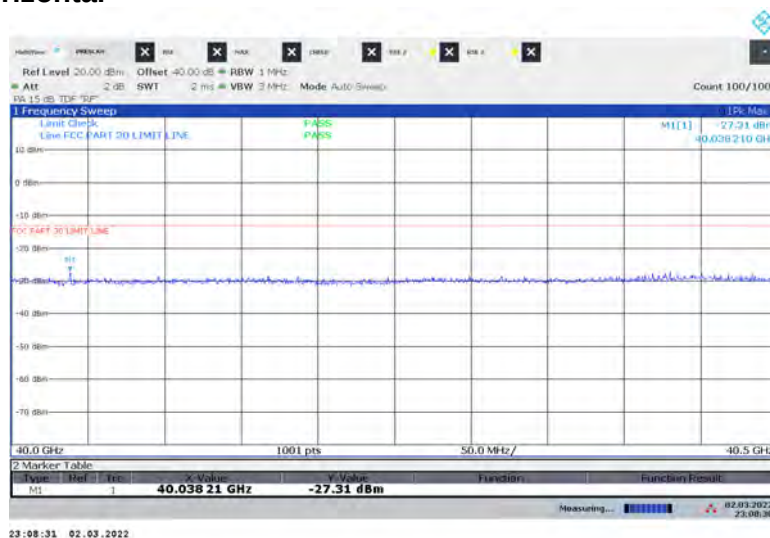


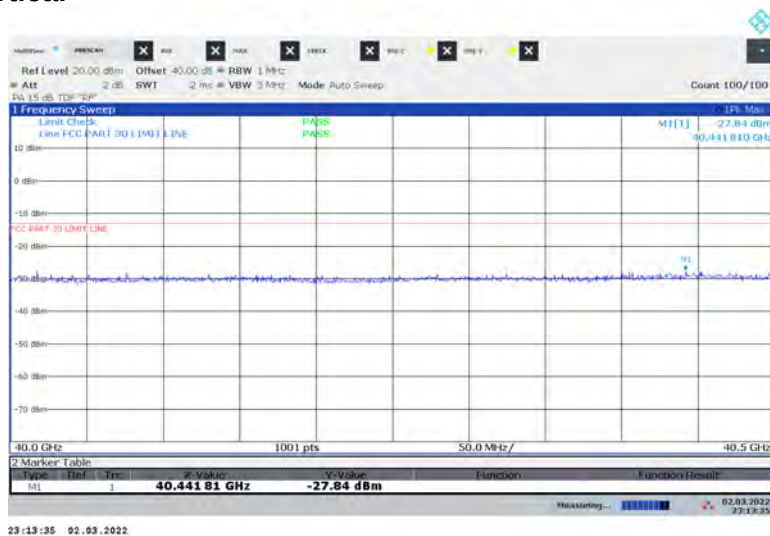
8.4.34. RSE n260 40 – 40.5 GHz

Note: 37 - 40 GHz covered by Fundamental and BE measurements.

40 – 40.5 GHz, ANT M2, 1CC (Pre-scan using Pk Det.) Horizontal

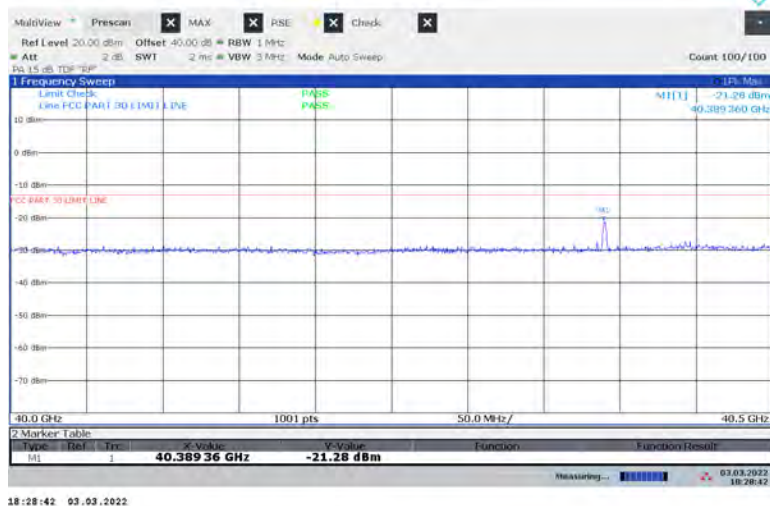


40 – 40.5 GHz, ANT M2, 1CC (Pre-scan using Pk Det.) Vertical

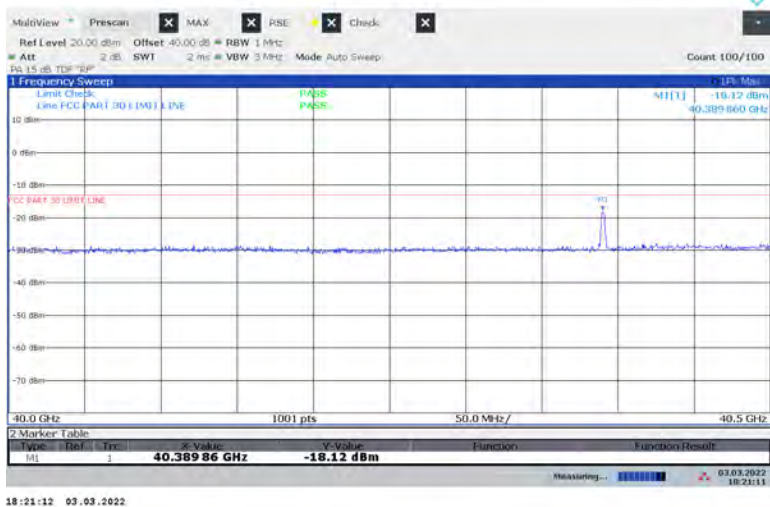


Emissions detected using Peak Detection at pre-scan. Avg EIRP was measured

**40 – 40.5 GHz, ANT M3, 1CC (Pre-scan using Pk Det.)
Horizontal**



**40 – 40.5 GHz, ANT M3, 1CC (Pre-scan using Pk Det.)
Vertical**

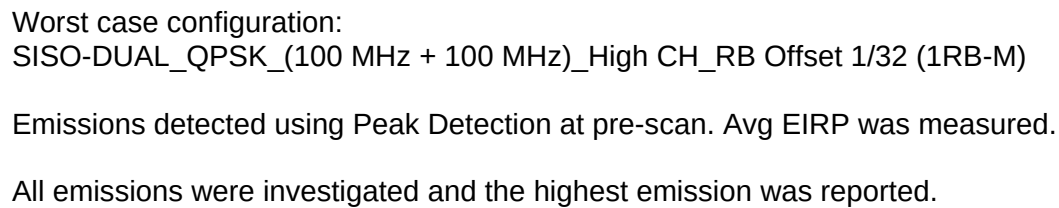


Emissions detected using Peak Detection at pre-scan. Avg EIRP was measured

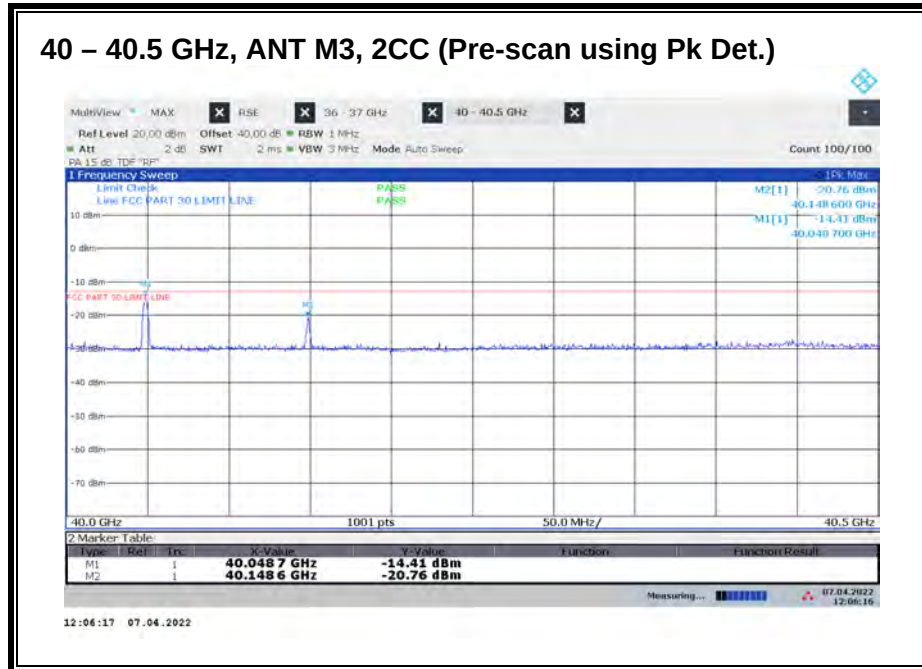
40 – 40.5 GHz n260, 1CC

Antenna	Freq.	Meas. Distance	Rx Ant. Polarity	Corrected Avg EIRP	TRP Limit	Margin
	(GHz)	(m)	H/V	(dBm)	(dBm)	(dB)
M2	40.038	3	H	-31.71	-13	-18.71
M2	40.038	3	V	-41.18	-13	-28.18
M3	40.390	3	H	-26.80	-13	-13.80
M3	40.390	3	V	-20.19	-13	-7.19

40 – 40.5 GHz, ANT M2, 2CC (Pre-scan using Pk Det.)



