

CTC Laboratories, Inc.

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China

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TEST REPORT				
Report No. ·····:	CTC2024205902			
FCC ID:	2AQ5R-HM-5U			
Applicant:	Shenzhen KTC Commercial Display	/ Technology Co.,LTD.		
Address······	No.4023,Northern Wuhe Road,Bantia trict,Shenzhen City,Guangdong Provir			
Manufacturer	Shenzhen Bluesource Electronics Tec	hnology Co., Ltd		
Address:	Building 5A1103, Huaqiang IdeaPark, zhen, China	Guangming District, Shen-		
Product Name······:	Speakerphone			
Trade Mark:	/			
Model/Type reference······:	HM-5U			
Listed Model(s) ······	/			
Standard:	FCC CFR Title 47 Part 15 Subpart C Section 15.247			
Date of receipt of test sample:	Aug. 23, 2024			
Date of testing	Aug. 23, 2024 ~ Sept. 25, 2024			
Date of issue:	Sept. 26, 2024			
Result:	PASS			
Compiled by:		T: Jima		
(Printed name+signature)	Jim Jiang	Jim f		
Supervised by:		Jim Jiang Zoic zhang		
(Printed name+signature)	Eric Zhang	BACZA		
Approved by: (Printed name+signature)	Totti Zhao	Johnas		
		Ø		
Testing Laboratory Name:	CTC Laboratories, Inc.			
Address	Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China			
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1. TEST SUMMARY

1.1. Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.247: Operation within the bands of 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz.

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

1.2. Report Version

Revised No.	Report No.	Date of issue	Description
01	CTC2024205902	Sept. 26, 2024	Original

1.3. Test Description

FCC Part 15 Subpart C (15.247)					
Test Item	Standard Section	Decult	Test Engineer		
rest item	FCC	Result			
Antenna Requirement	15.203	Pass	Jim Jiang		
Conducted Emission	15.207	Pass	Jim Jiang		
Restricted Bands	15.205	Pass	Jim Jiang		
Hopping Channel Separation	15.247(a)(1)	Pass	Jim Jiang		
Dwell Time	15.247(a)(iii)	Pass	Jim Jiang		
Peak Output Power	15.247(b)(1)	Pass	Jim Jiang		
Number of Hopping Frequency	15.247(a)(iii)	Pass	Jim Jiang		
Conducted Band Edge and Spu- rious Emissions	15.247(d)	Pass	Jim Jiang		
Radiated Band Edge and Spurious Emissions	15.205&15.209& 15.247(d)	Pass	Jim Jiang		
Radiated Spurious Emission	15.247(d)&15.209	Pass	Jim Jiang		
20dB Bandwidth	15.247(a)	Pass	Jim Jiang		

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

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Laboratory accreditation

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

A2LA-Lab Cert. No.: 4340.01

CTC Laboratories, Inc. 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.

Industry Canada (Registration No.: 9783A, CAB Identifier: CN0029)

CTC Laboratories, Inc. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9783A on Jan, 2016.

FCC (Registration No.: 951311, Designation Number CN1208)

CTC Laboratories, Inc. 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 inour files. Registration 951311, Aug 26, 2017.

1.5. 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 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 radio equipment characteristics; Part 2" and is documented in the CTC Laboratories, Inc. 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.

Below is the best measurement capability for CTC Laboratories, Inc.



Test Items	Measurement Uncertainty	Notes
RF output power	± 1.24 dB	(1)
Power Spectral Density	±1.88 dB	(1)
Duty Cycle	±0.566 dB	(1)
Tx-sequence	±0.566 dB	(1)
Тх-дар	±0.566 dB	(1)
Medium Utilization (MU) factor	±0.566 dB	(1)
Dwell time	±0.028%	(1)
Minimum Frequency Occupation	±0.028%	(1)
Hopping Sequence	±1.9%	(1)
Hopping Frequency Separation	±1.9%	(1)
Occupied Channel Bandwidth	±0.0196%	(1)
Transmitter unwanted emissions in the out-of-band domain	±1.328dB	(1)
Transmitter unwanted emissions in the spurious domain	30MHz~1GHz: ±0.746dB 1GHz~12.75GHz: ±1.328dB	(1)
Receiver spurious emissions	30MHz~1GHz: ±0.746dB 1GHz~12.75GHz: ±1.328dB	(1)

Note (1): This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.6. Environmental Conditions

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

Temperature:	21°C ~ 27°C
Relative Humidity:	40% ~ 60%
Air Pressure:	101kPa

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2. GENERAL INFORMATION

2.1. Client Information

EN

Applicant:	Shenzhen KTC Commercial Display Technology Co.,LTD.
Address:	No.4023,Northern Wuhe Road,Bantian Street, Longgang Dis- trict,Shenzhen City,Guangdong Province,P.R.
Manufacturer:	Shenzhen Bluesource Electronics Technology Co., Ltd
Address:	Building 5A1103, Huaqiang IdeaPark, Guangming District, Shenzhen, China

2.2. General Description of EUT

Product Name:	Speakerphone		
Trade Mark:	/		
Model/Type reference:	HM-5U		
Listed Model(s):	/		
Model Difference:	/		
Power supply:	DC 15V 2.4A from adapter		
Hardware version:	/		
Software version:	/		
Bluetooth 5.0/ BR/EDR			
Modulation:	GFSK, π/4-DQPSK		
Operation frequency:	2402MHz~2480MHz		
Channel number:	79		
Channel separation:	1MHz		
Antenna type:	PCB Antenna		
Antenna gain:	1.72dBi		

Note: The EUT contains two Bluetooth modules with the same PCB, layout and electrical circuit. This report only records the test data of one module.

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2.3. Accessory Equipment Information

Equipment Information						
Name Model S/N Manufacturer						
Notebook ThinkBook 14 G3 ACL		/	Lenovo			
USB TO TTL	/	/	/			
Adapter	FJ-SW248G1502400N /		FUJIA			
Cable Information	Cable Information					
Name Shielded Type Ferrite Core Length						
USB Cable	Unshielded	Without	100cm			
Test Software Information						
Name / / / /						
FCC assist	1.0.2.2	/	/			

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2.4. Operation State

Operation Frequency List: The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing. BT EDR, 79 channels are provided to the EUT. Channels 00/39/78 were selected for testing.

Operation Frequency List:

Channel	Frequency (MHz)
00	2402
01	2403
:	:
38	2440
39	2441
40	2442
:	:
77	2479
78	2480

Note: The display in grey were the channel selected for testing.

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 spurious 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.



2.5. Measurement Instruments List

	RF Test System - SRD					
Item	tem Test Equipment Manufacturer Model No. Serial No. Calibrate					
1	1 Spectrum Analyzer Keys		N9020A	MY52091402	Aug. 21, 2025	
2	USB Wideband Power Sensor	Keysight	U2021XA	MY55130004	Mar. 21 2025	
3	USB Wideband Power Sensor	Keysight	U2021XA	MY55130006	Mar. 21 2025	
4	Test Software	Tonscend	JS1120-3	V3.3.38	/	

	Radiated emission					
Item Test Equipment Manufacturer Model No. Serial No. Calib						
1	Trilog-Broadband Antenna	Schwarzbeck	VULB 9163	01026	Dec. 18, 2024	
2	Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-647	Sep. 25, 2025	
3	Test Receiver	Keysight	N9038A	MY56400071	Dec. 12, 2024	
4	Broadband Amplifier	SCHWARZBECK	BBV9743B	259	Dec. 12, 2024	
5	Mirowave Broadband Amplifier	SCHWARZBECK	BBV9718C	111	Dec. 12, 2024	
6	3m chamber 3	YIHENG	EE106	/	Aug. 28, 2026	
7	Test Software	FARA	EZ-EMC	FA-03A2	/	

	Conducted emission												
Item	Test Equipment	Calibrated until											
1	LISN	R&S	ENV216	101112	Dec. 12, 2024								
2	LISN	R&S	ENV216	101113	Dec. 12, 2024								
3	EMI Test Receiver	R&S	ESCS30	100353	Dec. 12, 2024								
4	ISN CAT6	Schwarzbeck	NTFM 8158	CAT6-8158-0046	Dec. 12, 2024								
5	ISN CAT5	Schwarzbeck	NTFM 8158	CAT5-8158-0046	Dec. 12, 2024								
6	Test Software	R&S	EMC32	6.10.10	/								

Note: 1. The Cal. Interval was one year.

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2. The cable loss has calculated in test result which connection between each test instruments.

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3.1. Conducted Emission

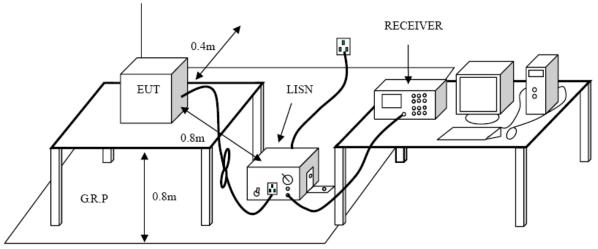
Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.207

	Limit (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			

* Decreases with the logarithm of the frequency.

Test Configuration



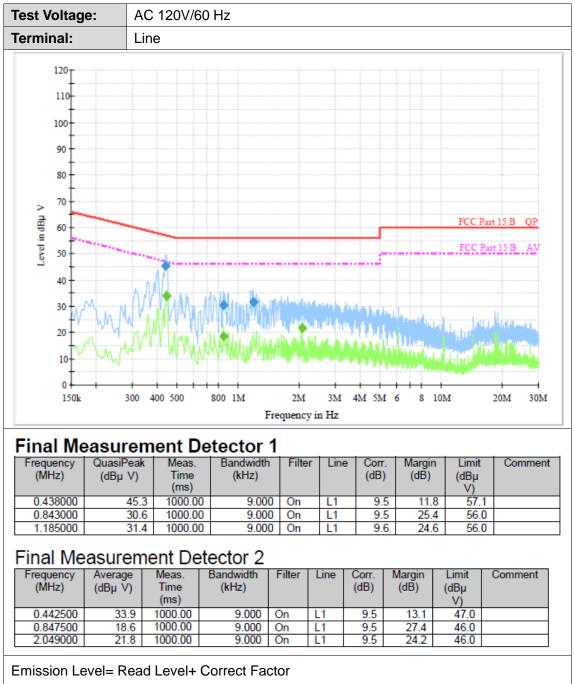
Test Procedure

- 1. The EUT was setup according to ANSI C63.10:2013 requirements.
- The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting 2. 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.
- The EUT and simulators are connected to the main power through a line impedances stabilization 3. network (LISN). The LISN provides a 500hm /50uH coupling impedance for the measuring equipment. 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)
- Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was 4. individually connected through a LISN to the input power source.
- 5. 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.
- 6. Conducted Emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
- 7. During the above scans, the emissions were maximized by cable manipulation.

Test Mode

Please refer to the clause 2.4.

