

Preco, Inc. Sentry® ST97and Side Defender® II SDII97

FCC 15.249:2018 24.05-24.25 GHz Low Power (SRD) Transceiver

Report # PRCO0085





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Last Date of Test: November 16, 2018 Preco, Inc. Model: Sentry® ST97and Side Defender® II SDII97

Radio Equipment Testing

Standards

Specification	Method
FCC 15.249:2018	ANSI C63.10:2013

Results

Method Clause	Lest Description		Results	Comments
6.2	Powerline Conducted Emissions	No	N/A	Not requested.
6.5, 6.6	Field Strength of Harmonics and Spurious Radiated Emissions	Yes	Pass	
6.6 7.5	Field Strength of Fundamental	Yes	Pass	
7.5	Duty Cycle	No	N/A	Not requested.

Deviations From Test Standards

None

Approved By:

Kyle Holgate, 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



Revisior 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). 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

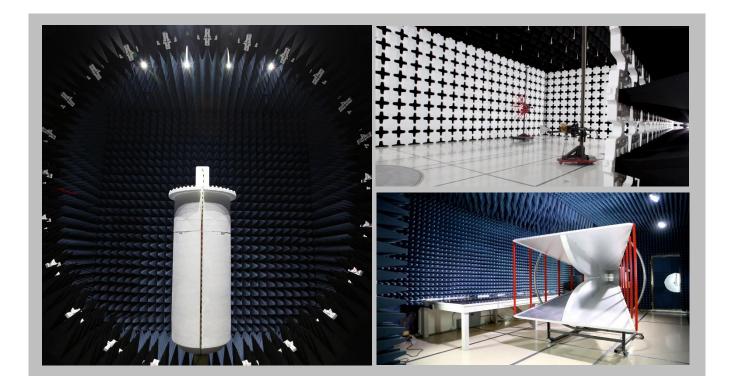
For details on the Scopes of our Accreditations, please visit: https://www.nwemc.com/emc-testing-accreditations

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	New York Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214	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	
		NV	LAP			
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	
		BSI	МІ			
SL2-IN-E-1154R	SL2-IN-E-1152R	N/A	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R	
		VC	CI			
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	



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.

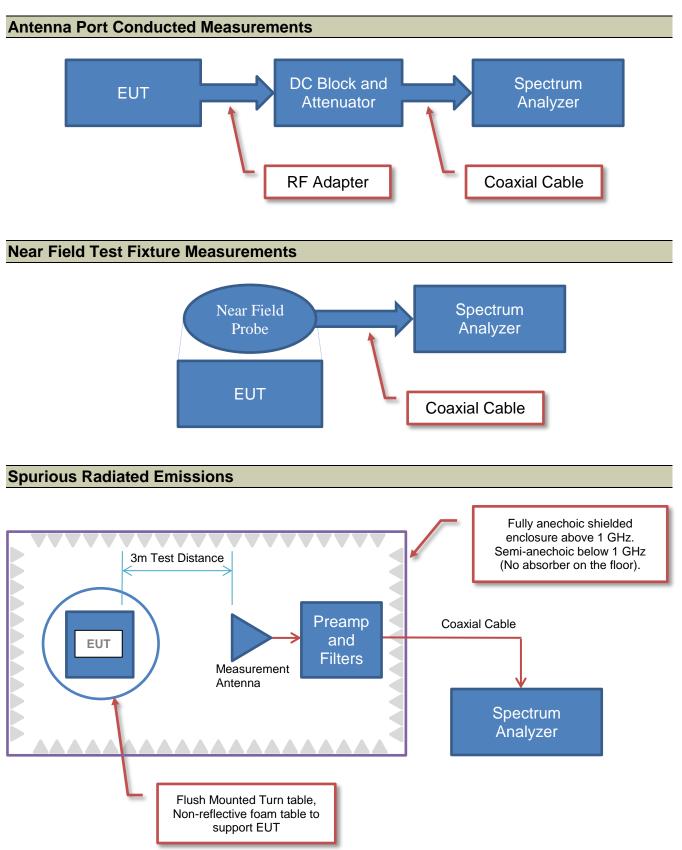
A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found included as part of the applicable 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 (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)	5.2 dB	-5.2 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

Test Setup Block Diagrams





PRODUCT DESCRIPTION



Client and Equipment Under Test (EUT) Information

Company Name:	Preco, Inc.
Address:	10335 W Emerald St
City, State, Zip:	Boise, ID 83704-5018
Test Requested By:	John Fadgen
Model:	Sentry® ST97and Side Defender® II SDII97
First Date of Test:	November 14, 2018
Last Date of Test:	November 16, 2018
Receipt Date of Samples:	November 14, 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: Radar Unit

Seeking to demonstrate compliance to the Low Power SRD Transceiver under FCC 15.249:2018 for operation in the 24.05-24.25 GHz Band.

CONFIGURATIONS



Configuration PRCO0085-1

Software/Firmware Running during test					
Description	Version				
NextGen PET	1.7.9				

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Radar Unit 1	Preco Electronics, Inc.	None	1

Peripherals in test setup boundary						
Description	Manufacturer	Model/Part Number	Serial Number			
DC Linear Power Supply	TOPWARD ELECTRONIC INSTURMENTS	TPS 2000	TPD			

Remote Equipment Outside of Test Setup Boundary						
Description Manufacturer Model/Part Number Serial Number						
Remote Laptop	HP	ProBook 6545b	CND03005M8			

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Main Harness	No	10 m	No	Main Harness to Serial	I/O Cable
I/O Cable	No	0.2 m	No	Main Harness	Radar Unit 1
DC Power	DC Power No 1.3 m N	No	Main Harness	DC Linear	
DC Fower	INO	1.5 11	INO	Main Hamess	Power Supply
Main Harness to Serial	No	1.3 m	No	Main Harness	Serial to USB
Serial to USB	Yes	0.8 m	No	Main Harness to Serial	Remote Laptop
AC Mains	No	1.8 m	No	DC Linear Power Supply	AC Mains





Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2018-11-14	Field Strength of	Tested as delivered to	No EMI suppression devices were added or	EUT remained at Element following the
		Fundamental	Test Station.	modified during this test.	test.
2	2018-11-15	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.
3	2018-11-16	Field Strength of Harmonics	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

FIELD STRENGTH OF FUNDAMENTAL



PSA-ESCI 2018.07.27

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. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Continuous Tx, Low Ch = 24056 MHz, Mid Ch = 24153 MHz, High Ch = 24247 MHz

POWER SETTINGS INVESTIGATED

12.0 VDC

CONFIGURATIONS INVESTIGATED

PRCO0085 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency 24056 MHz

Stop Frequency 24247 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
Antenna - Standard Gain	ETS Lindgren	3160-09	AHY	NCR	0 mo
Cable	Micro-Coax	UFD150A-1-0720-200200	EVK	24-Aug-2018	12 mo
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	18-Mar-2018	12 mo

TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was transmitting and while set at the lowest channel, a middle channel, and the highest channel available. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT and EUT antenna in 3 orthogonal planes.

