

# Divigraph

REVISED TEST REPORT TO 105719-6

**Wireless Gateway  
Model: 100A1000-01**

Tested to The Following Standards:

FCC Part 15 Subpart C Section(s)

**15.247  
(DTS 2400-2483.5MHz)**

**Report No.: 105719-6A**

Date of issue: September 17, 2021



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:**

Divigraph  
Divigraph (Pty) Ltd  
Prosperity Park  
Milnerton  
Cape Town  
7441  
South Africa

**REPORT PREPARED BY:**

Kim Romero  
CKC Laboratories, Inc.  
5046 Sierra Pines Drive  
Mariposa, CA 95338

Representative: Radek Tanski

Project Number: 105719

**DATE OF EQUIPMENT RECEIPT:**

July 14, 2021

**DATE(S) OF TESTING:**

July 14 – 16, 20 and 21, 2021

### Revision History

**Original:** Testing of Wireless Gateway, Model: 100A1000-01 to FCC 15.247.

**Revision A:** To add Middle and High Channel data to Radiated Emissions.

To replaced Radiated Band Edge Data sheet.

### 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.  
5046 Sierra Pines Drive  
Mariposa, CA 95338

## Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.03.19

## 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 - 15.247 (DTS)

Test Procedure	Description	Modifications	Results
15.247(a)(2)	Occupied Bandwidth	NA	PASS
15.247(b)(3)	Output Power	NA	PASS
15.247(d)	RF Conducted Emissions & Band Edge	NA	PASS
15.247(d)	Radiated Emissions & Band Edge	NA	PASS
15.247(e)	Power Spectral Density	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
Note: CKC Laboratories performed testing with the HUBER+SUHNER antenna, as it had a higher gain than the Divigraph antenna and was the worst case configuration.

## 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
Wireless Gateway	Divigraph	100A1000-01	6EE00061
Rod Antenna	HUBER+SUHNER	1355.17.0002	2496204659
Rod Antenna	Divigraph	100A1002	NA

Note: See appendix A for customer provided information.

#### *Support Equipment:*

Device	Manufacturer	Model #	S/N
Computer	Intel	NUC10FNH	G8FN0320071Q
Mouse	Samsung	MOARUOA	1011003262
Keyboard	Microsoft	X8233051-001	76887605440281
PoE Adapter	Tenda	PoE30G-AT	E5192017049000115

### Configuration 2

#### *Equipment Tested:*

Device	Manufacturer	Model #	S/N
Wireless Gateway	Divigraph	100A1000-01	6EE00061
Rod Antenna	HUBER+SUHNER	1355.17.0002	2496204659
Rod Antenna	Divigraph	100A1002	NA

Note: See appendix A for customer provided information.

#### *Support Equipment:*

Device	Manufacturer	Model #	S/N
Computer	Intel	NUC10FNH	G8FN0320071Q
Mouse	Samsung	MOARUOA	1011003262
Keyboard	Microsoft	X8233051-001	76887605440281
PoE Adapter	Shortel	PowerDsine 3001GC	PD-3001C/AC

## EQUIPMENT UNDER TEST (EUT) CONTINUED

### Configuration 3

#### *Equipment Tested:*

Device	Manufacturer	Model #	S/N
Wireless Gateway	Divigraph	100A1000-01	6EE00061
Rod Antenna	HUBER+SUHNER	1355.17.0002	2496204659
Rod Antenna	Divigraph	100A1002	NA

Note: See appendix A for customer provided information.

#### *Support Equipment:*

Device	Manufacturer	Model #	S/N
Computer	Intel	NUC10FNH	G8FN0320071Q
Mouse	Samsung	MOARUOA	1011003262
Keyboard	Microsoft	X8233051-001	76887605440281
DC Power Supply	Protek	3006B	AG4070

## General Product Information:

Product Information	Manufacturer-Provided Details
Equipment Type:	Stand-Alone Equipment
Type of Wideband System:	802.15.4
Operating Frequency Range:	2405 – 2480MHz
Modulation Type(s):	OQPSK, DSSS
Maximum Duty Cycle:	100%
Number of TX Chains:	1
Antenna Type(s) and Gain:	Rod antenna (6dBi and 2dBi) <i>Note: For all testing, the 6dBi antenna was used. The 2dBi antenna will gain compliance by similarity. Customer declares 6dBi antenna worst case.</i>
Beamforming Type:	NA
Antenna Connection Type:	External Connector
Nominal Input Voltage:	24VDC
Firmware / Software used for Test:	Rutty Ver: 0.63.0.0

## EUT and Accessory Photo(s)



Setup





2dB Antenna



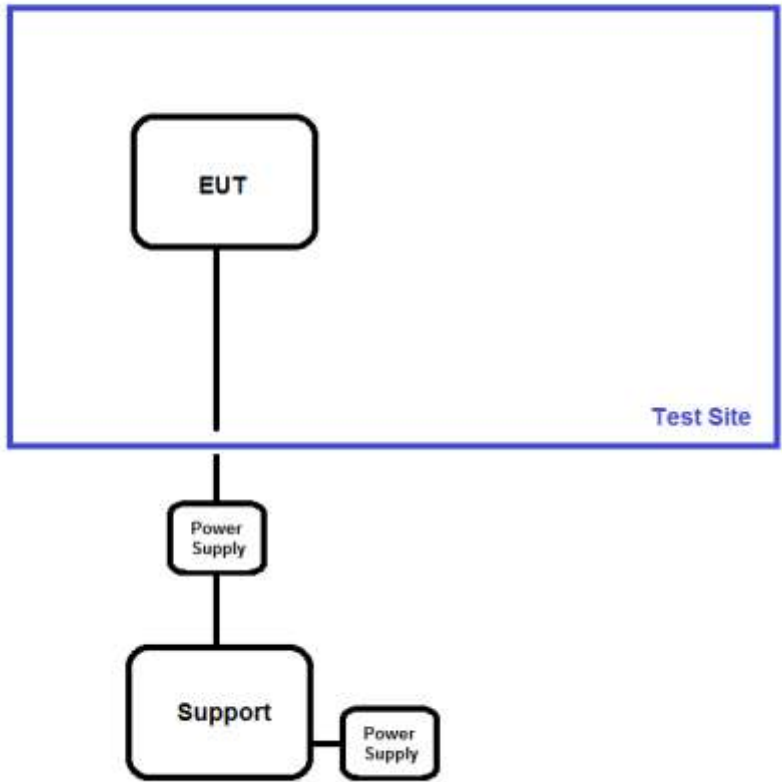
6dB Antenna

**Support Equipment Photo(s)**



**Block Diagram of Test Setup(s)**

**Test Setup Block Diagram**



## FCC Part 15 Subpart C

### 15.247(a)(2) Occupied Bandwidth

Test Setup/Conditions			
Test Location:	Mariposa Lab A	Test Engineer:	Michael Rauch Jr/Jonathan Wharton/Benny Lovan
Test Method:	ANSI C63.10 (2013) KDB 558074 (2019)	Test Date(s):	7/14/2021
Configuration:	1		
Test Setup:	PSA is connected directly to the EUT via an attenuator and cable. A support PC is connected via Ethernet and is using Rутty software to program the EUT.		

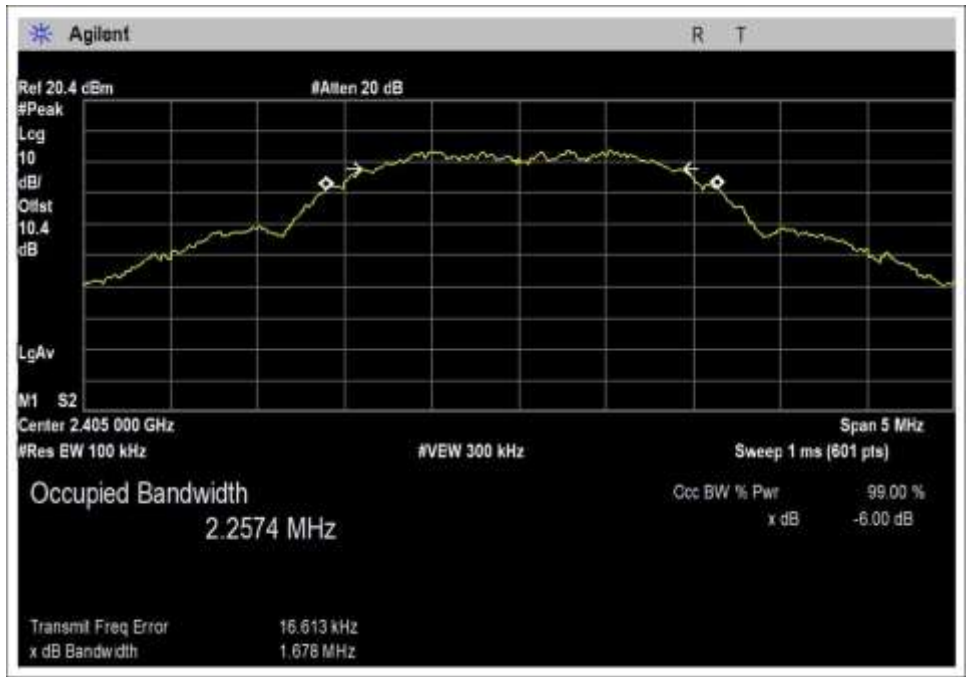
Environmental Conditions			
Temperature (°C)	24.7	Relative Humidity (%):	36.1

Test Equipment					
Asset#	Description	Manufacturer	Model	Cal Date	Cal Due
02138	Attenuator	Weinschel	54-10	11/12/2019	11/12/2021
03011	Cable	AstroSteel	32022-2-2909K-24TC	6/15/2020	6/15/2022
02668	Spectrum Analyzer	Agilent	E4446A	4/14/2021	4/14/2022

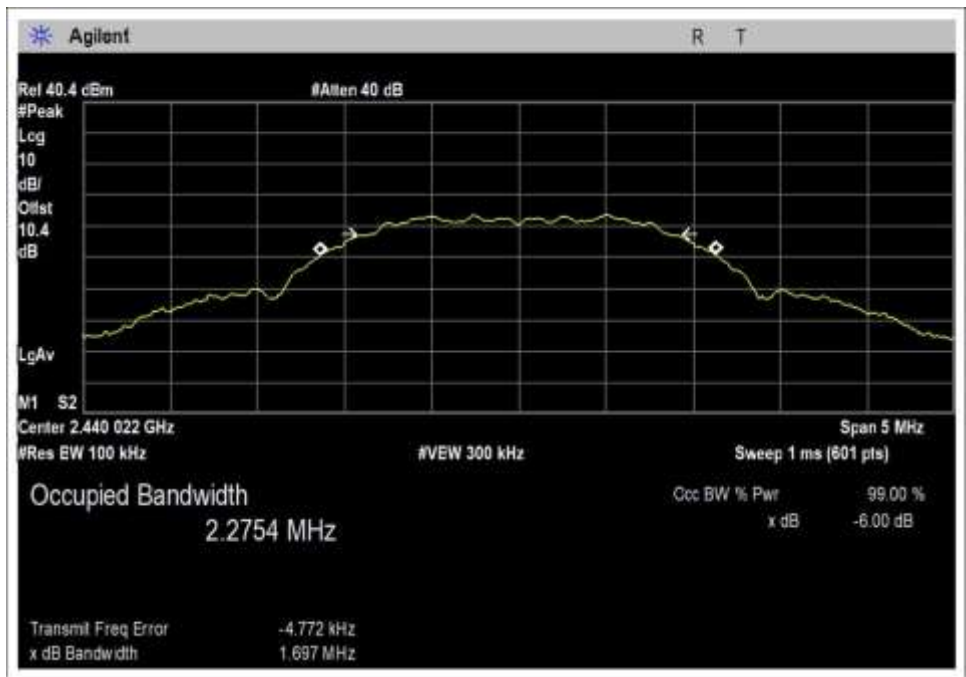
Test Data Summary, 6dB Occupied Bandwidth					
Frequency (MHz)	Antenna Port	Modulation	Measured (MHz)	Limit (kHz)	Results
2404	1	OQPSK, DSSS	1.678	≥500	Pass
2440	1	OQPSK, DSSS	1.697	≥500	Pass
2480	1	OQPSK, DSSS	1.660	≥500	Pass

Test Data Summary, 99% Occupied Bandwidth					
Frequency (MHz)	Antenna Port	Modulation	Measured (MHz)	Limit (kHz)	Results
2404	1	OQPSK, DSSS	2.2574	≥500	Pass
2440	1	OQPSK, DSSS	2.2754	≥500	Pass
2480	1	OQPSK, DSSS	2.2836	≥500	Pass

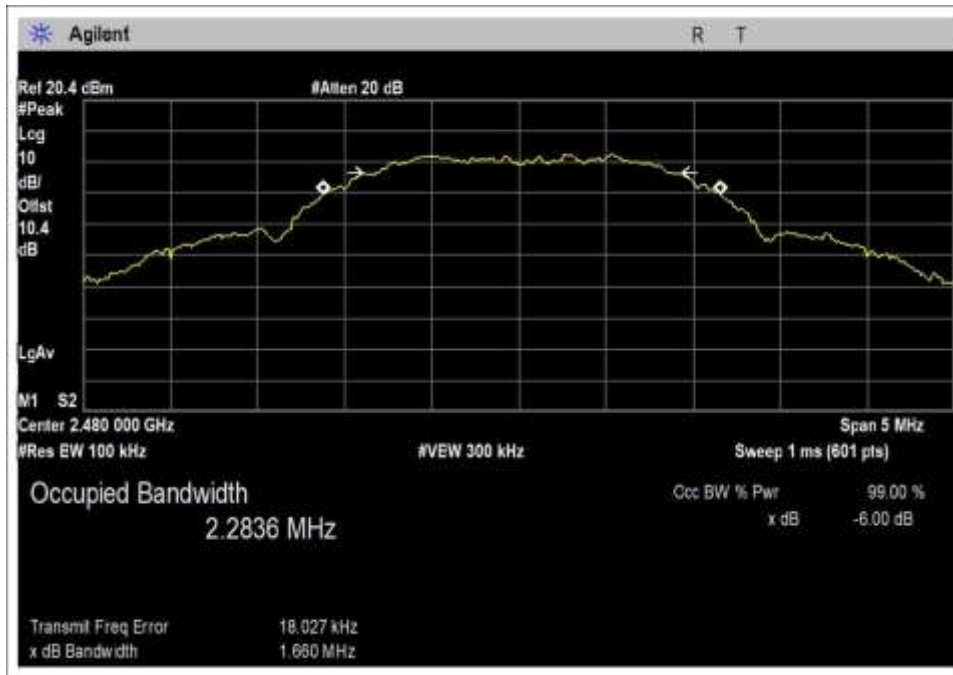
**Plot(s)**



Low Channel



Middle Channel



High Channel

**Test Setup Photo(s)**



## 15.247(b)(3) Output Power

Test Setup/Conditions			
Test Location:	Mariposa Lab A	Test Engineer:	Michael Rauch Jr/Jonathan Wharton/Benny Lovan
Test Method:	ANSI C63.10 (2013), KDB 558074 (2019)	Test Date(s):	7/15/2021
Configuration:	1		
Test Setup:	PSA is connected directly to the EUT via an attenuator and cable. A support PC is connected via Ethernet and is using RUTTY software to program the EUT.		

Environmental Conditions			
Temperature (°C)	25.6	Relative Humidity (%):	34.4

Test Equipment					
Asset#	Description	Manufacturer	Model	Cal Date	Cal Due
02138	Attenuator	Weinschel	54-10	11/12/2019	11/12/2021
03011	Cable	AstroSteel	32022-2-2909K-24TC	6/15/2020	6/15/2022
02668	Spectrum Analyzer	Agilent	E4446A	4/14/2021	4/14/2022

Test Data Summary - Voltage Variations (PoE)					
Frequency (MHz)	Modulation / Ant Port	V <sub>Minimum</sub> (dBm)	V <sub>Nominal</sub> (dBm)	V <sub>Maximum</sub> (dBm)	Max Deviation from V <sub>Nominal</sub> (dB)
2404	OQPSK, DSSS/External	8.29	8.3	8.3	0.01
2440	OQPSK, DSSS/External	7.88	7.95	7.92	0.07
2480	OQPSK, DSSS/External	7.04	7.15	7.12	0.11

Test Data Summary - Voltage Variations (M12)					
Frequency (MHz)	Modulation / Ant Port	V <sub>Minimum</sub> (dBm)	V <sub>Nominal</sub> (dBm)	V <sub>Maximum</sub> (dBm)	Max Deviation from V <sub>Nominal</sub> (dB)
2404	OQPSK, DSSS/External	8.31	8.36	8.35	0.05
2440	OQPSK, DSSS/External	7.93	7.93	7.93	0.00
2480	OQPSK, DSSS/External	7.13	7.10	7.07	0.06

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

**Parameter Definitions:**

POE Measurement performed at input voltage according to manufacturer specification.

Parameter	Value
V <sub>Nominal</sub> :	51VDC
V <sub>Minimum</sub> :	43.65VDC
V <sub>Maximum</sub> :	57VDC*

\*Customer declared that EUT input voltage beyond 57VDC was damaging to the unit.

M12M cable Measurements performed at input voltage according to manufacturer specification.

Parameter	Value
V <sub>Nominal</sub> :	24.0VDC
V <sub>Minimum</sub> :	20.4VDC
V <sub>Maximum</sub> :	27.6VDC

Test Data Summary - RF Conducted Measurement (PoE)					
Measurement Option: RBW > DTS Bandwidth					
Frequency (MHz)	Modulation	Ant. Type / Gain (dBi)	Measured (dBm)	Limit (dBm)	Results
2404	OQPSK, DSSS	Rod/6dB	8.35	≤30	Pass
2440	OQPSK, DSSS	Rod/6dB	7.93	≤30	Pass
2480	OQPSK, DSSS	Rod/6dB	7.07	≤30	Pass

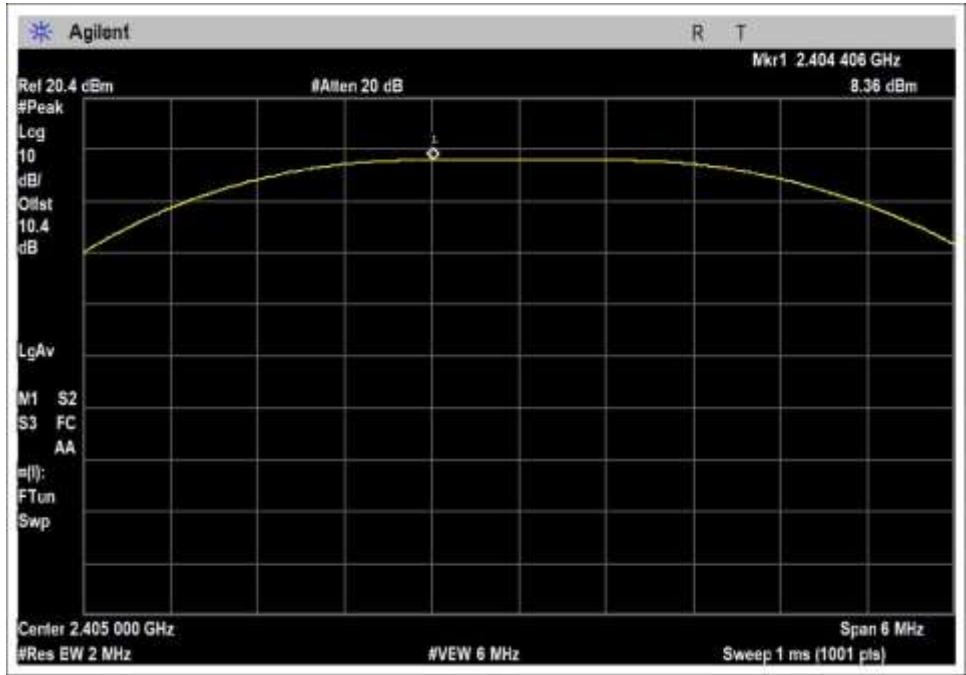
Test Data Summary - RF Conducted Measurement (M12)					
Measurement Option: RBW > DTS Bandwidth					
Frequency (MHz)	Modulation	Ant. Type / Gain (dBi)	Measured (dBm)	Limit (dBm)	Results
2404	OQPSK, DSSS	Rod/6dB	8.32	≤30	Pass
2440	OQPSK, DSSS	Rod/6dB	7.92	≤30	Pass
2480	OQPSK, DSSS	Rod/6dB	7.15	≤30	Pass

For fixed point-to-point antennas, the limit is calculated in accordance with 15.247(c)(1):

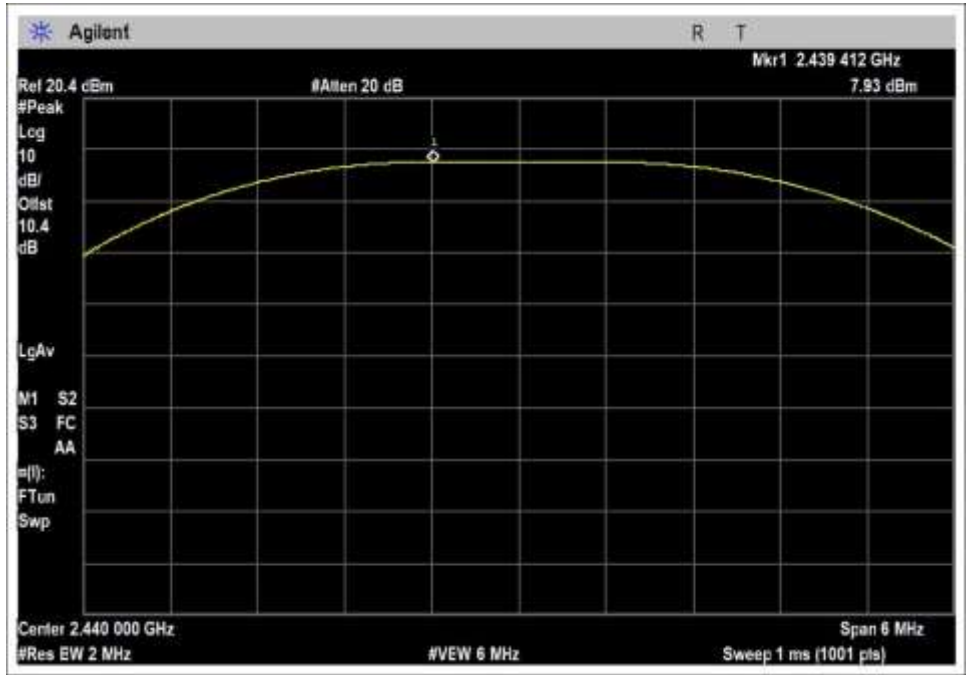
$$Limit = 30 - Roundup\left(\frac{G-6}{3}\right)$$

For directional beamforming antennas, the limit is calculated in accordance with 15.247(c)(2) and KDB 662911.

