

TEST REPORT

Report Number: R16028751-E1

Applicant : Garmin International Inc.
1200 East 151st Street
Olathe, KS 66062-3426, USA

FCC ID : IPH-04809

IC : 1792A-04809

MODEL : A04809

EUT Description : 51mm Extremity Worn Digital Transceiver

Test Standard(s) : FCC CFR 47 Part 2, Part 24, Part 25 and Part 27.
ISED RSS-GEN ISSUE 5 + A1 + A2, RSS-133 ISSUE 7,
RSS-139 ISSUE 4, RSS-130 ISSUE 2, RSS-170 Issue 4,

Date Of Issue:

2025-12-01

Prepared by:

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Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2025-11-13	Initial Review	Charles Moody
V2	2025-11-18	Revised Antenna Type and Gain	Charles Moody
V3	2025-12-01	Removed non-applicable rule part from Pg. 6	Noah Bennett

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Garmin International Inc.
1200 East 151st Street
Olathe, KS 66062-3426, USA

EUT DESCRIPTION: Extremity Worn Digital Transceiver

MODEL: A04809

SERIAL NUMBERS: 8UC005414

SAMPLE RECEIPT DATE: 2025-10-08

DATE TESTED: 2025-11-03 TO 2025-11-04

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC CFR 47 Part 2, Part 24, Part 25, Part 27 ISED RSS-GEN ISSUE 5 + A1 + A2, RSS-133 ISSUE 7, RSS-139 ISSUE 4, RSS-130 ISSUE 2, RSS-170 Issue 4,	See Section 2

UL LLC 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.

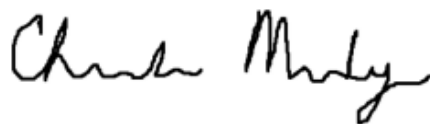
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2. SUMMARY OF TEST RESULTS

This report contains data provided by the customer which can impact the validity of results. UL LLC. 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. EUT Cable loss (see section 8)
3. Supported bands, bandwidths, modulations, power settings, and MPR configurations. (section 6.1)

Requirement Description	Band	Requirement Clause Number (FCC)	Requirement Clause Number (IC)	Result	Remarks
Equivalent Radiated Power	12	27.50 (c) (10)	RSS130§4.6.3	Not Performed	See Note 1
Equivalent Isotropic Radiated Power	2	24.232 (c)	RSS133§5.5		
	4	27.50 (d) (4)	RSS139§5.5		

Requirement Description	Requirement Clause Number (FCC)	Requirement Clause Number (IC)	Result	Remarks
Occupied Bandwidth	2.1049	RSS-GEN§6.7, RSS133 RSS130§4.5	Not Performed	See Note 1
Band Edge and Emission Mask	2.1051, 24.238 (a), 27.53 (h), 27.53 (g),, 25.202	RSS133§5.6 RSS139§5.6 RSS130§4.7		
Out of Band Emissions				
Frequency Stability	2.1055, 27.54, 25.202 (d)	RSS133§5.4 RSS139§5.4 RSS130§4.5 RSS170§5.3		
Peak-to-Average Ratio	24.232(d), 27.50(d)(5), 25.204	RSS133§5.5 RSS139§5.5 RSS130§4.6.1		
Field Strength of Spurious Radiation	2.1051, 24.238 (a), 25.202(f) 27.53 (h), 27.53 (g),	RSS133§5.6 RSS139§5.6 RSS130§4.7 RSS170§5.7.2, 5.8	Complies	See Note 2
Additional Unwanted and Carrier Off State Emissions	25.216	RSS170§5.9.2, 5.10	Complies	See Note 2

NOTE1: This test report covers the radiated spotcheck testing for LTE B2/4/12 and NTN n23 as well as the Class 2 Permissive Change of NTN n255. Therefore, only radiated, field strength emissions, were performed for testing.

NOTE 2: Field Strength spotchecks on LTE B2/4/12 and NTN n23 as well as full radiated emissions testing on NTN n255 were found to be **Compliant**.

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 24, Part 25, Part 27
- [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
- [FCC KDB 273109 D02](#): Part 25 SCS and CMRS-Bands
- ISED RSS-GEN ISSUE 5 + A1 + A2, RSS-133 ISSUE 7, RSS-139 ISSUE 4, RSS-130 ISSUE 2, RSS-170 Issue 4,

4. FACILITIES AND ACCREDITATION

UL LLC is accredited by A2LA, Certificate Number 0751.06, 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: 12 Laboratory Dr Durham, NC 27713, U.S.A	US0067	2180C	825374
☒	Building: 2800 Perimeter Park Drive, Suite B, Morrisville, NC, 27560		27265	

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}
Radio Frequency (Spectrum Analyzer)	141.2 Hz
Occupied Channel Bandwidth	1.22%
RF output power, conducted	1.3 dB (PK) 0.45 dB (AV)
Power Spectral Density, conducted	2.47 dB
Unwanted Emissions, conducted	1.94 dB
All emissions, radiated	6.01 dB
Conducted Emissions (0.150-30MHz) - LISN	3.40 dB
Temperature	0.57°C
Humidity	3.39%
DC Supply voltages	1.70%

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

5.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:

$$\begin{aligned} \text{EIRP (dBm)} &= \text{Measured Power (dBm)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Preamp Gain (dB)} + \text{Correction Factor (dB)} \\ \text{EIRP (dBm)} &= -56.5 \text{ dBm} + 40.4 \text{ dB/m} + 0.5 \text{ dB} - 36 \text{ dB} + 11.8 \text{ dB} = -39.8 \text{ dBm} \end{aligned}$$

6. EQUIPMENT UNDER TEST

6.1. DESCRIPTION OF EUT

The EUT is an Extremity Worn Digital Transceiver.

This test report covers the WWAN radio of the EUT due to a change in output power from the original equipment test report. Only Bands 2, 4 and 12 are subject to the output power change.

The EUT supports the following Technologies:

Wireless technologies	Frequency bands	Operating mode	UE Category
LTE	LTE Band 2 LTE Band 4 LTE Band 12 NTN Band 23 NTN Band 255	BPSK ^b QPSK 16QAM	Cat eMTC M1

Notes:

- A) The EUT operated in a 1x1 SISO configuration.
- B) NTN Band(s) only.

6.2. MAXIMUM OUTPUT POWER

NOTE: This test report covers the radiated spotcheck testing for LTE B2/4/12 and NTN n23 as well as the Class 2 Permissive Change of NTN n255. Therefore, only radiated, field strength emissions, were performed for testing. EUT, as declared by the manufacturer, has the equivalent output power for all radios as based on the original certification.

6.3. SOFTWARE AND FIRMWARE

EUT FW Version: 16.29

6.4. MAXIMUM ANTENNA GAIN

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

WWAN Bands	Antenna Type	Antenna Peak Gain (dBi)
LTE B12	Slot	-11.09
LTE B4		-4.93
LTE B2		-4.5
NTN B23		-5.90
NTN B255		-4.90

6.5. WORST-CASE CONFIGURATION AND MODE

The EUT was investigated in three orthogonal orientations X/Y/Z on both Low Band (Fundamental Below 1GHz) and Mid Band (Fundamental between 1-3GHz) over all antennas to find the worst-case orientation. For the Below 1 GHz bands, this was found to be Z. For the above 1 GHz bands, this was found to be Z.

NTN Band 255 was fully tested for radiated emissions at the same modes that were tested on the original certification. This was found to be 3.75 kHz SCS BPSK for Low, Middle and High channels. As well as 15kHz SCS QPSK for Mid channel.

The worst-case LTE B2/4/14 and NTN n23 scans as found on the original certification were spotchecked to ensure continued compliance. These modes were found to be:

LTE B2: Channel 18700, 20 MHz, QPSK, RB1-0
LTEB4: Channel 20300, 20 MHz, QPSK, RB1-0
LTEB12: Channel 23095, 10 MHz, QPSK, RB1-0
NTN n23: Channel 25699, 3.75 kHz SCS, BPSK, SC=1

The EUT was tested while connected to AC Lines via charging cable and brick to represent worst case emissions.

6.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
EUT Charging Brick	Garmin	AQ27A-59CFA	-	-

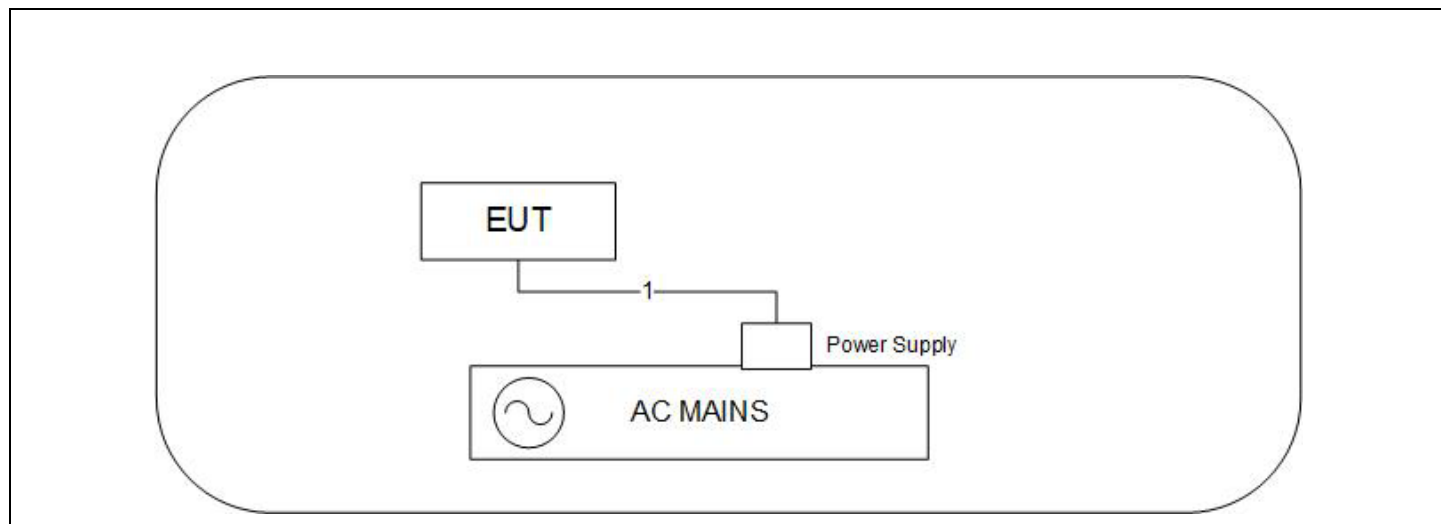
I/O CABLES

I/O Cable List						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Proprietary	1	USB-C	Shielded	<3m	Program/Charge EUT

