Nalloy, LLC

TEST REPORT FOR

H8J8DL

Tested to The Following Standards:

FCC Part 15 Subpart C Section(s)

15.207 & 15.225
(13.110-14.010MHz)

Report No.: 107516-39

Date of issue: December 21, 2022

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

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

Test Certificate # 803.01

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

Nalloy, LLC
2301 5th Avenue
Seattle, WA 98108

Representative: Naga Suryadevara
Customer Reference Number: 2D-09331917

REPORT PREPARED BY:

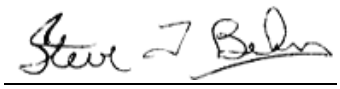
Lisa Bevington
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 107516

DATE OF EQUIPMENT RECEIPT: October 13, 2022
DATE(S) OF TESTING: October 13 & 19, 2022
December 8, 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.
22116 23rd Drive S.E. Suite A
Bothell, WA 98021

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 - 15.225

Test Procedure	Description	Modifications	Results
15.215(c)	Occupied Bandwidth	NA	Pass
15.225(a)-(c)	Field Strength of Fundamental	NA	Pass
15.225(e)	Frequency Stability	NA	Pass
15.225(d)	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
None	Nalloy LLC, Amazon retail LLC	H8J8DL	NA

Support Equipment:

Device	Manufacturer	Model #	S/N
POE Injector	Cudy	POE350	NA
Laptop	HP	14-fq0032od	NA
USB to Ethernet Dongle	Amazon Basics	USB 3.0 to 10/100/1000 Gigabit Ethernet Adapter	NA

Configuration 2

Equipment Tested:

Device	Manufacturer	Model #	S/N
None	Nalloy LLC, Amazon retail LLC	H8J8DL	NA

Support Equipment:

Device	Manufacturer	Model #	S/N
POE Injector	Allnet	ALL048900V2	NA
AC Adapter (for POE Injector)	Fuyuang	FY5502000	NA
Laptop	HP	14-fq0032od	NA
USB to Ethernet Dongle	Amazon Basics	USB 3.0 to 10/100/1000 Gigabit Ethernet Adapter	NA

General Product Information:

Product Information	Manufacturer-Provided Details
Equipment Type:	Stand-Alone Equipment
Modulation Type(s):	NFC, RFID
Maximum Duty Cycle:	Tested as 100%
Antenna Type(s) and Gain:	NA
Antenna Connection Type:	Integral
Nominal Input Voltage:	120VAC/60Hz
Firmware / Software used for Test:	IGT FW Version: 2229 Wisepad – WPS33.01-41027 Baxter - 1.0.62.0 RFIdeas configuration utility – 6.0.5 Putty – 0.77
The validity of results is dependent on the stated product details, the accuracy of which the manufacturer assumes full responsibility.	

EUT Photo(s)

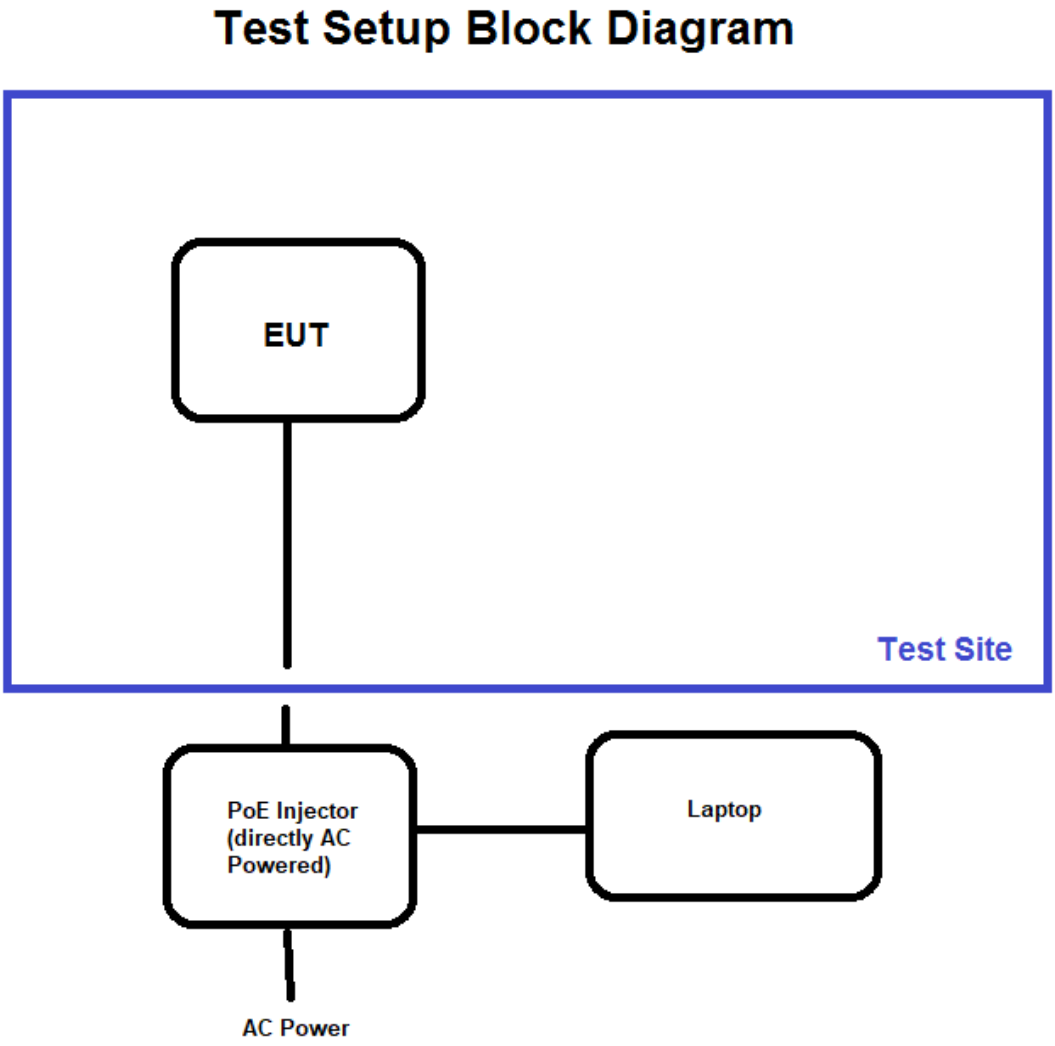
Support Equipment Photo(s)

Laptop and Ethernet Adapter

PoE Injectors

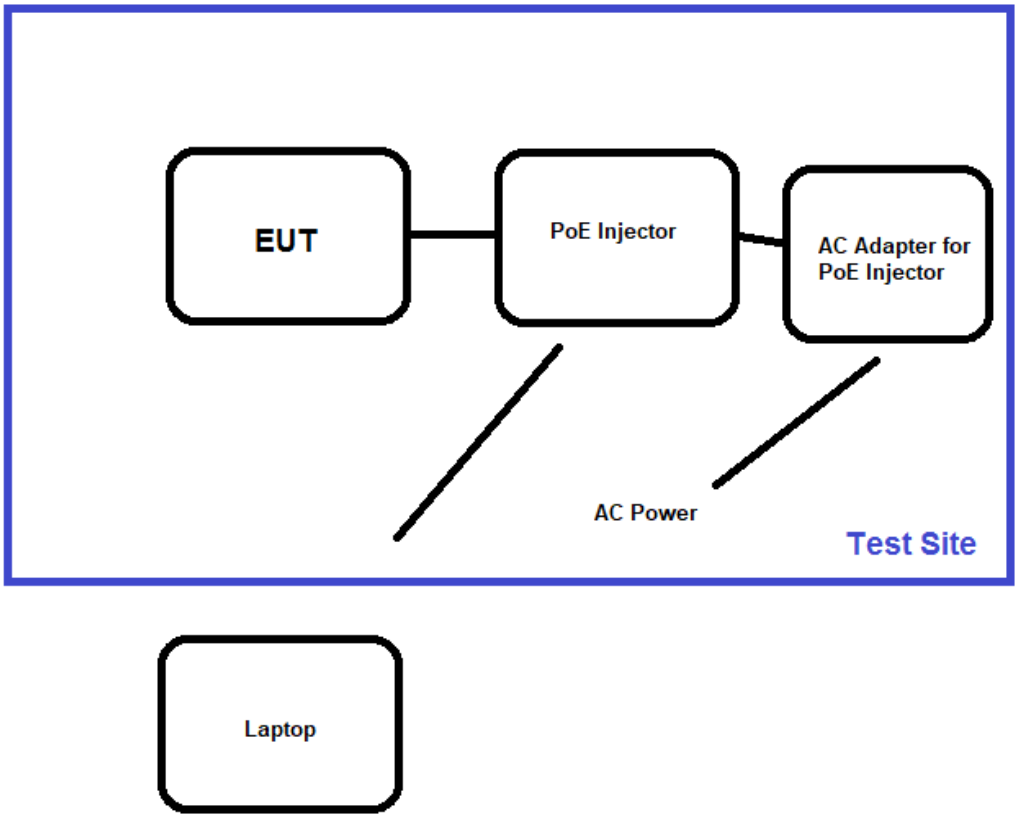
Block Diagram of Test Setup(s)

Configuration #1



Configuration #2

Test Setup Block Diagram



FCC Part 15 Subpart C

15.215(c) Occupied Bandwidth (20dB BW)

