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RF Test Report On

FCC Testing of the
PF54A0-mb480-05 Radio Unit for wireless base station
FCC ID: 2BHMSA1452201
FCC CFR 47 Part 2, [FCC CFR 47 Part 96E](#)
COMMERCIAL-IN-CONFIDENCE

PREPARED BY

A handwritten signature in black ink that reads 'Scott Drysdale'.

Scott Drysdale
Test Personnel

APPROVED BY

A handwritten signature in black ink that reads 'Steve McFarlane'.

Steve McFarlane
Authorised Signatory

DATED

16 December
2024



Product Service

CONTENTS

Section	Page No
1	REPORT INFORMATION 3
1.1	Report Details 4
1.2	Brief Summary of Results 5
1.3	Configuration Description 6
1.4	Declaration of Build Status 7
1.5	Product Information 8
1.6	Test Conditions 12
1.7	Deviation(s) From The Standard 12
1.8	Modification Record 12
1.9	Test Site 12
2	TEST DETAILS 13
2.1	Peak Output Power and Peak to Average Ratio - Conducted 14
2.2	Occupied Bandwidth 24
2.3	Band Edge 26
2.4	Transmitter Spurious Emissions 30
2.5	Frequency Stability 40
2.6	Radiated Emission 44
3	TEST EQUIPMENT USED 54
3.1	Test Equipment Used 55
3.2	Measurement Uncertainty 56
4	ACCREDITATION, DISCLAIMERS AND COPYRIGHT 57
4.1	Accreditation, Disclaimers and Copyright 58



Product Service

SECTION 1

REPORT INFORMATION



Product Service

1.1 REPORT DETAILS

Manufacturer	NEC Corporation
Address	7-1, Shiba 5-chome, Minato-ku, Tokyo, 108-8001 Japan
Product Name	Radio Unit for wireless base station
Product Number	PF54A0-mb480-05
Serial Number(s)	Na23X9011123 / Na23X9011124(spare)
Software Version	04.07
Hardware/Model Version	PF54A0-mb480-05
Test Specification/Issue/Date	FCC CFR 47 Part 2: 2023 FCC CFR 47 Part 96:2023
Start of Test	March 22, 2024
Finish of Test	April 15, 2024
Name of Tester(s)	Scott Drysdale
Report issue / Revisions	April 18, 2024 - 000 Draft RF Test report Dec 6, 2024 – 001 Revision following CBRS testing Dec 11, 2024 – 002 Modifications as per client request. Dec 16, 2024 – 003 Modifications as per client request. Dec 16, 2024 – 004 Modifications as per TCB request.
Related Document(s)	KDB 971168 D01 v03r01 KDB 662911 D01 v02r01 KDB 940660 D01 Part 96 CBRS Eqpt v01 ANSI C63.26:2015

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate compliance with FCC CFR 47 Part 96. The sample tested was found to comply with the requirements defined in the applied rules.

Tester

Scott Drysdale



Product Service

1.2 BRIEF SUMMARY OF RESULTS

A brief summary of results for each configuration, in accordance with FCC CFR 47 Part 2, [FCC CFR 47 Part 96E](#) is shown below.

Table 1 –Test Summary

Section	Specification Clause		Test Description	Result
	FCC CFR 47 Part 2	FCC CFR 47 Part 96		
2.1	§2.1046	§96.41 (b)(c)(g)	Peak Output Power and Peak to Average Ratio – Conducted, PSD	Pass
2.2	§2.1049	§96.41 (e)(3)	Occupied Bandwidth	Pass
2.3	§2.1051	§96.41 (e)(3)	Band Edge	Pass
2.4	§2.1051	§96.41 (e)(1)	Transmitter Spurious Emissions	Pass
2.5	§2.1055(d)	-	Frequency Stability	Pass
2.6	§2.1051	-	Radiated Spurious Emission	Pass



Product Service

1.3 CONFIGURATION DESCRIPTION

1.3 CONFIGURATION DESCRIPTION

The Radio Unit for wireless base station PF54A0-mb480-05 in Band 48 (3550 MHz – 3700 MHz).

The NR Test Models (as defined in 3GPP TS 36.141) were used to represent QPSK, 16QAM, 64QAM, and 256QAM modulation, respectively.

TX test cases: Maximum Conducted Output Power, Maximum Power Spectral Density, Spurious Emissions at Antenna Terminals (± 1 MHz) and Conducted Spurious Emissions, measurements were performed on the RF Port. All testing was performed with the EUT transmitting at maximum RF power unless otherwise stated.

The EUT was powered via external DC power supply.

1.4 DECLARATION OF BUILD STATUS

Table 2 – Declaration

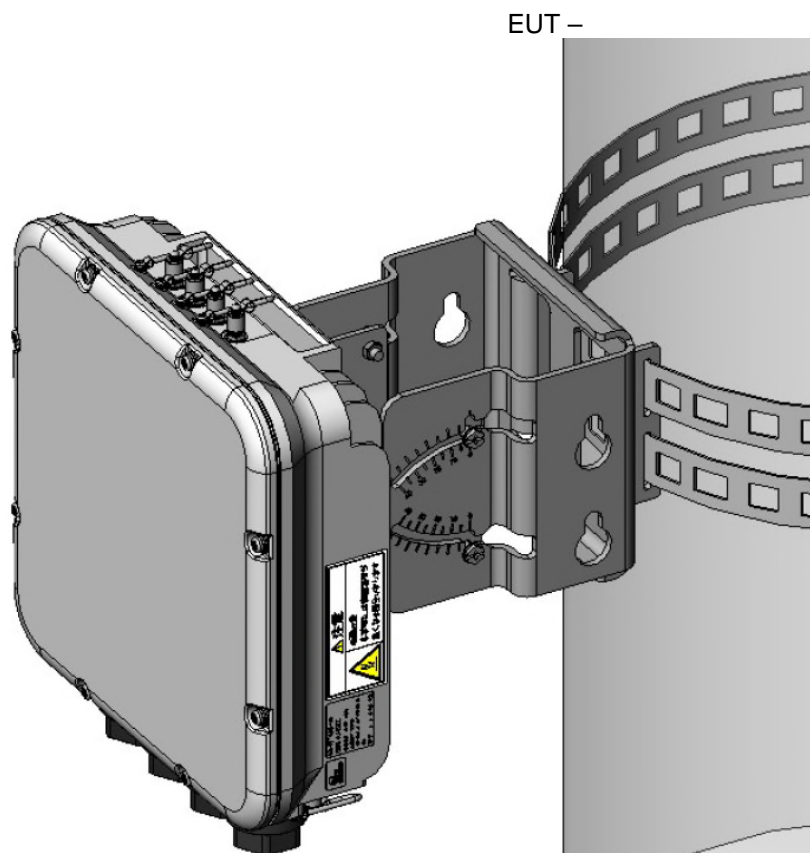
MAIN EUT	
MANUFACTURING DESCRIPTION	
MANUFACTURER	NEC Corporation
TYPE	CBRS device – Category B
TRANSMITTER OPERATING RANGE	B48 3550 – 3700 MHz (TDD)
RECEIVER OPERATING RANGE	B48 3550 – 3700 MHz (TDD)
COUNTRY OF ORIGIN	Japan
INTERMEDIATE FREQUENCIES	DL: 110 – 150MHz, UL: 40 – 80MHz
EMISSION DESIGNATOR(S): (i.e. G1D, GXW)	NR 40M0 W7D
MODULATION TYPES: (i.e. GMSK, QPSK)	NR: QPSK, 16QAM, 64QAM, 256 QAM
Antenna Gain	10.8 dBi
HIGHEST INTERNALLY GENERATED FREQUENCY	3.7 GHz
TARGET OUTPUT POWER (W or dBm)	26.2 dBm + 10.8 dBi (Category B) = 37 dBm EIRP
FCC ID	2BHMSA1452201
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The EUT is a CBSD radio unit for a wireless base station that provides a communications in Band 48.

1.5 PRODUCT INFORMATION

1.5.1 Technical Description

The Equipment Under Test

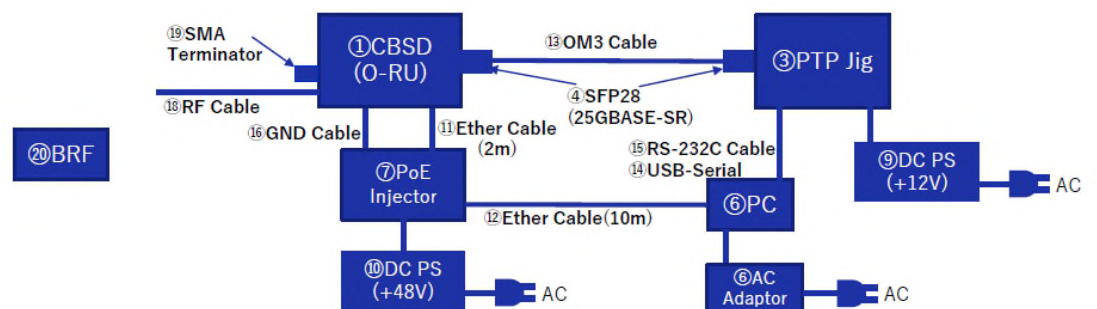
The Equipment Under Test (EUT) is shown in the depiction below. A full technical description can be found in the Manufacturer's documentation.



1.5.2 EUT configurations

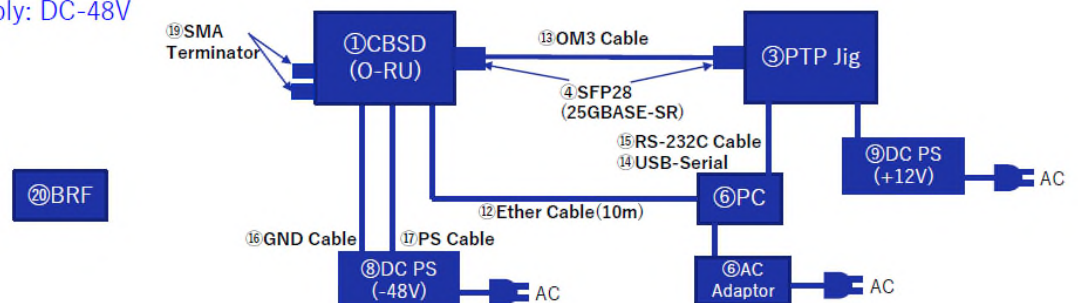
Table 3 – EUT Test Configurations Test Setup

Test setup - Antenna port Conducted



Test setup – Radiated emissions

Power Supply: DC-48V



1.5.2.1 TDD Synchronization

The customer provided a test model with a high duty cycle

Gate View Sweep Time (ms)	Gate Delay (us)	Gate length (ms)	Sweep Time (s)
6.4	800	2.9	5s

1.5.2.1 Conducted Power

Spectrum Analyzer	Setting
RBW	1- 5% of OBW
VBW	3 x OBW

Span	1.5 x OBW
Sweep points (RMS)	>2xSpan/RBW
Detector	RMS (or peak)
BP integration	40MHz
Detector	RMS
Trace mode	Trace Averaging (RMS) with enough sweeps to stabilize.

1.5.3 Frequency List

Table 4 – EUT Frequency per BW

BW(MHz)	Lowest (MHz)	Middle (MHz)	Highest (MHz)
40	3570.0	3625.0	3680.0



Product Service

1.5.4 Worst-Case Scenario

Testing was performed for all configurations on both Port A and Port B. All EUT configurations were measured and only the worst-case or representative scenario for each measurement is presented in graph format.

Table 5 – Worst Case QPSK of Power Conducted Measurements+ Antenna Gain

40MHz (EIRP values shown)		
(dBm/1MHz)	(dBm/10MHz)	dBm (Total)
21.3	31.1	36.9



Product Service

1.6 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure, test laboratories or a chamber as appropriate.

FCC Measurement Facility Accreditation Designation Number: CA4180
TÜV SÜD Canada (Ottawa)

1.7 DEVIATION(S) FROM THE STANDARD

No deviations from the applicable test standards or test plan were made during testing.

1.8 MODIFICATION RECORD

No modifications were made to the EUT during testing.

1.9 TEST SITE

Under our Accreditation, TÜV SÜD Canada, Ottawa conducted the following tests at 1280 Teron Rd, Ottawa, Canada.

Test Name	Name of Test personnel
Peak Output Power and Peak to Average Ratio – Conducted, PSD	Scott Drysdale
Occupied Bandwidth	Scott Drysdale
Band Edge	Scott Drysdale
Transmitter Spurious Emissions	Scott Drysdale
Frequency Stability	Scott Drysdale
Radiated Emissions	Scott Drysdale



Product Service

SECTION 2

TEST DETAILS



Product Service

2.1 PEAK OUTPUT POWER AND PEAK TO AVERAGE RATIO - CONDUCTED

2.1.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1046
FCC CFR 47 Part 96, Clause 96.41 (b)(c)(g)

2.1.2 Date of Test and Modification State

April 1-5, 2024 – Modification State 0

2.1.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.4 Environmental Conditions

Ambient Temperature	21°C
Relative Humidity	20%

2.1.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01, clause 5.2.1 and summed in accordance with FCC KDB 662911 D01. EIRP values were calculated by adding $10\log(2 \text{ ports})$ for Port A and Port B, and a maximum antenna gain of 10.8 dBi.

Test Results



Product Service

2.1.5.1 Worst-case measurements - Summary

Table 6 – Worst-Case: QPSK Modulation – Conducted Power Measurements - PSD
(Category B operation)

Bandwidth (MHz)	Conducted Average Power (dBm/1MHz)	Conducted Average Power (dBm/10MHz)	EIRP (dBm/1MHz) <Note 1>	Limit (dBm/1MHz) <Note 2>	EIRP (dBm/10MHz) <Note 1>	Limit (dBm/10MHz) <Note 2>	Results
40	7.7	17.5	21.5	37.0	31.3	47.0	Pass
<p>Note 1. EIRP/MHz (worst case) = Power (dBm/xMHz) + + 10log(number of ports) + Gain(10.8 dBi) as per section 2.1 in 412172 D01</p> <p>Note 2: Limit as Per FCC Part 96 Category B operation.</p> <p>Note 3: Reading shown were as obtained on Port 'A' as worst case (highest readings). Readings between Port A and Port B were within 1 dB.</p>							

Table 7 – Combined maximum total output power

	Low dBm	Mid dBm	High dBm	Cable dB	Total dBm	Antenna dBi	Max EIRP dBm
Port A	4.8	5.2	4.1				
Port B	5.5	5.3	4.4				
Linearly summed A&B <Note 1>	8.2	8.3	7.3	17.8	26.1	10.8	36.9
<p>Note 1: Linearly summed as per FCC KDB 662911 D01 (E)(1)</p>							



Product Service

Table 8 – PAPR – Worst-Case: QPSK Modulation

Bandwidth (MHz)	PAPR (@.1%)	Limit	Result
40	8.6	13	Pass



Product Service

2.1.5.1.1.1 PSD summary measurement table

Table 9 –Port A

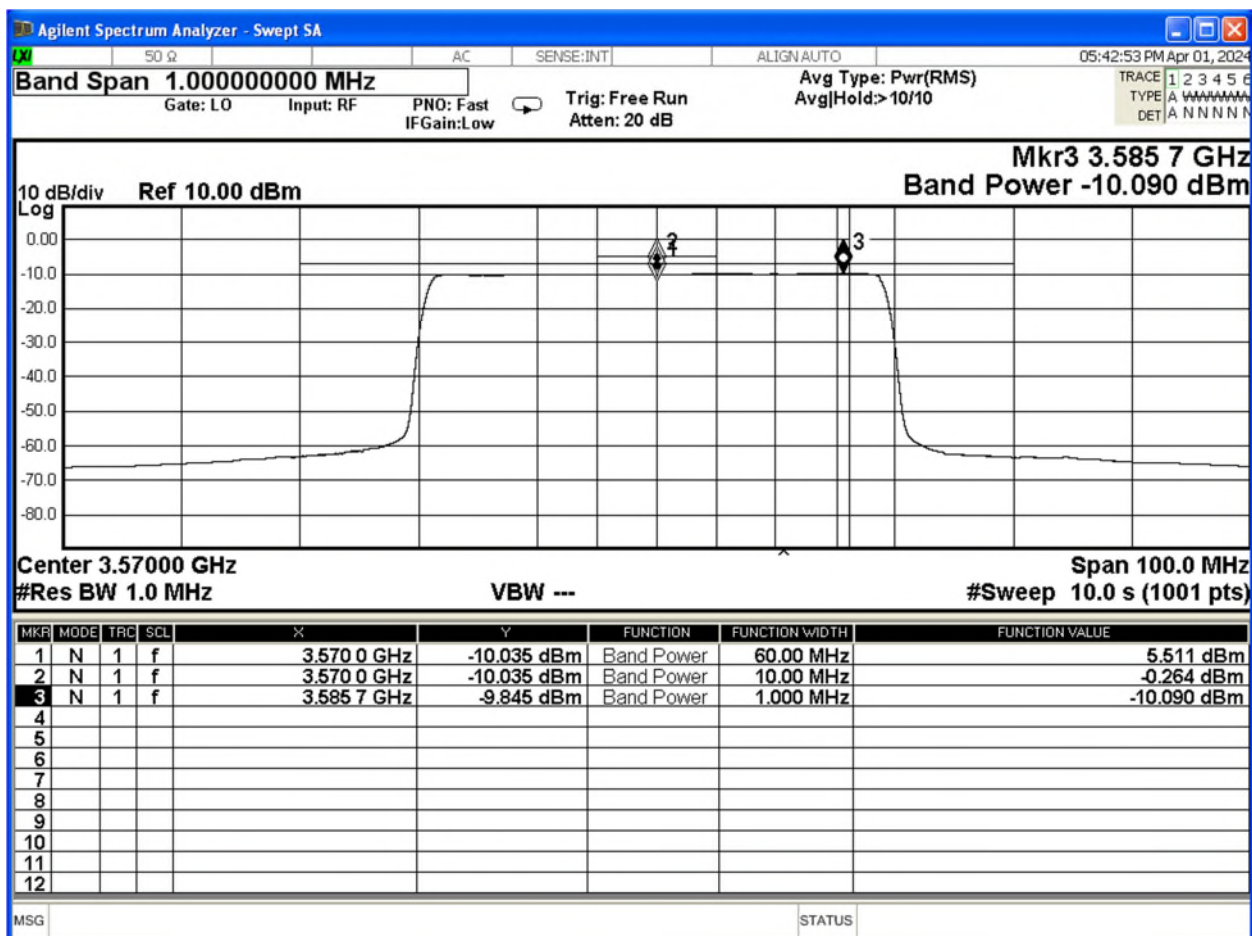
	Low	Mid	High	Cable	Antenna	2 ports factor	Max EIRP	Limit	Margin	Result
	dBm	dBm	dBm	dB	dB	dB	dBm	dBm	dB	
1MHz	-10.1	-10.2	-11.1	17.8	10.8	3	21.5	37	-15.5	Pass
10MHz	-0.3	-0.5	-1.2	17.8	10.8	3	31.3	47	-15.7	Pass