The average values were calculated as per FCC KDB 890966 - Measurement Procedure for Level Probing Radars, Section 9. The steps for the calculation are as follows:

1. Calculate the dwell time, T_D, of the sweep frequency signal per MHz of the sweep frequency span:

 $T_D = Ts/\Delta F$, where:

Ts is the signal sweep frequency time in seconds ΔF is the signal sweep frequency span in MHz

2. Calculate the Average Factor:

Average factor = $(T_D) / \text{cycle time}$, where:

cycle time is the total time for a complete cycle of the signal including retrace and any other latency times.

3. Calculate the Duty Cycle Correctoin Factor (DCCF):

DCCF = 10*log(Average Factor)

4. Apply the DCCF to the PK measurements to determine the AVG value

FIELD STRENGTH OF FUNDAMENTAL



										EmiR5 2018.09.26		PSA-ESCI 2018.07.27	<u>.</u>
We	ork Order:		O0085		Date:		v-2018		1	1		-	
	Project:		one	Tei	mperature:		3 ℃	0	A	-/			
Soria	Job Site: I Number:		/01 2	Barom	Humidity: etric Pres.:		% RH mbar		Tested by:	Jeff Alcoke	~]
Jena					r® II SDII97		mbai		Tested by.	Jell Alcoke			-
Conf	figuration:												-
(Customer:	Preco, Inc											-
	Attendees:												-
El	UT Power:							<u> </u>					-
Operat	ing Mode:	Continuou	s Ix, Low C	h = 24056	MHz, Mid C	h = 24153	MHz, High	Ch = 2424	(MHz				
		None											-
D	eviations:	110110											
					el, Modulatio PK measure								-
C	omments:	5.86*10^-6	6 s/MHz, an	d a Cycle T	ime of 11.1	ms. The Av	verage Fac	tor = T D/C	Cycle Time =	= 5.27*10^-4	. The DC	CF used to	
					g(Average F			_	,				
						•							-
Test Spec							Test Meth						-
FCC 15.24	9:2018						ANSI C63.	10:2013					
Run #	9	Test Di	stance (m)	3	Antenna	a Height(s)		1 to 4(m)		Results	Pa	ass	-
140 -													-
110													
120 -													
.20													
100 -													
100													
= 80 -				*						*			
dBuV/m													
Ş													
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- 00													
40 -													
40													
20 -													
20 -													
0 -													
	950	24000		24050	2410	00	24150	2	4200	24250		24300	
						MHz				PK	◆ AV	o QP	
					Duty Cycle		Polarity/						
Freq	Amplitude	Factor	Antenna Height	Azimuth	Correction Factor	External Attenuation	Transducer Type	Detector	Distance Adjustment	Adjusted	Spec. Limit	Compared to Spec.	
(MHz)	(dBuV)	(dB)	(meters)	(degrees)	(dB)	(dB)	1,100	Detector	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
	70.0	40.0	4.5	050.0		0.0	Ment	DV	0.0	445.0	400.0	40.0	Comments Mid Ch. CW/ EUT on Side
24153.000 24247.020	72.6 72.6	43.2 43.1	1.5 1.5	350.0 350.0		0.0 0.0	Vert Vert	PK PK	0.0 0.0	115.8 115.7	128.0 128.0	-12.2 -12.3	Mid Ch, CW, EUT on Side High Ch, CW, EUT on Side
24056.030	72.3	43.3	1.5	351.0		0.0	Vert	PK	0.0	115.6	128.0	-12.5	Low Ch, CW, EUT on Side
24247.000	71.2	43.1	1.6	352.0		0.0	Horz	PK	0.0	114.3	128.0	-13.7	High Ch, CW, EUT Horz
24153.020	71.0	43.2	1.7	355.0		0.0	Horz	PK PK	0.0 0.0	114.2	128.0 128.0	-13.8	Mid Ch, CW, EUT Horz Low Ch, CW, EUT Horz
24056.020 24153.000	70.5 72.6	43.3 43.2	1.7 1.5	351.0 350.0	-32.8	0.0 0.0	Horz Vert	PK AV	0.0	113.8 83.0	128.0	-14.2 -25.0	Mid Ch, CW, EUT on Side
24247.020	72.6	43.1	1.5	350.0	-32.8	0.0	Vert	AV	0.0	82.9	108.0	-25.1	High Ch, CW, EUT on Side
24056.030	72.3	43.3	1.5	351.0	-32.8	0.0	Vert	AV	0.0	82.8	108.0	-25.2	Low Ch, CW, EUT on Side
24247.000 24153.020	71.2 71.0	43.1 43.2	1.6 1.7	352.0 355.0	-32.8 -32.8	0.0 0.0	Horz Horz	AV AV	0.0 0.0	81.5 81.4	108.0 108.0	-26.5 -26.6	High Ch, CW, EUT Horz Mid Ch, CW, EUT Horz
24056.020	70.5	43.3	1.7	351.0	-32.8	0.0	Horz	AV	0.0	81.0	108.0	-27.0	Low Ch, CW, EUT Horz



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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Cable	OML, Inc.	S119BFSS100390443	SUN	NCR	NCR
Diplexer	OML, Inc.	DPL26	DAA	NCR	NCR
Antenna	OML, Inc.	M08HWAX	AIL	25-Aug-16	25-Aug-19
Antenna	OML, Inc.	M12HWAX	AIK	25-Aug-16	25-Aug-19
Antenna	OML, Inc.	M19HWAX	AIJ	25-Aug-16	25-Aug-19
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	18-Mar-18	18-Mar-19

TEST DESCRIPTION

The measurement was made in a radiated configuration of the fundamental with the carrier fully maximized for its highest radiated power. The EUT was transmitting with an unmodulated carrier. The testing was done at distances closer than 3m as called out in the data sheets. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna orientation and polarization, and manipulating the EUT and EUT antenna in 3 orthogonal planes (per ANSI C63.10:2009). The specifiation limit was adjusted for the closer test distances at 20 dB per decade as called out in the following table:

	Spec limit							
	3m	1m	50cm	20 cm	10 cm	5 cm	2 cm	
Average	68	77.54	83.56	91.5	97.5	103.6	111.5	
Peak	88	97.54	103.56	111.5	117.5	123.6	131.5	

The analyzer display was offset with the value of the test equipment losses (mixers, duplexers, and cables) specific to each band and the antenna factor per the following tables:

Low Frequency: 24056 MHz

Freq	Antenna Gain	Antenna Factor	lixer / Duplexer los	Analyzer Offset
(MHz)	(dBi)	(dB/m)	(dB)	(dB)
48112.00	24.05	39.87	33.98	73.84
72168.00	24.05	43.39	39.59	82.97
96224.00	24.05	45.89	33.39	79.27

Mid Frequency: 24153 MHz

Freq	Antenna Gain	Antenna Factor	lixer / Duplexer los	Analyzer Offset
(MHz)	(dBi)	(dB/m)	(dB)	(dB)
48306.00	24.05	39.90	30.37	70.25
72459.00	24.05	43.42	40.27	83.72
96612.00	24.05	45.92	34.17	80.12

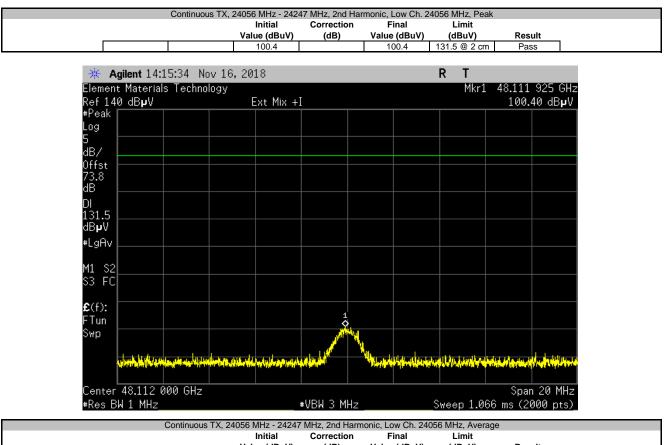
High Frequency: 24257 MHz

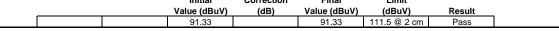
Freq	Antenna Gain	Antenna Factor	lixer / Duplexer los	Analyzer Offset
(MHz)	(dBi)	(dB/m)	(dB)	(dB)
48494.00	24.05	39.93	30.14	70.07
72741.00	24.05	43.46	40.16	83.62
96988.00	24.05	45.95	34.95	80.90



EUT	Sentry® ST97and Side Defender® II S	DII97				Work Order:	PRC00085	
Serial Number		2.101					16-Nov-18	
	Preco, Inc.					Temperature:		
Attendees						Humidity:		
Project						Barometric Pres.:		
	Jeff Alcoke		Power: 12.0 VDC			Job Site:	EV01	
EST SPECIFICAT			Test Method					
CC 15.249:2018			ANSI C63.10:2013					
OMMENTS								
UT was maximize	ed on all three (x,y,z) orientations.							
EVIATIONS FRO	M TEST STANDARD							
one								
			- / /					
Configuration #	1		Jeff /					
		Signature	Car His	*				
				Initial	Correction	Final	Limit	
				Value (dBuV)	(dB)	Value (dBuV)	(dBuV)	Result
continuous TX, 240	56 MHz - 24247 MHz							
	2nd Harmonic							
	Low Ch. 24056 MHz							_
	Peak			100.4		100.4	131.5 @ 2 cm	Pass
	Average			91.33		91.33	111.5 @ 2 cm	Pass
	Mid Ch. 24153 MHz			04.70		04.70	404 5 @ 0	Deres
	Peak			94.72 87.51		94.72 87.51	131.5 @ 2 cm	Pass Pass
	Average High Ch. 24247 MHz			87.51		87.51	111.5 @ 2 cm	Pass
	Peak			94.33		94.33	131.5 @ 2 cm	Pass
	Average			86.24		86.24	111.5 @ 2 cm	Pass
	3rd Harmonic			00.24		00.24	111.0 @ 2 011	1 455
	Low Ch. 24056 MHz							
	Peak			106.18		106.18	131.5 @ 2 cm	Pass
	Average			93.74		93.74	111.5 @ 2 cm	Pass
	Mid Ch. 24153 MHz							
	Peak			107.77		107.77	131.5 @ 2 cm	Pass
	Average			93.32		93.32	111.5 @ 2 cm	Pass
	High Ch. 24247 MHz							
	Peak			106.63		106.63	131.5 @ 2 cm	Pass
	Average			93.15		93.15	111.5 @ 2 cm	Pass
	4th Harmonic							
	Low Ch. 24056 MHz							
	Peak			104.19		104.19	131.5 @ 2 cm	Pass
	Average			90.41		90.41	111.5 @ 2 cm	Pass
	Mid Ch. 24153 MHz							
	Peak			105.51		105.51	131.5 @ 2 cm	Pass
	Average			91.61		91.61	111.5 @ 2 cm	Pass
	High Ch. 24247 MHz							-
	Peak Average			106.63 91.37		106.63 91.37	131.5 @ 2 cm 111.5 @ 2 cm	Pass Pass