24VDC Plots

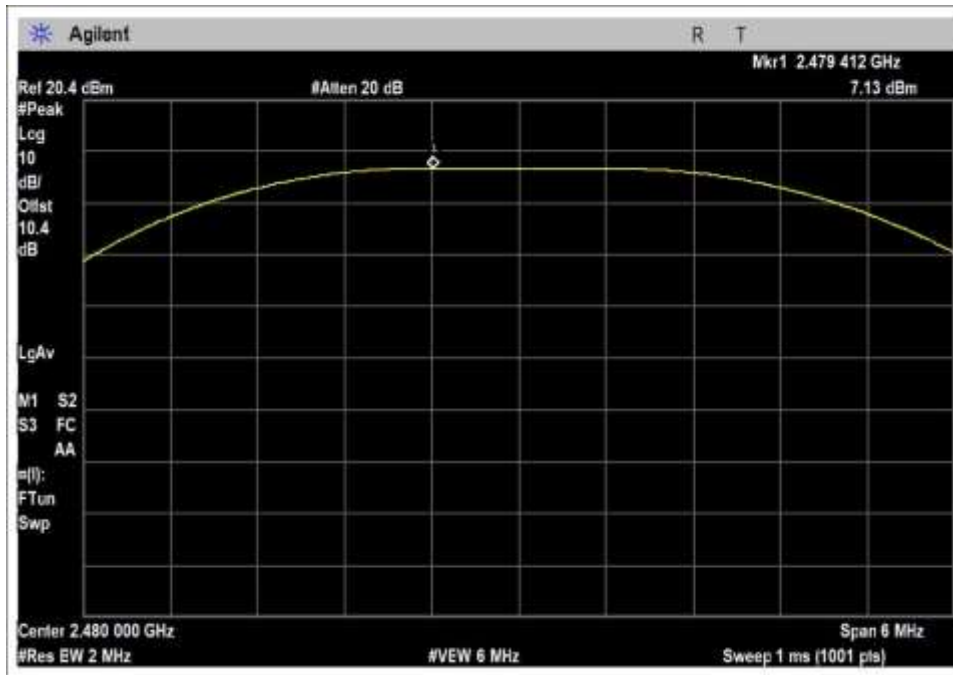


Nominal; Low Channel



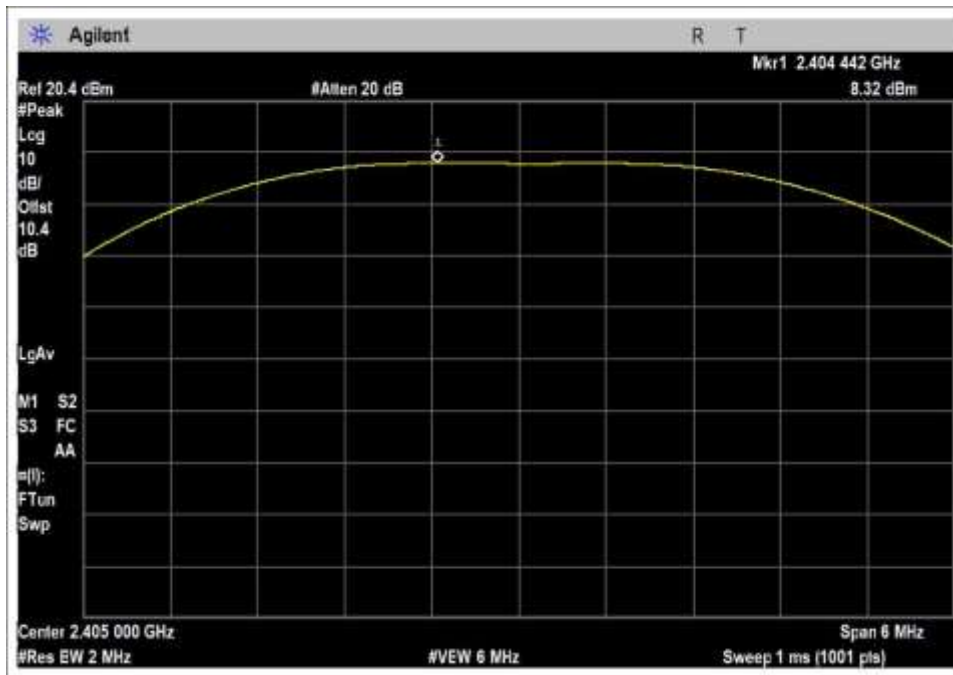
-15%; Middle Channel



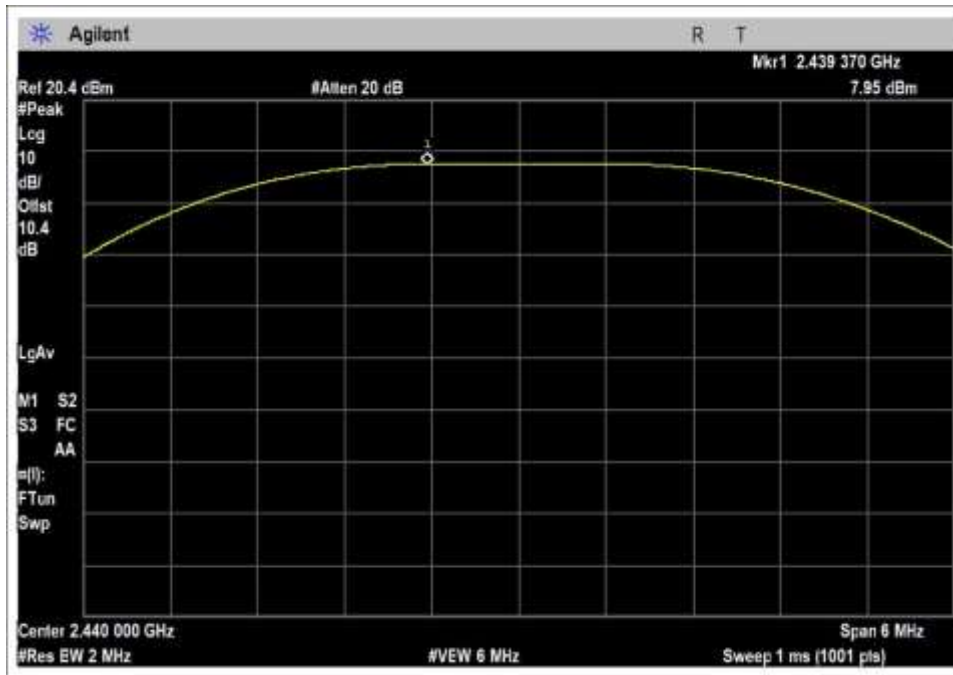


15%; High Channel

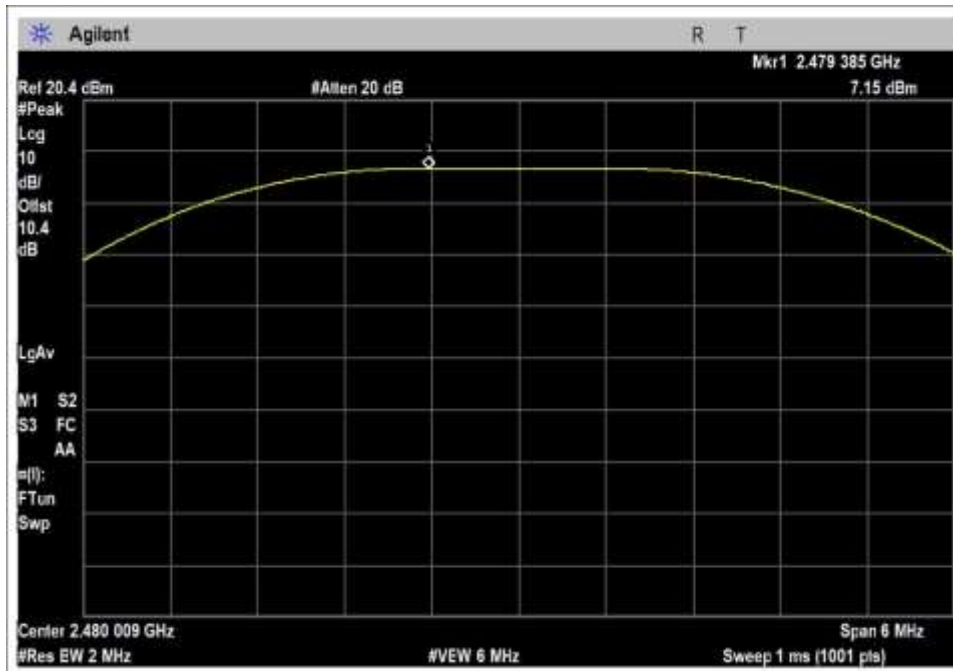
PoE Plots



Nominal; Low Channel



Nominal; Middle Channel



Nominal; High Channel

**Test Setup Photo(s)**



## 15.247(d) RF Conducted Emissions & Band Edge

### Test Setup / Conditions / Data

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209)-299-5240  
 Customer: **Divigraph**  
 Specification: **15.247(d) Conducted Spurious Emissions**  
 Work Order #: **105719** Date: 7/16/2021  
 Test Type: **Conducted Emissions** Time: 2:14:37 PM  
 Tested By: Jonathan Wharton Sequence#: 2  
 Software: EMITest 5.03.19 51V DC POE

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 1			

***Support Equipment:***

Device	Manufacturer	Model #	S/N
Configuration 1			

***Test Conditions / Notes:***

Conducted Spurious Emission

Frequency Range: 9kHz to 25GHz

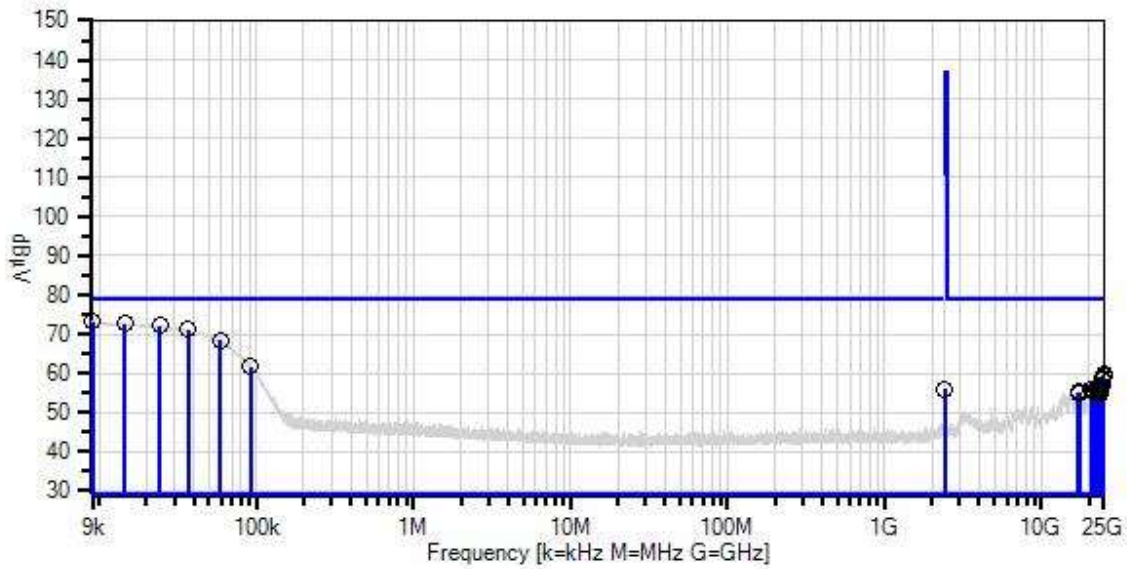
Test Environment Conditions:  
 Temperature: 23.9°C  
 Humidity: 33.3%  
 Atmospheric Pressure: 101.4kPa  
 Software: Ruddy version 0.63.0.0  
 Internal Generated Frequency: 32kHz, 38.4MHz, 2.48GHz

Test Method: ANSI C63.10 2013

The EUT is set up as intended. It is connected via POE to a support computer that provides signal information and power.

Note:  
 Low Channel

Divigraph W/O#: 105719 Sequence#: 2 Date: 7/16/2021  
 15.247(d) Conducted Spurious Emissions Test Lead: 51V DC POE External Antenna Port



- Sweep Data
  - Peak Readings
  - \* Average Readings
  - Readings
  - × QP Readings
  - ▼ Ambient
  - 1 - 15.247(d) Conducted Spurious Emissions
- Software Version: 5.03.19

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02668	Spectrum Analyzer	E4446A	4/14/2021	4/14/2022
T1	AN02138	Attenuator	54-10	11/12/2019	11/12/2021
T2	AN03011	Cable	32022-2-2909K-24TC	6/15/2020	6/15/2022

**Measurement Data:** Reading listed by margin. Test Lead: External Antenna Port

#	Freq MHz	Rdng dB $\mu$ V	T1 dB	T2 dB		Dist Table	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB	Polar Ant
1	9.100k	63.5	+9.8	+0.0		+0.0	73.3	78.9	-5.6	Exter
2	14.536k	63.0	+9.8	+0.0		+0.0	72.8	78.9	-6.1	Exter
3	24.212k	62.4	+9.8	+0.0		+0.0	72.2	78.9	-6.7	Exter
4	36.915k	61.5	+9.8	+0.0		+0.0	71.3	78.9	-7.6	Exter
5	58.658k	58.6	+9.8	+0.0		+0.0	68.4	78.9	-10.5	Exter
6	91.641k	51.9	+9.8	+0.0		+0.0	61.7	78.9	-17.2	Exter
7	24874.734 M	47.7	+10.6	+1.4		+0.0	59.7	78.9	-19.2	Exter
8	24963.464 M	47.4	+10.6	+1.4		+0.0	59.4	78.9	-19.5	Exter
9	24185.770 M	46.8	+10.4	+1.5		+0.0	58.7	78.9	-20.2	Exter
10	24039.626 M	46.7	+10.4	+1.5		+0.0	58.6	78.9	-20.3	Exter
11	24217.086 M	46.5	+10.4	+1.5		+0.0	58.4	78.9	-20.5	Exter
12	24316.255 M	46.4	+10.4	+1.6		+0.0	58.4	78.9	-20.5	Exter
13	24498.935 M	45.0	+10.5	+1.6		+0.0	57.1	78.9	-21.8	Exter
14	23329.784 M	44.6	+10.5	+1.4		+0.0	56.5	78.9	-22.4	Exter
15	23491.586 M	44.7	+10.4	+1.4		+0.0	56.5	78.9	-22.4	Exter
16	23256.712 M	44.4	+10.5	+1.4		+0.0	56.3	78.9	-22.6	Exter
17	23366.320 M	44.4	+10.5	+1.4		+0.0	56.3	78.9	-22.6	Exter
18	22186.730 M	43.8	+10.7	+1.5		+0.0	56.0	78.9	-22.9	Exter

19	23220.176 M	44.0	+10.5	+1.5	+0.0	56.0	78.9	-22.9	Exter
20	2399.761M	45.5	+10.0	+0.4	+0.0	55.9	78.9	-23.0	Exter
21	20537.392 M	43.8	+10.6	+1.4	+0.0	55.8	78.9	-23.1	Exter
22	22646.039 M	43.5	+10.7	+1.4	+0.0	55.6	78.9	-23.3	Exter
23	20761.827 M	43.5	+10.5	+1.4	+0.0	55.4	78.9	-23.5	Exter
24	17123.836 M	43.6	+10.4	+1.3	+0.0	55.3	78.9	-23.6	Exter
25	21894.442 M	43.1	+10.7	+1.5	+0.0	55.3	78.9	-23.6	Exter
26	22886.133 M	43.2	+10.6	+1.5	+0.0	55.3	78.9	-23.6	Exter
27	21753.518 M	43.1	+10.6	+1.5	+0.0	55.2	78.9	-23.7	Exter
28	17307.313 M	43.5	+10.4	+1.2	+0.0	55.1	78.9	-23.8	Exter
29	22693.014 M	43.0	+10.7	+1.4	+0.0	55.1	78.9	-23.8	Exter
30	23867.385 M	43.2	+10.4	+1.5	+0.0	55.1	78.9	-23.8	Exter



Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209)-299-5240  
 Customer: **Divigraph**  
 Specification: **15.247(d) Conducted Spurious Emissions**  
 Work Order #: **105719** Date: 7/16/2021  
 Test Type: **Conducted Emissions** Time: 2:35:35 PM  
 Tested By: Jonathan Wharton Sequence#: 3  
 Software: EMITest 5.03.19 51V DC POE

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 1			

***Support Equipment:***

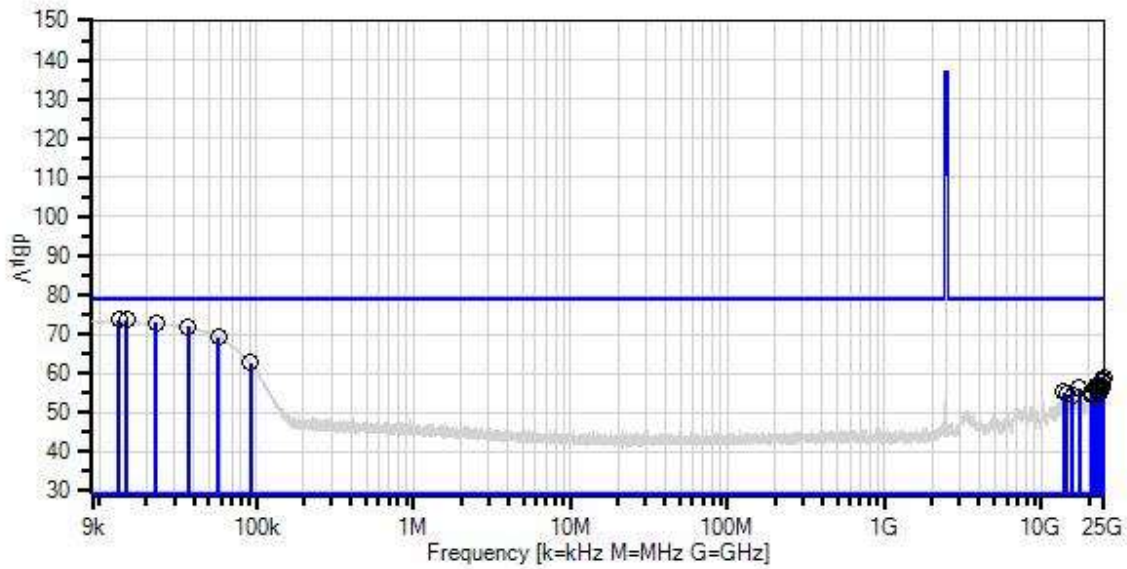
Device	Manufacturer	Model #	S/N
Configuration 1			

***Test Conditions / Notes:***

Conducted Spurious Emission  
 Frequency Range: 9kHz to 25GHz  
 Test Environment Conditions:  
 Temperature: 23.9°C  
 Humidity: 33.3%  
 Atmospheric Pressure: 101.4kPa  
 Software: Rummy version 0.63.0.0  
 Internal Generated Frequency: 32kHz, 38.4MHz, 2.48GHz  
 Test Method: ANSI C63.10 2013  
 The EUT is set up as intended. It is connected via POE to a support computer that provides signal information and power.  
 Note:  
 Mid Channel



Divigraph W/O#: 105719 Sequence#: 3 Date: 7/16/2021  
 15.247(d) Conducted Spurious Emissions Test Lead: 51V DC POE External Antenna Port



- Sweep Data
  - Peak Readings
  - \* Average Readings
  - Readings
  - × QP Readings
  - ▼ Ambient
  - 1 - 15.247(d) Conducted Spurious Emissions
- Software Version: 5.03.19

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02668	Spectrum Analyzer	E4446A	4/14/2021	4/14/2022
T1	AN02138	Attenuator	54-10	11/12/2019	11/12/2021
T2	AN03011	Cable	32022-2-2909K-24TC	6/15/2020	6/15/2022

**Measurement Data:** Reading listed by margin. Test Lead: External Antenna Port

#	Freq MHz	Rdng dB $\mu$ V	T1 dB	T2 dB			Dist Table	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB	Polar Ant
1	13.290k	63.9	+9.8	+0.0			+0.0	73.7	78.9	-5.2	Exter
2	14.849k	63.8	+9.8	+0.0			+0.0	73.6	78.9	-5.3	Exter
3	22.790k	63.2	+9.8	+0.0			+0.0	73.0	78.9	-5.9	Exter
4	36.681k	62.1	+9.8	+0.0			+0.0	71.9	78.9	-7.0	Exter
5	57.505k	59.4	+9.8	+0.0			+0.0	69.2	78.9	-9.7	Exter
6	91.695k	52.9	+9.8	+0.0			+0.0	62.7	78.9	-16.2	Exter
7	24911.270 M	47.1	+10.6	+1.4			+0.0	59.1	78.9	-19.8	Exter
8	24822.540 M	46.9	+10.5	+1.5			+0.0	58.9	78.9	-20.0	Exter
9	24253.622 M	46.5	+10.4	+1.6			+0.0	58.5	78.9	-20.4	Exter
10	24488.496 M	45.6	+10.5	+1.6			+0.0	57.7	78.9	-21.2	Exter
11	22118.877 M	44.8	+10.7	+1.5			+0.0	57.0	78.9	-21.9	Exter
12	23533.342 M	45.2	+10.4	+1.4			+0.0	57.0	78.9	-21.9	Exter
13	23418.514 M	44.9	+10.5	+1.4			+0.0	56.8	78.9	-22.1	Exter
14	23549.000 M	45.0	+10.4	+1.4			+0.0	56.8	78.9	-22.1	Exter
15	24509.374 M	44.4	+10.5	+1.6			+0.0	56.5	78.9	-22.4	Exter
16	23282.809 M	44.6	+10.5	+1.4			+0.0	56.5	78.9	-22.4	Exter
17	23298.467 M	44.6	+10.5	+1.4			+0.0	56.5	78.9	-22.4	Exter
18	22035.367 M	44.1	+10.7	+1.5			+0.0	56.3	78.9	-22.6	Exter