Table 10 –Port B

	Low	Mid	High	Cable	Antenna	2 ports factor	Max EIRP	Limit	Margin	Result
	dBm	dBm	dBm	dB	dB	dB	dBm	dBm	dB	
1MHz	-10.8	-10.5	-11.3	17.8	10.8	3	21.1	37	-15.9	Pass
10MHz	-1	-0.6	-1.7	17.8	10.8	3	31.0	47	-16.0	Pass

2.1.5.1.1.2 Lower Channel: 3570MHz

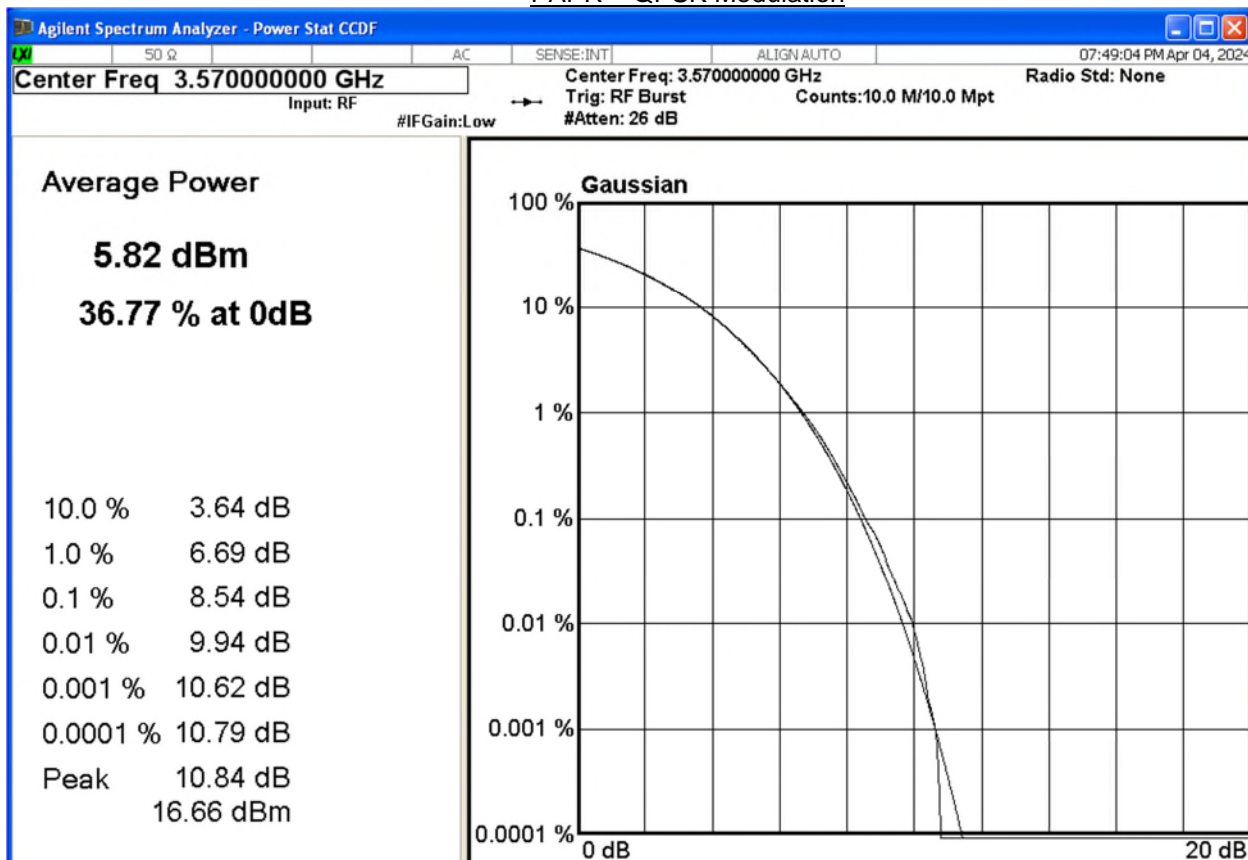
Conducted Output Power – QPSK Modulation, BW: 40MHz





