5.1.1.4 30 MHz BW, TM3.1, 64QAM, 3465 MHz, TX42

9k-150kHz 01:46:37 PM Jan 24 Radio Std: None Fred r Freq 3.540000000 G Avg 63.192 k 84.213 di Ref 0.00 dBr Center Fr 3.540000000 G 0 kH Stop 150 kHz CFS Δ Limi Δ Lim -26.21 de -27.50 dE Freq Off

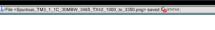
30M-1GHz

L I	RF 5	Spurious Emission SO D AC DODODOD G	Hz			00000 GHz Avg Hold: Ext Gain:		(1:49:11) Radio Str Radio De		Freque	ncy
0 dB/div	Ref 0.	.00 dBm						798 -90.1	.59 MHz 16 dBm		
0.0 0.0 0.0										Cent 3.540000	
0.0											
0.0											
tart 30 M	ИНz							SI	op 1 GHz		F Step
Spur	Range	Frequen	cy i	Amplitude		Limit		∆ Limit		4.0200 Auto	ICO MH Ma
										Freq	Offse 0 H
a l'imite a	Caurious 7	M3 1_1C 3	010101 24	CE TY10 20	1000		E STATU				











150k-30MHz

Global Product Compliance Laboratory



5.1.1.5 30 MHz BW, TM3.2, QPSK/16QAM, 3500 MHz, 3500 MHz, TX42



150k-30MHz







30M-1GHz



9G-36GHz



5.1.1.6 30 MHz BW, TM3.1a, 256QAM, 3535 MHz, TX43

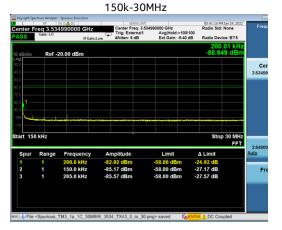
9k-150kHz (5:40:59 PM Jan 24 Radio Std: None Fred r Freq 13.2550000 Avg 61.687 84.579 d Ref -40.00 dBr Center Fr 13. 0 kH Stop 150 kHz FFT CF ΔL Freg Off dB dB dB dB dB

Keysight Spe	ctrum Analyzer -	- Spurious Emissions					
enter F		50 9 AC 1990000 GHz	Trig: External	.534990000 GHz Avg Hold: 100/10		None	Frequency
ASS		IFGain:	.ow #Atten: 6 dB	Ext Gain: -10.80		BTS	
0 dB/div	Ref 0.	.00 dBm				0 dBm	
og 0.0							
0.0							Center Fr
0.0							3.534990000 G
0.0							
n							
0.0							
0.0							
n.n							
				▲ ¹			
0.0							
tart 30	MHz				Sto	p 1 GHz	
							CF Ste 2.64900000 GH
Spur	Range	Frequency	Amplitude	Limit	∆ Limit		Auto Ma
	1	653.9 MHz	-82.33 dBm	-58.00 dBm	-24.33 dB	<u>^</u>	
1	1	285.2 MHz	-83.27 dBm	-58.00 dBm	-25.27 dB		Freq Offs
1 2			-83,40 dBm	-58.00 dBm	-25.40 dB	1	01
	1	670.0 MHz					
2 3 4		670.0 MHz 791.0 MHz	-83.43 dBm	-58.00 dBm	-25.43 dB		
2 3				-58.00 dBm -58.00 dBm	-25.43 dB -25.58 dB		
2 3 4	1	791.0 MHz	-83.43 dBm				

MEG 📣 File <Spurious_TM3_1a_1C_30MBW_3534_TX43_30_to_1000.png> saved 🛛 🚺

Keysight Spe Center F PASS	RF					0000 GHz Avg Hold Ext Gain:		04:49:27 P Radio Std Radio Der		Fr	equency
10 dB/div	Ref 0	.00 dBm						3.49 -37.2	95 GHz 10 dBm		
-10.0 -20.0 -30.0									}		Center Freq 4990000 GHz
-40.0 -50.0 -60.0 -70.0							·				
-90.0 -90.0 Start 3,4-	4 GH7							Stor	o 3.5 GHz		
Spur	Range	Freque		Amplitude		Limit		∆ Limit		7 <u>Auto</u>	CF Step 100000 MHz Man
1		3.499 G	Hz	-37.21 dBm		31.06 dB	m -	3.150 dB			Freq Offset 0 Hz
мsa 📣 File -	<spurious_< td=""><td>TM3_1a_1C</td><td>_30MBW_</td><td>3534_TX43_3</td><td>440_to_350</td><td>0.png> sav</td><td>ved state</td><td>6</td><td></td><td></td><td></td></spurious_<>	TM3_1a_1C	_30MBW_	3534_TX43_3	440_to_350	0.png> sav	ved state	6			

