

Polaris Industries, Inc.

Voyager Pro FCC 15.247:2018 902 – 928 MHz Transceiver

Report # POLR0007





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CERTIFICATE OF TEST



Last Date of Test: February 1, 2018 Polaris Industries, Inc. Model: Voyager Pro

Radio Equipment Testing

Standards

Specification	Method
FCC 15.247:2018	ANSI C63.10:2013

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	No	N/A	Not required, EUT is DC powered from a vehicle.
6.5, 6.6	Spurious Radiated Emissions	Yes	Pass	
7.5	Duty Cycle	Yes	Pass	
7.8.2	Carrier Frequency Separation	Yes	Pass	
7.8.3	Number of Hopping Frequencies	Yes	Pass	
7.8.4	Dwell Time	Yes	Pass	
7.8.5	Output Power	Yes	Pass	
7.8.6	Band Edge Compliance	Yes	Pass	
7.8.6	Band Edge Compliance - Hopping Mode	Yes	Pass	
7.8.7	Occupied Bandwidth	Yes	Pass	
7.8.8	Spurious Conducted Emissions	Yes	Pass	
11.10.2	Power Spectral Density	No	N/A	Not required for FHSS devices.

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.

REVISION HISTORY



Revision Number	Description	Date	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

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

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	<u>- MU</u>
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