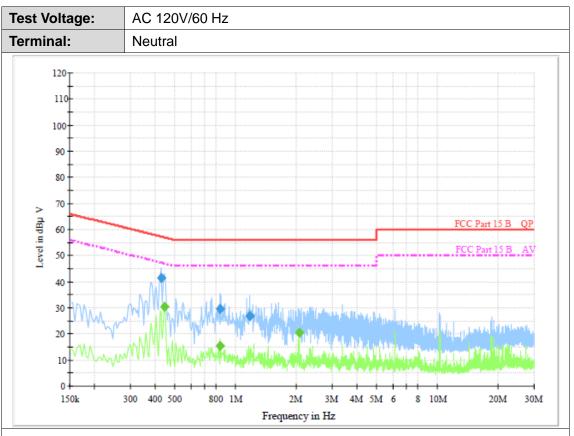




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Final Measurement Detector 1

	Frequency (MHz)	QuasiPeak (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
Γ	0.424500	41.5	1000.00	9.000	On	N	9.4	15.9	57.4	
Γ	0.838500	29.7	1000.00	9.000	On	N	9.4	26.3	56.0	
Γ	1.171500	26.8	1000.00	9.000	On	Ν	9.5	29.2	56.0	

Final Measurement Detector 2

	Frequency (MHz)	Average (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
ľ	0.442500	30.3	1000.00	9.000	On	N	9.4	16.7	47.0	
	0.838500	15.5	1000.00	9.000	On	N	9.4	30.5	46.0	
	2.049000	20.7	1000.00	9.000	On	Ν	9.4	25.3	46.0	

Emission Level= Read Level+ Correct Factor

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3.2. Radiated Emission

<u>Limit</u>

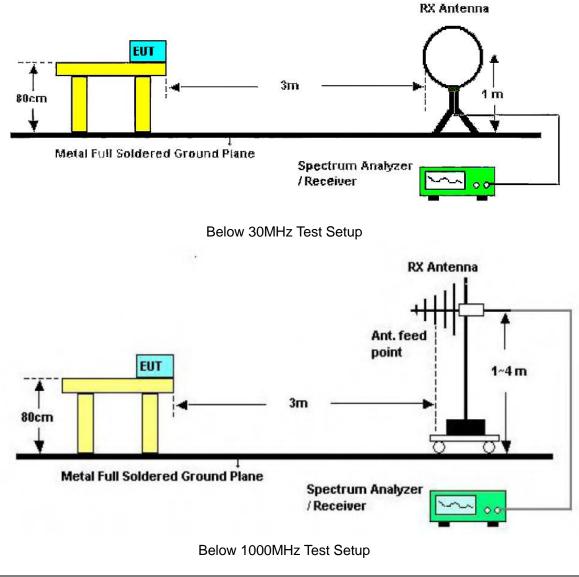
FCC CFR Title 47 Part 15 Subpart C Section 15.209

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
	54.00	Average
Above 1 GHz	74.00	Peak

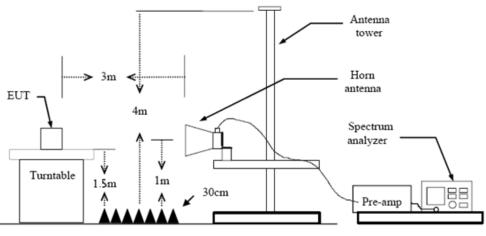
Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission Level (dBuV/m)=20log Emission Level (uV/m).

Test Configuration







Above 1GHz Test Setup

Test Procedure

1. The EUT was setup and tested according to ANSI C63.10:2013

2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.

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) 9k – 150kHz:

RBW=300 Hz, VBW=1 kHz, Sweep=auto, Detector function=peak, Trace=max hold (3) 0.15M – 30MHz:

RBW=10 kHz, VBW=30 kHz, Sweep=auto, Detector function=peak, Trace=max hold (4) 30M - 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 detector is 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.

(5) From 1 GHz to 10th harmonic:

RBW=1MHz, VBW=3MHz Peak detector for Peak value.

RBW=1MHz, VBW see note 1 with Peak Detector for Average Value.

Note 1: For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 3.8 Duty Cycle.

Test Mode

Please refer to the clause 2.4.

Test Result

9 KHz~30 MHz

From 9 KHz to 30 MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



nt. Po	ol.	Hori	zontal					
est M	ode:	ТХ (GFSK Mod	e 2402MHz				
Remar	k:	Only	y worse ca	se is reported	ł			
90.0 d	Bu¥/m							
80								
70								
60					F	CC Part 15 RE-Class	B 30-1000M	
50						largin -6 dB		
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30				ANN	of the house the fact	M Man Man	withmetholith	And And
20	montan	many	a. I hikit	payawa wata		- Chroniteente		
10		- Qawa	" When a different week					
0 -10								
30.000		60.00		(MHz)	300.	.00		1000.00
No.	Freque (MH	-	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecto
1	179.3	800	49.18	-17.67	31.51	43.50	-11.99	QP
2	191.9		54.73	-18.97	35.76	43.50	-7.74	QP
3	222.7		56.64	-18.57	38.07	46.00	-7.93	QP
4 *	363.0		52.86	-13.98	38.88	46.00	-7.12	QP
5	797.2		37.72	-3.83	33.89	46.00	-12.11	QP
6	893.6	233	35.50	-2.78	32.72	46.00	-13.28	QP

2.Margin value = Level -Limit value

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Ant. Po	Ι.	Vert	tical								
Test Mo	de:	ТХ	GFSł	< Mod	e 2402MHz						
Remark	:	Only	Only worse case is reported								
90.0 dB	u¥/m									T T]	
80											
70		_									
60		_									
50		_					FCC Part Margin -6	15 RE-Class	B 30-1000M		
40		_									
30		_		1	1	2	3 S		hu hadilari	5 5 	
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10	Murana	www.	mayus	JAM MA	· • • • • • • • • • • • • • • • • • • •						
0											
-10 30.000										1000.000	
30.000		60.00			(MHz)	3	00.00			1000.000	
No.	Freque (MHz		1	ading BuV)	Factor (dB/m)	Level		imit uV/m)	Margin (dB)	Detector	
	· ·	-/	(01	Juvj	(ab/m)	(dBuV/m		, , ,	· · ·		
1	118.91			4.05	-18.16	25.89		3.50	-17.61	QP	
1 2		66	44				43			QP QP	
-	118.91	66 66	44	4.05	-18.16	25.89	4:	3.50	-17.61		
2 3 4	118.91 215.91	66 66 00	44 49 45	4.05 9.58	-18.16 -18.80	25.89 30.78	4:	3.50 3.50	-17.61 -12.72	QP	
2 3	118.91 215.91 362.71	66 66 00 66	44 49 45 45	4.05 9.58 5.91	-18.16 -18.80 -13.99	25.89 30.78 31.92	4:	3.50 3.50 6.00	-17.61 -12.72 -14.08	QP QP	

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor 2.Margin value = Level -Limit value



ŀ	Ant. Pol.		Hori	zontal								
٦	lest Mo	de:	тх (TX GFSK Mode 2402MHz (BT Module 1)								
Remark:				eport for the bed limit.	emission v	vhich more t	han 20 dB b	elow the	pre-			
	No.	Frequer (MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector			
ľ	1	4387.9	17	40.59	1.11	41.70	74.00	-32.30	peak			
ľ	2	6416.7	50	38.76	7.11	45.87	74.00	-28.13	peak			
	3	8050.0	00	39.24	10.75	49.99	74.00	-24.01	peak			
ľ	4	9957.4	17	39.17	13.13	52.30	74.00	-21.70	peak			
ľ	5 *	11120.6	67	38.42	14.73	53.15	74.00	-20.85	peak			
	6	12444.5	500	37.32	15.62	52.94	74.00	-21.06	peak			

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Ant. Po	I.	Vert	ical					
Test Mo	de:	TX (GFSK Mode	2402MHz	(BT Module	1)		
Remark	K:		report for the ped limit.	emission v	which more t	han 20 dB b	elow the	pre-
No.	Frequer (MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4293.9	17	40.81	0.91	41.72	74.00	-32.28	peak
2	6428.5	00	40.24	7.14	47.38	74.00	-26.62	peak
3	8136.1	67	39.79	10.52	50.31	74.00	-23.69	peak
4	9522.6	67	38.48	12.59	51.07	74.00	-22.93	peak
5 *	10815.1	67	38.49	14.47	52.96	74.00	-21.04	peak
6	12201.6	67	37.23	15.72	52.95	74.00	-21.05	peak

EN

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value



An	nt. Pol	l.	Hori	zontal						
Te	TX GFSK Mode 2441MHz (BT Module 1)									
Re	emark	:		report for the bed limit.	emission v	vhich more t	han 20 dB b	elow the	pre-	
	No.	Frequer (MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	
	1	3968.8	33	41.55	0.42	41.97	74.00	-32.03	peak	
	2	6369.7	50	39.35	6.94	46.29	74.00	-27.71	peak	
	3	7388.0	83	39.35	10.09	49.44	74.00	-24.56	peak	
	4	8915.5	83	39.48	11.57	51.05	74.00	-22.95	peak	
	5	10396.0)83	38.96	13.88	52.84	74.00	-21.16	peak	
	6 *	12001.9	917	37.81	15.45	53.26	74.00	-20.74	peak	

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Ant. Po	I.	Vert	ical					
Test Mo	ode:	тх (GFSK Mode	2441MHz (BT Module	1)		
Remark	:		eport for the bed limit.	emission v	vhich more t	han 20 dB b	elow the	pre-
No.	Frequer (MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	3953.1	67	41.40	0.36	41.76	74.00	-32.24	peak
2	5974.1	67	40.04	5.56	45.60	74.00	-28.40	peak
3	7932.5	00	40.04	10.71	50.75	74.00	-23.25	peak
4	9197.5	83	39.33	12.35	51.68	74.00	-22.32	peak
5	10760.3	333	38.10	14.37	52.47	74.00	-21.53	peak
6 *	11927.5	500	37.76	15.32	53.08	74.00	-20.92	peak

Remarks:

EN

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor 2.Margin value = Level -Limit value



Remark: No rep		2480MHz (• >								
	ort for the		Test Mode: TX GFSK Mode 2480MHz (BT Module 1)									
scribed		emission w	/hich more t	han 20 dB b	elow the	pre-						
	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector						
1 3949.250	41.00	0.34	41.34	74.00	-32.66	peak						
2 7329.333	38.52	10.07	48.59	74.00	-25.41	peak						
3 9319.000	38.68	12.47	51.15	74.00	-22.85	peak						
4 10372.583	38.82	13.84	52.66	74.00	-21.34	peak						
5 11375.250	37.92	14.84	52.76	74.00	-21.24	peak						
6 * 12409.250	37.56	15.52	53.08	74.00	-20.92	peak						

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Ant. Po	l.	Vert	ical								
Test Mo	ode:	TX	TX GFSK Mode 2480MHz (BT Module 1)								
Remark	K :		report for the bed limit.	e emission v	which more t	han 20 dB t	pelow the	e pre-			
No.	Frequer (MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector			
1	4203.8	33	41.22	0.74	41.96	74.00	-32.04	peak			
2	6424.5	83	39.66	7.13	46.79	74.00	-27.21	peak			
3	7854.1	67	39.45	10.54	49.99	74.00	-24.01	peak			
4	8939.0	83	39.51	11.61	51.12	74.00	-22.88	peak			
5	10744.6	67	38.26	14.35	52.61	74.00	-21.39	peak			
6 *	12021.5	500	37.46	15.48	52.94	74.00	-21.06	peak			

Remarks:

EN

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor 2.Margin value = Level -Limit value



A	Ant. Pol.		Hori	Horizontal								
Te	est Mo	de:	ТΧ	π/4-DQPSK	Mode 2402	2MHz (BT M	odule 1)					
R	emark	:		eport for the bed limit.	emission v	vhich more t	han 20 dB b	elow the	pre-			
	No. Frequer (MHz)		-	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector			
	1	3933.5	83	42.59	0.28	42.87	74.00	-31.13	peak			
	2	7235.3	33	39.05	10.03	49.08	74.00	-24.92	peak			
	3	8328.0	83	40.04	10.48	50.52	74.00	-23.48	peak			
	4 9953.5		00	39.62	13.13	52.75	74.00	-21.25	peak			
	5	11011.0	000	38.36	14.68	53.04	74.00	-20.96	peak			
	6 *	12233.0	000	37.51	15.69	53.20	74.00	-20.80	peak			

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Ant. Po	I.	Vert	ical								
Test Mo	ode:	ТХ	TX π/4-DQPSK Mode 2402MHz (BT Module 1)								
Remark	κ:		eport for the bed limit.	emission v	which more t	han 20 dB b	elow the	pre-			
No.	Frequer (MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector			
1	3894.4	17	41.07	0.13	41.20	74.00	-32.80	peak			
2	7086.5	00	39.11	9.40	48.51	74.00	-25.49	peak			
3	8508.2	50	39.63	10.76	50.39	74.00	-23.61	peak			
4	10020.0)83	38.83	13.22	52.05	74.00	-21.95	peak			
5	10823.0	000	37.81	14.48	52.29	74.00	-21.71	peak			
6 *	12088.0	083	37.70	15.57	53.27	74.00	-20.73	peak			

