Yantrr Electronic Systems

EMC TEST REPORT FOR

Cellular Wireless Router
Model: ARCA-V206A

Tested to The Following Standard:

ICES-003 Issue 6

Report No.: 100084-4

Date of issue: July 17, 2017

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 EMC 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:

Yantrr Electronic Systems
105 Serra Way #352
Milpitas, CA 95035
FRN: 0025861576

Representative: Namita Varma

REPORT PREPARED BY:

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

Project Number: 100084

DATE OF EQUIPMENT RECEIPT: July 14, 2017
DATE(S) OF TESTING: July 14, 2017

Report Authorization

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

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

Test Facility Information

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

TEST LOCATION(S):
CKC Laboratories, Inc.
110 Olinda Place
Brea, CA 92823

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.03.02
EMITest Immunity	5.03.02

Site Registration & Accreditation Information

Location	CB #	TAIWAN	CANADA	FCC	JAPAN
Brea D, CA	US0060	SL2-IN-E-1146R	3082D-2	US1025	A-0147

SUMMARY OF RESULTS

Standard / Specification: ICES-003 Issue 6

Test Procedure	Description	Modifications	Results
ICES-003 Class B	Conducted Emissions	Mod. #1	Pass
ICES-003 Class B	Radiated Emissions	Mod. #1	Pass

NA = Not Applicable

Modifications During Testing

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

Summary of Conditions
Modification #1: Removed paint and installed EMI conducted tape between the top cover and main chassis.

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
Cellular Wireless Router	Yantrr Electronic Systems	ARCA-V206A	1706280001
5V Power Supply	Mean Well	GS25U05-P1J	NA

Support Equipment:

Device	Manufacturer	Model #	S/N
LCD Monitor	Samsung	B2230HD	Z2F1HCRC212809L
16GB USB Drive	Sandisk	Cruzer Blade 16GB	NA
16GB USB Drive	Sandisk	Cruzer Blade 16GB	NA
128GB USB Drive	Sandisk	128GB	NA

ICES-003

Conducted Emissions

Test Setup / Conditions / Data

Test Location: CKC Laboratories, Inc. • 110 N Olinda Place • Brea, CA 92823 • 714-993-6112
Customer: **Yantrr Electronic Systems**
Specification: **ICES-003 AC Mains Class B - Average**
Work Order #: **100084**   Date: 7/14/2017
Test Type: **Conducted Emissions**   Time: 16:35:59
Tested By: Don Nguyen   Sequence#: 1
Software: EMITest 5.03.02   120V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The EUT is placed on tabletop. Cellular, GPS, and Wi-Fi antenna ports are connected to antennas. 3x USB ports are connected to 3x USB thumb drives. Audio port is connected to an earphone. Ethernet port is connected to sections of cable. HDMI port is connected to support monitor in standby mode. I2C port is not populated.
All wireless modules are set in receiver mode.
Approved wireless modules installed in the EUT are:

Wi-Fi module: BL-R8723BT1 / FCC ID : S8J-R8723BT1
Cellular module: Telit: LE910-NAG, FCC ID Filing: RI7LE910NA

Antenna information:
GPS- operating frequency: 1575.42MHz, voltage: 3V-5V, manufacture and model unknown/generic.
Wi-Fi- 5dBi gain, manufacture and model: unknown/generic.
Cellular- 2.5dBi gain, manufacturer: Pulse Electronics, model: W1900

The manufacturer declares that the highest frequency generated or used in the device is 2462MHz.

Frequency range of measurement = 150kHz-30MHz
RBW=9kHz,VBW=9kHz;
Test Method: ANSI C63.4 (2014)

Site D

Test environment conditions: Temperature: 26°C, Relative Humidity: 48%, Pressure: 100kPa

Modification #1 was in place during testing.

Yantrr Electronic Systems WO#: 100084 Sequence#: 1 Date: 7/14/2017
ICES-003 AC Mains Class B - Average Test Lead: 120V 60Hz L1
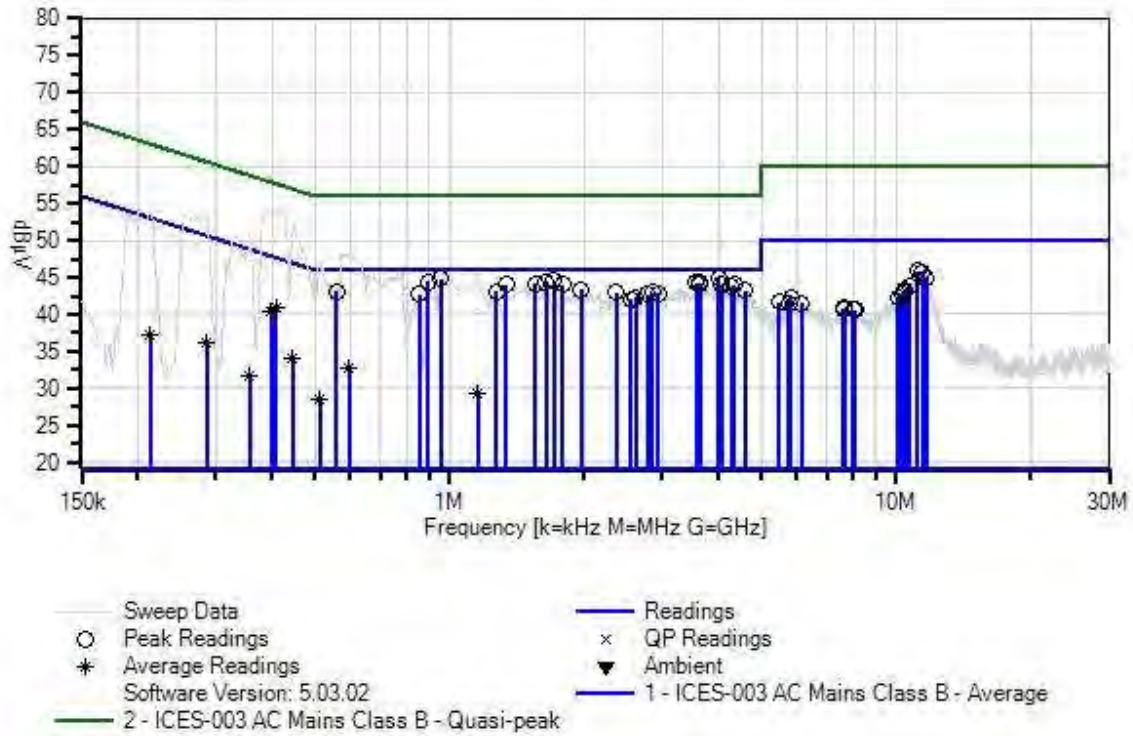
Legend:
- Sweep Data
- ○ Peak Readings
- ＊ Average Readings
- Software Version: 5.03.02
- —— 2 - ICES-003 AC Mains Class B - Quasi-peak
- —— Readings
- × QP Readings
- ▼ Ambient
- —— 1 - ICES-003 AC Mains Class B - Average