3.44G-3.5GHz



1G-3.35GHz

nter F SS		50 0 AC 4990000 GHz IFGain:1	Trig: External1	534990000 GHz		one Fro
IB/div	Ref 0	.00 dBm			2.865 -74.462	
						C 3.534
					↓ 1	
rt 1 G	Hz				Stop 3.3	
Spur	Range	Frequency	Amplitude	Limit	∆ Limit	2.649 Auto
1	1	2.865 GHz	-69.48 dBm	-58.00 dBm	-11.48 dB	<u> </u>
2		2.691 GHz	-69.70 dBm	-58.00 dBm	-11.70 dB	
3		3.165 GHz	-69.81 dBm	-58.00 dBm	-11.81 dB	1
		3.090 GHz	-69.81 dBm	-58.00 dBm	-11.81 dB	
5		3.127 GHz	-69.91 dBm	-58.00 dBm	-11.91 dB	
5		3.109 GHz	-70.03 dBm	-58.00 dBm	-12.03 dB	
	1	2.681 GHz	-70.03 dBm	-58.00 dBm	-12.03 dB	



3.65G-9GHz

Global Product Compliance Laboratory



5.1.1.7 40 MHz BW, TM3.1, 64QAM, 3470 MHz, TX31

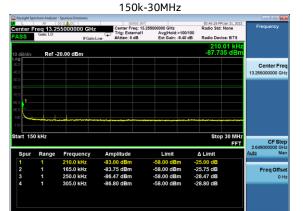
9k-150kHz

	req 13.2	∞ a≜ ∝ 55000000 Gi	iz Cen	sense:INT ter Freq: 13.2 : External1	55000000 GHz AvgiHold	~100/100	(3:46:12 P Radio Std	None	Fi
ASS	Gate: LO	IFGi		en: 6 dB	Ext Gain:		Radio Dev	ice: BTS	
0 d <u>B/div</u>	Ref ⊰	40.00 dBm						598 kHz 76 dBm	
og 0.0									
0.0									13.25
0.0									
0.0		1							
0.0		<u> </u>							
100									
110									
120									
130									
tart 9 k	Hz						Stop	150 kHz	
								FFT	2.64
Spur	Range	Frequency	Amplit	ude	Limit		∆ Limit		Auto
1	1	36.60 kHz	-78.67 0	IBm	-58.00 dB	m -2	0.67 dB	<u>^</u>	
2		66.20 kHz	-78.70 0		-58.00 dB		0.70 dB		
3		47.14 kHz	-78.78 0		-58.00 dB		0.78 dB	1	
4		9.000 kHz	-79.46 0		-58.00 dB		1.46 dB		
5		55.67 kHz	-79.82 (-58.00 dB		1.82 dB		
6	1	31.58 kHz	-81.14 0		-58.00 dB		3.14 dB		
7	1	26.56 kHz	-81.48 c	IBm	-58.00 dB	m -2	3.48 dB		