Antenna	Freq.	Meas. Distance	Rx Ant. Polarity	Corrected Avg EIRP	TRP Limit	Margin
	(GHz)	(m)	H/V	(dBm)	(dBm)	(dB)
M2	40.049	3	--	-23.95	-13	-10.95



Worst case configuration:

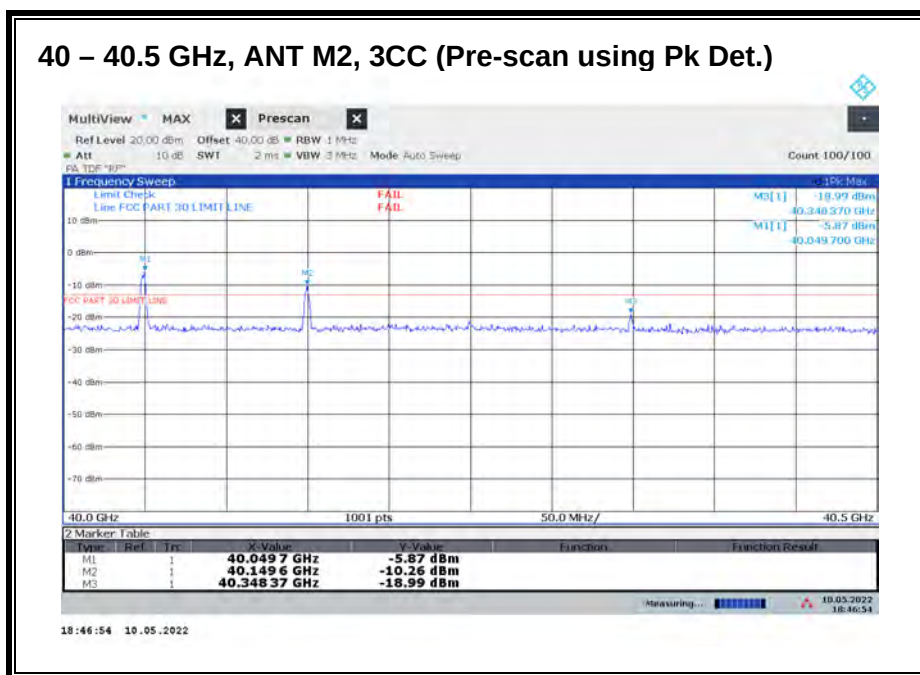
SISO-DUAL_QPSK_(100 MHz + 100 MHz)_High CH_RB Offset 1/32 (1RB-M)

Emissions detected using Peak Detection at pre-scan. Avg EIRP was measured.

All emissions were investigated and the highest emission was reported.

Antenna	Freq.	Meas. Distance	Rx Ant. Polarity	Corrected Avg EIRP	TRP Limit	Margin
	(GHz)	(m)	H/V	(dBm)	(dBm)	(dB)
M3	40.049	3	--	-23.90	-13	-10.90

40 – 40.5 GHz n260, 3CC



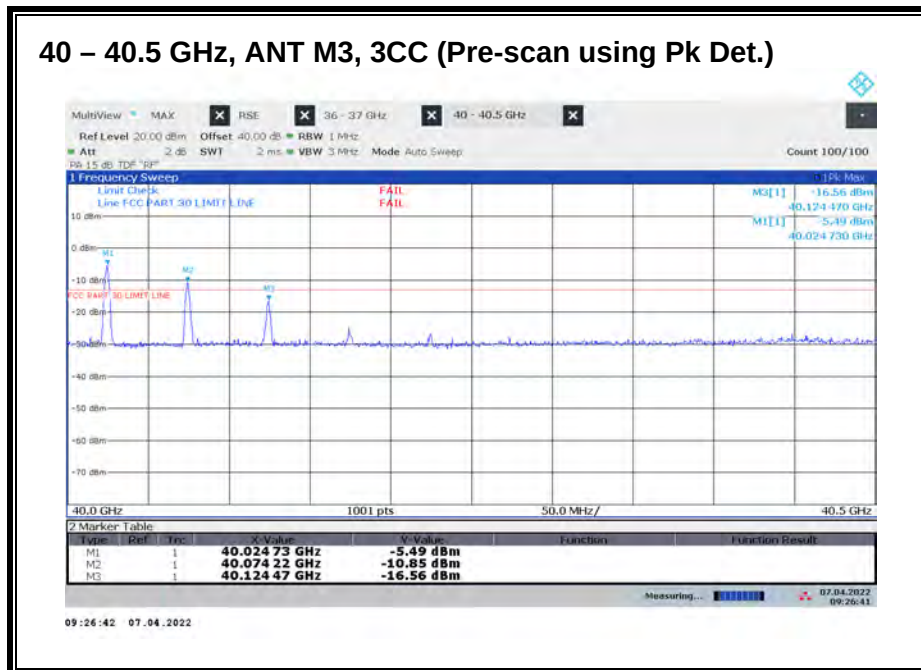
Worst case configuration:

SISO-DUAL_QPSK_(100 MHz + 100 MHz + 100 MHz)_High CH_RB Offset 1/32 (1RB-M)

Emissions detected using Peak Detection at pre-scan. Avg EIRP was measured.

All emissions were investigated and the highest emission was reported.

Antenna	Freq.	Meas. Distance	Rx Ant. Polarity	Corrected Avg EIRP	TRP Limit	Margin
	(GHz)	(m)	H/V	(dBm)	(dBm)	(dB)
M2	40.049	3	--	-20.16	-13	-7.16



Worst case configuration:

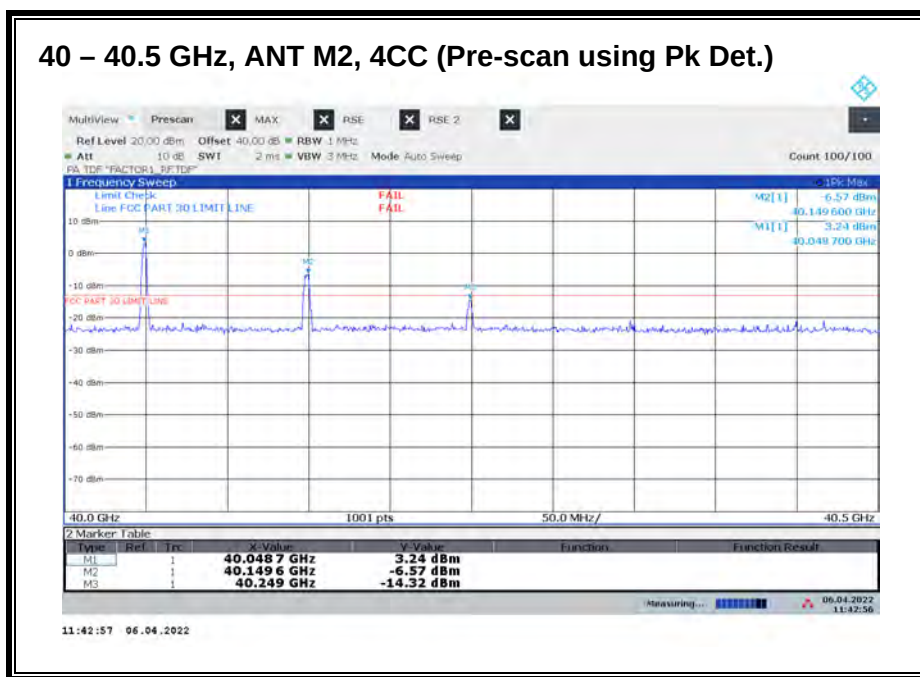
SISO-DUAL_QPSK_(50 MHz + 50 MHz + 50 MHz)_High CH_RB Offset 1/15 (1RB-M)

Emissions detected using Peak Detection at pre-scan. Avg EIRP was measured.

All emissions were investigated and the highest emission was reported.

