



TEST REPORT

Report Number : R13255054-E3

Applicant : Dynetics
1002 Explorer Boulevard
Huntsville, AL 35806

Model : GA9120

FCC ID : QFS001-10044139

EUT Description : Ground Radar

Test Standard(s) : FCC CFR47 PART 90.103

Date of Issue:

2021-05-18

Prepared by:

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NVLAP Lab code: 200246-0

REVISION HISTORY

Ver.	Issue Date	Revisions	Revised By
1	2020-12-31	Initial Release	Brian T. Kiewra
2	2021-05-18	Revised worst-case configuration testing.	Brian T. Kiewra

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Dynetics
1002 Explorer Boulevard
Huntsville, AL 35806-2806

EUT DESCRIPTION: Ground Radar

MODEL: GA9120

SERIAL NUMBER: 9144

SAMPLE RECEIPT DATE: 2020-03-30

DATE TESTED: 2020-12-01 to 2021-04-08

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
47 CFR Part 90.103	Compliant

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL LLC based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

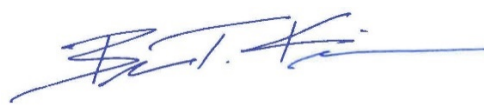
Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. government.

Approved & Released
For UL LLC by:



Dan Coronio
Operations Leader
UL – Consumer Technology Division

Prepared By:



Brian T. Kiewra
Project Engineer
UL – Consumer Technology Division

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, 47 CFR Part 90 and ANSI C63.26-2015.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 12 Laboratory Dr., Research Triangle Park, NC 27709, USA and 2800 Perimeter Park Drive, Suite B, Morrisville, NC 27560.

12 Laboratory Dr.	2800 Perimeter Park Dr.
☐ Chamber A RTP	☒ North Chamber
☐ Chamber C RTP	☐ South Chamber

The above test sites and facilities are covered under FCC Test Firm Registration # 703469.

UL LLC (RTP) is accredited by NVLAP, Laboratory Code 200246-0

4. DECISION RULES AND MEASUREMENT UNCERTAINTY

4.1. 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.

4.2. 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.)

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
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	3.05 dB
All emissions, radiated	6.01 dB
Temperature	2.26°C
Humidity	6.79%
DC Supply voltages	1.70%
Time	3.39%

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

4.4. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\begin{aligned}\text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m}\end{aligned}$$

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a wide-band ground radar used to monitor a specific area.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output powers as follows:

Channel	Mode 1 Peak power (dBm)	Mode 2 Peak Power (dBm)	Mode 3 Peak Power (dBm)
Low Channel	52.80	53.03	52.83
Middle Channel	51.37	51.43	51.36
High Channel	53.09	53.16	53.20

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The antenna type is a custom wheel antenna. The maximum antenna gain is 15dBi. The antenna connector type is SMA.

5.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was version 9360.

The EUT software installed during testing was 9360-002.

5.5. WORST-CASE CONFIGURATION AND MODE

The EUT operates in three specific modes as follows: Mode 1, Mode 2, and Mode 3. All modes and three channels (low, middle, high) were tested during antenna-port measurements except for frequency stability where the middle channel was evaluated.

All modes were tested during radiated spurious emissions testing. The low, middle, and high channels were evaluated in the 1-18GHz range, while the middle channel was evaluated in the other ranges of interest.

The device is intended to operate in only one orientation and was thus testing in the device's intended orientation.

The operating frequencies of the EUT are as follows:

Center Frequencies (MHz)	Mode	Channel
3148	1,2,3	Low
3180	1,2,3	Mid
3211	1,2,3	High

5.6. DESCRIPTION OF TEST SETUP

CONDUCTED AND RADIATED TESTS SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Dell	Latitude E6440	CY9BM32	NA
Load	Pasternack	PE7214-30	PE7214-30	NA

I/O CABLES

I/O Cable List						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	1	1	Circular Straight pin connector	Mains	>3m	Connects to both power (mains) and laptop (ENET)
2	1	1	Circular Straight pin connector	ENET	>3m	Connects to both power (mains) and laptop (ENET)
3	Coax	1	SMA	Coax	>3	Goes to the load

SETUP DIAGRAM

Refer to exhibit R13255053-EP1

6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville - North Chamber)

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
0.009-30MHz(Loop Ant.)					
AT0079	Active Loop Antenna	ETS-Lindgren	6502	2020-08-20	2021-08-20
30-1000 MHz					
AT0074	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2020-07-27	2021-07-27
1-18 GHz					
AT0072	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2020-04-27	2021-04-27
18-40 GHz					
AT0063	Horn Antenna, 18-26.5GHz	ARA	MWH-1826/B	2020-10-30	2021-10-30
AT0061	Horn Antenna, 26-40GHz	ARA	MWH-2640/B	2020-10-30	2021-10-30
Gain-Loss Chains					
N-SAC01	Gain-loss string: 0.009-30MHz	Various	Various	2020-07-29	2021-07-29
N-SAC02	Gain-loss string: 25-1000MHz	Various	Various	2020-07-29	2021-07-29
N-SAC03	Gain-loss string: 1-18GHz	Various	Various	2020-07-28	2021-07-28
N-SAC04	Gain-loss string: 18-40GHz	Various	Various	2020-07-31	2021-07-31
Receiver & Software					
SA0026	Spectrum Analyzer	Agilent	N9030A	2020-07-16	2021-07-16
SA0027	Spectrum Analyzer	Agilent	N9030A	2020-06-10	2021-06-10
SOFTEMI	EMI Software	UL	Version 9.5 (2020-08-18)		
Additional Equipment used					
s/n 200037610	Environmental Meter	Fisher Scientific	06-662-4	2020-01-22	2022-01-22

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville - South Chamber)

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
0.009-30MHz					
AT0079	Active Loop Antenna	ETS-Lindgren	6502	2020-08-20	2021-08-20
30-1000 MHz					
AT0075	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2020-10-27	2021-10-27
18-40 GHz					
AT0063	Horn Antenna, 18-26.5GHz	ARA	MWH-1826/B	2020-10-30	2021-10-30
AT0061	Horn Antenna, 26-40GHz	ARA	MWH-2640/B	2020-10-30	2021-10-30
Gain-Loss Chains					
S-SAC01	Gain-loss string: 0.009-30MHz	Various	Various	2020-07-10	2021-07-10
S-SAC02	Gain-loss string: 25-1000MHz	Various	Various	2020-07-10	2021-07-10
S-SAC04	Gain-loss string: 18-40GHz	Various	Various	2020-07-07	2021-07-07
Receiver & Software					
SA0026	Spectrum Analyzer	Agilent	N9030A	2020-07-16	2021-07-16
SA0027	Spectrum Analyzer	Agilent	N9030A	2020-06-10	2021-06-10
SOFTEMI	EMI Software	UL	Version 9.5 (2020-08-18)		
Additional Equipment used					
s/n 200037635	Environmental Meter	Fisher Scientific	06-662-4	2020-01-22	2022-01-22

Test Equipment Used - Wireless Conducted Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
SA0018	Spectrum Analyzer	Agilent	N9030A	2020-03-18	2021-03-18
N/A	Cable, Coaxial	Unknown	Unknown	2020-04-14	2021-04-14
N/A	Cable, Coaxial	Unknown	Unknown	2020-04-14	2021-04-14
N/A	30dB, 100W Attenuator	Pasternack	PE7214-30	2020-04-14	2021-04-14
BK9446	30dB, 100W Attenuator	Wienschel	48-30-43	2020-04-16	2021-04-16
MM0130	Multimeter	Fluke	21 III	2019-07-27	2021-07-27
9945B1018	Power supply	Sorenson	DCS60-18	N/A	N/A
72822	Spectrum Analyzer	Agilent Technologies	E4446A	2020-01-02	2021-01-02
HI0087	Environmental Meter	Extech	SD700	2020-08-20	2021-08-20
EC0213	Environmental Chamber	Thermotron	FA-35-CH-5-5	2020-03-20	2021-03-20

Note: All equipment within calibration at time of use.

7. RF POWER OUTPUT

REQUIREMENT

§2.1046 Measurements required: RF power output.

(a) For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in §2.1033(c)(8). The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

§90.205 Output Power.

(r) All other frequency bands. Requested transmitter power will be considered and authorized on a case by case basis.

TEST PROCEDURE

The transmitter output was connected to the input of Spectrum Analyzer via calibrated coaxial cable and attenuator.

The output power was measured with the spectrum analyzer at the low, middle and high channel for each mode.

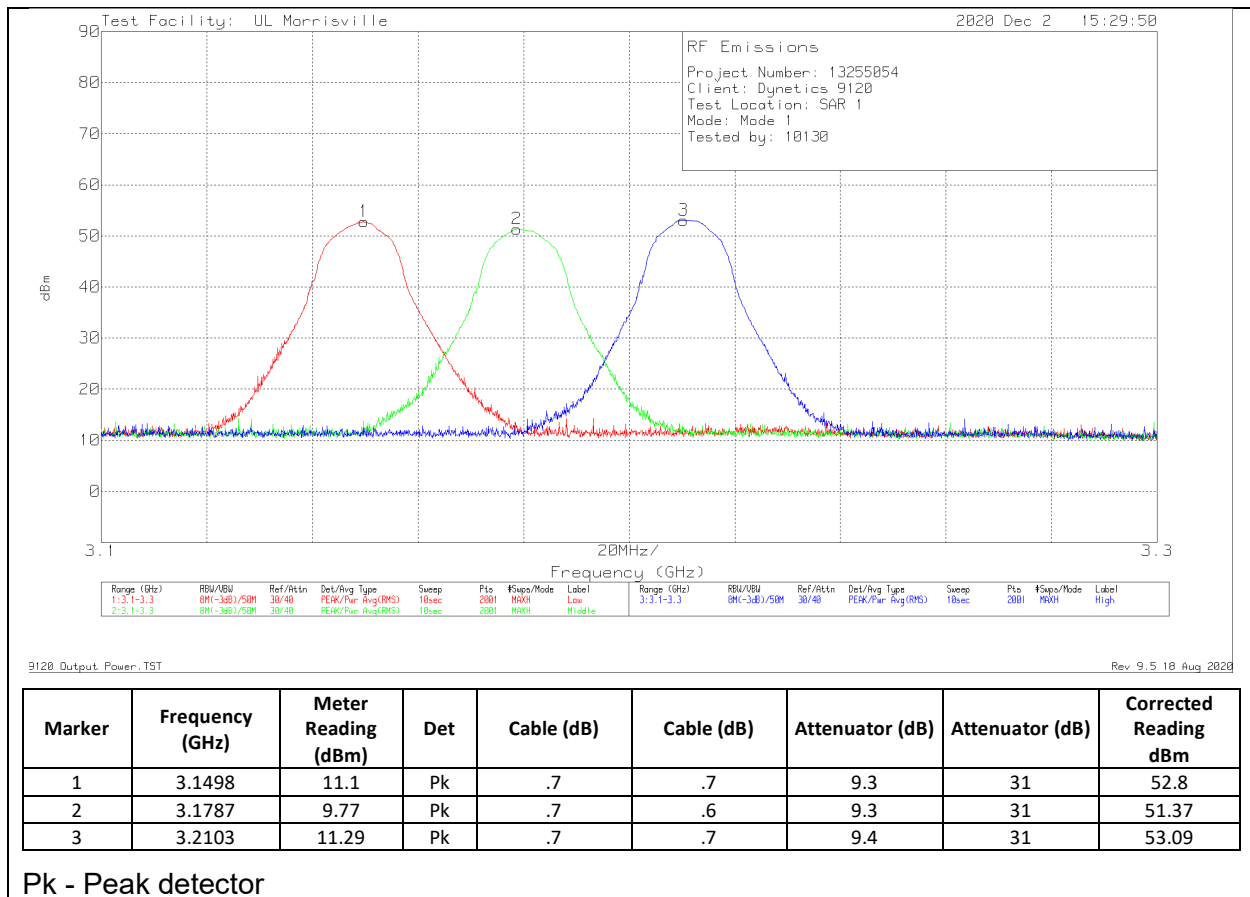
- Set the spectrum analyzer span wide enough or greater than the modulated signal BW.
- Set a spectrum analyzer at peak detection mode with VBW $\geq$ RBW. The RBW was set to largest available (8MHz). It is less then overall bandwidth of individual channel but is larger than bandwidth of individual pulse within a channel.
- Set a marker to point the corresponding peak value.

TABULAR RESULTS

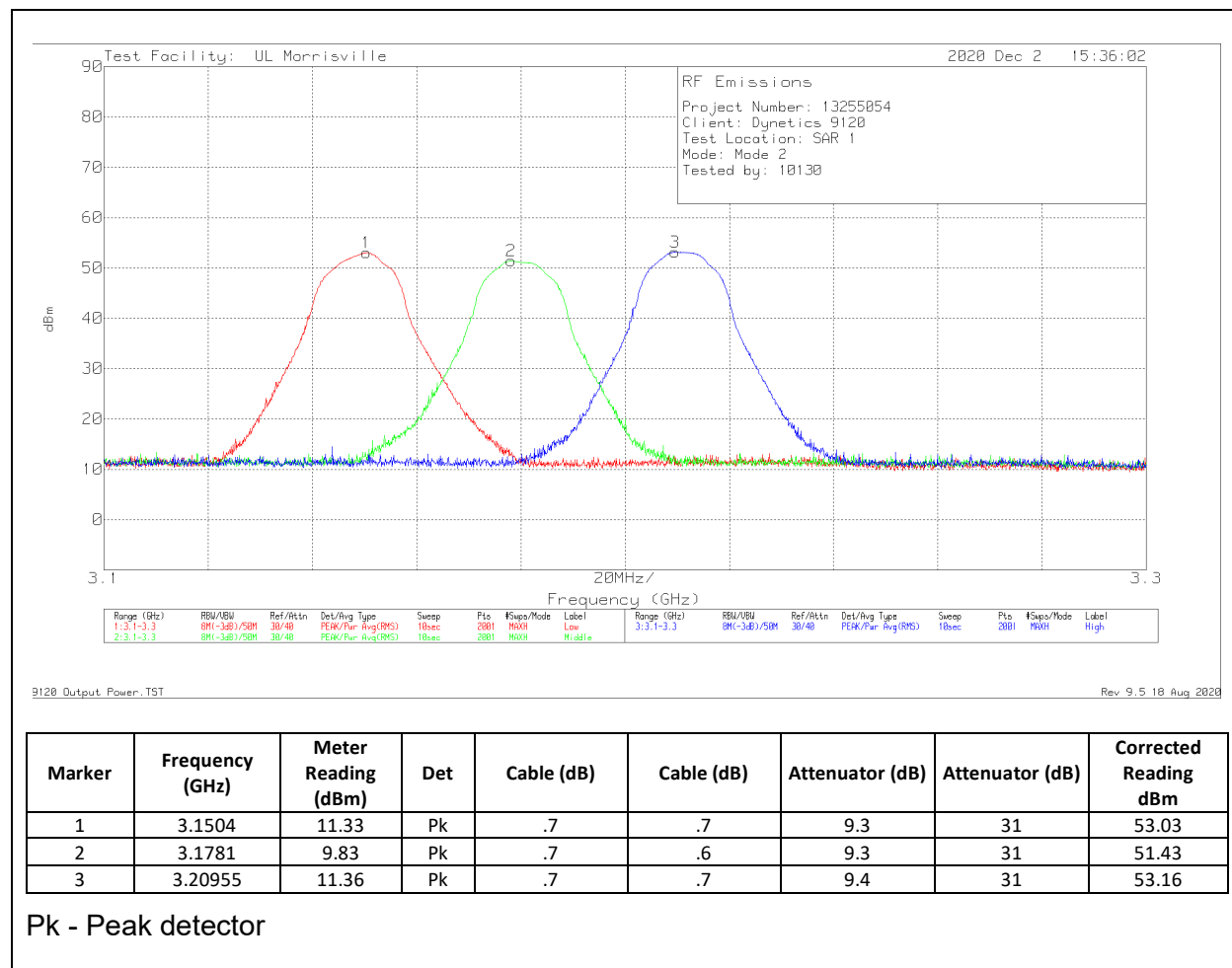
Channel	Mode 1 Peak power (dBm)	Mode 2 Peak Power (dBm)	Mode 3 Peak Power (dBm)
Low Channel	52.80	53.03	52.83
Middle Channel	51.34	51.43	51.36
High Channel	53.09	53.16	53.20

* The maximum power was derived from exported numeric trace data.

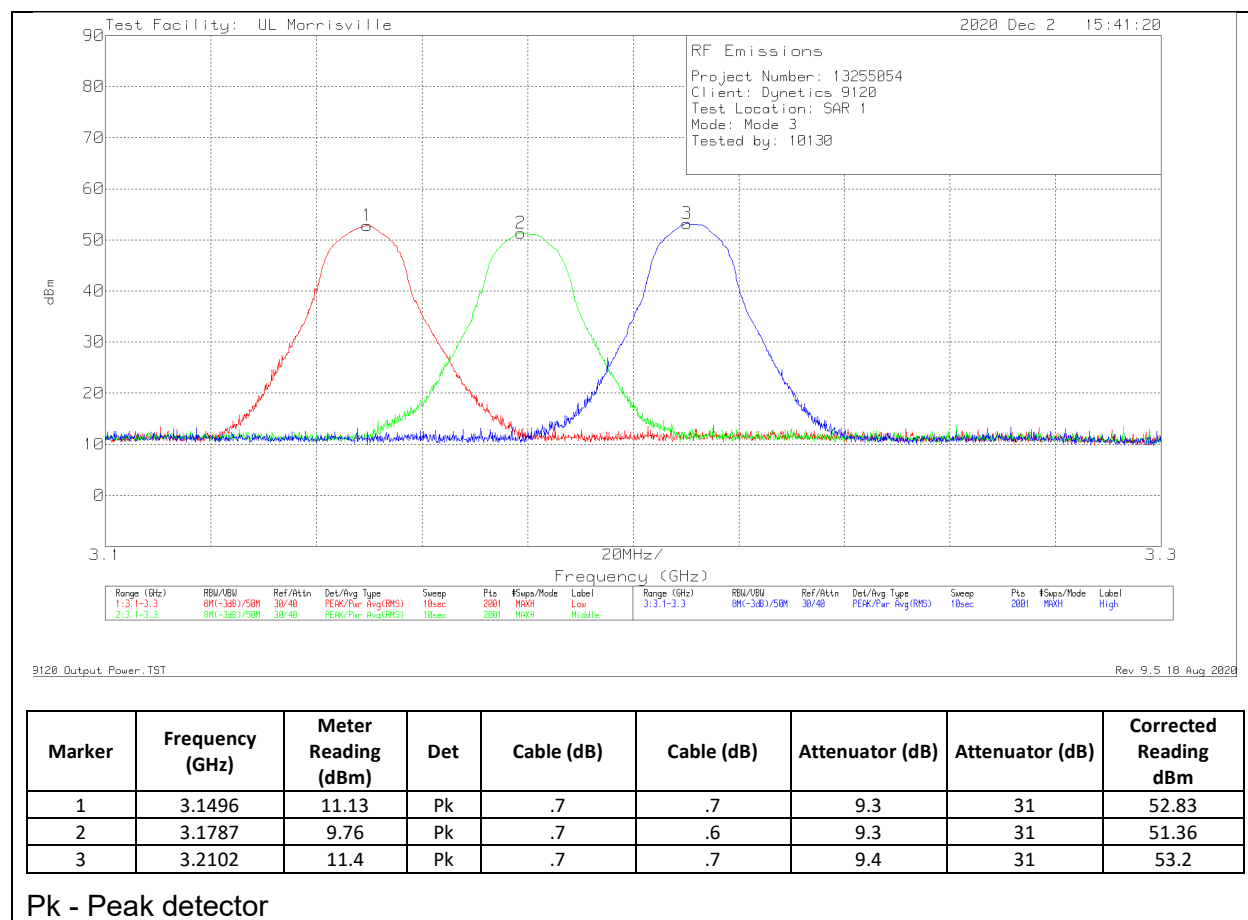
MODE 1



MODE 2



MODE 3



8. EMISSIONS TEST RESULTS

8.1. OCCUPIED BANDWIDTH

RULE PART(S)

§2.105 Measurements required: Occupied bandwidth.

§90.207 Types of emissions.

(k) For radiolocation operations as may be authorized in accordance with subpart F, unless otherwise provided for any type of emission may be authorized upon a satisfactory showing of need.

§90.209 Bandwidth Limitation.

Above 2500 MHz:

²Bandwidths for radiolocation stations in the 420-450 MHz band and for stations operating in bands subject to this footnote will be reviewed and authorized on a case-by-case basis.

LIMITS

For reporting purposes only.

TEST PROCEDURE

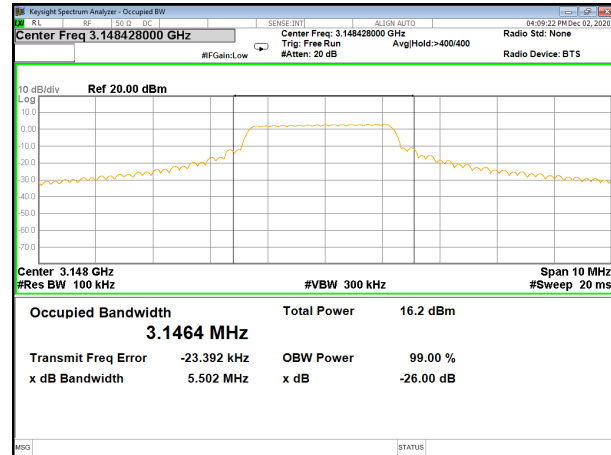
The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band.

TABULAR RESULTS

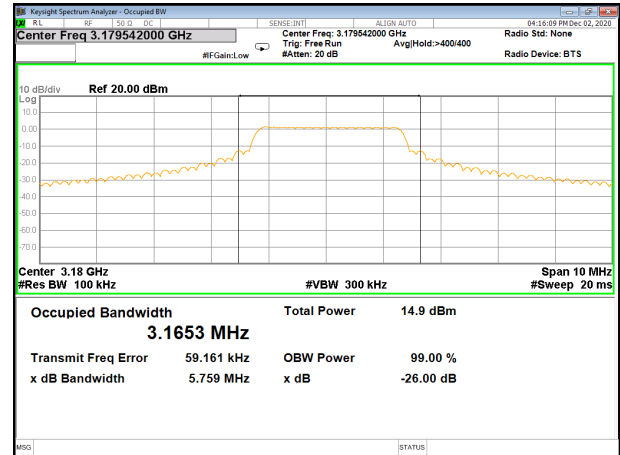
Channel	Mode 1 99% Bandwidth MHz	Mode 2 99% Bandwidth MHz	Mode 3 99% Bandwidth MHz
Low Channel	3.1464	5.1234	3.1420
Middle Channel	3.1653	5.1932	3.1636
High Channel	3.1530	5.1650	3.1531

MODE 1

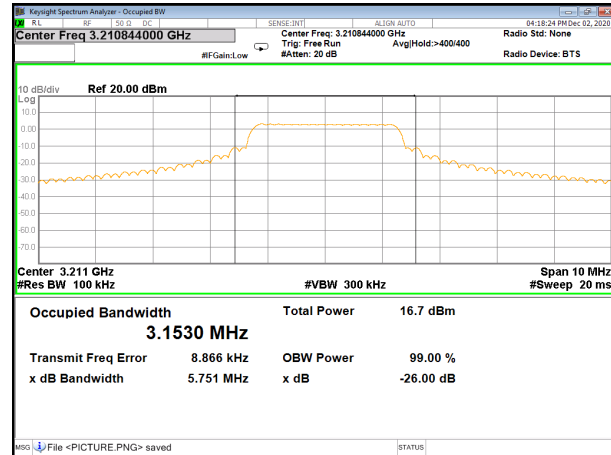
Low CH



Middle CH



High CH

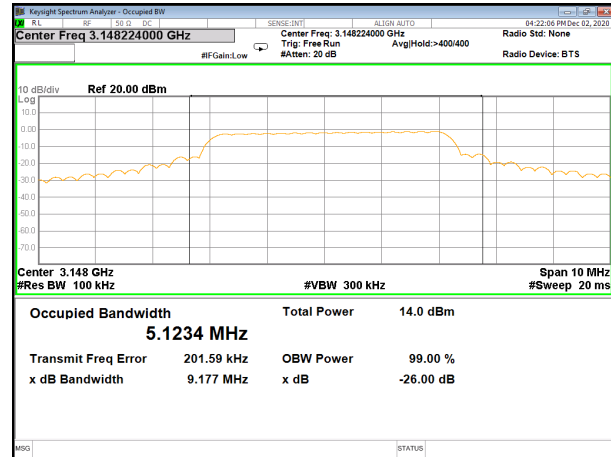


Date: 2020-12-02
Project No: 13255054
Location: SAR1
Tested by: 10130

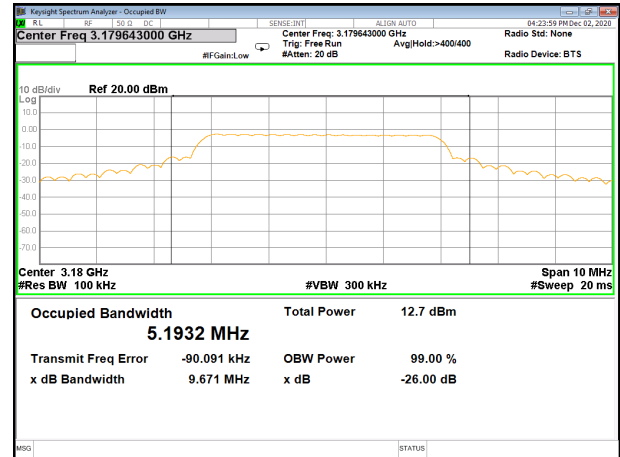
Detector: Peak
Mode: Max Hold

MODE 2

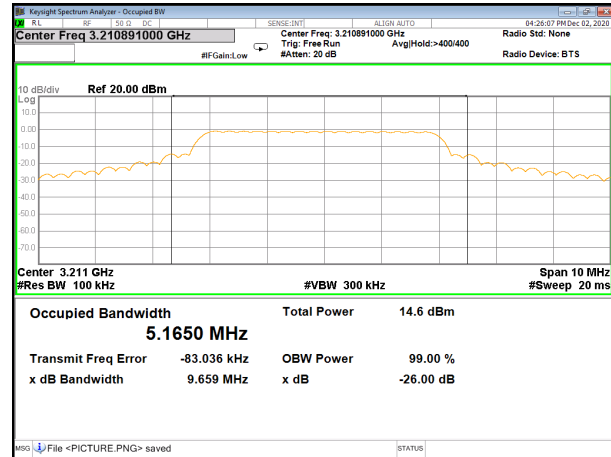
Low CH



Middle CH



High CH

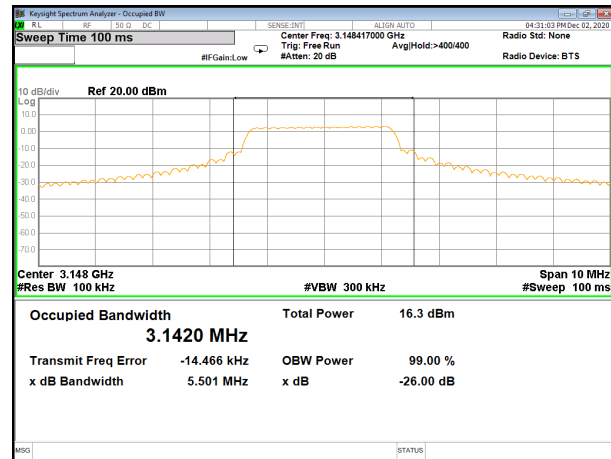


Date: 2020-12-02
Project No: 13255054
Location: SAR1
Tested by: 10130

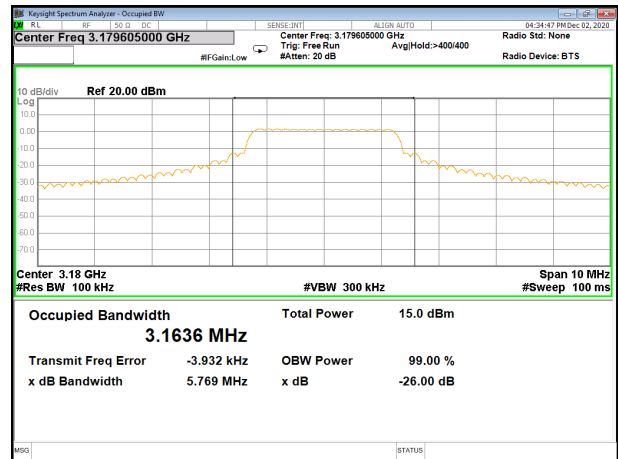
Detector: Peak
Mode: Max Hold

MODE 3

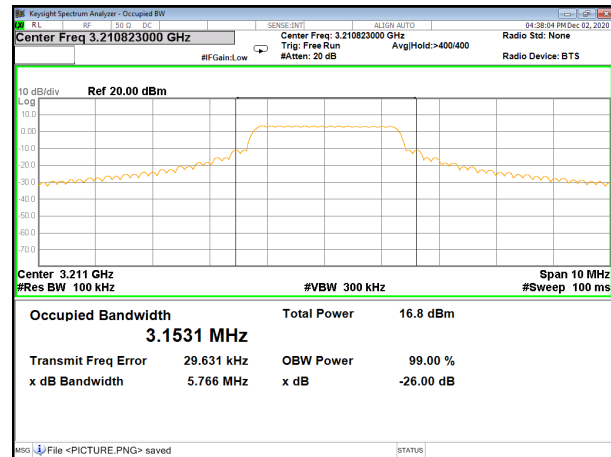
Low CH



Middle CH



High CH



Date: 2020-12-02
Project No: 13255054
Location: SAR1
Tested by: 10130

Detector: Peak
Mode: Max Hold

8.2. BAND EDGE

RULE PART(S)

§2.1051 Measurements required: Spurious emissions at antenna terminals. (At the band edges.)