19	17270.617 M	44.6	+10.4	+1.2	+0.0	56.2	78.9	-22.7	Exter
20	23136.665 M	44.1	+10.6	+1.5	+0.0	56.2	78.9	-22.7	Exter
21	22155.413 M	43.8	+10.7	+1.5	+0.0	56.0	78.9	-22.9	Exter
22	23783.874 M	43.7	+10.4	+1.5	+0.0	55.6	78.9	-23.3	Exter
23	23731.680 M	43.6	+10.4	+1.4	+0.0	55.4	78.9	-23.5	Exter
24	13887.312 M	43.9	+10.2	+1.2	+0.0	55.3	78.9	-23.6	Exter
25	21012.359 M	43.2	+10.5	+1.4	+0.0	55.1	78.9	-23.8	Exter
26	20542.611 M	42.8	+10.6	+1.4	+0.0	54.8	78.9	-24.1	Exter
27	14334.995 M	43.2	+10.3	+1.2	+0.0	54.7	78.9	-24.2	Exter
28	20704.413 M	42.7	+10.6	+1.4	+0.0	54.7	78.9	-24.2	Exter
29	15656.025 M	43.0	+10.3	+1.3	+0.0	54.6	78.9	-24.3	Exter
30	20824.460 M	42.7	+10.5	+1.4	+0.0	54.6	78.9	-24.3	Exter



Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209)-299-5240  
 Customer: **Divigraph**  
 Specification: **15.247(d) Conducted Spurious Emissions**  
 Work Order #: **105719** Date: 7/16/2021  
 Test Type: **Conducted Emissions** Time: 2:50:49 PM  
 Tested By: Jonathan Wharton Sequence#: 4  
 Software: EMITest 5.03.19 51V DC POE

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 1			

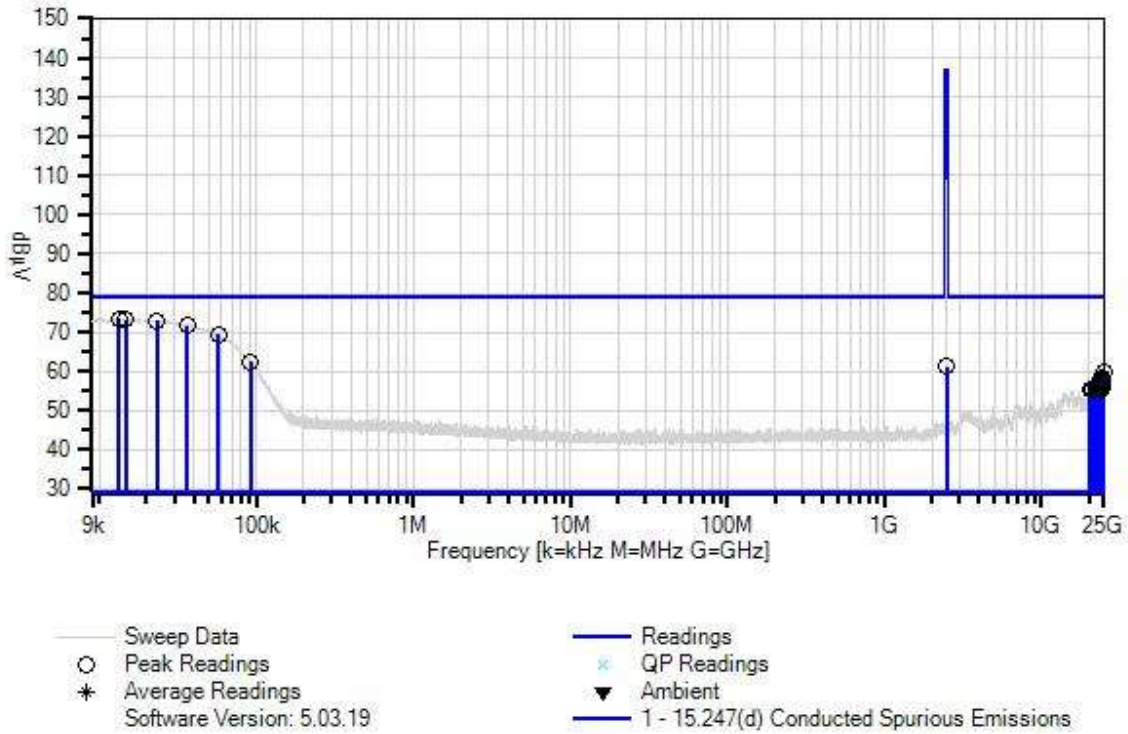
***Support Equipment:***

Device	Manufacturer	Model #	S/N
Configuration 1			

***Test Conditions / Notes:***

Conducted Spurious Emission  
 Frequency Range: 9kHz to 25GHz  
 Test Environment Conditions:  
 Temperature: 23.9°C  
 Humidity: 33.3%  
 Atmospheric Pressure: 101.4kPa  
 Software: Ratty version 0.63.0.0  
 Internal Generated Frequency: 32kHz, 38.4MHz, 2.48GHz  
 Test Method: ANSI C63.10 2013  
 The EUT is set up as intended. It is connected via POE to a support computer that provides signal information and power.  
 Note:  
 High Channel

Divigraph W/O#: 105719 Sequence#: 4 Date: 7/16/2021  
 15.247(d) Conducted Spurious Emissions Test Lead: 51V DC POE External Antenna Port



**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02668	Spectrum Analyzer	E4446A	4/14/2021	4/14/2022
T1	AN02138	Attenuator	54-10	11/12/2019	11/12/2021
T2	AN03011	Cable	32022-2-2909K-24TC	6/15/2020	6/15/2022

**Measurement Data:** Reading listed by margin. Test Lead: External Antenna Port

#	Freq MHz	Rdng dB $\mu$ V	T1 dB	T2 dB		Dist Table	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB	Polar Ant
1	13.354k	63.6	+9.8	+0.0		+0.0	73.4	78.9	-5.5	Exter
2	14.840k	63.5	+9.8	+0.0		+0.0	73.3	78.9	-5.6	Exter
3	23.233k	63.2	+9.8	+0.0		+0.0	73.0	78.9	-5.9	Exter
4	36.169k	62.0	+9.8	+0.0		+0.0	71.8	78.9	-7.1	Exter
5	57.505k	59.6	+9.8	+0.0		+0.0	69.4	78.9	-9.5	Exter
6	91.479k	52.6	+9.8	+0.0		+0.0	62.4	78.9	-16.5	Exter
7	2483.610M	50.8	+10.0	+0.4		+0.0	61.2	78.9	-17.7	Exter
8	24947.806 M	48.1	+10.6	+1.4		+0.0	60.1	78.9	-18.8	Exter
9	24196.209 M	46.7	+10.4	+1.5		+0.0	58.6	78.9	-20.3	Exter
10	24029.187 M	46.6	+10.4	+1.5		+0.0	58.5	78.9	-20.4	Exter
11	24399.766 M	46.4	+10.4	+1.6		+0.0	58.4	78.9	-20.5	Exter
12	24039.626 M	46.1	+10.4	+1.5		+0.0	58.0	78.9	-20.9	Exter
13	23392.417 M	46.0	+10.5	+1.4		+0.0	57.9	78.9	-21.0	Exter
14	24373.669 M	45.9	+10.4	+1.6		+0.0	57.9	78.9	-21.0	Exter
15	24483.277 M	45.3	+10.5	+1.6		+0.0	57.4	78.9	-21.5	Exter
16	23950.896 M	45.1	+10.4	+1.5		+0.0	57.0	78.9	-21.9	Exter
17	23606.414 M	45.1	+10.4	+1.4		+0.0	56.9	78.9	-22.0	Exter
18	22651.259 M	44.5	+10.7	+1.4		+0.0	56.6	78.9	-22.3	Exter

19	23214.957 M	44.3	+10.5	+1.5	+0.0	56.3	78.9	-22.6	Exter
20	22118.877 M	43.9	+10.7	+1.5	+0.0	56.1	78.9	-22.8	Exter
21	24639.860 M	43.8	+10.5	+1.5	+0.0	55.8	78.9	-23.1	Exter
22	23804.752 M	43.8	+10.4	+1.5	+0.0	55.7	78.9	-23.2	Exter
23	20829.679 M	43.7	+10.5	+1.4	+0.0	55.6	78.9	-23.3	Exter
24	20521.733 M	43.6	+10.6	+1.4	+0.0	55.6	78.9	-23.3	Exter
25	23877.824 M	43.7	+10.4	+1.5	+0.0	55.6	78.9	-23.3	Exter
26	22781.744 M	43.4	+10.7	+1.5	+0.0	55.6	78.9	-23.3	Exter
27	23115.788 M	43.4	+10.6	+1.5	+0.0	55.5	78.9	-23.4	Exter
28	23736.899 M	43.7	+10.4	+1.4	+0.0	55.5	78.9	-23.4	Exter
29	23851.726 M	43.5	+10.4	+1.5	+0.0	55.4	78.9	-23.5	Exter
30	20318.176 M	43.2	+10.6	+1.4	+0.0	55.2	78.9	-23.7	Exter

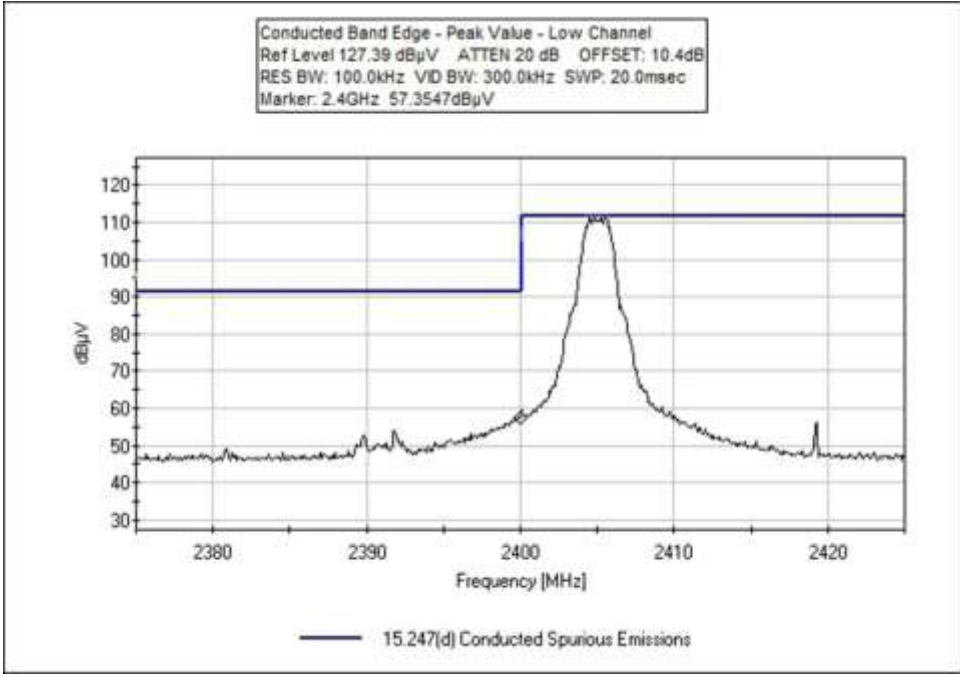
## Band Edge

### Band Edge Summary

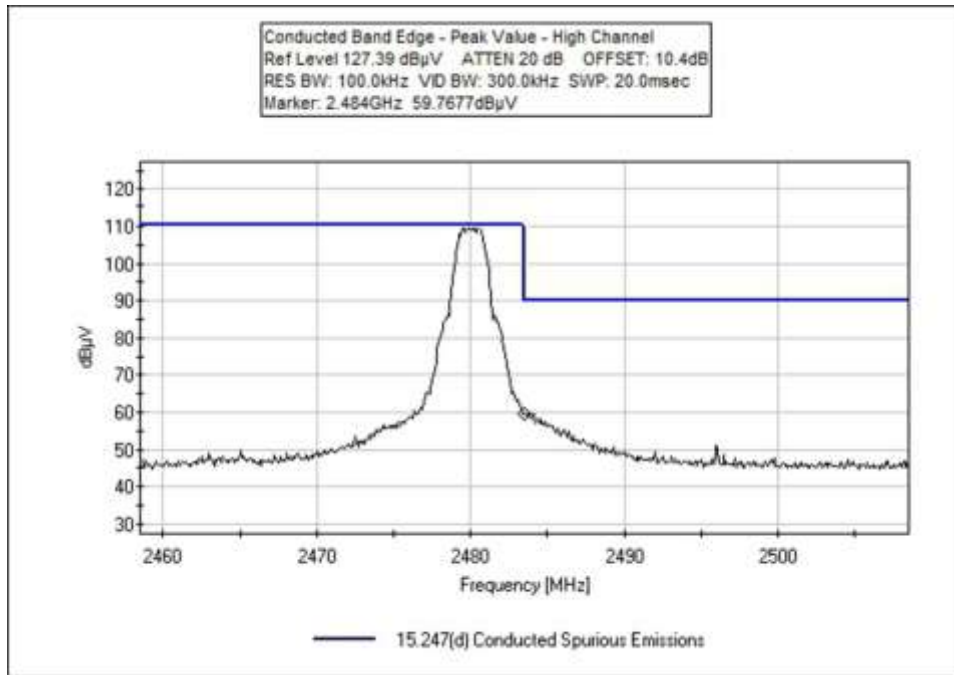
Limit applied: Max Power/100kHz - 20dB.

Frequency (MHz)	Modulation	Measured (dBm)	Limit (dBm)	Results
2400.0	OQPSK, DSSS	57.35	<95.3	Pass
2483.5	OQPSK, DSSS	59.77	<95.3	Pass

## Band Edge Plots







**Test Setup Photo(s)**



## 15.247(d) Radiated Emissions & Band Edge

### Test Setup / Conditions / Data

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209)-299-5240  
 Customer: **Divigraph**  
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**  
 Work Order #: **105719** Date: 7/16/2021  
 Test Type: **Radiated Scan** Time: 09:00:14  
 Tested By: Jonathan Wharton Sequence#: 2  
 Software: EMITest 5.03.19

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 1			

***Support Equipment:***

Device	Manufacturer	Model #	S/N
Configuration 1			

***Test Conditions / Notes:***

Radiated Spurious Emission

Frequency Range: 30MHz to 1GHz

Test Environment Conditions:  
 Temperature: 23.9°C  
 Humidity: 33.3%  
 Atmospheric Pressure: 101.4kPa  
 Software: Ruddy version 0.63.0.0  
 Internal Generated Frequency: 32kHz, 38.4MHz, 2.48GHz

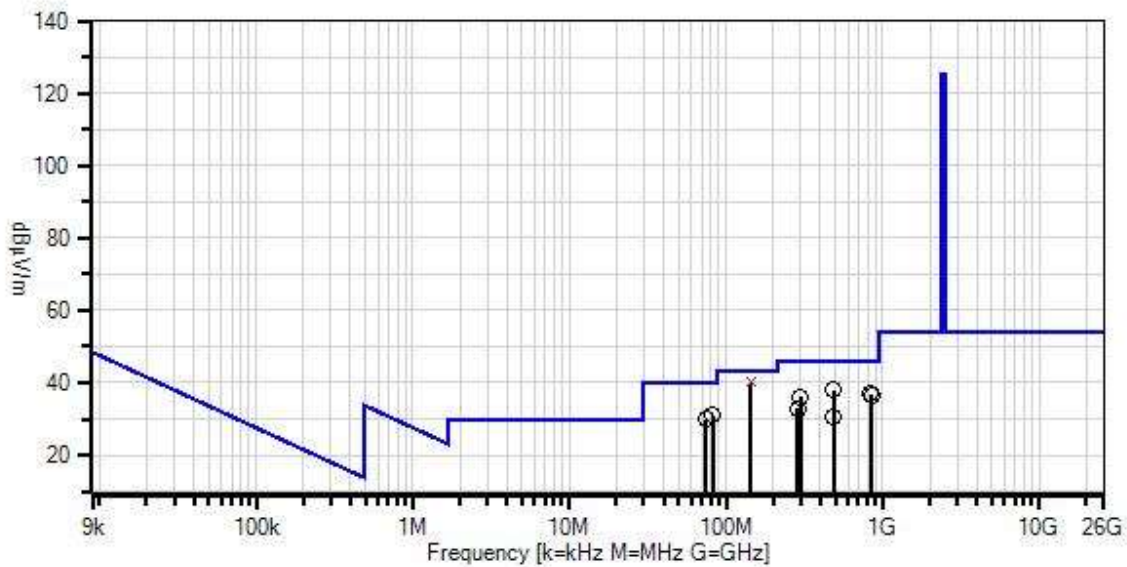
Test Method: ANSI C63.10 2013

The EUT is set up as intended. It is connected via POE to a support computer that provides signal information.

Note:  
 Low Channel

All measurements were performed/collected in low, mid and high channels for this testing low channel was found to be worst case.

Divigraph W/D#: 105719 Sequence#: 2 Date: 7/16/2021  
 15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 10 Meters Various



— Readings  
 × QP Readings  
 ▼ Ambient  
 — 1 - 15.247(d) / 15.209 Radiated Spurious Emissions

○ Peak Readings  
 \* Average Readings  
 Software Version: 5.03.19

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02668	Spectrum Analyzer	E4446A	4/14/2021	4/14/2022
T1	AN00449	Preamp-Upper Ports (dB)	8447F	1/13/2020	1/13/2022
T2	ANP07418	Cable	CNT-195-FR	6/18/2020	6/18/2022
T3	ANP06847	Cable	LMR195-FR-6	8/16/2019	8/16/2021
T4	ANP04249	Cable		3/12/2020	3/12/2022
T5	AN01995	Biconilog Antenna	CBL6111C	4/14/2020	4/14/2022
T6	ANP05275	Attenuator	1W	3/26/2020	3/26/2022
T7	ANP06229	Cable-Insertion Loss (dB) (+113°F to 32°F)	CXTA04A-50	7/9/2020	7/9/2022

**Measurement Data:**

Reading listed by margin.