Test Setup

The EUT was connected to a base station simulator and set to transmit at max power for LTE/NTN testing

Setup Diagram



7. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 4)

Equip. ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
	1-18 GHz				
206211	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2024-04-09	2026-04-09
	Gain-Loss Chains				
207640	Gain-loss string: 1-18GHz	Various	Various	2025-06-13	2026-06-13
	Receiver & Software				
197954	Spectrum Analyzer	Rohde & Schwarz	ESW44	2025-04-21	2026-04-21
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
	Additional Equipment used				
241204	Environmental Meter	Fisher Scientific	15-077-963	2025-08-05	2027-08-05
82635 (HPF009)	1GHz high-pass filter, 2W, Fhigh = 10GHz	Micro-Tronics	HPM17672	2025-03-13	2026-03-13
169106 (BRF008)	1710-1785MHz notch filter, 2W, Fhigh = 9GHz	Micro-Tronics	BRM50713-01	2025-03-13	2026-03-13
213025	Wideband Radio Communications Tester	Rohde and Schwarz	CMW500	2025-01-14	2026-01-14

8. 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 ERP or 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.

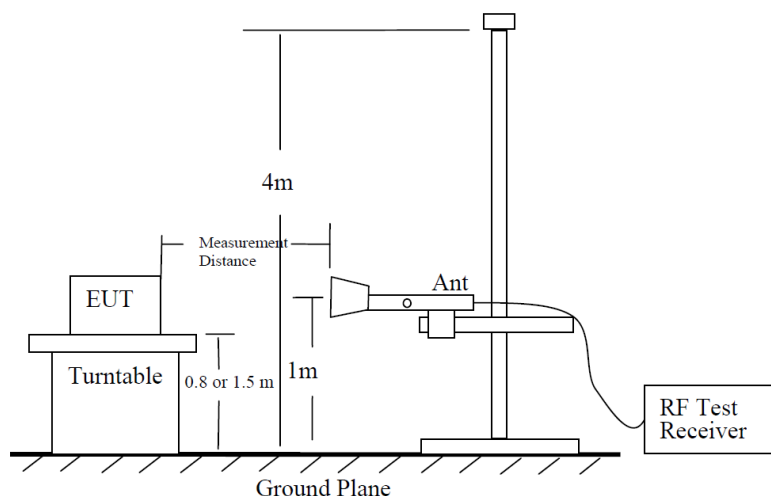


Figure 6 —Test site-up for radiated ERP and/or EIRP measurements

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) $E \text{ (dB}\mu\text{V/m)} = \text{EIRP (dBm)} - 20\log(D) + 104.8;$ where D is the measurement distance (in the far field region) in m.
- d) $\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20\log(D) - 104.8;$ 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, $\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 9.5424 - 104.8 = E \text{ (dB}\mu\text{V/m)} - 95.2576$

Note: Confidence check of each chamber is performed daily to see if any degradation from expected/normal reading reference data. Ambient check of each chamber is performed monthly.

8.1. FIELD STRENGTH OF SPURIOUS RADIATION, ABOVE 1GHz

TEST PROCEDURE

KDB 971168 D01 v03r01/D02 v02/r01

All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz

RESULTS

8.1.1. LTE BAND 2

LIMITS

FCC: §24.238 (a)

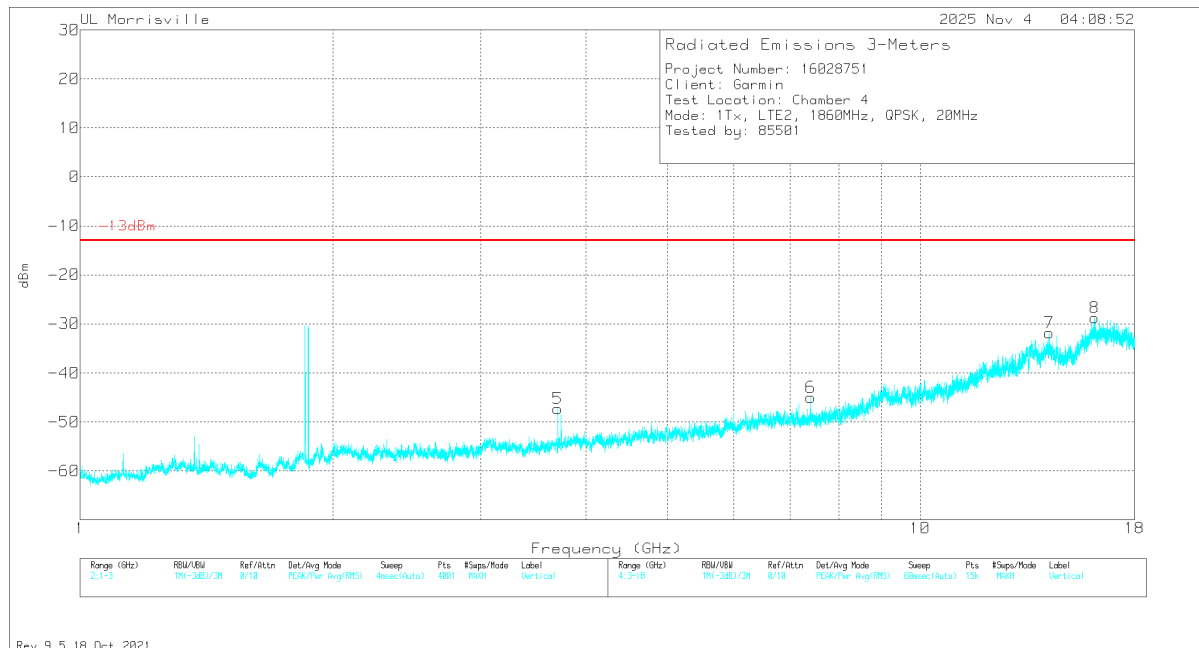
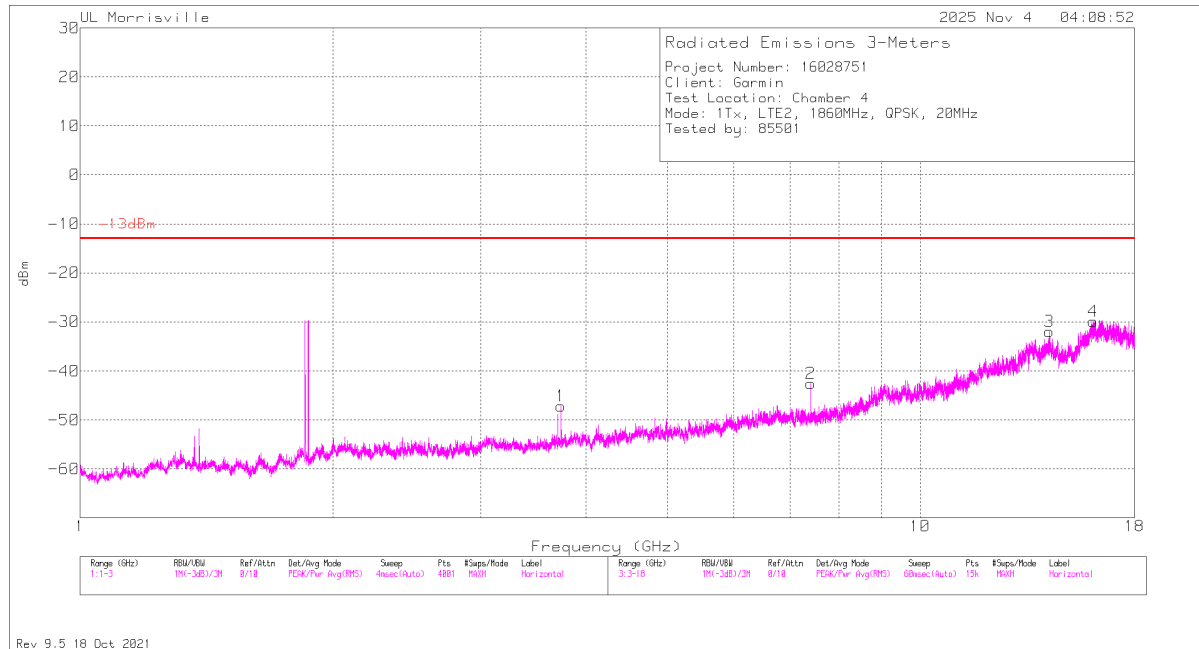
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

ISED: RSS133§5.6

For all equipment, the TRP or total conducted power (sum of conducted power across all antenna connectors), where applicable, of the unwanted emissions outside the frequency block or frequency block group shall not exceed the limits shown in the table 3.

