

# **TEST REPORT**

Report No.:	BCTC2504777249E					
Applicant:	SHENZHEN JUNYE ELECTRONICS CO LTD					
Product Name:	Wireless Headphones					
Test Model:	JY-2413					
Tested Date:	2025-04-29 to 2025-05-07					
Issued Date:	2025-05-24					
She	enzhen BCTC Testing Co., Ltd.					
No.: BCTC/RF-EMC-005	Page: 1 of 81					



# FCC ID: 2BB3B-HP2413ANC

Product Name:	Wireless Headphones
Trademark:	N/A
Model/Type Reference:	JY-2413,HPFABANC
Prepared For:	SHENZHEN JUNYE ELECTRONICS CO LTD
Address:	201,Building 7,Xingye er Road,Fenghuang Village, Fuyong Town,Baoan District, Shenzhen City,Guangdong Province,China
Manufacturer:	SHENZHEN JUNYE ELECTRONICS CO LTD
Address:	201,Building 7,Xingye er Road,Fenghuang Village, Fuyong Town,Baoan District, Shenzhen City,Guangdong Province,China
Prepared By:	Shenzhen BCTC Testing Co., Ltd
Address:	1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Tangwei, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China
Sample Received Date:	2025-04-29
Sample Tested Date:	2025-04-29 to 2025-05-07
Report No.:	BCTC2504777249E
Test Standards	FCC Part15.247 ANSI C63.10-2013
Test Results	PASS
Remark:	This is Bluetooth Classic radio test report.

Tested by:

Vave

Brave Zeng/ Project Handler

Approved by: Zero Zhou/Reviewer

The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen BCTC Testing Co., Ltd, this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client.

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# 1. Version

Report No.	Report No. Issue Date		Approved
BCTC2504777249E	2025-05-24	Original	Valid



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#### **Test Summary** 2.

The Product has been tested according to the following specifications:

No.	Test Parameter	Clause No.	Results
1	Conducted emission AC power port	§15.207	PASS
2	Conducted peak output power for FHSS	§15.247(b)(1)	PASS
3	20dB Occupied bandwidth	§15.247(a)(1)	PASS
4	Number of hopping frequencies	§15.247(a)(1)(iii)	PASS
5	Dwell Time	§15.247(a)(1)(iii)	PASS
6	Spurious RF conducted emissions	§15.247(d)	PASS
7	Band edge	§15.247(d)	PASS
8	Spurious radiated emissions for transmitter	§15.247(d) & §15.209 & §15.205	PASS
9	Antenna Requirement	15.203	PASS
	N/A (Not Applicable)	1	

NOTE1: N/A (Not Applicable) NOTE2: According to FCC OET KDB 558074, the report use radiated measurements in the restricted frequency bands. In addition, the radiated test is also performed to ensure the emissions emanating from the device cabinet also comply with the applicable limits.

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# 3. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

No.	Item	Uncertainty
1	3m chamber Radiated spurious emission(30MHz-1GHz)	U=4.3dB
2	3m chamber Radiated spurious emission(9KHz-30MHz)	U=3.7dB
3	3m chamber Radiated spurious emission(1GHz-18GHz)	U=4.5dB
4	3m chamber Radiated spurious emission(18GHz-40GHz)	U=3.34dB
5	Conducted Emission (150kHz-30MHz)	U=3.20dB
6	Conducted Adjacent channel power	U=1.38dB
7	Conducted output power uncertainty Above 1G	U=1.576dB
8	Conducted output power uncertainty below 1G	U=1.28dB
9	humidity uncertainty	U=5.3%
10	Temperature uncertainty	<b>U=0.59</b> ℃



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# 4. Product Information and Test Setup

# 4.1 Product Information

Model/Type reference:	JY-2413,HPFABANC
Model differences:	The following models of devices we produce are identical in terms of electrical, mechanical, and physical structure; The difference lies in the model name and color, and we ultimately have JY-2413 as the test model.
Hardware Version:	N/A
Software Version:	N/A
Operation Frequency:	Bluetooth: 2402-2480MHz
Type of Modulation:	Bluetooth: GFSK, π/ 4 DQPSK,8DPSK
Number Of Channel	79CH
Antenna installation:	Internal antenna
Antenna Gain:	-0.65dBi
Remark:	The antenna gain of the product comes from the antenna report provided by the customer, and the test data is affected by the customer information.
power supply:	DC 5V,1A
Battery:	DC 3.7V/200mAh

# 4.2 Test Setup Configuration

See test photographs attached in eut test setup photographs for the actual connections between product and support equipment.

Conducted Emission:



**Radiated Spurious Emission** 



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# 4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note
E-1	Wireless Headphones	N/A	JY-2413	N/A	EUT
E-2	Adapter	N/A	N/A	N/A	Auxiliary

ltem	Shielded Type	Ferrite Core	Length	Note
C-1	N/A	N/A	N/A	N/A

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

# 4.4 Channel List

СН	Frequency (MHz)	СН	Frequency (MHz)	СН	Frequency (MHz)	СН	Frequency (MHz)
0	2402	1	2403	2	2404	3	2405
4	2406	5	2407	6	2408	7	2409
8	2410	9	2411	10	2412	11	2413
12	2414	13	2415	14	2416	15	2417
16	2418	17	2419	18	2420	19	2421
20	2422	21	2423	22	2424	23	2425
24	2426	25	2427	26	2428	27	2429
28	2430	29	2431	30	2432	31	2433
32	2434	33	2435	34	2436	35	2437
36	2438	37	2439	38	2440	39	2441
40	2442	41	2443	42	2444	43	2445
44	2446	45	2447	46	2448	47	2449
48	2450	49	2451	50	2452	51	2453
52	2454	53	2455	54	2456	55	2457
56	2458	57	2459	58	2460	59	2461
60	2462	61	2463	62	2464	63	2465
64	2466	65	2467	66	2468	67	2469
68	2470	69	2471	70	2472	71	2473
72	2474	73	2475	74	2476	75	2477
76	2478	77	2479	78	2480	79	//////

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# 4.5 Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Test Mode	Test mode	Low channel	Middle channel	High channel		
1	Transmitting(GFSK)	2402MHz	2441MHz	2480MHz		
2	Transmitting(π/ 4 DQPSK)	2402MHz	2441MHz	2480MHz		
3	Transmitting(8DPSK)	2402MHz	2441MHz	2480MHz		
4	Transmitting (Conducted emission & Radiated emission)					

Note:

(1) The measurements are performed at the highest, middle, lowest available channels.

(2) Fully-charged battery is used during the test

# 4.6 Table Of Parameters Of Text Software Setting

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters

Test software Version	FCC_assist 1.0.1.2			
Frequency	2402 MHz	2441 MHz	2480 MHz	
Parameters	DEF	DEF	DEF	

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# 5. Test Facility And Test Instrument Used

#### 5.1 Test Facility

All measurement facilities used to collect the measurement data are located at Shenzhen BCTC Testing Co., Ltd. Address: 1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Tangwei, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards. FCC Test Firm Registration Number: 712850 IC Registered No.: 23583

## 5.2 Test Instrument Used

Conducted Emissions Test						
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.	
Receiver	R&S	ESR3	102075	May 16, 2024	May 15, 2025	
LISN	R&S	ENV216	101375	May 16, 2024	May 15, 2025	
Software	Frad	EZ-EMC	EMC-CON 3A1	١	\	
Pulse limiter	Schwarzbeck	VTSD 9561-F	01323	May 16, 2024	May 15, 2025	

	RF Conducted Test						
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.		
Power meter	Keysight	E4419	١	May 16, 2024	May 15, 2025		
Power Sensor (AV)	Keysight	E9300A	/	May 16, 2024	May 15, 2025		
Signal Analyzer20kH z-26.5GHz	Keysight	N9020A	MY49100060	May 16, 2024	May 15, 2025		
Spectrum Analyzer9kHz- 40GHz	R&S	FSP40	100363	May 16, 2024	May 15, 2025		

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Radiated Emissions Test (966 Chamber)						
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.	
966 chamber	ChengYu	966 Room	966	May 16, 2024	May 15, 2025	
Receiver	R&S	ESR3	102075	May 16, 2024	May 15, 2025	
Receiver	R&S	ESRP	101154	May 16, 2024	May 15, 2025	
Amplifier	Schwarzbeck	BBV9744	9744-0037	May 16, 2024	May 15, 2025	
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	942	May 21, 2024	May 20, 2025	
Loop Antenna(9KHz -30MHz)	Schwarzbeck	FMZB1519B	00014	May 21, 2024	May 20, 2025	
Amplifier	SKET	LAPA_01G1 8G-45dB	SK202104090 1	May 16, 2024	May 15, 2025	
Horn Antenna	Schwarzbeck	BBHA9120D	1541	May 30, 2024	May 29, 2025	
Amplifier(18G Hz-40GHz)	MITEQ	TTA1840-35- HG	2034381	May 16, 2024	May 15, 2025	
Horn Antenn(18GH z-40GHz)	Schwarzbeck	BBHA9170	00822	May 21, 2024	May 20, 2025	
Spectrum Analyzer9kHz- 40GHz	R&S	FSP40	100363	May 16, 2024	May 15, 2025	
Software	Frad	EZ-EMC	FA-03A2 RE	\	\	

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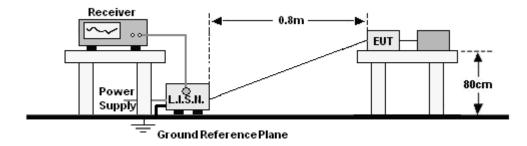
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# 6. Conducted Emissions

# 6.1 Block Diagram Of Test Setup



# 6.2 Limit

	Limit (dBuV)		
Frequency (MHz)	Quas-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	
0.50 -5.0	56.00	46.00	
5.0 -30.0	60.00	50.00	

Notes:

1. \*Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

#### 6.3 Test procedure

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

a. The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).

b. The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.

c. For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

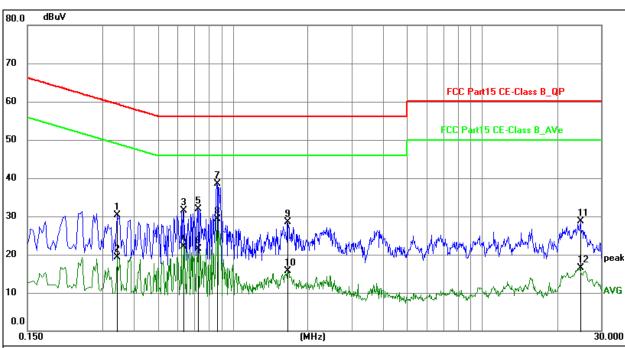
# 6.4 EUT operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.



