



	TEST REPORT	
FCC ID :	2AFW2-B033-1	
Test Report No::	TCT220217E901	
Date of issue:	Mar. 03, 2022	
Testing laboratory:	SHENZHEN TONGCE TESTING LAB	
Testing location/ address:	TCT Testing Industrial Park Fuqiao 5th Industrial Zone, Street, Bao'an District Shenzhen, Guangdong, 518103 Republic of China	
Applicant's name: :	Shenzhen DZH Industrial Co., Ltd	
Address:	3th Floor, YiTuo Mike Industrial A building, Bu Yong Ind zone, ShaJing, Shenzhen, China	dustrial D
Manufacturer's name :	Shenzhen DZH Industrial Co., Ltd	
Address:	3th Floor, YiTuo Mike Industrial A building, Bu Yong Ind zone, Shajing, Shenzhen, China	dustrial D
Standard(s):	FCC CFR Title 47 Part 15 Subpart C Section 15.247 FCC KDB 558074 D01 15.247 Meas Guidance v05r02 ANSI C63.10:2013	(C)
Test item description :	Dual mode wireless keyboard	
Trade Mark:	N/A (S)	
Model/Type reference :	B033	
Rating(s):	Rechargeable Li-ion Battery DC 3.7V	(3)
Date of receipt of test item	Feb. 17, 2022	
Date (s) of performance of test:	Feb. 17, 2022 ~ Feb. 24, 2022	
Tested by (+signature) :	Rleo LIU	
Check by (+signature) :	Beryl ZHAO	
Approved by (+signature):	Tomsin	F
Remark:	This test report was based on TCT220217E005; Chang applicant, address, product name and product model N	-

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## **1. General Product Information**

### 1.1. EUT description

Test item description:	Dual mode wireless keyboard	<b>(()</b>
Model/Type reference:	B033	
Sample Number	TCT220217E005-0101	
Bluetooth Version:	V3.0	
Operation Frequency:	2402MHz~2480MHz	
Transfer Rate:	1 Mbits/s	
Number of Channel:	79	
Modulation Type:	GFSK	
Modulation Technology:	FHSS	
Antenna Type:	PCB Antenna	
Antenna Gain:	0.55dBi	S
Rating(s):	Rechargeable Li-ion Battery DC 3.7V	

Note: The antenna gain listed in this report is provided by applicant, and the test laboratory is not responsible for this parameter.

### 1.2. Model(s) list

None.

### 1.3. Operation Frequency

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	20	2422MHz	40	2442MHz	60	2462MHz
1	2403MHz	21	2423MHz	41	2443MHz	61	2463MHz
<b></b>	(	<b>X</b>		<b></b>	/	····	(
10	2412MHz	30	2432MHz	50	2452MHz	70	2472MHz
11	2413MHz	31	2433MHz	51	2453MHz	71	2473MHz
18	2420MHz	38	2440MHz	58	2460MHz	78	2480MHz
19	2421MHz	39	2441MHz	59	2461MHz		-

Remark: Channel 0, 39 &78 have been tested for GFSK modulation mode.

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## 2. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna Requirement	§15.203/§15.247 (c)	PASS
AC Power Line Conducted Emission	§15.207	PASS
Conducted Peak Output Power	§15.247 (b)(1)	PASS
20dB Occupied Bandwidth	§15.247 (a)(1)	PASS
Carrier Frequencies Separation	§15.247 (a)(1)	PASS
Hopping Channel Number	§15.247 (a)(1)	PASS
Dwell Time	§15.247 (a)(1)	PASS
Radiated Emission	§15.205/§15.209	PASS (
Band Edge	§15.247(d)	PASS

#### Note:

1. PASS: Test item meets the requirement.

2. Fail: Test item does not meet the requirement.

3. N/A: Test case does not apply to the test object.

4. The test result judgment is decided by the limit of test standard.

## 3. General Information

### 3.1. Test environment and mode

Operating Environment:							
Condition	Conducted Emission	Radiated Emission					
Temperature:	25.0 °C	24 °C					
Humidity:	55 % RH	45 % RH					
Atmospheric Pressure:	1010 mbar	1010 mbar					
Test Software:	·						
Software Information:	fcc_test_tool v1.6						
Power Level:	Default						
Te et Me de :							

Test Mode:

<b>U</b>	Keep the EUT in continuous transmitting by select channel and modulations with Fully-charged battery.
	, , , ,

The sample was placed 0.8m & 1.5m for the measurement below & above 1GHz above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case( Z axis) are shown in Test Results of the following pages. DH1 DH3 DH5 all have been tested, only worse case DH1 is reported.

## 3.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
Adapter	JD-050200	2012010907576735	/	/

Note:

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

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

3. For conducted measurements (Output Power, 20dB Occupied Bandwidth, Carrier Frequencies Separation, Hopping Channel Number, Dwell Time, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.

## **FCT**通测检测 4. Facilities and Accreditations

### 4.1. Facilities

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

• FCC - Registration No.: 645098

SHENZHEN TONGCE TESTING LAB

Designation Number: CN1205

The testing lab has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC Registration No.: 10668A-1
- SHENZHEN TONGCE TESTING LAB
- CAB identifier: CN0031

The testing lab has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

### 4.2. Location

#### SHENZHEN TONGCE TESTING LAB

Address: TCT Testing Industrial Park Fuqiao 5th Industrial Zone, Fuhai Street, Bao'an District Shenzhen, Guangdong, 518103, People's Republic of China TEL: +86-755-27673339

### 4.3. Measurement Uncertainty

The reported uncertainty of measurement  $y \pm U$ , where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	± 3.10 dB
2	RF power, conducted	± 0.12 dB
3	Spurious emissions, conducted	± 0.11 dB
4	All emissions, radiated(<1 GHz)	± 4.56 dB
5	All emissions, radiated(1 GHz - 18 GHz)	± 4.22 dB
6	All emissions, radiated(18 GHz- 40 GHz)	± 4.36 dB



#### 5. Test Results and Measurement Data

### 5.1. Antenna requirement

#### FCC Part15 C Section 15.203 /247(c) **Standard requirement:**

#### 15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(c) (1)(i) requirement:

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

#### **E.U.T** Antenna:

The Bluetooth antenna is PCB antenna which permanently attached, and the best case gain of the antenna is 0.55dBi.



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### 5.2. Conducted Emission

#### 5.2.1. Test Specification

			( (			
Test Requirement:	FCC Part15 C Section 15.207					
Test Method:	ANSI C63.10:2013					
Frequency Range:	150 kHz to 30 MHz					
Receiver setup:	RBW=9 kHz, VBW=30	) kHz, Sweep time	e=auto			
	Frequency range	Limit (	Limit (dBuV)			
	(MHz)	Quasi-peak	Average			
Limits:	0.15-0.5	66 to 56*	56 to 46*			
	0.5-5	56	46			
	5-30	60	50			
	Referenc	e Plane				
Test Setup:	E.U.T       AC powe         Test table/Insulation plane         Remark:         E.U.T: Equipment Under Test         LISN: Line Impedence Stabilization N         Test table height=0.8m	EMI Receiver	AC power			
Test Mode:	Charging + Transmittir	0				
	<ul> <li>provides a 50ohm/50uH coupling impedance for the measuring equipment.</li> <li>2. The peripheral devices are also connected to the ma power through a LISN that provides a 50ohm/50u coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup ar photographs).</li> <li>3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all the interface cables must be changed according to</li> </ul>					
Test Procedure:	<ul> <li>impedance stabiliz provides a 50ohm/s measuring equipme</li> <li>2. The peripheral device power through a L coupling impedance refer to the block photographs).</li> <li>3. Both sides of A.C. conducted interferent emission, the relative the interface cables</li> </ul>	zation network 50uH coupling im nt. ces are also conne ISN that provides with 50ohm tern diagram of the line are checke nce. In order to fin re positions of equ must be changed	(L.I.S.N.). This pedance for the ected to the main a 500hm/50ul- nination. (Please test setup and ed for maximum nd the maximum ipment and all of according to			
Test Procedure: Test Result:	<ul> <li>impedance stabiliz provides a 50ohm/s measuring equipme</li> <li>2. The peripheral device power through a Licoupling impedance refer to the block photographs).</li> <li>3. Both sides of A.C. conducted interference emission, the relative</li> </ul>	zation network 50uH coupling im nt. ces are also conne ISN that provides with 50ohm tern diagram of the line are checke nce. In order to fin re positions of equ must be changed	(L.I.S.N.). This pedance for the ected to the main a 500hm/50ul- nination. (Please test setup and ed for maximum nd the maximum ipment and all of according to			

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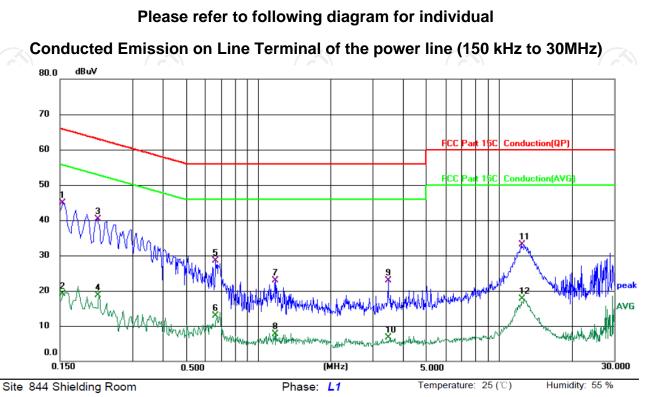
http://www.tct-lab.com

Fax: 86-755-27673332

#### 5.2.2. Test Instruments

Conducted Emission Shielding Room Test Site (843)									
Equipment	Equipment Manufacturer		Serial Number	Calibration Due					
EMI Test Receiver	R&S	ESCI3	100898	Jul. 07, 2022					
Line Impedance Stabilisation Newtork(LISN)	Schwarzbeck	NSLK 8126	8126453	Mar. 11, 2022					
Line-5	ТСТ	CE-05	5 N/A Jul. 07,						
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A					