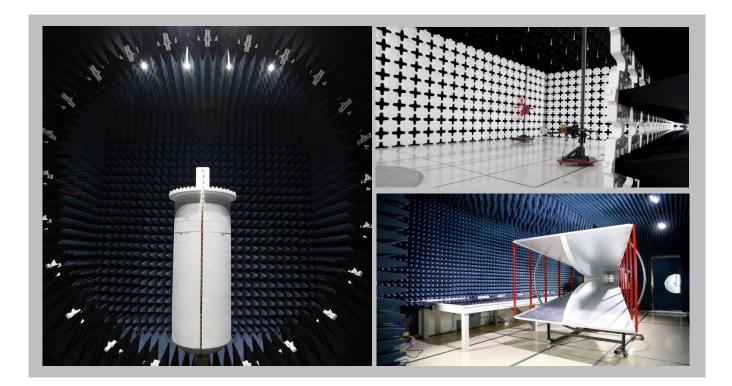
FACILITIES



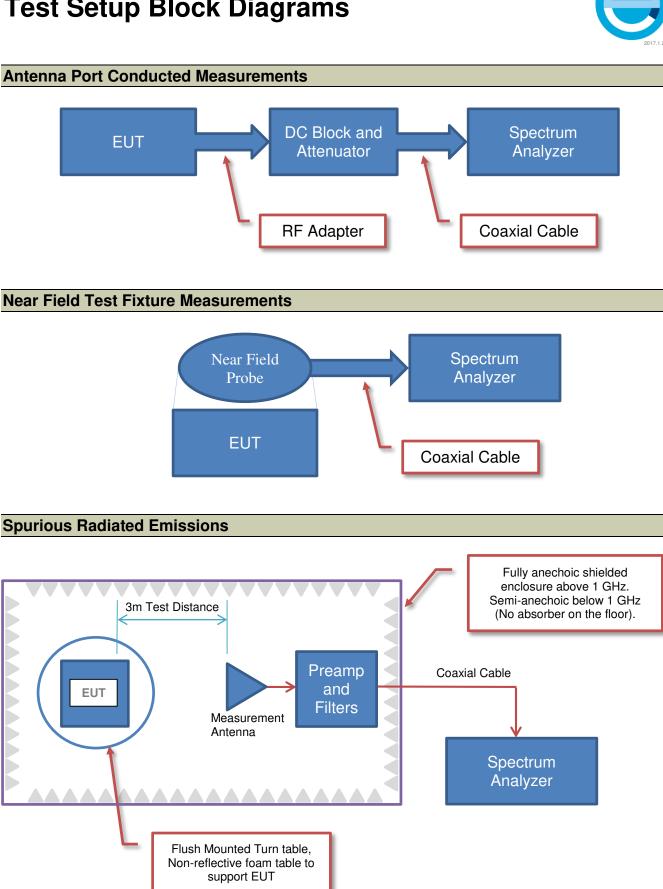




California	Minnesota	New York	Oregon	Texas	Washington		
Labs OC01-17	Labs MN01-10	Labs NY01-04	Labs EV01-12	Labs TX01-09	Labs NC01-05		
41 Tesla	9349 W Broadway Ave.	4939 Jordan Rd.	6775 NE Evergreen Pkwy #400	3801 E Plano Pkwy	19201 120 th Ave NE		
Irvine, CA 92618	Brooklyn Park, MN 55445	Elbridge, NY 13060	Hillsboro, OR 97124	Plano, TX 75074	Bothell, WA 98011		
(949) 861-8918	(612)-638-5136	(315) 554-8214	(503) 844-4066	(469) 304-5255	(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		
		BS	МІ				
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		
US0158	US0175	N/A	US0017	US0191	US0157		



Test Setup Block Diagrams



PRODUCT DESCRIPTION



Client and Equipment Under Test (EUT) Information

Company Name:	Polaris Industries, Inc.
Address:	1600 SE 18th Ave.
City, State, Zip:	Battle Ground, WA 98604
Test Requested By:	Alex Baltes
Model:	Voyager Pro
First Date of Test:	January 22, 2018
Last Date of Test:	February 1, 2018
Receipt Date of Samples:	January 22, 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:

Display for use on vehicles which includes a 915 MHz FHSS radio.

Testing Objective:

Seeking to demonstrate compliance of the FHSS radio under FCC 15.247:2018 for operation in the 902 - 928 MHz Band.

CONFIGURATIONS



Configuration POLR0007-1

Software/Firmware Running during test				
Description	Version			
TeraTerm	4.96			
Engineering Node Web Server	Unknown			

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Vehicle Display Unit	Polaris Industries, Inc.	Voyager Pro	15

Peripherals in test setup boundary					
Description	Model/Part Number	Serial Number			
Linear DC Power Supply	TOPWARD ELECTRIC INSTRUMENTS CO. LTD.	TPS-2000	None		

Cables						
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2	
DC Power Cable	No	0.1 m	No	Vehicle Display Unit	DC Leads	
DC Leads	No	0.8 m	No	DC Power Cable	Linear DC Power Supply	

CONFIGURATIONS



Configuration POLR0007-2

Software/Firmware Running during test				
Description	Version			
TeraTerm	4.96			
Engineering Node Web Server	Unknown			

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Vehicle Display Unit	Polaris Industries, Inc.	Voyager Pro	15

Peripherals in test setup boundary									
Description	Manufacturer	Model/Part Number	Serial Number						
Linear DC Power Supply	TOPWARD ELECTRIC INSTRUMENTS CO. LTD.	TPS-2000	None						
Automotive Whip Antenna	Laird	Unknown	None						
GPS antenna	Trail Tech	Unknown	None						

Cables											
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2						
DC Power Cable	No	0.1 m	No	Vehicle Display Unit	DC Leads						
DC Leads	No	0.8 m	No	DC Power Cable	Linear DC Power Supply						
Coax (Whip Antenna)	Yes	3.5 m	No	Automotive Whip Antenna	Vehicle Display Unit						
Coax (GPS)	Yes	1.6 m	No	GPS Antenna	Vehicle Display Unit						
I/O Cables (x3)	No	1.1 m	No	Unterminated	Vehicle Display Unit						

