

TEST REPORT

Report Number: 15496282-E9V4

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

Model : A3260 (Parent)
A3516, A3517, A3518 (Variants)

Brand : APPLE

FCC ID : BCG-E8948A(Parent)
BCG-E8954A, BCG-E8955A, BCG-E8956A (Variants)

IC : 579C-E8948A (Parent)
579C-E8954A, 579C-E8955A, 579C-E8956A (Variants)

EUT Description : SMARTPHONE

Test Standard(s) : FCC 47 CFR PART 15 SUBPART E
ISED RSS-248 Issue 3
ISED RSS-GEN Issue 5 + A1 + A2

Date Of Issue:
2025-08-21

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REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2025-07-18	Initial Review	---
V2	2025-07-23	Updated section 9	Tri Pham
V3	2025-07-25	Addressed TCB questions on sections 1, 6, 9 & 10	G. Escano
V4	2025-08-21	Fix main model number	G. Escano

TABLE OF CONTENTS

REPORT REVISION HISTORY	2
TABLE OF CONTENTS	3
1. ATTESTATION OF TEST RESULTS.....	5
2. TEST RESULT SUMMARY	6
3. TEST METHODOLOGY	7
4. FACILITIES AND ACCREDITATION.....	7
5. DECISION RULES AND MEASUREMENT UNCERTAINTY.....	8
5.1. METROLOGICAL TRACEABILITY	8
5.2. DECISION RULES	8
5.3. MEASUREMENT UNCERTAINTY	8
5.4. SAMPLE CALCULATION.....	9
6. EQUIPMENT UNDER TEST	9
6.1. EUT DESCRIPTION.....	9
6.2. MAXIMUM OUTPUT POWER.....	10
6.3. DESCRIPTION OF AVAILABLE ANTENNAS AND CABLE LOSS	11
6.4. SOFTWARE AND FIRMWARE	11
6.5. WORST-CASE CONFIGURATION AND MODE.....	12
6.6. DESCRIPTION OF TEST SETUP.....	14
7. MEASUREMENT METHOD	19
8. TEST AND MEASUREMENT EQUIPMENT	20
9. ANTENNA PORT TEST RESULTS	22
9.1. ON TIME AND DUTY CYCLE	22
9.2. 26 dB AND 99% BANDWIDTH.....	23
9.2.1. UNII-5 BAND SISO MODE.....	24
9.2.2. UNII-5 BAND MIMO TXBF MODE	27
9.3. VLP OUTPUT POWER AND PSD	31
9.3.1. UNII-5 BAND SISO MODE.....	34
9.3.2. UNII-5 BAND MIMO TXBF MODE	37
9.4. VLP SPURIOUS EMISSIONS IN-BAND– EMISSION MASK.....	39
9.4.1. HIGH POWER UNII-5 BAND SISO MODE	40
9.4.2. HIGH POWER UNII-5 BAND MIMO TXBF MODE.....	47
9.4.3. LOW POWER UNII-5 BAND SISO MODE	54
9.4.4. LOW POWER UNII-5 BAND MIMO TXBF MODE.....	61

10. VLP TPC.....	68
11. RADIATED TEST RESULTS	70
11.1. <i>TRANSMITTER OUTSIDE 5.925 - 7.125 GHz, 1- 18GHz.....</i>	72
11.1.1. UNII-5 BAND SISO MODE – BANDEDGE – HIGH POWER.....	72
11.1.2. UNII-5 BAND MIMO MODE – BANDEDGE – HIGH POWER.....	76
11.1.3. UNII-5 BAND MIMO TXBF MODE - SPURIOUS EMISSIONS – HIGH POWER..	79
11.2. <i>WORST CASE BELOW 1 GHz – HIGH POWER</i>	85
11.3. <i>WORST CASE 18-26 GHz – HIGH POWER.....</i>	87
11.4. <i>WORST CASE 26-40 GHz – HIGH POWER.....</i>	89
12. AC POWER LINE CONDUCTED EMISSIONS	91
12.1. <i>EUT WITH AC ADAPTER.....</i>	92
12.2. <i>EUT WITH LAPTOP</i>	94
13. SETUP PHOTOS.....	96
14. APPENDIX A – SPOT CHECK EVALUATION	96
14.1. <i>MODEL DIFFERENCES.....</i>	96
14.2. <i>SPOT CHECK VERIFICATION RESULTS SUMMARY FOR A3516.....</i>	97
14.3. <i>SPOT CHECK VERIFICATION RESULTS SUMMARY FOR A3517.....</i>	97
14.4. <i>SPOT CHECK VERIFICATION RESULTS SUMMARY FOR A3518.....</i>	97

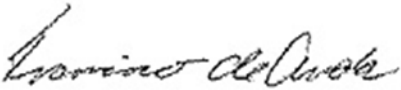
1. ATTESTATION OF TEST RESULTS

Applicant Name and Address	APPLE INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
Model	A3260 (Parent) A3516, A3517, A3518 (Variants)
Brand	APPLE
FCC ID	BCG-E8948A(Parent) BCG-E8954A, BCG-E8955A, BCG-E8956A (Variants)
IC	579C-E8948A (Parent) 579C-E8954A, 579C-E8955A, 579C-E8956A (Variants)
EUT Description	SMARTPHONE
Serial Number	C07HC90002Z0000X9L (Conducted) Lfk6GGFV2V (Radiated)
Sample Receipt Date	2025-02-21
Date Tested	2025-05-09 to 2025-07-25
Applicable Standards	CFR 47 Part 15 Subpart E ISED RSS-248 Issue 3 ISED RSS-GEN Issue 5 + A1 + A2
Test Results	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 can demonstrate 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 considered 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 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

Approved & Released By: 	Prepared & Reviewed By: 
Francisco de Anda Staff Engineer UL Verification Services, Inc.	Jordan Bailey and Glenn Escano Laboratory Engineer UL Verification Services, Inc.

2. TEST RESULT 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)

Requirement Description	Requirement Clause Number (FCC)	Requirement Clause Number (ISED)	Result	Comment
Duty Cycle	See Comment		Reporting purposes only	ANSI C63.10 Section 12.2
99% BW	§15.407 (a) (11) / KDB 987594	RSS-248 4.4 D03 v02 Q18	Compliant	ANSI C63.10 Section 6.9.3
26dB BW				
Output Power EIRP	§15.407 (a) (7), (8), (9)	RSS-248 4.5.3, 4.5.5, 4.5.6	Compliant	Dual Client
PSD EIRP	§15.407 (a) (7), (8), (9)	RSS-248 4.5.3, 4.5.5, 4.5.6	Compliant	Dual Client
Emissions outside 5.925-7.125 GHz band	§15.407 (b) (6) (7)	RSS-248 4.6.2(a)	Compliant	None
Emissions within 5.925-7.125 GHz Band (Emissions Mask)	§15.407 (b) (7)	RSS-248 4.6.2(b)	Compliant	None
Unwanted emissions in restricted bands	§15.205	RSS-GEN 8.10	Compliant	None
Radiated Spurious Emissions	§15.209	RSS-GEN 8.9	Compliant	None
AC Mains Conducted Emissions	§15.207	RSS-GEN 8.8	Compliant	None
Transmit Power Control Mechanism	§15.407 (d) (10)	RSS-248 4.5.6	Compliant	Very Low Power Device

3. TEST METHODOLOGY

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

- ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024
- FCC 47 CFR Part 2
- FCC 47CFR Part 15
- FCC KDB 414788 D01 Radiated Test Site
- FCC KDB 662911 D01 Multiple Transmitter Output
- FCC KDB 789033 D02 General UNII Test Procedures New Rules
- FCC KDB 987594 D01 General Requirements
- FCC KDB 987594 D02 EMC Measurement
- RSS-248 Issue 3
- RSS-GEN Issue 5 + A1 +A2

*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

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			

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	1.940 dB
Power Spectral Density	2.466 dB
Time Domain Measurements Using SA	3.39 %
RF Power Measurement Direct Method Using Power Meter	0.450 dB (Ave) 1.300 dB (Peak)
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
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.29 db

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

5.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:

Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.

$36.5 \text{ dBuV} + 0 \text{ dB} + 10.1 \text{ dB} + 0 \text{ dB} = 46.6 \text{ dBuV}$

6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

The Apple iPhone is a smartphone with cellular GSM, GPRS, EGPRS, WCDMA, LTE, 5G NR1, 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.

This report covers the UNII-5 NB, which operates in the frequency range of 6106-6420MHz, equipped with VLP client device.

6.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum EIRP output power as follows:

UNII-5 Frequency Range (MHz)	Mode	Antenna	Configuration	Output Power EIRP (dBm)	Output Power EIRP (mW)
6106 -6420	BDR	Ant 6	High Power	-6.7	0.21
			Low Power	-6.73	0.21
		Ant 5	High Power	-5.71	0.27
			Low Power	-5.71	0.27
		BF, Ant 6 + Ant 5	High Power	-6.72	0.21
			Low Power	-6.64	0.22
6106 -6420	LE1M	Ant 6	High Power	-6.4	0.23
			Low Power	-6.41	0.23
		Ant 5	High Power	-5.31	0.29
			Low Power	-5.31	0.29
		BF, Ant 6 + Ant 5	High Power	-6.35	0.23
			Low Power	-6.37	0.23
6106 -6420	LE2M	Ant 6	High Power	-5.75	0.27
			Low Power	-5.60	0.28
		Ant 5	High Power	-4.51	0.35
			Low Power	-4.51	0.35
		BF, Ant 6 + Ant 5	High Power	-5.59	0.28
			Low Power	-5.6	0.28
6106 -6420	HDT2	Ant 6	High Power	-4.04	0.39
			Low Power	-4.19	0.38
		Ant 5	High Power	-3	0.50
			Low Power	-3.01	0.50
		BF, Ant 6 + Ant 5	High Power	-4.03	0.40
			Low Power	-4.02	0.40
6106 -6420	HDR4	Ant 6	High Power	-4.43	0.36
			Low Power	-4.44	0.36
		Ant 5	High Power	-3.33	0.46
			Low Power	-3.4	0.46
		BF, Ant 6 + Ant 5	High Power	-4.34	0.37
			Low Power	-4.37	0.37
6107 -6420	HDRPM4	Ant 6	High Power	-1.61	0.69
			Low Power	-1.61	0.69
		Ant 5	High Power	-0.52	0.89
			Low Power	-0.51	0.89
		BF, Ant 6 + Ant 5	High Power	-1.52	0.70
			Low Power	-1.54	0.70
6109 -6417	HDRPL8	Ant 6	High Power	1.45	1.40
			Low Power	1.5	1.41
		Ant 5	High Power	2.49	1.77
			Low Power	1.09	1.29
		BF, Ant 6 + Ant 5	High Power	1.56	1.43
			Low Power	1.56	1.43

6.3. DESCRIPTION OF AVAILABLE ANTENNAS AND CABLE LOSS

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

Antenna Type is IFA

Frequency Range (MHz)	Sub-band (MHz)	Antenna 6 (dBi)	Antenna 5 (dBi)	Uncorrelated Chains (dBi)	Correlated Chains (dBi)
6105 - 6425 UNII-5	Sub-band 2 (6115 - 6255)	-0.80	-0.90	-0.85	2.16
	Sub-band 3 (6275 - 6415)	0.00	-2.50	-1.07	1.85

Note: antenna C0 and antenna C1 indicated in power tune-up document pertain to Ant 6 and ANT 5 of this report respectively.

Cable: SMA

Cable Loss		
Frequency Range (MHz)	Antenna 6 (dBi)	Antenna 5 (dBi)
5925-6105	-0.48	-2.72
6105-6265	-0.48	-2.72
6265-6425	-0.48	-2.72

Cable loss used for RF antenna port tests was included in offset of the test equipment during testing.

6.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was Luck23A256.

6.5. WORST-CASE CONFIGURATION AND MODE

This report is to document the very low power client mode only.

The fundamental of the EUT was investigated in three orthogonal orientations X, Y, and Z. It was determined that Z (Portrait) orientation was worst-case orientation for ANT6 and ANT5 and Z (Portrait) was the worst-case orientation for 2TX.

For the radiated bandedge testing, we investigated and found that there were no emissions at both lower and upper bandedges.

For the radiation spurious harmonics testing, we have been investigated both SISO and MIMO modes under low power and high power, and we only report in high power mode, as this represents the worst case.

For radiated harmonics spurious below 1GHz, 1-18GHz L/M/H channels, 18-26GHz, 26-40GHz and power line conducted emissions were performed with the EUT set at the 2TX BF at high power mode with power setting equal or higher than SISO modes as worst-case scenario.

Below 1GHz tests were performed with EUT connected to AC power adapter as the worst case; and for above 1GHz tests, the worst-case configuration reported was with EUT only. There were no emissions found below 30MHz within 20dB of the limit. For AC line conducted emission, test was investigated with AC power adapter and with laptop.

After the investigation, the worst case of power and PSD modes selecting for test are as table shown below.

UNII-5					
Mode	BW (MHz)	Modulation	Frequency Range (MHz)	Worst Case Tone	
				Power	PSD
BT5G	1MHz	BDR	6106-6420	X	X
	1.5MHz	EDR	6106-6420		
LE	1MHz	LE Adv	6106-6420		
		LE1M		X	X
		LELR125k			
		LELR500k			
	2MHz	LE2M	6106-6420	X	X
	2.5MHz	HDT2	6106-6420	X	X
		HDT3			
		HDT4			
		HDT6			
		HDT8			
HDR	2.5MHz	HDR4	6106-6420	X	X
		HDRPS2			
		XHDRPS2			
	5MHz	HDR8	6107-6420		
		HDRPM4		X	X
		HDRPM6			
		HDRPM8			
		XHDRPM4			
		XHDRPM6			
		XHDRPM8			
		HDRPM12			
		HDRPM16			
		XHDRPM12			
		XHDRPM16			
	9MHz	HDRPL8	6109-6417	X	X
		HDRPL12			
		HDRPL16			
		XHDRPL8			
		XHDRPL12			
		XHDRPL16			
		HDRPL24			
		HDRPL32			
		XHDRPL24			
		XHDRPL32			

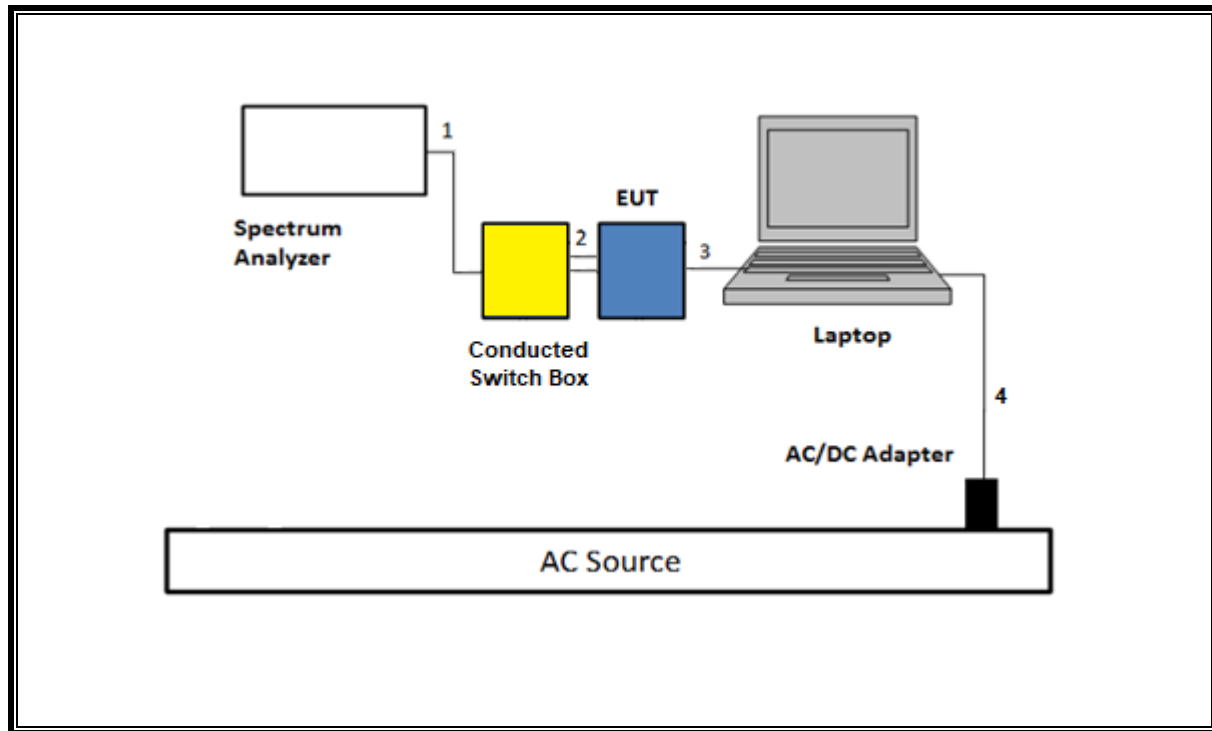
6.6. DESCRIPTION OF TEST SETUP

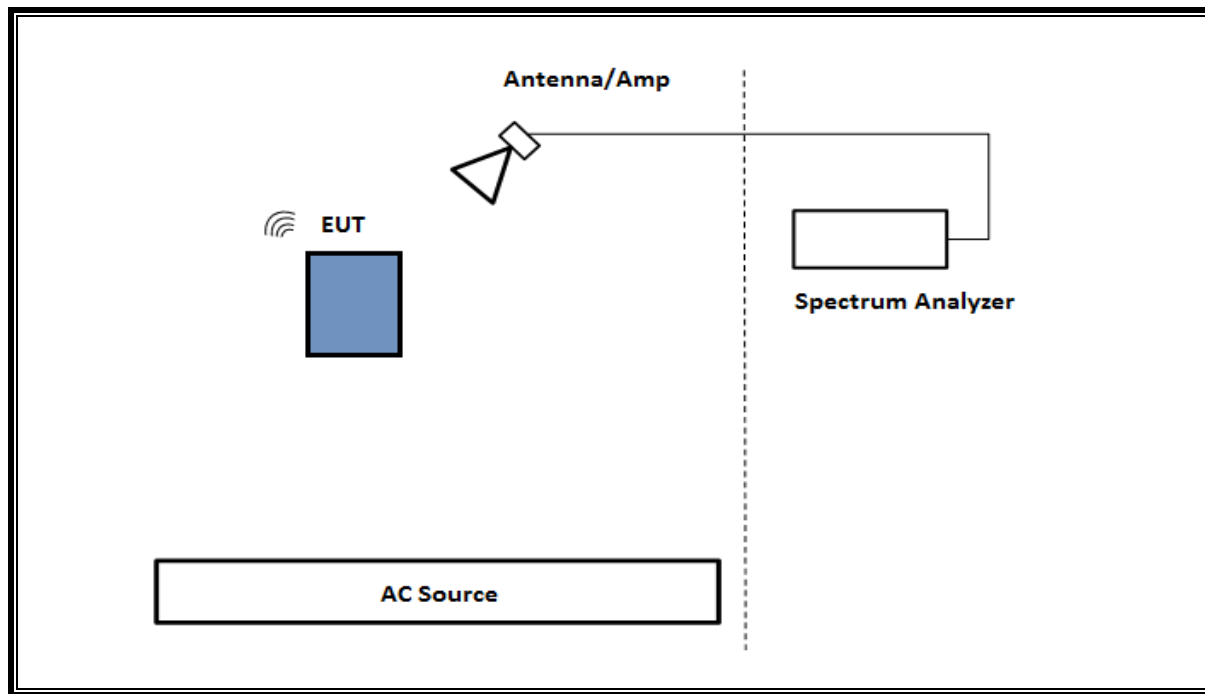
SUPPORT TEST EQUIPMENT						
Description		Manufacturer	Model	Serial Number		FCC ID/ DoC
Laptop		Apple	Macbook	G2YKJ9LWH5		N/A
Laptop AC/DC adapter		Apple	N/A	C4H238408AEPM0WAS		DoC
EUT AC/DC adapter		Apple	N/A	C4H238505ARPM0WAP		DoC
Conducted Switch Box		UL	N/A	245782		N/A
I/O CABLES (RF CONDUCTED TEST)						
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	2	SMA	Shielded	0.2	EUT to Switchbox
3	USB	1	USB-C	Shielded	1.0	N/A
4	DC	1	DC	Shielded	2	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
I/O CABLES (TPC CONDUCTED TEST)						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	2-Prong	Un-shielded	1	DC to AC Mains
2	DC	1	DC	Shielded	1.5	
3	USB-C	1	USB-C	Shielded	1.0	N/A
4	SMA	4	SMA	Shielded	0.75	To PXA, coupler, step attenuator and companion device

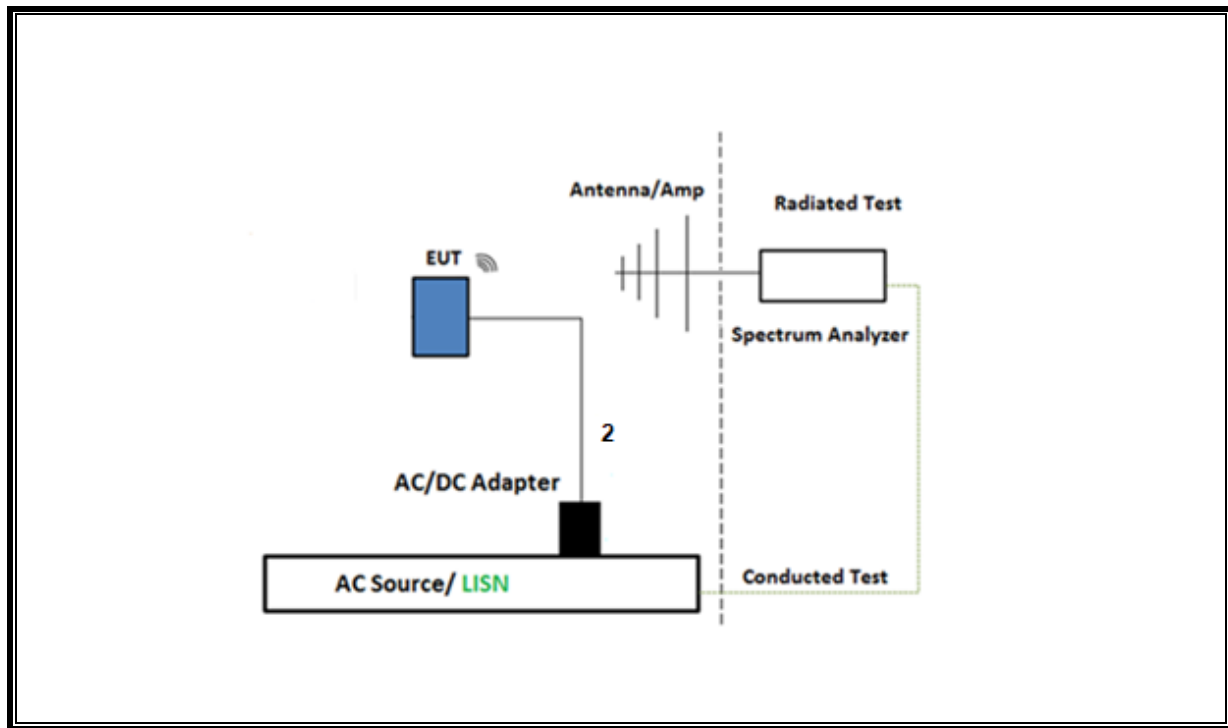
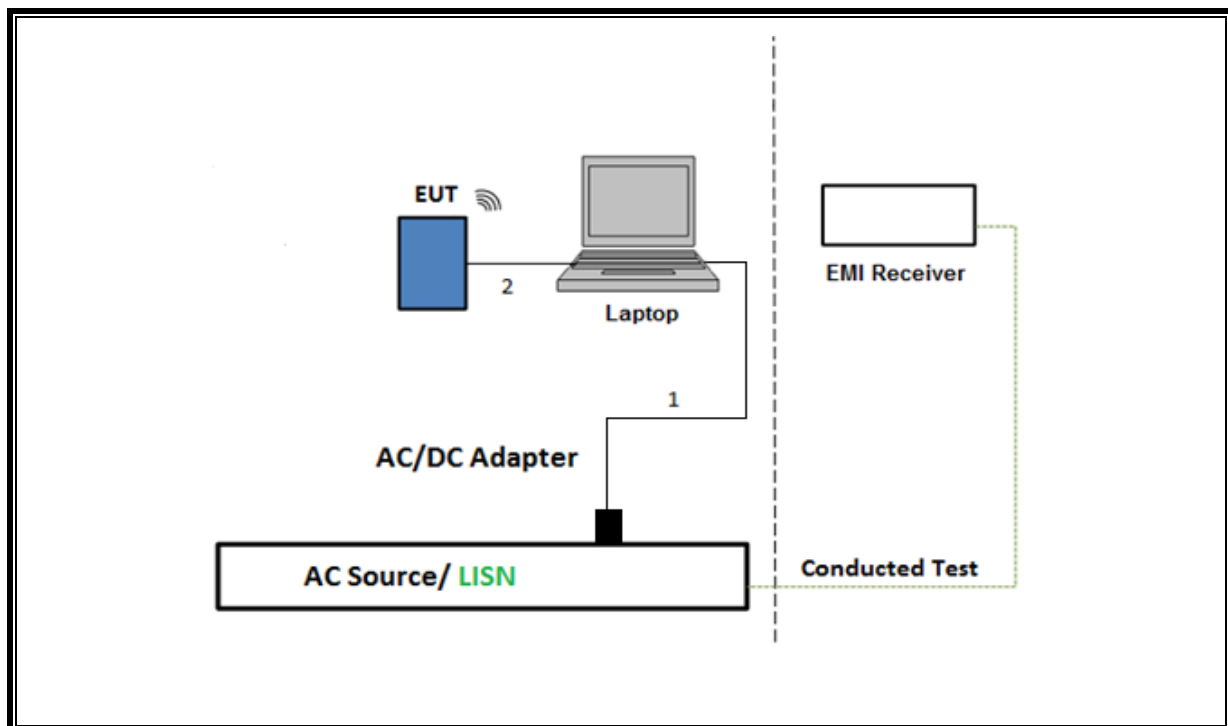
TEST SETUP

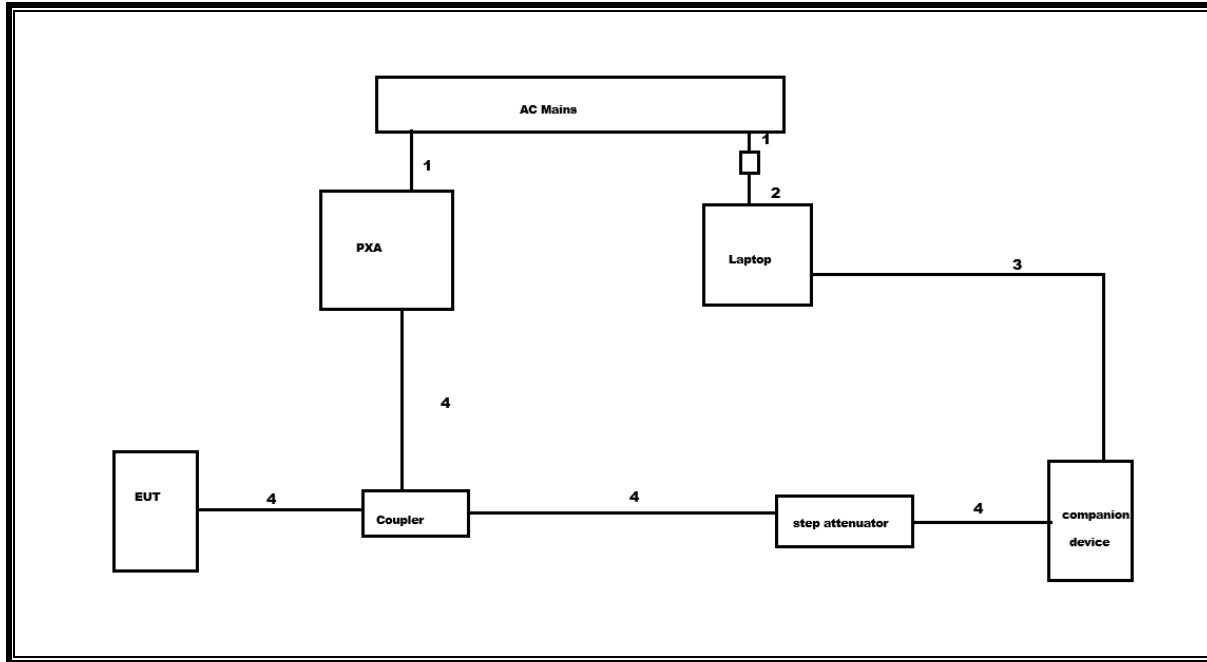
The EUT setup is shown as below. Test software exercised the radio card.

Note, For TPC test, companion device is same device type and model as the EUT and is used to establish a peer-to-peer link.

SETUP DIAGRAM FOR CONDUCTED TESTS

SETUP DIAGRAM FOR RADIATED TESTS Above 1 GHz

SETUP DIAGRAM FOR Below 1GHz and AC LINE CONDUCTED TEST**TEST SETUP- AC LINE CONDUCTED: LAPTOP CONFIGURATION**

SETUP DIAGRAM FOR TPC TEST

7. MEASUREMENT METHOD

On Time and Duty Cycle: KDB 789033 D02, Section II-B.

26 dB Emission BW: KDB 789033 D02, Section II-C.

99% Occupied Bandwidth: KDB 789033 D02, Section II-D

Conducted Output Power: KDB 789033 D02, Section II E.3.b (Method PM-G).

Power Spectral Density (PSD): KDB 789033 D02, Section II- F

Spurious emissions within 5.925-7.125 GHz Band (Emissions Mask): KDB 987594 D02 EMC Measurement Section II-J

Unwanted emissions in restricted bands: KDB 789033 D02, Section II-G.3, G.4, G.5, and G.6.

Unwanted emissions in non-restricted bands: KDB 789033 D02, Section II- G.3, G.4, and G.5.

AC Power Line Conducted Emissions: ANSI C63.10-2020, Section 6.2.

Radiated Spurious Emissions Below 30MHz: ANSI C63.10-2020 Section 6.4

8. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	ID Num	Cal Due
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, Horn 1-18GHz	ETS-Lindgren	3117	41112	2026-10-31
RF Filter Box, 1-18GHz	UL-FR1	RATS 3.1	243707	2026-04-30
EMI Test Receiver	Rohde & Schwarz	ESW44	169927	2026-02-28
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	81887	2027-03-31
RF Filter Box, 1-18GHz	UL-FR1	RATS 2.0	225575	2025-11-30
EMI Test Receiver	Rohde & Schwarz	ESW44	201498	2026-02-28
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	230299	2027-02-28
RF Filter Box, 1-18GHz	UL-FR1	RATS 2.0	226780	2026-05-31
EMI Test Receiver	Rohde & Schwarz	ESW44	226079	2026-02-28
Antenna, Broadband Hybrid 30 MHz - 2 or 3 GHz	Sunol Sciences Corp.	JB3	171863	2026-11-30
Link File, 3m, 9kHz-1000MHz Hybrid Path Loss	UL-FR1	Port 0 Factors	230919	2026-05-30
EMI Test Receiver	Rohde & Schwarz	ESW44	201502	2026-02-28
Antenna, Horn 18-26.5GHz	A.R.A	MWH-1826/B	81139	2025-08-31
Link File, RF Amplifier Assembly, 18-26.5GHz, 60dB Gain	Ampical	AMP18G26.5-60	220194	2026-04-29
Antenna, Horn 26.5-40GHz	A.R.A	MWH-2640/B	81105	2025-08-31
Link File, RF Amplifier Assembly, 26.5-40GHz, 65dB Gain	Ampical	AMP26G40-65	220193	2026-04-30
EMI Test Receiver	Rohde & Schwarz	ESW44	226078	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 5.3, 6.0, 6.1	
Radiated Software	UL	UL EMC	Ver 9.5, May 1 , 2023	
AC Line Conducted Software	UL	UL EMC	Ver 9.5, Mar 3, 2023	
TPC CONDUCTED TEST				
Description	Manufacturer	Model	ID Num	Cal Due
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A	80400	2026-01-31
Step Attenuator 70dB	HP	8495B	2406A01354	N/A
Directional Coupler	Pasternack Enterprises	PE2204-6	246270	2026-05-31

9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

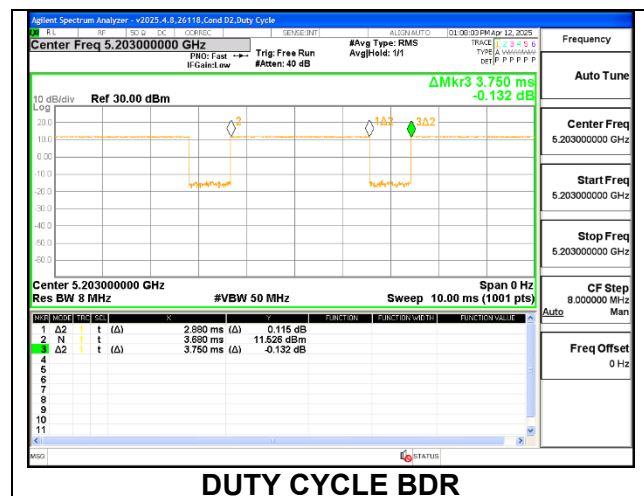
KDB 789033 Zero-Span Spectrum Analyzer Method.

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)
BDR	2.88	3.75	0.768	76.8	1.15	0.347
LE1M	2.12	2.50	0.848	84.8	0.72	0.472
LE2M	1.06	1.88	0.564	56.4	2.49	0.943
HDT2	2.13	2.22	0.960	96.0	0.18	0.470
HDR4	2.78	3.75	0.741	74.1	1.30	0.360
HDRPM4	8.07	8.70	0.928	92.8	0.33	0.124
HDRPL8	3.56	3.75	0.949	94.9	0.23	0.281

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

DUTY CYCLE PLOTS



9.2. 26 dB AND 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

PROCEDURE

ANSI C63.10: 2020, Section 6.9.3

Worst-Case Mode	RBW (kHz)	VBW (kHz)
BDR	30	91
LE1M	30	91
LE2M	43	150
HDT2	43	150
HDR4	30	91
HDRPM4	100	300
HDRPL8	200	620

RESULTS

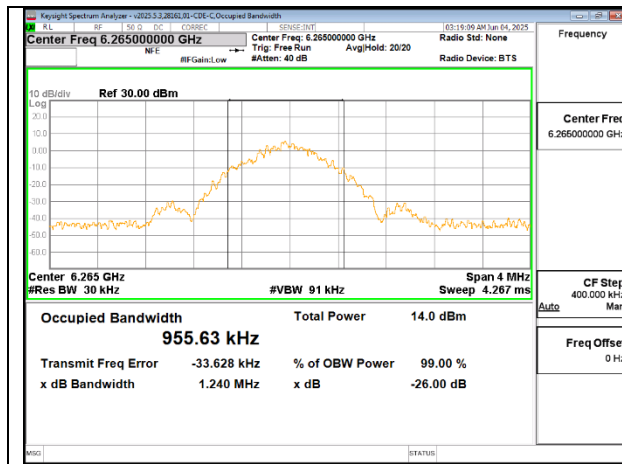
ID:	32181	Date:	2025-06-23
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The plots in these sections are for reference settings only for different bandwidths and different antennas.

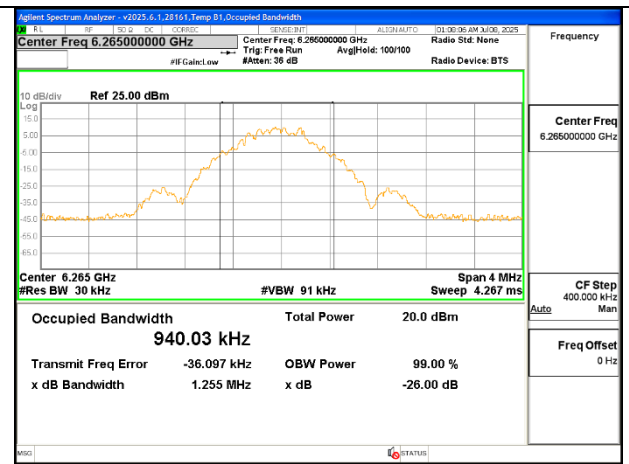
The tests performed on this device show that both 99% and 26dB bandwidths are less than 320 MHz. for all supported channel bandwidths.

9.2.1. UNII-5 BAND SISO MODE

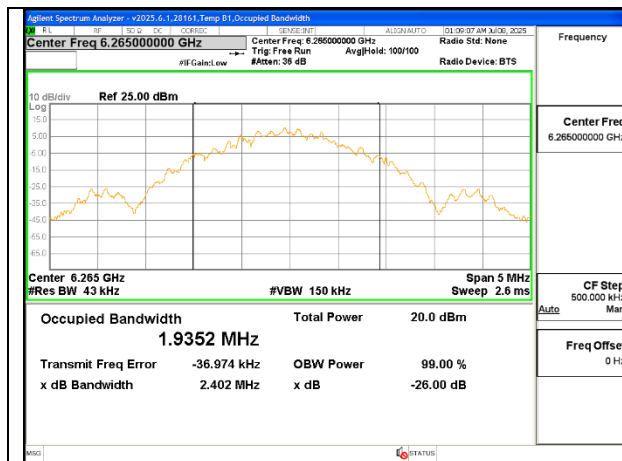
Worst-Case Mode (SISO)	Frequency (MHz)	Channel Number	26 dB Bandwidth (MHz)		99% Bandwidth (MHz)	
			Ant 6	Ant 5	Ant 6	Ant 5
BDR	6106	Low	1.232	1.250	0.9391	0.9582
	6265	Mid	1.240	1.269	0.9556	0.9492
	6420	High	1.227	1.212	0.9471	0.9565
LE1M	6106	Low	1.262	1.262	0.9459	0.9515
	6265	Mid	1.263	1.255	0.9454	0.9400
	6420	High	1.262	1.258	0.9450	0.9521
LE2M	6106	Low	2.411	2.503	1.8943	1.9148
	6265	Mid	2.402	2.417	1.9352	1.9195
	6420	High	2.411	2.500	1.9181	1.9087
HDT2	6106	Low	2.760	2.750	2.3654	2.3563
	6265	Mid	2.759	2.751	2.3595	2.3574
	6420	High	2.748	2.757	2.3668	2.3614
HDR4	6106	Low	2.691	2.674	2.3335	2.3382
	6265	Mid	2.671	2.675	2.3313	2.3396
	6420	High	2.700	2.720	2.3314	2.3434
HDRPM4	6107	Low	5.543	5.580	4.7441	4.7682
	6265	Mid	5.541	5.571	4.7529	4.7636
	6420	High	5.578	5.576	4.7710	4.7682
HDRPL8	6109	Low	10.690	10.920	9.4222	9.4251
	6265	Mid	11.150	10.680	9.4446	9.4642
	6417	High	10.740	11.080	9.3844	9.4320



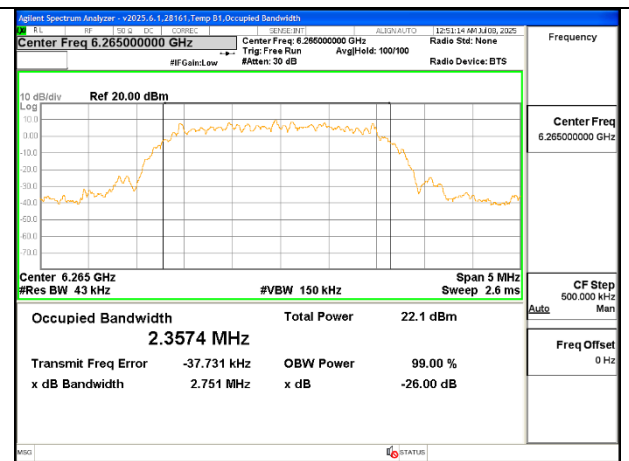
Mid Channel (UNII-5 BDR) – Ant 6



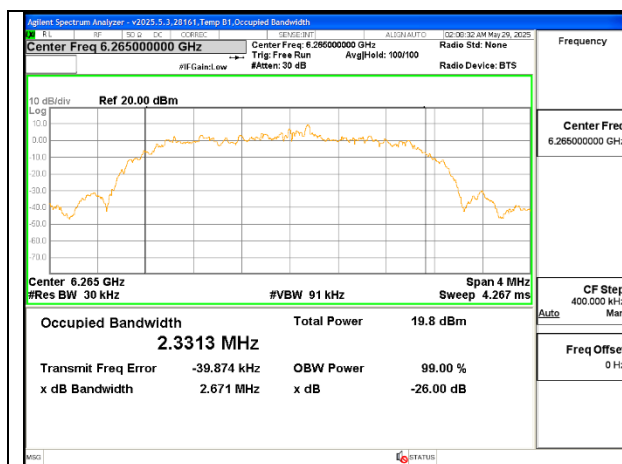
Mid Channel (UNII-5 LE1M) – Ant 5



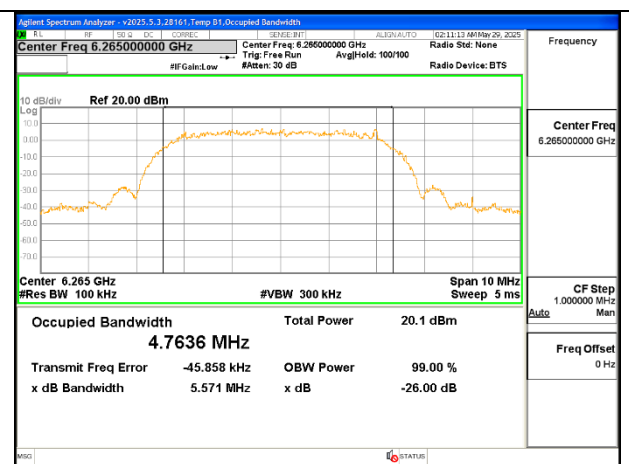
Mid Channel (UNII-5 LE2M) – Ant 6



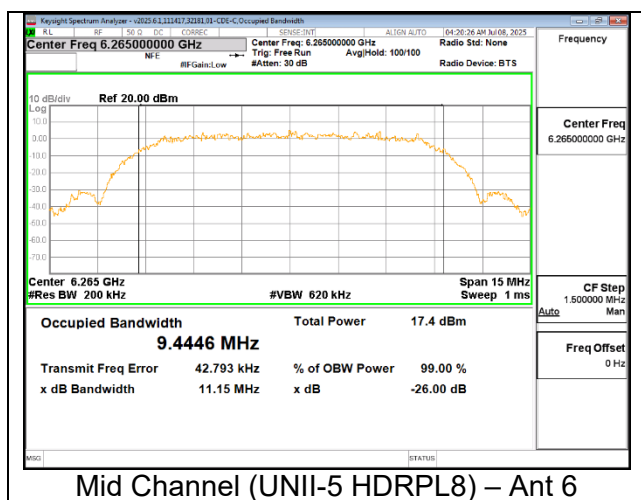
Mid Channel (UNII-5 HDT2) – Ant 5



Mid Channel (UNII-5 HDR4) – Ant 6

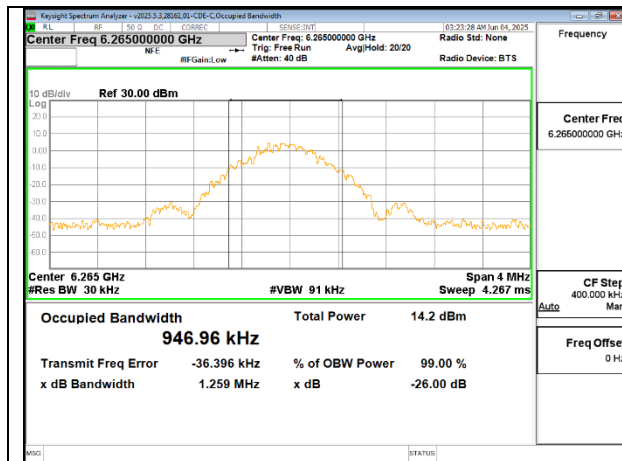


Mid Channel (UNII-5 HDRPM4) – Ant 5

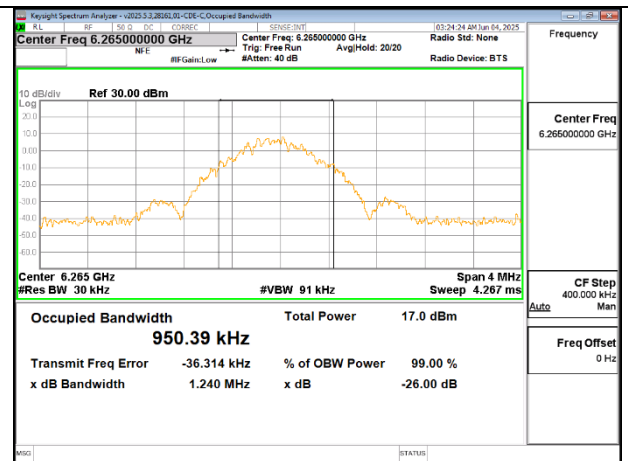


9.2.2. UNII-5 BAND MIMO TXBF MODE

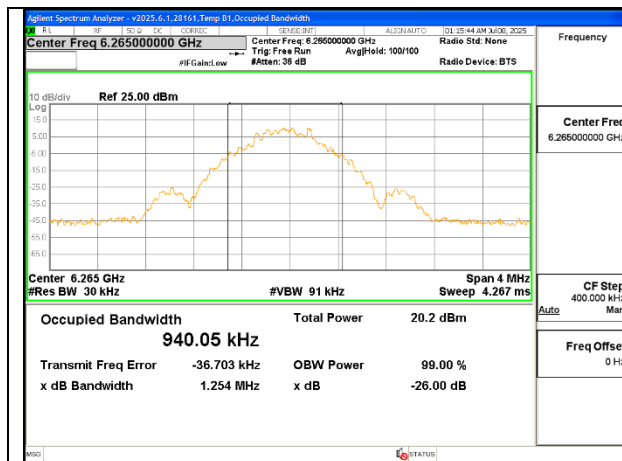
Worst-Case Mode (TxBF)	Frequency (MHz)	Channel Number	26 dB Bandwidth (MHz)		99% Bandwidth (MHz)	
			Ant 6	Ant 5	Ant 6	Ant 5
BDR	6106	Low	1.236	1.186	0.9536	0.9237
	6265	Mid	1.259	1.240	0.9470	0.9504
	6420	High	1.238	1.208	0.9529	0.9421
LE1M	6106	Low	1.262	1.263	0.9456	0.9464
	6265	Mid	1.254	1.263	0.9401	0.9467
	6420	High	1.262	1.245	0.9528	0.9435
LE2M	6106	Low	2.515	2.517	2.0323	2.0476
	6265	Mid	2.506	2.524	2.0385	2.0229
	6420	High	2.520	2.502	2.0543	2.0410
HDT2	6106	Low	2.810	2.802	2.3683	2.3697
	6265	Mid	2.756	2.756	2.3545	2.3647
	6420	High	2.802	2.812	2.3700	2.3672
HDR4	6106	Low	2.736	2.763	2.3614	2.3633
	6265	Mid	2.674	2.710	2.3404	2.3387
	6420	High	2.722	2.676	2.3469	2.3397
HDRPM4	6107	Low	5.436	5.361	4.7757	4.7480
	6265	Mid	5.318	5.393	4.7249	4.7489
	6420	High	5.356	5.349	4.7467	4.7399
HDRPL8	6109	Low	11.110	10.790	9.4189	9.4508
	6265	Mid	11.120	11.170	9.4586	9.4042
	6417	High	11.130	11.120	9.4574	9.4410



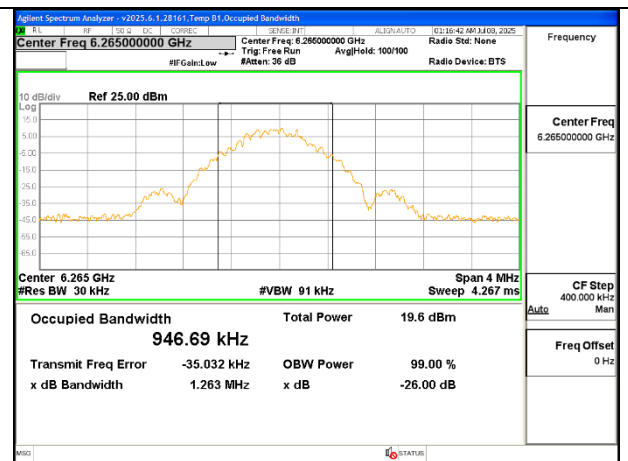
Mid Channel (UNII-5 BDR) – Ant 6



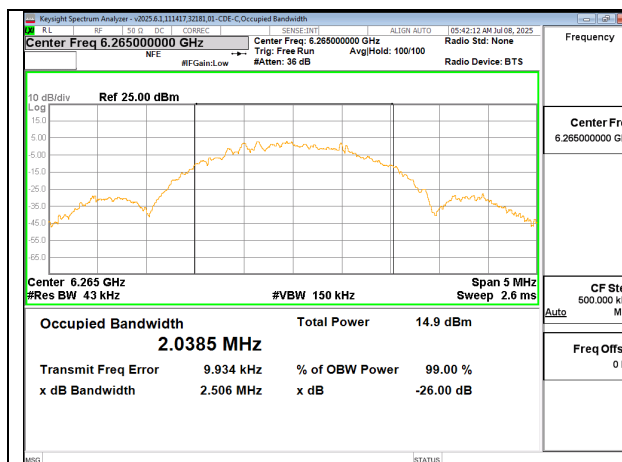
Mid Channel (UNII-5 BDR) – Ant 5



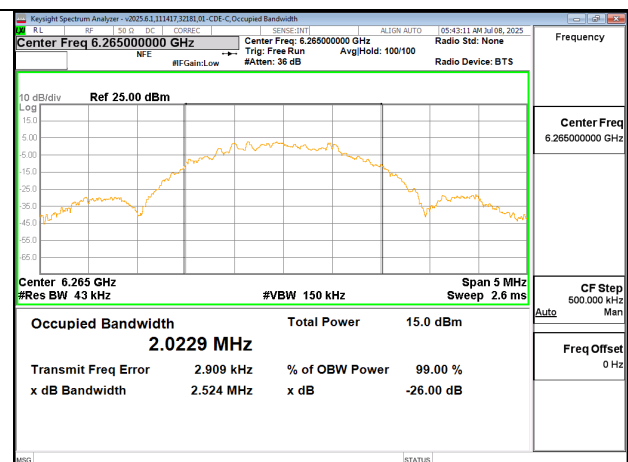
Mid Channel (UNII-5 LE1M) – Ant 6



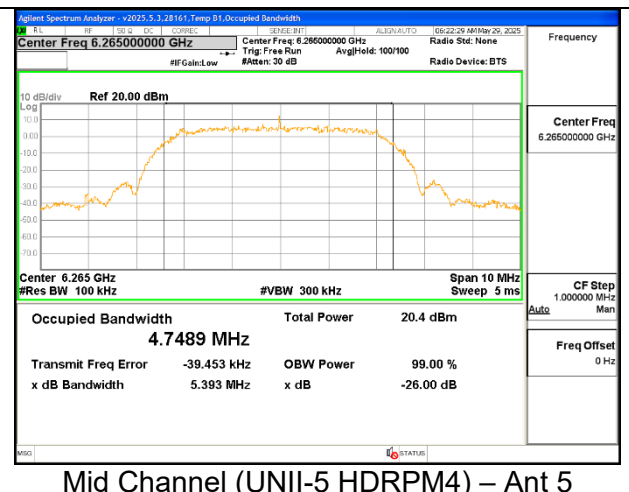
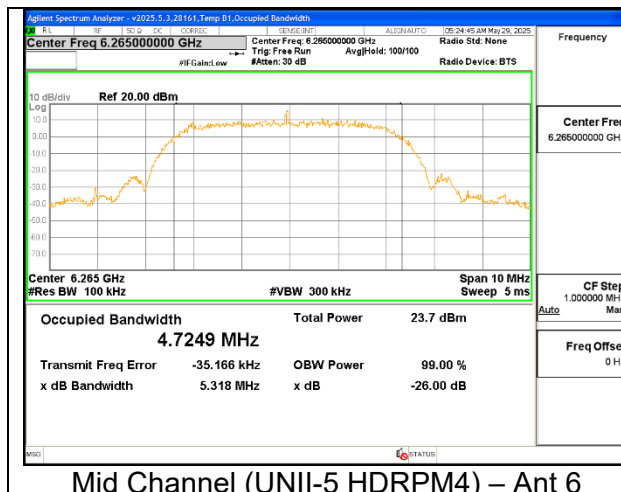
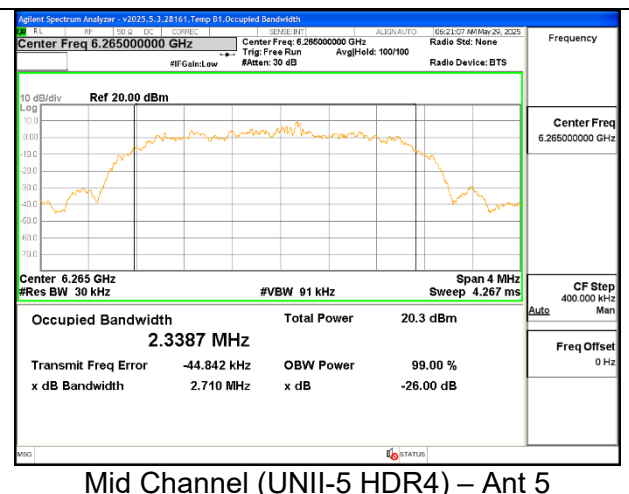
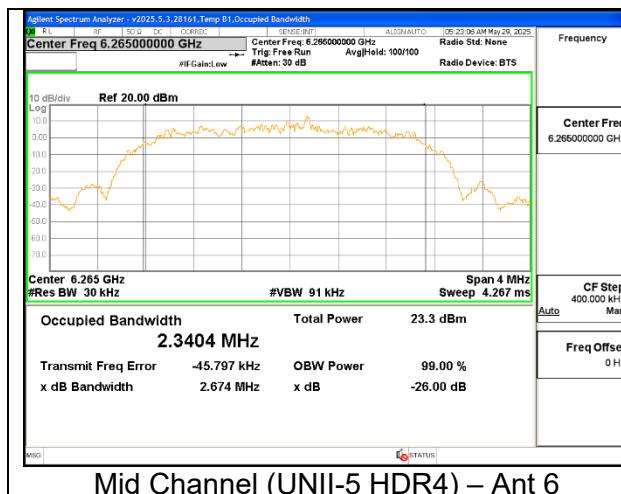
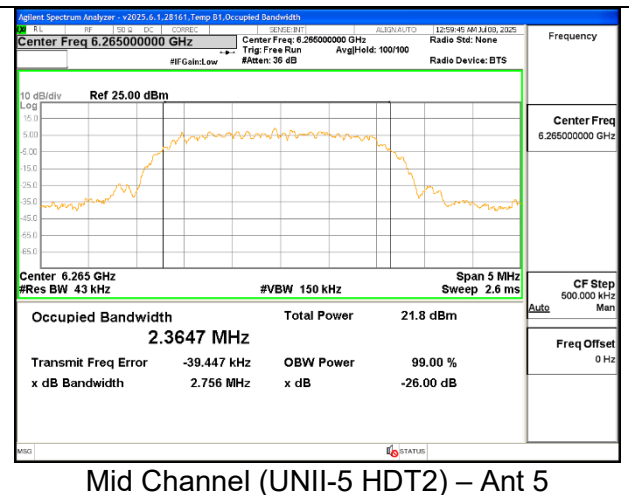
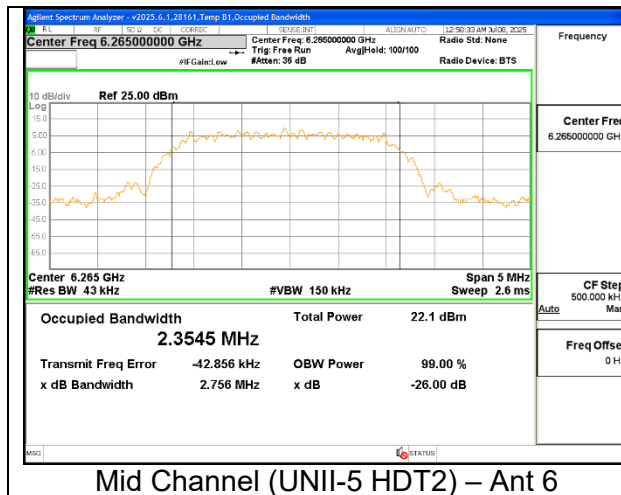
Mid Channel (UNII-5 LE1M) – Ant 5

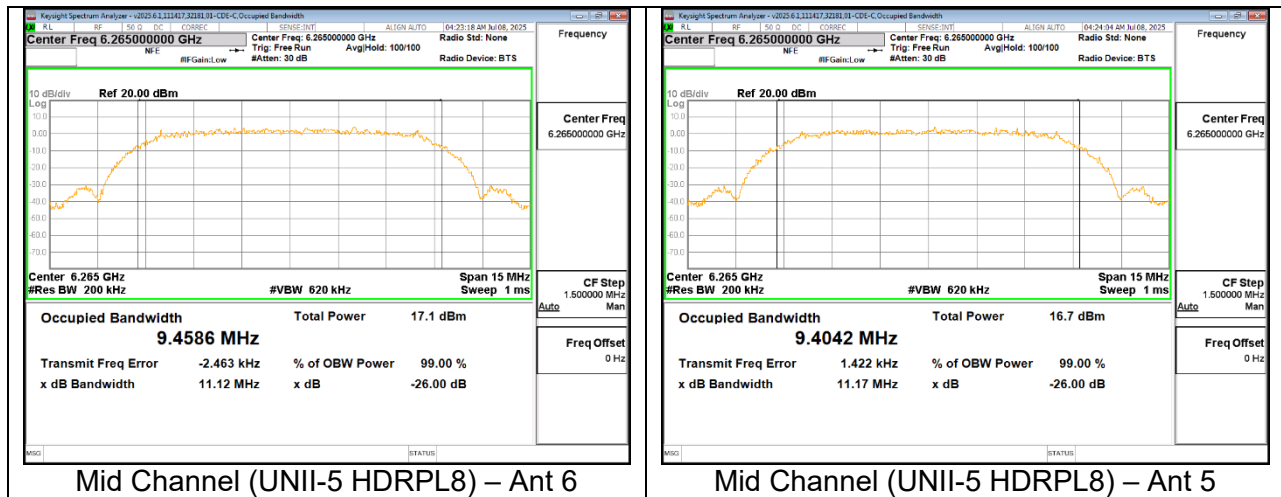


Mid Channel (UNII-5 LE2M) – Ant 6



Mid Channel (UNII-5 LE2M) – Ant 5





9.3. VLP OUTPUT POWER AND PSD

LIMITS

FCC §15.407

Bands: 5.925–6.425 GHz and 6.525–6.875 GHz

(9) For very low power devices operating in the 5.925-6.425 GHz and 6.525-6.875 GHz bands, the maximum power spectral density must not exceed –5 dBm e.i.r.p in any 1-megahertz band and the maximum e.i.r.p must not exceed 14 dBm.

RSS 248 4.5.6

Power limits for very low-power devices

Both of the following limits shall apply to very low-power devices:

- a. the maximum e.i.r.p. spectral density shall not exceed –5 dBm/MHz
- b. the maximum e.i.r.p. shall not exceed 14 dBm

TEST PROCEDURE

Conducted Output Power: KDB 789033 D02 v02r01, Section II E.3.b (Method PM-G). Gated power measurement is used to calculate EIRP. Power does not include any corrections for duty factor.

The measurement method used for power spectral density is KDB 789033 D02 v02r01, Section F

RESULTS

The plots in these sections are for reference settings only for different bandwidths and different antenna ports.

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:

BF MIMO Tx chains used correlated gain for power EIRP calculation and correlated gain for PSD EIRP calculation; For the straddle channels, the higher antenna gains were chosen between two bands where straddle channels are located. The directional gains are as follows:

Frequency Range (MHz)	Sub-band (MHz)	Antenna 6 (dBi)	Antenna 5 (dBi)	Uncorrelated Chains (dBi)	Correlated Chains (dBi)
6105 - 6425 UNII-5	Sub-band 2 (6115 - 6255)	-0.80	-0.90	-0.85	2.16
	Sub-band 3 (6275 - 6415)	0.00	-2.50	-1.07	1.85

DIRECTIONAL GAIN CALCULATION:

ANSI C63.10 section 14.4.3

Uncorrelated directional gain= $10 \cdot \log((10^{(\text{Ant6}/10)} + 10^{(\text{Ant5}/10)})/2)$

Correlated directional Gain= $10 \cdot \log(((10^{(\text{Ant6}/20)} + 10^{(\text{Ant5}/20)})^2)/2)$

Sample Calculation at UNII-5 Band:

Ant6=-0.8, Ant5=-0.9

Uncorrelated Antenna gain= $10 \log[(10^{(-0.8/10)} + 10^{(-0.90/10)})/2] = -0.85 \text{ dBi}$

Correlated Antenna gain= $10 \log[(10^{(-0.8/20)} + 10^{(-0.90/20)})^2/2] = 2.16 \text{ dBi}$

EIRP Calculation:**1Tx**

EIRP corr'd power = Ant6 + Antenna Gain

Sample Calculation at UNII-5 Band:

Ant6 Power = -6.78 dBm

EIRP corr'd power = -6.78 + (-0.9) = -7.68 dBm

2Tx

EIRP corr'd power = $10 \cdot \log(10^{(\text{Ant6}/10)} + 10^{(\text{Ant5}/10)}) + \text{correlated directional gain}$

Sample Calculation at UNII-5 Band:

Ant6 Power = -11.96 dBm, Ant5 Power = -11.98 dBm

EIRP corr'd power = $10 \cdot \log(10^{(-11.96/10)} + 10^{(-11.98/10)}) + (1.39) = -6.18 \text{ dBm}$

EIRP PSD Calculation:**1Tx**

EIRP corr'd PSD = DCCF + Ant6 + Antenna Gain

Sample Calculation at UNII-5 Band:

Ant6 PSD = -8.143 dBm/1MHz

EIRP corr'd PSD = 1.15 + (-8.143) + (-0.9) = -7.893 dBm/1MHz

2Tx (OFDMA)

EIRP corr'd PSD = $(10 \cdot \log(10^{((\text{DCCF} + \text{Ant6})/10)} + 10^{((\text{DCCF} + \text{Ant5})/10)})) + \text{correlated directional gain}$

Sample Calculation at UNII-5 Band:

Ant6 PSD = -11.335 dBm/1MHz, Ant5 PSD = -11.618 dBm/1MHz

EIRP corr'd PSD = $(10 \cdot \log(10^{((1.15 + (-11.335))/10)} + 10^{((1.15 + (-11.618))/10)})) + (1.39) = -5.924 \text{ dBm/1MHz}$

9.3.1. UNII-5 BAND SISO MODE

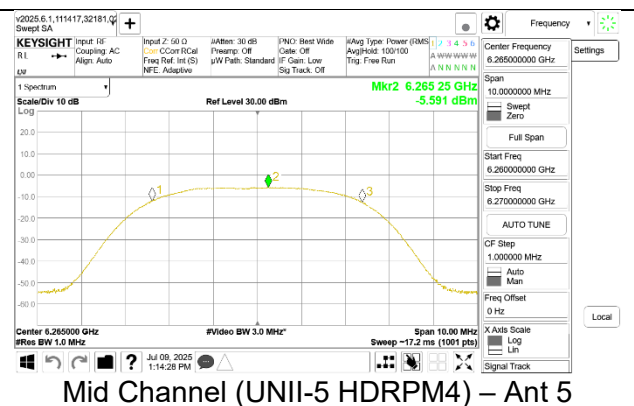
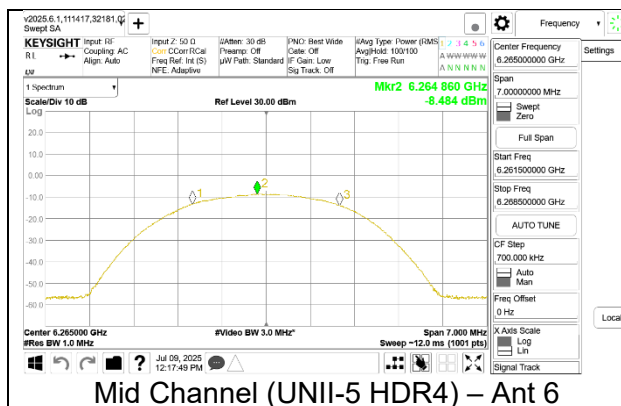
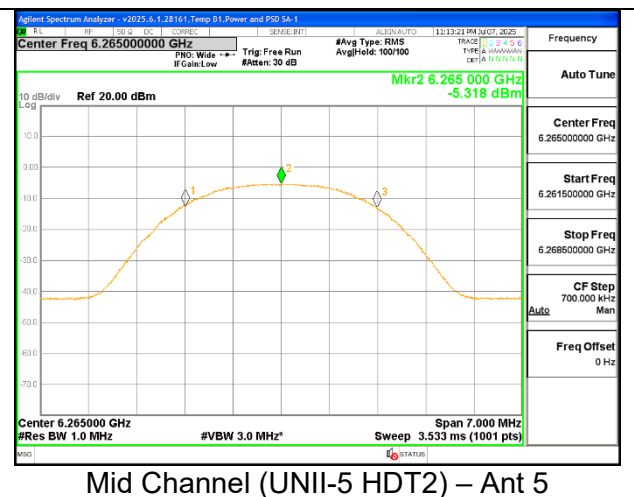
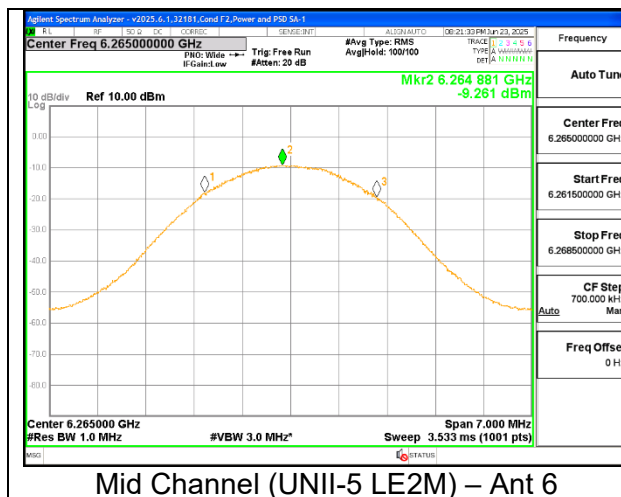
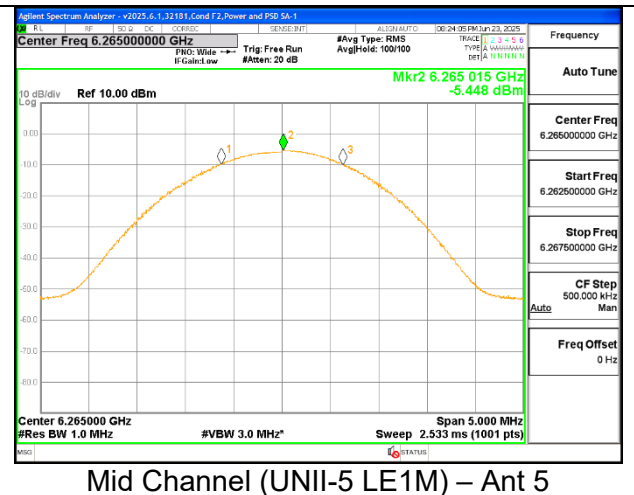
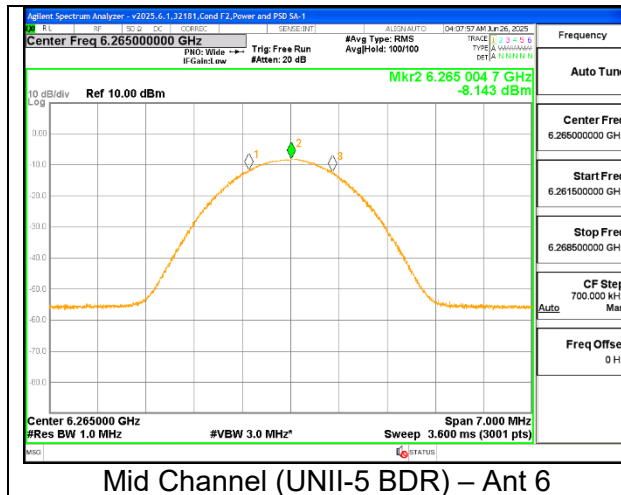
UNII-5 (SISO) (6105 - 6425MHz)	Low	Mid	High
Ant 6 (dBi)	-0.80	-0.80	0.00
Ant 5 (dBi)	-0.90	-0.90	-2.50

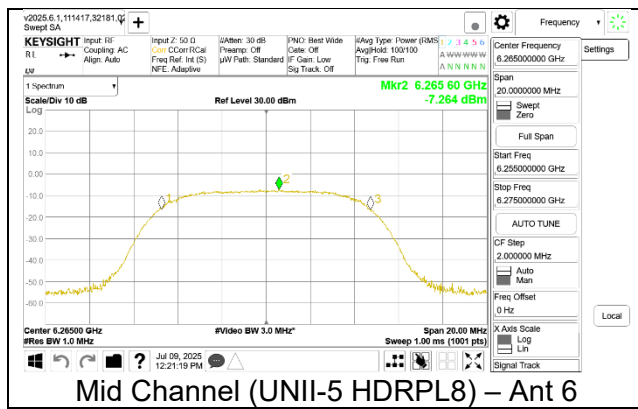
UNII-5 (SISO)	Power Config.	Freq (MHz)	Ch. #	Duty Cycle (dB)	Conducted Power (Gated) (dBm)		EIRP Power (Limit = 14dBm EIRP)		Conducted PSD (dBm/MHz)		EIRP PSD (Limit = -5dBm/MHz EIRP)	
					Ant 6	Ant 5	Ant 6	Ant 5	Ant 6	Ant 5	Ant 6	Ant 5
BDR	High	6106	Low	1.15	-6.72	-4.81	-7.52	-5.71	-8.009	-6.270	-7.659	-6.020
		6265	Mid		-6.80	-4.85	-7.60	-5.75	-8.143	-6.068	-7.793	-5.818
		6420	High		-6.70	-4.80	-6.70	-7.30	-8.081	-6.169	-6.931	-7.519
	Low	6106	Low		-6.70	-4.82	-7.50	-5.72	-8.126	-5.925	-7.776	-5.675
		6265	Mid		-6.75	-4.81	-7.55	-5.71	-8.068	-6.081	-7.718	-5.831
		6420	High		-6.73	-4.83	-6.73	-7.33	-8.377	-6.275	-7.227	-7.625
LE1M	High	6106	Low	0.72	-6.48	-4.41	-7.28	-5.31	-7.994	-5.354	-8.074	-5.534
		6265	Mid		-6.46	-4.44	-7.26	-5.34	-7.869	-5.448	-7.949	-5.628
		6420	High		-6.40	-4.40	-6.40	-6.90	-7.821	-5.981	-7.101	-7.761
	Low	6106	Low		-6.44	-4.42	-7.24	-5.32	-8.546	-6.678	-8.626	-6.858
		6265	Mid		-6.45	-4.41	-7.25	-5.31	-8.696	-6.577	-8.776	-6.757
		6420	High		-6.41	-4.41	-6.41	-6.91	-8.617	-6.618	-7.897	-8.398
LE2M	High	6106	Low	2.49	-5.60	-3.61	-6.40	-4.51	-9.121	-7.152	-7.431	-5.562
		6265	Mid		-5.75	-3.70	-6.55	-4.60	-9.261	-7.319	-7.571	-5.729
		6420	High		-5.75	-3.61	-5.75	-6.11	-8.929	-6.752	-6.439	-6.762
	Low	6106	Low		-5.64	-3.63	-6.44	-4.53	-10.419	-8.537	-8.729	-6.947
		6265	Mid		-5.61	-3.61	-6.41	-4.51	-10.323	-8.339	-8.633	-6.749
		6420	High		-5.60	-3.62	-5.60	-6.12	-10.556	-8.819	-8.066	-8.829
HDT2	High	6106	Low	0.18	-4.01	-2.12	-4.81	-3.02	-7.280	-5.452	-7.900	-6.172
		6265	Mid		-4.03	-2.10	-4.83	-3.00	-7.330	-5.318	-7.950	-6.038
		6420	High		-4.04	-2.14	-4.04	-4.64	-7.035	-5.325	-6.855	-7.645
	Low	6106	Low		-4.10	-2.11	-4.90	-3.01	-7.845	-6.104	-8.465	-6.824
		6265	Mid		-4.11	-2.18	-4.91	-3.08	-8.060	-5.726	-8.680	-6.446
		6420	High		-4.19	-2.14	-4.19	-4.64	-8.044	-5.868	-7.864	-8.188
HDR4	High	6106	Low	1.30	-4.40	-2.43	-5.20	-3.33	-8.525	-5.475	-8.025	-5.075
		6265	Mid		-4.45	-2.49	-5.25	-3.39	-8.484	-5.665	-7.984	-5.265
		6420	High		-4.43	-2.40	-4.43	-4.90	-8.119	-5.559	-6.819	-6.759
	Low	6106	Low		-4.41	-2.50	-5.21	-3.40	-8.442	-5.958	-7.942	-5.558
		6265	Mid		-4.42	-2.60	-5.22	-3.50	-8.530	-5.672	-8.030	-5.272
		6420	High		-4.44	-2.44	-4.44	-4.94	-8.300	-5.779	-7.000	-6.979
HDRPM4	High	6107	Low	0.33	-1.62	0.37	-2.42	-0.53	-7.974	-5.479	-8.444	-6.049
		6265	Mid		-1.65	0.38	-2.45	-0.52	-7.905	-5.591	-8.375	-6.161
		6420	High		-1.61	0.35	-1.61	-2.15	-7.919	-5.554	-7.589	-7.724
	Low	6107	Low		-1.60	0.39	-2.40	-0.51	-7.519	-5.958	-7.989	-6.528
		6265	Mid		-1.65	0.32	-2.45	-0.58	-7.562	-5.672	-8.032	-6.242
		6420	High		-1.61	0.38	-1.61	-2.12	-7.451	-5.779	-7.121	-7.949
HDRPL8	High	6109	Low	0.23	1.49	3.39	0.69	2.49	-7.130	-4.841	-7.700	-5.511
		6265	Mid		1.47	3.38	0.67	2.48	-7.264	-4.789	-7.834	-5.459
		6417	High		1.45	3.40	1.45	0.90	-7.449	-4.796	-7.219	-7.066
	Low	6109	Low		1.49	1.97	0.69	1.07	-7.248	-6.790	-7.818	-7.460
		6265	Mid		1.50	1.99	0.70	1.09	-7.055	-6.589	-7.625	-7.259
		6417	High		1.50	1.96	1.50	-0.54	-7.164	-6.465	-6.934	-8.735

Note:

EIRP Output Power (dBm) = Measured Conducted Power (dBm) + Peak Antenna Gain (dBi)

EIRP PSD (dBm/MHz) = Measured Conducted PSD (dBm/MHz) + Duty Factor (dB) + Peak Antenna Gain (dBi)





9.3.2. UNII-5 BAND MIMO TXBF MODE

UNII-5 (MIMO BF) (6105 - 6425MHz)	Low	Mid	High
Un-Correlated Gain (dBi)	-0.85	-0.85	-1.07
Correlated Gain (dBi)	2.16	2.16	1.85

UNII-5 (MIMO BF)	Power Config.	Freq (MHz)	Ch. #	Duty Cycle (dB)	Conducted Power (Gated) (dBm)		EIRP Power (Limit = 14dBm EIRP)	Conducted PSD (dBm/MHz)		EIRP PSD (Limit = -5dBm/MHz EIRP)
					Ant 6	Ant 5		Ant 6	Ant 5	
BDR	High	6106	Low	1.15	-12.00	-11.81	-6.73	-11.440	-11.679	-5.238
		6265	Mid		-11.96	-11.82	-6.72	-11.335	-11.618	-5.154
		6420	High		-11.94	-11.85	-7.03	-11.246	-11.570	-5.395
	Low	6106	Low		-11.82	-11.81	-6.64	-13.360	-13.334	-7.027
		6265	Mid		-11.85	-11.88	-6.69	-13.542	-13.125	-7.008
		6420	High		-11.84	-11.83	-6.97	-13.054	-13.555	-7.287
LE1M	High	6106	Low	0.72	-11.50	-11.55	-6.35	-12.052	-11.852	-6.061
		6265	Mid		-11.52	-11.70	-6.44	-11.811	-12.551	-6.275
		6420	High		-11.70	-11.50	-6.74	-12.131	-12.012	-6.491
	Low	6106	Low		-11.54	-11.54	-6.37	-13.429	-13.364	-7.506
		6265	Mid		-11.55	-11.55	-6.38	-13.268	-13.555	-7.519
		6420	High		-11.51	-11.52	-6.65	-13.168	-13.222	-7.615
LE2M	High	6106	Low	2.49	-10.75	-10.78	-5.59	-12.636	-12.798	-5.056
		6265	Mid		-10.76	-10.77	-5.59	-12.927	-13.095	-5.350
		6420	High		-10.80	-10.80	-5.94	-13.042	-13.243	-5.791
	Low	6106	Low		-10.76	-10.79	-5.60	-15.262	-15.376	-7.658
		6265	Mid		-10.85	-10.76	-5.63	-15.586	-15.728	-7.996
		6420	High		-10.77	-10.77	-5.91	-15.332	-15.227	-7.929
HDT2	High	6106	Low	0.18	-9.19	-9.35	-4.10	-12.839	-12.786	-7.462
		6265	Mid		-9.20	-9.20	-4.03	-12.372	-12.388	-7.030
		6420	High		-9.10	-9.32	-4.35	-12.012	-12.970	-7.424
	Low	6106	Low		-9.13	-9.30	-4.04	-13.037	-13.236	-7.785
		6265	Mid		-9.10	-9.28	-4.02	-13.467	-13.171	-7.966
		6420	High		-9.17	-9.20	-4.32	-13.257	-13.174	-8.175
HDR4	High	6106	Low	1.30	-9.53	-9.52	-4.35	-13.700	-13.400	-7.077
		6265	Mid		-9.51	-9.51	-4.34	-14.077	-13.621	-7.373
		6420	High		-9.55	-9.52	-4.67	-14.005	-13.888	-7.786
	Low	6106	Low		-9.56	-9.66	-4.44	-13.189	-13.224	-6.736
		6265	Mid		-9.51	-9.57	-4.37	-13.260	-13.247	-6.783
		6420	High		-9.55	-9.61	-4.72	-12.847	-13.415	-6.961
HDRPM4	High	6107	Low	0.33	-6.61	-6.77	-1.52	-14.003	-13.817	-8.409
		6265	Mid		-6.63	-6.76	-1.52	-14.145	-14.077	-8.611
		6420	High		-6.61	-6.79	-1.84	-14.323	-13.973	-8.954
	Low	6107	Low		-6.61	-6.81	-1.54	-13.042	-12.762	-7.399
		6265	Mid		-6.64	-6.78	-1.54	-13.588	-13.414	-8.000
		6420	High		-6.63	-6.77	-1.84	-13.493	-13.335	-8.223
HDRPL8	High	6109	Low	0.23	-3.61	-3.62	1.56	-13.123	-13.423	-7.870
		6265	Mid		-3.65	-3.66	1.52	-12.735	-13.780	-7.826
		6417	High		-3.62	-3.67	1.22	-13.039	-13.565	-8.204
	Low	6109	Low		-3.61	-3.61	1.56	-12.700	-12.478	-7.187
		6265	Mid		-3.60	-3.66	1.54	-12.733	-12.361	-7.143
		6417	High		-3.66	-3.68	1.19	-12.701	-12.622	-7.571

Note:

EIRP MIMO Output Power (dBm) = Measured Conducted Power (dBm) (Ant 1 + Ant 2) + Un-Correlated Antenna Gain (dBi)

EIRP MIMO PSD (dBm/MHz) = Measured Conducted PSD (dBm/MHz) (Ant 1 + Ant 2) + Duty Factor (dB) + Correlated Antenna Gain (dBi)