Table 3: Unwanted emission limits for all equipment	
Offset frequency from the edge of the frequency block group (MHz)	Unwanted emission limit
≤ 1	-13 dBm/(1% of OBW)
> 1	-13 dBm/MHz

QPSK LTE2 (20MHz, Low Channel)



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	206211 (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5	3.703	-57.81	Pk	33.2	-34.5	11.8	0	-47.31	-13	-34.31	0-360	300	V
1	3.737	-58.61	Pk	33.2	-33.6	11.8	0	-47.21	-13	-34.21	0-360	200	H
6	7.406	-64.56	Pk	35.5	-27.7	11.8	0	-44.96	-13	-31.96	0-360	200	V
2	7.407	-62.23	Pk	35.5	-27.6	11.8	0	-42.53	-13	-29.53	0-360	100	H
7	14.247	-67.51	Pk	38.8	-14.9	11.8	0	-31.81	-13	-18.81	0-360	300	V
3	14.253	-67.41	Pk	38.8	-15.1	11.8	0	-31.91	-13	-18.91	0-360	200	H
4	16.065	-66.68	Pk	40.7	-15.7	11.8	0	-29.88	-13	-16.88	0-360	100	H
8	16.139	-66.5	Pk	40.8	-14.8	11.8	0	-28.7	-13	-15.7	0-360	300	V

Pk - Peak detector

8.1.2. LTE BAND 4

LIMITS

FCC: §27.53(h)

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

ISED: RSS139§5.6

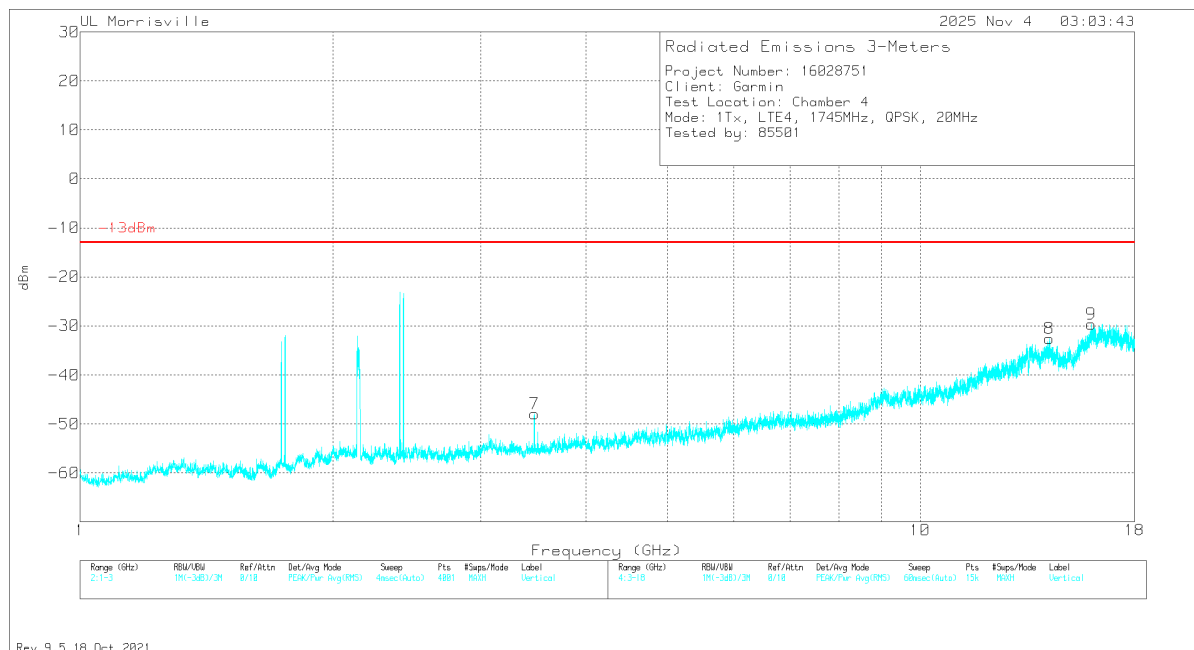
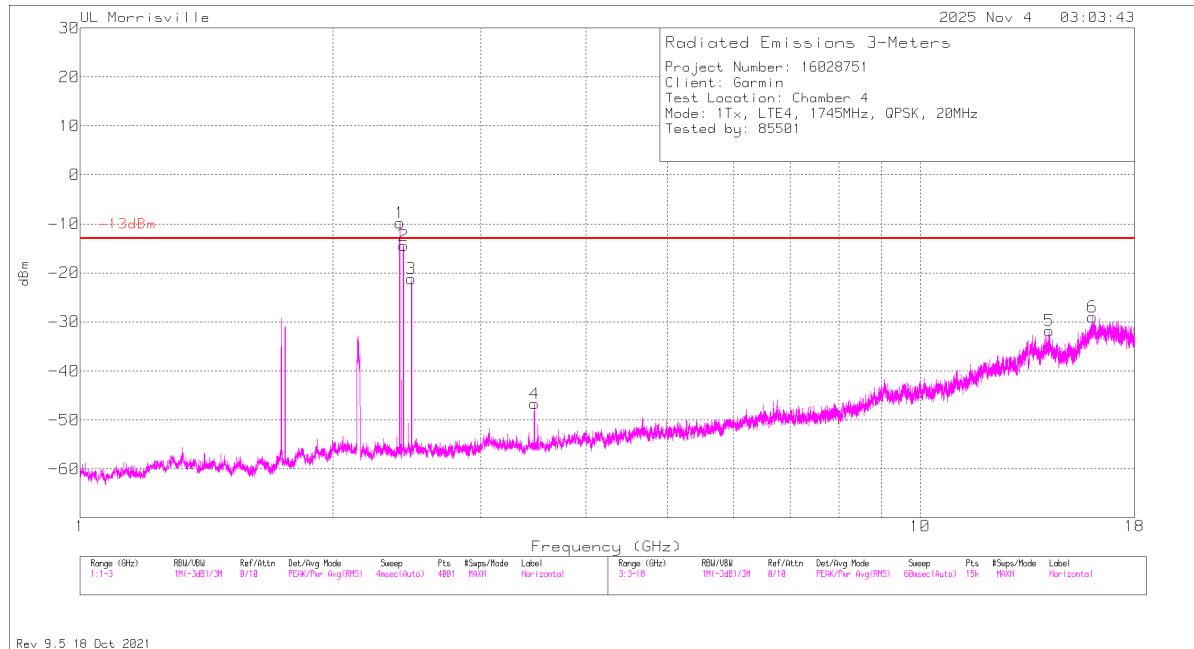
Unwanted emissions shall be measured in terms of average values.

For all equipment, the TRP or total conducted power (sum of conducted power across all antenna connectors) of the unwanted emissions outside the frequency block or frequency block group shall not exceed the limits shown in table 4.

Table 6: Unwanted emission limits	
Offset from the edge of the frequency block or frequency block group	Unwanted emission limits
≤1 MHz	-13 dBm/(1% of B*)
>1 MHz	-13 dBm/MHz

*B is the frequency block or frequency block group.

QPSK LTE4 (20MHz, High Channel)



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	206211 (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
*1	2.40174	-16.04	Pk	32	-37.2	11.8	.6	-8.84	-	-	160	200	H
*2	2.42614	-21.31	Pk	32.2	-37.4	11.8	.6	-14.11	-	-	238	142	H
*3	2.48	-29.07	Pk	32.3	-36.7	11.8	.5	-21.17	-	-	0-360	200	H
4	3.473	-56.71	Pk	32.6	-34.4	11.8	0	-46.71	-13	-33.71	0-360	100	H
7	3.473	-57.93	Pk	32.6	-34.4	11.8	0	-47.93	-13	-34.93	0-360	300	V
5	14.2485	-68.07	Pk	38.8	-14.3	11.8	0	-31.77	-13	-18.77	0-360	100	H
8	14.252	-68.23	Pk	38.8	-14.9	11.8	0	-32.53	-13	-19.53	0-360	300	V
9	15.995	-67.22	Pk	40.7	-14.9	11.8	0	-29.62	-13	-16.62	0-360	300	V
6	16.045	-66.04	Pk	40.7	-15.5	11.8	0	-29.04	-13	-16.04	0-360	200	H

Pk - Peak detector

*NOTE: This is a BLE Advertising signal not related to the cellular radio.

