TEST REPORT

Report Number: 15496249-E2V2

Applicant	:	APPLE INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
Model	:	A3257 (Parent) A3525, A3526, A3527 (Variants)
Brand	:	APPLE
FCC ID	:	BCG-E8950A (Parent) BCG-E8960A, BCG-E8961A, BCG-E8962A (Variants)
IC	:	579C-E8950A (Parent) 579C-E8960A, 579C-E8961A, 579C-E8962A (Variants)
EUT Description	:	SMARTPHONE
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C ISED RSS-247 Issue 3 ISED RSS-GEN Issue 5 + A1 + A2

Date Of Issue:
2025-08-09

Prepared by:
UL Verification Services Inc.
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CERT #0751.05

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2025-07-31	Initial Issue	Michael Kennedy
V2	2025-08-09	Updated Section 6 and 9	Gerardo Abrego

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TABLE OF CONTENTS

REPORT REVISION HISTORY **2**

TABLE OF CONTENTS **3**

1. ATTESTATION OF TEST RESULTS **6**

2. TEST SUMMARY **8**

3. TEST METHODOLOGY **8**

4. FACILITIES AND ACCREDITATION **9**

5. DECISION RULES AND MEASUREMENT UNCERTAINTY **10**

5.1. METROLOGICAL TRACEABILITY *10*

5.2. DECISION RULES *10*

5.3. MEASUREMENT UNCERTAINTY *10*

6. EQUIPMENT UNDER TEST **11**

6.1. EUT DESCRIPTION *11*

6.2. MAXIMUM OUTPUT POWER *11*

6.3. DESCRIPTION OF AVAILABLE ANTENNAS AND CABLE LOSS *12*

6.4. SOFTWARE AND FIRMWARE *12*

6.5. WORST-CASE CONFIGURATION AND MODE *13*

6.6. DESCRIPTION OF TEST SETUP *14*

7. TEST AND MEASUREMENT EQUIPMENT **18**

8. MEASUREMENT METHODS **20**

9. ANTENNA PORT TEST RESULTS **21**

9.1. ON TIME AND DUTY CYCLE *21*

9.2. 20 dB AND 99% BANDWIDTH *23*

9.2.1. HIGH POWER BASIC DATA RATE GFSK MODULATION 24

9.2.2. HIGH POWER BASIC DATA RATE TXBF GFSK MODULATION 25

9.2.3. HIGH POWER ENHANCED DATA RATE 8PSK MODULATION 26

9.2.4. HIGH POWER ENHANCED DATA RATE TXBF 8PSK MODULATION 27

9.2.5. HIGH POWER ENHANCED DATA RATE BTCSM2 MODULATION 28

9.2.6. HIGH POWER ENHANCED DATA RATE TXBF BTCSM2 MODULATION 29

9.3. HOPPING FREQUENCY SEPARATION *30*

9.3.1. HIGH POWER BASIC DATA RATE GFSK MODULATION 31

9.3.2. HIGH POWER BASIC DATA RATE BTCSM2 MODULATION 31

9.4. NUMBER OF HOPPING CHANNELS *32*

9.4.1. HIGH POWER BASIC DATA RATE GFSK MODULATION 33

9.4.2. HIGH POWER BASIC DATA RATE BTCSM2 MODULATION 35

9.5. AVERAGE TIME OF OCCUPANCY *37*

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9.5.1. HIGH POWER BASIC DATA RATE GFSK MODULATION 38
9.5.2. HIGH POWER BASIC DATA RATE BTCSM2 MODULATION 42

9.6. OUTPUT POWER 44
9.6.1. HIGH POWER BASIC DATA RATE GFSK MODULATION 46
9.6.2. HIGH POWER BASIC DATA RATE TXBF GFSK MODULATION 46
9.6.3. HIGH POWER ENHANCED DATA RATE QPSK MODULATION 47
9.6.4. HIGH POWER ENHANCED DATA RATE TXBF QPSK MODULATION 47
9.6.5. HIGH POWER ENHANCED DATA RATE 8PSK MODULATION 48
9.6.6. HIGH POWER ENHANCED DATA RATE TXBF 8PSK MODULATION 48
9.6.7. HIGH POWER ENHANCED DATA RATE BTCSM2 MODULATION 49
9.6.8. HIGH POWER ENHANCED DATA RATE TXBF BTCSM2 MODULATION 49
9.6.9. LOW POWER BASIC DATA RATE GFSK MODULATION 49
9.6.10. LOW POWER BASIC DATA RATE TXBF GFSK MODULATION 50
9.6.11. LOW POWER ENHANCED DATA RATE QPSK MODULATION 51
9.6.12. LOW POWER ENHANCED DATA RATE TXBF QPSK MODULATION 51
9.6.13. LOW POWER ENHANCED DATA RATE 8PSK MODULATION 52
9.6.14. LOW POWER ENHANCED DATA RATE TXBF 8PSK MODULATION 52
9.6.15. LOW POWER ENHANCED DATA RATE BTCSM2 MODULATION 53
9.6.16. LOW POWER ENHANCED DATA RATE TXBF BTCSM2 MODULATION 53

9.7. AVERAGE POWER 54
9.7.1. HIGH POWER BASIC DATA RATE GFSK MODULATION 55
9.7.2. HIGH POWER BASIC DATA RATE TXBF GFSK MODULATION 55
9.7.3. HIGH POWER ENHANCED DATA RATE QPSK MODULATION 56
9.7.4. HIGH POWER ENHANCED DATA RATE TXBF QPSK MODULATION 56
9.7.5. HIGH POWER ENHANCED DATA RATE 8PSK MODULATION 57
9.7.6. HIGH POWER ENHANCED DATA RATE TXBF 8PSK MODULATION 57
9.7.7. HIGH POWER ENHANCED DATA RATE BTCSM2 MODULATION 58
9.7.8. HIGH POWER ENHANCED DATA RATE TXBF BTCSM2 MODULATION 58
9.7.9. LOW POWER BASIC DATA RATE GFSK MODULATION 59
9.7.10. LOW POWER BASIC DATA RATE TXBF GFSK MODULATION 59
9.7.11. LOW POWER ENHANCED DATA RATE QPSK MODULATION 60
9.7.12. LOW POWER ENHANCED DATA RATE TXBF QPSK MODULATION 60
9.7.13. LOW POWER ENHANCED DATA RATE 8PSK MODULATION 61
9.7.14. LOW POWER ENHANCED DATA RATE TXBF 8PSK MODULATION 61
9.7.15. LOW POWER ENHANCED DATA RATE BTCSM2 MODULATION 62
9.7.16. LOW POWER ENHANCED DATA RATE TXBF BTCSM2 MODULATION 62

9.8. CONDUCTED SPURIOUS EMISSIONS 63
9.8.1. HIGH POWER BASIC DATA RATE GFSK MODULATION 64
9.8.2. HIGH POWER BASIC DATA RATE TXBF GFSK MODULATION 68
9.8.3. HIGH POWER ENHANCED DATA RATE 8PSK MODULATION 72
9.8.4. HIGH POWER ENHANCED DATA RATE TXBF 8PSK MODULATION 76
9.8.5. HIGH POWER ENHANCED DATA RATE BTCSM2 MODULATION 80
9.8.6. HIGH POWER ENHANCED DATA RATE TXBF BTCSM2 MODULATION 84
9.8.7. LOW POWER BASIC DATA RATE GFSK MODULATION 88
9.8.8. LOW POWER BASIC DATA RATE TXBF GFSK MODULATION 92
9.8.9. LOW POWER ENHANCED DATA RATE 8PSK MODULATION 96
9.8.10. LOW POWER ENHANCED DATA RATE TXBF 8PSK MODULATION 100
9.8.11. LOW POWER ENHANCED DATA RATE BTCSM2 MODULATION 104
9.8.12. LOW POWER ENHANCED DATA RATE TXBF BTCSM2 MODULATION 108

10. RADIATED TEST RESULTS 112

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10.1. TRANSMITTER ABOVE 1 GHz 114
10.1.1. HIGH POWER BASIC DATA RATE GFSK MODULATION 114
10.1.2. HIGH POWER BASIC DATA RATE TX BF GFSK MODULATION 122
10.1.3. HIGH POWER ENHANCED DATA RATE 8PSK MODULATION 126
10.1.4. HIGH POWER ENHANCED DATA RATE TXBF 8PSK MODULATION 134
10.1.5. HIGH POWER ENHANCED DATA RATE BTCSM2 MODULATION 138
10.1.6. HIGH POWER ENHANCED DATA RATE TXBF BTCSM2 MODULATION 146
10.1.7. LOW POWER BASIC DATA RATE GFSK MODULATION 150
10.1.8. LOW POWER BASIC DATA RATE TXBF GFSK MODULATION 158
10.1.9. LOW POWER ENHANCED DATA RATE 8PSK MODULATION 162
10.1.10. LOW POWER ENHANCED DATA RATE TXBF 8PSK MODULATION 170
10.1.11. LOW POWER ENHANCED DATA RATE BTCSM2 MODULATION 174
10.1.12. LOW POWER ENHANCED DATA RATE TXBF BTCSM2 MODULATION 182
10.1.13. GFSK TXBF HARMONICS AND SPURIOUS EMISSIONS 186
10.1.14 BTCSM2 TXBF HARMONICS AND SPURIOUS EMISSIONS 192
10.2. WORST CASE BELOW 1 GHz 198
10.3. WORST CASE 18-26 GHz 200
11. AC POWER LINE CONDUCTED EMISSIONS 202
11.1.1. AC POWER LINE WITH LAPTOP 203
11.1.2. AC POWER LINE WITH AC/DC ADAPTER 205
12. SETUP PHOTOS 207
13. APPENDIX A - SPOT CHECK EVALUATION 207
13.1. MODEL DIFFERENCES 207
13.2. SPOT CHECK VERIFICATION RESULTS SUMMARY FOR A3525 208
13.3. SPOT CHECK VERIFICATION RESULTS SUMMARY FOR A3526 208
13.4. SPOT CHECK VERIFICATION RESULTS SUMMARY FOR A3527 208

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: APPLE INC.
1 APPLE PARK WAY
CUPERTINO, CA 95014, U.S.A

EUT DESCRIPTION: SMARTPHONE

MODEL: A3256 (Parent)
BCG-E8950A (Parent)
BCG-E8960A, BCG-E8961A, BCG-E8962A (Variants)

BRAND: APPLE

SERIAL NUMBER: HVHHCY0001P0000YEE, HVHHHD0004U0000YE8 (Conducted)
KQ2V66FV9N (Radiated)

SAMPLE RECEIPT DATE: 2025-03-07

DATE TESTED: 2025-03-28 to 2025-08-09

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Complies
ISED RSS-247 Issue 3	Complies
ISED RSS-GEN Issue 5 + A1 + A2	Complies

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL Verification Services Inc and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc will constitute fraud and shall nullify the document.

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2. TEST SUMMARY

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. is only responsible for correctly integrating customer-provided data with measurements performed by UL Verification Services Inc.

Below is a list of the data provided by the customer:

1. Antenna gain and type (see section 6.3)
2. Cable loss (see section 6.3)

FCC Clause	ISED Clause	Requirement	Result	Comment
See Comment		Duty Cycle	Reporting purposes only	Per ANSI C63.10, Section 11.6.
See Comment	RSS-GEN 6.7	20dB BW/99% OBW	Reporting purposes only	ANSI C63.10 Sections 6.9.2 and 6.9.3
15.247 (a)(1)	RSS-247 (5.1) (b)	Hopping Frequency Separation	Complies	None.
15.247 (a)(1)(iii)	RSS-247 (5.1) (d)	Number of Hopping Channels	Complies	None.
15.247 (a)(1)(iii)	RSS-247 (5.1) (d)	Average Time of Occupancy	Complies	None.
15.247 (b)(1)	RSS-247 (5.4) (b)	Output Power	Complies	None.
See Comment		Average Power	Reporting purposes only	Per ANSI C63.10, Section 11.9.2.3.2.
15.247 (d)	RSS-247 (5.5)	Conducted Spurious Emissions	Complies	None.
15.209, 15.205	RSS-GEN 8.9, 8.10	Radiated Emissions	Complies	None.
15.207	RSS-Gen 8.8	AC Mains Conducted Emissions	Complies	None.

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with:

- FCC 47 CFR Part 2
- FCC 47 CFR Part 15C
- *ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024
- KDB 558074 D01 15.247 Meas Guidance
- KDB 414788 D01 Radiated Test Site
- KDB 662911 D01 Multiple Transmitter Output
- KDB 484596 D01 Referencing Test Data
- RSS-GEN Issue 5 + A1 + A2
- RSS-247 Issue 3

*Note: The use of ANSI C63.10-2020 + Cor. 1-2023 + C63.10a-2024 does not deviate from the testing procedures of ANSI C63.10-2020

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4. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by A2LA, certification #0751.05, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
☐	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	550739
☒	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA			
☒	Building 3: 843 Auburn Court, Fremont, CA 94538, USA			
☒	Building 4: 47658 Kato Rd, Fremont, CA 94538, USA			
☒	Building 5: 47670 Kato Rd, Fremont, CA 94538, USA			

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5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

5.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not considered when stating conformity with a specified requirement.)

5.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	U_{LAB}
Conducted Antenna Port Emission Measurement	1.94 dB
Time Domain Measurements Using SA	3.39 %
RF Power Measurement Direct Method Using Power Meter	1.3 dB (Pk), 0.45 dB (Ave)
Radio Frequency (Spectrum Analyzer)	141.16 Hz
Occupied Bandwidth	1.22 %
Carrier Frequency Separation	19.70 Hz
Number of Hopping Frequencies	0.000 dB
Worst Case Conducted Disturbance, 9kHz to 0.15 MHz	3.78 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.40 dB
Worst Case Radiated Disturbance, 9kHz to 30 MHz	2.87 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	6.01 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.73 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.51 dB

Uncertainty figures are valid to a confidence level of 95%.

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6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

The Apple iPhone is a smartphone with cellular GSM, GPRS, EGPRS, UMTS, LTE, 5GNR1, 5GNR2, IEEE 802.11a/b/g/n/ac/ax/be, Bluetooth (BT), Ultra-Wideband (UWB), GPS, NFC, NB UNII, 802.15.4, 802.15.4ab-NB and MSS technologies. The rechargeable battery is not user accessible.

6.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

Antenna	Config	Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
ANT 2	High Power	2402 - 2480	Basic GFSK	19.89	97.50
		2402 - 2480	DQPSK	19.53	89.74
		2402 - 2480	Enhanced 8PSK	19.73	93.97
		2402-2480	BTCSM2	11.16	13.06
	Low Power	2402 - 2480	Basic GFSK	7.93	6.21
		2402 - 2480	DQPSK	7.28	5.35
		2402 - 2480	Enhanced 8PSK	7.84	6.08
		2402-2480	BTCSM2	8.05	6.38
ANT 1	High Power	2402 - 2480	Basic GFSK	19.96	99.08
		2402 - 2480	DQPSK	19.86	96.83
		2402 - 2480	Enhanced 8PSK	19.96	99.08
		2402-2480	BTCSM2	11.10	12.88
	Low Power	2402 - 2480	Basic GFSK	9.27	8.45
		2402 - 2480	DQPSK	8.84	7.66
		2402 - 2480	Enhanced 8PSK	8.81	7.60
		2402-2480	BTCSM2	9.31	8.53
BF, ANT 2 + ANT 1	High Power	2402 - 2480	Basic GFSK TxBF	20.17	103.99
		2402 - 2480	DQPSK TxBF	19.86	96.83
		2402 - 2480	Enhanced 8PSK TxBF	19.93	98.40
		2402-2480	BTCSM2	11.34	13.61
	Low Power	2402 - 2480	Basic GFSK TxBF	11.59	14.42
		2402 - 2480	DQPSK TxBF	10.91	12.33
		2402 - 2480	Enhanced 8PSK TxBF	11.08	12.65
		2402-2480	BTCSM2	11.23	13.27

Note: GFSK, DQPSK, 8PSK average Power are all investigated, The GFSK, 8PSK, BTCSM2 Power are the worst case. Testing is based on these modes to showing compliance. For average power data please refer to section 9.7.

