TCT通测检测 FCC ID. 2ARMK-PDC01 Test Report No. TCT210702E004 Date of issue Jul. 28, 2021	S)						
Test Report No: TCT210702E004 Date of issue: Jul. 28, 2021							
Date of issue: Jul. 28, 2021	S)						
Testing laboratory:: SHENZHEN TONGCE TESTING LAB							
	TCT Testing Industrial Park Fuqiao 5th Industrial Zone, Fuhai Street, Bao'an District Shenzhen, Guangdong, 518103, People's Republic of China						
Applicant's name: GUANGZHOU YOUGUANG OPTOELECTRONICS CO., LT	D.						
Address: No. 75, Pacific Ind. Zone, Xingtang Town, Zengcheng, Guangzhou, 511340 China							
Manufacturer's name: GUANGZHOU YOUGUANG OPTOELECTRONICS CO., LT	D.						
Address: No. 75, Pacific Ind. Zone, Xingtang Town, Zengcheng, Guangzhou, 511340 China							
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	3						
Test item description: Pedestal Digital Display Case							
Trade Mark: N/A							
Model/Type reference: PDC01							
Rating(s):: AC 120V/60Hz	2						
Date of receipt of test item Jul. 02, 2021	\mathcal{D}						
Date (s) of performance of test See dates for each test case							
Tested by (+signature): Brews Xu							
Check by (+signature): Beryl Zhao	9						
Approved by (+signature): Tomsin							
General disclaimer:							

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1. General Product Information

1.1. EUT description

Test item description:	Pedestal Digital Display Case	(3)		(\mathbf{c}^{*})
Model/Type reference:	PDC01			
Sample Number:	TCT210702E004-0101			
Bluetooth Version:	V4.2		S	
Operation Frequency:	2402MHz~2480MHz			
Transfer Rate:	1/2/3 Mbits/s			
Number of Channel:	79			
Modulation Type:	GFSK, π/4-DQPSK, 8DPSK			
Modulation Technology:	FHSS			
Antenna Type:	Internal Antenna			
Antenna Gain:	5dBi	K)		
Rating(s):	AC 120V/60Hz			

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
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		-
-	Channel 0 3					L DRSK 80	PSK

Remark: Channel 0, 39 &78 have been tested for GFSK, π/4-DQPSK, 8DPSK modulation mode.

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2. Test Result Summary

Requirement	CFR 47 Section		Result		
Antenna Requirement	§15.203/§15.247 (c)	S.	PASS	K.	
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	25.0 °C						
Humidity:	55 % RH	55 % RH						
Atmospheric Pressure:	1010 mbar	1010 mbar						
Test Software:								
Software Information:	RFTestTool-user-5.6							

Power Level:

Test Mode:

Engineering mode: Keep the EUT in continuous transmitting by select channel and modulations.

Default

The sample was placed 0.1m 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
1	1	1	1	/

Note:

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.

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

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

15.203 requirement:

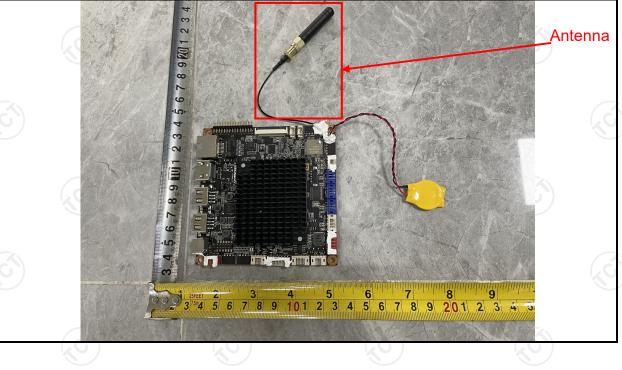
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit 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 internal antenna which permanently attached, and the best case gain of the antenna is 5dBi.







5.2. Conducted Emission

5.2.1. Test Specification

 Test Procedure: Test Procedure: a 500hm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the measure power through a LISN that provides a 500hm/50u coupling impedance with 500hm termination. (Pleatrefer to the block diagram of the test setup a photographs). 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 ANSI C63.10:2013 on conducted measurement. 				(
Frequency Range: 150 kHz to 30 MHz Receiver setup: RBW=9 kHz, VBW=30 kHz, Sweep time=auto Limits: Frequency range Limit (dBuV) 0.15-0.5 66 to 56* 56 to 46* 0.5-5 56 46 5-30 60 50 Reference Plane Frequency range U.Imits: 0.15-0.5 Frequency range 0.15-0.5 66 to 56* 50 46 5-30 60 Setup: Reference Plane Ferume Ferume Ferume Ferume Ferume <td colspa<="" td=""><td>Test Requirement:</td><td>FCC Part15 C Section</td><td>n 15.207 🤡</td><td>No.</td></td>	<td>Test Requirement:</td> <td>FCC Part15 C Section</td> <td>n 15.207 🤡</td> <td>No.</td>	Test Requirement:	FCC Part15 C Section	n 15.207 🤡	No.	
Receiver setup: RBW=9 kHz, VBW=30 kHz, Sweep time=auto Limits: Frequency range Limit (dBuV) Quasi-peak Average 0.15-0.5 66 to 56* 56 to 46* 0.5-5 56 46 5-30 60 50 Reference Plane Test Setup: Reference Plane Vertication plane Reference Plane Vertication plane Vertication plane Reference Plane Vertication plane <	Test Method:	ANSI C63.10:2013				
Limits: Frequency range (MHz) Limit (dBuV) Quasi-peak Average 0.15-0.5 66 to 56* 56 to 46* 0.5-5 56 46 5-30 60 50 Reference Plane Image: Colspan="2">Image: Colspan="2">Image: Colspan="2">Colspan="2">Colspan="2">Image: Colspan="2">Image: Colspan="2">Image: Colspan="2">Colspan="2">Image: Colspan="2">Colspan="2">Image: Colspan="2">Colspan="2">Image: Colspan="2">Image: Colspan="2" Test Mode: Test Mode: Refer to item 3.1 1. The E.U.T is connected to an adapter through a limpedance stabilization network (L.I.S.N.). The provides a 500hm/50UH coupling impedance for t measuring equipment. Test Mode: Test Procedure: Test Procedure: <	Frequency Range:	150 kHz to 30 MHz	(\mathbf{c})	$\left(\begin{array}{c} \\ \\ \\ \end{array} \right)$		
Imits: (MHz) Quasi-peak Average 0.15-0.5 66 to 56* 56 to 46* 0.5-5 56 46 5-30 60 50 Reference Plane Image: Colspan="2">Image: Colspan="2">Colspan="2"Colspan=	Receiver setup:	RBW=9 kHz, VBW=30) kHz, Sweep time	e=auto		
Imits: (MHz) Quasi-peak Average 0.15-0.5 66 to 56* 56 to 46* 0.5-5 56 46 5-30 60 50 Reference Plane Imit of the power EUT Equament Under Test EUT Equament Under Test LIT Equament Under Test LIST Une Impedence Stabilization network (L.I.S.N.). The provides a 50ohm/50uH coupling impedance for t		Frequency range	dBuV)			
0.5-5 56 46 5-30 60 50 Reference Plane Image: Colspan="2">Image: Colspan="2" Test Setup: Test Mode: Refer to item 3.1 1 The E.U.T is connected to an adapter through a limpedance stabilization network (L.I.S.N.). The provides a 500hm/50uH coupling impedance for the measuring equipment. Test Mode: Test Procedure: Test Procedure: Test Procedure: Description of the test setup a power through a LISN that provides a 500hm/50U coupling impedance with 500hm termination. (Plea refer to the block diagram of the test setup a photographs). Both sides of A.C. line are checked for maximu conducted interference. In order to find the maximu emission, the relative positions of equipment and all the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.			Quasi-peak	Áverage		
Test Setup: 5-30 60 50 Reference Plane Image: Colspan="2">Image: Colspan="2" Test Setup: Test Mode: Refer to item 3.1 1. The E.U.T is connected to an adapter through a lip impedance stabilization network (L.I.S.N.). The provides a 500hm/50uH coupling impedance for t measuring equipment. Test Procedure: Test Procedure: Set Procedure: Set Procedure: A colspan="2" Network Test LUSK Line frame Integration Network Test LUSK Line frame Impedance stabilization network (L.I.S.N.). The provides a 500hm/50uH coupling impedance for t measuring equipment. 2. The peripheral devices are also connected to the max power through a LISN that provides a 500hm/50u coupling impedance with 500hm termination. (Plea refer to the block diagram of the test setup a photographs). 3. Both sides of A.C. line are checked for maximu conducted interference. In order to find the maximu emission, the relative positions of equipment and all the interface cables must be changed according to	Limits:	0.15-0.5	66 to 56*	56 to 46*		
Test Setup: Reference Plane Image: Permark Image: Permark Full Full Fermark Full Full Full Test Mode: Refer to item 3.1 1. The E.U.T is connected to an adapter through a linimpedance stabilization network (L.I.S.N). The provides a 500hm/50uH coupling impedance for t measuring equipment. 2. The peripheral devices are also connected to the map power through a LISN that provides a 500hm/50uH coupling impedance for t measuring equipment. 3. The peripheral devices are also connected to the maximu conducted interference. In order to find the maximu emission, the relative positions of equipment and all the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.		0.5-5	56	46		
Test Setup: Image: Test Setup: Remark: E.U.T.Facpower EUT Equipment Under Test EMI LISN Line impedence Stabilization Network Test Mode: Refer to item 3.1 1. The E.U.T is connected to an adapter through a lini impedance stabilization network (L.I.S.N.). The provides a 500hm/50uH coupling impedance for the measuring equipment. Test Procedure: 2. The peripheral devices are also connected to the mapower through a LISN that provides a 500hm/50uH coupling impedance for the block diagram of the test setup a photographs). 3. Both sides of A.C. line are checked for maximule emission, the relative positions of equipment and all the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.		5-30	60	50		
Test Setup: Image: Filter and power for the proceedure of the procedure of the		Reference	e Plane			
 Test Procedure: 1. The E.U.T is connected to an adapter through a linimpedance stabilization network (L.I.S.N.). The provides a 500hm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the material power through a LISN that provides a 500hm/50u coupling impedance with 500hm termination. (Pleater to the block diagram of the test setup a photographs). 3. Both sides of A.C. line are checked for maximute conducted interference. In order to find the maximute mission, the relative positions of equipment and all the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement. 	Test Setup:	E.U.T AC power Filter AC power Filter AC power EMI Receiver Remark: E.U.T: Equipment Under Test LISN: Line Impedence Stabilization Network				
 impedance stabilization network (L.I.S.N.). The provides a 500hm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the material power through a LISN that provides a 500hm/50u coupling impedance with 500hm termination. (Plear refer to the block diagram of the test setup a photographs). Both sides of A.C. line are checked for maximute conducted interference. In order to find the maximute mission, the relative positions of equipment and all the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement. 	Test Mode:	Refer to item 3.1				
	Test Procedure:	 impedance stabilizion provides a 500hm/sion measuring equipme 2. The peripheral device power through a Licoupling impedance refer to the block photographs). 3. Both sides of A.C conducted interfere emission, the relative the interface cables 	zation network 50uH coupling im ent. ces are also conne ISN that provides e with 50ohm tern diagram of the . line are checke nce. In order to fin re positions of equal must be changed	(L.I.S.N.). This pedance for the ected to the mains a 50ohm/50uH nination. (Please test setup and ed for maximum nd the maximum ipment and all o according to		
Test Result: PASS						