#### 5.2.3. Test data



Limit: FCC Part 15C Conduction(QP) Power: DC 5 V(Adapter Input AC 120 V/60 Hz)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1539	35.37	9.59	44.96	65.79	-20.83	QP	
2		0.1539	9.52	9.59	19.11	55.79	-36.68	AVG	
3		0.2140	30.96	9.37	40.33	63.05	-22.72	QP	
4		0.2140	9.41	9.37	18.78	53.05	-34.27	AVG	
5		0.6660	19.36	9.18	28.54	56.00	-27.46	QP	
6		0.6660	3.71	9.18	12.89	46.00	-33.11	AVG	
7		1.1740	13.47	9.35	22.82	56.00	-33.18	QP	
8		1.1740	-1.62	9.35	7.73	46.00	-38.27	AVG	
9		3.4700	13.28	9.53	22.81	56.00	-33.19	QP	
10		3.4700	-2.88	9.53	6.65	46.00	-39.35	AVG	
11		12.4340	23.44	9.63	33.07	60.00	-26.93	QP	
12		12.4340	7.98	9.63	17.61	50.00	-32.39	AVG	

#### Note:

Freq. = Emission frequency in MHz

Reading level  $(dB\mu V) = Receiver reading$ 

Corr. Factor (dB) = LISN factor + Cable loss

Measurement  $(dB\mu V) = Reading \ level (dB\mu V) + Corr. Factor (dB)$ 

Limit (dB $\mu$ V) = Limit stated in standard

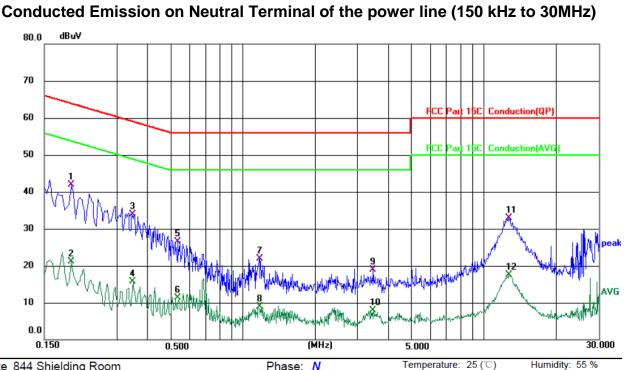
 $Margin (dB) = Measurement (dB\mu V) - Limits (dB\mu V)$ 

Q.P. =Quasi-Peak

AVG =average

\* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

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Site 844 Shielding Room

Limit: FCC Part 15C Conduction(QP)

TCT通测检测 TESTING CENTRE TECHNOLOGY

Power: DC 5 V(Adapter Input AC 120 V/60 Hz)

Report No.: TCT220217E901

				· · ·					
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1940	32.49	9.51	42.00	63.86	-21.86	QP	
2		0.1940	11.54	9.51	21.05	53.86	-32.81	AVG	
3		0.3459	24.61	9.31	33.92	59.06	-25.14	QP	
4		0.3459	6.40	9.31	15.71	49.06	-33.35	AVG	
5		0.5380	17.30	9.22	26.52	56.00	-29.48	QP	
6		0.5380	2.01	9.22	11.23	46.00	-34.77	AVG	
7		1.1779	12.65	9.33	21.98	56.00	-34.02	QP	
8		1.1779	-0.36	9.33	8.97	46.00	-37.03	AVG	
9		3.4780	9.55	9.43	18.98	56.00	-37.02	QP	
10		3.4780	-1.49	9.43	7.94	46.00	-38.06	AVG	
11		12.7820	23.33	9.65	32.98	60.00	-27.02	QP	
12		12.7820	7.81	9.65	17.46	50.00	-32.54	AVG	

Phase: N

#### Note1:

Freq. = Emission frequency in MHz Reading level  $(dB\mu V) = Receiver reading$ Corr. Factor (dB) = LISN factor + Cable loss Measurement  $(dB\mu V) = Reading \, level \, (dB\mu V) + Corr. Factor (dB)$ Limit  $(dB\mu V) = Limit$  stated in standard Margin (dB) = Measurement (dB $\mu$ V) – Limits (dB $\mu$ V) Q.P. =Quasi-Peak AVG =average

\* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

#### Note2:

Measurements were conducted in all three channels (high, middle, low) and the worst case Mode (Lowest channel) was submitted only.



## 5.3. Conducted Output Power

#### 5.3.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (b)(1)
Test Method:	KDB 558074 D01 v05r02
Limit:	Section 15.247 (b) The maximum peak conducted output power of the intentional radiator shall not exceed the following: (1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band 0.125 watts.
Test Setup:	Spectrum Analyzer EUT
Test Mode:	Transmitting mode with modulation
Test Procedure:	Use the following spectrum analyzer settings: Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel RBW > the 20 dB bandwidth of the emission being measured VBW ≥ RBW Sweep = auto Detector function = peak Trace = max hold Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission.
Test Result:	PASS

#### 5.3.2. Test Instruments

Name	Manufacturer	Model No.	Serial Number	<b>Calibration Due</b>
Spectrum Analyzer	Agilent	N9020A	MY49100619	Jul. 18, 2022
Combiner Box	Ascentest	AT890-RFB	N/A	Jul. 07, 2022





## 5.4. 20dB Occupy Bandwidth

#### 5.4.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)			
Test Method:	KDB 558074 D01 v05r02			
Limit:	N/A			
Test Setup:	Spectrum Analyzer EUT			
Test Mode:	Transmitting mode with modulation			
Test Procedure:	<ol> <li>The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.</li> <li>Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>Use the following spectrum analyzer settings for 20dB Bandwidth measurement. Span = approximately 2 to 5 times the 20 dB bandwidth, centered on a hopping channel; 1%≤RBW≤5% of the 20 dB bandwidth; VBW≥3RBW; Sweep = auto; Detector function = peak; Trace = max hold.</li> <li>Measure and record the results in the test report.</li> </ol>			
Test Result:	PASS			

#### 5.4.2. Test Instruments

Manufacturer	Model No.	Serial Number	Calibration Due
Agilent	N9020A	MY49100619	Jul. 18, 2022
Ascentest	AT890-RFB	N/A	Jul. 07, 2022



## 5.5. Carrier Frequencies Separation

#### 5.5.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	KDB 558074 D01 v05r02
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 125 mW.
Test Setup:	Spectrum Analyzer EUT
Test Mode:	Hopping mode
Test Procedure:	<ol> <li>The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.</li> <li>Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>Enable the EUT hopping function.</li> <li>Use the following spectrum analyzer settings: Span = wide enough to capture the peaks of two adjacent channels; RBW is set to approximately 30% of the channel spacing, adjust as necessary to best identify the center of each individual channel; VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold.</li> <li>Use the marker-delta function to determine the separation between the peaks of the adjacent channels. Record the value in report.</li> </ol>
Test Result:	PASS (S)

#### 5.5.2. Test Instruments

Name	Manufacturer	Model No.	Serial Number	Calibration Due	
Spectrum Analyzer	Agilent	N9020A	MY49100619	Jul. 18, 2022	
Combiner Box	Ascentest	AT890-RFB	N/A	Jul. 07, 2022	

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## 5.6. Hopping Channel Number

#### 5.6.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	KDB 558074 D01 v05r02
Limit:	Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.
Test Setup:	Spectrum Analyzer EUT
Test Mode:	Hopping mode
Test Procedure:	<ol> <li>The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.</li> <li>Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>Enable the EUT hopping function.</li> <li>Use the following spectrum analyzer settings: Span = the frequency band of operation; set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller; VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold.</li> <li>The number of hopping frequency used is defined as the number of total channel.</li> <li>Record the measurement data in report.</li> </ol>
Test Result:	PASS

#### 5.6.2. Test Instruments

Name	Manufacturer	Model No.	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100619	Jul. 18, 2022
Combiner Box	Ascentest	AT890-RFB	N/A	Jul. 07, 2022
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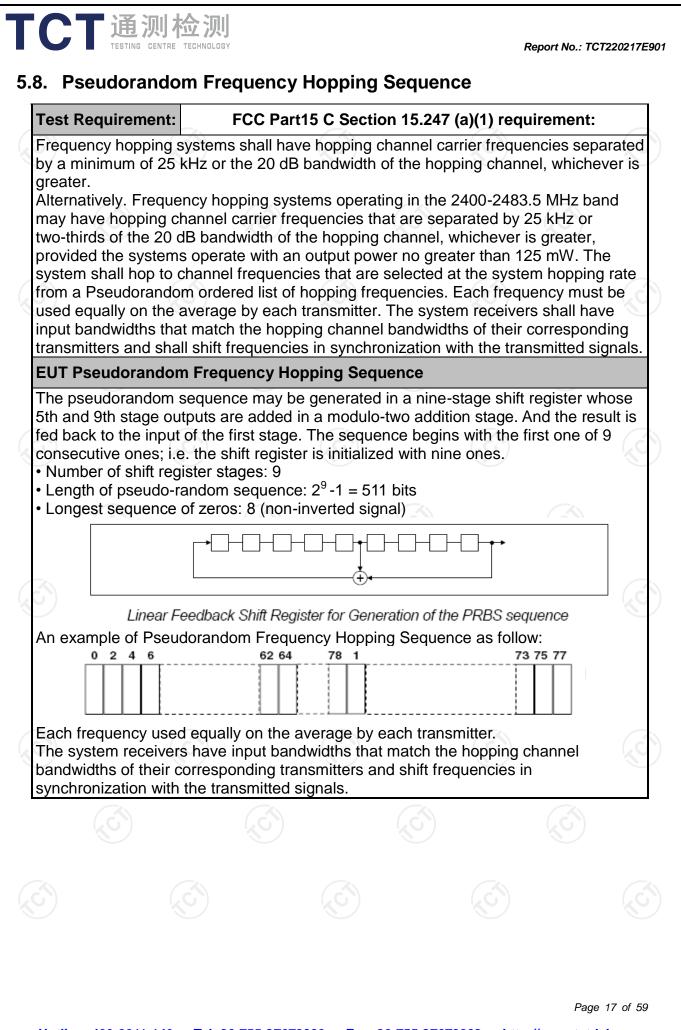
### 5.7. Dwell Time

#### 5.7.1. Test Specification

FCC Part15 C Section 15.247 (a)(1)
KDB 558074 D01 v05r02
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.
Spectrum Analyzer EUT
Hopping mode
<ol> <li>The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.</li> <li>Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>Enable the EUT hopping function.</li> <li>Use the following spectrum analyzer settings: Span = zero span, centered on a hopping channel; RBW shall be ≤ channel spacing and where possible RBW should be set &gt;&gt; 1 / T, where T is the expected dwell time per channel; VBW≥RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold.</li> <li>Measure and record the results in the test report.</li> </ol>
PASS