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6.3. DESCRIPTION OF AVAILABLE ANTENNAS AND CABLE LOSS

The antenna(s) gain, type and cable loss, as provided by the manufacturer' are as follows:

Frequency Band (GHz)	Antenna Type	Antenna Peak Gain ANT 2 (dBi)	Antenna Peak Gain ANT 1 (dBi)	Cable Loss ANT 2 (dB)	Cables Loss ANT 1 (dB)
2.4	IFA	-1.1	-3.1	2.1	1.9

The cables were used for RF antenna port tests that had been offset to the test equipment during testing.

6.4. SOFTWARE AND FIRMWARE

The EUT firmware 23A258.

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6.5. WORST-CASE CONFIGURATION AND MODE

EUT was investigated in three orthogonal orientations X (Flatbed), Y (Landscape) and Z (Portrait) on ANT 2, ANT 1, and 2TX. It was determined that X (Flatbed) was the worst-case orientation for ANT 2, ANT 1 and 2TX Beamforming.

Radiated band edge, harmonic, and spurious emissions from 1GHz to 18GHz were performed with the EUT was set to transmit at highest power on Low/Middle/High channels.

Radiated emissions below 30MHz, below 1GHz, 18-26GHz and power line conducted emissions were performed with the EUT transmits at the channel with the highest output power as worst-case scenario. There were no emissions found below 30MHz within 20dB of the limit.

For below 1GHz tests, EUT was connected to AC power adapter as the worst case; and for above 1GHz, the worst-case configuration reported was tested with EUT only. For AC line conducted emission, test was investigated with AC power adapter and with laptop.

For simultaneous transmission of multiple channels in the 2.4GHz BT and 5GHz bands, no noticeable emission was found.

GFSK, DQPSK, 8PSK, BTCSM2 average power are all investigated, The GFSK, 8PSK & BTCSM2 power are the worst cases. For average power data please refer to section 9.7.

Worst-case data rates as provided by the client were:

GFSK mode : DH5
8PSK mode : 3-DH5
BTCSM2 test mode

Beamforming: GFSK, DH5, 8PSK, 3-DH5, BTCSM2

For radiated harmonic spurious emissions test, high power beamforming GFSK mode is set to maximum power per chain to cover both SISO and MIMO modes to comply with radiated spurious emissions limits in the restricted bands between 1GHz and 18GHz low/mid/high channel. For GFSK and 8PSK mode, GFSK mode was selected for test to cover 8PSK as it has higher tune up level.

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6.6. DESCRIPTION OF TEST SETUP

SUPPORT TEST EQUIPMENT						
Description		**Manufacturer**	**Model**	**Serial Number**		**FCC ID/ DoC**
Laptop		Apple	Macbook Pro	C02VD7SAHV22		BCGA1708
Laptop AC/DC adapter		Liteon Technology	A1424	NSW25679		DoC
EUT AC/DC adapter		Apple	A1720	C3D8417A7R93KVPA8		DoC
Conducted Switch Box		UL	n/a	208281		N/A
I/O CABLES (RF CONDUCTED TEST)						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	SMA	1	SMA	Shielded	0.2	To spectrum Analyzer
2	Antenna	1	SMA	Shielded	0.2	EUT to Switchbox
3	USB	1	USB-C	Shield	1.0	N/A
4	DC	1	DC	Shield	2.0	N/A
I/O CABLES (RF RADIATED AND AC LINE CONDUCTED TEST)						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	DC	1	DC	Shielded	2	N/A
2	USB	1	USB-C	Shielded	1	N/A

TEST SETUP

The EUT setup is shown as below. Test software exercised the radio card.

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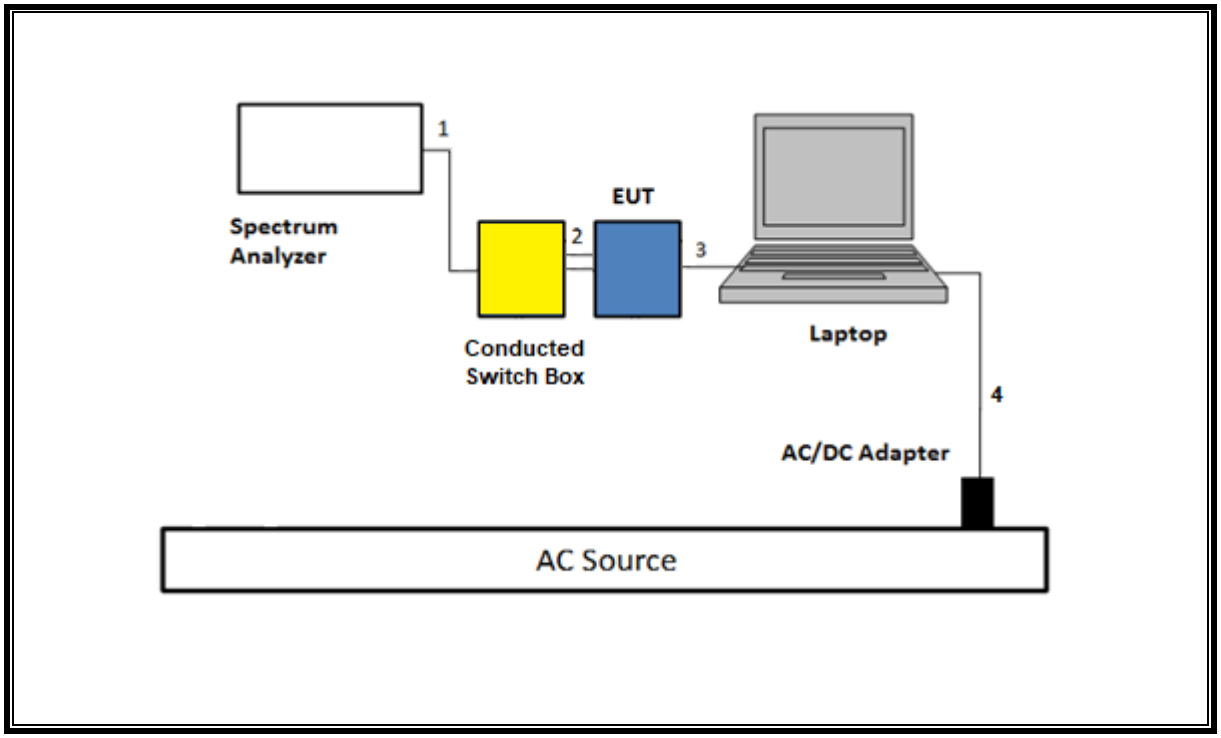
SETUP DIAGRAM FOR CONDUCTED TESTS



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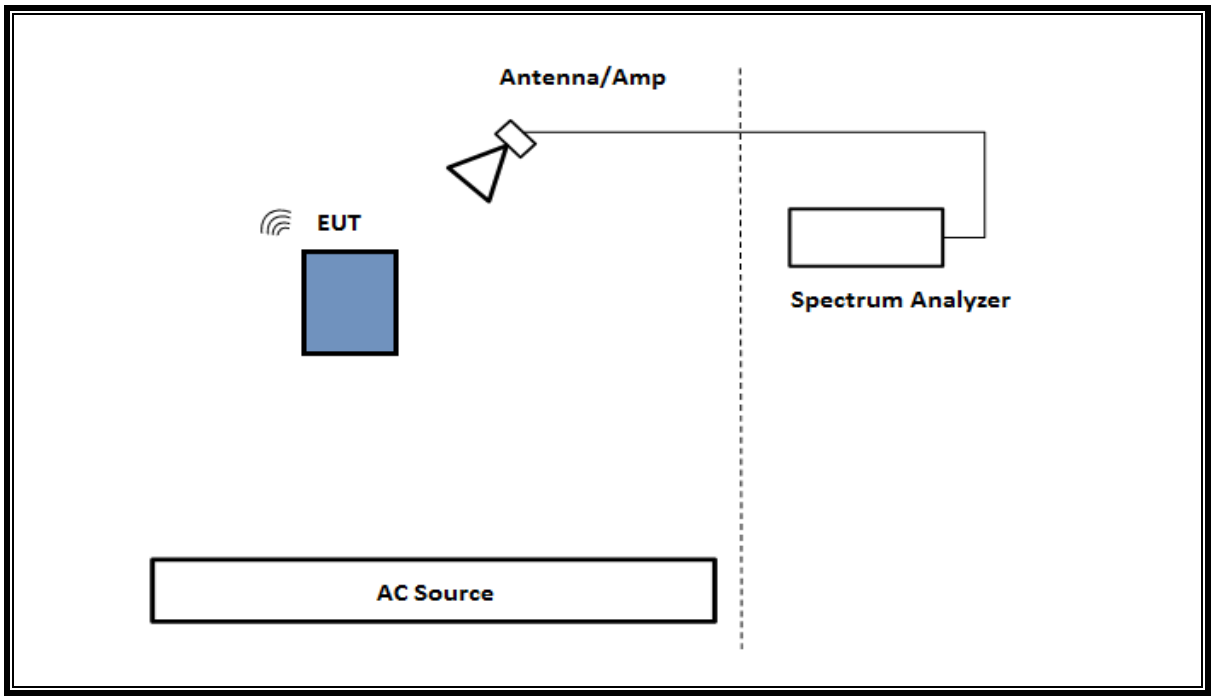
SETUP DIAGRAM FOR RADIATED TESTS Above 1 GHz



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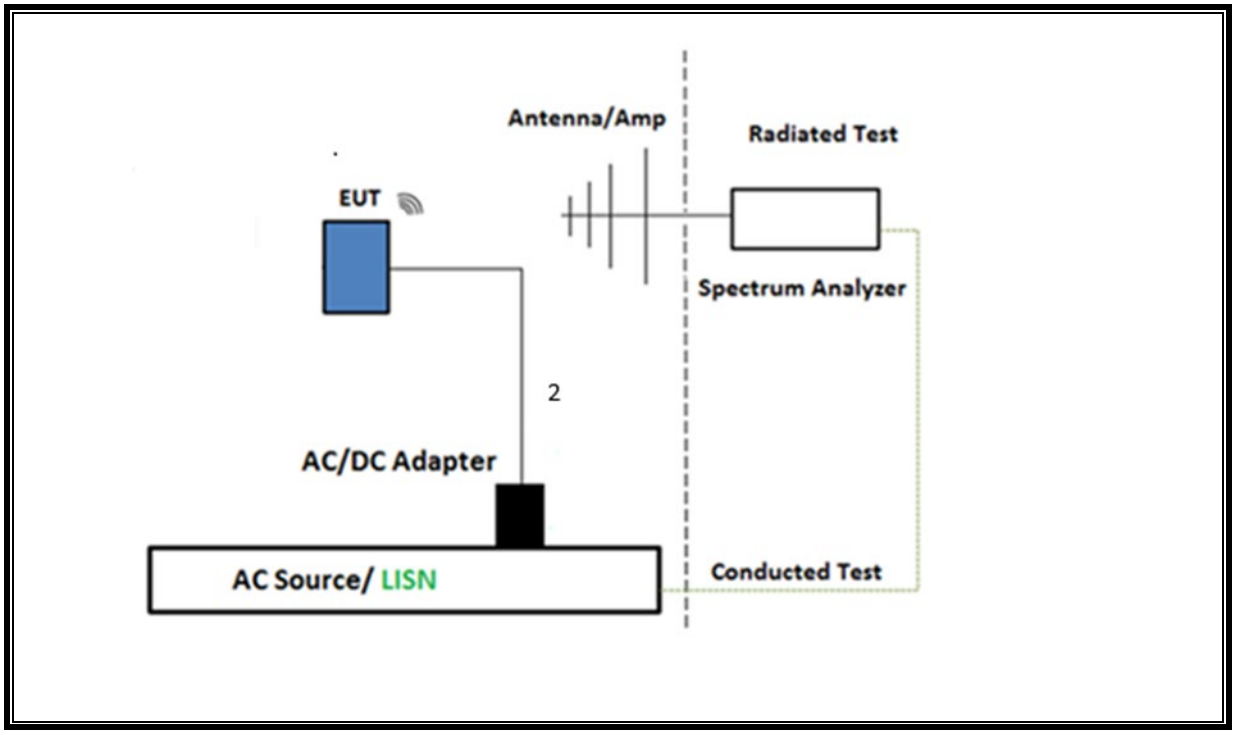
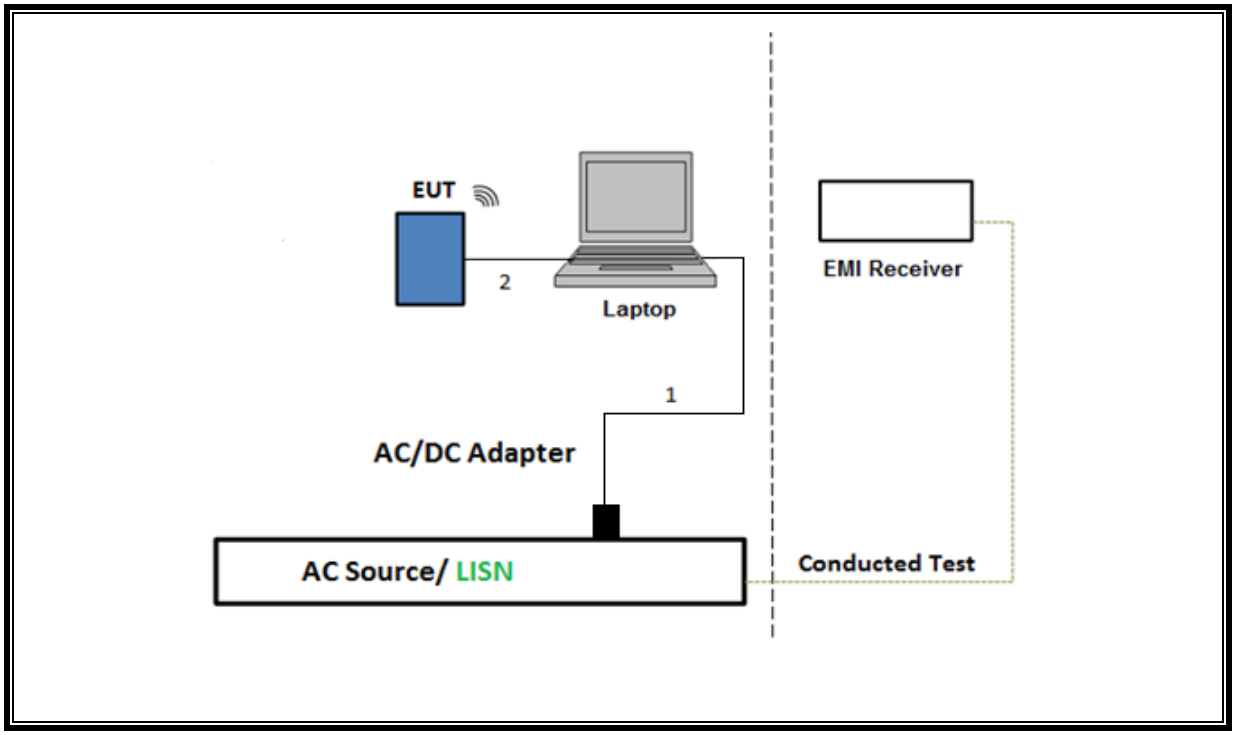
SETUP DIAGRAM FOR Below 1GHz and AC LINE CONDUCTED TEST



