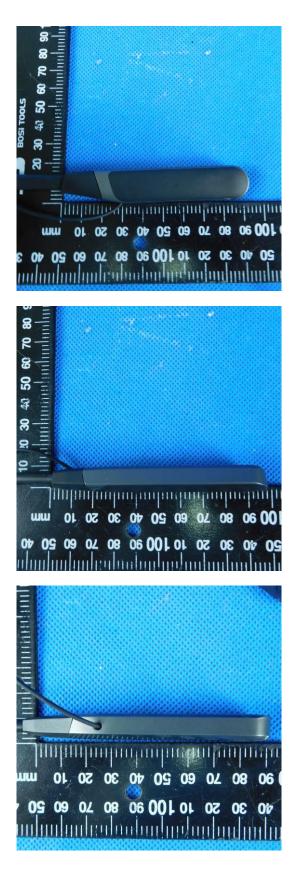
7. EXTERANAL AND INTERNAL PHOTOS

EXTERANAL PHOTOS





3



INTERNAL PHOTOS



