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:
2025-08-11

Prepared by:
UL Verification Services Inc.
47173 Benicia Street
Fremont, CA 94538 U.S.A.
TEL: (510) 319-4000
FAX: (510) 661-0888

ACCREDITED
CERT #0751.05

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2025-07-29	Initial Issue	Tony Li
V2	2025-08-11	Addressed TCB Comments on sections 6, 9, 10, and added Appendix A	Tony Li

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

TABLE OF CONTENTS

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

1. ATTESTATION OF TEST RESULTS

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

EUT DESCRIPTION: SMARTPHONE

MODEL: A3257 (Parent)
A3525, A3526, A3527 (Variants)

BRAND: APPLE

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

SAMPLE RECEIPT DATE: 2025-02-28

DATE TESTED: 2025-04-09 to 2025-08-10

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.

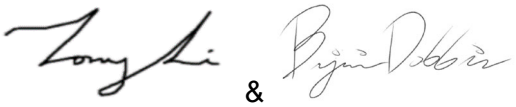
This document may not be altered or revised in any way unless done so by UL Verification Services Inc and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc will constitute fraud and shall nullify the document.

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

Approved & Released For
UL Verification Services Inc. By:

Frank Ibrahim
Staff Engineer
Consumer Technology Division
UL Verification Services Inc.

Prepared By:



Tony Li, Benjamin Dobbins
Lead Test Engineer, Senior Test Engineer
Consumer Technology Division
UL Verification Services Inc.

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

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	ANSI C63.10 Section 11.6.
-	RSS-GEN 6.7	99% OBW	Reporting purposes only	ANSI C63.10 Section 6.9.3.
15.247 (a) (2)	RSS-247 5.2 (a)	6dB BW	Complies	None.
15.247 (b) (3)	RSS-247 5.4 (d)	Output Power	Complies	None.
See Comment		Average power	Reporting purposes only	Per ANSI C63.10, Section 11.9.2.3.2.
15.247 (e)	RSS-247 5.2 (b)	PSD	Complies	None.
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

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

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			

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

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 taken into account 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
Power Spectral Density	2.466 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 %
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%.

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

The Apple iPhone is a smartphone with cellular GSM, GPRS, EGPRS, WCDMA, LTE, 5GNR1, 5GNR2, IEEE 802.11a/b/g/n/ac/ax/be, Bluetooth (BT), Ultra-Wideband (UWB), Global Positioning System (GPS), Near-Field Communication (NFC), Narrow-Band (NB) UNII, 802.15.4, 802.15.4ab-Narrow Band (NB), Wireless Power Transfer (WPT) and Mobile Satellite Service (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	Configuration	Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
ANT 2	High Power	2402 - 2480	BLE 125k	13.07	20.28
	Low Power			7.86	6.11
	High Power	2402 - 2480	BLE 1M	20.46	111.17
	Low Power			7.84	6.08
	High Power	2404 - 2478	BLE 2M	20.46	111.17
	Low Power			7.85	6.10
	High Power	2404 - 2476	BLE HDT3	16.08	40.55
	Low Power			7.52	5.65
ANT 1	High Power	2402 - 2480	BLE 125k	13.10	20.42
	Low Power			9.09	8.11
	High Power	2402 - 2480	BLE 1M	21.03	126.77
	Low Power			9.06	8.05
	High Power	2404 - 2478	BLE 2M	20.98	125.31
	Low Power			9.13	8.18
	High Power	2404 - 2476	BLE HDT3	16.59	45.60
	Low Power			8.14	6.52
BF, ANT 2 + ANT 1	High Power	2402 - 2480	BLE 125k	13.00	19.95
	Low Power			11.47	14.03
	High Power	2402 - 2480	BLE 1M	22.94	196.79
	Low Power			11.51	14.16
	High Power	2404 - 2478	BLE 2M	23.61	229.61
	Low Power			11.55	14.29
	High Power	2404 - 2476	BLE HDT3	19.34	85.90
	Low Power			10.76	11.91

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

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 is 23A258.

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

6.5. WORST-CASE CONFIGURATION AND MODE

The EUT was investigated in three orthogonal orientations X, Y and Z on ANT 2, ANT 1 and 2TX beamforming. It was determined that X (Flatbed) orientation was the worst-case orientation for ANT 2 and 2Tx beamforming, and Y (landscape) orientation for ANT1.

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 were performed with EUT 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 BLE and 5GHz bands, no noticeable emission was found.

The output power and PSD were investigated among all different modulations.
Please see worst case summary table below.

2G					
Mode	BW (MHz)	Modulation	Frequency Range (MHz)	Worst Case Tone	
				Power	PSD
LE	1MHz	LE Adv	2402-2480		
		LE1M		X	
		LELR8		X	X
		LELR2			
		BTCSM1_LE1M			
	2MHz	LE2M	2404-2478	X	X
		BTCSM1_LE2M			
	2.5MHz	HDT2	2404-2476		
		HDT3		X	X
		HDT4			
		HDT6			
		HDT8			

Note: BLE 125kbps = BLE LELR8, BLE 1Mbps=BLE LE1M, BLE 2Mbps= BLE LE2M

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

6.6. DESCRIPTION OF TEST SETUP

SUPPORT TEST EQUIPMENT				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID/ DoC**
Laptop	Apple	Macbook	G2YKJ9LWH5	N/A
Laptop AC/DC adapter	Apple	N/A	C4H238408AEPM0WAS	DoC
EUT AC/DC adapter	Apple	N/A	C4H238505ARPM0WAP	DoC
Conducted Switch Box	UL	N/A	245782	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

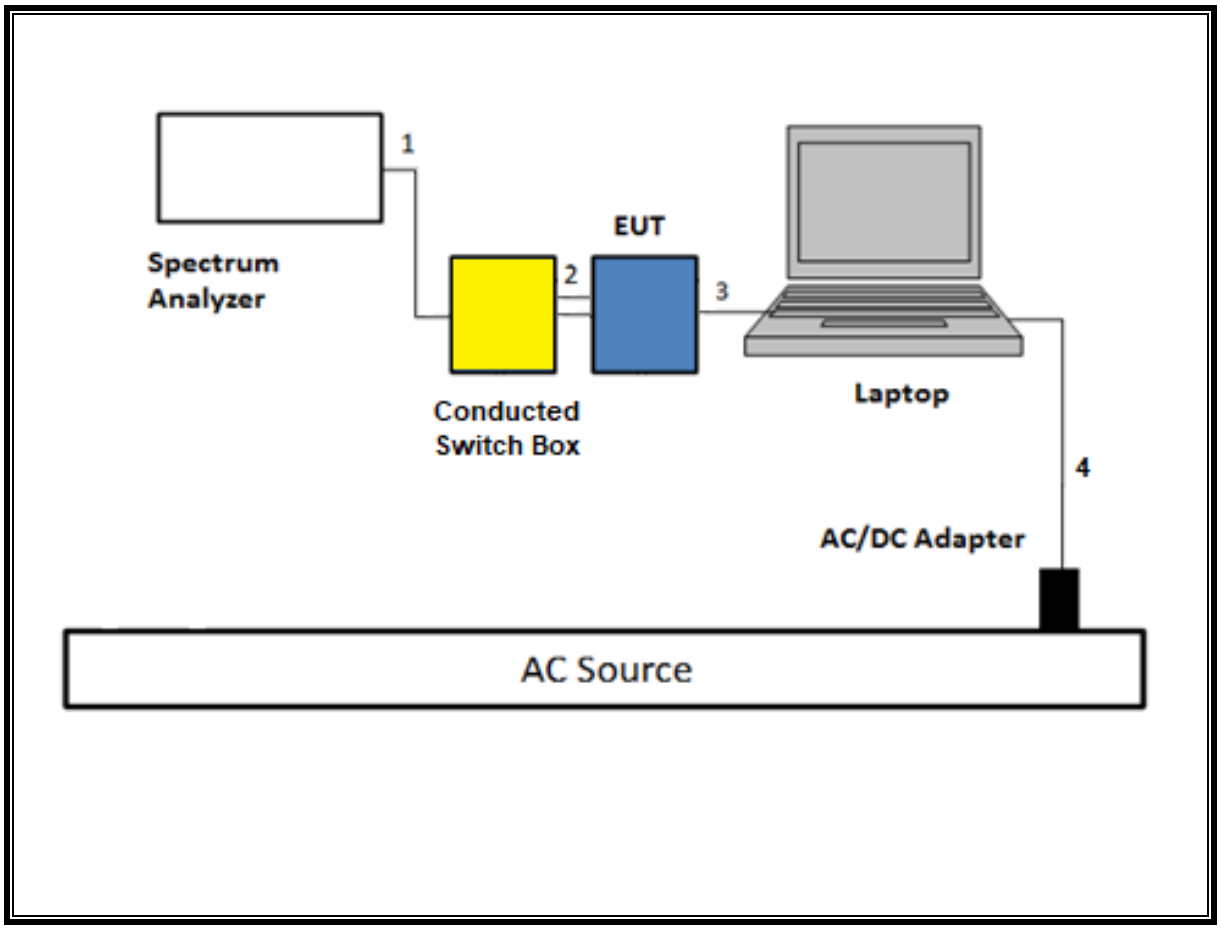
I/O CABLES (RF RADIATED TEST)						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	AC	1	AC	Un-shielded	2	N/A
2	USB	1	USB	Un-shielded	1	N/A

TEST SETUP

The EUT is connected to a test laptop during the tests. Test software exercised the radio card.

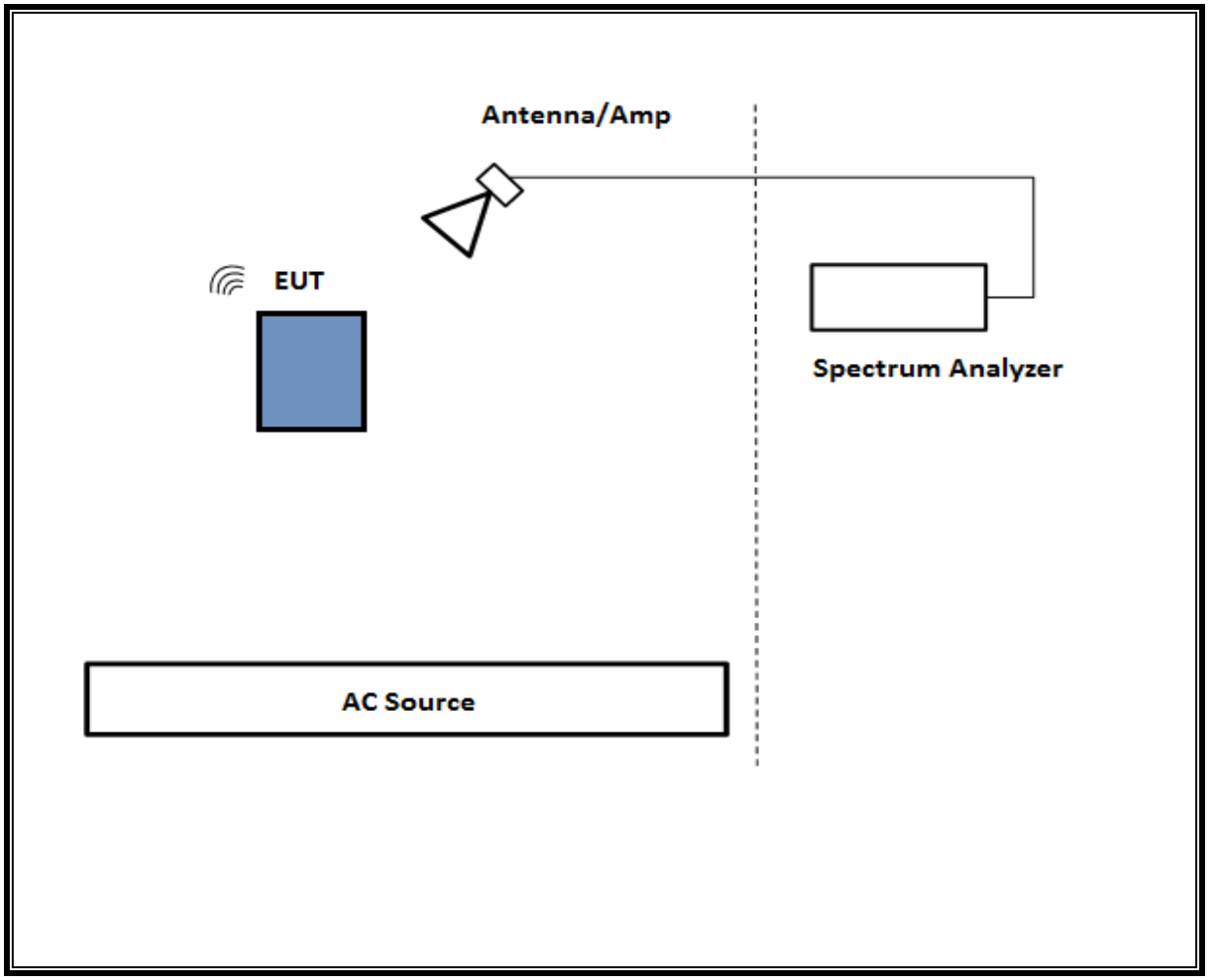
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