#### 5.7.2. Test Instruments

Name	Manufacturer	Model No.	Serial Number	<b>Calibration Due</b>
Spectrum Analyzer	Agilent	N9020A	MY49100619	Jul. 18, 2022
Combiner Box	Ascentest	AT890-RFB	N/A	Jul. 07, 2022





## 5.9. Conducted Band Edge Measurement

#### 5.9.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB 558074 D01 v05r02
Limit:	In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fal in the restricted bands must also comply with the radiated emission limits.
Test Setup:	Spectrum Analyzer EUT
Test Mode:	Transmitting mode with modulation
Test Procedure:	<ol> <li>Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>Set RBW = 100 kHz (≥1% span=10MHz), VBW = 300 kHz (≥RBW). Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100kHz RBW. The attenuation shall be 30 dB instead of 20 dB when RMS conducted output power procedure is used.</li> <li>Enable hopping function of the EUT and then repeat step 2 and 3.</li> <li>Measure and record the results in the test report.</li> </ol>
Test Result:	PASS

#### 5.9.2. Test Instruments

Name	Manufacturer	Model No.	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100619	Jul. 18, 2022
Combiner Box	Ascentest	AT890-RFB	N/A	Jul. 07, 2022
	(G)	) ()	(G <sup>*</sup> )	$(\mathcal{G})$



## 5.10. Conducted Spurious Emission Measurement

#### 5.10.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB 558074 D01 v05r02
Limit:	In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.
Test Setup:	Spectrum Analyzer EUT
Test Mode:	Transmitting mode with modulation
Test Procedure:	<ol> <li>The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.</li> <li>Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>Set RBW = 100 kHz, VBW = 300kHz, scan up through 10th harmonic. All harmonics / spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.</li> <li>Measure and record the results in the test report.</li> <li>The RF fundamental frequency should be excluded against the limit line in the operating frequency band.</li> </ol>
Test Result:	PASS

#### 5.10.2. Test Instruments

Name	Manufacturer	Model No.	Serial Number	<b>Calibration Due</b>		
Spectrum Analyzer	Agilent	N9020A	MY49100619	Jul. 18, 2022		
Combiner Box	Ascentest	AT890-RFB	N/A	Jul. 07, 2022		



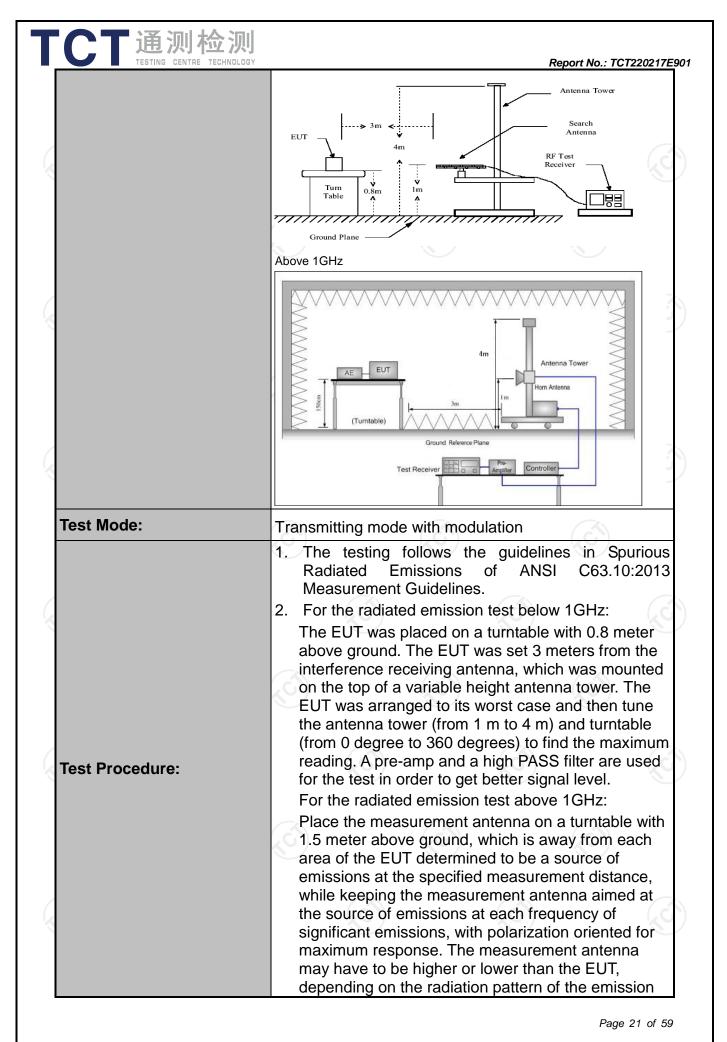




#### 5.11.1. Test Specification

TCT通测检测 TESTING CENTRE TECHNOLOGY

Test Requirement:	FCC Part15	C Section	15.209	S S		1			
Test Method:	ANSI C63.1	0:2013							
Frequency Range:	9 kHz to 25	GHz			6	<i>.</i>			
Measurement Dista	nce: 3 m	X	9		R				
Antenna Polarizatio	n: Horizontal &	Horizontal & Vertical							
	Frequency	Frequency Detector		VBW	F	Remark			
	9kHz- 150kHz 150kHz-	Quasi-peal Quasi-peal		1kHz 30kHz		i-peak Value i-peak Value			
Receiver Setup:	30MHz	Questines	4001/11-	0001/11-	0.00				
	<u>30MHz-1GHz</u>	Quasi-peal Peak	C 120KHz	300KHz 3MHz		i-peak Value eak Value			
	Above 1GHz	Peak	1MHz	10Hz		rage Value			
	Frequei	ncy	Field Stre (microvolts	-		asurement nce (meters)			
	0.009-0.	490	2400/F(I		Diotal	300			
	0.490-1.		24000/F			30			
	1.705-		30			30			
	30-88		100		3				
l incit.	88-21		150		3				
Limit:	216-96		200		3				
	Above S		500		l,	3			
	Frequency		d Strength ovolts/meter)	Measure Distan (meter	nce Detector ers)				
	Above 1GH	lz 📃	500	3	Average				
	For radiated em	issions below	5000 30MHz	3		Peak			
	D	Distance = 3m			Comput	cr			
	1		$\bigcirc$	Pre -	Amplifier	Ц			
Test setup:	EUT		$\parallel \uparrow \parallel$			'     <sup>_</sup>			
	0.8m	Turn table	1m						
			⊥	_ Ц	Receiver				
		Ground	d Plane	L		1			
	30MHz to 1GHz								
<del>3</del> ) (2									



	recu mea mai antu rest abo 3. Se EU 4. Us (1) (2)	<ul> <li>max hold for period</li> <li>For average mean correction factor</li> <li>15.35(c). Duty cycle</li> </ul>	he emission source n signal. The final a elevation shall be ons. The measure maximum emission f heights of from 1 eference ground p power setting and busly. ctrum analyzer se nough to fully cap easured; lz for f < 1 GHz, R /≥RBW; Detector function = eak asurement: use du method per	e that which ment ons shall be I m to 4 m olane. d enable the ettings: oture the RBW=1MHz = peak; Trace uty cycle milliseconds
	Ś	Where N1 is nun length of type 1 p	on Level = Peak E outy cycle) g: Antenna Factor	mission r + Cable
Test results:	PASS	Where N1 is nun length of type 1 p Average Emissic Level + 20*log(D Corrected Readin	oulses, etc. on Level = Peak E outy cycle) g: Antenna Factor	mission r + Cable
Test results:	PASS	Where N1 is nun length of type 1 p Average Emissic Level + 20*log(D Corrected Readin	oulses, etc. on Level = Peak E outy cycle) g: Antenna Factor	mission r + Cable
Test results:	PASS	Where N1 is nun length of type 1 p Average Emissic Level + 20*log(D Corrected Readin	oulses, etc. on Level = Peak E outy cycle) g: Antenna Factor	mission r + Cable
Test results:	PASS	Where N1 is nun length of type 1 p Average Emissic Level + 20*log(D Corrected Readin	oulses, etc. on Level = Peak E outy cycle) g: Antenna Factor	mission r + Cable



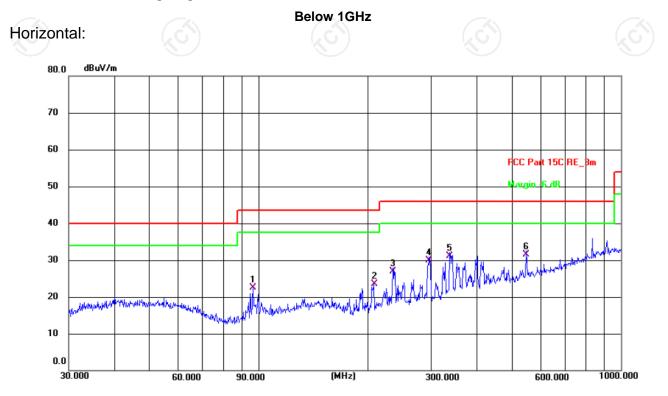
### 5.11.2. Test Instruments

	Radiated En	nission Test Site	e (966)	
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESIB7	100197	Jul. 07, 2022
Spectrum Analyzer	R&S	FSQ40	200061	Jul. 07, 2022
Pre-amplifier	SKET	LNPA_0118G- 45	SK2021012 102	Mar. 11, 2022
Pre-amplifier	SKET	LNPA_1840G- 50	SK2021092 03500	Apr. 08, 2022
Pre-amplifier	HP	8447D	2727A05017	Jul. 07, 2022
Loop antenna	ZHINAN	ZN30900A	12024	Sep. 05, 2022
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 04, 2022
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Sep. 04, 2022
Horn Antenna	Schwarzbeck	BBHA 9170	00956	Apr. 10, 2023
Antenna Mast	Keleto	RE-AM	N/A	N/A
Coaxial cable	SKET	RC_DC18G-N	N/A	Apr. 08, 2022
Coaxial cable	SKET	RC-DC18G-N	N/A	Apr. 08, 2022
Coaxial cable	SKET	RC-DC40G-N	N/A	Jul. 07, 2022
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A
			)	