8.1.3. LTE BAND 12

LIMITS

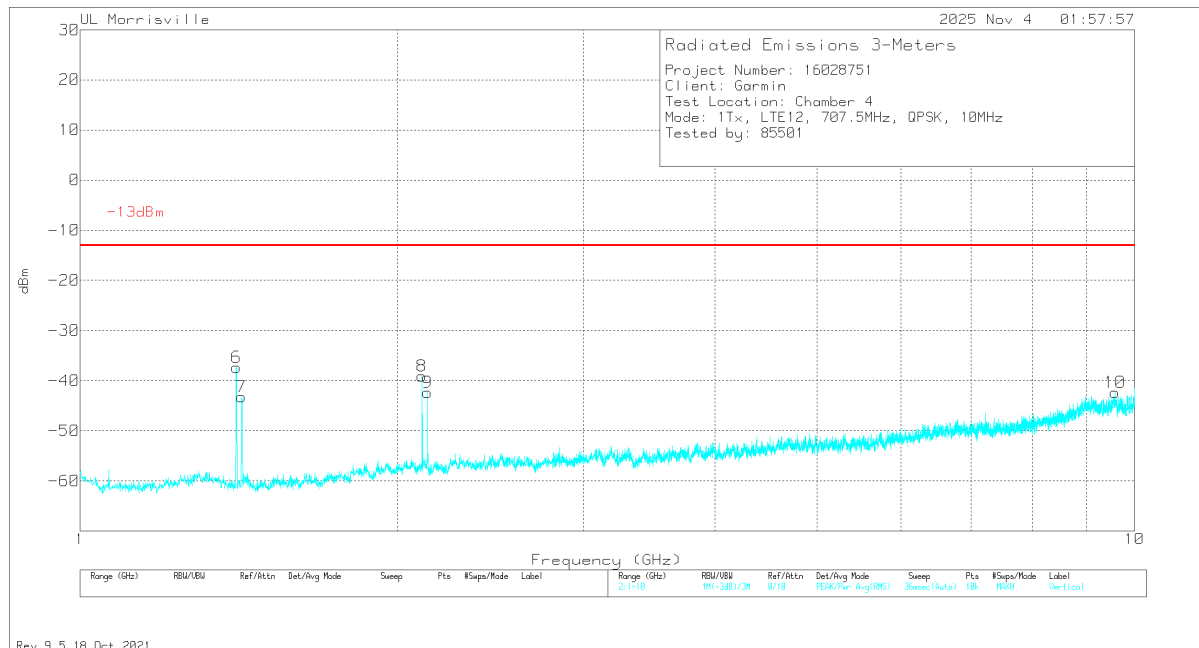
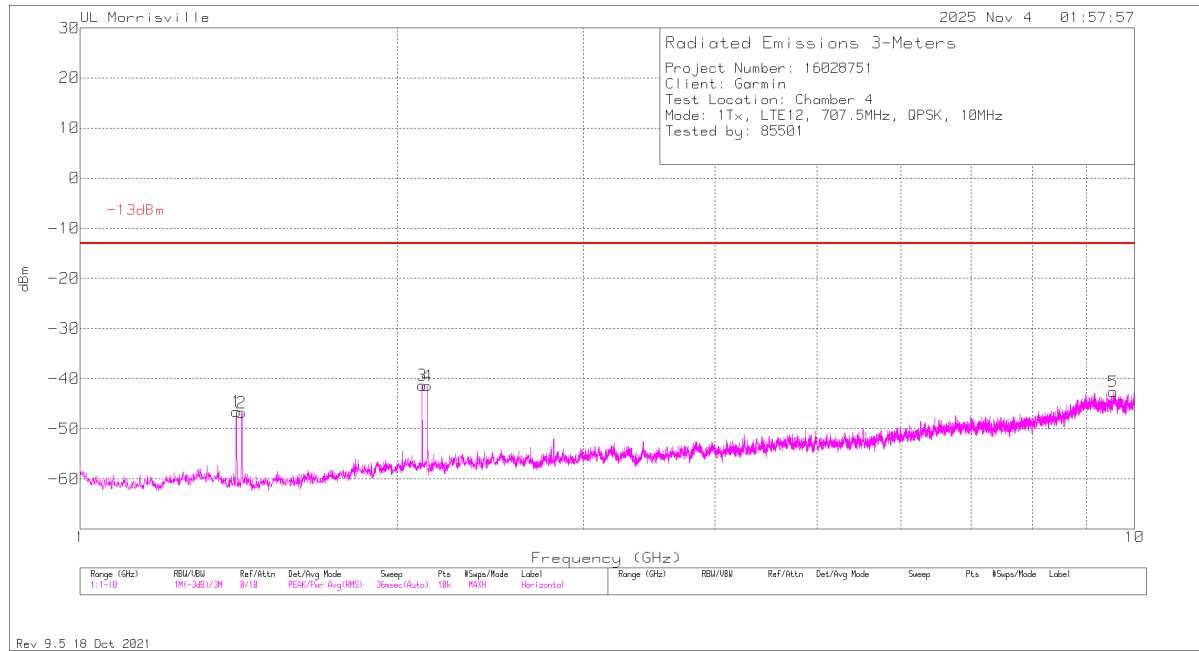
FCC: §27.53 (g)

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

ISED: RSS130§4.7

The minimum permissible attenuation level of any spurious emissions is $43 + 10 \log (P)$ dB where transmitting power (P) in Watts.

QPSK LTE12 (10MHz, Mid Channel)



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	206211 (dB/m)	Gain/Loss (dB)	Filter (dB)	CF (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.4068	-50.14	Pk	28.4	-37.2	.5	11.8	-46.64	-13	-33.64	0-360	100	H
6	1.4068	-40.87	Pk	28.4	-37.2	.5	11.8	-37.37	-13	-24.37	0-360	100	V
2	1.423	-50.39	Pk	28.4	-37.1	.5	11.8	-46.79	-13	-33.79	0-360	100	H
7	1.423	-46.84	Pk	28.4	-37.1	.5	11.8	-43.24	-13	-30.24	0-360	100	V
8	2.1097	-45.83	Pk	31.6	-37	.3	11.8	-39.13	-13	-26.13	0-360	100	V
3	2.1106	-48.14	Pk	31.6	-37	.4	11.8	-41.34	-13	-28.34	0-360	100	H
4	2.1349	-47.81	Pk	31.4	-37.2	.4	11.8	-41.41	-13	-28.41	0-360	100	H
9	2.1349	-48.7	Pk	31.4	-37.2	.4	11.8	-42.3	-13	-29.3	0-360	200	V
5	9.55	-66.95	Pk	36.7	-24.7	.5	11.8	-42.65	-13	-29.65	0-360	100	H
10	9.5815	-66.09	Pk	36.6	-25.2	.5	11.8	-42.39	-13	-29.39	0-360	100	V

Pk - Peak detector

8.1.4. NTN Band 23

LIMITS

FCC 47 CFR 25.202(f)

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;

(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;

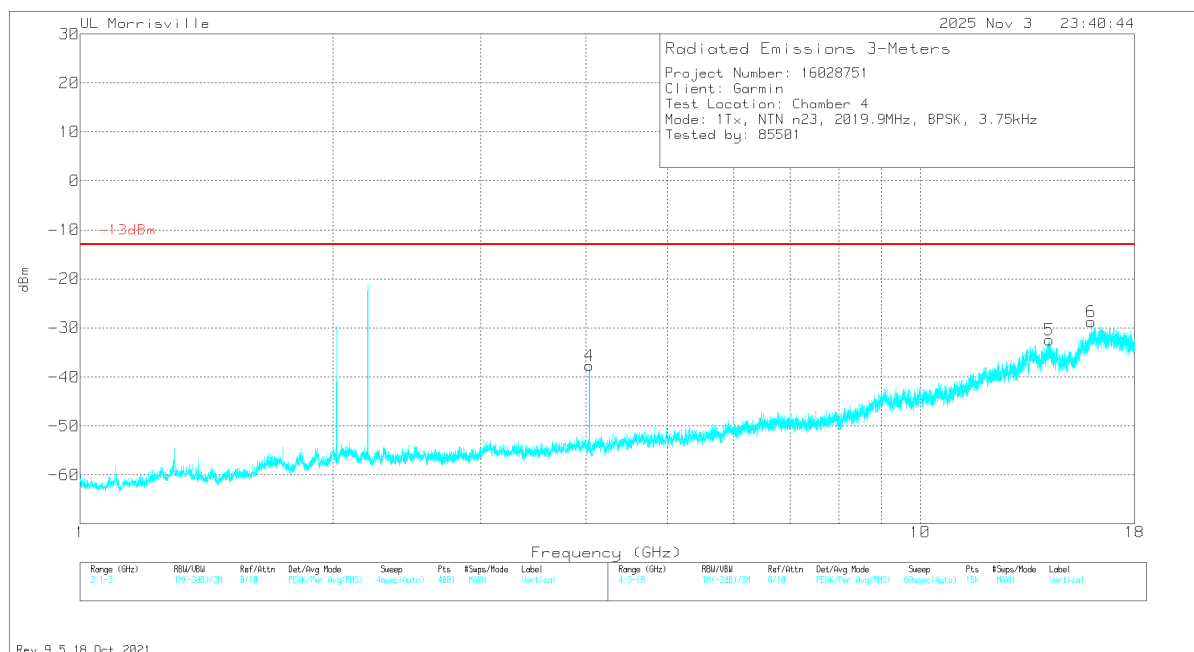
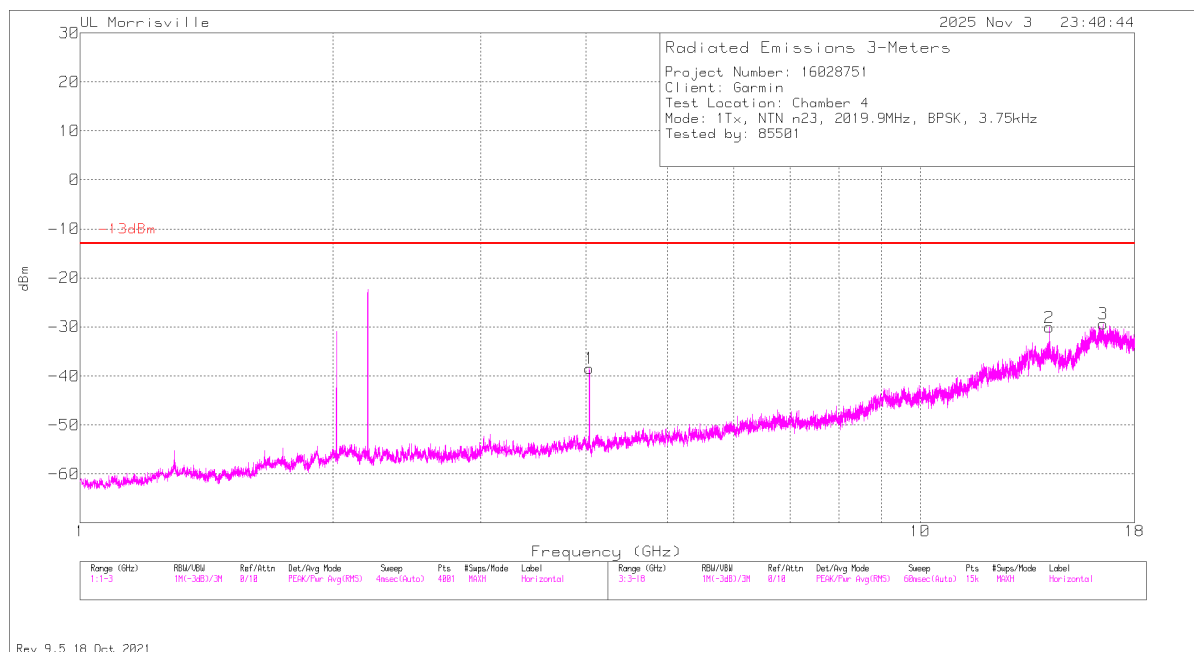
(4) In any event, when an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in [paragraphs \(f\) \(1\), \(2\) and \(3\)](#) of this section.

