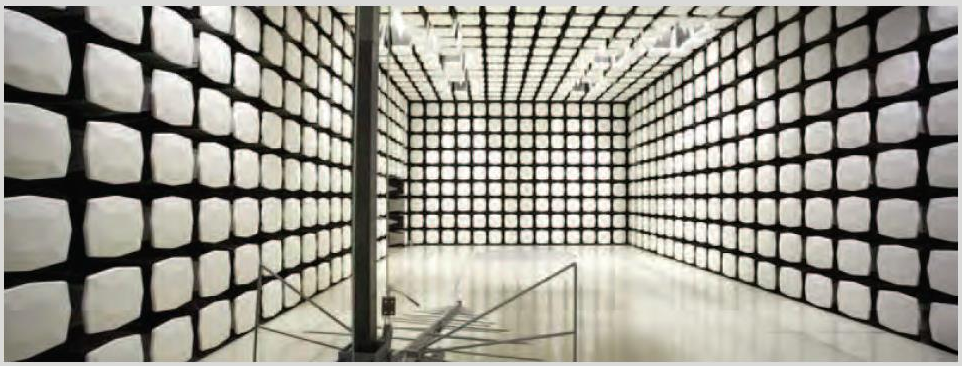
Cleaveland Price Inc.

LineScope® Radio Module

FCC 15.247:2019

902-928MHz Other Wideband (DTS) Transceiver

Report # CLEV0001



NVLAP LAB CODE: 201049-0

CERTIFICATE OF TEST

Last Date of Test: July 23, 2019
Cleaveland Price Inc.
Model: LineScope Radio Module

Radio Equipment Testing

Standards

Specification	Method
FCC 15.207:2019	ANSI C63.10:2013, KDB 558074
FCC 15.247:2019	

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	Yes	Pass	
6.5, 6.6, 11.12.1, 11.13.2	Spurious Radiated Emissions	Yes	Pass	
7.8.2	Carrier Frequency Separation	No	N/A	Not required for DTS devices.
7.8.3	Number of Hopping Frequencies	No	N/A	Not required for DTS devices.
7.8.4	Dwell Time	No	N/A	Not required for DTS devices.
7.8.6	Band Edge Compliance - Hopping Mode	No	N/A	Not required for DTS devices.
11.6	Duty Cycle	Yes	Pass	
11.8.2	Occupied Bandwidth	Yes	Pass	
11.9.1.1	Output Power	Yes	Pass	
11.9.1.1	Equivalent Isotropic Radiated Power	Yes	Pass	
11.10.2	Power Spectral Density	Yes	Pass	
11.11	Band Edge Compliance	Yes	Pass	
11.11	Spurious Conducted Emissions	Yes	Pass	

Deviations From Test Standards

None

Approved By:

Jeremiah Darden, Operations Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information. As indicated in the Statement of Work sent with the quotation, Element's standard process is to always use the latest published version of the test methods even when earlier versions are cited in the test specification. Issuance of a purchase order was de facto acceptance of this approach. Otherwise, the client would have advised Element in writing of the specific version of the test methods they wanted applied to the subject testing.

REVISION HISTORY

Revision Number	Description	Date (yyyy-mm-dd)	Page Number
00	None		

ACCREDITATIONS AND AUTHORIZATIONS

United States

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Accredited by A2LA to ISO / IEC 17065 as a product certifier. This allows Element to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

ISED - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB) and as a CAB for the acceptance of test data.

European Union

European Commission – Within Element, we have a EU Notified Body validated for the EMCD and RED Directives.

Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

Korea

MSIT / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

Singapore

IDA – Recognized by IDA as a CAB for the acceptance of test data.

Israel

MOC – Recognized by MOC as a CAB for the acceptance of test data.

Hong Kong

OFCA – Recognized by OFCA as a CAB for the acceptance of test data.

Vietnam

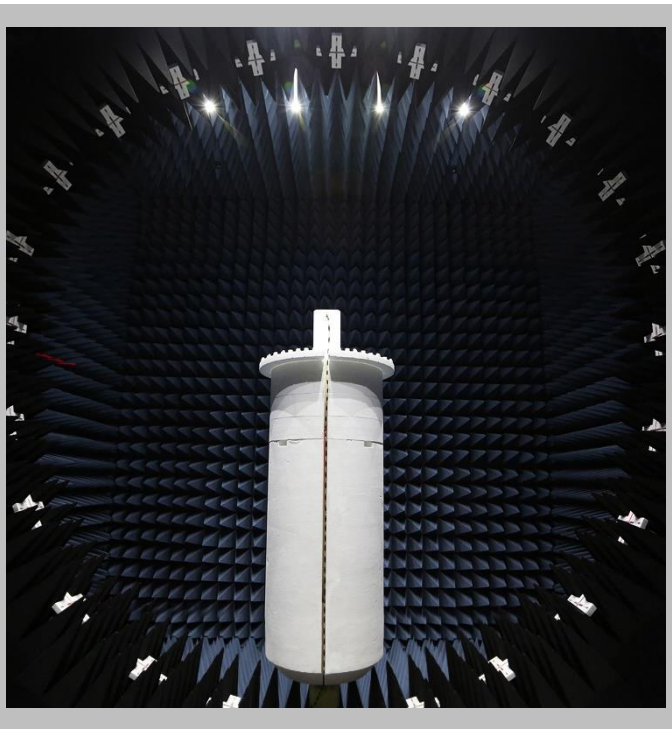
MIC – Recognized by MIC as a CAB for the acceptance of test data.

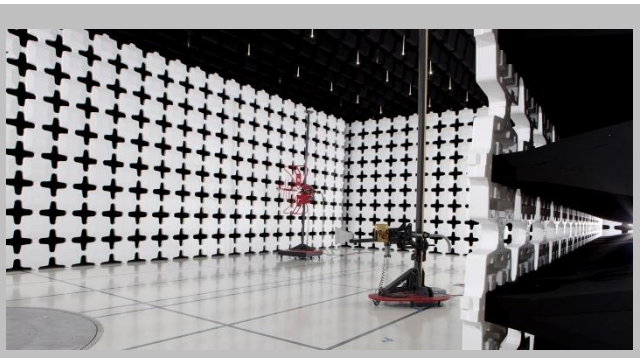
SCOPE

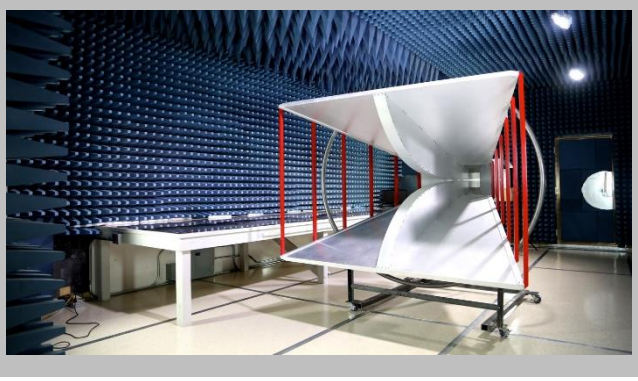
For details on the Scopes of our Accreditations, please visit:
https://www.nwemc.com/emc-testing-accreditations

FACILITIES

California	Minnesota	Oregon	Texas	Washington
Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs MN01-10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Labs EV01-12 6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Labs NC01-05 19201 120th Ave NE Bothell, WA 98011 (425)984-6600
NVLAP				
NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200630-0	NVLAP Lab Code:201049-0	NVLAP Lab Code: 200629-0
Innovation, Science and Economic Development Canada				
2834B-1, 2834B-3	2834E-1, 2834E-3	2834D-1	2834G-1	2834F-1
BSMI				
SL2-IN-E-1154R	SL2-IN-E-1152R	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI				
A-0029	A-0109	A-0108	A-0201	A-0110
Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA				
US0158	US0175	US0017	US0191	US0157







MEASUREMENT UNCERTAINTY

element
TMU.2015.07.10

Measurement Uncertainty

When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

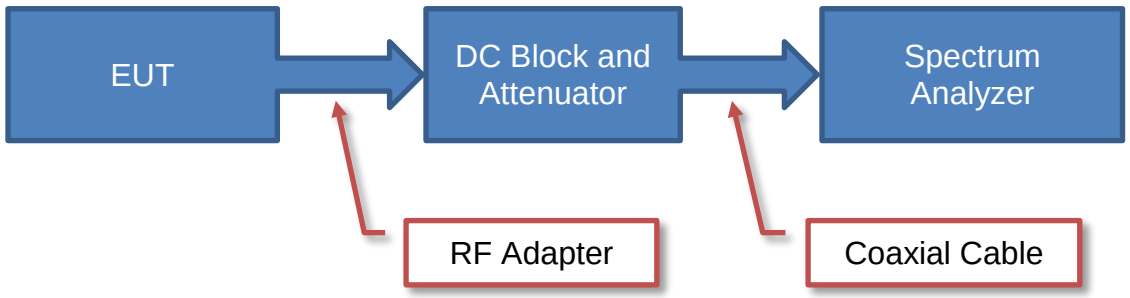
A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found included as part of the applicable test description page. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable), and are available upon request.

The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

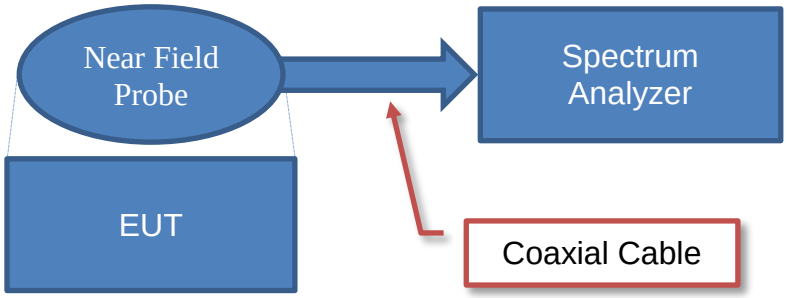
Test	+ MU	- MU
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	1.2 dB	-1.2 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	5.1 dB	-5.1 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

Test Setup Block Diagrams

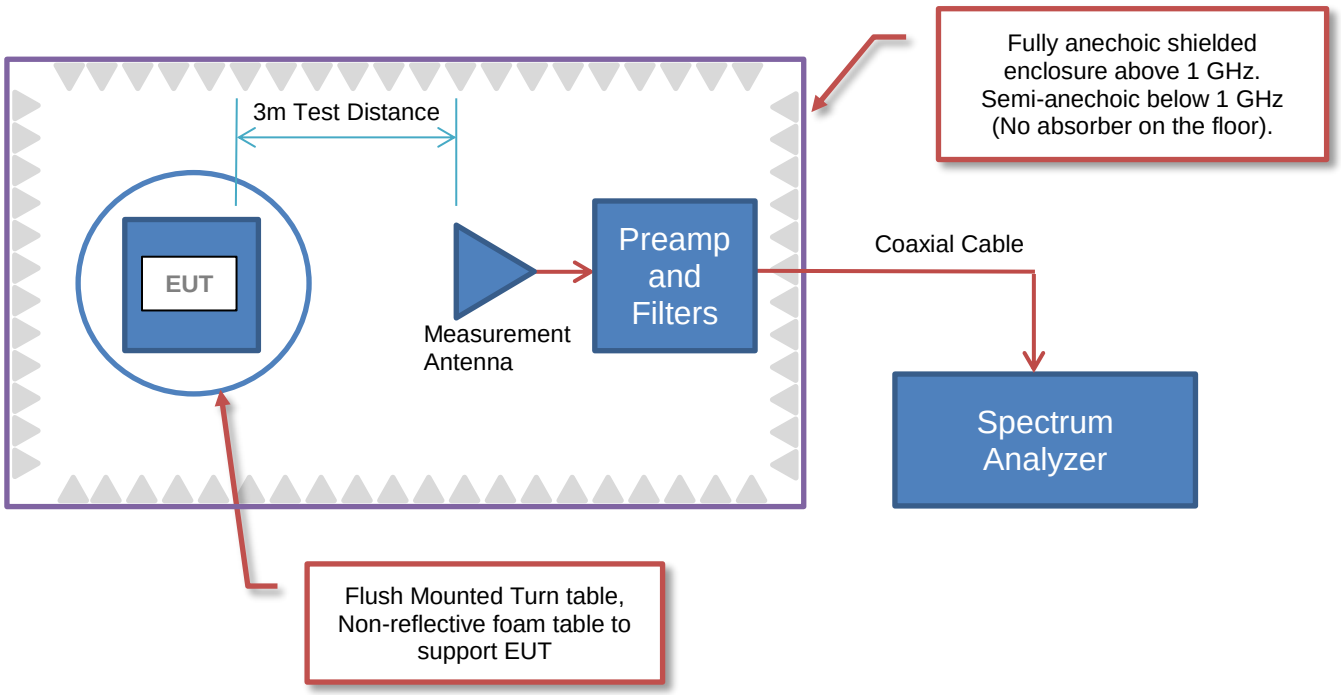
Antenna Port Conducted Measurements



Near Field Test Fixture Measurements



Spurious Radiated Emissions



PRODUCT DESCRIPTION

Client and Equipment Under Test (EUT) Information

Company Name:	Cleaveland Price Inc.
Address:	14000 Route 993
City, State, Zip:	Trafford, PA 15085
Test Requested By:	Justin Reinhart
Model:	LineScope Radio Module
First Date of Test:	May 23, 2019
Last Date of Test:	July 23, 2019
Receipt Date of Samples:	May 23, 2019
Equipment Design Stage:	Prototype
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
902-928MHz DTS radio module for use in wireless power line monitoring systems

Testing Objective:
Seeking to demonstrate compliance under FCC 15.247:2019 for operation in the 902 - 928 MHz Band.

CONFIGURATIONS

Configuration CLEV0001- 1

Software/Firmware Running during test	
Description	**Version**
Putty	0.71

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Radio Module Board	Cleaveland Price Inc.	Unknown	004372RP
RHCP Antenna	PCTEL	FMD9023-CP	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
12VDC Battery	B. B. Battery	BP8-12	None
Serial DC Power Card	Cleaveland Price Inc.	Unknown	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Power Leads	No	5.5m	No	12VDC Battery	Serial DC Power Card
Ribbon Cable	No	0.5m	Yes (External)	Serial DC Power Card	Radio Module Board
u.FL to SMA Cable	Yes	0.5m	No	Radio Module Board	Antenna

CONFIGURATIONS

Configuration CLEV0001- 2

Software/Firmware Running during test	
Description	**Version**
Putty	0.71

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Radio Module Board	Cleaveland Price Inc.	Unknown	004372RP
Salt Shaker Antenna	PCTEL	Unknown	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
12VDC Battery	B. B. Battery	BP8-12	None
Serial DC Power Card	Cleaveland Price Inc.	Unknown	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Power Leads	No	5.5m	No	12VDC Battery	Serial DC Power Card
Ribbon Cable	No	0.5m	Yes (External)	Serial DC Power Card	Radio Module Board
u.FL to SMA Cable	Yes	0.5m	No	Radio Module Board	Antenna

CONFIGURATIONS

Configuration CLEV0001- 3

Software/Firmware Running during test	
Description	**Version**
Putty	0.71

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Radio Module Board	Cleaveland Price Inc.	Unknown	004372RP
Yagi Antenna	ZDA Communications US LLC	ZDADJ928-14YG	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
12VDC Battery	B. B. Battery	BP8-12	None
Serial DC Power Card	Cleaveland Price Inc.	Unknown	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Power Leads	No	5.5m	No	12VDC Battery	Serial DC Power Card
Ribbon Cable	No	0.5m	Yes (External)	Serial DC Power Card	Radio Module Board
u.FL to SMA Cable	Yes	0.5m	No	Radio Module Board	Antenna

CONFIGURATIONS

Configuration CLEV0001- 4

Software/Firmware Running during test	
Description	**Version**
Putty	0.71

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Radio Module Board	Cleaveland Price Inc.	Unknown	004372RP
Dipole PCB Antenna	Unknown	Unknown	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
12VDC Battery	B. B. Battery	BP8-12	None
Serial DC Power Card	Cleaveland Price Inc.	Unknown	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Power Leads	No	5.5m	No	12VDC Battery	Serial DC Power Card
Ribbon Cable	No	0.5m	Yes (External)	Serial DC Power Card	Radio Module Board

CONFIGURATIONS

Configuration CLEV0001- 6

Software/Firmware Running during test	
Description	**Version**
Putty	0.71

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Radio Module Board	Cleaveland Price Inc.	Unknown	004372RP

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
12VDC Battery	B. B. Battery	BP8-12	None
Serial DC Power Card	Cleaveland Price Inc.	Unknown	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Power Leads	No	5.5m	No	12VDC Battery	Serial DC Power Card
Ribbon Cable	No	0.5m	Yes (External)	Serial DC Power Card	Radio Module Board
u.FL to SMA Cable	Yes	0.5m	No	Radio Module Board	Antenna

CONFIGURATIONS

Configuration CLEV0001- 7

Software/Firmware Running during test	
Description	**Version**
Putty	0.71

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Radio Module Board	Cleaveland Price Inc.	Unknown	004372RP
RHCP Antenna	PCTEL	FMD9023-CP	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Serial DC Power Card	Cleaveland Price Inc.	Unknown	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Ribbon Cable	No	0.5m	Yes (External)	Serial DC Power Card	Radio Module Board
u.FL to SMA Cable	Yes	0.5m	No	Radio Module Board	Antenna
DC Power Leads	No	2m	No	LISN	Serial DC Power Card

CONFIGURATIONS

Configuration CLEV0001- 8

Software/Firmware Running during test	
Description	**Version**
Putty	0.71

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Radio Module Board	Cleaveland Price Inc.	Unknown	004372RP
Salt Shaker Antenna	PCTEL	Unknown	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Serial DC Power Card	Cleaveland Price Inc.	Unknown	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Ribbon Cable	No	0.5m	Yes (External)	Serial DC Power Card	Radio Module Board
u.FL to SMA Cable	Yes	0.5m	No	Radio Module Board	Antenna
DC Power Leads	No	2m	No	LISN	Serial DC Power Card

CONFIGURATIONS

Configuration CLEV0001- 9

Software/Firmware Running during test	
Description	**Version**
Putty	0.71

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Radio Module Board	Cleaveland Price Inc.	Unknown	004372RP
Yagi Antenna	ZDA Communications US LLC	ZDADJ928-14YG	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Serial DC Power Card	Cleaveland Price Inc.	Unknown	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Ribbon Cable	No	0.5m	Yes (External)	Serial DC Power Card	Radio Module Board
u.FL to SMA Cable	Yes	0.5m	No	Radio Module Board	Antenna
DC Power Leads	No	2m	No	LISN	Serial DC Power Card

CONFIGURATIONS

Configuration CLEV0001- 10

Software/Firmware Running during test	
Description	**Version**
Putty	0.71

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Radio Module Board	Cleaveland Price Inc.	Unknown	004372RP
Dipole PCB Antenna	Unknown	Unknown	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Serial DC Power Card	Cleaveland Price Inc.	Unknown	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Ribbon Cable	No	0.5m	Yes (External)	Serial DC Power Card	Radio Module Board
DC Power Leads	No	2m	No	LISN	Serial DC Power Card

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2019-05-23	Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
2	2019-05-23	Duty Cycle	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
3	2019-05-23	Equivalent Isotropic Radiated Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
4	2019-05-23	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
5	2019-05-23	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
6	2019-05-23	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
7	2019-05-23	Power Spectral Density	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
8	2019-06-05	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT taken home by the client before the next scheduled test.
9	2019-07-23	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

POWER SETTINGS

The EUT was tested using the power settings provided by the manufacturer:

SETTINGS FOR ALL TESTS IN THIS REPORT

Position	Frequency (MHz)	Power Setting
Low Channel	903.1	9 (11dBm)
Mid Channel	915.0	9 (11dBm)
High Channel	926.6	9 (11dBm)

POWERLINE CONDUCTED EMISSIONS

element
WTD.2019.1.24

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Per the standard, an insulating material was also added to ground plane between the EUT's power and remote I/O cables. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50ohm measuring port is terminated by a 50ohm EMI meter or a 50ohm resistive load. All 50ohm measuring ports of the LISN are terminated by 50ohm. The test data represents the configuration/ operating mode/ model that produced the highest emission levels as compared to the specification limit.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2019-03-19	2020-03-19
Cable - Conducted Cable Assembly	Northwest EMC	TXA, HHZ, TQU	TXAA	2019-01-30	2020-01-30
LISN	Solar Electronics	9252-50-R-24-BNC	LJK	2018-09-07	2019-09-07
Power Supply - DC	Ametek Programmable Power, Inc.	Sorenson XEL30-3D	TQE	NCR	NCR

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	2.4 dB	-2.4 dB

CONFIGURATIONS INVESTIGATED

CLEV0001-10
CLEV0001-7
CLEV0001-8
CLEV0001-9

MODES INVESTIGATED

Transmitting at Mid Channel 915.0 MHz

POWERLINE CONDUCTED EMISSIONS

EUT:	LineScope Radio Module	Work Order:	CLEV0001
Serial Number:	See Configurations	Date:	2019-07-23
Customer:	Cleaveland Price Inc.	Temperature:	22.2°C
Attendees:	None	Relative Humidity:	49.6%
Customer Project:	None	Bar. Pressure:	1024 mb
Tested By:	Jonathan Kiefer	Job Site:	TX01
Power:	12VDC	Configuration:	CLEV0001-7

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2019	ANSI C63.10:2013

TEST PARAMETERS

Run #:	32	Line:	Positive Lead	Add. Ext. Attenuation (dB):	0

COMMENTS

Power setting 9

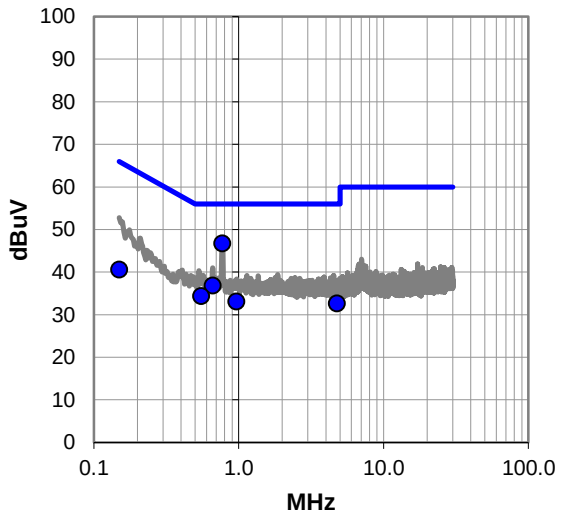
EUT OPERATING MODES

Transmitting at Mid Channel 915.0 MHz

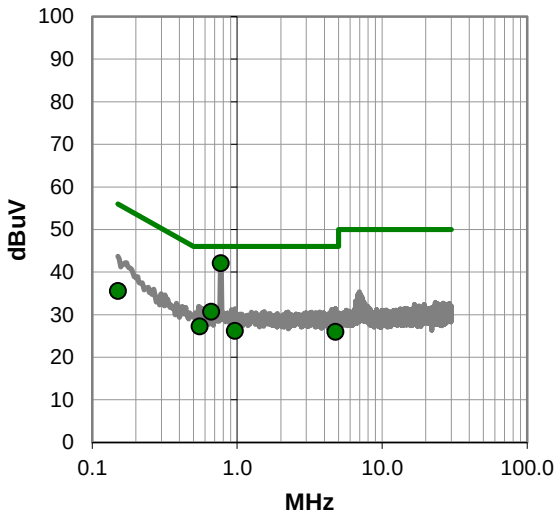
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

element
WTD.2019.1.24

RESULTS - Run #32

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.770	26.6	20.2	46.8	56.0	-9.2
0.660	16.7	20.2	36.9	56.0	-19.1
0.549	14.3	20.1	34.4	56.0	-21.6
0.962	12.9	20.2	33.1	56.0	-22.9
4.758	12.5	20.2	32.7	56.0	-23.3
0.150	20.3	20.3	40.6	66.0	-25.4

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.770	21.9	20.2	42.1	46.0	-3.9
0.660	10.5	20.2	30.7	46.0	-15.3
0.549	7.2	20.1	27.3	46.0	-18.7
0.962	6.0	20.2	26.2	46.0	-19.8
4.758	5.8	20.2	26.0	46.0	-20.0
0.150	15.3	20.3	35.6	56.0	-20.4

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS

EUT:	LineScope Radio Module	Work Order:	CLEV0001
Serial Number:	See Configurations	Date:	2019-07-23
Customer:	Cleaveland Price Inc.	Temperature:	22.2°C
Attendees:	None	Relative Humidity:	49.6%
Customer Project:	None	Bar. Pressure:	1024 mb
Tested By:	Jonathan Kiefer	Job Site:	TX01
Power:	12VDC	Configuration:	CLEV0001-7

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2019	ANSI C63.10:2013

TEST PARAMETERS

Run #:	33	Line:	Negative Lead	Add. Ext. Attenuation (dB):	0

COMMENTS

Power setting 9

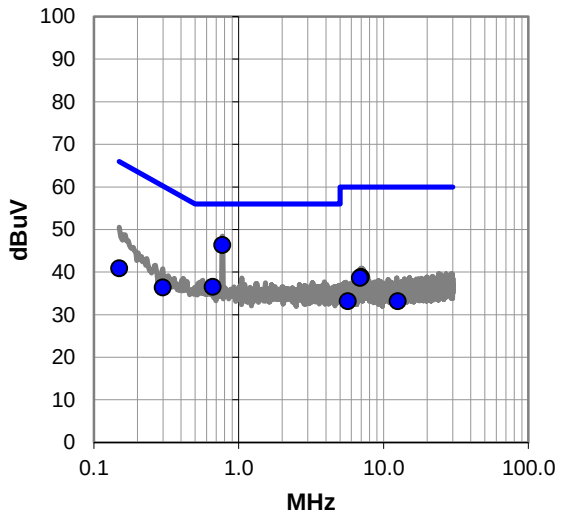
EUT OPERATING MODES

Transmitting at Mid Channel 915.0 MHz

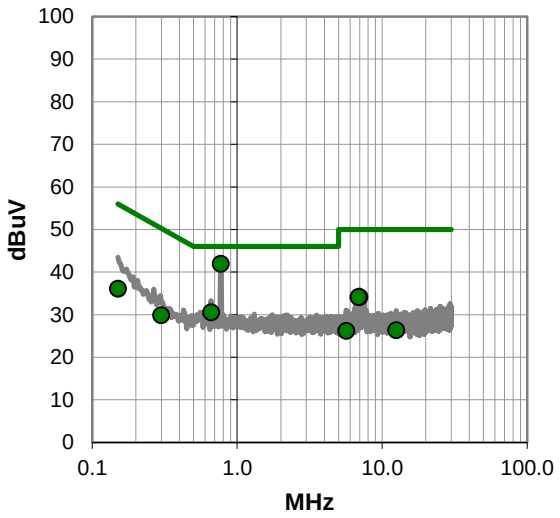
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

element
WTD.2019.1.24

RESULTS - Run #33

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.770	26.2	20.2	46.4	56.0	-9.6
0.661	16.4	20.2	36.6	56.0	-19.4
6.979	18.6	20.3	38.9	60.0	-21.1
6.861	18.4	20.3	38.7	60.0	-21.3
0.299	16.3	20.1	36.4	60.3	-23.9
0.150	20.6	20.3	40.9	66.0	-25.1
5.651	12.9	20.3	33.2	60.0	-26.8
12.514	12.6	20.6	33.2	60.0	-26.8

