

# **TEST REPORT**

Report No.:	BCTC2412396756E				
Applicant:	SHENZHEN JUNYE ELECTRONICS CO LTD				
Product Name:	TWS Earbuds				
Test Model:	Y95				
Tested Date:	2024-12-30 to 2025-01-08				
Issued Date:	2025-01-09				
She	nzhen BCTC Testing Co., Ltd.				
No.: BCTC/RF-EMC-005	Page: 1 of 81				



# FCC ID: 2BB3B-TWSY95

Product Name:	TWS Earbuds
Trademark:	N/A
Model/Type Reference:	Y95,TWE2-BLK
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:	2024-12-30
Sample Tested Date:	2024-12-30 to 2025-01-08
Report No.:	BCTC2412396756E
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.

Page: 2 of 81



# Table of Content

Test	Report Declaration	Page
1.	Version	5
2.	Test Summary	6
3.	Measurement Uncertainty	
4.	Product Information and Test Setup	
4.1	Product Information	
4.2	Test Setup Configuration	
4.3	Support Equipment	
4.4	Channel List	
4.5	Test Mode	
4.6	Table Of Parameters Of Text Software Setting	
5.	Test Facility And Test Instrument Used	
5.1	Test Facility	
5.2	Test Instrument Used	
5.z 6.	Conducted Emissions	
0. 6.1	Block Diagram Of Test Setup	
6.2		
6.2 6.3	Limit	
	Test procedure	
6.4	EUT operating Conditions	
6.5	Test Result.	
7.	Radiated emissions	
7.1	Block Diagram Of Test Setup	
7.2	Limit	
7.3	Test procedure	
7.4	EUT operating Conditions	
7.5	Test Result	
8.	Radiated Band Emission Measurement and Restricted Bands of Operation	
8.1	Block Diagram Of Test Setup	
8.2	Limit	
8.3	Test procedure	
8.4	EUT operating Conditions	
8.5	Test Result	
9.	Spurious RF Conducted Emissions	
9.1	Block Diagram Of Test Setup	
9.2	Limit	27
9.3	Test procedure Test Result	
9.4	Test Result	28
10.	20 dB Bandwidth	49
10.1	Block Diagram Of Test Setup	49
10.2	Limit	49
10.3	20 dB Bandwidth Block Diagram Of Test Setup Limit Test procedure	49
10.4	Test Result Maximum Peak Output Power Block Diagram Of Test Setup Limit	50
11.	Maximum Peak Output Power	
11.1	Block Diagram Of Test Setup	56
11.2	Limit	
11.3	Test procedure	56

JC JC JC

еро



11.4 Test Result	
12. Hopping Channel Separation	
12.1 Block Diagram Of Test Setup	
12.2 Limit	62
12.3 Test procedure	62
12.4 Test Result	62
13. Number of Hopping Frequency	68
13.1 Block Diagram Of Test Setup	68
13.2 Limit	
13.3 Test procedure	68
13.4 Test Result	68
14. Dwell Time	71
14.1 Block Diagram Of Test Setup	71
14.2 Limit	71
14.3 Test procedure	71
14.4 Test Result	
15. Antenna Requirement	78
15.1 Limit	78
15.2 Test Result	78
16. EUT Test Setup Photographs	79

t Sea

Page: 4 of 81



## 1. Version

Report No.	Issue Date	Description	Approved
BCTC2412396756E	2025-01-09	Original	Valid



Page: 5 of 81



#### **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)		

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.

Page: 6 of 81



#### 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	U=0.59℃



No.: BCTC/RF-EMC-005

Page: 7 of 81



## 4. Product Information and Test Setup

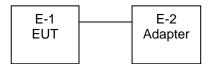
#### 4.1 Product Information

Model/Type reference:	Y95,TWE2-BLK
Model differences:	The following models of units we produce are identical in electrical, mechanical and physical structure; The difference is only in the model name, we finally have Y95 as 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:	1.7dBi
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/30mAh

# 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** 



Page: 8 of 81

Edition: B.2

E



# 4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note
E-1	TWS Earbuds	N/A	Y95	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	/

,TC 3C PR





#### 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 (Co	nducted emissio	n & Radiated emiss	sion)

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		

t Se

Page: 10 of 81



#### 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#	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	\	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			

Page: 11 of 81



Radiated Emissions Test (966 Chamber)								
Equipment	Equipment Manufacturer		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	\	\			

n 00.,LT

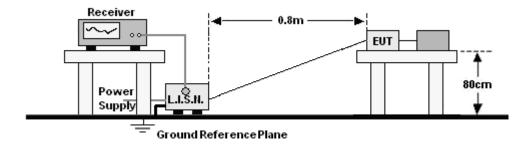
No.: BCTC/RF-EMC-005

Page: 12 of 81



#### 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.

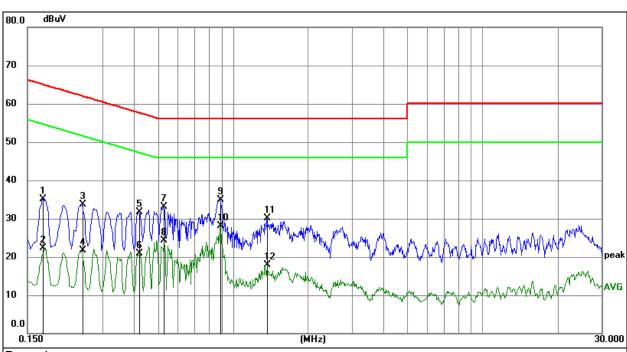
#### 6.4 EUT operating Conditions

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.

<ol><li>Measurement =</li></ol>	Reading Level +	Correct Factor

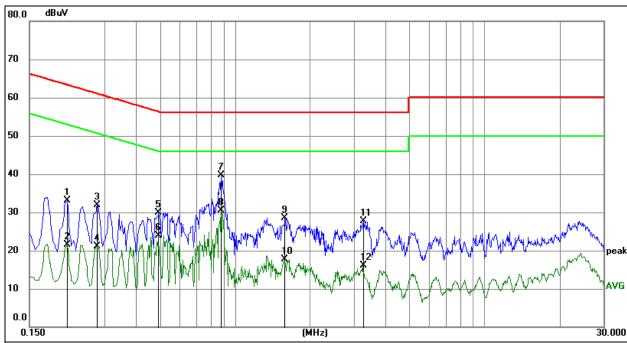
4. Over = Measurement - Limit

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1725	24.49	10.58	35.07	64.84	-29.77	QP
2	0.1725	11.71	10.58	22.29	54.84	-32.55	AVG
3	0.2490	23.08	10.59	33.67	61.79	-28.12	QP
4	0.2490	11.14	10.59	21.73	51.79	-30.06	AVG
5	0.4200	21.14	10.61	31.75	57.45	-25.70	QP
6	0.4200	10.22	10.61	20.83	47.45	-26.62	AVG
7	0.5280	22.48	10.64	33.12	56.00	-22.88	QP
8	0.5280	13.63	10.64	24.27	46.00	-21.73	AVG
9	0.8880	24.28	10.61	34.89	56.00	-21.11	QP
10 *	0.8880	17.58	10.61	28.19	46.00	-17.81	AVG
11	1.3695	19.35	10.66	30.01	56.00	-25.99	QP
12	1.3695	7.33	10.66	17.99	46.00	-28.01	AVG

E



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	0.2127	22.43	10.59	33.02	63.10	-30.08	QP
2	0.2127	10.95	10.59	21.54	53.10	-31.56	AVG
3	0.2802	21.30	10.60	31.90	60.81	-28.91	QP
4	0.2802	10.56	10.60	21.16	50.81	-29.65	AVG
5	0.4940	19.31	10.63	29.94	56.10	-26.16	QP
6	0.4940	13.27	10.63	23.90	46.10	-22.20	AVG
7	0.8802	29.05	10.62	39.67	56.00	-16.33	QP
8 *	0.8802	19.81	10.62	30.43	46.00	-15.57	AVG
9	1.5849	17.73	10.70	28.43	56.00	-27.57	QP
10	1.5849	7.02	10.70	17.72	46.00	-28.28	AVG
11	3.2755	16.73	10.93	27.66	56.00	-28.34	QP
12	3.2755	5.12	10.93	16.05	46.00	-29.95	AVG





TE.

