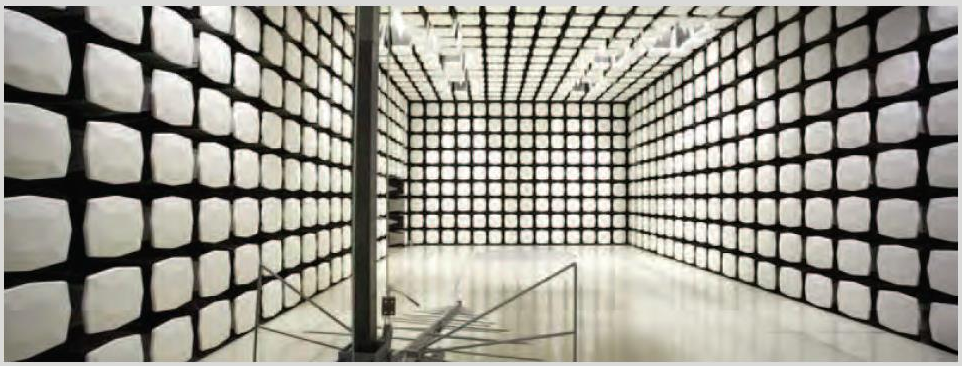
Harsco Corporation

Xtend 900MHz 1 Watt Radio

902-928 MHz FHSS Transceiver

FCC 15.247:2019

Report # DGII0355.1



NVLAP LAB CODE: 200881-0

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CERTIFICATE OF TEST

Last Date of Test: June 27, 2019
Harsco Corporation
Model: Xtend 900MHz 1 Watt Radio

Radio Equipment Testing

Standards

Specification	Method
FCC 15.247:2019	ANSI C63.10:2013

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	No	N/A	Testing completed under previous filing. Please see filing documents under FCC ID: 2AEO5-XBPSX
6.5, 6.6	Spurious Radiated Emissions	Yes	Pass	
7.5	Duty Cycle	No	N/A	Testing completed under previous filing. Please see filing documents under FCC ID: 2AEO5-XBPSX
7.8.2	Carrier Frequency Separation	No	N/A	Testing completed under previous filing. Please see filing documents under FCC ID: 2AEO5-XBPSX
7.8.3	Number of Hopping Frequencies	No	N/A	Testing completed under previous filing. Please see filing documents under FCC ID: 2AEO5-XBPSX
7.8.4	Dwell Time	No	N/A	Testing completed under previous filing. Please see filing documents under FCC ID: 2AEO5-XBPSX
7.8.5	Output Power	Yes	Pass	
7.8.5	Equivalent Isotropic Radiated Power	Yes	Pass	
7.8.6	Band Edge Compliance	No	N/A	Testing completed under previous filing. Please see filing documents under FCC ID: 2AEO5-XBPSX
7.8.6	Band Edge Compliance - Hopping Mode	No	N/A	Testing completed under previous filing. Please see filing documents under FCC ID: 2AEO5-XBPSX
7.8.7	Occupied Bandwidth	No	N/A	Testing completed under previous filing. Please see filing documents under FCC ID: 2AEO5-XBPSX
7.8.8	Spurious Conducted Emissions	No	N/A	Testing completed under previous filing. Please see filing documents under FCC ID: 2AEO5-XBPSX
11.10.2	Power Spectral Density	No	N/A	Not required for FHSS devices.

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.

CERTIFICATE OF TEST

Deviations From Test Standards

None

Approved By:

Rod Munro, 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

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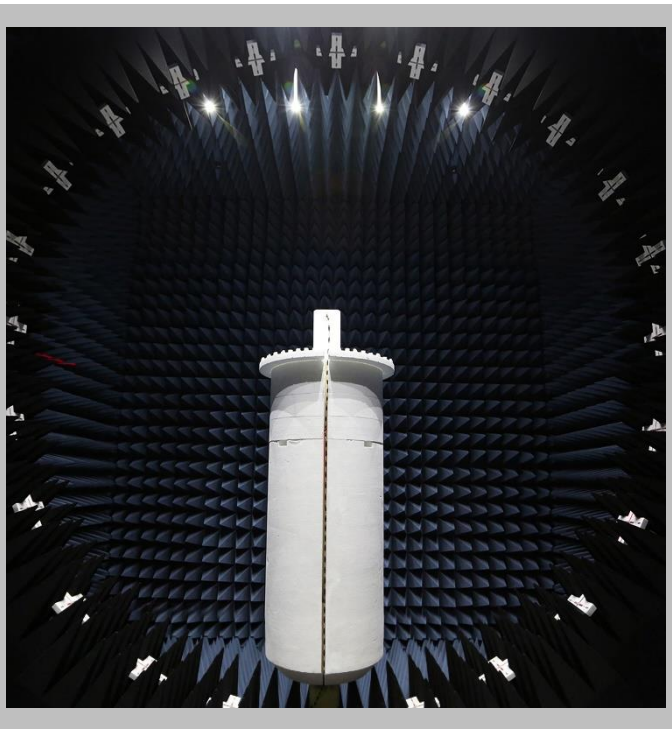
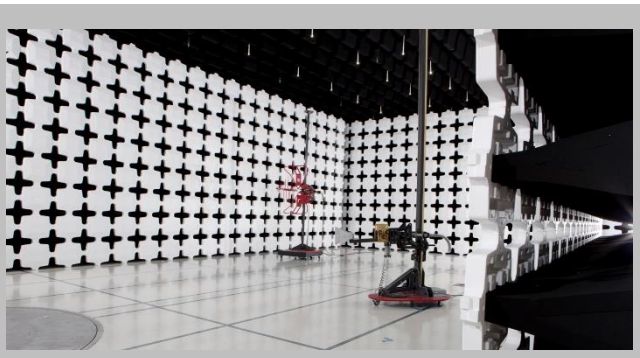
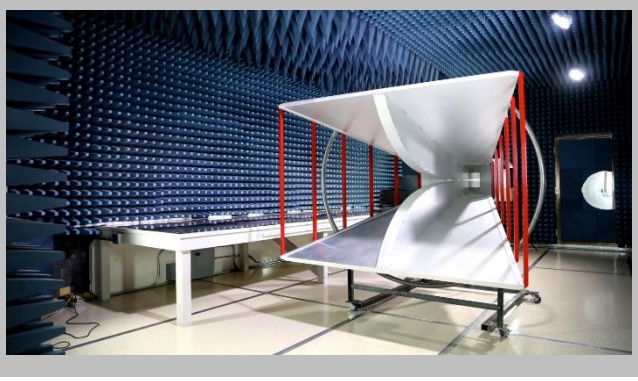
https://www.nwemc.com/emc-testing-accreditations

