Garrett Metal Detectors

Pro-Pointer AT Z-Lynk

FCC 15.247:2018

2400 – 2483.5 MHz DTS Transceiver

Report # GARR0038.1

NVLAP Lab Code: 201049-0

CERTIFICATE OF TEST

2017-1-25

Last Date of Test: February 21, 2018
Garrett Metal Detectors
Model: Pro-Pointer AT Z-Lynk

Radio Equipment Testing

Standards

Specification	Method
FCC 15.247:2018	ANSI C63.10:2013, KDB 558074

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	No	N/A	Not required for a battery powered EUT.
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	N/A	Characterization of radio operation.
11.8.2	Occupied Bandwidth	Yes	Pass	
11.9.1.1	Output Power	Yes	Pass	
11.11	Band Edge Compliance	Yes	Pass	
11.11	Spurious Conducted Emissions	Yes	Pass	
11.10.2	Power Spectral Density	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.

REVISION HISTORY

Revision Number	Description	Date	Page Number
00	None		

ACCREDITATIONS AND AUTHORIZATIONS

2018.2.20

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). Certification chambers and Open Area Test Sites are filed with ISED.

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:
http://portlandcustomer.element.com/ts/scope/scope.htm
http://gsi.nist.gov/global/docs/cabs/designations.html

MEASUREMENT UNCERTAINTY

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.

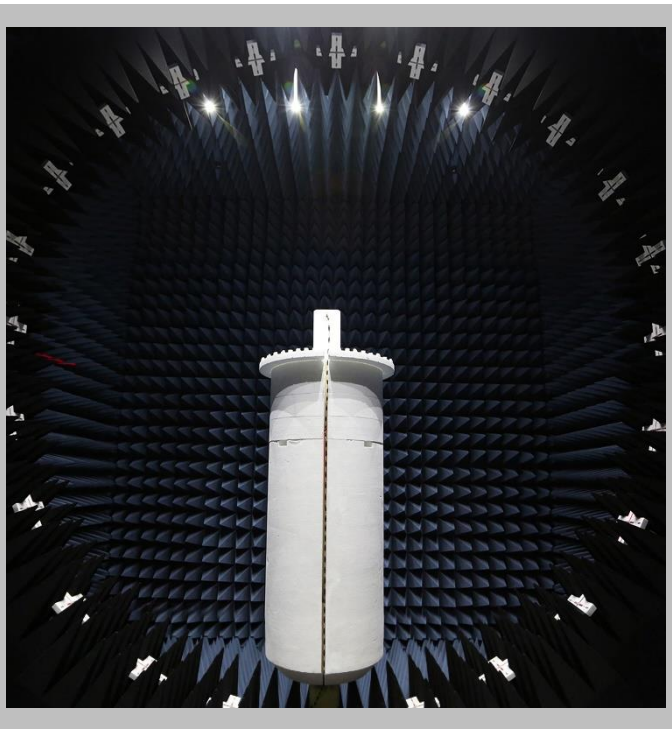
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

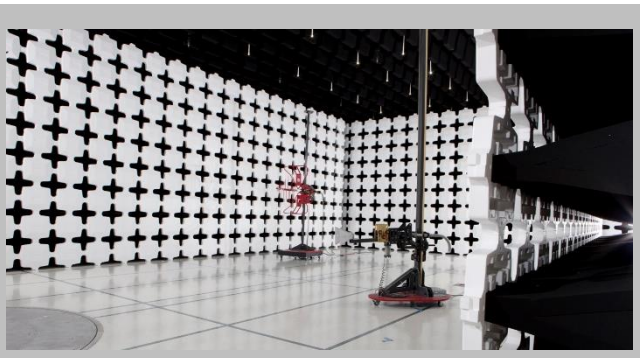
Test	+ MU	- MU
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	4.9 dB	-4.9 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

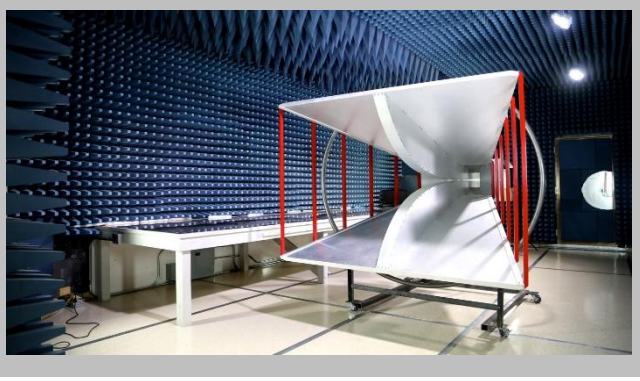
FACILITIES

2017.9.15

California	Minnesota	New York	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 NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214	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: 200761-0	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	N/A	2834D-1, 2834D-*2*	2834G-1	2834F-1
BSMI					
SL2-IN-E-1154R	SL2-IN-E-1152R	N/A	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI					
A-0029	A-0109	N/A	A-0108	A-0201	A-0110
Recognized Phase I CAB for ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA					
US0158	US0175	N/A	US0017	US0191	US0157

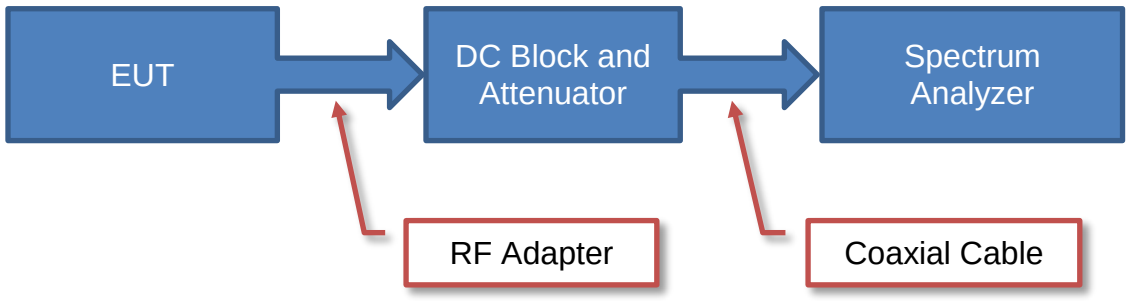




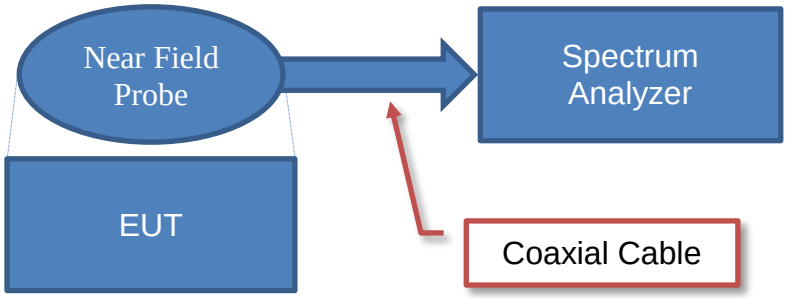


Test Setup Block Diagrams

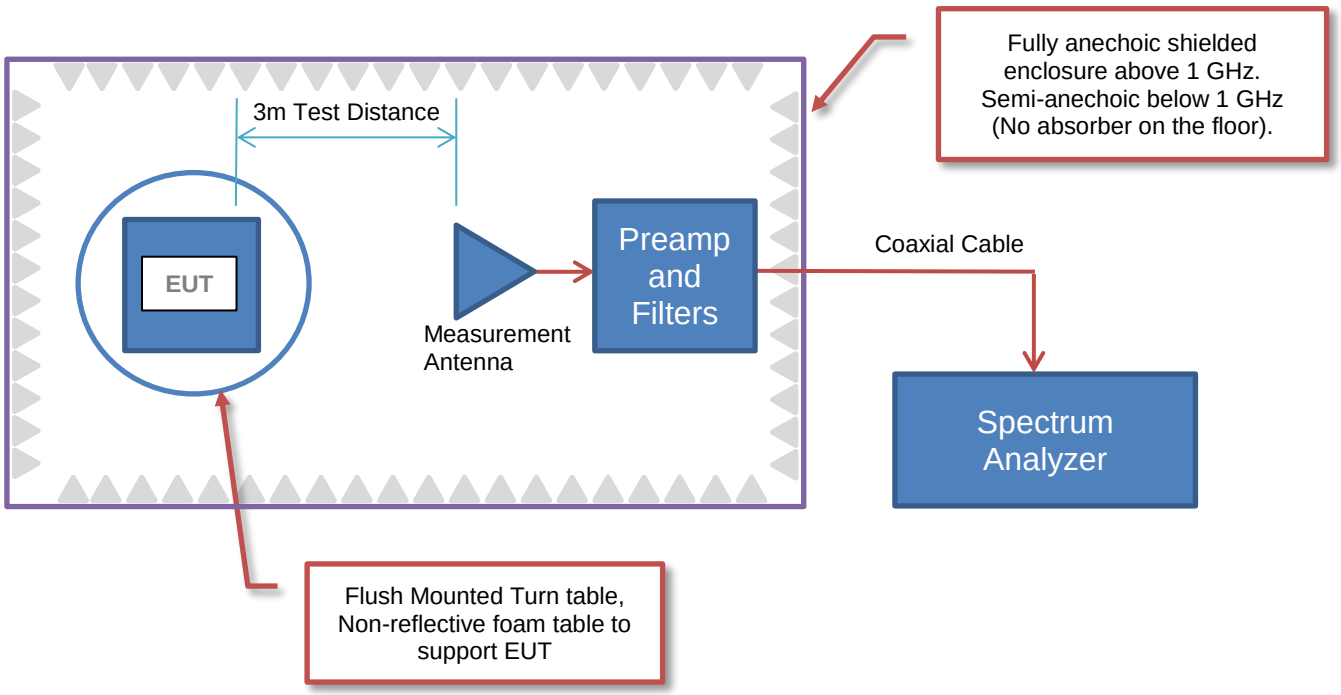
Antenna Port Conducted Measurements



Near Field Test Fixture Measurements



Spurious Radiated Emissions



PRODUCT DESCRIPTION

2017-1-25

Client and Equipment Under Test (EUT) Information

Company Name:	Garrett Metal Detectors
Address:	1881 W. State Street
City, State, Zip:	Garland, TX 75042
Test Requested By:	Weldon Sanders
Model:	Pro-Pointer AT Z-Lynk
First Date of Test:	February 20, 2018
Last Date of Test:	February 21, 2018
Receipt Date of Samples:	February 20, 2018
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
Portable metal detector with Z-Lynk 2.4 GHz DTS radio

Testing Objective:
Seeking to demonstrate compliance under FCC 15.247:2018 for operation in the 2400 - 2483.5 MHz Band.