SETUP DIAGRAM FOR CONDUCTED TESTS



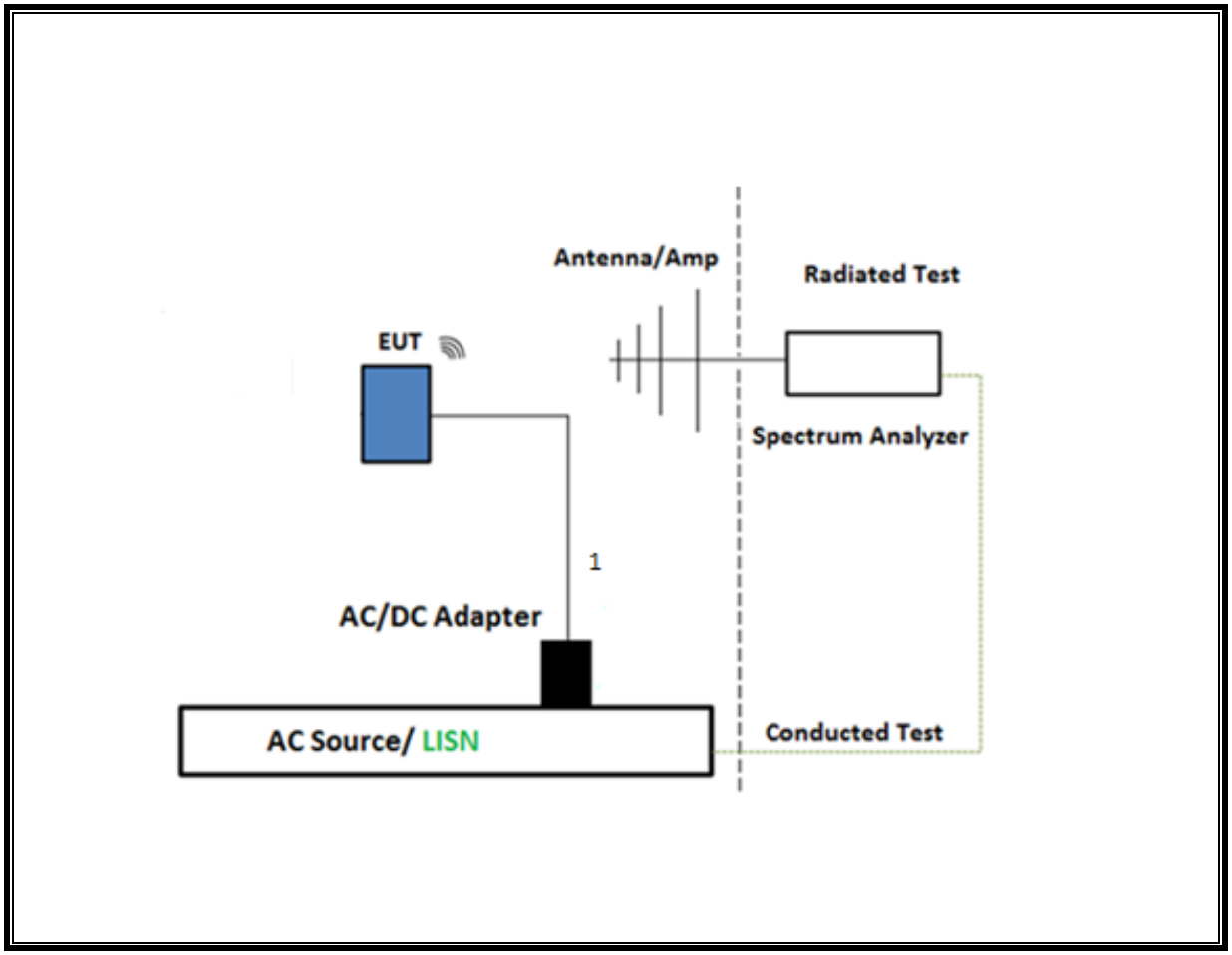
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

SETUP DIAGRAM FOR RADIATED TESTS Above 1 GHz



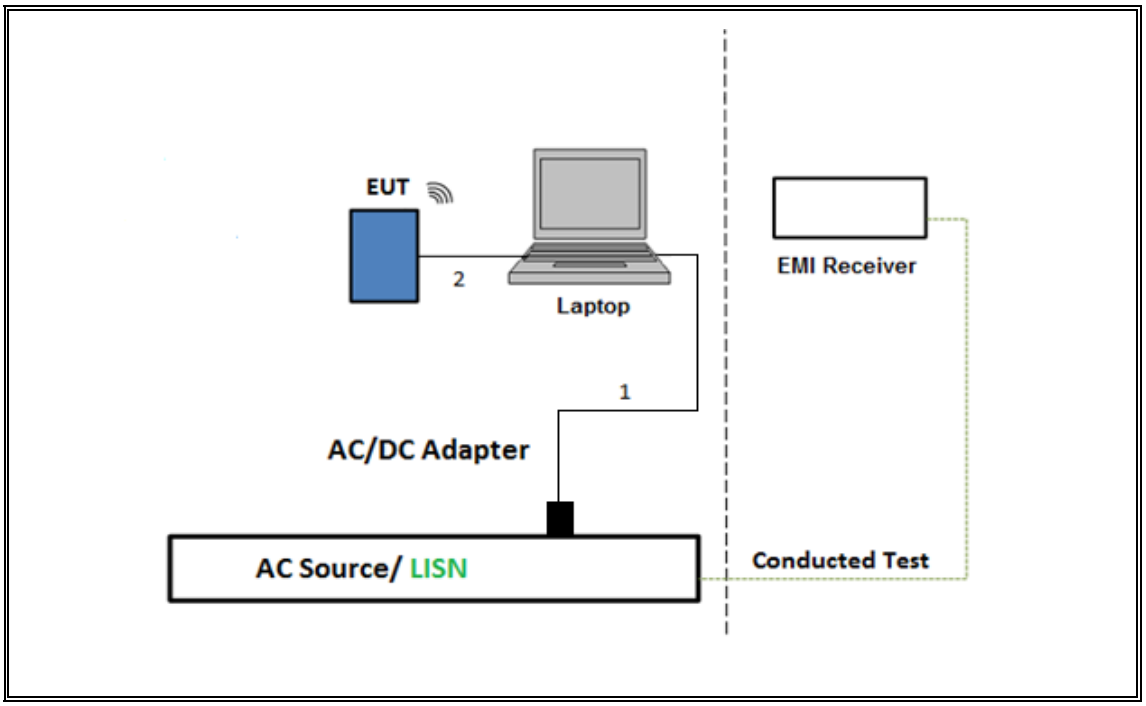
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

SETUP DIAGRAM FOR Below 1GHz and AC LINE CONDUCTED TEST



UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

TEST SETUP- AC LINE CONDUCTED: LAPTOP CONFIGURATION



UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

7. MEASUREMENT METHOD

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

6 dB BW: ANSI C63.10 Section 11.8.1 RBW ≥ DTS BW

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

Output Power: ANSI C63.10 Section 11.9.1.2 Method PKPM1 Peak-reading power meter

Output Power: ANSI C63.10 Section 11.9.2.3.2 Measurement using gated average power meter

PSD: ANSI C63.10 Section 11.10.2 Method PKPSD (peak PSD)

Radiated emissions restricted frequency bands: ANSI C63.10 Section 11.12.1 and 13

Conducted emissions in restricted frequency bands: ANSI C63.10 Section 11.12.2

Band-edge: ANSI C63.10 Section 11.12.2.4 and 13: Peak Measurement

Band-edge: ANSI C63.10 Section 11.12.2.5 and 13: Average Measurement

AC Power Line Conducted Emissions: ANSI C63.10 Section 6.2

Radiated emissions non-restricted frequency bands ANSI C63.10 Section 11.11 and 13

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

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

8. 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 (Cedar Park, Texas)	3117	84796	2026-10-31
RF Filter Box, 1-18GHz, 12 Port	UL-FR1	Frankenstein	230878	2026-05-31
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	191428	2026-02-28
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	226671	2026-02-28
RF Filter Box, 1-18GHz, 17 Port	UL-FR1	RATS	234726	2025-10-31
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	223460	2026-02-28
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	230300	2027-03-10
RF Filter Box, 1-18GHz, 17 Port	UL-FR1	RATS	225474	2026-05-31
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	201501	2026-02-28
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	80707	2026-06-30
RF Filter Box, 1-18GHz, 6 Port	UL-FR1	RATS	171875	2026-03-31
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	245268	2026-02-28
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	200896	2027-03-31
RF Filter Box, 1-18GHz, 12 Port	UL-FR1	Frankenstein	216812	2026-01-31
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	230548	2026-02-28
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	222740	2026-09-30
RF Filter Box, 1-18GHz, 6 Port	UL-FR1	RATS	171389	2026-03-30
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	201497	2026-02-28
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	226672	2026-02-28
RF Filter Box, 1-18GHz, 12 Port	UL-FR1	Frankenstein	231876	2026-04-30
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	223459	2026-02-28
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	80404	2025-08-31
RF Filter Box, 1-18GHz, 17 Port	UL-FR1	RATS	226781	2026-05-31
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	226078	2026-02-28
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	226673	2026-02-28
RF Filter Box, 1-18GHz, 12 Port	UL-FR1	Frankenstein	231874	2026-06-29
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	169933	2026-02-28
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	222741	2026-09-30
RF Filter Box, 1-18GHz, 12 Port	UL-FR1	Frankenstein	217521	2025-08-31
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	223461	2026-02-28
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	206808	2026-04-30
RF Filter Box, 1-18GHz, 6 Port	UL-FR1	RATS	197920	2026-03-31
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	225688	2026-02-28
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	41112	2025-10-31
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A-544	90238	2026-01-31
Spectrum Analyzer, PXA, 3Hz to 50GHz w/Ext. Mixer	Keysight Technologies Inc	N9030A	80400	2026-01-31
Power Meter, P-series single channel	Keysight Technologies Inc	N1911A	90718	2026-03-31
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1921A	257704	2026-03-31
RF Device, Switch	UL	CSB	245262	2026-04-30
RF Device, Switch	UL	CSB	262287	2026-04-30
Antenna, Broadband Hybrid, 30MHz to 3GHz	Sunol Sciences Corp.	JB3	85150	2025-12-30

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

TEST EQUIPMENT LIST - Cont				
Description	**Manufacturer**	**Model**	**ID Num**	**Cal Due**
Amplifier 9 KHz - 1 GHz	SONOMA INSTRUMENT	310N	208807	2026-01-31
Antenna, Horn 18 to 26.5GHz	A.R.A.	MWH-1826/B	199659	2027-03-31
Link File, RF Amplifier Assembly, 18-26.5GHz, 60dB Gain	AMPLICAL	AMP18G26.5-60	234683	2026-02-28
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

AC Line Conducted				
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	2025-09-30

UL AUTOMATION SOFTWARE			
Conducted Software	UL	Antenna Port	Ver 2022.8.16 & 2024.2.23
Conducted Software	UL	Station Tool	Ver 1.0 & 5.3
Radiated Software	UL	UL EMC	Ver 9.5, May 1 , 2023
AC Line Conducted Software	UL	UL EMC	Ver 9.5, May 1 , 2023

*Testing was conducted before equipment's calibration due date or after calibration was completed

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

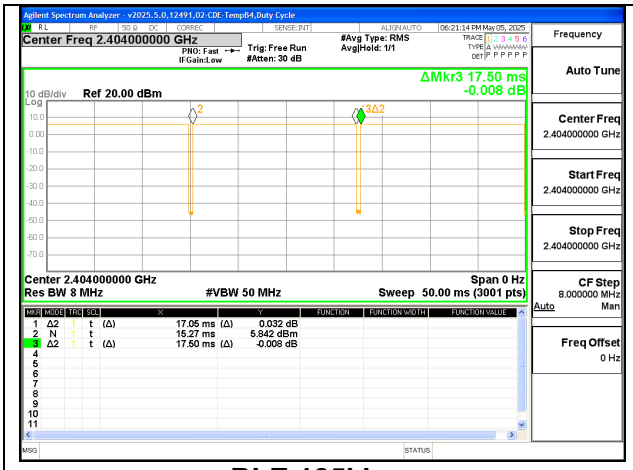
PROCEDURE

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

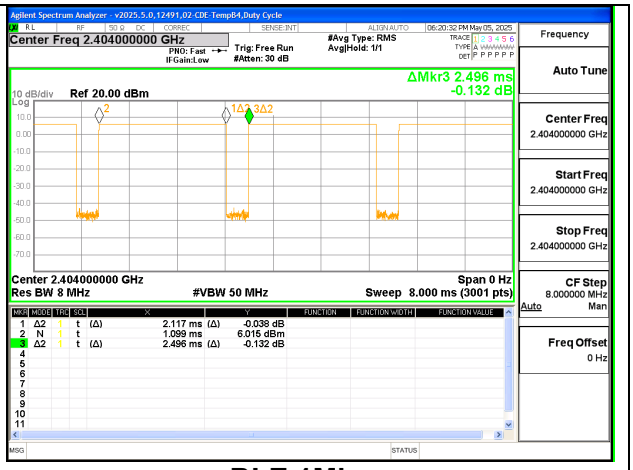
ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time T (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)
2.4GHz Band						
BLE, 125kbps	17.050	17.500	0.974	97.43	0.11	0.059
BLE, 1Mbps	2.117	2.496	0.848	84.82	0.72	0.472
BLE, 2Mbps	1.063	1.875	0.567	56.69	2.46	0.941
HDT3	1.4448	1.5222	0.949	94.92	0.23	0.692

Note: The same DCCF was used for both 1TX and 2TX.

