

TESTING CENTRE TEC	TEST REPOR	Т		
FCC ID:	2BDNT-PV28			
Test Report No::	TCT240418E030			
Date of issue::	Apr. 25, 2024			
Testing laboratory:	SHENZHEN TONGCE TESTING	G LAB		
Testing location/ address:	2101 & 2201, Zhenchang Factor Fuhai Subdistrict, Bao'an District 518103, People's Republic of Ch	t, Shenzhen, Guangdong		
Applicant's name::	Jiangmen Purevox Science and	Technology Co., Ltd.		
Address::	Floor 3, Building 5, No. 46-1, Xiy Jiangmen, Guangdong, China	ongli, Pengjiang District,		
Manufacturer's name:	Jiangmen Purevox Science and	Technology Co., Ltd.		
Address:	Floor 3, Building 5, No. 46-1, Xiyongli, Pengjiang District, Jiangmen, Guangdong, 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			
Product Name::	MULTI-FUNCTION CAR STERE	EO		
Trade Mark::	N/M	(3)		
Model/Type reference:	Refer to model list of page 3			
Rating(s)::	DC 12V			
Date of receipt of test item ::	Apr. 18, 2024		(0)	
Date (s) of performance of test:	Apr. 18, 2024 ~ Apr. 25, 2024	(c)		
Tested by (+signature):	Onnado YE	Onnado Jaigce	,	
Check by (+signature):	Beryl ZHAO	BoyC TOT	(C)	
Approved by (+signature):	Tomsin	Joms in s		

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1. General Product Information

1.1. EUT description

Product Name:	MULTI-FUNCTION CAR STEREO	
Model/Type reference:	PV28	
Sample Number:	TCT240418E030-0101	
Bluetooth Version:	V4.0	
Operation Frequency:	2402MHz~2480MHz	
Transfer Rate:	1/2/3 Mbits/s	$\langle C \rangle$
Number of Channel:	79	
Modulation Type:	GFSK, π/4-DQPSK, 8DPSK	
Modulation Technology:	FHSS	
Antenna Type:	External Antenna	
Antenna Gain:	-3.74dBi	
Rating(s):	DC 12V	

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

No.	Model No.	Tested with
1	PV28	
Other models	PV29, PV30, PV5540, PV5300A, PV5300L, PV5300, PV5351, PV5368, PV5366, PV5370, PV5000, PV7001, PV7002, PV7003, PV7004, PV7006, PV7007, PV7008, PV7009, PV7010, PV7011, PV7012, PV7018, PV7200, PV7021, PV7023, PV7024, PV7043, PV9000, PV9001, PV9002, PV9003, PV9006, PV9008, PV9009, PV9010, PV9011, PV9012, PV9018, PV9312, PV9319, PV1000, PV1001, PV1002, PV1003, PV1006, PV1008, PV1009, PV1010, PV1011, PV1012, PV1018, PV1101, PV1102, PV1103, PV1106, PV1108, PV1109, PV1110, PV1112, PV1116, PV1118, PV1200, PV1703, PV4005, PV28, RCPA-L224, RUXD-J168	

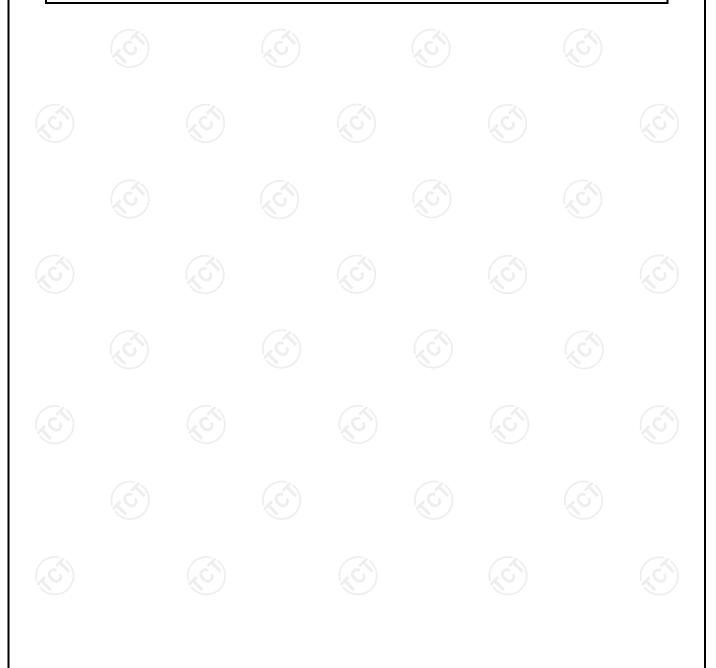
Note: PV28 is tested model, other models are derivative models. The models are identical in circuit and PCB layout, only different on the model names. So the test data of PV28 can represent the remaining models.



1.3. Operation Frequency

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	_ 20	2422MHz	40	2442MHz	60	2462MHz
G)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	- X	-

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





2. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna Requirement	§15.203/§15.247 (c)	PASS
AC Power Line Conducted Emission	§15.207	N/A
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.





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3. General Information

3.1. Test environment and mode

Operating Environment:			
Condition	Radiated Emission		
Temperature:	24.1 °C		
Humidity:	54 % RH		
Atmospheric Pressure:	1010 mbar		
Test Software:			
Software Information:	ADB Command		
Power Level:	Default		
Test Mode:			
Engineering mode: Keep the EUT in continuous transmitting by select channel. The sample was placed 0.8m & 1.5m for the measurement below & above 1G			

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

DH1 DH3 DH5 all have been tested, only worse case DH1 is reported.

3.2. Description of Support Units

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

Equipment	Model No.	Serial No.	FCC ID	Trade Name
/	1	/	/	1

Note:

- 1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
- Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.
- 3. For conducted measurements (Output Power, 20dB Occupied Bandwidth, Carrier Frequencies Separation, Hopping Channel Number, Dwell Time, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.

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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: 2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, 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

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5. Test Results and Measurement Data

5.1. Antenna requirement

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

15.203 requirement:

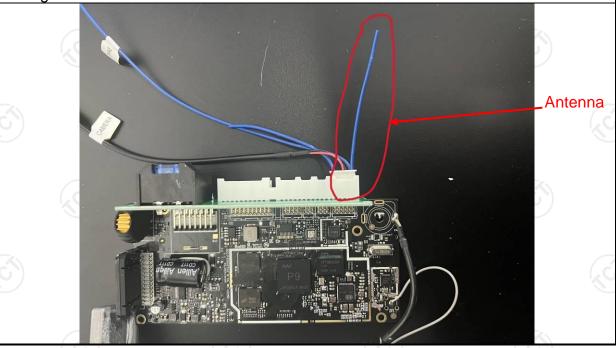
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit 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 external antenna which permanently attached, and the best case gain of the antenna is -3.74dBi.





5.2. Conducted Emission

5.2.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.207			
Test Method:	ANSI C63.10:2013			
Frequency Range:	150 kHz to 30 MHz	150 kHz to 30 MHz		
Receiver setup:	RBW=9 kHz, VBW=30	kHz, Sweep time	e=auto	
Limits:	Frequency range (MHz) 0.15-0.5 0.5-5 5-30	Limit Quasi-peak 66 to 56* 56 60	(dBuV) Average 56 to 46* 46 50	
Test Setup:	Reference Plane 40cm E.U.T AC power Filter AC power Filter AC power EMI Remark E.U.T: Equipment Under Test LISN: Line Impedence Stabilization Network Test table height=0.8m			
Test Mode:	Transmitting Mode			
Test Procedure:	 Transmitting Mode The E.U.T is connected to an adapter 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). 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 C63.10:2013 on conducted measurement. 			
Test Result:	N/A, The EUT is powered by car's power, So not applicable.			



5.3. Conducted Output Power

5.3.1. Test Specification

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

5.3.2. Test Instruments

N.	Name	Manufacturer	Model No.	Serial Number	Calibration Due
	Spectrum Analyzer	Agilent	N9020A	MY49100619	Jun. 28, 2024
	Combiner Box	Ascentest	AT890-RFB	9 1	(6)



5.4. 20dB Occupy Bandwidth

5.4.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)			
Test Method:	KDB 558074 D01 v05r02			
Limit:	N/A			
Test Setup:	Spectrum Analyzer		EUT	
Test Mode:	Transmitting mode with modulation			
Test Procedure:	 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 = mahold. 			The path loss ach I enable the ettings for 20dB e 20 dB annel; n; VBW≥3RBW;
Test Result:	PASS			

5.4.2. Test Instruments

Name	Manufacturer	Model No.	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100619	Jun. 28, 2024
Combiner Box	Ascentest	AT890-RFB	/	/





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 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.
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

5.5.2. Test Instruments

1	Name	Manufacturer	Model No.	Serial Number	Calibration Due
	Spectrum Analyzer	Agilent	N9020A	MY49100619	Jun. 28, 2024
	Combiner Box	Ascentest	AT890-RFB	(6) /	(0)/

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



5.6. Hopping Channel Number

5.6.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	KDB 558074 D01 v05r02
Limit:	Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.
Test Setup:	Spectrum Anakara EUT
Test Mode:	Spectrum Analyzer 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 = the frequency band of operation; set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller; VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold. The number of hopping frequency used is defined as the number of total channel. Record the measurement data in report.
Test Result:	PASS
1 7	

5.6.2. Test Instruments

Name	Manufacturer	Model No.	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100619	Jun. 28, 2024
Combiner Box	Ascentest	AT890-RFB	/	/



5.7. Dwell Time

5.7.1. Test Specification

J.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 not 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	Jun. 28, 2024
Combiner Box	Ascentest	AT890-RFB		



5.8. Pseudorandom Frequency Hopping Sequence

Test Requirement: FCC Part

FCC Part15 C Section 15.247 (a)(1) requirement:

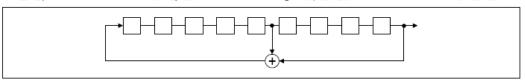
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

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. The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudorandom 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.

EUT Pseudorandom Frequency Hopping Sequence

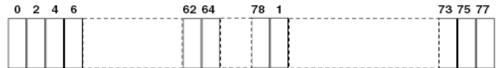
The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first one of 9 consecutive ones; i.e. the shift register is initialized with nine ones.

- Number of shift register stages: 9
- Length of pseudo-random sequence: 29-1 = 511 bits
- Longest sequence of zeros: 8 (non-inverted signal)



Linear Feedback Shift Register for Generation of the PRBS sequence

An example of Pseudorandom Frequency Hopping Sequence as follow:



Each frequency used equally on the average by each transmitter. The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.