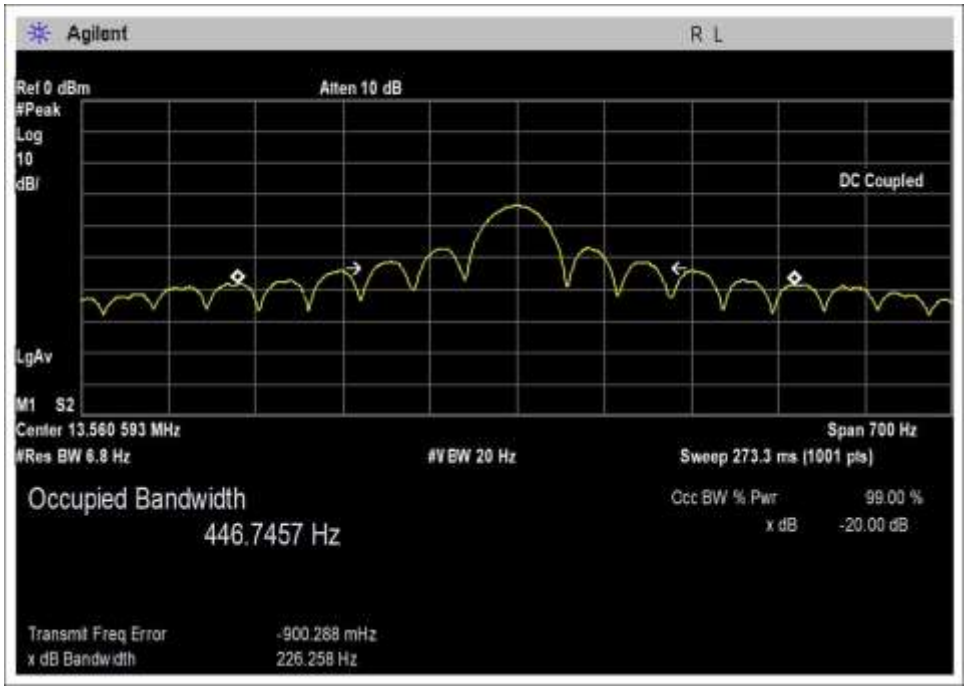
Test Setup/Conditions			
Test Location:	Bothell Lab C3	Test Engineer:	M. Harrison
Test Method:	ANSI C63.10 (2013)	Test Date(s):	10/19/2022
Configuration:	1		
Test Setup:	The EUT is on a test bench inside a semi anechoic chamber.		

Environmental Conditions			
Temperature (ºC)	25	Relative Humidity (%):	45

Test Equipment					
Asset#	Description	Manufacturer	Model	Cal Date	Cal Due
00052	Loop Antenna	EMCO	6502	5/11/2022	5/11/2024
02872	Spectrum Analyzer	Agilent	E4440A	11/29/2021	11/29/2023
P05305	Cable	Andrews	ETSI-50T	9/15/2021	9/15/2023
P06540	Cable	Andrews	Heliax	1/17/2022	1/17/2024

Test Data Summary					
Frequency (MHz)	Antenna Port	Modulation	Measured (kHz)	Limit (kHz)	Results
13.56	NA	NFC / RFID	226.3	None	NA

Plot(s)


Agilent
R L
Ref 0 dBm
Atten 10 dB
#Peak
Log
10
dB/
DC Coupled
LgAv
M1 S2
Center 13.560 593 MHz
Span 700 Hz
#Res BW 6.8 Hz
#VBW 20 Hz
Sweep 273.3 ms (1001 pts)
Occupied Bandwidth
446.7457 Hz
Occ BW % Pwr 99.00 %
x dB -20.00 dB
Transmit Freq Error -900.288 mHz
x dB Bandwidth 226.258 Hz

Test Setup Photo(s)

Below 1GHz View 1

Below 1GHz View 2

15.225(a)-(c) Field Strength of Fundamental

Test Setup/Conditions			
Test Location:	Bothell Lab C3	Test Engineer:	M. Harrison
Test Method:	ANSI C63.10 (2013)	Test Date(s):	10/19/2022
Configuration:	1		
Test Setup:	The EUT is on a test bench inside a semi anechoic chamber. Measurements are made at 3m test distance with distance correction applied. 3 x orthogonal antenna polarities investigated, worst case reported. Manufacturer declared the AC mains to be varied on the PoE injector.		

Environmental Conditions			
Temperature (ºC)	25	Relative Humidity (%):	45

Test Data Summary - Voltage Variations					
Frequency (MHz)	**Modulation**	**$V_{Minimum}$ (dBuV/m@3m)**	**$V_{Nominal}$ (dBuV/m@3m)**	**$V_{Maximum}$ (dBuV/m@3m)**	**Max Deviation from $V_{Nominal}$ (dB)**
13.56	NFC/RFID	32.8	32.8	32.8	0.0

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

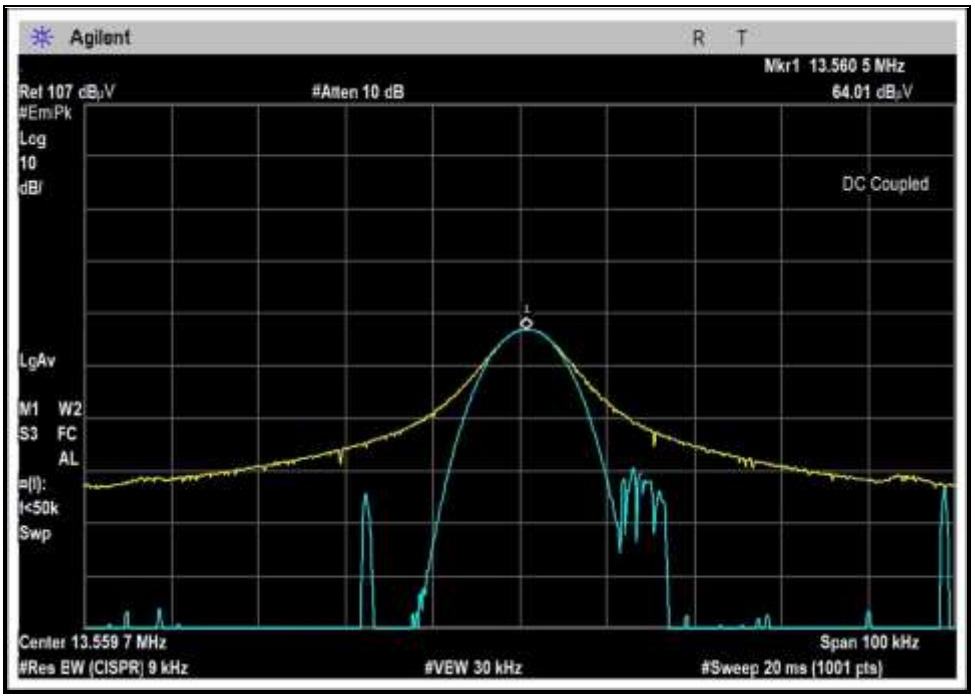
Parameter Definitions:

Measurements performed at input voltage Vnominal ± 15%.

Parameter	Value
$V_{Nominal}$:	120 VAC
$V_{Minimum}$:	102.00 VAC
$V_{Maximum}$:	138.00 VAC

Test Data Summary – Radiated Field Strength Measurement					
Frequency (MHz)	**Modulation**	**Ant. Type**	**Measured (dBuV/m @ 30m)**	**Limit (dBuV/m @ 30m)**	**Results**
13.56	NFC/RFID	NA	32.8	≤84	Pass

Emissions Mask Data



Test Setup / Conditions / Data

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)		
Customer:	**Nalloy, LLC**		
Specification:	**15.225 Carrier and Spurious Emissions (13.110-14.010 MHz Transmitter)**		
Work Order #:	**106997**	Date:	10/19/2022
Test Type:	**Radiated Scan**	Time:	10:55:49
Tested By:	Matt Harrison	Sequence#:	8
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:

Environmental Conditions:
Temperature: 25°C
Humidity: 45%
Pressure: 101.4kPa

Method: ANSI C63.10: 2013

Frequency range: Fund

Setup:
EUT is setup in a floor-standing configuration. It is connected to a remote POE injector and a laptop via Ethernet Cables.