Test Distance: 10 Meters

#	Freq MHz	Rdng dB $\mu$ V	T1 T5 dB	T2 T6 dB	T3 T7 dB	T4 dB	Dist Table	Corr dB $\mu$ V/m	Spec dB $\mu$ V/m	Margin dB	Polar Ant
1	143.350M QP	35.8	-26.8 +11.6	+0.2 +6.0	+0.4 +1.3	+1.0	+10.5	40.0	43.5	-3.5	Vert
^	143.285M	40.3	-26.8 +11.6	+0.2 +6.0	+0.4 +1.3	+1.0	+10.5	44.5	43.5	+1.0	Vert
3	488.500M	26.3	-27.8 +17.7	+0.2 +6.1	+0.6 +2.6	+1.8	+10.5	38.0	46.0	-8.0	Vert
4	82.500M	31.7	-27.0 +7.6	+0.1 +6.0	+0.3 +1.0	+0.8	+10.5	31.0	40.0	-9.0	Vert
5	845.750M	18.0	-27.7 +22.9	+0.3 +6.1	+0.8 +3.5	+2.4	+10.5	36.8	46.0	-9.2	Horiz
6	848.250M	17.6	-27.6 +22.9	+0.3 +6.1	+0.8 +3.5	+2.4	+10.5	36.5	46.0	-9.5	Vert
7	300.000M	28.4	-26.3 +13.4	+0.2 +6.1	+0.5 +2.0	+1.4	+10.5	36.2	46.0	-9.8	Horiz
8	74.500M	31.6	-27.0 +6.7	+0.1 +6.0	+0.3 +0.9	+0.7	+10.5	29.8	40.0	-10.2	Horiz
9	285.500M	25.4	-26.3 +13.2	+0.2 +6.1	+0.5 +1.9	+1.4	+10.5	32.9	46.0	-13.1	Vert
10	490.250M	18.7	-27.8 +17.8	+0.2 +6.1	+0.6 +2.6	+1.8	+10.5	30.5	46.0	-15.5	Horiz



Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209)-299-5240  
 Customer: **Divigraph**  
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**  
 Work Order #: **105719** Date: 7/16/2021  
 Test Type: **Radiated Scan** Time: 08:56:16  
 Tested By: Jonathan Wharton Sequence#: 3  
 Software: EMITest 5.03.20

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 1			

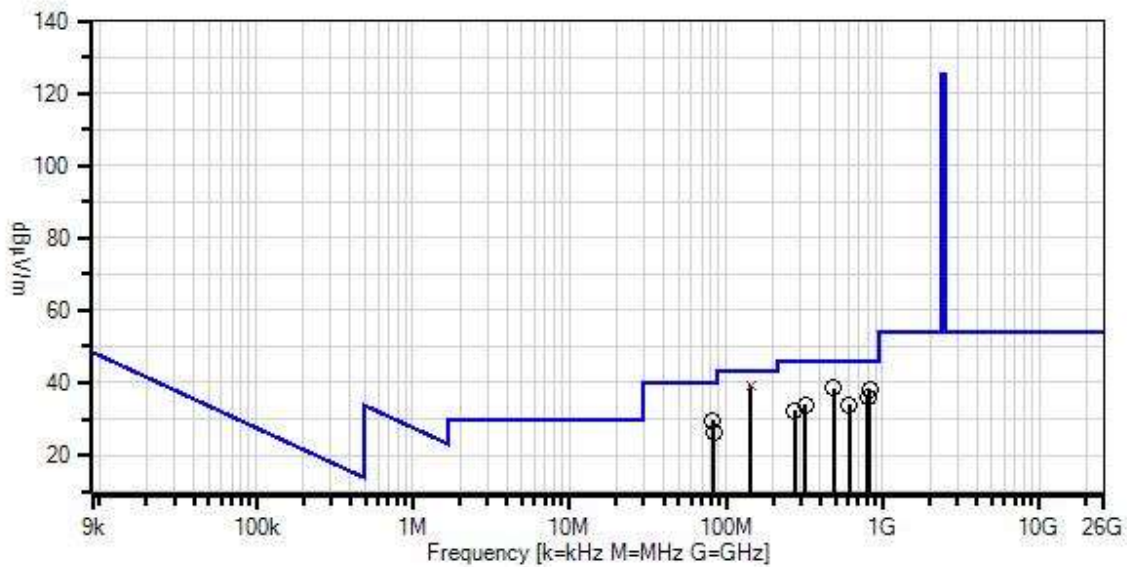
***Support Equipment:***

Device	Manufacturer	Model #	S/N
Configuration 1			

***Test Conditions / Notes:***

Radiated Spurious Emission  
 Frequency Range: 30MHz to 1GHz  
 Test Environment Conditions:  
 Temperature: 23.9°C  
 Humidity: 33.3%  
 Atmospheric Pressure: 101.4kPa  
 Software: Ratty version 0.63.0.0  
 Internal Generated Frequency: 32kHz, 38.4MHz, 2.48GHz  
 Test Method: ANSI C63.10 2013  
 The EUT is set up as intended. It is connected via POE to a support computer that provides signal information.  
 Note:  
 Middle Channel

Divigraph W/D#: 105719 Sequence#: 3 Date: 7/16/2021  
 15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 10 Meters Various



— Readings  
 × QP Readings  
 ▼ Ambient  
 — 1 - 15.247(d) / 15.209 Radiated Spurious Emissions  
 ○ Peak Readings  
 \* Average Readings  
 Software Version: 5.03.20

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02668	Spectrum Analyzer	E4446A	4/14/2021	4/14/2022
T1	AN00449	Preamp-Upper Ports (dB)	8447F	1/13/2020	1/13/2022
T2	ANP07418	Cable	CNT-195-FR	6/18/2020	6/18/2022
T3	ANP06847	Cable	LMR195-FR-6	8/16/2019	8/16/2021
T4	ANP04249	Cable		3/12/2020	3/12/2022
T5	AN01995	Biconilog Antenna	CBL6111C	4/14/2020	4/14/2022
T6	ANP05275	Attenuator	1W	3/26/2020	3/26/2022
T7	ANP06229	Cable-Insertion Loss (dB) (+113°F to 32°F)	CXTA04A-50	7/9/2020	7/9/2022

**Measurement Data:**

Reading listed by margin.

Test Distance: 10 Meters

#	Freq MHz	Rdng dB $\mu$ V	T1 T5 dB	T2 T6 dB	T3 T7 dB	T4 dB	Dist Table	Corr dB $\mu$ V/m	Spec dB $\mu$ V/m	Margin dB	Polar Ant
1	143.375M QP	35.0	-26.8 +11.6	+0.2 +6.0	+0.4 +1.3	+1.0	+10.5	39.2	43.5	-4.3	Horiz
^	143.310M	38.6	-26.8 +11.6	+0.2 +6.0	+0.4 +1.3	+1.0	+10.5	42.8	43.5	-0.7	Horiz
3	488.800M	26.9	-27.8 +17.7	+0.2 +6.1	+0.6 +2.6	+1.8	+10.5	38.6	46.0	-7.4	Vert
4	824.000M	19.3	-27.7 +22.7	+0.3 +6.1	+0.8 +3.5	+2.4	+10.5	37.9	46.0	-8.1	Horiz
5	808.800M	17.9	-27.8 +22.6	+0.3 +6.1	+0.8 +3.4	+2.4	+10.5	36.2	46.0	-9.8	Vert
6	82.500M	30.4	-27.0 +7.6	+0.1 +6.0	+0.3 +1.0	+0.8	+10.5	29.7	40.0	-10.3	Vert
7	609.000M	19.5	-28.0 +19.9	+0.3 +6.1	+0.7 +2.9	+2.1	+10.5	34.0	46.0	-12.0	Horiz
8	320.600M	25.4	-26.4 +13.9	+0.2 +6.1	+0.5 +2.1	+1.5	+10.5	33.8	46.0	-12.2	Horiz
9	83.050M	26.9	-27.0 +7.7	+0.1 +6.0	+0.3 +1.0	+0.8	+10.5	26.3	40.0	-13.7	Horiz
10	276.400M	24.9	-26.3 +13.1	+0.2 +6.1	+0.5 +1.9	+1.4	+10.5	32.3	46.0	-13.7	Vert



Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209)-299-5240  
 Customer: **Divigraph**  
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**  
 Work Order #: **105719** Date: 7/16/2021  
 Test Type: **Radiated Scan** Time: 09:23:35  
 Tested By: Jonathan Wharton Sequence#: 4  
 Software: EMITest 5.03.20

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 1			

***Support Equipment:***

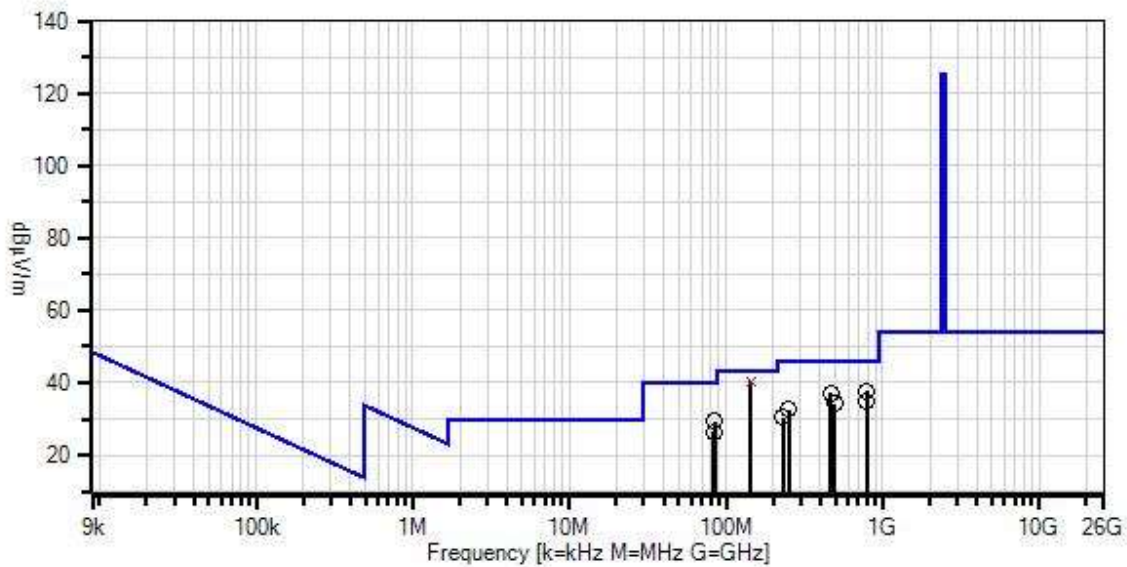
Device	Manufacturer	Model #	S/N
Configuration 1			

***Test Conditions / Notes:***

Radiated Spurious Emission  
 Frequency Range: 30MHz to 1GHz  
 Test Environment Conditions:  
 Temperature: 23.9°C  
 Humidity: 33.3%  
 Atmospheric Pressure: 101.4kPa  
 Software: Ruddy version 0.63.0.0  
 Internal Generated Frequency: 32kHz, 38.4MHz, 2.48GHz  
 Test Method: ANSI C63.10 2013  
 The EUT is set up as intended. It is connected via POE to a support computer that provides signal information.  
 Note:  
 High Channel



Divigraph W/D#: 105719 Sequence#: 4 Date: 7/16/2021  
 15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 10 Meters Various



— Readings  
 × QP Readings  
 ▼ Ambient  
 — 1 - 15.247(d) / 15.209 Radiated Spurious Emissions  
 ○ Peak Readings  
 \* Average Readings  
 Software Version: 5.03.20

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02668	Spectrum Analyzer	E4446A	4/14/2021	4/14/2022
T1	AN00449	Preamp-Upper Ports (dB)	8447F	1/13/2020	1/13/2022
T2	ANP07418	Cable	CNT-195-FR	6/18/2020	6/18/2022
T3	ANP06847	Cable	LMR195-FR-6	8/16/2019	8/16/2021
T4	ANP04249	Cable		3/12/2020	3/12/2022
T5	AN01995	Biconilog Antenna	CBL6111C	4/14/2020	4/14/2022
T6	ANP05275	Attenuator	1W	3/26/2020	3/26/2022
T7	ANP06229	Cable-Insertion Loss (dB) (+113°F to 32°F)	CXTA04A-50	7/9/2020	7/9/2022

**Measurement Data:**

Reading listed by margin.

Test Distance: 10 Meters

#	Freq MHz	Rdng dB $\mu$ V	T1 T5 dB	T2 T6 dB	T3 T7 dB	T4 dB	Dist Table	Corr dB $\mu$ V/m	Spec dB $\mu$ V/m	Margin dB	Polar Ant
1	143.295M QP	36.2	-26.8 +11.6	+0.2 +6.0	+0.4 +1.3	+1.0	+10.5	40.4	43.5	-3.1	Vert
^	143.297M	39.7	-26.8 +11.6	+0.2 +6.0	+0.4 +1.3	+1.0	+10.5	43.9	43.5	+0.4	Vert
3	788.840M	19.8	-27.8 +22.3	+0.3 +6.1	+0.8 +3.4	+2.4	+10.5	37.8	46.0	-8.2	Vert
4	469.220M	26.0	-27.7 +17.3	+0.2 +6.1	+0.6 +2.5	+1.8	+10.5	37.3	46.0	-8.7	Horiz
5	84.340M	29.8	-27.0 +7.9	+0.1 +6.0	+0.3 +1.0	+0.8	+10.5	29.4	40.0	-10.6	Vert
6	789.720M	16.7	-27.8 +22.4	+0.3 +6.1	+0.8 +3.4	+2.4	+10.5	34.8	46.0	-11.2	Horiz
7	493.600M	22.2	-27.8 +17.8	+0.2 +6.1	+0.6 +2.6	+1.9	+10.5	34.1	46.0	-11.9	Vert
8	252.340M	25.8	-26.3 +12.7	+0.2 +6.1	+0.5 +1.8	+1.3	+10.5	32.6	46.0	-13.4	Vert
9	84.000M	26.9	-27.0 +7.9	+0.1 +6.0	+0.3 +1.0	+0.8	+10.5	26.5	40.0	-13.5	Horiz
10	232.220M	25.1	-26.4 +11.5	+0.2 +6.1	+0.5 +1.7	+1.3	+10.5	30.5	46.0	-15.5	Horiz



Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209)-299-5240  
 Customer: **Divigraph**  
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**  
 Work Order #: **105719** Date: 7/19/2021  
 Test Type: **Radiated Scan** Time: 07:44:30  
 Tested By: Jonathan Wharton Sequence#: 5  
 Software: EMITest 5.03.20

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 2			

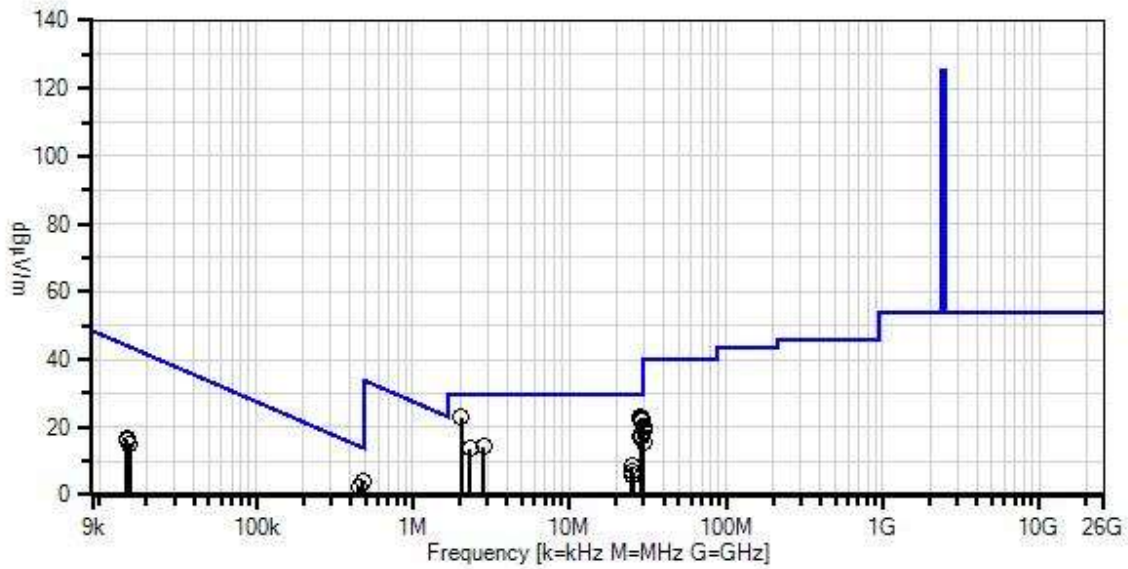
***Support Equipment:***

Device	Manufacturer	Model #	S/N
Configuration 2			

***Test Conditions / Notes:***

Radiated Spurious Emission  
  
 Frequency Range: 9kHz to 30MHz  
  
 Test Environment Conditions:  
 Temperature: 23.9°C  
 Humidity: 33.3%  
 Atmospheric Pressure: 101.4kPa  
 Software: Ruddy version 0.63.0.0  
 Internal Generated Frequency: 32kHz, 38.4MHz, 2.48GHz  
 Test Method: ANSI C63.10 2013  
 Antenna used: 6dBi Omni  
  
 The EUT is set up as intended. It is connected via POE to a support computer that provides signal information  
  
 Note:  
 Low Channel  
 All measurements were performed/collected in low, mid and high channels for this testing low channel was found to be worst case.

Divigraph W/D#: 105719 Sequence#: 5 Date: 7/19/2021  
 15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Various



— Readings  
 × QP Readings  
 ▼ Ambient  
 — 1 - 15.247(d) / 15.209 Radiated Spurious Emissions  
 ○ Peak Readings  
 \* Average Readings  
 Software Version: 5.03.20

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02668	Spectrum Analyzer	E4446A	4/14/2021	4/14/2022
T1	AN00226	Loop Antenna	6502	3/11/2021	3/11/2023
T2	ANP07591	Cable	RG214	7/16/2021	7/16/2023

**Measurement Data:**

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dB $\mu$ V	T1 dB	T2 dB			Dist Table	Corr dB $\mu$ V/m	Spec dB $\mu$ V/m	Margin dB	Polar Ant
1	2.039M	32.9	+9.9	+0.2			-20.0	23.0	29.5	-6.5	Z
2	28.685M	35.9	+6.0	+1.0			-20.0	22.9	29.5	-6.6	Y
3	28.685M	35.6	+6.0	+1.0			-20.0	22.6	29.5	-6.9	X
4	29.235M	35.6	+5.8	+1.0			-20.0	22.4	29.5	-7.1	X
5	29.235M	35.3	+5.8	+1.0			-20.0	22.1	29.5	-7.4	Y
6	29.905M	33.5	+5.7	+1.0			-20.0	20.2	29.5	-9.3	X
7	479.300k	34.3	+9.9	+0.1			-40.0	4.3	14.0	-9.7	Z
8	480.000k	33.9	+9.9	+0.1			-40.0	3.9	14.0	-10.1	Y
9	29.905M	32.2	+5.7	+1.0			-20.0	18.9	29.5	-10.6	Y
10	29.235M	30.5	+5.8	+1.0			-20.0	17.3	29.5	-12.2	Z
11	28.685M	30.2	+6.0	+1.0			-20.0	17.2	29.5	-12.3	Z
12	450.500k	32.1	+9.9	+0.1			-40.0	2.1	14.5	-12.4	X
13	29.995M	29.0	+5.7	+1.0			-20.0	15.7	29.5	-13.8	Z
14	2.858M	23.9	+10.0	+0.3			-20.0	14.2	29.5	-15.3	X
15	2.340M	23.4	+10.0	+0.2			-20.0	13.6	29.5	-15.9	Y
16	25.018M	20.7	+7.0	+0.9			-20.0	8.6	29.5	-20.9	X
17	25.324M	19.1	+6.9	+0.9			-20.0	6.9	29.5	-22.6	Z
18	25.100M	17.7	+6.9	+0.9			-20.0	5.5	29.5	-24.0	Y
19	15.000k	40.0	+16.6	+0.0			-40.0	16.6	44.1	-27.5	Y
20	15.000k	39.6	+16.6	+0.0			-40.0	16.2	44.1	-27.9	X
21	15.600k	38.9	+16.3	+0.0			-40.0	15.2	43.7	-28.5	Z



Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209)-299-5240  
 Customer: **Divigraph**  
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**  
 Work Order #: **105719** Date: 7/19/2021  
 Test Type: **Radiated Scan** Time: 08:01:07  
 Tested By: Jonathan Wharton Sequence#: 6  
 Software: EMITest 5.03.20

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 2			

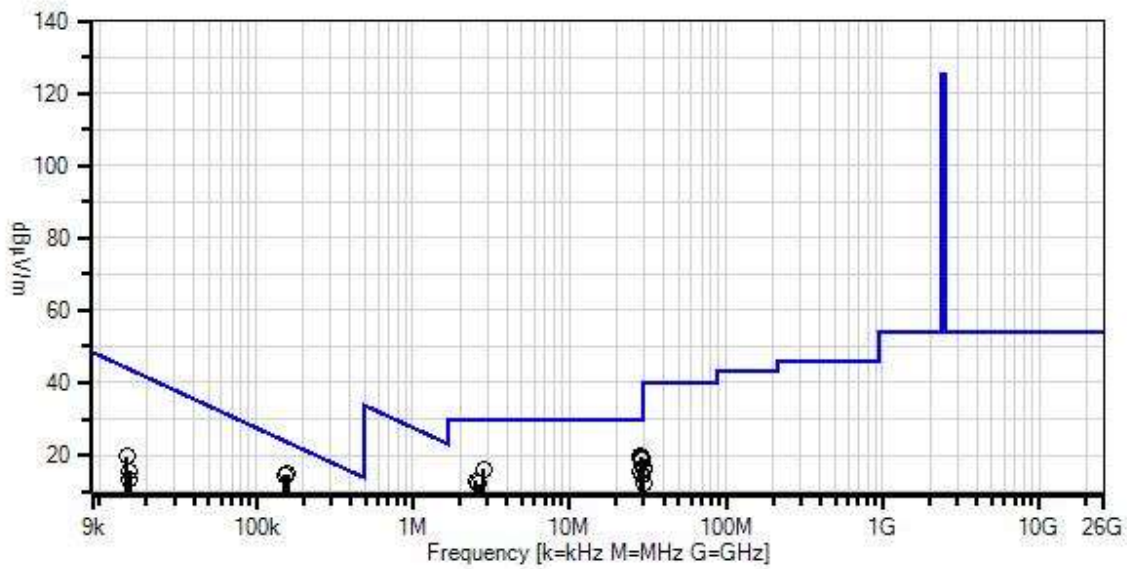
***Support Equipment:***

Device	Manufacturer	Model #	S/N
Configuration 2			

***Test Conditions / Notes:***

Radiated Spurious Emission  
 Frequency Range: 9kHz to 30MHz  
 Test Environment Conditions:  
 Temperature: 23.9°C  
 Humidity: 33.3%  
 Atmospheric Pressure: 101.4kPa  
 Software: Ratty version 0.63.0.0  
 Internal Generated Frequency: 32kHz, 38.4MHz, 2.48GHz  
 Test Method: ANSI C63.10 2013  
 The EUT is set up as intended. It is connected via POE to a support computer that provides signal information  
 Note:  
 Middle Channel

Divigraph W/D#: 105719 Sequence#: 6 Date: 7/19/2021  
 15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Various



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

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02668	Spectrum Analyzer	E4446A	4/14/2021	4/14/2022
T1	AN00226	Loop Antenna	6502	3/11/2021	3/11/2023
T2	ANP07591	Cable	RG214	7/16/2021	7/16/2023

