Honeywell International Inc.

EMC TEST REPORT FOR

K-Band Radar System
Model: IntuVue RDR-84K

Tested to The Following Standards:

FCC Part 2 / 87 Subpart D and F

Report No.: 103157-9

Date of issue: January 6, 2020

This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

Test Certificate # 803.01

Testing the Future
CKC LABORATORIES, INC.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

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15001 NE 36th Street
Redmond WA 98052

Representative: Glenn Wildberger
Customer Reference Number: 3503769220E

REPORT PREPARED BY:

Terri Rayle
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 103157

DATE OF EQUIPMENT RECEIPT: December 12, 2019
DATE(S) OF TESTING: December 12-17, 2019

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the equipment provided by the client, tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.

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Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information

Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
22116 23rd Drive S.E., Suite A
Canyon Park, Bothell, WA 98021

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.03.12
EMITest Immunity	5.03.10

Site Registration & Accreditation Information

Location	*NIST CB #	FCC	Japan
Canyon Park, Bothell, WA	US0081	US1022	A-0136
Brea, CA	US0060	US1025	A-0136
Fremont, CA	US0082	US1023	A-0136
Mariposa, CA	US0103	US1024	A-0136

*CKC's list of NIST designated countries can be found at: https://standards.gov/cabs/designations.html

SUMMARY OF RESULTS

Standard / Specification: FCC Part(s) 2 / 87 Subpart D and F

Test Procedure	Description	Modifications	Results
2.1046 / 87.131	RF Output Power	NA	Note 4
2.1047 / 87.132	Modulation Characteristics	NA	NA
2.1055 / 87.133	Frequency Stability	NA	Pass
2.1051 / 87.134	Spurious Emissions at Antenna Terminals	NA	NA1
2.1049 / 87.135	Occupied Bandwidth	NA	Pass
2.1053 / 87.139	Field Strength of Spurious Emissions/Emissions Mask	NA	Pass

NA = Not applicable
NA1 = Not applicable because EUT does not have antenna terminals
Note 4: Frequency, emission, and maximum power will be determined after coordination with appropriate Government agencies.

ISO/IEC 17025 Decision Rule
The declaration of pass or fail herein is based upon assessment to the specification(s) listed above, including where applicable, assessment of measurement uncertainties. For performance related tests, equipment was monitored for specified criteria identified in that section of testing.

Modifications During Testing

This list is a summary of the modifications made to the equipment during testing.

Summary of Conditions
No modifications were made during testing.

Modifications listed above must be incorporated into all production units.

Conditions During Testing

This list is a summary of the conditions noted to the equipment during testing.

Summary of Conditions
Radiated power measurements are performed in accordance with ANSI C63.26 clause 5.2.7 utilizing the following formula:P(dBm)EIRP=E(dBuV⁄m)+20LOG(d) -104.8

EQUIPMENT UNDER TEST (EUT)

During testing, numerous configurations may have been utilized. The configurations listed below support compliance to the standard(s) listed in the Summary of Results section.

Configuration 1

Equipment Tested:

Device	Manufacturer	Model #	S/N
K-Band Radar System	Honeywell International, Inc.	IntuVue RDR-84K	RAR

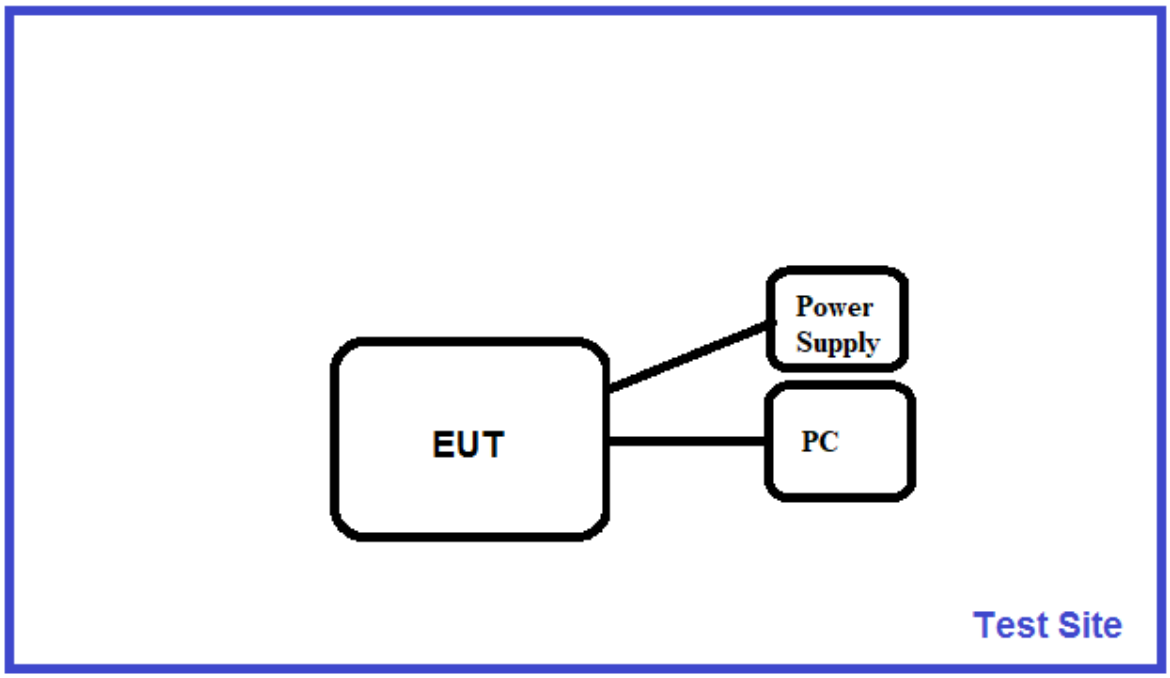
Support Equipment:

Device	Manufacturer	Model #	S/N
PC	Intel	NUC	G6BE9190006Q
Monitor	Asus	VE228	K6LMQS068777
Keyboard	Logitech	Y-U0011	1743SY005YGB
Mouse	Logitech	Y-U0026	NA
DC Supply	Agilent	E3632A OEM	MY40022357

General Product Information:

Product Information	Manufacturer-Provided Details
Equipment Type:	Stand-Alone Equipment
Modulation Type(s):	FMCW, Chirped
Antenna Type(s) and Gain:	Microstrip Patch, 17 dBi
Antenna Connection Type:	Integral
Nominal Input Voltage:	23 VDC
Firmware / Software used for Test:	SWM69005623-5BI
Temperature Range	-40°C to +70°C

Test Setup Block Diagram



FCC PART(S) 2 / 87

2.1046 / 87.131 RF Power Output

Test Setup/Conditions			
Test Location:	Bothell Lab C3	Test Engineer:	M. Harrison
Test Method:	ANSI C63.26: 2015	Test Date(s):	12/12/2019 & 12/17/2019
Configuration:	1		
Test Setup:	Firmware power setting: Max Power Software: SWM69005623-5BI Protocol / Modulation: FMCW Test Mode: UUT is continuously transmitting Test Setup: The EUT is sitting on an 80cm test table for below 1GHz and 150cm test table for above 1GHz. The EUT is connected to the support equipment outside the chamber through the EMI Harness		

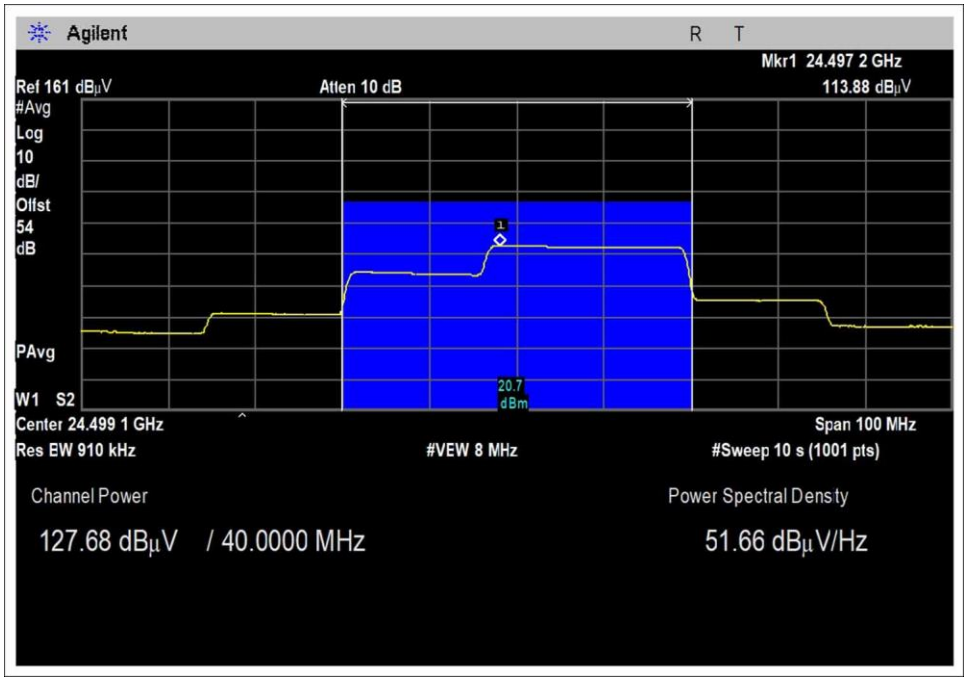
Environmental Conditions			
Temperature (ºC)	22	Relative Humidity (%):	35

Test Equipment					
Asset#	**Description**	**Manufacturer**	**Model**	**Cal Date**	**Cal Due**
02112	Horn Antenna	HP	84125-80008	10/8/2019	10/8/2021
02871	Spectrum Analyzer	Agilent	E4440A	10/15/2019	10/15/2021
02757	Temperature Chamber	Bemco	F100/350-8	12/20/2018	12/20/2020
03029	Thermometer, Digital Infrared	Fluke	566	2/20/2019	2/20/2021
02673	Spectrum Analyzer	Agilent	E4446A	2/22/2019	2/22/2021

Test Data Summary					
Temperature (ºC)	**Voltage**	**Power (dBm)**	**Power Watts**	**Limit Watts**	**Results**
-40	$V_{Nominal}$	31.27	1.34	None	Pass
-30	$V_{Nominal}$	31.94	1.56	None	
-20	$V_{Nominal}$	31.96	1.57	None	
-10	$V_{Nominal}$	32.28	1.69	None	
0	$V_{Nominal}$	32.21	1.66	None	
10	$V_{Nominal}$	32.29	1.69	None	
20	$V_{Minimum}$	32.35	1.72	None	
20	$V_{Nominal}$	32.45	1.76	None	
20	$V_{Maximum}$	32.13	1.63	None	
30	$V_{Nominal}$	31.55	1.43	None	
40	$V_{Nominal}$	30.95	1.24	None	
50	$V_{Nominal}$	31.21	1.32	None	
60	$V_{Nominal}$	29.10	0.81	None	
70	$V_{Nominal}$	29.56	0.90	None	

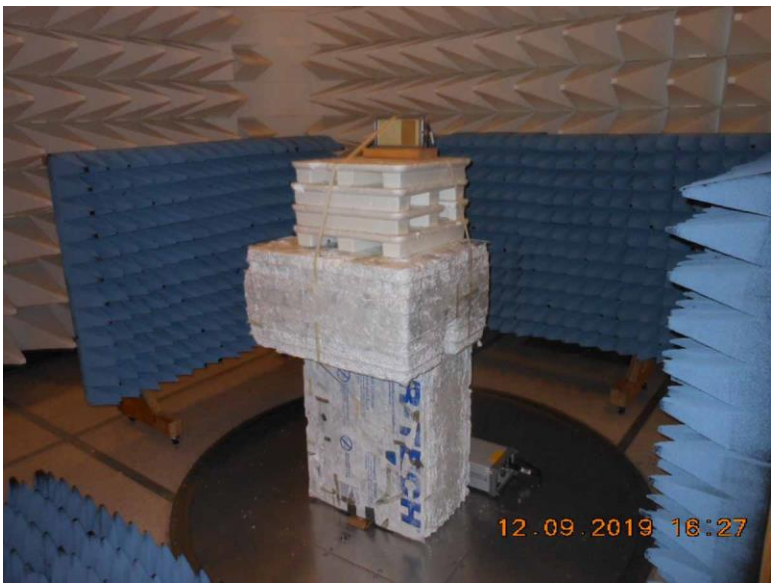
Transmit power =Pt =$(E \cdot d)$^2/(30 G)
EIRP = Pt x G
= $(E \cdot d)$^2/(30)
= (2.42*3)^2 / (30) , note (127.67dBuV = 2.42V)
= 1.76W
= 32.45 dBm