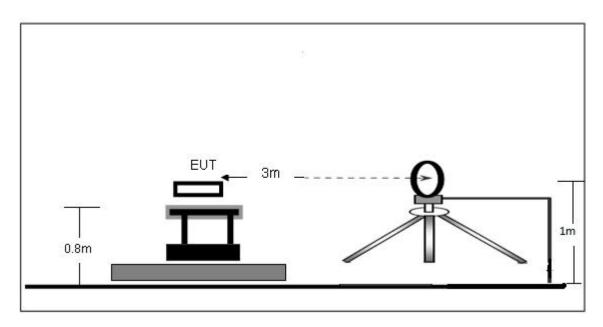
**T(** 

t Sea

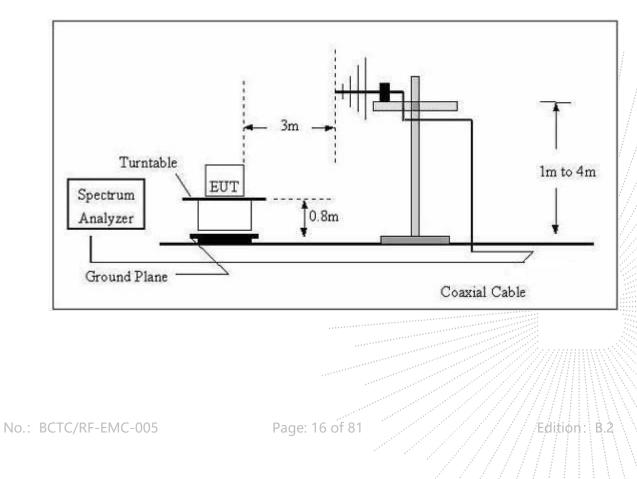
#### 7. Radiated emissions

#### 7.1 Block Diagram Of Test Setup

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

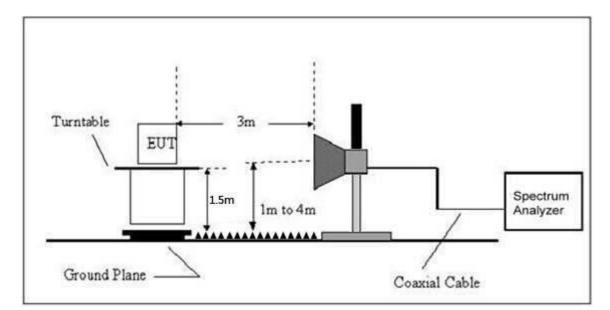


(B) Radiated Emission Test-Up Frequency 30MHz~1GHz





(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>			
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)

Fraguanay (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).

Page: 17 of 81



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.

Page: 19 of 81



#### 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 vollage.	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.

No.: BCTC/RF-EMC-005

Page: 20 of 81

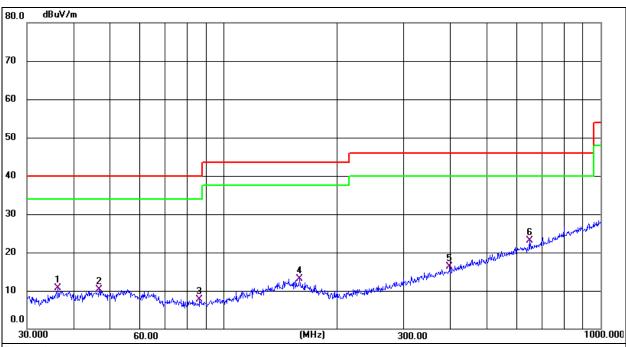
Edition: B.2

E



#### Between 30MHz - 1GHz

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



Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Measurement = Reading Level + Correct Factor
 Over = Measurement - Limit

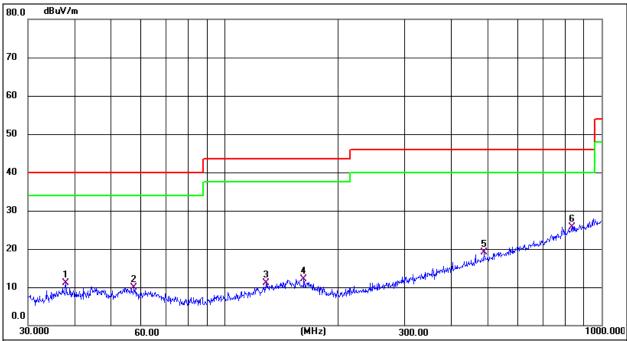
						1 i	. <u>(</u> 1 ) 1
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	36.2541	28.19	-17.47	10.72	40.00	-29.28	QP
2	46.6664	27.17	-16.87	10.30	40.00	-29.70	QP
3	86.2001	27.32	-19.67	7.65	40.00	-32.35	QP
4	158.6677	27.91	-14.77	13.14	43.50	-30.36	QP
5	397.6334	26.94	-10.59	16.35	46.00	-29.65	QP
6 *	647.3856	27.22	-4.09	23.13	46.00	-22.87	QP
						an an ana	

JC JC JC

ероі



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

5. Over –							
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	37.8121	28.35	-17.27	11.08	40.00	-28.92	QP
2	57.3923	27.02	-17.08	9.94	40.00	-30.06	QP
3	128.5630	27.21	-16.10	11.11	43.50	-32.39	QP
4	162.0414	27.09	-15.00	12.09	43.50	-31.41	QP
5	487.3151	26.87	-7.85	19.02	46.00	-26.98	QP
6 *	833.3171	25.50	0.14	25.64	46.00	-20.36	QP

Page: 22 of 81



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	71.37	-19.99	51.38	74.00	-22.62	PK		
V	4804.00	61.42	-19.99	41.43	54.00	-12.57	AV		
V	7206.00	62.51	-14.22	48.29	74.00	-25.71	PK		
V	7206.00	53.41	-14.22	39.19	54.00	-14.81	AV		
Н	4804.00	67.21	-19.99	47.22	74.00	-26.78	PK		
Н	4804.00	56.80	-19.99	36.81	54.00	-17.19	AV		
Н	7206.00	59.71	-14.22	45.49	74.00	-28.51	PK		
Н	7206.00	51.59	-14.22	37.37	54.00	-16.63	AV		
	·	G	FSK Middle c	hannel					
V	4882.00	68.46	-19.84	48.62	74.00	-25.38	PK		
V	4882.00	59.63	-19.84	39.79	54.00	-14.21	AV		
V	7323.00	60.63	-13.90	46.73	74.00	-27.27	PK		
V	7323.00	51.77	-13.90	37.87	54.00	-16.13	AV		
Н	4882.00	63.49	-19.84	43.65	74.00	-30.35	PK		
Н	4882.00	53.76	-19.84	33.92	54.00	-20.08	AV		
Н	7323.00	58.02	-13.90	44.12	74.00	-29.88	PK		
Н	7323.00	50.23	-13.90	36.33	54.00	-17.67	AV		
		(	GFSK High ch	annel					
V	4960.00	71.49	-19.68	51.81	74.00	-22.19	PK		
V	4960.00	62.90	-19.68	43.22	54.00	-10.78	AV		
V	7440.00	65.23	-13.57	51.66	74.00	-22.34	PK		
V	7440.00	55.58	-13.57	42.01	54.00	-11,99	, AV		
Н	4960.00	69.96	-19.68	50.28	74.00	-23.72	PK		
Н	4960.00	60.27	-19.68	40.59	54.00	-13.41	AV		
Н	7440.00	62.41	-13.57	48.84	74.00	-25.16	PK		
Н	7440.00	54.36	-13.57	40.79	54.00	-13.21	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.

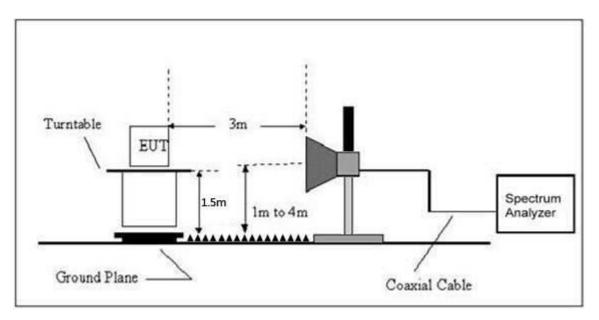
) ED



#### 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			

Page: 24 of 81



Limits Of Radiated Emission Measurement (Above 1000MHz)