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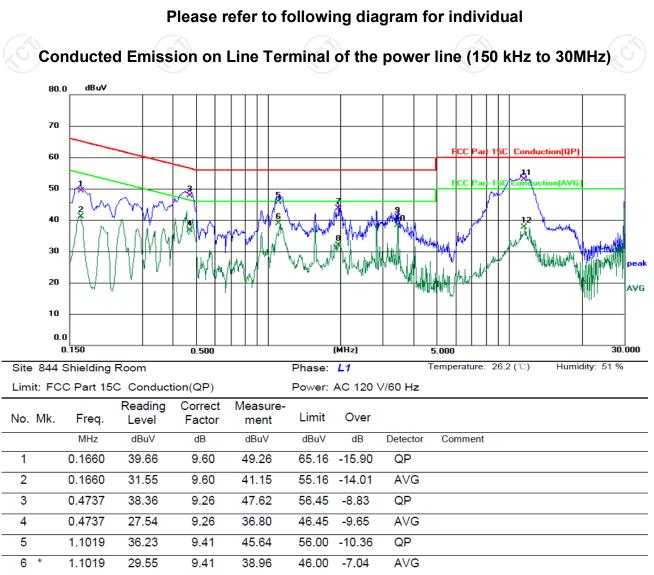
5.2.2. Test Instruments

Conducted Emission Shielding Room Test Site (843)											
Manufacturer	Model	Serial Number	Calibration Due								
R&S	ESCI3	100898	Jul. 07, 2022								
Schwarzbeck	NSLK 8126	8126453	Mar. 11, 2022								
ТСТ	CE-05	N/A	Jul. 07, 2022								
EMI Test Software Shurple Technology		N/A	N/A								
	Manufacturer R&S Schwarzbeck TCT Shurple	ManufacturerModelR&SESCI3SchwarzbeckNSLK 8126TCTCE-05ShurpleEZ EMC	ManufacturerModelSerial NumberR&SESCI3100898SchwarzbeckNSLK 81268126453TCTCE-05N/AShurpleEZ EMCN/A								



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5.2.3. Test data



6 *	1.1019	29.55	9.41	38.96	46.00	-7.04	AVG
7	1.9657	34.27	9.51	43.78	56.00 -	-12.22	QP
8	1.9657	22.40	9.51	31.91	46.00 -	-14.09	AVG
9	3.4500	31.31	9.60	40.91	56.00 -	-15.09	QP
10	3.4500	28.62	9.60	38.22	46.00	-7.78	AVG
11	11.5137	43.14	9.71	52.85	60.00	-7.15	QP
12	11.5137	27.98	9.71	37.69	50.00 -	-12.31	AVG

Note:

 Freq. = Emission frequency in MHz

 Reading level (dBμV) = Receiver reading

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

 Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)

 Limit (dBμV) = Limit stated in standard

 Margin (dB) = Measurement (dBμV) - Limits (dBμV)

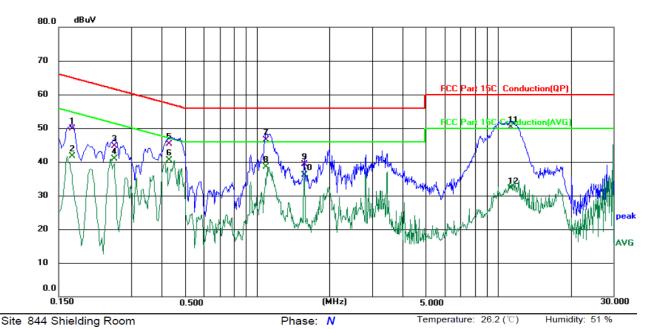
 Q.P. =Quasi-Peak

 AVG =average

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

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Power: AC 120 V/60 Hz

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)

Limit: FCC Part 15C Conduction(QP)

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No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1700	40.28	9.57	49.85	64.96	-15.11	QP	
2		0.1700	32.14	9.57	41.71	54.96	-13.25	AVG	
3		0.2540	35.30	9.35	44.65	61.63	-16.98	QP	
4		0.2540	31.49	9.35	40.84	51.63	-10.79	AVG	
5		0.4300	36.11	9.29	45.40	57.25	-11.85	QP	
6	*	0.4300	31.21	9.29	40.50	47.25	-6.75	AVG	
7		1.0900	37.21	9.39	46.60	56.00	-9.40	QP	
8		1.0900	29.14	9.39	38.53	46.00	-7.47	AVG	
9		1.5700	29.87	9.42	39.29	56.00	-16.71	QP	
10		1.5700	26.78	9.42	36.20	46.00	-9.80	AVG	
11		11.2980	40.50	9.73	50.23	60.00	-9.77	QP	
12		11.2980	22.38	9.73	32.11	50.00	-17.89	AVG	

Note1:

Freq. = Emission frequency in MHz

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

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

Measurement (dBµV) = Reading level (dBµV) + Corr. Factor (dB)

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

Margin (dB) = Measurement (dB μ V) – Limits (dB μ 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 three modulation (GFSK, Pi/4 DQPSK, 8DPSK), and the worst case Mode (Lowest channel and GFSK) 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 out power of the intentional radiator shall not exceed the following: (1) For frequency hopping systems operatin 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:				
Test Mode:	Spectrum Analyzer Eur Transmitting mode with modulation Image: Content of the second			
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	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100619	Jul. 18, 2022
Combiner Box	Ascentest	AT890-RFB	S N/A	Jul. 07, 2022





5.4. 20dB Occupy Bandwidth

5.4.1. Test Specification

<u></u>				
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:	 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. Set to the maximum power setting and enable the EUT transmit continuously. 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. Measure and record the results in the test report. 			
Test Result:	PASS			

5.4.2. 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



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:	 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. Set to the maximum power setting and enable the EUT transmit continuously. Enable the EUT hopping function. 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. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. Record the value in report.
Test Result:	PASS O

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



5.6. Hopping Channel Number

5.6.1. Test Specification

FCC Part15 C Section 15.247 (a)(1)			
KDB 558074 D01 v05r02			
Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.			
		(C	
Spectrum Analyzer Hopping mode	LUT		
 spectrum analyzer lipath loss was component. 2. Set to the maximum EUT transmit contin 3. Enable the EUT hop 4. Use the following spectrum the frequency band than 30% of the char bandwidth, which even auto; Detector fur 5. The number of hopponent the number of total 	by RF cable and attenu bensated to the results f in power setting and ena- nuously. pping function. pectrum analyzer settin of operation; set the R annel spacing or the 20 ver is smaller; VBW≥RB nction = peak; Trace = r ping frequency used is channel.	ator. The for each able the gs: Span = BW to less dB W; Sweep nax hold.	
PASS	•		
	 KDB 558074 D01 v05r Frequency hopping system of the sy	 KDB 558074 D01 v05r02 Frequency hopping systems in the 2400-2483 band shall use at least 15 channels. Spectrum Analyzer Hopping mode 1. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenu path loss was compensated to the results for measurement. 2. Set to the maximum power setting and enal EUT transmit continuously. 3. Enable the EUT hopping function. 4. Use the following spectrum analyzer setting the frequency band of operation; set the R than 30% of the channel spacing or the 20 bandwidth, whichever is smaller; VBW≥RB = auto; Detector function = peak; Trace = r 5. The number of hopping frequency used is the number of total channel. 6. Record the measurement data in report. 	

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

5.7. Dwell Time

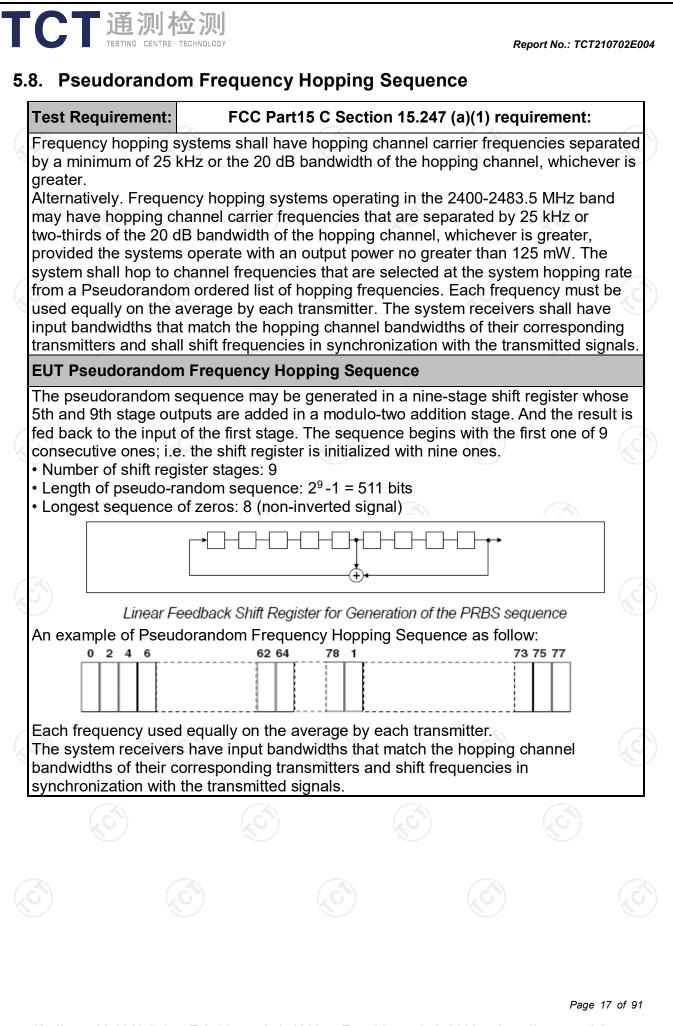
5.7.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)			
Test Method:	KDB 558074 D01 v05r02			
Limit:	The average time of occupancy on any channel shall no be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.			
Test Setup:	Spectrum Analyzer EUT			
Test Mode:	Hopping mode			
Test Procedure:	 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. Set to the maximum power setting and enable the EUT transmit continuously. Enable the EUT hopping function. 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 >> 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. Measure and record the results in the test report. 			
Test Result:	PASS			

5.7.2. 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







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 th radiated power. In addition, radiated emissions whi 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:	 Set to the maximum power setting and enable the EUT transmit continuously. Set RBW = 100 kHz (≥1% span=10MHz), VBW kHz (≥RBW). Band edge emissions must be at 20 dB down from the highest emission level with the authorized band as measured with a 100kH RBW. The attenuation shall be 30 dB instead of dB when RMS conducted output power procedured. Enable hopping function of the EUT and then results in the test report. 			
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



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:	 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. Set to the maximum power setting and enable the EUT transmit continuously. 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. Measure and record the results in the test report. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
Test Result:	PASS

