



TEST REPORT

Application No.: GZCR211021328AT
Applicant: POGS B.V
Address of Applicant: Hendrik Andriessenlaan 42 2102CZ Heemstede Netherlands
Manufacturer: POGS B.V
Address of Manufacturer: Hendrik Andriessenlaan 42 2102CZ Heemstede Netherlands
Factory:
1. Minami Acoustics Limited
2. Minami Acoustics Limited
Address of Factory:
1. Shangou Industrial Park GongJiang Town, Yudu County Ganzhou City
Jiangxi Province, P.R. China
2. No.13. Maonan Road, Torch Development District, Zhongshan, Guangdong,
China

Equipment Under Test (EUT):

EUT Name: Bluetooth Headphone
Model No.: The Gecko
Trade Mark: POGS
Standard(s): 47 CFR Part 15, Subpart C 15.247
Date of Receipt: 2020-12-08
Date of Test: 2020-12-16 to 2020-12-31
Date of Issue: 2021-11-05

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Kobe Jian
EMC Laboratory Manager



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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2021-11-05		Original

Authorized for issue by:			
Tested By		 Curry_Wu /Project Engineer	
Checked By		 Ricky_Liu /Reviewer	

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2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.247	N/A	47 CFR Part 15, Subpart C 15.203 & 15.247(c)	Pass
Other requirements Frequency Hopping Spread Spectrum System Hopping Sequence	47 CFR Part 15, Subpart C 15.247	N/A	47 CFR Part 15, Subpart C 15.247(a)(1),(g),(h)	Pass

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Conducted Peak Output Power	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.5	47 CFR Part 15, Subpart C 15.247(b)(1)	Pass
20dB Bandwidth	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.7	47 CFR Part 15, Subpart C 15.247(a)(1)	Pass
Carrier Frequencies Separation	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.2	47 CFR Part 15, Subpart C 15.247a(1)	Pass
Hopping Channel Number	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.3	47 CFR Part 15, Subpart C 15.247a(1)(iii)	Pass
Dwell Time	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.4	47 CFR Part 15, Subpart C 15.247a(1)(iii)	Pass
Conducted Band Edges Measurement	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.6	47 CFR Part 15, Subpart C 15.247(d)	Pass
Conducted Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.8	47 CFR Part 15, Subpart C 15.247(d)	Pass
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.4,6.5,6.6	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass

Note:

E.U.T./EUT means Equipment Under Test.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.

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4 General Information

4.1 Details of E.U.T.

Power Supply:	DC 5V supply by adaptor DC 3.7V rechargeable battery
Test Voltage:	DC 3.7V
Cable:	About 0.5m unscreened micro USB cable About 1m unscreened AUX in cable About 1.2m unscreened AUX in cable
Antenna Gain:	1.5dBi
Antenna Type:	PCB antenna
Channel Spacing:	1MHz
Modulation Type:	GFSK, π/4DQPSK, 8DPSK
Number of Channels:	79
Operation Frequency:	2402MHz to 2480MHz
Spectrum Spread Technology:	Frequency Hopping Spread Spectrum(FHSS)
Testing software	BQB.exe
Firmware version	EPH-TJ-WT230U-Rooky-B-WT230U-1126-V3
Hardware version	V1.0
Sample No	A1

4.2 Description of Support Units

The EUT has been tested as an independent unit.

4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Peak Output Power	± 0.75dB
20dB Bandwidth	± 3%
Carrier Frequencies Separation	± 7.25 x 10 ⁻⁸
Hopping Channel Number	± 7.25 x 10 ⁻⁸
Dwell Time	± 0.37%
Conducted Band Edges Measurement	± 0.75dB
Conducted Spurious Emissions	± 0.75dB
Radiated Emissions which fall in the restricted bands	±5.08dB (1GHz-6GHz); ±5.14dB(above 6GHz)
Radiated Spurious Emissions	±5.06dB (3m); ±4.46dB (10m)

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4.4 Test Location

All tests were performed at:

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No tests were sub-contracted.



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4.5 Test Facility

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

● NVLAP (Lab Code: 200611-0)

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

● ACMA

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

● SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

● CNAS (Lab Code: L0167)

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2018 accreditation criteria for testing laboratories (identical to

ISO/IEC 17025:2017 General Requirements) for the Competence of Testing Laboratories.

● FCC Recognized Accredited Test Firm(Registration No.: 486818)

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818, Jul 13, 2017.

● ISED (Registration No.: 4620B, CAB identifier: CN0052)

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

● VCCI (Registration No.: R-12460, C-12584, G-10449 and T-11179)

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-10449 and T-11179 respectively.

● CBTL (Lab Code: TL129)

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2005, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.



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4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

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5 Equipment List

Conducted Peak Output Power					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer	AgilentTechnologies	N9010A	EMC2138	2020-09-17	2021-09-16
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01
MI CABLE	SGS-EMC	0.8M	EMC2137	2019-11-02	2021-11-01

20dB Bandwidth					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer	AgilentTechnologies	N9010A	EMC2138	2020-09-17	2021-09-16
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01
MI CABLE	SGS-EMC	0.8M	EMC2137	2019-11-02	2021-11-01

Carrier Frequencies Separation					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer	AgilentTechnologies	N9010A	EMC2138	2020-09-17	2021-09-16
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01
MI CABLE	SGS-EMC	0.8M	EMC2137	2019-11-02	2021-11-01

Hopping Channel Number					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer	AgilentTechnologies	N9010A	EMC2138	2020-09-17	2021-09-16
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01
MI CABLE	SGS-EMC	0.8M	EMC2137	2019-11-02	2021-11-01

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Dwell Time					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer	AgilentTechnologies	N9010A	EMC2138	2020-09-17	2021-09-16
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01
MI CABLE	SGS-EMC	0.8M	EMC2137	2019-11-02	2021-11-01

Conducted Band Edges Measurement					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
MXA Signal Analyzer	AgilentTechnologies	N9020A	SEM004-10	2020-03-02	2021-03-01
ESG Vector Signal Generator	Keysight	E4438C	SEM006-03	2020-03-31	2021-03-30
EXG Analog Signal Generator	AgilentTechnologies	N5171B	SEM006-04	2020-07-15	2021-07-14
Power Meter	AgilentTechnologies	U2021XA_Ch2	SEM009-02	2020-05-26	2021-05-25
Power Meter	AgilentTechnologies	U2021XA_Ch3	SEM009-03	2020-05-26	2021-05-25
EXA Signal Analyzer	AgilentTechnologies	N9010A	EMC2138	2020-09-17	2021-09-16
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01
MI CABLE	SGS-EMC	0.8M	EMC2137	2019-11-02	2021-11-01

Conducted Spurious Emissions					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer	AgilentTechnologies	N9010A	EMC2138	2020-09-17	2021-09-16
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01
MI CABLE	SGS-EMC	0.8M	EMC2137	2019-11-02	2021-11-01



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Radiated Emissions which fall in the restricted bands

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI Test Receiver	Rohde & Schwarz	ESIB26	EMC0522	2020-01-10	2021-01-09
EMI Test Receiver	Rohde & Schwarz	ESCI	EMC0056	2020-01-10	2021-01-09
Chamber cable	HangTianXing	N/A	EMC0542	2019-06-28	2021-06-27
Trilog Broadband Antenna 25MHz-1GHz	SCHWARZBECKME SS-ELEKTRONIK	VULB 9168	EMC2174	2018-09-06	2021-09-05
Bi-log Type Antenna	Schaffner Chase	CBL6143	EMC0519	2020-06-08	2023-06-07
Horn Antenna	SCHWARZBECKME SS-ELEKTRONIK	BBHA 9120D	EMC2016	2019-09-25	2022-09-24
Horn Antenna 1GHz-18GHz	Rohde & Schwarz	HF906	EMC0518	2018-09-02	2021-09-01
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2020-01-10	2021-01-09
Amplifier	HP	8447F	EMC2065	2020-05-26	2021-05-25
Pre-Amplifier MH648A	ANRITSU CORP	MH648A	EMC2086	2020-11-13	2021-11-12
Active Loop Antenna	EMCO	6502	EMC0523	2018-03-05	2021-03-04
High Pass Filter(915MHz)	FSY MICROWAVE	HM1465-9SS	EMC2079	2020-01-10	2021-01-09
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2020-01-10	2021-01-09
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2019-10-20	2022-10-19
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-19	2023-12-18
MXE EMI Receiver	Keysight	N9038A	EMC2139	2020-11-13	2021-11-12
EXA Signal Analyzer	Keysight	N9010A	EMC2138	2020-09-17	2021-09-16
Trilog Broadband Antenna 30MHz-1GHz	SCHWARZBECKME SS-ELEKTRONIK	VULB 9168	SEM003-18	2019-02-22	2022-02-22
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A

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Radiated Spurious Emissions

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI Test Receiver	Rohde & Schwarz	ESIB26	EMC0522	2020-01-10	2021-01-09
EMI Test Receiver	Rohde & Schwarz	ESCI	EMC0056	2020-01-10	2021-01-09
Chamber cable	HangTianXing	N/A	EMC0542	2019-06-28	2021-06-27
Trilog Broadband Antenna 25MHz-1GHz	SCHWARZBECKME SS-ELEKTRONIK	VULB 9168	EMC2174	2018-09-06	2021-09-05
Bi-log Type Antenna	Schaffner Chase	CBL6143	EMC0519	2020-06-08	2023-06-07
Horn Antenna	SCHWARZBECKME SS-ELEKTRONIK	BBHA 9120D	EMC2016	2019-09-25	2022-09-24
Horn Antenna 1GHz-18GHz	Rohde & Schwarz	HF906	EMC0518	2018-09-02	2021-09-01
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2020-01-10	2021-01-09
Amplifier	HP	8447F	EMC2065	2020-05-26	2021-05-25
Pre-Amplifier MH648A	ANRITSU CORP	MH648A	EMC2086	2020-11-13	2021-11-12
Active Loop Antenna	EMCO	6502	EMC0523	2018-03-05	2021-03-04
High Pass Filter(915MHz)	FSY MICROWAVE	HM1465-9SS	EMC2079	2020-01-10	2021-01-09
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2020-01-10	2021-01-09
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2019-10-20	2022-10-19
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-19	2023-12-18
MXE EMI Receiver	Keysight	N9038A	EMC2139	2020-11-13	2021-11-12
EXA Signal Analyzer	Keysight	N9010A	EMC2138	2020-09-17	2021-09-16
Trilog Broadband Antenna 30MHz-1GHz	SCHWARZBECKME SS-ELEKTRONIK	VULB 9168	SEM003-18	2019-02-22	2022-02-22
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A

General used equipment

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DMM	Fluke	73	EMC0006	2020-07-09	2021-07-08
DMM	Fluke	73	EMC0007	2020-07-09	2021-07-08

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6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203 & 15.247(c)

6.1.2 Conclusion

Standard Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(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.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 1.5dBi.

Antenna photo please refer to internal photo.



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6.2 Other requirements Frequency Hopping Spread Spectrum System Hopping Sequence

6.2.1 Test Requirement:

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

6.2.2 Conclusion

Standard Requirement:

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

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

> Number of shift register stages: 9

> Length of pseudo-random sequence: $2^9 - 1 = 511$ bits

> Longest sequence of zeros: 8 (non-inverted signal)

Linear Feedback Shift Register for Generation of the PRBS sequence

An example of Pseudorandom Frequency Hopping Sequence as follow:

Each frequency used equally on the average by each transmitter.

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 Bluetooth 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 bands



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7 Radio Spectrum Matter Test Results

7.1 Conducted Peak Output Power

Test Requirement 47 CFR Part 15, Subpart C 15.247(b)(1)

Test Method: ANSI C63.10 (2013) Section 7.8.5

Limit:

Frequency range(MHz)	Output power of the intentional radiator(watt)
902-928	1 for ≥ 50 hopping channels
	0.25 for $25 \leq$ hopping channels < 50
	1 for digital modulation
2400-2483.5	1 for ≥ 75 non-overlapping hopping channels
	0.125 for all other frequency hopping systems
	1 for digital modulation
5725-5850	1 for frequency hopping systems and digital modulation

7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 24.6 °C Humidity: 38.8 % RH Atmospheric Pressure: 1020 mbar

Test Mode: c:TX_non-Hop mode_Keep the EUT in continuously transmitting mode with GFSK modulation, $\pi/4$ DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.

