

Garrett Metal Detectors

ACE Apex

2.4 GHz Transceiver FCC 15.247:2020

Report: GARR0079.4, Issue Date: September 17, 2020



TESTING



NVLAP LAB CODE: 201049-0

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CERTIFICATE OF TEST



Last Date of Test: June 5, 2020 Garrett Metal Detectors EUT: ACE Apex

Radio Equipment Testing

Standards	
Specification	Method
FCC 15.247:2020	ANSI C63.10:2013, KDB 558074

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions (Transmitter)	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	
11.6	Duty Cycle	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.
11.9.1.1	Output Power	Yes	Pass	
11.9.1.1	Equivalent Isotropic Radiated Power	Yes	Pass	
11.11	Band Edge Compliance	Yes	Pass	
7.8.6	Band Edge Compliance - Hopping Mode	No	N/A	Not required for DTS devices.
11.8.2	Occupied Bandwidth	Yes	Pass	
11.11	Spurious Conducted Emissions	Yes	Pass	
11.10.2	Power Spectral Density	Yes	Pass	

Deviations From Test Standards

None

Approved By:

Adam Bruno, 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

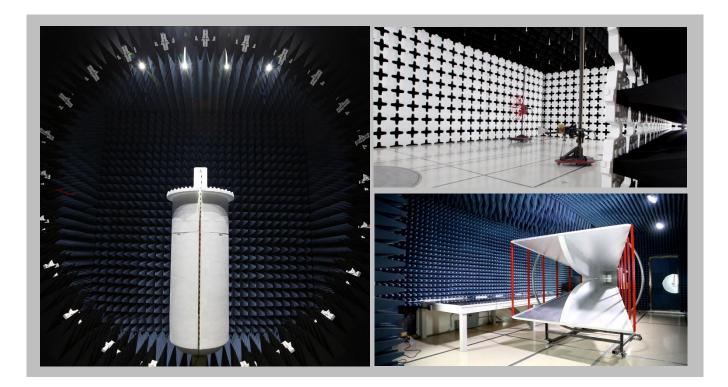
For details on the Scopes of our Accreditations, please visit: https://www.nwemc.com/emc-testing-accreditations

FACILITIES





California Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Minnesota Labs MN01-10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Oregon Labs EV01-12 6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	Texas Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Washington Labs NC01-05 19201 120 th 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



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.

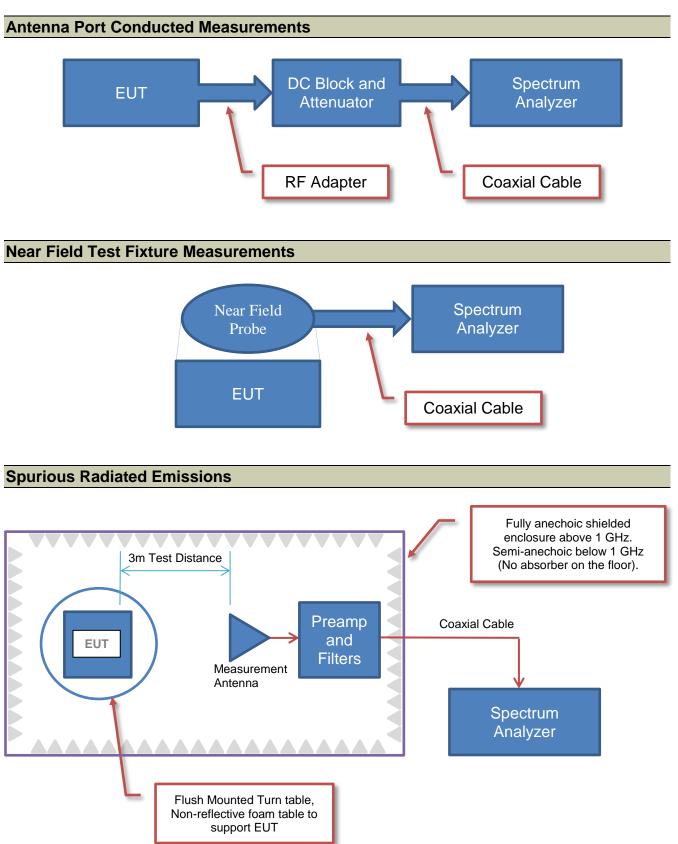
A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found included as part of the applicable 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	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)	2.6 dB	-2.6 dB

Test Setup Block Diagrams





PRODUCT DESCRIPTION



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:	Bob Podhrasky
EUT:	ACE Apex
First Date of Test:	June 4, 2020
Last Date of Test:	June 5, 2020
Receipt Date of Samples:	June 4, 2020
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

Metal Detector

Testing Objective:

Seeing to demonstrate compliance under FCC 15.247:2020 for operation in the 2400 – 2483.5 MHz band.

CONFIGURATIONS



Configuration GARR0077-1

Software/Firmware Running during test	
Description	Version
Programming Software	V.101

EUT						
Description	Manufacturer	Model/Part Number	Serial Number			
Metal Detector	Garrett Metal Detectors	ACE Apex	None			
Metal Detector Antenna	Garrett Metal Detectors	None	D7			

Peripherals in test setup boundary					
Description	Manufacturer	Model/Part Number	Serial Number		
DC Power Supply	Mastech	HY1803D	None		
I/O Programmer	Texas Instruments	None	None		
Laptop	Acer	ZG5	09-0053		
Mouse	Dell	MS116T1	CN-OPRDV9-L0300-934-0IOD		
AC/DC Adapter (Laptop)	Delta Electronics, Inc.	ADP-30JH B	202W91502BN		

