RF TEST REPORT

Product Name: SLAM LiDAR

Model Name: M10, M10 Backpack, M10+, M10+ Backpack

FCC ID: 2A8YS-M10

Issued For : Wuhan Eleph-Print Tech Co.,Ltd

701, Blk B, Huishang Bldg, 2 Wudayuan Rd, Wuhan, Hubei, China

Issued By : Shenzhen LGT Test Service Co., Ltd.

Room 205, Building 13, Zone B, Zhenxiong Industrial Park, No.177, Renmin West Road, Jinsha, Kengzi Street, Pingshan District, Shenzhen, Guangdong, China

Report Number:	LGT23E048RF02
Sample Received Date:	May 23, 2023
Date of Test:	May 23, 2023 – Jun. 07, 2023
Date of Issue:	Jun. 07, 2023

TEST REPORT CERTIFICATION

Applicant:	Wuhan Eleph-Print Tech Co.,Ltd
Address:	701, Blk B, Huishang Bldg, 2 Wudayuan Rd, Wuhan, Hubei, China
Manufacturer:	Wuhan Eleph-Print Tech Co.,Ltd
Address:	701, Blk B, Huishang Bldg, 2 Wudayuan Rd, Wuhan, Hubei, China
Factory:	Wuhan Eleph-Print Tech Co.,Ltd
Address:	701, Blk B, Huishang Bldg, 2 Wudayuan Rd, Wuhan, Hubei, China
Product Name:	SLAM LiDAR
Trademark:	EPiC
Model Name:	M10, M10 Backpack, M10+, M10+ Backpack
Sample Status:	Normal

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC Part 15.247, Subpart C ANSI C63.10-2013	PASS

Prepared by:

Zane Shan

Zane Shan
Engineer

Approved by:

Vita Li
Technical Director

SHENZHEN LGT TEST SERVICE CO., LTD.
LGT
领冠检测

Table of Contents — Page

1. SUMMARY OF TEST RESULTS **6**

1.1 TEST FACTORY 7

1.2 MEASUREMENT UNCERTAINTY 7

2. GENERAL INFORMATION **8**

2.1 GENERAL DESCRIPTION OF THE EUT 8

2.2 DESCRIPTION OF THE TEST MODES 10

2.3 TEST SOFTWARE AND POWER LEVEL 11

2.4 TABLE OF PARAMETERS OF TEST SOFTWARE SETTING 11

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS 12

3. EMC EMISSION TEST **13**

3.1 CONDUCTED EMISSION MEASUREMENT 13

3.2 RADIATED EMISSION MEASUREMENT 15

4. CONDUCTED SPURIOUS & BAND EDGE EMISSION **26**

4.1 LIMIT 26

4.2 TEST PROCEDURE 26

4.3 DEVIATION FROM STANDARD 26

4.4 TEST SETUP 26

4.5 EUT OPERATION CONDITIONS 26

4.6 TEST RESULTS 26

5. POWER SPECTRAL DENSITY TEST **27**

5.1 LIMIT 27

5.2 TEST PROCEDURE 27

5.3 DEVIATION FROM STANDARD 27

5.4 TEST SETUP 27

5.5 EUT OPERATION CONDITIONS 27

5.6 TEST RESULTS 27

6. BANDWIDTH TEST **28**

6.1 LIMIT 28

6.2 TEST PROCEDURE 28

6.3 DEVIATION FROM STANDARD 28

6.4 TEST SETUP 28

6.5 EUT OPERATION CONDITIONS 28

6.6 TEST RESULTS 28

Table of Contents **Page**

7. PEAK OUTPUT POWER TEST **29**

7.1 LIMIT 29

7.2 TEST PROCEDURE 29

7.3 DEVIATION FROM STANDARD 29

7.4 TEST SETUP 29

7.5 EUT OPERATION CONDITIONS 29

7.6 TEST RESULTS 29

8. ANTENNA REQUIREMENT **30**

8.1 STANDARD REQUIREMENT 30

8.2 EUT ANTENNA 30

APPENDIX I:TEST RESULTS **31**

DUTY CYCLE 31

MAXIMUM PEAK CONDUCTED OUTPUT POWER 36

-6DB BANDWIDTH 37

OCCUPIED CHANNEL BANDWIDTH 42

MAXIMUM POWER SPECTRAL DENSITY LEVEL 47

BAND EDGE 52

CONDUCTED RF SPURIOUS EMISSION 59

Revision History

Rev.	Issue Date	Contents
00	Jun. 07, 2023	Initial Issue

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:
KDB 558074 D01 15.247 Meas Guidance v05r02.

FCC Part 15.247,Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	N/A	Note 3
15.247 (a)(2)	6dB Bandwidth	PASS	--
15.247 (b)(3)	Output Power	PASS	--
15.209	Radiated Spurious Emission	PASS	--
15.247 (d)	Conducted Spurious & Band Edge Emission	PASS	--
15.247 (e)	Power Spectral Density	PASS	--
15.205	Restricted Band Edge Emission	PASS	--
Part 15.247(d)/ Part 15.209(a)	Band Edge Emission	PASS	--
15.203	Antenna Requirement	PASS	--

NOTE:

(1) ‘N/A’ denotes test is not applicable in this Test Report.

(2) All tests are according to ANSI C63.10-2013.

(3) EUT cannot be charged when it is powered on. Therefore, the test of AC power supply is not evaluated.

1.1 TEST FACTORY

Company Name:	Shenzhen LGT Test Service Co., Ltd.
Address:	Room 205, Building 13, Zone B, Zhenxiong Industrial Park, No.177, Renmin West Road, Jinsha, Kengzi Street, Pingshan District, Shenzhen, Guangdong, China
Accreditation Certificate	A2LA Certificate No.: 6727.01
	FCC Registration No.: 746540
	CAB ID: CN0136

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **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** %.

Parameter	Uncertainty
Occupied Channel Bandwidth	±3.2 %
RF Output Power, Conducted	±0.71dB
Power Spectral Density, Conducted	±1.57 dB
Unwanted Emission, Conducted	±0.63dB
Conducted emission	±2.80dB
All Emissions, Radiated (0.009-30MHz)	±2.16dB
All Emissions, Radiated (30MHz-1GHz)	±4.40dB
All Emissions, Radiated (1GHz-18GHz)	±5.49dB
Temperature	±0.5°C
Humidity	±2%
Duty Cycle	±2.3%

Note: The measurement uncertainty is not included in the test result.

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

<table>
<tr><td>Product Name:</td><td>SLAM LiDAR</td></tr>
<tr><td>Trademark:</td><td>EPiC</td></tr>
<tr><td>Model Name:</td><td>M10</td></tr>
<tr><td>Series Model:</td><td>M10 Backpack, M10+, M10+ Backpack</td></tr>
<tr><td>Model Difference:</td><td>The product circuit is the same, only the model name is different.</td></tr>
<tr><td>Product Description:</td><td>The EUT is a SLAM LiDAR
<table>
<tr><td>Operation Frequency:</td><td>802.11b/g/n (20MHz): 2412~2462 MHz
802.11n (40MHz):2422~2452MHz</td></tr>
<tr><td>Modulation Type:</td><td>802.11b(DSSS):CCK,DQPSK,DBPSK
802.11g(OFDM):BPSK,QPSK,16-QAM,64-QAM
802.11n(OFDM):BPSK,QPSK,16-QAM,64-QAM</td></tr>
<tr><td>Number of Channel:</td><td>802.11b/g/n/ac (20MHz): 11CH
802.11n/ac (40MHz): 7CH</td></tr>
<tr><td>Antenna Designation:</td><td>Dipole antenna</td></tr>
<tr><td>Antenna Gain(dBi):</td><td>1dBi</td></tr>
<tr><td>Duty Cycle:</td><td>>98%</td></tr>
</table></td></tr>
<tr><td>Channel List:</td><td>Please refer to the Note 2.</td></tr>
<tr><td>Adapter:</td><td>Model: D0119500615
Input: AC 110-240V, 50/60Hz, 1.75A Max
Output: DC 19.5V, 6.15A</td></tr>
<tr><td>Battery:</td><td>Capacity: 3300mAh 47.52Wh
Rated Voltage: 14.4V</td></tr>
<tr><td>Hardware Version:</td><td>M10_V1.0.0</td></tr>
<tr><td>Software Version:</td><td>Easy Point Access M V1.00.00Beta(23.03.27)</td></tr>
<tr><td>Connecting I/O Port(s):</td><td>Please refer to the Note 1.</td></tr>
</table>

802.11 b/g : SISO mode only, 802.11n HT20 /HT40/AX40: MIMO mode only.

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User Manual.

2.

Operation Frequency of channel			
802.11b/g/n/ax(20MHz)		Channel List for 802.11n/ax(40MHz)	
Channel	Frequency	Channel	Frequency
01	2412	03	2422
02	2417	04	2427
03	2422	05	2432
04	2427	06	2437
05	2432	07	2442
06	2437	08	2447
07	2442	09	2452
08	2447		
09	2452		
10	2457		
11	2462		

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	EPiC	M10	Dipole antenna	N/A	1	2.4G WIFI

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

2.4GHz Test Frequency:

For 802.11b/g/n (20MHz)		For 802.11n (40MHz)	
Channel	Freq.(MHz)	Channel	Freq.(MHz)
01	2412	03	2422
06	2437	06	2437
11	2462	09	2452

Note: The antenna information refer the manufacturer provide report, applicable only to the tested sample identified in the report.

2.2 DESCRIPTION OF THE TEST MODES

Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Worst Mode	Description	Data Rate
Mode 1	TX IEEE 802.11b CH1	1 Mbps
Mode 2	TX IEEE 802.11b CH6	1 Mbps
Mode 3	TX IEEE 802.11 b CH11	1 Mbps
Mode 4	TX IEEE 802.11g CH1	6 Mbps
Mode 5	TX IEEE 802.11g CH6	6 Mbps
Mode 6	TX IEEE 802.11g CH11	6 Mbps
Mode 7	TX IEEE 802.11n HT20 CH1	MCS 0
Mode 8	TX IEEE 802.11n HT20 CH6	MCS 0
Mode 9	TX IEEE 802.11n HT20 CH11	MCS 0
Mode 10	TX IEEE 802.11n HT40 CH3	MCS 0
Mode 11	TX IEEE 802.11n HT40 CH6	MCS 0
Mode 12	TX IEEE 802.11n HT40 CH9	MCS 0

Note:

(1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.

(2) We have be tested for all avaiable U.S. voltage and frequencies(For 120V,50/60Hz and 240V, 50/60Hz) for which the device is capable of operation, and the worst case of 120V /60Hz is shown in the report.