Product Service

PAPR – QPSK Modulation

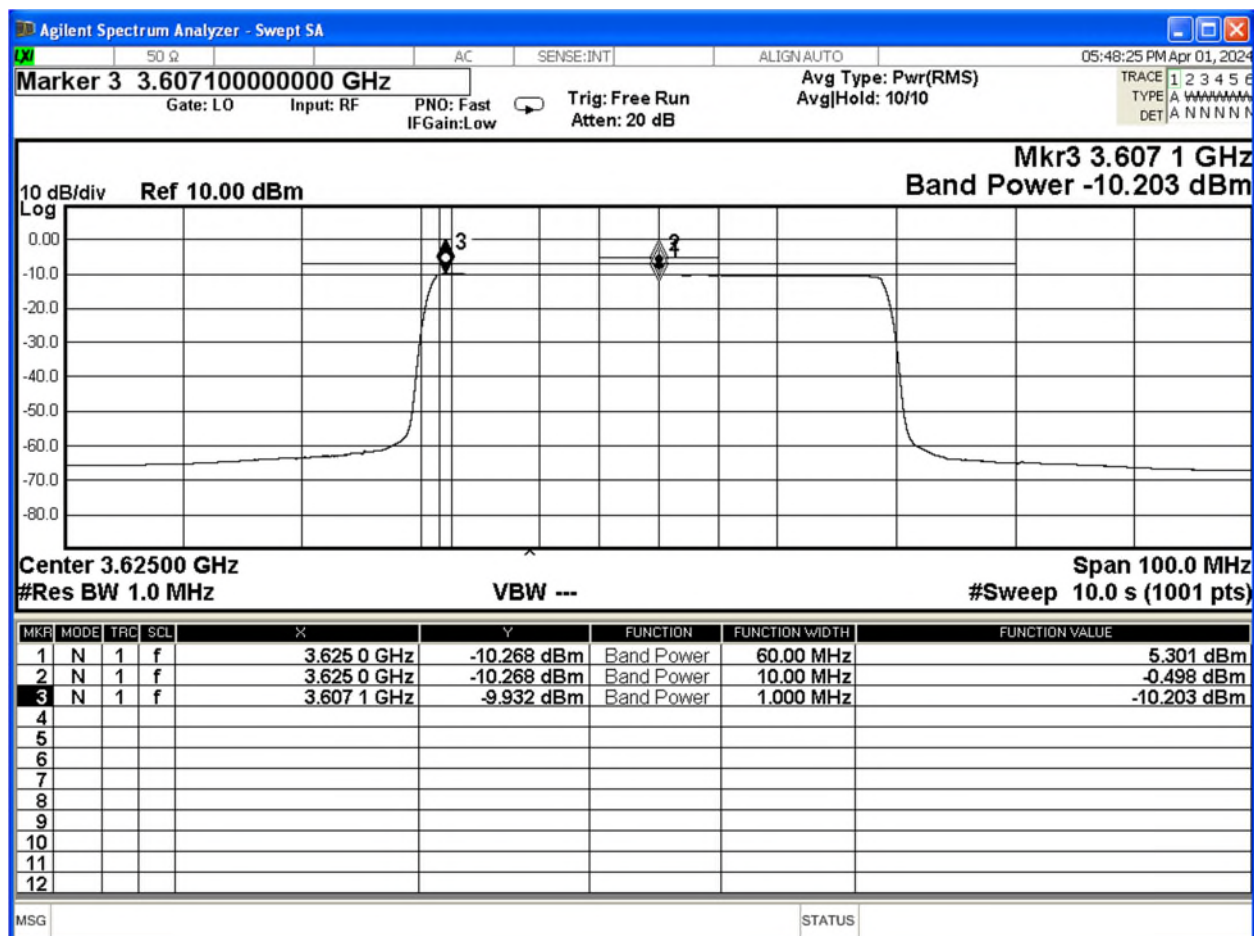




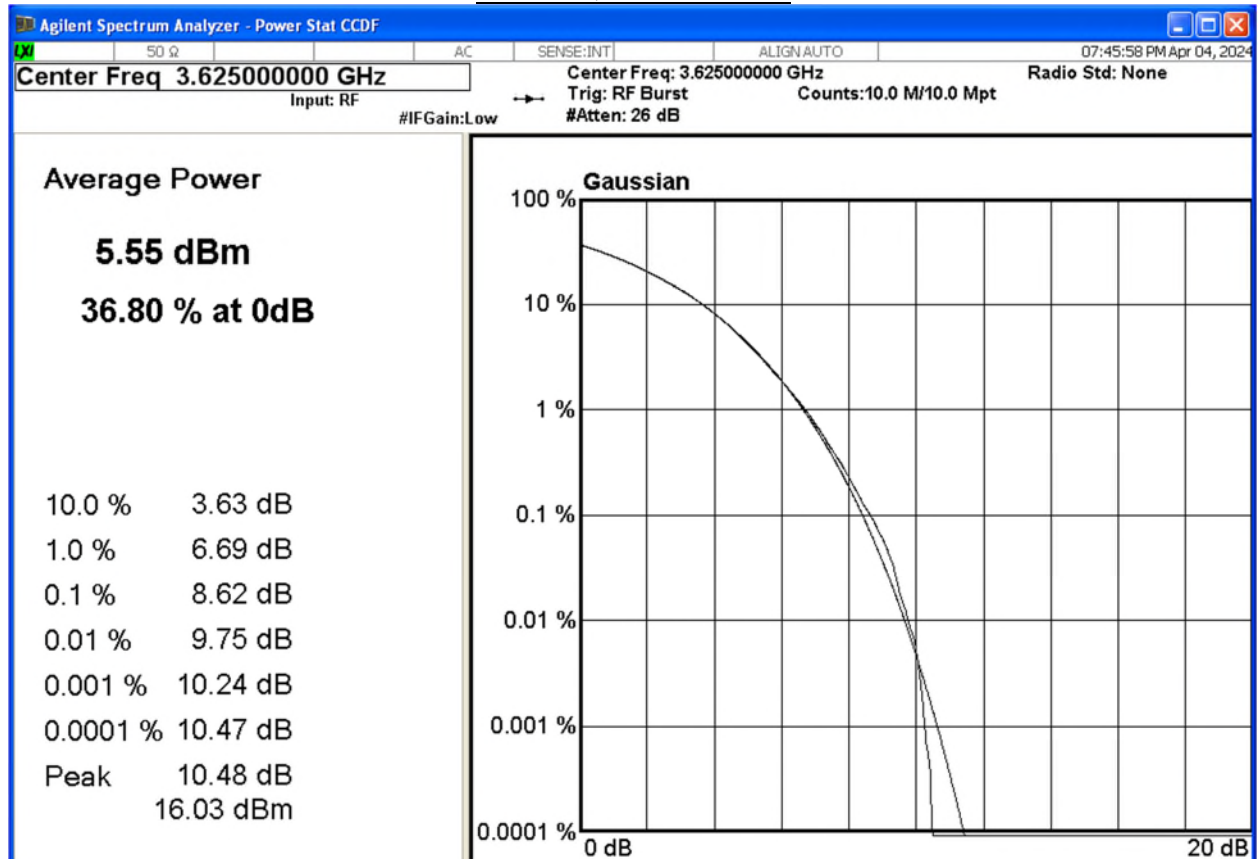
Product Service

2.1.5.1.1.1 Mid Channel: 3625 MHz

Conducted Output Power – QPSK Modulation, BW: 40MHz



PAPR – QPSK Modulation

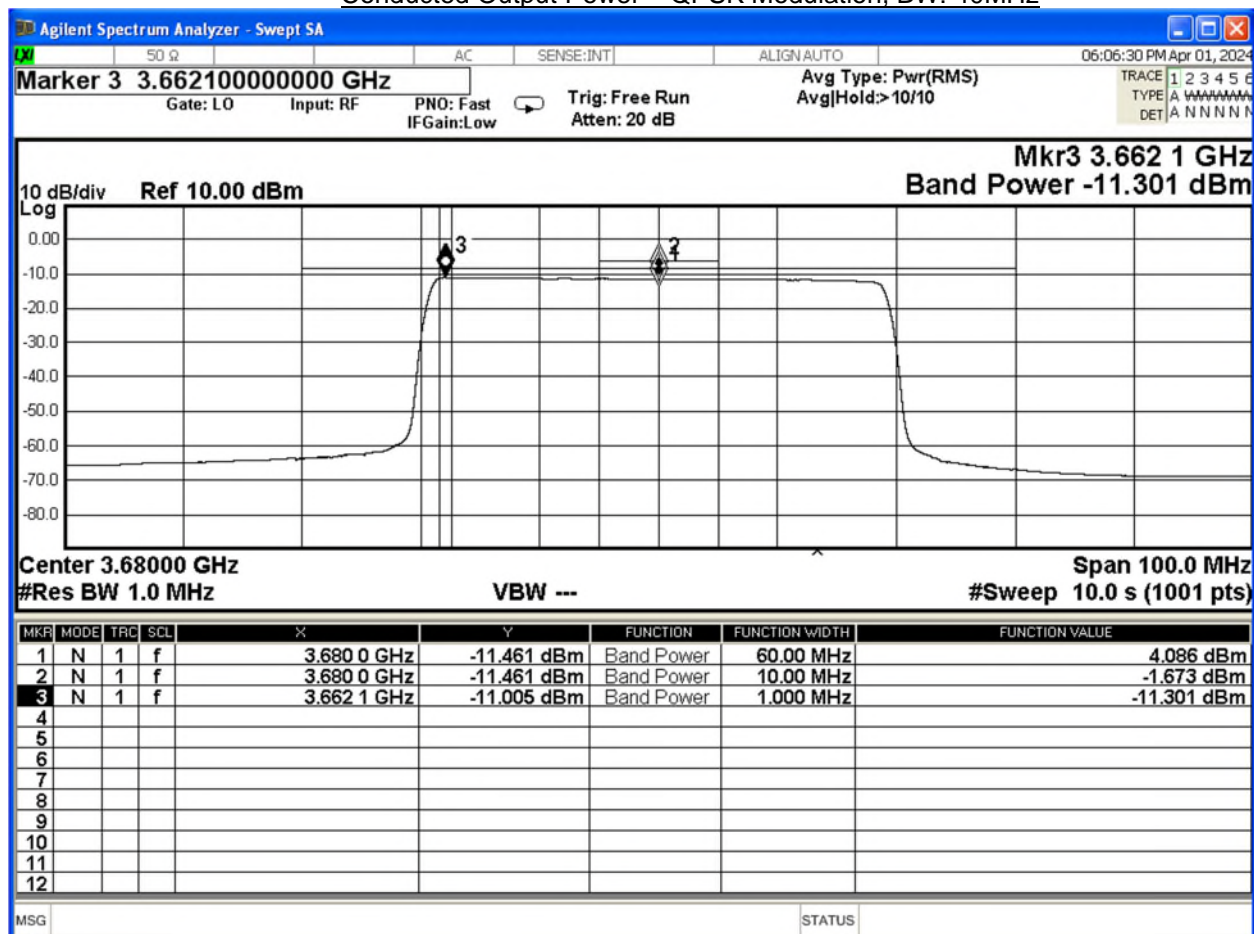




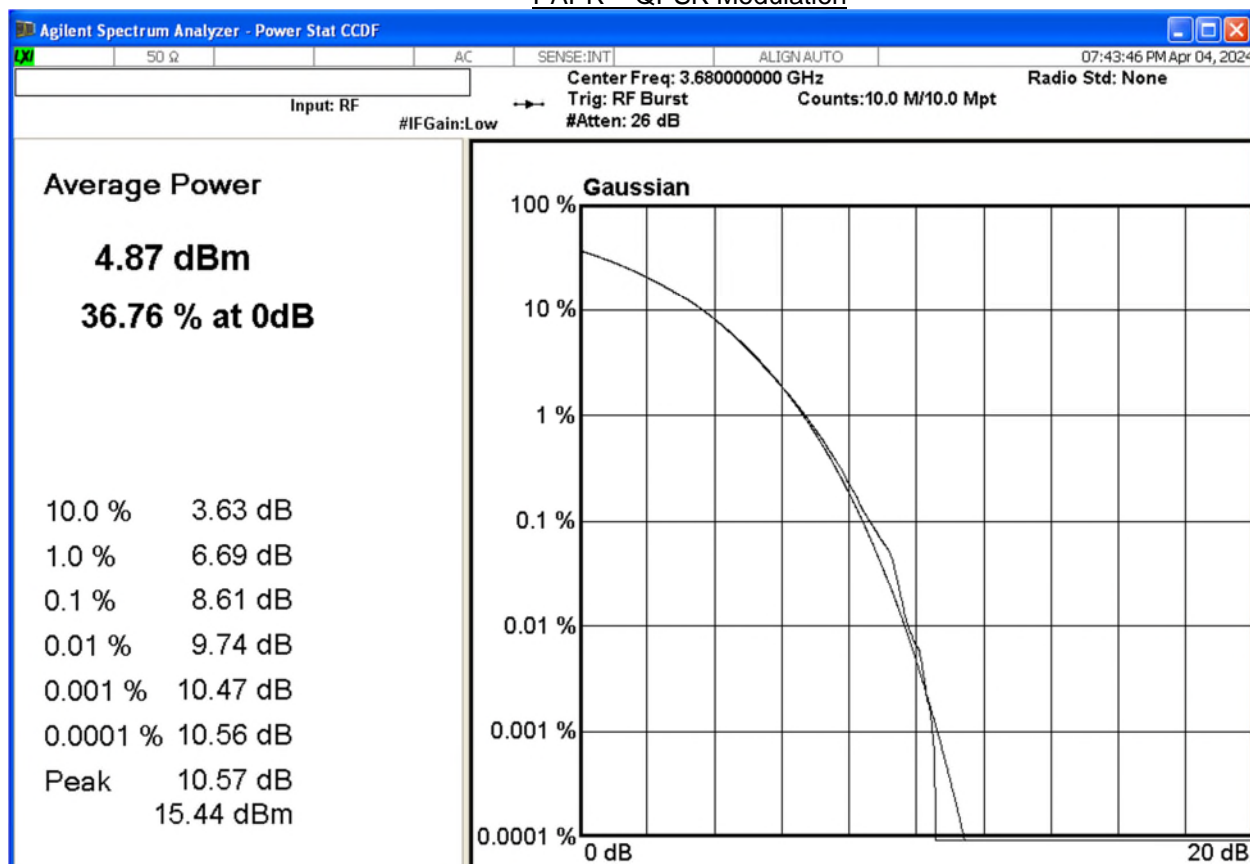
Product Service

2.1.5.1.1.1 High Channel: 3680MHz

Conducted Output Power – QPSK Modulation, BW: 40MHz



PAPR – QPSK Modulation





Product Service

2.2 OCCUPIED BANDWIDTH

2.2.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1049
FCC CFR 47 Part 96, Clause 96.41 (e)(3)

2.2.2 Date of Test and Modification State

April 1-5, 2024 – Modification State 0

2.2.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.4 Environmental Conditions

Ambient Temperature 22°C
Relative Humidity 19%

2.2.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01.

2.2.6 Test Results

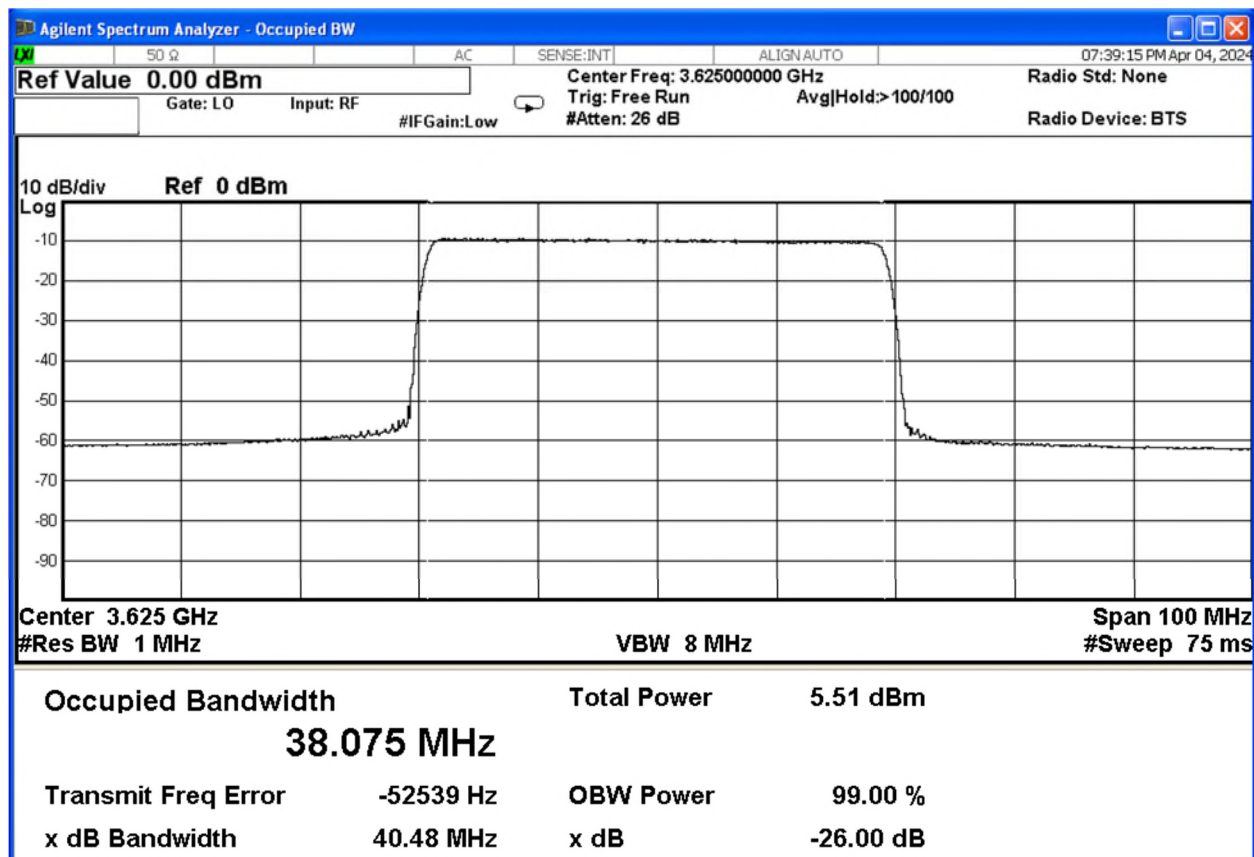
Table 11 – Worst Case of OBW of Measurements in MHz

Low (3570 MHz)	Middle (3625 MHz)	High (3680 MHz)
38.065	38.075	37.96



Product Service

2.2.6.1.1 Middle Channel: 3625MHz





Product Service

2.3 BAND EDGE

2.3.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051
FCC CFR 47 Part 96, Clause 96.41 (e)(3)

2.3.2 Date of Test and Modification State

April 1 to 5th, 2024 – Modification State 0

2.3.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.3.4 Environmental Conditions

Ambient Temperature	23°C
Relative Humidity	15%

2.3.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01.
The EUT was connected to a Spectrum Analyser via an attenuator. The path loss between the EUT and the Spectrum Analyser was measured prior to band edge measurements

The maximum measured path loss over the range shown was entered as a Reference Level Offset in the Spectrum Analyser. The Spectrum Analyser RBW was adjusted to be 1 MHz or at least 1% of the measured 26dB Bandwidth. Using an RMS or peak detector, the frequency spectrum up to 1MHz away from the Band Edge was investigated.

The worst-case scenarios are given for low, middle and high channel.

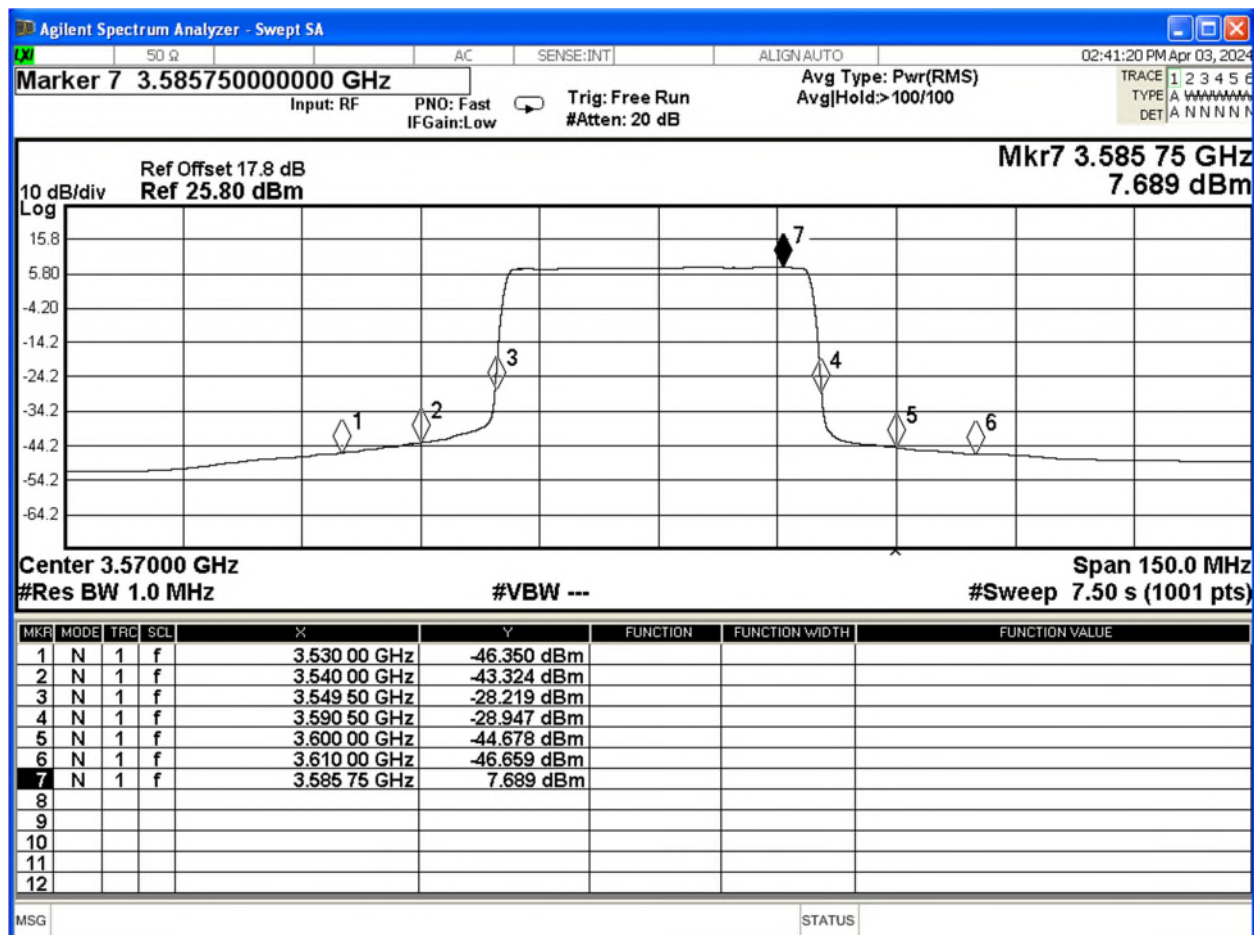
The following limits were applied:

–13 dBm/MHz within 0-10 megahertz above or below the upper SAS-assigned channel edge

2.3.6 Test Results

Maximum Output Power 37 dBm EIRP

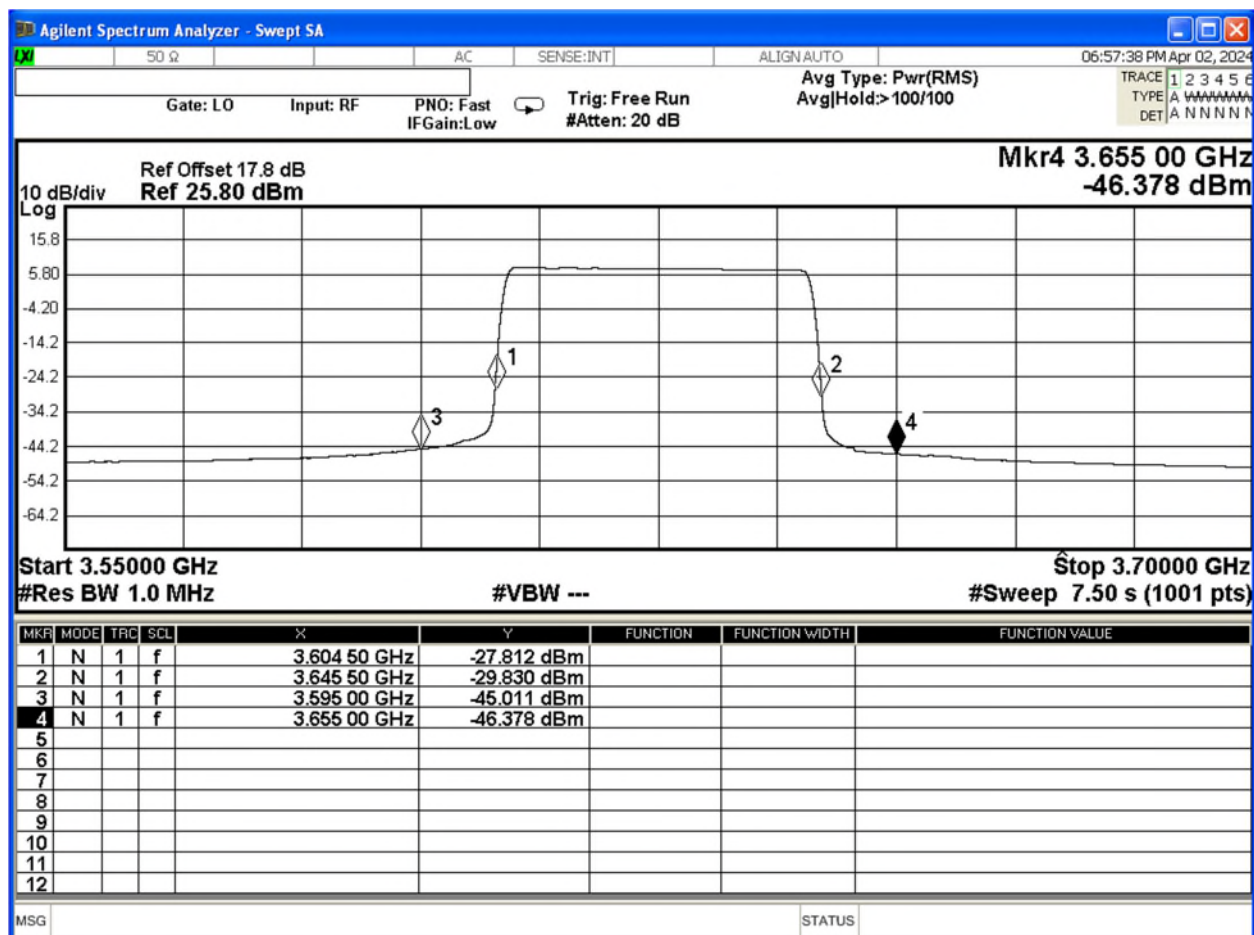
2.3.6.1 Bottom Channel: 3580 MHz – QPSK Modulation – BW:40MHz