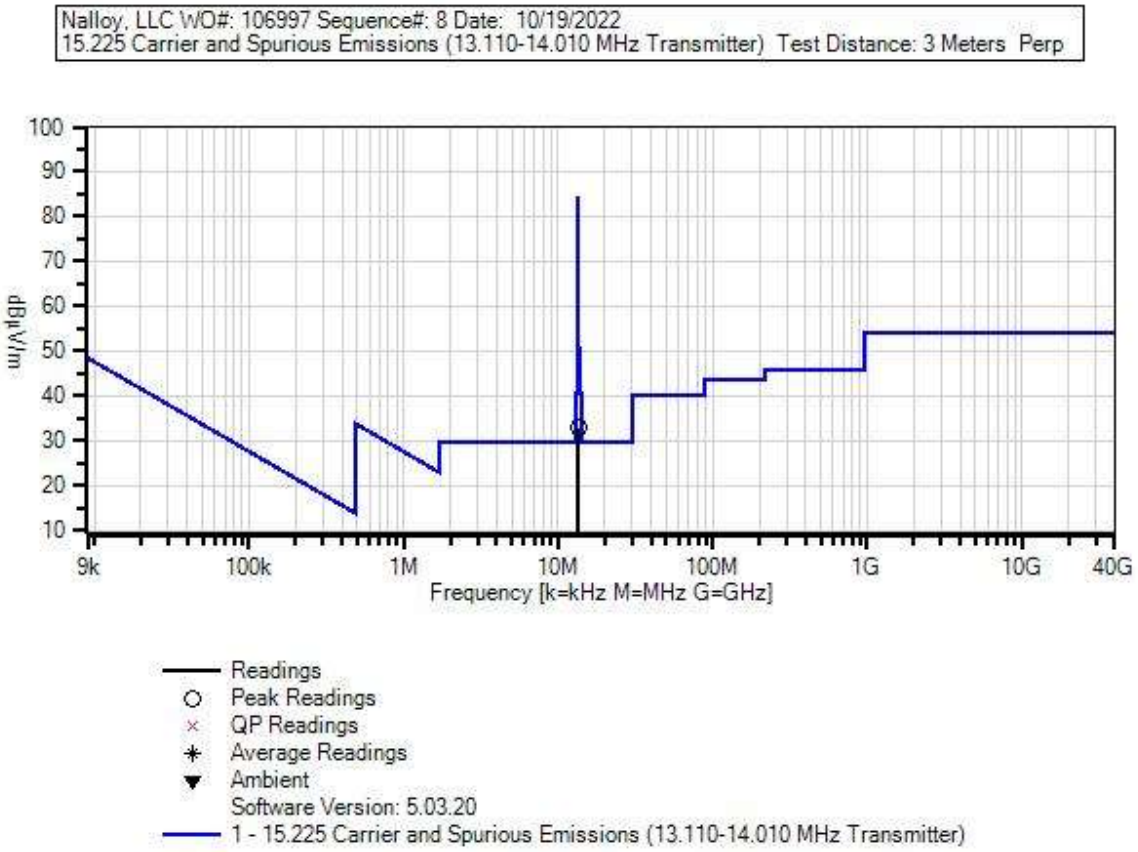
Mode 2:
Honeycrisp (Fuji):
Fuji- CPU DDR eMMC Stress
Audio 1kHz Tone on Speaker at 100% Volume
Display Max Brightness
USB to Caramel 480Mbps

Honeycrisp (Opal):
No Stress

Caramel:
Ethernet 100Mbps
USB 2.0 x1 12Mbps to Wisepad
USB B No Stressor to Baxter

Wisepad:
Connected and powered on

Tap Mode   Baxter and Rufus Peripherals: Ethernet 100Mbps Prefect- Stressors on CPU DDR eMMC Solenoid continuously cycling Position sensor enabled Audio over speaker playing representative tone Microphone on and Recording USB on Baxter Mass Storage devices no cable USB A to B from Baxter to Caramel No Stressor Marshall and Burgundy: Stressed GPIO Active LED Toggling Colors Buddy: POE Fully loaded and stressed 4x .1uf caps between POE power and power return to ground



Test Equipment:

ID	Asset #/Serial #	Description	Model	Calibration Date	Cal Due Date
T1	AN00052	Loop Antenna	6502	5/11/2022	5/11/2024
T2	ANP05305	Cable	ETSI-50T	9/15/2021	9/15/2023
T3	ANP06540	Cable	Heliax	1/17/2022	1/17/2024
	AN02872	Spectrum Analyzer	E4440A	11/29/2021	11/29/2023

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

#	Freq	Rdng	T1	T2	T3		Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	13.561M	64.0	+8.6	+0.2	+0.0		-40.0	32.8	84.0	-51.2	Perp

Test Setup Photo(s)

Below 1GHz View 1

Below 1GHz View 2

15.225(e) Frequency Stability

Test Setup/Conditions			
Test Location:	Bothell Lab Bench	Test Engineer:	M. Atkinson
Test Method:	ANSI C63.10 (2013)	Test Date(s):	12/9/2022
Configuration:	1		
Test Setup:	EUT is setup in a temperature chamber, a near field probe is used to monitor the EUT.		

Environmental Conditions			
Temperature (ºC)	20	Relative Humidity (%):	28

Test Equipment					
Asset#	**Description**	**Manufacturer**	**Model**	**Cal Date**	**Cal Due**
03029	Thermometer, Digital Infrared	Fluke	566	3/11/2021	3/11/2023
D06024	Walk-In Temp/Humidity Chamber	Hastest	HPCH(R1.5)-2600NSUH	9/8/2022	9/8/2024
03803	Spectrum Analyzer	Agilent	E4440A	2/23/2022	2/23/2024

Test Data Summary					
Temperature (ºC)	**Voltage**	**Frequency (MHz)**	**Deviation (%)**	**Limit (%)**	**Results**
-20	$V_{Nominal}$	13.56059	0.00096	±0.01	Pass
-10	$V_{Nominal}$	13.56057	0.00081	±0.01	
0	$V_{Nominal}$	13.56055	0.00066	±0.01	
10	$V_{Nominal}$	13.56051	0.00041	±0.01	
20	$V_{Minimum}$	13.56045	0.00008	±0.01	
20	$V_{Nominal}$	13.56046	0.00000	±0.01	
20	$V_{Maximum}$	13.56046	0.00000	±0.01	
30	$V_{Nominal}$	13.56046	0.00004	±0.01	
40	$V_{Nominal}$	13.56043	0.00022	±0.01	
50	$V_{Nominal}$	13.56039	0.00048	±0.01	
Nominal Frequency:		13.56046			

Parameter Definitions:

Measurements performed at input voltage Vnominal ± 15%.

Parameter	Value
$V_{Nominal}$:	120 VAC
$V_{Minimum}$:	102.00 VAC
$V_{Maximum}$:	138.00 VAC

Test Setup Photo(s)

Temperature Testing

15.225(d) Radiated Emissions & Band Edge

Test Setup / Conditions/ Data

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)		
Customer:	**Nalloy, LLC**		
Specification:	**15.225 Carrier and Spurious Emissions (13.110-14.010 MHz Transmitter)**		
Work Order #:	**106997**	Date:	10/19/2022
Test Type:	**Radiated Scan**	Time:	13:02:21
Tested By:	Matt Harrison	Sequence#:	10
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:

Environmental Conditions:
Temperature: 25°C
Humidity: 45%
Pressure: 101.4kPa

Method: ANSI C63.10: 2013

Frequency range: 150k-30MHz

Setup:
EUT is setup in a floor-standing configuration. It is connected to a remote POE injector and a laptop via Ethernet Cables.

Mode 2:
Honeycrisp (Fuji):
Fuji- CPU DDR eMMC Stress
Audio 1kHz Tone on Speaker at 100% Volume
Display Max Brightness
USB to Caramel 480Mbps

Honeycrisp (Opal):
No Stress

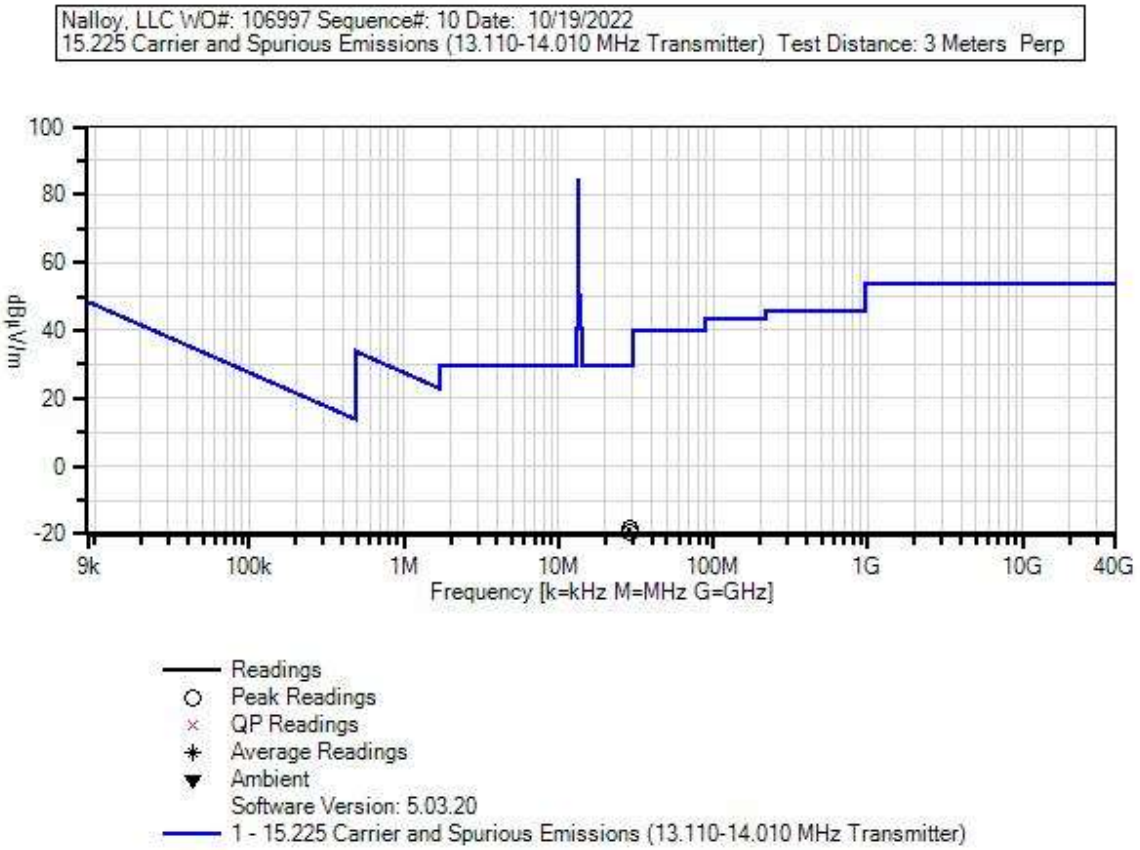
Caramel:
Ethernet 100Mbps
USB 2.0 x1 12Mbps to Wisepad
USB B No Stressor to Baxter

