

FCC RF Test Report

(Bluetooth)

Applicant: SHENZHEN TRANSCHEAN TECHNOLOGY LIMITED

Address of Applicant: Room 03, 23/F, Unit B Building, No 9, Shenzhen Bay Eco - Technology Park, Yuehai Street, Nanshan District, Shenzhen, China

Equipment Under Test (EUT)

Product Name: Mobile Phone

Model No.: P662LS

Trade Mark: VIMOQ

FCC ID: 2A5RQ-P662LS

Applicable Standards: FCC CFR Title 47 Part 15C (§15.247)

Date of Sample Receipt: 25 Jul., 2023

Date of Test: 26 Jul., to 15 Aug., 2023

Date of Report Issued: 16 Aug., 2023

Test Result: PASS

Tested by: Lucy Ding

Date: 16 Aug., 2023

Reviewed by: James Lee

Date: 16 Aug., 2023

Approved by: Kevin Zhou

Date: 16 Aug., 2023

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in above the application standard version. Test results reported herein relate only to the item(s) tested.

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1 Version

Version No.	Date	Description
00	16 Aug., 2023	<i>Original</i>

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3 General Information

3.1 Client Information

Applicant:	SHENZHEN TRANSCHEAN TECHNOLOGY LIMITED
Address:	Room 03, 23/F, Unit B Building, No 9, Shenzhen Bay Eco -Technology Park, Yuehai Street, Nanshan District, Shenzhen, China
Manufacturer:	SHENZHEN TRANSCHEAN TECHNOLOGY LIMITED
Address:	Room 03, 23/F, Unit B Building, No 9, Shenzhen Bay Eco -Technology Park, Yuehai Street, Nanshan District, Shenzhen, China
Factory:	SHENZHEN TECNO TECHNOLOGY CO., LTD.
Address:	101, Building 24, Waijing Industrial Park, Fumin Community, Fucheng Street, Longhua District, Shenzhen City, P.R.China

3.2 General Description of E.U.T.

Product Name:	Mobile Phone
Model No.:	P662LS
Operation Frequency:	2402 MHz - 2480 MHz
Transfer Rate:	1/2/3 Mbits/s
Number of Channel:	79
Modulation Type:	GFSK, π/4-DQPSK, 8DPSK
Modulation Technology:	FHSS
Antenna Type:	Internal Antenna
Antenna Gain:	1.0 dBi (declare by applicant)
Antenna transmit mode:	SISO (1TX, 1RX)
Power Supply:	Rechargeable Li-ion Polymer Battery DC3.87V, 5850mAh
AC Adapter:	Model: U180VSA Input: AC100-240V, 50/60Hz, 0.6A Output: DC 5.0V, 2.4A or 7.5V, 2.4A 18.0W Max
Test Sample Condition:	The test samples were provided in good working order with no visible defects.

3.3 Test Mode and Test Environment

Test Modes:	
Non-hopping mode:	Keep the EUT in continuous transmitting mode.
Hopping mode:	Keep the EUT in hopping mode.
Remark:	
<ol style="list-style-type: none"> For AC power line conducted emission and radiated spurious emission, pre-scan GFSK, $\pi/4$-DQPSK, 8DPSK modulation mode, found GFSK modulation was worse case mode. The report only reflects the test data of worst mode. Channel Low, Mid and High for each type band with rated data rate were chosen for full testing. The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for these modes. Just the worst case position (H mode) shown in report. 	
Operating Environment:	
Temperature:	15°C ~ 35°C
Humidity:	20 % ~ 75 % RH
Atmospheric Pressure:	1008 mbar

3.4 Description of Test Auxiliary Equipment

The EUT has been tested as an independent unit.
N/A

3.5 Measurement Uncertainty

Parameter	Expanded Uncertainty (Confidence of 95% (U = 2Uc(y)))
Conducted Emission for LISN (9kHz ~ 10MHz)	1.9 dB
Conducted Emission for LISN (10MHz ~ 30MHz)	2.6 dB
Radiated Emission (30MHz ~ 1GHz) (3m SAC)	3.8 dB
Radiated Emission (1GHz ~ 18GHz) (3m SAC)	3.6 dB
Radiated Emission (18GHz ~ 40GHz) (3m SAC)	5.34 dB

Note: All the measurement uncertainty value were shown with a coverage k=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

3.6 Additions to, Deviations, or Exclusions From the Method

No

3.7 Laboratory Facility

<p>The test facility is recognized, certified, or accredited by the following organizations:</p> <ul style="list-style-type: none"> FCC - Designation No.: CN1211 JianYan Testing Group Shenzhen Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551. ISED – CAB identifier.: CN0021 The 3m Semi-anechoic chamber and 10m Semi-anechoic chamber of JianYan Testing Group Shenzhen Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1. CNAS - Registration No.: CNAS L15527 JianYan Testing Group Shenzhen Co., Ltd. is accredited to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L15527. A2LA - Registration No.: 4346.01 This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: https://portal.a2la.org/scopepdf/4346-01.pdf

3.8 Laboratory Location

JianYan Testing Group Shenzhen Co., Ltd.

Address: No.101, Building 8, Innovation Wisdom Port, No.155 Hongtian Road, Huangpu Community, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, People's Republic of China.