§90.210 Emission Mask

Mask of 90.210(b) is met as all emissions are below -13dBc as worst case limit.

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in §2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

LIMITS

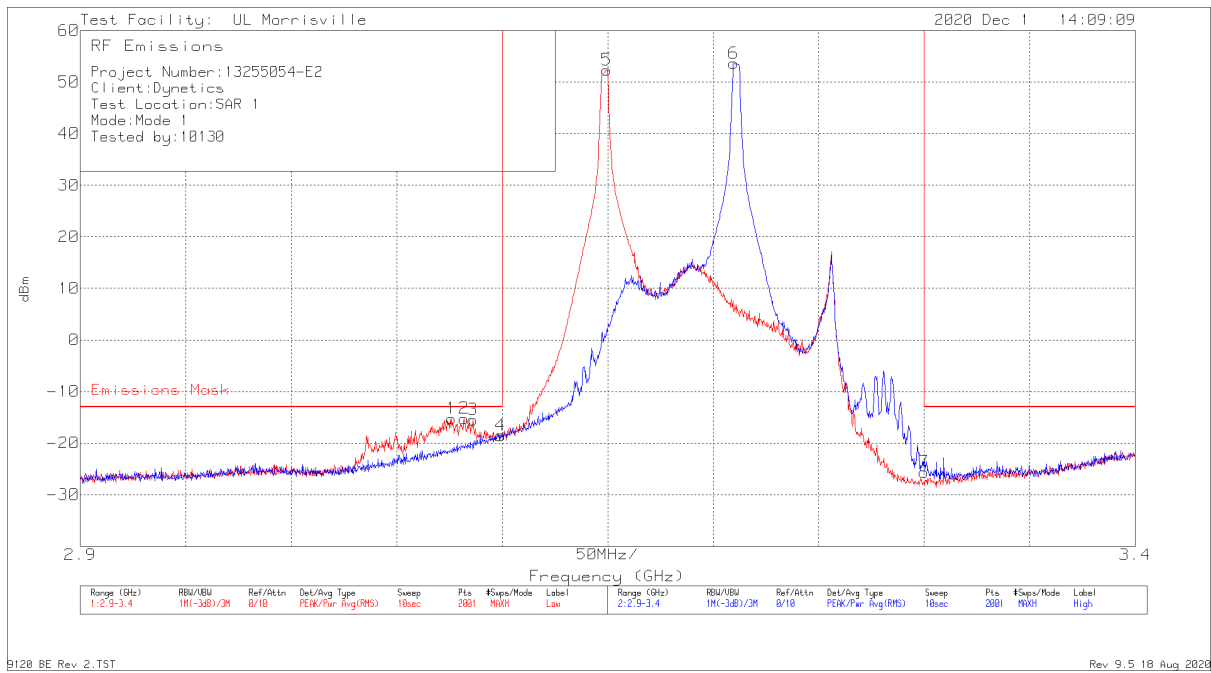
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB. (-13dBm)

TEST PROCEDURE

The transmitter output was connected to the input of Spectrum Analyzer via calibrated coaxial cable and attenuator.

The output power was measured with the spectrum analyzer at the low and high channel for each mode.

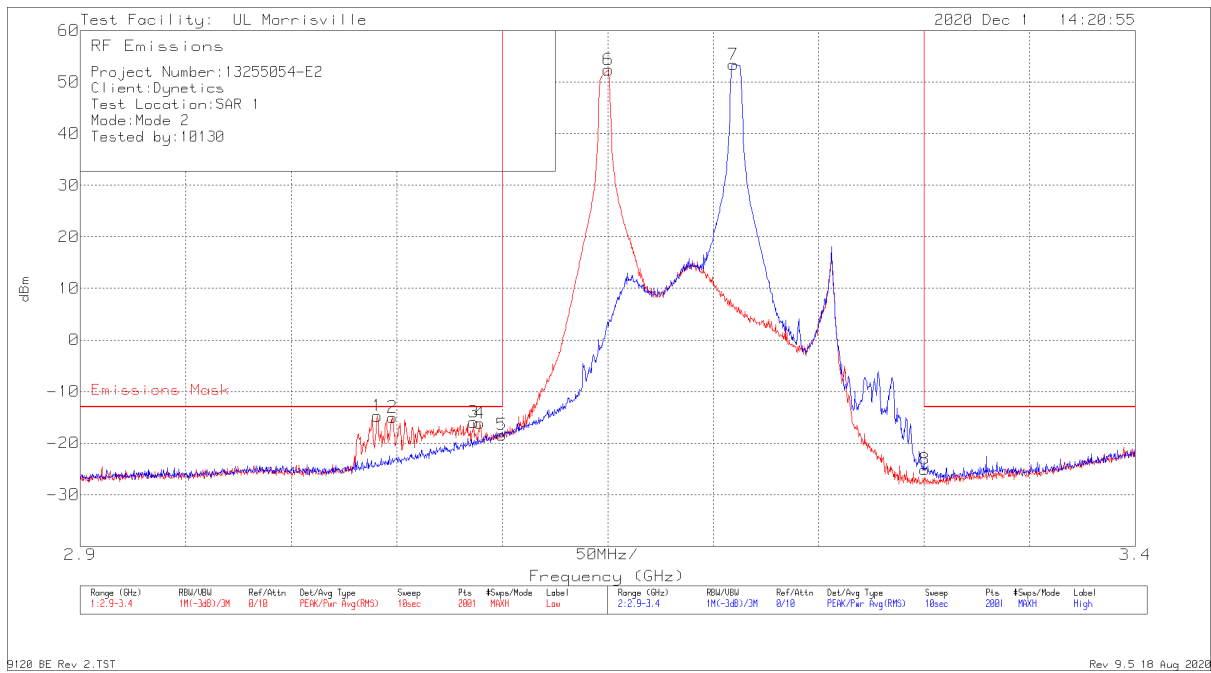
MODE 1



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	Cable (dB)	Cable (dB)	Attenuator (dB)	Filter (dB)	Corrected Reading dBm	Emissions Mask	PK Margin (dB)
1	3.076	-63.73	Pk	.6	.6	30.8	16.5	-15.23	-13	-2.23
2	3.082	-64.14	Pk	.6	.6	30.7	17	-15.24	-13	-2.24
3	3.086	-64.87	Pk	.6	.6	30.7	17.5	-15.47	-13	-2.47
4	3.09925	-69.41	Pk	.6	.6	30.7	19	-18.51	-13	-5.51
7	3.3	-68.02	Pk	.6	.6	30.7	10.5	-25.62	-13	-12.62

Pk - Peak detector

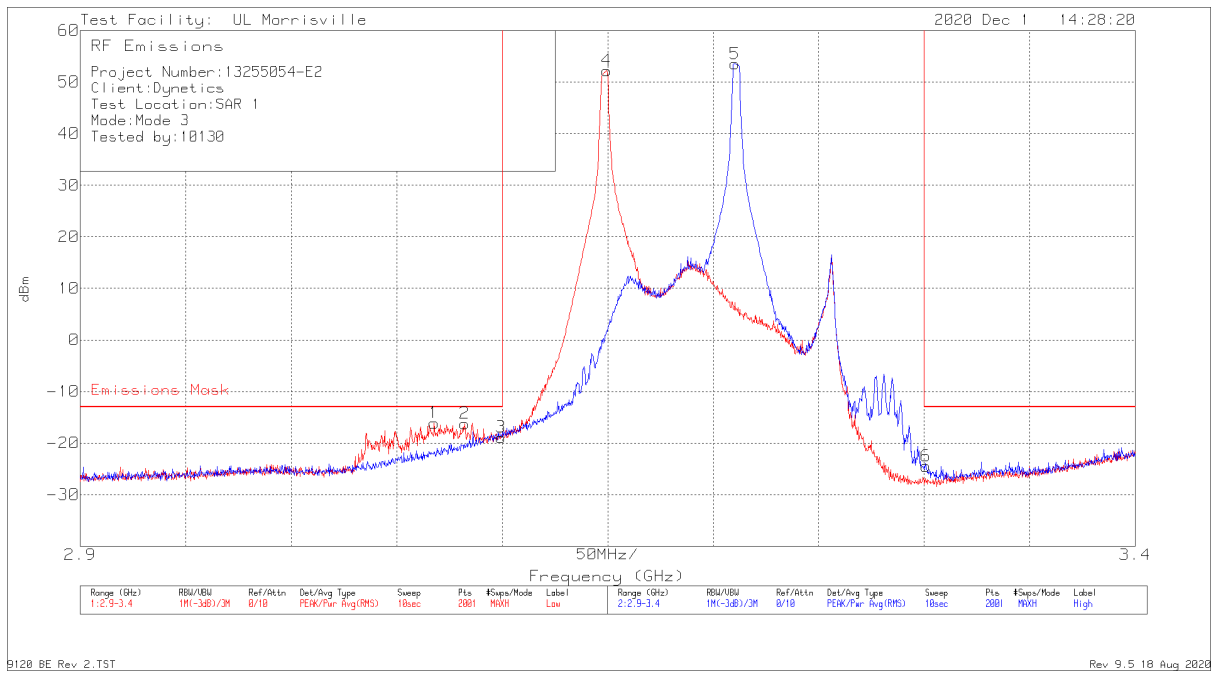
MODE 2



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	Cable (dB)	Cable (dB)	Attenuator (dB)	Filter (dB)	Corrected Reading dBm	Emissions Mask	PK Margin (dB)
1	3.04075	-60.42	Pk	.7	.6	30.7	13.7	-14.72	-13	-1.72
2	3.048	-61.22	Pk	.7	.6	30.7	14.2	-15.02	-13	-2.02
3	3.0865	-65.35	Pk	.6	.6	30.7	17.5	-15.95	-13	-2.95
4	3.08925	-65.84	Pk	.6	.6	30.7	17.8	-16.14	-13	-3.14
5	3.09975	-69.4	Pk	.6	.6	30.7	19.1	-18.4	-13	-5.4
8	3.30025	-67.5	Pk	.6	.6	30.7	10.5	-25.1	-13	-12.1

Pk - Peak detector

MODE 3



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	Cable (dB)	Cable (dB)	Attenuator (dB)	Filter (dB)	Corrected Reading dBm	Emissions Mask	PK Margin (dB)
1	3.06775	-63.89	Pk	.7	.6	30.8	15.7	-16.09	-13	-3.09
2	3.08225	-65.21	Pk	.6	.6	30.7	17.1	-16.21	-13	-3.21
3	3.0995	-69.89	Pk	.6	.6	30.7	19.1	-18.89	-13	-5.89
6	3.30075	-66.86	Pk	.6	.6	30.7	10.5	-24.46	-13	-11.46

Pk - Peak detector

8.3. OUT OF BAND EMISSIONS (ANTENNA PORT AND RADIATED)

RULE PART(S)

§2.1051 Measurements required: Spurious emissions at antenna terminals.

§2.1053 Measurements required: Field strength of spurious radiation.

§90.210 Emission Masks

Mask of 90.210(b) is met as all emissions are below -13dBc as worst case limit.

LIMITS

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.

TEST PROCEDURE

For antenna port the RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

For radiated emissions the radio output was terminated with artificial antenna (50Ohm Load). The measured electric field was converted to an EIRP value using the theoretical relationships given in section 5.2.7 of ANSI C63.26-2015 and is outlined below.

Know

$$(1) \text{ EIRP} = E - 95.2 \text{ (At a measurement distance of 3m.)}$$

Where

EIRP = equivalent isotropically radiated power in dBm

E = electric field in dBuV/m

$$(2) E = AF + V + G/L$$

Where

AF = antenna factor of receive antenna in dB/m.

V = receiver measured voltage in dBuV

G/L = gain-loss string between receive antenna and receiver

$$(3) V \text{ (dBuV)} = W \text{ (dBm)} + 107\text{dB}$$

Combine all the above and get the following:

$$\text{EIRP} = (AF + V + G/L) - 95.2 = (AF + (W + 107) + G/L) - 95.2$$

$$\text{EIRP} = AF + V + G/L + 11.8$$

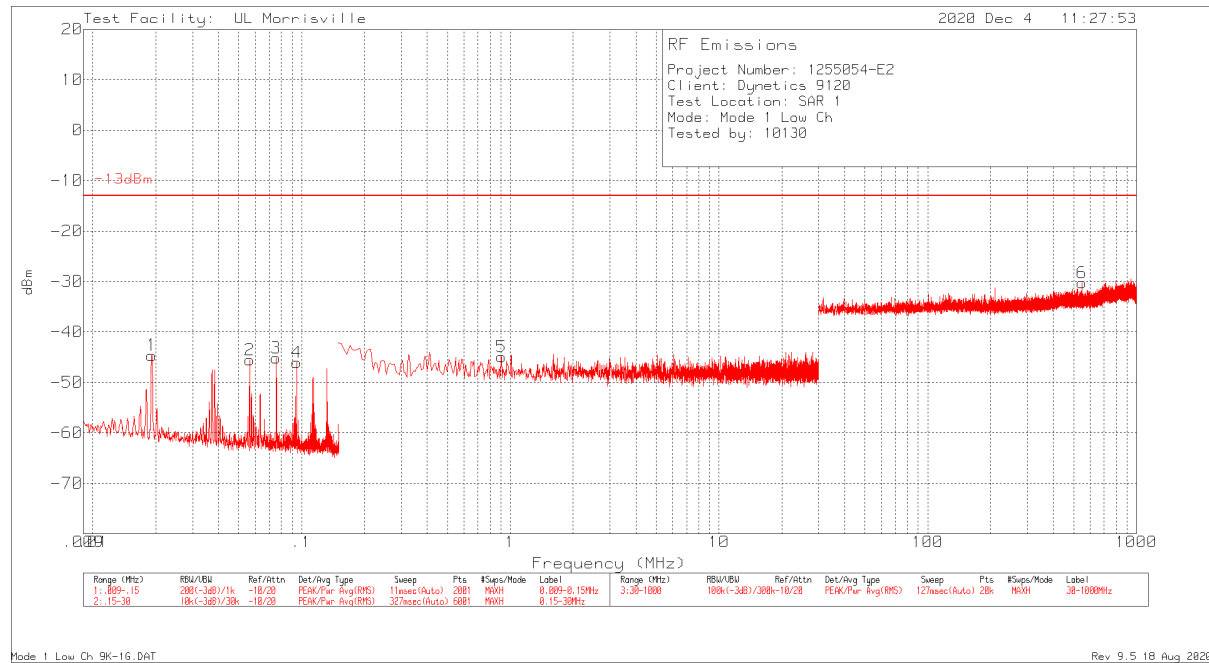
This EIRP value was then compared to the emissions limit of -13dBm.

RESULTS

8.3.1. ANTENNA PORT OUT OF BAND EMISSIONS

Note – All plots in section 8.3.1 should have a project reference of 13255054 as opposed to 1255054.

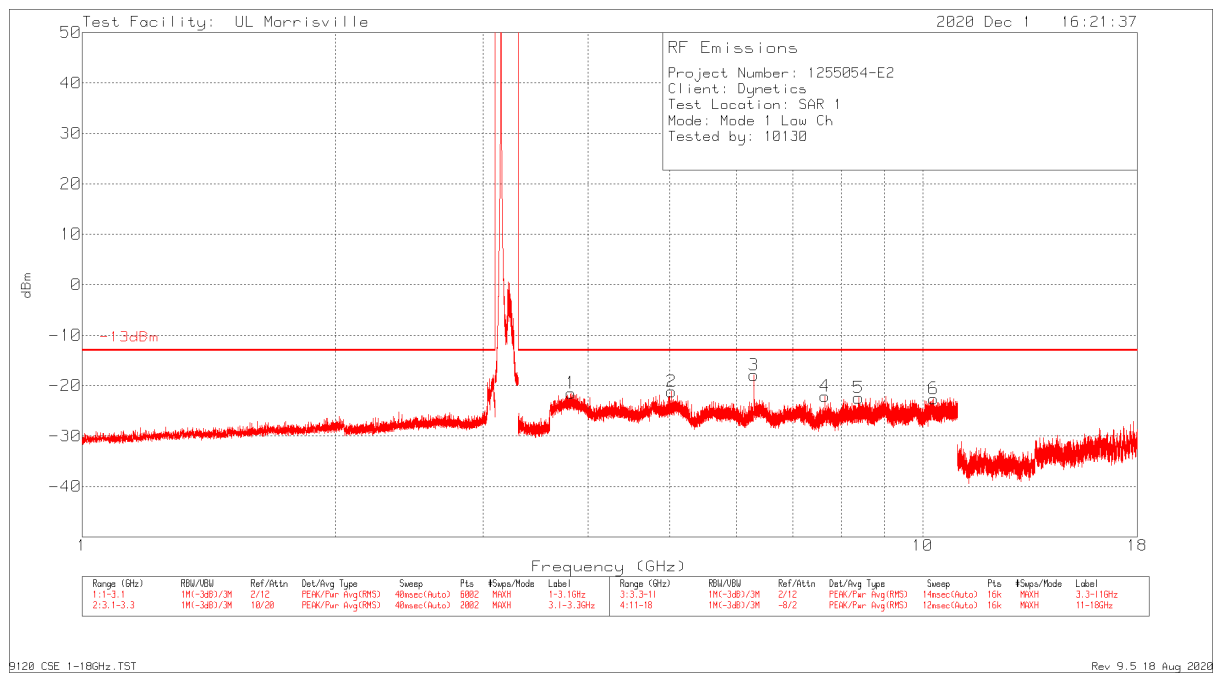
Mode 1, Low Channel, Below 9kHz – 1000MHz



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	Pad (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)
1	.01915	-83.93	Pk	39.3	-44.63	-13	-31.63
2	.05636	-84.95	Pk	39.4	-45.55	-13	-32.55
3	.0756	-84.6	Pk	39.4	-45.2	-13	-32.2
4	.09477	-85.46	Pk	39.4	-46.06	-13	-33.06
5	.9062	-84.29	Pk	39.4	-44.89	-13	-31.89
6	547.0585	-70.54	Pk	40.3	-30.24	-13	-17.24

Pk - Peak detector

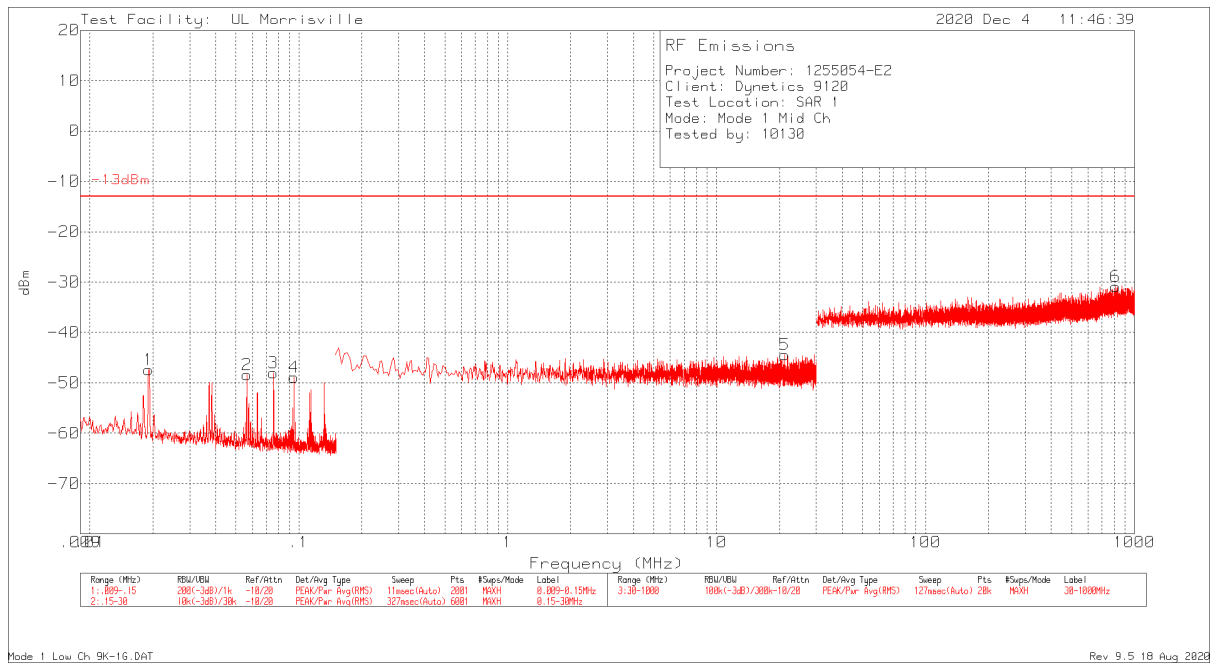
Mode 1, Low Channel, 1 – 18GHz



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	Attenuator (dB)	Attenuator (dB)	Cable (dB)	Cable (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)
1	3.81731	-63.37	Pk	31	9.4	.8	.7	-21.47	-13	-8.47
2	5.02758	-62.97	Pk	30.9	9.3	.8	.8	-21.17	-13	-8.17
3	6.29752	-59.82	Pk	30.9	9.2	.9	.9	-17.92	-13	-4.92
4	7.65215	-64.61	Pk	31.1	9.4	1	1	-22.11	-13	-9.11
5	8.38794	-65.11	Pk	31.3	9.4	1	1	-22.41	-13	-9.41
6	10.30175	-65.4	Pk	30.9	9.4	1.3	1.2	-22.6	-13	-9.6

Pk - Peak detector

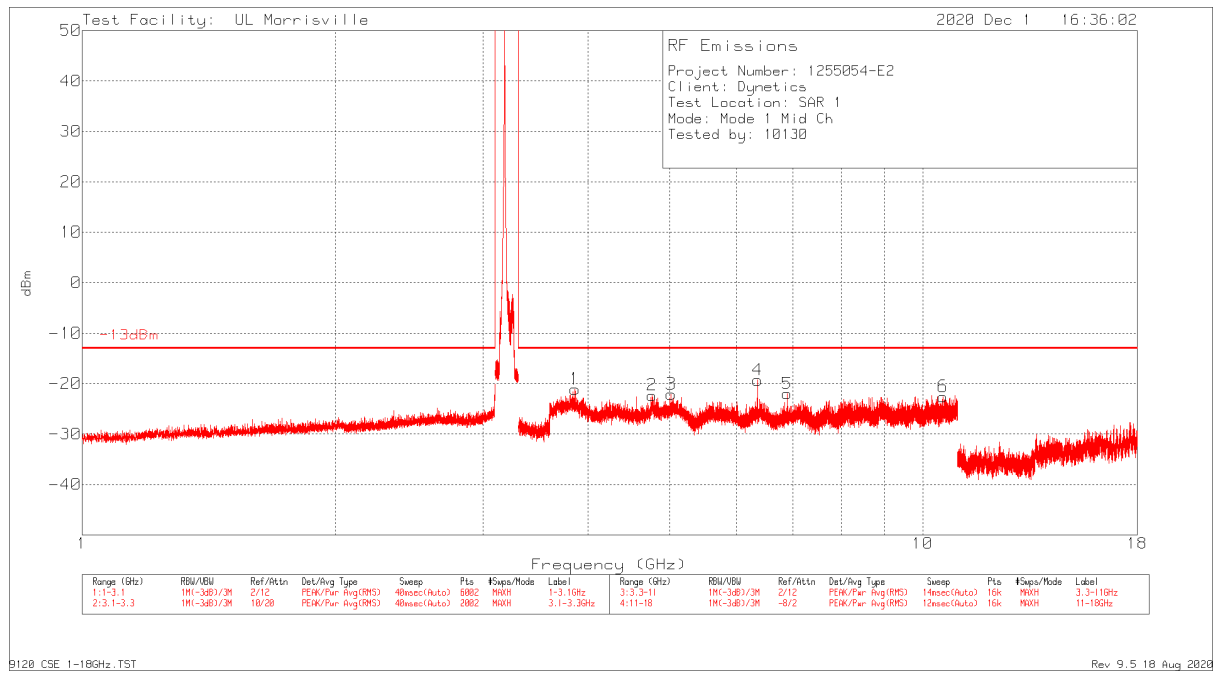
Mode 1, Mid Channel, Below 9kHz – 1000MHz



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	Pad (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)
1	.01908	-86.69	Pk	39.3	-47.39	-13	-34.39
2	.05639	-87.77	Pk	39.4	-48.37	-13	-35.37
3	.0756	-87.44	Pk	39.4	-48.04	-13	-35.04
4	.09477	-88.32	Pk	39.4	-48.92	-13	-35.92
5	21.14948	-83.91	Pk	39.5	-44.41	-13	-31.41
6	811.917	-71.66	Pk	40.8	-30.86	-13	-17.86