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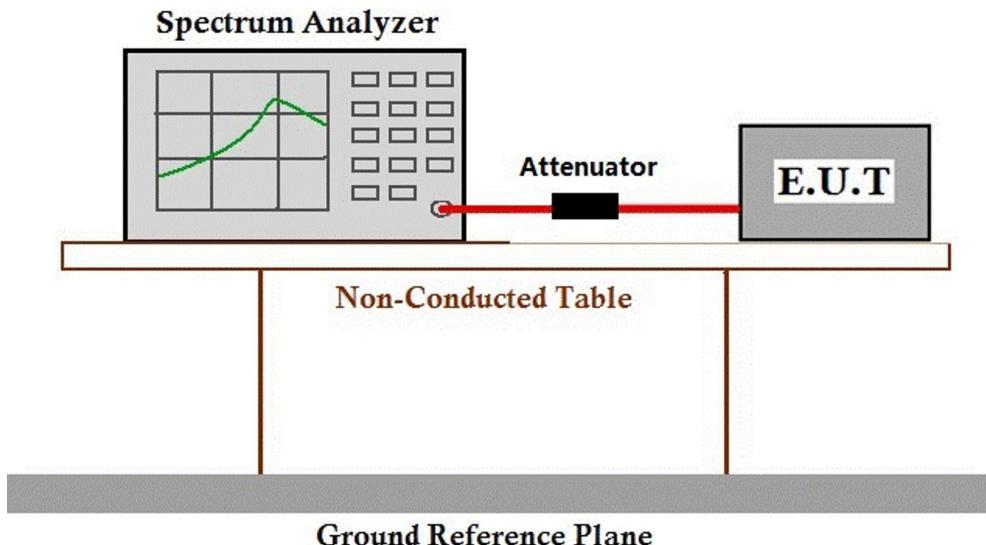
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7.1.2 Test Setup Diagram**7.1.3 Measurement Procedure and Data**

The detailed test data see: Appendix 15.247

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7.2 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.247(a)(1)

Test Method: ANSI C63.10 (2013) Section 7.8.7

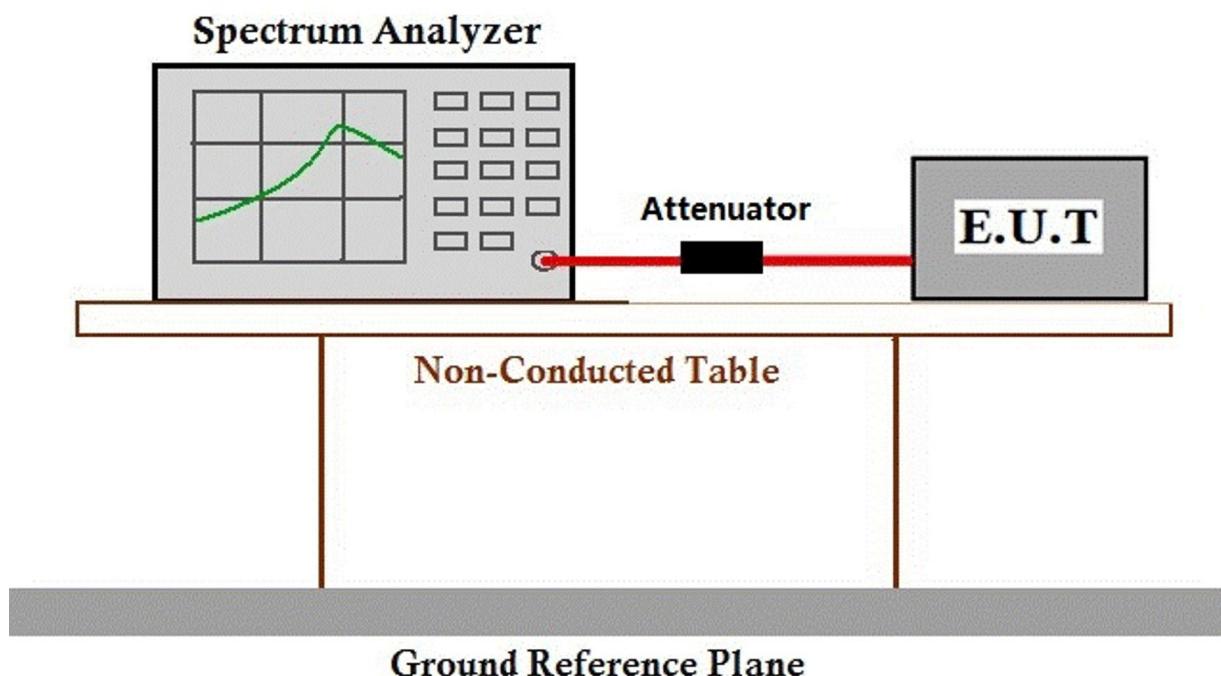
7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 24.6 °C Humidity: 38.8 % RH Atmospheric Pressure: 1020 mbar

Test Mode: c:TX_non-Hop mode_Keep the EUT in continuously transmitting mode with GFSK modulation, π/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.

7.2.2 Test Setup Diagram



7.2.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247



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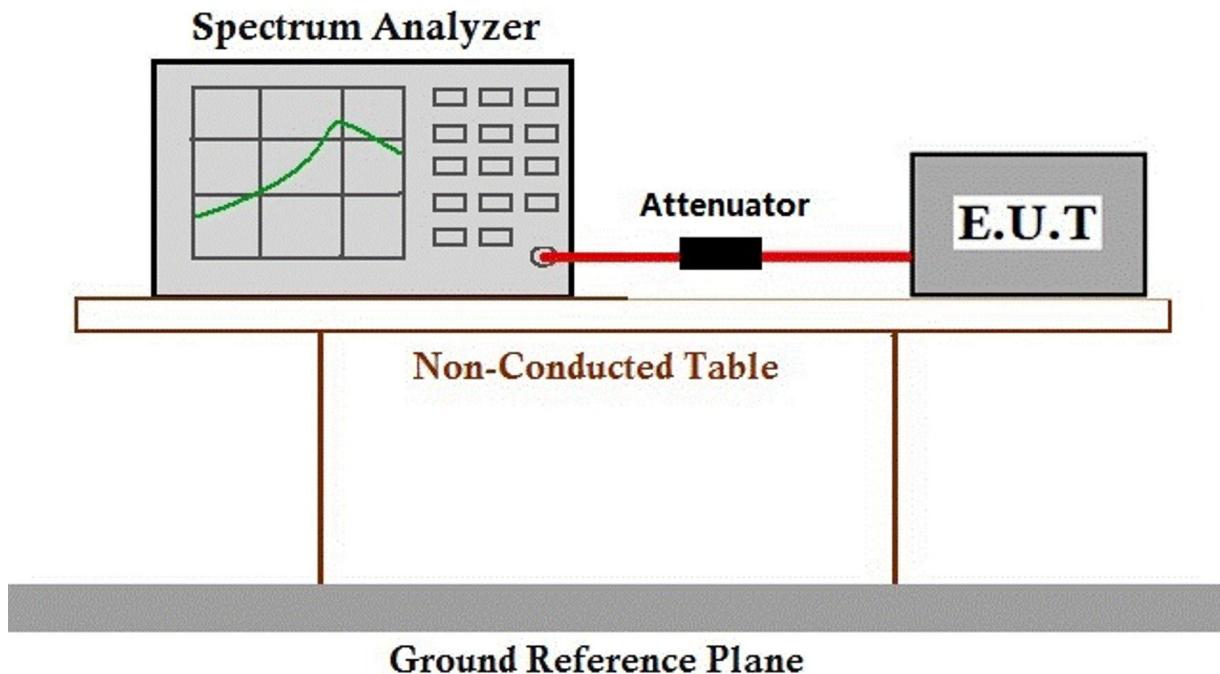
7.3 Carrier Frequencies Separation

Test Requirement 47 CFR Part 15, Subpart C 15.247a(1)
Test Method: ANSI C63.10 (2013) Section 7.8.2
Limit: 2/3 of the 20dB bandwidth base on the transmission power is less than 0.125W

7.3.1 E.U.T. Operation

Operating Environment:
Temperature: 24.6 °C Humidity: 38.8 % RH Atmospheric Pressure: 1020 mbar
Test Mode: b:TX_Hop mode_Keep the EUT in frequency hopping mode with GFSK modulation, π/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.

7.3.2 Test Setup Diagram



7.3.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247



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7.4 Hopping Channel Number

Test Requirement 47 CFR Part 15, Subpart C 15.247a(1)(iii)

Test Method: ANSI C63.10 (2013) Section 7.8.3

Limit:

Frequency range(MHz)	Number of hopping channels (minimum)
902-928	50 for 20dB bandwidth <250kHz
	25 for 20dB bandwidth \geq 250kHz
2400-2483.5	15
5725-5850	75

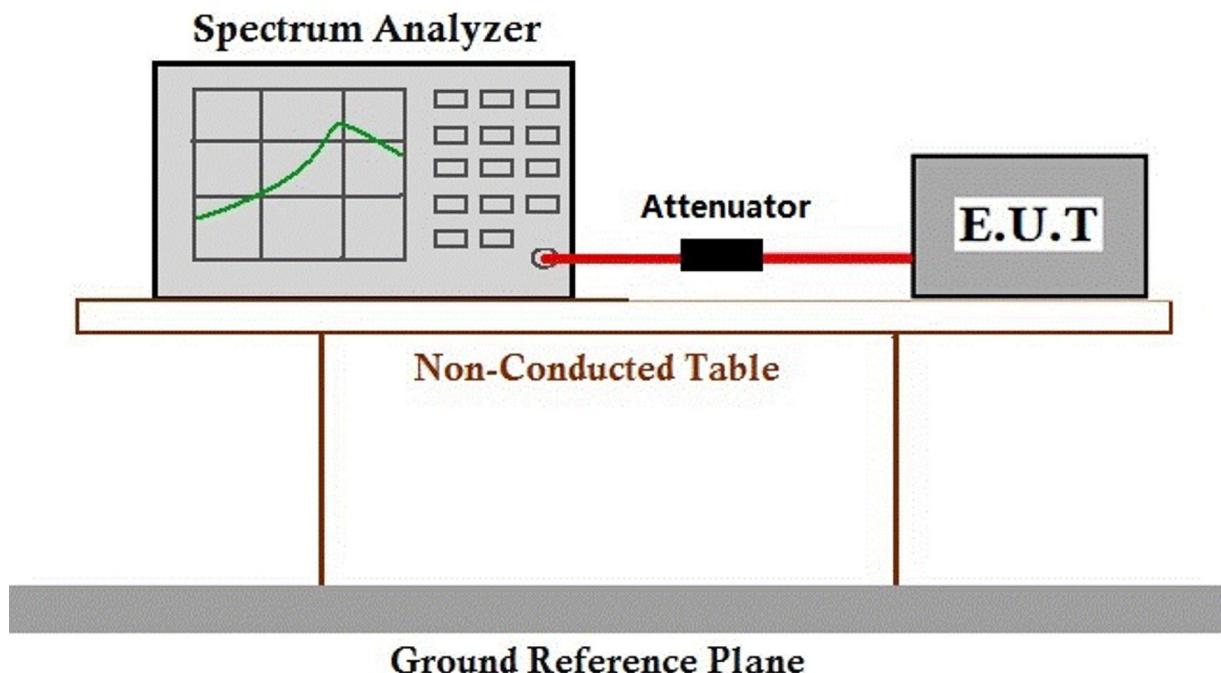
7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 24.6 °C Humidity: 38.8 % RH Atmospheric Pressure: 1020 mbar

Test Mode: b:TX_Hop mode_Keep the EUT in frequency hopping mode with GFSK modulation, π/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.

7.4.2 Test Setup Diagram



7.4.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247

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7.5 Dwell Time

Test Requirement 47 CFR Part 15, Subpart C 15.247a(1)(iii)

Test Method: ANSI C63.10 (2013) Section 7.8.4

Limit:

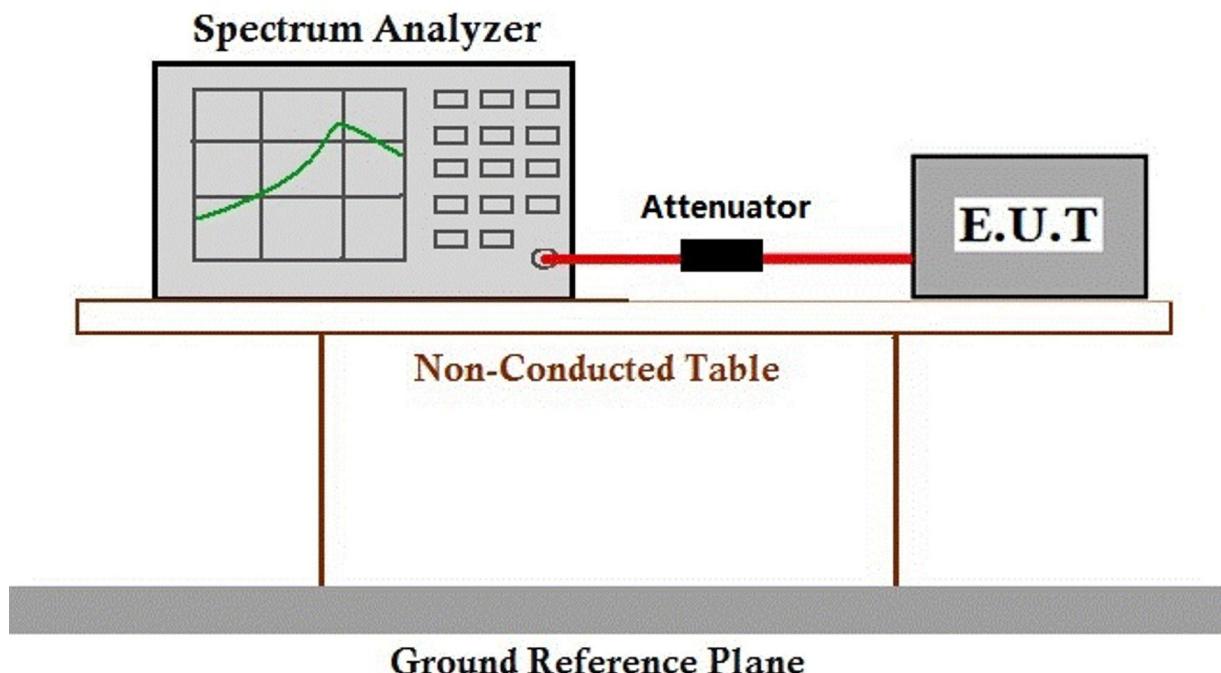
Frequency(MHz)	Limit
902-928	0.4S within a 20S period(20dB bandwidth<250kHz)
	0.4S within a 10S period(20dB bandwidth≥250kHz)
2400-2483.5	0.4S within a period of 0.4S multiplied by the number of hopping channels
5725-5850	0.4S within a 30S period

7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 24.6 °C Humidity: 38.8 % RH Atmospheric Pressure: 1020 mbar

Test Mode: b:TX_Hop mode_Keep the EUT in frequency hopping mode with GFSK modulation, π/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.

7.5.2 Test Setup Diagram**7.5.3 Measurement Procedure and Data**

The detailed test data see: Appendix 15.247



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7.6 Conducted Band Edges Measurement

Test Requirement	47 CFR Part 15, Subpart C 15.247(d)
Test Method:	ANSI C63.10 (2013) Section 7.8.6
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c))

7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 24.6 °C Humidity: 38.8 % RH Atmospheric Pressure: 1020 mbar

Test mode: b:TX_Hop mode_Keep the EUT in frequency hopping mode with GFSK modulation, π/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.