Plots



Average Channel Power

Test Setup Photo(s)



Above 1GHz

Above 1GHz

Temperature Test Setup

Temperature Test Setup

2.1055 / 87.133 Frequency Stability

Test Setup/Conditions			
Test Location:	Bothell Lab Bench	Test Engineer:	M. Harrison
Test Method:	ANSI C63.26: 2015	Test Date(s):	12/12/2019
Configuration:	1		
Test Setup:	Firmware power setting: Max Power Software: SWM69005623-5BI Protocol / Modulation: FMCW Test Mode: UUT is continuously transmitting Test Setup: The EUT is sitting in a temp chamber with a receive antenna 15cm away. The EUT is connected to the support equipment outside the chamber through the EMI Harness		

Environmental Conditions			
Temperature (ºC)	20	Relative Humidity (%):	33

Test Equipment					
Asset#	**Description**	**Manufacturer**	**Model**	**Cal Date**	**Cal Due**
02112	Horn Antenna	HP	84125-80008	10/8/2019	10/8/2021
02871	Spectrum Analyzer	Agilent	E4440A	10/15/2019	10/15/2021
02757	Temperature Chamber	Bemco	F100/350-8	12/20/2018	12/20/2020
03029	Thermometer, Digital Infrared	Fluke	566	2/20/2019	2/20/2021
02673	Spectrum Analyzer	Agilent	E4446A	2/22/2019	2/22/2021

Test Data Summary					
Temperature (ºC)	**Voltage**	**Frequency (GHz)**	**Deviation (PPM)**	**Limit (PPM)**	**Results**
-40	$V_{Nominal}$	24.51608	30.96239	5000	Pass
-30	$V_{Nominal}$	24.51619	26.68778	5000	
-20	$V_{Nominal}$	24.51619	26.44305	5000	
-10	$V_{Nominal}$	24.51616	27.93590	5000	
0	$V_{Nominal}$	24.51612	29.44099	5000	
10	$V_{Nominal}$	24.51600	34.18059	5000	
20	$V_{Minimum}$	24.51721	15.18548	5000	
20	$V_{Nominal}$	24.51684	0.00000	5000	
20	$V_{Maximum}$	24.51768	34.11940	5000	
30	$V_{Nominal}$	24.51588	39.25873	5000	
40	$V_{Nominal}$	24.51587	39.58911	5000	
50	$V_{Nominal}$	24.51591	38.07587	5000	
60	$V_{Nominal}$	24.51595	36.24447	5000	
70	$V_{Nominal}$	24.51647	14.96930	5000	
Nominal Frequency:		24.51684			

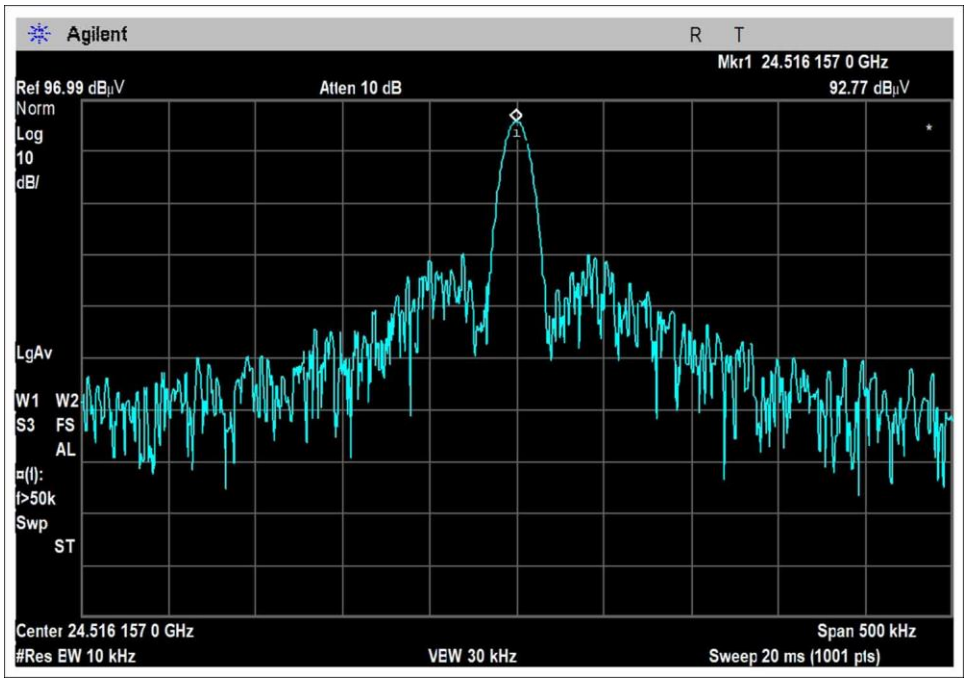
Limit for Radionavigation stations in the 10.5 to 40 GHz Band used per FCC Part 87.133 (a) (9)

Parameter Definitions:

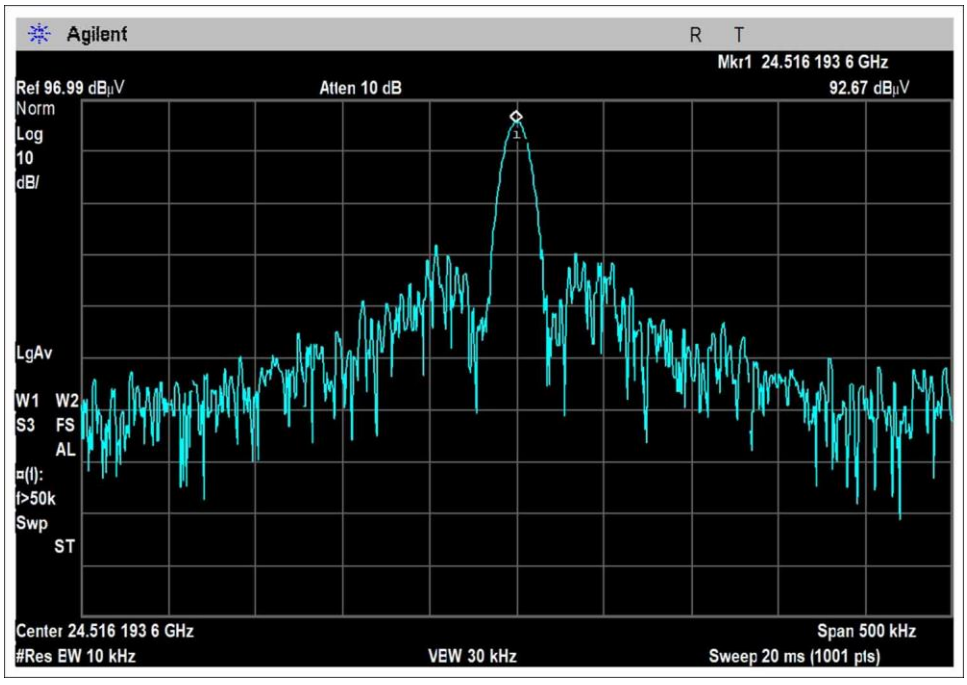
Measurements performed at input voltage Vnominal ± 15%.

Parameter	Value
$V_{Nominal}$:	19.55 VDC
$V_{Minimum}$:	23 VDC
$V_{Maximum}$:	26.45 VDC

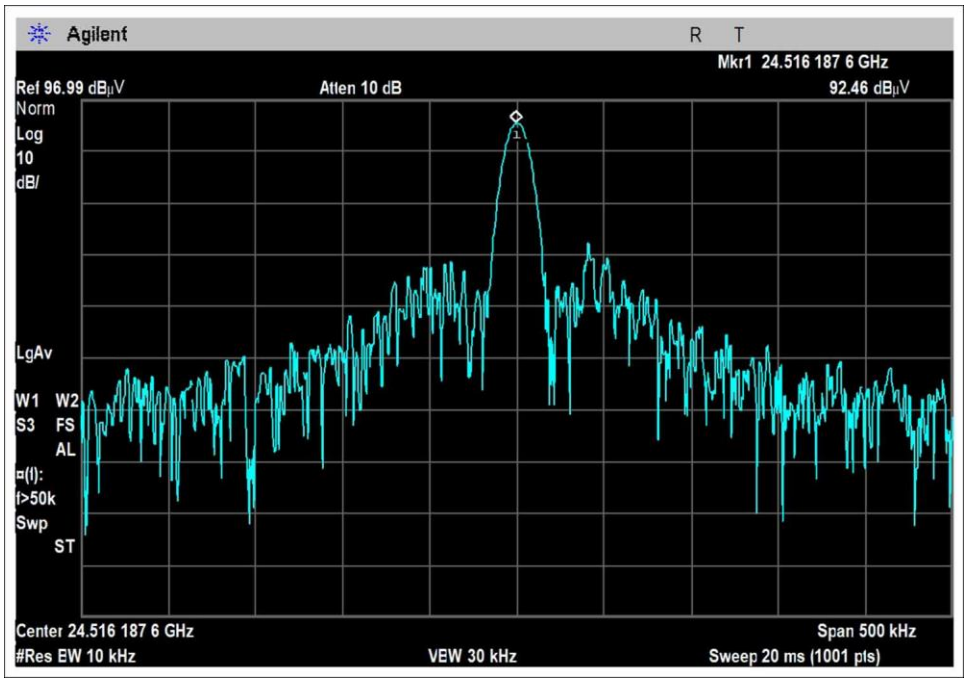
Plot(s)