Antenna	Freq.	Meas. Distance	Rx Ant. Polarity	Corrected Avg EIRP	TRP Limit	Margin
	(GHz)	(m)	H/V	(dBm)	(dBm)	(dB)
M3	40.024	3	--	-21.77	-13	-8.77

40 – 40.5 GHz n260, 4CC



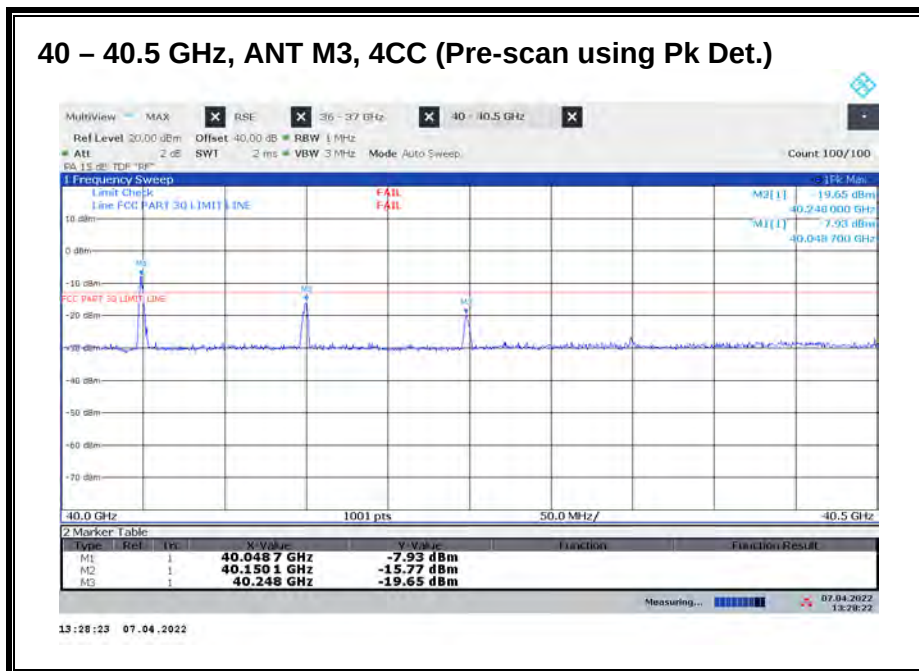
Worst case configuration:

SISO-DUAL_QPSK_(100 MHz + 100 MHz + 100 MHz + 100 MHz)_High CH_RB Offset 1/32 (1RB-M)

Emissions detected using Peak Detection at pre-scan. Avg EIRP was measured.

All emissions were investigated and the highest emission was reported.

Antenna	Freq.	Meas. Distance	Rx Ant. Polarity	Corrected Avg EIRP	TRP Limit	Margin
	(GHz)	(m)	H/V	(dBm)	(dBm)	(dB)
M2	40.049	3	--	-17.18	-13	-4.18



Worst case configuration:
SISO-DUAL_QPSK_(100 MHz + 100 MHz + 100 MHz + 100 MHz)_High CH_RB Offset 1/32
(1RB-M)

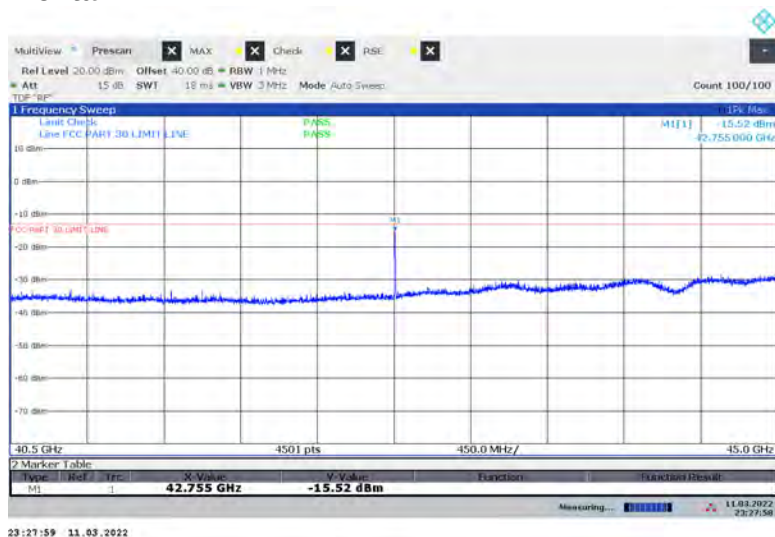
Emissions detected using Peak Detection at pre-scan. Avg EIRP was measured.

All emissions were investigated and the highest emission was reported.

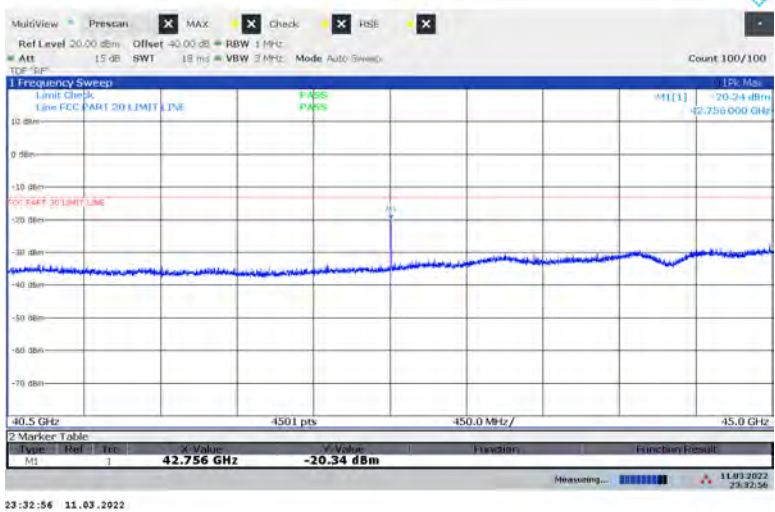
Antenna	Freq.	Meas. Distance	Rx Ant. Polarity	Corrected Avg EIRP	TRP Limit	Margin
	(GHz)	(m)	H/V	(dBm)	(dBm)	(dB)
M3	40.049	3	--	-19.09	-13	-6.09

8.4.35. RSE n260 40.5 – 45 GHz

40.5 – 45 GHz, ANT M2, 1CC (Pre-scan using Pk Det.) Horizontal

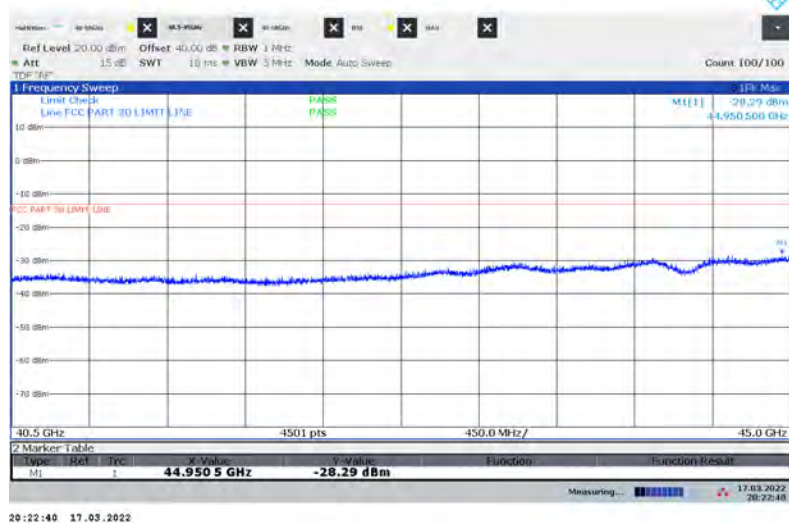


40.5 – 45 GHz, ANT M2, 1CC (Pre-scan using Pk Det.) Vertical

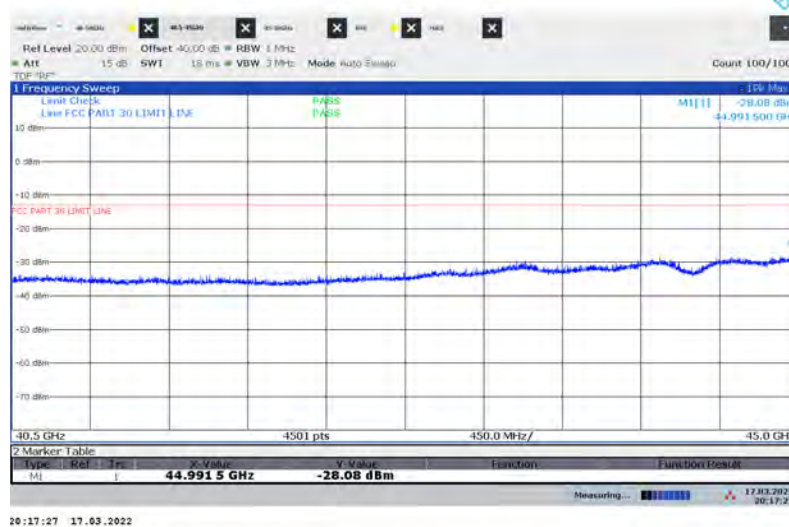


Emissions detected using Peak Detection at pre-scan. Avg EIRP was measured.

