

FCC PART 15.247 TEST REPORT

On Behalf of

SHOKZ (SINGAPORE) PTE. LTD.

1 NORTH BUONA VISTA DRIVE #16-09 THE METROPOLIS SINGAPORE 138589

Singapore

FCC ID: 2BCD6-C120 Model: SHOKZ C120, SHOKZ C121

September 18, 2024

This Report Cor ⊠ Original Rep	O A G G	Equipment Type: OpenComm2 2025 Upgrade		
Test Engineer:	LBiLi/ B	The we do not the the of the		
Report Number:	QCT24IR-2	2121E-01 5 10 6 5 10 10 10 10 10 10 10 10 10 10 10 10 10		
Test Date:	September 1, 2024 ~ September 18, 2024			
Reviewed By:	Gordon Tar	n/ Gordin. Tan		
Reviewed By: <u>Gordon Ta</u>		ng/fam un		
Prepared By:	East of 1/F. Shuiku Roa			

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Address: East of 1/F., Building E, Xinghong Science Park, No.111, Shuiku Road, Fenghuanggang, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China Tel: 0755-23008269 Fax: 0755-23726780 www.qctest.com.cn



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11.2	Radiated Emission Method	



Report Number	Description	Issued Date
QCT24IR-2121E-01	Initial Issue	2024-9-18
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Revision History of This Test Report

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1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Description:	OpenComm2 2025 Upgrade
Model No.:	SHOKZ C120, SHOKZ C121
HVIN:	SHOKZ C120, SHOKZ C121 Note: the two models/HVIN are identical and different model number and NFC function, Only SHOKZ C121 has NFC function and the NFC module activated by induced energy.
Tested Model:	SHOKZ C120
HW Version:	1.0 of che to the structure of the struc
SW Version:	HCU_A_01_20240506
Sample(s) Status:	Engineer sample
Operation Frequency:	2402MHz~2480MHz
Channel numbers:	79° of children of the structure of the
Channel separation:	1MHz & chi jan a chi
Modulation type:	GFSK, π/4-DQPSK, 8-DPSK
Antenna Type:	PIFA Antenna
Antenna gain:	2-1dBi C C the start of the sta
Power supply:	DC 5V(Powered by adapter) DC 3.8V(Powered by battery)
Trade Mark:	SHOKZ IN A STATISTICS OF A STA
Applicant:	SHOKZ (SINGAPORE) PTE. LTD.
Address:	11 NORTH BUONA VISTA DRIVE #16-09 THE METROPOLIS SINGAPORE 138589, Singapore
Manufacturer:	SHOKZ (SINGAPORE) PTE. LTD.
Address:	11 NORTH BUONA VISTA DRIVE #16-09 THE METROPOLIS SINGAPORE 138589, Singapore
Sample No.:	Y24I2121E01LW

Note: The above EUT information is declared by manufacturer and for more detailed features description please refers to the manufacturer's specifications or User's Manual.

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1.2 System Test Configuration

1.2.1 Channel List

Operation Fre	equency each o	of channel	o of the p		Strand Co	A SIN NO	of the time
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402MHz	21	2422MHz	41	2442MHz	61 ²⁰	2462MHz
2 2	2403MHz	22	2423MHz	42	2443MHz	62 6	2463MHz
1 30° 1°	2404MHz	23	2424MHz	43	2444MHz	63	2464MHz
4 5 4 6	2405MHz	o 24	2425MHz	44	2445MHz	64	2465MHz
e 15 1	2406MHz	25	2426MHz	45	2446MHz	65	2466MHz
6 6	2407MHz	26	2427MHz	46	2447MHz	66	2467MHz
0 70 P	2408MHz	27	2428MHz	47	2448MHz	67 0	2468MHz
5 m 8 0 0	2409MHz	28	2429MHz	48	2449MHz	68	2469MHz
19 59 0	2410MHz	29	2430MHz	49	2450MHz	69	2470MHz
8 AO	2411MHz	30	2431MHz	50 0	2451MHz	0 70 🖑	2471MHz
0 11 St	2412MHz	31 0	2432MHz	\$ 51	2452MHz	71° 0	2472MHz
12° 4	2413MHz	32	2433MHz	52	2453MHz	72	2473MHz
a 13 ° s	2414MHz	33	2434MHz	530	2454MHz	73	2474MHz
14 0	2415MHz	34	2435MHz	54	2455MHz	74	2475MHz
8 15 M	2416MHz	35	2436MHz	55	2456MHz	0 75	2476MHz
° 16 6	2417MHz	36	2437MHz	56	2457MHz	76	2477MHz
1 17 ° K	2418MHz	37 6	2438MHz	57	2458MHz	677 8	2478MHz
A 18 .	2419MHz	38	2439MHz	58	2459MHz	78	2479MHz
19	2420MHz	39	2440MHz	59	2460MHz	79	2480MHz
20 20	2421MHz	40	2441MHz	60	2461MHz	10 0° 2	12 Jun 20

Note: In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel Channel	Frequency	Channel	Frequency
The lowest channel	2402MHz	The middle channel	2441MHz
The Highest channel	2480MHz		Stand Stand

1.2.2 EUT Exercise Software

" BlueTest3 " software was used to test, The power level is default. The software and power level was provided by the applicant.

1.2.3 Support Equipment

10 0	Manufacturer	Description	Model	Remark
0.00	Vivo	Adapter	BK-T-01Q	Input:110-240V~, 50/60Hz Output:5V/1A

1.2.4 Test mode

Transmitting mode: Keep the EUT in continuously transmitting.

1.3 Test Facility

Test Firm : Shenzhen QC Testing Laboratory Co., Ltd.

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19. The testing quality system of our laboratory meets with ISO/IEC-17025 requirements. This approval result is accepted by MRA of APLAC.

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

CNAS - Registration No.: L8464

The EMC Laboratory has been accredited by CNAS, and in compliance with ISO/IEC 17025:2017 General Requirements for testing Laboratories.

A2LA Certificate Number: 6759.01

The EMC Laboratory has been accredited by A2LA, and in compliance with ISO/IEC 17025:2017 General Requirements for testing Laboratories.

FCC Registration Number: 561109

The EMC Laboratory has been registered and fully described in a report filed with the (FCC Federal Communications commission.

IC Registration Number: 29628

CAB identifier: CN0141

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada.

1.4 Measurement Uncertainty

Parameter	Uncertainty
Occupied Channel Bandwidth	±1.42 x10 ⁻⁴ %
RF output power, conducted	±1.06dB
Power Spectral Density, conducted	±1.06dB
Unwanted Emissions, conducted	±2.51dB
AC Power Line Conducted Emission	±1.80dB
Radiated Spurious Emission test (9kHz-30MHz)	±2.66dB
Radiated Spurious Emission test (30MHz-1000MHz)	±4.04dB
Radiated Spurious Emission test (1000MHz- 18000MHz)	±4.70 dB
Radiated Spurious Emission test (18GHz-40GHz)	±4.80dB
Temperature	±0.8°C
Humidity of a start of the start of the	±3.2%
DC and low frequency voltages	±0.1%
Time? M & & A A A & & A A A & & A	±5%
Duty cycle	5 6 ±5%

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



2. Summary of Test Results

Test Item	Section	Result
Antenna Requirement	15.203/15.247 (c)	Pass
AC Power Line Conducted Emission	15.207 March 6 6 6	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 (b)(1)	Pass
Dwell Time	15.247 (a)(1)(iii)	Pass
Radiated Emission	15.205/15.209	Pass
Band Edge	15.247(d)	Pass

Note: 1. Pass: The EUT complies with the essential requirements in the standard.

2. All indications of Pass/Fail in this report are opinions expressed by Shenzhen QC Testing Laboratory Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.



3. List of Test and Measurement Instruments

3.1 Conducted Emission Test

ltem	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
LI LO	EMI Test Receiver	Rohde&Schwarz	ESIB 7	2277573376	2024.03.14	2025.03.13
2	EMI Test Receiver	Rohde&Schwarz	ESCI3	101820	2024.08.06	2025.08.05
3	Artificial Mains Network	SCHWARZBECK	NSLK8126	8126200	2024.08.06	2025.08.05
4	PULSE LIMITER	Rohde&Schwarz	ESH3-Z2	100058	2024.03.14	2025.03.13

tem	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1.	EMI Test Receiver	R&S Col	ESIB 7	2277573376	2024.03.14	2025.03.13
2.	EMI Test Receiver	ESPI3	ESPI3	101131	2024.03.14	2025.03.13
3.	Spectrum Analyzer	Rohde&Schwarz	FSV 40	101458	2024.03.14	2025.03.13
4.4	TRILOG Broadband Test-Antenna	SCHWARZBECK	VULB9168	VULB9168-588	2023.04.01	2025.03.31
5.	Loop Antenna	EMCO	6502	2133	2023.03.18	2025.03.17
6.	horn antenna	SCHWARZBECK	BBHA9120D	2069	2023.04.01	2025.03.31
7.	Horn Antenna	COM-MW	ZLB7-18-40G -950	12221225	2023.01.12	2025.01.09
8.	Pre-amplifier	MITEQ	TTA0001-18	2063645	2024.03.27	2025.03.26
9.10	Pre-amplifier	COM-MW	DLAN-18000 -40000-02	10229104	2024.03.14	2025.03.13
10.	966 Camber	ZhongYU	9*6*6	the los to	2023.05.08	2026.05.07

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ltem	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
112 1. 0 112 1. 0	Wideband Radio Communication Tester	Rohde & Schwarz	CW500	151583	2024.03.14	2025.03.13
2.	Spectrum Analyzer	ROHDE& SCHWARZ	FSV 40	101458	2024.03.14	2025.03.13
3.	Signal Generator	Agilent	N5182A	MY50141563	2024.03.14	2025.03.13
4.	RF Automatic Test System	MW Share	MW100-RFCB/ MW100-PSB	MW2007004	2024.03.14	2025.03.13

3.3 RE Conducted test

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4. 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-topoint 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.

EUT Antenna: The Ant is PIFA Antenna, the best case gain of the antenna is -1dBi, reference to the Internal photo for details.

Report No.: QCT24IR-2121E-01

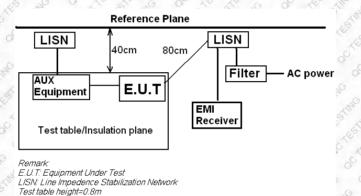
5. Conducted Emissions

- Applicable Standard
 - FCC Part15 C Section 15.207
- 5.2 Limit

		Limit (c	dΒμV)
	Frequency range (MHz)	Quasi-peak	Average
,	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	5 . 60 . 5 . 5 . 5 . 5 . 5 . 5 . 5 . 5 . 5 .	50 50

Note *: The level decreases linearly with the logarithm of the frequency.

5.3 Test setup



5.4 EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz. RBW=9 kHz, VBW=30 kHz, Sweep time=auto

5.5 Test procedure

- 1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.
- The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).
- 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 of the interface cables must be changed according to ANSI C63.10 on conducted measurement.
- 5.6 Test Data

6	Temperature	24°C	Humidity	51%
00	ATM Pressure	101kPa	Antenna Gain	-1dBi
0	Test by	LBiLi	Test result	PASS of A A

Test voltage: AC 120V/60Hz

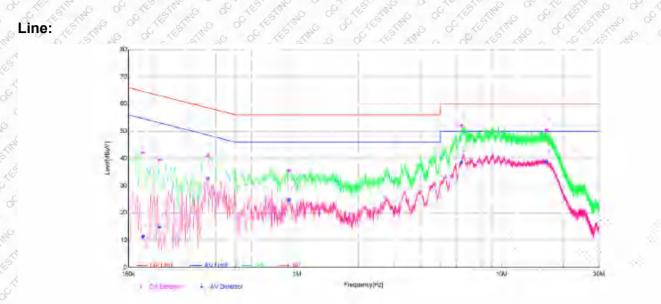
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Measurement data:

8

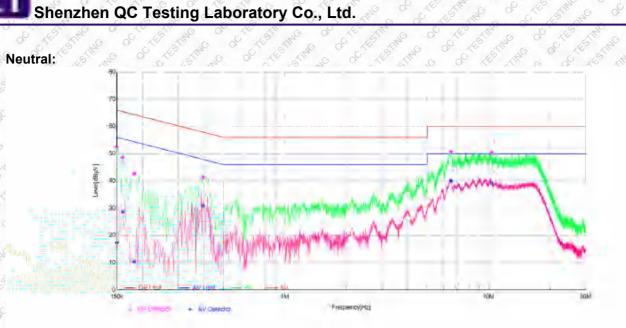
Pre-scan all test modes, found worst case at GFSK 2402MHz, and so only show the test result of GFSK 2402MHz.