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.

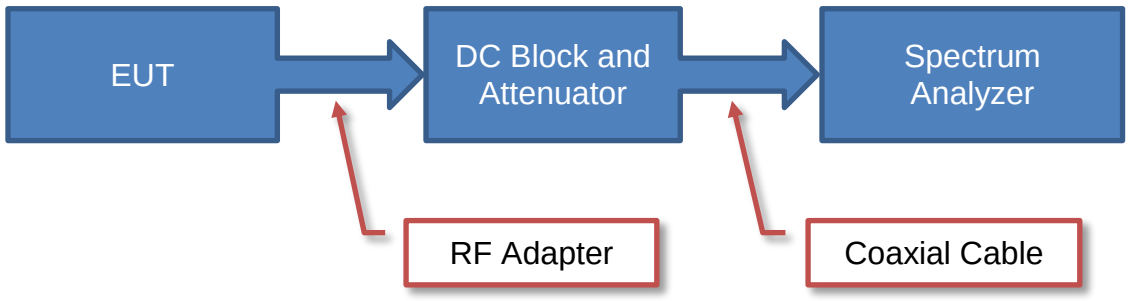
A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found included as part of the applicable 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.

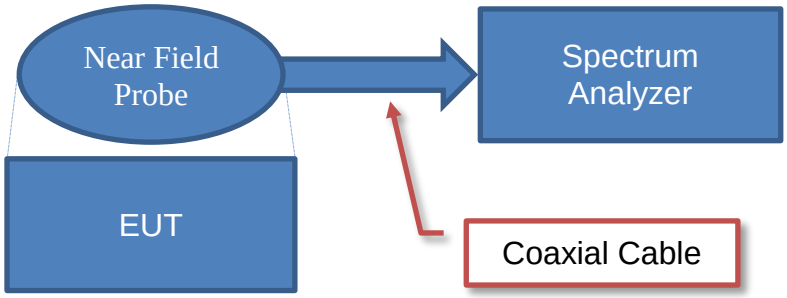
Test	+ MU	- MU
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	1.2 dB	-1.2 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	5.2 dB	-5.2 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

