

Report No.: SEWM2312000501RG01

Rev.: 01

Page: 1 of 108

# TEST REPORT

**Application No.:** SEWM2312000501RG  
**Applicant:** Lenovo (Shanghai) Electronics Technology Co., Ltd.  
**Address of Applicant:** Section 304-305, Building No. 4, # 222, Meiyue Road, China (Shanghai) Pilot Free Trade Zone  
**Manufacturer:** Lenovo PC HK Limited  
**Address of Manufacturer:** 23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry Bay, Hong Kong, China  
**EUT Description:** Portable Tablet Computer  
**Model No.:** TB330FUP  
**Trade Mark:** Lenovo  
**FCC ID:** O57TB330FUP  
**Standards:** FCC 47 CFR Part 2, Subpart J  
FCC 47 CFR Part 15, Subpart C  
**Date of Receipt:** 2023/12/06  
**Date of Test:** 2023/12/20 to 2024/01/05  
**Date of Issue:** 2024/01/05

<b>Test Result :</b>	<b>PASS *</b>
----------------------	---------------

\* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Authorized Signature:

Well Wei

Well Wei  
Wireless Laboratory Manager



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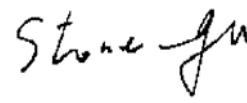
Report No.: SEWM2312000501RG01

Rev.: 01

Page: 2 of 108

## 1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2024/01/05		Original

Prepared By		 (Tizzy Song) / Test Engineer
Checked By		 (Stone Gu) / Reviewer



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## 2 Test Summary

Test Item	FCC Rule No.	Test Method	Test Result	Result	Test Lab*
Antenna Requirement	15.203/15.247(b)	--	Clause 4.1	PASS	--
AC Power Line Conducted Emission	15.207	ANSI C63.10-2020 Section 6.2	Clause 4.3	PASS	A
Conducted Peak Output Power	15.247 (b)(1)	ANSI C63.10-2020 Section 11.9.1.2	Clause 4.4	PASS	B
20dB Emission Bandwidth & 99% Occupied Bandwidth	15.247 (a)(1)	ANSI C63.10-2020 Section 6.9.2/6.9.3	Clause 4.5	For Report Purpose	B
Carrier Frequencies Separation	15.247 (a)(1)	ANSI C63.10-2020 Section 7.8.2	Clause 4.6	PASS	B
Hopping Channel Number	15.247 (a)(1)	ANSI C63.10-2020 Section 7.8.3	Clause 4.7	PASS	B
Dwell Time	15.247 (a)(1)	ANSI C63.10-2020 Section 7.8.4	Clause 4.8	PASS	B
Band-edge for RF Conducted Emissions	15.247(d)	ANSI C63.10-2020 Section 7.8.7.2	Clause 4.9	PASS	B
RF Conducted Spurious Emissions	15.247(d)	ANSI C63.10-2020 Section 7.8.7.1	Clause 4.10	PASS	B
Radiated Spurious emissions	15.247(d); 15.205/15.209	ANSI C63.10-2020 Section 6.4 / 6.5 / 6.6	Clause 4.11	PASS	A
Restricted bands around fundamental frequency (Radiated Emission)	15.247(d); 15.205/15.209	ANSI C63.10-2020 Section 6.10.5	Clause 4.12	PASS	A
Remark: Lab A SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd. Lab B SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch.					

Remark:

According to the declaration letter from client.

Only SKU1 was fully tested, RSE were tested on worst mode for SKU2 and SKU5.



## Contents

1	Version .....	2
2	Test Summary .....	3
3	General Information .....	5
3.1	Details of Client .....	5
3.2	Test Location .....	5
3.3	Test Facility .....	6
3.4	General Description of EUT .....	7
3.5	Test Environment .....	9
3.6	Description of Support Units .....	9
4	Test results and Measurement Data .....	10
4.1	Antenna Requirement .....	10
4.2	Other requirements Frequency Hopping Spread Spectrum System Hopping Sequence .....	11
4.2.1	Test Requirement: .....	11
4.2.2	Conclusion .....	11
4.3	AC Power Line Conducted Emissions .....	13
4.4	Conducted Output Power .....	21
4.5	20dB Emission Bandwidth & 99% Occupied Bandwidth .....	22
4.6	Carrier Frequencies Separation .....	23
4.7	Hopping Channel Number .....	24
4.8	Dwell Time .....	25
4.9	Band-edge for RF Conducted Emissions .....	26
4.10	Spurious RF Conducted Emissions .....	27
4.11	Radiated Spurious Emissions .....	28
4.12	Restricted bands around fundamental frequency .....	31
5	Measurement Uncertainty (95% confidence levels, k=2) .....	33
6	Equipment List .....	34
7	Photographs - Setup Photos .....	37



Report No.: SEWM2312000501RG01

Rev.: 01

Page: 5 of 108

### 3 General Information

#### 3.1 Details of Client

Applicant:	Lenovo (Shanghai) Electronics Technology Co., Ltd.
Address of Applicant:	Section 304-305, Building No. 4, # 222, Meiyue Road, China (Shanghai) Pilot Free Trade Zone
Manufacturer:	Lenovo PC HK Limited
Address of Manufacturer:	23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry Bay, Hong Kong, China

#### 3.2 Test Location

<b>Lab A:</b>	
Company:	SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.
Address:	South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu) Pilot Free Trade Zone
Post code:	215000
Test engineer:	Tizzy Song
<b>Lab B:</b>	
Company:	SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch
Address:	No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China.
Post code:	518057
Test engineer:	Calvin Weng



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Report No.: SEWM2312000501RG01  
Rev.: 01  
Page: 6 of 108

### 3.3 Test Facility

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

#### Lab A:

• **A2LA (Certificate No. 6336.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6336.01.

• **Innovation, Science and Economic Development Canada**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0120.

IC#: 27594.

• **FCC –Designation Number: CN1312**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized as an accredited testing laboratory.

Designation Number: CN1312.

Test Firm Registration Number: 717327

#### Lab B:

• **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• **VCCI (Member No. 1937)**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen EMC laboratory have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• **FCC –Designation Number: CN1336**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1336. Test Firm Registration Number: 787754.

• **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.



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Rev.: 01

Page: 7 of 108

### 3.4 General Description of EUT

EUT Description:	Portable Tablet Computer	
Model No.:	TB330FUP	
Trade Mark:	Lenovo	
Hardware Version:	TB330FUP	
Software Version:	TB330FUP_RF01_231121	
Power Supply:	Lithium Battery (3.91V)	
SN:	RF Conducted	HA1V52V6
	RSE & AC power line	HA1X3Q7J
Operation Frequency:	2400MHz~2483.5MHz fc = 2402 MHz + N * 1 MHz, where: -fc = “Operating Frequency” in MHz, -N = “Channel Number” with the range from 0 to 78.	
Bluetooth version:	Bluetooth V5.1	
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)	
Modulation Type:	GFSK, π/4DQPSK, 8DPSK	
Number of Channel:	79	
Hopping Channel Type:	Adaptive Frequency Hopping systems	
Antenna Type:	PIFA Antenna	
Antenna Gain:	-1.93dBi	
	Note: The antenna gain are derived from the gain information report provided by the manufacturer.	
RF Cable:	1.2dB	
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Operation Frequency of each channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	20	2422MHz	40	2442MHz	60	2462MHz
1	2403MHz	21	2423MHz	41	2443MHz	61	2463MHz
2	2404MHz	22	2424MHz	42	2444MHz	62	2464MHz
3	2405MHz	23	2425MHz	43	2445MHz	63	2465MHz
4	2406MHz	24	2426MHz	44	2446MHz	64	2466MHz
5	2407MHz	25	2427MHz	45	2447MHz	65	2467MHz
6	2408MHz	26	2428MHz	46	2448MHz	66	2468MHz
7	2409MHz	27	2429MHz	47	2449MHz	67	2469MHz
8	2410MHz	28	2430MHz	48	2450MHz	68	2470MHz
9	2411MHz	29	2431MHz	49	2451MHz	69	2471MHz
10	2412MHz	30	2432MHz	50	2452MHz	70	2472MHz
11	2413MHz	31	2433MHz	51	2453MHz	71	2473MHz
12	2414MHz	32	2434MHz	52	2454MHz	72	2474MHz
13	2415MHz	33	2435MHz	53	2455MHz	73	2475MHz
14	2416MHz	34	2436MHz	54	2456MHz	74	2476MHz
15	2417MHz	35	2437MHz	55	2457MHz	75	2477MHz
16	2418MHz	36	2438MHz	56	2458MHz	76	2478MHz
17	2419MHz	37	2439MHz	57	2459MHz	77	2479MHz
18	2420MHz	38	2440MHz	58	2460MHz	78	2480MHz
19	2421MHz	39	2441MHz	59	2461MHz		

Remark:

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

Channel	Frequency
The Lowest channel(CH0)	2402MHz
The Middle channel(CH39)	2441MHz
The Highest channel(CH78)	2480MHz





Report No.: SEWM2312000501RG01  
Rev.: 01  
Page: 9 of 108

### 3.5 Test Environment

Environment Parameter	96.0~101.0 kPa Selected Values During Tests	
Relative Humidity	40-60 % RH Ambient	
Value	Temperature(℃)	Voltage(V)
NTNV	22~25	3.91
Remark: NV: Normal Voltage NT: Normal Temperature		

### 3.6 Description of Support Units

The EUT has been tested as an independent unit.



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Report No.: SEWM2312000501RG01  
Rev.: 01  
Page: 10 of 108

## 4 Test results and Measurement Data

### 4.1 Antenna Requirement

<b>Standard requirement:</b>	47 CFR Part 15C Section 15.203 /247(b)
<p>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.</p> <p>15.247(b) (4) requirement: The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.</p>	
<p>The antenna is PIFA Antenna and no consideration of replacement. The best case gain of the antenna is -1.93dBi.</p> <p><i>*Note:</i> The antenna gain are derived from the gain information report provided by the manufacturer.</p> <p><i>Remark:</i> As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.</p>	



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## 4.2 Other requirements Frequency Hopping Spread Spectrum System Hopping Sequence

#### 4.2.1 Test Requirement:

47 CFR Part 15, Subpart C 15.247(a)(1),(g),(h)

### 4.2.2 Conclusion

Standard Requirement:

The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals. Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. However, the system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this section should the transmitter be presented with a continuous data (or information) stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its transmissions over the minimum number of hopping channels specified in this section.

The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hopsets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

Compliance for section 15.247(a)(1):

According to Technical Specification, the pseudo random 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.

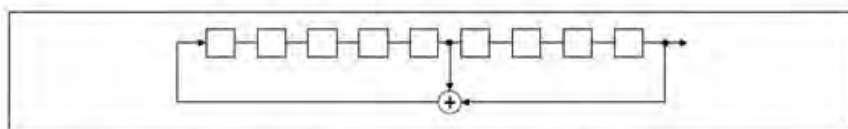
> Number of shift register stages: 9

> 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:



#### Linear Feedback Shift Register for Generation of the PRBS sequence

An example of Pseudorandom Frequency Hopping Sequence as follow:

20	62	46	77	7	64	8	73	16	75	1
----	----	----	----	---	----	---	----	----	----	---

Each frequency used equally on the average by each transmitter.



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Report No.: SEWM2312000501RG01

Rev.: 01

Page: 12 of 108

According to Technical Specification, the receivers are designed to have input and IF bandwidths that match the hopping channel bandwidths of any transmitters and shift frequencies in synchronization with the transmitted signals.

Compliance for section 15.247(g):

According to Technical Specification, the system transmits the packet with the pseudorandom hopping frequency with a continuous data and the short burst transmission from the RF system is also transmitted under the frequency hopping system with the pseudorandom hopping frequency system.

Compliance for section 15.247(h):

According to Technical specification, the system incorporates with an adaptive system to detect other user within the spectrum band so that it individually and independently to avoid hopping on the occupied channels. The system is designed not have the ability to coordinated with other FHSS System in an effort to avoid the simultaneous occupancy of individual hopping frequencies by multiple transmitter.



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### 4.3 AC Power Line Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10-2020 Section 6.2		
Test Frequency Range:	150kHz to 30MHz		
Receiver Setup:	RBW = 9kHz, VBW = 30kHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
* Decreases with the logarithm of the frequency.			
Test Procedure:	<ol style="list-style-type: none"> <li>1) The mains terminal disturbance voltage test was conducted in a shielded room.</li> <li>2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.</li> <li>3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.</li> <li>4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.</li> <li>5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10-2020 on conducted measurement.</li> </ol>		



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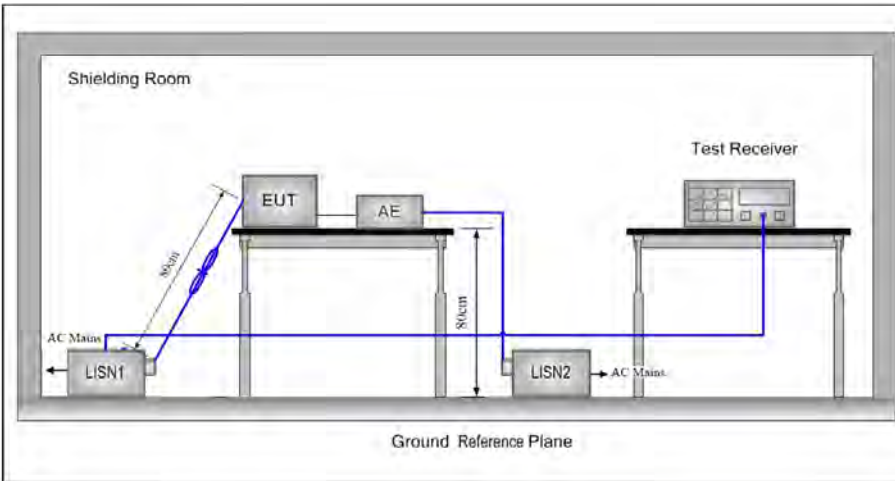
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Report No.: SEWM2312000501RG01

Rev.: 01

Page: 14 of 108

Test Setup:	
Test Mode:	Non-hopping transmitting mode with all kind of modulation and all kind of data type at the lowest, middle, high channel. Charge + Transmitting mode.
Final Test Mode:	Through Pre-scan, find the DH5 of data type and GFSK modulation at the lowest channel is the worst case. Charge + Transmitting mode Only the worst case is recorded in the report.
Instruments Used:	Refer to section 6 for details.
Test Results:	Pass



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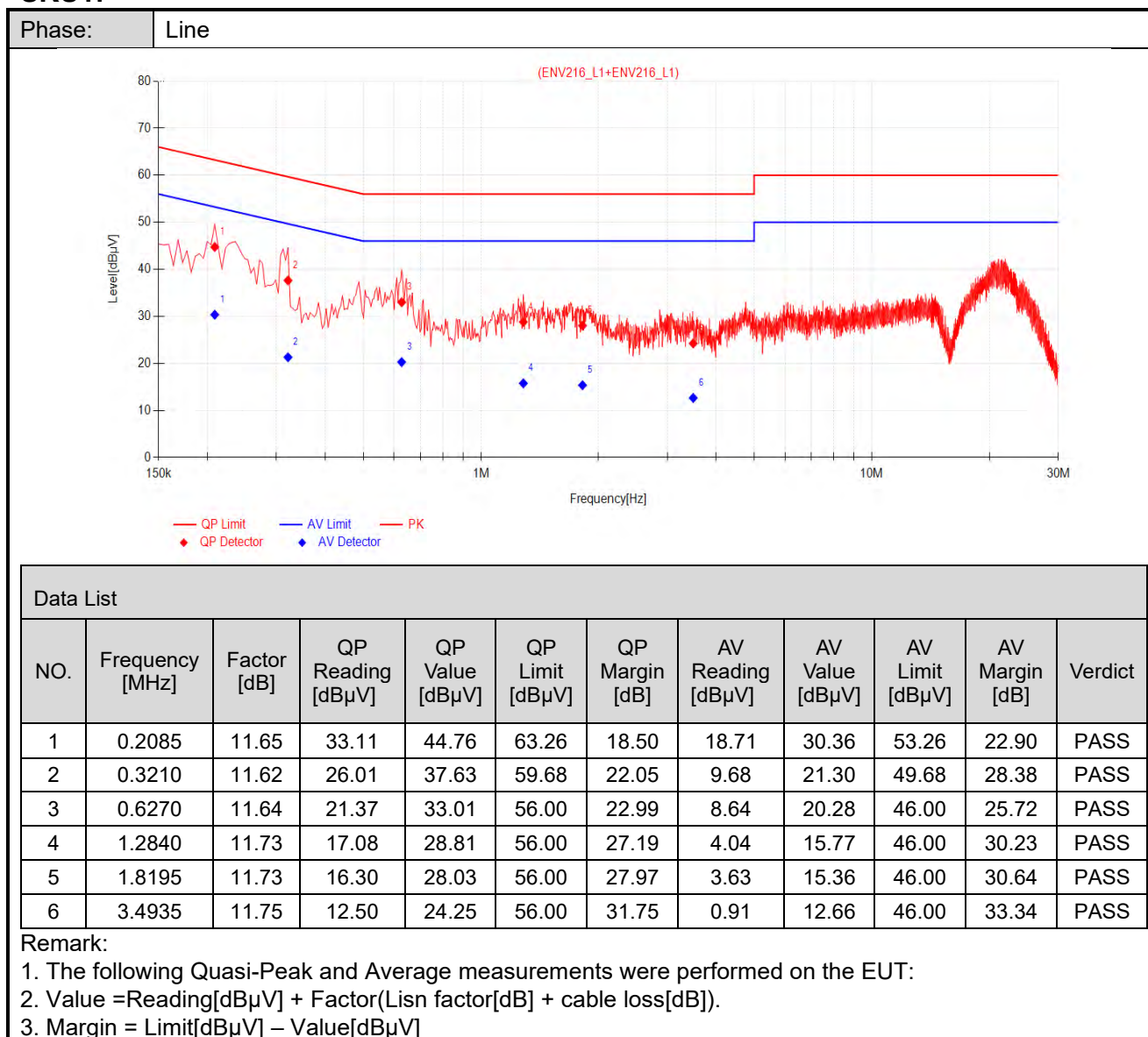
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Report No.: SEWM2312000501RG01  
Rev.: 01  
Page: 15 of 108

### Measurement Data

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

### SKU1:

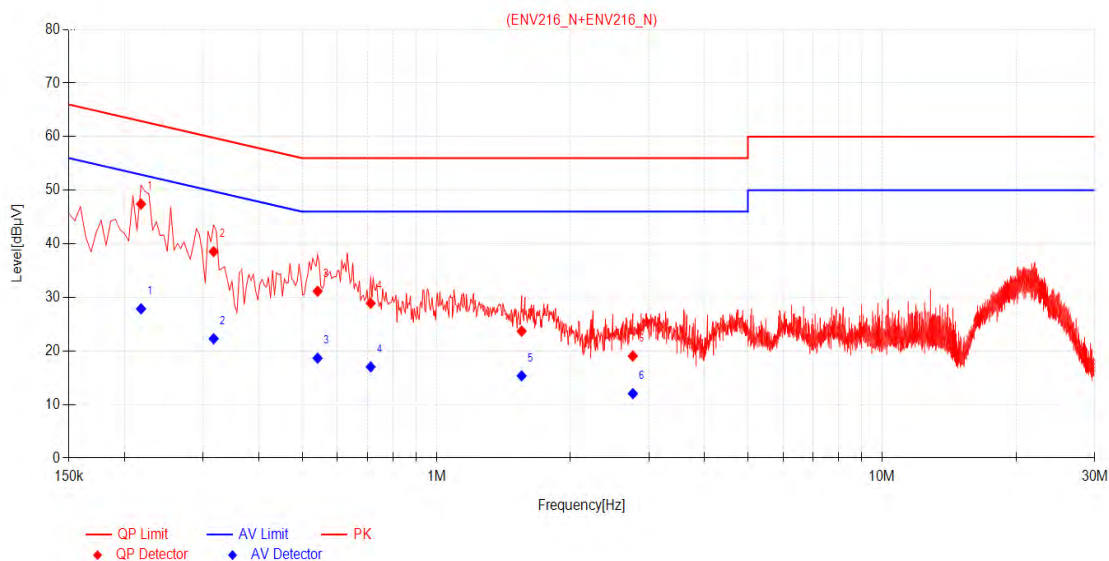


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Phase:	Neutral
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## Data List

NO.	Frequency [MHz]	Factor [dB]	QP Reading [dBμV]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Reading [dBμV]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Verdict
1	0.2175	11.65	35.77	47.42	62.91	15.49	16.21	27.86	52.91	25.05	PASS
2	0.3165	11.62	26.93	38.55	59.80	21.25	10.67	22.29	49.80	27.51	PASS
3	0.5415	11.62	19.54	31.16	56.00	24.84	7.04	18.66	46.00	27.34	PASS
4	0.7125	11.67	17.25	28.92	56.00	27.08	5.36	17.03	46.00	28.97	PASS
5	1.5540	11.73	11.97	23.70	56.00	32.30	3.62	15.35	46.00	30.65	PASS
6	2.7600	11.74	7.32	19.06	56.00	36.94	0.30	12.04	46.00	33.96	PASS

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Value = Reading[dBμV] + Factor(Lisn factor[dB] + cable loss[dB]).
3. Margin = Limit[dBμV] – Value[dBμV]



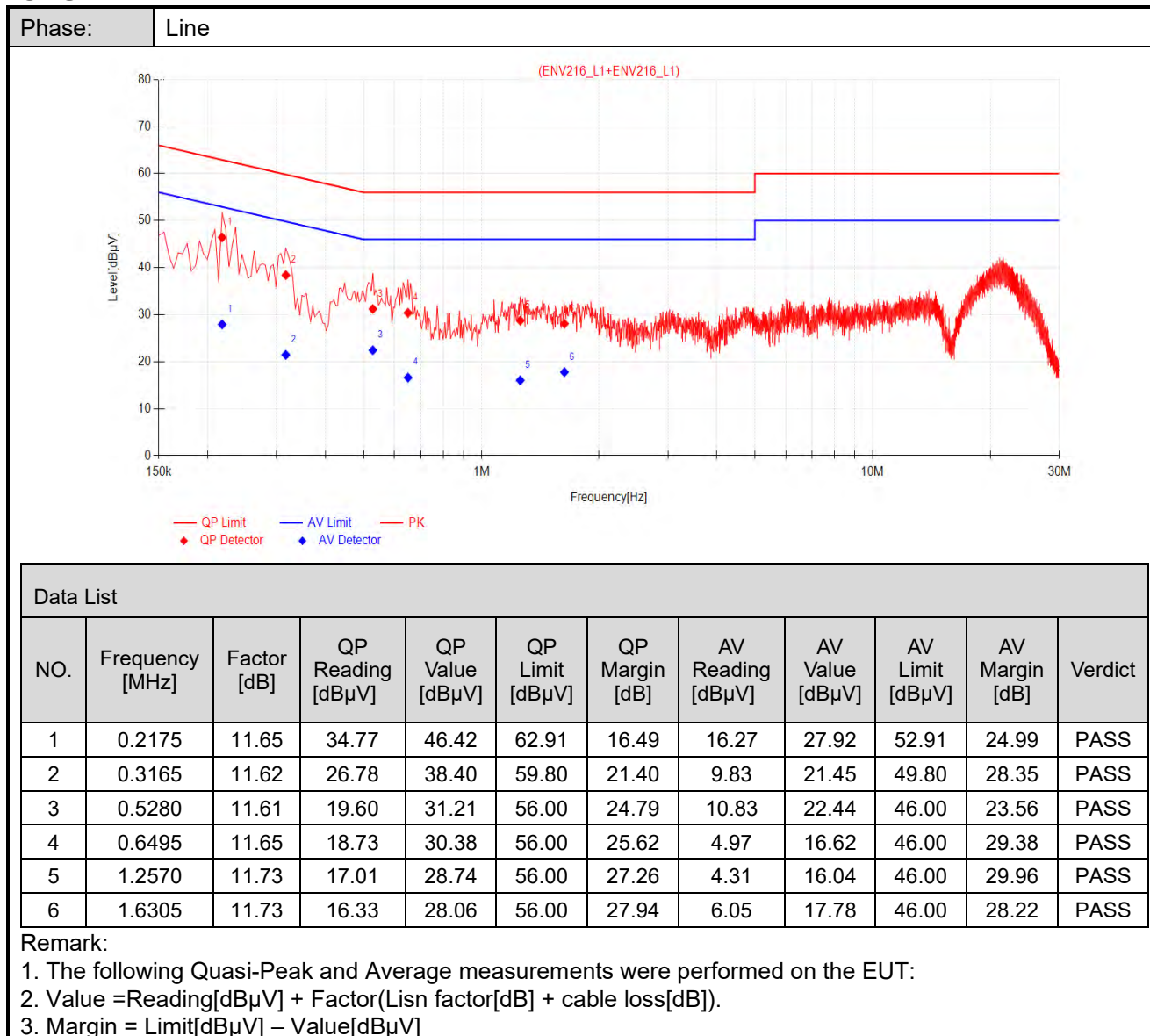
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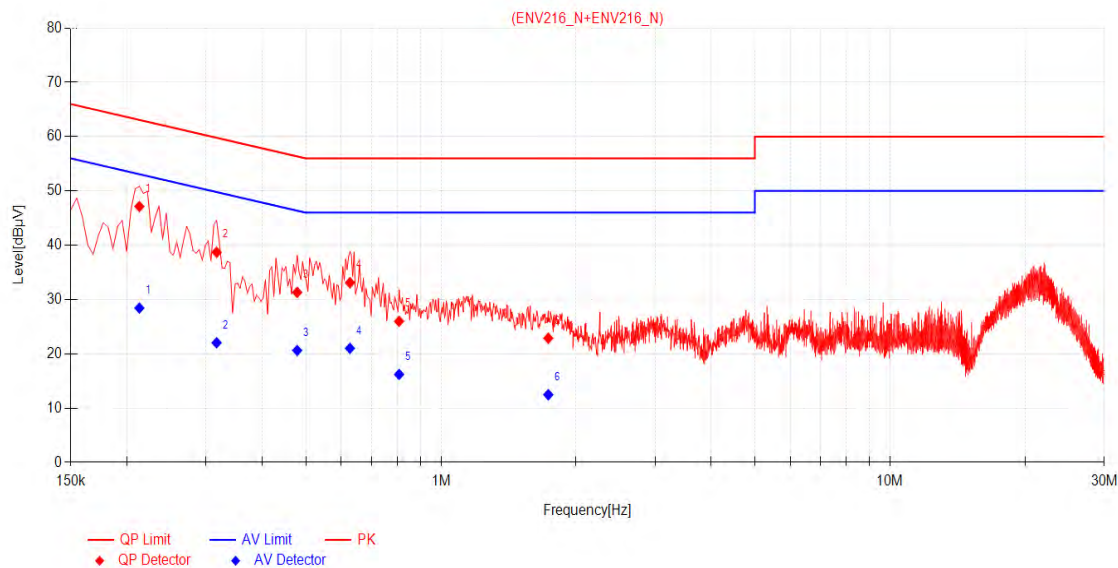
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## SKU2:





Phase: Neutral



## Data List

NO.	Frequency [MHz]	Factor [dB]	QP Reading [dBμV]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Reading [dBμV]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Verdict
1	0.2130	11.65	35.49	47.14	63.09	15.95	16.79	28.44	53.09	24.65	PASS
2	0.3165	11.62	27.09	38.71	59.80	21.09	10.42	22.04	49.80	27.76	PASS
3	0.4785	11.60	19.72	31.32	56.37	25.05	9.03	20.63	46.37	25.74	PASS
4	0.6270	11.64	21.46	33.10	56.00	22.90	9.38	21.02	46.00	24.98	PASS
5	0.8070	11.69	14.31	26.00	56.00	30.00	4.52	16.21	46.00	29.79	PASS
6	1.7340	11.72	11.16	22.88	56.00	33.12	0.76	12.48	46.00	33.52	PASS

## Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Value = Reading [dBμV] + Factor (Lisn factor [dB] + cable loss [dB]).
3. Margin = Limit [dBμV] - Value [dBμV]



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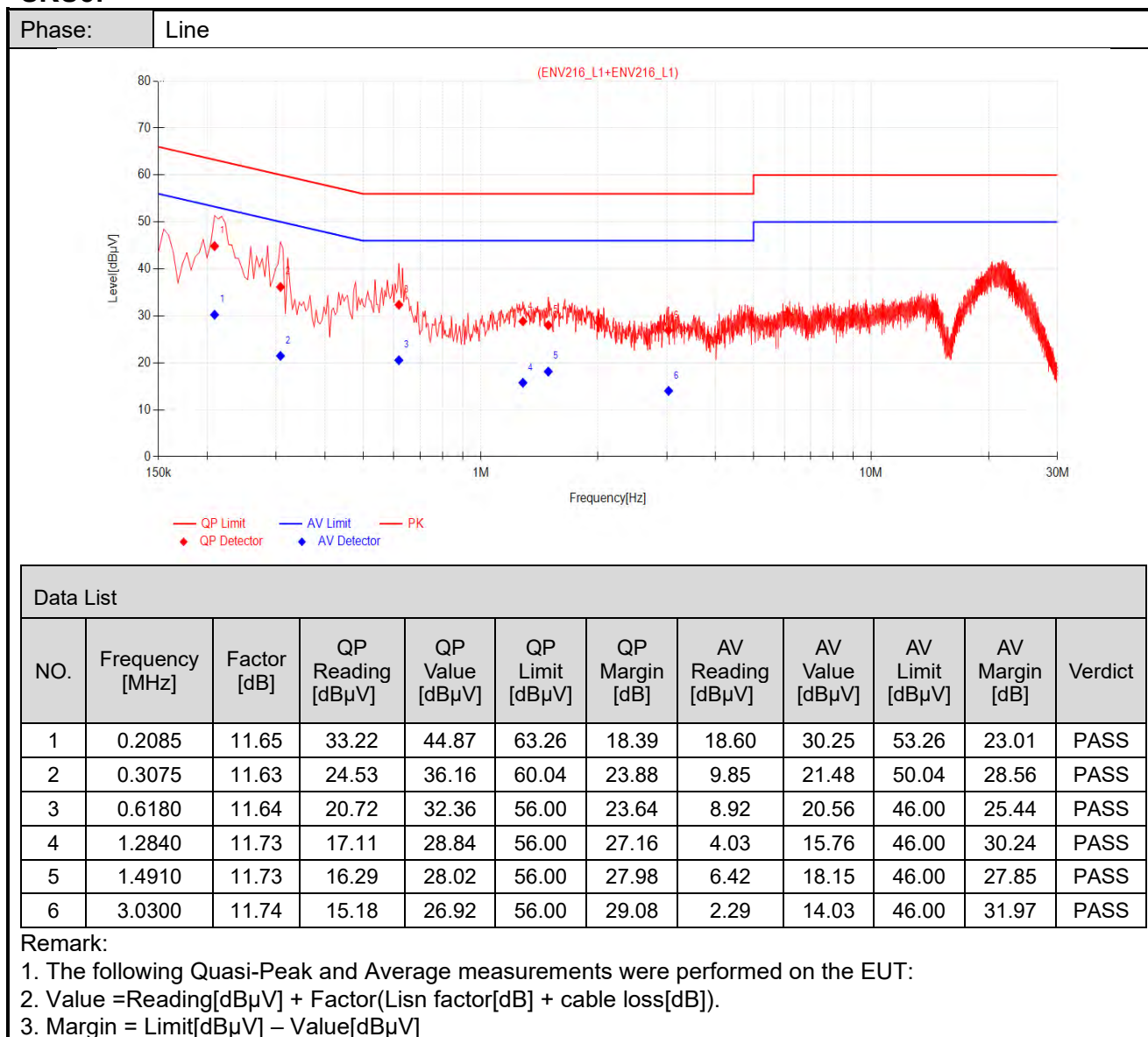
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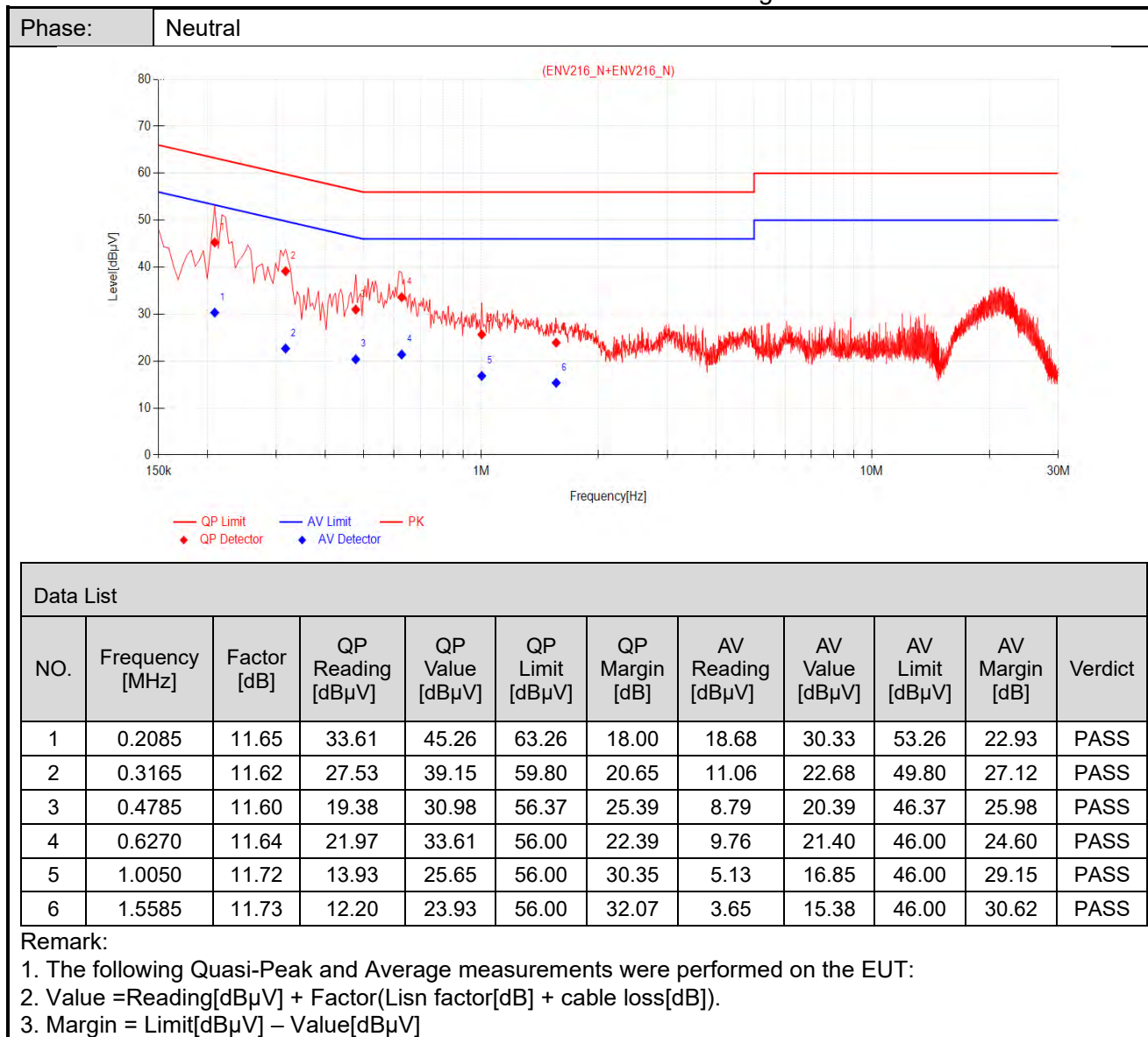
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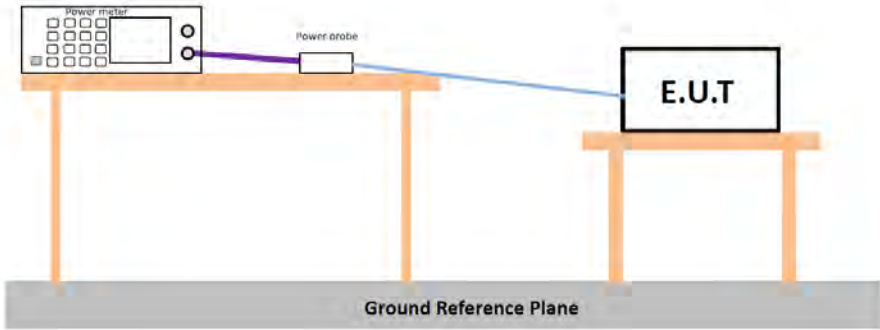
### SKU5:





Report No.: SEWM2312000501RG01  
Rev.: 01  
Page: 21 of 108

#### 4.4 Conducted Output Power

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)&15.247 (b)(1)
Test Method:	ANSI C63.10-2020 Section 11.9.1.2
Test Setup:	 <p>* Test with power meter (Detector function: Peak)</p>
Test Instruments:	Refer to section 6 for details
Exploratory Test Mode:	Non-hopping transmitting with all kind of modulation and all kind of data type.
Final Test Mode:	Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of $\pi/4$ DQPSK modulation type, 3-DH5 of data type is the worst case of 8DPSK modulation type.
Limit:	0.125 watts
Test Results:	Pass
The detailed test data see: <b>Appendix</b>	



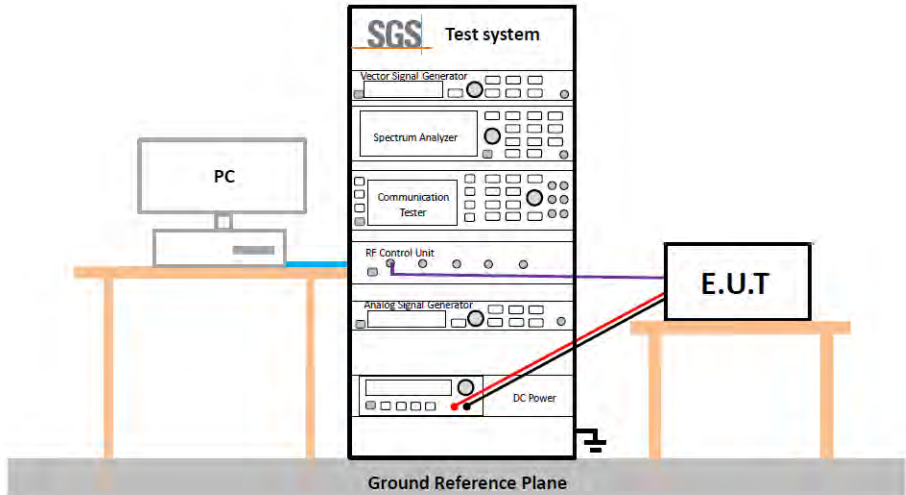
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Rev.: 01  
Page: 22 of 108

## 4.5 20dB Emission Bandwidth & 99% Occupied Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)
Test Method:	ANSI C63.10-2020 Section 6.9.2 and 6.9.3
Test Setup:	
Instruments Used:	Refer to section 6 for details
Exploratory Test Mode:	Non-hopping transmitting with all kind of modulation and all kind of data type.
Final Test Mode:	Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of $\pi/4$ DQPSK modulation type, 3-DH5 of data type is the worst case of 8DPSK modulation type.
Limit:	No restriction limits
Test Results:	For Report Purpose
The detailed test data see: <b>Appendix</b>	



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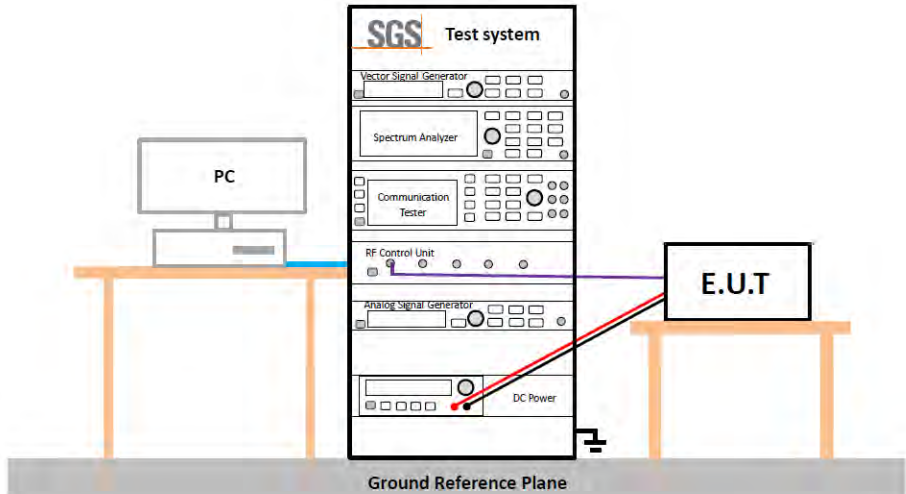
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Report No.: SEWM2312000501RG01  
Rev.: 01  
Page: 23 of 108

## 4.6 Carrier Frequencies Separation

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)
Test Method:	ANSI C63.10-2020 Section 7.8.2
Test Setup:	
Test Instruments:	Refer to section 6 for details
Exploratory Test Mode:	Hopping transmitting with all kind of modulation and all kind of data type.
Final Test Mode:	Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of $\pi/4$ DQPSK modulation type, 3-DH5 of data type is the worst case of 8DPSK modulation type.
Limit:	2/3 of the 20dB bandwidth Remark: the transmission power is less than 0.125W.
Test Results:	Pass
The detailed test data see: <b>Appendix</b>	



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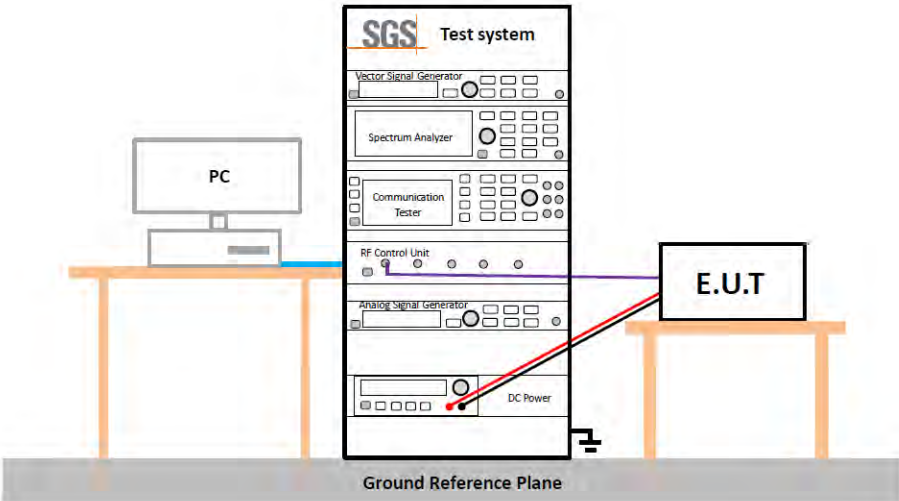


Report No.: SEWM2312000501RG01

Rev.: 01

Page: 24 of 108

### 4.7 Hopping Channel Number

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)
Test Method:	ANSI C63.10-2020 Section 7.8.3
Test Setup:	
Instruments Used:	Refer to section 6 for details
Test Mode:	Hopping transmitting with all kind of modulation
Limit:	At least 15 channels
Test Results:	Pass
The detailed test data see: <b>Appendix</b>	



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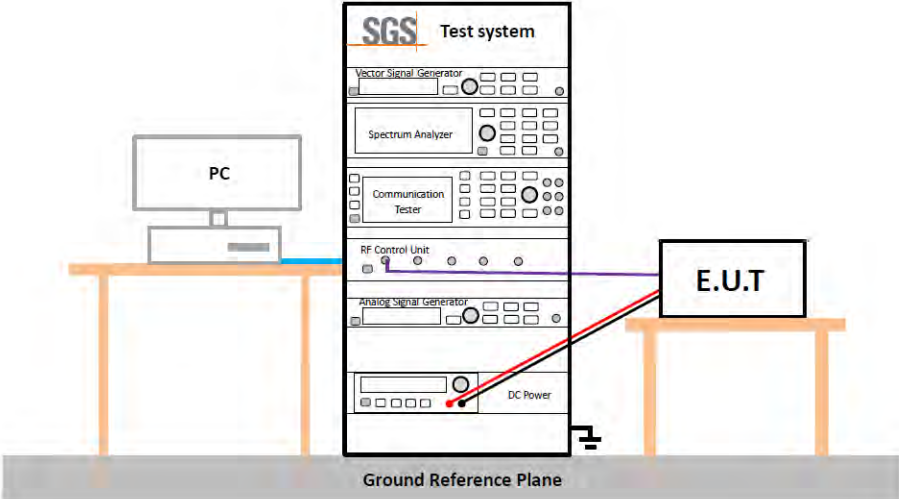
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Report No.: SEWM2312000501RG01  
Rev.: 01  
Page: 25 of 108

## 4.8 Dwell Time

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)
Test Method:	ANSI C63.10-2020 Section 7.8.4
Test Setup:	
Instruments Used:	Refer to section 6 for details
Test Mode:	Hopping transmitting with all kind of modulation and all kind of data type.
Limit:	0.4 Second
Test Results:	Pass
The detailed test data see: <b>Appendix</b>	



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Report No.: SEWM2312000501RG01  
Rev.: 01  
Page: 26 of 108

## 4.9 Band-edge for RF Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10-2020 Section 7.8.7.2
Test Setup:	
Instruments Used:	Refer to section 6 for details
Exploratory Test Mode:	Hopping and Non-hopping transmitting with all kind of modulation and all kind of data type.
Final Test Mode:	Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of $\pi/4$ DQPSK modulation type, 3-DH5 of data type is the worst case of 8DPSK modulation type.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test Results:	Pass
The detailed test data see: <b>Appendix</b>	



Report No.: SEWM2312000501RG01  
Rev.: 01  
Page: 27 of 108

## 4.10 Spurious RF Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10-2020 Section 7.8.7.1
Test Setup:	
Instruments Used:	Refer to section 6 for details
Exploratory Test Mode:	Non-hopping transmitting with all kind of modulation and all kind of data type.
Final Test Mode:	Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of $\pi/4$ DQPSK modulation type, 3-DH5 of data type is the worst case of 8DPSK modulation type.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test Results:	Pass
The detailed test data see: <b>Appendix</b>	





Report No.: SEWM2312000501RG01  
Rev.: 01  
Page: 28 of 108

## 4.11 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205				
Test Method:	ANSI C63.10-2020 Section 6.4 / 6.5 / 6.6				
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Test Frequency:	9kHz ~ 25GHz				
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
Remark: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.					

### Test Setup:

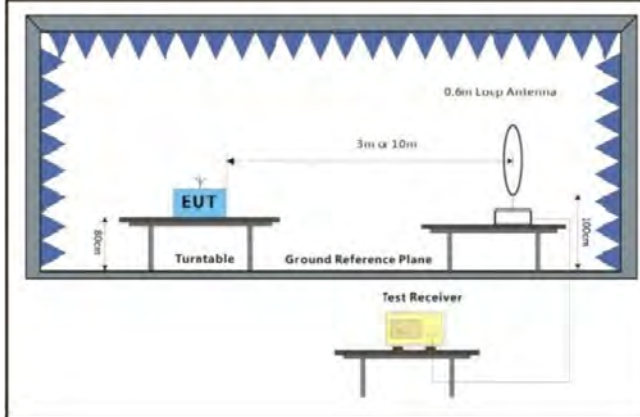


Figure 1. Below 30MHz

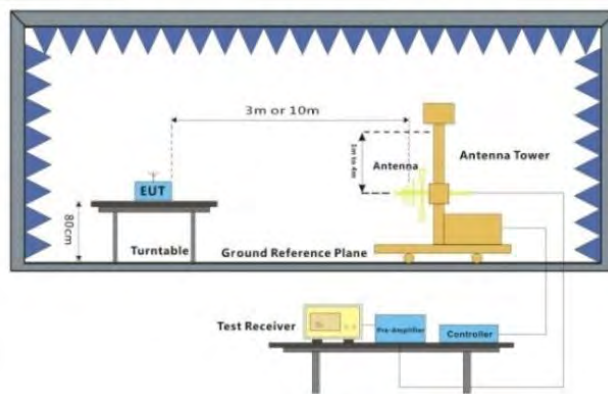


Figure 2. 30MHz to 1GHz



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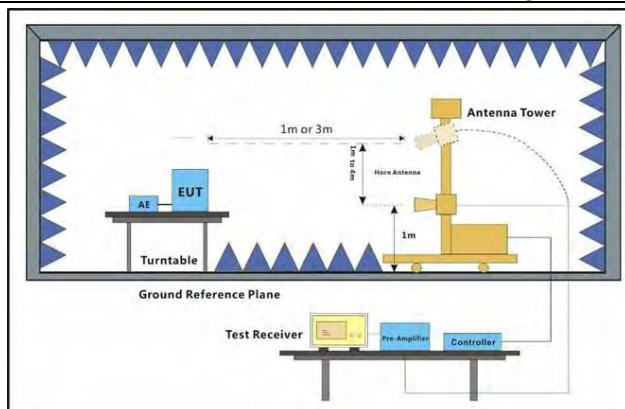


Figure 3. Above 1 GHz

Test Procedure:	<ol style="list-style-type: none"> <li>For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation (Distance from antenna to EUT is 1m for measurements &gt;18GHz).</li> <li>The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</li> <li>For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</li> <li>The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>Test the EUT in the lowest channel, the middle channel, the Highest channel.</li> <li>The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case.</li> <li>Repeat above procedures until all frequencies measured was complete.</li> <li>The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.</li> <li>The disturbance above 18GHz was very low, and the harmonics were the highest point could be found when testing, so only the harmonics had been displayed.</li> <li>At a measurement distance of 1 meter the limit line was increased by <math>20 \cdot \log(3/1) = 9.54 \text{ dB}</math>.</li> </ol>
Test Configuration:	<p>Measurements below 30MHz</p> <ul style="list-style-type: none"> <li>RBW = 10 kHz</li> <li>VBW = 30 kHz</li> <li>Detector = Peak &amp; Average &amp; Quasi-peak</li> <li>Trace mode = max hold</li> </ul> <p>Measurements Below 1000MHz</p>

Report No.: SEWM2312000501RG01

Rev.: 01

Page: 30 of 108

	<ul style="list-style-type: none"> <li>• RBW = 120 kHz</li> <li>• VBW = 300 kHz</li> <li>• Detector = Quasi-peak</li> <li>• Trace mode = max hold</li> </ul> <p>Peak Measurements Above 1000 MHz</p> <ul style="list-style-type: none"> <li>• RBW = 1 MHz</li> <li>• VBW ≥ 3 MHz</li> <li>• Detector = Peak</li> <li>• Sweep time = auto</li> <li>• Trace mode = max hold</li> </ul> <p>Average Measurements Above 1000MHz</p> <p>Use duty cycle correction factor method per 15.35(c).</p> <p>Duty cycle = On time / 100 milliseconds</p> <p>On time = <math>N_1 \cdot L_1 + N_2 \cdot L_2 \dots + N_{N-1} \cdot L_{N-1} + N_N \cdot L_N</math></p> <p>Where <math>N_1</math> is number of type 1 pulse, <math>L_1</math> is length of type 1 pulses, etc.</p> <p>Average Value = Peak Value + 20*log(Duty cycle).</p>
Exploratory Test Mode:	<p>Non-hopping transmitting mode with all kind of modulation and all kind of data type</p> <p>Charge + Transmitting mode.</p>
Final Test Mode:	<p>Through Pre-scan, find the DH5 of data type and GFSK modulation is the worst case.</p> <p>Pretest the EUT at Charge + Transmitting mode</p> <p>For below 1GHz part, through pre-scan all channels, but only the worst case is recorded in the report.</p>
Instruments Used:	Refer to section 6 for details
Test Results:	Pass
The detailed test data see: <b>Appendix</b>	



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## 4.12 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205		
Test Method:	ANSI C63.10-2020 Section 6.10.5		
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)		
Limit:	Frequency	Limit (dBuV/m)	Remark
	30MHz-88MHz	40.0	Quasi-peak
	88MHz-216MHz	43.5	Quasi-peak
	216MHz-960MHz	46.0	Quasi-peak
	960MHz-1GHz	54.0	Quasi-peak
	Above 1GHz	54.0	Average Value
		74.0	Peak Value

### Test Setup:

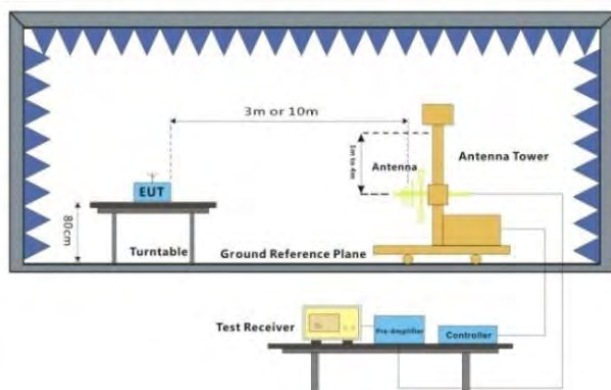


Figure 1. 30MHz to 1GHz

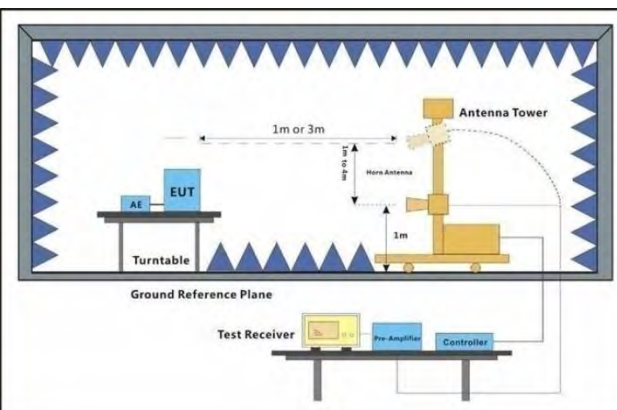


Figure 2. Above 1GHz

### Test Procedure:

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- Place a marker at the end of the restricted band closest to the transmit



Report No.: SEWM2312000501RG01

Rev.: 01

Page: 32 of 108

	<p>frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel.</p> <p>h. Test the EUT in the lowest channel , the Highest channel.</p> <p>i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case.</p> <p>j. Repeat above procedures until all frequencies measured was complete.</p>
Test Configuration:	<p>Measurements Below 1000MHz</p> <ul style="list-style-type: none"> <li>• RBW = 120 kHz</li> <li>• VBW = 300 kHz</li> <li>• Detector = Quasi-peak</li> <li>• Trace mode = max hold</li> </ul> <p>Peak Measurements Above 1000 MHz</p> <ul style="list-style-type: none"> <li>• RBW = 1 MHz</li> <li>• VBW ≥ 3 MHz</li> <li>• Detector = Peak</li> <li>• Sweep time = auto</li> <li>• Trace mode = max hold</li> </ul> <p>Average Measurements Above 1000MHz</p> <p>Use duty cycle correction factor method per 15.35(c).</p> <p>Duty cycle = On time / 100 milliseconds</p> <p>On time = <math>N_1 \cdot L_1 + N_2 \cdot L_2 \dots + N_{N-1} \cdot L_{N-1} + N_N \cdot L_N</math></p> <p>Where <math>N_1</math> is number of type 1 pulse, <math>L_1</math> is length of type 1 pulses, etc.</p> <p>Average Value = Peak Value + 20*log(Duty cycle).</p>
Exploratory Test Mode:	<p>Non-hopping transmitting mode with all kind of modulation and all kind of data type</p> <p>Charge + Transmitting mode.</p>
Final Test Mode:	<p>Through Pre-scan, find the DH5 of data type and GFSK modulation is the worst case.</p> <p>Pretest the EUT at Charge + Transmitting mode,</p> <p>Only the worst case is recorded in the report.</p>
Instruments Used:	Refer to section 6 for details
Test Results:	Pass
The detailed test data see: <b>Appendix</b>	





## 5 Measurement Uncertainty (95% confidence levels, k=2)

Lab A		
No.	Item	Measurement Uncertainty
1	Conduction Emission	± 2.90dB (150kHz to 30MHz)
2	Radiated Emission	± 3.13dB (9k -30MHz)
		± 4.88dB (30M -1GHz)
		± 4.75dB (1GHz to 18GHz)
		± 4.77dB (Above 18GHz)
Remark: The U <sub>lab</sub> (lab Uncertainty) is less than U <sub>CISPR/ETSI</sub> (CISPR/ETSI Uncertainty), so the test results – compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit; – non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.		

Lab B		
No.	Item	Measurement Uncertainty
1	Conducted Peak Output Power	$\pm 0.75\text{dB}$
2	20dB Bandwidth	$\pm 3\%$
3	Carrier Frequencies Separation	$\pm 7.25 \times 10^{-8}$
4	Hopping Channel Number	$\pm 7.25 \times 10^{-8}$
5	Dwell Time	$\pm 0.37\%$
6	Conducted Band Edges Measurement	$\pm 0.75\text{dB}$
7	Conducted Spurious Emissions	$\pm 0.75\text{dB}$
Remark: The $U_{\text{lab}}$ (lab Uncertainty) is less than $U_{\text{CISPR/ETSI}}$ (CISPR/ETSI Uncertainty), so the test results – compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit; – non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.		



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Report No.: SEWM2312000501RG01

Rev.: 01

Page: 34 of 108

## 6 Equipment List

Lab A Conduction Test Equipment					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
Shielding Room	Brilliant-emc	N/A	SUWI-04-03-01	2021/05/08	2024/05/07
Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	2023/02/08	2024/02/07
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-06	2023/02/07	2024/02/06
Artificial network	ROHDE&SCHWARZ	ENV216	SUWI-01-19-03	2023/02/08	2024/02/07
Artificial network	ROHDE&SCHWARZ	ENV216	SUWI-01-19-04	2023/02/08	2024/02/07
Measurement Software	Tonscend	JS32-CE V4.0.0.2	SUWI-02-09-05	NCR	NCR

Lab A RSE Test System					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
Semi-Anechoic Chamber	Brilliant-emc	N/A	SUWI-04-02-02	2021/11/25	2024/11/24
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-13	2023/02/07	2024/02/06
Signal Analyzer	ROHDE&SCHWARZ	FSW43	SUWI-01-02-04	2023/05/11	2024/05/10
Signal Analyzer	KEYSIGHT	N9020A	SUWI-01-02-06	2023/11/21	2024/11/20
Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	2023/02/08	2024/02/07
Receiving antenna	SCHWRZBECK MESS-ELEKTRONIK	VULB 9168	SUWI-01-11-04	2023/11/25	2024/11/24
Receiving antenna	SCHWRZBECK MESS-ELEKTRONIK	BBHA 9120D	SUWI-01-11-05	2023/11/25	2024/11/24
Receiving antenna	SCHWRZBECK MESS-ELEKTRONIK	BBHA 9170	SUWI-01-11-03	2023/05/12	2024/05/11
Active Loop Antenna	SCHWRZBECK MESS-ELEKTRONIK	FMZB 1519B	SUWI-01-21-01	2023/05/13	2024/05/12
Amplifier	Tonscend	TAP9K3G32	SUWI-01-14-06	2023/11/21	2024/11/20
Amplifier	Tonscend	TAP01018050	SUWI-01-14-04	2023/11/21	2024/11/20
Amplifier	Tonscend	TAP30M7G30	SUWI-01-14-05	2023/11/21	2024/11/20
Measurement Software	Tonscend	JS32-RE V4.0.0.0	SUWI-02-09-04	NCR	NCR



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Report No.: SEWM2312000501RG01

Rev.: 01

Page: 35 of 108

Lab B Conducted Peak Output Power					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
Power Sensor	TST PASS	TSPS2023R	SEM009-26	2023/04/01	2024/03/31
Power Sensor	KEYSIGHT	U2021XA	SEM009-16	2023/03/21	2024/03/20
DC Power Supply	Chroma	62012P-80-60	SEM011-11	2023/10/19	2024/10/18
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-19	2023/03/21	2024/03/20
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2023/07/07	2024/07/06
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2023/03/31	2024/03/30

Lab B 20dB Bandwidth					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
DC Power Supply	Chroma	62012P-80-60	SEM011-11	2023/10/19	2024/10/18
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-19	2023/03/21	2024/03/20
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2023/07/07	2024/07/06
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2023/03/31	2024/03/30

Lab B Carrier Frequencies Separation					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
DC Power Supply	Chroma	62012P-80-60	SEM011-11	2023/10/19	2024/10/18
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-19	2023/03/21	2024/03/20
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2023/07/07	2024/07/06
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2023/03/31	2024/03/30

Lab B Hopping Channel Number					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
DC Power Supply	Chroma	62012P-80-60	SEM011-11	2023/10/19	2024/10/18
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-19	2023/03/21	2024/03/20
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2023/07/07	2024/07/06
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2023/03/31	2024/03/30



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Report No.: SEWM2312000501RG01

Rev.: 01

Page: 36 of 108

Lab B Dwell Time					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
DC Power Supply	Chroma	62012P-80-60	SEM011-11	2023/10/19	2024/10/18
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-19	2023/03/21	2024/03/20
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2023/07/07	2024/07/06
Attenuator	Huber+Suhner	6620 SMA-50-1	SEM021-09	2023/03/31	2024/03/30

Lab B Conducted Band Edges Measurement					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
DC Power Supply	Chroma	62012P-80-60	SEM011-11	2023/10/19	2024/10/18
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-19	2023/03/21	2024/03/20
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2023/07/07	2024/07/06
Attenuator	Huber+Suhner	6620 SMA-50-1	SEM021-09	2023/03/31	2024/03/30

Lab B Conducted Spurious Emissions					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
DC Power Supply	Chroma	62012P-80-60	SEM011-11	2023/10/19	2024/10/18
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-19	2023/03/21	2024/03/20
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2023/07/07	2024/07/06
Attenuator	Huber+Suhner	6620 SMA-50-1	SEM021-09	2023/03/31	2024/03/30

Lab B General used equipment					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
Humidity/ Temperature Indicator	deli	8838	SEM002-32	2023/07/28	2024/07/27
Humidity/ Temperature Indicator	deli	8838	SEM002-33	2023/07/28	2024/07/27
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2023/03/23	2024/03/22



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Rev.: 01

Page: 37 of 108

## 7 Photographs - Setup Photos

Refer to Appendix A.1 WLAN Setup Photos.