40.5 – 45 GHz, ANT M3, 1CC (Pre-scan using Pk Det.) Horizontal



40.5 – 45 GHz, ANT M3, 1CC (Pre-scan using Pk Det.) Vertical

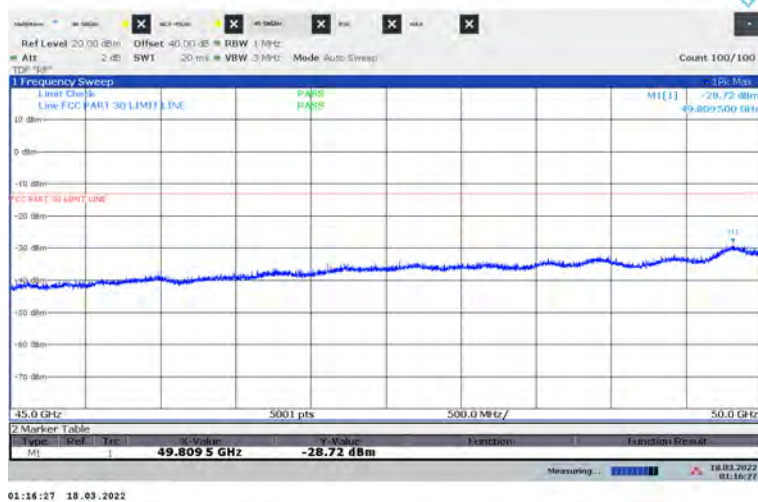


No emission detected using Peak Detection.

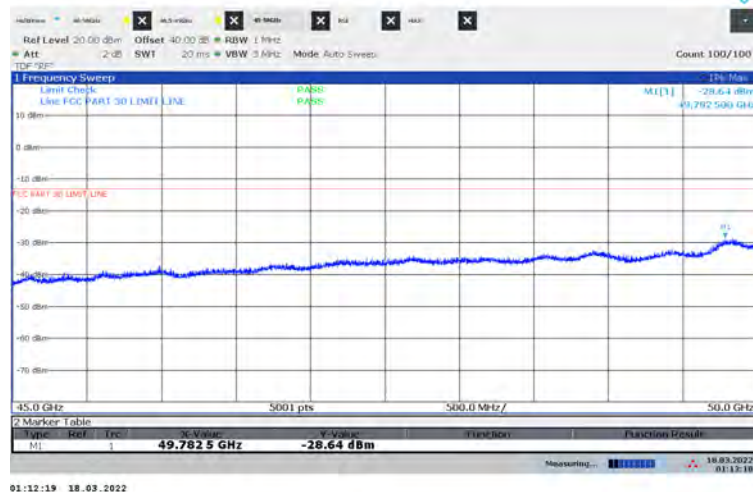
40.5 - 45 GHz n260, 1CC

Antenna	Freq.	Meas. Distance	Rx Ant. Polarity	Corrected Avg EIRP	TRP Limit	Margin
	(GHz)	(m)	H/V	(dBm)	(dBm)	(dB)
M2	42.755	3	H	-19.11	-13	-6.11
M2	42.755	3	V	-36.25	-13	-23.25

45 – 50 GHz, ANT M2, 1CC (Pre-scan using Pk Det.) Horizontal



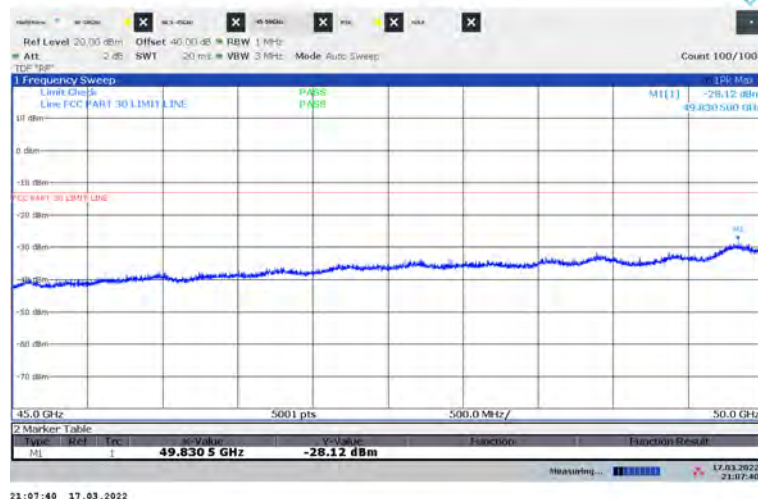
45 – 50 GHz, ANT M2, 1CC (Pre-scan using Pk Det.) Vertical



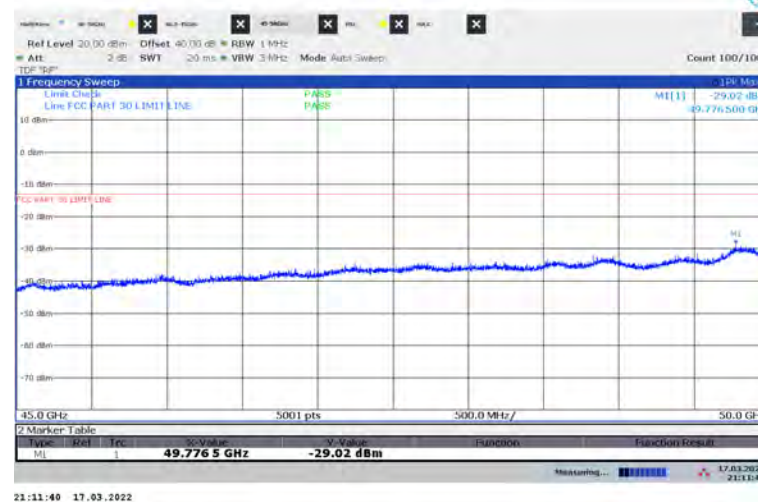
No emission detected using Peak Detection.

8.4.36. RSE n260 45 – 50 GHz

45 – 50 GHz, ANT M3, 1CC (Pre-scan using Pk Det.) Horizontal



45 – 50 GHz, ANT M3, 1CC (Pre-scan using Pk Det.) Vertical



No emission detected using Peak Detection.

8.4.37. RSE n260 50 - 75 GHz

50 - 75 GHz, ANT M2 (Pre-scan using Pk Det.) Horizontal

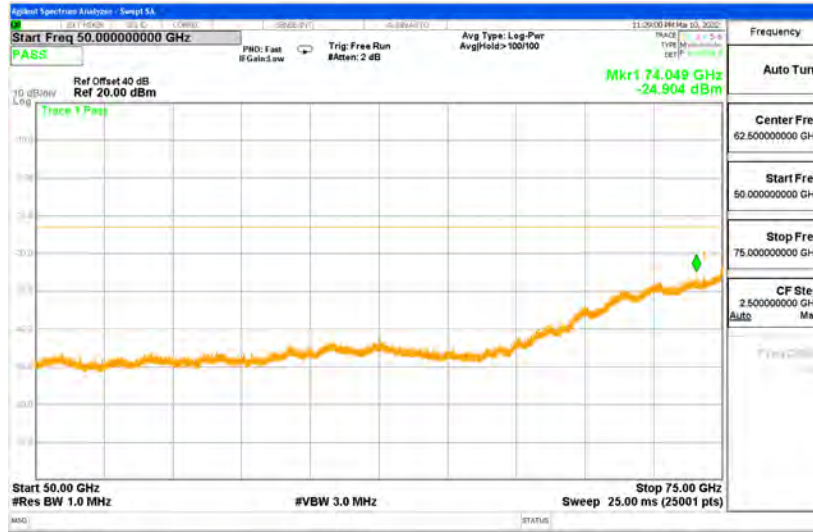


50 - 75 GHz, ANT M2 (Pre-scan using Pk Det.) Vertical



No emission detected using Peak Detection.

