

Leidos Security Detection & Automation, Inc.

TEST REPORT FOR

**Pro:Vision® 3, SafeView HD, PV1 to PV3 ,PV2 to PV3 Upgrade Kit
Model: 1600-30872-01**

Tested to The Following Standards:

FCC Part 15 Subpart C Section(s)

15.207 & 15.209

Report No.: 107144-12

Date of issue: January 5, 2023



Test Certificate # 803.01

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.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

Leidos Security Detection & Automation, Inc.
One Radcliff Road
Tewksbury, MA 01876

Representative: Uresh Patel
Customer Reference Number: P010276349

DATE OF EQUIPMENT RECEIPT:

DATE(S) OF TESTING:

REPORT PREPARED BY:

Lisa Bevington
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 107144

December 1, 2022

December 1, 6-9, 12-16, 2022

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.



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.
110 Olinda Place
Brea, CA 92823

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.03.20

Site Registration & Accreditation Information

Location	*NIST CB #	FCC	Canada	Japan
Canyon Park, Bothell, WA	US0103	US1024	3082C	A-0136
Brea, CA	US0103	US1024	3082D	A-0136
Fremont, CA	US0103	US1024	3082B	A-0136
Mariposa, CA	US0103	US1024	3082A	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 15 Subpart C - 15.209

Test Procedure	Description	Modifications	Results
15.215(c)	Occupied Bandwidth	NA	Pass
15.209	Field Strength of Fundamental	NA	Pass
15.209	Field Strength of Spurious Emissions	NA	Pass
15.207	AC Conducted Emissions	NA	Pass

NA = Not Applicable

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

None

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
Pro:Vision® 3, SafeView HD, PV1 to PV3 ,PV2 to PV3 Upgrade Kit	Leidos Security Detection & Automation, Inc.	1600-30872-01	001

Support Equipment:

Device	Manufacturer	Model #	S/N
Power supply	Cosel	GHA500F-24	NA
Power supply	Cosel	GHA500F-24	NA
Laptop	Dell	Latitude 5480	3347123943B

General Product Information:

Product Information	Manufacturer-Provided Details
Equipment Type:	Radio Module
Modulation Type(s):	FMCW
Maximum Duty Cycle:	98%
Antenna Type(s) and Gain:	Spiral circular polarized, Gain: see table below
Antenna Connection Type:	Integral
Nominal Input Voltage:	48V DC
Firmware / Software used for Test:	Test firmware V2.2.7, V 2.2.8*
The validity of results is dependent on the stated product details, the accuracy of which the manufacturer assumes full responsibility.	

* V2.2.8 same transmit parameter as V2.2.7 with improved receiver gain. Spot check perform to verify transmitter parameter.

Manufacturer provided antenna gain information

	Gain @Boresight (dBi)								
Freq (GHz)	20.0	22.5	25.0	27.5	30.0	32.5	35.0	37.5	40.0
LHCP	-1.66	-1.73	1.17	0.59	-0.13	0.30	-0.89	1.46	2.64

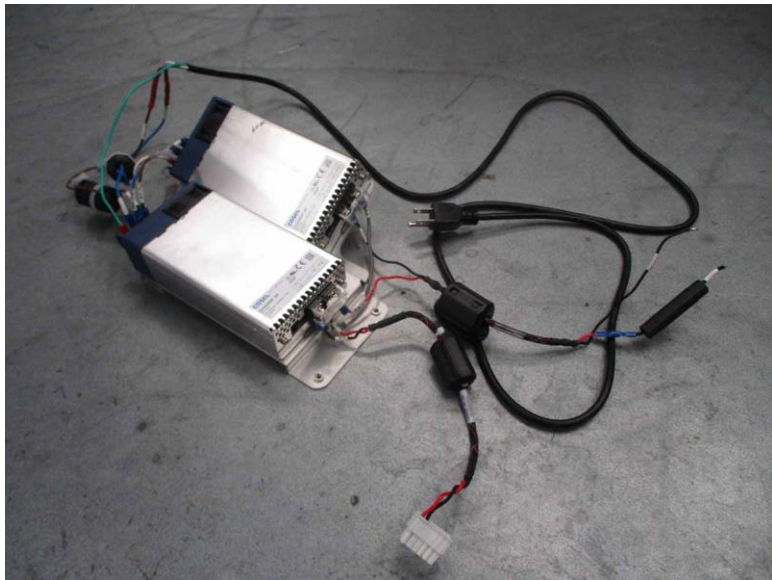
EUT and Accessory Photo(s)



Support Equipment Photo(s)

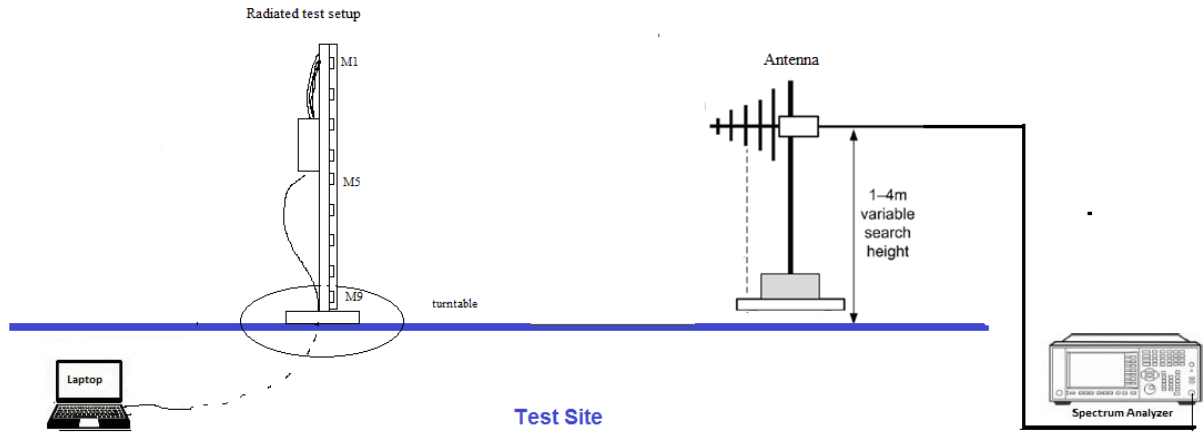


Laptop



Power Supply

Block Diagram of Test Setup(s)



FCC Part 15 Subpart C

15.215(c) Occupied Bandwidth (10dB BW)

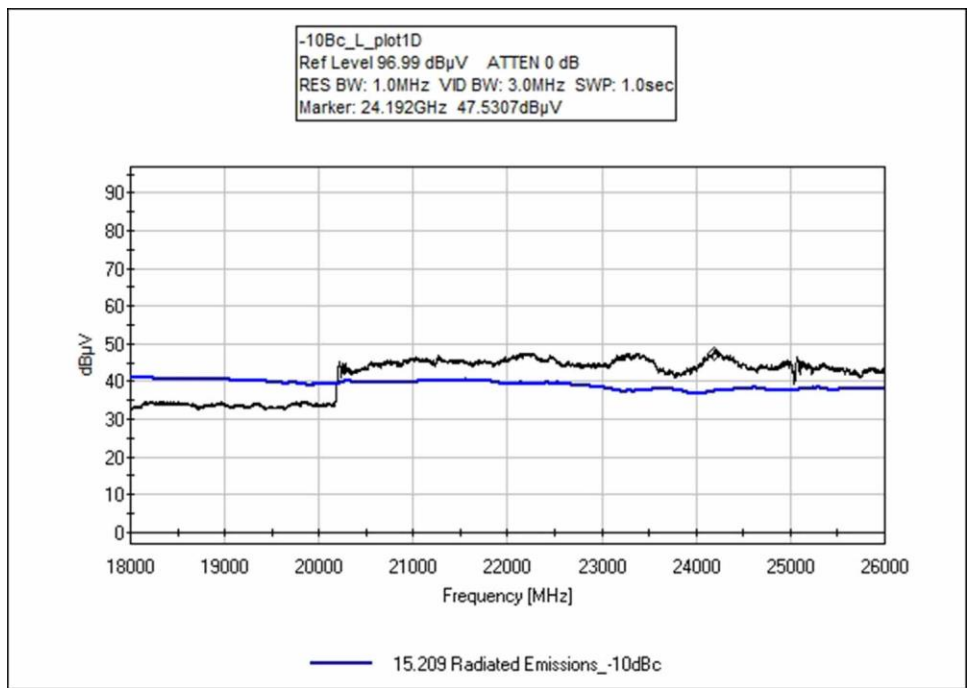
Test Setup/Conditions			
Test Location:	Brea Lab D	Test Engineer:	E. Wong
Test Method:	ANSI C63.10 (2013)	Test Date(s):	12/13/2022
Configuration:	1		
Test Setup:	<p>The EUT seeking limited modular approval is placed on the turntable with the bottom of the Mast elevated from the ground plan like normal installation.</p> <p>The USB ports of the Mast are connected to RF controlling device, Image Sampling Unit for data, control command and DC power.</p> <p>Two 24 V DC power supplies configured in series provides 48V to the Image Sampling Unit</p> <p>The EUT is operating as intended in sweeping mode per FCC waiver.</p> <p>Note, due to the low amplitude to the intended signal at higher frequency spectrum and the wide span of sweep, please refer to data sheet for corrected data. Measurement made with two antenna covering different frequency range of measurement.</p> <p>The intended emission signature was verified with additional antenna, ETS, model 3116C-PA covering the entire 20 – 40GH band.</p>		

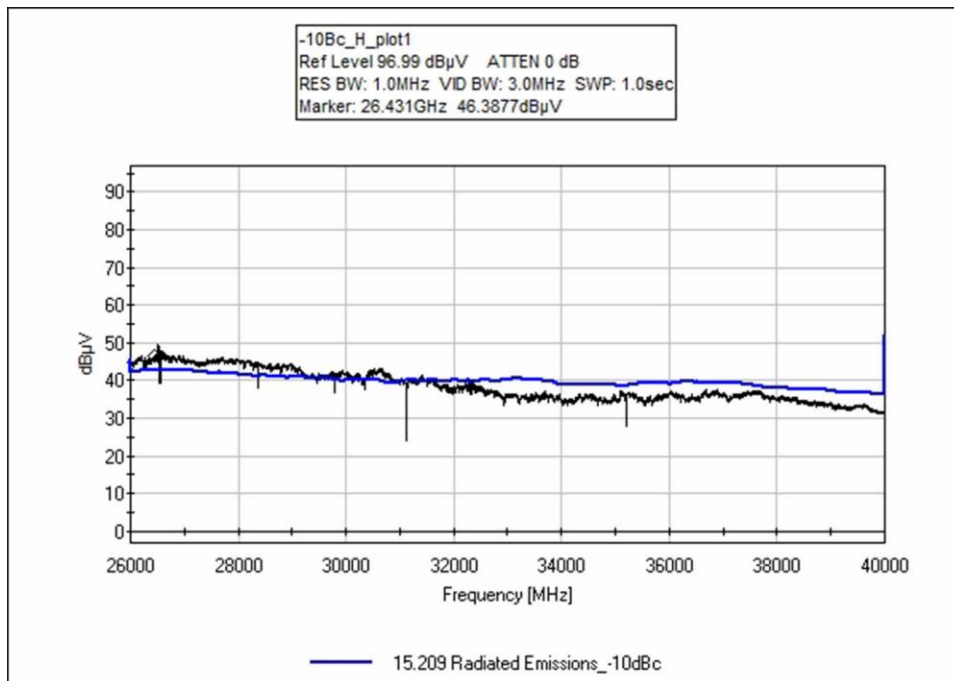
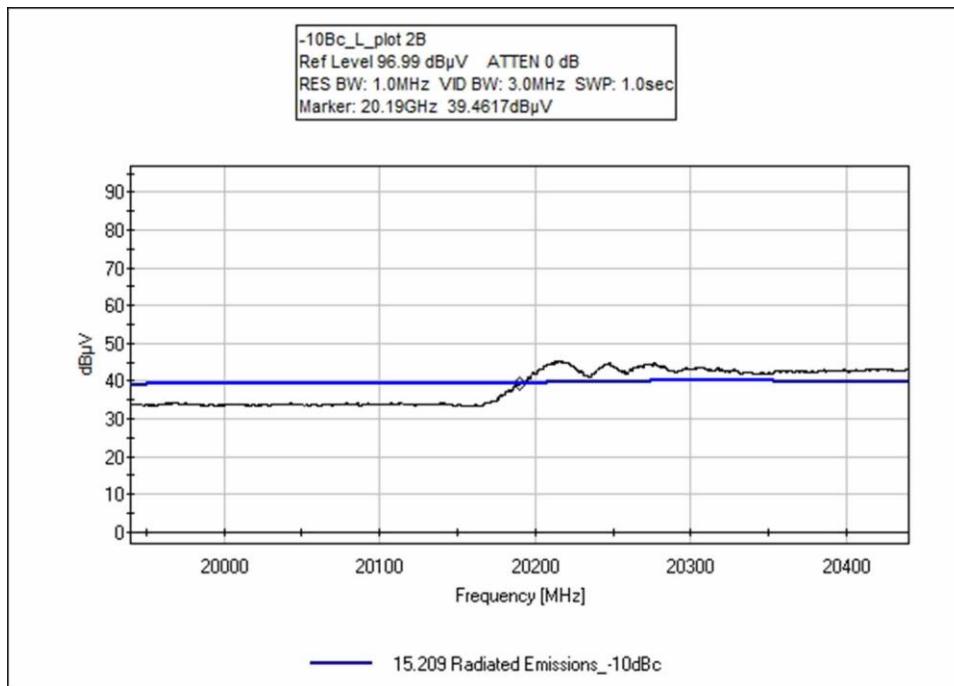
Environmental Conditions			
Temperature (°C)	11.9-15.2	Relative Humidity (%):	47 - 56