EN

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value



A	nt. Po	l.	Hori	Horizontal								
T	est Mo	de:	ТΧ	TX π /4-DQPSK Mode 2441MHz (BT Module 1)								
R	emark			eport for the bed limit.	emission v	vhich more t	han 20 dB t	elow the	pre-			
	No. Frequer (MHz)		-	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector			
	1	4023.6	67	40.40	0.56	40.96	74.00	-33.04	peak			
	2	6083.8	33	40.11	5.91	46.02	74.00	-27.98	peak			
	3	7278.4	17	39.08	10.05	49.13	74.00	-24.87	peak			
	4	9648.0	00	38.74	12.68	51.42	74.00	-22.58	peak			
	5 *	11061.9	917	38.14	14.70	52.84	74.00	-21.16	peak			
	6	12417.0)83	37.25	15.55	52.80	74.00	-21.20	peak			

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Ant. Po	I.	Vert	ical								
est Mc	ode:	ΤХ	TX π/4-DQPSK Mode 2441MHz (BT Module 1)								
Remark	(:		report for the ped limit.	emission v	which more t	han 20 dB k	elow the	pre-			
No. Frequer (MHz			Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector			
1	4317.4	17	41.40	0.96	42.36	74.00	-31.64	peak			
2	7278.4	17	39.44	10.05	49.49	74.00	-24.51	peak			
3	8488.6	67	40.56	10.71	51.27	74.00	-22.73	peak			
4	9969.1	67	38.56	13.14	51.70	74.00	-22.30	peak			
5	10897.4	117	38.51	14.56	53.07	74.00	-20.93	peak			
6 *	11896.1	167	37.96	15.26	53.22	74.00	-20.78	peak			

Remarks:

EN

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value



/	Ant. Pol		Hori	zontal					
Test Mode: TX π/4-DQPSK Mode 2480MHz (BT Module 1)									
F	Remark	:		eport for the bed limit.	emission w	/hich more t	han 20 dB b	elow the	pre-
	No. Frequer (MHz			Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	4008.0	00	40.46	0.55	41.01	74.00	-32.99	peak
	2	7192.2	50	39.03	9.98	49.01	74.00	-24.99	peak
	3 8751.0		83	39.59	11.31	50.90	74.00	-23.10	peak
	4	10415.0	667	38.72	13.90	52.62	74.00	-21.38	peak
	5 *	11175.	500	38.15	14.75	52.90	74.00	-21.10	peak
	6	12287.8	833	37.28	15.62	52.90	74.00	-21.10	peak
				,					·

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Ant. Po	I.	Vert	ical								
Test Mo	ode:	ΤХ	TX π/4-DQPSK Mode 2480MHz (BT Module 1)								
Remark	κ:		report for the bed limit.	e emission v	which more t	han 20 dB b	elow the	pre-			
No.	Frequer (MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector			
1	3906.1	67	41.94	0.17	42.11	74.00	-31.89	peak			
2	6604.7	50	38.90	7.59	46.49	74.00	-27.51	peak			
3	8363.3	33	39.86	10.50	50.36	74.00	-23.64	peak			
4	9260.2	50	38.49	12.42	50.91	74.00	-23.09	peak			
5 *	10396.0)83	39.65	13.88	53.53	74.00	-20.47	peak			
6	12374.0	000	37.50	15.52	53.02	74.00	-20.98	peak			

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

EN





A	Ant. Pol	l.	Hori	zontal								
I	est Mo	de:	тх о	TX GFSK Mode 2402MHz (BT Module 2)								
F	Remark	:		eport for the bed limit.	emission v	which more t	than 20 dB l	below the	e pre-			
	No.	No. Freque (MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector			
	1	1195.8	33	48.74	-7.73	41.01	74.00	-32.99	peak			
•	2	4826.5	83	40.84	2.02	42.86	74.00	-31.14	peak			
ŀ	3	6867.1	67	38.88	8.25	47.13	74.00	-26.87	peak			
	4	9381.6	67	39.47	12.53	52.00	74.00	-22.00	peak			
ľ	5	11011.0	000	38.36	14.68	53.04	74.00	-20.96	peak			
	6 *	12648.1	167	37.08	16.19	53.27	74.00	-20.73	peak			

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Ant. Po	I .	Verti	ical									
Test Mo	de:	тх с	TX GFSK Mode 2402MHz (BT Module 2)									
Remark	:		eport for the bed limit.	emission v	vhich more t	han 20 dB t	pelow the	e pre-				
No.	(MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector				
1	1195.8	33	50.73	-7.73	43.00	74.00	-31.00	peak				
2	5186.9	17	41.24	2.84	44.08	74.00	-29.92	peak				
3	7536.9	17	38.95	10.08	49.03	74.00	-24.97	peak				
4	9413.0	00	39.07	12.54	51.61	74.00	-22.39	peak				
5	10823.	000	38.11	14.48	52.59	74.00	-21.41	peak				
6 *	12475.	833	37.86	15.71	53.57	74.00	-20.43	peak				

Remarks:

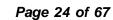
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1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor 2.Margin value = Level -Limit value

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A	nt. Pol		Hori	zontal								
T	est Mo	de:	тх с	TX GFSK Mode 2441MHz (BT Module 2) No report for the emission which more than 20 dB below the pre- scribed limit.								
F	Remark	:										
	No.	No. Freque (MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector			
	1	1207.5	83	49.73	-7.69	42.04	74.00	-31.96	peak			
	2	5942.8	33	39.48	5.44	44.92	74.00	-29.08	peak			
	3	7799.3	33	39.17	10.42	49.59	74.00	-24.41	peak			
	4	9366.0	00	39.44	12.51	51.95	74.00	-22.05	peak			
	5	11061.9	917	38.14	14.70	52.84	74.00	-21.16	peak			
	6 *	12671.0	667	37.06	16.24	53.30	74.00	-20.70	peak			

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Ant. Pol		Vert	ical									
Test Mo	de:	тх (TX GFSK Mode 2441MHz (BT Module 2)									
Remark	:		eport for the bed limit.	emission v	which more	than 20 dB l	pelow the	e pre-				
No.	(MHZ		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector				
1	1195.8	33	48.92	-7.73	41.19	74.00	-32.81	peak				
2	3216.8	33	42.70	-1.94	40.76	74.00	-33.24	peak				
3	6048.5	83	39.37	5.80	45.17	74.00	-28.83	peak				
4	8645.3	33	40.48	11.11	51.59	74.00	-22.41	peak				
5	10403.9	917	38.52	13.89	52.41	74.00	-21.59	peak				
6 *	11896.1	167	37.96	15.26	53.22	74.00	-20.78	peak				

Remarks:

EN

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor 2.Margin value = Level -Limit value



A	Ant. Pol.	Hori	zontal									
T	est Mo	de:	тх с	TX GFSK Mode 2480MHz (BT Module 2)								
F	Remark	:		eport for the bed limit.	emission v	vhich more t	han 20 dB l	pelow the	e pre-			
	No. Frequer (MHz			Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector			
	1	1199.7	50	51.04	-7.71	43.33	74.00	-30.67	peak			
	2	4008.0	00	39.96	0.55	40.51	74.00	-33.49	peak			
	3	5942.8	33	39.62	5.44	45.06	74.00	-28.94	peak			
	4	8406.4	17	40.08	10.55	50.63	74.00	-23.37	peak			
	5	10309.9	917	38.78	13.74	52.52	74.00	-21.48	peak			
	6 *	11880.	500	38.09	15.23	53.32	74.00	-20.68	peak			

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

ŀ	Ant. Pol	-	Vertical											
٦	lest Mo	de:	тх (TX GFSK Mode 2480MHz (BT Module 2)										
F	Remark	:		eport for the bed limit.	emission v	which more	than 20 dB l	below the	e pre-					
	No.	Frequency (MHz)		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector					
	1	1195.8	33	52.88	-7.73	45.15	74.00	-28.85	peak					
	2	3929.6	67	41.26	0.26	41.52	74.00	-32.48	peak					
	3	6412.8	33	39.51	7.10	46.61	74.00	-27.39	peak					
	4	8363.3	33	40.16	10.50	50.66	74.00	-23.34	peak					
	5	10834.7	750	38.74	14.50	53.24	74.00	-20.76	peak					
	6 *	12444.	500	37.87	15.62	53.49	74.00	-20.51	peak					

Remarks:

EN

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor 2.Margin value = Level -Limit value

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Α	nt. Pol	•	Hori	zontal										
T	est Mo	de:	TX 1	TX π /4-DQPSK Mode 2402MHz (BT Module 2)										
R	emark	:		eport for the bed limit.	emission v	vhich more t	han 20 dB l	pelow the	e pre-					
	No.	Freque (MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector					
	1	3216.8	33	42.90	-1.94	40.96	74.00	-33.04	peak					
	2	6134.7	50	39.66	6.06	45.72	74.00	-28.28	peak					
	3	8755.0	00	39.65	11.31	50.96	74.00	-23.04	peak					
	4	9937.8	33	38.78	13.11	51.89	74.00	-22.11	peak					
	5	11116.7	750	38.29	14.72	53.01	74.00	-20.99	peak					
	6 *	12354.4	117	38.05	15.54	53.59	74.00	-20.41	peak					

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Ant. Pol	-	Verti	ical										
Test Mo	de:	TX	TX π /4-DQPSK Mode 2402MHz (BT Module 2)										
Remark	:		eport for the bed limit.	emission v	vhich more t	han 20 dB t	pelow the	e pre-					
No.	Freque (MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector					
1	1199.7	50	48.27	-7.71	40.56	74.00	-33.44	peak					
2	4274.3	33	41.44	0.88	42.32	74.00	-31.68	peak					
3	7137.4	17	38.20	9.68	47.88	74.00	-26.12	peak					
4	8802.0	00	39.75	11.41	51.16	74.00	-22.84	peak					
5	10176.	750	38.65	13.54	52.19	74.00	-21.81	peak					
6 *	12295.0	667	37.66	15.62	53.28	74.00	-20.72	peak					

Remarks:

EN

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value



	nt. Pol	•	Hori	zontal					
Te	est Mo	de:	TX 1	π/4-DQPSK	Mode 2441	IMHz (BT M	odule 2)		
R	emark	:		eport for the bed limit.	emission v	vhich more t	han 20 dB t	pelow the	e pre-
	No.	Freque (MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	1	1199.7	50	49.27	-7.71	41.56	74.00	-32.44	peak
	2	3921.8	33	41.99	0.24	42.23	74.00	-31.77	peak
	3	6373.6	67	38.50	6.96	45.46	74.00	-28.54	peak
	4	8308.5	00	39.65	10.45	50.10	74.00	-23.90	peak
	5	10168.9	917	39.38	13.52	52.90	74.00	-21.10	peak
	6 *	12319.1	167	37.99	15.59	53.58	74.00	-20.42	peak

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Ant. Pol		Vert	ical								
Fest Mo	de:	TX ·	π/4-DQPSK	Mode 2441	IMHz (BT M	odule 2)					
Remark	:		report for the emission which more than 20 dB below the pre ibed limit.								
No.	Freque (MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector			
1	1195.8	33	49.20	-7.73	41.47	74.00	-32.53	peak			
2	4818.7	50	40.75	2.01	42.76	74.00	-31.24	peak			
3	6330.5	83	40.01	6.79	46.80	74.00	-27.20	peak			
4	8046.0	83	39.69	10.75	50.44	74.00	-23.56	peak			
5	9945.6	67	39.35	13.11	52.46	74.00	-21.54	peak			
6 *	12554.	167	37.80	15.94	53.74	74.00	-20.26	peak			

Remarks:

EN

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

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A	Ant. Pol		Horizontal										
Т	est Mo	de:	TX π /4-DQPSK Mode 2480MHz (BT Module 2)										
F	Remark	:		eport for the bed limit.	emission v	which more	than 20 dB l	pelow the	e pre-				
	No.	Frequer (MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector				
ľ	1	1497.4	17	52.43	-6.88	45.55	74.00	-28.45	peak				
	2	3937.5	00	41.27	0.30	41.57	74.00	-32.43	peak				
ľ	3	6005.5	00	39.90	5.66	45.56	74.00	-28.44	peak				
	4	8324.1	67	40.82	10.46	51.28	74.00	-22.72	peak				
	5	10067.0)83	39.18	13.31	52.49	74.00	-21.51	peak				
ľ	6 *	11841.3	333	38.37	15.16	53.53	74.00	-20.47	peak				

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Ant. Pol	-	Vert	ical										
Test Mo	de:	TX [·]	TX π /4-DQPSK Mode 2480MHz (BT Module 2)										
Remark	:		eport for the bed limit.	emission v	vhich more t	han 20 dB l	pelow the	e pre-					
No.	Freque (MHz		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector					
1	1497.4	17	51.37	-6.88	44.49	74.00	-29.51	peak					
2	4834.4	17	40.37	2.03	42.40	74.00	-31.60	peak					
3	6424.5	83	39.28	7.13	46.41	74.00	-27.59	peak					
4	8833.3	33	39.80	11.46	51.26	74.00	-22.74	peak					
5	11199.0	000	38.25	14.76	53.01	74.00	-20.99	peak					
6 *	12511.0	083	37.51	15.82	53.33	74.00	-20.67	peak					

Remarks:

EN

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

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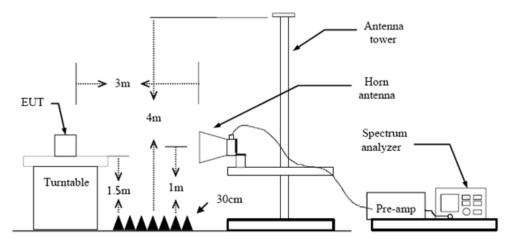
3.3. Band Edge Emissions (Radiated)

<u>Limit</u>

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

Restricted Frequency Band	(dBuV/m	n)(at 3m)
(MHz)	Peak	Average
2310 ~ 2390	74	54
2483.5 ~ 2500	74	54

Test Configuration



Test Procedure

- 1. The EUT was setup and tested according to ANSI C63.10:2013 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 was positioned 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.
- 5. The receiver set as follow:

RBW=1MHz, VBW=3MHz Peak detector for Peak value.