RSS-170 5.8: Unwanted emission limits for MESSs in all frequency bands

The average power of unwanted emissions shall be attenuated below the average output power, P (dBW), of the transmitter, as specified below:

- a. 25 dB in any 4 kHz, the frequency of which is offset from the channel centre frequency by more than 50%, up to and including 100% of the occupied bandwidth or necessary bandwidth, whichever is greater
- b. 35 dB in any 4 kHz, the frequency of which is offset from the channel centre frequency by more than 100%, up to and including 250% of the occupied bandwidth or necessary bandwidth, whichever is greater
- c. $43 + 10 \log p$ (watts) in any 4 kHz, the frequency of which is offset from the channel centre frequency by more than 250% of the occupied bandwidth or necessary bandwidth, whichever is greater

BPSK NTN B23 (High Channel)



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	206211 (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	4.039	-50.53	Pk	33.3	-33	11.8	0	-38.43	-13	-25.43	0-360	100	H
4	4.039	-49.77	Pk	33.3	-33	11.8	0	-37.67	-13	-24.67	0-360	300	V
5	14.248	-68.58	Pk	38.8	-14.5	11.8	0	-32.48	-13	-19.48	0-360	300	V
2	14.252	-65.78	Pk	38.8	-14.9	11.8	0	-30.08	-13	-17.08	0-360	100	H
6	15.993	-66.41	Pk	40.7	-14.8	11.8	0	-28.71	-13	-15.71	0-360	300	V
3	16.507	-65.95	Pk	41.2	-16.4	11.8	0	-29.35	-13	-16.35	0-360	100	H

Pk - Peak detector

8.1.5. NTN Band 255

LIMITS

FCC 47 CFR 25.202(f)

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;

(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;

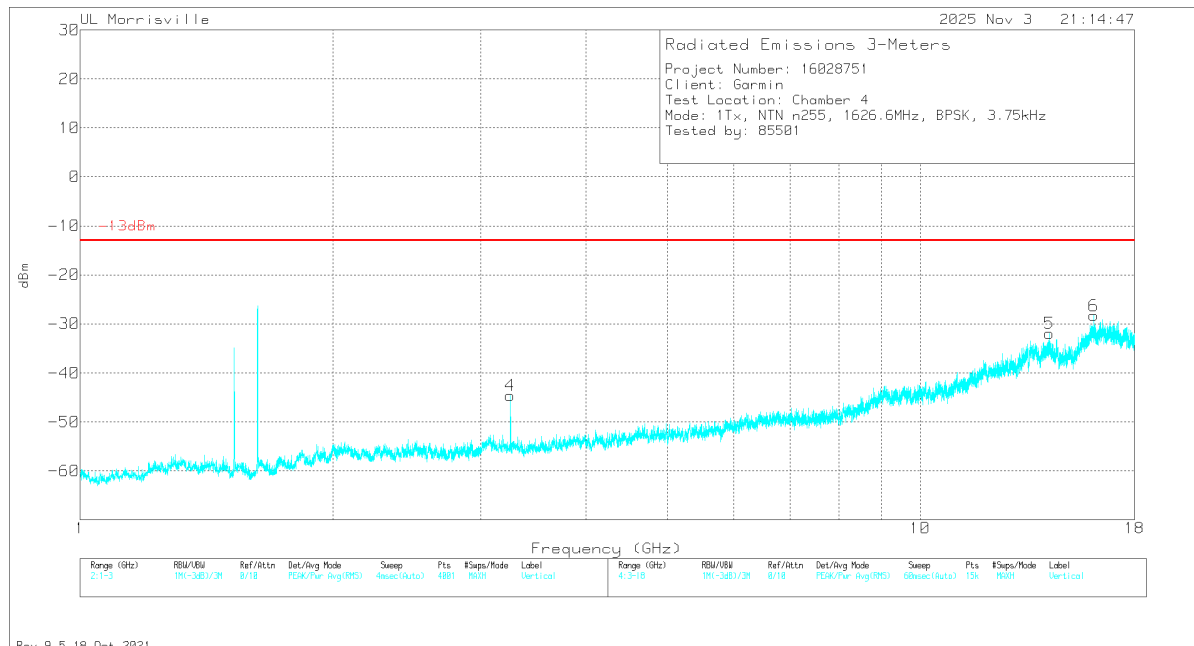
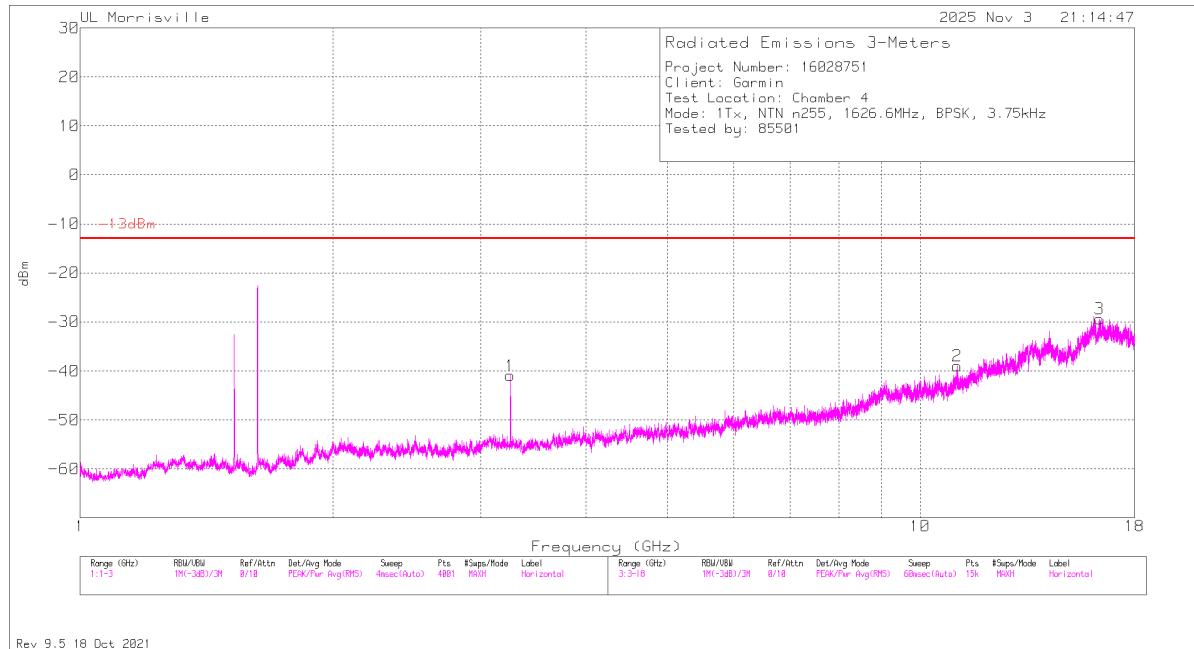
(4) In any event, when an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in [paragraphs \(f\) \(1\), \(2\) and \(3\)](#) of this section.