AC Conducted Emission

Test Case	
AC Conducted Emission	Mode13: TX Mode + WLAN Link

2.3 TEST SOFTWARE AND POWER LEVEL

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

Accessories Equipment

Description	Manufacturer	Model	S/N	Rating
USB Cable	N/A	N/A	N/A	0.8m
Lithium Ion Battery Pack	SHENZHEN Grace Technology Development Co.,Ltd	GS2054DH	N/A	Nominal Voltage:14.4V Rated Capacity:3300mAh 47.52Wh
Smart Battery Charger	SHENZHEN Grace Technology Development Co.,Ltd	GSCH4000A	N/A	Input:DC 9V-26V/4A
Adapter	Shenzhen Delippo Technology Co.,Ltd	D0119500615	N/A	Input:110-240V ~ 50/60Hz 1.75A Output:19.5V, 6.15A
USB Flash disk	SAMSUNG	N/A	N/A	N/A

Auxiliary Equipment

Description	Manufacturer	Model	S/N	Rating
Laptop	Lenovo	Thinkbook 14	N/A	N/A

2.4 TABLE OF PARAMETERS OF TEST SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of FHSS.

Test software Version	Test program: 2.4G WIFI	
QATool_Dbg_0.0.0.96	Mode Or Modulation type	Power setting
	b	Default
	g	Default
	n20	Default
	n40	Default

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Conducted Emission					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date**	**Cal. Until**
EMI Test Receiver	R&S	ESU8	100372	2023.04.13	2024.04.12
LISN	COM-POWER	LI-115	02032	2023.04.07	2024.04.06
LISN	SCHWARZBECK	NNLK 8121	00847	2023.04.07	2024.04.06
LISN	SCHWARZBECK	NNLK 8122	00160	2023.04.07	2024.04.06
ISN	FCC	T4-02	91317	2022.06.08	2023.06.07
ISN	SCHWARZBECK	NTFM 8158	00303	2023.04.07	2024.04.06
Transient Limiter	CYBERTEK	EM5010A	E2250100049	2023.04.07	2024.04.06
Temperature & Humidity	KTJ	TA218B	N.A	2023.04.24	2024.04.23
Testing Software	EMC-I_V1.4.0.3_SKET				

Radiated Test equipment					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date**	**Cal. Until**
EMI Test Receiver	R&S	ESU8	100372	2023.04.13	2024.04.12
Active loop Antenna	ETS	6502	00049544	2022.06.02	2025.06.01
Spectrum Analyzer	Keysight	N9010B	MY60242508	2023.04.10	2024.04.09
Bilog Antenna	SCHAFFNER	CBL6112B	2705	2022.06.05	2025.06.04
Horn Antenna	SCHWARZBECK	3115	10SL0060	2022.06.02	2025.06.01
Pre-amplifier(9kHz-1GHz)	EMtrace	RP01A	02017	2023.04.07	2024.04.06
Pre-amplifier(1-26.5G)	Agilent	8449B	3008A4722	2023.04.07	2024.04.06
Wireless Communications Test Set	R&S	CMW 500	137737	2023.04.13	2024.04.12
Temperature & Humidity	KTJ	TA218B	N.A	2023.04.24	2024.04.23
Testing Software	EMC-I_V1.4.0.3_SKET				

Conducted Test equipment					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date**	**Cal. Until**
Signal Analyzer	Keysight	N9010B	MY60242508	2023.04.10	2024.04.09
Wireless Communications Test Set	R&S	CMW 500	137737	2023.04.13	2024.04.12
MXG Vector Signal Generator	Keysight	N5182B	MY59100717	2023.04.07	2024.04.06
RF Automatic Test system	MW	MW100-RFCB	MW220324LG-33	2023.04.13	2024.04.12
Temperature & Humidity	KTJ	TA218B	N.A	2023.04.24	2024.04.23
Temperature& Humidity test chamber	AISRY	LX-1000L	171200018	2023.05.10	2024.05.09
Attenuator	eastsheep	90db	N.A	2023.04.10	2024.04.09
Testing Software	MTS8200_ V2.0.0.0_MW				

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

The radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table.

FREQUENCY (MHz)	Conducted Emissionlimit (dBuV)	
	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

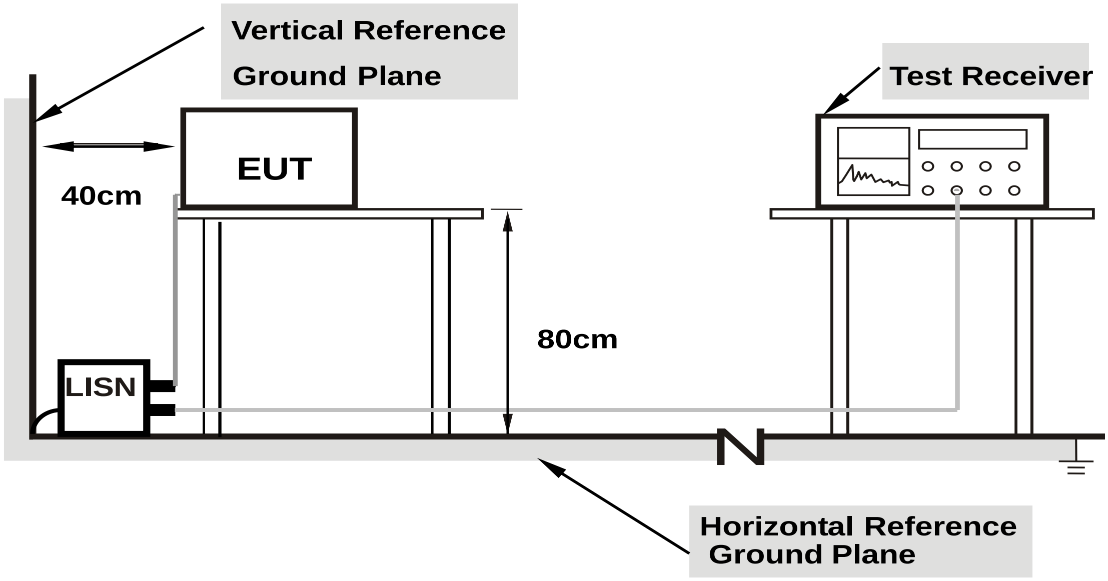
The following table is the setting of the receiver

Receiver Parameters	**Setting**
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.2 TEST PROCEDURE

a. The EUT is 0.8 m from the horizontal ground plane and 0.4 m from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments are powered from additional LISN(s). The LISN provides 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN is at least 80 cm from the nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 TEST SETUP



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes support units.

3.1.4 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.5 TEST RESULT

N/A

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS

In any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the Restricted band specified on Part15.205(a)&209(a) limit in the table and according to ANSI C63.10-2013 below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (0.009MHz - 1000MHz)

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (1000MHz-25GHz)

FREQUENCY (MHz)	(dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RESTRICTED FREQUENCY BANDS

FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (GHz)
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

For Radiated Emission

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/QP/AV
Start Frequency	9 KHz/150KHz(Peak/QP/AV)
Stop Frequency	150KHz/30MHz(Peak/QP/AV)
RB / VB (emission in restricted band)	200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz); 200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz)

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/QP
Start Frequency	30 MHz(Peak/QP)
Stop Frequency	1000 MHz (Peak/QP)
RB / VB (emission in restricted band)	120 KHz / 300 KHz

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak
Start Frequency	1000 MHz(Peak/AV)
Stop Frequency	10th carrier hamonic(Peak/AV)
RB / VB (emission in restricted band)	1 MHz / 3 MHz(Peak) 1 MHz/1/T MHz(AVG)

For Restricted band

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	Lower Band Edge: 2310 to 2430 MHz Upper Band Edge: 2445 to 2500 MHz
RB / VB	1 MHz / 3 MHz(Peak) 1 MHz/1/T MHz(AVG)

Receiver Parameter	Setting
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

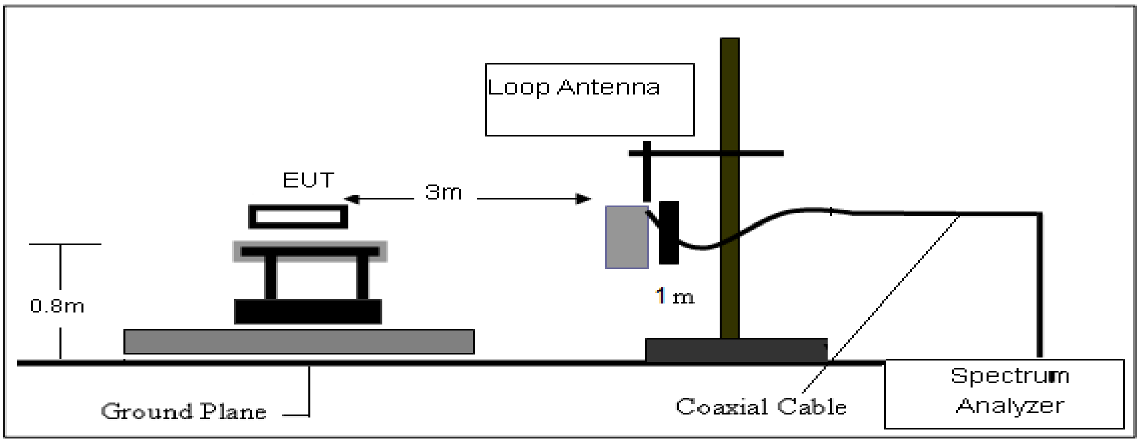
a. The measuring distance at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz, and above 1GHz.
b. The EUT was placed on the top of a rotating table 0.8 m (above 1GHz is 1.5 m) above the ground at a 3 m anechoic chamber test site. The table was rotated 360 degree to determine the position of the highest radiation.
c. The height of the equipment shall be 0.8 m (above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. Horizontal and vertical polarization of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and QuasiPeak detector mode will be re-measured.
e. If the Peak Mode measured value is compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and no additional QP Mode measurement was performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

   Note:

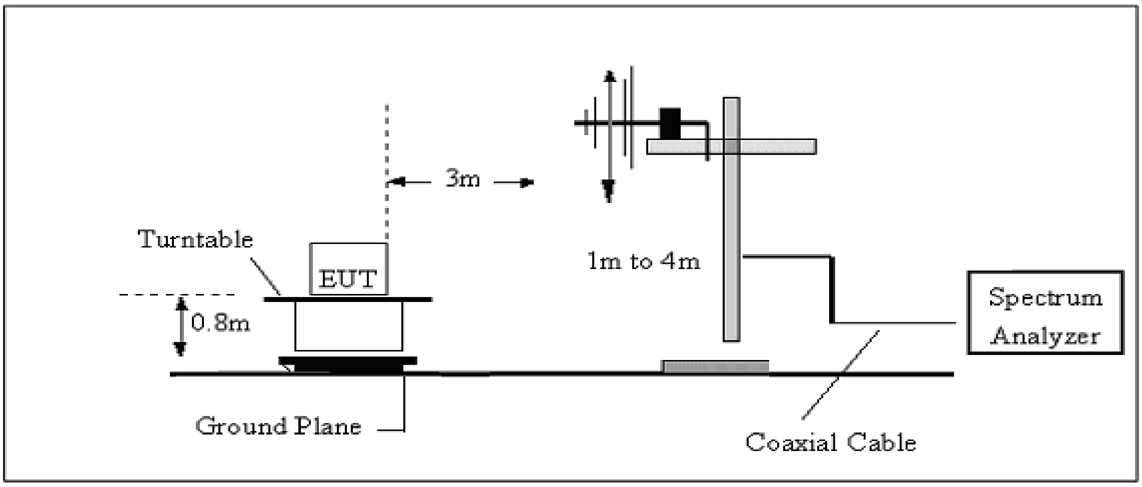
   Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

3.2.3 TEST SETUP

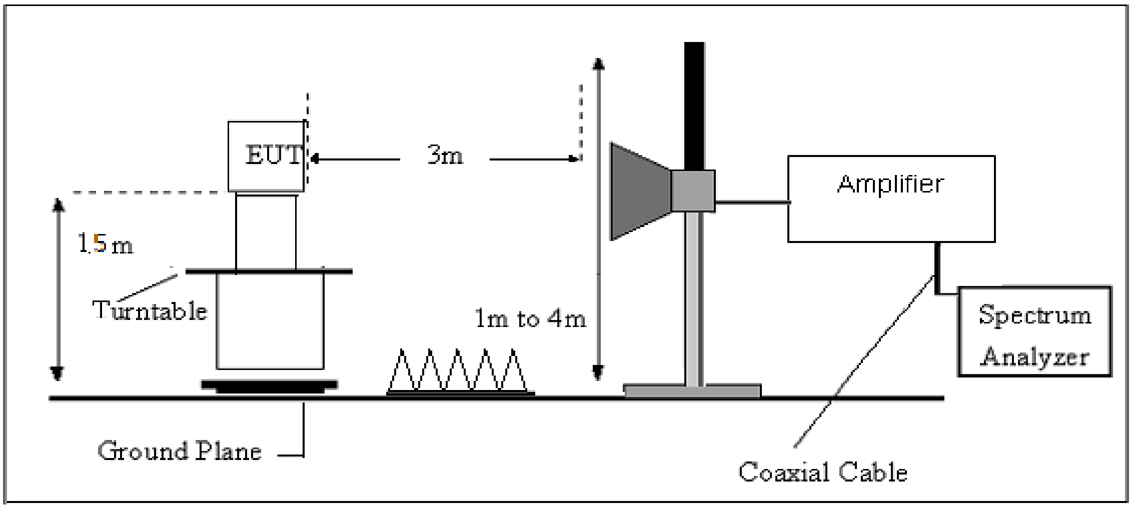
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



3.2.4 EUT OPERATING CONDITIONS

Please refer to section 3.1.4 of this report.