RBW=1MHz, VBW see note 1 with Peak Detector for Average Value.

Note 1: For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 3.10 Duty Cycle.

Test Mode

Please refer to the clause 2.4.



Test Results

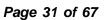
nt. P	ol.	Hor	zontal					
est M	ode:	GFS	SK Mode 240	D2MHz				
20.0 d	BuV/m							
10								
00								
io —								
10 <u> </u>						ar(15 RE-Class & A	have 15 PK	
'o 📛						airto ne-class o A	DOVE TO FK	
50 <u> </u>					ECC F	ar(15 RE-Class & A	bave 15 AV	
50 -							*	
					www.com/www.com/actives.com	المريح ومراجع ومرجع ومرجع		T. A
:0								
20								
0 —								
	00 2297.60	2309.60	2321.60 23	33.60 (MHz)	2357.60 2	369.60 2381.6	0 2393.60) 2405.6
No.		uency IHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecto
1	239	0.000	18.78	31.31	50.09	74.00	-23.91	peak
2 *	239	0.000	5.47	31.31	36.78	54.00	-17.22	AVG

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor 2.Margin value = Level -Limit value

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nt. Po	l.	Vert	ical					
est Mo	de:	GFS	SK Mode 24	02MHz				
120.0 dB	uV/m							
110								
100								
90								
30					FCC P	ar(15 RE-Class B #	have 16 PK	-A
70					ru r			
50					ECC P	ar(15 RE-Class B /	boye 15 eV	
50							1 X	
10 <u> </u>							2	
30	uniter and the second second	rede alere a dive	and and provide a state of the second second		10000		Contraction (Contraction)	
20								
10		_						
0.0 2287.400) 2299.40	2311.40	2323.40 23	335.40 (MHz)	2359.40 2	371.40 2383.4	40 2395.40) 2407.40
No.	Freque (MHz	-	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecto
1	2390.0	000	15.42	31.31	46.73	74.00	-27.27	peak
2 *	2390.0	000	3.80	31.31	35.11	54.00	-18.89	AVG



• ·														
	Pol.		-	izonta										
Test	Mode	:	GF	SK Mo	ode 24	80 MHz								
120.0) dBu¥/	m												
110														
100														
	٨													
90														
80									FCC F	art15 RE-Cl	A 8 226	bove 1G PK		
70														
60									FCC F	art15 RE-Cl	ass B A	bove 1G AV		
50		1 X												
40	~^[1	2											Aborton to Monto	
30	·				a cod a conse and								411-4-17-57 Sector	
20							_							
10							_			_				
0.0														
24	72.200	2484.20	2496.20	250	8.20 2	520.20 (MHz)	254	4.20 2	2556.20	2568.2	20 2580.	20 2592	2.20
N	0.	Freque (MH:	-		ading BuV)	Fact (dB/n			vel V/m)	Limi (dBuV		Margir (dB)	Detec	tor
1		2483.5	500	16	6.54	31.4	8	48	.02	74.0	0	-25.98	pea	k
2	*	2483.5	500	5	.16	31.4	8	36	.64	54.0	0	-17.36	6 AVC	3
	narks:		• •	_				_				<i></i>		
1.Fa	ictor (c	IB/m) =	Anter	nna Fa	actor (d	dB/m)+C	Cabl	e Fac	tor (dB)-Pre-a	mpli	tier Fact	tor	

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2.Margin value = Level -Limit value

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Ant	. Po	I.		Vert	ical											
Tes	t Mc	de:		GFS	SK M	lode 24	480) MHz								
120.0) dB	uV/m	1			1			_				_			
110																
100																
90													_			
80		n		_					_							
70									+		FUUF	art15 RE-Cla	2 B A	bove 16 I	PK	
60		4		_					_							
50		1 X							+		FUUF	ar 15 RE-Cla	S B A	Dove 15 /		
40		2		_					-				_			
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20				_					_				_			
10				_			_		_				+			
0.0 24	73.40	748	35.40 2	497.40	250	9.40	2521	40 0	Hz)	254	5.40 2	557.40 2	569.4	10 258	31.40	2593.40
N	0.	F	requei (MHz	-		ading BuV)		Fact			evel	Limit		Marg		Detector
				·				(dB/n	· ·	-	-	(dBuV/	-	-		
1	-	<u> </u>	483.5		1	5.50		31.4			6.98	74.00		-27.0		peak
2	*	2	483.5	00	4	1.03		31.4	8	35	5.51	54.00)	-18.4	19	AVG
I.Fa		r (dE	8/m) = / lue = L					8/m)+C	Cabl	e Fac	tor (dE	8)-Pre-ar	npli	fier Fa	icto	r



Ant. Pol. Test Mode:		Horizontal π/4-DQPSK Mode 2402MHz														
													120.0	dBuʻ	//m	
110 -																
100 -																
90 -							_							A		
80 -							_				_			1		
70 -							-		FUU P	arl15 RE-Cla	A H 22	bove 1	G PK			
60 -							_						_	+	Ц	
50 -							-		FLUP	ar(15 RE-Cla	SS B A	1 X		N	Ħ	
40 -							_			Johnson and the second		- 2	لسر		Į.	
30 🗋	within	and a second and a second as the	undera, or	ennord, A	and the second	ten en state ten transmer		sindere de la constante de la c	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Johnson	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	hopen the second	adrel			
20 -							_				_				_	
10 -											_		_		_	
0.0	6.800	2298.80	2310.80	232	2.80 23	334.80 (I	MHz)	235	8.80 2	370.80 2	2382.8	0 :	2394.8	0	2406.80	
No).	Frequer	-		ading	Fact		1	evel	Limi	-		rgin	De	etector	
		(MHz)		(dBuV)		(dB/m)				(dBuV/m)						
1		2390.000		16.93		31.31		48.24		74.00		-25.76		peak		
2	*	2390.0	2390.000		4.54		31.31		35.85		54.00		-18.15		AVG	
Rema		: (dB/m) = /														

2.Margin value = Level -Limit value

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Ant. Po	Ι.	Vert	ical						
Test Mo	de:	π/4-	DQPSK Mo	de 2402M⊦	lz				
120.0 dB	uV/m								
110		_							
100		_							
90		_							
80					FCC F	Part15 RE-Class B #	Above 1G PK		
70								71-1	
60					FCC F	Part15 RE-Class B #	Above 1G AV		
50							X		
40	an a		un much some market	and many and a de	maland market all and a second			V La	
30									
20									
10 0.0									
2288.000) 2300.00 ;	2312.00	2324.00 23	336.00 (MHz)	2360.00	2372.00 2384.	00 2396.0	0 2408.00	
No.	Frequer (MHz			Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	
1	2390.0	390.000 1		31.31	48.16	74.00	-25.84	peak	
2 *	2390.0	00	4.41	31.31	35.72	54.00	-18.28	AVG	
	(dB/m) =		na Factor (Limit value	dB/m)+Cab	e Factor (dB	8)-Pre-ampli	fier Facto	or	



Ant. Pol.		Horizontal											
Test Mode:		π/4-DQPSK Mode 2480MHz											
120.0 dBu	iV/m												
110		_							_				
100		_							_				
90	<u>م</u>								_				
80	Α —												
70								FUUF	Part15 RE-C	lass B /	Above 16 I	PK	
60									_				
50 A	1							FCC F	art15 RE-C	lass B /	Above 1G /	NV	
40		_							_				
30	22	eren an ara	Annan	ereselving	10 de mar contra na		inner	water the stage	na hanna an	***	muter had	the section of the se	
20		_							_				
10		_							_				
0.0	2484.20	2496.20	2508.20		i20.20 (MI			4.20 2	2556.20	2568.		0.20 2592	
No.	Frequency (MHz)		Reading (dBuV)		Factor (dB/m)		Level (dBuV/m)		Limit (dBuV/m)		Marg (dB)		or
1	1 2483.5		16.01		31.48		47.49		74.00		-26.5	1 peak	ĸ
2 *	2483.5	00	3.61	.61 31		1.48		35.09		54.00		1 AVG	3
	<u>.</u>												

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor 2.Margin value = Level -Limit value

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st Mo	de:	π/4-	DQPS	K Mo	de 2480	мн	z						
	uV/m												
10													
10													
0													
o													
0	A							FCC F	art15 RE-	Class B A	bove 1G	РК	
0													
0								FCC F	ari15 RE-	Class B A	bove 16 .	<u> </u>	
0													
0	-	ment market	all march and	and a start and a start and a start a s	and a stand and	www.e	monoper	montor	den prestan	manun	ana dharan an a	enhander	maan
0						_							
o													
0.0	D 2485.40	2497.40	2509.4		i21.40 β	MHz)		5.40 2	2557.40	2569.4		81.40	2593.4
No.	Freque (MH	-	Read (dBu	~ 1	Fact (dB/n			evel JV/m)	Lin (dBu)		Marg (dB		Detecto
1	2483.	500	17.	58	31.4	8	49	.06	74.	00	-24.9	94	peak
2 *	2483.	500	4.5	54	31.4	8	36	. 02	54.	00	-17.9	98	AVG
			1				1						

2.Margin value = Level -Limit value

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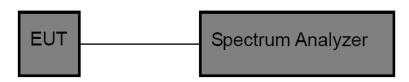


3.4. Band edge and Spurious Emissions (Conducted)

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

- The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss 1. 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: RBW = 100 kHz, VBW \geq 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 2.4.