Final Data List										
No	Freq. [MHz]	Factor(cB)	QP Value (3BeV]	DP Limit [d6uV]	CIP Margin [08]	AV Malue [dBj2V]	AV mt_ dBµV]	AV Margin (dB]	Phase	Venoice.
+	0.1775	10.63	42.06	64.60	22.54	11.34	54.60	43.26	L	PASS
2	0.2125	10.67	39,42	63,11	23,69	14.86	53.11	38.25	L	PASS
3	0.3675	10.74	40.99	58.56	17.57	32.65	48.56	15.91	1 4	PASS
4	0.9125	10.68	35,54	56.00	20.46	24.76	46.00	21.24	L	PASS
5	6.3695	10.75	52.14	60.00	7.86	38.52	50.00	11.48	L,	PASS
6	16.5755	10.98	50.28	60.00	9,72	38,70	50.00	11.30	L	PASS

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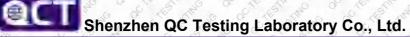


Fin	al Data	List								
NO.	Freq [MH2]	Factor(dB)	DP Value [k3,V]	DP Limit [dBµV]	QP Margin [0E]	AV Value [d6uV]	AV Limit (oBµV]	AV Margin (dB)	Phase	Verdia
1	0.15	10.48	52.36	66.00	13.64	17.35	56.00	38.65	N	PASS
2	0.16	10,48	48.60	65.46	16.86	28.66	55.46	26.80	N	PASS
3	0.1825	10.48	42.63	64.37	21.74	10.39	54.37	43.98	N	PASS
4	0.3975	10.60	41.16	57.91	16.75	30.83	47.91	17.08	N	PASS
5	6.5495	10.45	50.67	60.00	9.33	39.91	50.00	10.09	N	PASS
8	10,3475	10.79	50.29	60.00	9.71	39.28	50.00	10.72	N	PASS

Notes:

- 1. An initial pre-scan was performed on the line and neutral lines with peak detector.
- 2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.

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6. Conducted Peak Output Power

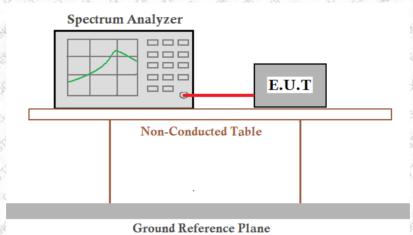
6.1 Applicable Standard

FCC Part15 C Section 15.247 (a)(1)

6.2 Limit

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. And for all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

6.3 Test setup



6.4 Test Data

Temperature	23 °C	Humidity	51 %
ATM Pressure	101kPa	Antenna Gain	-1dBio of the second
Test by	L'Bi List a a a fair a	Test result	PASS

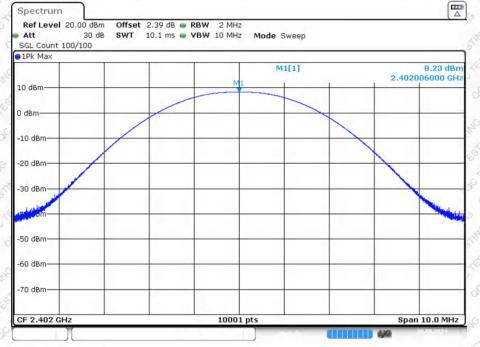
Please refer to following table and plots.



Mode	Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
STAR STAR O	Lowest	8.23	THE OF THE STIME	of the still as
GFSK	Middle	8.26	20.97	Pass
	Highest	8.24	of testing and a content	Still of State
Star of K	Lowest	10.53	of the star of	All Stand of S
π/4-DQPSK	Middle	10.44	20.97	Pass
of the ter the	Highest	10.38	Still a contraction	NO OCT TEST TING
	Lowest	° (11,31 ° °	the time of the le	
8-DPSK	Middle	11.03	20.97	Pass
Har I'm G G	Highest	11.08	o of the time o	of the time of a

Output Power:

Power NVNT 1-DH5 2402MHz Ant1

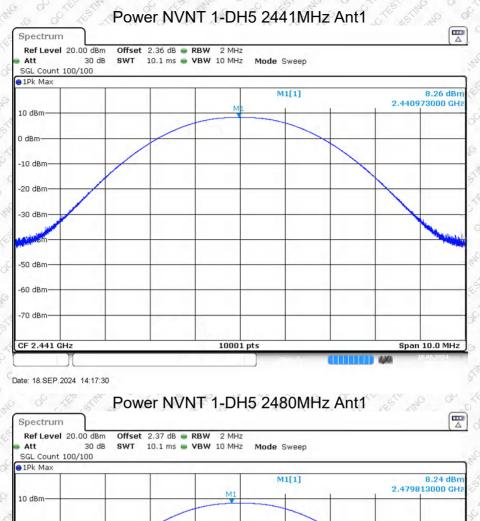


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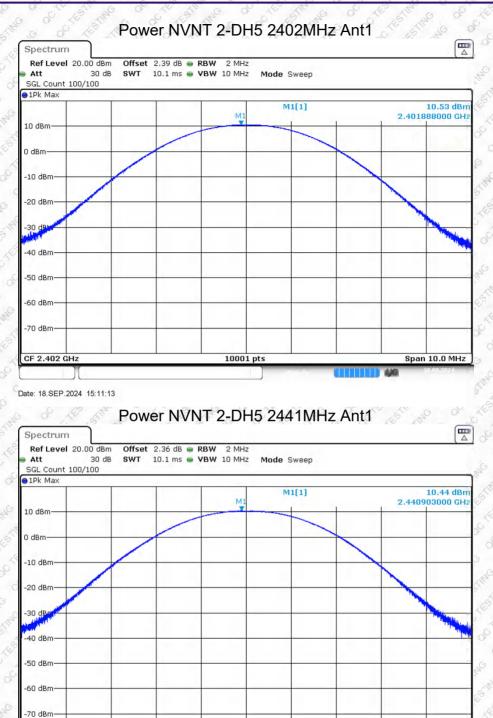


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Date: 18.SEP.2024 15:17:35

CF 2.441 GHz

Report No.: QCT24IR-2121E-01

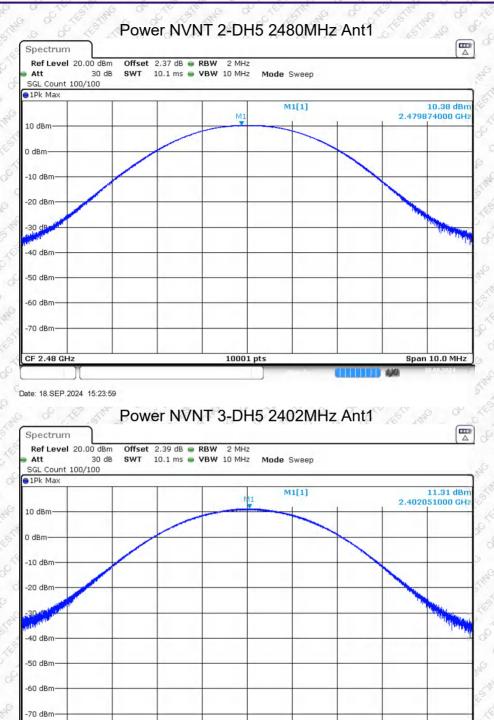
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Span 10.0 MHz

Address: East of 1/F., Building E, Xinghong Science Park, No.111, Shuiku Road, Fenghuanggang, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China Tel: 0755-23008269 Fax: 0755-23726780 www.qctest.com.cn

10001 pts





Date: 18.SEP.2024 15:43:05

CF 2.402 GHz

Report No.: QCT24IR-2121E-01

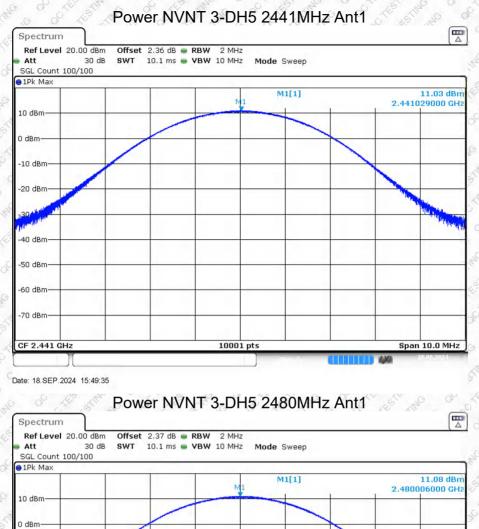
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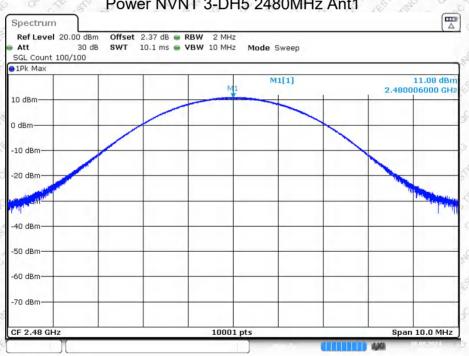
Span 10.0 MHz

Address: East of 1/F., Building E, Xinghong Science Park, No.111, Shuiku Road, Fenghuanggang, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China Tel: 0755-23008269 Fax: 0755-23726780 www.qctest.com.cn

10001 pts







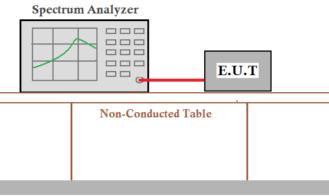
Date: 18.SEP.2024 15:55:58

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7. 20dB Emission Bandwidth

- 7.1 Applicable Standard FCC Part15 C Section 15.247 (a)(1)
- 7.2 Limit
 - N/A
- 7.3 Test setup



Ground Reference Plane

7.4 Test Procedure

The following conditions shall be observed for measuring the occupied bandwidth and x dB bandwidth: • The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

• The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.

• The detector of the spectrum analyzer shall be set to "Sample". However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or "Max Hold") may be necessary to determine the occupied / x dB bandwidth if the device is not transmitting continuously.

• The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.

Note: It may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.

For the 99% emission bandwidth, the trace data points are recovered and directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99% emission bandwidth).

7.5 Test Data

Temperature	23 °C 0 0	Humidity	51 %
ATM Pressure	101kPa	Antenna Gain	-1dBi
Test by	LBili & Contant	Test result	PASS

Please refer to following table and plots.