# 6.5 Test Result

Temperature:	<b>26</b> ℃	Relative Humidity:	54%
Pressure:	101KPa	Phase :	L
Test Mode:	Mode 4	Test Voltage :	AC120V/60Hz



#### Remark:

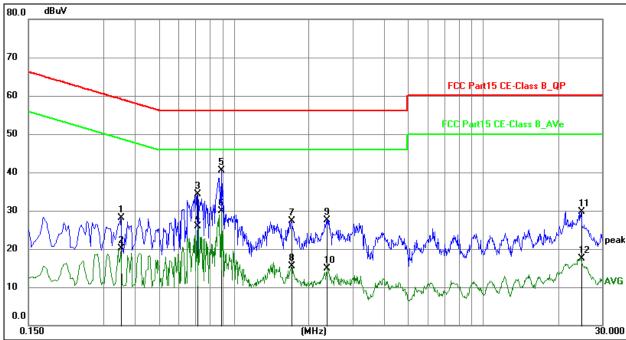
All readings are Quasi-Peak and Average values.
 Factor = Insertion Loss + Cable Loss.
 Measurement = Reading Level + Correct Factor
 Over = Measurement - Limit

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.3435	19.86	10.50	30.36	59.12	-28.76	QP
2	0.3435	8.76	10.50	19.26	49.12	-29.86	AVG
3	0.6315	21.01	10.51	31.52	56.00	-24.48	QP
4	0.6315	11.58	10.51	22.09	46.00	-23.91	AVG
5	0.7260	21.42	10.51	31.93	56.00	-24.07	QP
6	0.7260	10.97	10.51	21.48	46.00	-24.52	AVG
7	0.8655	28.02	10.51	38.53	56.00	-17.47	QP
8 *	0.8655	18.81	10.51	29.32	46.00	-16.68	AVG
9	1.6620	17.93	10.62	28.55	56.00	-27.45	QP
10	1.6620	5.01	10.62	15.63	46.00	-30.37	AVG
11	24.8100	17.17	11.61	28.78	60.00	-31.22	QP
12	24.8100	4.86	11.61	16.47	50.00	-33.53	AVG

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Temperature:	<b>26</b> ℃	Relative Humidity:	54%
Pressure:	101KPa	Phase :	Ν
Test Mode:	Mode 4	Test Voltage :	AC120V/60Hz



Remark:

All readings are Quasi-Peak and Average values.
 Factor = Insertion Loss + Cable Loss.
 Measurement = Reading Level + Correct Factor
 Over = Measurement - Limit

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.3525	17.66	10.50	28.16	58.90	-30.74	QP
2	0.3525	9.60	10.50	20.10	48.90	-28.80	AVG
3	0.7125	23.75	10.51	34.26	56.00	-21.74	QP
4	0.7125	15.41	10.51	25.92	46.00	-20.08	AVG
5 *	0.8925	30.05	10.51	40.56	56.00	-15.44	QP
6	0.8925	19.40	10.51	29.91	46.00	-16.09	AVG
7	1.7070	16.65	10.62	27.27	56.00	-28.73	QP
8	1.7070	4.95	10.62	15.57	46.00	-30.43	AVG
9	2.3640	16.93	10.67	27.60	56.00	-28.40	QP
10	2.3640	4.22	10.67	14.89	46.00	-31.11	AVG
11	24.7515	18.10	11.61	29.71	60.00	-30.29	QP
12	24.7515	5.89	11.61	17.50	50.00	-32.50	AVG

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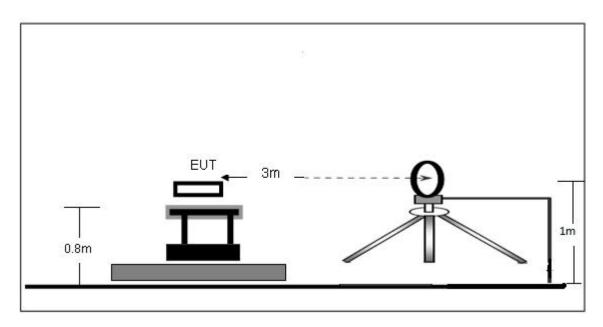
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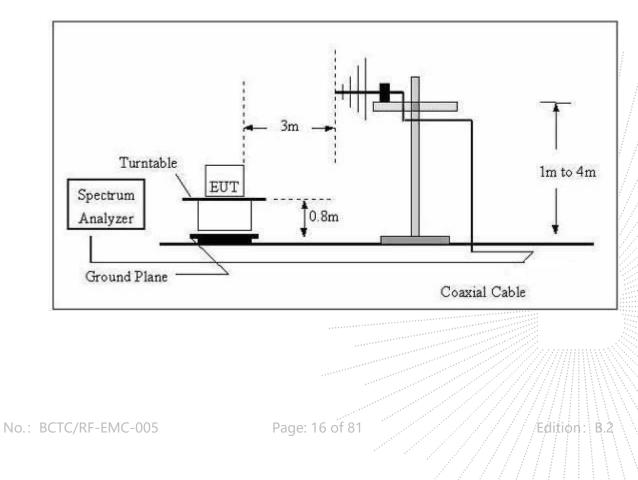
# 7. Radiated emissions

# 7.1 Block Diagram Of Test Setup

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

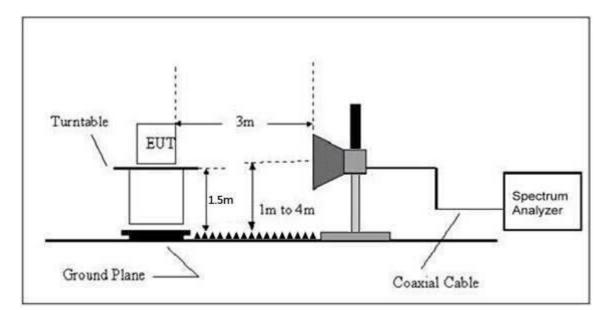


(B) Radiated Emission Test-Up Frequency 30MHz~1GHz





(C) Radiated Emission Test-Up Frequency Above 1GHz



# 7.2 Limit

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequency	Field Strength	Distance	Field Strength Limit at 3m Distance		
(MHz)	uV/m	(m)	uV/m dBuV/m		
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	20log <sup>(2400/F(kHz))</sup> + 80	
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	20log <sup>(24000/F(kHz))</sup> + 40	
1.705 ~ 30	30	30	100 * 30	20log <sup>(30)</sup> + 40	
30 ~ 88	100	3	100	20log <sup>(100)</sup>	
88 ~ 216	150	3	150	20log <sup>(150)</sup>	
216 ~ 960	200	3	200	20log <sup>(200)</sup>	
Above 960	500	3	500	20log <sup>(500)</sup>	

Limits Of Radiated Emission Measurement (Above 1000MHz)

Erequency (MHz)	Limit (dBuV/m) (at 3M)
Frequency (MHz)	Peak Average
Above 1000	74

Notes:

(1)The limit for radiated test was performed according to FCC PART 15C.

(2)The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

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Frequency Range Of Radiated Measurement

(a) For an intentional radiator the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to at least the frequency shown in this paragraph:

(1) If the intentional radiator operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

(2) If the intentional radiator operates at or above 10 GHz and below 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.

(3) If the intentional radiator operates at or above 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 200 GHz, whichever is lower, unless specified otherwise elsewhere in the rules.

(4) If the intentional radiator operates at or above 95 GHz: To the third harmonic of the highest fundamental frequency or to 750 GHz, whichever is lower, unless specified otherwise elsewhere in the rules.

(5) If the intentional radiator contains a digital device, regardless of whether this digital device controls the functions of the intentional radiator or the digital device is used for additional control or function purposes other than to enable the operation of the intentional radiator, the frequency range shall be investigated up to the range specified in paragraphs (a) (1)through (4) of this section or the range applicable to the digital device, as shown in paragraph (b)(1) of this section, whichever is the higher frequency range of investigation.

# 7.3 Test procedure

Receiver Parameter	Setting
Attenuation	Auto
9kHz~150kHz	RBW 200Hz for QP
150kHz~30MHz	RBW 9kHz for QP
30MHz~1000MHz	RBW 120kHz for QP

Spectrum Parameter	Setting
1-25GHz	RBW 1 MHz /VBW 1 MHz for Peak,
1-25GHZ	RBW 1 MHz / VBW 10Hz for Average

Below 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.



d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.

b.The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c.The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d.For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.

e.The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

g. Test the EUT in the lowest channel, the middlest channel, the Highest channel.

Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

# 7.4 EUT operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

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# 7.5 Test Result

#### Below 30MHz

Temperature:	<b>26</b> ℃	Relative Humidity:	54%	
Pressure:	101KPa	Test Voltage :	DC 3.7V	
Test Mode:	Mode 4	Test voltage.	DC 3.7 V	

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
				PASS
				PASS

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the

permissible value has no need to be reported.

Distance extrapolation factor =40 log (specific distance/test distance)(dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.

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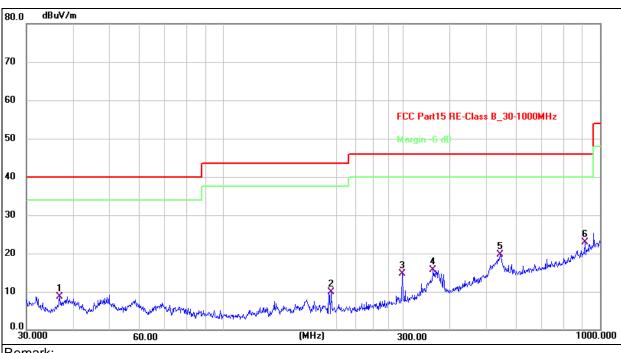
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#### Between 30MHz – 1GHz

Temperature:	<b>26</b> ℃	Relative Humidity:	54%
Pressure:	101KPa	Phase :	Horizontal
Test Mode:	Mode 4	Test Voltage :	DC 3.7V



Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.
 Measurement = Reading Level + Correct Factor

3. Over = Measurement - Limit

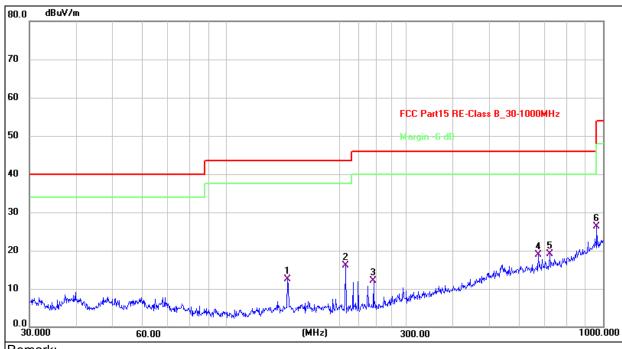
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No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	36.7662	26.20	-17.42	8.78	40.00	-31.22	QP
2	193.0945	29.31	-19.36	9.95	43.50	-33.55	QP
3	298.2681	31.77	-17.01	14.76	46.00	-31.24	QP
4	360.4476	31.19	-15.52	15.67	46.00	-30.33	QP
5	543.2742	29.86	-10.14	19.72	46.00	-26.28	QP
6 *	912.8620	26.44	-3.52	22.92	46.00	-23.08	QP