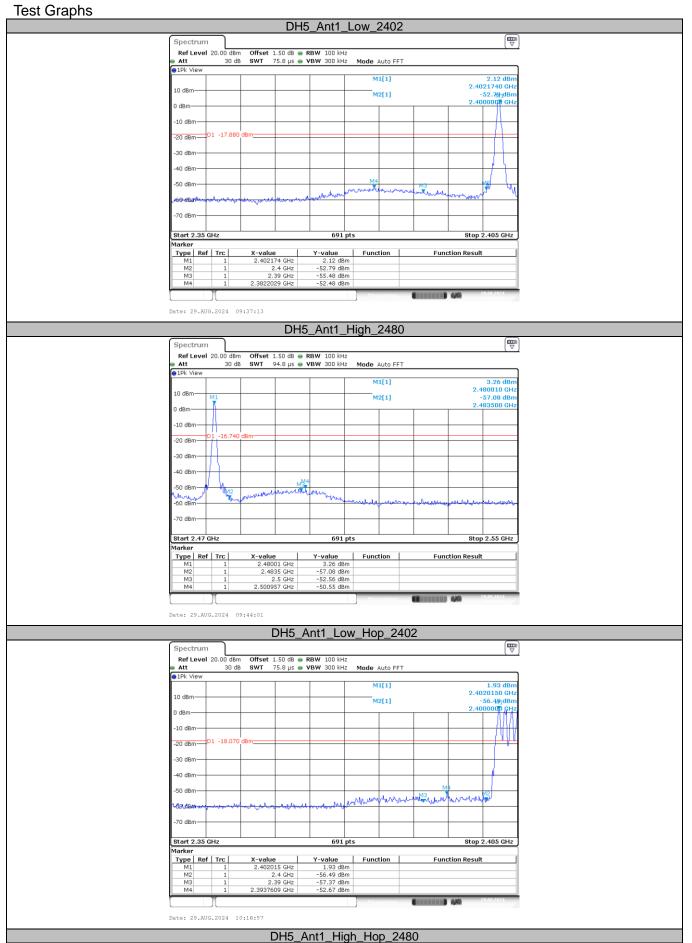
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Test Results

(1) Band edge Conducted Test

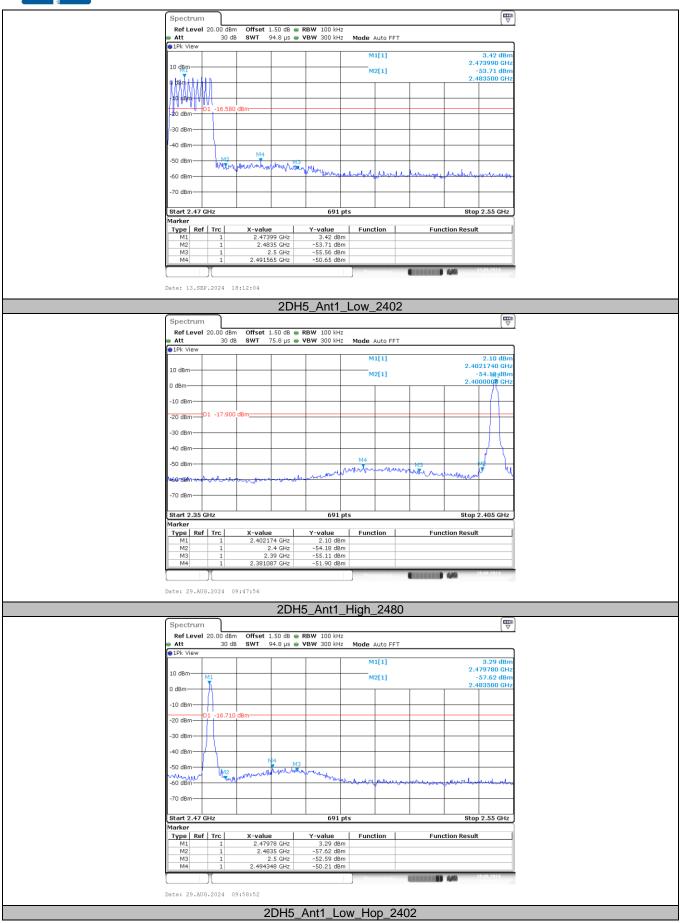
Toot Mode	Antenna	ChName		RefLevel	Result	Limit	Vordiat
Test Mode	Antenna	Chivame	Freq(MHz)	[dBm]	[dBm]	[dBm]	Verdict
		Low	2402	2.12	-52.48	≤-17.88	PASS
DH5	Ant1	High	2480	3.26	-50.55	≤-16.74	PASS
DHD	Anti	Low	Hop_2402	1.93	-52.67	≤-18.07	PASS
		High	Hop_2480	3.42	-50.65	≤-16.58	PASS
		Low	2402	2.10	-51.90	≤-17.90	PASS
	A pt1	High	2480	3.29	-50.21	≤-16.71	PASS
2003	2DH5 Ant1	Low	Hop_2402	-0.98	-51.87	≤-20.98	PASS
		High	Hop_2480	-0.43	-50.21	≤-20.43	PASS





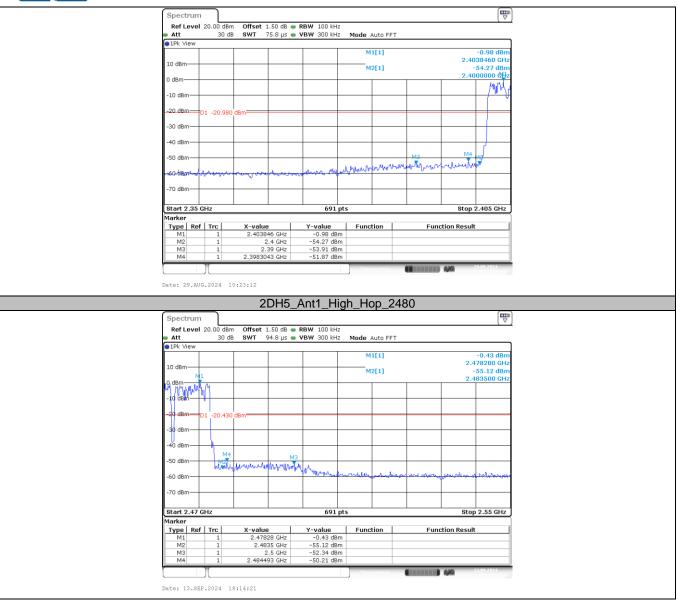
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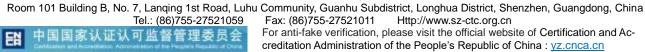










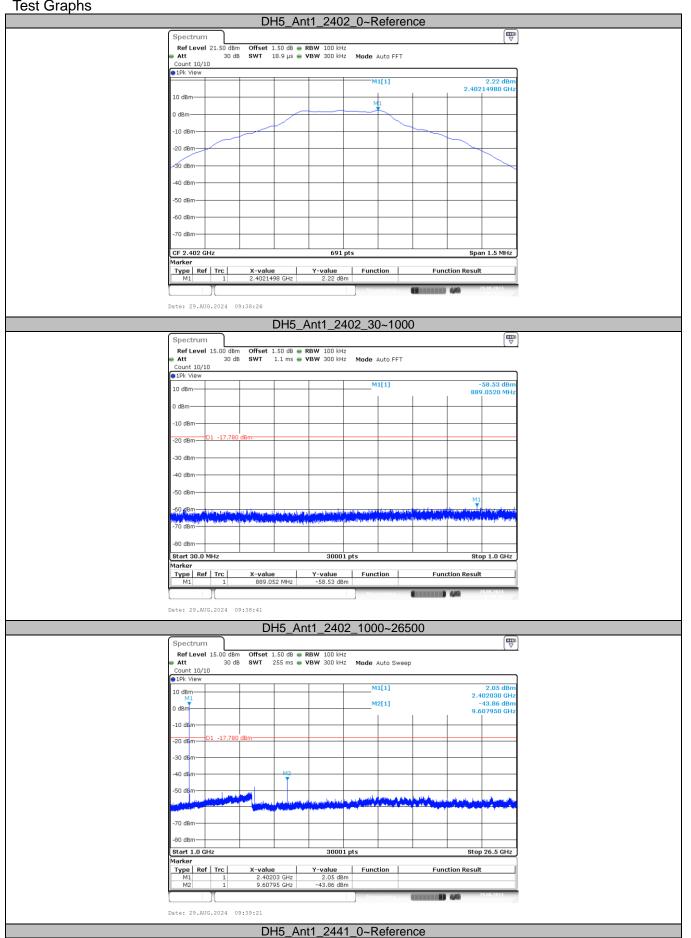




(2) Conducted Spurious Emissions Test

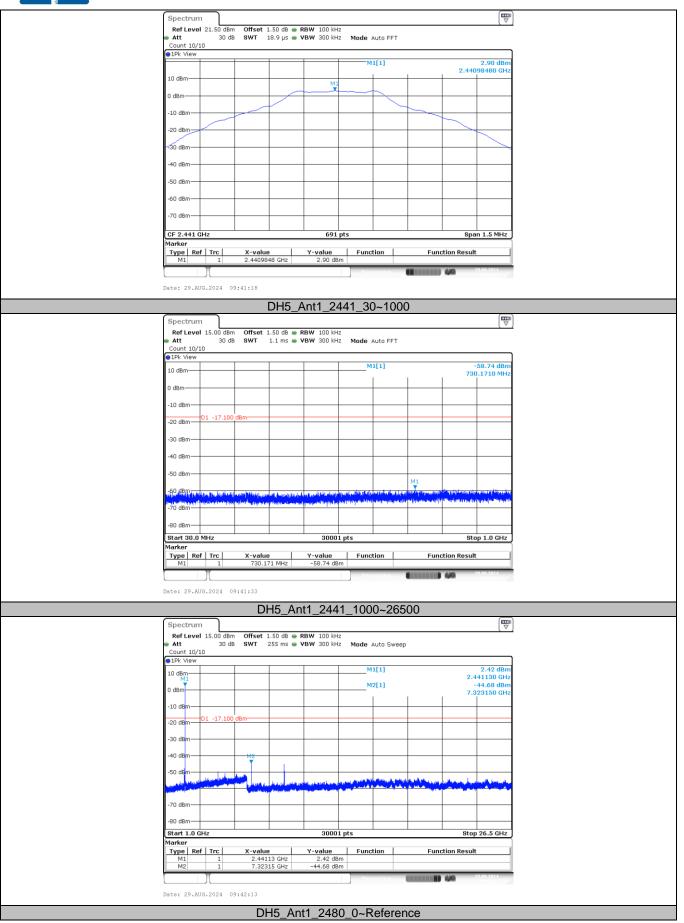
Test Mode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict	
			Reference	2.22	2.22		PASS	
		2402	30~1000	2.22	-58.53	≤-17.78	PASS	
			1000~26500	2.22	-43.86	≤-17.78	PASS	
			Reference	2.90	2.90		PASS	
DH5	Ant1	2441	30~1000	2.90	-58.74	≤-17.10	PASS	
			1000~26500	2.90	-44.68	≤-17.10	PASS	
				Reference	3.22	3.22		PASS
		2480	30~1000	3.22	-58.73	≤-16.78	PASS	
			1000~26500	3.22	-44.03	≤-16.78	PASS	
			Reference	2.23	2.23		PASS	
		2402	30~1000	2.23	-57.88	≤-17.77	PASS	
			1000~26500	2.23	-43.71	≤-17.77	PASS	
			Reference	2.94	2.94		PASS	
2DH5	Ant1	2441	30~1000	2.94	-58.37	≤-17.06	PASS	
			1000~26500	2.94	-45.23	≤-17.06	PASS	
			Reference	3.28	3.28		PASS	
		2480	30~1000	3.28	-58.78	≤-16.72	PASS	
			1000~26500	3.28	-43.78	≤-16.72	PASS	