5.9. Conducted Band Edge Measurement

5.9.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (d)			
Test Method:	KDB 558074 D01 v05r02			
Limit:	In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fal in the restricted bands must also comply with the radiated emission limits.			
Test Setup:	Spectrum Analyzer EUT			
Test Mode:	Transmitting mode with modulation			
Test Procedure:	 Set to the maximum power setting and enable the EUT transmit continuously. Set RBW = 100 kHz (≥1% span=10MHz), VBW = 300 kHz (≥RBW). Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100kHz RBW. The attenuation shall be 30 dB instead of 20 dB when RMS conducted output power procedure is used. Enable hopping function of the EUT and then repeat step 2 and 3. Measure and record the 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	Jun. 28, 2024
Combiner Box	Ascentest	AT890-RFB	/	/



5.10. Conducted Spurious Emission Measurement

5.10.1. Test Specification

FCC Part15 C Section 15.247 (d)
KDB 558074 D01 v05r02
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.
Spectrum Analyzer EUT
Transmitting mode with modulation
 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.
PASS

5.10.2. Test Instruments

Name	Manufacturer	Model No.	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100619	Jun. 28, 2024
Combiner Box	Ascentest	AT890-RFB		

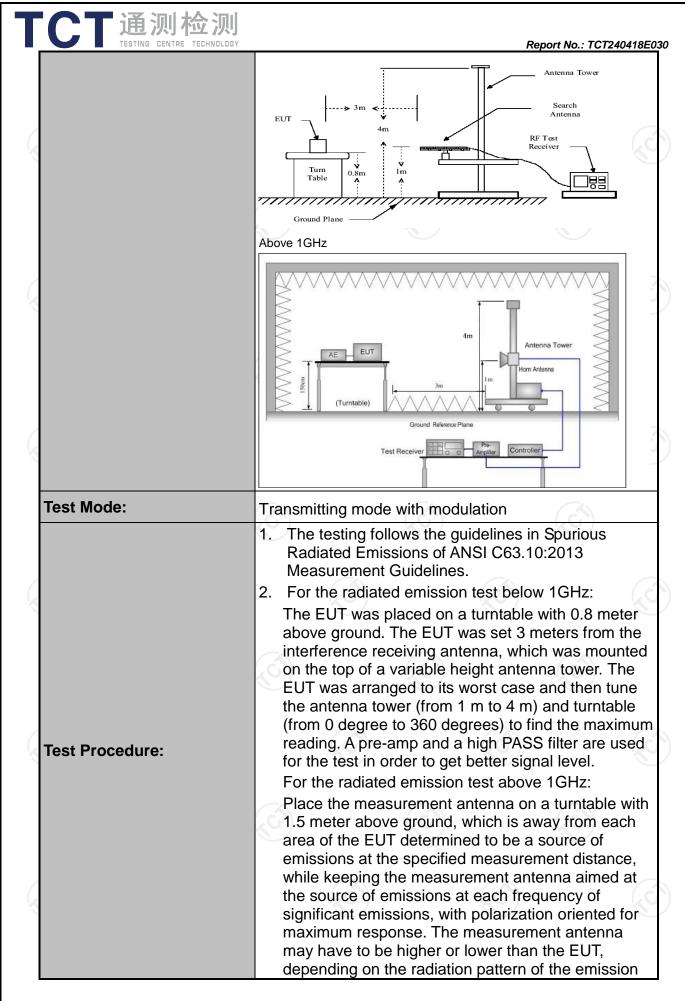
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5.11. Radiated Spurious Emission Measurement

5.11.1. Test Specification

		<u> </u>					
Test Requirement:	FCC Part15	C Sect	on '	15.209	(0)		/C
Test Method:	ANSI C63.10):2013					
Frequency Range:	9 kHz to 25 (Frequency					
Measurement Distance:	3 m		10			100	
Antenna Polarization:	Horizontal &	Vertica	ıl				
		<i>-</i>			\smile		- 7
Receiver Setup:	150kHz-						
р.			7 0			1 0	
	Above 1GHz		-7-	/			/
		Frequency			ength (meter)	Mea	asurement nce (meters)
					7		
					1112)		
::	88-216			150		(ć	3
Limit:	216-96	216-960					3
	Above 9	60		500			3
	Frequency			-	Distan	се	Detector
	Above 1GH:	,					Average
	7,5575 1611		5	0000	3		Peak
	For radiated emis	ssions be	low 3	0MHz			
	Di	stance = 3m				Comput	ter
Test setup:	0.8m		round P	\perp	—∟ F		
'is '' ''.	30MHz to 1GHz	7.					



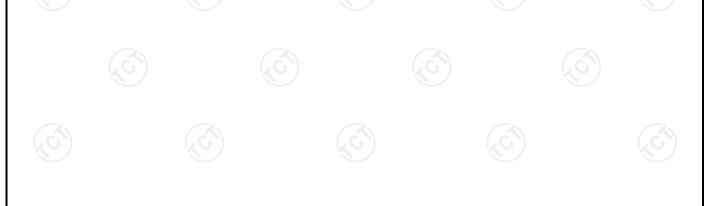
CT	通测检测		
1 <u>01</u>	TESTING CENTRE TECHNOLOGY		Report No.: TCT240418E030
		reco mea maa anto resi abo 3. Se	I staying aimed at the emission source for eiving the maximum signal. The final asurement antenna elevation shall be that which simizes the emissions. The measurement enna elevation for maximum emissions shall be cricted to a range of heights of from 1 m to 4 m ove the ground or reference ground plane. It to the maximum power setting and enable the T transmit continuously.
		(1)	e the following spectrum analyzer settings: Span shall wide enough to fully capture the emission being measured; Set RBW=120 kHz for f < 1 GHz, RBW=1MHz for f>1GHz; VBW≥RBW; Sweep = auto; Detector function = peak; Trace
		(S) (S)	 = max hold for peak B) For average measurement: use duty cycle correction factor method per 15.35(c). Duty cycle = On time/100 milliseconds On time =N1*L1+N2*L2++Nn-1*LNn-1+Nn*Ln Where N1 is number of type 1 pulses, L1 is length of type 1 pulses, etc. Average Emission Level = Peak Emission Level + 20*log(Duty cycle)
			Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
Test resu	Its:	PASS	





5.11.2. Test Instruments

	Radiated Em	nission Test Site	e (966)	
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESIB7	100197	Jun. 29, 2024
Spectrum Analyzer	R&S	FSQ40	200061	Jun. 29, 2024
Pre-amplifier	SKET	LNPA_0118G- 45	SK2021012 102	Jan. 31, 2025
Pre-amplifier	SKET	LNPA_1840G- 50	SK2021092 03500	Jan. 31, 2025
Pre-amplifier	HP	8447D	2727A05017	Jun. 27, 2024
Loop antenna	Schwarzbeck	FMZB1519B	00191	Jul. 02, 2024
Broadband Antenna	Schwarzbeck	VULB9163	340	Jul. 01, 2024
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Jul. 01, 2024
Horn Antenna	Schwarzbeck	BBHA 9170	00956	Feb. 02, 2025
Antenna Mast	Keleto	RE-AM	/	/
Coaxial cable	SKET	RC-18G-N-M	1	Jan. 31, 2025
Coaxial cable	SKET	RC_40G-K-M	/	Jan. 31, 2025
EMI Test Software	Shurple Technology	EZ-EMC	(6)	1 6



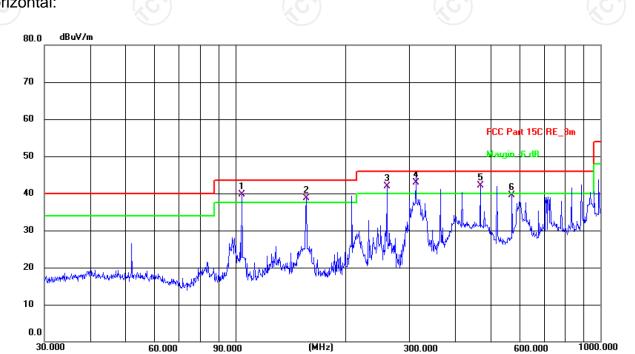


5.11.3. Test Data

Please refer to following diagram for individual

Horizontal:

Below 1GHz



Site 3m Anechoic Chamber Polarization: Horizontal Temperature: 24.1(C) Humidity: 54 %

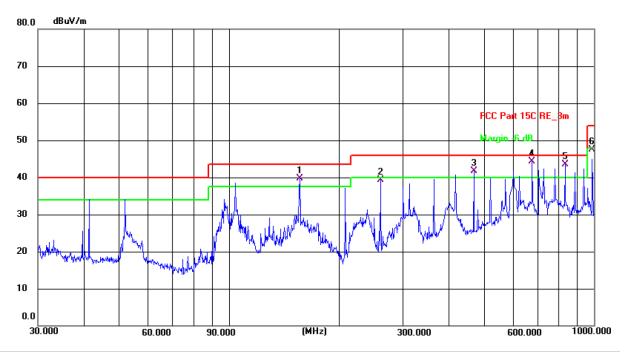
Limit: FCC Part 15C RE_3m Power: DC 12 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1!	104.1701	28.55	11.25	39.80	43.50	-3.70	QP	Р	
2!	156.4576	23.69	14.95	38.64	43.50	-4.86	QP	Р	
3 !	260.1444	28.67	13.31	41.98	46.00	-4.02	QP	Р	
4 *	312.1792	27.93	15.07	43.00	46.00	-3.00	QP	Р	
5 !	468.8761	23.25	18.81	42.06	46.00	-3.94	QP	Р	
6	572.6144	18.68	20.88	39.56	46.00	-6.44	QP	Р	





Vertical:



Site 3m Anechoic Chamber Temperature: 24.1(C) Humidity: 54 % Polarization: Vertical

989.5353

6

Limit: I	FCC Part 15C F	RE_3m				Power:	DC 12 V		
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector	P/F	Remark
1!	156.4576	24.73	14.95	39.68	43.50	-3.82	QP	Р	
2	260.1444	26.07	13.31	39.38	46.00	-6.62	QP	Р	
3 !	468.8761	22.96	18.81	41.77	46.00	-4.23	QP	Р	
4 *	677.5797	21.40	22.84	44.24	46.00	-1.76	QP	Р	
5 !	833.3170	19.26	24.31	43.57	46.00	-2.43	QP	Р	

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

54.00

-6.57

QP

Ρ

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

21.12

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 $(dB\mu V/m)$

26.31

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

47.43

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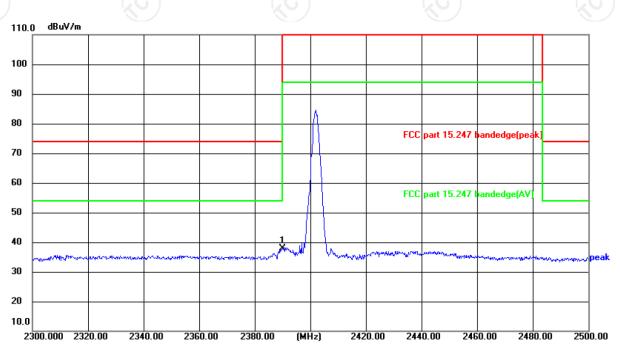
Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com