50 - 75 GHz, ANT M3 (Pre-scan using Pk Det.) Horizontal



50 - 75 GHz, ANT M3 (Pre-scan using Pk Det.) Vertical



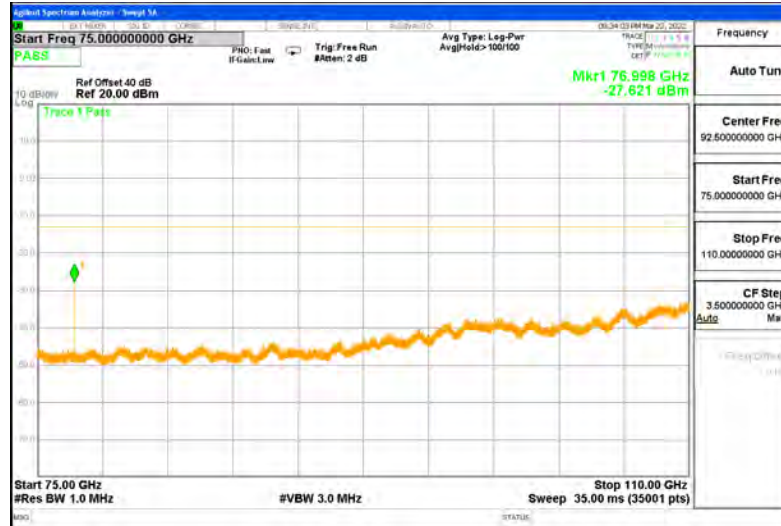
Emissions detected using Peak Detection at pre-scan. Avg EIRP was measured.

50 - 75 GHz n260, 1CC

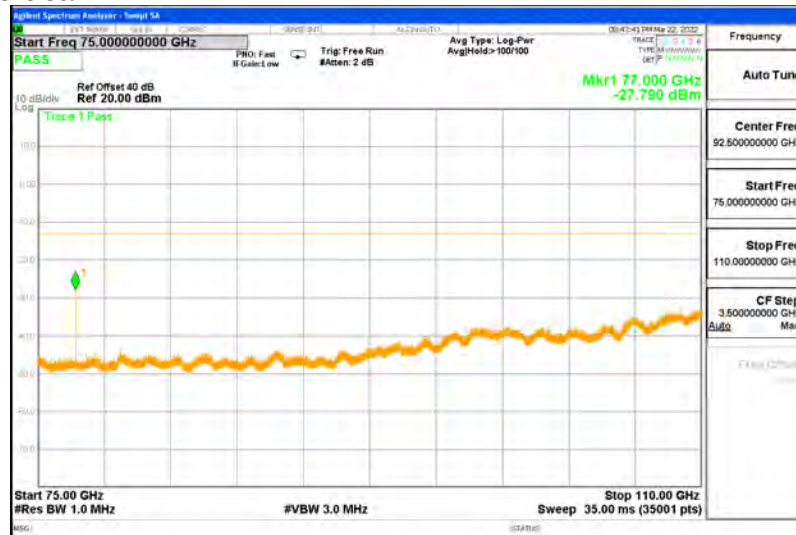
Antenna	Freq.	Meas. Distance	Rx Ant. Polarity	Corrected Avg EIRP	TRP Limit	Margin
	(GHz)	(m)	H/V	(dBm)	(dBm)	(dB)
M3	74.047	1.5	H	-27.39	-13	-14.39
M3	74.047	1.5	V	-33.21	-13	-20.21

8.4.38. RSE n260 75 - 110 GHz

75 - 110 GHz, ANT M2 (Pre-scan using Pk Det.) Horizontal

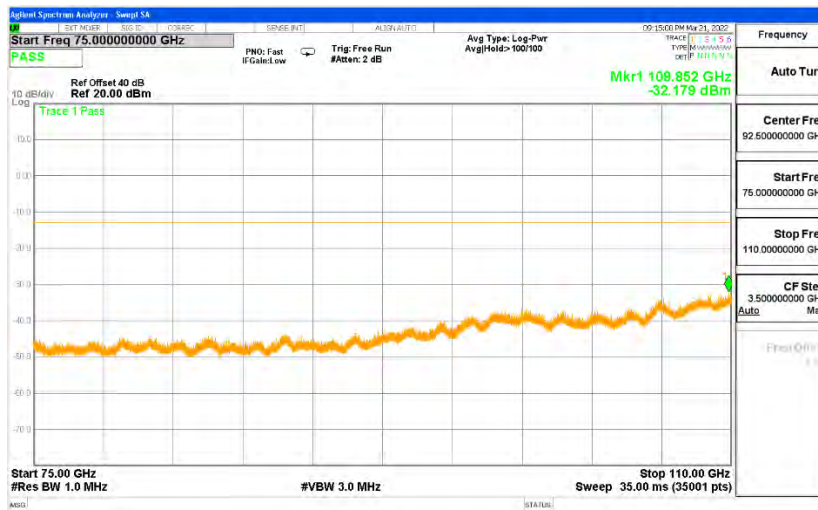


75 - 110 GHz, ANT M2 (Pre-scan using Pk Det.) Vertical

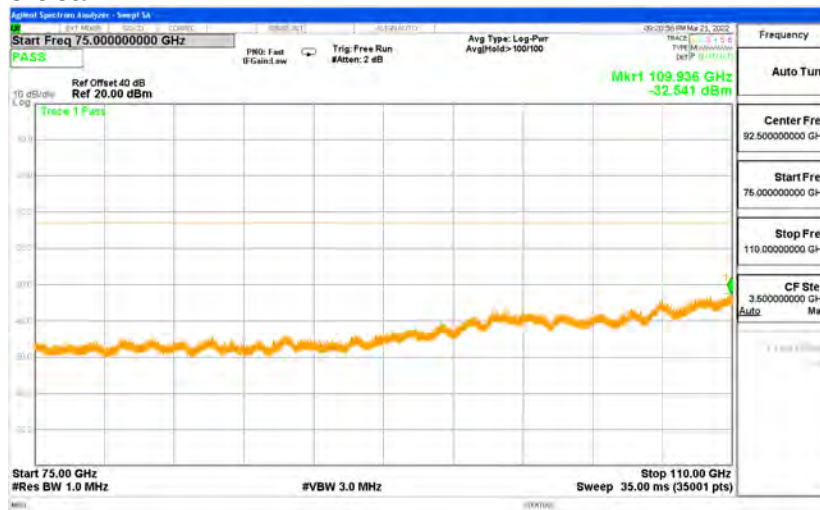


Emissions detected using Peak Detection at pre-scan. Avg EIRP was measured.

75 - 110 GHz, ANT M3 (Pre-scan using Pk Det.) Horizontal



75 - 110 GHz, ANT M3 (Pre-scan using Pk Det.) Vertical



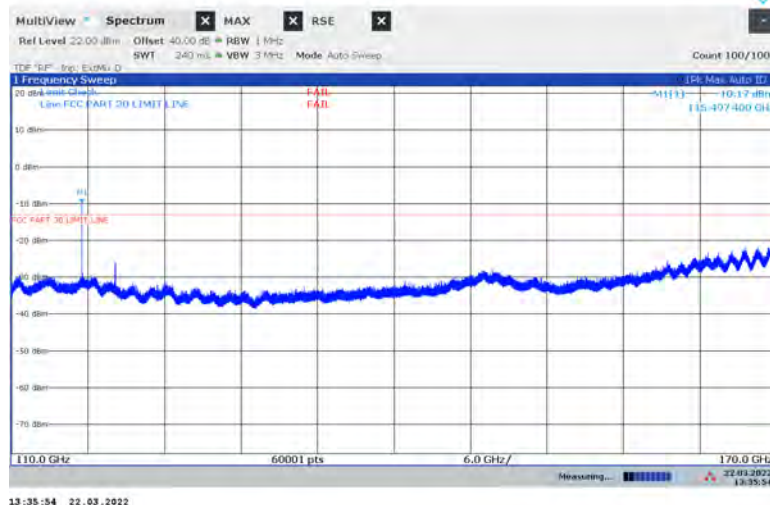
No emission detected using Peak Detection.