Wisepad:
Connected and powered on
Tap Mode

Baxter and Rufus Peripherals:
Ethernet 100Mbps
Prefect- Stressors on CPU DDR eMMC
Solenoid continuously cycling
Position sensor enabled
Audio over speaker playing representative tone
Microphone on and Recording
USB on Baxter Mass Storage devices no cable
USB A to B from Baxter to Caramel No Stressor
Marshall and Burgundy:
Stressed
GPIO Active
LED Toggling Colors

Buddy:
POE Fully loaded and stressed

4x .1uf caps between POE power and power return to ground



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00052	Loop Antenna	6502	5/11/2022	5/11/2024
T2	ANP05305	Cable	ETSI-50T	9/15/2021	9/15/2023
T3	ANP06540	Cable	Heliax	1/17/2022	1/17/2024
	AN02872	Spectrum Analyzer	E4440A	11/29/2021	11/29/2023

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	28.687M	17.3	+4.2	+0.2	+0.1		-40.0	-18.2	29.5	-47.7	Perp
2	29.224M	16.0	+3.9	+0.3	+0.1		-40.0	-19.7	29.5	-49.2	Perp

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)		
Customer:	**Nalloy, LLC**		
Specification:	**15.225 Carrier and Spurious Emissions (13.110-14.010 MHz Transmitter)**		
Work Order #:	**106997**	Date:	10/13/2022
Test Type:	**Radiated Scan**	Time:	15:10:22
Tested By:	Matt Harrison	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:

Environmental Conditions:
Temperature: 25°C
Humidity: 45%
Pressure: 101.4kPa

Method: ANSI C63.10 (2013)

Frequency range: 30-1000MHz

Setup:
EUT is setup in a floor-standing configuration. It is connected to a remote POE injector and a laptop via Ethernet Cables.

Mode 2:
Honeycrisp (Fuji):
Fuji- CPU DDR eMMC Stress
Audio 1kHz Tone on Speaker at 100% Volume
Display Max Brightness
USB to Caramel 480Mbps

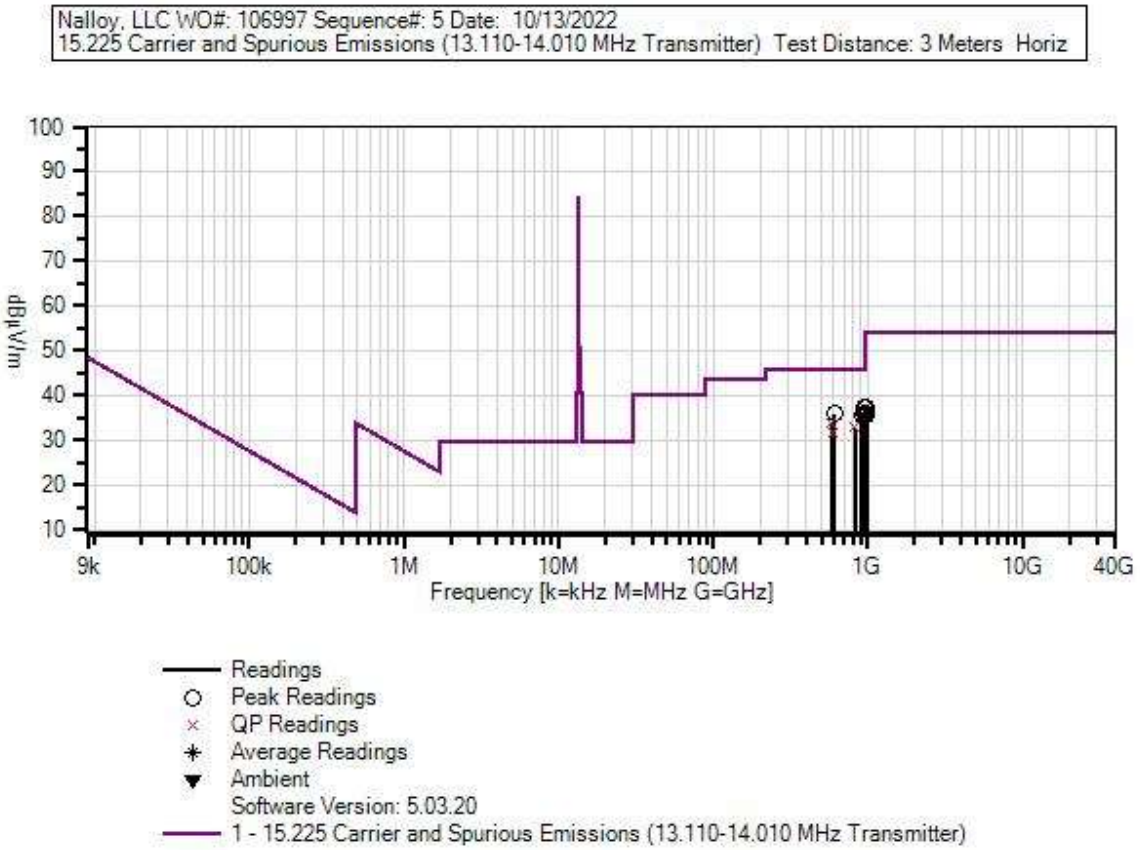
Honeycrisp (Opal):
No Stress

Caramel:
Ethernet 100Mbps
USB 2.0 x1 12Mbps to Wisepad
USB B No Stressor to Baxter

Wisepad:
Connected and powered on
Tap Mode

Baxter and Rufus Peripherals:
Ethernet 100Mbps
Prefect- Stressors on CPU DDR eMMC
Solenoid continuously cycling
Position sensor enabled
Audio over speaker playing representative tone
Microphone on and Recording
USB on Baxter Mass Storage devices no cable
USB A to B from Baxter to Caramel No Stressor
Marshall and Burgundy:
Stressed
GPIO Active
LED Toggling Colors

Buddy:
POE Fully loaded and stressed



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02307	Preamp	8447D	1/6/2022	1/6/2024
T2	AN03628	Biconilog Antenna	3142E	6/3/2021	6/3/2023
T3	ANP05360	Cable	RG214	2/4/2022	2/4/2024
T4	ANP06515	Cable	Heliax	5/23/2022	5/23/2024
T5	ANP06540	Cable	Heliax	1/17/2022	1/17/2024
	AN02872	Spectrum Analyzer	E4440A	11/29/2021	11/29/2023

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

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	949.035M	28.9	-27.2 +0.3	+31.2	+2.4	+1.6	+0.0	37.2	46.0	-8.8	Horiz
2	948.659M	27.6	-27.2 +0.3	+31.2	+2.4	+1.6	+0.0	35.9	46.0	-10.1	Horiz
3	939.831M	27.6	-27.3 +0.3	+31.2	+2.4	+1.6	+0.0	35.8	46.0	-10.2	Horiz
4	938.766M	27.7	-27.3 +0.3	+31.1	+2.4	+1.6	+0.0	35.8	46.0	-10.2	Horiz
5	602.975M	33.8	-28.1 +0.3	+26.6	+1.9	+1.3	+0.0	35.8	46.0	-10.2	Horiz
6	907.839M	29.0	-27.4 +0.3	+29.8	+2.4	+1.6	+0.0	35.7	46.0	-10.3	Horiz
7	579.001M QP	33.0	-28.2 +0.2	+25.7	+1.8	+1.2	+0.0	33.7	46.0	-12.3	Horiz
^	579.001M	38.7	-28.2 +0.2	+25.7	+1.8	+1.2	+0.0	39.4	46.0	-6.6	Horiz
9	825.020M QP	27.2	-27.6 +0.3	+29.3	+2.2	+1.5	+0.0	32.9	46.0	-13.1	Horiz
^	825.020M	40.6	-27.6 +0.3	+29.3	+2.2	+1.5	+0.0	46.3	46.0	+0.3	Horiz
11	584.977M QP	30.5	-28.1 +0.3	+25.8	+1.9	+1.3	+0.0	31.7	46.0	-14.3	Horiz
^	584.977M	36.9	-28.1 +0.3	+25.8	+1.9	+1.3	+0.0	38.1	46.0	-7.9	Horiz
13	961.870M	29.5	-27.2 +0.3	+30.6	+2.4	+1.7	+0.0	37.3	54.0	-16.7	Horiz
14	981.029M	28.5	-27.2 +0.3	+30.1	+2.5	+1.7	+0.0	35.9	54.0	-18.1	Horiz
15	968.945M	28.2	-27.2 +0.3	+30.4	+2.5	+1.7	+0.0	35.9	54.0	-18.1	Horiz
16	962.308M	28.1	-27.2 +0.3	+30.6	+2.4	+1.7	+0.0	35.9	54.0	-18.1	Horiz
17	975.707M	28.1	-27.2 +0.3	+30.3	+2.5	+1.7	+0.0	35.7	54.0	-18.3	Horiz
18	975.081M	28.1	-27.2 +0.3	+30.3	+2.5	+1.7	+0.0	35.7	54.0	-18.3	Horiz

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)		
Customer:	**Nalloy, LLC**		
Specification:	**15.225 Carrier and Spurious Emissions (13.110-14.010 MHz Transmitter)**		
Work Order #:	**106997**	Date:	10/13/2022
Test Type:	**Radiated Scan**	Time:	14:46:14
Tested By:	Matt Harrison	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:

Environmental Conditions:
Temperature: 25°C
Humidity: 45%
Pressure: 101.4kPa

Method: ANSI C63.10 (2013)

Frequency range: 30-1000MHz

Setup:
EUT is setup in a floor-standing configuration. It is connected to a remote POE injector and a laptop via Ethernet Cables.