Product Service

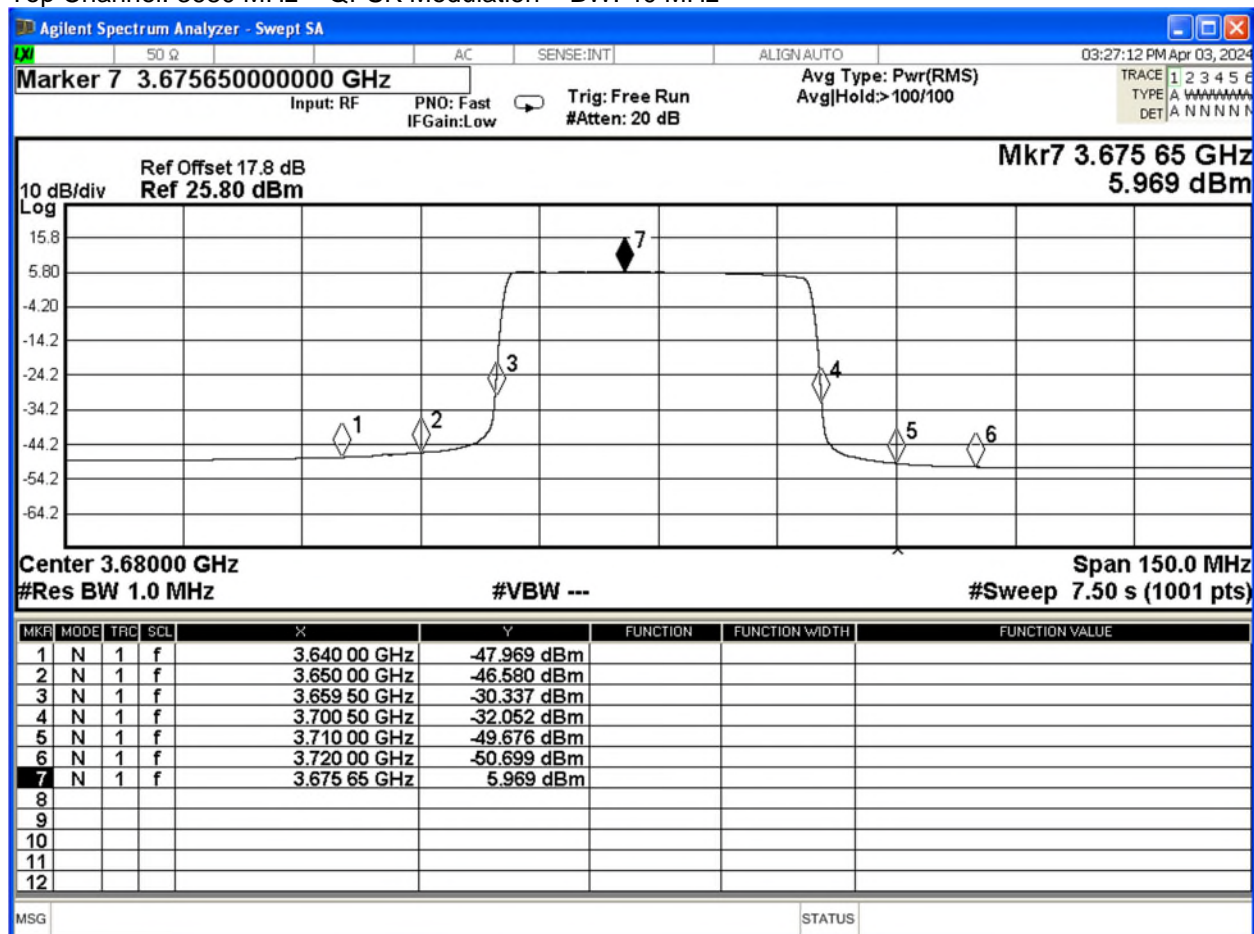
2.3.6.2 Middle Channel: 3625 MHz – QPSK Modulation – BW:40MHz





Product Service

Top Channel: 3680 MHz – QPSK Modulation – BW: 40 MHz





Product Service

2.4 TRANSMITTER SPURIOUS EMISSIONS

2.4.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051
FCC CFR 47 Part 96, Clause 96.41 (e)(1)

2.4.2 Date of Test and Modification State

April 1-5, 2024 – Modification State 0

2.4.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.4.4 Environmental Conditions

Ambient Temperature	23°C
Relative Humidity	35%

2.4.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01.

The EUT was connected to a Spectrum Analyser via an attenuator and switching box. Prior to testing, a Network Analyser was used to calibrate the path loss between the EUT and the Spectrum Analyser. The worst-case path loss in the measured ranges was entered as a reference level offset. Over the measured ranges, the RBW was set to 1MHz with a VBW of 3MHz. All measurement results are specified as average with an RMS detector, or peak detector as a “worst case” measurement, being used in conjunction with a trace setting of Max Hold.

Test limits applied

The power transmitted out the antenna port shall not exceed :

–13 dBm/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge (See band edge).

At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, shall not exceed –25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed –40dBm/MHz.

The worst-case test cases are presented for Port A.



Product Service

2.4.6 Test Results

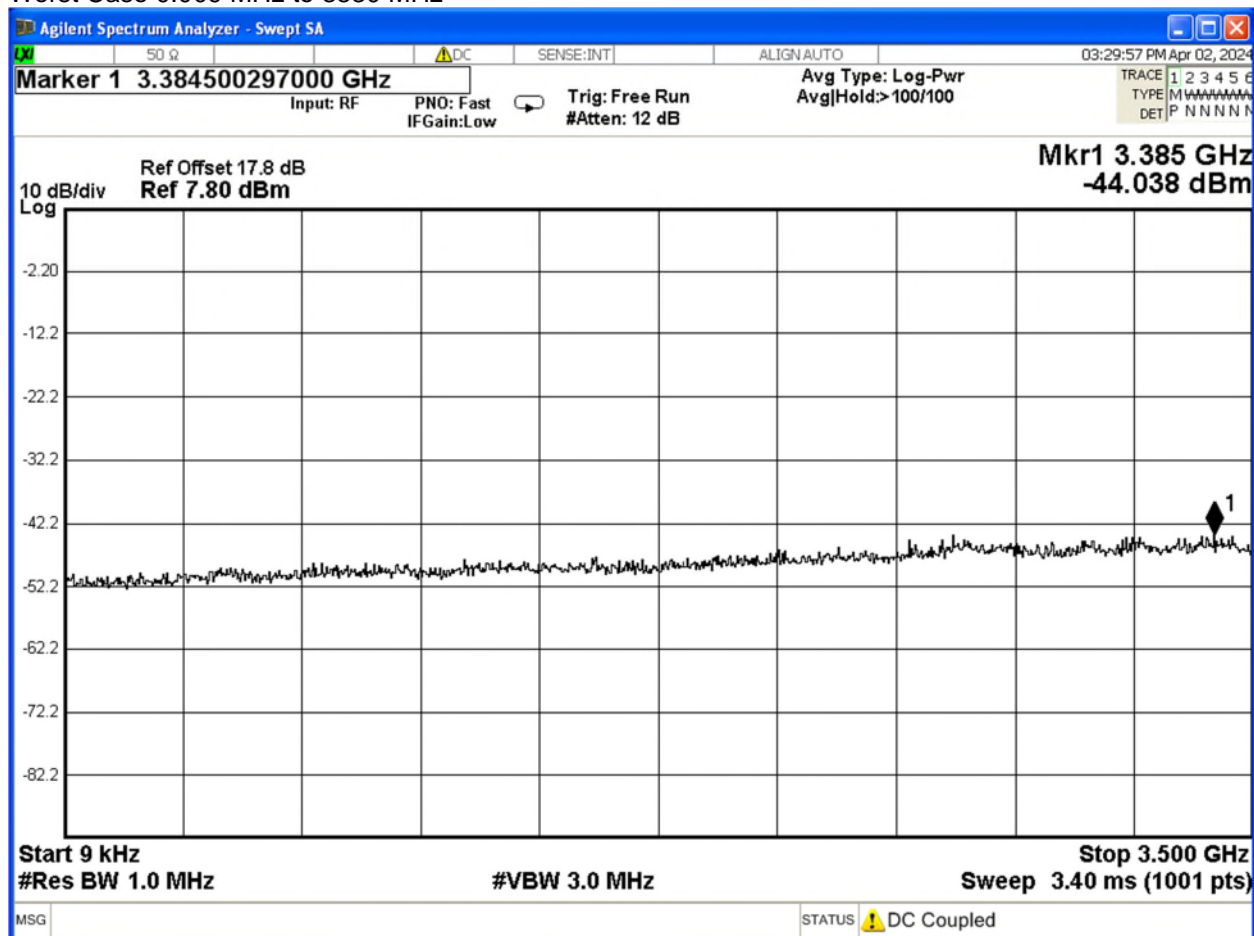
Maximum Output Power 37 dBm

Range Frequency (MHz)	Limit (dBm)	Result
0.009 to 3530	-40	Pass <Note 1>
3530 to 3540	-25	Pass
3540 to 3550	-13	Pass
3700 to 3710	-13	Pass
3710 to 3720	-25	Pass
3720 to 40000	-40	Pass <Note 2>
Note 1. The device was scanned from 9kHz to 3530MHz with no emission (peak values less than 6Bd from the limit) was found		
Note 2. The device was scanned up to 40Ghz with no emission (values less than 6dB from the limit) was found		