	20dB Er	nission Bandwidth (I	MHz)	Deput
Test CH	GFSK	π/4-DQPSK	8-DPSK	Result
Lowest	0.955	o 1.333	1.312	The stine of of
Middle	0.953	1.334	1.314	Pass
Highest	0.954	1.334	1.314	a a de la la

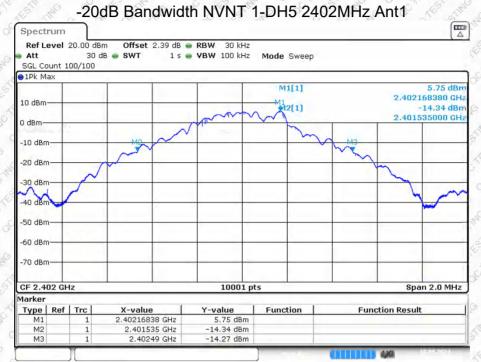
Measurement Data

Test CH	99% O	ccupy Bandwidth (M	lHz)	Decult
	GFSK	π/4-DQPSK	8-DPSK	Result
Lowest	0.879	ି ^{(ମ} .196 ି	A 1.19 A	China Contraction
Middle	0.871	ی ۲.196 ^{مر}	1.191	Pass
Highest	۵.871 ۵ A	51 6 1.194 S	1.19 No. 6	a ter ter the a

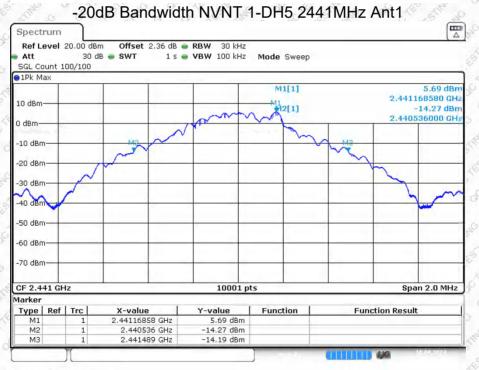
Report No.: QCT24IR-2121E-01



-20dB Bandwidth:



Date: 18.SEP.2024 14:49:04

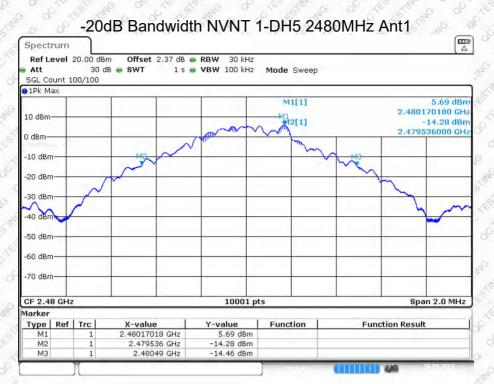


Date: 18,SEP.2024 14:40:41

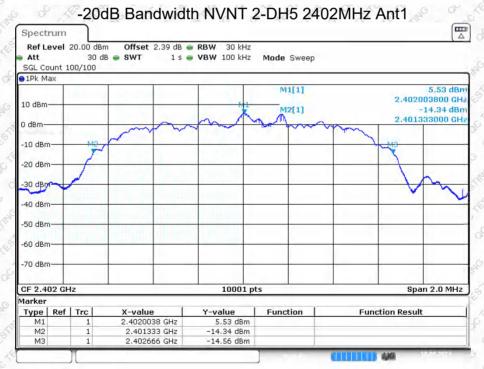
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Date: 18.SEP.2024 14:32:27

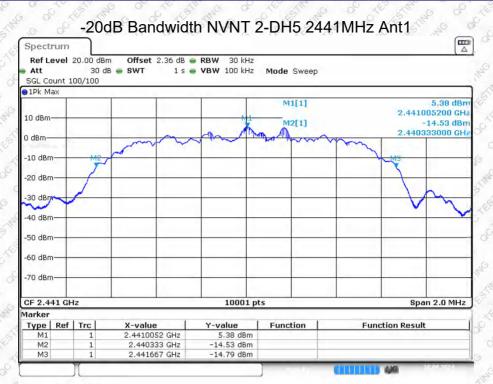


Date: 18.SEP.2024 15:14:54

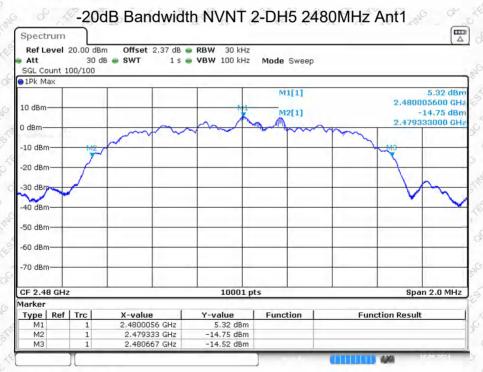
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Date: 18,SEP.2024 15:21:18

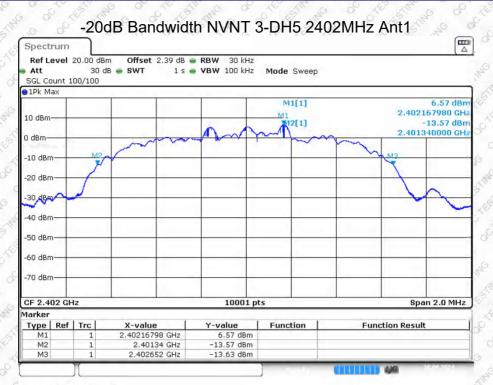


Date: 18,SEP.2024 15:35:17

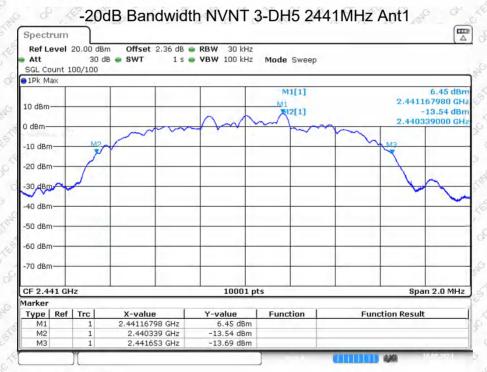
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Date: 18,SEP.2024 15:46:49

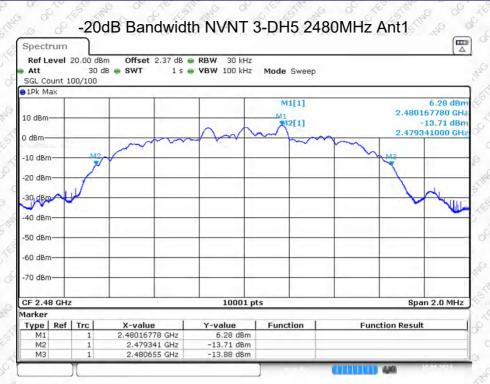


Date: 18.SEP.2024 15:53:20

Report No.: QCT24IR-2121E-01

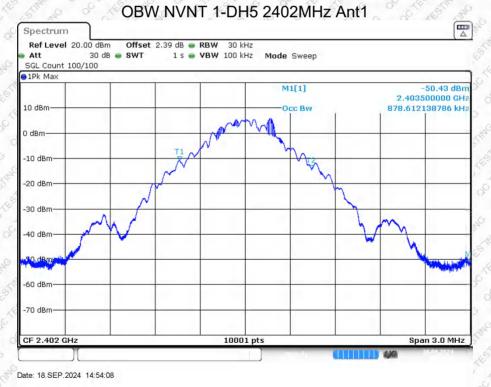
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Date: 18,SEP.2024 15:59:41

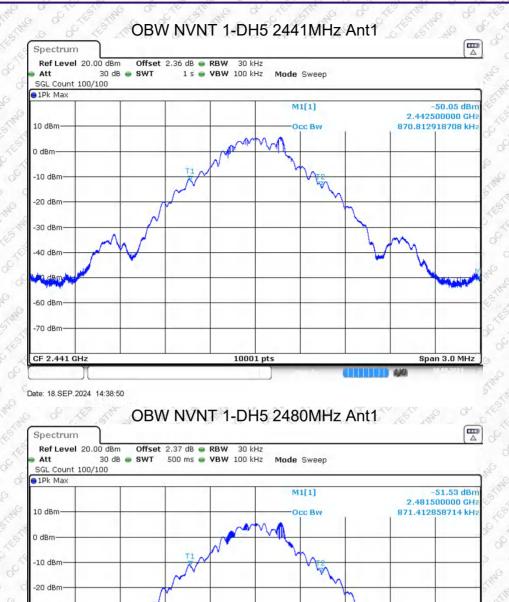
99% Occupied Bandwidth:



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- dBm dBm

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-30 dBm-

-60 dBm -70 dBm

CF 2.48 GHz

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-Uub

Span 3.0 MHz

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10001 pts





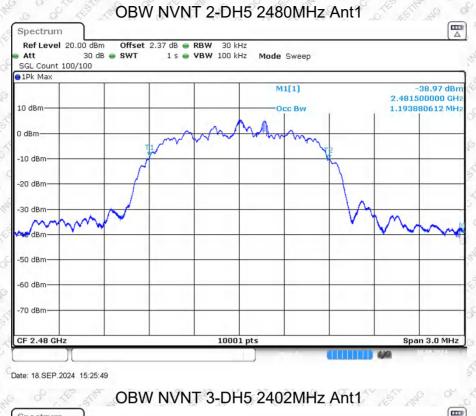
-30 dBm -40 dBm -50 dBm -60 dBm -70 dBm Span 3.0 MHz CF 2.441 GHz 10001 pts

Date: 18.SEP.2024 15:19:26

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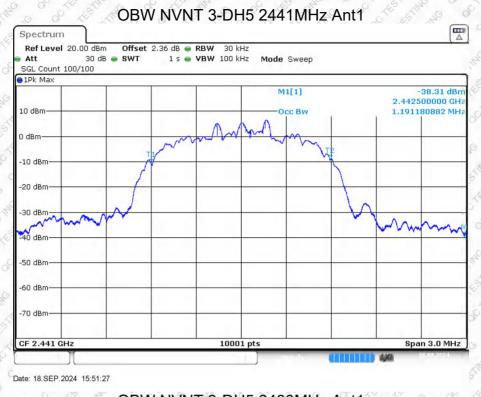




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OBW NVNT 3-DH5 2480MHz Ant1 Spectrum Offset 2.37 dB @ RBW 30 kHz Ref Level 20.00 dBm 1 s 👄 VBW 100 kHz Att 30 dB 👄 SWT Mode Sweep SGL Count 100/100 O 1Pk Max M1[1] 38.85 dBn 2.481500000 GH 10 dBm 1.189981002 MH Occ Bw 0 dBm -10 dBm -20 dBm -30 dBm 40 dBm -50 dBm--60 dBm -70 dBm Span 3.0 MHz CF 2.48 GHz 10001 pts

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Address: East of 1/F., Building E, Xinghong Science Park, No.111, Shuiku Road, Fenghuanggang, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China Tel: 0755-23008269 Fax: 0755-23726780 www.qctest.com.cn

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8. Carrier Frequencies Separation

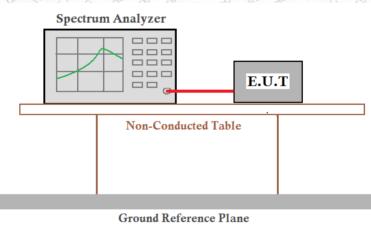
8.1 Applicable Standard

FCC Part15 C Section 15.247 (a)(1)

8.2 Limit

Frequency hopping systems shall have hoping 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. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

8.3 Test setup



8.4 Test Procedure

- 1. Set the EUT in transmitting mode, max hold the channel.
- 2. Set the adjacent channel of the EUT and max hold another trace.
- 3. Measure the channel separation.

8.5 Test Data

Temperature	23 °C° of 510 00 00	Humidity	51 %
ATM Pressure	101kPa	Antenna Gain	-1dBi
Test by	LBi Li	Test result	PASS

Please refer to following table and plots.