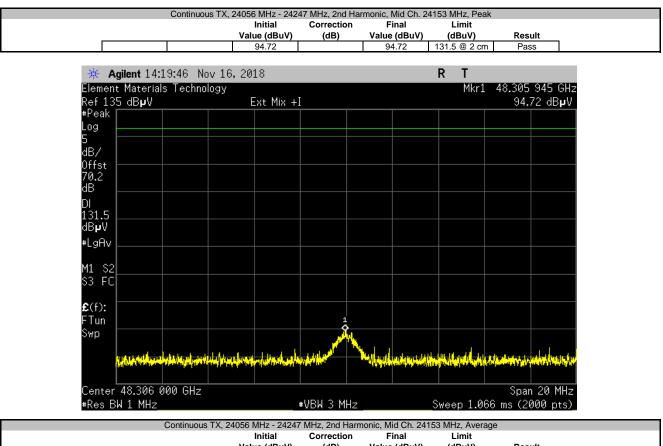






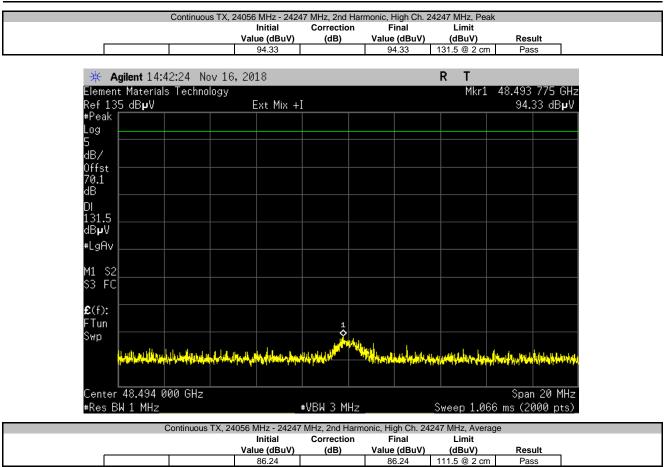
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Element Materials Techn Ref 120 dB µ V	ology Ext Mix +1		Mi	r1 48.111 945 GHz 91.33 dB µ V
#Avg Log				
5 dB/				
Offst				
73.8 dB				
DI 111.5				
dBµV #LgAv				
M1 S2 S3 FC		-		
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FTun Swp				
Center 48.112 000 GHz				Span 20 MHz
#Res BW 1 MHz		₩VBW 3 MHz	#Sw	eep 2 s (2000 pts)_





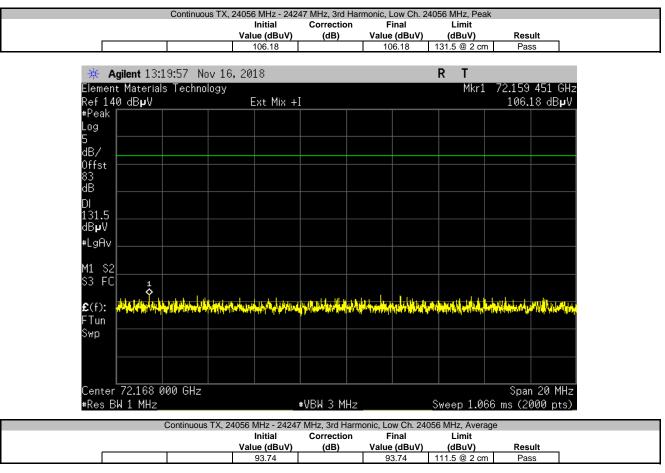
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Element Materials Technol					Mkr1		965 GHz
Ref 120 dB µ V	Ext Mix +1					87.5	1 dB µ V
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5							
dB/							
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70.2 dB							
DI 111.5							
111.5							
dB u V							
#LgAv							
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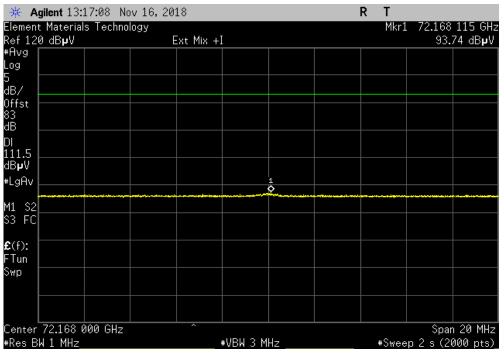




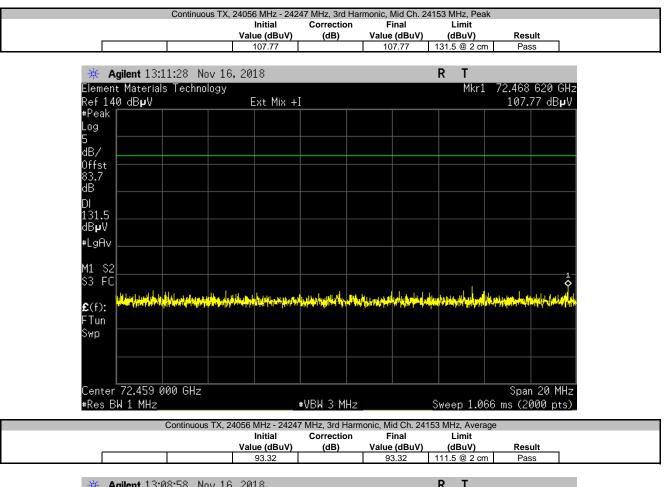
🔆 Agilent 14:37:58			R	T
Element Materials Tech Ref 120 dB µ V	nology Ext Mix +	I		Mkr1 48.493 965 GHz 86.24 dBµV
#Avg Log				
5 dB/				
0ffst 70.1 dB				
DI 1111.5 dBµV				
#LgAv				
M1 S2 S3 FC		1		
£(f): FTun				
Swp				
Center 48.494 000 GH: #Res BW 1 MHz		₩VBW 3 MHz		Span 20 MHz ≢Sweep 2 s (2000 pts)