**Measurement Data:**

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dB $\mu$ V	T1 dB	T2 dB			Dist Table	Corr dB $\mu$ V/m	Spec dB $\mu$ V/m	Margin dB	Polar Ant
1	450.000k	36.8	+9.9	+0.1			-40.0	6.8	14.5	-7.7	Z
2	159.200k	44.3	+10.3	+0.1			-40.0	14.7	23.6	-8.9	X
3	151.600k	44.1	+10.3	+0.1			-40.0	14.5	24.0	-9.5	Y
4	28.689M	32.6	+6.0	+1.0			-20.0	19.6	29.5	-9.9	Z
5	28.685M	32.5	+6.0	+1.0			-20.0	19.5	29.5	-10.0	Y
6	29.235M	32.2	+5.8	+1.0			-20.0	19.0	29.5	-10.5	Y
7	29.234M	32.1	+5.8	+1.0			-20.0	18.9	29.5	-10.6	Z
8	29.905M	29.7	+5.7	+1.0			-20.0	16.4	29.5	-13.1	Y
9	29.994M	29.5	+5.7	+1.0			-20.0	16.2	29.5	-13.3	Z
10	2.830M	25.7	+10.0	+0.3			-20.0	16.0	29.5	-13.5	Z
11	28.685M	28.5	+6.0	+1.0			-20.0	15.5	29.5	-14.0	X
12	29.235M	27.4	+5.8	+1.0			-20.0	14.2	29.5	-15.3	X
13	2.539M	22.7	+10.0	+0.2			-20.0	12.9	29.5	-16.6	X
14	29.965M	25.6	+5.7	+1.0			-20.0	12.3	29.5	-17.2	X
15	2.652M	21.8	+10.0	+0.2			-20.0	12.0	29.5	-17.5	Y
16	25.030M	20.4	+7.0	+0.9			-20.0	8.3	29.5	-21.2	Y
17	25.100M	19.7	+6.9	+0.9			-20.0	7.5	29.5	-22.0	Z
18	25.020M	19.2	+7.0	+0.9			-20.0	7.1	29.5	-22.4	X
19	15.050k	43.0	+16.6	+0.0			-40.0	19.6	44.0	-24.4	X
20	15.550k	38.9	+16.4	+0.0			-40.0	15.3	43.8	-28.5	Z
21	15.450k	36.7	+16.4	+0.0			-40.0	13.1	43.8	-30.7	Z





Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209)-299-5240  
 Customer: **Divigraph**  
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**  
 Work Order #: **105719** Date: 7/19/2021  
 Test Type: **Radiated Scan** Time: 08:12:00  
 Tested By: Jonathan Wharton Sequence#: 7  
 Software: EMITest 5.03.20

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 2			

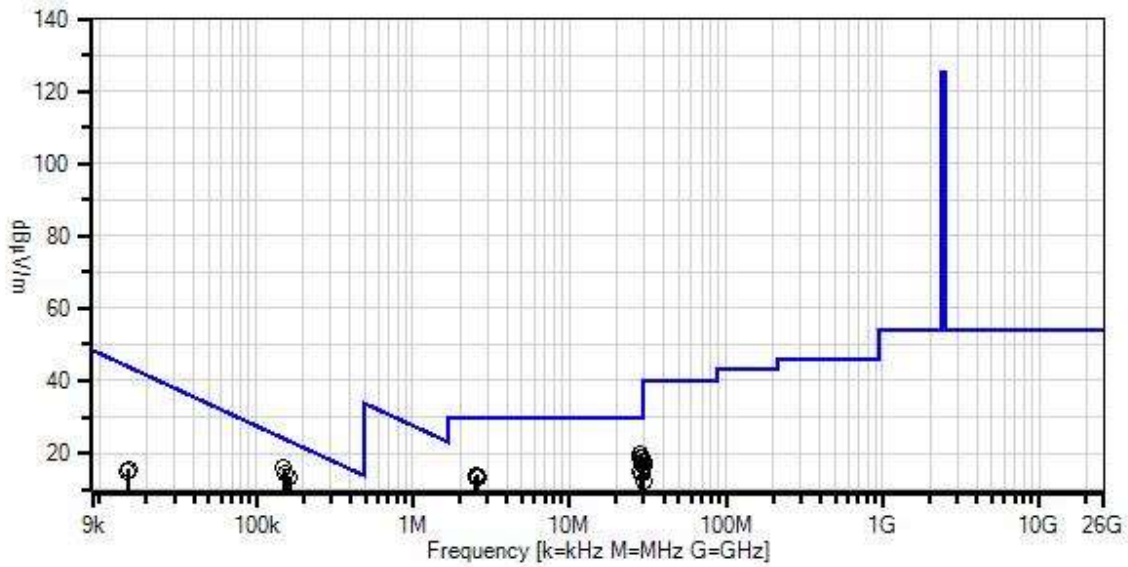
***Support Equipment:***

Device	Manufacturer	Model #	S/N
Configuration 2			

***Test Conditions / Notes:***

Radiated Spurious Emission  
 Frequency Range: 9kHz to 30MHz  
 Test Environment Conditions:  
 Temperature: 23.9°C  
 Humidity: 33.3%  
 Atmospheric Pressure: 101.4kPa  
 Software: Ratty version 0.63.0.0  
 Internal Generated Frequency: 32kHz, 38.4MHz, 2.48GHz  
 Test Method: ANSI C63.10 2013  
 The EUT is set up as intended. It is connected via POE to a support computer that provides signal information  
 Note:  
 High Channel

Divigraph W/D#: 105719 Sequence#: 7 Date: 7/19/2021  
 15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Various



— Readings  
 × QP Readings  
 ▼ Ambient  
 — 1 - 15.247(d) / 15.209 Radiated Spurious Emissions  
 ○ Peak Readings  
 \* Average Readings  
 Software Version: 5.03.20

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02668	Spectrum Analyzer	E4446A	4/14/2021	4/14/2022
T1	AN00226	Loop Antenna	6502	3/11/2021	3/11/2023
T2	ANP07591	Cable	RG214	7/16/2021	7/16/2023

**Measurement Data:**

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dB $\mu$ V	T1 dB	T2 dB			Dist Table	Corr dB $\mu$ V/m	Spec dB $\mu$ V/m	Margin dB	Polar Ant
1	150.000k	45.5	+10.3	+0.1			-40.0	15.9	24.1	-8.2	Y
2	155.000k	43.9	+10.3	+0.1			-40.0	14.3	23.8	-9.5	X
3	165.000k	43.1	+10.3	+0.1			-40.0	13.5	23.2	-9.7	Z
4	28.683M	32.6	+6.0	+1.0			-20.0	19.6	29.5	-9.9	Y
5	29.238M	31.7	+5.8	+1.0			-20.0	18.5	29.5	-11.0	Y
6	28.688M	31.4	+6.0	+1.0			-20.0	18.4	29.5	-11.1	Z
7	29.238M	30.8	+5.8	+1.0			-20.0	17.6	29.5	-11.9	Z
8	29.908M	30.8	+5.7	+1.0			-20.0	17.5	29.5	-12.0	Z
9	29.908M	29.8	+5.7	+1.0			-20.0	16.5	29.5	-13.0	Y
10	28.685M	27.7	+6.0	+1.0			-20.0	14.7	29.5	-14.8	X
11	29.235M	27.5	+5.8	+1.0			-20.0	14.3	29.5	-15.2	X
12	2.570M	23.7	+10.0	+0.2			-20.0	13.9	29.5	-15.6	X
13	2.605M	23.4	+10.0	+0.2			-20.0	13.6	29.5	-15.9	Z
14	2.525M	23.3	+10.0	+0.2			-20.0	13.5	29.5	-16.0	Y
15	29.965M	25.8	+5.7	+1.0			-20.0	12.5	29.5	-17.0	X
16	25.058M	20.6	+7.0	+0.9			-20.0	8.5	29.5	-21.0	Y
17	25.045M	18.4	+7.0	+0.9			-20.0	6.3	29.5	-23.2	Z
18	25.185M	18.2	+6.9	+0.9			-20.0	6.0	29.5	-23.5	X
19	15.450k	39.3	+16.4	+0.0			-40.0	15.7	43.8	-28.1	X
20	15.250k	38.2	+16.5	+0.0			-40.0	14.7	43.9	-29.2	Z



Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209)-299-5240  
 Customer: **Divigraph**  
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**  
 Work Order #: **105719** Date: 7/21/2021  
 Test Type: **Radiated Scan** Time: 08:06:17  
 Tested By: Michael Rauch Jr. Sequence#: 7  
 Software: EMITest 5.03.19

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 2			

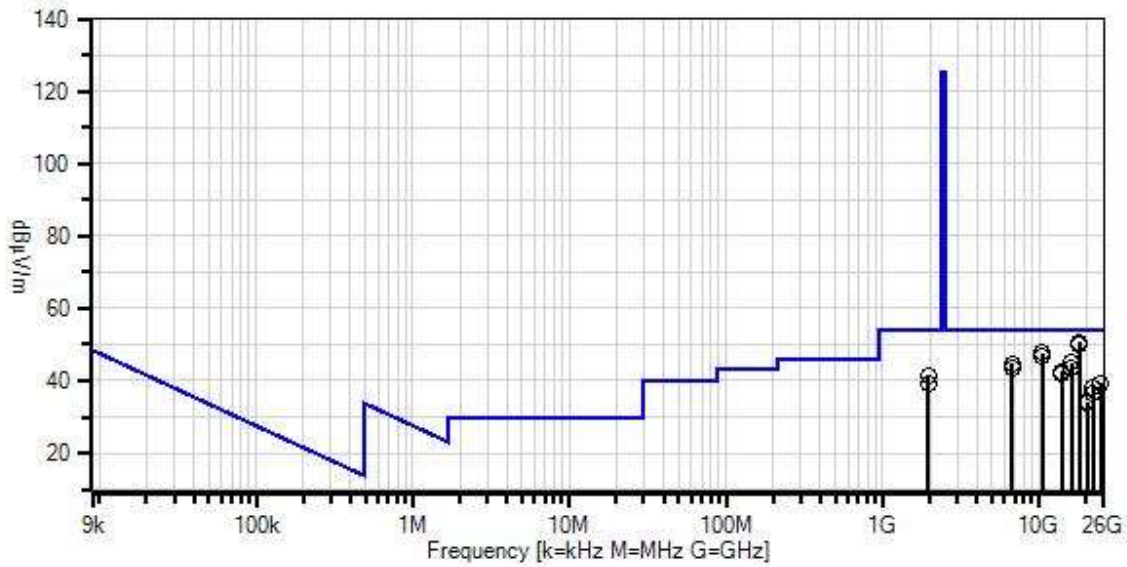
***Support Equipment:***

Device	Manufacturer	Model #	S/N
Configuration 2			

***Test Conditions / Notes:***

Radiated Spurious Emission  
 Frequency Range: 1GHz to 25GHz  
 Test Environment Conditions:  
 Temperature: 26.0°C  
 Humidity: 39.3%  
 Atmospheric Pressure: 101.1kPa  
 Software: Ruddy version 0.63.0.0  
 Internal Generated Frequency: 32kHz, 38.4MHz, 2.48GHz  
 Test Method: ANSI C63.10 2013  
 The EUT is set up as intended. It is connected via POE to a support computer that provides signal information.  
 Notes:  
 Low Channel  
 All measurements were performed/collected in low, mid and high channels for this testing low channel was found to be worst case.

Divigraph W/D#: 105719 Sequence#: 7 Date: 7/21/2021  
 15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Various



— Readings  
 × QP Readings  
 ▼ Ambient  
 — 1 - 15.247(d) / 15.209 Radiated Spurious Emissions

○ Peak Readings  
 \* Average Readings  
 Software Version: 5.03.19

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02668	Spectrum Analyzer	E4446A	4/14/2021	4/14/2022
T1	ANP07585	Cable	32026-2-29094K-360TC	8/26/2019	8/26/2021
T2	AN02115	Preamp	83051A	4/2/2021	4/2/2023
T3	AN00327	Horn Antenna	3115	11/24/2020	11/24/2022
T4	AN03011	Cable	32022-2-2909K-24TC	6/15/2020	6/15/2022
T5	AN03366	Horn Antenna	GH-62-25	9/1/2020	9/1/2022
T6	AN02046	Horn Antenna	MWH-1826/B	9/2/2020	9/2/2022
T7	AN03361	Cable	32022-2-29094-48TC	6/15/2020	6/15/2022

**Measurement Data:**

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dB $\mu$ V	T1 T5 dB	T2 T6 dB	T3 T7 dB	T4 dB	Dist Table	Corr dB $\mu$ V/m	Spec dB $\mu$ V/m	Margin dB	Polar Ant
1	17981.500 M	31.7	+19.0 +31.3	-32.6 +0.0	+0.0 +0.0	+1.3	+0.0	50.7	54.0	-3.3	Horiz
2	17982.000 M	30.8	+19.0 +31.3	-32.6 +0.0	+0.0 +0.0	+1.3	+0.0	49.8	54.0	-4.2	Vert
3	10519.300 M	28.6	+13.2 +0.0	-32.5 +0.0	+37.4 +0.0	+0.8	+0.0	47.5	54.0	-6.5	Horiz
4	10519.800 M	28.0	+13.2 +0.0	-32.5 +0.0	+37.4 +0.0	+0.8	+0.0	46.9	54.0	-7.1	Vert
5	16086.500 M	31.0	+17.2 +30.5	-34.9 +0.0	+0.0 +0.0	+1.2	+0.0	45.0	54.0	-9.0	Horiz
6	6689.270M	32.3	+10.8 +0.0	-31.9 +0.0	+33.0 +0.0	+0.6	+0.0	44.8	54.0	-9.2	Vert
7	16087.000 M	29.6	+17.2 +30.5	-34.9 +0.0	+0.0 +0.0	+1.2	+0.0	43.6	54.0	-10.4	Vert
8	6688.770M	30.9	+10.8 +0.0	-31.9 +0.0	+33.0 +0.0	+0.6	+0.0	43.4	54.0	-10.6	Horiz
9	14011.500 M	31.2	+15.8 +29.2	-34.8 +0.0	+0.0 +0.0	+1.2	+0.0	42.6	54.0	-11.4	Horiz
10	14012.000 M	30.4	+15.8 +29.2	-34.8 +0.0	+0.0 +0.0	+1.2	+0.0	41.8	54.0	-12.2	Vert
11	1944.003M	42.5	+5.6 +0.0	-33.9 +0.0	+27.0 +0.0	+0.3	+0.0	41.5	54.0	-12.5	Horiz
12	24854.500 M	34.8	+0.0 +0.0	-34.0 +34.2	+0.0 +2.9	+1.5	+0.0	39.4	54.0	-14.6	Horiz
13	1944.500M	40.1	+5.6 +0.0	-33.9 +0.0	+27.0 +0.0	+0.3	+0.0	39.1	54.0	-14.9	Vert
14	24854.000 M	34.4	+0.0 +0.0	-34.0 +34.2	+0.0 +2.9	+1.5	+0.0	39.0	54.0	-15.0	Vert

15	22064.500 M	32.2	+0.0 +0.0	-32.0 +33.5	+0.0 +2.9	+1.5	+0.0	38.1	54.0	-15.9	Horiz
16	22064.000 M	30.4	+0.0 +0.0	-32.0 +33.5	+0.0 +2.9	+1.5	+0.0	36.3	54.0	-17.7	Vert
17	20339.000 M	29.9	+0.0 +0.0	-32.8 +33.1	+0.0 +2.6	+1.4	+0.0	34.2	54.0	-19.8	Vert
18	20339.500 M	29.5	+0.0 +0.0	-32.8 +33.1	+0.0 +2.6	+1.4	+0.0	33.8	54.0	-20.2	Horiz



Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209)-299-5240  
 Customer: **Divigraph**  
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**  
 Work Order #: **105719** Date: 7/20/2021  
 Test Type: **Radiated Scan** Time: 07:49:18  
 Tested By: Jonathan Wharton Sequence#: 7  
 Software: EMITest 5.03.20

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 2			

***Support Equipment:***

Device	Manufacturer	Model #	S/N
Configuration 2			

***Test Conditions / Notes:***

Radiated Spurious Emission  
 Frequency Range: 1GHz to 25GHz  
 Test Environment Conditions:  
 Temperature: 26.0°C  
 Humidity: 49.6%  
 Atmospheric Pressure: 101.4kPa  
 Software: Ruddy version 0.63.0.0  
 Internal Generated Frequency: 32kHz, 38.4MHz, 2.48GHz  
 Test Method: ANSI C63.10 2013  
 The EUT is set up as intended. It is connected via POE to a support computer that provides signal information.  
 Note:  
 Middle Channel



Divigraph W/D#: 105719 Sequence#: 7 Date: 7/20/2021  
 15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Various



— Readings  
 × QP Readings  
 ▼ Ambient  
 — 1 - 15.247(d) / 15.209 Radiated Spurious Emissions  
 ○ Peak Readings  
 \* Average Readings  
 Software Version: 5.03.20

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02668	Spectrum Analyzer	E4446A	4/14/2021	4/14/2022
T1	ANP07585	Cable	32026-2-29094K-360TC	8/26/2019	8/26/2021
T2	AN02115	Preamp	83051A	4/2/2021	4/2/2023
T3	AN00327	Horn Antenna	3115	11/24/2020	11/24/2022
T4	AN03011	Cable	32022-2-2909K-24TC	6/15/2020	6/15/2022
T5	AN03366	Horn Antenna	GH-62-25	9/1/2020	9/1/2022
T6	AN02046	Horn Antenna	MWH-1826/B	9/2/2020	9/2/2022
T7	AN03361	Cable	32022-2-29094-48TC	6/15/2020	6/15/2022

**Measurement Data:**

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dB $\mu$ V	T1 T5 dB	T2 T6 dB	T3 T7 dB	T4 dB	Dist Table	Corr dB $\mu$ V/m	Spec dB $\mu$ V/m	Margin dB	Polar Ant
1	24945.000 M	42.4	+0.0 +0.0	-34.0 +34.2	+0.0 +2.8	+1.4	+0.0	46.8	54.0	-7.2	Vert
2	16130.000 M	31.9	+17.2 +30.5	-34.9 +0.0	+0.0 +0.0	+1.2	+0.0	45.9	54.0	-8.1	Vert
3	10349.500 M	26.9	+13.3 +0.0	-32.4 +0.0	+37.3 +0.0	+0.8	+0.0	45.9	54.0	-8.1	Vert
4	24765.000 M	40.5	+0.0 +0.0	-33.9 +34.1	+0.0 +3.0	+1.5	+0.0	45.2	54.0	-8.8	Horiz
5	16105.000 M	30.1	+17.2 +30.5	-34.9 +0.0	+0.0 +0.0	+1.2	+0.0	44.1	54.0	-9.9	Horiz
6	14190.000 M	31.9	+15.9 +29.3	-34.9 +0.0	+0.0 +0.0	+1.2	+0.0	43.4	54.0	-10.6	Vert
7	22275.000 M	37.3	+0.0 +0.0	-32.0 +33.5	+0.0 +2.8	+1.4	+0.0	43.0	54.0	-11.0	Vert
8	22560.000 M	37.4	+0.0 +0.0	-32.0 +33.5	+0.0 +2.7	+1.4	+0.0	43.0	54.0	-11.0	Horiz
9	14050.000 M	31.0	+15.8 +29.2	-34.8 +0.0	+0.0 +0.0	+1.2	+0.0	42.4	54.0	-11.6	Horiz
10	20145.000 M	38.3	+0.0 +0.0	-32.9 +33.0	+0.0 +2.6	+1.3	+0.0	42.3	54.0	-11.7	Horiz
11	10504.400 M	22.7	+13.2 +0.0	-32.5 +0.0	+37.4 +0.0	+0.8	+0.0	41.6	54.0	-12.4	Horiz
12	6499.400M	30.0	+10.6 +0.0	-32.2 +0.0	+32.4 +0.0	+0.6	+0.0	41.4	54.0	-12.6	Horiz
13	20145.000 M	36.7	+0.0 +0.0	-32.9 +33.0	+0.0 +2.6	+1.3	+0.0	40.7	54.0	-13.3	Vert
14	6434.500M	28.8	+10.6 +0.0	-32.2 +0.0	+32.5 +0.0	+0.6	+0.0	40.3	54.0	-13.7	Vert
15	17950.000 M	19.1	+18.9 +31.2	-32.7 +0.0	+0.0 +0.0	+1.3	+0.0	37.8	54.0	-16.2	Horiz
	Ave										
^	17950.000 M	31.3	+18.9 +31.2	-32.7 +0.0	+0.0 +0.0	+1.3	+0.0	50.0	54.0	-4.0	Horiz

17	17940.000 M	19.0	+18.9 +31.2	-32.7 +0.0	+0.0 +0.0	+1.3	+0.0	37.7	54.0	-16.3	Vert
Ave											
^	17940.000 M	30.9	+18.9 +31.2	-32.7 +0.0	+0.0 +0.0	+1.3	+0.0	49.6	54.0	-4.4	Vert
19	1400.000M	38.6	+4.7 +0.0	-36.1 +0.0	+25.1 +0.0	+0.4	+0.0	32.7	54.0	-21.3	Vert
20	1385.000M	37.3	+4.7 +0.0	-36.1 +0.0	+25.1 +0.0	+0.4	+0.0	31.4	54.0	-22.6	Horiz
21	2439.430M	70.7	+6.7 +0.0	-33.8 +0.0	+28.3 +0.0	+0.4	+0.0	72.3	125.2	-52.9	Horiz
22	2439.470M	68.4	+6.7 +0.0	-33.8 +0.0	+28.3 +0.0	+0.4	+0.0	70.0	125.2	-55.2	Vert



Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209)-299-5240  
 Customer: **Divigraph**  
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**  
 Work Order #: **105719** Date: 7/20/2021  
 Test Type: **Radiated Scan** Time: 07:44:32  
 Tested By: Jonathan Wharton Sequence#: 8  
 Software: EMITest 5.03.20

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 2			

***Support Equipment:***

Device	Manufacturer	Model #	S/N
Configuration 2			

***Test Conditions / Notes:***

Radiated Spurious Emission  
 Frequency Range: 1GHz to 25GHz  
 Test Environment Conditions:  
 Temperature: 26.0°C  
 Humidity: 49.6%  
 Atmospheric Pressure: 101.4kPa  
 Software: Ratty version 0.63.0.0  
 Internal Generated Frequency: 32kHz, 38.4MHz, 2.48GHz  
 Test Method: ANSI C63.10 2013  
 The EUT is set up as intended. It is connected via POE to a support computer that provides signal information.  
 Note:  
 High Channel

Divigraph W/D#: 105719 Sequence#: 8 Date: 7/20/2021  
 15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Various



— Readings  
 × QP Readings  
 ▼ Ambient  
 — 1 - 15.247(d) / 15.209 Radiated Spurious Emissions  
 ○ Peak Readings  
 \* Average Readings  
 Software Version: 5.03.20