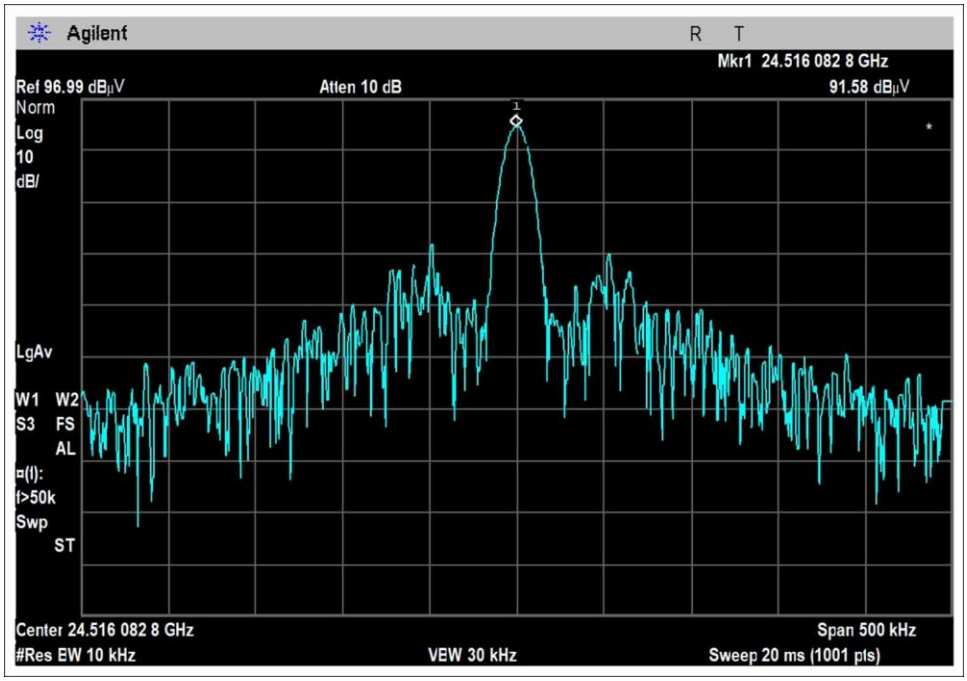
- 10C FS Nom Voltage



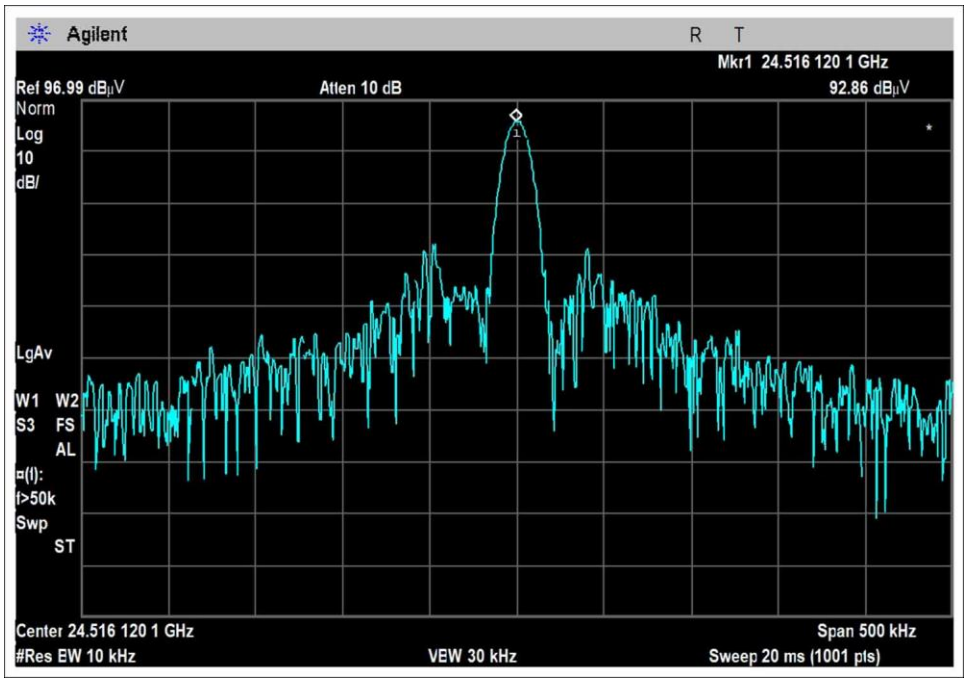
- 20C FS Nom Voltage



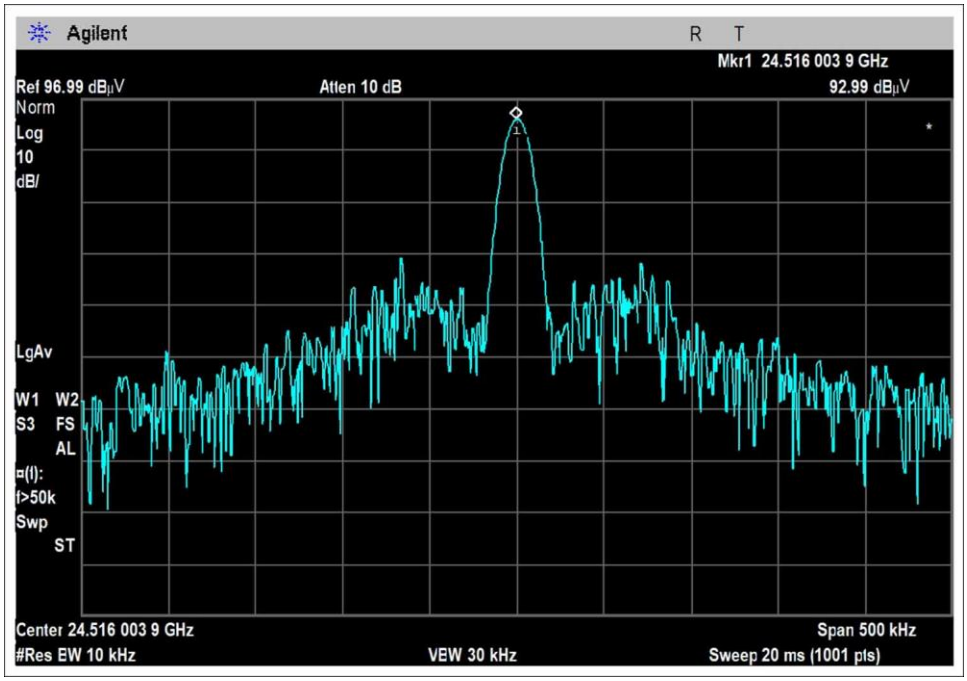
- 30C FS Nom Voltage



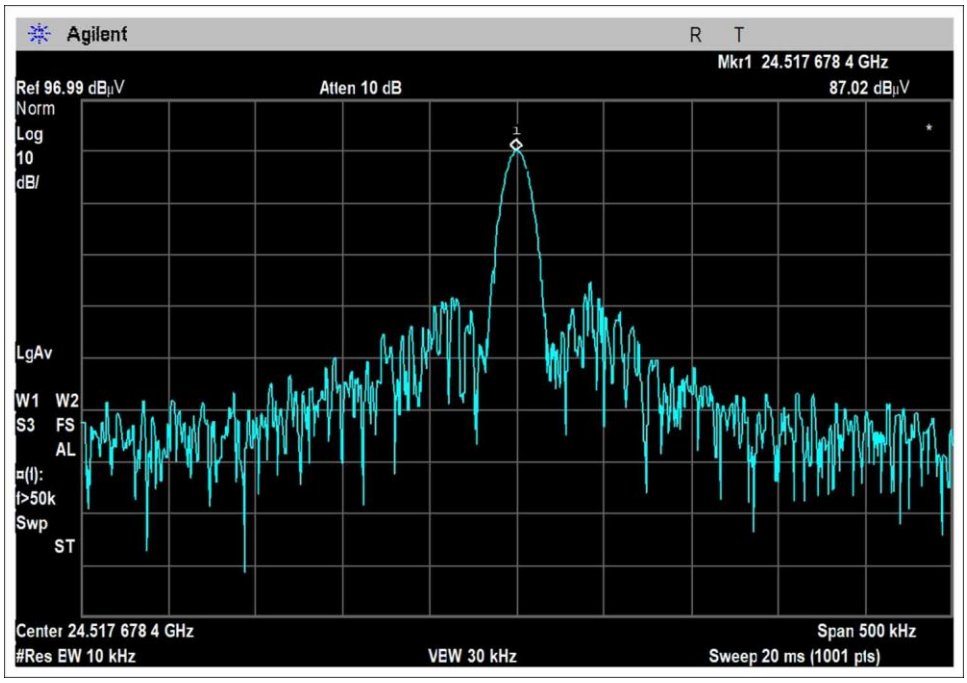
- 40C FS Nom Voltage



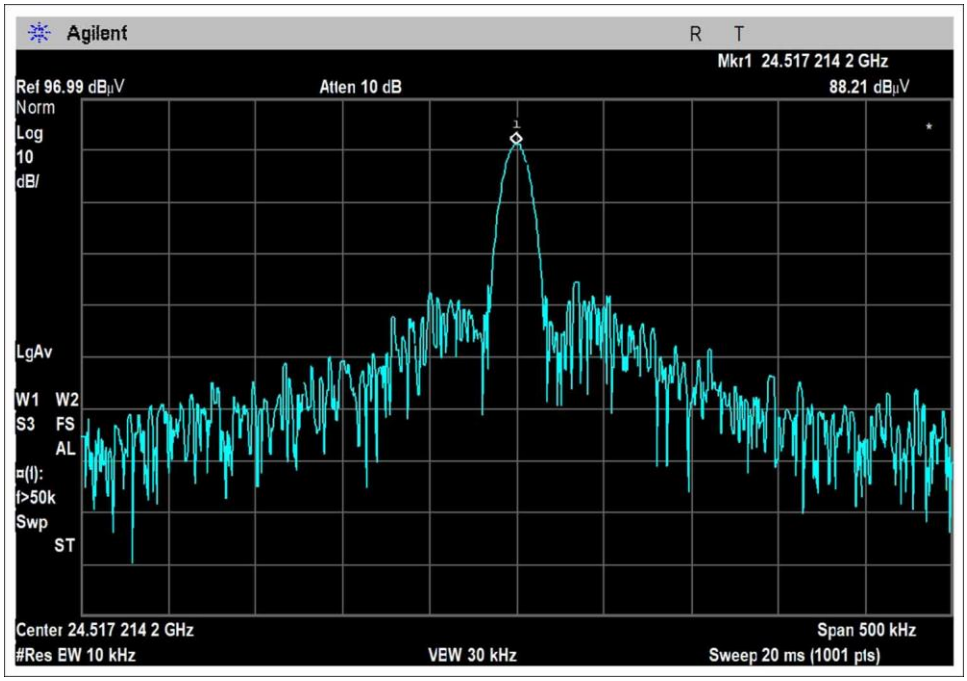
+0C FS Nom Voltage



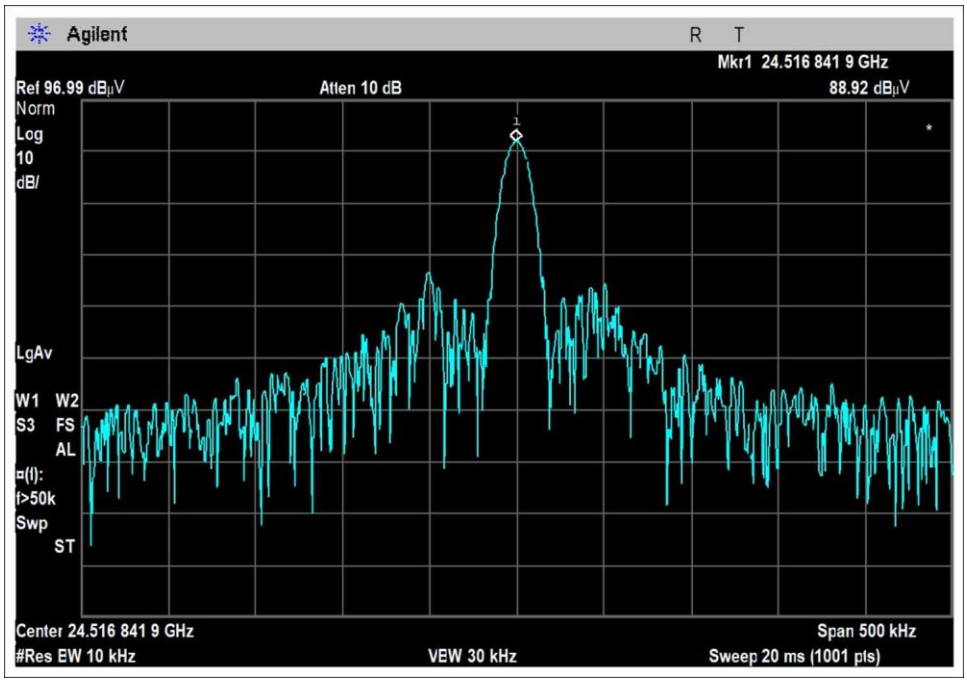
+10C FS Nom Voltage



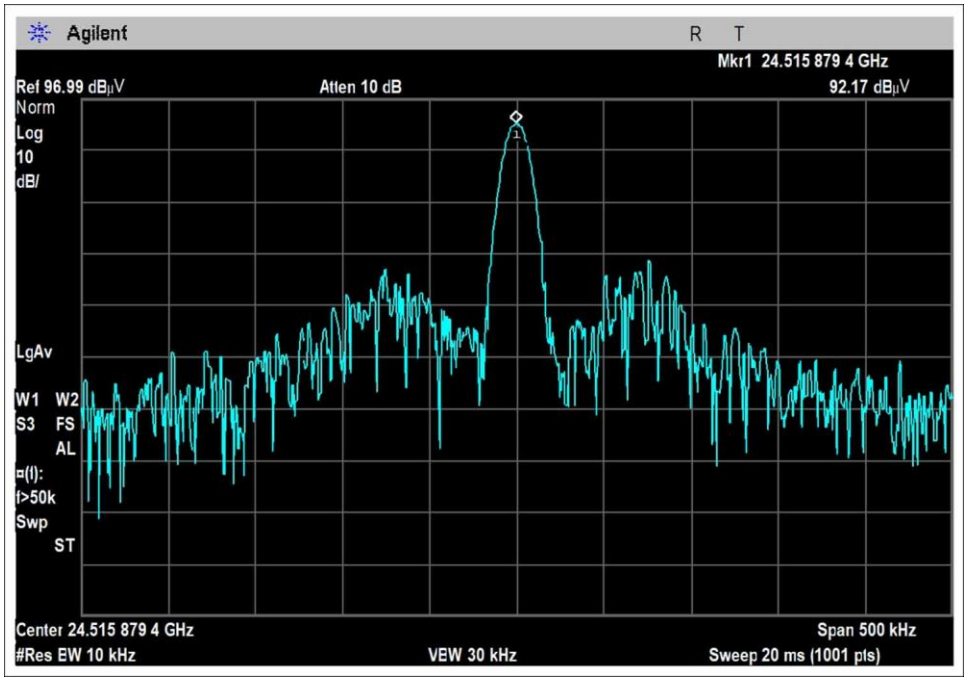
+20C FS High Voltage



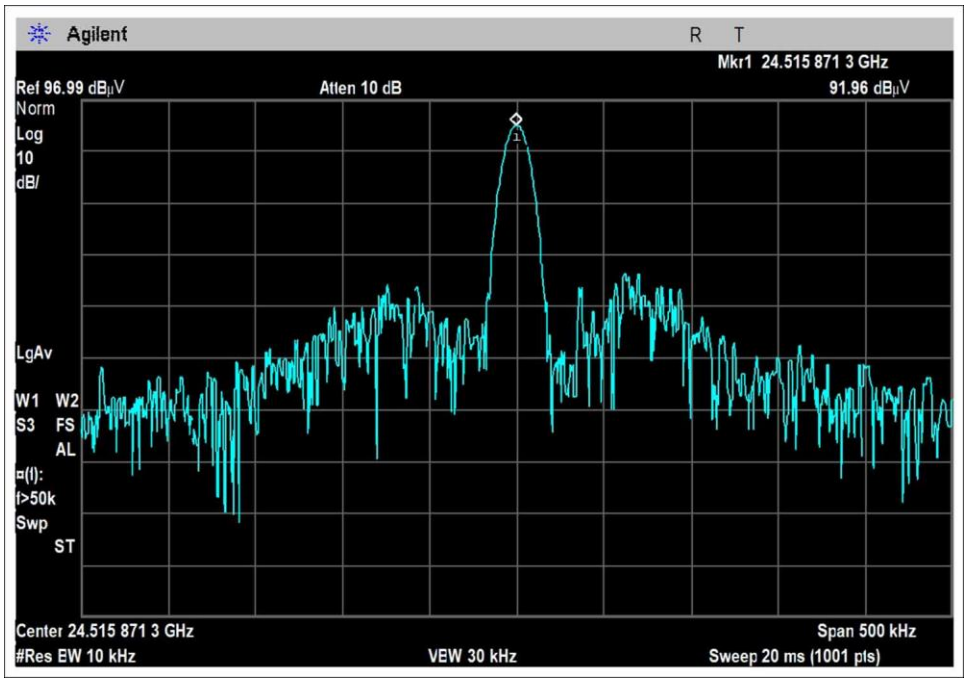
+20C FS Low Voltage



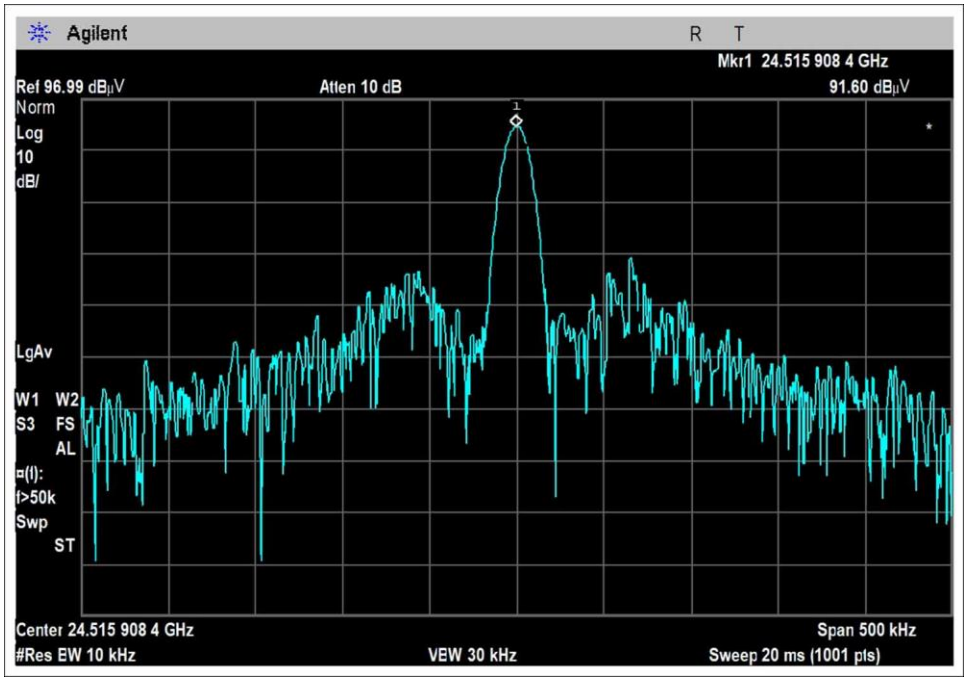
+20C FS Nom Voltage



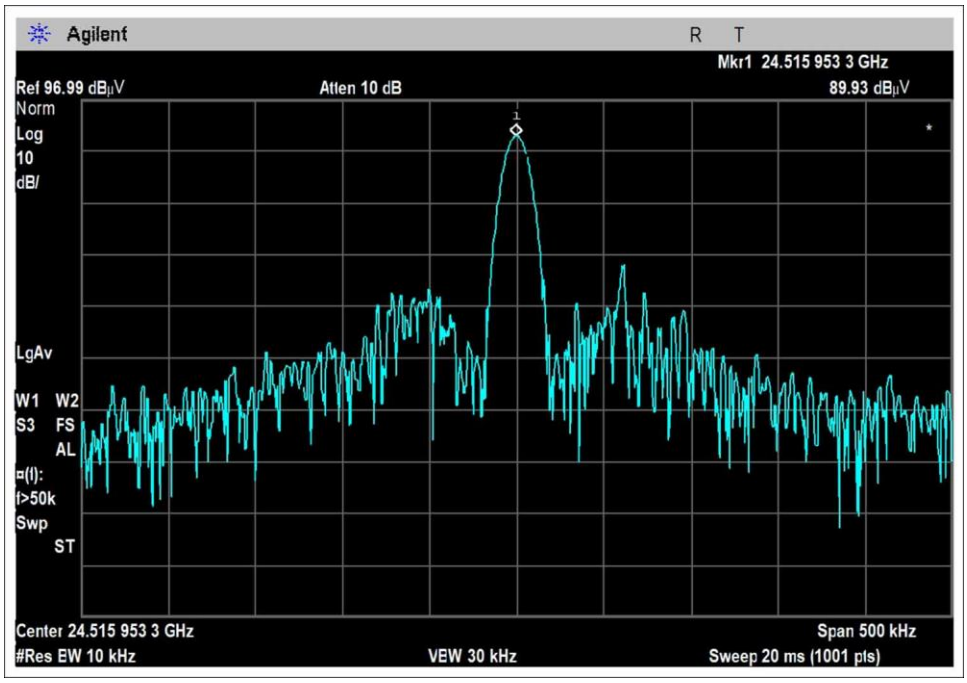
+30C FS Nom Voltage



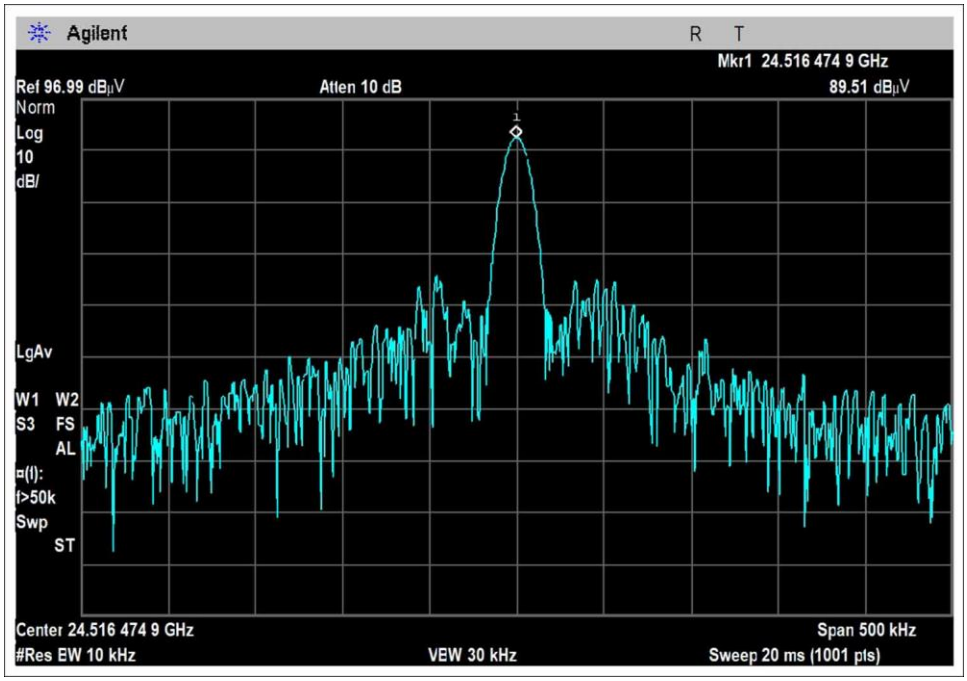