TEST SETUP- AC LINE CONDUCTED: LAPTOP CONFIGURATION



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7. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment were utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**ID Num**	**Cal Due**
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	80402	2026-08-31
RF Filter Box, 1-18GHz	UL-FR1	Frankenstein	216812	2026-01-31
EMI Test Receiver	Rohde & Schwarz	ESW44	230548	2026-02-28
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	226671	2027-07-31
RF Filter Box, 1-18GHz	UL-FR1	Rats 2.0	236726	2025-10-31
EMI Test Receiver	Rohde & Schwarz	ESW44	223460	2026-02-28
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	80404	2026-8-31
RF Filter Box, 1-18GHz	UL-FR1	Rats 2.0	226781	2026-05-31
EMI Test Receiver	Rohde & Schwarz	ESW44	226078	2026-02-28
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	222741	2026-09-30
RF Filter Box, 1-18GHz	UL-FR1	Frankenstein	217521	2025-08-31
EMI Test Receiver	Rohde & Schwarz	ESW44	223461	2026-02-28
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	226673	2026-02-28
RF Filter Box, 1-18GHz	UL-FR1	Rats 2.0	231874	2026-06-29
EMI Test Receiver	Rohde & Schwarz	ESW44	PRE0179372	2026-02-28
Antenna, Broadband Hybrid, 30MHz to 2GHz	Sunol Sciences Corp.	JB3	85150	2025-12-30
Antenna, Horn 18 to 26.5GHz	A.R.A.	MWH-1826/B	199658	2026-02-02
Link File, RF Amplifier Assembly, 18-26.5GHz, 60dB Gain	AMPLICAL	AMP18G26.5-60	234683	2026-02-28
DC Power Supply	TDK-LAMBDA	GEN 60-25	PRE0074753	N/A
DC Power Supply	TDK-LAMBDA	GEN 60-25	PRE0074756	N/A
Spectrum Analyzer, PXA, 3Hz to 44GHz	N9030A	Keysight Technologies Inc	80397	2026-01-31
Spectrum Analyzer, PXA, 3Hz to 44GHz	sN9030A	Keysight Technologies Inc	125179	2026-02-28
Conducted Switch Box	UL-FR1	CSB	245782	2025-07-31
Conducted Switch Box	UL-FR1	CSB	245781	2026-04-30
Power Meter, P-series single channel	Keysight Technologies Inc	N1911A	90715	2026-01-31
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1921A	81319	2026-01-31
Power Meter, P-series single channel	Keysight Technologies Inc	N1911A	90718	2026-01-31
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1921A	90419	2026-01-31
Antenna, Passive Loop 30Hz - 1MHz	ELECTRO-METRICS	EM-6871	170013	2025-07-31
Antenna, Passive Loop 100KHz - 30MHz	ELECTRO-METRICS	EM-6872	170015	2025-07-31

Description	**Manufacturer**	**Model**	**ID Num**	**Cal Due**
EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESR	171646	2026-02-28
LISN for Conducted Emissions CISPR-16	FISCHER CUSTOM COMMUNICATIONS	FCC-LISN-50/250-25-2-01-480V	175765	2026-01-31
Transient Limiter	TE	TBFL1	207996	2026-09-30
UL AUTOMATION SOFTWARE				
Radiated Software	UL	UL EMC	May 1, 2023 Ver 9.5, August 31 2024 Ver 9.5, Rev 9.5, June 9, 2025, 31 July 2024	
Conducted Software	UL	UL EMC	Ver 9.5 Jan 09, 2023	
AC Line Conducted Software	UL	UL EMC	Ver 9.5, Jan 9, 2023	

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8. MEASUREMENT METHODS

On Time and Duty Cycle: ANSI C63.10 Section 11.6

Occupied BW (20dB): ANSI C63.10 Section 6.9.2

Occupied BW (99%): ANSI C63.10 Section 6.9.3

Carrier Frequency Separation: ANSI C63.10 Section 7.8.2

Number of Hopping Frequencies: ANSI C63.10 Section 7.8.3

Time of Occupancy (Dwell Time): ANSI C63.10 Section 7.8.4

Peak Output Power: ANSI C63.10 Section 7.8.5

Conducted Spurious Emissions: ANSI C63.10 Section 7.8.7

Conducted Band-Edge: ANSI C63.10 Section 6.10.4

Radiated Spurious Emissions Below 30MHz: ANSI C63.10 Section 6.4 & 13

Radiated Spurious Emissions 30-1000MHz: ANSI C63.10 Section 6.3, 6.5 & 13

Radiated Spurious Emissions above 1GHz: ANSI C63.10 Section 6.3, 6.6 & 13

Radiated Band-edge: ANSI C63.10 Section 6.10.5 & 13

AC Power-line conducted emissions: ANSI C63.10 Section 6.2

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9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

ANSI C63.10, Section 11.6: Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time T (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)
Bluetooth GFSK	2.87	3.75	0.765	76.5	1.16	0.348
Bluetooth 8PSK	2.75	3.75	0.733	73.3	1.35	0.364
BTCSM2	0.04	0.47	0.092	9.2	10.37	23.436

Note: Both 1TX and 2TX have the same DCCF.

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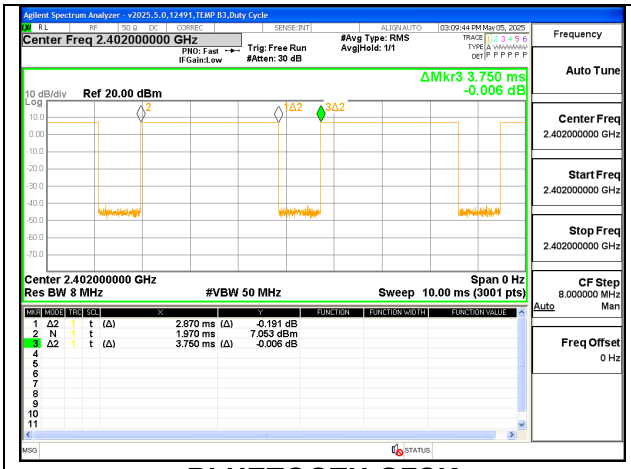
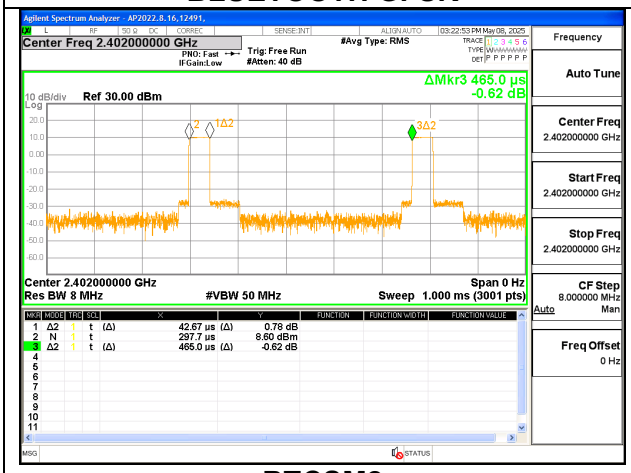


BLUETOOTH GFSK

BLUETOOTH 8PSK



BTCSM2

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9.2. 20 dB AND 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to ≥ 1% of the 20 dB bandwidth. The VBW is set to ≥ 3xRBW. The sweep time is coupled.

RESULTS

Only the High-Power modes result is reported, it covers all Low Power modes. Only Mid channel plot is reported to show the analyzer's settings.

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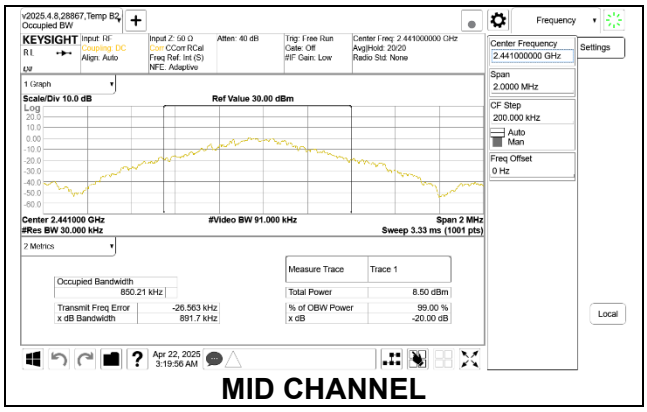
9.2.1. HIGH POWER BASIC DATA RATE GFSK MODULATION

ANT 2

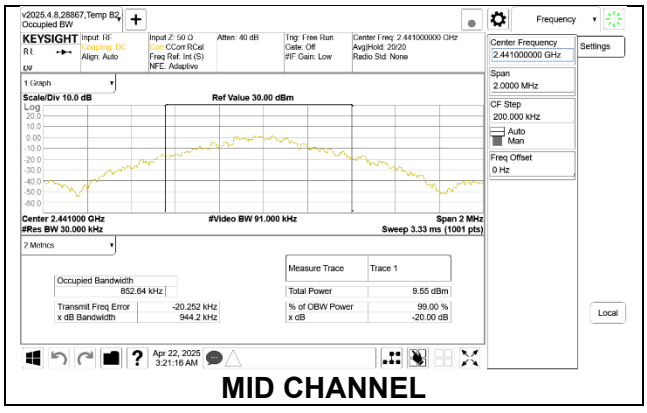
Channel	Frequency (MHz)	20dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	0.923	0.848
Mid	2441	0.892	0.850
High	2480	0.924	0.851



MID CHANNEL

ANT 1

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	0.924	0.850
Mid	2441	0.944	0.853
High	2480	0.942	0.853

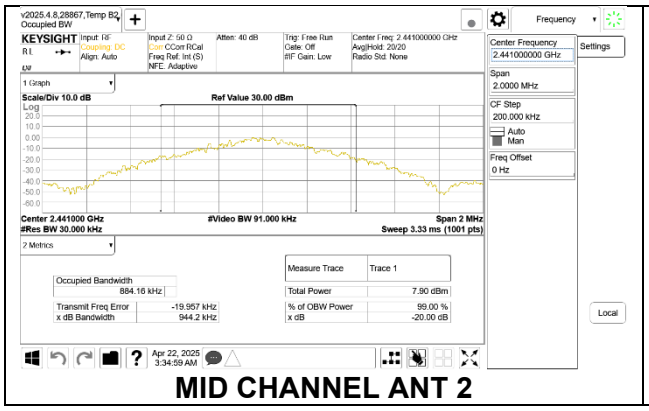


MID CHANNEL

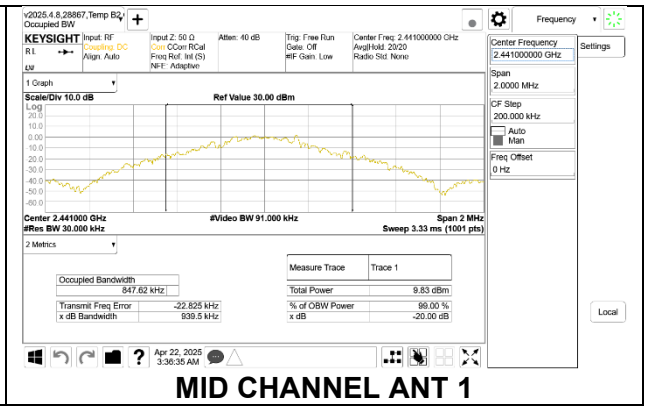
9.2.2. HIGH POWER BASIC DATA RATE TXBF GFSK MODULATION

Channel	Frequency (MHz)	20dB Bandwidth ANT 2 (MHz)	20dB Bandwidth ANT 1 (MHz)	99% Bandwidth ANT 2 (MHz)	99% Bandwidth ANT 1 (MHz)
Low	2402	0.935	0.920	0.856	0.850
Mid	2441	0.944	0.940	0.884	0.848
High	2480	0.936	0.945	0.840	0.850

Note: Test procedures and setting on beamforming mode are same as BT basic and EDR mode



MID CHANNEL ANT 2

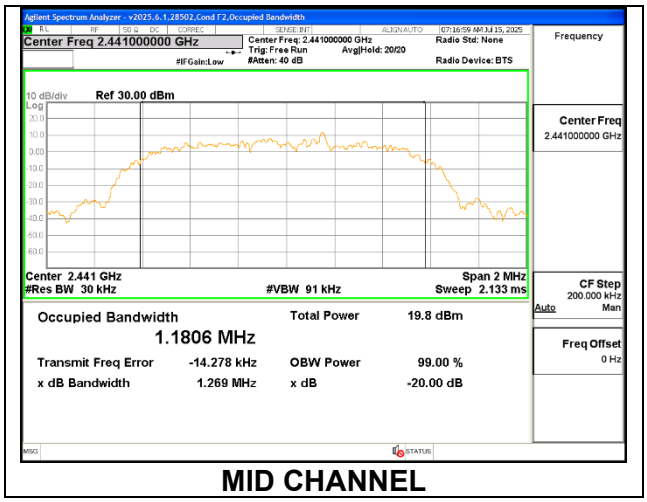


MID CHANNEL ANT 1

9.2.3. HIGH POWER ENHANCED DATA RATE 8PSK MODULATION

ANT 2

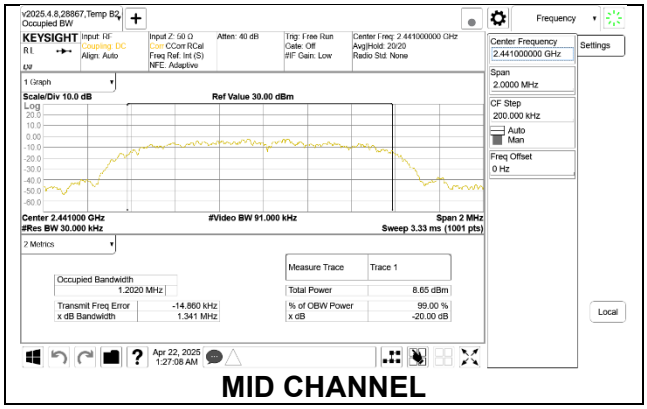
Channel	Frequency (MHz)	20dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.343	1.200
Mid	2441	1.269	1.181
High	2480	1.331	1.192



MID CHANNEL

ANT 1

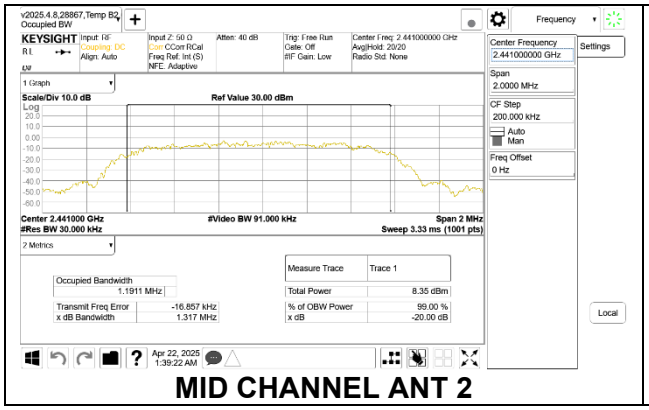
Channel	Frequency (MHz)	20dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.307	1.198
Mid	2441	1.341	1.202
High	2480	1.298	1.201