#### 5.11.3. **Test Data**

#### Please refer to following diagram for individual



Site #2 3m Anechoic Chamber Limit: FCC Part 15C RE\_3m

Polarization: Horizontal Power: DC 3.7 V

Temperature: 24(C) Humidity: 45 %

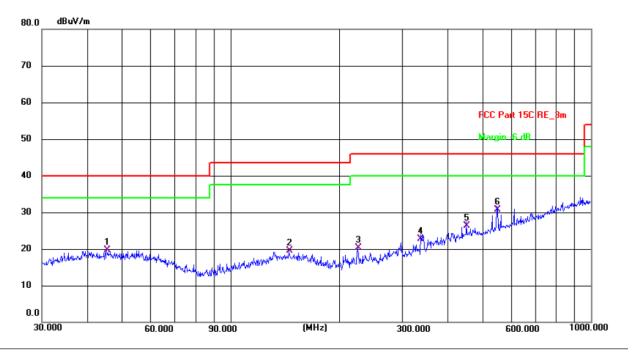
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No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	96.7749	12.56	10.02	22.58	43.50	-20.92	QP	Ρ	
2	208.5803	12.67	10.77	23.44	43.50	-20.06	QP	Ρ	
3	234.9909	14.46	12.44	26.90	46.00	-19.10	QP	Ρ	
4	296.1836	16.07	13.83	29.90	46.00	-16.10	QP	Ρ	
5	337.2155	16.05	15.05	31.10	46.00	-14.90	QP	Р	
6 *	547.0977	11.33	20.27	31.60	46.00	-14.40	QP	Ρ	

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#### Vertical:

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Site #	2 3m Anechoi	c Chambe	Polarization: Vertical					Temperature: 24(C) Humidity: 45 9		
Limit:	FCC Part 150	RE_3m			Pov	ver: DC	3.7 V			
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark	
1	45.3755	5.83	13.88	19.71	40.00	-20.29	QP	Р		
2	145.3506	6.13	13.29	19.42	43.50	-24.08	QP	Ρ		
3	225.3080	8.46	11.79	20.25	46.00	-25.75	QP	Р		
4	337.2155	7.75	15.05	22.80	46.00	-23.20	QP	Р		
5	451.1350	8.05	18.35	26.40	46.00	-19.60	QP	Р		
6 *	549.0195	10.40	20.30	30.70	46.00	-15.30	QP	Р		

**Note:** 1. The low frequency, which started from 9KHz~30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

2. Measurements were conducted in all three channels (high, middle, low), and the worst case Mode (Lowest channel) was submitted only.

3. Freq. = Emission frequency in MHz

Measurement  $(dB\mu V/m) = Reading level (dB\mu V) + Corr. Factor (dB)$ 

Correction Factor= Antenna Factor + Cable loss – Pre-amplifier

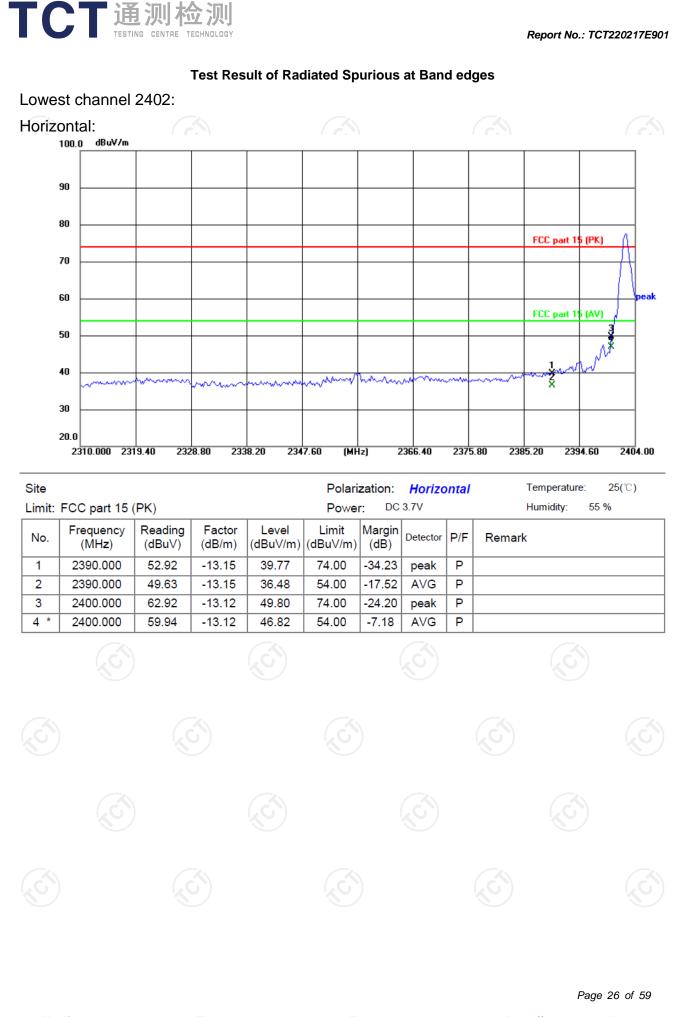
Limit  $(dB\mu V/m) = Limit$  stated in standard

 $Over (dB) = Measurement (dB\mu V/m) - Limits (dB\mu V/m)$ 

\* is meaning the worst frequency has been tested in the test frequency range.

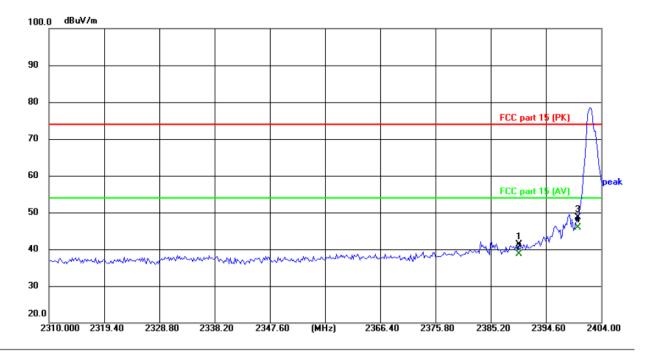
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#### Vertical:



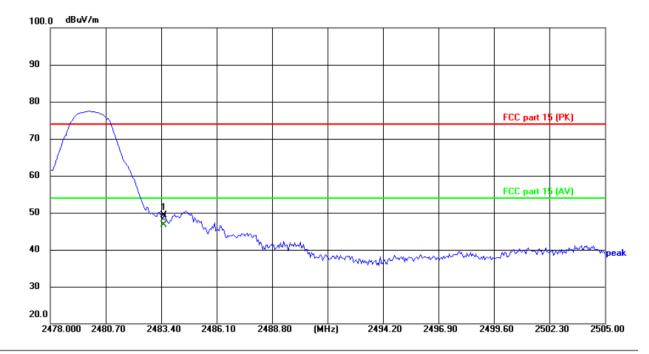
Site					Polari	zation:	Temperature: 25(℃)		
Limit:	FCC part 15	(PK)		Power	r: DC	3.7V		Humidity: 55 %	
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	2390.000	54.54	-13.15	41.39	74.00	-32.61	peak	Ρ	
2	2390.000	51.91	-13.15	38.76	54.00	-15.24	AVG	Ρ	
3	2400.000	61.81	-13.12	48.69	74.00	-25.31	peak	Ρ	
4 *	2400.000	59.04	-13.12	45.92	54.00	-8.08	AVG	Ρ	
X		X	5,		X.	)			KU KU

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Highest channel 2480:

Horizontal:



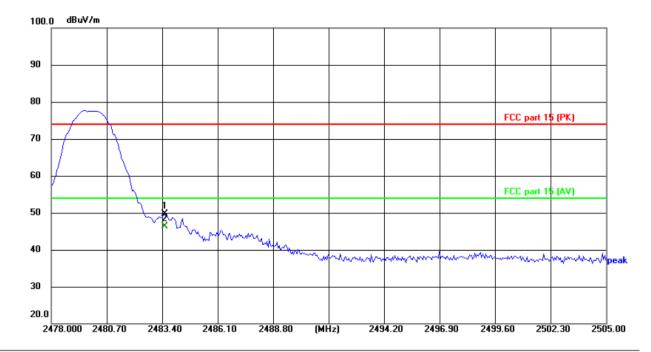
Limit:         FCC part 15 (PK)         Power:         DC 3.7V         Humidity:         55 %           No.         Frequency (MHz)         Reading (dBuV)         Factor (dB/m)         Level (dBuV/m)         Limit (dBuV/m)         Margin (dB)         Detector         P/F         Remark           1         2483.500         62.19         -12.84         49.35         74.00         -24.65         peak         P           2 *         2483.500         59.59         -12.84         46.75         54.00         -7.25         AVG         P	Site					Polaria	zation:	Temperature: 25(℃)			
No.         (MHz)         (dBuV)         (dB/m)         (dBuV/m)         (dBuV/m)         (dB)         Detector         P/F         Remark           1         2483.500         62.19         -12.84         49.35         74.00         -24.65         peak         P	Limit:	FCC part 15 (	PK)			Power	: DC	3.7V	Humidity: 55 %		
	No.		· ·					Detector	P/F	Remark	
2 * 2483.500 59.59 -12.84 46.75 54.00 -7.25 AVG P	1	2483.500	62.19	-12.84	49.35	74.00	-24.65	peak	Ρ		
	2 *	2483.500	59.59	-12.84	46.75	54.00	-7.25	AVG	Ρ		

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#### Vertical:



Site					Polari	zation:	Vertica	Temperature: 25(°C)		
Limit:	FCC part 15 (	PK)			Power	: DC	3.7V	Humidity: 55 %		
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector	P/F	Remark	
1	2483.500	62.53	-12.84	49.69	74.00	-24.31	peak	Ρ		
2 *	2483.500	59.22	-12.84	46.38	54.00	-7.62	AVG	Ρ		



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# 

Above 1GHz

Modul	ation	Type: GF	SK									
Low cl	Low channel: 2402 MHz											
Freque (MH		Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBuV)	Correction Factor (dB/m)	Peak	n Level AV (dBµV/m)	Peak limit (dBµV/m)	AV limit (dBµV/m)	Margin (dB)		
480	)4	Н	45.89		0.66	46.55		74	54	-7.45		
720	)6	Н	37.24		9.50	46.74		74	54	-7.26		
	-	H				/						
	(	<b>()</b>		J.J	<b>`</b> )	(,	· ()		$(\mathcal{O})$			
480	)4	V	46.95		0.66	47.61		74	54	-6.39		
720	)6	V	35.87		9.50	45.37		74	54	-8.63		
	-	V										

Middle cha	nnel: 2441	MHz			)				N.
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBµV)	Correction Factor (dB/m)	Peak		Peak limit (dBµV/m)		Margin (dB)
4882	Н	45.08		0.99	46.07	·	74	54	-7.93
7323	KOH)	35.79	1.0	9.87	45.66		74	54	-8.34
	Ĥ								
4882	V	47.83		0.99	48.82		74	54	-5.18
7323	V	36.94		9.87	46.81		74	54	-7.19
	V			'\	//				

#### High channel: 2480 MHz

Frequency	Ant Rol	Peak	AV	Correction	Emission Level		Peak limit	AV/ limit	Margin	
'	(MHz)	H/V	reading	reading	Factor	Peak	AV	(dBµV/m)	(dBµV/m)	(dB)
	, ,		(dBµV)	(dBµV)	(dB/m)	(aBhr/w)	(dBµV/m)	· · /	· · /	. ,
	4960	Н	46.14		1.33	47.47		74	54	-6.53
	7440	Н	35.50		10.22	45.72		74	54	-8.28
_	<u> </u>	Н								
	4960	V	47.54		1.33	48.87		74	54	-5.13
	7440	V	35.66		10.22	45.88		74	54	-8.12
		V								
		V						-		

#### Note:

1. Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier

2. Margin (dB) = Emission Level (Peak) (dB $\mu$ V/m)-Average limit (dB $\mu$ V/m)

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

4. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.

