TEST REPORT

Application No.:	SZCR2506002538AT
Applicant:	Edifier International Limited
Address of Applicant:	P.O. Box 6264 General Post Office, Hong Kong
Manufacturer:	Beijing Edifier Technology Co., Ltd.
Address of Manufacturer:	815, Floor 8, Shuangqiao Building, No.68, North Fourth Ring West Road, Haidian District, 100080 Beijing, P.R. China
Factory:	Dongguan Edifier Technology Co., Ltd.
Address of Factory:	No.2 Gongyedong Road, Songshan Lake Sci.&Tech. Industry Park, Dongguan, 523808 Guangdong, P.R. China
Equipment Under Test (EUT):	
EUT Name:	True Wireless Noise Cancelling Earbuds
Model No.:	EDF200199
Trade Mark:	EDIFIER
Standard(s) :	EN 300 328 V2.2.2
Date of Receipt:	2025-06-16
Date of Test:	2025-06-18 to 2025-06-19
Date of Issue:	2025-06-20
Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu
EMC Laboratory Manager

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Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2025-06-20		Original

Authorized for issue by:				
		Bill Chen/Project Engineer		
		Eric Fu/Reviewer		

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2 Test Summary

Radio Spectrum Technical Requirement				
Item	**Standard**	**Method**	**Requirement**	**Result**
Geo-location capability	EN 300 328 V2.2.2	N/A	EN 300 328 V2.2.2 Clause 4.3.1.13.3	Customer Declaration

Radio Spectrum Matter Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Transmitter unwanted emissions in the spurious domain	EN 300 328 V2.2.2	EN 300 328 V2.2.2 Clause 5.4.9.2	EN 300 328 V2.2.2 Clause 4.3.1.10.3	Pass
Receiver spurious emissions		EN 300 328 V2.2.2 Clause 5.4.10.2	EN 300 328 V2.2.2 Clause 4.3.1.11.3	Pass
RF Output Power		EN 300 328 V2.2.2 Clause 5.4.2.2.1.2	EN 300 328 V2.2.2 Clause 4.3.1.2.3	Pass
Accumulated Transmit Time, Frequency Occupation and Hopping Sequence		EN 300 328 V2.2.2 Clause 5.4.4.2.1	EN 300 328 V2.2.2 Clause 4.3.1.4.3	Pass
Hopping Frequency Separation		EN 300 328 V2.2.2 Clause 5.4.5.2.1	EN 300 328 V2.2.2 Clause 4.3.1.5.3	Pass
Occupied Channel Bandwidth		EN 300 328 V2.2.2 Clause 5.4.7.2.1	EN 300 328 V2.2.2 Clause 4.3.1.8.3	Pass
Transmitter unwanted emissions in the OOB domain		EN 300 328 V2.2.2 Clause 5.4.8.2.1	EN 300 328 V2.2.2 Clause 4.3.1.9.3	Pass
Receiver Blocking		EN 300 328 V2.2.2 Clause 5.4.11.2.1	EN 300 328 V2.2.2 Clause 4.3.1.12.4	Pass

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4 General Information

4.1 Details of E.U.T.

Power supply:	Lithium Ion Battery: DC 3.85V 45mAh 0.173Wh rechargeable battery which charged by charging case for left earbud and right earbud Lithium Ion Battery: DC 3.8V 460mAh 1.748Wh rechargeable battery which charged by USB port for charging case
Cable(s):	Type C cable:30cm unshielded
Operation Frequency:	2402MHz to 2480MHz
Modulation Type:	GFSK, Pi/4DQPSK
Channel Spacing:	1MHz
Number of Channels:	79
Antenna Type:	PIFA Antenna
Antenna Gain:	0.7dBi

Remark:The information in this section is provided by the applicant or manufacturer, SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

4.2 Environment Parameter

Environment Parameter	Selected Values During Tests	
Relative Humidity	Ambient	
Value	Temperature(°C)	Voltage(V)
Normal Temperature & Normal Voltage	+23	DC3.85V
Low Extreme Test Temperature & Normal Voltage	0	DC3.85V
High Extreme Test Temperature & Normal Voltage	+45	DC3.85V
Low Extreme Test Temperature & Normal Voltage	0	DC3.85V
High Extreme Test Temperature & Normal Voltage	+45	DC3.85V

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4.3 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
--	--	--	--
The EUT has been tested as an independent unit.			

4.4 Measurement Uncertainty

Test Item	Measurement Uncertainty
Transmitter unwanted emissions in the spurious domain	± 4.5dB (Below 1GHz), ± 4.8dB (Above 1GHz)
Receiver spurious emissions	± 4.5dB (Below 1GHz), ± 4.8dB (Above 1GHz)
RF Output Power	± 0.75dB
Accumulated Transmit Time, Frequency Occupation and Hopping Sequence	± 0.37%
Hopping Frequency Separation	± 7.25 x 10-8
Occupied Channel Bandwidth	± 3%
Transmitter unwanted emissions in the OOB domain	± 0.75dB
Receiver Blocking	± 3%

Remark:
The U_{lab} (lab Uncertainty) is less than $U_{cispr/ETSI}$ (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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4.5 Test Location

All tests were performed at:

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Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.6 Test Facility

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

• 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.

4.7 Deviation from Standards

None

4.8 Abnormalities from Standard Conditions

None

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5 Equipment List

Transmitter unwanted emissions in the spurious domain					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
MXE EMI receiver	KEYSIGHT	N9038B	SEM004-29	2024-08-14	2025-08-13
Signal & Spectrum Analyzer	Rohde & Schwarz	FSV	SZ-WRG-M-048	2025-01-07	2026-01-06
Low Noise Amplifier 1G-18GHz	Tonscend	TAP01018050	SZ-WRG-M-051	2025-01-07	2026-01-06
Double-ridged waveguide horn(1-18GHz)	ETS-LINDGREN	3117	SEM033-11	2023-09-16	2025-09-15
Trilog-Broadband Antenna(25MHz-2GHz)	Schwarzbeck	VULB9168	SEM003-44	2025-05-28	2027-05-27
TRILOG Breitband Antenne 30MHz-1GHz	SCHWARZBECK	VULB 9168	SZ-WRG-M-054	2023-12-25	2025-12-24
Double Ridge Horn Antenna 1GHz-18GHz	SCHWARZBECK	BBHA 9120 D	SZ-WRG-M-055	2023-12-21	2025-12-20
RSE Test Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Chamber	CRTSGSSAC966	N/A	SZ-WRG-C-063	2025-01-06	2028-01-05
Humidity and Temperature Indicator	deli	8838	SEM002-46	2024-07-24	2025-07-23
Pre-amplifier(30MHz-1GHz)	SGS	AMP30M1G30	SEM005-33	2025-03-04	2026-03-03

Receiver spurious emissions					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
MXE EMI receiver	KEYSIGHT	N9038B	SEM004-29	2024-08-14	2025-08-13
Signal & Spectrum Analyzer	Rohde & Schwarz	FSV	SZ-WRG-M-048	2025-01-07	2026-01-06
Low Noise Amplifier 1G-18GHz	Tonscend	TAP01018050	SZ-WRG-M-051	2025-01-07	2026-01-06
Double-ridged waveguide horn(1-18GHz)	ETS-LINDGREN	3117	SEM033-11	2023-09-16	2025-09-15
Trilog-Broadband Antenna(25MHz-2GHz)	Schwarzbeck	VULB9168	SEM003-44	2025-05-28	2027-05-27
TRILOG Breitband Antenne 30MHz-1GHz	SCHWARZBECK	VULB 9168	SZ-WRG-M-054	2023-12-25	2025-12-24
Double Ridge Horn Antenna 1GHz-18GHz	SCHWARZBECK	BBHA 9120 D	SZ-WRG-M-055	2023-12-21	2025-12-20
RSE Test Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A

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Chamber	CRTSGSSAC966	N/A	SZ-WRG-C-063	2025-01-06	2028-01-05
Humidity and Temperature Indicator	deli	8838	SEM002-46	2024-07-24	2025-07-23
Pre-amplifier(30MHz-1GHz)	SGS	AMP30M1G30	SEM005-33	2025-03-04	2026-03-03

RF Conducted Test

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Shielding Room	AUDIX	N/A	SEM001-08	2025-05-16	2028-05-15
EXA Signal Analyzer	KEYSIGHT	N9010A	SEM004-09	2025-03-03	2026-03-02
DC Power Supply	KEYSIGHT	E3642A	SEM011-07	2025-02-26	2026-02-25
Manual Step Attenuator	KEYSIGHT	8494B	SEM021-05	2025-03-03	2026-03-02
Manual Step Attenuator	KEYSIGHT	8496B	SEM021-06	2025-03-03	2026-03-02
Power Sensor	TST PASS	TSPS2023R	SEM009-26	2025-03-04	2026-03-03
Power Sensor	TST PASS	TSPS2023R	SEM009-27	2025-03-04	2026-03-03
Power Sensor	TST PASS	TSPS2023R	SEM009-28	2025-03-04	2026-03-03
Power Sensor	TST PASS	TSPS2023R	SEM009-29	2025-03-04	2026-03-03
Programmable Temperature&Humidity Chamber	Votsch Industrietechnik GmbH	VT 4002	SEM002-15	2025-02-26	2026-02-25
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM028-01	2024-07-06	2025-07-05
Signal Generator	KEYSIGHT	N5171B	SEM006-13	2025-03-03	2026-03-02
Universal Radio Communication Tester	Rohde&Schwarz	CMW500	SEM010-08	2025-03-04	2026-03-03

General used equipment

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	deli	8838	SEM002-32	2024-07-24	2025-07-23
Humidity/ Temperature Indicator	deli	8838	SEM002-33	2024-07-24	2025-07-23
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2025-03-03	2026-03-02

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中国・广东・深圳市南山区科技园中区M-10栋1号厂房 邮编: 518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com

6 Radio Spectrum Technical Requirement

6.1 Geo-location capability

6.1.1 Test Requirement:

EN 300 328 V2.2.2 Clause 4.3.1.13.3

Limit:

The geographical location determined by the FHSS equipment as defined in clause 4.3.1.13.2 shall not be accessible to the user in a way that would allow the user to alter it.

Definition:

Geo-location capability is a feature of the equipment to determine its geographical location with the purpose to configure itself according to the regulatory requirements applicable at the geographical location where it operates.

The geo-location capability may be present in the equipment or in an external device (temporary) associated with the equipment operating at the same geographical location during the initial power up of the equipment. The geographical location may also be available in equipment already installed and operating at the same geographical location.

6.1.2 Conclusion

The applicant declares:The product does not have the geo-location function.

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7 Radio Spectrum Matter Test Results

7.1 Transmitter unwanted emissions in the spurious domain

Test Requirement EN 300 328 V2.2.2 Clause 4.3.1.10.3
Test Method: EN 300 328 V2.2.2 Clause 5.4.9.2
Measurement Distance: 3m

Limit:

Table 1: Transmitter limits for spurious emissions

Frequency range	Maximum power, e.r.p. (≤ 1 GHz) e.i.r.p. (> 1 GHz)	Bandwidth
30 MHz to 47 MHz	-36dBm	100 kHz
47 MHz to 74 MHz	-54dBm	100 kHz
74 MHz to 87,5 MHz	-36dBm	100 kHz
87,5 MHz to 118 MHz	-54dBm	100 kHz
118 MHz to 174 MHz	-36dBm	100 kHz
174 MHz to 230 MHz	-54dBm	100 kHz
230 MHz to 470 MHz	-36dBm	100 kHz
470 MHz to 694 MHz	-54dBm	100 kHz
694 MHz to 1 GHz	-36dBm	100 kHz
1 GHz to 12,75 GHz	-30dBm	1MHz

7.1.1 E.U.T. Operation

Operating Environment:
Temperature: 22.3 °C Humidity: 53.1 % RH Atmospheric Pressure: 1020 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX_non-Hop mode(Left earbud)_Keep the EUT in continuously transmitting mode with GFSK modulation, pi/4DQPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.
Final test	05	TX_non-Hop mode(Right earbud)_Keep the EUT in continuously transmitting mode with GFSK modulation, pi/4DQPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.

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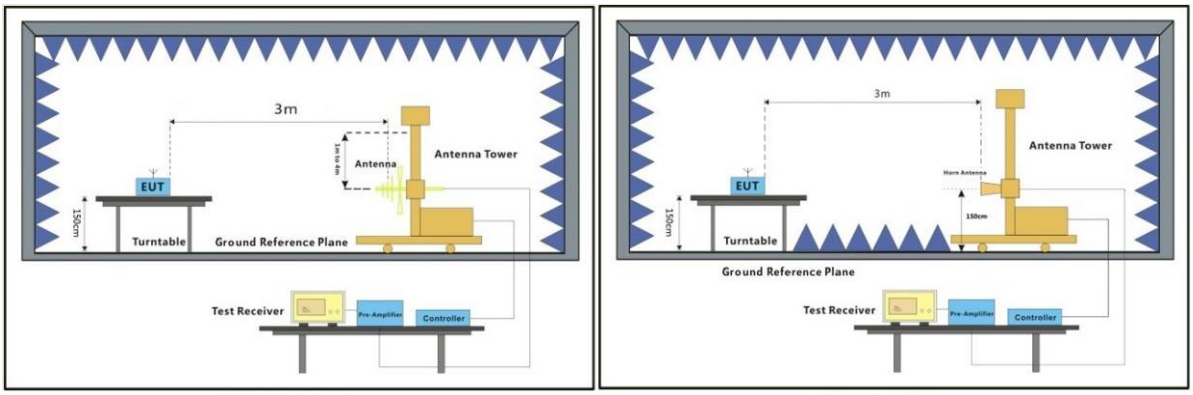
7.1.3 Test Setup Diagram



30MHz-1GHz Above 1GHz

7.1.4 Measurement Procedure and Data

1. Using test software to set up the lowest channel, the middle channel and the highest channel.

2. Scan from 30MHz to 12.75GHz, find the maximum radiation frequency to measure. No Standby Mode apply for the EUT.

3. The technique used to find the Spurious Emissions of the transmitter was a pre-calibration method which is measure the path loss from the measurement antenna to the substitution antenna and subtract this from the signal generator level to reach the measurement result. The method was performed to determine the actual ERP/EIRP emission levels of the EUT.

Test procedure as below:

1) The EUT was powered ON and placed on a table in the chamber. The antenna of the transmitter was extended to its maximum length. Receiver mode and the measuring receiver shall be tuned to the frequency of the transmitter under test.

2) The disturbance of the transmitter was maximized on the test receiver display by raising and lowering the receive antenna and by rotating through 360° the turntable. After the fundamental emission was maximized, a field strength measurement was made.

3) The test antenna shall be raised or lowered again, if necessary, through the specified height range until a maximum is obtained. This level shall be recorded.

4) This measurement shall be repeated for horizontal and vertical polarization.

Remark:

The disturbance below 1GHz was very low and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

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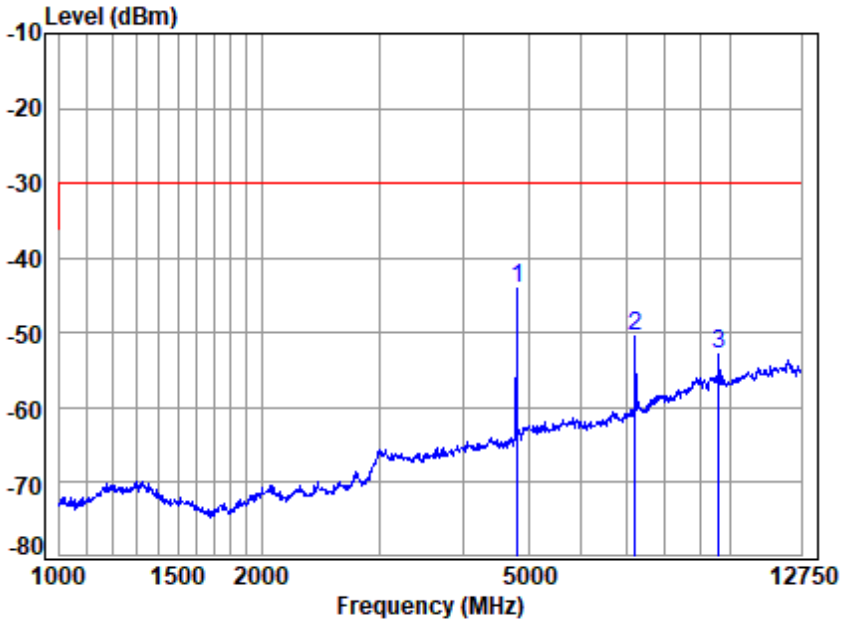
Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:Low



Condition: 3m HORIZONTAL
Job No.: 02538AT
Test mode:2402 TX RSE
:BT L
:

Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	4809.50	-44.15	-30.00	-14.15
2	7209.02	-50.40	-30.00	-20.40
3	9611.66	-52.91	-30.00	-22.91

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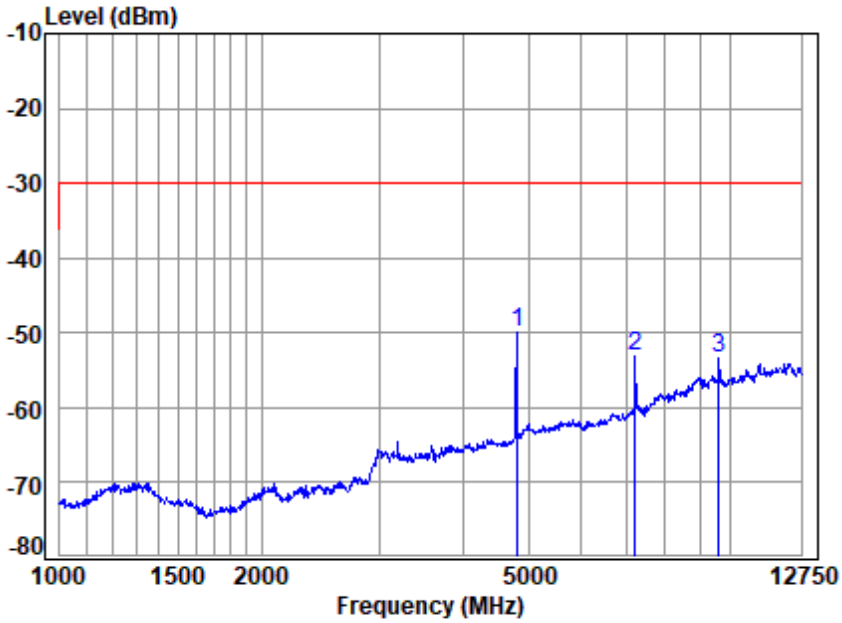
Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:Low



Condition: 3m VERTICAL
Job No.: 02538AT
Test mode:2402 TX RSE
:BT L
:

Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	4809.50	-49.86	-30.00	-19.86
2	7209.02	-52.99	-30.00	-22.99
3	9611.66	-53.50	-30.00	-23.50

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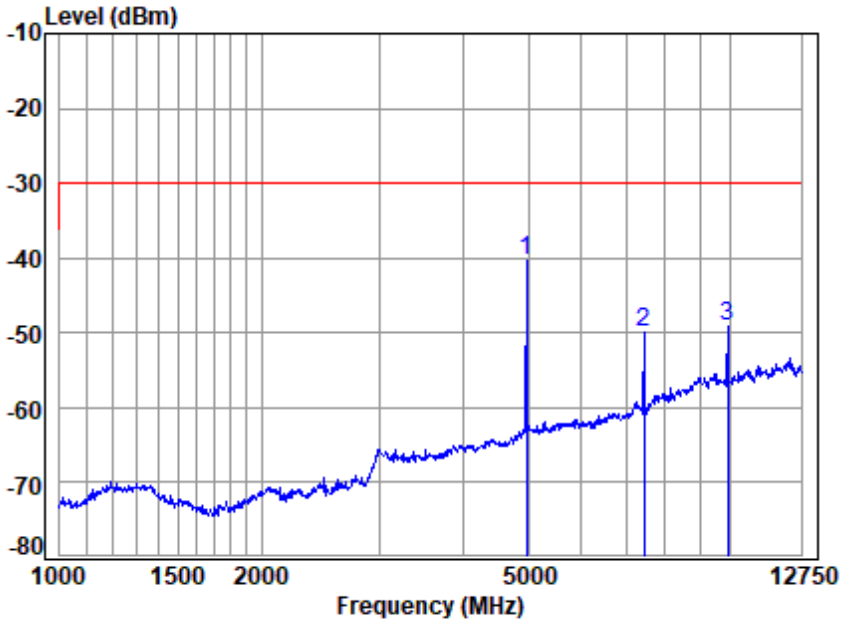
Test Mode: 01; Polarity: Horizontal; Modulation:GFSK; Channel:High



Condition: 3m HORIZONTAL
Job No.: 02538AT
Test mode:2480 TX RSE
:BT L
:

Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	4958.68	-40.42	-30.00	-10.42
2	7432.62	-49.93	-30.00	-19.93
3	9909.80	-49.17	-30.00	-19.17

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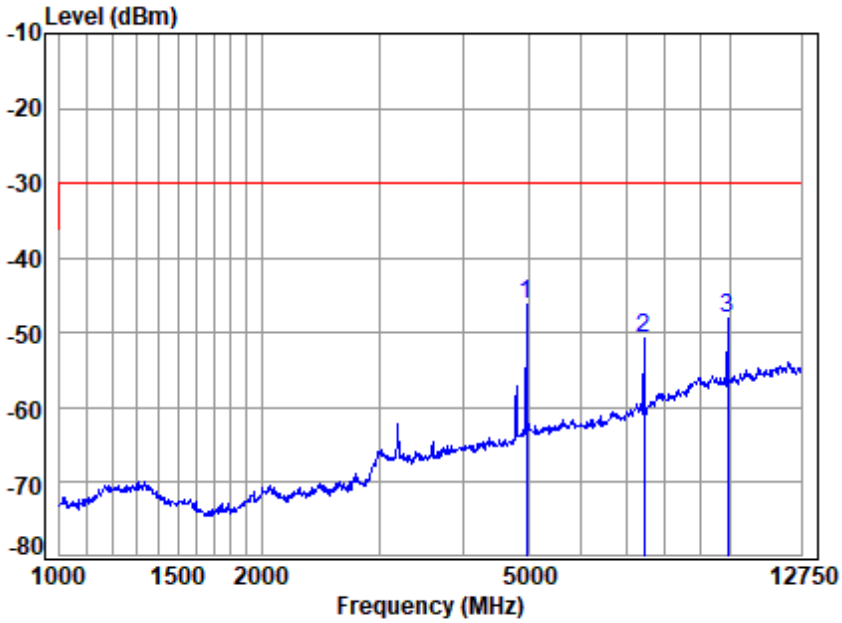
Test Mode: 01; Polarity: Vertical; Modulation:GFSK; Channel:High



Condition: 3m VERTICAL
Job No.: 02538AT
Test mode:2480 TX RSE
:BT L
:

Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	4958.68	-46.10	-30.00	-16.10
2	7432.62	-50.62	-30.00	-20.62
3	9909.80	-47.98	-30.00	-17.98

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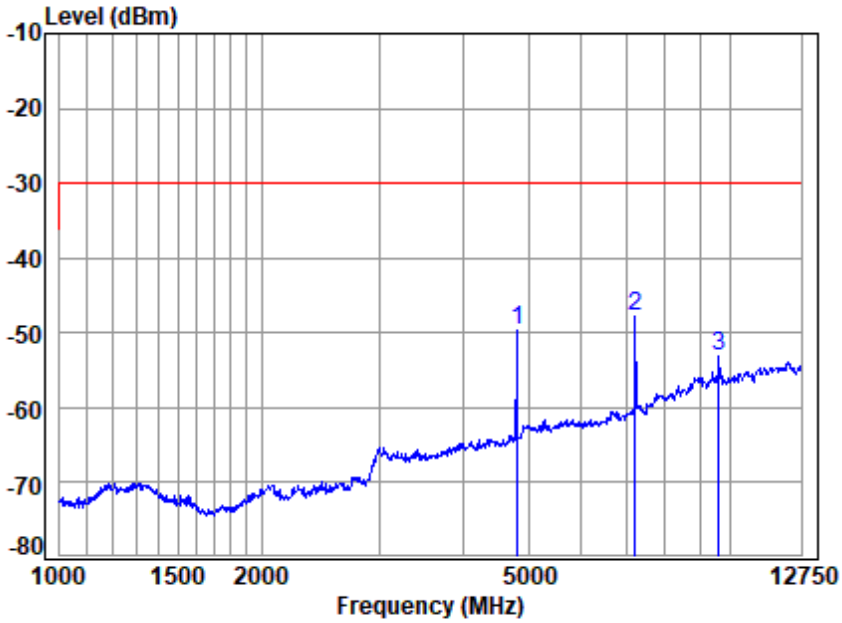
Test Mode: 05; Polarity: Horizontal; Modulation:GFSK; Channel:Low



Condition: 3m HORIZONTAL
Job No.: 02538AT
Test mode:2402 TX RSE
:BT R
:

Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	4809.50	-49.75	-30.00	-19.75
2	7209.02	-47.75	-30.00	-17.75
3	9611.66	-52.99	-30.00	-22.99

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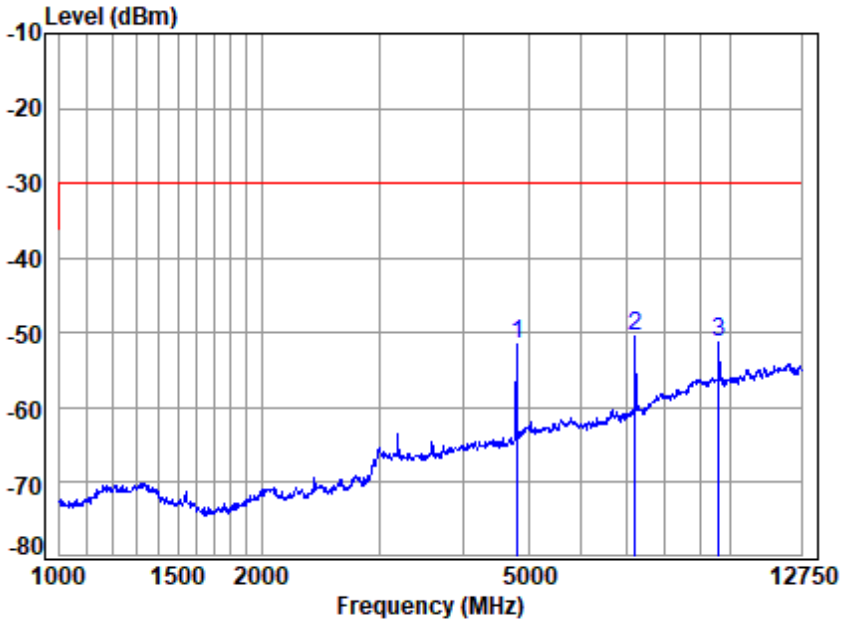
Test Mode: 05; Polarity: Vertical; Modulation:GFSK; Channel:Low



Condition: 3m VERTICAL
Job No.: 02538AT
Test mode:2402 TX RSE
:BT R
:

Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	4809.50	-51.49	-30.00	-21.49
2	7209.02	-50.38	-30.00	-20.38
3	9611.66	-51.28	-30.00	-21.28

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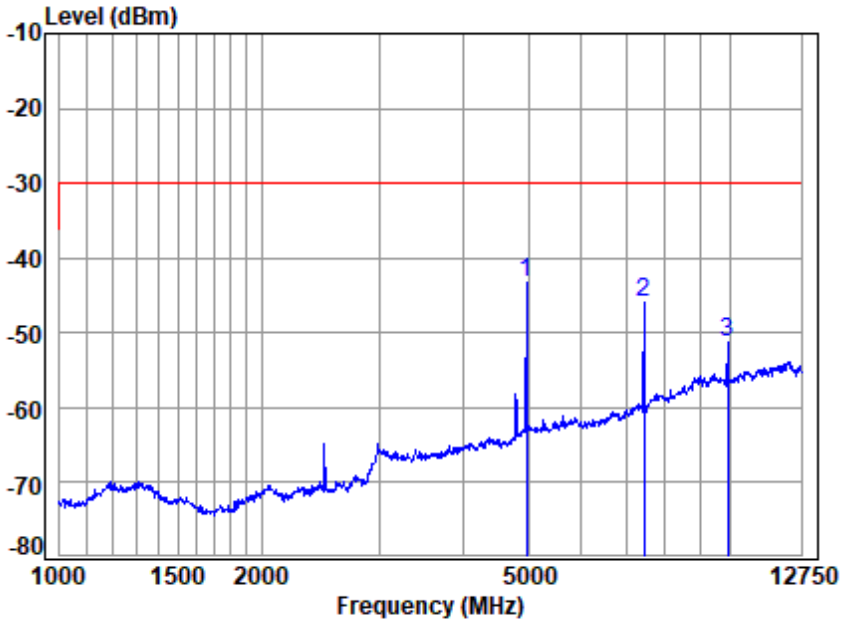
Test Mode: 05; Polarity: Horizontal; Modulation:GFSK; Channel:High



Condition: 3m HORIZONTAL
Job No.: 02538AT
Test mode:2480 TX RSE
:BT R
:

Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	4958.68	-43.29	-30.00	-13.29
2	7432.62	-45.99	-30.00	-15.99
3	9909.80	-51.17	-30.00	-21.17

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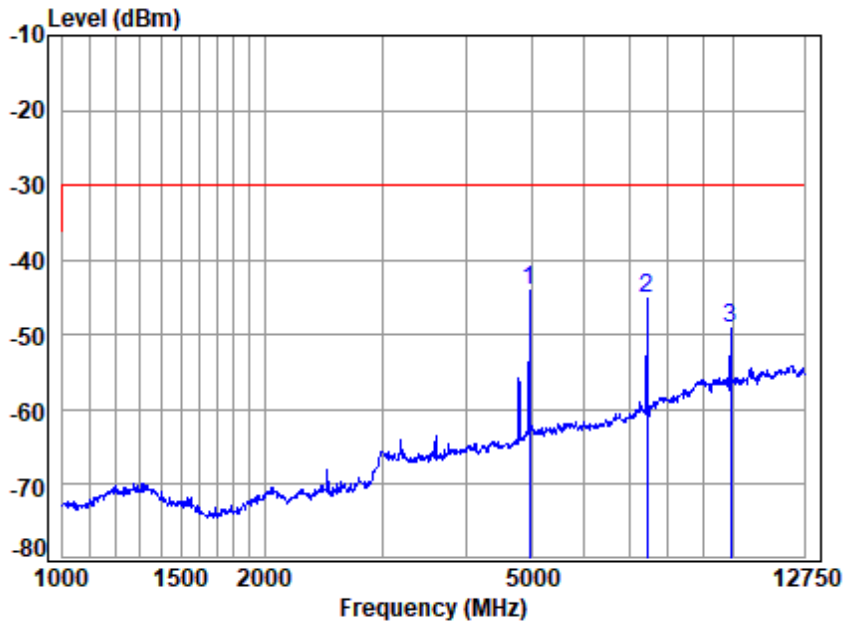
Test Mode: 05; Polarity: Vertical; Modulation:GFSK; Channel:High



Condition: 3m VERTICAL
Job No.: 02538AT
Test mode:2480 TX RSE
:BT R
:

Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	4958.68	-43.94	-30.00	-13.94
2	7432.62	-45.26	-30.00	-15.26
3	9909.80	-49.10	-30.00	-19.10

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7.2 Receiver spurious emissions

Test Requirement EN 300 328 V2.2.2 Clause 4.3.1.11.3
Test Method: EN 300 328 V2.2.2 Clause 5.4.10.2
Measurement Distance: 3m

Limit:

The spurious emissions of the receiver shall not exceed the values in tables in the indicated bands:

Frequency Range	Limit
30 MHz to 1 GHz	2nW(-57dBm)
Above 1GHz	20nW(-47dBm)

7.2.1 E.U.T. Operation

Operating Environment:
Temperature: 23.0 °C Humidity: 50.8 % RH Atmospheric Pressure: 1020 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	02	RX mode(Left earbud)_Keep the EUT in receiving mode with GFSK modulation, pi/4DQPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.
Final test	06	RX mode(Right earbud)_Keep the EUT in receiving mode with GFSK modulation, pi/4DQPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.