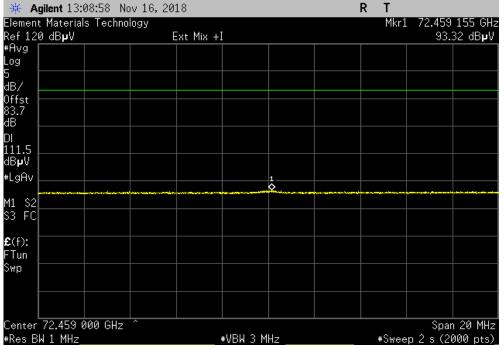




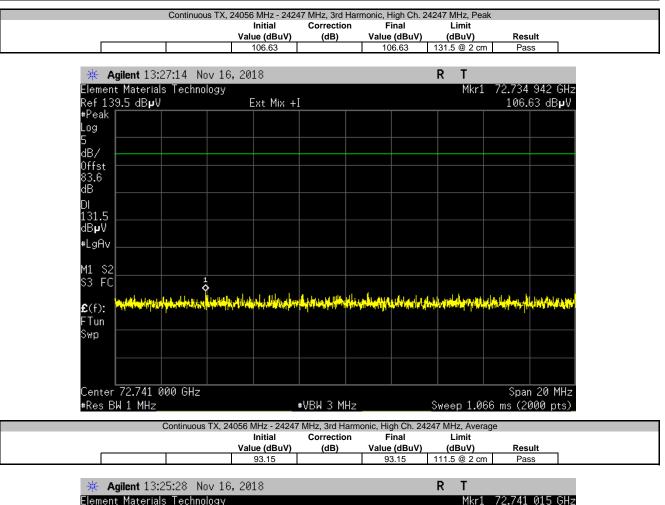


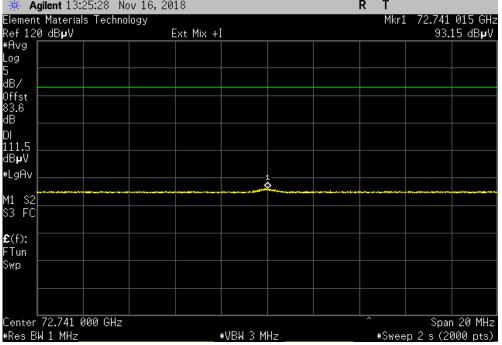














Continuous	TX, 24056 MHz - 2424 Initial Value (dBuV)	Correction (dB)	Final Value (dBuV)	Limit (dBuV)	Result
	104.19	(UB)	104.19	131.5 @ 2 cm	Pass
Agilent 13:58:02 Nov Element Materials Technolo Ref 140 dBµV #Peak Log 5 dB/ Offst				R T Mkr1	96.228 667 GH z 104.19 dB µ V
79.3 dB DI 131.5 dB µ V #LgAv M1 S2					
\$3 FC	hanathag belandaga belanda ang sa sa belanda belanda sa	hundiger and the second	haitah Jawan lai Uniya	1 Werthingth (Marthington)	when we want in the first state of the second states of the second state
Center 96.224 000 GHz #Res BW 1 MHz		•VBW 3 MHz		Sweep 1.066	Span 20 MHz ms (2000 pts)
Continuous T	X, 24056 MHz - 24247 Initial Value (dBuV) 90.41	MHz, 4th Harm Correction (dB)	ionic, Low Ch. 240 Final Value (dBuV) 90.41	56 MHz, Average Limit (dBuV) 111.5 @ 2 cm	e Result Pass
✤ Agilent 13:59:54 Nov Element Materials Technolo				R T Mkr1	96.224 015 GHz

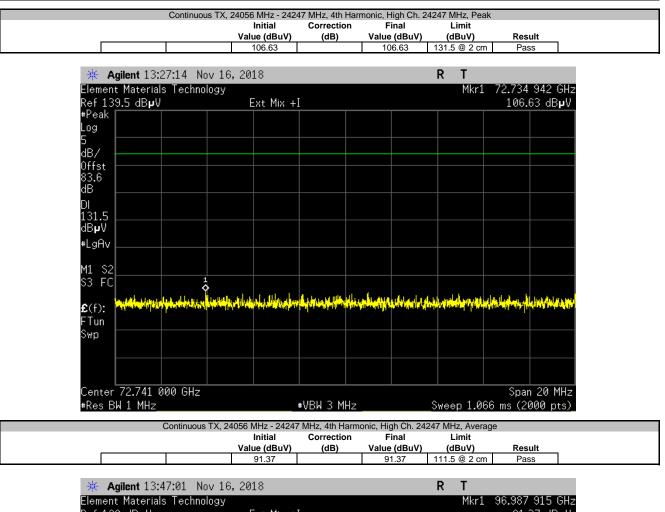
	Nov 16, 2018	RT						
Element Materials Teo			Mkr					
Ref 120 dB µ V	Ext Mix	+I		90.41 dBµV				
+Avg								
.og								
, IB/								
iffst								
ffst 9.3 B								
11.5 BµV								
LgAv								
1 \$2								
3 FC								
:(f):								
Tun								
wp								
enter 96.224 000 G	jHz		^	Span 20 MHz				
Res BW 1 MHz		₩VBW 3 MHz	#Swe	#Sweep 2 s (2000 pts)				



		Continuous	In	itial	47 MHz, 4th F Correction	F	inal	Li	mit	_	
				(dBuV) 5.51	(dB)		e (dBuV) 05.51		BuV) @ 2 cm	Res Pas	
I			10	0.01			0.01	101.0	© 2 011	140	
		55:29 Nov		3				R	Т		
		ls Technolo							Mkr1		495 GHz
Ref 14	0 dB µ V		Ex	t Mix +I						105.	51 dB µ V
#Peak ∣											
Log											
J dB/											
Offst											
80.1											
dB											
DI											
131.5 dB µ V											
#LgAv											
M1 S2											
S3 FC											
£ (f):	La starte al ante	والمطال المقطرا والمعالية	ale Lin del.	وريادي والدوال	فيعتبه فتدعه بالمتربية	A. Hulling	hende belefte et	ل حد الارامة		J. H. L. Market	ale Alexander
FTun		ALCOLOGIC DE DE C	n at an an an an an an	and the state of	or all states and the states of the states o	11.00	(the second second	and one of the first			a da sta de ser a la ser
Swp											
Contor	96.612									<u> </u>	1 20 MHz
	90.012 V W 1 MHz	000 GHZ			⊭VBW 3 MH	-		Swaai	n 1 060		120 MHZ 000 pts)
TINES D	M I PHIZ										900 pts/_
		Continuous			7 MHz, 4th Ha				, 0	е	
				itial (dBuV)	Correction (dB)		inal (dBuV)		imit 3uV)	Res	ult
				1.61	(~=)	1	1.61		@ 2 cm	Pas	
	-	53:05 Nov		3				R	T		
		ls Technolo							Mkr1		985 GHz
Ref 12	0 dB µ V		Ex	t Mix +I						91.0	61 dB µ V

lement Materials Techno	logy		Mkr1 96.6	11 985 GH		
ef 120 dB µ V	Ext Mix +	Ι	9	1.61 dB µ ∖		
Avg						
og						
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0.1						
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11.5 BµV						
LgAv						
1 00		\$				
1 \$2 3 FC						
:(f):						
Tun						
wp						
enter 96.612 000 GHz		<u>_</u>	<.			
Res BW 1 MHz			Span 20 MHz #Sweep 2 s (2000 pts)			
Nes DW I PINZ		₩VBW 3 MHz	*Sweep Z S	(Zeee pts,		





Agilent 13:47:01		RT						
Element Materials Tec			Mk	r1 96.987 915 GHz				
Ref 120 dB µ V	Ext M	ix +I		91.37 dBµV				
#Avg								
Log								
5 dB/								
AD/ Affst								
Offst 80.9 dB								
dB								
DI 111.5								
111.5								
dBµV								
#LgAv								
M1 S2								
S3 FC								
£ (f):								
FTun								
Swp								
Center 96.988 000 G	Hz ^			Span 20 MHz				
#Res BW 1 MHz		₩VBW 3 MHz	#Sw	#Sweep 2 s (2000 pts)				