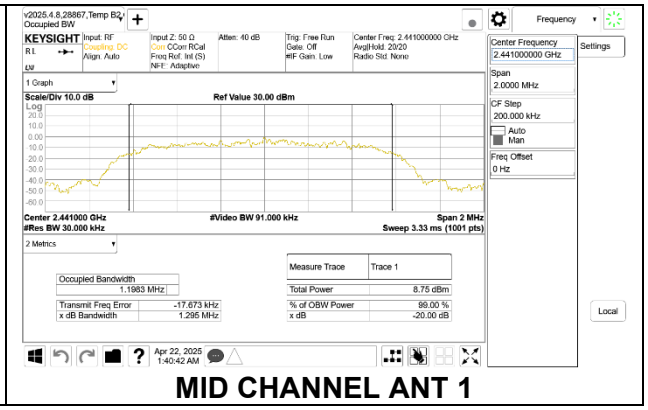
MID CHANNEL

9.2.4. HIGH POWER ENHANCED DATA RATE TXBF 8PSK MODULATION

Channel	Frequency (MHz)	20dB Bandwidth ANT 2 (MHz)	20dB Bandwidth ANT 1 (MHz)	99% Bandwidth ANT 2 (MHz)	99% Bandwidth ANT 1 (MHz)
Low	2402	1.322	1.314	1.206	1.188
Mid	2441	1.317	1.295	1.191	1.198
High	2480	1.315	1.328	1.804	1.199



MID CHANNEL ANT 2



MID CHANNEL ANT 1

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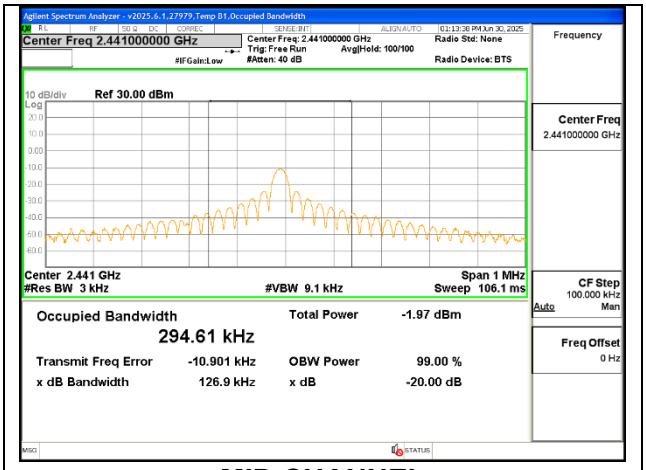
9.2.5. HIGH POWER ENHANCED DATA RATE BTCSM2 MODULATION

ANT 2

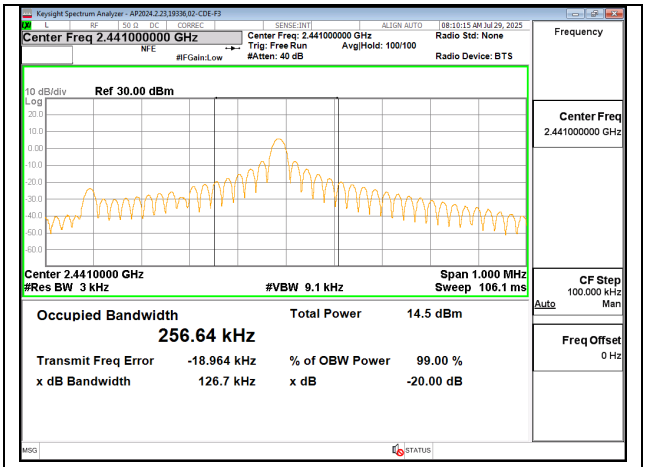
Channel	Frequency (MHz)	20dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	0.127	0.283
Mid	2441	0.127	0.295
High	2480	0.127	0.271



MID CHANNEL

ANT 1

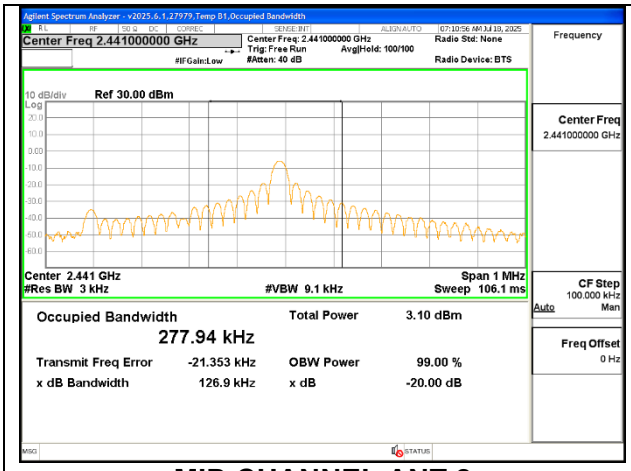
Channel	Frequency (MHz)	20dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	0.127	0.256
Mid	2441	0.126	0.257
High	2480	0.127	0.278



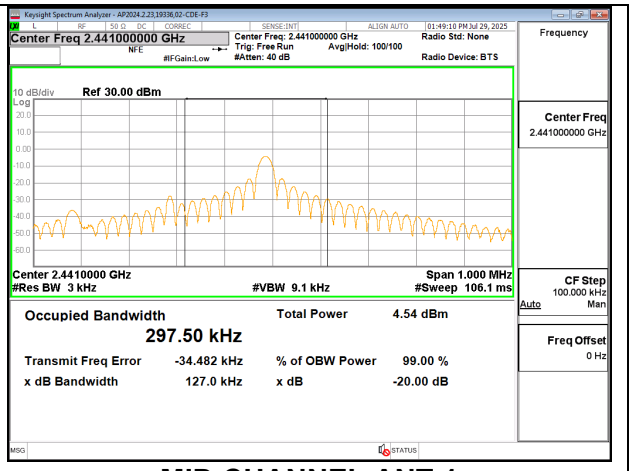
MID CHANNEL

9.2.6. HIGH POWER ENHANCED DATA RATE TXBF BTCSM2 MODULATION

Channel	Frequency (MHz)	20dB Bandwidth ANT 2 (MHz)	20dB Bandwidth ANT 1 (MHz)	99% Bandwidth ANT 2 (MHz)	99% Bandwidth ANT 1 (MHz)
Low	2402	0.127	0.127	0.276	0.282
Mid	2441	0.127	0.127	0.278	0.298
High	2480	0.127	0.127	0.274	0.283



MID CHANNEL ANT 2



MID CHANNEL ANT 1

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9.3. HOPPING FREQUENCY SEPARATION

LIMITS

FCC §15.247 (a) (1)

RSS-247 (5.1) (b)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 300 kHz and the VBW is set to VBW >= 3xRBW. The sweep time is coupled.

RESULTS

Only High-Power GFSK mode result is reported since EDR (QPSK/8PSK) has exactly the same channel plan.

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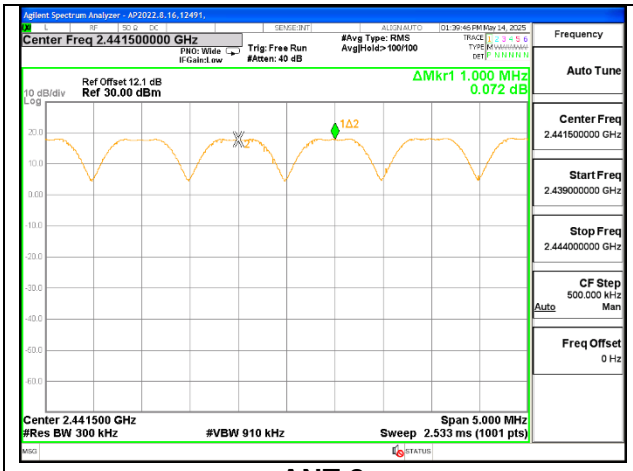
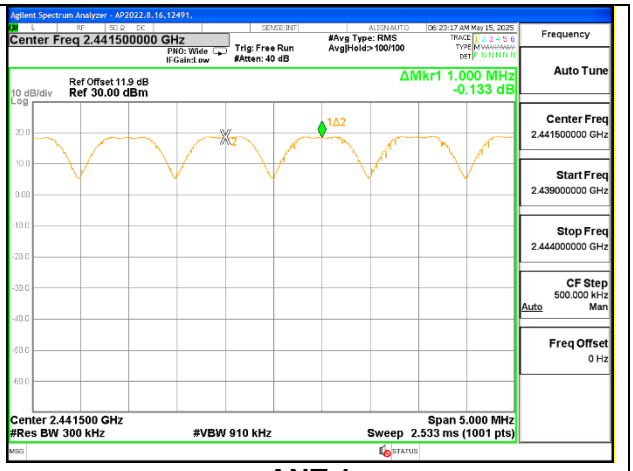
9.3.1. HIGH POWER BASIC DATA RATE GFSK MODULATION

HOPPING FREQUENCY SEPARATION



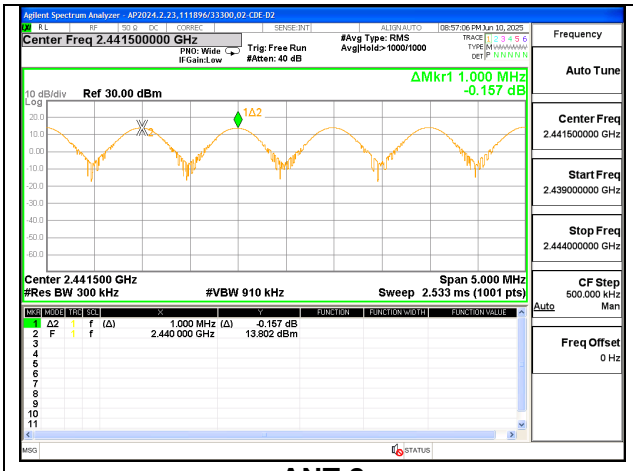
ANT 2



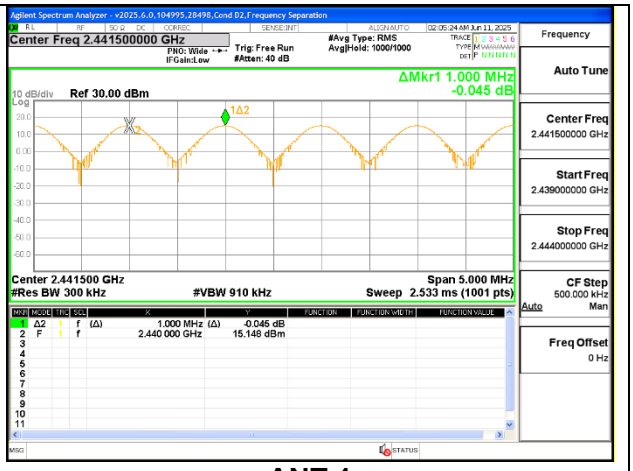
ANT 1

9.3.2. HIGH POWER BASIC DATA RATE BTCSM2 MODULATION

HOPPING FREQUENCY SEPARATION



ANT 2



ANT 1

9.4. NUMBER OF HOPPING CHANNELS

LIMITS

FCC §15.247 (a) (1) (iii)

RSS-247 (5.1) (d)

Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

Normal Mode: 79 Channels observed for BDR/EDR and 78 channels observed for BTCSM2 . Only the High-Power GFSK mode result is reported since EDR (QPSK/8PSK) has the same channel plan.

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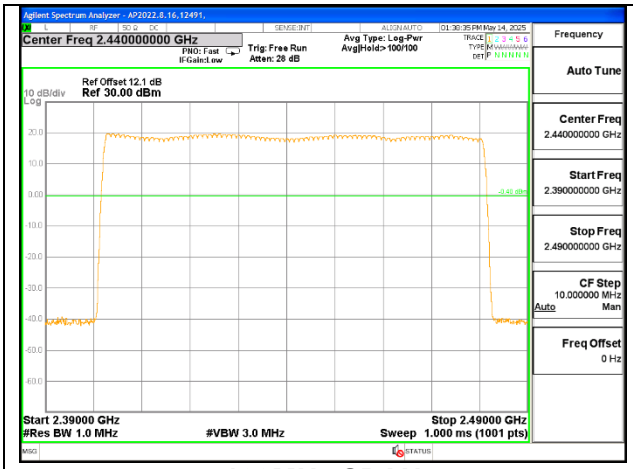
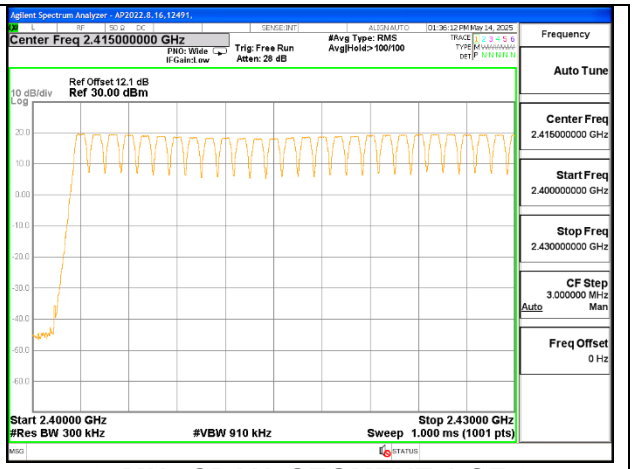
9.4.1. HIGH POWER BASIC DATA RATE GFSK MODULATION