Tel: +86-755-23118282, Fax: +86-755-23116366

Email: info-JYTee@lets.com, Website: <http://jyt.lets.com>

3.9 Test Instruments List

Conducted Method:					
Test Equipment	Manufacturer	Model No.	Manage No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
Spectrum Analyzer	Keysight	N9010B	WXJ004-3	10-17-2022	10-16-2023
Temperature Humidity Chamber	ZHONG ZHI	CZ-A-80D	WXJ032-3	01-09-2023	01-08-2025
Power Detector Box	MWRFTEST	MW100-PSB	WXJ007-4	10-17-2022	10-16-2023
DC Power Supply	Keysight	E3642A	WXJ025-2		N/A
RF Control Unit	MWRFTEST	MW100-RFCB	WXG006		N/A
Test Software	MWRFTEST	MTS 8310		Version: 2.0.0.0	

4 Measurement Setup and Procedure

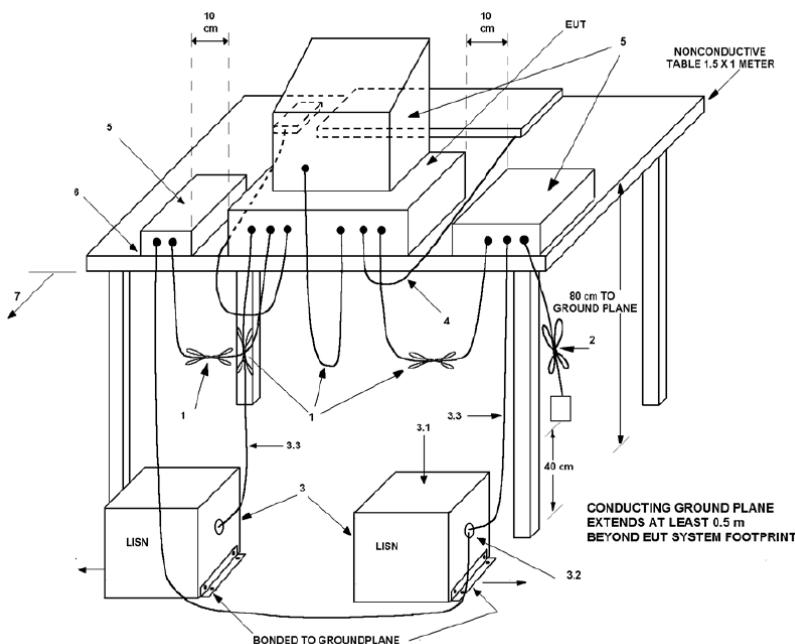
4.1 Test Channel

According to ANSI C63.10-2013 chapter 5.6.1 Table 4 requirement, select lowest channel, middle channel, and highest channel in the frequency range in which device operates for testing. The detailed frequency points are as follows:

Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
0	2402	39	2441	78	2480

4.2 Test Setup

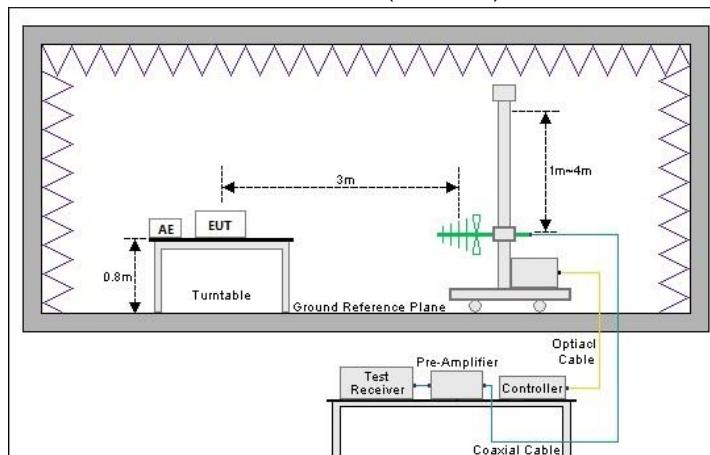
1) Conducted emission measurement:

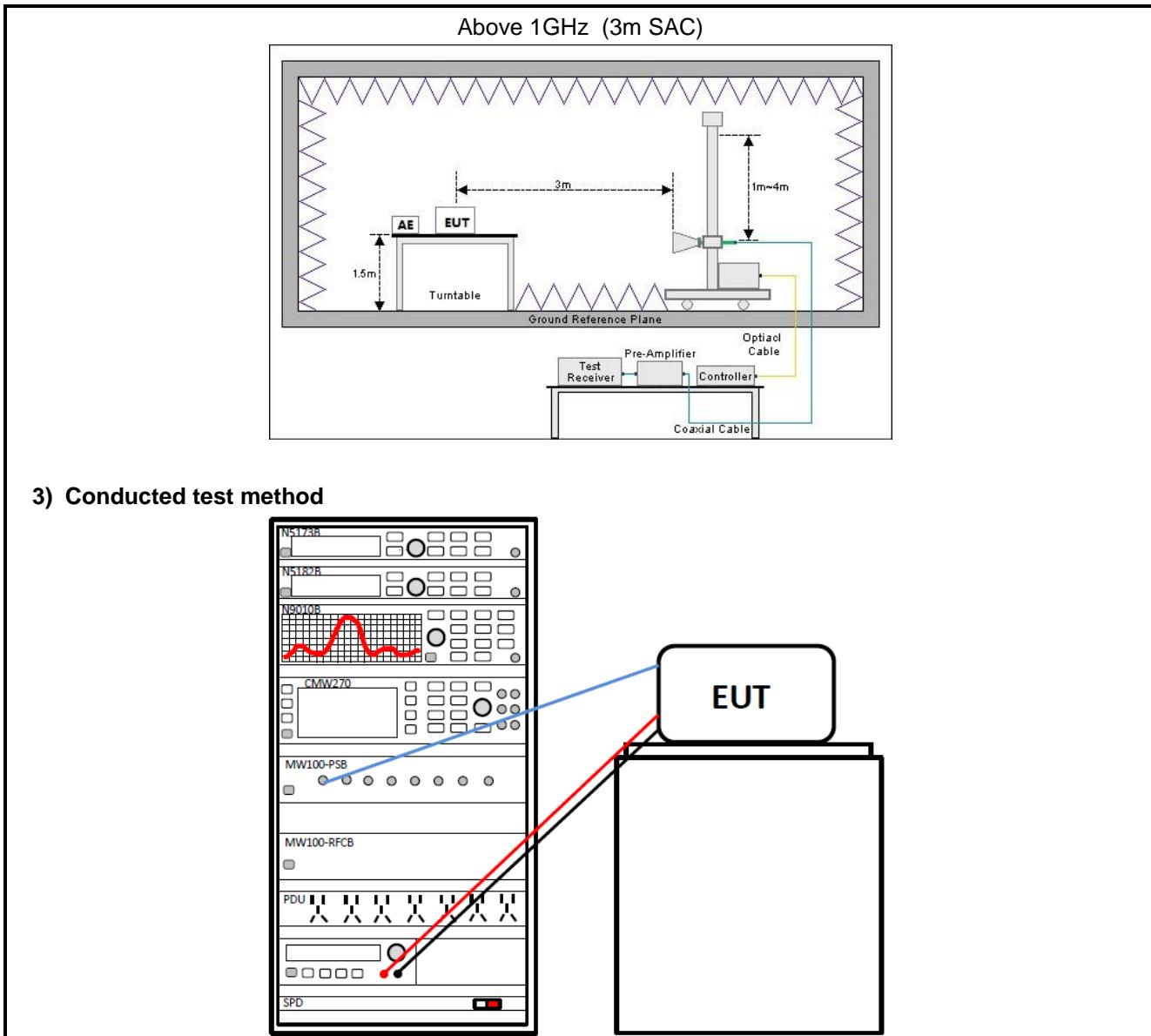


Note: The detailed descriptions please refer to Figure 8 of ANSI C63.4:2014.

2) Radiated emission measurement:

Below 1GHz (3m SAC)





4.3 Test Procedure

Test method	Test step
Conducted emission	<ol style="list-style-type: none">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.2. 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.
Radiated emission	<p>For below 1GHz:</p> <ol style="list-style-type: none">1. The EUT was placed on the tabletop of a rotating table 0.8 m the ground at a 3 m semi anechoic chamber. The measurement distance from the EUT to the receiving antenna is 3 m.2. EUT works in each mode of operation that needs to be tested, and having the EUT continuously working, respectively on 3 axis (X, Y & Z) and considered typical configuration to obtain worst position. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations.3. Open the test software to control the test antenna and test turntable. Perform the test, save the test results, and export the test data. <p>For above 1GHz:</p> <ol style="list-style-type: none">1. The EUT was placed on the tabletop of a rotating table 1.5 m the ground at a 3 m fully anechoic room. The measurement distance from the EUT to the receiving antenna is 3 m.2. EUT works in each mode of operation that needs to be tested, and having the EUT continuously working, respectively on 3 axis (X, Y & Z) and considered typical configuration to obtain worst position. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations.3. Open the test software to control the test antenna and test turntable. Perform the test, save the test results, and export the test data.
Conducted test method	<ol style="list-style-type: none">1. The Bluetooth antenna port of EUT was connected to the test port of the test system through an RF cable.2. The EUT is keeping in continuous transmission mode and tested in all modulation modes.3. Open the test software, prepare a test plan, and control the system through the software. After the test is completed, the test report is exported through the test software.

5 Test Results

5.1 Summary

5.1.1 Clause and data summary

This report is revised according to the JYTSZ-R12-2300403 report, FCC ID: 2A5RQ-P662LO issued by JianYan Testing Group Shenzhen Co., Ltd. Differences: Memory increased, updated model and FCC ID, so need to Spot test Conducted Output Power.