+40C FS Nom Voltage



+50C FS Nom Voltage



+60C FS Nom Voltage



+70C FS Nom Voltage

Test Setup Photo(s)

Temperature Test Setup

Temperature Test Setup

2.1049 / 87.135 Occupied Bandwidth

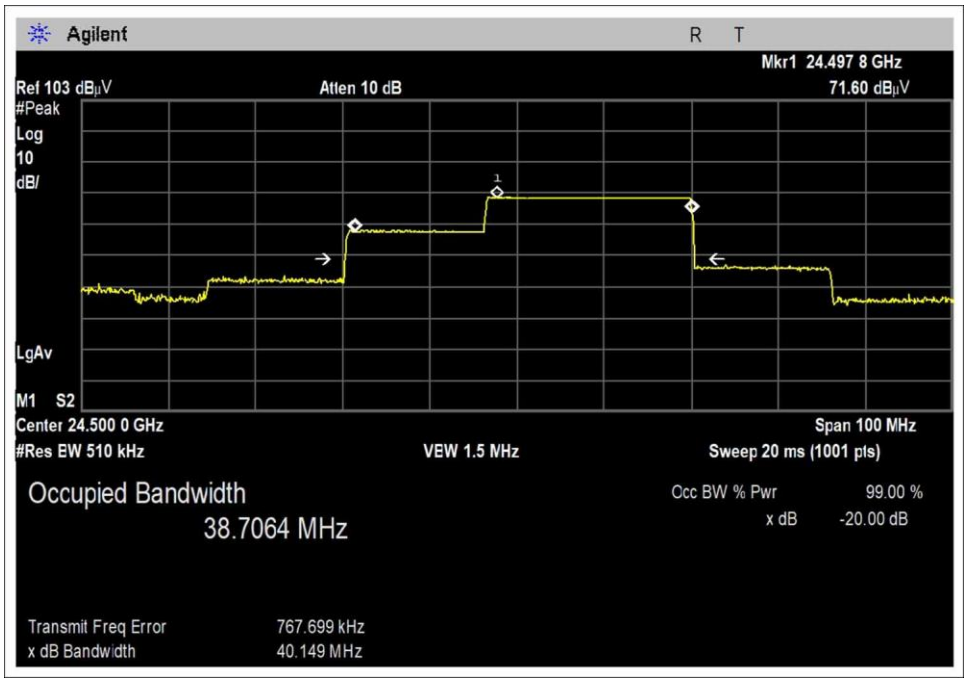
Test Setup/Conditions			
Test Location:	Bothell Lab C3	Test Engineer:	M. Harrison
Test Method:	FCC CFR 47, Part 2.1049	Test Date(s):	12/10/2019
Configuration:	1		
Test Setup:	Firmware power setting: Max Power Software: SWM69005623-5BI Protocol / Modulation: FMCW Test Mode: UUT is continuously transmitting Test Setup: The EUT is sitting on a 150cm test table for above 1GHz. The EUT is connected to the support equipment outside the chamber through the EMI Harness.		

Environmental Conditions			
Temperature (ºC)	22	Relative Humidity (%):	35

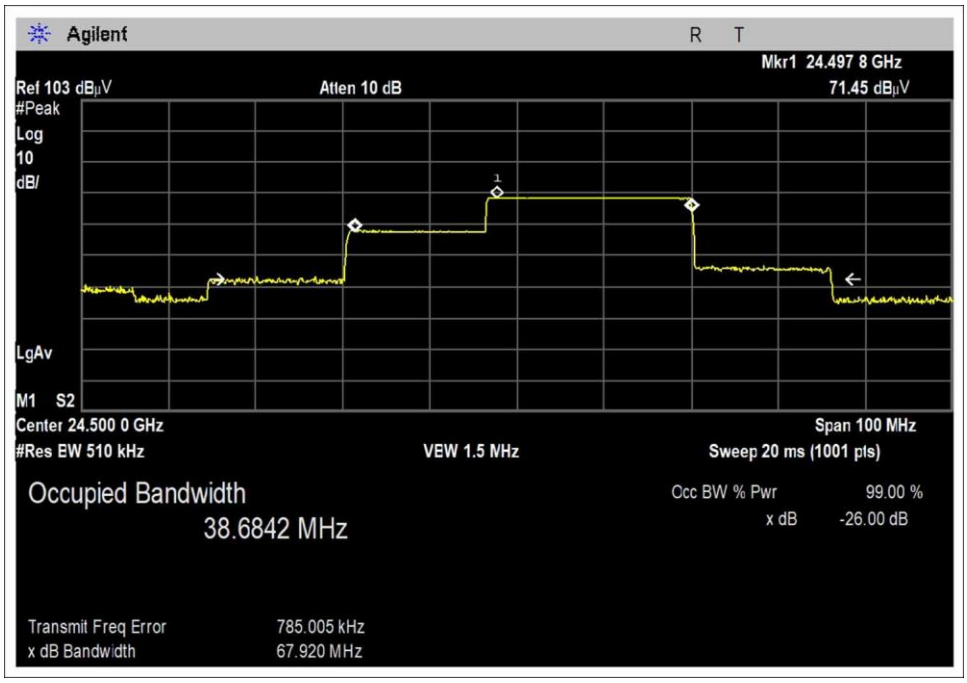
Test Equipment					
Asset#	**Description**	**Manufacturer**	**Model**	**Cal Date**	**Cal Due**
02112	Horn Antenna	HP	84125-80008	10/8/2019	10/8/2021
02673	Spectrum Analyzer	Agilent	E4446A	2/22/2019	2/22/2021

Test Data Summary					
Frequency (GHz)	**Antenna Port**	**Modulation**	**Measured (MHz)**	**Limit**	**Results**
24.5	1	FMCW	67.92	None	Pass

Plot(s)

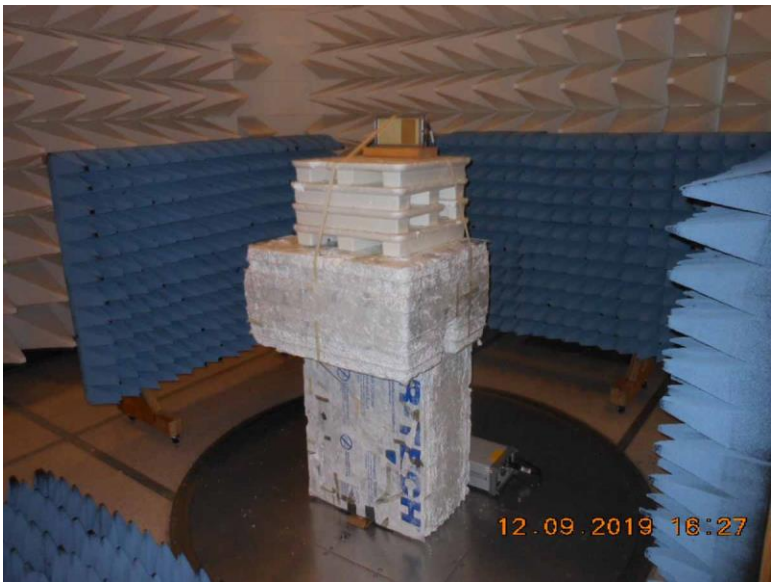


-20dB



-26dB

Test Setup Photo(s)



Above 1GHz

Above 1GHz

2.1053 / 87.139 Emissions Limitations Radiated

Test Setup/Conditions			
Test Location:	Bothell Lab C3	Test Engineer:	M. Harrison
Test Method:	ANSI C63.26: 2015	Test Date(s):	12/13/2019-12/17/2019
Configuration:	1		
Test Setup:	Firmware power setting: Max Power Software: SWM69005623-5BI Protocol / Modulation: FMCW Test Mode: UUT is continuously transmitting Test Setup: The EUT is sitting on an 80cm test table for below 1GHz and 150cm test table for above 1GHz. The EUT is connected to the support equipment outside the chamber through the EMI Harness.		

Environmental Conditions			
Temperature (ºC)	25	Relative Humidity (%):	35

Test Equipment					
Asset#	Description	Manufacturer	Model	Cal Date	Cal Due
01467	Horn Antenna	EMCO	3115	7/5/2019	7/5/2021
02112	Horn Antenna	HP	84125-80008	10/8/2019	10/8/2021
02307	Preamp	HP	8447D	1/15/2018	1/15/2020
02673	Spectrum Analyzer	Agilent	E4446A	2/22/2019	2/22/2021
02743	Active Horn Antenna	Miteq	AMFW-5F-260400-33-8P	4/26/2019	4/26/2021
00052	Loop Antenna	EMCO	6502	5/7/2018	5/7/2020
P06123	Attenuator	Aeroflex	18N-6	4/5/2019	4/5/2021
03540	Preamp	HP	83017A	5/13/2019	5/13/2021
03628	Biconilog Antenna	ETS	3142E	6/11/2019	6/11/2021
02347	Horn Antenna	OML	M19HWA	3/6/2019	3/6/2021
02348	Horn Antenna	OML	M12HWA	3/6/2019	3/6/2021
02349	Horn Antenna	OML	M08HWA	3/6/2019	3/6/2021
02350	Horn Antenna	OML	M05HWA	3/6/2019	3/6/2021
P05915	Diplexor	OML	DPL26	3/6/2019	3/6/2021
02741	Active Horn Antenna	Miteq	AMFW-5F-12001800-20-10P	4/26/2019	4/26/2021

Test Data Summary

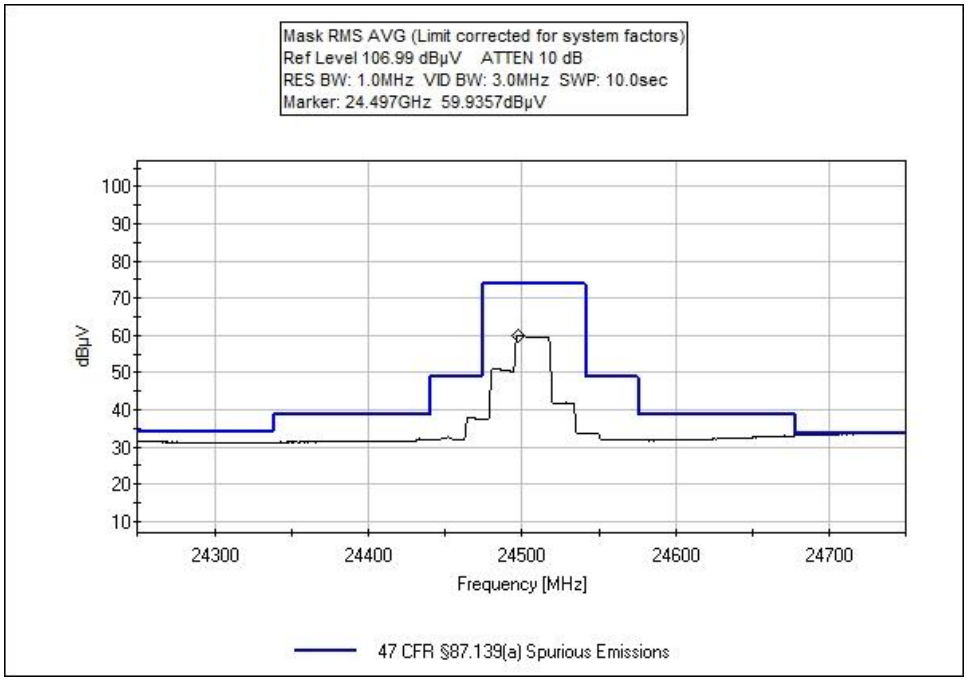
Limit Definition:

Highest Measured Power:	1.8 dBm
Measurement Distance:	3 meters and 0.5 meters above 40GHz

Frequency Range		**Limit (dBc)**	**Limit Calculation**	
9kHz - 100GHz		40	NA	
Frequency (MHz)	**Reference Level (dBm)**	**Measured (dBc)**	**Margin**	**Antenna Polarity**
37335.000	-55.5	57.3	-17.3	Horizontal
49032.000	-59.1	60.9	-20.9	Horizontal
991.861	-66.1	67.9	-27.9	Horizontal
12251.000	-67.6	69.4	-29.4	Horizontal
25002.000	-87.0	88.8	-48.8	Horizontal

Both horizontal and vertical were investigated, worst case reported.

Plot(s)



Notes: In a reduced RBW no EUT signals were observed on edges of mask.

The 87.139 emissions mask was created for an aircraft station utilizing parameters of the power (Py) from the measured channel power, the authorized bandwidth (ABW) from the measured 26dB bandwidth.

Test Setup/Conditions/Data

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive SE • Bothell, WA 98021 • 800-500-4362		
Customer:	**Honeywell**		
Specification:	**47 CFR §87.139(a) Spurious Emissions**		
Work Order #:	**103157**	Date:	12/10/2019
Test Type:	**Maximized Emissions**	Time:	8:26:47 AM
Tested By:	Matthew Harrison	Sequence#:	16
Software:	EMITest 5.03.12		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

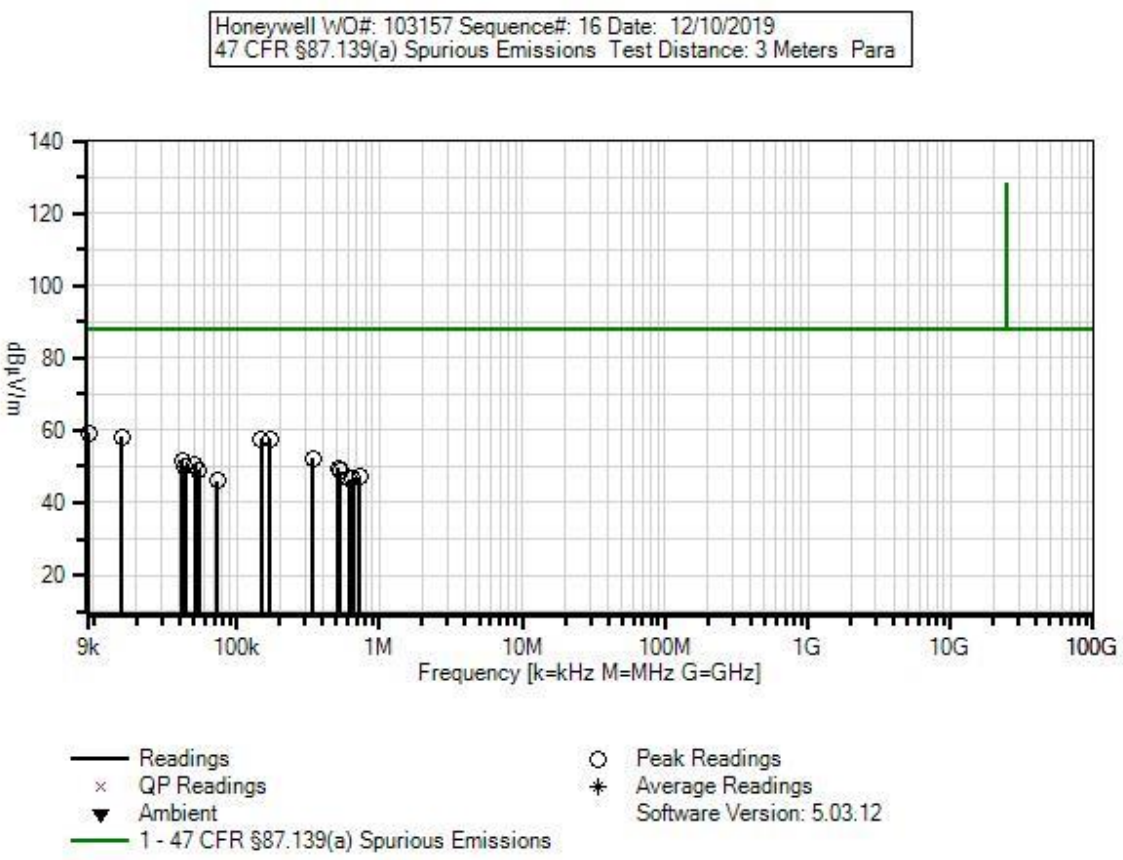
Temperature: 22°C
Humidity: 34%
Pressure: 102.8 kPa

Frequency Range: 9k-30 MHz (Highest Clock 24GHz)

Test Method: ANSI C63.26: 2015

Setup:
The EUT is setup in a tabletop configuration 80 cm high on a Styrofoam table.
It is connected to a power supply and a remote PC via Ethernet and wiring harness.
The Transmitter is active.

No readings observed within 20dB from 9 kHz-30 MHz


Honeywell WO#: 103157 Sequence#: 16 Date: 12/10/2019
47 CFR §87.139(a) Spurious Emissions Test Distance: 3 Meters Para
140
120
100
80
60
40
20
dBµV/m
9k
100k
1M
10M
100M
1G
10G
100G
Frequency [k=kHz M=MHz G=GHz]
Readings
QP Readings
Ambient
1 - 47 CFR §87.139(a) Spurious Emissions
Peak Readings
Average Readings
Software Version: 5.03.12

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
T1	AN00052	Loop Antenna	6502	5/7/2018	5/7/2020
T2	ANP06515	Cable	Heliax	6/29/2018	6/29/2020
T3	ANP06540	Cable	Heliax	8/23/2019	8/23/2021

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	9.250k	43.0	+16.3	+0.0	+0.0		+0.0	59.3	87.8	-28.5	Para
2	15.773k	45.4	+12.7	+0.0	+0.0		+0.0	58.1	87.8	-29.7	Para
3	150.000k	48.0	+9.7	+0.0	+0.0		+0.0	57.7	87.8	-30.1	Para
4	170.907k	47.9	+9.7	+0.0	+0.0		+0.0	57.6	87.8	-30.2	Para
5	342.344k	42.7	+9.6	+0.0	+0.0		+0.0	52.3	87.8	-35.5	Para
6	41.991k	41.2	+10.4	+0.0	+0.0		+0.0	51.6	87.8	-36.2	Para
7	50.897k	40.5	+10.2	+0.0	+0.0		+0.0	50.7	87.8	-37.1	Para
8	43.371k	39.7	+10.3	+0.0	+0.0		+0.0	50.0	87.8	-37.8	Para
9	511.691k	39.9	+9.7	+0.0	+0.0		+0.0	49.6	87.8	-38.2	Para
10	54.033k	38.8	+10.0	+0.0	+0.0		+0.0	48.8	87.8	-39.0	Para
11	528.417k	39.1	+9.7	+0.0	+0.0		+0.0	48.8	87.8	-39.0	Para
12	727.033k	37.2	+9.9	+0.0	+0.0		+0.0	47.1	87.8	-40.7	Para
13	651.768k	37.0	+9.8	+0.0	+0.0		+0.0	46.8	87.8	-41.0	Para
14	616.226k	36.8	+9.7	+0.0	+0.0		+0.0	46.5	87.8	-41.3	Para
15	73.602k	36.5	+9.6	+0.0	+0.0		+0.0	46.1	87.8	-41.7	Para

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive SE • Bothell, WA 98021 • 800-500-4362		
Customer:	**Honeywell**		
Specification:	**47 CFR §87.139(a) Spurious Emissions**		
Work Order #:	**103157**	Date:	12/10/2019
Test Type:	**Maximized Emissions**	Time:	7:31:31 AM
Tested By:	Matthew Harrison	Sequence#:	13
Software:	EMITest 5.03.12		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

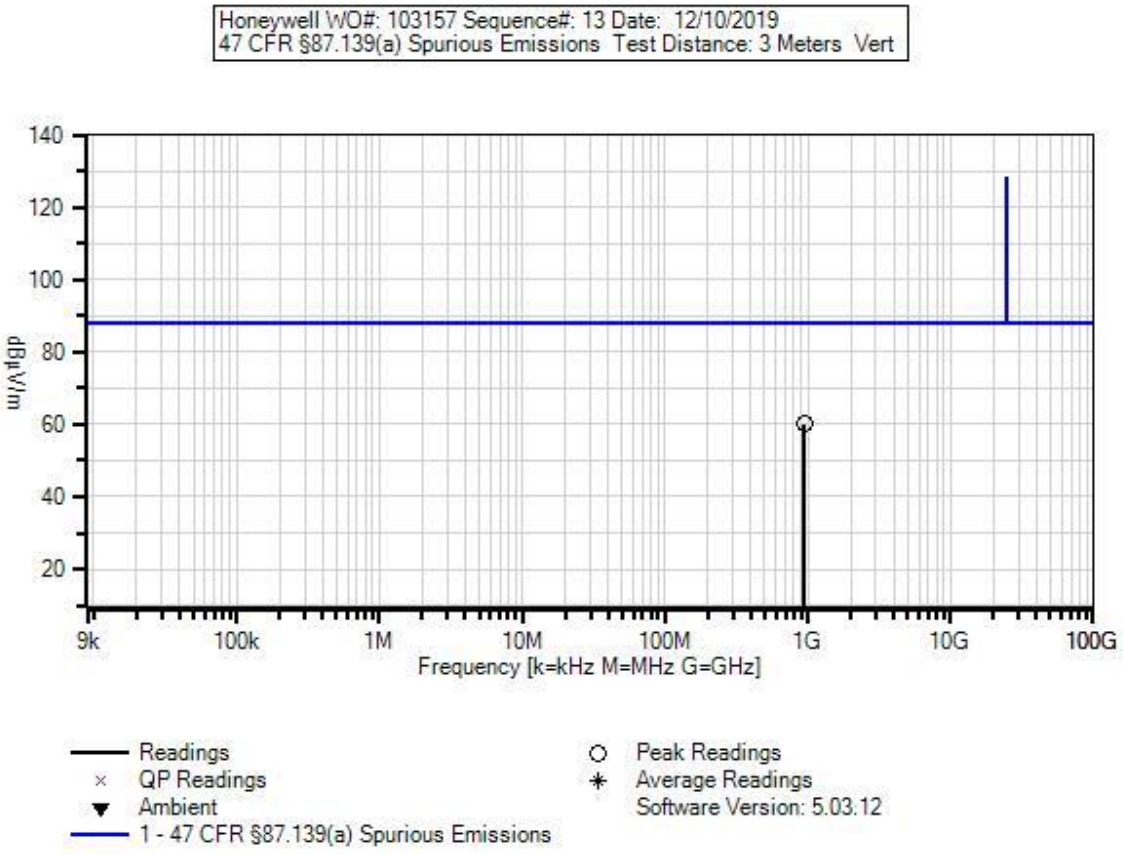
Temperature: 22°C
Humidity: 34%
Pressure: 102.8 kPa

Frequency Range: 30-1000 MHz (Highest Clock 24GHz)

Test Method: ANSI C63.26: 2015

Setup:
The EUT is setup in a tabletop configuration 80 cm high on a Styrofoam table.
It is connected to a power supply and a remote PC via Ethernet and wiring harness.
The Transmitter is active.

No readings observed within 20dB from 30-1000 MHz



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
T1	AN03628	Biconilog Antenna	3142E	6/11/2019	6/11/2021
T2	ANP06123	Attenuator	18N-6	4/5/2019	4/5/2021
T3	ANP05305	Cable	ETSI-50T	9/6/2019	9/6/2021
T4	ANP05360	Cable	RG214	1/31/2018	1/31/2020
T5	ANP06540	Cable	Heliax	8/23/2019	8/23/2021

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	945.841M	26.0	+24.4 +0.4	+5.8	+1.5	+2.0	+0.0	60.1	87.8	-27.7	Vert

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive SE • Bothell, WA 98021 • 800-500-4362		
Customer:	**Honeywell**		
Specification:	**47 CFR §87.139(a) Spurious Emissions**		
Work Order #:	**103157**	Date:	12/17/2019
Test Type:	**Maximized Emissions**	Time:	13:18:11
Tested By:	Matthew Harrison	Sequence#:	12
Software:	EMITest 5.03.12		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

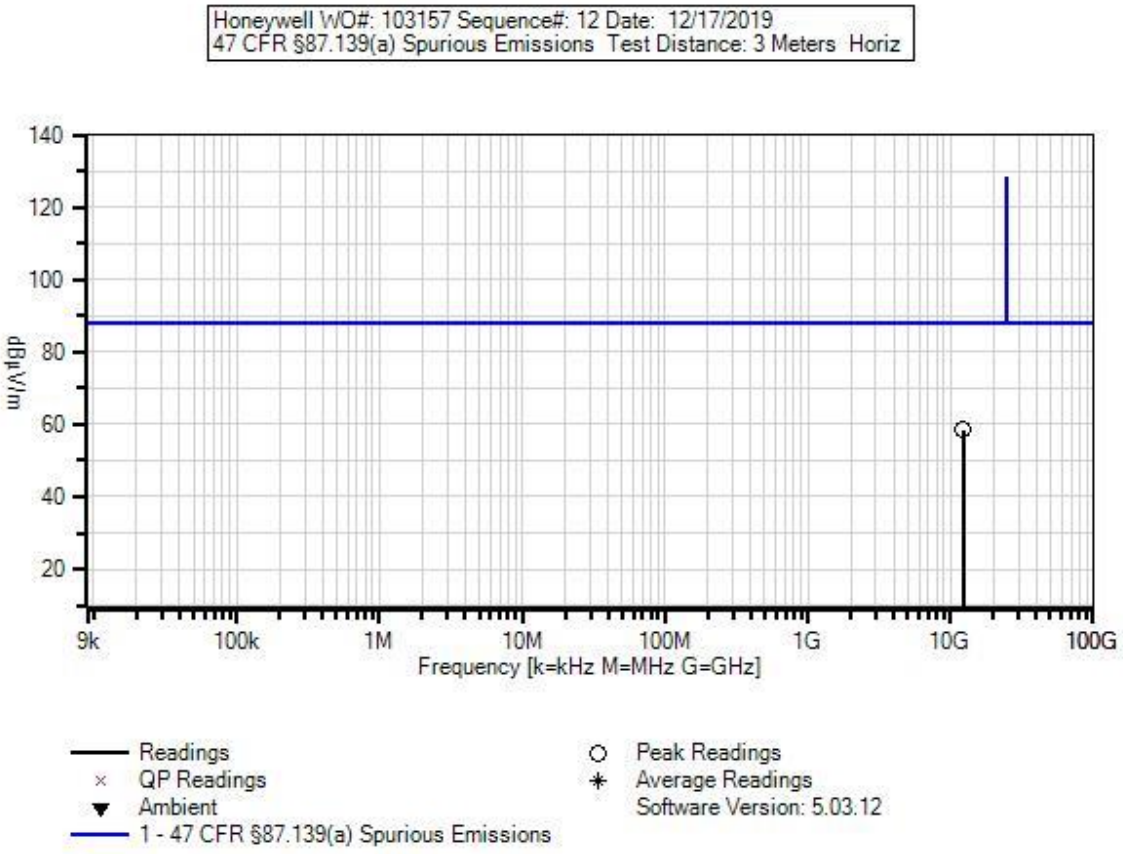
Temperature: 22°C
Humidity: 34%
Pressure: 102.8 kPa

Frequency Range: 1-18 GHz (Highest Clock 24GHz)

Test Method: ANSI C63.26: 2015

Setup:
The EUT is setup in a tabletop configuration 150 cm high on a Styrofoam table.
It is connected to a power supply and a remote PC via Ethernet and wiring harness.
The Transmitter is active.

No readings observed within 20dB from 1-18 GHz



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
	AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	7/5/2019	7/5/2021
T1	ANP06515	Cable	Heliax	6/29/2018	6/29/2020
T2	ANP06540	Cable	Heliax	8/23/2019	8/23/2021
T3	AN02741	Active Horn Antenna	AMFW-5F-12001800-20-10P	4/26/2019	4/26/2021

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	12251.000 M	63.0	+6.9	+1.4	-12.9		+0.0	58.4	87.8	-29.4	Horiz

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive SE • Bothell, WA 98021 • 800-500-4362		
Customer:	**Honeywell**		
Specification:	**47 CFR §87.139(a) Spurious Emissions**		
Work Order #:	**103157**	Date:	12/17/2019
Test Type:	**Maximized Emissions**	Time:	13:03:47
Tested By:	Matthew Harrison	Sequence#:	20
Software:	EMITest 5.03.12		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

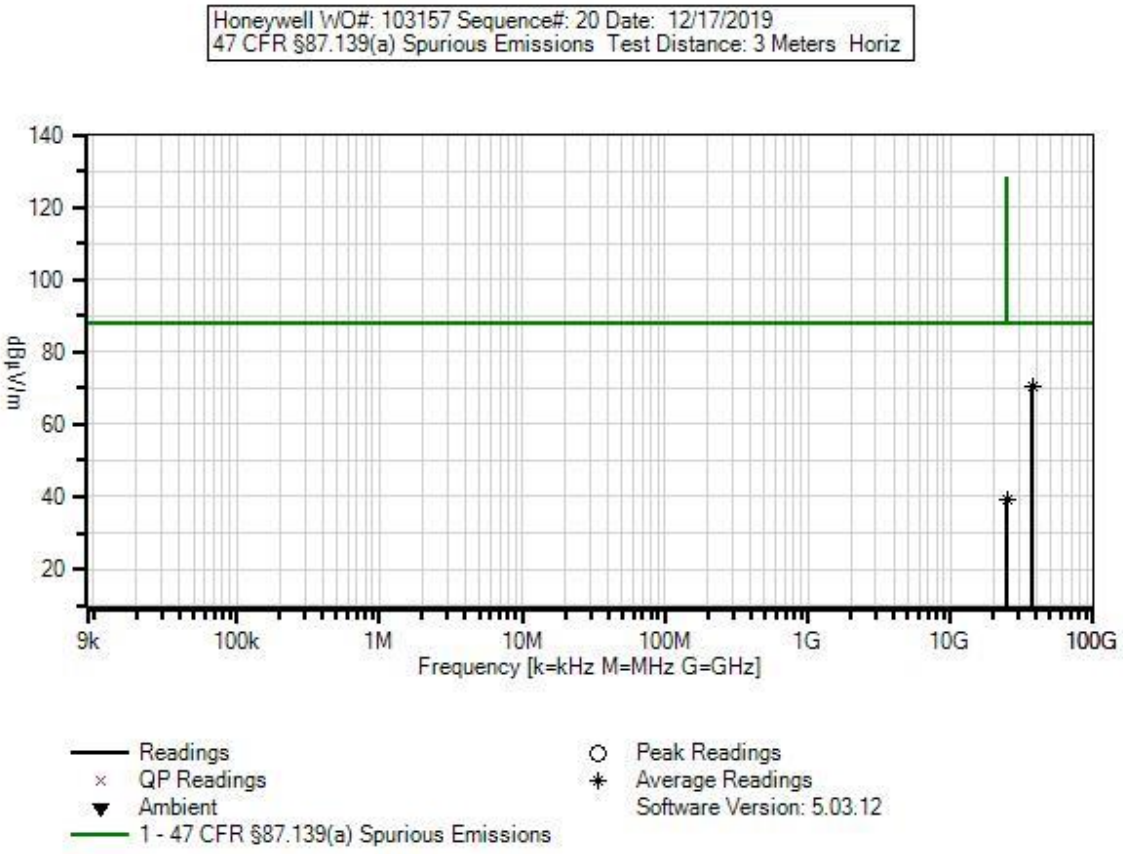
Test Conditions / Notes:

Temperature: 22°C
Humidity: 34%
Pressure: 102.8 kPa

Frequency Range: 18-45 GHz (Highest Clock 24GHz)

Test Method: ANSI C63.26: 2015

Setup:
The EUT is setup in a tabletop configuration 150 cm high on a Styrofoam table.
It is connected to a power supply and a remote PC via Ethernet and wiring harness.
The Transmitter is active.


Honeywell WO#: 103157 Sequence#: 20 Date: 12/17/2019
47 CFR §87.139(a) Spurious Emissions Test Distance: 3 Meters Horiz
140
120
100
80
60
40
20
dBµV/m
9k
100k
1M
10M
100M
1G
10G
100G
Frequency [k=kHz M=MHz G=GHz]
Readings
QP Readings
Ambient
1 - 47 CFR §87.139(a) Spurious Emissions
Peak Readings
Average Readings
Software Version: 5.03.12

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
T2	AN02763-69	Waveguide	Multiple	4/23/2018	4/23/2020
T3	ANP06678	Cable	32026-29801-29801-144	3/13/2018	3/13/2020
T4	ANP07211	Cable	32026-29801-29801-18	8/7/2019	8/7/2021
T5	ANP07212	Cable	32026-29801-29801-18	8/7/2019	8/7/2021
	AN02112	Horn Antenna-ANSI C63.5 3m	84125-80008	10/8/2019	10/8/2021
	ANP06242	Attenuator	54A-10	3/13/2018	3/13/2020
	ANP06243	Attenuator	54A-10	3/13/2018	3/13/2020
T6	AN02743	Active Horn Antenna	AMFW-5F-260400-33-8P	4/26/2019	4/26/2021
T7	AN02764-70	Waveguide	Multiple	4/23/2018	4/23/2020
T8	AN02742	Active Horn Antenna	AMFW-5F-18002650-20-10P	10/16/2018	10/16/2020

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6	T7	T8					
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	37335.000	47.5	+0.0	+0.0	+12.9	+1.3	+0.0	70.5	87.8	-17.3	Horiz
	M		+1.9	+3.8	+3.1	+0.0					
	Ave								RMS		
2	25002.000	37.3	+0.0	+1.8	+9.9	+0.7	+0.0	39.0	87.8	-48.8	Horiz
	M		+1.2	+0.0	+0.0	-11.9					
	Ave								RMS		

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive SE • Bothell, WA 98021 • 800-500-4362		
Customer:	**Honeywell**		
Specification:	**47 CFR §87.139(a) Spurious Emissions**		
Work Order #:	**103157**	Date:	12/16/2019
Test Type:	**Maximized Emissions**	Time:	14:50:28
Tested By:	Matthew Harrison	Sequence#:	21
Software:	EMITest 5.03.12		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

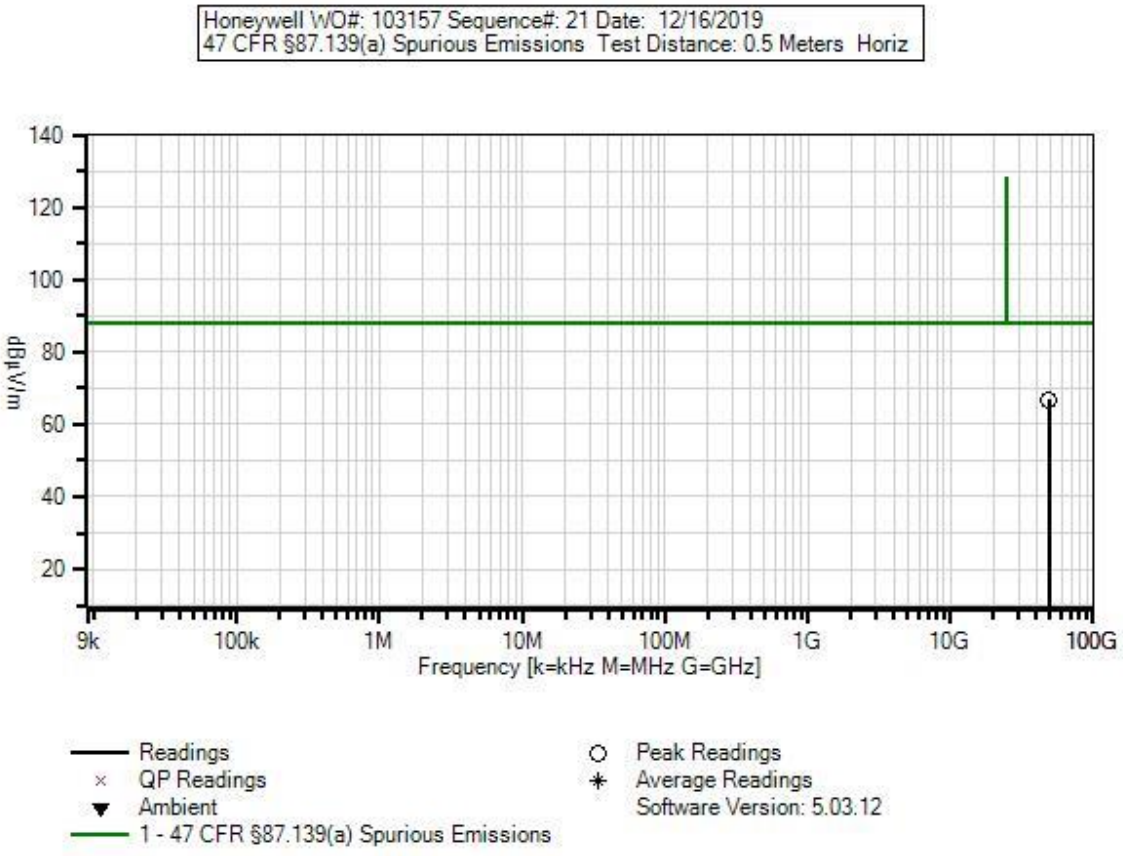
Temperature: 22°C
Humidity: 34%
Pressure: 102.8 kPa

Frequency Range: 40-60 GHz (Highest Clock 24GHz)

Test Method: ANSI C63.26: 2015

Setup:
The EUT is setup in a tabletop configuration 150 cm high on a Styrofoam table.
It is connected to a power supply and a remote PC via Ethernet and wiring harness.
The Transmitter is active.

No readings observed within 20dB from 40-60 GHz



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
T1	AN02347	Horn Antenna		3/6/2019	3/6/2021
T2	ANP05546	Cable	Heliax	8/24/2018	8/24/2020

Measurement Data: Reading listed by margin. Test Distance: 0.5 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	49032.000 M	7.3	+73.4	+1.8			-15.6	66.9	87.8	-20.9	Horiz

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive SE • Bothell, WA 98021 • 800-500-4362		
Customer:	**Honeywell**		
Specification:	**47 CFR §87.139(a) Spurious Emissions**		
Work Order #:	**103157**	Date:	12/16/2019
Test Type:	**Maximized Emissions**	Time:	14:52:45
Tested By:	Matthew Harrison	Sequence#:	22
Software:	EMITest 5.03.12		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

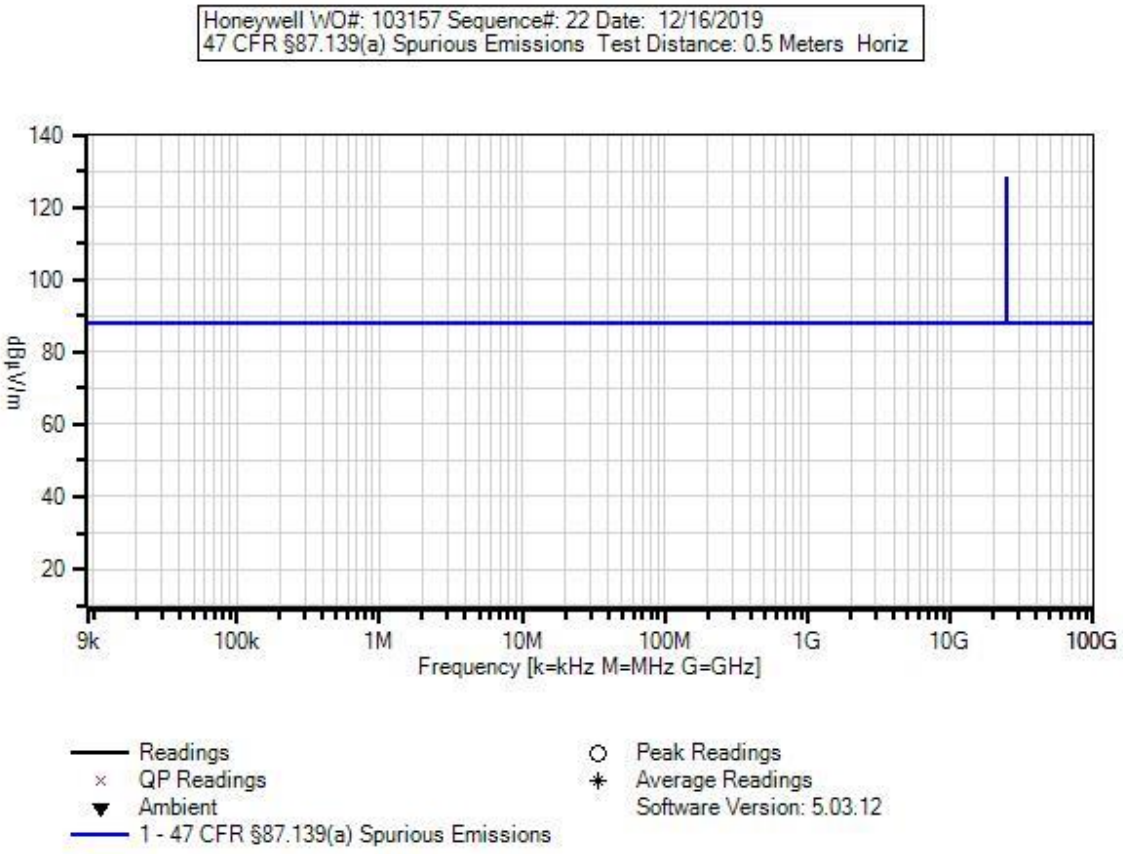
Temperature: 22°C
Humidity: 34%
Pressure: 102.8 kPa

Frequency Range: 60-90 GHz (Highest Clock 24GHz)

Test Method: ANSI C63.26: 2015

Setup:
The EUT is setup in a tabletop configuration 150 cm high on a Styrofoam table.
It is connected to a power supply and a remote PC via Ethernet and wiring harness.
The Transmitter is active.

No readings observed within 20dB from 60-90 GHz



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
	AN02348	Horn Antenna	M12HWA	3/6/2019	3/6/2021
	ANP05546	Cable	Heliax	8/24/2018	8/24/2020

Measurement Data: Reading listed by margin. Test Distance: 0.5 Meters

#	Freq	Rdng					Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive SE • Bothell, WA 98021 • 800-500-4362		
Customer:	**Honeywell**		
Specification:	**47 CFR §87.139(a) Spurious Emissions**		
Work Order #:	**103157**	Date:	1/14/2020
Test Type:	**Maximized Emissions**	Time:	14:57:09
Tested By:	Matthew Harrison	Sequence#:	23
Software:	EMITest 5.03.12		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

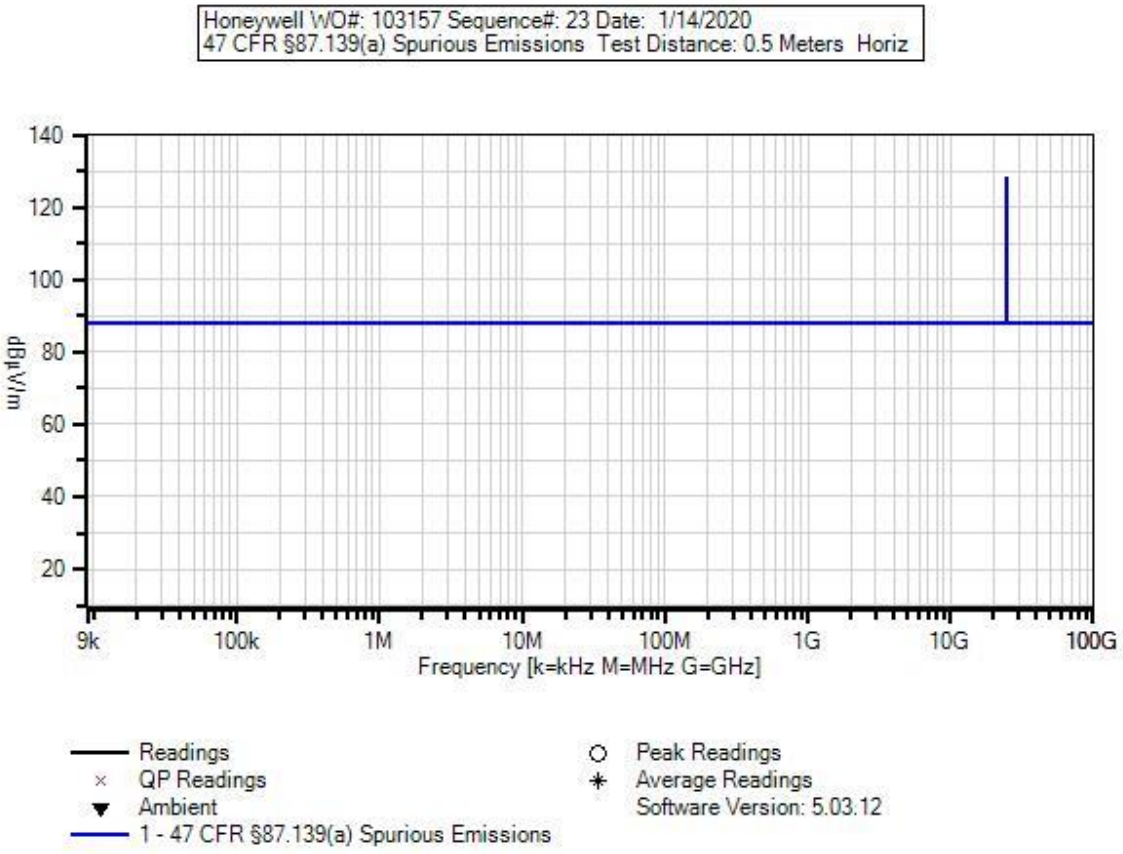
Temperature: 22°C
Humidity: 34%
Pressure: 102.8 kPa

Frequency Range: 90-100 GHz (Highest Clock 24GHz)

Test Method: ANSI C63.26: 2015

Setup:
The EUT is setup in a tabletop configuration 150 cm high on a Styrofoam table.
It is connected to a power supply and a remote PC via Ethernet and wiring harness.
The Transmitter is active.

No readings observed within 20dB from 90-100 GHz



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02673	Spectrum Analyzer	E4446A	2/22/2019	2/22/2021
	ANP05546	Cable	Heliax	8/24/2018	8/24/2020
	AN02349	Horn Antenna	M08HWA	3/6/2019	3/6/2021

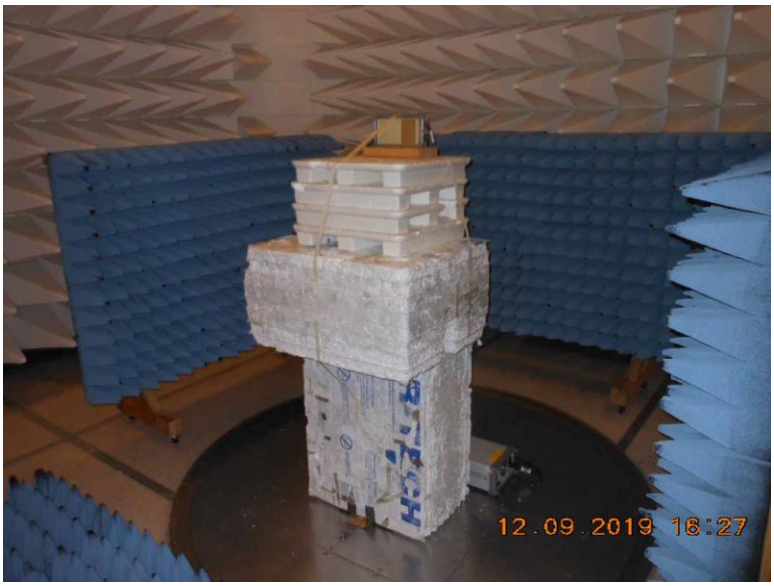
Measurement Data: Reading listed by margin. Test Distance: 0.5 Meters

#	Freq	Rdng					Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant

Test Setup Photo(s)

Below 1GHz

Below 1GHz



Above 1GHz

Above 1GHz

Support Equipment

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

Uncertainty Value	Parameter
4.73 dB	Radiated Emissions
3.34 dB	Mains Conducted Emissions
3.30 dB	Disturbance Power

Uncertainties reported are worst case for all CKC Laboratories' sites and represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2. Compliance is deemed to occur provided measurements are below the specified limits.