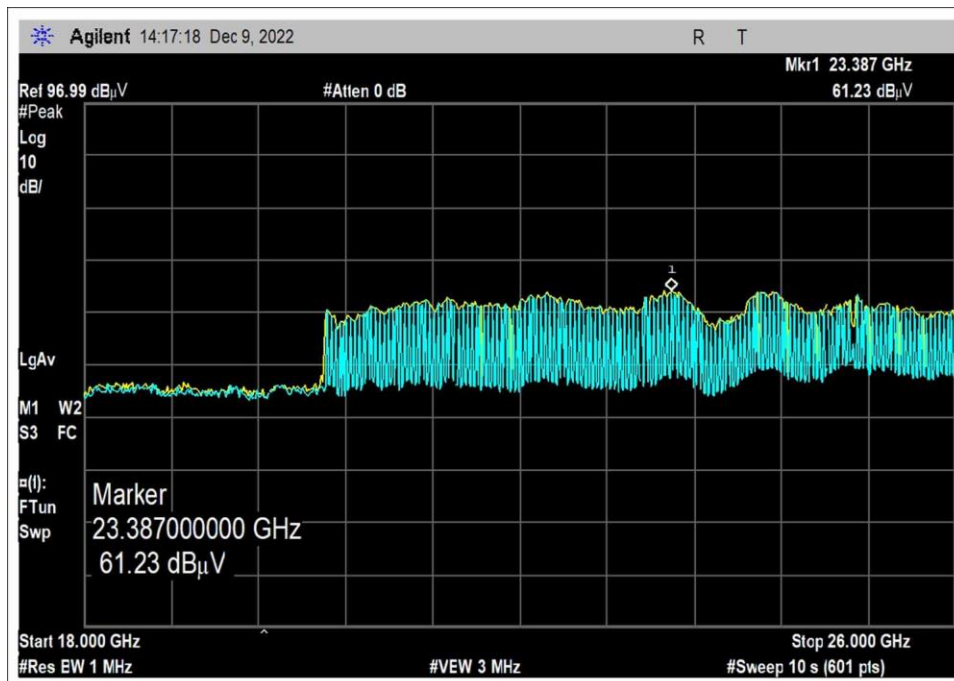
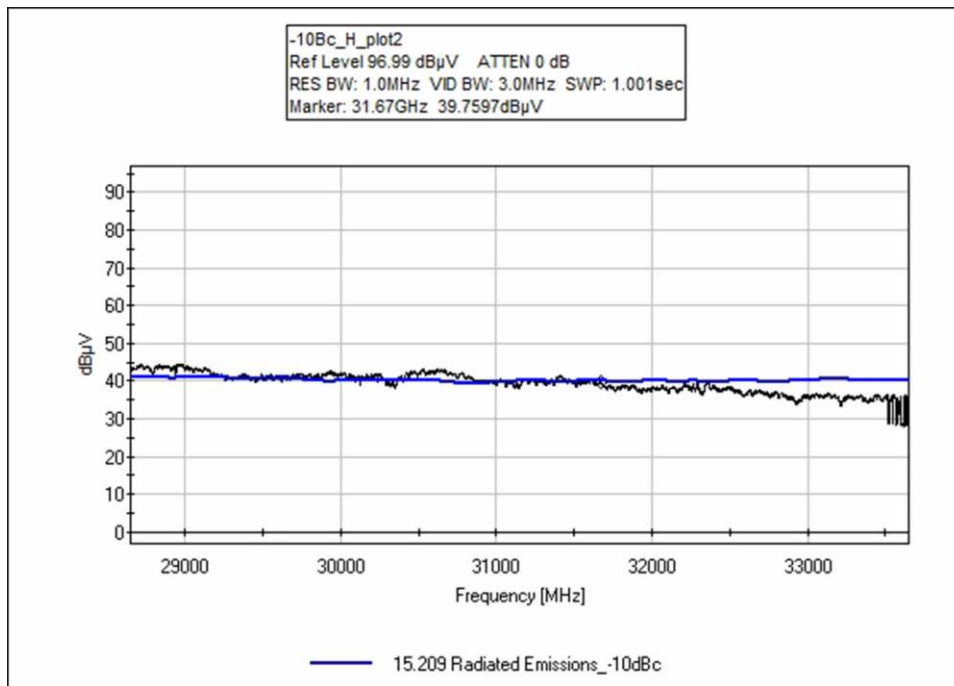
Test Equipment					
Asset#	Description	Manufacturer	Model	Cal Date	Cal Due
02672	Spectrum Analyzer	Agilent	E4446A	5/9/2022	5/9/2024
01413	Horn Antenna	HP	84125-80008	10/3/2022	10/3/2024
07657	Cable	Astrolab, Inc.	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
00787	Preamplifier	HP	83017A	6/23/2021	6/23/2023
07659	Cable	Astrolab, Inc.	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
07660	Cable	Astrolab, Inc.	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
07656	Cable	Astrolab, Inc.	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
07655	Cable	Astrolab, Inc.	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
03158	Horn Antenna	Dorado	GH-28-25	8/10/2021	8/10/2022
R00219	Horn Antenna	ETS Lindgren	3116C-PA	9/16/2021	9/16/2023

Test Data Summary					
Frequency (GHz)	Antenna Port	Modulation	Measured (GHz)	Limit -10dB within band GHz	Results
FL-20.190528 FH-31.669500	NA	FMCW	11.478972	20 – 40	Pass

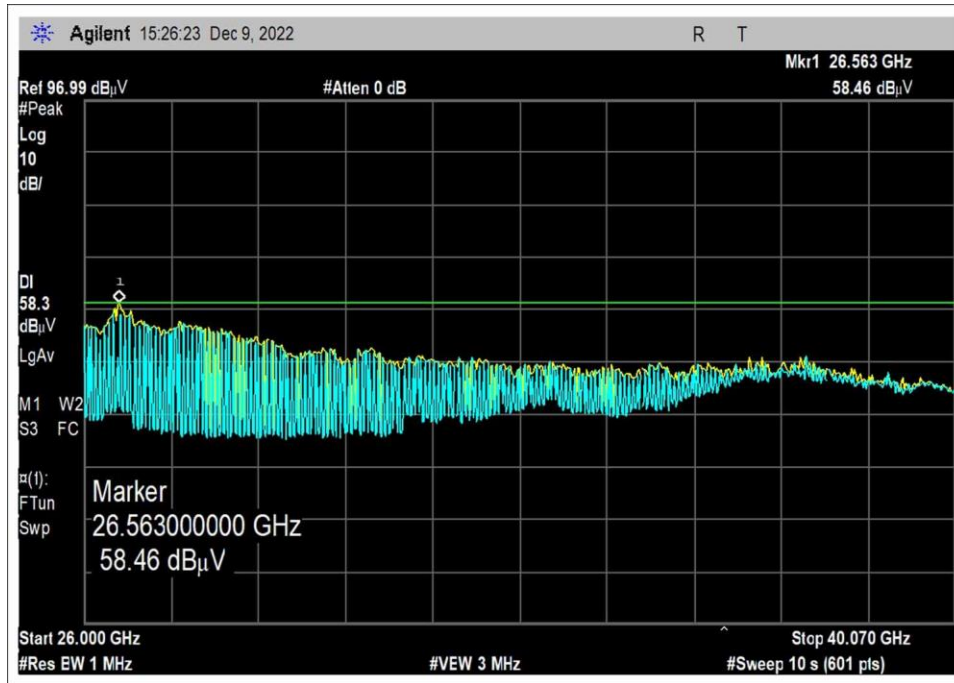
Plot(s)



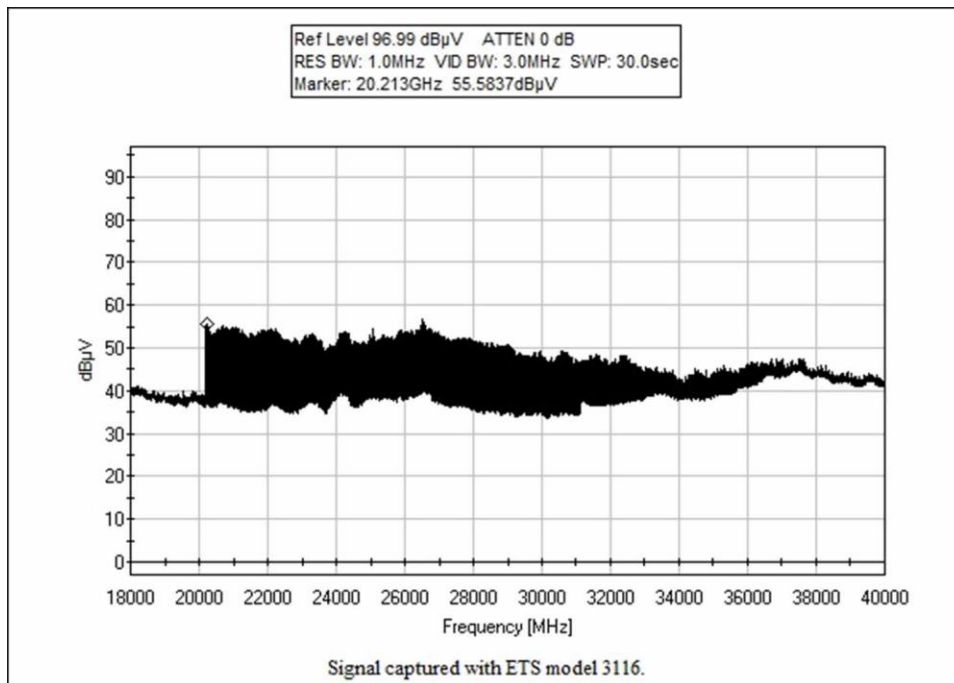




Low Frequency Range 18-26GHz



Higher Frequency Range 26-40GHz



18-40GHz

Test Setup / Conditions / Data

Test Location: CKC Laboratories, Inc • 110 N. Olinda Place • Brea, CA • 714 993 6112
 Customer: **Leidos Security Detection & Automation, Inc.**
 Specification: **15.209 Radiated Emissions**
 Work Order #: **107144** Date: 12/16/2022
 Test Type: **Radiated Scan** Time: 10:22:54
 Tested By: E. Wong Sequence#: 3
 Software: EMITest 5.03.20

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The EUT seeking limited modular approval is place on the turntable with the bottom of the Mast elevated from the ground plan like normal installation.

The USB ports of the Mast are connected to RF controlling device, Image Sampling Unit for data, control command and DC power.

The EUT contains 9 transmitter modules.

Two 24 V DC power supplies configured in series provides 48V to the Image Sampling Unit

The EUT is operating as intended in sweeping mode active and reactive (CW) per FCC waiver.
 In CW mode, recorded frequency is adjusted to compensate for frequency drift

TX freq Range : 20- 40GHz
 TX freq =20.08 - 39.80GHz

Modulation : FMCW
 Firmware : V2.2.7, V2.2.8 (with improved receiver gain)
 Transmitter: M5

Frequency range of measurement = Fundamental, in band

In band measurement per FCC Waiver
 Ave
 Mode = sweep enabled, detector =RMS,
 RBW=1MHz,VBW=3MHz
 sweep =1 sec

Test environment conditions:
 Temperature 11.9 - 15.2 Deg° C
 Relative Humidity: 47- 56%

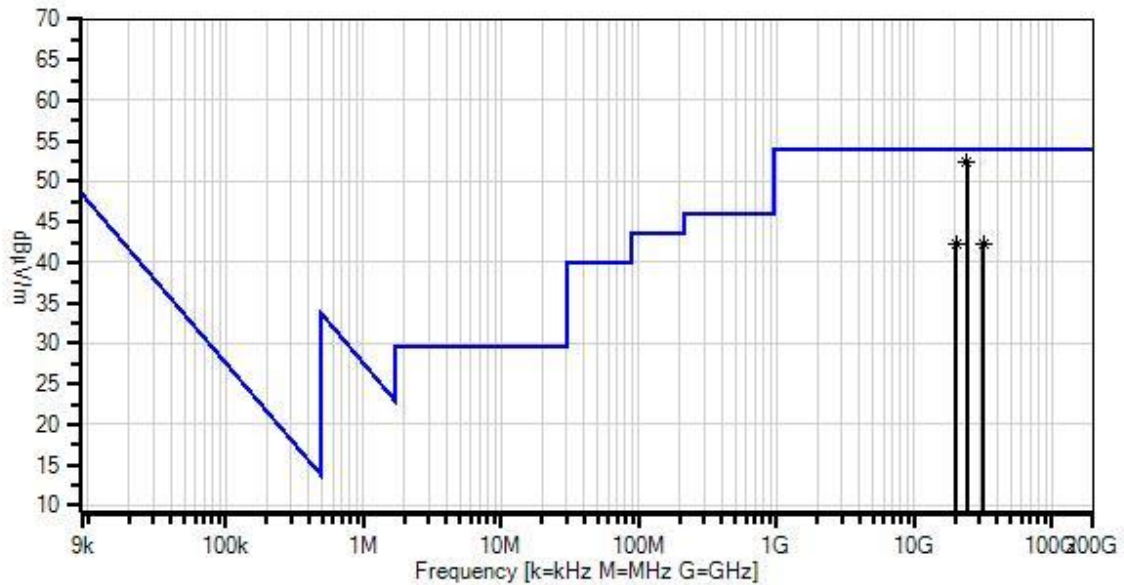
Pressure: 99kPa

Site D
ANSI C63.10-2013

Peak limit above 1 GHz is 41dB above 15.209 (a) limit IAW FCC waiver.

FCC waiver DA06-1589 Aug 04th, 2006
FCC waiver DA16-1075 Nov 22nd, 2016

Leidos Security Detection & Automation, Inc. WO#: 107144 Sequence#: 3 Date: 12/16/2022
15.209 Radiated Emissions Test Distance: 1 Meter Vert



— Readings ○ Peak Readings × QP Readings
 * Average Readings ▼ Ambient Software Version: 5.03.20
 — 1 - 15.209 Radiated Emissions

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02672	Spectrum Analyzer	E4446A	5/9/2022	5/9/2024
	AN01413	Horn Antenna	84125-80008	10/3/2022	10/3/2024
	ANP07657	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
	AN00787	Preamp	83017A	6/23/2021	6/23/2023
T2	ANP07659	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T3	ANP07660	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T4	ANP07656	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T5	ANP07655	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T6	AN03158A	Horn Antenna	GH-28-25	8/10/2021	8/10/2023
	ANR00219	Active Horn Antenna	SAS -200/512	9/16/2021	9/16/2023

Measurement Data: Reading listed by margin. Test Distance: 1 Meter

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dB μ V	T5	T6			Table	dB μ V/m	dB μ V/m	dB	Ant
1	20190.528	39.4	+0.0	+1.4	+1.4	+1.3	-9.5	42.3	42.4	-0.1	Vert
	M		+1.5	+0.0							
	Ave								-10dB point L		
2	31669.500	39.8	+0.0	+1.8	+1.6	+1.5	-9.5	42.2	42.4	-0.2	Vert
	M		+1.8	+5.2							
	Ave								-10dB point H		
3	24197.046	47.5	+0.0	+1.5	+1.8	+1.5	-9.5	52.4	54.0	-1.6	Vert
	M		+1.7	+0.0							
	Ave								121222 max		

Test Setup Photo(s)



In band 3116



In Band M5, View #1



In band M5, View #2

15.209 Field Strength of Fundamental

Test Setup/Conditions			
Test Location:	Brea Lab D	Test Engineer:	E. Wong
Test Method:	ANSI C63.10 (2013)	Test Date(s):	12/13/2022
Configuration:	1		
Test Setup	<p>The EUT seeking limited modular approval is placed on the turntable with the bottom of the Mast elevated from the ground plane like normal installation.</p> <p>The USB ports of the Mast are connected to RF controlling device, Image Sampling Unit for data, control command and DC power. The EUT contains 9 transmitter modules. Two 24 V DC power supplies configured in series provides 48V to the Image Sampling Unit The EUT is operating as intended in sweeping mode per FCC waiver.</p> <p>TX freq Range : 20- 40GHz, TX freq =20.08 - 39.80GHz</p> <p>Modulation : FMCW Firmware : V2.2.7 Transmitter: M1, M5, M9 (for M9 , the EUT is elevated 60 cm from ground plane) In band measurement per FCC Waiver</p> <p>Ave Mode = sweep enabled, detector =RMS, RBW=1MHz,VBW=3MHz sweep =1 sec</p> <p>Peak Mode=sweep disabled, detector =Peak RBW=100kHz, VBW1MHz</p>		

Environmental Conditions			
Temperature (°C)	11.9-15.2	Relative Humidity (%):	47 - 56

Test Equipment					
Asset#	Description	Manufacturer	Model	Cal Date	Cal Due
07164	Multimeter	Fluke	8845A/G	8/13/2021	8/13/2023
01438	DC Power Supply	Topward	6306D	1/27/2021	1/27/2023
02672	Spectrum Analyzer	Agilent	E4446A	5/9/2022	5/9/2024
01413	Horn Antenna	HP	84125-80008	10/3/2022	10/3/2024
07657	Cable	Astrolab, Inc.	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
00787	Preamp	HP	83017A	6/23/2021	6/23/2023
07659	Cable	Astrolab, Inc.	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
07660	Cable	Astrolab, Inc.	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
07656	Cable	Astrolab, Inc.	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
07655	Cable	Astrolab, Inc.	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
03158	Horn Antenna	Dorado	GH-28-25	8/10/2021	8/10/2022

Test Data Summary - Voltage Variations					
Frequency (MHz)	Modulation / Ant Port	V _{Minimum} (dBuV/m)	V _{Nominal} (dBuV/m)	V _{Maximum} (dBuV/m)	Max Deviation from V _{Nominal} (dB)
24 197046 V	FMCW	52.4	52.4	52.4	0

Test performed using operational mode with the highest output power, representing worst case. Module M5

Parameter Definitions:

Measurements performed at input voltage V_{nominal} ± 15%.