RSS-170 5.8: **Unwanted emission limits for MESs in all frequency bands**

The average power of unwanted emissions shall be attenuated below the average output power, P (dBW), of the transmitter, as specified below:

- a. 25 dB in any 4 kHz, the frequency of which is offset from the channel centre frequency by more than 50%, up to and including 100% of the occupied bandwidth or necessary bandwidth, whichever is greater
- b. 35 dB in any 4 kHz, the frequency of which is offset from the channel centre frequency by more than 100%, up to and including 250% of the occupied bandwidth or necessary bandwidth, whichever is greater
- c. $43 + 10 \log p$ (watts) in any 4 kHz, the frequency of which is offset from the channel centre frequency by more than 250% of the occupied bandwidth or necessary bandwidth, whichever is greater

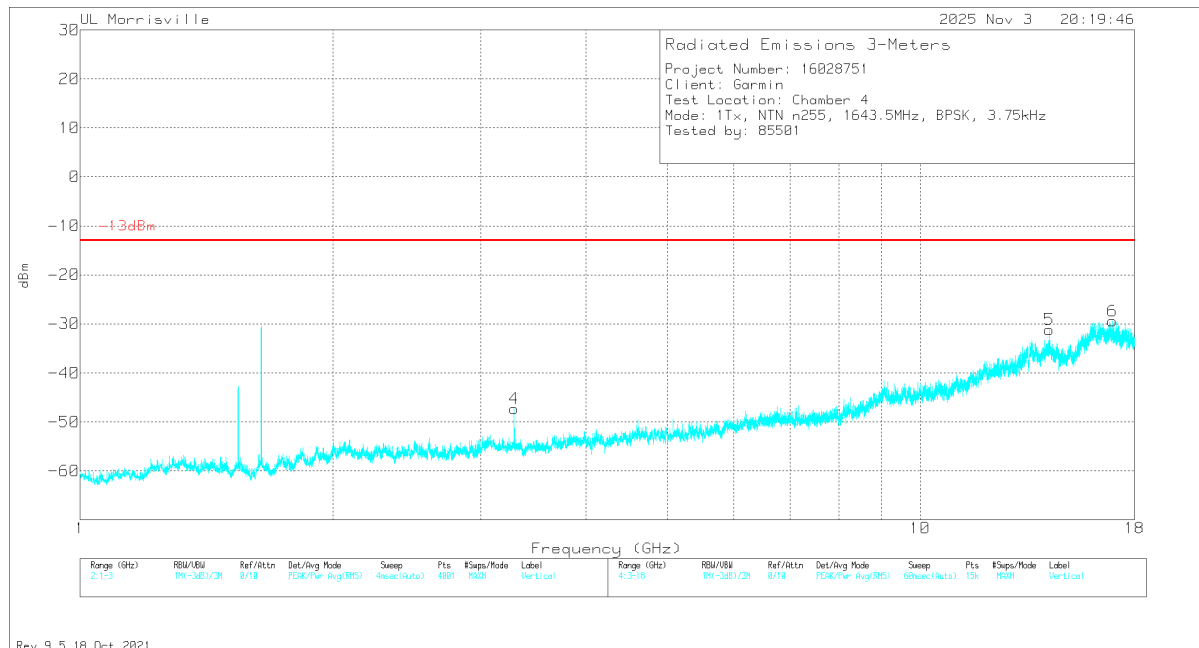
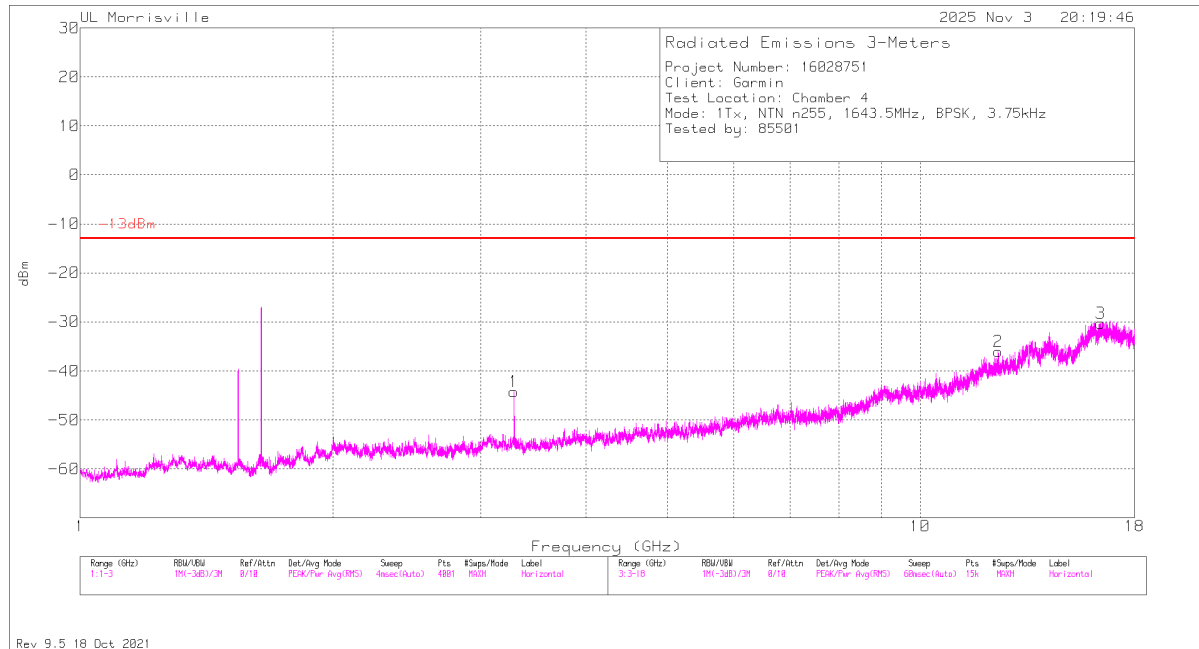
BPSK NTN B255 (Low Channel)



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	206211 (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	3.252	-50.15	Pk	32.8	-35.4	11.8	0	-40.95	-13	-27.95	0-360	100	H
4	3.253	-53.78	Pk	32.8	-35.4	11.8	0	-44.58	-13	-31.58	0-360	300	V
2	11.064	-66.77	Pk	37.8	-21.8	11.8	0	-38.97	-13	-25.97	0-360	100	H
5	14.251	-67.78	Pk	38.8	-14.7	11.8	0	-31.88	-13	-18.88	0-360	200	V
6	16.105	-65.69	Pk	40.8	-15.2	11.8	0	-28.29	-13	-15.29	0-360	200	V
3	16.35	-66.05	Pk	40.9	-16	11.8	0	-29.35	-13	-16.35	0-360	100	H

Pk - Peak detector

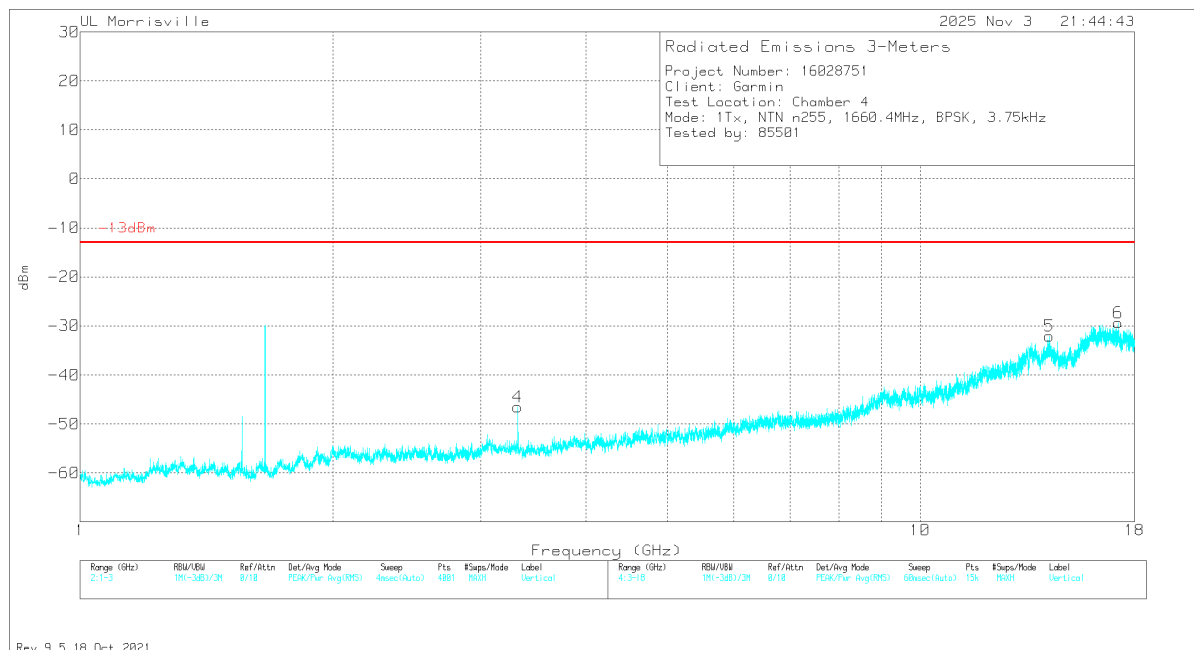
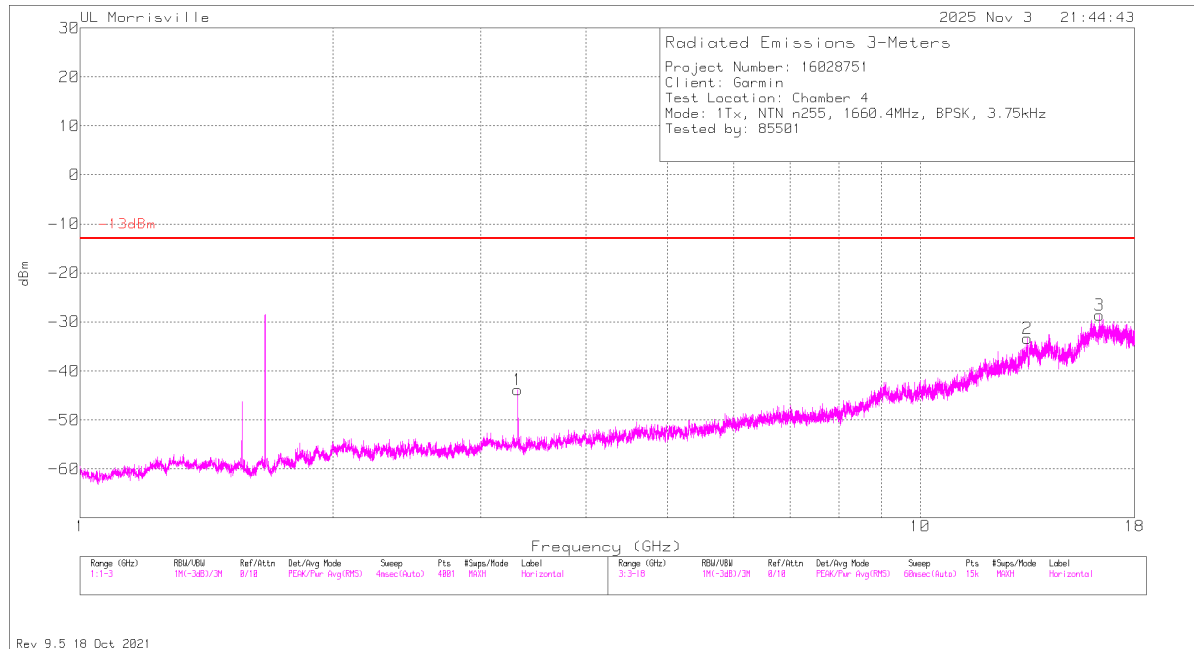
BPSK NTN B255 (Mid Channel)