Test Result of Radiated Spurious at Band edges

Lowest channel 2402:

Horizontal:



Site: 3m Anechoic Chamber Polarization: Horizontal Temperature: 25.3(°C) Humidity: 52 %

Limit: FCC part 15.247 bandedge(peak)

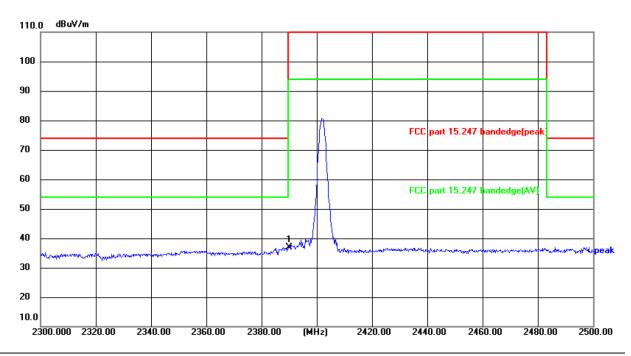
Power: DC 12 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 *	2390.000	55.00	-17.10	37.90	74.00	-36.10	peak	Р	





Vertical:



Site: 3m Anechoic Chamber Polarization: Vertical Temperature: 25.3(°C) Humidity: 52 %

Limit: FCC part 15.247 bandedge(peak)

Power:DC 12 V

No.	Frequency (MHz)	Reading (dBuV)		Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 *	2390.000	53.96	-17.10	36.86	74.00	-37.14	peak	Р	

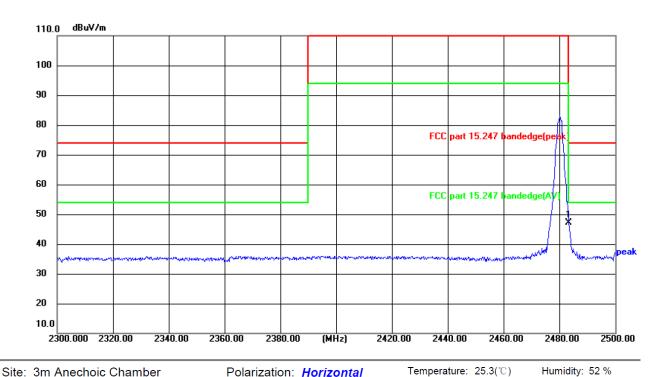




Highest channel 2480:

Horizontal:

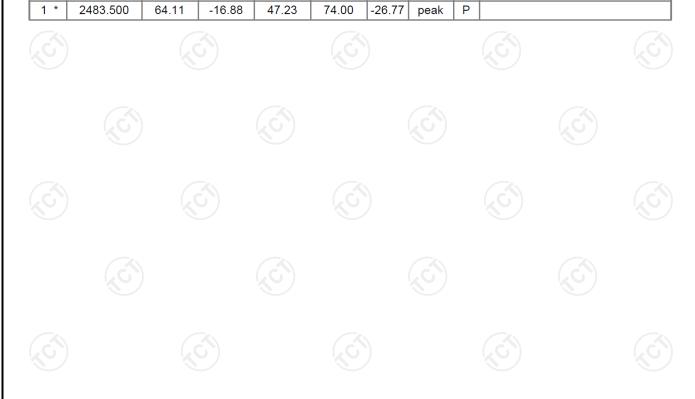
No.



Limit: FCC part 15.247 bandedge(peak)

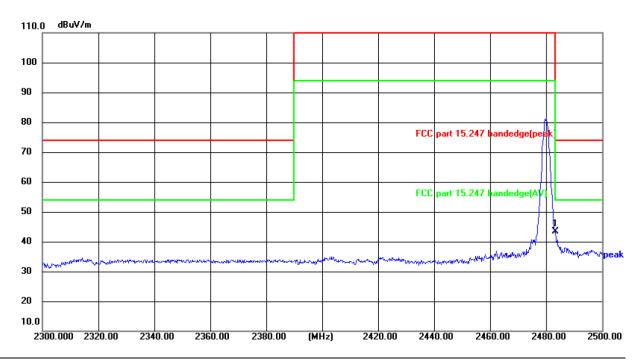
Power:DC 12 V

Frequency Reading Factor Level Limit Margin Detector P/F Remark (MHz) (dBuV) (dB/m) (dBuV/m) (dBuV/m) (dB) 2483.500 47.23 74.00 -26.77 64.11 -16.88 Ρ peak





Vertical:



Site: 3m Anechoic Chamber Polarization: *Vertical* Temperature: 25.3(℃) Humidity: 52 %

Limit: FCC part 15.247 bandedge(peak)

Power:DC 12 V

No.	Frequency (MHz)			Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 *	2483.500	60.22	-16.88	43.34	74.00	-30.66	peak	Р	

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





Above 1GHz

Modulation	Type: 8D	PSK							
Low chann	el: 2402 M	lHz							
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBuV)	Correction Factor (dB/m)	Emissic Peak (dBµV/m)	l AV	Peak limit (dBµV/m)	AV limit (dBµV/m)	Margin (dB)
4804	Н	45.25		0.66	45.91		74	54	-8.09
7206	Н	35.43		9.50	44.93		74	54	-9.07
	H							7-7	
	.G')		(, C			·C')		(, (, ')	
4804	V	45.55		0.66	46.21	<u></u>	74	54	-7.79
7206	V	35.39	-	9.50	44.89		74	54	-9.11
	V								

Middle cha	nnel: 2441	MHz		K)		(0)		ZC.
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBµV)	Correction Factor (dB/m)	Peak	n Level AV (dBµV/m)	Peak limit (dBµV/m)	AV limit (dBµV/m)	Margin (dB)
4882	H	44.87	-	0.99	45.86		74	54	-8.14
7323	(H)	34.19		9.87	44.06	(O :]-	74	54	-9.94
	H					<u></u>			
4882	V	44.36		0.99	45.35		74	54	-8.65
7323	V	35.98		9.87	45.85		74	54	-8.15
5	V	(A=2)			//		()		

High chann	High channel: 2480 MHz											
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBµV)	Correction Factor (dB/m)	Emissic Peak (dBµV/m)	AV	Peak limit (dBµV/m)	AV limit (dBµV/m)	Margin (dB)			
4960	Н	45.12	-	1.33	46.45	i	74	54	-7.55			
7440	Н	34.99		10.22	45.21		74	54	-8.79			
	Η											
(C)		(.C)		(, ((.C)		(,C			
4960	V	44.16		1.33	45.49		74	54	-8.51			
7440	V	35.07		10.22	45.29		74	54	-8.71			
	V											

Note:

- 1. Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss Pre-amplifier
- 2. Margin (dB) = Emission Level (Peak) (dB μ V/m)-Average limit (dB μ V/m)
- 3. The emission levels of other frequencies are very lower than the limit and not show in test report.
- 4. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 5. Data of measurement shown "---"in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.
- 6. Measurements were conducted in all three modulation (GFSK, Pi/4 DQPSK, 8DPSK), and the worst case Mode (8DPSK) was submitted only.
- 7. All the restriction bands are compliance with the limit of 15.209.



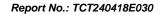


Appendix A: Test Result of Conducted Test

Maximum Conducted Output Power

Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict								
1-DH1	2402	3.67	30	Pass								
1-DH1	2441	3.87	30	Pass								
1-DH1	2480	3.32	30	Pass								
2-DH1	2402	4.58	21	Pass								
2-DH1	2441	4.71	21	Pass								
2-DH1	2480	4.15	21	Pass								
3-DH1	2402	5.15	21	Pass								
3-DH1	2441	5.27	21	Pass								
3-DH1	2480	4.72	21	Pass								
	1-DH1 1-DH1 2-DH1 2-DH1 2-DH1 3-DH1 3-DH1	1-DH1 2402 1-DH1 2441 1-DH1 2480 2-DH1 2402 2-DH1 2441 2-DH1 2480 3-DH1 2402 3-DH1 2402	1-DH1 2402 3.67 1-DH1 2441 3.87 1-DH1 2480 3.32 2-DH1 2402 4.58 2-DH1 2441 4.71 2-DH1 2480 4.15 3-DH1 2402 5.15 3-DH1 2441 5.27	Mode (MHz) Power (dBm) Limit (dBm) 1-DH1 2402 3.67 30 1-DH1 2441 3.87 30 1-DH1 2480 3.32 30 2-DH1 2402 4.58 21 2-DH1 2441 4.71 21 2-DH1 2480 4.15 21 3-DH1 2402 5.15 21 3-DH1 2441 5.27 21								





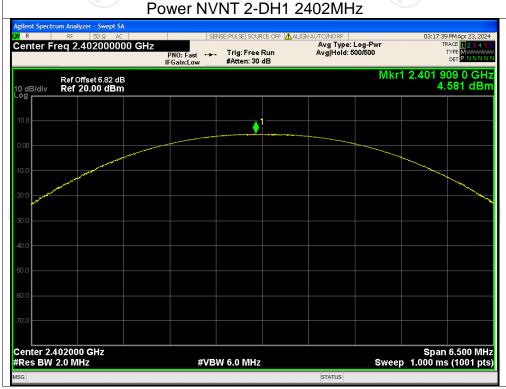






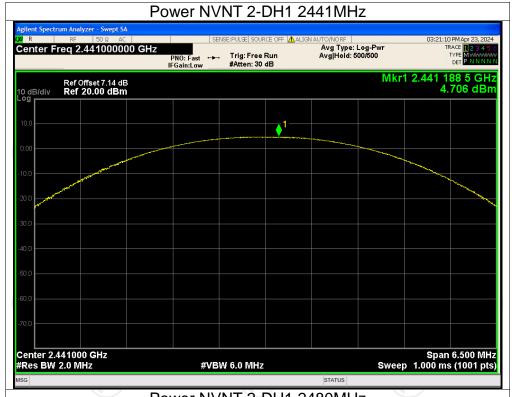




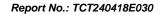








| Power NVNT 2-DH1 2480MHz | Sentence of Authorized | Sentence of Autho

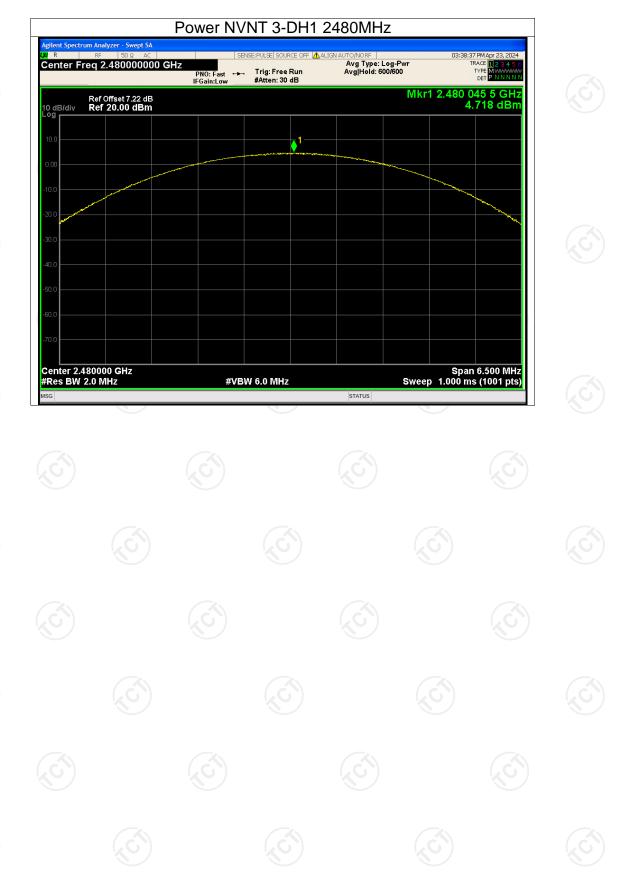






| Power NVNT 3-DH1 2441MHz | Sense Pulse | Source CFF | Author National Pulse | Sourc