3.2.5 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting theAmplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where

FS = Field Strength

CL = Cable Attenuation Factor (Cable Loss)

RA = Reading Amplitude

AG = Amplifier Gain

AF = Antenna Factor

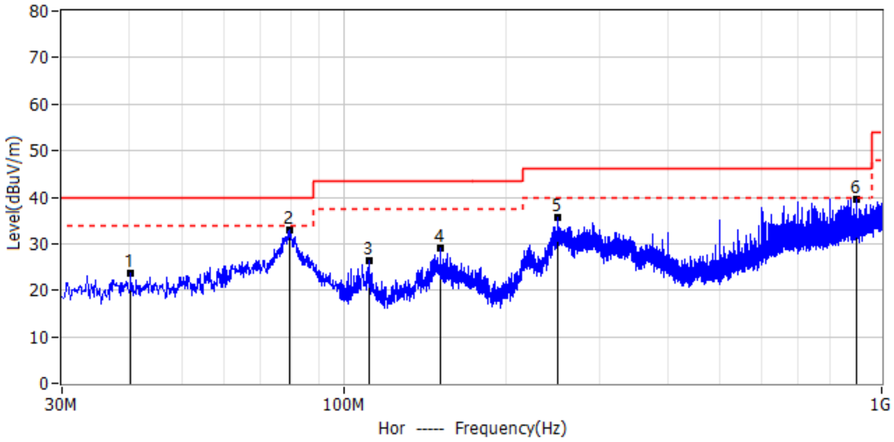
For example

Frequency	FS	RA	AF	CL	AG	Factor
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dB)	(dB)	(dB)
300	40	58.1	12.2	1.6	31.9	-18.1

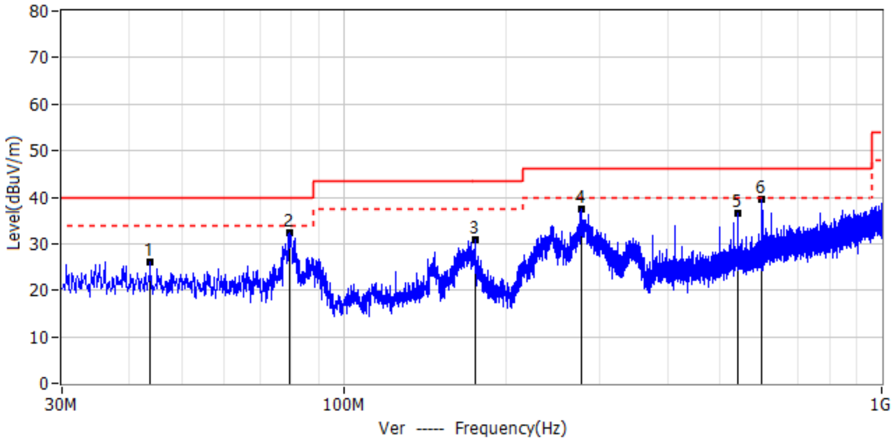
Factor=AF+CL-AG

3.2.6 TEST RESULT

Project: LGT23E048	Test Engineer: Dylan.shi
EUT: SLAM LiDAR	Temperature: 27℃
M/N: M10	Humidity: 56%RH
Test Voltage: Battery	Test Data: 2023-06-07
Test Mode: 2.4G Wi-Fi TX	
Note:	

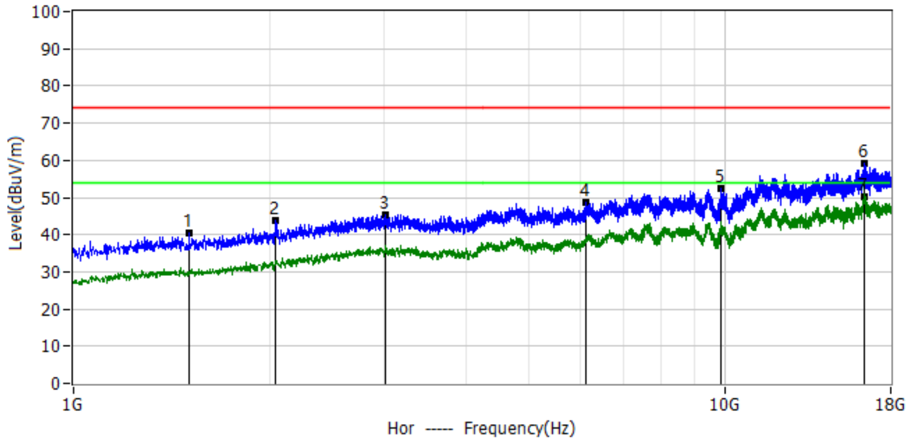


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	40.306MHz	4.17	19.37	23.54	40.00	-16.46	QP	Hor
2*	79.228MHz	17.50	15.42	32.92	40.00	-7.08	QP	Hor
3*	111.601MHz	9.32	16.92	26.24	43.50	-17.26	QP	Hor
4*	151.614MHz	9.21	19.97	29.18	43.50	-14.32	QP	Hor
5*	250.796MHz	17.27	18.27	35.54	46.00	-10.46	QP	Hor
6*	900.090MHz	6.28	33.24	39.52	46.00	-6.48	QP	Hor

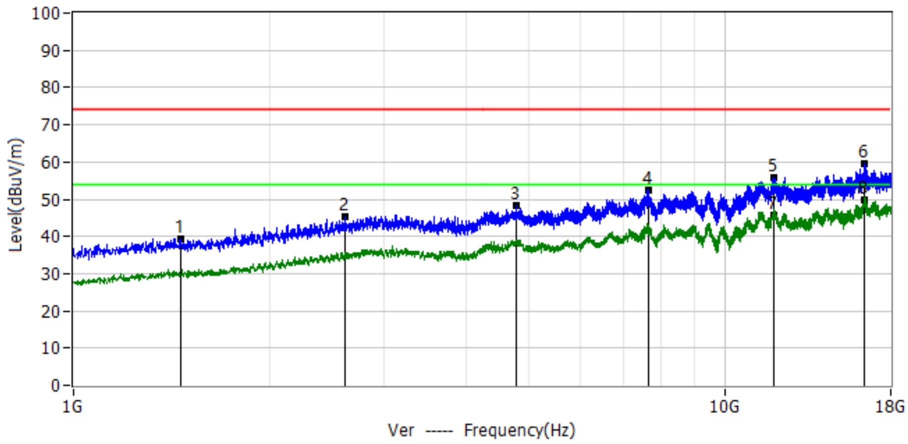


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	43.823MHz	6.79	19.26	26.05	40.00	-13.95	QP	Ver
2*	79.228MHz	16.79	15.42	32.21	40.00	-7.79	QP	Ver
3*	175.379MHz	11.47	19.27	30.74	43.50	-12.76	QP	Ver
4*	277.593MHz	17.91	19.47	37.38	46.00	-8.62	QP	Ver
5*	539.978MHz	10.52	25.92	36.44	46.00	-9.56	QP	Ver
6*	599.996MHz	11.87	27.72	39.59	46.00	-6.41	QP	Ver

Project: LGT23E048	Test Engineer: Dylan.shi
EUT: SLAM LiDAR	Temperature: 27.9℃
M/N: M10	Humidity: 55%RH
Test Voltage: Battery	Test Data: 2023-06-03
Test Mode: 802.11b 2412	
Note:	

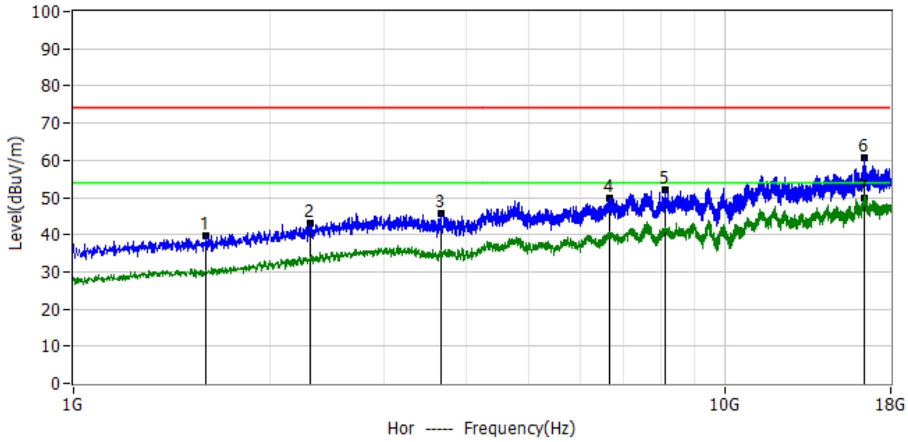


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.5036GHz	61.37	-20.82	40.55	74.00	-33.45	PK	Hor
2*	2.0455GHz	59.52	-15.75	43.77	74.00	-30.23	PK	Hor
3*	3.0124GHz	53.80	-8.34	45.46	74.00	-28.54	PK	Hor
4*	6.1255GHz	55.84	-7.30	48.54	74.00	-25.46	PK	Hor
5*	9.8931GHz	53.55	-1.18	52.37	74.00	-21.63	PK	Hor
6*	16.3659GHz	52.26	6.83	59.09	74.00	-14.91	PK	Hor
7*	16.3659GHz	43.27	6.83	50.10	54.00	-3.90	AV	Hor

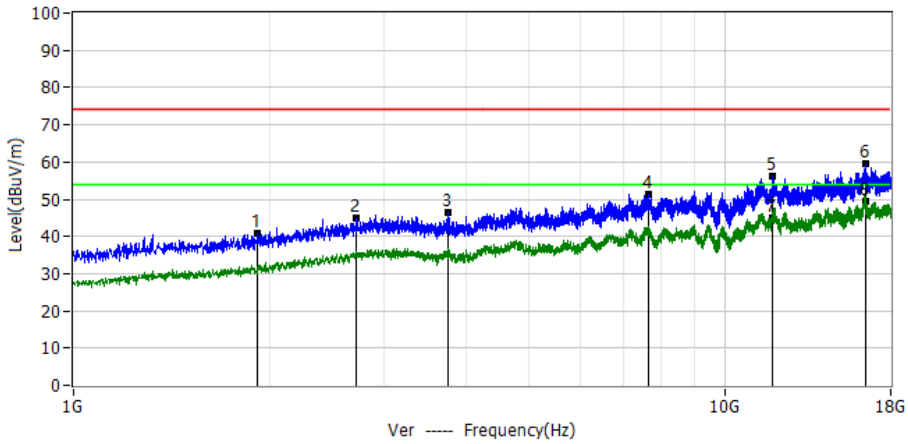


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.4632GHz	60.37	-21.04	39.33	74.00	-34.67	PK	Ver
2*	2.6150GHz	55.80	-10.38	45.42	74.00	-28.58	PK	Ver
3*	4.7910GHz	54.20	-5.98	48.22	74.00	-25.78	PK	Ver
4*	7.6449GHz	56.56	-4.21	52.35	74.00	-21.65	PK	Ver
5*	11.9161GHz	53.52	2.17	55.69	74.00	-18.31	PK	Ver
6*	16.3744GHz	52.73	6.84	59.57	74.00	-14.43	PK	Ver
7*	11.9161GHz	43.63	2.17	45.80	54.00	-8.20	AV	Ver
8*	16.3744GHz	43.06	6.84	49.90	54.00	-4.10	AV	Ver

Project: LGT23E048	Test Engineer: Dylan.shi
EUT: SLAM LiDAR	Temperature: 27.9℃
M/N: M10	Humidity: 55%RH
Test Voltage: Battery	Test Data: 2023-06-03
Test Mode: 802.11b 2437	
Note:	