5.10.2. 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

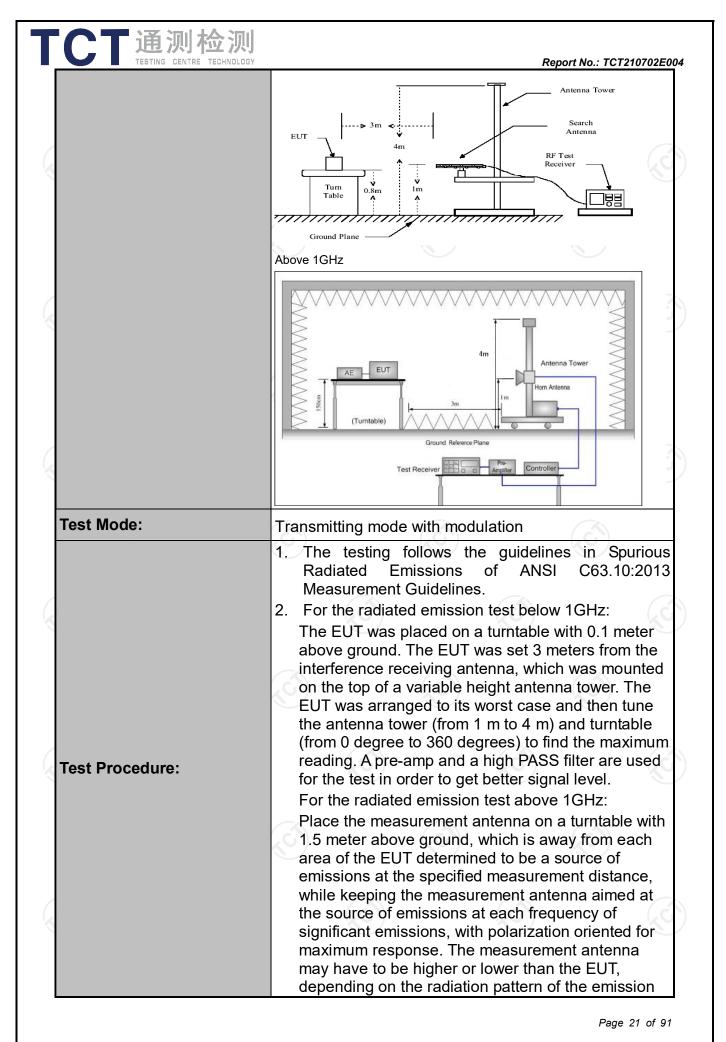


5.11. Radiated Spurious Emission Measurement

5.11.1. Test Specification

TCT通测检测 TESTING CENTRE TECHNOLOGY

Test Requirement:	FCC Part15	C Section	n 15.209			No.
Test Method:	ANSI C63.10):2013				
Frequency Range:	9 kHz to 25 (GHz			G	<u> </u>
Measurement Distance:	3 m	No.			R	
Antenna Polarization:	Horizontal &	Vertical				
	Frequency	Detector	RBW	VBW		Remark
	9kHz- 150kHz	Quasi-pea		1kHz		i-peak Value
Receiver Setup:	150kHz- 30MHz	Quasi-pea	ık 9kHz	30kHz	Quas	si-peak Value
	30MHz-1GHz	Quasi-pea	k 120KHz	300KHz	Quas	i-peak Value
		Peak	1MHz	3MHz		eak Value
	Above 1GHz	Peak	1MHz	10Hz	Ave	erage Value
	_		Field Str	ength	Me	asurement
	Frequen	су	(microvolts	-		nce (meters)
	0.009-0.4		2400/F(KHz)		300
	0.490-1.7		24000/F			30
	1.705-3		30			30
	30-88 88-216		100 150		3	
mit:	216-96	200		33		
	Above 9		500		3	
	Above 1GHz		ovolts/meter) 500 5000	(meter 3 3	rs)	Average Peak
Test setup:	For radiated emis	stance = 3m	v 30MHz		Comput	
<u>3</u>			(
						Page 20 of 9



	recei meas maxi anter restr abov 3. Set EUT 4. Use (1) (2)	iving the ma surement ar imizes the e nna elevatic icted to a ra ve the groun to the maxi transmit co the followin Span shall v emission be Set RBW=1 for f>1GHz Sweep = a = max hold For averag correction 15.35(c). Du	ig spectrum wide enough eing measure 20 kHz for f ; VBW≥RBV uto; Detecto for peak e measurem factor metho uty cycle = C	ission so al. The fir ation shall ne measu um emiss nts of fron ce ground setting a analyzer to fully c ed; < 1 GHz v; or functior ment: use od per	hal I be that w urement sions sha n 1 m to 4 d plane. and enak settings: capture th , RBW=1 n = peak; duty cycl	which all be 4 m ble th ne MHz Trac le
	J.	Where N1 length of ty Average E Level + 20 Corrected R	is number o /pe 1 pulses mission Lev *log(Duty cy Reading: Anto	, etc. el = Peak cle) enna Fac	c Emissio etor + Cat	1 is n ole
est results:	J.	Where N1 length of ty Average E Level + 20 Corrected R	is number o /pe 1 pulses mission Lev *log(Duty cy	, etc. el = Peak cle) enna Fac	c Emissio etor + Cat	1 is n ole
est results:	Ì	Where N1 length of ty Average E Level + 20 Corrected R	is number o /pe 1 pulses mission Lev *log(Duty cy Reading: Anto	, etc. el = Peak cle) enna Fac	c Emissio etor + Cat	1 is n ole
est results:	Ì	Where N1 length of ty Average E Level + 20 Corrected R	is number o /pe 1 pulses mission Lev *log(Duty cy Reading: Anto	, etc. el = Peak cle) enna Fac	c Emissio etor + Cat	1 is n ole
est results:	Ì	Where N1 length of ty Average E Level + 20 Corrected R	is number o /pe 1 pulses mission Lev *log(Duty cy Reading: Anto	, etc. el = Peak cle) enna Fac	c Emissio etor + Cat	1 is n ole

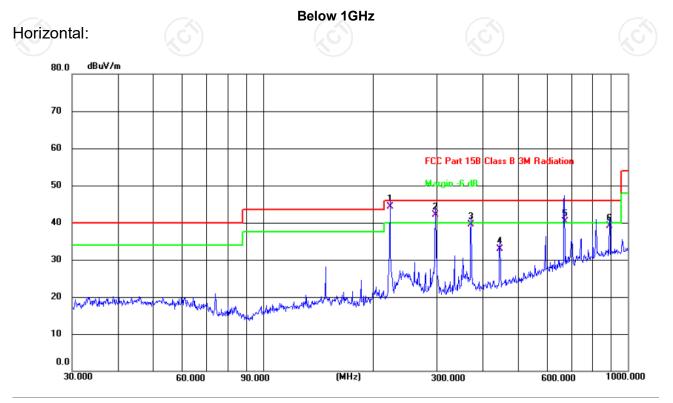


5.11.2. Test Instruments

	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

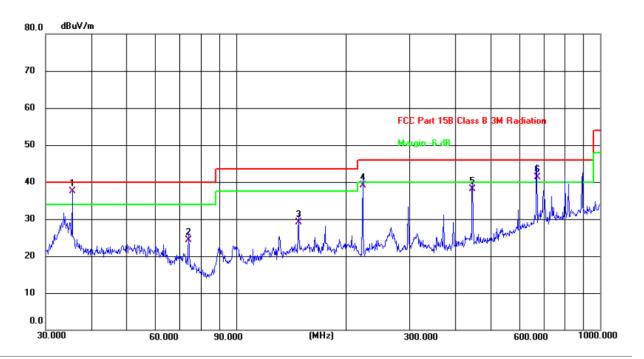


Site					Polari	zation:	Horizo	ontal	Temperature: 23.6(C)
Limit:	FCC Part 15	B Class B 3	3M Radiat	tion	Powe	r: AC	120 V/60	Hz	Humidity: 53 %
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 *	222.9502	32.82	11.58	44.40	46.00	-1.60	QP	Р	
2 !	297.2238	28.15	13.95	42.10	46.00	-3.90	QP	Ρ	
3	372.0045	23.64	15.86	39.50	46.00	-6.50	QP	Ρ	
4	446.4139	15.18	17.72	32.90	46.00	-13.10	QP	Р	
5!	670.4893	18.16	22.14	40.30	46.00	-5.70	QP	Р	
6	890.7277	13.66	25.54	39.20	46.00	-6.80	QP	Ρ	

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Report No.: TCT210702E004

Vertical:



Site					Polari	zation:	Vertic	al	Temperature: 23.6(C)
Limit:	FCC Part 158	B Class B 🤅	3M Radiat	ion	Powe	r: AC	120 V/60	Hz	Humidity: 53 %
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 *	35.4992	24.09	13.51	37.60	40.00	-2.40	QP	Р	
2	74.1350	13.95	10.45	24.40	40.00	-15.60	QP	Р	
3	148.4410	15.62	13.48	29.10	43.50	-14.40	QP	Ρ	
4	222.9500	27.62	11.58	39.20	46.00	-6.80	QP	Р	
5	446.4139	20.48	17.72	38.20	46.00	-7.80	QP	Ρ	
6 !	670.4892	19.26	22.14	41.40	46.00	-4.60	QP	Ρ	

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.

 Measurements were conducted in all three channels (high, middle, low) and three modulation (GFSK, Pi/4 DQPSK, 8DPSK) and the worst case Mode (Lowest channel and GFSK) was submitted only.
 Freq. = Emission frequency in MHz

Measurement $(dB\mu V/m) = Reading level (dB\mu V) + Corr. Factor (dB) Correction Factor= Antenna Factor + Cable loss – Pre-amplifier$

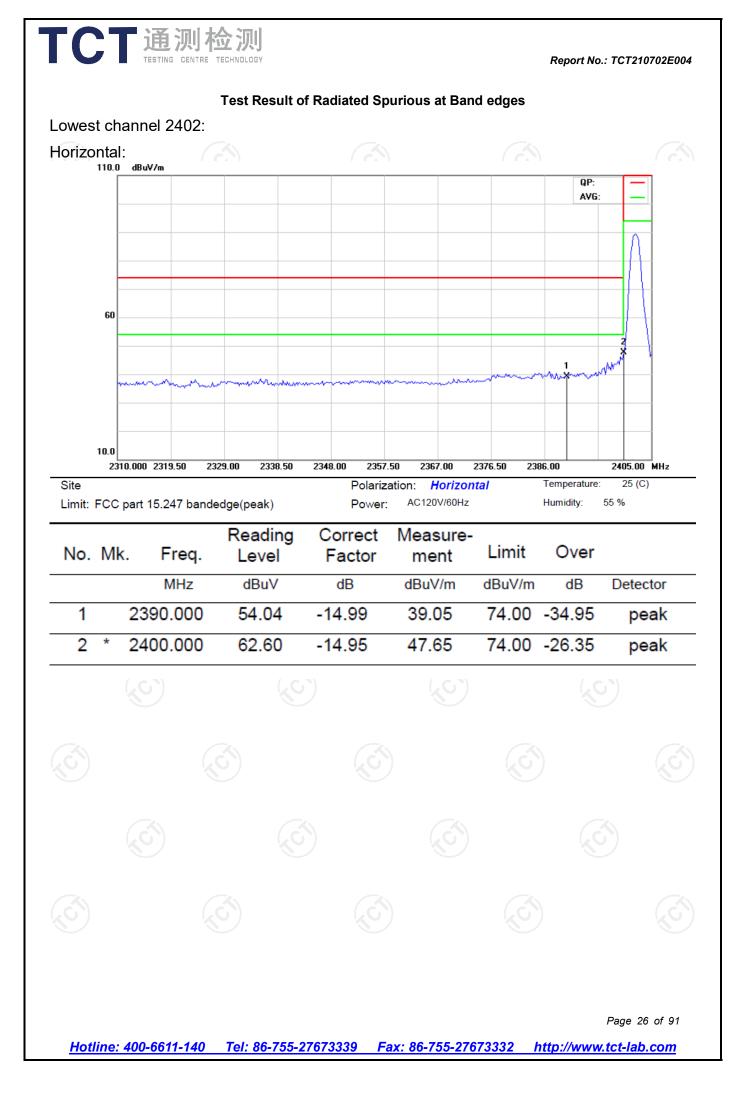
 $Limit (dB\mu V/m) = Limit stated in standard$