Test Setup Block Diagrams

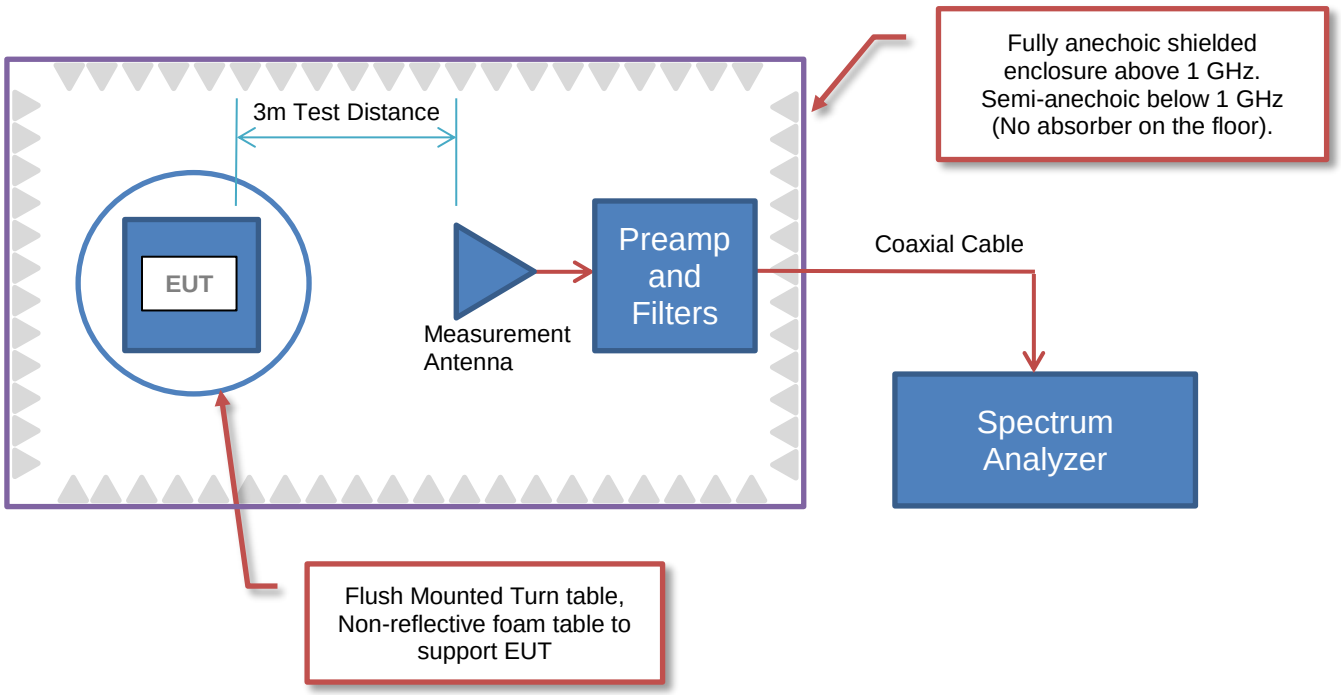
Antenna Port Conducted Measurements



Near Field Test Fixture Measurements



Spurious Radiated Emissions



PRODUCT DESCRIPTION

Client and Equipment Under Test (EUT) Information

Company Name:	Harsco Corporation
Address:	2401 Edmund Road
City, State, Zip:	West Columbia, SC 29170
Test Requested By:	Travis Sjostrom - Digi International Inc.
Model:	Xtend 900MHz 1 Watt Radio
First Date of Test:	June 27, 2019
Last Date of Test:	June 27, 2019
Receipt Date of Samples:	June 27, 2019
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
1 Watt Long-Range OEM RF Module.

Testing Objective:
Seeking to demonstrate compliance under FCC 15.247:2019 for operation in the 902 - 928 MHz Band with a Class II Permissive Change to FCC ID: 2AEO5-XBPSX.

CONFIGURATIONS

Configuration DGII0355- 1

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Xtend 900MHz 1 Watt Radio	Harsco Corporation	XPBSX	100BAF1B

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Dev Board	Harsco Corporation	XTIB-U REV.3	I183506586
Antenna	Laird	MD24-12	None
24VDC Power Supply	PhiHong	PSA15R-240P	P81300420A1

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Coax Cable	Yes	4.5m	No	Coax Adapter Cable	Antenna
Coax Adapter Cable	Yes	0.1m	No	Dev Board	Coax Cable
DC Power	No	1.7m	Yes	24VDC Power Supply	Dev Board

Configuration DGII0355- 3

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Xtend 900MHz 1 Watt Radio	Harsco Corporation	XPBSX	100BAF1B

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Dev Board	Harsco Corporation	XTIB-U REV.3	I183506586
Laptop PC	Hewlett-Packard	EliteBook	01040
24VDC Power Supply	PhiHong	PSA15R-240P	P81300420A1

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB	Yes	1.8m	No	Laptop PC	Dev Board
Coax Adapter Cable	Yes	0.1m	No	Dev Board	Coax Cable
DC Power	No	1.7m	Yes	24VDC Power Supply	Dev Board

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2019-06-27	Spurious Radiated 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.
2	2019-06-27	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.
3	2019-06-27	Equivalent Isotropic Radiated Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

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

Tx sine wave with 10.3% duty cycle on Low, Mid, or High Ch at 902.75, 915.25, 927.25 MHz.

POWER SETTINGS INVESTIGATED

24VDC

CONFIGURATIONS INVESTIGATED

DGII0355 - 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	LFM	24-Sep-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVV	8-Feb-2019	12 mo
Cable	ESM Cable Corp.	Standard Gain Horn Cables	MNJ	8-Mar-2019	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AXP	NCR	0 mo
Attenuator	Fairview Microwave	SA18E-20	TWZ	24-Sep-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVT	8-Feb-2019	12 mo
Cable	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	24-Sep-2018	12 mo
Antenna - Double Ridge	ETS-Lindgren	3115	AJQ	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AVO	2-Nov-2018	12 mo
Cable	ESM Cable Corp.	Bilog Cables	MNH	2-Nov-2018	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AYD	25-Jan-2018	24 mo
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	1-May-2019	12 mo
Filter - Band Pass/Notch	K&L Microwave	3TNF-500/1000-N/N	HGS	31-Jul-2018	12 mo

MEASUREMENT BANDWIDTHS

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

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.