Frequency (MHz)	Limit (dBuV/m) (at 3M)			
	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		Frequency (MHz)	, Reading Level (dBuV/m)	Correct Factor (dB)	Measure- ment (dBuV/m)	Limits (dBuV/m)		Result			
		(11112)			РК	PK	AV				
	Low Channel 2402MHz										
GFSK	Н	2390.00	72.70	-25.43	47.27	74.00	54.00	PASS			
	Н	2400.00	74.35	-25.40	48.95	74.00	54.00	PASS			
	V	2390.00	73.25	-25.43	47.82	74.00	54.00	PASS			
	V	2400.00	74.59	-25.40	49.19	74.00	54.00	PASS			
OI OK	High Channel 2480MHz										
	<u> </u>	2483.50	71.90	-25.15	46.75	74.00	54.00	PASS			
	Н	2500.00	69.57	-25.10	44.47	74.00	54.00	PASS			
	V	2483.50	72.62	-25.15	47.47	74.00	54.00	PASS			
	V	2500.00	69.49	-25.10	44.39	74.00	54.00	PASS			
	Low Channel 2402MHz										
	Н	2390.00	73.61	-25.43	48.18	74.00	54.00	PASS			
	Н	2400.00	75.97	-25.40	50.57	74.00	54.00	PASS			
	V	2390.00	74.10	-25.43	48.67	74.00	54.00	PASS			
π/4DQPSK	V	2400.00	75.19	-25.40	49.79	74.00	54.00	PASS			
	High Channel 2480MHz										
	Н	2483.50	72.25	-25.15	47.10	74.00	54.00	PASS			
	Н	2500.00	69.22	-25.10	44.12	74.00	54.00	PASS			
	V	2483.50	73.98	-25.15	48.83	74.00	54.00	PASS			
	V	2500.00	70.58	-25.10	45.48	74.00	54.00	PASS			
	Low Channel 2402MHz										
	Н	2390.00	73.39	-25.43	47.96	74.00	54.00	PASS			
8DPSK	Н	2400.00	75.28	-25.40	49.88	74.00	54.00	PASS			
	V	2390.00	74.19	-25.43	48.76	74.00	54.00	PASS			
	V	2400.00	75.76	-25.40	50.36	74.00	54.00	PASS			
				h Channel 2							
	Н	2483.50	71.98	-25.15	46.83	74.00	54.00	PASS			
	Н	2500.00	68.56	-25.10	43.46	74.00	54.00	PASS			
	V	2483.50	73.54	-25.15	48.39	74.00	54.00	PASS			
	V	2500.00	69.13	-25.10	44.03	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 JPR

epoi

Page: 27 of 81



#### 9.4 Test Result













# C. CO.,LTA





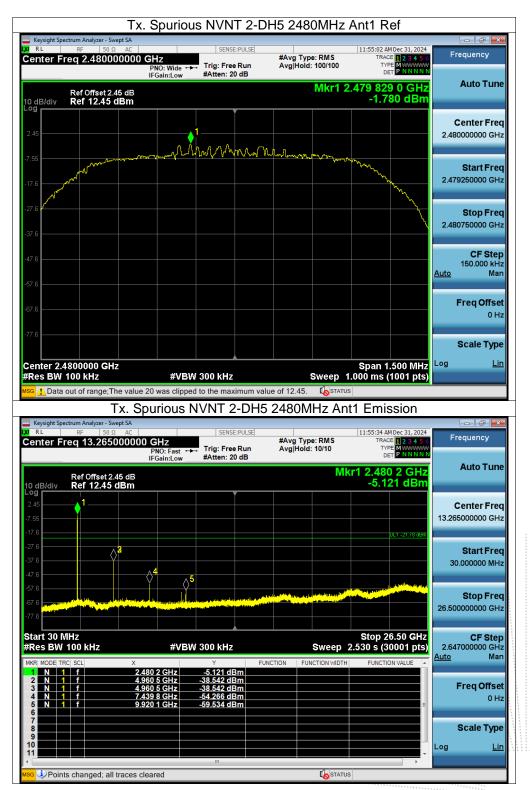








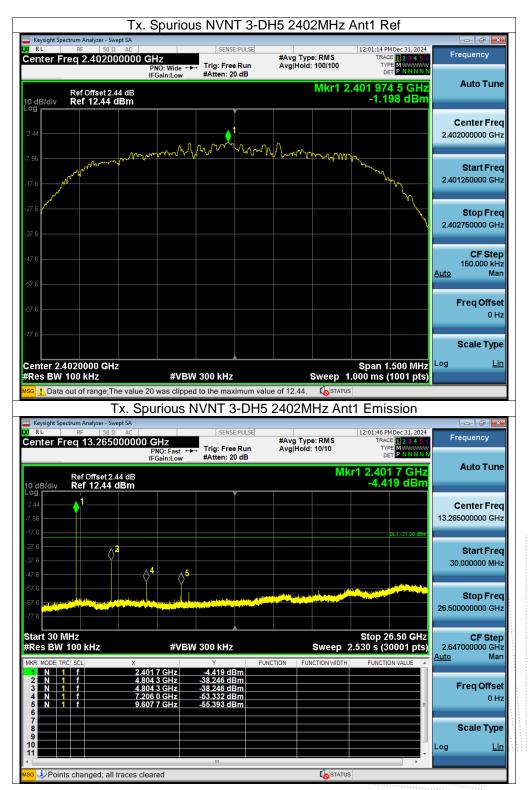




JC JC PPR

epoi





# 



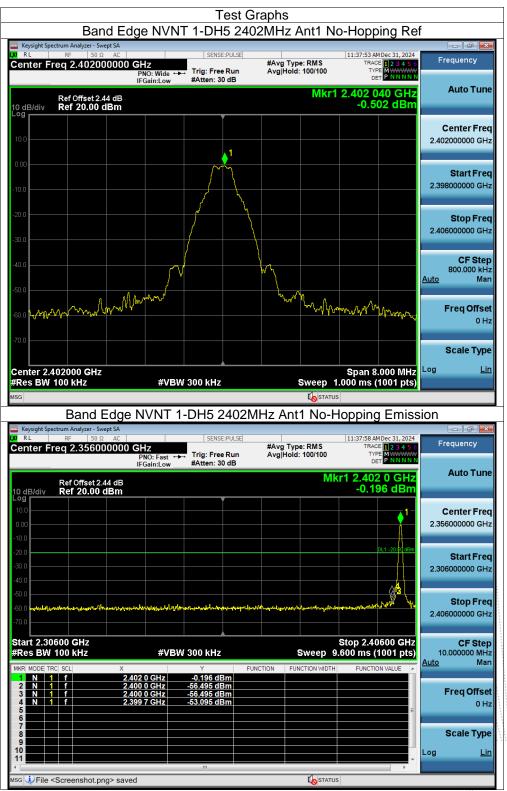






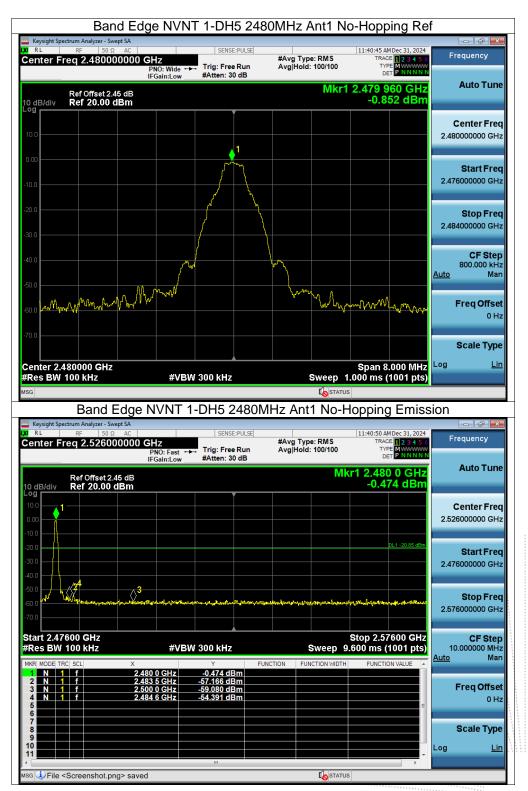
Page: 36 of 81



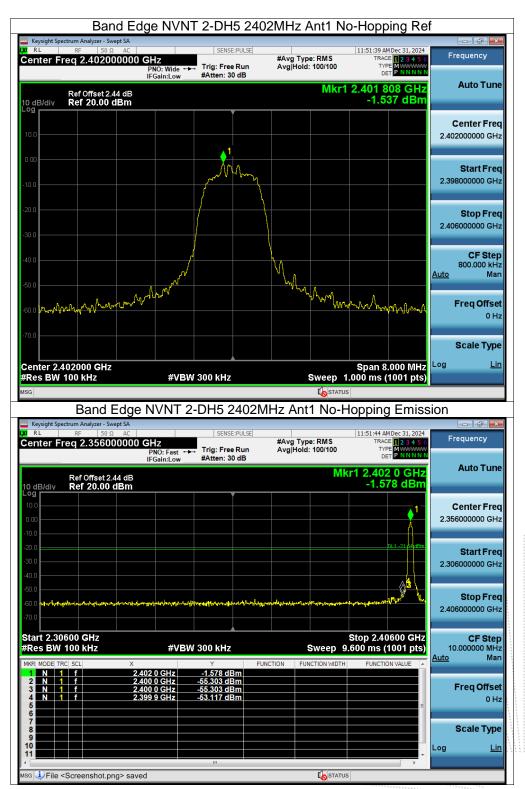


AFNZHE.