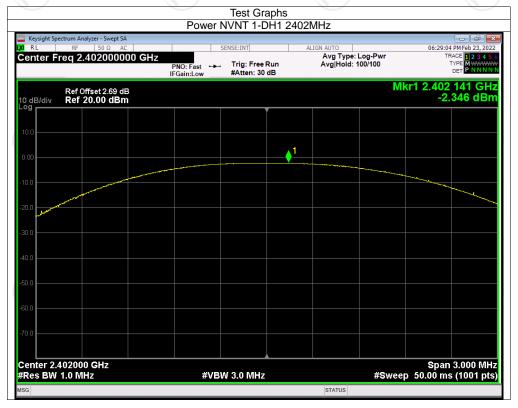
5. Data of measurement shown "----"in the above table mean that the reading of emissions is attenuated more than 20 dB

below the limits or the field strength is too small to be measured.

6. All the restriction bands are compliance with the limit of 15.209.



Maximum Conducted Output Power									
Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict				
NVNT	1-DH1	2402	-2.35	30	Pass				
NVNT	1-DH1	2441	-2.59	30	Pass				
NVNT	1-DH1	2480	-3.20	30	Pass				





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	Keysight Spectrum Analyzer - Swept SA           RL         RF         50 Ω         AC           enter Freq 2.441000000 GH3	Z PNO: Fast Trig: Free Run IFGain:Low #Atten: 30 dB	ALIGN AUTO Avg Type: Log-Pwr Avg Hold: 200/200	06:29:54 PM Feb 23, 2022 TRACE 1 2 3 4 5 6 TYPE M
10	Ref Offset 2.82 dB dB/div Ref 20.00 dBm g	in dum.Low	Mkr1	2.441 132 GHz -2.586 dBm
	0.0			
	00	<b>↓</b> 1		
				The second se
-30				
	.0			
-60	.0			
-70	.0			
Ce #F	enter 2.441000 GHz Res BW 1.0 MHz	#VBW 3.0 MHz	#Sweep 1	Span 3.000 MHz 10.00 ms (1001 pts)
		Power NVNT 1-DH1 248		
LX/	Keysight Spectrum Analyzer - Swept SA           RL         RF         50 Ω         AC           enter Freq 2.480000000 GH:	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr	06:31:50 PM Feb 23, 2022 TRACE 23 4 5 6
	Ref Offset 2.91 dB	PNO: Fast Trig: Free Run IFGain:Low #Atten: 30 dB	Avg Hoid: 1000/1000 Mkr1	TRACE 1 2 3 4 5 6 TYPE MWWWWW DET PNNNNN 2.479 853 GHz
La				-3.203 dBm
	00	<b>1</b>		
-10	0.0			
	0.0			م <del>ار</del> ا
	.0			
-50				
-60	0.0			
C	enter 2.480000 GHz			Span 3.000 MHz
#F	Res BW 1.0 MHz	#VBW 3.0 MHz	Sweep 1	1.000 ms (1001 pts)



### -20dB Bandwidth

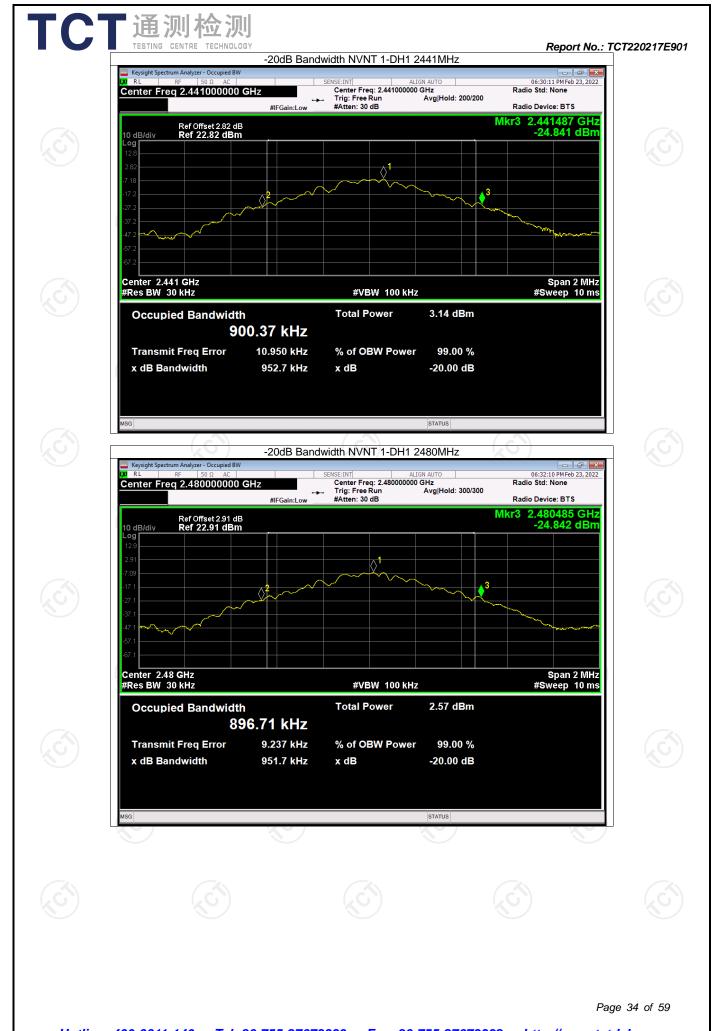
Condition	Mode	Frequency (MHz)	-20 dB Bandwidth (MHz)	Verdict
NVNT	1-DH1	2402	0.954	Pass
NVNT	1-DH1	2441	0.953	Pass
NVNT	1-DH1	2480	0.952	Pass



STATUS

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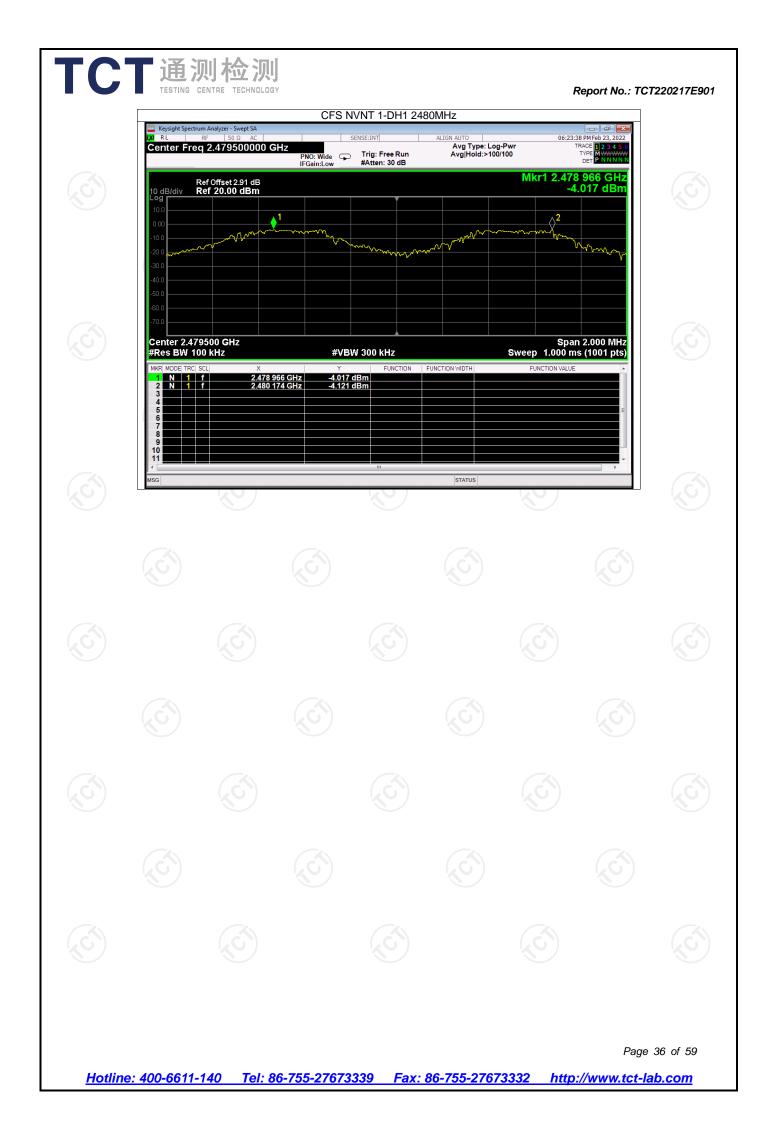


Condition	Mode	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH1	2401.962	2403.078	1.116	0.954	Pass
NVNT	1-DH1	2441.080	2442.060	0.980	0.954	Pass
NVNT	1-DH1	2478.966	2480.174	1.208	0.954	Pass