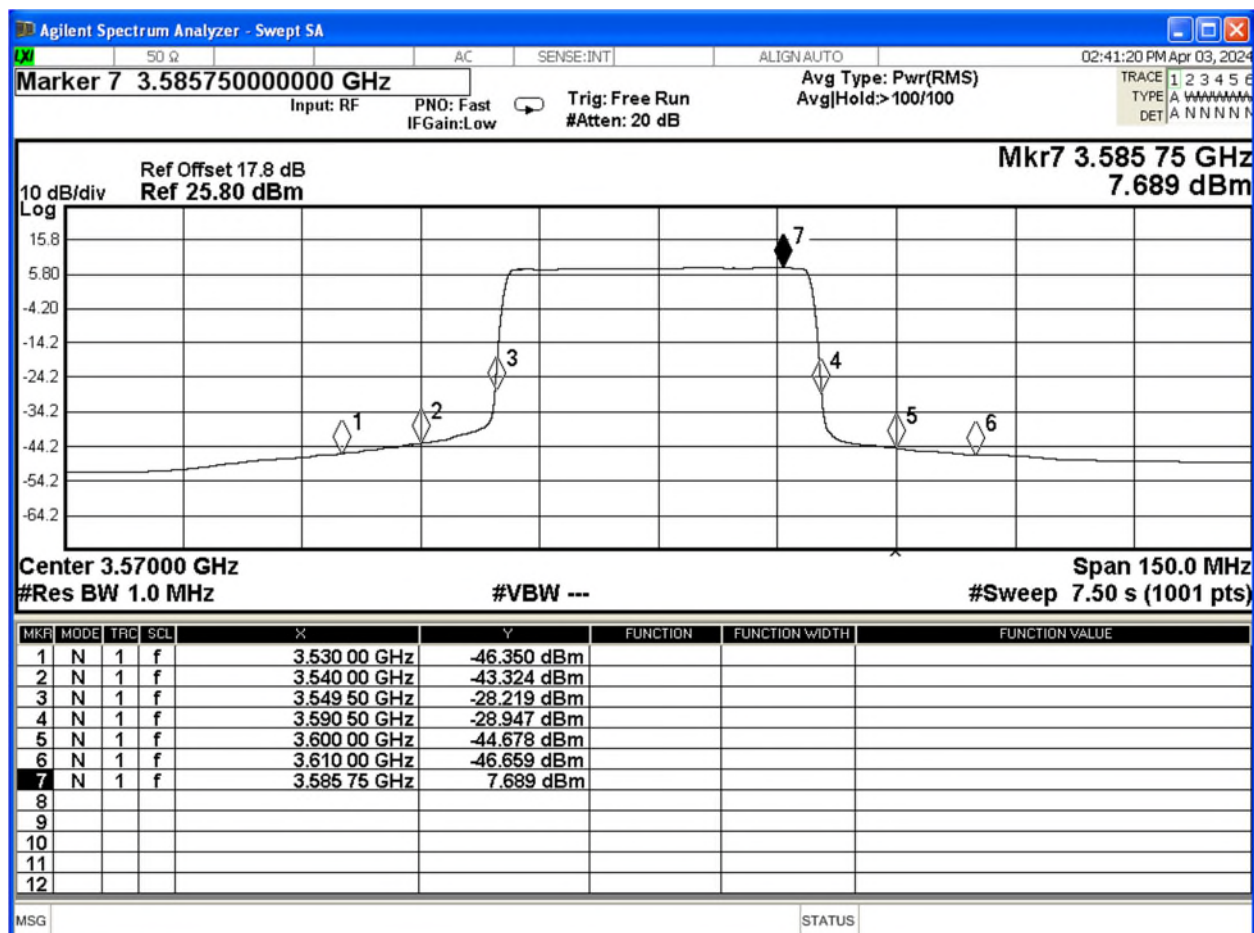


Product Service

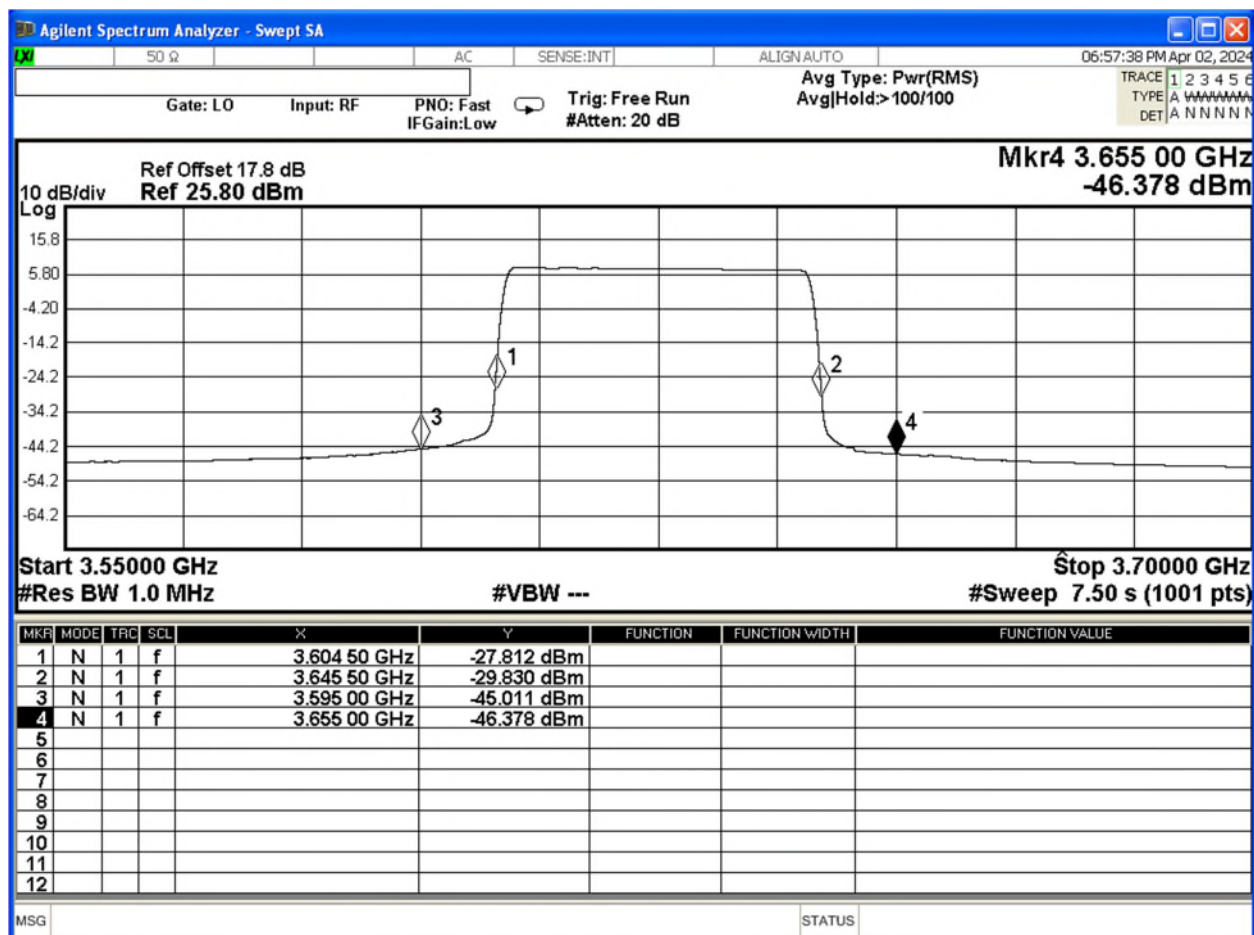
Worst Case 0.009 MHz to 3530 MHz



2.4.6.1 Worst-Case Bottom Channel



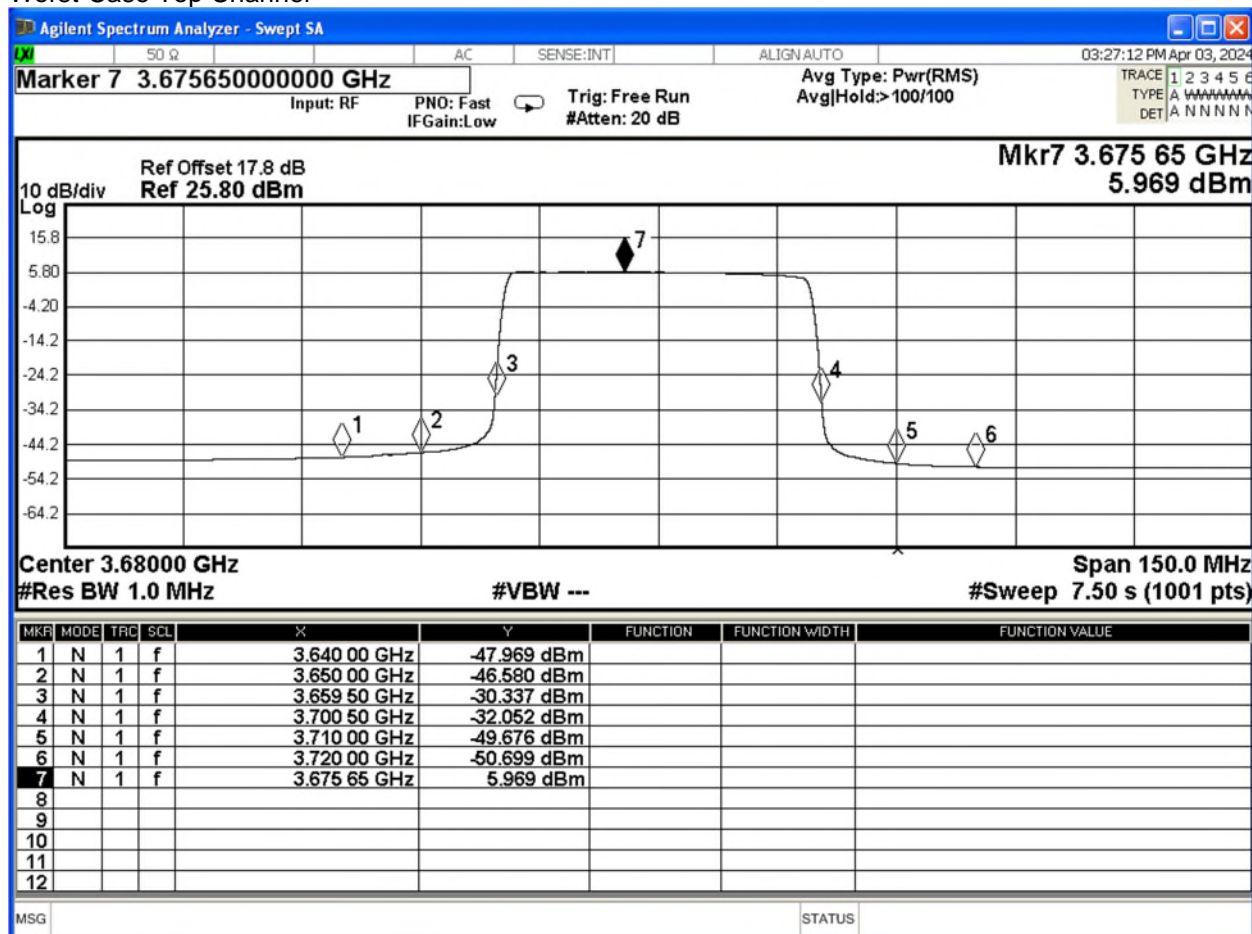
2.4.6.2 Worst-Case Mid Channel





Product Service

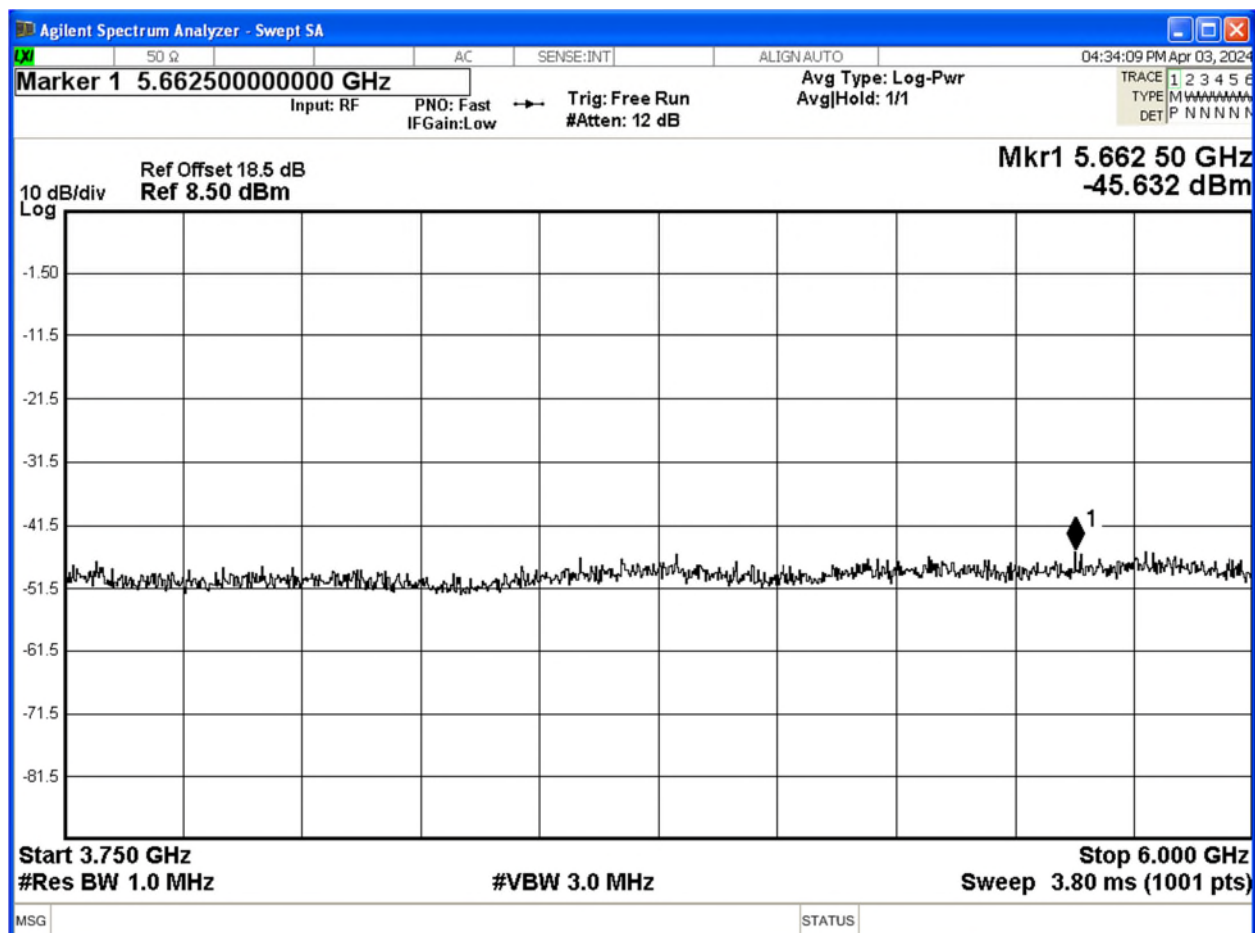
Worst-Case Top Channel





Product Service

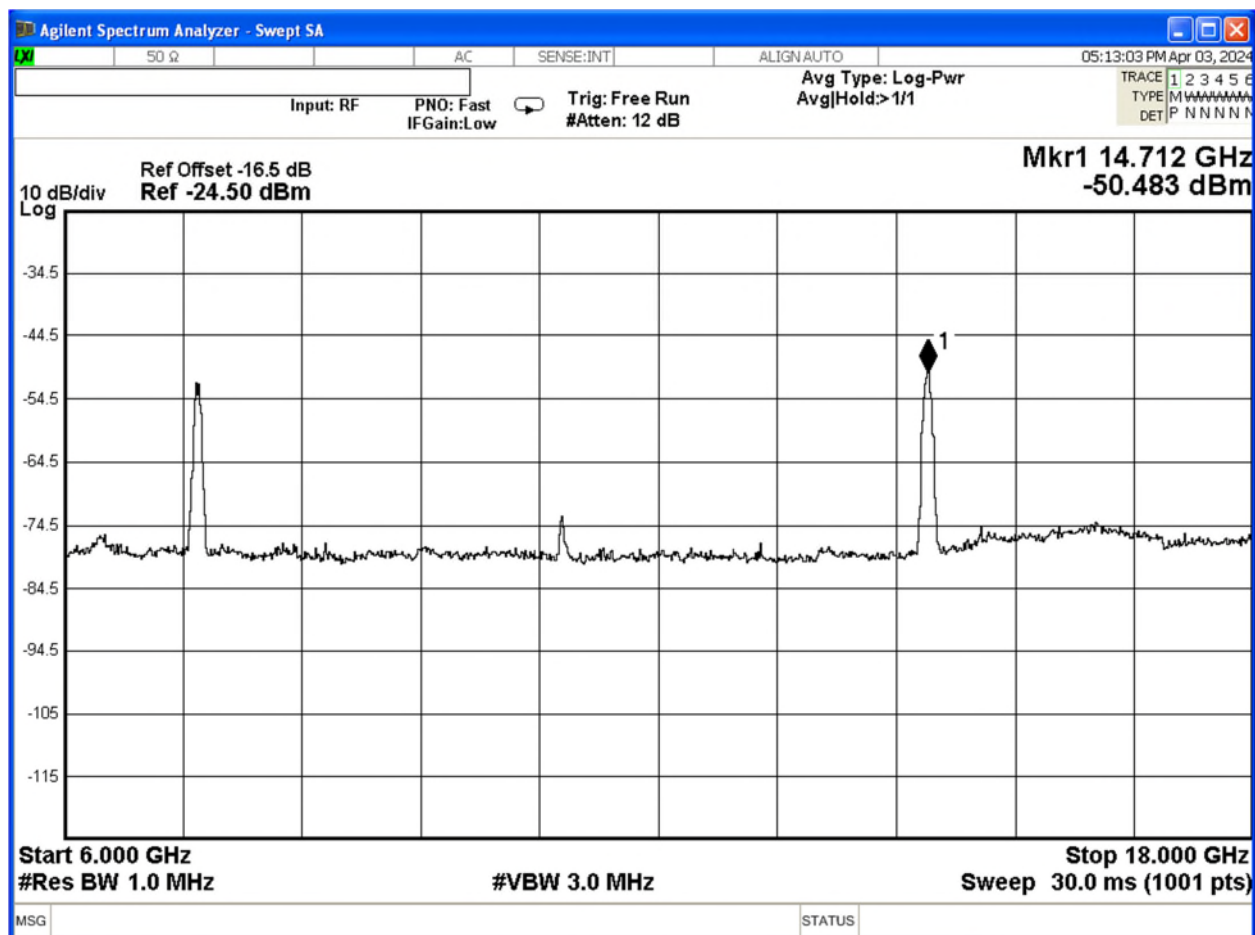
2.4.6.3 Worst case 3.75 GHz to 6 GHz





Product Service

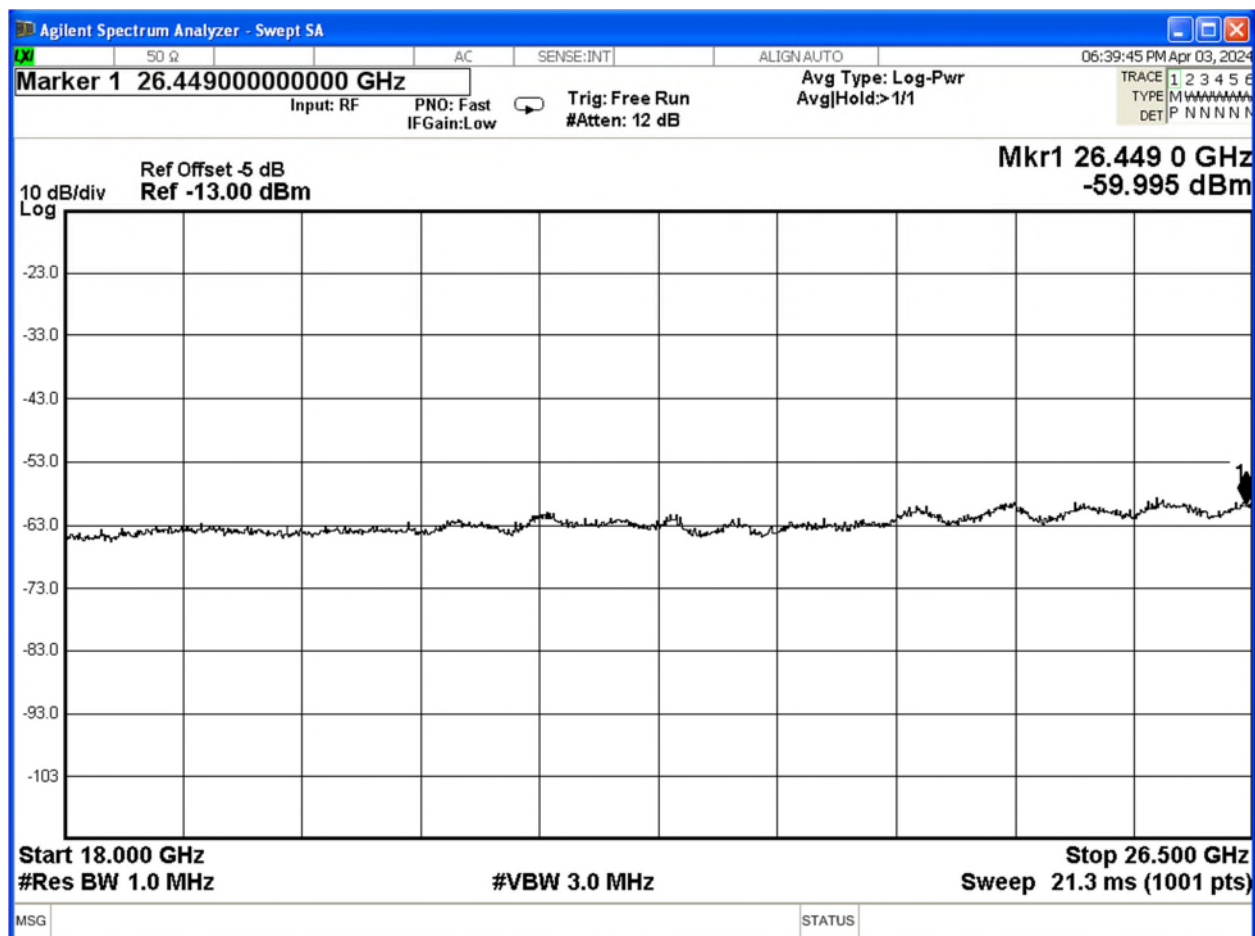
2.4.6.4 Worst case 6 GHz to 18 GHz



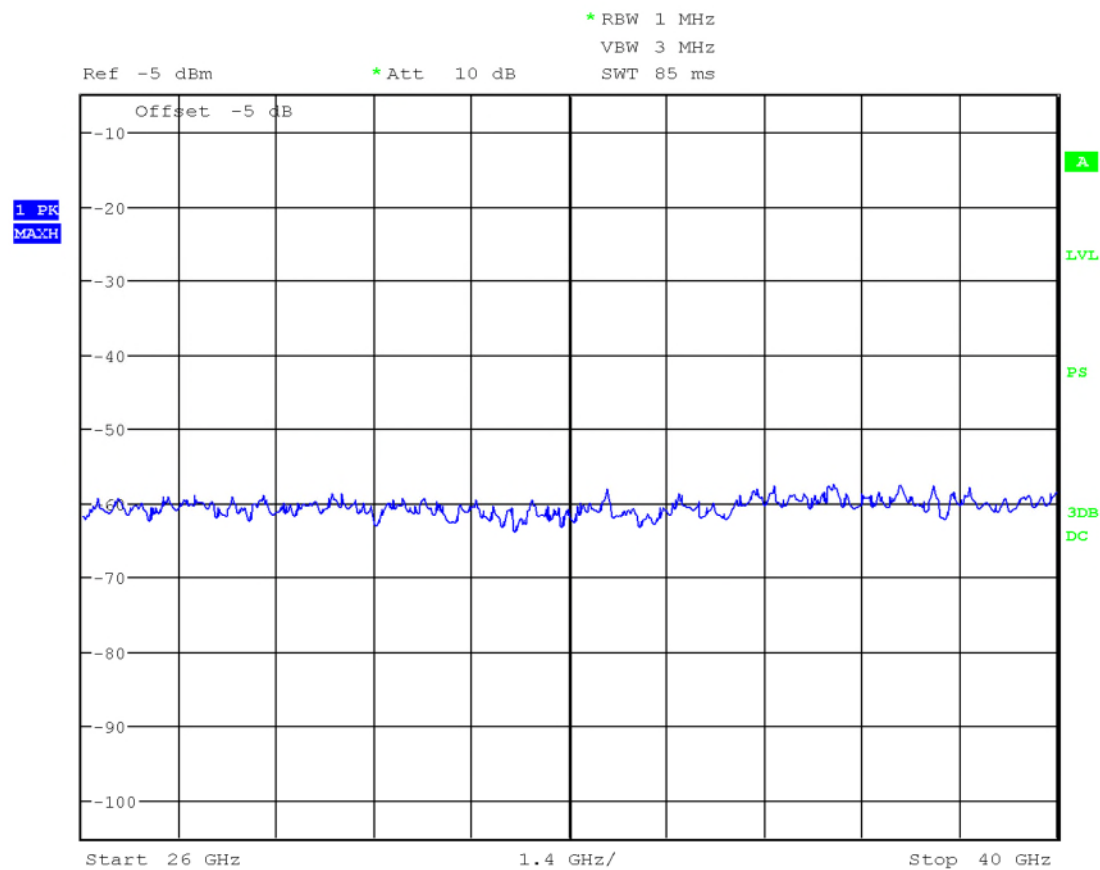


Product Service

2.4.6.5 Worst case 18 GHz to 26.5 GHz



2.4.6.6 Worst case 26.5 GHz to 40 GHz



Date: 3.APR.2024 16:27:58



Product Service

2.5 FREQUENCY STABILITY

2.5.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1055
FCC CFR 47 Part 96, Clause 27.54

2.5.2 Date of Test and Modification State

April 8, 2024 - Modification State 0

2.5.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.5.4 Environmental Conditions (Test equipment)

Ambient Temperature 22°C
Relative Humidity 30%

2.5.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01. Equipment under test was placed in CW (unmodulated) mode to enable accurate detection of frequency stability.