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Temperature:	<b>26</b> ℃	Relative Humidity:	54%
Pressure:	101KPa	Phase :	Vertical
Test Mode:	Mode 4	Test Voltage :	DC 3.7V



# Remark:

# Factor = Antenna Factor + Cable Loss – Pre-amplifier. Measurement = Reading Level + Correct Factor Over = Measurement - Limit

1							
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	145.3506	31.63	-19.03	12.60	43.50	-30.90	QP
2	207.1226	35.34	-19.33	16.01	43.50	-27.49	QP
3	245.9509	30.88	-18.72	12.16	46.00	-33.84	QP
4	672.8444	27.31	-8.35	18.96	46.00	-27.04	QP
5 *	721.7259	26.72	-7.61	19.11	46.00	-26.89	QP
6	962.1623	28.13	-1.88	26.25	54.00	-27.75	QP

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#### Between 1GHz – 25GHz

Polar	Frequency	Reading Level	Correct Factor	Measure- ment	Limits	Over	Detector	
(H/V)	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/ m)	(dB)	Туре	
	GFSK Low channel							
V	4804.00	72.67	-19.99	52.68	74.00	-21.32	PK	
V	4804.00	62.81	-19.99	42.82	54.00	-11.18	AV	
V	7206.00	64.53	-14.22	50.31	74.00	-23.69	PK	
V	7206.00	54.61	-14.22	40.39	54.00	-13.61	AV	
Н	4804.00	68.02	-19.99	48.03	74.00	-25.97	PK	
Н	4804.00	57.23	-19.99	37.24	54.00	-16.76	AV	
Н	7206.00	63.29	-14.22	49.07	74.00	-24.93	PK	
Н	7206.00	55.43	-14.22	41.21	54.00	-12.79	AV	
	·	G	FSK Middle c	hannel				
V	4882.00	69.21	-19.84	49.37	74.00	-24.63	PK	
V	4882.00	60.32	-19.84	40.48	54.00	-13.52	AV	
V	7323.00	59.98	-13.90	46.08	74.00	-27.92	PK	
V	7323.00	51.97	-13.90	38.07	54.00	-15.93	AV	
Н	4882.00	64.81	-19.84	44.97	74.00	-29.03	PK	
Н	4882.00	54.29	-19.84	34.45	54.00	-19.55	AV	
Н	7323.00	58.24	-13.90	44.34	74.00	-29.66	PK	
Н	7323.00	50.85	-13.90	36.95	54.00	-17.05	AV	
		(	GFSK High ch	annel				
V	4960.00	71.50	-19.68	51.82	74.00	-22.18	PK	
V	4960.00	62.47	-19.68	42.79	54.00	-11.21	AV	
V	7440.00	63.97	-13.57	50.40	74.00	-23.60	PK	
V	7440.00	53.78	-13.57	40.21	54.00	-13,79	: AV	
Н	4960.00	69.30	-19.68	49.62	74.00	-24.38	PK	
Н	4960.00	58.95	-19.68	39.27	54.00	-14.73	AV	
Н	7440.00	61.60	-13.57	48.03	74.00	-25.97	PK	
Н	7440.00	53.56	-13.57	39.99	54.00	-14.01	AV	

#### Remark:

1.Emission Level = Meter Reading + Factor, Factor = Antenna Factor + Cable Loss – Pre-amplifier. Over= Emission Level - Limit

2.If peak below the average limit, the average emission was no test.

3. In restricted bands of operation, The spurious emissions below the permissible value more than 20dB

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

5.All the Modulation are test, the worst mode is GFSK, the data recording in the report.

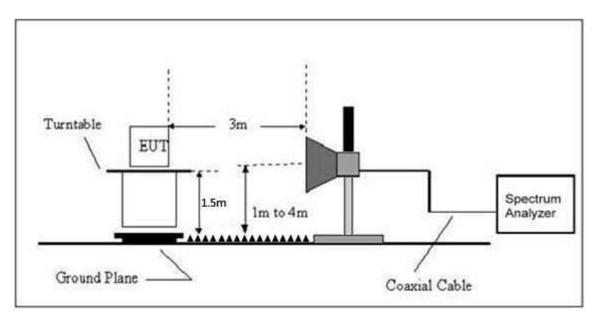
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# 8. Radiated Band Emission Measurement and Restricted Bands of Operation

# 8.1 Block Diagram Of Test Setup

Radiated Emission Test-Up Frequency Above 1GHz



#### 8.2 Limit

FCC Part15 C Section 15.209 and 15.205

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
<sup>1</sup> 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	( <sup>2</sup>
13.36-13.41			

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Limits Of Radiated Emission Measurement (Above 1000MHz)

Frequency (MHz)	Limit (dBuV/m) (at 3M)			
Frequency (MHz)	Peak Average			
Above 1000	74	54		

Notes:

(1)The limit for radiated test was performed according to FCC PART 15C.

(2)The tighter limit applies at the band edges.

(3)Emission level (dBuV/m)=20log Emission level (uV/m).

#### 8.3 Test procedure

Receiver Parameter	Setting
Attenuation	Auto
Start Frequency	2300MHz
Stop Frequency	2520
RB / VB (Emission In Restricted Band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Above 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.

b.The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d.For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.

e.The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

g. Test the EUT in the lowest channel, the middlest channel, the Highest channel.

Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

# 8.4 EUT operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.



## 8.5 Test Result

Test mode	Polar (H/V)	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Measure- ment (dBuV/m)	Limits (dBuV/m)		Result
					РК	PK	AV	
	Low Channel 2402MHz							
GFSK	Н	2390.00	72.31	-25.43	46.88	74.00	54.00	PASS
	Н	2400.00	74.16	-25.40	48.76	74.00	54.00	PASS
	V	2390.00	72.57	-25.43	47.14	74.00	54.00	PASS
	V	2400.00	73.67	-25.40	48.27	74.00	54.00	PASS
	High Channel 2480MHz							
	Н	2483.50	70.89	-25.15	45.74	74.00	54.00	PASS
	Н	2500.00	68.72	-25.10	43.62	74.00	54.00	PASS
	V	2483.50	71.08	-25.15	45.93	74.00	54.00	PASS
	V	2500.00	67.48	-25.10	42.38	74.00	54.00	PASS
π/4DQPSK	Low Channel 2402MHz							
	Н	2390.00	72.58	-25.43	47.15	74.00	54.00	PASS
	Н	2400.00	74.09	-25.40	48.69	74.00	54.00	PASS
	V	2390.00	73.05	-25.43	47.62	74.00	54.00	PASS
	V	2400.00	73.87	-25.40	48.47	74.00	54.00	PASS
	High Channel 2480MHz							
	Н	2483.50	71.94	-25.15	46.79	74.00	54.00	PASS
	Н	2500.00	67.63	-25.10	42.53	74.00	54.00	PASS
	V	2483.50	72.55	-25.15	47.40	74.00	54.00	PASS
	V	2500.00	69.41	-25.10	44.31	74.00	54.00	PASS
8DPSK	Low Channel 2402MHz							
	Н	2390.00	73.11	-25.43	47.68	74.00	54.00	PASS
	Н	2400.00	74.79	-25.40	49.39	74.00	54.00	PASS
	V	2390.00	72.49	-25.43	47.06	74.00	54.00	PASS
	V	2400.00	72.55	-25.40	47.15	74.00	54.00	PASS
	High Channel 2480MHz							
	Н	2483.50	71.31	-25.15	46.16	74.00	54.00	PASS
	Н	2500.00	69.52	-25.10	44.42	74.00	54.00	PASS
	V	2483.50	70.54	-25.15	45.39	74.00	54.00	PASS
	V	2500.00	67.28	-25.10	42.18	74.00	54.00	PASS

#### Remark:

1. Emission Level = Meter Reading + Factor, Factor = Antenna Factor + Cable Loss – Pre-amplifier. Over= Emission Level - Limit

2. If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.

3 In restricted bands of operation, The spurious emissions below the permissible value more than 20dB

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



# 9. Spurious RF Conducted Emissions

# 9.1 Block Diagram Of Test Setup



# 9.2 Limit

Regulation 15.247 (d),In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.205(c))

#### 9.3 Test procedure

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

2. Set the spectrum analyzer: Below 30MHz: RBW = 100kHz, VBW = 300kHz, Sweep = auto Detector function = peak, Trace = max hold Above 30MHz: RBW = 100KHz, VBW = 300KHz, Sweep = auto Detector function = peak, Trace = max hold JC JC JC

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#### 9.4 Test Result





























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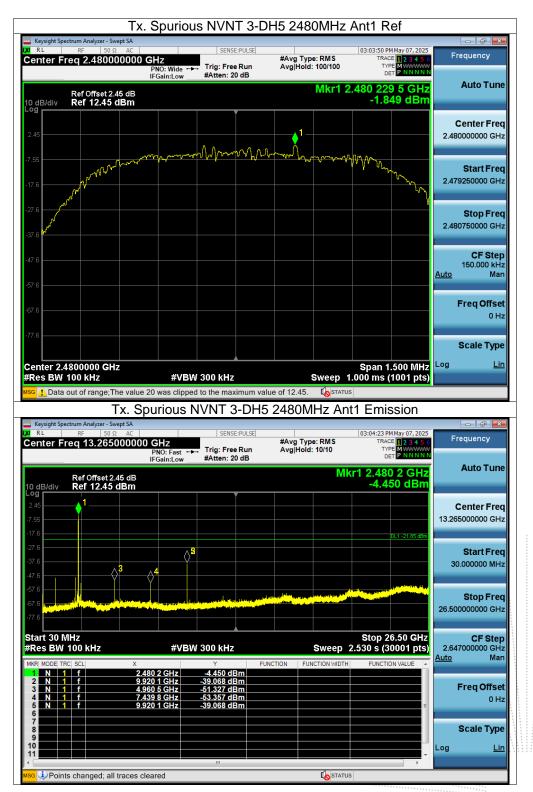
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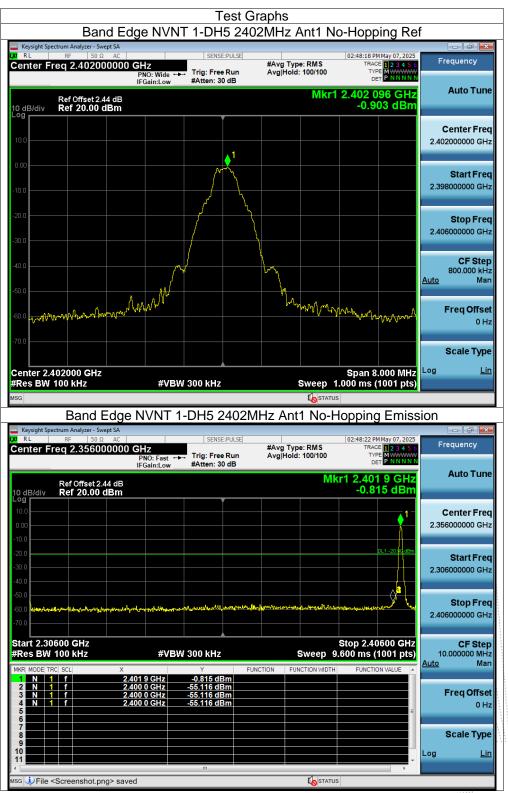