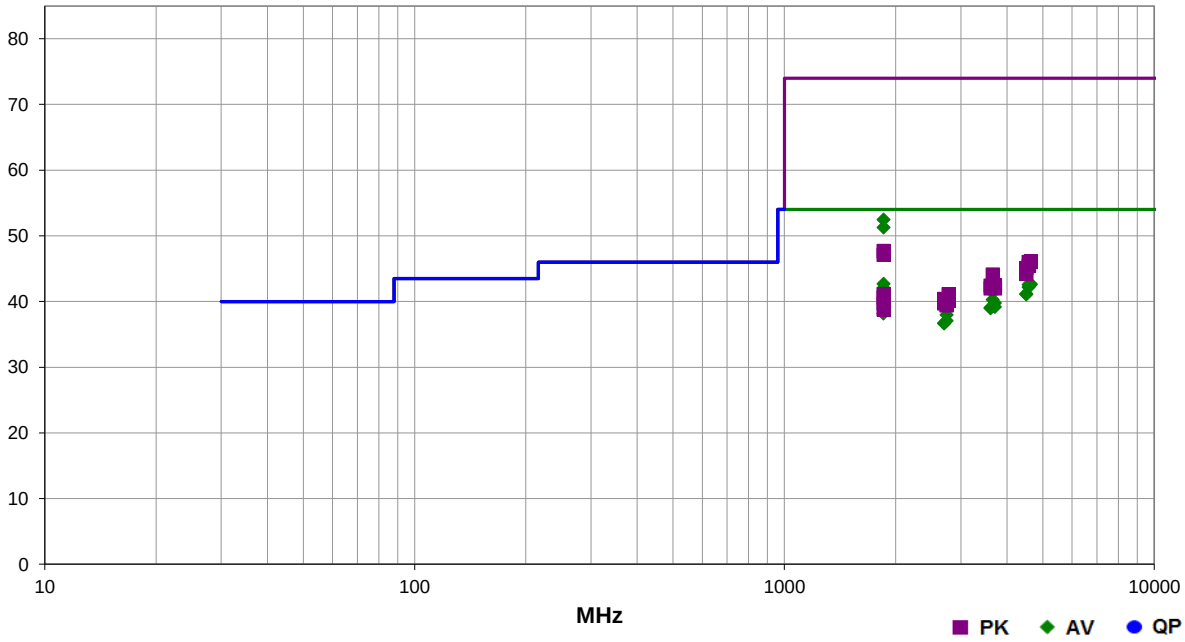
SPURIOUS RADIATED EMISSIONS

EmiR5 2019.05.20 PSA-ESCI 2019.05.10

Work Order:	DGII0355	**Date:**	27-Jun-2019		
Project:	None	**Temperature:**	21.9 °C		
Job Site:	MN05	**Humidity:**	60.9% RH		
Serial Number:	100BAF1B	**Barometric Pres.:**	1019 mbar	**Tested by:**	Kyle McMullan
EUT:	Xtend 900MHz 1 Watt Radio				
Configuration:	1				
Customer:	Harsco Corporation				
Attendees:	Travis Sjostrom				
EUT Power:	24VDC				
Operating Mode:	Tx sine wave with 10.3% duty cycle on Low, Mid, or High Ch at 902.75, 915.25, 927.25 MHz.				
Deviations:	None				
Comments:	Duty cycle correction factor based on the equation 10*log(1/duty cycle). This comes out to a correction factor of 9.87 dB.				

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

Run #	19	**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 (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
1854.383	47.0	-4.4	1.5	184.0	9.9	0.0	Vert	AV	0.0	52.5	54.0	-1.5	Ant Upright, High Ch
1854.708	45.8	-4.4	1.5	185.9	9.9	0.0	Horz	AV	0.0	51.3	54.0	-2.7	Ant On Side, High Ch
4636.258	28.6	4.2	1.5	22.0	9.9	0.0	Vert	AV	0.0	42.7	54.0	-11.3	Ant Upright, High Ch
3661.375	32.6	0.2	1.0	137.0	9.9	0.0	Vert	AV	0.0	42.7	54.0	-11.3	Ant Upright, Mid Ch
1854.508	37.2	-4.4	1.5	321.0	9.9	0.0	Vert	AV	0.0	42.7	54.0	-11.3	Ant Horz, High Ch
4638.750	28.5	4.2	3.9	127.9	9.9	0.0	Horz	AV	0.0	42.6	54.0	-11.4	Ant On Side, High Ch
4576.408	28.8	3.9	1.5	325.9	9.9	0.0	Vert	AV	0.0	42.6	54.0	-11.4	Ant Upright, Mid Ch
4576.125	28.4	3.9	1.5	145.9	9.9	0.0	Horz	AV	0.0	42.2	54.0	-11.8	Ant On Side, Mid Ch
1854.292	36.6	-4.4	1.5	268.9	9.9	0.0	Horz	AV	0.0	42.1	54.0	-11.9	Ant Upright, High Ch
1854.492	36.1	-4.4	1.5	16.9	9.9	0.0	Horz	AV	0.0	41.6	54.0	-12.4	Ant Horz, High Ch
4511.358	27.7	3.6	1.5	318.0	9.9	0.0	Vert	AV	0.0	41.2	54.0	-12.8	Ant Upright, Low Ch
4511.517	27.6	3.6	1.5	0.0	9.9	0.0	Horz	AV	0.0	41.1	54.0	-12.9	Ant On Side, Low Ch
3660.925	30.2	0.2	1.5	153.9	9.9	0.0	Horz	AV	0.0	40.3	54.0	-13.7	Ant On Side, Mid Ch
2781.517	33.3	-3.1	1.5	336.0	9.9	0.0	Vert	AV	0.0	40.1	54.0	-13.9	Ant Upright, High Ch
3709.108	29.4	0.5	1.5	160.0	9.9	0.0	Vert	AV	0.0	39.8	54.0	-14.2	Ant Upright, High Ch
2781.542	33.0	-3.1	1.5	6.9	9.9	0.0	Horz	AV	0.0	39.8	54.0	-14.2	Ant On Side, High Ch
3709.000	28.8	0.5	1.5	216.0	9.9	0.0	Horz	AV	0.0	39.2	54.0	-14.8	Ant On Side, High Ch