Parameter	Value
V _{Nominal} :	48,0 vdc
V _{Minimum} :	40,8 vdc
V _{Maximum} :	55.2 vdc

Test Data Summary – Radiated Field Strength Measurement					
Average					
Frequency (MHz)	Modulation	Ant. Type	Measured (dBuV/m @ 3m)	Limit (dBuV/m @ 3m)	Results
M1					
20 080.000 V	FMCW	Integral	35.0	≤54	Pass
20 225.000 V	FMCW	Integral	37.5	≤54	Pass
24 293.333 V	FMCW	Integral	50.3	≤54	Pass
30 000.000 H	FMCW	Integral	45.4	≤54	Pass
39 750.000 H	FMCW	Integral	37.2	≤54	Pass
39 800.000 V	FMCW	Integral	37.3	≤54	Pass
M5					
20 080.000 H	FMCW	Integral	34.8	≤54	Pass
20 225.000 V	FMCW	Integral	39.5	≤54	Pass
24 197.046 V	FMCW	Integral	52.4	≤54	Pass
30 000.000 V	FMCW	Integral	44.0	≤54	Pass
39 750.000 H	FMCW	Integral	37.0	≤54	Pass
39 800.000 V	FMCW	Integral	37.3	≤54	Pass
M9					
20 080.000 V	FMCW	Integral	34.0	≤54	Pass
20 225.000 V	FMCW	Integral	42.7	≤54	Pass
22 120.000 V	FMCW	Integral	50.3	≤54	Pass
30 000.000 V	FMCW	Integral	32.0	≤54	Pass
39 750.000 V	FMCW	Integral	37.2	≤54	Pass
39 800.000 V	FMCW	Integral	37.3	≤54	Pass

Peak					
Frequency (MHz)	Modulation	Ant. Type	Measured (dBuV/m @ 3m)	Limit (dBuV/m @ 3m)	Results
M1					
20 800.000 V	CW	Integral	85.6	≤95	Pass
20 225.000 V	CW	Integral	83.4	≤95	Pass
24 293.333 V	CW	Integral	88.6	≤95	Pass
30 000.000 H	CW	Integral	73.4	≤95	Pass
39 750.000 V	CW	Integral	60.8	≤95	Pass
39 800.000 V	CW	Integral	65.1	≤95	Pass
M5					
20 080.000 V	CW	Integral	84.9	≤95	Pass
20 225.000 V	CW	Integral	85.3	≤95	Pass
24 197.046 V	CW	Integral	88.5	≤95	Pass
30 000.000 V	CW	Integral	81.4	≤95	Pass
39 750.000 V	CW	Integral	70.8	≤95	Pass
39 800.000 V	CW	Integral	71.9	≤95	Pass
M9					
20 080.000V	CW	Integral	88.1	≤95	Pass
20 225.000V	CW	Integral	87.2	≤95	Pass
22 120.000V	CW	Integral	91.4	≤95	Pass
30 000.000 H	CW	Integral	83.5	≤95	Pass
39 750.000V	CW	Integral	71.6	≤95	Pass
39 800.000V	CW	Integral	72.1	≤95	Pass

Worse case of receiving antenna polarity presented. See data sheet for additional data.

Test Setup / Conditions / Data

Test Location: CKC Laboratories, Inc • 110 N. Olinda Place • Brea, CA • 714 993 6112
 Customer: **Leidos Security Detection & Automation, Inc.**
 Specification: **15.209 Radiated Emissions_peak**
 Work Order #: **107144** Date: 12/15/2022
 Test Type: **Radiated Scan** Time: 09:42:24
 Tested By: E. Wong Sequence#: 4
 Software: EMITest 5.03.20

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The EUT seeking limited modular approval is place on the turntable with the bottom of the Mast elevated from the ground plan like normal installation.

The USB ports of the Mast are connected to RF controlling device, Image Sampling Unit for data, control command and DC power.

The EUT contains 9 transmitter modules.

Two 24 V DC power supplies configured in series provides 48V to the Image Sampling Unit

The EUT is operating as intended in sweeping mode active (FMCW) and deactivated (CW) per FCC waiver. In CW mode, recorded frequency is adjusted to compensate for frequency drift

TX freq Range : 20- 40GHz
 TX freq =20.08 - 39.80GHz

Modulation : FMCW
 Firmware : V2.2.7
 Transmitter: M1

Frequency range of measurement = Fundamental, in band

In band measurement per FCC Waiver
 Ave
 Mode = sweep enabled, detector =RMS,
 RBW=1MHz,VBW=3MHz
 sweep =1 sec

Peak
 Mode=sweep disabled, detector =Peak
 RBW=100kHz, VBW1MHz

Test environment conditions:

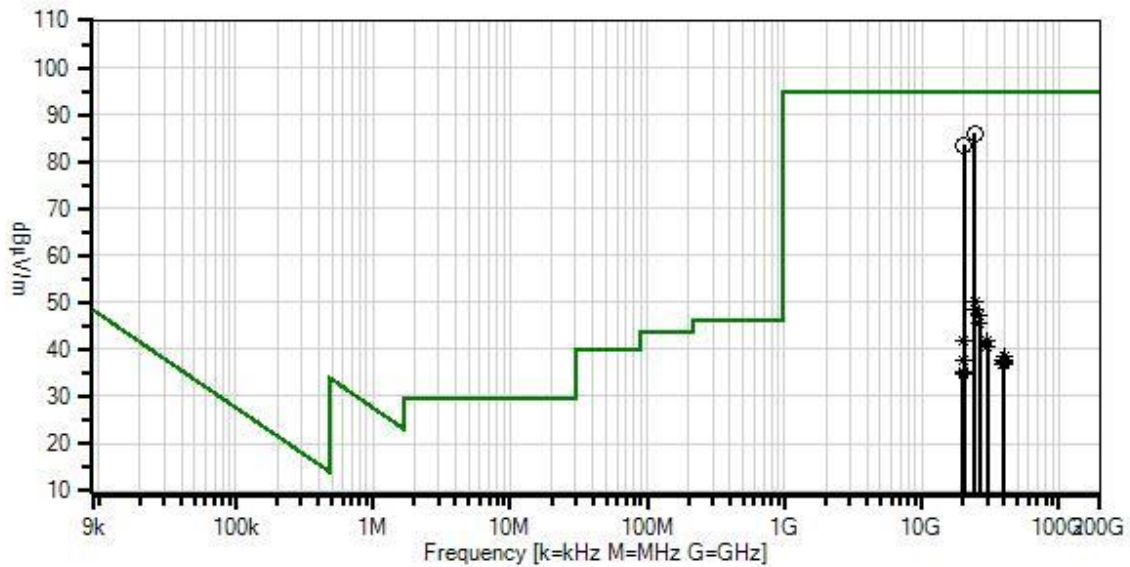
Temperature 11.9 - 15.2 Deg° C
Relative Humidity: 47- 56%
Pressure: 99kPa

Site D
ANSI C63.10-2013

Peak limit above 1 GHz is 41dB above 15.209 (a) limit IAW FCC waiver.

FCC waiver DA06-1589 Aug 04th, 2006
FCC waiver DA16-1075 Nov 22nd, 2016

Leidos Security Detection & Automation, Inc. W/O#: 107144 Sequence#: 4 Date: 12/15/2022
 15.209 Radiated Emissions_peak Test Distance: 1 Meter Vert



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02672	Spectrum Analyzer	E4446A	5/9/2022	5/9/2024
T2	AN01413	Horn Antenna	84125-80008	10/3/2022	10/3/2024
T3	ANP07657	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T4	AN00787	Preamp	83017A	6/23/2021	6/23/2023
T5	ANP07659	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T6	ANP07660	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T7	ANP07656	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T8	ANP07655	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T9	AN03158A	Horn Antenna	GH-28-25	8/10/2021	8/10/2023

Measurement Data: Reading listed by margin. Test Distance: 1 Meter

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	T5	T6	T7	T8	Table	dBμV/m	dBμV/m	dB	Ant
			T9								
1	24293.333	45.5	+0.0	+0.0	+0.0	+0.0	-9.5	50.3	54.0	-3.7	Vert
	M		+1.5	+1.8	+1.5	+1.7					
	Ave		+0.0						FMCW		
^	24293.333	83.8	+0.0	+40.3	+1.6	-34.1	-9.5	88.6	95.0	-6.4	Vert
	M		+1.5	+1.8	+1.5	+1.7					
			+0.0						CW		
3	24240.000	43.8	+0.0	+40.3	+1.5	-34.0	-9.5	48.6	54.0	-5.4	Horiz
	M		+1.5	+1.8	+1.5	+1.7					
	Ave		+0.0						FMCW		
4	26550.000	47.6	+0.0	+0.0	+0.0	+0.0	-9.5	47.3	54.0	-6.7	Vert
	M		+1.6	+1.7	+1.6	+1.8					
	Ave		+2.5						FMCW		
5	26550.000	45.7	+0.0	+0.0	+0.0	+0.0	-9.5	45.4	54.0	-8.6	Horiz
	M		+1.6	+1.7	+1.6	+1.8					
	Ave		+2.5						FMCW		
6	24241.667	81.3	+0.0	+40.3	+1.5	-34.0	-9.5	86.1	95.0	-8.9	Horiz
	M		+1.5	+1.8	+1.5	+1.7					
			+0.0						CW		
7	20224.533	80.8	+0.0	+40.5	+1.4	-35.2	-9.5	83.4	95.0	-11.6	Vert
	M		+1.4	+1.3	+1.3	+1.4					
			+0.0						CW		
8	30000.000	39.7	+0.0	+0.0	+0.0	+0.0	-9.5	42.0	54.0	-12.0	Horiz
	M		+1.7	+1.7	+1.7	+1.8					
	Ave		+4.9						FMCW		
^	30000.000	71.1	+0.0	+0.0	+0.0	+0.0	-9.5	73.4	95.0	-21.6	Horiz
	M		+1.7	+1.7	+1.7	+1.8					
			+4.9						CW		
10	20250.000	39.4	+0.0	+40.4	+1.4	-35.2	-9.5	41.9	54.0	-12.1	Vert
	M		+1.4	+1.3	+1.3	+1.4					
	Ave		+0.0						FMCW		
11	30000.000	38.2	+0.0	+0.0	+0.0	+0.0	-9.5	40.5	54.0	-13.5	Vert
	M		+1.7	+1.7	+1.7	+1.8					
	Ave		+4.9						FMCW		
^	30000.000	70.0	+0.0	+0.0	+0.0	+0.0	-9.5	72.3	95.0	-22.7	Vert
	M		+1.7	+1.7	+1.7	+1.8					
			+4.9						CW		
13	39500.000	32.8	+0.0	+0.0	+0.0	+0.0	-9.5	38.4	54.0	-15.6	Vert
	M		+2.0	+2.2	+2.0	+2.2					
	Ave		+6.7						FMCW		
14	39500.000	32.1	+0.0	+0.0	+0.0	+0.0	-9.5	37.7	54.0	-16.3	Horiz
	M		+2.0	+2.2	+2.0	+2.2					
	Ave		+6.7						FMCW		
15	39250.000	31.9	+0.0	+0.0	+0.0	+0.0	-9.5	37.6	54.0	-16.4	Vert
	M		+2.0	+2.3	+2.0	+2.3					
	Ave		+6.6						FMCW		

16	20225.000	34.9	+0.0	+40.5	+1.4	-35.2	-9.5	37.5	54.0	-16.5	Horiz
	M		+1.4	+1.3	+1.3	+1.4					
	Ave		+0.0						FMCW		
^	20225.000	76.0	+0.0	+40.5	+1.4	-35.2	-9.5	78.6	95.0	-16.4	Horiz
	M		+1.4	+1.3	+1.3	+1.4					
			+0.0						CW		
18	39800.000	31.5	+0.0	+0.0	+0.0	+0.0	-9.5	37.3	54.0	-16.7	Vert
	M		+2.0	+2.1	+2.0	+2.4					
	Ave		+6.8						FMCW		
^	39800.000	59.3	+0.0	+0.0	+0.0	+0.0	-9.5	65.1	95.0	-29.9	Vert
	M		+2.0	+2.1	+2.0	+2.4					
			+6.8						CW		
^	39800.000	56.3	+0.0	+0.0	+0.0	+0.0	-9.5	62.1	95.0	-32.9	Vert
	M		+2.0	+2.1	+2.0	+2.4					
			+6.8						CW		
21	39750.000	31.5	+0.0	+0.0	+0.0	+0.0	-9.5	37.2	54.0	-16.8	Vert
	M		+2.0	+2.1	+2.0	+2.3					
	Ave		+6.8						FMCW		
^	39750.000	57.5	+0.0	+0.0	+0.0	+0.0	-9.5	63.2	95.0	-31.8	Vert
	M		+2.0	+2.1	+2.0	+2.3					
			+6.8						CW		
23	39750.000	31.5	+0.0	+0.0	+0.0	+0.0	-9.5	37.2	54.0	-16.8	Horiz
	M		+2.0	+2.1	+2.0	+2.3					
	Ave		+6.8						FMCW		
^	39750.000	55.1	+0.0	+0.0	+0.0	+0.0	-9.5	60.8	95.0	-34.2	Horiz
	M		+2.0	+2.1	+2.0	+2.3					
			+6.8						CW		
25	39800.000	31.2	+0.0	+0.0	+0.0	+0.0	-9.5	37.0	54.0	-17.0	Horiz
	M		+2.0	+2.1	+2.0	+2.4					
	Ave		+6.8						FMCW		
26	39250.000	31.1	+0.0	+0.0	+0.0	+0.0	-9.5	36.8	54.0	-17.2	Horiz
	M		+2.0	+2.3	+2.0	+2.3					
	Ave		+6.6						FMCW		
27	20000.000	32.1	+0.0	+0.0	+0.0	+0.0	-9.5	35.3	54.0	-18.7	Vert
	M		+1.5	+1.4	+1.4	+1.4					
	Ave		+0.0						FMCW		
28	20025.000	32.2	+0.0	+40.4	+1.4	-34.9	-9.5	35.2	54.0	-18.8	Vert
	M		+1.4	+1.4	+1.3	+1.5					
	Ave		+0.0						FMCW		
29	20000.000	31.9	+0.0	+40.4	+1.5	-34.9	-9.5	35.1	54.0	-18.9	Horiz
	M		+1.5	+1.4	+1.4	+1.4					
	Ave		+0.0						FMCW		
30	20080.000	32.0	+0.0	+40.5	+1.4	-35.0	-9.5	35.0	54.0	-19.0	Vert
	M		+1.4	+1.4	+1.3	+1.5					
	Ave		+0.0						FMCW		

^	20080.000	81.6	+0.0	+40.5	+1.4	-35.0	-9.5	84.6	95.0	-10.4	Vert
	M		+1.4	+1.4	+1.3	+1.5					
			+0.0						CW		
32	20080.000	31.6	+0.0	+40.5	+1.4	-35.0	-9.5	34.6	54.0	-19.4	Horiz
	M		+1.4	+1.4	+1.3	+1.5					
	Ave		+0.0						FMCW		
^	20080.000	75.5	+0.0	+40.5	+1.4	-35.0	-9.5	78.5	95.0	-16.5	Horiz
	M		+1.4	+1.4	+1.3	+1.5					
			+0.0						CW		

Test Location: CKC Laboratories, Inc • 110 N. Olinda Place • Brea, CA • 714 993 6112
 Customer: **Leidos Security Detection & Automation, Inc.**
 Specification: **15.209 Radiated Emissions**
 Work Order #: **107144** Date: 12/16/2022
 Test Type: **Radiated Scan** Time: 10:22:54
 Tested By: E. Wong Sequence#: 3
 Software: EMITest 5.03.20

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The EUT seeking limited modular approval is placed on the turntable with the bottom of the Mast elevated from the ground plane like normal installation.