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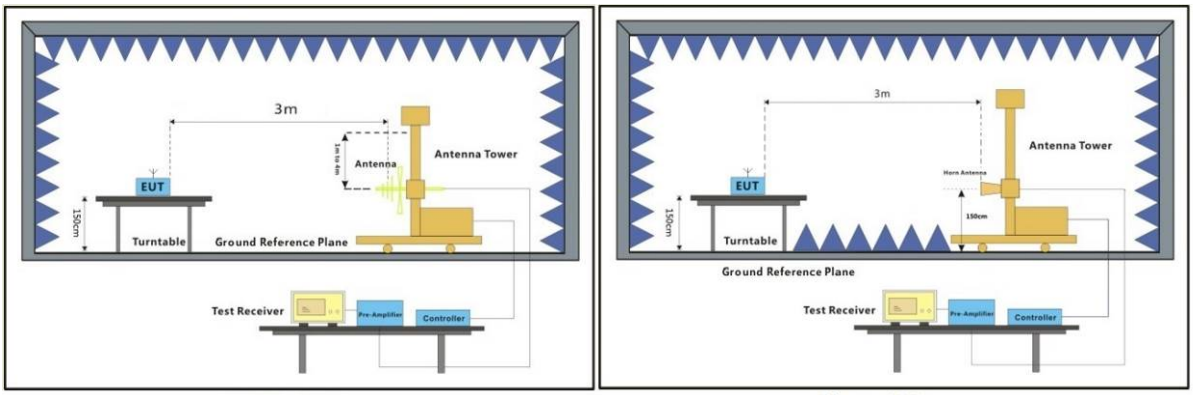
7.2.3 Test Setup Diagram



30MHz-1GHz Above 1GHz

7.2.4 Measurement Procedure and Data

1. Using test software to set up the lowest channel, the middle channel and the highest channel.

2. Scan from 30MHz to 12.75GHz, find the maximum radiation frequency to measure. No Standby Mode apply for the EUT.

3. The technique used to find the Spurious Emissions of the transmitter was a pre-calibration method which is measure the path loss from the measurement antenna to the substitution antenna and subtract this from the signal generator level to reach the measurement result. The method was performed to determine the actual ERP/EIRP emission levels of the EUT.

Test procedure as below:

1) The EUT was powered ON and placed on a table in the chamber. The antenna of the transmitter was extended to its maximum length. Receiver mode and the measuring receiver shall be tuned to the frequency of the transmitter under test.

2) The disturbance of the transmitter was maximized on the test receiver display by raising and lowering the receive antenna and by rotating through 360° the turntable. After the fundamental emission was maximized, a field strength measurement was made.

3) The test antenna shall be raised or lowered again, if necessary, through the specified height range until a maximum is obtained. This level shall be recorded.

4) This measurement shall be repeated for horizontal and vertical polarization.

Remark:

The disturbance below 1GHz was very low and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

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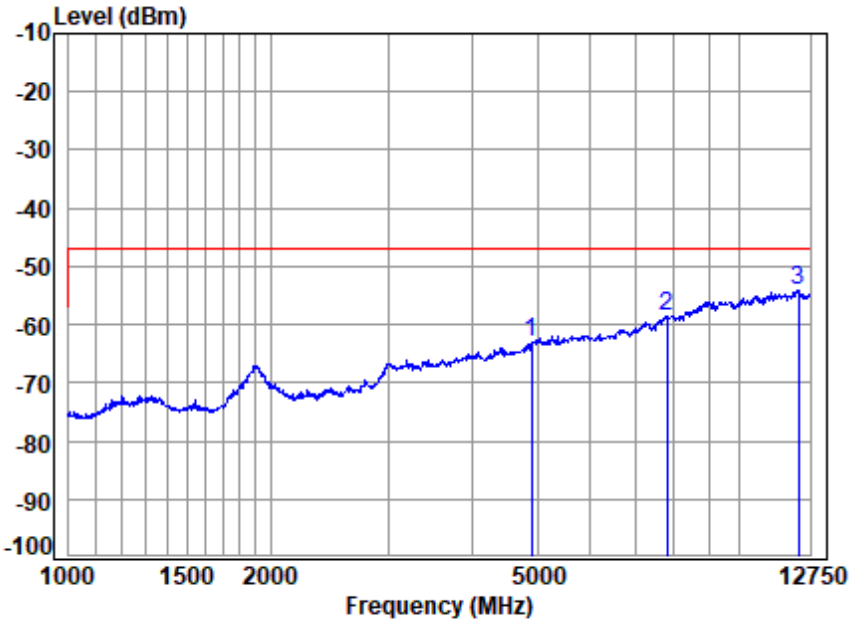
Test Mode: 02; Polarity: Horizontal; Modulation:GFSK; Channel:Low



Condition: 3m HORIZONTAL
Job No.: 02538AT
Test mode:2402 RX RSE
:BT L
:

Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	4895.97	-63.07	-47.00	-16.07
2	7800.94	-58.50	-47.00	-11.50
3	12241.14	-54.18	-47.00	-7.18

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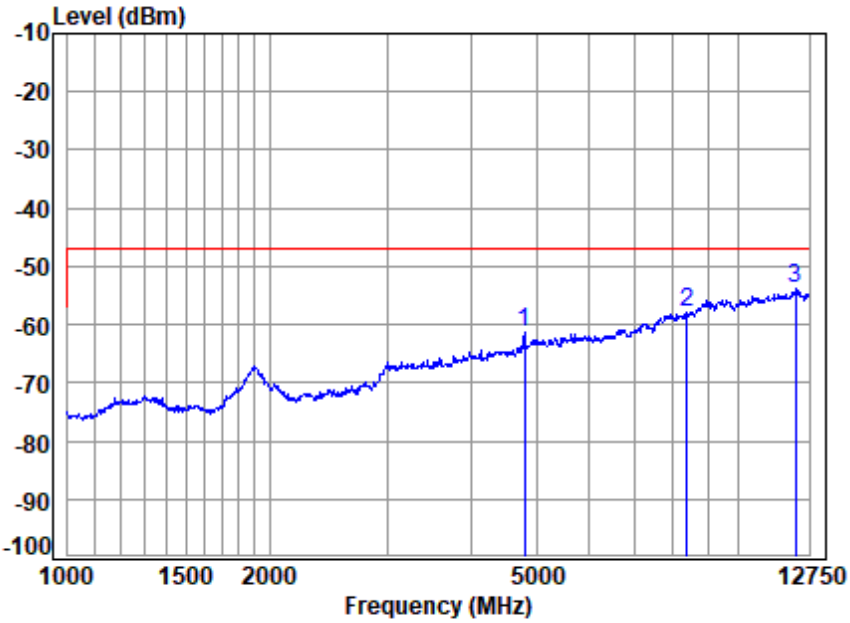
Test Mode: 02; Polarity: Vertical; Modulation:GFSK; Channel:Low



Condition: 3m VERTICAL
Job No.: 02538AT
Test mode:2402 RX RSE
:BT L
:

Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	4797.27	-61.47	-47.00	-14.47
2	8377.24	-58.05	-47.00	-11.05
3	12178.98	-53.72	-47.00	-6.72

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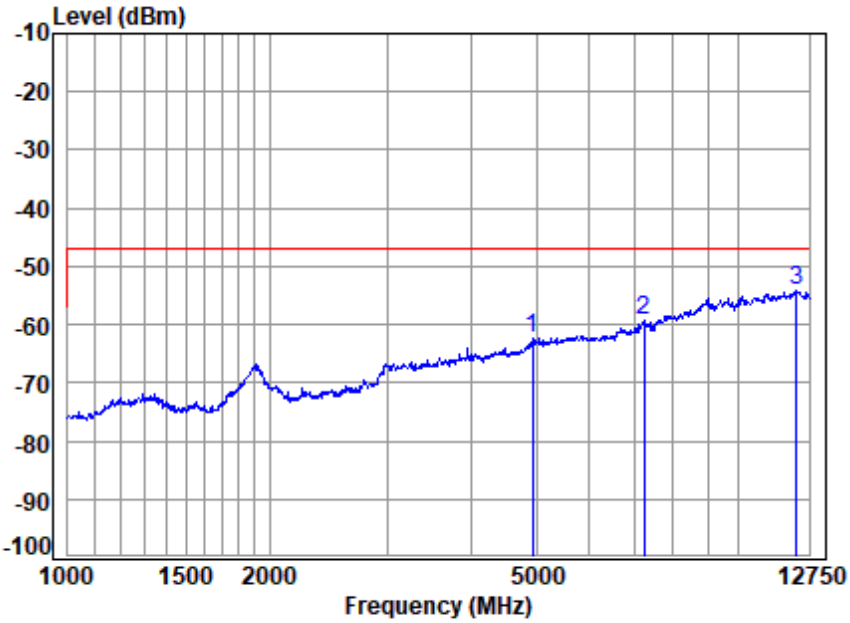
Test Mode: 02; Polarity: Horizontal; Modulation:GFSK; Channel:High



Condition: 3m HORIZONTAL
Job No.: 02538AT
Test mode:2480 RX RSE
:BT L
:

Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	4933.50	-62.40	-47.00	-15.40
2	7227.39	-59.37	-47.00	-12.37
3	12210.02	-54.00	-47.00	-7.00

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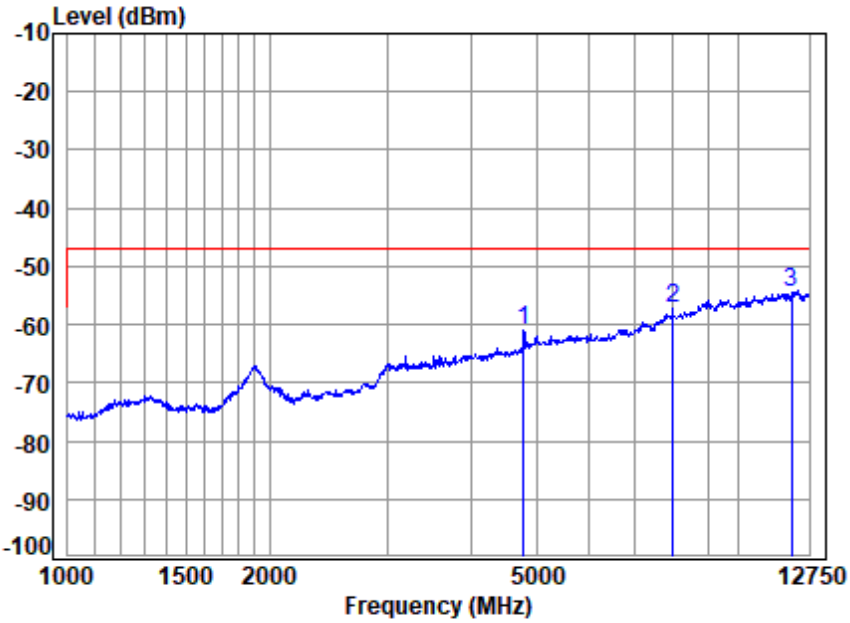
Test Mode: 02; Polarity: Vertical; Modulation:GFSK; Channel:High



Condition: 3m VERTICAL
Job No.: 02538AT
Test mode:2480 RX RSE
:BT L
:

Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	4785.08	-61.06	-47.00	-14.06
2	7981.72	-57.32	-47.00	-10.32
3	11994.38	-54.33	-47.00	-7.33

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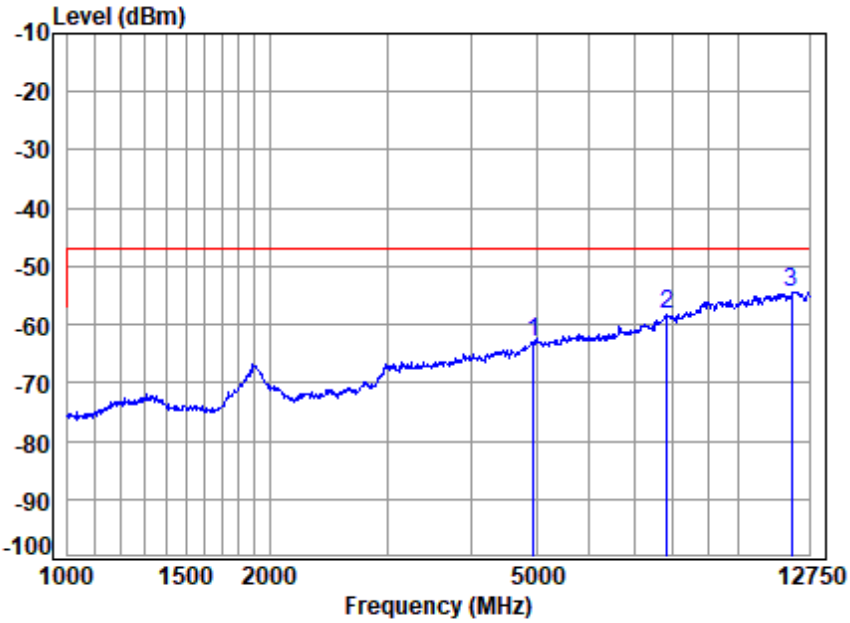
Test Mode: 06; Polarity: Horizontal; Modulation:GFSK; Channel:Low



Condition: 3m HORIZONTAL
Job No.: 02538AT
Test mode:2402 RX RSE
:BT R
:

Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	4946.07	-62.90	-47.00	-15.90
2	7840.75	-58.27	-47.00	-11.27
3	12024.96	-54.62	-47.00	-7.62

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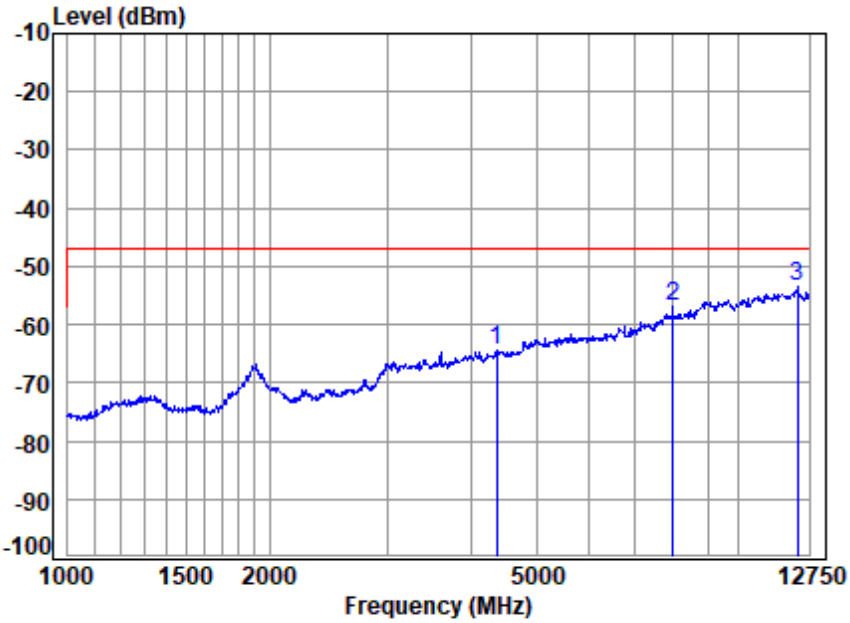
Test Mode: 06; Polarity: Vertical; Modulation:GFSK; Channel:Low



Condition: 3m VERTICAL
Job No.: 02538AT
Test mode:2402 RX RSE
:BT R
:

Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	4366.07	-64.49	-47.00	-17.49
2	7981.72	-56.90	-47.00	-9.90
3	12241.14	-53.41	-47.00	-6.41

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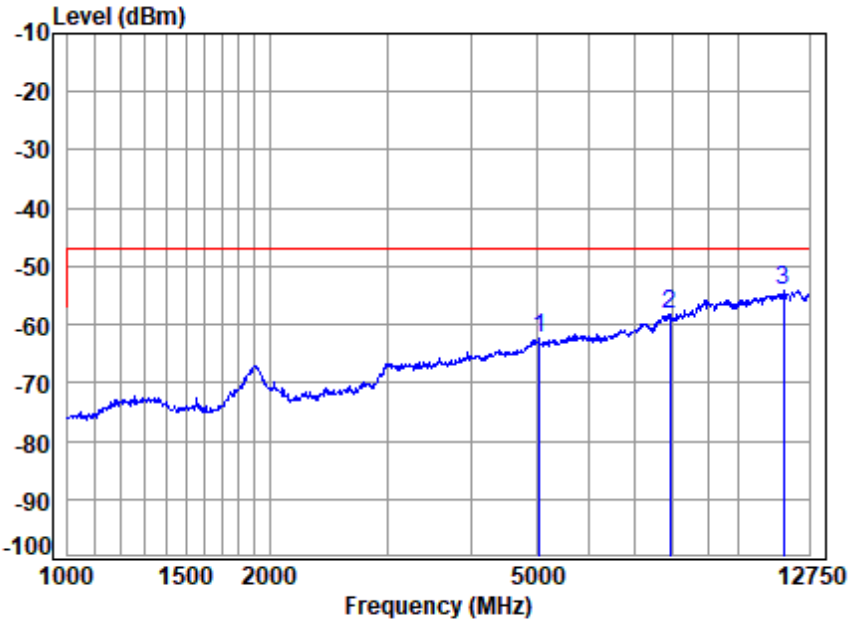
Test Mode: 06; Polarity: Horizontal; Modulation:GFSK; Channel:High



Condition: 3m HORIZONTAL
Job No.: 02538AT
Test mode:2480 RX RSE
:BT R
:

Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	5047.83	-62.40	-47.00	-15.40
2	7900.86	-58.32	-47.00	-11.32
3	11663.19	-54.06	-47.00	-7.06

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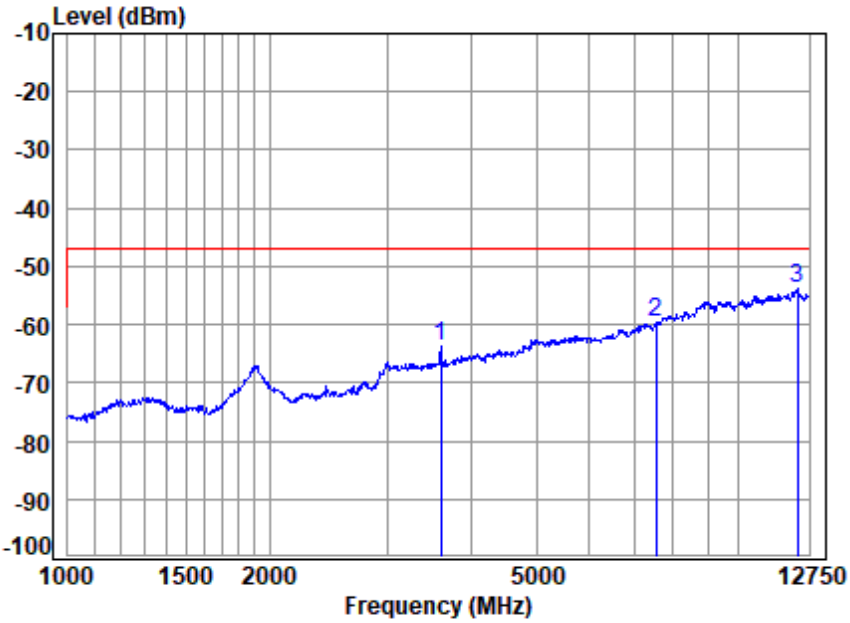
Test Mode: 06; Polarity: Vertical; Modulation:GFSK; Channel:High



Condition: 3m VERTICAL
Job No.: 02538AT
Test mode:2480 RX RSE
:BT R
:

Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	3598.09	-63.89	-47.00	-16.89
2	7527.83	-59.63	-47.00	-12.63
3	12272.34	-53.80	-47.00	-6.80

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7.3 RF Output Power

Test Requirement EN 300 328 V2.2.2 Clause 4.3.1.2.3
Test Method: EN 300 328 V2.2.2 Clause 5.4.2.2.1.2

Limit:

Frequency band(MHz)	Limit
2400-2483.5	20dBm/(100mw) (e.i.r.p)

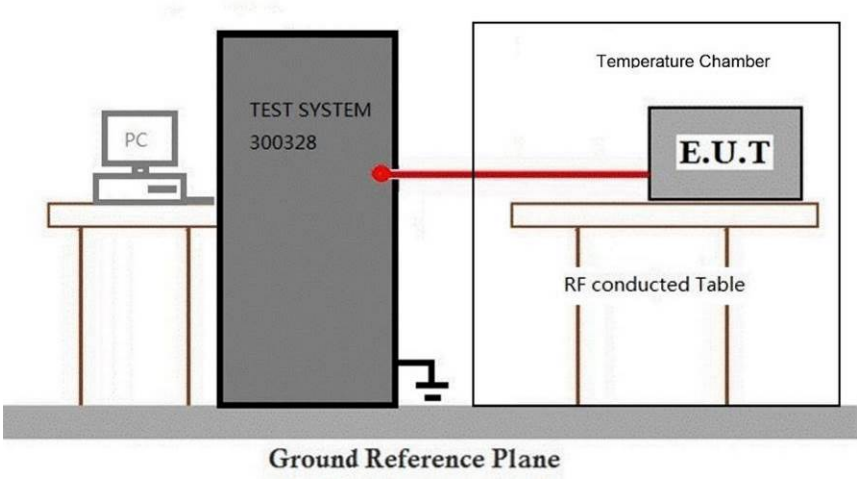
7.3.1 E.U.T. Operation

Operating Environment:
Temperature: 28.0 °C Humidity: 37.5 % RH Atmospheric Pressure: 1020 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX_Hop mode(Left earbud)_Keep the EUT in frequency hopping mode with GFSK modulation, pi/4DQPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.
Final test	04	TX_Hop mode(Right earbud)_Keep the EUT in frequency hopping mode with GFSK modulation, pi/4DQPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.

7.3.3 Test Setup Diagram



7.3.4 Measurement Procedure and Data

Please Refer to Appendix for Details

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7.4 Accumulated Transmit Time, Frequency Occupation and Hopping Sequence

Test Requirement EN 300 328 V2.2.2 Clause 4.3.1.4.3

Test Method: EN 300 328 V2.2.2 Clause 5.4.4.2.1

Limit:

Non-adaptive frequency hopping equipment:

The Accumulated Transmit Time on any hopping frequency shall not be greater than 15 ms within any observation period of 15 ms multiplied by the minimum number of hopping frequencies (N) that have to be used.

The hopping sequence(s) shall contain at least N hopping frequencies where N is either 5 or the result of 15 MHz divided by the minimum Hopping Frequency Separation in MHz, whichever is the greater. The minimum Hopping Frequency Separation for non-adaptive equipment is equal to the Occupied Channel Bandwidth with a minimum of 100 kHz.

Adaptive frequency hopping equipment

Adaptive Frequency Hopping equipment shall be capable of operating over a minimum of 70 % of the band.

The Accumulated Transmit Time on any hopping frequency shall not be greater than 400 ms within any observation period of 400 ms multiplied by the minimum number of hopping frequencies (N) that have to be used.

The hopping sequence(s) shall contain at least N hopping frequencies at all times, where N is either 15 or the result of 15 MHz divided by the minimum Hopping Frequency Separation in MHz, whichever is the greater.

7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 28.0 °C Humidity: 37.5 % RH Atmospheric Pressure: 1020 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX_Hop mode(Left earbud)_Keep the EUT in frequency hopping mode with GFSK modulation, pi/4DQPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.
Final test	04	TX_Hop mode(Right earbud)_Keep the EUT in frequency hopping mode with GFSK modulation, pi/4DQPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.

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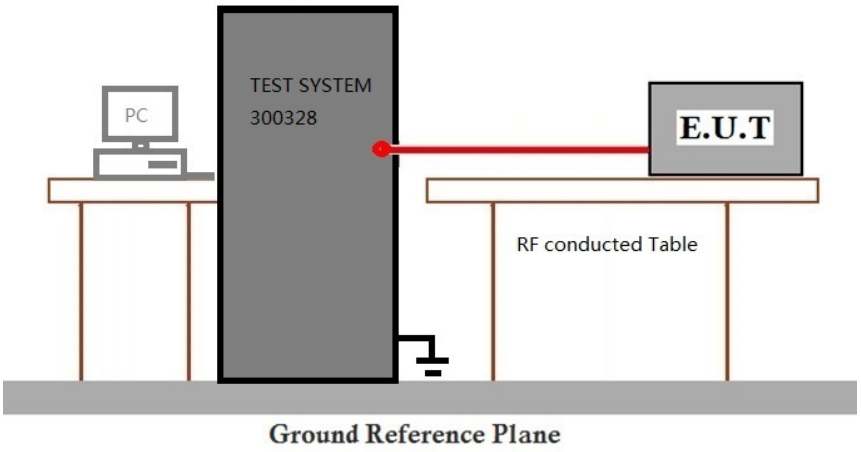
7.4.3 Test Setup Diagram



7.4.4 Measurement Procedure and Data

Please Refer to Appendix for Details

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7.5 Hopping Frequency Separation

Test Requirement EN 300 328 V2.2.2 Clause 4.3.1.5.3

Test Method: EN 300 328 V2.2.2 Clause 5.4.5.2.1

Limit:

Non-adaptive frequency hopping equipment:

For non-adaptive Frequency Hopping equipment, the Hopping Frequency Separation shall be equal to or greater than the Occupied Channel Bandwidth, with a minimum separation of 100 kHz.

For equipment with a maximum declared RF Output power level of less than 10 dBm e.i.r.p. or for non-adaptive Frequency Hopping equipment operating in a mode where the RF Output power is less than 10 dBm e.i.r.p. only the minimum Hopping Frequency Separation of 100 kHz applies.

Adaptive frequency hopping equipment:

For adaptive Frequency Hopping equipment, the minimum Hopping Frequency Separation shall be 100 kHz.

Adaptive Frequency Hopping equipment that switched to a non-adaptive mode for one or more hopping frequencies because interference was detected on these hopping frequencies with a level above the threshold level, is allowed to continue to operate with a minimum Hopping Frequency Separation of 100 kHz as long as the interference remains present on these hopping frequencies. The equipment shall continue to operate in an adaptive mode on other hopping frequencies.

Adaptive Frequency Hopping equipment which decided to operate in a non-adaptive mode on one or more hopping frequencies without the presence of interference, shall comply with the limit for Hopping Frequency Separation for non-adaptive equipment for these hopping frequencies as well as with all other requirements applicable to non-adaptive frequency hopping equipment.

7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 28.0 °C Humidity: 37.5 % RH Atmospheric Pressure: 1020 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX_Hop mode(Left earbud)_Keep the EUT in frequency hopping mode with GFSK modulation, pi/4DQPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.
Final test	04	TX_Hop mode(Right earbud)_Keep the EUT in frequency hopping mode with GFSK modulation, pi/4DQPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.