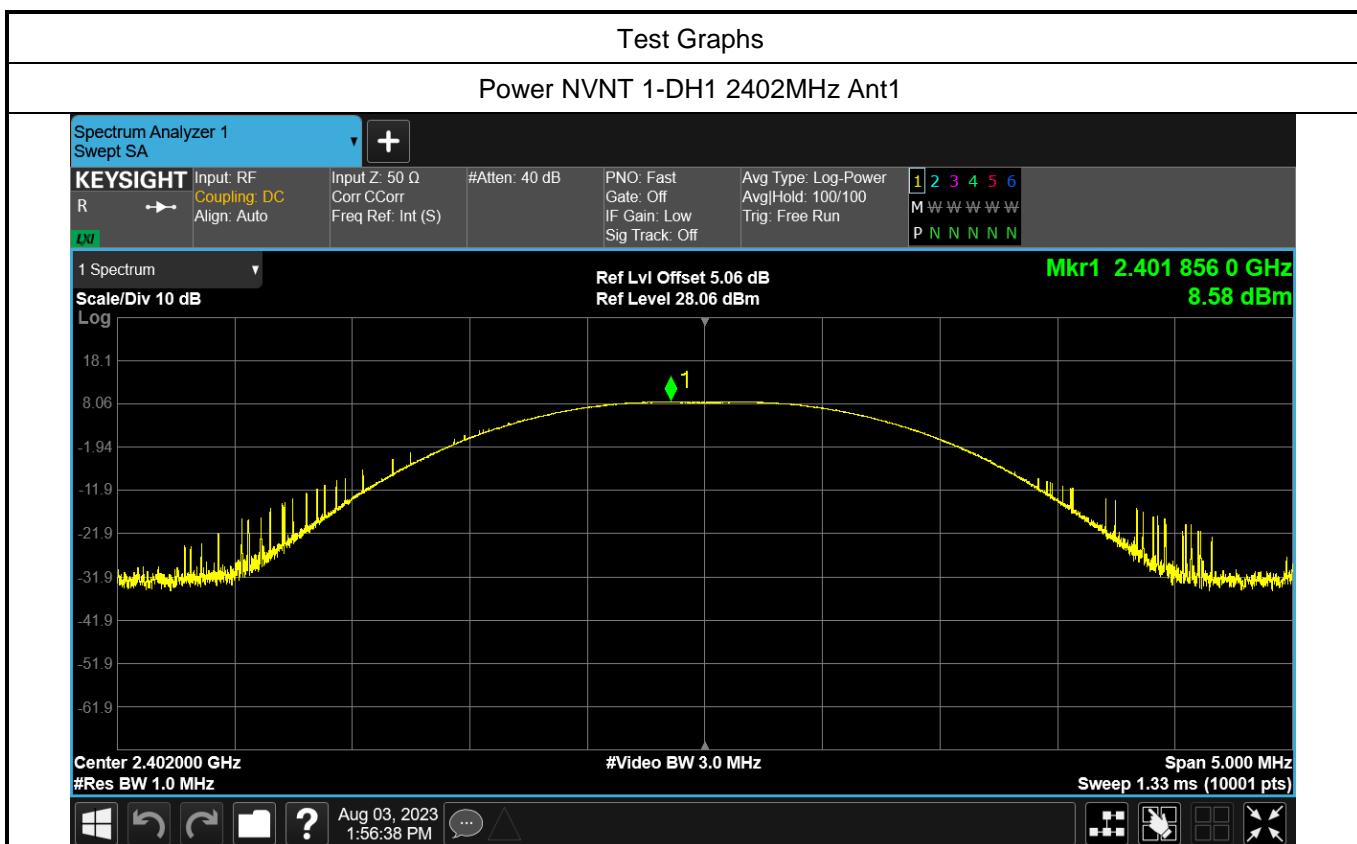
Test items	Standard clause	Test data	Result
Antenna Requirement	15.203 15.247 (b)(4)	Please refer to report No.: JYTSZ-R12-2300403.	Pass*
AC Power Line Conducted Emission	15.207	Please refer to report No.: JYTSZ-R12-2300403.	Pass*
Conducted Output Power	15.247 (b)(1)	See Section 5.2	Pass
20dB Occupied Bandwidth	15.247 (a)(1)	Please refer to report No.: JYTSZ-R12-2300403.	Pass*
Carrier Frequencies Separation	15.247 (a)(1)	Please refer to report No.: JYTSZ-R12-2300403.	Pass*
Hopping Channel Number	5.247 (a)(1)(iii)	Please refer to report No.: JYTSZ-R12-2300403.	Pass*
Dwell Time	15.247 (a)(1)(iii)	Please refer to report No.: JYTSZ-R12-2300403.	Pass*
Band-edge Emission Conduction Spurious Emission	15.247 (d)	Please refer to report No.: JYTSZ-R12-2300403.	Pass*
Emissions in Restricted Frequency Bands	15.205 15.247 (d)	Please refer to report No.: JYTSZ-R12-2300403.	Pass*
Emissions in Non-restricted Frequency Bands	15.209 15.247(d)	Please refer to report No.: JYTSZ-R12-2300403.	Pass*
Remark: 1. Pass: The EUT complies with the essential requirements in the standard. 2. Pass*: Please refer to FCC ID: 2A5RQ-P662LO, report No.: JYTSZ-R12-2300403 issue by JianYan Testing Group Shenzhen Co., Ltd. 3. The cable insertion loss used by "RF Output Power" and other conduction measurement items is 0.5dB (provided by the customer).			
Test Method:	ANSI C63.10-2013 KDB 558074 D01 15.247 Meas Guidance v05r02		