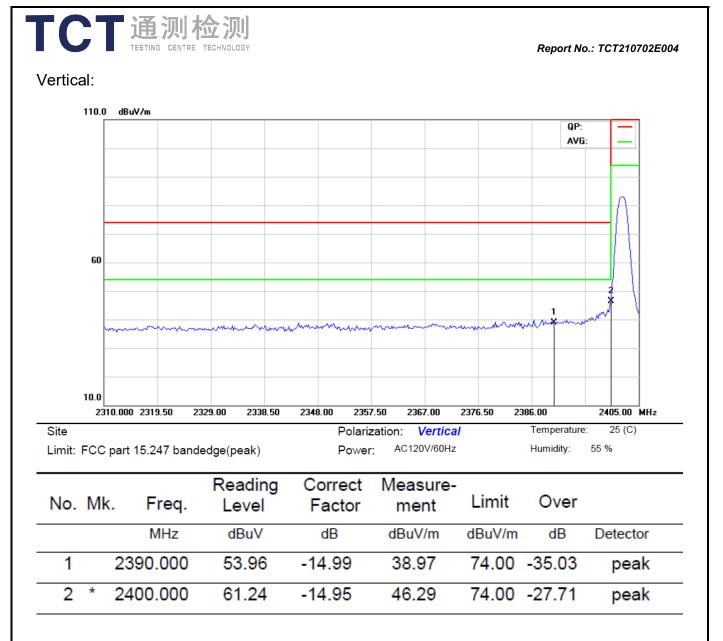
 $Over (dB) = Measurement (dB\mu V/m) - Limits (dB\mu V/m)$

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

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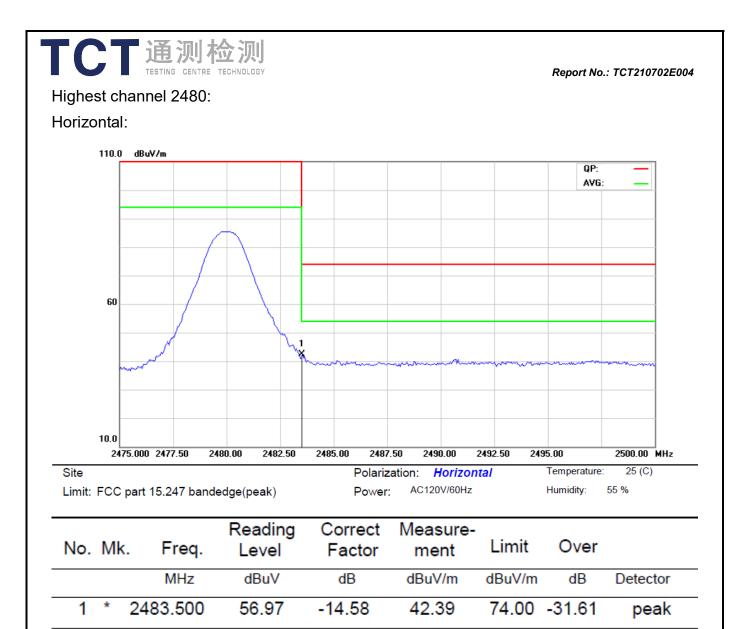
Report No.: TCT210702E004

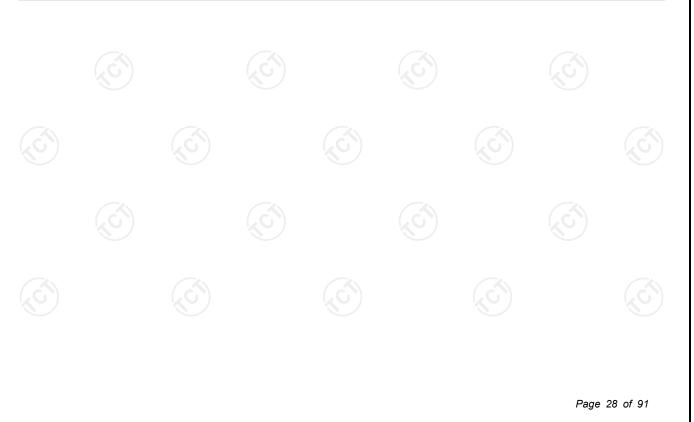


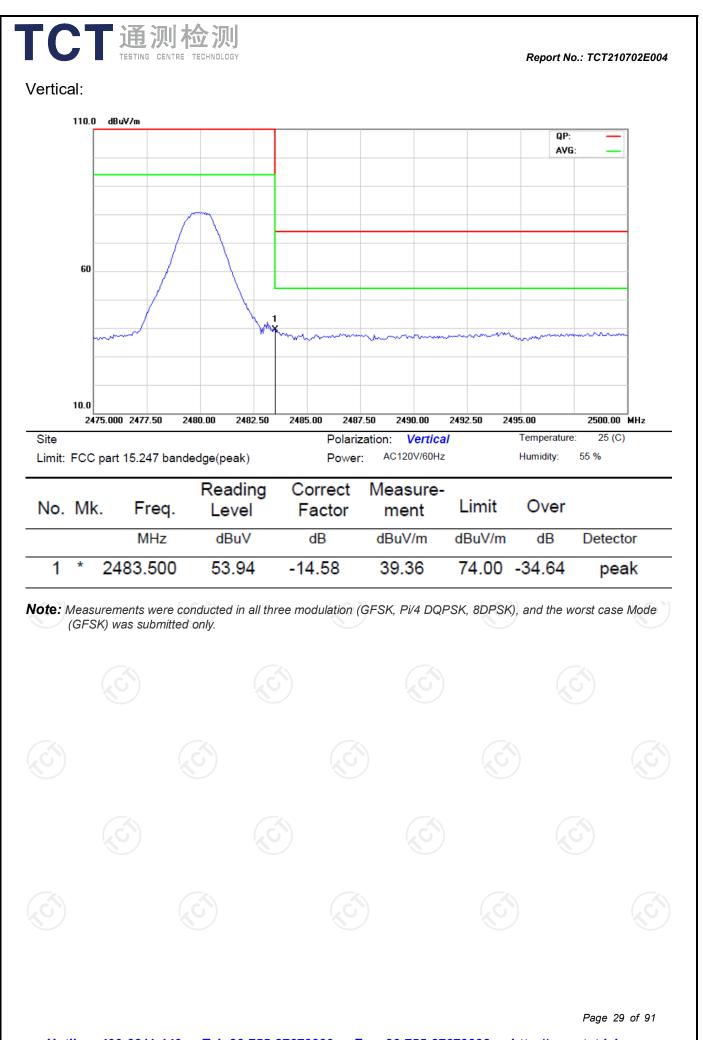




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Above 1GHz

Modul	ation	Type: GF	SK							
Low cl	hann	el: 2402 N	1Hz							
Frequ (MF	ency Iz)	Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBuV)	Correction Factor (dB/m)	Emissic Peak (dBµV/m)	AV	Peak limit (dBµV/m)	AV limit (dBµV/m)	Margin (dB)
480)4	Н	46.80		0.66	47.46		74	54	-6.54
720)6	Н	35.94		9.50	45.44		74	54	-8.56
	-	Н					~~			
	(<u> </u>		J.J			.G`)		(\mathcal{O})	
480)4	V	47.15		0.66	47.81		74	54	-6.19
720)6	V	36.39		9.50	45.89		74	54	-8.11
	-	V								

Middle ch	annel: 244	1 MHz			(د				KU
Frequence (MHz)	y Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBµV)	Correction Factor (dB/m)		on Level AV (dBµV/m)	Peak limit (dBµV/m)	AV limit (dBµV/m)	Margin (dB)
4882	Н	43.84		0.99	44.83	-	74	54	-9.17
7323	KOH)	34.70	N N	9.87	44.57	01	74	54	-9.43
	Ĥ					<u> </u>			
4882	V	46.74		0.99	47.73		74	54	-6.27
7323	V	37.26		9.87	47.13		74	54	-6.87
· · · ·	V)				

High channel: 2480 MHz

r ngri charn		11 12							
Frequency	Ant Pol	Peak	AV	Correction	Emissic	on Level	Peak limit	Δ\/ limit	Margin
(MHz)	H/V	reading (dBμV)	reading (dBµV)	Factor (dB/m)	Peak (dBµV/m)		(dBu)/(m)	(dBµV/m)	(dB)
4960	H	43.86		1.33	45.19		74	54	-8.81
7440	Н	34.75		10.22	44.97		74	54	-9.03
	Н								
G)		(\dot{G})		(.0			$(\dot{\mathbf{G}})$		(.C)
4960	V	46.10		1.33	47.43		74	54	-6.57
7440	V	35.72		10.22	45.94		74	54	-8.06
	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.

 Measurements were conducted in all three modulation (GFSK, Pi/4 DQPSK, 8DPSK), and the worst case Mode (GFSK) was submitted only.

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



Appendix A: Test Result of Conducted Test

Maximum Conducted Output Power

Condition	Mode	Frequency	Conducted Power	Total Power	Limit	Verdict
Condition	woue	(MHz)	(dBm)	(dBm)	(dBm)	vertrict
NVNT	1-DH1	2402	4.493	4.493	30	Pass
NVNT	1-DH1	2441	4.047	4.047	30	Pass
NVNT	1-DH1	2480 🔍 🔾	3.609	3.609	30	Pass
NVNT	2-DH1	2402	3.797	3.797	21	Pass
NVNT	2-DH1	2441	3.416	3.416	21	Pass
NVNT	2-DH1	2480	2.885	2.885	21	Pass
NVNT	3-DH1	2402	3.796	3.796	21	Pass
NVNT	3-DH1	2441	3.432	3.432	21	Pass
NVNT	3-DH1	2480	2.972	2.972	21	Pass
						•



	r Freq 2.441000000 GH	Z PNO: Fast Trig: Free Run IFGain:Low #Atten: 30 dB	ALIGNAUTO Avg Type: Log-Pwr Avg Hold: 200/200	04:13:05 PM Jul 27, 2021 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N N	
10 dB/d Log	Ref Offset 7.06 dB iv Ref 20.00 dBm		Mkr	1 2.440 945 GHz 4.047 dBm	
10.0					
0.00					
-10.0					
-20.0					
-40.0					
-50.0					
-60.0					
-70.0					
Center #Res E	r 2.441000 GHz 3W 3.0 MHz	#VBW 8.0 MHz	#Sweep	Span 5.000 MHz 100.0 ms (1001 pts)	
		Power NVNT 1-DH1)	
LXI RL	pectrum Analyzer - Swept SA	Z PNO: Fast →→ Trig: Free Run	ALIGN AUTO Avg Type: Log-Pwr Avg Hold: 200/200	04:15:13 PM Jul 27, 2021 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N N	
	Ref Offset 7.03 dB iv Ref 20.00 dBm	IFGain:Low #Atten: 30 dB	Mkr1	2.479 922 0 GHz 3.609 dBm	
10 dB/d Log					
0.00					
-10.0					
-20.0					
-30.0					
-50.0					
-60.0					
-70.0	r 2.480000 GHz 3W 3.0 MHz	#VBW 8.0 MHz	#Sweep ′	Span 5.000 MHz 100.0 ms (10001 pts)	
Center		148.4.1	STATUS	100	
Center	7				
Center #Res E)				
Center #Res E					