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
3613.250	29.3	-0.1	3.9	200.9	9.9	0.0	Vert	AV	0.0	39.1	54.0	-14.9	Ant Upright, Low Ch
3613.283	29.2	-0.1	1.5	260.0	9.9	0.0	Horz	AV	0.0	39.0	54.0	-15.0	Ant On Side, Low Ch
1854.167	32.7	-4.4	1.5	329.9	9.9	0.0	Vert	AV	0.0	38.2	54.0	-15.8	Ant On Side, High Ch
2746.075	31.5	-3.4	1.5	351.0	9.9	0.0	Vert	AV	0.0	38.0	54.0	-16.0	Ant Upright, Mid Ch
2745.842	30.6	-3.4	1.5	81.0	9.9	0.0	Horz	AV	0.0	37.1	54.0	-16.9	Ant On Side, Mid Ch
2705.833	30.1	-3.3	1.5	192.0	9.9	0.0	Vert	AV	0.0	36.7	54.0	-17.3	Ant Upright, Low Ch
2706.008	30.1	-3.3	1.5	231.0	9.9	0.0	Horz	AV	0.0	36.7	54.0	-17.3	Ant On Side, Low Ch
1854.417	52.1	-4.4	1.5	184.0	0.0	0.0	Vert	PK	0.0	47.7	74.0	-26.3	Ant Upright, High Ch
1854.392	51.5	-4.4	1.5	185.9	0.0	0.0	Horz	PK	0.0	47.1	74.0	-26.9	Ant On Side, High Ch
4638.733	41.9	4.2	1.5	22.0	0.0	0.0	Vert	PK	0.0	46.1	74.0	-27.9	Ant Upright, High Ch
4638.467	41.8	4.2	3.9	127.9	0.0	0.0	Horz	PK	0.0	46.0	74.0	-28.0	Ant On Side, High Ch
4576.492	42.1	3.9	1.5	325.9	0.0	0.0	Vert	PK	0.0	46.0	74.0	-28.0	Ant Upright, Mid Ch
4574.783	41.5	3.9	1.5	145.9	0.0	0.0	Horz	PK	0.0	45.4	74.0	-28.6	Ant On Side, Mid Ch
4511.642	41.5	3.6	1.5	318.0	0.0	0.0	Vert	PK	0.0	45.1	74.0	-28.9	Ant Upright, Low Ch
4511.267	40.6	3.6	1.5	0.0	0.0	0.0	Horz	PK	0.0	44.2	74.0	-29.8	Ant On Side, Low Ch
3660.475	43.9	0.2	1.0	137.0	0.0	0.0	Vert	PK	0.0	44.1	74.0	-29.9	Ant Upright, Mid Ch
3709.800	42.0	0.5	1.5	160.0	0.0	0.0	Vert	PK	0.0	42.5	74.0	-31.5	Ant Upright, High Ch
3660.742	42.3	0.2	1.5	153.9	0.0	0.0	Horz	PK	0.0	42.5	74.0	-31.5	Ant On Side, Mid Ch
3612.883	42.5	-0.1	1.5	260.0	0.0	0.0	Horz	PK	0.0	42.4	74.0	-31.6	Ant On Side, Low Ch
3707.342	41.5	0.5	1.5	216.0	0.0	0.0	Horz	PK	0.0	42.0	74.0	-32.0	Ant On Side, High Ch
3611.758	42.2	-0.2	3.9	200.9	0.0	0.0	Vert	PK	0.0	42.0	74.0	-32.0	Ant Upright, Low Ch
2782.017	44.2	-3.1	1.5	336.0	0.0	0.0	Vert	PK	0.0	41.1	74.0	-32.9	Ant Upright, High Ch
1854.542	45.5	-4.4	1.5	268.9	0.0	0.0	Horz	PK	0.0	41.1	74.0	-32.9	Ant Upright, High Ch
1854.483	45.0	-4.4	1.5	321.0	0.0	0.0	Vert	PK	0.0	40.6	74.0	-33.4	Ant Horz, High Ch
2705.908	43.7	-3.3	1.5	231.0	0.0	0.0	Horz	PK	0.0	40.4	74.0	-33.6	Ant On Side, Low Ch
2745.392	43.7	-3.4	1.5	351.0	0.0	0.0	Vert	PK	0.0	40.3	74.0	-33.7	Ant Upright, Mid Ch
2781.558	43.2	-3.1	1.5	6.9	0.0	0.0	Horz	PK	0.0	40.1	74.0	-33.9	Ant On Side, High Ch
2706.325	43.0	-3.3	1.5	192.0	0.0	0.0	Vert	PK	0.0	39.7	74.0	-34.3	Ant Upright, Low Ch
1854.717	44.1	-4.4	1.5	16.9	0.0	0.0	Horz	PK	0.0	39.7	74.0	-34.3	Ant Horz, High Ch
2744.933	42.8	-3.4	1.5	81.0	0.0	0.0	Horz	PK	0.0	39.4	74.0	-34.6	Ant On Side, Mid Ch
1854.425	43.2	-4.4	1.5	329.9	0.0	0.0	Vert	PK	0.0	38.8	74.0	-35.2	Ant On Side, High Ch

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
Attenuator	Fairview Microwave	18B5W-26	RFY	7-Jun-19	7-Jun-20
Generator - Signal	Agilent	E4422B	TGQ	15-Mar-18	15-Mar-21
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNO	7-Jun-19	7-Jun-20
Block - DC	Fairview Microwave	SD3379	AMI	7-Sep-18	7-Sep-19
Analyzer - Spectrum Analyzer	Keysight	N9010A (EXA)	AFQ	13-Dec-18	13-Dec-19

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The peak output power was measured with the EUT set to low, medium and high transmit frequencies. The EUT was transmitting in a no hop mode at the data rate(s) listed in the datasheet.