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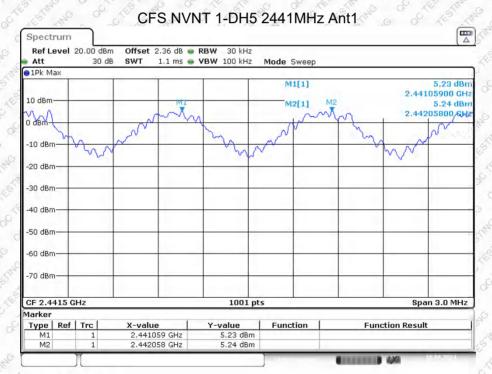


Mode	Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
GFSK	Middle	0.999	635.33	Pass
π/4-DQPSK	Middle	5 8 1.167 8 8 1	888.67	Pass
8-DPSK	Middle	A 1.17 . S	874.67	Pass

E	Mode	20dB bandwidth (kHz)	Limit (kHz)	
		(worse case)	(Carrier Frequencies Separation)	
0	GFSK	0.953 6 8	635.33	
0	π/4-DQPSK	1.333	888.67	
1	8-DPSK	8 X 1.312	874.67	

Note: According to section 7.5

Limit = (2/3) * 20 dB bandwidth

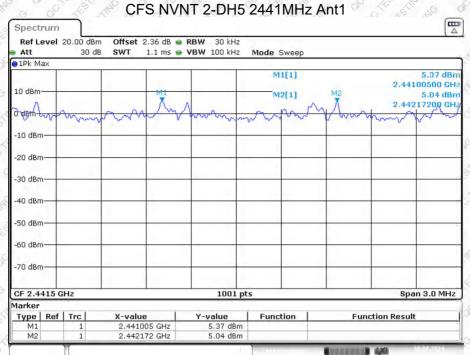


Date: 18.SEP.2024 14:56:06

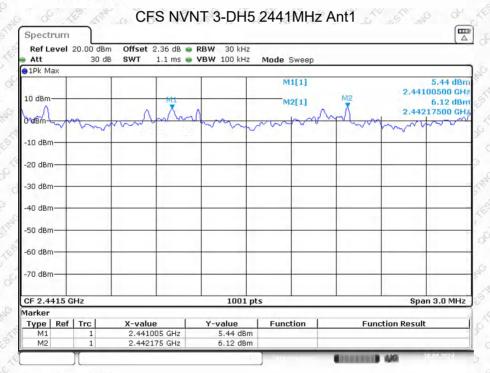
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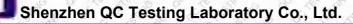


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9. Hopping Channel Number

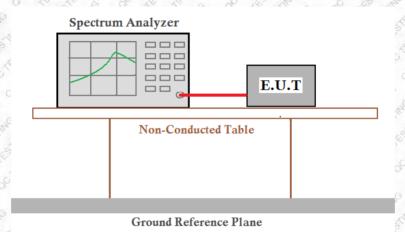
9.1 Applicable Standard

FCC Part15 C Section 15.247 (a) (1) (iii)

9.2 Limit

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

9.3 Test setup



9.4 Test Procedure

- 1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
- 2. Set the EUT in hopping mode from first channel to last.
- 3. By using the max-hold function record the quantity of the channel.
- 9.5 Test Data

2	Temperature	23 °C	Humidity	51 %
9	ATM Pressure	101kPa	Antenna Gain	-1dBi
ŝ	Test by		Test result	PASS

Please refer to following table and plots.

Measurement Data:

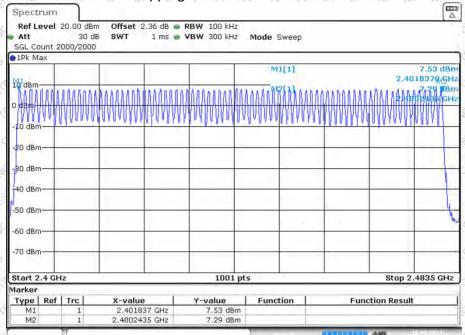
Mode	Hopping channel numbers	Limit	Result
GFSK S	0 10 5 Th 79 8 10 1	6 6 A 15 6 6	Pass
π/4-DQPSK	S & \$ 79 S & \$	11° ° ° 15,5° m	Pass
8-DPSK	79 10 00	Star 15 the Star	Pass

Report No.: QCT24IR-2121E-01

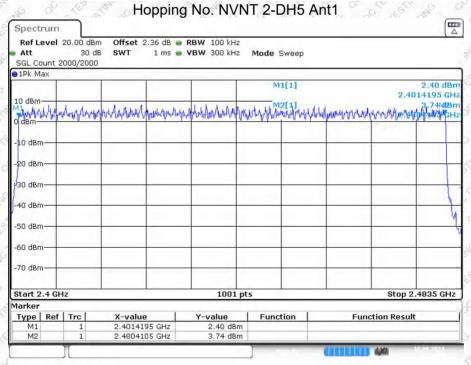
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Date: 18.SEP.2024 14:56:14



Date: 18,SEP.2024 15:05:35

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Att		0.00 dBm 30 dB 000/2000			RBW 100 kH VBW 300 kH		Sweep			
10 dBm-		yloudynmu	Whendyanalan	within	Alfrah har when he		11[1] 12[1] MMM/M/W	Whenthematry		1.19 dBn 14195 GH 4.34 ¹ 0Bn 199940 GH
-10 dBm										
-20 dBm	_	_		-			_			
30 dBm	+	-						-		
-40 dBm	+	-						-		
-50 dBm	+							-		1
-60 dBm	+	-								
-70 dBm	-	-								
Start 2.	4 GH	z			1001	pts	1		Stop 2	.4835 GHz
1arker				-	Y-value	Fund	tion	Fun	ction Result	
Type M1 M2	Ret	Trc 1	2.4014195 2.480494		1.19 dE 4.34 dE	m		Fun	ction Result	

Hopping No. NIV/NT 3-DH5 Apt1

Date: 18.SEP.2024 15:40:15

Report No.: QCT24IR-2121E-01

10. Dwell Time

10.1 Applicable Standard

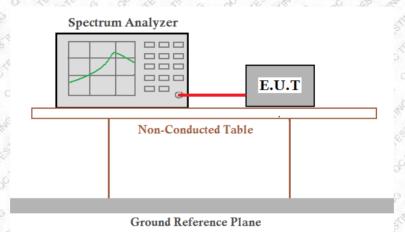
FCC Part15 C Section 15.247 (a)(1)(iii)

10.2 Limit

ec

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

10.3 Test setup



10.4 Test Data

Temperature	23 °C	Humidity	51 %
ATM Pressure	101kPa	Antenna Gain	(-1dBi) A A
Test by	d'Biti no se la	Test result	PASS

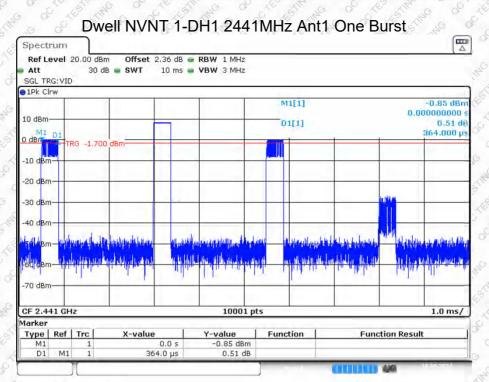
Please refer to following table and plots.

QCT

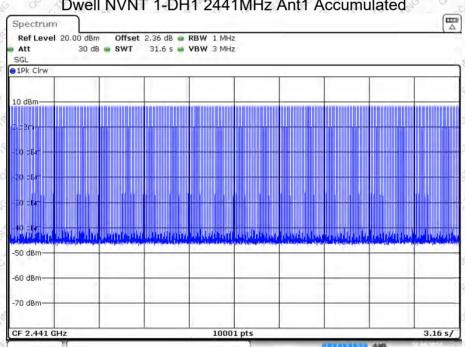
Mode	Channel	Burst Width [ms]	Total Hops [Num]	Result[s]	Limit[s]	Result
DH1	Нор	0.364	319	116.116	<=0.4	PASS
DH3	Hop	1.623	159	258.057	<=0.4	PASS
DH5	Hop	2.871	107 00 0	307.197	<=0.4	PASS
2DH1	Нор	0.365	320	116.8	<=0.4	PASS
2DH3	Hop	1.608	159	255.672	<=0.4	PASS
2DH5	Нор	2.861	107	306.127	<=0.4	PASS
3DH1	Нор	0.241	319	76.879	<=0.4	PASS
3DH3	Hop	1.492	159	237.228	1 ^{m0} <=0.4	PASS
3DH5	Нор	2.742	105	287.91	<=0.4	PASS

Note: The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s.





Date: 18.SEP.2024 14:58:01



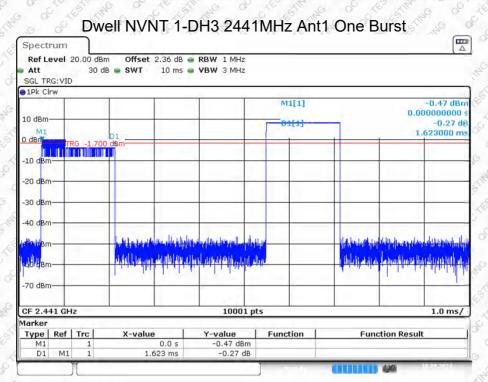
Dwell NVNT 1-DH1 2441MHz Ant1 Accumulated

Date: 18.SEP.2024 14:58:34

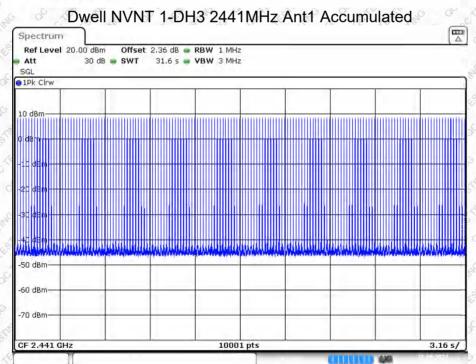
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Report No.: QCT24IR-2121E-01





Date: 18.SEP.2024 14:59:00

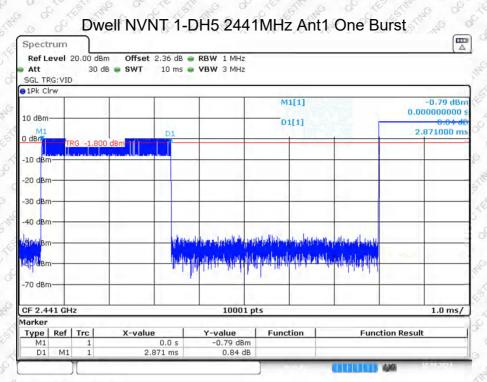


Date: 18.SEP.2024 14:59:33

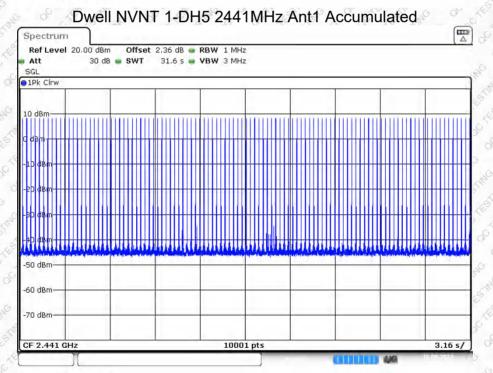
Report No.: QCT24IR-2121E-01

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Date: 18.SEP.2024 14:56:19

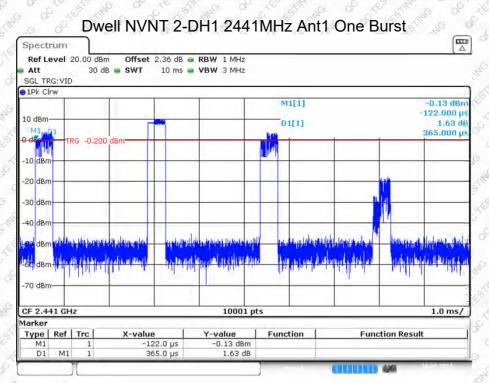


Date: 18.SEP.2024 14:56:52

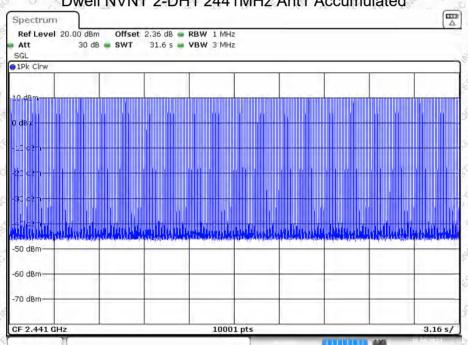
Report No.: QCT24IR-2121E-01

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Date: 18.SEP.2024 15:00:20



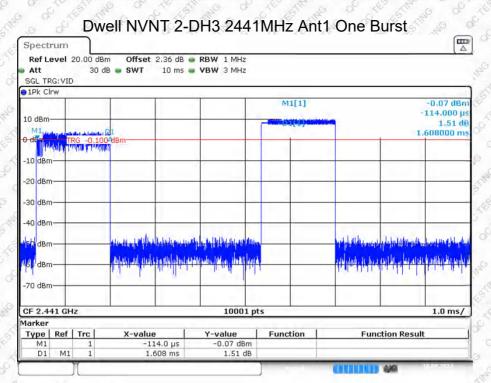
Dwell NVNT 2-DH1 2441MHz Ant1 Accumulated