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP06085	Attenuator	SA18N10W-09	11/14/2016	11/14/2018
T2	ANP01910	Cable	RG-142	11/30/2015	11/30/2017
T3	AN00847.1	50uH LISN-Line 1 (L1)	3816/2NM	3/14/2017	3/14/2018
	AN00847.1	50uH LISN-Line2 (L2)	3816/2NM	3/14/2017	3/14/2018
	AN02467	Spectrum Analyzer	E7405A	6/26/2017	6/26/2018
T4	AN02343	High Pass Filter	HE9615-150K-50-720B	1/25/2017	1/25/2019

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

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	4.008M	39.0	+5.7	+0.0	+0.1	+0.1	+0.0	44.9	46.0	-1.1	L1
2	958.406k	39.0	+5.7	+0.0	+0.0	+0.1	+0.0	44.8	46.0	-1.2	L1
3	1.716M	38.7	+5.7	+0.0	+0.0	+0.1	+0.0	44.5	46.0	-1.5	L1
4	895.249k	38.6	+5.7	+0.0	+0.0	+0.1	+0.0	44.4	46.0	-1.6	L1
5	1.644M	38.6	+5.7	+0.0	+0.0	+0.1	+0.0	44.4	46.0	-1.6	L1
6	3.575M	38.4	+5.7	+0.0	+0.1	+0.1	+0.0	44.3	46.0	-1.7	L1
7	3.647M	38.4	+5.7	+0.0	+0.1	+0.1	+0.0	44.3	46.0	-1.7	L1
8	3.629M	38.3	+5.7	+0.0	+0.1	+0.1	+0.0	44.2	46.0	-1.8	L1
9	1.554M	38.3	+5.7	+0.0	+0.0	+0.1	+0.0	44.1	46.0	-1.9	L1
10	1.788M	38.2	+5.7	+0.0	+0.0	+0.1	+0.0	44.0	46.0	-2.0	L1
11	1.337M	38.2	+5.7	+0.0	+0.0	+0.1	+0.0	44.0	46.0	-2.0	L1
12	4.333M	38.1	+5.7	+0.0	+0.1	+0.1	+0.0	44.0	46.0	-2.0	L1
13	4.062M	38.1	+5.7	+0.0	+0.1	+0.1	+0.0	44.0	46.0	-2.0	L1
14	4.270M	37.8	+5.7	+0.0	+0.1	+0.1	+0.0	43.7	46.0	-2.3	L1
15	1.969M	37.6	+5.7	+0.0	+0.0	+0.1	+0.0	43.4	46.0	-2.6	L1
16	4.594M	37.3	+5.7	+0.0	+0.1	+0.1	+0.0	43.2	46.0	-2.8	L1
17	557.235k	37.2	+5.7	+0.0	+0.0	+0.2	+0.0	43.1	46.0	-2.9	L1
18	1.274M	37.3	+5.7	+0.0	+0.0	+0.1	+0.0	43.1	46.0	-2.9	L1

19	2.844M	37.0	+5.7	+0.0	+0.1	+0.1	+0.0	42.9	46.0	-3.1	L1
20	2.366M	37.1	+5.7	+0.0	+0.0	+0.1	+0.0	42.9	46.0	-3.1	L1
21	2.934M	36.9	+5.7	+0.0	+0.1	+0.1	+0.0	42.8	46.0	-3.2	L1
22	2.772M	36.8	+5.7	+0.0	+0.1	+0.1	+0.0	42.7	46.0	-3.3	L1
23	857.207k	36.9	+5.7	+0.0	+0.0	+0.1	+0.0	42.7	46.0	-3.3	L1
24	2.619M	36.4	+5.7	+0.0	+0.1	+0.1	+0.0	42.3	46.0	-3.7	L1
25	2.546M	36.2	+5.7	+0.0	+0.0	+0.1	+0.0	42.0	46.0	-4.0	L1
26	11.199M	39.9	+5.7	+0.1	+0.1	+0.1	+0.0	45.9	50.0	-4.1	L1
27	11.443M	39.7	+5.7	+0.1	+0.1	+0.1	+0.0	45.7	50.0	-4.3	L1
28	11.704M	38.9	+5.7	+0.1	+0.1	+0.1	+0.0	44.9	50.0	-5.1	L1
29	10.721M	37.7	+5.7	+0.0	+0.2	+0.1	+0.0	43.7	50.0	-6.3	L1
30	10.450M	37.4	+5.7	+0.0	+0.2	+0.1	+0.0	43.4	50.0	-6.6	L1
31	408.158k Ave	35.2	+5.7	+0.0	+0.0	+0.1	+0.0	41.0	47.7	-6.7	L1
^	408.158k	48.3	+5.7	+0.0	+0.0	+0.1	+0.0	54.1	47.7	+6.4	L1
33	10.423M	37.0	+5.7	+0.0	+0.2	+0.1	+0.0	43.0	50.0	-7.0	L1
34	10.288M	36.8	+5.7	+0.0	+0.2	+0.1	+0.0	42.8	50.0	-7.2	L1
35	399.410k Ave	34.7	+5.7	+0.0	+0.0	+0.1	+0.0	40.5	47.9	-7.4	L1
^	399.410k	47.5	+5.7	+0.0	+0.0	+0.1	+0.0	53.3	47.9	+5.4	L1
37	5.813M	36.4	+5.7	+0.0	+0.1	+0.1	+0.0	42.3	50.0	-7.7	L1
38	10.080M	36.2	+5.7	+0.0	+0.2	+0.1	+0.0	42.2	50.0	-7.8	L1
39	10.179M	36.2	+5.7	+0.0	+0.2	+0.1	+0.0	42.2	50.0	-7.8	L1
40	5.479M	35.7	+5.7	+0.0	+0.1	+0.1	+0.0	41.6	50.0	-8.4	L1
41	6.155M	35.6	+5.7	+0.0	+0.1	+0.1	+0.0	41.5	50.0	-8.5	L1
42	5.749M	35.5	+5.7	+0.0	+0.1	+0.1	+0.0	41.4	50.0	-8.6	L1
43	7.680M	35.0	+5.7	+0.0	+0.1	+0.1	+0.0	40.9	50.0	-9.1	L1
44	7.626M	34.8	+5.7	+0.0	+0.1	+0.1	+0.0	40.7	50.0	-9.3	L1