The method found in ANSI C63.10:2013 Section 7.8.5 was used for a FHSS radio.

OUTPUT POWER

TbtTx 2018.09.13 XMit 2019.05.15

EUT:	**Xtend 900MHz 1 Watt Radio**			**Work Order:**	**DGII0355**
Serial Number:	**100BAF1B**			**Date:**	**27-Jun-19**
Customer:	**Harsco Corporation**			**Temperature:**	**22.4 °C**
Attendees:	**Travis Sjostrom**			**Humidity:**	**55.8% RH**
Project:	**None**			**Barometric Pres.:**	**1018 mbar**
Tested by:	**Kyle McMullan**	**Power:**	**24VDC**	**Job Site:**	**MN08**

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

COMMENTS

Tested using the minimum amount of required cable.

DEVIATIONS FROM TEST STANDARD

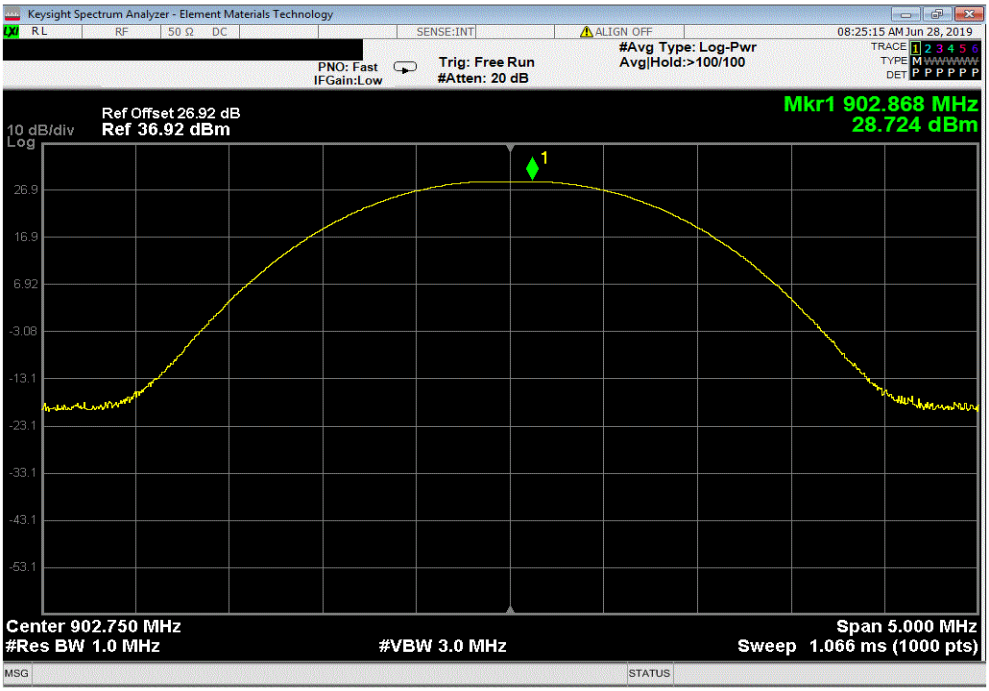
None

Configuration #	**3**	*Signature*

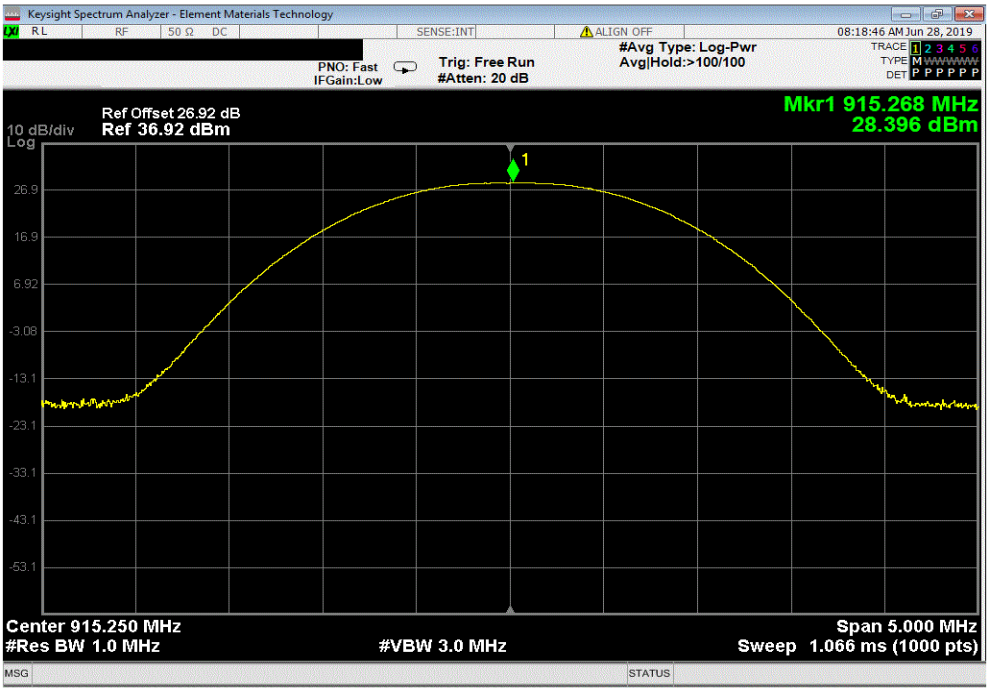
	Out Pwr (dBm)	**Limit (dBm)**	**Result**
Low Channel, 902.75 MHz, Sine Wave	28.724	30	Pass
Mid Channel, 915.25 MHz, Sine Wave	28.396	30	Pass
High Channel, 927.25 MHz, Sine Wave	28.355	30	Pass