75 - 110 GHz n260, 1CC

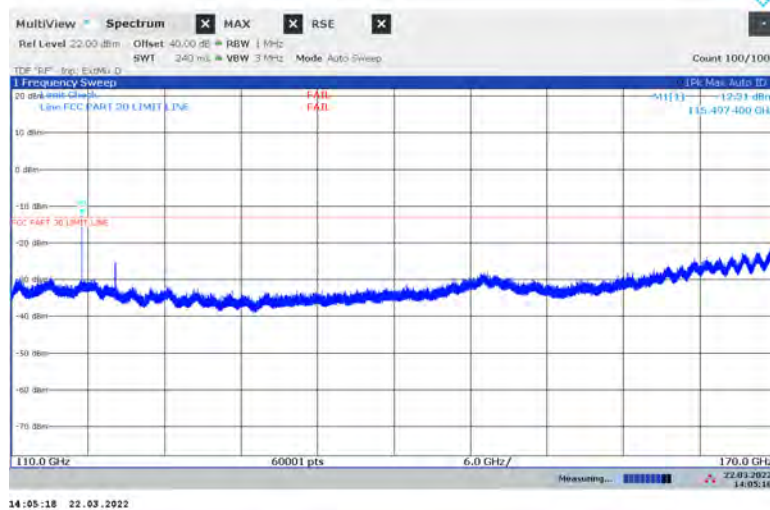
Antenna	Freq.	Meas. Distance	Rx Ant. Polarity	Corrected Avg EIRP	TRP Limit	Margin
	(GHz)	(m)	H/V	(dBm)	(dBm)	(dB)
M2	77.000	1	H	-35.72	-13	-22.72
M2	77.000	1	V	-28.34	-13	-15.34

8.4.39. RSE n260 110 - 170 GHz

110 - 170 GHz, ANT M2 (Pre-scan using Pk Det.) Horizontal

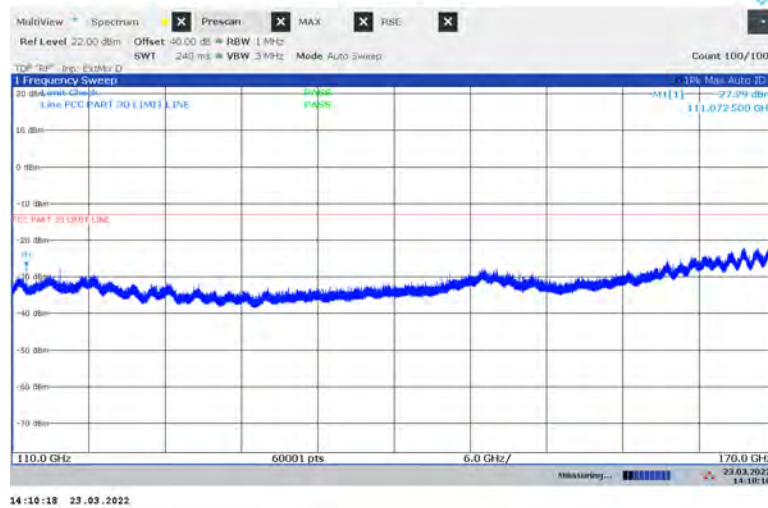


110 - 170 GHz, ANT M2 (Pre-scan using Pk Det.) Vertical

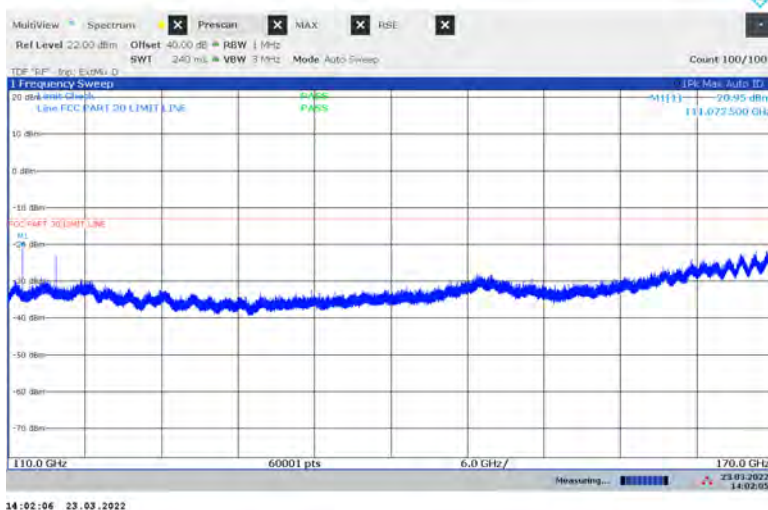


Emissions detected using Peak Detection at pre-scan. Avg EIRP was measured.

110 - 170 GHz, ANT M3 (Pre-scan using Pk Det.) Horizontal



110 - 170 GHz, ANT M3 (Pre-scan using Pk Det.) Vertical



Emissions detected using Peak Detection at pre-scan. Avg EIRP was measured.

110 - 170 GHz n260, 1CC

Antenna	Freq.	Meas. Distance	Rx Ant. Polarity	Corrected Avg EIRP	TRP Limit	Margin
	(GHz)	(m)	H/V	(dBm)	(dBm)	(dB)
M2	115.497	1	H	-23.28	-13	-10.28
M2	115.497	1	V	-35.77	-13	-22.77
M3	111.073	1	H	-37.64	-13	-24.64
M3	111.073	1	V	-29.67	-13	-16.67

8.4.40. RSE n260 170 - 200 GHz

170 - 200 GHz, ANT M2 (Pre-scan using Pk Det.) Horizontal



170 - 200 GHz, ANT M2 (Pre-scan using Pk Det.) Vertical



No emission detected using Peak Detection.

**170 - 200 GHz, ANT M3 (Pre-scan using Pk Det.)
Horizontal**



**170 - 200 GHz, ANT M3 (Pre-scan using Pk Det.)
Vertical**



No emission detected using Peak Detection.

8.5. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055

LIMIT

For reporting purposes only

TEST PROCEDURES

KDB 842590 D01 Upper Microwave Flexible Use Service v01 Section 4.5
ANSI C63.26-2015 Section 5.6

Test procedures for temperature variation:

- a. Position the EUT in temperature/humidity chamber with power off.
 - b. Set chamber temperature to -30°C and stabilize the EUT for at least 30 minutes.
 - c. Record maximum change in frequency within one minute after powering the EUT.
 - d. Increase chamber temperature at 10°C intervals from -30°C to 50°C. Record maximum change in frequency at each temperature.
 - e. A period of at least 30 minutes is provided to allow stabilization of the equipment at each temperature level.
- Temp. = -30°C to +50°C

Test procedures for voltage variation:

- a. Position the EUT in temperature/humidity chamber with power off.
 - b. Set chamber temperature to 20°C.
 - c. Record maximum frequency change within one minute after powering the EUT.
 - d. The primary supply voltage is varied from 85% to 115% of the nominal value for hand-carried, battery-powered equipment. primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.
- Voltage = (85% - 115%)
 - Nominal: 3.8 VDC; Low: 3.32VDC; High: 4.37 VDC

The measurements were performed with the CW signal of center frequency of each frequency band. Testing of n258 SB1 and n261 bands on Ant M2 represent the performance of Chipset 1. Likewise, testing of n258 SB2 and n260 bands on Ant M3, represent the performance of Chipset 2.

RESULTS

See the following pages.

Employee IDs: 19459 & 24303
Test Date: 5/26/2022 - 5/27/2022
Test Location: Temperature Chamber

8.5.1. FREQUENCY STABILITY n258 SB1

		Antenna M2 n258 SB1	
Input Voltage	Environment	Frequency	Delta
	Temperature (°C)	(GHz)	(kHz)
Normal	50	24.3551798	218.800
Normal	40	24.3551259	164.900
Normal	30	24.3550509	89.900
Normal	20	24.3549610	Reference
Normal	10	24.3549640	3.000
Normal	0	24.3550150	54.000
Normal	-10	24.3550240	63.000
Normal	-20	24.3550270	66.000
Normal	-30	24.3550450	84.000
115%	20	24.3550480	87.000
85%	20	24.3550300	69.000

8.5.2. FREQUENCY STABILITY n258 SB2

		Antenna M3 n258 SB2	
Input Voltage	Environment	Frequency	Delta
	Temperature (°C)	(GHz)	(kHz)
Normal	50	25.0049251	-59.900
Normal	40	25.0049371	-47.900
Normal	30	25.0049940	9.000
Normal	20	25.0049850	Reference
Normal	10	25.0049880	3.000
Normal	0	25.0049940	9.000
Normal	-10	25.0049790	-6.000
Normal	-20	25.0049640	-21.000
Normal	-30	25.0049520	-33.000
115%	20	25.0049880	3.000
85%	20	25.0050000	15.000

8.5.3. FREQUENCY STABILITY n261

		Antenna M2 n261	
Input Voltage	Environment	Frequency	Delta
	Temperature (°C)	(GHz)	(kHz)
Normal	50	27.9300150	-30.000
Normal	40	27.9300480	3.000
Normal	30	27.9300480	3.000
Normal	20	27.9300450	Reference
Normal	10	27.9300390	-6.000
Normal	0	27.9300390	-6.000
Normal	-10	27.9300360	-9.000
Normal	-20	27.9300210	-24.000
Normal	-30	27.9300180	-27.000
115%	20	27.9300360	-9.000
85%	20	27.9300450	0.000

8.5.4. FREQUENCY STABILITY n260

		Antenna M3 n260	
Input Voltage	Environment	Frequency	Delta
	Temperature (°C)	(GHz)	(kHz)
Normal	50	38.5050569	62.900
Normal	40	38.5049910	-3.000
Normal	30	38.5049940	0.000
Normal	20	38.5049940	Reference
Normal	10	38.5049730	-21.000
Normal	0	38.5049550	-39.000
Normal	-10	38.5049910	-3.000
Normal	-20	38.5049371	-56.900
Normal	-30	38.5049730	-21.000
115%	20	38.5049371	-56.900
85%	20	38.5049580	-36.000

The occupied bandwidths (Section 8.1) are smaller than the channel bandwidths by at least 3 MHz for all modes of operation, the signal is at least 1.5 MHz from either edge of the channel. As the channels are fully contained within the FCC-allocated bands, and the frequency stability is significantly less than 1.5 MHz, with maximum frequency shift of 218.8 kHz over the test conditions (Ant M2 n258 SB1 at 50°C). The signal is always contained within the allocated channel, therefore, always contained within the allocated band.