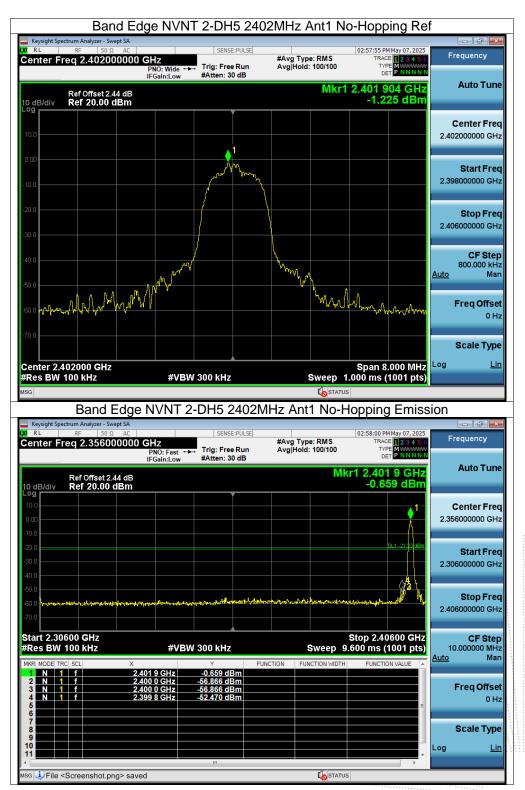
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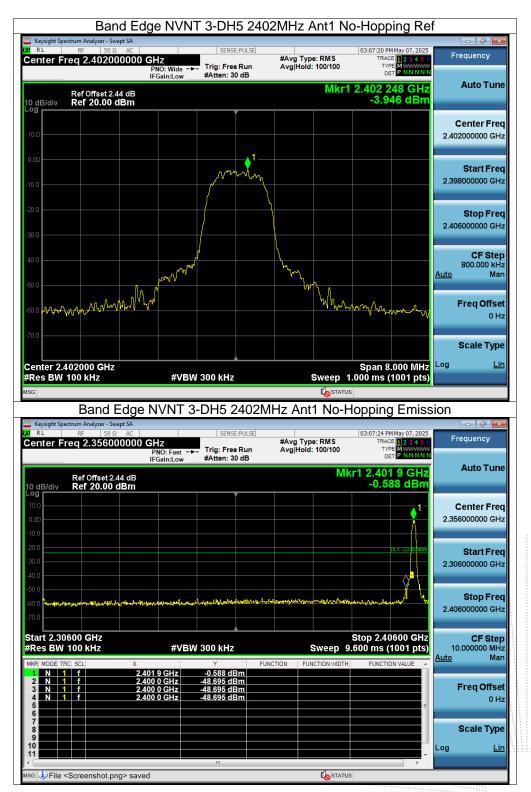
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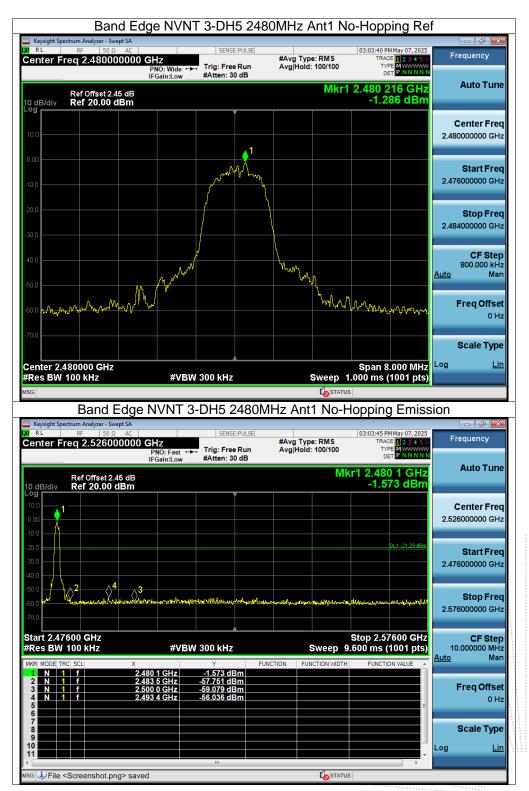


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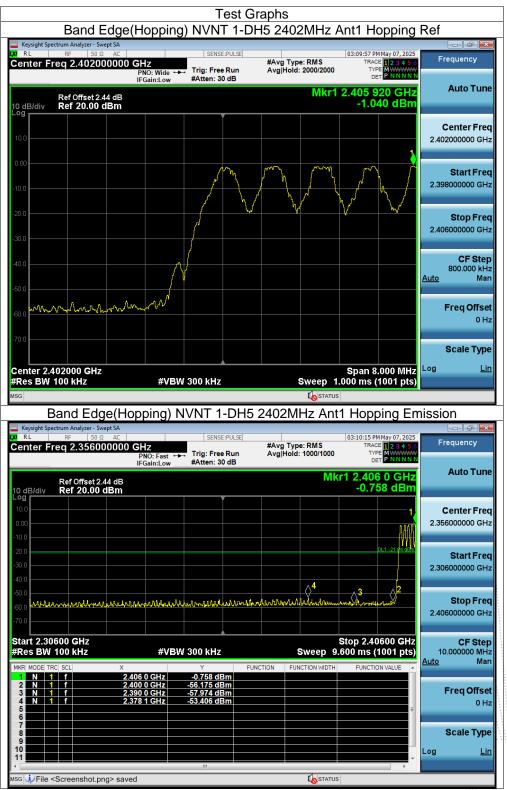








































#### 10. 20 dB Bandwidth

#### 10.1 Block Diagram Of Test Setup



10.2 Limit

N/A

- 10.3 Test procedure
- 1. Set RBW = 30kHz.
- 2. Set the video bandwidth (VBW)  $\ge$  3 x RBW.
- 3. Detector = Peak.
- 4. Trace mode = max hold.
- 5. Sweep = auto couple.

6. Allow the trace to stabilize.

7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

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## 10.4 Test Result

Condition	Mode	Frequency (MHz)	-20 dB Bandwidth (MHz)	Verdict
NVNT	1-DH5	2402	0.958	Pass
NVNT	1-DH5	2441	0.94	Pass
NVNT	1-DH5	2480	0.956	Pass
NVNT	2-DH5	2402	1.305	Pass
NVNT	2-DH5	2441	1.275	Pass
NVNT	2-DH5	2480	1.279	Pass
NVNT	3-DH5	2402	1.293	Pass
NVNT	3-DH5	2441	1.296	Pass
NVNT	3-DH5	2480	1.348	Pass

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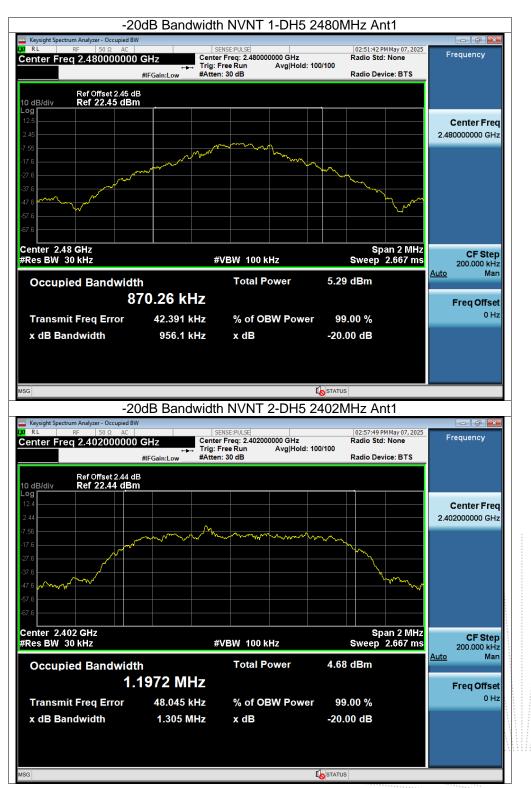




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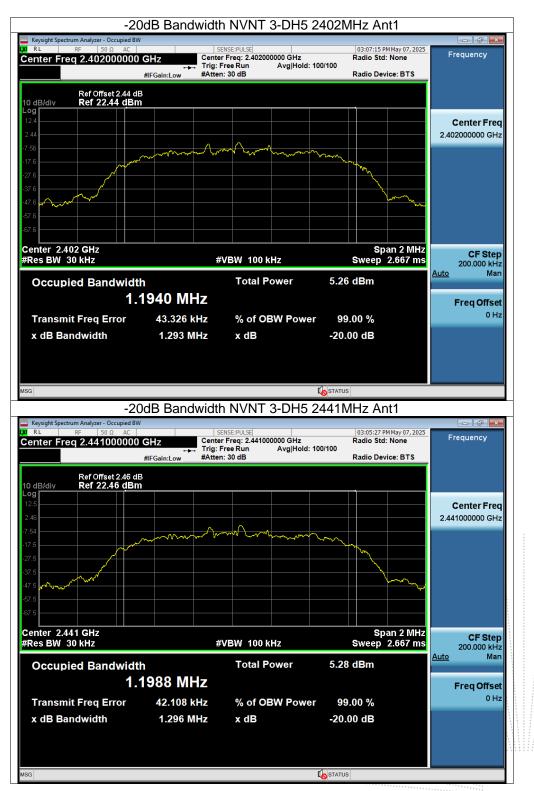
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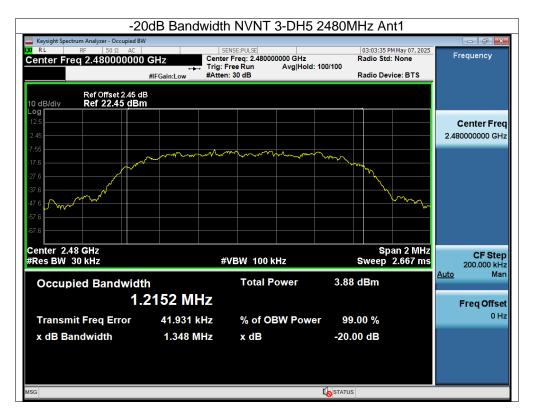
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#### 11. Maximum Peak Output Power