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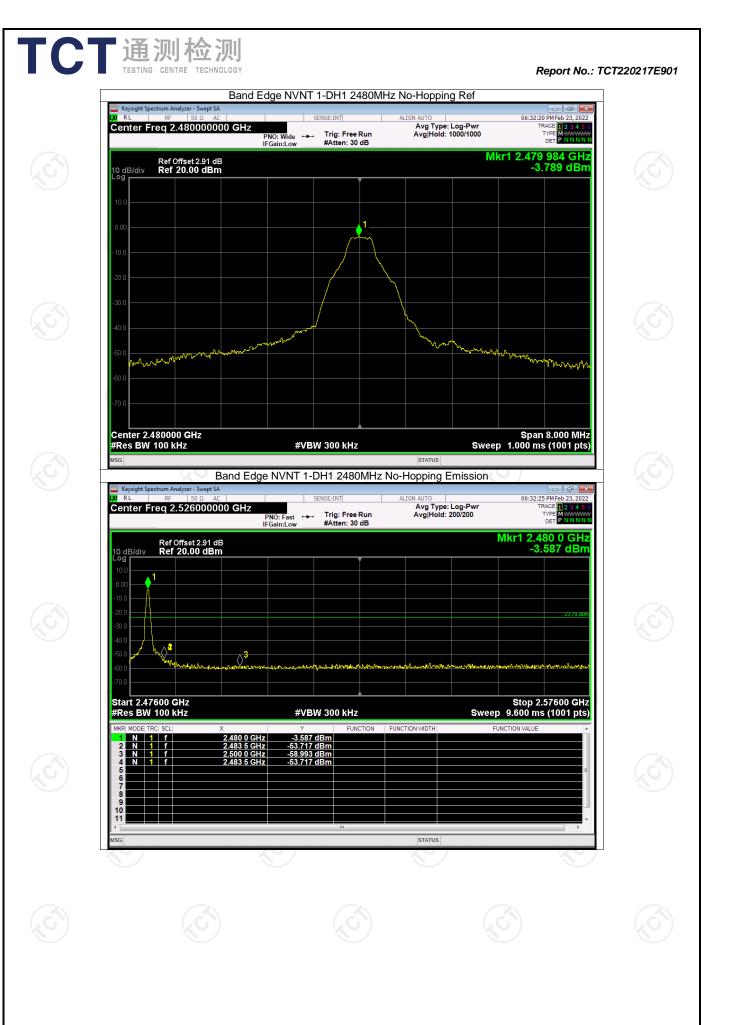
Condition	Mode	Frequency (MHz)	Band Edge Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH1	2402	No-Hopping	-53.90	-20	Pass
NVNT	1-DH1	2480	No-Hopping	-49.92	-20	Pass
	···· Keysight Spectrum Ana		Test Graphs /NT 1-DH1 2402MHz No-	Hopping Ref		
	XI RL RF Center Freq 2.4	50 Ω AC 4020000000 GHz PNO: Wide IFGain:Low	🛶 Trig: Free Run 🖌	Avg Type: Log-Pwr Avg Hold: 1000/1000	27:44 PM Feb 23, 2022 TRACE 1 2 3 4 5 6 TYPE M WWWWW DET P N N N N	
	Ref Of 10 dB/div Ref 2	fset 2.69 dB 0.00 dBm		Mkr1 2.4	01 976 GHz -2.939 dBm	
<u>(</u> )	10.0					
	0.00		1			
	-10.0					
	-20.0					
	-30.0					
	-40.0		h h	~~~		
	-50.0	Your of the second of the seco		Mart of the second second second	www.www.	
	-60.0					
	-70.0					
¢	Center 2.402000 #Res BW 100 kH	GHz Iz	#VBW 300 kHz	Sween 1 000	pan 8.000 MHz ms (1001 pts)	
	ISG			STATUS		
		lyzer - Swept SA 50 Ω AC	SENSE:INT ALIGN		27:48 PM Feb 23, 2022	
	Center Freq 2.3	356000000 GHz PNO: Fast IFGain:Low	斗 Trig: Free Run 🛛 🖌	Avg Type: Log-Pwr Avg Hold: 200/200	TRACE 1 2 3 4 5 6 TYPE NNNNN DET PNNNNN	
	10 dB/div Ref 2	ffset 2.69 dB 20.00 dBm			2.402 1 GH <mark>z</mark> -3.000 dBm	
	10.0				1	
	-10.0					
	-20.0				-22:54 dBm	
$\mathbf{S}$	-40.0	\$ <b>4</b>			· · ·	
	-60.0	aluevano altra	nerelistanlighten than to de all the and the and the second second second second second second second second se	ur yner refulsion yn die gedd allyn ache stad allyn llen ar ferddallan yn ar yn ar yn ar yn ar yn ar yn ar yn a I ferddau yn ar		
	Start 2.30600 GI #Res BW 100 kH		#VBW 300 kHz		p 2.40600 GHz ms (1001 pts)	
	MKR MODE TRC SCL	× 2.402 1 GHz -3	Y FUNCTION FUNCTION			
	2 N 1 f 3 N 1 f 4 N 1 f	2.390 0 GHz -59	0.419 dBm 0.024 dBm 0.849 dBm			
	5 6 7 8					
	9 10 11				•	
	۲		m	STATUS	4	