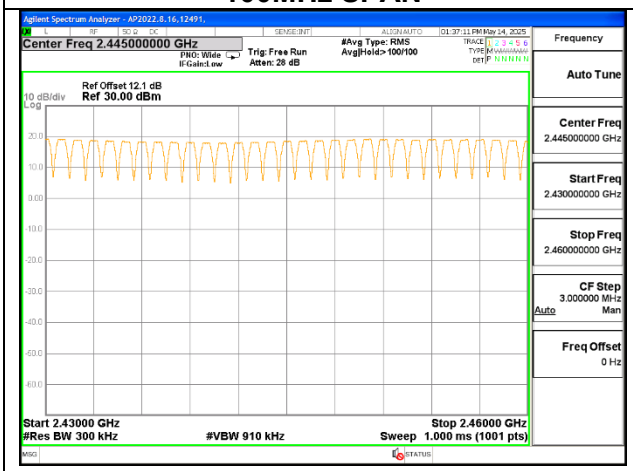
ANT 2



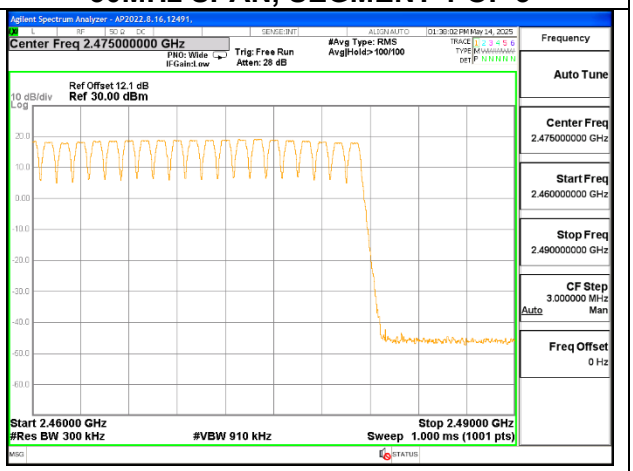
100MHz SPAN



30MHz SPAN, SEGMENT 1 OF 3

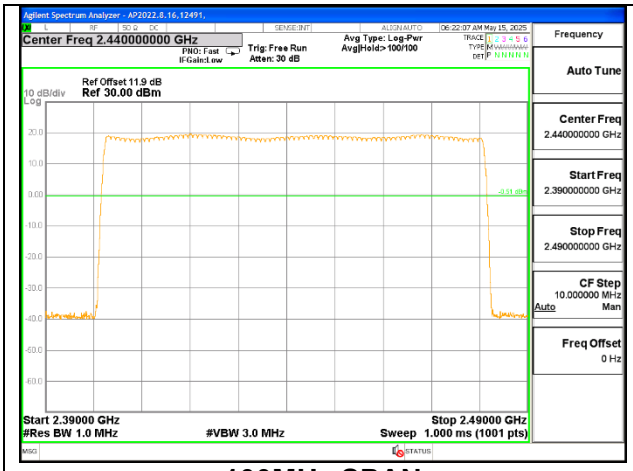


30MHz SPAN, SEGMENT 2 OF 3

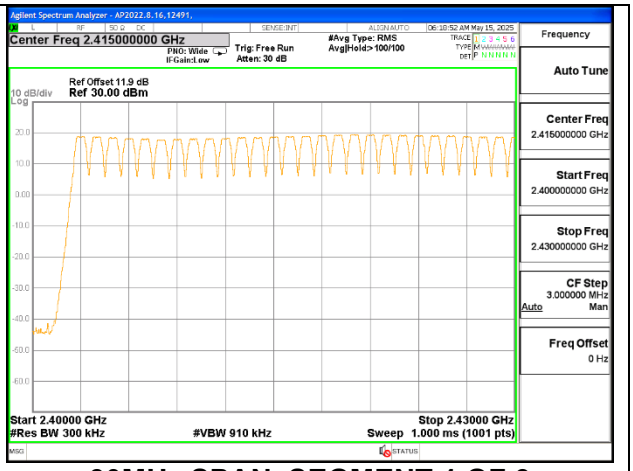


30MHz SPAN, SEGMENT 3 OF 3

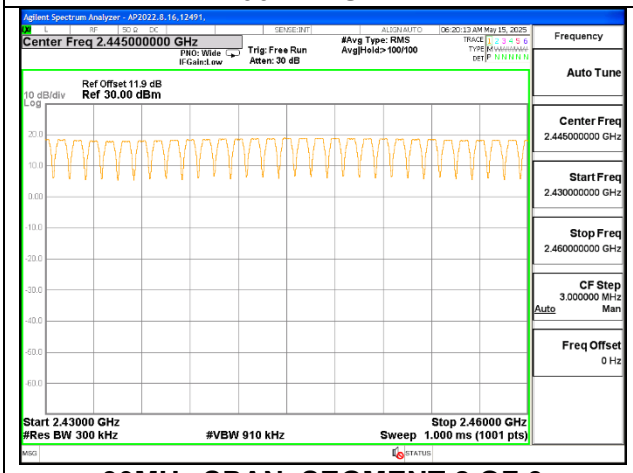
ANT 1



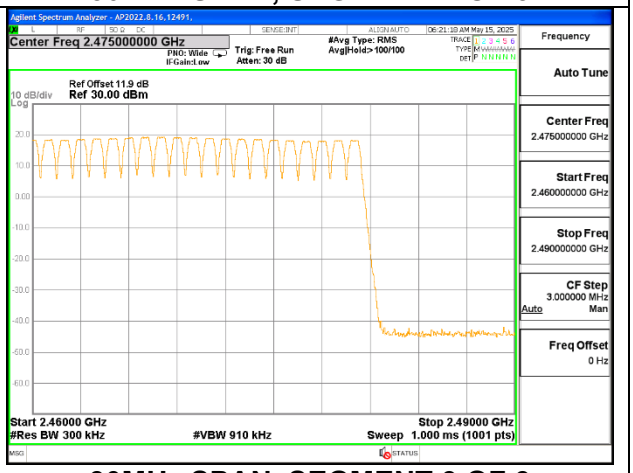
100MHz SPAN



30MHz SPAN, SEGMENT 1 OF 3



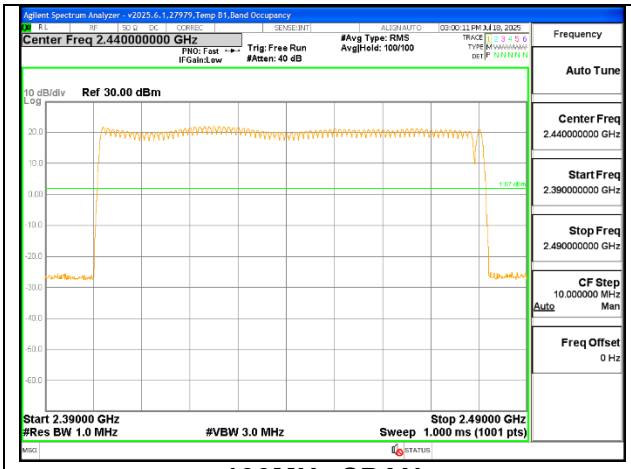
30MHz SPAN, SEGMENT 2 OF 3



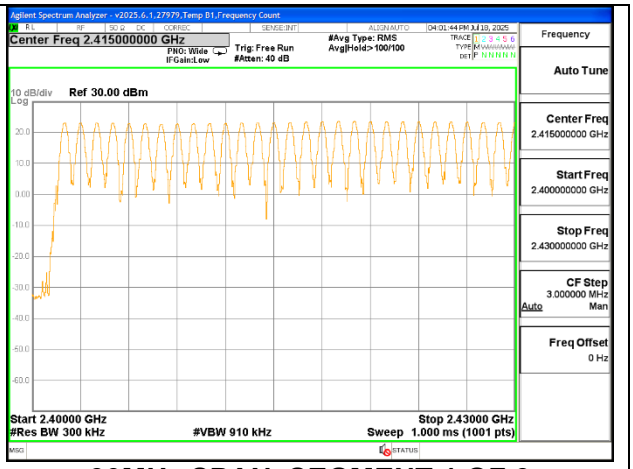
30MHz SPAN, SEGMENT 3 OF 3

9.4.2. HIGH POWER BASIC DATA RATE BTCSM2 MODULATION

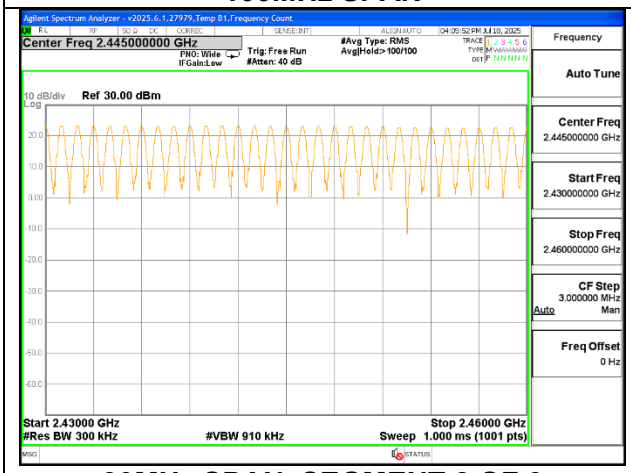
ANT 2



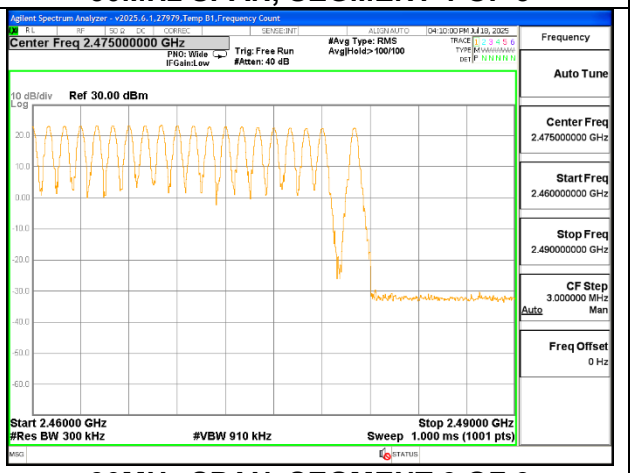
100MHz SPAN



30MHz SPAN, SEGMENT 1 OF 3

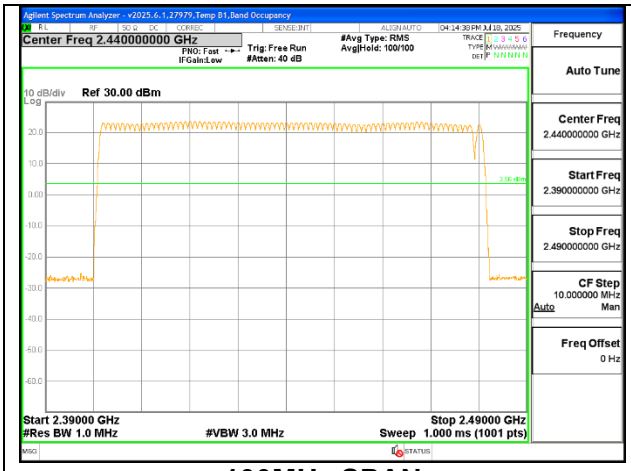


30MHz SPAN, SEGMENT 2 OF 3

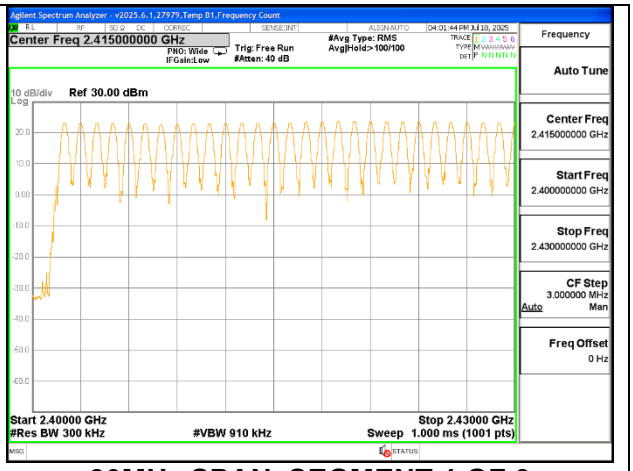


30MHz SPAN, SEGMENT 3 OF 3

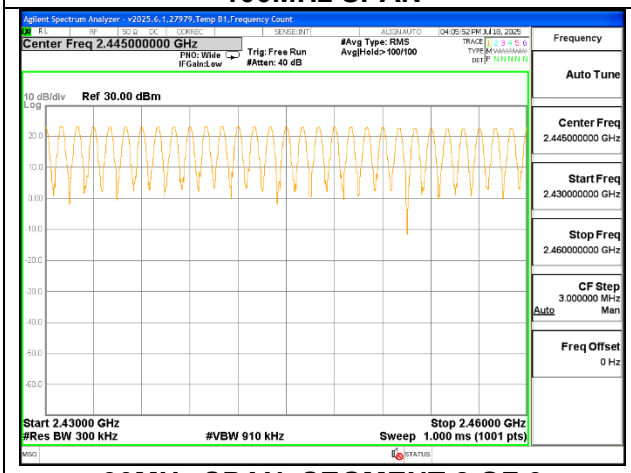
ANT 1



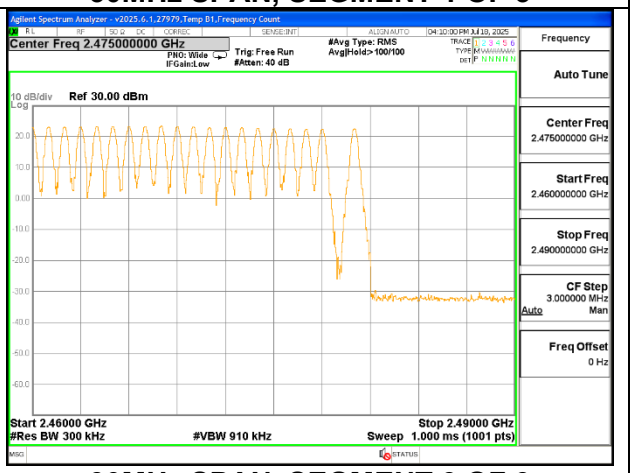
100MHz SPAN



30MHz SPAN, SEGMENT 1 OF 3



30MHz SPAN, SEGMENT 2 OF 3



30MHz SPAN, SEGMENT 3 OF 3

9.5. AVERAGE TIME OF OCCUPANCY

LIMITS

FCC §15.247 (a) (1) (iii)

RSS-247 (5.1) (d)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16-second scan to enable resolution of each occurrence.

The average time of occupancy in the specified 3.16-second period (79 channels * 0.4 s) is equal to 10 * (# of pulses in 3.16 s) * pulse width.

For AFH mode, the average time of occupancy in the specified 8-second period (20 channels * 0.4 seconds) is equal to 10 * (# of pulses in 0.8 s) * pulse width.

RESULTS

Only the High-Power GFSK mode result is reported since EDR (QPSK/8PSK) has exactly the same timing.