	r Freq 2.402000000 GHz	SENSE:PULSE PNO: Fast ↔→ Trig: Free Run IFGain:Low #Atten: 30 dB	ALIGNAUTO Avg Type: Log-Pwr Avg Hold: 200/200	04:24:48 PM Jul 27, 2021 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N	
10 dB/d Log	Ref Offset 6.98 dB liv Ref 20.00 dBm		Mk	r1 2.401 736 GHz 3.797 dBm	
10.0					
0.00	and the second and th	1			
-10.0					
-20.0					
-30.0					
-40.0					
-50.0					
-60.0					
-70.0					
Center #Res E	r 2.402000 GHz 3W 3.0 MHz	#VBW 8.0 MHz	Sweep	Span 6.000 MHz 1.000 ms (1001 pts)	
MSG		ower NVNT 2-DH1	status 2441MHz	5)	
LXI RL	pectrum Analyzer - Swept SA	SENSE:PULSE PNO: Fast →→ Trig: Free Run	ALIGNAUTO Avg Type: Log-Pwr Avg Hold: 200/200	04:27:40 PM Jul 27, 2021 TRACE 123456 TYPE MAMAAAAAA DET P.N.N.N.N.N	
	Ref Offset 7.06 dB	PNO: Fast		r1 2.440 796 GHz	
10 dB/d Log	liv Ref 20.00 dBm			3.416 dBm	
10.0		1			
0.00	WWW. MANNA ARE LAND - WILLIAM - MILLION				
-10.0					
-30.0					
-40.0					
-50.0					
-60.0					
-70.0					
Center	r 2.441000 GHz			Span 6.000 MHz	
#Res	3W 3.0 MHz	#VBW 8.0 MHz	Sweep	9 1.000 ms (1001 pts)	
MSG					
MSG					
MSG					

	ectrum Analyzer - Swept SA RF 50 Q AC r Freq 2.480000000 GH:	SENSE:PULSE Z PNO: Fast IFGain:Low #Atten: 30 dB	ALIGNAUTO Avg Type: Log-Pwr Avg Hold: 200/200	04:29:20 PM Jul 27, 2021 TRACE 123456 TYPE MWWWWW DET PINNNNN	
10 dB/di Log	Ref Offset 7.03 dB iv Ref 20.00 dBm		N	kr1 2.479 790 GHz 2.885 dBm	
0.00	1 - D. State - March - March	non management of the second s			
-10.0	mundument all and a				
-20.0					
-30.0					
-40.0					
-50.0					
-60.0					
-70.0					
Center #Res B	2.480000 GHz 3W 3.0 MHz	#VBW 8.0 MHz	Swee	Span 6.000 MHz ep 1.000 ms (1001 pts)	
MSG	(¿G`) I	Power NVNT 3-DH1	status 2402MHz	G`)	
LXI RL	ectrum Analyzer - Swept SA RF 50Ω AC r Freq 2.402000000 GH:	SENSE:PULSE	ALIGN AUTO Avg Type: Log-Pwr	04:41:16 PM Jul 27, 2021 TRACE 1 2 3 4 5 6	
		- PNO: Fast ↔ Trig: Free Run IFGain:Low #Atten: 30 dB	Avg Hold: 200/200	TRACE 123456 TYPE MWWWW DET PNNNNN	
10 dB/di Log	Ref Offset 6.98 dB iv Ref 20.00 dBm			3.796 dBm	
10.0		1			
0.00	- allow and a second and a second				
-10.0					
-20.0					
-30.0					
-40.0					
-50.0					
-70.0					
Contor	- 2 402000 OU-			Span 6.000 MHz	
#Res E	2.402000 GHz SW 3.0 MHz	#VBW 8.0 MHz	Swee	ep 1.000 ms (1001 pts)	
N. C.	/	100		N N	

LXI RL	Spectrum Analyzer - Swept SA RF 50 Ω AC er Freq 2.441000000 GH2	SENSE:PULSE Z PNO: Fast →→ Trig: Free Run IFGain:Low #Atten: 30 dB	ALIGNAUTO Avg Type: Log-Pwr Avg Hold: 200/200	04:44:04 PM Jul 27, 2021 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N N	
10 dB Log r	Ref Offset 7.06 dB /div Ref 20.00 dBm		MI	r1 2.440 910 GHz 3.432 dBm	
Log -					
0.00 -	a national and a state of the s	_			
م - 10.0					
-20.0 -					
-30.0 -					
-40.0 -					
-60.0 -					
-70.0 -					
Cent	er 2.441000 GHz			Span 6.000 MHz	
#Res	BW 3.0 MHz	#VBW 8.0 MHz	STATUS	0 1.000 ms (1001 pts)	
	Spectrum Analyzer - Swept SA	Power NVNT 3-DH1		51)	
Cent	er Freq 2.480000000 GH	Z PNO: Fast -→- Trig: Free Run IFGain:Low #Atten: 30 dB	ALIGNAUTO Avg Type: Log-Pwr Avg Hold: 200/200	04:45:36 PM Jul 27, 2021 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N N	
10 dB	Ref Offset 7.03 dB /div Ref 20.00 dBm	IFGall.LUW IN MELLION U	M	r1 2.479 862 GHz 2.972 dBm	
Log -					
0.00 -	and the second sec	<u> </u>			
ہ -10.0	and the second				
-20.0 -					
-30.0 -					
-40.0 =					
-50.0 -					
-70.0 -					
Cent	er 2.480000 GHz			Span 6.000 MHz	
#Res	BW 3.0 MHz	#VBW 8.0 MHz	Sweep	9 1.000 ms (1001 pts)	

Condition	Mode	Frequency (MHz)	-20 dB Bandwidth (MHz)	Verdict
NVNT	1-DH1	2402	0.824	Pass
NVNT	1-DH1	2441	0.819	Pass
NVNT	1-DH1	2480	0.820	Pass
NVNT	2-DH1	2402	1.114	Pass
NVNT	2-DH1	2441	1.119	Pass
NVNT	2-DH1	2480	1.117	Pass
NVNT	3-DH1	2402	1.163	Pass
NVNT	3-DH1	2441	1.165	Pass
NVNT	3-DH1	2480	1.166	Pass
-	20)	KO.		

-20dB Bandwidth

FCT通测检测 TESTING CENTRE TECHNOLOGY

-20dB Bandwidth NVNT 1-DH1 2402MHz

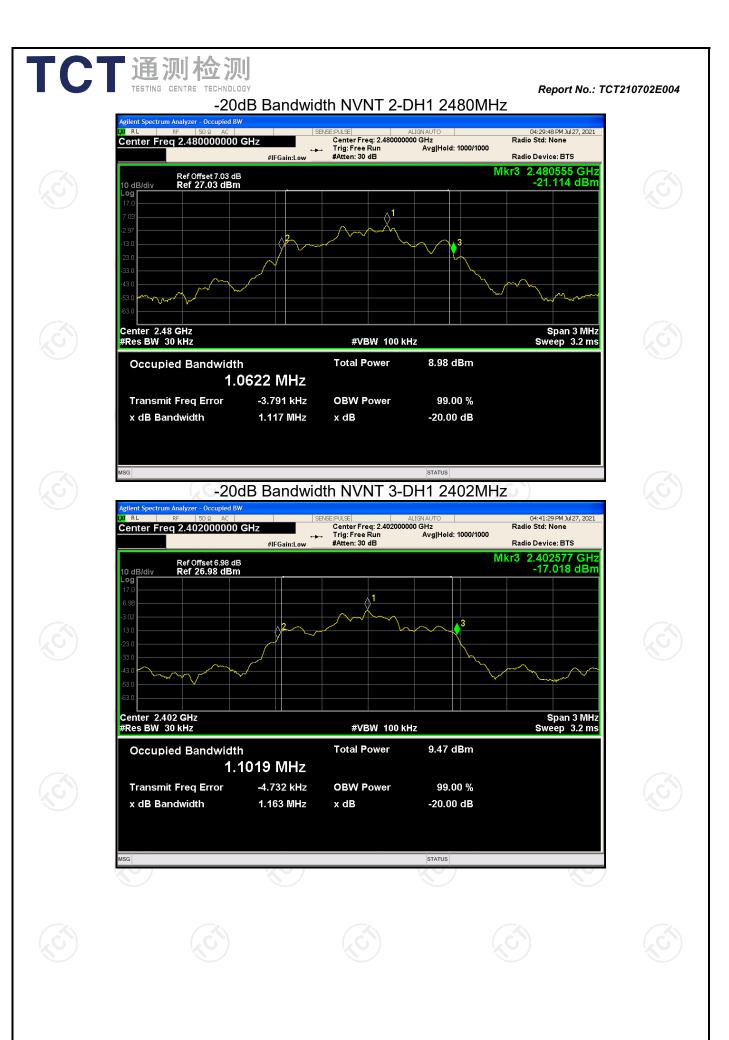


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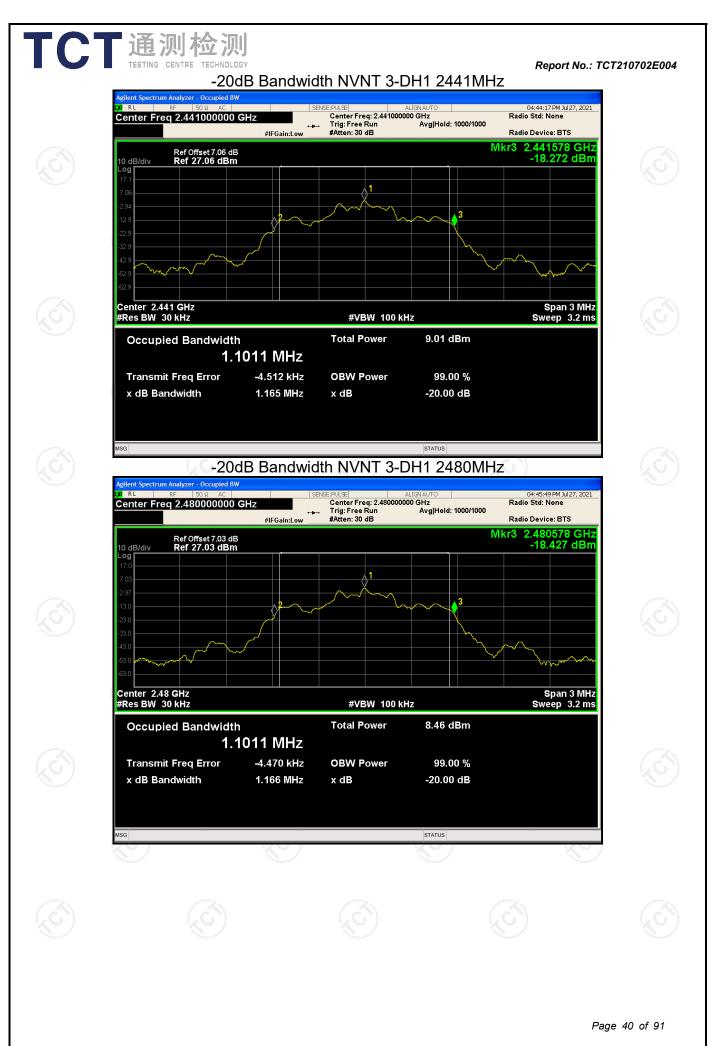