Pk - Peak detector

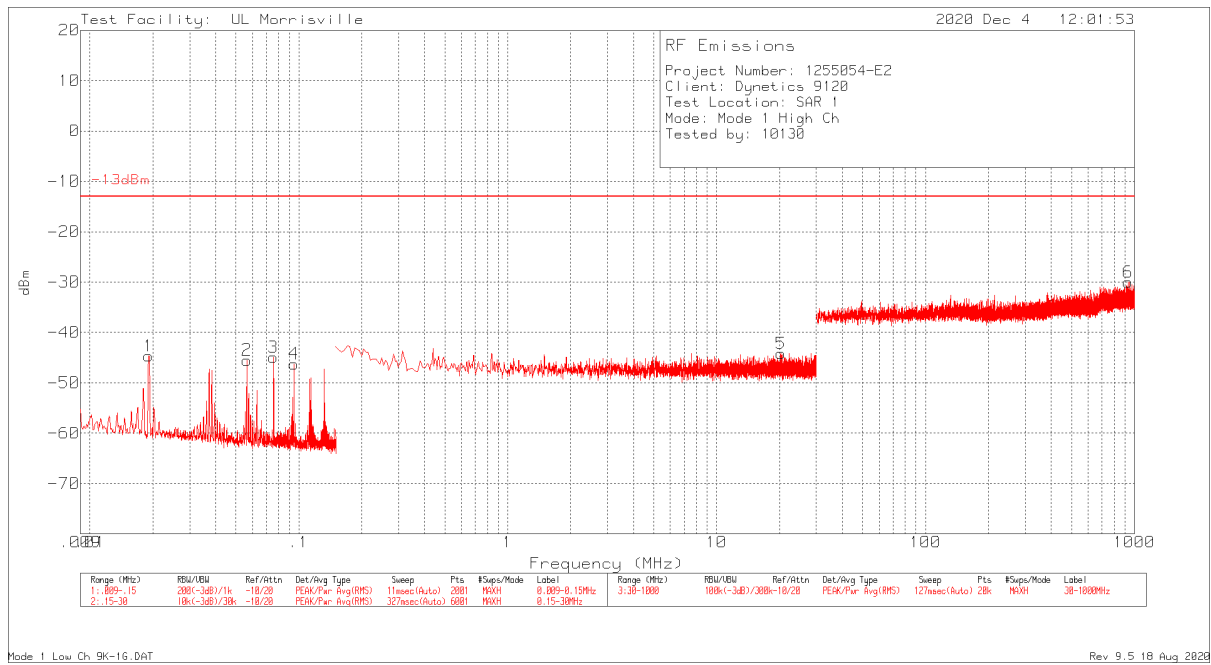
Mode 1, Mid Channel, 1 – 18GHz



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	Attenuator (dB)	Attenuator (dB)	Cable (dB)	Cable (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)
1	3.85773	-62.8	Pk	31	9.3	.7	.7	-21.1	-13	-8.1
2	4.76628	-64.21	Pk	31	9.3	.8	.8	-22.31	-13	-9.31
3	5.02036	-63.88	Pk	31	9.2	.8	.8	-22.08	-13	-9.08
4	6.35912	-61.2	Pk	30.9	9.2	.9	.9	-19.3	-13	-6.3
5	6.89856	-64.39	Pk	31.1	9.3	1	1	-21.99	-13	-8.99
6	10.57605	-65.77	Pk	30.8	9.4	1.5	1.5	-22.57	-13	-9.57

Pk - Peak detector

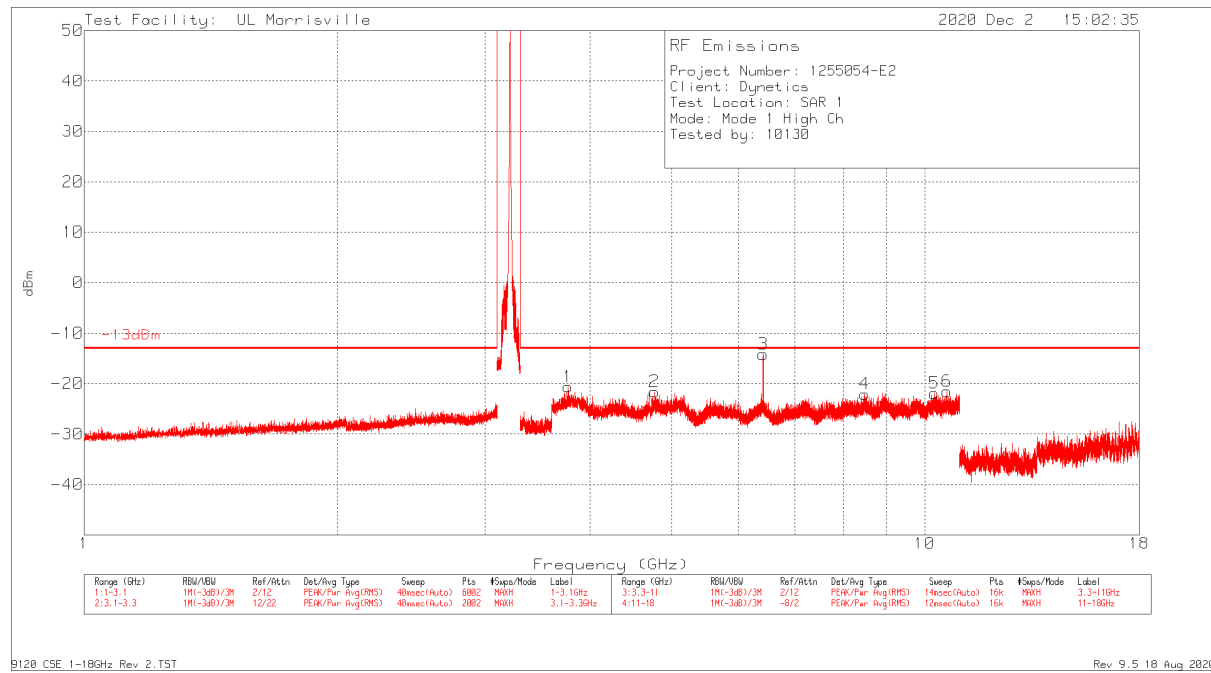
Mode 1, High Channel, Below 9kHz – 1000MHz



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	Pad (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)
1	.01912	-83.98	Pk	39.3	-44.68	-13	-31.68
2	.05643	-84.89	Pk	39.4	-45.49	-13	-32.49
3	.0756	-84.31	Pk	39.4	-44.91	-13	-31.91
4	.09477	-85.63	Pk	39.4	-46.23	-13	-33.23
5	20.36343	-83.66	Pk	39.5	-44.16	-13	-31.16
6	931.3725	-70.88	Pk	40.9	-29.98	-13	-16.98

Pk - Peak detector

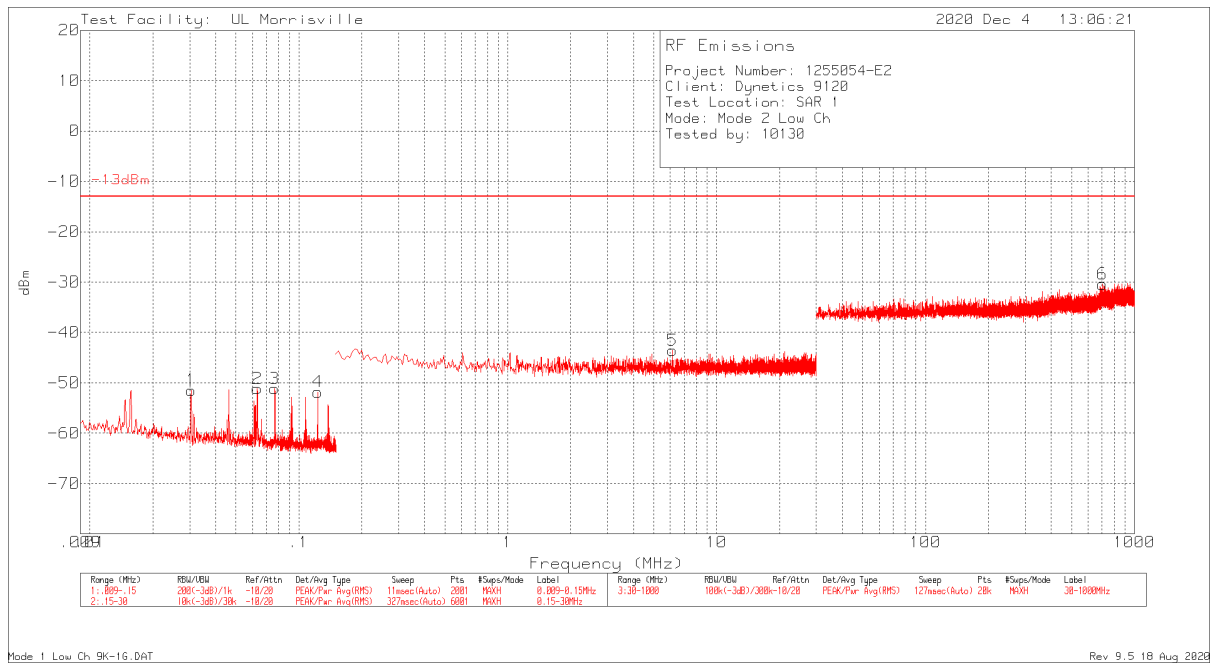
Mode 1, High Channel, 1 – 18GHz



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	Attenuator (dB)	Attenuator (dB)	Cable (dB)	Cable (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)
1	3.76293	-62.45	Pk	31	9.4	.7	.7	-20.65	-13	-7.65
2	4.76916	-63.37	Pk	31	9.2	.8	.8	-21.57	-13	-8.57
3	6.42312	-56.5	Pk	31.1	9.2	1	1	-14.2	-13	-1.2
4	8.47889	-64.96	Pk	31.3	9.4	1.1	1.1	-22.06	-13	-9.06
5	10.26181	-65.11	Pk	31	9.4	1.4	1.4	-21.91	-13	-8.91
6	10.63018	-64.64	Pk	30.9	9.4	1.4	1.4	-21.54	-13	-8.54

Pk - Peak detector

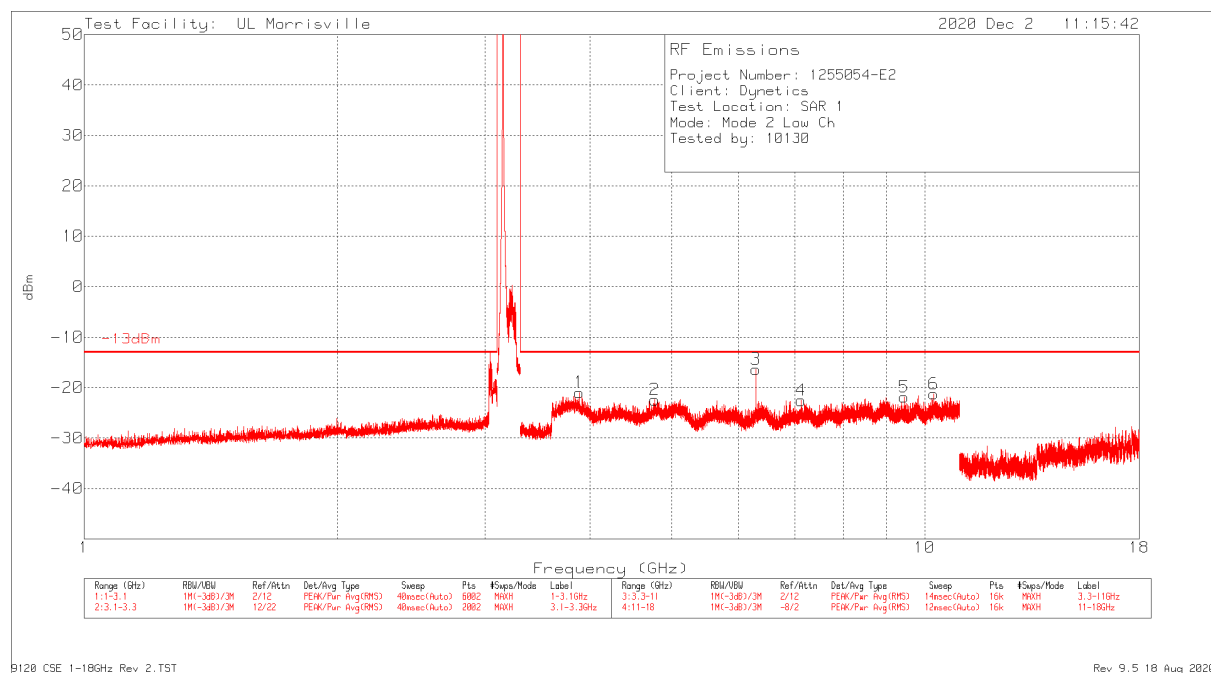
Mode 2, Low Channel, Below 9kHz – 1000MHz



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	Pad (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)
1	.03044	-90.85	Pk	39.4	-51.45	-13	-38.45
2	.06324	-90.53	Pk	39.4	-51.13	-13	-38.13
3	.07673	-90.54	Pk	39.4	-51.14	-13	-38.14
4	.12296	-91.21	Pk	39.4	-51.81	-13	-38.81
5	6.1598	-82.95	Pk	39.4	-43.55	-13	-30.55
6	701.337	-71.33	Pk	40.9	-30.43	-13	-17.43

Pk - Peak detector

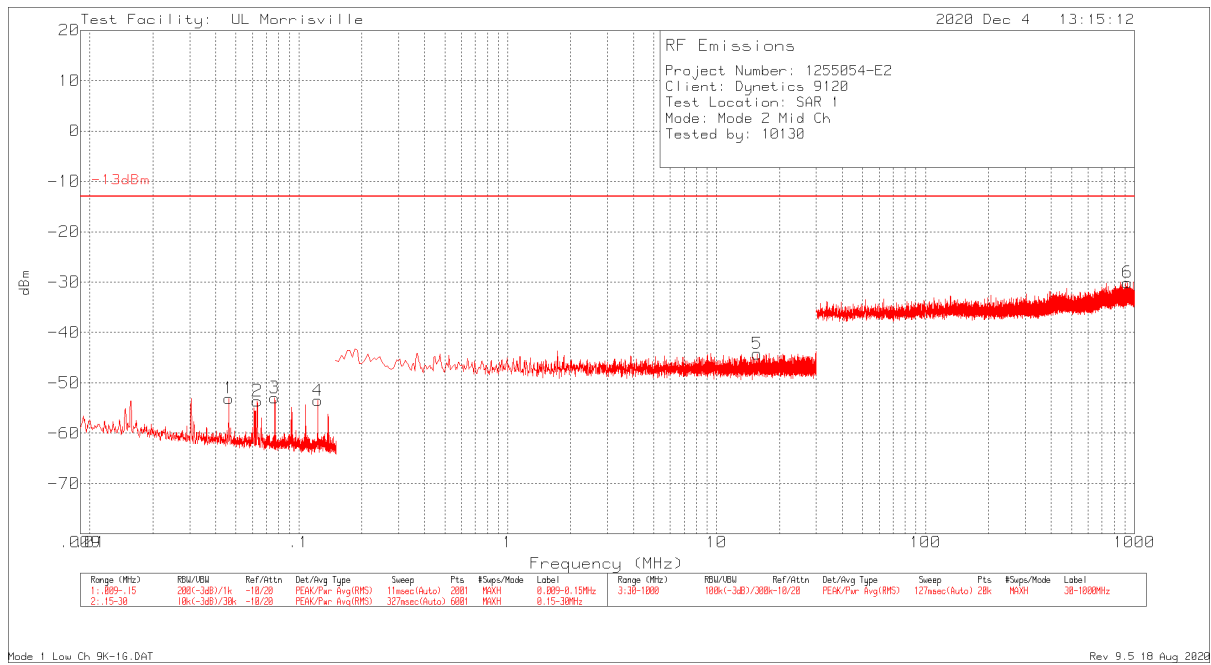
Mode 2, Low Channel, 1 – 18GHz



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	Attenuator (dB)	Attenuator (dB)	Cable (dB)	Cable (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)
1	3.88276	-62.95	Pk	31	9.4	.8	.8	-20.95	-13	-7.95
2	4.77205	-64.2	Pk	30.9	9.2	.9	.8	-22.4	-13	-9.4
3	6.30089	-58.36	Pk	30.9	9.3	.9	.9	-16.36	-13	-3.36
4	7.13003	-64.84	Pk	31.1	9.3	1	.9	-22.54	-13	-9.54
5	9.44903	-64.38	Pk	30.9	9.4	1.1	1.1	-21.88	-13	-8.88
6	10.25267	-64.55	Pk	31	9.3	1.5	1.5	-21.25	-13	-8.25

Pk - Peak detector

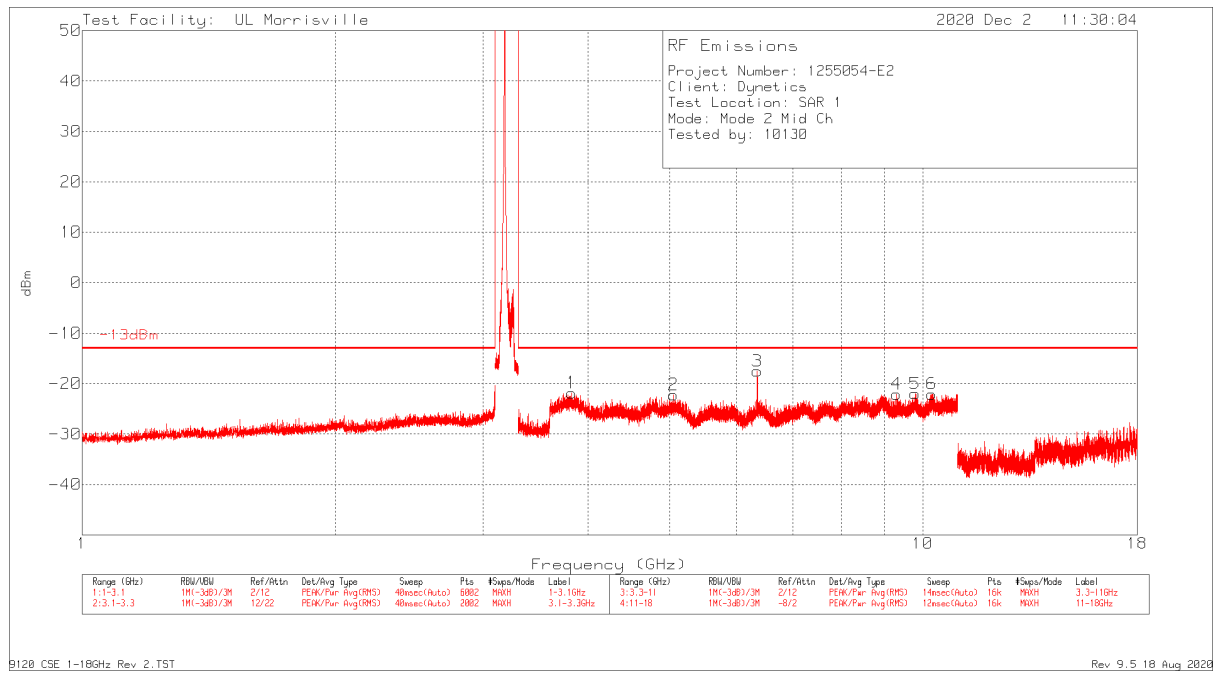
Mode 2, Mid Channel, Below 9kHz – 1000MHz



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	Pad (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)
1	.0462	-92.46	Pk	39.4	-53.06	-13	-40.06
2	.06324	-92.98	Pk	39.4	-53.58	-13	-40.58
3	.07673	-92.34	Pk	39.4	-52.94	-13	-39.94
4	.12296	-92.87	Pk	39.4	-53.47	-13	-40.47
5	15.58743	-83.73	Pk	39.5	-44.23	-13	-31.23
6	925.2615	-70.87	Pk	40.8	-30.07	-13	-17.07

Pk - Peak detector

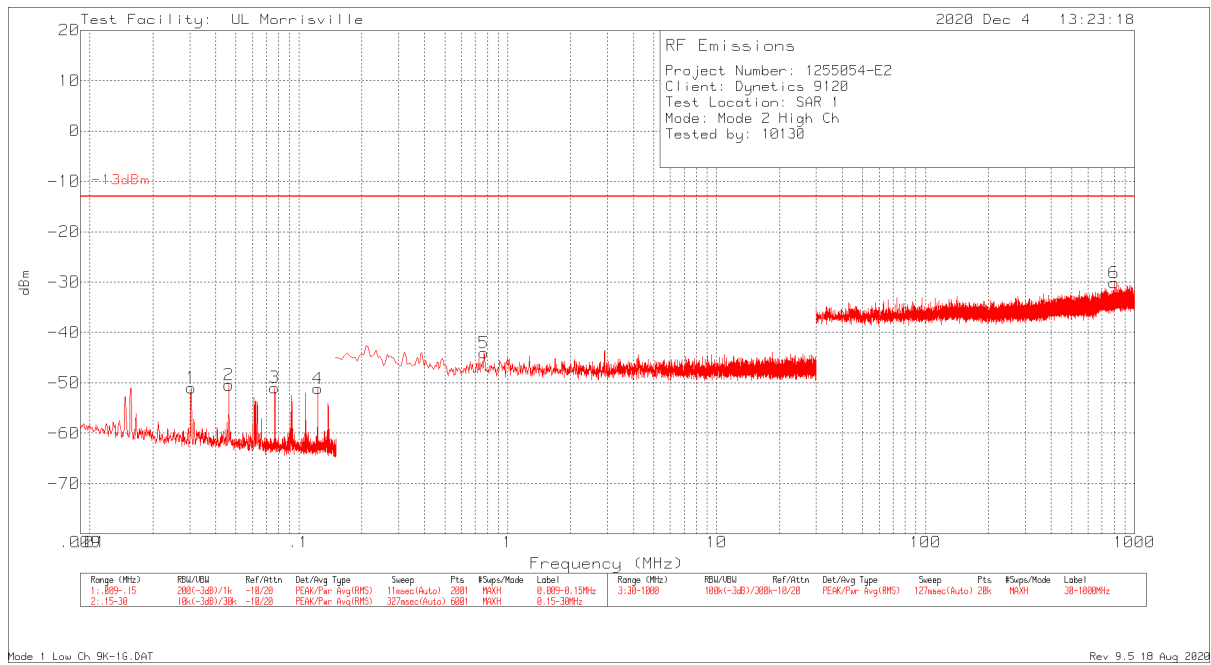
Mode 2, Mid Channel, 1 – 18GHz



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	Attenuator (dB)	Attenuator (dB)	Cable (dB)	Cable (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)
1	3.81972	-63.75	Pk	31	9.4	.8	.7	-21.85	-13	-8.85
2	5.04972	-64.01	Pk	30.9	9.3	.8	.8	-22.21	-13	-9.21
3	6.35575	-59.54	Pk	30.9	9.3	.9	.9	-17.54	-13	-4.54
4	9.31236	-64.68	Pk	31	9.3	1.1	1.2	-22.08	-13	-9.08
5	9.79214	-64.79	Pk	30.9	9.1	1.4	1.4	-21.99	-13	-8.99
6	10.24497	-65.06	Pk	30.8	9.3	1.5	1.4	-22.06	-13	-9.06

Pk - Peak detector

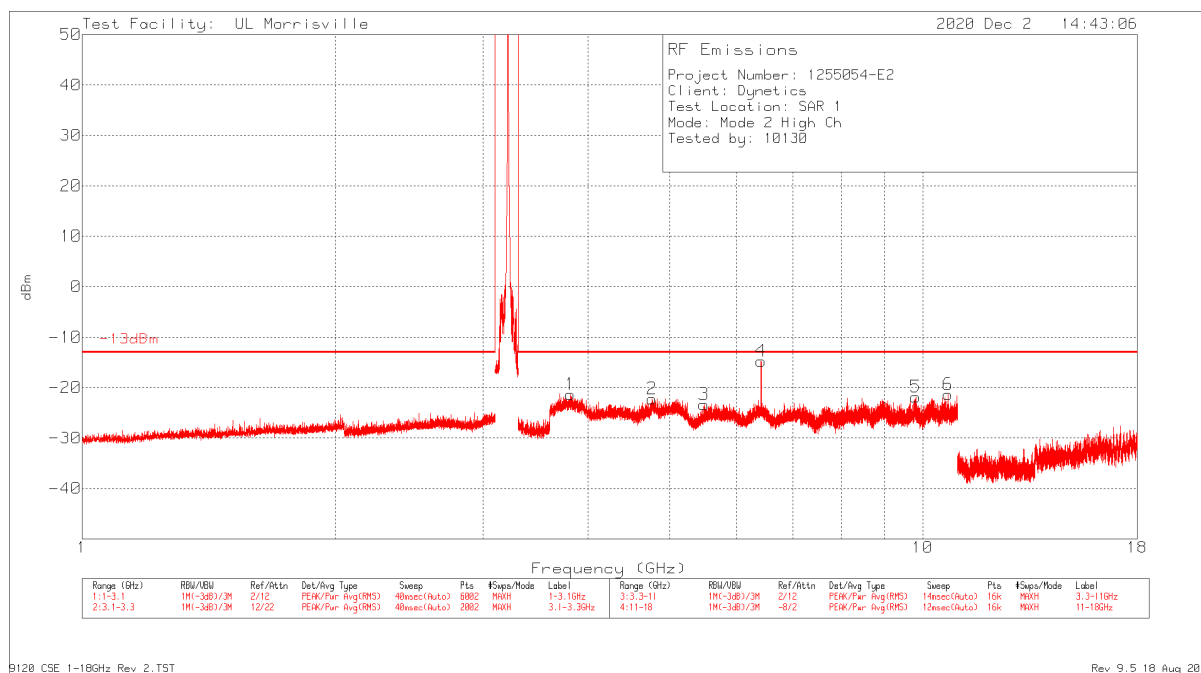
Mode 2, High Channel, Below 9kHz – 1000MHz



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	Pad (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)
1	.03044	-90.37	Pk	39.4	-50.97	-13	-37.97
2	.0462	-89.83	Pk	39.4	-50.43	-13	-37.43
3	.07673	-90.35	Pk	39.4	-50.95	-13	-37.95
4	.12296	-90.53	Pk	39.4	-51.13	-13	-38.13
5	.7669	-83.42	Pk	39.4	-44.02	-13	-31.02
6	798.919	-70.81	Pk	40.7	-30.11	-13	-17.11

Pk - Peak detector

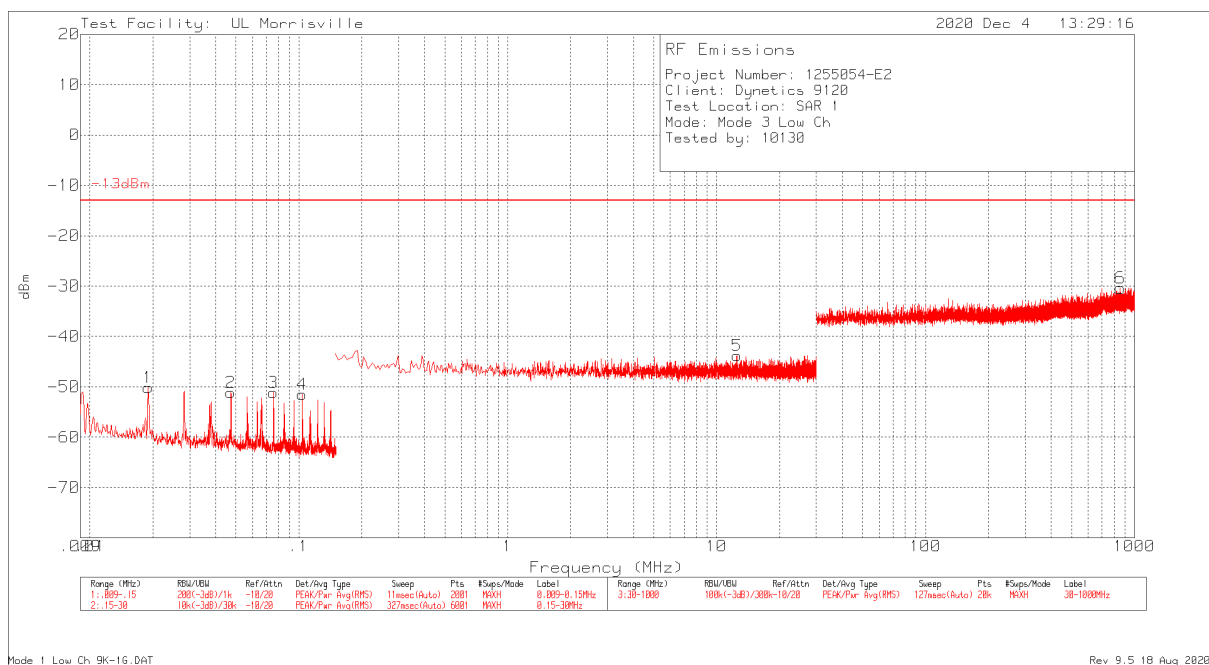
Mode 2, High Channel, 1 – 18GHz



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	Attenuator (dB)	Attenuator (dB)	Cable (dB)	Cable (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)
1	3.81057	-63.25	Pk	31	9.4	.8	.7	-21.35	-13	-8.35
2	4.76676	-64.12	Pk	31	9.3	.8	.8	-22.22	-13	-9.22
3	5.49148	-65.12	Pk	30.9	9.2	.9	.8	-23.32	-13	-10.32
4	6.42216	-57.02	Pk	31.1	9.2	1	1	-14.72	-13	-1.72
5	9.80898	-64.72	Pk	31.1	9.2	1.3	1.3	-21.82	-13	-8.82
6	10.7233	-64.56	Pk	30.9	9.4	1.5	1.4	-21.36	-13	-8.36