The USB ports of the Mast are connected to RF controlling device, Image Sampling Unit for data, control command and DC power.

The EUT contains 9 transmitter modules.

Two 24 V DC power supplies configured in series provides 48V to the Image Sampling Unit

The EUT is operating as intended in sweeping mode active (FMCW) and deactivated (CW) per FCC waiver. In CW mode, recorded frequency is adjusted to compensate for frequency drift

TX freq Range : 20- 40GHz
 TX freq =20.08 - 39.80GHz
 Modulation : FMCW
 Firmware : V2.2.7, V2.2.8 (with improved receiver gain)
 Transmitter: M5

Frequency range of measurement = Fundamental, in band

In band measurement per FCC Waiver
 Ave
 Mode = sweep enabled, detector =RMS,
 RBW=1MHz,VBW=3MHz
 sweep =1 sec

Peak
 Mode=sweep disabled, detector =Peak
 RBW=100kHz, VBW1MHz

Test environment conditions:
 Temperature 11.9 - 15.2 Deg° C
 Relative Humidity: 47- 56%

Pressure: 99kPa

Site D

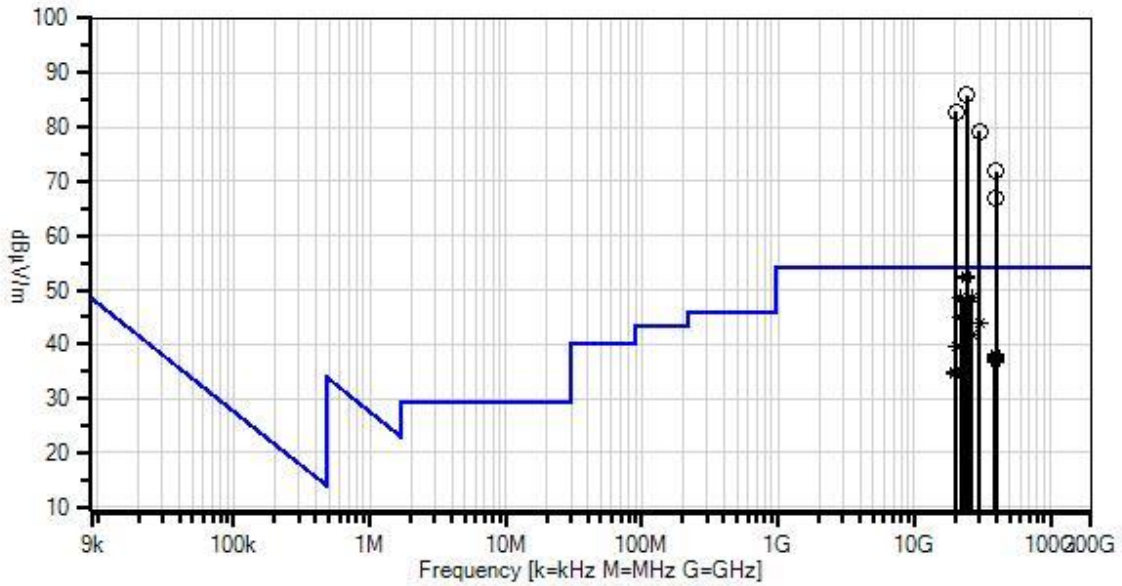
ANSI C63.10-2013

Peak limit above 1 GHz is 41dB above 15.209 (a) limit IAW FCC waiver.

FCC waiver DA06-1589 Aug 04th, 2006

FCC waiver DA16-1075 Nov 22nd, 2016

Leidos Security Detection & Automation, Inc. WO#: 107144 Sequence#: 3 Date: 12/16/2022
 15.209 Radiated Emissions Test Distance: 1 Meter Vert



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02672	Spectrum Analyzer	E4446A	5/9/2022	5/9/2024
T2	AN01413	Horn Antenna	84125-80008	10/3/2022	10/3/2024
T3	ANP07657	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T4	AN00787	Preamp	83017A	6/23/2021	6/23/2023
T5	ANP07659	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T6	ANP07660	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T7	ANP07656	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T8	ANP07655	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T9	AN03158A	Horn Antenna	GH-28-25	8/10/2021	8/10/2023
T10	ANR00219	Active Horn Antenna	SAS -200/512	9/16/2021	9/16/2023

<i>Measurement Data:</i>		Reading listed by margin.						Test Distance: 1 Meter				
#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar	
	MHz	dB μ V	T5	T6	T7	T8	Table	dB μ V/m	dB μ V/m	dB	Ant	
			T9	T10								
1	24197.046	47.5	+0.0	+0.0	+0.0	+0.0	-9.5	52.4	54.0	-1.6	Vert	
	M		+1.5	+1.8	+1.5	+1.7						
	Ave		+0.0	+0.0					FMCW_Max			
2	24197.045	47.2	+0.0	+0.0	+0.0	+0.0	-9.5	52.1	54.0	-1.9	Vert	
	M		+1.5	+1.8	+1.5	+1.7						
	Ave		+0.0	+0.0					FMCW V2.2.8 verification			
^	24197.046	83.6	+0.0	+40.3	+1.5	-33.9	-9.5	88.5	95.0	-6.5	Vert	
	M		+1.5	+1.8	+1.5	+1.7						
			+0.0	+0.0					CW			
4	22179.303	45.6	+0.0	+40.4	+1.6	-35.4	-9.5	48.7	54.0	-5.3	Vert	
	M		+1.5	+1.6	+1.4	+1.5						
	Ave		+0.0	+0.0					FMCW			
5	26525.000	48.8	+0.0	+0.0	+0.0	+0.0	-9.5	48.5	54.0	-5.5	Vert	
	M		+1.6	+1.7	+1.6	+1.8						
	Ave		+2.5	+0.0					FMCW			
6	24133.333	42.5	+0.0	+40.3	+1.6	-33.6	-9.5	47.8	54.0	-6.2	Horiz	
	M		+1.5	+1.8	+1.5	+1.7						
	Ave		+0.0	+0.0					FMCW			
7	22179.000	41.8	+0.0	+40.4	+1.6	-35.4	-9.5	44.9	54.0	-9.1	Horiz	
	M		+1.5	+1.6	+1.4	+1.5						
	Ave		+0.0	+0.0					FMCW			
8	24197.046	80.9	+0.0	+40.3	+1.5	-33.9	-9.5	85.8	95.0	-9.2	Horiz	
	M		+1.5	+1.8	+1.5	+1.7						
			+0.0	+0.0					CW			
9	30000.000	41.7	+0.0	+0.0	+0.0	+0.0	-9.5	44.0	54.0	-10.0	Horiz	
	M		+1.7	+1.7	+1.7	+1.8						
	Ave		+4.9	+0.0					FMCW			
10	30000.000	41.7	+0.0	+0.0	+0.0	+0.0	-9.5	44.0	54.0	-10.0	Vert	
	M		+1.7	+1.7	+1.7	+1.8						
	Ave		+4.9	+0.0					FMCW			
11	30000.000	41.6	+0.0	+0.0	+0.0	+0.0	-9.5	43.9	54.0	-10.1	Vert	
	M		+1.7	+1.7	+1.7	+1.8						
	Ave		+4.9	+0.0					FMCW			
^	30000.000	79.1	+0.0	+0.0	+0.0	+0.0	-9.5	81.4	95.0	-13.6	Vert	
	M		+1.7	+1.7	+1.7	+1.8						
			+4.9	+0.0					CW			
13	20225.000	80.3	+0.0	+40.5	+1.4	-35.2	-9.5	82.9	95.0	-12.1	Horiz	
	M		+1.4	+1.3	+1.3	+1.4						
			+0.0	+0.0					CW			
14	26550.000	42.1	+0.0	+0.0	+0.0	+0.0	-9.5	41.8	54.0	-12.2	Horiz	
	M		+1.6	+1.7	+1.6	+1.8						
	Ave		+2.5	+0.0					FMCW			
15	20225.000	36.9	+0.0	+40.5	+1.4	-35.2	-9.5	39.5	54.0	-14.5	Vert	
	M		+1.4	+1.3	+1.3	+1.4						
	Ave		+0.0	+0.0					FMCW			

^	20225.000	82.7	+0.0	+40.5	+1.4	-35.2	-9.5	85.3	95.0	-9.7	Vert
	M		+1.4	+1.3	+1.3	+1.4					
			+0.0	+0.0					CW		
17	39250.000	32.6	+0.0	+0.0	+0.0	+0.0	-9.5	38.3	54.0	-15.7	Vert
	M		+2.0	+2.3	+2.0	+2.3					
	Ave		+6.6	+0.0					FMCW		
18	30000.150	76.9	+0.0	+0.0	+0.0	+0.0	-9.5	79.2	95.0	-15.8	Horiz
	M		+1.7	+1.7	+1.7	+1.8					
			+4.9	+0.0					CW		
19	39550.000	32.8	+0.0	+0.0	+0.0	+0.0	-9.5	38.2	54.0	-15.8	Vert
	M		+2.0	+2.1	+2.0	+2.2					
	Ave		+6.6	+0.0					FMCW		
20	39500.000	32.0	+0.0	+0.0	+0.0	+0.0	-9.5	37.6	54.0	-16.4	Horiz
	M		+2.0	+2.2	+2.0	+2.2					
	Ave		+6.7	+0.0					FMCW		
21	39800.000	31.5	+0.0	+0.0	+0.0	+0.0	-9.5	37.3	54.0	-16.7	Vert
	M		+2.0	+2.1	+2.0	+2.4					
	Ave		+6.8	+0.0					FMCW		
22	39750.000	31.3	+0.0	+0.0	+0.0	+0.0	-9.5	37.0	54.0	-17.0	Horiz
	M		+2.0	+2.1	+2.0	+2.3					
	Ave		+6.8	+0.0					FMCW		
^	39750.000	60.6	+0.0	+0.0	+0.0	+0.0	-9.5	78.2	95.0	-16.8	Horiz
	M		+2.0	+2.1	+2.0	+2.3					
			+0.0	+18.7					CW		
24	39800.000	31.2	+0.0	+0.0	+0.0	+0.0	-9.5	37.0	54.0	-17.0	Horiz
	M		+2.0	+2.1	+2.0	+2.4					
	Ave		+6.8	+0.0					FMCW		
25	39750.000	31.2	+0.0	+0.0	+0.0	+0.0	-9.5	36.9	54.0	-17.1	Vert
	M		+2.0	+2.1	+2.0	+2.3					
	Ave		+6.8	+0.0					FMCW		
^	39750.017	65.1	+0.0	+0.0	+0.0	+0.0	-9.5	70.8	95.0	-24.2	Vert
	M		+2.0	+2.1	+2.0	+2.3					
			+6.8	+0.0					CW		
27	39250.000	30.9	+0.0	+0.0	+0.0	+0.0	-9.5	36.6	54.0	-17.4	Horiz
	M		+2.0	+2.3	+2.0	+2.3					
	Ave		+6.6	+0.0					FMCW		
28	20000.000	31.8	+0.0	+40.4	+1.5	-34.9	-9.5	35.0	54.0	-19.0	Horiz
	M		+1.5	+1.4	+1.4	+1.4					
	Ave		+0.0	+0.0					FMCW		
29	20000.000	31.7	+0.0	+40.4	+1.5	-34.9	-9.5	34.9	54.0	-19.1	Vert
	M		+1.5	+1.4	+1.4	+1.4					
	Ave		+0.0	+0.0					FMCW		
30	20080.000	31.8	+0.0	+40.5	+1.4	-35.0	-9.5	34.8	54.0	-19.2	Horiz
	M		+1.4	+1.4	+1.3	+1.5					
	Ave		+0.0	+0.0					FMCW		
^	20080.000	80.1	+0.0	+40.5	+1.4	-35.0	-9.5	83.1	95.0	-11.9	Horiz
	M		+1.4	+1.4	+1.3	+1.5					
			+0.0	+0.0					CW		
32	20080.000	31.6	+0.0	+40.5	+1.4	-35.0	-9.5	34.6	54.0	-19.4	Vert
	M		+1.4	+1.4	+1.3	+1.5					
	Ave		+0.0	+0.0					FMCW		

^	20080.000	81.9	+0.0	+40.5	+1.4	-35.0	-9.5	84.9	95.0	-10.1	Vert
	M		+1.4	+1.4	+1.3	+1.5					
			+0.0	+0.0					CW		
34	39800.383	66.1	+0.0	+0.0	+0.0	+0.0	-9.5	71.9	95.0	-23.1	Vert
	M		+2.0	+2.1	+2.0	+2.4					
			+6.8	+0.0					CW		
35	39800.383	61.0	+0.0	+0.0	+0.0	+0.0	-9.5	66.8	95.0	-28.2	Horiz
	M		+2.0	+2.1	+2.0	+2.4					
			+6.8	+0.0					CW		

Test Location: CKC Laboratories, Inc • 110 N. Olinda Place • Brea, CA • 714 993 6112
 Customer: **Leidos Security Detection & Automation, Inc.**
 Specification: **15.209 Radiated Emissions**
 Work Order #: **107144** Date: 12/14/2022
 Test Type: **Radiated Scan** Time: 16:14:36
 Tested By: E. Wong Sequence#: 5
 Software: EMITest 5.03.20

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The EUT seeking limited modular approval is place on the turntable with the bottom of the Mast elevated from the ground plan like normal installation.

Mast is elevated with M9 is 0.6 m from the ground plane

The USB ports of the Mast are connected to RF controlling device, Image Sampling Unit for data, control command and DC power.

The EUT contains 9 transmitter modules.

Two 24 V DC power supplies configured in series provides 48V to the Image Sampling Unit

The EUT is operating as intended in sweeping mode active (FMCW) and deactivated (CW) per FCC waiver. In CW mode, recorded frequency is adjusted to compensate for frequency drift

TX freq Range : 20-. 40GHz
 TX freq =20.08 - 39.80GHz
 Modulation : FMCW
 Firmware : V2.2.7
 Transmitter: M9

Frequency range of measurement = Fundamental, in band

In band measurement per FCC Waiver
 Ave
 Mode = sweep enabled, detector =RMS,
 RBW=1MHz,VBW=3MHz
 sweep =1 sec

Peak
 Mode=sweep disabled, detector =Peak
 RBW=100kHz, VBW1MHz

Test environment conditions:
 Temperature 11.9 - 15.2 Deg° C
 Relative Humidity: 47- 56%

Pressure: 99kPa

Site D

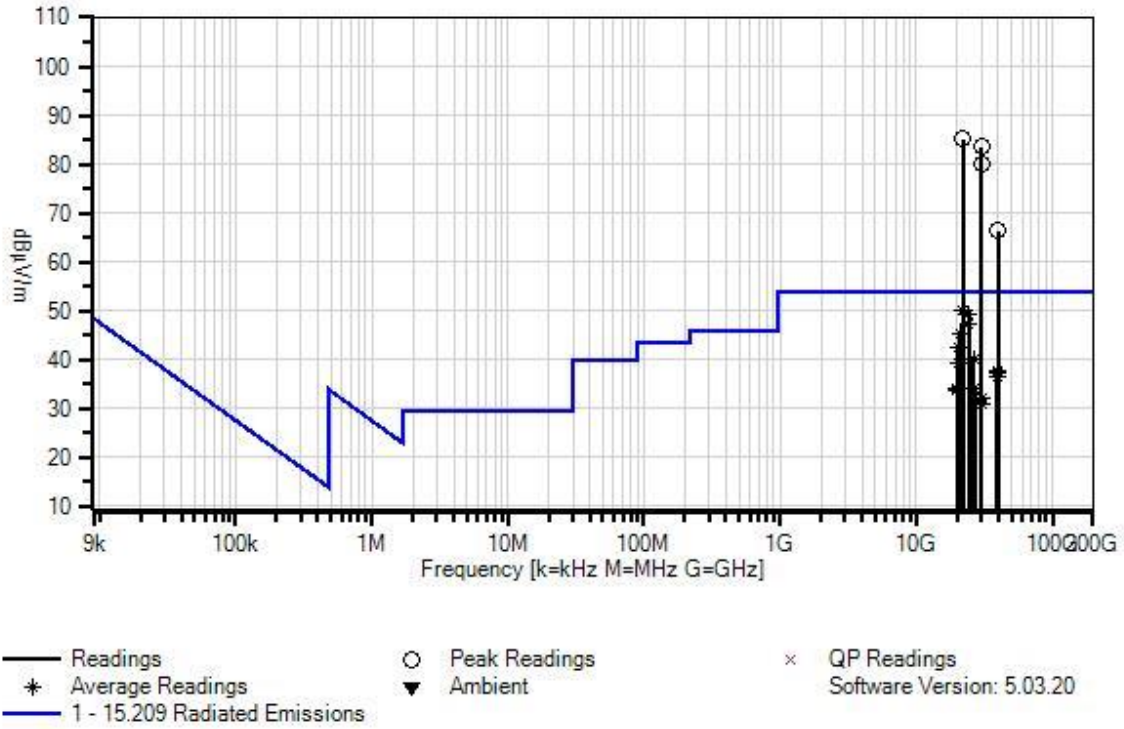
ANSI C63.10-2013

Peak limit above 1 GHz is 41dB above 15.209 (a) limit IAW FCC waiver.