OUTPUT POWER

Low Channel, 902.75 MHz, Sine Wave						
				Out Pwr (dBm)	Limit (dBm)	Result
				28.724	30	Pass

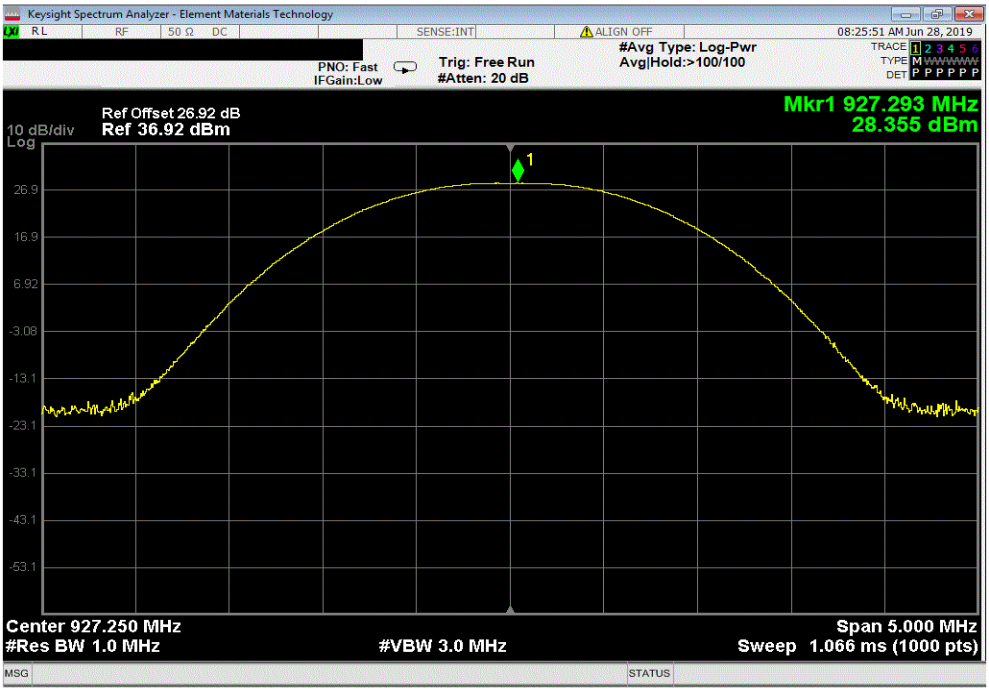


Mid Channel, 915.25 MHz, Sine Wave						
				Out Pwr (dBm)	Limit (dBm)	Result
				28.396	30	Pass



OUTPUT POWER

High Channel, 927.25 MHz, Sine Wave						
				Out Pwr (dBm)	Limit (dBm)	Result
				28.355	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
Generator - Signal	Agilent	E4422B	TGQ	15-Mar-18	15-Mar-21
Attenuator	Fairview Microwave	18B5W-26	RFY	7-Jun-19	7-Jun-20
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNO	7-Jun-19	7-Jun-20
Block - DC	Fairview Microwave	SD3379	AMI	7-Sep-18	7-Sep-19
Analyzer - Spectrum Analyzer	Keysight	N9010A (EXA)	AFQ	13-Dec-18	13-Dec-19

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The peak output power was measured with the EUT set to low, medium and high transmit frequencies. The EUT was transmitting in a no hop mode at the data rate(s) listed in the datasheet.

The method found in ANSI C63.10:2013 Section 7.8.5 was used for a FHSS radio.

The declared antenna gain in dBi was added to the conducted output power in dBm to find the EIRP.

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

element

TbtTx 2018.09.13 XMit 2019.05.15

EUT:	Xtend 900MHz 1 Watt Radio			**Work Order:**	DGII0355
Serial Number:	100BAF1B			**Date:**	27-Jun-19
Customer:	Harsco Corporation			**Temperature:**	20 °C
Attendees:	Travis Sjostrom			**Humidity:**	20% RH
Project:	None			**Barometric Pres.:**	1000 mbar
Tested by:	Kyle McMullan	**Power:**	24VDC	**Job Site:**	MN08

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

COMMENTS

Tested using the minimum amount of required cable.

DEVIATIONS FROM TEST STANDARD

None

Configuration #	3	*Signature*

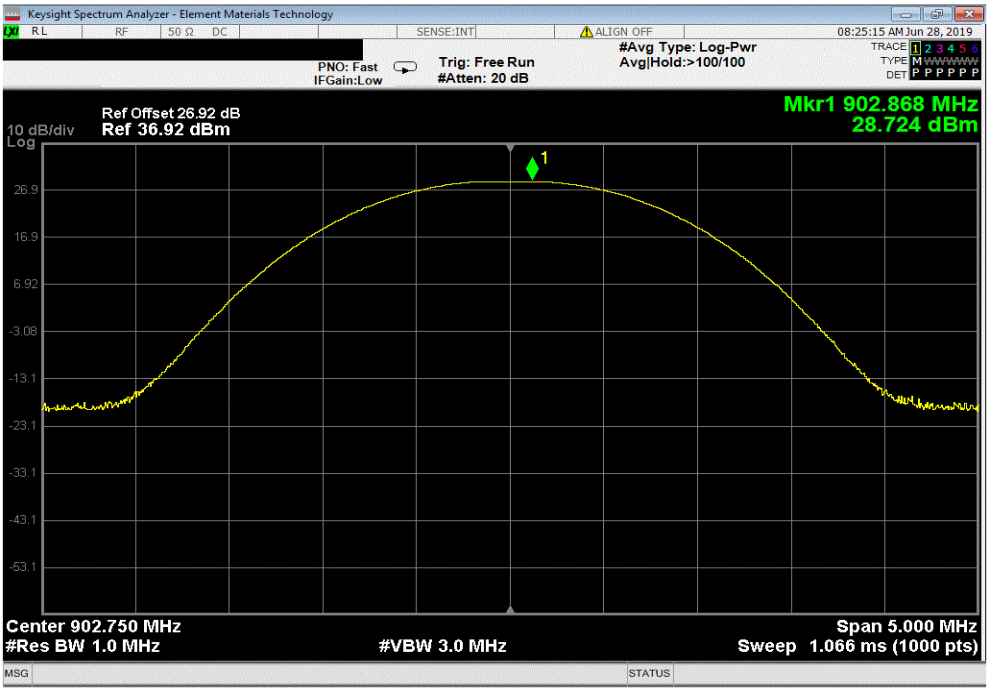
	Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
Low Channel, 902.75 MHz, Sine Wave	28.724	-3	25.724	36	Pass
Mid Channel, 915.25 MHz, Sine Wave	28.396	-3	25.396	36	Pass
High Channel, 927.25 MHz, Sine Wave	28.355	-3	25.355	36	Pass

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

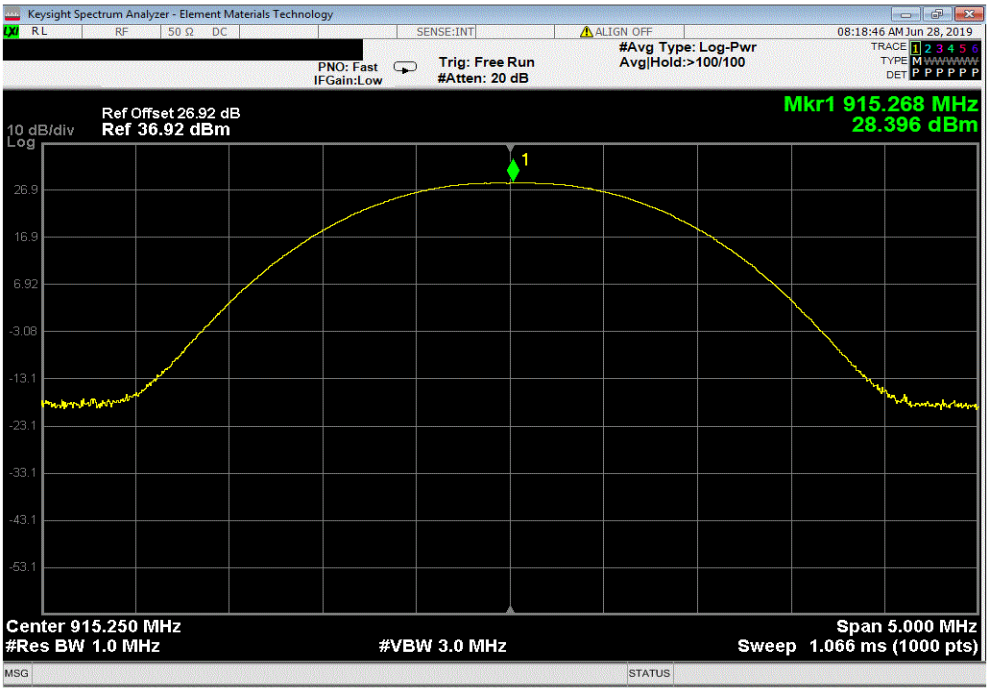
element

TbtTx 2018.09.13 XMit 2019.05.15

Low Channel, 902.75 MHz, Sine Wave						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		28.724	-3	25.724	36	Pass



Mid Channel, 915.25 MHz, Sine Wave						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		28.396	-3	25.396	36	Pass



EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

TbtTx 2018.09.13 XMit 2019.05.15

High Channel, 927.25 MHz, Sine Wave						
		Out Pwr (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		28.355	-3	25.355	36	Pass