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Rev.: 01  
Page: 38 of 108

# Appendix



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 Rev.: 01  
 Page: 39 of 108

## Bandwidth OBW Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	99% Occupied Bandwidth (MHz)	Verdict
					Result	
GFSK	SISO	2402	DH5	1	0.747	Pass
		2441	DH5	1	0.747	Pass
		2480	DH5	1	0.744	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	1.135	Pass
		2441	2DH5	1	1.135	Pass
		2480	2DH5	1	1.137	Pass
8DPSK	SISO	2402	3DH5	1	1.150	Pass
		2441	3DH5	1	1.150	Pass
		2480	3DH5	1	1.146	Pass



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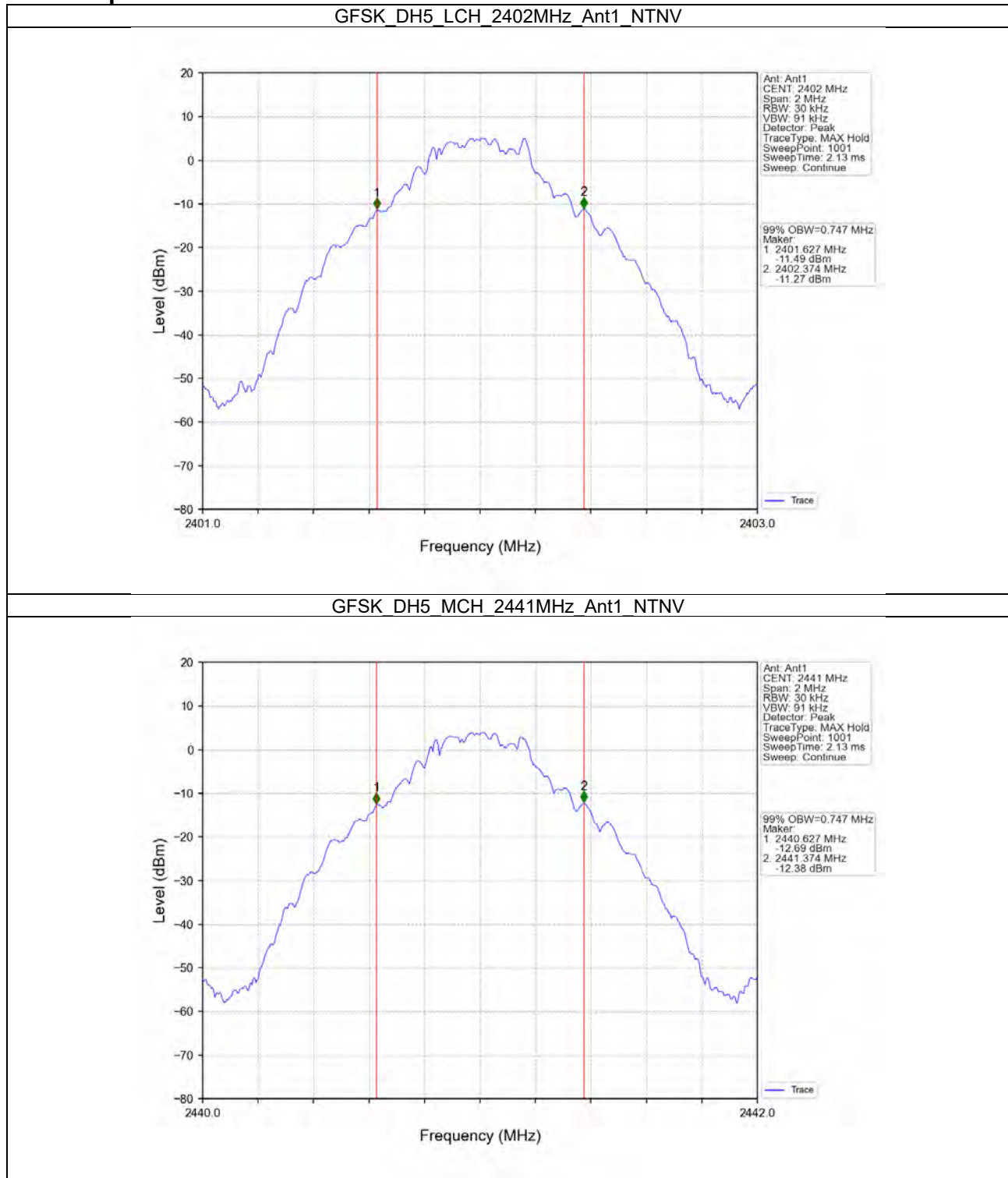
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### Test Graph



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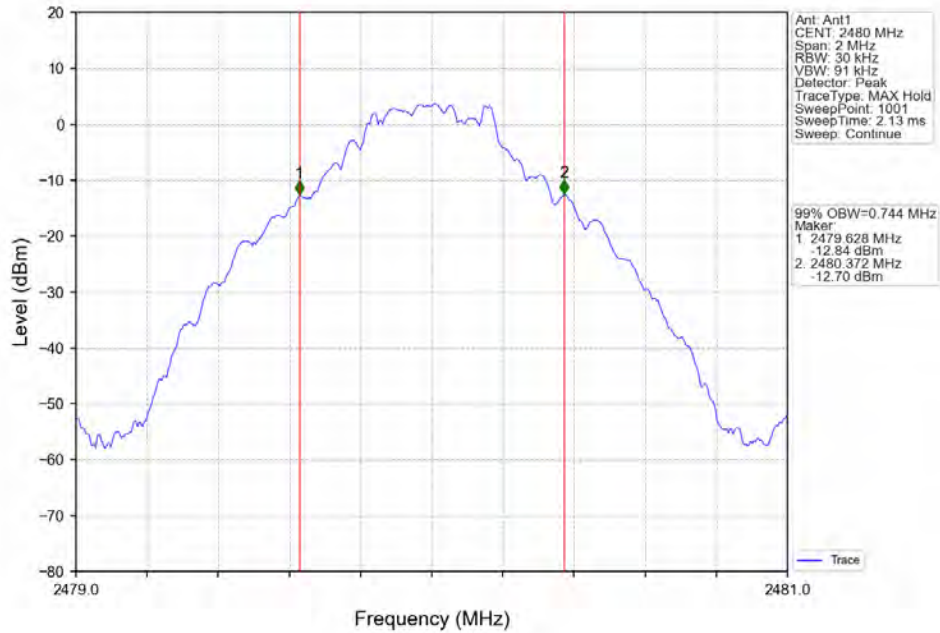


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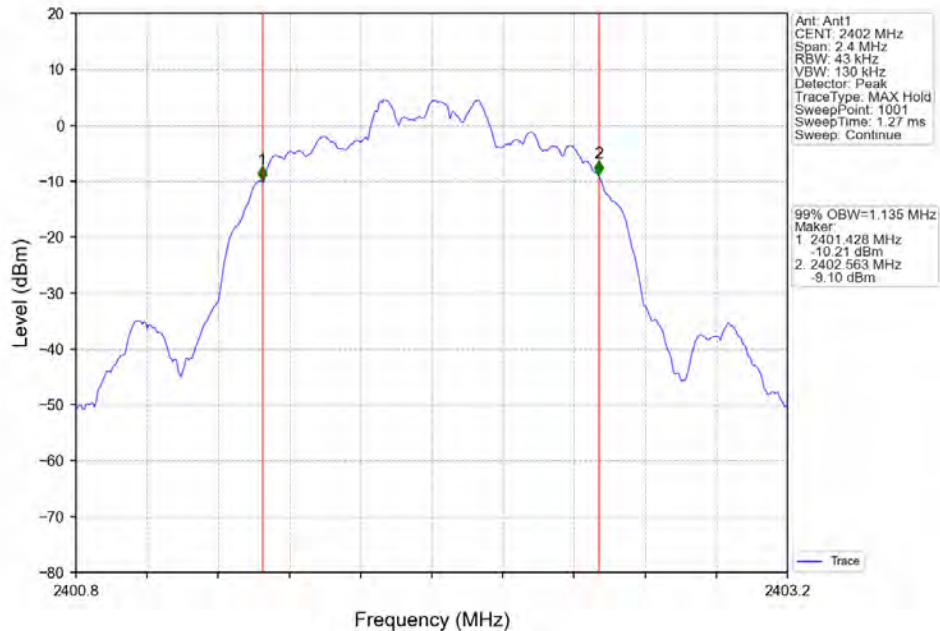
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### GFSK DH5 HCH 2480MHz Ant1 NTN



### Pi/4DQPSK 2DH5 LCH 2402MHz Ant1 NTN



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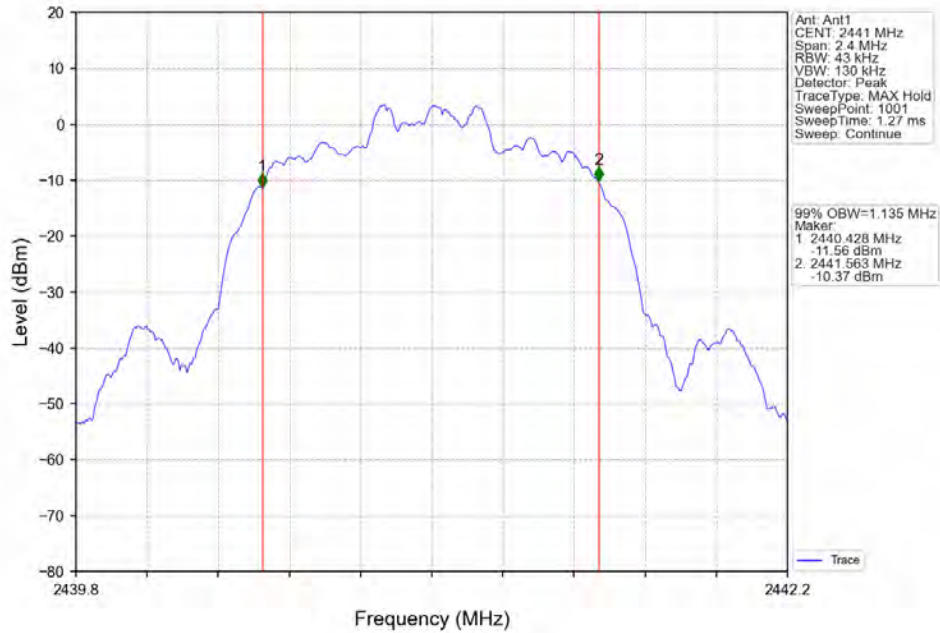
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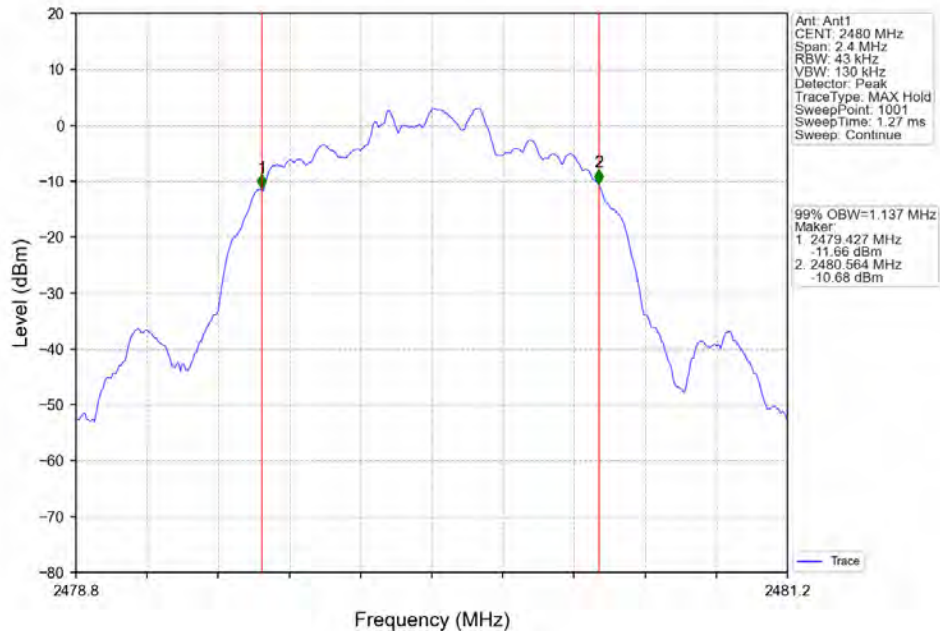
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### Pi/4DQPSK 2DH5 MCH 2441MHz Ant1\_NTNV



### Pi/4DQPSK 2DH5 HCH 2480MHz Ant1\_NTNV



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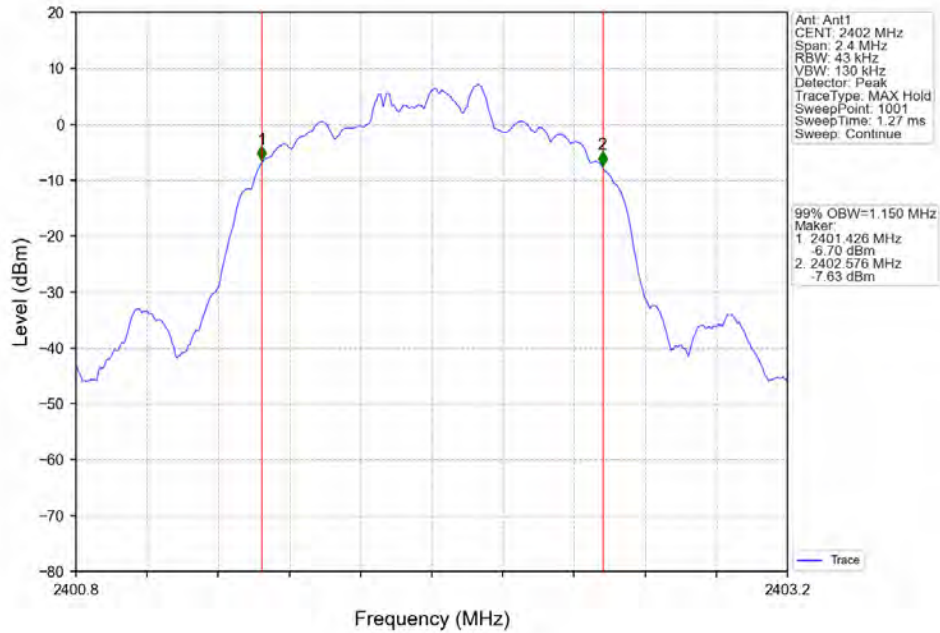
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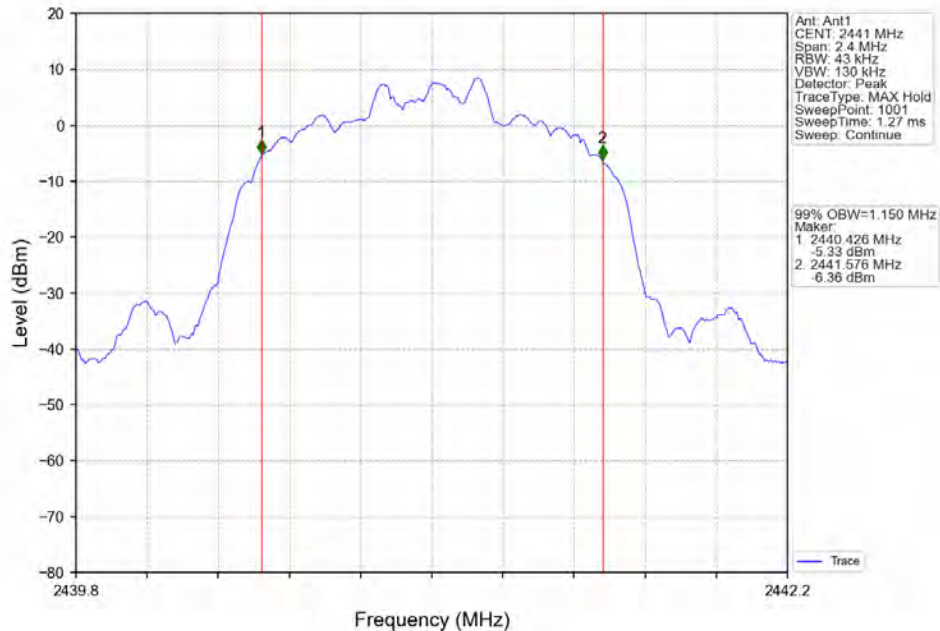
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### 8DPSK 3DH5\_LCH\_2402MHz\_Ant1\_NTNV



### 8DPSK 3DH5\_MCH\_2441MHz\_Ant1\_NTNV



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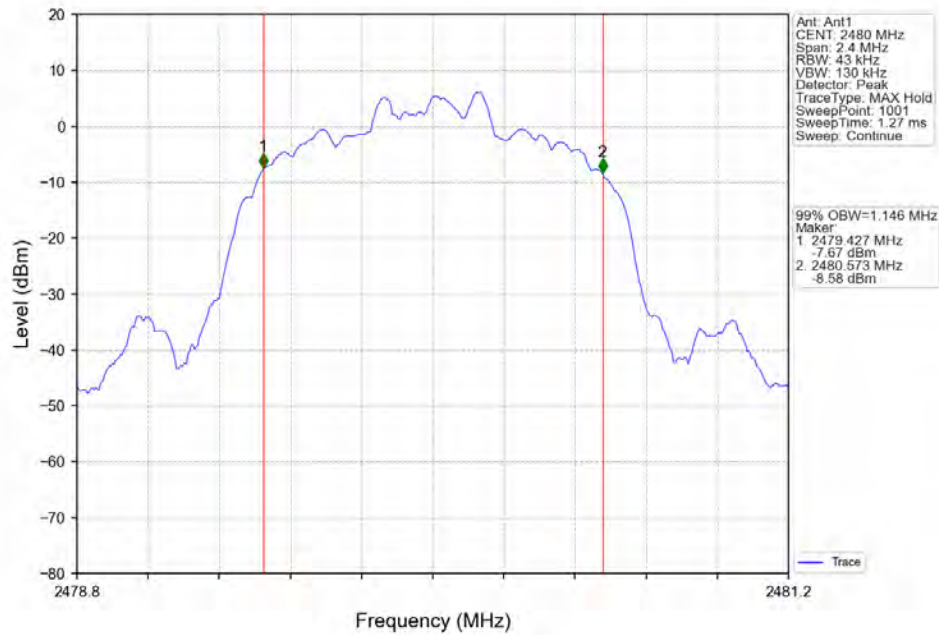


Report No.: SEWM2312000501RG01

Rev.: 01

Page: 44 of 108

8DPSK\_3DH5\_HCH\_2480MHz\_Ant1\_NTNV



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Report No.: SEWM2312000501RG01  
 Rev.: 01  
 Page: 45 of 108

## 20dB BW Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	20dB Bandwidth (MHz)	Verdict
					Result	
GFSK	SISO	2402	DH5	1	0.848	Pass
		2441	DH5	1	0.847	Pass
		2480	DH5	1	0.841	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	1.278	Pass
		2441	2DH5	1	1.274	Pass
		2480	2DH5	1	1.274	Pass
8DPSK	SISO	2402	3DH5	1	1.289	Pass
		2441	3DH5	1	1.290	Pass
		2480	3DH5	1	1.288	Pass



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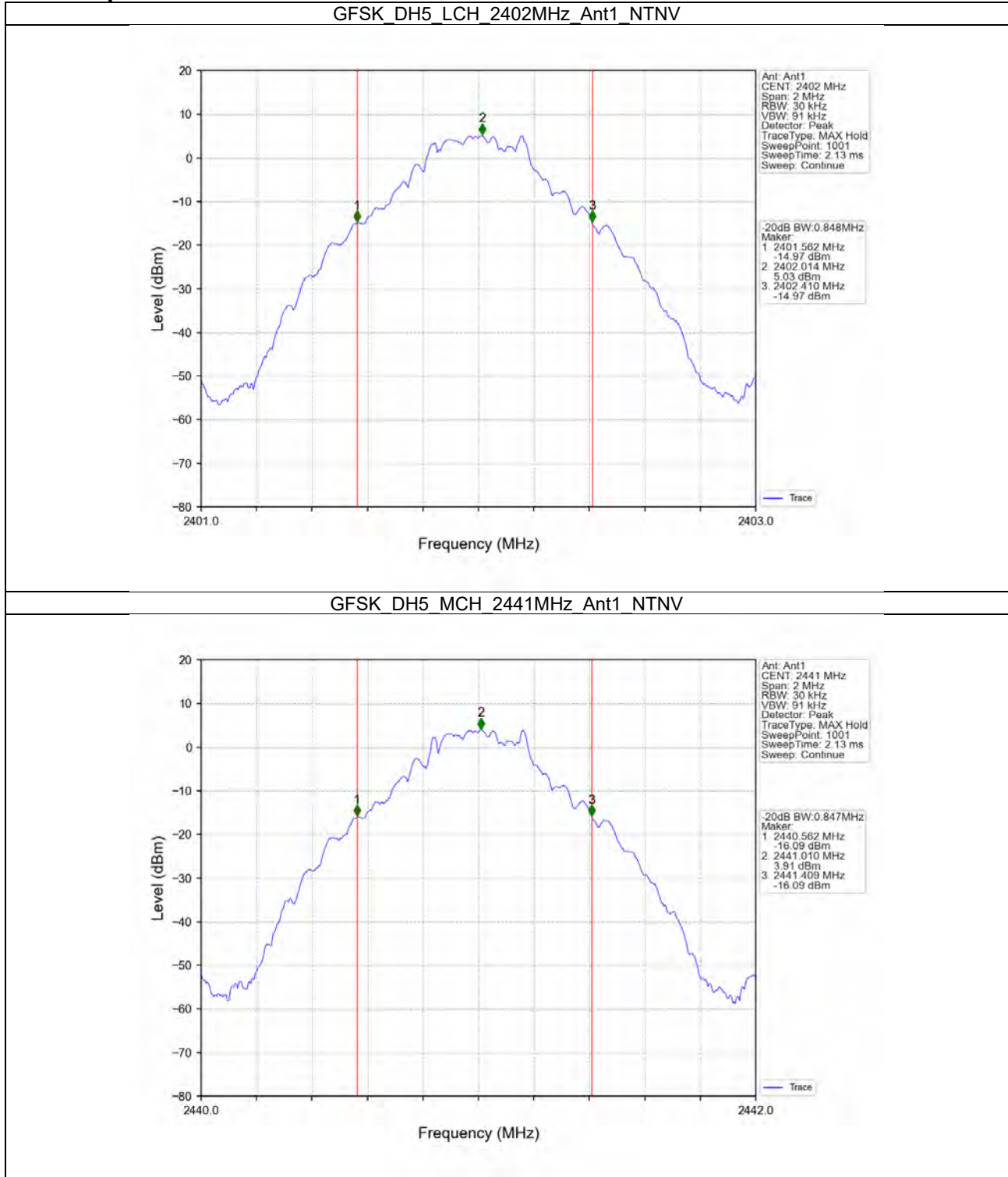
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Report No.: SEWM2312000501RG01

Rev.: 01

Page: 46 of 108

### Test Graph



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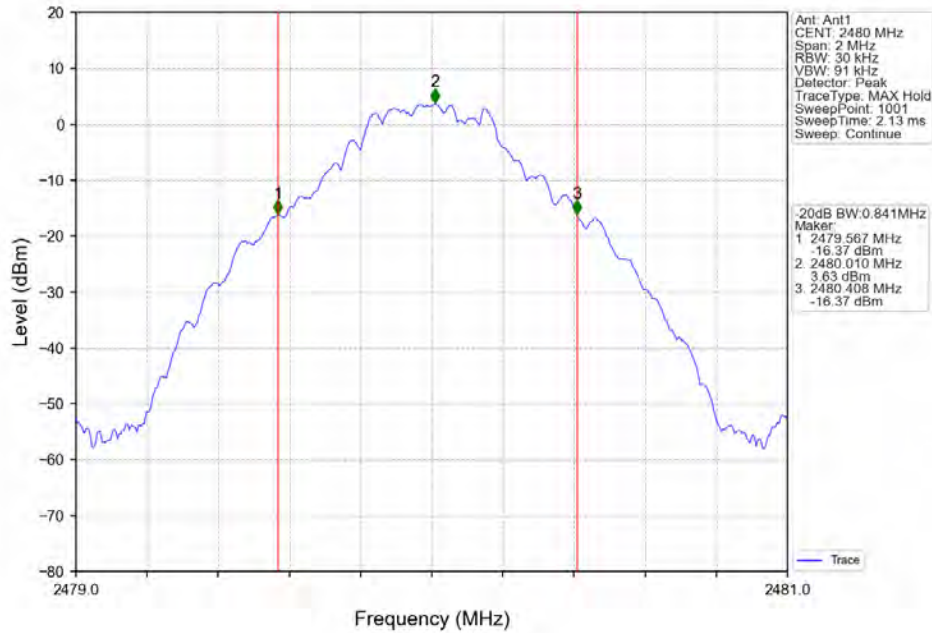
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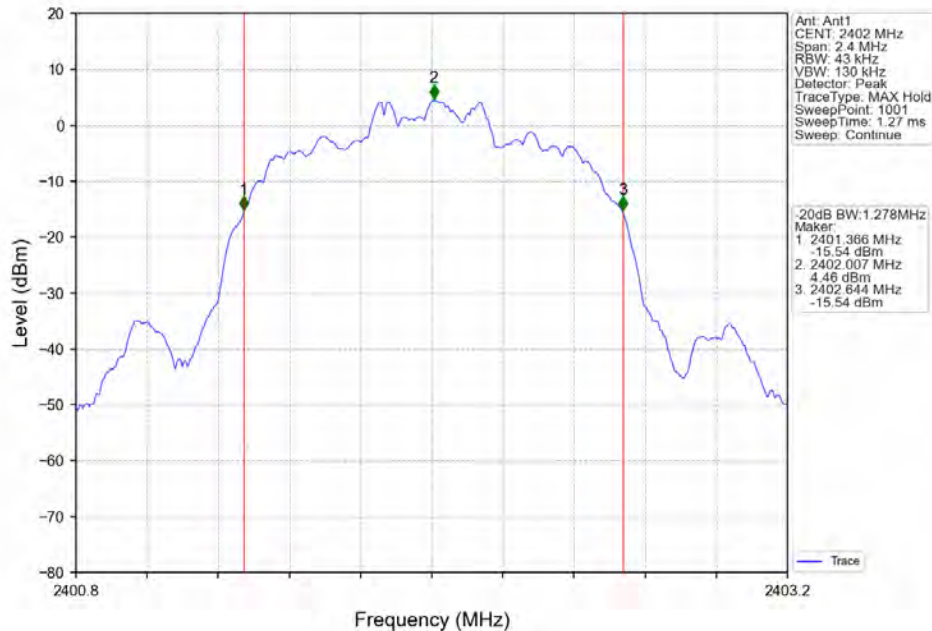
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Page: 47 of 108

### GFSK DH5 HCH 2480MHz Ant1 NTN



### Pi/4DQPSK 2DH5 LCH 2402MHz Ant1 NTN



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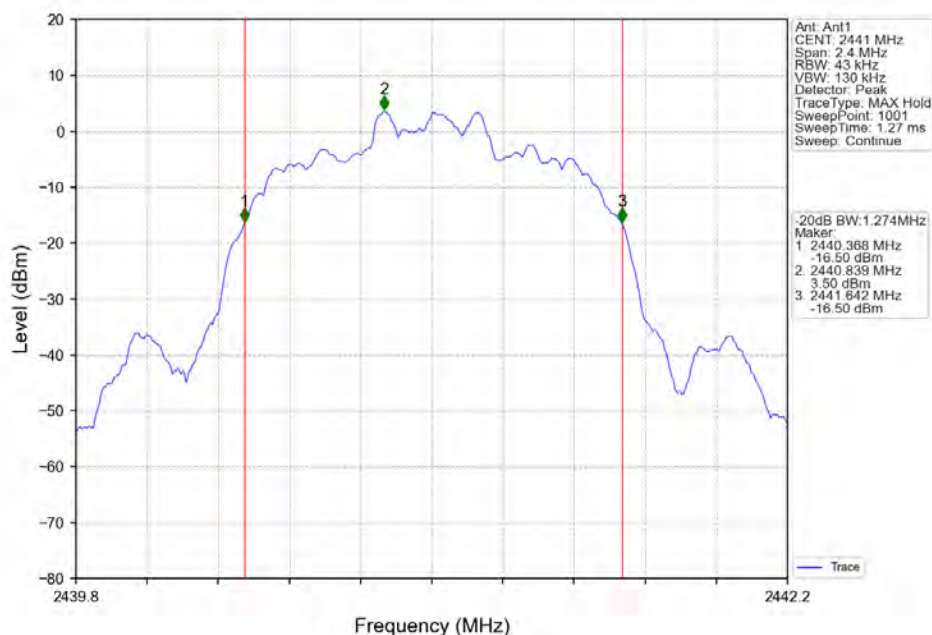


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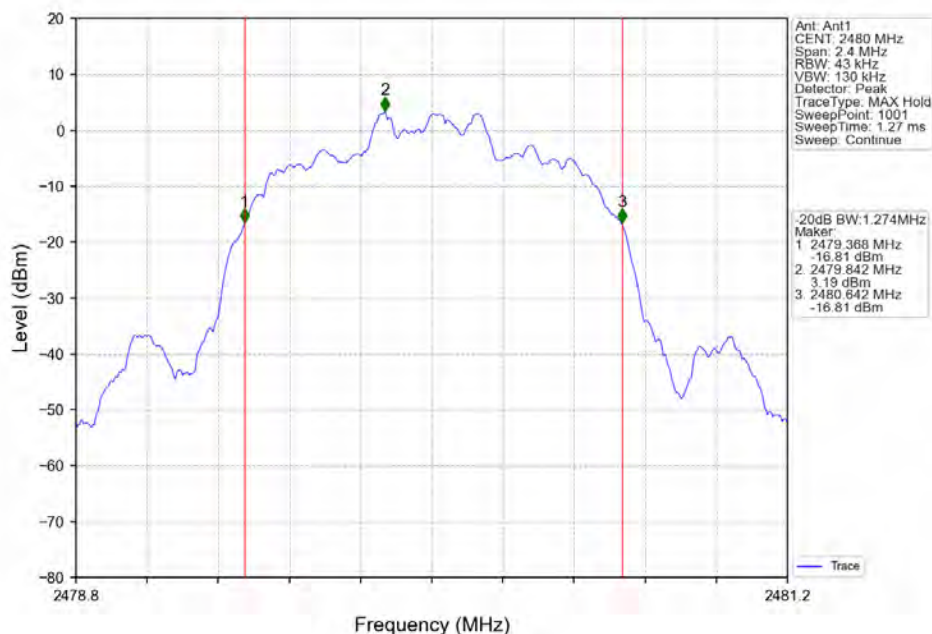
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Page: 48 of 108

### Pi/4DQPSK 2DH5 MCH 2441MHz Ant1\_NTNV



### Pi/4DQPSK 2DH5 HCH 2480MHz Ant1\_NTNV



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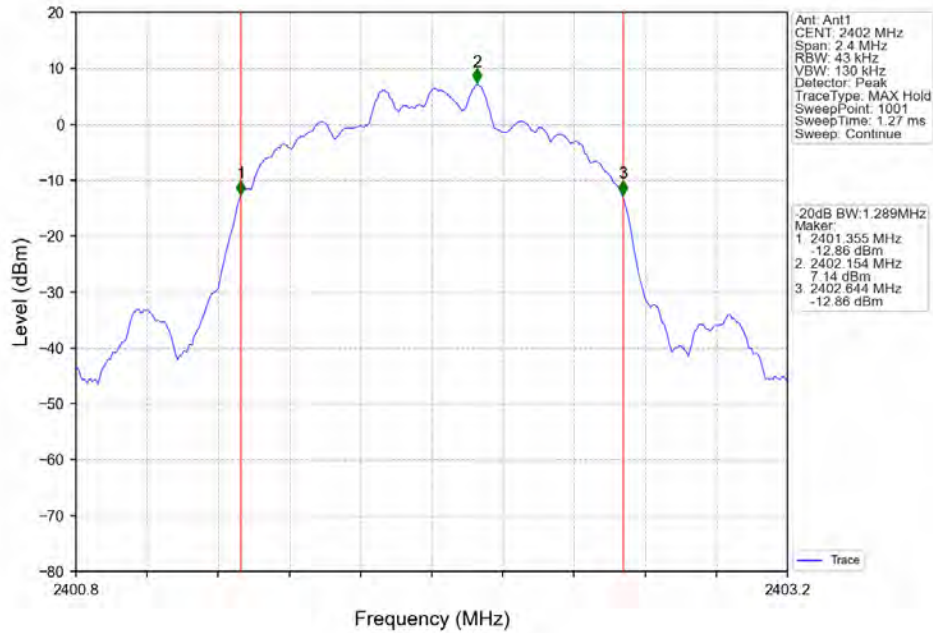


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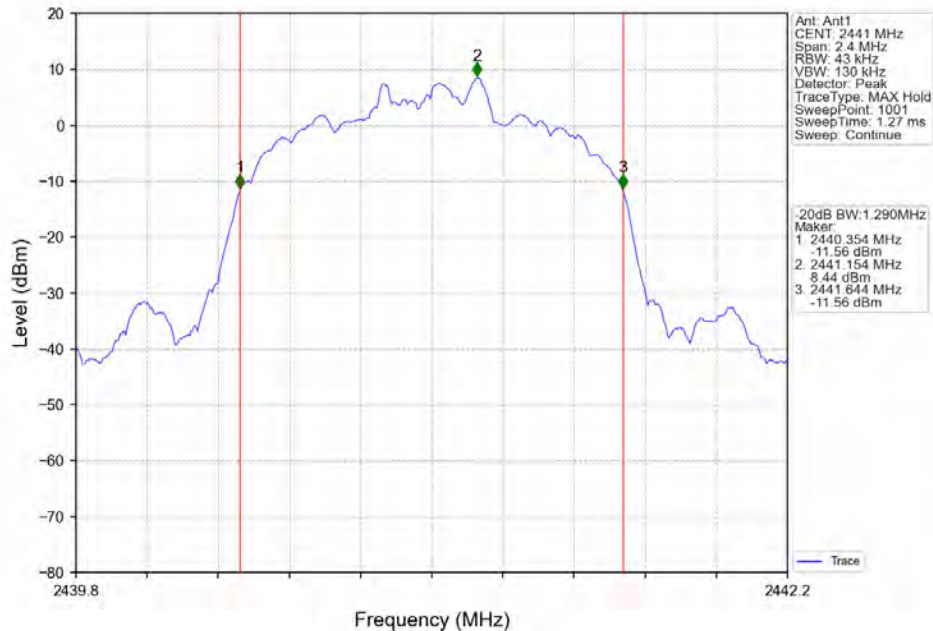
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Page: 49 of 108

### 8DPSK 3DH5\_LCH\_2402MHz\_Ant1\_NTNV



### 8DPSK 3DH5\_MCH\_2441MHz\_Ant1\_NTNV



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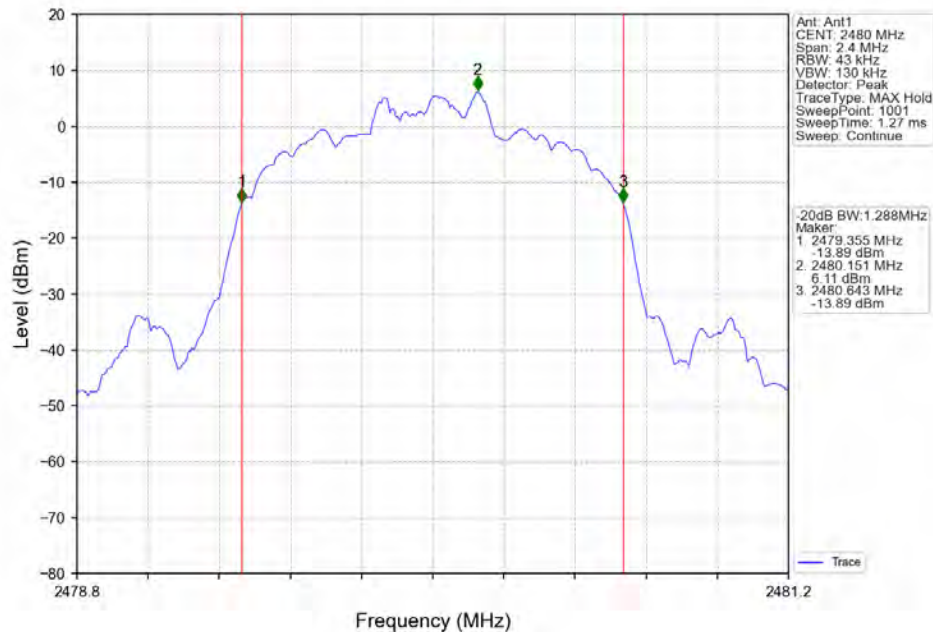
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8DPSK\_3DH5\_HCH\_2480MHz\_Ant1\_NTNV



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Rev.: 01

Page: 51 of 108

## Maximum Conducted Output Power

### Power

### Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	Maximum Peak Conducted Output Power (dBm)		Verdict
				ANT1	Limit	
GFSK	SISO	2402	DH5	9.43	<=30.00	Pass
		2441	DH5	9.81	<=30.00	Pass
		2480	DH5	9.07	<=30.00	Pass
Pi/4DQPSK	SISO	2402	2DH5	6.70	<=20.97	Pass
		2441	2DH5	6.05	<=20.97	Pass
		2480	2DH5	5.76	<=20.97	Pass
8DPSK	SISO	2402	3DH5	6.75	<=20.97	Pass
		2441	3DH5	7.10	<=20.97	Pass
		2480	3DH5	5.79	<=20.97	Pass

## Carrier Frequency Separation

### Test Result

Ant1							
Mode	Tx Type	Frequency (MHz)	Packet Type	Channel Separation (MHz)	20dB Bandwidth (MHz)	Limit (MHz)	Verdict
GFSK	SISO	HOPP	DH5	0.994	0.848	>=0.848	Pass
Pi/4DQPSK	SISO	HOPP	2DH5	1.229	1.278	>=0.852	Pass
8DPSK	SISO	HOPP	3DH5	1.025	1.290	>=0.86	Pass