Mode 2:
Honeycrisp (Fuji):
Fuji- CPU DDR eMMC Stress
Audio 1kHz Tone on Speaker at 100% Volume
Display Max Brightness
USB to Caramel 480Mbps

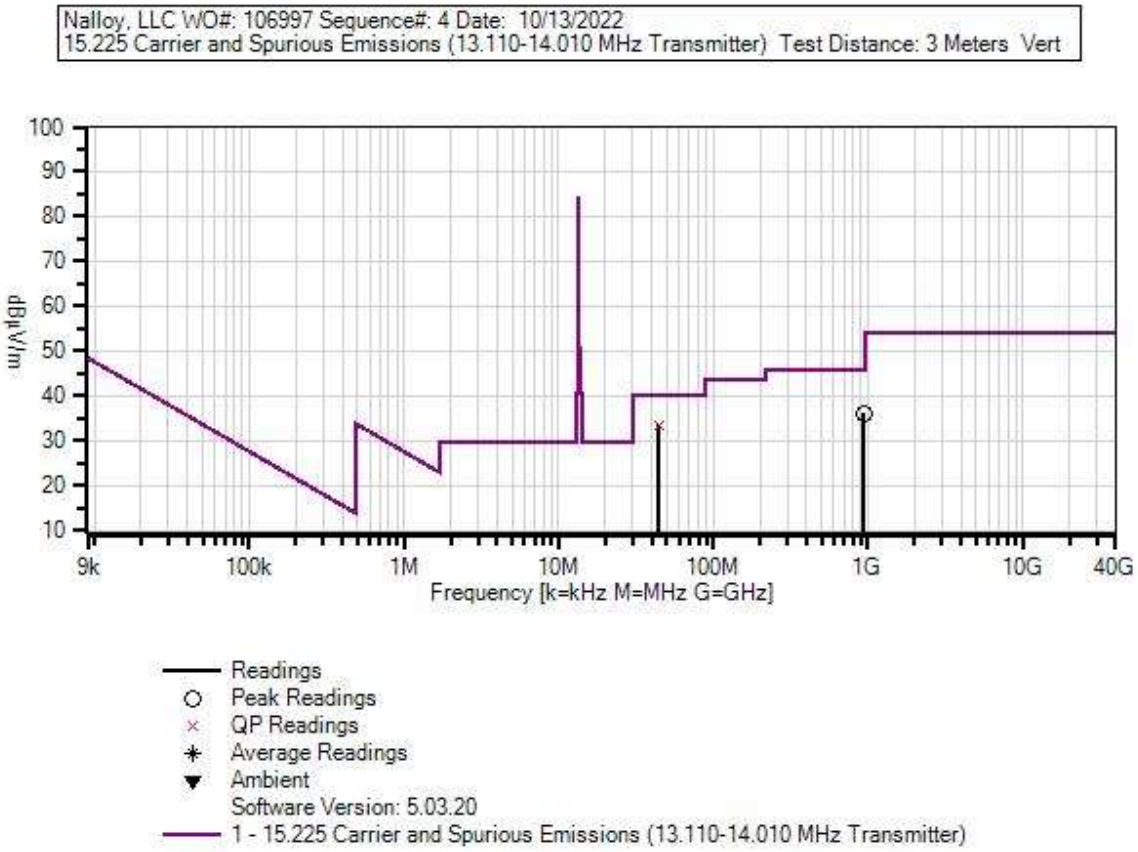
Honeycrisp (Opal):
No Stress

Caramel:
Ethernet 100Mbps
USB 2.0 x1 12Mbps to Wisepad
USB B No Stressor to Baxter

Wisepad:
Connected and powered on
Tap Mode

Baxter and Rufus Peripherals:
Ethernet 100Mbps
Prefect- Stressors on CPU DDR eMMC
Solenoid continuously cycling
Position sensor enabled
Audio over speaker playing representative tone
Microphone on and Recording
USB on Baxter Mass Storage devices no cable
USB A to B from Baxter to Caramel No Stressor
Marshall and Burgundy:
Stressed
GPIO Active
LED Toggling Colors

Buddy:
POE Fully loaded and stressed



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02307	Preamp	8447D	1/6/2022	1/6/2024
T2	AN03628	Biconilog Antenna	3142E	6/3/2021	6/3/2023
T3	ANP05360	Cable	RG214	2/4/2022	2/4/2024
T4	ANP06515	Cable	Heliax	5/23/2022	5/23/2024
T5	ANP06540	Cable	Heliax	1/17/2022	1/17/2024
	AN02872	Spectrum Analyzer	E4440A	11/29/2021	11/29/2023

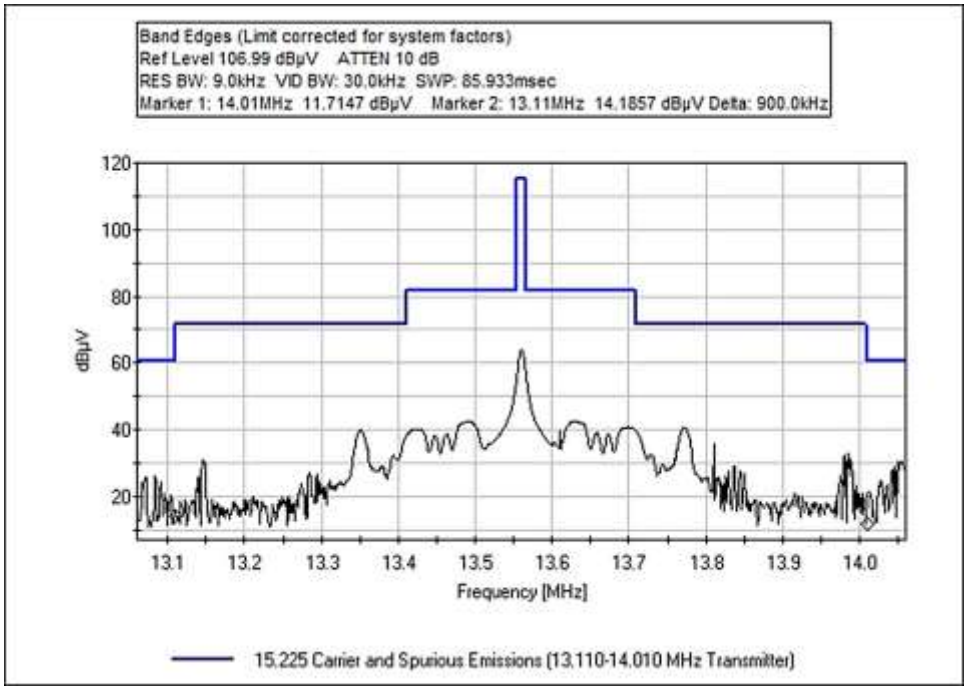
Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	44.247M	46.3	-27.8 +0.1	+14.0	+0.5	+0.3	+0.0	33.4	40.0	-6.6	Vert
QP											
^	44.247M	49.9	-27.8 +0.1	+14.0	+0.5	+0.3	+0.0	37.0	40.0	-3.0	Vert
3	933.305M	28.2	-27.3 +0.3	+30.9	+2.4	+1.6	+0.0	36.1	46.0	-9.9	Vert

Band Edge

Band Edge Summary					
Frequency (MHz)	**Modulation**	**Ant. Type**	**Field Strength (dBuV/m @30m)**	**Limit (dBuV/m @30m)**	**Results**
13.110	NCF / RFID	NA	-14.4	≤29.5	Pass
14.010	NCF / RFID	NA	-19.5	≤29.5	Pass

Band Edge Plots



Test Setup / Conditions / Data

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)		
Customer:	**Nalloy, LLC**		
Specification:	**15.225 Carrier and Spurious Emissions (13.110-14.010 MHz Transmitter)**		
Work Order #:	**106997**	Date:	10/19/2022
Test Type:	**Radiated Scan**	Time:	11:59:47
Tested By:	Matt Harrison	Sequence#:	9
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:

Environmental Conditions:
Temperature: 25°C
Humidity: 45%
Pressure: 101.4kPa

Method: ANSI C63.10: 2013

Frequency range: Band Edge

Setup:
EUT is setup in a floor-standing configuration. It is connected to a remote POE injector and a laptop via Ethernet Cables.

Mode 2:
Honeycrisp (Fuji):
Fuji- CPU DDR eMMC Stress
Audio 1kHz Tone on Speaker at 100% Volume
Display Max Brightness
USB to Caramel 480Mbps

Honeycrisp (Opal):
No Stress

Caramel:
Ethernet 100Mbps
USB 2.0 x1 12Mbps to Wisepad
USB B No Stressor to Baxter

Wisepad:
Connected and powered on

Tap Mode

Baxter and Rufus Peripherals:
Ethernet 100Mbps
Prefect- Stressors on CPU DDR eMMC
Solenoid continuously cycling
Position sensor enabled
Audio over speaker playing representative tone
Microphone on and Recording
USB on Baxter Mass Storage devices no cable
USB A to B from Baxter to Caramel No Stressor
Marshall and Burgundy:
Stressed
GPIO Active
LED Toggling Colors

Buddy:
POE Fully loaded and stressed

4x .1uf caps between POE power and power return to ground

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00052	Loop Antenna	6502	5/11/2022	5/11/2024
T2	ANP05305	Cable	ETSI-50T	9/15/2021	9/15/2023
T3	ANP06540	Cable	Heliax	1/17/2022	1/17/2024
	AN02872	Spectrum Analyzer	E4440A	11/29/2021	11/29/2023

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	13.110M	16.7	+8.7	+0.2	+0.0		-40.0	-14.4	29.5	-43.9	Perp
2	14.010M	11.7	+8.6	+0.2	+0.0		-40.0	-19.5	29.5	-49.0	Perp