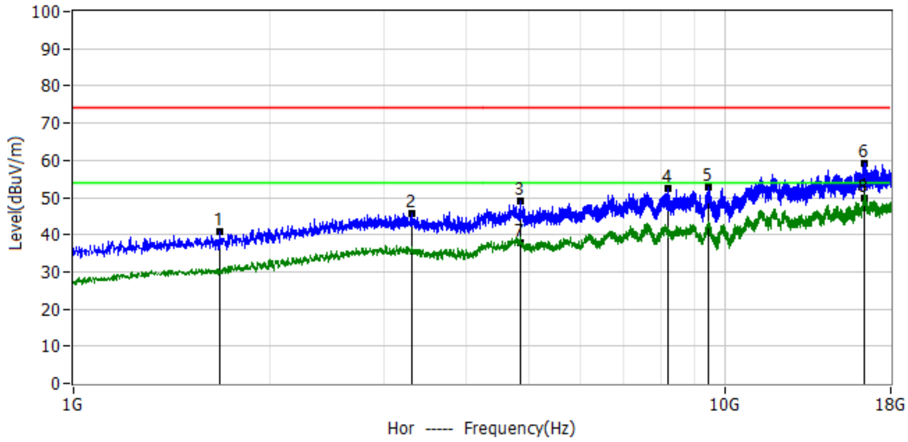


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.5950GHz	59.92	-20.21	39.71	74.00	-34.29	PK	Hor
2*	2.3132GHz	56.04	-12.94	43.10	74.00	-30.90	PK	Hor
3*	3.6669GHz	53.98	-8.29	45.69	74.00	-28.31	PK	Hor
4*	6.6737GHz	55.97	-6.26	49.71	74.00	-24.29	PK	Hor
5*	8.0996GHz	55.79	-3.72	52.07	74.00	-21.93	PK	Hor
6*	16.3829GHz	53.65	6.86	60.51	74.00	-13.49	PK	Hor
7*	16.3829GHz	42.94	6.86	49.80	54.00	-4.20	AV	Hor

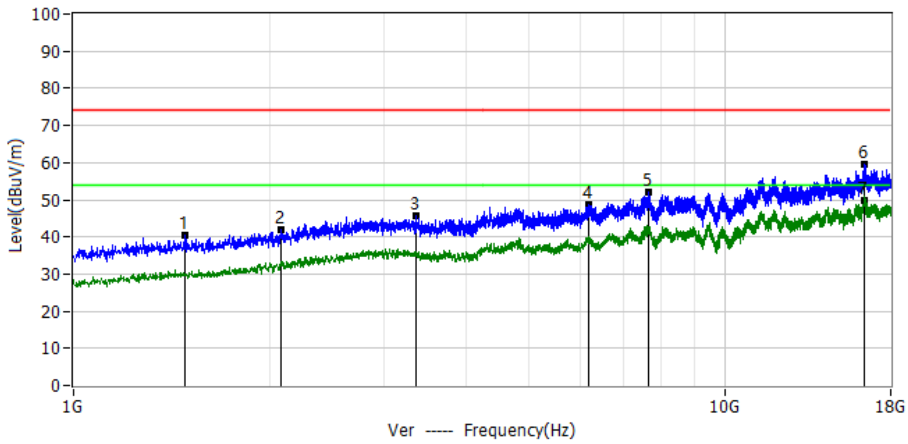


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.9201GHz	57.98	-17.04	40.94	74.00	-33.06	PK	Ver
2*	2.7170GHz	54.72	-9.84	44.88	74.00	-29.12	PK	Ver
3*	3.7689GHz	54.58	-8.16	46.42	74.00	-27.58	PK	Ver
4*	7.6555GHz	55.57	-4.20	51.37	74.00	-22.63	PK	Ver
5*	11.8630GHz	53.89	2.14	56.03	74.00	-17.97	PK	Ver
6*	16.4615GHz	52.52	6.98	59.50	74.00	-14.50	PK	Ver
7*	11.8630GHz	42.86	2.14	45.00	54.00	-9.00	AV	Ver
8*	16.4615GHz	42.62	6.98	49.60	54.00	-4.40	AV	Ver

Project: LGT23E048	Test Engineer: Dylan.shi
EUT: SLAM LiDAR	Temperature: 27.9℃
M/N: M10	Humidity: 55%RH
Test Voltage: Battery	Test Data: 2023-06-03
Test Mode: 802.11b 2462	
Note:	



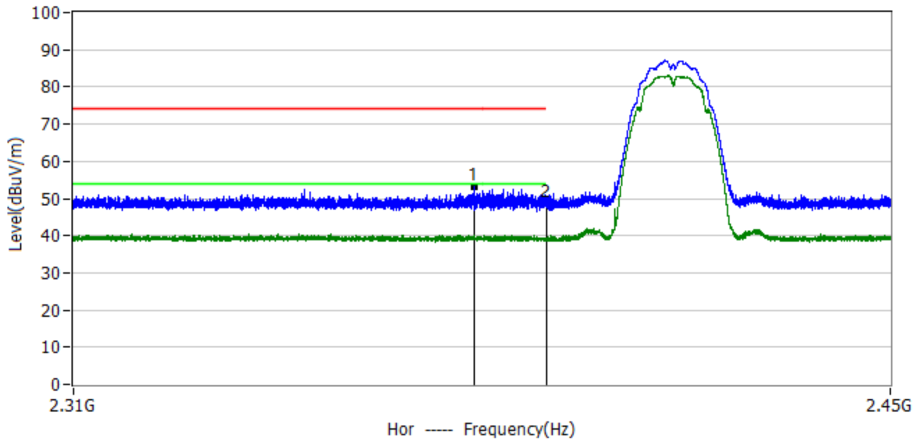
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.6779GHz	60.20	-19.43	40.77	74.00	-33.23	PK	Hor
2*	3.3035GHz	54.23	-8.44	45.79	74.00	-28.21	PK	Hor
3*	4.8547GHz	55.02	-6.03	48.99	74.00	-25.01	PK	Hor
4*	8.1676GHz	55.97	-3.53	52.44	74.00	-21.56	PK	Hor
5*	9.4341GHz	53.83	-1.17	52.66	74.00	-21.34	PK	Hor
6*	16.3659GHz	52.32	6.83	59.15	74.00	-14.85	PK	Hor
7*	4.8547GHz	44.03	-6.03	38.00	54.00	-16.00	AV	Hor
8*	16.3659GHz	43.07	6.83	49.90	54.00	-4.10	AV	Hor



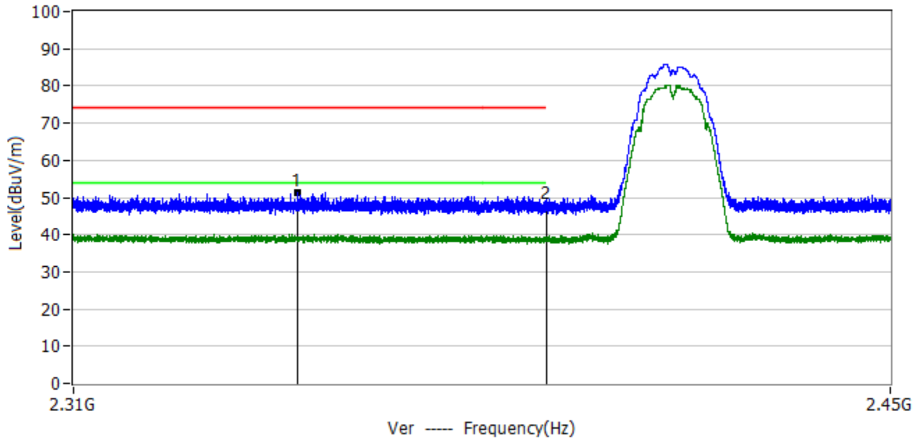
No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	1.4802GHz	61.27	-20.95	40.32	74.00	-33.68	PK	Ver
2*	2.0837GHz	57.17	-15.35	41.82	74.00	-32.18	PK	Ver
3*	3.3609GHz	54.28	-8.46	45.82	74.00	-28.18	PK	Ver
4*	6.1892GHz	55.70	-7.17	48.53	74.00	-25.47	PK	Ver
5*	7.6534GHz	56.20	-4.20	52.00	74.00	-22.00	PK	Ver
6*	16.3807GHz	52.83	6.85	59.68	74.00	-14.32	PK	Ver
7*	16.3807GHz	43.05	6.85	49.90	54.00	-4.10	AV	Ver

3.2.7 RADIATED BAND EDGE

Project: LGT23E048	Test Engineer: Dylan.shi
EUT: SLAM LiDAR	Temperature: 27.9℃
M/N: M10	Humidity: 55%RH
Test Voltage: Battery	Test Data: 2023-06-03
Test Mode: 802.11b 2412	
Note:	

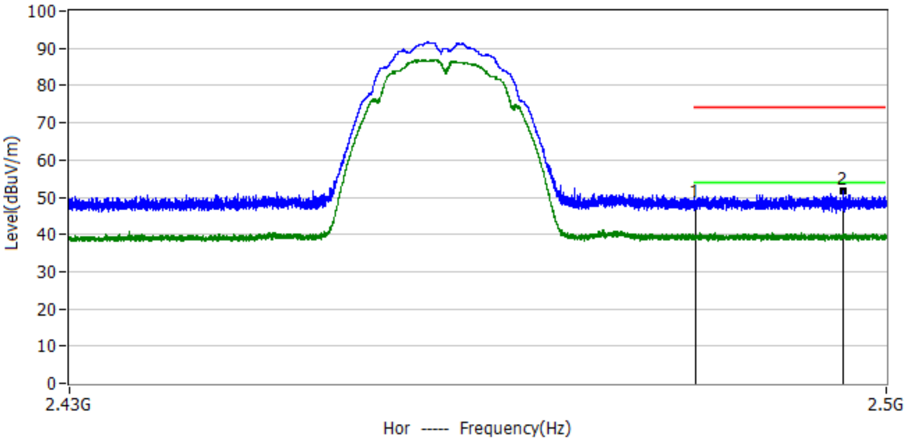


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	2.3776GHz	19.05	33.98	53.03	74.00	-20.97	PK	Hor
2*	2.3900GHz	14.75	33.95	48.70	74.00	-25.30	PK	Hor

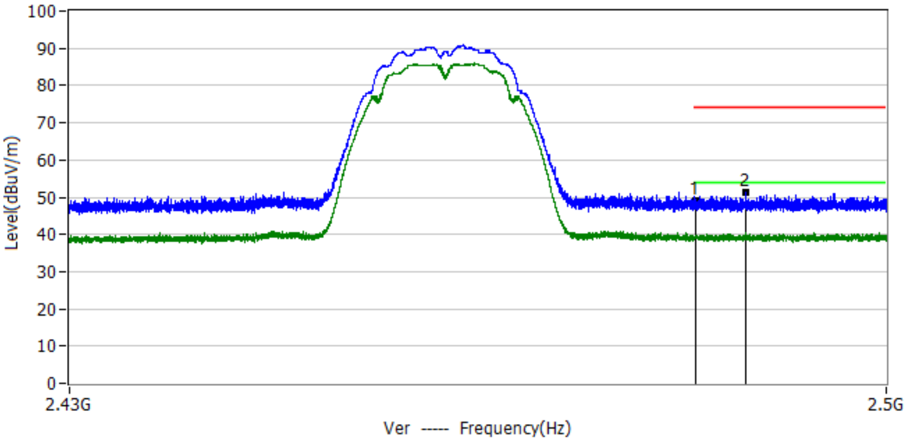


No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	2.3476GHz	17.43	34.05	51.48	74.00	-22.52	PK	Ver
2*	2.3900GHz	13.95	33.95	47.90	74.00	-26.10	PK	Ver

Project: LGT23E048	Test Engineer: Dylan.shi
EUT: SLAM LiDAR	Temperature: 27.9℃
M/N: M10	Humidity: 55%RH
Test Voltage: Battery	Test Data: 2023-06-03
Test Mode: 802.11b 2462	
Note:	



No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	2.4835GHz	14.07	34.13	48.20	74.00	-25.80	PK	Hor
2*	2.4963GHz	17.46	34.16	51.62	74.00	-22.38	PK	Hor



No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Detector	Polar
1*	2.4835GHz	14.77	34.13	48.90	74.00	-25.10	PK	Ver
2*	2.4878GHz	17.26	34.14	51.40	74.00	-22.60	PK	Ver

4. CONDUCTED SPURIOUS & BAND EDGE EMISSION

4.1 LIMIT

According to FCC section 15.247(d), in any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

4.2 TEST PROCEDURE

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	30 MHz to 10th carrier harmonic
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

For Band edge

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	Lower Band Edge: 2300 to 2432 MHz Upper Band Edge: 2442 to 2500 MHz
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

4.3 DEVIATION FROM STANDARD

No deviation.