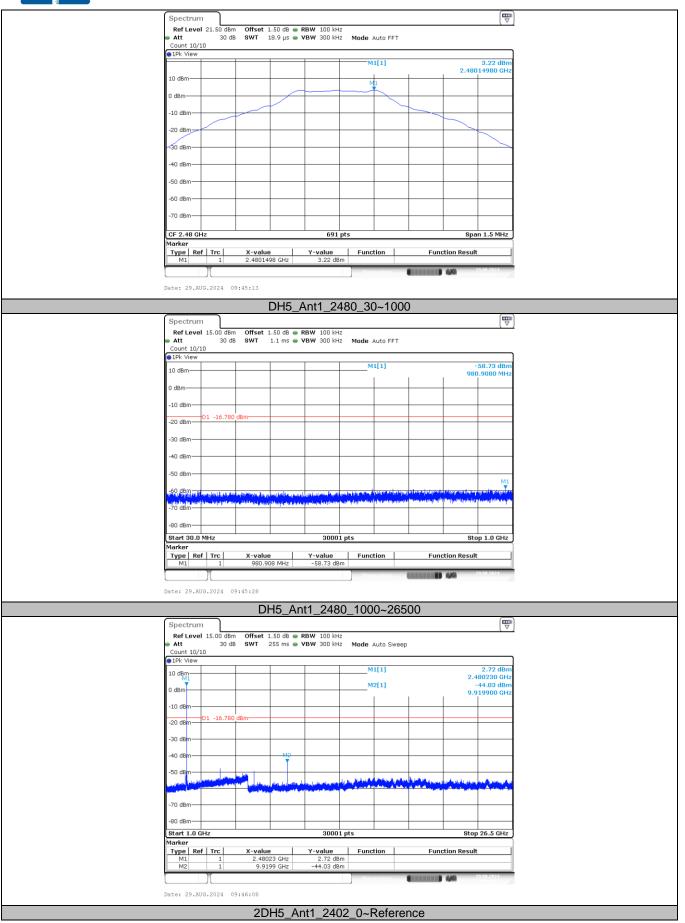
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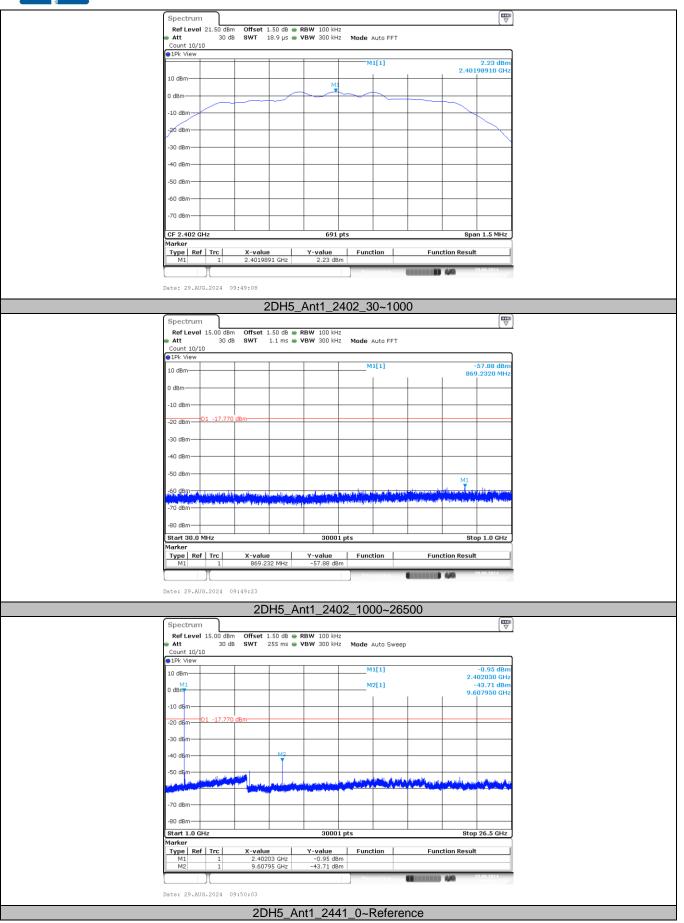






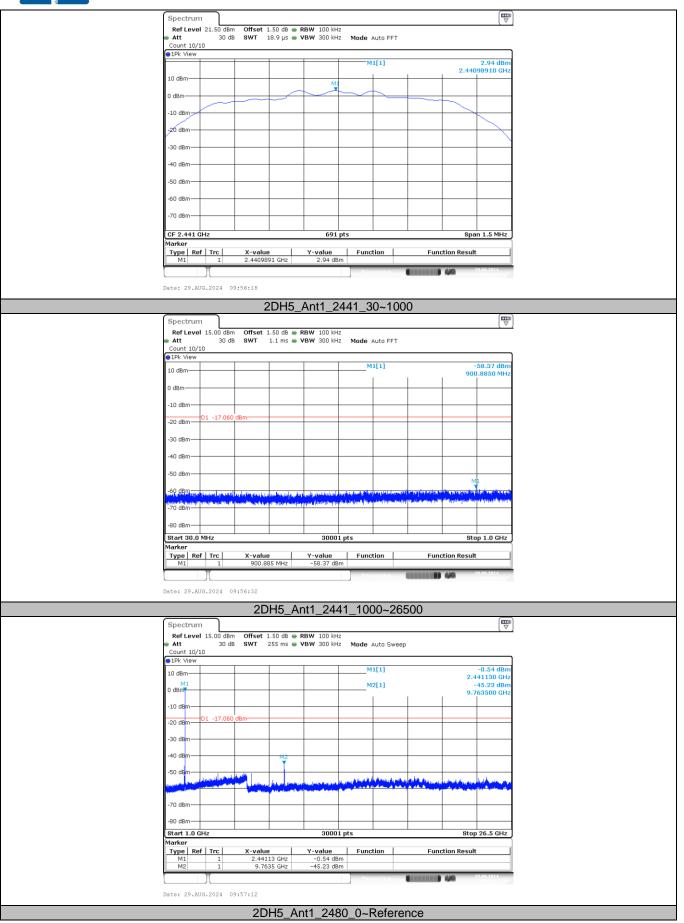






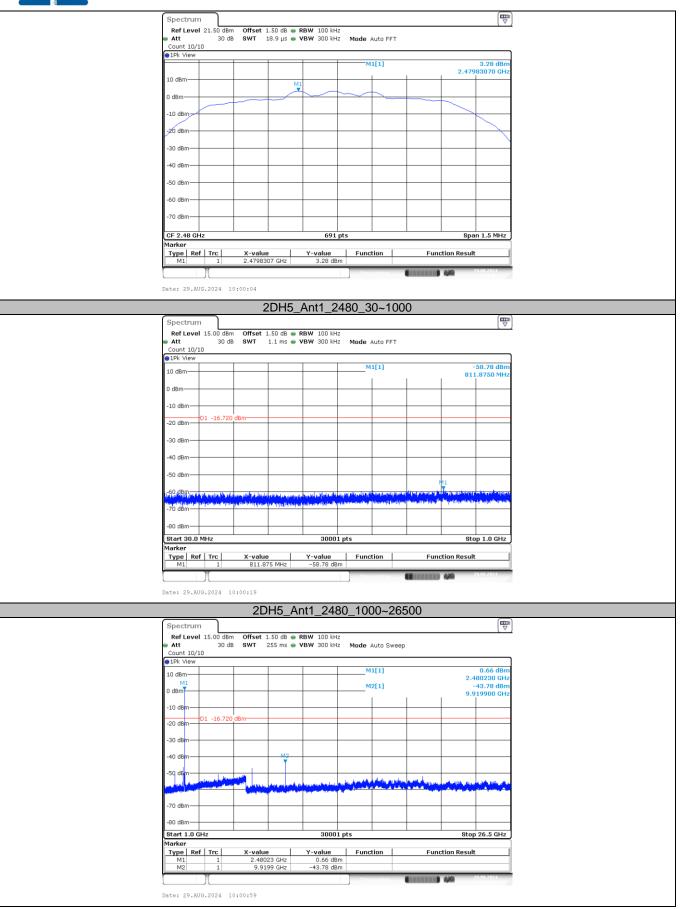












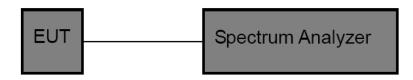


3.5. Bandwidth

Limit

N/A

Test Configuration



Test Procedure

- 1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- 2. OCB and 20dB Spectrum Setting:
 - (1) Set RBW = $1\% \sim 5\%$ occupied bandwidth.
 - (2) Set the video bandwidth (VBW) \geq 3 RBW.
 - (3) Detector = Peak.

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- (4) Trace mode = Max hold.
- (5) Sweep = Auto couple.

Note: The EUT was set to continuously transmitting in each mode and low, Middle and high channel for the test.

Test Mode

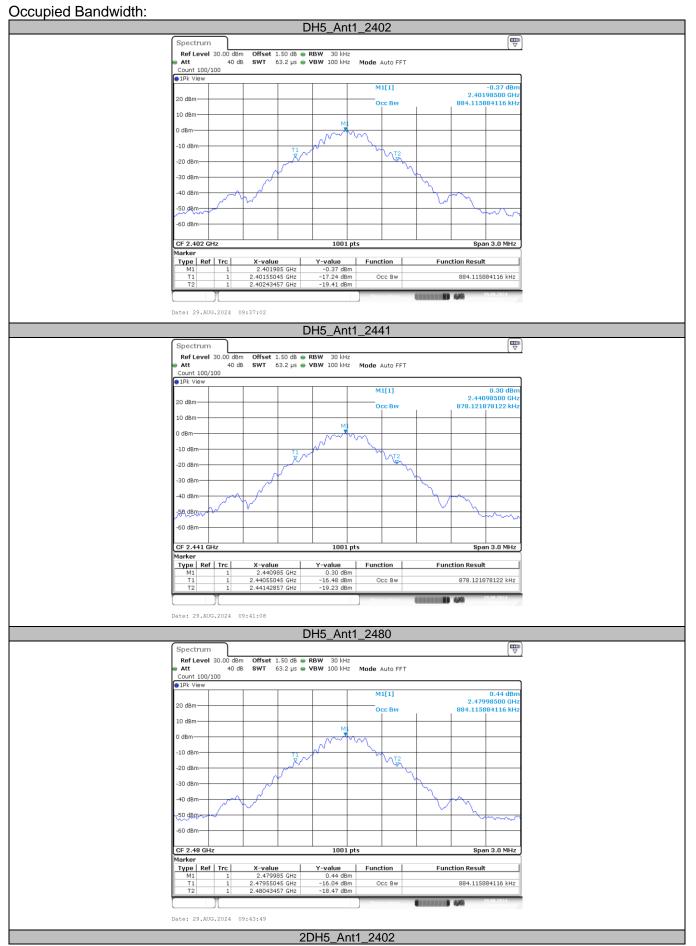
Please refer to the clause 2.4.

Test Results

Modulation type	Channel	Occupied Bandwidth (MHz)	20dB Bandwidth (MHz)	20dB Bandwidth *2/3 (MHz)
	00	0.884	0.987	0.658
GFSK	39	0.878	0.996	0.664
	78	0.884	1.008	0.672
	00	1.184	1.293	0.862
π/4-DQPSK	39	1.181	1.293	0.862
	78	1.181	1.293	0.862

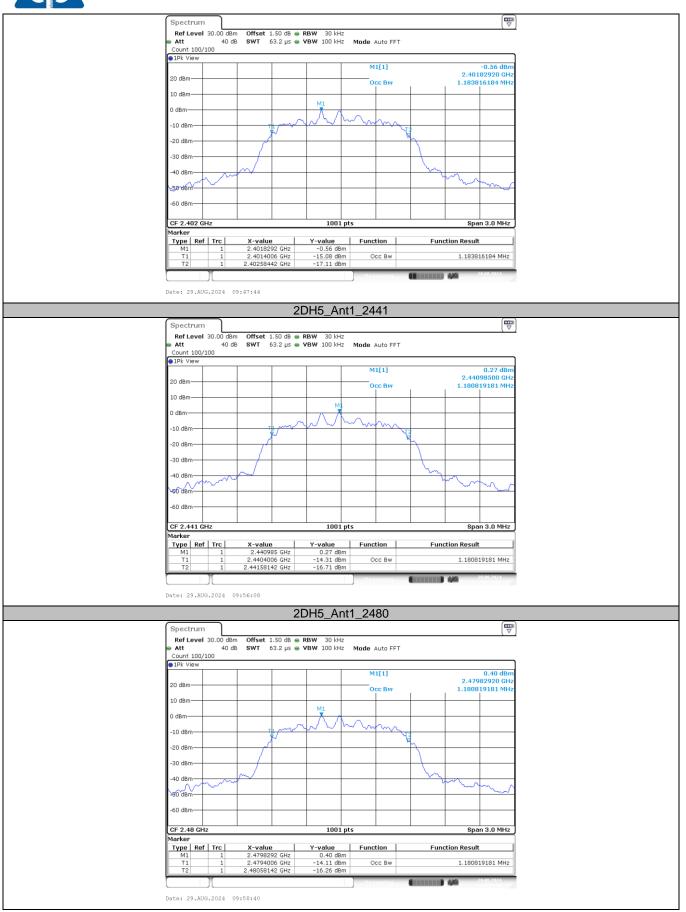
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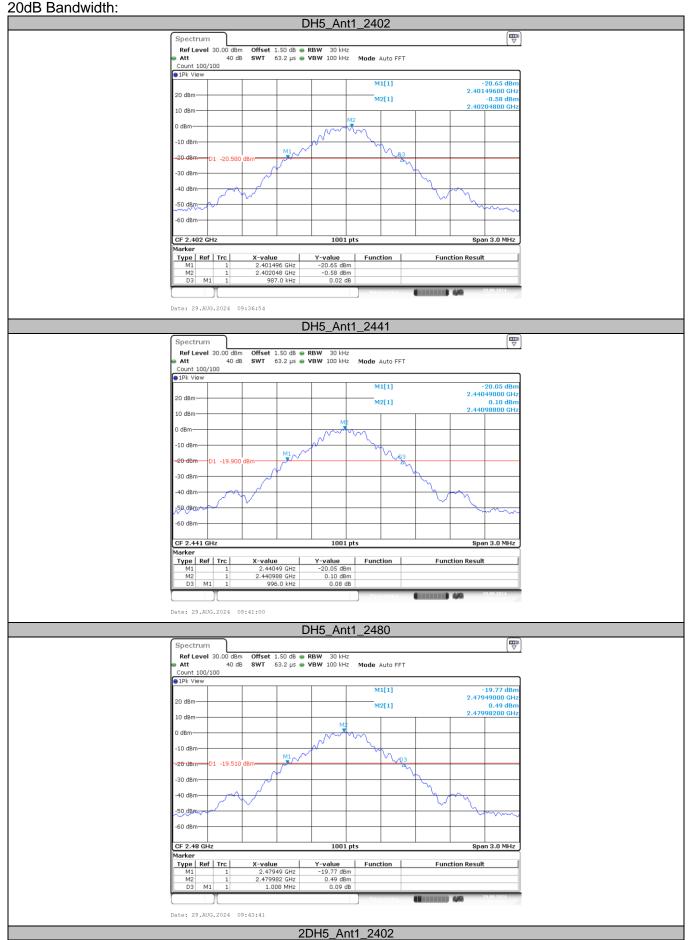