Test Setup Photo(s)

Below 1GHz View 1

Below 1GHz View 2

15.207 AC Conducted Emissions

Test Setup / Conditions / Data

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)		
Customer:	**Nalloy, LLC**		
Specification:	**15.207 AC Mains - Average**		
Work Order #:	**106997**	Date:	12/8/2022
Test Type:	**Conducted Emissions**	Time:	14:10:54
Tested By:	Michael Atkinson	Sequence#:	44
Software:	EMITest 5.03.20		120V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

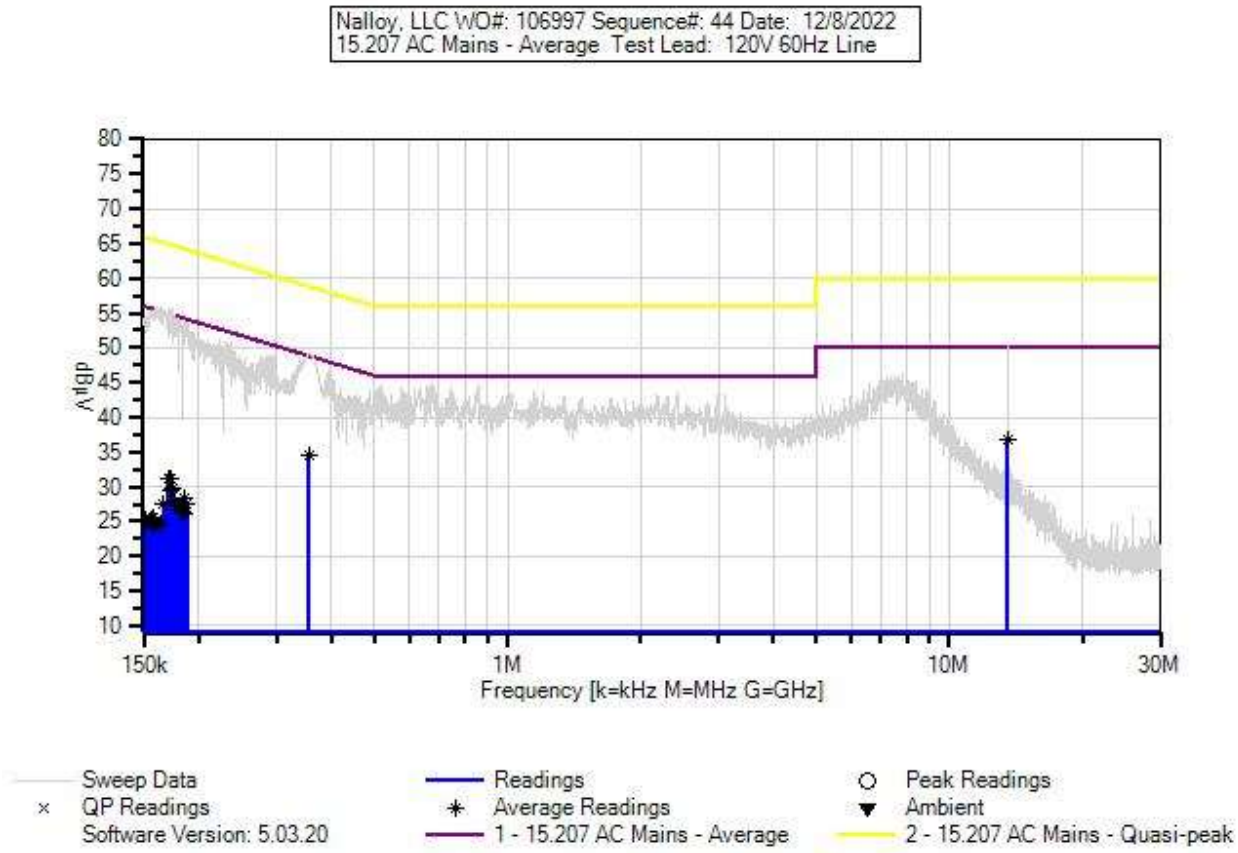
Test Conditions / Notes:

Environmental Conditions:
Temperature: 20.6°C
Humidity: 39%
Pressure: 101.1kPa

Method: ANSI C63.10 (2013)

Frequency range: 150k-30MHz

Setup:
EUT is setup in a floor-standing configuration. It is connected to a remote POE injector and a laptop via Ethernet Cables. EUT is repeatedly transmitting NFC A.



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP06219	Attenuator	768-10	3/23/2022	3/23/2024
T2	ANP05305	Cable	ETSI-50T	9/15/2021	9/15/2023
T3	ANP06540	Cable	Heliax	1/17/2022	1/17/2024
	AN02872	Spectrum Analyzer	E4440A	11/29/2021	11/29/2023
T4	AN02611	High Pass Filter	HE9615-150K-50-720B	1/5/2022	1/5/2024
T5	AN01311	50uH LISN-Line1 (L)	3816/2	2/23/2022	2/23/2024
	AN01311	50uH LISN-Line2 (N)	3816/2	2/23/2022	2/23/2024

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

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	13.561M	27.3	+9.1	+0.2	+0.0	+0.0	+0.0	36.7	50.0	-13.3	Line
	Ave		+0.1								
^	13.557M	40.8	+9.1	+0.2	+0.0	+0.0	+0.0	50.2	50.0	+0.2	Line
			+0.1								
3	355.197k	25.3	+9.1	+0.0	+0.1	+0.0	+0.0	34.6	48.8	-14.2	Line
	Ave		+0.1								
^	355.196k	39.9	+9.1	+0.0	+0.1	+0.0	+0.0	49.2	48.8	+0.4	Line
			+0.1								
5	172.426k	21.6	+9.1	+0.0	+0.1	+0.3	+0.0	31.2	54.8	-23.6	Line
	Ave		+0.1								
6	171.063k	21.5	+9.1	+0.0	+0.1	+0.3	+0.0	31.1	54.9	-23.8	Line
	Ave		+0.1								
7	174.731k	20.2	+9.1	+0.0	+0.1	+0.3	+0.0	29.8	54.7	-24.9	Line
	Ave		+0.1								
8	173.264k	19.9	+9.1	+0.0	+0.1	+0.3	+0.0	29.5	54.8	-25.3	Line
	Ave		+0.1								
9	185.699k	18.9	+9.1	+0.0	+0.1	+0.2	+0.0	28.4	54.2	-25.8	Line
	Ave		+0.1								
10	188.186k	18.1	+9.1	+0.0	+0.1	+0.1	+0.0	27.5	54.1	-26.6	Line
	Ave		+0.1								
11	176.513k	18.3	+9.1	+0.0	+0.1	+0.3	+0.0	27.9	54.6	-26.7	Line
	Ave		+0.1								
12	177.142k	17.8	+9.1	+0.0	+0.1	+0.3	+0.0	27.4	54.6	-27.2	Line
	Ave		+0.1								
^	174.731k	46.1	+9.1	+0.0	+0.1	+0.3	+0.0	55.7	54.7	+1.0	Line
			+0.1								
^	173.264k	45.7	+9.1	+0.0	+0.1	+0.3	+0.0	55.3	54.8	+0.5	Line
			+0.1								
^	172.425k	45.4	+9.1	+0.0	+0.1	+0.3	+0.0	55.0	54.8	+0.2	Line
			+0.1								
16	181.186k	17.6	+9.1	+0.0	+0.1	+0.3	+0.0	27.2	54.4	-27.2	Line
	Ave		+0.1								
^	177.141k	45.3	+9.1	+0.0	+0.1	+0.3	+0.0	54.9	54.6	+0.3	Line
			+0.1								
^	176.512k	45.2	+9.1	+0.0	+0.1	+0.3	+0.0	54.8	54.6	+0.2	Line
			+0.1								
19	166.662k	17.7	+9.1	+0.0	+0.1	+0.4	+0.0	27.4	55.1	-27.7	Line
	Ave		+0.1								
^	171.063k	46.0	+9.1	+0.0	+0.1	+0.3	+0.0	55.6	54.9	+0.7	Line
			+0.1								
21	184.334k	17.0	+9.1	+0.0	+0.1	+0.2	+0.0	26.5	54.3	-27.8	Line
	Ave		+0.1								