FCC waiver DA06-1589 Aug 04th, 2006

FCC waiver DA16-1075 Nov 22nd, 2016

Leidos Security Detection & Automation, Inc. W/O#: 107144 Sequence#: 5 Date: 12/14/2022
 15.209 Radiated Emissions Test Distance: 1 Meter Vert



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02672	Spectrum Analyzer	E4446A	5/9/2022	5/9/2024
T2	AN01413	Horn Antenna	84125-80008	10/3/2022	10/3/2024
T3	ANP07657	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T4	AN00787	Preamp	83017A	6/23/2021	6/23/2023
T5	ANP07659	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T6	ANP07660	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T7	ANP07656	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T8	ANP07655	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T9	AN03158A	Horn Antenna	GH-28-25	8/10/2021	8/10/2023

Measurement Data: Reading listed by margin. Test Distance: 1 Meter

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	T5	T6	T7	T8	Table	dBμV/m	dBμV/m	dB	Ant
			T9								
1	22120.000	47.4	+0.0	+40.4	+1.6	-35.3	-9.5	50.3	54.0	-3.7	Vert
	M		+1.4	+1.5	+1.3	+1.5					
	Ave		+0.0						FMCW		
^	22120.000	88.5	+0.0	+40.4	+1.6	-35.3	-9.5	91.4	95.0	-3.6	Vert
	M		+1.4	+1.5	+1.3	+1.5					
			+0.0						CW		
3	22103.333	47.1	+0.0	+40.4	+1.6	-35.3	-9.5	50.0	54.0	-4.0	Horiz
	M		+1.4	+1.5	+1.3	+1.5					
	Ave		+0.0						FMCW		
4	24195.000	44.4	+0.0	+40.3	+1.5	-33.9	-9.5	49.3	54.0	-4.7	Vert
	M		+1.5	+1.8	+1.5	+1.7					
	Ave		+0.0						FMCW		
^	24195.000	87.0	+0.0	+40.3	+1.5	-33.9	-9.5	91.9	95.0	-3.1	Vert
	M		+1.5	+1.8	+1.5	+1.7					
			+0.0						CW		
6	24238.333	42.4	+0.0	+40.3	+1.5	-34.0	-9.5	47.2	54.0	-6.8	Horiz
	M		+1.5	+1.8	+1.5	+1.7					
	Ave		+0.0						FMCW		
7	21080.000	43.0	+0.0	+40.2	+1.5	-35.6	-9.5	45.4	54.0	-8.6	Horiz
	M		+1.5	+1.4	+1.4	+1.5					
	Ave		+0.0						FMCW		
8	22103.000	82.3	+0.0	+40.4	+1.6	-35.3	-9.5	85.2	95.0	-9.8	Horiz
	M		+1.4	+1.5	+1.3	+1.5					
			+0.0						CW		
9	20225.000	40.1	+0.0	+40.5	+1.4	-35.2	-9.5	42.7	54.0	-11.3	Vert
	M		+1.4	+1.3	+1.3	+1.4					
	Ave		+0.0						FMCW		
^	20225.000	84.6	+0.0	+40.5	+1.4	-35.2	-9.5	87.2	95.0	-7.8	Vert
	M		+1.4	+1.3	+1.3	+1.4					
			+0.0						CW		
11	30000.967	81.2	+0.0	+0.0	+0.0	+0.0	-9.5	83.5	95.0	-11.5	Horiz
	M		+1.7	+1.7	+1.7	+1.8					
			+4.9						CW		
12	26575.000	40.4	+0.0	+0.0	+0.0	+0.0	-9.5	40.1	54.0	-13.9	Vert
	M		+1.6	+1.7	+1.6	+1.8					
	Ave		+2.5						FMCW		
^	26575.000	88.2	+0.0	+0.0	+0.0	+0.0	-9.5	87.9	95.0	-7.1	Vert
	M		+1.6	+1.7	+1.6	+1.8					
			+2.5						CW		
14	20225.000	36.9	+0.0	+40.5	+1.4	-35.2	-9.5	39.5	54.0	-14.5	Horiz
	M		+1.4	+1.3	+1.3	+1.4					
	Ave		+0.0						FMCW		
^	20225.000	79.1	+0.0	+40.5	+1.4	-35.2	-9.5	81.7	95.0	-13.3	Horiz
	M		+1.4	+1.3	+1.3	+1.4					
			+0.0						CW		

16	30000.400 M	77.9	+0.0 +1.7 +4.9	+0.0 +1.7 +1.7	+0.0 +1.7 +1.7	+0.0 +1.8 +1.8	-9.5	80.2	95.0	-14.8	Vert
									CW		
17	39250.000 M Ave	32.1	+0.0 +2.0 +6.6	+0.0 +2.3 +2.0	+0.0 +2.0 +2.0	+0.0 +2.3 +2.0	-9.5	37.8	54.0	-16.2	Horiz
									FMCW		
18	39500.000 M Ave	32.1	+0.0 +2.0 +6.7	+0.0 +2.2 +2.0	+0.0 +2.0 +2.0	+0.0 +2.2 +2.2	-9.5	37.7	54.0	-16.3	Horiz
									FMCW		
19	39800.000 M Ave	31.5	+0.0 +2.0 +6.8	+0.0 +2.1 +2.0	+0.0 +2.0 +2.0	+0.0 +2.4 +2.4	-9.5	37.3	54.0	-16.7	Vert
									FMCW		
^	39800.000 M	66.3	+0.0 +2.0 +6.8	+0.0 +2.1 +2.0	+0.0 +2.0 +2.0	+0.0 +2.4 +2.4	-9.5	72.1	95.0	-22.9	Vert
									CW		
21	39750.000 M Ave	31.5	+0.0 +2.0 +6.8	+0.0 +2.1 +2.0	+0.0 +2.0 +2.0	+0.0 +2.3 +2.3	-9.5	37.2	54.0	-16.8	Vert
									FMCW		
^	39750.000 M	65.9	+0.0 +2.0 +6.8	+0.0 +2.1 +2.0	+0.0 +2.0 +2.0	+0.0 +2.3 +2.3	-9.5	71.6	95.0	-23.4	Vert
									CW		
23	39750.000 M Ave	31.5	+0.0 +2.0 +6.8	+0.0 +2.1 +2.0	+0.0 +2.0 +2.0	+0.0 +2.3 +2.3	-9.5	37.2	54.0	-16.8	Horiz
									FMCW		
24	39800.000 M Ave	31.4	+0.0 +2.0 +6.8	+0.0 +2.1 +2.0	+0.0 +2.0 +2.0	+0.0 +2.4 +2.4	-9.5	37.2	54.0	-16.8	Horiz
									FMCW		
^	39800.000 M	62.8	+0.0 +2.0 +6.8	+0.0 +2.1 +2.0	+0.0 +2.0 +2.0	+0.0 +2.4 +2.4	-9.5	68.6	95.0	-26.4	Horiz
									CW		
26	39550.000 M Ave	31.8	+0.0 +2.0 +6.6	+0.0 +2.1 +2.0	+0.0 +2.0 +2.0	+0.0 +2.2 +2.2	-9.5	37.2	54.0	-16.8	Vert
									FMCW		
27	39250.000 M Ave	30.9	+0.0 +2.0 +6.6	+0.0 +2.3 +2.0	+0.0 +2.0 +2.0	+0.0 +2.3 +2.3	-9.5	36.6	54.0	-17.4	Vert
									FMCW		
28	26825.000 M Ave	34.8	+0.0 +1.6 +2.5	+0.0 +1.6 +1.6	+0.0 +1.5 +1.5	+0.0 +1.8 +1.8	-9.5	34.3	54.0	-19.7	Horiz
									FMCW		
^	26825.000 M	83.5	+0.0 +1.6 +2.5	+0.0 +1.6 +1.6	+0.0 +1.5 +1.5	+0.0 +1.8 +1.8	-9.5	83.0	95.0	-12.0	Horiz
									CW		
30	20080.000 M Ave	31.0	+0.0 +1.4 +0.0	+40.5 +1.4 +1.4	+1.4 +1.3 +1.3	-35.0 +1.5 +1.5	-9.5	34.0	54.0	-20.0	Vert
									FMCW		
^	20080.000 M	85.1	+0.0 +1.4 +0.0	+40.5 +1.4 +1.4	+1.4 +1.3 +1.3	-35.0 +1.5 +1.5	-9.5	88.1	95.0	-6.9	Vert
									CW		
32	20080.000 M Ave	30.7	+0.0 +1.4 +0.0	+40.5 +1.4 +1.4	+1.4 +1.3 +1.3	-35.0 +1.5 +1.5	-9.5	33.7	54.0	-20.3	Horiz
									FMCW		

^	20080.000	82.6	+0.0	+40.5	+1.4	-35.0	-9.5	85.6	95.0	-9.4	Horiz
	M		+1.4	+1.4	+1.3	+1.5					
			+0.0						CW		
34	30000.000	29.7	+0.0	+0.0	+0.0	+0.0	-9.5	32.0	54.0	-22.0	Vert
	M		+1.7	+1.7	+1.7	+1.8					
	Ave		+4.9						FMCW		
35	30000.000	28.5	+0.0	+0.0	+0.0	+0.0	-9.5	30.8	54.0	-23.2	Horiz
	M		+1.7	+1.7	+1.7	+1.8					
	Ave		+4.9						FMCW		
36	39751.983	60.7	+0.0	+0.0	+0.0	+0.0	-9.5	66.4	95.0	-28.6	Horiz
	M		+2.0	+2.1	+2.0	+2.3					
			+6.8						CW		

Test Setup Photo(s)



In Band M1



In Band M5, View #1



In Band M5, View #2



In Band M9



Voltage Variation

15.209 Radiated Emissions

Test Setup / Conditions / Data

Test Location: CKC Laboratories, Inc • 110 N. Olinda Place • Brea, CA • 714 993 6112
 Customer: **Leidos Security Detection & Automation, Inc.**
 Specification: **15.209 Radiated Emissions**
 Work Order #: **107144** Date: 12/19/2022
 Test Type: **Radiated Scan** Time: 15:22:42
 Tested By: E. Wong Sequence#: 6
 Software: EMITest 5.03.20

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The EUT seeking limited modular approval is placed on the turntable with the bottom of the Mast elevated from the ground plane like normal installation.

The USB ports of the Mast are connected to RF controlling device, Image Sampling Unit for data, control command and DC power.

The EUT contains 9 transmitter modules.

Two 24 V DC power supplies configured in series provides 48V to the Image Sampling Unit

The EUT is operating as intended in sweeping mode FMCW per FCC waiver.

TX freq Range : 20- 40GHz
 TX freq =20.08 - 39.80GHz
 Modulation : FMCW
 Firmware : V1.2.7 V2.2.8
 Transmitter: M1, M5, M9

Frequency range of measurement = 9 kHz- 20 GHz.

9 kHz -150 kHz;RBW=200 Hz,VBW=600 Hz;
 150 kHz-30 MHz;RBW=9 kHz,VBW=27 kHz;
 30 MHz-1000 MHz;RBW=120 kHz,VBW=360 kHz,
 1000 MHz-200000 MHz;RBW=1MHz,VBW=3 MHz.

In band measurement per FCC Waiver

Ave
 Mode = sweep enabled, detector =RMS,

RBW=1MHz,VBW=3MHz

sweep =1 sec

Peak

Mode=sweep disabled, detector =Peak

RBW=100kHz, VBW1MHz

Test environment conditions:

Temperature: 24 Deg°C

Relative Humidity: 29%

Pressure: 99kPa

Site D

ANSI C63.10-2013

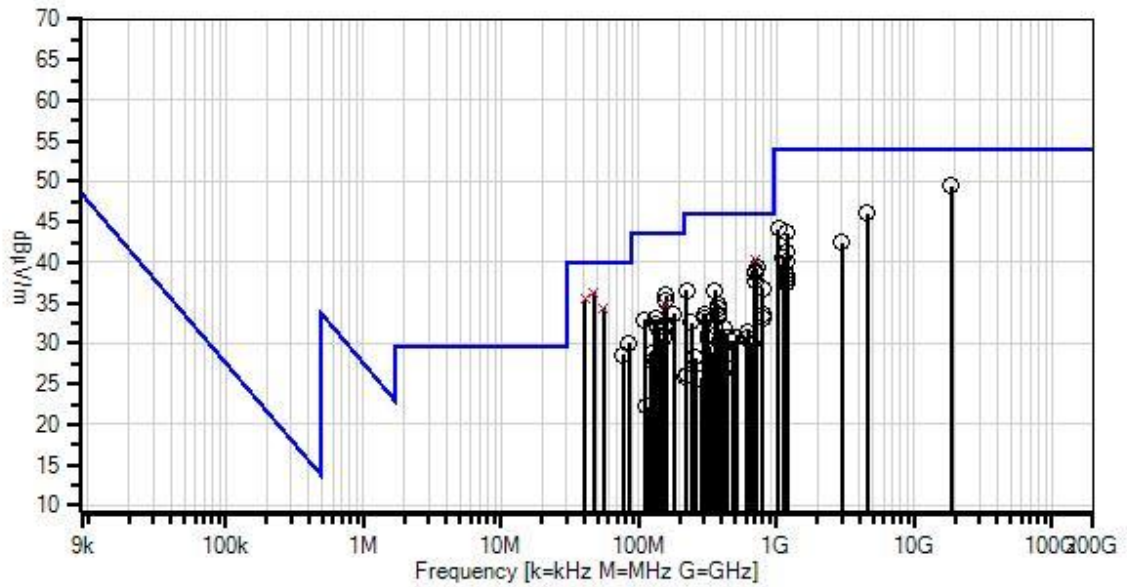
Peak limit above 1 GHz is 41dB above 15.209 (a) limit IAW FCC waiver.