SPURIOUS RADIATED EMISSIONS



PSA-ESCI 2018.07.27

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. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Continuous Tx, Low Ch = 24056 MHz, Mid Ch = 24153 MHz, High Ch = 24247 MHz

POWER SETTINGS INVESTIGATED

12.0 VDC

CONFIGURATIONS INVESTIGATED

PRCO0085 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency 30 MHz

Stop Frequency 40000 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 - Low Pass	Micro-Tronics	LPM50004	LFD	28-Feb-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	30-Nov-2017	12 mo
Cable	None	Standard Gain Horns Cable	EVF	30-Nov-2017	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AHU	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAG	29-Nov-2017	12 mo
Cable	N/A	Double Ridge Horn Cables	EVB	29-Nov-2017	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIZ	7-Feb-2018	24 mo
Cable	N/A	Bilog Cables	EVA	25-Jul-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AOL	30-Nov-2017	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AXR	2-Oct-2018	24 mo
Antenna - Standard Gain	ETS Lindgren	3160-09	AHY	NCR	0 mo
Cable	Micro-Coax	UFD150A-1-0720-200200	EVK	24-Aug-2018	12 mo
Cable	ESM Cable Corp.	KNKN-72 SMA Cable	EVZ	5-Jun-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	JSW45-26004000-40-5P	PAE	5-Jun-2018	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-10	AIW	NCR	0 mo
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	18-Mar-2018	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, 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.

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.

The average values were calculated as per FCC KDB 890966 - Measurement Procedure for Level Probing Radars, Section 9. The steps for the calculation are as follows:

1. Calculate the dwell time, T_D, of the sweep frequency signal per MHz of the sweep frequency span:

 $T_D = Ts/\Delta F$, where:

Ts is the signal sweep frequency time in seconds ΔF is the signal sweep frequency span in MHz

2. Calculate the Average Factor:

Average factor = $(T_D) / \text{cycle time}$, where:

cycle time is the total time for a complete cycle of the signal including retrace and any other latency times.

3. Calculate the Duty Cycle Correctoin Factor (DCCF):

DCCF = 10*log(Average Factor)

4. Apply the DCCF to the PK measurements to determine the AVG value

SPURIOUS RADIATED EMISSIONS



										EmiR5 2018.09.26	F	PSA-ESCI 2018.07.27			
We	ork Order:	PRC	O0085		Date:	15-Nov	v-2018								
	Project:		one		nperature:	21									
	Job Site:	E١	V01		Humidity:		% RH								
Seria	I Number:		1		etric Pres.:	1032	mbar	-	Tested by:	Jeff Alcoke			-		
			T97and Sid	le Defendei	r® II SDII97								-		
	iguration:												-		
		Preco, Inc											-		
	ttendees:												-		
EL	UI Power:	12.0 VDC						01 0101					-		
Operat	ing Mode:	Continuou	Continuous Tx, Low Ch = 24056 MHz, Mid Ch = 24153 MHz, High Ch = 24247 MHz												
		Nama	None												
D	eviations:	None	None												
		See comments below for Channel, Modulation type and EUT orientation. The radio employs FMCW modulation, the AVG													
C	omments:	value was 5.86*10^-6	see comments below for Channel, Modulation type and EOT orientation. The radio employs FMCW modulation, the AVG value was calculated from the PK measurement as per FCC KDB 890966 Section F. The radio has a dwell time (T_D) of 5.86*10^6 s/MHz, and a Cycle Time of 11.1 ms. The Average Factor = T_D/Cycle Time = 5.27*10^4. The DCCF used to calculate the AVG value is 10*log(Average Factor) = -32.8 dB												
Test Spec	ifications	1					Test Meth	od					-		
FCC 15.24							ANSI C63.						-		
Run #	8	Test Di	stance (m)	0.1	Antenna	Height(s)		1 to 4(m)		Results	De	ass	-		
	0	Test Di	stance (III)	0.1	Antenna	neight(s)		1 to 4(11)		Results	Γ¢	155	-		
140 -															
120 -															
100 -															
100 -															
80 -															
										- T					
60 -															
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40 -															
20															
20 -															
0 -												<u> </u>			
239	950	24000		24050	2410		24150	2	4200	24250		24300			
						MHz				PK	♦ Δ\/				
											• •	<u> </u>			
					Duty Cycle Correction	External	Polarity/		Distance			Composed			
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Factor (dB)	External Attenuation (dB)	Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments		
24250.310	57.4	43.1	1.6	0.0		0.0	Vert	PK	-29.5	71.0	74.0	-3.0	High Ch, CW, EUT on Side		
24250.240	57.1	43.1	1.5	330.0	20.0	0.0	Horz	PK	-29.5	70.7	74.0	-3.3	High Ch, CW, EUT Horz		
24250.310 24250.240	57.4 57.1	43.1 43.1	1.6 1.5	0.0 330.0	-32.8 -32.8	0.0 0.0	Vert	AV	-29.5 -29.5	38.2 37.9	54.0 54.0	-15.8	High Ch, CW, EUT on Side High Ch, CW, EUT Horz		
24250.240 23998.950	57.1 41.5	43.1 43.3	1.5	330.0 0.0	-32.8	0.0	Horz Vert	AV PK	-29.5 -29.5	37.9 55.3	54.0 74.0	-16.1 -18.7	Low Ch, CW, EUT on Side		
23999.570	41.4	43.3	1.5	330.0		0.0	Horz	PK	-29.5	55.2	74.0	-18.8	Low Ch, CW, EUT Horz		
23998.950	41.5	43.3	1.6	0.0	-32.8	0.0	Vert	AV	-29.5	22.5	54.0	-31.5	Low Ch, CW, EUT on Side		
23999.570	41.4	43.3	1.5	330.0	-32.8	0.0	Horz	AV	-29.5	22.4	54.0	-31.6	Low Ch, CW, EUT Horz		