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Leads	No	1.0m	No	Metal Detector	DC Power Supply
AC Cable (DC Power Supply)	No	2.5m	No	DC Power Supply	AC Mains
Programming Cable	No	.1m	No	Metal Detector	Programmer
Programmer USB	Yes	1.5m	No	Laptop	Programmer
USB Mouse Cable	Yes	2.0m	No	Mouse	Laptop
AC Cable (Laptop Adapter)	No	2.0m	No	AC Mains	AC/DC Adapter
DC Cable (Laptop Adapter)	No	2.0m	No	AC/DC Adapter	Laptop

CONFIGURATIONS



Configuration GARR0077-2

Software/Firmware Running during test	
Description	Version
Programming Software	V.101

EUT						
Description	Manufacturer	Model/Part Number	Serial Number			
Metal Detector	Garrett Metal Detectors	ACE Apex	None			
Metal Detector Antenna	Garrett Metal Detectors	None	D7			

Peripherals in test se	Peripherals in test setup boundary									
Description	Manufacturer	Model/Part Number	Serial Number							
I/O Programmer	Texas Instruments	None	None							
Laptop	Acer	ZG5	09-0053							
Mouse	Dell	MS116T1	CN-OPRDV9-L0300-934-0IOD							
AC/DC Adapter (Laptop)	Delta Electronics, Inc.	ADP-30JH B	202W91502BN							
AC/DC Wall Power Adapter	POWER ADAPTER	US2018	E500295							

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Programming Cable	No	.1m	No	Metal Detector	Programmer
Programmer USB	Yes	1.5m	No	Laptop	Programmer
USB Mouse Cable	Yes	2.0m	No	Mouse	Laptop
AC Cable (Laptop Adapter)	No	2.0m	No	AC Mains	AC/DC Adapter
DC Cable (Laptop Adapter)	No	2.0m	No	AC/DC Adapter	Laptop
USB DC Power	Yes	1.5m	No	DC Power Brick	Metal Detector
Metal Detector Antenna Cable	Yes	2.5m	No	Antenna	Metal Detector Head

MODIFICATIONS



Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2020-06-04	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	2020-06-04	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.
3	2020-06-04	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.
4	2020-06-05	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	2020-06-05	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	2020-06-05	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	2020-06-05	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	2020-06-05	Spurious Radiated 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 2020.04.03.0

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 channel 2406 MHz Continuously transmitting at Mid channel 2438 MHz Continuously transmitting at High channel 2474 MHz

POWER SETTINGS INVESTIGATED

4.0 VDC

CONFIGURATIONS INVESTIGATED

GARR0077 - 2 GARR0077 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency 30 MHz

Stop Frequency 26000 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
Filter - High Pass	Micro-Tronics	HPM50108	HGD	2019-09-18	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	PAK	2019-09-18	12 mo
Cable	Northwest EMC	8-18GHz	TXD	2020-05-14	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAJ	2020-06-02	12 mo
Cable	Northwest EMC	1-8.2 GHz	TXC	2020-06-02	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AJL	2018-10-11	24 mo
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	2020-05-07	12 mo
Amplifier - Pre-Amplifier	Fairview Microwave	FMAM63001	PAS	2020-05-28	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	PAL	2019-09-18	12 mo
Amplifier - Pre-Amplifier	Miteq	JSDWK42-18004000-60-5P	PAM	2019-09-20	12 mo
Cable	Northwest EMC	N/A	TXE	2019-09-20	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AJF	NCR	0 mo
Antenna - Standard Gain	ETS Lindgren	3160-08	AJG	NCR	0 mo
Attenuator	WeinSchel Corp	4H-20	AWB	2020-03-11	12 mo
Cable	Northwest EMC	RE 9kHz - 1GHz	TXB	2020-05-28	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AYD	2020-02-05	24 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 within 2 MHz of the allowable band may have been taken using the integration method from ANSI C63.10 clause 11.13.3. This procedure uses the channel power feature of the spectrum analyzer to integrate the power of the emission within a 1 MHz bandwidth.

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(1/dc).