2.5.6 Test Results

Worst Case Scenario

Maximum Output Power 37dBm

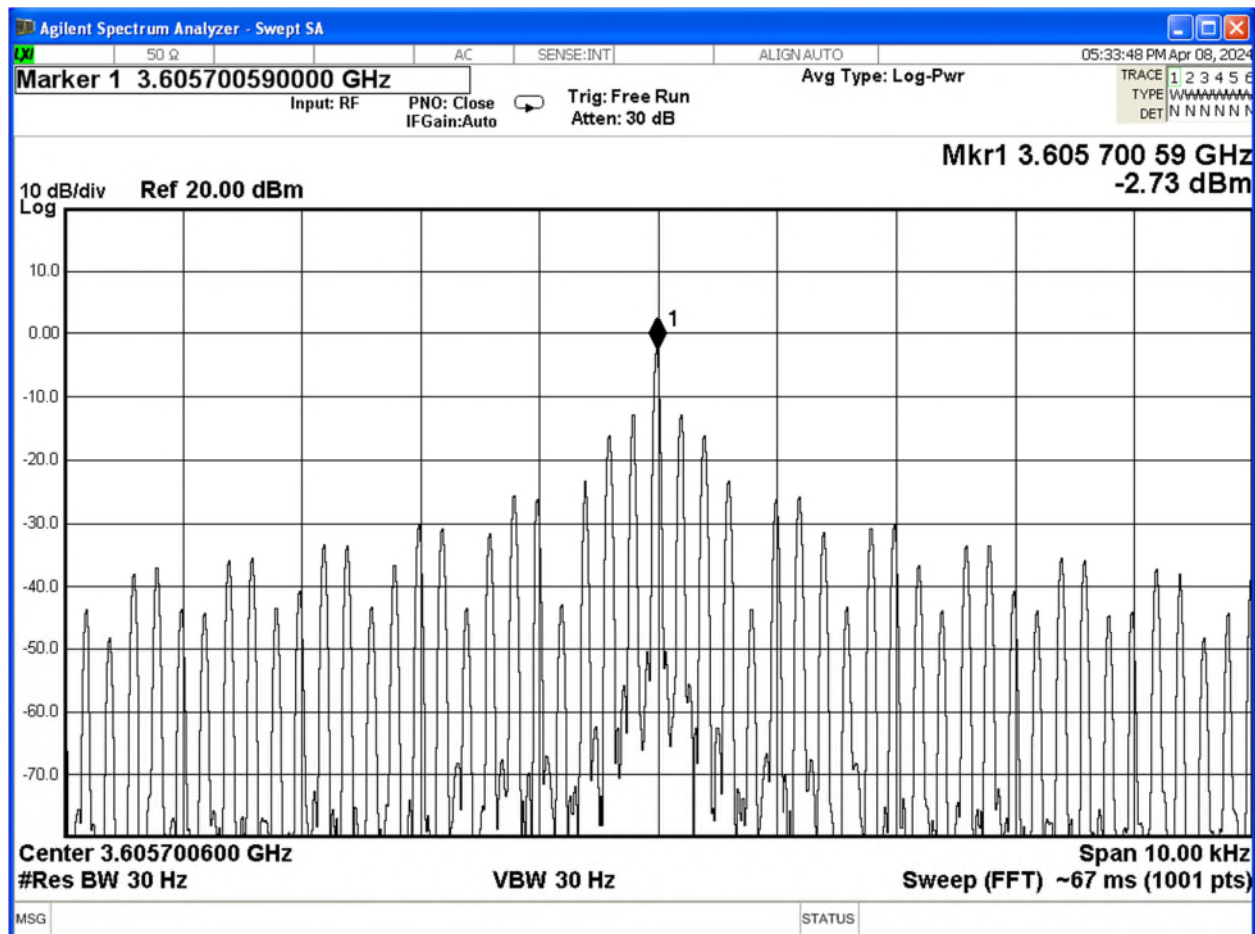
Table 12 – Worst Case of Frequency Stability Measurement

Temperature	Voltage (DC)	Frequency Error	Limit ppm <Note 2>	Result
-30°C	48	< 1 kHz	±1.5	Pass
-20°C	48	< 1 kHz	±1.5	Pass
-10°C	48	< 1 kHz	±1.5	Pass
0°C	48	< 1 kHz	±1.5	Pass
+10°C	48	< 1 kHz	±1.5	Pass
+20°C	48	< 1 kHz	±1.5	Pass
+20°C	40.8	< 1 kHz	±1.5	Pass
+20°C	55.2	< 1 kHz	±1.5	Pass
+30°C	48	< 1 kHz	±1.5	Pass
+40°C	48	< 1 kHz	±1.5	Pass
+50°C	48	< 1 kHz	±1.5	Pass
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation				



Product Service

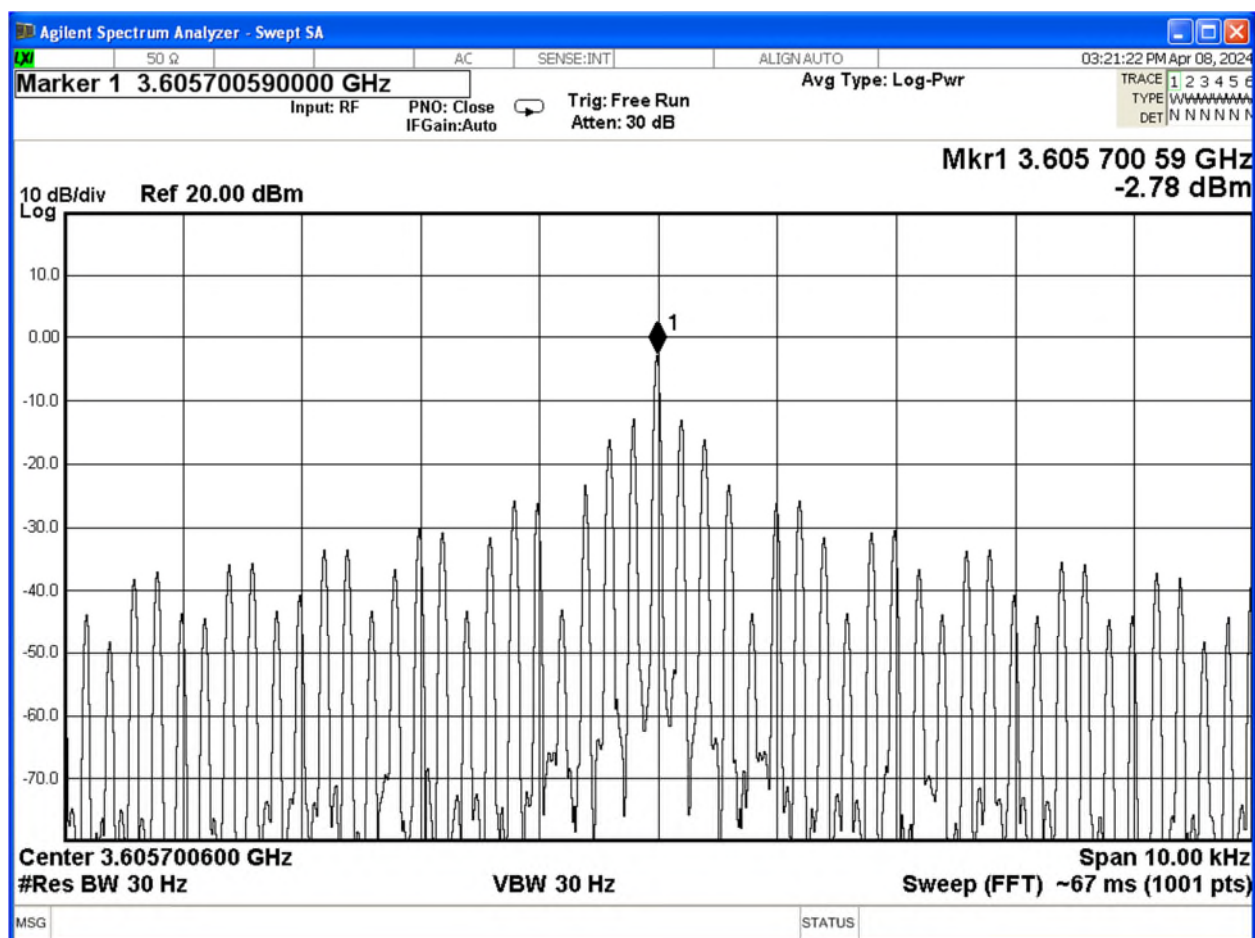
-30C





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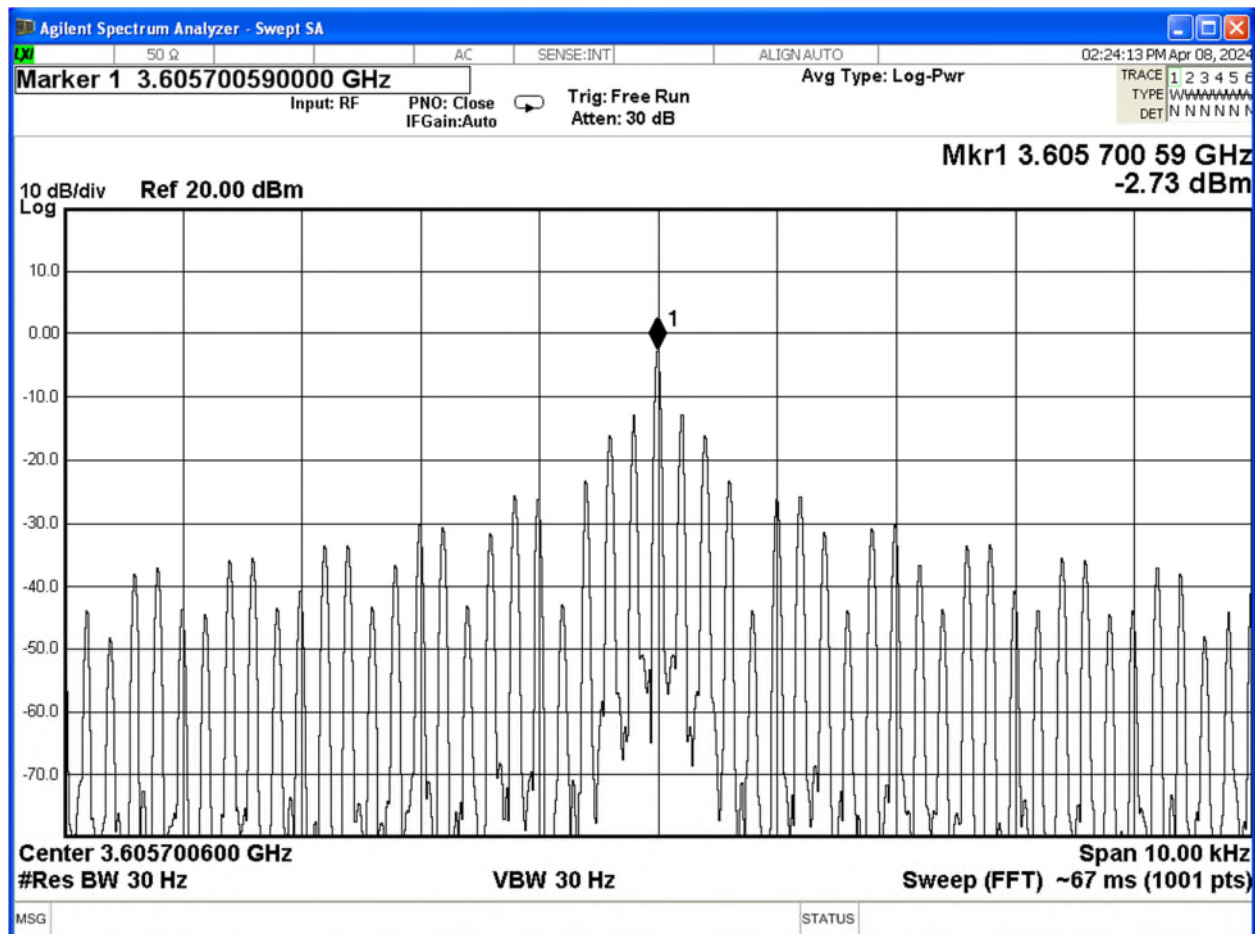
20C (Room temperature)





Product Service

50C





Product Service

2.6 RADIATED EMISSION

2.6.1 Specification Reference

FCC CFR 47 Part §2.1051
FCC CFR 47 Part 96.41

2.6.2 Date of Test and Modification State

April 9 -12, 2024 – Modification State 0

2.6.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.6.4 Environmental Conditions

Ambient Temperature	23.1°C
Relative Humidity	13.4%

2.6.5 Test Method

All measurements were made in accordance with:

- 971168 D01 Power Meas License Digital Systems v03r01 Clause 5.6
- 971168 D01 Power Meas License Digital Systems v03r01 Clause 7

Measurements were performed in configurations of the EUT as reported below. Testing was performed with RF on with a test limit of FCC 15 Subpart B Class B (or 15.209 where applicable) at 3m, or 1 meter above 18 GHz.

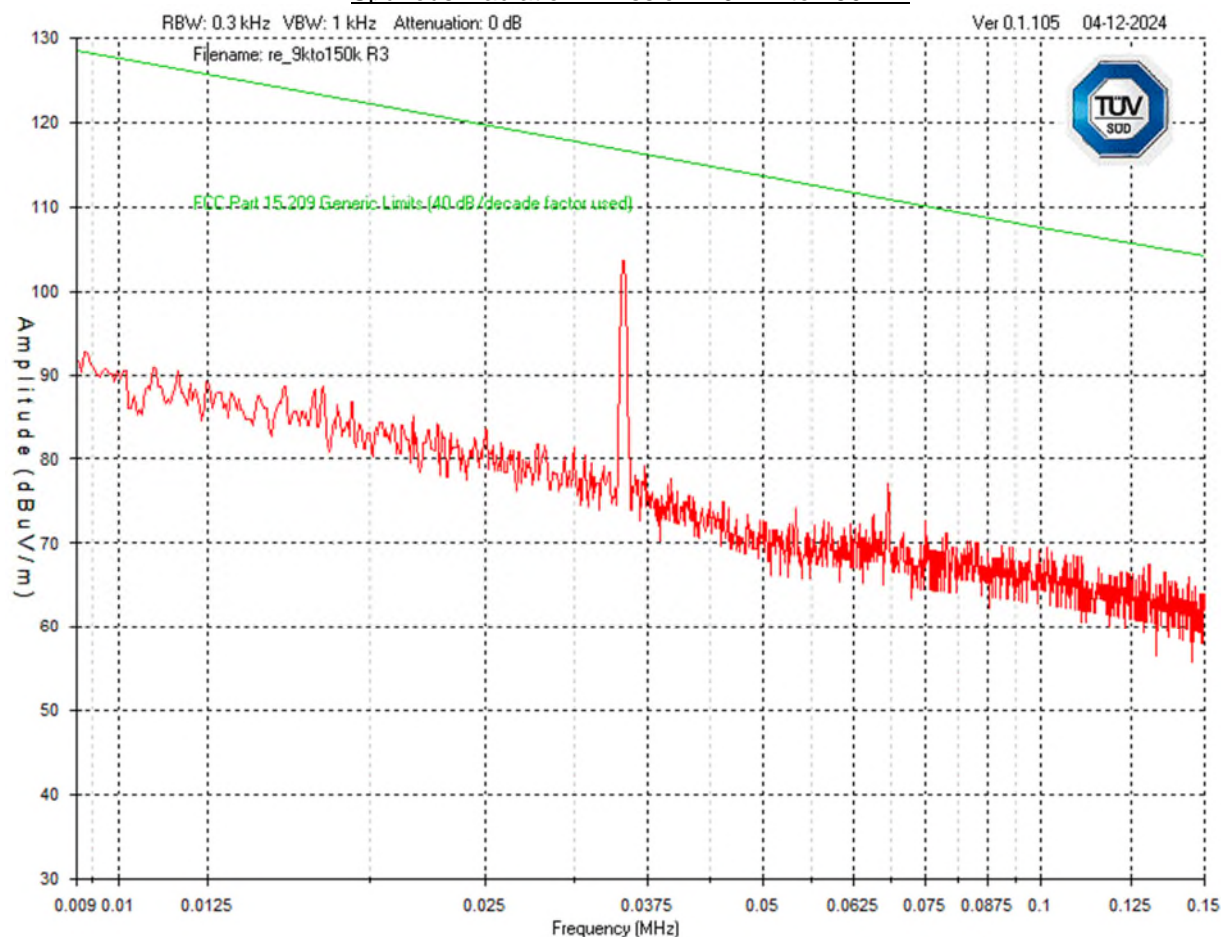
2.6.6 Test Results

A summary of the test result is depicted in the table below.