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02668	Spectrum Analyzer	E4446A	4/14/2021	4/14/2022
T2	ANP07585	Cable	32026-2-29094K-360TC	8/26/2019	8/26/2021
T3	AN02115	Preamp	83051A	4/2/2021	4/2/2023
T4	AN00327	Horn Antenna	3115	11/24/2020	11/24/2022
T5	AN03011	Cable	32022-2-2909K-24TC	6/15/2020	6/15/2022
T6	AN03366	Horn Antenna	GH-62-25	9/1/2020	9/1/2022
T7	AN02046	Horn Antenna	MWH-1826/B	9/2/2020	9/2/2022
T8	AN03361	Cable	32022-2-29094-48TC	6/15/2020	6/15/2022

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

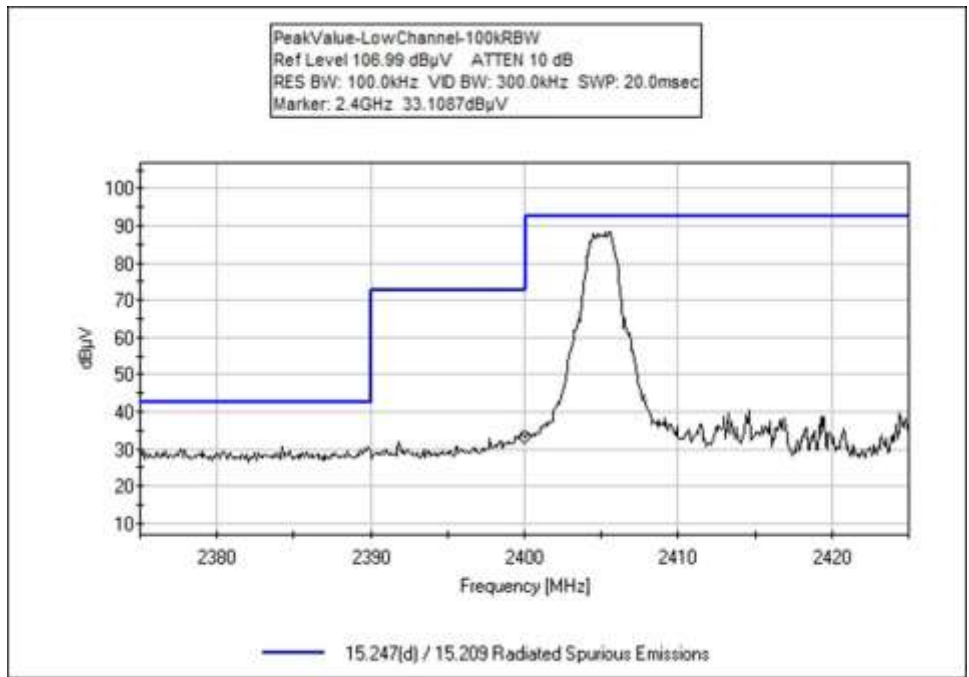
#	Freq MHz	Rdng dBμV	T1 T5 dB	T2 T6 dB	T3 T7 dB	T4 T8 dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	24825.000 M	42.2	+0.0 +1.5	+0.0 +0.0	-33.9 +34.2	+0.0 +2.9	+0.0	46.9	54.0	-7.1	Vert
2	16180.000 M	32.8	+0.0 +1.2	+17.2 +30.4	-34.8 +0.0	+0.0 +0.0	+0.0	46.8	54.0	-7.2	Horiz
3	24960.000 M	42.1	+0.0 +1.4	+0.0 +0.0	-34.0 +34.2	+0.0 +2.8	+0.0	46.5	54.0	-7.5	Horiz
4	22290.000 M	39.5	+0.0 +1.4	+0.0 +0.0	-32.0 +33.5	+0.0 +2.8	+0.0	45.2	54.0	-8.8	Horiz
5	10375.000 M	26.0	+0.0 +0.8	+13.3 +0.0	-32.4 +0.0	+37.3 +0.0	+0.0	45.0	54.0	-9.0	Vert
6	22260.000 M	39.1	+0.0 +1.4	+0.0 +0.0	-32.0 +33.5	+0.0 +2.8	+0.0	44.8	54.0	-9.2	Vert
7	14105.000 M	33.1	+0.0 +1.2	+15.9 +29.2	-34.8 +0.0	+0.0 +0.0	+0.0	44.6	54.0	-9.4	Horiz
8	16020.000 M	30.6	+0.0 +1.2	+17.1 +30.4	-35.0 +0.0	+0.0 +0.0	+0.0	44.3	54.0	-9.7	Vert
9	10380.000 M	25.2	+0.0 +0.8	+13.3 +0.0	-32.4 +0.0	+37.3 +0.0	+0.0	44.2	54.0	-9.8	Horiz
10	20370.000 M	39.3	+0.0 +1.4	+0.0 +0.0	-32.8 +33.1	+0.0 +2.6	+0.0	43.6	54.0	-10.4	Horiz
11	14055.000 M	31.2	+0.0 +1.2	+15.8 +29.2	-34.8 +0.0	+0.0 +0.0	+0.0	42.6	54.0	-11.4	Vert
12	6210.000M	30.5	+0.0 +0.7	+10.5 +0.0	-32.1 +0.0	+32.8 +0.0	+0.0	42.4	54.0	-11.6	Vert
13	6440.000M	29.4	+0.0 +0.6	+10.6 +0.0	-32.2 +0.0	+32.5 +0.0	+0.0	40.9	54.0	-13.1	Horiz
14	20160.000 M	35.9	+0.0 +1.3	+0.0 +0.0	-32.9 +33.0	+0.0 +2.6	+0.0	39.9	54.0	-14.1	Vert
15	17875.000 M	19.0	+0.0 +1.3	+18.7 +31.2	-32.7 +0.0	+0.0 +0.0	+0.0	37.5	54.0	-16.5	Vert
	Ave										
^	17875.000 M	31.2	+0.0 +1.3	+18.7 +31.2	-32.7 +0.0	+0.0 +0.0	+0.0	49.7	54.0	-4.3	Vert

17	17805.000 M	19.0	+0.0 +1.3	+18.6 +31.3	-32.8 +0.0	+0.0 +0.0	+0.0	37.4	54.0	-16.6	Horiz
Ave											
^	17805.000 M	31.2	+0.0 +1.3	+18.6 +31.3	-32.8 +0.0	+0.0 +0.0	+0.0	49.6	54.0	-4.4	Horiz
19	1980.000M	34.0	+0.0 +0.3	+5.7 +0.0	-33.8 +0.0	+27.1 +0.0	+0.0	33.3	54.0	-20.7	Horiz
20	1390.000M	37.5	+0.0 +0.4	+4.7 +0.0	-36.1 +0.0	+25.1 +0.0	+0.0	31.6	54.0	-22.4	Vert
21	2480.600M	73.7	+0.0 +0.4	+6.7 +0.0	-33.7 +0.0	+28.4 +0.0	+0.0	75.5	125.2	-49.7	Horiz
22	2480.633M	71.5	+0.0 +0.4	+6.7 +0.0	-33.7 +0.0	+28.4 +0.0	+0.0	73.3	125.2	-51.9	Vert

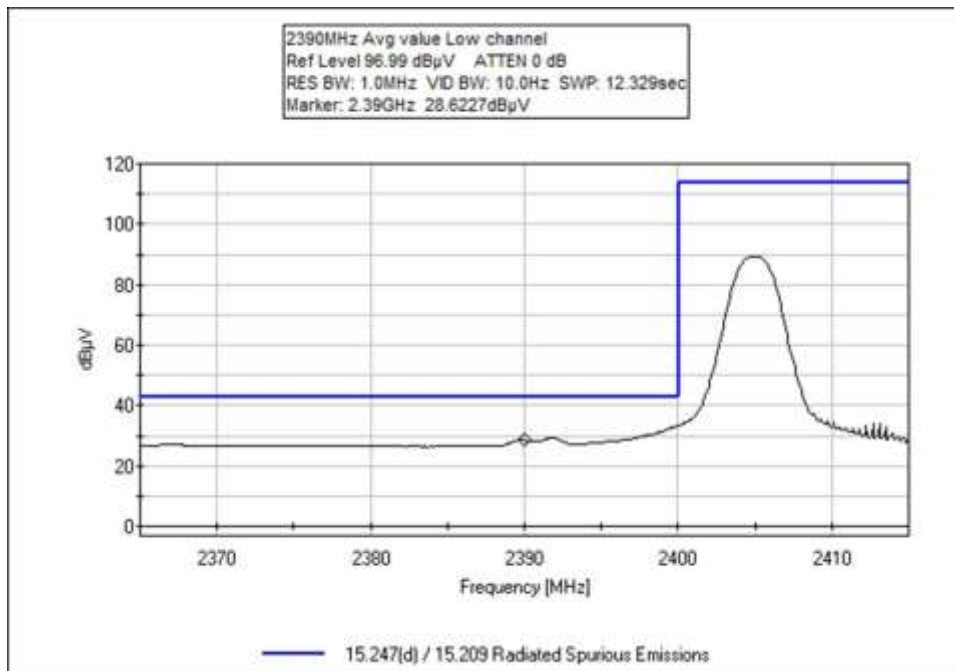
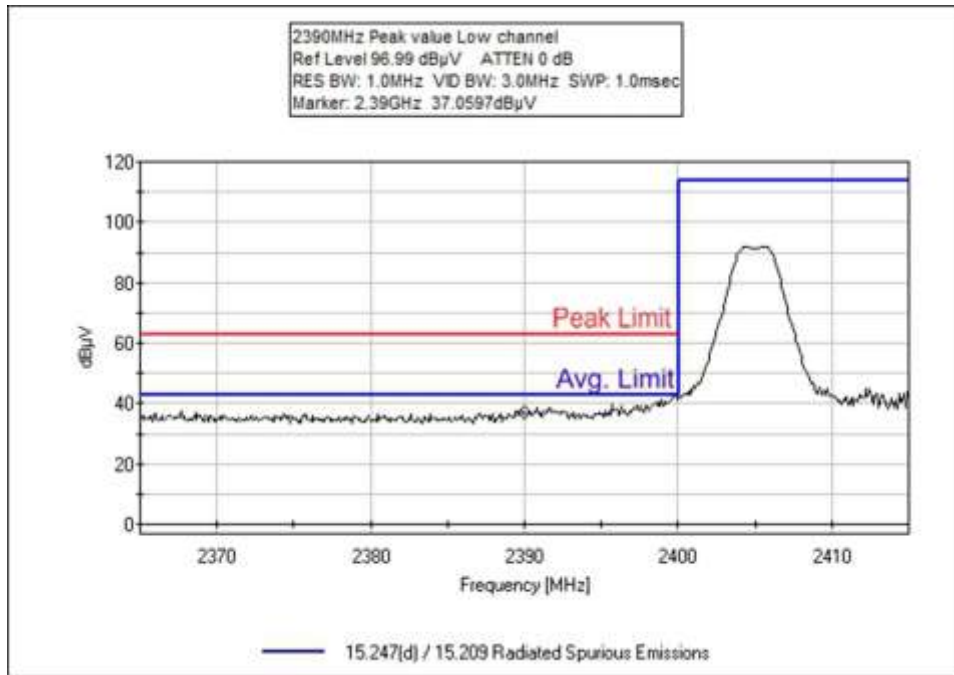
## Band Edge

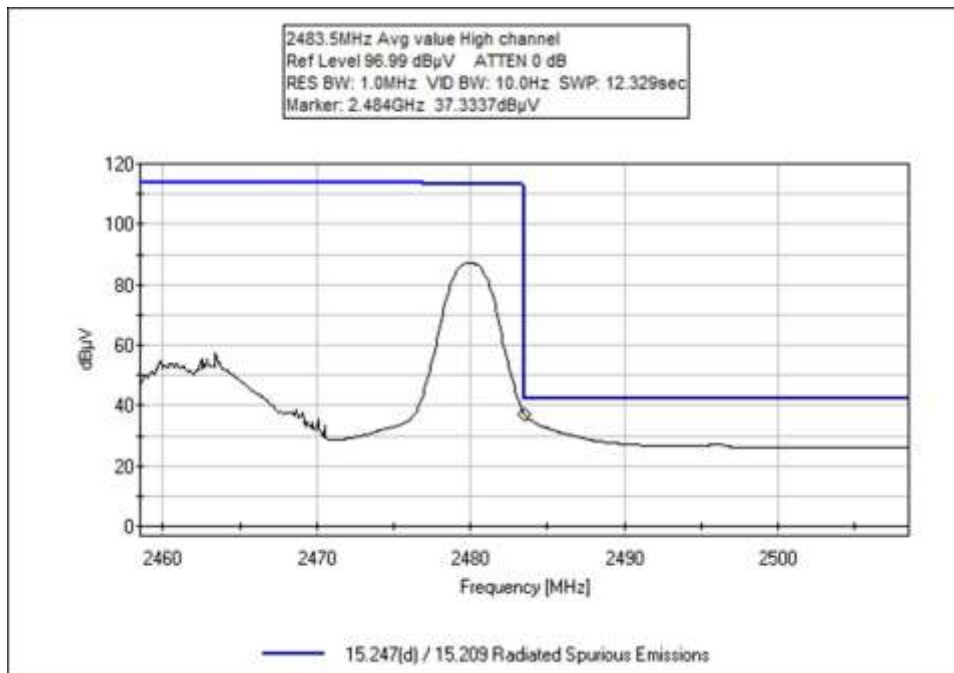
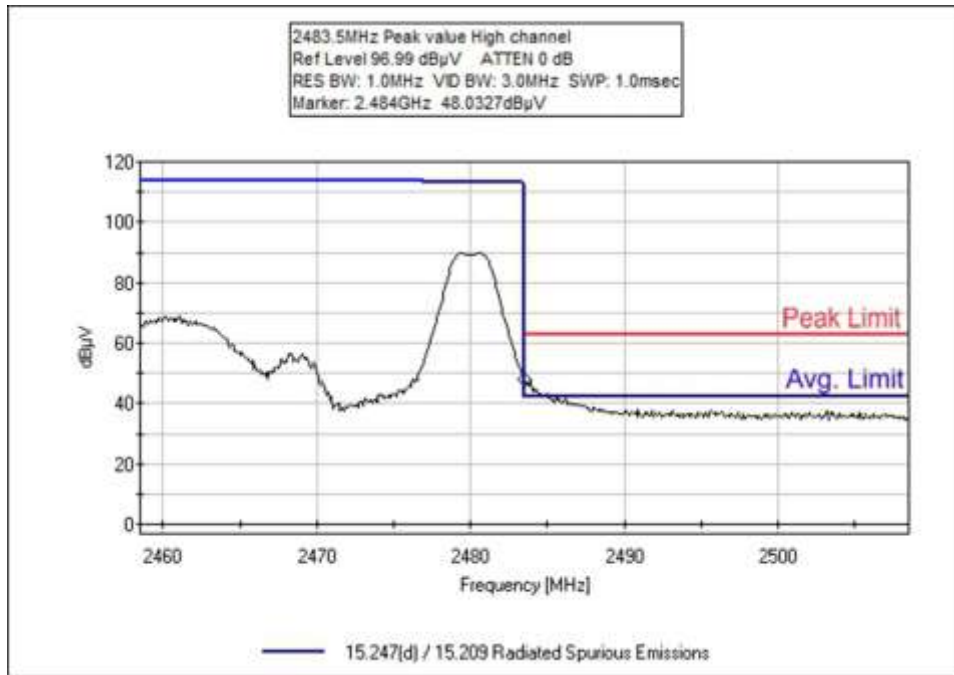
Band Edge Summary					
Frequency (MHz)	Modulation	Ant. Type	Field Strength (dBuV/m @3m)	Limit (dBuV/m @3m)	Results
2390.0	OQPSK, DSSS	Rod/6dB	51.8	<54	Pass
2400.0	OQPSK, DSSS	Rod/6dB	44.5	<84	Pass
2483.5	OQPSK, DSSS	Rod/6dB	49.1	<54	Pass

## Band Edge Plots









**Test Setup / Conditions / Data**

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209)-299-5240  
 Customer: **Divigraph**  
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**  
 Work Order #: **105719** Date: 7/20/2021  
 Test Type: **Radiated Scan** Time: 11:28:48  
 Tested By: Jonathan Wharton Sequence#: 7  
 Software: EMITest 5.03.19

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 2			

***Support Equipment:***

Device	Manufacturer	Model #	S/N
Configuration 2			

***Test Conditions / Notes:***

Radiated Band Edge

Frequency Range: 1GHz to 12GHz

Test Environment Conditions:  
 Temperature: 26.0°C  
 Humidity: 49.6%  
 Atmospheric Pressure: 101.4kPa  
 Software: Ratty version 0.63.0.0  
 Internal Generated Frequency: 32kHz, 38.4MHz, 2.48GHz

Test Method: ANSI C63.10 2013

The EUT is set up as intended. It is connected via POE to a support computer that provides signal information.

Note:  
 Low/High Channel

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02668	Spectrum Analyzer	E4446A	4/14/2021	4/14/2022
T2	ANP07585	Cable	32026-2- 29094K-360TC	8/26/2019	8/26/2021
T3	AN02115	Preamp	83051A	4/2/2021	4/2/2023
T4	AN00327	Horn Antenna	3115	11/24/2020	11/24/2022
T5	AN03011	Cable	32022-2-2909K- 24TC	6/15/2020	6/15/2022
	AN03366	Horn Antenna	GH-62-25	9/1/2020	9/1/2022
	AN02046	Horn Antenna	MWH-1826/B	9/2/2020	9/2/2022
	AN03361	Cable	32022-2-29094- 48TC	6/15/2020	6/15/2022
	AN03309	High Pass Filter	11SH10- 3000/T10000- O/O	3/26/2020	3/26/2022
T6	AN02138	Attenuator	54-10	11/12/2019	11/12/2021

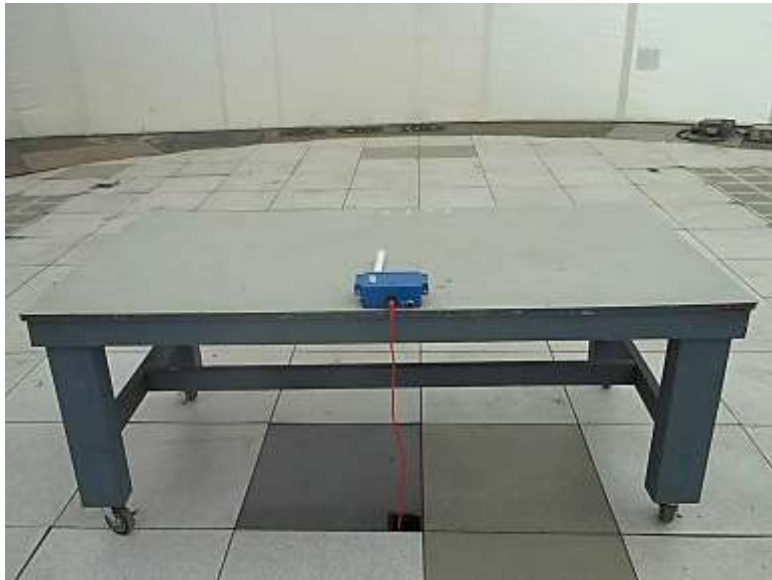
**Measurement Data:**

Reading listed by margin.

Test Distance: 3 Meters

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dB $\mu$ V	T5 dB	T6 dB	dB	dB	Table	dB $\mu$ V/m	dB $\mu$ V/m	dB	Ant
1	2483.500M	37.3	+0.0	+6.7	-33.7	+28.4	+0.0	49.1	54.0	-4.9	None
	Ave		+0.4	+10.0							
^	2483.500M	33.0	+0.0	+6.7	-33.7	+28.4	+0.0	44.8	54.0	-9.2	None
			+0.4	+10.0					100kHz RBW		
3	2400.000M	33.1	+0.0	+6.7	-33.9	+28.2	+0.0	44.5	54.0	-9.5	None
			+0.4	+10.0					100kHz RBW		
4	2390.000M	28.6	+0.0	+6.7	-33.9	+28.2	+0.0	40.0	54.0	-14.0	None
	Ave		+0.4	+10.0							
^	2390.000M	40.4	+0.0	+6.7	-33.9	+28.2	+0.0	51.8	54.0	-2.2	None
			+0.4	+10.0							

**Test Setup Photo(s)**



30MHz – 1GHz; Test Setup



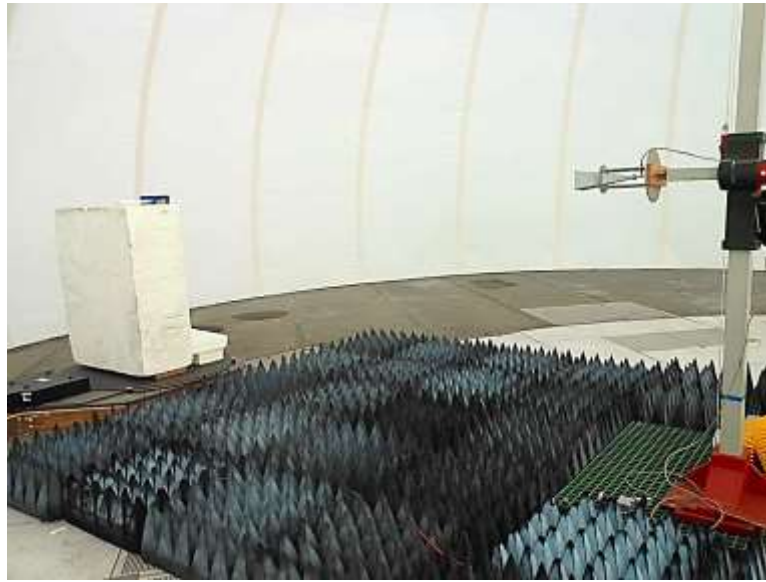
30MHz – 1GHz; Antenna



1 – 12GHz; Front View



12 -18GHz, Side View



18 – 25GHz; Side View

## 15.247(e) Power Spectral Density

### Test Setup/Conditions

Test Location:	Mariposa Lab A	Test Engineer:	Michael Rauch Jr/Jonathan Wharton/Benny Lovan
Test Method:	ANSI C63.10 (2013), KDB 558074 (2019)	Test Date(s):	7/14/2021
Configuration:	1		
Test Setup:	PSA is connected directly to the EUT via an attenuator and cable.		