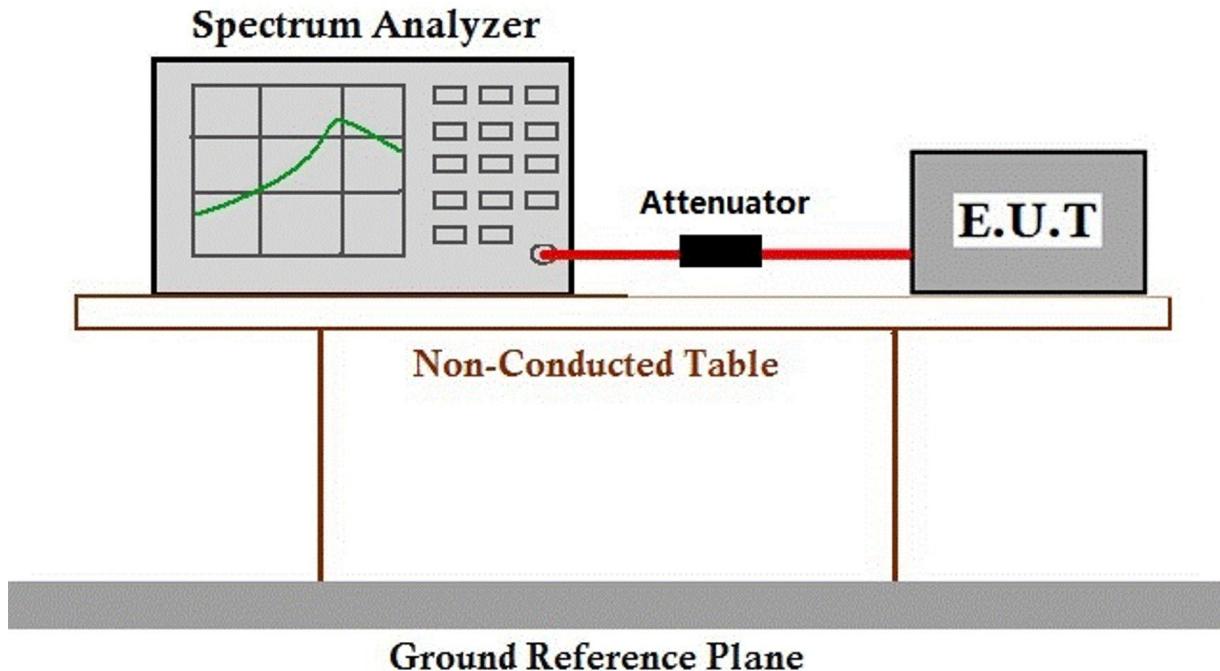
c:TX_non-Hop mode_Keep the EUT in continuously transmitting mode with GFSK modulation, π/4DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.

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7.6.2 Test Setup Diagram**7.6.3 Measurement Procedure and Data**

The detailed test data see: Appendix 15.247

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7.7 Conducted Spurious Emissions

Test Requirement	47 CFR Part 15, Subpart C 15.247(d)
Test Method:	ANSI C63.10 (2013) Section 7.8.8
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c))

7.7.1 E.U.T. Operation

Operating Environment:	
Temperature:	24.6 °C
Test Mode:	Humidity: 38.8 % RH Atmospheric Pressure: 1020 mbar c:TX_non-Hop mode_Keep the EUT in continuously transmitting mode with GFSK modulation, $\pi/4$ DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.

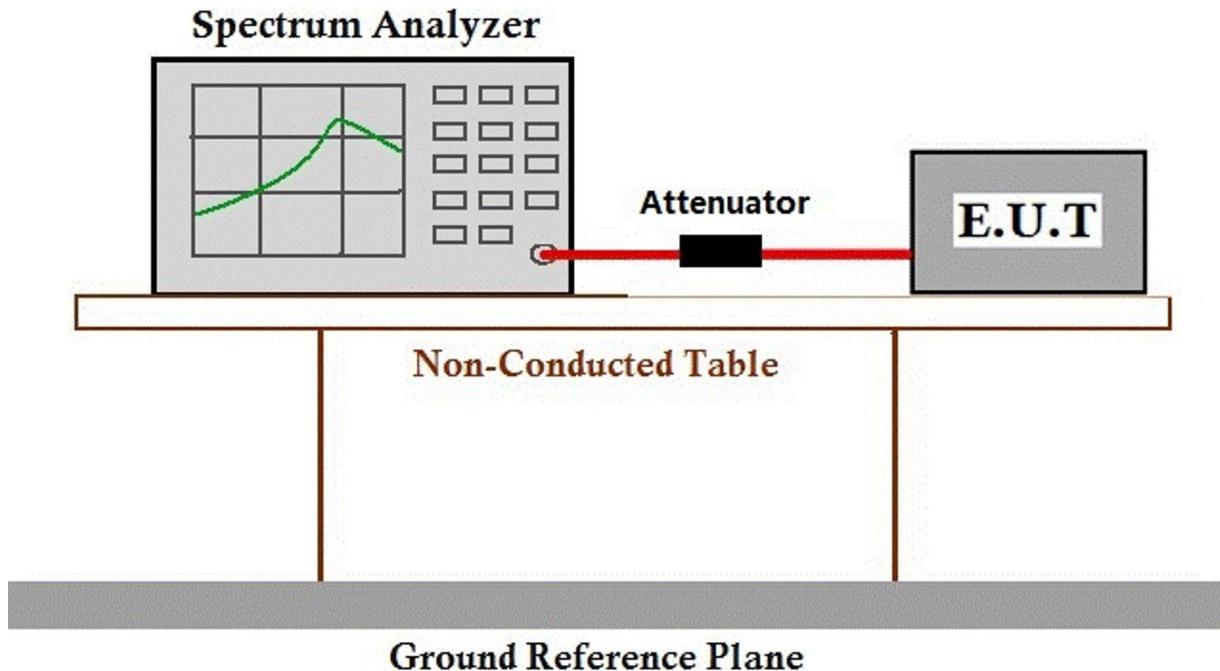
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7.7.2 Test Setup Diagram**7.7.3 Measurement Procedure and Data**

The detailed test data see: Appendix 15.247



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7.8 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.10.5

Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

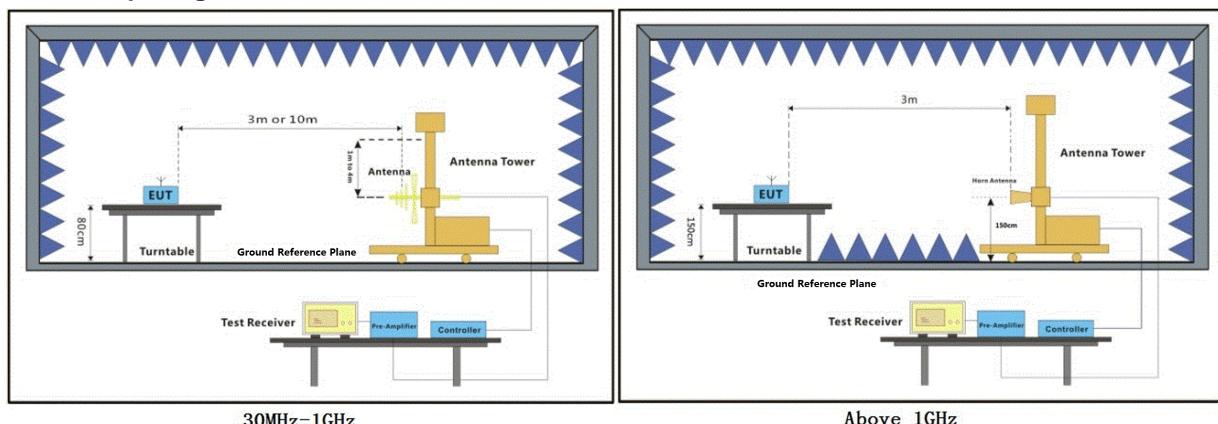
7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 20.8 °C Humidity: 58.8 % RH Atmospheric Pressure: 1020 mbar

Test Mode: c:TX_non-Hop mode_Keep the EUT in continuously transmitting mode with GFSK modulation, $\pi/4$ DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.

7.8.2 Test Setup Diagram



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7.8.3 Measurement Procedure and Data

- a. 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.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. 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.
- d. 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.
- e. 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.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

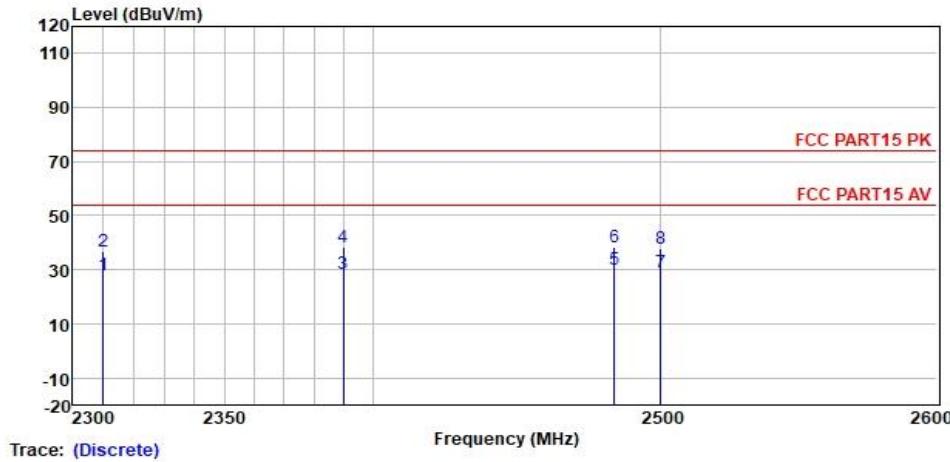


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Mode:c; Polarization:Horizontal; Modulation:GFSK; ; Channel:Low



Site : SGS
 Condition: FCC PART15 PK
 Test Mode: FHSS 2402
 Product :
 Model :
 Remark : Level=Read Level + Cable loss
 + Antenna Factor - Preamp factor

Freq MHz	Read Level dBuV	Antenna Factor dB/m	Cable Loss dB	Preamp Factor dB	Limit Line dBuV/m	Over Limit dBuV/m	Pol/ Phase	Remark
1 2310.00	35.29	27.15	3.32	37.62	28.14	54.00	-25.86	HORIZONTAL Average
2 2310.00	44.09	27.15	3.32	37.62	36.94	74.00	-37.06	HORIZONTAL Peak
3 2390.00	35.52	27.33	3.48	37.59	28.74	54.00	-25.26	HORIZONTAL Average
4 2390.00	45.27	27.33	3.48	37.59	38.49	74.00	-35.51	HORIZONTAL Peak
5 2483.50	36.57	27.48	3.53	37.57	30.01	54.00	-23.99	HORIZONTAL Average
6 2483.50	44.94	27.48	3.53	37.57	38.38	74.00	-35.62	HORIZONTAL Peak
7 2500.00	35.68	27.50	3.40	37.56	29.02	54.00	-24.98	HORIZONTAL Average
8 2500.00	44.53	27.50	3.40	37.56	37.87	74.00	-36.13	HORIZONTAL Peak

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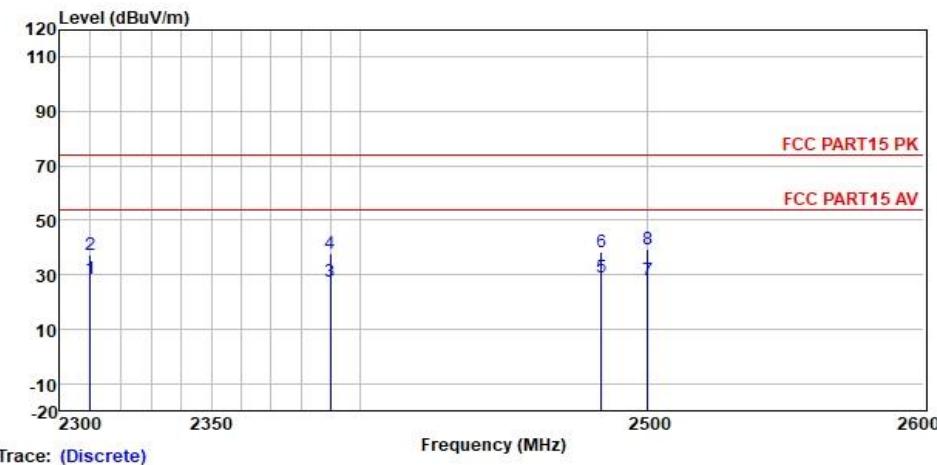


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 Guangzhou Branch Testing Center EEC Laboratory

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邮编: 510663 t (86-20) 82155555 f (86-20) 82075058 sgs.china@sgs.com

Mode:c; Polarization:Vertical; Modulation:GFSK; ; Channel:Low



Site : SGS
 Condition: FCC PART15 PK
 Test Mode: FHSS 2402
 Product :
 Model :
 Remark : Level=Read Level + Cable loss
 : + Antenna Factor - Preamp factor

Freq	Read	Antenna	Cable	Preamp	Limit	Over	Pol/	Remark
	Level	Factor	Loss	Factor				
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2310.00	35.73	27.15	3.32	37.62	28.58	54.00	-25.42 VERTICAL Average
2	2310.00	44.38	27.15	3.32	37.62	37.23	74.00	-36.77 VERTICAL Peak
3	2390.00	34.40	27.33	3.48	37.59	27.62	54.00	-26.38 VERTICAL Average
4	2390.00	44.40	27.33	3.48	37.59	37.62	74.00	-36.38 VERTICAL Peak
5	2483.50	35.88	27.48	3.53	37.57	29.32	54.00	-24.68 VERTICAL Average
6	2483.50	44.77	27.48	3.53	37.57	38.21	74.00	-35.79 VERTICAL Peak
7	2500.00	34.45	27.50	3.40	37.56	27.79	54.00	-26.21 VERTICAL Average
8	2500.00	46.01	27.50	3.40	37.56	39.35	74.00	-34.65 VERTICAL Peak