Date: 18.SEP.2024 15:00:53

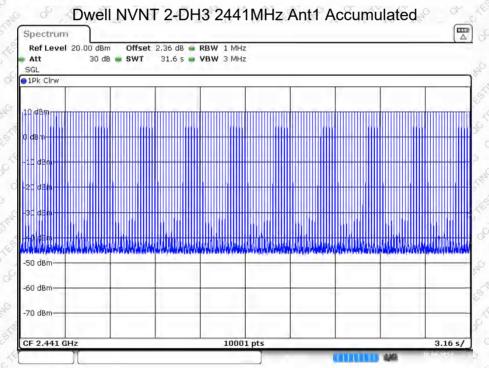
Report No.: QCT24IR-2121E-01

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Date: 18.SEP.2024 15:01:12

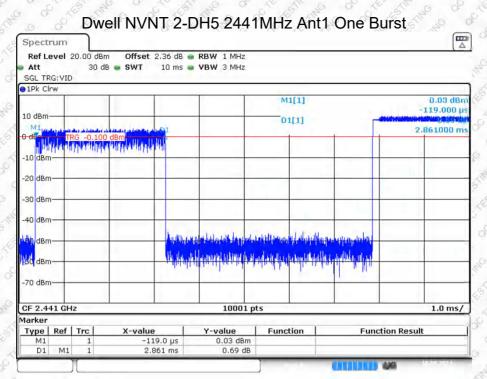


Date: 18.SEP.2024 15:01:45

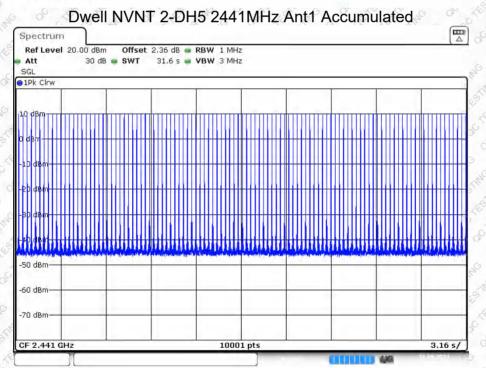
Report No.: QCT24IR-2121E-01

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Date: 18.SEP.2024 15:05:40

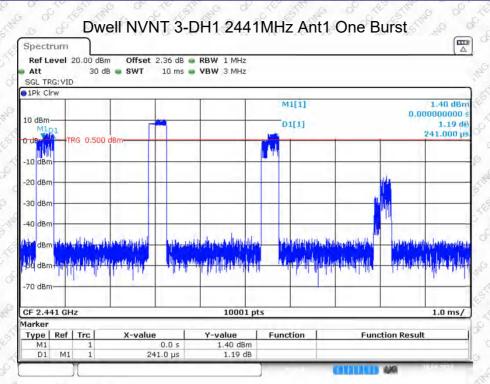


Date: 18,SEP.2024 15:06:13

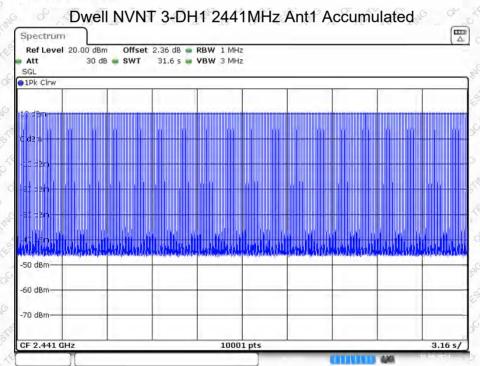
Report No.: QCT24IR-2121E-01

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Date: 18.SEP.2024 15:36:22

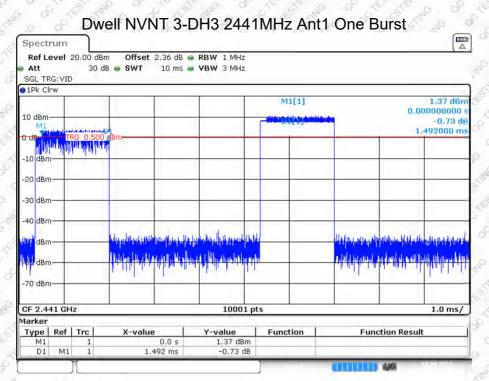


Date: 18,SEP.2024 15:36:54

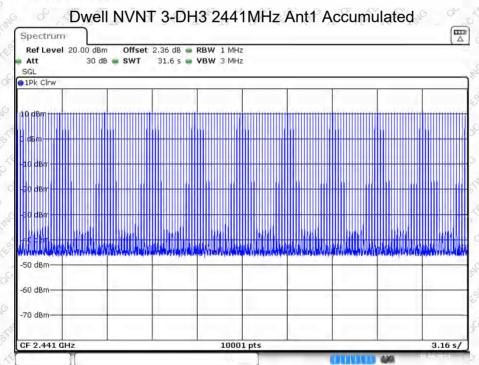
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Report No.: QCT24IR-2121E-01





Date: 18.SEP.2024 15:37:36

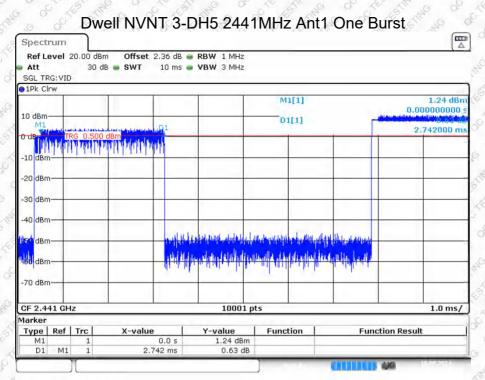


Date: 18.SEP.2024 15:38:09

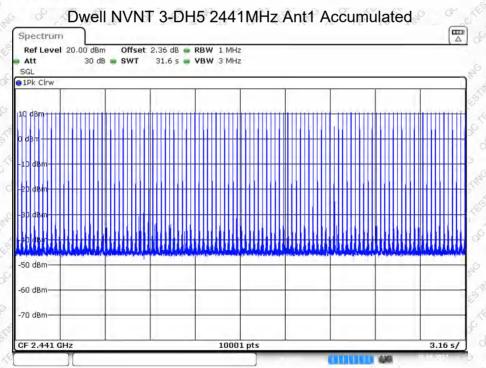
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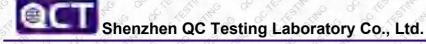
Date: 18.SEP.2024 15:40:21



Date: 18,SEP.2024 15:40:54

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Report No.: QCT24IR-2121E-01

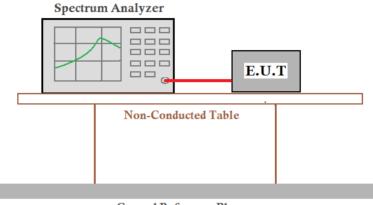


11. Spurious Emission in Non-restricted & restricted Bands

- 11.1 Conducted Emission Method
 - 11.1.1 Applicable Standard
 - FCC Part15 C Section 15.247 (d)
 - 11.1.2 Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

11.1.3 Test setup





- 11.1.4 Test Procedure
 - Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
- Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
- Repeat above procedures until all measured frequencies were complete.

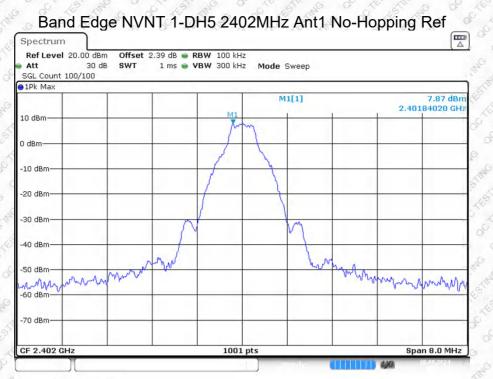
1.1.5 Test Data	AV AN O O AV AN O	S & S & S	Re all a la la la
Temperature	23 °C	Humidity	51 %
ATM Pressure	101kPa	Antenna Gain	-1dBi
Test by	LBiLie	Test result	PASS S S

Please refer to following plots.

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Date: 18.SEP.2024 14:16:43

Band Edge NVNT 1-DH5 2402MHz Ant1 No-Hopping Emission

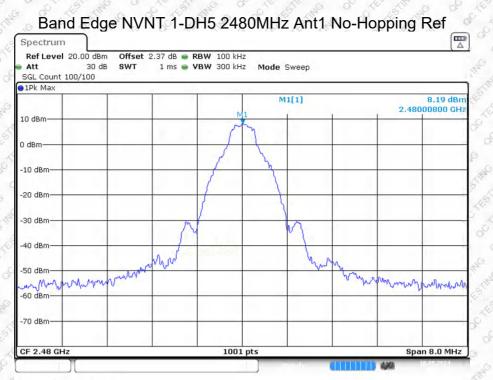
Att SGL Co	unt 1	30 dB 00/100	SWT 1 m	15 - 1	BW 300 kHz	Mode :	Sweep					
∋1Pk Ma	эх	-										
10 dBm·				M1[1] M2[1]					7.86 dB 2.40205000\\$ -52.78 4B 2.40000000 GH			
0 dBm—	-	-				_	1	- E	2.400	100000	PF	
-10 dBm	D	1 -12,130	dBm	_		_		-				
-20 dBm											-	
-30 dBm	-			_		_		-			+	
-40 dBm		-		-		_		-			+	
-50 dBm	-		41	_		_		-	M3	M	M	
-60 dBm	rdurable	(pure-tendrated	www.www.www.www.www.	hendelship	moundermonth	arkinalphad	Humulto	mannanmana	darring allow	Hundrich		
-70 dBm	+	_						_				
Start 2	.306	GHz			1001 p	its			Stop	2.406 (GHz	
1arker												
Type	Ref	Trc	X-value		Y-value	Func	tion	Fun	ction Result	t		
M1		1	2.40205 GH	-	7.86 dBm							
M2		1	2.4 GH	-	-52.78 dBm							
M3		1	2.39 GH 2.3271 GH		-57.70 dBm -54.53 dBm							

Date: 18.SEP.2024 14:16:45

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Date: 18.SEP.2024 14:18:44

Band Edge NVNT 1-DH5 2480MHz Ant1 No-Hopping Emission

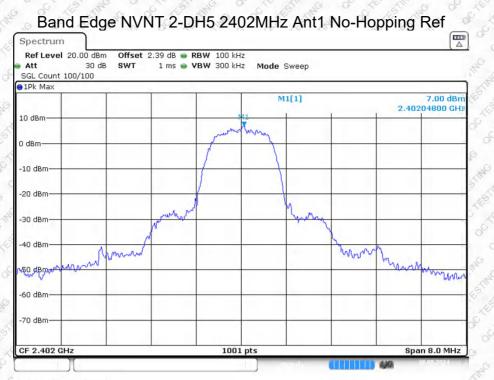
Spectr	um									
Ref Le Att SGL Cou		0.00 dBm 30 dB 0/100			RBW 100 kH VBW 300 kH		Sweep			
1Pk Ma	x									
10 <mark>6</mark> 8m-		M1[1] M2[1]					7.76 dBr 2,48005000 GH -54.61 dBr			
) dBm—	_						1	T.	2.48	3350000 GH
-10 dBm-	D1	-11.809	dBm					_		
-20 cBm-	+	-								
-30 dBm-	+	-						-	-	-
-40 dBm-	+	-		-	-	-		-	-	-
-50 dBm	r T		M3 www.handywww.d	waharaha	uppletantmost	trafitituriation	monut	white	normalizadianess	nikitalikutalin
-70 dBm-	-	_								-
Start 2.	476 G	Hz		-	1001	pts			Stop	2.576 GH
larker				_						
Type	Ref	Trc	X-value	e	Y-value	Fund	tion	F	unction Resu	lt
M1		1	2.480	05 GHz	7.76 dB					
M2		1	2.48	35 GHz	-54.61 dB					
MЗ		1	2	2.5 GHz	-57.60 dB	m				
M4		1	2.48	81 GHz	-52.37 dB	m				