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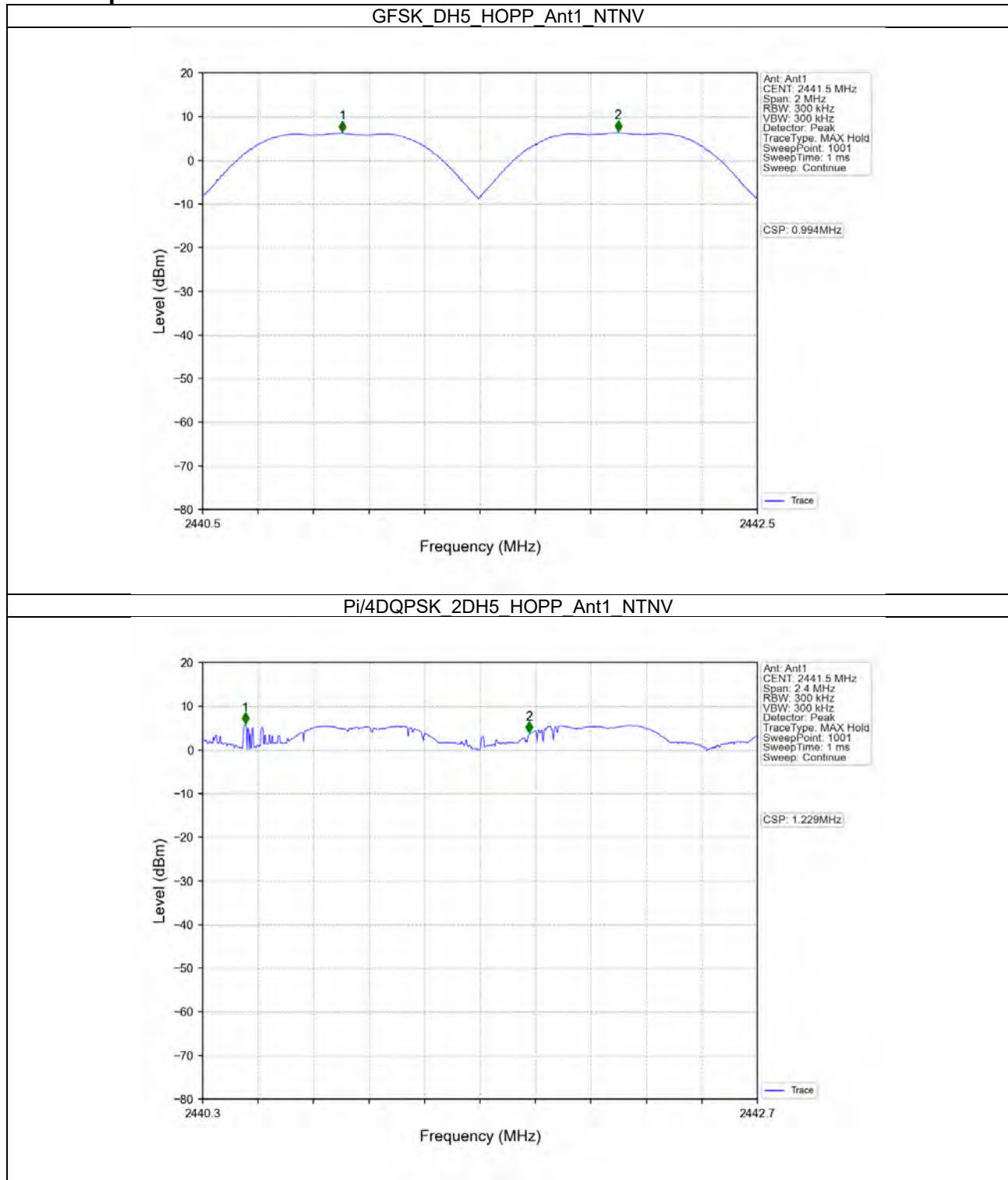
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Page: 52 of 108

## Test Graph



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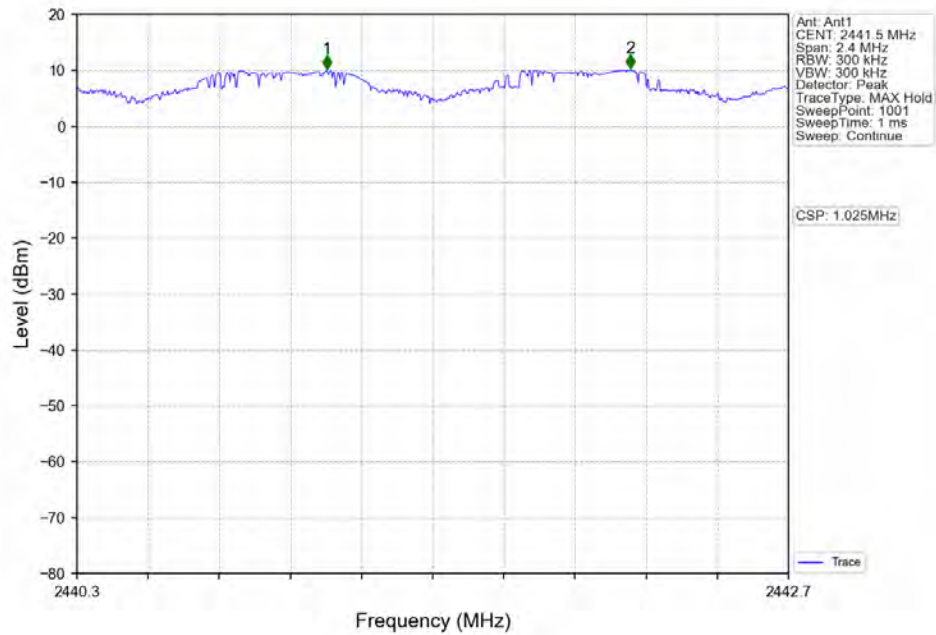


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8DPSK 3DH5\_HOPP\_Ant1\_NTNV



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Report No.: SEWM2312000501RG01

Rev.: 01

Page: 54 of 108

## Number of Hopping Frequencies Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	Num of Hopping Frequencies		Verdict
				ANT1	Limit	
GFSK	SISO	HOPP	DH5	79	>=15	Pass
Pi/4DQPSK	SISO	HOPP	2DH5	79	>=15	Pass
8DPSK	SISO	HOPP	3DH5	79	>=15	Pass



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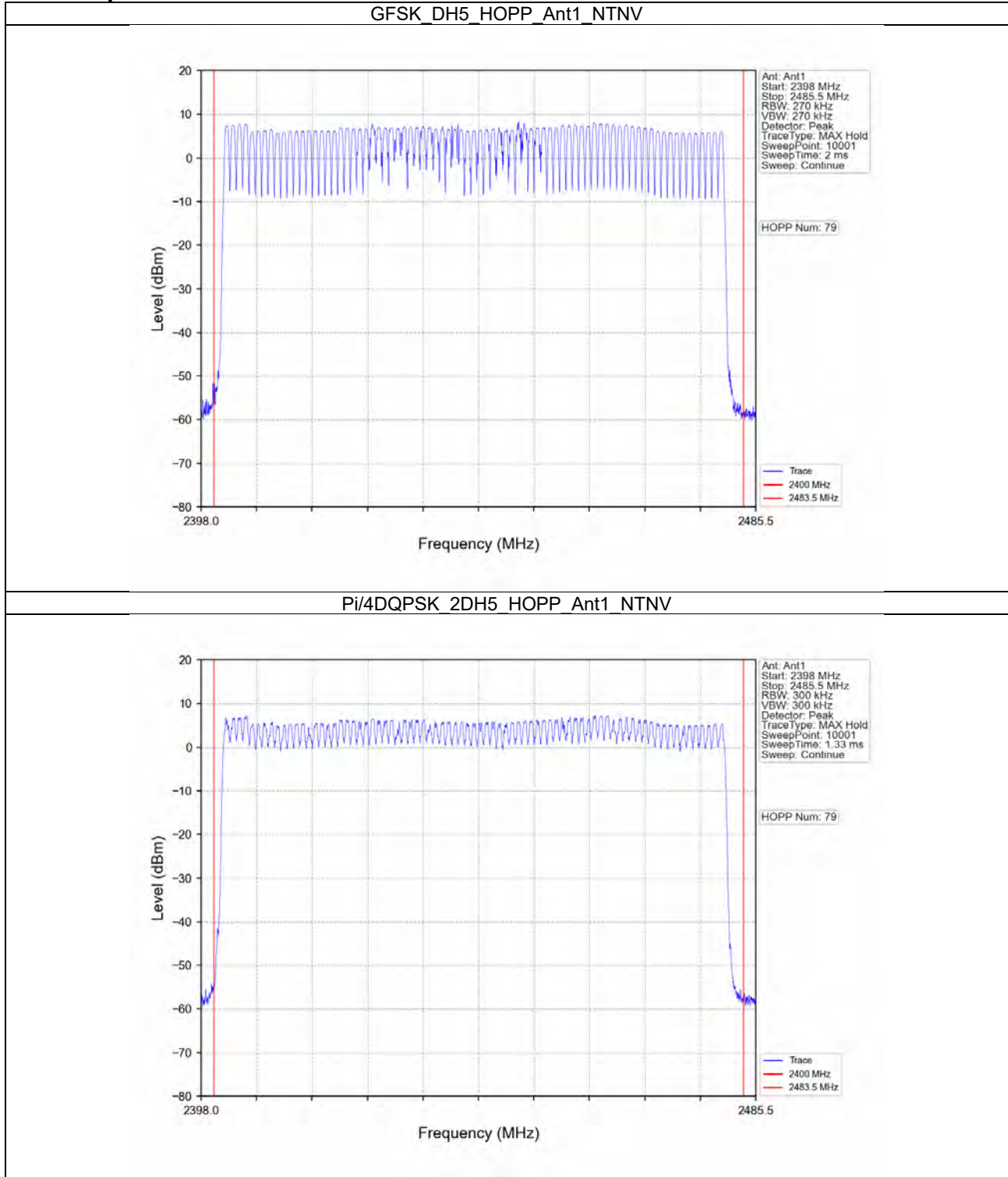
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Rev.: 01

Page: 55 of 108

### Test Graph



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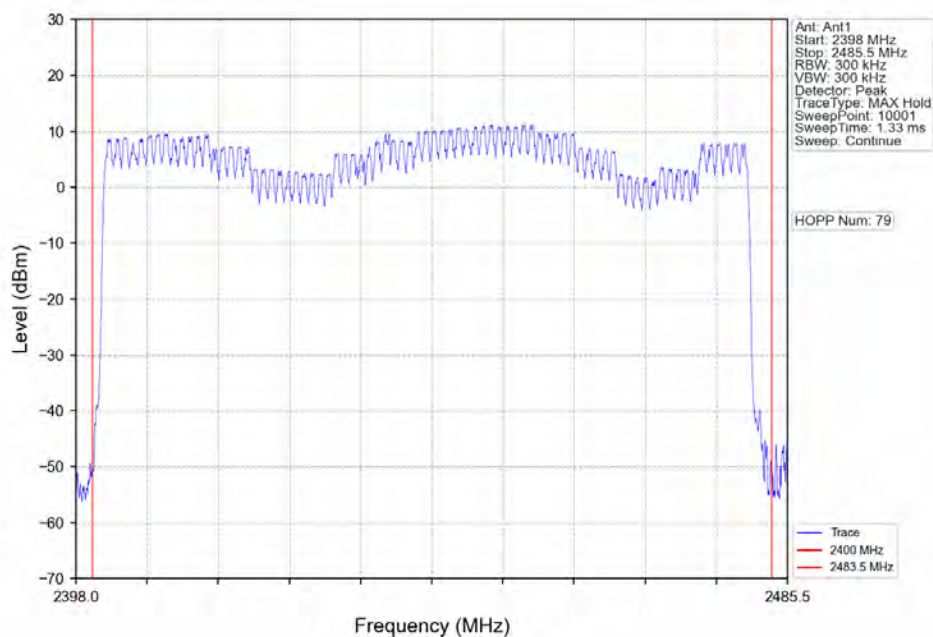
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Rev.: 01

Page: 56 of 108

### 8DPSK 3DH5\_HOPP\_Ant1\_NTNV



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Report No.: SEWM2312000501RG01

Rev.: 01

Page: 57 of 108

## Time of Occupancy (Dwell Time)

### Test Result

Ant1									
Mode	TX Type	Frequency (MHz)	Packet Type	Duration of Single Pulse (ms)	Observation Period (s)	Num of Pulse in Observation Period	Dwell Time (ms)	Limit (ms)	Verdict
GFSK	SISO	HOPP	DH1	0.390	31.600	320	124.800	<=400	Pass
			DH3	1.646	31.600	160	263.360	<=400	Pass
			DH5	2.894	31.600	102	295.188	<=400	Pass
Pi/4DQPSK	SISO	HOPP	2DH1	0.388	31.600	320	124.160	<=400	Pass
			2DH3	1.642	31.600	159	261.078	<=400	Pass
			2DH5	2.896	31.600	90	260.640	<=400	Pass
8DPSK	SISO	HOPP	3DH1	0.390	31.600	314	122.460	<=400	Pass
			3DH3	1.648	31.600	158	260.384	<=400	Pass
			3DH5	2.898	31.600	93	269.514	<=400	Pass



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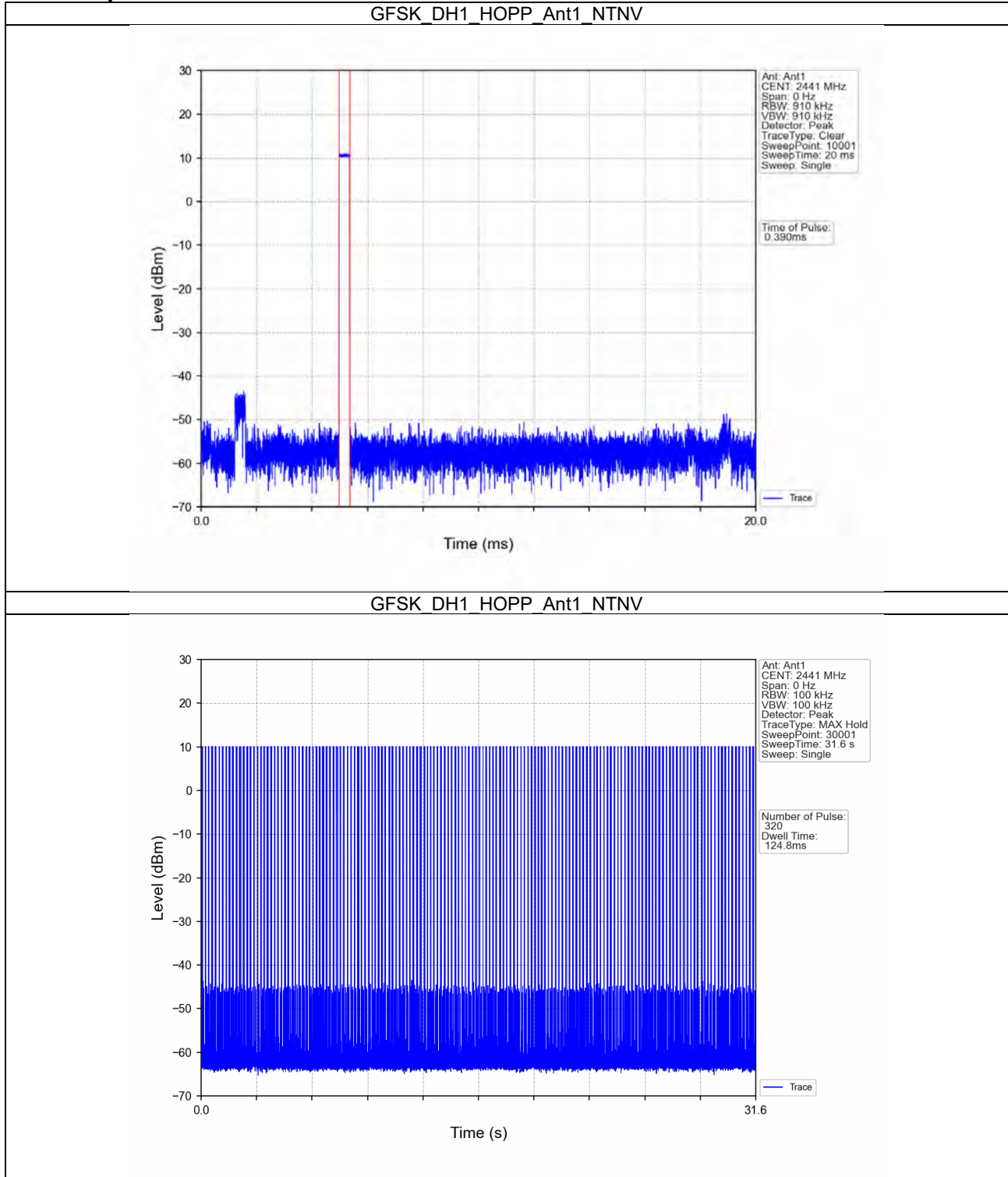
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Rev.: 01

Page: 58 of 108

### Test Graph



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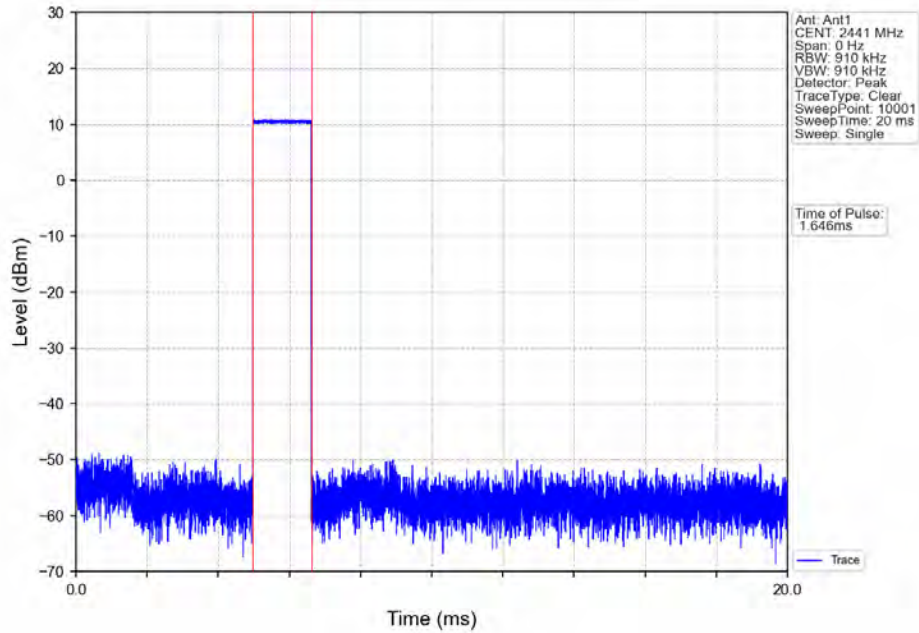
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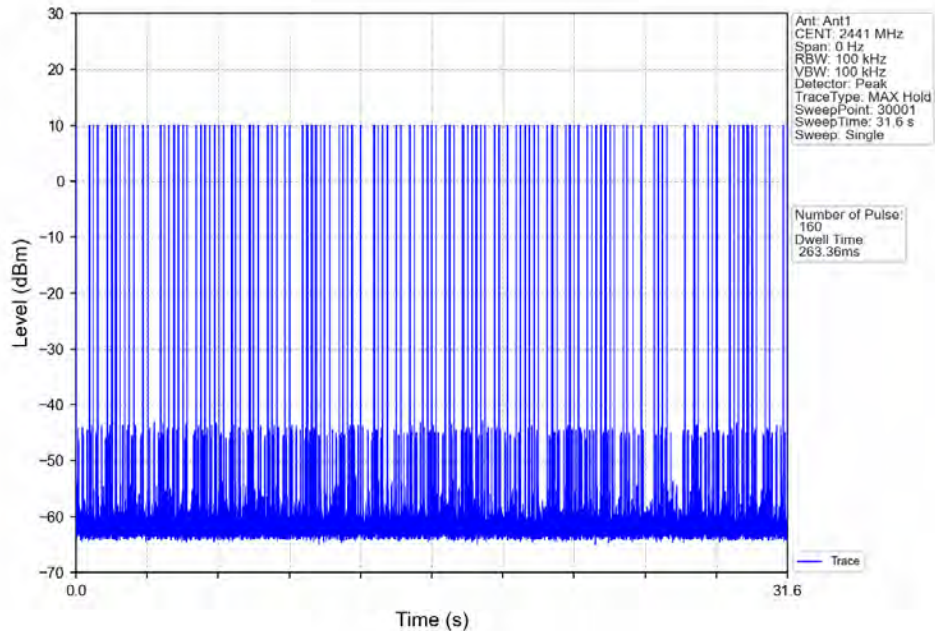
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Page: 59 of 108

### GFSK DH3 HOPP Ant1 NTN



### GFSK DH3 HOPP Ant1 NTN



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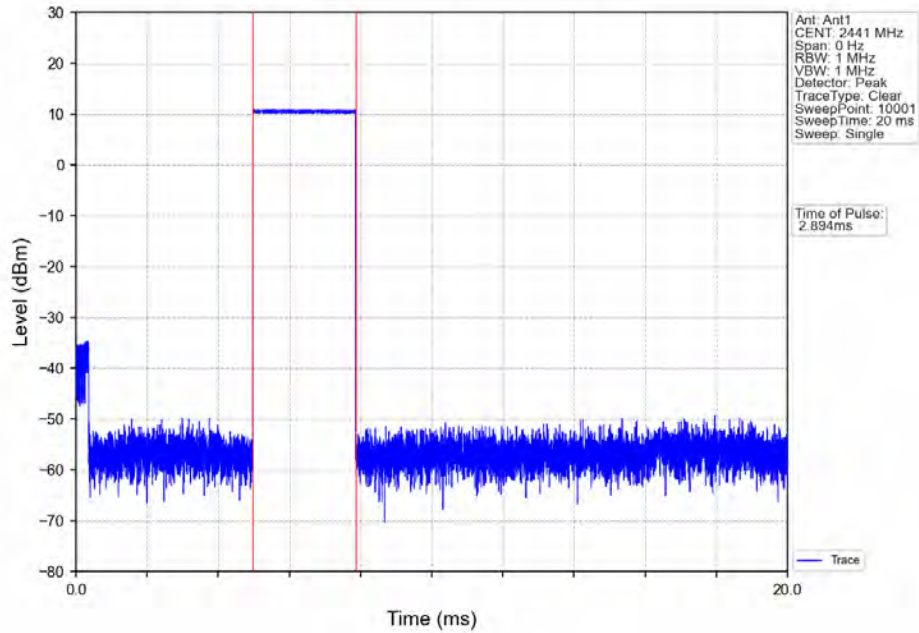


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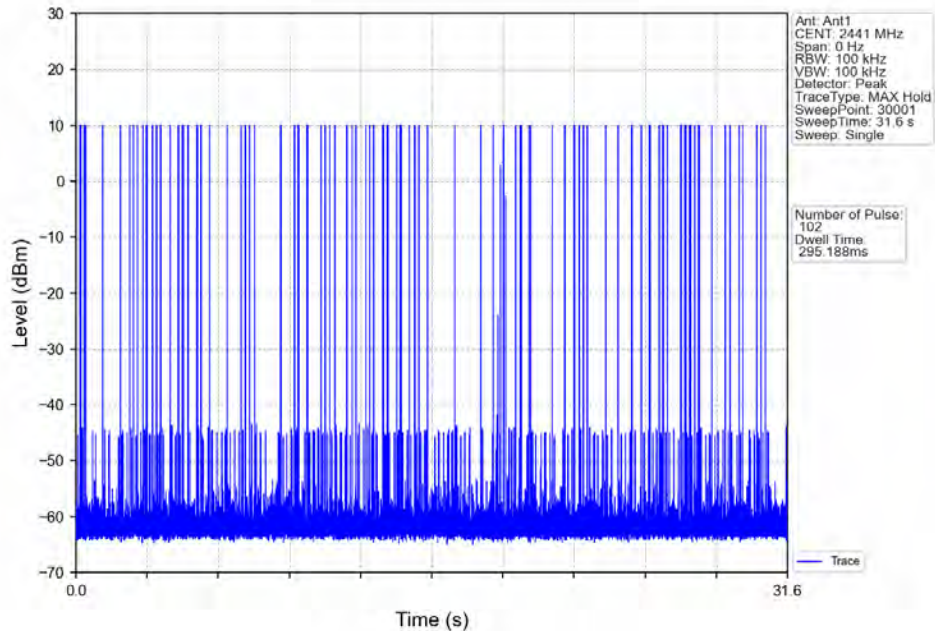
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### GFSK DH5 HOPP Ant1 NTN



### GFSK DH5 HOPP Ant1 NTN



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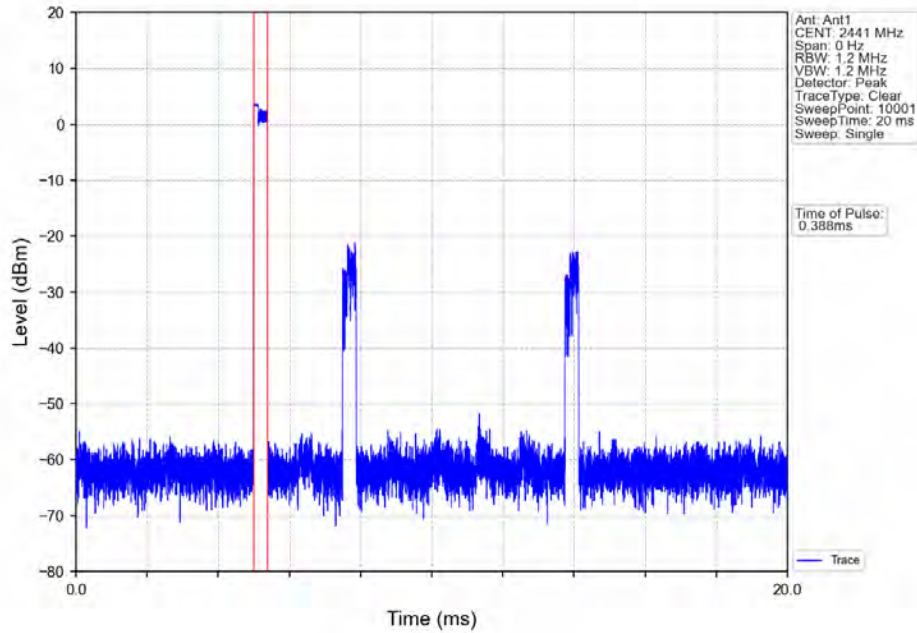


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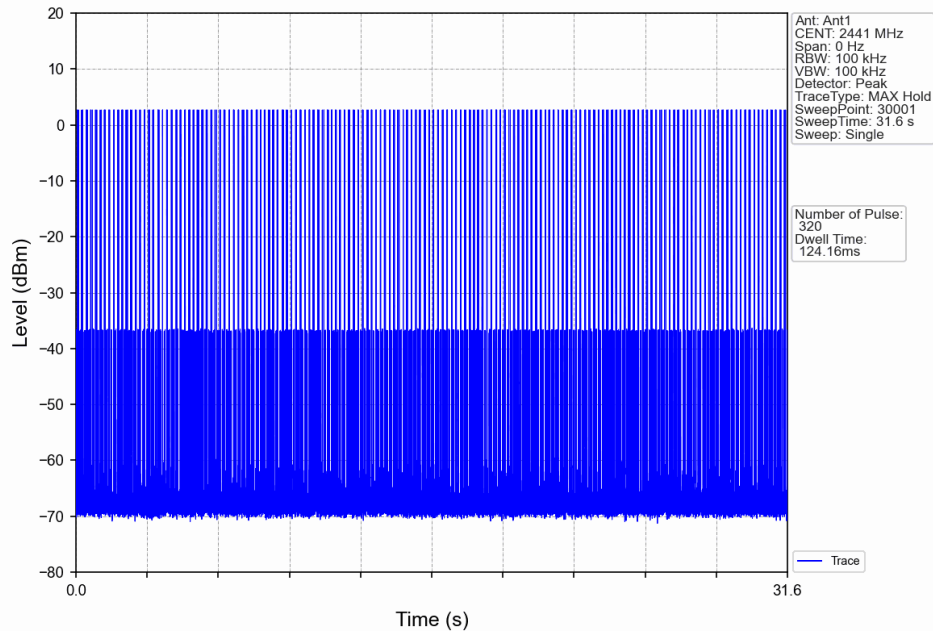
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Page: 61 of 108

### Pi/4DQPSK\_2DH1\_HOPP\_Ant1\_NTNV



### Pi/4DQPSK\_2DH1\_HOPP\_Ant1\_NTNV



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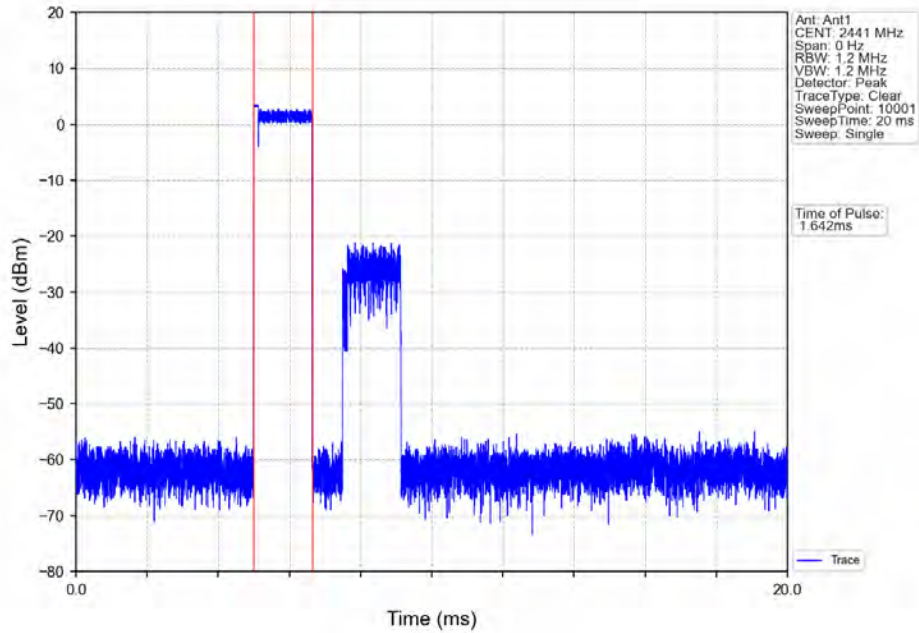
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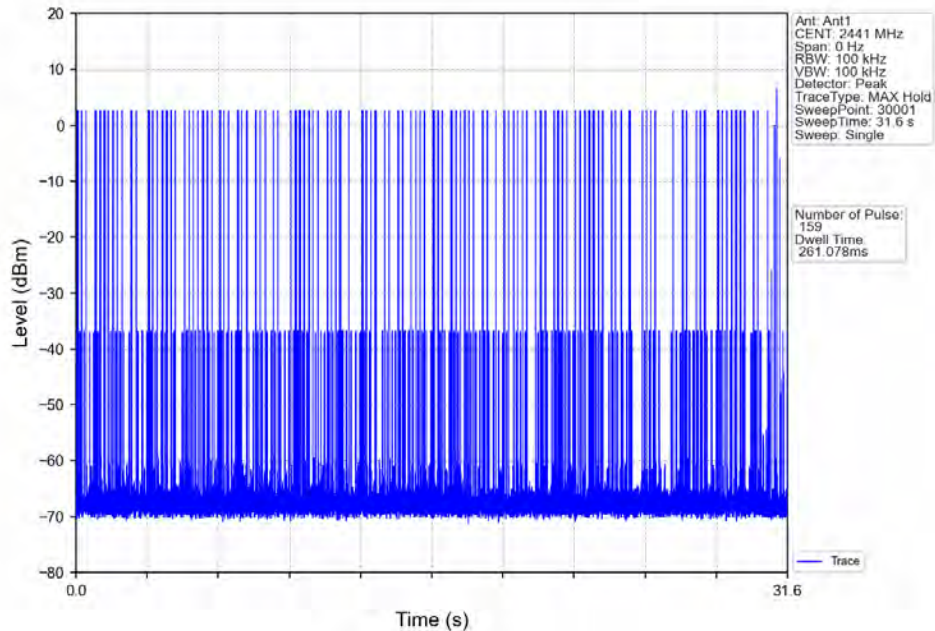
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Page: 62 of 108