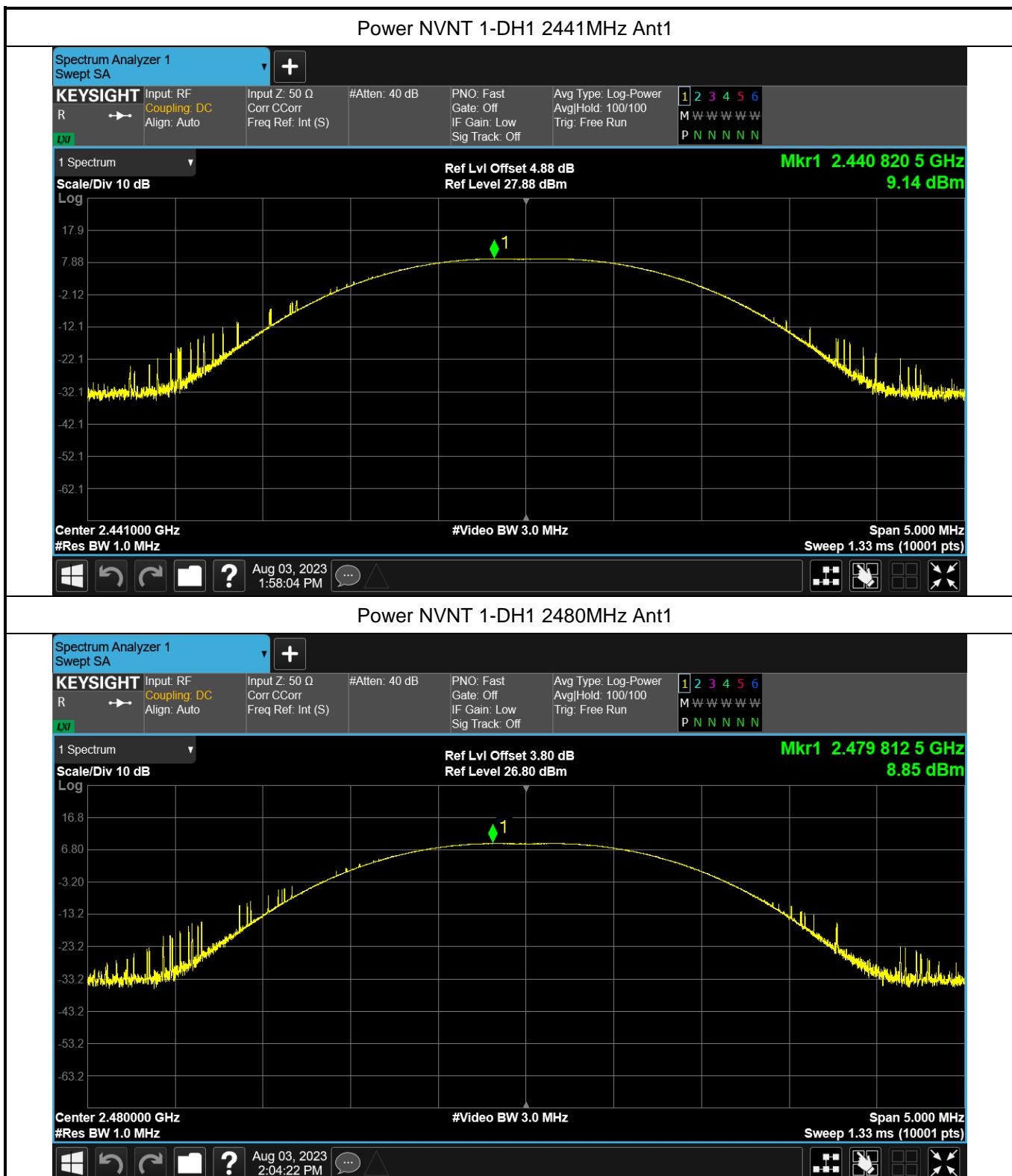
5.1.2 Test Limit

Test items	Limit			
AC Power Line Conducted Emission	Frequency (MHz)	Limit (dB μ V)		
		Quasi-Peak	Average	
		0.15 – 0.5	66 to 56 <small>Note 1</small>	
		0.5 – 5	56	
Conducted Output Power	For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.			
20dB Occupied Bandwidth	Within authorization band			
Carrier Frequencies Separation	a) 0.025MHz or the 20dB bandwidth (whichever is greater). b) 0.025MHz or two-thirds of the 20dB bandwidth (whichever is greater).			
Hopping Channel Number	At least 15 channels.			
Dwell Time	Not be greater than 0.4 seconds.			
Band-edge Emission	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).			
Conduction Spurious Emission				
Emissions in Restricted Frequency Bands	Frequency (MHz)	Limit (dB μ V/m)		
		@ 3m	@ 10m	
		30 – 88	40.0	
		88 – 216	43.5	
Emissions in Non-restricted Frequency Bands		216 – 960	46.0	
		960 – 1000	54.0	
		Note: The more stringent limit applies at transition frequencies.		
Frequency	Limit (dB μ V/m) @ 3m			
	Average		Peake	
Above 1 GHz	54.0		74.0	
Note: The measurement bandwidth shall be 1 MHz or greater.				