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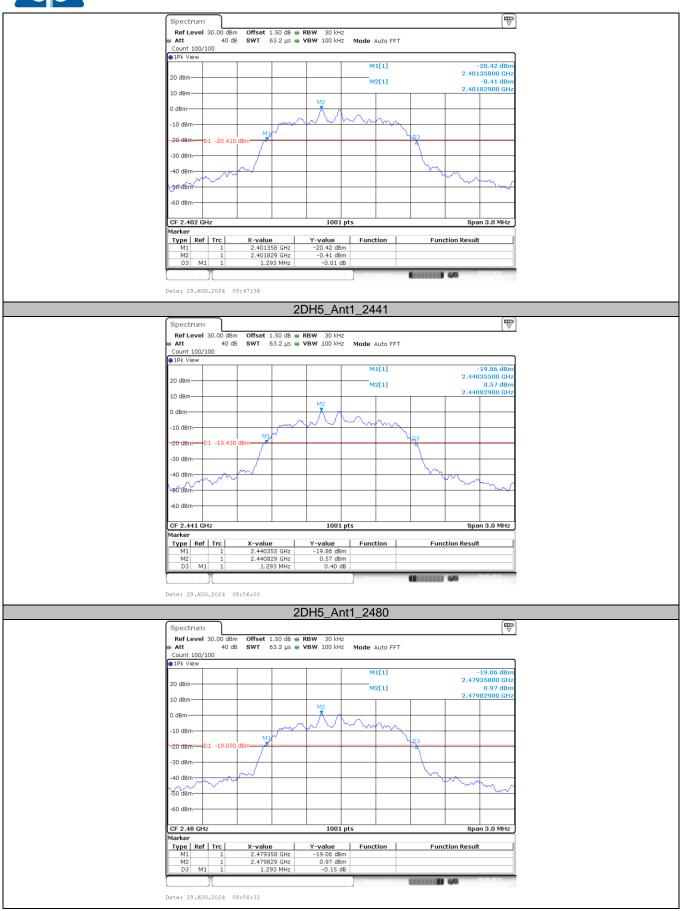






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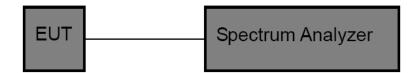
3.6. Channel Separation

Limit

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

Test Item	Limit	Frequency Range(MHz)
Channel Separation	>25KHz or >two-thirds of the 20 dB bandwidth Which is greater	2400~2483.5

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.

2. Spectrum Setting:

- (1) Set RBW = 100 kHz.
- (2) Set the video bandwidth (VBW) \ge 3 RBW.
- (3) Detector = Peak.
- (4) Trace mode = Max hold.
- (5) Sweep = Auto couple.

Test Mode

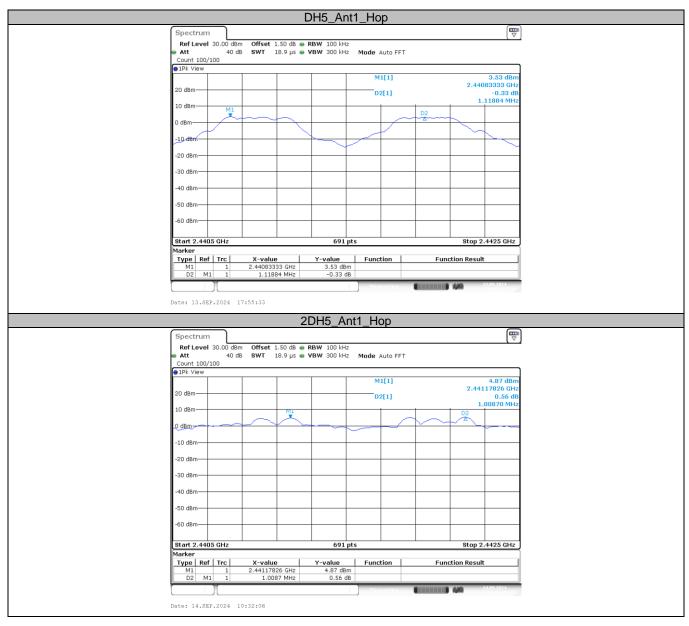
ΕN

Please refer to the clause 2.4.



Test Results

Test Mode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Нор	1.119	≥0.664	PASS
2DH5	Ant1	Нор	1.009	≥0.862	PASS



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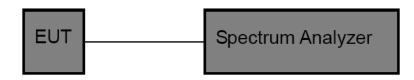
3.7. Number of Hopping Channel

Limit

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

Section	Test Item	Limit
15.247 (a)(iii)	Number of Hopping Channel	≥15

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.

2. Spectrum Setting:

(1) Peak Detector: RBW=100 kHz, VBW≥RBW, Sweep time= Auto.

Test Mode

Please refer to the clause 2.4.

Test Result

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Modulation type	Channel number	Limit	Result
GFSK	79	> 4 5 00	Data
π/4-DQPSK	79	≥15.00	Pass



			D	H5_Ar	nt1_Ho	р			
Spectru	m								
Ref Lev	el 30.00 dBm	Offset 1.	.50 dB 👄 R	BW 300 kH	z				(
Att 1Pk View	40 dB	SWT 3:	1.7 µs 🖷 V	'BW 300 kH	2 Mode /	uto FFT			
TPK TICK									
20 dBm-									
10 dBm									
088800	เกิดกลากกลาง	งกกกกกกก	สภากการกา	лааллала	ากกกกกกก	ADAAAAAAA	กกลุกกลุก	hananana	เกกกกก
ogenity	n)))haallaad	kaabkalle	n A Ll Ka A Ll Ka	ilkalteol	loabball	Valtaalk	allaalla	llaattaal	MIL
-10 dBm—		-							
-20 dBm-									
-30 dBm—									
40 dBm-									
0									L I
-50 dBm-									
-60 dBm-									
Start 2.4	GHz			691	pts			Stop 2.	4835 GH
Marker									0.00.0001
					Mea	suring		6/6	
Date: 29.	AUG.2024 10	:21:05							
			20	DH5_A	nt1 Ha	n			
						JD JD			
Spectru	m			<u></u>	<u></u>	γ			
	el 30.00 dBm		.50 dB 👄 R	BW 300 kH	2				Ę
Ref Lev Att	el 30.00 dBm 40 dB		.50 dB 👄 R		2				Ę
Ref Lev	el 30.00 dBm 40 dB		.50 dB 👄 R	BW 300 kH	2				Ę
Ref Lev Att 1Pk Viev	el 30.00 dBm 40 dB		.50 dB 👄 R	BW 300 kH	2				Ę
Ref Lev Att	el 30.00 dBm 40 dB		.50 dB 👄 R	BW 300 kH	2				
Ref Lev Att 10 dBm- 10 dBm-	el 30.00 dBm 40 dB	SWT 3.	.50 dB 🖷 R 11.7 μs 🖷 V	BW 300 kH	2 2 Mode /	uto FFT			
Ref Lev Att 10 dBm- 10 dBm-	el 30.00 dBm 40 dB	SWT 3.	.50 dB 🖷 R 11.7 μs 🖷 V	BW 300 kH	2 2 Mode /	uto FFT			
Ref Lev Att 10 dBm- 10 dBm-	el 30.00 dBm 40 dB	SWT 3.	.50 dB 🖷 R 11.7 μs 🖷 V	BW 300 kH	2 2 Mode /	uto FFT		-two-w	
Ref Lev Att 10 dBm- 10 dBm-	el 30.00 dBm 40 dB	SWT 3.	.50 dB 🖷 R 11.7 μs 🖷 V	BW 300 kH	2 2 Mode /	uto FFT		-www.wł	
Ref Lev ▲ Att ● IPk Viev 20 dBm 10 dBm 10 dBm	el 30.00 dBm 40 dB	SWT 3.	.50 dB 🖷 R 11.7 μs 🖷 V	BW 300 kH	2 2 Mode /	uto FFT		www	
Ref Lev Att 1Pk Viev 20 dBm 10 dBm -10 dBm -20 dBm	el 30.00 dBm 40 dB	SWT 3.	.50 dB 🖷 R 11.7 μs 🖷 V	BW 300 kH	2 2 Mode /	uto FFT			
Ref Lev ▲ Att ● IPk Viev 20 dBm 10 dBm 10 dBm	el 30.00 dBm 40 dB	SWT 3.	.50 dB 🖷 R 11.7 μs 🖷 V	BW 300 kH	2 2 Mode /	uto FFT	~^^^	-www.w	
Ref Lev ▲ Att ● IPk Viev 20 dBm 10 dBm -10 dBm -20 dBm -30 dBm	el 30.00 dBm 40 dB	SWT 3.	.50 dB 🖷 R 11.7 μs 🖷 V	BW 300 kH	2 2 Mode /	uto FFT	~^^^	www	
Ref Lev Att 1Pk Viev 20 dBm 10 dBm -10 dBm -20 dBm	el 30.00 dBm 40 dB	SWT 3.	.50 dB 🖷 R 11.7 μs 🖷 V	BW 300 kH	2 2 Mode /	uto FFT	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
Ref Lev ▲ Att ● IPk Viev 20 dBm 10 dBm -10 dBm -20 dBm -30 dBm	el 30.00 dBm 40 dB	SWT 3.	.50 dB 🖷 R 11.7 μs 🖷 V	BW 300 kH	2 2 Mode /	uto FFT	~^^^		
Ref Lev ▲ Att ● IPk Viev 20 dBm— 10 dBm— 0/dd/a10,- -10 dBm— -20 dBm— -30 dBm— -30 dBm— -50 dBm—	el 30.00 dBm 40 dB	SWT 3.	.50 dB 🖷 R 11.7 μs 🖷 V	BW 300 kH	2 2 Mode /	uto FFT	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
Ref Lev Att 1Pk Viev 20 dBm— 10 dBm— 0/dem=10, -10 dBm— -20 dBm— -30 dBm— -40 dBm—	el 30.00 dBm 40 dB	SWT 3.	.50 dB 🖷 R 11.7 μs 🖷 V	BW 300 kH	2 2 Mode /	uto FFT			
Ref Lev ▲ Att ● IPk Viev 20 dBm— 10 dBm— 0/de/a10,- -10 dBm— -20 dBm— -30 dBm— -30 dBm— -50 dBm—	el 30.00 dBm 40 dB /	SWT 3.	.50 dB 🖷 R 11.7 μs 🖷 V	BW 300 kH	2 2 Mode /	uto FFT	~^^^		
Ref Lev ▲ Att ■ IPk Viev 20 dBm— 10 dBm— -10 dBm— -20 dBm— -30 dBm— -30 dBm— -50 dBm—	el 30.00 dBm 40 dB /	SWT 3.	.50 dB 🖷 R 11.7 μs 🖷 V	BW 300 kH BW 300 kH	2 2 Mode /	MARAAM		Stop 2.	
Ref Lev Att ● 1Pk View 20 dBm 10 dBm 0 (ub/k*1)/ -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -50 dBm	el 30.00 dBm 40 dB /	SWT 3.	.50 dB 🖷 R 11.7 μs 🖷 V	BW 300 kH BW 300 kH	2 2 Mode /	MARAAM		Stop 2.	