### Pi/4DQPSK\_2DH3\_HOPP\_Ant1\_NTNV



### Pi/4DQPSK\_2DH3\_HOPP\_Ant1\_NTNV



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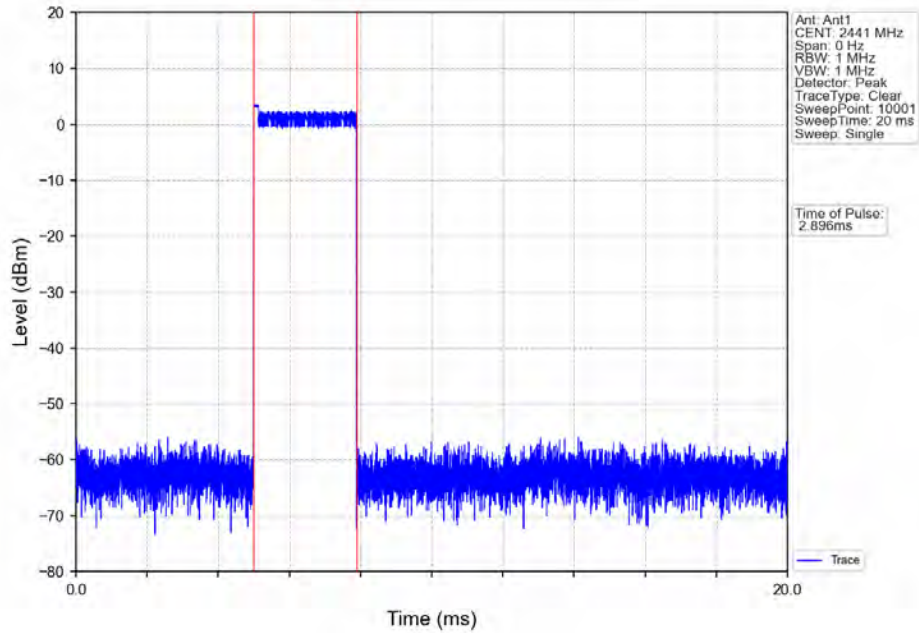
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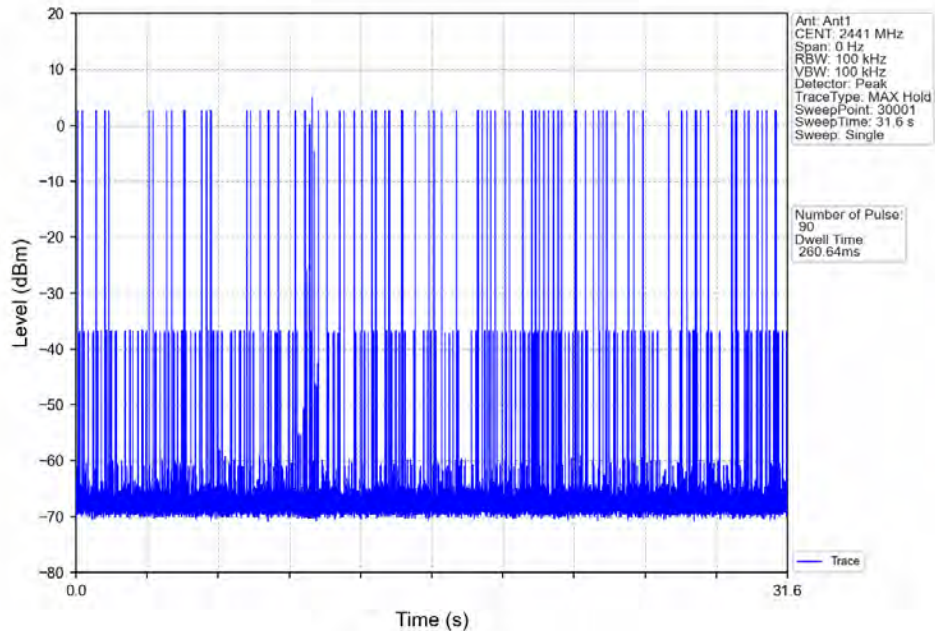
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### Pi/4DQPSK\_2DH5\_HOPP\_Ant1\_NTNV



### Pi/4DQPSK\_2DH5\_HOPP\_Ant1\_NTNV



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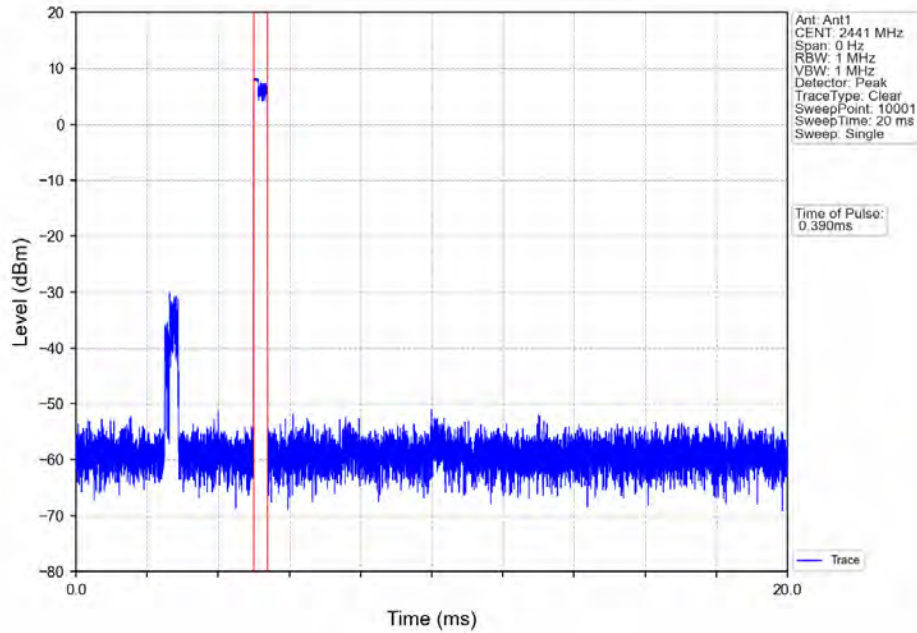


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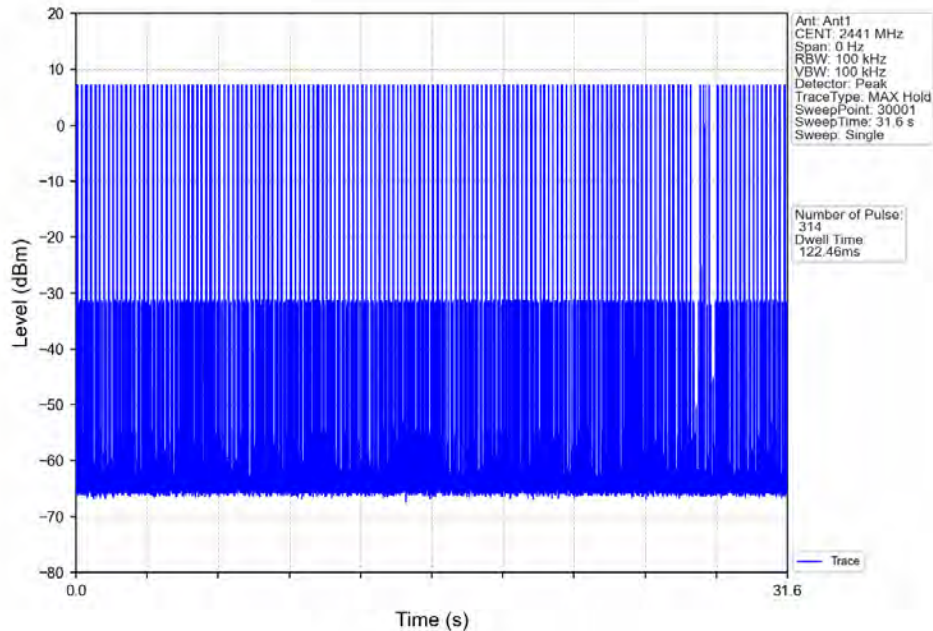
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### 8DPSK 3DH1\_HOPP\_Ant1\_NTNV



### 8DPSK 3DH1\_HOPP\_Ant1\_NTNV



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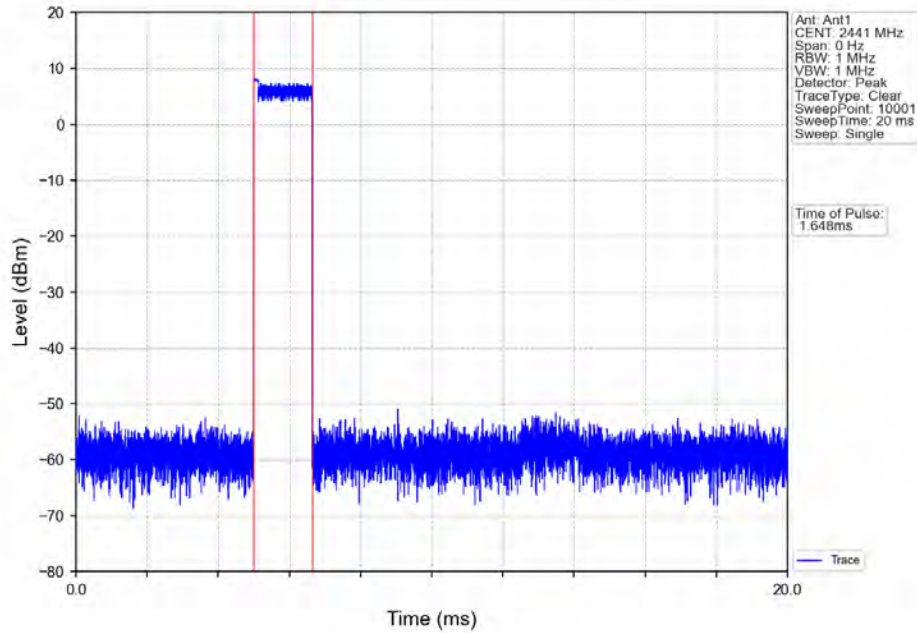


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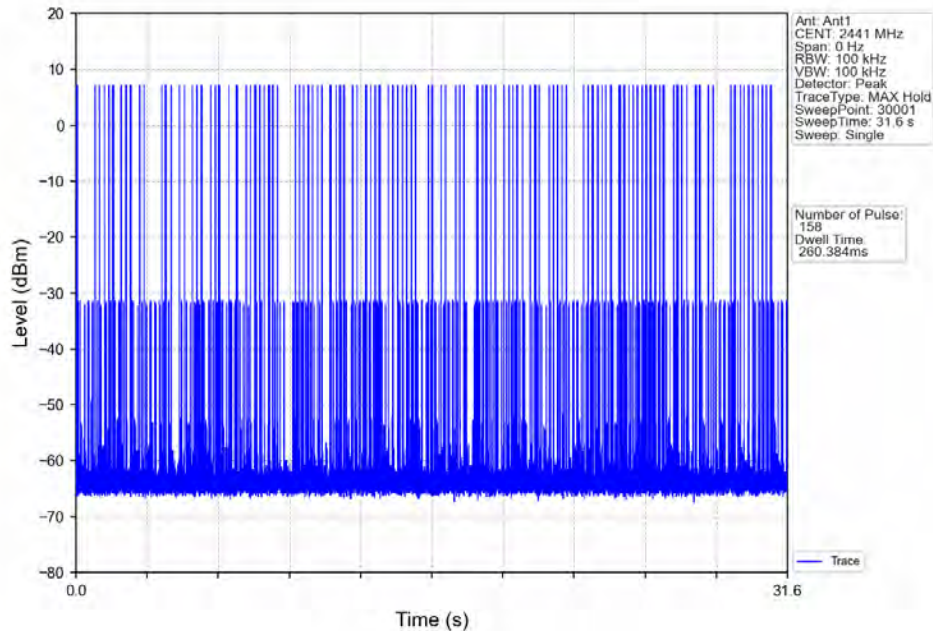
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### 8DPSK 3DH3\_HOPP\_Ant1\_NTNV



### 8DPSK 3DH3\_HOPP\_Ant1\_NTNV



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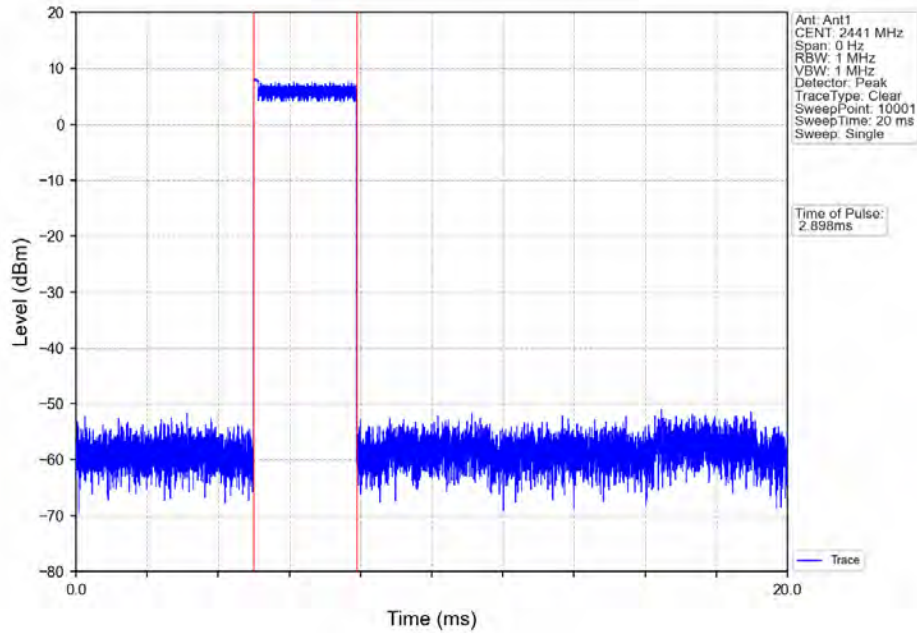
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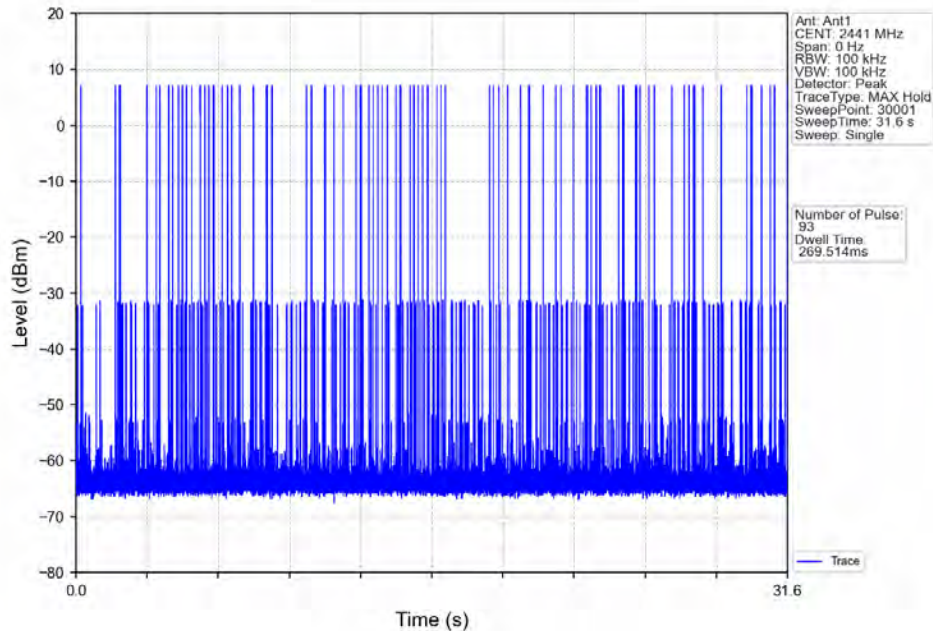
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### 8DPSK 3DH5\_HOPP\_Ant1\_NTNV



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Rev.: 01  
Page: 67 of 108

## Unwanted Emissions In Non-restricted Frequency Bands Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)
GFSK	SISO	2402	DH5	1	8.89
		2441	DH5	1	10.31
		2480	DH5	1	7.60
Pi/4DQPSK	SISO	2402	2DH5	1	6.19
		2441	2DH5	1	7.74
		2480	2DH5	1	5.45
8DPSK	SISO	2402	3DH5	1	6.51
		2441	3DH5	1	7.81
		2480	3DH5	1	5.54



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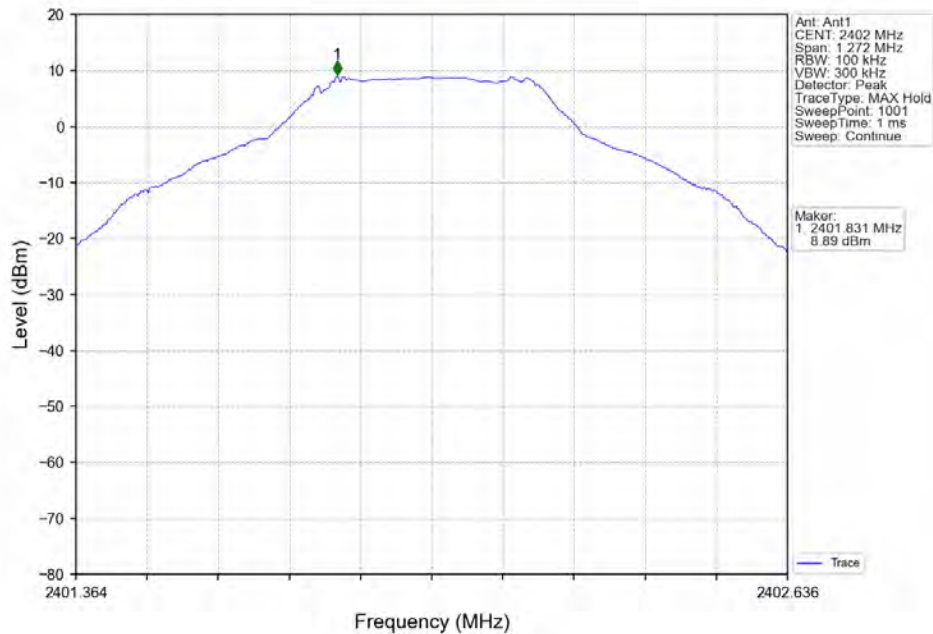
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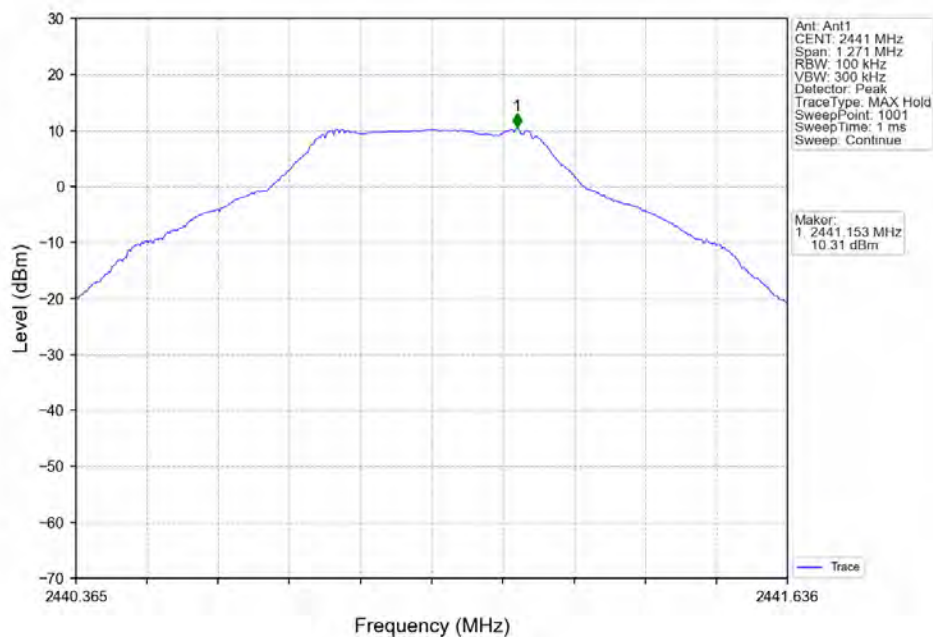
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### Test Graph

GFSK DH5 LCH 2402MHz Ant1 NTN



GFSK DH5 MCH 2441MHz Ant1 NTN



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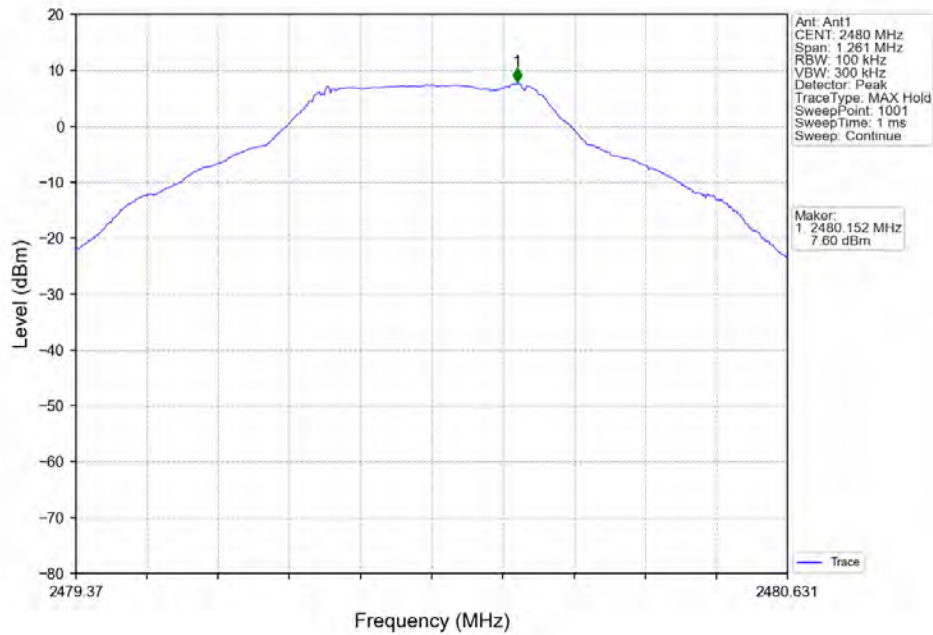


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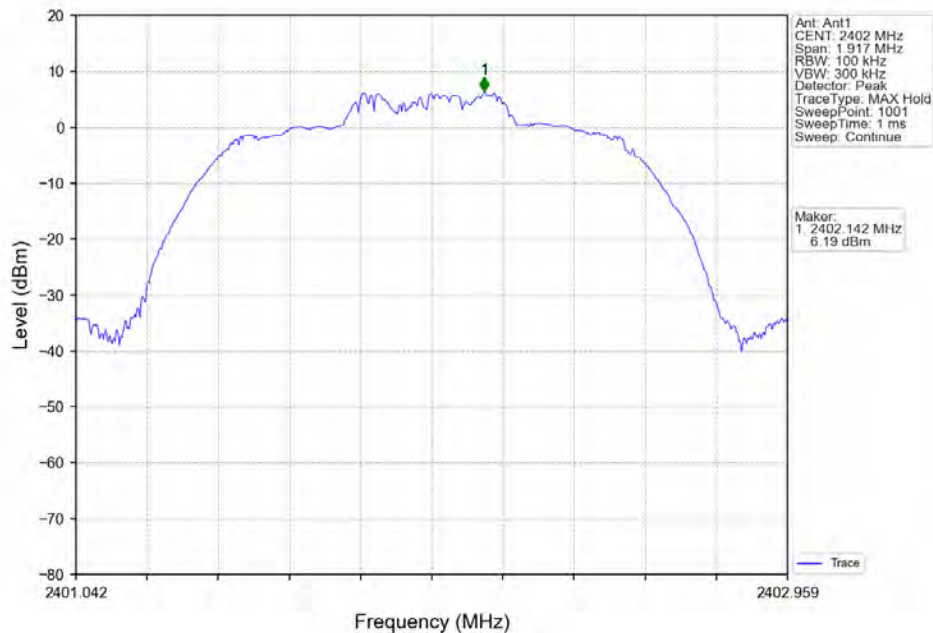
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### GFSK DH5 HCH 2480MHz Ant1 NTN



### Pi/4DQPSK 2DH5 LCH 2402MHz Ant1 NTN



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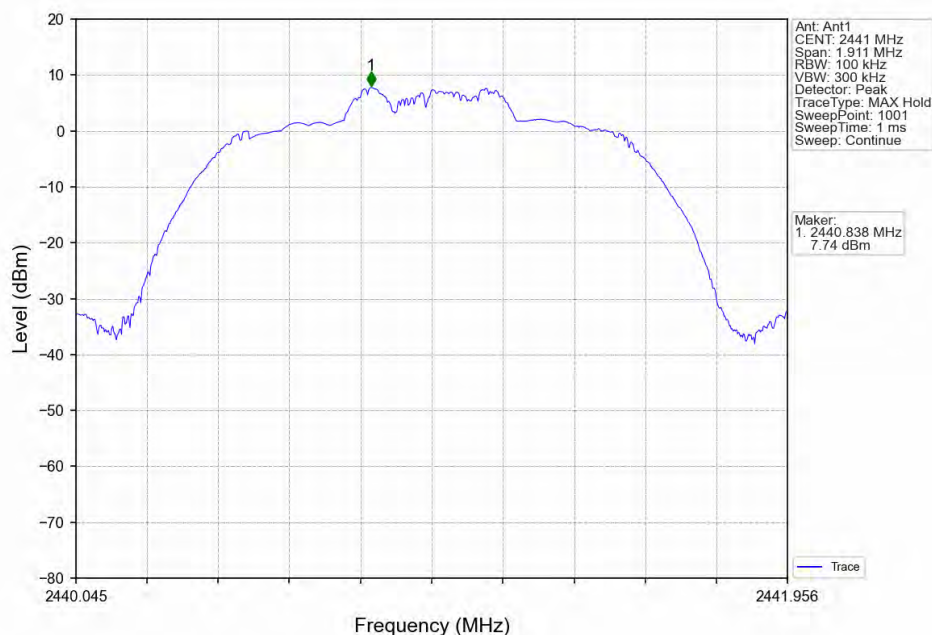
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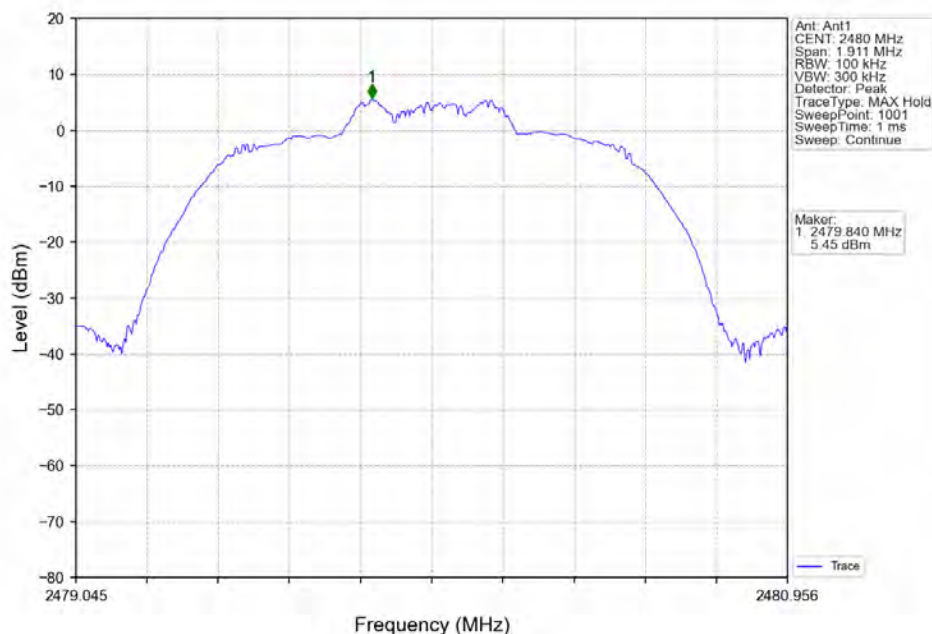
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### Pi/4DQPSK 2DH5 MCH 2441MHz Ant1\_NTNV



### Pi/4DQPSK 2DH5 HCH 2480MHz Ant1\_NTNV



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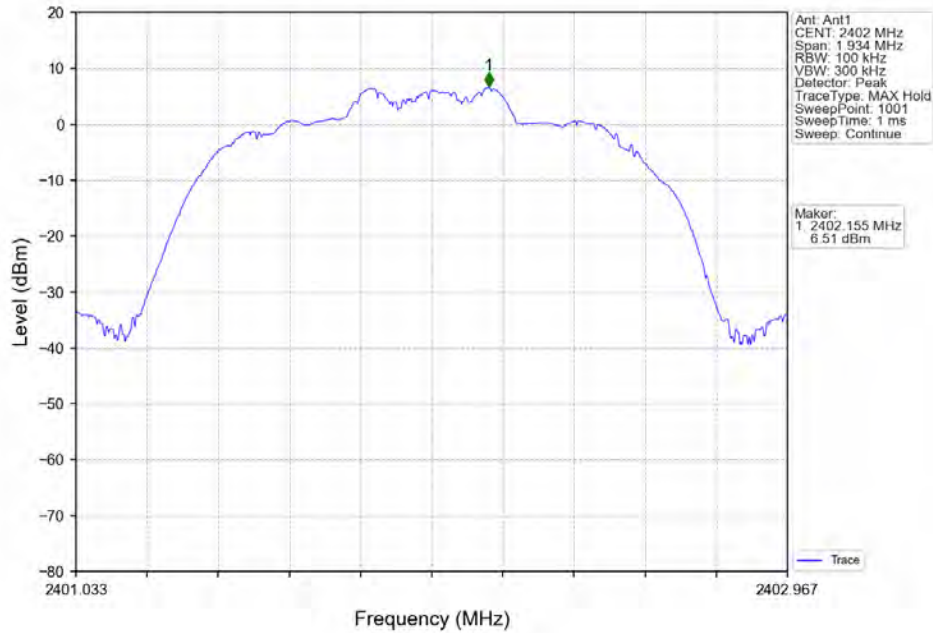
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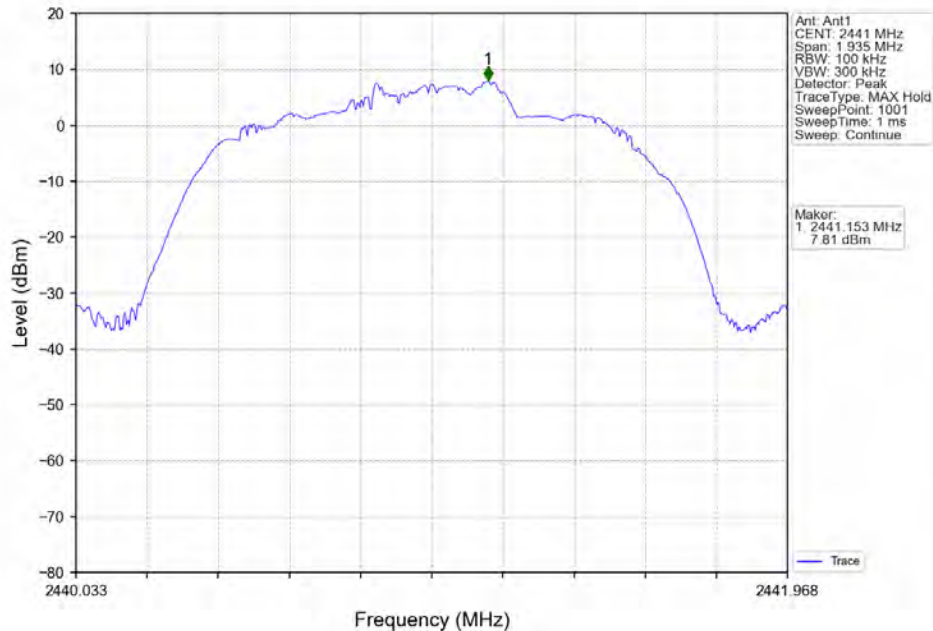
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Page: 71 of 108

### 8DPSK 3DH5\_LCH\_2402MHz\_Ant1\_NTNV



### 8DPSK 3DH5\_MCH\_2441MHz\_Ant1\_NTNV



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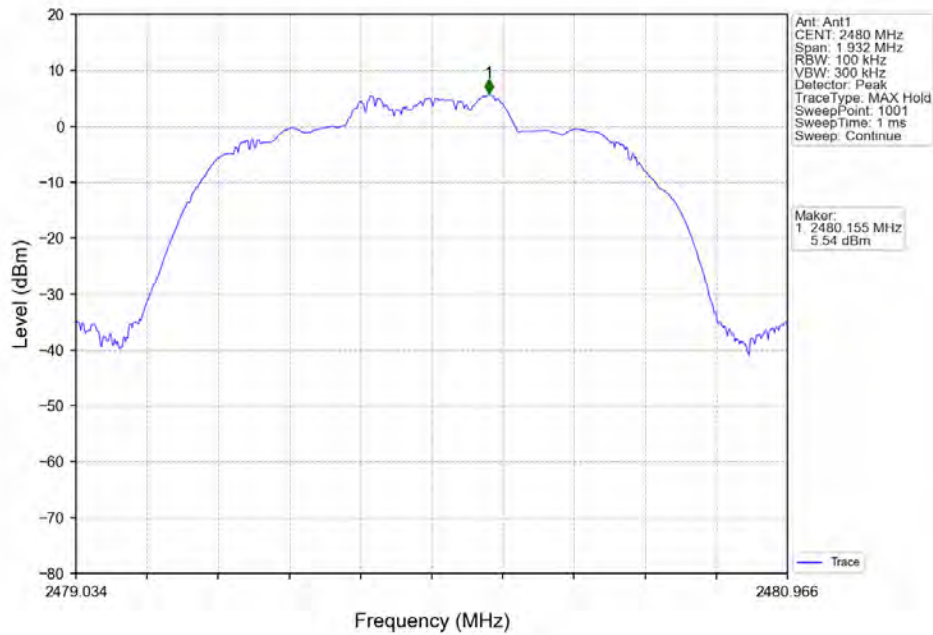


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Page: 72 of 108

8DPSK\_3DH5\_HCH\_2480MHz\_Ant1\_NTNV



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Page: 73 of 108

## CSE

### Test Result

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
GFSK	SISO	2402	DH5	1	10.31	-9.69	Pass
		2441	DH5	1	10.31	-9.69	Pass
		2480	DH5	1	10.31	-9.69	Pass
		HOPP	DH5	1	10.31	-9.69	Pass
					10.31	-9.69	Pass
Pi/4DQPSK	SISO	2402	2DH5	1	7.74	-12.26	Pass
		2441	2DH5	1	7.74	-12.26	Pass
		2480	2DH5	1	7.74	-12.26	Pass
		HOPP	2DH5	1	7.74	-12.26	Pass
					7.74	-12.26	Pass
8DPSK	SISO	2402	3DH5	1	7.81	-12.19	Pass
		2441	3DH5	1	7.81	-12.19	Pass
		2480	3DH5	1	7.81	-12.19	Pass
		HOPP	3DH5	1	7.81	-12.19	Pass
					7.81	-12.19	Pass