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9.5.1. HIGH POWER BASIC DATA RATE GFSK MODULATION

ANT 2

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK Normal Mode					
DH1	0.367	32	0.117	0.4	-0.283
DH3	1.620	15	0.243	0.4	-0.157
DH5	2.864	10	0.286	0.4	-0.114
DH Packet	Pulse Width (msec)	Number of Pulses in 0.8 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK AFH Mode					
DH1	0.367	8	0.029	0.4	-0.371
DH3	1.62	3.75	0.061	0.4	-0.339
DH5	2.864	2.5	0.072	0.4	-0.328

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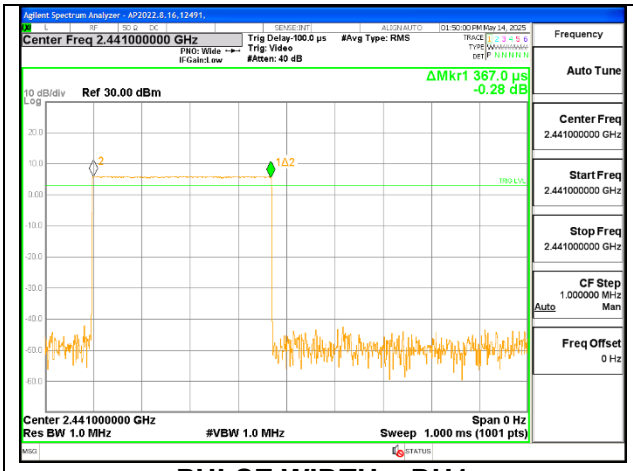
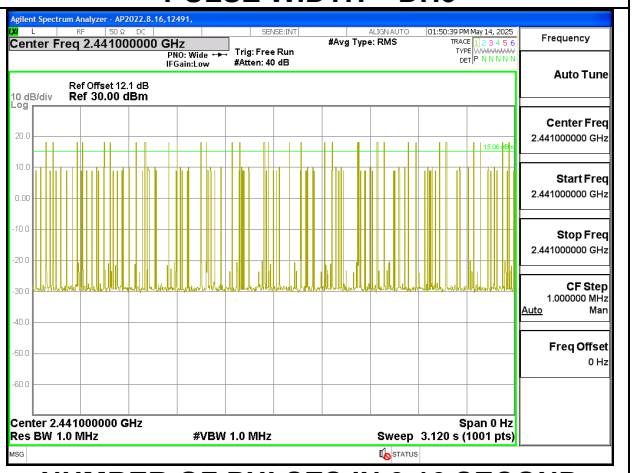


PULSE WIDTH – DH1

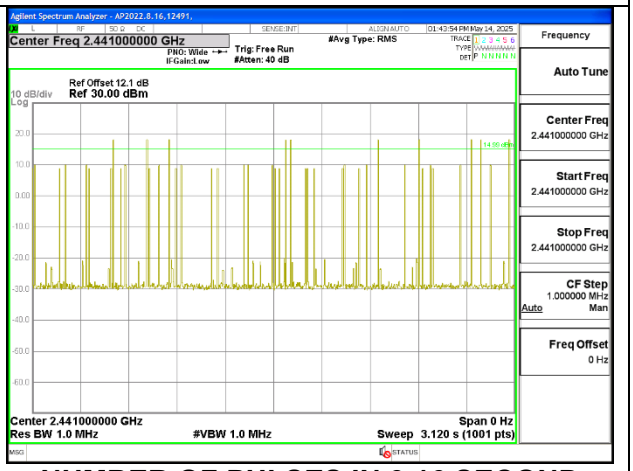
PULSE WIDTH – DH3

PULSE WIDTH – DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH1

NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH3



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH5

ANT 1

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK Normal Mode					
DH1	0.368	30	0.110	0.4	-0.290
DH3	1.62	15	0.243	0.4	-0.157
DH5	2.864	10	0.286	0.4	-0.114
DH Packet	Pulse Width (msec)	Number of Pulses in 0.8 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK AFH Mode					
DH1	0.368	7.5	0.028	0.4	-0.372
DH3	1.62	3.75	0.061	0.4	-0.339
DH5	2.864	2.5	0.072	0.4	-0.328

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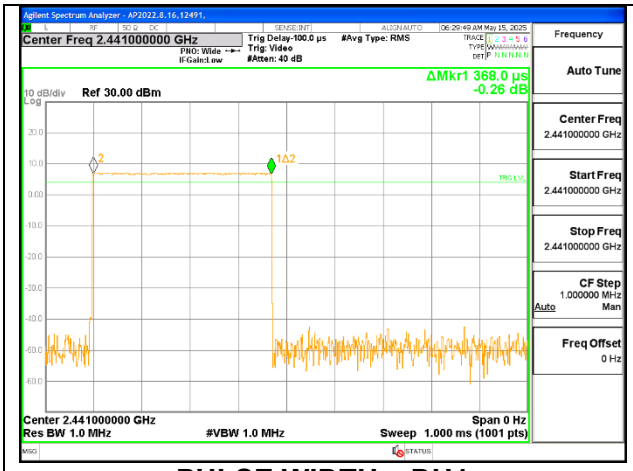
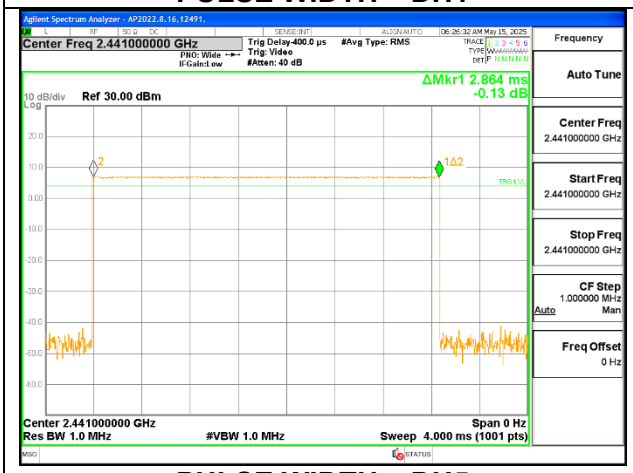
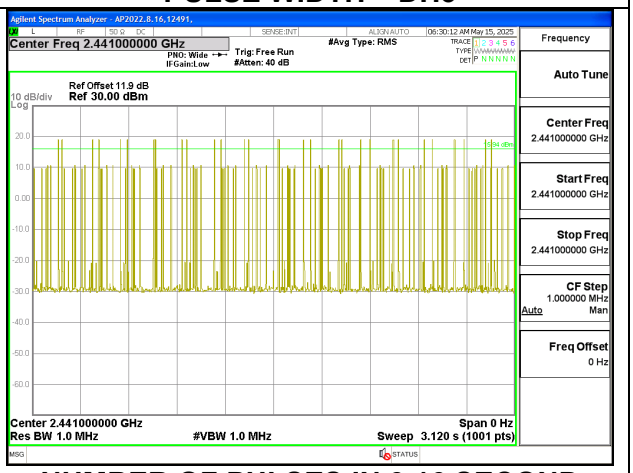


PULSE WIDTH – DH1

PULSE WIDTH – DH3

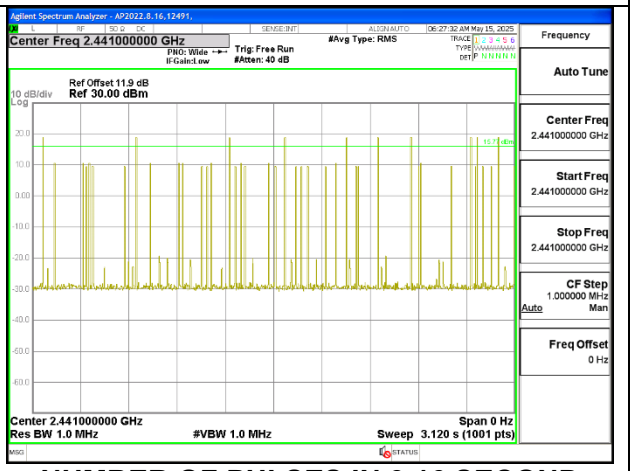


PULSE WIDTH – DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH1

NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH3



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH5

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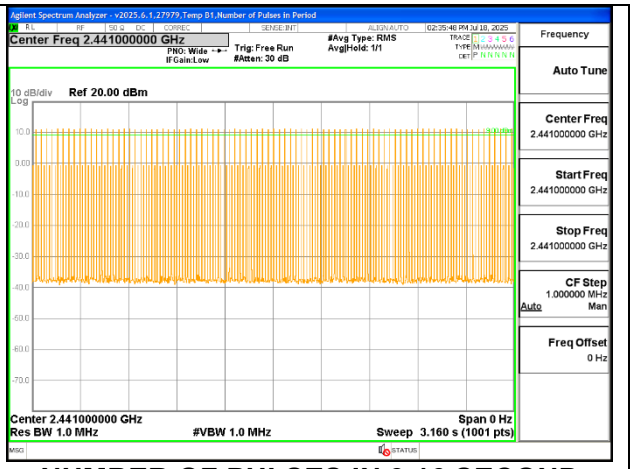
9.5.2. HIGH POWER BASIC DATA RATE BTCSM2 MODULATION

ANT 2

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK Normal Mode					
DH1	0.04	87	0.035	0.4	-0.365
DH Packet	Pulse Width (msec)	Number of Pulses in 0.8 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK AFH Mode					
DH1	0.04	21.75	0.009	0.4	-0.391

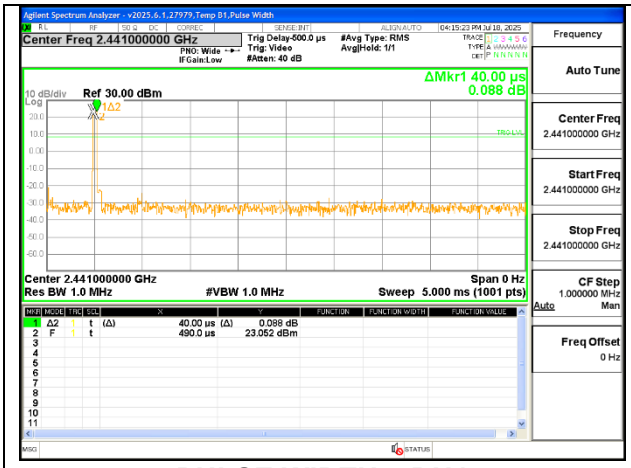
PULSE WIDTH – DH1



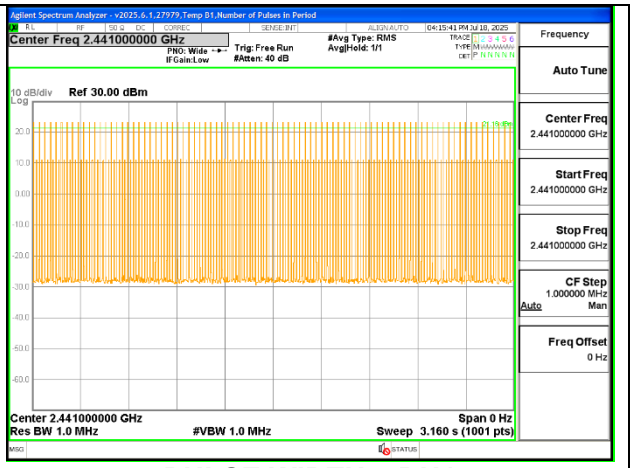
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH1

ANT 1

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK Normal Mode					
DH1	0.04	87	0.035	0.4	-0.365
DH Packet	Pulse Width (msec)	Number of Pulses in 0.8 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK AFH Mode					
DH1	0.04	21.75	0.009	0.4	-0.391



PULSE WIDTH – DH1



PULSE WIDTH – DH1

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9.6. OUTPUT POWER

LIMITS

§15.247 (b) (1)

RSS-247 (5.4) (b)

The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts

TEST PROCEDURE

Measurements were performed using a wideband RF power meter.

The power output was measured on the EUT antenna port using SMA cable with 10dB attenuator connected to a power meter via wideband power sensor. Peak output power was read directly from the power meter.

DIRECTIONAL ANTENNA GAIN

For 1 TX:
There is only one transmitter output therefore the directional gain is equal to the antenna gain.

For 2 TX:

Tx chains are correlated for power due to the device supporting Beamforming. The directional gains are as follows:

Band (GHz)	ANT 2 Antenna 2 Gain (dBi)	ANT 1 Antenna 1 Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
2.4	-1.10	-3.10	-1.99	0.97

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DIRECTIONAL GAIN CALCULATION:

ANSI C63.10-2020 section 14.6.3

Uncorrelated directional gain=10*LOG((10^(Ant2/10)+10^(Ant1/10))/2)
Correlated directional Gain=10*LOG(((10^(Ant2/20)+10^(Ant1/20))^2)/2)

Sample Calculation:

Ant2=-1.1, Ant1=-3.1

Uncorrelated Antenna gain=10log[(10^(-1.1/10)+10^(-3.1/10))/2]= -1.99dBi

Correlated Antenna gain=10log[(10^(-1.1/20)+10^(-3.1/20))^2)/2]= 0.97 dBi

RESULTS

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9.6.1. HIGH POWER BASIC DATA RATE GFSK MODULATION

ANT 2

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	19.89	21	-1.11
Middle	2441	19.88	21	-1.12
High	2480	19.87	21	-1.13

ANT 1

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	19.92	21	-1.08
Middle	2441	19.96	21	-1.04
High	2480	19.95	21	-1.05

9.6.2. HIGH POWER BASIC DATA RATE TXBF GFSK MODULATION

ANT 2 + ANT 1

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Output Power ANT 2 (dBm)	Output Power ANT 1 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	17.02	17.13	20.09	21	-0.91
Middle	2441	17.07	17.22	20.16	21	-0.84
High	2480	17.11	17.20	20.17	21	-0.83

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9.6.3. HIGH POWER ENHANCED DATA RATE QPSK MODULATION

ANT 2

Tested By:	HN 27979
Date:	2025-08-09

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	19.11	21	-1.89
Middle	2441	18.99	21	-2.01
High	2480	19.53	21	-1.47

ANT 1

Tested By:	HN 27979
Date:	2025-08-09

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	19.73	21	-1.27
Middle	2441	19.8	21	-1.2
High	2480	19.86	21	-1.14

9.6.4. HIGH POWER ENHANCED DATA RATE TXBF QPSK MODULATION

ANT 2 + ANT 1

Tested By:	HN 27979
Date:	2025-08-09

Channel	Frequency (MHz)	Output Power ANT 2 (dBm)	Output Power ANT 1 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	16.80	16.69	19.76	21	-1.24
Middle	2441	16.84	16.77	19.82	21	-1.18
High	2480	16.96	16.74	19.86	21	-1.14

9.6.5. HIGH POWER ENHANCED DATA RATE 8PSK MODULATION

ANT 2

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	19.72	21	-1.28
Middle	2441	19	21	-2
High	2480	19.73	21	-1.27

ANT 1

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	19.92	21	-1.08
Middle	2441	19.96	21	-1.04
High	2480	19.95	21	-1.05

9.6.6. HIGH POWER ENHANCED DATA RATE TXBF 8PSK MODULATION

ANT 2 + ANT 1

Tested By:	HN 27979
Date:	2025-08-09

Channel	Frequency (MHz)	Output Power ANT 2 (dBm)	Output Power ANT 1 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	16.97	16.80	19.90	21	-1.10
Middle	2441	16.95	16.88	19.93	21	-1.07
High	2480	17.02	16.82	19.93	21	-1.07

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9.6.7. HIGH POWER ENHANCED DATA RATE BTCSM2 MODULATION

ANT 2

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.16	21	-9.84
Middle	2441	11.06	21	-9.94
High	2480	11.13	21	-9.87

ANT 1

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.10	21	-9.9
Middle	2441	10.98	21	-10.02
High	2480	11.1	21	-9.9

9.6.8. HIGH POWER ENHANCED DATA RATE TXBF BTCSM2 MODULATION

ANT 2 + ANT 1

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Output Power ANT 2 (dBm)	Output Power ANT 1 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	8.29	8.29	11.30	21	-9.70
Middle	2441	8.25	8.16	11.22	21	-9.78
High	2480	8.31	8.35	11.34	21	-9.66

9.6.9. LOW POWER BASIC DATA RATE GFSK MODULATION

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ANT 2

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	7.92	21	-13.08
Middle	2441	7.93	21	-13.07
High	2480	7.87	21	-13.13

ANT 1

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	9.22	21	-11.78
Middle	2441	9.19	21	-11.81
High	2480	9.27	21	-11.73

9.6.10. LOW POWER BASIC DATA RATE TXBF GFSK MODULATION

ANT 2 + ANT 1

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Output Power ANT 2 (dBm)	Output Power ANT 1 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	7.88	9.19	11.59	21	-9.41
Middle	2441	7.84	9.20	11.58	21	-9.42
High	2480	7.81	9.16	11.55	21	-9.45

9.6.11. LOW POWER ENHANCED DATA RATE QPSK MODULATION

ANT 2

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	7.21	21	-13.79
Middle	2441	7.26	21	-13.74
High	2480	7.28	21	-13.72

ANT 1

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	8.08	21	-12.92
Middle	2441	8.09	21	-12.91
High	2480	8.84	21	-12.16

9.6.12. LOW POWER ENHANCED DATA RATE TXBF QPSK MODULATION

ANT 2 + ANT 1

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Output Power ANT 2 (dBm)	Output Power ANT 1 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	7.42	7.97	10.71	21	-10.29
Middle	2441	7.64	8.14	10.91	21	-10.09
High	2480	7.22	8.42	10.87	21	-10.13

9.6.13. LOW POWER ENHANCED DATA RATE 8PSK MODULATION

ANT 2

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	7.82	21	-13.18
Middle	2441	7.84	21	-13.16
High	2480	7.76	21	-13.24

ANT 1

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	8.81	21	-12.19
Middle	2441	8.54	21	-12.46
High	2480	8.77	21	-12.23

9.6.14. LOW POWER ENHANCED DATA RATE TXBF 8PSK MODULATION

ANT 2 + ANT 1

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Output Power ANT 2 (dBm)	Output Power ANT 1 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	7.77	8.17	10.98	21	-10.02
Middle	2441	7.78	8.34	11.08	21	-9.92
High	2480	7.71	8.38	11.07	21	-9.93

9.6.15. LOW POWER ENHANCED DATA RATE BTCSM2 MODULATION

ANT 2

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	8.05	21	-12.95
Middle	2441	7.97	21	-13.03
High	2480	8.04	21	-12.96

ANT 1

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	9.31	21	-11.69
Middle	2441	9.06	21	-11.94
High	2480	9.15	21	-11.85

9.6.16. LOW POWER ENHANCED DATA RATE TXBF BTCSM2 MODULATION

ANT 2 + ANT 1

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Output Power ANT 2 (dBm)	Output Power ANT 1 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	8.07	8.31	11.20	21	-9.80
Middle	2441	7.95	8.14	11.06	21	-9.94
High	2480	8.05	8.38	11.23	21	-9.77

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9.7. AVERAGE POWER

LIMITS

None; for reporting purposes only

TEST PROCEDURE

Measurements were performed using a wideband RF power meter.