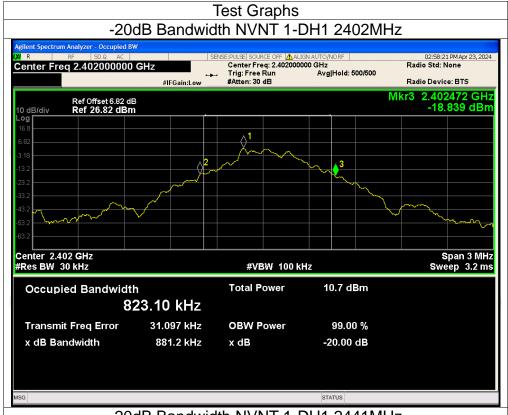
-20dB Bandwidth

Condition	Mode	Frequency (MHz)	-20 dB Bandwidth (MHz)	Verdict
NVNT	1-DH1	2402	0.881	Pass
NVNT	1-DH1	2441	0.866	Pass
NVNT	1-DH1	2480	0.880	Pass
NVNT	2-DH1	2402	1.255	Pass
NVNT	2-DH1	2441	1.256	Pass
NVNT	2-DH1	2480	1.253	Pass
NVNT	3-DH1	2402	1.248	Pass
NVNT	3-DH1	2441	1.222	Pass
NVNT	3-DH1	2480	1.225	Pass

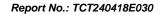
















-20dB Bandwidth NVNT 2-DH1 2402MHz | SENSE:PULSE| SOURCE OFF | ALIGN AUTO/NORF | | Center Free; 2.402000000 GHz | Trig: Free Run | Avg|Hold: 500/500 | | #Atten: 30 dB 03:17:57 PM Apr 23, 2024 Radio Std: None Center Freq 2.402000000 GHz Radio Device: BTS #IFGain:Low Mkr3 2.402661 GHz -17.241 dBm Span 3 MHz Sweep 3.2 ms Center 2.402 GHz #Res BW 30 kHz #VBW 100 kHz Total Power 10.7 dBm Occupied Bandwidth 1.1663 MHz Transmit Freq Error 33.654 kHz **OBW Power** 99.00 % 1.255 MHz -20.00 dB x dB Bandwidth x dB STATUS







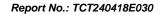
-20dB Bandwidth NVNT 2-DH1 2480MHz SENSE:PULSE SOURCE OFF ALIGN AUTO/NORF Center Free; 2.480000000 GHz Trig: Free Run #Atten: 30 dB SOURCE OFF ALIGN AUTO/NORF Center Free Run Auto/NorF 03:23:37 PM Apr 23, 2024 Radio Std: None Center Freq 2.480000000 GHz #IFGain:Low Radio Device: BTS Mkr3 2.48066 GHz -17.969 dBm Center 2.48 GHz #Res BW 30 kHz Span 3 MHz Sweep 3.2 ms #VBW 100 kHz Total Power 10.2 dBm Occupied Bandwidth 1.1637 MHz Transmit Freq Error 33.488 kHz **OBW Power** 99.00 % 1.253 MHz -20.00 dB x dB Bandwidth x dB STATUS













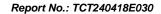




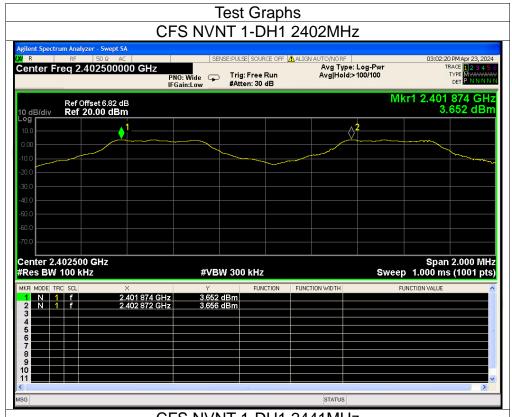
Carrier Frequencies Separation

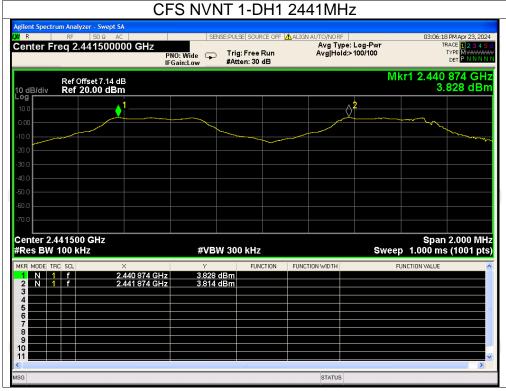
Condition	Mode	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH1	2401.874	2402.872	0.998	0.881	Pass
NVNT	1-DH1	2440.874	2441.874	1.000	0.881	Pass
NVNT	1-DH1	2478.874	2479.874	1.000	0.881	Pass
NVNT	2-DH1	2401.874	2402.874	1.000	0.837	Pass
NVNT	2-DH1	2440.874	2441.874	1.000	0.837	Pass
NVNT	2-DH1	2478.874	2479.876	1.002	0.837	Pass
NVNT	3-DH1	2401.876	2402.874	0.998	0.832	Pass
NVNT	3-DH1	2440.876	2441.874	0.998	0.832	Pass
NVNT	3-DH1	2478.874	2479.872	0.998	0.832	Pass