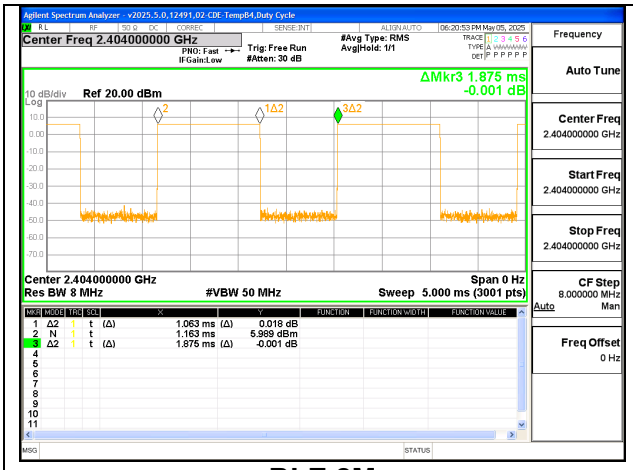


BLE 125kbps



BLE 1Mbps

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888



BLE 2M

HDT3

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

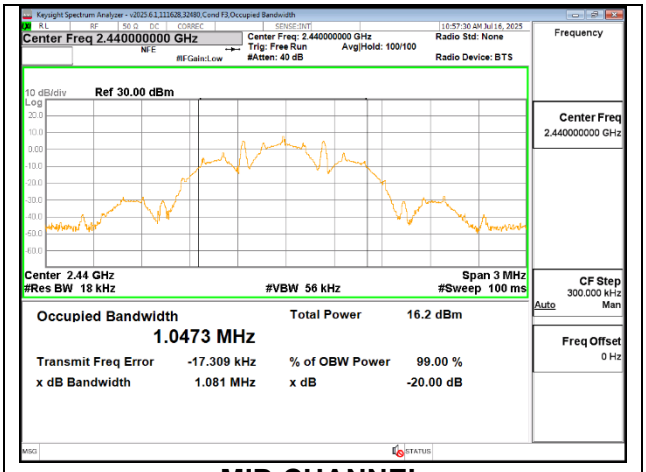
Only High-Power modes results are reported; it covers all Low Power modes. Only Mid channel plot is reported to show the analyzer's settings.

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.2.1. HIGH POWER BLE (125kbps)

ANT 2

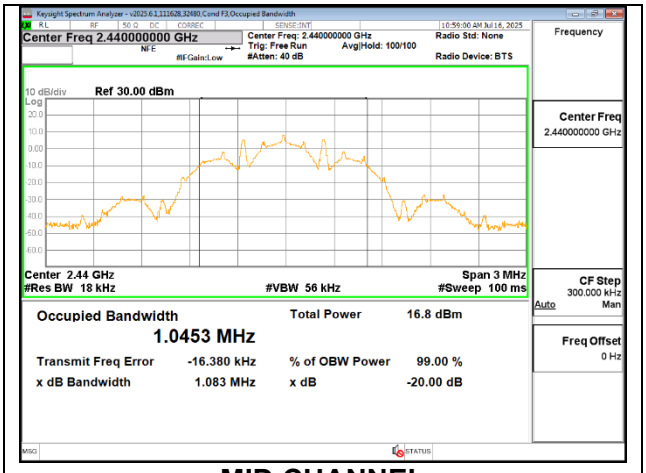
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0481
Middle	2440	1.0473
High	2480	1.0471



MID CHANNEL

ANT 1

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0481
Middle	2440	1.0453
High	2480	1.0483

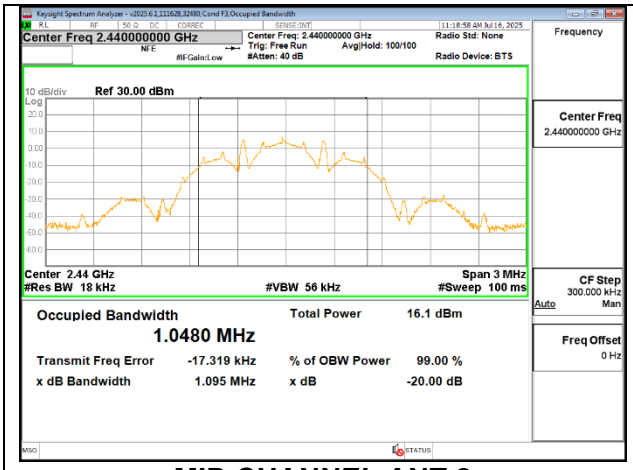


MID CHANNEL

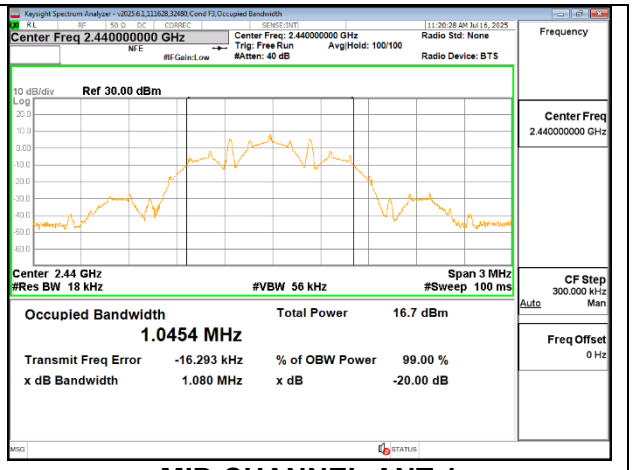
9.2.2. HIGH POWER BLE TXBF (125kbps)

Channel	Frequency (MHz)	99% Bandwidth ANT 2 (MHz)	99% Bandwidth ANT 1 (MHz)
Low	2402	1.0462	1.0493
Mid	2440	1.0480	1.0454
High	2480	1.0462	1.0490

Note: Test procedures and settings are the same as BLE normal mode.



MID CHANNEL ANT 2



MID CHANNEL ANT 1

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.2.3. HIGH POWER BLE (1Mbps)

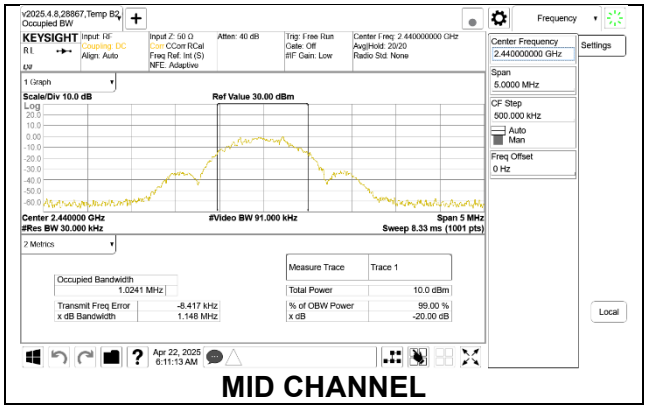
ANT 2

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0191
Middle	2440	1.0253
High	2480	1.0295

MID CHANNEL

ANT 1

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0238
Middle	2440	1.0241
High	2480	1.0128

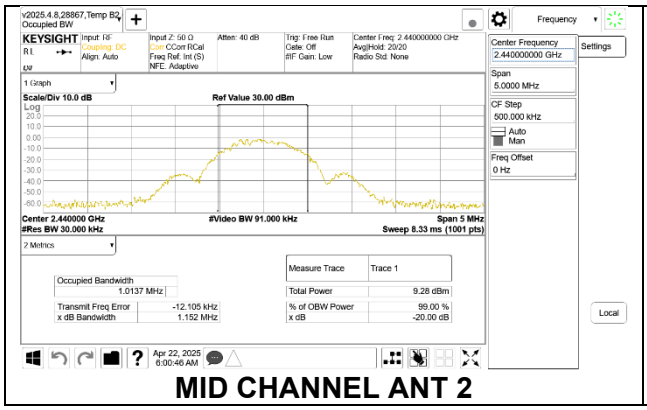


MID CHANNEL

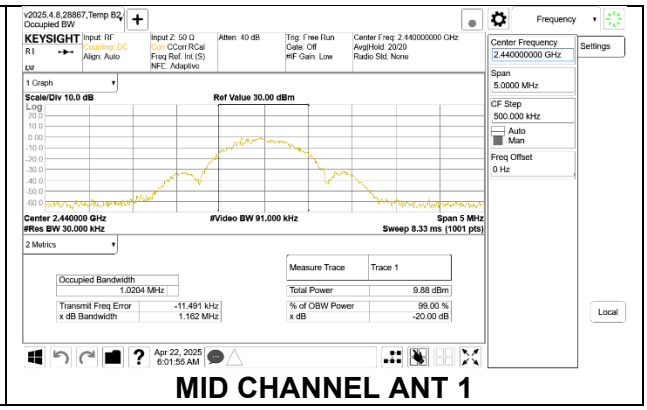
9.2.4. HIGH POWER BLE TXBF (1Mbps)

Channel	Frequency (MHz)	99% Bandwidth ANT 2 (MHz)	99% Bandwidth ANT 1 (MHz)
Low	2402	1.0335	1.0242
Mid	2440	1.0137	1.0204
High	2480	1.0203	1.0311

Note: Test procedures and settings are the same as BLE normal mode.



MID CHANNEL ANT 2

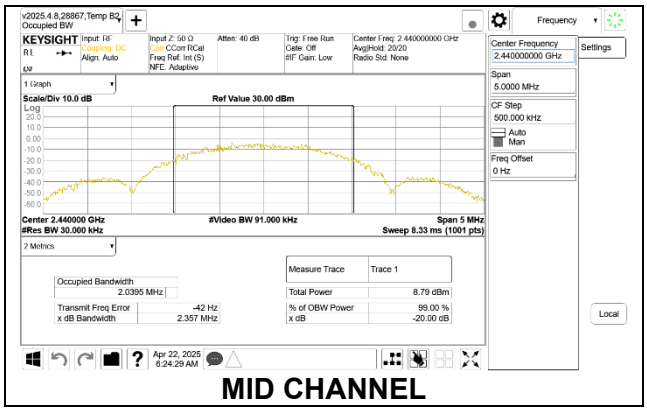


MID CHANNEL ANT 1

9.2.5. HIGH POWER BLE (2Mbps)

ANT 2

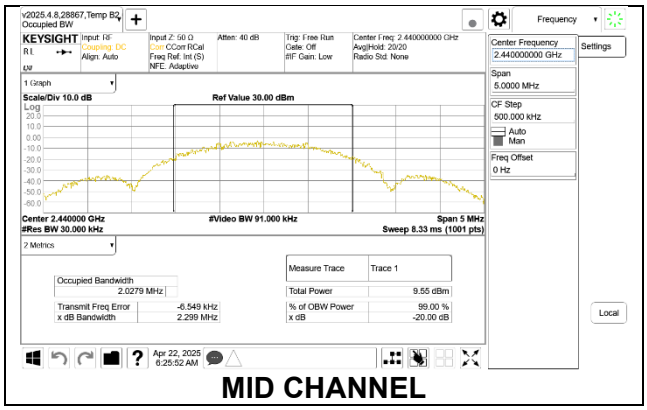
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2404	2.0350
Middle	2440	2.0395
High	2478	2.0325



MID CHANNEL

ANT 1

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2404	2.0355
Middle	2440	2.0279
High	2478	2.0515

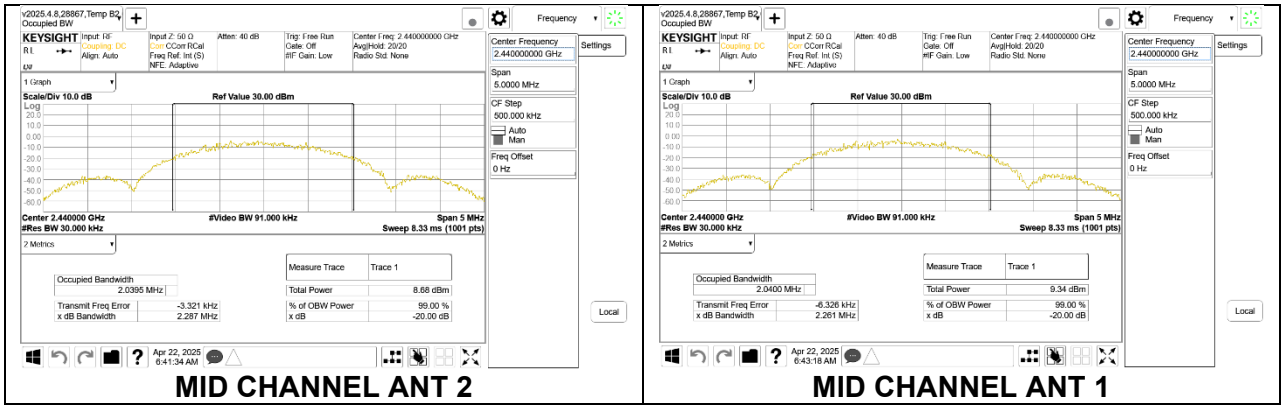


MID CHANNEL

9.2.6. HIGH POWER BLE TXBF (2Mbps)

Channel	Frequency (MHz)	99% Bandwidth ANT 2 (MHz)	99% Bandwidth ANT 1 (MHz)
Low	2404	2.0385	2.0263
Mid	2440	2.0395	2.0400
High	2478	2.0498	2.0434

Note: Test procedures and settings are the same as BLE normal mode.