Pk - Peak detector

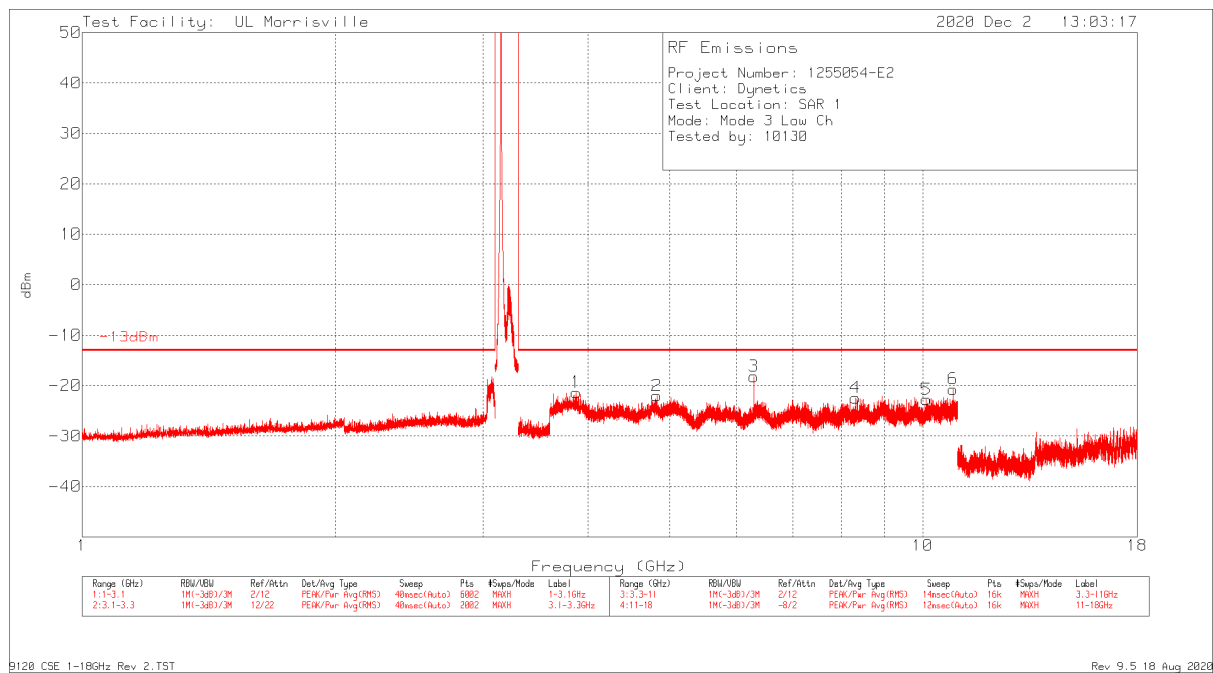
Mode 3, Low Channel, Below 9kHz – 1000MHz



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	Pad (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)
1	.01901	-89.55	Pk	39.4	-50.15	-13	-37.15
2	.04727	-90.54	Pk	39.4	-51.14	-13	-38.14
3	.0756	-90.52	Pk	39.4	-51.12	-13	-38.12
4	.10386	-90.91	Pk	39.4	-51.51	-13	-38.51
5	12.55268	-83.28	Pk	39.5	-43.78	-13	-30.78
6	855.8095	-70.73	Pk	40.3	-30.43	-13	-17.43

Pk - Peak detector

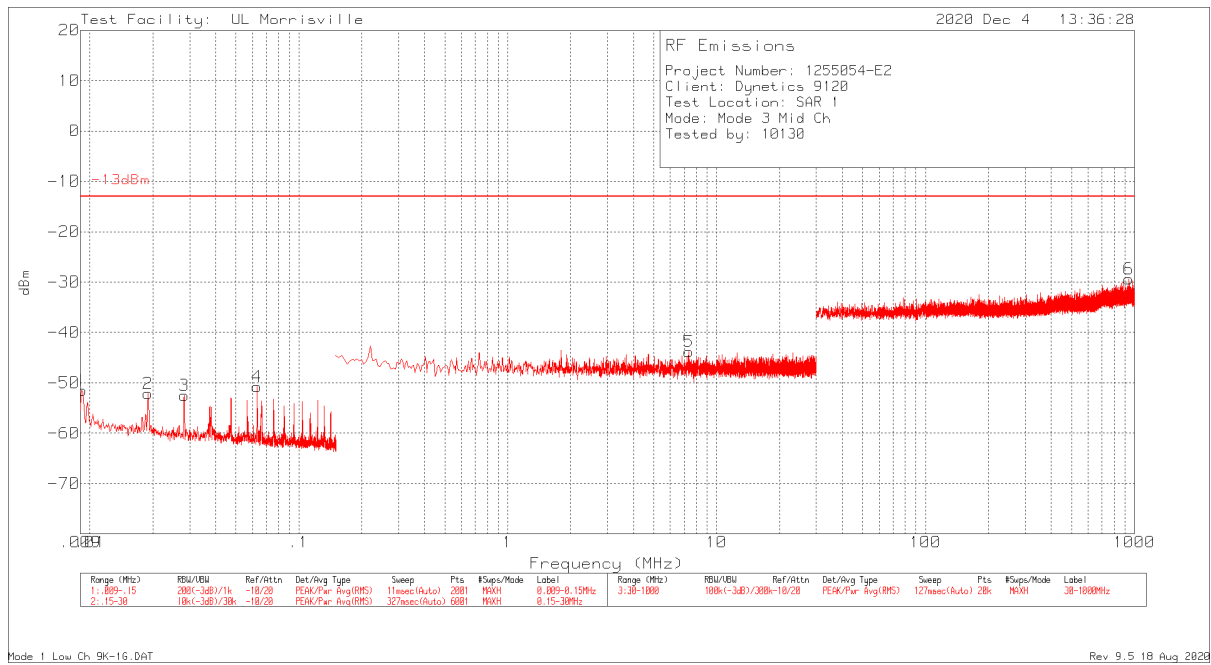
Mode 3, Low Channel, 1 – 18GHz



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	Attenuator (dB)	Attenuator (dB)	Cable (dB)	Cable (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)
1	3.87121	-63.35	Pk	31	9.4	.8	.8	-21.35	-13	-8.35
2	4.82691	-63.92	Pk	31	9.3	.8	.8	-22.02	-13	-9.02
3	6.29752	-60.09	Pk	30.9	9.2	.9	.9	-18.19	-13	-5.19
4	8.31672	-65.52	Pk	31.3	9.4	1.2	1.2	-22.42	-13	-9.42
5	10.10012	-65.75	Pk	30.9	9.3	1.4	1.4	-22.75	-13	-9.75
6	10.87103	-63.89	Pk	30.9	9.4	1.5	1.4	-20.69	-13	-7.69

Pk - Peak detector

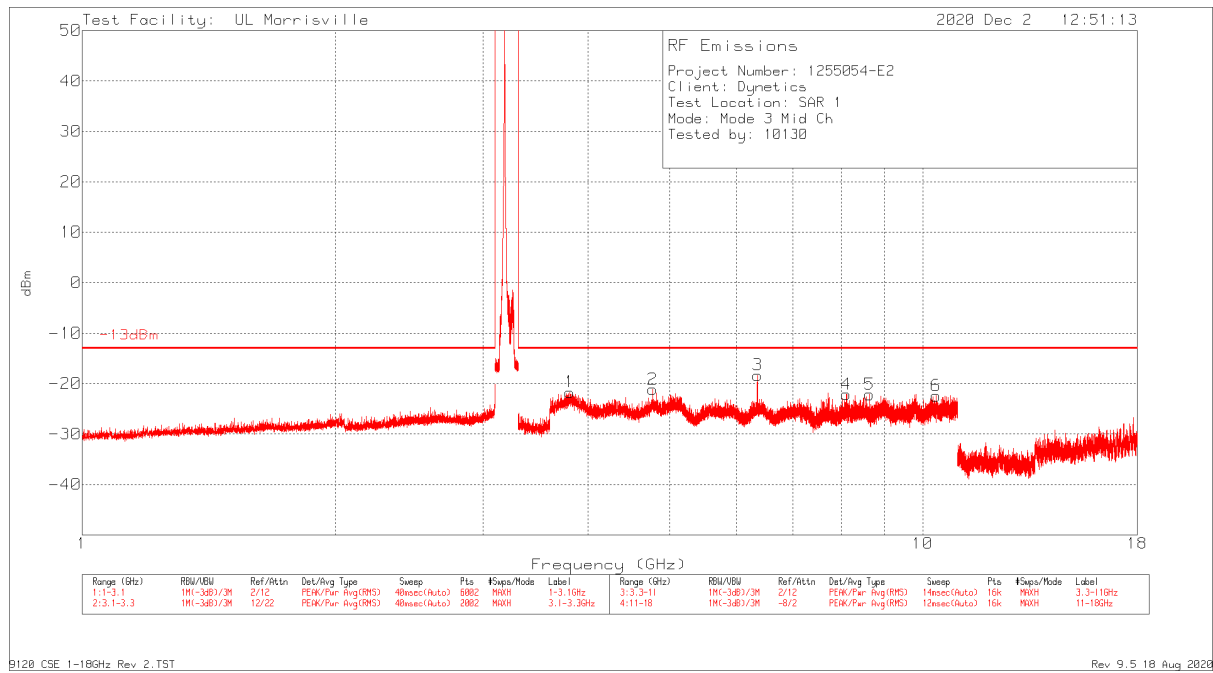
Mode 3, Mid Channel, Below 9kHz – 1000MHz



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	Pad (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)
1	.00914	-90.8	Pk	39.3	-51.5	-13	-38.5
2	.01894	-91.52	Pk	39.4	-52.12	-13	-39.12
3	.02824	-91.88	Pk	39.4	-52.48	-13	-39.48
4	.0631	-90.18	Pk	39.4	-50.78	-13	-37.78
5	7.34883	-83.32	Pk	39.5	-43.82	-13	-30.82
6	937.92	-70.29	Pk	40.9	-29.39	-13	-16.39

Pk - Peak detector

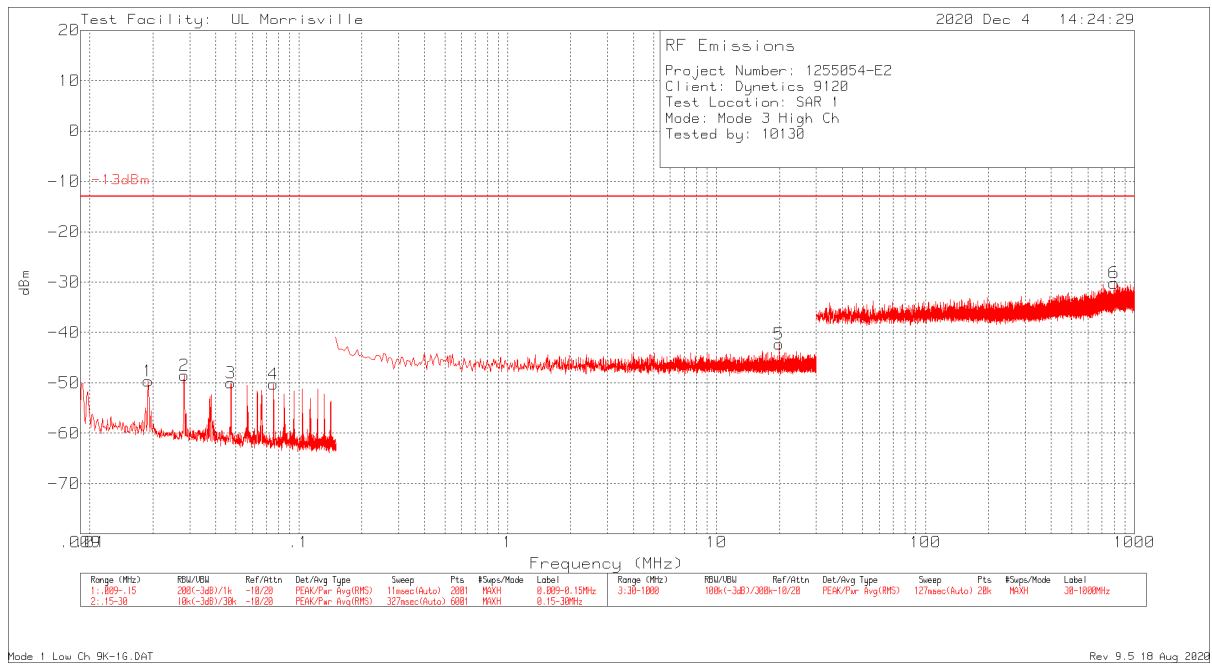
Mode 3, Mid Channel, 1 – 18GHz



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	Attenuator (dB)	Attenuator (dB)	Cable (dB)	Cable (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)
1	3.8048	-63.48	Pk	31	9.4	.7	.7	-21.68	-13	-8.68
2	4.7735	-62.93	Pk	30.9	9.2	.9	.8	-21.13	-13	-8.13
3	6.3596	-60.23	Pk	30.9	9.2	.9	.9	-18.33	-13	-5.33
4	8.11509	-65.23	Pk	31.4	9.5	1.1	1.1	-22.13	-13	-9.13
5	8.64299	-65.35	Pk	31.4	9.4	1.2	1.2	-22.15	-13	-9.15
6	10.36768	-65.01	Pk	30.9	9.3	1.2	1.2	-22.41	-13	-9.41

Pk - Peak detector

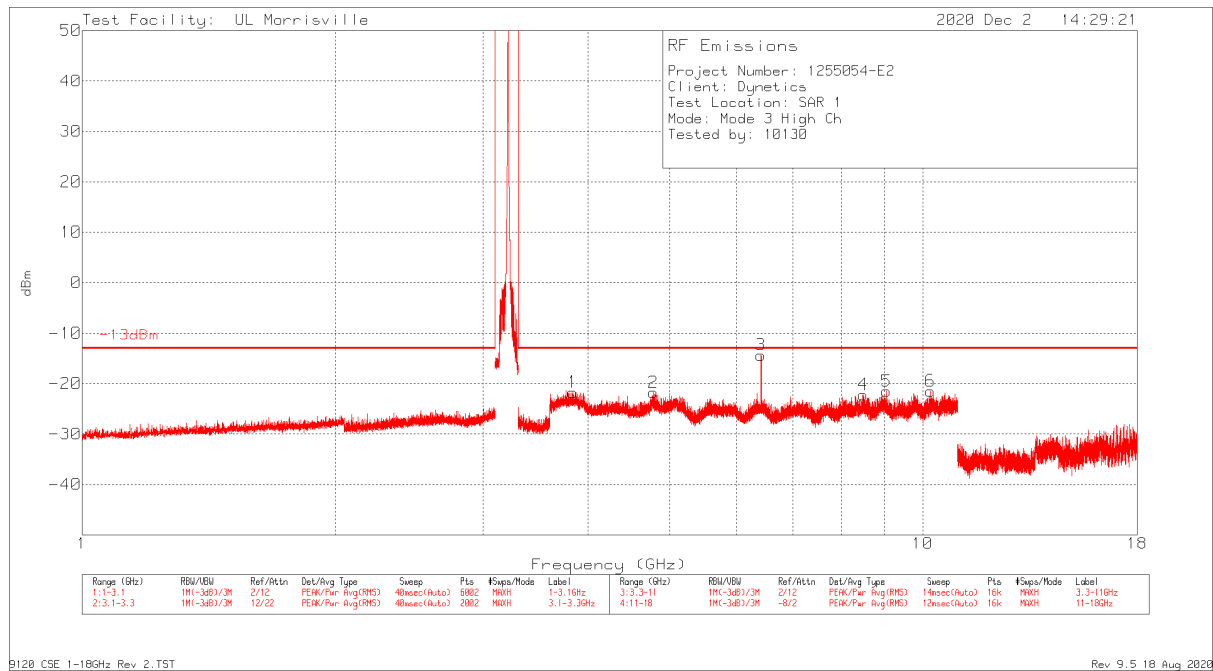
Mode 3, High Channel, Below 9kHz – 1000MHz



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	Pad (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)
1	.01901	-89.04	Pk	39.4	-49.64	-13	-36.64
2	.02824	-87.94	Pk	39.4	-48.54	-13	-35.54
3	.04727	-89.42	Pk	39.4	-50.02	-13	-37.02
4	.0756	-89.69	Pk	39.4	-50.29	-13	-37.29
5	19.92065	-81.84	Pk	39.5	-42.34	-13	-29.34
6	799.113	-70.88	Pk	40.7	-30.18	-13	-17.18

Pk - Peak detector

Mode 3, High Channel, 1 – 18GHz

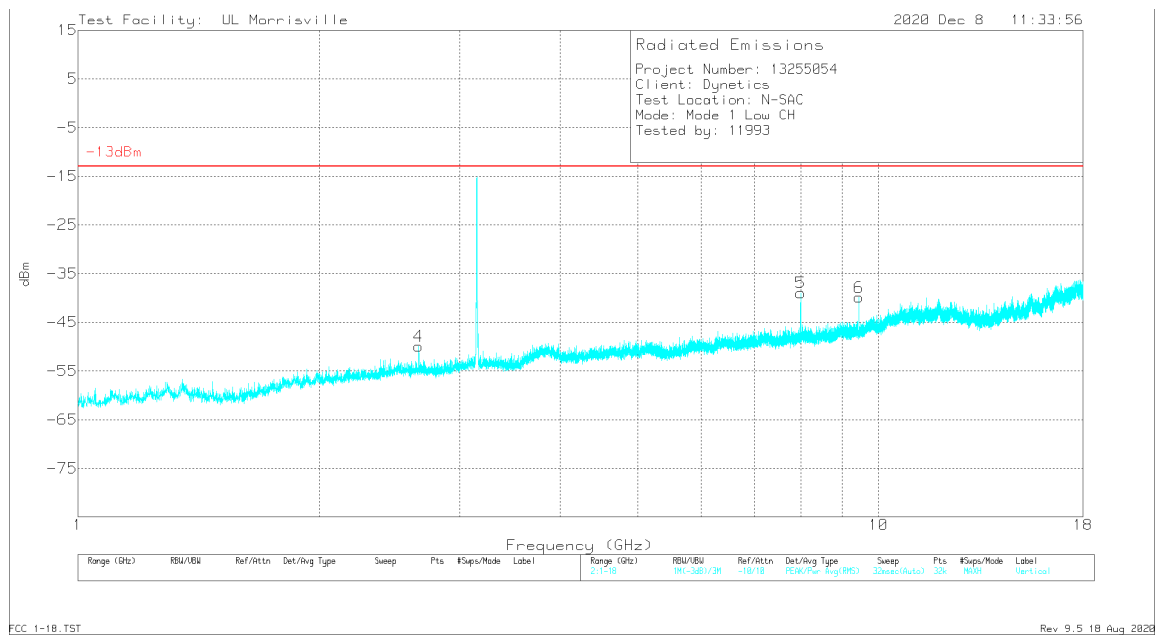
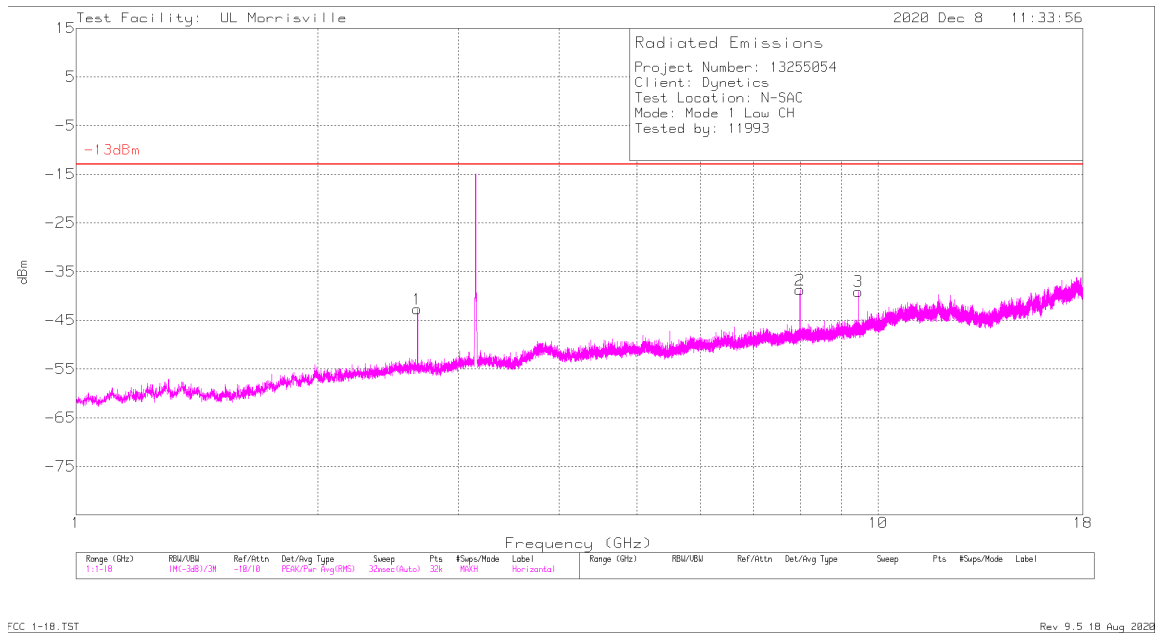


Marker	Frequency (GHz)	Meter Reading (dBm)	Det	Attenuator (dB)	Attenuator (dB)	Cable (dB)	Cable (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)
1	3.83271	-63.5	Pk	31	9.4	.7	.7	-21.7	-13	-8.7
2	4.78168	-63.65	Pk	31	9.3	.8	.8	-21.75	-13	-8.75
3	6.42023	-56.53	Pk	31	9.2	1	1	-14.33	-13	-1.33
4	8.4991	-65.4	Pk	31.4	9.4	1.2	1.2	-22.2	-13	-9.2
5	9.05106	-64.42	Pk	31.2	9.5	1.1	1.1	-21.52	-13	-8.52
6	10.21321	-63.87	Pk	30.8	9.3	1.2	1.1	-21.47	-13	-8.47

Pk - Peak detector

8.3.2. RADIATED ENCLOSURE PORT OUT OF BAND EMISSIONS

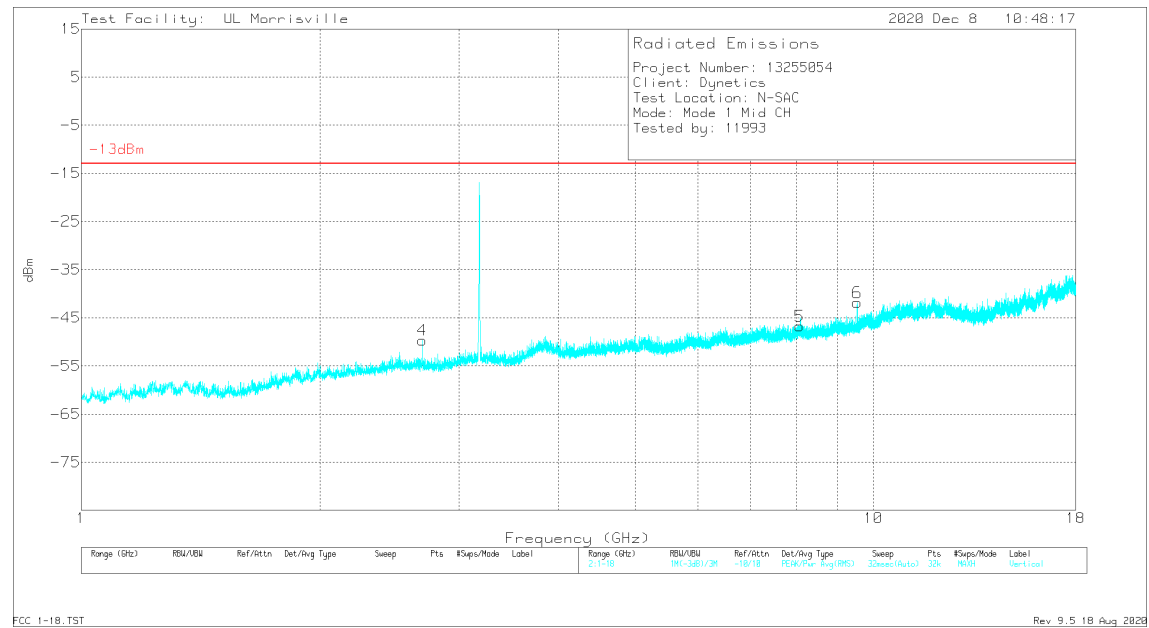
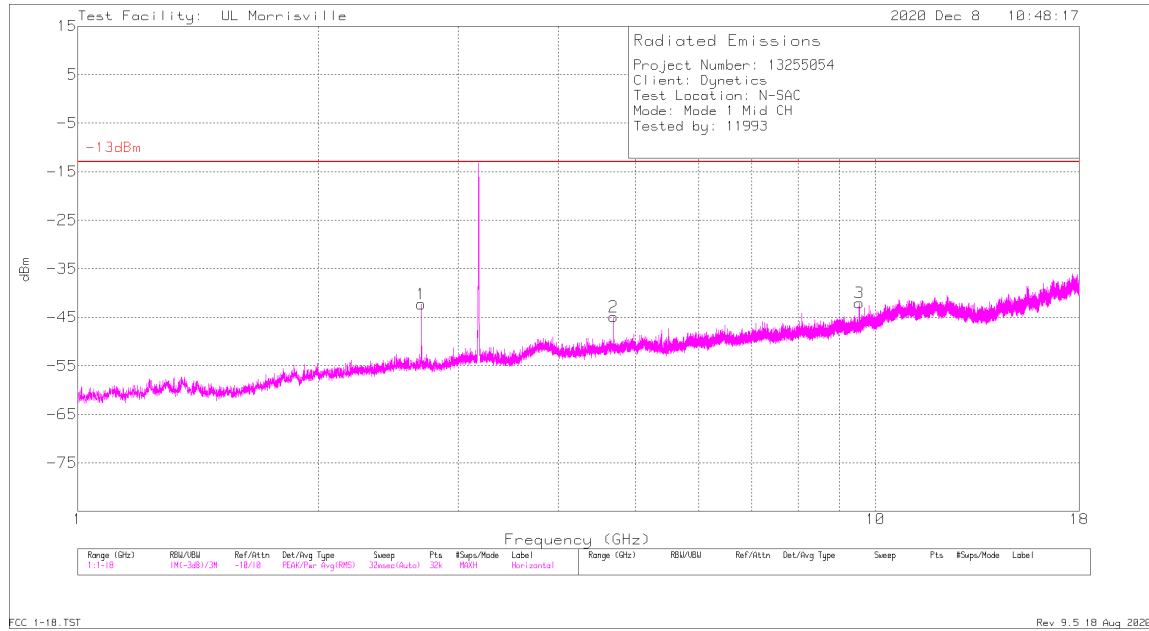
MODE 1, LOW CHANNEL 1-18GHz