4.4 TEST SETUP

The EUT which is powered by the ${ Power }, is connected to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.

4.5 EUT OPERATION CONDITIONS

Please refer to section 3.1.4 of this report.

4.6 TEST RESULTS

For the measurement records，refer to the appendix I.

5. POWER SPECTRAL DENSITY TEST

5.1 LIMIT

FCC Part15.247 , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(e)	Power Spectral Density	≤8 dBm (RBW ≥3KHz)	2400-2483.5	PASS

5.2 TEST PROCEDURE

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the 100 kHz ≥ RBW ≥3 kHz.
4. Set the VBW ≥ 3 x RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

5.3 DEVIATION FROM STANDARD

No deviation.

5.4 TEST SETUP

5.5 EUT OPERATION CONDITIONS

Please refer to section 3.1.4 of this report.

5.6 TEST RESULTS

For the measurement records，refer to the appendix I.

6. BANDWIDTH TEST

6.1 LIMIT

FCC Part15.247,Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	≥500KHz (6dB bandwidth)	2400-2483.5	PASS

6.2 TEST PROCEDURE

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described above (i.e., RBW = 100 kHz, VBW≥3RBW, peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be≥6 dB.

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP

6.5 EUT OPERATION CONDITIONS

Please refer to section 3.1.4 of this report.

6.6 TEST RESULTS

For the measurement records，refer to the appendix I.

7. PEAK OUTPUT POWER TEST

7.1 LIMIT

FCC Part15.247,Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Output Power	1 watt or 30dBm	2400-2483.5	PASS

7.2 TEST PROCEDURE

One of the following procedures may be used to determine the maximum peak conducted output power of a DTS EUT.

RBW ≥ DTS bandwidth

The following procedure shall be used when an instrument with a resolution bandwidth that is greater than the DTS bandwidth is available to perform the measurement:

a) Set the RBW ≥ DTS bandwidth.
b) Set VBW ≥ [3 × RBW].
c) Set span ≥ [3 × RBW].
d) Sweep time = auto couple.
e) Detector = peak.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use peak marker function to determine the peak amplitude level.

Integrated band power method:

The following procedure can be used when the maximum available RBW of the instrument is less than the
DTS bandwidth:

a) Set the RBW = 1 MHz.
b) Set the VBW ≥ [3 × RBW].
c) Set the span ≥ [1.5 × DTS bandwidth].
d) Detector = peak.
e) Sweep time = auto couple.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges (for some instruments, this may require a manual override to select the peak detector). If the instrument does not have a band power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the DTS channel bandwidth.

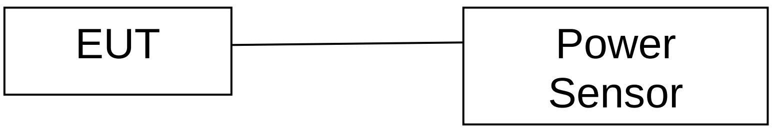
PKPM1 Peak power meter method:

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast-responding diode detector.

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP



7.5 EUT OPERATION CONDITIONS

Please refer to section 3.1.4 of this report.

7.6 TEST RESULTS

For the measurement records，refer to the appendix I.

8. ANTENNA REQUIREMENT

8.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible partyshall be used with the device.

8.2 EUT ANTENNA

The EUT antenna is Dipole antenna. It comply with the standard requirement.

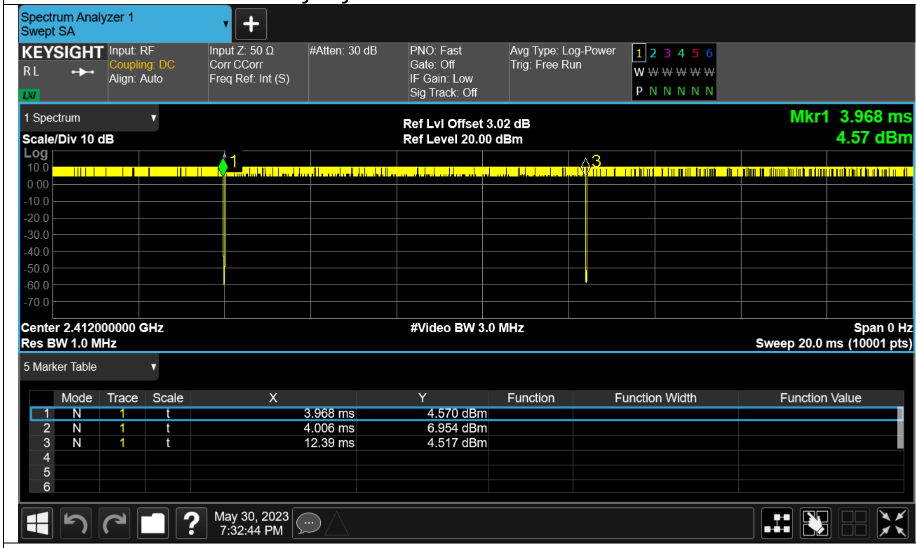
APPENDIX I:TEST RESULTS

DUTY CYCLE

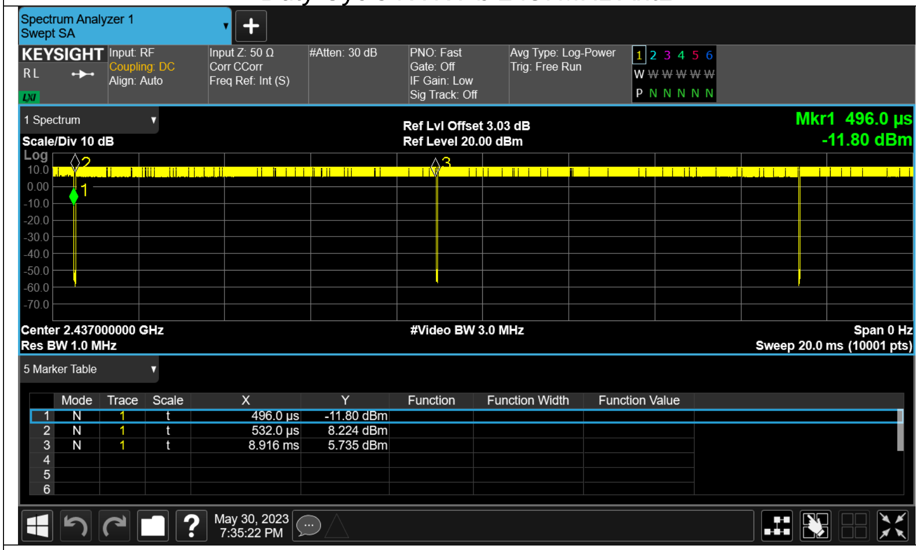
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	b	2412	Ant1	99.55	0	0.12
NVNT	b	2437	Ant1	99.57	0	0.12
NVNT	b	2462	Ant1	99.55	0	0.12
NVNT	g	2412	Ant1	97.08	0.13	0.72
NVNT	g	2437	Ant1	96.94	0.13	0.72
NVNT	g	2462	Ant1	96.94	0.13	0.72
NVNT	n20	2412	Ant1	96.73	0.14	0.77
NVNT	n20	2437	Ant1	96.73	0.14	0.77
NVNT	n20	2462	Ant1	96.88	0.14	0.77
NVNT	n40	2422	Ant1	93.94	0.27	1.54
NVNT	n40	2437	Ant1	93.93	0.27	1.54
NVNT	n40	2452	Ant1	93.93	0.27	1.54