45	8.014M	34.7	+5.7	+0.0	+0.1	+0.1	+0.0	40.6	50.0	-9.4	L1
46	8.113M	34.7	+5.7	+0.0	+0.1	+0.1	+0.0	40.6	50.0	-9.4	L1
47	446.336k Ave	28.2	+5.7	+0.0	+0.0	+0.1	+0.0	34.0	46.9	-12.9	L1
^	446.336k	46.3	+5.7	+0.0	+0.0	+0.1	+0.0	52.1	46.9	+5.2	L1
49	597.232k Ave	26.9	+5.7	+0.0	+0.0	+0.2	+0.0	32.8	46.0	-13.2	L1
^	597.231k	42.5	+5.7	+0.0	+0.0	+0.2	+0.0	48.4	46.0	+2.4	L1
51	286.351k Ave	30.5	+5.7	+0.0	+0.0	+0.1	+0.0	36.3	50.6	-14.3	L1
^	286.351k	48.1	+5.7	+0.0	+0.0	+0.1	+0.0	53.9	50.6	+3.3	L1
53	213.631k Ave	31.2	+5.7	+0.0	+0.0	+0.2	+0.0	37.1	53.1	-16.0	L1
^	213.630k	47.9	+5.7	+0.0	+0.0	+0.2	+0.0	53.8	53.1	+0.7	L1
55	1.157M Ave	23.5	+5.7	+0.0	+0.0	+0.1	+0.0	29.3	46.0	-16.7	L1
^	1.157M	39.6	+5.7	+0.0	+0.0	+0.1	+0.0	45.4	46.0	-0.6	L1
57	357.254k Ave	25.9	+5.7	+0.0	+0.0	+0.1	+0.0	31.7	48.8	-17.1	L1
^	357.253k	44.9	+5.7	+0.0	+0.0	+0.1	+0.0	50.7	48.8	+1.9	L1
59	513.603k Ave	22.7	+5.7	+0.0	+0.0	+0.2	+0.0	28.6	46.0	-17.4	L1
^	513.603k	41.5	+5.7	+0.0	+0.0	+0.2	+0.0	47.4	46.0	+1.4	L1

Test Location: CKC Laboratories, Inc. • 110 N Olinda Place • Brea, CA 92823 • 714-993-6112
Customer: **Yantrr Electronic Systems**
Specification: **ICES-003 AC Mains Class B - Average**
Work Order #: **100084**   Date: 7/14/2017
Test Type: **Conducted Emissions**   Time: 16:44:13
Tested By: Don Nguyen   Sequence#: 2
Software: EMITest 5.03.02   120V 60Hz

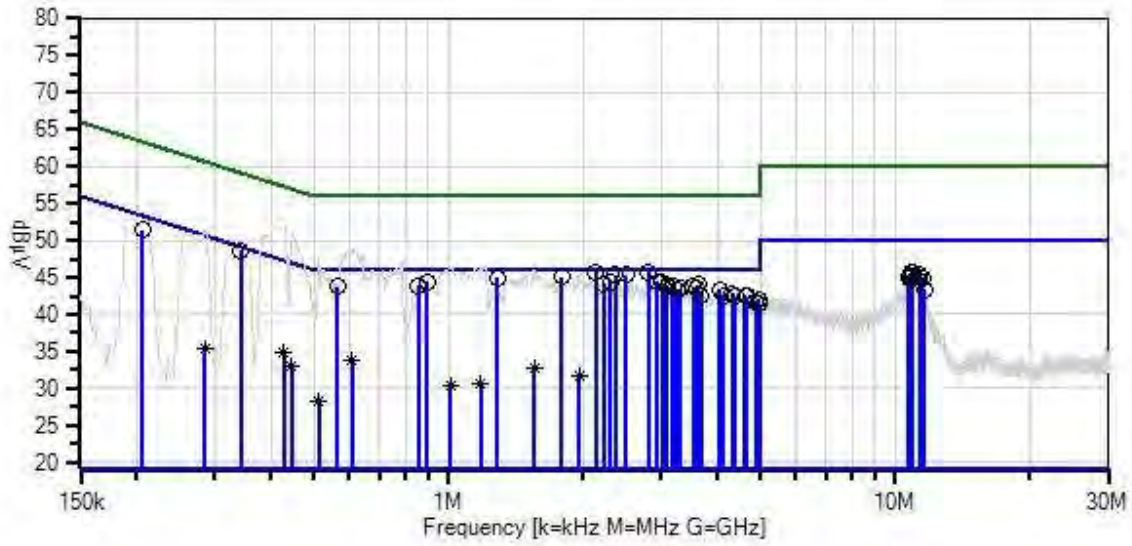*Equipment Tested:*

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The EUT is placed on tabletop. Cellular, GPS, and Wi-Fi antenna ports are connected to antennas. 3x USB ports are connected to 3x USB thumb drives. Audio port is connected to an earphone. Ethernet port is connected to sections of cable. HDMI port is connected to support monitor in standby mode. I2C port is not populated.
All wireless modules are set in receiver mode.
Approved wireless modules installed in the EUT are:

Wi-Fi module: BL-R8723BT1 / FCC ID : S8J-R8723BT1
Cellular module: Telit: LE910-NAG, FCC ID Filing: RI7LE910NA

Antenna information:
GPS- operating frequency: 1575.42MHz, voltage: 3V-5V, manufacture and model unknown/generic.
Wi-Fi- 5dBi gain, manufacture and model: unknown/generic.
Cellular- 2.5dBi gain, manufacturer: Pulse Electronics, model: W1900

The manufacturer declares that the highest frequency generated or used in the device is 2462MHz.