30M-1GHz

enter F ASS	Gate: LO	55000000 GH	Trig: Exte		R: 100/100	3:48:46 PH Jan 21, 2022 adio Std: None adio Device: BTS	Fr
dB/div	Ref 0	.00 dBm				734.79 MHz -91.152 dBm	
3.0							
.0							13.25
1.0							
.0							
.0							
1.0					1		
1.0					- X		
	MHz					Stop 1 GHz	
tart 30							
art 30							2.64
art 30 Spur	Range	Frequency	Amplitude	Limit	ΔL	imit	2.64 <u>Auto</u>
		Frequency 734.8 MHz	Amplitude -82.35 dBm	Limit -58.00 dl			
Spur 1 2		734.8 MHz 792.1 MHz	-82.35 dBm -82.50 dBm	-58.00 di -58.00 di	8m -24.3 8m -24.5	5 dB	Auto
Spur 1 2 3		734.8 MHz 792.1 MHz 914.3 MHz	-82.35 dBm -82.50 dBm -82.93 dBm	-58.00 dl -58.00 dl -58.00 dl	8m -24.3 8m -24.5 8m -24.9	5 dB *	2.64 <u>Auto</u>
Spur 1 2 3 4		734.8 MHz 792.1 MHz 914.3 MHz 971.8 MHz	-82.35 dBm -82.50 dBm -82.93 dBm -83.08 dBm	-58.00 d -58.00 d -58.00 d -58.00 d	8m -24.3 8m -24.5 8m -24.9 8m -25.0	5 dB 60 dB 13 dB 18 dB	Auto
Spur 1 2 3 4 5	Range 1 1 1	734.8 MHz 792.1 MHz 914.3 MHz 971.8 MHz 747.9 MHz	-82.35 dBm -82.50 dBm -82.93 dBm -83.08 dBm -83.21 dBm	-58.00 di -58.00 di -58.00 di -58.00 di -58.00 di	8m -24.3 8m -24.5 8m -24.9 8m -25.0 8m -25.2	5 dB / / / / / / / / / / / / / / / / / /	Auto
Spur 1 2 3 4	Range 1 1 1	734.8 MHz 792.1 MHz 914.3 MHz 971.8 MHz	-82.35 dBm -82.50 dBm -82.93 dBm -83.08 dBm	-58.00 d -58.00 d -58.00 d -58.00 d	8m -24.3 8m -24.5 8m -24.9 8m -25.0 8m -25.2	5 dB / / / / / / / / / / / / / / / / / /	Auto





File <Spurious_TM3_1_1C_40MBW_3470_TX31_0_to_30.png> saved





File <Spurious_TM3_1_1C_40MBW_3470_TX31_1000_to_3350.png> saved File <Spurious_TM3_1_1C_40MBW_3470_to_300_



5.1.1.8 40 MHz BW, TM3.2, QPSK/16QAM, 3500 MHz, TX6

9k-150kHz

enter F ASS		50 9 ▲ DC 0000000 GHz IFGain:1	Center Freq: 3.4 Trig: External1 #Atten: 6 dB	480000000 GHz		ne Fr
dB/div	Ref ⊰	10.00 dBm			47.135 -85.488	
9 1.0 1.0						3.480
1.0 1.0 1.0		¹	·····		~~~~~.	
00 10 20						
30						
tart 9 k	Hz				Stop 15	O KHZ FFT
Spur	Range	Frequency	Amplitude	Limit	∆ Limit	Auto
1	1	47.14 kHz	-78.20 dBm	-58.00 dBm	-20.20 dB	4
2		62.19 kHz	-79.14 dBm	-58.00 dBm	-21.14 dB	
3		41.62 kHz	-79.23 dBm	-58.00 dBm	-21.23 dB	
4		108.9 kHz	-79.27 dBm	-58.00 dBm	-21.27 dB	
5		70.22 kHz	-80.72 dBm	-58.00 dBm	-22.72 dB	
6		68.21 kHz	-81.09 dBm	-58.00 dBm	-23.09 dB	
7	1	65.70 kHz	-81.16 dBm	-58.00 dBm	-23.16 dB	

30M-1GHz

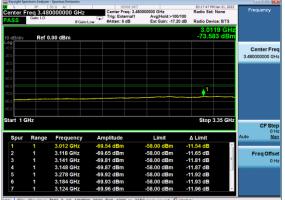
enter F		0000000 G	G	Center Fr		Avg Hold	: 100/100 -10.80 dB	Radio Sto		Fr
dB/div	Ref 0	.00 dBm	FGain:Low	#Atten: 6	dB	Ext Gain:	-10.80 dB	934	.85 MHz 86 dBm	
ng 1.0										(
1.0										3.48
.0										
.0										
1.0										
1.0										
1.0									- 1	
1.0										
art 30	MHz							St	op 1 GHz	
Spur	Range	Frequen	cy A	mplitude		Limit		∆ Limit		Auto
1		934.8 MF		2.62 dBm		-58.00 dB		24.62 dB	<u>^</u>	
	1	988.6 MH		3.36 dBm		-58.00 dB		25.36 dB		
2	1	953.4 MF		3.51 dBm 3.57 dBm		-58.00 dB		25.51 dB		
3						-58.00 dB	- m	25.57 dB		
3 4	1	994.9 MH				59 00 dB	m _*	25 61 dB		
3 4 5		528.2 MH	Iz -8	3.61 dBm		-58.00 dB		25.61 dB		
3 4	1		lz -8 lz -8			-58.00 dB -58.00 dB -58.00 dB	m -	25.61 dB 25.70 dB 25.81 dB		