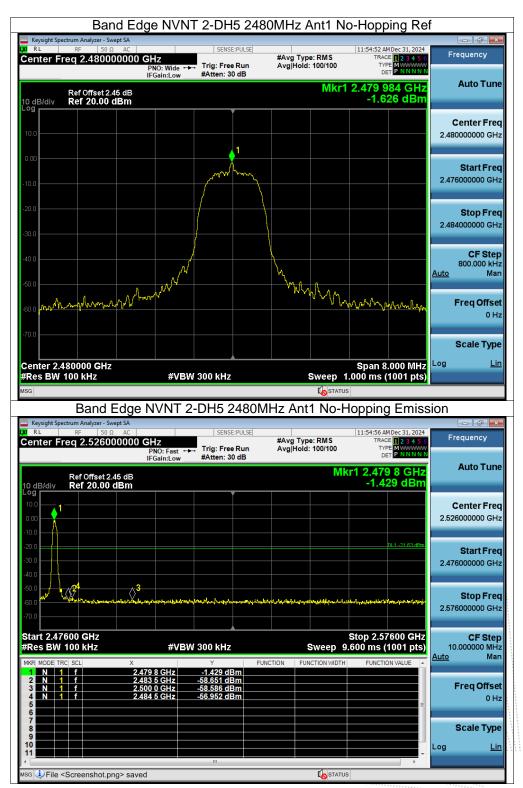




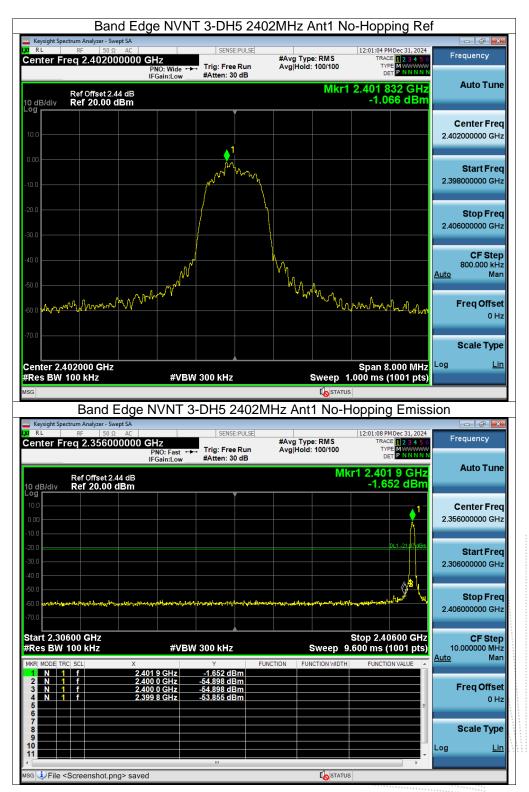
JC JC PPR

еро

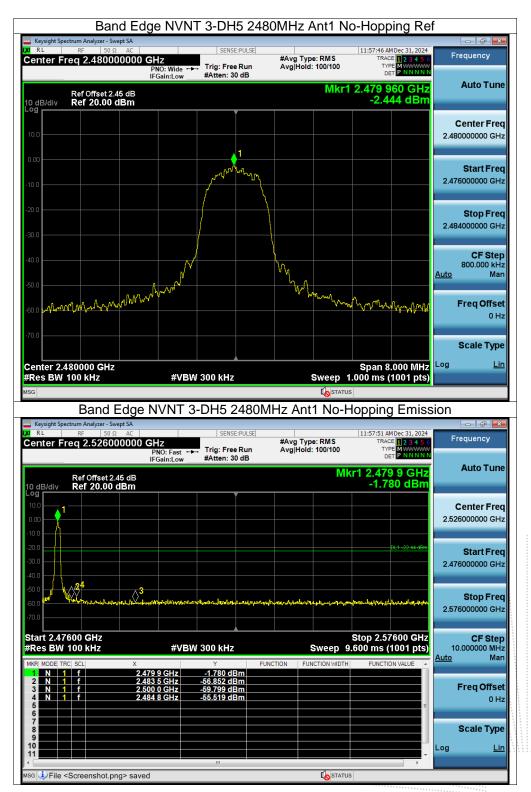




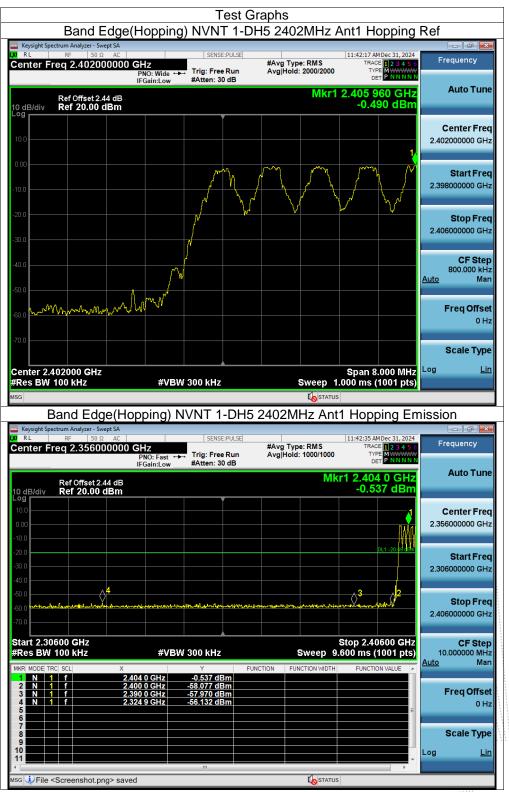






















'epoi





# 

Page: 46 of 81









Page: 48 of 81



#### 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.

CHENZHE.

Page: 49 of 81



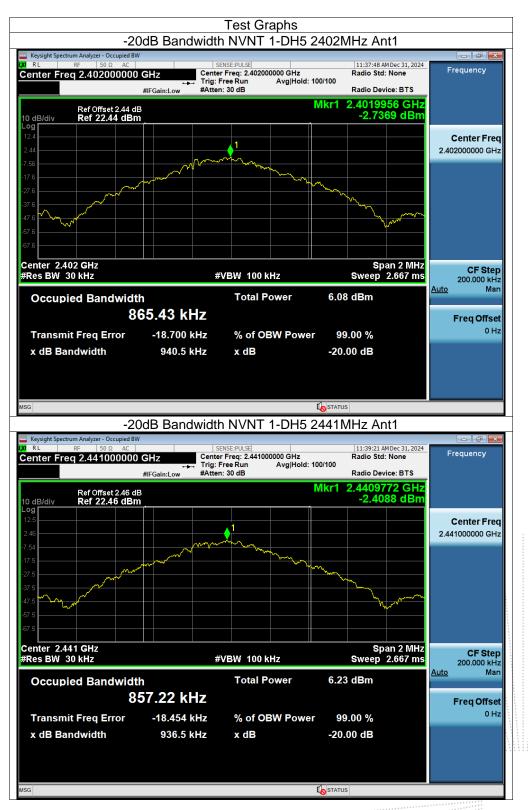
#### 10.4 Test Result

Condition	Mode	Frequency (MHz)	-20 dB Bandwidth (MHz)	Verdict
NVNT	1-DH5	2402	0.941	Pass
NVNT	1-DH5	2441	0.937	Pass
NVNT	1-DH5	2480	0.949	Pass
NVNT	2-DH5	2402	1.334	Pass
NVNT	2-DH5	2441	1.318	Pass
NVNT	2-DH5	2480	1.318	Pass
NVNT	3-DH5	2402	1.286	Pass
NVNT	3-DH5	2441	1.294	Pass
NVNT	3-DH5	2480	1.303	Pass