Table 13 – Radiated Emission Measurement

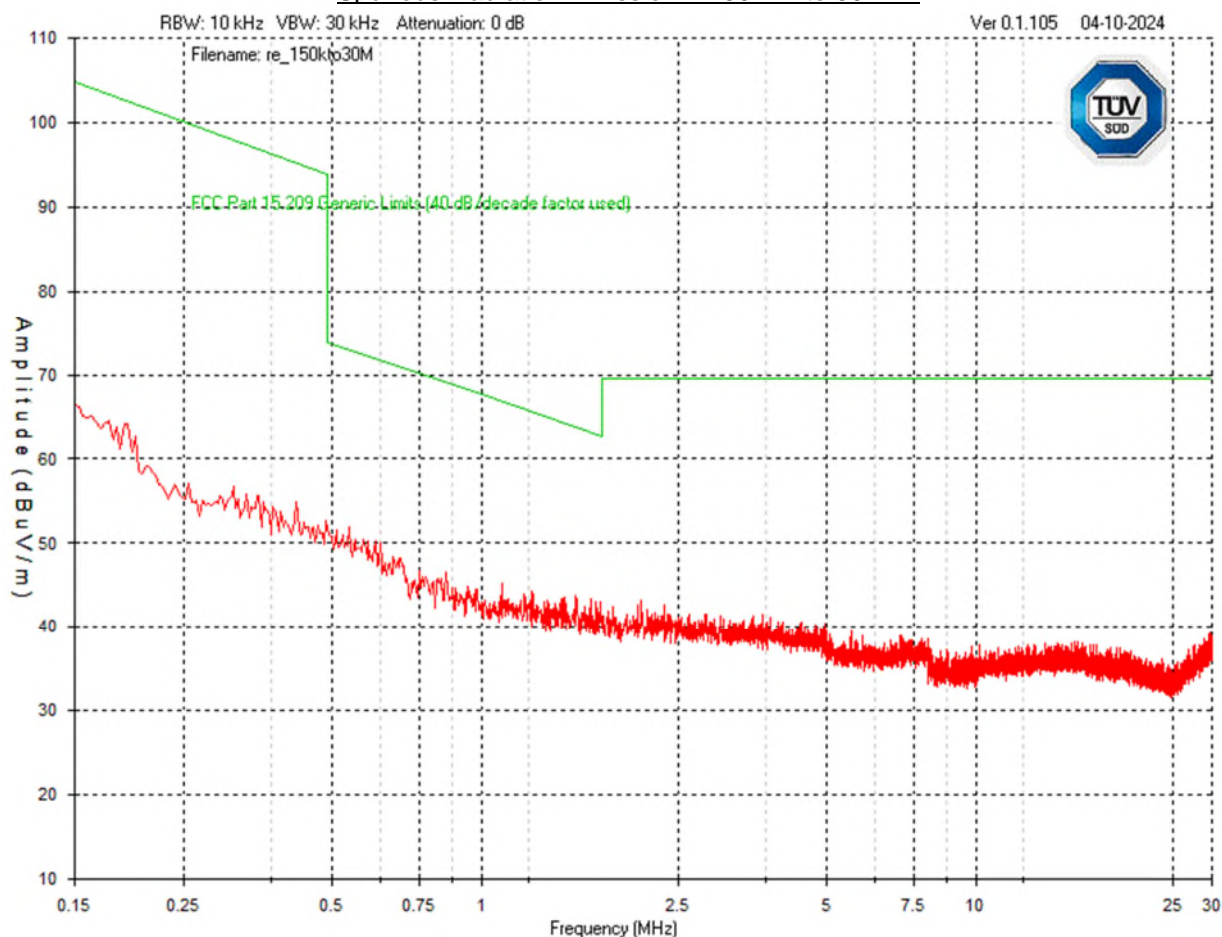
Range Frequency (MHz)	Limit uV/m	Limit <Note 1> dBµV/m	Result
0.009 to 0.490	2400/F(kHz) @ 300m	128.5 to 93.8	Pass
0.49 to 1.705	24000/F(kHz) @ 30m	73.9 to 63.0	Pass
1.705 to 30 MHz	30 @ 30m	69.5	Pass
30 to 88	100 @ 3m	40.0	Pass
88 to 216	150 @ 3m	43.5	Pass
216 to 960	200 @ 3m	46.0	Pass
960 to 1 GHz	500 @ 3m	54.0	Pass
1 GHz to 18 GHz	500 @ 3m	54.0	Pass
18 000 to 26 500	500 @ 3m	64.0	Pass
26 500 to 40 000	500 @ 3m	64.0	Pass
Note 1. 40 dB/decade applied below 30 MHz. 20 dB/decade applied above 18 GHz. Only the most restricting detector level (or limit in the range) is provided			

Spurious Radiation Spurious Radiation Emission – 9kHz to 150kHz



Note: Peak reading shown. Frequency at 35 kHz was determined to be an ambient emission, not related to EUT. No significant emission (i.e., less than 10dB below the limit) was noted.

Spurious Radiation Spurious Radiation Emission – 150kHz to 30MHz



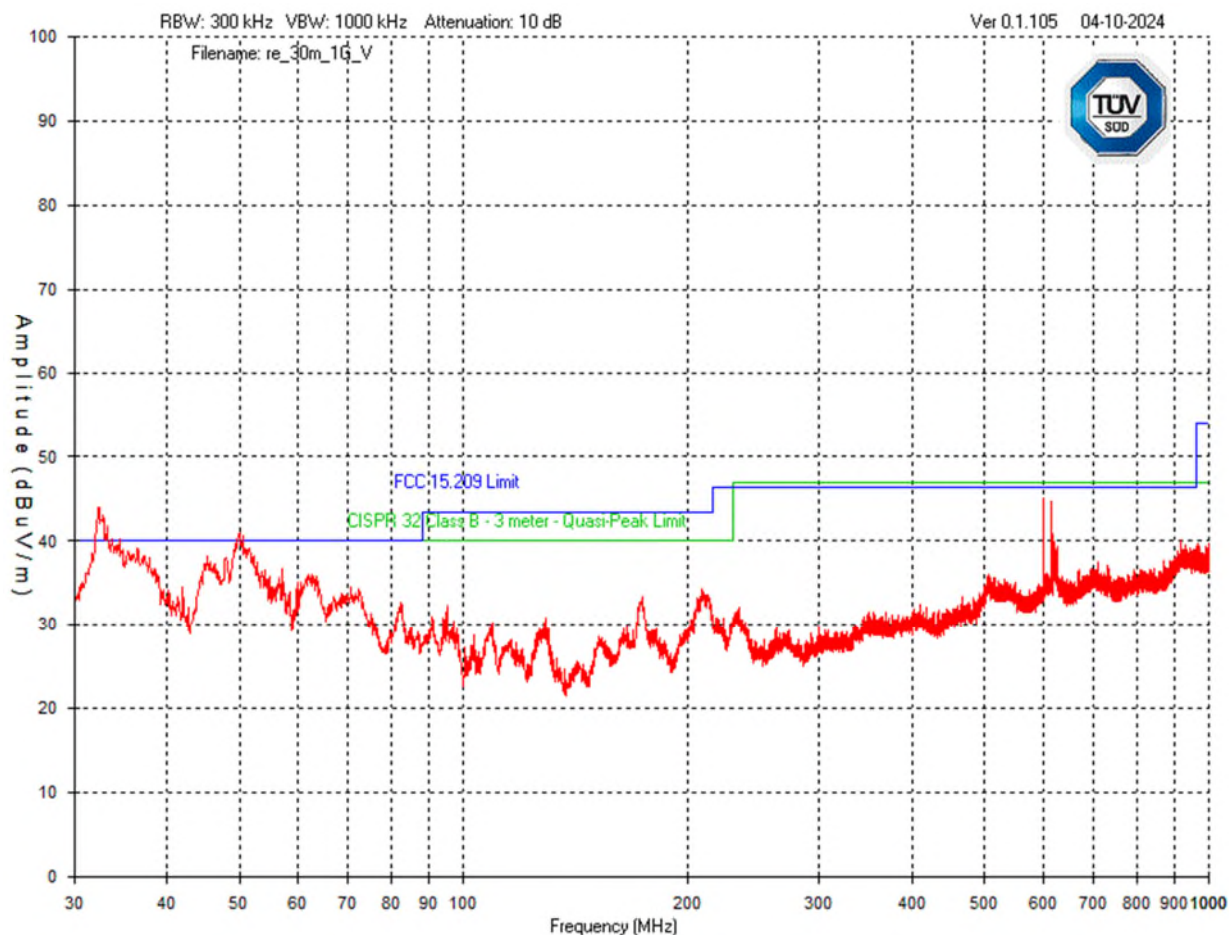
Note: Peak reading shown. No significant emission was noted.



Product Service

Spurious Radiation (Distance 3m)
Spurious Radiation Emission – 30MHz to 1GHz

Vertical



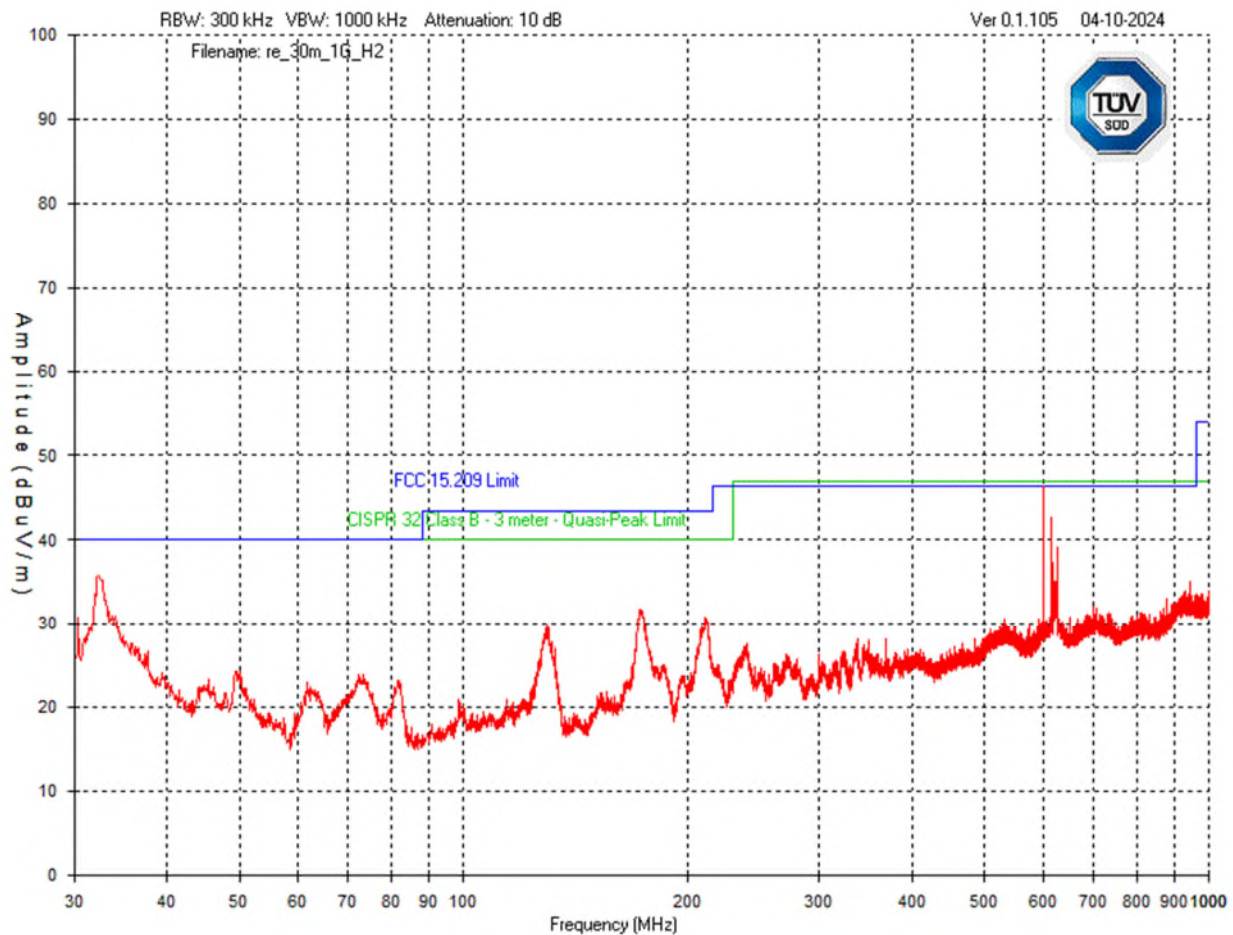
Note: Peak reading shown in graph above vs. Quasi-peak limit. Where the peak reading meets the quasi-peak limit, the EUT is determined to pass without requiring quasi-peak measurement.

Freq (MHz)	Det.	Raw (dBuV)	Ant - Factor (dB/m)	Atten Factor (dB)	Cable Factor (dB)	Preamp-Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Result
32.330	QP	38.7	18.9	3	0.3	-26.9	34	40	-6	Pass
50.002	QP	50.4	10.6	3	0.3	-27.3	37	40	-3	Pass
600.154	PK	43.2	25	3	1.1	-27.2	45.1	46.4	-1.3	Pass
614.427	PK	42.2	25.8	3	1.1	-27.3	44.8	46.4	-1.6	Pass
61.8478	PK	49.5	10.5	3	0.4	-27.3	36.1	40	-3.9	Pass
617.437	PK	38	25.9	3	1.1	-27.3	40.7	46.4	-5.7	Pass

QP = Quasi-Peak

PK = Peak

Horizontal



Note: Peak reading shown in graph above vs. Quasi-peak limit. Where the peak reading meets the quasi-peak limit, the EUT is determined to pass without requiring quasi-peak measurement.