Frequency range of measurement = 150kHz-30MHz
RBW=9kHz,VBW=9kHz;
Test Method: ANSI C63.4 (2014)

Site D

Test environment conditions: Temperature: 26°C, Relative Humidity: 48%, Pressure: 100kPa

Modification #1 was in place during testing.

Yantrr Electronic Systems WO#: 100084 Sequence#: 2 Date: 7/14/2017
ICES-003 AC Mains Class B - Average Test Lead: 120V 60Hz L2

Sweep Data
○ Peak Readings
∗ Average Readings
Software Version: 5.03.02
— 2 - ICES-003 AC Mains Class B - Quasi-peak

— Readings
× QP Readings
▼ Ambient
— 1 - ICES-003 AC Mains Class B - Average

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP06085	Attenuator	SA18N10W-09	11/14/2016	11/14/2018
T2	ANP01910	Cable	RG-142	11/30/2015	11/30/2017
	AN00847.1	50uH LISN-Line 1 (L1)	3816/2NM	3/14/2017	3/14/2018
T3	AN00847.1	50uH LISN-Line2 (L2)	3816/2NM	3/14/2017	3/14/2018
	AN02467	Spectrum Analyzer	E7405A	6/26/2017	6/26/2018
T4	AN02343	High Pass Filter	HE9615-150K-50-720B	1/25/2017	1/25/2019

Measurement Data: Reading listed by margin.   Test Lead: L2

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	2.140M	39.9	+5.7	+0.0	+0.0	+0.1	+0.0	45.7	46.0	-0.3	L2
2	2.799M	39.8	+5.7	+0.0	+0.1	+0.1	+0.0	45.7	46.0	-0.3	L2
3	342.709k	42.8	+5.7	+0.0	+0.0	+0.1	+0.0	48.6	49.1	-0.5	L2
4	2.501M	39.5	+5.7	+0.0	+0.1	+0.1	+0.0	45.4	46.0	-0.6	L2
5	2.366M	39.4	+5.7	+0.0	+0.1	+0.1	+0.0	45.3	46.0	-0.7	L2
6	1.788M	39.3	+5.7	+0.0	+0.0	+0.1	+0.0	45.1	46.0	-0.9	L2
7	1.283M	39.2	+5.7	+0.0	+0.0	+0.1	+0.0	45.0	46.0	-1.0	L2
8	2.303M	38.5	+5.7	+0.0	+0.1	+0.1	+0.0	44.4	46.0	-1.6	L2
9	2.934M	38.5	+5.7	+0.0	+0.1	+0.1	+0.0	44.4	46.0	-1.6	L2
10	895.249k	38.6	+5.7	+0.0	+0.0	+0.1	+0.0	44.4	46.0	-1.6	L2
11	3.007M	38.4	+5.7	+0.0	+0.1	+0.1	+0.0	44.3	46.0	-1.7	L2
12	2.231M	38.4	+5.7	+0.0	+0.0	+0.1	+0.0	44.2	46.0	-1.8	L2
13	206.358k	45.5	+5.7	+0.0	+0.0	+0.2	+0.0	51.4	53.4	-2.0	L2
14	3.629M	38.1	+5.7	+0.0	+0.1	+0.1	+0.0	44.0	46.0	-2.0	L2
15	3.178M	38.0	+5.7	+0.0	+0.1	+0.1	+0.0	43.9	46.0	-2.1	L2
16	857.207k	38.1	+5.7	+0.0	+0.0	+0.1	+0.0	43.9	46.0	-2.1	L2
17	564.507k	37.9	+5.7	+0.0	+0.0	+0.2	+0.0	43.8	46.0	-2.2	L2
18	3.079M	37.9	+5.7	+0.0	+0.1	+0.1	+0.0	43.8	46.0	-2.2	L2

19	3.530M	37.9	+5.7	+0.0	+0.1	+0.1	+0.0	43.8	46.0	-2.2	L2
20	3.584M	37.7	+5.7	+0.0	+0.1	+0.1	+0.0	43.6	46.0	-2.4	L2
21	3.313M	37.6	+5.7	+0.0	+0.1	+0.1	+0.0	43.5	46.0	-2.5	L2
22	3.250M	37.4	+5.7	+0.0	+0.1	+0.1	+0.0	43.3	46.0	-2.7	L2
23	4.053M	37.3	+5.7	+0.0	+0.1	+0.1	+0.0	43.2	46.0	-2.8	L2
24	4.324M	36.9	+5.7	+0.0	+0.1	+0.1	+0.0	42.8	46.0	-3.2	L2
25	3.683M	36.7	+5.7	+0.0	+0.1	+0.1	+0.0	42.6	46.0	-3.4	L2
26	4.125M	36.7	+5.7	+0.0	+0.1	+0.1	+0.0	42.6	46.0	-3.4	L2
27	4.603M	36.7	+5.7	+0.0	+0.1	+0.1	+0.0	42.6	46.0	-3.4	L2
28	4.658M	36.6	+5.7	+0.0	+0.1	+0.1	+0.0	42.5	46.0	-3.5	L2
29	4.396M	36.5	+5.7	+0.0	+0.1	+0.1	+0.0	42.4	46.0	-3.6	L2
30	4.937M	36.1	+5.7	+0.0	+0.1	+0.1	+0.0	42.0	46.0	-4.0	L2
31	4.874M	35.9	+5.7	+0.0	+0.1	+0.1	+0.0	41.8	46.0	-4.2	L2
32	10.856M	39.6	+5.7	+0.0	+0.2	+0.1	+0.0	45.6	50.0	-4.4	L2
33	10.946M	39.6	+5.7	+0.0	+0.2	+0.1	+0.0	45.6	50.0	-4.4	L2
34	11.325M	39.4	+5.7	+0.1	+0.2	+0.1	+0.0	45.5	50.0	-4.5	L2
35	4.973M	35.5	+5.7	+0.0	+0.1	+0.1	+0.0	41.4	46.0	-4.6	L2
36	10.793M	39.2	+5.7	+0.0	+0.2	+0.1	+0.0	45.2	50.0	-4.8	L2
37	10.838M	39.2	+5.7	+0.0	+0.2	+0.1	+0.0	45.2	50.0	-4.8	L2
38	11.533M	38.8	+5.7	+0.1	+0.2	+0.1	+0.0	44.9	50.0	-5.1	L2
39	10.721M	38.8	+5.7	+0.0	+0.2	+0.1	+0.0	44.8	50.0	-5.2	L2