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	206211 (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	3.286	-53.88	Pk	32.9	-35	11.8	0	-44.18	-13	-31.18	0-360	100	H
4	3.287	-57.01	Pk	32.9	-35	11.8	0	-47.31	-13	-34.31	0-360	300	V
2	12.39	-66.26	Pk	38.8	-20.4	11.8	0	-36.06	-13	-23.06	0-360	100	H
5	14.248	-67.27	Pk	38.8	-14.5	11.8	0	-31.17	-13	-18.17	0-360	300	V
3	16.394	-66.33	Pk	41.1	-16.8	11.8	0	-30.23	-13	-17.23	0-360	200	H
6	16.959	-66.93	Pk	41.6	-15.9	11.8	0	-29.43	-13	-16.43	0-360	300	V

Pk - Peak detector

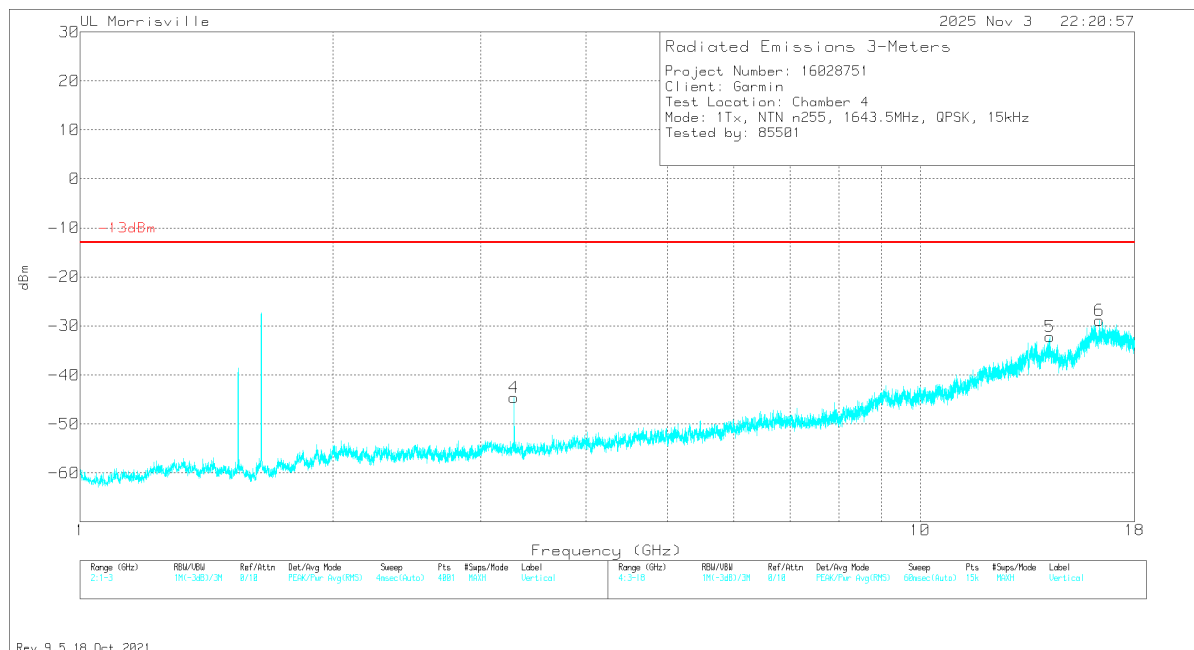
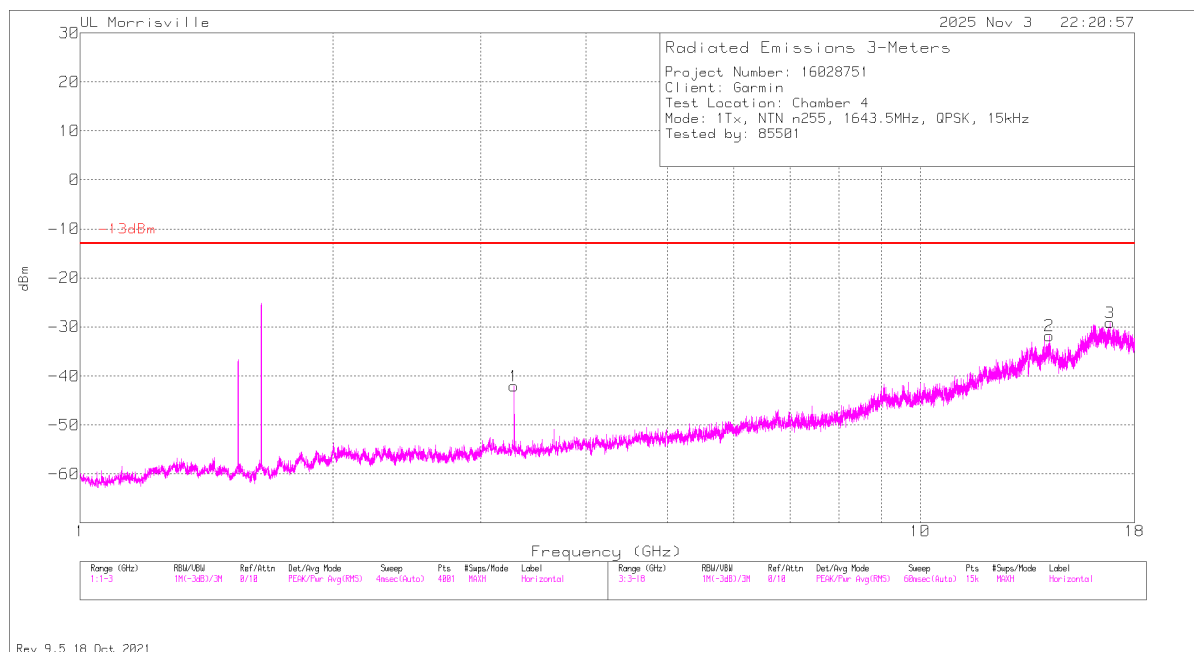
BPSK NTN B255 (High Channel)



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	206211 (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	3.32	-53.68	Pk	32.8	-34.8	11.8	0	-43.88	-13	-30.88	0-360	100	H
4	3.32	-56.3	Pk	32.8	-34.8	11.8	0	-46.5	-13	-33.5	0-360	300	V
2	13.419	-65.19	Pk	38.9	-18.8	11.8	0	-33.29	-13	-20.29	0-360	200	H
5	14.251	-67.95	Pk	38.8	-14.7	11.8	0	-32.05	-13	-19.05	0-360	200	V
3	16.352	-65.73	Pk	40.9	-15.6	11.8	0	-28.63	-13	-15.63	0-360	100	H
6	17.22	-66.32	Pk	41	-15.8	11.8	0	-29.32	-13	-16.32	0-360	300	V

Pk - Peak detector

QPSK NTN B255 (Mid Channel)



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	206211 (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	3.286	-51.8	Pk	32.9	-35	11.8	0	-42.1	-13	-29.1	0-360	100	H
4	3.286	-54.35	Pk	32.9	-35	11.8	0	-44.65	-13	-31.65	0-360	300	V
2	14.251	-67.74	Pk	38.8	-14.7	11.8	0	-31.84	-13	-18.84	0-360	100	H
5	14.271	-67.22	Pk	38.8	-15.6	11.8	0	-32.22	-13	-19.22	0-360	200	V
6	16.351	-65.75	Pk	40.9	-15.8	11.8	0	-28.85	-13	-15.85	0-360	300	V
3	16.832	-67.08	Pk	41.7	-15.6	11.8	0	-29.18	-13	-16.18	0-360	200	H

Pk - Peak detector

8.2. ADDITIONAL UNWANTED EMISSIONS (1559MHz – 1610MHz)

LIMITS

FCC 25.216

(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.

(f) Mobile earth stations placed in service after July 21, 2002 with assigned uplink frequencies in the 1610-1660.5 MHz band shall suppress the power density of emissions in the 1605-1610 MHz band to an extent determined by linear interpolation from -70 dBW/MHz at 1605 MHz to -10 dBW/MHz at 1610 MHz.

(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.

ISED RSS-170

5.9.2 Band 1626.5-1660.5 MHz

For MESs with transmitting frequencies between 1610 MHz and 1626.5 MHz, the e.i.r.p. density of unwanted emissions shall not exceed the limits shown below, which are the same as those for the band 1605-1610 MHz, averaged over any 2 ms active transmission interval:

- a. -70 dBW/MHz at 1605 MHz, linearly interpolated to -46 dBW/MHz at 1610 MHz, for broadband emissions
- b. -80 dBW/kHz at 1605 MHz, linearly interpolated to -56 dBW/kHz at 1610 MHz, for discrete emissions

TEST PROCEDURE

FCC KDB 971168 D01 v03r01/D02 v02r02

RBW = 1MHz

VBW = 3MHz

Detector = RMS

Sweep Time = >Sweep Points *2ms (1001*.002) = 2 Seconds.