Date: 18.SEP.2024 14:18:45

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Date: 18.SEP.2024 15:14:59

Band Edge NVNT 2-DH5 2402MHz Ant1 No-Hopping Emission

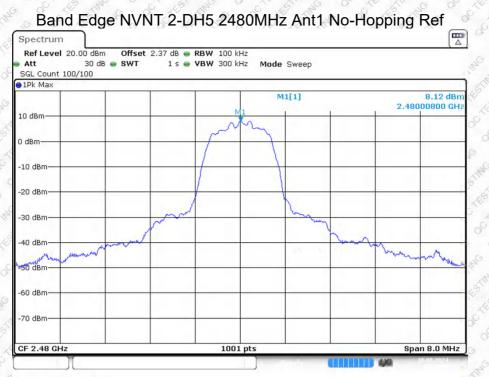
Ref Le Att		0.00 dBr 30 di			RBW 100 kHz VBW 300 kHz		Sweep				
SGL Co		0/100									_
1Pk Ma	X										
10 dBm-	-	_		-			1[1]	8.00 dBr 2.40205000 GH -42.12 Br			
0 dBm—	-	-		-			t.	Ē	2,40	000000	3H
-10 dBm		10.000		_		1		_			
-20 dBm		12.998	abm	_							
-30 dBm	-	-		-	-	_		-	-		4
-40 dBm	-	-		-	-	-		-		MP	ł
-50 dBm	_	_					-	-	M4 _{M3}	- AN	
-60 dem	urrowt	onorthere	which have been been been been been been been be	paliphonent	nouwhaltyphier	ylas produces for	Annahmon	manificeration	andhudowshi	Nr.	
-70 dBm	+	10		1.1				- d.736	in Augusta		
Start 2.	306 (Hz		_	1001	pts			Stop	2.406 GH	H;
1arker											
Type				Y-value	Func	tion	Fur	nction Resul	t		
M1		1	2.4020		8.00 dBn						
M2		1		4 GHz	-42.12 dBn						
MЗ		1		9 GHz	-55.25 dBn						_
M4		1	2.387	5 GHz	-53.13 dBn	1					_

Date: 18.SEP.2024 15:15:01

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Date: 18.SEP.2024 15:27:46

Band Edge NVNT 2-DH5 2480MHz Ant1 No-Hopping Emission

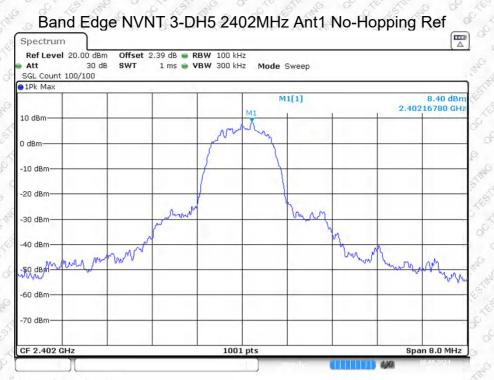
Spect	rum										
Att	evel 20.00 3 junt 100/10	30 dB 🕳 S1		 RBW 100 kHz VBW 300 kHz 		weep					
1Pk M	ax	-									
10 gBm 0 dBm-	_				M1[2			8.13 dBi 2,48005000 GH -44.64 dBi 2.48350000 GH		
-10 cBn	D1 -11	.881 dBm-		-							
-20 dBm	1										
-30 dBn	ı <u> </u>	-	_								
-90 dBN -50 dBn	ne	MB	-								
-60 dBn		when an	loubrether and the second second with	rtsplote-termine-regard	Manalohonikananolinak	altriante-fortune-	www.womman.work	of the property of the second s	augunearlifwalgele		
-70 dBn						-	-				
Start 2	.476 GHz			1001 p	its	-		Stop :	2.576 GHz		
larker											
Type	Ref Trc	X-	value	Y-value	Functio	on	Fund	ction Result			
M1	1		2.48005 GHz	8.13 dBm							
M2	1		2.4835 GHz	-44.64 dBm							
MЗ	1		2.5 GHz	-55.19 dBm							
M4	1		2.4835 GHz	-44.64 dBm		_					
_	1						CETTOTE	440	200,2021		

Date: 18.SEP.2024 15:29:32

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Date: 18.SEP.2024 15:46:55

Band Edge NVNT 3-DH5 2402MHz Ant1 No-Hopping Emission

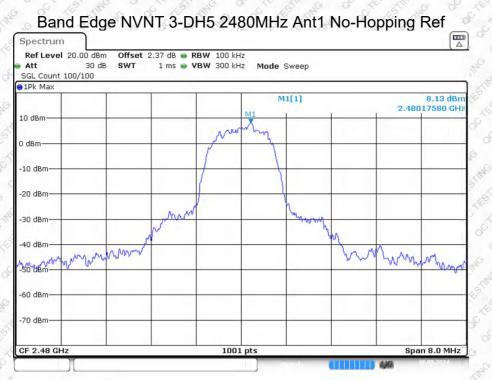
D1Pk M		00/100						
JIPK IVI	эx	_					1	
10 dBm		-			M1[1] M2[1]	8.18 dBm 2.40185000 ¹ GH -43.66 / Bm		
0 dBm—	-			-	(E.	2.4000000 GH	
-10 dBm	ш р	1 -11,604	dBm			-		
-20 dBm	-							
-30 dBm	+						+	
-40 dBm	-	-				_	MP)	
-50 dBm	-	_					page par	
-60 dBm	nunan.	belaunanalistin	drocametracionalisma	ware more to burge of	variations	wanter which	much line mallade the	
-70 dBm	+	-	123 ⁶			-		
Start 2	.306 (GHz		1001 p	ts		Stop 2.406 GHz	
1arker								
Туре	Ref	Trc	X-value	Y-value	Function	Fun	ction Result	
M1	_	1	2.40185 GHz	8.18 dBm				
M2		1	2.4 GHz	-43.66 dBm				
M3	_	1	2.39 GHz 2.3888 GHz	-57.82 dBm -54.03 dBm				

Date: 18.SEP.2024 15:46:57

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Date: 18.SEP.2024 15:59:46

Band Edge NVNT 3-DH5 2480MHz Ant1 No-Hopping Emission

Ref Level 20.00 dBm Offset 2.37 dB = RBW 100 kHz 1 ms 🖷 VBW 300 kHz Att 30 dB SWT Mode Sweep SGL Count 100/100 01Pk Max M1[1] 7.98 dBr 2,48015000 GH 10 dBn M2[1] 44.64 dBn 2.48350000 GH 0 dB -10 cBm D1 -11.874 dBm -20 dBm 30 dan -40 dBm -50 dBm 4 Mercudton MB perspective which the de Muhantert elabored hand MARAMA WAMPANAMA -companyation -60 dBm -70 dBm Stop 2.576 GHz Start 2.476 GHz 1001 pts Marker Type | Ref | Trc X-value Y-value Function **Function Result** 2.48015 GHz 7.98 dBm -44.64 dBm M2 2.4835 GHz 2.5 GHz -58.20 dBm МЗ M4 2.4835 GHz -44.64 dBm

Date: 18.SEP.2024 15:59:48

0

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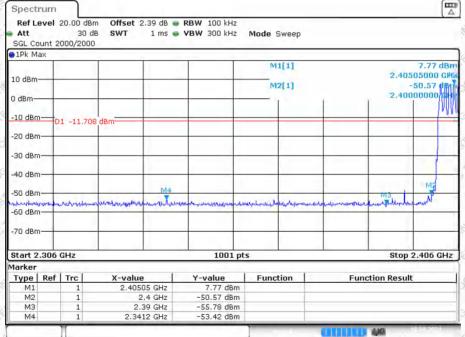




Band Edge(Hopping) NVNT 1-DH5 2402MHz Ant1 Hopping Ref

Date: 18.SEP.2024 14:55:18

Band Edge(Hopping) NVNT 1-DH5 2402MHz Ant1 Hopping Emission



Date: 18.SEP.2024 14:55:28

the time of the

Report No.: QCT24IR-2121E-01

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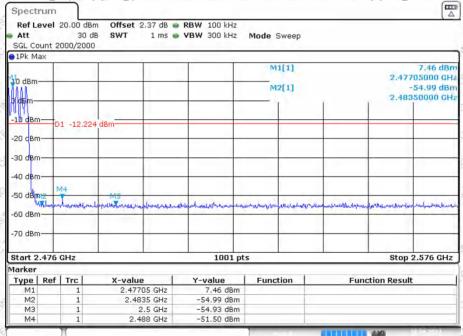


Band Edge(Hopping) NVNT 1-DH5 2480MHz Ant1 Hopping Ref



CDate: 18.SEP.2024 14:57:05

Band Edge(Hopping) NVNT 1-DH5 2480MHz Ant1 Hopping Emission

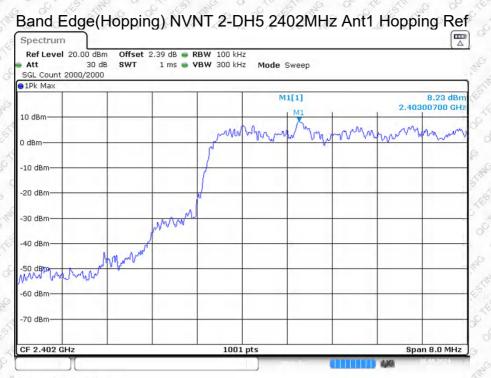


Date: 18.SEP.2024 14:57:10

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Date: 18.SEP.2024 15:04:39

Band Edge(Hopping) NVNT 2-DH5 2402MHz Ant1 Hopping Emission

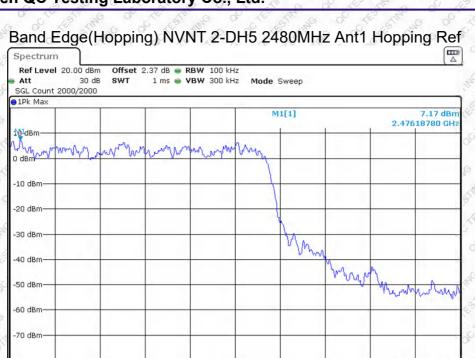
Att		20.00 dBr 30 d	B SWT		RBW 100 kHz VBW 300 kHz	Mode	Sweep				
SGL Co		000/2000)	_	_						
10 dBm-							1[1]		8.29 dBr 2,40515000 GA -43,13 dBr 2,4000000 GA		
-10 dBm		1 -11.76	5.dBm	<u> </u>						1 1	
-20 dBm	-			-				_	-		
-30 dBm	_		-	-					-		
-40 dBm	-		-	-				_		M2	
-50 dBm	_					M4		-	MB	1	
-60 dBm	well market	Antonional	- formular balance from	within the last water	erenspeadened we were apply	welderautu	handropped	returningermation.	when when the second	-topologica	
-70 dBm	+	-		-		_		-	+		
Start 2	.306 (GHz			1001 μ	ots			Stop	2.406 GHz	
larker											
				Y-value	Fund	tion	Fu	nction Resu	lt		
M1 M2		1		515 GHz	8.29 dBm -43.13 dBm						
M3		1		2.4 GHz .39 GHz	-43.13 dBm -55.30 dBm						
M4		1		518 GHz	-52.44 dBm						

Date: 18.SEP.2024 15:04:49

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CDate: 18.SEP.2024 15:07:52

CF 2.48 GHz

Band Edge(Hopping) NVNT 2-DH5 2480MHz Ant1 Hopping Emission

1001 pts

Span 8.0 MHz

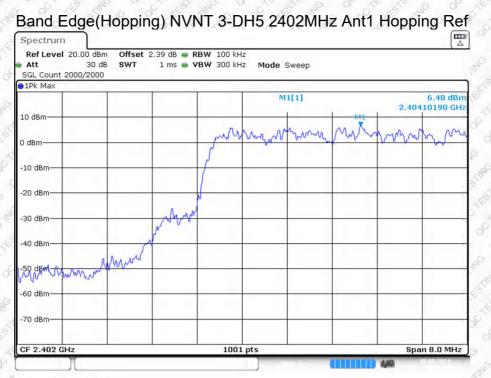
Att		0.00 dBn 30 dB 00/2000	SWT		RBW 100 kHz VBW 300 kHz	Mode	Sweep			
DIPk Ma		50/2000								
10 dBm-							1[1]	6.71 dBn 2.47705000 GH -51.19 dBn 2.48350000 GH		
-10 cBm		-12.826	dDate							
-20 dBm		-12.820	UBII							
-30 d8m	-	-						_		
-40 dBm		-			-			-	-	
-50 dBr	124 White	d	MO		all and a start and a start				a a fa ca i ca	Col. Docum
-60 dBm		- manufacture	adread fried	www.www.	and the second	- have an allow	produt dans		an and the second se	- management
-70 dBm	-	-						-	-	
Start 2	.476 GI	Hz		-	1001	ots			Stop	2.576 GHz
Marker										
Type	Ref	f Trc X-value			Y-value	Func	tion	Fu	nction Result	
M1		1 2.47705 GHz		6.71 dBm			1			
M2		1		35 GHz	-51.19 dBm					
M3		1		.5 GHz	-54.70 dBm					