CONFIGURATIONS

Configuration GARR0038- 1

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Metal Detector	Garrett Metal Detectors	Pro-Pointer AT Z-Lynk	1

Configuration GARR0038- 2

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Metal Detector	Garrett Metal Detectors	Pro-Pointer AT Z-Lynk	0.10

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2/20/2018	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	2/21/2018	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.
3	2/21/2018	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.
4	2/21/2018	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.
5	2/21/2018	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.
6	2/21/2018	Spurious Conducted Emissions	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 2017.09.18

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

Continuously transmitting at Low Ch 2406 MHz, High Ch 2476 MHz
Continuously transmitting at Low Ch 2406 MHz, Mid Ch 2437 MHz, High Ch 2476 MHz

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

GARR0038 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26500 MHz

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
Cable	Element	RE 9kHz - 1GHz	TXB	10-Oct-2017	12 mo
Antenna - Biconilog	ETS Lindgren	3143B	AYF	13-Apr-2016	24 mo
Amplifier - Pre-Amplifier	Miteq	AM-1551	PAH	10-Oct-2017	12 mo
Cable	Element	1-8.2 GHz	TXC	31-May-2017	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AJN	15-Sep-2016	24 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAJ	31-May-2017	12 mo
Cable	Element	8-18GHz	TXD	31-May-2017	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AJF	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	PAK	9-Oct-2017	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-08	AJG	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	PAL	9-Oct-2017	12 mo
Cable	Element	18-40GHz	TXE	17-Nov-2017	12 mo
Antenna - Double Ridge	A.H. Systems, Inc.	SAS-574	AXW	5-Aug-2016	24 mo
Amplifier - Pre-Amplifier	Miteq	JSDWK42-18004000-60-5P	PAM	17-Nov-2017	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	HHV	3-Aug-2017	12 mo
Attenuator	Weinschel Corp	4H-20	AWB	3-Mar-2017	12 mo
Filter - High Pass	Micro-Tronics	HPM50111	HGC	1-Mar-2017	12 mo
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	10-Oct-2017	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.

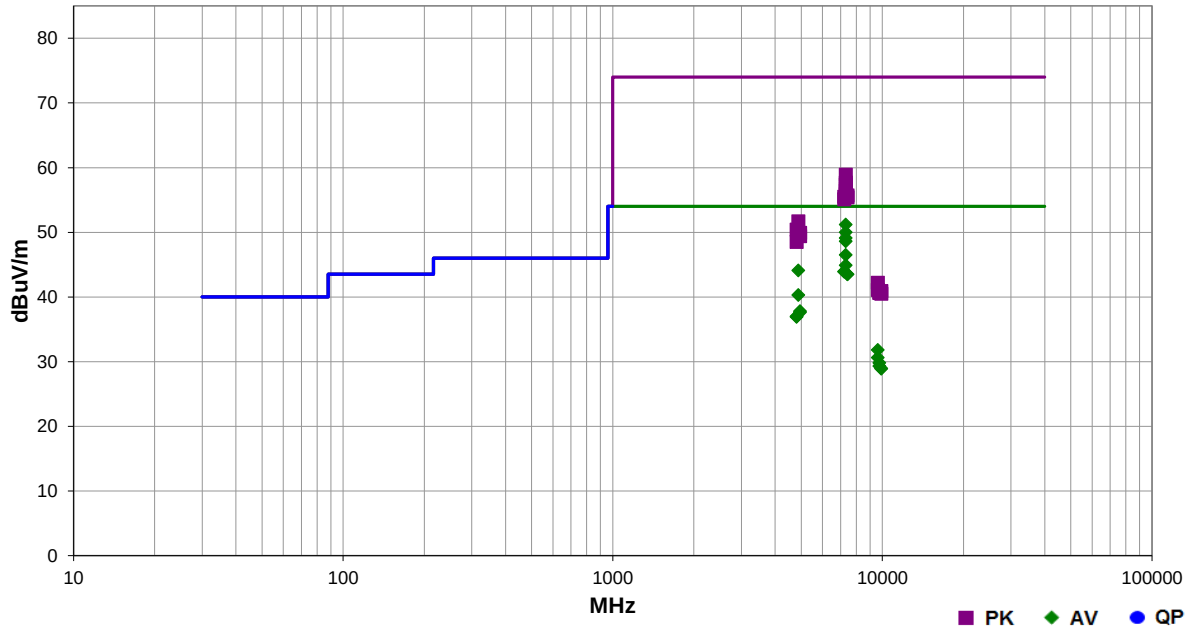
SPURIOUS RADIATED EMISSIONS

EmiR5 2017.09.18.2 PSA-ESCI 2017.09.18

Work Order:	GARR0038	**Date:**	20-Feb-2018		
Project:	None	**Temperature:**	23.5 °C		
Job Site:	TX02	**Humidity:**	58.5% RH		
Serial Number:	1	**Barometric Pres.:**	1015 mbar	**Tested by:**	Marty Martin
EUT:	Pro-Pointer AT Z-Lynk				
Configuration:	1				
Customer:	Garrett Metal Detectors				
Attendees:	None				
EUT Power:	Battery				
Operating Mode:	Continuously transmitting at Low Ch 2406 MHz, Mid Ch 2437 MHz, High Ch 2476 MHz				
Deviations:	None				
Comments:	PK and AVG(RMS) data. Harmonics.				

Test Specifications	**Test Method**
FCC 15.247:2018	ANSI C63.10:2013

Run #	18	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7310.940	37.2	14.0	1.5	177.0	3.0	0.0	Horz	AV	0.0	51.2	54.0	-2.8	Mid Ch, EUT on Side
7310.955	36.0	14.0	1.2	360.0	3.0	0.0	Horz	AV	0.0	50.0	54.0	-4.0	Mid Ch, EUT Vert
7310.945	35.1	14.0	2.1	160.9	3.0	0.0	Vert	AV	0.0	49.1	54.0	-4.9	Mid Ch, EUT Vert
7310.875	34.6	14.0	1.2	9.0	3.0	0.0	Horz	AV	0.0	48.6	54.0	-5.4	Mid Ch, EUT Horz
7310.930	32.5	14.0	1.2	331.0	3.0	0.0	Vert	AV	0.0	46.5	54.0	-7.5	Mid Ch, EUT on Side
7310.920	30.9	14.0	1.1	236.0	3.0	0.0	Vert	AV	0.0	44.9	54.0	-9.1	Mid Ch, EUT Horz
4879.975	37.2	6.9	2.8	123.0	3.0	0.0	Horz	AV	0.0	44.1	54.0	-9.9	Mid Ch, EUT on Side
7217.615	30.1	13.8	1.0	279.0	3.0	0.0	Horz	AV	0.0	43.9	54.0	-10.1	Low Ch, EUT on Side
7218.845	30.1	13.8	1.0	177.9	3.0	0.0	Vert	AV	0.0	43.9	54.0	-10.1	Low Ch, EUT on Side
7429.200	29.5	14.0	3.0	268.9	3.0	0.0	Horz	AV	0.0	43.5	54.0	-10.5	High Ch, EUT on Side
7428.235	29.5	14.0	1.1	217.0	3.0	0.0	Vert	AV	0.0	43.5	54.0	-10.5	High Ch, EUT on Side
4879.900	33.4	6.9	1.2	4.9	3.0	0.0	Vert	AV	0.0	40.3	54.0	-13.7	Mid Ch, EUT on Side
7310.810	44.9	14.0	1.5	177.0	3.0	0.0	Horz	PK	0.0	58.9	74.0	-15.1	Mid Ch, EUT on Side
4953.500	30.8	7.0	3.2	198.0	3.0	0.0	Horz	AV	0.0	37.8	54.0	-16.2	High Ch, EUT on Side
7311.135	43.7	14.0	1.2	360.0	3.0	0.0	Horz	PK	0.0	57.7	74.0	-16.3	Mid Ch, EUT Vert
4953.070	30.6	7.0	1.0	140.0	3.0	0.0	Vert	AV	0.0	37.6	54.0	-16.4	High Ch, EUT on Side
7311.205	43.4	14.0	2.1	160.9	3.0	0.0	Vert	PK	0.0	57.4	74.0	-16.6	Mid Ch, EUT Vert
4810.540	30.2	6.8	1.0	72.0	3.0	0.0	Vert	AV	0.0	37.0	54.0	-17.0	Low Ch, EUT on Side