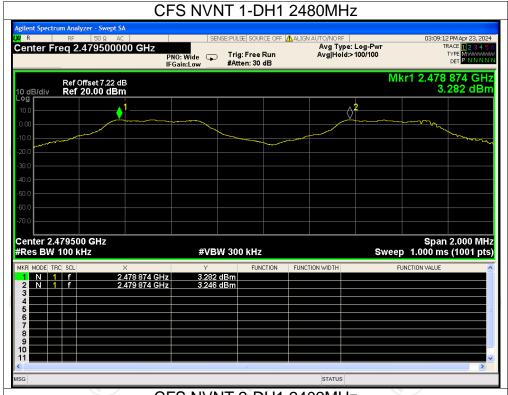


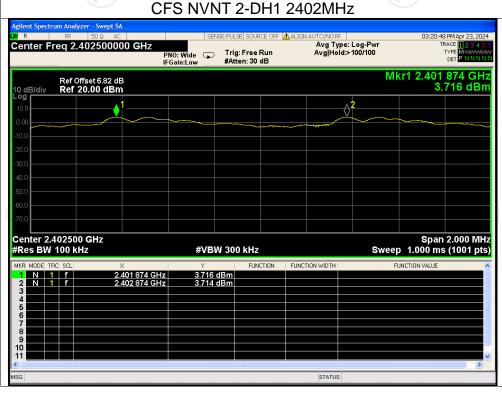






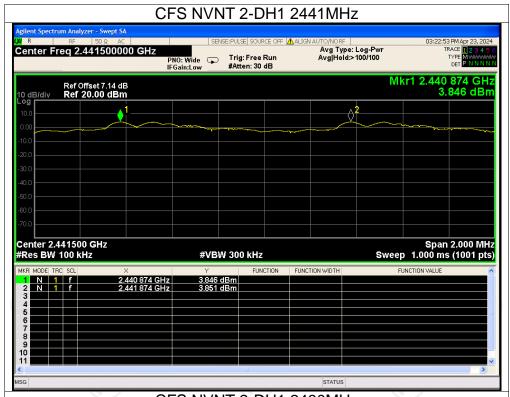


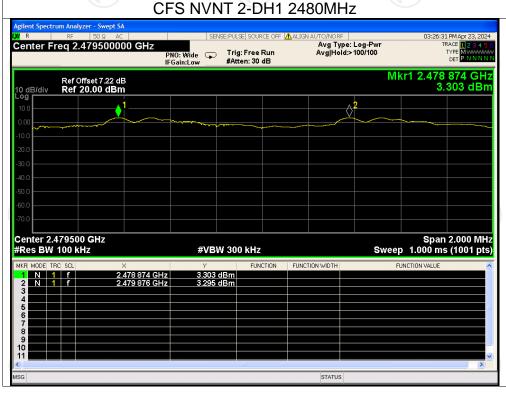






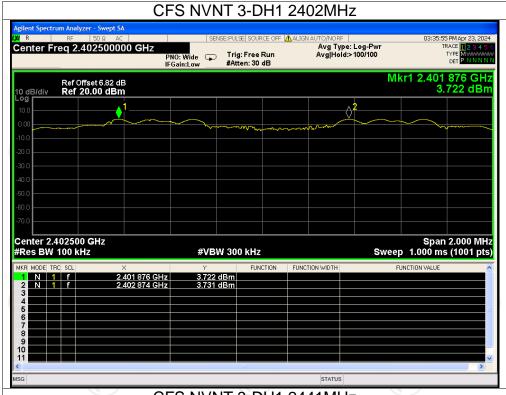


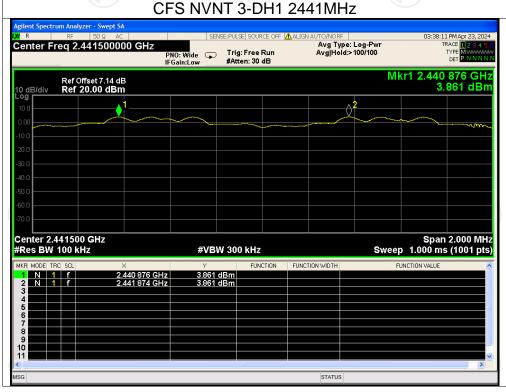






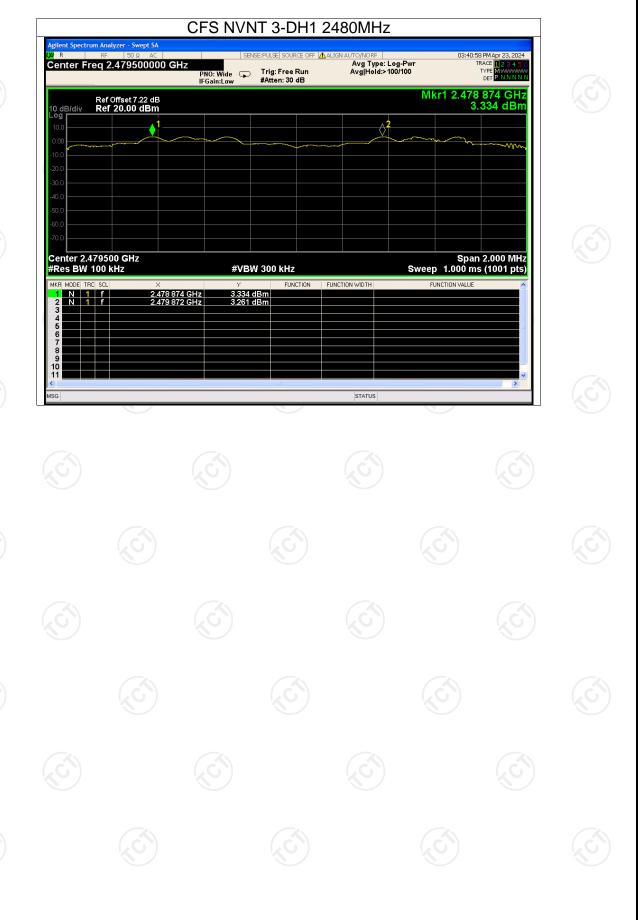








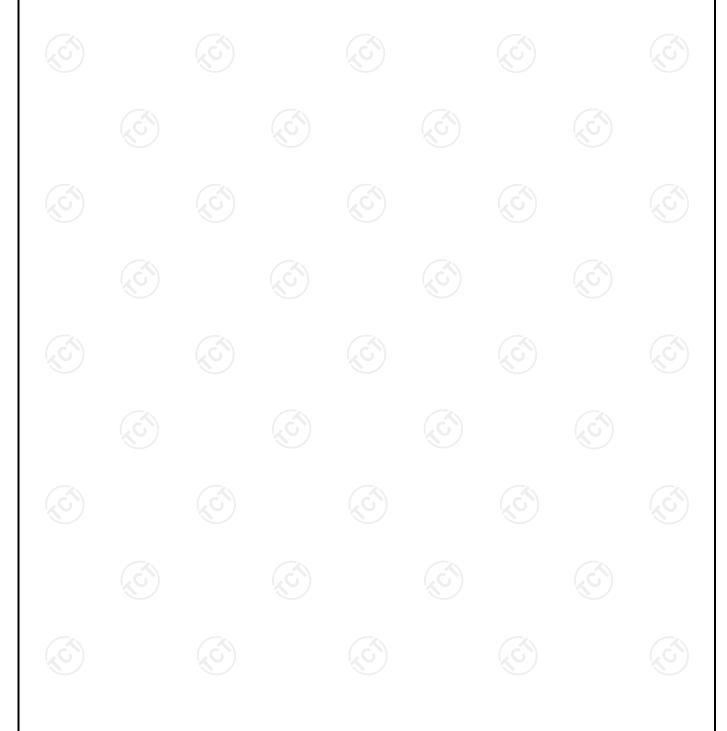




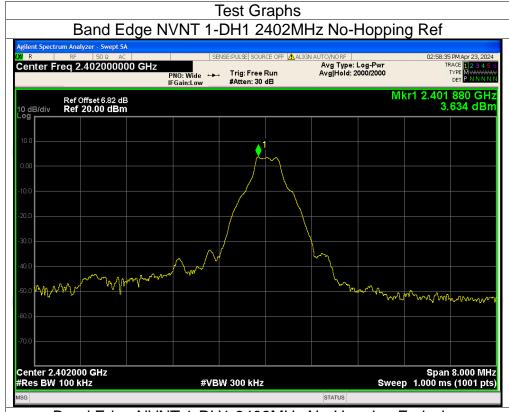


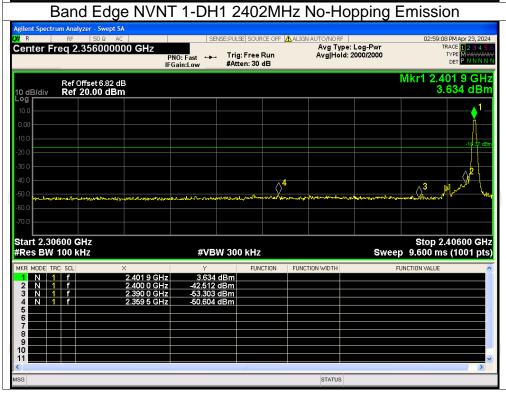
Band Edge

- and - ago								
Condition	Mode	Frequency (MHz)	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict		
NVNT	1-DH1	2402	No-Hopping	-54.23	-20	Pass		
NVNT	1-DH1	2480	No-Hopping	-52.42	-20	Pass		
NVNT	2-DH1	2402	No-Hopping	-54.21	-20	Pass		
NVNT	2-DH1	2480	No-Hopping	-53.76	-20	Pass		
NVNT	3-DH1	2402	No-Hopping	-54.54	-20	Pass		
NVNT	3-DH1	2480	No-Hopping	-53.44	-20	Pass		