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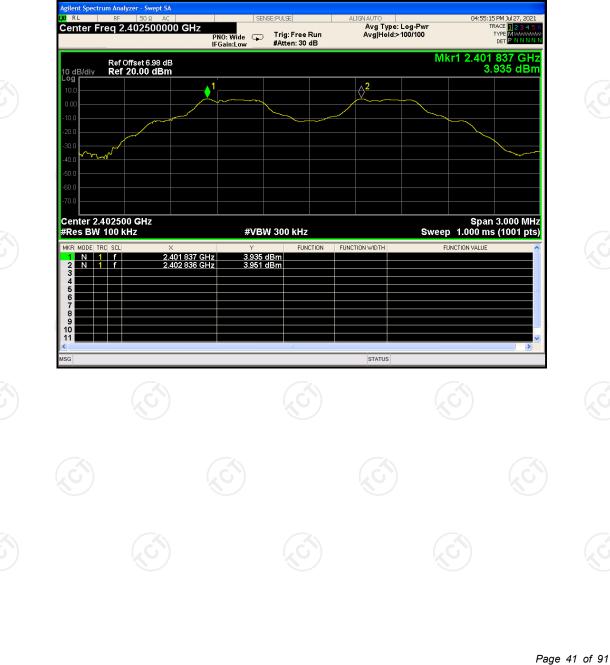


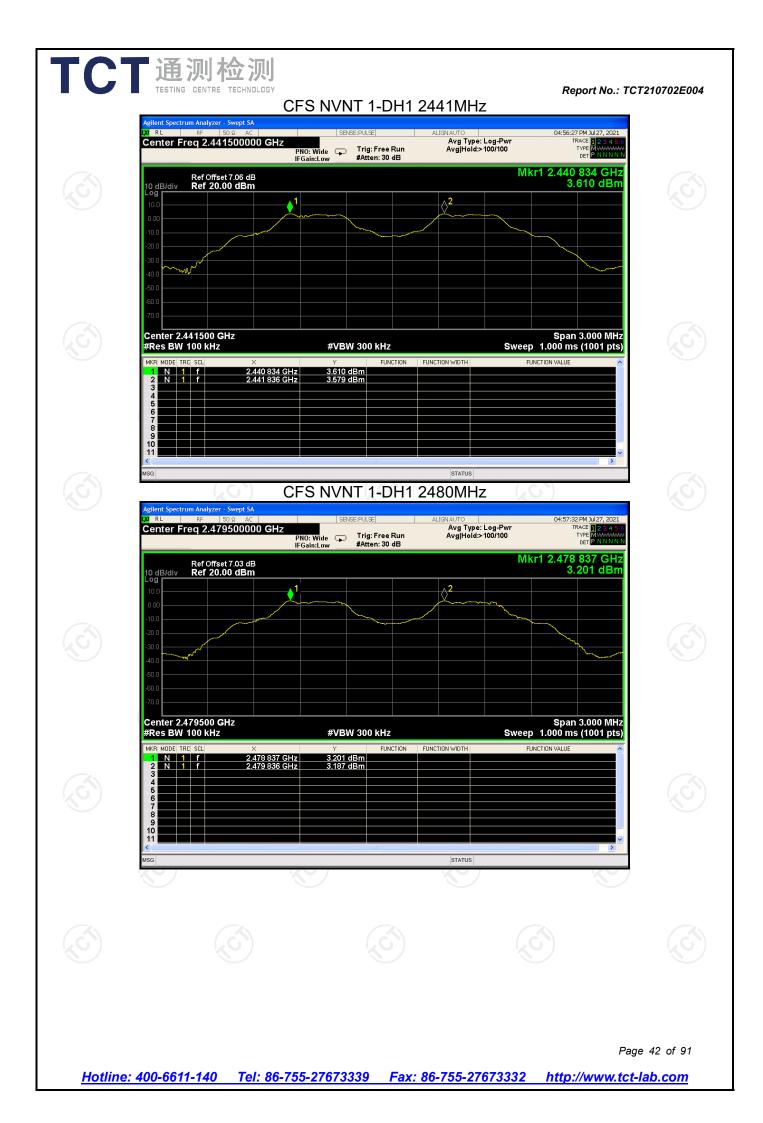
Report No.: TCT210702E004

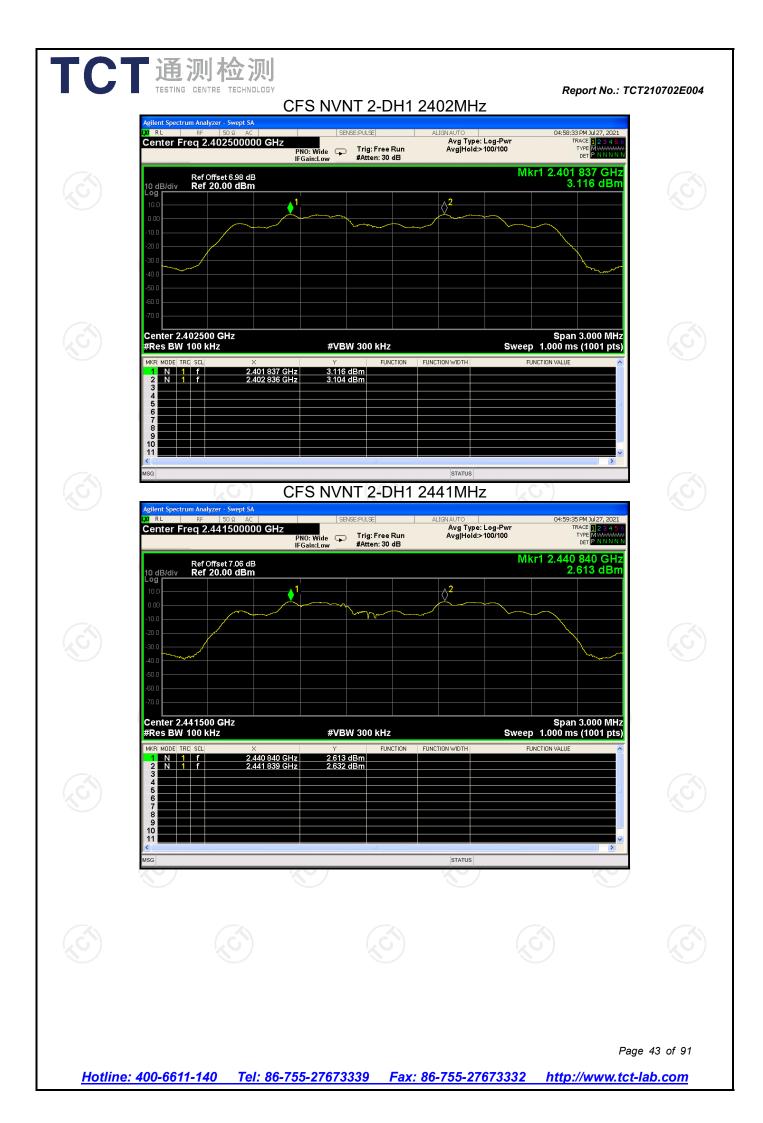
Condition	Mode	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH1	2401.837	2402.836	0.999	0.824	Pass
NVNT	1-DH1	2440.834	2441.836	1.002	0.824	Pass
NVNT	1-DH1	2478.837	2479.836	0.999	0.824	Pass
NVNT	2-DH1	2401.837	2402.836	0.999	0.746	Pass
NVNT	2-DH1	2440.840	2441.839	0.999	0.746	Pass
NVNT	2-DH1	2478.840	2479.842	1.002	0.746	Pass
NVNT	3-DH1	2401.837	2402.833	0.996	0.777	Pass
NVNT	3-DH1	2440.837	2441.836	0.999	0.777	Pass
NVNT	3-DH1	2478.837	2479.836	0.999	0.777	Pass