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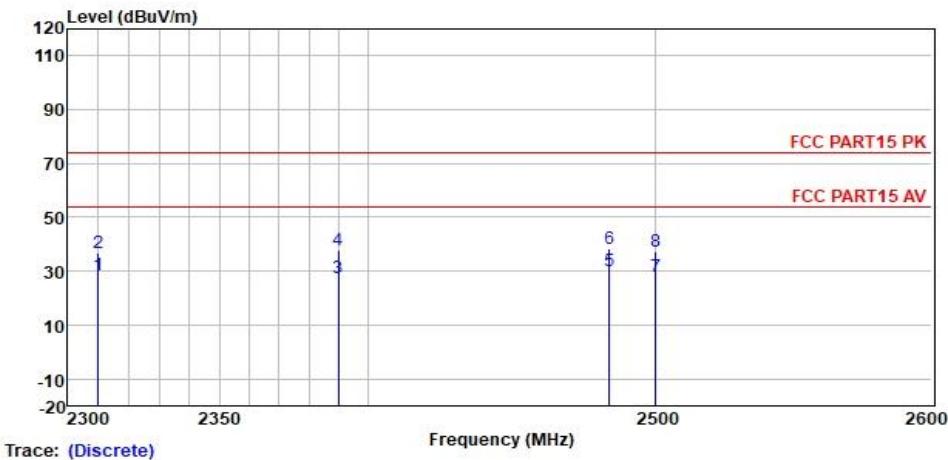


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邮编: 510663 t (86-20) 82155555 f (86-20) 82075058 sgs.china@sgs.com

Mode:c; Polarization:Horizontal; Modulation:GFSK; ; Channel:High



Site : SGS
 Condition: FCC PART15 PK
 Test Mode: FHSS 2480
 Product :
 Model :
 Remark : Level=Read Level + Cable loss
 : + Antenna Factor - Preamp factor

Freq	Read	Antenna	Cable	Preamp	Limit	Over	Pol/	Remark
	Level	Factor	Loss	Factor				
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 2310.00	35.64	27.15	3.32	37.62	28.49	54.00	-25.51	HORIZONTAL Average
2 2310.00	43.77	27.15	3.32	37.62	36.62	74.00	-37.38	HORIZONTAL Peak
3 2390.00	34.17	27.33	3.48	37.59	27.39	54.00	-26.61	HORIZONTAL Average
4 2390.00	44.87	27.33	3.48	37.59	38.09	74.00	-35.91	HORIZONTAL Peak
5 2483.50	36.76	27.48	3.53	37.57	30.20	54.00	-23.80	HORIZONTAL Average
6 2483.50	45.07	27.48	3.53	37.57	38.51	74.00	-35.49	HORIZONTAL Peak
7 2500.00	34.90	27.50	3.40	37.56	28.24	54.00	-25.76	HORIZONTAL Average
8 2500.00	44.11	27.50	3.40	37.56	37.45	74.00	-36.55	HORIZONTAL Peak

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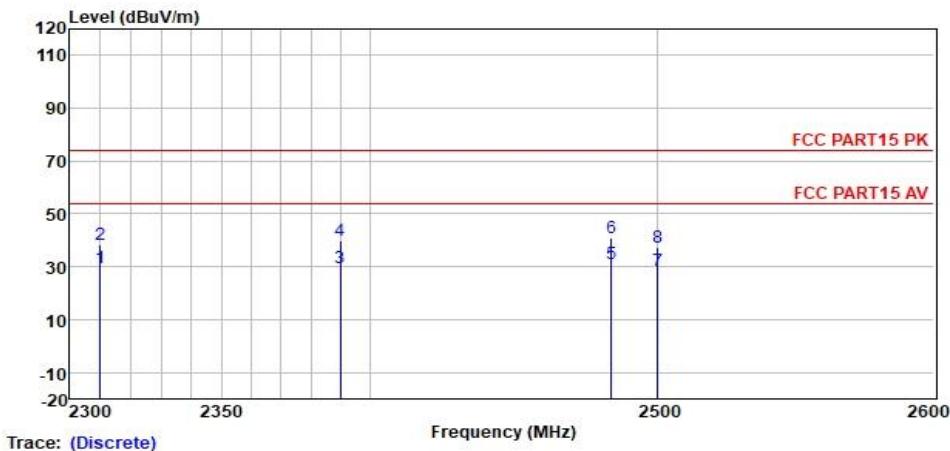


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Mode:c; Polarization:Vertical; Modulation:GFSK; ; Channel:High



Site : SGS
 Condition: FCC PART15 PK
 Test Mode: FHSS 2480
 Product :
 Model :
 Remark : Level=Read Level + Cable loss
 : + Antenna Factor - Preamp factor

Freq	Read	Antenna	Cable	Preamp	Limit	Over	Pol/	Phase	Remark
	Level	Factor	Loss	Factor					
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.00	36.54	27.15	3.32	37.62	29.39	54.00	-24.61	VERTICAL Average
2	2310.00	45.60	27.15	3.32	37.62	38.45	74.00	-35.55	VERTICAL Peak
3	2390.00	36.55	27.33	3.48	37.59	29.77	54.00	-24.23	VERTICAL Average
4	2390.00	46.48	27.33	3.48	37.59	39.70	74.00	-34.30	VERTICAL Peak
5	2483.50	37.64	27.48	3.53	37.57	31.08	54.00	-22.92	VERTICAL Average
6	2483.50	47.29	27.48	3.53	37.57	40.73	74.00	-33.27	VERTICAL Peak
7	2500.00	35.08	27.50	3.40	37.56	28.42	54.00	-25.58	VERTICAL Average
8	2500.00	43.86	27.50	3.40	37.56	37.20	74.00	-36.80	VERTICAL Peak

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7.9 Radiated Spurious Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.4,6.5,6.6

Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

7.9.1 E.U.T. Operation

Operating Environment:

Temperature: 20.8 °C Humidity: 58.8 % RH Atmospheric Pressure: 1020 mbar

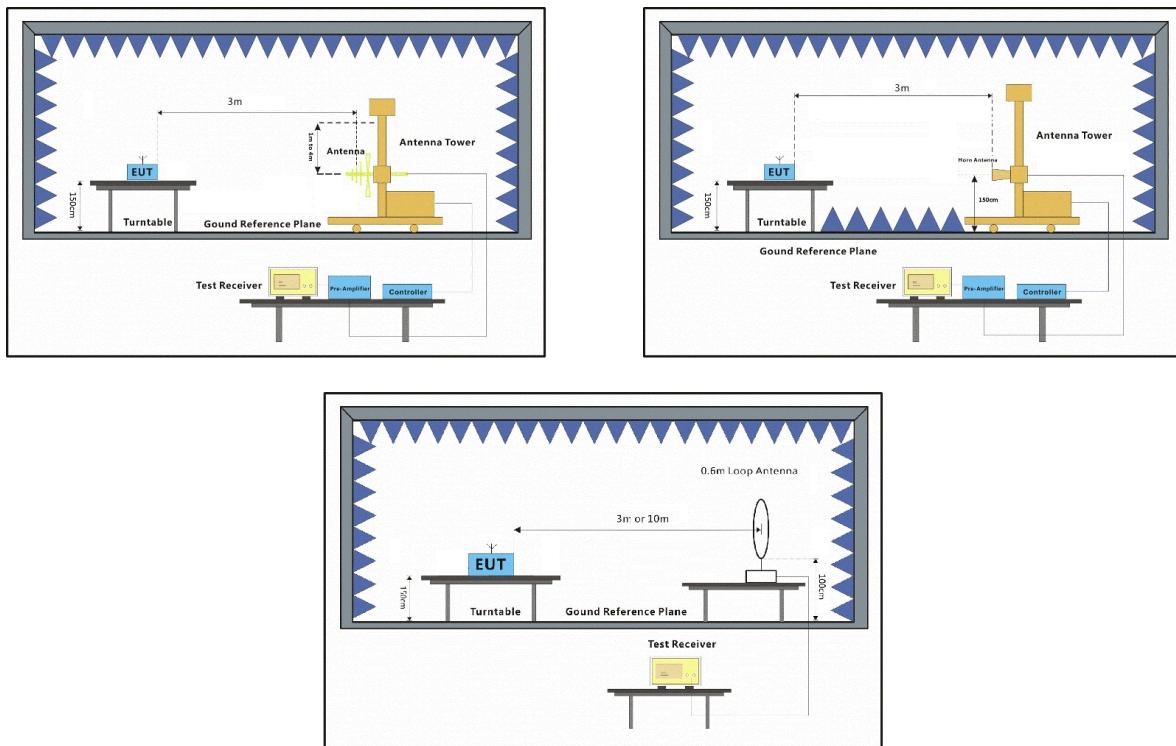
Test Mode: c:TX_non-Hop mode_Keep the EUT in continuously transmitting mode with GFSK modulation, $\pi/4$ DQPSK modulation, 8DPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.

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7.9.2 Test Setup Diagram

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7.9.3 Measurement Procedure and Data

- a. 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.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. 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.
- d. 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.
- e. 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.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark:

- 1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

- 3) Scan from 9kHz to 25GHz, the disturbance above 18GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

- 4) For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown



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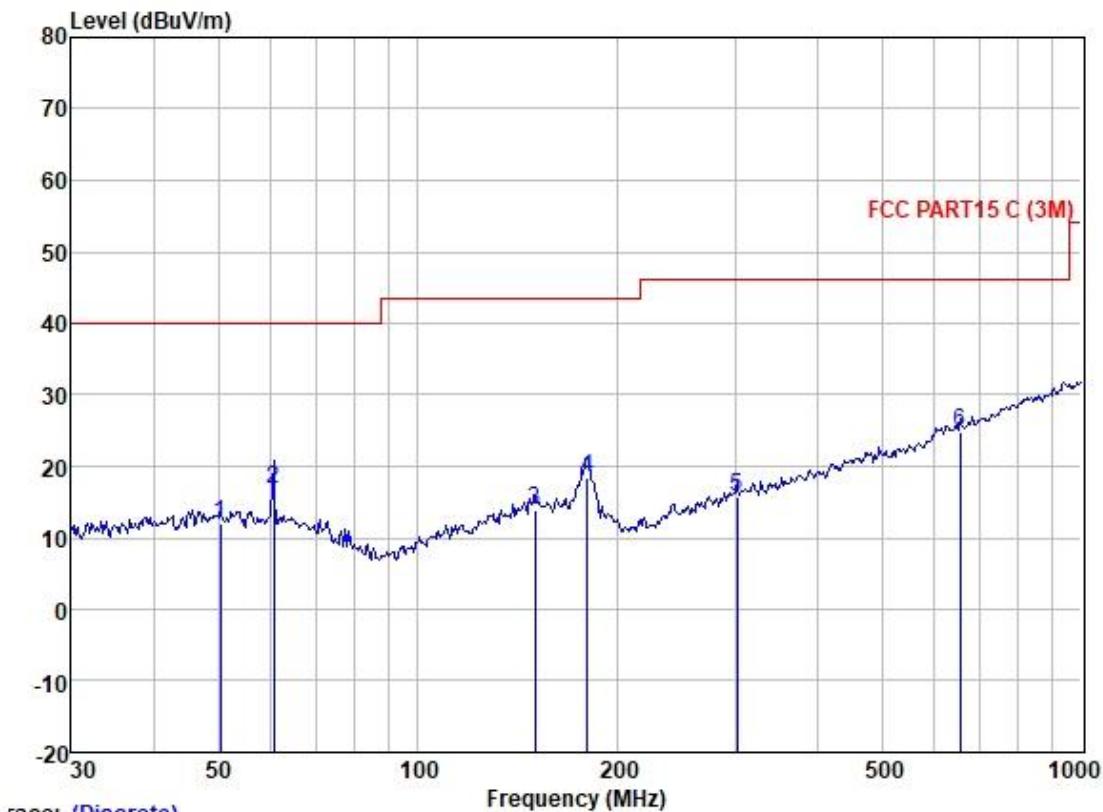
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Mode:c; Polarization:Horizontal; Modulation:GFSK; ; Channel:Low



Trace: (Discrete)
 Site : SGS
 Condition: FCC PART15 C (3M) 3m HORIZONTAL
 Job :
 Model :
 Power :
 Test Mode:

Freq	ReadAntenna	Cable	Preamp	Limit	Over	Pol/Phase	Remark
	Level	Factor	Loss				
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1 50.409	24.17	13.91	1.15	27.17	12.06	40.00	-27.94 HORIZONTAL QP
2 60.492	29.42	13.33	1.27	27.16	16.86	40.00	-23.14 HORIZONTAL QP
3 150.011	24.73	13.80	2.24	26.84	13.93	43.50	-29.57 HORIZONTAL QP
4 180.017	30.62	12.00	2.44	26.75	18.31	43.50	-25.19 HORIZONTAL QP
5 302.481	25.59	13.65	3.18	26.56	15.86	46.00	-30.14 HORIZONTAL QP
6 656.530	26.78	20.55	5.56	28.18	24.71	46.00	-21.29 HORIZONTAL QP

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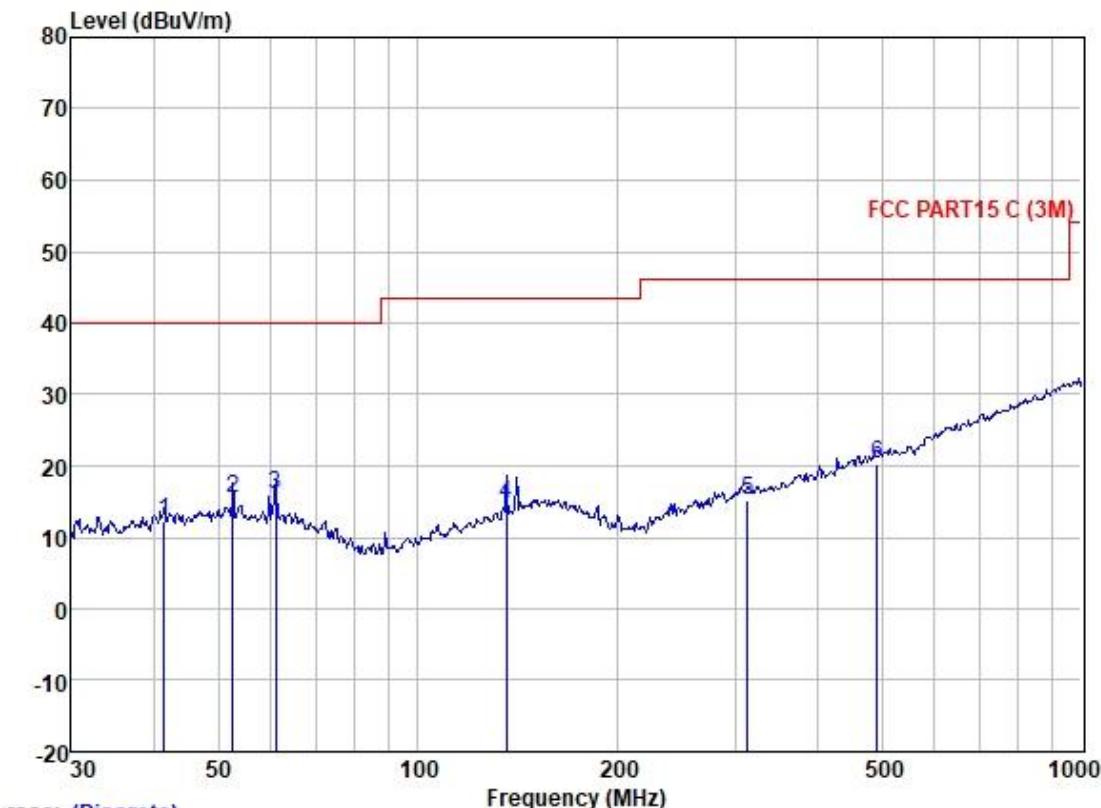