No.: BCTC/RF-EMC-005

Page: 50 of 81

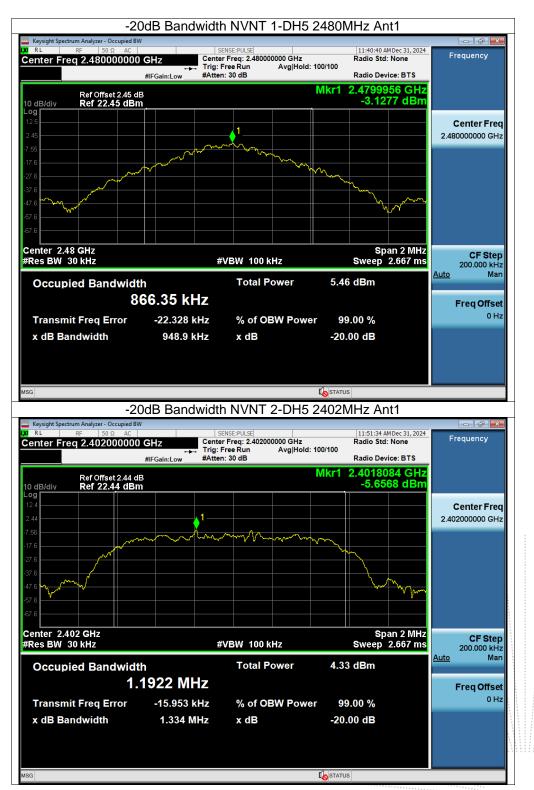




epoi

Page: 51 of 81



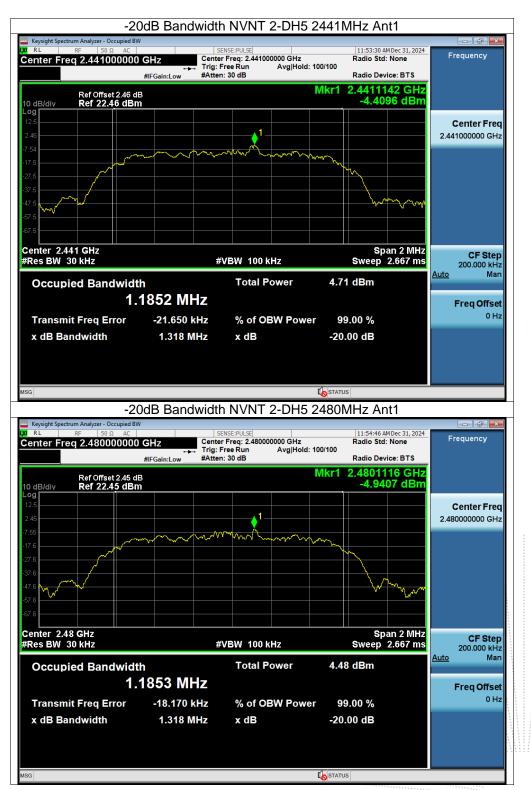


t Sea

No.: BCTC/RF-EMC-005

Page: 52 of 81







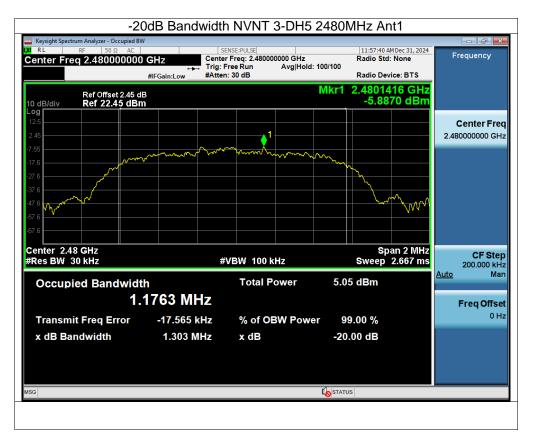
Page: 53 of 81





Page: 54 of 81







Page: 55 of 81



#### 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

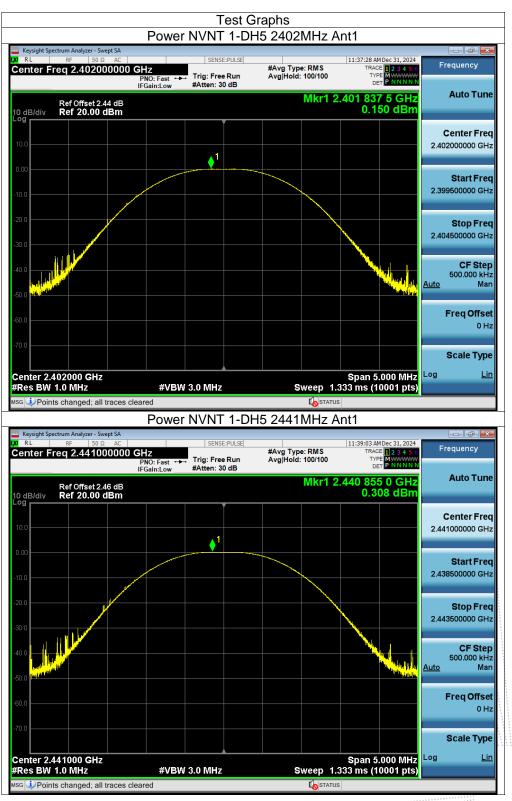
Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH5	2402	0.15	21	Pass
NVNT	1-DH5	2441	0.31	21	Pass
NVNT	1-DH5	2480	-0.27	21	Pass
NVNT	2-DH5	2402	0.52	21	Pass
NVNT	2-DH5	2441	0.68	21	Pass
NVNT	2-DH5	2480	0:11	21	Pass
NVNT	3-DH5	2402	0.95	21	Pass
NVNT	3-DH5	2441	1.16	21	Pass
NVNT	3-DH5	2480	0.61	21	Pass

Page: 56 of 81

E



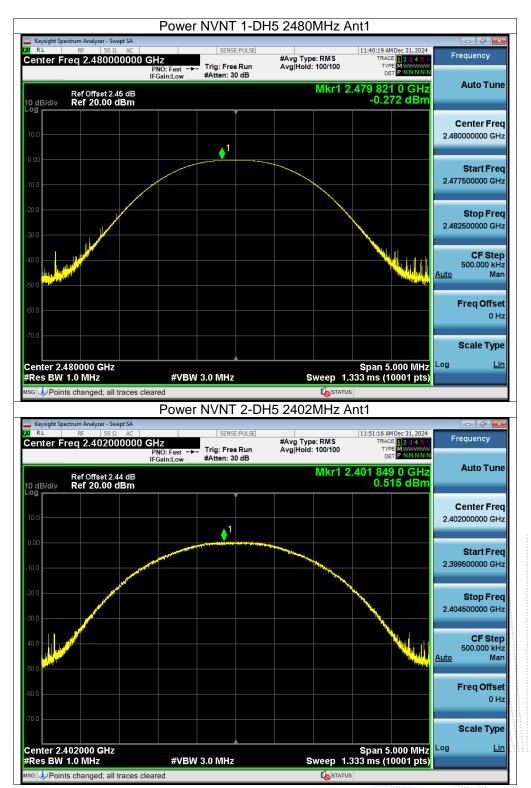




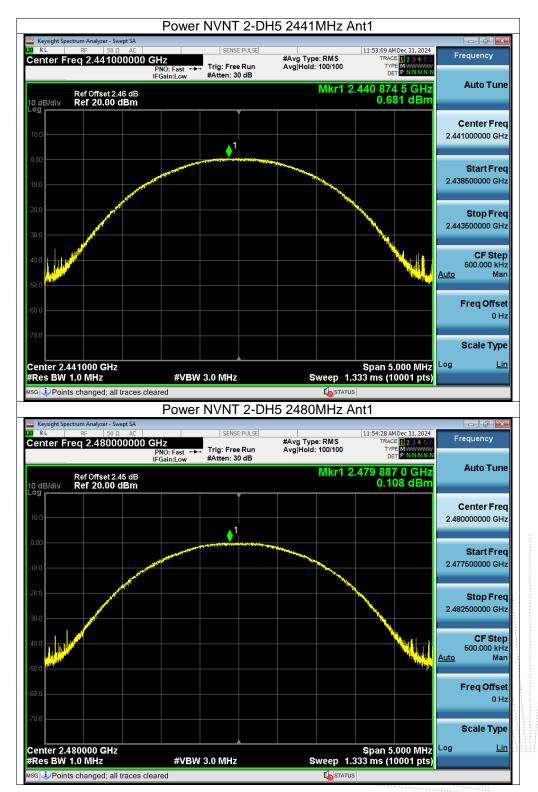
ероі

No.: BCTC/RF-EMC-005









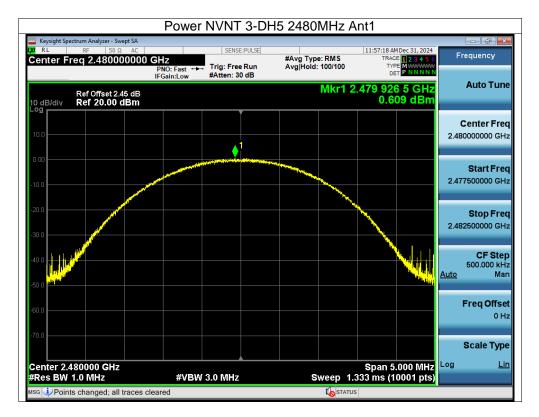
Page: 59 of 81





Page: 60 of 81





No.: BCTC/RF-EMC-005

Page: 61 of 81



#### 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	2401.972	2402.982	1.01	0.627	Pass
NVNT	1-DH5	2440.954	2441.884	0.93	0.625	Pass
NVNT	1-DH5	2478.956	2479.976	1.02	0.633	Pass
NVNT	2-DH5	2401.81	2403.13	1.32	0.889	Pass
NVNT	2-DH5	2440.986	2441.968	0.982	0.879	Pass
NVNT	2-DH5	2478.83	2479.962	1.132	0.879	Pass
NVNT	3-DH5	2401.978	2402.968	0.99	0.857	Pass
NVNT	3-DH5	2440.968	2441.972	1.004	0.863	Pass
NVNT	3-DH5	2478.99	2479.976	0.986	0.869	Pass
1						