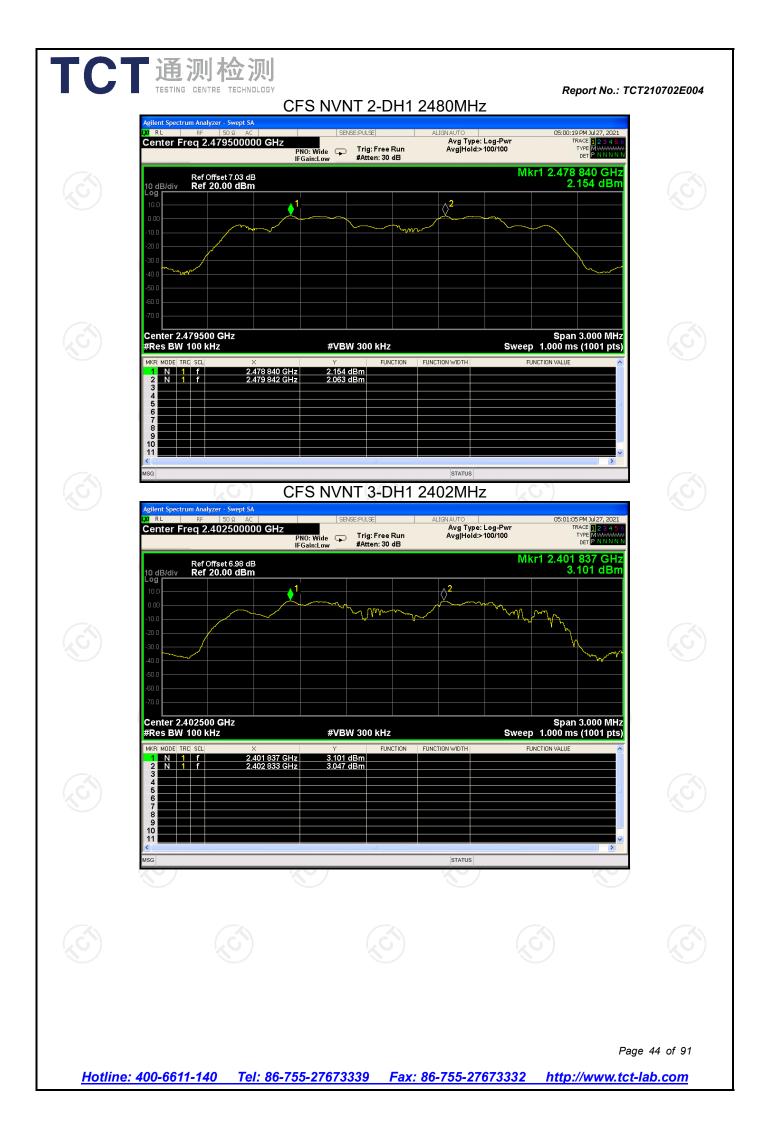
Carrier Frequencies Separation

CFS NVNT 1-DH1 2402MHz









	RL RF 50 Ω AC enter Freq 2.441500000 GHz	SENSE:PULSE PNO: Wide IFGain:Low #Atten: 30 dB	ALIGNAUTO Avg Type: Log-Pwr Avg Hold:>100/100	05:01:58 PM Jul 27, 2021 TRACE 123456 TYPE MWWWW DET P N N N N	
	Ref Offset 7.06 dB 0 dB/div Ref 20.00 dBm	1		1 2.440 837 GHz 2.636 dBm	
-1	0.00				
-3					
-6	0.0				
c	enter 2.441500 GHz Res BW 100 kHz	#VBW 300 kHz	Sweep	Span 3.000 MHz 1.000 ms (1001 pts)	
-	KR MODE TRC SCL X 1 N 1 f 2.440 837 G 2 N 1 f 2.441 836 G 3	Hz 2.636 dBm	FUNCTION WIDTH FUNC	TION VALUE	
	5 5 6 7			z	
1	8 9				
MS		CFS NVNT 3-DH1 2		>	
LXI	ilent Spectrum Analyzer - Swept SA RL RF 50 Q AC enter Freq 2.479500000 GHz	SENSE:PULSE	ALIGNAUTO Avg Type: Log-Pwr	05:03:13 PM Jul 27, 2021 TRACE 112:3:45:6	
	Ref Offset 7.03 dB	PNO: Wide Trig: Free Run IFGain:Low #Atten: 30 dB	Avg Hold:>100/100	TRACE 123456 TYPE MWWWWW DET PINNNNN 1 2.478 837 GHz	
L	dB/div Ref 20.00 dBm	1	2	2.146 dBm	
-1					
<u>د</u> ن ع	0.0				
-6	0.0				
	enter 2.479500 GHz Res BW 100 kHz	#VBW 300 kHz	Sweep	Span 3.000 MHz 1.000 ms (1001 pts)	
	KR MODE TRC SCL X 1 N 1 f 2.478 837 G 2 N 1 f 2.479 836 G 3	Y FUNCTION Hz 2.146 dBm Hz 2.134 dBm	FUNCTION WIDTH FUNC	TION VALUE	
	4 5 6 7			3	
	8 9 0 1			× >	
MS	G		STATUS		

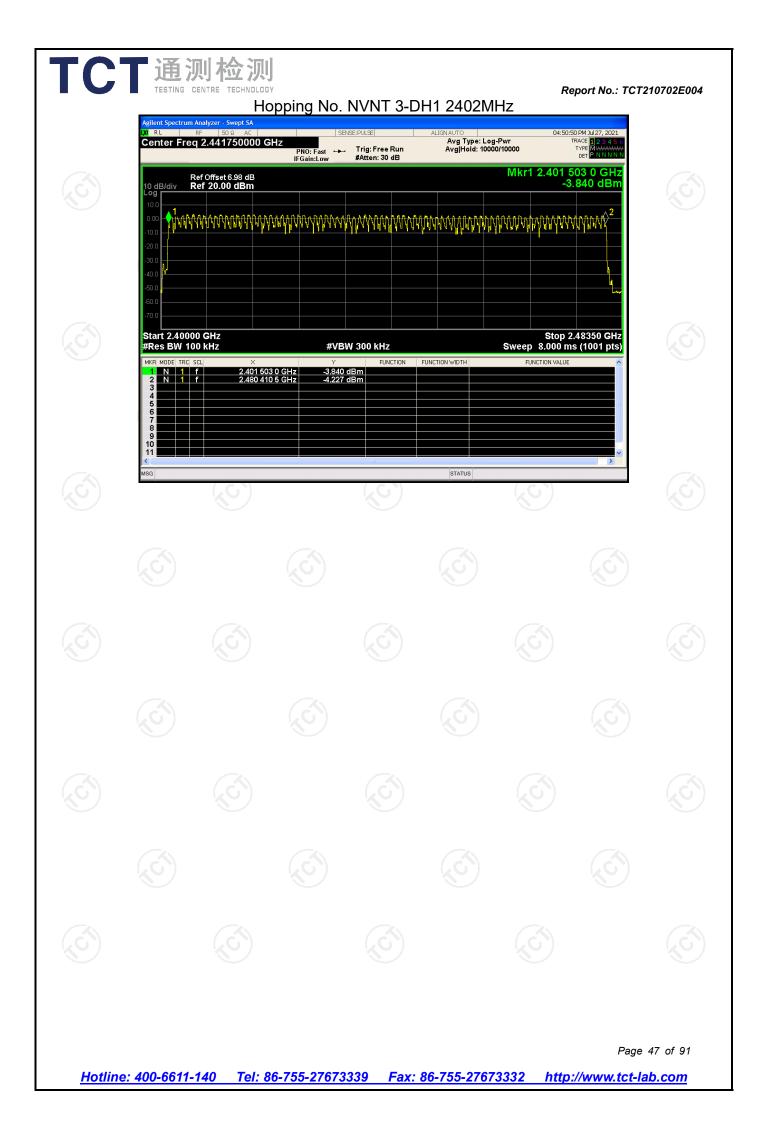
Number of Hopping Channel

Condition	Mode	Hopping Number	Limit	Verdict
NVNT	1-DH1	79	15	🔨 Pass
NVNT	2-DH1	79	15	Pass
NVNT	3-DH1	79	15	Pass

Hopping No. NVNT 1-DH1 2402MHz

		.4417500		PNO: Fast ↔ IFGain:Low		j: Free Ru :en: 30 dB	n	Avg Hold:	4000/4000		DET P N N
dB/div		Offset 6.98 o 20.00 dB							Mkr	1 2.401 8 4.	37 0 C 024 d
		WWW									
art 2.40 Res BW R MODE TR	100 k	(Hz 2.4	× 401 837 0 GH: 479 993 0 GH:	y z 4.02	BW 300 4 dBm 4 dBm	D KHZ Functio	IN FUNC	TION WIDTH		Stop 2. 3 8.000 ms	
2 N 1 3 4		2.4	4/9 995 U GH	2 3.11							
			Hoppi	ing No	NV	NT 2	2-DH ²	status 1 2402	PMHz		

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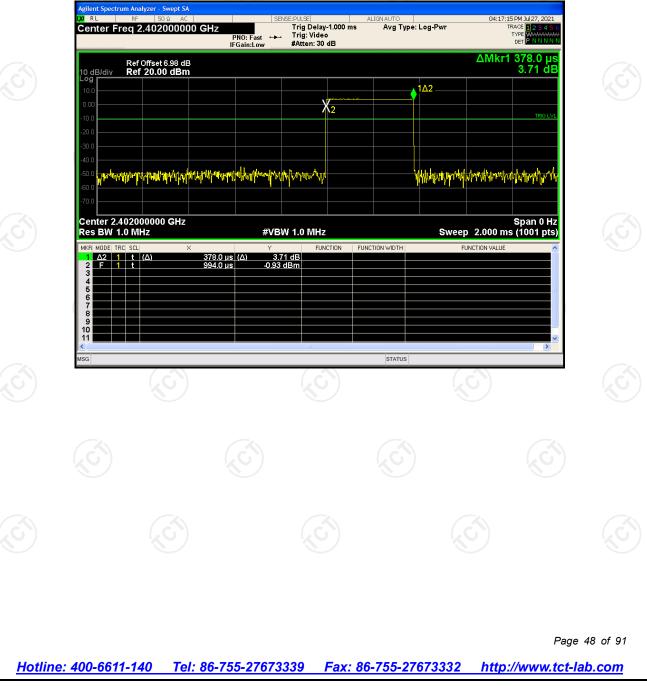


Report No.: TCT210702E004

Condition	Mode	Frequency (MHz)	Pulse Time (ms)	Total Dwell Time (ms)	Period Time (ms)	Limit (ms)	Verdict
NVNT	1-DH1	2402	0.378	120.960	31600	400	Pass
NVNT	1-DH3	2402	1.634	261.440	31600	400	Pass
NVNT	1-DH5	2402	2.882	307.413	31600	400	Pass
NVNT	2-DH1	2402	0.385	123.200	31600	400	Pass
NVNT	2-DH3	2402	1.637	261.920	31600	400	Pass
NVNT	2-DH5	2402	2.885	307.733	31600	400	Pass
NVNT	3-DH1	2402	0.386	123.520	31600	400	Pass
NVNT	3-DH3	2402	1.636	261.760	31600	400	Pass
NVNT	3-DH5	2402	2.887	307.947	31600	400	Pass

Dwell Time

Dwell NVNT 1-DH1 2402MHz



	通测检测 TESTING CENTRE TECHNOLOGY	Dwell NVNT 1-DH3 240	Report No.: TO)2MHz	CT210702E00
L.	RL RF 50Ω AC Center Freq 2.402000000 GH	SENSE:PULSE ALIG Z Trig Delay-1.000 ms PN0: Fast → Trig: Video IF63in:Low #Atten: 30 dB	NAUTO 04:23:56 PM Jul27, 2021 Avg Type: Log-Pwr TRACE 1234 5 6 TYPE WANNANN DET P NINNNN	
3	Ref Offset 6.98 dB 10 dB/div Ref 20.00 dBm	in Game Ow	∆Mkr1 1.634 ms -4.06 dB	
9	10.0 0.00			
	-10.0	X2		
	-30.0 -40.0 -50.0 b de tit thank all the all det and the tradition	d tratica a	rate in star staken stress ik	
	-50.0 <mark>596 2014 301 401 401 401 401 401 401 401 401 401 4</mark>			
	Center 2.402000000 GHz Res BW 1.0 MHz	#VBW 1.0 MHz	Span 0 Hz Sweep 3.000 ms (10001 pts)	
	2 F 1 t 99	Y FUNCTION FUNCTIO 34 ms (Δ) -4.06 dB 9.0 μs -3.78 dBm	N WIDTH FUNCTION VALUE	
	3 4 5 6			
	7 8 9 10			
Ň	II		STATUS	
9	Agilent Spectrum Analyzer - Swept SA	Dwell NVNT 1-DH5 240)2MHz	
	ଏ RL RF 50 ହ AC Center Freq 2.402000000 GH		NAUTO 04:24:15 PM Jul 27, 2021 Avg Type: Log-Pwr TRACE 12:3:45:56 TYPE TYPE TYPE DET P.N.N.N.N DET	
	Ref Offset 6.98 dB 10 dB/div Ref 20.00 dBm		ΔMkr1 2.882 ms -0.75 dB	
	10.0	ζ		
×1	-10.0			
G)				
\mathfrak{S}	-30.0 -40.0 -50.0			
\mathfrak{S}	-30.0		μμι Αμι Αμι	
9	300 400 500 500 500 500 500 500 5	#VBW 1.0 MHz	Span 0 Hz Sweep 4.000 ms (10001 pts)	
S	30.0 40.0 50.0 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.1 10.	#VBW 1.0 MHz #VBW 1.0 MHz 22 ms (Δ) - 0.75 dB 8.8 μs3.66 dBm	Sweep 4.000 ms (10001 pts)	
9	300 40.0 40.0 40.0 50.0 40.0 50.0 40.0 50.0 40.0 50.0 40.0 50.0 40.0 50.0 40.0 50.0 40.0 50.0 40.0 50.0 40.0 50.0 40.0 50.0 40.0 50.0 40.0 50.0 40.0 60.0 40.0 60.0 40.0 60.0 40.0 60.0 40.0 60.0 40.0 60.0 40.0 60.0 60.0 60.0 60.0 60.0 60.0 70.0 70.0 60.0 60.0 70.0 70.0 70.0 70.0 70.0 70.0 70.0 70.0 70.0 70.0 70.0 70.0 70.0 <td>Y FUNCTION FUNCTIO</td> <td>Sweep 4.000 ms (10001 pts)</td> <td></td>	Y FUNCTION FUNCTIO	Sweep 4.000 ms (10001 pts)	
9	33.0	Y FUNCTION FUNCTIO	Sweep 4.000 ms (10001 pts)	
S) S	330	Y FUNCTION FUNCTIO	Sweep 4.000 ms (10001 pts)	
S)	330 400 400 400 500 400 500 400 600 400 700 400 Center 2.402000000 GHz Res BW 1.0 MHz MKR MODEL TRC SCI 2 F 1 42 2 F 1 t 93 4 5 5 6 5 7 99 4 5 6 5 10 1	Y FUNCTION FUNCTIO	Sweep 4.000 ms (10001 pts)	
S) S)	330 400 400 400 500 400 500 400 600 400 700 400 Center 2.402000000 GHz Res BW 1.0 MHz MKR MODEL TRC SCI 2 F 1 42 2 F 1 t 93 4 5 5 6 5 7 99 4 5 6 5 10 1	Y FUNCTION FUNCTIO	Sweep 4.000 ms (10001 pts)	