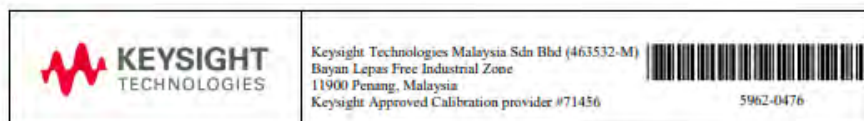
9. SETUP PHOTOS

Please refer to 14040863-EP20V1 for setup photos.

END OF REPORT

APPENDIX A

1. 50 - 80 GHz Keysight M1970V



Certificate Of Calibration

Certificate No: M1970VMY5139083020211007

Manufacturer: Keysight Technologies
Model No: M1970V
Options Installed With Specifications: 002

Description: Waveguide Harmonic Mixer
Serial No: MY51390830

Customer Asset:
Customer:
UL Verification Services Inc
47173 Benicia St
FREMONT CA 94538-7366
UNITED STATES

Location of Calibration:
Plot 44, Bayan Lepas Industrial Park IV
11900 Penang
Malaysia

Date of Calibration: 07-OCT-2021
Temperature: (23 ± 3)°C
Procedure: MTA-T0264

Received Date: 07-OCT-2021
Humidity: (20 to 70) % RH

This certifies that the equipment has been calibrated using applicable Keysight Technologies procedures in compliance with a quality management system registered to ISO 9001:2015.

As Received Conditions: Initial testing found the equipment to be IN SPECIFICATION at the points tested.

Action Taken: No corrective actions were necessary.

As Shipped Conditions: At the completion of calibration, measured values were IN SPECIFICATION at the parameters tested.

Remarks or special requirements:

Notes:

1. This calibration report may refer to equipment manufactured by HP, Agilent and Keysight as being manufactured by Keysight Technologies, Inc.
2. The test limits stated in the calibration report correspond to the published specifications of the equipment, at the points tested.
3. The documented test results relate to the equipment tested only.
4. This calibration report shall not be reproduced, except in full.

Traceability Information: Measurements are traceable to the International System of Units (SI) via national metrology institutes (www.keysight.com/find/NMI) that are signatories to the CIPM Mutual Recognition Arrangement.

Keysight Provider #71456			
DD	MM	YY	BY
CAL	07	10	21
DUE			

2. 75 - 110 GHz Keysight M1970W



Certificate Of Calibration

Certificate No: M1970WMY5143078420211008

Manufacturer: Keysight Technologies
Model No: M1970W
Options Installed With Specifications: N/A

Description: Waveguide Harmonic Mixer
Serial No: MY51430784

Customer Asset:
Customer:
UL Verification Services Inc
47173 Benicia St
FREMONT CA 94538-7366
UNITED STATES

Location of Calibration:
Plot 44, Bayan Lepas Industrial Park (Y)
11900 Penang
Malaysia

Date of Calibration: 08-OCT-2021
Temperature: (23 ± 3)°C
Procedure: MTA-T0264

Received Date: 08-OCT-2021
Humidity: (20 to 70) % RH

This certifies that the equipment has been calibrated using applicable Keysight Technologies procedures in compliance with a quality management system registered to ISO 9001:2015.

As Received Conditions: Initial testing found the equipment to be IN SPECIFICATION at the points tested.

Action Taken: No corrective actions were necessary.

As Shipped Conditions: At the completion of calibration, measured values were IN SPECIFICATION at the parameters tested.

Remarks or special requirements:

Notes:

1. This calibration report may refer to equipment manufactured by HP, Agilent and Keysight as being manufactured by Keysight Technologies, Inc.
2. The test limits stated in the calibration report correspond to the published specifications of the equipment at the points tested.
3. The documented test results relate to the equipment tested only.
4. This calibration report shall not be reproduced, except in full.

Traceability Information: Measurements are traceable to the International System of Units (SI) via national metrology institutes (www.keysight.com/find/NMI) that are signatories to the CIPM Mutual Recognition Arrangement.

Keysight Premier (P1446)			
100% TESTED BY			
DATE	BY	BY	BY
08/10/21	08/10/21	08/10/21	08/10/21

3. 110 - 170 GHz VDI WR6.5SAX

*WR6.5SAX, S/N: SAX 228



Virginia Diodes, Inc
979 2nd St. SE
Suite 309
Charlottesville, VA 22902
Phone: 434-297-3257
Fax: 434-297-3258

Certificate of Conformance

To: UL
47173 Benicia Street
Fremont, CA 94538
United States

From: Virginia Diodes, Inc.
979 2nd St. SE
Suite 309
Charlottesville, VA 22902

Packing List No: 212797
Shipping Date: 08/10/21

Today's Date: 08/10/21
PO Number: 7862019815

Quantity	Unit	Description	Order Job Number
1	EA	RETEST-WR10SAX SAX 649	21163-01
1	EA	RETEST-WR6.5SAX SAX 228	21163-02
1	EA	RETEST-WR4.3SAX SAX 229	21163-03

The VDI product(s) in this shipment meet(s) the guidelines for performance specifications established in accordance with the corresponding Purchase Order. Data presented in the User Guide, where applicable, has been obtained in accordance with VDI's Quality Management System. All instruments, used to obtain data, which require calibration have been calibrated with equipment traceable to the National Institute of Standards and Technology (NIST) and through NIST to the International System of Units (SI).

A handwritten signature in black ink, appearing to be "GMA", is written over a horizontal line.

Authorized Signature
Virginia Diodes, Inc

4. 170 - 260 GHz VDI WR4.3SAX

*WR4.3SAX, S/N: SAX 229



Virginia Diodes, Inc
979 2nd St. SE
Suite 309
Charlottesville, VA 22902
Phone: 434-297-3257
Fax: 434-297-3258

Certificate of Conformance

To: UL
47173 Benicia Street
Fremont, CA 94538
United States

From: Virginia Diodes, Inc
979 2nd St. SE
Suite 309
Charlottesville, VA 22902

Packing List No: 212797
Shipping Date: 08/10/21

Today's Date: 08/10/21
PO Number: 7862019815

Quantity	Unit	Description	Order Job Number
1	EA	RETEST-WR10SAX SAX 649	21163-01
1	EA	RETEST-WR6.5SAX SAX 228	21163-02
1	EA	RETEST-WR4.3SAX SAX 229	21163-03

The VDI product(s) in this shipment meet(s) the guidelines for performance specifications established in accordance with the corresponding Purchase Order. Data presented in the User Guide, where applicable, has been obtained in accordance with VDI's Quality Management System. All instruments, used to obtain data, which require calibration have been calibrated with equipment traceable to the National Institute of Standards and Technology (NIST) and through NIST to the International System of Units (SI).

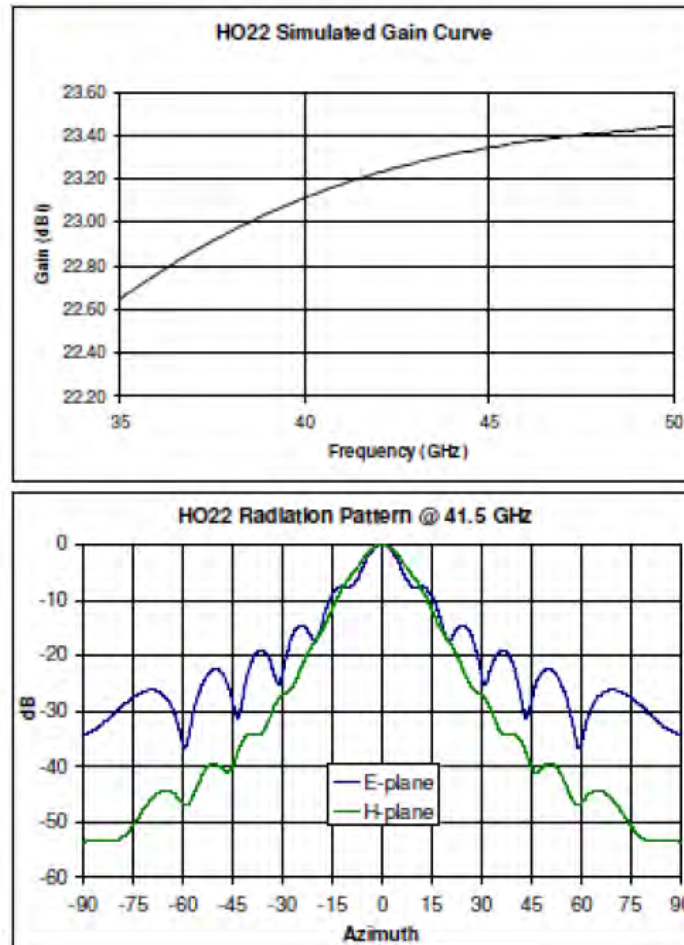
A handwritten signature in black ink, appearing to be "G. A.", is written over a horizontal line.