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Mode:c; Polarization:Vertical; Modulation:GFSK; ; Channel:Low



Race: (Discrete)

Site : SGS

Condition: FCC PART15 C (3M) 3m VERTICAL

Job :

Model :

Power :

Test Mode:

Freq	Read	Antenna	Cable	Preamp	Limit	Over	Pol/Phase	Remark
	MHz	Level	Factor	Loss				
1	41.422	24.55	13.65	1.11	27.17	12.14	40.00	-27.86 VERTICAL QP
2	52.575	27.63	13.94	1.16	27.17	15.56	40.00	-24.44 VERTICAL QP
3	60.918	28.67	13.25	1.27	27.16	16.03	40.00	-23.97 VERTICAL QP
4	135.982	26.81	12.80	2.03	26.96	14.68	43.50	-28.82 VERTICAL QP
5	313.276	24.50	14.04	3.26	26.62	15.18	46.00	-30.82 VERTICAL QP
6	492.469	25.97	17.85	4.37	27.95	20.24	46.00	-25.76 VERTICAL QP

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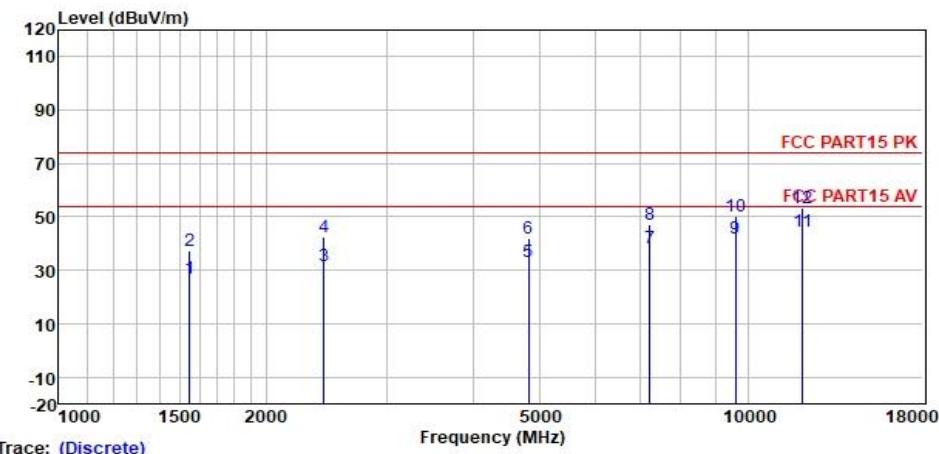


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Mode:c; Polarization:Horizontal; Modulation:GFSK; ; Channel:Low



Site : SGS
 Condition: FCC PART15 PK
 Test Mode: FHSS 2402
 Product :
 Model :
 Remark : Level=Read Level + Cable loss
 : + Antenna Factor - Preamp factor

Freq	Read	Antena	Cable	Preamp	Limit	Over	Pol/	Phase	Remark
	Level	Factor	Loss	Factor					
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1547.20	36.61	25.53	2.80	38.03	26.91	54.00	-27.09	HORIZONTAL Average
2	1547.20	46.90	25.53	2.80	38.03	37.20	74.00	-36.80	HORIZONTAL Peak
3	2428.67	38.44	27.40	3.43	37.58	31.69	54.00	-22.31	HORIZONTAL Average
4	2428.67	49.28	27.40	3.43	37.58	42.53	74.00	-31.47	HORIZONTAL Peak
5	4804.51	33.31	31.42	5.40	36.83	33.30	54.00	-20.70	HORIZONTAL Average
6	4804.51	41.84	31.42	5.40	36.83	41.83	74.00	-32.17	HORIZONTAL Peak
7	7206.21	34.05	35.54	5.98	37.38	38.19	54.00	-15.81	HORIZONTAL Average
8	7206.21	43.02	35.54	5.98	37.38	47.16	74.00	-26.84	HORIZONTAL Peak
9	9608.80	33.77	38.37	7.07	37.42	41.79	54.00	-12.21	HORIZONTAL Average
10	9608.80	42.19	38.37	7.07	37.42	50.21	74.00	-23.79	HORIZONTAL Peak
11	12010.47	34.61	38.90	8.19	37.10	44.60	54.00	-9.40	HORIZONTAL Average
12	12010.47	43.30	38.90	8.19	37.10	53.29	74.00	-20.71	HORIZONTAL Peak

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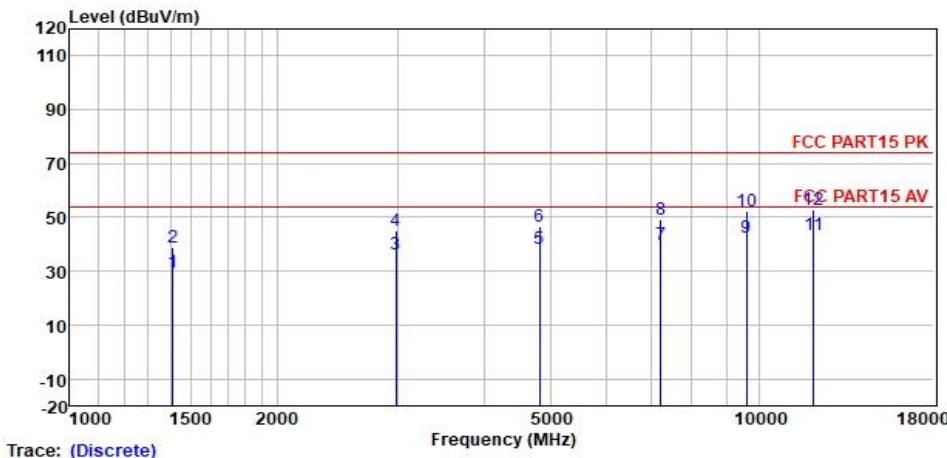


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Mode:c; Polarization:Vertical; Modulation:GFSK; ; Channel:Low



Site : SGS
 Condition: FCC PART15 PK
 Test Mode: FHSS 2402
 Product :
 Model :
 Remark : Level=Read Level + Cable loss
 + Antenna Factor - Preamp factor

Freq	Read		Antenna Factor	Cable Loss	Preamp Factor	Limit	Over Line	Over Phase	Pol/Phase	Remark
	Freq	Level								
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1410.51	39.69	25.40	2.62	38.22	29.49	54.00	-24.51	VERTICAL	Average
2	1410.51	49.20	25.40	2.62	38.22	39.00	74.00	-35.00	VERTICAL	Peak
3	2973.29	41.33	28.38	3.78	37.28	36.21	54.00	-17.79	VERTICAL	Average
4	2973.29	50.39	28.38	3.78	37.28	45.27	74.00	-28.73	VERTICAL	Peak
5	4804.62	38.22	31.42	5.40	36.83	38.21	54.00	-15.79	VERTICAL	Average
6	4804.62	46.42	31.42	5.40	36.83	46.41	74.00	-27.59	VERTICAL	Peak
7	7206.11	36.04	35.54	5.98	37.38	40.18	54.00	-13.82	VERTICAL	Average
8	7206.11	45.27	35.54	5.98	37.38	49.41	74.00	-24.59	VERTICAL	Peak
9	9608.68	34.44	38.37	7.07	37.42	42.46	54.00	-11.54	VERTICAL	Average
10	9608.68	44.09	38.37	7.07	37.42	52.11	74.00	-21.89	VERTICAL	Peak
11	12010.23	33.68	38.90	8.19	37.10	43.67	54.00	-10.33	VERTICAL	Average
12	12010.23	42.72	38.90	8.19	37.10	52.71	74.00	-21.29	VERTICAL	Peak

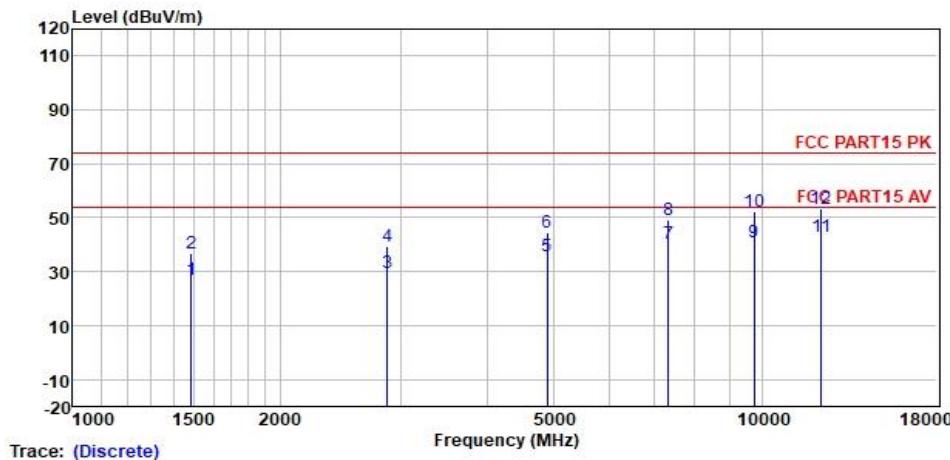
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Mode:c; Polarization:Horizontal; Modulation:GFSK; ; Channel:middle



Trace: (Discrete)

Site : SGS
 Condition: FCC PART15 PK
 Test Mode: FHSS 2441
 Product :
 Model :
 Remark : Level=Read Level + Cable loss
 : + Antenna Factor - Preamp factor

Freq	Read	Antenna	Cable	Preamp	Limit	Over	Pol/	Remark
	Freq	Level	Factor	Loss				
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1485.84	36.66	25.49	2.78	38.13	26.80	54.00	-27.20 HORIZONTAL Average
2	1485.84	46.54	25.49	2.78	38.13	36.68	74.00	-37.32 HORIZONTAL Peak
3	2863.65	35.23	28.25	3.70	37.36	29.82	54.00	-24.18 HORIZONTAL Average
4	2863.65	44.80	28.25	3.70	37.36	39.39	74.00	-34.61 HORIZONTAL Peak
5	4882.62	35.72	31.56	5.52	36.84	35.96	54.00	-18.04 HORIZONTAL Average
6	4882.62	44.37	31.56	5.52	36.84	44.61	74.00	-29.39 HORIZONTAL Peak
7	7323.79	35.81	36.00	6.13	37.43	40.51	54.00	-13.49 HORIZONTAL Average
8	7323.79	44.33	36.00	6.13	37.43	49.03	74.00	-24.97 HORIZONTAL Peak
9	9764.16	33.08	38.50	7.02	37.41	41.19	54.00	-12.81 HORIZONTAL Average
10	9764.16	43.99	38.50	7.02	37.41	52.10	74.00	-21.90 HORIZONTAL Peak
11	12205.16	33.46	38.74	8.08	37.00	43.28	54.00	-10.72 HORIZONTAL Average
12	12205.16	43.52	38.74	8.08	37.00	53.34	74.00	-20.66 HORIZONTAL Peak

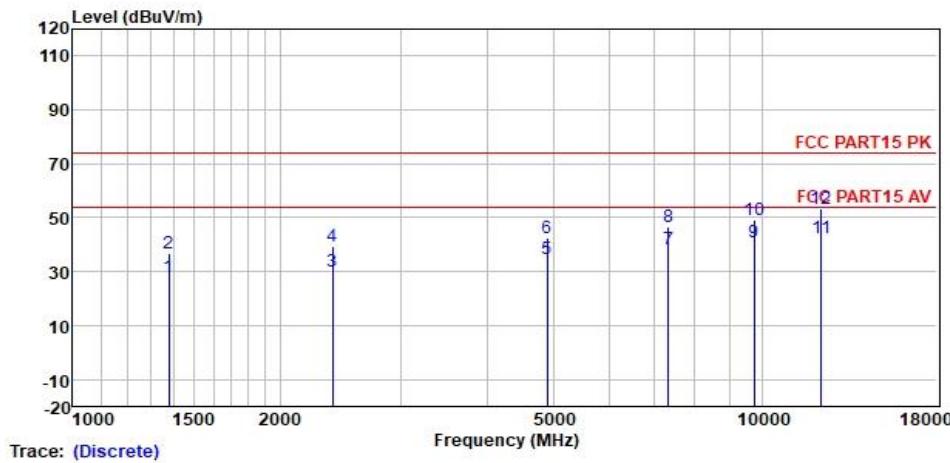
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Mode:c; Polarization:Vertical; Modulation:GFSK; ; Channel:middle



Site : SGS
 Condition: FCC PART15 PK
 Test Mode: FHSS 2441
 Product :
 Model :
 Remark : Level=Read Level + Cable loss
 : + Antenna Factor - Preamp factor