Test Graphs

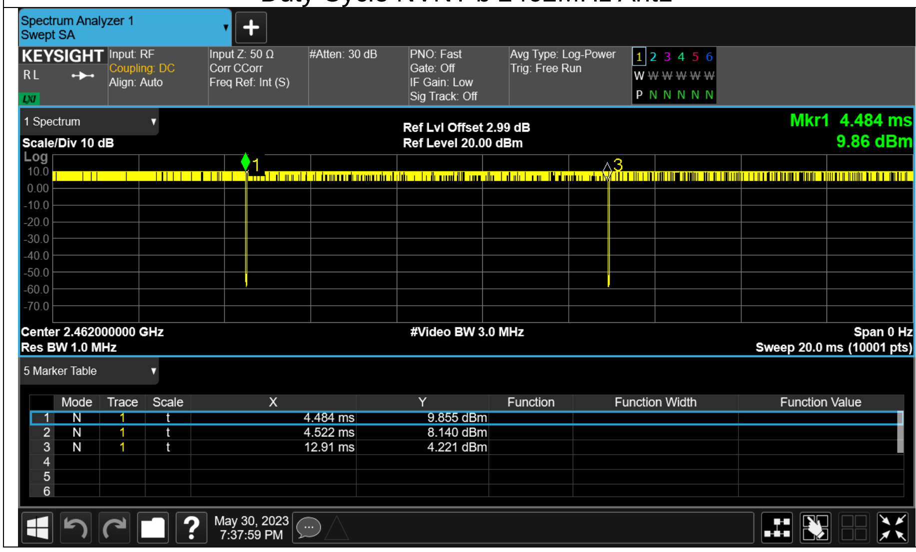
Duty Cycle NVNT b 2412MHz Ant1



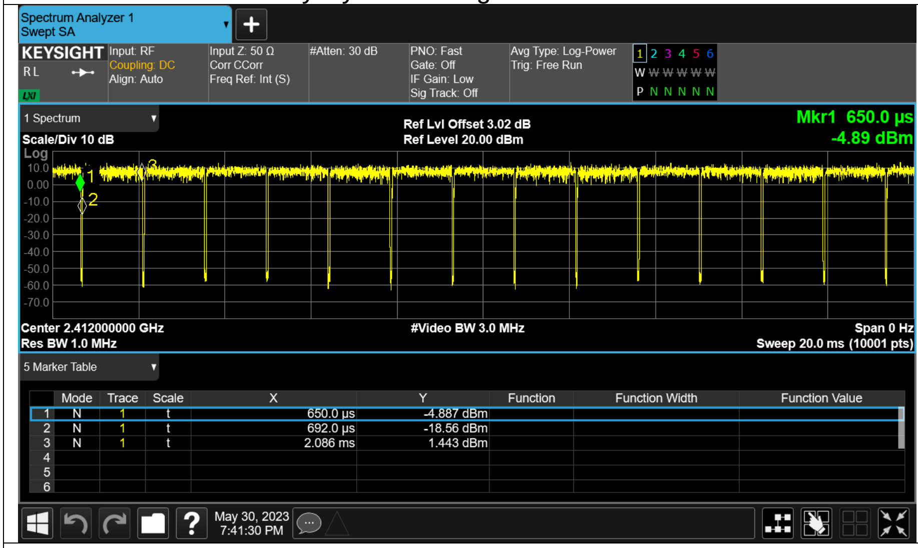
Duty Cycle NVNT b 2437MHz Ant1



Duty Cycle NVNT b 2462MHz Ant1

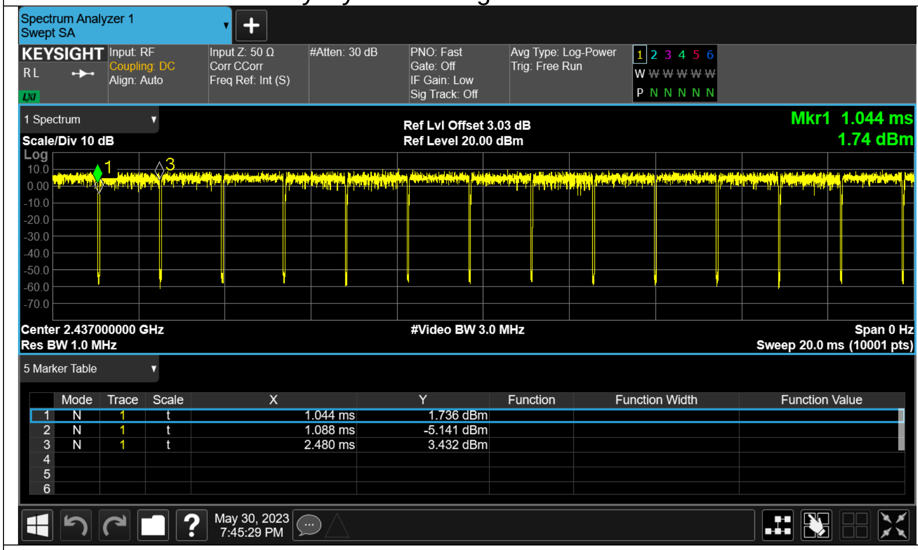


Duty Cycle NVNT g 2412MHz Ant1



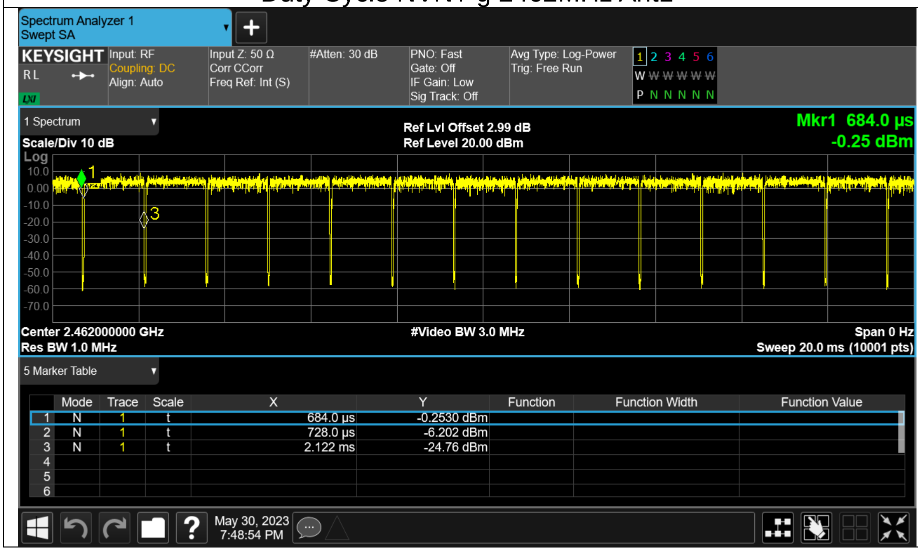
	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	t	650.0 µs	-4.887 dBm			
2	N	1	t	692.0 µs	-18.56 dBm			
3	N	1	t	2.086 ms	1.443 dBm			
4								
5								
6								

Duty Cycle NVNT g 2437MHz Ant1



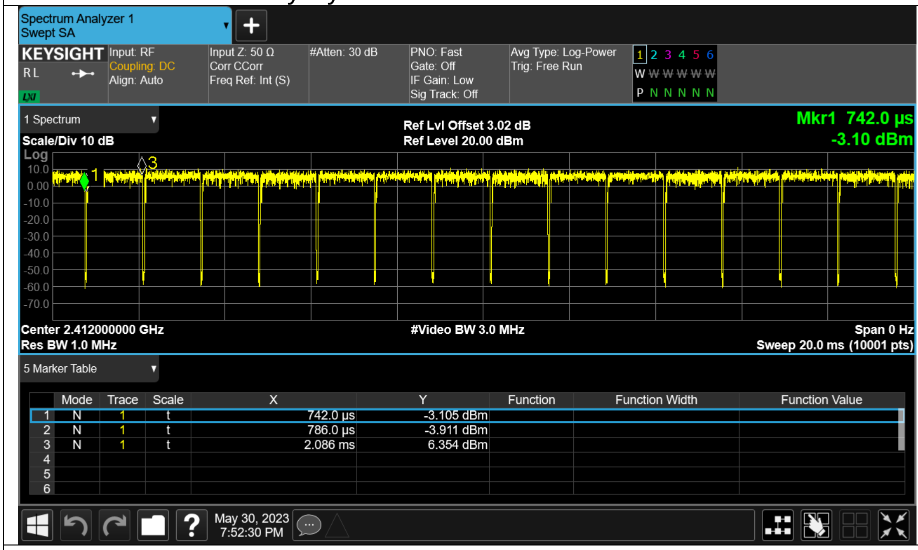
	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	t	1.044 ms	1.736 dBm			
2	N	1	t	1.088 ms	-5.141 dBm			
3	N	1	t	2.480 ms	3.432 dBm			
4								
5								
6								

Duty Cycle NVNT g 2462MHz Ant1

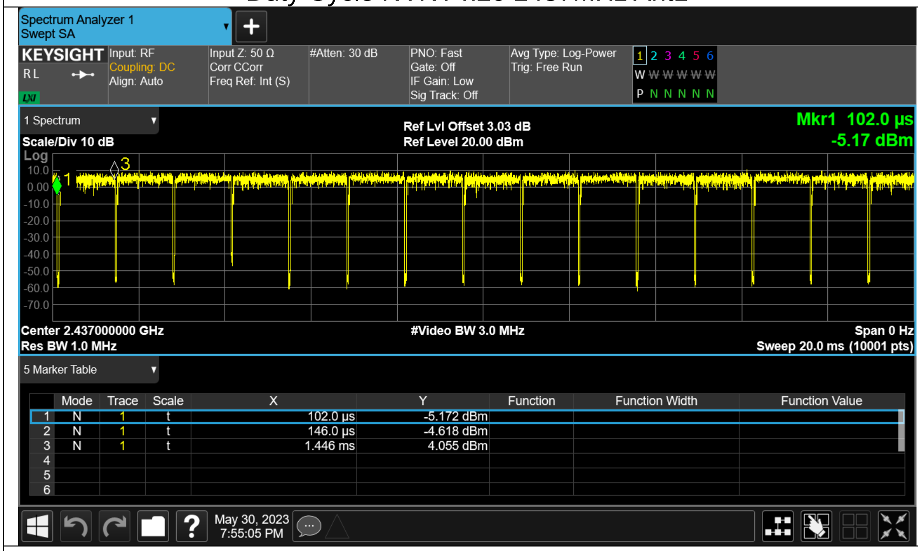


	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	t	684.0 µs	-0.2530 dBm			
2	N	1	t	728.0 µs	-6.202 dBm			
3	N	1	t	2.122 ms	-24.76 dBm			
4								
5								
6								