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AT0072 dB/(m)	Amp/Cbl/Filtr/Pad (dB)	Conversion Factor (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.66446	-52.93	Pk	32.5	-34.1	11.8	-42.73	-13	-29.73	0-360	101	H
2	7.99147	-57.08	Pk	35.9	-29.4	11.8	-38.78	-13	-25.78	0-360	101	H
3	9.44449	-58.47	Pk	36.7	-29.1	11.8	-39.07	-13	-26.07	0-360	200	H
4	2.66287	-60.01	Pk	32.5	-34.2	11.8	-49.91	-13	-36.91	0-360	300	V
5	7.99201	-57.24	Pk	35.9	-29.4	11.8	-38.94	-13	-25.94	0-360	200	V
6	9.44741	-59.24	Pk	36.7	-29.1	11.8	-39.84	-13	-26.84	0-360	300	V

Pk - Peak detector

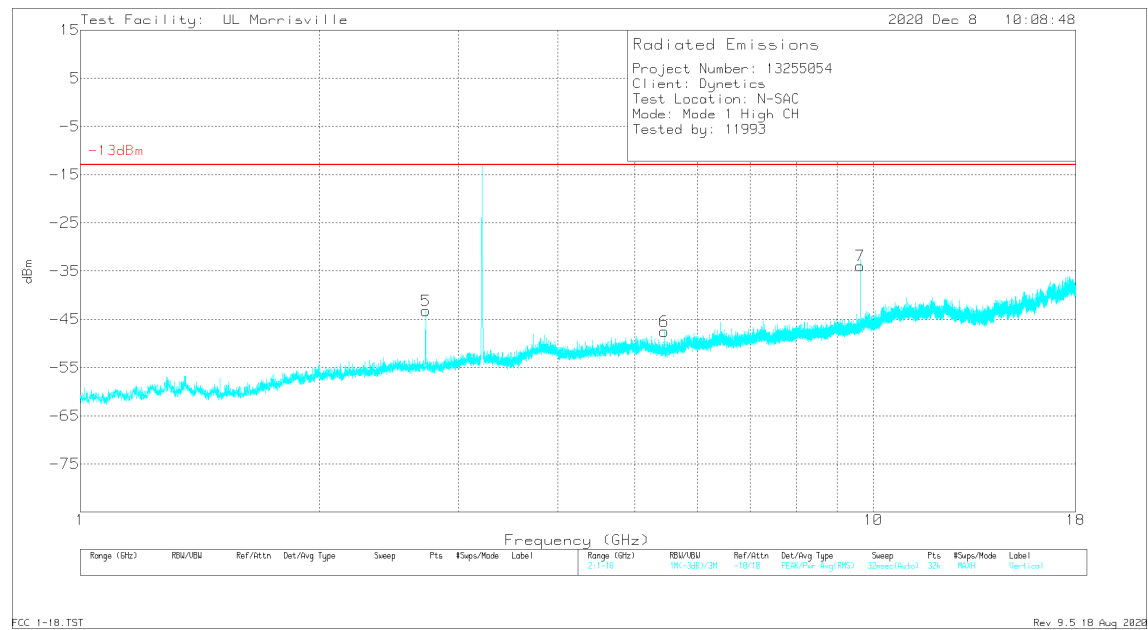
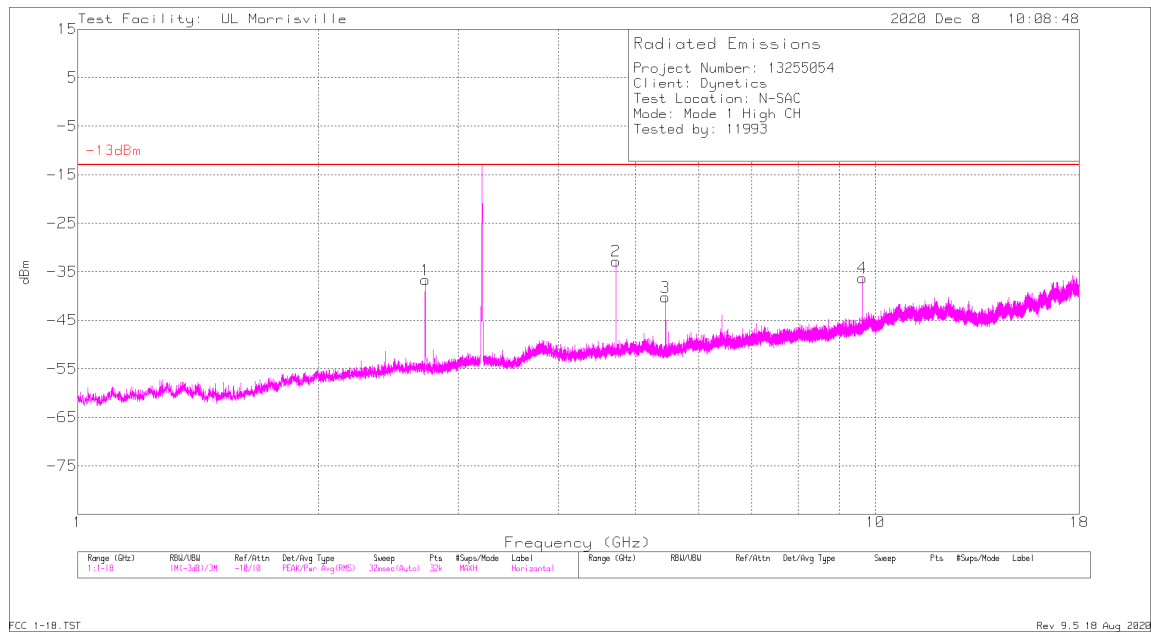
MODE 1, MIDDLE CHANNEL, 1-18GHz



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AT0072 dB/(m)	Amp/Cbl/Filtr/Pad (dB)	Conversion Factor (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.69527	-52.36	Pk	32.4	-34.1	11.8	-42.26	-13	-29.26	0-360	100	H
2	4.69443	-58.37	Pk	34.1	-32.4	11.8	-44.87	-13	-31.87	0-360	200	H
3	9.53959	-62.32	Pk	36.9	-28.4	11.8	-42.02	-13	-29.02	0-360	200	H
4	2.69421	-59.74	Pk	32.4	-34.1	11.8	-49.64	-13	-36.64	0-360	200	V
5	8.06957	-64.92	Pk	35.9	-29.5	11.8	-46.72	-13	-33.72	0-360	200	V
6	9.53852	-62	Pk	36.9	-28.5	11.8	-41.8	-13	-28.8	0-360	200	V

Pk - Peak detector

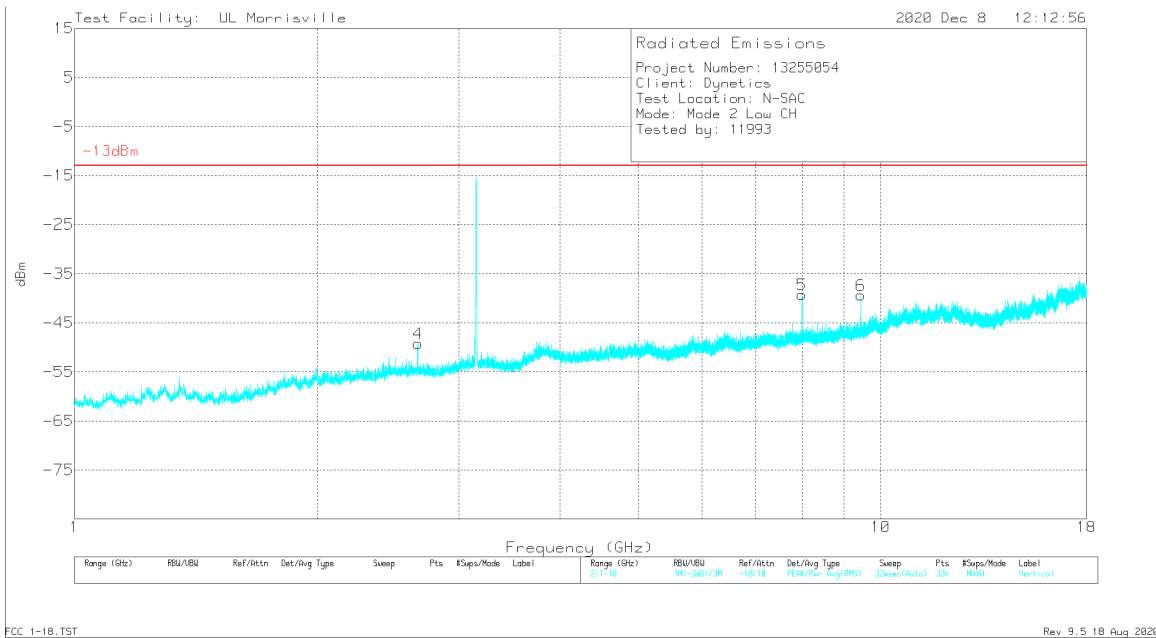
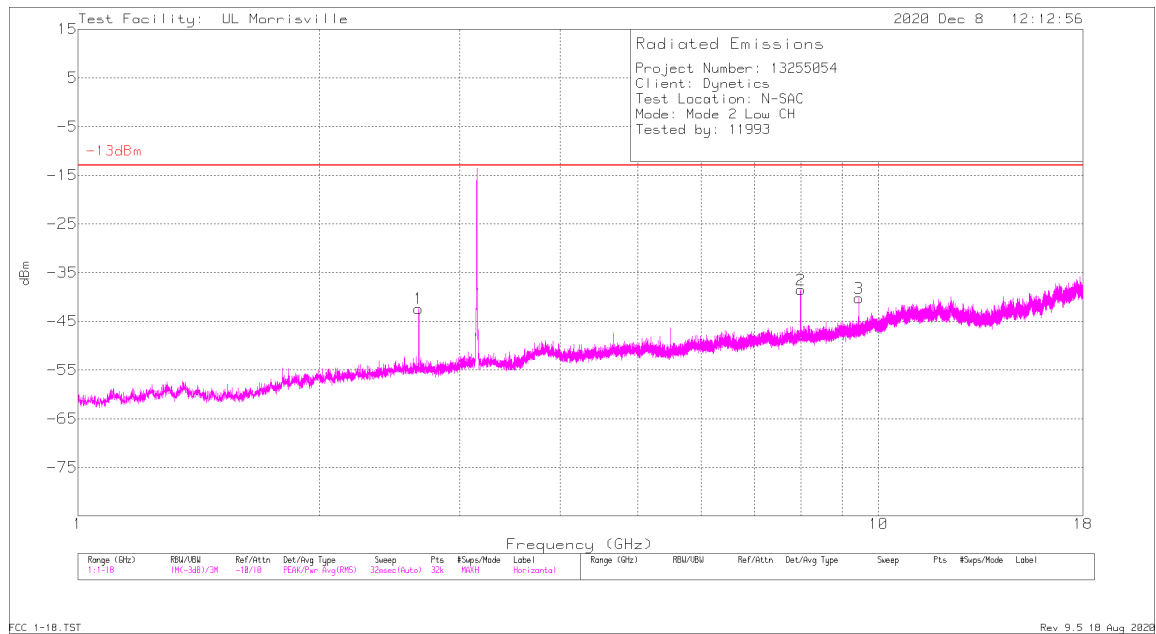
MODE 1, HIGH CHANNEL, 1-18GHz



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AT0072 dB/(m)	Amp/Cbl/Filtr/Pad (dB)	Conversion Factor (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.72715	-46.66	Pk	32.3	-34.1	11.8	-36.66	-13	-23.66	0-360	101	H
2	4.72524	-46.3	Pk	34.1	-32.4	11.8	-32.8	-13	-19.8	0-360	200	H
3	5.45521	-54.16	Pk	34.4	-32.3	11.8	-40.26	-13	-27.26	0-360	101	H
4	9.63256	-56.35	Pk	37	-28.7	11.8	-36.25	-13	-23.25	0-360	200	H
5	2.72715	-53.23	Pk	32.3	-34.1	11.8	-43.23	-13	-30.23	0-360	200	V
6	5.45521	-61.44	Pk	34.4	-32.3	11.8	-47.54	-13	-34.54	0-360	101	V
7	9.63256	-54.01	Pk	37	-28.7	11.8	-33.91	-13	-20.91	0-360	200	V

Pk - Peak detector

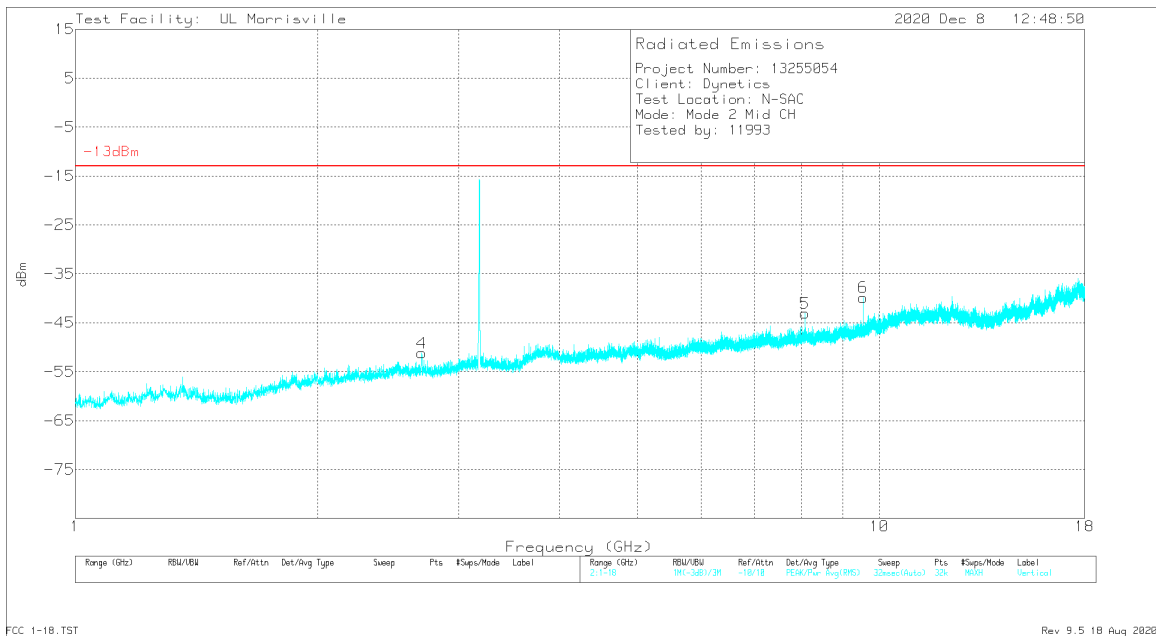
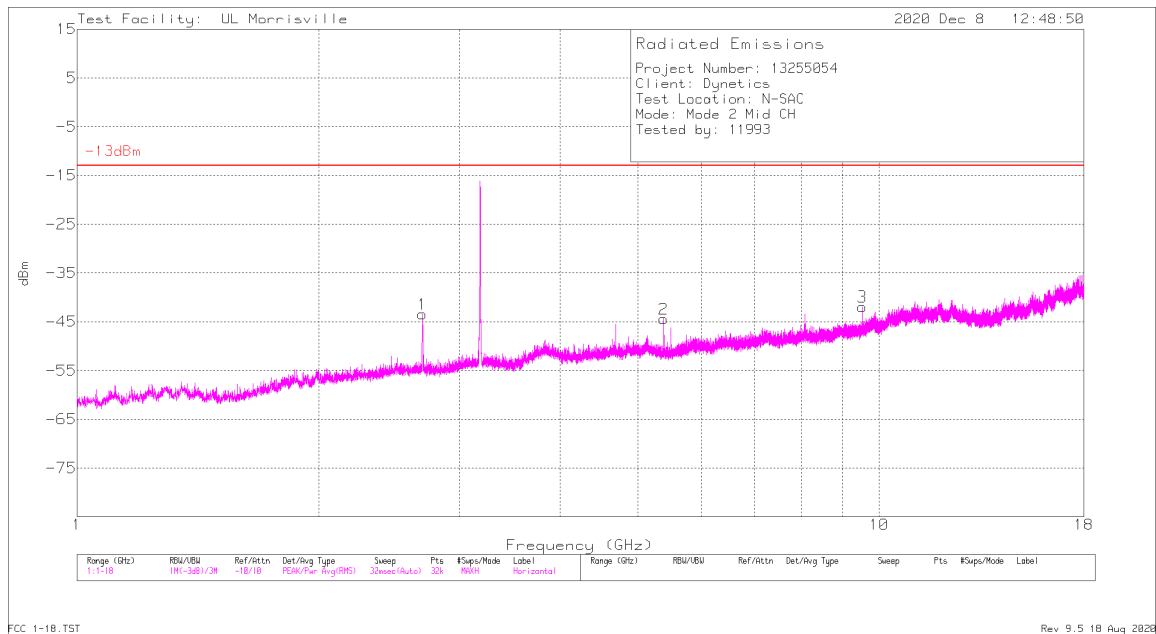
MODE 2, LOW CHANNEL, 1-18GHz



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AT0072 dB(m)	Amp/Cbl/Filtr/Pad (dB)	Conversion Factor (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.66287	-52.49	Pk	32.5	-34.2	11.8	-42.39	-13	-29.39	0-360	101	H
2	7.99254	-56.81	Pk	35.9	-29.4	11.8	-38.51	-13	-25.51	0-360	101	H
3	9.45033	-59.77	Pk	36.8	-29.1	11.8	-40.27	-13	-27.27	0-360	300	H
4	2.66552	-59.4	Pk	32.5	-34.1	11.8	-49.2	-13	-36.2	0-360	101	V
5	7.98882	-57.59	Pk	35.9	-29.4	11.8	-39.29	-13	-26.29	0-360	200	V
6	9.44502	-58.81	Pk	36.7	-29.1	11.8	-39.41	-13	-26.41	0-360	200	V

Pk - Peak detector

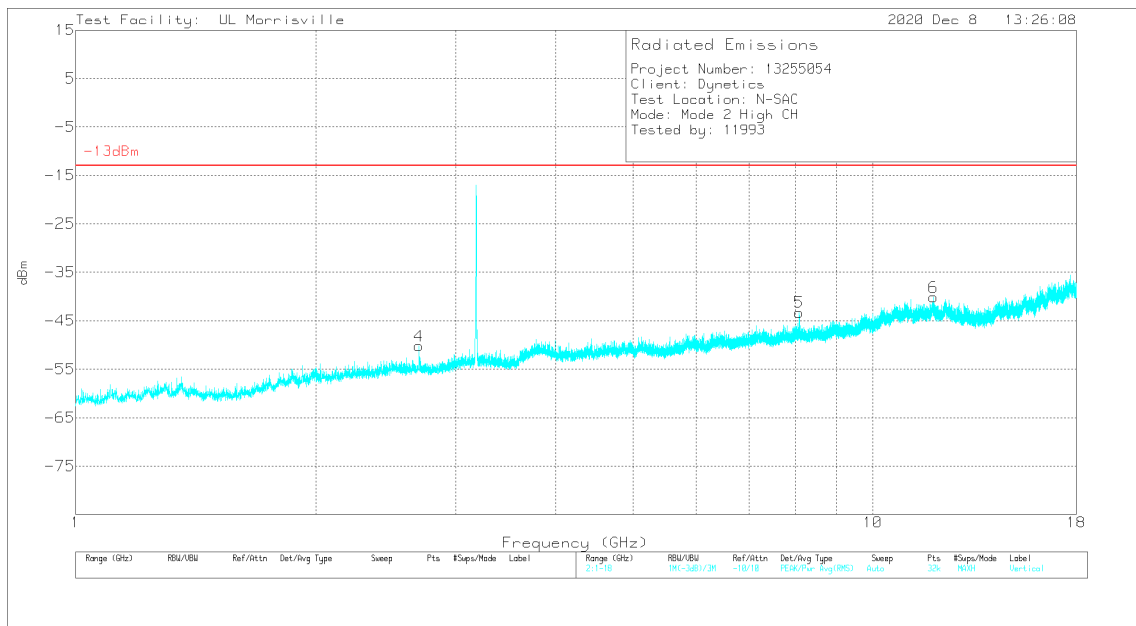
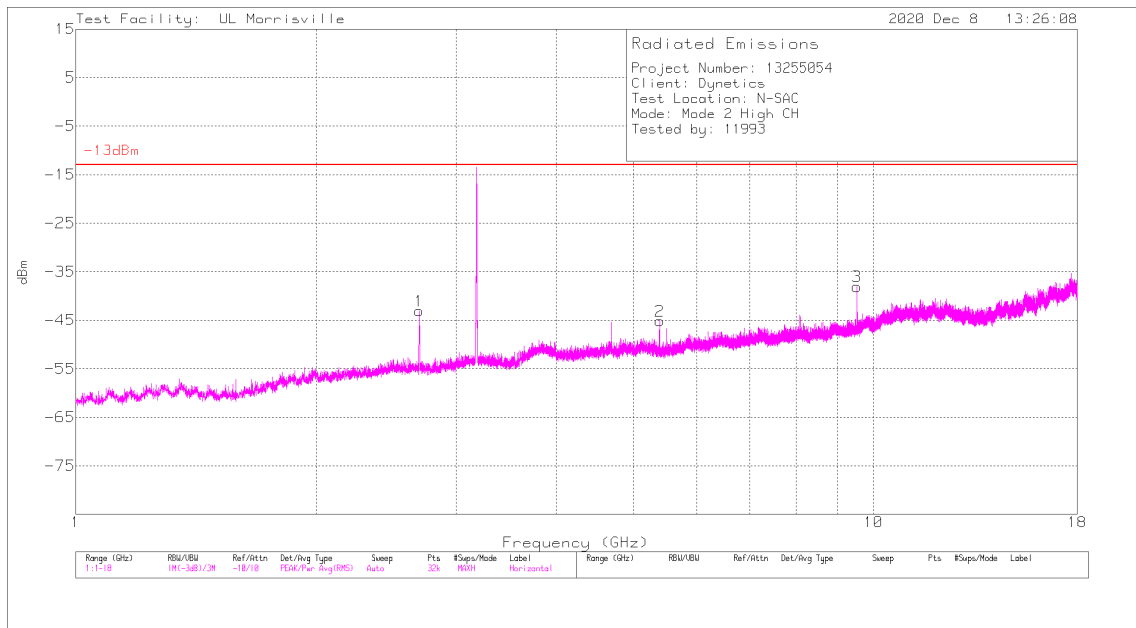
MODE 2, MIDDLE CHANNEL, 1-18GHz



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AT0072 dB/(m)	Amp/Cbl/Filtr/Pad (dB)	Conversion Factor (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.69634	-53.54	Pk	32.4	-34.1	11.8	-43.44	-13	-30.44	0-360	101	H
2	5.39039	-58.49	Pk	34.4	-32.1	11.8	-44.39	-13	-31.39	0-360	200	H
3	9.5364	-62.12	Pk	36.9	-28.5	11.8	-41.92	-13	-28.92	0-360	200	H
4	2.69687	-61.25	Pk	32.4	-34.1	11.8	-51.15	-13	-38.15	0-360	299	V
5	8.08073	-61.29	Pk	35.9	-29.5	11.8	-43.09	-13	-30.09	0-360	299	V
6	9.54437	-60.11	Pk	36.9	-28.4	11.8	-39.81	-13	-26.81	0-360	200	V

Pk - Peak detector

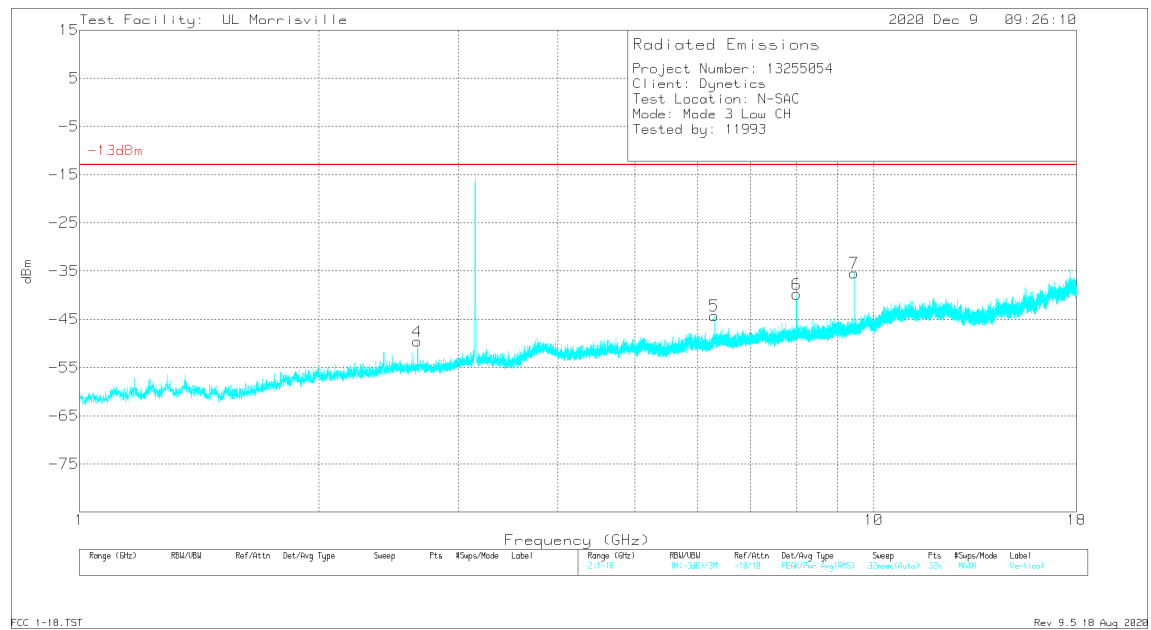
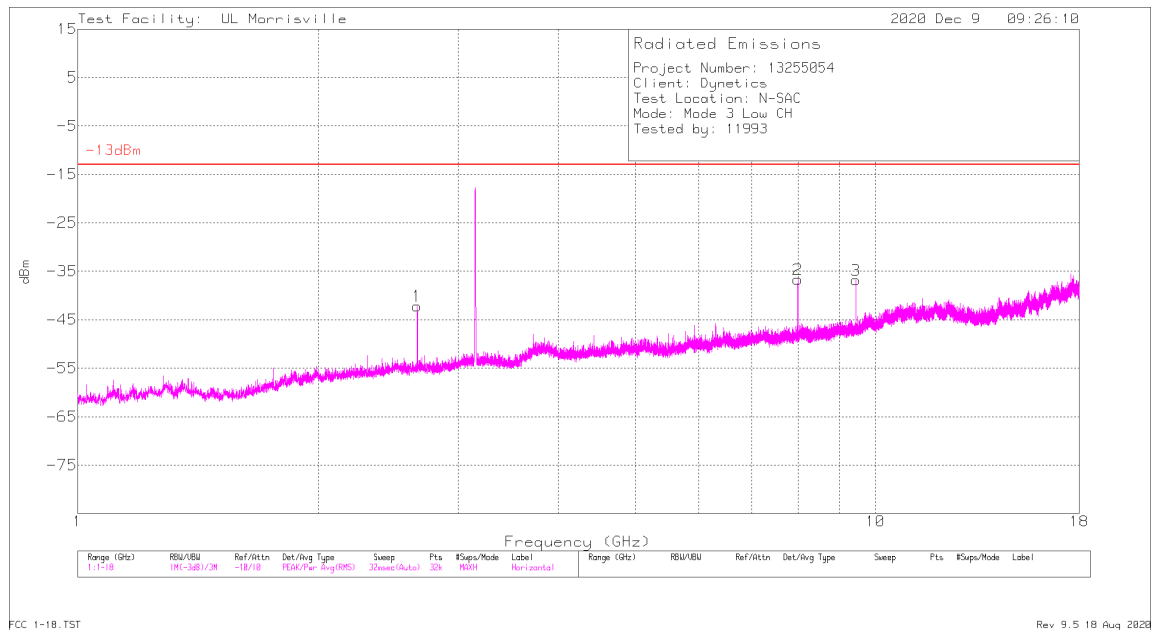
MODE 2, HIGH CHANNEL, 1-18GHz