FCC waiver DA06-1589 Aug 04th, 2006

FCC waiver DA16-1075 Nov 22nd, 2016

No emission detected below 30MHz

Leidos Security Detection & Automation, Inc. W/O#: 107144 Sequence#: 6 Date: 12/19/2022
 15.209 Radiated Emissions Test Distance: 3 Meters Horiz



— Readings	○ Peak Readings	× QP Readings
* Average Readings	▼ Ambient	Software Version: 5.03.20
— 1 - 15.209 Radiated Emissions		

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02672	Spectrum Analyzer	E4446A	5/9/2022	5/9/2024
T2	AN01413	Horn Antenna	84125-80008	10/3/2022	10/3/2024
T3	ANP07657	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T4	AN00787	Preamp	83017A	6/23/2021	6/23/2023
T5	ANP07659	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T6	ANP07660	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T7	ANP07656	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T8	ANP07655	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
	AN03158A	Horn Antenna	GH-28-25	8/10/2021	8/10/2023
T9	AN01646	Horn Antenna	3115	3/21/2022	3/21/2024
	AN03367	Horn Antenna	62-GH-62-25.	8/3/2021	8/3/2023
T10	AN01994	Biconilog Antenna	CBL6111C	6/1/2022	6/1/2024
T11	ANP01911	Cable-Amplitude +15C to +45C (dB)	RG214/U	1/5/2022	1/5/2024
T12	AN00010	Preamp	8447D	1/3/2022	1/3/2024
T13	ANP04382	Cable	LDF-50	5/18/2022	5/18/2024
T14	ANP06978	Cable	Sucoflex 104A	3/4/2022	3/4/2024
	AN00314	Loop Antenna	6502	3/29/2022	3/29/2024
T15	ANP07138	Cable	ANDL1-PNMNM-60	3/30/2021	3/30/2023

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

#	Freq	Rdng	Reading listed by margin.					Dist	Corr	Spec	Margin	Polar		
			T1	T2	T3	T4	T5							
	MHz	dB μ V	T6	T7	T8	T9	T10	T11	T12	Table	dB μ V/m	dB μ V/m	dB	Ant
1	46.883M	45.9	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	36.3	40.0	40.0	-3.7	Vert
	QP		+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0		M1			
			+0.0	+15.9	+0.6	-27.1								
			+0.9	+0.1	+0.0									
^	46.883M	48.6	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	39.0	40.0	40.0	-1.0	Vert
			+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0		M1			
			+0.0	+15.9	+0.6	-27.1								
			+0.9	+0.1	+0.0									
3	40.800M	42.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	35.5	40.0	40.0	-4.5	Vert
	QP		+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0		M5			
			+0.0	+19.1	+0.6	-27.1								
			+0.8	+0.1	+0.0									
^	40.800M	44.2	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	37.7	40.0	40.0	-2.3	Vert
			+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0		M5			
			+0.0	+19.1	+0.6	-27.1								
			+0.8	+0.1	+0.0									
5	18680.000	38.3	+0.0	+40.2	+1.3	-36.0	+0.0	+0.0	+0.0	49.4	54.0	54.0	-4.6	Horiz
	M		+1.5	+1.4	+1.4	+1.3					M5			
			+0.0	+0.0	+0.0	+0.0								
			+0.0	+0.0	+0.0									
6	55.800M	47.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	34.4	40.0	40.0	-5.6	Vert
	QP		+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0		M5			
			+0.0	+12.7	+0.7	-27.1								
			+1.0	+0.1	+0.0									
^	55.800M	49.3	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	36.7	40.0	40.0	-3.3	Vert
			+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0		M5			
			+0.0	+12.7	+0.7	-27.1								
			+1.0	+0.1	+0.0									
8	700.006M	35.6	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	40.4	46.0	46.0	-5.6	Vert
	QP		+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0		M5			
			+0.0	+26.6	+2.8	-27.9								
			+3.0	+0.3	+0.0									
^	700.006M	36.3	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	41.1	46.0	46.0	-4.9	Vert
			+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0		M5			
			+0.0	+26.6	+2.8	-27.9								
			+3.0	+0.3	+0.0									
^	700.000M	32.8	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	37.6	46.0	46.0	-8.4	Vert
			+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0		M9			
			+0.0	+26.6	+2.8	-27.9								
			+3.0	+0.3	+0.0									
11	719.996M	33.8	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	39.3	46.0	46.0	-6.7	Horiz
			+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0		M1			
			+0.0	+27.2	+2.8	-27.9								
			+3.1	+0.3	+0.0									

12	700.026M	34.1	+0.0	+0.0	+0.0	+0.0	+0.0	38.9	46.0	-7.1	Horiz
			+0.0	+0.0	+0.0	+0.0			M1		
			+0.0	+26.6	+2.8	-27.9					
			+3.0	+0.3	+0.0						
13	700.025M	33.9	+0.0	+0.0	+0.0	+0.0	+0.0	38.7	46.0	-7.3	Horiz
			+0.0	+0.0	+0.0	+0.0			M9		
			+0.0	+26.6	+2.8	-27.9					
			+3.0	+0.3	+0.0						
14	158.200M	43.6	+0.0	+0.0	+0.0	+0.0	+0.0	35.9	43.5	-7.6	Horiz
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+16.4	+1.2	-26.9					
			+1.4	+0.2	+0.0						
15	4537.000M	50.3	+0.0	+0.0	+0.6	-39.4	+0.0	46.1	54.0	-7.9	Horiz
			+0.6	+0.6	+0.6	+0.6			M5		
			+32.2	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0						
16	699.949M	33.0	+0.0	+0.0	+0.0	+0.0	+0.0	37.8	46.0	-8.2	Horiz
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+26.6	+2.8	-27.9					
			+3.0	+0.3	+0.0						
17	154.850M	42.8	+0.0	+0.0	+0.0	+0.0	+0.0	35.2	43.5	-8.3	Horiz
			+0.0	+0.0	+0.0	+0.0			M1		
			+0.0	+16.5	+1.2	-26.9					
			+1.4	+0.2	+0.0						
18	157.275M QP	42.4	+0.0	+0.0	+0.0	+0.0	+0.0	34.7	43.5	-8.8	Horiz
			+0.0	+0.0	+0.0	+0.0			M9		
			+0.0	+16.4	+1.2	-26.9					
			+1.4	+0.2	+0.0						
^	157.280M	45.8	+0.0	+0.0	+0.0	+0.0	+0.0	38.1	43.5	-5.4	Horiz
			+0.0	+0.0	+0.0	+0.0			M9		
			+0.0	+16.4	+1.2	-26.9					
			+1.4	+0.2	+0.0						
20	800.003M	29.8	+0.0	+0.0	+0.0	+0.0	+0.0	36.8	46.0	-9.2	Vert
			+0.0	+0.0	+0.0	+0.0			M9		
			+0.0	+28.1	+3.0	-27.8					
			+3.3	+0.4	+0.0						
21	223.008M	44.3	+0.0	+0.0	+0.0	+0.0	+0.0	36.5	46.0	-9.5	Horiz
			+0.0	+0.0	+0.0	+0.0			M9		
			+0.0	+15.4	+1.5	-26.6					
			+1.7	+0.2	+0.0						
22	358.123M	38.8	+0.0	+0.0	+0.0	+0.0	+0.0	36.5	46.0	-9.5	Horiz
			+0.0	+0.0	+0.0	+0.0			M1		
			+0.0	+20.5	+1.9	-27.0					
			+2.1	+0.2	+0.0						
23	180.400M	42.8	+0.0	+0.0	+0.0	+0.0	+0.0	33.7	43.5	-9.8	Vert
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+14.7	+1.3	-26.8					
			+1.5	+0.2	+0.0						
24	1040.033M	58.9	+0.0	+0.0	+0.3	-40.9	+0.0	44.1	54.0	-9.9	Vert
			+0.2	+0.2	+0.3	+0.3			M5		
			+24.8	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0						

25	84.277M	41.0	+0.0	+0.0	+0.0	+0.0	+0.0	30.0	40.0	-10.0	Vert
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+14.0	+0.8	-27.1					
			+1.2	+0.1	+0.0						
26	1199.900M	51.6	+0.0	+0.0	+0.3	-40.1	+0.0	43.7	54.0	-10.3	Vert
			+0.0	+0.0	+0.0	+0.0			M5		
			+25.4	+0.0	+0.0	+0.0					
			+3.9	+0.0	+2.6						
27	131.264M	40.1	+0.0	+0.0	+0.0	+0.0	+0.0	33.1	43.5	-10.4	Vert
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+17.5	+1.1	-27.0					
			+1.3	+0.1	+0.0						
28	109.779M	40.9	+0.0	+0.0	+0.0	+0.0	+0.0	32.9	43.5	-10.6	Vert
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+16.7	+1.0	-27.0					
			+1.2	+0.1	+0.0						
29	131.258M	39.5	+0.0	+0.0	+0.0	+0.0	+0.0	32.5	43.5	-11.0	Vert
			+0.0	+0.0	+0.0	+0.0			M9		
			+0.0	+17.5	+1.1	-27.0					
			+1.3	+0.1	+0.0						
30	374.965M	36.7	+0.0	+0.0	+0.0	+0.0	+0.0	34.9	46.0	-11.1	Vert
			+0.0	+0.0	+0.0	+0.0			M9		
			+0.0	+20.8	+2.0	-27.1					
			+2.2	+0.3	+0.0						
31	157.910M	40.0	+0.0	+0.0	+0.0	+0.0	+0.0	32.3	43.5	-11.2	Vert
			+0.0	+0.0	+0.0	+0.0			M1		
			+0.0	+16.4	+1.2	-26.9					
			+1.4	+0.2	+0.0						
32	77.343M	40.5	+0.0	+0.0	+0.0	+0.0	+0.0	28.6	40.0	-11.4	Vert
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+13.1	+0.8	-27.1					
			+1.2	+0.1	+0.0						
33	138.600M	38.8	+0.0	+0.0	+0.0	+0.0	+0.0	31.9	43.5	-11.6	Horiz
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+17.3	+1.2	-26.9					
			+1.3	+0.2	+0.0						
34	2999.850M	40.4	+0.0	+0.0	+0.5	-39.4	+0.0	42.4	54.0	-11.6	Horiz
			+0.0	+0.0	+0.0	+0.0			M5		
			+30.1	+0.0	+0.0	+0.0					
			+6.4	+0.0	+4.4						
35	158.046M	39.5	+0.0	+0.0	+0.0	+0.0	+0.0	31.8	43.5	-11.7	Vert
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+16.4	+1.2	-26.9					
			+1.4	+0.2	+0.0						
36	374.987M	36.1	+0.0	+0.0	+0.0	+0.0	+0.0	34.3	46.0	-11.7	Vert
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+20.8	+2.0	-27.1					
			+2.2	+0.3	+0.0						
37	374.990M	35.5	+0.0	+0.0	+0.0	+0.0	+0.0	33.7	46.0	-12.3	Horiz
			+0.0	+0.0	+0.0	+0.0			M1		
			+0.0	+20.8	+2.0	-27.1					
			+2.2	+0.3	+0.0						

38	300.033M	37.1	+0.0	+0.0	+0.0	+0.0	+0.0	33.6	46.0	-12.4	Vert
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+19.1	+1.7	-26.5					
			+2.0	+0.2	+0.0						
39	304.143M	36.9	+0.0	+0.0	+0.0	+0.0	+0.0	33.5	46.0	-12.5	Vert
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+19.2	+1.7	-26.5					
			+2.0	+0.2	+0.0						
40	799.993M	26.5	+0.0	+0.0	+0.0	+0.0	+0.0	33.5	46.0	-12.5	Horiz
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+28.1	+3.0	-27.8					
			+3.3	+0.4	+0.0						
41	1200.000M	49.3	+0.0	+0.0	+0.3	-40.1	+0.0	41.4	54.0	-12.6	Vert
			+0.0	+0.0	+0.0	+0.0			M1		
			+25.4	+0.0	+0.0	+0.0					
			+3.9	+0.0	+2.6						
42	375.067M	35.1	+0.0	+0.0	+0.0	+0.0	+0.0	33.3	46.0	-12.7	Horiz
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+20.8	+2.0	-27.1					
			+2.2	+0.3	+0.0						
43	800.072M	26.1	+0.0	+0.0	+0.0	+0.0	+0.0	33.1	46.0	-12.9	Vert
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+28.1	+3.0	-27.8					
			+3.3	+0.4	+0.0						
44	299.915M	36.6	+0.0	+0.0	+0.0	+0.0	+0.0	33.1	46.0	-12.9	Vert
			+0.0	+0.0	+0.0	+0.0			M9		
			+0.0	+19.1	+1.7	-26.5					
			+2.0	+0.2	+0.0						
45	149.375M	37.9	+0.0	+0.0	+0.0	+0.0	+0.0	30.6	43.5	-12.9	Horiz
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+16.9	+1.2	-26.9					
			+1.3	+0.2	+0.0						
46	239.910M	38.5	+0.0	+0.0	+0.0	+0.0	+0.0	32.6	46.0	-13.4	Horiz
			+0.0	+0.0	+0.0	+0.0			M9		
			+0.0	+17.1	+1.5	-26.5					
			+1.8	+0.2	+0.0						
47	319.994M	35.9	+0.0	+0.0	+0.0	+0.0	+0.0	32.6	46.0	-13.4	Horiz
			+0.0	+0.0	+0.0	+0.0			M1		
			+0.0	+19.4	+1.8	-26.7					
			+2.0	+0.2	+0.0						
48	1120.017M	54.3	+0.0	+0.0	+0.3	-40.4	+0.0	40.6	54.0	-13.4	Horiz
			+0.3	+0.3	+0.3	+0.3			M5		
			+25.2	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0						
49	358.131M	34.5	+0.0	+0.0	+0.0	+0.0	+0.0	32.2	46.0	-13.8	Vert
			+0.0	+0.0	+0.0	+0.0			M9		
			+0.0	+20.5	+1.9	-27.0					
			+2.1	+0.2	+0.0						
50	1199.967M	48.0	+0.0	+0.0	+0.3	-40.1	+0.0	40.1	54.0	-13.9	Vert
			+0.0	+0.0	+0.0	+0.0			M9		
			+25.4	+0.0	+0.0	+0.0					
			+3.9	+0.0	+2.6						

51	412.521M	32.1	+0.0	+0.0	+0.0	+0.0	+0.0	31.8	46.0	-14.2	Horiz
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+22.5	+2.0	-27.4					
			+2.3	+0.3	+0.0						
52	618.760M	27.5	+0.0	+0.0	+0.0	+0.0	+0.0	31.5	46.0	-14.5	Horiz
			+0.0	+0.0	+0.0	+0.0			M9		
			+0.0	+26.3	+2.5	-28.0					
			+2.9	+0.3	+0.0						
53	123.680M	36.0	+0.0	+0.0	+0.0	+0.0	+0.0	28.8	43.5	-14.7	Horiz
			+0.0	+0.0	+0.0	+0.0			M9		
			+0.0	+17.4	+1.1	-27.0					
			+1.2	+0.1	+0.0						
54	318.785M	34.6	+0.0	+0.0	+0.0	+0.0	+0.0	31.3	46.0	-14.7	Vert
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+19.4	+1.8	-26.7					
			+2.0	+0.2	+0.0						
55	439.498M	31.1	+0.0	+0.0	+0.0	+0.0	+0.0	30.8	46.0	-15.2	Horiz
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+22.5	+2.1	-27.6					
			+2.4	+0.3	+0.0						
56	508.806M	29.6	+0.0	+0.0	+0.0	+0.0	+0.0	30.7	46.0	-15.3	Vert
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+23.8	+2.3	-27.9					
			+2.6	+0.3	+0.0						
57	139.508M	35.1	+0.0	+0.0	+0.0	+0.0	+0.0	28.2	43.5	-15.3	Horiz
			+0.0	+0.0	+0.0	+0.0			M9		
			+0.0	+17.3	+1.2	-26.9					
			+1.3	+0.2	+0.0						
58	613.672M	26.6	+0.0	+0.0	+0.0	+0.0	+0.0	30.6	46.0	-15.4	Vert
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+26.3	+2.5	-28.0					
			+2.9	+0.3	+0.0						
59	319.985M	33.8	+0.0	+0.0	+0.0	+0.0	+0.0	30.5	46.0	-15.5	Vert
			+0.0	+0.0	+0.0	+0.0			M9		
			+0.0	+19.4	+1.8	-26.7					
			+2.0	+0.2	+0.0						
60	386.300M	32.1	+0.0	+0.0	+0.0	+0.0	+0.0	30.5	46.0	-15.5	Horiz
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+21.1	+2.0	-27.2					
			+2.2	+0.3	+0.0						
61	1199.800M	46.4	+0.0	+0.0	+0.3	-40.1	+0.0	38.5	54.0	-15.5	Horiz
			+0.0	+0.0	+0.0	+0.0			M5		
			+25.4	+0.0	+0.0	+0.0					
			+3.9	+0.0	+2.6						
62	480.039M	29.4	+0.0	+0.0	+0.0	+0.0	+0.0	30.3	46.0	-15.7	Vert
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+23.7	+2.2	-27.8					
			+2.5	+0.3	+0.0						
63	122.967M	34.9	+0.0	+0.0	+0.0	+0.0	+0.0	27.7	43.5	-15.8	Horiz
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+17.4	+1.1	-27.0					
			+1.2	+0.1	+0.0						