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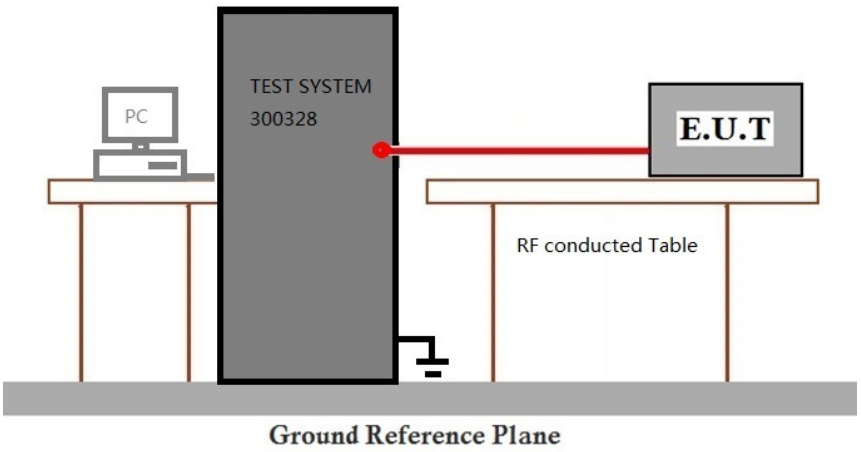
7.5.3 Test Setup Diagram



7.5.4 Measurement Procedure and Data

Please Refer to Appendix for Details

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7.6 Occupied Channel Bandwidth

Test Requirement EN 300 328 V2.2.2 Clause 4.3.1.8.3

Test Method: EN 300 328 V2.2.2 Clause 5.4.7.2.1

Limit:

The Occupied Channel Bandwidth for each hopping frequency shall be within the band given in table 1.

In addition, for non-adaptive FHSS equipment with e.i.r.p. greater than 10 dBm, the Occupied Channel Bandwidth for every occupied hopping frequency shall be equal to or less than 5 MHz.

7.6.1 E.U.T. Operation

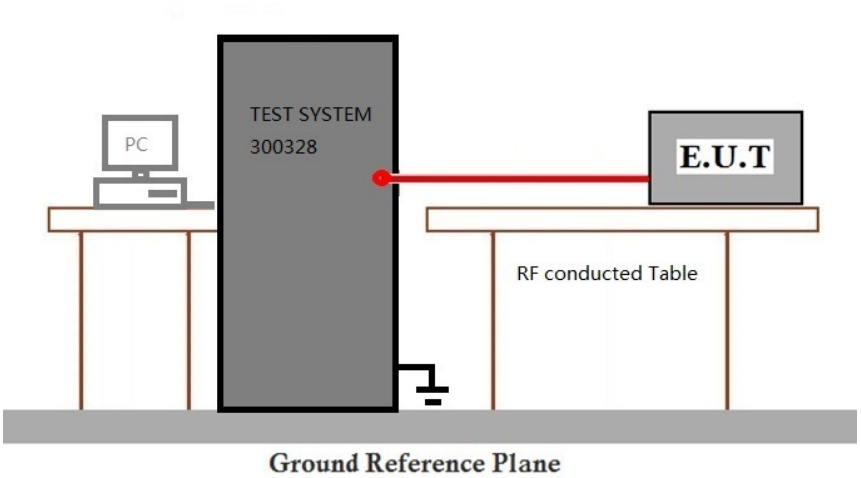
Operating Environment:

Temperature: 28.0 °C Humidity: 37.5 % RH Atmospheric Pressure: 1020 mbar

7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX_non-Hop mode(Left earbud)_Keep the EUT in continuously transmitting mode with GFSK modulation, pi/4DQPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.
Final test	05	TX_non-Hop mode(Right earbud)_Keep the EUT in continuously transmitting mode with GFSK modulation, pi/4DQPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.

7.6.3 Test Setup Diagram



7.6.4 Measurement Procedure and Data

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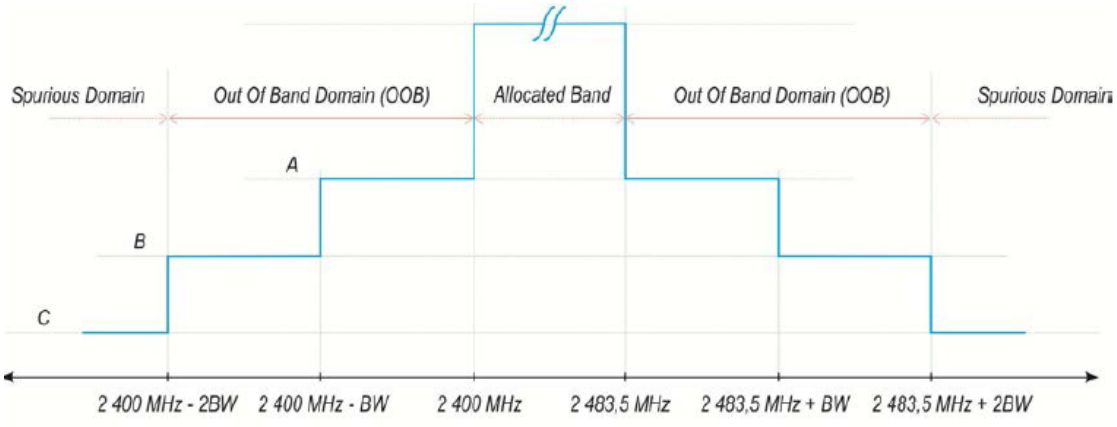
7.7 Transmitter unwanted emissions in the OOB domain

Test Requirement EN 300 328 V2.2.2 Clause 4.3.1.9.3
Test Method: EN 300 328 V2.2.2 Clause 5.4.8.2.1

Limit:



A: -10 dBm/MHz e.i.r.p.
B: -20 dBm/MHz e.i.r.p.
C: Spurious Domain limits

BW = Occupied Channel Bandwidth in MHz or 1 MHz whichever is greater

7.7.1 E.U.T. Operation

Operating Environment:
Temperature: 28.0 °C Humidity: 37.5 % RH Atmospheric Pressure: 1020 mbar

7.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX_Hop mode(Left earbud)_Keep the EUT in frequency hopping mode with GFSK modulation, pi/4DQPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.
Final test	04	TX_Hop mode(Right earbud)_Keep the EUT in frequency hopping mode with GFSK modulation, pi/4DQPSK modulation. All modes have been tested and only the data of worst case is recorded in the report.

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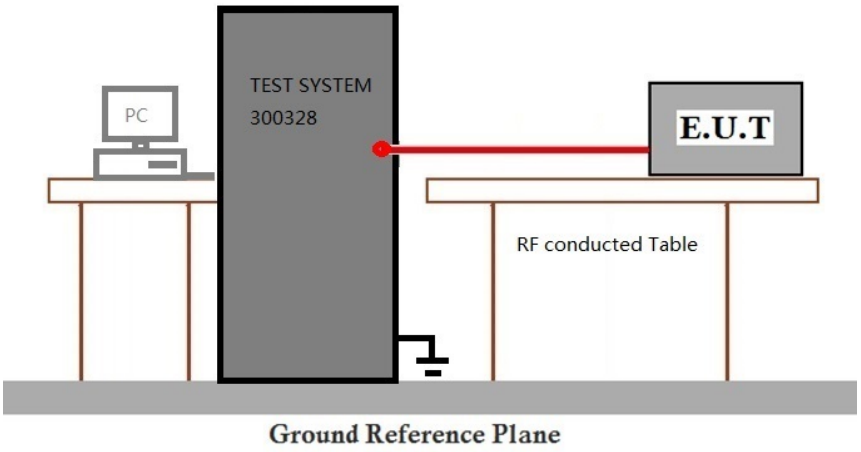
7.7.3 Test Setup Diagram



7.7.4 Measurement Procedure and Data

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7.8 Receiver Blocking

Test Requirement EN 300 328 V2.2.2 Clause 4.3.1.12.4

Test Method: EN 300 328 V2.2.2 Clause 5.4.11.2.1

Limit:

For equipment that supports a PER or FER test to be performed, the minimum performance criterion shall be a PER or FER less than or equal to 10 %.

For equipment that does not support a PER or a FER test to be performed, the minimum performance criterion shall be no loss of the wireless transmission function needed for the intended use of the equipment.

The blocking levels at specified frequency offsets shall be equal to or greater than the limits defined for the applicable receiver category provided below table.

Receiver Blocking parameters for Receiver Category 1 equipment			
Wanted signal mean power from companion device (dBm) (see notes 1 and 4)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 4)	Type of blocking signal
(-133 dBm + 10 × log10(OCBW)) or -68 dBm whichever is less (see note 2)	2380 2504	-34	CW
(-139 dBm + 10 × log10(OCBW)) or -74 dBm whichever is less (see note 3)	2 300 2 330 2 360 2 524 2 584 2 674		

NOTE 1: OCBW is in Hz.

NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to Pmin + 26 dB where Pmin is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.

NOTE 3: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to Pmin + 20 dB where Pmin is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.

NOTE 4: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.

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Receiver Blocking parameters for Receiver Category 2 equipment			
Wanted signal mean power from companion device (dBm) (see notes 1 and 3)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 3)	Type of blocking signal
(-139 dBm + 10 × log10(OCBW) + 10 dB) or (-74 dBm + 10 dB) whichever is less (see note 2)	2 380 2 504 2 300 2 584	-34	CW
NOTE 1: OCBW is in Hz. NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to Pmin + 26 dB where Pmin is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal. NOTE 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.			

Receiver Blocking parameters for Receiver Category 3 equipment			
Wanted signal mean power from companion device (dBm) (see notes 1 and 3)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 3)	Type of blocking signal
(-139 dBm + 10 × log10(OCBW) + 20 dB) or (-74 dBm + 20 dB) whichever is less (see note 2)	2 380 2 504 2 300 2 584	-34	CW
NOTE 1: OCBW is in Hz. NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to Pmin + 30 dB where Pmin is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal. NOTE 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.			

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7.8.1 E.U.T. Operation

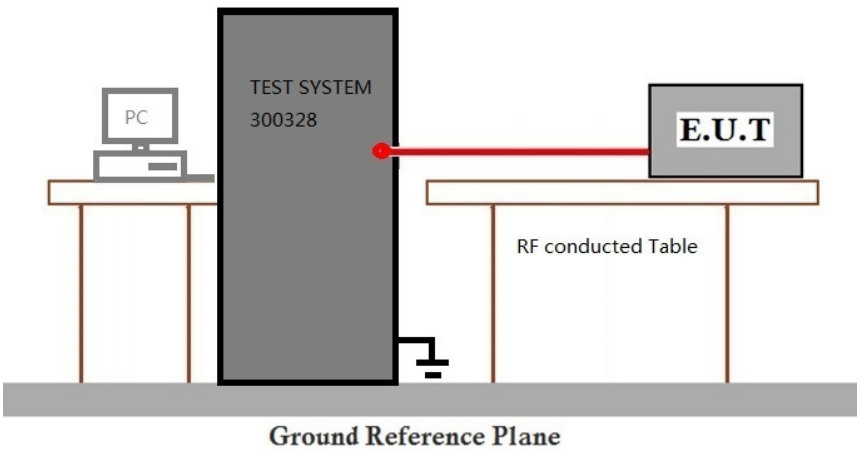
Operating Environment:

Temperature: 28.0 °C Humidity: 37.5 % RH Atmospheric Pressure: 1020 mbar

7.8.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	Normal operating(Left earbud)_Keep the EUT communication with the companion device.
Final test	07	Normal operating(Right earbud)_Keep the EUT communication with the companion device.

7.8.3 Test Setup Diagram



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8 Test Setup Photo

Transmitter unwanted emissions in the spurious domain

Left earbud



Right earbud



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Receiver spurious emissions

Left earbud



Right earbud



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9 EUT Constructional Details (EUT Photos)

Refer to Appendix_Photographs of EUT Constructional Details for SZCR2506002538AT

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10 Appendix

For right earbud:

1. RF Output Power

1.1 Test Result

1.1.1 Power

ENV	Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Gain (dBi)	Power (dBm)	EIRP (dBm)	Limit (dBm)	Verdict
NTNV	GFSK	SISO	HOPP	DH1	1	0.70	6.96	7.66	<=20	Pass
				DH3	1	0.70	6.95	7.65	<=20	Pass
				DH5	1	0.70	6.80	7.50	<=20	Pass
	Pi/4DQPSK	SISO	HOPP	2DH1	1	0.70	6.61	7.31	<=20	Pass
				2DH3	1	0.70	6.50	7.20	<=20	Pass
				2DH5	1	0.70	6.34	7.04	<=20	Pass
HTNV	GFSK	SISO	HOPP	DH1	1	0.70	6.95	7.65	<=20	Pass
				DH3	1	0.70	6.95	7.65	<=20	Pass
				DH5	1	0.70	6.85	7.55	<=20	Pass
	Pi/4DQPSK	SISO	HOPP	2DH1	1	0.70	6.64	7.34	<=20	Pass
				2DH3	1	0.70	6.47	7.17	<=20	Pass
				2DH5	1	0.70	6.36	7.06	<=20	Pass
LTNV	GFSK	SISO	HOPP	DH1	1	0.70	6.96	7.66	<=20	Pass
				DH3	1	0.70	6.93	7.63	<=20	Pass
				DH5	1	0.70	6.85	7.55	<=20	Pass
	Pi/4DQPSK	SISO	HOPP	2DH1	1	0.70	6.65	7.35	<=20	Pass
				2DH3	1	0.70	6.48	7.18	<=20	Pass
				2DH5	1	0.70	6.37	7.07	<=20	Pass
Note1: E.I.R.P = Measured Power + Antenna Gain										

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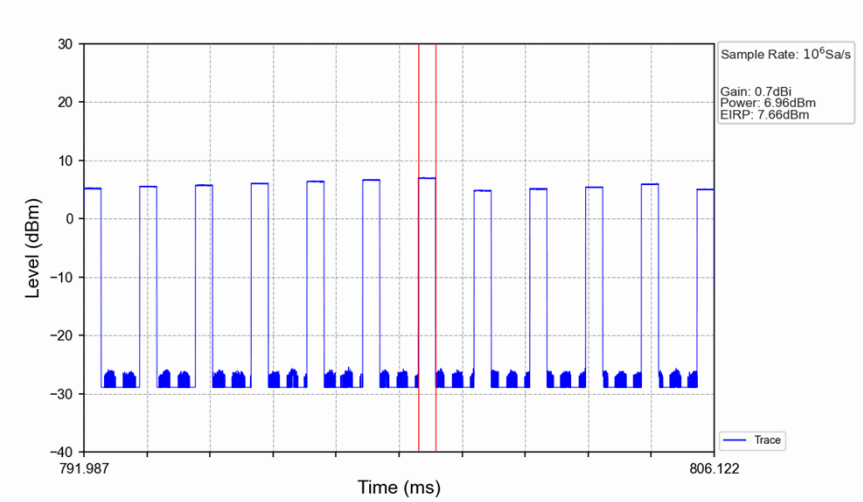
1.2 Test Graph

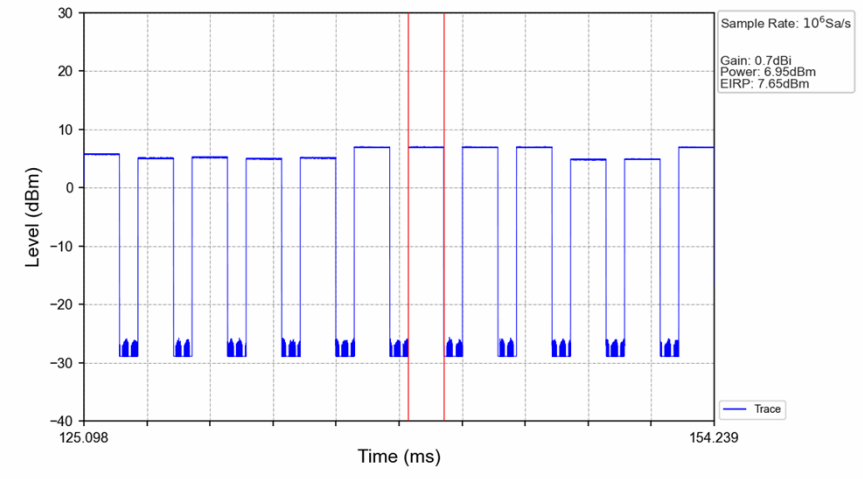
1.2.1 Power

GFSK_DH1_HOPP_Ant1_NTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	0.385	0.385	0.385	0.385	0.385	0.385	**0.385**	0.385	0.385	0.385	0.385	0.386
Power (dBm)	5.18	5.48	5.70	5.99	6.35	6.61	**6.96**	4.80	5.09	5.40	5.93	4.98
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

GFSK_DH3_HOPP_Ant1_NTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	1.641	1.641	1.641	1.641	1.641	1.641	**1.641**	1.641	1.641	1.642	1.642	1.642
Power (dBm)	5.73	5.02	5.21	4.95	5.12	6.95	**6.95**	6.95	6.95	4.82	4.89	6.94
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

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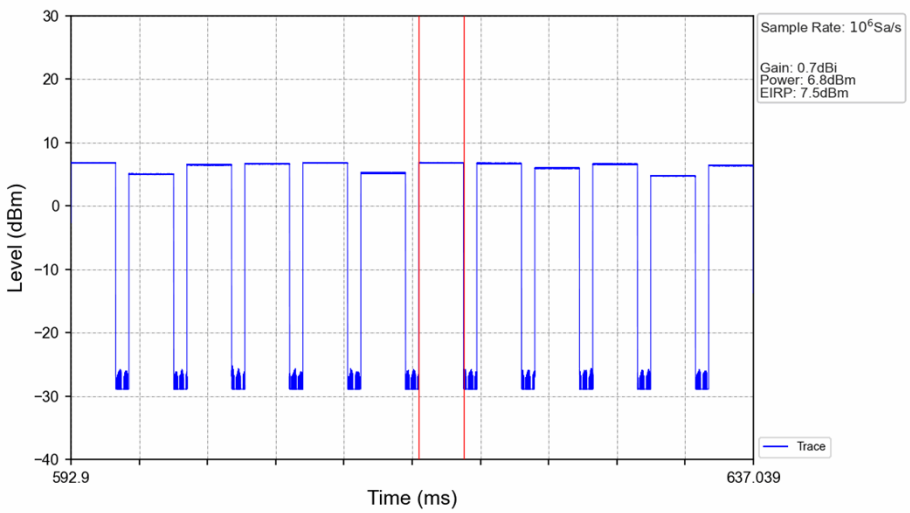
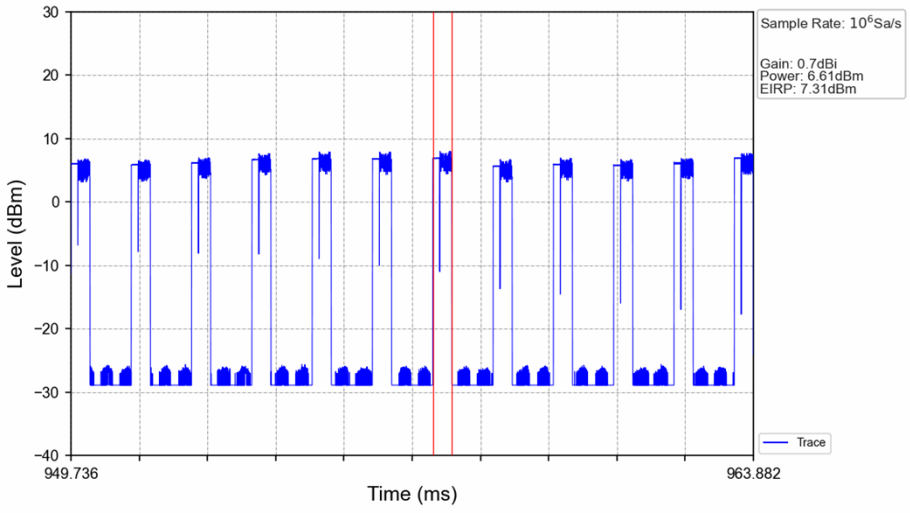
GFSK_DH5_HOPP_Ant1_NTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	2.889	2.889	2.889	2.889	2.889	2.889	**2.889**	2.889	2.889	2.889	2.889	2.890
Power (dBm)	6.80	4.99	6.49	6.63	6.79	5.20	**6.80**	6.71	5.97	6.59	4.73	6.37
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

Pi/4DQPSK_2DH1_HOPP_Ant1_NTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	0.397	0.396	0.396	0.396	0.396	0.396	**0.396**	0.396	0.396	0.396	0.396	0.396
Power (dBm)	5.53	5.44	5.82	6.39	6.56	6.52	**6.61**	5.33	5.63	5.44	5.73	6.48
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

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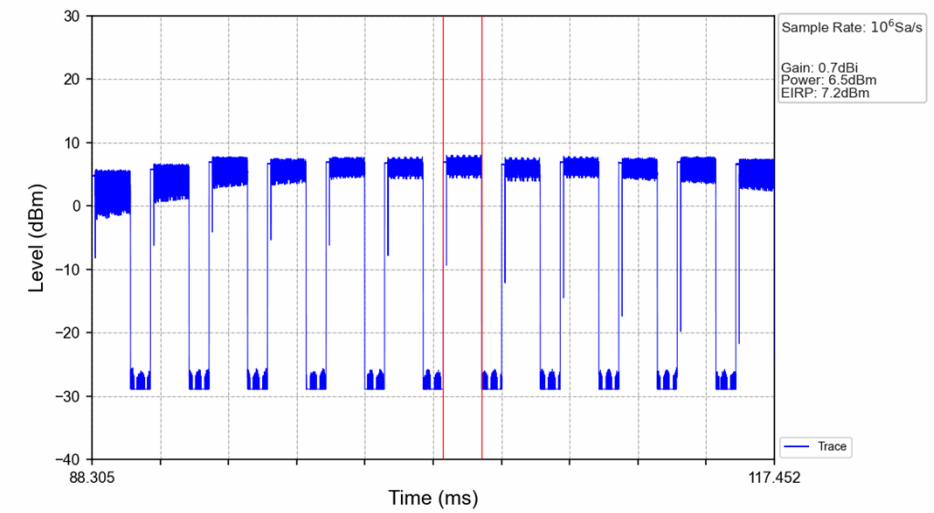
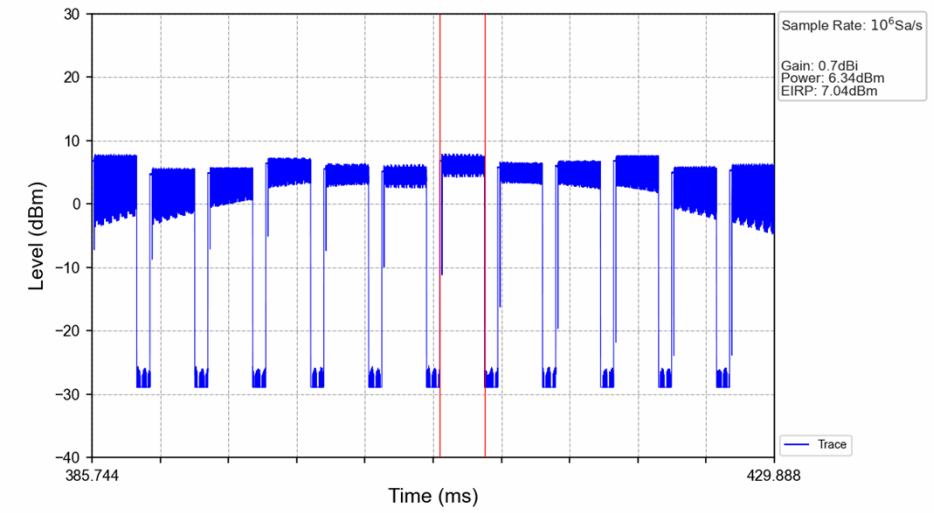
Pi/4DQPSK_2DH3_HOPP_Ant1_NTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	1.648	1.647	1.650	1.648	1.648	1.648	**1.648**	1.648	1.649	1.649	1.649	1.648
Power (dBm)	3.24	4.49	5.92	5.87	6.32	6.25	**6.50**	6.08	6.37	6.15	6.11	5.54
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	2.896	2.895	2.895	2.896	2.896	2.896	**2.896**	2.896	2.896	2.895	2.895	2.895
Power (dBm)	4.71	2.99	3.61	5.50	4.86	4.62	**6.34**	5.14	5.13	5.63	3.35	3.24
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

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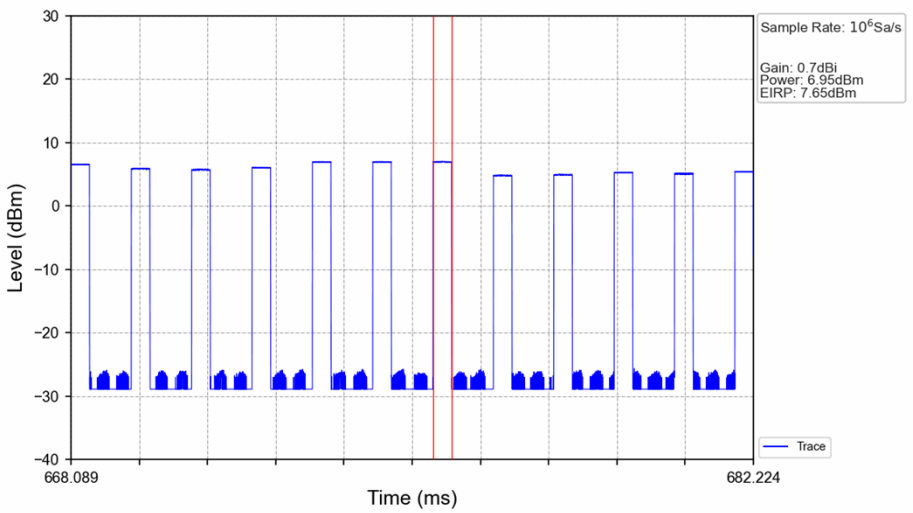
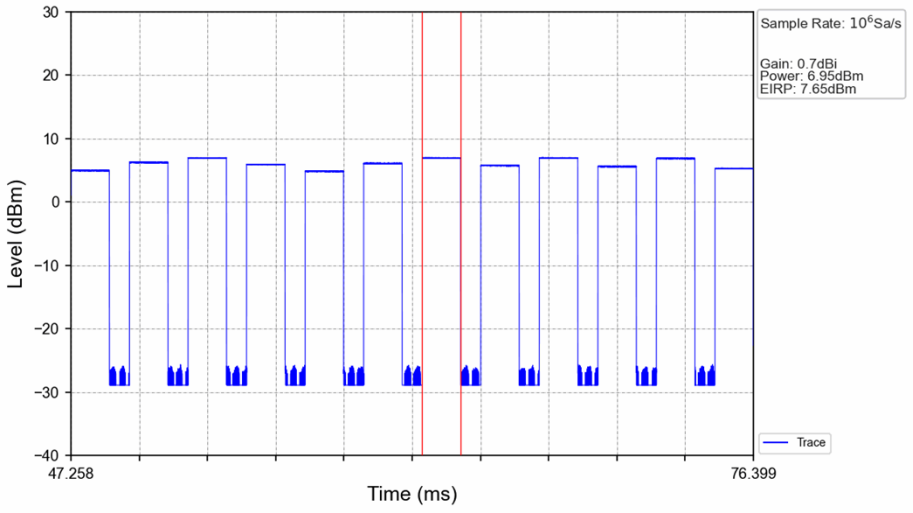
GFSK_DH1_HOPP_Ant1_HTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	0.385	0.385	0.385	0.385	0.385	0.385	**0.385**	0.385	0.385	0.385	0.385	0.385
Power (dBm)	6.53	5.84	5.69	5.99	6.94	6.94	**6.95**	4.79	4.91	5.24	5.06	5.39
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

GFSK_DH3_HOPP_Ant1_HTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	1.641	1.641	1.641	1.641	1.641	1.641	**1.641**	1.642	1.642	1.642	1.642	1.642
Power (dBm)	4.95	6.22	6.93	5.88	4.82	6.03	**6.95**	5.72	6.94	5.58	6.86	5.27
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

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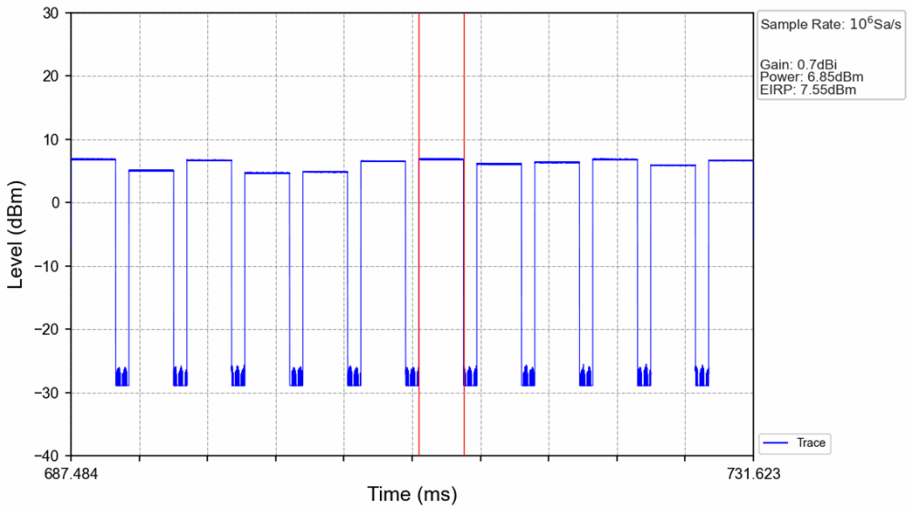
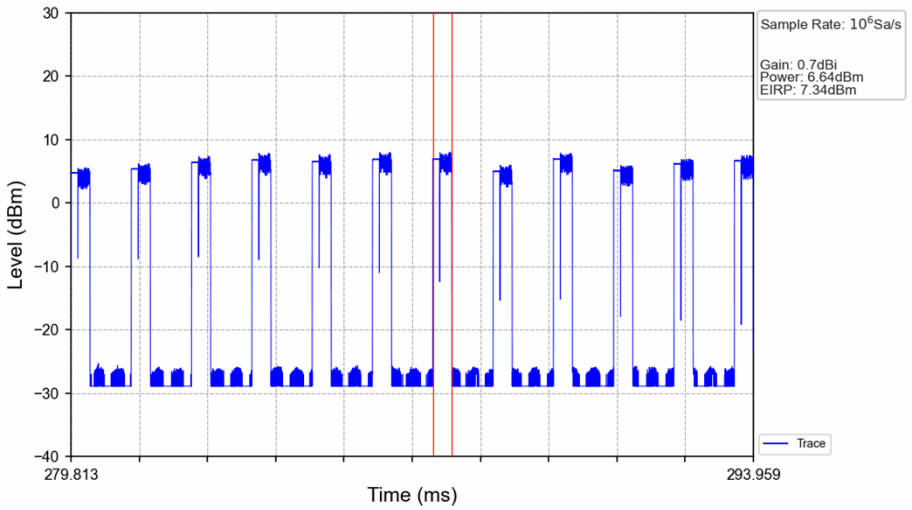


Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	2.890	2.890	2.890	2.889	2.889	2.889	**2.889**	2.889	2.889	2.889	2.889	2.889
Power (dBm)	6.84	5.05	6.69	4.66	4.84	6.54	**6.85**	6.13	6.36	6.83	5.88	6.64
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

Pi/4DQPSK_2DH1_HOPP_Ant1_HTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	0.396	0.396	0.396	0.396	0.396	0.397	**0.396**	0.396	0.396	0.396	0.396	0.396
Power (dBm)	4.35	4.97	6.06	6.53	6.24	6.59	**6.64**	4.65	6.59	4.73	5.75	6.20
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

Pi/4DQPSK_2DH3_HOPP_Ant1_HTNV

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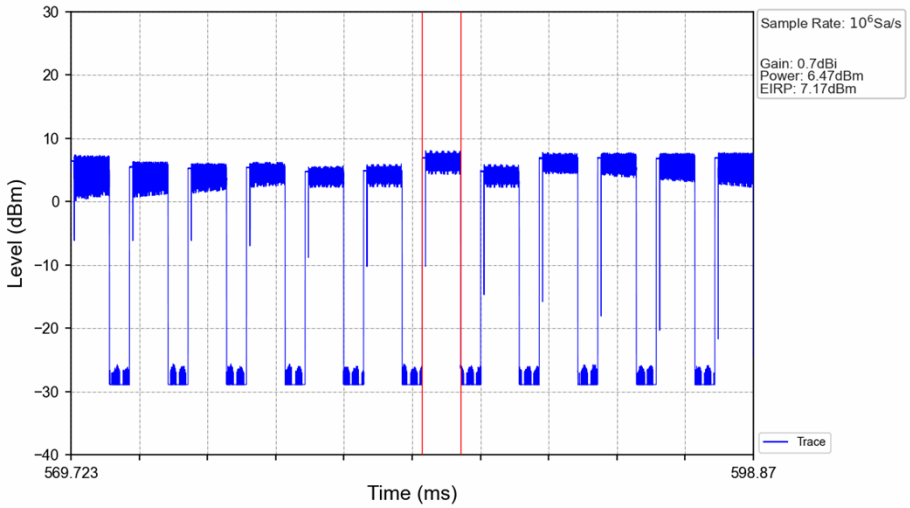
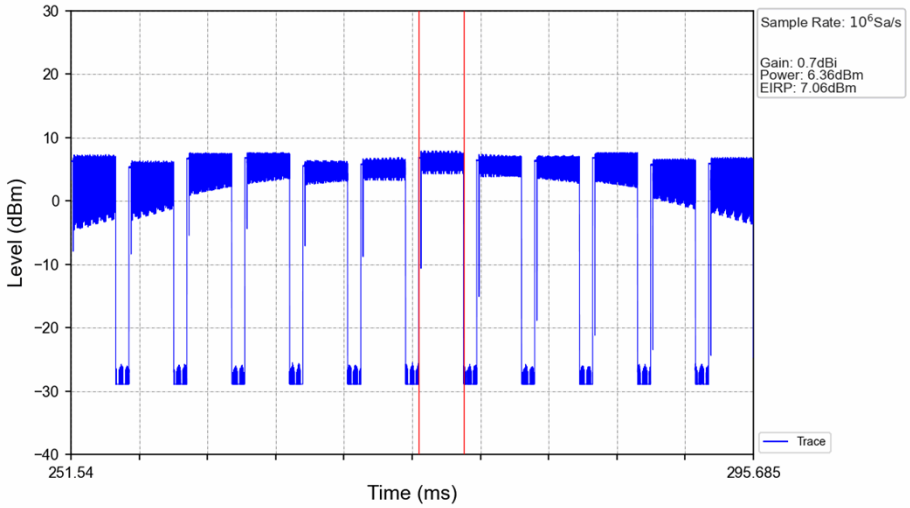


Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	1.648	1.647	1.648	1.648	1.648	1.648	**1.649**	1.648	1.648	1.648	1.648	1.648
Power (dBm)	4.96	4.28	4.29	4.64	4.15	4.37	**6.47**	4.31	6.30	6.20	5.93	5.76
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

Pi/4DQPSK_2DH5_HOPP_Ant1_HTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	2.896	2.895	2.895	2.896	2.896	2.896	**2.896**	2.896	2.896	2.896	2.896	2.896
Power (dBm)	4.10	3.54	5.35	5.82	4.86	5.28	**6.36**	5.81	5.51	5.67	4.15	3.91
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

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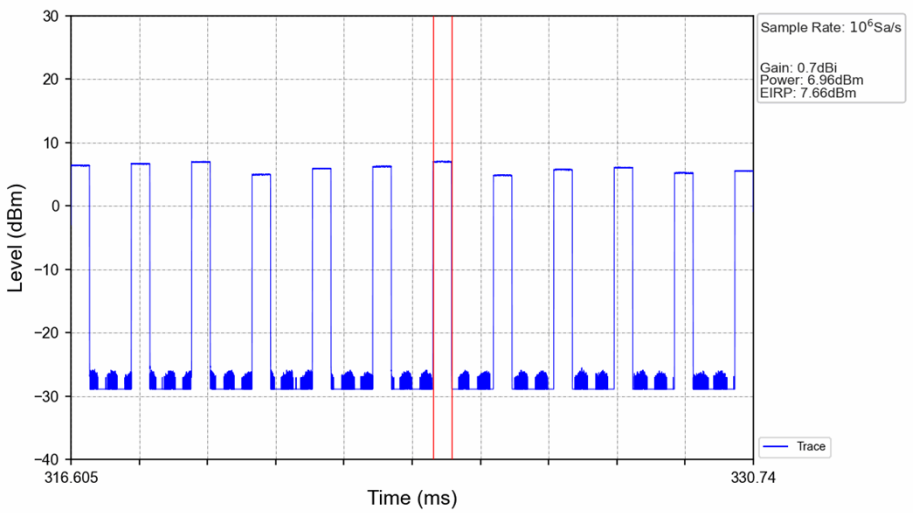
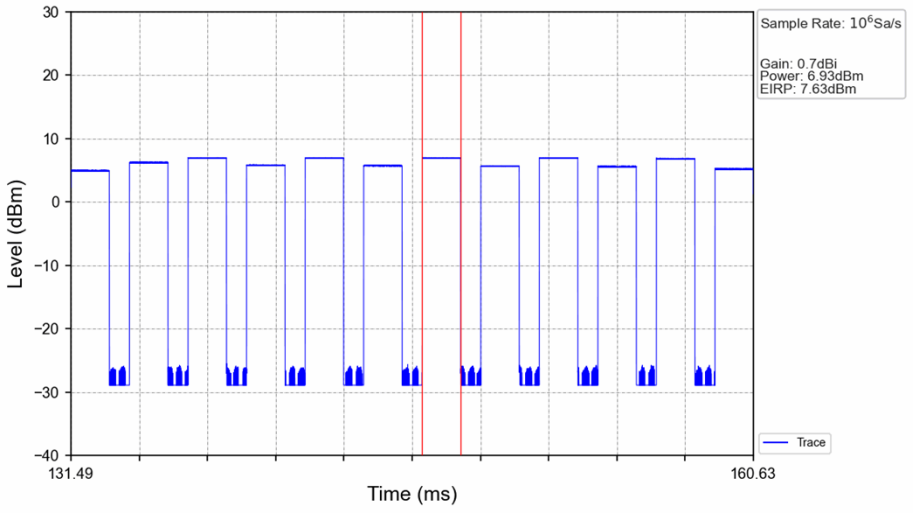


Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	0.385	0.386	0.386	0.385	0.385	0.385	**0.385**	0.385	0.385	0.385	0.385	0.385
Power (dBm)	6.35	6.60	6.94	4.93	5.85	6.20	**6.96**	4.81	5.70	6.00	5.18	5.48
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

GFSK_DH3_HOPP_Ant1_LTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	1.641	1.641	1.641	1.641	1.642	1.642	**1.642**	1.642	1.642	1.642	1.641	1.641
Power (dBm)	4.93	6.21	6.93	5.79	6.93	5.72	**6.93**	5.64	6.92	5.56	6.82	5.19
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

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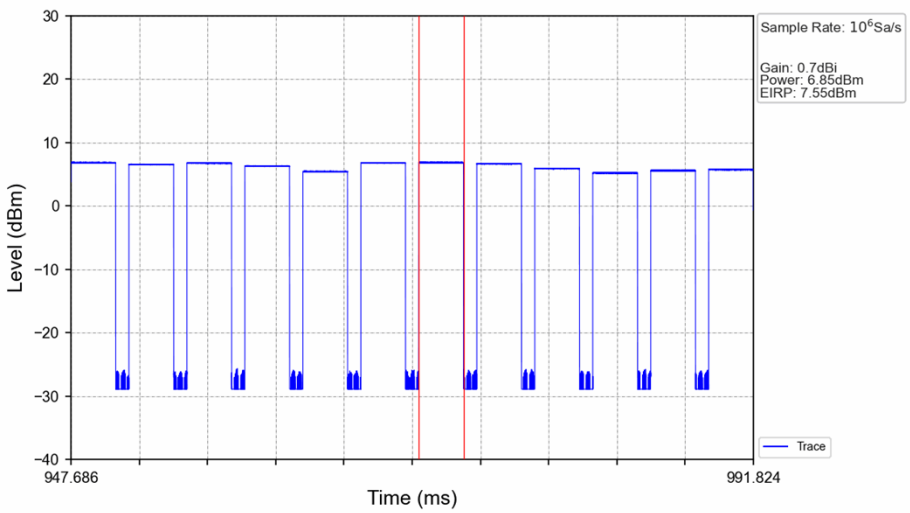
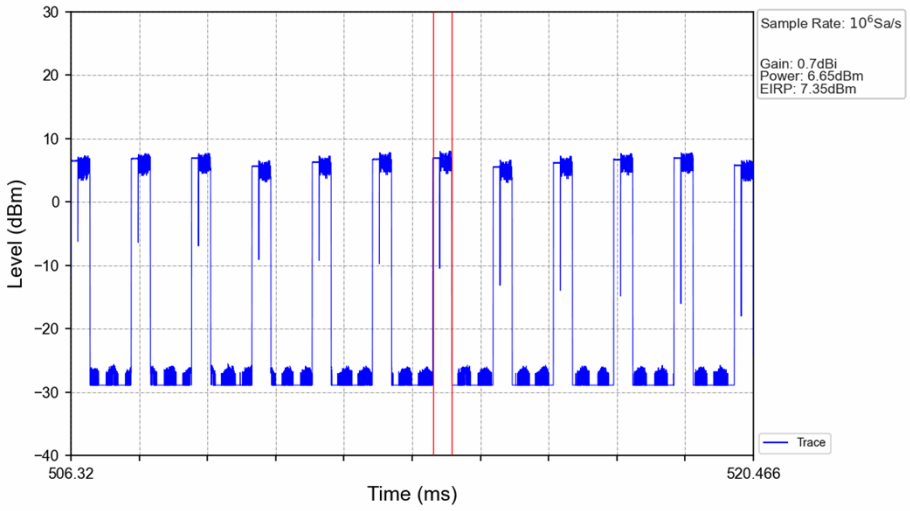
GFSK_DH5_HOPP_Ant1_LTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	2.889	2.889	2.889	2.889	2.890	2.890	**2.890**	2.889	2.889	2.889	2.889	2.889
Power (dBm)	6.83	6.53	6.75	6.28	5.42	6.78	**6.85**	6.64	5.88	5.20	5.58	5.73
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

Pi/4DQPSK_2DH1_HOPP_Ant1_LTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	0.396	0.398	0.396	0.396	0.396	0.396	**0.396**	0.396	0.396	0.396	0.396	0.396
Power (dBm)	5.97	6.40	6.52	5.28	5.95	6.46	**6.65**	5.26	5.89	6.38	6.57	5.38
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

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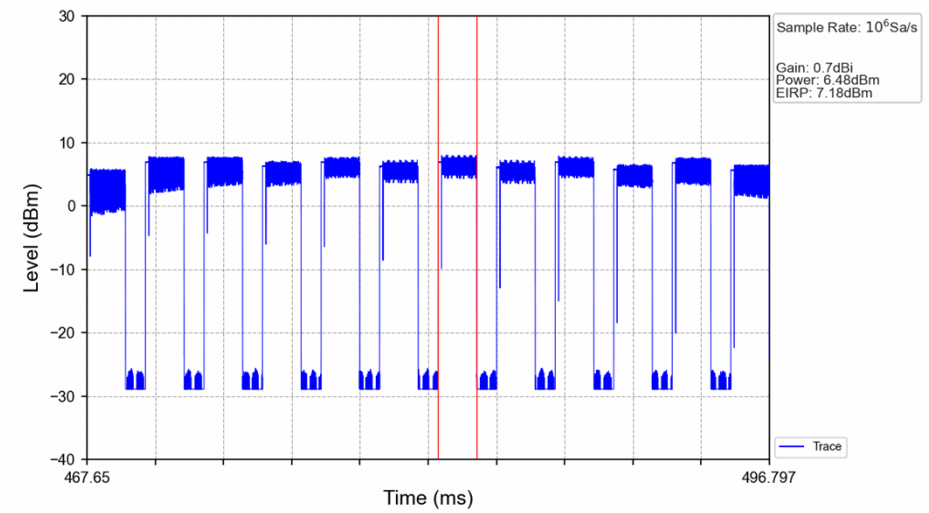
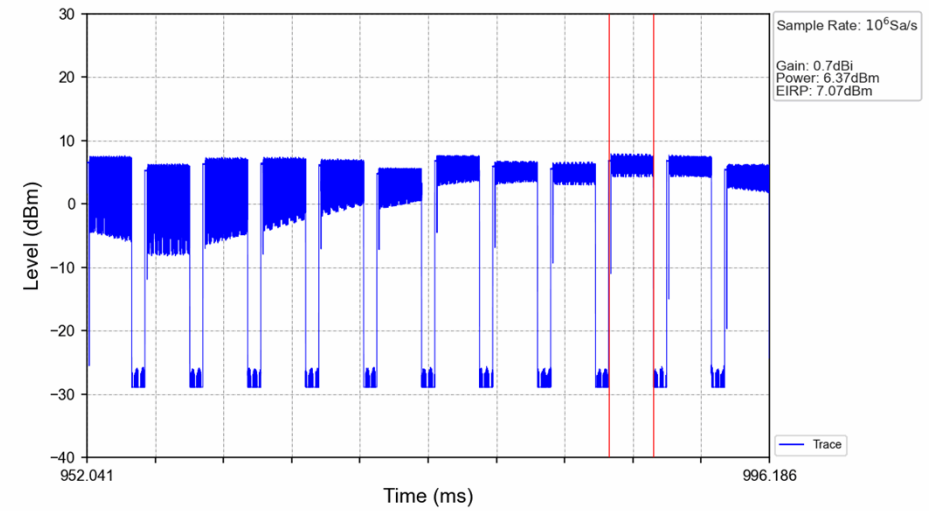
Pi/4DQPSK_2DH3_HOPP_Ant1_LTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	1.647	1.647	1.648	1.648	1.648	1.649	**1.648**	1.648	1.648	1.648	1.648	1.648
Power (dBm)	3.44	5.72	5.95	5.51	6.33	5.71	**6.48**	5.66	6.38	5.04	5.93	4.55
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

Pi/4DQPSK_2DH5_HOPP_Ant1_LTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	2.896	2.895	2.895	2.895	2.895	2.895	2.896	2.896	2.896	**2.896**	2.897	2.896
Power (dBm)	4.12	2.73	3.86	4.21	4.38	3.49	5.89	5.30	5.05	**6.37**	6.19	4.55
Remark	/	/	/	/	/	/	/	/	/	**Max**	/	/

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2. Accumulated Transmit Time, Frequency Occupation And Hopping Sequence

2.1 Test Result

2.1.1 ATT-Ant1

Ant1										
ENV	Mode	TX Type	Frequency (MHz)	Packet Type	HOPP Num_Mini	Data Points Of T_on	Duration Of One Point (ms)	Accumulated Transmit Time (ms)		Verdict
								Result	Limit	
NTNV	GFSK	SISO	HOPP	DH1	79	320	1.053	336.960	<=400	Pass
				DH3	79	242	1.053	254.826	<=400	Pass
				DH5	79	243	1.053	255.879	<=400	Pass
	Pi/4DQPSK	SISO	HOPP	2DH1	79	320	1.053	336.960	<=400	Pass
				2DH3	79	259	1.053	272.727	<=400	Pass
				2DH5	79	256	1.053	269.568	<=400	Pass

2.1.2 FO-Ant1

Ant1									
ENV	Mode	TX Type	Frequency (MHz)	Packet Type	HOPP Num_Mini	Dwell Time (ms)	Frequency Occupation (N)		Verdict
							Result	Limit	
NTNV	GFSK	SISO	HOPP	DH1	79	1.250	4	>=1	Pass
				DH3	79	2.500	5	>=1	Pass
				DH5	79	3.750	7	>=1	Pass
	Pi/4DQPSK	SISO	HOPP	2DH1	79	1.250	4	>=1	Pass
				2DH3	79	2.500	4	>=1	Pass
				2DH5	79	3.750	4	>=1	Pass

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2.1.3 HS-Ant1

Ant1									
ENV	Mode	TX Type	Frequency (MHz)	Packet Type	HOPP Num (N)		-20 dB Bandwidth (MHz)		Verdict
					Result	Limit	Result	Limit	
NTNV	GFSK	SISO	HOPP	DH5	79	>=15	79.634	>=58.45	Pass
	Pi/4DQPSK	SISO	HOPP	2DH5	79	>=15	80.249	>=58.45	Pass

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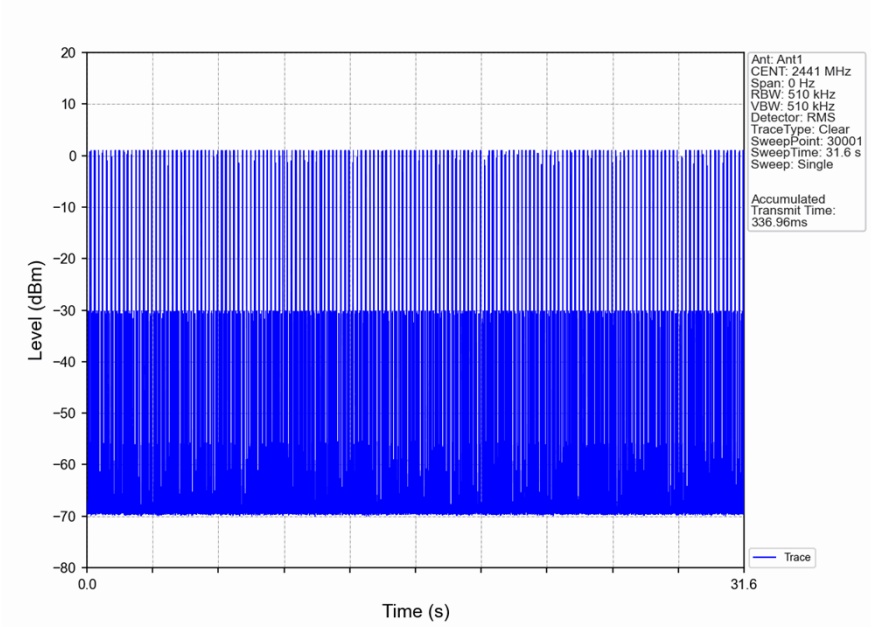
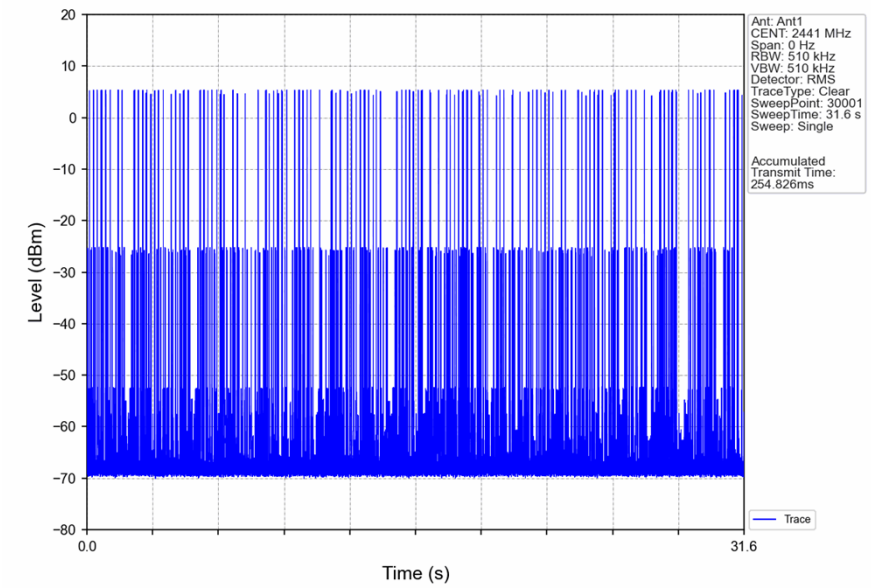
2.2 Test Graph

2.2.1 ATT-Ant1

GFSK_DH1_HOPP_Ant1_NTNV



GFSK_DH3_HOPP_Ant1_NTNV



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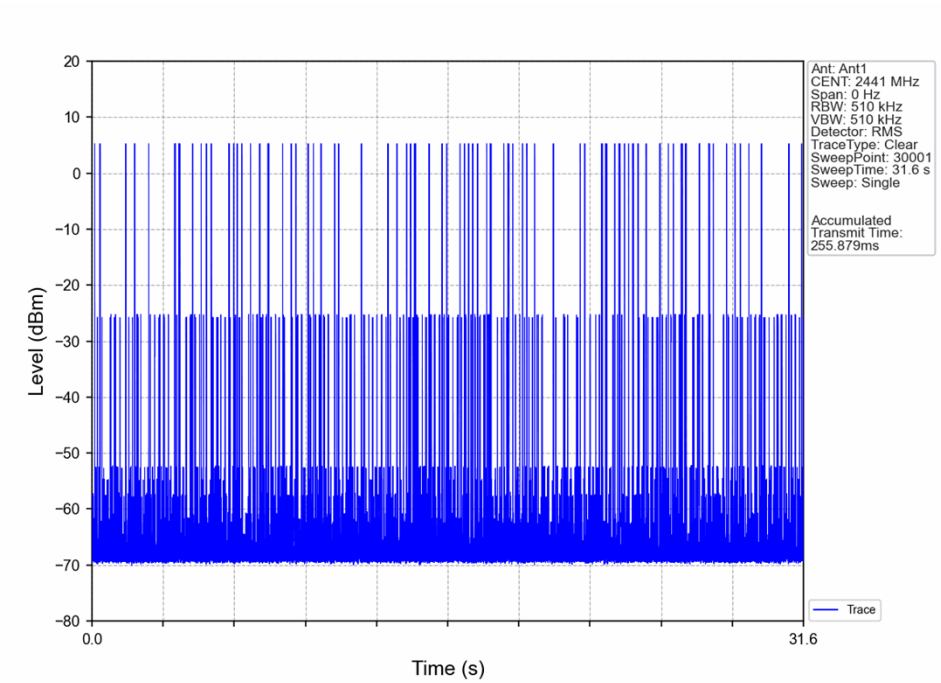
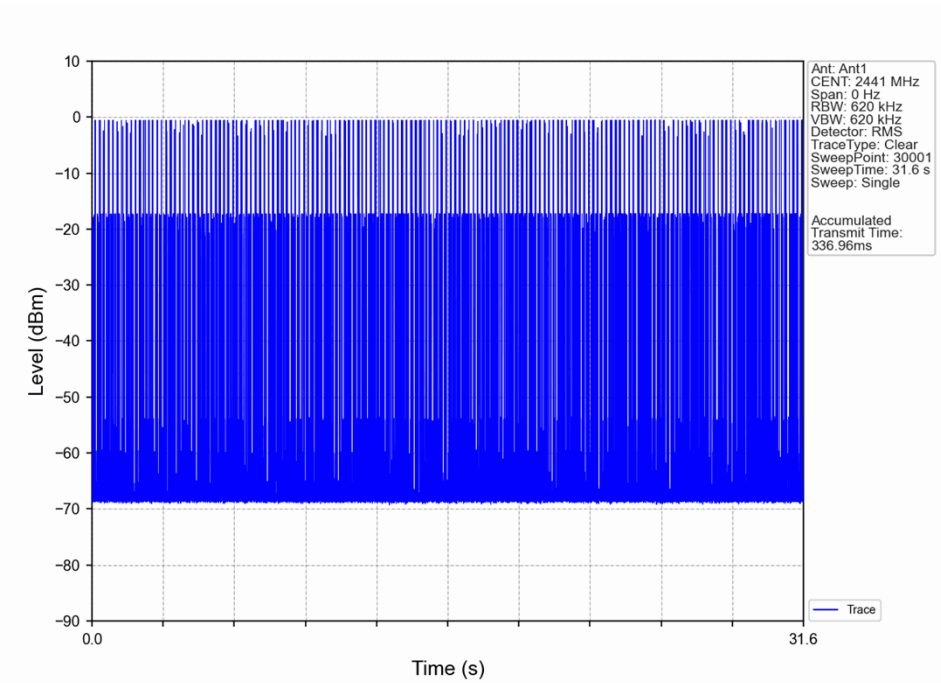


Pi/4DQPSK_2DH1_HOPP_Ant1_NTNV



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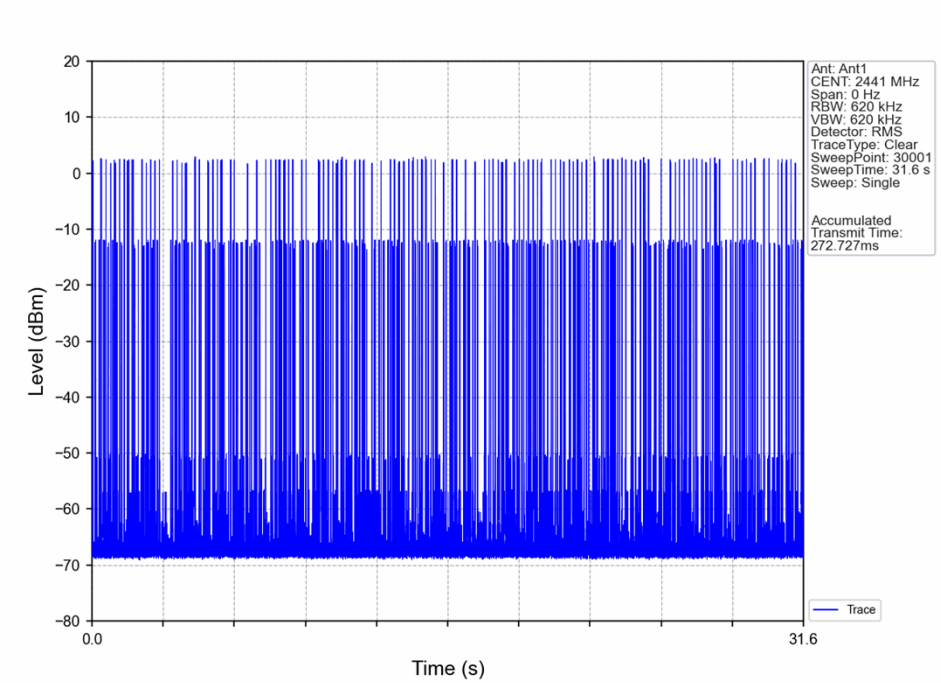

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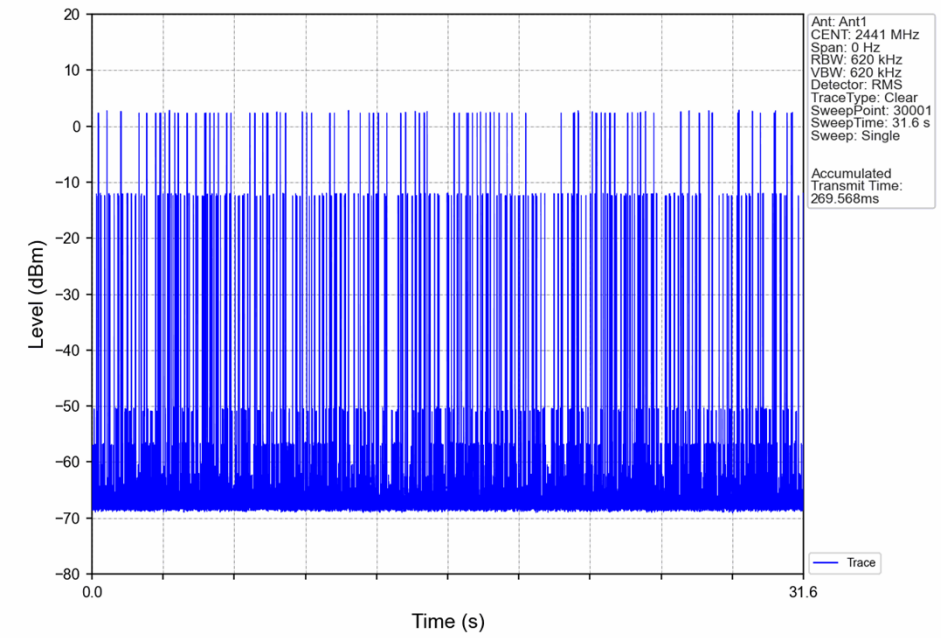