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AT0072 dB/(m)	Amp/Cbl/Filtr/Pad (dB)	Conversion Factor (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.6958	-53.16	Pk	32.4	-34.1	11.8	-43.06	-13	-30.06	0-360	101	H
2	5.39358	-59.33	Pk	34.4	-32	11.8	-45.13	-13	-32.13	0-360	200	H
3	9.53427	-58.27	Pk	36.9	-28.5	11.8	-38.07	-13	-25.07	0-360	200	H
4	2.69368	-60.32	Pk	32.4	-34.1	11.8	-50.22	-13	-37.22	0-360	101	V
5	8.08232	-61.45	Pk	35.9	-29.5	11.8	-43.25	-13	-30.25	0-360	299	V
6	11.91647	-64.84	Pk	38.6	-25.7	11.8	-40.14	-13	-27.14	0-360	101	V

Pk - Peak detector

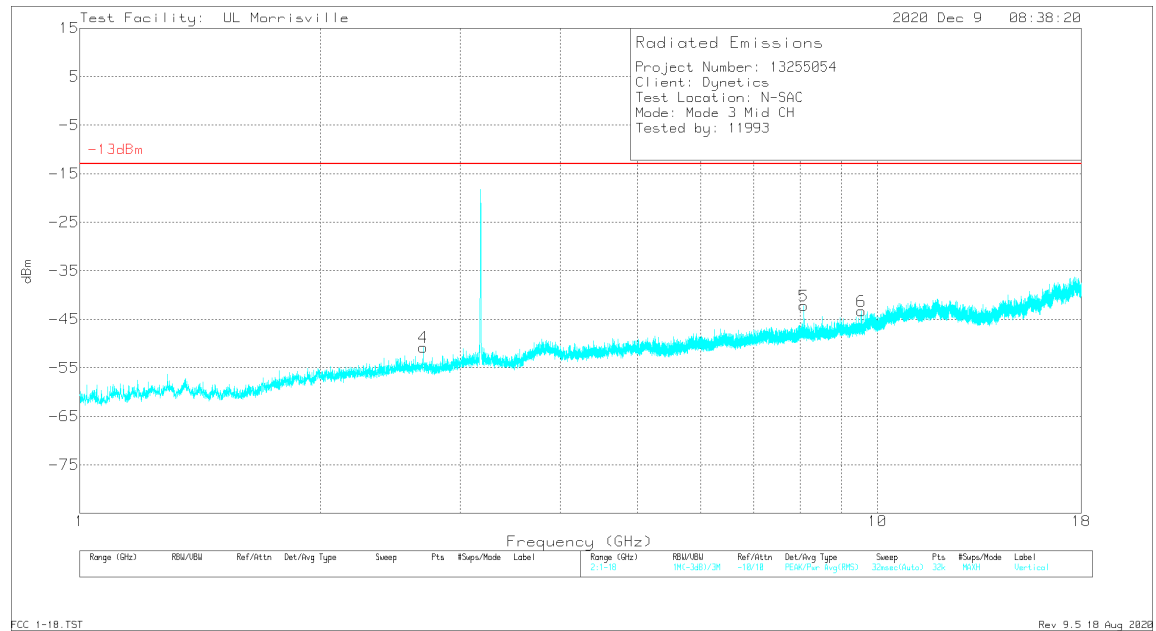
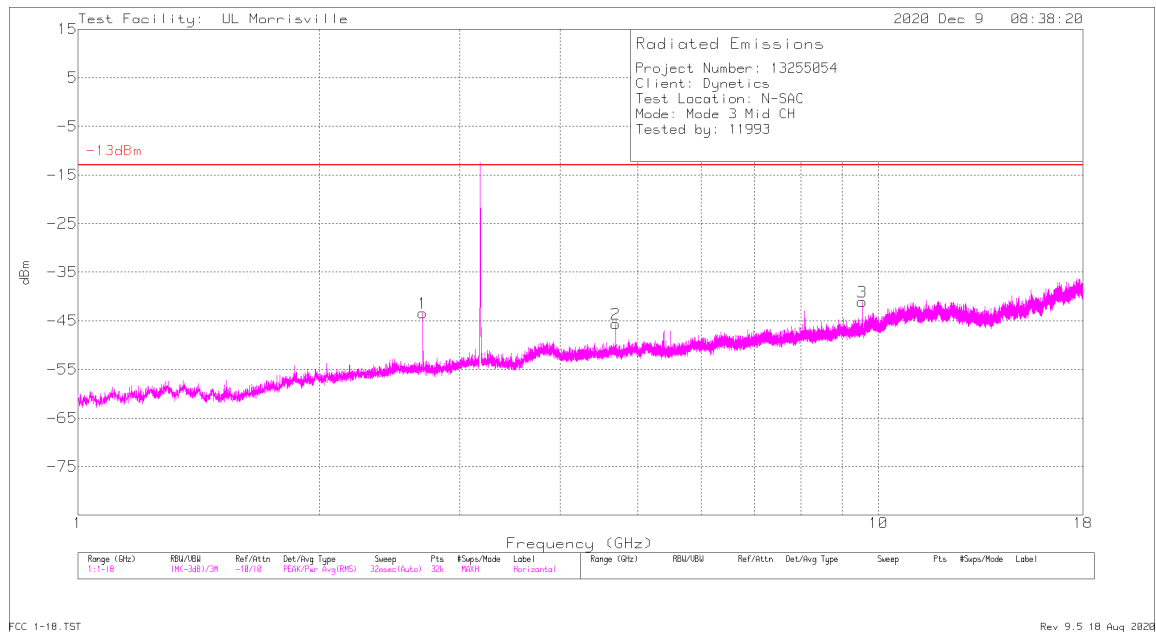
MODE 3, LOW CHANNEL, 1-18GHz



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AT0072 dB/(m)	Amp/Cbl/Filtr/Pad (dB)	Conversion Factor (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.66287	-52.25	Pk	32.5	-34.2	11.8	-42.15	-13	-29.15	0-360	101	H
2	7.99094	-55.01	Pk	35.9	-29.4	11.8	-36.71	-13	-23.71	0-360	101	H
3	9.44821	-56.21	Pk	36.7	-29.1	11.8	-36.81	-13	-23.81	0-360	200	H
4	2.6634	-59.71	Pk	32.5	-34.2	11.8	-49.61	-13	-36.61	0-360	101	V
5	6.29779	-60.64	Pk	35.6	-31	11.8	-44.24	-13	-31.24	0-360	200	V
6	7.99254	-58.09	Pk	35.9	-29.4	11.8	-39.79	-13	-26.79	0-360	200	V
7	9.44661	-54.8	Pk	36.7	-29.1	11.8	-35.4	-13	-22.4	0-360	101	V

Pk - Peak detector

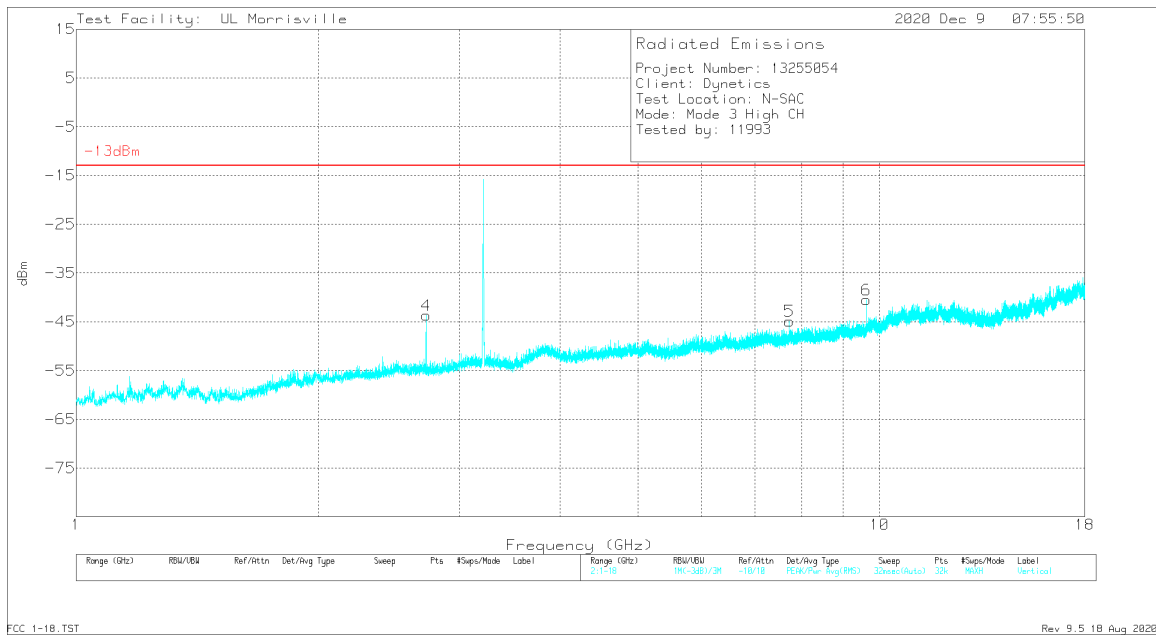
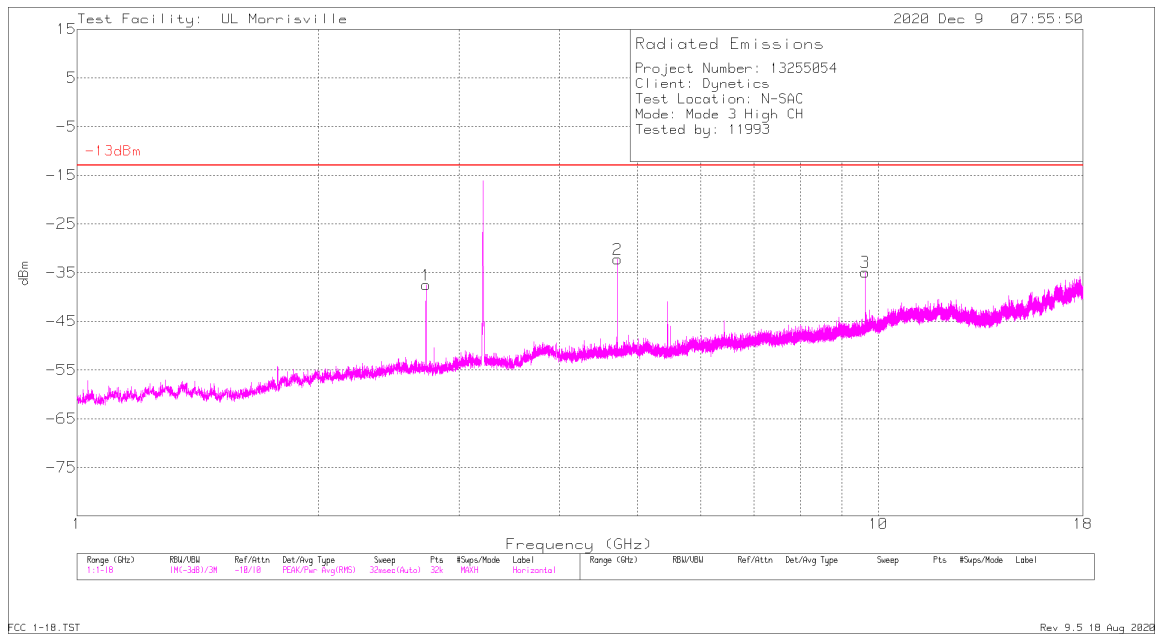
MODE 3, MIDDLE CHANNEL, 1-18GHz



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AT0072 dB/(m)	Amp/Cbl/Filtr/Pad (dB)	Conversion Factor (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.69421	-53.56	Pk	32.4	-34.1	11.8	-43.46	-13	-30.46	0-360	100	H
2	4.6939	-59.16	Pk	34.1	-32.4	11.8	-45.66	-13	-32.66	0-360	200	H
3	9.53905	-61.31	Pk	36.9	-28.5	11.8	-41.11	-13	-28.11	0-360	200	H
4	2.69421	-60.87	Pk	32.4	-34.1	11.8	-50.77	-13	-37.77	0-360	299	V
5	8.08391	-60.41	Pk	35.9	-29.5	11.8	-42.21	-13	-29.21	0-360	299	V
6	9.54224	-63.58	Pk	36.9	-28.4	11.8	-43.28	-13	-30.28	0-360	200	V

Pk - Peak detector

MODE 2, HIGH CHANNEL, 1-18GHz



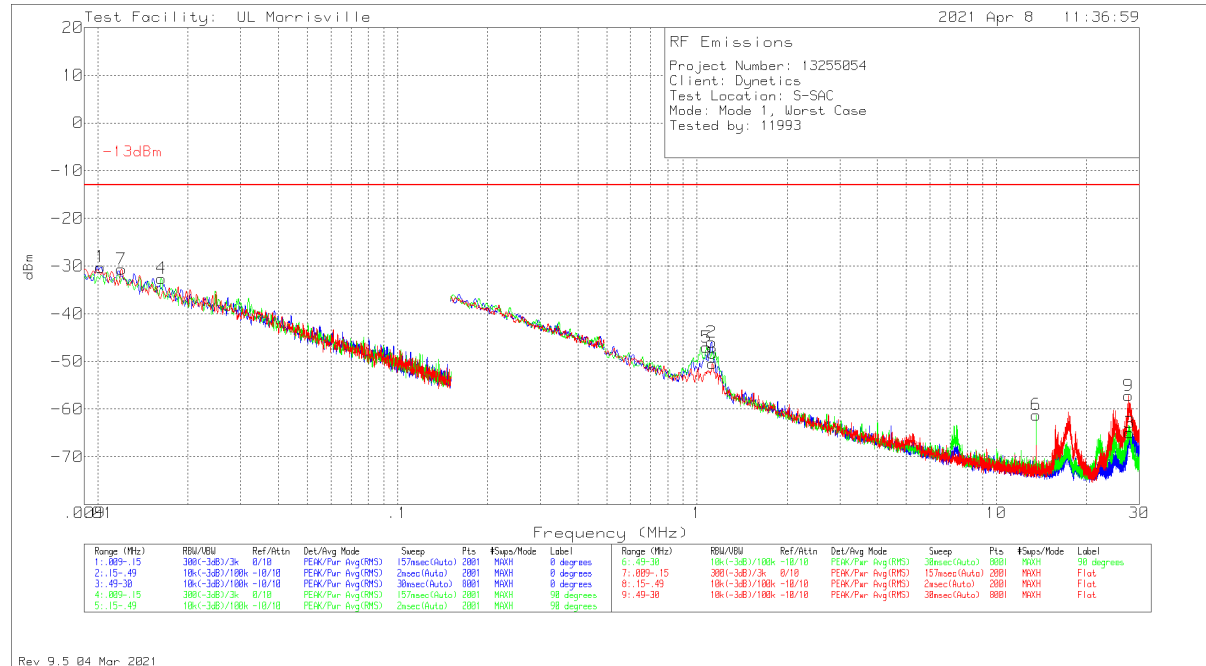
Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AT0072 dB/(m)	Amp/Cbl/Ftr/Pad (dB)	Conversion Factor (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.72556	-47.51	Pk	32.3	-34.1	11.8	-37.51	-13	-24.51	0-360	101	H
2	4.72604	-45.68	Pk	34.1	-32.5	11.8	-32.28	-13	-19.28	0-360	200	H
3	9.63309	-55.1	Pk	37	-28.6	11.8	-34.9	-13	-21.9	0-360	200	H
4	2.72741	-53.72	Pk	32.3	-34.1	11.8	-43.72	-13	-30.72	0-360	101	V
5	7.72053	-62.96	Pk	35.9	-29.6	11.8	-44.86	-13	-31.86	0-360	101	V
6	9.63256	-60.58	Pk	37	-28.7	11.8	-40.48	-13	-27.48	0-360	101	V

Pk - Peak detector

WORST-CASE CONFIGURATION

BELOW 30MHz

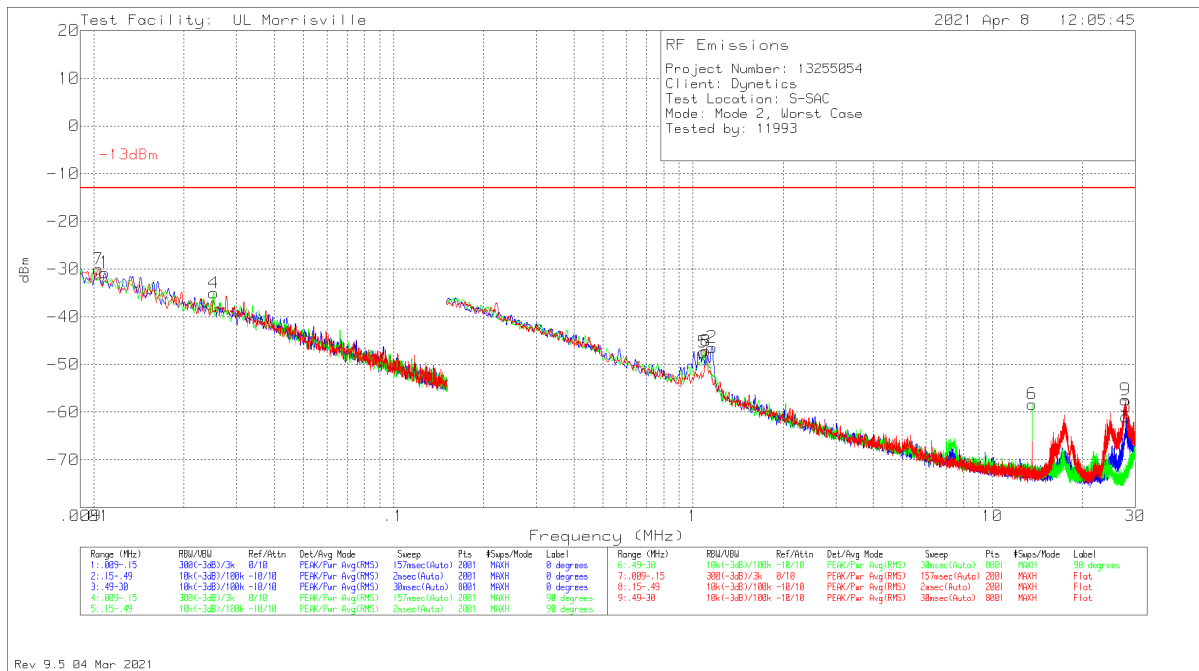
MODE 1



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AT0079 (dB/m)	Cbl (dB)	Conversion Factor (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)	Azimuth (Degs)	Antenna Face
1	.01021	-59.9	Pk	17.8	.1	11.8	-30.2	-13	-17.2	0-360	On
2	1.11897	-68.98	Pk	11	.2	11.8	-45.98	-13	-32.98	0-360	On
3	27.80705	-86.28	Pk	8.4	1.1	11.8	-64.98	-13	-51.98	0-360	On
4	.01631	-59.7	Pk	15.2	.1	11.8	-32.6	-13	-19.6	0-360	Off
5	1.07655	-70.05	Pk	11	.2	11.8	-47.05	-13	-34.05	0-360	Off
6	13.56013	-84.1	Pk	10.4	.7	11.8	-61.2	-13	-48.2	0-360	Off
7	.01198	-59.67	Pk	17.1	.1	11.8	-30.67	-13	-17.67	0-360	Flat
8	1.1282	-73.48	Pk	11	.2	11.8	-50.48	-13	-37.48	0-360	Flat
9	27.67055	-78.51	Pk	8.5	1	11.8	-57.21	-13	-44.21	0-360	Flat

Pk - Peak detector

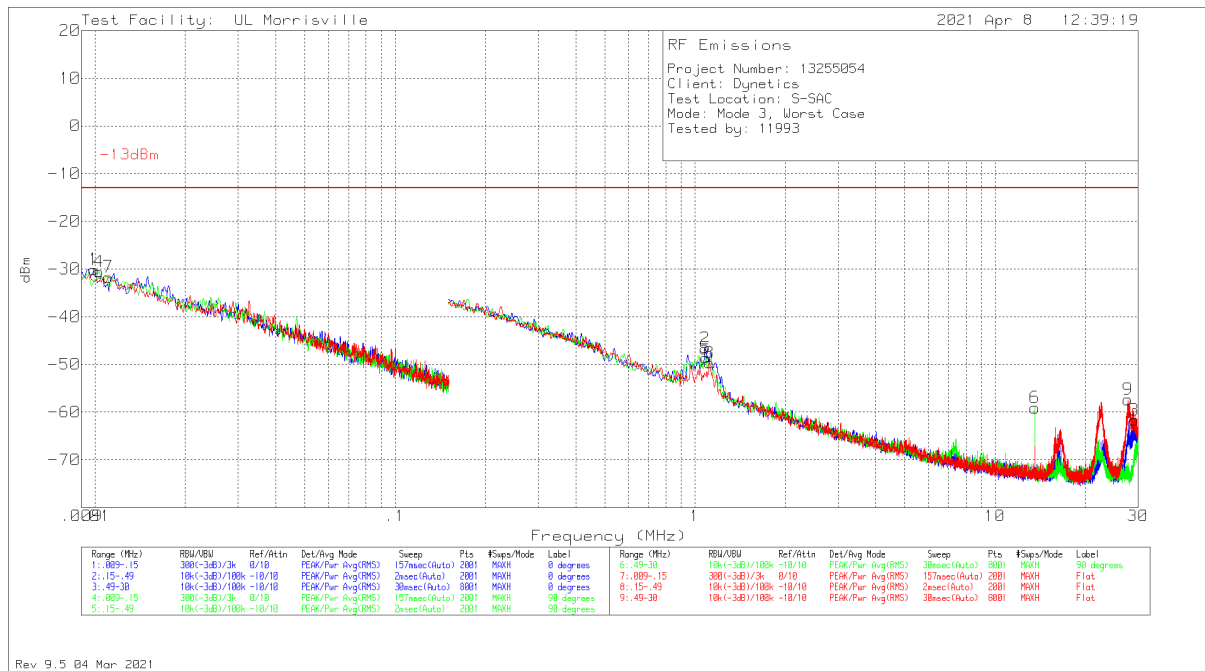
MODE 2



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AT0079 (dB/m)	Cbl (dB)	Conversion Factor (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)	Azimuth (Degs)	Antenna Face
1	.01085	-60.18	Pk	17.5	.1	11.8	-30.78	-13	-17.78	0-360	On
2	1.15771	-69.46	Pk	11	.2	11.8	-46.46	-13	-33.46	0-360	On
3	27.95092	-82.23	Pk	8.4	1.1	11.8	-60.93	-13	-47.93	0-360	On
4	.02512	-60.45	Pk	13.5	.1	11.8	-35.05	-13	-22.05	0-360	Off
5	1.08393	-70.42	Pk	11	.2	11.8	-47.42	-13	-34.42	0-360	Off
6	13.56013	-81.21	Pk	10.4	.7	11.8	-58.31	-13	-45.31	0-360	Off
7	.01035	-59.72	Pk	17.8	.1	11.8	-30.02	-13	-17.02	0-360	Flat
8	1.10606	-70.16	Pk	11	.2	11.8	-47.16	-13	-34.16	0-360	Flat
9	27.83287	-78.72	Pk	8.4	1.1	11.8	-57.42	-13	-44.42	0-360	Flat

Pk - Peak detector

MODE 3

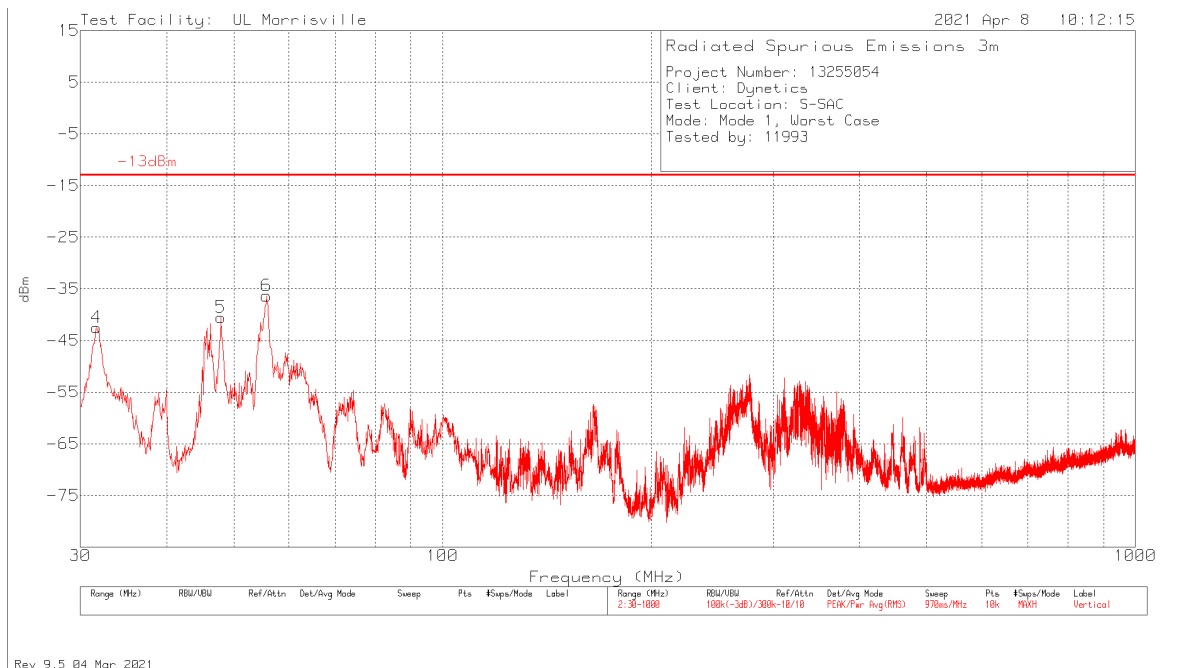
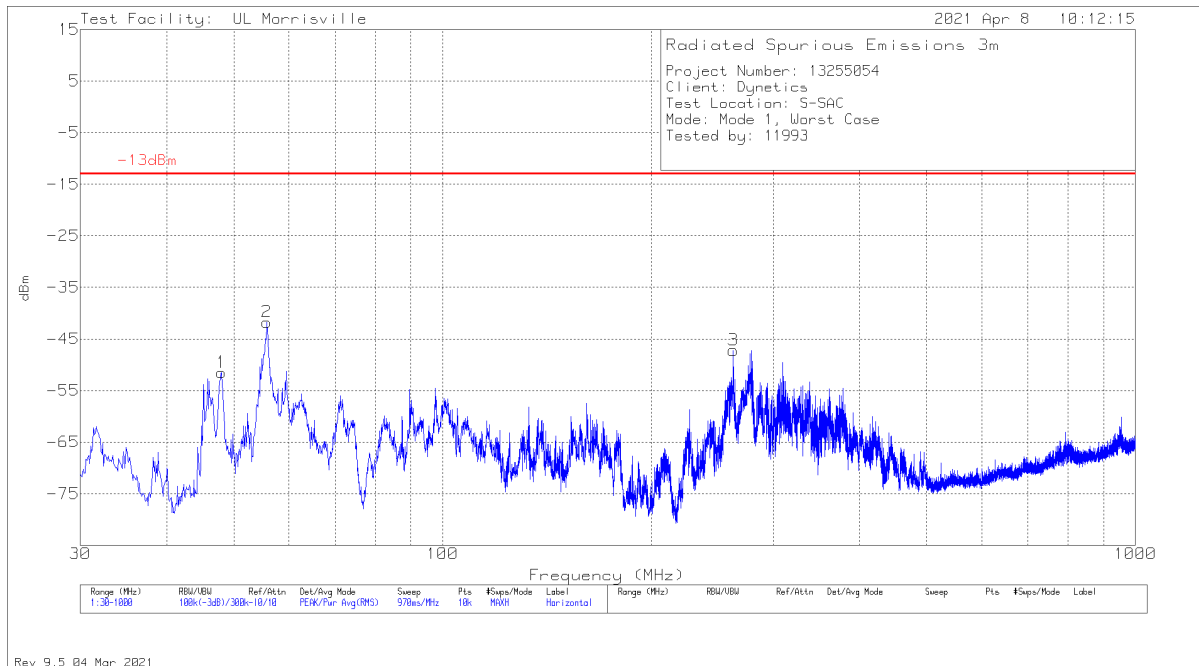


Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AT0079 (dB/m)	Cbl (dB)	Conversion Factor (dB)	Corrected Reading dBm	-13dBm	PK Margin (dB)	Azimuth (Degs)	Antenna Face
1	.00992	-60	Pk	18	.1	11.8	-30.1	-13	-17.1	0-360	On
2	1.08024	-69.73	Pk	11	.2	11.8	-46.73	-13	-33.73	0-360	On
3	29.12033	-82.69	Pk	8.1	1.1	11.8	-61.69	-13	-48.69	0-360	On
4	.01028	-60.25	Pk	17.8	.1	11.8	-30.55	-13	-17.55	0-360	Off
5	1.08393	-71.62	Pk	11	.2	11.8	-48.62	-13	-35.62	0-360	Off
6	13.56013	-81.98	Pk	10.4	.7	11.8	-59.08	-13	-46.08	0-360	Off
7	.01106	-61.07	Pk	17.5	.1	11.8	-31.67	-13	-18.67	0-360	Flat
8	1.11713	-72.68	Pk	11	.2	11.8	-49.68	-13	-36.68	0-360	Flat
9	27.74802	-78.67	Pk	8.5	1	11.8	-57.37	-13	-44.37	0-360	Flat

Pk - Peak detector

30-1000MHz

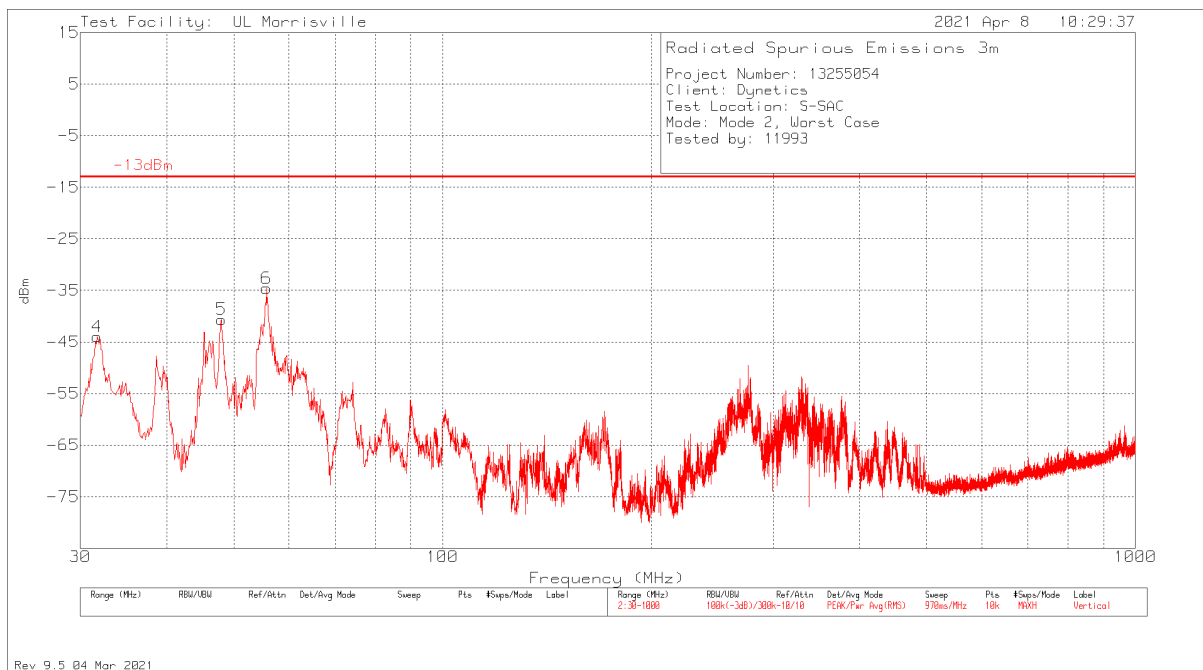
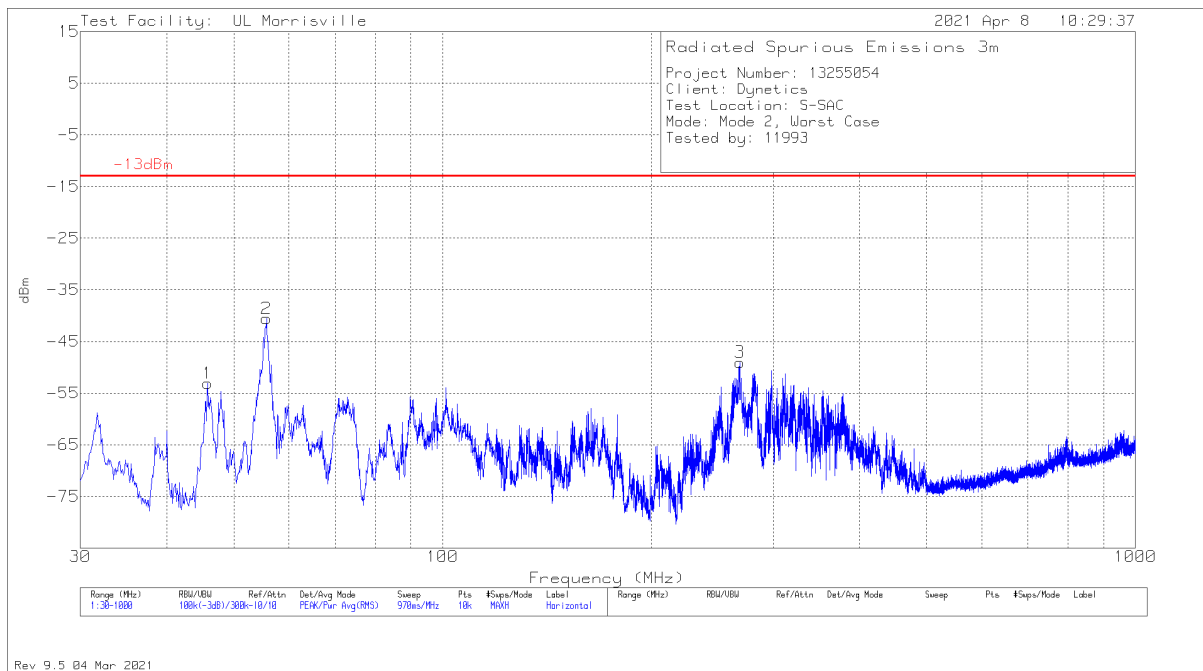
MODE 1



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AT0075 AF (dB/m)	Amp/Cbl (dB)	Filter (dB)	Conversion Factor (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	31.649	-48.89	Pk	26	-31.5	.1	11.8	-42.49	-13	-29.49	0-360	101	V
5	47.848	-36.13	Pk	15	-31.3	.1	11.8	-40.53	-13	-27.53	0-360	199	V
1	47.945	-47.11	Pk	14.9	-31.2	.1	11.8	-51.51	-13	-38.51	0-360	399	H
6	55.705	-30.65	Pk	13.5	-31.1	.1	11.8	-36.35	-13	-23.35	0-360	101	V
2	55.802	-36.02	Pk	13.5	-31.1	.1	11.8	-41.72	-13	-28.72	0-360	101	H
3	262.897	-48.69	Pk	18.4	-29	.3	11.8	-47.19	-13	-34.19	0-360	101	H

Pk - Peak detector

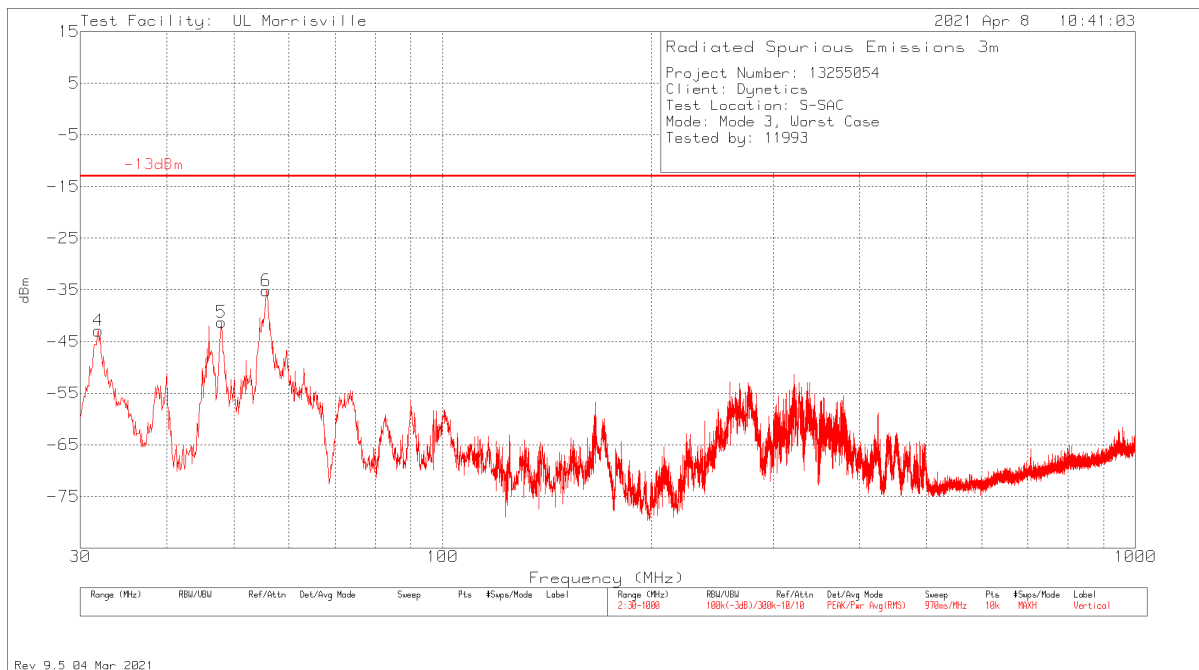
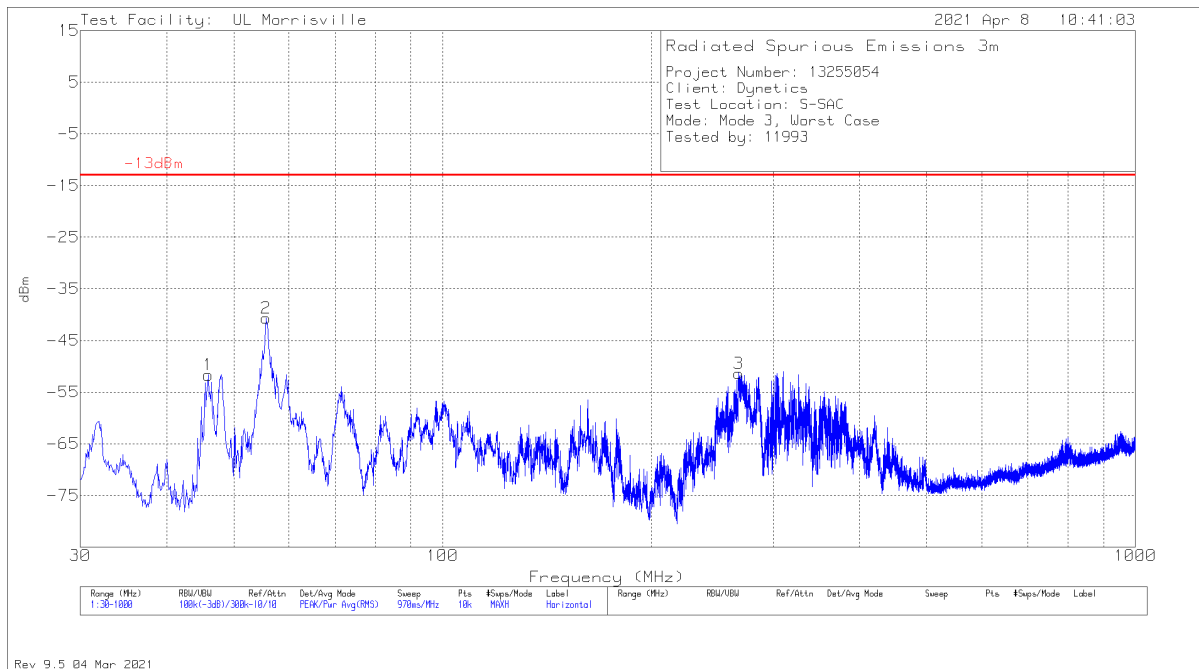
MODE 2



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AT0075 AF (dB/m)	Amp/Cbl (dB)	Filter (dB)	Conversion Factor (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	31.746	-50.27	Pk	25.9	-31.5	.1	11.8	-43.97	-13	-30.97	0-360	101	V
1	45.811	-49.6	Pk	15.9	-31.3	.1	11.8	-53.1	-13	-40.1	0-360	399	H
5	47.945	-36.24	Pk	14.9	-31.2	.1	11.8	-40.64	-13	-27.64	0-360	101	V
2	55.705	-34.87	Pk	13.5	-31.1	.1	11.8	-40.57	-13	-27.57	0-360	399	H
6	55.705	-28.91	Pk	13.5	-31.1	.1	11.8	-34.61	-13	-21.61	0-360	101	V
3	268.717	-51.25	Pk	19.1	-29	.3	11.8	-49.05	-13	-36.05	0-360	101	H

Pk - Peak detector

MODE 3

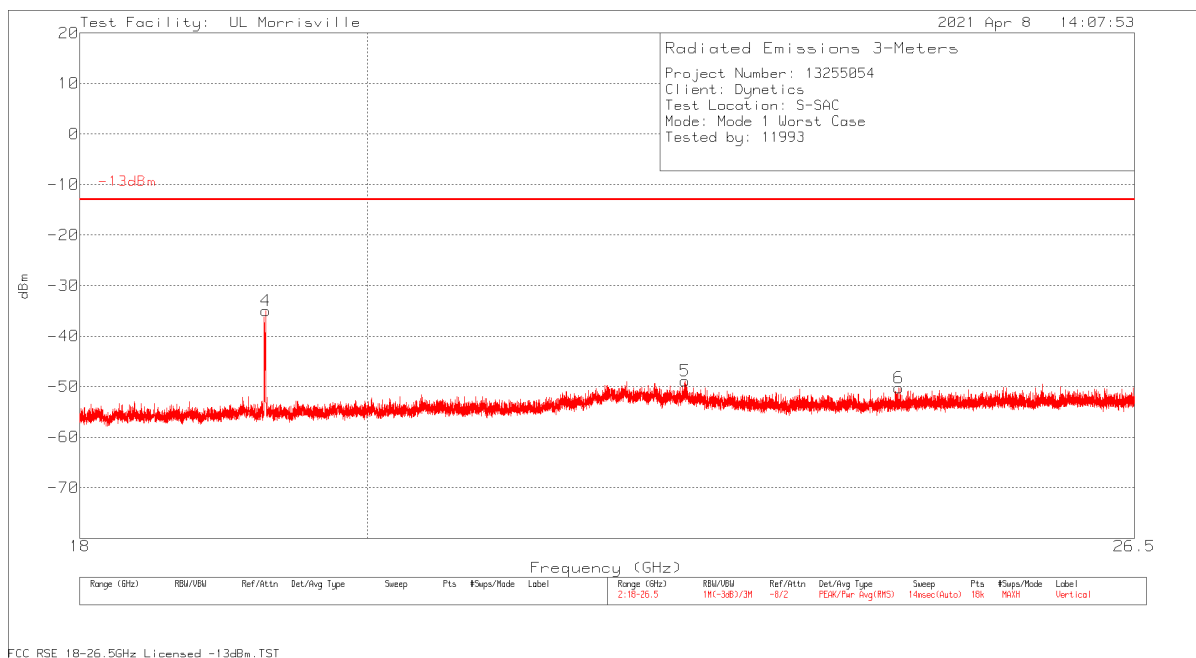
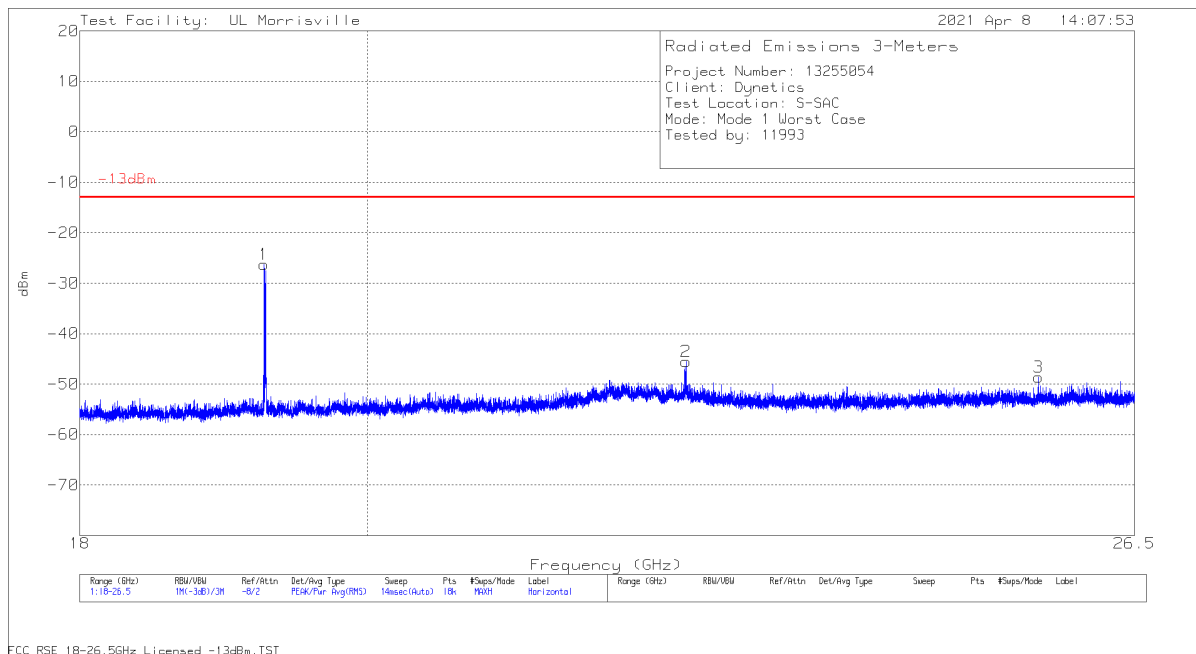


Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AT0075 AF (dB/m)	Amp/Cbl (dB)	Filter (dB)	Conversion Factor (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	31.843	-49.12	Pk	25.8	-31.5	.1	11.8	-42.92	-13	-29.92	0-360	101	V
1	45.908	-48.18	Pk	15.9	-31.3	.1	11.8	-51.68	-13	-38.68	0-360	399	H
5	47.945	-36.88	Pk	14.9	-31.2	.1	11.8	-41.28	-13	-28.28	0-360	101	V
2	55.608	-34.98	Pk	13.5	-31.1	.1	11.8	-40.68	-13	-27.68	0-360	399	H
6	55.608	-29.49	Pk	13.5	-31.1	.1	11.8	-35.19	-13	-22.19	0-360	101	V
3	267.844	-53.5	Pk	19	-29	.3	11.8	-51.4	-13	-38.4	0-360	101	H

Pk - Peak detector

18-26.5GHz

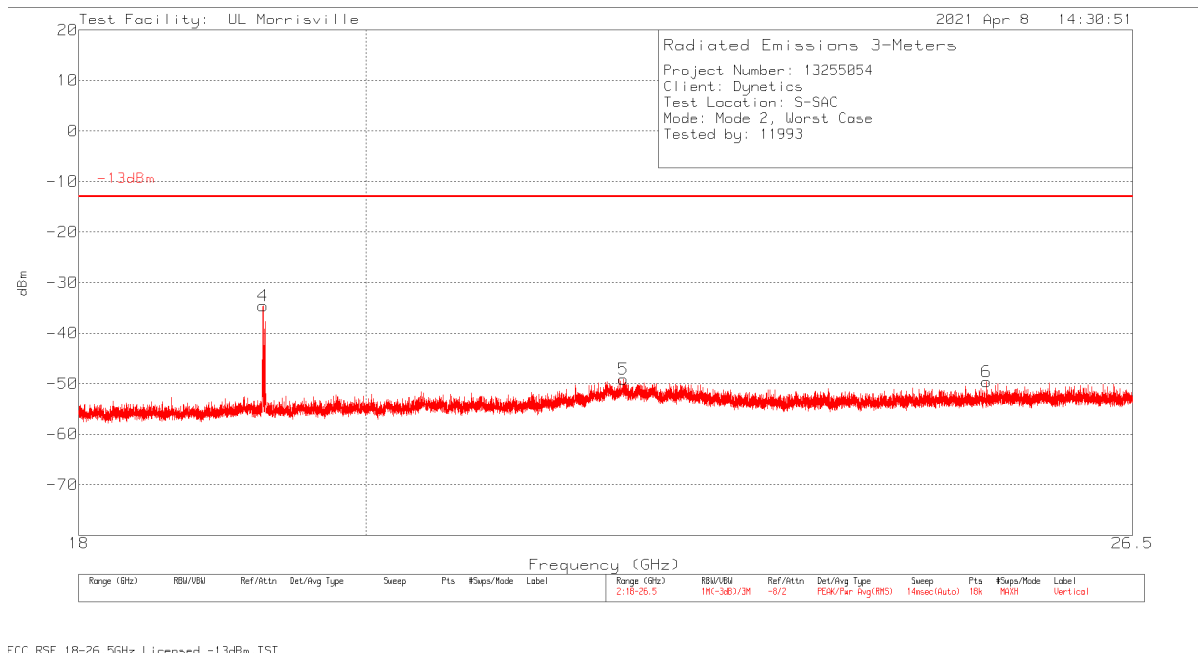
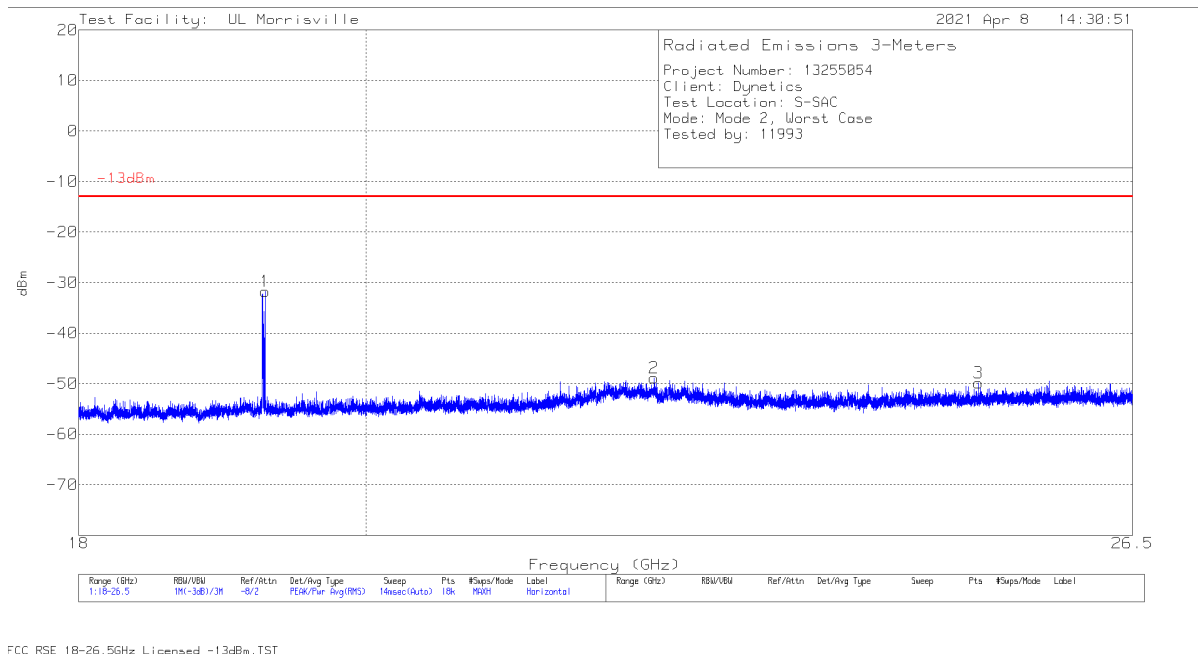
MODE 1



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AT0063 AF (dB/m)	Amp/Cbl (dB)	CF (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	19.25807	-32.47	Pk	33.5	-39.1	11.8	-26.27	-13	-13.27	0-360	300	H
4	19.27082	-41.18	Pk	33.5	-39.1	11.8	-34.98	-13	-21.98	0-360	150	V
5	22.47597	-58.23	Pk	36.5	-38.9	11.8	-48.83	-13	-35.83	0-360	251	V
2	22.48163	-54.94	Pk	36.4	-38.8	11.8	-45.54	-13	-32.54	0-360	300	H
6	24.30782	-58.75	Pk	34.8	-38.1	11.8	-50.25	-13	-37.25	0-360	200	V
3	25.58572	-57.93	Pk	35.2	-37.7	11.8	-48.63	-13	-35.63	0-360	149	H