#### 12.4 Test Result

E





ероі





Page: 64 of 81











CF	S NVNT 3-D	H5 2480	MHz A	nt1			
Keysight Spectrum Analyzer - Swept SA	SENSE:PULS	-		12:04:50 DM	Dec 31, 2024	_	
Center Freq 2.479500000 GHz PNO: Wide IFGain:Low	🖵 Trig: Free Run	#Avg T	ype: RMS bld:>100/100	TRACE	1 2 3 4 5 6 MWWWWW PNNNNN	F	requency
Ref Offset 2.45 dB 10 dB/div Ref 20.00 dBm			Mkr1	2.478 99 -5.26	90 GHz 5 dBm		Auto Tune
			~^ <sup>2</sup>	Marrie An			<b>Center Freq</b> 9500000 GHz
-20.0 -30.0	vh vh vh vh vh	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				2.47	Start Freq 8500000 GHz
-50.0 -60.0 -70.0						2.48	Stop Fred 30500000 GH2
Center 2.479500 GHz #Res BW 30 kHz #V	BW 100 kHz		Sweep 2	Span 2.0 2.133 ms (1	000 MHz 001 pts)	0	CF Step 200.000 kHz
MKR         MODE         TRC         SCL         X           1         N         1         f         2.478         990         GHz	Y -5.265 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION	V VALUE	<u>Auto</u>	Man
N 1 f 2.479 976 GHz	-5.998 dBm				=		Freq Offset 0 Hz
7 8 9							Scale Type
					-	Log	<u>Lin</u>
MSG			<b>I</b> o statu	s			



Page: 67 of 81



#### 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.

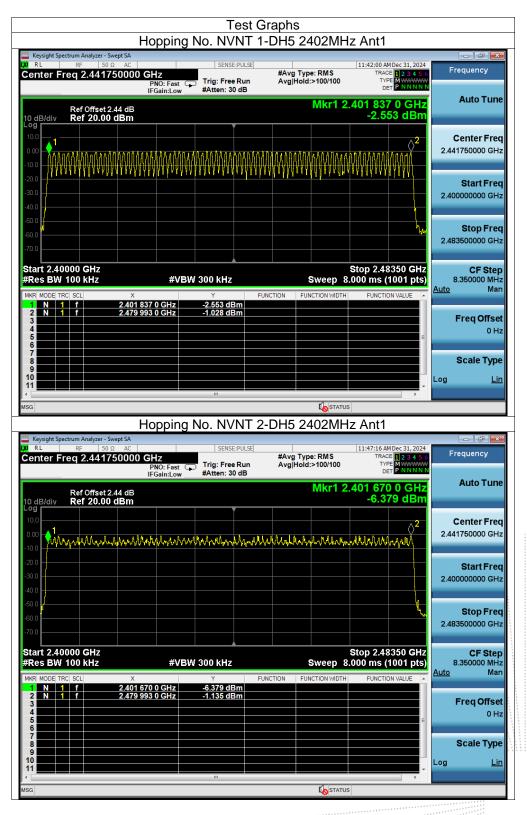
4. Set the spectrum analyzer: Start Frequency = 2.4GHz, Stop Frequency = 2.4835GHz. Sweep=auto;

#### 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

E





,TC 3C

'epoi



Hoppir	ng No. NVNT 3-	DH5 2402MH	z Ant1	
Keysight Spectrum Analyzer - Swept SA           K         RL         RF         50 Ω         AC	SENSE:PULSE	#Avg Type: RMS	12:02:24 PM Dec 31, 2024 TRACE 1 2 3 4 5 6	Frequency
Center Freq 2.441750000 GHz PNO: Fas IFGain:Lor		Avg Hold:>100/100		
Ref Offset 2.44 dB 10 dB/div Ref 20.00 dBm		Mkr1 2.	401 837 0 GHz -2.944 dBm	Auto Tune
Log 10.0 0.00 .10.0 .10.0	Wordprozvaluphrywny	www.www.www.	mahantin Upmyk 2	Center Freq 2.441750000 GHz
-20.0				Start Freq 2.400000000 GHz
-50.0 -60.0				Stop Freq 2.483500000 GHz
Start 2.40000 GHz #Res BW 100 kHz #\	/BW 300 kHz		Stop 2.48350 GHz 000 ms (1001 pts)	CF Step 8.350000 MHz
MKR MODE TRCI SCL X 1 N 1 f 2,401 837 0 GHz 2 N 1 f 2,480 494 0 GHz 3 4 5 6	-2.944 dBm	ICTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man Freq Offset 0 Hz
7 8 9 10 11				Scale Type Log <u>Lin</u>
MSG	III	<b>K</b> STATUS	4	

No.: BCTC/RF-EMC-005

Page: 70 of 81



#### 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.

Page: 71 of 81



Condition	Mode	Frequency (MHz)	Pulse Time (ms)	Total Dwell Time (ms)	Limit (ms)	Verdict
NVNT	1-DH1	2441	0.404	128.068	400	Pass
NVNT	1-DH3	2441	1.657	263.463	400	Pass
NVNT	1-DH5	2441	2.905	278.880	400	Pass
NVNT	2-DH1	2441	0.413	131.334	400	Pass
NVNT	2-DH3	2441	1.662	255.948	400	Pass
NVNT	2-DH5	2441	2.913	320.430	400	Pass
NVNT	3-DH1	2441	0.412	131.016	400	Pass
NVNT	3-DH3	2441	1.664	262.912	400	Pass
NVNT	3-DH5	2441	2.913	302.952	400	Pass

n 00.,LT

No.: BCTC/RF-EMC-005

Page: 72 of 81



	Test G		Durat	
LWC	II NVNT 1-DH1 244	1MHz Ant1 One	Burst	
XX RL RF 50Ω AC Center Freq 2.441000000 GH PF	SENSE:PULSE Trig Delay-500.0 µs Trig: Video Gain:Low #Atten: 30 dB	#Avg Type: RMS	L:43:58 PM Dec 31, 2024 TRACE 1 2 3 4 5 6 TYPE WWWWW DET P N N N N N	Frequency
Ref Offset 2.46 dB 10 dB/div Ref 20.00 dBm	Guineou	ΔΜ	kr1 404.0 µs 1.28 dB	Auto Tune
10.0 0.00 <b>1∆2</b>			TRIG LVL	Center Freq 2.441000000 GHz
-10.0 2 -20.0				Start Freq 2.441000000 GHz
	a para tera para para para para para para para p			<b>Stop Freq</b> 2.441000000 GHz
-70.0 Center 2.441000000 GHz				
Res BW 1.0 MHz	#VBW 3.0 MHz	Sweep 10.00	Span 0 Hz ms (10001 pts)	CF Step 1.000000 MHz <u>Auto</u> Man
2 F 1 t 49 3	14.0 μs (Δ) 1.28 dB 18.0 μs -9.25 dBm		н	<b>Freq Offset</b> 0 Hz
6 7 8 9 10				Scale Type
11 Msg Deints changed; all traces clear	m m		• •	
Dwe	II NVNT 1-DH3 244	1MHz Ant1 One	Burst	
Keysight Spectrum Analyzer - Swept SA     RL RF 50 Ω AC     Center Freq 2.441000000 GH     P	NO: Fast 🛶 Trig: Video	#Avg Type: RMS	1:45:39 PM Dec 31, 2024 TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P NNNNN	Frequency
Ref Offset 2.46 dB	Gain:Low #Atten: 30 dB	ΔΜ	cr1 1.657 ms 1.12 dB	Auto Tune
Logv 10.0 0.00				Center Freq 2.441000000 GHz
				Start Freq
-30.0	a (النابية والمعرفية المالك المالية وموالية ومن المالية والمعرفية والمالية المالية والمالية والمالية والمالية و المالية المالية والمالية والمالية المالية والمالية والمالية والمالية والمالية والمالية والمالية والمالية والمالي			2.441000000 GHz
	a posteri e trazi na presenta de la contra de la contra da			<b>Stop Freq</b> 2.441000000 GHz
Center 2.441000000 GHz Res BW 1.0 MHz	#VBW 3.0 MHz	-	Span 0 Hz ms (10001 pts)	CF Step 1.000000 MHz <u>Auto</u> Man
MKR         MODE[         TRC[         SCL[         X           1         Δ2         1         t         (Δ)         1.6           2         F         1         t         40           3         4         4         4         4           5         6         4         4         4	Y         FUN           57 ms (Δ)         1.12 dB           i9.0 μs         -18.11 dBm	CTION FUNCTION WIDTH	FUNCTION VALUE	Freq Offset 0 Hz
7 8 9 10				Scale Type
11			-	Log <u>Lin</u>