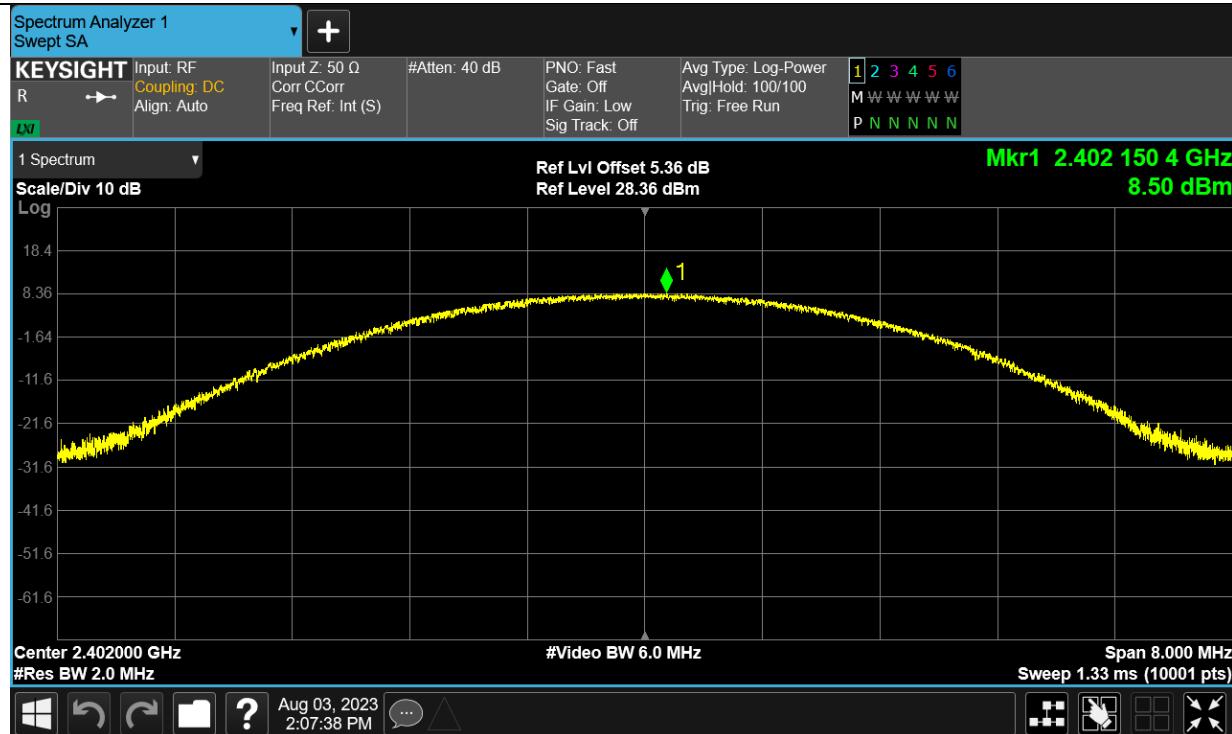
5.2 Conducted Output Power

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH1	2402	Ant1	8.577	30	Pass
NVNT	1-DH1	2441	Ant1	9.138	30	Pass
NVNT	1-DH1	2480	Ant1	8.854	30	Pass
NVNT	2-DH1	2402	Ant1	8.502	21	Pass
NVNT	2-DH1	2441	Ant1	9.182	21	Pass
NVNT	2-DH1	2480	Ant1	8.84	21	Pass
NVNT	3-DH1	2402	Ant1	8.666	21	Pass
NVNT	3-DH1	2441	Ant1	9.438	21	Pass
NVNT	3-DH1	2480	Ant1	9.01	21	Pass