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2.2.2 FO-Ant1

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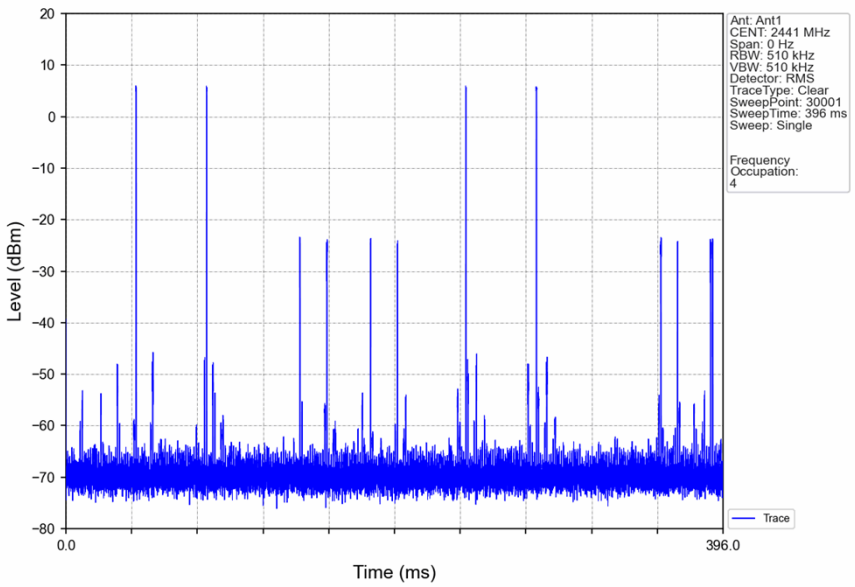

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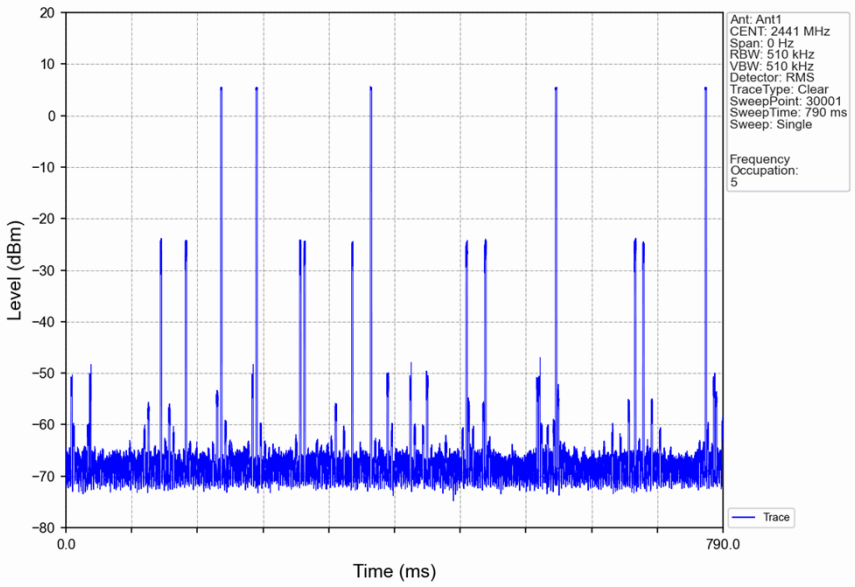

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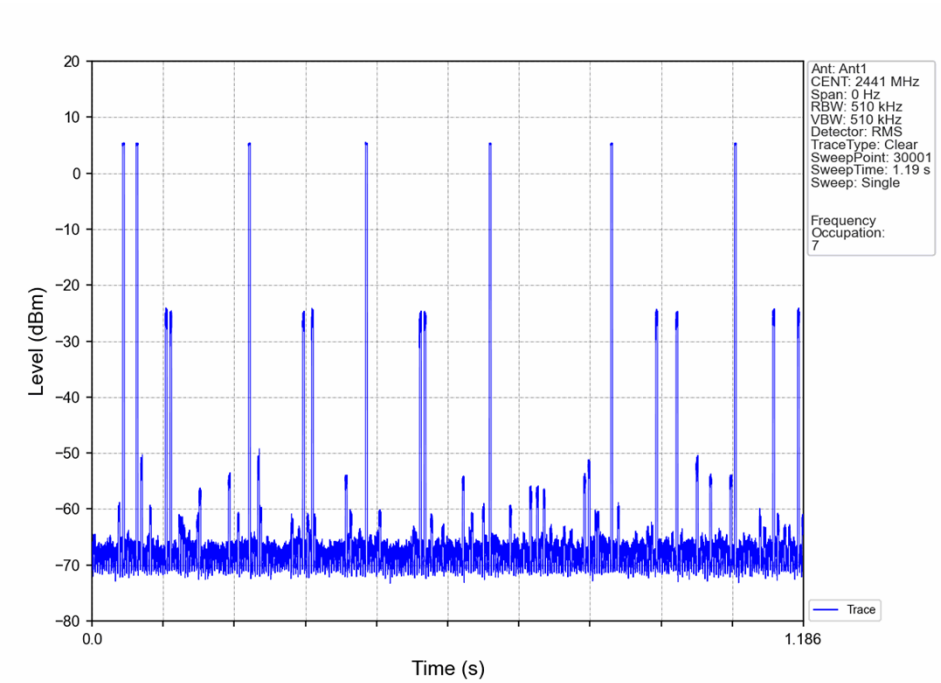

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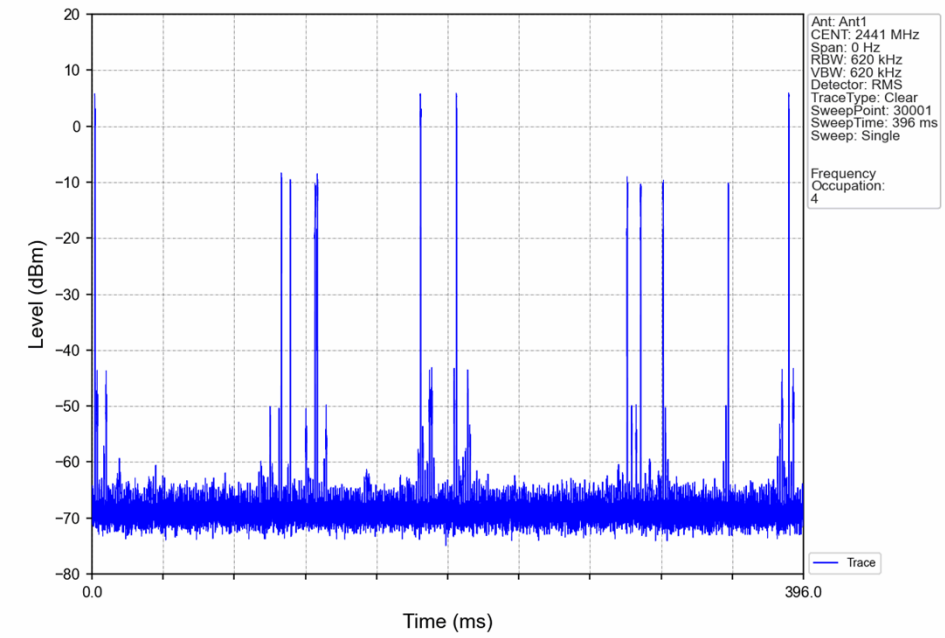

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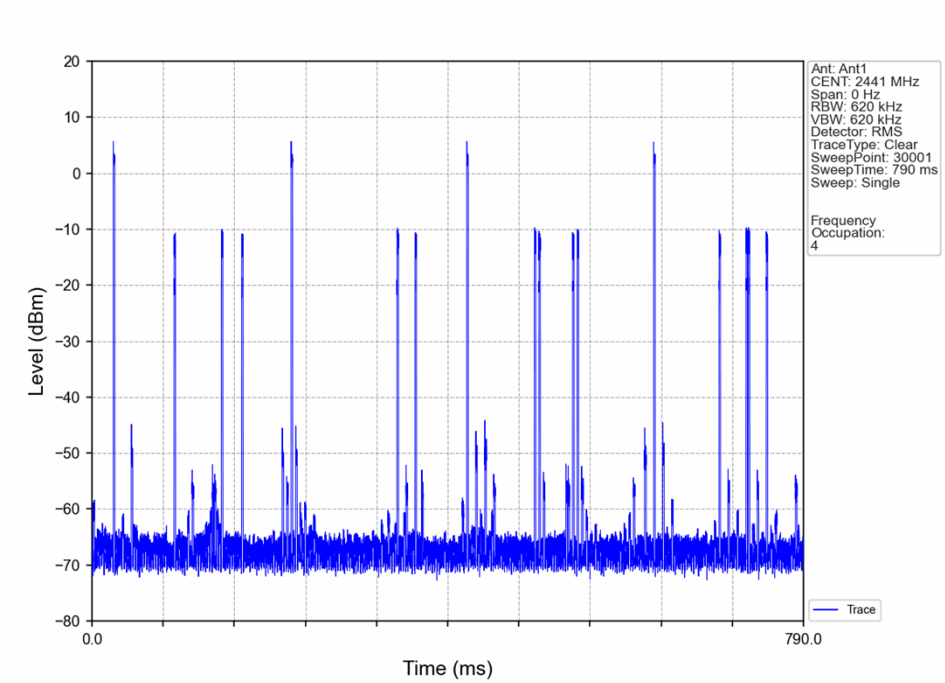
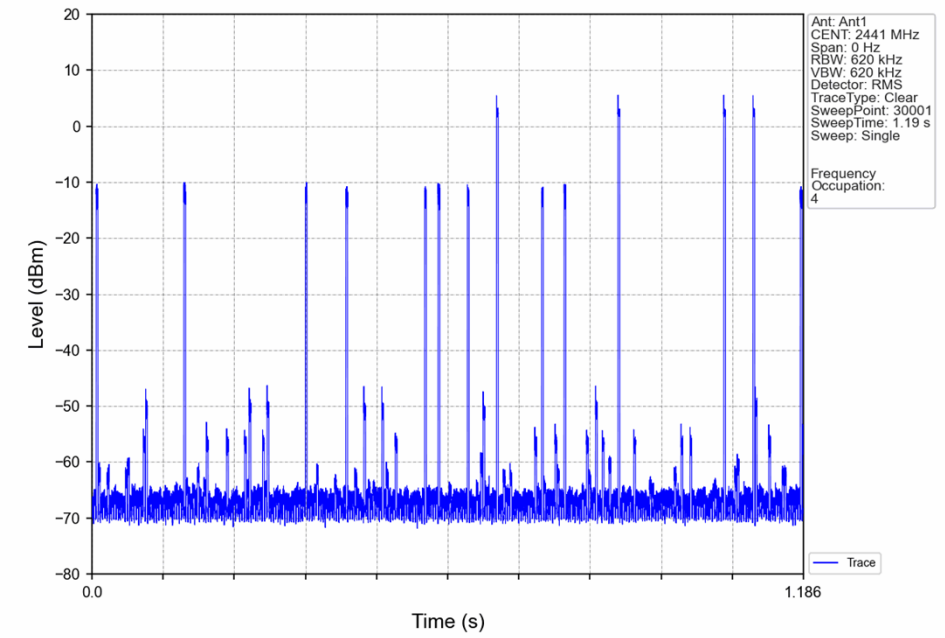


Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



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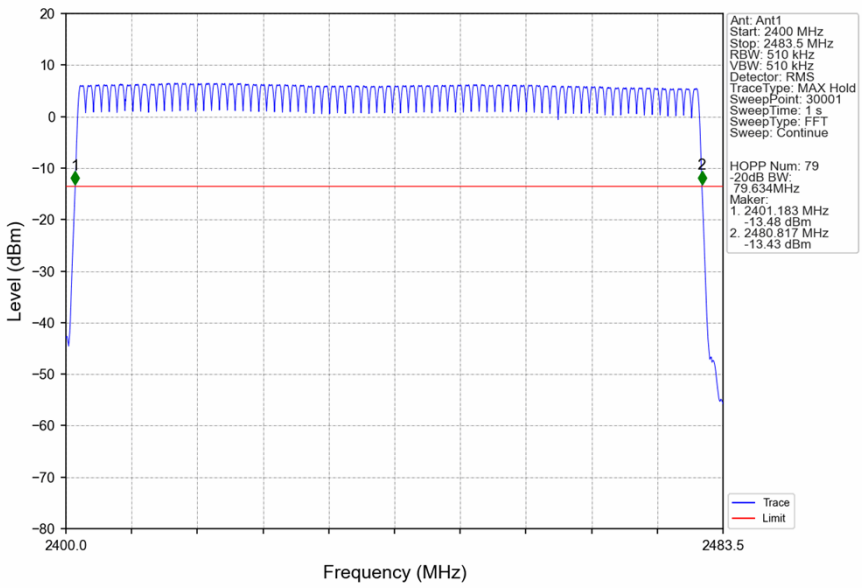
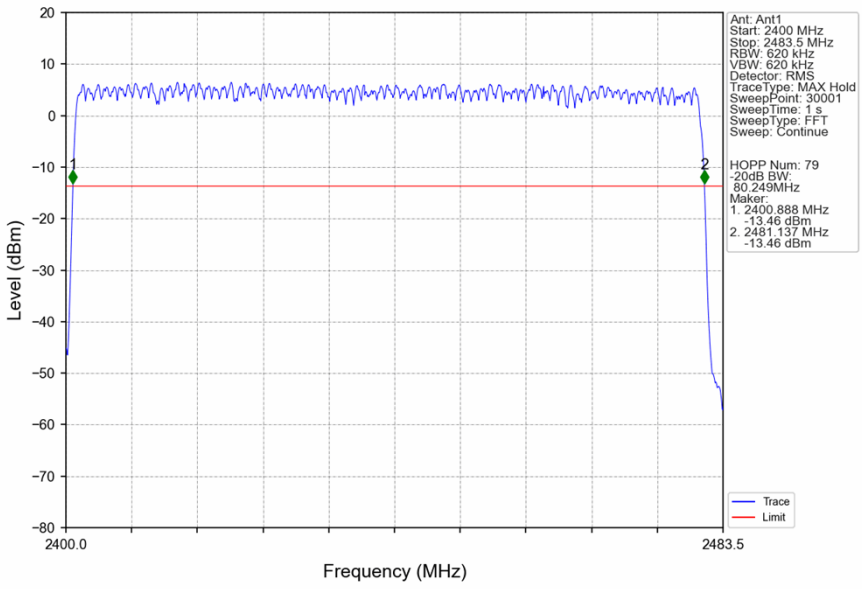
2.2.3 HS-Ant1

GFSK_DH5_HOPP_Ant1_NTNV



Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



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3. Hopping Frequency Separation

3.1 Test Result

3.1.1 Ant1

Ant1							
ENV	Mode	TX Type	Frequency (MHz)	Packet Type	Channel Separation (MHz)	Limit (MHz)	Verdict
NTNV	GFSK	SISO	HOPP	DH5	1.000	>=0.1	Pass
	Pi/4DQPSK	SISO	HOPP	2DH5	1.018	>=0.1	Pass

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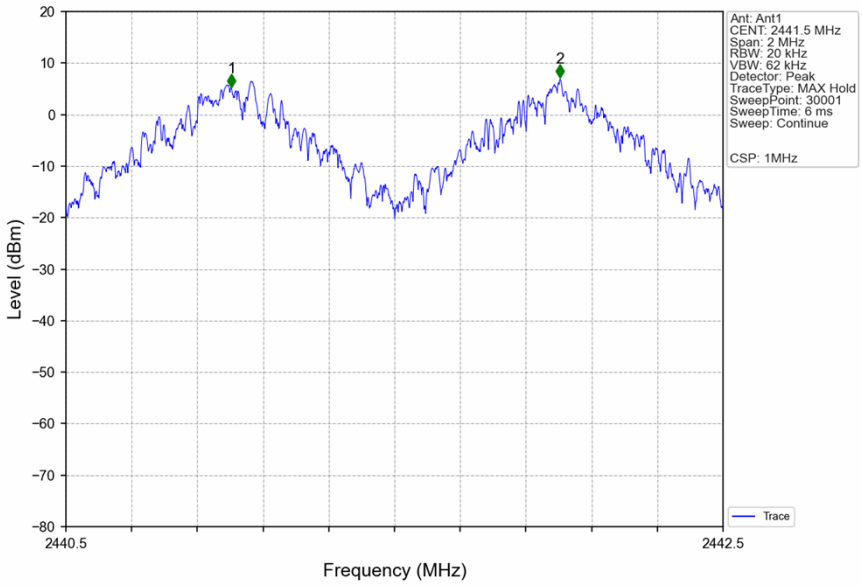
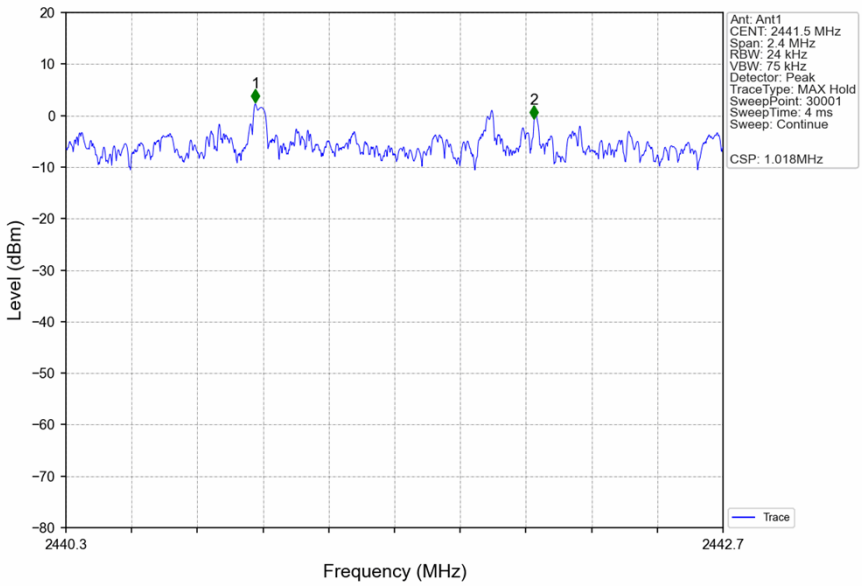
3.2 Test Graph

3.2.1 Ant1

GFSK_DH5_HOPP_Ant1_NTNV



Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



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4. Occupied Channel Bandwidth

4.1 Test Result

4.1.1 OBW_Ant1

Ant1									
ENV	Mode	TX Type	Frequency (MHz)	Packet Type	OBW (MHz)	Frequency Range (MHz)			Verdict
					Result	FL	FH	Limit	
NTNV	GFSK	SISO	2402	DH5	0.874	2401.568	/	>=2400	Pass
			2480	DH5	0.873	/	2480.441	<=2483.5	Pass
	Pi/4DQPSK	SISO	2402	2DH5	1.198	2401.411	/	>=2400	Pass
			2480	2DH5	1.197	/	2480.608	<=2483.5	Pass

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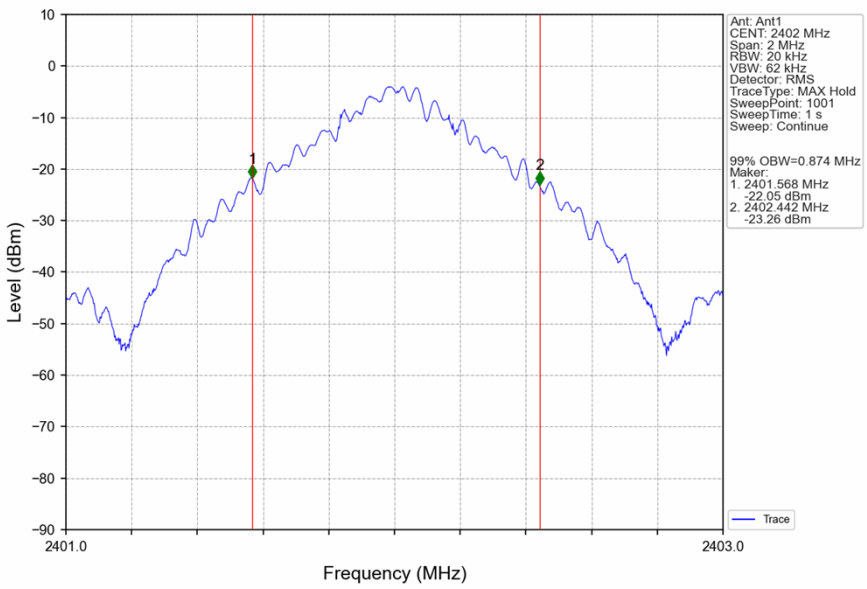
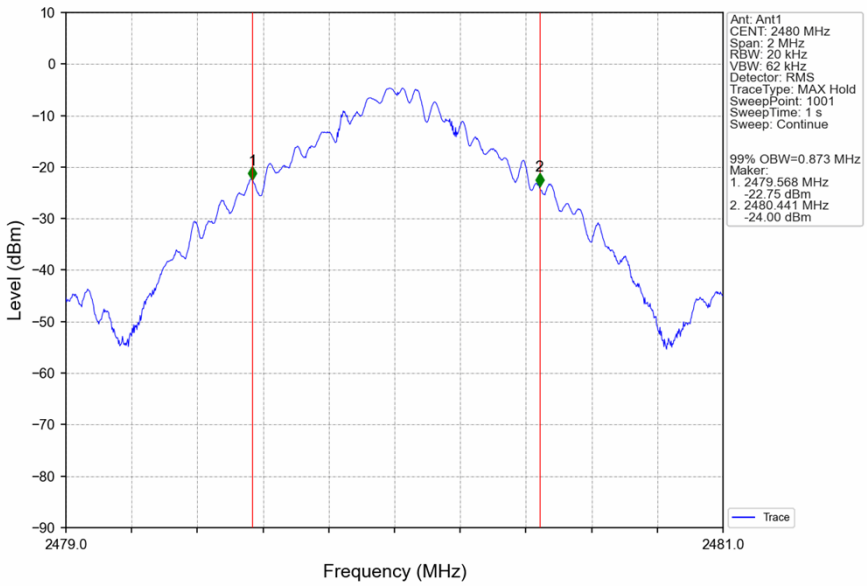
4.2 Test Graph

4.2.1 OBW_Ant1

GFSK_DH5_2402MHz_Ant1_NTNV



GFSK_DH5_2480MHz_Ant1_NTNV



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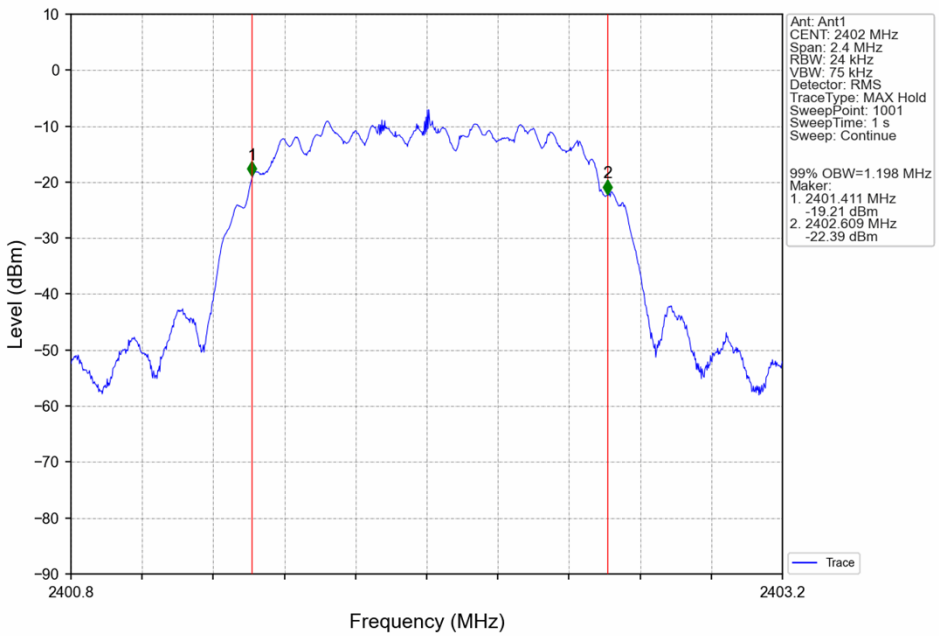
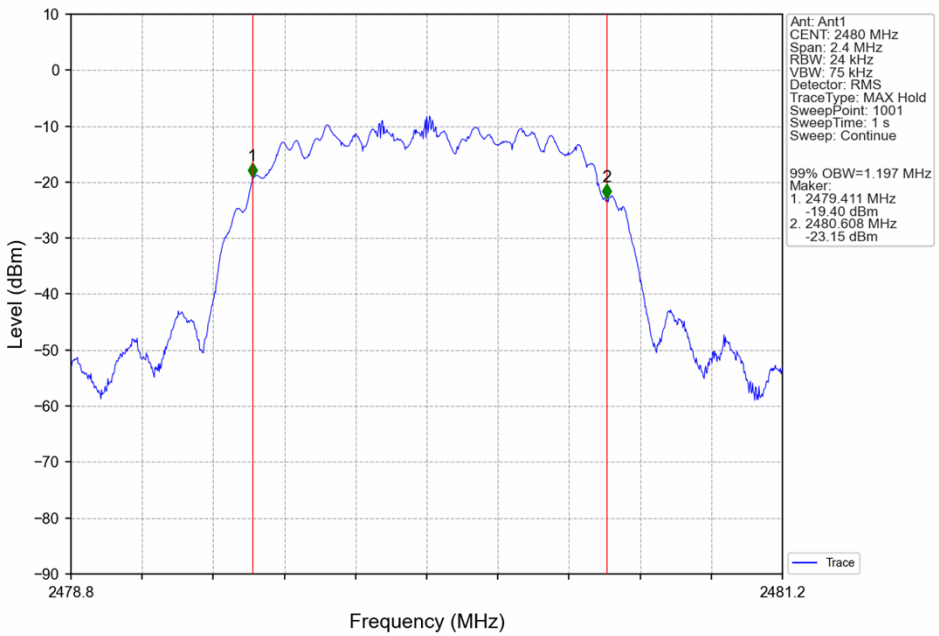
Pi/4DQPSK_2DH5_2402MHz_Ant1_NTNV



Pi/4DQPSK_2DH5_2480MHz_Ant1_NTNV



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5. Transmitter Unwanted Emissions In The Out-Of-Band Domain

5.1 Test Result

5.1.1 GFSK-Ant1

GFSK Ant1 NTNV								
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Test Freq. (MHz)	Result (dBm/MHz)	Limit (dBm/MHz)	Verdict
GFSK	SISO	HOPP	DH5	1	2398.500	-65.90	<=-20	Pass
					2399.500	-62.09	<=-10	Pass
		HOPP	DH5	1	2484.000	-64.60	<=-10	Pass
					2485.000	-65.31	<=-20	Pass

5.1.2 Pi/4DQPSK-Ant1

Pi/4DQPSK Ant1 NTNV								
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Test Freq. (MHz)	Result (dBm/MHz)	Limit (dBm/MHz)	Verdict
Pi/4DQPSK	SISO	HOPP	2DH5	1	2398.104	-65.81	<=-20	Pass
					2398.302	-63.15	<=-20	Pass
					2399.302	-63.78	<=-10	Pass
					2399.500	-63.31	<=-10	Pass
		HOPP	2DH5	1	2484.000	-65.04	<=-10	Pass
					2484.197	-64.45	<=-10	Pass
					2485.197	-64.10	<=-20	Pass
					2485.394	-65.23	<=-20	Pass

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5.2 Test Graph

5.2.1 GFSK-Ant1

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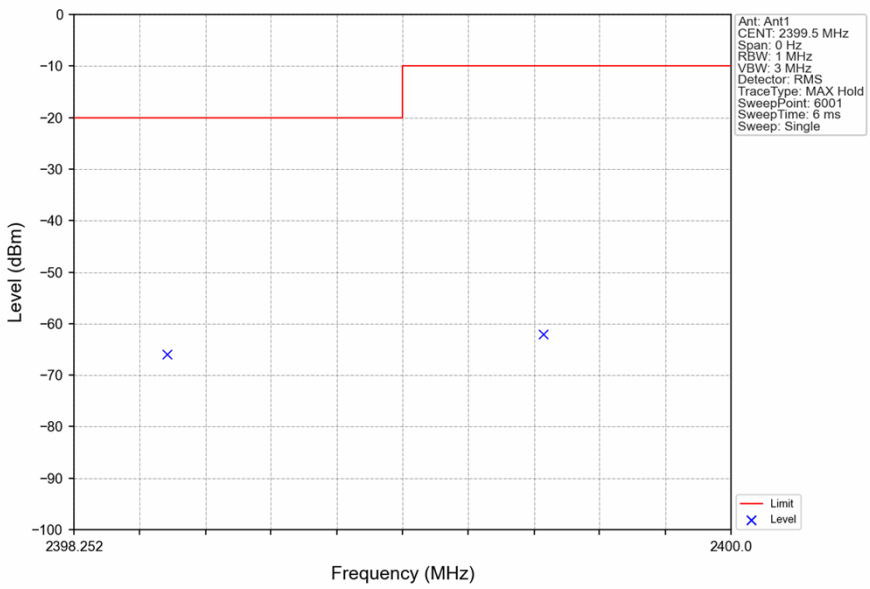
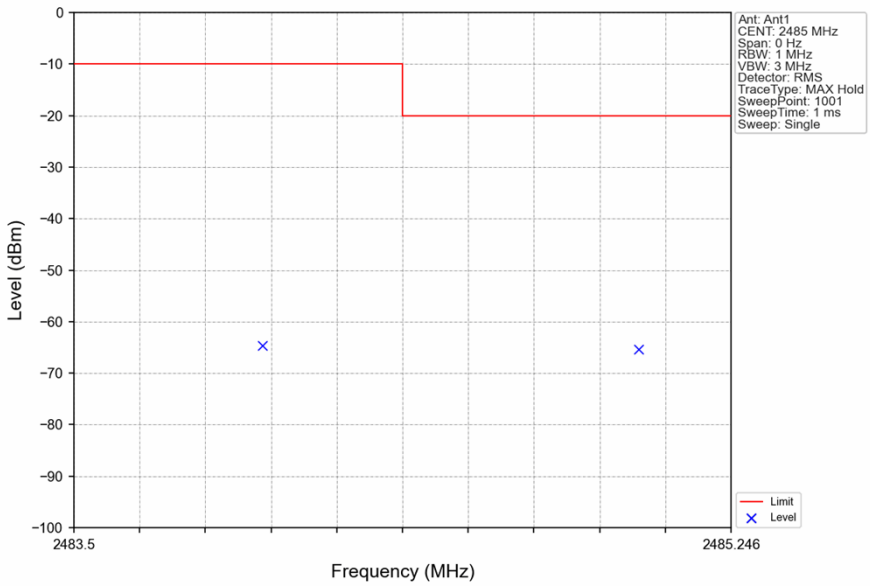