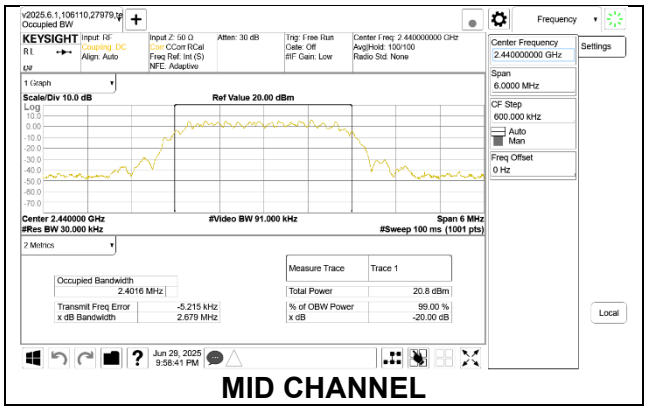


UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.2.7. HIGH POWER BLE (HDT3)

ANT 2

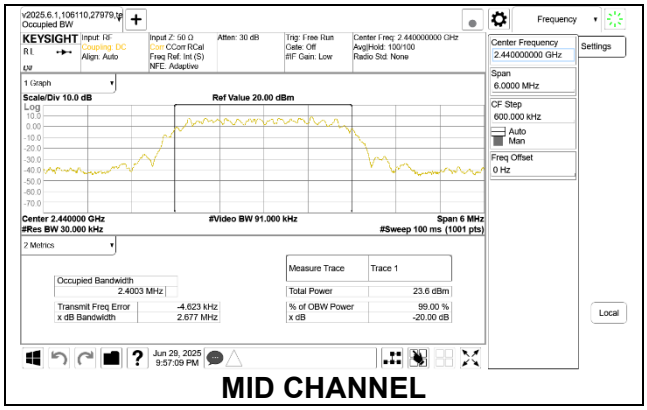
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2404	2.4008
Middle	2440	2.4016
High	2476	2.4028



MID CHANNEL

ANT 1

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2404	2.4009
Middle	2440	2.4003
High	2476	2.4023

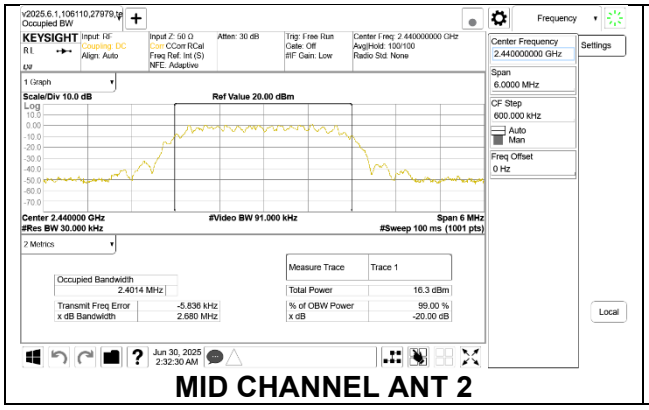


MID CHANNEL

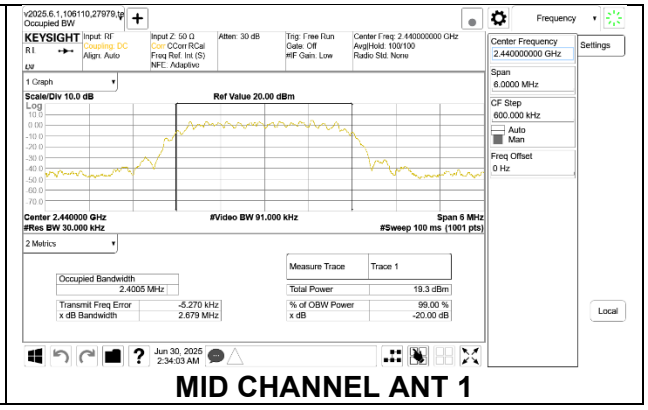
9.2.8. HIGH POWER BLE TXBF (HDT3)

Channel	Frequency (MHz)	99% Bandwidth ANT 2 (MHz)	99% Bandwidth ANT 1 (MHz)
Low	2404	2.4009	2.4007
Mid	2440	2.4014	2.4005
High	2476	2.4021	2.4020

Note: Test procedures and settings are the same as BLE normal mode.



MID CHANNEL ANT 2



MID CHANNEL ANT 1

9.3. 6 dB BANDWIDTH

LIMITS

FCC §15.407 (e)

RSS-247 5.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

All narrow bandwidths have been investigated, only the worst-case test results of LELR8 & 1Mbps has been reported.

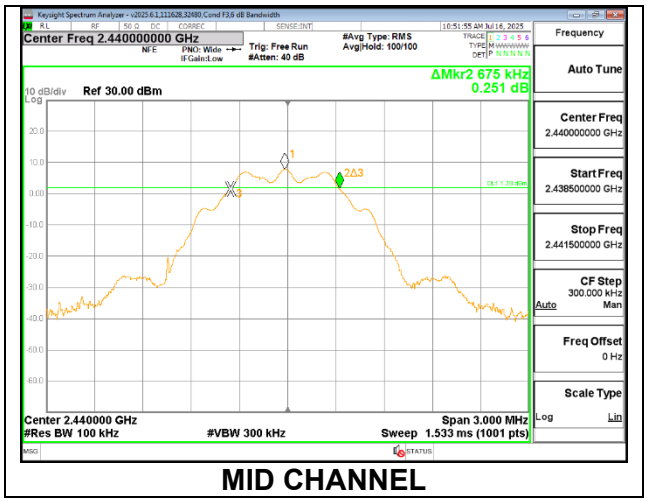
Only Mid channel plot is reported to show the analyzer's settings.

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.3.1. HIGH POWER BLE (125kbps)

ANT 2

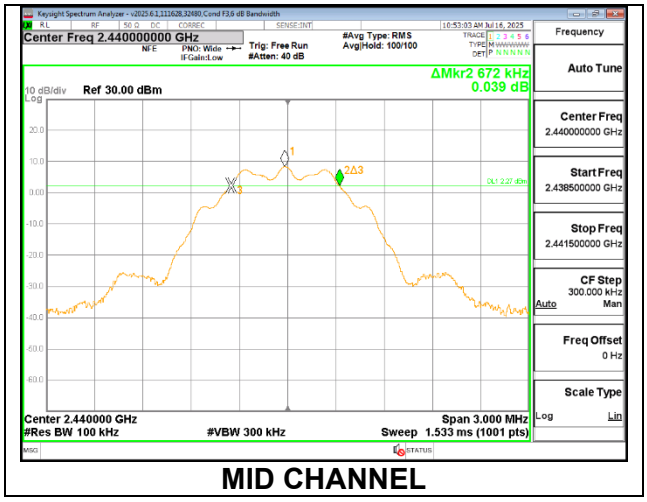
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.675	0.5
Middle	2440	0.675	0.5
High	2480	0.678	0.5



MID CHANNEL

ANT 1

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.675	0.5
Middle	2440	0.672	0.5
High	2480	0.678	0.5

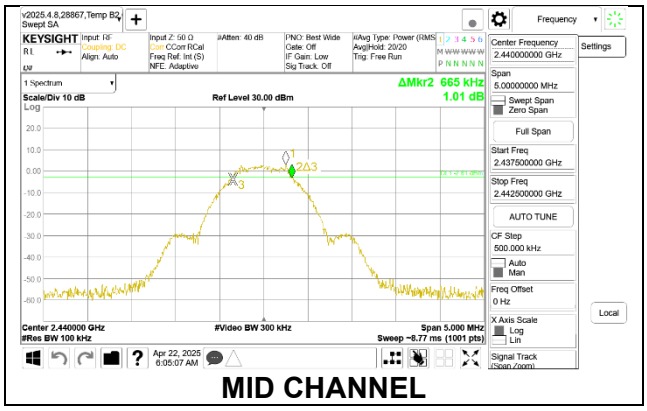


MID CHANNEL

9.3.2. HIGH POWER BLE (1Mbps)

ANT 2

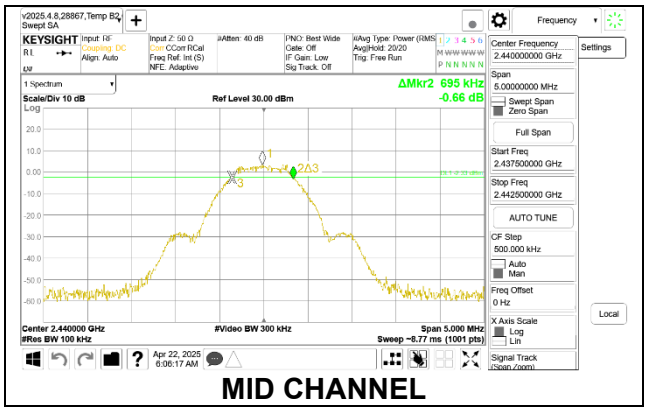
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.665	0.5
Middle	2440	0.665	0.5
High	2480	0.690	0.5



MID CHANNEL

ANT 1

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.655	0.5
Middle	2440	0.695	0.5
High	2480	0.660	0.5



MID CHANNEL

9.4. OUTPUT POWER

LIMITS

FCC §15.247 (b) (3)

RSS-247 5.4 (d)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

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 2TX:

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

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

DIRECTIONAL GAIN CALCULATION:

ANSI C63.10 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=-1.10, Ant1=-3.10

Uncorrelated Antenna gain=10log[(10^(-1.10/10)+10^(-3.10/10))/2]= -1.99dBi
Correlated Antenna gain=10log[(10^(-1.10/20)+10^(-3.10/20))^2)/2]= 0.97dBi

RESULTS

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.4.1. HIGH POWER BLE (125kbps)

ANT 2

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	13.03	30	-16.97
Middle	2440	13.07	30	-16.93
High	2480	13.02	30	-16.98

ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	13.07	30	-16.93
Middle	2440	13.05	30	-16.95
High	2480	13.10	30	-16.90

9.4.2. HIGH POWER BLE TXBF (125kbps)

ANT 2 + ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Output Power ANT 2 (dBm)	Output Power ANT 1 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	9.95	10.02	13.00	30	-17.00
Middle	2440	9.91	9.89	12.91	30	-17.09
High	2480	9.81	10.03	12.93	30	-17.07

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.4.3. HIGH POWER BLE (1Mbps)

ANT 2

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	20.42	30	-9.58
Middle	2440	20.33	30	-9.67
High	2480	20.46	30	-9.54

ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	20.90	30	-9.10
Middle	2440	21.03	30	-8.97
High	2480	20.97	30	-9.03

9.4.4. HIGH POWER BLE TXBF (1Mbps)

ANT 2 + ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Output Power ANT 2 (dBm)	Output Power ANT 1 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	19.95	19.91	22.94	30	-7.06
Middle	2440	19.89	19.93	22.92	30	-7.08
High	2480	19.90	19.95	22.94	30	-7.06

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.4.5. HIGH POWER BLE (2Mbps)

ANT 2

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2404	20.46	30	-9.54
Middle	2440	20.38	30	-9.62
High	2478	20.43	30	-9.57

ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2404	20.87	30	-9.13
Middle	2440	20.98	30	-9.02
High	2478	20.98	30	-9.02

9.4.6. HIGH POWER BLE TXBF (2Mbps)

ANT 2 + ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Output Power ANT 2 (dBm)	Output Power ANT 1 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2404	20.43	20.68	23.57	30	-6.43
Middle	2440	20.41	20.73	23.58	30	-6.42
High	2478	20.38	20.81	23.61	30	-6.39

9.4.7. HIGH POWER BLE (HDT3)

ANT 2

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2404	16.02	30	-13.98
Middle	2440	16.08	30	-13.92
High	2476	16.03	30	-13.97

ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2404	16.59	30	-13.41
Middle	2440	16.54	30	-13.46
High	2476	16.55	30	-13.45

9.4.8. HIGH POWER BLE TXBF (HDT3)

ANT 2 + ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Output Power ANT 2 (dBm)	Output Power ANT 1 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2404	15.95	16.42	19.20	30	-10.80
Middle	2440	16.02	16.61	19.34	30	-10.66
High	2476	15.98	16.52	19.27	30	-10.73

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.4.9. LOW POWER BLE (125kbps)

ANT 2

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	7.82	30	-22.18
Middle	2440	7.78	30	-22.22
High	2480	7.86	30	-22.14

ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	9.01	30	-20.99
Middle	2440	9.09	30	-20.91
High	2480	9.00	30	-21.00

9.4.10. LOW POWER BLE TXBF (125kbps)

ANT 2 + ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Output Power ANT 2 (dBm)	Output Power ANT 1 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	7.82	9.00	11.46	30	-18.54
Middle	2440	7.82	9.01	11.47	30	-18.53
High	2480	7.81	8.72	11.30	30	-18.70

9.4.11. LOW POWER BLE (1Mbps)

ANT 2

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	7.84	30	-22.16
Middle	2440	7.82	30	-22.18
High	2480	7.74	30	-22.26

ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	8.85	30	-21.15
Middle	2440	9.06	30	-20.94
High	2480	8.97	30	-21.03

9.4.12. LOW POWER BLE TXBF (1Mbps)

ANT 2 + ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Output Power ANT 2 (dBm)	Output Power ANT 1 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	7.83	8.84	11.37	30	-18.63
Middle	2440	7.86	9.06	11.51	30	-18.49
High	2480	7.75	8.86	11.35	30	-18.65

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.4.13. LOW POWER BLE (2Mbps)

ANT 2

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2404	7.85	30	-22.15
Middle	2440	7.79	30	-22.21
High	2478	7.85	30	-22.15

ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2404	8.95	30	-21.05
Middle	2440	9.13	30	-20.87
High	2478	9.13	30	-20.87

9.4.14. LOW POWER BLE TXBF (2Mbps)

ANT 2 + ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Output Power ANT 2 (dBm)	Output Power ANT 1 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2404	7.89	8.94	11.46	30	-18.54
Middle	2440	7.87	9.06	11.52	30	-18.48
High	2478	7.86	9.13	11.55	30	-18.45

9.4.15. LOW POWER BLE (HDT3)

ANT 2

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2404	7.52	30	-22.48
Middle	2440	7.22	30	-22.78
High	2476	7.28	30	-22.72

ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2404	7.83	30	-22.17
Middle	2440	7.94	30	-22.06
High	2476	8.14	30	-21.86

9.4.16. LOW POWER BLE TXBF (HDT3)

ANT 2 + ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Output Power ANT 2 (dBm)	Output Power ANT 1 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2404	7.21	8.23	10.76	30	-19.24
Middle	2440	7.23	8.16	10.73	30	-19.27
High	2478	7.28	8.18	10.76	30	-19.24

9.5. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

Measurements are 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. Gated average output power was read directly from power meter.