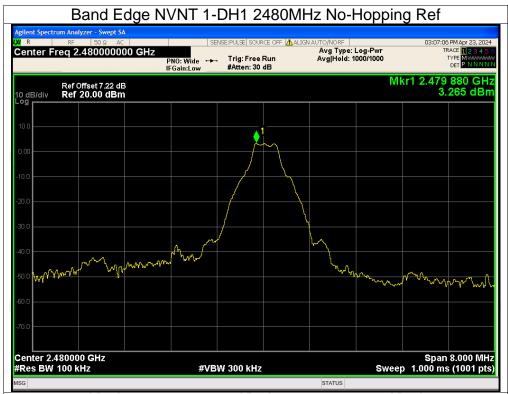


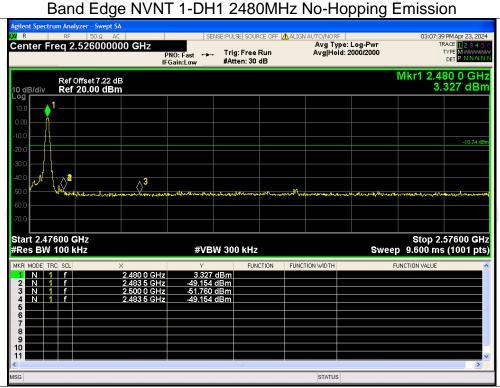


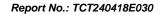






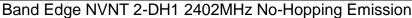


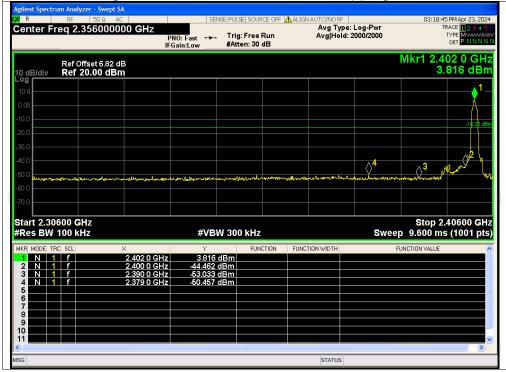


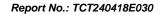




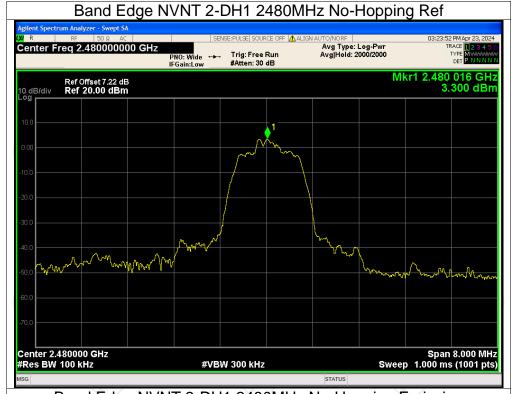




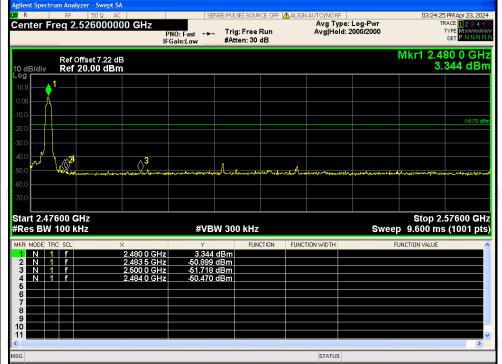


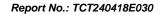




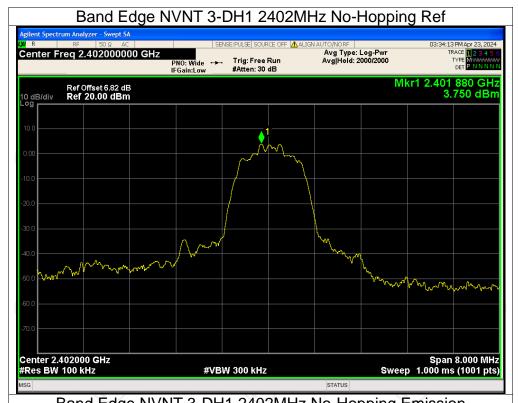




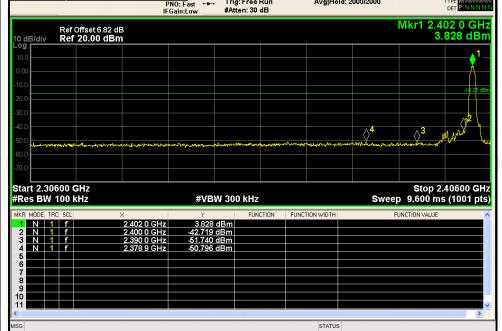


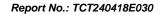




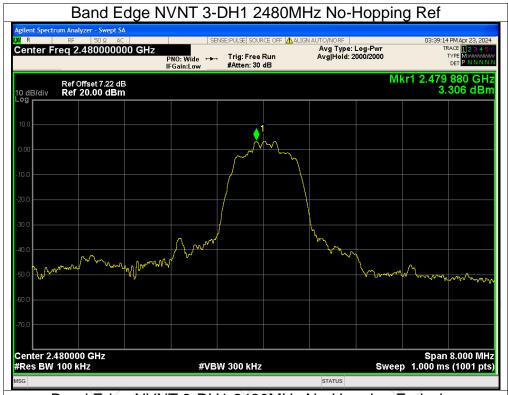


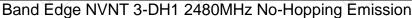


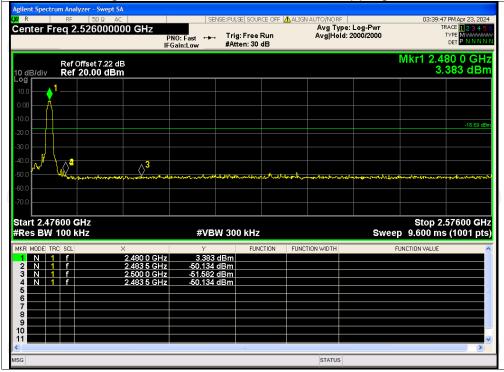








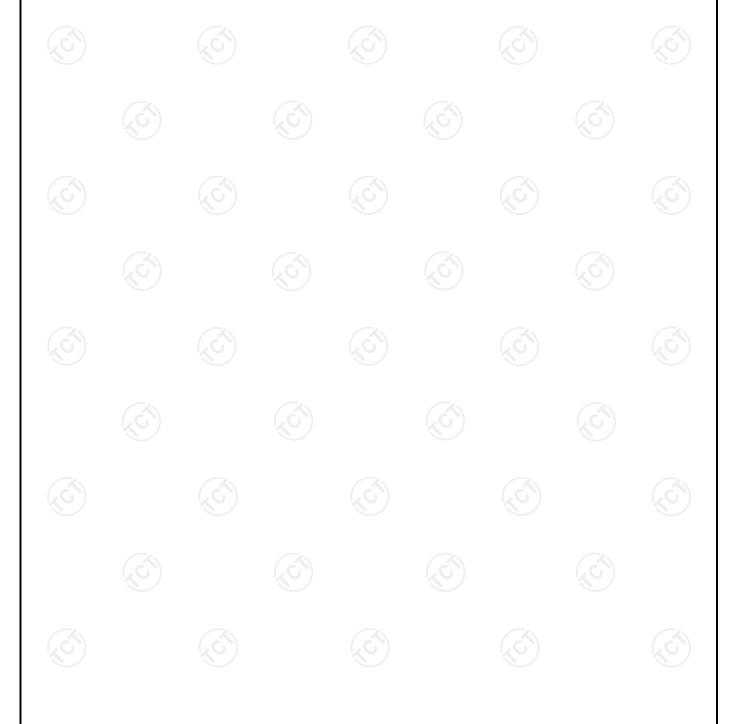


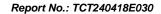




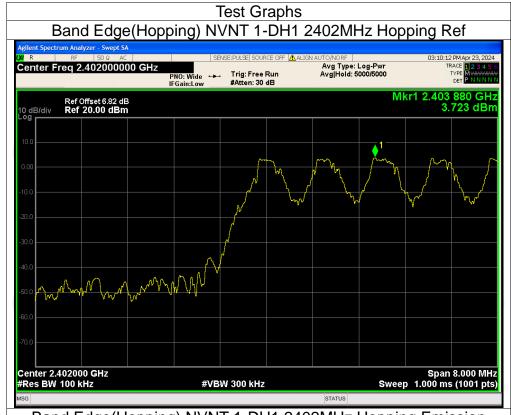
Band Edge(Hopping)

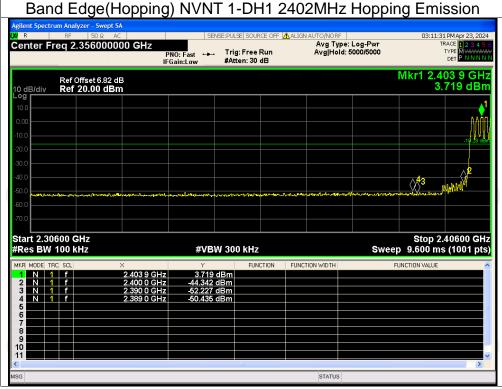
Condition	Mode	Frequency (MHz)	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict	
NVNT	1-DH1	2402	Hopping	-54.15	-20	Pass	
NVNT	1-DH1	2480	Hopping	-52.98	-20	Pass	
NVNT	2-DH1	2402	Hopping	-53.99	-20	Pass	
NVNT	2-DH1	2480	Hopping	-53.22	-20	Pass	
NVNT	3-DH1	2402	Hopping	-53.87	-20	Pass	
NVNT	3-DH1	2480	Hopping	-52.84	-20	Pass	









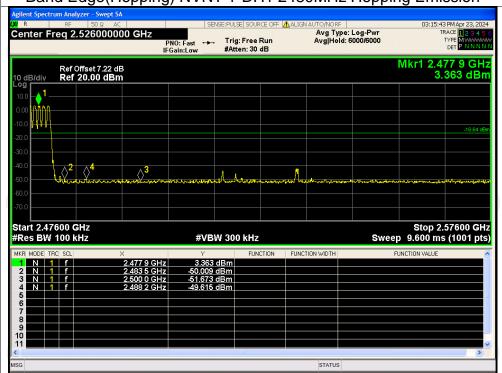










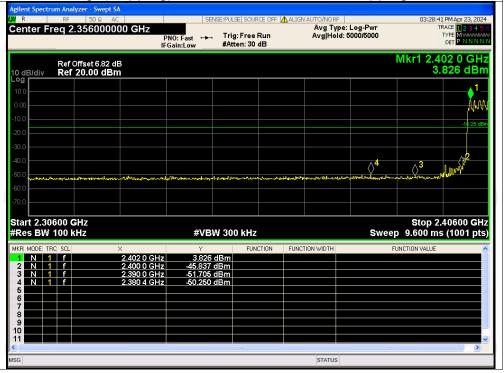










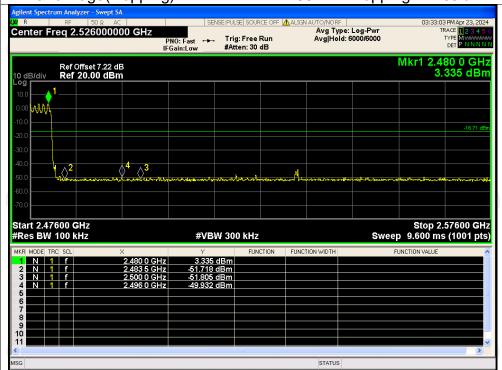






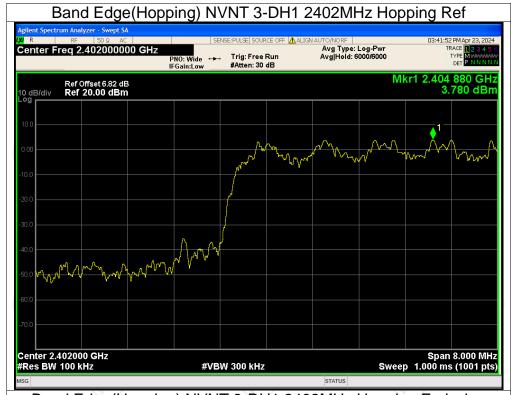




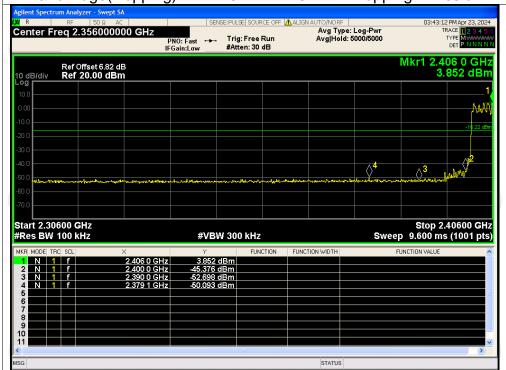


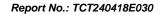








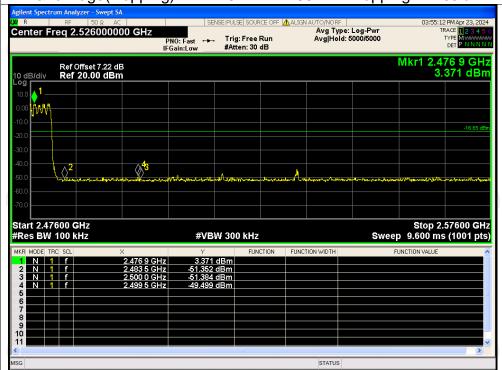














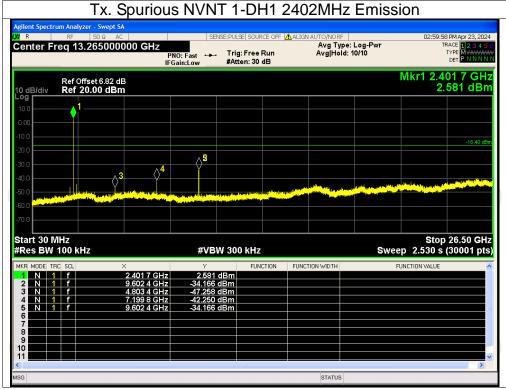
Conducted RF Spurious Emission

Condition	Mode	Frequency (MHz)	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH1	2402	-37.76	-20	Pass
NVNT	1-DH1	2441	-36.83	-20	Pass
NVNT	1-DH1	2480	-35.42	-20	Pass
NVNT	2-DH1	2402	-38.21	-20	Pass
NVNT	2-DH1	2441	-36.66	-20	Pass
NVNT	2-DH1	2480	-35.25	-20	Pass
NVNT	3-DH1	2402	-38.06	-20	Pass
NVNT	3-DH1	2441	-36.86	-20	Pass
NVNT	3-DH1	2480	-35.09	-20	Pass