64	134.008M	34.8	+0.0	+0.0	+0.0	+0.0	+0.0	27.7	43.5	-15.8	Horiz
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+17.4	+1.1	-27.0					
			+1.3	+0.1	+0.0						
65	656.156M	25.8	+0.0	+0.0	+0.0	+0.0	+0.0	30.0	46.0	-16.0	Vert
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+26.3	+2.6	-28.0					
			+3.0	+0.3	+0.0						
66	1200.000M	45.9	+0.0	+0.0	+0.3	-40.1	+0.0	38.0	54.0	-16.0	Horiz
			+0.0	+0.0	+0.0	+0.0			M1		
			+25.4	+0.0	+0.0	+0.0					
			+3.9	+0.0	+2.6						
67	400.015M	30.3	+0.0	+0.0	+0.0	+0.0	+0.0	29.4	46.0	-16.6	Vert
			+0.0	+0.0	+0.0	+0.0			M9		
			+0.0	+21.8	+2.0	-27.3					
			+2.3	+0.3	+0.0						
68	1199.917M	45.3	+0.0	+0.0	+0.3	-40.1	+0.0	37.4	54.0	-16.6	Horiz
			+0.0	+0.0	+0.0	+0.0			M9		
			+25.4	+0.0	+0.0	+0.0					
			+3.9	+0.0	+2.6						
69	377.460M	31.0	+0.0	+0.0	+0.0	+0.0	+0.0	29.2	46.0	-16.8	Vert
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+20.8	+2.0	-27.1					
			+2.2	+0.3	+0.0						
70	337.465M	31.7	+0.0	+0.0	+0.0	+0.0	+0.0	29.0	46.0	-17.0	Vert
			+0.0	+0.0	+0.0	+0.0			M9		
			+0.0	+19.9	+1.9	-26.8					
			+2.1	+0.2	+0.0						
71	255.780M	31.9	+0.0	+0.0	+0.0	+0.0	+0.0	28.2	46.0	-17.8	Horiz
			+0.0	+0.0	+0.0	+0.0			M9		
			+0.0	+19.2	+1.5	-26.5					
			+1.9	+0.2	+0.0						
72	431.331M	27.5	+0.0	+0.0	+0.0	+0.0	+0.0	27.2	46.0	-18.8	Horiz
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+22.5	+2.1	-27.6					
			+2.4	+0.3	+0.0						
73	399.870M	27.2	+0.0	+0.0	+0.0	+0.0	+0.0	26.3	46.0	-19.7	Horiz
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+21.8	+2.0	-27.3					
			+2.3	+0.3	+0.0						
74	222.846M	34.0	+0.0	+0.0	+0.0	+0.0	+0.0	26.2	46.0	-19.8	Vert
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+15.4	+1.5	-26.6					
			+1.7	+0.2	+0.0						
75	218.730M	34.1	+0.0	+0.0	+0.0	+0.0	+0.0	25.9	46.0	-20.1	Horiz
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+15.0	+1.5	-26.6					
			+1.7	+0.2	+0.0						
76	282.440M	29.7	+0.0	+0.0	+0.0	+0.0	+0.0	25.7	46.0	-20.3	Horiz
			+0.0	+0.0	+0.0	+0.0			M9		
			+0.0	+18.7	+1.6	-26.5					
			+2.0	+0.2	+0.0						

77	337.600M	28.3	+0.0	+0.0	+0.0	+0.0	+0.0	25.6	46.0	-20.4	Horiz
			+0.0	+0.0	+0.0	+0.0			M1		
			+0.0	+19.9	+1.9	-26.8					
			+2.1	+0.2	+0.0						
78	113.650M	29.9	+0.0	+0.0	+0.0	+0.0	+0.0	22.2	43.5	-21.3	Horiz
			+0.0	+0.0	+0.0	+0.0			M5		
			+0.0	+17.0	+1.0	-27.0					
			+1.2	+0.1	+0.0						

Test Location: CKC Laboratories, Inc • 110 N. Olinda Place • Brea, CA • 714 993 6112
 Customer: **Leidos Security Detection & Automation, Inc.**
 Specification: **15.209 Radiated Emissions_peak**
 Work Order #: **107144** Date: 12/20/2022
 Test Type: **Radiated Scan** Time: 11:00:12
 Tested By: E. Wong Sequence#: 4
 Software: EMITest 5.03.20

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The EUT seeking limited modular approval is place on the turntable with the bottom of the Mast elevated from the ground plan like normal installation.

The USB ports of the Mast are connected to RF controlling device, Image Sampling Unit for data, control command and DC power.

The EUT contains 9 transmitter modules.

Two 24 V DC power supplies configured in series provides 48V to the Image Sampling Unit

The EUT is operating as intended in sweeping mode active (FMCW) and deactivated (CW) per FCC waiver.

TX freq Range : 20- 40GHz
 TX freq =20.08 - 39.80GHz
 Modulation : FMCW
 Firmware : V2.2.7, V2.2.8 (with improved receiver gain)
 Transmitter: M1, M5, M9

Frequency range of measurement = 40- 200 GHz.

1000 MHz-200000 MHz;RBW=1MHz,VBW=3 MHz.

In band measurement per FCC Waiver
 Ave
 Mode = sweep enabled, detector =RMS,
 RBW=1MHz,VBW=3MHz
 sweep =1 sec

Peak
 Mode=sweep disabled, detector =Peak
 RBW=100kHz, VBW1MHz

Test environment conditions:
 Temperature: 24 Deg°C
 Relative Humidity: 29%

Pressure: 99kPa

Site D

ANSI C63.10-2013

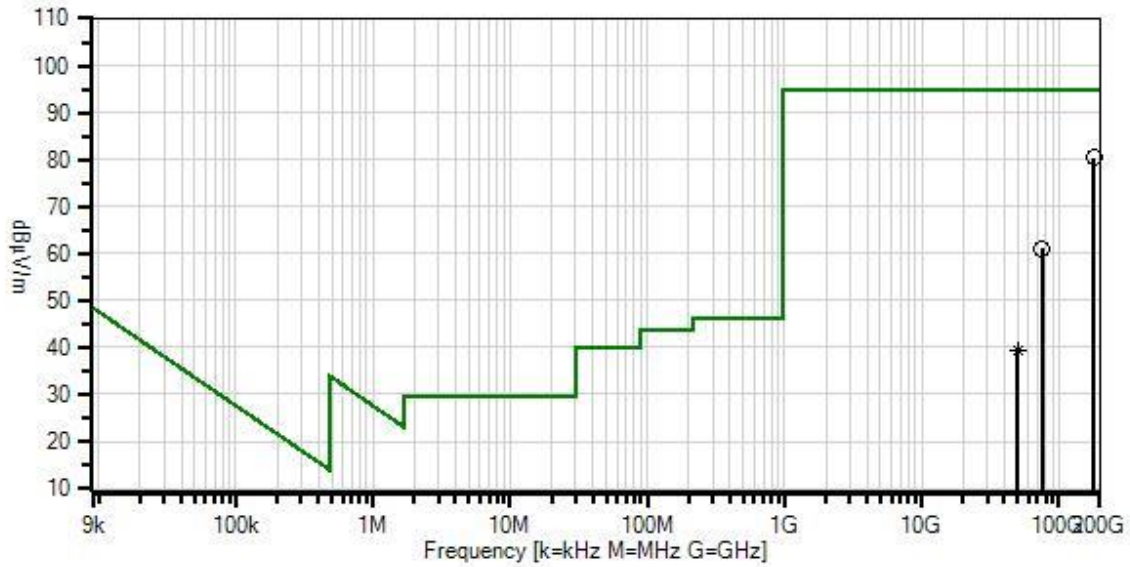
Peak limit above 1 GHz is 41dB above 15.209 (a) limit IAW FCC waiver.

FCC waiver DA06-1589 Aug 04th, 2006

FCC waiver DA16-1075 Nov 22nd, 2016

Measurement made with reduced RBW; the receiving antennas were placed at closer distance to the transmitting antennas to detect emission. No emission found, recorded data represent the noise floor at reduced RBW.

Leidos Security Detection & Automation, Inc. W/O#: 107144 Sequence#: 4 Date: 12/20/2022
 15.209 Radiated Emissions_peak Test Distance: 0.5 Meter Vert



- Readings
 - × QP Readings
 - ▼ Ambient
 - Peak Readings
 - * Average Readings
- Software Version: 5.03.20

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02672	Spectrum Analyzer	E4446A	5/9/2022	5/9/2024
T2	AN02347	Horn Antenna	M19HWA	3/9/2021	3/9/2023
T3	ANP07655-A	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T4	ANP07656-A	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T5	ANP07659-A	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T6	ANP07660-A	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T7	AN02348	Horn Antenna	M12HWA	3/9/2021	3/9/2023
T8	ANP07655-B	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T9	ANP07656-B	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T10	ANP07659-B	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T11	ANP07660-B	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
	AN02349	Horn Antenna	M08HWA	3/9/2021	3/9/2023
	ANP07655-C	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
	ANP07656-C	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
	ANP07659-C	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
	ANP07660-C	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T12	AN02350	Horn Antenna	M05HWA	3/9/2021	3/9/2023
T13	ANP07655-D	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T14	ANP07656-D	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T15	ANP07659-D	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T16	ANP07660-D	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024

Measurement Data:

Reading listed by margin.

Test Distance: 0.5 Meter

#	Freq	Rdng	Reading listed by margin.				Dist	Corr	Spec	Margin	Polar
			T1	T2	T3	T4					
			T5	T6	T7	T8					
			T9	T10	T11	T12					
			T13	T14	T15	T16					
	MHz	dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
1	50000.000	-19.2	+0.0	+71.3	+0.7	+0.8	-15.6	39.4	54.0	-14.6	Vert
	M		+0.7	+0.7	+0.0	+0.0					
	Ave		+0.0	+0.0	+0.0	+0.0			M9 FMCW		
			+0.0	+0.0	+0.0	+0.0					
2	80000.000	-15.6	+0.0	+0.0	+0.0	+0.0	-15.6	80.4	95.0	-14.6	Vert
	M		+0.0	+0.0	+0.0	+0.0					
			+0.0	+0.0	+0.0	+108.9			M5 200800MHz		
			+0.7	+0.7	+0.6	+0.7					
3	75000.000	-11.1	+0.0	+0.0	+0.0	+0.0	-15.6	61.0	95.0	-34.0	Vert
	M		+0.0	+0.0	+84.9	+0.6					
			+0.7	+0.7	+0.8	+0.0			M1 300000MHz		
			+0.0	+0.0	+0.0	+0.0					

Bandedge Data

Test Location: CKC Laboratories, Inc • 110 N. Olinda Place • Brea, CA • 714 993 6112
 Customer: **Leidos Security Detection & Automation, Inc.**
 Specification: **15.209 Radiated Emissions**
 Work Order #: **107144** Date: 12/16/2022
 Test Type: **Radiated Scan** Time: 10:22:54
 Tested By: E. Wong Sequence#: 3
 Software: EMITest 5.03.20

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The EUT seeking limited modular approval is place on the turntable with the bottom of the Mast elevated from the ground plan like normal installation.

The USB ports of the Mast are connected to RF controlling device, Image Sampling Unit for data, control command and DC power.

The EUT contains 9 transmitter modules.

Two 24 V DC power supplies configured in series provides 48V to the Image Sampling Unit

The EUT is operating as intended in sweeping mode active (FMCW) and deactivated (CW) per FCC waiver. In CW mode, recorded frequency is adjusted to compensate for frequency drift

TX freq Range : 20- 40GHz
 TX freq =20.08 - 39.80GHz
 Modulation : FMCW
 Firmware : V2.2.7, V2.2.8 with improved receiver gain)
 Transmitter: M5

Frequency range of measurement = Fundamental, in band

In band measurement per FCC Waiver
 Ave
 Mode = sweep enabled, detector =RMS,
 RBW=1MHz,VBW=3MHz
 sweep =1 sec

Peak
 Mode=sweep disabled, detector =Peak
 RBW=100kHz, VBW1MHz

Test environment conditions:
 Temperature: 24 Deg°C
 Relative Humidity: 29%

Pressure: 99kPa

Site D

ANSI C63.10-2013

Peak limit above 1 GHz is 41dB above 15.209 (a) limit IAW FCC waiver.

FCC waiver DA06-1589 Aug 04th, 2006

FCC waiver DA16-1075 Nov 22nd, 2016

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02672	Spectrum Analyzer	E4446A	5/9/2022	5/9/2024
T2	AN01413	Horn Antenna	84125-80008	10/3/2022	10/3/2024
T3	ANP07657	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T4	AN00787	Preamp	83017A	6/23/2021	6/23/2023
T5	ANP07659	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T6	ANP07660	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T7	ANP07656	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T8	ANP07655	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T9	AN03158A	Horn Antenna	GH-28-25	8/10/2021	8/10/2023
	ANR00219	Active Horn Antenna	SAS -200/512	9/16/2021	9/16/2023

Measurement Data:

Reading listed by margin.

Test Distance: 1 Meter

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	T5	T6	T7	T8	Table	dBμV/m	dBμV/m	dB	Ant
1	40000.000	31.0	+0.0	+0.0	+0.0	+0.0	-9.5	37.1	54.0	-16.9	Vert
	M		+2.0	+2.2	+2.0	+2.4					
	Ave		+7.0						bandedge H		
^	39999.999	31.3	+0.0	+0.0	+0.0	+0.0	-9.5	37.4	95.0	-57.6	Vert
	M		+2.0	+2.2	+2.0	+2.4					
			+7.0						CW TX on 39800MHz Bandedge H		
3	20000.000	32.6	+0.0	+40.4	+1.5	-34.9	-9.5	35.8	54.0	-18.2	Vert
	M		+1.5	+1.4	+1.4	+1.4					
	Ave		+0.0						Bandedge_L		
4	20000.000	32.0	+0.0	+40.4	+1.5	-34.9	-9.5	35.2	95.0	-59.8	Horiz
	M		+1.5	+1.4	+1.4	+1.4					
			+0.0						CW TX on 20080 MHz Bandedge L		

Test Setup Photo(s)



Below 1GHz, View #1



Below 1GHz, View #2



Above 1GHz, View #1



Above 1GHz, View #2



MM Wave, View #1



MM Wave, View #2

15.207 AC Conducted Emissions

Test Data

Test Location: CKC Laboratories, Inc • 110 N. Olinda Place • Brea, CA • 714 993 6112
 Customer: **Leidos Security Detection & Automation, Inc.**
 Specification: **15.207 AC Mains - Average**
 Work Order #: **107144** Date: 12/16/2022
 Test Type: **Conducted Emissions** Time: 16:35:37
 Tested By: E. Wong Sequence#: 30
 Software: EMITest 5.03.20 120/60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The EUT seeking limited modular approval is placed on the turntable with the bottom of the Mast elevated from the ground plane like normal installation.