	Dwell NVN7	1-DH5 244	1MHz Ant1 O	ne Burst	
Keysight Spectrum Analyzer - Sw					
Center Freq 2.44100		SENSE:PULSE Trig Delay-500.0 µs Trig: Video #Atten: 30 dB	#Avg Type: RMS	11:43:11 AM Dec 31, 2024 TRACE 1 2 3 4 5 6 TYPE WWWWW DET P N N N N N	Frequency
Ref Offset 2. 10 dB/div Ref 20.00	46 dB	WAREN. OU UD	Δ	Mkr1 2.905 ms 2.07 dB	Auto Tune
10.0 0.00	1Δ2			TRIG LVL	Center Freq 2.441000000 GHz
-20.0	Yhoulua Jan laist, ita a ar da a				<b>Start Freq</b> 2.441000000 GHz
-50.0 2010	the state of the s	nin indin i star of star starts Party din i starts and starts	ene poste la collectiva e con tra feire e contra Terre d'activ <mark>itan poste la constance de la const Terre d'activitante de la constance de la const</mark>	ad na sang ng kang ng tang ng kang ng ng Ng ang tang ng n	<b>Stop Freq</b> 2.441000000 GHz
Center 2.441000000 C Res BW 1.0 MHz		3.0 MHz		Span 0 Hz .00 ms (10001 pts)	CF Step 1.000000 MHz <u>Auto</u> Man
MKR         MODE         TRC         SCL           1         Δ2         1         t         (Δ)           2         F         1         t         (Δ)           3         -         -         -         -           4         -         -         -         -           5         -         -         -         -	× 2,905 ms (Δ) 469.0 μs	Y FUNC 2.07 dB -17.75 dBm	TION FUNCTION WIDTH	FUNCTION VALUE	Freq Offset
6 7 8 9 10					Scale Type
11				-	Log <u>Lin</u>
MSG <b>i</b> Points changed; all	traces cleared				
	Dwell NVN	2-DH1 244	1MHz Ant1 O	ne Burst	
		2 0111 211			
₩ RL RF 50 Ω Center Freq 2.44100		SENSE:PULSE Trig Delay-500.0 μs Trig: Video #Atten: 30 dB	#Avg Type: RMS	01:46:29 PM Dec 31, 2024 TRACE 1 2 3 4 5 6 TYPE WWWWW DET P N N N N N	Frequency
Ref Offset 2. 10 dB/div Ref 20.00 ( Log	46 dB			∆Mkr1 413.0 µs -1.26 dB	Auto Tune
10.0 0.00 -10.0 ↓2 1Δ2				TRIG LVL	Center Freq 2.441000000 GHz
-20.0					Start Freq 2.441000000 GHz
-50.0 (1997) -60.0 (1997) -70.0	and the first of the second		landi kutaran yan ng humu ha patan yan Manda kutara jukita hapangkan kuta kutat Manda kutara jukita hapangkan kutat	ar a suit an	<b>Stop Freq</b> 2.441000000 GHz
10.0					
Center 2.441000000 C Res BW 1.0 MHz		3.0 MHz	Sweep 10	Span 0 Hz 00 ms (10001 pts).	1.000000 MHz
Center 2.44 1000000 C           Res BW 1.0 MHz           ΜKR MODE TRC SCL           1 Δ2 1 t (Δ)           2 F 1 t           3 4           5			Sweep 10		1.000000 MHz <u>Auto</u> Man Freq Offset
Center 2.4410000000 C Res BW 1.0 MHz MKR MODE TRC SCL 2 F 1 t (Δ) 2 F 1 t 3	#VBW × 413.0 μs (Δ)	Y FUNC		.00 ms (10001 pts)	Freq Offset 0 Hz Scale Type
Δ         Δ           Center 2.441000000 C         C           Res BW 1.0 MHz         MkRi MODE TRC  SCL            1 Δ2 1 t (Δ)         2           2 F 1 t         3           4         -           5         -           6         -           7         -           8         -	#VBW × 413.0 μs (Δ)	Y FUNC		.00 ms (10001 pts)	1.000000 MHz <u>Auto</u> Man <b>Freq Offset</b> 0 Hz



	Dwell NVN	T 2-DH3 244	1MHz Ant1 C	ne Burst	
Keysight Spectrum Analyzer - S					- ē ×
enter Freq 2.4410		SENSE:PULSE Trig Delay-500.0 µs Trig: Video #Atten: 30 dB	#Avg Type: RMS	01:47:51 PM Dec 31, 2024 TRACE 1 2 3 4 5 6 TYPE WWWWW DET P N N N N N	Frequency
Ref Offset 2 0 dB/div Ref 20.00	2.46 dB	#Atten: 50 dB	l	∆Mkr1 1.662 ms 1.24 dB	Auto Tune
0 dB/div Ref 20.00					Center Freq
0.00	142			TRIG LVL	2.441000000 GHz
					Start Fred
40.0					2.441000000 GHz
50.0	upper light of the state of the		al an		Stop Fred
70.0					2.441000000 GH:
enter 2.441000000 tes BW 1.0 MHz		V 3.0 MHz	Sweep 10	Span 0 Hz 0.00 ms (10001 pts)	CF Step 1.000000 MH
IKR MODE TRC SCL	× 1.662 ms (Δ)		CTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Mar
2 F 1 t 3 4	470.0 µs	-13.64 dBm			Freq Offse
5				=	
8 9 10					Scale Type
11					Log <u>Lir</u>
sg 🔱 Points changed; a	Il traces cleared		STATU	IS	
Keysight Spectrum Analyzer - S		T 2-DH5 244	1MHz Ant1 C	one Burst	
RL RF 50 enter Freq 2.4410	Ω AC 000000 GHz PNO: Fast ↔	SENSE:PULSE Trig Delay-500.0 µs Trig: Video	#Avg Type: RMS	11:48:12 AM Dec 31, 2024 TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P NN N N	Frequency
Ref Offset		#Atten: 30 dB		∆Mkr1 2.913 ms -1.08 dB	Auto Tuno
0 dB/div Ref 20.00					Center Free
0.00	1∆2			TRIG LVL	2.441000000 GH
10.0 A2					Start Free
40.0					2.441000000 GH
50.0 <mark>app</mark>	a traingentation and a construction	al de la contra de l	त्रियमें सेवता।।तम्ब <del>क्वांत में</del> स्वतंत्र कृत्वन्त्र हिंद	an a	Stop Fred
50.0 <mark>/ 11</mark> 70.0	and filling out of the second second	dady aday pay to by gardened	indudyal se induktival pod hu		2.441000000 GH
Center 2.441000000 Res BW 1.0 MHz		V 3.0 MHz	Sweep 1	Span 0 Hz 5.33 ms (10001 pts)	CF Step 1.000000 MH
MKR MODE TRC SCL	× 2.913 ms (Δ)		CTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Mar
2 F 1 t	496.8 μs	-7.27 dBm			Freq Offse
4 5 6				E	0 H:
7 8 9					Scale Type
10 11					Log <u>Lir</u>
G Deints changed: a	Il traces cleared		<b>I</b> STATU	IS	