_1m3_2_1C_40mbtv_3000_1X0_30_00_1000.pig> saved





1G-3.35GHz



File <Spurious_TM3_2_1C_40MBW_3500_TX6_1000_to_3350.png> saved



5.1.1.9 40 MHz BW, TM3.1a, 256QAM, 3530 MHz, TX1

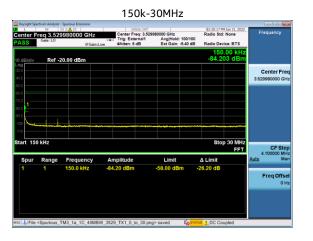
9k-150kHz





Center Fr		50 9 AC 9980000 G	i Hz FGain:Lov	Center F	ernal1	980000 GHz Avg Hold Ext Gain:	(2:32:37 F Radio Sto Radio De		Frequen
10 dB/div	Ref 0.	.00 dBm					953 -90.8	.55 MHz 53 dBm	
-10.0 -20.0									Cente 3.52998000
40.0 50.0									
60.0 70.0									
80.0 90.0								● ¹	
Start 30 N	MHz						St	op 1 GHz	4,1000
Spur	Range	Frequen	су	Amplitude		Limit	∆ Limit		Auto
									Freq









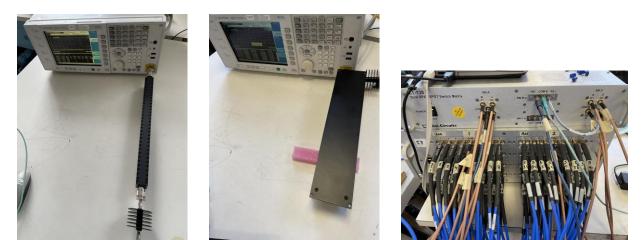


Photographs

AEQU Unit



Radio Testing Setup



Asset ID	Manufacturer	Туре	Description	Model	Serial	Calibration Date	Calibration Due
E831	Agilent Technologies	MXA Signal Analyzer	20Hz-26.5GHz	N9020A	MY48011791	2020-06-16	2022-06-16
E896	Agilent Technologies	Network Analyzer	10 MHz - 40 GHz	N5230C	MY49000897	2021-03-03	2023-03-03
E1338	KeySight Technologies	MXA Signal Analyzer		N9020B	MY57430927	2021-01-07	2023-01-07
E1579	KeySight Technologies	MXA Signal Analyzer	10 Hz - 50 GHz	N9021B	MY60080199	2021-11-30	2023-11-30
E1212	RLC Electronics Inc	Filter, High Pass	10 - 30 GHz, 2W, 5dB	F-19414	1444002	CNR-V	CNR-V
E1156	Weinschel	Attenuator	10dB 0.05GHz- 26GHz 25W	74-10-12	1069	CNR-V	CNR-V
	CF	Notch Filter	03380/3620- 5000MHz		2018260005	NA	NA
	Mini Circuit		8 port RF Switch	C/B11311100013	S E480101350	NA	NA
	Mini Circuit		64 port RF Switch	S E210301724	11702280003	NA	NA
	Microcoax Utiflex		RF Cable	UFB142A-) 0720_2G0200 A	MFR 64639 227883-001	NA	NA
	Microcoax Utiflex		RF Cable	UFB142A-) 0720_2G0200 A	MFR 64639 227883-002	NA	NA

Test Equipment

CNR-V: Calibration Not Required, Must Be Verified

Tests Dates: 1/13/2022 – 1/28/2022.