#### 11.1 Block Diagram Of Test Setup



#### 11.2 Limit

FCC Part15 (15.247) , Subpart C						
Section	Test Item	Limit	Frequency Range (MHz)	Result		
15.247(b)(1)	Peak Output Power	0.125 watt or 21dBm	2400-2483.5	PASS		

#### 11.3 Test procedure

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

2. Set the spectrum analyzer: RBW = 2MHz. VBW = 6MHz. Sweep = auto; Detector Function = Peak.

3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

#### 11.4 Test Result

Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH5	2402	-0.54	21	Pass
NVNT	1-DH5	2441	-0.58	21	Pass
NVNT	1-DH5	2480	-1.16	21	Pass
NVNT	2-DH5	2402	0.08	21	Pass
NVNT	2-DH5	2441	0.05	21	Pass
NVNT	2-DH5	2480	-0.54	21	Pass
NVNT	3-DH5	2402	0.36	21	Pass
NVNT	3-DH5	2441	0.35	21	Pass
NVNT	3-DH5	2480	-0.3	21	Pass

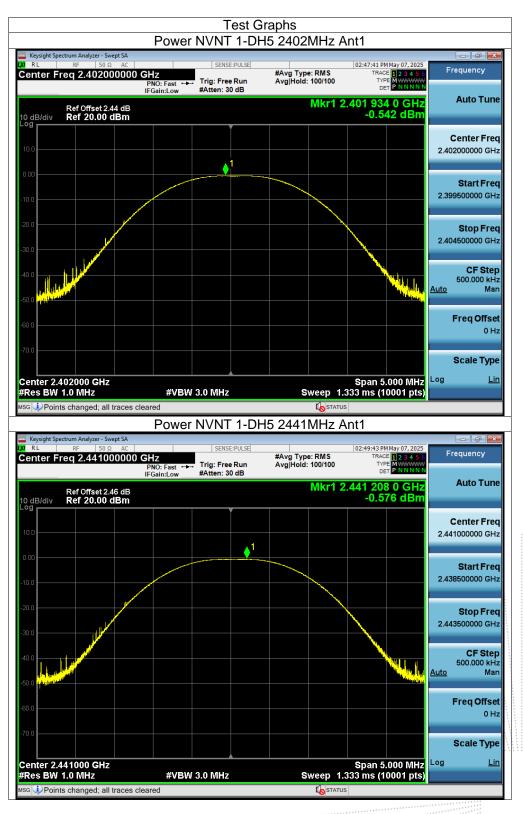
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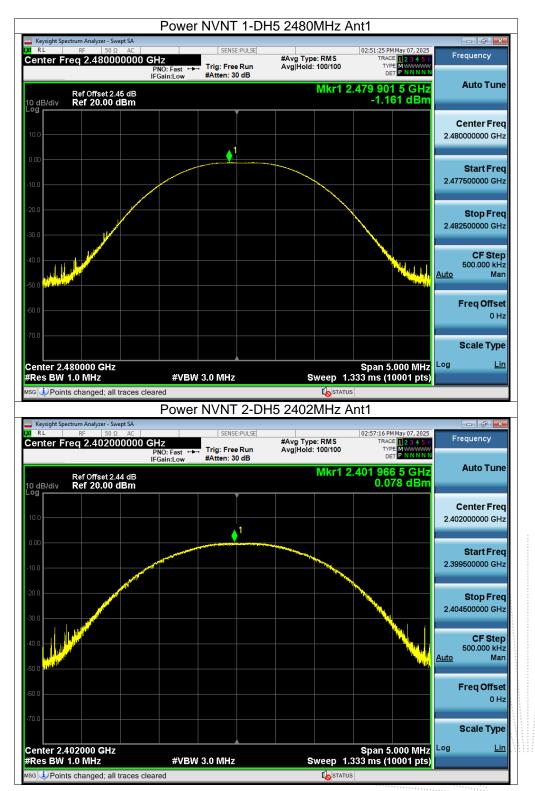




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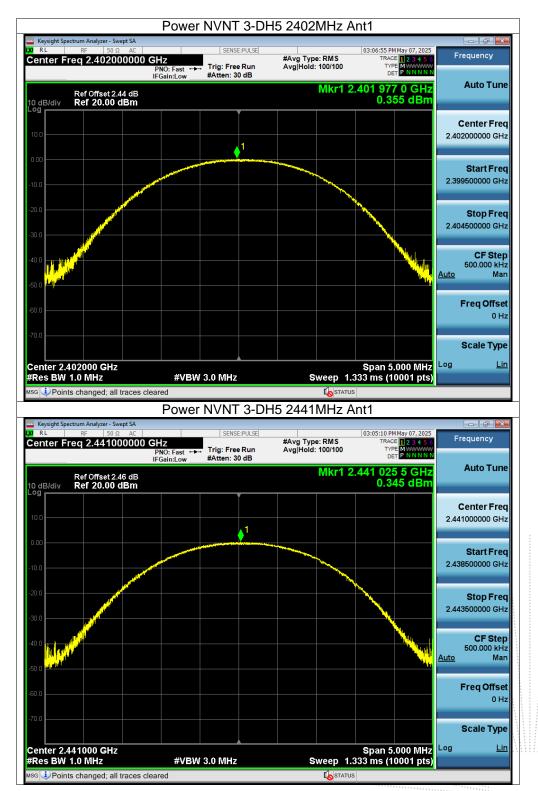


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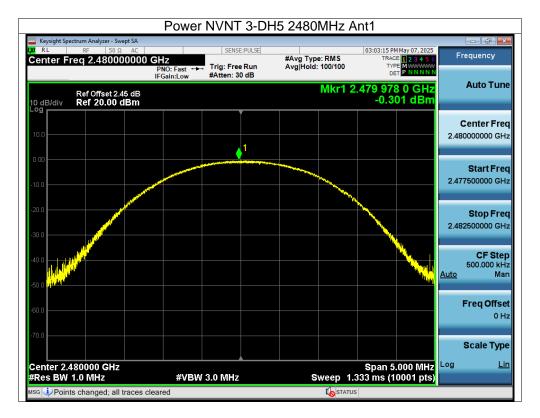






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#### 12. Hopping Channel Separation

#### 12.1 Block Diagram Of Test Setup



#### 12.2 Limit

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 0.125W.

#### 12.3 Test procedure

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

2. Set the spectrum analyzer: RBW = 30kHz. VBW = 100kHz , Span = 2.0MHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.

3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

Condition	Mode	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH5	2402.04	2403.018	0.978	0.025	Pass
NVNT	1-DH5	2441.018	2442.022	1.004	0.025	Pass
NVNT	1-DH5	2479.038	2480.018	0.98	0.025	Pass
NVNT	2-DH5	2401.87	2402.88	1.01	0.87	Pass
NVNT	2-DH5	2441.046	2442.04	0.994	0.85	Pass
NVNT	2-DH5	2478.882	2480.032	1.15	0.853	Pass
NVNT	3-DH5	2402.038	2403.038	1.000	0.862	Pass
NVNT	3-DH5	2441.04	2442.04	1.000	0.864	Pass
NVNT	3-DH5	2479.038	2480.042	1.004	0.899	Pass

#### 12.4 Test Result

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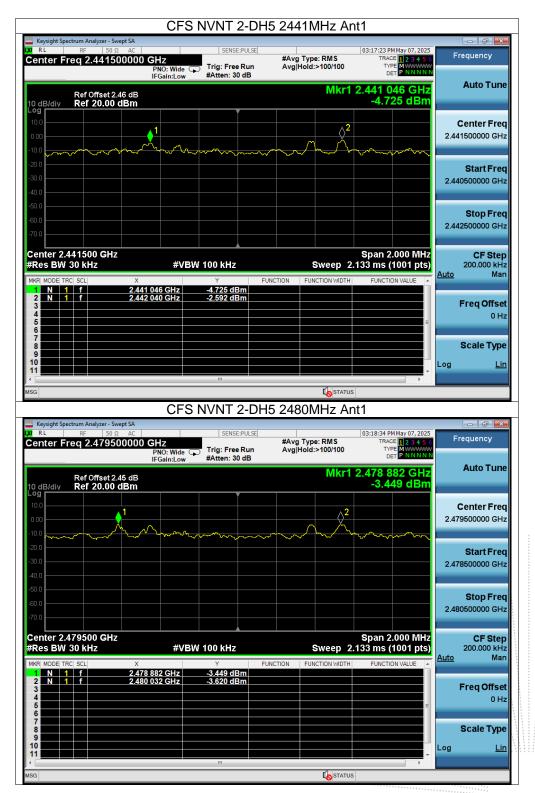


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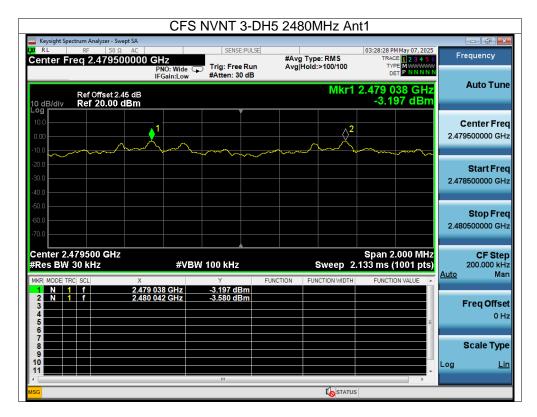












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#### 13. Number of Hopping Frequency

#### 13.1 Block Diagram Of Test Setup



#### 13.2 Limit

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

#### 13.3 Test procedure

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

2. Set the spectrum analyzer: RBW = 100kHz. VBW = 300kHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.

3. Allow the trace to stabilize. It may prove necessary to break the span up to sections. in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section.