Freq (MHz)	Det.	Raw (dBuV)	Ant - Factor (dB/m)	Atten Factor (dB)	Cable Factor (dB)	Preamp-Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Result
600.154	QP	43.4	25	3	1.1	-27.2	45.3	46.4	-1.1	Pass
614.427	QP	39.8	25.8	3	1.1	-27.3	42.4	46.4	-4	Pass
32.6216	PK	41.7	18.7	3	0.3	-26.9	36.8	40	-3.2	Pass
173.315	PK	44.3	15	3	0.6	-27.4	35.5	43.5	-8	Pass
211.377	PK	42	15.9	3	0.6	-27.3	34.2	43.5	-9.3	Pass
130.107	PK	43	13.2	3	0.5	-27.4	32.3	43.5	-11.2	Pass

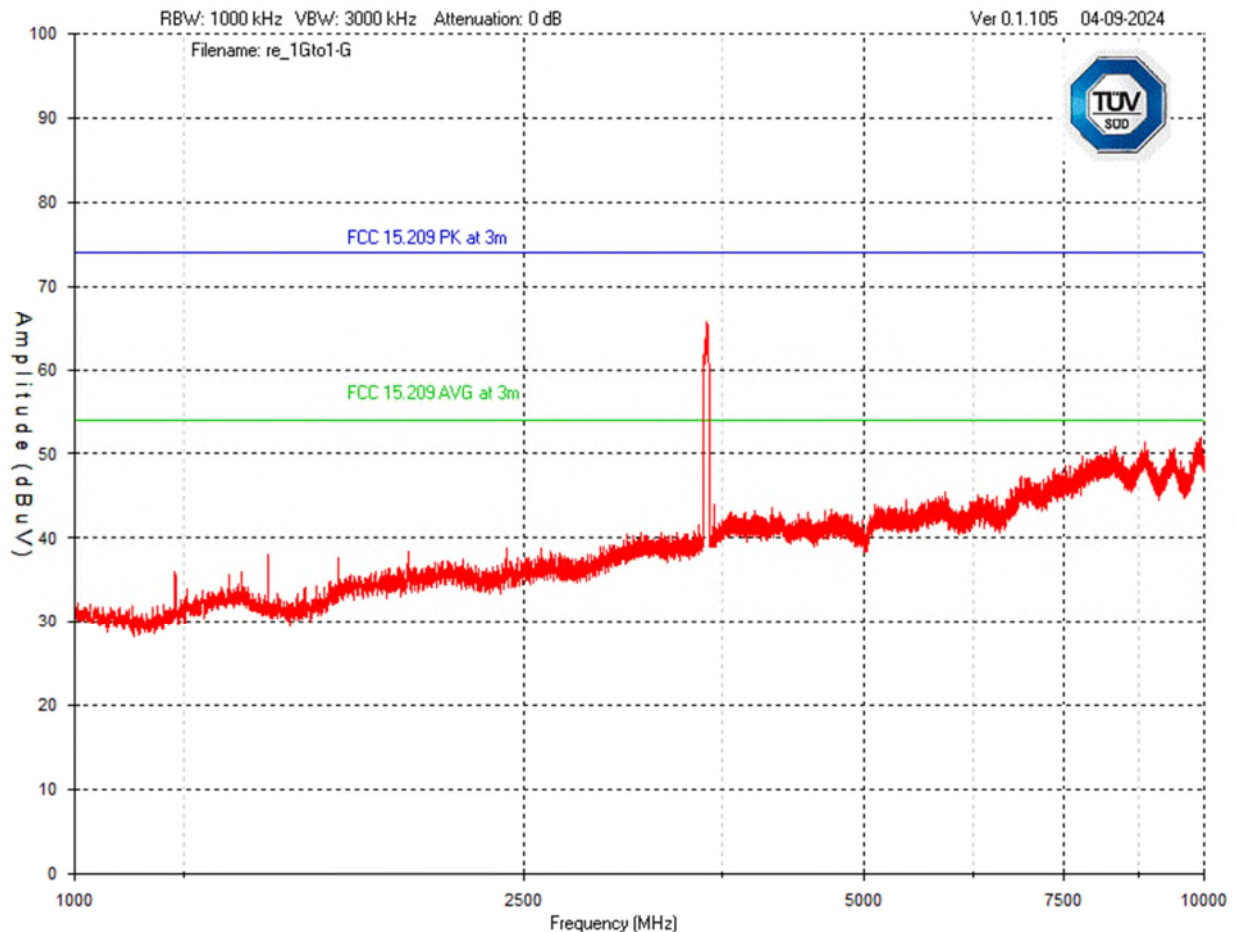
QP = Quasi-Peak
PK = Peak



Product Service

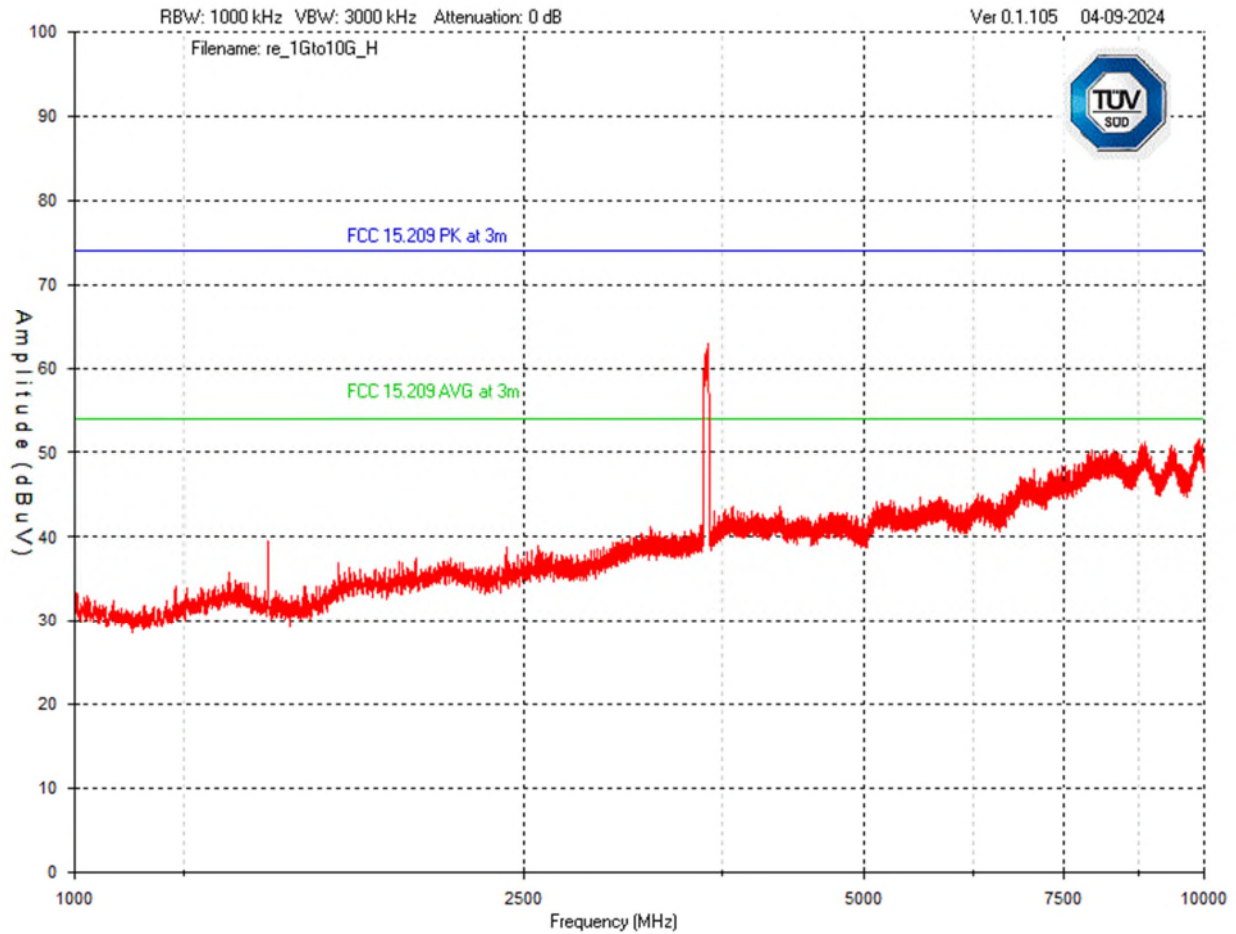
Spurious Radiation (Distance 3m)
Spurious Radiation Emission – 1GHz to 10GHz

Vertical



Note: Peak reading shown in graph above. Frequency shown above the was the in-band signal due to RF leakage from the termination(s) used.

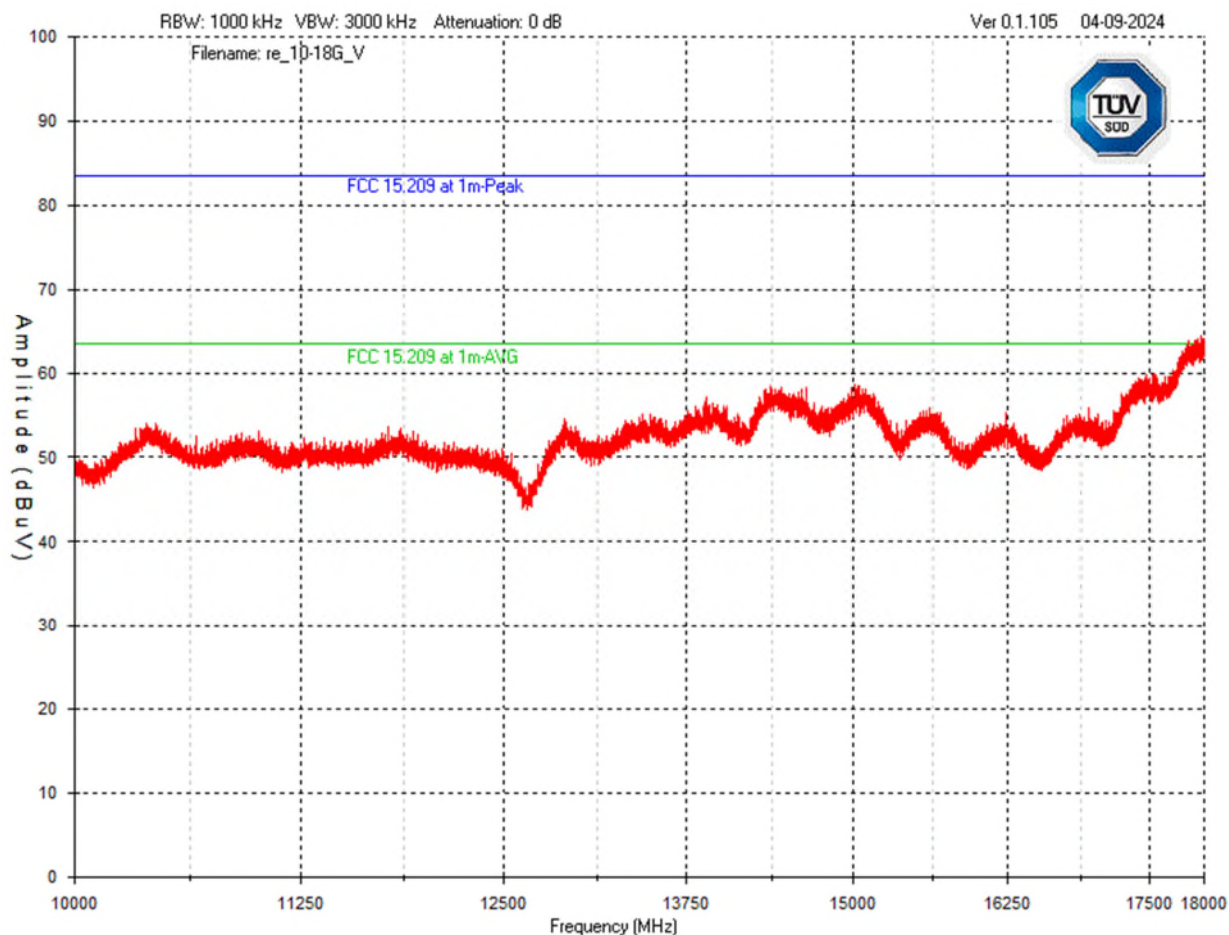
Horizontal



Note: Peak reading shown in graph above. Frequency shown above the was the in-band signal due to RF leakage from the termination(s) used.

Spurious Radiation (Distance 3m)
Spurious Radiation Emission –10GHz to 18GHz

Vertical

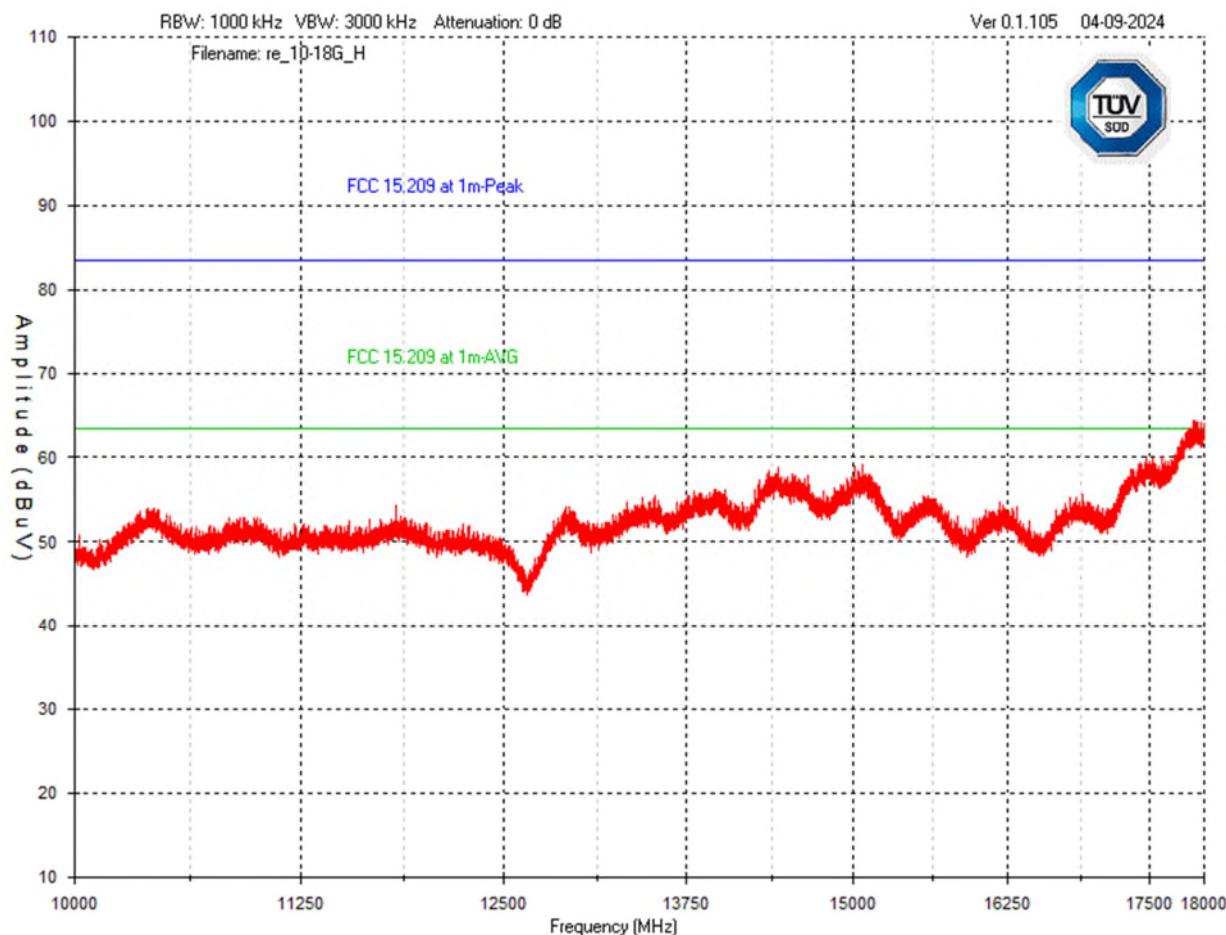


Note: Peak reading shown in graph above. Above 17.5 GHz, measurements to the AVG limit were verified with an average detector. No emissions were detected and the noise floor in average mode was below the average limit. The EUT was scanned to 40 GHz, no emissions were detected between 18 GHz and 40 GHz and the noise floor was below the applicable limit.



Product Service

Horizontal



Note: Peak reading shown in graph above. Above 17.5 GHz, measurements to the AVG limit were verified with an average detector. No emissions were detected and the noise floor in average mode was below the average limit. The EUT was scanned to 40 GHz, no emissions were detected between 18 GHz and 40 GHz and the noise floor was below the applicable limit.



Product Service

SECTION 3

TEST EQUIPMENT USED



Product Service

3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	Asset No.	Calibration Date	Calibration Due
Bilog Antenna	ETS Lindgren	3141E	LAVE04002	June 16, 2023	June 16, 2025
Horn Antenna 3MCH 00003	ETS	3117	LAVE04211	May 11, 2022	May 11, 2024
Spectrum analyser	Rohde & Schwarz	ESU-40	LAVE04092	May 2, 2022	May 2, 2024
Spectrum analyser	Agilent	MXA	SSG013930	April 26, 2022	April 26, 2024
Coaxial Cable	Huber & Suhner	106A	SSG012455	Feb 11, 2024	Feb 11, 2025
Coaxial Cable	Huber & Suhner	106A	SSG012711	Feb 11, 2024	Feb 11, 2025
Coaxial Cable	Huber & Suhner	104PEA	SSG012041	Feb 11, 2024	Feb 11, 2025
Coaxial Cable	Huber & Suhner	ST18/Nm/Nm/36	SSG012785	Feb 11, 2024	Feb 11, 2025
Coaxial Cable	Micro-Coax	UFA 210B-1-1500-504504	SSG012376	Feb 11, 2024	Feb 11, 2025
Pre-Amplifier	Hp	8447D	SSG013045	April 26, 2023	April 26, 2025
Pre-Amplifier	BNR	LNA	SSG012594	April 25, 2023	April 25, 2025
Power Supply	Hewlett Packard	6216A	SSG013063	not required	not required
N/A: No applicable O/P Mon – Output monitored with Calibrated Equipment					



Product Service

3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	Frequency / Parameter	MU
Conducted Maximum Peak Output Power	30 MHz to 20 GHz Amplitude	± 0.5 dB
Conducted Emissions	30 MHz to 20 GHz Amplitude	± 2.3 dB
Frequency Stability	30 MHz to 4 GHz	± 5.0 Hz
Occupied Bandwidth	Up to 40 MHz Bandwidth	± 10.1 Hz
Band Edge	30 MHz to 20 GHz Amplitude	± 2.3 dB



Product Service

SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



Product Service

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This report relates only to the actual item/items tested.

This report does not imply product endorsement by any government, accreditation agency, or TÜV SÜD Canada Inc.

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