6. FCC Section 2.1053 - Field strength of spurious radiation

6.1 Section 2.1053 Field Strength of Spurious Emissions

Field strength measurements of radiated spurious emissions were made in an FCC registered 3m Semi-Anechoic Chamber which is maintained by Nokia Bell Labs in Murray Hill, New Jersey. A complete description and full measurement data for the site is on file with the Commission (Site Registration Number: 515091).

The spectrum from 30 MHz to beyond the tenth harmonic of the carrier, 37 GHz, was searched for spurious radiation. Measurements were made using both horizontally and vertically polarized broadband antennas. Per FCC regulations, the comparison of out of band spurious emissions directly to the limit is appropriately made using the substitution method. However, when the emissions are more than 20 dB below the specification limit, the use of field strength measurements for compliance determination is acceptable and those emissions are considered not reportable (Section 2.1053 and the FCC Interpretive database for 2.1053). For this case the evaluation of acceptable radiated field strength is as follows.

6.2 Field Strength of Spurious Emissions - Limits

Sections 2.1053 and 27.53 contain the requirements for the levels of spurious radiation as a function of the level of the unmodulated carrier. The reference level for the unmodulated carrier is calculated as the field produced by an ideal dipole excited by the transmitter output power according to the following relation taken from Reference Data for Radio Engineers, page 676, 4th edition, IT&T Corp.

E= [(30*P)^{1/2}]/R

20 log (E*10⁶) – (43 + 10 log P) = 82.23 dBµV/meter

Where:

E = Field Intensity in Volts/meter	P = Transmitted Power in Watts
R = Measurement distance in meters = 3 m	

The Part 27 Limit is 82.23 dBµV/m at 3m and 91.77 dBuV/m at 1m The Part 27 non-report level is 62.23 dBµV/m at 3m.

The calculated emission levels were found by:

Measured level (dB μ V) + Cable Loss(dB)+Antenna Factor(dB) = Field Strength (dB μ V/m)

RESULTS:

For compliance with 47CFR Parts 2 and 27, the field strength of any spurious radiation, measured at 3m, is required to be less than 82.23 dB_µV/meter (82.23 @ 3m). Emissions equal to or less than 62.23 dB_µV/meter at 3m are not reportable and may be verified using field strength measurements and broadband antennas. Over the out of band spectrum investigated from 30 MHz to beyond the tenth harmonic of the carrier (up to 37 GHz), no reportable spurious emissions were detected.

7. FCC Section 2.1055 - Measurement of Frequency Stability

Frequency Stability testing was completed on the AEQU Unit with Center Frequency 3500.01 MHz. Testing was performed from 12/6/2021 through 12/8/2021 on the radio, which was located in the T-15 Thermal chamber of the Global Product Compliance Laboratory (GPCL) test facility located in Building 4, Room 4-280, Murray Hill, NJ, by Joe Bordonaro from GPCL.

The temperatures to which the UUT were subjected ranged from a high temperature of +50°C system ambient to a low temperature of -30°C system ambient with measurements recorded at 10°C increments

Frequency Stability performance was verified by measuring Frequency Tolerance using an MXE Signal Analyzer. Frequency Tolerance is a measurement of the difference between the actual transmit frequency and the assigned frequency (3500.01 MHz).

Frequency Block Tested: AEQU (CF = 3500.01 MHz)

(a) Set the power supply to nominal Voltage. (b) Record the frequency at ~25°C. (c) Raise EUT operating temperature to 50°C. (d) Record the frequency difference. (e) Repeat step (d) at each 10°C step down to -30°C. Result will be 10 readings and take temperature readings to establish thermal stability at each point.