Authorized Signature
Virginia Diodes, Inc

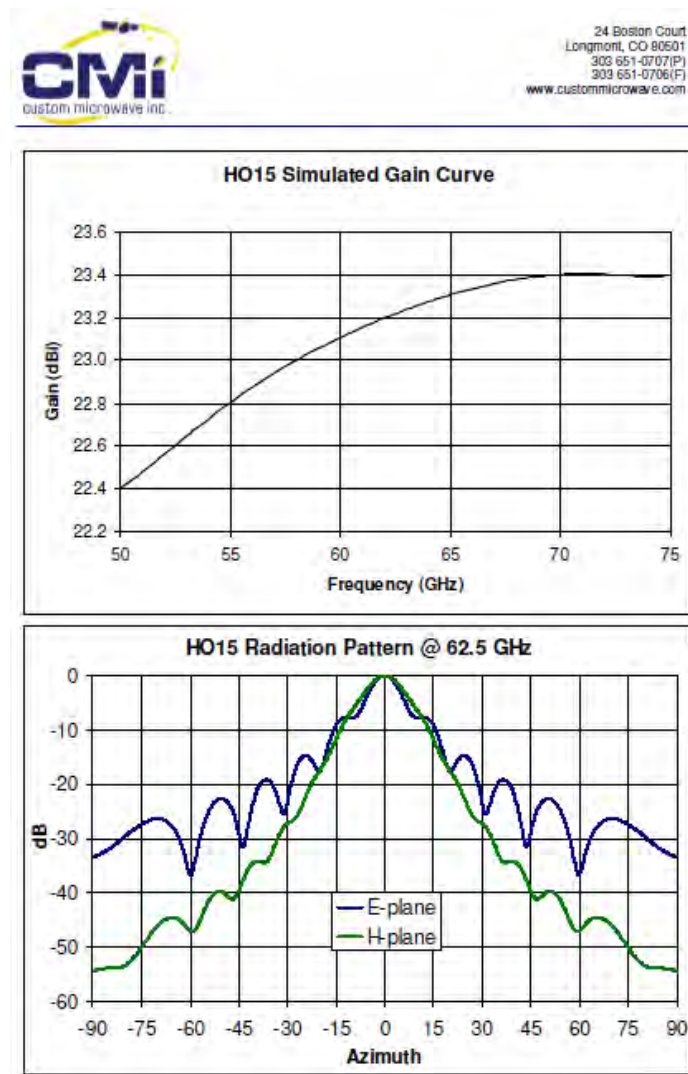
5. 35 - 50 GHz CMI HO22R HORN ANTENNA



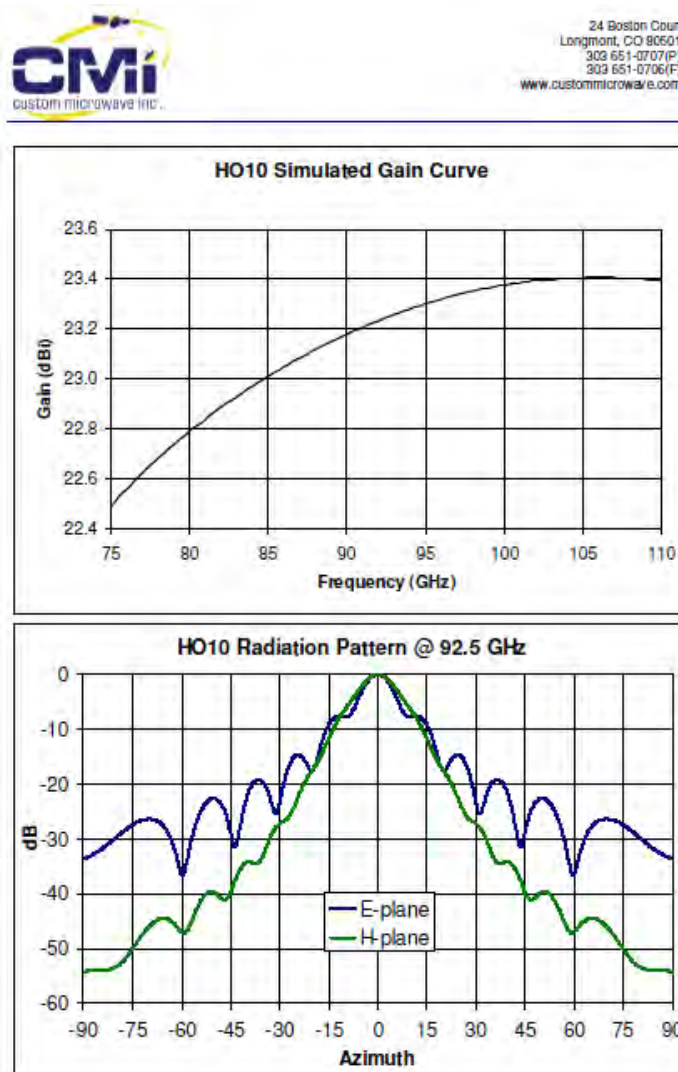
24 Boston Court
Longmont, CO 80501
303.651-0707(F)
303.651-0706(F)
www.custommicrowave.com



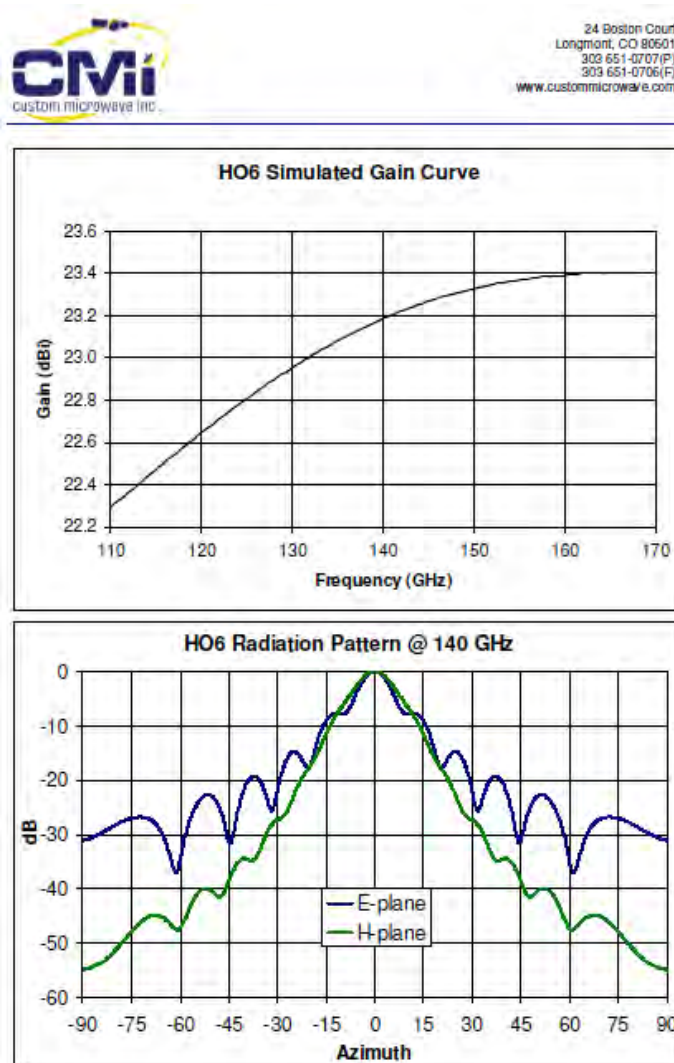
6. 50 - 75 GHz CMI HO15R HORN ANTENNA



7. 75 - 110 GHz CMI HO10R HORN ANTENNA



8. 110 - 170 GHz CMI HO6R HORN ANTENNA



9. 170 - 260 GHz CMI HO4R HORN ANTENNA