Freq	Read	Antenna	Cable	Preamp	Limit	Over	Pol/	Remark
	Level	Factor	Loss	Factor				
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1378.27	38.20	25.36	2.60	38.25	27.91	54.00	-26.09 VERTICAL Average
2	1378.27	47.24	25.36	2.60	38.25	36.95	74.00	-37.05 VERTICAL Peak
3	2380.03	37.14	27.31	3.46	37.60	30.31	54.00	-23.69 VERTICAL Average
4	2380.03	46.23	27.31	3.46	37.60	39.40	74.00	-34.60 VERTICAL Peak
5	4882.38	34.66	31.56	5.52	36.84	34.90	54.00	-19.10 VERTICAL Average
6	4882.38	42.46	31.56	5.52	36.84	42.70	74.00	-31.30 VERTICAL Peak
7	7323.14	33.64	36.00	6.13	37.43	38.34	54.00	-15.66 VERTICAL Average
8	7323.14	42.13	36.00	6.13	37.43	46.83	74.00	-27.17 VERTICAL Peak
9	9764.47	33.03	38.50	7.02	37.41	41.14	54.00	-12.86 VERTICAL Average
10	9764.47	41.35	38.50	7.02	37.41	49.46	74.00	-24.54 VERTICAL Peak
11	12205.18	32.64	38.74	8.08	37.00	42.46	54.00	-11.54 VERTICAL Average
12	12205.18	43.73	38.74	8.08	37.00	53.55	74.00	-20.45 VERTICAL Peak

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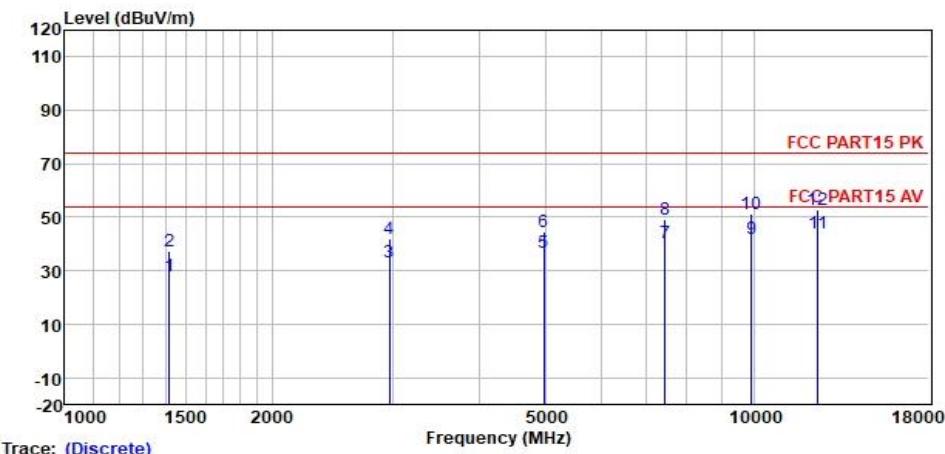


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Mode:c; Polarization:Horizontal; Modulation:GFSK; ; Channel:High



Site : SGS
 Condition: FCC PART15 PK
 Test Mode: FHSS 2480
 Product :
 Model :
 Remark : Level=Read Level + Cable loss
 : + Antenna Factor - Preamp factor

Freq MHz	Read Level dBuV	Antena Factor dB/m	Cable Loss dB	Preamp Factor dB	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Pol/ Phase	Remark
	MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m	dB		
1	1418.69	37.99	25.42	2.63	38.20	27.84	54.00	-26.16	HORIZONTAL Average
2	1418.69	47.71	25.42	2.63	38.20	37.56	74.00	-36.44	HORIZONTAL Peak
3	2956.16	38.51	28.36	3.76	37.30	33.33	54.00	-20.67	HORIZONTAL Average
4	2956.16	47.17	28.36	3.76	37.30	41.99	74.00	-32.01	HORIZONTAL Peak
5	4960.41	36.23	31.65	5.65	36.84	36.69	54.00	-17.31	HORIZONTAL Average
6	4960.41	44.16	31.65	5.65	36.84	44.62	74.00	-29.38	HORIZONTAL Peak
7	7440.05	35.19	36.27	6.22	37.47	40.21	54.00	-13.79	HORIZONTAL Average
8	7440.05	43.97	36.27	6.22	37.47	48.99	74.00	-25.01	HORIZONTAL Peak
9	9920.48	34.03	38.65	6.96	37.40	42.24	54.00	-11.76	HORIZONTAL Average
10	9920.48	43.00	38.65	6.96	37.40	51.21	74.00	-22.79	HORIZONTAL Peak
11	12400.54	34.21	38.57	7.97	36.88	43.87	54.00	-10.13	HORIZONTAL Average
12	12400.54	43.30	38.57	7.97	36.88	52.96	74.00	-21.04	HORIZONTAL Peak

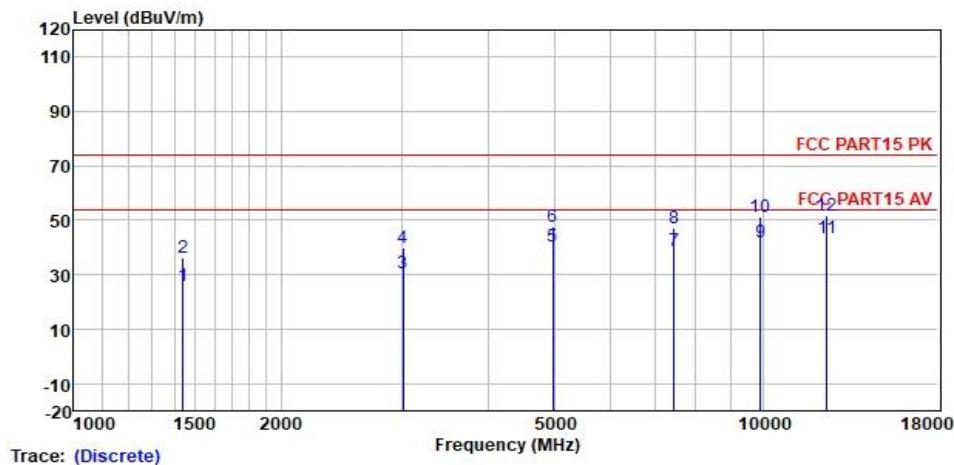
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Mode:c; Polarization:Vertical; Modulation:GFSK; ; Channel:High



Site : SGS
 Condition: FCC PART15 PK
 Test Mode: FHSS 2480
 Product :
 Model :
 Remark : Level=Read Level + Cable loss
 : + Antenna Factor - Preamp factor

Freq	Read	Antenna	Cable	Preamp	Limit	Over	Pol/	Remark
	Level	Factor	Loss	Factor				
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1439.34	36.15	25.44	2.68	38.17	26.10	54.00	-27.90 VERTICAL Average
2	1439.34	46.44	25.44	2.68	38.17	36.39	74.00	-37.61 VERTICAL Peak
3	3007.87	35.86	28.41	3.81	37.25	30.83	54.00	-23.17 VERTICAL Average
4	3007.87	45.12	28.41	3.81	37.25	40.09	74.00	-33.91 VERTICAL Peak
5	4960.49	39.79	31.65	5.65	36.84	40.25	54.00	-13.75 VERTICAL Average
6	4960.49	47.21	31.65	5.65	36.84	47.67	74.00	-26.33 VERTICAL Peak
7	7440.76	33.88	36.27	6.22	37.47	38.90	54.00	-15.10 VERTICAL Average
8	7440.76	42.07	36.27	6.22	37.47	47.09	74.00	-26.91 VERTICAL Peak
9	9920.88	33.62	38.65	6.96	37.40	41.83	54.00	-12.17 VERTICAL Average
10	9920.88	42.99	38.65	6.96	37.40	51.20	74.00	-22.80 VERTICAL Peak
11	12400.02	33.93	38.57	7.97	36.88	43.59	54.00	-10.41 VERTICAL Average
12	12400.02	42.19	38.57	7.97	36.88	51.85	74.00	-22.15 VERTICAL Peak

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8 Test Setup Photo

Refer to Appendix_ Setup Photo for GZCR211102132802



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9 EUT Constructional Details

Refer to Appendix – External and Internal Photos for GZCR2111021328AT

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10 Appendix

Cable Loss=0.9 dB

10.1 Appendix A: 20dB Emission Bandwidth

10.1.1 Test Result

TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.915	2401.493	2402.408	---	PASS
		2441	1.026	2440.499	2441.525	---	PASS
		2480	0.963	2479.547	2480.510	---	PASS
2DH5	Ant1	2402	1.233	2401.379	2402.612	---	PASS
		2441	1.164	2440.409	2441.573	---	PASS
		2480	1.182	2479.409	2480.591	---	PASS
3DH5	Ant1	2402	1.254	2401.364	2402.618	---	PASS
		2441	1.245	2440.370	2441.615	---	PASS
		2480	1.164	2479.430	2480.594	---	PASS



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10.1.2 Test Graphs



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10.2 Appendix B: Maximum conducted output power**10.2.1 Test Result**

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	2402	3.22	<=20.97	PASS
		2441	1.57	<=20.97	PASS
		2480	1.08	<=20.97	PASS
2DH5	Ant1	2402	3.21	<=20.97	PASS
		2441	1.59	<=20.97	PASS
		2480	1.06	<=20.97	PASS
3DH5	Ant1	2402	3.2	<=20.97	PASS
		2441	1.61	<=20.97	PASS
		2480	1.11	<=20.97	PASS

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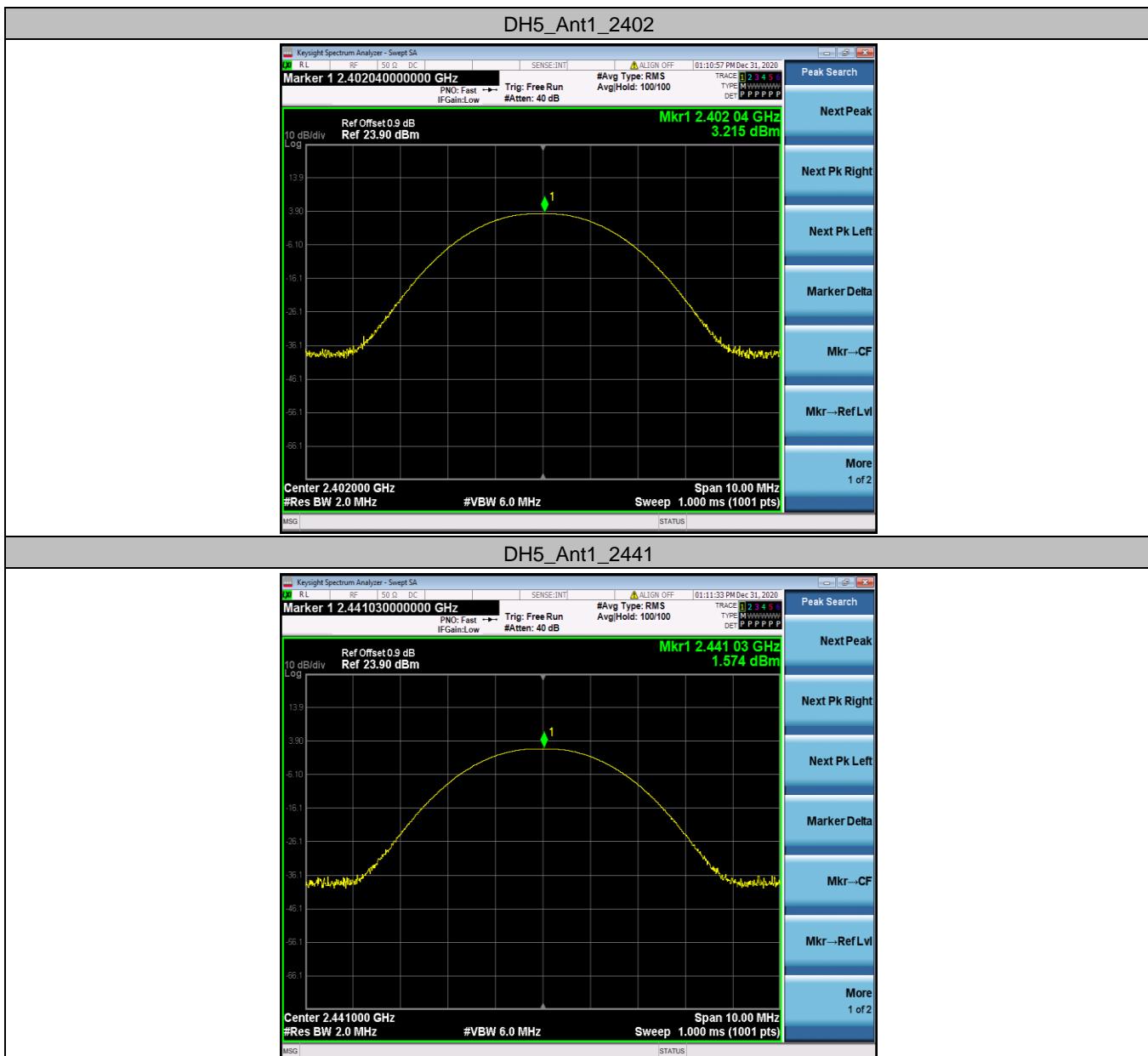
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10.2.2 Test Graphs