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NVNT       1-DH1       2402       Hopping       -52.97       -20       Pass         NVNT       1-DH1       2480       Hopping       -51.77       -20       Pass         Test Graphs         Band Edge(Hopping) MULT LoH1 2003MHz Hopping Ref         Center Freq 240200000 GHz       Spans 8000MHz         Center Freq 24020000 GHz       WEW 300 Kiz       Spans 8000MHz       Spans 8000MHz       Spans 8000MHz         Center Freq 23500000 GHz       WEW 300 Kiz       Spans 8000MHz       Spans 8000MHz       Spans 8000MHz         Center Freq 235000000 GHz       WEW 300 Kiz       Spans 8000MHz       Spans 8000MHz       Spans 8000MHz         Center Freq 235000000 GHz       WEW 300 Kiz       Spans 8000MHz       Spans 8000MHz       Spans 8000MHz         Center Freq 235000000 GHz       WEW 300 Kiz       Spans 8000MHz       Spans 8000MHz       Spans 8000MHz       Spans 8000MHz         Center Freq 235000000 GHz       WEW 300 Kiz       Spans 8000MHz       Spans 8000MHz<	ondition	Mode	Frequency (MHz)	d Edge(Hopp Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdic	
Test Graphs         Band Edge(Hopping) NVNT 1-DH1 2020MHz Hopping Ref         Certer Freq 2-10200000 GHz         Mint 2 4001 Bit and the test matching of t			2402		-52.97	-20		
Band Edge(Hopping) NVNT 1-DH1 2402MHz Hopping Ref         Alter Freq 240200000 GHz         Mitri 2408 Ref         Mitri 2408 Ref         Official Press         Alter Freq 240200000 GHz         Ref office 280 Ref         Mitri 2408 Ref         Office 280 Ref         Mitri 2408 Ref         Office 280 Ref <td cols<="" td=""><td>NVNT</td><td>1-DH1</td><td>2480</td><td>Hopping</td><td>-51.77</td><td>-20</td><td>Pass</td></td>	<td>NVNT</td> <td>1-DH1</td> <td>2480</td> <td>Hopping</td> <td>-51.77</td> <td>-20</td> <td>Pass</td>	NVNT	1-DH1	2480	Hopping	-51.77	-20	Pass
Image: State in the intermediate interm	_		Band Edge/Hopp	Test Graphs				
Center Fred 2.40200000 GHz       File File Run Market State       And Trace Log Prove Trace State       File File Run Market State         Image: State Run Market State			Analyzer - Swept SA					
Mkr1 2.405 120 CHz         Sol at the second secon		Center Freq 2	2.402000000 GHz PNO: Wide	Trig: Free Run	Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6		
Image: Second		Ref						
Image: constraint of the second of the se								
Image: control of the second secon		10.0						
30       0		0.00		Δ	0 m	1		
000       0		-10.0			M M M	MAN		
Image: Second Control of the second		-20.0		AN MAN				
Image: Section of the section of th		-30.0				Ų		
600       0		-40.0						
Center 2.402000 CHz       Span 8.000 MHz         ##Res BW 100 kHz       #VBW 300 kHz         Band Edge(Hopping) NVNT 1-DH1 2402MHz Hopping Emission         Center Freq 2.356000000 GHz       Stee:INT         Alex Arg       Alex Arg         Ref Offset 2.68 dB       Mkr1 2.401 9 GHz         Interfere 2.000 dBm	9	-50.0	λ					
Span 8.000 MHz         #VBW 300 kHz       Span 8.000 MHz         Band Edge(Hopping) NVNT 1-DH1 2402MHz Hopping Emission         Band Edge(Hopping) NVNT 1-DH1 2402MHz Hopping Emission         Center Freq 2.355600000 GHz       Align Auton Auton       O 95.514 Bits 25.2222         Mikr1 2.401 9 GHz         O 100 Frat       Trig: Free Run         Align Auton       O 95.514 Bits 25.2222         O 100 Gits 255000000 GHz       Mikr1 2.401 9 GHz         O 100 Gits 2550 dB       O 100 Gits 255001000 GHz         O 100 Gits 2550 dB       O 100 Gits 25500000 GHz         O 100 Gits 2550 dB       O 100 Gits 255001000 GHz         O 100 Gits 2550 dB       O 100 Gits 2550 dB         O 100 Gits 2550 dB       O 100 Gits 2550 dB         O 100 Gits 2550 dB       O 100 Gits 2550 dB         O 100 Gits 2550 dB       O 100 Gits 2550 dB         O 100 Gits 2550 dB       O 100 Gits 2550 dB         O 200 Gits 2550 dB       O 200 Gits 2550 dB         O 200 Gits 2550 dB       O 200 Gits 2550 dB		-60.0 × 1.00 × 1	Mal management	Y I				
#Res BW 100 kHz       #VBW 300 kHz       Sweep 1.000 ms (1001 pts)         Msd       istatus         Band Edge(Hopping) NVNT 1-DH1 2402MHz Hopping Emission         Image: Sweep 3.000         Image: Sweep 3.000         Ref offset 2.89 dB         Mkr1 2.401 9 GHz         Statt 2.356000000 GHZ         Image: Sweep 3.000         Image: Sweep 3.000         Image: Sweep 3.000         Image: Sweep 3.000         Center Freq 2.3560000000 GHZ         Image: Sweep 3.000         Image: Sweep 3.000         Image: Sweep 3.000         Mkr1 2.401 9 GHz         Sweep 3.000         Image: Sweep 3.000         Sweep 3.000		-70.0						
#Res BW 100 kHz       #VBW 300 kHz       Sweep 1.000 ms (1001 pts)         Msd       istatus         Band Edge(Hopping) NVNT 1-DH1 2402MHz Hopping Emission         Image: Sweep 3.000         Image: Sweep 3.000         Ref offset 2.89 dB         Mkr1 2.401 9 GHz         Statt 2.356000000 GHZ         Image: Sweep 3.000         Image: Sweep 3.000         Image: Sweep 3.000         Image: Sweep 3.000         Center Freq 2.3560000000 GHZ         Image: Sweep 3.000         Image: Sweep 3.000         Image: Sweep 3.000         Mkr1 2.401 9 GHz         Sweep 3.000         Image: Sweep 3.000         Sweep 3.000		Contor 2 4020				on 8 000 MHz		
Band Edge(Hopping) NVNT 1-DH1 2402MHz Hopping Emission		#Res BW 100		#VBW 300 kHz	Sweep 1.000	ms (1001 pts)		
Mit         NP         SOR         SENSE:INT         ALION AUTO         0555:14 MHeb 23, 2022           Center Freq 2.355600000 GHz         PR07, Fast         Trig: Free Run IFGainLow         Avg Type: Log-Pwr AvgIHold: 5000/6000         Trig: Tree Plant         Avg Type: Log-Pwr AvgIHold: 5000/6000         Tree Plant         3.356 dBm           10 dB/div         Ref Offset 2.89 dB				) NVNT 1-DH1 2402MH;				
PNO: Fast	$\mathbf{O}$	XI RL RF	50 Ω AC	SENSE:INT ALIG	Avg Type: Log-Pwr	5:14 PM Feb 23, 2022 TRACE 1 2 3 4 5 6		
Netromset 28 dB       -3.356 dBm         100       -3.356 dBm         100       -1         100       -1         100       -1         100       -1         100       -1         100       -1         100       -1         100       -1         100       -1         100       -1         -200       -1         -200       -1         -200       -1         -200       -1         -200       -1         -200       -1         -200       -1         -200       -1         -200       -1         -200       -2         -200       -2         -200       -2         -200       -2         -200       -2         -200       -2         -200       -2         -200       -2         -200       -2         -200       -2         -200       -2         -200       -2         -200       -2         -200       -2         -2 </td <td></td> <td></td> <td>PNO: Fast</td> <td></td> <td>Avg Hold: 5000/5000</td> <td>DET P N N N N N</td> <td></td>			PNO: Fast		Avg Hold: 5000/5000	DET P N N N N N		
100       1		10 dB/div Re	Offset 2.69 dB F <b>20.00 dBm</b>					
-100       -200       -200       -200         -300       -300       -200       -200         -300       -200       -200       -200         -300       -200       -200       -200         -300       -200       -200       -200         -300       -200       -200       -200         -400       -200       -200       -200         -600       -200       -200       -200         -600       -200       -200       -200         -600       -200       -200       -200         -600       -200       -200       -200         -600       -200       -200       -200         -700       -200       -200       -200         -700       -200       -200       -200         Start 2.30600 GHz       #VBW 300 kHz       Stop 2.40600 GHz         Start 2.30600 GHz       -3.356 dBm       -200         1       1       1       2.401 9 GHz       -52.268 dBm         3       N       1       f       2.390 0 GHz       -57.514 dBm         3       N       1       f       2.379 3 GHz       -56.468 dBm         5		10.0				1		
-300     -300     -400						AAAA		
-500     -4     -3     -1/1       -700     -200     -200     -200     -200       -700     -200     -200     -200     -200       Start 2.30600 GHz     #VBW 300 kHz     Stop 2.40600 GHz       #Res BW 100 kHz     #VBW 300 kHz     Sweep 9.600 ms (1001 pts)       MRR MODE TRCI SCLI     X     Y     Function Function width       1     N     1     f     2.401 9 GHz       -500 GHz     -57.514 dBm     -     -       3     N     1     f     2.3366 dBm       3     N     1     f     2.3379 3 GHz       -56.468 dBm     -     -     -						-22.49 abm		
MKR         MODE         TRC         Start         Star	G)				<u>^4</u> <u>3</u>	2 <sup>2</sup>		
Start 2.30600 GHz         Stop 2.40600 GHz           #Res BW 100 kHz         #VBW 300 kHz         Stop 2.40600 GHz           MKR MODE TRC SCL         X         Y         FUNCTION WIDTH         FUNCTION VALUE           MKR MODE TRC SCL         X         Y         FUNCTION FUNCTION WIDTH         FUNCTION VALUE           1         N         1         f         2.401 9 GHz         -52.268 dBm         -           2         N         1         f         2.399 0 GHz         -57.514 dBm         -         -           3         N         1         f         2.379 3 GHz         -56.468 dBm         -         -         -           5         6         -         -         -         -         -         -         -         -         -         -		-60.0 -		<u>*************************************</u>	mouth the second state of the second se			
#Res BW 100 kHz         #VBW 300 kHz         Sweep         9.600 ms (1001 pts)           MKR MODELTRC SCL         X         Y         FUNCTION         FUNCTION VIDTH         FUNCTION VALUE           1         N         1         f         2.401 9 GHz         -3.356 dBm         -3.379 dBm <td< td=""><td></td><td></td><td></td><td></td><td></td><td>2 40600 CH-</td><td></td></td<>						2 40600 CH-		
1       N       1       f       2.4019 GHz       -3.356 dBm         2       N       1       f       2.400 0 GHz       -52.268 dBm         3       N       1       f       2.390 0 GHz       -57.514 dBm         4       N       1       f       2.379 3 GHz       -56.468 dBm         5       -       -       -       -       -         6       -       -       -       -       -		#Res BW 100	kHz		Sweep 9.600	ms (1001 pts)		
3 N 1 f 2.390 0 GHz -57.514 dBm 4 N 1 f 2.379 3 GHz -56.468 dBm 5 6 7 □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □		1 N 1 f 2 N 1 f	2.401 9 GHz -5	3.356 dBm	FUNCTION VAL	JE A		
		4 N 1 f	2.390 0 GHz -5 2.379 3 GHz -5	7.514 dBm 5.468 dBm		=		
	Ś	8 9 9 10 11						

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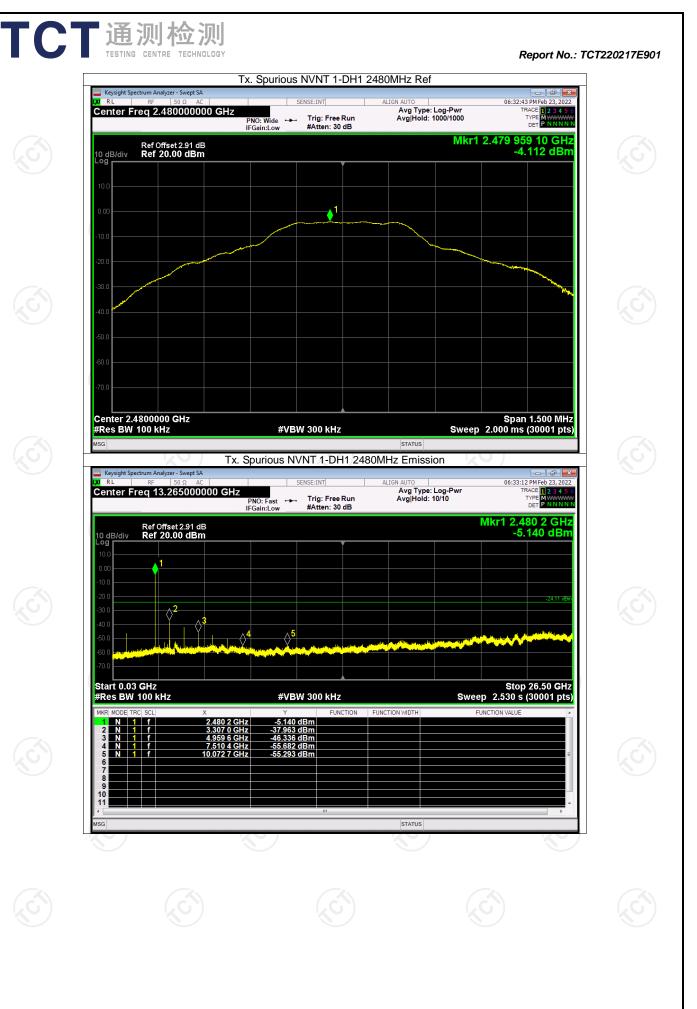
			purious Emissio		
Condition		quency (MHz)	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH1	2402	-33.13	-20	Pass
NVNT	1-DH1	2441	-33.88	-20	Pass
NVNT	1-DH1	2480	-33.85	-20	Pass
			Graphs		
	Keysight Spectrum Analyzer - Swept SA	Tx. Spurious NVNT	1-DH1 2402MHz Ref		_
Ce	RL RF 50 Ω AC nter Freq 2.402000000		ALIGN AUTO Avg Type: Log-Pwr	06:28:07 PM Feb 23, 2022 TRACE <b>1 2 3 4 5 6</b> TYPE <b>M WWWW</b> DET <b>P N N N N N</b>	
		PNO: Wide ↔ Trig: F IFGain:Low #Atten			
10	Ref Offset 2.69 dB dB/div Ref 20.00 dBm		WIK	r1 2.401 958 00 GHz -3.270 dBm	
10.	0				
0.0	0				
-10.	0				
-20.					
-20.					
-30.				E Contraction of the second se	
-40.					Ch
-50.	0				K
-60.					
-70.					
Ce	nter 2.4020000 GHz			Span 1.500 MHz	
#R	es BW 100 kHz	#VBW 300 k	Hz Swe	ep 2.000 ms (30001 pts)	
		Tx. Spurious NVNT 1-	DH1 2402MHz Emission		
	Keysight Spectrum Analyzer - Swept SA R L RF 50 Ω AC	SENSE:INT	ALIGN AUTO	06:28:37 PM Feb 23, 2022	Ú,
Ce	nter Freq 13.26500000	IO GHZ PNO: Fast ↔ Trig: F IFGain:Low #Atten	Avg Type: Log-Pwr ree Run Avg Hold: 10/10	TRACE 123456 TYPE MWWWW DET PNNNNN	
	Ref Offset 2.69 dB	IFGain:Low #Atten		Mkr1 2.402 6 GHz	
10 Log	dB/div Ref 20.00 dBm			-3.326 dBm	
10	▲ <b>1</b>				
-10.					
-20.				-23.27 dBm	
-30-					
-50.	المسجو بالمتقار الأربابي والمراج				No.
-60. -70.	and the second sec				
Sta	art 0.03 GHz			Stop 26.50 GHz	
	es BW 100 kHz	#VBW 300 k		eep 2.530 s (30001 pts)	
MKF	MODE         TRC         SCL         X           N         1         f         2           N         1         f         3	.402 6 GHz -3.326 dBm .202 9 GHz -36.405 dBm	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	
3	N 1 f 4 N 1 f 7	.804 3 GHz -46.736 dBm .116 9 GHz -54.412 dBm			
5677	N 1 f 9	.487 7 GHz -56.027 dBm		= 	
89					(20)
10				~	