	Dweil NVI	11 3-DHI 244	1MHz Ant1 C	one Burst	
Keysight Spectrum Analyzer - So				01-40-21 PMD 21 2024	
Center Freq 2.4410		SENSE:PULSE Trig Delay-500.0 µs → Trig: Video #Atten: 30 dB	#Avg Type: RMS	01:49:21 PM Dec 31, 2024 TRACE 1 2 3 4 5 6 TYPE DET P N N N N	Frequency
Ref Offset 2 10 dB/div Ref 20.00	.46 dB			ΔMkr1 412.0 μs 2.69 dB	Auto Tune
10.0					Center Freq
					2.441000000 GHz
-20.0					<b>Start Freq</b> 2.441000000 GHz
-40.0	hidi ali	ואין איז די איז איזער וייד איז		alleit landa illeitore ditta	
-60.0	والمراجب والمراجل والمراجب والمراجب			and the second	<b>Stop Freq</b> 2.441000000 GHz
Center 2.441000000 Res BW 1.0 MHz		N 3.0 MHz	Sweep 10	Span 0 Hz 0.00 ms (10001 pts)	CF Step 1.000000 MHz
MKR MODE TRC SCL	× 412.0 μs (Δ	Y FUNC	CTION FUNCTION WIDTH		<u>Auto</u> Man
2 F 1 t 3 4 5	477.0 μs	-14.55 dBm			Freq Offset 0 Hz
6 7 8					Scale Type
9 10 11					Log <u>Lin</u>
Msg Doints changed; al	I traces cleared		STATU	IS	
	Dwell NVN	IT 3-DH3 244	1MHz Ant1 C	ne Burst	
Keysight Spectrum Analyzer - Si	wept SA				
N KL   N   30 3	Ω AC	SENSE:PULSE		01:50:10 PM Dec 31, 2024	
Center Freq 2.4410		Trig Delay-500.0 µs	#Avg Type: RMS	01:50:10 PM Dec 31, 2024 TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P N N N N	Frequency
Center Freq 2.4410 Ref Offset 2 10 dB/div Ref 20.00	000000 GHz PNO: Fast ← IFGain:Low	Trig Delay-500.0 µs Trig: Video		TRACE 1 2 3 4 5 6	
Center Freq 2.4410 Ref Offset 2 10 dB/div Ref 20.00	000000 GHz PNO: Fast ← IFGain:Low	Trig Delay-500.0 µs Trig: Video		TRACE 123456 TYPE WWWWW DET PNNNNN	Frequency Auto Tune Center Freq
Center Freq 2.4410	200000 GHz PNO: Fast ← IFGain:Low ← 46 dB dBm	Trig Delay-500.0 µs Trig: Video		TRACE 123456 TYPE WWWWW DET PNNNNN	Frequency Auto Tune
Center Freq 2.4410 Ref Offset 2 10 dB/div Ref 20.00 10 0 0.00 V/mpd/mb/div	200000 GHz PNO: Fast ← IFGain:Low ← 46 dB dBm	Trig Delay-500.0 µs Trig: Video		TRACE 12.2.3.5.6 Type WWWWWW DET PINNINN AMkr1 1.664 ms 3.12 dB	Frequency Auto Tune Center Freq
Center Freq 2.4410	00000 GHz PNO: Fast - IFGain:Low dBm 1Δ2	Trig Delay-500.0 µs Trig: Video #Atten: 30 dB			Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz
Center Freq 2.4410 Ref Offset 2 10 dB/div Ref 20.00 10 0 10 0 10 0 20 0 -10 0 -20 0 -30 0 -40 0 -40 0 -40 0 	00000 GHz PNO: Fast IFGain:Low dBm 1Δ2	Trig Delay-500.0 µs Trig: Video	دا <mark>زده و با ا</mark> یترا این معرف <mark>ر از </mark>		Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq
Center Freq 2.4410 Ref Offset 2 0 dB/div Ref 20.00 10 0 10 0 20 0 -10 0 -20 0 -30 0 -40 0 -40 0 -60 0 -40 0 -60 0 -40 0 -60 0 -40 0	00000 GHz PNO: Fast IFGain:Low 46 dB 1Δ2 1Δ2 000000 GHz	Trig Delay-500.0 µs Trig: Video #Atten: 30 dB			Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq
Center Freq 2.4410 Ref Offset 2 10 dB/div Ref 20.00 10 0 10 0 20 0 -10 0 -20 0 -30 0 -40 0 -50 0 -50 0 -70 0 Center 2.441000000	00000 GHz PNO: Fast - IFGain:Low 46 dB 1Δ2 1Δ2 000000 GHz #VB1 X	Trig Delay-500.0 µs           Trig Video           #Atten: 30 dB		TRACE 12.2.4.5 6 TRACE 12.2.4.5 6 TOTOLOGY AND A STATEMENT A	Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz 2.441000000 GHz CF Step
Center Freq 2.4410	00000 GHz PNO: Fast IFGain:Low 46 dB dBm 1Δ2 1Δ2 46 dB 1Δ2 46 dB 46	Trig Delay-500.0 µs           Trig Video           #Atten: 30 dB	Sweep 10	TRACE 12.2.4.5 6 TRACE 12.2.4.5 6 TOTOLOGY AND A STATEMENT A	Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz
Center Freq 2.4410	00000 GHz PNO: Fast IFGain:Low 2.46 dB 1∆2 1∆2 0.400000000000000000000000000000000000	Trig Delay-500.0 µs           Trig: Video           #Atten: 30 dB	Sweep 10	TRACE 1.2.3 % 6 TYPE WANNEL	Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz Auto Man Freq Offset
Center Freq 2.4410 Ref Offset 2 10 dB/div Ref 20.00 10 0 10 0 20 1 t (Δ) 20 0 20 1 t (Δ) 20 0 20 1 t (Δ) 20 0 20	00000 GHz PNO: Fast IFGain:Low 2.46 dB 1∆2 1∆2 0.400000000000000000000000000000000000	Trig Delay-500.0 µs           Trig: Video           #Atten: 30 dB	Sweep 10	TRACE 1.2.3 % 6 TYPE WANNEL	Frequency Auto Tune Center Freq 2.441000000 GHz 2.441000000 GHz 2.441000000 GHz 2.441000000 GHz 1.000000 MHz Auto Man Freq Offset 0 Hz

ер



Dwell NVNT 3-DH5 2441MHz Ant1 One Burst				
	O: Fast 🛶 Trig: Video	#Avg Type: RMS	12:04:01 PM Dec 31, 2024 TRACE 1 2 3 4 5 6 TYPE WWWWWWW	Frequency
Ref Offset 2.46 dB 10 dB/div Ref 20.00 dBm	Gain:Low#Atten: 30 dB	Ĺ	Mkr1 2.913 ms 0.81 dB	Auto Tune
	1Δ2		TRIG LVL	Center Freq 2.441000000 GHz
-20.0 X.2 10 hand to be a finite of the second seco				Start Fred 2.441000000 GHz
-50.0 (170) -60.0 (10) -70.0	iya bagan pu ta'an baran baran ang baran Barang pang pang pang barang	ar a ligar plan, ballar an film Ar an		Stop Fred 2.441000000 GHz
Center 2.441000000 GHz Res BW 1.0 MHz	#VBW 3.0 MHz	-	Span 0 Hz ).00 ms (10001 pts)	<b>CF Step</b> 1.000000 MH: <u>Auto</u> Mar
	13 ms (Δ) 0.81 dB 3.0 μs -15.56 dBm	ICTION FUNCTION WIDTH	FUNCTION VALUE	Freq Offse 0 H:
7 8 9 10				Scale Type
MSG Deints changed; all traces cleared	ed		s	

No.: BCTC/RF-EMC-005

Page: 77 of 81



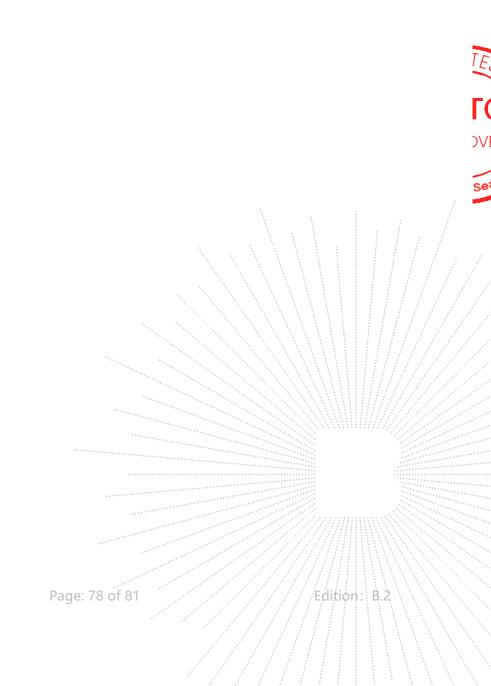
#### 15. Antenna Requirement

#### 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.



No.: BCTC/RF-EMC-005



## 16. EUT Test Setup Photographs

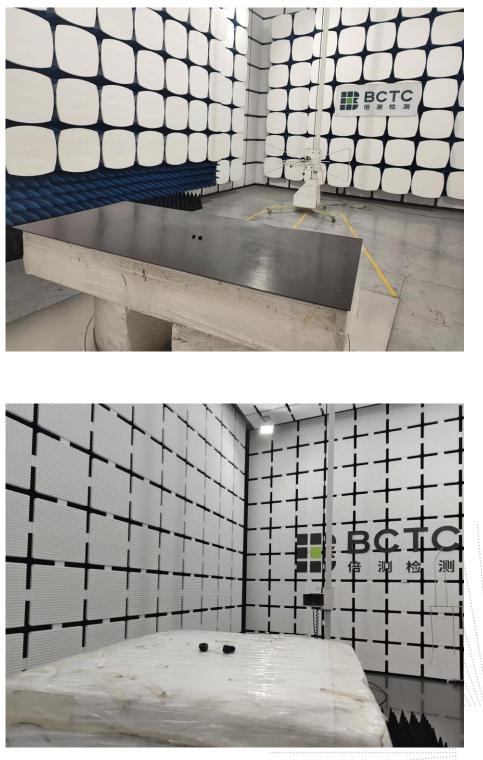
**Conducted Emission Measurement Photos** 



Page: 79 of 81



**Radiated Measurement Photos** 



No.: BCTC/RF-EMC-005

Page: 80 of 81



## **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 stamp of laboratory.

4. The test report is invalid without signature of person(s) testing and authorizing.

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

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

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

Address:

1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Tangwei, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China

TEL: 400-788-9558

P.C.: 518103

FAX: 0755-33229357

Website: http://www.chnbctc.com

Consultation E-mail: bctc@bctc-lab.com.cn

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

**\*\*\*\*\*\* END \*\*\*\*** 

Page: 81 of 81