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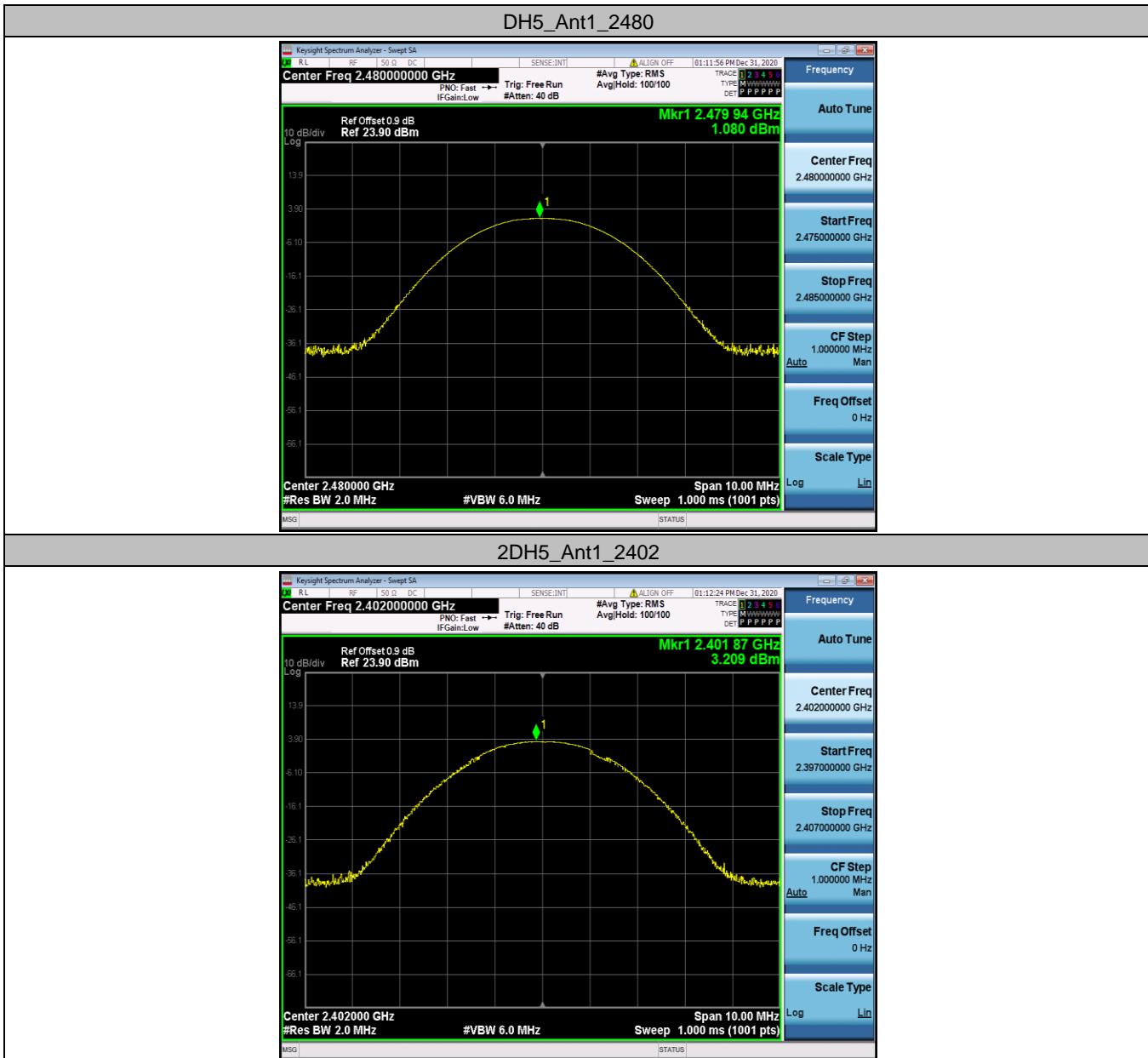
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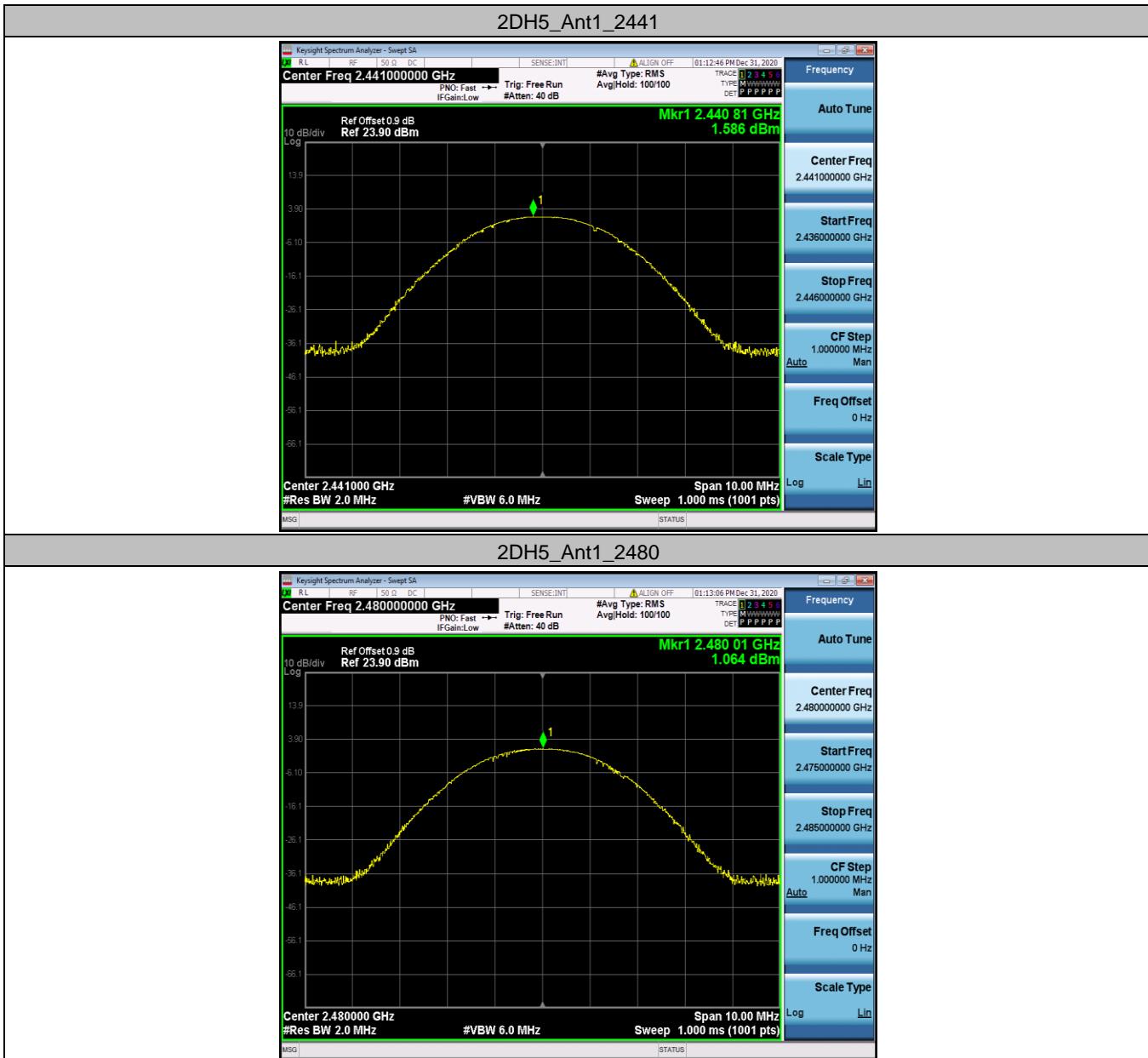


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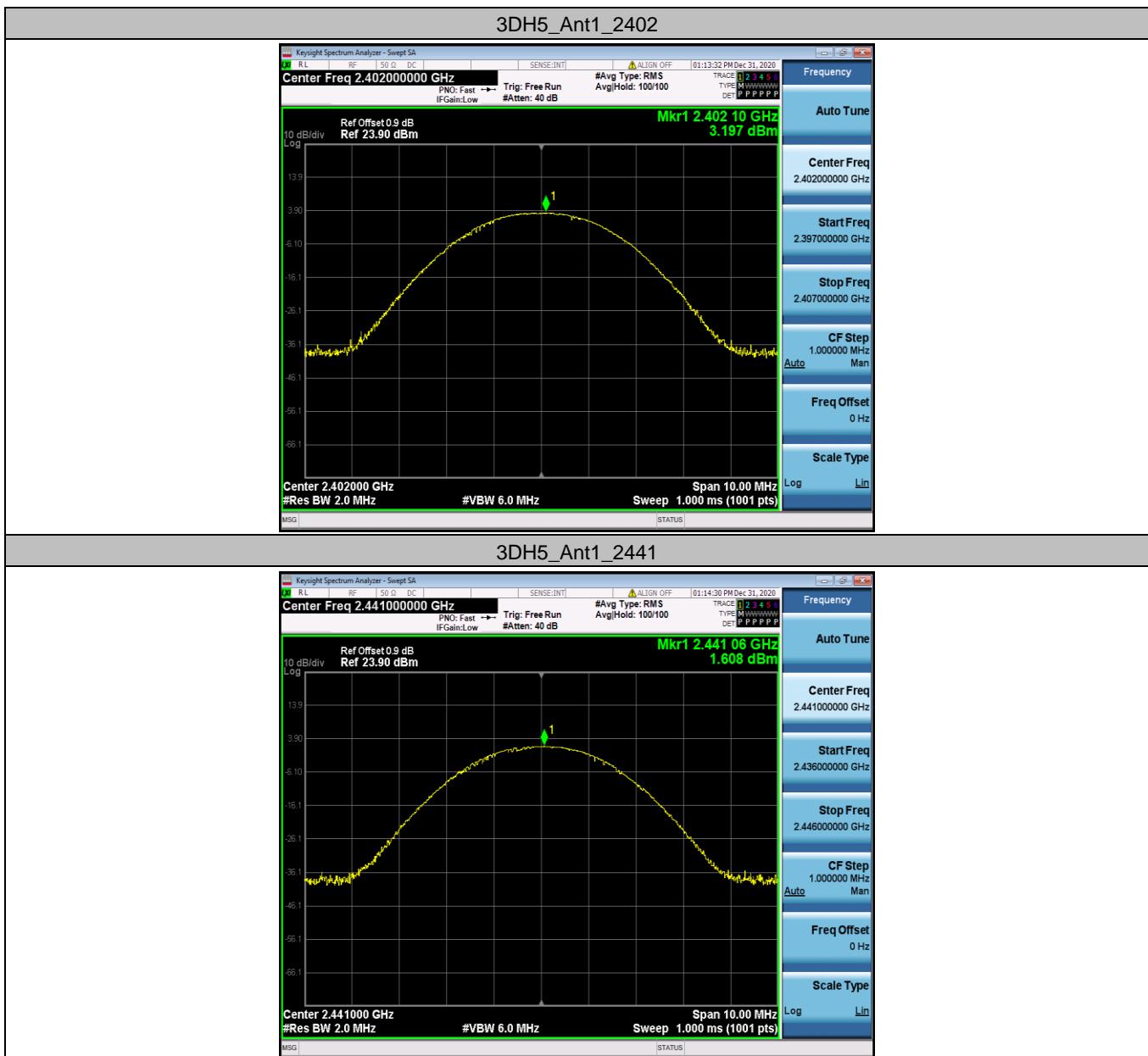


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10.3 Appendix C: Carrier frequency separation

10.3.1 Test Result

TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop_2402	1.011	>=0.610	PASS
		Hop_2441	1.005	>=0.684	PASS
		Hop_2480	1.101	>=0.642	PASS

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10.3.2 Test Graphs



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10.4 Appendix D: Time of occupancy**10.4.1 Test Result**

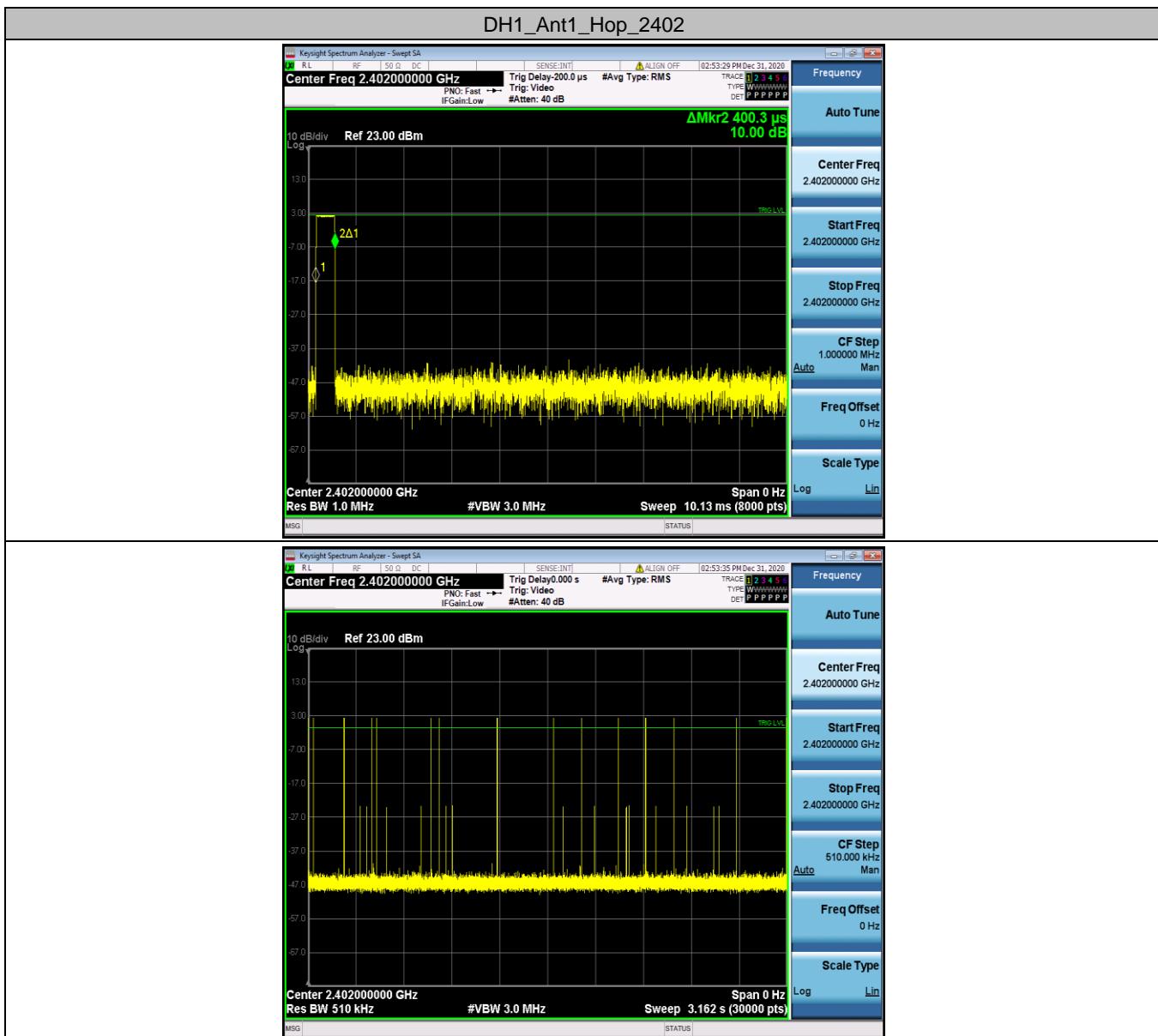
TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop_2402	0.40	160	0.064	<=0.4	PASS
		Hop_2441	0.40	140	0.056	<=0.4	PASS
		Hop_2480	0.40	150	0.06	<=0.4	PASS
DH3	Ant1	Hop_2402	1.66	80	0.132	<=0.4	PASS
		Hop_2441	1.66	110	0.182	<=0.4	PASS
		Hop_2480	1.66	110	0.182	<=0.4	PASS
DH5	Ant1	Hop_2402	2.90	90	0.261	<=0.4	PASS
		Hop_2441	2.90	80	0.232	<=0.4	PASS
		Hop_2480	2.90	60	0.174	<=0.4	PASS
2DH1	Ant1	Hop_2402	0.41	190	0.078	<=0.4	PASS
		Hop_2441	0.41	160	0.065	<=0.4	PASS
		Hop_2480	0.41	140	0.057	<=0.4	PASS
2DH3	Ant1	Hop_2402	1.66	110	0.183	<=0.4	PASS
		Hop_2441	1.66	100	0.166	<=0.4	PASS
		Hop_2480	1.66	120	0.199	<=0.4	PASS
2DH5	Ant1	Hop_2402	2.91	90	0.262	<=0.4	PASS
		Hop_2441	2.91	120	0.349	<=0.4	PASS
		Hop_2480	2.91	80	0.233	<=0.4	PASS
3DH1	Ant1	Hop_2402	0.41	120	0.049	<=0.4	PASS
		Hop_2441	0.41	140	0.057	<=0.4	PASS
		Hop_2480	0.41	140	0.057	<=0.4	PASS
3DH3	Ant1	Hop_2402	1.66	110	0.183	<=0.4	PASS
		Hop_2441	1.66	130	0.216	<=0.4	PASS
		Hop_2480	1.66	150	0.249	<=0.4	PASS
3DH5	Ant1	Hop_2402	2.91	70	0.204	<=0.4	PASS
		Hop_2441	2.91	130	0.378	<=0.4	PASS
		Hop_2480	2.91	90	0.262	<=0.4	PASS