Date: 18.SEP.2024 15:07:57

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CDate: 18.SEP.2024 15:39:12

Band Edge(Hopping) NVNT 3-DH5 2402MHz Ant1 Hopping Emission

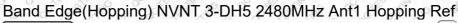
Att		20.00 dBr 30 d	B SWT		RBW 100 kHz VBW 300 kHz	Mode S	weep			
SGL Co		000/2000)			-	_			
10 dBm-						M1 M2		8.08 dBr 2.40505000 GH -46.97 dB 2.40000000 GH		
-10 dBm	_							-		
-20 dBm		1 -13.52	2 dBm-					-		
-30 dBm	+			-			_	-		- M
-40 dBm	-						-	+		M2:
-50 dBm	Auguraus	unbrough	M4	Rosen restrictions	ens have been and a part	M. Michaeling	aunadura	Mellowelensing	M3	with the
-60 dBm -70 dBm										
Start 2		0113			1001 g	at c			Pton	2.406 GHz
Marker	.300	GHZ			1001				otop	2.400 GH2
	Ref	Trc	X-valu	e	Y-value	Functi	ion	Fun	ction Resu	lt
M1		1	2.405	05 GHz	8.08 dBm					
M2		1		2.4 GHz	-46.97 dBm					
M3 M4		1		.39 GHz	-55.95 dBm -53.26 dBm					

Date: 18.SEP.2024 15:39:23

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CDate: 18.SEP.2024 15:41:11

Band Edge(Hopping) NVNT 3-DH5 2480MHz Ant1 Hopping Emission

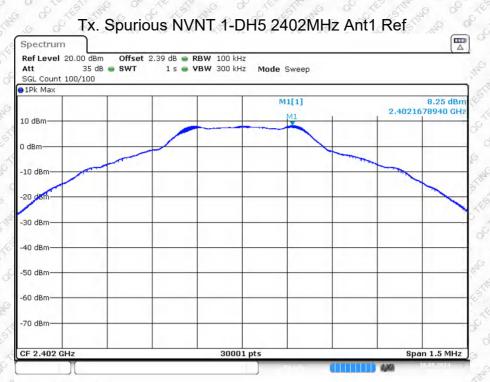
Ref Le	vel	20.00 dBr 30 d			RBW 100 kHz VBW 300 kHz	Mode	Cuinen		
	unt 2	000/2000		1 1115	VEW SOU KHZ	Moue	aweeb		
D1Pk Ma	X								
			1			M	1[1]		7.71 dB
0 dBm-	-			-					2.47705000 GH
Anna						M	2[1]		-52.09 dB 2.48350000 GF
0 dBm—	-		-				1	- F	2.48330000 GP
-10 cBm				2		-			
-10 060	-D	1 -12,17	2 dBm						
-20 dBm	_								
-30 dBm	-	-							1 1 1
-40 dBm		_							
	1.0								
-50 dB	~		MS						
	mon	Ash-watny	m. Mus Kursen	minutedraw	whenternetwenterhand	householden	humungh	energy which have the	male benerous the and when we are
-60 dBm		500	1 101 10 100	1					
-70 dBm	_				-	_		_	
Start 2	476	GHz			1001	pts			Stop 2.576 GHz
Marker									
Type	Ref	Trc	X-value		Y-value	Func	tion	Fun	iction Result
M1		1		05 GHz	7.71 dBm				
M2		1		35 GHz	-52.09 dBm				
M3 M4		1		.5 GHz 43 GHz	-55.49 dBm -51.67 dBm				

Date: 18,SEP.2024 15:41:16

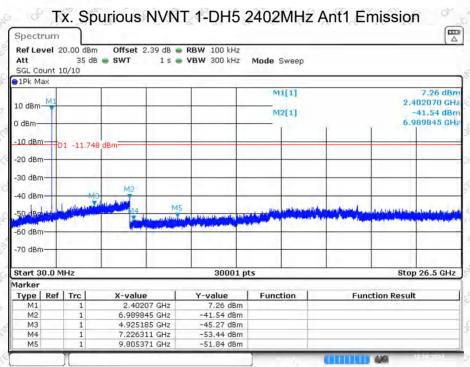
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Date: 18.SEP.2024 14:50:53

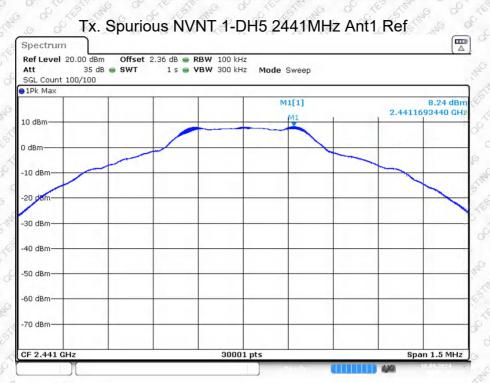


Date: 18,SEP.2024 14:51:13

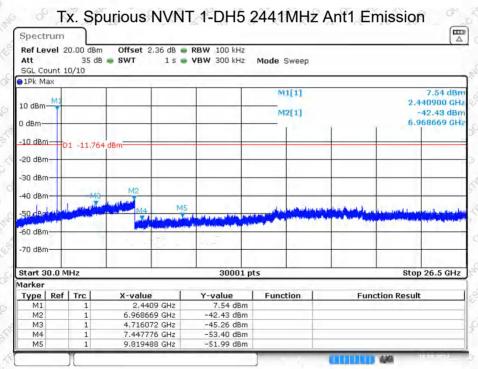
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Date: 18.SEP.2024 14:42:30

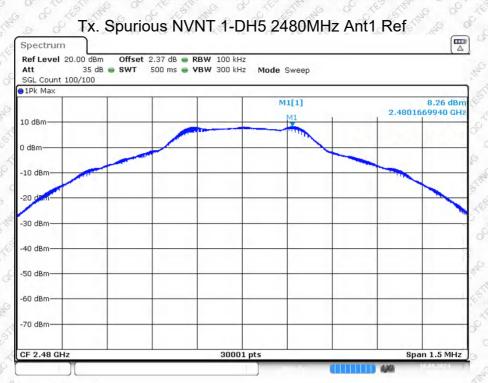


Date: 18.SEP.2024 14:42:49

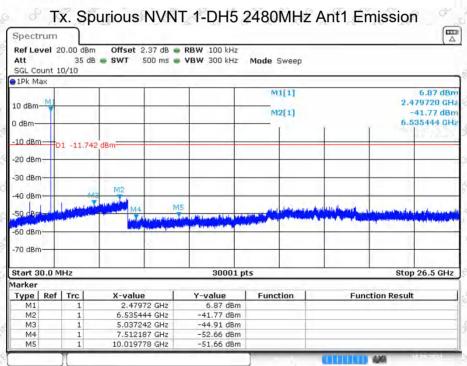
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Date: 18.SEP.2024 14:29:31

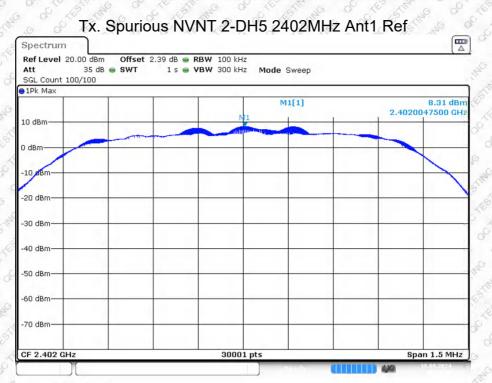


Date: 18.SEP.2024 14:29:45

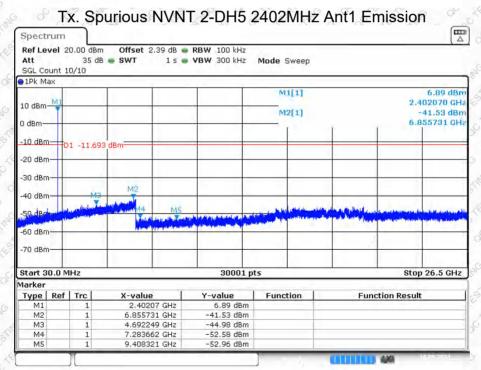
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Date: 18.SEP.2024 15:16:50

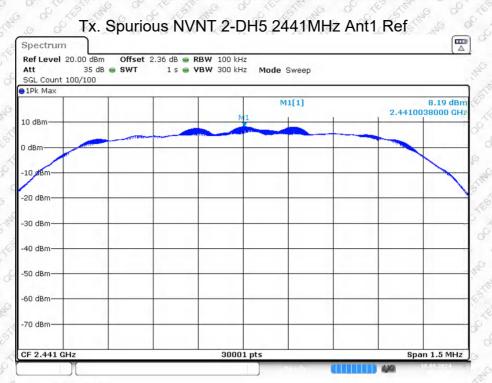


Date: 18.SEP.2024 15:17:10

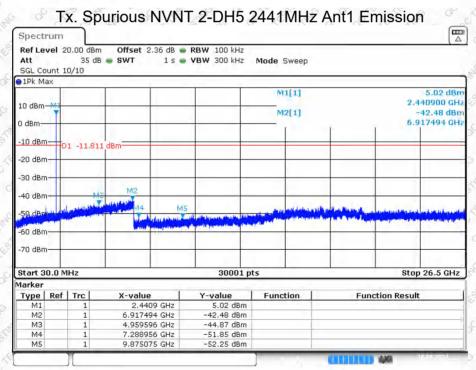
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Date: 18.SEP.2024 15:23:08

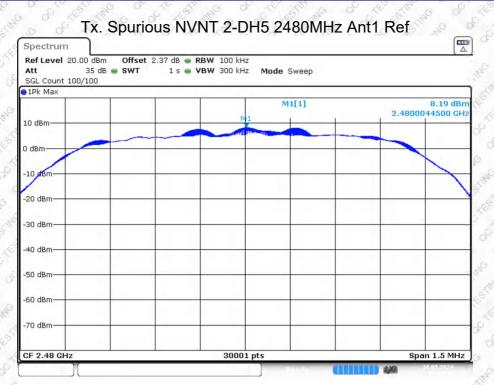


Date: 18.SEP.2024 15:23:28

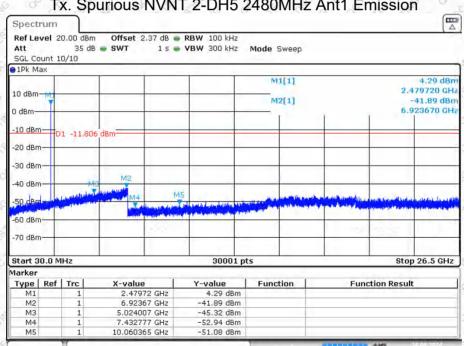
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Date: 18.SEP.2024 15:31:21



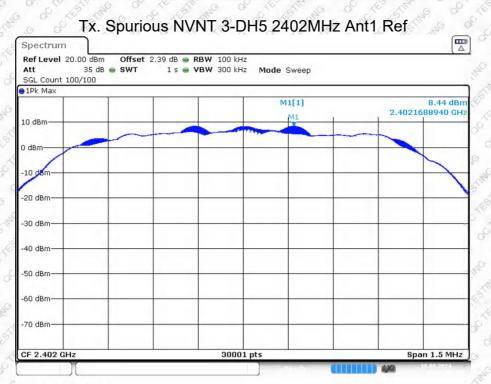
Tx. Spurious NVNT 2-DH5 2480MHz Ant1 Emission