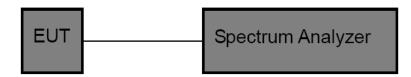
3.8. Dwell Time

Limit

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

Section	Test Item	Limit
15.247 (a)(iii)	Average Time of Occupancy	0.4 sec

Test Configuration



Test Procedure

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the 1. block diagram above.
- Spectrum Setting: 2.
 - (1) Spectrum Setting: RBW=1MHz, VBW≥RBW.
 - (2) Use video trigger with the trigger level set to enable triggering only on full pulses.
 - (3) Sweep Time is more than once pulse time.
- (4) Set the center frequency on any frequency would be measure and set the frequency span to

zero.

- (5) Measure the maximum time duration of one single pulse.
- (6) Set the EUT for packet transmitting.

Test Mode

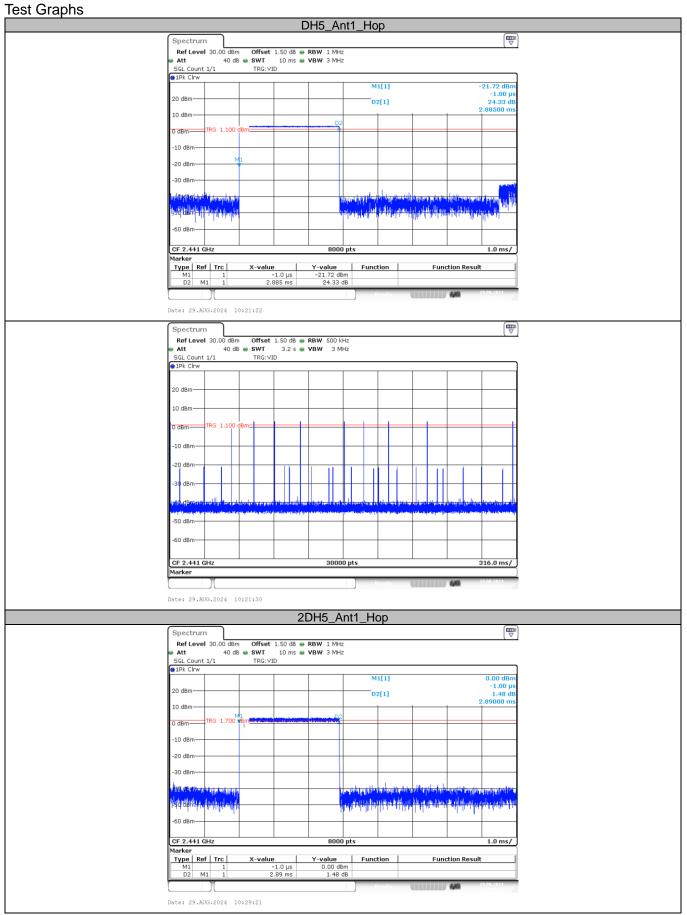
Please refer to the clause 2.4.

Test Result

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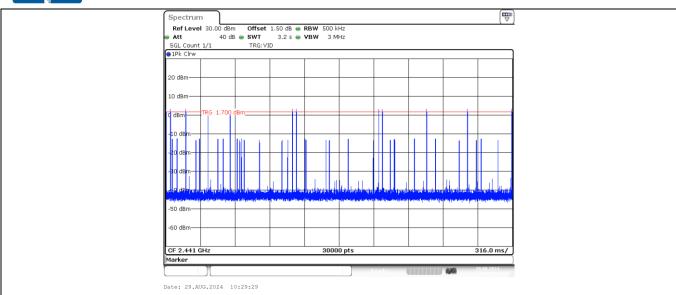
Test Mode	Antenna	Freq(MHz)	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH5	Ant1	Нор	2.885	100	0.289	≤0.4	PASS
2DH5	Ant1	Нор	2.890	120	0.347	≤0.4	PASS













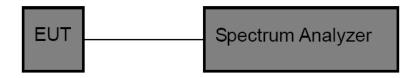
3.9. Peak Output Power

Limit

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

Test Item	Limit	Frequency Range(MHz)
Maximum Conducted Peak Output Power	Hopping Channels>75 Pow- er<1W(30dBm) Other <125mW(21dBm)	2400~2483.5

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.

- 2. Spectrum Setting:
 - (1) Set RBW> 20DB Bandwidth.
 - (2) Set the video bandwidth (VBW) \geq RBW.
 - (3) Detector = Peak.

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- (4) Trace mode = Max hold.
- (5) Sweep = Auto couple.

Test Mode

Please refer to the clause 2.4.

Test Result

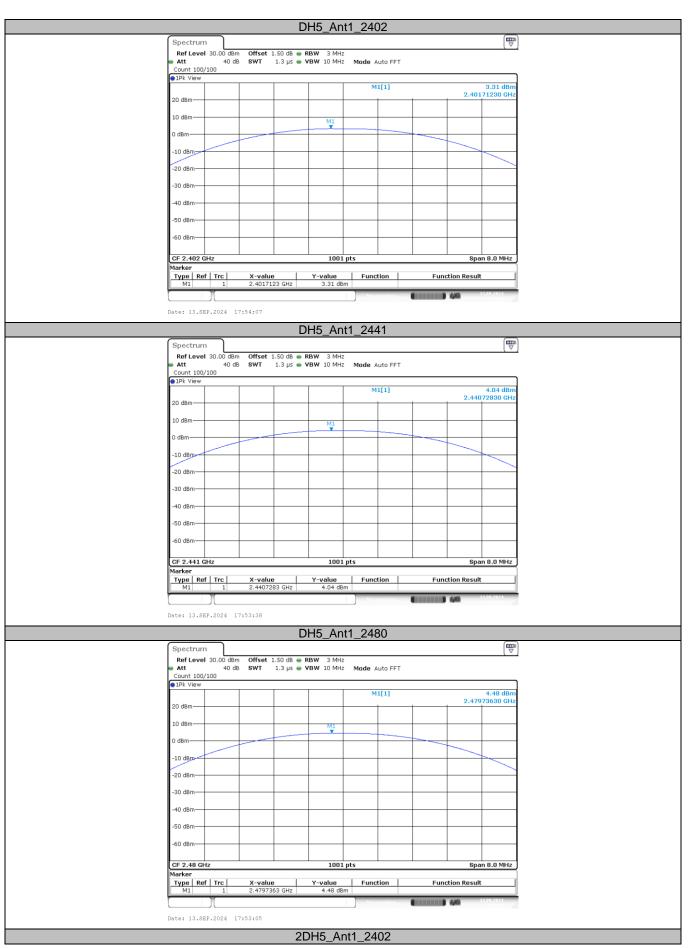
Test Mode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	2402	3.31	≤20.97	PASS
		2441	4.04	≤20.97	PASS
		2480	4.48	≤20.97	PASS
2DH5	Ant1	2402	3.79	≤20.97	PASS
		2441	4.63	≤20.97	PASS
		2480	4.98	≤20.97	PASS

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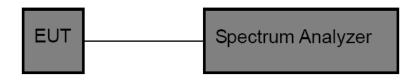


3.10. Duty Cycle

Limit

None, for report purposes only.

Test Configuration



Test Procedure

- 1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- 2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.

3. Spectrum Setting:

Set analyzer center frequency to test channel center frequency. Set the span to 0Hz Set the RBW to 10MHz Set the VBW to 10MHz **Detector: Peak** Sweep time: Auto

Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

Test Mode

Please refer to the clause 2.4.

Test Result

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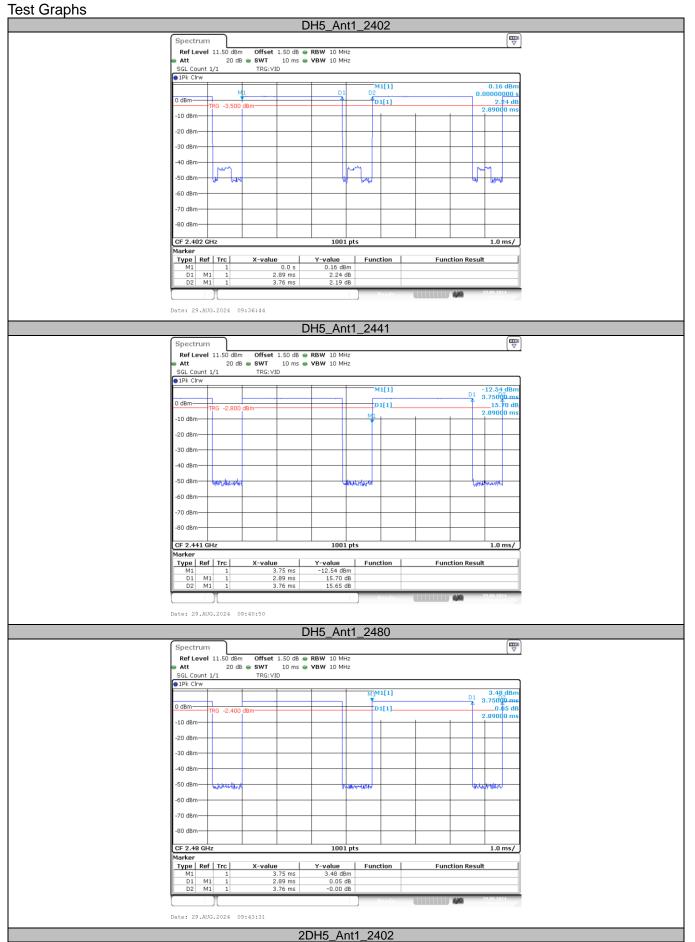
Test Mode	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/T Minimum VBW (kHz)	Final setting For VBW (kHz)
GFSK	2402	2.89	3.76	76.86	0.35	1
	2441	2.89	3.76	76.86	0.35	1
	2480	2.89	3.76	76.86	0.35	1
π/4-DQPSK	2402	2.89	3.75	77.07	0.35	1
	2441	2.90	3.76	77.13	0.34	1
	2480	2.90	3.75	77.33	0.34	1

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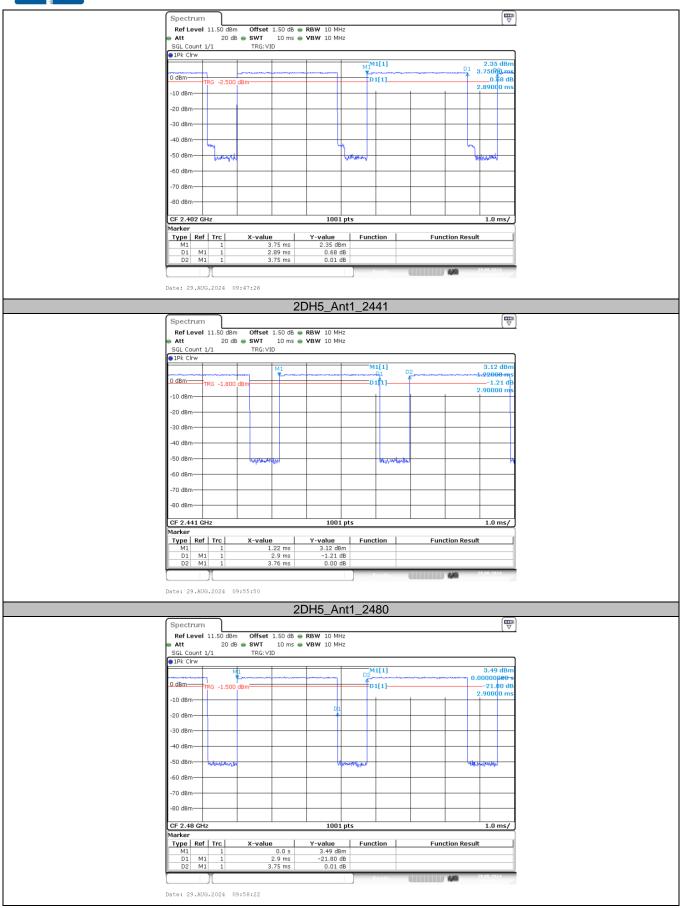
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3.11. Antenna Requirement

Requirement

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 antenna 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 6dBi 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 6dBi.

Test Result

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