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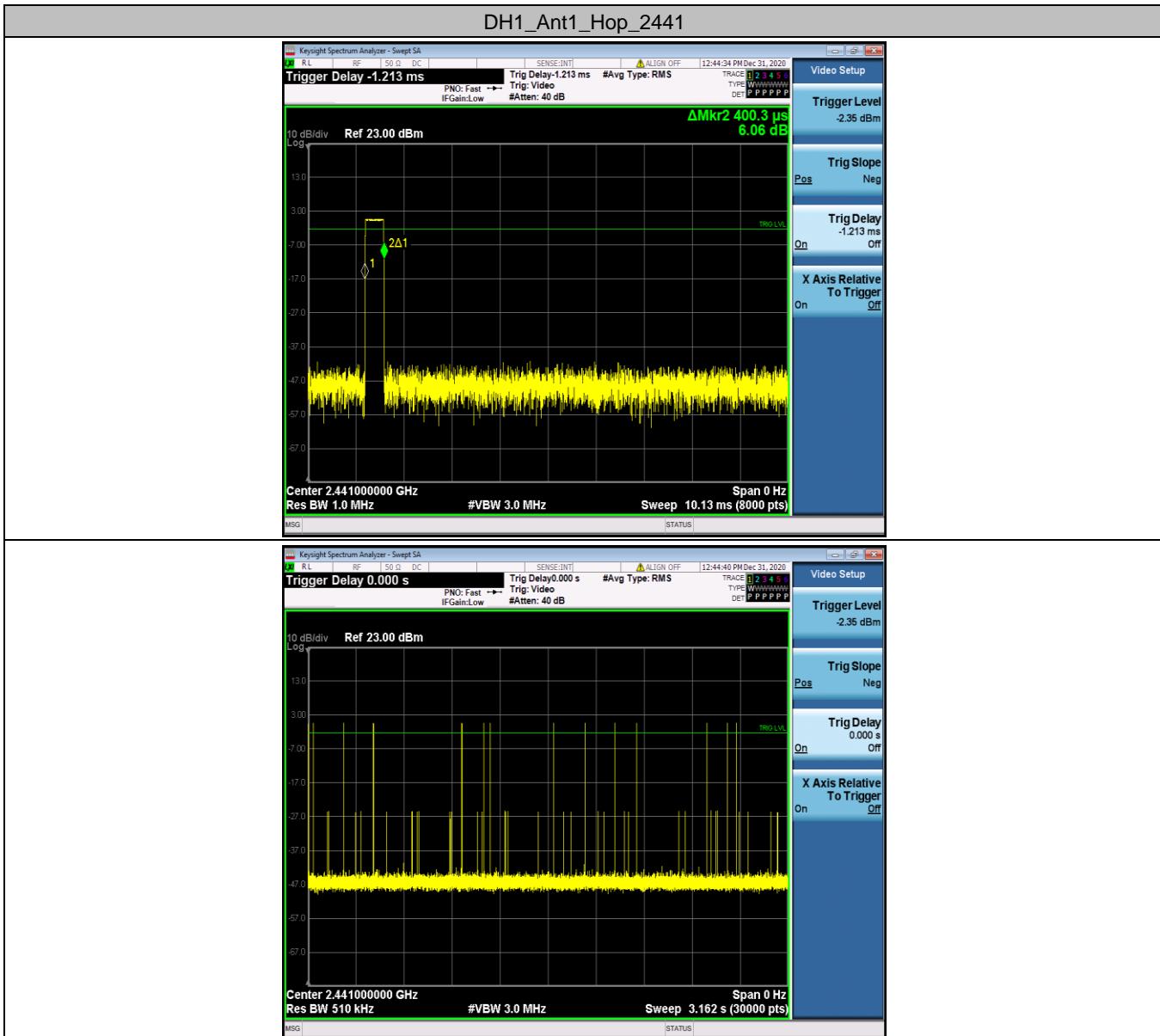


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10.4.2 Test Graphs

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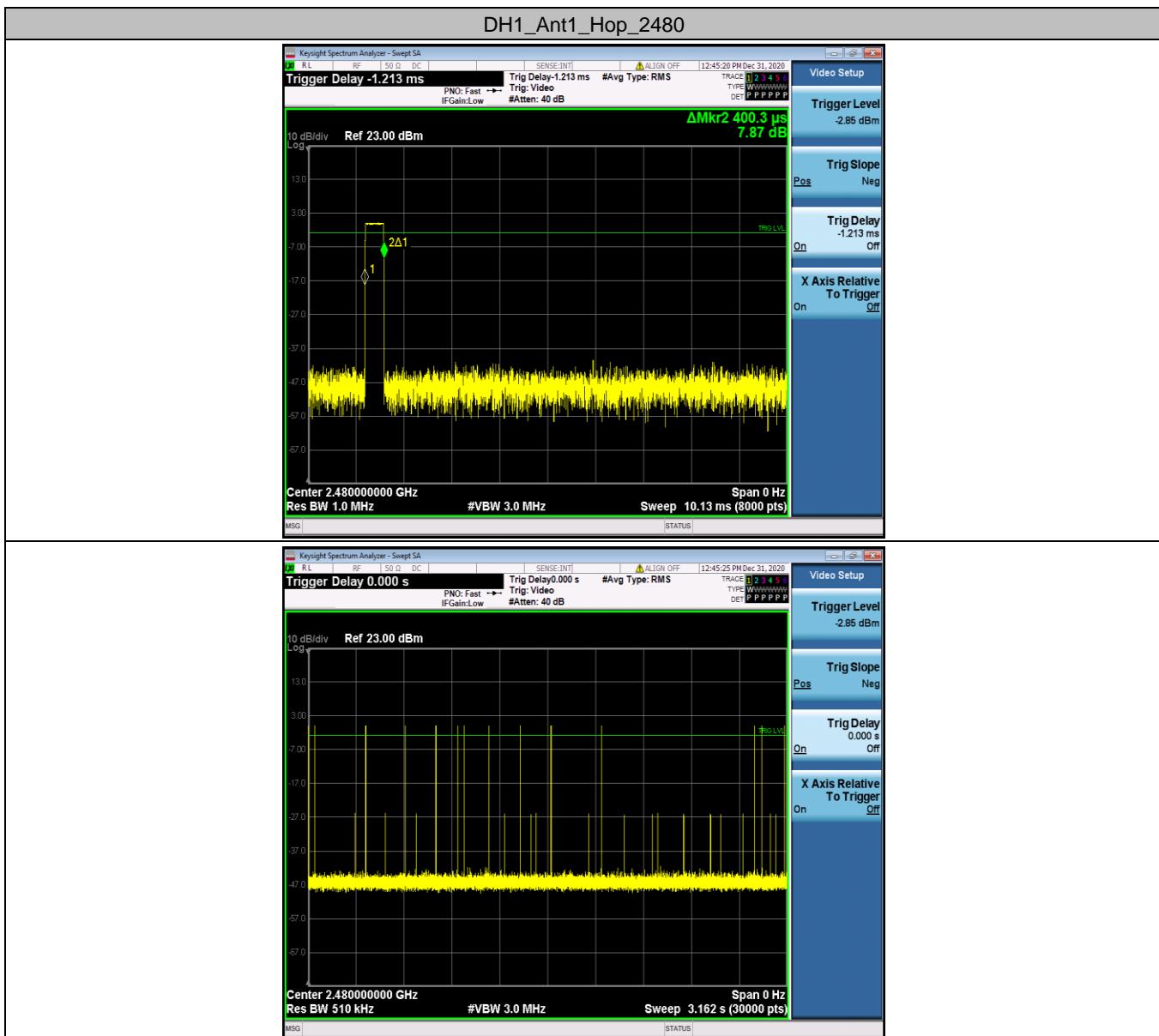
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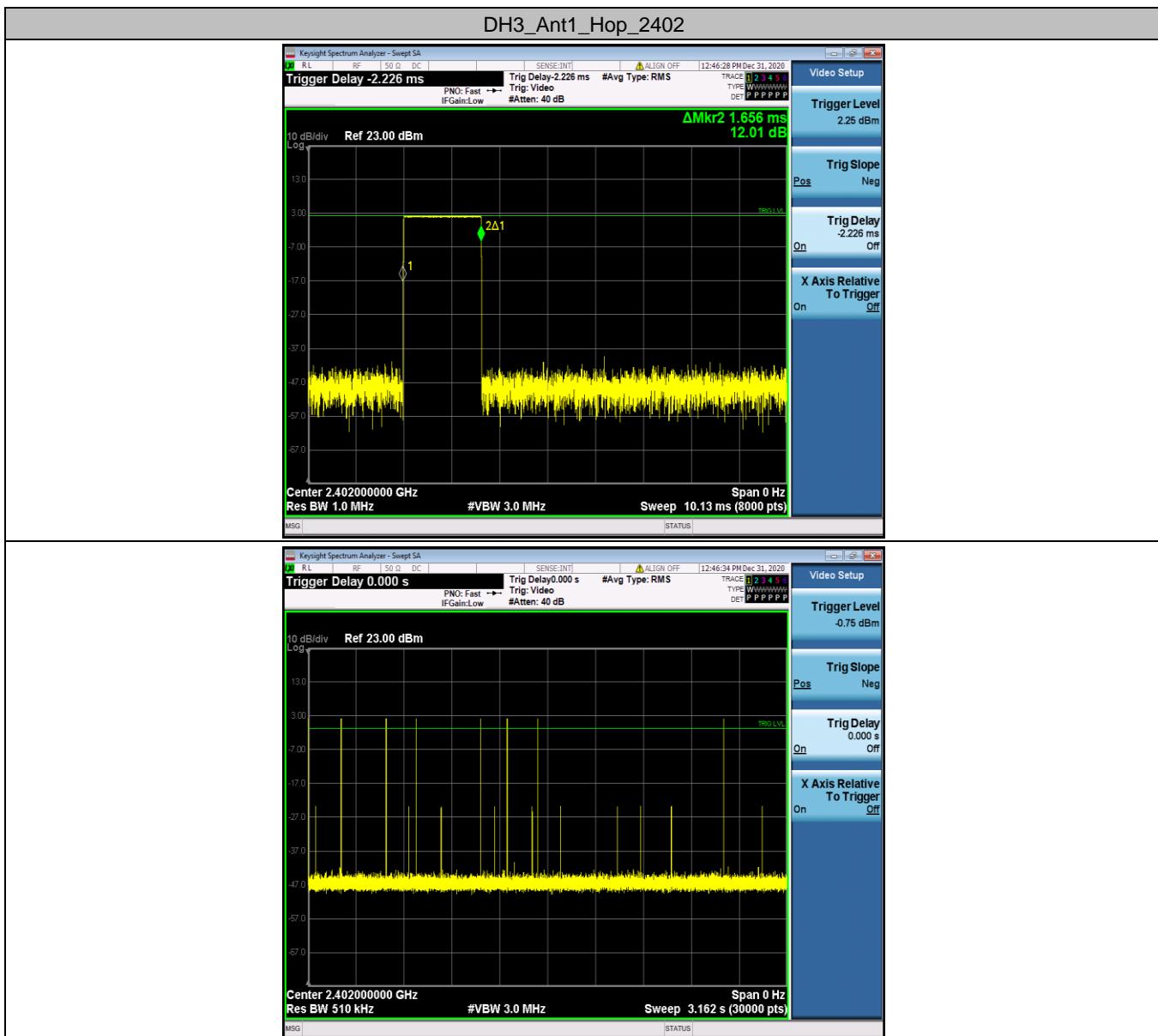


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