SPURIOUS RADIATED EMISSIONS



							EmiR5 2018.09.26	PSA-ESCI 2018.07.27						
Woi	rk Order:	PRCO0085		Date:	15-Nov-2018									
	Project:	None	٦	Temperature:	21 °C									
	Job Site:	EV01		Humidity:	40.9% RH									
Serial	Number:	1		metric Pres.:	1030 mbar	Tested b	y: Jeff Alcoke							
0		Sentry® ST97ar	id Side Defen	der® II SDII97										
	guration:													
		Preco, Inc.												
	tendees:													
EU	I Power:	12.0 VDC	01 040		04450 141									
Operatir	ng Mode:		_ow Ch = 240	56 MHZ, Mid Ch	= 24153 MHZ, HI	gh Ch = 24247 MHz								
De	viations:	None	one ee comments below for Channel, Modulation type and EUT orientation. The radio employs FMCW modulation, the AVG											
Co	mments:	value was calcu	ated from the z, and a Cycle	PK measureme Time of 11.1 n	ent as per FCC KD ns. The Average F	entation. The radio em B 890966 Section F. Ti actor = T_D/Cycle Tim	he radio has a dwe	ell time (T_D) of						
Toot Specifi	iantiona				Test Me	thad								
Test Specif FCC 15.249						63.10:2013								
Run #	20	Test Distanc	e (m) 3	Antenna l	Height(s)	1 to 4(m)	Results	Pass						
140 🕇			111											
120 -														
100 -														
80 -														
60 -														
10														
40 -														
20 -			+					+ + + + + + + + + + + + + + + + + + + +						
						■ ■ ■ ■ ■								
0 -														
0 + 10)		100		1000	10000		100000						
10	,		100			10000		100000						
					MHz		■ PK ◆	AV OP						

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
22731.750	43.4	43.5	1.6	0.0		0.0	Vert	PK	-29.5	57.4	74.0	-16.6	High Ch, CW, EUT on Side
22643.580	42.9	43.3	1.6	0.0		0.0	Vert	PK	-29.5	56.7	74.0	-17.3	Mid Ch, CW, EUT on Side
22643.520	42.8	43.3	1.5	330.0		0.0	Horz	PK	-29.5	56.6	74.0	-17.4	Mid Ch, CW, EUT Horz
22552.450	42.6	43.1	1.6	0.0		0.0	Vert	PK	-29.5	56.2	74.0	-17.8	Low Ch, CW, EUT on Side
22552.330	42.4	43.1	1.5	330.0		0.0	Horz	PK	-29.5	56.0	74.0	-18.0	Low Ch, CW, EUT Horz
7577.433	40.4	12.5	2.1	355.0		0.0	Horz	PK	0.0	52.9	74.0	-21.1	High Ch, CW, EUT on Side
7548.063	40.1	12.6	3.2	168.0		0.0	Vert	PK	0.0	52.7	74.0	-21.3	Mid Ch, CW, EUT on Side
7517.545	39.8	12.7	4.0	87.0		0.0	Horz	PK	0.0	52.5	74.0	-21.5	Low Ch, CW, EUT on Side
7575.683	39.7	12.5	1.0	250.0		0.0	Vert	PK	0.0	52.2	74.0	-21.8	High Ch, CW, EUT on Side
7546.388	39.1	12.6	1.0	296.0		0.0	Horz	PK	0.0	51.7	74.0	-22.3	Mid Ch, CW, EUT on Side
7517.345	38.8	12.7	1.0	10.0		0.0	Vert	PK	0.0	51.5	74.0	-22.5	Low Ch, CW, EUT on Side
4528.775	47.0	4.2	1.2	16.0		0.0	Horz	PK	0.0	51.2	74.0	-22.8	Mid Ch, CW, EUT on Side
4546.285	46.3	4.2	1.0	344.0		0.0	Vert	PK	0.0	50.5	74.0	-23.5	High Ch, CW, EUT on Side
4546.547	46.3	4.2	1.1	353.0		0.0	Horz	PK	0.0	50.5	74.0	-23.5	High Ch, CW, EUT on Side
4546.155	46.3	4.2	1.0	244.0		0.0	Vert	PK	0.0	50.5	74.0	-23.5	High Ch, CW, EUT Vert
4546.347	46.2	4.2	1.2	355.0		0.0	Vert	PK	0.0	50.4	74.0	-23.6	High Ch, CW, EUT Horz
4546.297	45.6	4.2	1.0	357.0		0.0	Horz	PK	0.0	49.8	74.0	-24.2	High Ch, CW, EUT Horz
4510.448	45.6	4.1	1.3	17.0		0.0	Horz	PK	0.0	49.7	74.0	-24.3	Low Ch, CW, EUT on Side
10524.590	50.1	-0.9	1.8	39.0		0.0	Vert	PK	0.0	49.2	74.0	-24.8	Low Ch, CW, EUT on Side
4546.440	43.8	4.2	1.0	146.0		0.0	Horz	PK	0.0	48.0	74.0	-26.0	High Ch, CW, EUT Vert

			A-1		Duty Cycle	External	Polarity/ Transducer		Distance			0	
Freq	Amplitude	Factor	Antenna Height	Azimuth	Correction Factor	Attenuation	Type	Detector	Adjustment	Adjusted	Spec. Limit	Compared to Spec.	
(MHz)	(dBuV)	(dB)	(meters)	(degrees)	(dB)	(dB)			(dB)	(dBuV/m)	(dBuV/m)	(dB)	
													Comments
10607.970	48.3	-0.7	1.7	45.0		0.0	Vert	PK	0.0	47.6	74.0	-26.4	High Ch, CW, EUT on Side
4528.818	43.3	4.2	1.0	9.0		0.0	Vert	PK	0.0	47.5	74.0	-26.5	Mid Ch, CW, EUT on Side
4510.482	43.4	4.1	1.0	9.0		0.0	Vert	PK	0.0	47.5	74.0	-26.5	Low Ch, CW, EUT on Side
10566.940	48.3	-0.9	1.7	39.0		0.0	Vert	PK	0.0	47.4	74.0	-26.6	Mid Ch, CW, EUT on Side
10608.190	48.0	-0.7	3.2	262.0		0.0	Horz	PK	0.0	47.3	74.0	-26.7	High Ch, CW, EUT on Side
10524.430	47.9	-0.9	1.1	236.0		0.0	Horz	PK	0.0	47.0	74.0	-27.0	Low Ch, CW, EUT on Side
10566.890	47.9	-0.9	2.9	164.0		0.0	Horz	PK	0.0	47.0	74.0	-27.0	Mid Ch, CW, EUT on Side
1509.425	52.3	-6.9	1.2	231.0		0.0	Horz	PK	0.0	45.4	74.0	-28.6	Mid Ch, CW, EUT on Side
1515.587	51.9	-6.9	1.3	229.0	00.0	0.0	Horz	PK	0.0	45.0	74.0	-29.0	High Ch, CW, EUT on Side
22731.750	43.4	43.5	1.6	0.0	-32.8	0.0	Vert	AV	-29.5	24.6	54.0	-29.4	High Ch, CW, EUT on Side
22643.580	42.9	43.3	1.6	0.0	-32.8	0.0	Vert	AV	-29.5	23.9	54.0	-30.1	Mid Ch, CW, EUT on Side
22643.520	42.8	43.3	1.5	330.0	-32.8	0.0	Horz	AV	-29.5	23.8	54.0	-30.2	Mid Ch, CW, EUT Horz
22552.450	42.6	43.1	1.6	0.0	-32.8	0.0	Vert	AV	-29.5	23.4	54.0	-30.6	Low Ch, CW, EUT on Side
22552.330	42.4	43.1	1.5	330.0	-32.8	0.0	Horz	AV	-29.5	23.2	54.0	-30.8	Low Ch, CW, EUT Horz
1503.387	50.1	-6.9	1.0	112.0		0.0	Vert	PK	0.0	43.2	74.0	-30.8	Low Ch, CW, EUT on Side
1515.378	49.6	-6.9	1.0	191.0		0.0	Vert	PK	0.0	42.7	74.0	-31.3	High Ch, CW, EUT on Side
1503.453	47.3	-6.9	1.7	184.0		0.0	Horz	PK	0.0	40.4	74.0	-33.6	Low Ch, CW, EUT on Side
1509.650	47.2	-6.9	3.1	188.0		0.0	Vert	PK	0.0	40.3	74.0	-33.7	Mid Ch, CW, EUT on Side
7577.433	40.4	12.5	2.1	355.0	-32.8	0.0	Horz	AV	0.0	20.1	54.0	-33.9	High Ch, CW, EUT on Side
7548.063	40.1	12.6	3.2	168.0	-32.8	0.0	Vert	AV	0.0	19.9	54.0	-34.1	Mid Ch, CW, EUT on Side
7517.545	39.8	12.7	4.0	87.0	-32.8	0.0	Horz	AV	0.0	19.7	54.0	-34.3	Low Ch, CW, EUT on Side
7575.683	39.7	12.5	1.0	250.0	-32.8	0.0	Vert	AV	0.0	19.4	54.0	-34.6	High Ch, CW, EUT on Side
7546.388	39.1	12.6	1.0	296.0	-32.8	0.0	Horz	AV	0.0	18.9	54.0	-35.1	Mid Ch, CW, EUT on Side
7517.345	38.8	12.7	1.0	10.0	-32.8	0.0	Vert	AV	0.0	18.7	54.0	-35.3	Low Ch, CW, EUT on Side
4528.775	47.0	4.2	1.2	16.0	-32.8	0.0	Horz	AV	0.0	18.4	54.0	-35.6	Mid Ch, CW, EUT on Side
4546.285	46.3	4.2	1.0	344.0	-32.8	0.0	Vert	AV	0.0	17.7	54.0	-36.3	High Ch, CW, EUT on Side
4546.547	46.3	4.2	1.1	353.0	-32.8	0.0	Horz	AV	0.0	17.7	54.0	-36.3	High Ch, CW, EUT on Side
4546.155	46.3	4.2	1.0	244.0	-32.8	0.0	Vert	AV	0.0	17.7	54.0	-36.3	High Ch, CW, EUT Vert
4546.347	46.2	4.2	1.2	355.0	-32.8	0.0	Vert	AV	0.0	17.6	54.0	-36.4	High Ch, CW, EUT Horz
4546.297	45.6	4.2	1.0	357.0	-32.8	0.0	Horz	AV	0.0	17.0	54.0	-37.0	High Ch, CW, EUT Horz
4510.448	45.6	4.1	1.3	17.0	-32.8	0.0	Horz	AV	0.0	16.9	54.0	-37.1	Low Ch, CW, EUT on Side
10524.590	50.1	-0.9	1.8	39.0	-32.8	0.0	Vert	AV	0.0	16.4	54.0	-37.6	Low Ch, CW, EUT on Side
4546.440	43.8	4.2	1.0	146.0	-32.8	0.0	Horz	AV	0.0	15.2	54.0	-38.8	High Ch, CW, EUT Vert
10607.970	48.3	-0.7	1.7	45.0	-32.8	0.0	Vert	AV	0.0	14.8	54.0	-39.2	High Ch, CW, EUT on Side
4528.818	43.3	4.2	1.0	9.0	-32.8	0.0	Vert	AV	0.0	14.7	54.0	-39.3	Mid Ch, CW, EUT on Side
4510.482	43.4	4.1	1.0	9.0	-32.8	0.0	Vert	AV	0.0	14.7	54.0	-39.3	Low Ch, CW, EUT on Side
10566.940	48.3	-0.9	1.7	39.0	-32.8	0.0	Vert	AV	0.0	14.6	54.0	-39.4	Mid Ch, CW, EUT on Side
10608.190	48.0	-0.7	3.2	262.0	-32.8	0.0	Horz	AV	0.0	14.5	54.0	-39.5	High Ch, CW, EUT on Side
10524.430	47.9	-0.9	1.1	236.0	-32.8	0.0	Horz	AV	0.0	14.2	54.0	-39.8	Low Ch, CW, EUT on Side
10566.890	47.9	-0.9	2.9	164.0	-32.8	0.0	Horz	AV	0.0	14.2	54.0	-39.8	Mid Ch, CW, EUT on Side
1509.425	52.3	-6.9	1.2	231.0	-32.8	0.0	Horz	AV	0.0	12.6	54.0	-41.4	Mid Ch, CW, EUT on Side
1515.587	51.9	-6.9	1.3	229.0	-32.8	0.0	Horz	AV	0.0	12.2	54.0	-41.8	High Ch, CW, EUT on Side
1503.387	50.1	-6.9	1.0	112.0	-32.8	0.0	Vert	AV	0.0	10.4	54.0	-43.6	Low Ch, CW, EUT on Side
1515.378	49.6	-6.9	1.0	191.0	-32.8	0.0	Vert	AV	0.0	9.9	54.0	-44.1	High Ch, CW, EUT on Side
1503.453	47.3	-6.9	1.7	184.0	-32.8	0.0	Horz	AV	0.0	7.6	54.0	-46.4	Low Ch, CW, EUT on Side
1509.650	47.2	-6.9	3.1	188.0	-32.8	0.0	Vert	AV	0.0	7.5	54.0	-46.5	Mid Ch, CW, EUT on Side