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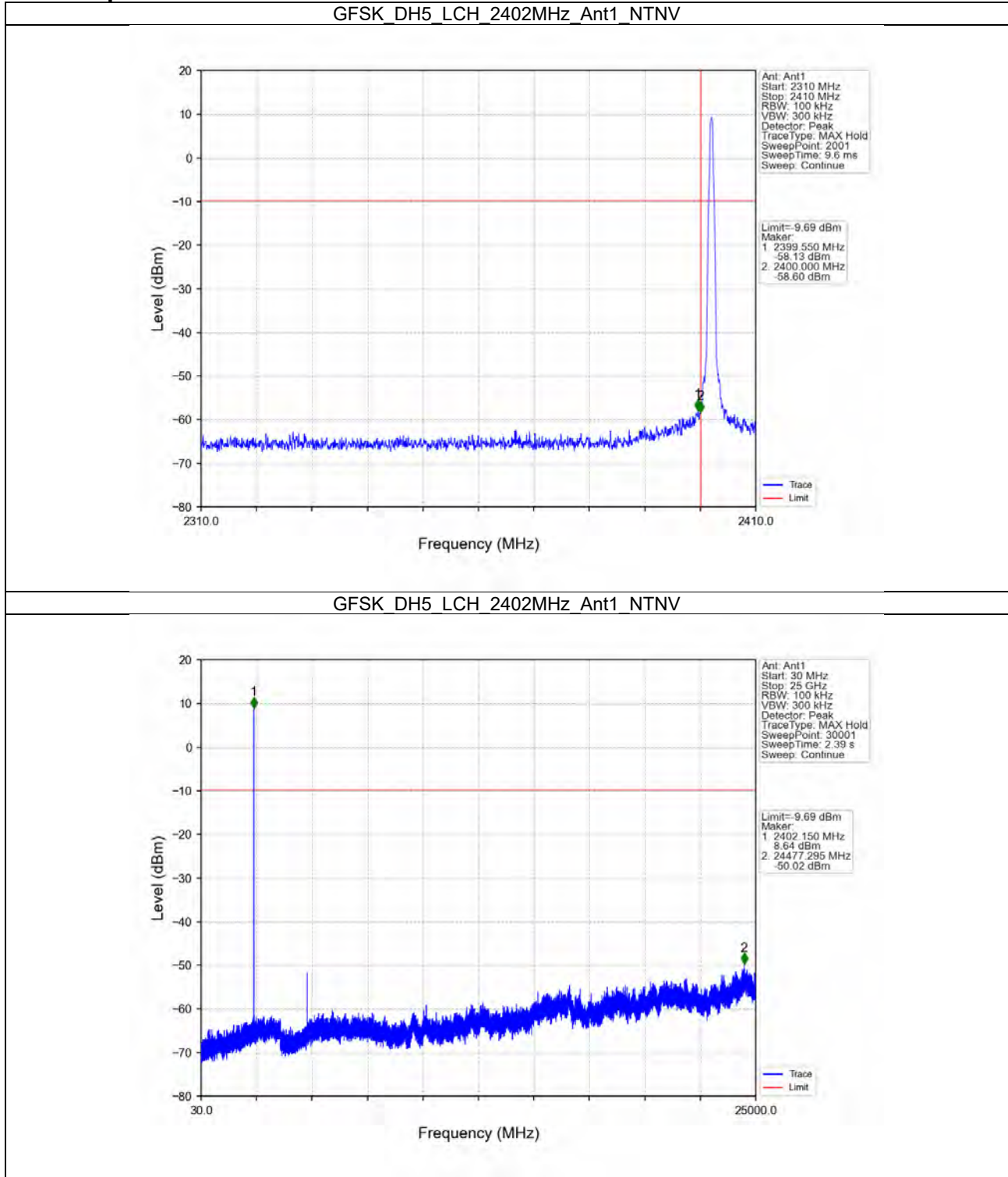
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### Test Graph



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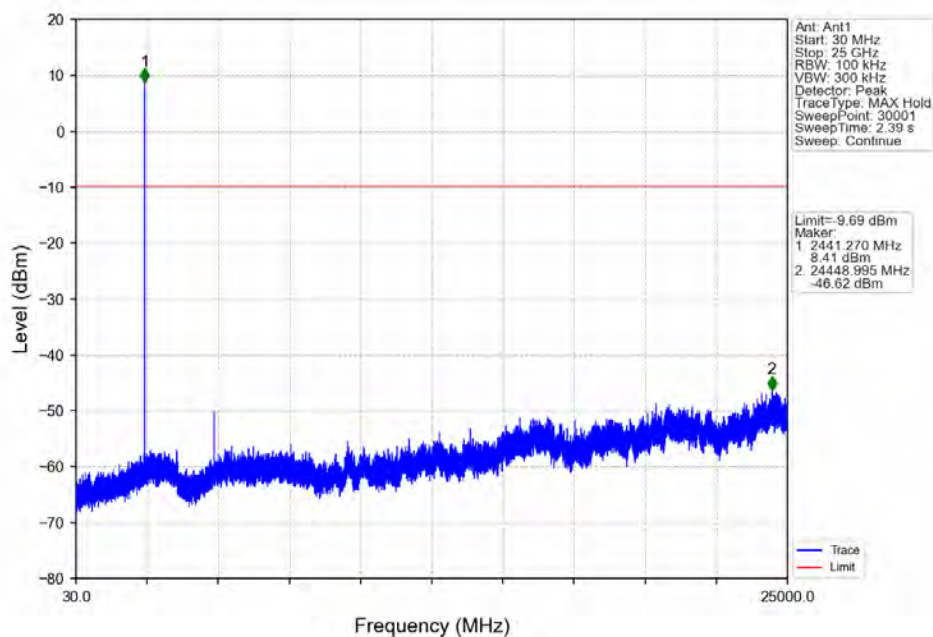
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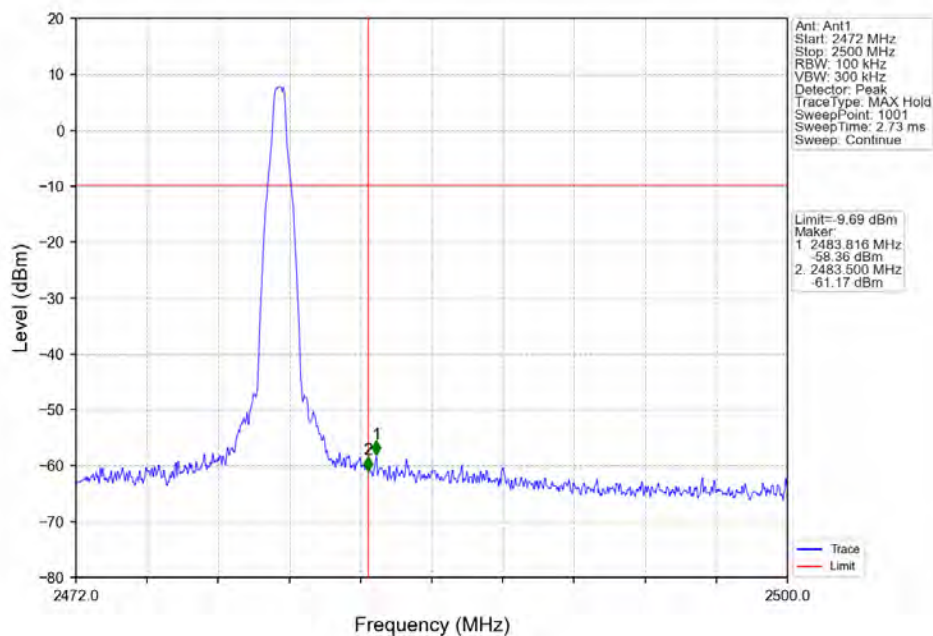
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### GFSK DH5 MCH 2441MHz Ant1 NTNV



### GFSK DH5 HCH 2480MHz Ant1 NTNV



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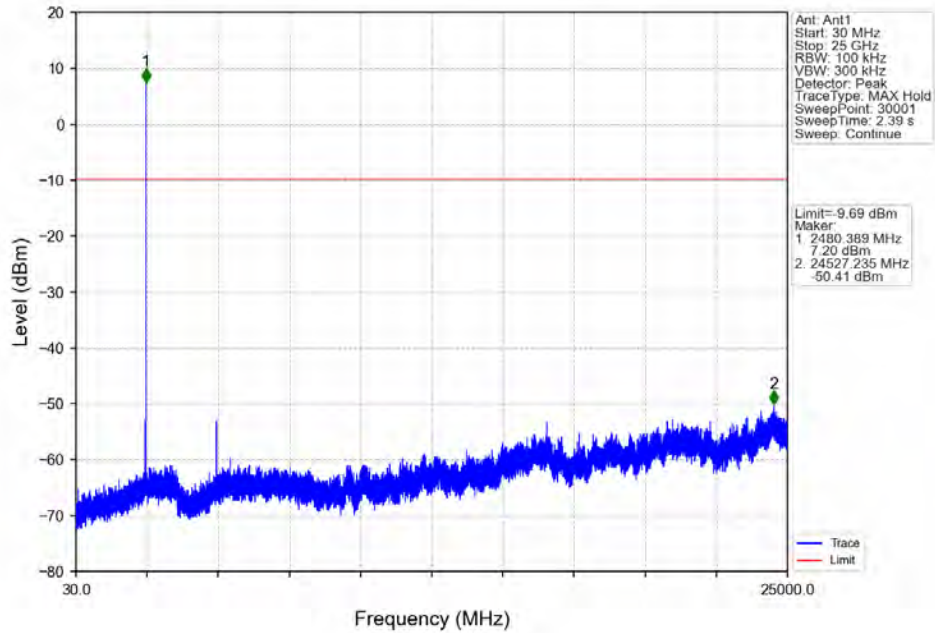


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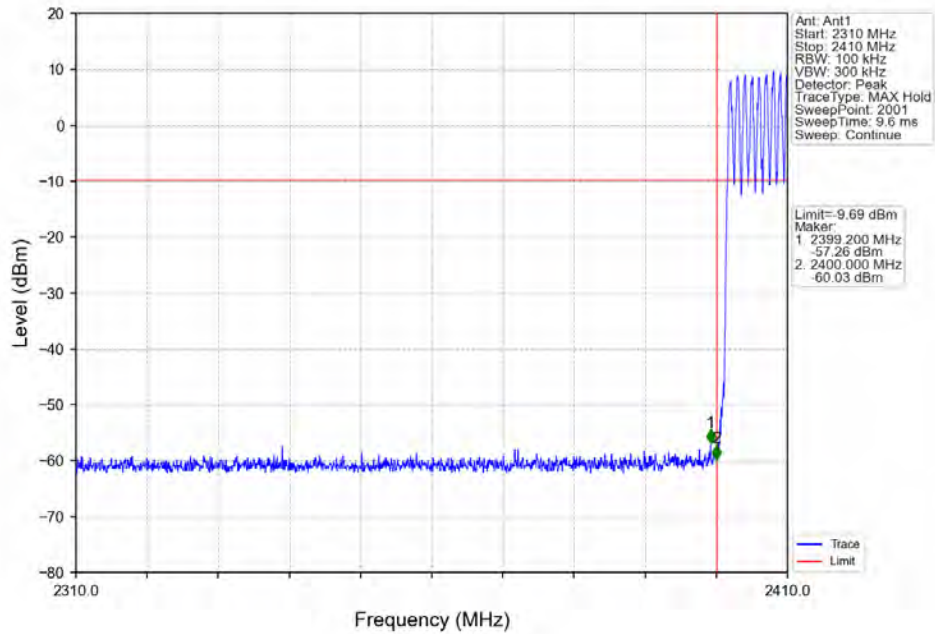
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### GFSK DH5 HCH 2480MHz Ant1 NTNV



### GFSK DH5 HOPP Ant1 NTNV



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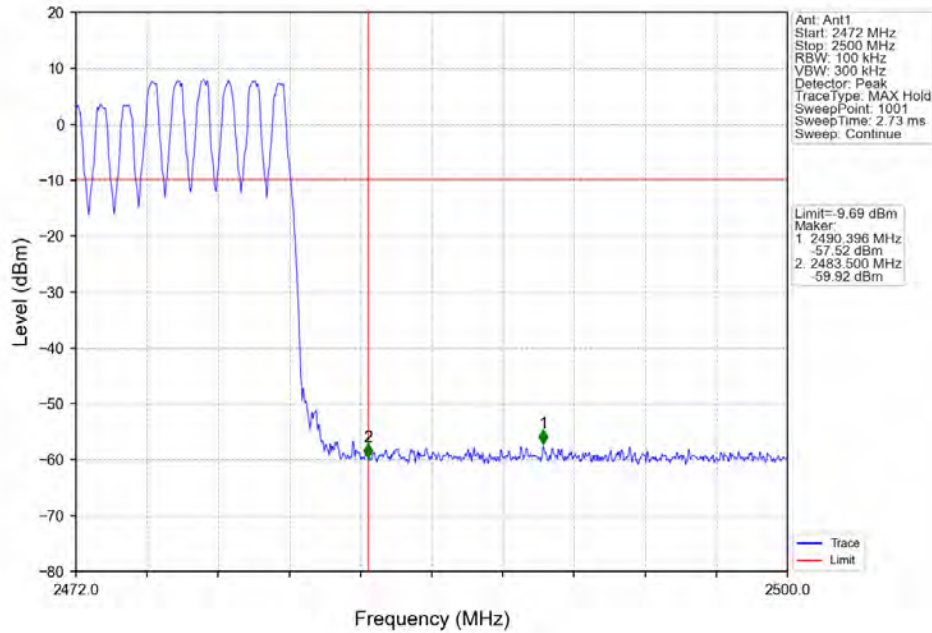


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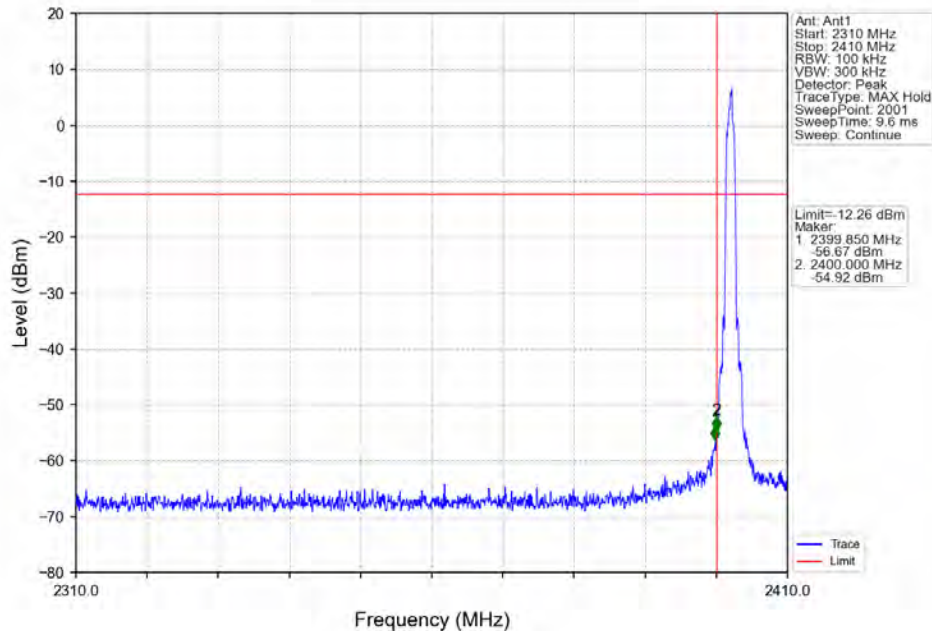
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### GFSK DH5 HOPP\_Ant1\_NTNV



### Pi/4DQPSK\_2DH5\_LCH\_2402MHz\_Ant1\_NTNV



### Pi/4DQPSK\_2DH5\_LCH\_2402MHz\_Ant1\_NTNV



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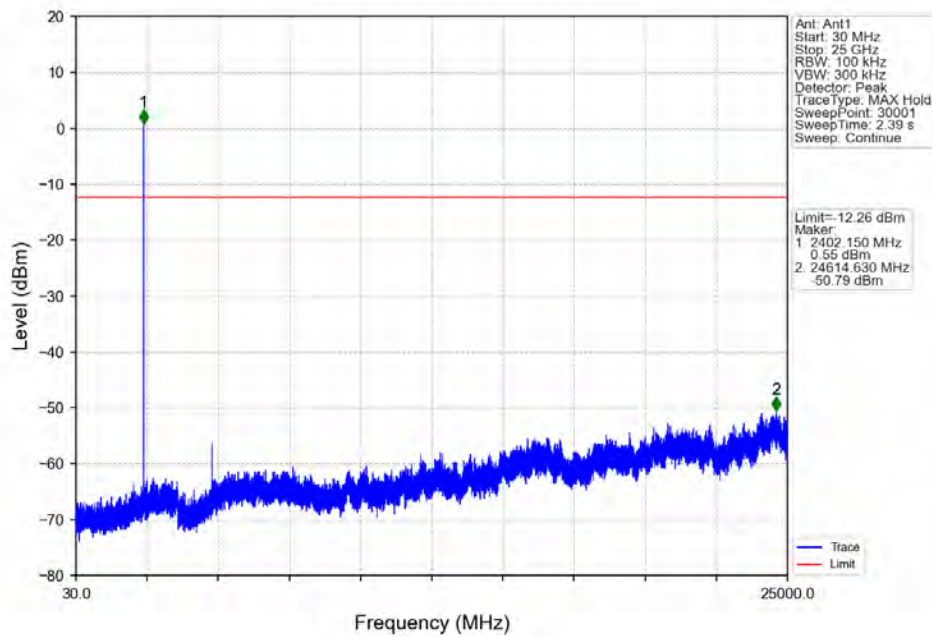
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Rev.: 01

Page: 78 of 108



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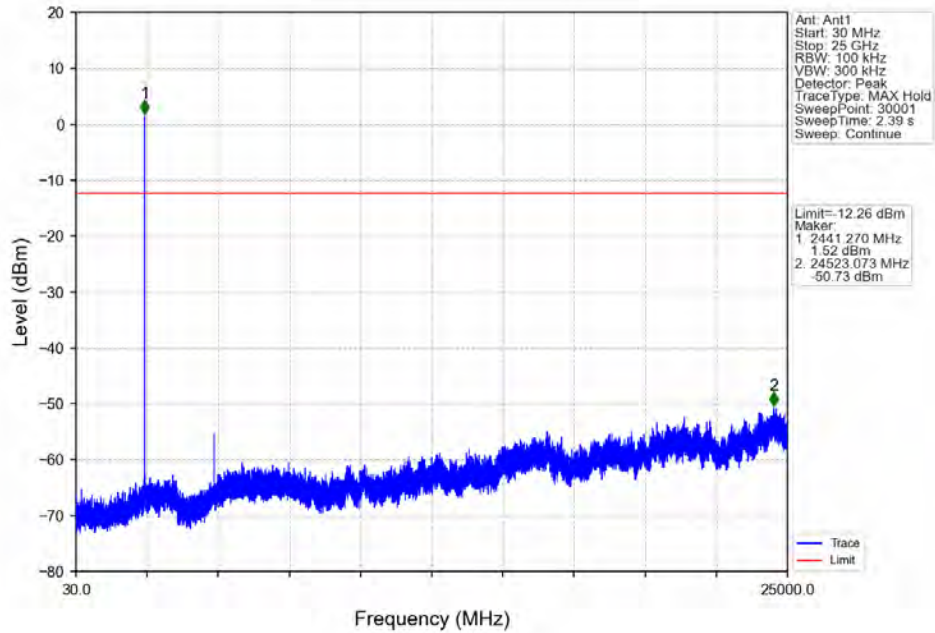
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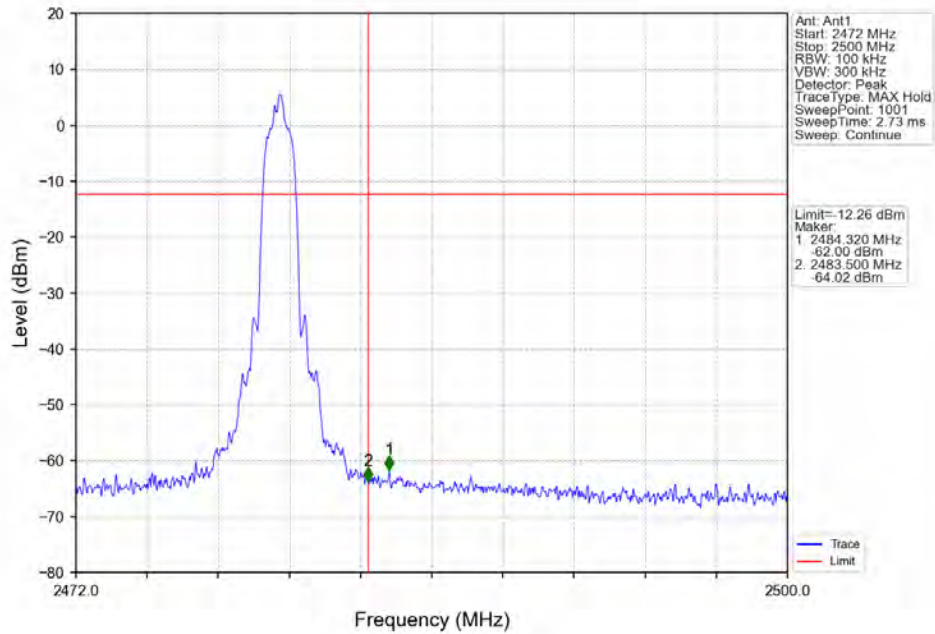
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Page: 79 of 108

### Pi/4DQPSK 2DH5 MCH 2441MHz\_Ant1\_NTNV



### Pi/4DQPSK 2DH5 HCH 2480MHz\_Ant1\_NTNV



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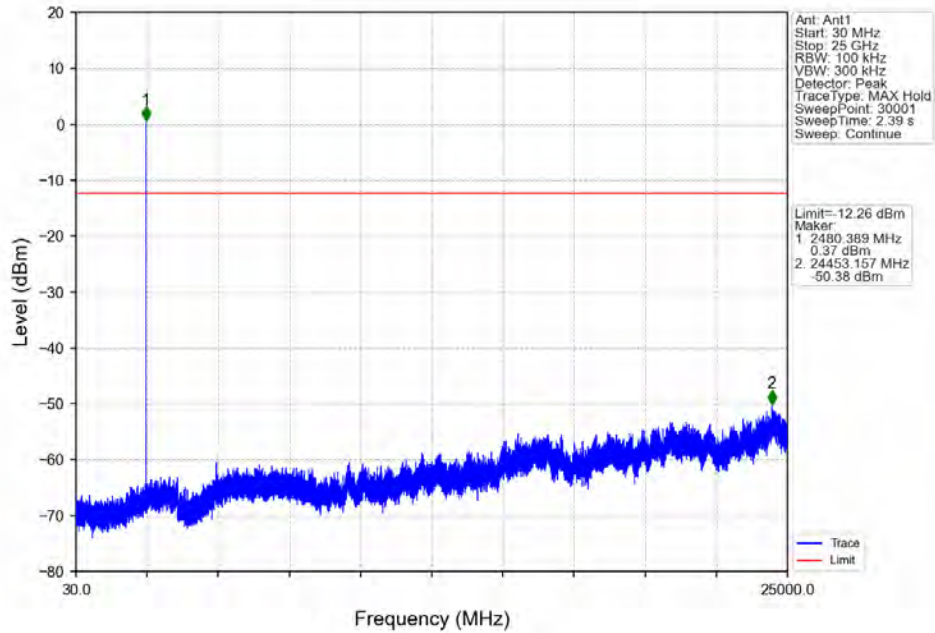


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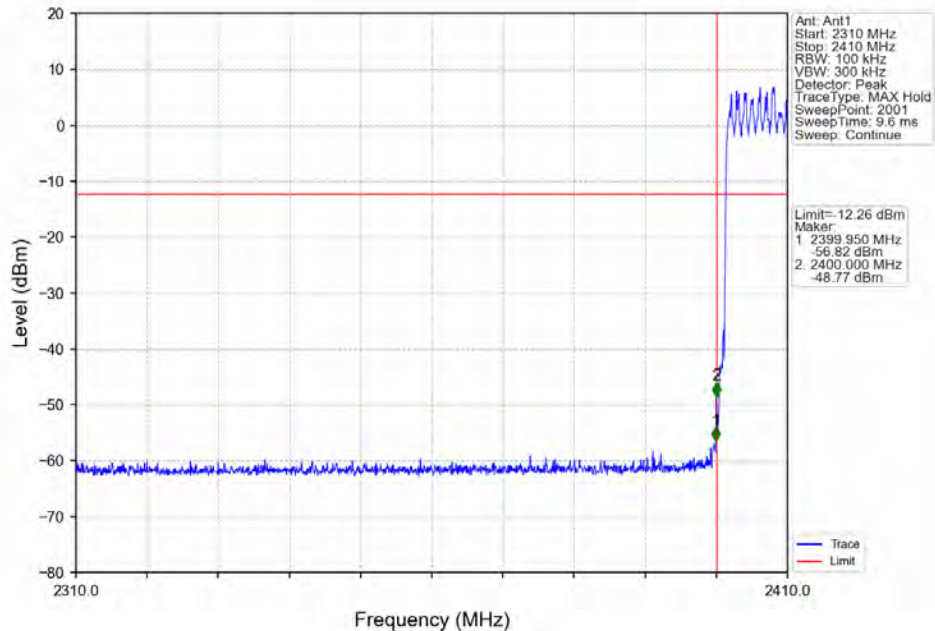
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Page: 80 of 108

### Pi/4DQPSK\_2DH5\_HCH\_2480MHz\_Ant1\_NTNV



### Pi/4DQPSK\_2DH5\_HOPP\_Ant1\_NTNV



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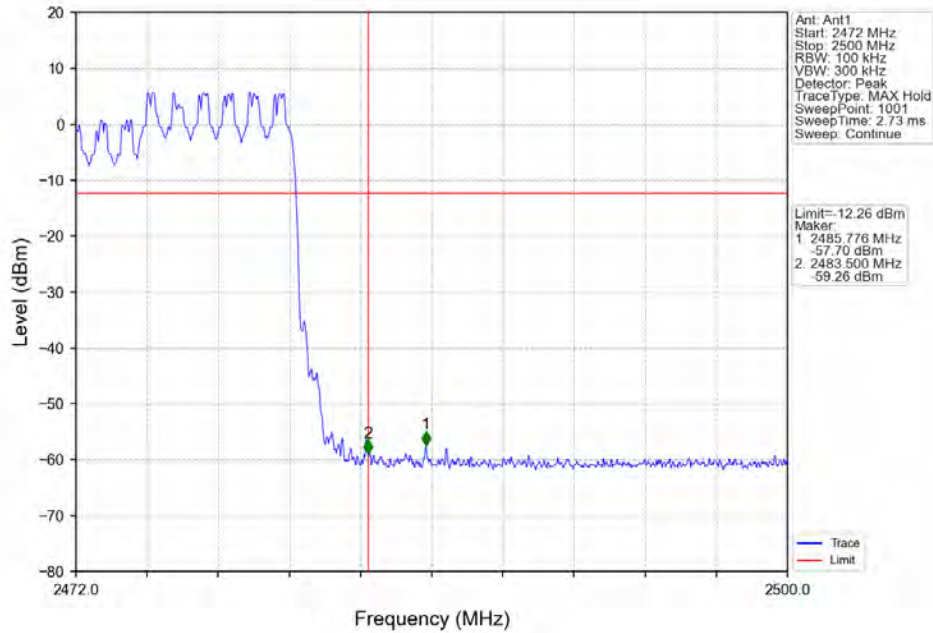


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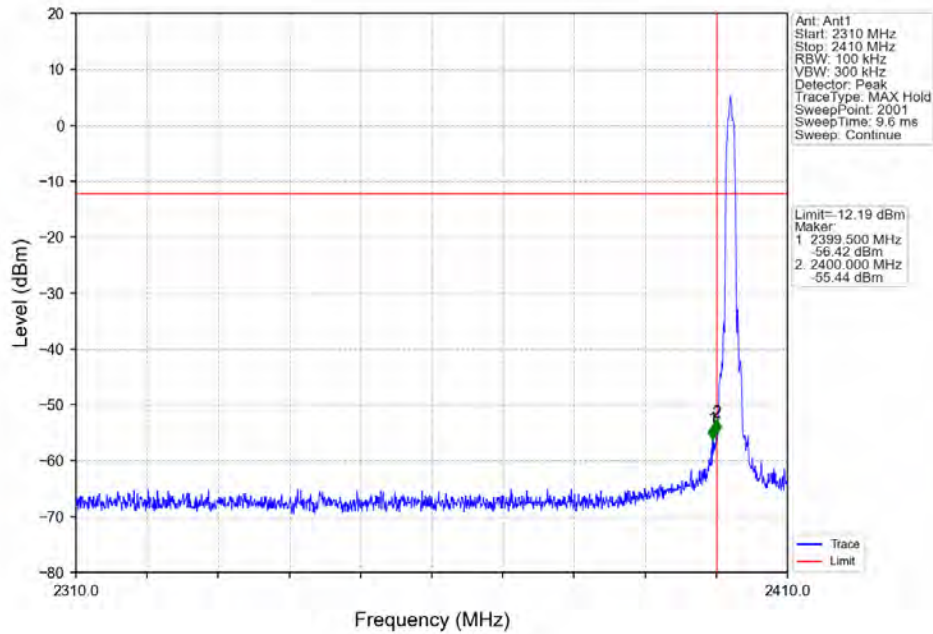
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Page: 81 of 108

### Pi/4DQPSK 2DH5\_HOPP\_Ant1\_NTNV



### 8DPSK 3DH5\_LCH\_2402MHz\_Ant1\_NTNV



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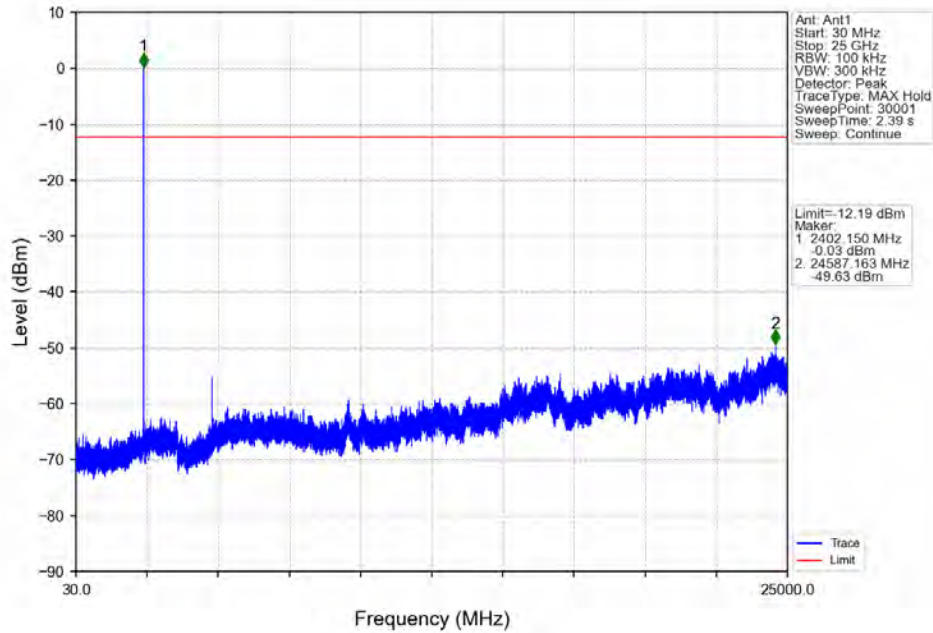
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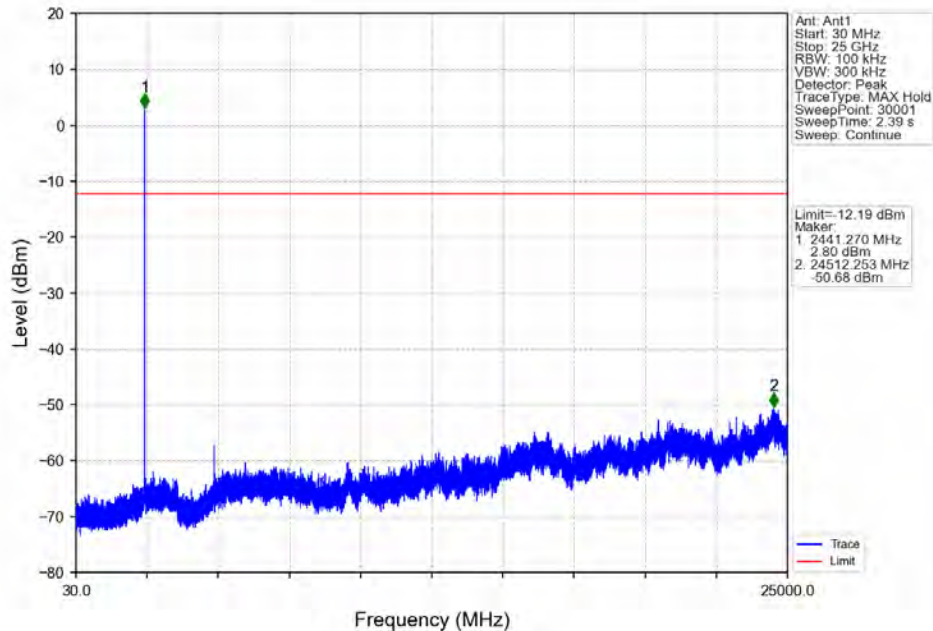
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Page: 82 of 108