SPURIOUS RADIATED EMISSIONS



	k Order:				Date:	2020-0			7		1	
	Project:		ne	Ter	nperature:	21.9		12	- and		far	1
	Job Site:		(02		Humidity:	53.7%		/		\sim	8	
Serial I	Number		ne	Barome	etric Pres.:	1015 r	nbar	Те	sted by:	Marty Marti	in, Brando	n Hobbs
	EUT	ACE Apex										
	juration											
		Garrett Me	tal Detector	S								
	tendees											
EUT	Power:	4.0 VDC										
Operatin	g Mode	Continuou MHz	sly transmit	ting at 100%	% duty cycle	Low channe	el 2406 MH	Iz, Mid chanr	el 2438 N	1Hz, and Hig	gh channe	el 2474
Dev	viations	None										
Cor	mments	cycle insid	e any 100 n	ns period is		efore, the do	wnward D	en operating CCF correcti d = -13.13.				
t Specifi	cations					-	Fest Metho	od				
C 15.247:	:2020					/	ANSI C63.1	10:2013				
Run #	25	Test Di	stance (m)	3	Antenna	Height(s)		1 to 4(m)		Results	P	ass
ı	25	Test Di	stance (m)	3	Antenna	Height(s)		1 to 4(m)		Results	P	ass
80	25	Test Di	stance (m)	3	Antenna	Height(s)		1 to 4(m)		Results	P	Pass
ı	25	Test Di	stance (m)	3	Antenna	Height(s)		1 to 4(m)		Results	P	
80	25	Test Di	stance (m)	3	Antenna	Height(s)		1 to 4(m)		Results	P	2ass
80	25	Test Di	stance (m)	3	Antenna	Height(s)		1 to 4(m)		Results	P	Pass
80	25	Test Di	stance (m)	3	Antenna	Height(s)		1 to 4(m)		Results	P	
80	25		stance (m)	3	Antenna			1 to 4(m)		Results	P	
80	25		stance (m)	3	Antenna	Height(s)		1 to 4(m)		Results	P	
80 70 60 50 40 30	25		stance (m)	3	Antenna	Height(s)		1 to 4(m)		Results	P	
80 70 60 50 40	25			3	Antenna	Height(s)		1 to 4(m)		Results	P	
80 70 60 50 40 30	25			3	Antenna	Height(s)		1 to 4(m)			P	
80 70 60 50 40 30 20				3	Antenna						P	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)
7218.268	56.3	9.7	2.9	313.0	0.0	0.0	Vert	PK	0.0	66.0	74.0	-8.0
7218.383	56.2	9.7	1.3	349.0	0.0	0.0	Horz	PK	0.0	65.9	74.0	-8.1
7218.383	56.0	9.7	1.5	96.0	0.0	0.0	Horz	PK	0.0	65.7	74.0	-8.3
7218.413	55.2	9.7	1.7	262.9	0.0	0.0	Vert	PK	0.0	64.9	74.0	-9.1
7218.408	48.2	9.7	2.9	313.0	-13.1	0.0	Vert	AV	0.0	44.8	54.0	-9.2
7218.347	48.1	9.7	1.3	349.0	-13.1	0.0	Horz	AV	0.0	44.7	54.0	-9.3
7218.413	47.8	9.7	1.5	96.0	-13.1	0.0	Horz	AV	0.0	44.4	54.0	-9.6
7218.277	54.4	9.7	1.6	122.0	0.0	0.0	Vert	PK	0.0	64.1	74.0	-9.9
7218.277	54.1	9.7	3.8	286.9	0.0	0.0	Horz	PK	0.0	63.8	74.0	-10.2
7218.425	47.0	9.7	1.7	262.9	-13.1	0.0	Vert	AV	0.0	43.6	54.0	-10.4
7218.432	46.2	9.7	1.6	122.0	-13.1	0.0	Vert	AV	0.0	42.8	54.0	-11.2
7218.363	45.8	9.7	3.8	286.9	-13.1	0.0	Horz	AV	0.0	42.4	54.0	-11.6
7313.640	40.3	9.9	1.5	31.0	0.0	0.0	Vert	PK	0.0	50.2	74.0	-23.8
7422.445	40.3	9.9	1.5	177.9	0.0	0.0	Horz	PK	0.0	50.2	74.0	-23.8

SPURIOUS RADIATED EMISSIONS



									EmiR5 2020.04.20.0	PSA-ESCI 2020.04.03
Wor	k Order:	GARR	0077		Date:	2020-	06-05			
	Project:	Nor		Те	mperature:	22.6	S°C	14		-
	Job Site:	TXC)2		Humidity:	55.5%	6 RH	1	\sim	
Serial I	Number:	D7	7	Barom	etric Pres.:	1017	mbar	Teste	ed by: Marty Martin	, Brandon Hobbs
	EUT:	ACE Apex								
Config	guration:	2								
Cı	ustomer:	Garrett Met	al Detecto	rs						
	tendees:									
EUT	T Power:	4.0 VDC								
Operatin	ng Mode:	Continuous	ly transmit	ting at 100	% duty cycle	at Low ch	annel 240	6 MHz and High	channel 2474	
De	viations:	None								
Со	mments:	EUT chargii	ng via USE	3 adapter.						
Test Specifi	ications						Test Met	hod		
FCC 15.247								3.10:2013		
Run #	28	Test Dist	tance (m)	3	Antenna I	Height(s)		1 to 4(m)	Results	Pass
80										
70										
60				_						
										-
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20										
10 -										
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2350		2370	23	90	2410	24	30	2450	2470	2490
						MHz				A AN - OF
									PK	🔶 AV 🛛 🔍 QP

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)
2482.660	32.8	-6.1	1.5	81.9	3.0	20.0	Vert	AV	0.0	46.7	54.0	-7.3
2482.570	32.6	-6.1	4.0	313.0	3.0	20.0	Horz	AV	0.0	46.5	54.0	-7.5
2482.667	32.4	-6.1	1.5	280.9	3.0	20.0	Horz	AV	0.0	46.3	54.0	-7.7
2482.763	32.3	-6.1	1.5	57.0	3.0	20.0	Vert	AV	0.0	46.2	54.0	-7.8
2389.010	32.5	-6.4	1.5	279.0	3.0	20.0	Horz	AV	0.0	46.1	54.0	-7.9
2389.200	32.4	-6.4	1.4	27.9	3.0	20.0	Horz	AV	0.0	46.0	54.0	-8.0
2389.340	32.4	-6.4	1.5	219.0	3.0	20.0	Vert	AV	0.0	46.0	54.0	-8.0
2389.630	32.4	-6.4	1.5	260.0	3.0	20.0	Horz	AV	0.0	46.0	54.0	-8.0
2389.423	32.4	-6.4	1.5	33.9	3.0	20.0	Vert	AV	0.0	46.0	54.0	-8.0
2483.293	44.9	-6.1	4.0	313.0	3.0	20.0	Horz	PK	0.0	58.8	74.0	-15.2
2389.543	44.0	-6.4	1.5	260.0	3.0	20.0	Horz	PK	0.0	57.6	74.0	-16.4
2388.913	43.9	-6.4	1.5	279.0	3.0	20.0	Horz	PK	0.0	57.5	74.0	-16.5
2482.560	43.5	-6.1	1.5	81.9	3.0	20.0	Vert	PK	0.0	57.4	74.0	-16.6
2483.743	43.4	-6.1	1.5	280.9	3.0	20.0	Horz	PK	0.0	57.3	74.0	-16.7





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 DESCRIPTION

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 test software provided for operation in a fixed, single channel mode allows the EUT to operate continuously at 100% Duty Cycle.



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
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	27-Feb-20	27-Feb-21
Generator - Signal	Keysight	N5171B-506	TEW	2-May-18	2-May-21
Cable	Micro-Coax	UFD150A-1-0720-200200	TXG	18-Sep-19	18-Sep-20
Attenuator	Fairview Microwave	SA4018-20	TYW	13-Mar-20	13-Mar-21
Block - DC	Fairview Microwave	SD3379	AMM	13-Mar-20	13-Mar-21

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.



					TbtTx 2019.08.30.0	XMit 2020.03.2
EUT: AC	E Apex			Work Order:	GARR0077	
Serial Number: D7				Date:	4-Jun-20	
Customer: Gar	rrett Metal Detectors			Temperature:	22.1 °C	
Attendees: Nor	ne			Humidity:	54.8% RH	
Project: Nor				Barometric Pres.:		
Tested by: Bra		Power: 4.0 VDC		Job Site:	TX05	
TEST SPECIFICATIONS	8	Test Method				
CC 15.247:2020		ANSI C63.10:	013			
COMMENTS						
All losses in the measu	rement path were accounted for: cable, DC block and a	ttenuator.				
DEVIATIONS FROM TE	SI SIANDARD					
lone						
Saudiana di su di		1 1 1				
Configuration #	0'matur	furt fail				
	Signature			0.4 Pro-	1.111	
				Out Pwr	Limit	Result
OF 4. 0400 MILE-				(dBm)	(dBm)	
ow Ch.1, 2406 MHz				4.112	30	Pass
Aid Ch.9, 2438 MHz				4.227	30	Pass
ligh Ch.18, 2474 MHz				3.911	30	Pass



			Low Ch.1, 2	406 MHz			
				Out Pwr	Limit		
				(dBm)	(dBm)	Result	
				4.112	30	Pass	
	rum Analyzer - Element Material	Technology					
L <mark>X/</mark> RL	RF 50 Ω DC		SENSE:INT	ALIGN OFF	pe: Log-Pwr	05:17:17 PM Jun 03, 20	20
		PNO: Fast	斗 Trig: Free	Run Avg Hol	d: 100/100	TRACE 1 2 3 4 TYPE M DET P P P P	WW+
		IFGain:Low	#Atten: 10	dB			and the second se
	Ref Offset 21.17 dB				Mkr	1 2.407 839 GI	Z
5 dB/div Log	Ref 9.00 dBm					4.112 dB	
				1			
4.00				▼			
-1.00							
-6.00							
-11.0						`	$ \prec $
-16.0							
-21.0							
-26.0							
-26.0							
-31.0							
31.0							
-36.0							
Center 2.40 #Res BW 8			≇VBW 50 MHz		Swoon	Span 15.00 M 1.066 ms (1000 p	HZ te)
	WINZ	1			Sweep	1.000 ms (1000 pi	19)
MSG				STATUS			
			Mid Ch.9, 2	438 MH7			
			- Wild On.9, 2	Out Pwr	Limit		
				(dBm)	(dBm)	Result	
				4.227	30	Pass	

RL RF 50 Ω DC	ils Technology	ENSE:INT	ALIGN OFF	05:23	
	PNO: Fast +++ IFGain:Low	Trig: Free Run #Atten: 10 dB	#Avg Type: Log- Avg Hold:>100/1	Pwr	TRACE 1 2 3 4 TYPE MWWW DET P P P P
Ref Offset 21.17 dB B/div Ref 9.00 dBm				Mkr1 2.43	89 824 GH 4.227 dB
9			↓ ¹		
10					
0					
0					
0					
0					
nter 2.438000 GHz es BW 8 MHz	#VBV	V 50 MHz		Spa Sweep 1.066	an 15.00 M ms (1000 p
			STATUS		



	Н	igh Ch.18, 2474 I	ИНz			
			Out Pwr (dBm)	Limit (dBm)	Result	
			3.911	30	Pass	
Meysight Spectrum Analyzer - Element Materials	Technology					x
KL RF 50Ω DC		ENSE:INT	ALIGN OFF		05:33:41 PM Jun 03, 20	20
	PNO: Fast +++ IFGain:Low	Trig: Free Run #Atten: 10 dB	#Avg Type: Avg Hold: 1	Log-Pwr 00/100	TRACE 1 2 3 4 TYPE MWWW DET P P P	56 ₩₩ РР
Ref Offset 21.17 dB				Mkr	1 2.471 995 GI	Z
5 dB/div Ref 9.00 dBm					3.911 dB	m
4.00						
-1.00						
-6.00						
-11.0						
-16.0						
-21.0						
-26.0						
-31.0						
-36.0						
Center 2.474000 GHz #Res BW 8 MHz	#\/B)	V 50 MHz		Sween	Span 15.00 M 1.066 ms (1000 p	Z
MSG	# V D V		STATUS	Gweep	nooo nis (rooo p	27



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
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	27-Feb-20	27-Feb-21
Generator - Signal	Keysight	N5171B-506	TEW	2-May-18	2-May-21
Cable	Micro-Coax	UFD150A-1-0720-200200	TXG	18-Sep-19	18-Sep-20
Attenuator	Fairview Microwave	SA4018-20	TYW	13-Mar-20	13-Mar-21
Block - DC	Fairview Microwave	SD3379	AMM	13-Mar-20	13-Mar-21

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.

Equivalent Isotropic Radiated Power (EIRP) = Max Measured Power + Antenna gain (dBi)



EUT: A	CE Apex					Work Order:	GARR0077	
Serial Number: D	7					Date:	4-Jun-20	
Customer: G	arrett Metal Detectors					Temperature:	22.1 °C	
Attendees: N	ne						54.8% RH	
Project: N	one					Barometric Pres.:	1013 mbar	
Tested by: B	randon Hobbs					Job Site:	TX05	
EST SPECIFICATION	NS		Test Meth	d				
CC 15.247:2020			ANSI C63.	0:2013				
COMMENTS	surement path were accounted	I for: cable, DC block and a	ttenuator.					
Il losses in the meas	-	I for: cable, DC block and a	ttenuator.					
	-	I for: cable, DC block and a	ttenuator.					
II losses in the meas EVIATIONS FROM T Ione	-		ttenuator.					
II losses in the meas EVIATIONS FROM T	-	I for: cable, DC block and at Signature	ttenuator.	wr Duty Cycle	Antenna	EIRP	EIRP Limit	
II losses in the meas EVIATIONS FROM T one	-		Ja Ja		Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
II losses in the meas EVIATIONS FROM T one onfiguration #	-) Correction (dB)				Result Pass
II losses in the meas DEVIATIONS FROM T	-		Jacob San Jacob	Correction (dB)	Gain (dBi)	(dBm)	(dBm)	



			w Ch.1, 2406 M⊦			
	Out Pwr	Duty Cycle	Antenna	EIRP	EIRP Limit	
	(dBm)	Correction (dB)	Gain (dBi)	(dBm)	(dBm)	Result
	4.112	0	5.44	9.552	36	Pass
📜 Keysight Spectrum Analyzer -						
LXI RL RF 5	0Ω DC	SEN	SE:INT	ALIGN OFF	e: Log-Pwr	05:17:17 PM Jun 03, 2020
		PNO: Fast ↔→→ IFGain:Low	Trig: Free Run #Atten: 10 dB	Avg Hold	: 100/100	TRACE 1 2 3 4 5 6 TYPE MWWWW DET PPPPP
Ref Offset	21 17 dB				Mkr1	2.407 839 GHz
5 dB/div Ref 9.00	dBm					4.112 dBm
Log				. 4		
4.00				↓ ¹		
4.00						
-1.00						
-6.00						
-11.0						
-16.0						
-21.0						
-26.0						
-31.0						
-36.0						
Center 2.406000 GH	1-2					Span 15.00 MHz
#Res BW 8 MHz	12	#VBW	50 MHz		Sweep 1.	066 ms (1000 pts)
MSG				STATUS		
		N //	d Ch.9, 2438 MF	7		
	Out Pwr	Duty Cycle	Antenna	EIRP	EIRP Limit	
	(dBm)	Correction (dB)	Gain (dBi)	(dBm)	(dBm)	Result
	4.227		5.44	9.667	36	Pass

Keysight Spectrum Analyzer - Element Materials RL RF 50 Ω DC	SENSE:INT	ALIGN OFF	05:23:52 PM Jun 03, 202
	PNO: Fast ↔→→ Trig: Free Rur IFGain:Low #Atten: 10 dB	#Avg Type: Log-Pw Avg Hold:>100/100	TRACE 2 3 4 5 TYPE MWWW DET P P P P
Ref Offset 21.17 dB			Mkr1 2.439 824 GH 4.227 dBr
•g		♦ ¹	
.00			
1.0			
6.0			
1.0			
6.0			
1.0			
6.0			
enter 2.438000 GHz Res BW 8 MHz	#VBW 50 MHz	s	Span 15.00 Ml weep 1.066 ms (1000 pt
G		STATUS	



	Out Pwr		h Ch.18, 2474 N	EIRP	EIRP Limit	
	(dBm)	Duty Cycle Correction (dB)	Antenna Gain (dBi)	(dBm)	(dBm)	Result
	3.911		<u>бап (бы)</u> 5.44	9.351	(dBIII) 36	Pass
	3.911	0	5.44	9.551		F 855
🗾 Keysight Spectrum Analyzer - Ele	mont Materials To	shaalaas				
Keysight Spectrum Analyzer Fee			SE:INT	ALIGN OFF		05:33:41 PM Jun 03, 2020
		PNO: Fast ↔→ IFGain:Low	Trig: Free Run #Atten: 10 dB	#Avg Type Avg Hold:	: Log-Pwr 100/100	TRACE 1 2 3 4 5 6 TYPE M WWWW DET P P P P P P
Ref Offset 21	47 40				Mkr	1 2.471 995 GHz
5 dBidiy Ref 9 00 d	Bm					3.911 dBm
4.00		<mark>↓</mark> 1				
4.00						
-1.00						
-6.00						
-6.00						
-11.0						
-16.0						
-21.0						
-26.0						
-20.0						
-31.0						
-36.0						
Center 2.474000 GHz						Span 15.00 MHz
#Res BW 8 MHz		#VBW	50 MHz		Sweep	1.066 ms (1000 pts)

BAND EDGE COMPLIANCE



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
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	27-Feb-20	27-Feb-21
Generator - Signal	Keysight	N5171B-506	TEW	2-May-18	2-May-21
Attenuator	Fairview Microwave	SA4018-20	TYW	13-Mar-20	13-Mar-21
Cable	Micro-Coax	UFD150A-1-0720-200200	TXG	18-Sep-19	18-Sep-20
Block - DC	Fairview Microwave	SD3379	AMM	13-Mar-20	13-Mar-21

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



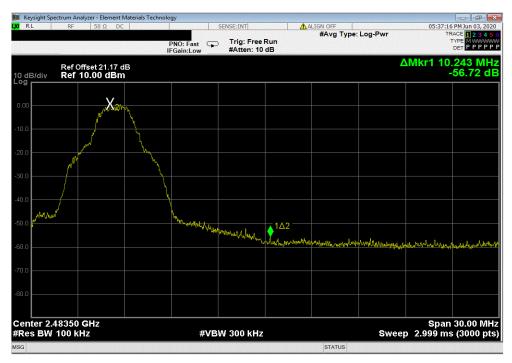
			TbtTx 2019.08.30.0	XMit 2020.03.25.0
EUT: ACE Apex		Work Order:	GARR0077	
Serial Number: D7		Date:	5-Jun-20	
Customer: Garrett Metal Detectors				
Attendees: None		Humidity:	53.3% RH	
Project: None		Barometric Pres.:	1016 mbar	
Tested by: Brandon Hobbs	Power: 4.0 VDC	Job Site:	TX05	
TEST SPECIFICATIONS	Test Method			
FCC 15.247:2020	ANSI C63.10:2013			
COMMENTS				
All losses in the measurement path were accounted for: cable, DC block and atte	enuator.			
DEVIATIONS FROM TEST STANDARD				
None				
Configuration # 1 Signature	2. Jar			
		Value	Limit	
		(dBc)	≤ (dBc)	Result
Low Ch.1, 2406 MHz		-40.6	-20	Pass
High Ch.18, 2474 MHz		-56.72	-20	Pass

BAND EDGE COMPLIANCE





	Hig	gh Ch.18, 2474 M	lHz		
			Value	Limit	
			(dBc)	≤ (dBc)	Result
			-56.72	-20	Pass





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
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	27-Feb-20	27-Feb-21
Generator - Signal	Keysight	N5171B-506	TEW	2-May-18	2-May-21
Attenuator	Fairview Microwave	SA4018-20	TYW	13-Mar-20	13-Mar-21
Cable	Micro-Coax	UFD150A-1-0720-200200	TXG	18-Sep-19	18-Sep-20
Block - DC	Fairview Microwave	SD3379	AMM	13-Mar-20	13-Mar-21

TEST DESCRIPTION

The EUT was set to the channels and modes listed in the datasheet.

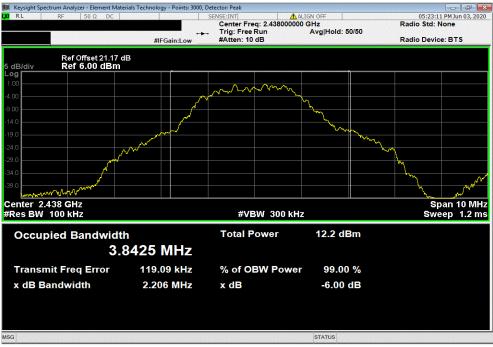
The 6dB occupied bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The 99.0% occupied bandwidth was also measured at the same time which can be needed during Output Power depending on the applicable method.



				TbtTx 2019.08.30.0	XMit 2020.03.25.0
EUT:	ACE Apex		Work Order:	GARR0077	
Serial Number:	D7		Date:	5-Jun-20	
Customer:	Garrett Metal Detectors		Temperature:	22.5 °C	
Attendees:	None		Humidity:	53.7% RH	
Project:	None		Barometric Pres.:	1017 mbar	
Tested by:	Brandon Hobbs	Power: 4.0 VDC	Job Site:	TX05	
TEST SPECIFICATI	DNS	Test Method			
FCC 15.247:2020		ANSI C63.10:2013			
COMMENTS					
All losses in the me	asurement path were accounted for: cable, DC block and atte	nuator.			
		induction in the second s			
DEVIATIONS FROM	TEST STANDARD				
None					
Configuration #	1	7-1-1			
-	Signature	And American			
				Limit	
			Value	(≥)	Result
Low Ch.1, 2406 MHz			2.207 MHz	500 kHz	Pass
Mid Ch.9, 2438 MHz			2.206 MHz	500 kHz	Pass
High Ch.18, 2474 MI	7		2.199 MHz	500 kHz	Pass
1 ngi 1 0 n. 10, 2 n 1 ni			21100 11112	000 14 12	1 000













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
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	27-Feb-20	27-Feb-21
Block - DC	Fairview Microwave	SD3379	AMM	13-Mar-20	13-Mar-21
Attenuator	Fairview Microwave	SA4018-20	TYW	13-Mar-20	13-Mar-21
Cable	Micro-Coax	UFD150A-1-0720-200200	TXG	18-Sep-19	18-Sep-20
Block - DC	Fairview Microwave	SD3379	AMM	13-Mar-20	13-Mar-21

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.



EUT: ACE A	Apex					Work Order:		
Serial Number: D7							5-Jun-20	
	ett Metal Detectors					Temperature:		
Attendees: None						Humidity:		
Project: None						Barometric Pres.:		
Tested by: Brand	don Hobbs		Power: 4.0 VDC			Job Site:	TX05	
EST SPECIFICATIONS			Test Metho	od				
CC 15.247:2020		ANSI C63.10:2013						
OMMENTS								
	ement path were account							
EVIATIONS FROM TEST	T STANDARD							
EVIATIONS FROM TEST	T STANDARD							
	T STANDARD	Signature	J.S.	4				
lone	T STANDARD	Signature	Freque	-A	Measured	Max Value	Limit	
lone	T STANDARD	Signature	7		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
one configuration #	T STANDARD	Signature	Freque	ge				Result N/A
one onfiguration #	T STANDARD	Signature	Freque Rang	ge nental	Freq (MHz)	(dBc)	≤ (dBc)	
onfiguration # ow Ch.1, 2406 MHz ow Ch.1, 2406 MHz	1 1	Signature	Freque Rang Fundam	ge nental 2.5 GHz	Freq (MHz) 2406.23	(dBc) N/A	≤ (dBc) N/A	N/A
one onfiguration # ow Ch.1, 2406 MHz ow Ch.1, 2406 MHz ow Ch.1, 2406 MHz	1 1	Signature	Freque Rang Fundam 30 MHz - 1	ge nental 2.5 GHz 25 GHz	Freq (MHz) 2406.23 7217.26	(dBc) N/A -52.68	<mark>≤ (dBc)</mark> N/A -20	N/A Pass
one onfiguration # bw Ch.1, 2406 MHz ow Ch.1, 2406 MHz bw Ch.1, 2406 MHz id Ch.9, 2438 MHz	1 1	Signature	Freque Rang Fundam 30 MHz - 1 12.5 GHz -	ge nental 2.5 GHz 25 GHz nental	Freq (MHz) 2406.23 7217.26 24081.31	(dBc) N/A -52.68 -52.29	≤ (dBc) N/A -20 -20	N/A Pass Pass
one onfiguration # ow Ch.1, 2406 MHz ow Ch.1, 2406 MHz ow Ch.1, 2406 MHz lid Ch.9, 2438 MHz id Ch.9, 2438 MHz	1 1	Signature	Freque Rang Fundam 30 MHz - 1 12.5 GHz - Fundam	ge nental 2.5 GHz 25 GHz nental 2.5 GHz	Freq (MHz) 2406.23 7217.26 24081.31 2438.24	(dBc) N/A -52.68 -52.29 N/A	≤ (dBc) N/A -20 -20 N/A	N/A Pass Pass N/A
one onfiguration # ow Ch.1, 2406 MHz ow Ch.1, 2406 MHz bid Ch.9, 2438 MHz bid Ch.9, 2438 MHz bid Ch.9, 2438 MHz	1 1	Signature	Freque Rang Fundam 30 MHz - 1 12.5 GHz - Fundam 30 MHz - 1 30 MHz - 1	ge nental 2.5 GHz 25 GHz nental 2.5 GHz 2.5 GHz	Freq (MHz) 2406.23 7217.26 24081.31 2438.24 3808.6	(dBc) N/A -52.68 -52.29 N/A -52.12	≤ (dBc) N/A -20 -20 N/A -20	N/A Pass Pass N/A Pass
lone	1 1	Signature	Freque Rang Fundam 30 MHz - 1 12.5 GHz - Fundam 30 MHz - 1 12.5 GHz -	ge nental 2.5 GHz 25 GHz 25 GHz 2.5 GHz 25 GHz nental	Freq (MHz) 2406.23 7217.26 24081.31 2438.24 3808.6 24185.08	(dBc) N/A -52.68 -52.29 N/A -52.12 -52.35	≤ (dBc) N/A -20 -20 N/A -20 -20	N/A Pass Pass N/A Pass Pass

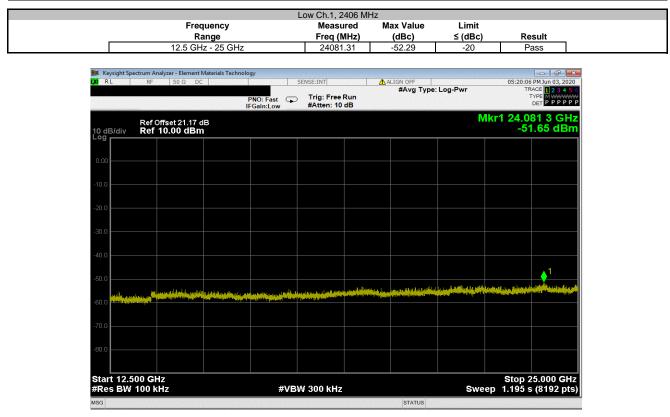




LC	ow Ch.1, 2406 MI	ΗZ		
Frequency	Measured	Max Value	Limit	
Range	Freq (MHz)	(dBc)	≤ (dBc)	Result
30 MHz - 12.5 GHz	7217.26	-52.68	-20	Pass

RL	RF		ent Materials Teo	Innology		ENSE:INT		LIGN OFF		05-10-1	👝 🗗 📕
KL	KF	50 Ω	DC		5	ENSE:INT		#Avg Type			
				PNO: Fast IFGain:Low	Ģ	Trig: Free F #Atten: 10		#Avg Type	Log-Pwr		TYPE MWWW DET P P P P F
dB/div	Ref 0 Ref 1	ffset 21.1 10.00 di	7 dB 3m							Mkr1 7.2 -5	217 3 GF 2.04 dB
^{og}											
.00											
0.0											
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القيدانة		and the state of the									
).0											
)30 GHz N 100 ki				VBV	V 300 kHz			Sw	Stop eep 1.192	12.500 GH
				"		1 000 1112			011	oop 1.132	o (0102 pi

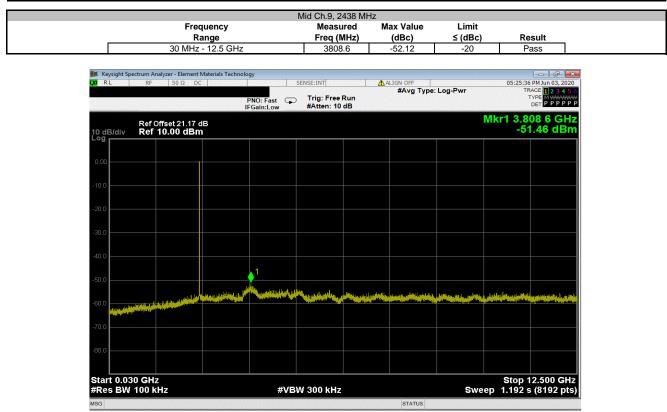




Mid Ch.9, 2438 MHz						
Frequency	Measured	Max Value	Limit			
Range	Freq (MHz) (dBc)	≤ (dBc)	Result	_	
Fundamental	2438.24	N/A	N/A	N/A		

RL	RF	50 Ω DC		SE	INSE:INT	ALIGN OFF		05:24:32 PM	Jun 03, 20
			PNO IFGa	Wide 😱	Trig: Free Run #Atten: 10 dB	#Avg Type		TYP DE	E 1 2 3 4 5 E M WWW T P P P P 1
dB/div	Ref Offs Ref 10	et 21.17 dE .00 dBm	3				Mkr1	2.438 235 0.6	53GH 56dB
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	2.438000			#\/D14	(200 kH=		0	Span 5. 1.092 ms (8	000 M
es B	N 100 kHz			#VBW	/ 300 kHz		Sweep	1.092 ms (8	5192 p

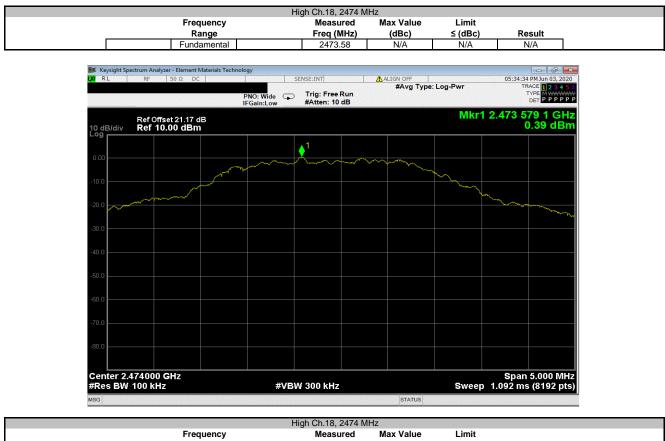




N	lid Ch.9, 2438 Mł	Ηz		
Frequency	Measured	Max Value	Limit	
Range	Freq (MHz)	(dBc)	≤ (dBc)	Result
12.5 GHz - 25 GHz	24185.08	-52.35	-20	Pass

			nt Materials	lechnology	and the second						
RL	RF	50 Ω	DC		S	ENSE:INT		ALIGN OFF		05:2	8:50 PM Jun 03, 20
				PNO: Fast IFGain:Lov		Trig: Free F #Atten: 10		#Avg Type	: Log-Pwr		TRACE 1 2 3 4 TYPE MWWW DET PPPP
) dB/div	Ref Off Ref 10	set 21.1 0 .00 dE	7 dB Sm							Mkr1 24	.185 1 GH 51.69 dB
^g				1							
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D.O 0.C											
0.0											
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art 12.5	00 GHz									Sto	p 25.000 GI
Res BW					#VBV	V 300 kHz			S	weep 1.19	5 s (8192 p
G		STATISTICS AND						STATUS			





Frequency	Measured	Max Value	Limit	
Range	Freq (MHz)	(dBc)	≤ (dBc)	Result
30 MHz - 12.5 GHz	4941.27	-51.17	-20	Pass

RL	RF	50 Ω	DC	and the second	S	ENSE:INT	<u>∧</u> ∧	ALIGN OFF		05:35:4	6 PM Jun 03, 202
				PNO: Fast IFGain:Low	Ģ	Trig: Free #Atten: 10		#Avg Type:	Log-Pwr	T	RACE 1 2 3 4 5 TYPE MWWW DET PPPP
dB/div	Ref Offs Ref 10	set 21.17 .00 dB	7 dB Sm							Mkr1 4.9 -5	41 3 GH 0.78 dB
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).0 											
).0											
art 0.03	O GHZ									Stop	12.500 GF
	100 kHz	2		#	VBV	V 300 kHz			Sw	eep 1.192 :	



			High Ch.18, 24					
	Frequency		Measure		ax Value	Limit		
	Range		Freq (MH		(dBc)	≤ (dBc)		esult
	12.5 GHz - 25 GHz	1	24671.9	9	-52.21	-20	P	ass
	Analyzer - Element Materials Technol	ology						
LX/RL RF	50 Ω DC		SENSE:INT	<u>^</u>	LIGN OFF			6 PM Jun 03, 2020
		PNO: Fast	Trig: Free Ru	ın	#Avg Type	: Log-Pwr	11	RACE 1 2 3 4 5 6 TYPE MWWWW DET P P P P P P
		IFGain:Low	#Atten: 10 dB					DETPPPPP
Pof	Offset 21.17 dB					M		71 9 GHz
10 dB/div Ref	10.00 dBm						-51	1.82 dBm
Log								
0.00								
-10.0								
-20.0								
-30.0								
-40.0								
								<u>1</u>
-50.0						والأربية الشعاد الألبي	ann an In	
أسلاب ومنظلة ورزار واللمقة	ويلافأها وفاقتهم فنخف وفاقله المتعالين	where the dealer has not follow	A division of Printiperiod					
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-70.0								
-80.0								
Start 12.500 G	Hz						Stop.2	25.000 GHz
#Res BW 100		#VB	W 300 kHz			Swe		s (8192 pts)
MSG					STATUS		•	· · · ·



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
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	27-Feb-20	27-Feb-21
Attenuator	Fairview Microwave	SA4018-20	TYW	13-Mar-20	13-Mar-21
Cable	Micro-Coax	UFD150A-1-0720-200200	TXG	18-Sep-19	18-Sep-20
Block - DC	Fairview Microwave	SD3379	AMM	13-Mar-20	13-Mar-21
Generator - Signal	Keysight	N5171B-506	TEW	2-May-18	2-May-21

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.



			TbtTx 2019.08.30.0	XMit 2020.03.25.0			
EUT: ACE Apex		Work Order:	GARR0077				
Serial Number: D7		Date:	5-Jun-20				
Customer: Garrett Metal Detectors		Temperature:	22.6 °C				
Attendees: None	Humidity:	53.2% RH					
Project: None	Barometric Pres.:	1016 mbar					
Tested by: Brandon Hobbs	Tested by: Brandon Hobbs Power: 4.0 VDC						
TEST SPECIFICATIONS	Test Method						
FCC 15.247:2020	ANSI C63.10:2013						
COMMENTS							
All losses in the measurement path were accounted for: cable, DC block and atter	nuator.						
DEVIATIONS FROM TEST STANDARD							
None							
Configuration # 1 Signature	2 Jan						
		Value	Limit				
		dBm/3kHz	< dBm/3kHz	Results			
Low Ch.1, 2406 MHz		-13.259	8	Pass			
Mid Ch.9, 2438 MHz		-13.619	8	Pass			
High Ch.18, 2474 MHz		-14.059	8	Pass			