## Conducted RF Spurious Emission

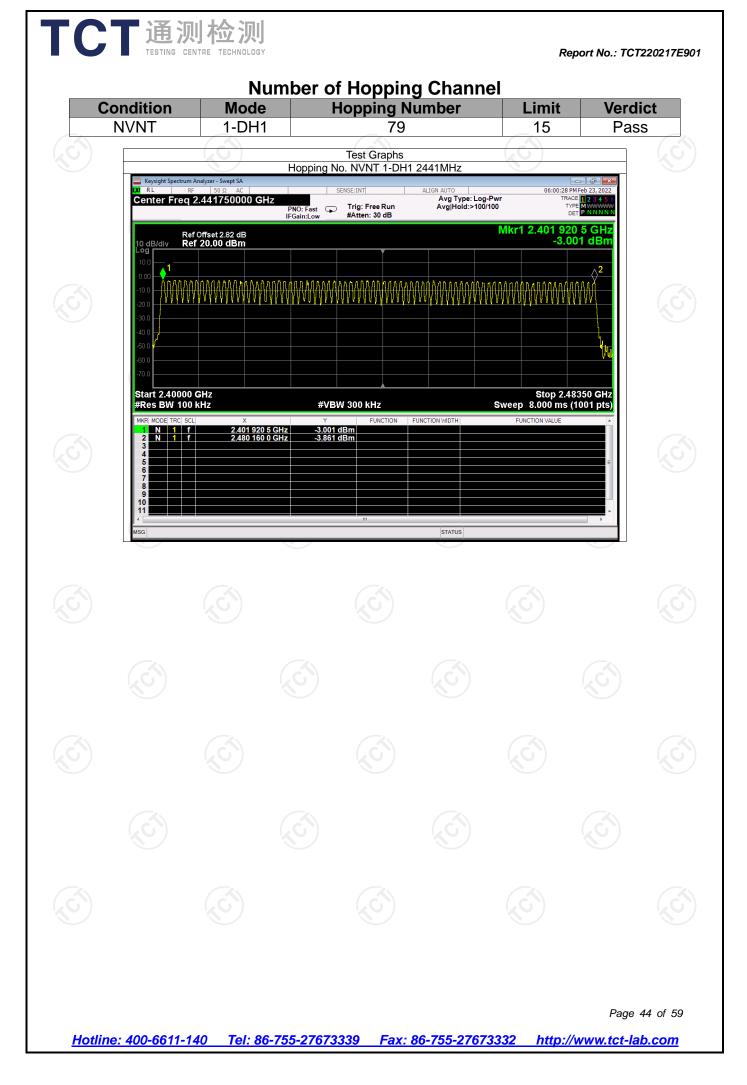
TCT通测检测 TESTING CENTRE TECHNOLOGY

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Keysight Spectrum Analyzer - Swe			06:30:29 PM Feb 23, 2022
ເx RL RF 50Ω Center Freq 2.44100		ALIGN AUTO Avg Type: Log-Pwr Avg Hold: 1000/1000	06:30:29 PM F60 23, 2022 TRACE 1 2 3 4 5 6 TYPE WWWW DET PNNNNN
Ref Offset 2.8 10 dB/div Ref 20.00 d	2 dB	Mkr1 2.4	41 157 50 GHz -3.517 dBm
10.0			
0.00		1	
-10.0			
-20.0			
-30.0			
-50.0			
-60.0			
-70.0			
Center 2.4410000 GHz #Res BW 100 kHz	#VBW 300 kHz	Sween 2.0	Span 1.500 MHz 000 ms (30001 pts)
MSG	Tx. Spurious NVNT 1-DH1 2	STATUS	
	AC SENSE:INT	ALIGN AUTO	06:30:59 PM Feb 23, 2022
Center Freq 13.2650	OOOOOO GHZ PNO: Fast ← Trig: Free Run IFGain:Low #Atten: 30 dB	Avg Type: Log-Pwr Avg Hold: 10/10	TRACE 123456 TYPE MWWWWW DET PNNNNN
Ref Offset 2.8 10 dB/div Ref 20.00 d Log	2 dB Bm	MK	r1 2.441 4 GHz -4.363 dBm
-10.0			-23.52 dBm
-30.0			
-50.0 -60.0 -70.0			
Start 0.03 GHz #Res BW 100 kHz	#VBW 300 kHz	Sween	Stop 26.50 GHz 2.530 s (30001 pts)
MKR MODE TRC SCL	X Y FUNCTION 2.441 4 GHz -4.363 dBm	-	ON VALUE
2 N 1 f 3 N 1 f 4 N 1 f 5 N 1 f	3.254 9 GHz -37.400 dBm 4.882 0 GHz -46.607 dBm 7.521 0 GHz -55.843 dBm 9.571 6 GHz -56.254 dBm		=
6 7 8 9			
10 11 • [			~
MSG		STATUS	~~



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		(11172)	(ms)	(ms)	Count	(ms)	(1115)	
IVNT	1-DH1	2441	0.43	24.08	56	31600	400	Pass
IVNT	1-DH3	2441	1.63	83.13	51	31600	400	Pass
IVNT	1-DH5	2441	2.83	130.18	46	31600	400	Pass
	Ref 10 dB/div Ref Log			est Graphs DH1 2441MHz On ImT ALIG ig Delay-500.0 µs ig: Video Atten: 30 dB	N AUTO Avg Type: Log-Pwr	06:25:51 PMF TRACE TYPE DET	1 2 3 4 5 6 WWWWWW P N N N N N	
	10.0 0.00 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0 -60.0 -70.0 Center 2.4410 Res BW 1.0 Res BW 1.0 MKR MODE TRC SCL -1 -1 -1 -1 -1 -1 -1 -1 -1 -1	000000 GHz Hz	#VBW 3.	FUNCTION FUNCTIO		Sp ep 5.000 ms (10) FUNCTION VALUE	TRO LVL an 0 Hz 001 pts)	
	2 F 1 t 3 5 6 7 8 9 10 11 MSG	43 49	0.0 μs (Δ) 1.52 dE 8.6 μs -10.99 dBm		STATUS		,	

Pulse

Time

Frequency

(MHz)

Mode

Condition

**Dwell Time** Total

Dwell

Time

Report No.: TCT220217E901

Verdict

Limit

(ms)

Period

Time

Burst

Count

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Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com

	Keysight Spectrum Analyzer - Swept SA         RL       RF       50 Ω       AC       SENSE:INT         enter Freq 2.4410000000 GHz       PNO: Fast       Frig: Free         IFGain:Low       #Atten: 30		06:26:29 MEE 62 3, 2022 TRACE 12 3 4 5 6 TYPE WWWWWW DET P NNNN
	dB/div Ref 20.00 dBm		
	00 enter 2.441000000 GHz IS BW 1.0 MHz S Dwell NVNT 1-DH3 2 Keysight Spectrum Analyzer - Swept SA RL RF 50 Q AC SENSE:INT PNO: Fast → Trig: Vide IFGain:Low HT41::30	STATUS 441MHz One Burst ALIGN AUTO -500.0 µs Avg Type: Log-Pwr	Span 0 Hz 31.60 s (10001 pts) 06:34:38 PMFeb 23, 2022 TRACE 12 3 4 5 6 TYPE W
Ś		स्रोत्रां ने के कि बांधी जिसने साथ के रूप दे के और साथ हिसाय के हिस्स ये हराय 	Mkr1 1.630 ms 0.93 dB
	Mode         Y         FUN           enter 2.441000000 GHz         #VBW 3.0 MHz         #VBW 3.0 MHz           es BW 1.0 MHz         #VBW 3.0 MHz         #VBW 3.0 MHz           R         MODE         TRC         SC           A2         1         t         (Δ)         1.650 ms           F         1         t         498.0 μs         -9.91 dBm           A5         4         498.0 μs         -9.91 dBm           A5         4         498.0 μs         -9.91 dBm	Sweep 10.	Span 0 Hz 00 ms (10001 pts)
		STATUS	

	ESTING CENTRE TECHNOLOGY  Report No.: TCT220217Es  Dwell NVNT 1-DH3 2441MHz Accumulated  Keysight Spectrum Analyzer - Swept SA  Keysight Spectrum Analyzer - Swept SA  Keysight Spectrum Analyzer - Swept SA  Figlin: Center Freq 2.4410000000 GHz  PNO: Fast Figlin: Low  Figlin:
	Ref Offset 2.82 dB         Ref 20.00 dBm           10 dB/div         Ref 20.00 dBm           10 0         000
	60.0       70.0       Span 0 Hz         Center 2.441000000 GHz       Span 0 Hz         Res BW 1.0 MHz       #VBW 3.0 MHz       Sweep 31.60 s (10001 pts)         Msg       Status         Dwell NVNT 1-DH5 2441MHz One Burst       Grant Status
	Weil NVN T 1-DIS 244 IVIT2 One Buist         Weil NVN T 1-DIS 244 IVIT2 One Buist         Center Freq 2.441000000 GHz         PNO: Fast         IFGain:Low         Ref Offset 2.82 dB         10 dB/div         Ref 20.00 dBm
Ś	
	Center 2.441000000 GHz         Span 0 Hz           Res BW 1.0 MHz         #VBW 3.0 MHz         Sweep 10.00 ms (10001 pts)           MKR MODE TRC SCL         X         Y         Function         Function width         Function value         A           1         Δ2         1         t         (Δ)         2.03 dB         A         Function width         Function value         A
Ś	