Baseline Measurement at +25°C	mhz =milli-hertz
Transmit Frequency Deviation at +25	5°C at 100% of Nominal Voltage, -48VDC
Time	Transmit Carrier Deviation
(minutes)	(Hz)
0	-103.0mHz
0.5	538.55 mHz
1.0	-163.6 mHz
1.5	487.38 mHz
2.0	281.89 mHz
2.5	1.2287
3.0	873.55 mHz
SPECIFICATION	3500.01 MHz (±0.05ppm)
	± 0.05 ppm = ± 175 Hz
RESULT	PASS

Transmit Frequency Deviation at +50°C at 100% of Nominal Voltage, -48VDC	
Time	Transmit Carrier Deviation
(minutes)	(Hz)
0	413.61 mHz
0.5	169.59 mHz
1.0	445.51 mHz

1.3912
1.4279
448.40 mHz
51.765 mHz
3500.01 MHz (±0.05ppm)
\pm 0.05ppm = \pm 175Hz
PASS

Transmit Frequency Deviation at +40°C at 100% of Nominal Voltage, -48VDC	
Time	Transmit Carrier Deviation
(minutes)	(Hz)
0	738.16 mHz
0.5	1.3413
1.0	263.62 mHz
1.5	495.22 mHz
2.0	-480.6 mHz
2.5	125.20 mHz
3.0	1.2433
SPECIFICATION	3500.01 MHz (±0.05ppm)
	\pm 0.05ppm = \pm 175Hz
RESULT	PASS

Transmit Frequency Deviation at +30°C at 100% of Nominal Voltage, -48VDC	
Time	Transmit Carrier Deviation
(minutes)	(Hz)
0	-445.4 mHz
0.5	2.2132 mHz
1.0	-540.9 mHz
1.5	1.5443
2.0	1.0018
2.5	841.16 mHz
3.0	-537.8 mHz
SPECIFICATION	3500.01 MHz (±0.05ppm)
	\pm 0.05ppm = \pm 175Hz
RESULT	PASS

Transmit Frequency Deviation at +20°C at 100% of Nominal Voltage, -48VDC	
Time	Transmit Carrier Deviation
(minutes)	(Hz)
0	2.4307

AEQU

0.5	-369.0 mHz
1.0	2.0542
1.5	-207.8 mHz
2.0	458.51 mHz
2.5	1.6510
3.0	556.53 mHz
SPECIFICATION	3500.01 MHz (±0.05ppm)
	± 0.05 ppm = ± 175 Hz
RESULT	PASS

Transmit Frequency Deviation at +10°C at 100% of Nominal Voltage, -48VDC	
Time	Transmit Carrier Deviation
(minutes)	(Hz)
0	632.15 mHz
0.5	-326.0 mHz
1.0	-2.7555
1.5	-1.4039
2.0	12.111
2.5	261.32 mHz
3.0	1.9263
SPECIFICATION	3500.01 MHz (±0.05ppm)
	±0.05ppm = ± 175Hz
RESULT	PASS

Transmit Frequency Deviation at 0°C at 100% of Nominal Voltage, -48VDC	
Time	Transmit Carrier Deviation
(minutes)	(Hz)
0	1.9831
0.5	301.93 mHz
1.0	-1.3306
1.5	2.2250
2.0	-268.9 mHz
2.5	-1.1102
3.0	1.4095
SPECIFICATION	3500.01 MHz (±0.05ppm)
	\pm 0.05ppm = \pm 175Hz
RESULT	PASS

Transmit Frequency Deviation at -10°C at 100% of Nominal Voltage, -48VDC	
Time	Transmit Carrier Deviation

(minutes)	(Hz)
0	1.1038
0.5	700.39 mHz
1.0	-1.3479
1.5	212.64 mHz
2.0	-454.3 mHz
2.5	2.1493
3.0	1.0615
SPECIFICATION	3500.01 MHz (±0.05ppm)
	\pm 0.05ppm = \pm 175Hz
RESULT	PASS

Transmit Frequency Deviation at -20°C at 100% of Nominal Voltage, -48VDC	
Time	Transmit Carrier Deviation
(minutes)	(Hz)
0	-1.0511
0.5	707.47 mHz
1.0	-1.4491
1.5	432.66 mHz
2.0	994.12 mHz
2.5	1.1916
3.0	128.84 mHz
SPECIFICATION	3500.01 MHz (±0.05ppm)
	±0.05ppm = ± 175Hz
RESULT	PASS

Transmit Frequency Deviation at -30°C at 100% of Nominal Voltage, -48VDC	
Time	Transmit Carrier Deviation
(minutes)	(Hz)
0	1.3313
0.5	-79.48 mHz
1.0	2.0110
1.5	1.9011
2.0	946.11 mHz
2.5	1.0722
3.0	2.0827
SPECIFICATION	3500.01 MHz (±0.05ppm)
	±0.05ppm = ± 175Hz
RESULT	PASS

Upon return to +25°C.