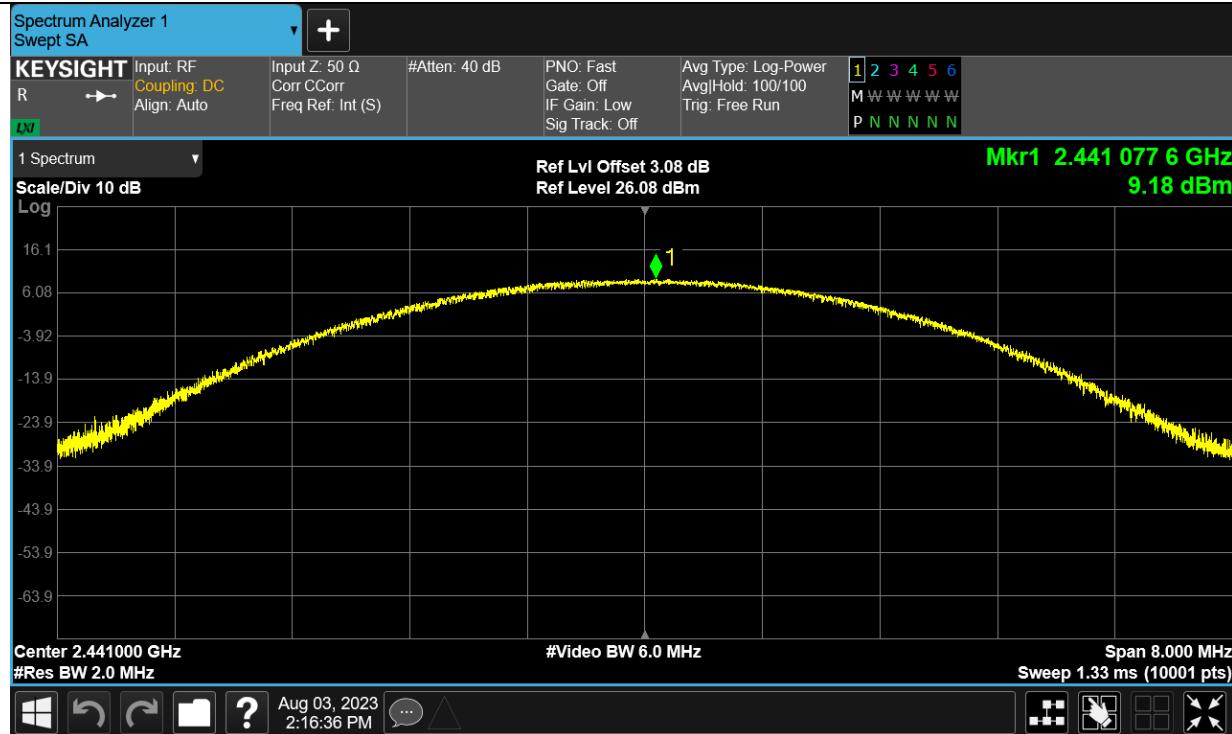




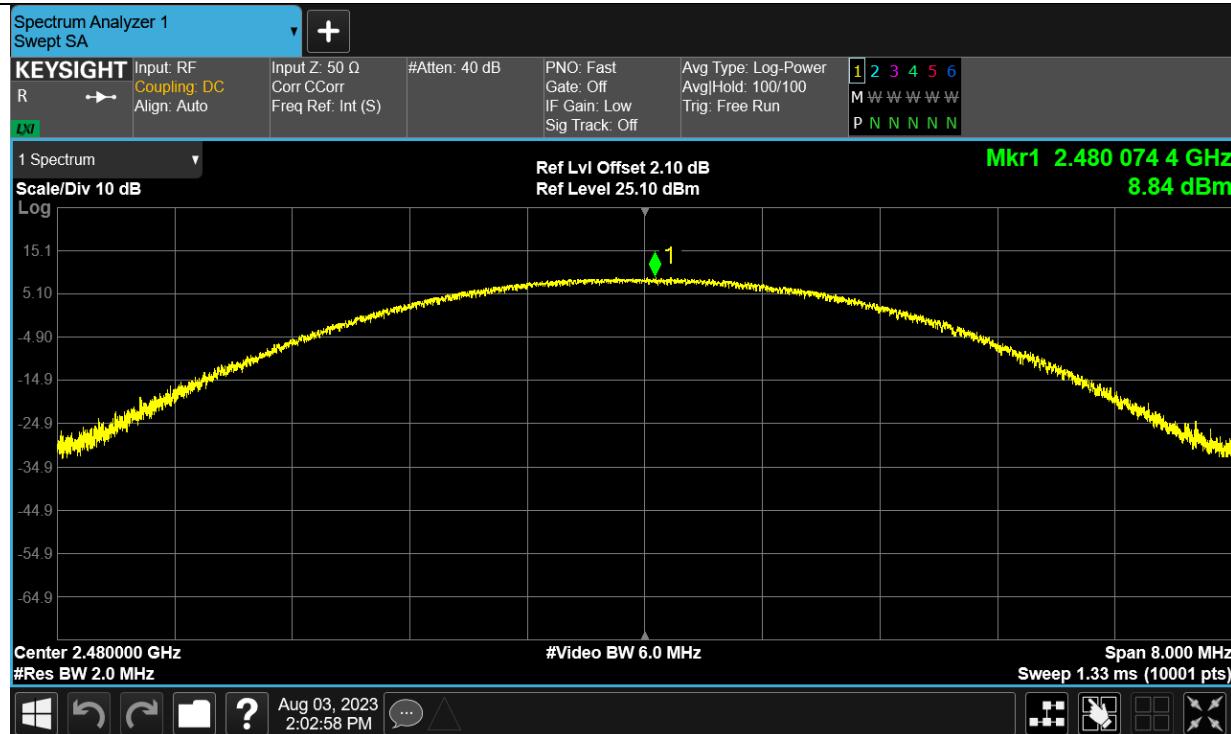
Power NVNT 2-DH1 2402MHz Ant1



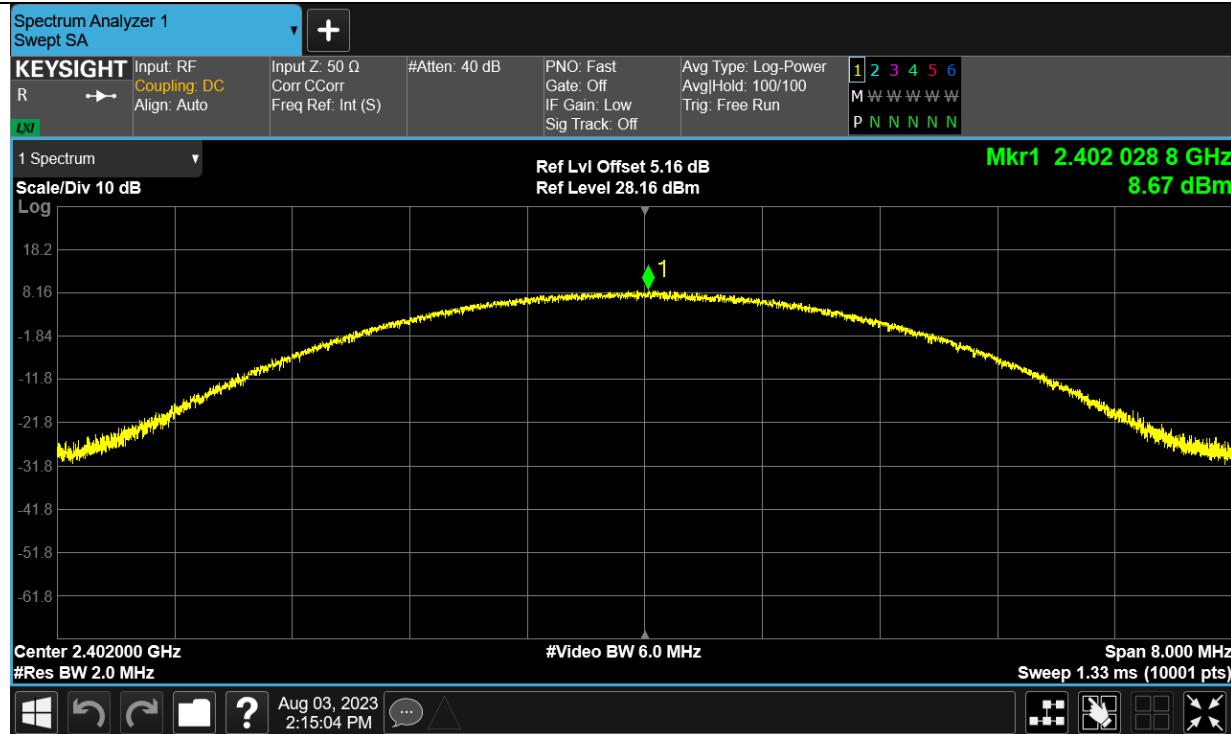
Power NVNT 2-DH1 2441MHz Ant1



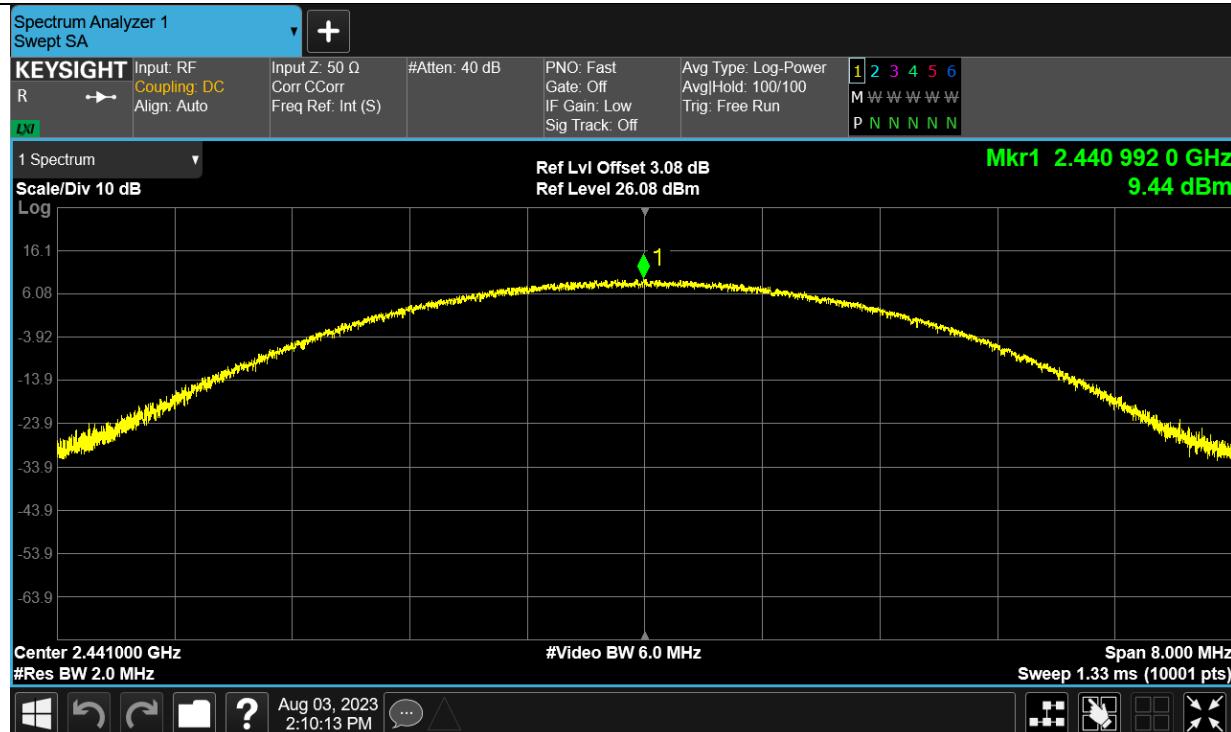