RESULTS

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.5.1. HIGH POWER BLE (125kbps)

ANT 2

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	12.70
Middle	2440	12.70
High	2480	12.73

ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	12.70
Middle	2440	12.70
High	2480	12.67

9.5.2. HIGH POWER BLE TXBF (125kbps)

ANT 2 + ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Average Power ANT 2 (dBm)	Average Power ANT 1 (dBm)	Total Power (dBm)
Low	2402	9.7	9.73	12.73
Middle	2440	9.71	9.69	12.71
High	2480	9.72	9.71	12.73

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.5.3. HIGH POWER BLE (1Mbps)

ANT 2

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	20.21
Middle	2440	20.12
High	2480	20.22

ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	20.66
Middle	2440	20.71
High	2480	20.72

9.5.4. HIGH POWER BLE TXBF (1Mbps)

ANT 2 + ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Average Power ANT 2 (dBm)	Average Power ANT 1 (dBm)	Total Power (dBm)
Low	2402	19.69	19.65	22.68
Middle	2440	19.69	19.65	22.68
High	2480	19.61	19.68	22.66

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.5.5. HIGH POWER BLE (2Mbps)

ANT 2

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	AV power (dBm)
Low	2404	20.22
Middle	2440	20.17
High	2478	20.16

ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	AV power (dBm)
Low	2404	20.67
Middle	2440	20.68
High	2478	20.66

9.5.6. HIGH POWER BLE TXBF (2Mbps)

ANT 2 + ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Average Power ANT 2 (dBm)	Average Power ANT 1 (dBm)	Total Power (dBm)
Low	2404	20.20	20.47	23.35
Middle	2440	20.21	20.44	23.34
High	2478	20.17	20.49	23.34

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.5.7. HIGH POWER BLE (HDT3)

ANT 2

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	AV power (dBm)
Low	2404	13.20
Middle	2440	13.23
High	2476	13.20

ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	AV power (dBm)
Low	2404	13.68
Middle	2440	13.63
High	2476	13.71

9.5.8. HIGH POWER BLE TXBF (HDT3)

ANT 2 + ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Average Power ANT 2 (dBm)	Average Power ANT 1 (dBm)	Total Power (dBm)
Low	2404	13.15	13.65	16.42
Middle	2440	13.21	13.65	16.45
High	2476	13.18	13.64	16.43

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.5.9. LOW POWER BLE (125kbps)

ANT 2

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	7.68
Middle	2440	7.63
High	2480	7.70

ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	8.88
Middle	2440	8.98
High	2480	8.85

9.5.10. LOW POWER BLE TXBF (125kbps)

ANT 2 + ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Average Power ANT 2 (dBm)	Average Power ANT 1 (dBm)	Total Power (dBm)
Low	2402	7.68	8.86	11.32
Middle	2440	7.64	8.89	11.32
High	2480	7.65	8.60	11.16

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.5.11. LOW POWER BLE (1Mbps)

ANT 2

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	7.66
Middle	2440	7.66
High	2480	7.60

ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	8.70
Middle	2440	8.89
High	2480	8.80

9.5.12. LOW POWER BLE TXBF (1Mbps)

ANT 2 + ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Average Power ANT 2 (dBm)	Average Power ANT 1 (dBm)	Total Power (dBm)
Low	2402	7.71	8.70	11.24
Middle	2440	7.70	8.93	11.37
High	2480	7.62	8.73	11.22

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.5.13. LOW POWER BLE (2Mbps)

ANT 2

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	AV power (dBm)
Low	2404	7.70
Middle	2440	7.63
High	2478	7.65

ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	AV power (dBm)
Low	2404	8.84
Middle	2440	8.95
High	2478	8.94

9.5.14. LOW POWER BLE TXBF (2Mbps)

ANT 2 + ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Average Power ANT 2 (dBm)	Average Power ANT 1 (dBm)	Total Power (dBm)
Low	2404	7.72	8.83	11.32
Middle	2440	7.74	8.91	11.37
High	2478	7.63	8.92	11.33

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.5.15. LOW POWER BLE (HDT3)

ANT 2

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	AV power (dBm)
Low	2404	4.43
Middle	2440	4.41
High	2476	4.41

ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	AV power (dBm)
Low	2404	5.39
Middle	2440	5.31
High	2476	5.39

9.5.16. LOW POWER BLE TXBF (HDT3)

ANT 2 + ANT 1

Tested By:	27979
Date:	2025-07-22

Channel	Frequency (MHz)	Average Power ANT 2 (dBm)	Average Power ANT 1 (dBm)	Total Power (dBm)
Low	2404	4.47	5.45	8.00
Middle	2440	4.44	5.45	7.98
High	2476	4.45	5.41	7.97

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.6. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

RSS-247 (5.2) (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

RESULTS

Only Mid channel plot is reported to show the analyzer's settings.

Only High-Power modes results are reported; it covers all Low Power modes.

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.6.1. HIGH POWER BLE (125kbps)

ANT 2

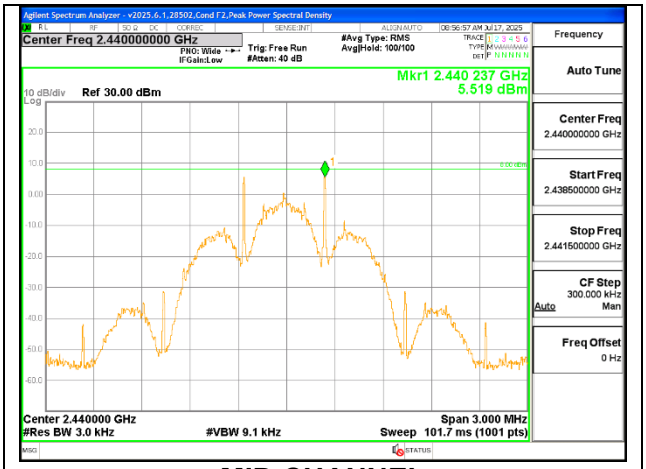
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	5.280	5.280	8.0	-2.72
Middle	2440	5.829	5.829	8.0	-2.17
High	2480	5.755	5.755	8.0	-2.25

MID CHANNEL

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

ANT 1

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	5.363	5.363	8	-2.64
Middle	2440	5.519	5.519	8	-2.48
High	2480	5.650	5.650	8	-2.35



MID CHANNEL

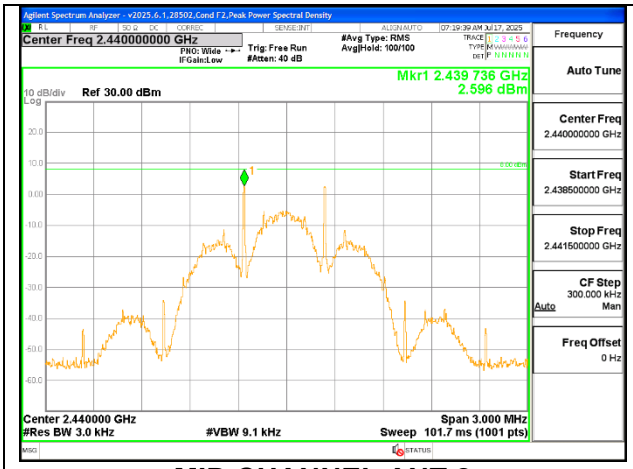
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.6.2. HIGH POWER BLE TXBF (125kbps)

PSD Results

Channel	Frequency (MHz)	ANT 2 Meas (dBm/ 3kHz)	ANT 1 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low	2402	2.204	2.232	5.228	8.0	-2.8
Mid	2440	2.596	2.576	5.596	8.0	-2.4
Hjigh	2480	2.609	2.507	5.569	8.0	-2.4

Note: Test procedures and settings are the same as BLE normal mode.



MID CHANNEL ANT 2

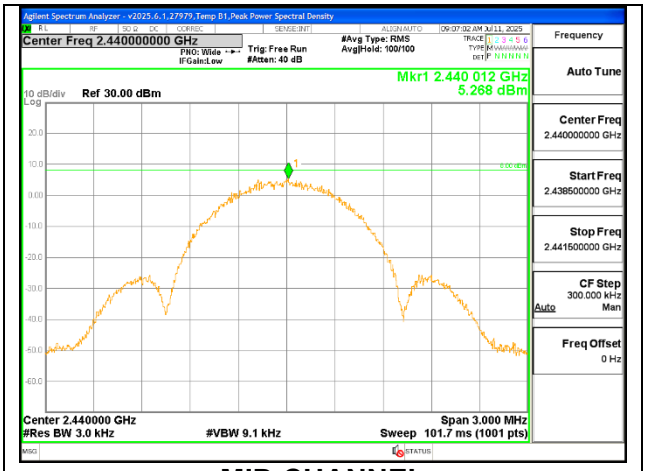
MID CHANNEL ANT 1

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.6.3. HIGH POWER BLE (1Mbps)

ANT 2

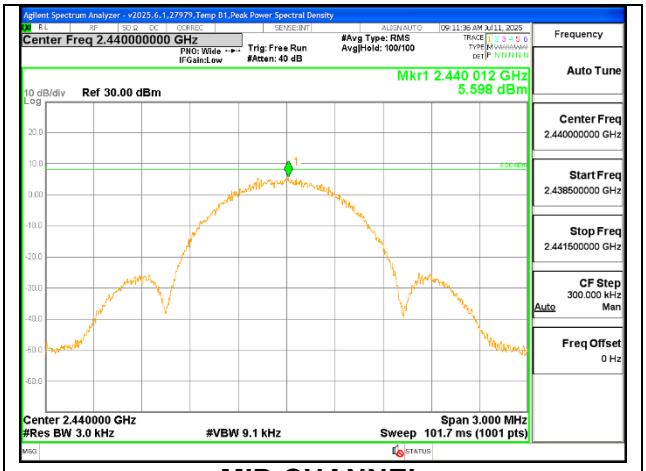
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	5.300	5.300	8.0	-2.70
Middle	2440	5.268	5.268	8.0	-2.73
High	2480	5.397	5.397	8.0	-2.60



MID CHANNEL

ANT 1

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	5.271	5.271	8	-2.73
Middle	2440	5.598	5.598	8	-2.40
High	2480	5.514	5.514	8	-2.49



MID CHANNEL

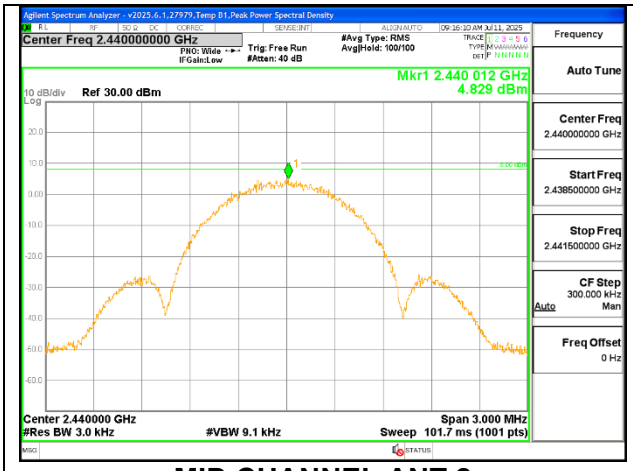
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.6.4. HIGH POWER BLE TXBF (1Mbps)

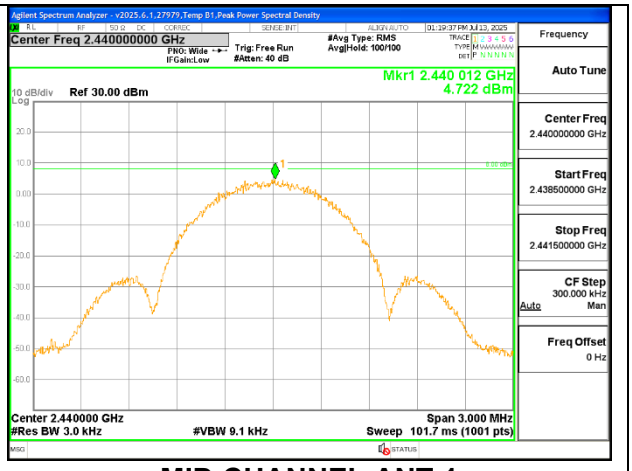
PSD Results

Channel	Frequency (MHz)	ANT 2 Meas (dBm/ 3kHz)	ANT 1 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low	2402	4.582	4.966	7.789	8.0	-0.2
Mid	2440	4.829	4.722	7.786	8.0	-0.2
Hjigh	2480	4.519	4.502	7.521	8.0	-0.5

Note: Test procedures and settings are the same as BLE normal mode.