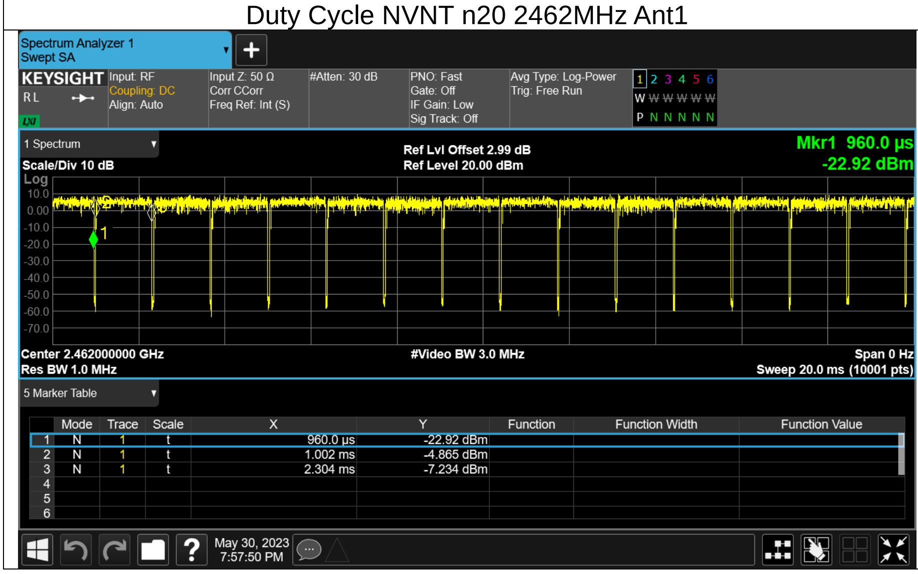
Duty Cycle NVNT n20 2412MHz Ant1



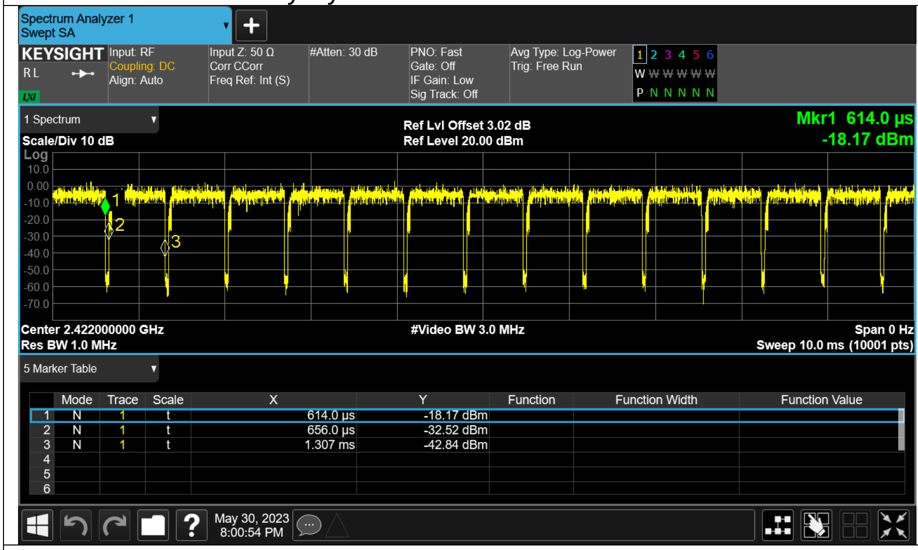
Duty Cycle NVNT n20 2437MHz Ant1



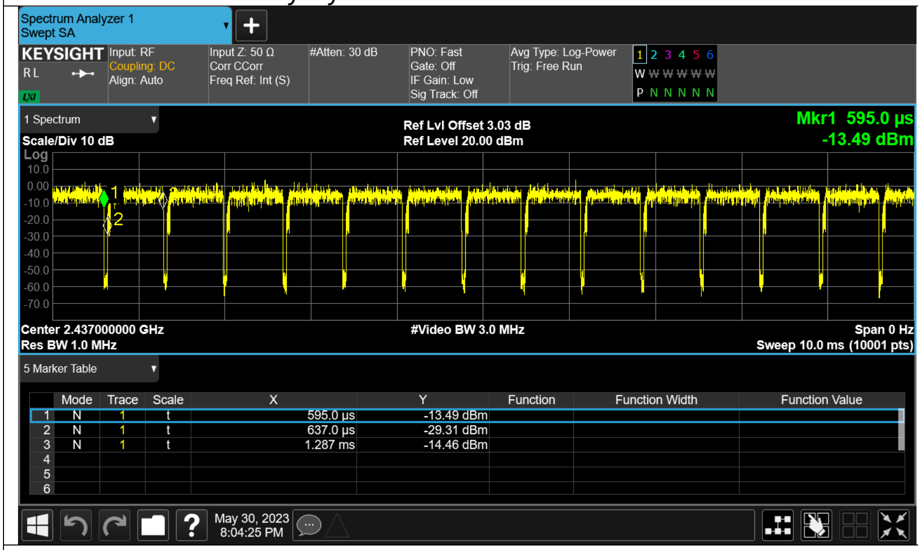
Duty Cycle NVNT n20 2462MHz Ant1



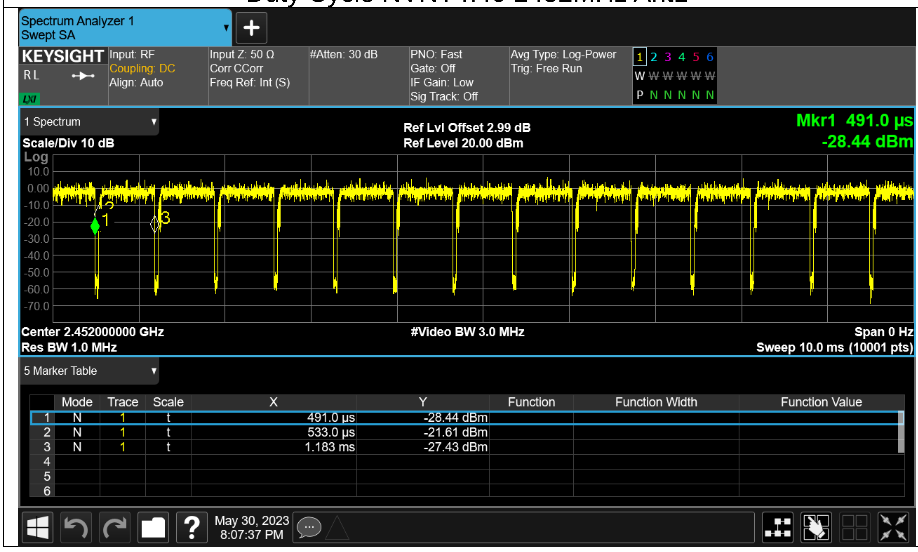
Duty Cycle NVNT n40 2422MHz Ant1



Duty Cycle NVNT n40 2437MHz Ant1



Duty Cycle NVNT n40 2452MHz Ant1



MAXIMUM PEAK CONDUCTED OUTPUT POWER

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	b	2412	Ant1	17.06	30	Pass
NVNT	b	2437	Ant1	17.63	30	Pass
NVNT	b	2462	Ant1	18.64	30	Pass
NVNT	g	2412	Ant1	17.35	30	Pass
NVNT	g	2437	Ant1	16.52	30	Pass
NVNT	g	2462	Ant1	18.18	30	Pass
NVNT	n20	2412	Ant1	18.59	30	Pass
NVNT	n20	2437	Ant1	17.42	30	Pass
NVNT	n20	2462	Ant1	18.08	30	Pass
NVNT	n40	2422	Ant1	16.23	30	Pass
NVNT	n40	2437	Ant1	18.32	30	Pass
NVNT	n40	2452	Ant1	16.32	30	Pass

-6DB BANDWIDTH

Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	b	2412	Ant1	7.597	0.5	Pass
NVNT	b	2437	Ant1	8.501	0.5	Pass
NVNT	b	2462	Ant1	8.574	0.5	Pass
NVNT	g	2412	Ant1	15.651	0.5	Pass
NVNT	g	2437	Ant1	15.7	0.5	Pass
NVNT	g	2462	Ant1	13.185	0.5	Pass
NVNT	n20	2412	Ant1	15.955	0.5	Pass
NVNT	n20	2437	Ant1	15.692	0.5	Pass
NVNT	n20	2462	Ant1	10.993	0.5	Pass
NVNT	n40	2422	Ant1	34.415	0.5	Pass
NVNT	n40	2437	Ant1	35.698	0.5	Pass
NVNT	n40	2452	Ant1	16.318	0.5	Pass