GFSK_DH5_HOPP_Ant1_NTNV



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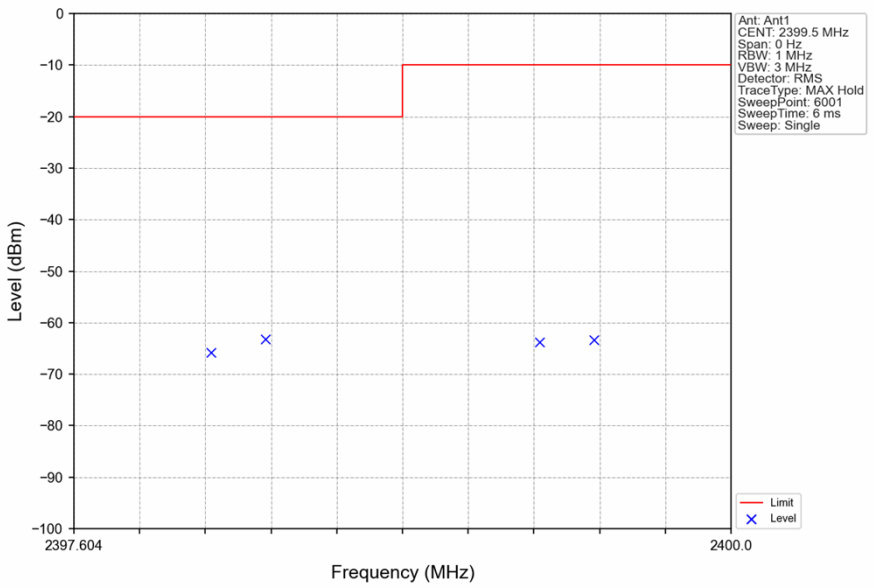
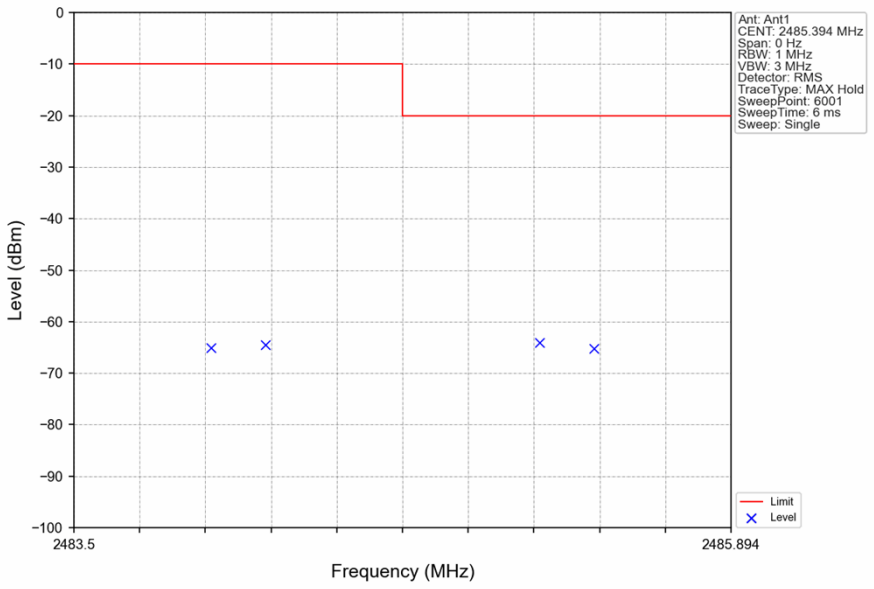
5.2.2 Pi/4DQPSK-Ant1

Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



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6. Receiver Blocking

6.1 Test Result

6.1.1 Ant1

Ant1										
ENV	Mode	TX Type	Frequency (MHz)	Packet Type	Wanted signal level (dBm)	Blocking Signal		PER (%)	Limit (%)	Verdict
						Frequency (MHz)	Power (dBm)			
NTNV	GFSK	SISO	HOPP	DH1	-68.89	2300	-33.3	1.25	<=10	Pass
						2380	-33.3	0.82	<=10	Pass
			HOPP	DH1	-68.89	2504	-33.3	0.76	<=10	Pass
						2584	-33.3	0.60	<=10	Pass
Note1: Receiver Category=2										

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For left earbud:

1. RF Output Power

1.1 Test Result

1.1.1 Power

ENV	Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Gain (dBi)	Power (dBm)	EIRP (dBm)	Limit (dBm)	Verdict
NTNV	GFSK	SISO	HOPP	DH1	1	0.70	6.42	7.12	<=20	Pass
				DH3	1	0.70	6.50	7.20	<=20	Pass
				DH5	1	0.70	6.41	7.11	<=20	Pass
	Pi/4DQPSK	SISO	HOPP	2DH1	1	0.70	6.24	6.94	<=20	Pass
				2DH3	1	0.70	6.02	6.72	<=20	Pass
				2DH5	1	0.70	5.92	6.62	<=20	Pass
HTNV	GFSK	SISO	HOPP	DH1	1	0.70	6.44	7.14	<=20	Pass
				DH3	1	0.70	6.49	7.19	<=20	Pass
				DH5	1	0.70	6.40	7.10	<=20	Pass
	Pi/4DQPSK	SISO	HOPP	2DH1	1	0.70	6.24	6.94	<=20	Pass
				2DH3	1	0.70	6.01	6.71	<=20	Pass
				2DH5	1	0.70	5.92	6.62	<=20	Pass
LTNV	GFSK	SISO	HOPP	DH1	1	0.70	6.45	7.15	<=20	Pass
				DH3	1	0.70	6.49	7.19	<=20	Pass
				DH5	1	0.70	6.39	7.09	<=20	Pass
	Pi/4DQPSK	SISO	HOPP	2DH1	1	0.70	6.24	6.94	<=20	Pass
				2DH3	1	0.70	6.00	6.70	<=20	Pass
				2DH5	1	0.70	5.89	6.59	<=20	Pass
Note1: E.I.R.P = Measured Power + Antenna Gain										

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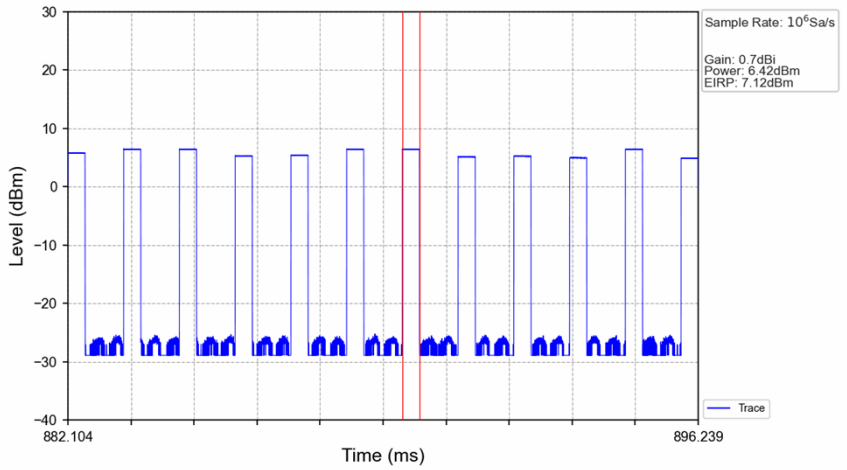
1.2 Test Graph

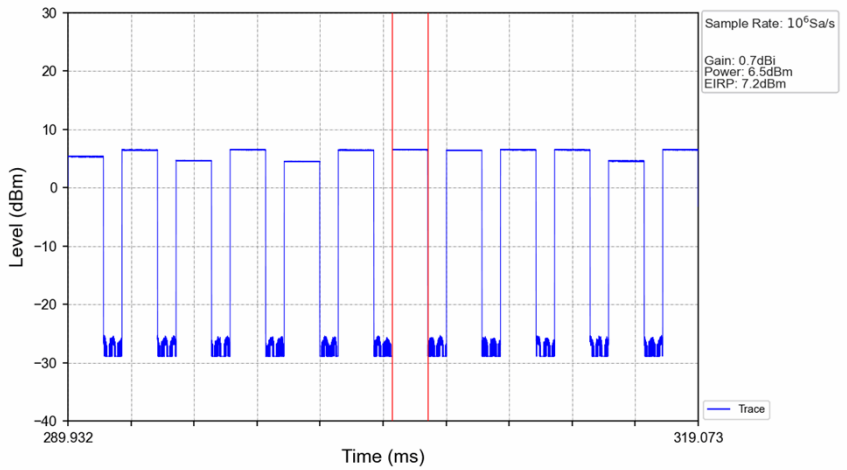
1.2.1 Power

GFSK_DH1_HOPP_Ant1_NTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	0.386	0.386	0.386	0.385	0.385	0.385	**0.385**	0.385	0.385	0.385	0.385	0.385
Power (dBm)	5.78	6.40	6.39	5.28	5.36	6.41	**6.42**	5.12	5.21	4.94	6.41	4.86
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

GFSK_DH3_HOPP_Ant1_NTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	1.642	1.641	1.641	1.641	1.641	1.641	**1.641**	1.641	1.641	1.641	1.642	1.642
Power (dBm)	5.33	6.47	4.64	6.50	4.51	6.46	**6.50**	6.41	6.49	6.48	4.56	6.49
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

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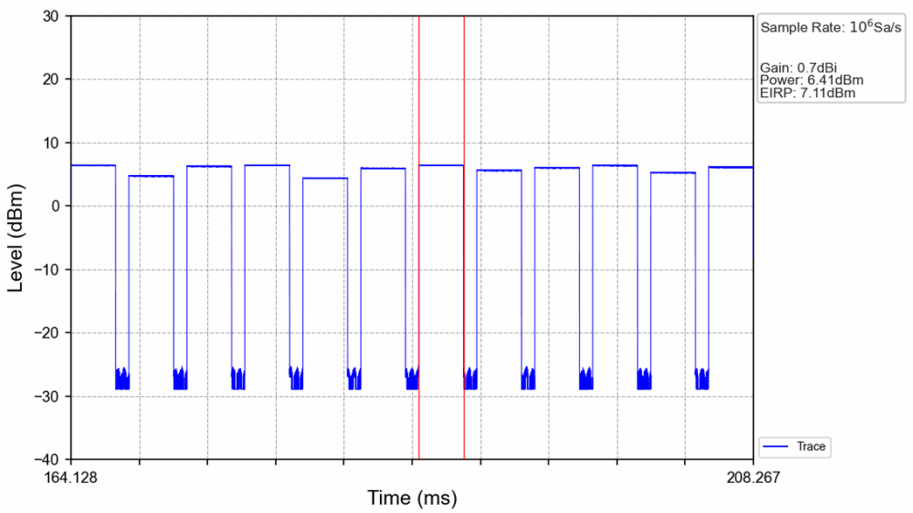
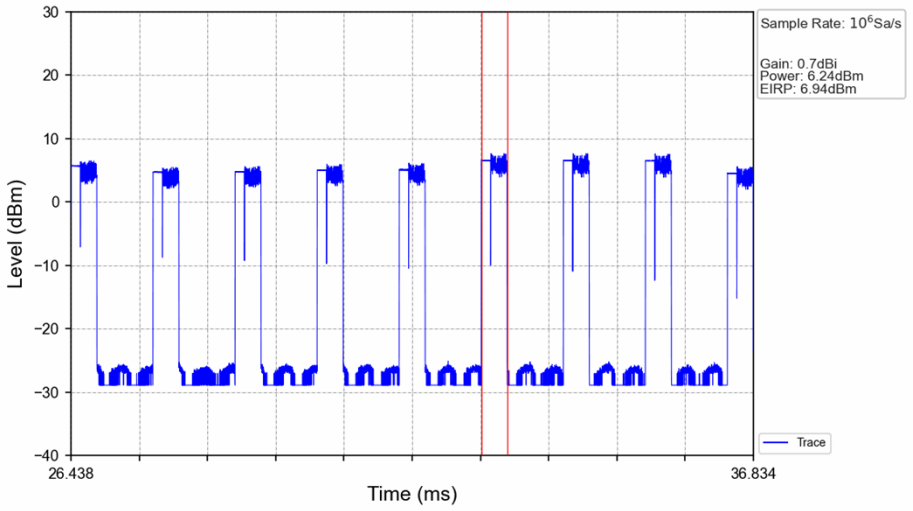
GFSK_DH5_HOPP_Ant1_NTNV



Burst No.	1	2	3	4	5	6	**7**	8	9	10	11	12
Length (ms)	2.890	2.889	2.889	2.889	2.889	2.889	**2.889**	2.889	2.890	2.890	2.890	2.890
Power (dBm)	6.39	4.71	6.24	6.41	4.37	5.94	**6.41**	5.60	5.99	6.37	5.23	6.13
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

Pi/4DQPSK_2DH1_HOPP_Ant1_NTNV



Burst No.	1	2	3	4	5	6	**7**	8	9	10	11	12
Length (ms)	0.396	0.396	0.396	0.396	0.396	0.001	**0.396**	0.001	0.396	0.001	0.396	0.396
Power (dBm)	5.24	4.29	4.41	4.67	4.77	-25.11	**6.24**	-25.21	6.24	-25.21	6.20	4.19
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

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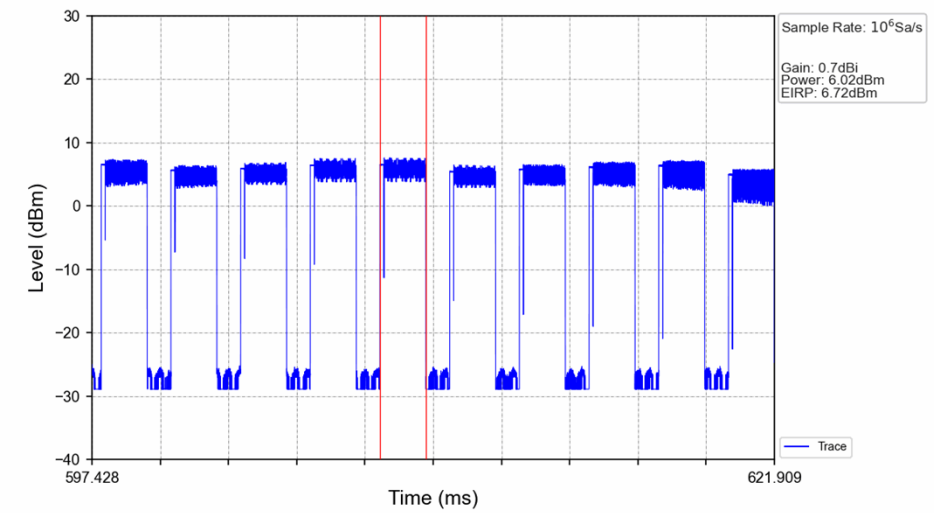
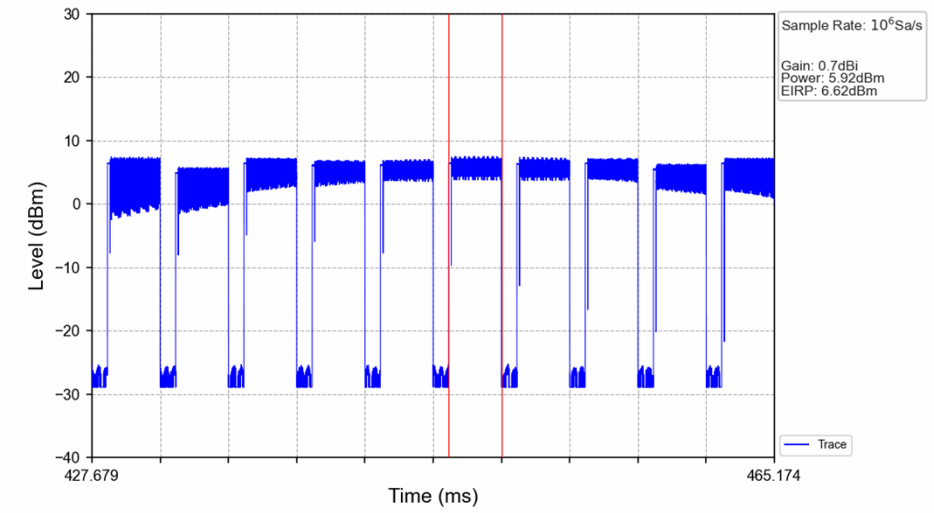


Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	0.001	1.648	1.649	0.001	1.648	1.648	**1.648**	1.648	1.648	1.648	1.648	1.648
Power (dBm)	-25.00	5.66	4.92	-25.21	5.35	5.94	**6.02**	4.91	5.11	5.37	5.37	3.75
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	0.001	2.897	2.896	2.896	2.896	2.896	**2.896**	0.001	2.896	2.896	2.896	2.895
Power (dBm)	-25.21	4.51	3.39	5.30	5.29	5.56	**5.92**	-25.21	5.79	5.72	4.51	5.09
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

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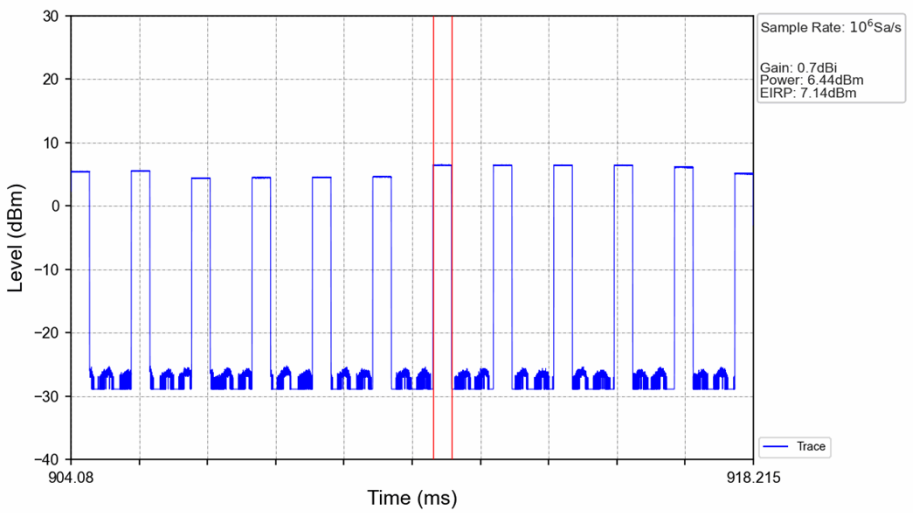
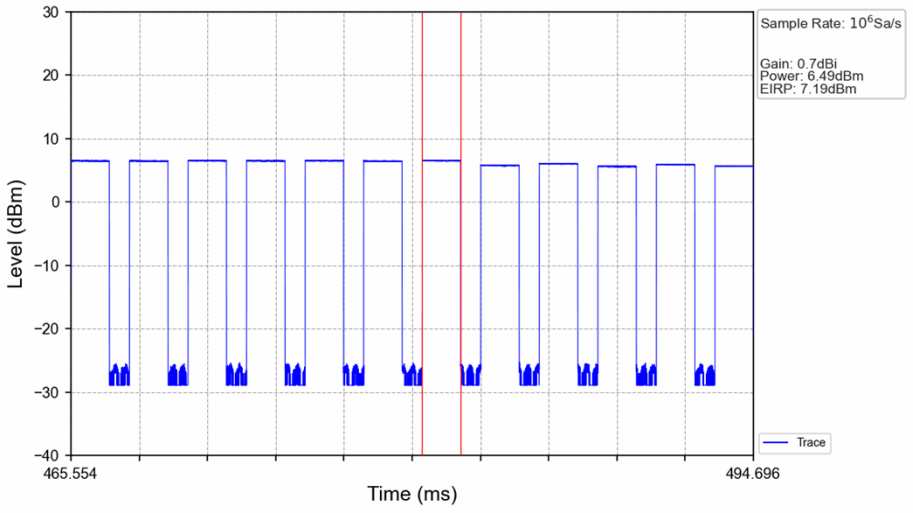


Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	0.385	0.385	0.385	0.385	0.385	0.385	**0.385**	0.385	0.385	0.385	0.385	0.385
Power (dBm)	5.42	5.49	4.36	4.43	4.50	4.57	**6.44**	6.43	6.42	6.40	6.11	5.10
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

GFSK_DH3_HOPP_Ant1_HTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	1.642	1.642	1.642	1.642	1.642	1.642	**1.642**	1.642	1.642	1.642	1.642	1.642
Power (dBm)	6.47	6.46	6.49	6.48	6.48	6.45	**6.49**	5.73	5.99	5.59	5.87	5.66
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

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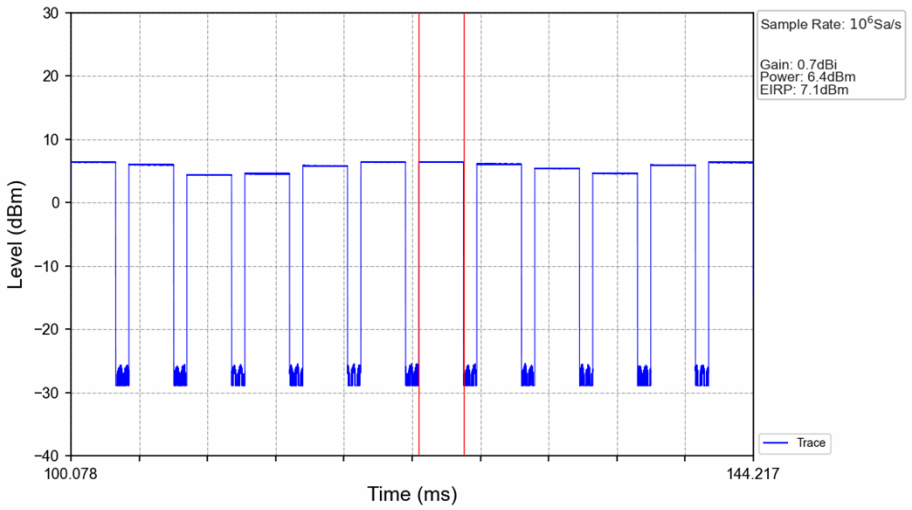
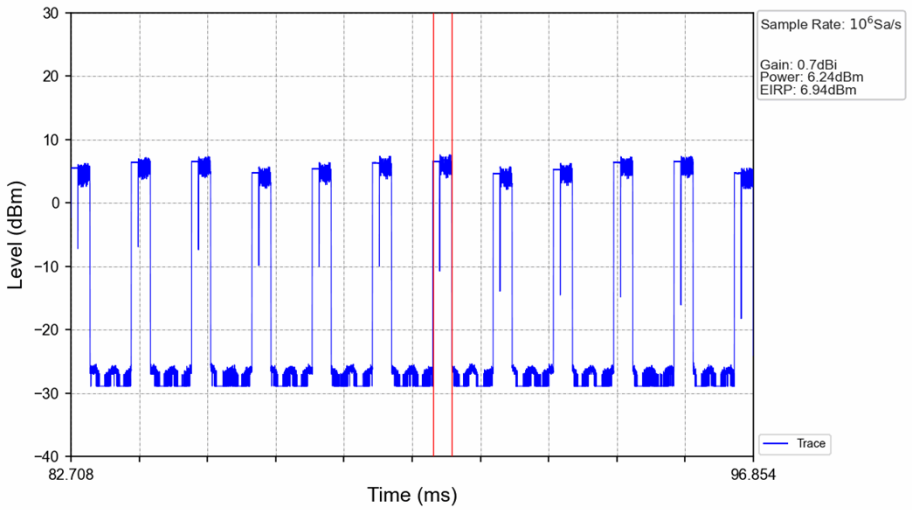


Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	2.889	2.889	2.889	2.889	2.889	2.890	**2.890**	2.890	2.890	2.890	2.890	2.890
Power (dBm)	6.38	5.98	4.36	4.57	5.80	6.39	**6.40**	6.04	5.38	4.60	5.92	6.36
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

Pi/4DQPSK_2DH1_HOPP_Ant1_HTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	0.396	0.397	0.397	0.396	0.396	0.396	**0.396**	0.396	0.396	0.397	0.406	0.396
Power (dBm)	4.99	5.97	6.14	4.43	5.08	6.03	**6.24**	4.34	4.93	6.02	6.05	4.29
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

Pi/4DQPSK_2DH3_HOPP_Ant1_HTNV

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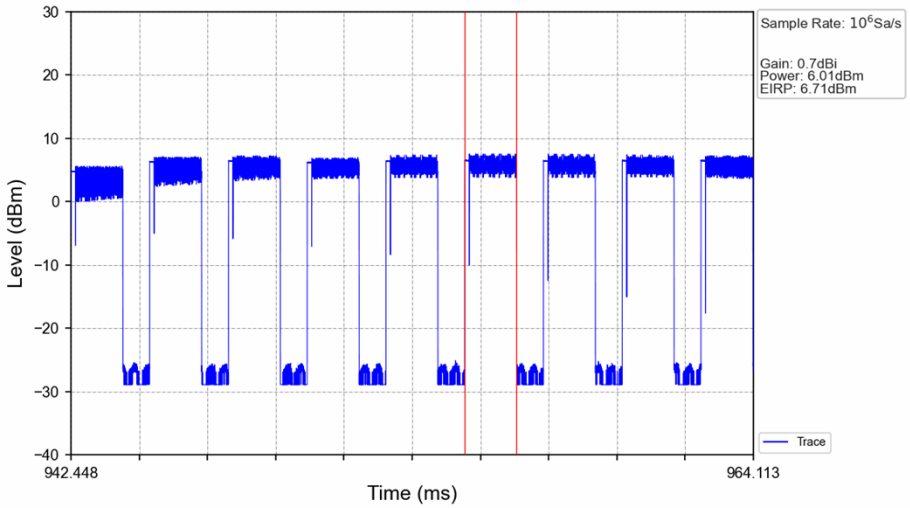
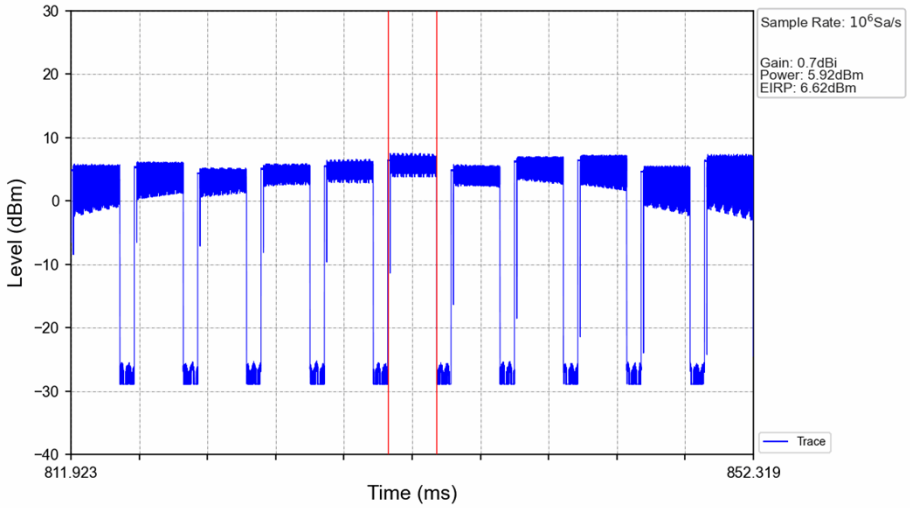


Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	1.649	1.648	1.648	1.648	1.648	0.001	**1.648**	1.648	0.001	1.649	1.649	0.001
Power (dBm)	3.58	5.34	5.68	5.59	5.86	-25.11	**6.01**	5.96	-25.21	5.91	5.79	-25.11
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

Pi/4DQPSK_2DH5_HOPP_Ant1_HTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	2.896	2.896	2.896	2.896	0.001	2.896	**2.896**	2.896	2.896	2.896	2.896	2.896
Power (dBm)	3.22	4.08	3.45	4.43	-25.21	4.96	**5.92**	4.22	5.37	5.23	3.06	4.38
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