22	185.765k Ave	16.6	+9.1 +0.1	+0.0	+0.1	+0.2	+0.0	26.1	54.2	-28.1	Line
^	181.186k	45.7	+9.1 +0.1	+0.0	+0.1	+0.3	+0.0	55.3	54.4	+0.9	Line
^	184.334k	45.5	+9.1 +0.1	+0.0	+0.1	+0.2	+0.0	55.0	54.3	+0.7	Line
^	185.765k	45.3	+9.1 +0.1	+0.0	+0.1	+0.2	+0.0	54.8	54.2	+0.6	Line
^	188.186k	44.6	+9.1 +0.1	+0.0	+0.1	+0.1	+0.0	54.0	54.1	-0.1	Line
^	185.699k	43.7	+9.1 +0.1	+0.0	+0.1	+0.2	+0.0	53.2	54.2	-1.0	Line
28	157.462k Ave	15.7	+9.1 +0.1	+0.0	+0.1	+0.6	+0.0	25.6	55.6	-30.0	Line
29	155.447k Ave	15.2	+9.1 +0.1	+0.0	+0.1	+0.7	+0.0	25.2	55.7	-30.5	Line
30	164.252k Ave	15.0	+9.1 +0.1	+0.0	+0.1	+0.4	+0.0	24.7	55.2	-30.5	Line
^	166.661k	45.9	+9.1 +0.1	+0.0	+0.1	+0.4	+0.0	55.6	55.1	+0.5	Line
32	159.712k Ave	15.1	+9.1 +0.1	+0.0	+0.1	+0.5	+0.0	24.9	55.5	-30.6	Line
33	152.195k Ave	15.1	+9.1 +0.1	+0.0	+0.1	+0.9	+0.0	25.3	55.9	-30.6	Line
^	152.195k	45.2	+9.1 +0.1	+0.0	+0.1	+0.9	+0.0	55.4	55.9	-0.5	Line
35	159.972k Ave	14.9	+9.1 +0.1	+0.0	+0.1	+0.5	+0.0	24.7	55.5	-30.8	Line
^	164.251k	46.2	+9.1 +0.1	+0.0	+0.1	+0.4	+0.0	55.9	55.2	+0.7	Line
37	158.138k Ave	14.4	+9.1 +0.1	+0.0	+0.1	+0.6	+0.0	24.3	55.6	-31.3	Line
^	159.972k	47.2	+9.1 +0.1	+0.0	+0.1	+0.5	+0.0	57.0	55.5	+1.5	Line
^	158.138k	46.8	+9.1 +0.1	+0.0	+0.1	+0.6	+0.0	56.7	55.6	+1.1	Line
^	157.462k	46.6	+9.1 +0.1	+0.0	+0.1	+0.6	+0.0	56.5	55.6	+0.9	Line
^	159.712k	46.2	+9.1 +0.1	+0.0	+0.1	+0.5	+0.0	56.0	55.5	+0.5	Line
^	155.447k	44.9	+9.1 +0.1	+0.0	+0.1	+0.7	+0.0	54.9	55.7	-0.8	Line

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 1-800-500-4EMC (4362)		
Customer:	**Nalloy, LLC**		
Specification:	**15.207 AC Mains - Average**		
Work Order #:	**106997**	Date:	12/8/2022
Test Type:	**Conducted Emissions**	Time:	14:43:40
Tested By:	Michael Atkinson	Sequence#:	45
Software:	EMITest 5.03.20		120V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 2			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 2			

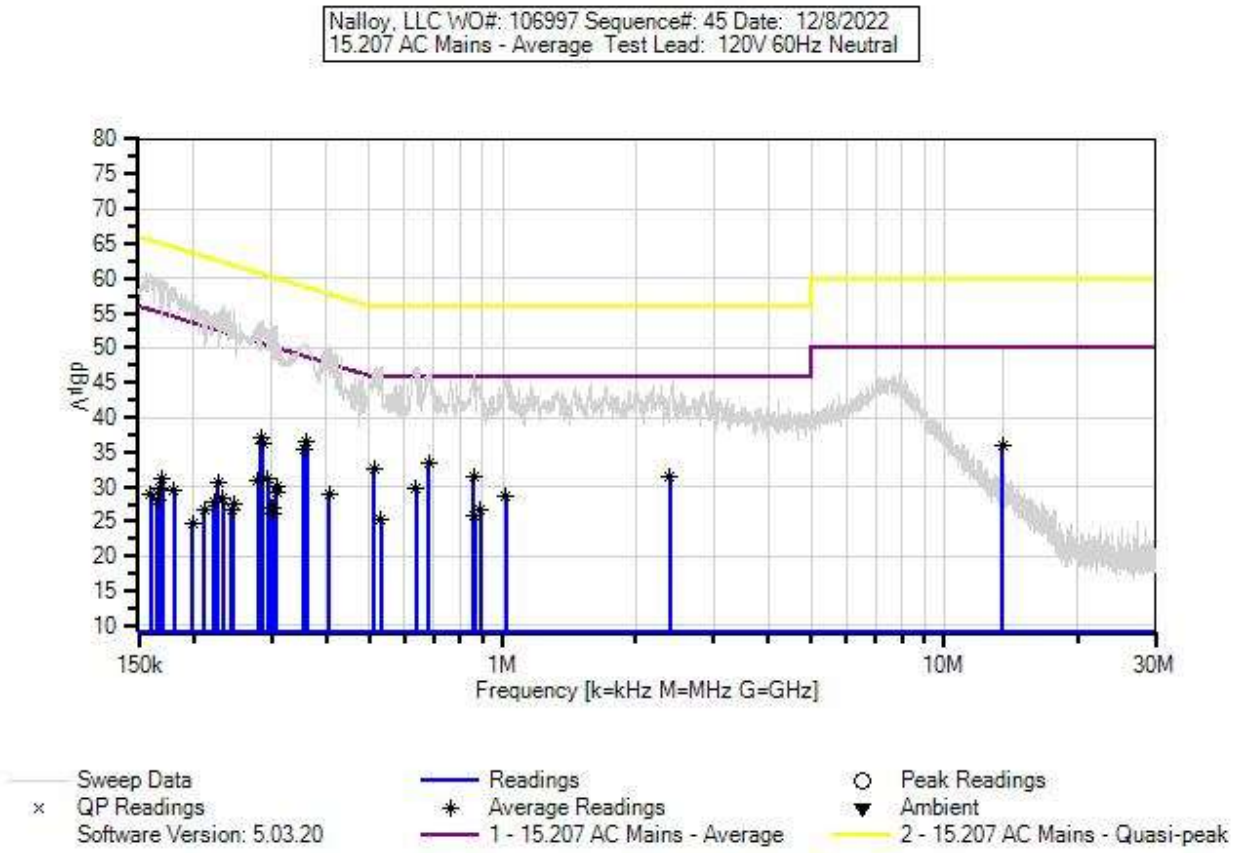
Test Conditions / Notes:

Environmental Conditions:
Temperature: 20.6°C
Humidity: 39%
Pressure: 101.1kPa

Method: ANSI C63.10 (2013)

Frequency range: 150k-30MHz

Setup:
EUT is setup in a floor-standing configuration. It is connected to a remote POE injector and a laptop via Ethernet Cables. EUT is repeatedly transmitting NFC A.



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP06219	Attenuator	768-10	3/23/2022	3/23/2024
T2	ANP05305	Cable	ETSI-50T	9/15/2021	9/15/2023
T3	ANP06540	Cable	Heliax	1/17/2022	1/17/2024
T4	AN02872	Spectrum Analyzer	E4440A	11/29/2021	11/29/2023
T5	AN02611	High Pass Filter	HE9615-150K-50-720B	1/5/2022	1/5/2024
	AN01311	50uH LISN-Line1 (L)	3816/2	2/23/2022	2/23/2024
T6	AN01311	50uH LISN-Line2 (N)	3816/2	2/23/2022	2/23/2024

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

#	Freq	Rdng	T1 T5	T2 T6	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	360.490k	27.2	+9.1	+0.0	+0.1	+0.0	+0.0	36.5	48.7	-12.2	Neutr
	Ave		+0.0	+0.1							
^	360.490k	40.7	+9.1	+0.0	+0.1	+0.0	+0.0	50.0	48.7	+1.3	Neutr
			+0.0	+0.1							
3	682.400k	23.9	+9.1	+0.0	+0.1	+0.0	+0.0	33.4	46.0	-12.6	Neutr
	Ave		+0.2	+0.1							
^	682.400k	37.4	+9.1	+0.0	+0.1	+0.0	+0.0	46.9	46.0	+0.9	Neutr
			+0.2	+0.1							
5	511.500k	23.3	+9.1	+0.0	+0.1	+0.0	+0.0	32.7	46.0	-13.3	Neutr
	Ave		+0.1	+0.1							
^	511.500k	37.5	+9.1	+0.0	+0.1	+0.0	+0.0	46.9	46.0	+0.9	Neutr
			+0.1	+0.1							
7	355.250k	26.2	+9.1	+0.0	+0.1	+0.0	+0.0	35.5	48.8	-13.3	Neutr
	Ave		+0.0	+0.1							
^	355.250k	41.3	+9.1	+0.0	+0.1	+0.0	+0.0	50.6	48.8	+1.8	Neutr
			+0.0	+0.1							
9	283.991k	27.7	+9.1	+0.0	+0.1	+0.0	+0.0	37.0	50.7	-13.7	Neutr
	Ave		+0.0	+0.1							
10	13.562M	26.6	+9.1	+0.2	+0.0	+0.0	+0.0	35.9	50.0	-14.1	Neutr
	Ave		+0.0	+0.0							
^	13.562M	40.7	+9.1	+0.2	+0.0	+0.0	+0.0	50.0	50.0	+0.0	Neutr
			+0.0	+0.0							
12	286.483k	27.0	+9.1	+0.0	+0.1	+0.0	+0.0	36.3	50.6	-14.3	Neutr
	Ave		+0.0	+0.1							
^	286.483k	44.6	+9.1	+0.0	+0.1	+0.0	+0.0	53.9	50.6	+3.3	Neutr
			+0.0	+0.1							
14	858.400k	22.1	+9.1	+0.0	+0.1	+0.0	+0.0	31.5	46.0	-14.5	Neutr
	Ave		+0.1	+0.1							
^	858.400k	36.8	+9.1	+0.0	+0.1	+0.0	+0.0	46.2	46.0	+0.2	Neutr
			+0.1	+0.1							
^	855.400k	36.2	+9.1	+0.0	+0.1	+0.0	+0.0	45.6	46.0	-0.4	Neutr
			+0.1	+0.1							
17	2.394M	22.0	+9.1	+0.1	+0.1	+0.0	+0.0	31.4	46.0	-14.6	Neutr
	Ave		+0.0	+0.1							
^	2.394M	37.1	+9.1	+0.1	+0.1	+0.0	+0.0	46.5	46.0	+0.5	Neutr
			+0.0	+0.1							
19	637.900k	20.4	+9.1	+0.0	+0.1	+0.0	+0.0	29.8	46.0	-16.2	Neutr
	Ave		+0.1	+0.1							
^	637.900k	38.2	+9.1	+0.0	+0.1	+0.0	+0.0	47.6	46.0	+1.6	Neutr
			+0.1	+0.1							
21	1.016M	19.1	+9.1	+0.1	+0.1	+0.0	+0.0	28.6	46.0	-17.4	Neutr
	Ave		+0.1	+0.1							
^	1.016M	36.7	+9.1	+0.1	+0.1	+0.0	+0.0	46.2	46.0	+0.2	Neutr
			+0.1	+0.1							