Test Graphs

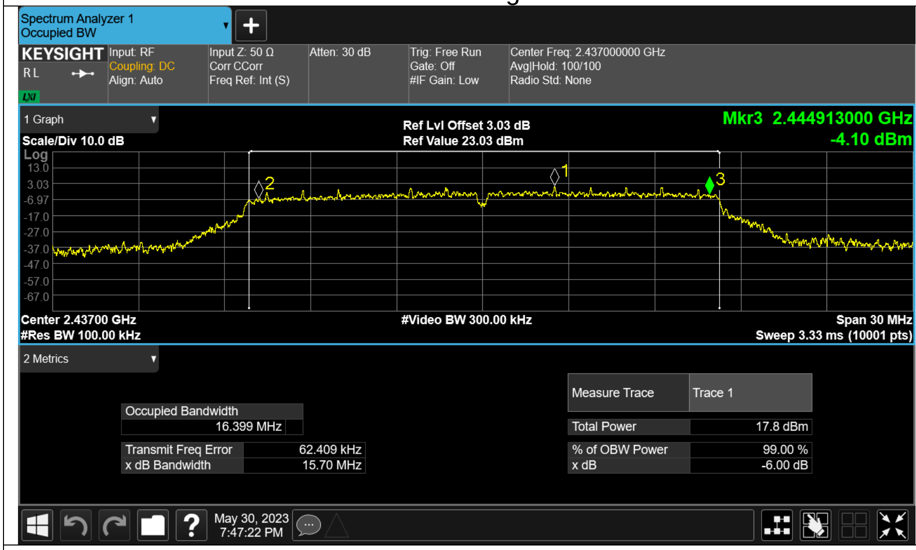
-6dB Bandwidth NVNT b 2412MHz Ant1

-6dB Bandwidth NVNT b 2437MHz Ant1

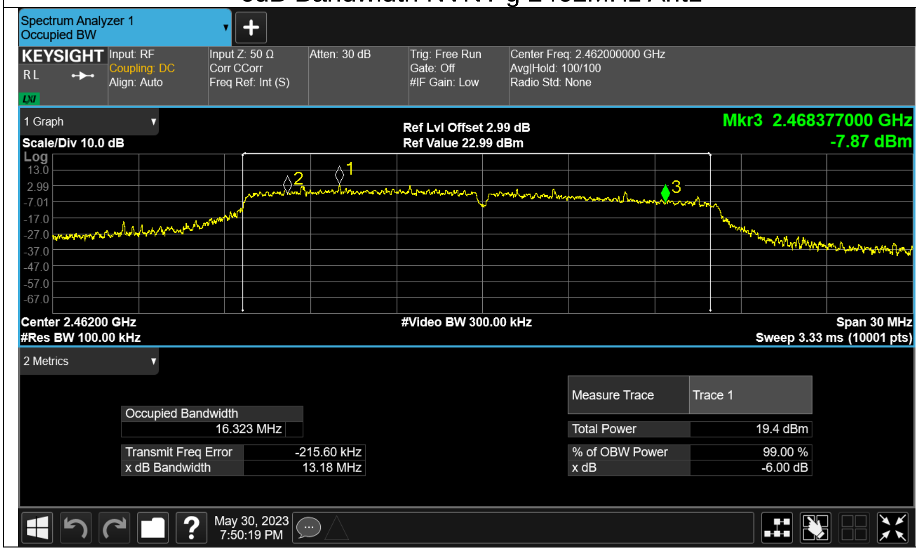
-6dB Bandwidth NVNT b 2462MHz Ant1

-6dB Bandwidth NVNT g 2412MHz Ant1

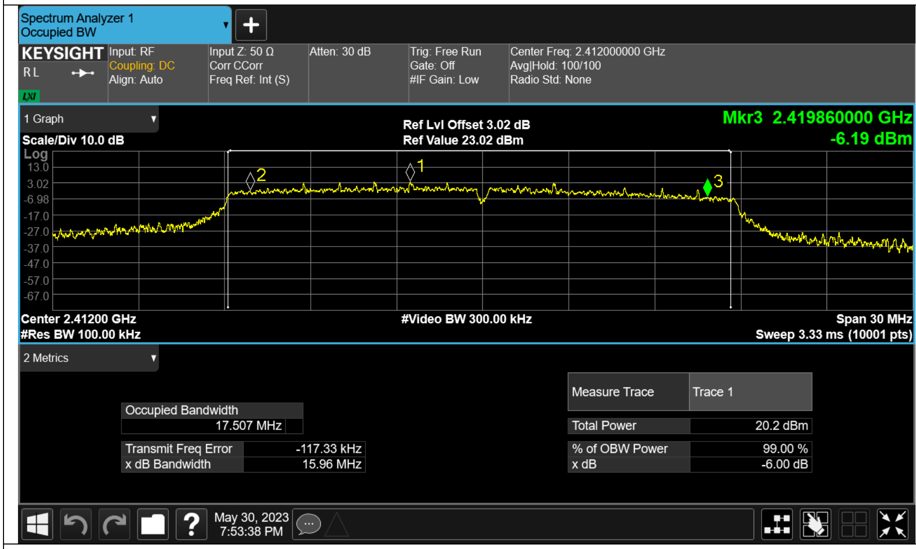
-6dB Bandwidth NVNT g 2437MHz Ant1



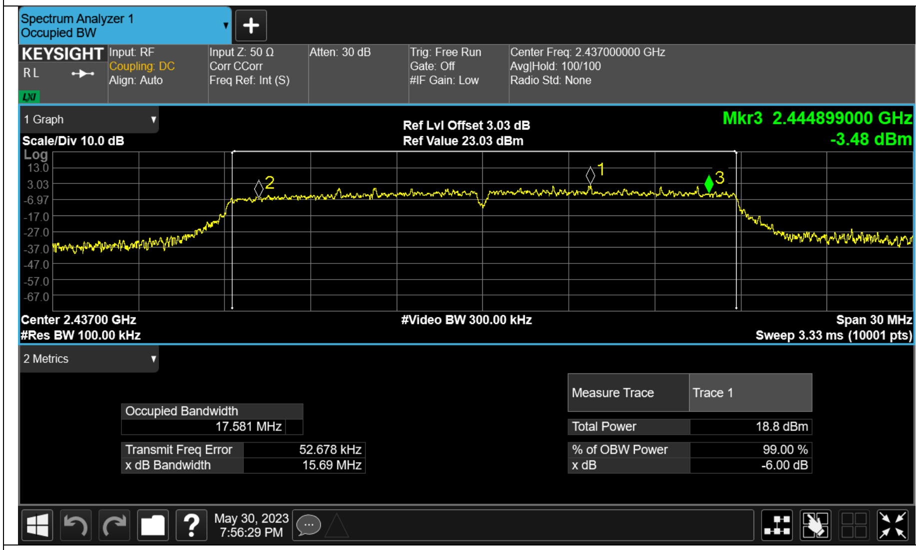
-6dB Bandwidth NVNT g 2462MHz Ant1



-6dB Bandwidth NVNT n20 2412MHz Ant1

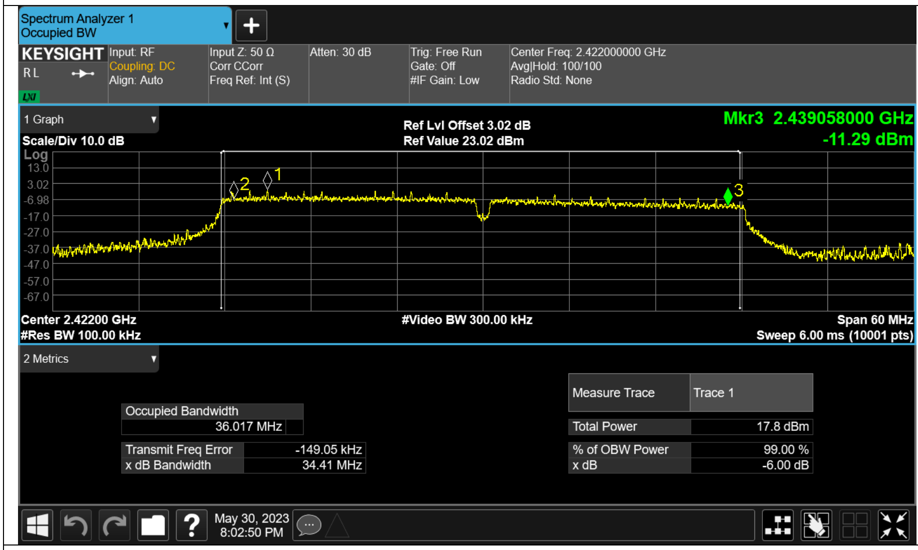


-6dB Bandwidth NVNT n20 2437MHz Ant1

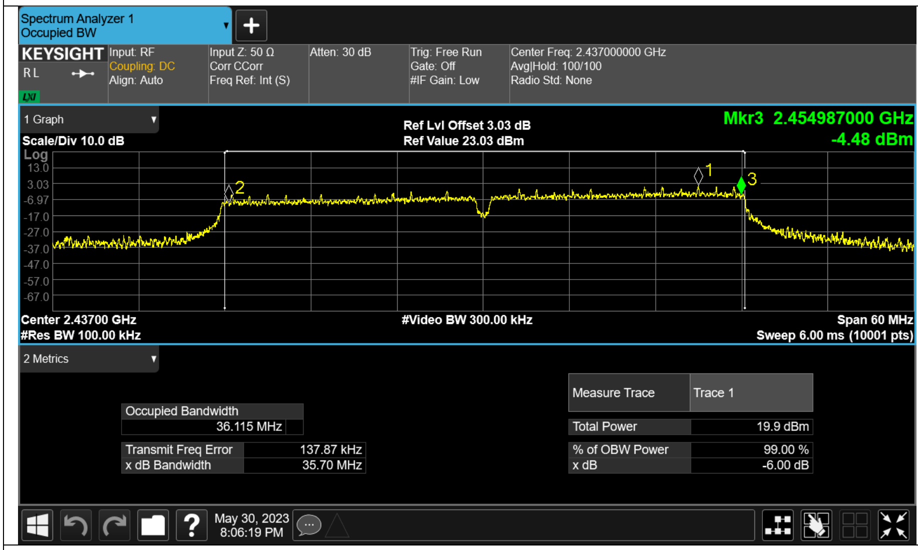


-6dB Bandwidth NVNT n20 2462MHz Ant1

-6dB Bandwidth NVNT n40 2422MHz Ant1



-6dB Bandwidth NVNT n40 2437MHz Ant1

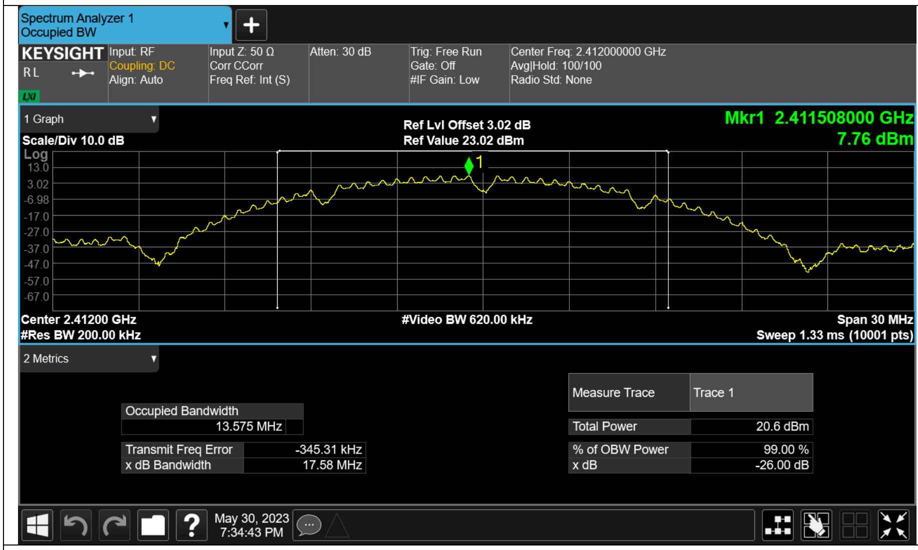


-6dB Bandwidth NVNT n40 2452MHz Ant1

OCCUPIED CHANNEL BANDWIDTH

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	b	2412	Ant1	13.575
NVNT	b	2437	Ant1	13.659
NVNT	b	2462	Ant1	14.818
NVNT	g	2412	Ant1	16.403
NVNT	g	2437	Ant1	16.523
NVNT	g	2462	Ant1	16.416
NVNT	n20	2412	Ant1	17.586
NVNT	n20	2437	Ant1	17.665
NVNT	n20	2462	Ant1	17.529
NVNT	n40	2422	Ant1	36.282
NVNT	n40	2437	Ant1	36.399
NVNT	n40	2452	Ant1	35.005

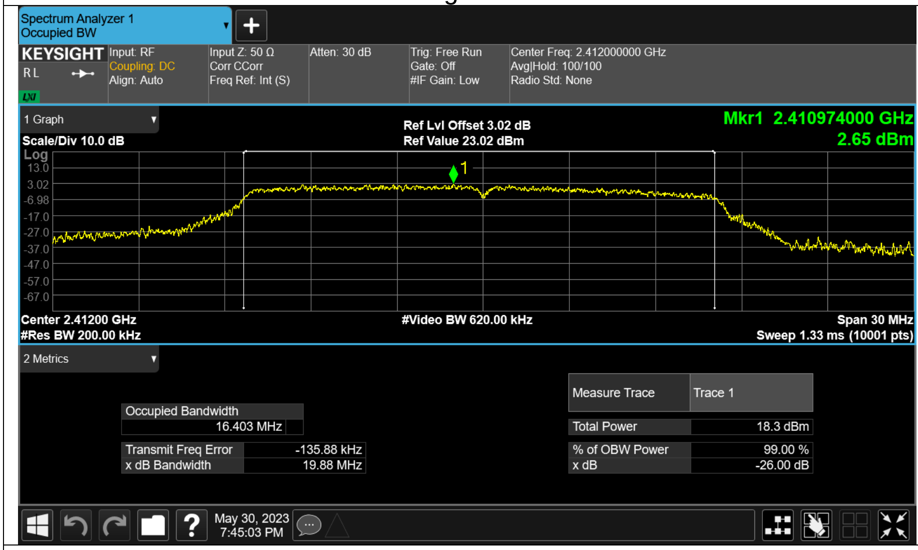
Test Graphs
OBW NVNT b 2412MHz Ant1



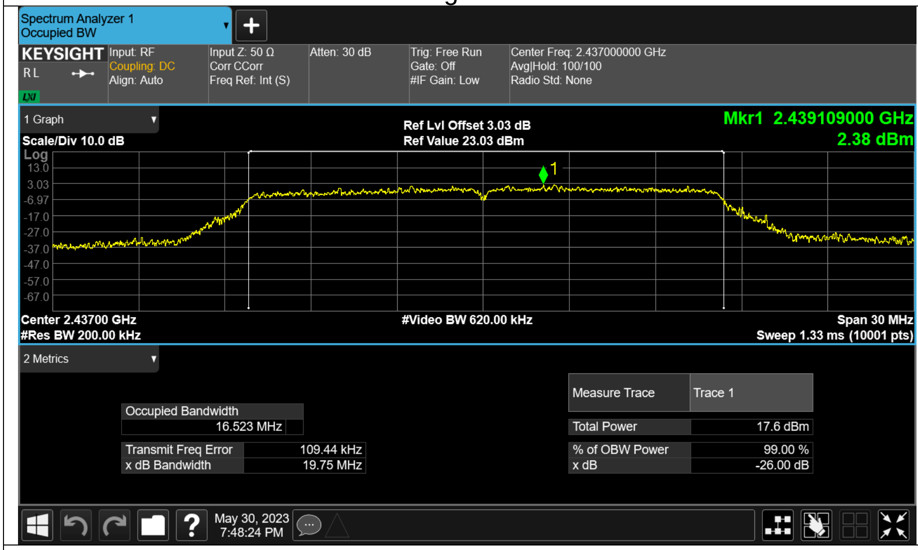
OBW NVNT b 2437MHz Ant1

OBW NVNT b 2462MHz Ant1

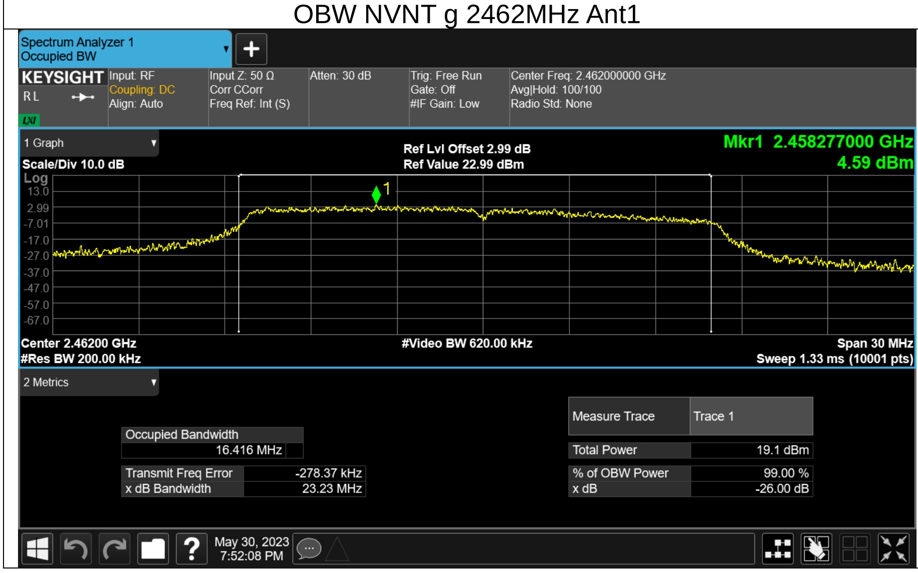
OBW NVNT g 2412MHz Ant1



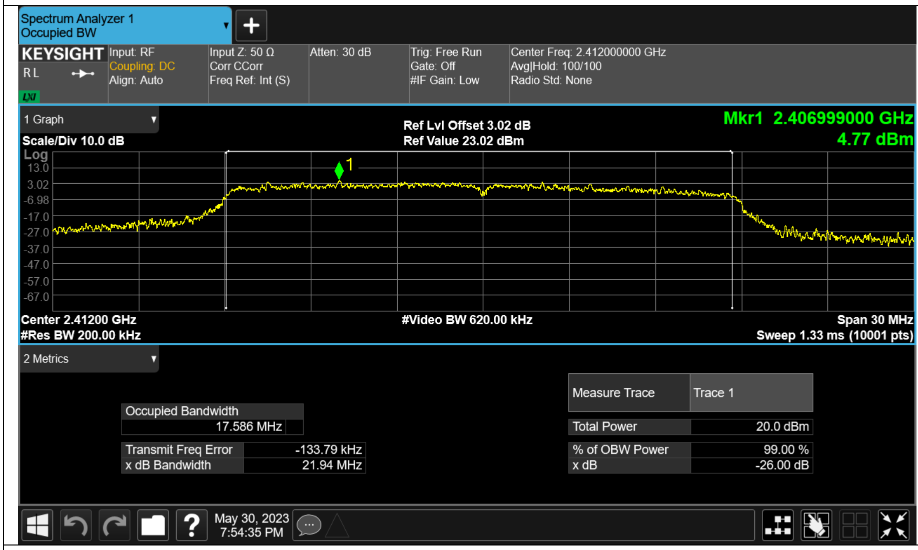
OBW NVNT g 2437MHz Ant1



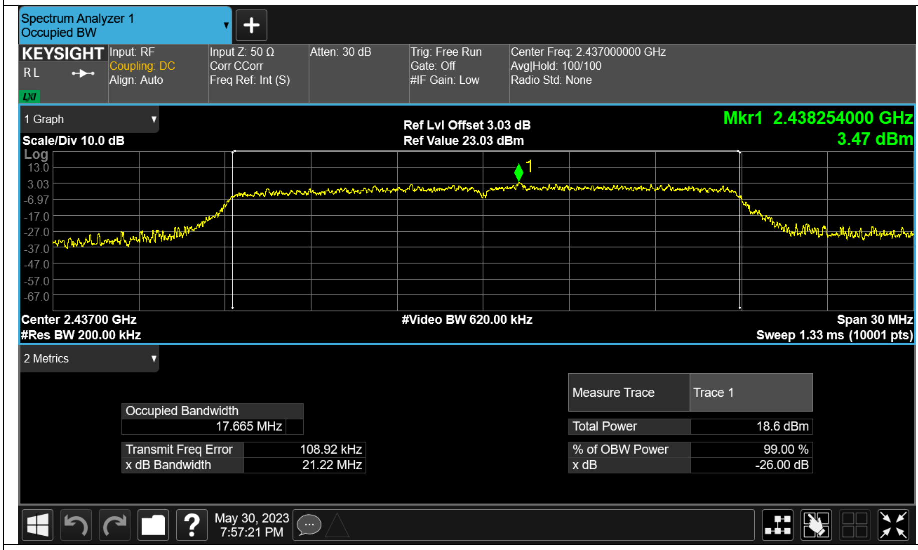
OBW NVNT g 2462MHz Ant1



OBW NVNT n20 2412MHz Ant1



OBW NVNT n20 2437MHz Ant1



OBW NVNT n20 2462MHz Ant1