 At ambient, vary voltage to +15% and -15% of nominal VAC and record frequency difference. Result will be 12 readings for each voltage (nominal, ~+ 3%, ~+6%, ~+9%, ~+12%, +15%, and nominal, ~- 3%, ~-6%, ~-9%, ~-12%, -15%).

Transmit Frequency Deviation at +25°C at 100% of Nominal Voltage, -48VDC	
Time	Transmit Carrier Deviation
(minutes)	(Hz)
0	676.90 mHz
0.5	-149.3 mHz
1.0	1.1526
1.5	277.40 mHz
2.0	1.4864
2.5	9.1178
3.0	-606.5 mHz
SPECIFICATION	3500.01 MHz (±0.05ppm)
	\pm 0.05ppm = \pm 175Hz
RESULT	PASS

Transmit Frequency Deviation at +25°C at 103% of Nominal Voltage, -49.44VDC	
Time	Transmit Carrier Deviation
(minutes)	(Hz)
0	595.30 mHz
0.5	-1.3347
1.0	-365.1 mHz
1.5	1.3395
2.0	-2.5593
2.5	-183.3 mHz
3.0	1.7113
SPECIFICATION	3500.01 MHz (±0.05ppm)
	\pm 0.05ppm = \pm 175Hz
RESULT	PASS

Fransmit Frequency Deviation at +25°C at 106% of Nominal Voltage, -50.88VDC	
Time (minutes)	Transmit Carrier Deviation (Hz)
0	1.3063
0.5	-2.5164
1.0	928.37 mHz
1.5	144.67 mHz
2.0	2.1063

2.5	-428.1 mHz
3.0	1.6926
SPECIFICATION	3500.01 MHz (±0.05ppm)
	± 0.05 ppm = ± 175 Hz
RESULT	PASS

Transmit Frequency Deviation at +25°C at 109% of Nominal Voltage, -52.32VDC	
Time	Transmit Carrier Deviation
(minutes)	(Hz)
0	1.4042
0.5	198.71 mHz
1.0	2.5559
1.5	478.22 mHz
2.0	-1.0730
2.5	943.70 mHz
3.0	721.85 mHz
SPECIFICATION	3500.01 MHz (±0.05ppm)
	±0.05ppm = ± 175Hz
RESULT	PASS

Transmit Frequency Deviation at +25°C at 112% of Nominal Voltage, -53.76VDC	
Time	Transmit Carrier Deviation
(minutes)	(Hz)
0	1.2244
0.5	6.1111
1.0	-117.4 mHz
1.5	199.05 mHz
2.0	1.2447
2.5	6.0850
3.0	712.05 mHz
SPECIFICATION	3500.01 MHz (±0.05ppm)
	±0.05ppm = ± 175Hz
RESULT	PASS

Transmit Frequency Deviation at +25°C at 115% of Nominal Voltage, -55.20VDC	
Time	Transmit Carrier Deviation
(minutes)	(Hz)
0	2.0657
0.5	-645.9 mHz
1.0	1.1556

-9.7775
517.22 mHz
2.4489
8.2997
3500.01 MHz (±0.05ppm)
\pm 0.05ppm = \pm 175Hz
PASS

Transmit Frequency Deviation at +25°C at 100% of Nominal Voltage, -48.0VDC	
Time	Transmit Carrier Deviation
(minutes)	(Hz)
0	1.1053
0.5	509.22 mHz
1.0	1.0217
1.5	1.2277
2.0	347.12 mHz
2.5	158.87 mHz
3.0	1.5507
SPECIFICATION	3500.01 MHz (±0.05ppm)
	±0.05ppm = ± 175Hz
RESULT	PASS

Transmit Frequency Deviation at +25°C at -3% of Nominal Voltage, -46.56VDC	
Time	Transmit Carrier Deviation
(minutes)	(Hz)
0	3.2517
0.5	714.69 mHz
1.0	20.716
1.5	1.1770
2.0	268.7 mHz
2.5	-601.8 mHz
3.0	14.475
SPECIFICATION	3500.01 MHz (±0.05ppm)
	\pm 0.05ppm = \pm 175Hz
RESULT	PASS