4. Set the spectrum analyzer: Start Frequency = 2.4GHz, Stop Frequency = 2.4835GHz. Sweep=auto;

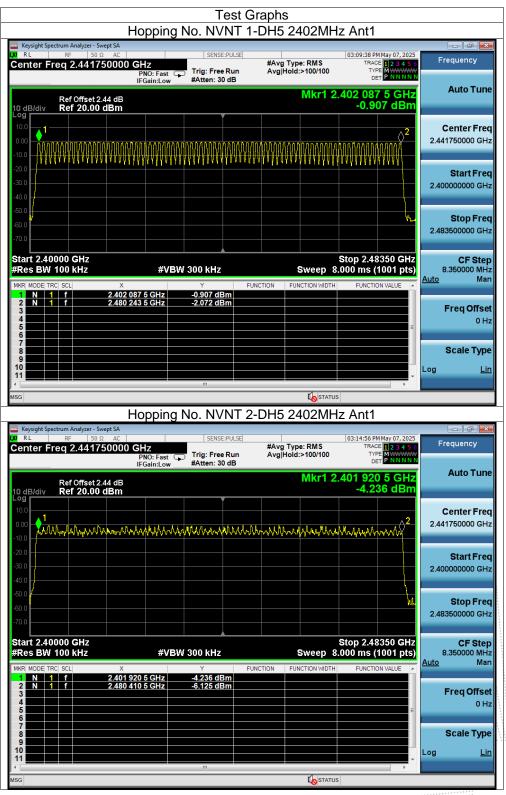
#### 13.4 Test Result

Condition	Mode	Hopping Number	Limit	Verdict
NVNT	1-DH5	79	15	Pass
NVNT	2-DH5	79	15	Pass
NVNT	3-DH5	79	15	Pass

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Hoppin	g No. NVNT 3-	DH5 2402MH	z Ant1	
Keysight Spectrum Analyzer - Swept SA (X) RL RF 50 Ω AC	SENSE:PULSE		03:20:15 PM May 07, 2025	Frequency
Center Freq 2.441750000 GHz PNO: Fast IFGain:Lov		#Avg Type: RMS Avg Hold:>100/100	TRACE 1 2 3 4 5 6 TYPE M WWWW DET P NNNN	
Ref Offset 2.44 dB 10 dB/div Ref 20.00 dBm		Mkr1 2.	401 670 0 GHz -4.906 dBm	Auto Tune
Log 10.0 0.00 10.0 10.0	WWwwwww	www.whereweither	2 Mmulhalad	Center Freq 2.441750000 GHz
-20.0				<b>Start Freq</b> 2.400000000 GHz
-50.0 -60.0 -70.0			<u> </u>	Stop Freq 2.483500000 GHz
Start 2.40000 GHz #Res BW 100 kHz #V	/BW 300 kHz		Stop 2.48350 GHz 000 ms (1001 pts)	CF Step 8.350000 MHz
MKR         MODE         TRC         SCL         X           1         N         1         f         2.401         670         0         GHz           2         N         1         f         2.480         243         5         GHz           3         4         5         6         6         6         6         6         6         6         6         6         6         6         6         6         7 </td <td>Y FUN -4.906 dBm -1.380 dBm</td> <td>CTION FUNCTION WIDTH</td> <td>FUNCTION VALUE</td> <td><u>Auto</u> Man Freq Offset 0 Hz</td>	Y FUN -4.906 dBm -1.380 dBm	CTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man Freq Offset 0 Hz
7 8 9 9 9 10 11 11 1 1 1 1 1 1 1 1 1 1 1 1				Scale Type
MSG	m	<b>K</b> STATUS	•	

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#### 14. Dwell Time

#### 14.1 Block Diagram Of Test Setup



#### 14.2 Limit

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

#### 14.3 Test procedure

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

2. Set spectrum analyzer span = 0. Centred on a hopping channel;

3. Set RBW = 1MHz and VBW = 3MHz.Sweep = as necessary to capture the entire dwell time per hopping channel. Set the EUT for DH5, DH3 and DH1 packet transmitting.

4. Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

#### 14.4 Test Result

DH5 Packet permit maximum 1600 / 79 / 6 hops per second in each channel (5 time slots RX, 1 time slot TX).

DH3 Packet permit maximum 1600 / 79 / 4 hops per second in each channel (3 time slots RX, 1 time slot TX).

DH1 Packet permit maximum 1600 / 79 /2 hops per second in each channel (1 time slot RX, 1 time slot TX). So, the Dwell Time can be calculated as follows:

DH5:1600/79/6\*0.4\*79\*(MkrDelta)/1000 DH3:1600/79/4\*0.4\*79\*(MkrDelta)/1000 DH1:1600/79/2\*0.4\*79\*(MkrDelta)/1000 Remark: Mkr Delta is once pulse time.

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Condition	Mode	Frequency (MHz)	Pulse Time (ms)	Total Dwell Time (ms)	Limit (ms)	Verdict
NVNT	1-DH1	2441	0.382	120.33	400	Pass
NVNT	1-DH3	2441	1.638	247.338	400	Pass
NVNT	1-DH5	2441	2.886	288.6	400	Pass
NVNT	2-DH1	2441	0.392	125.44	400	Pass
NVNT	2-DH3	2441	1.643	262.88	400	Pass
NVNT	2-DH5	2441	2.89	277.44	400	Pass
NVNT	3-DH1	2441	0.392	125.048	400	Pass
NVNT	3-DH3	2441	1.642	272.572	400	Pass
NVNT	3-DH5	2441	2.893	280.621	400	Pass

n 00.,LT

No.: BCTC/RF-EMC-005

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Dw	Test Gr ell NVNT 1-DH1 244		ot
www.com analyzer - Swept SA			
KL RF 50 Ω AC     Center Freq 2.441000000 (	SENSE:PULSE CHZ PNO: Fast ↔ Trig: Video IFGain:Low #Atten: 30 dB	#Avg Type: RMS TRAC	May 07, 2025 E 1 2 3 4 5 6 E WWWWWW T P NNNNN
Ref Offset 2.46 dB 10 dB/div Ref 20.00 dBm		ΔMkr1 3	82.0 µs Auto Tune 0.46 dB
			Center Freq 2.441000000 GHz
-20.0			<b>Start Freq</b> 2.441000000 GHz
	en a baldaren ipa (erre filo) di antia baldari baldari <sup>14</sup> en 1949 - Antia Antia (erre filo) di antia antia di anti	han bar an	Stop Freq 2,44100000 GHz
Center 2.441000000 GHz Res BW 1.0 MHz	#VBW 3.0 MHz	Sweep 10.00 ms (1	Auto Man
MKR         MODE         TRC         SCL         X           1         42         1         t         (A)           2         F         1         t         3           3         -         -         -         -           5         -         -         -         -	382.0 μs (Δ) 0.46 dB 498.0 μs -1.78 dBm	FUNCTION WIDTH FUNCTION	Freq Offset 0 Hz
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10 11 MSG Depints changed; all traces cle	m m	<b>K</b> ostatus	Log <u>Lin</u>
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Keysight Spectrum Analyzer - Swept SA           κ         RF         50 Ω         AC           Center Freq 2.441000000 (	PNO: Fast ++++ Trig: Video	#Avg Type: RMS TRAC	Imay 07, 2025         Frequency           1 2 3 4 5 6         Frequency           F PNNNNN         F
Ref Offset 2.46 dB 10 dB/div Ref 20.00 dBm	IFGain:Low #Atten: 30 dB	ΔMkr1 1.	Auto Tupe
Log 10.0 0.00 -10.0 Δημαρικομικου 1Δ2			Center Freq 2.441000000 GHz
-20.0 -30.0 -40.0			Start Freq 2.441000000 GHz
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Center 2.441000000 GHz Res BW 1.0 MHz	#VBW 3.0 MHz	S Sweep 10.00 ms (1	pan 0 Hz 0001 pts) 1.00000 MHz Auto Man
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5 6 7 8 8			Scale Type
	mini mini mini mini mini mini mini mini	<b>K</b> ostatus	Log Lin



	Dwell N	VNT 1-DH5	5 Z44 TIVI	HZ ANTI O	ne Burst	
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© RL RF 50Ω Center Freq 2.441000			500.0 µs #Av	vg Type: RMS	03:10:34 PM May 07, 20 TRACE 2 3 4 TYPE WWWW DET PNNN	5 6 Frequency
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Image: Signed Spectrum Analyzer - Swep (RL RF) 50 0         Center Freq 2.441000         Image: Signed Spectrum Analyzer - Swep (RL RF) 50 0         Center Freq 2.441000         Image: Signed Spectrum Analyzer - Swep (RL RF) 50 0         Center Freq 2.441000         Image: Signed Spectrum Analyzer - Swep (RL RF) 50 0         Image: Signed Spectrum Analyzer - Swep (RL RF) 50 0         Image: Signed Spectrum Analyzer - Swep (RL RF) 50 0         Image: Signed Spectrum Analyzer - Swep (RL RF) 50 0         Image: Signed Spectrum Analyzer - Swep (RL RF) 50 0         Image: Signed Spectrum Analyzer - Swep (RL RF) 50 0         Image: Signed Spectrum Analyzer - Swep (RL RF) 50 0         Image: Signed Spectrum Analyzer - Swep (RL RF) 50 0         Image: Signed Spectrum Analyzer - Swep (RL RF) 50 0         Image: Signed Spectrum Analyzer - Swep (RL RF) 50 0         Image: Signed Spectrum Analyzer - Swep (RL RF) 50 0         Image: Signed Spectrum Analyzer - Swep (RL RF) 50 0         Image: Signed Spectrum Analyzer - Swep (RL RF) 50 0         Image: Signed Spectrum Analyzer - Swep (RL RF) 50 0         Image: Signed Spectrum Analyzer - Swep (RL RF) 50 0         Image: Signed Spectrum Analyzer - Swep (RL RF) 50 0         Image: Signed Spectrum Analyzer - Swep (RL RF) 50 0         Image: Signed Spectrum Analyzer - Swep (RL RF) 50 0         Image: Signed Spectrum Analyzer - Swep (RL R	Dwell N' ar SA C D0000 GHz PNO: Far IFGainLo S dB B M Hz Hz X 392.0 JP	VNT 2-DH1	ULSE 500.0 μS #A1 500.0 μS #A1 dB dB dB dB dB dB dB dB dB dB dB dB dB	Hz Ant1 O	ne Burst	<ul> <li>Frequency</li> <li>Auto Tune</li> <li>Center Freq</li> <li>2.441000000 GHz</li> <li>Start Freq</li> <li>2.441000000 GHz</li> <li>Stop Freq</li> <li>2.44100000 GHz</li> <li>CF Step</li> <li>1.00000 MHz</li> <li>Auto Man</li> <li>Freq Offset</li> <li>0 Hz</li> </ul>
Resignt Spectrum Analyzer - Swep           RL         RF         50 Ω           Center Freq 2.441000         Ref Offset 2.40         Ref Offset 2.40           0 dB/div         Ref Offset 2.40         Ref Offset 2.40	Dwell N' ar SA C D0000 GHz PNO: Far IFGainLo S dB B M Hz Hz X 392.0 JP	VNT 2-DH1	ULSE 500.0 μS #A1 500.0 μS #A1 dB dB dB dB dB dB dB dB dB dB dB dB dB	Hz Ant1 O	ne Burst	225       Frequency         Start Freq       2.441000000 GHz         Center Freq       2.441000000 GHz         Stop Freq       2.441000000 GHz         Stop Freq       2.441000000 GHz         L       Stop Freq         L       CF Step         Auto       Man         Freq Offset       0 Hz
Resignt Spectrum Analyzer - Swep           RL         RF         50 Ω           center Freq 2.441000         G         G         G           0 dB/div         Ref Offset 2.46         G         G         G           0 00         0         0         1Δ2         G         G         G           0 00         0         0         0         1Δ2         G <t< td=""><td>Dwell N' ac   D000 GHz PN0: Fa: IFGainLC 6 dB Bm   Hz Hz # 392.0 µc 498.0 µc</td><td>VNT 2-DH1</td><td>ULSE 500.0 μS #A1 500.0 μS #A1 dB dB dB dB dB dB dB dB dB dB dB dB dB</td><td>Hz Ant1 O</td><td>Ine Burst</td><td>225       Frequency         1       Auto Tune         1       Center Frequency         2       Auto Tune         2       Center Frequency         2       Auto Tune         2       Start Frequency         3       CF Step         4       Auto         4       Freq Offset         0       Hz         5       Scale Type</td></t<>	Dwell N' ac   D000 GHz PN0: Fa: IFGainLC 6 dB Bm   Hz Hz # 392.0 µc 498.0 µc	VNT 2-DH1	ULSE 500.0 μS #A1 500.0 μS #A1 dB dB dB dB dB dB dB dB dB dB dB dB dB	Hz Ant1 O	Ine Burst	225       Frequency         1       Auto Tune         1       Center Frequency         2       Auto Tune         2       Center Frequency         2       Auto Tune         2       Start Frequency         3       CF Step         4       Auto         4       Freq Offset         0       Hz         5       Scale Type