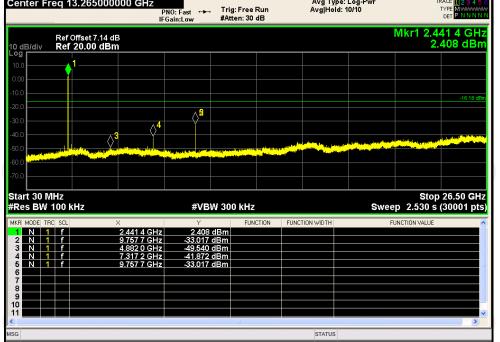


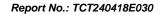




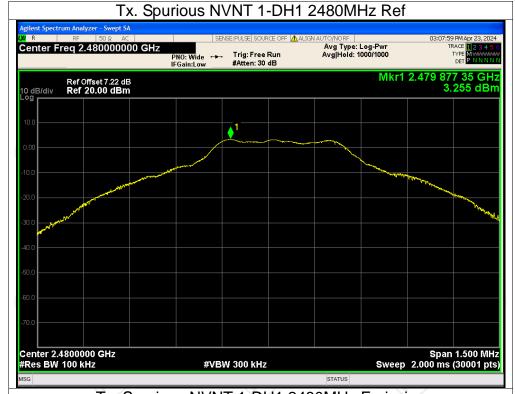


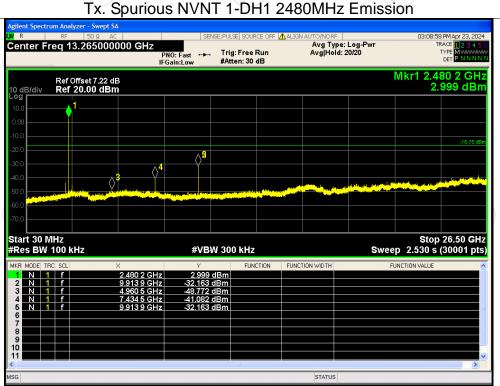


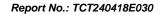






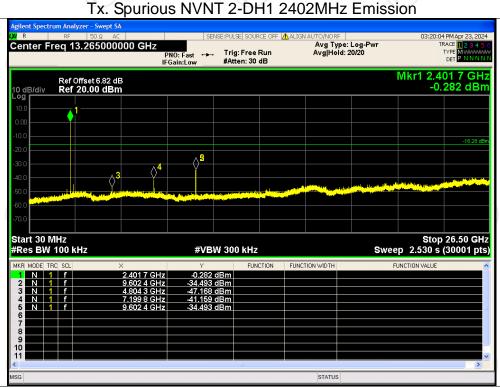


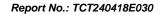








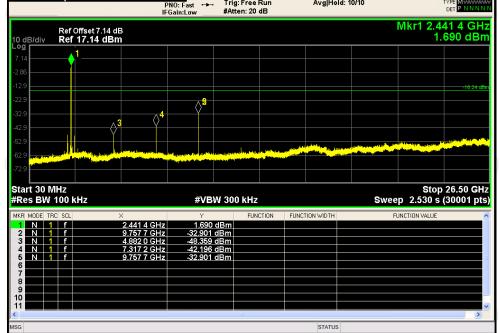


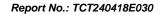






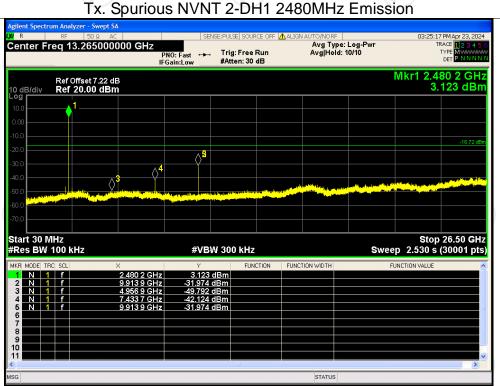








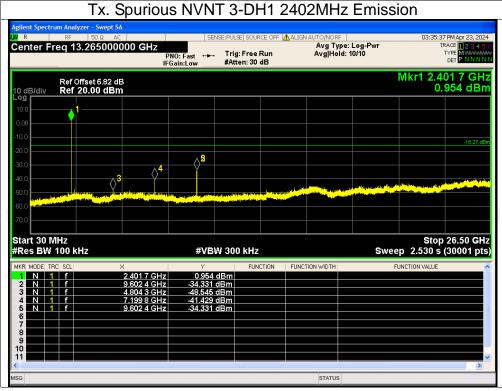






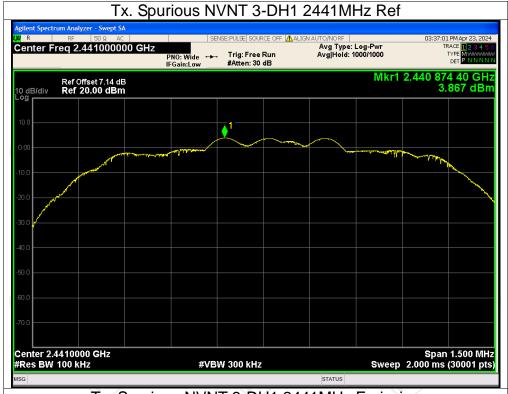


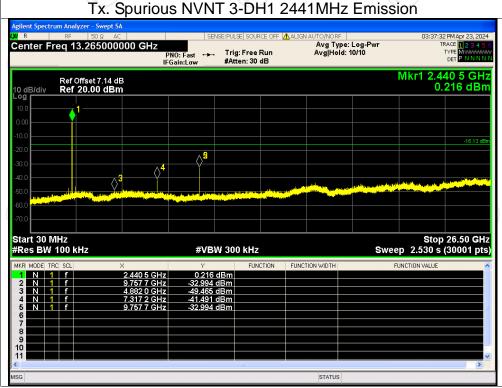


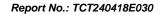






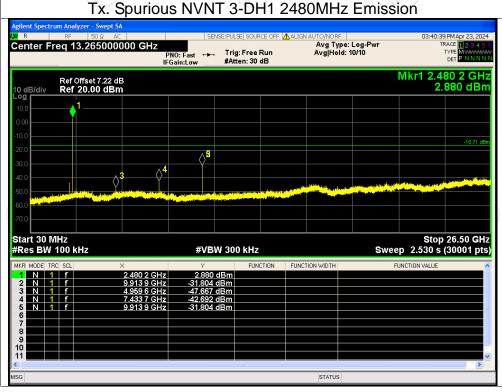








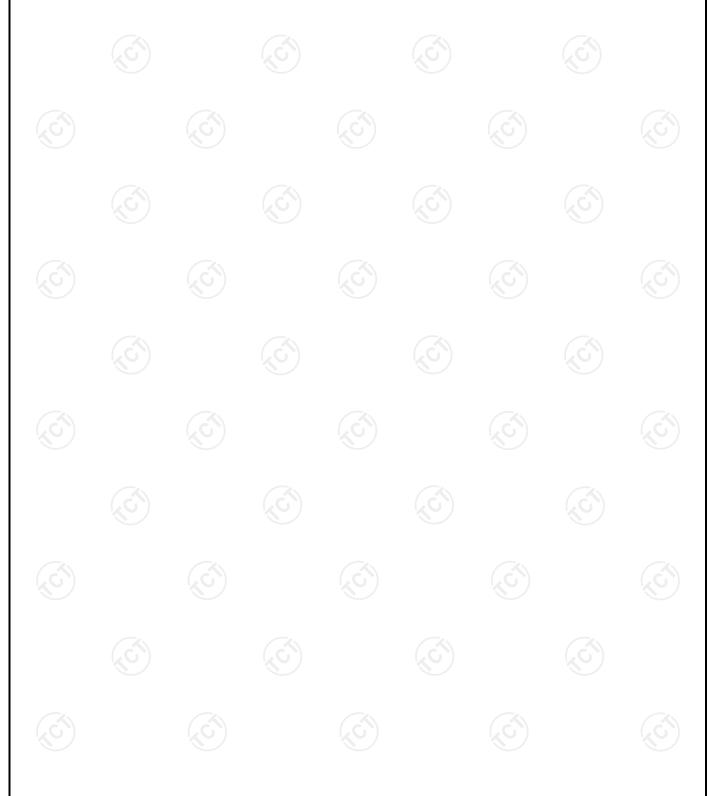






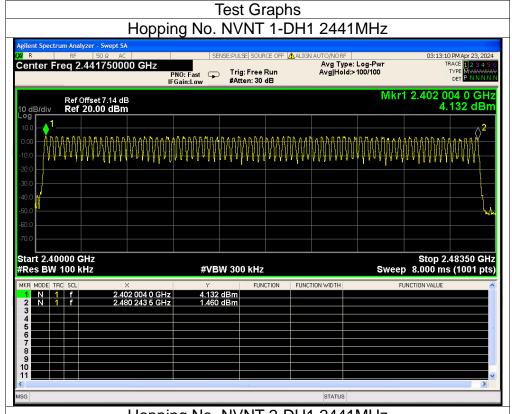
Number of Hopping Channel

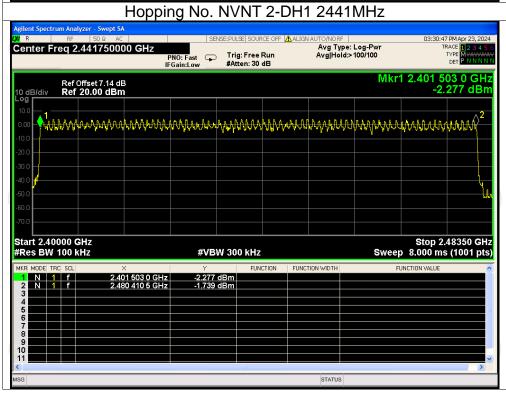
Condition Mode		Hopping Number	Limit	Verdict	
NVNT	1-DH1	79	15	Pass	
NVNT	2-DH1	79	15	Pass	
NVNT	3-DH1	79	15	Pass	

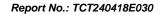




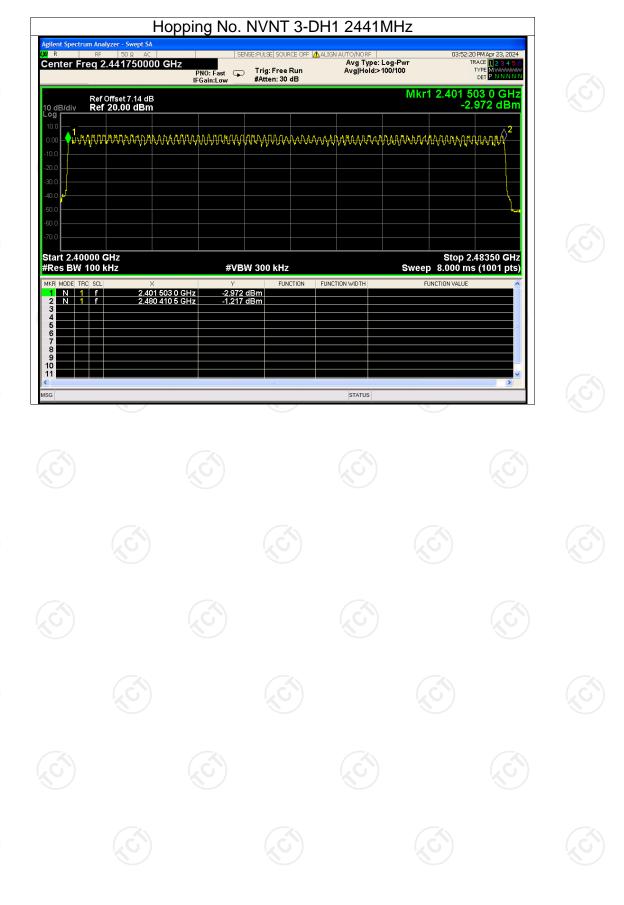














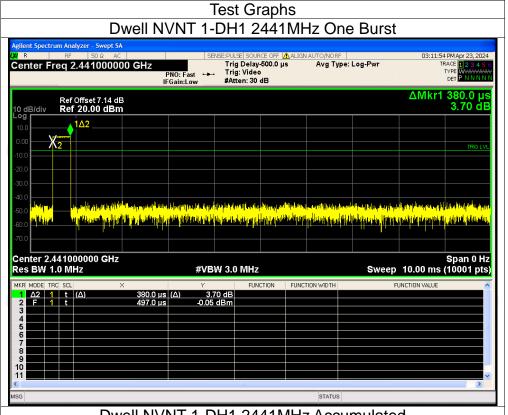
Dwell Time

Condition	Mode	Frequency (MHz)	Pulse Time (ms)	Total Dwell Time (ms)	Burst Count	Period Time (ms)	Limit (ms)	Verdict
NVNT	1-DH1	2441	0.38	120.46	317	31600	400	Pass
NVNT	1-DH3	2441	1.64	282.08	172	31600	400	Pass
NVNT	1-DH5	2441	2.89	320.79	111	31600	400	Pass
NVNT	2-DH1	2441	0.39	123.24	316	31600	400	Pass
NVNT	2-DH3	2441	1.64	259.12	158	31600	400	Pass
NVNT	2-DH5	2441	2.89	317.90	110	31600	400	Pass
NVNT	3-DH1	2441	0.39	124.02	318	31600	400	Pass
NVNT	3-DH3	2441	1.64	283.72	173	31600	400	Pass
NVNT	3-DH5	2441	2.89	297.67	103	31600	400	Pass