23 Ave	404.685k	19.4	+9.1 +0.1	+0.0 +0.1	+0.1	+0.0	+0.0	28.8	47.8	-19.0	Neutr
^	404.685k	66.8	+9.1 +0.1	+0.0 +0.1	+0.1	+0.0	+0.0	76.2	47.8	+28.4	Neutr
^	404.684k	40.9	+9.1 +0.1	+0.0 +0.1	+0.1	+0.0	+0.0	50.3	47.8	+2.5	Neutr
^	404.685k	39.6	+9.1 +0.1	+0.0 +0.1	+0.1	+0.0	+0.0	49.0	47.8	+1.2	Neutr
^	404.685k	39.0	+9.1 +0.1	+0.0 +0.1	+0.1	+0.0	+0.0	48.4	47.8	+0.6	Neutr
^	404.685k	38.5	+9.1 +0.1	+0.0 +0.1	+0.1	+0.0	+0.0	47.9	47.8	+0.1	Neutr
^	404.685k	37.7	+9.1 +0.1	+0.0 +0.1	+0.1	+0.0	+0.0	47.1	47.8	-0.7	Neutr
^	404.685k	37.5	+9.1 +0.1	+0.0 +0.1	+0.1	+0.0	+0.0	46.9	47.8	-0.9	Neutr
^	404.685k	33.8	+9.1 +0.1	+0.0 +0.1	+0.1	+0.0	+0.0	43.2	47.8	-4.6	Neutr
32 Ave	293.782k	21.9	+9.1 +0.0	+0.0 +0.1	+0.1	+0.0	+0.0	31.2	50.4	-19.2	Neutr
^	293.782k	43.5	+9.1 +0.0	+0.0 +0.1	+0.1	+0.0	+0.0	52.8	50.4	+2.4	Neutr
34 Ave	890.000k	17.3	+9.1 +0.1	+0.0 +0.1	+0.1	+0.0	+0.0	26.7	46.0	-19.3	Neutr
^	890.000k	34.9	+9.1 +0.1	+0.0 +0.1	+0.1	+0.0	+0.0	44.3	46.0	-1.7	Neutr
36 Ave	279.185k	21.7	+9.1 +0.0	+0.0 +0.1	+0.1	+0.0	+0.0	31.0	50.8	-19.8	Neutr
^	283.991k	44.5	+9.1 +0.0	+0.0 +0.1	+0.1	+0.0	+0.0	53.8	50.7	+3.1	Neutr
^	279.184k	44.2	+9.1 +0.0	+0.0 +0.1	+0.1	+0.0	+0.0	53.5	50.8	+2.7	Neutr
39 Ave	308.735k	20.7	+9.1 +0.0	+0.0 +0.1	+0.1	+0.0	+0.0	30.0	50.0	-20.0	Neutr
40 Ave	865.600k	16.4	+9.1 +0.1	+0.0 +0.1	+0.1	+0.0	+0.0	25.8	46.0	-20.2	Neutr
^	865.600k	35.8	+9.1 +0.1	+0.0 +0.1	+0.1	+0.0	+0.0	45.2	46.0	-0.8	Neutr
42 Ave	530.800k	15.9	+9.1 +0.1	+0.0 +0.1	+0.1	+0.0	+0.0	25.3	46.0	-20.7	Neutr
^	530.800k	38.2	+9.1 +0.1	+0.0 +0.1	+0.1	+0.0	+0.0	47.6	46.0	+1.6	Neutr
44 Ave	307.311k	19.8	+9.1 +0.0	+0.0 +0.1	+0.1	+0.0	+0.0	29.1	50.0	-20.9	Neutr
^	308.735k	43.6	+9.1 +0.0	+0.0 +0.1	+0.1	+0.0	+0.0	52.9	50.0	+2.9	Neutr
46 Ave	227.445k	21.2	+9.1 +0.1	+0.0 +0.1	+0.1	+0.0	+0.0	30.6	52.5	-21.9	Neutr

^	227.444k	45.7	+9.1 +0.1	+0.0 +0.1	+0.1	+0.0	+0.0	55.1	52.5	+2.6	Neutr

48	303.395k	17.7	+9.1	+0.0	+0.1	+0.0	+0.0	27.0	50.1	-23.1	Neutr
	Ave		+0.0	+0.1							
^	307.311k	43.8	+9.1	+0.0	+0.1	+0.0	+0.0	53.1	50.0	+3.1	Neutr
			+0.0	+0.1							
50	299.122k	17.7	+9.1	+0.0	+0.1	+0.0	+0.0	27.0	50.3	-23.3	Neutr
	Ave		+0.0	+0.1							
51	169.596k	21.7	+9.1	+0.0	+0.1	+0.0	+0.0	31.3	55.0	-23.7	Neutr
	Ave		+0.3	+0.1							
52	232.870k	19.0	+9.1	+0.0	+0.1	+0.0	+0.0	28.4	52.3	-23.9	Neutr
	Ave		+0.1	+0.1							
^	232.870k	46.3	+9.1	+0.0	+0.1	+0.0	+0.0	55.7	52.3	+3.4	Neutr
			+0.1	+0.1							
54	301.437k	16.9	+9.1	+0.0	+0.1	+0.0	+0.0	26.2	50.2	-24.0	Neutr
	Ave		+0.0	+0.1							
^	301.436k	43.8	+9.1	+0.0	+0.1	+0.0	+0.0	53.1	50.2	+2.9	Neutr
			+0.0	+0.1							
^	303.394k	43.7	+9.1	+0.0	+0.1	+0.0	+0.0	53.0	50.1	+2.9	Neutr
			+0.0	+0.1							
^	299.122k	43.7	+9.1	+0.0	+0.1	+0.0	+0.0	53.0	50.3	+2.7	Neutr
			+0.0	+0.1							
58	246.099k	18.0	+9.1	+0.0	+0.1	+0.0	+0.0	27.4	51.9	-24.5	Neutr
	Ave		+0.1	+0.1							
59	222.205k	18.5	+9.1	+0.0	+0.1	+0.0	+0.0	27.9	52.7	-24.8	Neutr
	Ave		+0.1	+0.1							
^	222.204k	45.7	+9.1	+0.0	+0.1	+0.0	+0.0	55.1	52.7	+2.4	Neutr
			+0.1	+0.1							
61	180.495k	19.9	+9.1	+0.0	+0.1	+0.0	+0.0	29.5	54.5	-25.0	Neutr
	Ave		+0.3	+0.1							
^	180.495k	49.2	+9.1	+0.0	+0.1	+0.0	+0.0	58.8	54.5	+4.3	Neutr
			+0.3	+0.1							
63	167.710k	20.2	+9.1	+0.0	+0.1	+0.0	+0.0	29.8	55.1	-25.3	Neutr
	Ave		+0.3	+0.1							
64	243.890k	17.2	+9.1	+0.0	+0.1	+0.0	+0.0	26.6	52.0	-25.4	Neutr
	Ave		+0.1	+0.1							
^	246.098k	46.3	+9.1	+0.0	+0.1	+0.0	+0.0	55.7	51.9	+3.8	Neutr
			+0.1	+0.1							
^	243.890k	46.1	+9.1	+0.0	+0.1	+0.0	+0.0	55.5	52.0	+3.5	Neutr
			+0.1	+0.1							
67	211.830k	17.4	+9.1	+0.0	+0.1	+0.0	+0.0	26.8	53.1	-26.3	Neutr
	Ave		+0.1	+0.1							
^	211.829k	46.1	+9.1	+0.0	+0.1	+0.0	+0.0	55.5	53.1	+2.4	Neutr
			+0.1	+0.1							
69	159.745k	19.1	+9.1	+0.0	+0.1	+0.0	+0.0	28.9	55.5	-26.6	Neutr
	Ave		+0.5	+0.1							
^	159.745k	50.9	+9.1	+0.0	+0.1	+0.0	+0.0	60.7	55.5	+5.2	Neutr
			+0.5	+0.1							

71 Ave	165.614k	18.4	+9.1 +0.4	+0.0 +0.1	+0.1	+0.0	+0.0	28.1	55.2	-27.1	Neutr
^	169.596k	50.2	+9.1 +0.3	+0.0 +0.1	+0.1	+0.0	+0.0	59.8	55.0	+4.8	Neutr
^	165.613k	50.3	+9.1 +0.4	+0.0 +0.1	+0.1	+0.0	+0.0	60.0	55.2	+4.8	Neutr
^	167.709k	50.0	+9.1 +0.3	+0.0 +0.1	+0.1	+0.0	+0.0	59.6	55.1	+4.5	Neutr
75 Ave	199.359k	15.3	+9.1 +0.1	+0.0 +0.1	+0.1	+0.0	+0.0	24.7	53.6	-28.9	Neutr
^	199.358k	47.1	+9.1 +0.1	+0.0 +0.1	+0.1	+0.0	+0.0	56.5	53.6	+2.9	Neutr

Test Setup Photo(s)

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.