	Dwell NVN	T 2-DH3 244	1MHz Ant1 C	ne Burst	
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ଷ RL RF 50 Ω Center Freq 2.44100		SENSE:PULSE Trig Delay-500.0 μs - Trig: Video #Atten: 30 dB	#Avg Type: RMS	04:23:10 PM May 07, 2025 TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P N N N N N	Frequency
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70.0				Span 0 Hz	CF Step
Res BW 1.0 MHz		Y FUN	Sweep 10	0.00 ms (10001 pts)	1.000000 MHz Auto Mar
1         Δ2         1         t         (Δ)           2         F         1         t         1 <td>1.643 ms (Δ) 486.0 μs</td> <td>-0.50 dB -11.46 dBm</td> <td></td> <td></td> <td>Freq Offse 0 H</td>	1.643 ms (Δ) 486.0 μs	-0.50 dB -11.46 dBm			Freq Offse 0 H
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sg iPoints changed; all	traces cleared		<b>I</b> STATU	IS	
		T 2-DH5 244			
Keysight Spectrum Analyzer - Sw RL RF 50 Ω				03:15:53 PM May 07, 2025	
enter Freq 2.44100	00000 GHz PNO: Fast ↔ IFGain:Low	Trig Delay-500.0 µs → Trig: Video #Atten: 30 dB	#Avg Type: RMS	TRACE 1 2 3 4 5 6 TYPE WWWWWW DET PNNNN	Frequency
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0.00	1Δ2				Center Fred 2.441000000 GH:
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🚾 Keysight Spectrum Analyzer - Sw 🗶 RL RF 50 Ω		SENSE:PULS	E	04-23-5	9 PM May 07, 2025	
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5						
7 8						Scale Type
9						Log <u>Lin</u>
11						
ISG Deints changed; all	traces cleared			STATUS		
	Dwell N	/NT 3-DH3 2	2441MHz Ar	nt1 One Bi	urst	
Keysight Spectrum Analyzer - Sw	vept SA		2441MHz Ar			
RL RF 50Ω	vept SA 2 AC 00000 GHz PNO: Fas	SENSE:PULS Trig Delay-500 Trig: Video	ε	04:24:4	6 PM May 07, 2025 RACE 12 3 4 5 6 TYPE WWWWWW	Frequency
RL RF 50 G Center Freq 2.44100 Ref Offset 2.	vept SA 2 AC <b>GHz</b> PNO: Fas IFGain:Lo	SENSE:PULS Trig Delay-500 Trig: Video	ε	04:24:4 RMS т	6 PM May 07, 2025 RACE 1 2 3 4 5 6 TYPE WWWWWWWW DET P N N N N N 1.642 ms	Frequency
RL         RF         50 S           Center Freq 2.44100         Ref Offset 2.         Ref Offset 2.           0 dB/div         Ref 20.00         Ref 20.00	vept SA 2 AC <b>GHz</b> PNO: Fas IFGain:Lo	SENSE:PULS Trig Delay-500 Trig: Video	ε	04:24:4 RMS т	6 PM May 07, 2025 RACE 1 2 3 4 5 6 TYPE WWWWWWW DET P NNNN	Frequency
RL         RF         50 S           Center Freq 2.44100         Ref Offset 2.         Ref Offset 2.           0 dB/div         Ref 20.00         Ref 20.00	vept SA 2 AC <b>GHz</b> PNO: Fas IFGain:Lo	SENSE:PULS Trig Delay-500 Trig: Video	ε	04:24:4 RMS т	6 PM May 07, 2025 RACE 1 2 3 4 5 6 TYPE WWWWWWWW DET P N N N N N 1.642 ms	Frequency Auto Tune Center Freq
RL RF 50 G Center Freq 2.44100 Ref Offset 2. 0 dB/div Ref 20.00	vept SA 2 AC D00000 GHz PNO: Fas IFGain:Lo 46 dB dBm	SENSE:PULS Trig Delay-500 Trig: Video	ε	04:24:4 RMS т	6 PM May 07, 2025 RACE 1 2 3 4 5 6 DET PNNNNN DET PNNNNN 1.642 ms -1.99 dB	Frequency Auto Tune Center Freq
RL RF 50 G Center Freq 2.44100 Ref Offset 2. 0 dB/div Ref 20.00	vept SA 2 AC D00000 GHz PNO: Fas IFGain:Lo 46 dB dBm	SENSE:PULS Trig Delay-500 Trig: Video	ε	04:24:4 RMS т	6 PM May 07, 2025 RACE 1 2 3 4 5 6 TYPE WWWWWWWW DET P N N N N N 1.642 ms	Frequency Auto Tune Center Freq
RL RF 50 9 Center Freq 2.44100 Ref Offset 2. 0 dB/div Ref 20.00 0 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	vept SA 2 AC D00000 GHz PNO: Fas IFGain:Lo 46 dB dBm	SENSE:PULS Trig Delay-500 Trig: Video	ε	04:24:4 RMS т	6 PM May 07, 2025 RACE 1 2 3 4 5 6 DET PNNNNN DET PNNNNN 1.642 ms -1.99 dB	Frequency Auto Tune Center Freq 2.44100000 GHz Start Freq
REF 0155612 Center Freq 2.44100 Ref 0156612 10 dB/div Ref 20.00 0 00 0 00 0 0 00 0	vept SA 2 AC D00000 GHz PNO: Fas IFGain:Lo 46 dB dBm	SENSE:PULS Trig Delay-500 Trig: Video	ε	04:24:4 RMS т	6 PM May 07, 2025 RACE 1 2 3 4 5 6 DET PNNNNN DET PNNNNN 1.642 ms -1.99 dB	Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq
REF 0155542. Ref 0155542. 10 dB/div Ref 20.00 0 00 0 00 20 0 20 0	vept SA 2 AC D00000 GHz PNO: Fas IFGain:Lo 46 dB dBm	Trig Delay-500 t → Trig: Video w #Atten: 30 dB	E Avg Type: I	<u>04:24:4</u> RMS T ▲Mkr1	EPMMay 07, 2025 RACE 1 2 3 4 5 6 DET P NNNN 1.642 ms -1.99 dB	
REF 0155642.	vept SA 2 AC D00000 GHz PNO: Fas IFGain:Lo 46 dB dBm	Trig Delay-500 t → Trig: Video w #Atten: 30 dB	E 0 μs #Avg Type: I μ μ μ μ μ μ μ μ μ μ μ μ μ	04:24:4 RMS т <u> <u> </u> </u>	EPMMay 07, 2025 RACE 1 2 3 4 5 6 DET P NNNN 1.642 ms -1.99 dB	Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz
RL RF 50 G Center Freq 2.44100 0 00 Ref 20.00 0 00	vept SA 2 AC D00000 GHz PNO: Fas IFGain:Lo 46 dB dBm	Trig Delay-500 t → Trig: Video w #Atten: 30 dB	E Avg Type: I	04:24:4 RMS т <u> <u> </u> </u>	EPMMay 07, 2025 RACE 1 2 3 4 5 6 DET P NNNN 1.642 ms -1.99 dB	Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq
Ref Offset 2. 0 dB/div Ref 20.00 0 dB/div Ref 20.00 0 0 X 2 0 dB/div Ref 20.00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	vept SA 2 AC 2 AC PNO: Fas IFGain:Lo 46 dB dBm 1 A2 1 A2 1 A2 1 A2 1 A2	Trig Delay-500 t → Trig: Video w #Atten: 30 dB	E 0 μs #Avg Type: I μ μ μ μ μ μ μ μ μ μ μ μ μ	04:24:4 RMS т <u> <u> </u> </u>		Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz
RE         S0 G           Center Freq 2.44100           0 dB/div           Ref Offset 2.           0 dB/div           Ref 20.00           0 dB/div           0 dB/div </td <td>vept SA 2 AC PNO: Fas IFGain:Lo 46 dB dBm 1 A 2 1 A 2 C A C C A</td> <td>Trig Delay-500 t → Trig: Video w #Atten: 30 dB</td> <td></td> <td>04:24:4 RMS т <u> <u> </u> </u></td> <td>6 PM May 07, 2025 4442E 11 23 4 5 00 TYPE 23 4 5 00 DET P NNNNN 1.642 ms -1.99 dB TRIO LVL 1.00 LVL 1.00 LVL 1.00 LVL 1.00 LVL 1.00 LVL 1.00 LVL 1.00 LVL</td> <td>Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz</td>	vept SA 2 AC PNO: Fas IFGain:Lo 46 dB dBm 1 A 2 1 A 2 C A C C A	Trig Delay-500 t → Trig: Video w #Atten: 30 dB		04:24:4 RMS т <u> <u> </u> </u>	6 PM May 07, 2025 4442E 11 23 4 5 00 TYPE 23 4 5 00 DET P NNNNN 1.642 ms -1.99 dB TRIO LVL 1.00 LVL 1.00 LVL 1.00 LVL 1.00 LVL 1.00 LVL 1.00 LVL 1.00 LVL	Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz
Ref Offset 2. 0 dB/div Ref 20.00 0 db/div Re	vept SA 2 AC PNO: Fas IFGain:Lo 46 dB dBm 1 A 2 1 A 2 C A C C A	Trig Delay-500 Trig Delay-500 W #Atten: 30 dB	E O μs #Avg Type: I	04:24:4 RMS T AMKr1	6 PM May 07, 2025 4442E 11 23 4 5 00 TYPE 23 4 5 00 DET P NNNNN 1.642 ms -1.99 dB TRIO LVL 1.00 LVL 1.00 LVL 1.00 LVL 1.00 LVL 1.00 LVL 1.00 LVL 1.00 LVL	Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz
Ref Offset 2.           0 dB/div         Ref Offset 2.           0 dB/div         Ref 20.00           10 dB/div         Ref 20.00           20 dB/div         Ref 20.00	vept SA 2 AC 2 AC PNO: Fas IFGain:Lo 46 dB dBm 142 142 46 dB dBm 142 46 dB dBm 46 dB dBm 46 dB dBm 46 dB dBm 46 dB 46 dB dBm 46 dB 46 dB 4	/ SENSE-PULS Trig Delay-500 w #Atten: 30 dB	E Avg Type: I	04:24:4 RMS T AMKr1	6 PM May 07, 2025 ACCE 112 34 5 50 DET P NNNNN 1.642 ms -1.99 dB TRIO LVL TRIO LVL Span 0 Hz (10001 pts)	Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz 2.441000000 GHz 2.441000000 GHz 1.000000 MHz 1.000000 MHz Auto Man
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RE         SO G           Center Freq 2.44100           0 dB/div           Ref Offset 2.           10 dB/div           Ref 20.00           0 dB/div           0 dB/div           20.0           30.0 <t< td=""><td>vept SA 2 AC 2 AC PNO: Fas IFGain:Lo 46 dB dBm 142 142 46 dB dBm 142 46 dB dBm 46 dB dBm 46 dB dBm 46 dB dBm 46 dB 46 dB dBm 46 dB 46 dB 4</td><td>/ SENSE-PULS Trig Delay-500 w #Atten: 30 dB</td><td>E Avg Type: I</td><td>04:24:4 RMS T AMKr1</td><td>6 PM May 07, 2025 ACCE 112 34 5 50 DET P NNNNN 1.642 ms -1.99 dB TRIO LVL TRIO LVL Span 0 Hz (10001 pts)</td><td>Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz</td></t<>	vept SA 2 AC 2 AC PNO: Fas IFGain:Lo 46 dB dBm 142 142 46 dB dBm 142 46 dB dBm 46 dB dBm 46 dB dBm 46 dB dBm 46 dB 46 dB dBm 46 dB 46 dB 4	/ SENSE-PULS Trig Delay-500 w #Atten: 30 dB	E Avg Type: I	04:24:4 RMS T AMKr1	6 PM May 07, 2025 ACCE 112 34 5 50 DET P NNNNN 1.642 ms -1.99 dB TRIO LVL TRIO LVL Span 0 Hz (10001 pts)	Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz
Ref         S0 G           Center         Freq         2.44100           O dB/div         Ref Offset 2.           10 dB/div         Ref 20.00           -00	vept SA 2 AC 2 AC PNO: Fas IFGain:Lo 46 dB dBm 142 142 46 dB dBm 142 46 dB dBm 46 dB dBm 46 dB dBm 46 dB dBm 46 dB 46 dB dBm 46 dB 46 dB 4	/ SENSE-PULS Trig Delay-500 w #Atten: 30 dB	E Avg Type: I	04:24:4 RMS T AMKr1	EPM May 07, 2025 FARCE 12 34 5 0 TYPE WANNED TYPE WANNED TYPE WANNED TRISLAL TRISLAL Span 0 Hz (10001 pts) CTION VALUE	Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz 2.441000000 GHz 2.441000000 GHz 1.000000 MHz Auto Man Freq Offset 0 Hz
Ref         S0 G           Center         Freq         2.44100           0 dB/div         Ref Offset 2.           0 dB/div         Ref 20.00           0 d0         Ref 20.00           1 d2         Ref 20.00           1 d2         1 t           2 e         1 t           3 d         Ref 20.00           1 d1         Ref 20.00      <	vept SA 2 AC 2 AC PNO: Fas IFGain:Lo 46 dB dBm 142 142 46 dB dBm 142 46 dB dBm 46 dB dBm 46 dB dBm 46 dB dBm 46 dB 46 dB dBm 46 dB 46 dB 4	/ SENSE-PULS Trig Delay-500 w #Atten: 30 dB	E Avg Type: I	04:24:4 RMS T AMKr1	EPM May 07, 2025 FARCE 12 34 5 0 TYPE WANNED TYPE WANNED TYPE WANNED TRISLAL TRISLAL Span 0 Hz (10001 pts) CTION VALUE	Frequency Auto Tune Center Freq 2.441000000 GHz 2.441000000 GHz 2.441000000 GHz 2.441000000 GHz 2.441000000 GHz 2.441000000 MHz Auto Man
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RL         RF         50 g           Center Freq 2.44100         Ref Offset 2.           0 dB/div         Ref 20.00           0 g         Ref 20.00	wept SA         2       AC         2       AC         2       AC         2       AC         000000 GHz       PN0: Fas         PN0: Fas       IFGain:Lo         46 dB       dBm         1       1	/ SENSE-PULS Trig Delay-500 w #Atten: 30 dB	E Avg Type: I 0 μs #Avg Type: I 1 μa <sup>-1</sup> pair in the second	04:24:4 RMS T AMKr1	EPM May 07, 2025 FARCE 12 34 5 0 TYPE WANNED TYPE WANNED TYPE WANNED TRISLAL TRISLAL Span 0 Hz (10001 pts) CTION VALUE	Frequency Auto Tune Center Freq 2.441000000 GHz 2.441000000 GHz 3.0000 GHz 2.441000000 GHz 3.0000 GHZ 3.00000 GHZ 3.0000 GHZ 3.00000 GHZ 3.0000 GHZ 3.00000 GHZ 3.0000 GHZ 3.0000 GHZ 3.0000 GHZ 3.0000 GHZ 3.0000 GHZ 3.0000 GHZ 3.00000 GHZ 3.00000 GHZ 3.00000 GHZ 3.0000000 GHZ 3.00000 GHZ 3.00000 GHZ 3.0000000000000000000000000