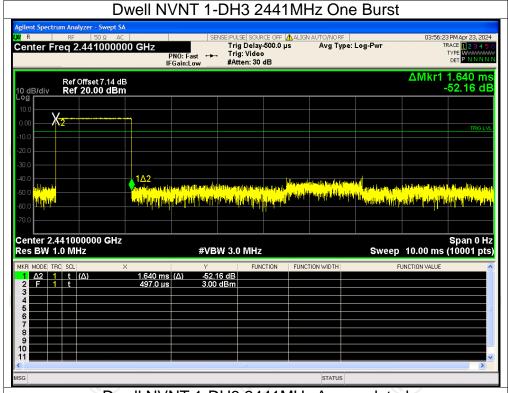




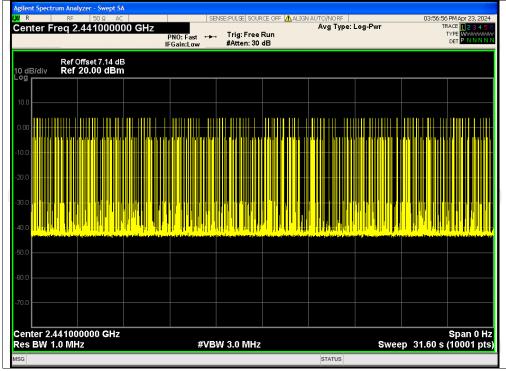






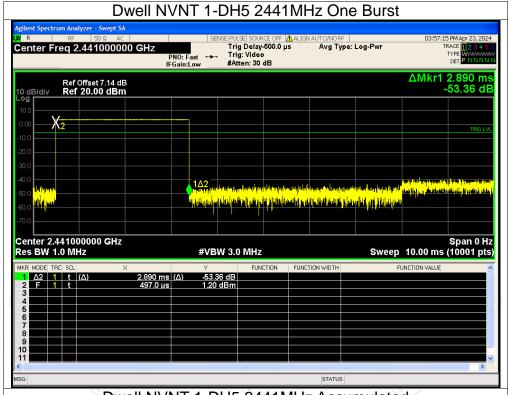


Dwell NVNT 1-DH3 2441MHz Accumulated

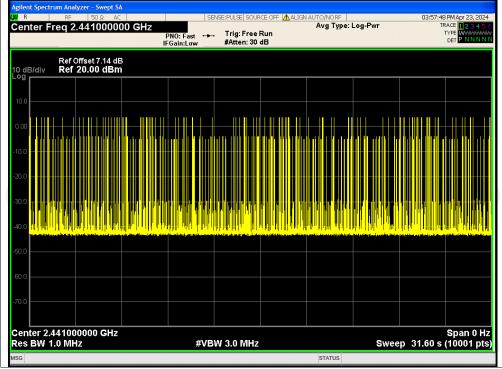






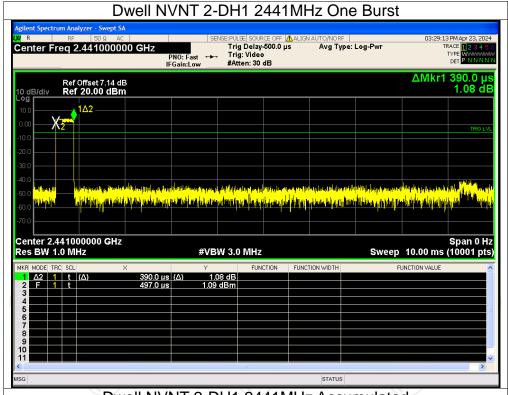


Dwell NVNT 1-DH5 2441MHz Accumulated

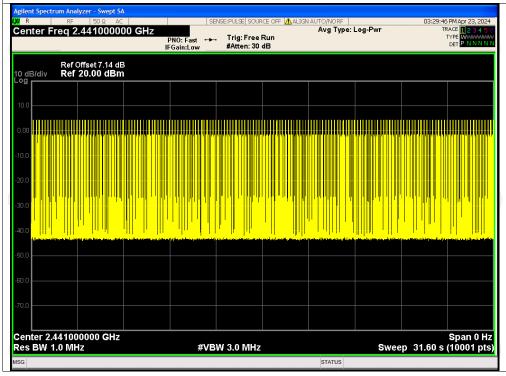






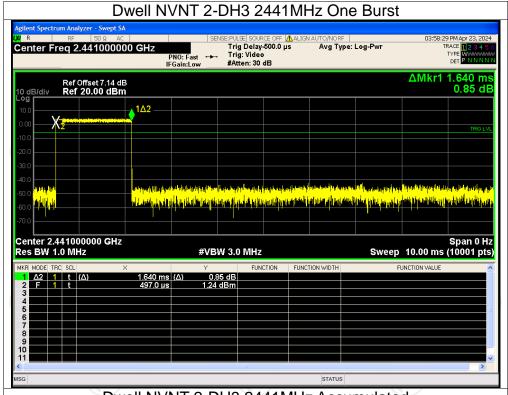


Dwell NVNT 2-DH1 2441MHz Accumulated

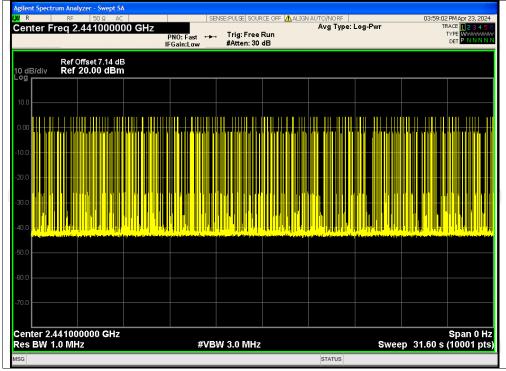






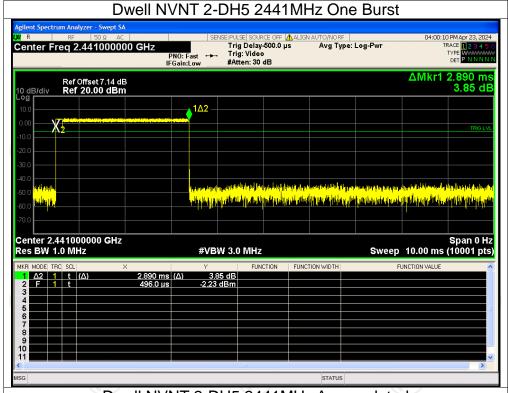


Dwell NVNT 2-DH3 2441MHz Accumulated

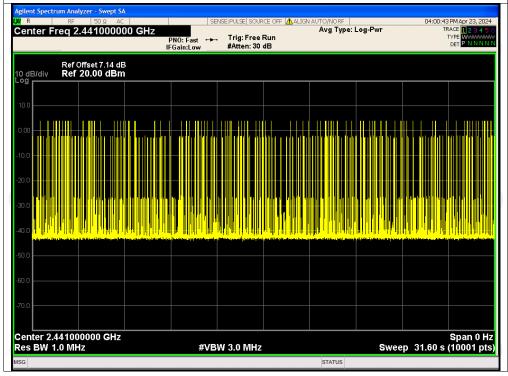






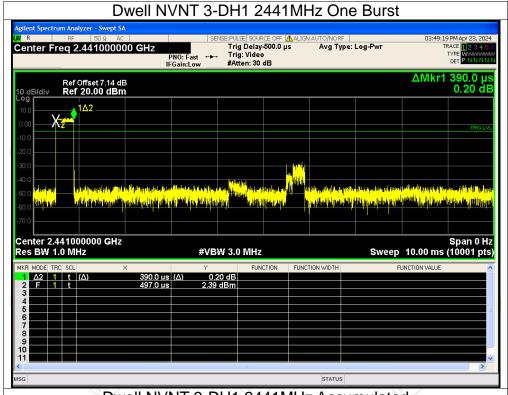


Dwell NVNT 2-DH5 2441MHz Accumulated

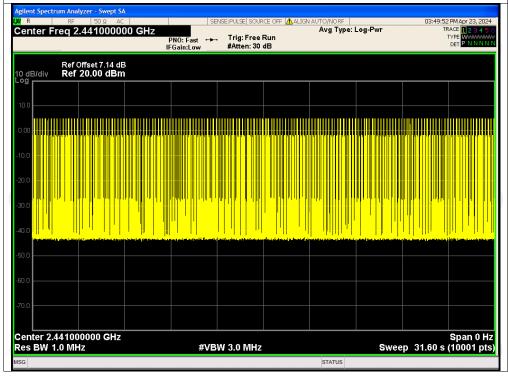






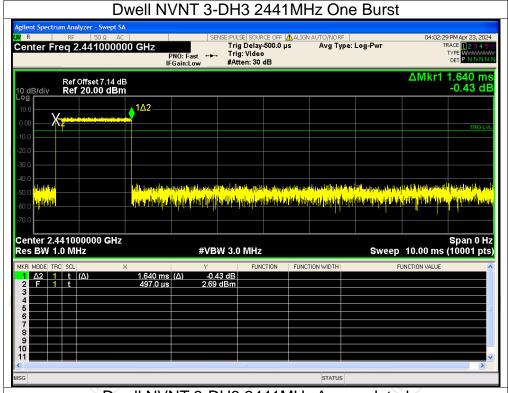


Dwell NVNT 3-DH1 2441MHz Accumulated









Dwell NVNT 3-DH3 2441MHz Accumulated