Transmit Frequency Deviation at +25°C at -6% of Nominal Voltage, -45.12VDC	
Time Transmit Carrier Deviation	
(minutes)	(Hz)
0	39.477 mHz

Product: AirScale MAA 64T64R 192AE n78 200W AEQU

0.5	-714.7 mHz
1.0	1.9172
1.5	9.3351
2.0	1.5451
2.5	229.50 mHz
3.0	10.456
SPECIFICATION	3500.01 MHz (±0.05ppm)
	± 0.05 ppm = ± 175 Hz
RESULT	PASS

Transmit Frequency Deviation at +25°C at -9% of Nominal Voltage, -43.68VDC					
Time	Transmit Carrier Deviation				
(minutes)	(Hz)				
0	-556.0 mHz				
0.5	1.2994				
1.0	1.4559 983.97 mHz				
1.5					
2.0	-919.9 mHz				
2.5	75.533 mHz				
3.0	1.1071				
SPECIFICATION	3500.01 MHz (±0.05ppm)				
	\pm 0.05ppm = \pm 175Hz				
RESULT	PASS				

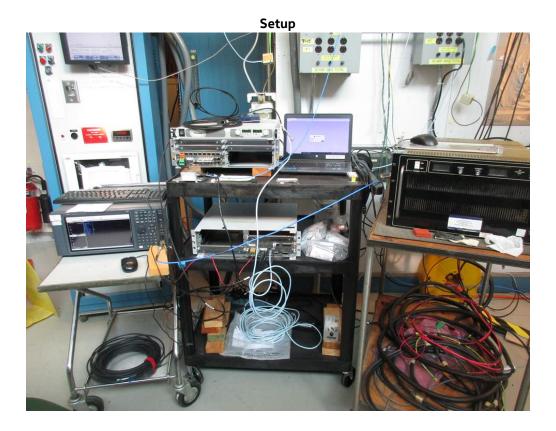
Transmit Frequency Deviation at +25°C at -12% of Nominal Voltage, -42.24VDC					
Time	Transmit Carrier Deviation				
(minutes)	(Hz)				
0	2.0577				
0.5	317.76 mHz				
1.0	-12.637 798.60 mHz				
1.5					
2.0	2.3182				
2.5	38.216 mHz				
3.0	-1.1075				
SPECIFICATION	3500.01 MHz (±0.05ppm)				
	\pm 0.05ppm = \pm 175Hz				
RESULT	PASS				

Transmit Frequency Deviation at +25°C at -15% of Nominal Voltage, -40.80VDC					
Time	Transmit Carrier Deviation				
(minutes)	(Hz)				
0	-162.2 mHz				
0.5	22.120 mHz				
1.0	-1.8047				
1.5	1.1218				
2.0	-7.265 mHz				
2.5	601.34 mHz				
3.0	-1.2780				
SPECIFICATION	3500.01 MHz (±0.05ppm)				
	\pm 0.05ppm = \pm 175Hz				
RESULT	PASS				

Photographs



Radio in thermal chamber



Serial Number



Page 55 of 58



Chamber Temperature Plot

Asset ID	Manufacturer	Туре	Description	Model	Serial	Calibration Date	Calibration Due
TH513-T15	Envirotronics	Controller	Chamber Controller	Envirotronics SPPCM	SP001316	2020-02-27	2022-02-27
TH-T15	Envirotronics	Thermal Chamber	Thermal Chamber	N/A	3015242		
TH071	Extech	Data Logger	Barometric Pressure/Humidity/ Temperature	SD700	Q668911	2019-12-27	2021-12-27
TH079	Yokogawa	Recorder		GP20	S5P506676	2020-02-25	2022-02-25
TH044	Fluke	Multimeter	DMM	83III	74910377	2020-02-25	2022-02-25
MY57431033	KeySight Technologies	MXA Signal Analyzer	20 Hz-44 GHz (Analysis Bandwidth 125 MHz)	N9020B	MY5712033	2020-07-08	2022-07-08

Test Equipment

Test Dates: 12/6/2021 - 12/8/2021.

8. NVLAP Certificate of Accreditation