Date: 18.SEP.2024 15:31:41

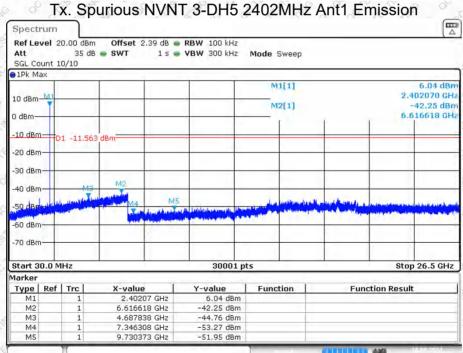
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Date: 18.SEP.2024 15:48:47

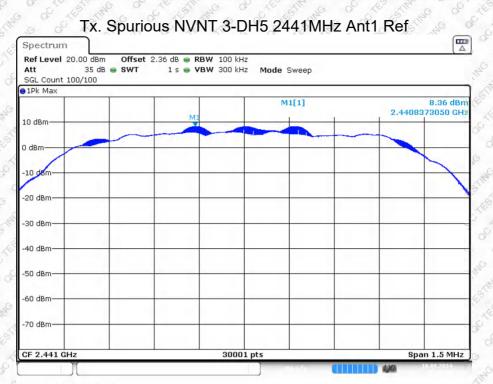


Date: 18.SEP.2024 15:49:07

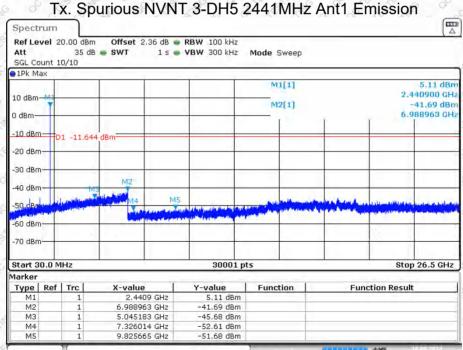
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Date: 18.SEP.2024 15:55:11

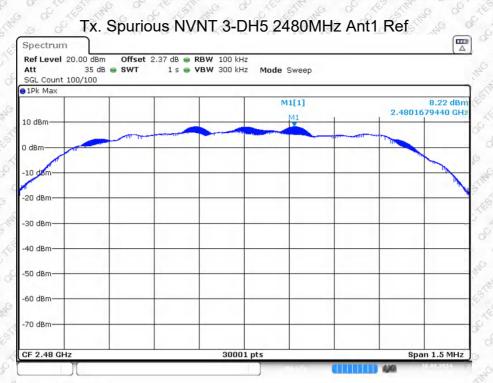


Date: 18.SEP.2024 15:55:31

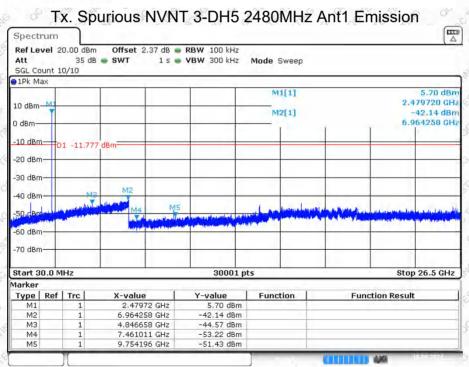
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Date: 18.SEP.2024 16:01:39



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- 11.2 Radiated Emission Method
 - 11.2.1 Applicable Standard

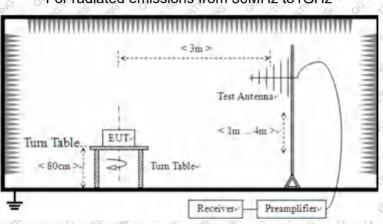
FCC Part15 C Section 15.209 and 15.205

11.2.2 Limit

Frequency	Field Strengths Limits (µV/m at 3 m)	Field Strengths Limits (dBµV/m at 3 m)	Remark		
30 - 88	° ~ 100° ° ~	40.0	Quasi-peak		
88 – 216	150	43.5	Quasi-peak		
216 – 960	5 200 C 1	46.0	Quasi-peak		
Above 960	12 500 Sta	54.0	Quasi-peak		
Above 1GHz		54.0	Peak Peak		
ADOVE IGHZ	o of the star o of	74.0	Average		

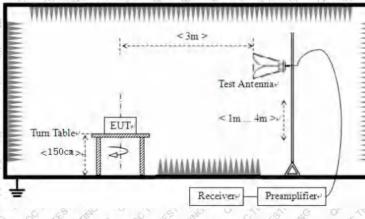
Note: dBµV/m =20log(µV/m)

11.2.3 Test setup



For radiated emissions from 30MHz to1GHz

For radiated emissions from above 1GHz



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RBW IF B/W Frequency VBW Measurement 30 MHz - 1000 MHz 100 kHz 300 kHz 120 kHz QP 3 MHz 1 MHz Peak Above 1 GHz 1 MHz 10 Hz Average

11.2.4 EMI Test Receiver Setup

11.2.5 Test procedure

The EUT was placed on the top of a rotating table (0.8m for below 1G and 1.5m for above 1G) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.

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

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

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

- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasipeak or average method as specified and then reported in a data sheet.

11.2.6 Test Data

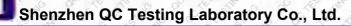
Temperature	26 °C	Humidity	54%
ATM Pressure	101kPa	Antenna Gain	-1dBi
Test by	LBi Li C A A	Test result	PASS

Test voltage: DC 3.7V.

Remarks:

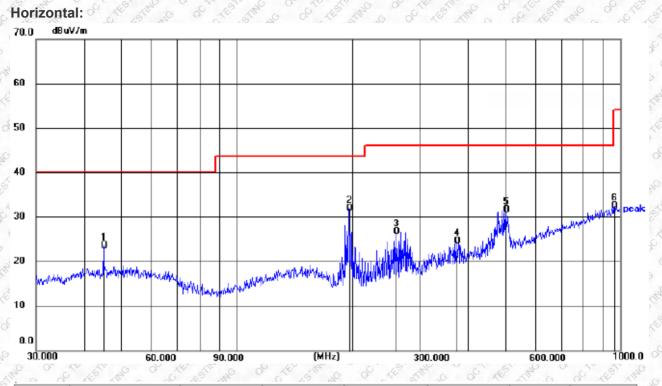
- 1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y- axis which it is worse case.
- 2. The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

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Below 1GHz

Pre-scan all test modes, found worst case at GFSK 2402MHz, and so only show the test result of GFSK 2402MHz.



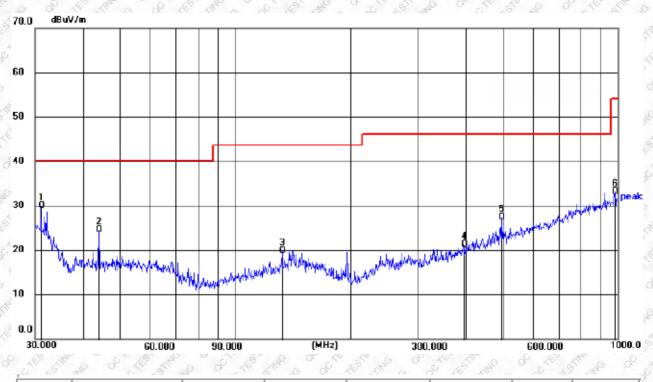
No).	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1		45.0583	8.85	14.72	23.57	40.00	16.43	QP
2	*	195.8218	20.40	11.56	31.96	43.50	11.54	QP
3		260.1444	13.10	13.56	26.66	46.00	19.34	QP
4		375.9384	7.56	17.02	24.58	46.00	21.42	QP
5		501.1789	11.53	20.06	31.59	46.00	14.41	QP
6		965.5420	5.69	26.84	32.53	54.00	21.47	QP

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Vertical:



2 . V.	No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
<	1 *	31.0705	17.36	12.65	30.01	40.00	9.99	QP
4	2	44.1200	10.06	14.53	24.59	40.00	15.41	QP
3	3	132.6850	6.05	13.87	19.92	43.50	23.58	QP
1.0.	4	394.8544	3.81	17.43	21.24	46.00	24.76	QP
C.	5	495.9343	7.86	19.47	27.33	46.00	18.67	QP
>	6	982.6200	6.23	26.85	33.08	54.00	20.92	QP

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Above 1GHz

Pre-scan all test modes, found worst case at GFSK Mode, and so only show the test result of GFSK Mode.

Frequency (MHz)	Read Level (dBµV)	polarization	Factor (dB/m)	Level (dBµV/m)	Limit Line (dBµV/m)	Margin (dB)	Detector
2310	51.70	Still Had of	-11.46	40.24	740	33.76	peak
2310	51.45	E Le Vine	-11.46	39.99	74	34.01	peak
2362.10	64.51	6 CH A	-11.26	53.25	74	20.75	peak
2362.10	56.60	HALL HOUL	-11.26	45.34	54	8.66	AVG
2362	65.66	CO ATV CO	-11.26	54.40	74 0	19.60	peak
2362	56.50	of the stand	-11.26	45.24	54	8.76	AVG
2390	54.10	SH A	-11.16	42.94	6 74	31.06	peak
2390	53.88	Stand of S	-11.16	42.72	6 74	31.28	peak
3602.751	65.07	A H S	-8.41	56.66	74	17.34	peak
3602.751	53.10	O OH ON	-8.41	44.69	54	9.31	AVG
3602.748	60.43	No Vorter	-8.41	52.02	74	21.98	peak
3602.748	54.72	Con Star Con Con	-8.41	46.31	54 %	7.69	AVG
4804	54.40	of the star	-5.98	48.42	574	25.58	peak
4804	53.22	o ov de	-5.98	47.24	74	26.76	peak

Test channel: Lowest channel

Test channel: Middle channel

Frequency (MHz)	Read Level (dBµV)	polarization	Factor (dB/m)	Level (dBµV/m)	Limit Line (dBµV/m)	Margin (dB)	Detector
3661.742	60.87	A H L	-8.38	52.49	74	21.51	peak
3661.724	54.22	Strand of	-8.38	45.84	54	8.16	AVG
3661.724	63.03	Che the man	-8.38	54.65	74	19.35	peak
3661.724	52.48	G GO OF TESTING	-8.38	44.10	54	9.90	AVG
4882	52.75	He He He	-5.71	47.04	74	26.96	peak
4882	52.50	ARTIN CO	-5.71	46.79	74	27.21	peak

Test channel: Highest channel

5	Frequency (MHz)	Read Level (dBµV)	polarization	Factor (dB/m)	Level (dBµV/m)	Limit Line (dBµV/m)	Margin (dB)	Detector
Co x	2483.5	53.92	A HOLES	-10.81	43.11	74 0	30.89	peak

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2 A	0 2 2	6 6	S O N	S 0 0	A AN AN	3 8 28	AN G
2483.5	54.68	NO V 10	-10.81	43.87	74	30.13	peak
2500	54.34	ETHER H OF	-10.75	43.59	74 0	30.41	peak
2500	56.41	and Winne	-10.75	45.66	74	28.34	peak
3720.195	62.22	o He Lan	-8.37	53.85	5 74 JIN	20.15	peak
3720.195	52.74	He He che	-8.37	44.37	54	9.63	AVG
3720.271	61.83	AST V G	-8.37	53.46	5 ¹¹ ,74 °	20.54	peak
3720.271	50.67	St. N. In	-8.37	42.30	54	11.70	AVG
4960	53.27	S B B	-5.45	47.82	~ 74 ST	26.18	peak
4960	55.01	Nº Yº &	-5.45	49.56	· 74	24.44	peak

Remarks:

QCT

- 1. Level =Receiver Read level + Factor
- 2. The emission levels of other frequencies are very lower than the limit and not show in test report.
- 3. If the peak-detected amplitude can be shown to comply with the average limit, then it is not necessary to perform separate average measurement.

--- THE END OF TEST REPORT --

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