MID CHANNEL ANT 2

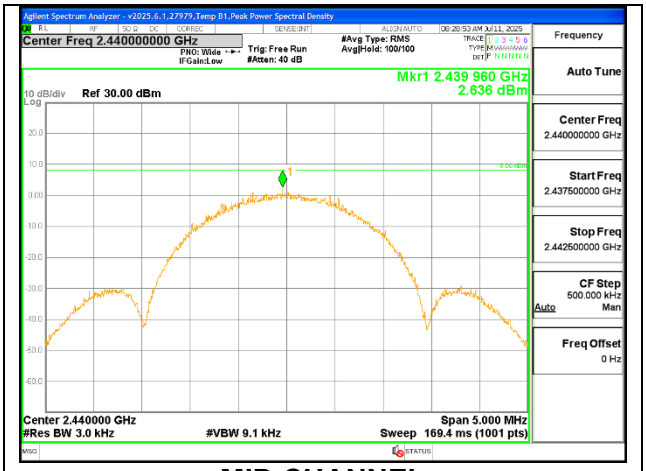


MID CHANNEL ANT 1

9.6.5. HIGH POWER BLE (2Mbps)

ANT 2

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2404	2.533	2.533	8.0	-5.47
Middle	2440	2.636	2.636	8.0	-5.36
High	2478	2.397	2.397	8.0	-5.60

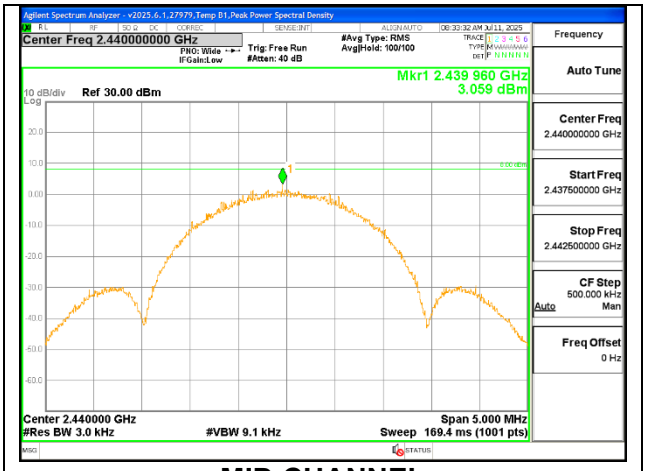


MID CHANNEL

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

ANT 1

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2404	3.121	3.121	8	-4.88
Middle	2440	3.059	3.059	8	-4.94
High	2478	2.915	2.915	8	-5.09



MID CHANNEL

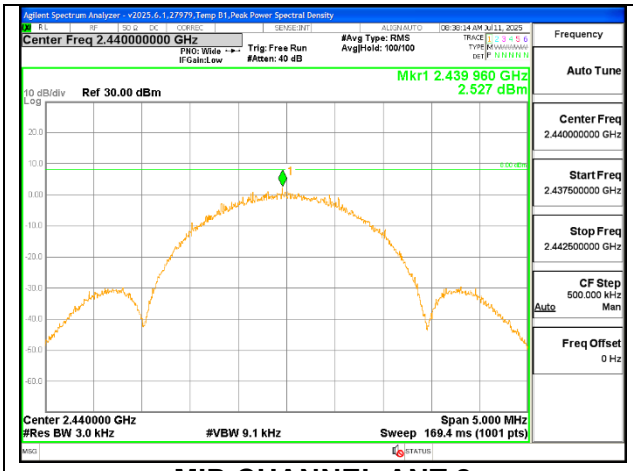
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.6.6. HIGH POWER BLE TXBF (2Mbps)

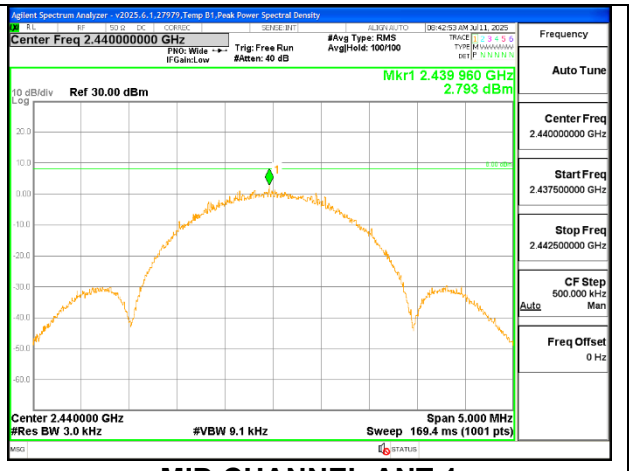
PSD Results

Channel	Frequency (MHz)	ANT 2 Meas (dBm/ 3kHz)	ANT 1 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low	2404	2.481	2.551	5.526	8.0	-2.47
Mid	2440	2.527	2.793	5.672	8.0	-2.33
Hjigh	2478	2.391	2.726	5.572	8.0	-2.43

Note: Test procedures and settings are the same as BLE normal mode.



MID CHANNEL ANT 2



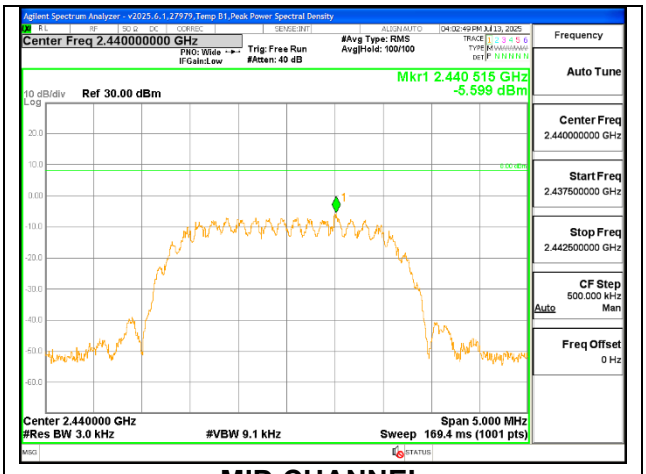
MID CHANNEL ANT 1

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.6.7. HIGH POWER BLE (HDT3)

ANT 2

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2404	-5.190	-5.190	8.0	-13.19
Middle	2440	-5.599	-5.599	8.0	-13.60
High	2476	-5.236	-5.236	8.0	-13.24

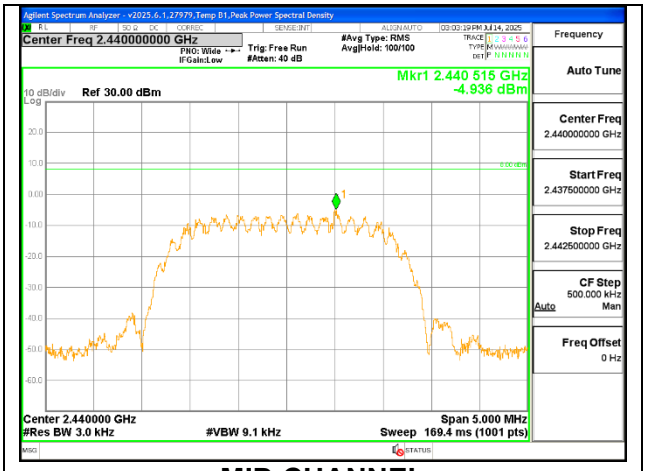


MID CHANNEL

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

ANT 1

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2404	-5.089	-5.089	8.0	-13.09
Middle	2440	-4.936	-4.936	8.0	-12.94
High	2476	-5.047	-5.047	8.0	-13.05



MID CHANNEL

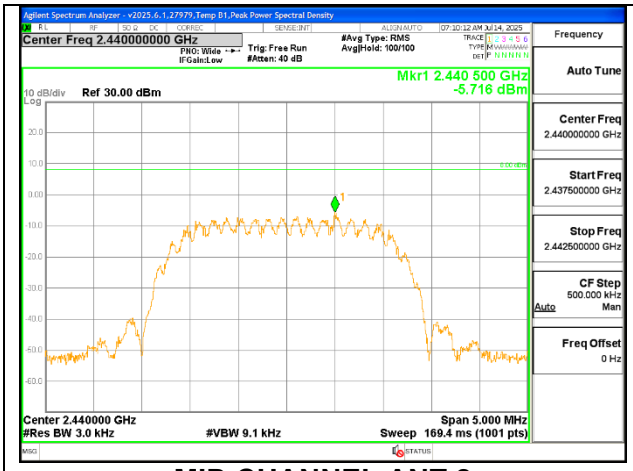
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.6.8. HIGH POWER BLE TXBF (HDT3)

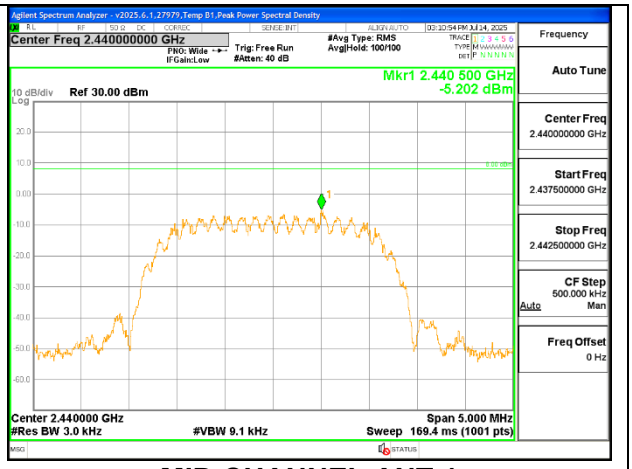
PSD Results

Channel	Frequency (MHz)	ANT 2 Meas (dBm/ 3kHz)	ANT 1 Meas (dBm/ 3kHz)	Total Corr'd PSD (dBm/ 3kHz)	Limit (dBm/ 3kHz)	Margin (dB)
Low	2404	-5.424	-5.343	-2.37	8.0	-10.4
Mid	2440	-5.716	-5.202	-2.44	8.0	-10.4
Hjigh	2476	-5.808	-5.123	-2.44	8.0	-10.4

Note: Test procedures and settings are the same as BLE normal mode.



MID CHANNEL ANT 2



MID CHANNEL ANT 1

9.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

RSS-247 5.5

Output power was measured based on the use of a peak measurement; therefore, the required attenuation is 20 dBc.

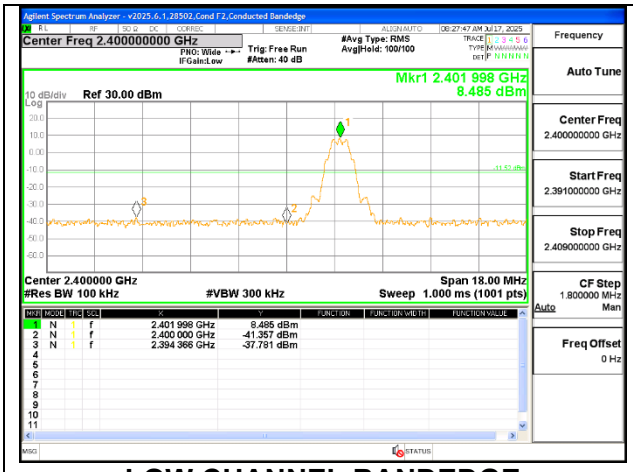
Note: Test procedures and setting are same as BLE normal mode.

RESULTS

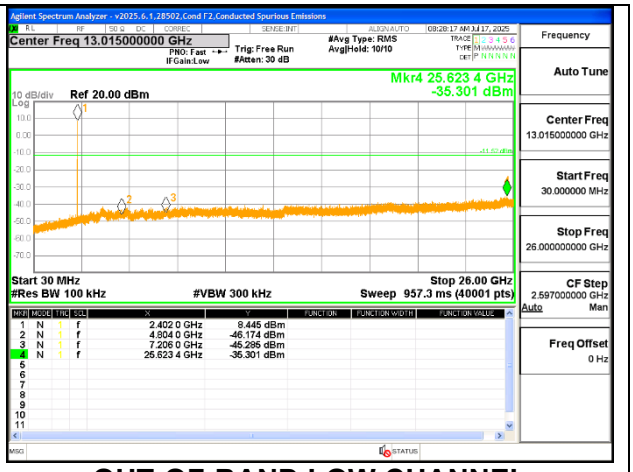
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.7.1. HIGH POWER BLE (125kbps)