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Dwell	NVNT 3-DH5 24	41MHz Ant1 C	One Burst	
	0: Fast 🛶 Trig: Video	s #Avg Type: RMS	03:24:15 PM May 07, 2025 TRACE 123456 TYPE WWWWWW	Frequency
Ref Offset 2.46 dB	ain:Low #Atten: 30 dB		ΔMkr1 2.893 ms -2.33 dB	Auto Tune
	1Δ2		TRIG LVL	Center Freq 2.441000000 GHz
-100 -200 -200 -300 -400				Start Freq 2.441000000 GHz
-50.0 <mark></mark>	a separata na anti kanfanana na atani karika Taka maja na atani karika na ana atani karika	an an an tao amin' a Tao amin'		Stop Fred 2.441000000 GHz
Center 2.441000000 GHz Res BW 1.0 MHz	#VBW 3.0 MHz	-	Span 0 Hz 0.00 ms (10001 pts)	CF Step 1.000000 MHz <u>Auto</u> Mar
	3 ms (Δ) -2.33 dB .0 μs -11.55 dBm	NCTION FUNCTION WIDT	H FUNCTION VALUE	Freq Offset 0 Hz
7 8 9 9 10 11				Scale Type
MSG VPoints changed; all traces cleared	"" d	STAT	4 su	

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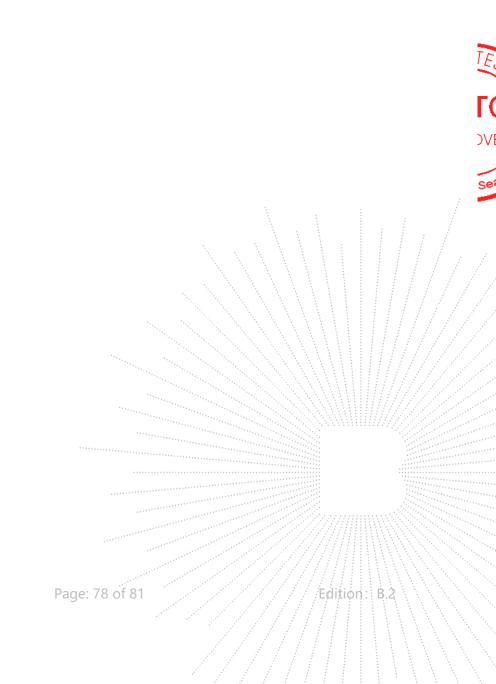
#### 15. Antenna Requirement

#### 15.1 Limit

15.203 requirement: For intentional device, according to 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.

#### 15.2 Test Result

The EUT antenna is internal antenna, fulfill the requirement of this section.





## 16. EUT Test Setup Photographs

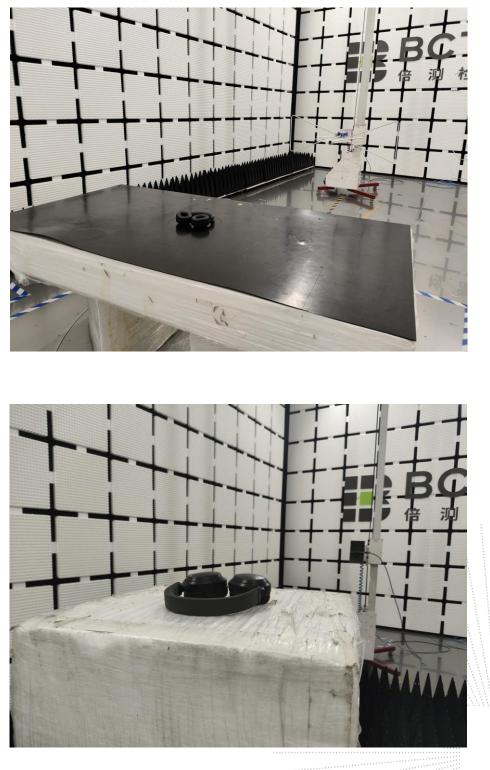
Conducted Emission Measurement Photos



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**Radiated Measurement Photos** 



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## STATEMENT

1. The equipment lists are traceable to the national reference standards.

2. The test report can not be partially copied unless prior written approval is issued from our lab.

3. The test report is invalid without the "special seal for inspection and testing".

4. The test report is invalid without the signature of the approver.

5. The test process and test result is only related to the Unit Under Test.

6. Sample information is provided by the client and the laboratory is not responsible for its authenticity.

7. The quality system of our laboratory is in accordance with ISO/IEC17025.

8. If there is any objection to this test report, the client should inform issuing laboratory within 15 days from the date of receiving test report.

Address:

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Complaint/Advice E-mail: advice@bctc-lab.com.cn

#### **\*\*\*\*\*\* END \*\*\*\***

No.: BCTC/RF-EMC-005

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