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		RL RF 50 Q AC Center Freq 2.402000000 G		Ignauto 04:32:17 PM Jul27, 2021 Avg Type: Log-Pwr TRACE Type: Log-Pwr TRACE Type: PNNNN DET PNNNN	-
Automatic meter and a second and a second a s	S)	Log		∆Mkr1 385.0 µs -0.93 dE	
		-10.0	X2		
Res BW 1.0 MHz X VEW 1.0 MHz Sweep 2.000 ms (10001 pts) Res BW 1.0 MHz X FARCHOR VICTOR VALUE RUCTOR VICTOR VALUE Res BW 1.0 MHz X FARCHOR VICTOR VALUE RUCTOR VICTOR VALUE Res BW 1.0 MHz X FARCHOR VICTOR VALUE RUCTOR VICTOR VALUE Res BW 1.0 MHz X FARCHOR VICTOR VALUE RUCTOR VICTOR VALUE Res BW 1.0 MHz Sweep 3.000 ms (10001 pts) RUCTOR VICTOR VALUE Res BW 1.0 MHz FWE 1.0 MHz Sweep 3.000 ms (10001 pts) Res BW 1.0 MHz FWW 1.0 MHz Sweep 3.000 ms (10001 pts) Res BW 1.0 MHz FWW 1.0 MHz Sweep 3.000 ms (10001 pts) Res BW 1.0 MHz FWW 1.0 MHz Sweep 3.000 ms (10001 pts) Res BW 1.0 MHz FWW 1.0 MHz Sweep 3.000 ms (10001 pts)		-40.0 -50.0 ut pt. hord out to desire the desired of the -60.0 ut pt. hord out to desired of the desired of t	an a	an a	
Image: Sector of the sector		Res BW 1.0 MHz		Sweep 2.000 ms (10001 pts	
Image: Section Analyzer - Sweet 35: Image: Status Image: Sectin Analyzer - Sweet 35:<		1 Δ2 1 t (Δ) 2 2 F 1 t		ION WIDTH FUNCTION VALUE	
Image: Several severa several several several several several s		6 7 8 9			
Aglent Spectrum Analyzer - Swept SA IV. R.L. RF 100 % AC Center Fireq 2.402000000 CHz File Situation of the set of the	P	11 <			
Center Freq 2.40200000 GHz Frig Delay-1000 ms Avg Type: Log-Pwr Trig Delay-1000 ms -2.12 dB -2.12 dB -2.	G) [(₂ G`)	Dwell NVNT 2-DH3 24	02MHz (20)	
-2.12 dB -2.12					
100 2 1780 LV 200 200 200 300 400 100 400 400 100 600 400 400 600 400 400 600 400 400 600 400 400 600 400 400 600 400 400 700 400 400 700 500 500 600 400 400 700 400 400 700 500 500 700 700 500 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 <t< th=""><th>L.</th><th>XIRL RF 50Ω AC</th><th>CHZ Trig Delay-1.000 ms PNO: Fast ↔→ Trig: Video</th><th>Avg Type: Log-Pwr TRACE 12345 Type WWWWW Det PNNNN</th><th></th></t<>	L.	XIRL RF 50Ω AC	CHZ Trig Delay-1.000 ms PNO: Fast ↔→ Trig: Video	Avg Type: Log-Pwr TRACE 12345 Type WWWWW Det PNNNN	
30.0 40.0		RL RF 50 Ω AC Center Freq 2.40200000 G Ref 0ffset 6.98 dB Ref 0ffset 6.98 dB 10 dB/div Ref 20.00 dBm Ref 20.00 dBm	CHZ Trig Delay-1.000 ms PNO: Fast ↔→ Trig: Video	Avg Type: Log-Pwr Trove U2345 Trove WMMMM Det P NNNN AMkr1 1.637 ms	
Total Total Total Center 2.402000000 GHz Span 0 Hz Res BW 1.0 MHz #VBW 1.0 MHz Sweep 3.000 ms (10001 pts)	L L	RL RF 50 Q AC Center Freq 2.402000000 G Ref Offset 6.98 dB Ref Offset 6.98 dB 10 dB/div Ref 20,00 dBm Ref 20,00 dBm 10 0	GHz Trig Delay-1.000 ms PN0: Fast →→ Trig: Video IFGain:Low #Atten: 30 dB	Avg Type: Log-Pwr TRACE 12 3 4 5 TYPE WWWWW DET PNNNN ΔMkr1 1.637 ms -2.12 dE	
Res BW 1.0 MHz #VBW 1.0 MHz Sweep 3.000 ms (10001 pts) MKR MODE TRC SCL × Y FUNCTION FUNCTION VIDTH FUNCTION VALUE 1 Δ2 1 t (Δ) 1.637 ms (Δ) 2.12 dB - 2 F 1 t 999.0 µs -3.55 dBm - - 4 - - - - - - 6 - - - - - 9 - - - - - 10 - - - - - 11 - - - - -	L L	Ref Offset 6.98 dB 10 dB/div Ref Offset 6.98 dB 10 dB/div Ref 20.00 dBm -9	GHz PN0: Fast IFGain:Low	Avg Type: Log-Pwr TRACE 12 3 4 5 TYPE WWWWW DET PNNNN ΔMkr1 1.637 ms -2.12 dE	
1 Δ2 1 t (Δ) 1.637 ms (Δ) 2.12 dB 2 F 1 t 999.0 µs -3.55 dBm -3.55 dBm 3 4 - - - - - 4 - - - - - - 6 - - - - - - 7 - - - - - - 9 - - - - - - - 10 - </th <th>L L</th> <th>RL RF 50.0 AC Center Freq 2.402000000 G Ref Offset 6.98 dB 10 dB/div Ref 20.00 dBm 10 0 </th> <th>GHz PNO: Fast IFGain:Low 2 Trig: Video #Atten: 30 dB</th> <th>Avg Type: Log-Pwr TRACE 12345 TYPE Log-Pwr AMkr1 1.637 ms -2.12 dE TRO LVL TRO LVL TRO LVL TRO LVL</th> <th></th>	L L	RL RF 50.0 AC Center Freq 2.402000000 G Ref Offset 6.98 dB 10 dB/div Ref 20.00 dBm 10 0	GHz PNO: Fast IFGain:Low 2 Trig: Video #Atten: 30 dB	Avg Type: Log-Pwr TRACE 12345 TYPE Log-Pwr AMkr1 1.637 ms -2.12 dE TRO LVL TRO LVL TRO LVL TRO LVL	
6 7 8 9 10 11	Ś	RL RF S0.0 AC Center Freq 2.402000000 G Ref Offset 6.98 dB Ref 20.00 dBm Ref 20.00 dBm 10 dB/div Ref 20.00 dBm Ref 20.00 dBm Ref 20.00 dBm Ref 20.00 dBm 10 dB/div Ref 20.00 dBm Ref 20.00 dBm Ref 20.00 dBm Ref 20.00 dBm 10 dB/div Ref 20.00 dBm Ref 20.00 dBm Ref 20.00 dBm Ref 20.00 dBm .00 db/div	GHz Trig: Video PN0: Fast Trig: Video #Atten: 30 dB	Avg Type: Log-Pwr TRACE 01204 55 DET PNNNN AMkr1 1.637 ms -2.12 dE 142 TROLVI TROLVI Span 0 Hz Sweep 3.000 ms (10001 pts	
	J)	RL RF 50.0 AC Center Freq 2.402000000 G Ref Offset 6.98 dB Ref Offset 6.98 dB Ref Offset 6.98 dB 10 dB/div Ref 20.00 dBm 0 </td <td>GHz Trig: Video PN0: Fast → IFGain:Low Trig: Video #Atten: 30 dB</td> <td>Avg Type: Log-Pwr TRACE 01204 55 DET PNNNN AMkr1 1.637 ms -2.12 dE 142 TROLVI TROLVI Span 0 Hz Sweep 3.000 ms (10001 pts</td> <td></td>	GHz Trig: Video PN0: Fast → IFGain:Low Trig: Video #Atten: 30 dB	Avg Type: Log-Pwr TRACE 01204 55 DET PNNNN AMkr1 1.637 ms -2.12 dE 142 TROLVI TROLVI Span 0 Hz Sweep 3.000 ms (10001 pts	
	Ś	RL RF SOR AC Center Freq 2.402000000 G Ref Offset 6.98 dB Ref 20.00 dBm Ref 20.00 dBm 10 dB/div Ref 20.00 dBm 0.00	GHz Trig: Video PN0: Fast → IFGain:Low Trig: Video #Atten: 30 dB	Avg Type: Log-Pwr TRACE 01204 55 DET PNNNN AMkr1 1.637 ms -2.12 dE 142 TROLVI TROLVI Span 0 Hz Sweep 3.000 ms (10001 pts	
		RL RF SOR AC Center Freq 2.402000000 G Ref Offset 6.98 dB Ref Offset 6.98 dB Ref Offset 6.98 dB 10 dB/div Ref 20.00 dBm 0 <td>GHz Trig: Video PN0: Fast → IFGain:Low Trig: Video #Atten: 30 dB</td> <td>Avg Type: Log-Pwr TRACE 02345 TRACE 0235 TRACE</td> <td></td>	GHz Trig: Video PN0: Fast → IFGain:Low Trig: Video #Atten: 30 dB	Avg Type: Log-Pwr TRACE 02345 TRACE 0235 TRACE	
	S S	RL RF SOR AC Center Freq 2.402000000 G Ref Offset 6.98 dB Ref Offset 6.98 dB Ref Offset 6.98 dB 10 dB/div Ref 20.00 dBm 0 <td>GHz Trig: Video PN0: Fast → IFGain:Low Trig: Video #Atten: 30 dB</td> <td>Avg Type: Log-Pwr TRACE 02345 TRACE 0235 TRACE</td> <td></td>	GHz Trig: Video PN0: Fast → IFGain:Low Trig: Video #Atten: 30 dB	Avg Type: Log-Pwr TRACE 02345 TRACE 0235 TRACE	