The power output was measured on the EUT antenna port using SMA cable with 10dB attenuator connected to a power meter via wideband average power sensor. Gated average output power was read directly from power meter.

RESULTS

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9.7.1. HIGH POWER BASIC DATA RATE GFSK MODULATION

ANT 2

Tested By:	HN 27979
Date	2025-07-16

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	19.72
Middle	2441	19.70
High	2480	19.73

ANT 1

Tested By:	HN 27979
Date	2025-07-16

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	19.77
Middle	2441	19.86
High	2480	19.86

9.7.2. HIGH POWER BASIC DATA RATE TXBF GFSK MODULATION

ANT 2 + ANT 1

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Average Power ANT 2 (dBm)	Average Power ANT 1 (dBm)	Total Power (dBm)
Low	2402	16.82	16.96	19.90
Middle	2441	16.87	16.97	19.93
High	2480	16.83	16.94	19.90

9.7.3. HIGH POWER ENHANCED DATA RATE QPSK MODULATION

ANT 2

Tested By:	HN 27979
Date	7/16/2025

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	16.19
Middle	2441	16.15
High	2480	16.16

ANT 1

Tested By:	HN 27979
Date	2025-07-16

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	16.46
Middle	2441	16.48
High	2480	16.40

9.7.4. HIGH POWER ENHANCED DATA RATE TXBF QPSK MODULATION

ANT 2 + ANT 1

Tested By:	HN 27979
Date:	2025-08-09

Channel	Frequency (MHz)	Average Power ANT 2 (dBm)	Average Power ANT 1 (dBm)	Total Power (dBm)
Low	2402	13.44	13.42	16.44
Middle	2441	13.46	13.39	16.44
High	2480	13.42	13.38	16.41

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9.7.5. HIGH POWER ENHANCED DATA RATE 8PSK MODULATION

ANT 2

Tested By:	HN 27979
Date	2025-07-16

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	16.20
Middle	2441	16.24
High	2480	16.22

ANT 1

Tested By:	HN 27979
Date	2025-07-16

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	16.47
Middle	2441	16.50
High	2480	16.49

9.7.6. HIGH POWER ENHANCED DATA RATE TXBF 8PSK MODULATION

ANT 2 + ANT 1

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Average Power ANT 2 (dBm)	Average Power ANT 1 (dBm)	Total Power (dBm)
Low	2402	13.49	13.44	16.48
Middle	2441	13.47	13.49	16.49
High	2480	13.45	13.38	16.43

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9.7.7. HIGH POWER ENHANCED DATA RATE BTCSM2 MODULATION

ANT 2

Tested By:	HN 27979
Date	2025-07-16

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	10.96
Middle	2441	10.87
High	2480	10.97

ANT 1

Tested By:	HN 27979
Date	2025-07-16

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	10.92
Middle	2441	10.93
High	2480	10.98

9.7.8. HIGH POWER ENHANCED DATA RATE TXBF BTCSM2 MODULATION

ANT 2 + ANT 1

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Average Power ANT 2 (dBm)	Average Power ANT 1 (dBm)	Total Power (dBm)
Low	2402	7.99	7.98	11.00
Middle	2441	7.95	7.93	10.95
High	2480	7.97	7.97	10.98

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9.7.9. LOW POWER BASIC DATA RATE GFSK MODULATION

ANT 2

Tested By:	HN 27979
Date	2025-07-16

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	7.68
Middle	2441	7.71
High	2480	7.74

ANT 1

Tested By:	HN 27979
Date	2025-07-16

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	8.94
Middle	2441	8.99
High	2480	8.91

9.7.10. LOW POWER BASIC DATA RATE TXBF GFSK MODULATION

ANT 2 + ANT 1

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Average Power ANT 2 (dBm)	Average Power ANT 1 (dBm)	Total Power (dBm)
Low	2402	7.74	8.99	11.42
Middle	2441	7.70	8.95	11.38
High	2480	7.69	8.97	11.39

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9.7.11. LOW POWER ENHANCED DATA RATE QPSK MODULATION

ANT 2

Tested By:	HN 27979
Date	2025-07-16

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	4.48
Middle	2441	4.47
High	2480	4.44

ANT 1

Tested By:	HN 27979
Date	2025-07-16

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	5.32
Middle	2441	5.34
High	2480	5.49

9.7.12. LOW POWER ENHANCED DATA RATE TXBF QPSK MODULATION

ANT 2 + ANT 1

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Average Power ANT 2 (dBm)	Average Power ANT 1 (dBm)	Total Power (dBm)
Low	2402	4.45	5.33	7.92
Middle	2441	4.47	5.48	8.01
High	2480	4.49	5.48	8.02

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9.7.13. LOW POWER ENHANCED DATA RATE 8PSK MODULATION

ANT 2

Tested By:	HN 27979
Date	2025-07-16

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	4.44
Middle	2441	4.49
High	2480	4.46

ANT 1

Tested By:	HN 27979
Date	2025-07-16

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	5.49
Middle	2441	5.46
High	2480	5.47

9.7.14. LOW POWER ENHANCED DATA RATE TXBF 8PSK MODULATION

ANT 2 + ANT 1

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Average Power ANT 2 (dBm)	Average Power ANT 1 (dBm)	Total Power (dBm)
Low	2402	4.49	5.43	8.00
Middle	2441	4.46	5.48	8.01
High	2480	4.47	5.46	8.00

9.7.15. LOW POWER ENHANCED DATA RATE BTCSM2 MODULATION

ANT 2

Tested By:	HN 27979
Date	2025-07-16

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	7.74
Middle	2441	7.69
High	2480	7.71

ANT 1

Tested By:	HN 27979
Date	2025-07-16

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	8.91
Middle	2441	8.97
High	2480	8.99

9.7.16. LOW POWER ENHANCED DATA RATE TXBF BTCSM2 MODULATION

ANT 2 + ANT 1

Tested By:	HN 27979
Date:	2025-07-16

Channel	Frequency (MHz)	Average Power ANT 2 (dBm)	Average Power ANT 1 (dBm)	Total Power (dBm)
Low	2402	7.64	7.99	10.83
Middle	2441	7.74	7.93	10.85
High	2480	7.69	7.97	10.84

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9.8. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

RSS-247 5.5

Limit = -20 dBc

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

The band edges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

RESULTS

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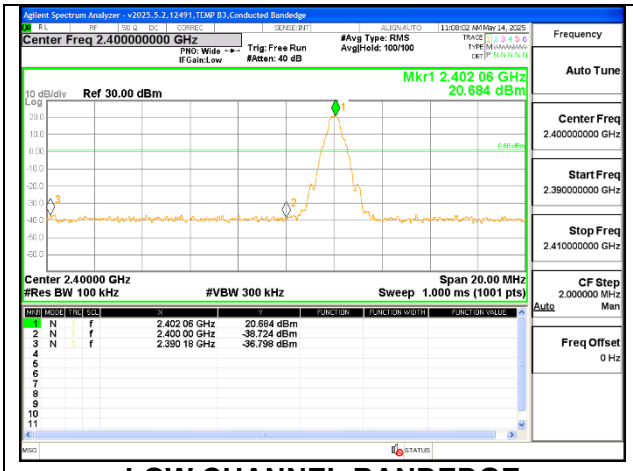
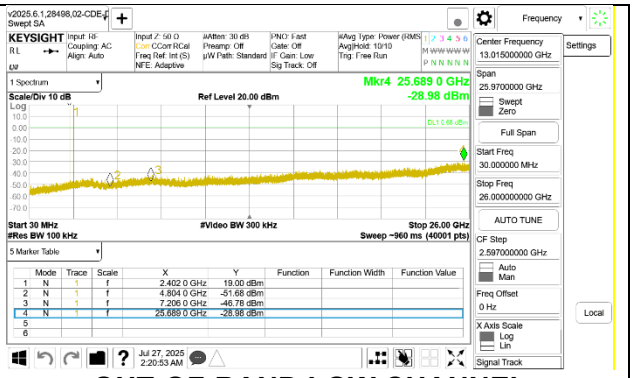
9.8.1. HIGH POWER BASIC DATA RATE GFSK MODULATION

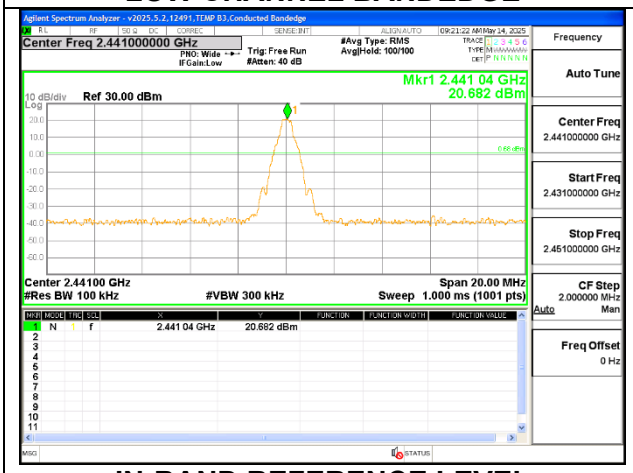
ANT 2 SPURIOUS EMISSIONS, NON-HOPPING



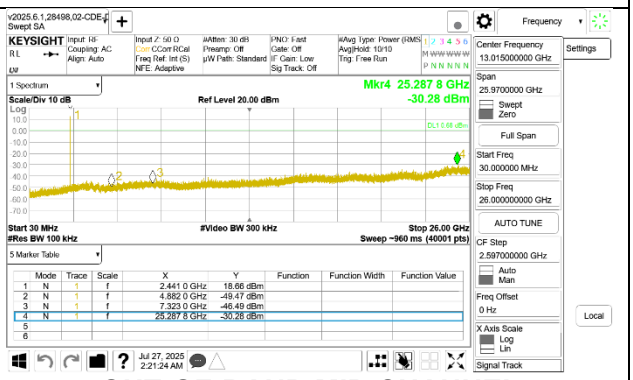
LOW CHANNEL BANDEDGE



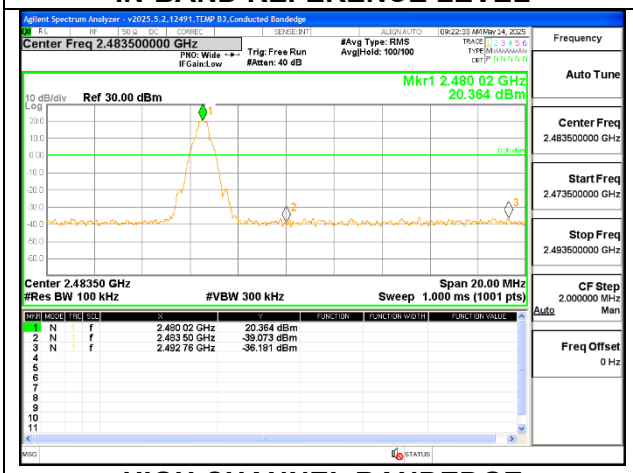
OUT-OF-BAND LOW CHANNEL



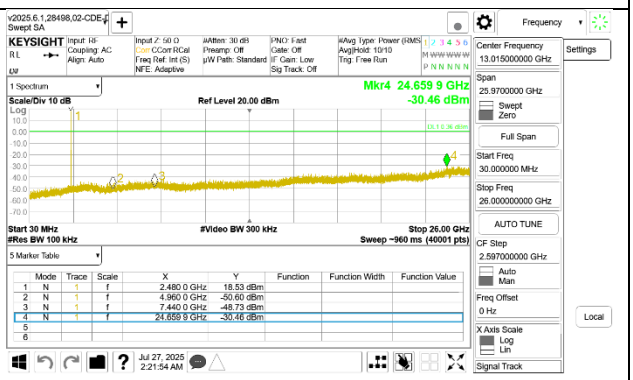
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