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.770	21.8	20.2	42.0	46.0	-4.0
0.661	10.4	20.2	30.6	46.0	-15.4
6.979	13.9	20.3	34.2	50.0	-15.8
6.861	13.9	20.3	34.2	50.0	-15.8
0.150	15.8	20.3	36.1	56.0	-19.9
0.299	9.8	20.1	29.9	50.3	-20.4
12.514	5.8	20.6	26.4	50.0	-23.6
5.651	5.9	20.3	26.2	50.0	-23.8

CONCLUSION

Pass

Jonathan Kiefer

Tested By

POWERLINE CONDUCTED EMISSIONS

EUT:	LineScope Radio Module	Work Order:	CLEV0001
Serial Number:	See Configurations	Date:	2019-07-23
Customer:	Cleaveland Price Inc.	Temperature:	22.2°C
Attendees:	None	Relative Humidity:	49.6%
Customer Project:	None	Bar. Pressure:	1024 mb
Tested By:	Jonathan Kiefer	Job Site:	TX01
Power:	12VDC	Configuration:	CLEV0001-8

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2019	ANSI C63.10:2013

TEST PARAMETERS

Run #:	34	Line:	Positive Lead	Add. Ext. Attenuation (dB):	0

COMMENTS

Power setting 9

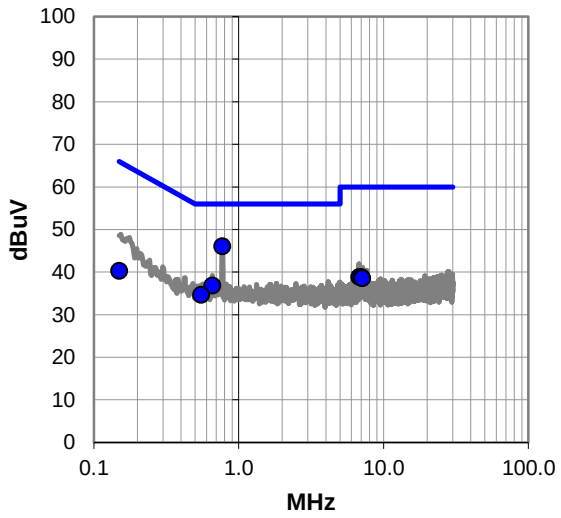
EUT OPERATING MODES

Transmitting at Mid Channel 915.0 MHz

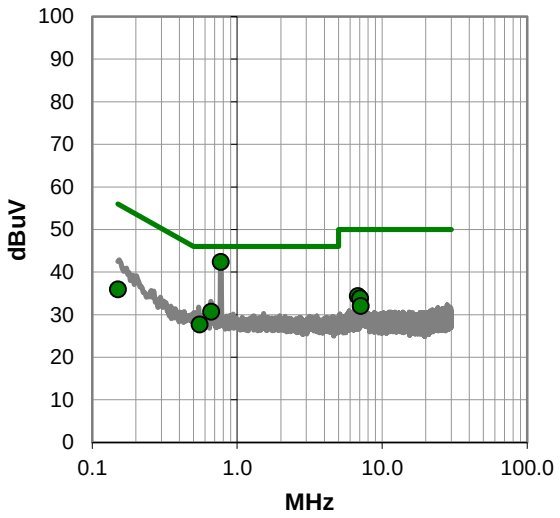
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

element
WTD.2019.1.24

RESULTS - Run #34

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.770	25.9	20.2	46.1	56.0	-9.9
0.660	16.7	20.2	36.9	56.0	-19.1
6.802	18.6	20.3	38.9	60.0	-21.1
7.038	18.5	20.3	38.8	60.0	-21.2
0.551	14.6	20.1	34.7	56.0	-21.3
7.128	18.3	20.3	38.6	60.0	-21.4
0.150	20.0	20.3	40.3	66.0	-25.7

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.770	22.2	20.2	42.4	46.0	-3.6
0.660	10.5	20.2	30.7	46.0	-15.3
6.802	14.1	20.3	34.4	50.0	-15.6
7.038	13.6	20.3	33.9	50.0	-16.1
7.128	11.8	20.3	32.1	50.0	-17.9
0.551	7.6	20.1	27.7	46.0	-18.3
0.150	15.7	20.3	36.0	56.0	-20.0

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS

EUT:	LineScope Radio Module	Work Order:	CLEV0001
Serial Number:	See Configurations	Date:	2019-07-23
Customer:	Cleaveland Price Inc.	Temperature:	22.2°C
Attendees:	None	Relative Humidity:	49.6%
Customer Project:	None	Bar. Pressure:	1024 mb
Tested By:	Jonathan Kiefer	Job Site:	TX01
Power:	12VDC	Configuration:	CLEV0001-8

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2019	ANSI C63.10:2013

TEST PARAMETERS

Run #:	35	Line:	Negative Lead	Add. Ext. Attenuation (dB):	0

COMMENTS

Power setting 9

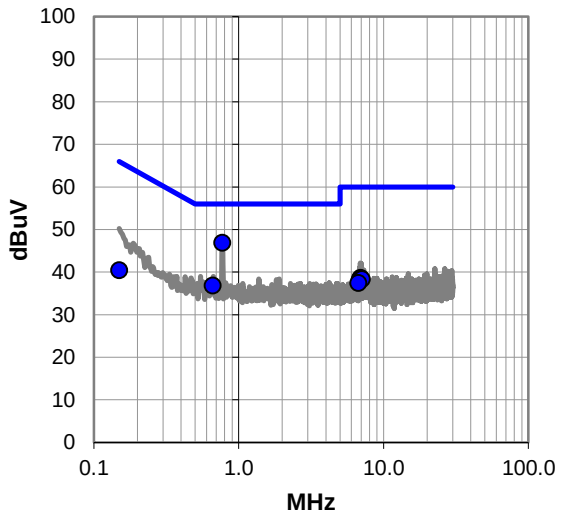
EUT OPERATING MODES

Transmitting at Mid Channel 915.0 MHz

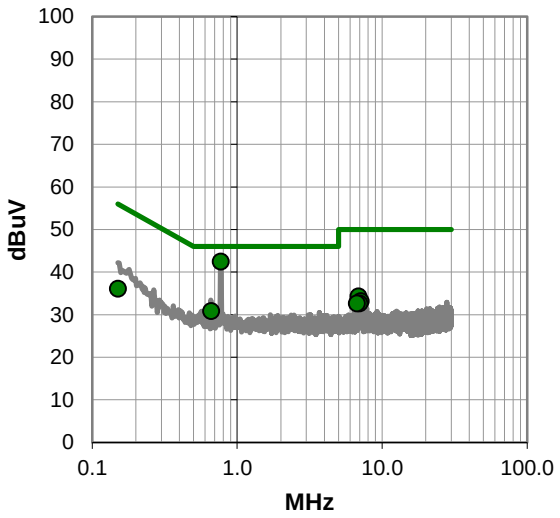
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

element
WTD.2019.1.24

RESULTS - Run #35

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.770	26.7	20.2	46.9	56.0	-9.1
0.660	16.7	20.2	36.9	56.0	-19.1
6.951	18.4	20.3	38.7	60.0	-21.3
6.862	18.1	20.3	38.4	60.0	-21.6
7.097	18.1	20.3	38.4	60.0	-21.6
6.685	17.2	20.3	37.5	60.0	-22.5
0.150	20.2	20.3	40.5	66.0	-25.5

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.770	22.3	20.2	42.5	46.0	-3.5
0.660	10.7	20.2	30.9	46.0	-15.1
6.862	14.0	20.3	34.3	50.0	-15.7
7.097	12.9	20.3	33.2	50.0	-16.8
6.951	12.4	20.3	32.7	50.0	-17.3
6.685	12.4	20.3	32.7	50.0	-17.3
0.150	15.8	20.3	36.1	56.0	-19.9

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS

EUT:	LineScope Radio Module	Work Order:	CLEV0001
Serial Number:	See Configurations	Date:	2019-07-23
Customer:	Cleaveland Price Inc.	Temperature:	22.2°C
Attendees:	None	Relative Humidity:	49.6%
Customer Project:	None	Bar. Pressure:	1024 mb
Tested By:	Jonathan Kiefer	Job Site:	TX01
Power:	12VDC	Configuration:	CLEV0001-9

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2019	ANSI C63.10:2013

TEST PARAMETERS

Run #:	36	Line:	Positive Lead	Add. Ext. Attenuation (dB):	0

COMMENTS

Power setting 9

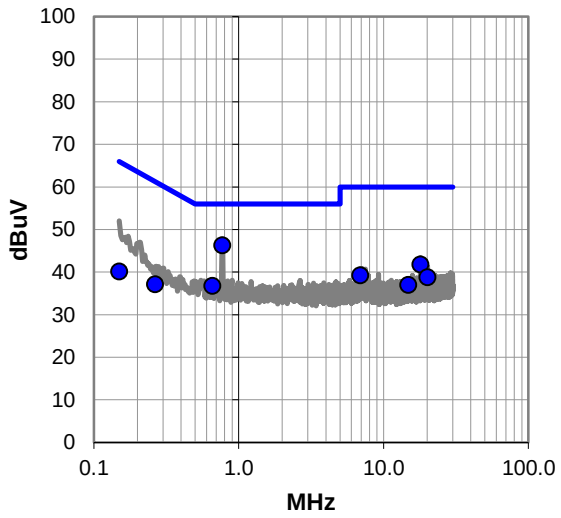
EUT OPERATING MODES

Transmitting at Mid Channel 915.0 MHz

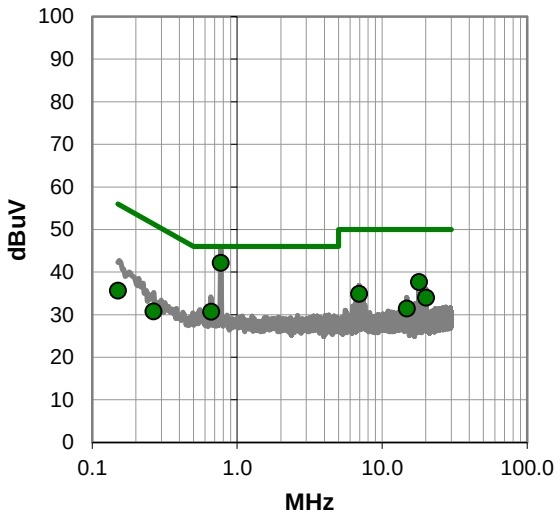
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

element
WTD.2019.1.24

RESULTS - Run #36

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.769	26.1	20.2	46.3	56.0	-9.7
17.961	20.9	20.9	41.8	60.0	-18.2
0.660	16.6	20.2	36.8	56.0	-19.2
6.921	19.0	20.3	39.3	60.0	-20.7
20.074	17.7	21.1	38.8	60.0	-21.2
14.791	16.3	20.7	37.0	60.0	-23.0
0.265	17.1	20.1	37.2	61.3	-24.1
0.150	19.9	20.3	40.2	66.0	-25.8

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.769	22.0	20.2	42.2	46.0	-3.8
17.961	16.8	20.9	37.7	50.0	-12.3
6.921	14.6	20.3	34.9	50.0	-15.1
0.660	10.5	20.2	30.7	46.0	-15.3
20.074	12.9	21.1	34.0	50.0	-16.0
14.791	10.8	20.7	31.5	50.0	-18.5
0.150	15.4	20.3	35.7	56.0	-20.3
0.265	10.7	20.1	30.8	51.3	-20.5

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS

EUT:	LineScope Radio Module	Work Order:	CLEV0001
Serial Number:	See Configurations	Date:	2019-07-23
Customer:	Cleaveland Price Inc.	Temperature:	22.2°C
Attendees:	None	Relative Humidity:	49.6%
Customer Project:	None	Bar. Pressure:	1024 mb
Tested By:	Jonathan Kiefer	Job Site:	TX01
Power:	12VDC	Configuration:	CLEV0001-9

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2019	ANSI C63.10:2013

TEST PARAMETERS

Run #:	37	Line:	Negative Lead	Add. Ext. Attenuation (dB):	0

COMMENTS

Power setting 9

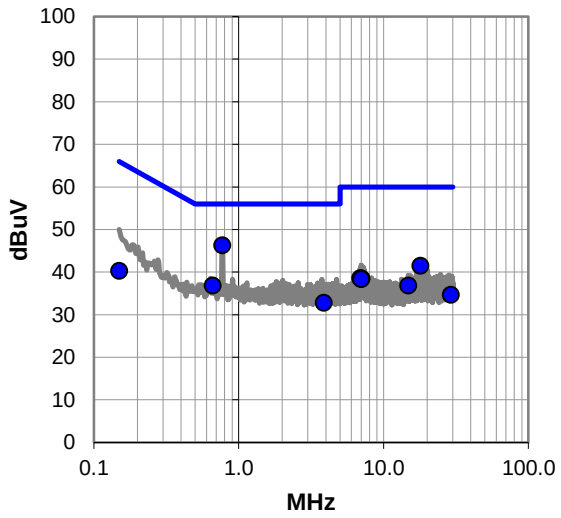
EUT OPERATING MODES

Transmitting at Mid Channel 915.0 MHz

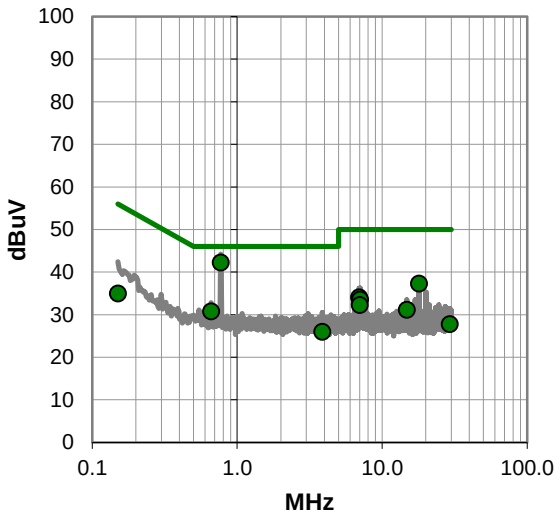
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

element
WTD.2019.1.24

RESULTS - Run #37

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.770	26.1	20.2	46.3	56.0	-9.7
17.961	20.6	20.9	41.5	60.0	-18.5
0.660	16.7	20.2	36.9	56.0	-19.1
6.921	18.3	20.3	38.6	60.0	-21.4
7.039	18.2	20.3	38.5	60.0	-21.5
7.009	18.1	20.3	38.4	60.0	-21.6
14.792	16.2	20.7	36.9	60.0	-23.1
3.864	12.6	20.2	32.8	56.0	-23.2
29.185	12.8	21.9	34.7	60.0	-25.3
0.150	20.0	20.3	40.3	66.0	-25.7

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.770	22.1	20.2	42.3	46.0	-3.7
17.961	16.4	20.9	37.3	50.0	-12.7
0.660	10.6	20.2	30.8	46.0	-15.2
6.921	13.8	20.3	34.1	50.0	-15.9
7.039	13.3	20.3	33.6	50.0	-16.4
7.009	12.0	20.3	32.3	50.0	-17.7
14.792	10.5	20.7	31.2	50.0	-18.8
3.864	5.8	20.2	26.0	46.0	-20.0
0.150	14.7	20.3	35.0	56.0	-21.0
29.185	5.9	21.9	27.8	50.0	-22.2

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS

element
WTD.2019.1.24

EUT:	LineScope Radio Module	Work Order:	CLEV0001
Serial Number:	See Configurations	Date:	2019-07-23
Customer:	Cleaveland Price Inc.	Temperature:	22.2°C
Attendees:	None	Relative Humidity:	49.6%
Customer Project:	None	Bar. Pressure:	1024 mb
Tested By:	Jonathan Kiefer	Job Site:	TX01
Power:	12VDC	Configuration:	CLEV0001-10

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2019	ANSI C63.10:2013

TEST PARAMETERS

Run #:	38	Line:	Positive Lead	Add. Ext. Attenuation (dB):	0

COMMENTS

Power setting 9

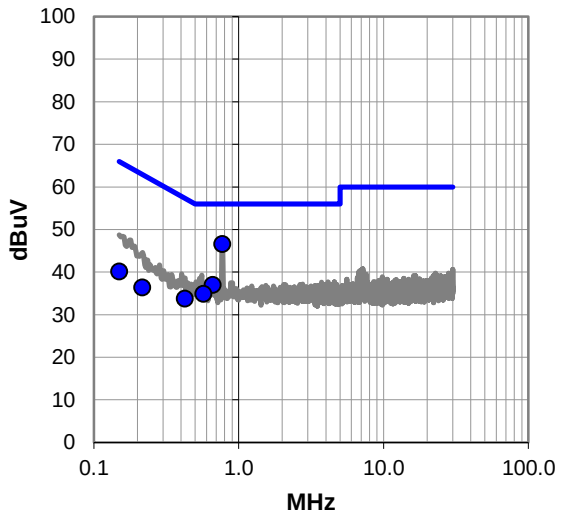
EUT OPERATING MODES

Transmitting at Mid Channel 915.0 MHz

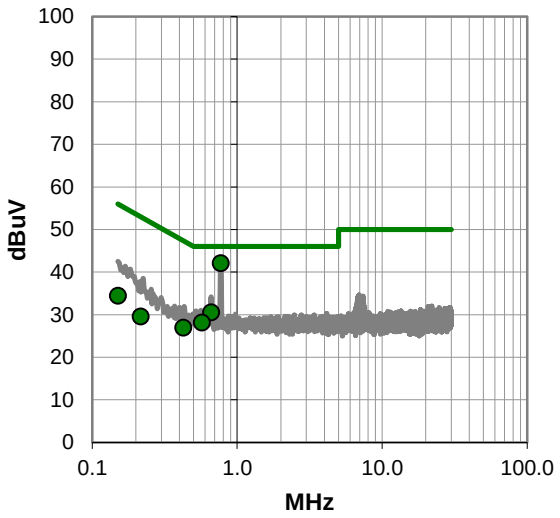
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

element
WTD.2019.1.24

RESULTS - Run #38

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.770	26.4	20.2	46.6	56.0	-9.4
0.660	16.8	20.2	37.0	56.0	-19.0
0.570	14.8	20.1	34.9	56.0	-21.1
0.425	13.7	20.1	33.8	57.3	-23.5
0.150	19.9	20.3	40.2	66.0	-25.8
0.216	16.2	20.2	36.4	63.0	-26.6

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.770	21.9	20.2	42.1	46.0	-3.9
0.660	10.4	20.2	30.6	46.0	-15.4
0.570	8.1	20.1	28.2	46.0	-17.8
0.425	6.9	20.1	27.0	47.3	-20.3
0.150	14.2	20.3	34.5	56.0	-21.5
0.216	9.4	20.2	29.6	53.0	-23.4

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS

EUT:	LineScope Radio Module	Work Order:	CLEV0001
Serial Number:	See Configurations	Date:	2019-07-23
Customer:	Cleaveland Price Inc.	Temperature:	22.2°C
Attendees:	None	Relative Humidity:	49.6%
Customer Project:	None	Bar. Pressure:	1024 mb
Tested By:	Jonathan Kiefer	Job Site:	TX01
Power:	12VDC	Configuration:	CLEV0001-10

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2019	ANSI C63.10:2013

TEST PARAMETERS

Run #:	39	Line:	Negative Lead	Add. Ext. Attenuation (dB):	0

COMMENTS

Power setting 9

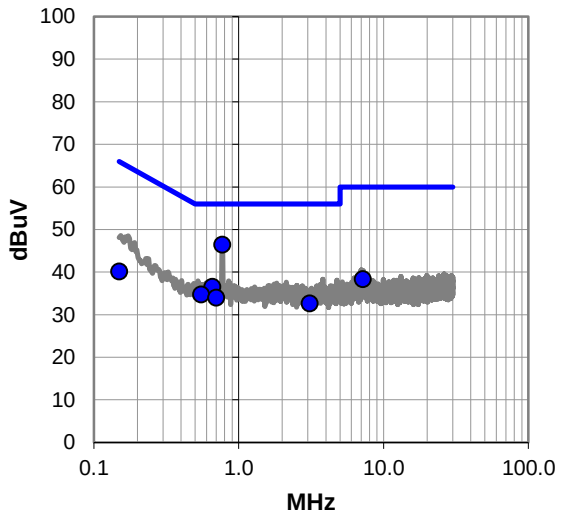
EUT OPERATING MODES

Transmitting at Mid Channel 915.0 MHz

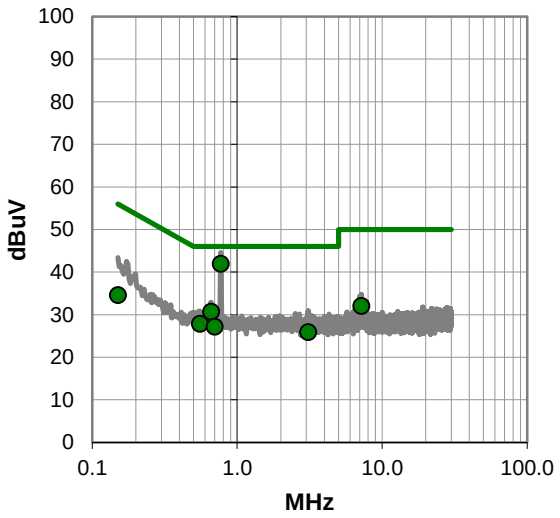
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

element
WTD.2019.1.24

RESULTS - Run #39

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.770	26.3	20.2	46.5	56.0	-9.5
0.660	16.4	20.2	36.6	56.0	-19.4
0.552	14.7	20.1	34.8	56.0	-21.2
7.188	18.1	20.3	38.4	60.0	-21.6
0.700	13.7	20.3	34.0	56.0	-22.0
3.093	12.5	20.2	32.7	56.0	-23.3
0.150	19.9	20.3	40.2	66.0	-25.8

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.770	21.8	20.2	42.0	46.0	-4.0
0.660	10.5	20.2	30.7	46.0	-15.3
7.188	11.8	20.3	32.1	50.0	-17.9
0.552	7.8	20.1	27.9	46.0	-18.1
0.700	6.9	20.3	27.2	46.0	-18.8
3.093	5.7	20.2	25.9	46.0	-20.1
0.150	14.3	20.3	34.6	56.0	-21.4

CONCLUSION

Pass

Tested By

SPURIOUS RADIATED EMISSIONS

PSA-ESCI 2019.05.10

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION See Configurations

Transmitting at Low Channel 903.1 MHz, Mid Channel 915.0 MHz, High Channel 926.6 MHz

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

CLEV0001 - 4
CLEV0001 - 3
CLEV0001 - 2
CLEV0001 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	10 GHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Filter - High Pass	Micro-Tronics	HPM50108	HGD	10-Oct-2018	12 mo
Attenuator	Weinschel Corp	4H-10	AWA	17-Mar-2019	12 mo
Attenuator	Weinschel Corp	4H-20	AWB	17-Mar-2019	12 mo
Filter - Band Reject	Wainwright Instruments	WTRCTV5-750-1000-20-70-60EEK	CUL	25-Feb-2019	12 mo
Filter - Low Pass	Micro-Tronics	LPM50003	HHT	3-Aug-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	PAK	9-Oct-2018	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AJF	NCR	0 mo
Cable	Northwest EMC	8-18GHz	TXD	14-May-2019	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAJ	17-Mar-2019	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AJL	11-Oct-2018	24 mo
Cable	Northwest EMC	1-8.2 GHz	TXC	14-May-2019	12 mo
Amplifier - Pre-Amplifier	Fairview Microwave	FMAM63001	PAS	24-Jan-2019	12 mo
Antenna - Biconilog	ETS Lindgren	3143B	AYF	10-May-2018	24 mo
Cable	Northwest EMC	RE 9kHz - 1GHz	TXB	22-Aug-2018	12 mo
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	27-Feb-2019	12 mo

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These “pre-scans” are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector
PK = Peak Detector
AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

Measurements at the edges of the allowable band may be presented in an alternative method as provided for in the ANSI C63.10 Marker-Delta method. This method involves performing an in-band fundamental measurement followed by a screen capture of the fundamental and out-of-band emission using reduced measurement instrumentation bandwidths. The amplitude delta measured on this screen capture is applied to the fundamental emission value to show the out-of-band emission level as applied to the limit.

Where the radio test software does not provide for a duty cycle at continuous transmit conditions (> 98%) and the RMS (power average) measurements were made across the on and off times of the EUT transmissions, a duty cycle correction is added to the measurements using the formula of 10 *LOG(dc).

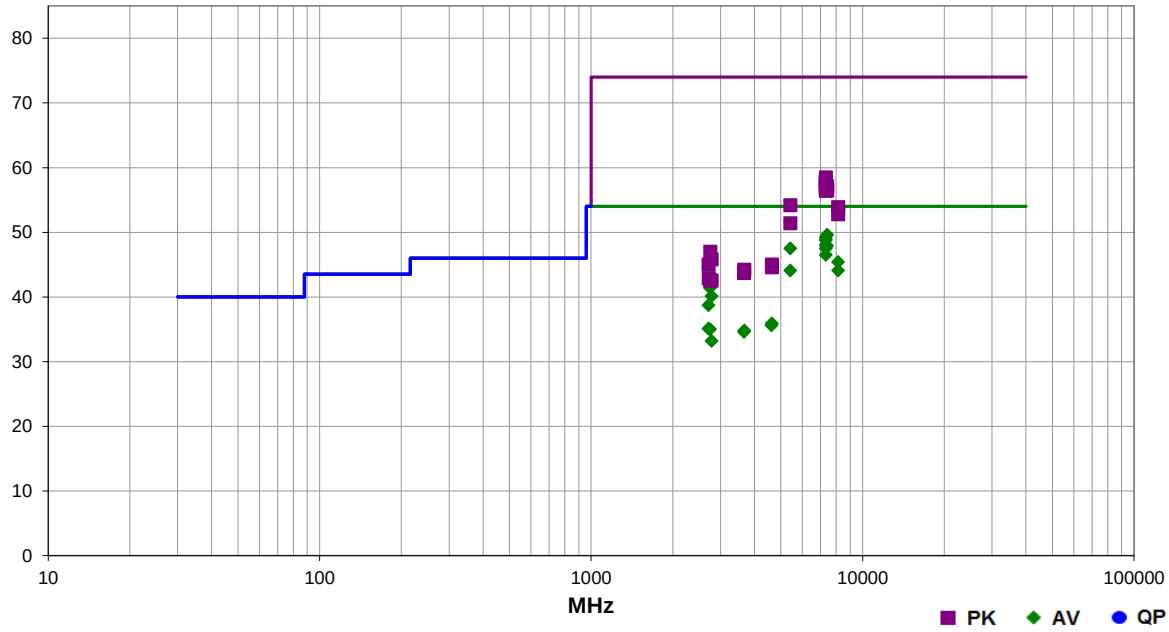
SPURIOUS RADIATED EMISSIONS

EmiR5 2019.05.20 PSA-ESCI 2019.05.10

Work Order:	CLEV0001	**Date:**	3-Jun-2019		
Project:	None	**Temperature:**	22.5 °C		
Job Site:	TX02	**Humidity:**	53.6% RH		
Serial Number:	See Configurations	**Barometric Pres.:**	1018 mbar	**Tested by:**	Jonathan Kiefer
EUT:	LineScope Radio Module				
Configuration:	1				
Customer:	Cleaveland Price Inc.				
Attendees:	None				
EUT Power:	Battery				
Operating Mode:	Transmitting at Low Channel 903.1 MHz, Mid Channel 915.0 MHz, High Channel 926.6 MHz				
Deviations:	None				
Comments:	See table comments for EUT channel and orientation information. EUT <98% duty cycle; therefore a correction factor was added: 10*LOG(1/DC) = 10*LOG(1/.727) = 1.4 dB. This correction factor was added to the average detector measurements.				

Test Specifications	**Test Method**
FCC 15.247:2019	ANSI C63.10:2013

Run #	91	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7413.292	36.5	11.7	1.5	115.0	1.4	0.0	Horz	AV	0.0	49.6	54.0	-4.4	High Ch, EUT On Side
7320.992	36.1	11.7	1.5	120.0	1.4	0.0	Horz	AV	0.0	49.2	54.0	-4.8	Mid Ch, EUT On Side
7321.050	35.7	11.7	1.0	315.9	1.4	0.0	Horz	AV	0.0	48.8	54.0	-5.2	Mid Ch, EUT Vertical
7321.117	35.7	11.7	2.0	44.0	1.4	0.0	Vert	AV	0.0	48.8	54.0	-5.2	Mid Ch, EUT Vertical
7320.958	34.9	11.7	1.5	342.0	1.4	0.0	Vert	AV	0.0	48.0	54.0	-6.0	Mid Ch, EUT Horizontal
7413.333	34.8	11.7	1.8	345.0	1.4	0.0	Vert	AV	0.0	47.9	54.0	-6.1	High Ch, EUT Vertical
7321.133	34.4	11.7	3.3	26.0	1.4	0.0	Horz	AV	0.0	47.5	54.0	-6.5	Mid Ch, EUT Horizontal
5419.500	39.6	6.5	3.2	42.0	1.4	0.0	Vert	AV	0.0	47.5	54.0	-6.5	Low Ch, EUT Vertical
7321.067	33.4	11.7	1.5	4.9	1.4	0.0	Vert	AV	0.0	46.5	54.0	-7.5	Mid Ch, EUT On Side
8129.583	31.8	12.2	2.7	105.0	1.4	0.0	Horz	AV	0.0	45.4	54.0	-8.6	Low Ch, EUT On Side
8129.583	30.5	12.2	1.4	58.9	1.4	0.0	Vert	AV	0.0	44.1	54.0	-9.9	Low Ch, EUT Vertical
5419.500	36.2	6.5	1.5	78.0	1.4	0.0	Horz	AV	0.0	44.1	54.0	-9.9	Low Ch, EUT On Side
2745.417	43.5	-3.5	2.9	68.0	1.4	0.0	Horz	AV	0.0	41.4	54.0	-12.6	Mid Ch, EUT On Side
2779.917	42.1	-3.4	2.6	86.0	1.4	0.0	Horz	AV	0.0	40.1	54.0	-13.9	High Ch, EUT On Side
2709.792	40.9	-3.6	2.6	68.0	1.4	0.0	Horz	AV	0.0	38.7	54.0	-15.3	Low Ch, EUT On Side
7320.875	46.8	11.7	1.5	120.0	0.0	0.0	Horz	PK	0.0	58.5	74.0	-15.5	Mid Ch, EUT On Side
7317.783	46.1	11.7	1.0	315.9	0.0	0.0	Horz	PK	0.0	57.8	74.0	-16.2	Mid Ch, EUT Vertical
7321.500	46.0	11.7	2.0	44.0	0.0	0.0	Vert	PK	0.0	57.7	74.0	-16.3	Mid Ch, EUT Vertical

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7322.308	45.5	11.7	3.3	26.0	0.0	0.0	Horz	PK	0.0	57.2	74.0	-16.8	Mid Ch, EUT Horizontal
7414.792	45.4	11.7	1.5	115.0	0.0	0.0	Horz	PK	0.0	57.1	74.0	-16.9	High Ch, EUT On Side
7317.708	45.2	11.7	1.5	342.0	0.0	0.0	Vert	PK	0.0	56.9	74.0	-17.1	Mid Ch, EUT Horizontal
7413.000	44.8	11.7	1.8	345.0	0.0	0.0	Vert	PK	0.0	56.5	74.0	-17.5	High Ch, EUT Vertical
7320.425	44.7	11.7	1.5	4.9	0.0	0.0	Vert	PK	0.0	56.4	74.0	-17.6	Mid Ch, EUT On Side
4633.125	31.1	3.4	3.1	195.0	1.4	0.0	Vert	AV	0.0	35.9	54.0	-18.1	High Ch, EUT Vertical
4622.000	30.9	3.3	1.5	360.0	1.4	0.0	Horz	AV	0.0	35.6	54.0	-18.4	High Ch, EUT On Side
2709.875	37.3	-3.6	1.0	186.0	1.4	0.0	Vert	AV	0.0	35.1	54.0	-18.9	Low Ch, EUT Vertical
2745.500	37.1	-3.5	2.4	360.0	1.4	0.0	Vert	AV	0.0	35.0	54.0	-19.0	Mid Ch, EUT Vertical
3671.917	32.1	1.3	1.5	339.9	1.4	0.0	Vert	AV	0.0	34.8	54.0	-19.2	Mid Ch, EUT Vertical
3660.667	32.0	1.2	1.5	102.0	1.4	0.0	Horz	AV	0.0	34.6	54.0	-19.4	Mid Ch, EUT On Side
5416.917	47.7	6.5	3.2	42.0	0.0	0.0	Vert	PK	0.0	54.2	74.0	-19.8	Low Ch, EUT Vertical
8123.708	41.7	12.2	2.7	105.0	0.0	0.0	Horz	PK	0.0	53.9	74.0	-20.1	Low Ch, EUT On Side
2779.125	35.2	-3.4	1.5	204.0	1.4	0.0	Vert	AV	0.0	33.2	54.0	-20.8	High Ch, EUT Vertical
8125.208	40.6	12.2	1.4	58.9	0.0	0.0	Vert	PK	0.0	52.8	74.0	-21.2	Low Ch, EUT Vertical
5417.375	44.9	6.5	1.5	78.0	0.0	0.0	Horz	PK	0.0	51.4	74.0	-22.6	Low Ch, EUT On Side
2746.375	50.5	-3.5	2.9	68.0	0.0	0.0	Horz	PK	0.0	47.0	74.0	-27.0	Mid Ch, EUT On Side
2780.250	49.2	-3.4	2.6	86.0	0.0	0.0	Horz	PK	0.0	45.8	74.0	-28.2	High Ch, EUT On Side
2710.083	48.6	-3.6	2.6	68.0	0.0	0.0	Horz	PK	0.0	45.0	74.0	-29.0	Low Ch, EUT On Side
4633.167	41.6	3.4	3.1	195.0	0.0	0.0	Vert	PK	0.0	45.0	74.0	-29.0	High Ch, EUT Vertical
4635.417	41.2	3.4	1.5	360.0	0.0	0.0	Horz	PK	0.0	44.6	74.0	-29.4	High Ch, EUT On Side
3668.083	42.9	1.3	1.5	102.0	0.0	0.0	Horz	PK	0.0	44.2	74.0	-29.8	Mid Ch, EUT On Side
3657.958	42.5	1.2	1.5	339.9	0.0	0.0	Vert	PK	0.0	43.7	74.0	-30.3	Mid Ch, EUT Vertical
2710.500	46.5	-3.6	1.0	186.0	0.0	0.0	Vert	PK	0.0	42.9	74.0	-31.1	Low Ch, EUT Vertical
2745.625	46.1	-3.5	2.4	360.0	0.0	0.0	Vert	PK	0.0	42.6	74.0	-31.4	Mid Ch, EUT Vertical
2779.583	45.9	-3.4	1.5	204.0	0.0	0.0	Vert	PK	0.0	42.5	74.0	-31.5	High Ch, EUT Vertical

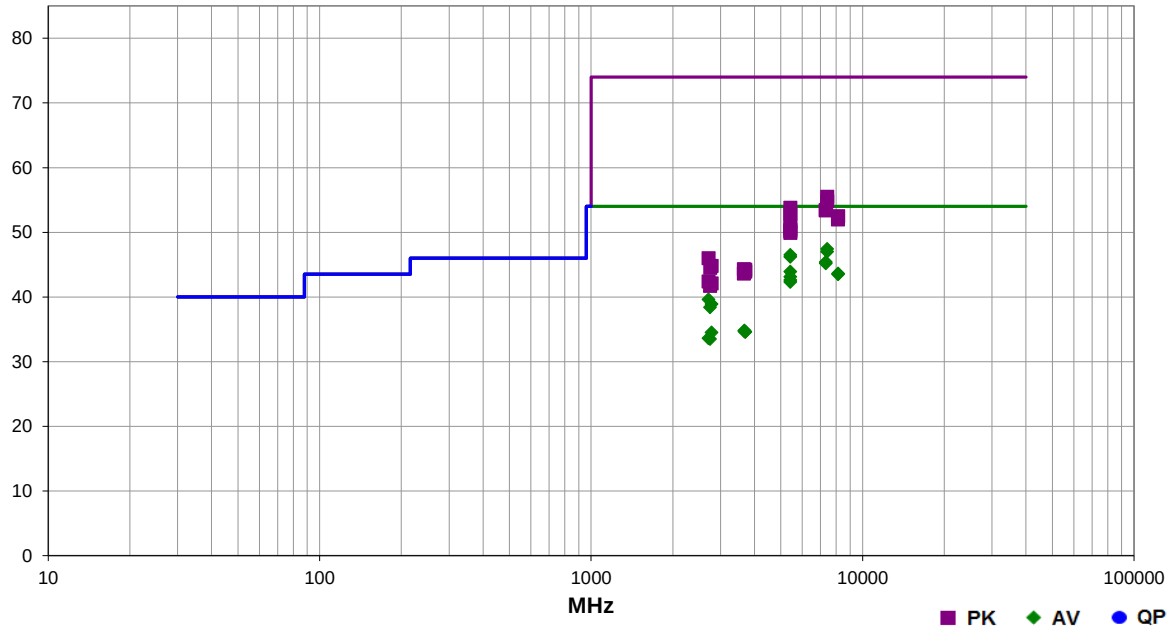
SPURIOUS RADIATED EMISSIONS

EmiR5 2019.05.20 PSA-ESCI 2019.05.10

Work Order:	CLEV0001	**Date:**	4-Jun-2019		
Project:	None	**Temperature:**	22.3 °C		
Job Site:	TX02	**Humidity:**	52.6% RH		
Serial Number:	See Configurations	**Barometric Pres.:**	1018 mbar	**Tested by:**	Jonathan Kiefer
EUT:	LineScope Radio Module				
Configuration:	2				
Customer:	Cleaveland Price Inc.				
Attendees:	None				
EUT Power:	Battery				
Operating Mode:	Transmitting at Low Channel 903.1 MHz, Mid Channel 915.0 MHz, High Channel 926.6 MHz				
Deviations:	None				
Comments:	Power setting 9. See table comments for EUT channel and orientation information. EUT <98% duty cycle; therefore a correction factor was added: 10*LOG(1/DC) = 10*LOG(1/.727) = 1.4 dB. This correction factor was added to the average detector measurements.				

Test Specifications	**Test Method**
FCC 15.247:2019	ANSI C63.10:2013

Run #	118	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7413.375	34.3	11.7	4.0	318.0	1.4	0.0	Vert	AV	0.0	47.4	54.0	-6.6	High Ch, EUT Horizontal
7413.500	33.9	11.7	1.6	16.9	1.4	0.0	Horz	AV	0.0	47.0	54.0	-7.0	High Ch, EUT On Side
5419.583	38.6	6.5	1.8	336.0	1.4	0.0	Horz	AV	0.0	46.5	54.0	-7.5	Low Ch, EUT On Side
5419.458	38.3	6.5	1.5	268.9	1.4	0.0	Horz	AV	0.0	46.2	54.0	-7.8	Low Ch, EUT Horizontal
7320.917	32.3	11.7	1.5	15.9	1.4	0.0	Horz	AV	0.0	45.4	54.0	-8.6	Mid Ch, EUT On Side
7321.250	32.1	11.7	1.5	105.9	1.4	0.0	Vert	AV	0.0	45.2	54.0	-8.8	Mid Ch, EUT Horizontal
5419.292	36.0	6.5	1.9	331.0	1.4	0.0	Vert	AV	0.0	43.9	54.0	-10.1	Low Ch, EUT Horizontal
8129.375	30.0	12.2	1.5	249.9	1.4	0.0	Vert	AV	0.0	43.6	54.0	-10.4	Low Ch, EUT Horizontal
8128.125	29.9	12.2	1.5	265.0	1.4	0.0	Horz	AV	0.0	43.5	54.0	-10.5	Low Ch, EUT On Side
5419.625	35.2	6.5	3.7	2.0	1.4	0.0	Vert	AV	0.0	43.1	54.0	-10.9	Low Ch, EUT Vertical
5419.542	34.7	6.5	1.8	244.9	1.4	0.0	Vert	AV	0.0	42.6	54.0	-11.4	Low Ch, EUT On Side
5419.583	34.4	6.5	1.5	342.0	1.4	0.0	Horz	AV	0.0	42.3	54.0	-11.7	Low Ch, EUT Vertical
2709.833	41.8	-3.6	2.8	336.0	1.4	0.0	Horz	AV	0.0	39.6	54.0	-14.4	Low Ch, EUT On Side
2780.000	40.9	-3.4	3.8	10.9	1.4	0.0	Horz	AV	0.0	38.9	54.0	-15.1	High Ch, EUT On Side
2745.500	40.5	-3.5	3.4	0.0	1.4	0.0	Horz	AV	0.0	38.4	54.0	-15.6	Mid Ch, EUT On Side
7415.375	43.8	11.7	4.0	318.0	0.0	0.0	Vert	PK	0.0	55.5	74.0	-18.5	High Ch, EUT Horizontal
7414.833	43.1	11.7	1.6	16.9	0.0	0.0	Horz	PK	0.0	54.8	74.0	-19.2	High Ch, EUT On Side
3671.583	32.1	1.3	1.5	214.9	1.4	0.0	Vert	AV	0.0	34.8	54.0	-19.2	Mid Ch, EUT Horizontal

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
3672.500	32.0	1.3	1.5	280.9	1.4	0.0	Horz	AV	0.0	34.7	54.0	-19.3	Mid Ch, EUT On Side
3700.042	31.9	1.3	1.5	201.9	1.4	0.0	Horz	AV	0.0	34.6	54.0	-19.4	High Ch, EUT On Side
3698.292	31.9	1.3	1.5	190.9	1.4	0.0	Vert	AV	0.0	34.6	54.0	-19.4	High Ch, EUT Horizontal
2779.917	36.5	-3.4	2.3	225.0	1.4	0.0	Vert	AV	0.0	34.5	54.0	-19.5	High Ch, EUT Horizontal
5418.542	47.3	6.5	1.5	268.9	0.0	0.0	Horz	PK	0.0	53.8	74.0	-20.2	Low Ch, EUT Horizontal
2709.750	35.8	-3.6	1.8	243.0	1.4	0.0	Vert	AV	0.0	33.6	54.0	-20.4	Low Ch, EUT Horizontal
2745.750	35.6	-3.5	1.5	249.0	1.4	0.0	Vert	AV	0.0	33.5	54.0	-20.5	Mid Ch, EUT Horizontal
7317.375	41.7	11.7	1.5	105.9	0.0	0.0	Vert	PK	0.0	53.4	74.0	-20.6	Mid Ch, EUT Horizontal
7321.167	41.7	11.7	1.5	15.9	0.0	0.0	Horz	PK	0.0	53.4	74.0	-20.6	Mid Ch, EUT On Side
5417.417	46.3	6.5	1.8	336.0	0.0	0.0	Horz	PK	0.0	52.8	74.0	-21.2	Low Ch, EUT On Side
8130.917	40.3	12.2	1.5	249.9	0.0	0.0	Vert	PK	0.0	52.5	74.0	-21.5	Low Ch, EUT Horizontal
8120.792	39.8	12.2	1.5	265.0	0.0	0.0	Horz	PK	0.0	52.0	74.0	-22.0	Low Ch, EUT On Side
5420.625	45.2	6.5	1.9	331.0	0.0	0.0	Vert	PK	0.0	51.7	74.0	-22.3	Low Ch, EUT Horizontal
5419.708	44.0	6.5	3.7	2.0	0.0	0.0	Vert	PK	0.0	50.5	74.0	-23.5	Low Ch, EUT Vertical
5418.167	43.7	6.5	1.8	244.9	0.0	0.0	Vert	PK	0.0	50.2	74.0	-23.8	Low Ch, EUT On Side
5421.000	43.4	6.5	1.5	342.0	0.0	0.0	Horz	PK	0.0	49.9	74.0	-24.1	Low Ch, EUT Vertical
2708.833	49.6	-3.6	2.8	336.0	0.0	0.0	Horz	PK	0.0	46.0	74.0	-28.0	Low Ch, EUT On Side
2779.375	48.2	-3.4	3.8	10.9	0.0	0.0	Horz	PK	0.0	44.8	74.0	-29.2	High Ch, EUT On Side
2746.375	48.0	-3.5	3.4	0.0	0.0	0.0	Horz	PK	0.0	44.5	74.0	-29.5	Mid Ch, EUT On Side
3656.042	43.1	1.2	1.5	214.9	0.0	0.0	Vert	PK	0.0	44.3	74.0	-29.7	Mid Ch, EUT Horizontal
3699.125	42.9	1.3	1.5	201.9	0.0	0.0	Horz	PK	0.0	44.2	74.0	-29.8	High Ch, EUT On Side
3697.167	42.6	1.3	1.5	190.9	0.0	0.0	Vert	PK	0.0	43.9	74.0	-30.1	High Ch, EUT Horizontal
3653.750	42.4	1.2	1.5	280.9	0.0	0.0	Horz	PK	0.0	43.6	74.0	-30.4	Mid Ch, EUT On Side
2707.875	46.0	-3.6	1.8	243.0	0.0	0.0	Vert	PK	0.0	42.4	74.0	-31.6	Low Ch, EUT Horizontal
2780.333	45.5	-3.4	2.3	225.0	0.0	0.0	Vert	PK	0.0	42.1	74.0	-31.9	High Ch, EUT Horizontal
2744.333	45.2	-3.5	1.5	249.0	0.0	0.0	Vert	PK	0.0	41.7	74.0	-32.3	Mid Ch, EUT Horizontal

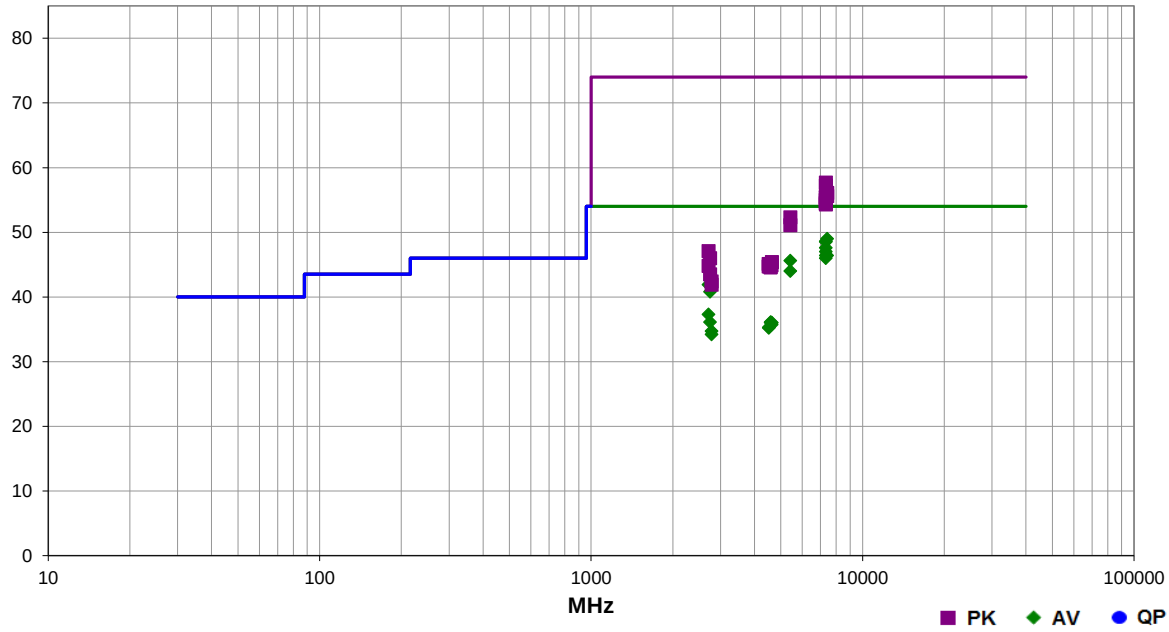
SPURIOUS RADIATED EMISSIONS

EmiR5 2019.05.20 PSA-ESCI 2019.05.10

Work Order:	CLEV0001	**Date:**	4-Jun-2019		
Project:	None	**Temperature:**	22.2 °C		
Job Site:	TX02	**Humidity:**	52.8% RH		
Serial Number:	See Configurations	**Barometric Pres.:**	1019 mbar	**Tested by:**	Jonathan Kiefer
EUT:	LineScope Radio Module				
Configuration:	3				
Customer:	Cleaveland Price Inc.				
Attendees:	None				
EUT Power:	Battery				
Operating Mode:	Transmitting at Low Channel 903.1 MHz, Mid Channel 915.0 MHz, High Channel 926.6 MHz				
Deviations:	None				
Comments:	Power setting 9. See table comments for EUT channel and orientation information. EUT <98% duty cycle; therefore a correction factor was added: 10*LOG(1/DC) = 10*LOG(1/.727) = 1.4 dB. This correction factor was added to the average detector measurements.				

Test Specifications	**Test Method**
FCC 15.247:2019	ANSI C63.10:2013

Run #	124	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7413.250	35.9	11.7	2.7	350.0	1.4	0.0	Vert	AV	0.0	49.0	54.0	-5.0	High Ch, EUT Horizontal
7321.250	35.5	11.7	2.7	334.9	1.4	0.0	Vert	AV	0.0	48.6	54.0	-5.4	Mid Ch, EUT Horizontal
7320.958	35.4	11.7	3.0	331.0	1.4	0.0	Vert	AV	0.0	48.5	54.0	-5.5	Mid Ch, EUT Vertical
7320.875	34.5	11.7	1.9	99.0	1.4	0.0	Vert	AV	0.0	47.6	54.0	-6.4	Mid Ch, EUT On Side
7321.208	33.9	11.7	1.5	10.9	1.4	0.0	Horz	AV	0.0	47.0	54.0	-7.0	Mid Ch, EUT On Side
7320.875	33.3	11.7	3.7	80.0	1.4	0.0	Horz	AV	0.0	46.4	54.0	-7.6	Mid Ch, EUT Horizontal
7413.167	33.3	11.7	1.5	25.0	1.4	0.0	Horz	AV	0.0	46.4	54.0	-7.6	High Ch, EUT On Side
7320.958	32.9	11.7	1.0	205.0	1.4	0.0	Horz	AV	0.0	46.0	54.0	-8.0	Mid Ch, EUT Vertical
5419.583	37.7	6.5	2.9	228.0	1.4	0.0	Vert	AV	0.0	45.6	54.0	-8.4	Low Ch, EUT Horizontal
5419.708	36.1	6.5	1.6	238.9	1.4	0.0	Horz	AV	0.0	44.0	54.0	-10.0	Low Ch, EUT On Side
2709.875	44.1	-3.6	2.9	344.0	1.4	0.0	Horz	AV	0.0	41.9	54.0	-12.1	Low Ch, EUT On Side
2745.458	42.9	-3.5	3.9	346.9	1.4	0.0	Horz	AV	0.0	40.8	54.0	-13.2	Mid Ch, EUT On Side
7323.583	46.0	11.7	2.7	334.9	0.0	0.0	Vert	PK	0.0	57.7	74.0	-16.3	Mid Ch, EUT Horizontal
2709.917	39.5	-3.6	1.5	247.0	1.4	0.0	Vert	AV	0.0	37.3	54.0	-16.7	Low Ch, EUT Horizontal
7321.375	45.5	11.7	3.0	331.0	0.0	0.0	Vert	PK	0.0	57.2	74.0	-16.8	Mid Ch, EUT Vertical
7412.000	44.4	11.7	2.7	350.0	0.0	0.0	Vert	PK	0.0	56.1	74.0	-17.9	High Ch, EUT Horizontal
4587.167	31.5	3.2	1.5	193.0	1.4	0.0	Horz	AV	0.0	36.1	54.0	-17.9	Mid Ch, EUT On Side
2745.583	38.2	-3.5	1.5	212.0	1.4	0.0	Vert	AV	0.0	36.1	54.0	-17.9	Mid Ch, EUT Horizontal

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4633.958	31.2	3.4	1.5	219.0	1.4	0.0	Vert	AV	0.0	36.0	54.0	-18.0	High Ch, EUT Horizontal
4587.458	31.4	3.2	1.5	120.0	1.4	0.0	Vert	AV	0.0	36.0	54.0	-18.0	Mid Ch, EUT Horizontal
4624.833	31.0	3.3	1.5	358.9	1.4	0.0	Horz	AV	0.0	35.7	54.0	-18.3	High Ch, EUT On Side
7415.208	43.9	11.7	1.5	25.0	0.0	0.0	Horz	PK	0.0	55.6	74.0	-18.4	High Ch, EUT On Side
7317.000	43.7	11.7	1.9	99.0	0.0	0.0	Vert	PK	0.0	55.4	74.0	-18.6	Mid Ch, EUT On Side
4524.542	31.0	2.9	1.5	92.0	1.4	0.0	Vert	AV	0.0	35.3	54.0	-18.7	Low Ch, EUT Horizontal
4516.833	30.9	2.9	1.5	267.0	1.4	0.0	Horz	AV	0.0	35.2	54.0	-18.8	Low Ch, EUT On Side
7319.542	43.3	11.7	1.5	10.9	0.0	0.0	Horz	PK	0.0	55.0	74.0	-19.0	Mid Ch, EUT On Side
2780.000	36.7	-3.4	2.3	223.0	1.4	0.0	Vert	AV	0.0	34.7	54.0	-19.3	High Ch, EUT Horizontal
7319.542	42.8	11.7	3.7	80.0	0.0	0.0	Horz	PK	0.0	54.5	74.0	-19.5	Mid Ch, EUT Horizontal
7321.042	42.6	11.7	1.0	205.0	0.0	0.0	Horz	PK	0.0	54.3	74.0	-19.7	Mid Ch, EUT Vertical
2780.083	36.2	-3.4	2.1	238.9	1.4	0.0	Horz	AV	0.0	34.2	54.0	-19.8	High Ch, EUT On Side
5416.375	45.8	6.5	2.9	228.0	0.0	0.0	Vert	PK	0.0	52.3	74.0	-21.7	Low Ch, EUT Horizontal
5420.042	44.6	6.5	1.6	238.9	0.0	0.0	Horz	PK	0.0	51.1	74.0	-22.9	Low Ch, EUT On Side
2708.333	50.7	-3.6	2.9	344.0	0.0	0.0	Horz	PK	0.0	47.1	74.0	-26.9	Low Ch, EUT On Side
2744.625	49.5	-3.5	3.9	346.9	0.0	0.0	Horz	PK	0.0	46.0	74.0	-28.0	Mid Ch, EUT On Side
4637.167	42.0	3.4	1.5	358.9	0.0	0.0	Horz	PK	0.0	45.4	74.0	-28.6	High Ch, EUT On Side
4506.958	42.2	2.9	1.5	267.0	0.0	0.0	Horz	PK	0.0	45.1	74.0	-28.9	Low Ch, EUT On Side
4620.750	41.6	3.3	1.5	219.0	0.0	0.0	Vert	PK	0.0	44.9	74.0	-29.1	High Ch, EUT Horizontal
2710.292	48.4	-3.6	1.5	247.0	0.0	0.0	Vert	PK	0.0	44.8	74.0	-29.2	Low Ch, EUT Horizontal
4511.083	41.8	2.9	1.5	92.0	0.0	0.0	Vert	PK	0.0	44.7	74.0	-29.3	Low Ch, EUT Horizontal
4582.917	41.5	3.1	1.5	193.0	0.0	0.0	Horz	PK	0.0	44.6	74.0	-29.4	Mid Ch, EUT On Side
4584.583	41.4	3.2	1.5	120.0	0.0	0.0	Vert	PK	0.0	44.6	74.0	-29.4	Mid Ch, EUT Horizontal
2745.792	47.0	-3.5	1.5	212.0	0.0	0.0	Vert	PK	0.0	43.5	74.0	-30.5	Mid Ch, EUT Horizontal
2780.667	45.8	-3.4	2.3	223.0	0.0	0.0	Vert	PK	0.0	42.4	74.0	-31.6	High Ch, EUT Horizontal
2778.958	45.3	-3.4	2.1	238.9	0.0	0.0	Horz	PK	0.0	41.9	74.0	-32.1	High Ch, EUT On Side

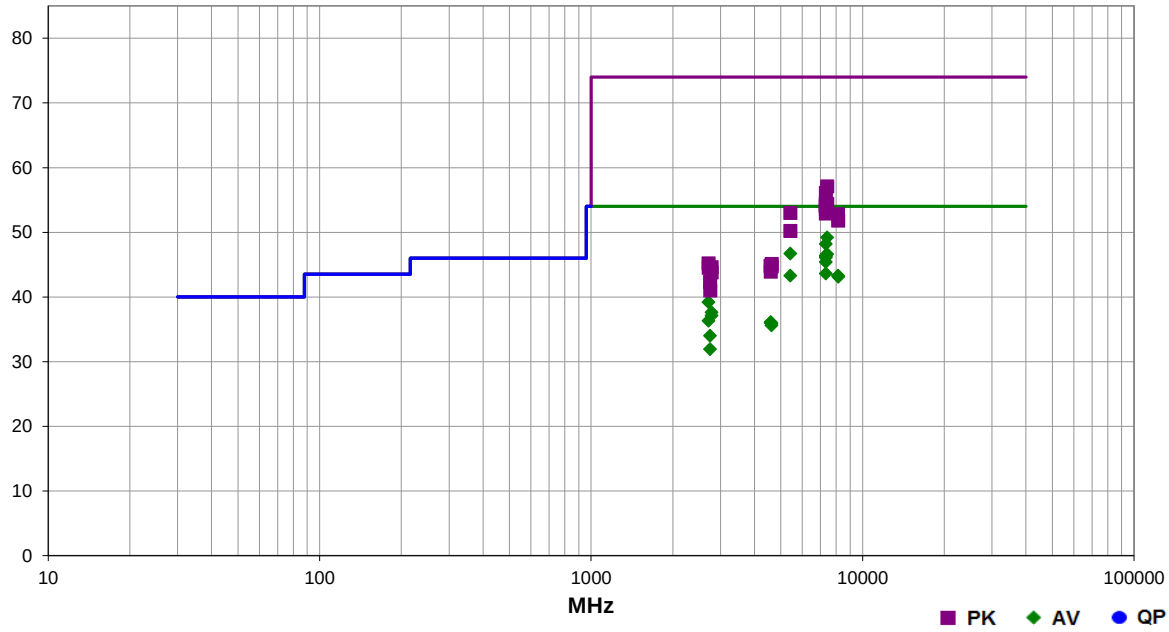
SPURIOUS RADIATED EMISSIONS

EmiR5 2019.05.20 PSA-ESCI 2019.05.10

Work Order:	CLEV0001	**Date:**	5-Jun-2019		
Project:	None	**Temperature:**	22.1 °C		
Job Site:	TX02	**Humidity:**	52.5% RH		
Serial Number:	See Configurations	**Barometric Pres.:**	1015 mbar	**Tested by:**	Jonathan Kiefer
EUT:	LineScope Radio Module				
Configuration:	4				
Customer:	Cleaveland Price Inc.				
Attendees:	None				
EUT Power:	Battery				
Operating Mode:	Transmitting at Low Channel 903.1 MHz, Mid Channel 915.0 MHz, High Channel 926.6 MHz				
Deviations:	None				
Comments:	Power setting 9. See table comments for EUT channel and orientation information. EUT <98% duty cycle; therefore a correction factor was added: 10*LOG(1/DC) = 10*LOG(1/.727) = 1.4 dB. This correction factor was added to the average detector measurements.				

Test Specifications	**Test Method**
FCC 15.247:2019	ANSI C63.10:2013

	138	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7413.083	36.1	11.7	2.9	318.0	1.4	0.0	Horz	AV	0.0	49.2	54.0	-4.8	High Ch, EUT On Side
7321.000	35.1	11.7	1.5	337.0	1.4	0.0	Vert	AV	0.0	48.2	54.0	-5.8	Mid Ch, EUT Horizontal
5419.500	38.8	6.5	2.1	250.9	1.4	0.0	Horz	AV	0.0	46.7	54.0	-7.3	Low Ch, EUT On Side
7412.875	33.5	11.7	1.5	339.0	1.4	0.0	Vert	AV	0.0	46.6	54.0	-7.4	High Ch, EUT Horizontal
7320.708	33.3	11.7	1.5	314.0	1.4	0.0	Horz	AV	0.0	46.4	54.0	-7.6	Mid Ch, EUT On Side
7320.917	33.1	11.7	1.5	351.9	1.4	0.0	Vert	AV	0.0	46.2	54.0	-7.8	Mid Ch, EUT On Side
7321.125	33.0	11.7	3.9	318.0	1.4	0.0	Horz	AV	0.0	46.1	54.0	-7.9	Mid Ch, EUT Vertical
7321.000	32.3	11.7	2.8	343.0	1.4	0.0	Vert	AV	0.0	45.4	54.0	-8.6	Mid Ch, EUT Vertical
7320.292	30.5	11.7	1.5	253.0	1.4	0.0	Horz	AV	0.0	43.6	54.0	-10.4	Mid Ch, EUT Horizontal
5419.417	35.4	6.5	1.7	278.0	1.4	0.0	Vert	AV	0.0	43.3	54.0	-10.7	Low Ch, EUT Horizontal
8128.500	29.7	12.2	1.5	86.0	1.4	0.0	Horz	AV	0.0	43.3	54.0	-10.7	Low Ch, EUT On Side
8140.208	29.5	12.2	1.5	331.0	1.4	0.0	Vert	AV	0.0	43.1	54.0	-10.9	Low Ch, EUT Horizontal
2709.875	41.4	-3.6	2.7	334.9	1.4	0.0	Horz	AV	0.0	39.2	54.0	-14.8	Low Ch, EUT On Side
2779.500	39.6	-3.4	3.7	43.0	1.4	0.0	Vert	AV	0.0	37.6	54.0	-16.4	High Ch, EUT Horizontal
7412.750	45.4	11.7	2.9	318.0	0.0	0.0	Horz	PK	0.0	57.1	74.0	-16.9	High Ch, EUT On Side
2779.917	39.1	-3.4	3.2	336.0	1.4	0.0	Horz	AV	0.0	37.1	54.0	-16.9	High Ch, EUT On Side
2709.708	38.5	-3.6	3.6	63.9	1.4	0.0	Vert	AV	0.0	36.3	54.0	-17.7	Low Ch, EUT Horizontal
7320.958	44.4	11.7	1.5	337.0	0.0	0.0	Vert	PK	0.0	56.1	74.0	-17.9	Mid Ch, EUT Horizontal

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4586.708	31.5	3.2	1.5	90.0	1.4	0.0	Horz	AV	0.0	36.1	54.0	-17.9	Mid Ch, EUT On Side
4586.667	31.4	3.2	2.4	110.0	1.4	0.0	Vert	AV	0.0	36.0	54.0	-18.0	Mid Ch, EUT Horizontal
4621.458	31.2	3.3	1.5	56.0	1.4	0.0	Horz	AV	0.0	35.9	54.0	-18.1	High Ch, EUT On Side
4621.583	30.9	3.3	1.5	171.0	1.4	0.0	Vert	AV	0.0	35.6	54.0	-18.4	High Ch, EUT Horizontal
7322.500	42.8	11.7	1.5	351.9	0.0	0.0	Vert	PK	0.0	54.5	74.0	-19.5	Mid Ch, EUT On Side
7409.917	42.7	11.7	1.5	339.0	0.0	0.0	Vert	PK	0.0	54.4	74.0	-19.6	High Ch, EUT Horizontal
7317.750	42.4	11.7	3.9	318.0	0.0	0.0	Horz	PK	0.0	54.1	74.0	-19.9	Mid Ch, EUT Vertical
7320.750	42.3	11.7	1.5	314.0	0.0	0.0	Horz	PK	0.0	54.0	74.0	-20.0	Mid Ch, EUT On Side
2745.625	36.1	-3.5	1.5	193.0	1.4	0.0	Horz	AV	0.0	34.0	54.0	-20.0	Mid Ch, EUT On Side
7321.917	41.8	11.7	2.8	343.0	0.0	0.0	Vert	PK	0.0	53.5	74.0	-20.5	Mid Ch, EUT Vertical
5417.917	46.5	6.5	2.1	250.9	0.0	0.0	Horz	PK	0.0	53.0	74.0	-21.0	Low Ch, EUT On Side
7326.500	41.2	11.7	1.5	253.0	0.0	0.0	Horz	PK	0.0	52.9	74.0	-21.1	Mid Ch, EUT Horizontal
8116.708	40.6	12.2	1.5	86.0	0.0	0.0	Horz	PK	0.0	52.8	74.0	-21.2	Low Ch, EUT On Side
2745.375	34.0	-3.5	1.5	207.9	1.4	0.0	Vert	AV	0.0	31.9	54.0	-22.1	Mid Ch, EUT Horizontal
8136.125	39.6	12.2	1.5	331.0	0.0	0.0	Vert	PK	0.0	51.8	74.0	-22.2	Low Ch, EUT Horizontal
5418.625	43.7	6.5	1.7	278.0	0.0	0.0	Vert	PK	0.0	50.2	74.0	-23.8	Low Ch, EUT Horizontal
2709.958	48.8	-3.6	2.7	334.9	0.0	0.0	Horz	PK	0.0	45.2	74.0	-28.8	Low Ch, EUT On Side
4624.625	41.8	3.3	1.5	56.0	0.0	0.0	Horz	PK	0.0	45.1	74.0	-28.9	High Ch, EUT On Side
4580.500	41.7	3.1	1.5	90.0	0.0	0.0	Horz	PK	0.0	44.8	74.0	-29.2	Mid Ch, EUT On Side
4631.625	41.3	3.4	1.5	171.0	0.0	0.0	Vert	PK	0.0	44.7	74.0	-29.3	High Ch, EUT Horizontal
2779.458	48.0	-3.4	3.7	43.0	0.0	0.0	Vert	PK	0.0	44.6	74.0	-29.4	High Ch, EUT Horizontal
2710.583	48.1	-3.6	3.6	63.9	0.0	0.0	Vert	PK	0.0	44.5	74.0	-29.5	Low Ch, EUT Horizontal
4586.833	40.7	3.2	2.4	110.0	0.0	0.0	Vert	PK	0.0	43.9	74.0	-30.1	Mid Ch, EUT Horizontal
2779.458	47.2	-3.4	3.2	336.0	0.0	0.0	Horz	PK	0.0	43.8	74.0	-30.2	High Ch, EUT On Side
2745.667	45.8	-3.5	1.5	193.0	0.0	0.0	Horz	PK	0.0	42.3	74.0	-31.7	Mid Ch, EUT On Side
2746.417	44.5	-3.5	1.5	207.9	0.0	0.0	Vert	PK	0.0	41.0	74.0	-33.0	Mid Ch, EUT Horizontal

DUTY CYCLE

XMit 2019.05.15

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Attenuator	Fairview Microwave	SA4018-20	TYE	10-Oct-18	10-Oct-19
Block - DC	Fairview Microwave	SD3379	AMT	10-Oct-18	10-Oct-19
Cable	Micro-Coax	UFD150A-1-0720-200200	TXG	10-Oct-18	10-Oct-19
Generator - Signal	Keysight	N5171B-506	TEW	2-May-18	2-May-21
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	19-Mar-19	19-Mar-20

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The Duty Cycle (x) of the single channel operation of the radio as controlled by the provided test software was measured for each of the EUT operating modes.

There is no compliance requirement to be met by this test, so therefore no Pass / Fail criteria.

The measurements were made using a zero span on the spectrum analyzer to see the pulses in the time domain. The transmit power was set to its default maximum.

The duty cycle was calculated by dividing the transmission pulse duration (T) by the total period of a single on and total off time.

If the transmit duty cycle < 98 percent, burst gating may have been used during some of the other tests in this report to only take the measurement during the burst duration.

DUTY CYCLE

TbtTx 2018.09.13 XMit 2019.05.15

EUT:	LineScope Radio Module			**Work Order:**	CLEV0001
Serial Number:	See Configuration			**Date:**	23-May-19
Customer:	Cleaveland Price Inc.			**Temperature:**	22.2 °C
Attendees:	None			**Humidity:**	55.8% RH
Project:	None			**Barometric Pres.:**	1019 mbar
Tested by:	Jonathan Kiefer	**Power:**	Battery	**Job Site:**	TX09

TEST SPECIFICATIONS	Test Method
FCC 15.247:2019	ANSI C63.10:2013

COMMENTS

Reference Offset 21.06 dB (20 dB attenuator + dc block + cable).

DEVIATIONS FROM TEST STANDARD

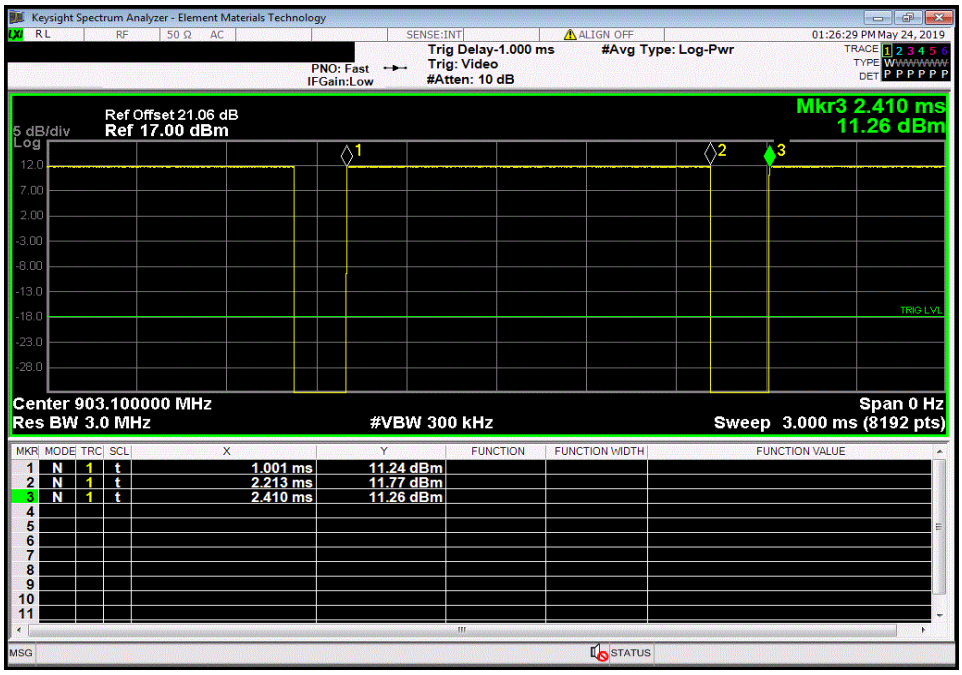
None

Configuration #	6	Signature	Jonathan Kiefer

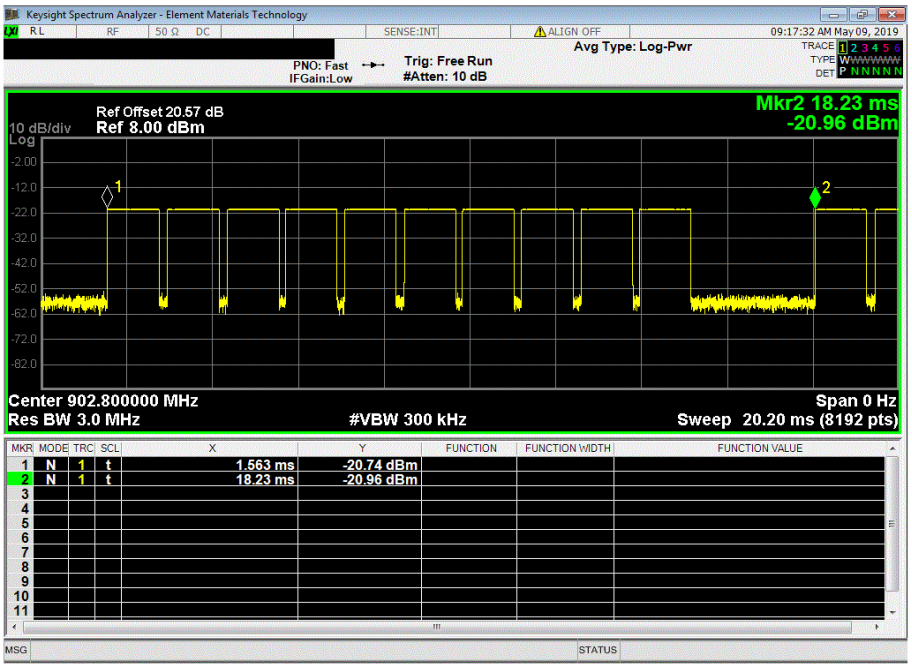
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
Low Channel, 903.1 MHz	1.212 ms	N/A	1	N/A	N/A	N/A
Low Channel, 903.1 MHz	N/A	16.667 ms	10	72.8	N/A	N/A
Mid Channel, 915 MHz	1.212 ms	N/A	1	N/A	N/A	N/A
Mid Channel, 915 MHz	N/A	16.667 ms	10	72.8	N/A	N/A
High Channel, 926.6 MHz	1.212 ms	N/A	1	N/A	N/A	N/A
High Channel, 926.6 MHz	N/A	16.667 ms	10	72.8	N/A	N/A

DUTY CYCLE

Low Channel, 903.1 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	1.212 ms	N/A	1	N/A	N/A	N/A

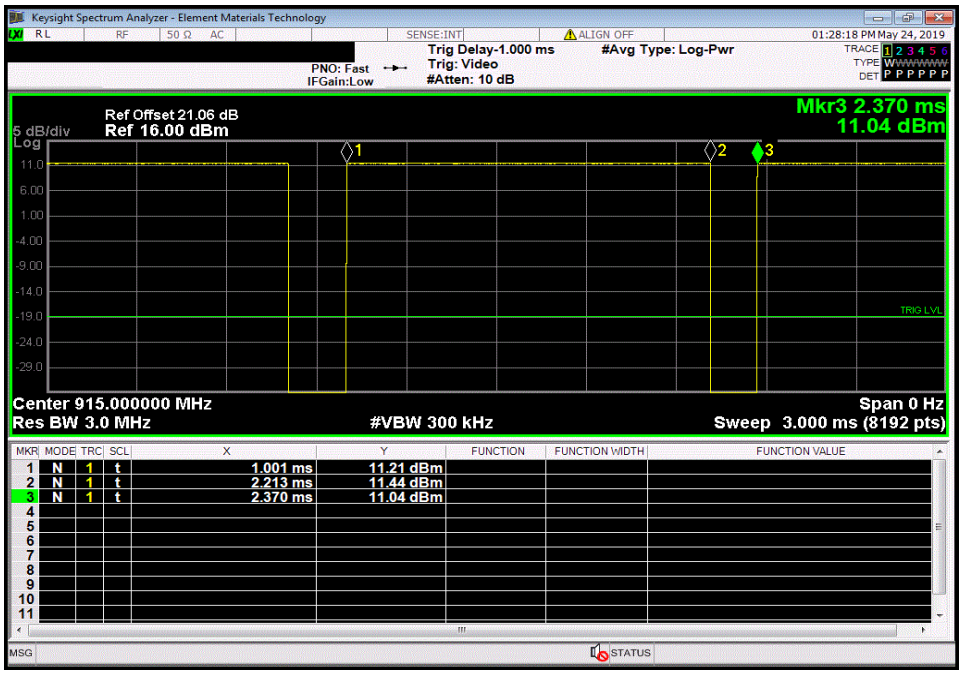


Low Channel, 903.1 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	16.667 ms	10	72.8	N/A	N/A

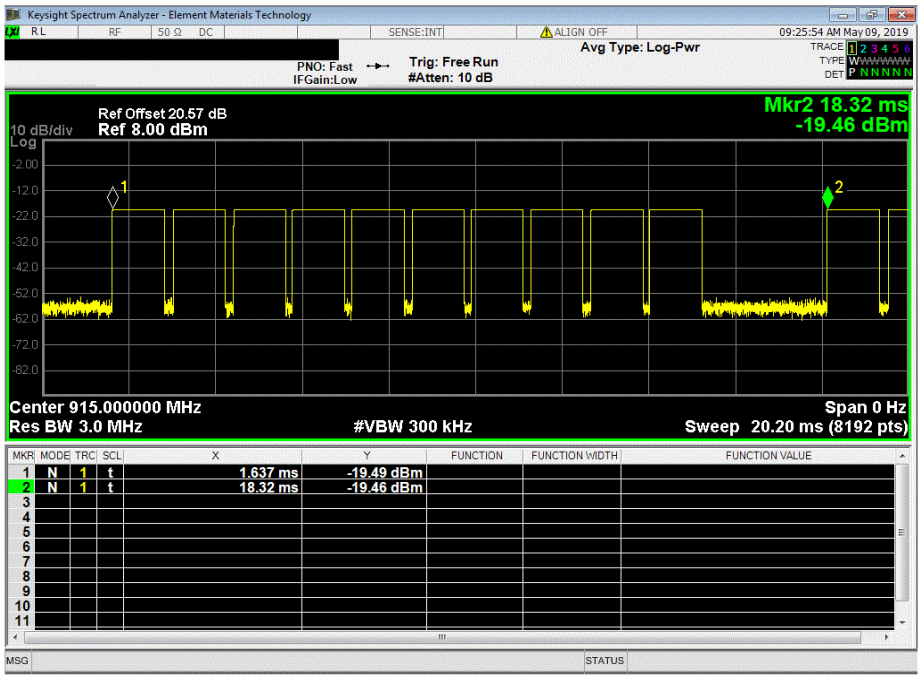


DUTY CYCLE

Mid Channel, 915 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	1.212 ms	N/A	1	N/A	N/A	N/A

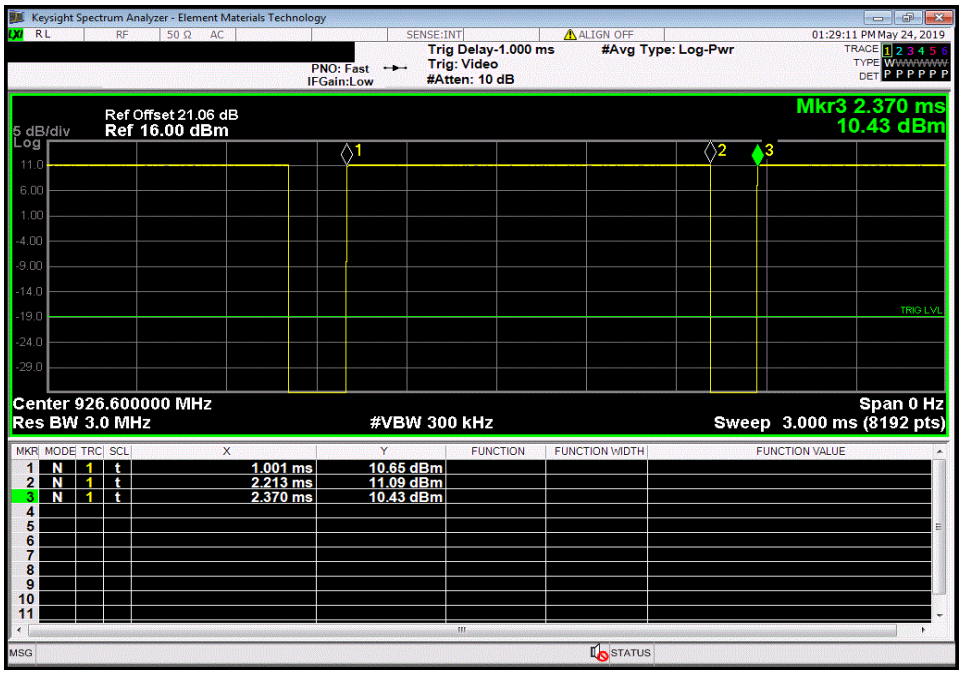


Mid Channel, 915 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	16.667 ms	10	72.8	N/A	N/A

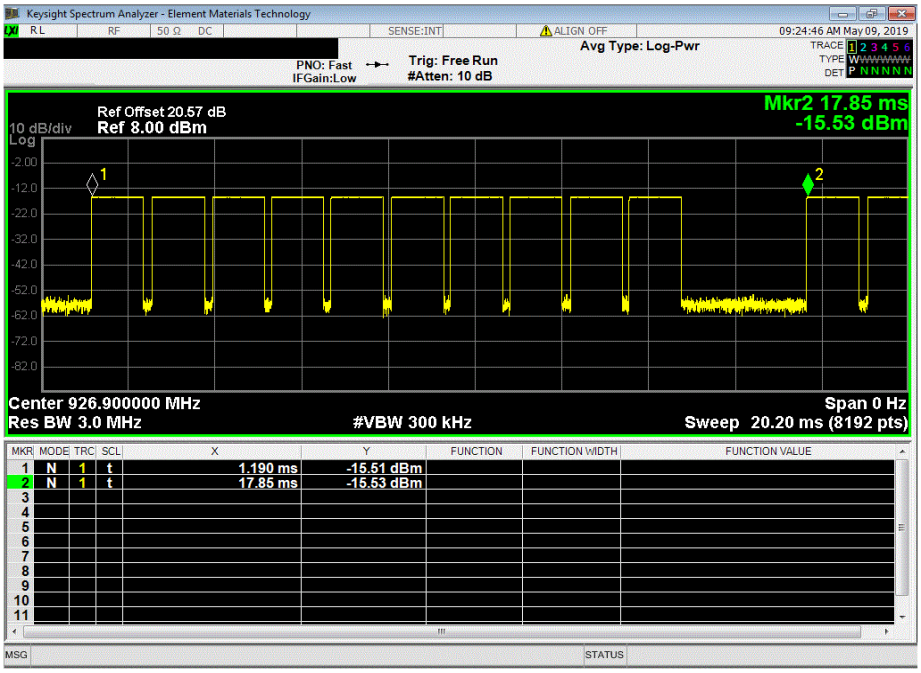


DUTY CYCLE

High Channel, 926.6 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	1.212 ms	N/A	1	N/A	N/A	N/A



High Channel, 926.6 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	16.667 ms	10	72.8	N/A	N/A



OCCUPIED BANDWIDTH

XMit 2019.05.15

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Attenuator	Fairview Microwave	SA4018-20	TYE	10-Oct-18	10-Oct-19
Block - DC	Fairview Microwave	SD3379	AMT	10-Oct-18	10-Oct-19
Cable	Micro-Coax	UFD150A-1-0720-200200	TXG	10-Oct-18	10-Oct-19
Generator - Signal	Keysight	N5171B-506	TEW	2-May-18	2-May-21
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	19-Mar-19	19-Mar-20

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The EUT was set to the channels and modes listed in the datasheet.

The 6dB occupied bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The 99.0% occupied bandwidth was also measured at the same time which can be needed during Output Power depending on the applicable method.

OCCUPIED BANDWIDTH

TbtTx 2018.09.13 XMit 2019.05.15

EUT:	LineScope Radio Module			**Work Order:**	CLEV0001
Serial Number:	See Configurations			**Date:**	23-May-19
Customer:	Cleaveland Price Inc.			**Temperature:**	22.2 °C
Attendees:	None			**Humidity:**	55.8% RH
Project:	None			**Barometric Pres.:**	1019 mbar
Tested by:	Jonathan Kiefer	**Power:**	Battery	**Job Site:**	TX09

TEST SPECIFICATIONS	Test Method
FCC 15.247:2019	ANSI C63.10:2013

COMMENTS

Reference Offset 21.06 dB (20 dB attenuator + dc block + cable).

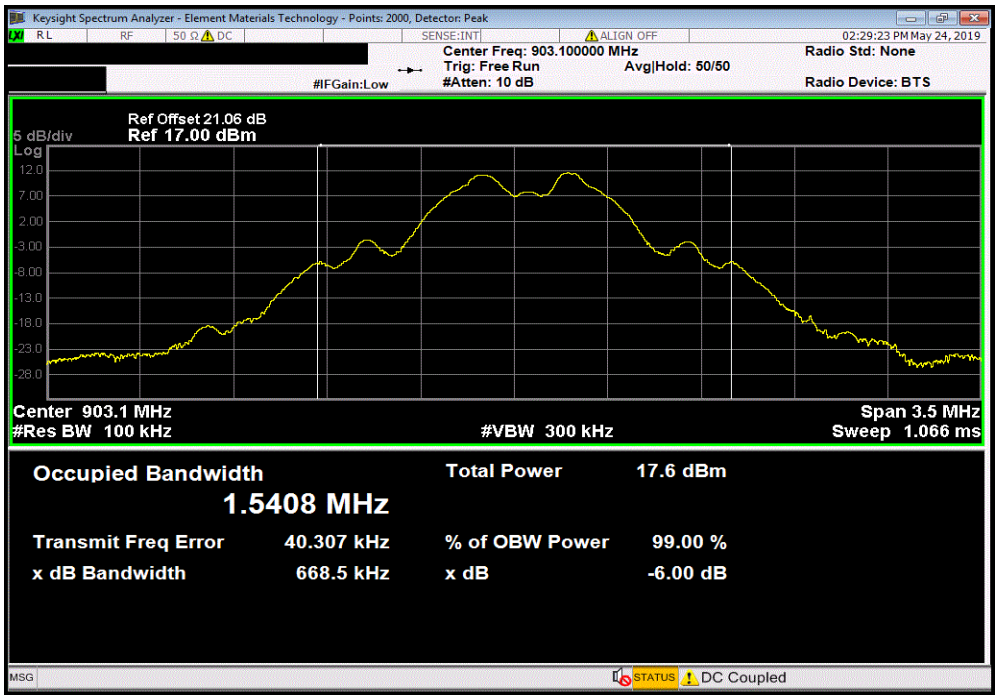
DEVIATIONS FROM TEST STANDARD

None

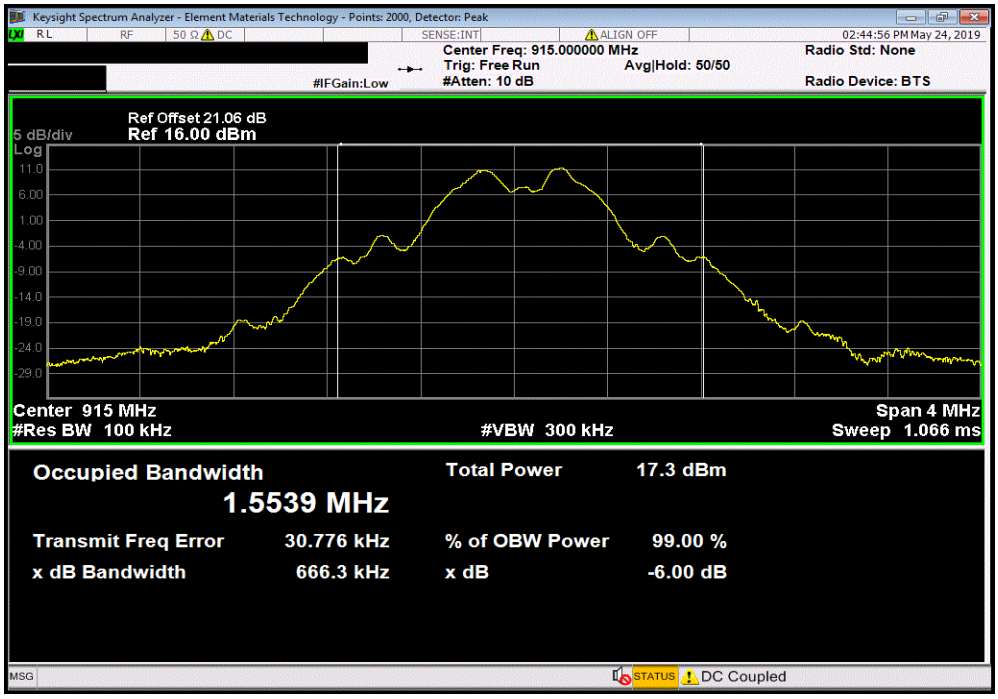
Configuration #	6	Signature Jonathan Kiefer

	Value	Limit (≥)	Result
Low Channel, 903.1 MHz	668.539 kHz	500 kHz	Pass
Mid Channel, 915 MHz	666.342 kHz	500 kHz	Pass
High Channel, 926.6 MHz	671.964 kHz	500 kHz	Pass

Low Channel, 903.1 MHz						
				Value	Limit (≥)	Result
				668.539 kHz	500 kHz	Pass

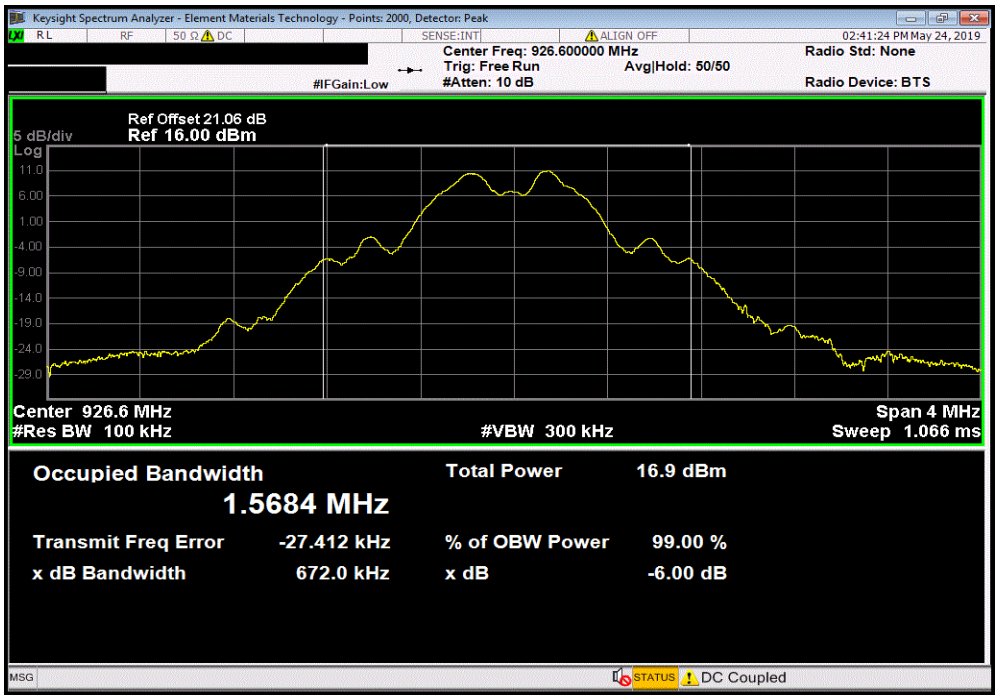


Mid Channel, 915 MHz						
				Value	Limit (≥)	Result
				666.342 kHz	500 kHz	Pass



OCCUPIED BANDWIDTH

High Channel, 926.6 MHz						
				Value	Limit (≥)	Result
				671.964 kHz	500 kHz	Pass



OUTPUT POWER

XMit 2019.05.15

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Keysight	N5171B-506	TEW	2-May-18	2-May-21
Cable	Micro-Coax	UFD150A-1-0720-200200	TXG	10-Oct-18	10-Oct-19
Attenuator	Fairview Microwave	SA4018-20	TYE	10-Oct-18	10-Oct-19
Block - DC	Fairview Microwave	SD3379	AMT	10-Oct-18	10-Oct-19
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	19-Mar-19	19-Mar-20

TEST DESCRIPTION

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum.

Prior to measuring peak transmit power the DTS bandwidth (B) was measured.

The method found in ANSI C63.10:2013 Section 11.9.1.1 was used because the RBW on the analyzer was greater than the DTS Bandwidth of the radio.

As per FCC 15.247 (b) (4), if transmitting antennas of directional gains greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

OUTPUT POWER

XMit 2019.05.15

EUT:	LineScope Radio Module			**Work Order:**	CLEV0001
Serial Number:	See Configurations			**Date:**	23-May-19
Customer:	Cleaveland Price Inc.			**Temperature:**	22.2 °C
Attendees:	None			**Humidity:**	55.8% RH
Project:	None			**Barometric Pres.:**	1019 mbar
Tested by:	Jonathan Kiefer	**Power:**	Battery	**Job Site:**	TX09

TEST SPECIFICATIONS	Test Method
FCC 15.247:2019	ANSI C63.10:2013

COMMENTS

Reference Offset 21.06 dB (20 dB attenuator + dc block + cable). External antenna gains: RHCP 3dBi, Salt Shaker 3dBi, Yagi 14dBi, Dipole PCB 3dBi.

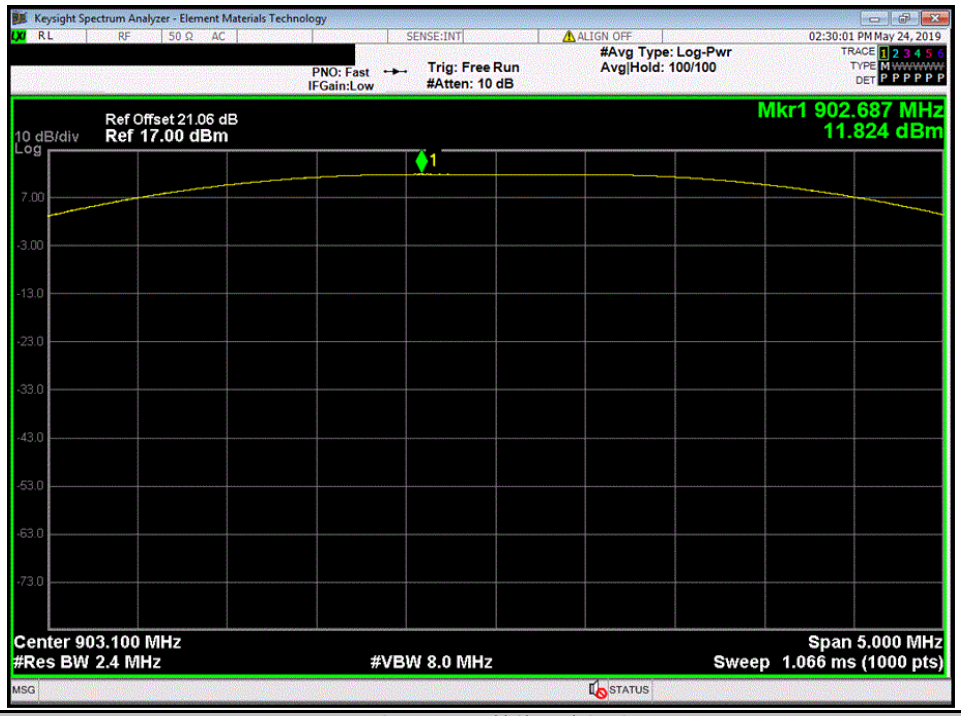
DEVIATIONS FROM TEST STANDARD

None

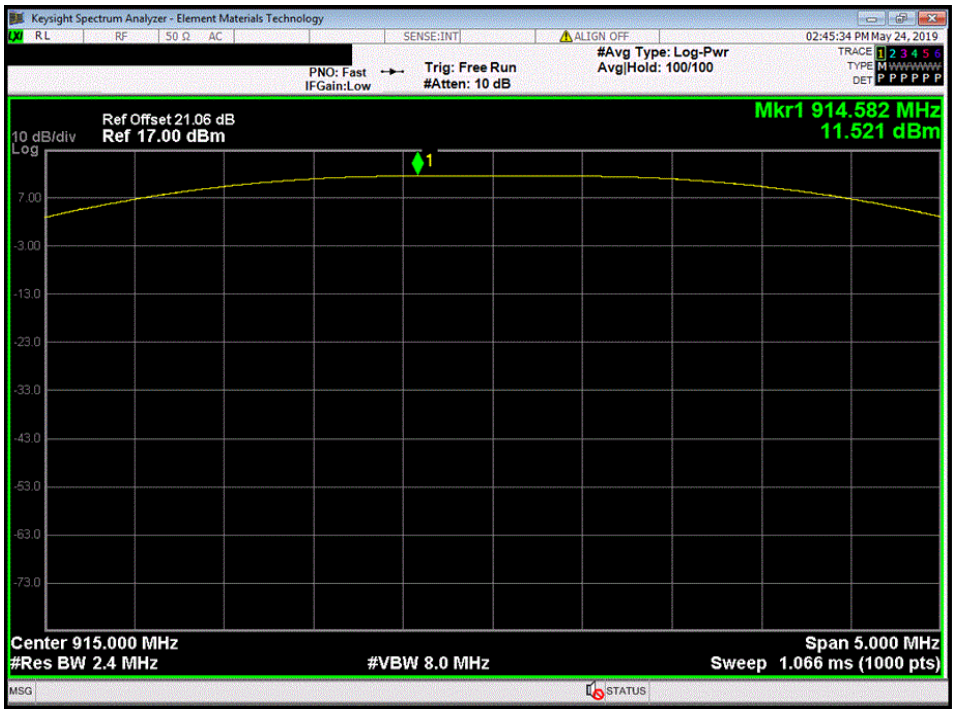
Configuration #	6	Signature Jonathan Kiefer

	Value (dBm)	Limit (dBm)	Result
RHCP Antenna			
Low Channel, 903.1 MHz	11.824	30	Pass
Mid Channel, 915.0 MHz	11.521	30	Pass
High Channel, 926.6 MHz	11.147	30	Pass
Salt Shaker Antenna			
Low Channel, 903.1 MHz	11.824	30	Pass
Mid Channel, 915.0 MHz	11.521	30	Pass
High Channel, 926.6 MHz	11.147	30	Pass
Yagi Antenna			
Low Channel, 903.1 MHz	11.824	22	Pass
Mid Channel, 915.0 MHz	11.521	22	Pass
High Channel, 926.6 MHz	11.147	22	Pass
Dipole PCB Antenna			
Low Channel, 903.1 MHz	11.824	30	Pass
Mid Channel, 915.0 MHz	11.521	30	Pass
High Channel, 926.6 MHz	11.147	30	Pass

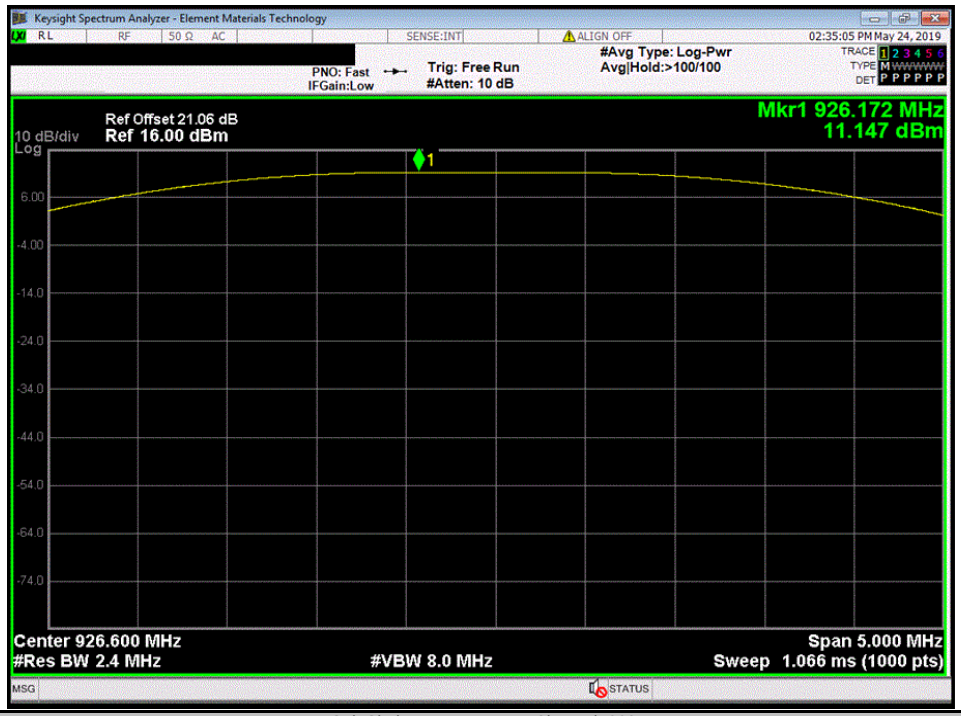
RHCP Antenna, Low Channel, 903.1 MHz						
				Value (dBm)	Limit (dBm)	Result
				11.824	30	Pass



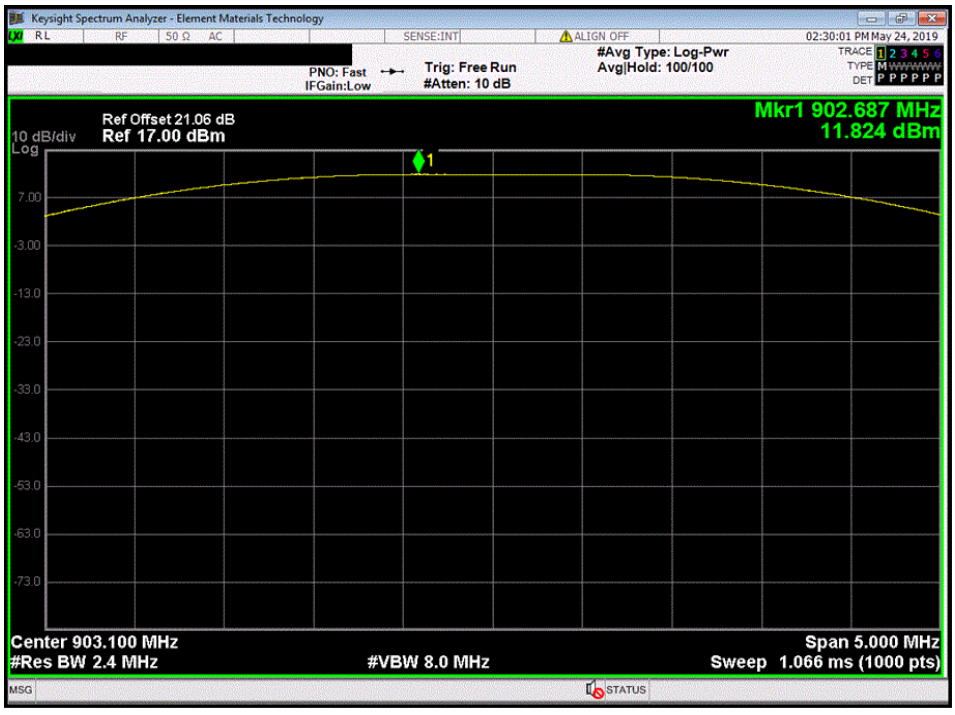
RHCP Antenna, Mid Channel, 915.0 MHz						
				Value (dBm)	Limit (dBm)	Result
				11.521	30	Pass



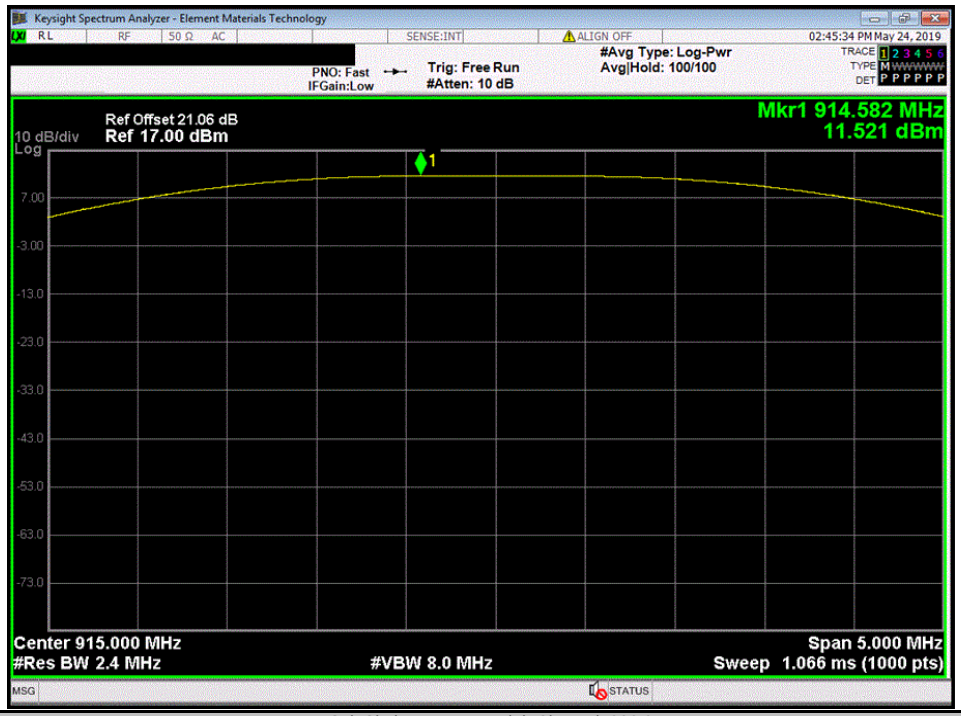
RHCP Antenna, High Channel, 926.6 MHz						
				Value (dBm)	Limit (dBm)	Result
				11.147	30	Pass



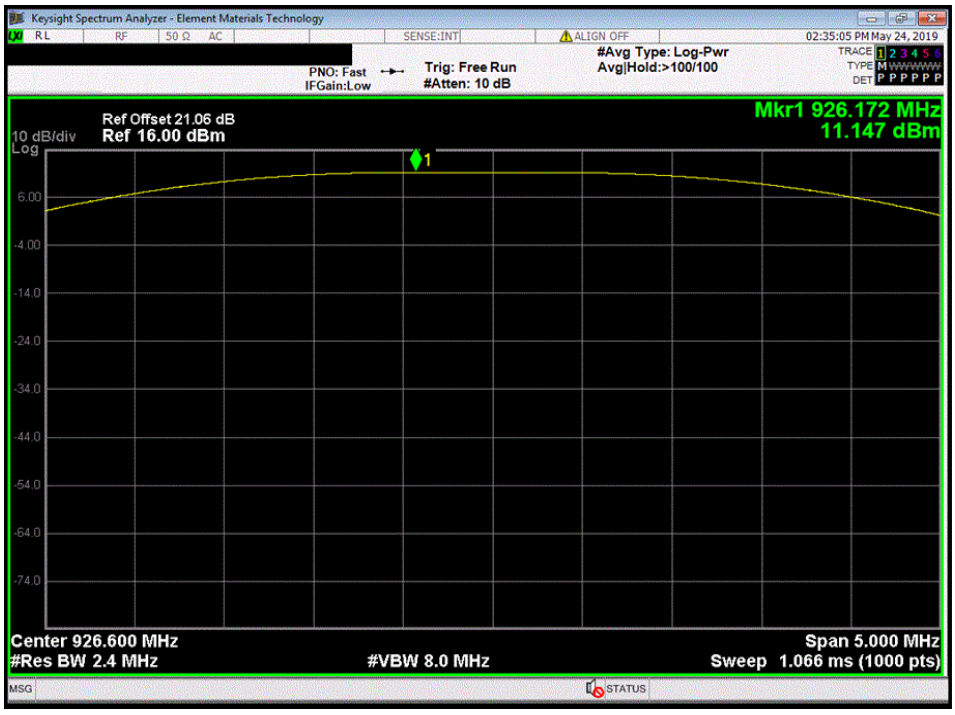
Salt Shaker Antenna, Low Channel, 903.1 MHz						
				Value (dBm)	Limit (dBm)	Result
				11.824	30	Pass



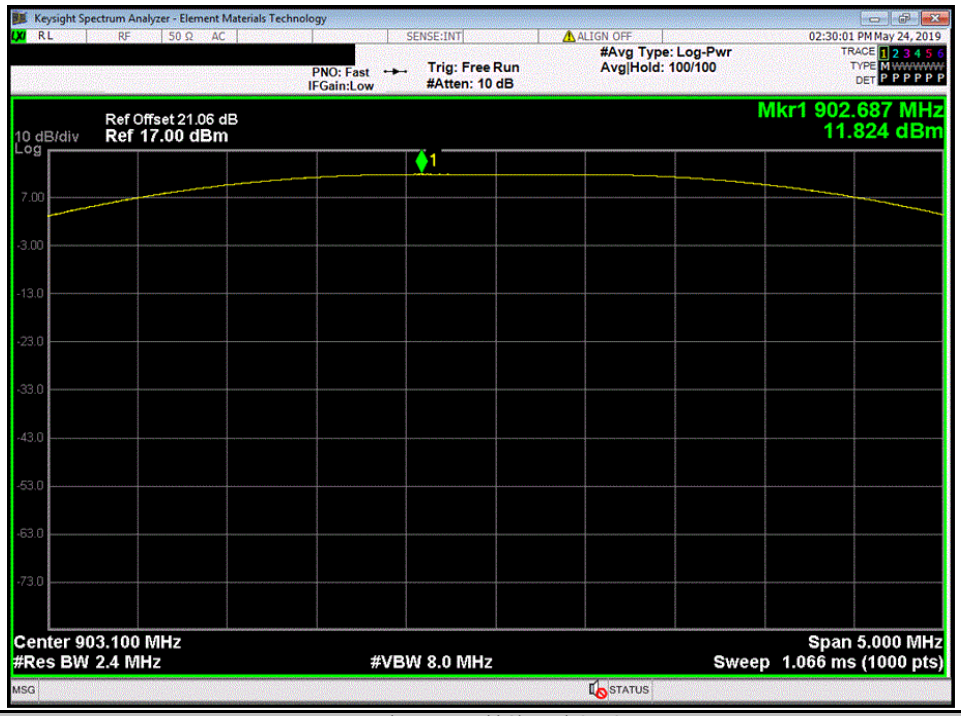
Salt Shaker Antenna, Mid Channel, 915.0 MHz							
					Value (dBm)	Limit (dBm)	Result
					11.521	30	Pass



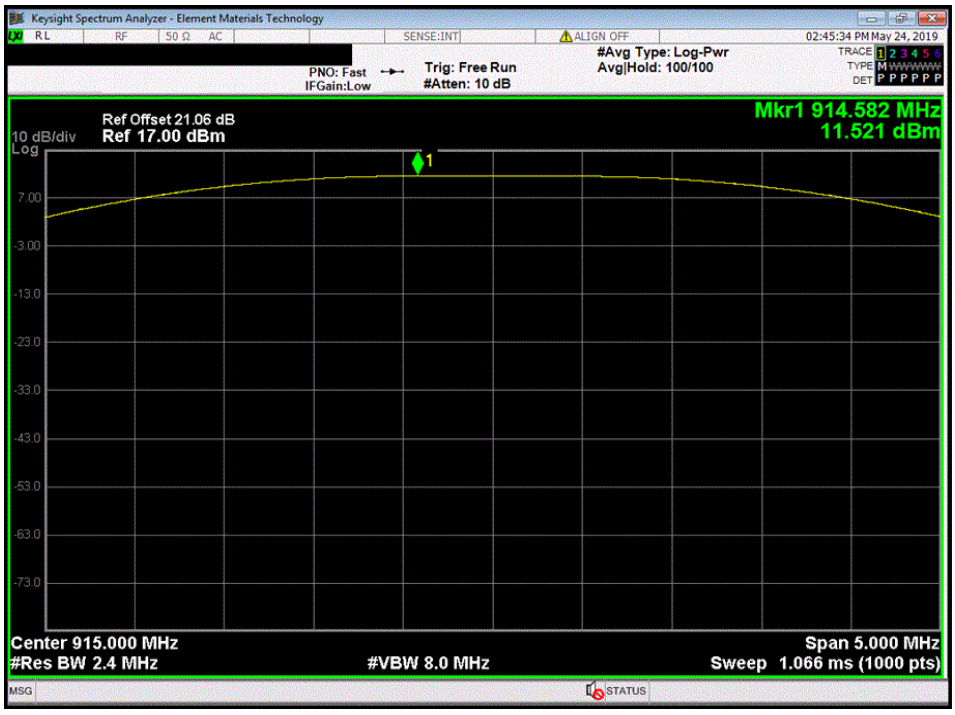
Salt Shaker Antenna, High Channel, 926.6 MHz							
					Value (dBm)	Limit (dBm)	Result
					11.147	30	Pass



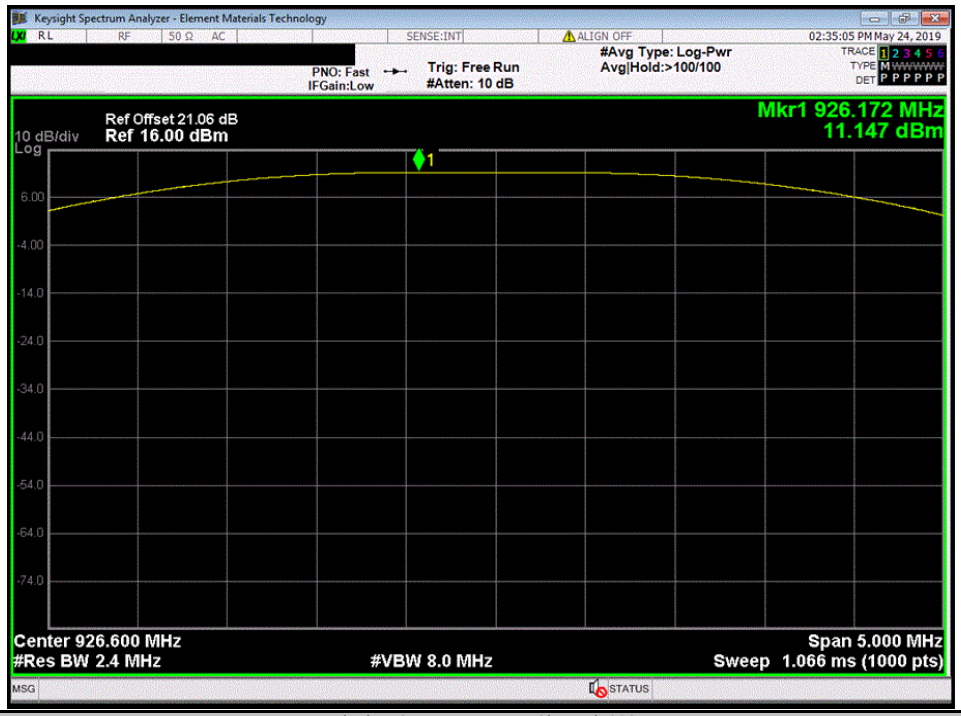
Yagi Antenna, Low Channel, 903.1 MHz						
				Value (dBm)	Limit (dBm)	Result
				11.824	22	Pass



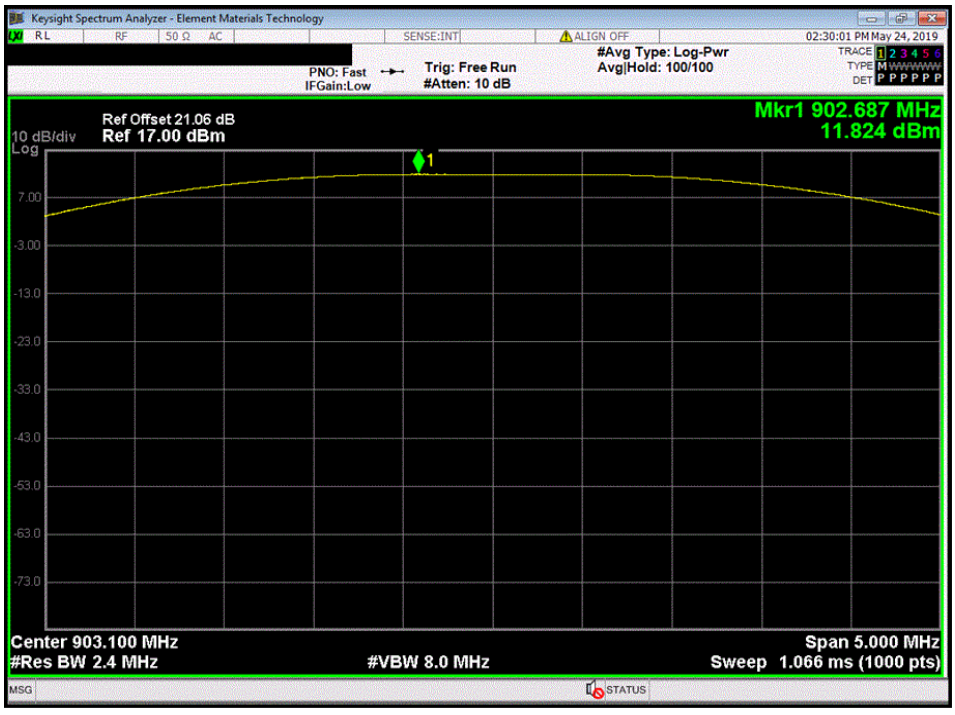
Yagi Antenna, Mid Channel, 915.0 MHz						
				Value (dBm)	Limit (dBm)	Result
				11.521	22	Pass



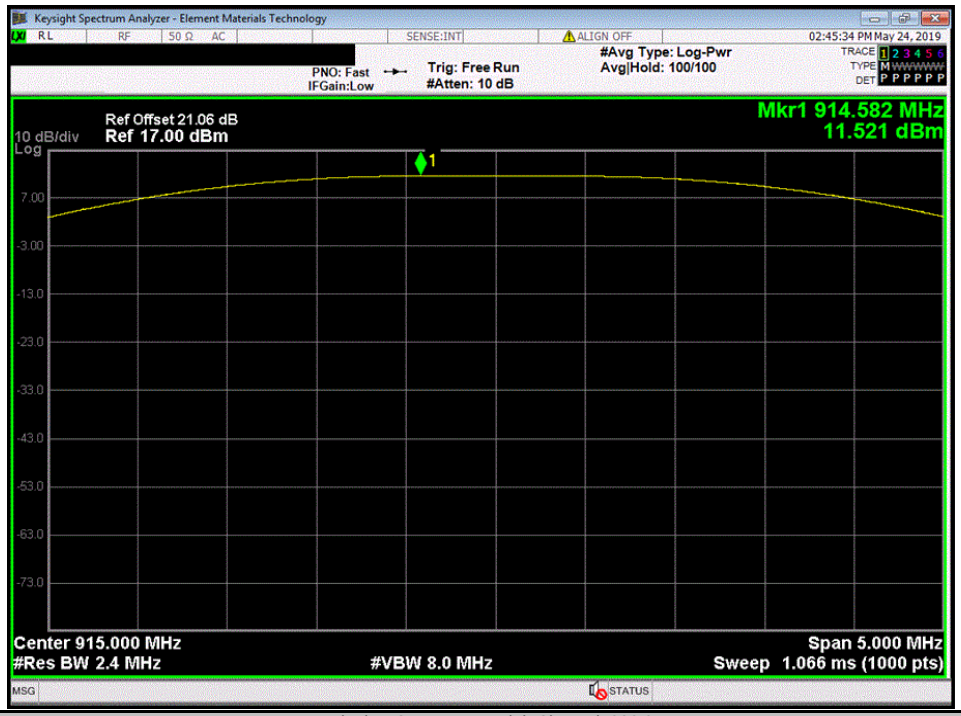
Yagi Antenna, High Channel, 926.6 MHz						
				Value (dBm)	Limit (dBm)	Result
				11.147	22	Pass



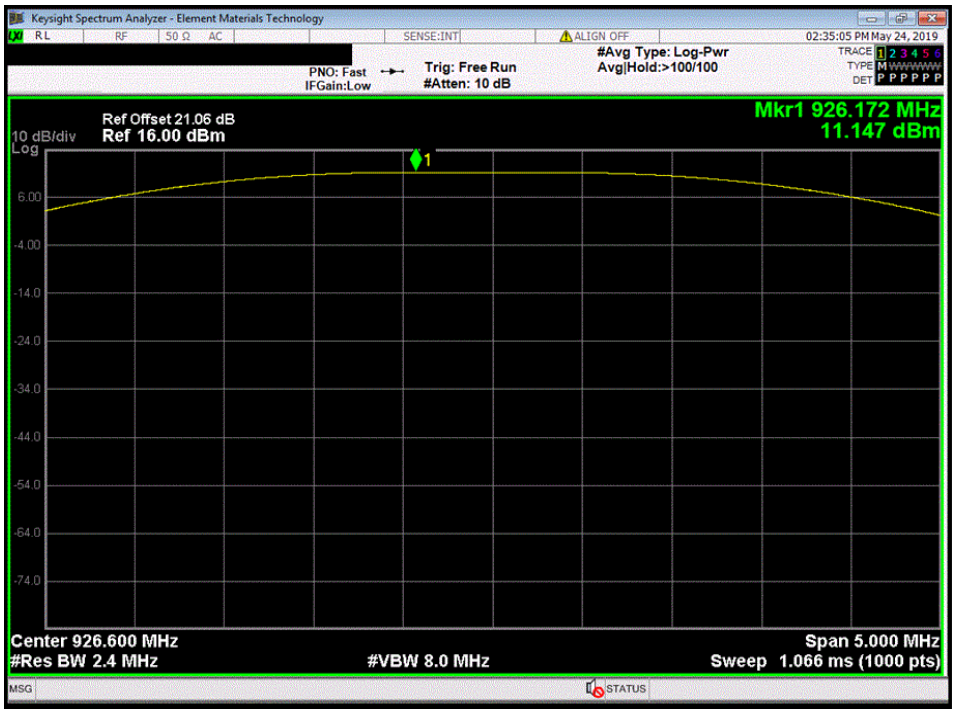
Dipole PCB Antenna, Low Channel, 903.1 MHz						
				Value (dBm)	Limit (dBm)	Result
				11.824	30	Pass



Dipole PCB Antenna, Mid Channel, 915.0 MHz							
					Value (dBm)	Limit (dBm)	Result
					11.521	30	Pass



Dipole PCB Antenna, High Channel, 926.6 MHz							
					Value (dBm)	Limit (dBm)	Result
					11.147	30	Pass



EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

XMit 2019.05.15

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Cable	Micro-Coax	UFD150A-1-0720-200200	TXG	10-Oct-18	10-Oct-19
Attenuator	Fairview Microwave	SA4018-20	TYE	10-Oct-18	10-Oct-19
Block - DC	Fairview Microwave	SD3379	AMT	10-Oct-18	10-Oct-19
Generator - Signal	Keysight	N5171B-506	TEW	2-May-18	2-May-21
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	19-Mar-19	19-Mar-20

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum.

Prior to measuring peak transmit power the DTS bandwidth (B) was measured.

The method found in ANSI C63.10:2013 Section 11.9.1.1 was used because the RBW on the analyzer was greater than the DTS Bandwidth of the radio.

The antenna gain is added to the peak transmit power to obtain the EIRP value. The EIRP limit is 36 dBm.

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

XMit 2019.05.15

EUT:	LineScope Radio Module			**Work Order:**	CLEV0001
Serial Number:	See Configurations			**Date:**	23-May-19
Customer:	Cleaveland Price Inc.			**Temperature:**	22.2 °C
Attendees:	None			**Humidity:**	55.8% RH
Project:	None			**Barometric Pres.:**	1019 mbar
Tested by:	Jonathan Kiefer	**Power:**	Battery	**Job Site:**	TX02

TEST SPECIFICATIONS	Test Method
FCC 15.247:2019	ANSI C63.10:2013

COMMENTS

Reference Offset 21.06 dB (20 dB attenuator + dc block + cable).

DEVIATIONS FROM TEST STANDARD

None

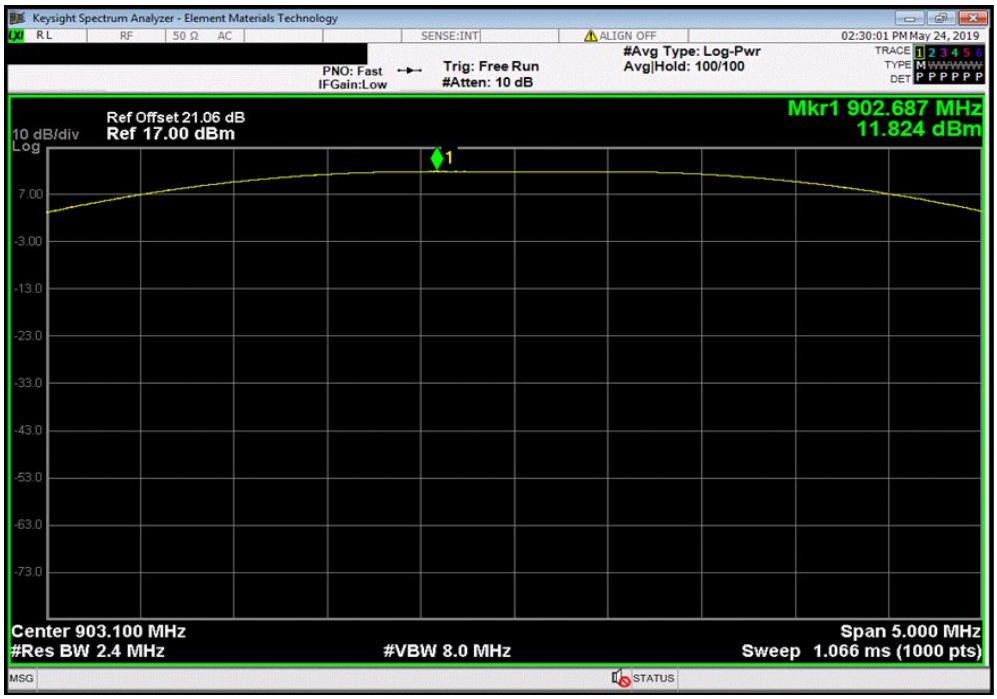
Configuration #	6	Signature	Jonathan Kiefer

	Peak Cond Value (dBm)	Antenna Gain (dBi)	EIRP Value (dBm)	Limit (dBm)	Results
RHCP Antenna					
Low Channel, 903.1 MHz	11.824	3	14.824	36	Pass
Mid Channel, 915.0 MHz	11.521	3	14.521	36	Pass
High Channel, 926.6 MHz	11.147	3	14.147	36	Pass
Salt Shaker Antenna					
Low Channel, 903.1 MHz	11.824	3	14.824	36	Pass
Mid Channel, 915.0 MHz	11.521	3	14.521	36	Pass
High Channel, 926.6 MHz	11.147	3	14.147	36	Pass
Yagi Antenna					
Low Channel, 903.1 MHz	11.824	14	25.824	36	Pass
Mid Channel, 915.0 MHz	11.521	14	25.521	36	Pass
High Channel, 926.6 MHz	11.147	14	25.147	36	Pass
Dipole PCB Antenna					
Low Channel, 903.1 MHz	11.824	3	14.824	36	Pass
Mid Channel, 915.0 MHz	11.521	3	14.521	36	Pass
High Channel, 926.6 MHz	11.147	3	14.147	36	Pass

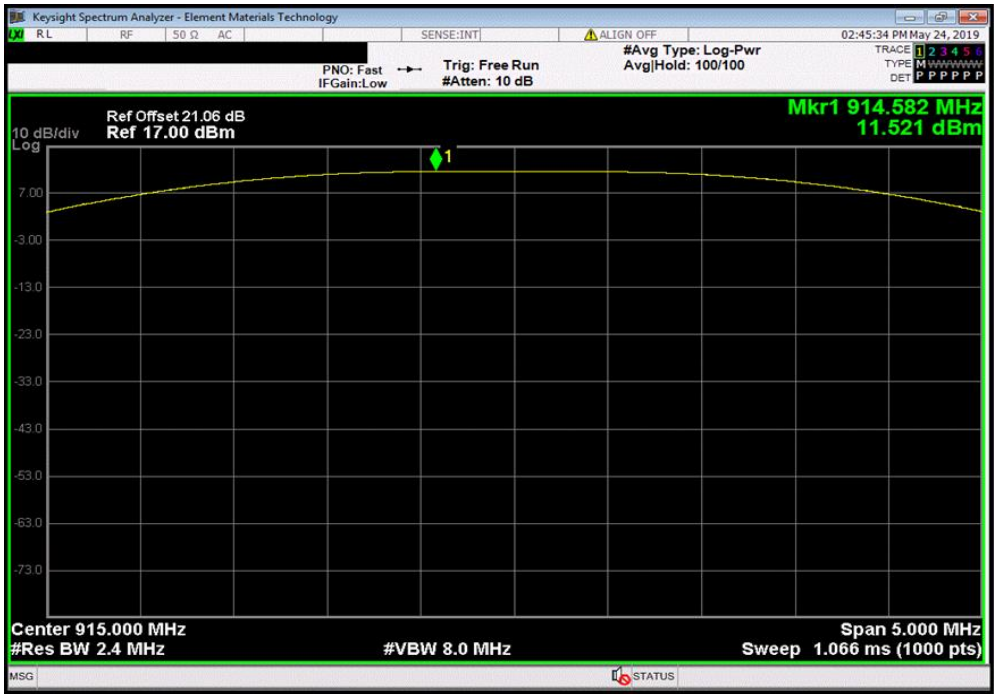
EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

XMit 2019.05.15

RHCP Antenna, Low Channel, 903.1 MHz						
		Peak Cond Value (dBm)	Antenna Gain (dBi)	EIRP Value (dBm)	Limit (dBm)	Results
		11.824	3	14.824	36	Pass



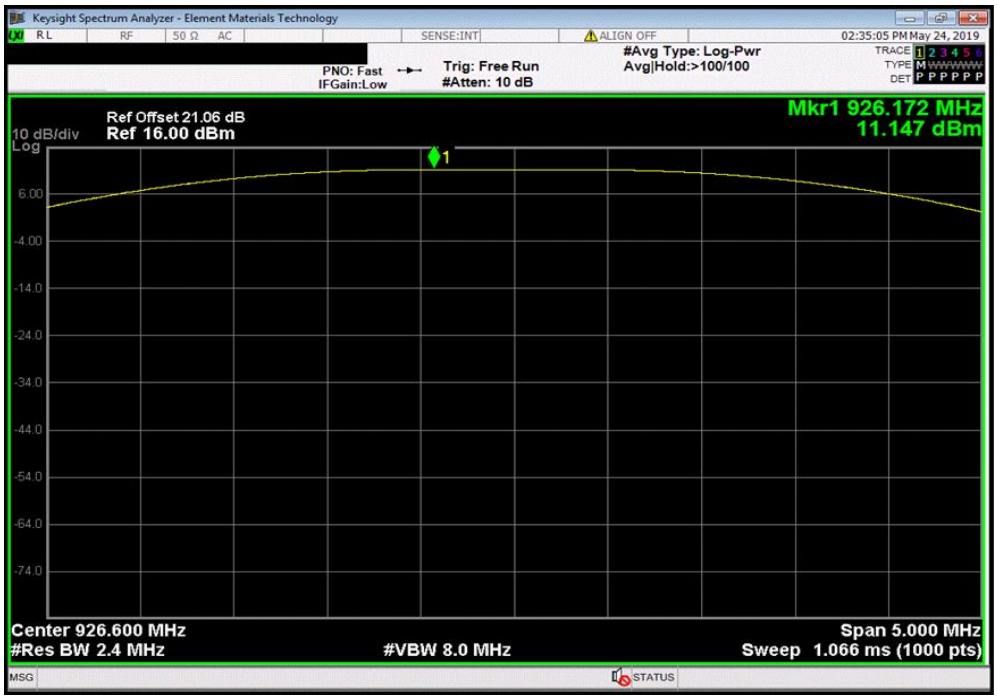
RHCP Antenna, Mid Channel, 915.0 MHz						
		Peak Cond Value (dBm)	Antenna Gain (dBi)	EIRP Value (dBm)	Limit (dBm)	Results
		11.521	3	14.521	36	Pass



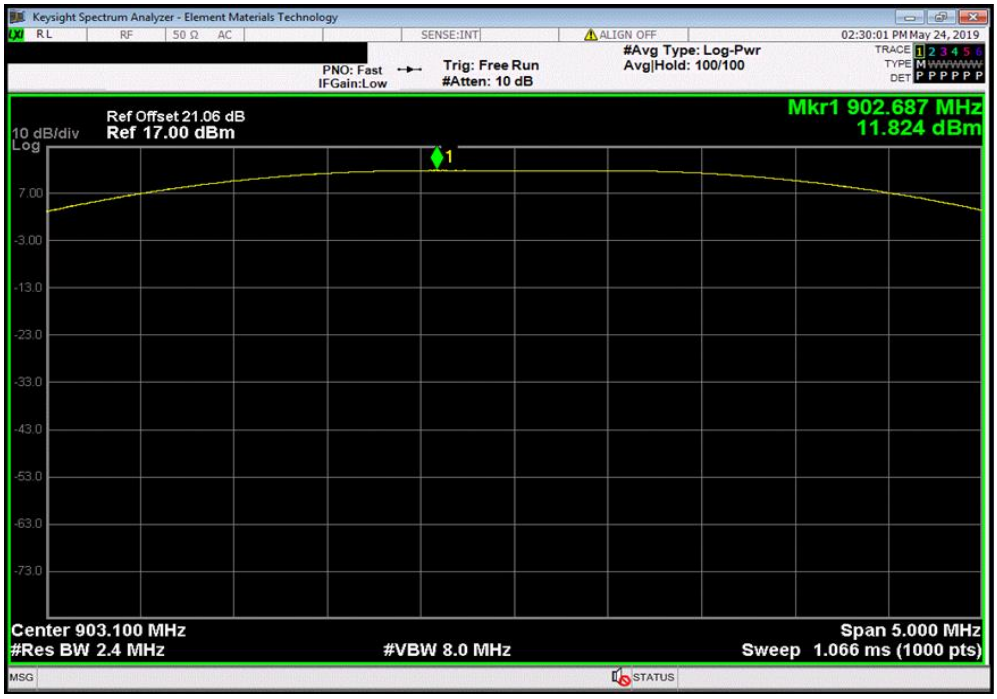
EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

XMit 2019.05.15

RHCP Antenna, High Channel, 926.6 MHz						
		Peak Cond Value (dBm)	Antenna Gain (dBi)	EIRP Value (dBm)	Limit (dBm)	Results
		11.147	3	14.147	36	Pass



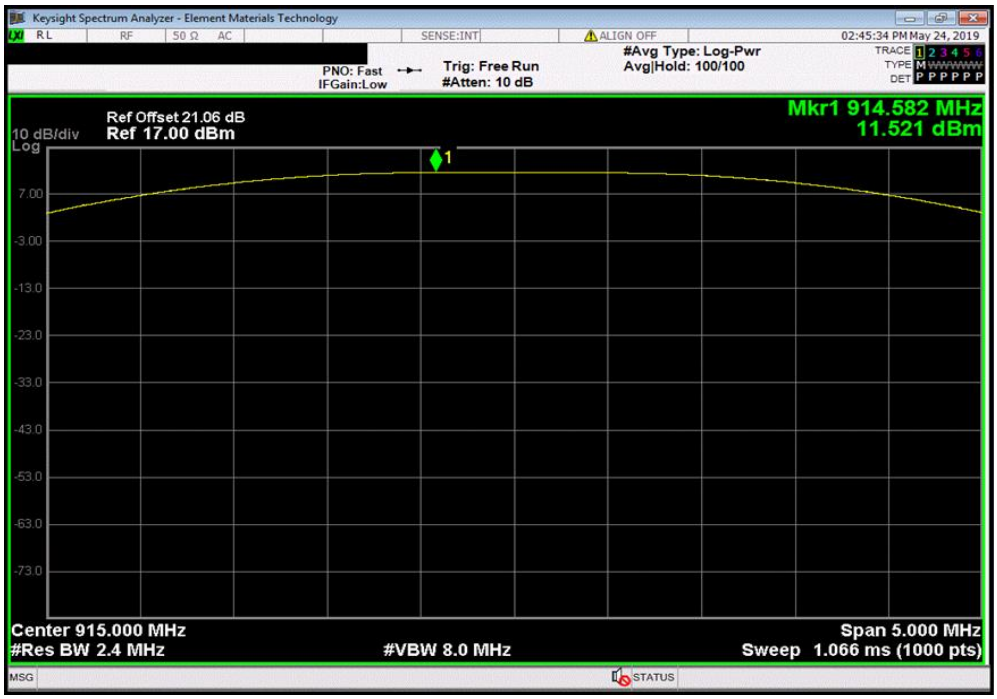
Salt Shaker Antenna, Low Channel, 903.1 MHz						
		Peak Cond Value (dBm)	Antenna Gain (dBi)	EIRP Value (dBm)	Limit (dBm)	Results
		11.824	3	14.824	36	Pass



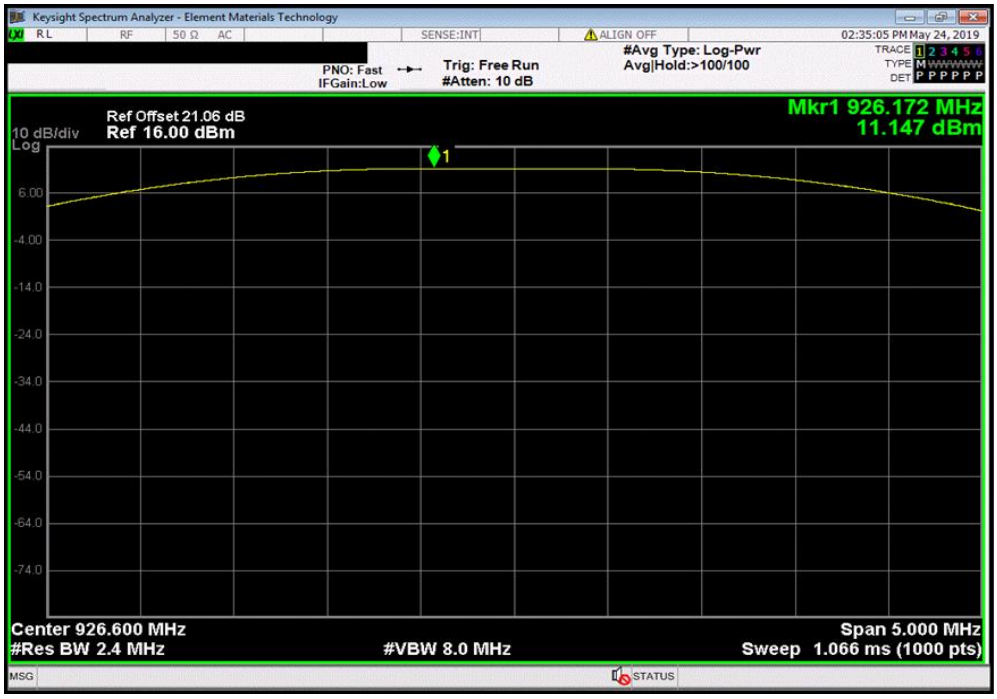
EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

XMit 2019.05.15

Salt Shaker Antenna, Mid Channel, 915.0 MHz						
		Peak Cond Value (dBm)	Antenna Gain (dBi)	EIRP Value (dBm)	Limit (dBm)	Results
		11.521	3	14.521	36	Pass



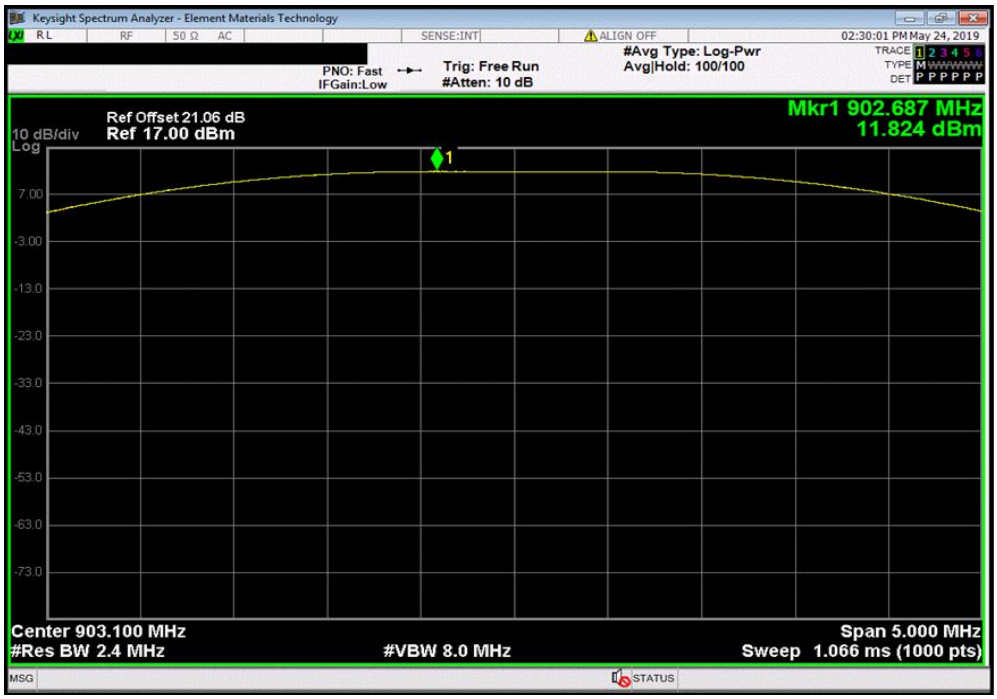
Salt Shaker Antenna, High Channel, 926.6 MHz						
		Peak Cond Value (dBm)	Antenna Gain (dBi)	EIRP Value (dBm)	Limit (dBm)	Results
		11.147	3	14.147	36	Pass



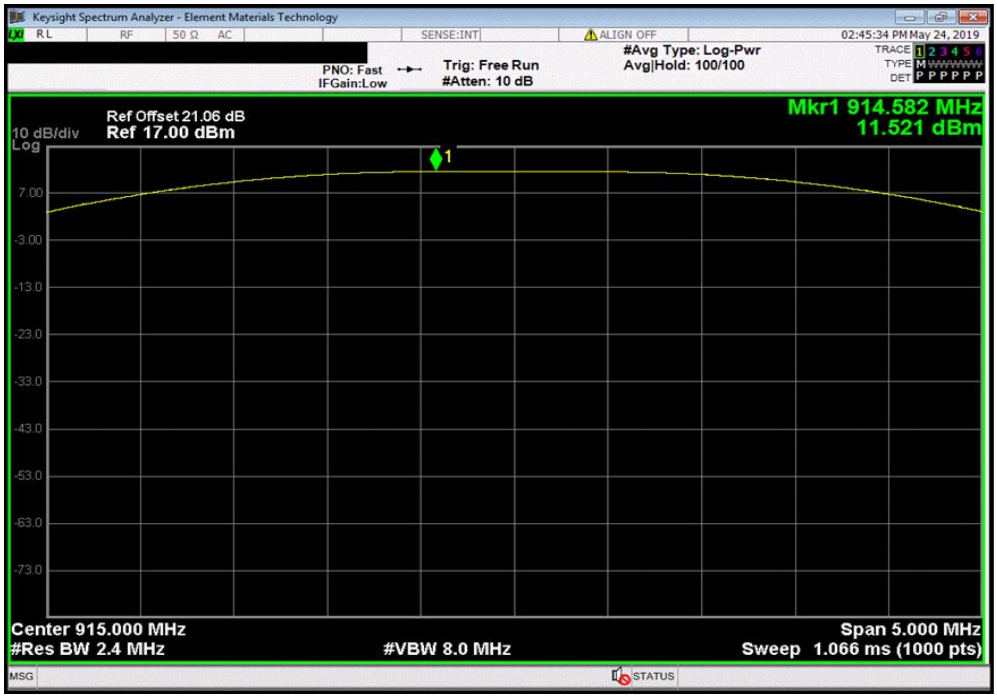
EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

XMit 2019.05.15

Yagi Antenna, Low Channel, 903.1 MHz						
		Peak Cond Value (dBm)	Antenna Gain (dBi)	EIRP Value (dBm)	Limit (dBm)	Results
		11.824	14	25.824	36	Pass



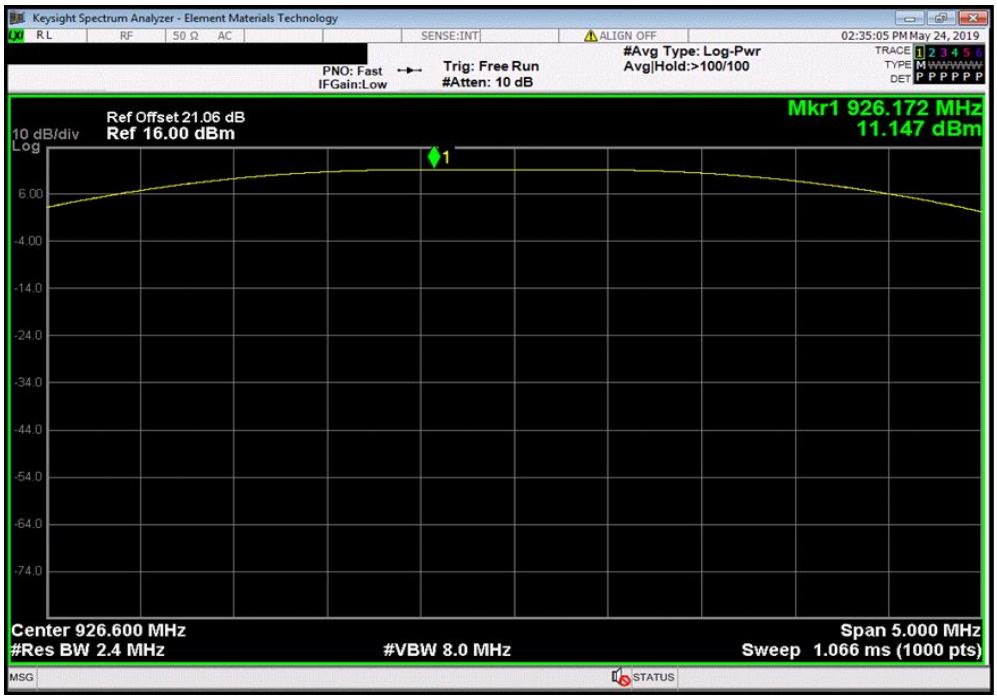
Yagi Antenna, Mid Channel, 915.0 MHz						
		Peak Cond Value (dBm)	Antenna Gain (dBi)	EIRP Value (dBm)	Limit (dBm)	Results
		11.521	14	25.521	36	Pass



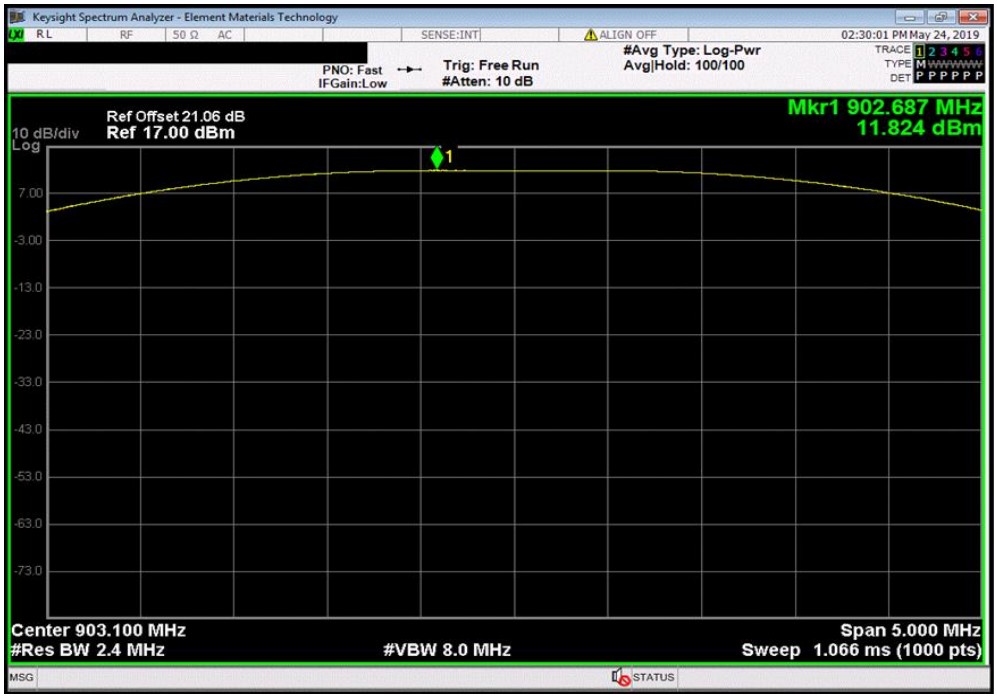
EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

XMit 2019.05.15

Yagi Antenna, High Channel, 926.6 MHz						
		Peak Cond Value (dBm)	Antenna Gain (dBi)	EIRP Value (dBm)	Limit (dBm)	Results
		11.147	14	25.147	36	Pass



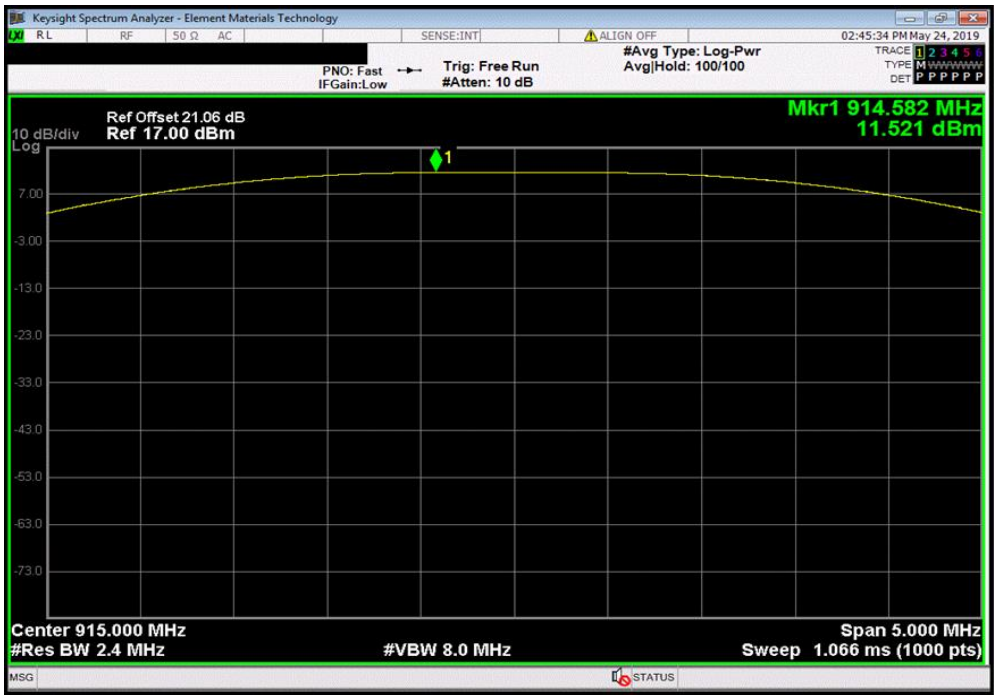
Dipole PCB Antenna, Low Channel, 903.1 MHz						
		Peak Cond Value (dBm)	Antenna Gain (dBi)	EIRP Value (dBm)	Limit (dBm)	Results
		11.824	3	14.824	36	Pass



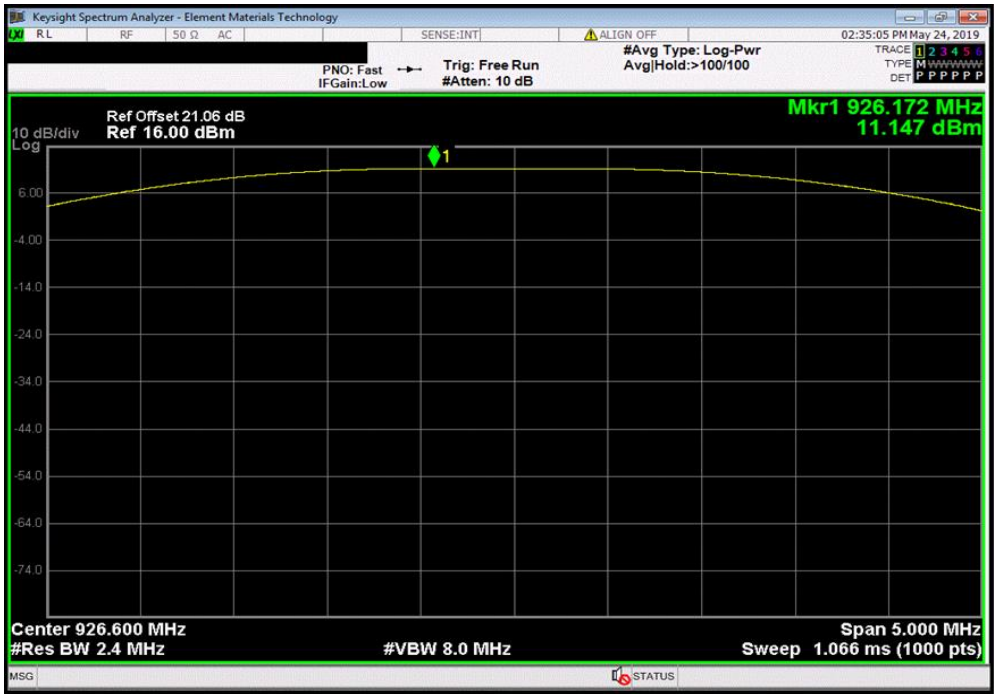
EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

XMit 2019.05.15

Dipole PCB Antenna, Mid Channel, 915.0 MHz						
		Peak Cond Value (dBm)	Antenna Gain (dBi)	EIRP Value (dBm)	Limit (dBm)	Results
		11.521	3	14.521	36	Pass



Dipole PCB Antenna, High Channel, 926.6 MHz						
		Peak Cond Value (dBm)	Antenna Gain (dBi)	EIRP Value (dBm)	Limit (dBm)	Results
		11.147	3	14.147	36	Pass



POWER SPECTRAL DENSITY

XMit 2019.05.15

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Attenuator	Fairview Microwave	SA4018-20	TYE	10-Oct-18	10-Oct-19
Block - DC	Fairview Microwave	SD3379	AMT	10-Oct-18	10-Oct-19
Cable	Micro-Coax	UFD150A-1-0720-200200	TXG	10-Oct-18	10-Oct-19
Generator - Signal	Keysight	N5171B-506	TEW	2-May-18	2-May-21
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	19-Mar-19	19-Mar-20

TEST DESCRIPTION

The maximum power spectral density measurements was measured using the channels and modes as called out on the following data sheets.

Per the procedure outlined in ANSI C63.10 the peak power spectral density was measured in a 3 kHz RBW.

POWER SPECTRAL DENSITY

element

TbtTx 2018.09.13 XMit 2019.05.15

EUT:	LineScope Radio Module			**Work Order:**	CLEV0001
Serial Number:	See Configurations			**Date:**	23-May-19
Customer:	Cleaveland Price Inc.			**Temperature:**	22.2 °C
Attendees:	None			**Humidity:**	55.8% RH
Project:	None			**Barometric Pres.:**	1019 mbar
Tested by:	Jonathan Kiefer	**Power:**	Battery	**Job Site:**	TX09

TEST SPECIFICATIONS	Test Method
FCC 15.247:2019	ANSI C63.10:2013

COMMENTS

Reference Offset 21.06 dB (20 dB attenuator + dc block + cable).

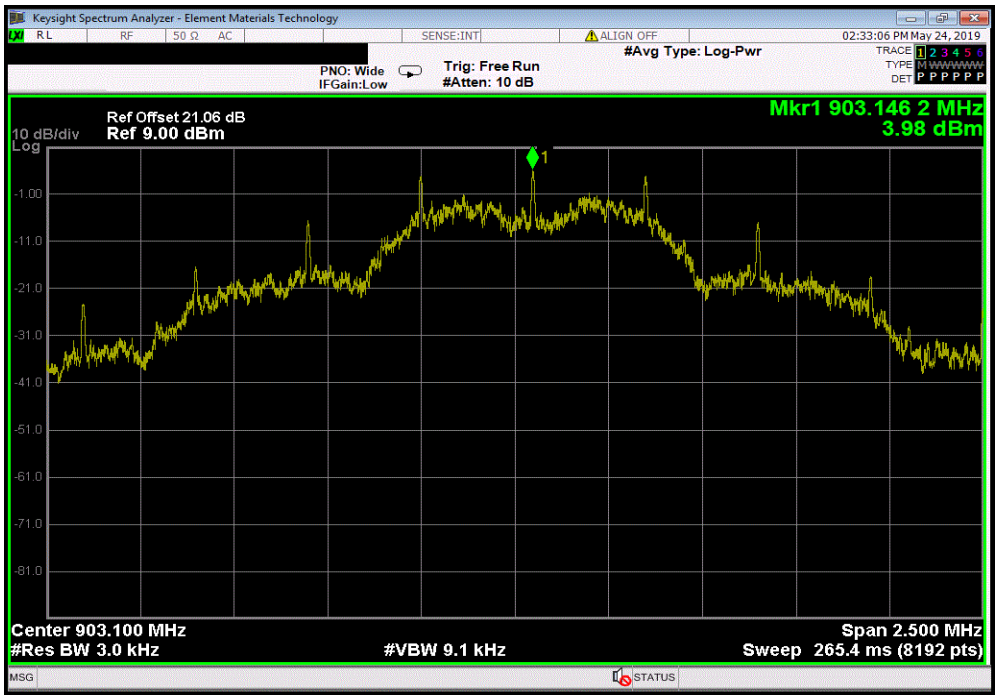
DEVIATIONS FROM TEST STANDARD

None

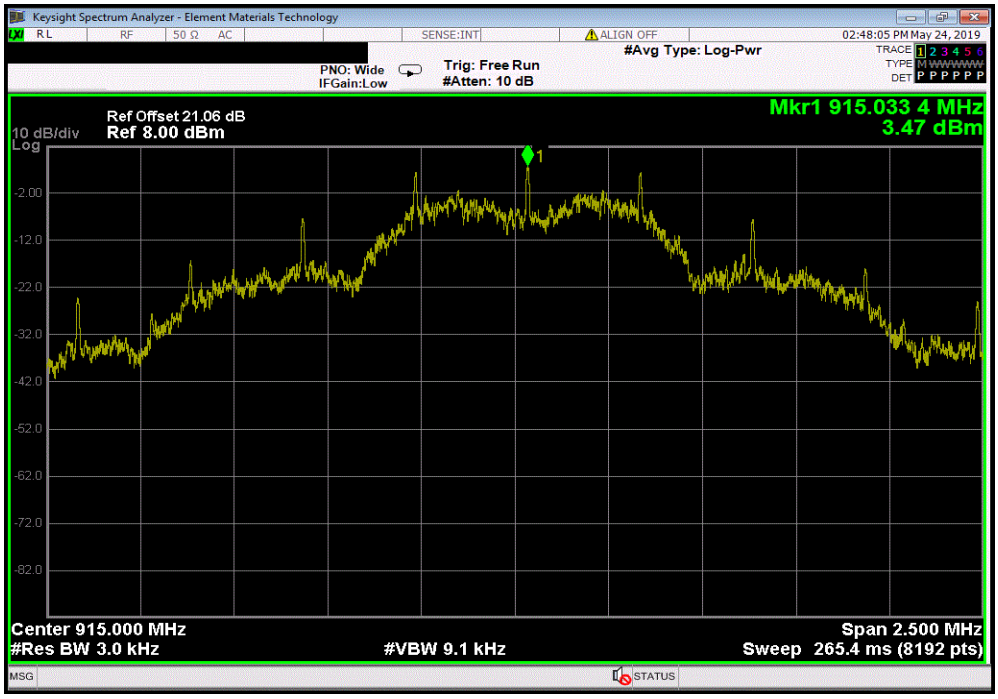
Configuration #	6	Signature Jonathan Kiefer

	Value dBm/3kHz	Limit < dBm/3kHz	Results
Low Channel, 903.1 MHz	3.981	8	Pass
Mid Channel, 915 MHz	3.468	8	Pass
High Channel, 926.6 MHz	3.19	8	Pass

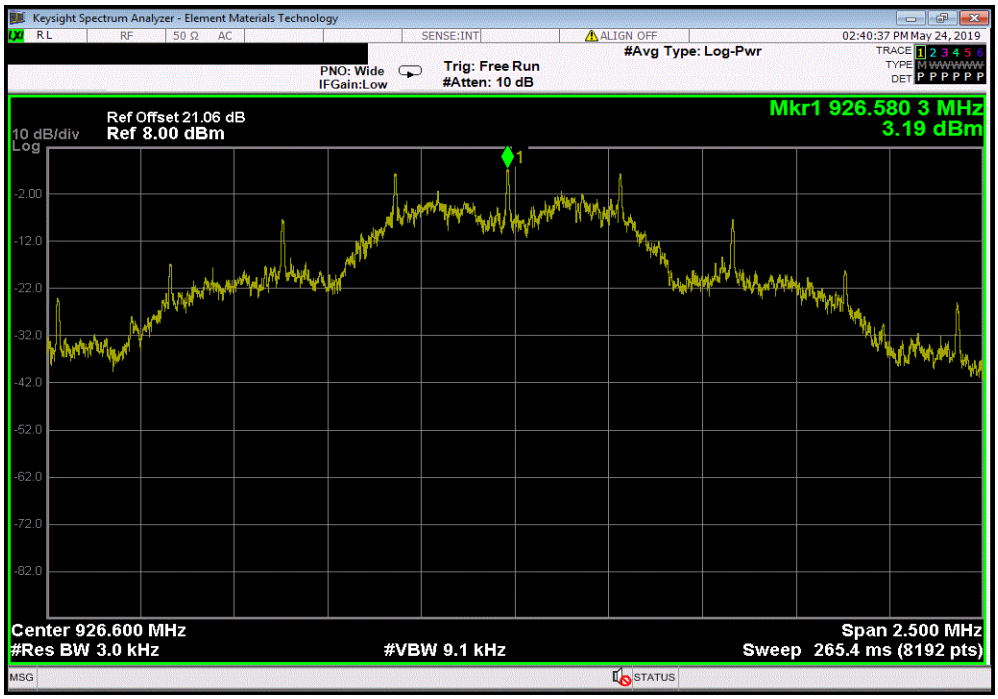
Low Channel, 903.1 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				3.981	8	Pass



Mid Channel, 915 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				3.468	8	Pass



High Channel, 926.6 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				3.19	8	Pass



BAND EDGE COMPLIANCE

XMit 2019.05.15

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Attenuator	Fairview Microwave	SA4018-20	TYE	10-Oct-18	10-Oct-19
Block - DC	Fairview Microwave	SD3379	AMT	10-Oct-18	10-Oct-19
Cable	Micro-Coax	UFD150A-1-0720-200200	TXG	10-Oct-18	10-Oct-19
Generator - Signal	Keysight	N5171B-506	TEW	2-May-18	2-May-21
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	19-Mar-19	19-Mar-20

TEST DESCRIPTION

The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in each available band. The channels closest to the band edges were selected. The EUT was transmitting at the data rate(s) listed in the datasheet.

The spectrum was scanned below the lower band edge and above the higher band edge.

BAND EDGE COMPLIANCE

element

TbtTx 2018.09.13 XMit 2019.05.15

EUT:	**LineScope Radio Module**			**Work Order:**	**CLEV0001**
Serial Number:	**See Configurations**			**Date:**	**23-May-19**
Customer:	**Cleaveland Price Inc.**			**Temperature:**	**22.2 °C**
Attendees:	**None**			**Humidity:**	**55.8% RH**
Project:	**None**			**Barometric Pres.:**	**1019 mbar**
Tested by:	**Jonathan Kiefer**	**Power:**	**Battery**	**Job Site:**	**TX09**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2019	ANSI C63.10:2013

COMMENTS

Reference Offset 21.06 dB (20 dB Attenuator + dc block + cable).

DEVIATIONS FROM TEST STANDARD

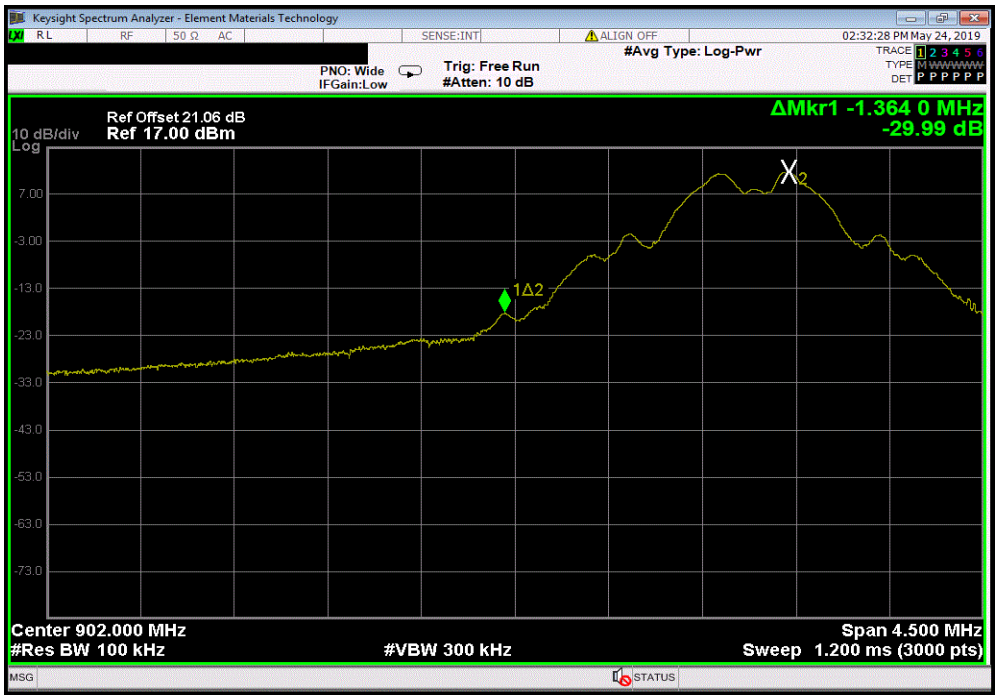
None

Configuration #	**6**	*Signature* Jonathan Kiefer

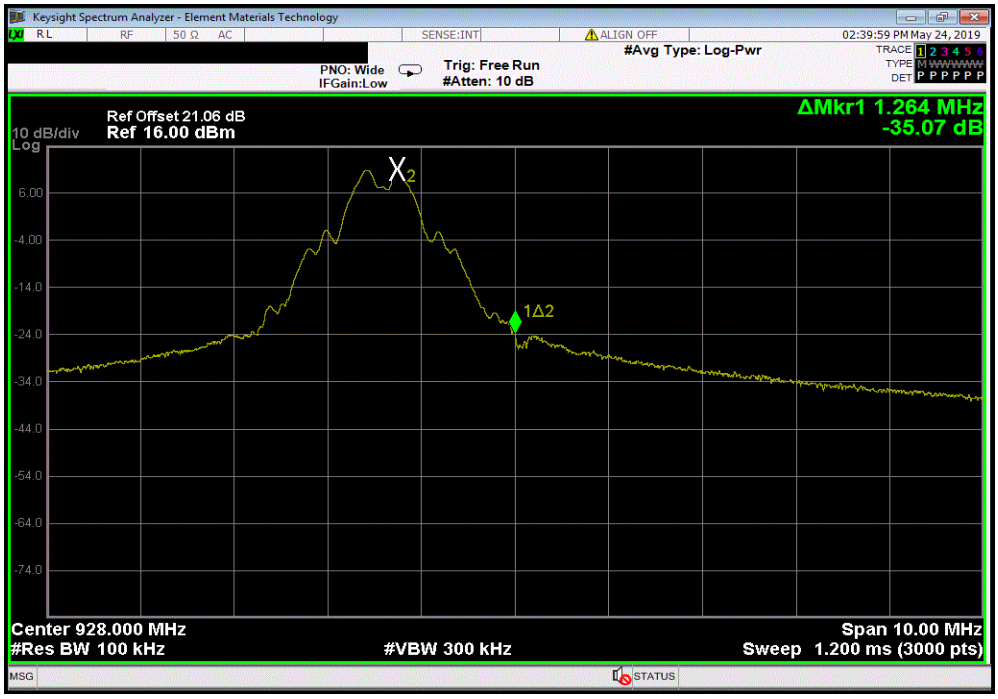
	Value (dBc)	**Limit ≤ (dBc)**	**Result**
Low Channel, 903.1 MHz	-29.99	-20	Pass
High Channel, 926.6 MHz	-35.07	-20	Pass

BAND EDGE COMPLIANCE

Low Channel, 903.1 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-29.99	-20	Pass



High Channel, 926.6 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-35.07	-20	Pass



SPURIOUS CONDUCTED EMISSIONS

XMit 2019.05.15

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Attenuator	Fairview Microwave	SA4018-20	TYE	10-Oct-18	10-Oct-19
Block - DC	Fairview Microwave	SD3379	AMT	10-Oct-18	10-Oct-19
Cable	Micro-Coax	UFD150A-1-0720-200200	TXG	10-Oct-18	10-Oct-19
Generator - Signal	Keysight	N5171B-506	TEW	2-May-18	2-May-21
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	19-Mar-19	19-Mar-20

TEST DESCRIPTION

The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The EUT was transmitting at the data rate(s) listed in the datasheet. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.

SPURIOUS CONDUCTED EMISSIONS

element

TbtTx 2018.09.13 XMit 2019.05.15

EUT:	**LineScope Radio Module**			**Work Order:**	**CLEV0001**
Serial Number:	**See Configurations**			**Date:**	**23-May-19**
Customer:	**Cleaveland Price Inc.**			**Temperature:**	**22.2 °C**
Attendees:	**None**			**Humidity:**	**55.8% RH**
Project:	**None**			**Barometric Pres.:**	**1019 mbar**
Tested by:	**Jonathan Kiefer**	**Power:**	**Battery**	**Job Site:**	**TX09**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2019	ANSI C63.10:2013

COMMENTS

Reference Offset 21.06 dB (20 dB attenuator + dc block + cable).

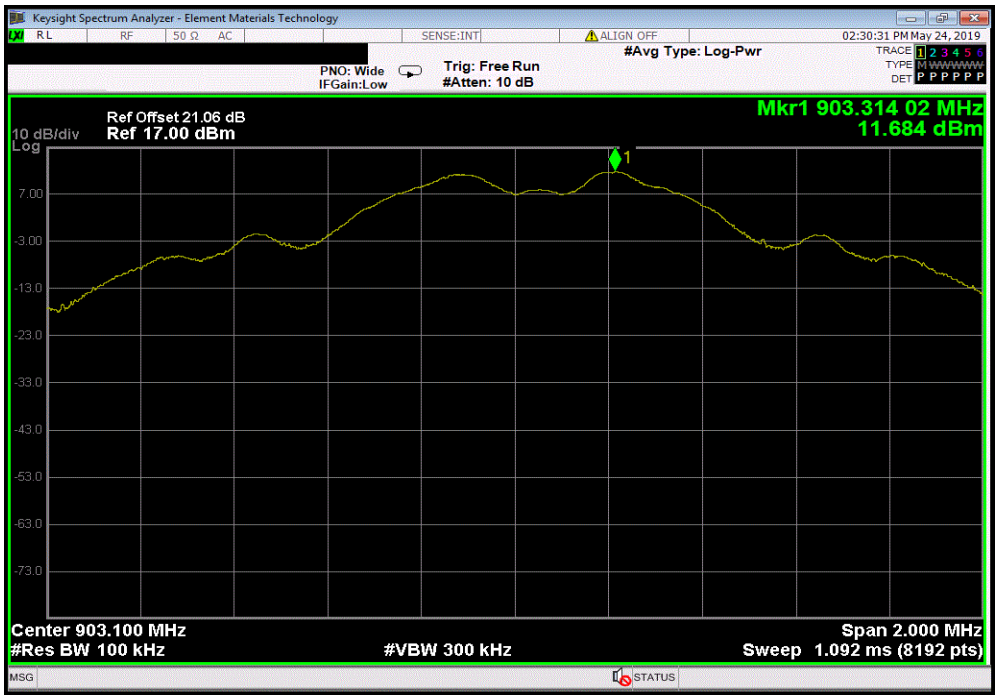
DEVIATIONS FROM TEST STANDARD

None

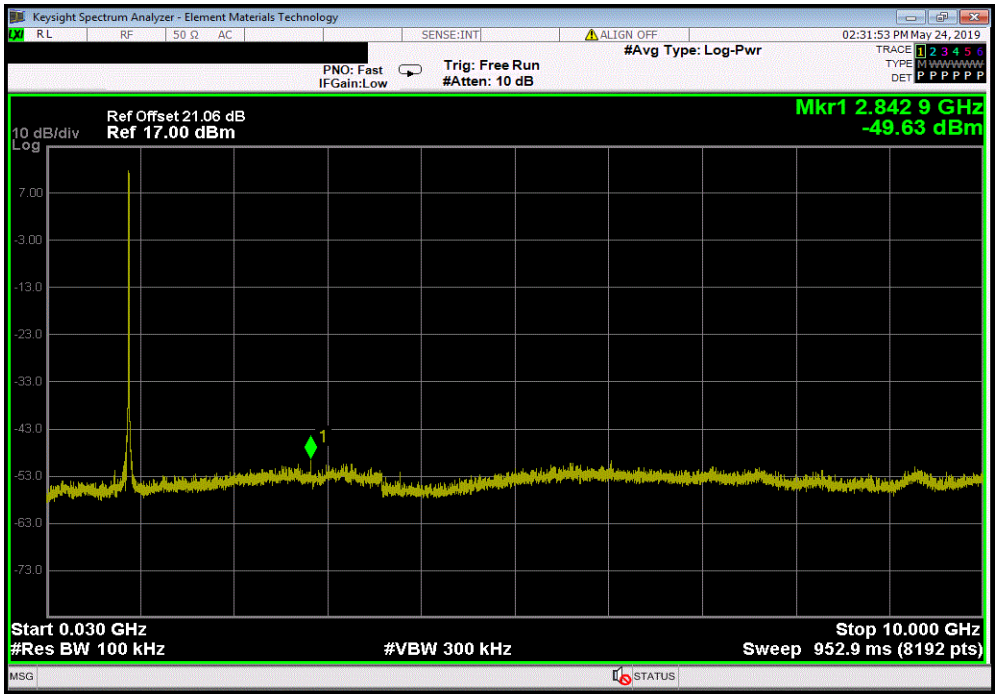
Configuration #	**6**	*Signature* Jonathan Kiefer

	Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
Low Channel, 903.1 MHz	Fundamental	903.31	N/A	N/A	N/A
Low Channel, 903.1 MHz	30 MHz - 10 GHz	2842.93	-61.31	-20	Pass
Mid Channel, 915 MHz	Fundamental	915.2	N/A	N/A	N/A
Mid Channel, 915 MHz	30 MHz - 10 GHz	2690.78	-61.35	-20	Pass
High Channel, 926.6 MHz	Fundamental	926.74	N/A	N/A	N/A
High Channel, 926.6 MHz	30 MHz - 10 GHz	3156.96	-61.35	-20	Pass

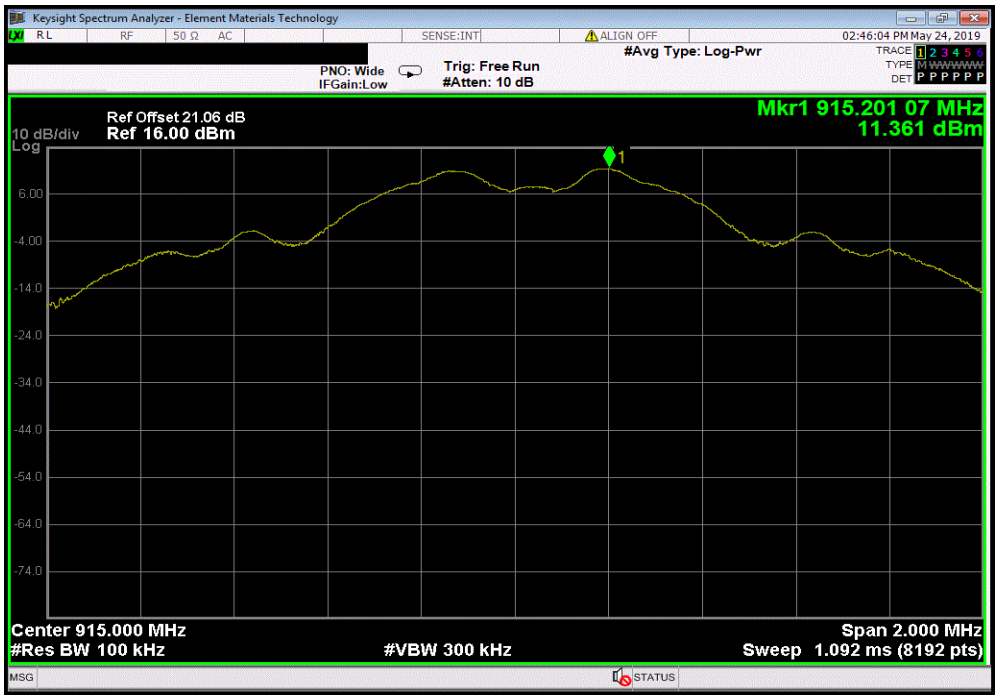
Low Channel, 903.1 MHz					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental	903.31	N/A	N/A	N/A



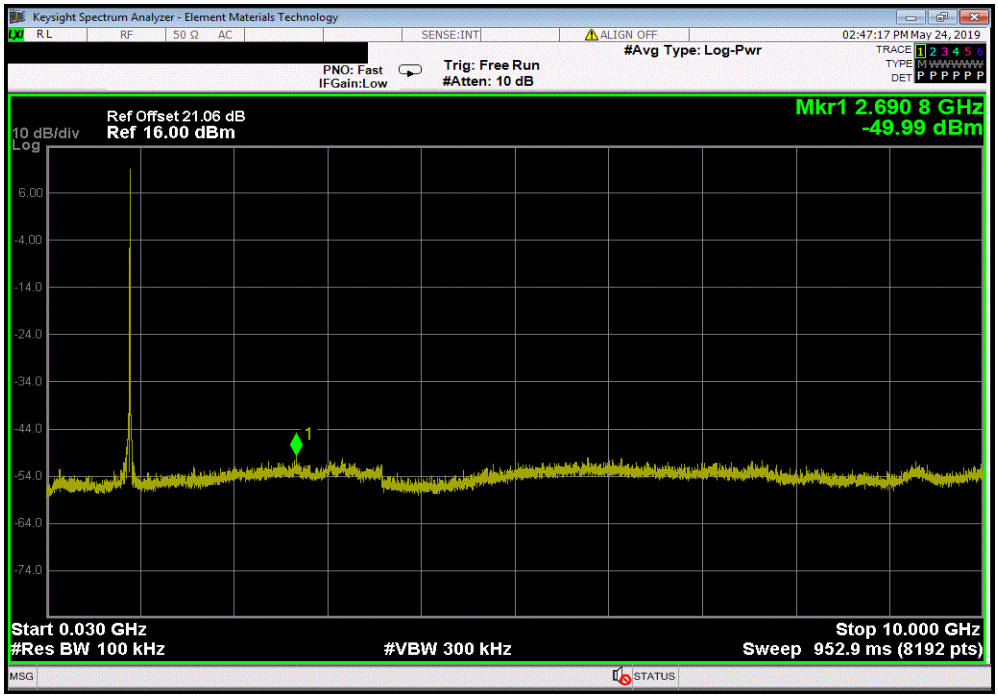
Low Channel, 903.1 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 10 GHz	2842.93	-61.31	-20	Pass



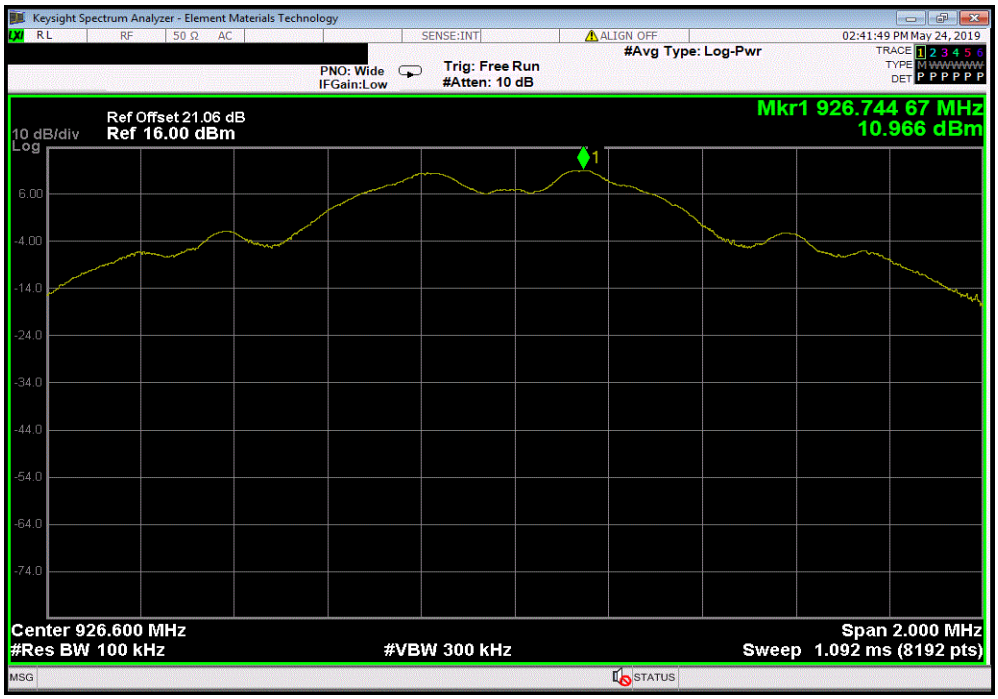
Mid Channel, 915 MHz					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental	915.2	N/A	N/A	N/A



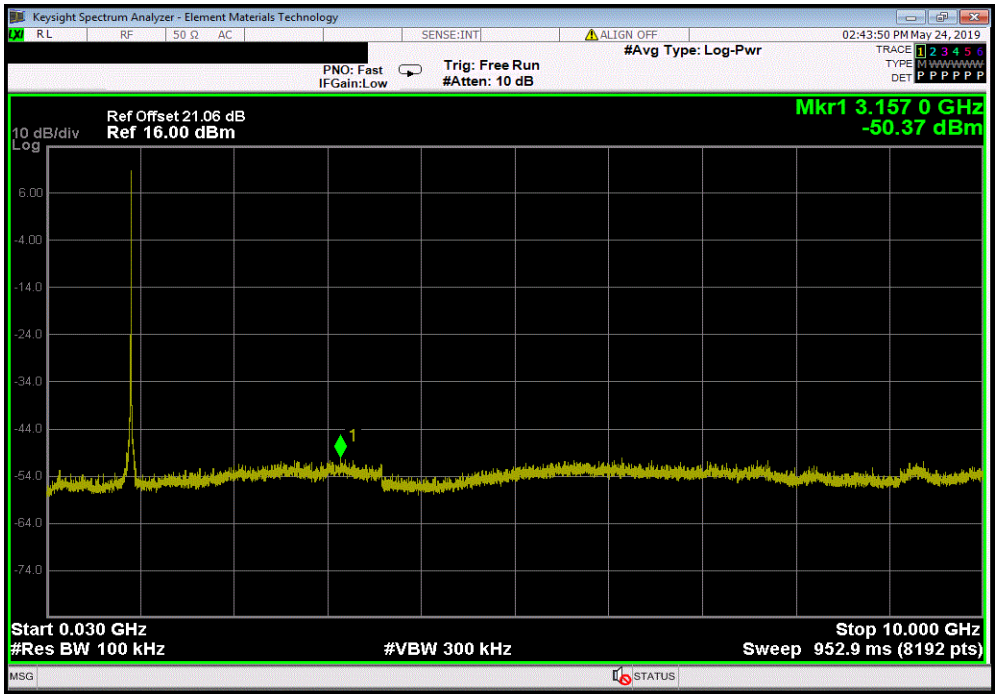
Mid Channel, 915 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 10 GHz	2690.78	-61.35	-20	Pass



High Channel, 926.6 MHz					
Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental	926.74	N/A	N/A	N/A



High Channel, 926.6 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 10 GHz	3156.96	-61.35	-20	Pass



APPENDIX

CLEAVELAND / PRICE INC.
14000 RT. 993 • Trafford, PA 15085-9550 • (724) 864-4177
www.cleavelandprice.com FAX (724) 864-9040

Ref: **FCC ID: 2ATMU-CP-RM001, ISED ID: 25561-CPRM001**

Dear Application Examiner(s) for FCC / ISED Certifications,

Cleaveland/Price is requesting an original, single modular certification on the LineScope™ wireless radio transceiver module (model number CP-RM001 for FCC, CPRM001 for ISED). During laboratory testing, the radio module *appears* to be very integrated into the system, *even though it is an entirely separate module.*

I attest that the modular transmitter was tested in a stand-alone configuration. DC power and data I/O lines connected to the module did not contain any ferrites not marketed with the module. The length of these lines are the length typical of actual use (PCB trace), as the module solders directly to the host board. The host board simply provides power and control of the radio.

Thank you for your efforts in reviewing this attestation.

Regards,

Justin Reinhart
Electrical Engineer
Cleaveland/Price Inc.