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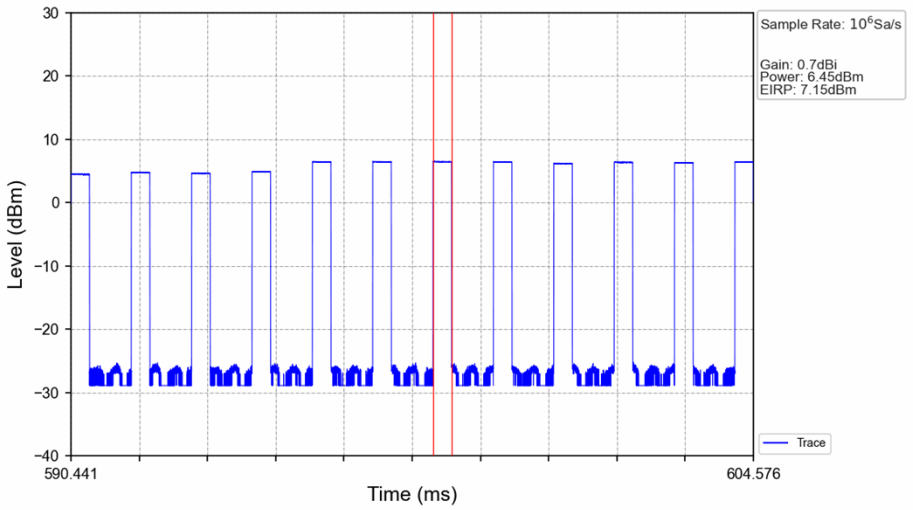
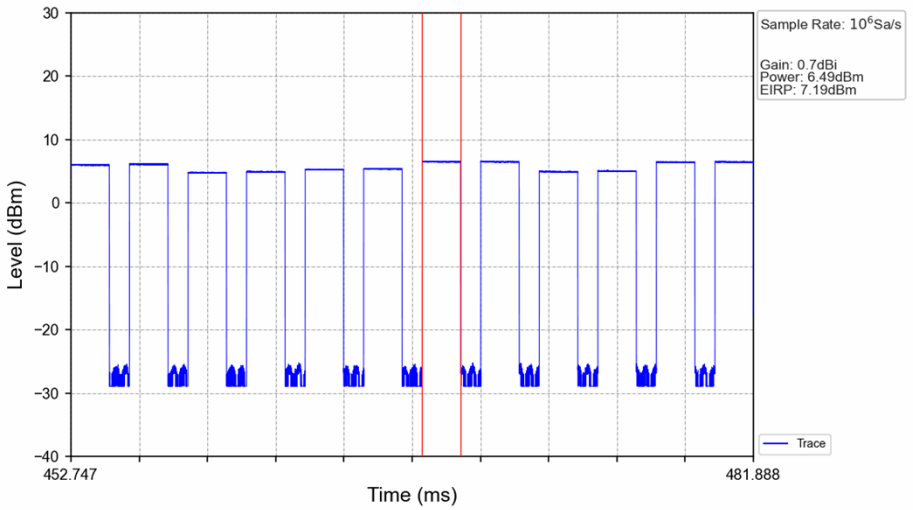


Burst No.	1	2	3	4	5	6	**7**	8	9	10	11	12
Length (ms)	0.385	0.385	0.385	0.385	0.385	0.385	**0.385**	0.385	0.385	0.385	0.385	0.385
Power (dBm)	4.44	4.72	4.58	4.85	6.44	6.44	**6.45**	6.42	6.17	6.34	6.26	6.40
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

GFSK_DH3_HOPP_Ant1_LTNV



Burst No.	1	2	3	4	5	6	**7**	8	9	10	11	12
Length (ms)	1.641	1.642	1.642	1.642	1.642	1.642	**1.642**	1.642	1.642	1.642	1.642	1.642
Power (dBm)	5.98	6.12	4.78	4.92	5.27	5.35	**6.49**	6.48	4.93	5.00	6.45	6.46
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

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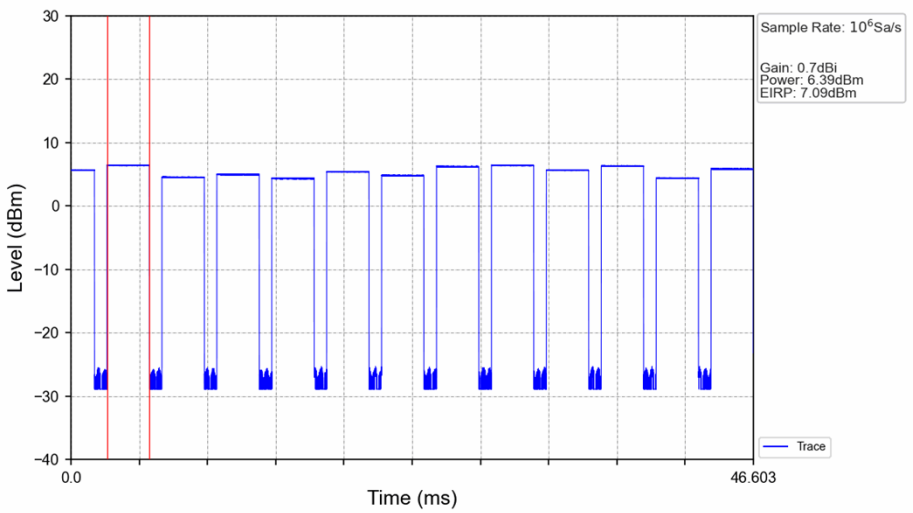
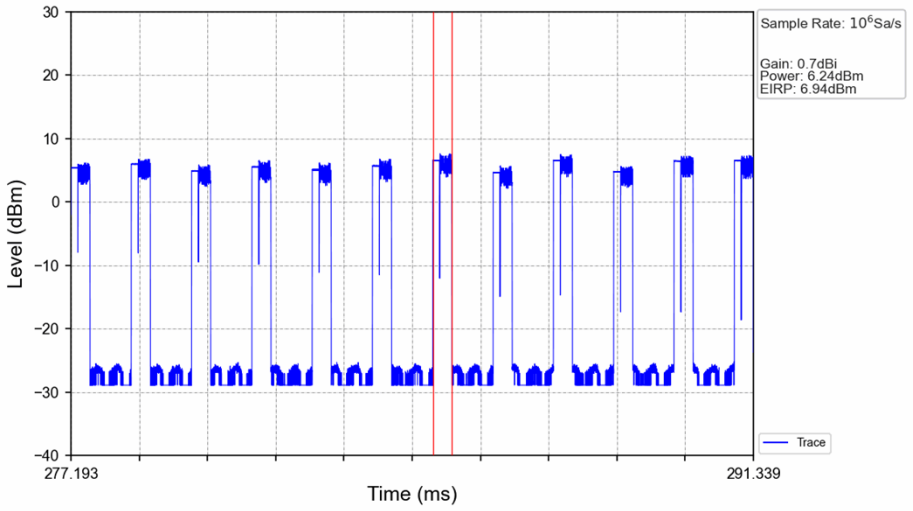
GFSK_DH5_HOPP_Ant1_LTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	**2.889**	2.889	2.890	2.890	2.890	2.890	2.890	2.890	2.890	2.890	2.890	2.890
Power (dBm)	**6.39**	4.53	4.95	4.32	5.37	4.80	6.20	6.38	5.63	6.31	4.39	5.83
Remark	**Max**	/	/	/	/	/	/	/	/	/	/	/

Pi/4DQPSK_2DH1_HOPP_Ant1_LTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	0.396	0.396	0.396	0.396	0.396	0.396	**0.396**	0.396	0.396	0.396	0.396	0.398
Power (dBm)	4.98	5.61	4.58	5.24	4.78	5.42	**6.24**	4.33	6.19	4.40	6.06	6.01
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

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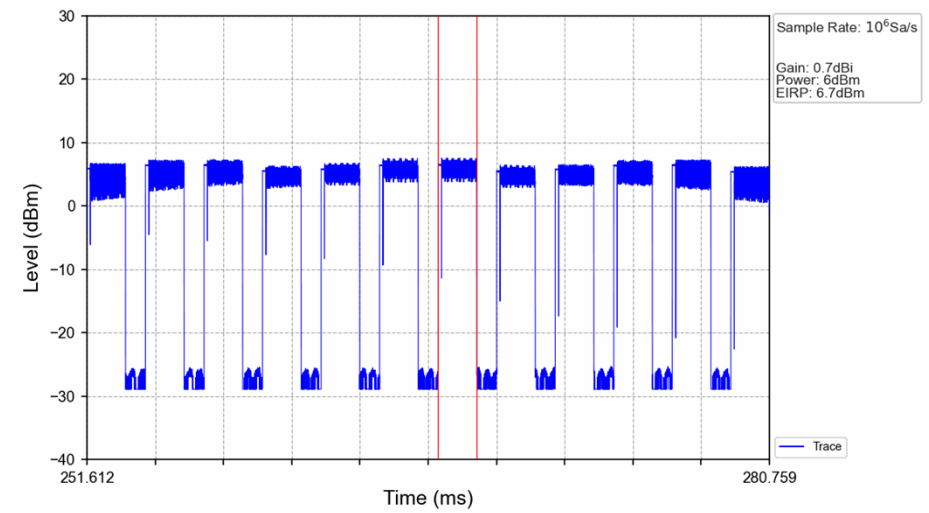
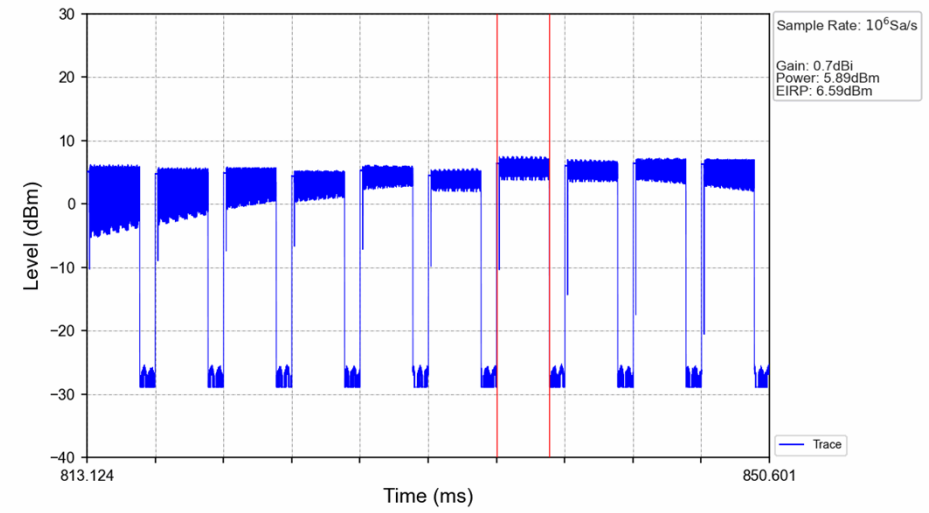


Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	1.648	1.648	1.648	1.648	1.648	1.648	**1.648**	1.648	1.648	1.648	1.648	1.647
Power (dBm)	4.65	5.42	5.66	4.88	5.30	5.93	**6.00**	4.92	5.12	5.59	5.48	4.16
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

Pi/4DQPSK_2DH5_HOPP_Ant1_LTNV



Burst No.	1	2	3	4	5	6	7	8	9	10	11	12
Length (ms)	2.896	2.896	2.896	2.896	2.896	2.896	**2.896**	0.001	2.896	2.896	2.897	0.001
Power (dBm)	3.00	2.99	3.54	3.40	4.57	3.98	**5.89**	-25.21	5.48	5.63	5.23	-25.21
Remark	/	/	/	/	/	/	**Max**	/	/	/	/	/

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2. Accumulated Transmit Time, Frequency Occupation And Hopping Sequence

2.1 Test Result

2.1.1 ATT-Ant1

Ant1										
ENV	Mode	TX Type	Frequency (MHz)	Packet Type	HOPP Num_Mini	Data Points Of T_on	Duration Of One Point (ms)	Accumulated Transmit Time (ms)		Verdict
								Result	Limit	
NTNV	GFSK	SISO	HOPP	DH1	79	319	1.053	335.907	<=400	Pass
				DH3	79	231	1.053	243.243	<=400	Pass
				DH5	79	270	1.053	284.310	<=400	Pass
	Pi/4DQPSK	SISO	HOPP	2DH1	79	320	1.053	336.960	<=400	Pass
				2DH3	79	262	1.053	275.886	<=400	Pass
				2DH5	79	297	1.053	312.741	<=400	Pass

2.1.2 FO-Ant1

Ant1									
ENV	Mode	TX Type	Frequency (MHz)	Packet Type	HOPP Num_Mini	Dwell Time (ms)	Frequency Occupation (N)		Verdict
							Result	Limit	
NTNV	GFSK	SISO	HOPP	DH1	79	1.250	4	>=1	Pass
				DH3	79	2.500	4	>=1	Pass
				DH5	79	3.750	4	>=1	Pass
	Pi/4DQPSK	SISO	HOPP	2DH1	79	1.109	2	>=1	Pass
				2DH3	79	2.242	4	>=1	Pass
				2DH5	79	3.314	6	>=1	Pass

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2.1.3 HS-Ant1

Ant1									
ENV	Mode	TX Type	Frequency (MHz)	Packet Type	HOPP Num (N)		-20 dB Bandwidth (MHz)		Verdict
					Result	Limit	Result	Limit	
NTNV	GFSK	SISO	HOPP	DH5	79	>=15	79.614	>=58.45	Pass
	Pi/4DQPSK	SISO	HOPP	2DH5	79	>=15	80.246	>=58.45	Pass

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2.2 Test Graph

2.2.1 ATT-Ant1

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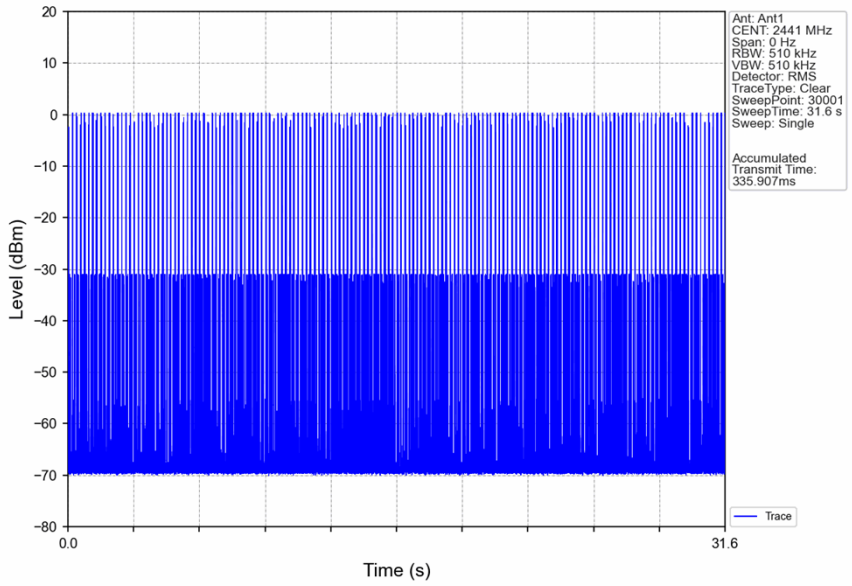
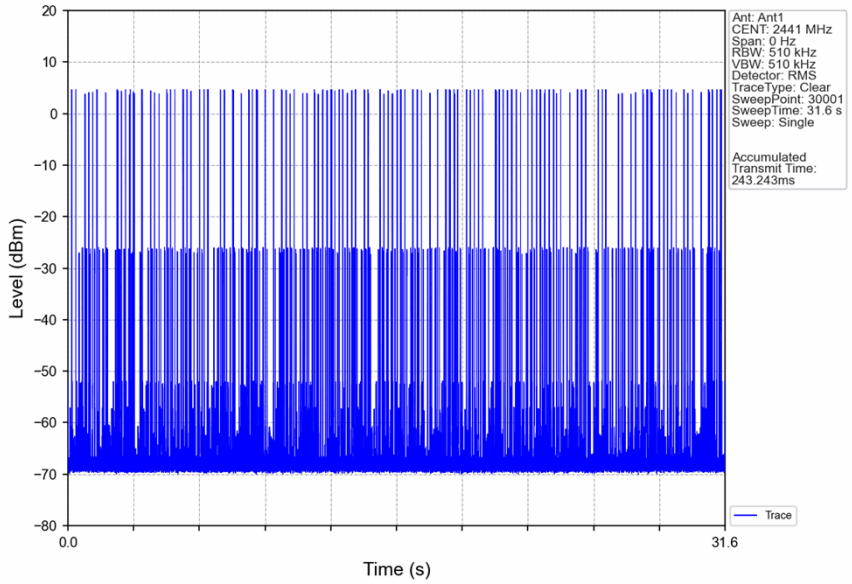


GFSK_DH3_HOPP_Ant1_NTNV



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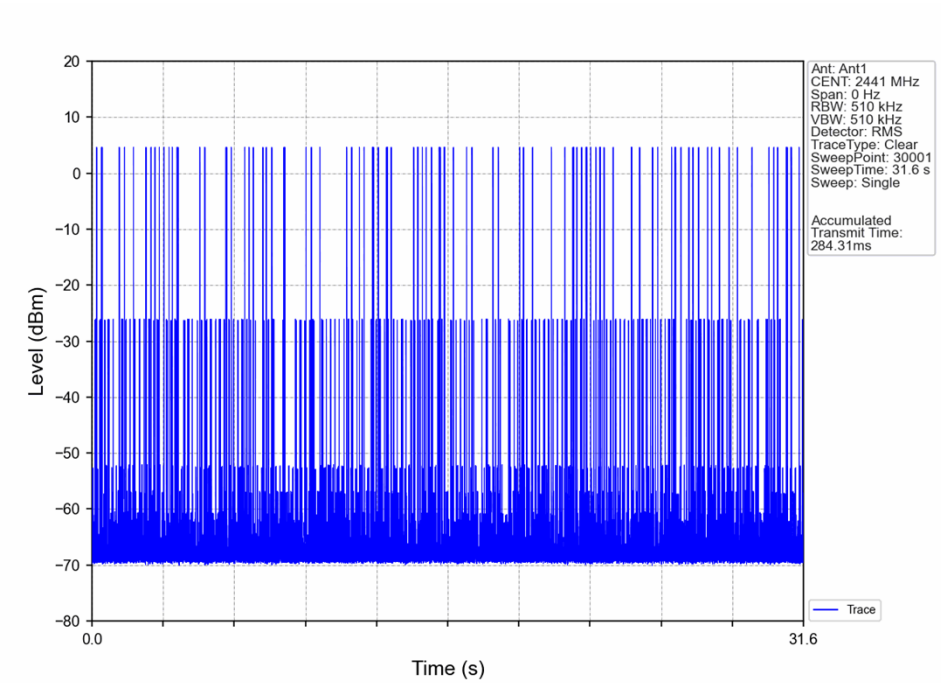
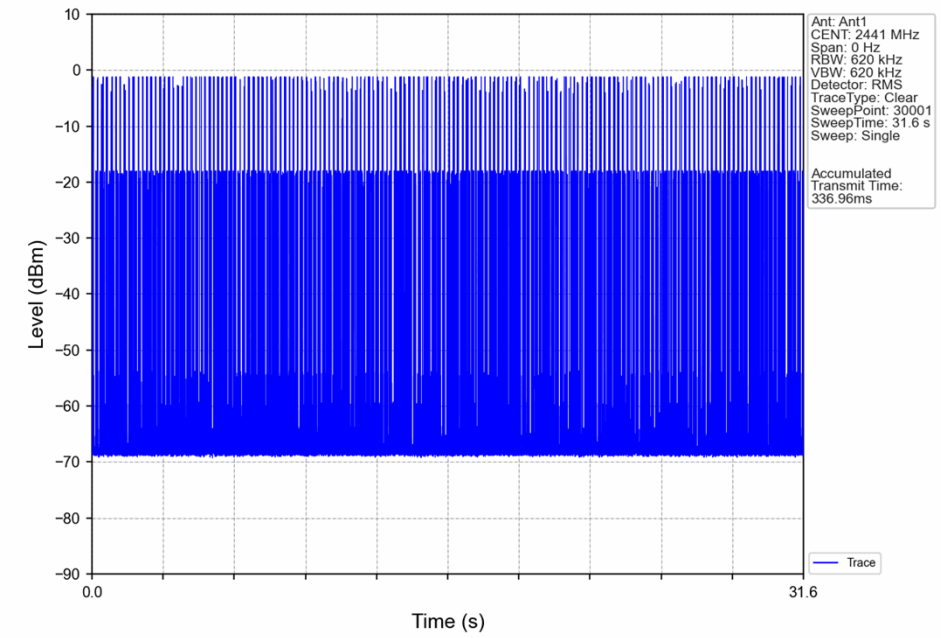


Pi/4DQPSK_2DH1_HOPP_Ant1_NTNV



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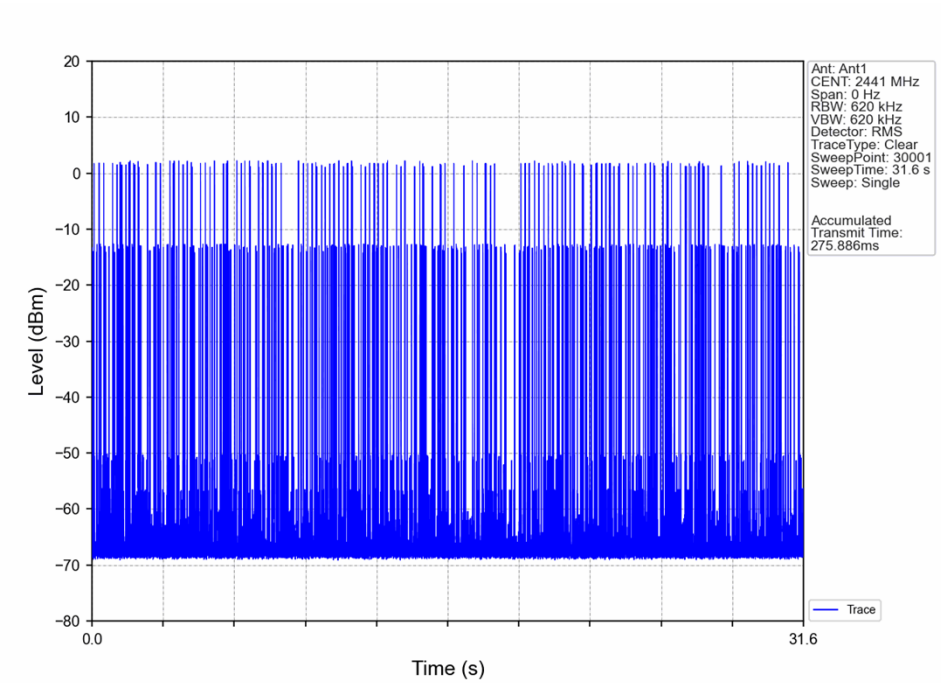

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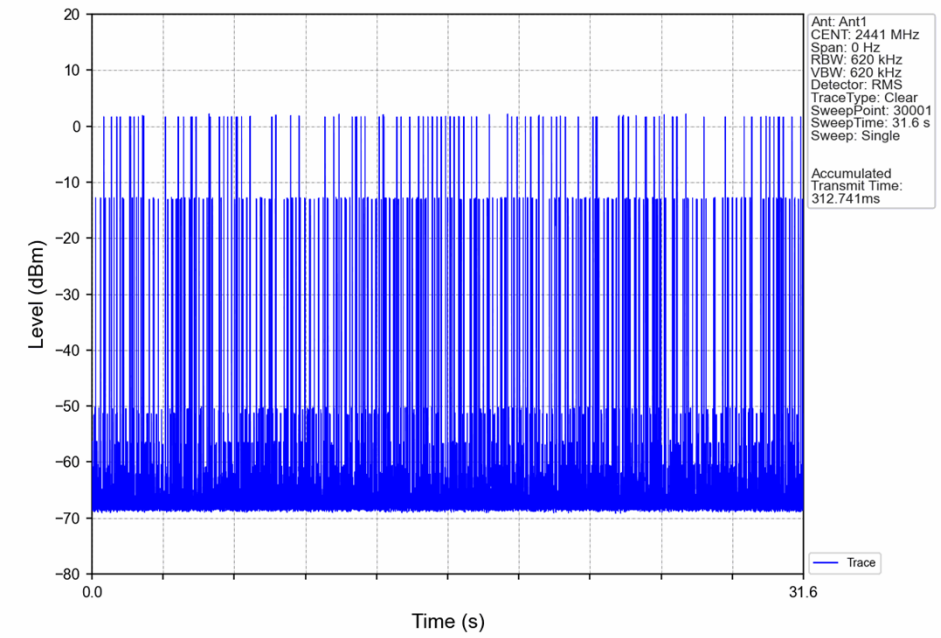

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2.2.2 FO-Ant1

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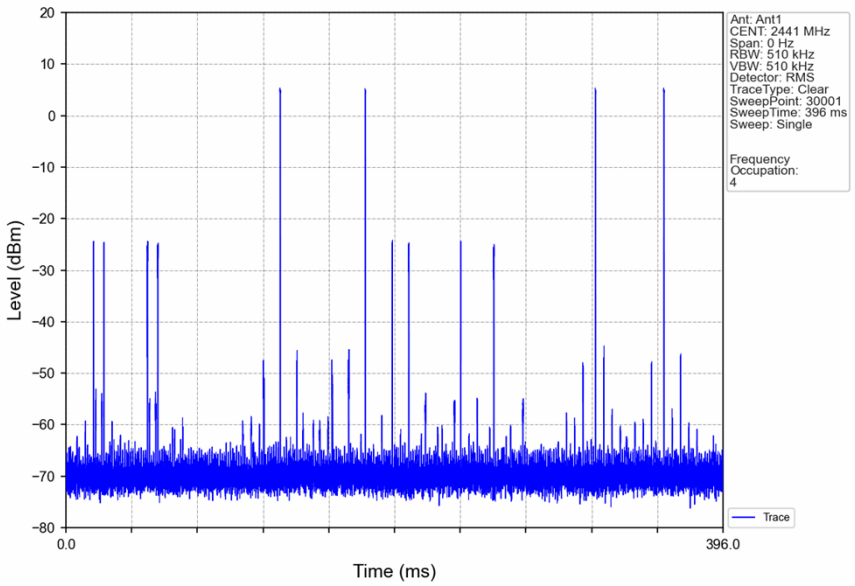

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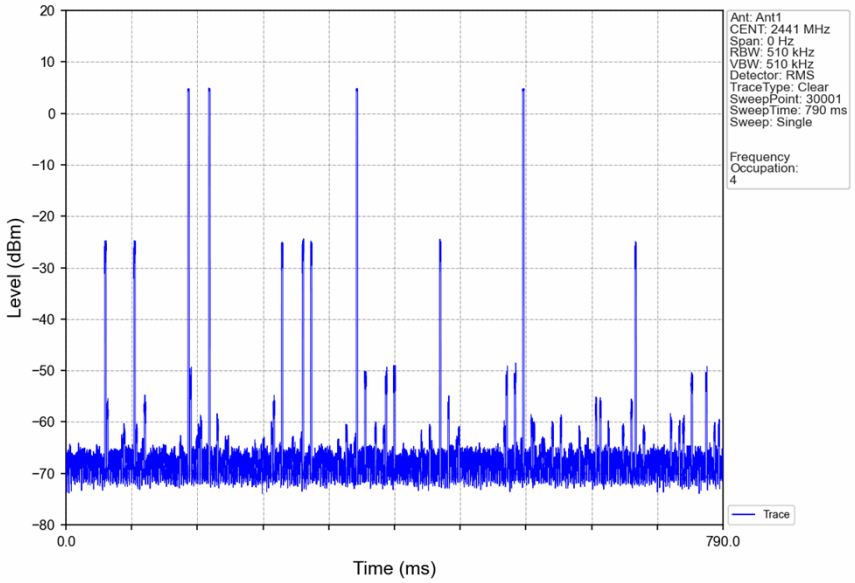

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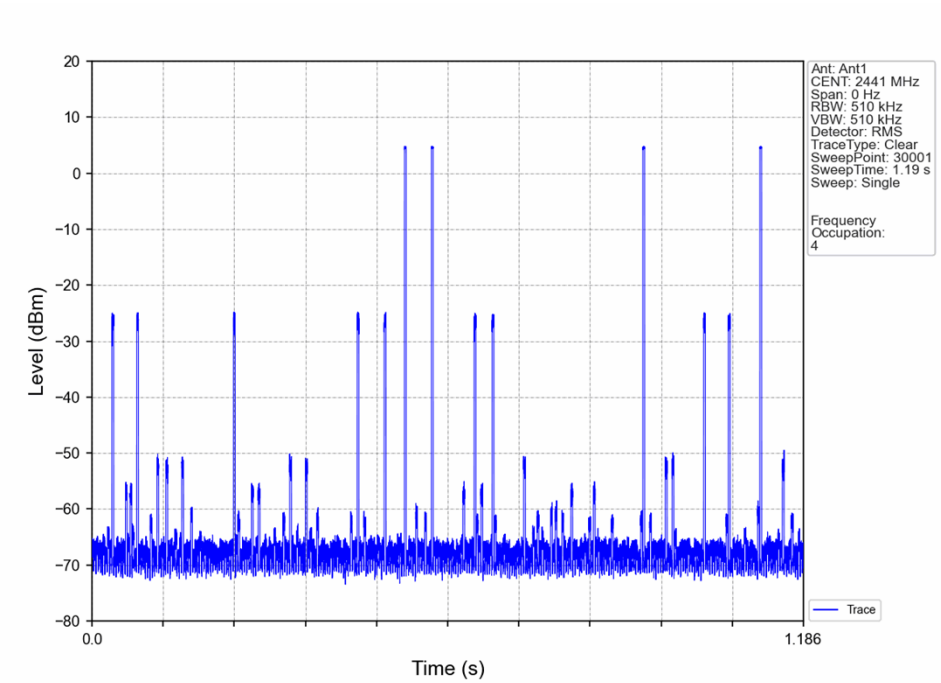