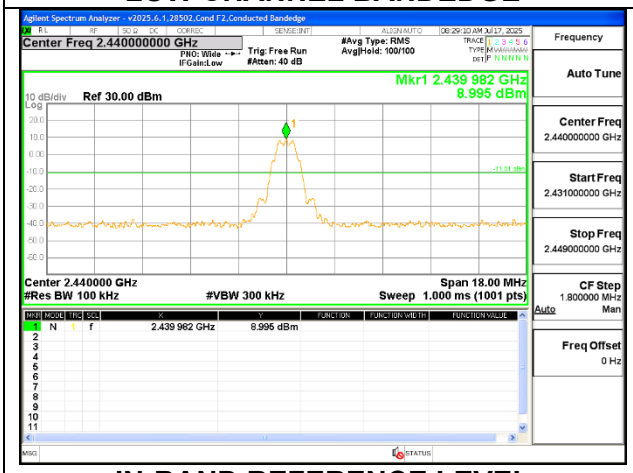
ANT 2



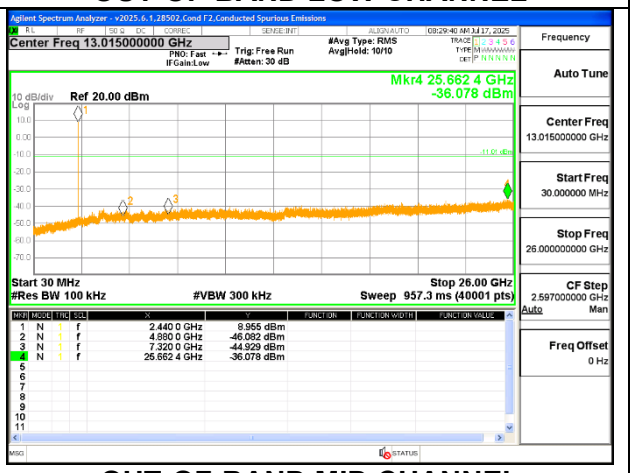
LOW CHANNEL BANDEDGE



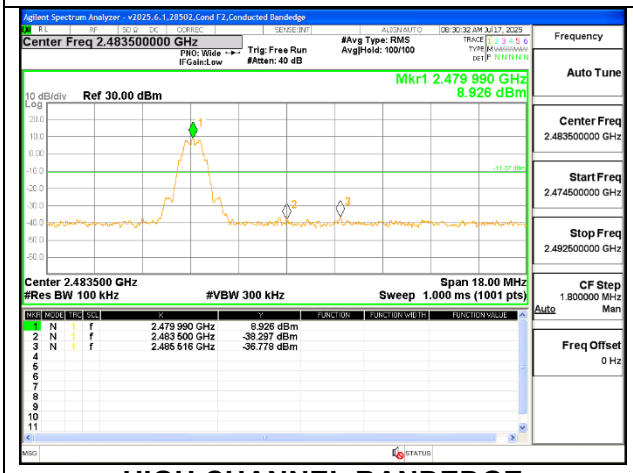
OUT-OF-BAND LOW CHANNEL



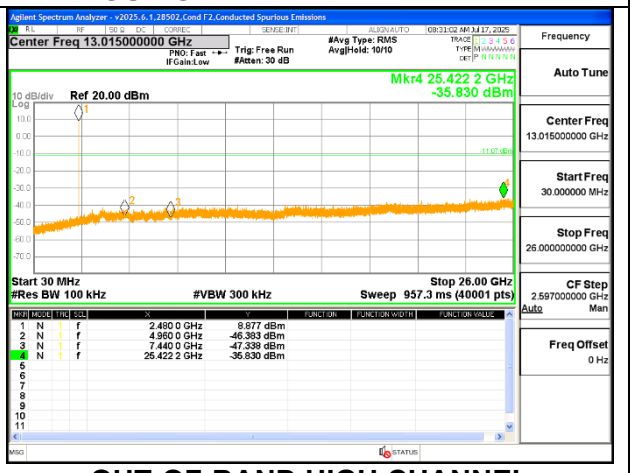
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

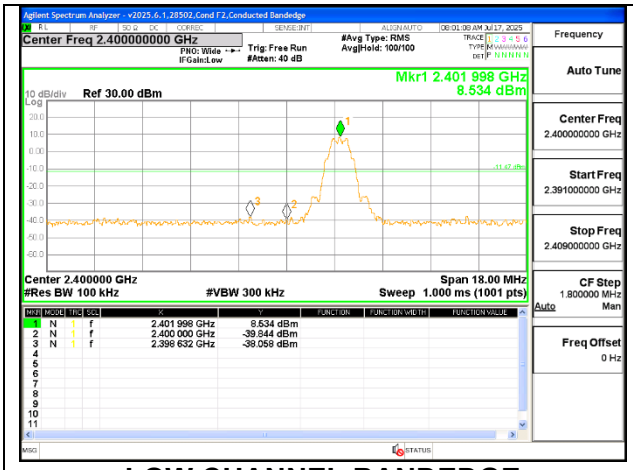


HIGH CHANNEL BANDEDGE

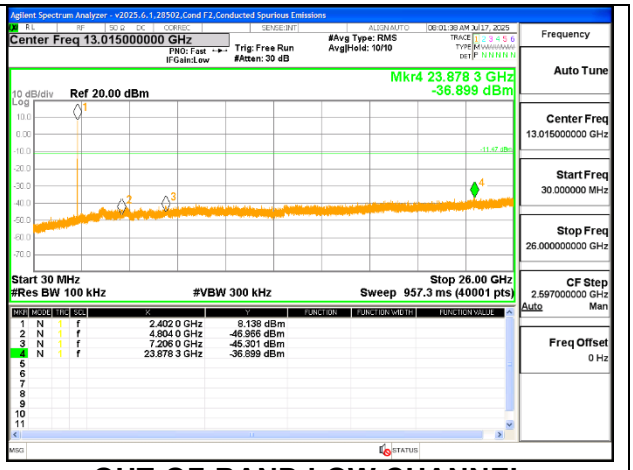


OUT-OF-BAND HIGH CHANNEL

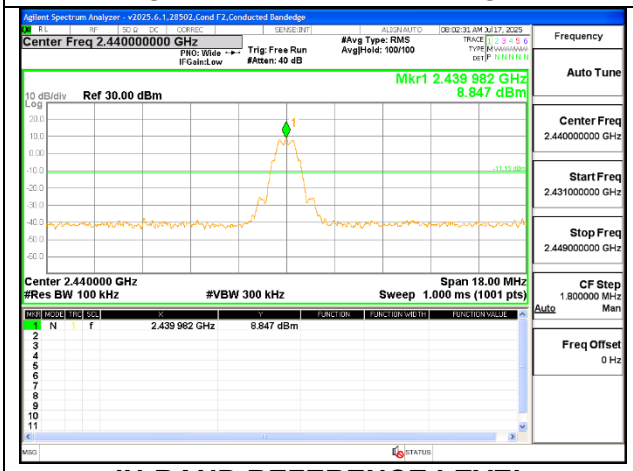
ANT 1



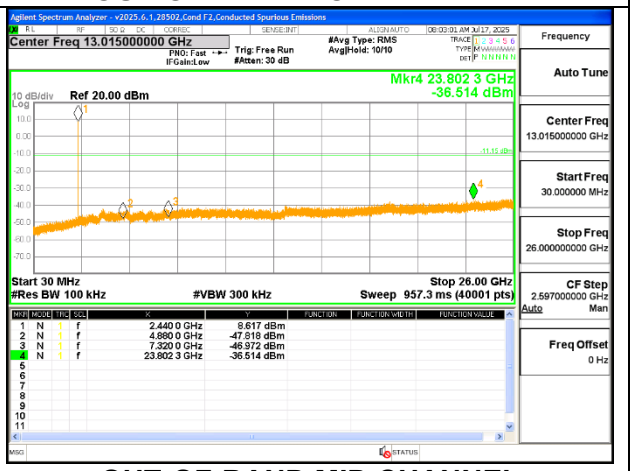
LOW CHANNEL BANDEDGE



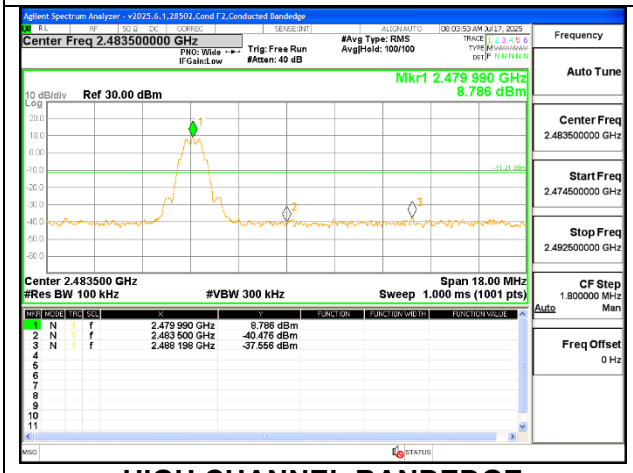
OUT-OF-BAND LOW CHANNEL



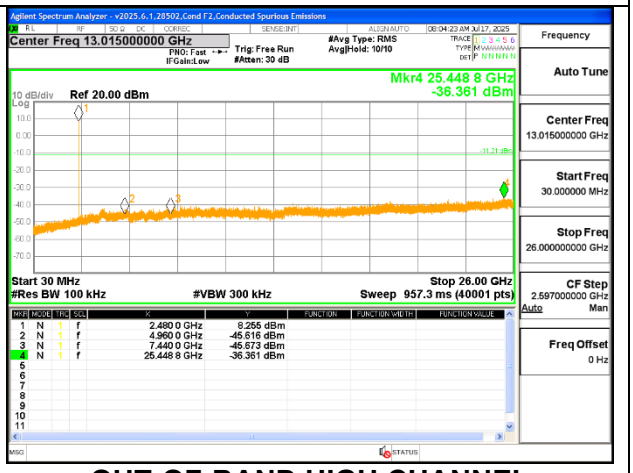
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE

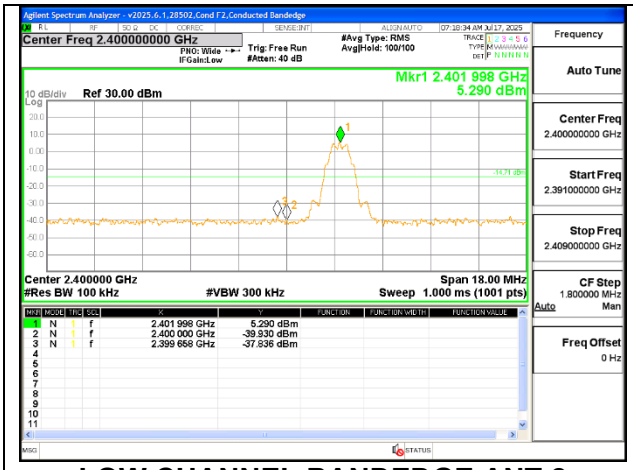


OUT-OF-BAND HIGH CHANNEL

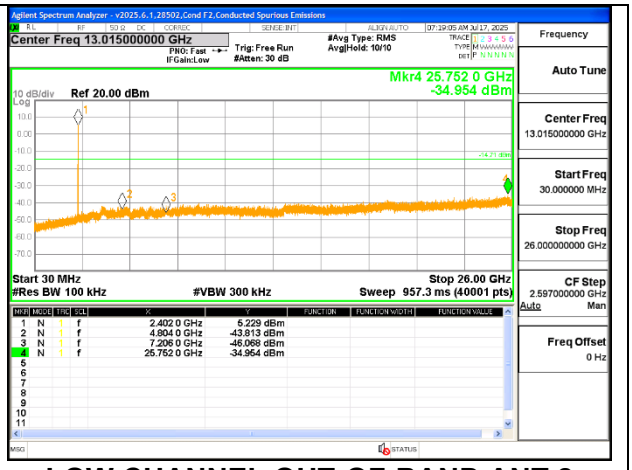
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.7.2. HIGH POWER BLE TXBF (125kbps)

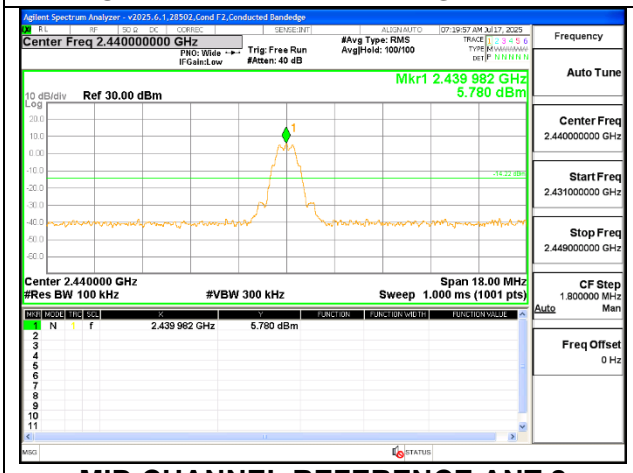
Note: Test procedures and settings are the same as BLE normal mode.