### 8DPSK 3DH5\_LCH\_2402MHz\_Ant1\_NTNV



### 8DPSK 3DH5\_MCH\_2441MHz\_Ant1\_NTNV



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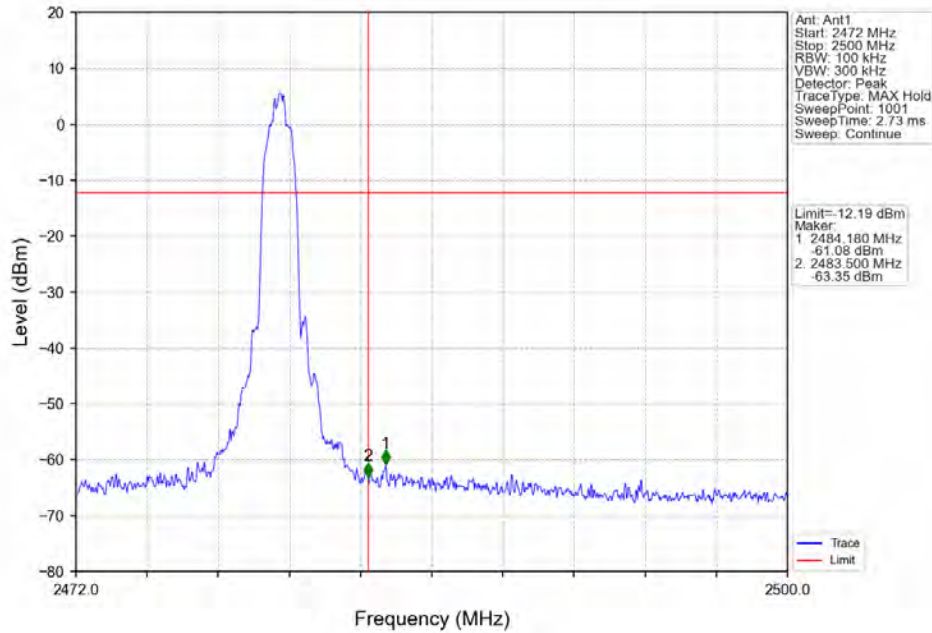
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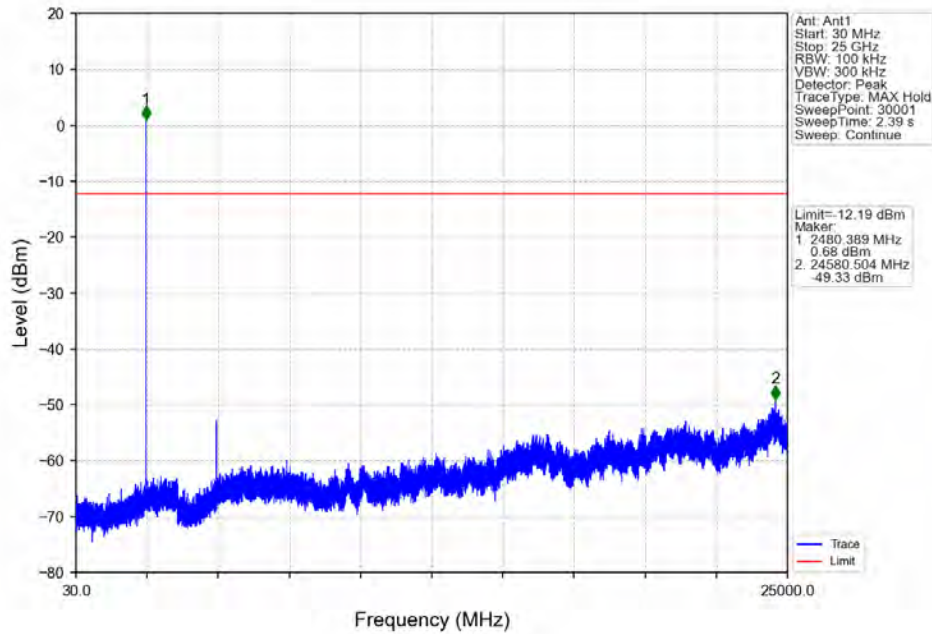
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Page: 83 of 108

### 8DPSK\_3DH5\_HCH\_2480MHz\_Ant1\_NTNV



### 8DPSK\_3DH5\_HCH\_2480MHz\_Ant1\_NTNV



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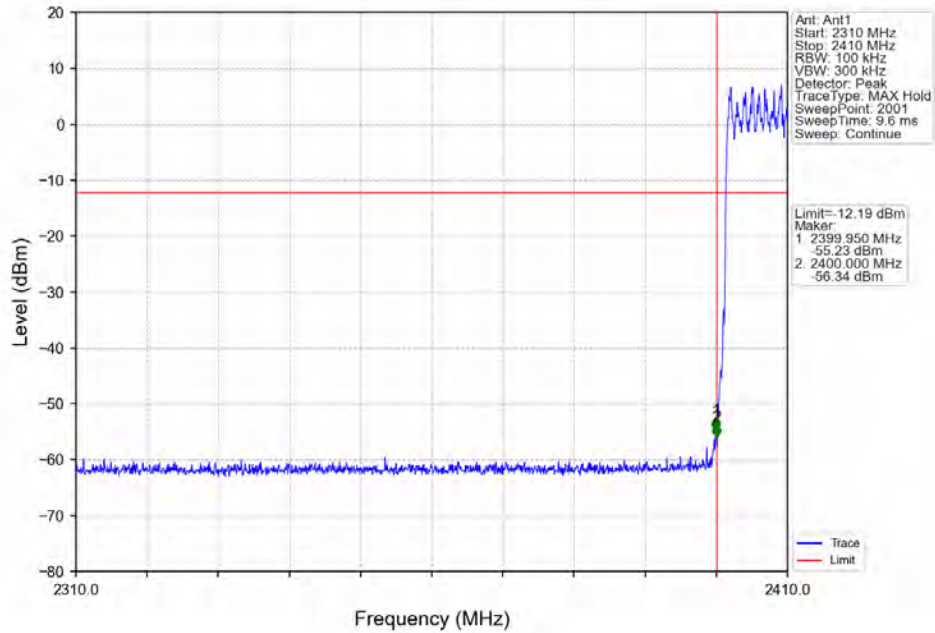


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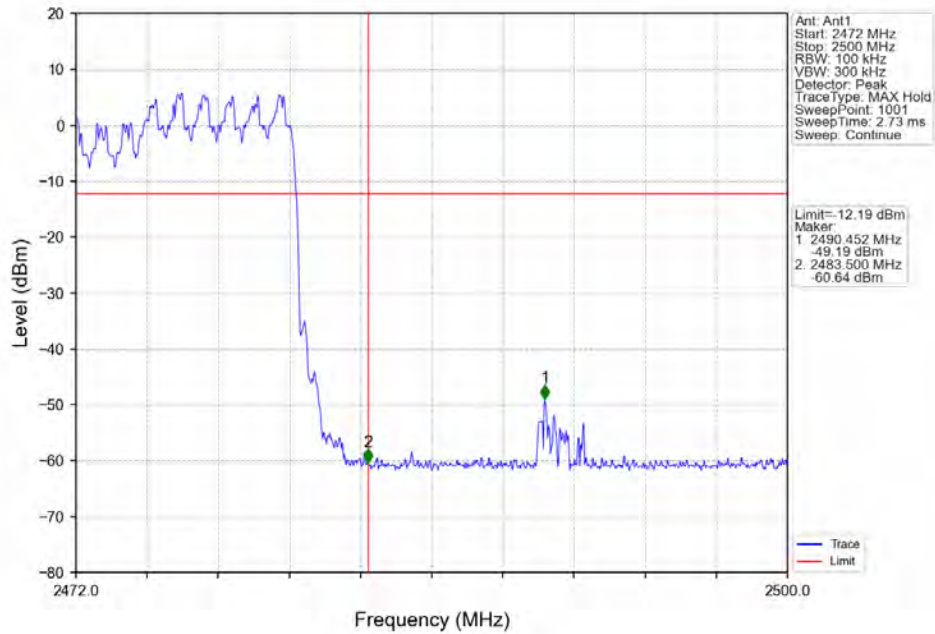
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### 8DPSK 3DH5\_HOPP\_Ant1\_NTNV



### 8DPSK 3DH5\_HOPP\_Ant1\_NTNV



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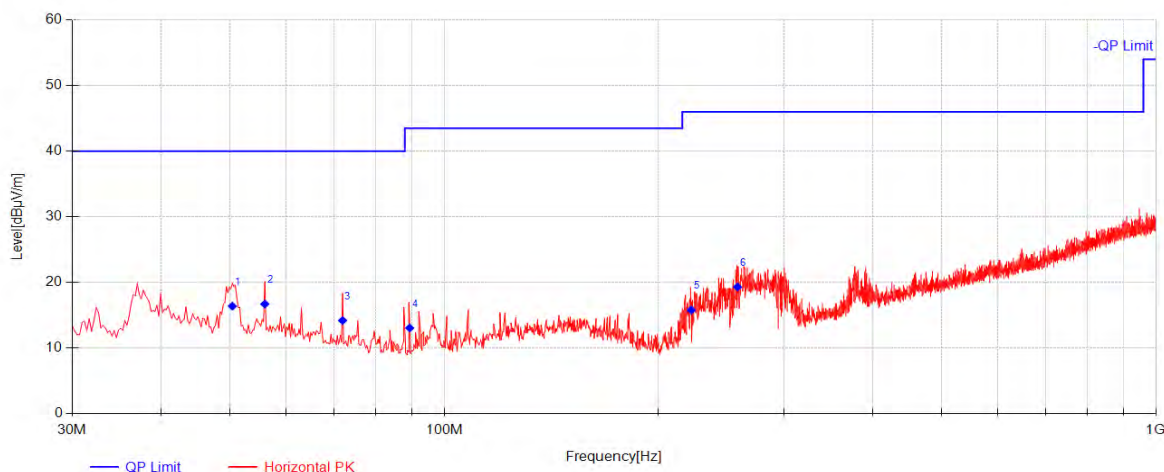
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Page: 85 of 108

### Radiated Spurious Emissions

### Radiated emission below 1GHz

Worst case Mode: GFSK\_Channel 78 (SKU1):



#### Data List

NO.	Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Polarity
1	50.37	39.56	-42.37	19.19	16.37	40.00	23.63	Horizontal
2	55.9475	40.02	-42.30	18.96	16.69	40.00	23.31	Horizontal
3	71.9525	39.48	-42.03	16.73	14.18	40.00	25.82	Horizontal
4	89.4125	40.03	-41.72	14.73	13.04	43.50	30.46	Horizontal
5	222.3025	40.14	-40.77	16.42	15.78	46.00	30.22	Horizontal
6	258.1925	42.54	-40.36	17.12	19.29	46.00	26.71	Horizontal



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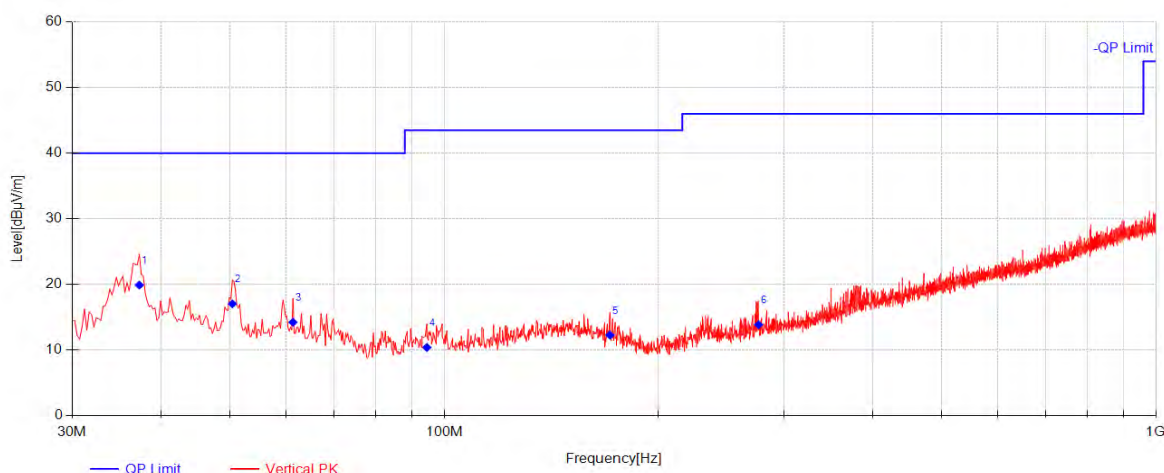
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Rev.: 01

Page: 86 of 108



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Polarity
1	37.275	43.19	-42.34	19.05	19.89	40.00	20.11	Vertical
2	50.37	40.22	-42.37	19.19	17.03	40.00	22.97	Vertical
3	61.2825	37.86	-42.22	18.58	14.22	40.00	25.78	Vertical
4	94.505	37.00	-41.68	15.06	10.38	43.50	33.12	Vertical
5	170.8925	35.86	-40.93	17.32	12.25	43.50	31.25	Vertical
6	276.38	36.48	-40.40	17.76	13.84	46.00	32.16	Vertical

### Remark:

- The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier gain. The basic equation with a sample calculation is as follows:  

$$\text{Value} = \text{Reading}(\text{dB}\mu\text{V}) + \text{AF}(\text{dB}/\text{m}) + \text{Factor}(\text{dB})$$

$$\text{AF} = \text{Antenna Factor}(\text{dB}/\text{m})$$

$$\text{Factor} = \text{Cable Factor}(\text{dB}) - \text{Preamplifier gain}(\text{dB})$$

$$\text{Margin} = \text{Limit}(\text{dB}\mu\text{V}/\text{m}) - \text{Value}(\text{dB}\mu\text{V}/\text{m})$$
- All channels have been tested, but only the worst case data displayed in this report.



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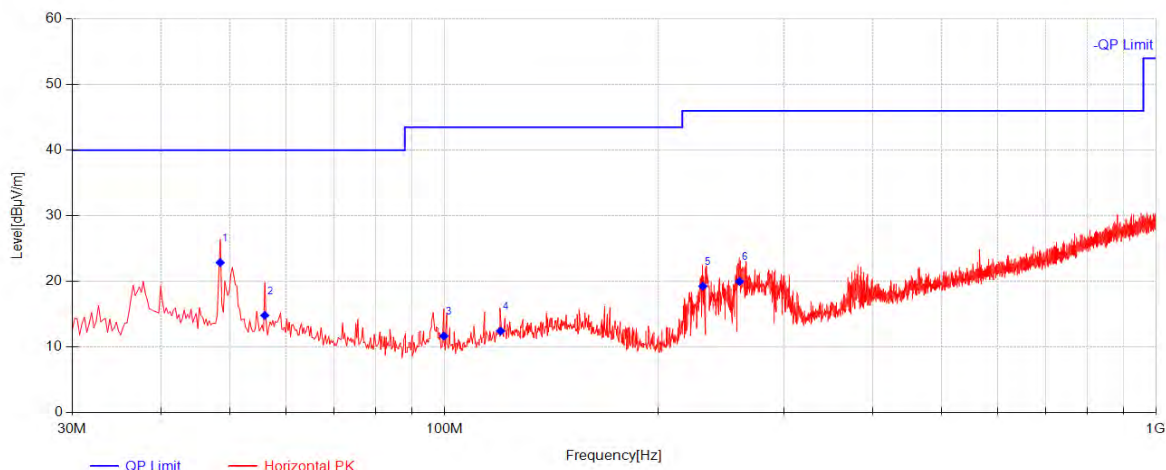
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Rev.: 01

Page: 87 of 108

## Test on the worst case(SKU2): GFSK\_Channel 78



### Data List

NO.	Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Polarity
1	48.43	45.95	-42.37	19.28	22.86	40.00	17.14	Horizontal
2	55.9475	38.13	-42.30	18.96	14.80	40.00	25.20	Horizontal
3	99.84	37.82	-41.65	15.49	11.66	43.50	31.84	Horizontal
4	119.9675	36.88	-41.76	17.30	12.42	43.50	31.08	Horizontal
5	230.79	43.19	-40.77	16.84	19.26	46.00	26.74	Horizontal
6	259.89	43.21	-40.33	17.10	19.98	46.00	26.02	Horizontal



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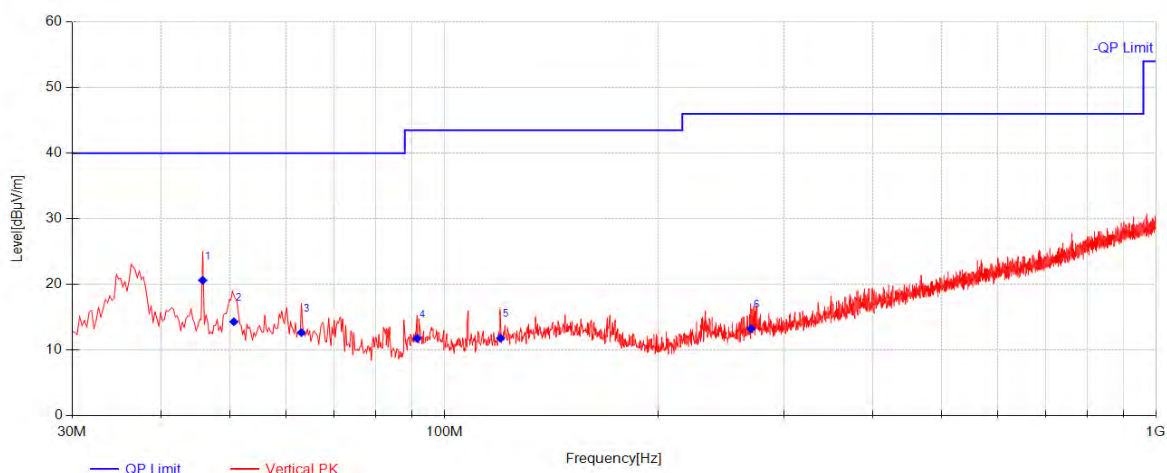
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Page: 88 of 108



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Polarity
1	45.7625	43.55	-42.35	19.41	20.61	40.00	19.39	Vertical
2	50.6125	37.49	-42.37	19.18	14.29	40.00	25.71	Vertical
3	62.98	36.54	-42.19	18.29	12.64	40.00	27.36	Vertical
4	91.595	38.62	-41.70	14.83	11.75	43.50	31.75	Vertical
5	119.9675	36.23	-41.76	17.30	11.77	43.50	31.73	Vertical
6	269.8325	36.10	-40.36	17.49	13.23	46.00	32.77	Vertical

### Remark:

- The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier gain. The basic equation with a sample calculation is as follows:  

$$\text{Value} = \text{Reading}(\text{dB}\mu\text{V}) + \text{AF}(\text{dB}/\text{m}) + \text{Factor}(\text{dB})$$

$$\text{AF} = \text{Antenna Factor}(\text{dB}/\text{m})$$

$$\text{Factor} = \text{Cable Factor}(\text{dB}) - \text{Preamplifier gain}(\text{dB})$$

$$\text{Margin} = \text{Limit}(\text{dB}\mu\text{V}/\text{m}) - \text{Value}(\text{dB}\mu\text{V}/\text{m})$$
- All channels have been tested, but only the worst case data displayed in this report.

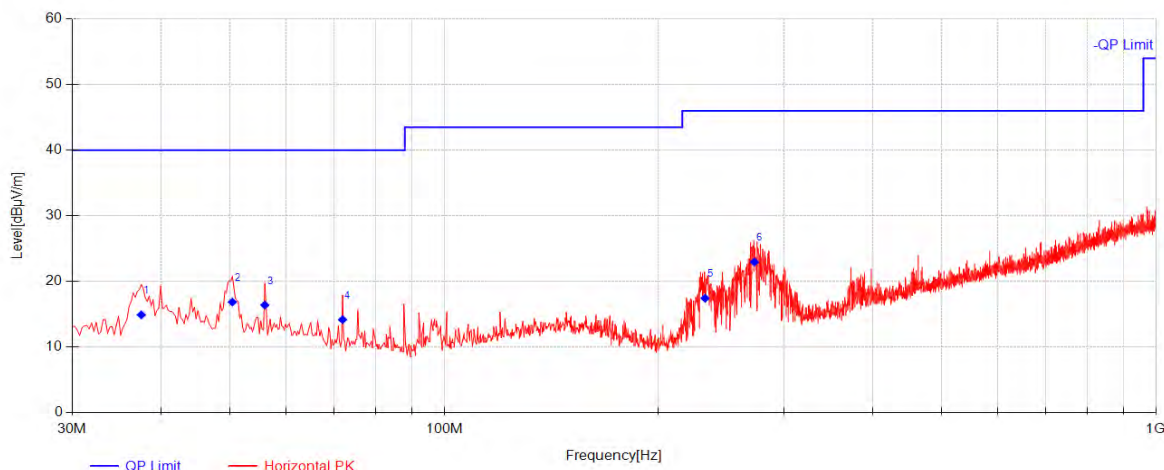


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## Test on the worst case(SKU5): GFSK\_Channel 78



### Data List

NO.	Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Polarity
1	37.5175	38.12	-42.34	19.10	14.88	40.00	25.12	Horizontal
2	50.37	40.03	-42.37	19.19	16.84	40.00	23.16	Horizontal
3	55.9475	39.71	-42.30	18.96	16.38	40.00	23.62	Horizontal
4	71.9525	39.46	-42.03	16.73	14.16	40.00	25.84	Horizontal
5	232.4875	41.26	-40.76	16.92	17.42	46.00	28.58	Horizontal
6	272.7425	45.72	-40.38	17.61	22.95	46.00	23.05	Horizontal



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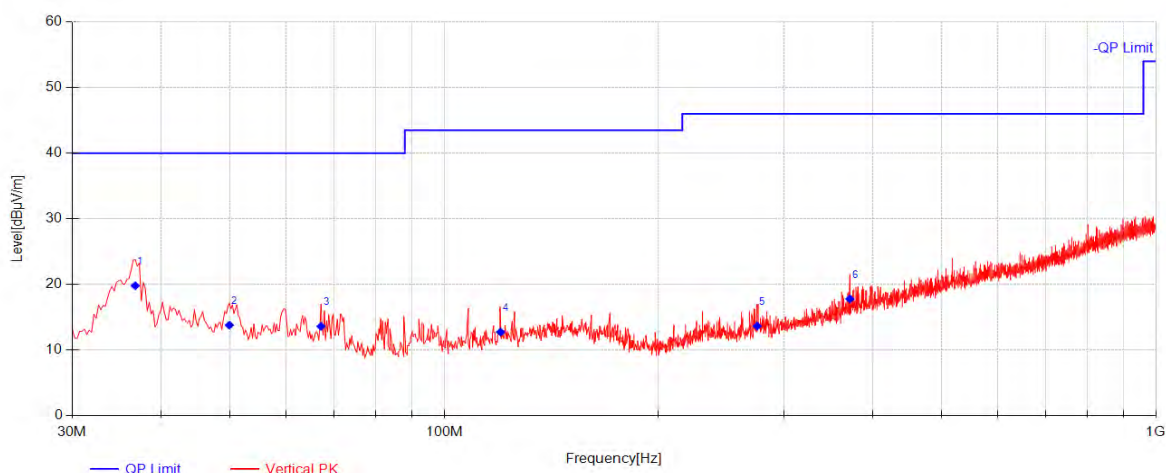
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Report No.: SEWM2312000501RG01

Rev.: 01

Page: 90 of 108



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Polarity
1	36.79	43.21	-42.35	18.93	19.79	40.00	20.21	Vertical
2	49.885	36.95	-42.38	19.21	13.78	40.00	26.22	Vertical
3	67.1025	38.12	-42.13	17.59	13.59	40.00	26.41	Vertical
4	119.9675	37.19	-41.76	17.30	12.73	43.50	30.77	Vertical
5	275.1675	36.32	-40.39	17.71	13.64	46.00	32.36	Vertical
6	371.44	37.14	-39.86	20.50	17.78	46.00	28.22	Vertical

### Remark:

- The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier gain. The basic equation with a sample calculation is as follows:  
Value = Reading(dBμV) + AF(dB/m) + Factor(dB):  
AF = Antenna Factor(dB/m)  
Factor = Cable Factor(dB) - Preamplifier gain(dB)  
Margin = Limit(dBμV/m) – Value(dBμV/m)
- All channels have been tested, but only the worst case data displayed in this report.



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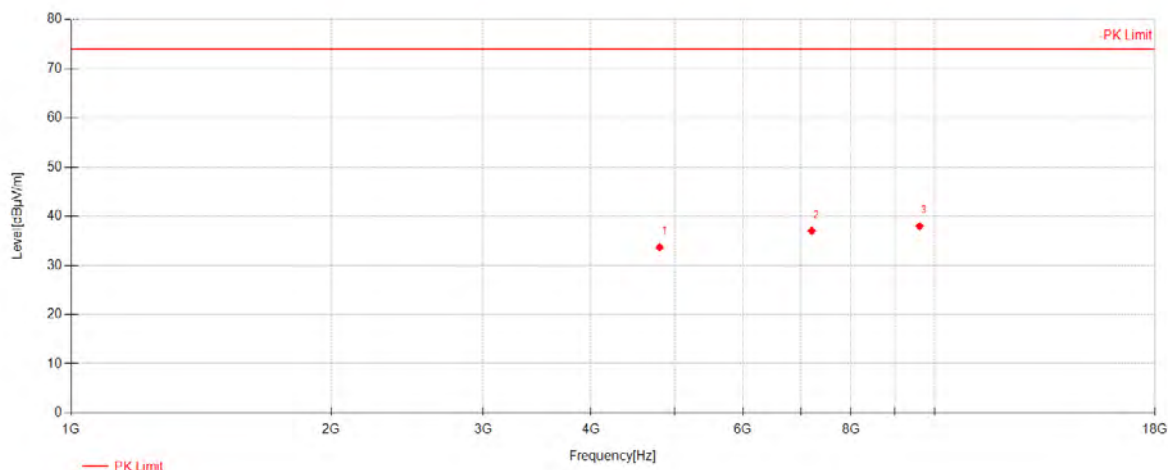
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Report No.: SEWM2312000501RG01  
Rev.: 01  
Page: 91 of 108

### Transmitter emission Above 1GHz(SKU1):

#### GFSK\_Channel 00



#### Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	4804.0000	48.26	30.97	-45.54	33.69	74.00	40.31	Horizontal
	4804	-	-	-	8.90	54.00	45.10	Horizontal
2	7206.0000	44.64	35.78	-43.44	36.98	74.00	37.02	Horizontal
	7206	-	-	-	12.19	54.00	41.81	Horizontal
3	9608.0000	40.14	37.46	-39.65	37.94	74.00	36.06	Horizontal
	9608	-	-	-	13.15	54.00	40.85	Horizontal



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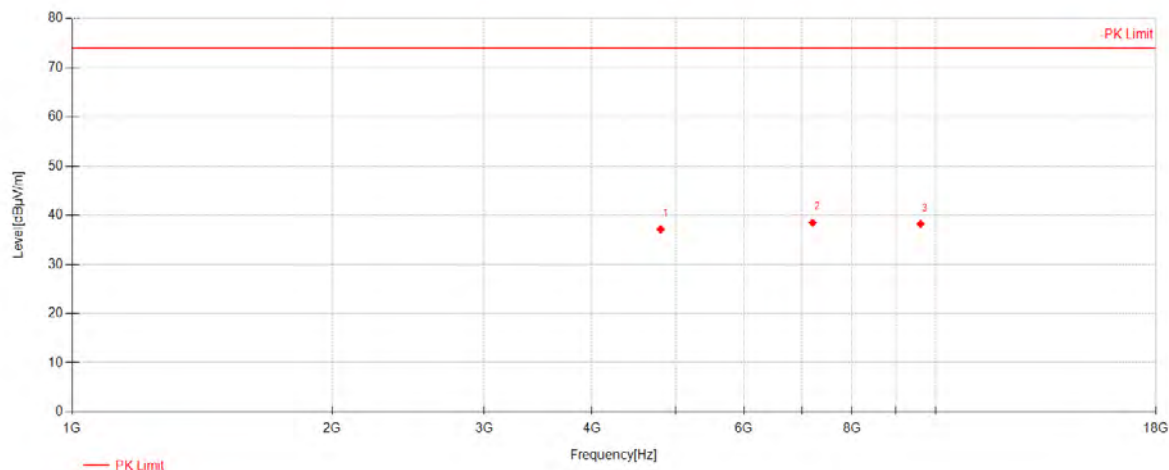


Report No.: SEWM2312000501RG01

Rev.: 01

Page: 92 of 108

### GFSK\_Channel 00



### Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	4804.0000	51.66	30.97	-45.54	37.09	74.00	36.91	Vertical
	4804	-	-	-	12.30	54.00	41.70	Vertical
2	7206.0000	46.12	35.78	-43.44	38.46	74.00	35.54	Vertical
	7206	-	-	-	13.67	54.00	40.33	Vertical
3	9608.0000	40.41	37.46	-39.65	38.21	74.00	35.79	Vertical
	9608	-	-	-	13.42	54.00	40.58	Vertical



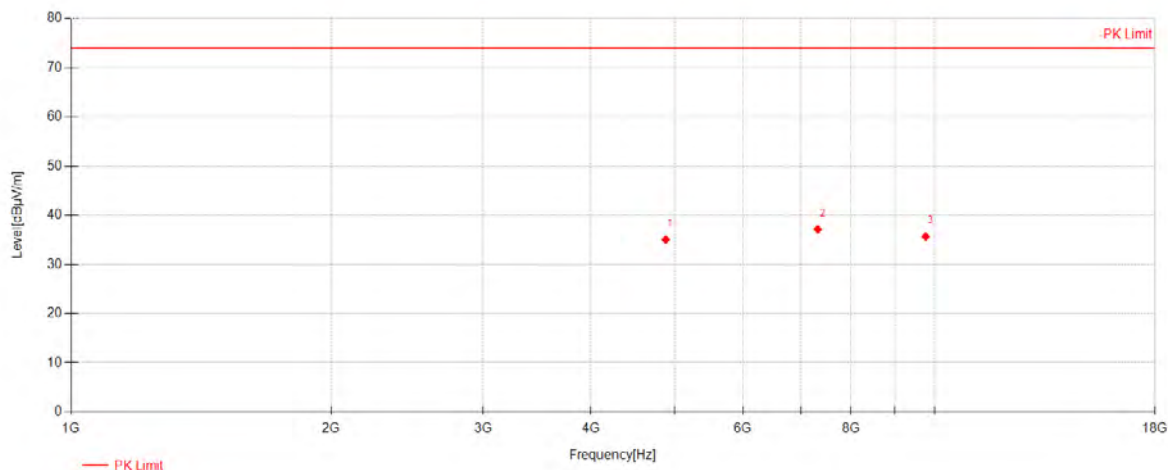
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Report No.: SEWM2312000501RG01  
Rev.: 01  
Page: 93 of 108

### GFSK\_Channel 39



### Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	4882.0000	49.43	31.14	-45.53	35.04	74.00	38.96	Horizontal
	4882	-	-	-	10.25	54.00	43.75	Horizontal
2	7323.0000	44.67	36.10	-43.67	37.10	74.00	36.90	Horizontal
	7323	-	-	-	12.31	54.00	41.69	Horizontal
3	9764.0000	37.37	37.75	-39.47	35.66	74.00	38.34	Horizontal
	9764	-	-	-	10.87	54.00	43.13	Horizontal



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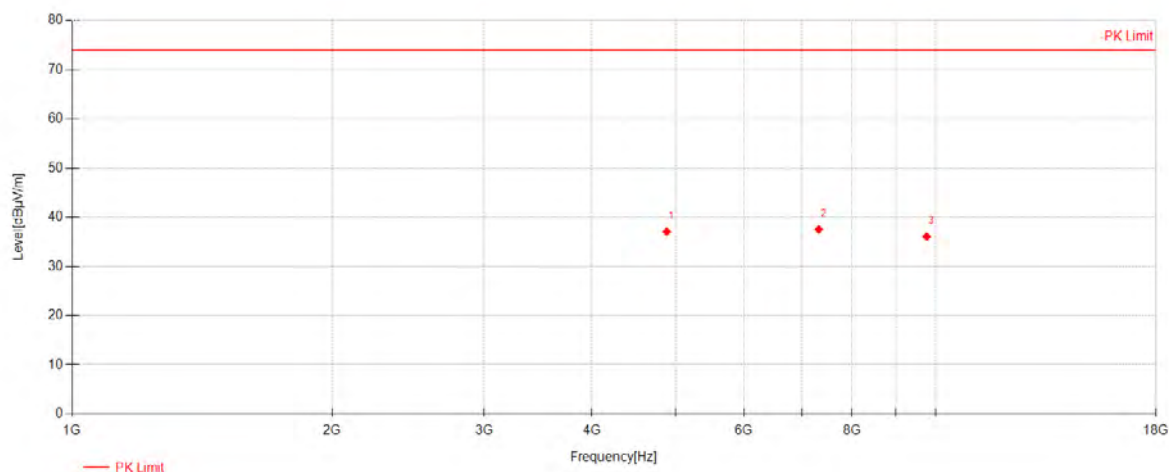
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Rev.: 01

Page: 94 of 108

## GFSK\_Channel 39



## Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	4882.0000	51.40	31.14	-45.53	37.01	74.00	36.99	Vertical
	4882	-	-	-	12.22	54.00	41.78	Vertical
2	7323.0000	45.05	36.10	-43.67	37.48	74.00	36.52	Vertical
	7323	-	-	-	12.69	54.00	41.31	Vertical
3	9764.0000	37.76	37.75	-39.47	36.05	74.00	37.95	Vertical
	9764	-	-	-	11.26	54.00	42.74	Vertical



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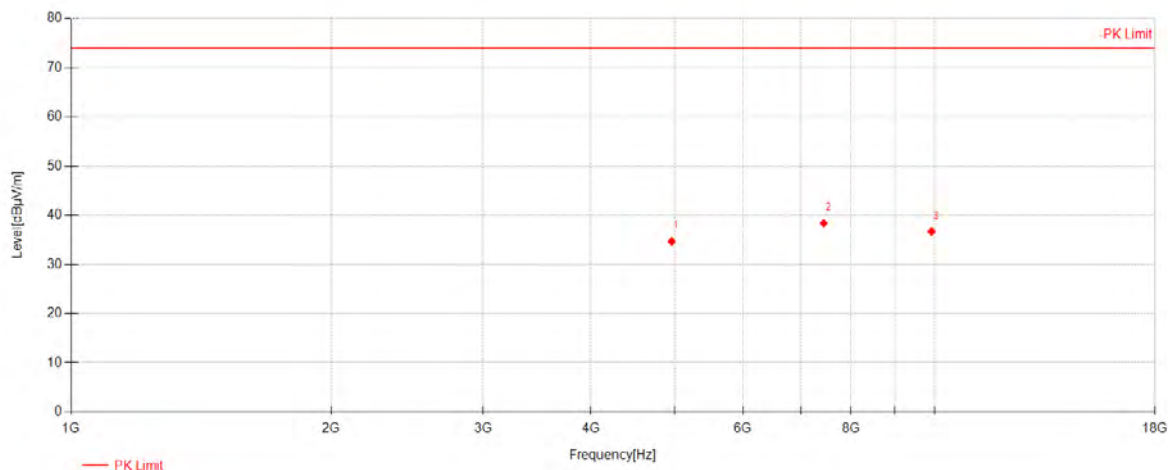
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Rev.: 01

Page: 95 of 108

### GFSK\_Channel 78



### Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	4960.0000	48.97	31.31	-45.60	34.69	74.00	39.31	Horizontal
	4960	-	-	-	9.90	54.00	44.10	Horizontal
2	7440.0000	45.23	36.43	-43.30	38.36	74.00	35.64	Horizontal
	7440	-	-	-	13.57	54.00	40.43	Horizontal
3	9920.0000	37.93	38.05	-39.31	36.67	74.00	37.33	Horizontal
	9920	-	-	-	11.88	54.00	42.12	Horizontal



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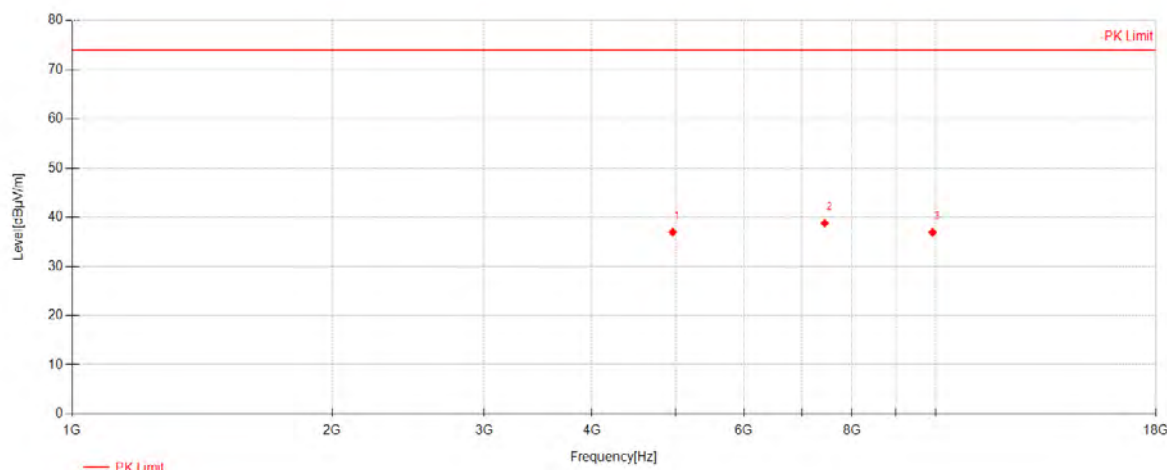


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Rev.: 01

Page: 96 of 108

## GFSK\_Channel 78



## Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	4960.0000	51.20	31.31	-45.60	36.92	74.00	37.08	Vertical
	4960	-	-	-	12.13	54.00	41.87	Vertical
2	7440.0000	45.64	36.43	-43.30	38.77	74.00	35.23	Vertical
	7440	-	-	-	13.98	54.00	40.02	Vertical
3	9920.0000	38.15	38.05	-39.31	36.89	74.00	37.11	Vertical
	9920	-	-	-	12.10	54.00	41.90	Vertical

## Remark:

- The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier gain. The basic equation with a sample calculation is as follows:  
Level = Reading(dBμV) + AF(dB/m) + Factor(dB):  
AF = Antenna Factor(dB/m)  
Factor = Cable Factor(dB) - Preamplifier gain(dB)  
Margin = Limit(dBμV/m) – Level(dBμV/m)
- All channels have been tested, but only the worst case data displayed in this report.