### Environmental Conditions

Temperature (°C)	24.7	Relative Humidity (%):	36.1
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### Test Equipment

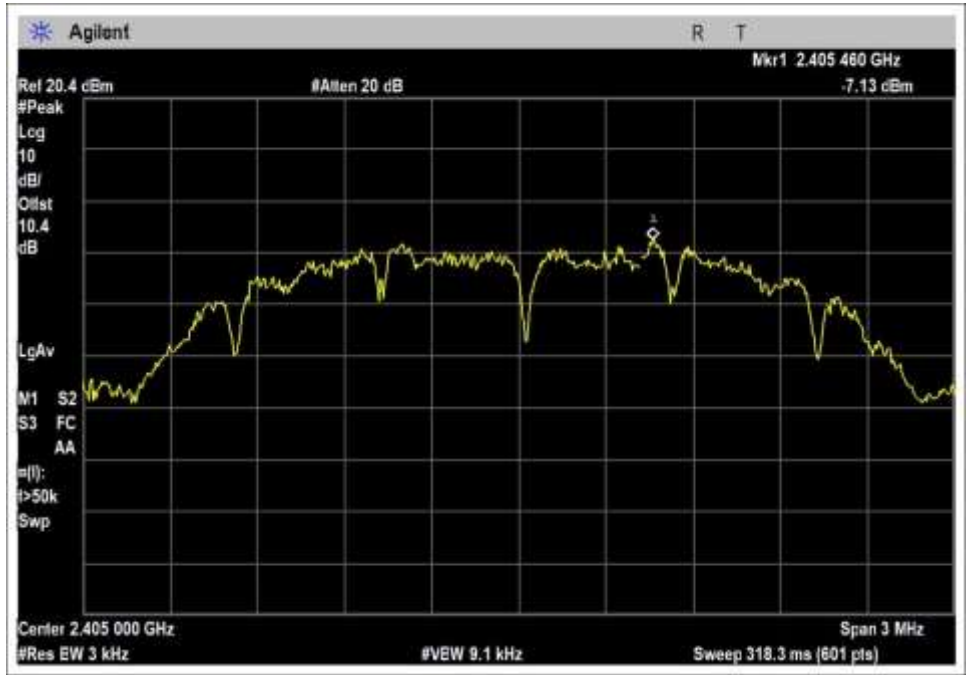
Asset#	Description	Manufacturer	Model	Cal Date	Cal Due
02138	Attenuator	Weinschel	54-10	11/12/2019	11/12/2021
03011	Cable	AstroSteel	32022-2-2909K-24TC	6/15/2020	6/15/2022
02668	Spectrum Analyzer	Agilent	E4446A	4/14/2021	4/14/2022

### Test Data Summary - RF Conducted Measurement

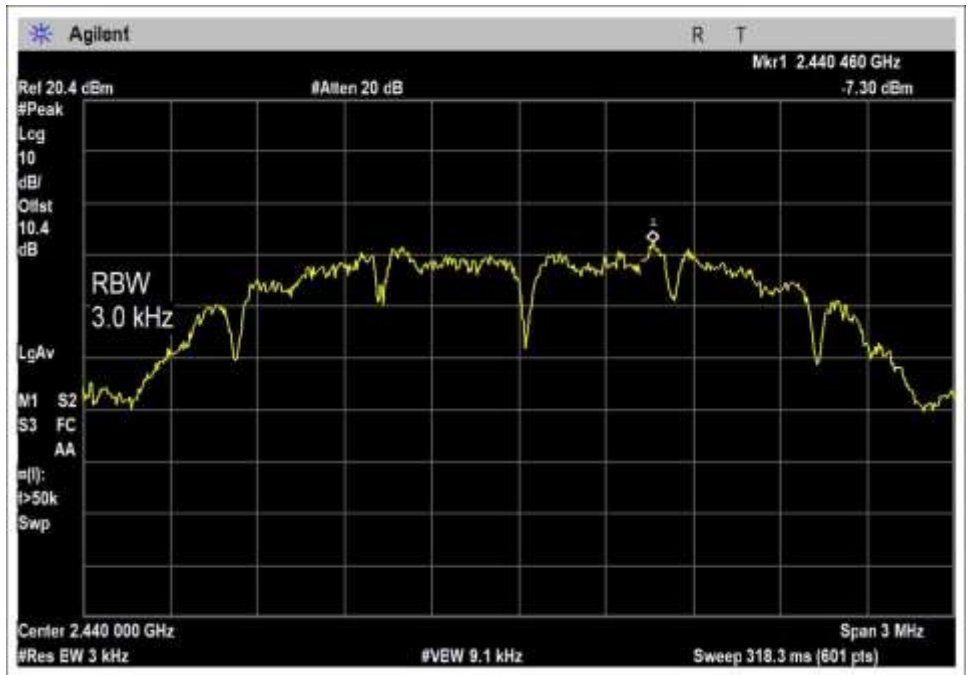
Measurement Method: PKPSD				
Frequency (MHz)	Modulation	Measured (dBm/3kHz)	Limit (dBm/3kHz)	Results
2405	OQPSK, DSSS	-7.13	≤8	Pass
2440	OQPSK, DSSS	-7.30	≤8	Pass
2480	OQPSK, DSSS	-8.87	≤8	Pass



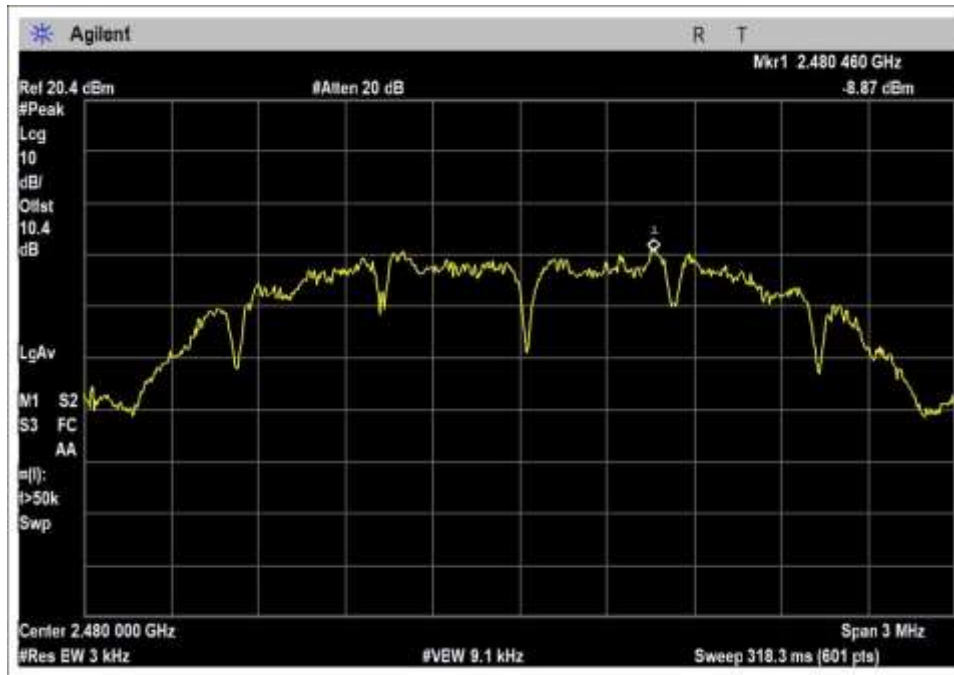
**Plots**



Low Channel



Middle Channel



High Channel

**Test Setup Photo(s)**



## 15.207 AC Conducted Emissions

### Test Setup / Conditions / Data

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338-9081 • (209) 299-5240  
 Customer: **Divigraph**  
 Specification: **15.207 AC Mains - Average**  
 Work Order #: **105719** Date: 7/21/2021  
 Test Type: **Conducted Emissions** Time: 15:16:03  
 Tested By: Michael Rauch Jr. Sequence#: 7  
 Software: EMITest 5.03.19 120VAC/60Hz

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 3			

***Support Equipment:***

Device	Manufacturer	Model #	S/N
Configuration 3			

***Test Conditions / Notes:***

Conducted Spurious Emission

Frequency Range: 150kHz to 30MHz

Test Environment Conditions:  
 Temperature: 23.9°C  
 Humidity: 33.3%  
 Atmospheric Pressure: 101.4kPa  
 Software: Ruddy version 0.63.0.0  
 Internal Generated Frequency: 32kHz, 38.4MHz, 2.48GHz

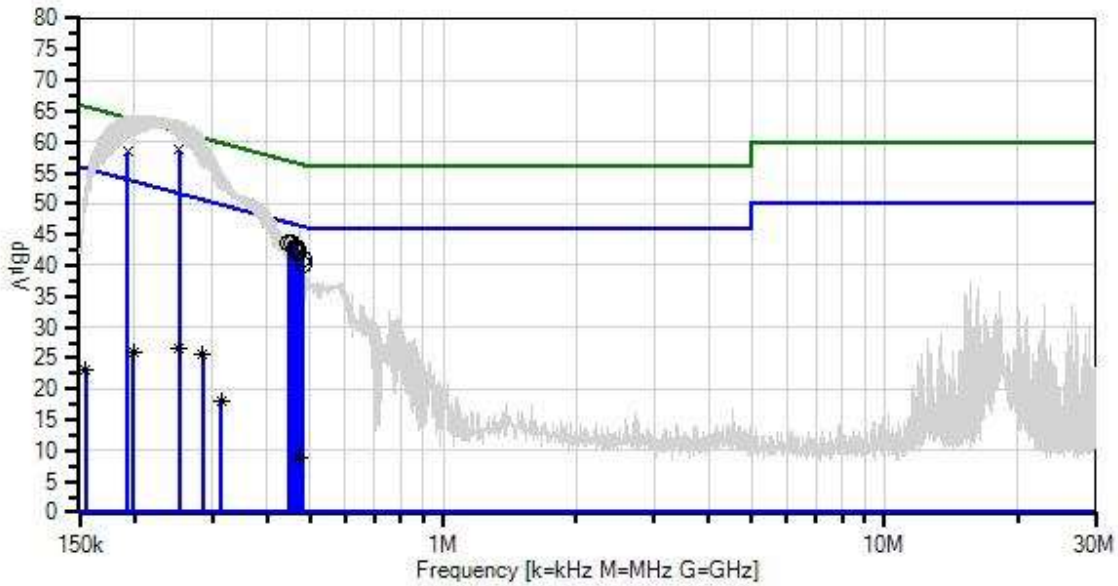
Test Method: ANSI C63.10 2013

The EUT is set up as intended. It is powered via a DC Power supply and connected via Ethernet to a support computer that provides signal information.

Note:  
 Low Channel

All measurements were performed/collected in low, mid and high channels for this testing low channel was found to be worst case.

Divigraph WO#: 105719 Sequence#: 7 Date: 7/21/2021  
 15.207 AC Mains - Average Test Lead: 120VAC/60Hz Positive



— 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
T1	AN02609	High Pass Filter	HE9615-150K-50-720B	9/28/2020	9/28/2022
T2	ANP07591	Cable	RG214	7/16/2021	7/16/2023
T3	ANP06770	Attenuator	PE7010-10	8/4/2020	8/4/2022
T4	AN00847.1	50uH LISN-(L) Line 1	3816/2NM	4/14/2021	4/14/2022
	AN00847.1	50uH LISN-(N) Line 2	3816/2NM	4/14/2021	4/14/2022
T5	AN02668	Spectrum Analyzer	E4446A	4/14/2021	4/14/2022

Measurement Data: Reading listed by margin. Test Lead: Positive

#	Freq MHz	Rdng dBμV	T1 T5 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	252.535k QP	48.4	+0.2 +0.0	+0.1	+10.1	+0.0	+0.0	58.8	61.7	-2.9	Posit
2	445.972k	33.3	+0.2 +0.0	+0.1	+10.1	+0.0	+0.0	43.7	46.9	-3.2	Posit
3	454.699k	33.1	+0.2 +0.0	+0.1	+10.1	+0.0	+0.0	43.5	46.8	-3.3	Posit
4	462.698k	32.7	+0.2 +0.0	+0.1	+10.1	+0.0	+0.0	43.1	46.6	-3.5	Posit
5	460.516k	32.4	+0.2 +0.0	+0.1	+10.1	+0.0	+0.0	42.8	46.7	-3.9	Posit
6	469.970k	32.2	+0.2 +0.0	+0.1	+10.1	+0.0	+0.0	42.6	46.5	-3.9	Posit
7	464.152k	32.2	+0.2 +0.0	+0.1	+10.1	+0.0	+0.0	42.6	46.6	-4.0	Posit
8	465.607k	32.1	+0.2 +0.0	+0.1	+10.1	+0.0	+0.0	42.5	46.6	-4.1	Posit
9	467.789k	31.7	+0.2 +0.0	+0.1	+10.1	+0.0	+0.0	42.1	46.6	-4.5	Posit
10	480.878k	30.6	+0.2 +0.0	+0.1	+10.1	+0.0	+0.0	41.0	46.3	-5.3	Posit
11	192.905k QP	48.0	+0.2 +0.0	+0.1	+10.1	+0.0	+0.0	58.4	63.9	-5.5	Posit
12	482.333k	29.8	+0.2 +0.0	+0.1	+10.1	+0.0	+0.0	40.2	46.3	-6.1	Posit
13	252.535k Ave	16.3	+0.2 +0.0	+0.1	+10.1	+0.0	+0.0	26.7	51.7	-25.0	Posit
^	252.535k	54.4	+0.2 +0.0	+0.1	+10.1	+0.0	+0.0	64.8	51.7	+13.1	Posit
15	285.988k Ave	15.2	+0.1 +0.0	+0.1	+10.1	+0.0	+0.0	25.5	50.6	-25.1	Posit
^	285.987k	50.4	+0.1 +0.0	+0.1	+10.1	+0.0	+0.0	60.7	50.6	+10.1	Posit
^	287.441k	50.3	+0.1 +0.0	+0.1	+10.1	+0.0	+0.0	60.6	50.6	+10.0	Posit
^	289.623k	49.7	+0.1 +0.0	+0.1	+10.1	+0.0	+0.0	60.0	50.5	+9.5	Posit
19	198.723k Ave	15.7	+0.2 +0.0	+0.1	+10.1	+0.0	+0.0	26.1	53.7	-27.6	Posit
^	198.722k	53.9	+0.2 +0.0	+0.1	+10.1	+0.0	+0.0	64.3	53.7	+10.6	Posit
^	197.268k	53.8	+0.2 +0.0	+0.1	+10.1	+0.0	+0.0	64.2	53.7	+10.5	Posit
22	315.076k Ave	7.6	+0.1 +0.0	+0.1	+10.1	+0.0	+0.0	17.9	49.8	-31.9	Posit
^	315.075k	45.0	+0.1 +0.0	+0.1	+10.1	+0.0	+0.0	55.3	49.8	+5.5	Posit

24	155.090k	11.5	+1.4	+0.1	+10.1	+0.0	+0.0	23.1	55.7	-32.6	Posit
	Ave		+0.0								
^	155.090k	41.3	+1.4	+0.1	+10.1	+0.0	+0.0	52.9	55.7	-2.8	Posit
			+0.0								
26	475.061k	-1.6	+0.2	+0.1	+10.1	+0.0	+0.0	8.8	46.4	-37.6	Posit
	Ave		+0.0								
^	475.061k	35.2	+0.2	+0.1	+10.1	+0.0	+0.0	45.6	46.4	-0.8	Posit
			+0.0								
^	471.425k	31.5	+0.2	+0.1	+10.1	+0.0	+0.0	41.9	46.5	-4.6	Posit
			+0.0								
^	478.697k	30.0	+0.2	+0.1	+10.1	+0.0	+0.0	40.4	46.4	-6.0	Posit
			+0.0								



Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338-9081 • (209) 299-5240  
 Customer: **Divigraph**  
 Specification: **15.207 AC Mains - Average**  
 Work Order #: **105719** Date: 7/21/2021  
 Test Type: **Conducted Emissions** Time: 15:04:41  
 Tested By: Michael Rauch Jr. Sequence#: 8  
 Software: EMITest 5.03.19 120VAC/60Hz

***Equipment Tested:***

Device	Manufacturer	Model #	S/N
Configuration 3			

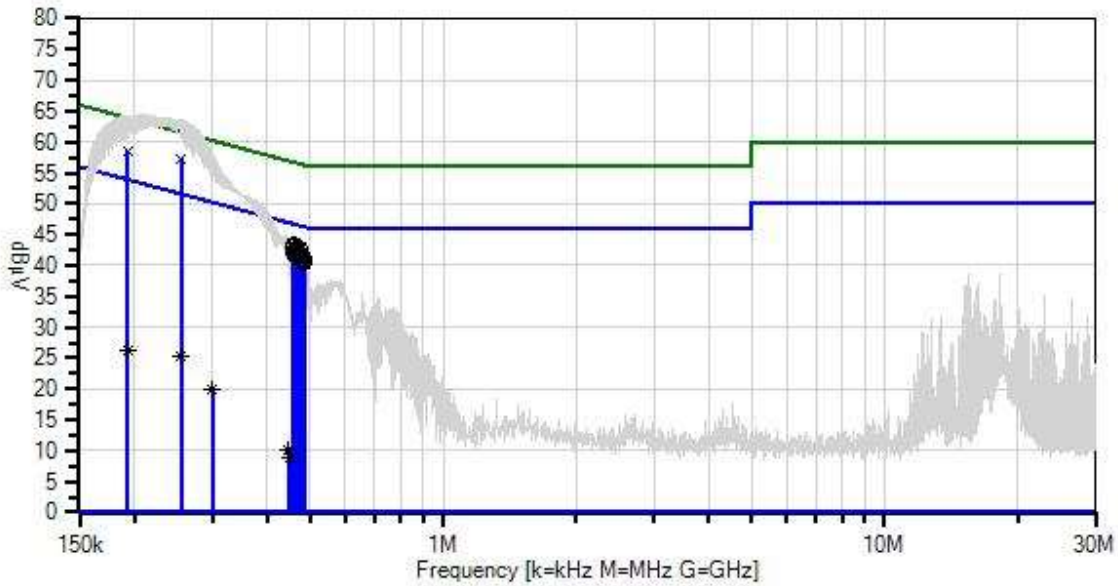
***Support Equipment:***

Device	Manufacturer	Model #	S/N
Configuration 3			

***Test Conditions / Notes:***

Conducted Spurious Emission  
 Frequency Range: 150kHz to 30MHz  
 Test Environment Conditions:  
 Temperature: 23.9°C  
 Humidity: 33.3%  
 Atmospheric Pressure: 101.4kPa  
 Software: Rummy version 0.63.0.0  
 Internal Generated Frequency: 32kHz, 38.4MHz, 2.48GHz  
 Test Method: ANSI C63.10 2013  
 The EUT is set up as intended. It is powered via a DC Power supply and connected via Ethernet to a support computer that provides signal information.  
 Note:  
 Low Channel  
 All measurements were performed/collected in low, mid and high channels for this testing low channel was found to be worst case.

Divigraph W/O#: 105719 Sequence#: 8 Date: 7/21/2021  
 15.207 AC Mains - Average Test Lead: 120VAC/60Hz Negative



— 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
T1	AN02609	High Pass Filter	HE9615-150K-50-720B	9/28/2020	9/28/2022
T2	ANP07591	Cable	RG214	7/16/2021	7/16/2023
T3	ANP06770	Attenuator	PE7010-10	8/4/2020	8/4/2022
T4	AN00847.1	50uH LISN-(L) Line 1	3816/2NM	4/14/2021	4/14/2022
	AN00847.1	50uH LISN-(N) Line 2	3816/2NM	4/14/2021	4/14/2022
	AN02668	Spectrum Analyzer	E4446A	4/14/2021	4/14/2022



**Measurement Data:**

Reading listed by margin.