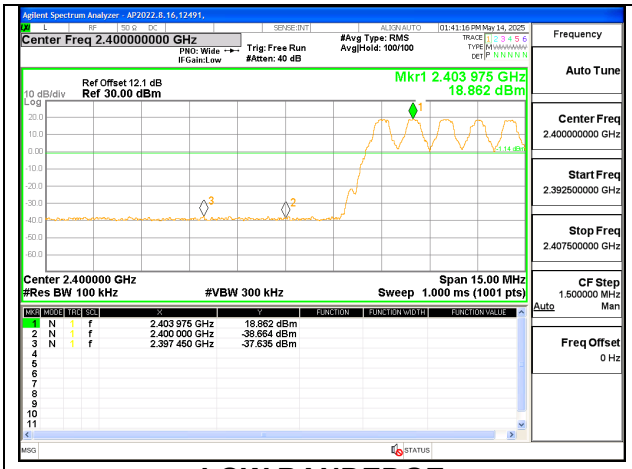


HIGH CHANNEL BANDEDGE

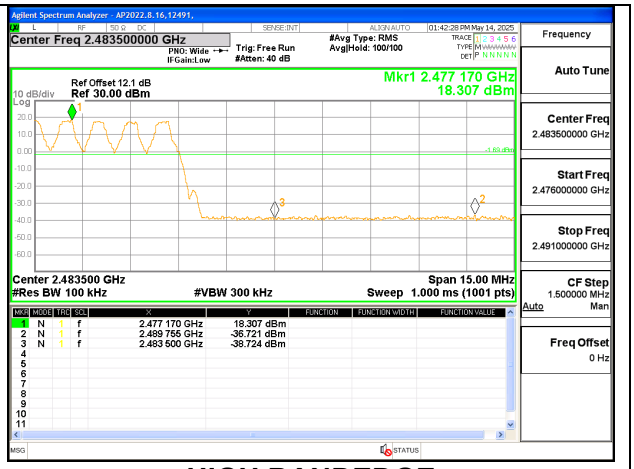


OUT-OF-BAND HIGH CHANNEL

ANT 2 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



LOW BANDEDGE



HIGH BANDEDGE

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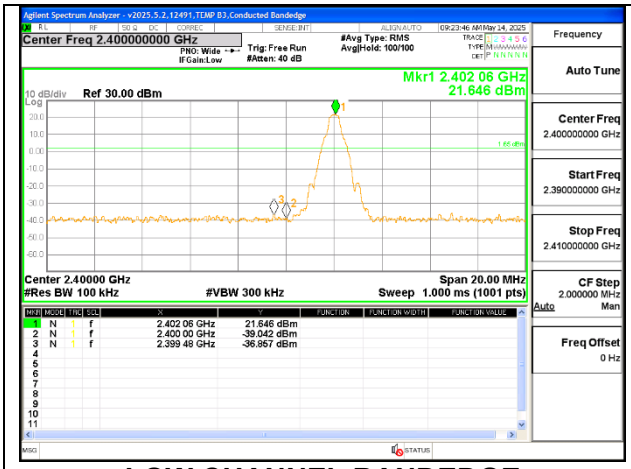
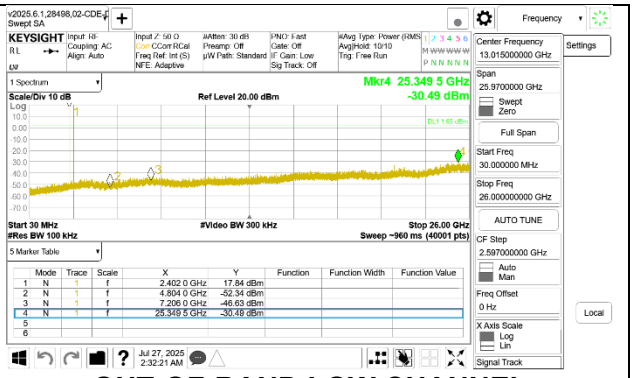
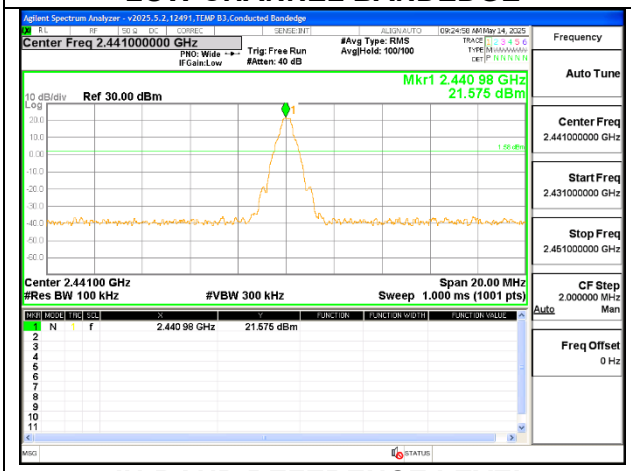
ANT 1 SPURIOUS EMISSIONS, NON-HOPPING



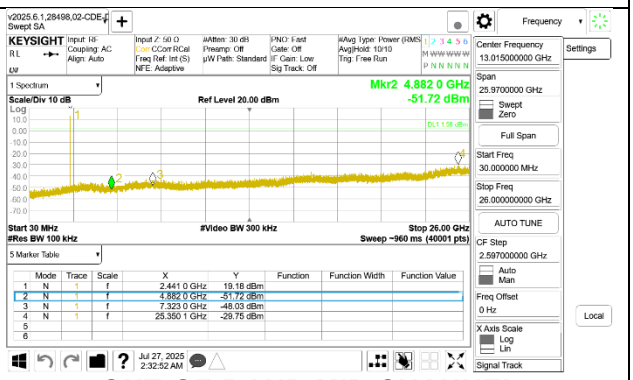
LOW CHANNEL BANDEDGE



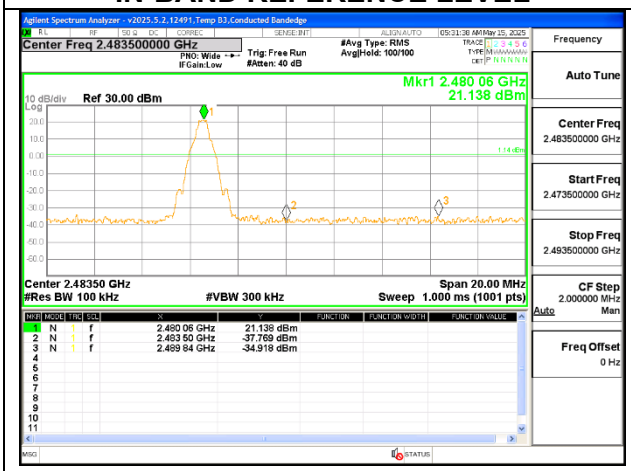
OUT-OF-BAND LOW CHANNEL



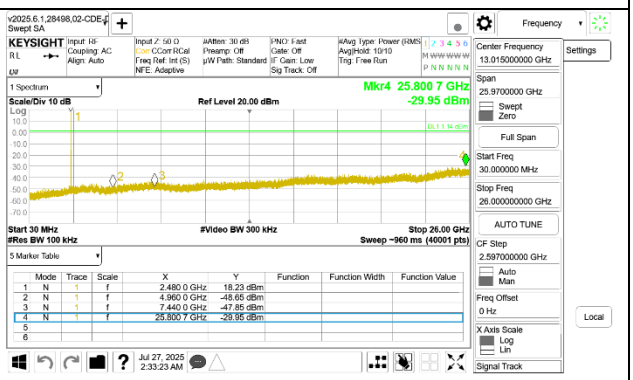
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

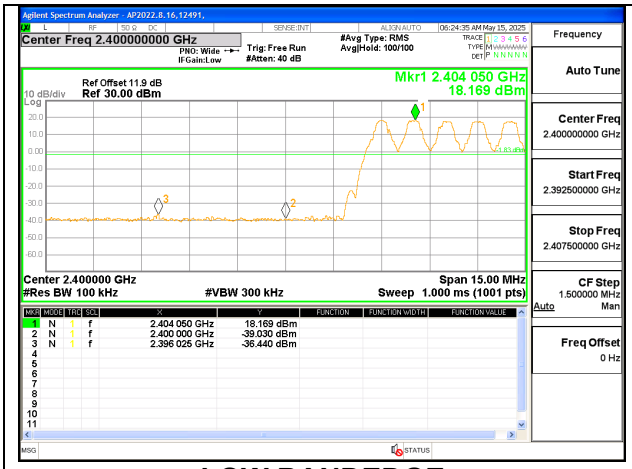


HIGH CHANNEL BANDEDGE

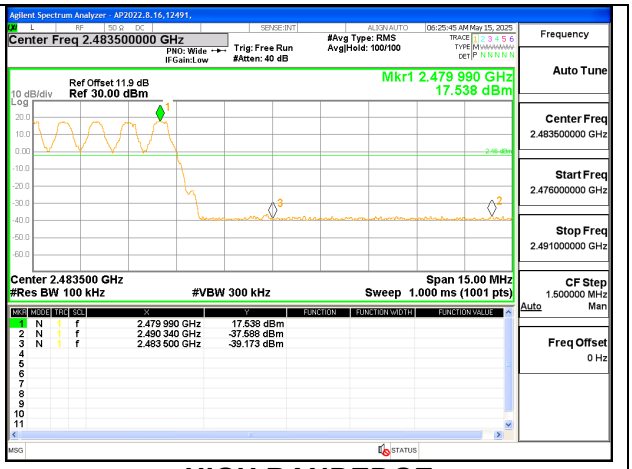


OUT-OF-BAND HIGH CHANNEL

ANT 1 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



LOW BANDEDGE



HIGH BANDEDGE

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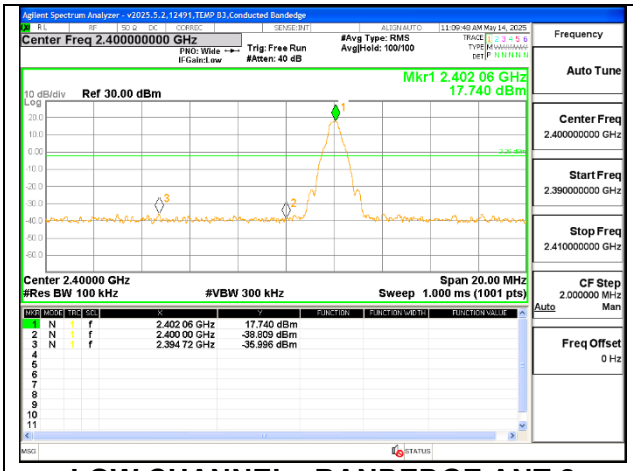
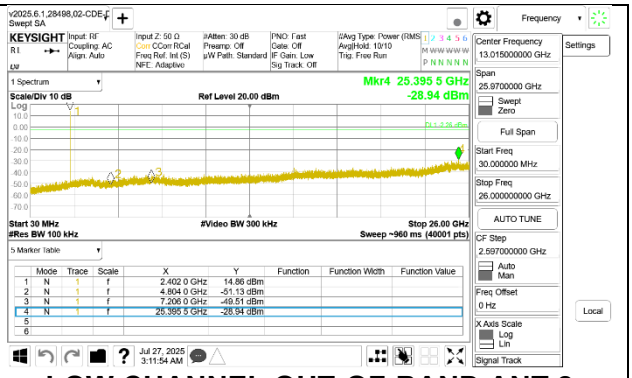
9.8.2. HIGH POWER BASIC DATA RATE TXBF GFSK MODULATION

Note: Test procedure on beamforming mode is same as BT basic and EDR mode

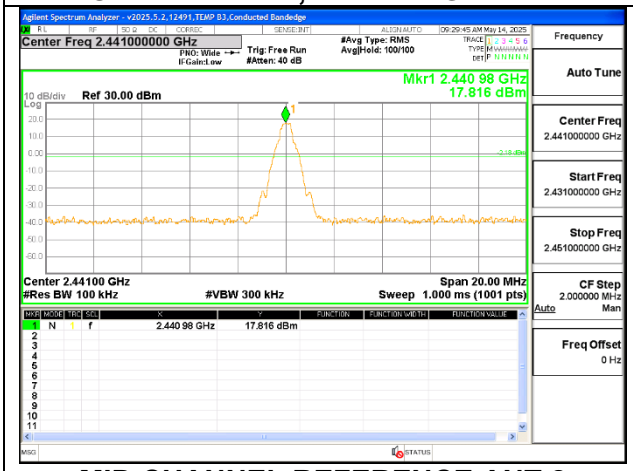
ANT 2



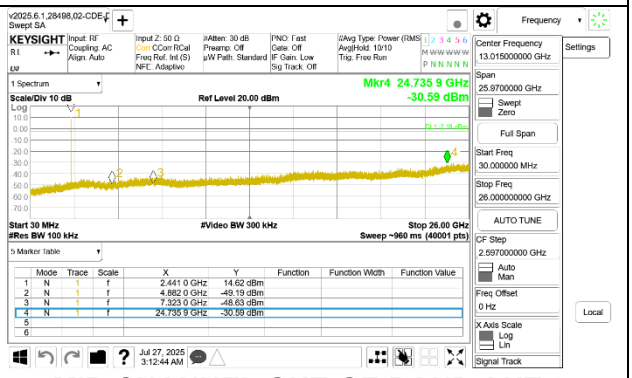
LOW CHANNEL , BANDEDGE ANT 2



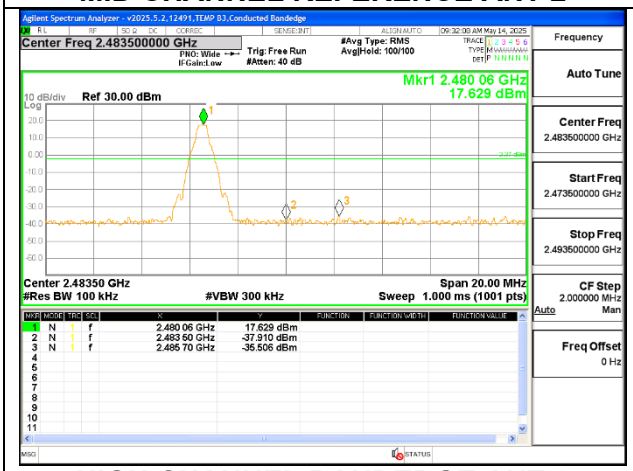
LOW CHANNEL OUT-OF-BAND ANT 2



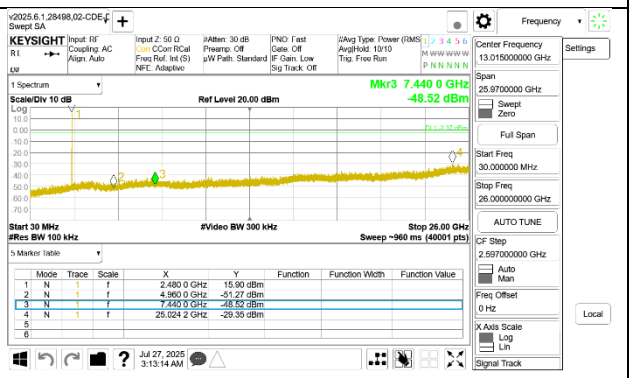
MID CHANNEL REFERENCE ANT 2



MID CHANNEL OUT-OF-BAND ANT 2

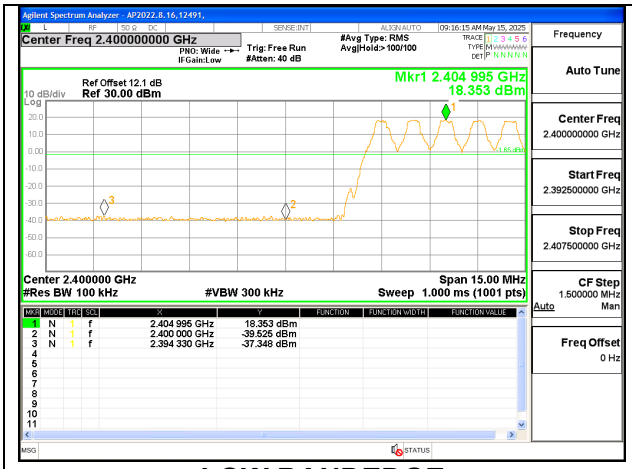


HIGH CHANNEL BANDEDGE ANT 2

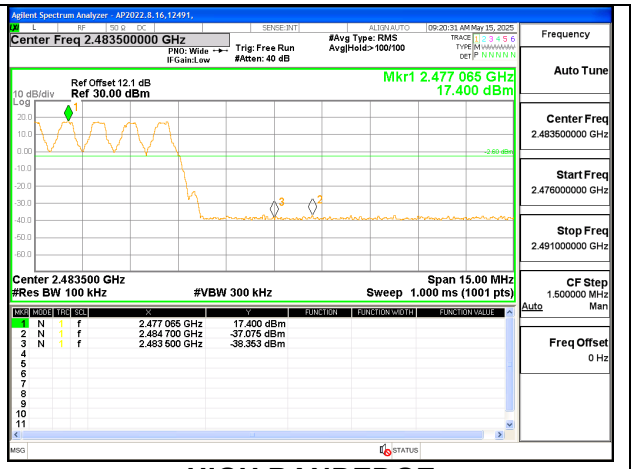


HIGH CHANNEL OUT-OF-BAND ANT 2

ANT 2 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



LOW BANDEDGE



HIGH BANDEDGE