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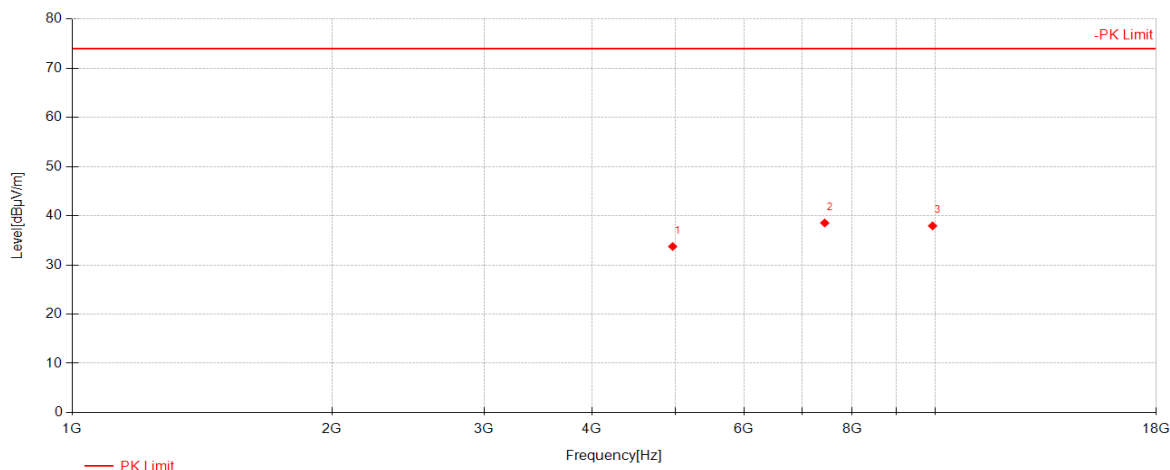
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Rev.: 01

Page: 97 of 108

## Test on the worst case(SKU2):

## GFSK\_Channel 78



## Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	4960.0000	48.03	31.31	-45.60	33.75	74.00	40.25	Horizontal
	4960	-	-	-	8.96	54.00	45.04	Horizontal
2	7440.0000	45.41	36.43	-43.30	38.54	74.00	35.46	Horizontal
	7440	-	-	-	13.75	54.00	40.25	Horizontal
3	9920.0000	39.20	38.05	-39.31	37.94	74.00	36.06	Horizontal
	9920	-	-	-	13.15	54.00	40.85	Horizontal



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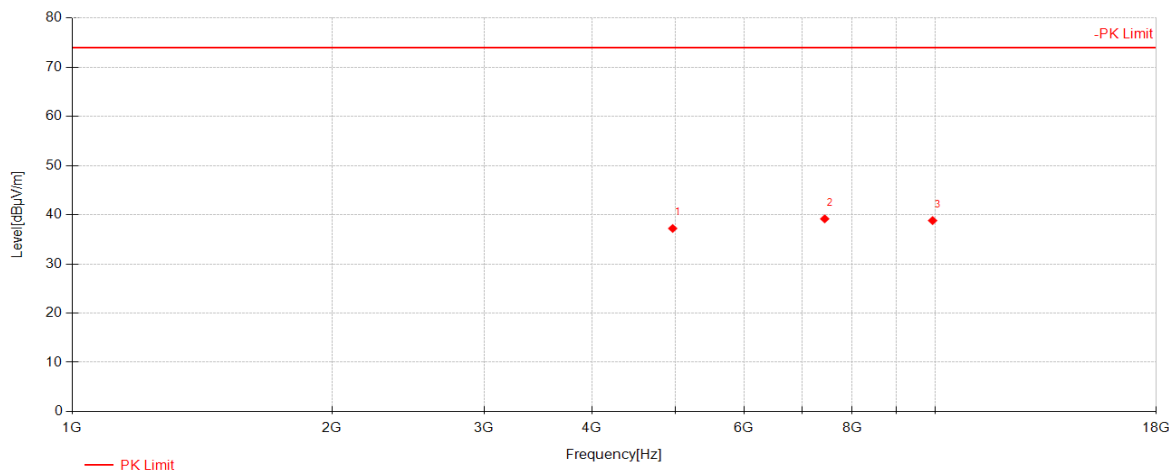
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Report No.: SEWM2312000501RG01

Rev.: 01

Page: 98 of 108

## GFSK\_Channel 78



## Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	4960.0000	51.50	31.31	-45.60	37.22	74.00	36.78	Vertical
	4960	-	-	-	12.43	54.00	41.57	Vertical
2	7440.0000	46.04	36.43	-43.30	39.17	74.00	34.83	Vertical
	7440	-	-	-	14.38	54.00	39.62	Vertical
3	9920.0000	40.08	38.05	-39.31	38.82	74.00	35.18	Vertical
	9920	-	-	-	14.03	54.00	39.97	Vertical

## Remark:

- 1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier gain. The basic equation with a sample calculation is as follows:

Level = Reading(dBμV) + AF(dB/m) + Factor(dB):

AF = Antenna Factor(dB/m)

Factor = Cable Factor(dB) - Preamplifier gain(dB)

Margin = Limit(dBμV/m) – Level(dBμV/m)

- 2) All channels have been tested, but only the worst case data displayed in this report.



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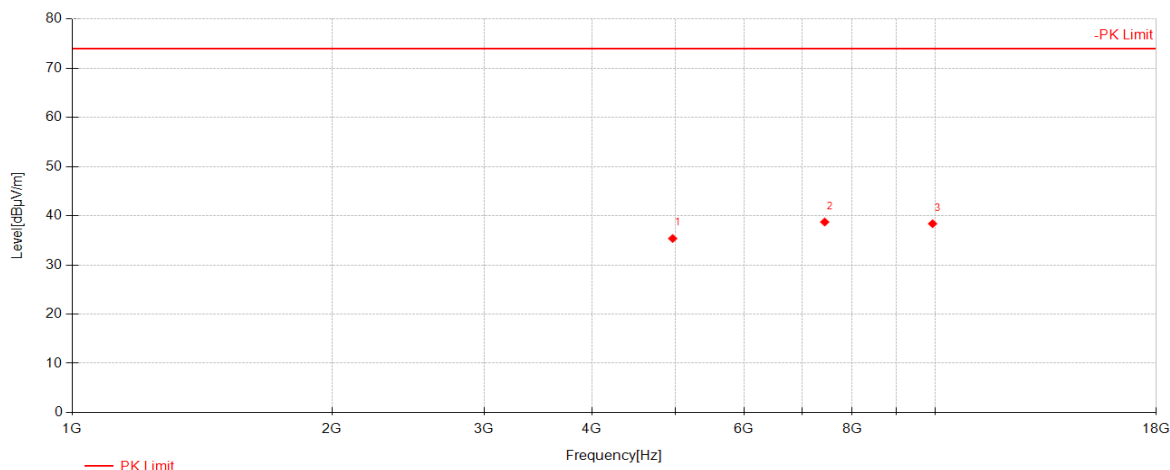
Report No.: SEWM2312000501RG01

Rev.: 01

Page: 99 of 108

## Test on the worst case(SKU5):

## GFSK\_Channel 78



## Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	4960.0000	49.66	31.31	-45.60	35.38	74.00	38.62	Horizontal
	4960	-	-	-	10.59	54.00	43.41	Horizontal
2	7440.0000	45.60	36.43	-43.30	38.73	74.00	35.27	Horizontal
	7440	-	-	-	13.94	54.00	40.06	Horizontal
3	9920.0000	39.64	38.05	-39.31	38.38	74.00	35.62	Horizontal
	9920	-	-	-	13.59	54.00	40.41	Horizontal



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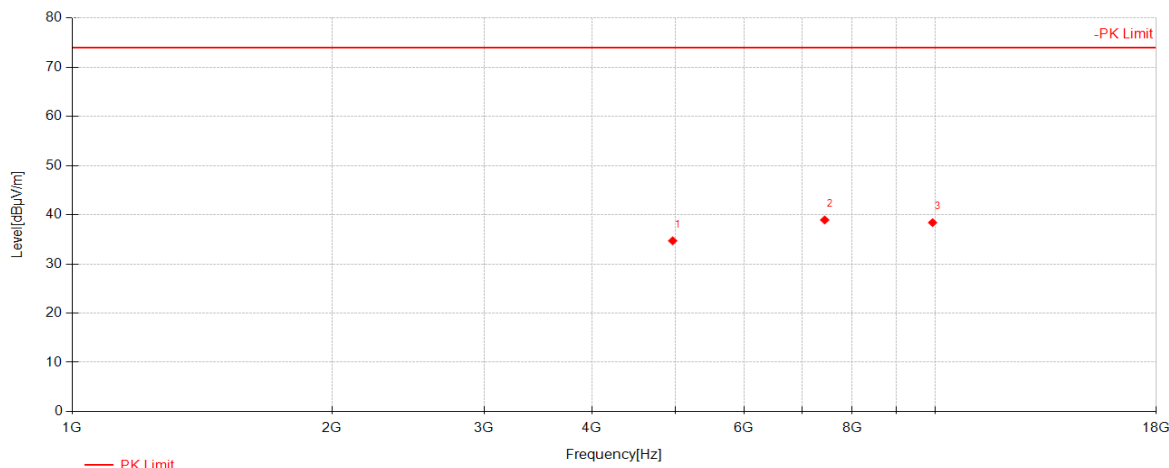


Report No.: SEWM2312000501RG01

Rev.: 01

Page: 100 of 108

## GFSK\_Channel 78



## Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	4960.0000	48.99	31.31	-45.60	34.71	74.00	39.29	Vertical
	4960	-	-	-	9.92	54.00	44.08	Vertical
2	7440.0000	45.81	36.43	-43.30	38.94	74.00	35.06	Vertical
	7440	-	-	-	14.15	54.00	39.85	Vertical
3	9920.0000	39.66	38.05	-39.31	38.40	74.00	35.60	Vertical
	9920	-	-	-	13.61	54.00	40.39	Vertical

## Remark:

- 1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier gain. The basic equation with a sample calculation is as follows:

Level = Reading(dBμV) + AF(dB/m) + Factor(dB):

AF = Antenna Factor(dB/m)

Factor = Cable Factor(dB) - Preamplifier gain(dB)

Margin = Limit(dBμV/m) – Level(dBμV/m)

- 2) All channels have been tested, but only the worst case data displayed in this report.



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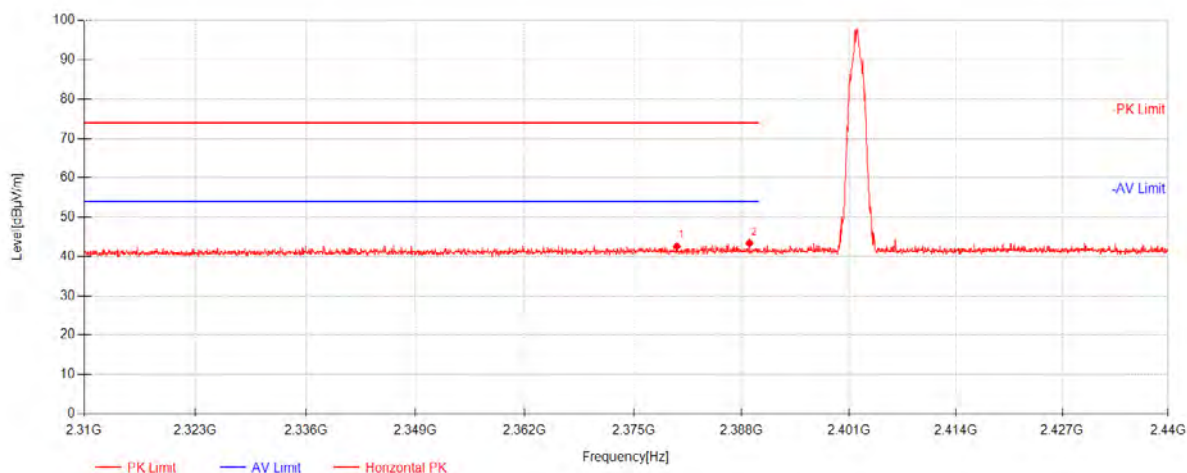
Report No.: SEWM2312000501RG01

Rev.: 01

Page: 101 of 108

### Restricted bands around fundamental frequency(SKU1):

#### GFSK\_Channel 00



#### Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2380.2	39.22	26.96	-23.57	42.61	74.00	31.39	Horizontal
	2380.2	-	-	-	17.82	54.00	36.18	Horizontal
2	2388.9533	39.98	26.99	-23.57	43.40	74.00	30.60	Horizontal
	2388.9533	-	-	-	18.61	54.00	35.39	Horizontal



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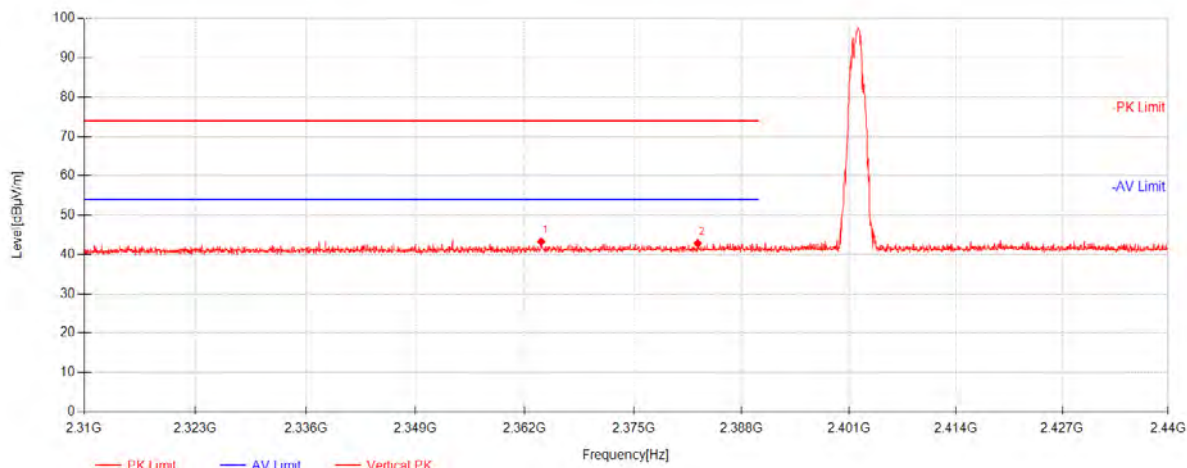
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Report No.: SEWM2312000501RG01

Rev.: 01

Page: 102 of 108

### GFSK\_Channel 00



### Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2363.95	39.93	26.92	-23.57	43.28	74.00	30.72	Vertical
	2363.95	-	-	-	18.49	54.00	35.51	Vertical
2	2382.7133	39.46	26.97	-23.57	42.86	74.00	31.14	Vertical
	2382.7133	-	-	-	18.07	54.00	35.93	Vertical



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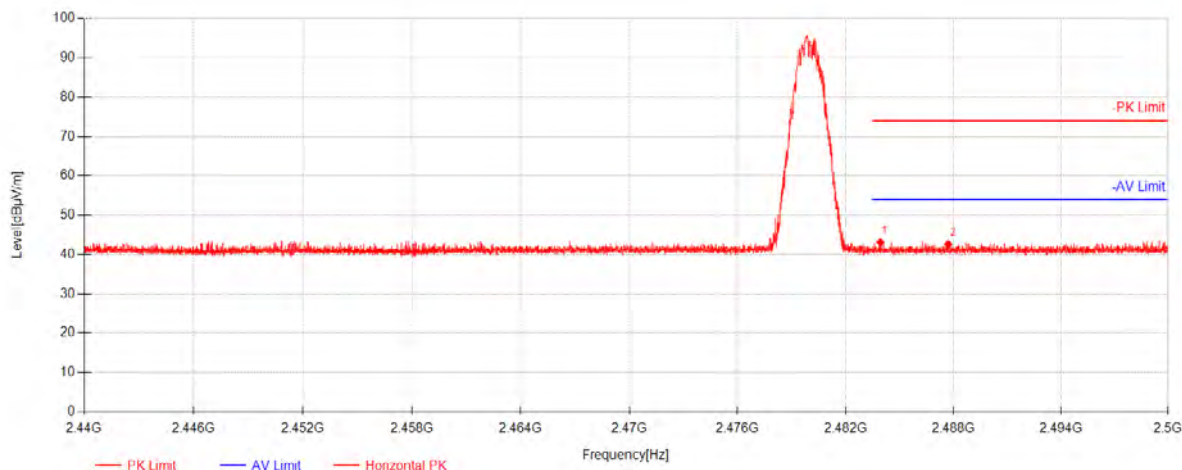
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Report No.: SEWM2312000501RG01

Rev.: 01

Page: 103 of 108

## GFSK\_Channel 78



## Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2483.935	39.42	27.26	-23.54	43.13	74.00	30.87	S
	2483.935	-	-	-	18.34	54.00	35.66	Horizontal
2	2487.715	38.93	27.27	-23.54	42.65	74.00	31.35	Horizontal
	2487.715	-	-	-	17.86	54.00	36.14	Horizontal



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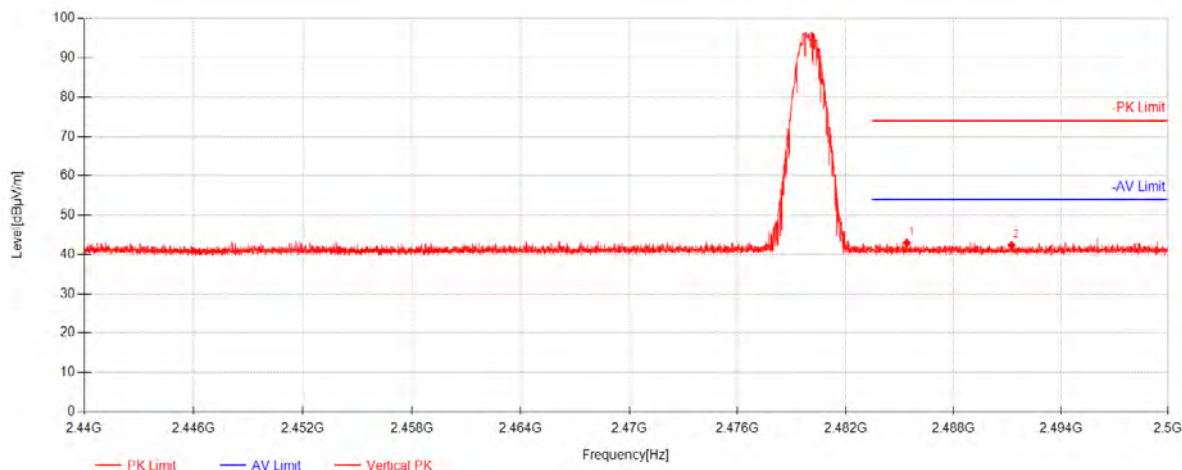


Report No.: SEWM2312000501RG01

Rev.: 01

Page: 104 of 108

### GFSK\_Channel 78



### Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2485.405	39.29	27.26	-23.54	43.00	74.00	31.00	Vertical
	2485.405	-	-	-	18.21	54.00	35.79	Vertical
2	2491.2475	38.62	27.28	-23.54	42.35	74.00	31.65	Vertical
	2491.2475	-	-	-	17.56	54.00	36.44	Vertical

### Remark:

- The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier gain. The basic equation with a sample calculation is as follows:

Level = Reading(dBμV) + AF(dB/m) + Factor(dB):

AF = Antenna Factor(dB/m)

Factor = Cable Factor(dB) - Preamplifier gain(dB)

Margin = Limit(dBμV/m) – Level(dBμV/m)



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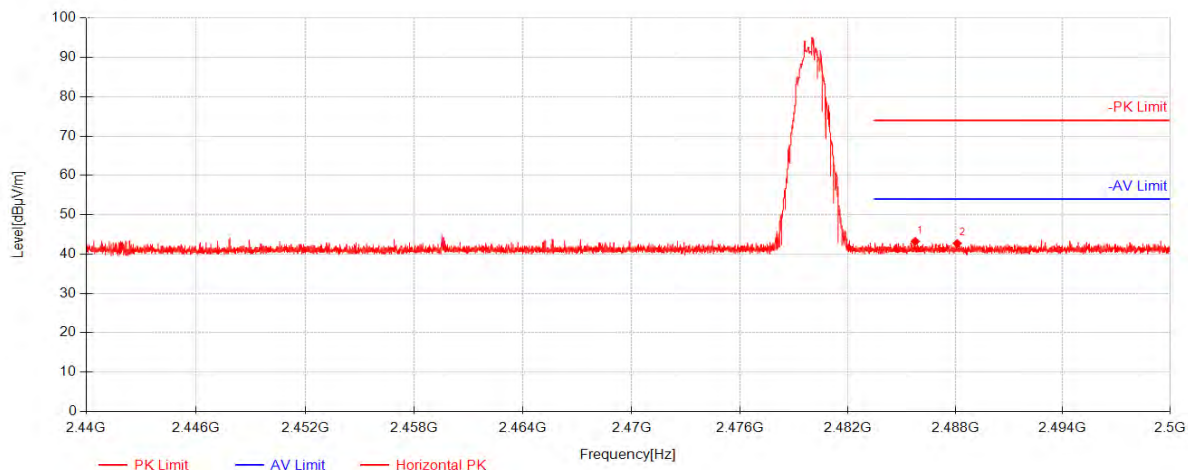
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Report No.: SEWM2312000501RG01

Rev.: 01

Page: 105 of 108

**Test on the worst case(SKU2):****GFSK\_Channel 78****Data List**

NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2485.765	39.51	27.26	-23.54	43.23	74.00	30.77	Horizontal
	2485.765	-	-	-	18.44	54.00	35.56	Horizontal
2	2488.105	39.00	27.27	-23.54	42.72	74.00	31.28	Horizontal
	2488.105	-	-	-	17.93	54.00	36.07	Horizontal



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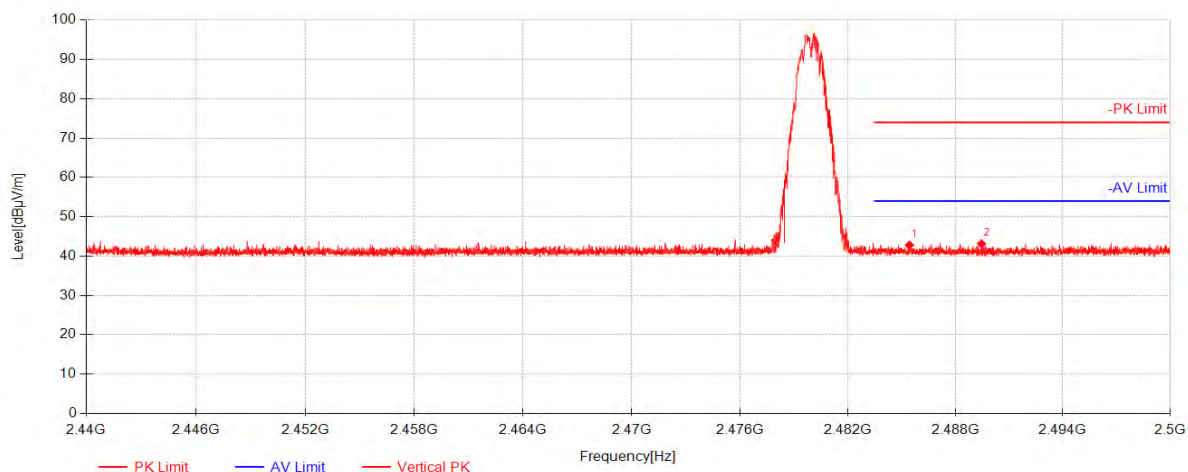
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Report No.: SEWM2312000501RG01

Rev.: 01

Page: 106 of 108

## GFSK\_Channel 78



## Data List

NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2485.4425	39.10	27.26	-23.54	42.81	74.00	31.19	Vertical
	2485.4425	-	-	-	18.02	54.00	35.98	Vertical
2	2489.4625	39.42	27.27	-23.54	43.15	74.00	30.85	Vertical
	2489.4625	-	-	-	18.36	54.00	35.64	Vertical

## Remark:

- 1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier gain. The basic equation with a sample calculation is as follows:

Level = Reading(dBμV) + AF(dB/m) + Factor(dB):

AF = Antenna Factor(dB/m)

Factor = Cable Factor(dB) - Preamplifier gain(dB)

Margin = Limit(dBμV/m) – Level(dBμV/m)



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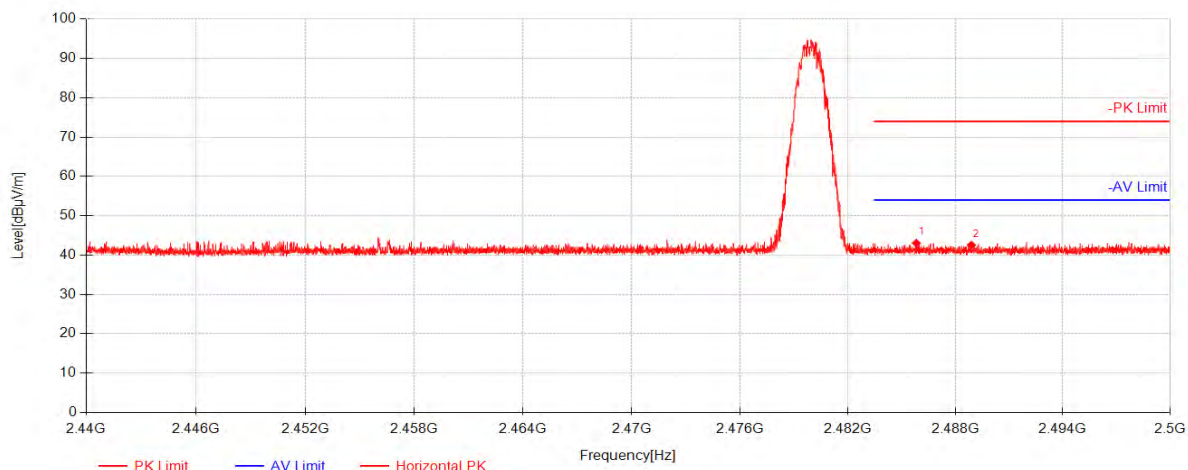
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Report No.: SEWM2312000501RG01

Rev.: 01

Page: 107 of 108

**Test on the worst case(SKU5):****GFSK\_Channel 78**

Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2485.825	39.33	27.26	-23.54	43.05	74.00	30.95	Horizontal
	2485.825	-	-	-	18.26	54.00	35.74	Horizontal
2	2488.8925	38.81	27.27	-23.54	42.54	74.00	31.46	Horizontal
	2488.8925	-	-	-	17.75	54.00	36.25	Horizontal



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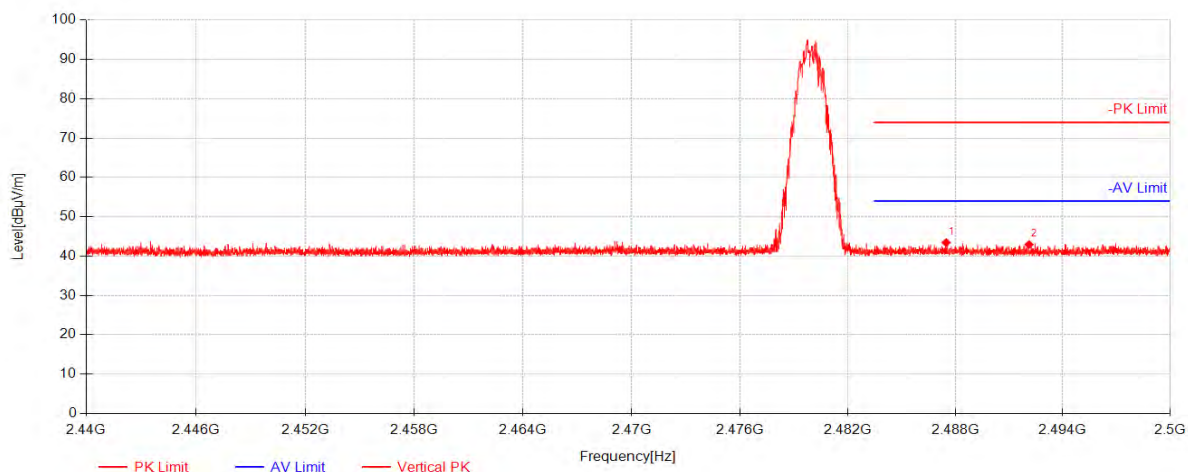


Report No.: SEWM2312000501RG01

Rev.: 01

Page: 108 of 108

## GFSK\_Channel 78



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2487.49	39.73	27.26	-23.54	43.45	74.00	30.55	Vertical
	2487.49	-	-	-	18.66	54.00	35.34	Vertical
2	2492.1175	39.22	27.28	-23.54	42.96	74.00	31.04	Vertical
	2492.1175	-	-	-	18.17	54.00	35.83	Vertical

## Remark:

- 1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier gain. The basic equation with a sample calculation is as follows:

Level = Reading(dBμV) + AF(dB/m) + Factor(dB):

AF = Antenna Factor(dB/m)

Factor = Cable Factor(dB) - Preamplifier gain(dB)

Margin = Limit(dBμV/m) – Level(dBμV/m)

---End of Report---



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