The USB ports of the Mast are connected to RF controlling device, Image Sampling Unit for data, control command and DC power.

The EUT contains 9 transmitter modules.

Two 24 V DC power supplies configured in series provides 48V to the Image Sampling Unit

The EUT is operating as intended in sweeping mode active

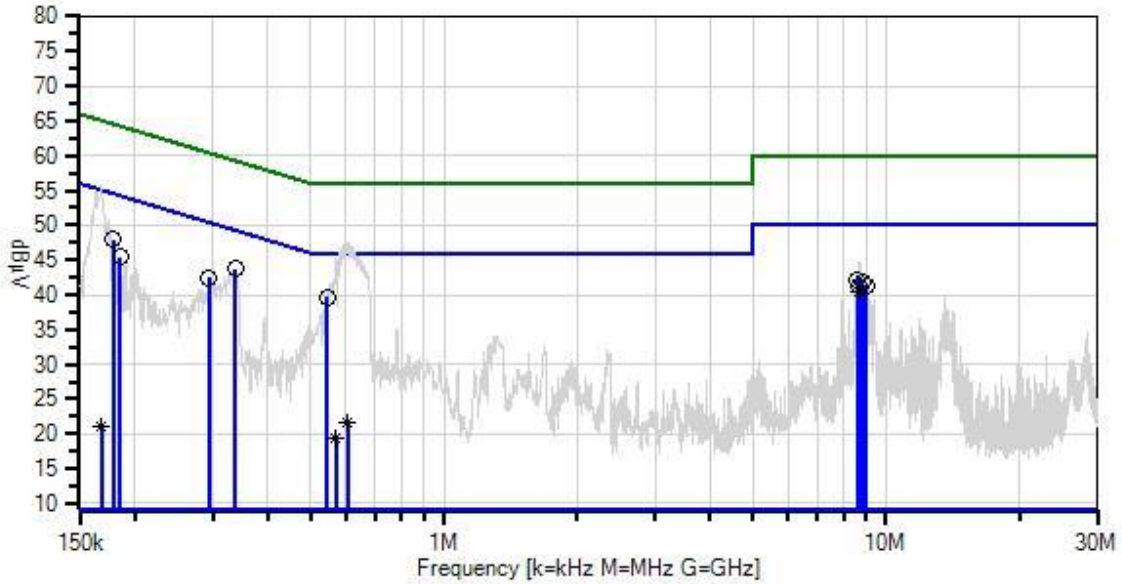
TX freq Range : 20- 40GHz / TX freq =20.08 - 39.80GHz
 Modulation : FMCW
 Firmware : V2.2.7, V2.2.8 with improved receiver gain)
 Transmitter: M5

Frequency range of measurement = 150kHz- 30MHz.
 150 kHz-30 MHz;RBW=9 kHz,VBW=30kHz

Test environment conditions:
 Temperature: 18 Deg°C
 Relative Humidity: 27%
 Pressure: 99kPa

Site D
 ANSI C63.10-2013
 AC conducted emission performed at AC mains of support power supply

Leidos Security Detection & Automation, Inc. WO#: 107144 Sequence#: 30 Date: 12/16/2022
 15.207 AC Mains - Average Test Lead: 120/60Hz L1-Line



— Sweep Data
 × QP Readings
 Software Version: 5.03.20

— Readings
 * Average Readings
 — 1 - 15.207 AC Mains - Average

○ Peak Readings
 ▼ Ambient
 — 2 - 15.207 AC Mains - Quasi-peak

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02672	Spectrum Analyzer	E4446A	5/9/2022	5/9/2024
T1	ANP06085	Attenuator	SA18N10W-06	10/24/2022	10/24/2024
T2	ANP01910	Cable	RG-142	9/8/2021	9/8/2023
T3	AN02610	High Pass Filter	HE9615-150K-50-720B	9/8/2021	9/8/2023
T4	AN00847.1	50uH LISN-(L) Line 1	3816/2NM	3/18/2022	3/18/2023
	AN00847.1	50uH LISN-(N) Line 2	3816/2NM	3/18/2022	3/18/2023

Measurement Data: Reading listed by margin. Test Lead: L1-Line

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar Ant
1	336.890k	37.7	+5.8	+0.1	+0.1	+0.0	+0.0	43.7	49.3	-5.6	L1-Li
2	543.417k	33.4	+5.8	+0.1	+0.3	+0.0	+0.0	39.6	46.0	-6.4	L1-Li
3	179.087k	41.8	+5.8	+0.1	+0.3	+0.0	+0.0	48.0	54.5	-6.5	L1-Li
4	8.598M	36.0	+5.8	+0.2	+0.1	+0.1	+0.0	42.2	50.0	-7.8	L1-Li
5	294.712k	36.4	+5.8	+0.1	+0.1	+0.0	+0.0	42.4	50.4	-8.0	L1-Li
6	8.824M	35.7	+5.8	+0.2	+0.1	+0.1	+0.0	41.9	50.0	-8.1	L1-Li
7	8.995M	35.2	+5.8	+0.2	+0.1	+0.1	+0.0	41.4	50.0	-8.6	L1-Li
8	9.031M	35.2	+5.8	+0.2	+0.1	+0.1	+0.0	41.4	50.0	-8.6	L1-Li
9	8.661M	35.1	+5.8	+0.2	+0.1	+0.1	+0.0	41.3	50.0	-8.7	L1-Li
10	185.632k	39.3	+5.8	+0.1	+0.2	+0.0	+0.0	45.4	54.2	-8.8	L1-Li
11	8.716M	34.3	+5.8	+0.2	+0.1	+0.1	+0.0	40.5	50.0	-9.5	L1-Li
Ave											
^	8.716M	38.5	+5.8	+0.2	+0.1	+0.1	+0.0	44.7	50.0	-5.3	L1-Li
13	606.684k	15.5	+5.8	+0.1	+0.3	+0.0	+0.0	21.7	46.0	-24.3	L1-Li
Ave											
^	606.684k	41.5	+5.8	+0.1	+0.3	+0.0	+0.0	47.7	46.0	+1.7	L1-Li
15	571.051k	13.3	+5.8	+0.1	+0.3	+0.0	+0.0	19.5	46.0	-26.5	L1-Li
Ave											
^	571.051k	39.2	+5.8	+0.1	+0.3	+0.0	+0.0	45.4	46.0	-0.6	L1-Li
^	573.232k	38.7	+5.8	+0.1	+0.3	+0.0	+0.0	44.9	46.0	-1.1	L1-Li
18	168.179k	14.8	+5.8	+0.1	+0.3	+0.0	+0.0	21.0	55.0	-34.0	L1-Li
Ave											
^	168.179k	49.4	+5.8	+0.1	+0.3	+0.0	+0.0	55.6	55.0	+0.6	L1-Li

Test Location: CKC Laboratories, Inc • 110 N. Olinda Place • Brea, CA • 714 993 6112
 Customer: **Leidos Security Detection & Automation, Inc.**
 Specification: **15.207 AC Mains - Average**
 Work Order #: **107144** Date: 12/16/2022
 Test Type: **Conducted Emissions** Time: 16:42:15
 Tested By: E. Wong Sequence#: 31
 Software: EMITest 5.03.20 120/60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The EUT seeking limited modular approval is place on the turntable with the bottom of the Mast elevated from the ground plan like normal installation.

The USB ports of the Mast are connected to RF controlling device, Image Sampling Unit for data, control command and DC power.

The EUT contains 9 transmitter modules.

Two 24 V DC power supplies configured in series provides 48V to the Image Sampling Unit

The EUT is operating as intended in sweeping mode active

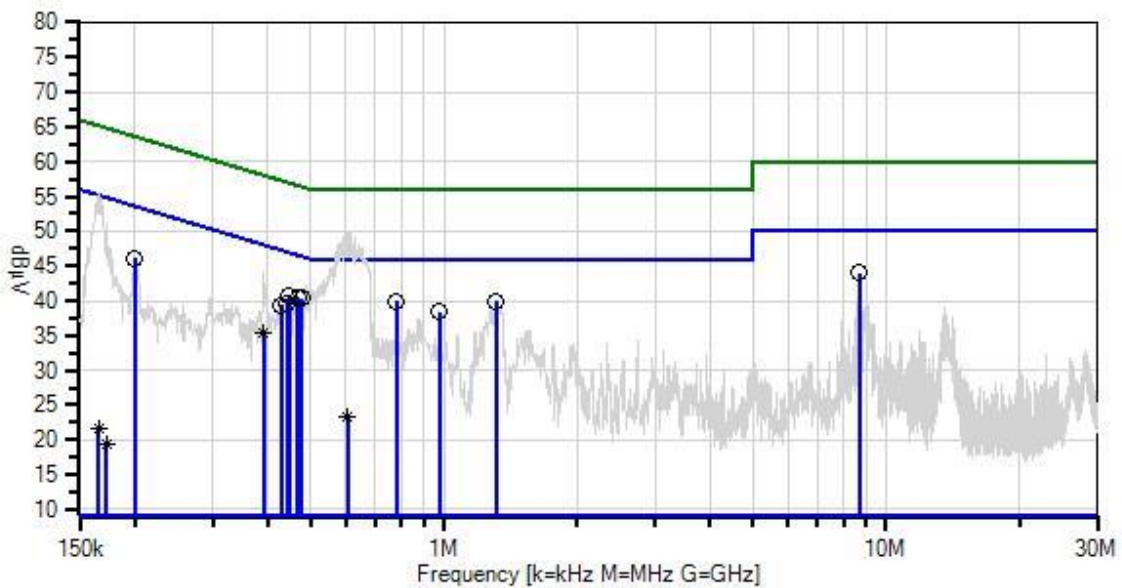
TX freq Range : 20- 40GHz
 TX freq =20.08 - 39.80GHz
 Modulation : FMCW
 Firmware : V2.2.7, V2.2.8 with improved receiver gain)
 Transmitter: M5

Frequency range of measurement = 150kHz- 30MHz.
 150 kHz-30 MHz;RBW=9 kHz,VBW=30kHz

Test environment conditions:
 Temperature: 18 Deg°C
 Relative Humidity: 27%
 Pressure: 99kPa

Site D
 ANSI C63.10-2013
 AC conducted emission performed at AC mains of support power supply

Leidos Security Detection & Automation, Inc. WO#: 107144 Sequence#: 31 Date: 12/16/2022
 15.207 AC Mains - Average Test Lead: 120/60Hz L2-Neutral



— Sweep Data
 × QP Readings
 Software Version: 5.03.20
 — Readings
 * Average Readings
 — 1 - 15.207 AC Mains - Average
 ○ Peak Readings
 ▼ Ambient
 — 2 - 15.207 AC Mains - Quasi-peak

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02672	Spectrum Analyzer	E4446A	5/9/2022	5/9/2024
T1	ANP06085	Attenuator	SA18N10W-06	10/24/2022	10/24/2024
T2	ANP01910	Cable	RG-142	9/8/2021	9/8/2023
T3	AN02610	High Pass Filter	HE9615-150K-50-720B	9/8/2021	9/8/2023
	AN00847.1	50uH LISN-(L) Line 1	3816/2NM	3/18/2022	3/18/2023
T4	AN00847.1	50uH LISN-(N) Line 2	3816/2NM	3/18/2022	3/18/2023

Measurement Data:

Reading listed by margin.

Test Lead: L2-Neutral

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar Ant
1	1.311M	33.9	+5.8	+0.1	+0.2	+0.0	+0.0	40.0	46.0	-6.0	L2-Ne
2	8.716M	37.8	+5.8	+0.2	+0.1	+0.1	+0.0	44.0	50.0	-6.0	L2-Ne
3	467.789k	34.3	+5.8	+0.1	+0.3	+0.0	+0.0	40.5	46.6	-6.1	L2-Ne
4	477.242k	34.1	+5.8	+0.1	+0.3	+0.0	+0.0	40.3	46.4	-6.1	L2-Ne
5	779.760k	33.7	+5.8	+0.1	+0.3	+0.0	+0.0	39.9	46.0	-6.1	L2-Ne
6	447.427k	34.5	+5.8	+0.1	+0.3	+0.0	+0.0	40.7	46.9	-6.2	L2-Ne
7	440.882k	33.6	+5.8	+0.1	+0.2	+0.0	+0.0	39.7	47.0	-7.3	L2-Ne
8	200.177k	40.0	+5.8	+0.1	+0.2	+0.0	+0.0	46.1	53.6	-7.5	L2-Ne
9	975.017k	32.3	+5.8	+0.1	+0.2	+0.0	+0.0	38.4	46.0	-7.6	L2-Ne
10	429.247k	33.3	+5.8	+0.1	+0.2	+0.0	+0.0	39.4	47.3	-7.9	L2-Ne
11	391.432k	29.3	+5.8	+0.1	+0.2	+0.0	+0.0	35.4	48.0	-12.6	L2-Ne
Ave											
^	391.432k	38.0	+5.8	+0.1	+0.2	+0.0	+0.0	44.1	48.0	-3.9	L2-Ne
13	605.958k	17.0	+5.8	+0.1	+0.3	+0.0	+0.0	23.2	46.0	-22.8	L2-Ne
Ave											
^	605.958k	43.7	+5.8	+0.1	+0.3	+0.0	+0.0	49.9	46.0	+3.9	L2-Ne
15	165.999k	15.3	+5.8	+0.1	+0.4	+0.0	+0.0	21.6	55.2	-33.6	L2-Ne
Ave											
^	165.998k	49.4	+5.8	+0.1	+0.4	+0.0	+0.0	55.7	55.2	+0.5	L2-Ne
17	172.543k	13.3	+5.8	+0.1	+0.3	+0.0	+0.0	19.5	54.8	-35.3	L2-Ne
Ave											
^	172.543k	45.1	+5.8	+0.1	+0.3	+0.0	+0.0	51.3	54.8	-3.5	L2-Ne
^	175.452k	41.7	+5.8	+0.1	+0.3	+0.0	+0.0	47.9	54.7	-6.8	L2-Ne

Test Setup Photo(s)



AC Mains View #1



AC Mains View #2

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.

Emissions Test Details

TESTING PARAMETERS

Unless otherwise indicated, the following configuration parameters are used for equipment setup: The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula. This reading was then compared to the applicable specification limit. Individual measurements were compared with the displayed limit value in the margin column. The margin was calculated based on subtracting the limit value from the corrected measurement value; a positive margin represents a measurement exceeding the limit, while a negative margin represents a measurement less than the limit.

SAMPLE CALCULATIONS		
	Meter reading	(dBµV)
+	Antenna Factor	(dB/m)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. Unless otherwise specified, the following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used.

MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	>1 GHz	1 MHz

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "positive peak" detector mode. Whenever a "quasi-peak" or "average" reading was recorded, the measurement was annotated with a "QP" or an "Ave" on the appropriate rows of the data sheets. In cases where quasi-peak or average limits were employed and data exists for multiple measurement types for the same frequency then the peak measurement was retained in the report for reference, however the numbering for the affected row was removed and an arrow or caret ("^") was placed in the far left-hand column indicating that the row above takes precedence for comparison to the limit. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the spectrum analyzer or receiver recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature called "peak hold," the measurement device had the ability to measure intermittent or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

Quasi-peak measurements were taken using the quasi-peak detector when the true peak values exceeded or were within 2 dB of a quasi-peak specification limit. Additional QP measurements may have been taken at the discretion of the operator.

Average

Average measurements were taken using the average detector when the true peak values exceeded or were within 2 dB of an average specification limit. Additional average measurements may have been taken at the discretion of the operator. If the specification or test procedure requires trace averaging, then the averaging was performed using 100 samples or as required by the specification. All other average measurements are performed using video bandwidth averaging. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point, the measuring device is set into the linear mode and the scan time is reduced.