Power NVNT 2-DH1 2480MHz Ant1



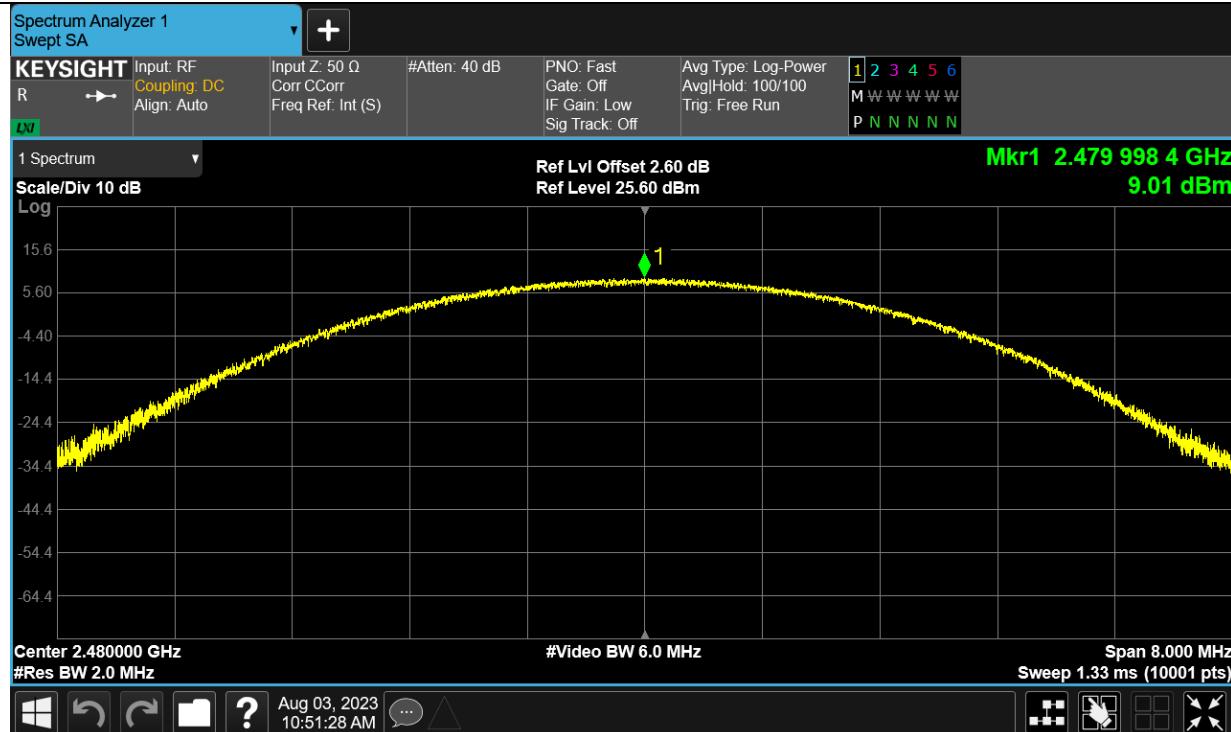
Power NVNT 3-DH1 2402MHz Ant1



Power NVNT 3-DH1 2441MHz Ant1



Power NVNT 3-DH1 2480MHz Ant1



-----End of report-----