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4810.505	30.1	6.8	3.1	160.9	3.0	0.0	Horz	AV	0.0	36.9	54.0	-17.1	Low Ch, EUT on Side
7310.830	42.8	14.0	1.2	9.0	3.0	0.0	Horz	PK	0.0	56.8	74.0	-17.2	Mid Ch, EUT Horz
7310.900	42.4	14.0	1.2	331.0	3.0	0.0	Vert	PK	0.0	56.4	74.0	-17.6	Mid Ch, EUT on Side
7311.260	41.9	14.0	1.1	236.0	3.0	0.0	Vert	PK	0.0	55.9	74.0	-18.1	Mid Ch, EUT Horz
7428.280	41.7	14.0	3.0	268.9	3.0	0.0	Horz	PK	0.0	55.7	74.0	-18.3	High Ch, EUT on Side
7219.100	41.7	13.8	1.0	279.0	3.0	0.0	Horz	PK	0.0	55.5	74.0	-18.5	Low Ch, EUT on Side
7429.020	41.4	14.0	1.1	217.0	3.0	0.0	Vert	PK	0.0	55.4	74.0	-18.6	High Ch, EUT on Side
7216.975	41.3	13.8	1.0	177.9	3.0	0.0	Vert	PK	0.0	55.1	74.0	-18.9	Low Ch, EUT on Side
4880.130	44.8	6.9	2.8	123.0	3.0	0.0	Horz	PK	0.0	51.7	74.0	-22.3	Mid Ch, EUT on Side
4879.895	42.6	6.9	1.2	4.9	3.0	0.0	Vert	PK	0.0	49.5	74.0	-24.5	Mid Ch, EUT on Side
9623.870	34.1	-2.3	1.0	153.9	3.0	0.0	Horz	AV	0.0	31.8	54.0	-22.2	Low Ch, EUT on Side
9623.880	32.9	-2.3	1.0	12.0	3.0	0.0	Vert	AV	0.0	30.6	54.0	-23.4	Low Ch, EUT on Side
4810.760	43.6	6.8	1.0	72.0	3.0	0.0	Vert	PK	0.0	50.4	74.0	-23.6	Low Ch, EUT on Side
4953.440	42.9	7.0	3.2	198.0	3.0	0.0	Horz	PK	0.0	49.9	74.0	-24.1	High Ch, EUT on Side
9748.000	32.4	-2.6	1.0	177.9	3.0	0.0	Horz	AV	0.0	29.8	54.0	-24.2	Mid Ch, EUT on Side
4953.370	42.4	7.0	1.0	140.0	3.0	0.0	Vert	PK	0.0	49.4	74.0	-24.6	High Ch, EUT on Side
9748.395	31.9	-2.6	1.0	122.0	3.0	0.0	Vert	AV	0.0	29.3	54.0	-24.7	Mid Ch, EUT on Side
9904.710	31.1	-2.2	1.4	267.0	3.0	0.0	Horz	AV	0.0	28.9	54.0	-25.1	High Ch, EUT on Side
9903.695	31.1	-2.2	1.0	330.0	3.0	0.0	Vert	AV	0.0	28.9	54.0	-25.1	High Ch, EUT on Side
4811.140	41.7	6.8	3.1	160.9	3.0	0.0	Horz	PK	0.0	48.5	74.0	-25.5	Low Ch, EUT on Side
9624.650	44.5	-2.3	1.0	153.9	3.0	0.0	Horz	PK	0.0	42.2	74.0	-31.8	Low Ch, EUT on Side
9624.585	43.4	-2.3	1.0	12.0	3.0	0.0	Vert	PK	0.0	41.1	74.0	-32.9	Low Ch, EUT on Side
9905.165	43.1	-2.2	1.4	267.0	3.0	0.0	Horz	PK	0.0	40.9	74.0	-33.1	High Ch, EUT on Side
9748.310	43.3	-2.6	1.0	177.9	3.0	0.0	Horz	PK	0.0	40.7	74.0	-33.3	Mid Ch, EUT on Side
9747.010	43.2	-2.6	1.0	122.0	3.0	0.0	Vert	PK	0.0	40.6	74.0	-33.4	Mid Ch, EUT on Side
9904.270	42.7	-2.2	1.0	330.0	3.0	0.0	Vert	PK	0.0	40.5	74.0	-33.5	High Ch, EUT on Side

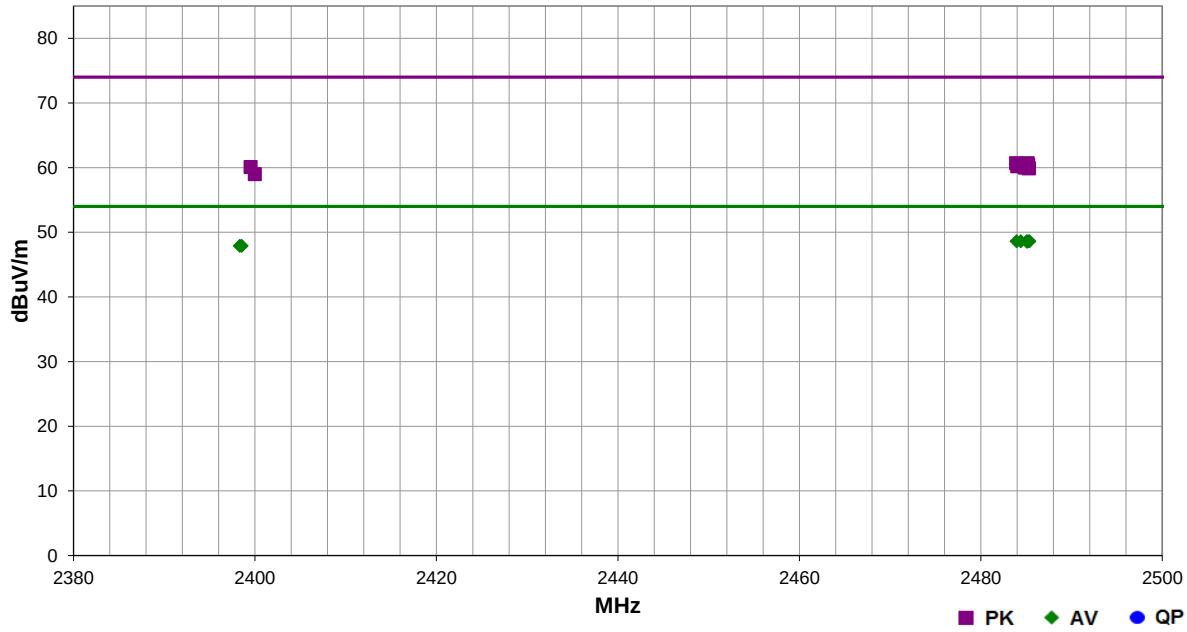
SPURIOUS RADIATED EMISSIONS

EmiR5 2017.09.18.2 PSA-ESCI 2017.09.18

Work Order:	GARR0038	**Date:**	20-Feb-2018		
Project:	None	**Temperature:**	23.5 °C		
Job Site:	TX02	**Humidity:**	58.5% RH		
Serial Number:	1	**Barometric Pres.:**	1015 mbar	**Tested by:**	Marty Martin
EUT:	Pro-Pointer AT Z-Lynk				
Configuration:	1				
Customer:	Garrett Metal Detectors				
Attendees:	None				
EUT Power:	Battery				
Operating Mode:	Continuously transmitting at Low Ch 2406 MHz, High Ch 2476 MHz				
Deviations:	None				
Comments:	PK and AVG(RMS) data. Transmit Band Edge.				

Test Specifications	**Test Method**
FCC 15.247:2018	ANSI C63.10:2013

Run #	21	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2484.423	32.6	-4.0	1.8	85.0	3.0	20.0	Horz	AV	0.0	48.6	54.0	-5.4	High Ch, EUT on side
2485.077	32.6	-4.0	1.0	92.0	3.0	20.0	Vert	AV	0.0	48.6	54.0	-5.4	High Ch, EUT on side
2485.380	32.6	-4.0	1.8	187.0	3.0	20.0	Horz	AV	0.0	48.6	54.0	-5.4	High Ch, EUT Horz
2485.220	32.6	-4.0	2.5	192.0	3.0	20.0	Horz	AV	0.0	48.6	54.0	-5.4	High Ch, EUT Vert
2483.957	32.6	-4.0	1.0	297.9	3.0	20.0	Vert	AV	0.0	48.6	54.0	-5.4	High Ch, EUT Vert
2485.127	32.5	-4.0	1.0	111.0	3.0	20.0	Vert	AV	0.0	48.5	54.0	-5.5	High Ch, EUT Horz
2398.330	32.6	-4.7	1.0	116.0	3.0	20.0	Horz	AV	0.0	47.9	54.0	-6.1	Low Ch, EUT on side
2398.540	32.6	-4.7	1.1	340.9	3.0	20.0	Vert	AV	0.0	47.9	54.0	-6.1	Low Ch, EUT on side
2483.893	44.7	-4.0	1.8	85.0	3.0	20.0	Horz	PK	0.0	60.7	74.0	-13.3	High Ch, EUT on side
2485.163	44.7	-4.0	1.0	92.0	3.0	20.0	Vert	PK	0.0	60.7	74.0	-13.3	High Ch, EUT on side
2485.230	44.4	-4.0	1.0	111.0	3.0	20.0	Vert	PK	0.0	60.4	74.0	-13.6	High Ch, EUT Horz
2484.010	44.2	-4.0	2.5	192.0	3.0	20.0	Horz	PK	0.0	60.2	74.0	-13.8	High Ch, EUT Vert
2399.507	44.8	-4.7	1.0	116.0	3.0	20.0	Horz	PK	0.0	60.1	74.0	-13.9	Low Ch, EUT on side
2484.853	44.0	-4.0	1.8	187.0	3.0	20.0	Horz	PK	0.0	60.0	74.0	-14.0	High Ch, EUT Horz
2485.310	43.9	-4.0	1.0	297.9	3.0	20.0	Vert	PK	0.0	59.9	74.0	-14.1	High Ch, EUT Vert
2399.983	43.7	-4.7	1.1	340.9	3.0	20.0	Vert	PK	0.0	59.0	74.0	-15.0	Low Ch, EUT on side

DUTY CYCLE

TEST DESCRIPTION

The Duty Cycle (x) were measured for each of the EUT operating modes. 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.

The EUT operates at 100% Duty Cycle.

OCCUPIED BANDWIDTH

XMit 2017.12.13

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	17-Nov-17	17-Nov-18
Block - DC	Fairview Microwave	SD3379	AMT	11-Oct-17	11-Oct-18
Power Supply - DC	B&K Precision	9110	TQI	NCR	NCR
Cable	Fairview Microwave	FMTC401-72	TXF	28-Nov-17	28-Nov-18
Generator - Signal	Agilent	E4422B	TGS	11-Jul-17	11-Jul-20
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	14-Mar-17	14-Mar-18

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 2017.12.14 XMit 2017.12.13

EUT:	**Pro-Pointer AT Z-Lynk**			**Work Order:**	**GARR0038**
Serial Number:	**0.10**			**Date:**	**21-Feb-18**
Customer:	**Garrett Metal Detectors**			**Temperature:**	**22 °C**
Attendees:	**None**			**Humidity:**	**41.9% RH**
Project:	**None**			**Barometric Pres.:**	**1027 mbar**
Tested by:	**Marty Martin**	**Power:**	**9 VDC**	**Job Site:**	**TX09**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2018	ANSI C63.10:2013

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

None

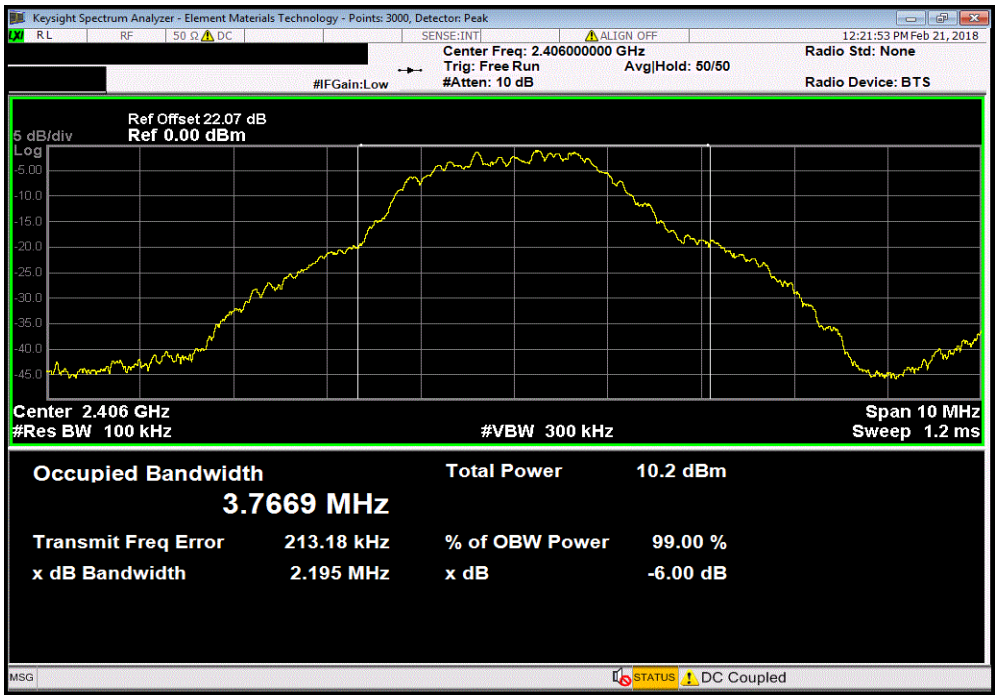
Configuration #	**2**	*Signature* Marty Martin

	Value	**Limit (>)**	**Result**
2400 MHz - 2483.5 MHz Band			
Low Channel, 2406 MHz	2.195 MHz	500 kHz	Pass
Mid Channel, 2437 MHz	2.202 MHz	500 kHz	Pass
High Channel, 2476 MHz	2.173 MHz	500 kHz	Pass

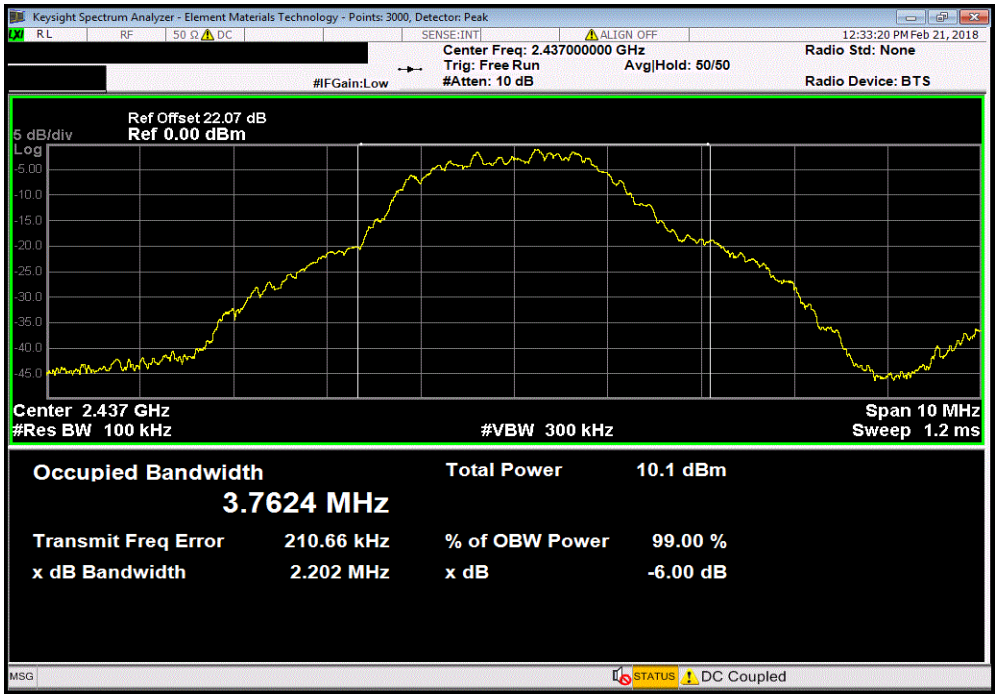
OCCUPIED BANDWIDTH

TbtTx 2017.12.14 XMit 2017.12.13

2400 MHz - 2483.5 MHz Band, Low Channel, 2406 MHz						
				Value	Limit (>)	Result
				2.195 MHz	500 kHz	Pass



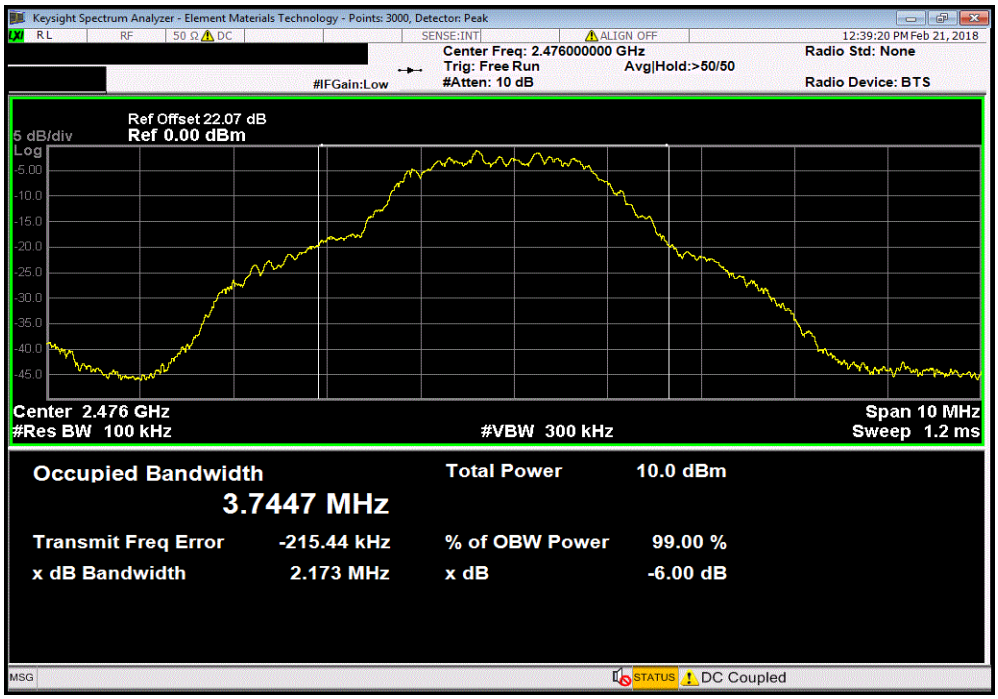
2400 MHz - 2483.5 MHz Band, Mid Channel, 2437 MHz						
				Value	Limit (>)	Result
				2.202 MHz	500 kHz	Pass



OCCUPIED BANDWIDTH

TbtTx 2017.12.14 XMit 2017.12.13

2400 MHz - 2483.5 MHz Band, High Channel, 2476 MHz						
				Value	Limit (>)	Result
				2.173 MHz	500 kHz	Pass



OUTPUT POWER

XMit 2017.12.13

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	TGS	11-Jul-17	11-Jul-20
Power Supply - DC	B&K Precision	9110	TQI	NCR	NCR
Cable	Fairview Microwave	FMTC401-72	TXF	28-Nov-17	28-Nov-18
Block - DC	Fairview Microwave	SD3379	AMT	11-Oct-17	11-Oct-18
Attenuator	Fairview Microwave	SA4018-20	TYE	17-Nov-17	17-Nov-18
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	14-Mar-17	14-Mar-18

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.

De Facto EIRP Limit: The EUT meets the de facto EIRP limit of +36 dBm.

OUTPUT POWER

TbtTx 2017.12.14 XMit 2017.12.13

EUT:	**Pro-Pointer AT Z-Lynk**			**Work Order:**	**GARR0038**
Serial Number:	**0.10**			**Date:**	**21-Feb-18**
Customer:	**Garrett Metal Detectors**			**Temperature:**	**22 °C**
Attendees:	**None**			**Humidity:**	**41.9% RH**
Project:	**None**			**Barometric Pres.:**	**1027 mbar**
Tested by:	**Marty Martin**	**Power:**	**9 VDC**	**Job Site:**	**TX09**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2018	ANSI C63.10:2013

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

None

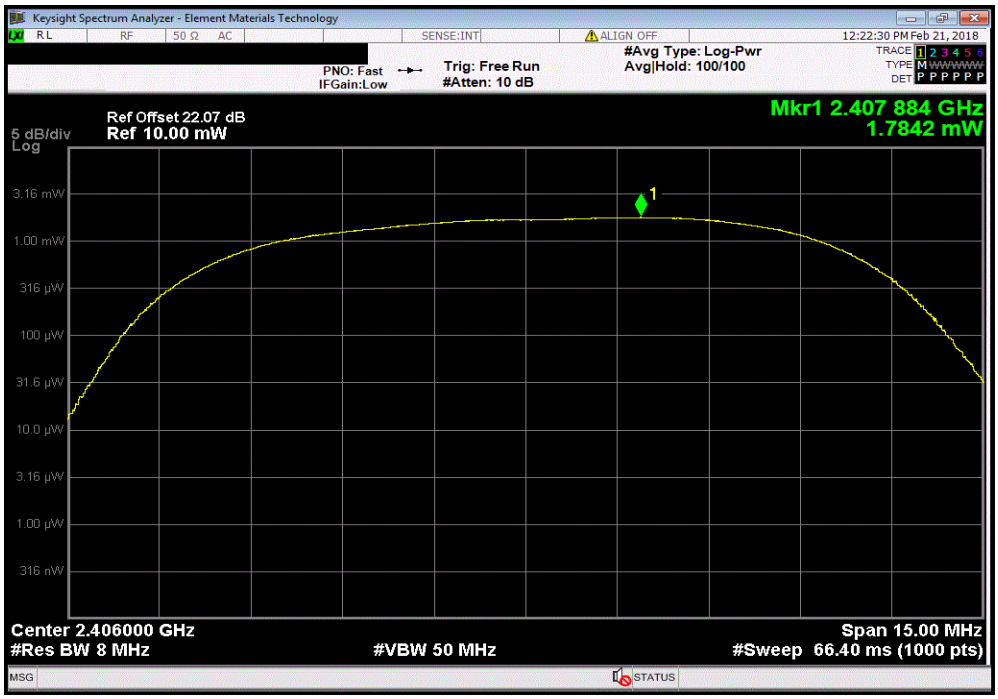
Configuration #	**2**	*Signature* Marty Martin

	Value	**Limit (<)**	**Result**
2400 MHz - 2483.5 MHz Band			
Low Channel, 2406 MHz	1.784 mW	1 W	Pass
Mid Channel, 2437 MHz	1.735 mW	1 W	Pass
High Channel, 2476 MHz	1.757 mW	1 W	Pass

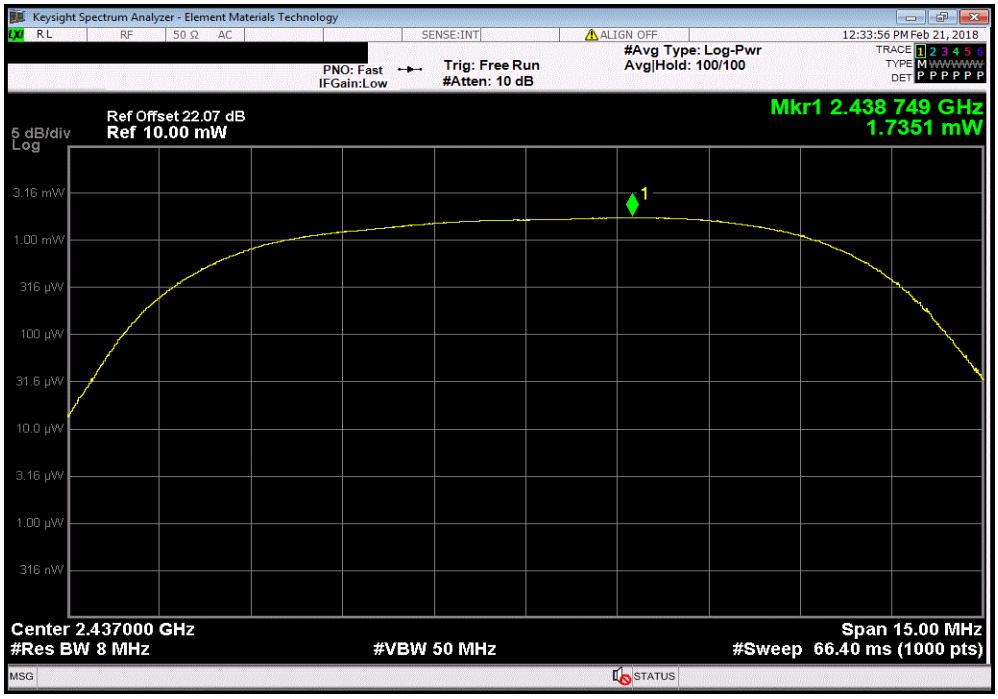
OUTPUT POWER

TbtTx 2017.12.14 XMit 2017.12.13

2400 MHz - 2483.5 MHz Band, Low Channel, 2406 MHz						
				Value	Limit (<)	Result
				1.784 mW	1 W	Pass



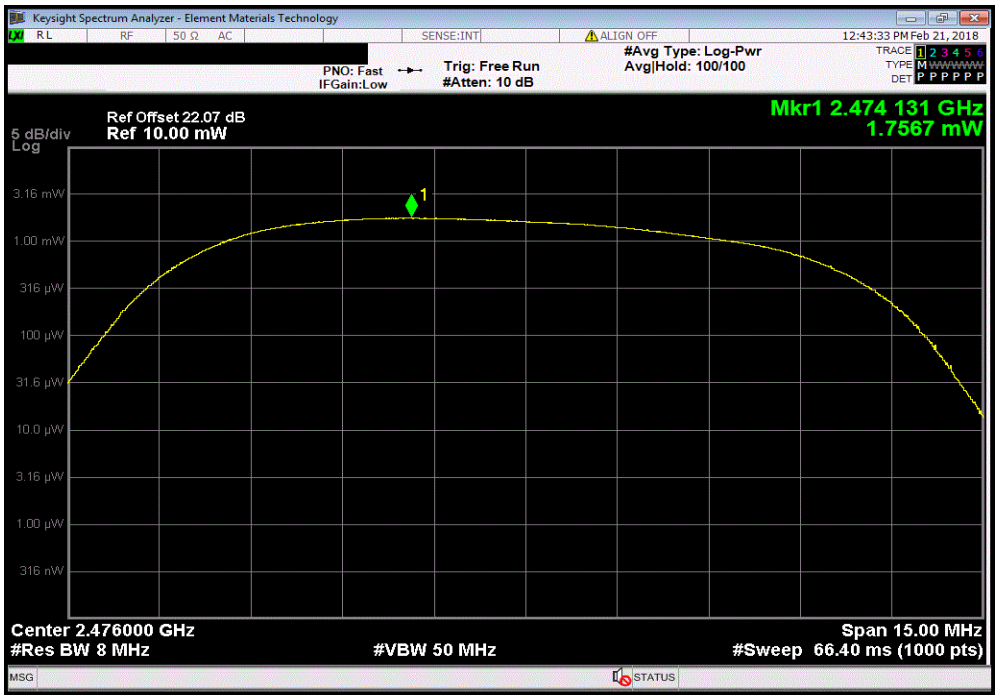
2400 MHz - 2483.5 MHz Band, Mid Channel, 2437 MHz						
				Value	Limit (<)	Result
				1.735 mW	1 W	Pass



OUTPUT POWER

TbtTx 2017.12.14 XMit 2017.12.13

2400 MHz - 2483.5 MHz Band, High Channel, 2476 MHz						
				Value	Limit (<)	Result
				1.757 mW	1 W	Pass



BAND EDGE COMPLIANCE

XMit 2017.12.13

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	TGS	11-Jul-17	11-Jul-20
Attenuator	Fairview Microwave	SA4018-20	TYE	17-Nov-17	17-Nov-18
Block - DC	Fairview Microwave	SD3379	AMT	11-Oct-17	11-Oct-18
Cable	Fairview Microwave	FMTC401-72	TXF	28-Nov-17	28-Nov-18
Power Supply - DC	B&K Precision	9110	TQI	NCR	NCR
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	14-Mar-17	14-Mar-18

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. 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

TbtTx 2017.12.14 XMit 2017.12.13

EUT:	**Pro-Pointer AT Z-Lynk**			**Work Order:**	**GARR0038**
Serial Number:	**0.10**			**Date:**	**21-Feb-18**
Customer:	**Garrett Metal Detectors**			**Temperature:**	**22 °C**
Attendees:	**None**			**Humidity:**	**41.9% RH**
Project:	**None**			**Barometric Pres.:**	**1028 mbar**
Tested by:	**Marty Martin**	**Power:**	**9 VDC**	**Job Site:**	**TX09**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2018	ANSI C63.10:2013

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

None

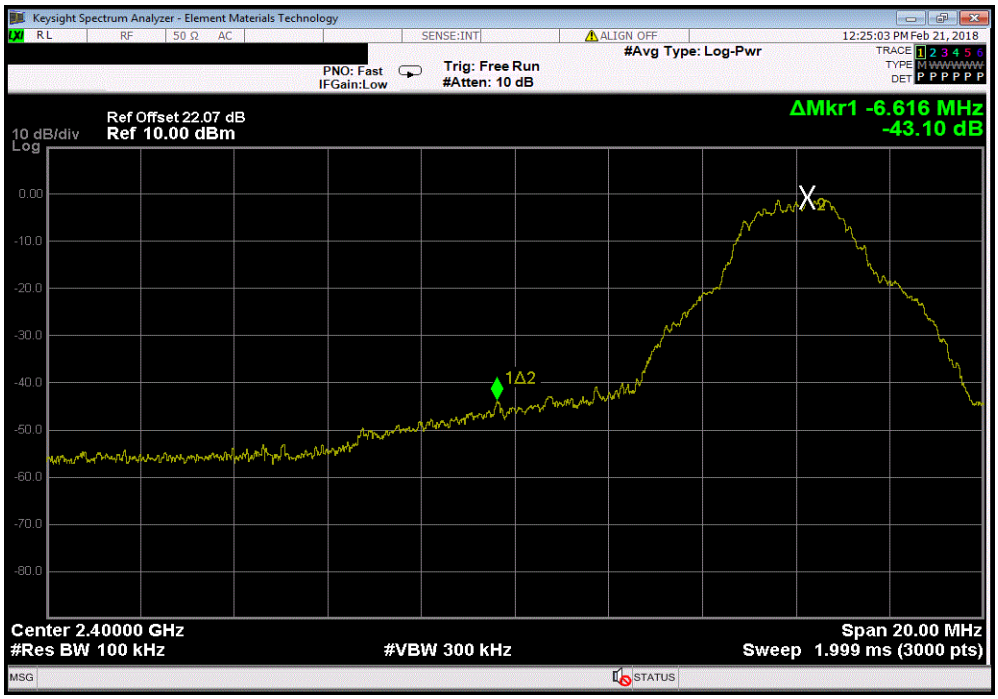
Configuration #	**2**	*Signature* Marty Martin

	Value (dBc)	**Limit ≤ (dBc)**	**Result**
2400 MHz - 2483.5 MHz Band			
Low Channel, 2406 MHz	-43.1	-20	Pass
High Channel, 2476 MHz	-45.09	-20	Pass

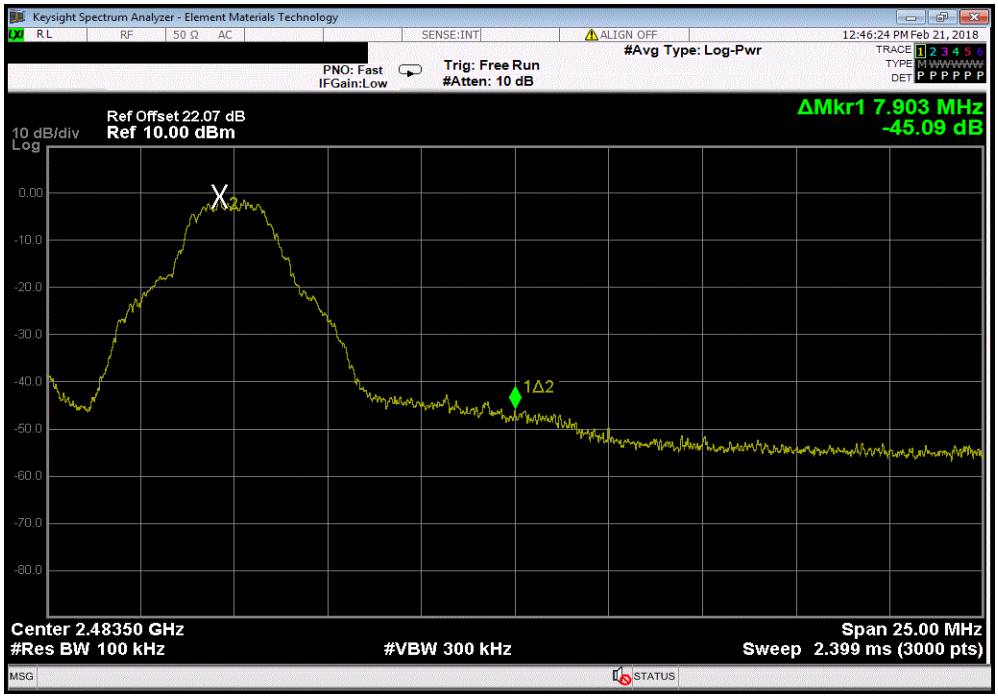
BAND EDGE COMPLIANCE

TbtTx 2017.12.14 XMit 2017.12.13

2400 MHz - 2483.5 MHz Band, Low Channel, 2406 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-43.1	-20	Pass



2400 MHz - 2483.5 MHz Band, High Channel, 2476 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-45.09	-20	Pass



SPURIOUS CONDUCTED EMISSIONS

XMit 2017.12.13

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
Power Supply - DC	B&K Precision	9110	TQI	NCR	NCR
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	14-Mar-17	14-Mar-18
Generator - Signal	Agilent	E4422B	TGS	11-Jul-17	11-Jul-20
Cable	Fairview Microwave	FMTC401-72	TXF	28-Nov-17	28-Nov-18
Block - DC	Fairview Microwave	SD3379	AMT	11-Oct-17	11-Oct-18
Attenuator	Fairview Microwave	SA4018-20	TYE	17-Nov-17	17-Nov-18

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. 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

TbtTx 2017.12.14 XMit 2017.12.13

EUT:	**Pro-Pointer AT Z-Lynk**			**Work Order:**	**GARR0038**
Serial Number:	**0.10**			**Date:**	**21-Feb-18**
Customer:	**Garrett Metal Detectors**			**Temperature:**	**21.9 °C**
Attendees:	**None**			**Humidity:**	**41.9% RH**
Project:	**None**			**Barometric Pres.:**	**1027 mbar**
Tested by:	**Marty Martin**	**Power:**	**9 VDC**	**Job Site:**	**TX09**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2018	ANSI C63.10:2013

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

None

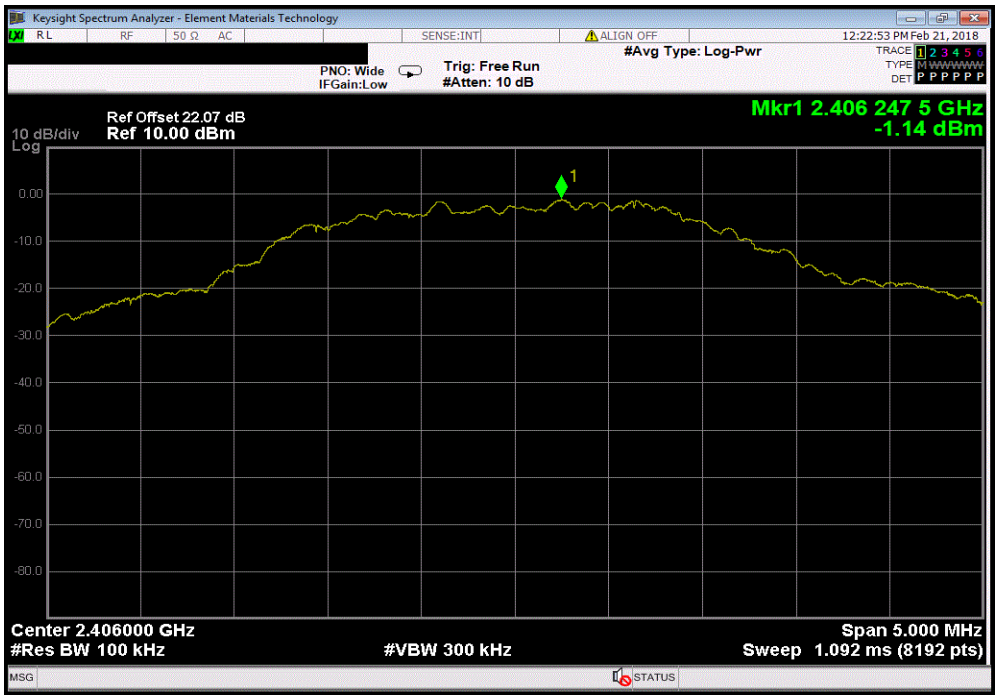
Configuration #	**2**	*Signature* Marty Martin

	Frequency Range	Max Value (dBc)	Limit ≤ (dBc)	Result
2400 MHz - 2483.5 MHz Band				
Low Channel, 2406 MHz	Fundamental	N/A	N/A	N/A
Low Channel, 2406 MHz	30 MHz - 12.5 GHz	-47.26	-20	Pass
Low Channel, 2406 MHz	12.5 GHz - 25 GHz	-37.21	-20	Pass
Mid Channel, 2437 MHz	Fundamental	N/A	N/A	N/A
Mid Channel, 2437 MHz	30 MHz - 12.5 GHz	-47.17	-20	Pass
Mid Channel, 2437 MHz	12.5 GHz - 25 GHz	-37.06	-20	Pass
High Channel, 2476 MHz	Fundamental	N/A	N/A	N/A
High Channel, 2476 MHz	30 MHz - 12.5 GHz	-47.67	-20	Pass
High Channel, 2476 MHz	12.5 GHz - 25 GHz	-37.01	-20	Pass

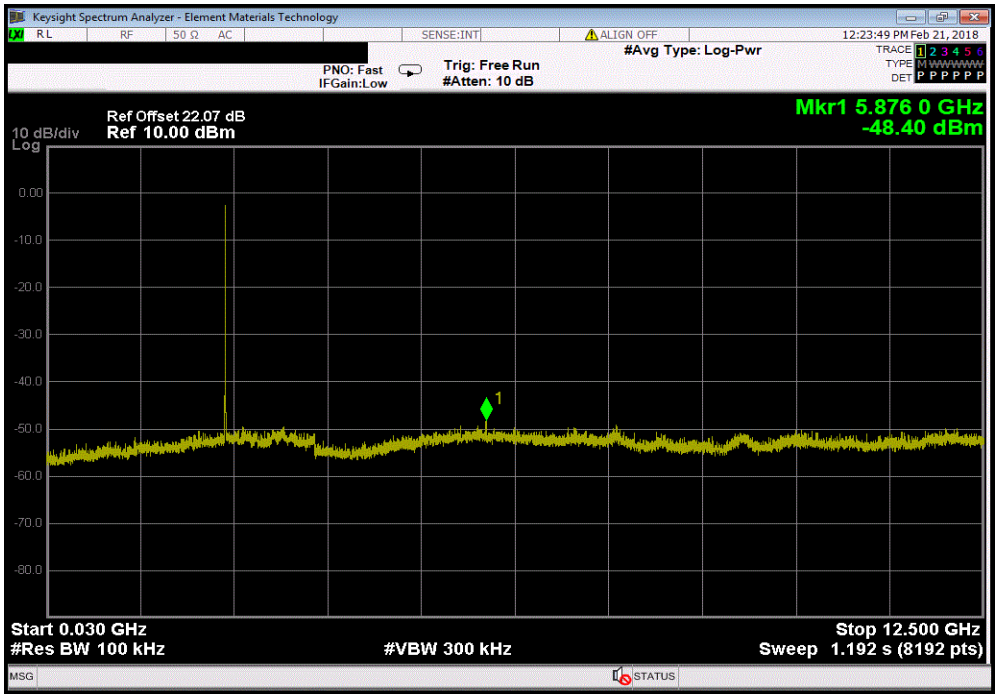
SPURIOUS CONDUCTED EMISSIONS

TbtTx 2017.12.14 XMit 2017.12.13

2400 MHz - 2483.5 MHz Band, Low Channel, 2406 MHz						
	Frequency Range			Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental			N/A	N/A	N/A



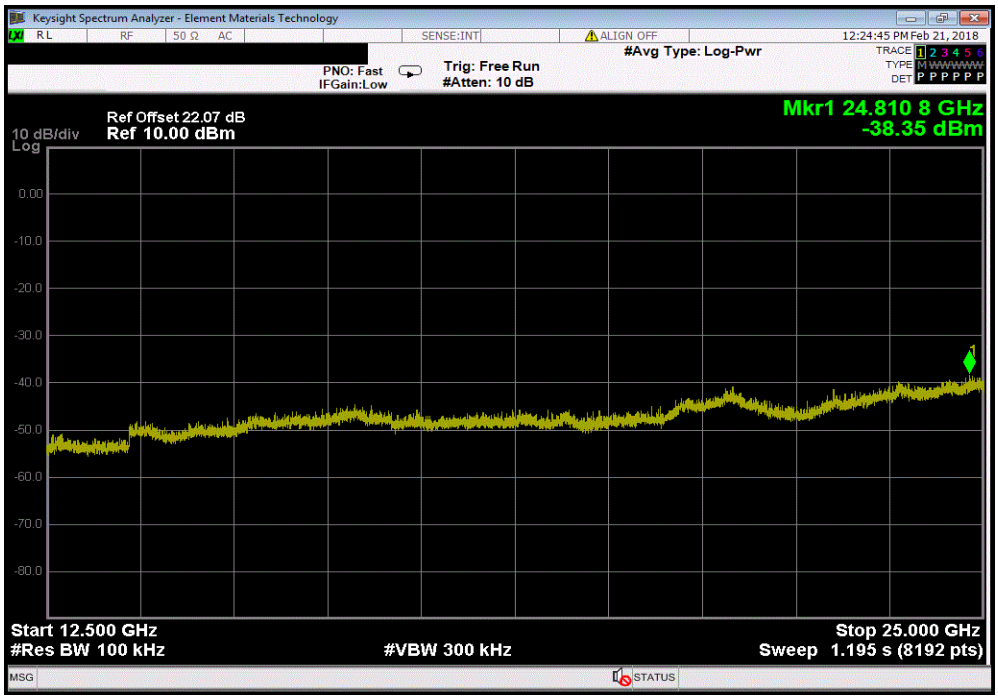
2400 MHz - 2483.5 MHz Band, Low Channel, 2406 MHz					
Frequency Range		Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz		-47.26	-20	Pass



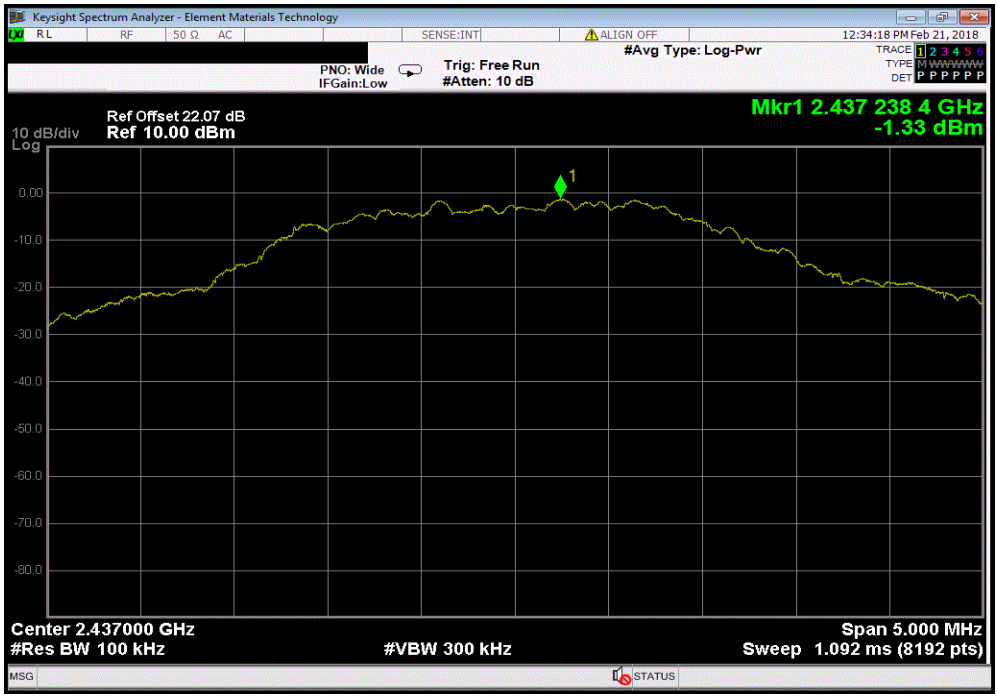
SPURIOUS CONDUCTED EMISSIONS

TbtTx 2017.12.14 XMit 2017.12.13

2400 MHz - 2483.5 MHz Band, Low Channel, 2406 MHz				
Frequency Range		Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz		-37.21	-20	Pass



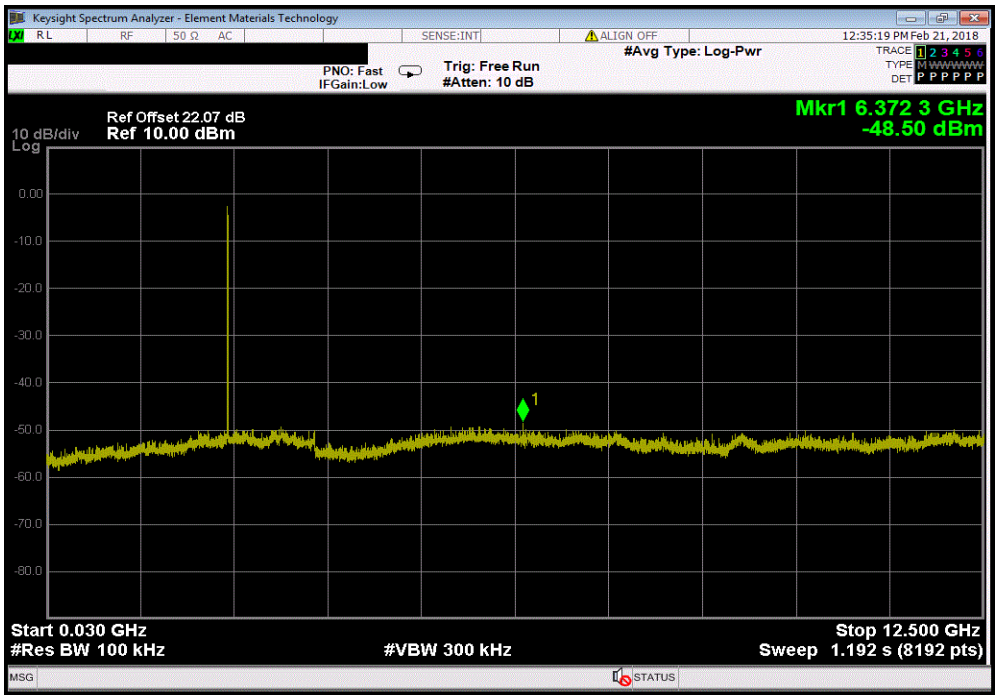
2400 MHz - 2483.5 MHz Band, Mid Channel, 2437 MHz						
	Frequency Range			Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental			N/A	N/A	N/A



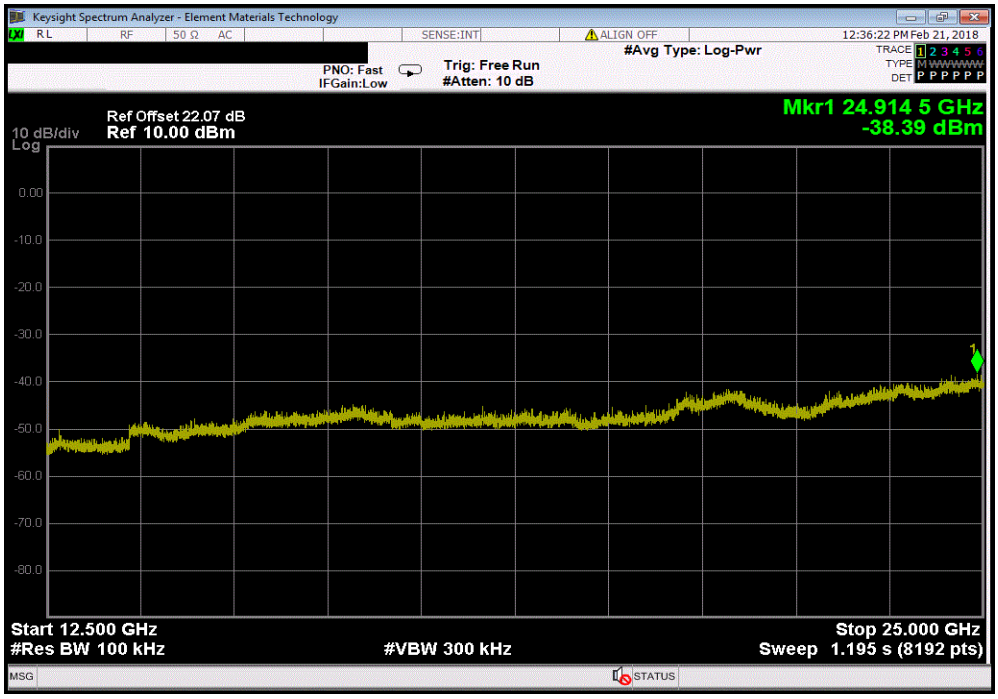
SPURIOUS CONDUCTED EMISSIONS

TbtTx 2017.12.14 XMit 2017.12.13

2400 MHz - 2483.5 MHz Band, Mid Channel, 2437 MHz				
Frequency Range		Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz		-47.17	-20	Pass



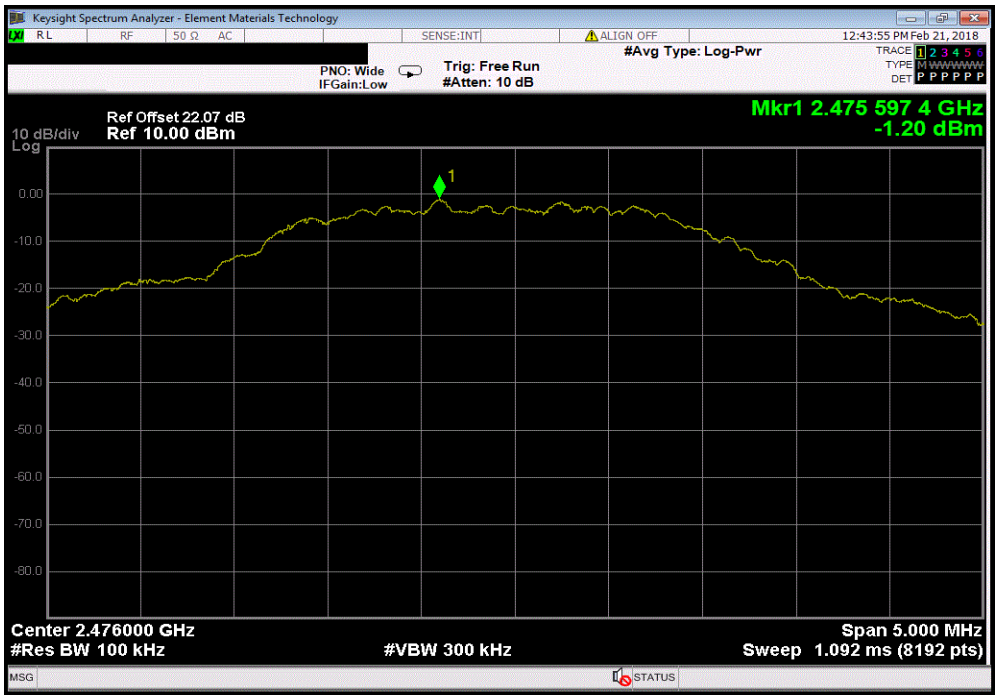
2400 MHz - 2483.5 MHz Band, Mid Channel, 2437 MHz				
Frequency Range		Max Value (dBc)	Limit ≤ (dBc)	Result
12.5 GHz - 25 GHz		-37.06	-20	Pass



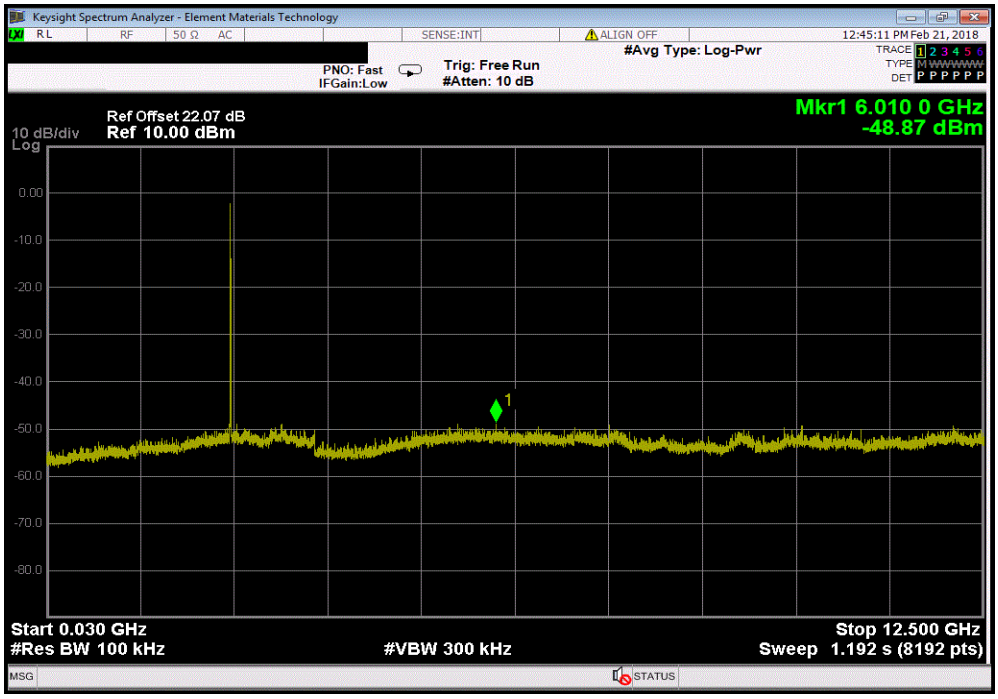
SPURIOUS CONDUCTED EMISSIONS

TbtTx 2017.12.14 XMit 2017.12.13

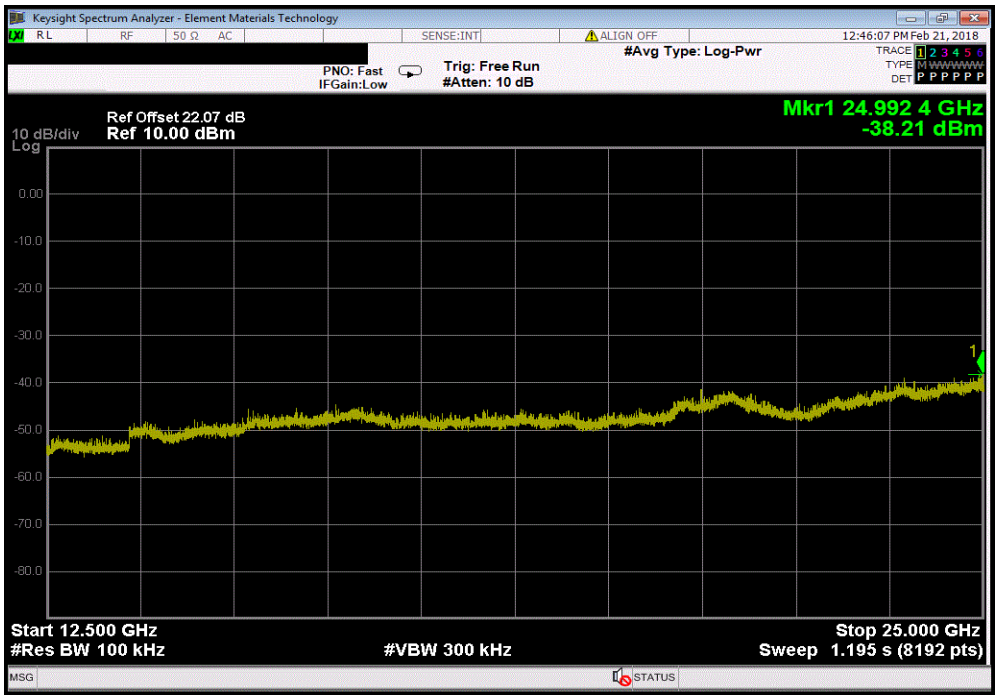
2400 MHz - 2483.5 MHz Band, High Channel, 2476 MHz						
	Frequency Range			Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental			N/A	N/A	N/A



2400 MHz - 2483.5 MHz Band, High Channel, 2476 MHz					
Frequency Range			Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz			-47.67	-20	Pass



2400 MHz - 2483.5 MHz Band, High Channel, 2476 MHz				
Frequency Range		**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz		-37.01	-20	Pass



POWER SPECTRAL DENSITY

XMit 2017.12.13

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	TGS	11-Jul-17	11-Jul-20
Power Supply - DC	B&K Precision	9110	TQI	NCR	NCR
Cable	Fairview Microwave	FMTC401-72	TXF	28-Nov-17	28-Nov-18
Block - DC	Fairview Microwave	SD3379	AMT	11-Oct-17	11-Oct-18
Attenuator	Fairview Microwave	SA4018-20	TYE	17-Nov-17	17-Nov-18
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	14-Mar-17	14-Mar-18

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. 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

TbtTx 2017.12.14 XMit 2017.12.13

EUT:	**Pro-Pointer AT Z-Lynk**			**Work Order:**	**GARR0038**
Serial Number:	**0.10**			**Date:**	**21-Feb-18**
Customer:	**Garrett Metal Detectors**			**Temperature:**	**21.9 °C**
Attendees:	**None**			**Humidity:**	**41.9% RH**
Project:	**None**			**Barometric Pres.:**	**1027 mbar**
Tested by:	**Marty Martin**	**Power:**	**9 VDC**	**Job Site:**	**TX09**

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2018	ANSI C63.10:2013

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

None

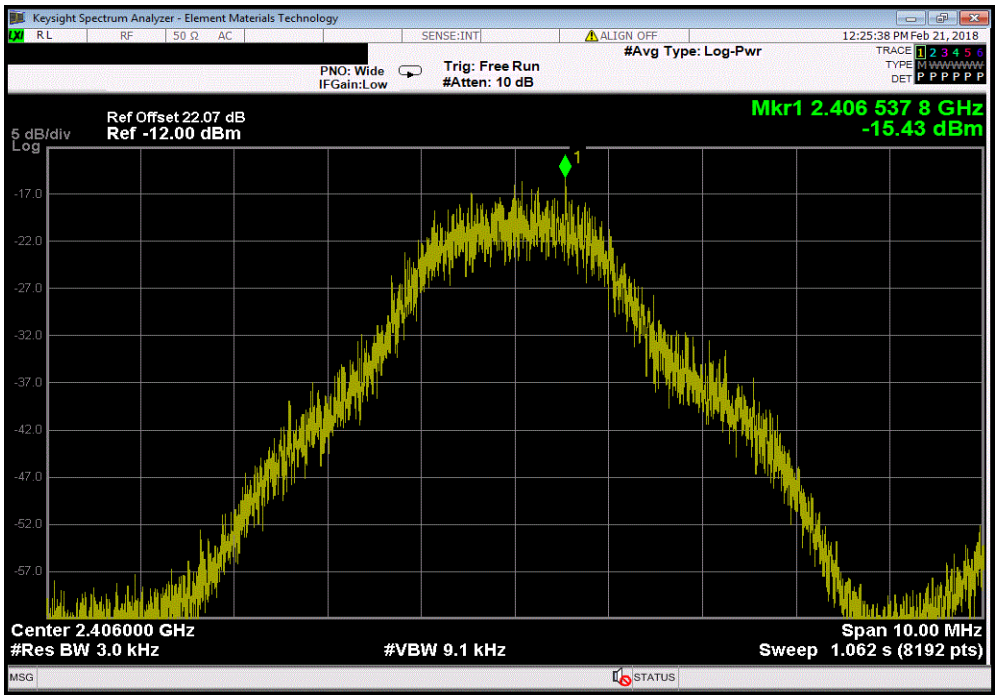
Configuration #	**2**	*Signature* Marty Martin

	Value dBm/3kHz	**Limit < dBm/3kHz**	**Results**
2400 MHz - 2483.5 MHz Band			
Low Channel, 2406 MHz	-15.426	8	Pass
Mid Channel, 2437 MHz	-15.508	8	Pass
High Channel, 2476 MHz	-15.713	8	Pass

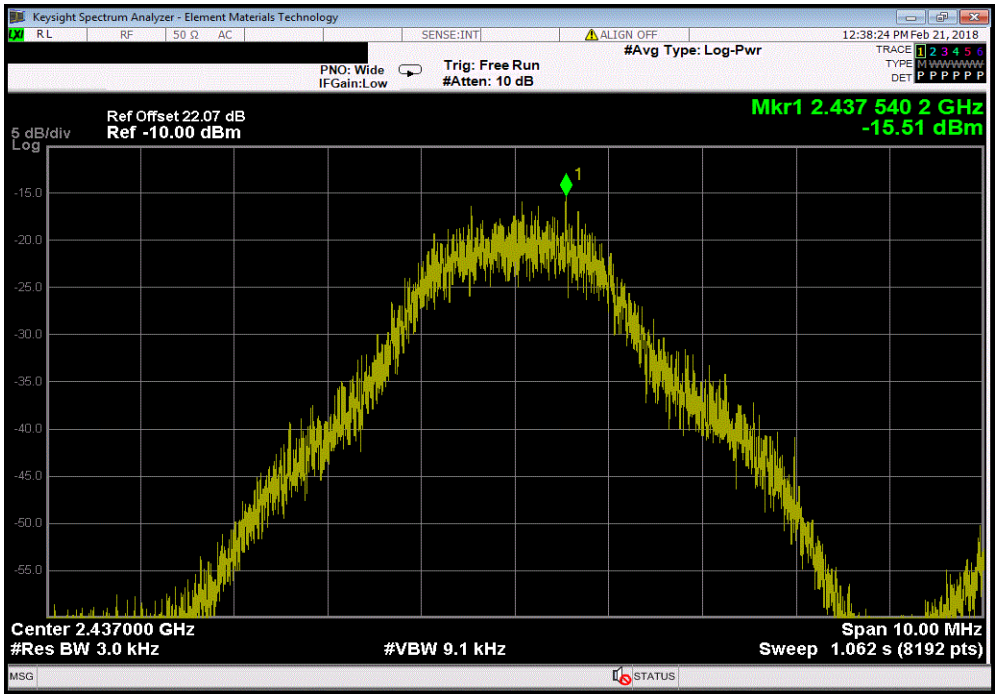
POWER SPECTRAL DENSITY

TbtTx 2017.12.14 XMit 2017.12.13

2400 MHz - 2483.5 MHz Band, Low Channel, 2406 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-15.426	8	Pass



2400 MHz - 2483.5 MHz Band, Mid Channel, 2437 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-15.508	8	Pass



POWER SPECTRAL DENSITY

TbtTx 2017.12.14 XMit 2017.12.13

2400 MHz - 2483.5 MHz Band, High Channel, 2476 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-15.713	8	Pass