40	11.343M	38.5	+5.7	+0.1	+0.2	+0.1	+0.0	44.6	50.0	-5.4	L2
41	11.623M	37.2	+5.7	+0.1	+0.2	+0.1	+0.0	43.3	50.0	-6.7	L2
42	608.140k Ave	27.8	+5.7	+0.0	+0.0	+0.2	+0.0	33.7	46.0	-12.3	L2
^	608.139k	42.8	+5.7	+0.0	+0.0	+0.2	+0.0	48.7	46.0	+2.7	L2
44	428.156k Ave	29.0	+5.7	+0.0	+0.0	+0.1	+0.0	34.8	47.3	-12.5	L2
^	428.156k	46.4	+5.7	+0.0	+0.0	+0.1	+0.0	52.2	47.3	+4.9	L2
46	1.554M Ave	26.9	+5.7	+0.0	+0.0	+0.1	+0.0	32.7	46.0	-13.3	L2
^	1.554M	40.2	+5.7	+0.0	+0.0	+0.1	+0.0	46.0	46.0	+0.0	L2
48	446.336k Ave	27.2	+5.7	+0.0	+0.0	+0.1	+0.0	33.0	46.9	-13.9	L2
^	446.336k	45.2	+5.7	+0.0	+0.0	+0.1	+0.0	51.0	46.9	+4.1	L2
50	1.960M Ave	26.0	+5.7	+0.0	+0.0	+0.1	+0.0	31.8	46.0	-14.2	L2
^	1.960M	40.0	+5.7	+0.0	+0.0	+0.1	+0.0	45.8	46.0	-0.2	L2
52	284.533k Ave	29.6	+5.7	+0.0	+0.0	+0.1	+0.0	35.4	50.7	-15.3	L2
^	284.533k	45.7	+5.7	+0.0	+0.0	+0.1	+0.0	51.5	50.7	+0.8	L2
54	1.184M Ave	24.8	+5.7	+0.0	+0.0	+0.1	+0.0	30.6	46.0	-15.4	L2
^	1.184M	40.8	+5.7	+0.0	+0.0	+0.1	+0.0	46.6	46.0	+0.6	L2
56	1.013M Ave	24.6	+5.7	+0.0	+0.0	+0.1	+0.0	30.4	46.0	-15.6	L2
^	1.013M	40.5	+5.7	+0.0	+0.0	+0.1	+0.0	46.3	46.0	+0.3	L2
58	511.785k Ave	22.3	+5.7	+0.0	+0.0	+0.2	+0.0	28.2	46.0	-17.8	L2
^	511.784k	41.6	+5.7	+0.0	+0.0	+0.2	+0.0	47.5	46.0	+1.5	L2

Radiated Emissions

Test Setup / Conditions / Data

Test Location: CKC Laboratories, Inc. • 110 N Olinda Place • Brea, CA 92823 • 714-993-6112
Customer: **Yantrr Electronic Systems**
Specification: **ICES-003 Radiated Emissions Class B**
Work Order #: **100084**   Date: 7/14/2017
Test Type: **Maximized Emissions**   Time: 16:07:59
Tested By: Don Nguyen   Sequence#: 0
Software: EMITest 5.03.02

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The EUT is placed on tabletop. Cellular, GPS, and Wi-Fi antenna ports are connected to antennas. 3x USB ports are connected to 3x USB thumb drives. Audio port is connected to an earphone. Ethernet port is connected to sections of cable. HDMI port is connected to support monitor in standby mode. I2C port is not populated.
All wireless modules are set in receiver mode.
Approved wireless modules installed in the EUT are:

Wi-Fi module: BL-R8723BT1 / FCC ID : S8J-R8723BT1
Cellular module: Telit: LE910-NAG, FCC ID Filing: RI7LE910NA

Antenna information:
GPS- operating frequency: 1575.42MHz, voltage: 3V-5V, manufacture and model unknown/generic.
Wi-Fi- 5dBi gain, manufacture and model: unknown/generic.
Cellular- 2.5dBi gain, manufacturer: Pulse Electronics, model: W1900

The manufacturer declares that the highest frequency generated or used in the device is 2462MHz.

Frequency range of measurement = 30-12310MHz.
30-1000MHz, RBW=120kHz,VBW=120kHz;
1000-12000MHz, RBW=1MHz,VBW=1MHz;
Test Method: ANSI C63.4 (2014)

Site D

Test environment conditions: Temperature: 26°C, Relative Humidity: 48%, Pressure: 100kPa

Modification #1 was in place during testing.

Yantrr Electronic Systems WO#: 100084 Sequence#: 0 Date: 7/14/2017
ICES-003 Radiated Emissions Class B Test Distance: 3 Meters Horiz
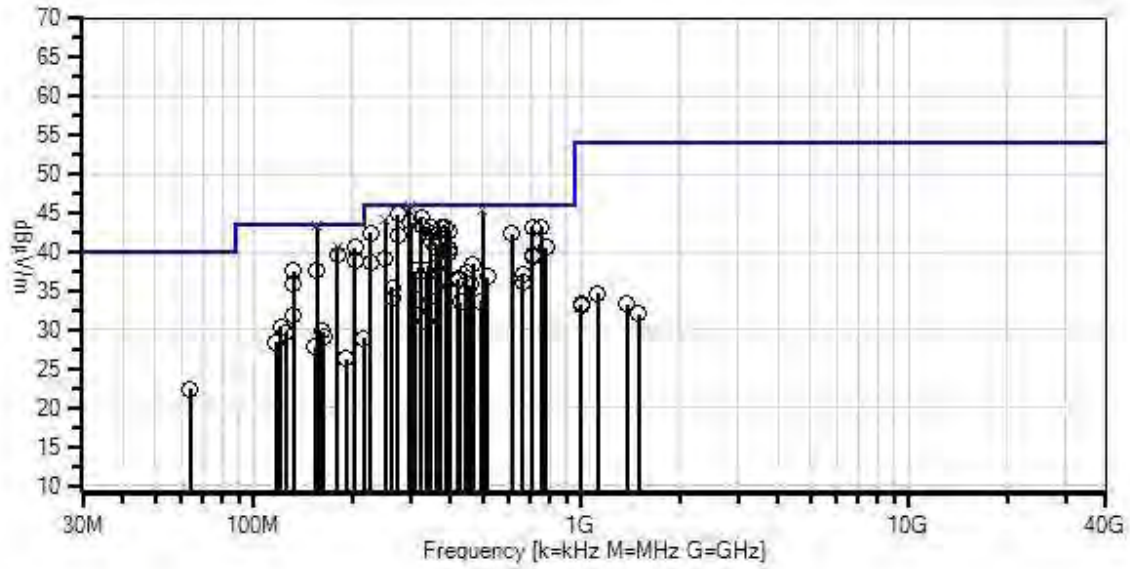
Legend:
- ——— Readings
- × QP Readings
- ▼ Ambient
- ——— 1 - ICES-003 Radiated Emissions Class B
- ○ Peak Readings
- ✳ Average Readings
- Software Version: 5.03.02

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00010	Preamp	8447D	3/14/2016	3/14/2018
T2	ANP05283	Attenuator	ATT-0218-06-NNN-02	5/5/2016	5/5/2018
T3	ANP05569	Cable-Amplitude +15C to +45C (dB)	RG-214/U	12/7/2016	12/7/2018
T4	AN01994	Biconilog Antenna	CBL6111C	3/11/2016	3/11/2018
T5	ANP06978	Cable	Sucoflex 104A	4/5/2016	4/5/2018
T6	ANP04382	Cable	LDF-50	6/6/2016	6/6/2018
	AN02672	Spectrum Analyzer	E4446A	3/2/2017	3/2/2019
T7	AN00787	Preamp	83017A	6/9/2017	6/9/2019
T8	AN01646	Horn Antenna	3115	3/4/2016	3/4/2018
T9	ANP06554	Cable	32022-29094K-29094K-24TC	12/30/2015	12/30/2017
T10	ANP07139	Cable	ANDL1-PNMNM-48	3/1/2017	3/1/2019

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

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1 QP	299.993M	48.6	-26.6 +0.2 +0.0	+5.8 +1.8 +0.0	+1.8 +0.0	+14.2 +0.0	+0.0	45.8	46.0	-0.2	Vert
^	299.993M	49.3	-26.6 +0.2 +0.0	+5.8 +1.8 +0.0	+1.8 +0.0	+14.2 +0.0	+0.0	46.5	46.0	+0.5	Vert
3 QP	155.995M	50.5	-26.9 +0.2 +0.0	+5.8 +1.3 +0.0	+1.3 +0.0	+11.1 +0.0	+0.0	43.3	43.5	-0.2	Vert
4 QP	156.000M	50.5	-26.9 +0.2 +0.0	+5.8 +1.3 +0.0	+1.3 +0.0	+11.1 +0.0	+0.0	43.3	43.5	-0.2	Vert
^	155.995M	51.6	-26.9 +0.2 +0.0	+5.8 +1.3 +0.0	+1.3 +0.0	+11.1 +0.0	+0.0	44.4	43.5	+0.9	Vert
^	156.000M	51.1	-26.9 +0.2 +0.0	+5.8 +1.3 +0.0	+1.3 +0.0	+11.1 +0.0	+0.0	43.9	43.5	+0.4	Vert
7 QP	500.000M	44.0	-28.0 +0.3 +0.0	+5.8 +2.4 +0.0	+2.3 +0.0	+18.6 +0.0	+0.0	45.4	46.0	-0.6	Horiz
^	500.000M	45.4	-28.0 +0.3 +0.0	+5.8 +2.4 +0.0	+2.3 +0.0	+18.6 +0.0	+0.0	46.8	46.0	+0.8	Horiz
9	275.995M	48.1	-26.6 +0.2 +0.0	+5.8 +1.7 +0.0	+1.7 +0.0	+14.0 +0.0	+0.0	44.9	46.0	-1.1	Vert

No.	Freq										Pol
10	323.990M	46.4	-26.7	+5.8	+1.9	+14.9	+0.0	44.4	46.0	-1.6	Horiz
			+0.2	+1.9	+0.0	+0.0					
			+0.0	+0.0							
11	251.990M QP	47.8	-26.6	+5.8	+1.6	+13.8	+0.0	44.2	46.0	-1.8	Vert
			+0.2	+1.6	+0.0	+0.0					
			+0.0	+0.0							
^	251.990M	48.4	-26.6	+5.8	+1.6	+13.8	+0.0	44.8	46.0	-1.2	Vert
			+0.2	+1.6	+0.0	+0.0					
			+0.0	+0.0							
13	300.000M	46.7	-26.6	+5.8	+1.8	+14.2	+0.0	43.9	46.0	-2.1	Horiz
			+0.2	+1.8	+0.0	+0.0					
			+0.0	+0.0							
14	324.000M	45.3	-26.7	+5.8	+1.9	+14.9	+0.0	43.3	46.0	-2.7	Vert
			+0.2	+1.9	+0.0	+0.0					
			+0.0	+0.0							
15	372.000M	44.1	-27.1	+5.8	+2.0	+16.2	+0.0	43.3	46.0	-2.7	Horiz
			+0.3	+2.0	+0.0	+0.0					
			+0.0	+0.0							
16	707.985M	36.9	-28.0	+5.8	+3.0	+22.2	+0.0	43.2	46.0	-2.8	Horiz
			+0.4	+2.9	+0.0	+0.0					
			+0.0	+0.0							
17	384.000M	43.6	-27.2	+5.8	+2.1	+16.5	+0.0	43.2	46.0	-2.8	Vert
			+0.3	+2.1	+0.0	+0.0					
			+0.0	+0.0							
18	756.000M	35.8	-27.9	+5.8	+3.1	+23.0	+0.0	43.2	46.0	-2.8	Vert
			+0.4	+3.0	+0.0	+0.0					
			+0.0	+0.0							
19	203.995M	48.3	-26.7	+5.8	+1.4	+10.1	+0.0	40.6	43.5	-2.9	Vert
			+0.2	+1.5	+0.0	+0.0					
			+0.0	+0.0							
20	348.000M	44.3	-26.9	+5.8	+2.0	+15.6	+0.0	43.1	46.0	-2.9	Horiz
			+0.3	+2.0	+0.0	+0.0					
			+0.0	+0.0							
21	180.000M QP	49.4	-26.9	+5.8	+1.3	+9.4	+0.0	40.6	43.5	-2.9	Vert
			+0.2	+1.4	+0.0	+0.0					
			+0.0	+0.0							
^	180.000M	50.2	-26.9	+5.8	+1.3	+9.4	+0.0	41.4	43.5	-2.1	Vert
			+0.2	+1.4	+0.0	+0.0					
			+0.0	+0.0							
^	180.000M	47.8	-26.9	+5.8	+1.3	+9.4	+0.0	39.0	43.5	-4.5	Vert
			+0.2	+1.4	+0.0	+0.0					
			+0.0	+0.0							
24	396.000M	43.0	-27.4	+5.8	+2.1	+16.8	+0.0	42.7	46.0	-3.3	Vert
			+0.3	+2.1	+0.0	+0.0					
			+0.0	+0.0							
25	228.000M	47.9	-26.7	+5.8	+1.5	+12.1	+0.0	42.4	46.0	-3.6	Horiz
			+0.2	+1.6	+0.0	+0.0					
			+0.0	+0.0							
26	347.990M	43.6	-26.9	+5.8	+2.0	+15.6	+0.0	42.4	46.0	-3.6	Horiz
			+0.3	+2.0	+0.0	+0.0					
			+0.0	+0.0							

27	612.008M	38.2	-28.1 +0.4 +0.0	+5.8 +2.6 +0.0	+2.7 +0.0	+20.8 +0.0	+0.0	42.4	46.0	-3.6	Vert
28	276.000M	45.4	-26.6 +0.2 +0.0	+5.8 +1.7 +0.0	+1.7 +0.0	+14.0 +0.0	+0.0	42.2	46.0	-3.8	Horiz
29	179.998M	48.3	-26.9 +0.2 +0.0	+5.8 +1.4 +0.0	+1.3 +0.0	+9.4 +0.0	+0.0	39.5	43.5	-4.0	Horiz
30	372.000M	42.5	-27.1 +0.3 +0.0	+5.8 +2.0 +0.0	+2.0 +0.0	+16.2 +0.0	+0.0	41.7	46.0	-4.3	Vert
31	348.000M	42.7	-26.9 +0.3 +0.0	+5.8 +2.0 +0.0	+2.0 +0.0	+15.6 +0.0	+0.0	41.5	46.0	-4.5	Vert
32	204.000M	46.5	-26.7 +0.2 +0.0	+5.8 +1.5 +0.0	+1.4 +0.0	+10.1 +0.0	+0.0	38.8	43.5	-4.7	Horiz
33	371.993M	41.9	-27.1 +0.3 +0.0	+5.8 +2.0 +0.0	+2.0 +0.0	+16.2 +0.0	+0.0	41.1	46.0	-4.9	Horiz
34	360.000M	41.7	-27.0 +0.3 +0.0	+5.8 +2.0 +0.0	+2.0 +0.0	+15.9 +0.0	+0.0	40.7	46.0	-5.3	Horiz
35	781.133M	32.3	-27.8 +0.4 +0.0	+5.9 +3.1 +0.0	+3.2 +0.0	+23.5 +0.0	+0.0	40.6	46.0	-5.4	Vert
36	396.000M	40.7	-27.4 +0.3 +0.0	+5.8 +2.1 +0.0	+2.1 +0.0	+16.8 +0.0	+0.0	40.4	46.0	-5.6	Horiz
37	156.003M	44.9	-26.9 +0.2 +0.0	+5.8 +1.3 +0.0	+1.3 +0.0	+11.1 +0.0	+0.0	37.7	43.5	-5.8	Horiz
38	132.000M	44.0	-27.0 +0.2 +0.0	+5.8 +1.2 +0.0	+1.2 +0.0	+12.1 +0.0	+0.0	37.5	43.5	-6.0	Horiz
39	395.995M	40.3	-27.4 +0.3 +0.0	+5.8 +2.1 +0.0	+2.1 +0.0	+16.8 +0.0	+0.0	40.0	46.0	-6.0	Horiz
40	708.008M	33.3	-28.0 +0.4 +0.0	+5.8 +2.9 +0.0	+3.0 +0.0	+22.2 +0.0	+0.0	39.6	46.0	-6.4	Vert
41	708.000M	33.2	-28.0 +0.4 +0.0	+5.8 +2.9 +0.0	+3.0 +0.0	+22.2 +0.0	+0.0	39.5	46.0	-6.5	Horiz
42	252.000M	42.7	-26.6 +0.2 +0.0	+5.8 +1.6 +0.0	+1.6 +0.0	+13.8 +0.0	+0.0	39.1	46.0	-6.9	Horiz
43	228.000M	44.2	-26.7 +0.2 +0.0	+5.8 +1.6 +0.0	+1.5 +0.0	+12.1 +0.0	+0.0	38.7	46.0	-7.3	Vert

44	467.983M	37.4	-27.8 +0.3 +0.0	+5.8 +2.3 +0.0	+2.3 +0.0	+18.1 +0.0	+0.0	38.4	46.0	-7.6	Vert
45	131.990M	42.3	-27.0 +0.2 +0.0	+5.8 +1.2 +0.0	+1.2 +0.0	+12.1 +0.0	+0.0	35.8	43.5	-7.7	Horiz
46	360.000M	38.8	-27.0 +0.3 +0.0	+5.8 +2.0 +0.0	+2.0 +0.0	+15.9 +0.0	+0.0	37.8	46.0	-8.2	Vert
47	312.000M	39.8	-26.7 +0.2 +0.0	+5.8 +1.9 +0.0	+1.9 +0.0	+14.6 +0.0	+0.0	37.5	46.0	-8.5	Horiz
48	336.000M	39.1	-26.8 +0.3 +0.0	+5.8 +1.9 +0.0	+1.9 +0.0	+15.3 +0.0	+0.0	37.5	46.0	-8.5	Horiz
49	443.995M	36.7	-27.7 +0.3 +0.0	+5.8 +2.2 +0.0	+2.3 +0.0	+17.7 +0.0	+0.0	37.3	46.0	-8.7	Horiz
50	660.008M	31.8	-28.1 +0.4 +0.0	+5.8 +2.8 +0.0	+2.8 +0.0	+21.5 +0.0	+0.0	37.0	46.0	-9.0	Vert
51	515.995M	35.0	-28.0 +0.3 +0.0	+5.8 +2.4 +0.0	+2.4 +0.0	+18.9 +0.0	+0.0	36.8	46.0	-9.2	Horiz
52	419.995M	36.4	-27.5 +0.3 +0.0	+5.8 +2.1 +0.0	+2.2 +0.0	+17.3 +0.0	+0.0	36.6	46.0	-9.4	Horiz
53	420.000M	36.1	-27.5 +0.3 +0.0	+5.8 +2.1 +0.0	+2.2 +0.0	+17.3 +0.0	+0.0	36.3	46.0	-9.7	Vert
54	659.995M	30.9	-28.1 +0.4 +0.0	+5.8 +2.8 +0.0	+2.8 +0.0	+21.5 +0.0	+0.0	36.1	46.0	-9.9	Horiz
55	456.000M	34.9	-27.7 +0.3 +0.0	+5.8 +2.2 +0.0	+2.3 +0.0	+17.9 +0.0	+0.0	35.7	46.0	-10.3	Vert
56	360.000M	36.7	-27.0 +0.3 +0.0	+5.8 +2.0 +0.0	+2.0 +0.0	+15.9 +0.0	+0.0	35.7	46.0	-10.3	Vert
57	263.990M	38.7	-26.6 +0.2 +0.0	+5.8 +1.7 +0.0	+1.7 +0.0	+13.9 +0.0	+0.0	35.4	46.0	-10.6	Vert
58	132.003M	38.4	-27.0 +0.2 +0.0	+5.8 +1.2 +0.0	+1.2 +0.0	+12.1 +0.0	+0.0	31.9	43.5	-11.6	Horiz
59	264.000M	37.5	-26.6 +0.2 +0.0	+5.8 +1.7 +0.0	+1.7 +0.0	+13.9 +0.0	+0.0	34.2	46.0	-11.8	Horiz
60	312.000M	36.2	-26.7 +0.2 +0.0	+5.8 +1.9 +0.0	+1.9 +0.0	+14.6 +0.0	+0.0	33.9	46.0	-12.1	Vert

61	491.995M	32.3	-28.0 +0.3 +0.0	+5.8 +2.4 +0.0	+2.3 +0.0	+18.5 +0.0	+0.0	33.6	46.0	-12.4	Horiz
62	427.950M	33.2	-27.6 +0.3 +0.0	+5.8 +2.2 +0.0	+2.2 +0.0	+17.4 +0.0	+0.0	33.5	46.0	-12.5	Vert
63	120.650M	37.0	-27.0 +0.2 +0.0	+5.8 +1.1 +0.0	+1.1 +0.0	+12.1 +0.0	+0.0	30.3	43.5	-13.2	Vert
64	348.000M	33.6	-26.9 +0.3 +0.0	+5.8 +2.0 +0.0	+2.0 +0.0	+15.6 +0.0	+0.0	32.4	46.0	-13.6	Vert
65	161.750M	37.6	-26.9 +0.2 +0.0	+5.8 +1.3 +0.0	+1.3 +0.0	+10.5 +0.0	+0.0	29.8	43.5	-13.7	Vert
66	162.450M	37.7	-26.9 +0.2 +0.0	+5.8 +1.3 +0.0	+1.3 +0.0	+10.4 +0.0	+0.0	29.8	43.5	-13.7	Horiz
67	125.000M	36.1	-27.0 +0.2 +0.0	+5.8 +1.1 +0.0	+1.1 +0.0	+12.2 +0.0	+0.0	29.5	43.5	-14.0	Vert
68	163.800M	37.1	-26.9 +0.2 +0.0	+5.8 +1.3 +0.0	+1.3 +0.0	+10.3 +0.0	+0.0	29.1	43.5	-14.4	Vert
69	336.000M	32.7	-26.8 +0.3 +0.0	+5.8 +1.9 +0.0	+1.9 +0.0	+15.3 +0.0	+0.0	31.1	46.0	-14.9	Vert
70	116.525M	35.5	-27.0 +0.2 +0.0	+5.8 +1.1 +0.0	+1.1 +0.0	+11.8 +0.0	+0.0	28.5	43.5	-15.0	Vert
71	154.050M	34.9	-26.9 +0.2 +0.0	+5.8 +1.3 +0.0	+1.3 +0.0	+11.2 +0.0	+0.0	27.8	43.5	-15.7	Vert
72	216.025M	35.5	-26.7 +0.2 +0.0	+5.8 +1.5 +0.0	+1.5 +0.0	+11.1 +0.0	+0.0	28.9	46.0	-17.1	Horiz
73	192.000M	34.6	-26.8 +0.2 +0.0	+5.8 +1.5 +0.0	+1.4 +0.0	+9.6 +0.0	+0.0	26.3	43.5	-17.2	Vert

74	64.050M	35.2	-27.2 +0.2 +0.0	+5.8 +0.8 +0.0	+0.7 +0.0	+6.9 +0.0	+0.0	22.4	40.0	-17.6	Horiz
75	1125.050M	47.5	+0.0 +0.0 +0.4	+0.0 +3.8 +1.9	+0.0 -41.3	+0.0 +22.4	+0.0	34.7	54.0	-19.3	Vert
76	1000.100M	47.7	+0.0 +0.0 +0.4	+0.0 +3.5 +1.8	+0.0 -42.0	+0.0 +21.9	+0.0	33.3	54.0	-20.7	Vert
77	1375.000M	43.6	+0.0 +0.0 +0.4	+0.0 +4.3 +2.1	+0.0 -40.3	+0.0 +23.2	+0.0	33.3	54.0	-20.7	Vert
78	1000.250M	47.4	+0.0 +0.0 +0.4	+0.0 +3.5 +1.8	+0.0 -42.0	+0.0 +21.9	+0.0	33.0	54.0	-21.0	Horiz
79	1500.100M	41.6	+0.0 +0.0 +0.4	+0.0 +4.5 +2.2	+0.0 -40.2	+0.0 +23.5	+0.0	32.0	54.0	-22.0	Vert

30MHz – 1GHz

30MHz – 1GHz

1 - 12GHz

1 - 12GHz

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.

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.