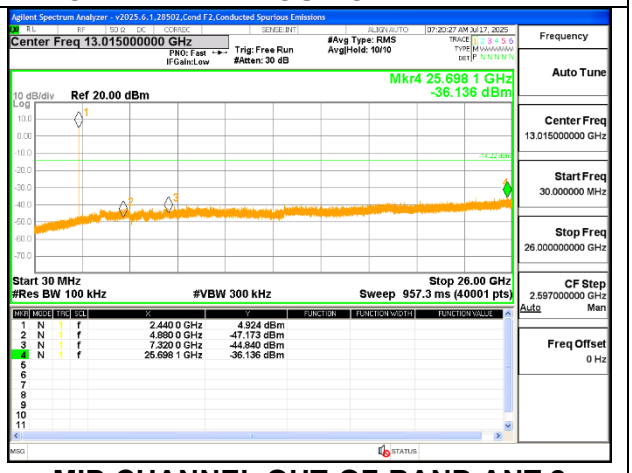
LOW CHANNEL BANDEDGE ANT 2



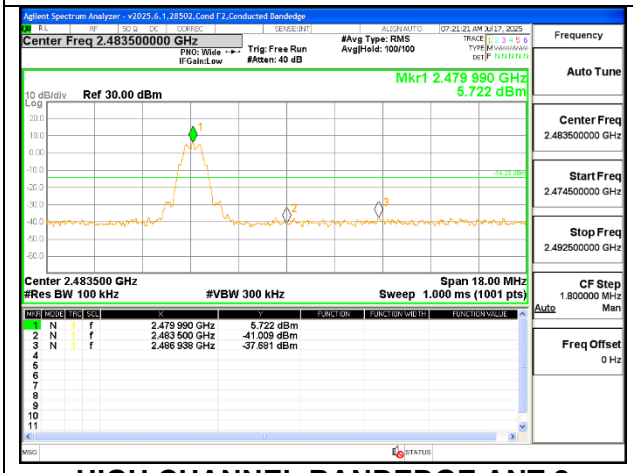
LOW CHANNEL OUT-OF-BAND ANT 2



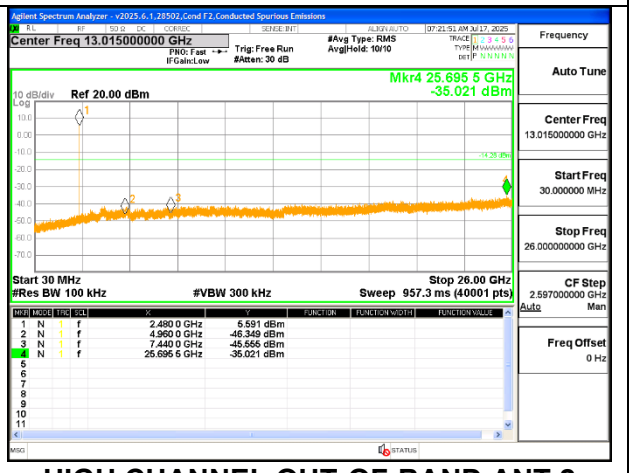
MID CHANNEL REFERENCE ANT 2



MID CHANNEL OUT-OF-BAND ANT 2

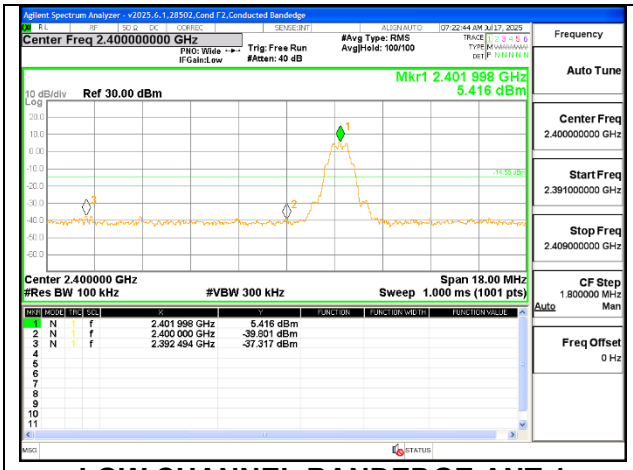


HIGH CHANNEL BANDEDGE ANT 2

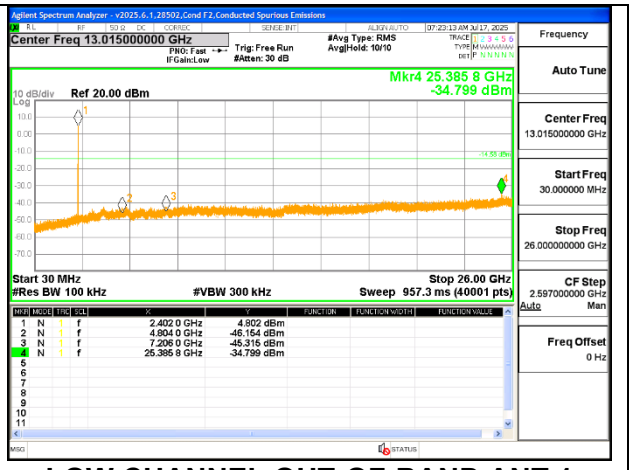


HIGH CHANNEL OUT-OF-BAND ANT 2

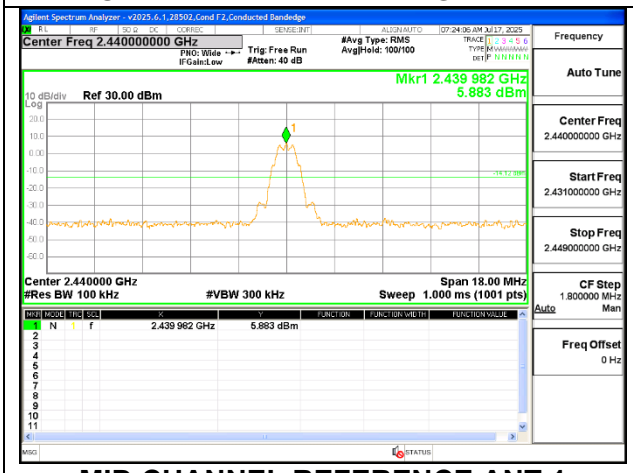
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888



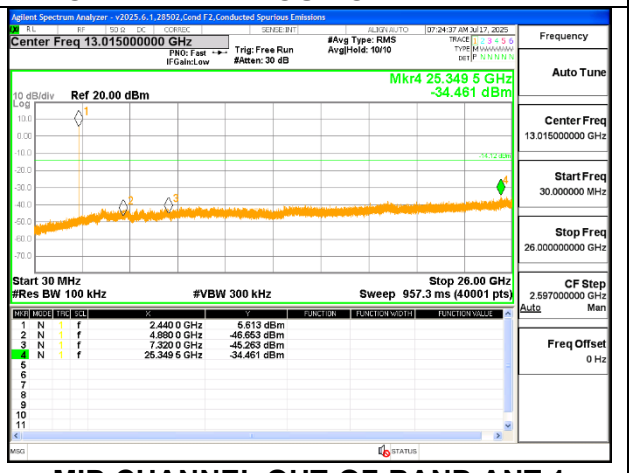
LOW CHANNEL BANDEDGE ANT 1



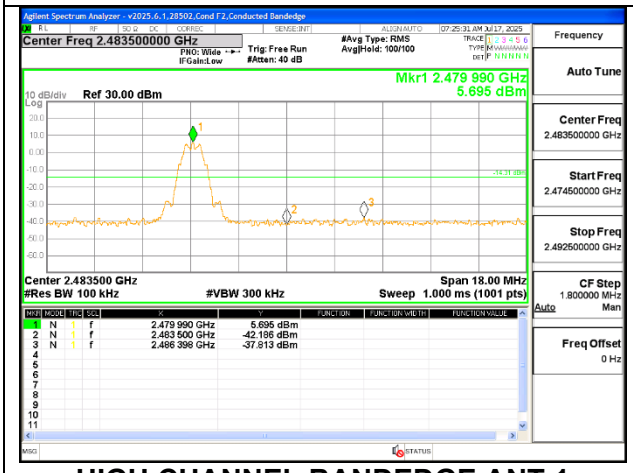
LOW CHANNEL OUT-OF-BAND ANT 1



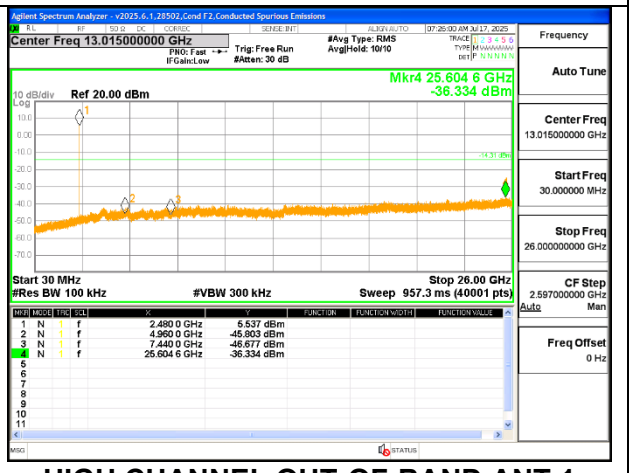
MID CHANNEL REFERENCE ANT 1



MID CHANNEL OUT-OF-BAND ANT 1



HIGH CHANNEL BANDEDGE ANT 1

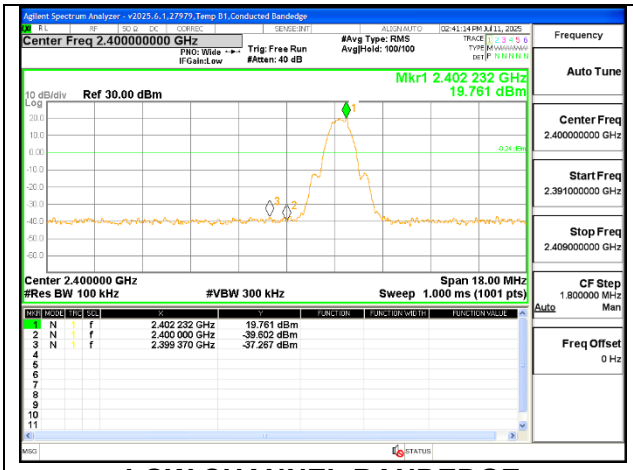


HIGH CHANNEL OUT-OF-BAND ANT 1

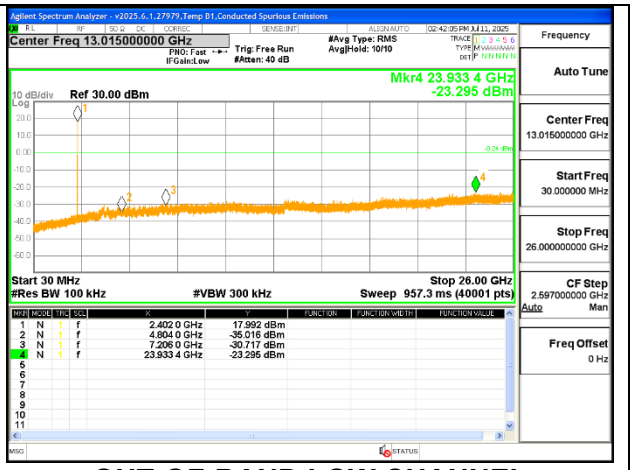
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.7.3. HIGH POWER BLE (1Mbps)

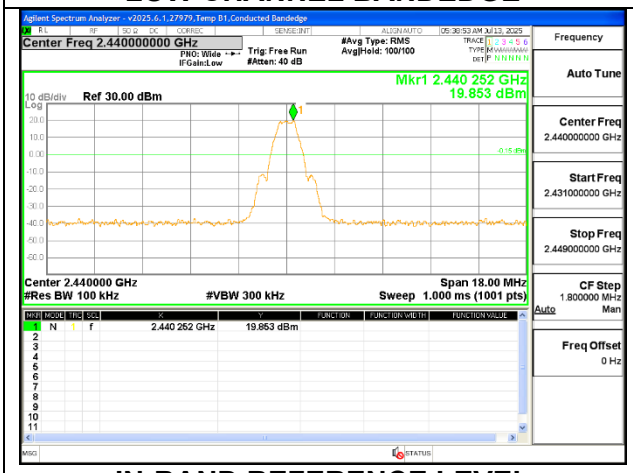
ANT 2



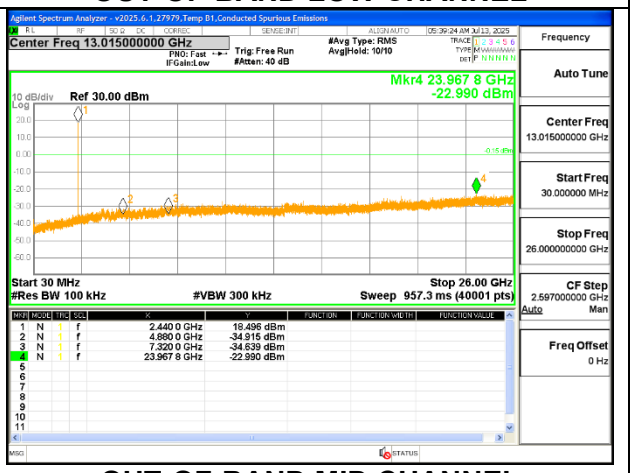
LOW CHANNEL BANDEDGE



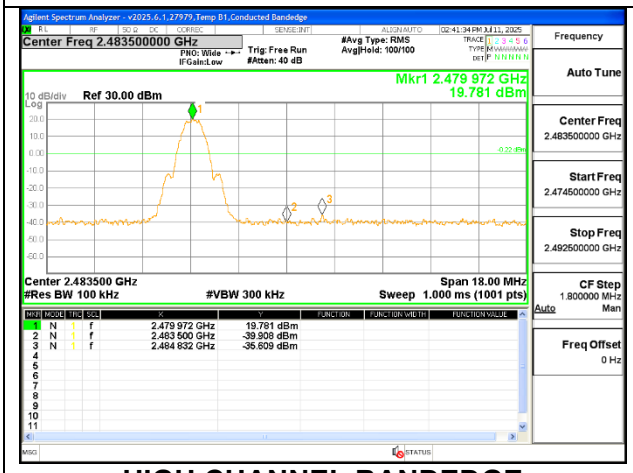
OUT-OF-BAND LOW CHANNEL



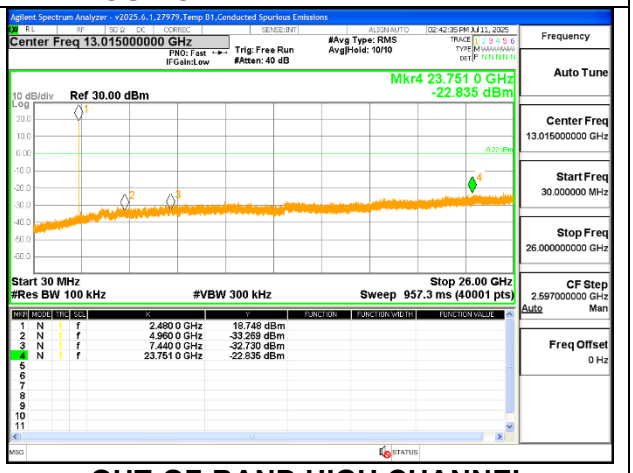
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL