

# **TEST REPORT**

**Report Number:** 15496277-E24V2

**Applicant :** APPLE INC.  
1 APPLE PARK WAY  
CUPERTINO, CA 95104, U.S.A.

**Model :** A3258 (PARENT)  
A3519, A3520 (VARIANTS)

**Brand :** APPLE

**FCC ID :** BCG-E8947A (PARENT)  
BCG-E8951A, BCG-E8952A (VARIANTS)

**IC :** 579C-E8947A (PARENT)  
579C-E8951A, 579C-E8952A (VARIANTS)

**EUT Description :** SMARTPHONE

**Test Standard(s) :** FCC 47 CFR PART 25  
ISED RSS-170 ISSUE 4

**Date Of Issue:**  
August 14, 2025

**Prepared by:**  
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**REPORT REVISION HISTORY**

Rev.		Issue Date		Revisions		Revised By
V1		7/29/2025		Initial Issue		--
V2		8/14/2025		Report revised from reviewer's feedback for the following: <ul style="list-style-type: none"><li>• Pages 24, 28, 37, and 45 – updated KDB with correct version and revision no.</li><li>• Sec. 10- updated Table to include correct column label.</li></ul>		Bobby Bayani

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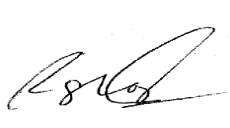
# 1. ATTESTATION OF TEST RESULTS

Applicant Name and Address	APPLE INC. 1 APPLE PARK WAY CUPERTINO, CA 95104, U.S.A.
Model	A3258 (PARENT) A3519, A3520 (VARIANTS)
Brand	APPLE
FCC ID	BCG-E8947A (PARENT) BCG-E8951A, BCG-E8952A (VARIANTS)
IC	579C-E8947A (PARENT) 579C-E8951A, 579C-E8952A (VARIANTS)
EUT Description	SMARTPHONE
Serial Number	RADIATED: KCCWVVG96F CONDUCTED: J6HHCZ0008U0000WEZ, J6HHCZ000EX0000WEZ FREQUENCY STABILITY(FS): CD6CGY12N4
Sample Receipt Date	(Conducted) 2025-02-05, (FS) 2025-02-27, (Radiated) 2025-05-29
Date Tested	2025-02-10 to 2025-06-11
Applicable Standards	FCC 47 CFR PART 25 ISED RSS-170 ISSUE 4
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 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.

Approved & Released By: 	Prepared & Reviewed By: 
Thu Chan Staff Engineer UL Verification Services, Inc.	Rolly Alegre Laboratory Engineer UL Verification Services, Inc.

## 2. SUMMARY OF TEST RESULTS

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. is only responsible for the validity of results after the integration of the data provided by the customer.

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

1. Antenna gain and type (see Section 6.4)
2. Cable loss (see Section 8)

Requirement Description	Requirement Clause Number (FCC)	Requirement Clause Number (ISED)	Result*	Remarks
RF Output Power Verification	25.204 (a)	RSS-170 §5.5	Complies	N/A
Occupied Bandwidth	2.1049	RSS-GEN	Complies	N/A
Emissions Mask - within 250% of Authorized Bandwidth	25.202 (f)(1)&(2)	RSS-170 §5.8 (a) (b)	Complies	N/A
Out of Band Emissions	25.202 (f)(3)	RSS-170 §5.8 (c)	Complies	N/A
Additional Unwanted Emission (1559-1610MHz)	25.216 (c)&(g) FCC 03-283	RSS-170 §5.9.1	Complies	N/A
Carrier-Off State Emissions (1559-1610MHz)	25.216 (i) FCC 03-283	RSS-170 §5.10	Complies	N/A
Frequency Stability	25.202 (d)	RSS-170 §5.3	Complies	N/A

## 3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with the following.

FCC published lists of [measurement procedures](#) for compliance testing.

ISED published lists of [normative test standards and acceptable alternatives procedures](#).

- ANSI C63.26:2015
- ANSI/TIA-603-E (2016)
- FCC 47 CFR Part 2, Part 25
- [FCC KDB 971168 D01](#) : Power Meas License Digital Systems (ISED acceptable alternative procedure)
- [FCC KDB 971168 D02](#) : Misc Rev Approv License Devices
- [FCC KDB 412172 D01](#) : Determining ERP and EIRP
- ISED RSS-GEN ISSUE 5 + A1 + A2, RSS-170 ISSUE 4

## 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
<input checked="" type="checkbox"/>	Building 1: 47173 Benicia Street, Fremont, CA 94538 USA	US0104	2324A	550739
<input checked="" type="checkbox"/>	Building 2: 47266 Benicia Street, Fremont, CA 94538 USA			
<input checked="" type="checkbox"/>	Building 3: 843 Auburn Court, Fremont, CA 94538 USA			
<input type="checkbox"/>	Building 4: 47658 Kato Rd, Fremont, CA 94538 USA			
<input type="checkbox"/>	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 <sub>Lab</sub>
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)

$$= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Preamp Gain (dB)}$$

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

## 6. EQUIPMENT UNDER TEST

### 6.1. DESCRIPTION OF EUT

The Apple iPhone is a smartphone with cellular GSM, GPRS, EGPRS, WCDMA, LTE, 5G NR1, 5G NR2, 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 device is not user-serviceable and requires special tools to disassemble.

### 6.2. MAXIMUM OUTPUT POWER

#### EIRP/ERP TEST PROCEDURE

ANSI C63.26:2015

KDB 971168 D01 Section 5.6

$$\text{EIRP} = \text{PMeas} + \text{GT} - \text{LC}$$

where: EIRP = effective isotropic radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm);

PMeas = measured transmitter output power or PSD, in dBm or dBW;

GT = gain of the transmitting antenna, in dBi (EIRP);

LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

For devices utilizing multiple antennas, KDB 662911 provides guidance for determining the effective array transmit antenna gain term to be used in the above equation.

The transmitter has a maximum average conducted and EIRP output powers as follows:

#### **FCC Part 25 & ISM RSS-170 (1610 - 1626.5MHz):**

Frequency (MHz)	Conducted Average Power (dBm)	Antenna Gain (dBi)	Limit (W)	EIRP		99% BW (kHz)	Emission Designator
				(dBm)	(W)		
1610.17	27.93	-3.2	10000	24.73	0.297	201.25	201KG1D
1618.40	<b>28.00</b>		10000	24.80	0.302	202.37	202KG1D
1626.03	27.93		10000	24.73	0.297	201.99	202KG1D



### 6.3. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was FW Version: 23A258.

### 6.4. MAXIMUM ANTENNA GAIN

The antenna(s) gains as provided by the manufacturer are as follows:

Frequency Range (MHz)	Antenna Gain ANT 1 (dBi)	Antenna Gain ANT 4 (dBi)
1610-1626.5	-3.3	-3.2

### 6.5. WORST-CASE CONFIGURATION AND MODE

The EUT was investigated in three orthogonal orientations: X (Flatbed), Y (Landscape), and Z (Portrait) on both ANT 1 and ANT 4. It was determined that Y (Landscape) orientation was the worst-case orientation with AC/DC adapter for both ANT 1 and ANT 4.

The emissions mask tests were performed based on declared authorized bandwidths of 200kHz, 230kHz and 280kHz.

Radiated spurious emissions below 1GHz were performed with the highest output power on both ANT 1 and ANT 4 as worst-case scenario.

Radiated spurious emissions below 30MHz were investigated and there were no emissions found with less than 20dB of margin below the specified emissions limits.

For simultaneous transmission of multiple channels in the 2.4GHz/5GHz WLAN, tests were conducted for various configurations having the highest power, least separation in frequencies and widest operation bandwidths. No noticeable new emission was found.

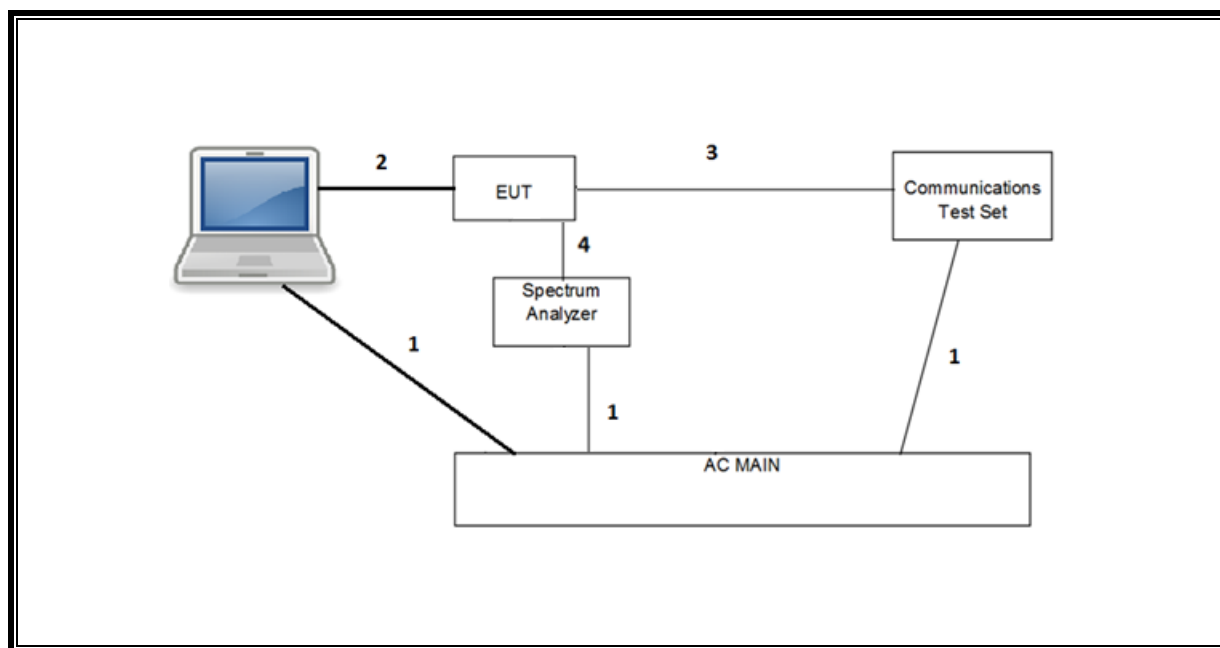
## 6.6. DESCRIPTION OF TEST SETUP

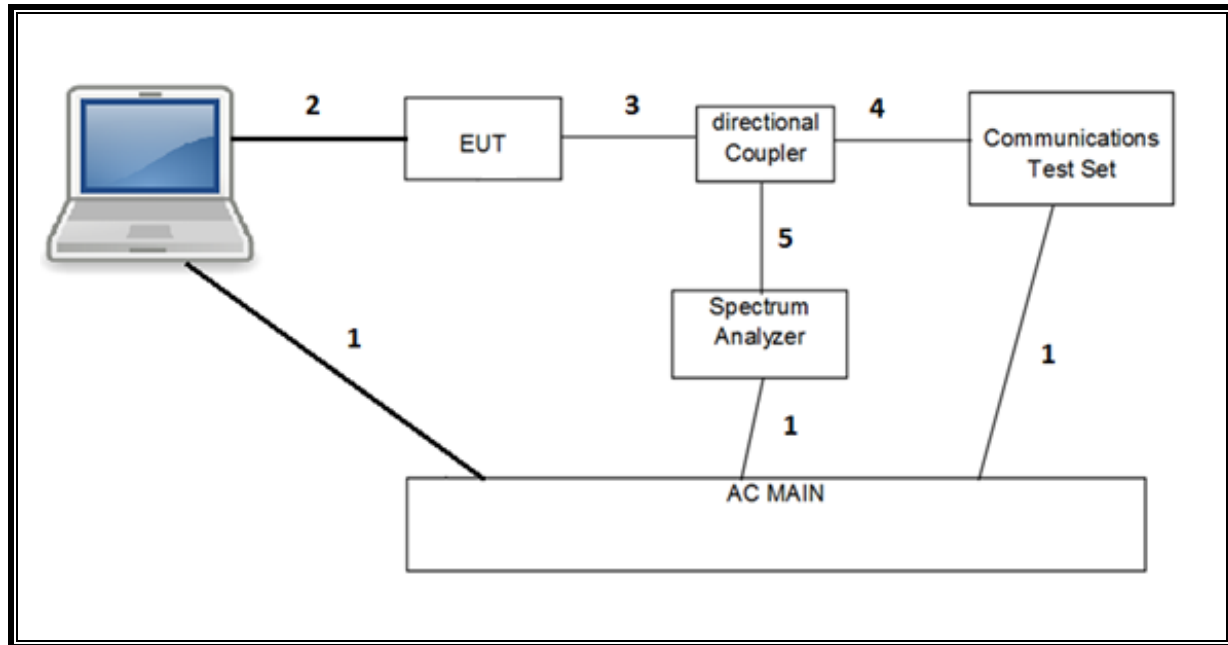
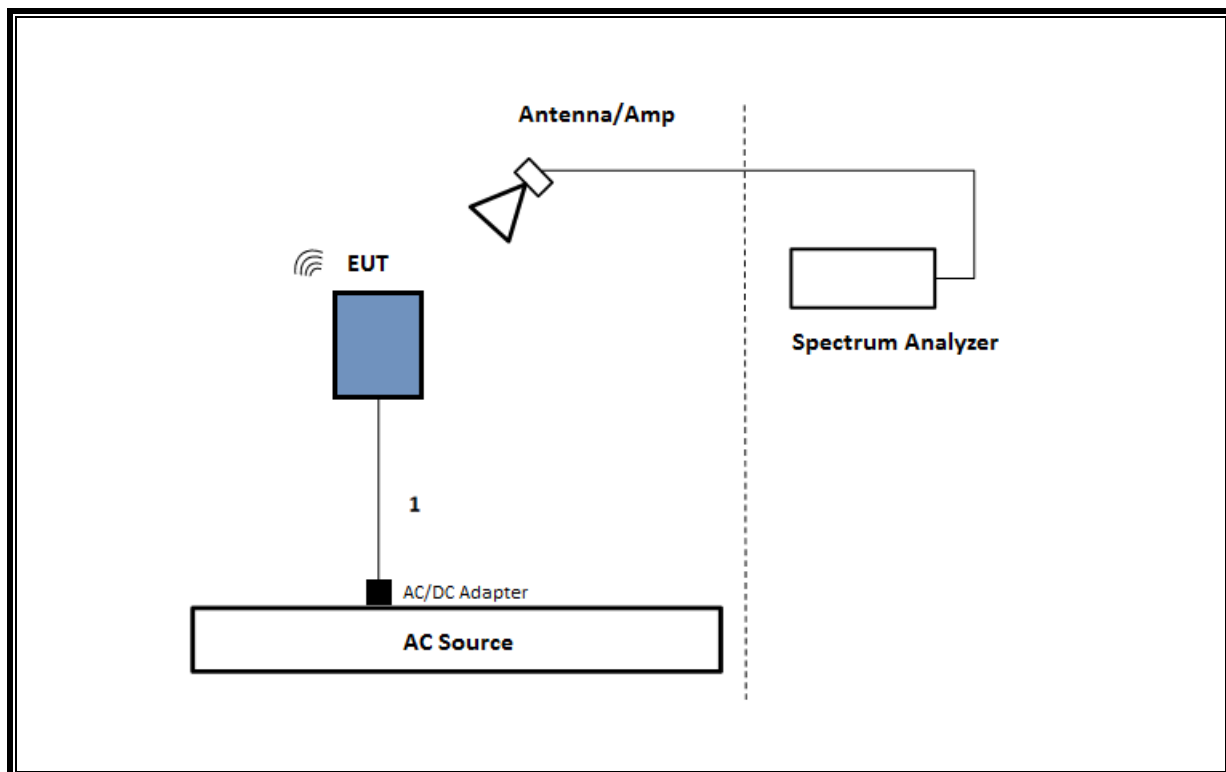
SUPPORT TEST EQUIPMENT				
Description	Manufacturer	Model	Serial Number	FCC ID/ DoC
Laptop	Apple	MacBook Pro	FVFWKENDHV29	DoC
Brisket – USB Adapter	Apple	Brisket UART Cable Pigtail	F2010M20000798	DoC
USB-C Power Adapter	Apple	A2305	F162163404UPM0685	DoC
USB-C 96W Power Adapter	Apple	A2166	C4H232105JPPM0WAH	DoC

I/O CABLES (RF CONDUCTED TEST)						
Cable No.	Port	# Of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	3	US 115V	Un-shielded	2.0	N/A
2	USB	1	Type-C	Shielded	2.0	N/A
3	RF In/Out	1	SMA	Shielded	1.0	N/A
4	RF In/Out	1	SMA	Shielded	0.5	N/A
5	RF In/Out	1	SMA Adapter	N/A	N/A	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	Type-C	Un-shielded	1.0	N/A

### CONDUCTED SETUP ANT 1



**CONDUCTED SETUP ANT 4****RADIATED SETUP**

## 7. TEST AND MEASUREMENT EQUIPMENT

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

Description	Manufacturer	Model	ID Num	Cal Due
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	169933	02-28-2026
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	223462	02-28-2026
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	169937	02-28-2026
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	169933	02-28-2026
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	226673	02-28-2026
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	200784	03-31-2027
RF Filter Box, 1-18GHz	UL-FR1	Frankenstein	231874	06-29-2026
RF Filter Box, 1-18GHz	UL-FR1	N/A	168534	02-28-2026
Antenna, Broadband Hybrid, 30MHz to 2GHz	Sunol Sciences Corp.	JB3	85150	12-30-2025
Antenna, Passive Loop 30Hz - 1MHz	ELECTRO-METRICS	EM-6871	29637	09-30-2026
Antenna, Passive Loop 100kHz to 30MHz	ELECTRO-METRICS	EM-6872	29640	09-30-2026
*Amplifier, 9KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310N	170649	08-31-2025
Directional Coupler	KRYTAR	152610	254457	10-31-2025
Directional Coupler	KRYTAR	152610	198817	11-30-2025
* Environmental Chamber	Cincinnati Sub Zero – Division of Weiss Technik	ZPHS-8-3.5-SCT/WC	82472	08-31-2025
Spectrum Analyzer, PXA, 3Hz to 50GHz	Keysight Technologies Inc.	N9030A	80400	01-31-2026
*Wideband Communication Test Set, Call Box	Rohde & Schwarz	CMW500	A0U396816	07-12-2025

UL AUTOMATION SOFTWARE			
Radiated Software	UL	UL EMC	Ver 9.5, May 1, 2023

### NOTES:

1. \* = Testing is completed before equipment expiration date.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

## 8. RF OUTPUT POWER MEASUREMENT

### LIMITS

FCC: §25.204

(a) In bands shared coequally with terrestrial radio communication services, the equivalent isotropically radiated power transmitted in any direction towards the horizon by an earth station, other than an ESV, operating in frequency bands between 1 and 15 GHz, shall not exceed the following limits except as provided for in paragraph (c) of this section:

+ 40 dBW in any 4 kHz band for  $\theta \leq 0^\circ$

+ 40 + 3 $\theta$  dBW in any 4 kHz band for  $0^\circ < \theta \leq 5^\circ$

where  $\theta$  is the angle of elevation of the horizon viewed from the center of radiation of the antenna of the earth station and measured in degrees as positive above the horizontal plane and negative below it.

ISED RSS-170: 5.5

Mobile Earth Stations (MESs)

The application for MES certification shall state the MES e.i.r.p. that is necessary for satisfactory communication. The maximum permissible e.i.r.p. will be the stated e.i.r.p. plus a 2 dB margin. If a detachable antenna is used, the certification application shall state the recommended antenna type and manufacturer, the antenna gain and the maximum transmitter output power at the antenna terminal.

### TEST PROCEDURE

The transmitter output is connected to a wideband power meter/sensor which is greater than the occupied bandwidth as worst-case scenario, also the total power readings still comply with the required limit.

The cable assembly insertion loss of 12.16 dB (ANT 1) / 12.81 dB (ANT 4) (including 10.7 dB coupler and 1.46 dB cable (ANT 1) / 10 dB pad and 2.81 dB cable (ANT 4) was entered as an offset in the power meter to allow for a gated average reading of power.

### RESULTS

<b>Test Engineer:</b>	26118 SB
<b>Test Date:</b>	2025-02-10, 2025-02-12

Test Frequency (MHz)	Conducted Average Power (dBm)		Antenna Gain (dBi)		EIRP Average Power (dBm)	
	ANT 1	ANT 4	ANT 1	ANT 4	ANT 1	ANT 4
1610.17	27.93	27.93	-3.3	-3.2	24.63	24.73
1618.40	27.96	<b>28.00</b>			24.66	<b>24.80</b>
1626.03	27.87	27.93			24.57	24.73

## 9. CONDUCTED TEST RESULTS

### 9.1. OCCUPIED BANDWIDTH

#### RULE PART(S)

FCC: §2.1049  
ISED RSS-170 and RSS-GEN

#### LIMITS

For reporting purposes only.

#### TEST PROCEDURE

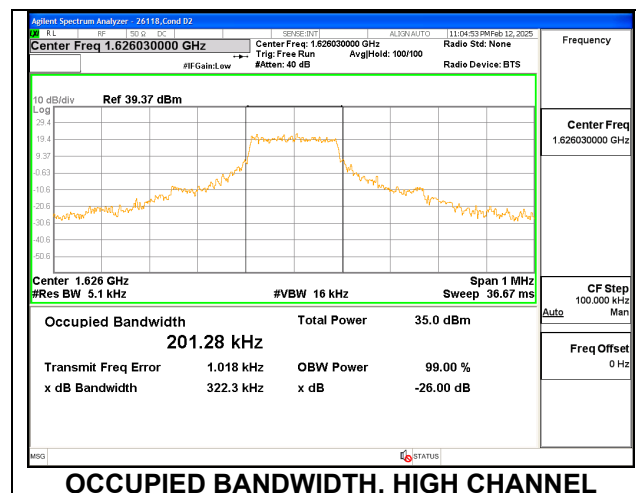
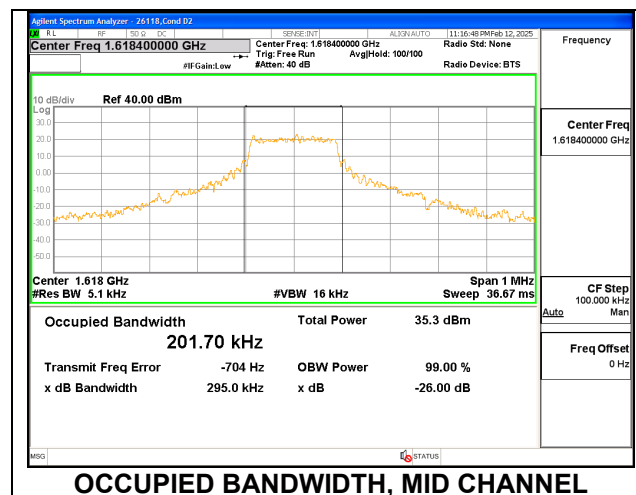
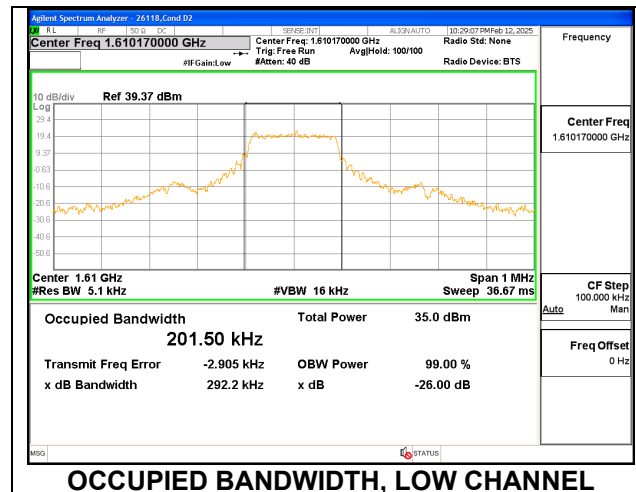
The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the middle channel in each band. The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set  $\geq 3 \times$  RBW. The 99% bandwidths were measured and recorded.

#### RESULTS

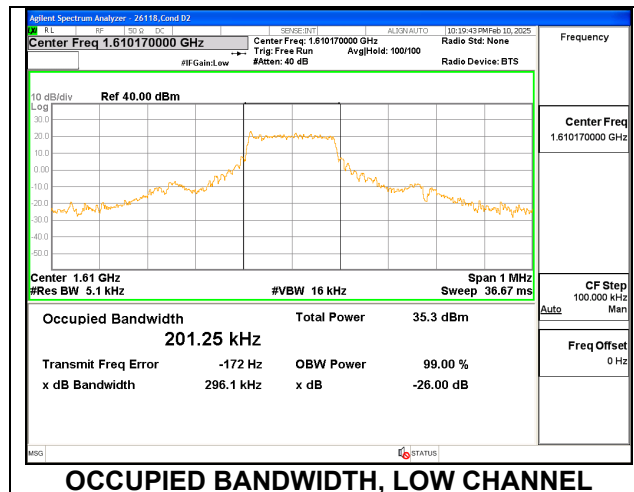
<b>Test Engineer:</b>	26118 SB
<b>Test Date:</b>	2025-02-10, 2025-02-12

<b>Test Frequency (MHz)</b>	<b>99% Bandwidth (kHz) ANT 1</b>	<b>99% Bandwidth (kHz) ANT 4</b>
1610.17	201.50	201.25
1618.40	201.70	202.37
1626.03	201.28	201.99

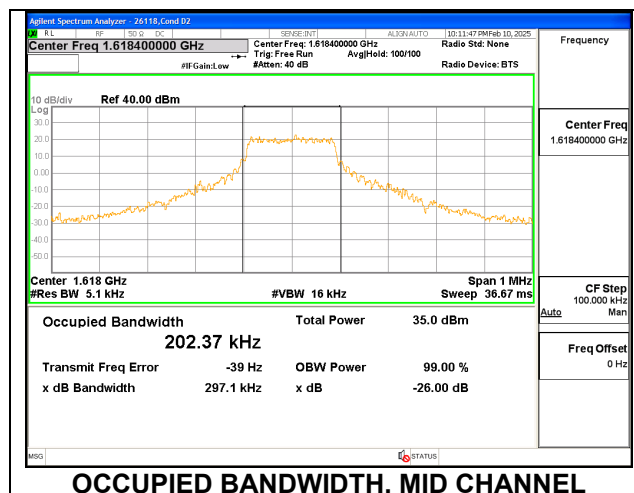
## 9.1.1. ANT 1



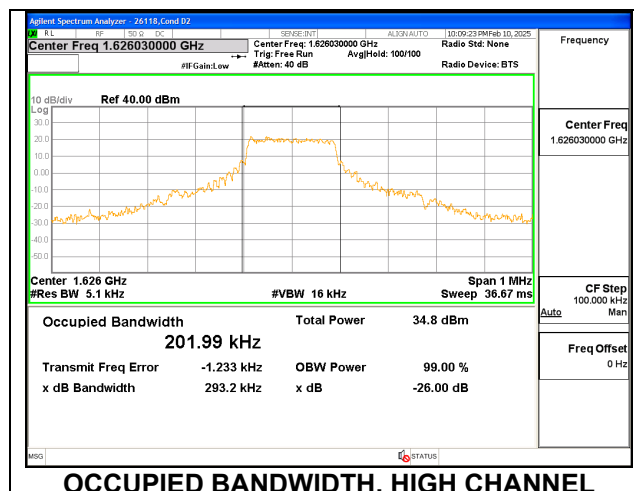
## 9.1.2. ANT 4



OCCUPIED BANDWIDTH, LOW CHANNEL



OCCUPIED BANDWIDTH, MID CHANNEL



OCCUPIED BANDWIDTH, HIGH CHANNEL



## 9.2. EMISSIONS MASK WITHIN 250% OF AUTHORIZED BANDWIDTH

### LIMITS

FCC §25.202 and ISSED RSS-170: 5.8

(f) Emission limitations. Except for SDARS terrestrial repeaters and as provided for in paragraph (i), the mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the schedule set forth in paragraphs (f)(1) through (f)(4) of this section. The out-of-band emissions of SDARS terrestrial repeaters shall be attenuated in accordance with the schedule set forth in paragraph (h) of this section.

(1) In any 4 kHz band, the center frequency of which is removed from the assigned frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: 25 dB;

(2) In any 4 kHz band, the center frequency of which is removed from the assigned frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: 35 dB;

### TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The channel edge emissions were measured on the low, mid and high channels. The limits within 250% of the authorized bandwidth are relative to the total in-band (channel) power. The measurement bandwidth (RBW) is set to  $\geq 4$  kHz and VBW set to at least 3 times the RBW. To measure the average value of the emissions the detector is set to rms while observing the minimum required number of points as detailed in ANSI C63.26 for average rms measurements. The sweep time is set to 2ms multiplied by the number of points to obtain the average over 2ms. Multiple sweeps with max hold enabled are made to capture the maximum average value.

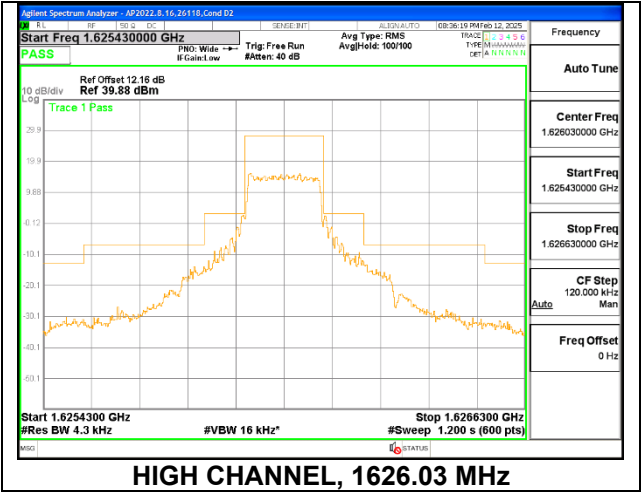
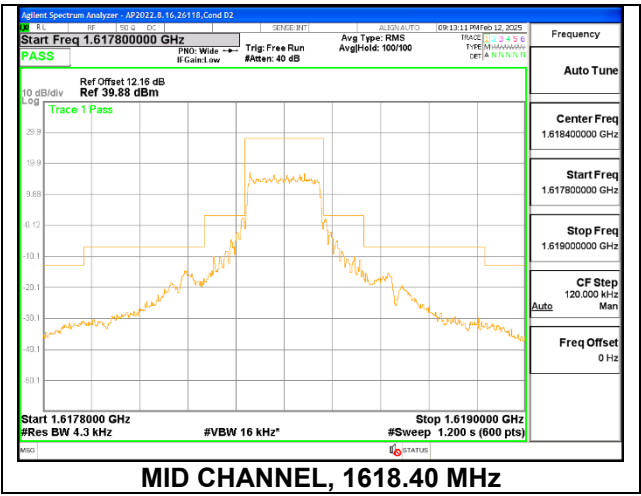
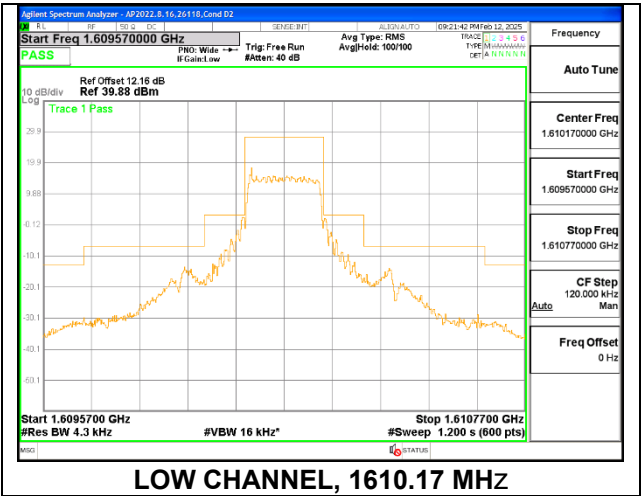
### RESULTS

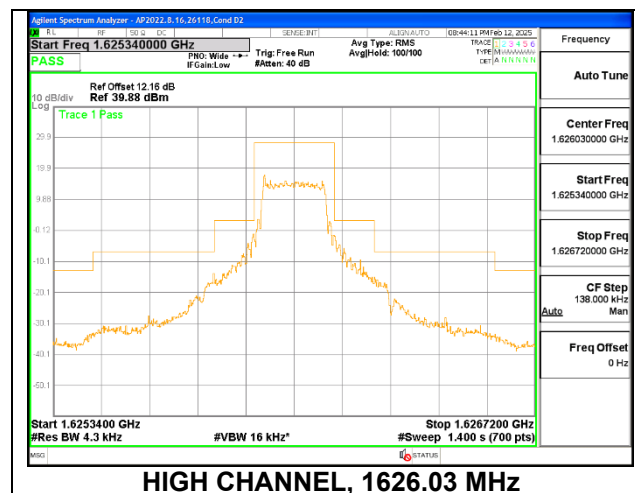
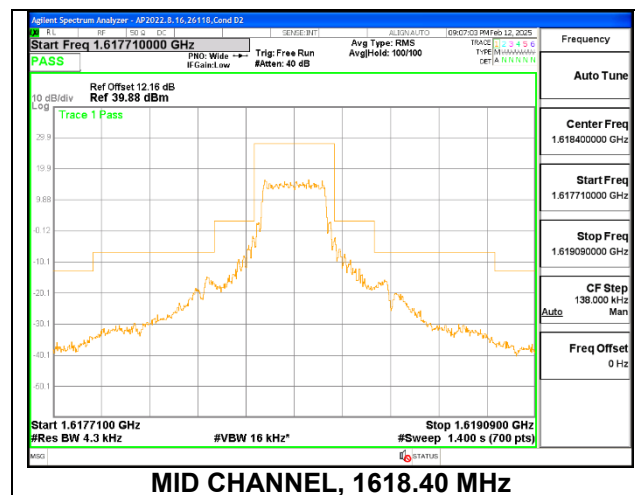
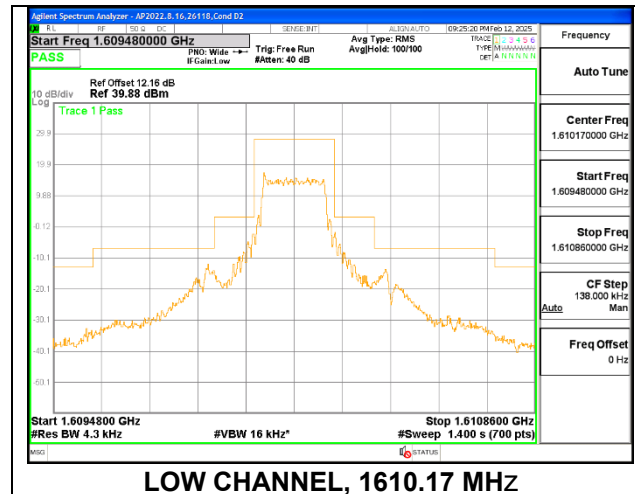
The tests were performed based on declared authorized bandwidths of 200 kHz, 230 kHz and 280 kHz.

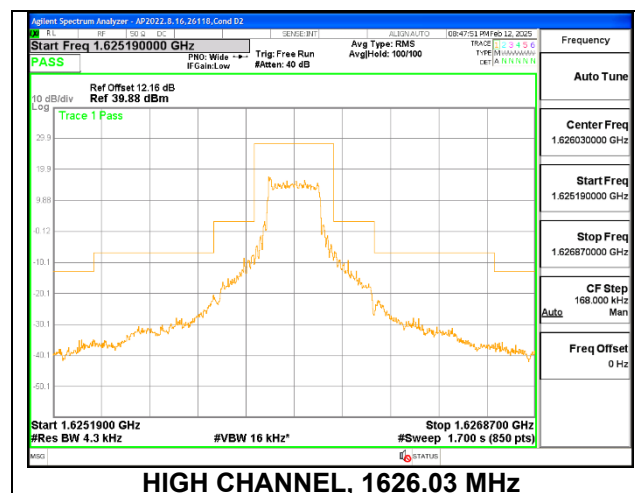
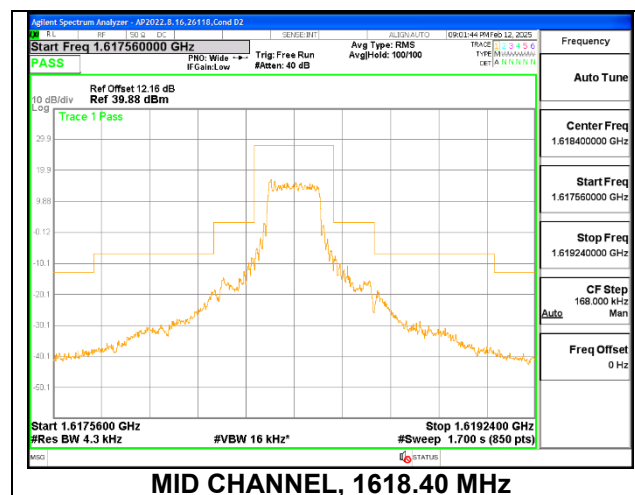
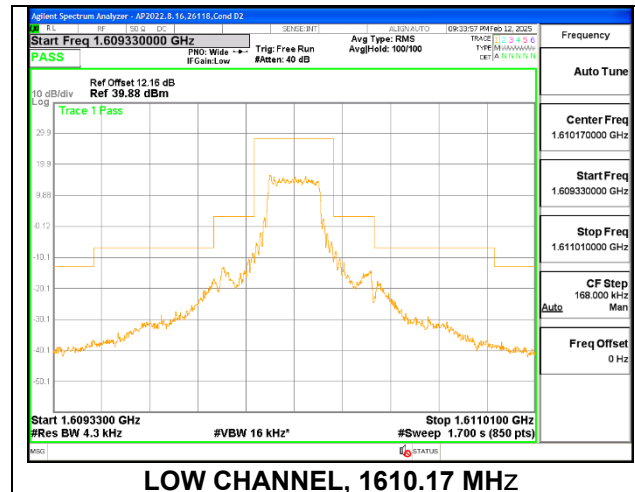
<b>Test Engineer:</b>	26118 SB
<b>Test Date:</b>	2025-02-10, 2025-02-12

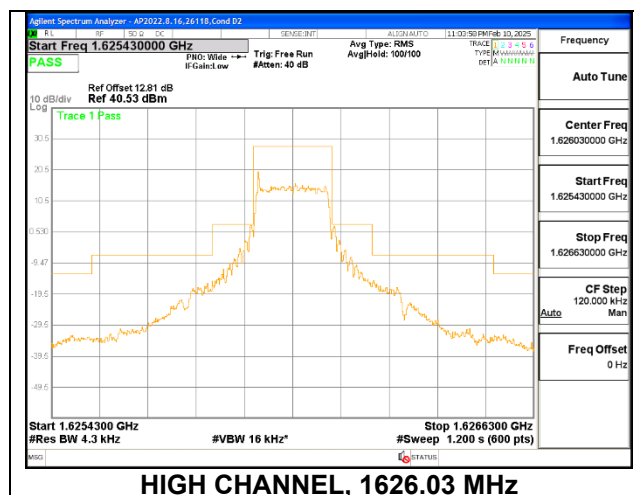
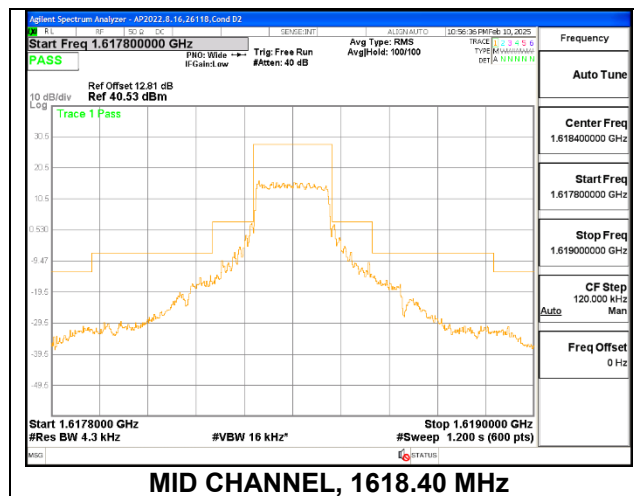
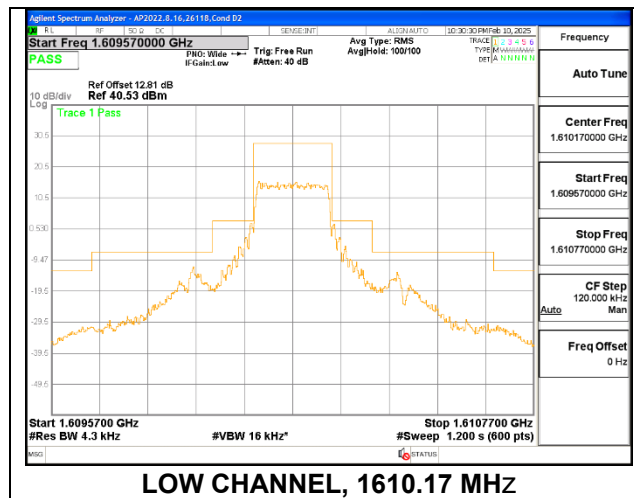
9.2.1. ANT 1

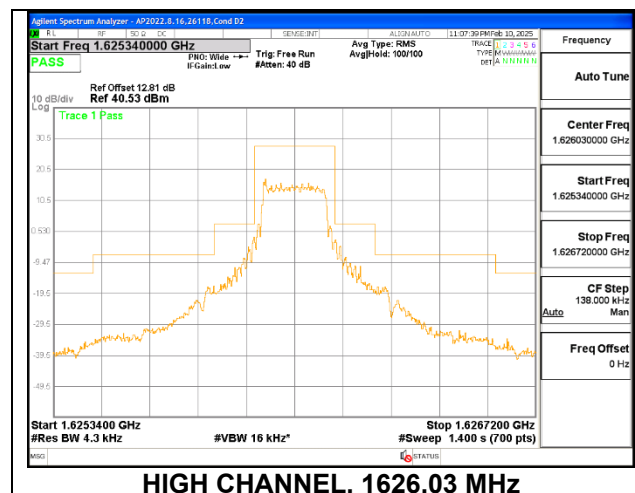
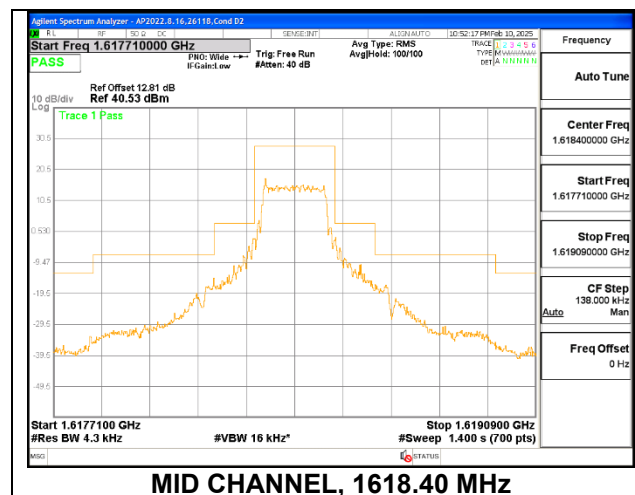
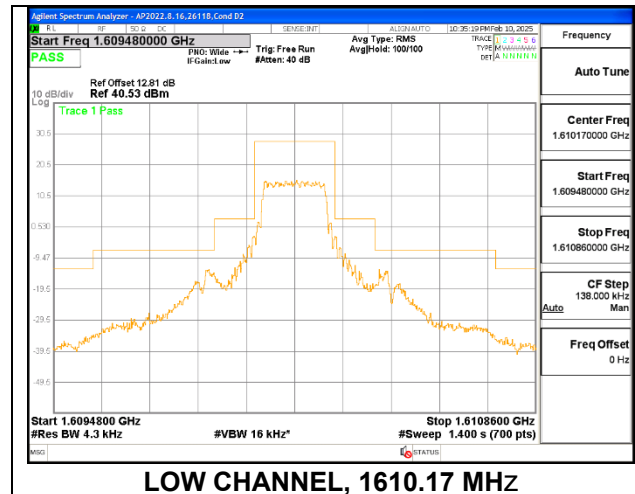
200 kHz Authorized Bandwidth

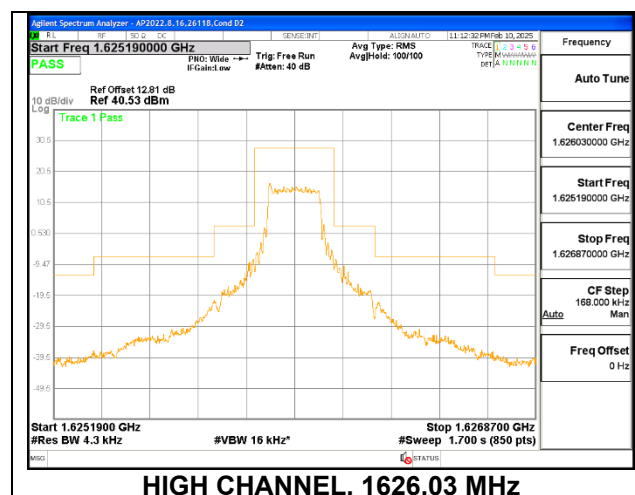
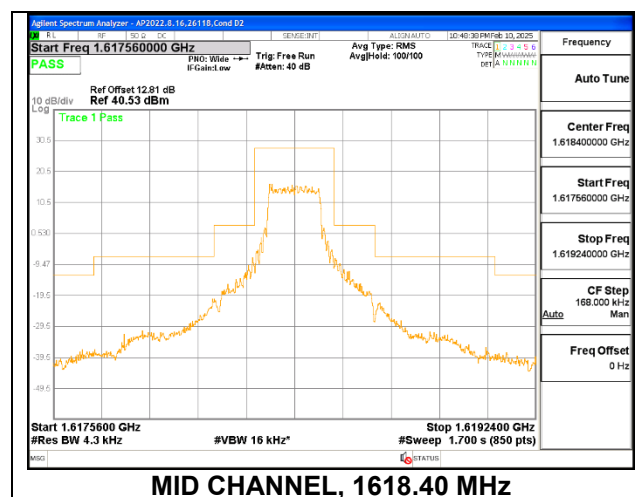
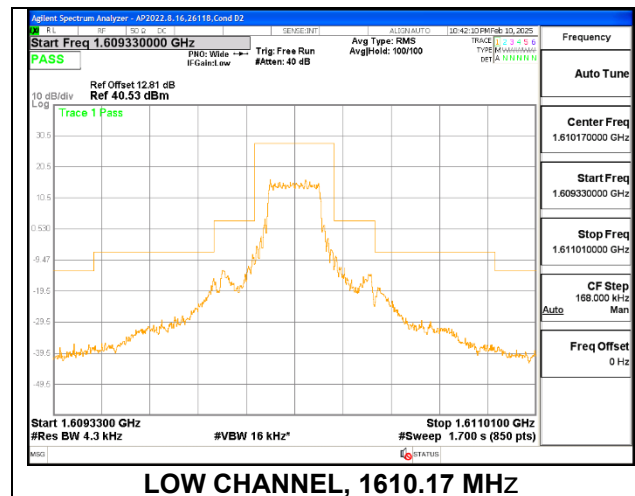


**230 kHz Authorized Bandwidth**

**280 kHz Authorized Bandwidth**

**9.2.2. ANT 4****200 kHz Authorized Bandwidth**

**230 kHz Authorized Bandwidth**

**280 kHz Authorized Bandwidth**

### 9.3. OUT OF BAND EMISSIONS

#### LIMITS

FCC §25.202 and ISSED RSS-170: 5.8

(f) Emission limitations. Except for SDARS terrestrial repeaters and as provided for in paragraph (i), the mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the schedule set forth in paragraphs (f)(1) through (f)(4) of this section. The out-of-band emissions of SDARS terrestrial repeaters shall be attenuated in accordance with the schedule set forth in paragraph (h) of this section.

(3) In any 4 kHz band, the center frequency of which is removed from the assigned frequency by more than 250 percent of the authorized bandwidth: An amount equal to 43 dB plus 10 times the logarithm (to the base 10) of the transmitter power in watts.

#### TEST PROCEDURE

KDB 971168 D01 v03r01/D02 v02r02

For each out of band emissions measurement:

- Set display line at -13 dBm (the limit of  $43 + 10\log(P)$ )
- Set RBW  $\geq 4\text{kHz}$  and VBW  $\geq 3 \times \text{RBW}$  with peak detector for all measurements. The limit is an average limit so any emissions that exceed the limit using the peak detector are measured using rms detection with an averaging time of 2ms.

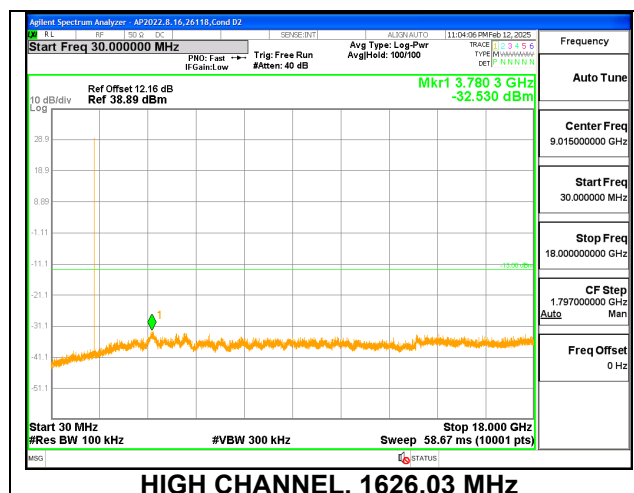
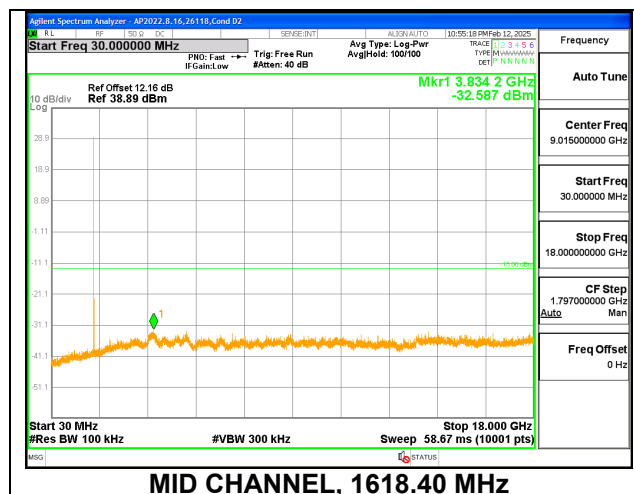
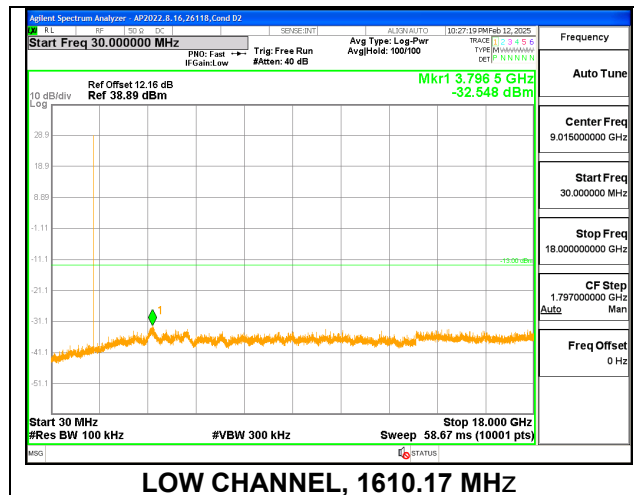
#### RESULTS

The conducted spurious emissions were performed with both antenna 1 and 4.

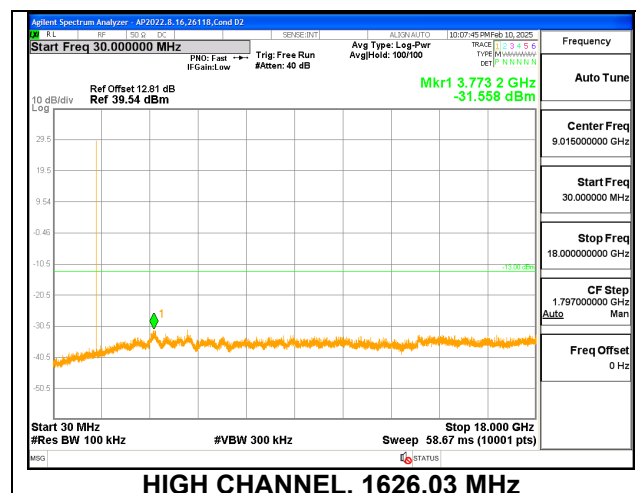
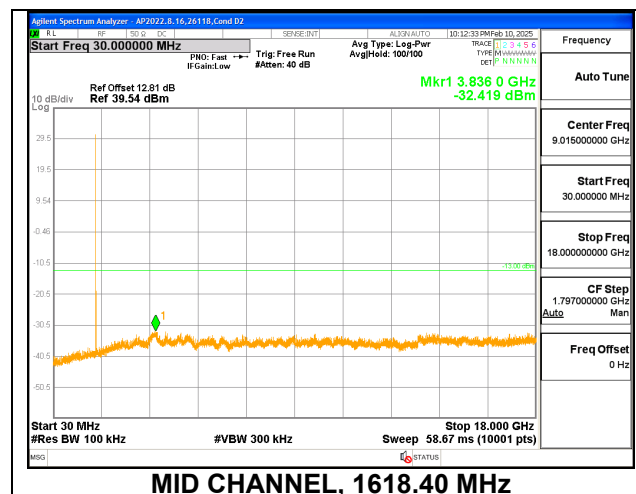
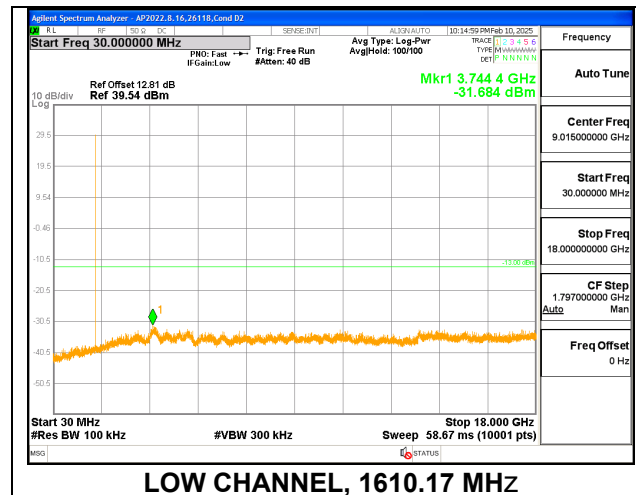
<b>Test Engineer:</b>	26118 SB
<b>Test Date:</b>	2025-02-10, 2025-02-12



## 9.3.1. ANT 1



## 9.3.2. ANT 4



## 10. RADIATED TEST RESULTS

### Radiated measurement using the Field Strength Method

Using the test configuration shown in Figure 6 below, we measure the radiated emissions directly from the EUT and convert the measured field strength or received power to EIRP, as required, for comparison to the applicable limits. As stated in 5.5.1 of ANSI C63.26-2015, the field strength measurement method using a test site validated to the requirements of ANSI C63.4 is an alternative to the substitution measurement method.

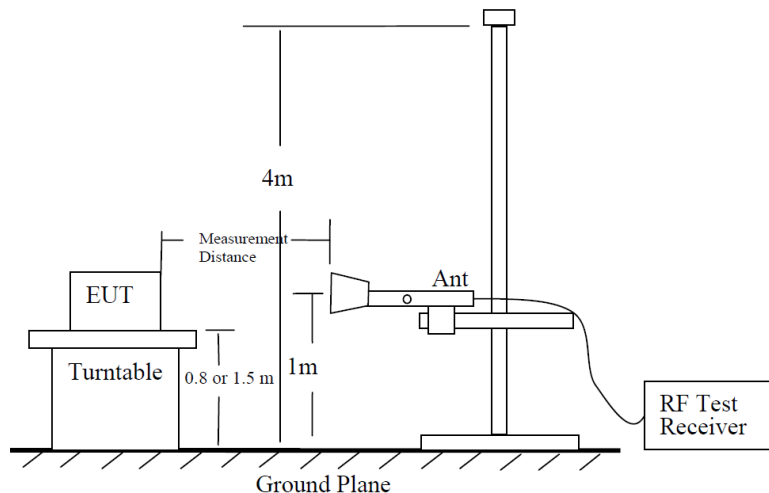


Figure 6 —Test site-up for radiated ERP and/or EIRP measurements

### Radiated Power Measurement Calculation According to ANSI C63.26-2015

- a)  $E \text{ (dB}\mu\text{V/m)} = \text{Measured amplitude level (dB}\mu\text{V)} + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$
- b)  $E \text{ (dB}\mu\text{V/m)} = \text{Measured amplitude level (dBm)} + 107 + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$
- c)  $E \text{ (dB}\mu\text{V/m)} = \text{EIRP (dBm)} - 20 \cdot \log(D) + 104.8$ ; where D is the measurement distance (in the far field region) in m
- d)  $\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20 \cdot \log(D) - 104.8$ ; where D is the measurement distance (in the far field region) in m

So, from d)

The measuring distance is usually at 3m, then  $20 \cdot \log(3) = 9.5424$

Then,  $\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 9.5424 - 104.8 = E \text{ (dB}\mu\text{V/m)} - 95.2576$

## 10.1. FIELD STRENGTH OF SPURIOUS RADIATION

### LIMITS

FCC §25.202 and ISSED RSS-170: 5.8

(f) Emission limitations. Except for SDARS terrestrial repeaters and as provided for in paragraph (i), the mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the schedule set forth in paragraphs (f)(1) through (f)(4) of this section. The out-of-band emissions of SDARS terrestrial repeaters shall be attenuated in accordance with the schedule set forth in paragraph (h) of this section.

(3) In any 4 kHz band, the center frequency of which is removed from the assigned frequency by more than 250 percent of the authorized bandwidth: An amount equal to 43 dB plus 10 times the logarithm (to the base 10) of the transmitter power in watts;

### TEST PROCEDURE

KDB 971168 D01 v03r01/D02 v02r02

For each out of band emissions measurement:

- Set display line at -13 dBm (the limit of  $43 + 10\log(P)$ )
- Set RBW  $\geq 4\text{kHz}$  and VBW  $\geq 3 \times \text{RBW}$  with peak detector for all measurements. The limit is an average limit so any emissions that exceed the limit using the peak detector are measured using rms detection with an averaging time of 2ms.

### RESULTS

Plots are provided for the center channel. Tabular data for all channels is presented.

**10.1.1. ANT 1 (Above 1 GHz)**

<b>Date:</b>	2025-05-29
<b>Test Engineer:</b>	111411 MA
<b>Configuration:</b>	EUT + Charger
<b>Mode:</b>	TX
<b>Chamber:</b>	03-RDE-A

**LOW CHANNEL DATA**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB/m)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*3.784766	45.26	Pk	33.4	-95.2	-46.92	-63.46	-13	-50.46	0-360	150	H
2	*3.781463	47.16	Pk	33.4	-95.2	-46.9	-61.54	-13	-48.54	0-360	150	V
3	4.830475	60.92	Pk	34	-95.2	-48.05	-48.33	-13	-35.33	354	148	H
4	4.830508	58.82	Pk	34	-95.2	-48.05	-50.43	-13	-37.43	170	240	V
5	*6.249369	45.44	Pk	35.5	-95.2	-45.5	-59.76	-13	-46.76	0-360	150	H
6	*6.238044	43.83	Pk	35.5	-95.2	-45.6	-61.47	-13	-48.47	0-360	150	V

Pk - Peak detector

\* - Noise floor

**MID CHANNEL DATA**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB/m)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*3.391694	45.71	Pk	32.8	-95.2	-46.9	-63.59	-13	-50.59	0-360	149	H
2	*3.391694	45.73	Pk	32.8	-95.2	-46.9	-63.57	-13	-50.57	0-360	149	V
3	4.855257	64.01	Pk	34	-95.2	-48.05	-45.24	-13	-32.24	347	141	H
4	4.855281	61.57	Pk	34	-95.2	-48.06	-47.69	-13	-34.69	183	278	V
5	*6.400369	43.98	Pk	35.6	-95.2	-45.44	-61.06	-13	-48.06	0-360	149	H
6	*6.387156	43.38	Pk	35.6	-95.2	-45.5	-61.72	-13	-48.72	0-360	149	V

Pk - Peak detector

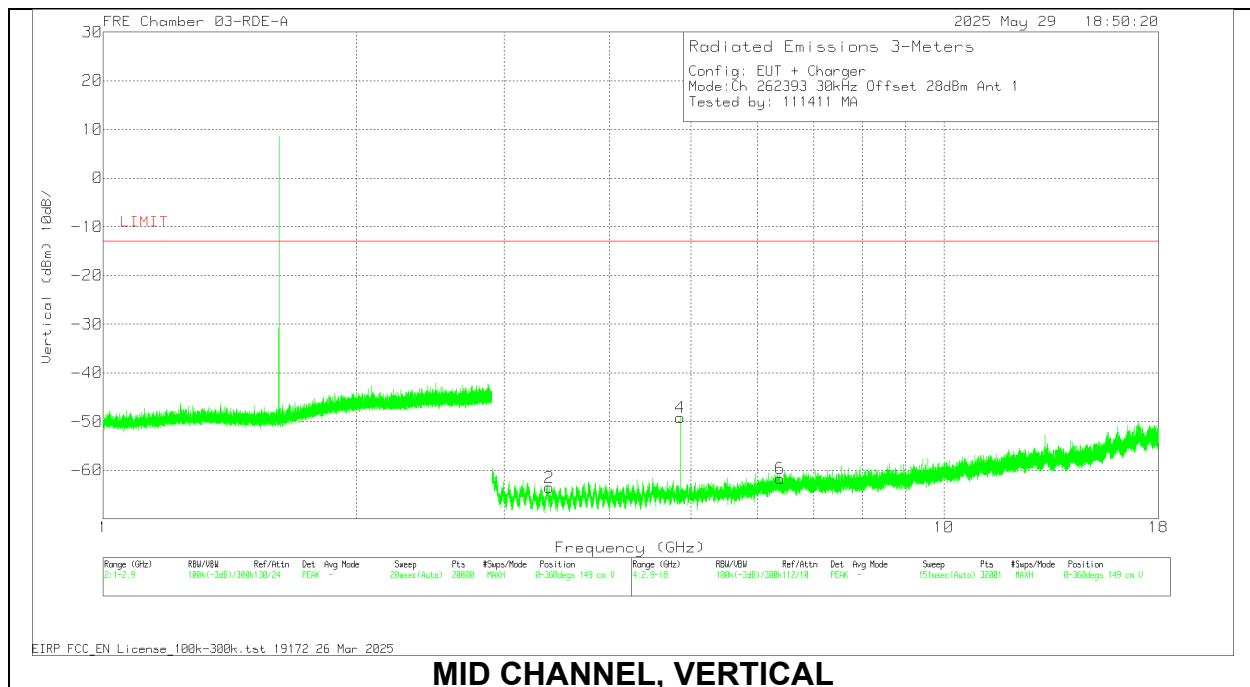
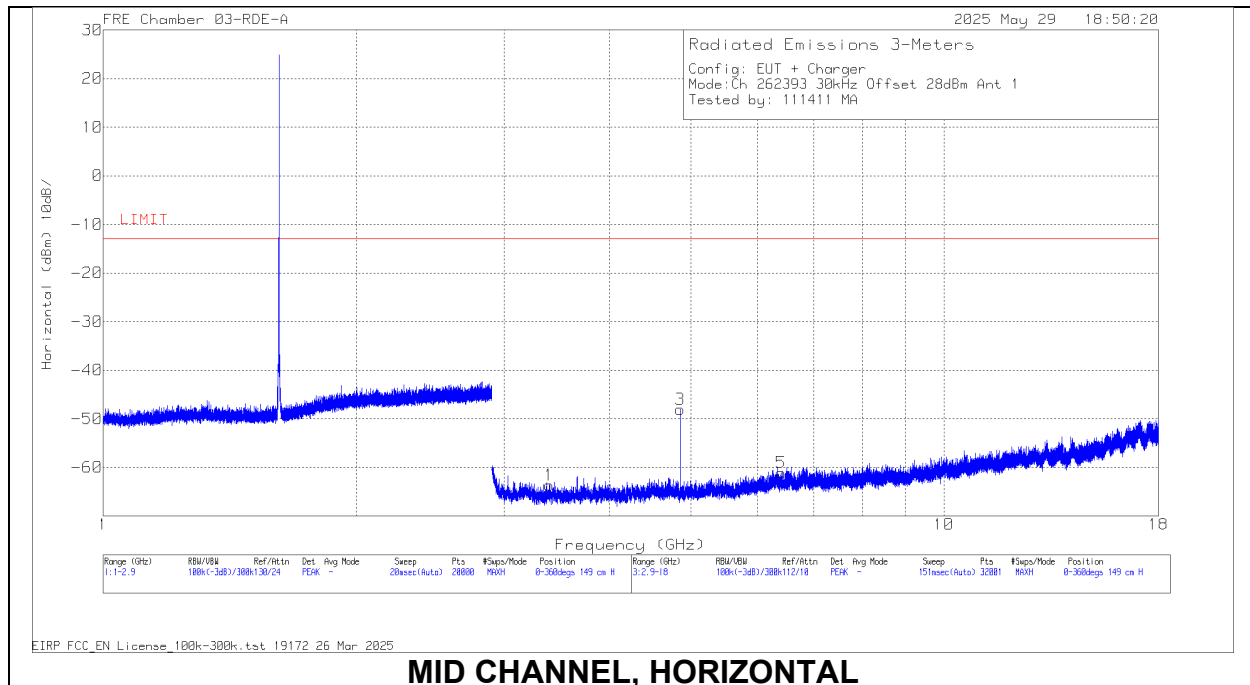
\* - Noise floor

**HIGH CHANNEL DATA**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB/m)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*3.029294	47.01	Pk	32.9	-95.2	-47.3	-62.59	-13	-49.59	0-360	149	H
2	*3.040147	48.44	Pk	32.9	-95.2	-47.21	-61.07	-13	-48.07	0-360	149	V
3	4.878071	66.11	Pk	34	-95.2	-47.9	-42.99	-13	-29.99	350	110	H
4	4.878069	65.7	Pk	34	-95.2	-47.9	-43.4	-13	-30.4	181	219	V
5	*6.608466	44.67	Pk	35.8	-95.2	-45.45	-60.18	-13	-47.18	0-360	149	H
6	*6.610825	44.57	Pk	35.8	-95.2	-45.5	-60.33	-13	-47.33	0-360	149	V

Pk - Peak detector

\* - Noise floor



**10.1.2. ANT 4 (Above 1 GHz)**

<b>Date:</b>	2025-05-29
<b>Test Engineer:</b>	111411 MA
<b>Configuration:</b>	EUT + Charger
<b>Mode:</b>	TX
<b>Chamber:</b>	03-RDE-A

**LOW CHANNEL DATA**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB/m)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 4.738897	47.54	Pk	34.1	-95.2	-48.2	-61.76	-13	-48.76	0-360	149	H
4	* 4.736066	45.94	Pk	34.1	-95.2	-48.2	-63.36	-13	-50.36	0-360	149	V
2	*3.287881	45.26	Pk	32.8	-95.2	-46.49	-63.63	-13	-50.63	0-360	149	V
1	*3.288353	44.7	Pk	32.8	-95.2	-46.5	-64.2	-13	-51.2	0-360	149	H
6	*6.524472	43.49	Pk	35.8	-95.2	-45.5	-61.41	-13	-48.41	0-360	149	V
5	*6.53155	43.75	Pk	35.8	-95.2	-45.4	-61.05	-13	-48.05	0-360	149	H

Pk - Peak detector

\* - Noise floor

**MID CHANNEL DATA**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB/m)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 4.507206	46.55	Pk	34	-95.2	-47.7	-62.35	-13	-49.35	0-360	149	H
4	* 4.510981	47.96	Pk	34	-95.2	-47.8	-61.04	-13	-48.04	0-360	149	V
1	*3.132163	46.72	Pk	32.9	-95.2	-47.18	-62.76	-13	-49.76	0-360	149	H
2	*3.144903	46.63	Pk	32.9	-95.2	-47.09	-62.76	-13	-49.76	0-360	149	V
6	*6.003994	45.52	Pk	35.4	-95.2	-46.1	-60.38	-13	-47.38	0-360	149	V
5	*6.012488	43.7	Pk	35.4	-95.2	-45.9	-62	-13	-49	0-360	149	H

Pk - Peak detector

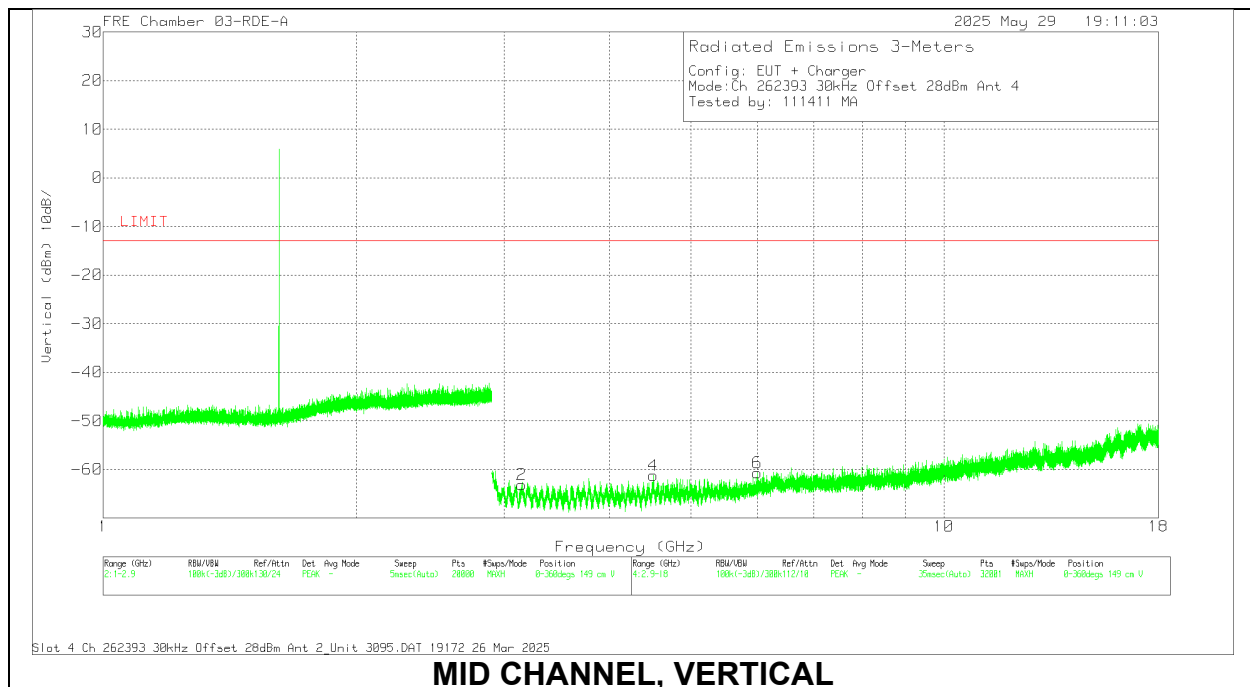
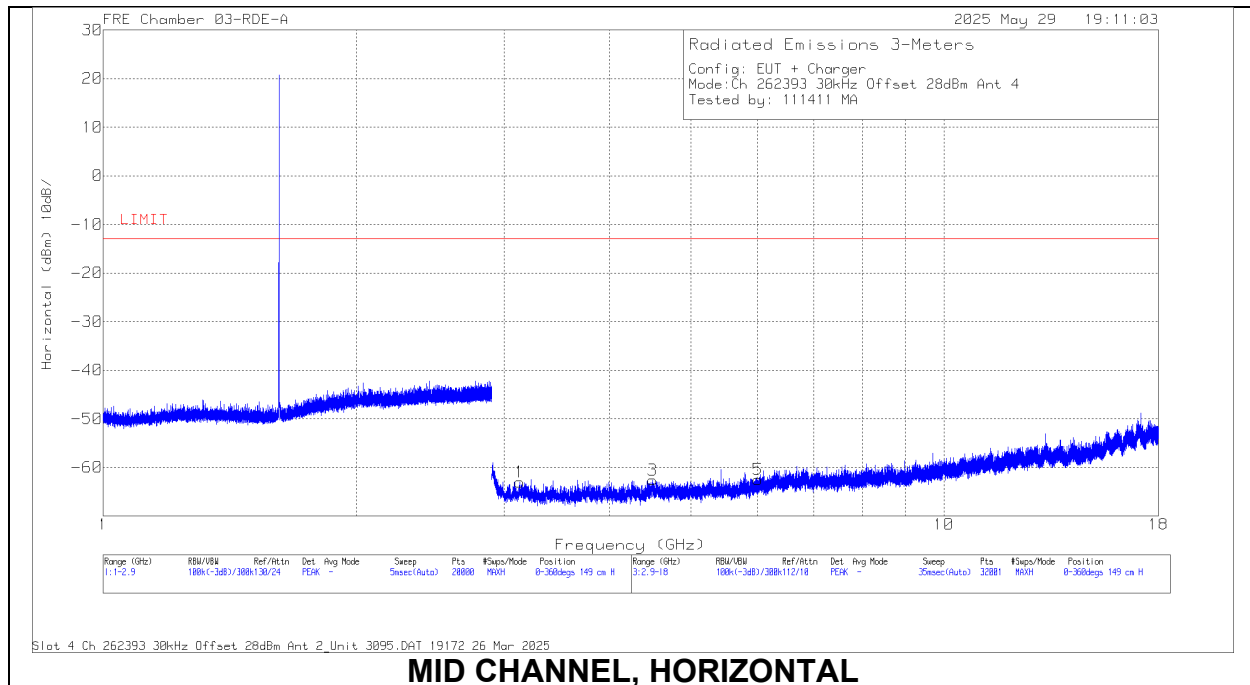
\* - Noise floor

**HIGH CHANNEL DATA**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	226673 ACF (dB/m)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	4.877628	48.55	Pk	34	-95.2	-47.9	-60.55	-13	-47.55	0-360	149	H
4	4.878045	53.23	Pk	34	-95.2	-47.9	-55.87	-13	-42.87	335	119	V
1	*3.482766	45.19	Pk	32.9	-95.2	-46.78	-63.89	-13	-50.89	0-360	149	H
2	*3.49645	46.27	Pk	32.9	-95.2	-46.65	-62.68	-13	-49.68	0-360	149	V
6	*6.628284	43.61	Pk	35.8	-95.2	-45.4	-61.19	-13	-48.19	0-360	149	V
5	*6.632531	43.69	Pk	35.8	-95.2	-45.3	-61.01	-13	-48.01	0-360	149	H

Pk - Peak detector

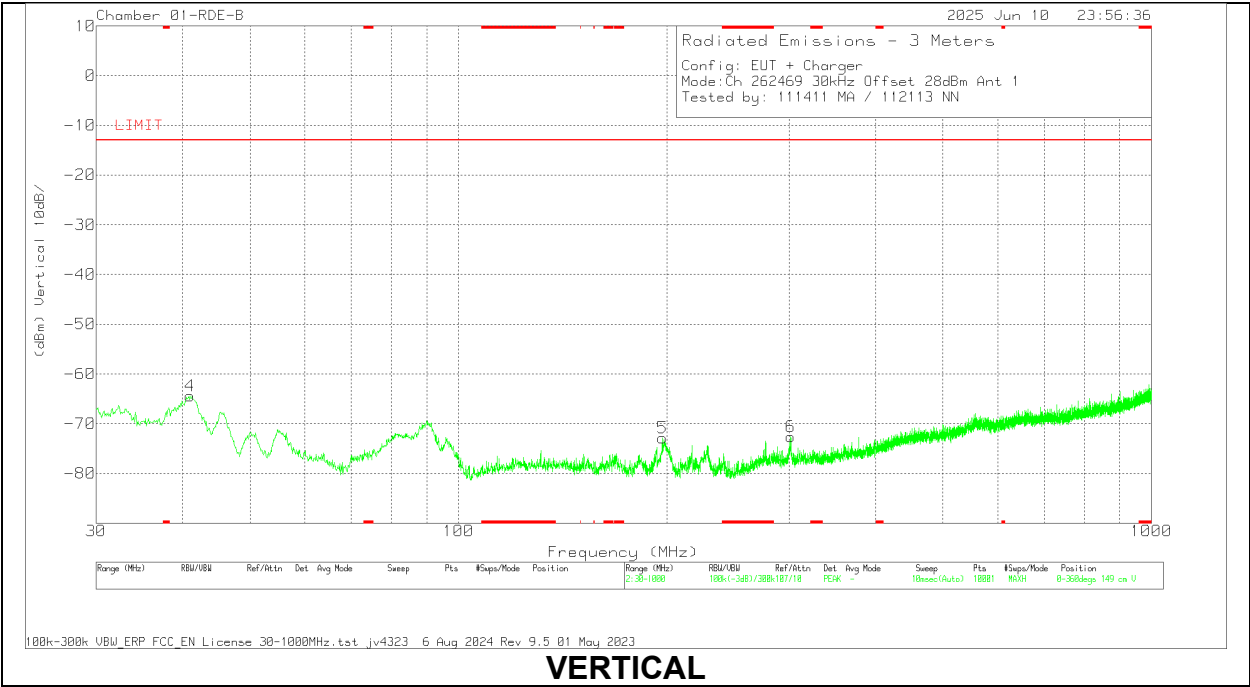
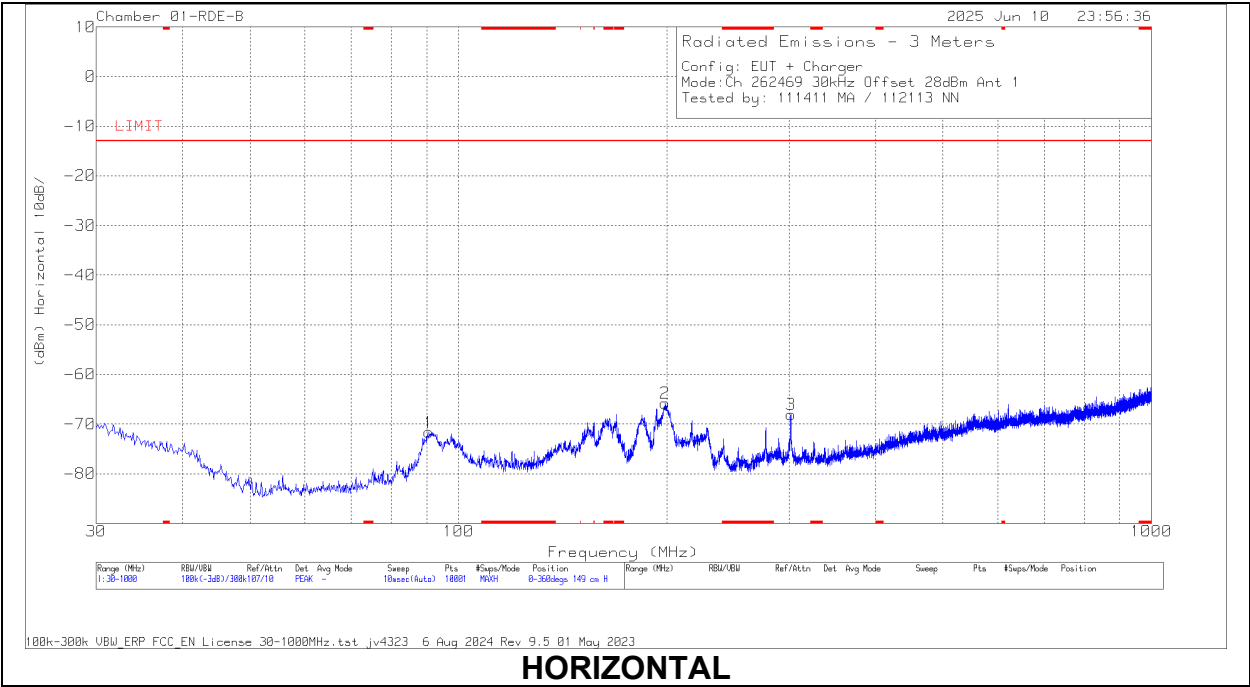
\* - Noise floor





10.1.3. ANT 1 (Below 1GHz)

Date:	2025-06-10
Test Engineer:	111411 MA
Configuration:	EUT + Charger
Mode:	TX
Chamber:	01-RDE-B



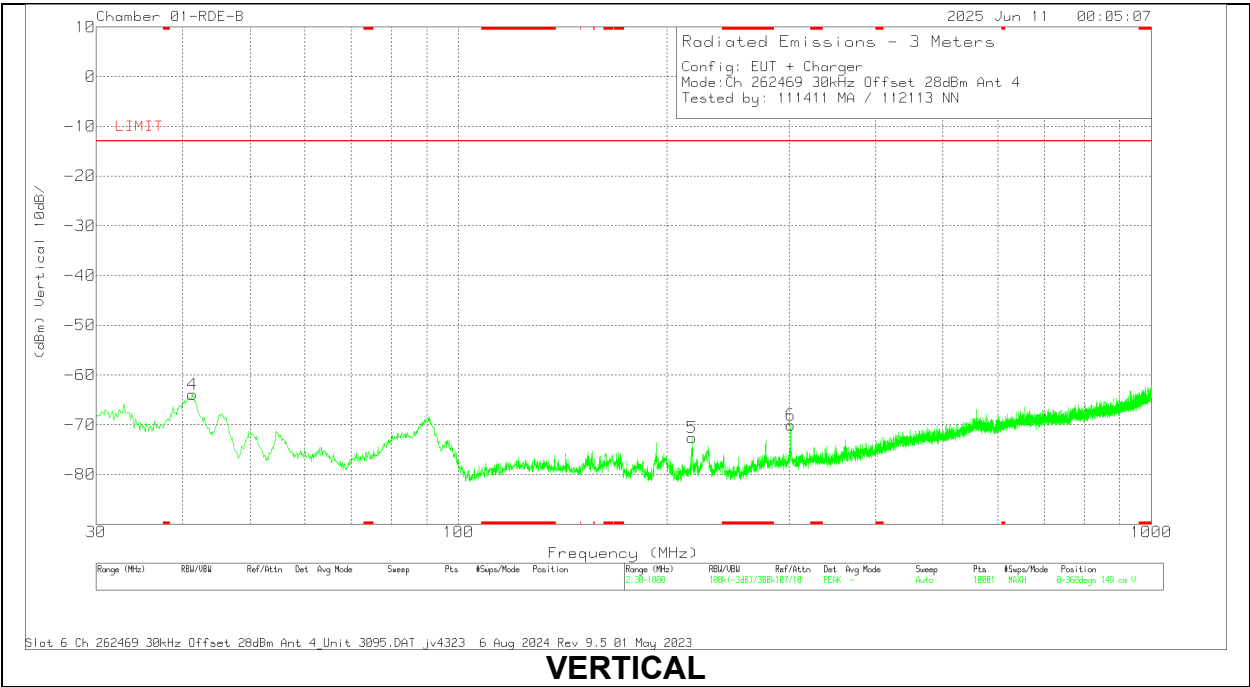
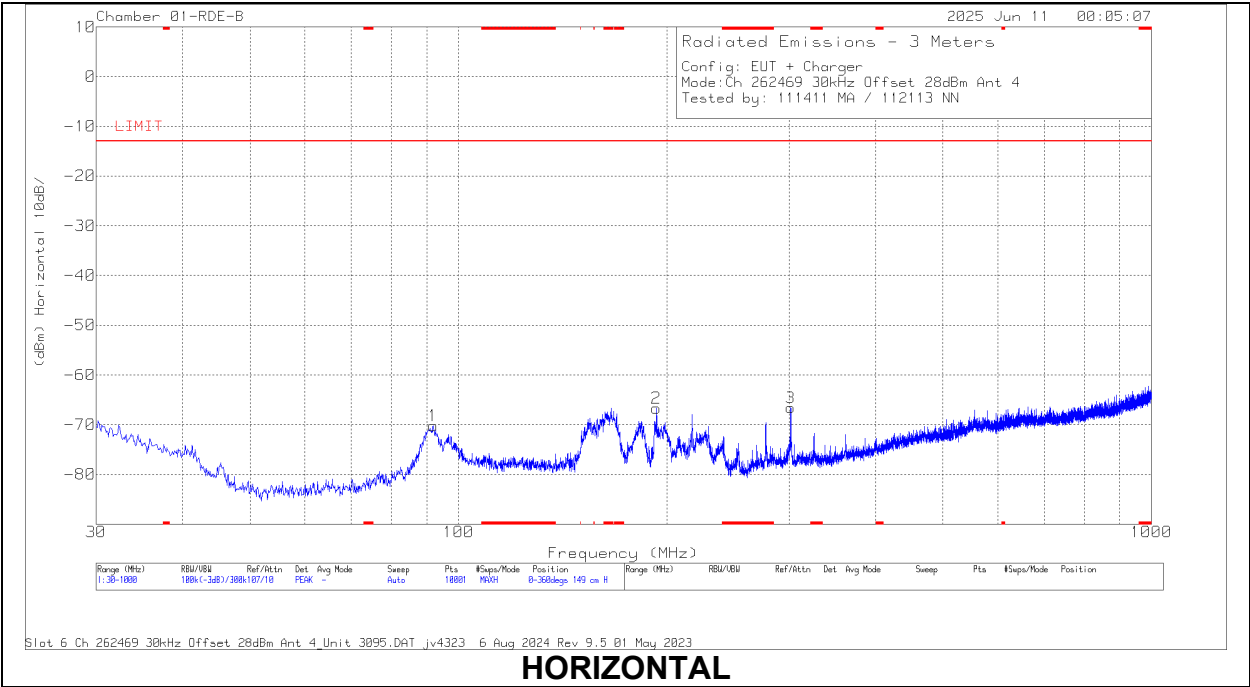
**DATA**

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	85150 ACF (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	40.961	42.49	Pk	19.7	-31.4	-95.2	-64.41	-13	-51.41	0-360	149	V
1	90.625	40.83	Pk	13.6	-30.9	-95.2	-71.67	-13	-58.67	0-360	149	H
5	197.034	34.37	Pk	18.2	-30.2	-95.2	-72.83	-13	-59.83	0-360	149	V
2	198.489	41.08	Pk	18.4	-30.1	-95.2	-65.82	-13	-52.82	0-360	149	H
6	301.6	33.01	Pk	19.3	-29.7	-95.2	-72.59	-13	-59.59	0-360	149	V
3	301.697	37.55	Pk	19.3	-29.7	-95.2	-68.05	-13	-55.05	0-360	149	H

Pk - Peak detector

10.1.4. ANT 4 (Below 1GHz)

Date:	2025-06-11
Test Engineer:	111411 MA
Configuration:	EUT + Charger
Mode:	TX
Chamber:	01-RDE-B



**DATA**

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	85150 ACF (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	41.349	43.31	Pk	19.4	-31.4	-95.2	-63.89	-13	-50.89	0-360	149	V
1	91.886	41.81	Pk	14	-30.8	-95.2	-70.19	-13	-57.19	0-360	149	H
2	193.057	41.18	Pk	17.5	-30.2	-95.2	-66.72	-13	-53.72	0-360	149	H
5	217.21	36.36	Pk	16.3	-30.1	-95.2	-72.64	-13	-59.64	0-360	149	V
3	301.6	38.98	Pk	19.3	-29.7	-95.2	-66.62	-13	-53.62	0-360	149	H
6	301.6	35.55	Pk	19.3	-29.7	-95.2	-70.05	-13	-57.05	0-360	149	V

Pk - Peak detector

## 10.2. ADDITIONAL UNWANTED EMISSION (1559MHz – 1610MHz)

### LIMITS

#### FCC §25.216

Limits on emissions from mobile earth stations for protection of aeronautical radionavigation-satellite service

(a) The e.i.r.p. density of emissions from mobile earth stations placed in service on or before July 21, 2002 ...

(b) The e.i.r.p. density of emissions from mobile earth stations placed in service on or before July 21, 2002 ...

(c) The e.i.r.p. density of emissions from mobile earth stations placed in service after July 21, 2002 with assigned uplink frequencies between 1610 MHz and 1660.5 MHz shall not exceed  $-70$  dBW/MHz, averaged over any 2 millisecond active transmission interval, in the band 1559-1605 MHz. The e.i.r.p. of discrete emissions of less than 700 Hz bandwidth from such stations shall not exceed  $-80$  dBW, averaged over any 2 millisecond active transmission interval, in the 1559-1605 MHz band.

#### FCC §25.216 and ISSED RSS-170: 5.9.1

(g) Mobile earth stations manufactured more than six months after Federal Register publication of the rule changes adopted in FCC 03-283 with assigned uplink frequencies in the 1610-1626.5 MHz band shall suppress the power density of emissions in the 1605-1610 MHz band-segment to an extent determined by linear interpolation from  $-70$  dBW/MHz at 1605 MHz to  $-10$  dBW/MHz at 1610 MHz averaged over any 2 millisecond active transmission interval. The e.i.r.p. of discrete emissions of less than 700 Hz bandwidth from such stations shall not exceed a level determined by linear interpolation from  $-80$  dBW at 1605 MHz to  $-20$  dBW at 1610 MHz, averaged over any 2 millisecond active transmission interval.

### TEST PROCEDURE

KDB 971168 D01 v03r01/D02 v02r02

Measure wideband emissions using either:

RBW = 1MHz, VB = 3MHz

RBW < 1MHz, integrate over 1MHz if necessary

Measure narrowband emissions using:

RBW = 10kHz, VB = 30kHz as worst case setting

Set detector = rms, sweep time ~ number of points x 2ms, and sweep multiple times with max hold enabled. When the detector is set to rms the number of points is set to exceed the minimum number required by ANSI C63.26 for average measurements. A peak detector may be used (e.g. to avoid slow sweep times for the narrowband emissions measurements) in lieu of average rms detection as this will provide a more conservative (higher) measured value than the rms value.

### RESULTS

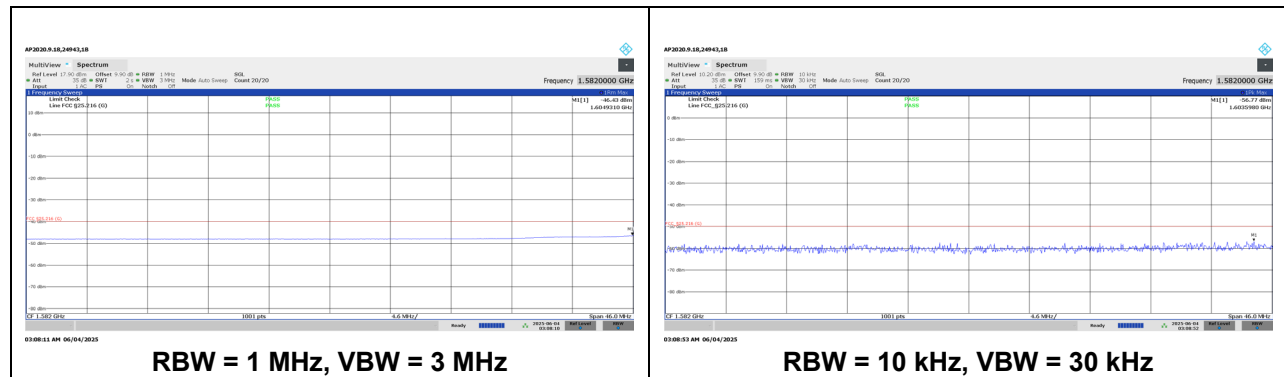
Both horizontal / vertical polarizations and low/ mid/ high channels were investigated on ANT 1 and ANT 4. It was found low channel to be the worst case for both antennas.

<b>Date:</b>	2025-06-04 – 2025-06-05
<b>Test Engineer:</b>	24933 MA
<b>Configuration:</b>	EUT + Charger
<b>Mode:</b>	TX
<b>Chamber:</b>	03-RDE-A

Offset Calculation:

Antenna Factor (dB/m)	Amp/Cbl/Filtr (dB)	EIRP CF	Offset (dB)
28.2	-30.1	11.8	9.9

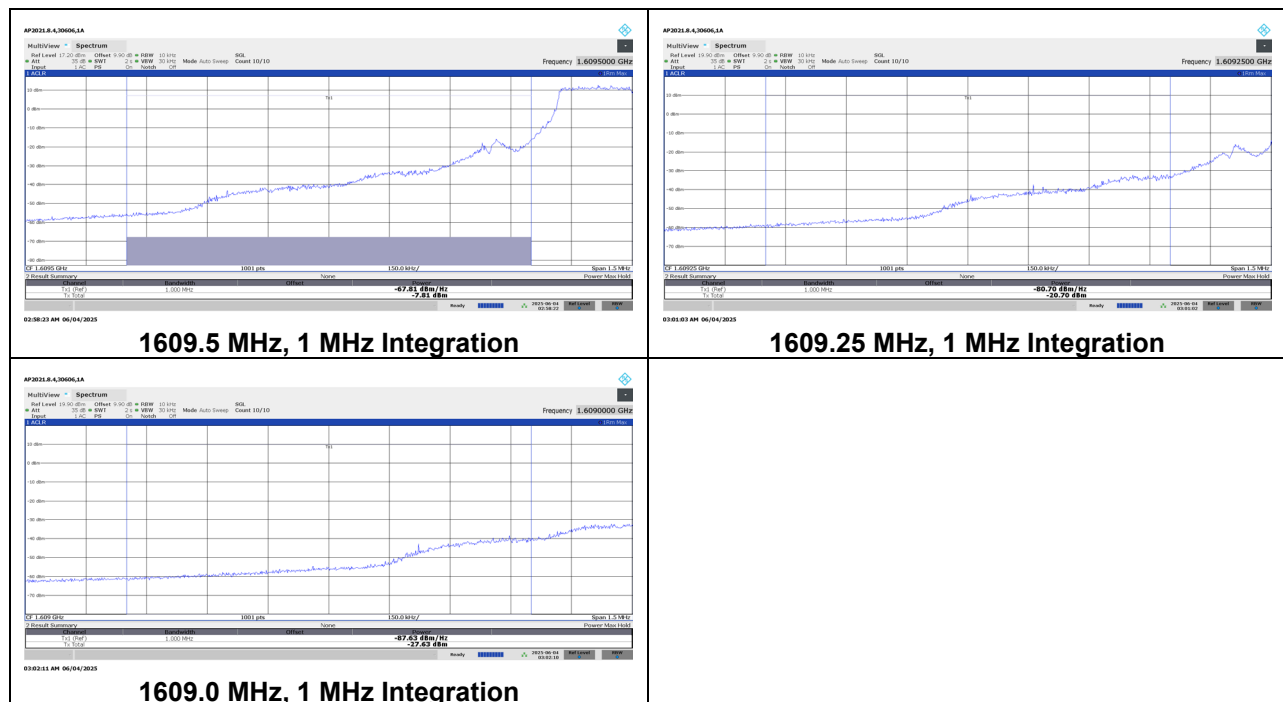
### Plots for Determining Wide Band or Narrow Band Emissions

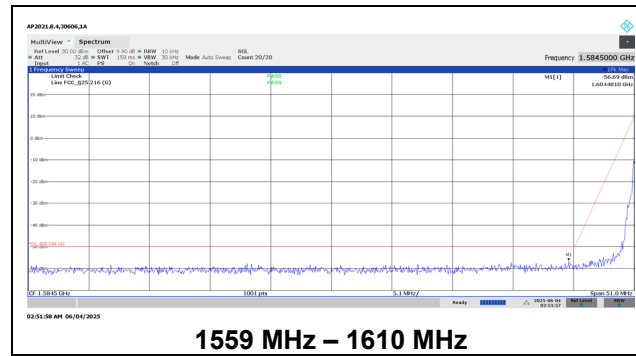


Note: It was found that the Marker x @ 1604.931 MHz frequency which belonged to wideband emission.

**10.2.1. ANT 1****HORIZONTAL DATA****Wideband Low Channel 1610.17 MHz:**

Plots below show passing result using integration method:



Narrowband Low Channel 1610.17 MHz:

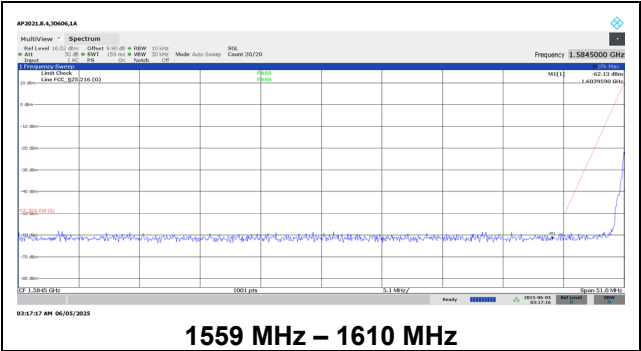


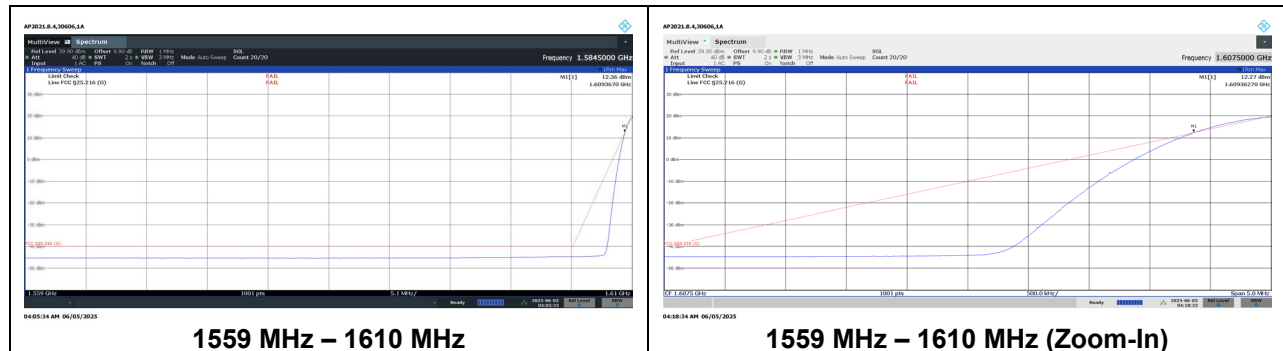
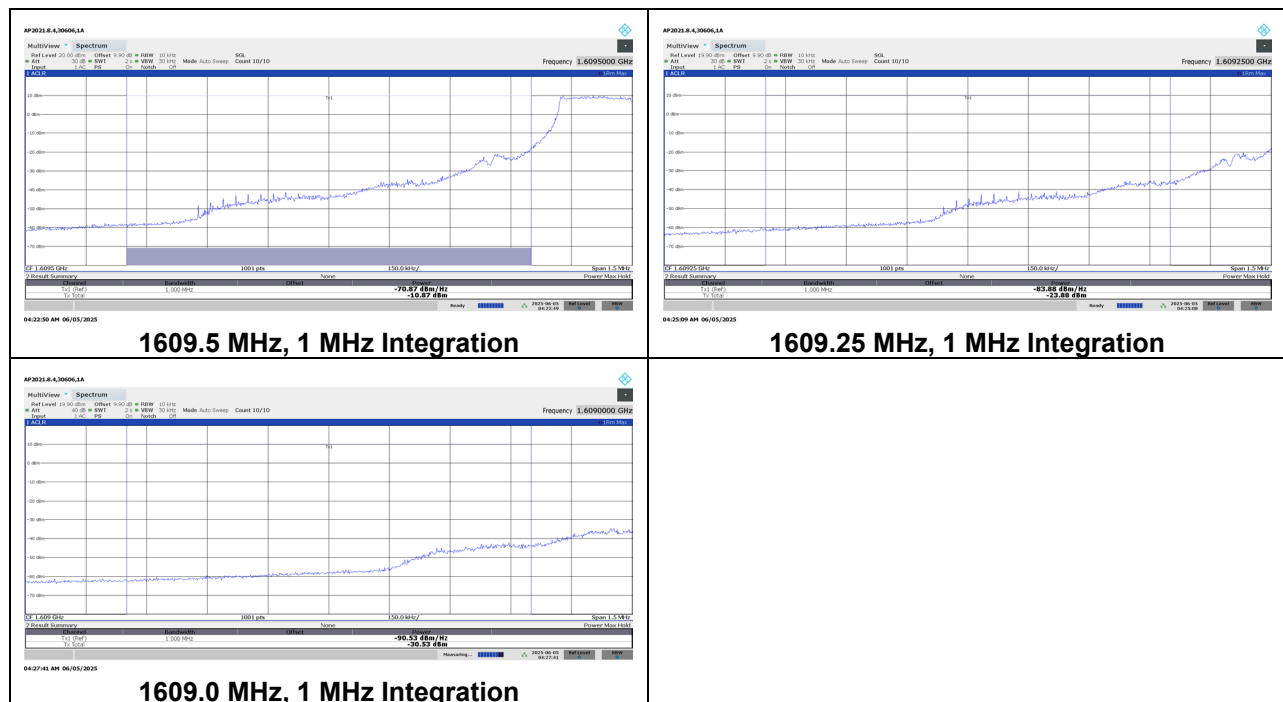
VERTICAL DATA

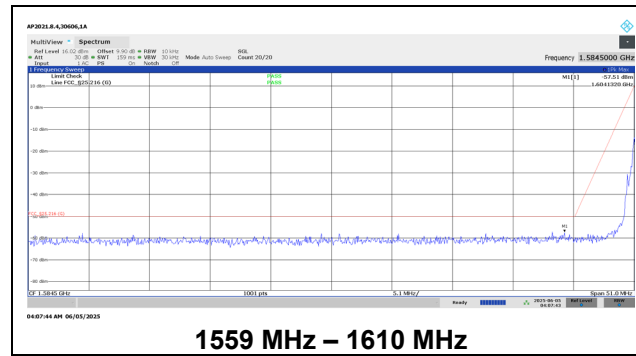
Wideband Low Channel 1610.17 MHz:

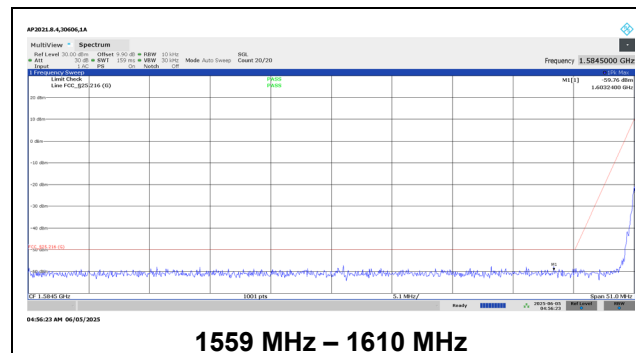


Narrowband Low Channel 1610.17 MHz:



**10.2.2. ANT 4****HORIZONTAL DATA**Wideband Low Channel 1610.17 MHz:Plots below show passing result using integration method:

Narrowband Low Channel 1610.17 MHz:

**VERTICAL DATA****Wideband Low Channel 1610.17 MHz:****Narrowband Low Channel 1610.17 MHz:**

### 10.3. CARRIER-OFF STATE EMISSIONS (1559 MHz – 1610 MHz)

#### LIMITS

FCC §25.216 and ISSED RSS-170: 5.10

Limits on emissions from mobile earth stations for protection of aeronautical radionavigation-satellite service

(i) The e.i.r.p density of carrier-off state emissions from mobile earth stations manufactured more than six months after Federal Register publication of the rule changes adopted in FCC 03-283 with assigned uplink frequencies between 1 and 3 GHz shall not exceed -80 dBW/MHz in the 1559-1610 MHz band averaged over any two millisecond interval.

ISSED RSS-170: 5.10 Carrier-off State Emissions

Mobile equipment with transmitting frequencies between 1 GHz and 3 GHz shall have the e.i.r.p. density of carrier-off state emissions in the band 1559-1610 MHz not exceed -80 dBW/MHz.

#### TEST PROCEDURE

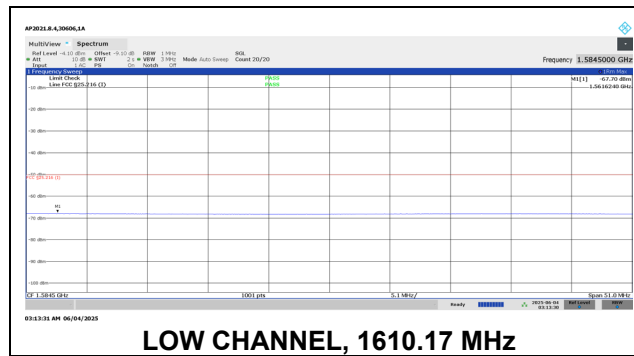
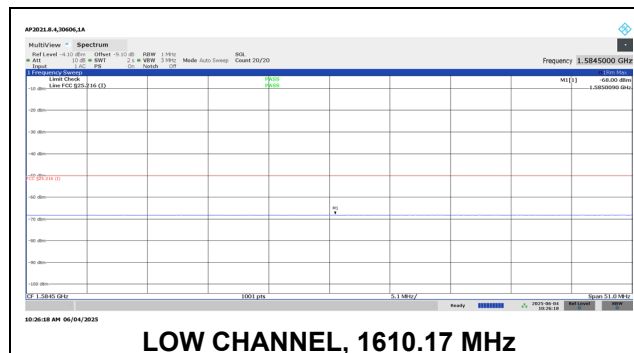
KDB 971168 D01 v03r01/D02 v02r02

Set RBW = 1MHz, VB = 3MHz, Detector = RMS, Sweep Time = Number of Points x 2ms, and sweep multiple times with Max Hold enabled.

#### RESULTS

No emissions were found on both horizontal and vertical polarization for ANT 1 and ANT 4.

<b>Date:</b>	2025-06-04
<b>Test Engineer:</b>	30606 HT
<b>Configuration:</b>	EUT + Charger
<b>Mode:</b>	RX (TX Off)
<b>Chamber:</b>	03-RDE-A

**10.3.1. ANT 1****10.3.2. ANT 4**

## 10.4. FREQUENCY STABILITY

### LIMITS

FCC §25.202

(d) Frequency tolerance, Earth stations. The carrier frequency of each earth station transmitter authorized in these services shall be maintained within 0.001 percent of the reference frequency.

ISED RSS-170: 5.3

For mobile earth station equipment, the carrier frequency shall not depart from the reference frequency by more than  $\pm 10$  ppm.

### TEST PROCEDURE

Use spectrum with Frequency Error measurement capability.

- Temp. =  $-30^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$
- Voltage = (85% - 115%)
  - Low Voltage = 3.23 VDC
  - Normal Voltage = 3.80 VDC
  - High Voltage = 4.37 VDC
  - End Voltage = 3.02 VDC

#### Frequency Stability vs Temperature:

The EUT is placed inside a temperature chamber. The temperature is set to  $20^{\circ}\text{C}$  and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by + 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until  $+50^{\circ}\text{C}$  is reached.

#### Frequency Stability vs Voltage:

The peak frequency error is recorded (worst-case).

### RESULTS

Test Engineer:	26118 SB
Test Date:	2025-03-18

Frequency Reference (MHz)		1610.17056		Frequency Reading  (MHz)	Delta  (Hz)	Frequency Stability  (ppm)
Condition		F low @ -10dB BW (MHz)	F high @ -10dB BW (MHz)			
Temperature	Voltage					
Normal (20 C)	Normal	1610.079054	1610.262056	1610.170555		
Extreme (50C)		1610.077970	1610.261601	1610.169786	-769.50	-0.48
Extreme (40C)		1610.077813	1610.261905	1610.169859	-696.00	-0.43
Extreme (30C)		1610.078664	1610.260414	1610.169539	-1016.00	-0.63
Extreme (10C)		1610.080047	1610.260274	1610.170161	-394.50	-0.25
Extreme (0C)		1610.078679	1610.261297	1610.169988	-567.00	-0.35
Extreme (-10C)		1610.078688	1610.261789	1610.170239	-316.50	-0.20
Extreme (-20C)		1610.078241	1610.260649	1610.169445	-1110.00	-0.69
Extreme (-30C)		1610.078524	1610.260244	1610.169384	-1171.00	-0.73
20C	+15%	1610.079414	1610.260884	1610.170149	-406.30	-0.25
	-15%	1610.079399	1610.261491	1610.170445	-109.95	-0.07
	End Point	1610.07828	1610.260681	1610.169481	-1074.40	-0.67

## 11. SETUP PHOTOS

Please refer to 15496277-EP1V1 for setup photos.

## APPENDIX A

### 12. SPOT CHECK EVALUATION

#### 12.1. MODEL DIFFERENCES

The manufacturer hereby declares the following for models A3258, A3519, A3520 and A3521.

These models have the same PCB layout, design, common components, antennas, antenna locations and housing cases, except for FR2 is removed from variants and disabled/enabled cellular bands via software as shown below.

Model	FCC ID	IC ID	Feature Difference	Sim Support	Reference Model
A3258	BCG-E8947A	579C-E8947A	-With FR2 -No B11/21 -No UL MIMO	eSIM	-
A3519	BCG-E8951A	579C-E8951A	-Without FR2 -Added B11/21 -No UL MIMO	eSIM	A3258
A3520	BCG-E8952A	579C-E8952A	-Without FR2 -No B14, B29, B71, B11/21 -No UL MIMO	eSIM+pSIM	
A3521	BCG-E8953A	579C-E8953A	-Without FR2 -No B14, B29, B71, B11/21, B53 -No UL MIMO, MSS	pSIM+pSIM	

The spot check plan allows for data reuse from the reference model where the variant model data meets the limits and has not changed by more than the criteria from KDB 484596 D01 v03 equation (4).

$$d_{dB} = |V_{dB} - R_{dB}| \quad (1)$$

$$d_{dB} \leq d_{dBmax} \quad (2)$$

$$d_{dBmax}(M_{dB}) = \begin{cases} (3 + M_{dB}/20) \text{ dB} & , \text{ for } 0 \leq M_{dB} \leq 60 \text{ dB} \\ 6 \text{ dB} & , \text{ for } M_{dB} > 60 \text{ dB} \end{cases} \quad (4)$$



Where  $d_{dB}$  is deviation between the variant and the reference model,  $V_{dB}$  is variant spot check level,  $R_{dB}$  is the corresponding reference measurement level,  $d_{dBmax}$  is the maximum deviation  $d_{dB}$  allowed, and  $M_{dB}$  is the margin in dB.

## 12.2. SPOT CHECK VERIFICATION RESULTS SUMMARY FOR A3519

A3519 SPOT CHECK RESULTS								
Equipment Class / Technology	Worst Mode	Test Item	Measured Frequency (MHz)	Original Model: A3258	Sub Model: A3519	Delta (dB or MHz)	Margin	Remarks
				FCC ID : BCG-E8947A IC : 579C-E8947A	FCC ID : BCG-E8951A IC : 579C-E8951A			
TNE / MSS	Ant 4	Avg EIRP Power (dBm)	1618.4 (-3.2dBi)	24.80	25.91	1.11	0.00	Note 1
	Ant 1	Additional Unwanted Emissions (dBm)	1609.5 (Horizontal)	-7.81	-8.13	-0.32	-21.81	Note 1
		Out-Of-Band Emissions (dBm)	1000 - 18000 (High Channel)	-42.99	-48.26	-5.27	-55.99	Note 1

Note 1: Deviation from reference to variant within the value allowed by equation (4) in KDB 484596. Additional tests not required.

Note 2: Deviation from reference to variant exceeds the value allowed by equation (4) in KDB 484596. Additional tests performed on second channel.

## 12.3. SPOT CHECK VERIFICATION RESULTS SUMMARY FOR A3520

A3520 SPOT CHECK RESULTS								
Equipment Class / Technology	Worst Mode	Test Item	Measured Frequency (MHz)	Original Model: A3258	Sub Model: A3520	Delta (dB or MHz)	Margin	Remarks
				FCC ID : BCG-E8947A IC : 579C-E8947A	FCC ID : BCG-E8952A IC : 579C-E8952A			
TNE / MSS	Ant 4	Avg EIRP Power (dBm)	1618.4 (-3.2dBi)	24.80	27.74	2.94	0.00	Note 1
	Ant 1	Additional Unwanted Emissions (dBm)	1609.5 (Horizontal)	-7.81	-6.19	1.62	-21.81	Note 1
		Out-Of-Band Emissions (dBm)	1000 - 18000 (High Channel)	-42.99	-41.71	1.28	-55.99	Note 1

Note 1: Deviation from reference to variant within the value allowed by equation (4) in KDB 484596. Additional tests not required.

Note 2: Deviation from reference to variant exceeds the value allowed by equation (4) in KDB 484596. Additional tests performed on second channel.

**END OF REPORT**