Test Lead: Negative

#	Freq MHz	Rdng dB $\mu$ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB	Polar Ant
1	458.334k	33.0	+0.2	+0.1	+10.1	+0.0	+0.0	43.4	46.7	-3.3	Negat
2	456.879k	32.6	+0.2	+0.1	+10.1	+0.0	+0.0	43.0	46.7	-3.7	Negat
3	462.697k	32.4	+0.2	+0.1	+10.1	+0.0	+0.0	42.8	46.6	-3.8	Negat
4	473.605k	32.2	+0.2	+0.1	+10.1	+0.0	+0.0	42.6	46.5	-3.9	Negat
5	469.969k	32.1	+0.2	+0.1	+10.1	+0.0	+0.0	42.5	46.5	-4.0	Negat
6	255.444k	47.0	+0.2	+0.1	+10.1	+0.0	+0.0	57.4	61.6	-4.2	Negat
	QP										
7	460.515k	31.8	+0.2	+0.1	+10.1	+0.0	+0.0	42.2	46.7	-4.5	Negat
8	475.060k	31.4	+0.2	+0.1	+10.1	+0.0	+0.0	41.8	46.4	-4.6	Negat
9	466.333k	31.5	+0.2	+0.1	+10.1	+0.0	+0.0	41.9	46.6	-4.7	Negat
10	471.424k	31.4	+0.2	+0.1	+10.1	+0.0	+0.0	41.8	46.5	-4.7	Negat
11	476.514k	31.3	+0.2	+0.1	+10.1	+0.0	+0.0	41.7	46.4	-4.7	Negat
12	467.788k	31.4	+0.2	+0.1	+10.1	+0.0	+0.0	41.8	46.6	-4.8	Negat
13	464.151k	31.3	+0.2	+0.1	+10.1	+0.0	+0.0	41.7	46.6	-4.9	Negat
14	480.877k	30.6	+0.2	+0.1	+10.1	+0.0	+0.0	41.0	46.3	-5.3	Negat
15	192.904k	48.2	+0.2	+0.1	+10.1	+0.0	+0.0	58.6	63.9	-5.3	Negat
	QP										
16	478.696k	30.6	+0.2	+0.1	+10.1	+0.0	+0.0	41.0	46.4	-5.4	Negat
17	484.513k	30.3	+0.2	+0.1	+10.1	+0.0	+0.0	40.7	46.3	-5.6	Negat
18	482.332k	30.1	+0.2	+0.1	+10.1	+0.0	+0.0	40.5	46.3	-5.8	Negat
19	255.444k	14.9	+0.2	+0.1	+10.1	+0.0	+0.0	25.3	51.6	-26.3	Negat
	Ave										
^	255.443k	53.4	+0.2	+0.1	+10.1	+0.0	+0.0	63.8	51.6	+12.2	Negat
21	192.904k	15.7	+0.2	+0.1	+10.1	+0.0	+0.0	26.1	53.9	-27.8	Negat
	Ave										
^	192.904k	53.9	+0.2	+0.1	+10.1	+0.0	+0.0	64.3	53.9	+10.4	Negat
23	300.531k	9.6	+0.1	+0.1	+10.1	+0.0	+0.0	19.9	50.2	-30.3	Negat
	Ave										
^	300.530k	47.8	+0.1	+0.1	+10.1	+0.0	+0.0	58.1	50.2	+7.9	Negat

25	445.972k	-0.4	+0.2	+0.1	+10.1	+0.0	+0.0	10.0	46.9	-36.9	Negat
	Ave										
^	445.971k	34.1	+0.2	+0.1	+10.1	+0.0	+0.0	44.5	46.9	-2.4	Negat
27	451.062k	-1.6	+0.2	+0.1	+10.1	+0.0	+0.0	8.8	46.9	-38.1	Negat
	Ave										
^	448.153k	33.8	+0.2	+0.1	+10.1	+0.0	+0.0	44.2	46.9	-2.7	Negat
^	449.607k	33.7	+0.2	+0.1	+10.1	+0.0	+0.0	44.1	46.9	-2.8	Negat
^	455.425k	33.4	+0.2	+0.1	+10.1	+0.0	+0.0	43.8	46.8	-3.0	Negat
^	451.062k	33.5	+0.2	+0.1	+10.1	+0.0	+0.0	43.9	46.9	-3.0	Negat
^	453.243k	33.1	+0.2	+0.1	+10.1	+0.0	+0.0	43.5	46.8	-3.3	Negat



Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338-9081 • (209) 299-5240  
 Customer: **Divigraph**  
 Specification: **15.207 AC Mains - Average**  
 Work Order #: **105719** Date: 7/21/2021  
 Test Type: **Conducted Emissions** Time: 10:22:32  
 Tested By: Michael Rauch Jr. Sequence#: 2  
 Software: EMITest 5.03.19 120VAC/60Hz

**Equipment Tested:**

Device	Manufacturer	Model #	S/N
Configuration 2			

**Support Equipment:**

Device	Manufacturer	Model #	S/N
Configuration 2			

**Test Conditions / Notes:**

Conducted Spurious Emission

Frequency Range: 150kHz to 30MHz

Test Environment Conditions:  
 Temperature: 23.9°C  
 Humidity: 33.3%  
 Atmospheric Pressure: 101.4kPa  
 Software: Ruppy version 0.63.0.0  
 Internal Generated Frequency: 32kHz, 38.4MHz, 2.48GHz

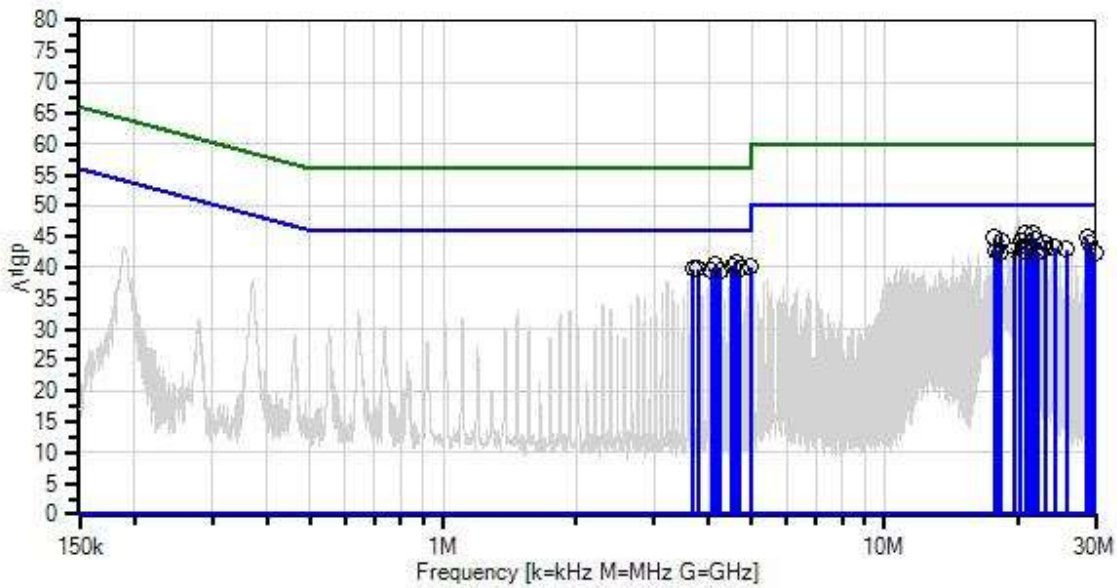
Test Method: ANSI C63.10 2013

The EUT is set up as intended. It is connected via POE to a support computer that provides signal information.

Note:  
 Low Channel

All measurements were performed/collected in low, mid and high channels for this testing low channel was found to be worst case.

Divigraph WD#: 105719 Sequence#: 2 Date: 7/21/2021  
 15.207 AC Mains - Average Test Lead: 120VAC/60Hz 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
T1	AN02609	High Pass Filter	HE9615-150K-50-720B	9/28/2020	9/28/2022
T2	ANP07591	Cable	RG214	7/16/2021	7/16/2023
T3	ANP06770	Attenuator	PE7010-10	8/4/2020	8/4/2022
T4	AN00847.1	50uH LISN-(L) Line 1	3816/2NM	4/14/2021	4/14/2022
	AN00847.1	50uH LISN-(N) Line 2	3816/2NM	4/14/2021	4/14/2022
	AN02668	Spectrum Analyzer	E4446A	4/14/2021	4/14/2022

**Measurement Data:**

Reading listed by margin.

Test Lead: Line

#	Freq MHz	Rdng dB $\mu$ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB	Polar Ant
1	20.806M	34.0	+0.2	+0.8	+10.1	+0.3	+0.0	45.4	50.0	-4.6	Line
2	21.661M	34.1	+0.2	+0.8	+10.1	+0.2	+0.0	45.4	50.0	-4.6	Line
3	4.603M	30.2	+0.1	+0.3	+10.1	+0.1	+0.0	40.8	46.0	-5.2	Line
4	28.684M	33.2	+0.2	+1.0	+10.1	+0.3	+0.0	44.8	50.0	-5.2	Line
5	17.697M	33.6	+0.2	+0.7	+10.1	+0.2	+0.0	44.8	50.0	-5.2	Line
6	4.143M	30.0	+0.1	+0.3	+10.1	+0.1	+0.0	40.6	46.0	-5.4	Line
7	21.905M	33.3	+0.2	+0.8	+10.1	+0.2	+0.0	44.6	50.0	-5.4	Line
8	18.364M	33.2	+0.2	+0.7	+10.1	+0.2	+0.0	44.4	50.0	-5.6	Line
9	20.382M	32.9	+0.2	+0.8	+10.1	+0.3	+0.0	44.3	50.0	-5.7	Line
10	23.130M	32.8	+0.2	+0.8	+10.1	+0.2	+0.0	44.1	50.0	-5.9	Line
11	4.973M	29.4	+0.1	+0.4	+10.1	+0.1	+0.0	40.1	46.0	-5.9	Line
12	29.233M	32.4	+0.2	+1.0	+10.1	+0.3	+0.0	44.0	50.0	-6.0	Line
13	4.513M	29.4	+0.1	+0.3	+10.1	+0.1	+0.0	40.0	46.0	-6.0	Line
14	20.258M	32.6	+0.2	+0.8	+10.1	+0.3	+0.0	44.0	50.0	-6.0	Line
Ave											
^	20.256M	36.5	+0.2	+0.8	+10.1	+0.3	+0.0	47.9	50.0	-2.1	Line
16	3.684M	29.2	+0.1	+0.3	+10.1	+0.1	+0.0	39.8	46.0	-6.2	Line
17	3.773M	29.2	+0.1	+0.3	+10.1	+0.1	+0.0	39.8	46.0	-6.2	Line
18	4.696M	29.1	+0.1	+0.3	+10.1	+0.1	+0.0	39.7	46.0	-6.3	Line
19	4.237M	29.0	+0.1	+0.3	+10.1	+0.1	+0.0	39.6	46.0	-6.4	Line
20	18.243M	32.4	+0.2	+0.7	+10.1	+0.2	+0.0	43.6	50.0	-6.4	Line
Ave											
^	18.247M	35.8	+0.2	+0.7	+10.1	+0.2	+0.0	47.0	50.0	-3.0	Line
22	4.050M	28.9	+0.1	+0.3	+10.1	+0.1	+0.0	39.5	46.0	-6.5	Line
23	24.347M	31.7	+0.2	+0.9	+10.1	+0.3	+0.0	43.2	50.0	-6.8	Line
24	21.049M	31.8	+0.2	+0.8	+10.1	+0.3	+0.0	43.2	50.0	-6.8	Line

25	23.067M	31.8	+0.2	+0.8	+10.1	+0.2	+0.0	43.1	50.0	-6.9	Line
26	25.875M	31.4	+0.2	+0.9	+10.1	+0.3	+0.0	42.9	50.0	-7.1	Line
27	17.941M	31.5	+0.2	+0.7	+10.1	+0.2	+0.0	42.7	50.0	-7.3	Line
28	20.869M	31.3	+0.2	+0.8	+10.1	+0.3	+0.0	42.7	50.0	-7.3	Line
29	18.310M	31.3	+0.2	+0.7	+10.1	+0.2	+0.0	42.5	50.0	-7.5	Line
30	29.904M	30.9	+0.2	+1.0	+10.1	+0.3	+0.0	42.5	50.0	-7.5	Line
31	22.211M	31.2	+0.2	+0.8	+10.1	+0.2	+0.0	42.5	50.0	-7.5	Line
32	19.710M	31.0	+0.2	+0.8	+10.1	+0.3	+0.0	42.4	50.0	-7.6	Line
	Ave										
^	19.706M	35.3	+0.2	+0.8	+10.1	+0.3	+0.0	46.7	50.0	-3.3	Line



Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338-9081 • (209) 299-5240  
 Customer: **Divigraph**  
 Specification: **15,207 AC Mains - Average**  
 Work Order #: **105719** Date: 7/21/2021  
 Test Type: **Conducted Emissions** Time: 10:15:21  
 Tested By: Michael Rauch Jr. Sequence#: 1  
 Software: EMITest 5.03.19 120VAC/60Hz

**Equipment Tested:**

Device	Manufacturer	Model #	S/N
Configuration 2			

**Support Equipment:**

Device	Manufacturer	Model #	S/N
Configuration 2			

**Test Conditions / Notes:**

Conducted Spurious Emission

Frequency Range: 150kHz to 30MHz

Test Environment Conditions:  
 Temperature: 23.9°C  
 Humidity: 33.3%  
 Atmospheric Pressure: 101.4kPa  
 Software: Rummy version 0.63.0.0  
 Internal Generated Frequency: 32kHz, 38.4MHz, 2.48GHz

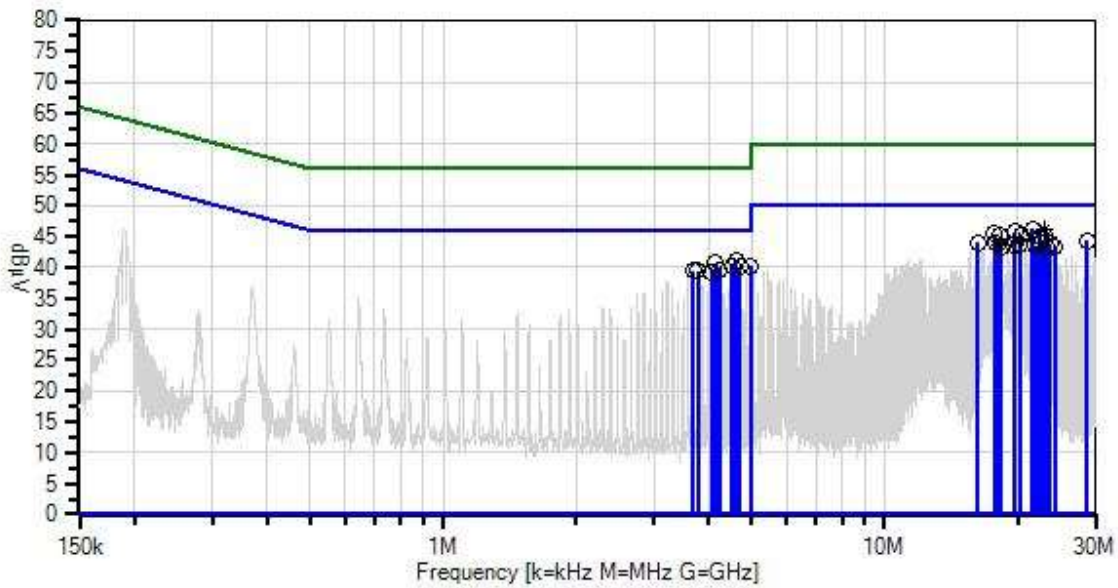
Test Method: ANSI C63.10 2013

The EUT is set up as intended. It is connected via POE to a support computer that provides signal information.

Note:  
 Low Channel

All measurements were performed/collected in low, mid and high channels for this testing low channel was found to be worst case.

Divigraph WO#: 105719 Sequence#: 1 Date: 7/21/2021  
 15.207 AC Mains - Average Test Lead: 120VAC/60Hz Return



— 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
T1	AN02609	High Pass Filter	HE9615-150K-50-720B	9/28/2020	9/28/2022
T2	ANP07591	Cable	RG214	7/16/2021	7/16/2023
T3	ANP06770	Attenuator	PE7010-10	8/4/2020	8/4/2022
	AN00847.1	50uH LISN-(L) Line 1	3816/2NM	4/14/2021	4/14/2022
T4	AN00847.1	50uH LISN-(N) Line 2	3816/2NM	4/14/2021	4/14/2022
	AN02668	Spectrum Analyzer	E4446A	4/14/2021	4/14/2022



**Measurement Data:**

Reading listed by margin.

Test Lead: Return

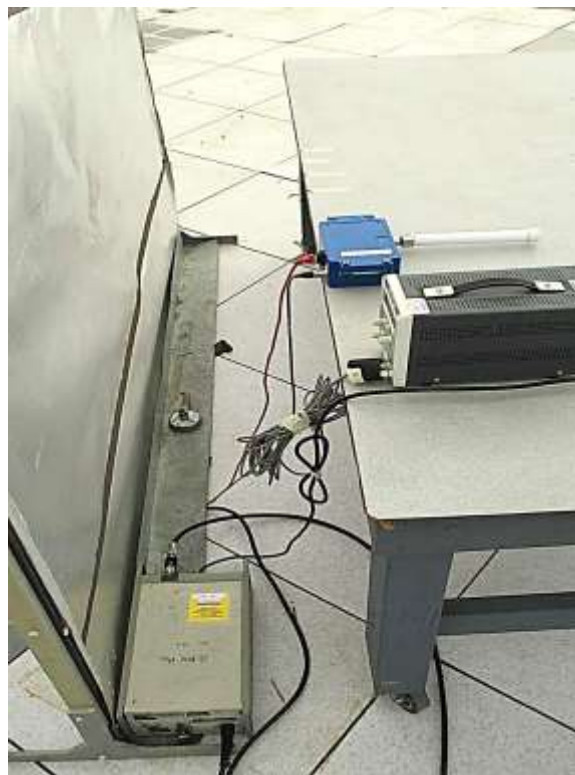
#	Freq MHz	Rdng dB $\mu$ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB	Polar Ant
1	21.661M	34.8	+0.2	+0.8	+10.1	+0.3	+0.0	46.2	50.0	-3.8	Retur
2	23.128M	34.6	+0.2	+0.8	+10.1	+0.4	+0.0	46.1	50.0	-3.9	Retur
Ave	^ 23.130M	36.4	+0.2	+0.8	+10.1	+0.4	+0.0	47.9	50.0	-2.1	Retur
4	19.706M	34.4	+0.2	+0.8	+10.1	+0.3	+0.0	45.8	50.0	-4.2	Retur
5	17.697M	34.1	+0.2	+0.7	+10.1	+0.3	+0.0	45.4	50.0	-4.6	Retur
6	20.382M	33.8	+0.2	+0.8	+10.1	+0.3	+0.0	45.2	50.0	-4.8	Retur
7	23.067M	33.6	+0.2	+0.8	+10.1	+0.4	+0.0	45.1	50.0	-4.9	Retur
8	18.301M	33.8	+0.2	+0.7	+10.1	+0.3	+0.0	45.1	50.0	-4.9	Retur
9	22.454M	33.6	+0.2	+0.8	+10.1	+0.3	+0.0	45.0	50.0	-5.0	Retur
10	4.598M	30.4	+0.1	+0.3	+10.1	+0.1	+0.0	41.0	46.0	-5.0	Retur
11	4.139M	30.1	+0.1	+0.3	+10.1	+0.1	+0.0	40.7	46.0	-5.3	Retur
12	28.684M	32.7	+0.2	+1.0	+10.1	+0.4	+0.0	44.4	50.0	-5.6	Retur
13	4.968M	29.6	+0.1	+0.4	+10.1	+0.1	+0.0	40.3	46.0	-5.7	Retur
14	20.258M	32.8	+0.2	+0.8	+10.1	+0.3	+0.0	44.2	50.0	-5.8	Retur
Ave	^ 20.256M	35.4	+0.2	+0.8	+10.1	+0.3	+0.0	46.8	50.0	-3.2	Retur
16	16.229M	33.0	+0.1	+0.7	+10.1	+0.2	+0.0	44.1	50.0	-5.9	Retur
17	4.505M	29.4	+0.1	+0.3	+10.1	+0.1	+0.0	40.0	46.0	-6.0	Retur
18	4.692M	29.4	+0.1	+0.3	+10.1	+0.1	+0.0	40.0	46.0	-6.0	Retur
19	22.580M	32.4	+0.2	+0.8	+10.1	+0.4	+0.0	43.9	50.0	-6.1	Retur
20	23.737M	32.2	+0.2	+0.9	+10.1	+0.4	+0.0	43.8	50.0	-6.2	Retur
21	17.941M	32.5	+0.2	+0.7	+10.1	+0.3	+0.0	43.8	50.0	-6.2	Retur
22	21.905M	32.2	+0.2	+0.8	+10.1	+0.3	+0.0	43.6	50.0	-6.4	Retur
23	4.233M	29.0	+0.1	+0.3	+10.1	+0.1	+0.0	39.6	46.0	-6.4	Retur

24	18.244M	32.2	+0.2	+0.7	+10.1	+0.3	+0.0	43.5	50.0	-6.5	Retur
Ave											
^	18.247M	35.7	+0.2	+0.7	+10.1	+0.3	+0.0	47.0	50.0	-3.0	Retur
26	3.769M	28.9	+0.1	+0.3	+10.1	+0.1	+0.0	39.5	46.0	-6.5	Retur
27	19.589M	32.1	+0.2	+0.8	+10.1	+0.3	+0.0	43.5	50.0	-6.5	Retur
28	3.680M	28.9	+0.1	+0.3	+10.1	+0.1	+0.0	39.5	46.0	-6.5	Retur
29	20.202M	32.1	+0.2	+0.8	+10.1	+0.3	+0.0	43.5	50.0	-6.5	Retur
30	23.374M	31.8	+0.2	+0.9	+10.1	+0.4	+0.0	43.4	50.0	-6.6	Retur
31	24.347M	31.8	+0.2	+0.9	+10.1	+0.4	+0.0	43.4	50.0	-6.6	Retur
32	18.364M	32.1	+0.2	+0.7	+10.1	+0.3	+0.0	43.4	50.0	-6.6	Retur
33	4.050M	28.7	+0.1	+0.3	+10.1	+0.1	+0.0	39.3	46.0	-6.7	Retur

Test Setup Photo(s)



24VDC Test Setup; Front View



24VDC Test Setup; Side View



PoE Test Setup; Front View



PoE Test Setup; Side View

## Appendix A: Customer Provided Information

See attached document:

**20DD2060 - NG Series Industrial Wireless Gateway - Antenna Declaration of Equivalency**

# 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.

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**To Whom It May Concern**

This letter is to inform you that we, Divigraph (Pty) Ltd, re-sell the following antenna products and have allocated part numbers as per the table below.

<b>Divigraph Part Number</b>	<b>Divigraph Description</b>	<b>Manufacturer Name</b>	<b>Manufacturer Part Number</b>	<b>Manufacturer Description</b>
100A10001	2dBi Omnidirectional Antenna	HUBER+SUHNER	1399.17.0224	SENCITY® Omni-S Thimble
100A10002	6dBi Omnidirectional Antenna	HUBER+SUHNER	1355.17.0002	SENCITY® Omni-M dual-band WiFi Stick Antenna

We hereby declare that the original product has not been changed or modified in any way. The specifications on for the herein identified products remain unchanged as provided by the manufacturer and continue to represent compliance for the products.

Sincerely,

*R Tanski*

Radek Tanski  
Design Engineer  
Divigraph (Pty) Ltd