Sweep Points = 1001

Trace Mode = Max Hold

RESULTS



05:20:26 PM 11/03/2025

Band n255 Low Channel BPSK – Horizontal



05:27:23 PM 11/03/2025

Band n255 Low Channel BPSK – Vertical

Project Number: 16028751
Client: Garmin
Test Location: Chamber 4
Mode: 1Tx, NTN n255, Low Channel
Tested by: 85501
Date: 2025-11-03

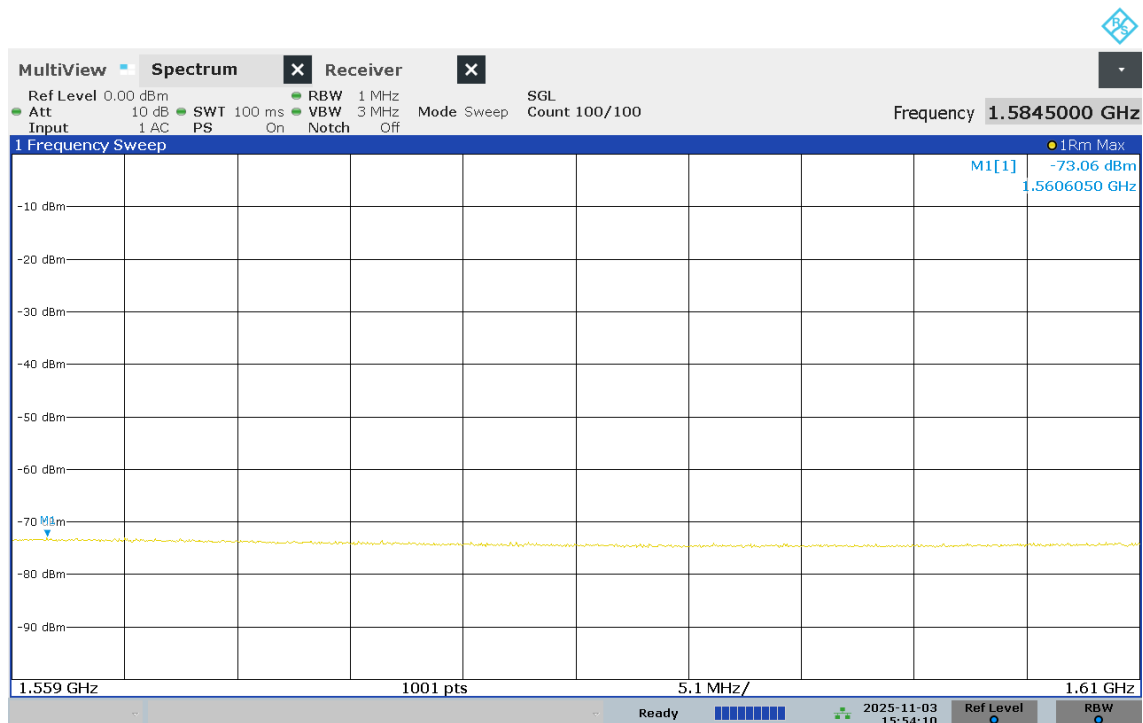
Frequency (GHz)	Meter Reading (dBm)	Det	206211 (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	Limit (dBm/MHz)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.55948	-72.91	RMS	28.1	-36.8	11.8	1.8	-68.01	-40	-28.01	112	365	V
1.56096	-72.7	RMS	28.1	-36.9	11.8	1.8	-67.9	-40	-27.9	87	381	H

RMS - RMS detection



03:49:50 PM 11/03/2025

Band n255 Mid Channel BPSK – Horizontal



03:54:11 PM 11/03/2025

Band n255 Mid Channel BPSK – Vertical

Project Number: 16028751
Client: Garmin
Test Location: Chamber 4
Mode: 1Tx, NTN n255, Mid Channel
Tested by: 19289
Date: 2025-11-03

Frequency (GHz)	Meter Reading (dBm)	Det	206211 (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	Limit (dBm/MHz)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.56061	-73.06	RMS	28.1	-36.9	11.8	1.8	-68.26	-40	-28.26	52	337	V
1.56213	-72.75	RMS	28.1	-36.9	11.8	1.8	-67.95	-40	-27.95	191	375	H

RMS - RMS detection



Band n255 High Channel BPSK – Horizontal



Band n255 High Channel BPSK – Vertical

Project Number: 16028751
Client: Garmin
Test Location: Chamber 4
Mode: 1Tx, NTN n255, High Channel
Tested by: 85501
Date: 2025-11-03

Frequency (GHz)	Meter Reading (dBm)	Det	206211 (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	Limit (dBm/MHz)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.55903	-62.26	RMS	28.1	-36.8	11.8	1.8	-57.36	-40	-17.36	47	247	H
1.55903	-57.37	RMS	28.1	-36.8	11.8	1.8	-52.47	-40	-12.47	336	143	V

RMS - RMS detection



Band n255 Mid Channel QPSK – Horizontal



Band n255 Mid Channel BPSK – Vertical

Project Number: 16028751
Client: Garmin
Test Location: Chamber 4
Mode: 1Tx, NTN n255, Mid Channel
Tested by: 85501
Date: 2025-11-03

Frequency (GHz)	Meter Reading (dBm)	Det	206211 (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	Limit (dBm/MHz)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.56035	-72.93	RMS	28.1	-36.8	11.8	1.8	-68.03	-40	-28.03	329	106	V
1.56137	-73.18	RMS	28.1	-36.9	11.8	1.8	-68.38	-40	-28.38	164	143	H

RMS - RMS detection

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

LIMITS

FCC 25.216

(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.

ISED RSS-170 5.10

5.10 Carrier-off state emissions

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

TEST PROCEDURE

FCC KDB 971168 D01 v03r01/D02 v02r02

RBW = 1MHz

VBW = 3MHz

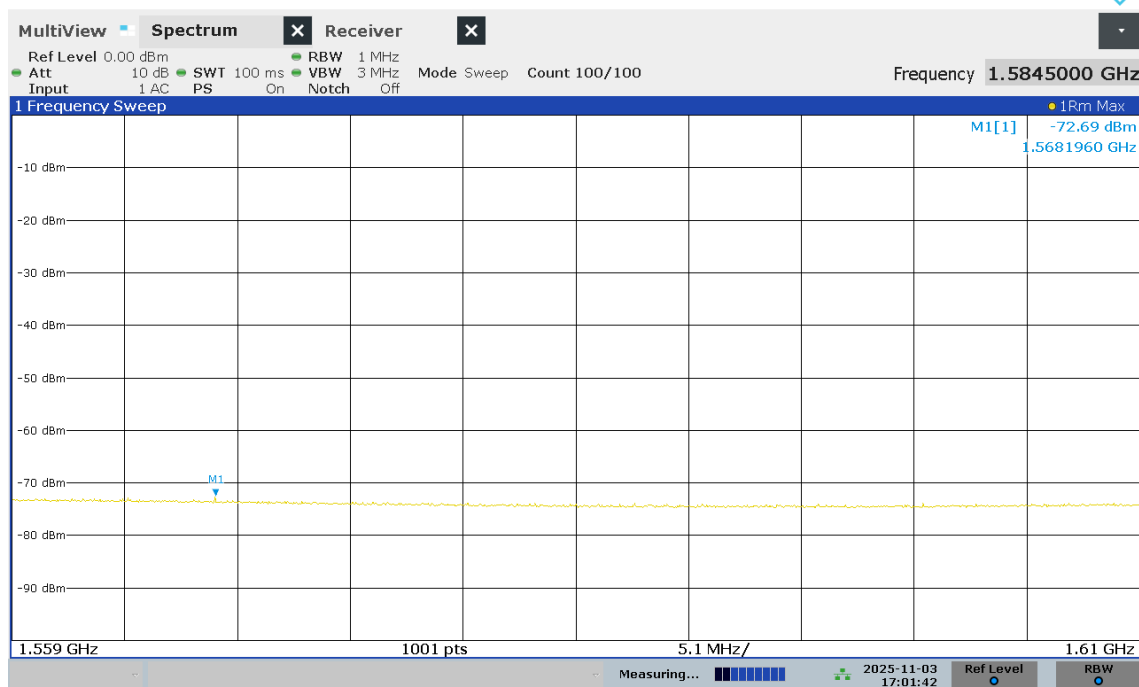
Detector = RMS

Sweep Time = >Sweep Points *2ms (1001*.002) = 2 Seconds.

Sweep Points = 1001

Trace Mode = Max Hold

RESULTS



05:01:43 PM 11/03/2025

Band n255 Mid Channel BPSK – Horizontal



05:08:09 PM 11/03/2025

Band n255 Mid Channel BPSK – Vertical

Project Number: 16028751
Client: Garmin
Test Location: Chamber 4
Mode: 1Tx, NTN n255, Mid Channel
Tested by: 85501
Date: 2025-11-03

Frequency (GHz)	Meter Reading (dBm)	Det	206211 (dB/m)	Gain/Loss (dB)	CF (dB)	Filter (dB)	Corrected Reading dBm	Limit (dBm/MHz)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.56316	-72.9	RMS	28.1	-36.9	11.8	1.8	-68.1	-50	-18.1	352	115	V
1.568196	-72.69	RMS	28	-36.9	11.8	1.8	-67.99	-50	-17.99	129	310	H

Pk - Peak detector
RMS - RMS detection