Pk - Peak detector

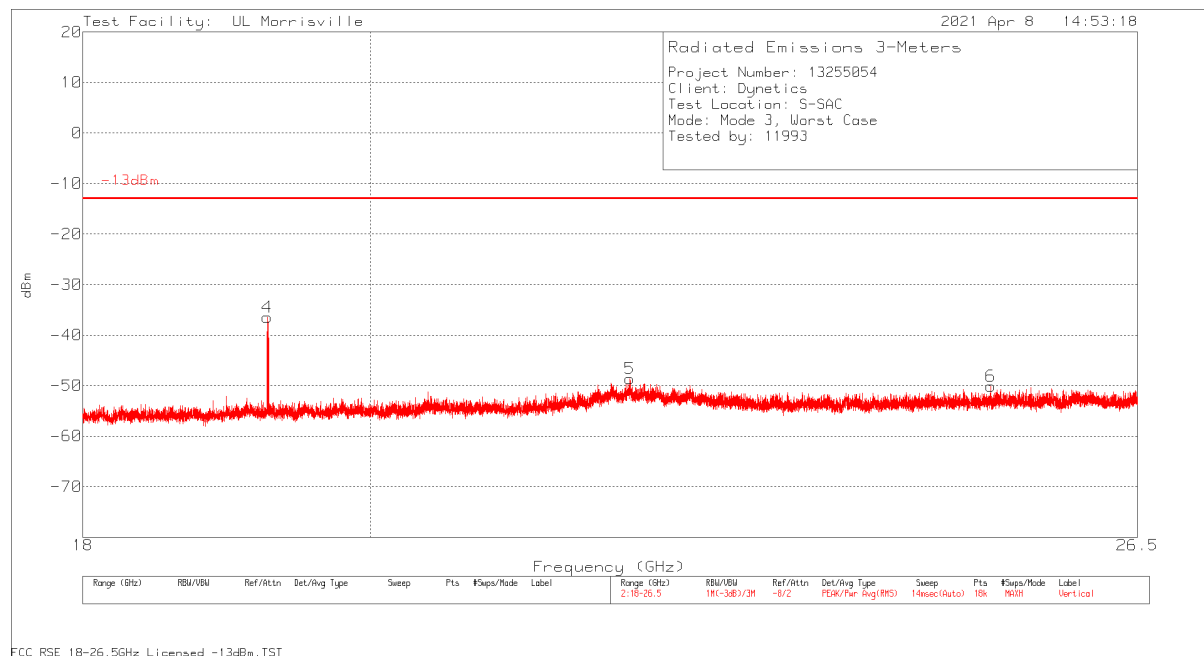
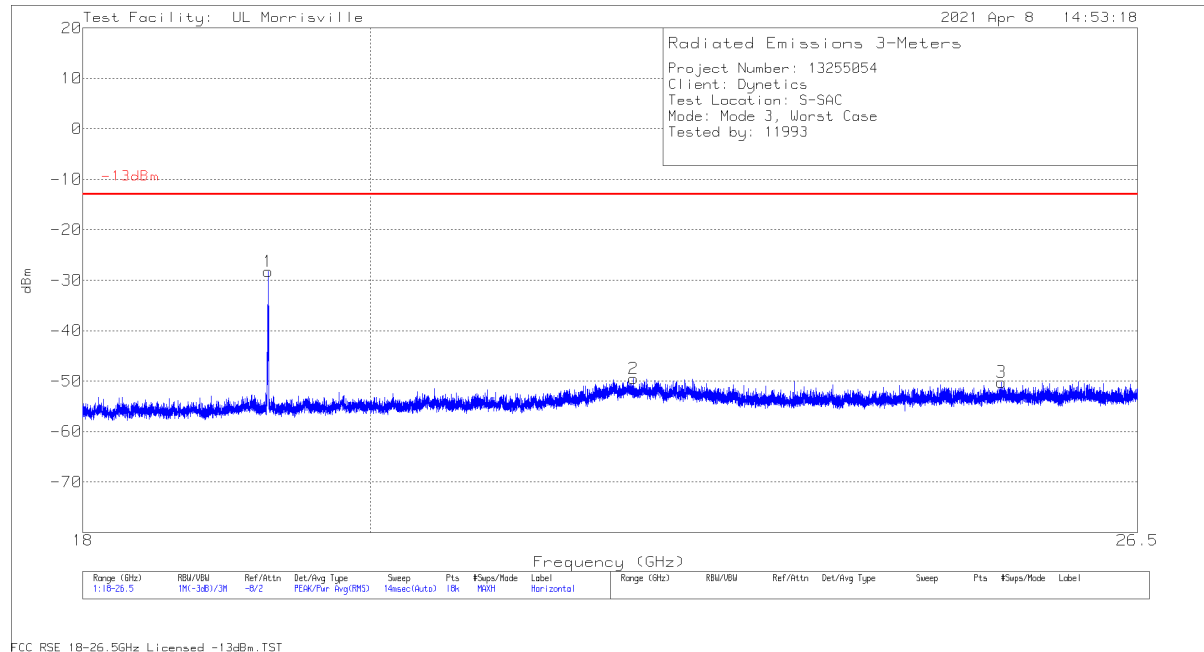
MODE 2



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AT0063 AF (dB/m)	Amp/Cbl (dB)	CF (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	19.25996	-40.76	Pk	33.5	-39.1	11.8	-34.56	-13	-21.56	0-360	101	V
1	19.2746	-37.89	Pk	33.5	-39.1	11.8	-31.69	-13	-18.69	0-360	300	H
5	21.98247	-59.09	Pk	37.1	-38.9	11.8	-49.09	-13	-36.09	0-360	200	V
2	22.2337	-58.42	Pk	36.6	-38.9	11.8	-48.92	-13	-35.92	0-360	149	H
3	25.04311	-58.82	Pk	35.2	-38	11.8	-49.82	-13	-36.82	0-360	300	H
6	25.11678	-58.78	Pk	35.3	-37.9	11.8	-49.58	-13	-36.58	0-360	200	V

Pk - Peak detector

MODE 3

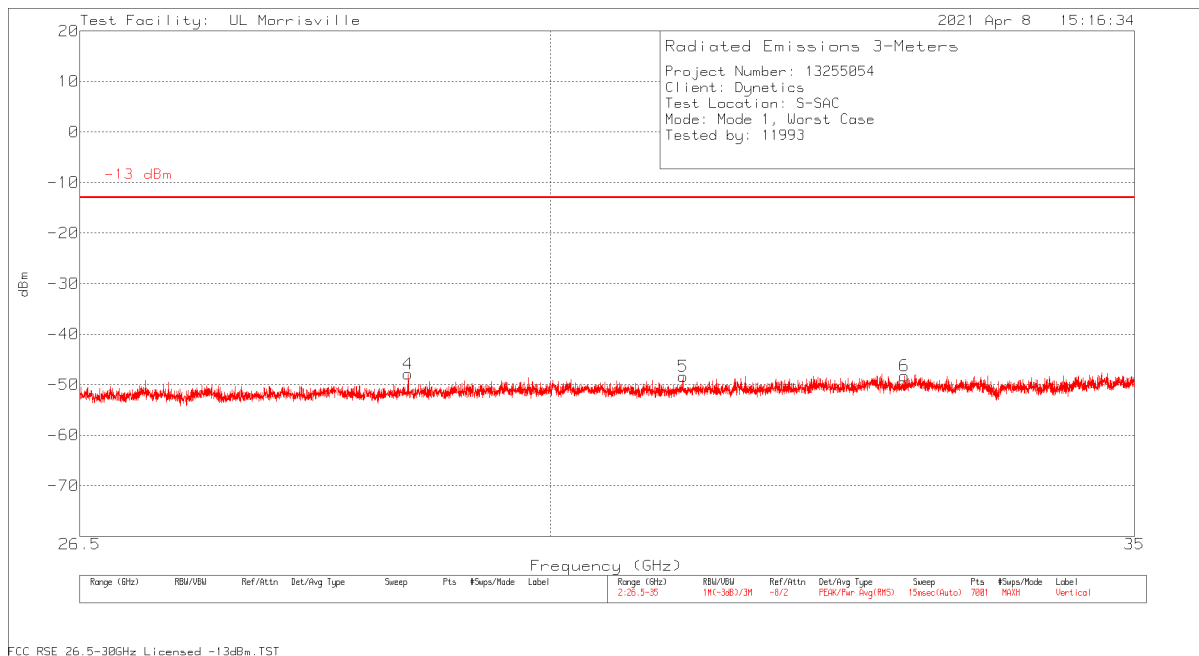
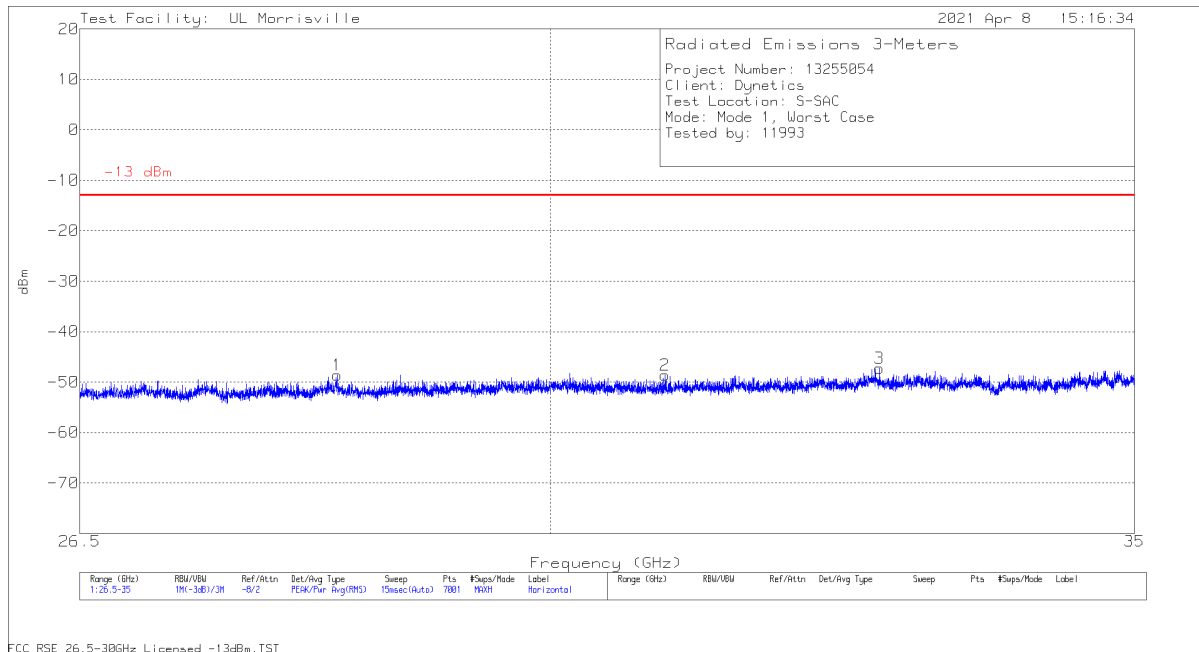


Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AT0063 AF (dB/m)	Amp/Cbl (dB)	CF (dB)	Corrected Reading dBm	-13dBm	Margin (dB)	Azimuth (Degr)	Height (cm)	Polarity
4	19.25996	-42.67	Pk	33.5	-39.1	11.8	-36.47	-13	-23.47	0-360	200	V
1	19.26704	-34.42	Pk	33.5	-39.1	11.8	-28.22	-13	-15.22	0-360	249	H
5	21.99852	-58.61	Pk	37.1	-38.9	11.8	-48.61	-13	-35.61	0-360	299	V
2	22.02686	-59.15	Pk	37	-39.2	11.8	-49.55	-13	-36.55	0-360	249	H
6	25.113	-59.29	Pk	35.3	-37.9	11.8	-50.09	-13	-37.09	0-360	101	V
3	25.20839	-59.38	Pk	35.3	-37.9	11.8	-50.18	-13	-37.18	0-360	199	H

Pk - Peak detector

ABOVE 26.5GHz

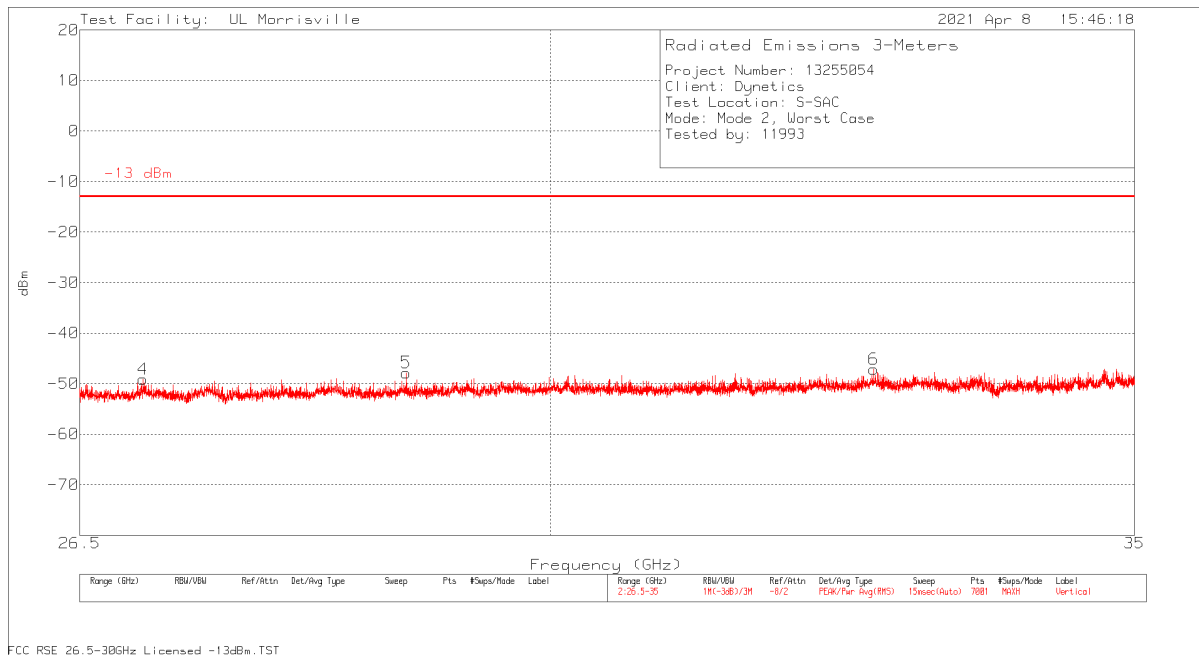
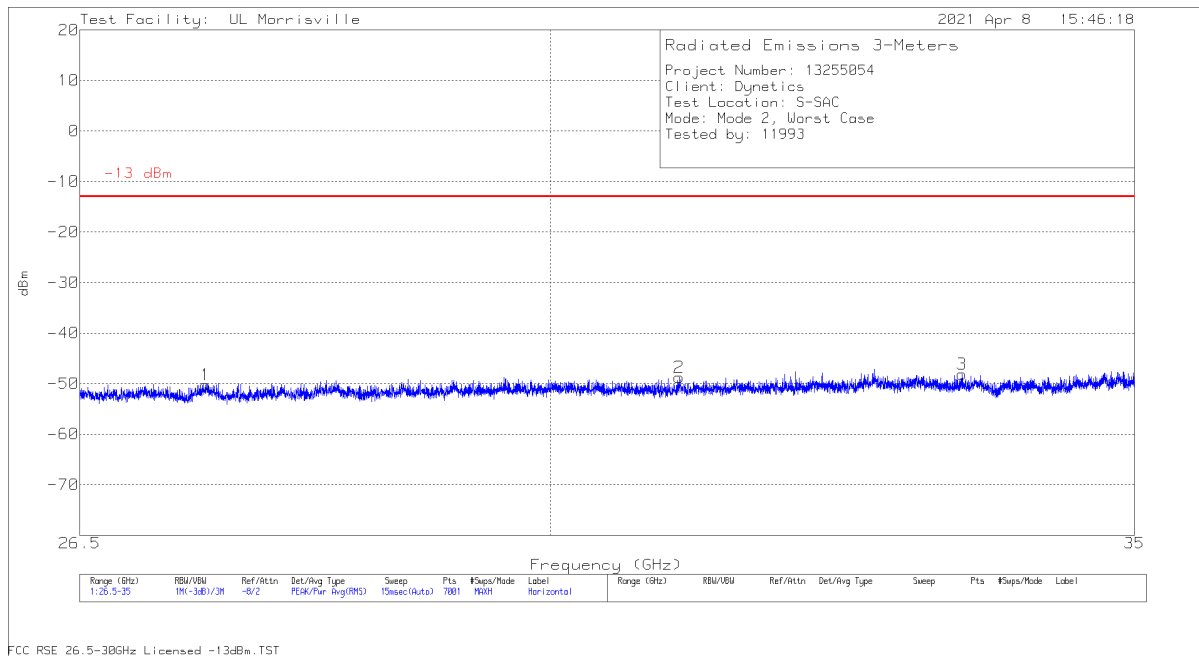
MODE 1



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AT0061 AF (dB/m)	Amp/Cbl (dB)	CF (dB)	Corrected Reading dBm	-13 dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	28.36029	-60.65	Pk	36.2	-36	11.8	-48.65	-13	-35.65	0-360	101	H
4	28.89943	-59.93	Pk	36.3	-36	11.8	-47.83	-13	-34.83	0-360	299	V
2	30.92364	-61.66	Pk	36.6	-35.4	11.8	-48.66	-13	-35.66	0-360	299	H
5	31.073	-61.43	Pk	36.7	-35.4	11.8	-48.33	-13	-35.33	0-360	150	V
3	32.72443	-60.57	Pk	37.2	-35.7	11.8	-47.27	-13	-34.27	0-360	150	H
6	32.93814	-61.21	Pk	37.3	-36.1	11.8	-48.21	-13	-35.21	0-360	200	V

Pk - Peak detector

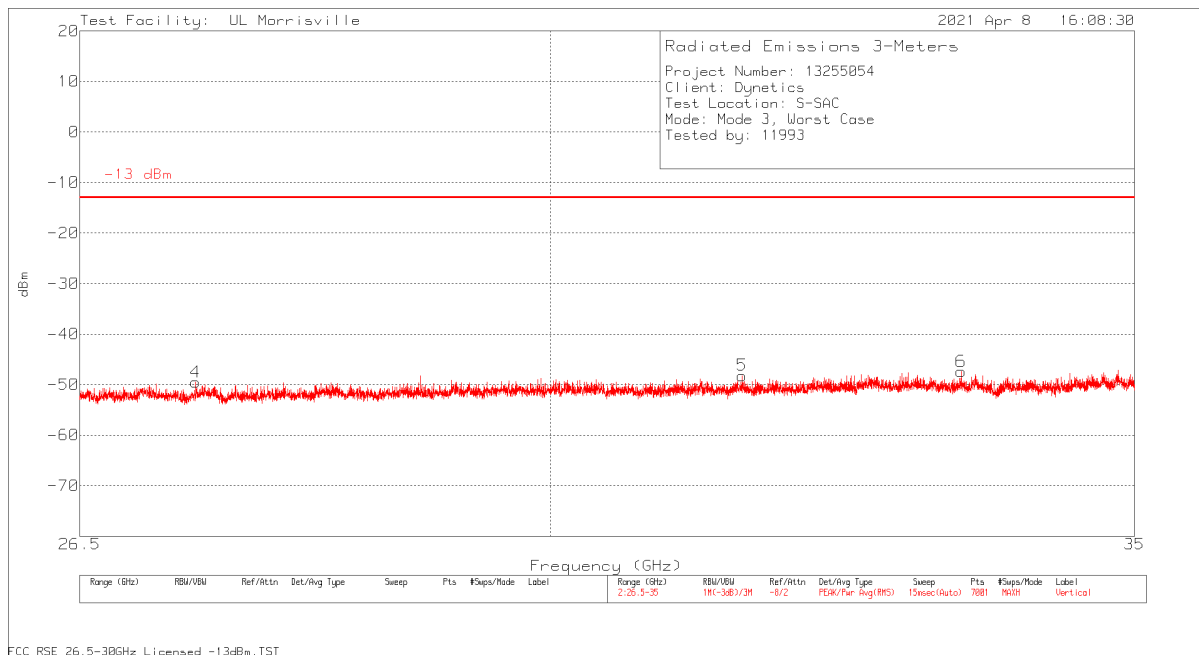
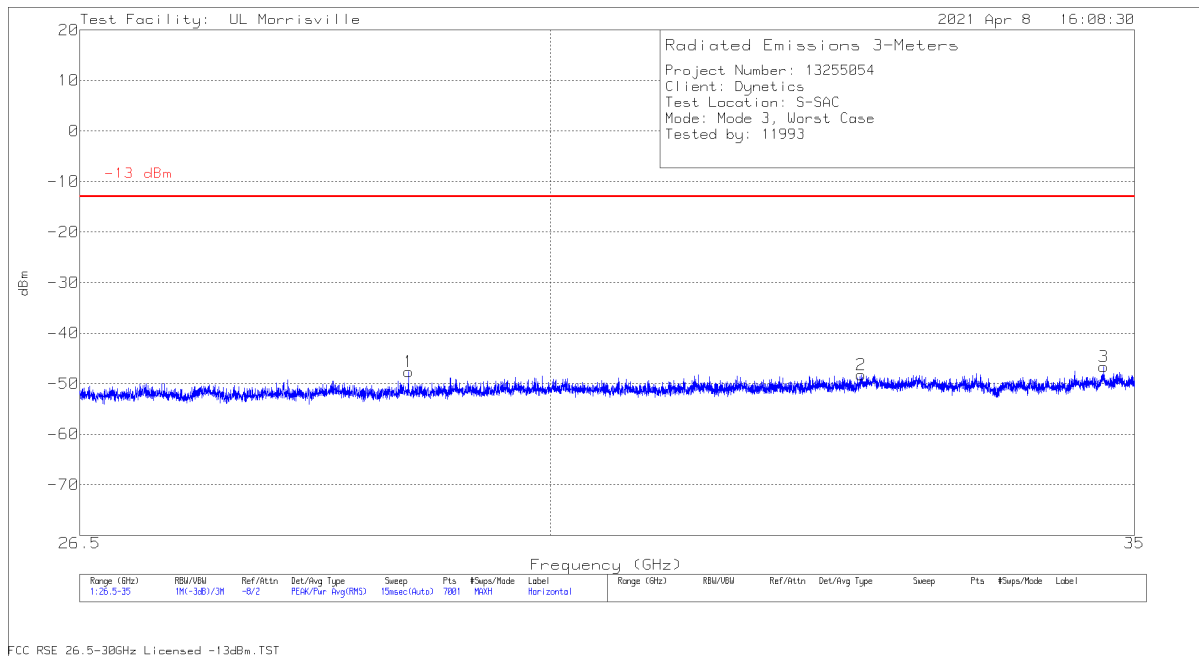
MODE 2



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AT0061 AF (dB/m)	Amp/Cbl (dB)	CF (dB)	Corrected Reading dBm	-13 dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	26.94564	-59.78	Pk	35.9	-37	11.8	-49.08	-13	-36.08	0-360	250	V
1	27.39371	-61.21	Pk	36.2	-37	11.8	-50.21	-13	-37.21	0-360	101	H
5	28.88486	-60.02	Pk	36.3	-35.9	11.8	-47.82	-13	-34.82	0-360	101	V
2	31.039	-61.71	Pk	36.7	-35.5	11.8	-48.71	-13	-35.71	0-360	299	H
6	32.67343	-60.2	Pk	37.1	-35.8	11.8	-47.1	-13	-34.1	0-360	101	V
3	33.4445	-60.78	Pk	37.1	-36.3	11.8	-48.18	-13	-35.18	0-360	299	H

Pk - Peak detector

MODE 3



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AT0061 AF (dB/m)	Amp/Cbl (dB)	CF (dB)	Corrected Reading dBm	-13 dBm	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	27.32207	-60.59	Pk	36.1	-36.8	11.8	-49.49	-13	-36.49	0-360	250	V
1	28.90064	-59.74	Pk	36.3	-36	11.8	-47.64	-13	-34.64	0-360	149	H
5	31.55993	-61.29	Pk	36.9	-35.6	11.8	-48.19	-13	-35.19	0-360	250	V
2	32.56414	-61.26	Pk	37	-35.8	11.8	-48.26	-13	-35.26	0-360	149	H
6	33.436	-60.19	Pk	37.1	-36.1	11.8	-47.39	-13	-34.39	0-360	250	V
3	34.71586	-59.13	Pk	37.6	-36.9	11.8	-46.63	-13	-33.63	0-360	249	H

Pk - Peak detector

9. FREQUENCY STABILITY

RULE PART(S)

§2.1055 Measurements required: Frequency stability.

§90.213 Frequency stability

Above 2450 MHz ¹⁰

¹⁰Except for DSRCS equipment in the 5850-5925 MHz band, frequency stability is to be specified in the station authorization. Frequency stability for DSRCS equipment in the 5850-5925 MHz band is specified in subpart M of this part.

LIMITS

Device must remain operating in between 3100MHz to 3300MHz.

TEST PROCEDURE

Use spectrum analyzer to measure -6dBc points

- Temp. = -30° to +50°C
- Voltage = Nominal & Nominal +/-15%

Frequency Stability vs Temperature:

Frequency stability is tested at 10 °C intervals of temperatures between -30 °C and +50 °C at the manufacturer's rated supply voltage per **section 5.6.4 of ANSI C63.26-2015**.

Frequency Stability vs Voltage:

Frequency stability is tested at +20 °C temperature and ±15% supply voltage variations per **section 5.6.5 of ANSI C63.26-2015**.

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

RESULTS

Based on the band edge measurements and the frequency error data the device will operate in between the frequency range of 3000MHz - 3100MHz under the temperature and voltage variations described in the preceding test-procedure section.

MODE 1

Programmed Freq (MHz): 3179.5120						
Limit		3100	3300	Freq (MHz) Center	Delta (MHz)	Frequency Stability (ppm)
Condition		F low @ -6dBc	F high @ -6dBc			
Temperature	Voltage (DC)	(MHz)	(MHz)			
Extreme (-30C)	120	3176.986	3181.666	3179.326	-0.1860	-58.500
Extreme (-20C)		3177.573	3181.219	3179.396	-0.1160	-36.484
Extreme (-10C)		3177.639	3181.293	3179.466	-0.0460	-14.468
Extreme (0C)		3177.696	3181.329	3179.513	0.0005	0.157
Extreme (10C)		3177.713	3181.369	3179.541	0.0290	9.121
Nominal (20C)		3177.716	3181.386	3179.551	0.0390	12.266
Extreme (30C)		3177.719	3181.389	3179.554	0.0420	13.210
Extreme (40C)		3177.679	3181.359	3179.519	0.0070	2.202
Extreme (50C)		3177.623	3181.309	3179.466	-0.0460	-14.468
20C	102.0	3177.554	3181.399	3179.477	-0.0355	-11.165
	120.0	3177.716	3181.386	3179.551	0.0390	12.266
	138.0	3177.682	3181.481	3179.582	0.0695	21.859

Date: 2020-12-15
Project No: 13255054
Location: NEBS
Tested by: 40882

MODE 2

Programmed Freq (MHz): 3179.5120						
Limit		3100	3300	Freq (MHz) Center	Delta (MHz)	Frequency Stability (ppm)
Condition		F low @ -6dBc	F high @ -6dBc			
Temperature	Voltage (DC)	(MHz)	(MHz)			
Extreme (-30C)	120	3176.766	3182.522	3179.644	0.1320	41.516
Extreme (-20C)		3176.826	3181.816	3179.321	-0.1910	-60.072
Extreme (-10C)		3176.889	3181.906	3179.398	-0.1145	-36.012
Extreme (0C)		3176.989	3181.899	3179.444	-0.0680	-21.387
Extreme (10C)		3176.976	3181.989	3179.483	-0.0295	-9.278
Nominal (20C)		3177.982	3181.386	3179.684	0.1720	54.096
Extreme (30C)		3176.983	3181.989	3179.486	-0.0260	-8.177
Extreme (40C)		3176.939	3181.983	3179.461	-0.0510	-16.040
Extreme (50C)		3176.829	3181.906	3179.368	-0.1445	-45.447
20C	102.0	3176.959	3182.009	3179.484	-0.0280	-8.806
	120.0	3177.982	3181.386	3179.684	0.1720	54.096
	138.0	3177.972	3181.229	3179.601	0.0885	27.834

Date: 2020-12-16
Project No: 13255054
Location: NEBS
Tested by: 40882

MODE 3

Programmed Freq (MHz): 3179.5120						
Limit		3100	3300	Freq (MHz) Center	Delta (MHz)	Frequency Stability (ppm)
Condition		F low @ -6dBc	F high @ -6dBc			
Temperature	Voltage (AC)	(MHz)	(MHz)			
Extreme (-30C)	120	3177.436	3181.176	3179.306	-0.2060	-64.790
Extreme (-20C)		3177.573	3181.249	3179.411	-0.1010	-31.766
Extreme (-10C)		3177.639	3181.303	3179.471	-0.0410	-12.895
Extreme (0C)		3177.689	3181.389	3179.539	0.0270	8.492
Extreme (10C)		3177.633	3181.399	3179.516	0.0040	1.258
Nominal (20C)		3177.716	3181.392	3179.554	0.0420	13.210
Extreme (30C)		3177.716	3181.389	3179.553	0.0405	12.738
Extreme (40C)		3177.696	3181.353	3179.525	0.0125	3.931
Extreme (50C)		3177.619	3181.619	3179.619	0.1070	33.653
20C	102.0	3177.716	3181.399	3179.558	0.0455	14.310
	120.0	3177.716	3181.392	3179.554	0.0420	13.210
	138.0	3177.667	3181.222	3179.445	-0.0675	-21.230

Date: 2020-12-16
Project No: 13255054
Location: NEBS
Tested by: 40882

10. TEST SETUP PHOTOS

Refer to exhibit R13255053-EP1

END OF REPORT