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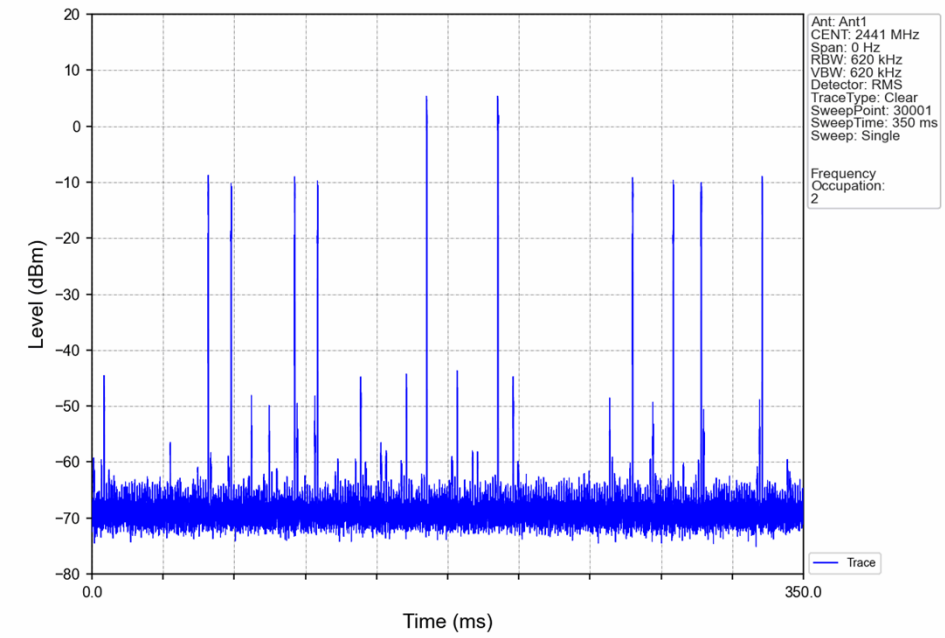

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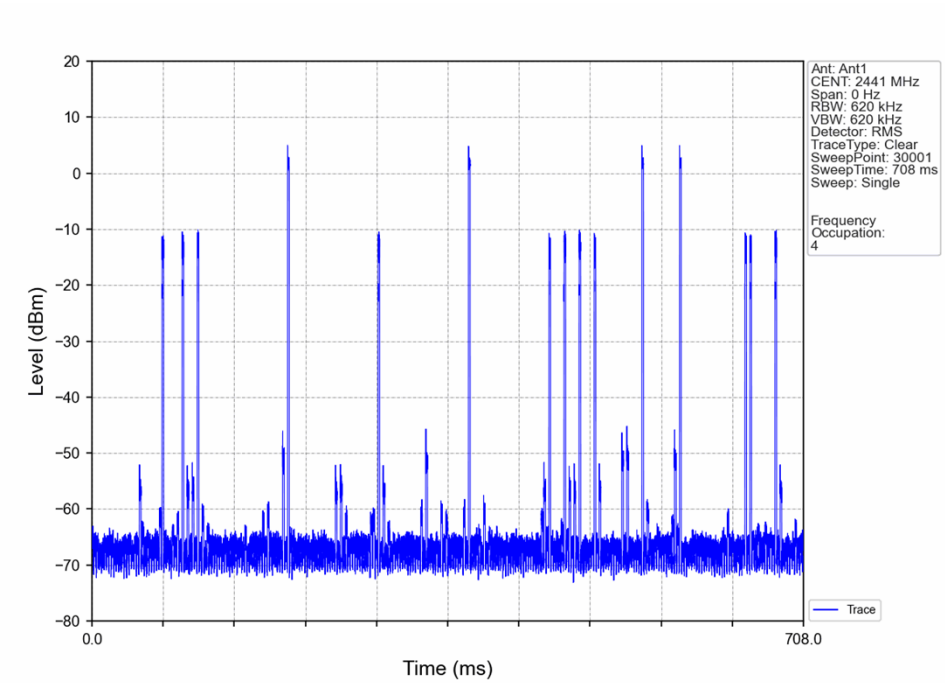

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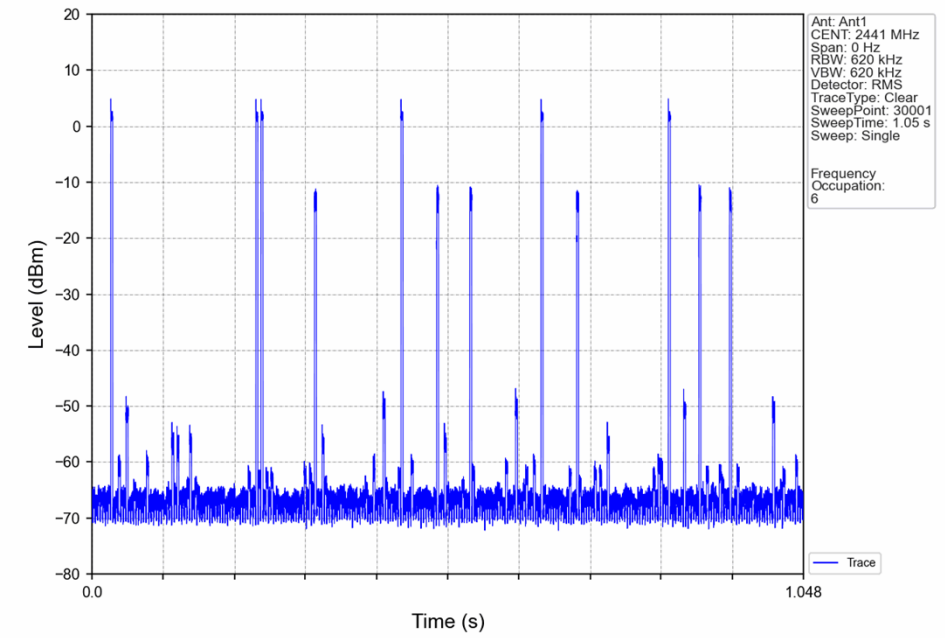

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2.2.3 HS-Ant1

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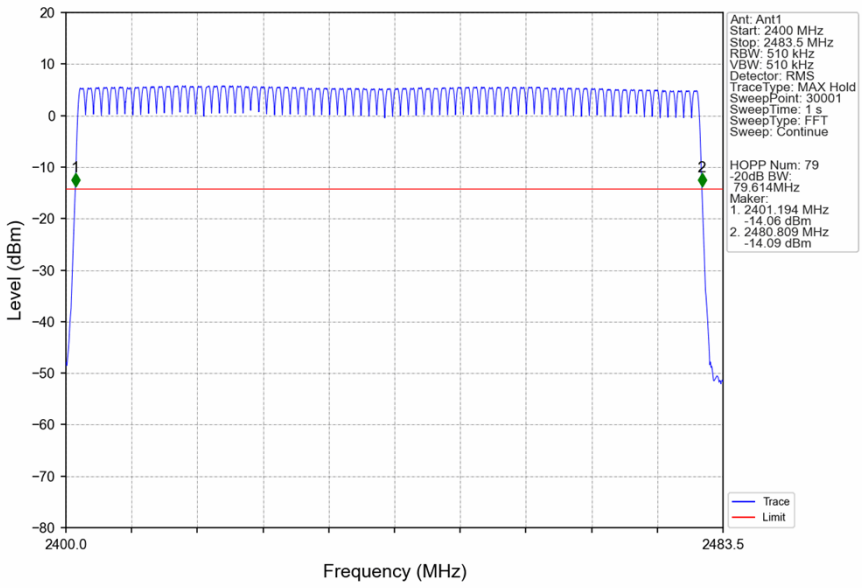
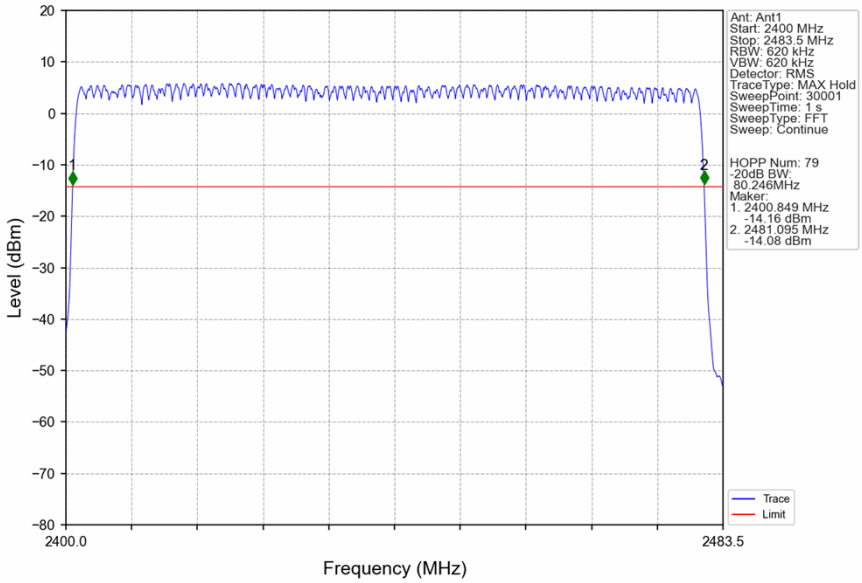


Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



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3. Hopping Frequency Separation

3.1 Test Result

3.1.1 Ant1

Ant1							
ENV	Mode	TX Type	Frequency (MHz)	Packet Type	Channel Separation (MHz)	Limit (MHz)	Verdict
NTNV	GFSK	SISO	HOPP	DH5	1.000	>=0.1	Pass
	Pi/4DQPSK	SISO	HOPP	2DH5	0.999	>=0.1	Pass

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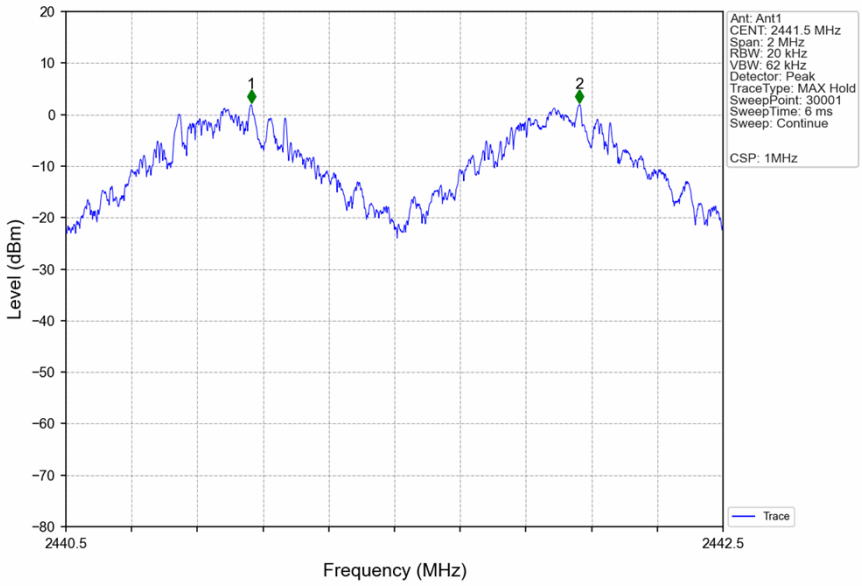
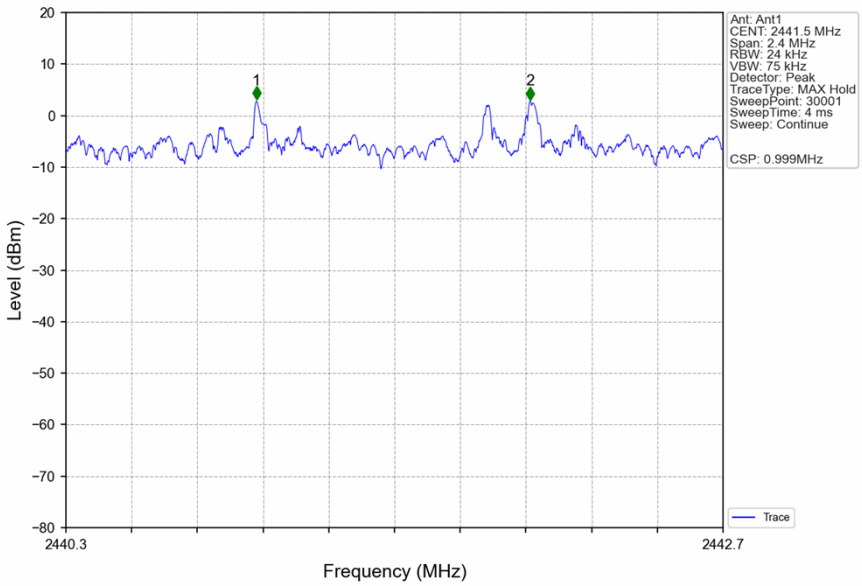
3.2 Test Graph

3.2.1 Ant1

GFSK_DH5_HOPP_Ant1_NTNV



Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



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4. Occupied Channel Bandwidth

4.1 Test Result

4.1.1 OBW_Ant1

Ant1									
ENV	Mode	TX Type	Frequency (MHz)	Packet Type	OBW (MHz)	Frequency Range (MHz)			Verdict
					Result	FL	FH	Limit	
NTNV	GFSK	SISO	2402	DH5	0.875	2401.565	/	>=2400	Pass
			2480	DH5	0.875	/	2480.440	<=2483.5	Pass
	Pi/4DQPSK	SISO	2402	2DH5	1.197	2401.409	/	>=2400	Pass
			2480	2DH5	1.196	/	2480.605	<=2483.5	Pass

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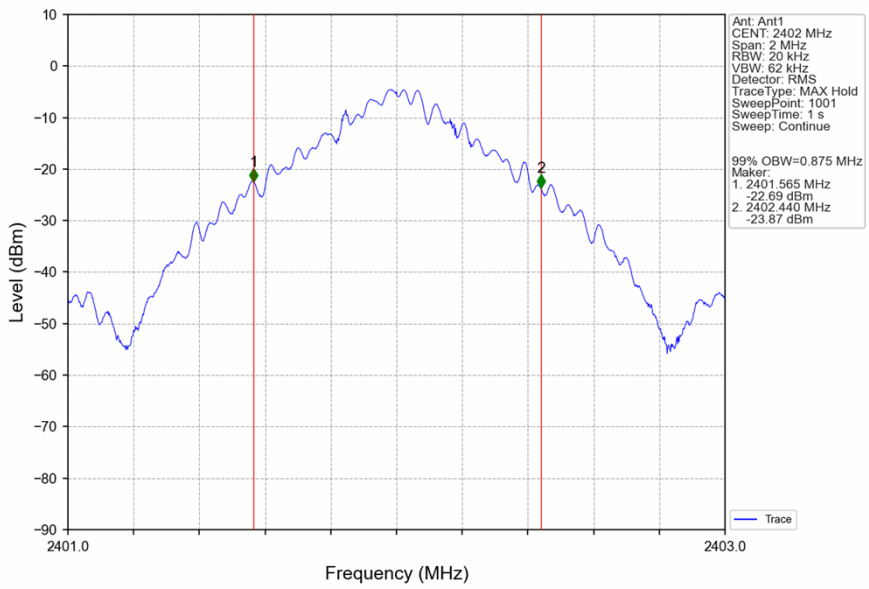
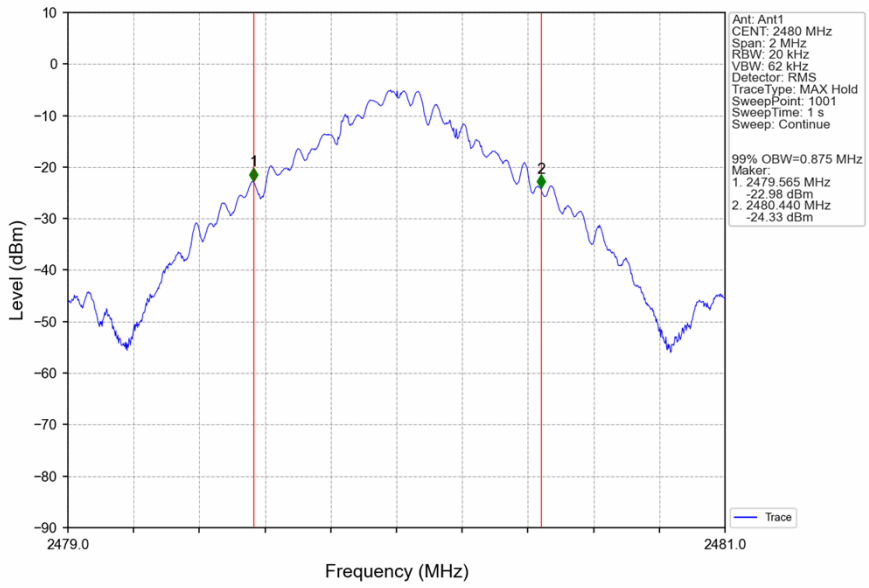
4.2 Test Graph

4.2.1 OBW_Ant1

GFSK_DH5_2402MHz_Ant1_NTNV



GFSK_DH5_2480MHz_Ant1_NTNV



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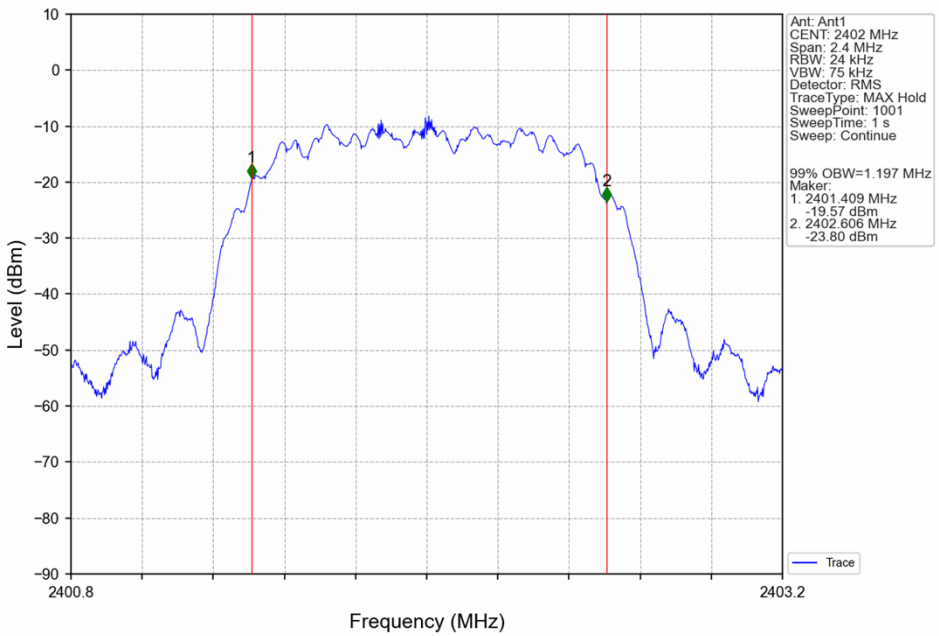
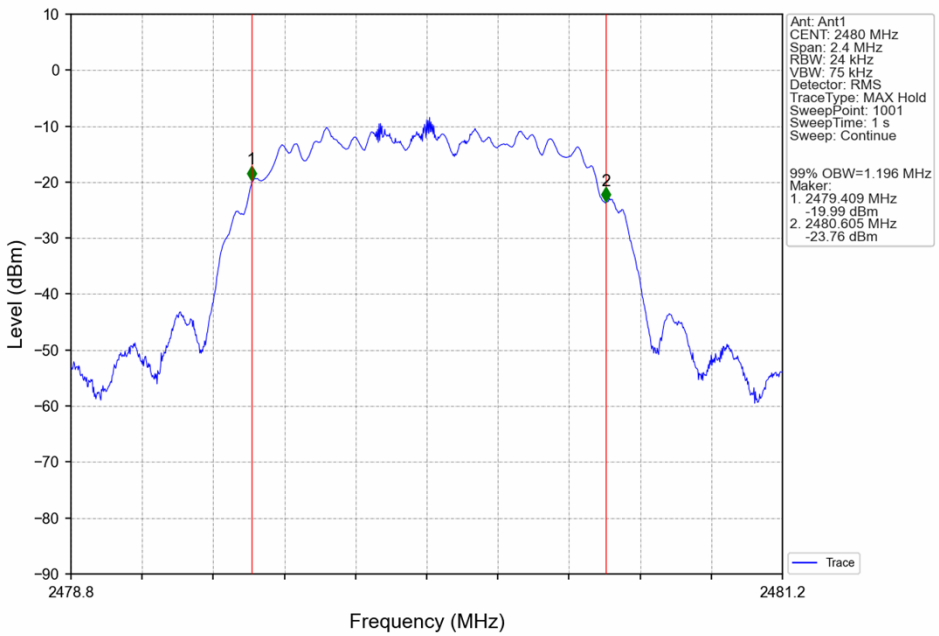
Pi/4DQPSK_2DH5_2402MHz_Ant1_NTNV



Pi/4DQPSK_2DH5_2480MHz_Ant1_NTNV



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5. Transmitter Unwanted Emissions In The Out-Of-Band Domain

5.1 Test Result

5.1.1 GFSK-Ant1

GFSK Ant1 NTNV								
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Test Freq. (MHz)	Result (dBm/MHz)	Limit (dBm/MHz)	Verdict
GFSK	SISO	HOPP	DH5	1	2398.500	-64.84	<=-20	Pass
					2399.500	-63.40	<=-10	Pass
		HOPP	DH5	1	2484.000	-64.28	<=-10	Pass
					2485.000	-63.93	<=-20	Pass

5.1.2 Pi/4DQPSK-Ant1

Pi/4DQPSK Ant1 NTNV								
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Test Freq. (MHz)	Result (dBm/MHz)	Limit (dBm/MHz)	Verdict
Pi/4DQPSK	SISO	HOPP	2DH5	1	2398.106	-66.09	<=-20	Pass
					2398.303	-66.18	<=-20	Pass
					2399.303	-64.70	<=-10	Pass
					2399.500	-63.26	<=-10	Pass
		HOPP	2DH5	1	2484.000	-65.60	<=-10	Pass
					2484.196	-62.38	<=-10	Pass
					2485.196	-64.10	<=-20	Pass
					2485.392	-65.22	<=-20	Pass

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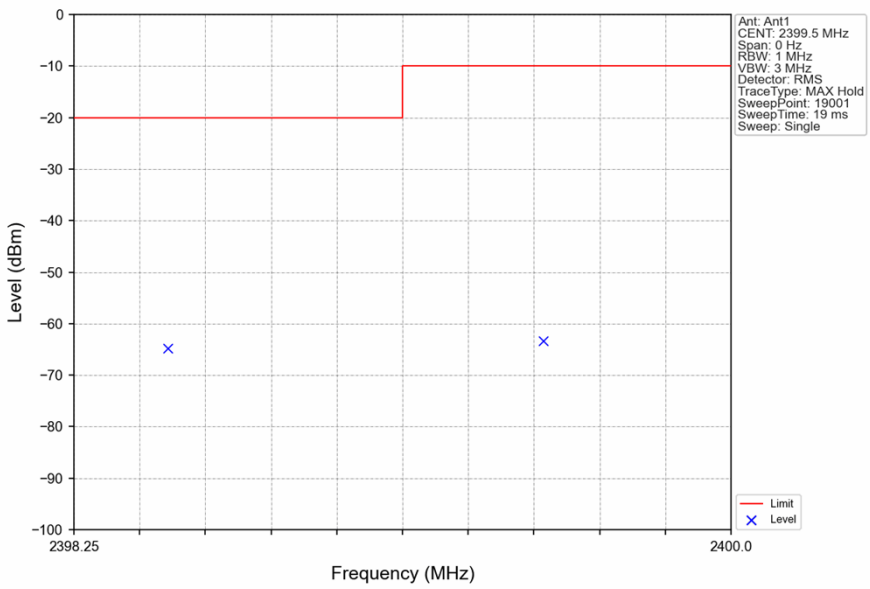
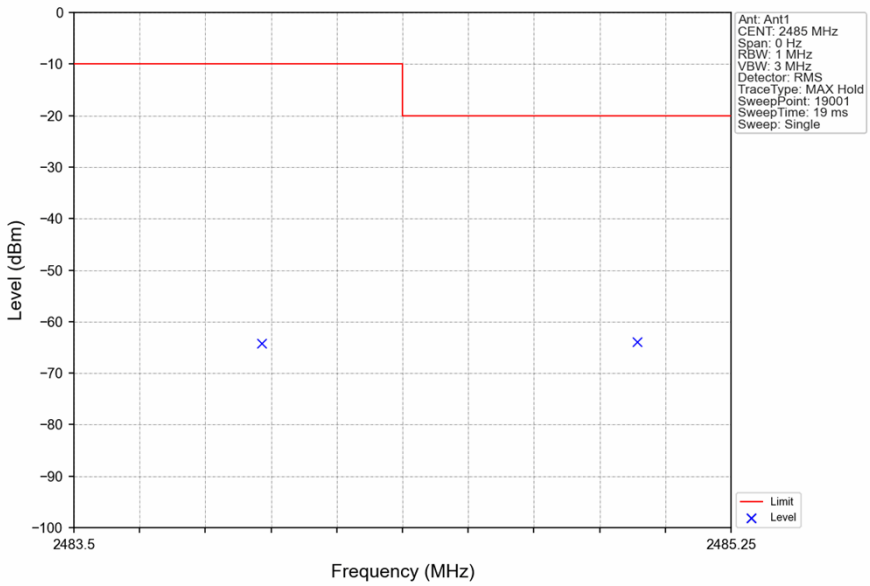
5.2 Test Graph

5.2.1 GFSK-Ant1

GFSK_DH5_HOPP_Ant1_NTNV



GFSK_DH5_HOPP_Ant1_NTNV



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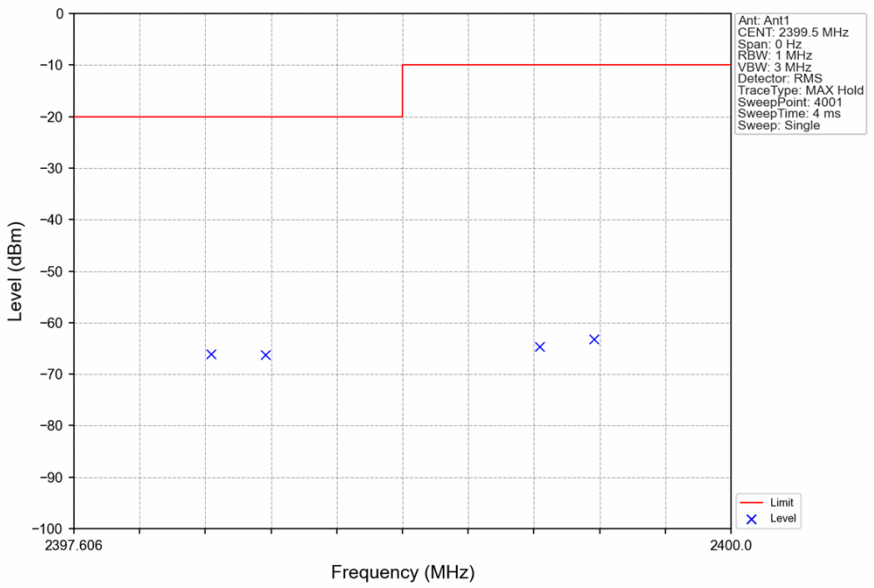
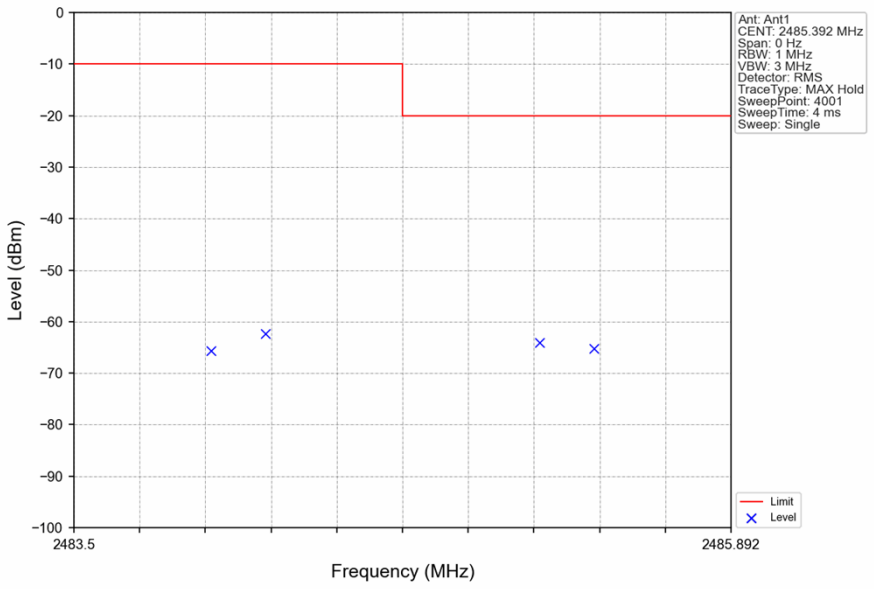
5.2.2 Pi/4DQPSK-Ant1

Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



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6. Receiver Blocking

6.1 Test Result

6.1.1 Ant1

Ant1										
ENV	Mode	TX Type	Frequency (MHz)	Packet Type	Wanted signal level (dBm)	Blocking Signal		PER (%)	Limit (%)	Verdict
						Frequency (MHz)	Power (dBm)			
NTNV	GFSK	SISO	HOPP	DH1	-68.88	2300	-33.3	0.47	<=10	Pass
						2380	-33.3	0.75	<=10	Pass
			HOPP	DH1	-68.88	2504	-33.3	0.65	<=10	Pass
						2584	-33.3	0.49	<=10	Pass
Note1: Receiver Category=2										

- End of the Report -

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