MODIFICATIONS



Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
			Tested as	No EMI suppression	EUT remained at
1	1/22/2018	Duty Cycle	delivered to	devices were added or	Element following the
			Test Station.	modified during this test.	test.
		Carrier	Tested as	No EMI suppression	EUT remained at
2	1/22/2018	Frequency	delivered to	devices were added or	Element following the
		Separation	Test Station.	modified during this test.	test.
		Number of	Tested as	No EMI suppression	EUT remained at
3	1/22/2018	Hopping	delivered to	devices were added or	Element following the
		Frequencies	Test Station.	modified during this test.	test.
		Output	Tested as	No EMI suppression	EUT remained at
4	1/22/2018	Power	delivered to	devices were added or	Element following the
			Test Station.	modified during this test.	test.
-		Band Edge	Tested as	No EMI suppression	EUT remained at
5	1/22/2018	Compliance	delivered to	devices were added or	Element following the
		•	Test Station.	modified during this test.	test.
		Band Edge	Tested as	No EMI suppression	EUT remained at
6	1/22/2018	Compliance -	delivered to	devices were added or	Element following the
		Hopping Mode	Test Station.	modified during this test.	test.
			Tested as	No EMI suppression	EUT remained at
7	1/22/2018	Occupied	delivered to	devices were added or	Element following the
,	1/22/2010	Bandwidth	Test Station.	modified during this test.	test.
		Spurious	Tested as	No EMI suppression	EUT remained at
8	1/22/2018	Conducted	delivered to	devices were added or	Element following the
Ũ	.,, _0 . 0	Emissions	Test Station.	modified during this test.	test.
		Spurious	Tested as	No EMI suppression	EUT remained at
9	1/23/2018	Radiated	delivered to	devices were added or	Element following the
-		Emissions	Test Station.	modified during this test.	test.
			Tested as	No EMI suppression	
10	2/1/2018	Dwell Time	delivered to	devices were added or	Scheduled testing
			Test Station.	modified during this test.	was completed.

SPURIOUS RADIATED EMISSIONS



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

LoRa Continuous Tx, Low Ch. 902.5, Mid Ch. 915 MHz, High Ch. 927.5 MHz. Default max power.

POWER SETTINGS INVESTIGATED

14.0 VDC

CONFIGURATIONS INVESTIGATED

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FREQUENCY RANGE INVESTIGATED

Start Frequency 30 MHz

Stop Frequency 12.4 GHz

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	13-Apr-2017	12 mo
Cable	None	Standard Gain Horns Cable	EVF	30-Nov-2017	12 mo
Amplifier - Pre-Amplifier	L-3 Narda-MITEQ	AMF-6F-08001200-30-10P	PAO	30-Nov-2017	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AHU	NCR	0 mo
Filter - High Pass	Micro-Tronics	HPM50108	HFV	6-Feb-2017	12 mo
Filter - Low Pass	Micro-Tronics	LPM50003	LFB	19-Apr-2017	12 mo
Filter - Band Pass/Notch	K&L Microwave	3TNF-500/1000-N/N	HFT	12-Dec-2017	12 mo
Attenuator	Coaxicom	3910-10	AWX	19-Apr-2017	12 mo
Attenuator	Coaxicom	3910-20	AXZ	19-Apr-2017	12 mo
Cable	N/A	Double Ridge Horn Cables	EVB	29-Nov-2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAG	29-Nov-2017	12 mo
Antenna - Double Ridge	EMCO	3115	AHC	23-Jun-2016	24 mo
Cable	N/A	Bilog Cables	EVA	30-Nov-2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AOL	30-Nov-2017	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AXR	30-Jun-2016	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 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



	ork Order:	POLR00	JU7 .		Date:	23-Jai	n-2018			
	Project:			Tem	perature:		9 °C	1	1/ 1	11
	Job Site:				Humidity:		% RH	C+	1/10	12
Serial	I Number:	1			tric Pres.:		mbar	Tested by	: Jody House an	d Jeff Alcoke
		Voyager Pro								
Conf	iguration:									
C	Customer:	Polaris Indus	tries, Inc.							
Α	ttendees:	Stephen Reic	and Ed	Vaynberg						
EL	JT Power:	14.0 VDC		<i>,</i> ,						
Operati	ing Mode:	LoRa Continu	Jous Tx,	Low Ch. 90	2.5, Mid Ch. 9	915 MHz,	, High Ch. 927.5 MHz	. Default m	lax power.	
D	eviations:	None								
Co	omments:	See commen	its below	for Channe	I and EUT ori	entation.				
st Speci	ifications						Test Method			
C 15.24							ANSI C63.10:2013			
Run #	12	Test Dista	ince (m)	3	Antenna H	leight(s)	1 to 4(m)	Results	Pass
Run #	12	Test Dista	ince (m)	3	Antenna H	leight(s)	1 to 4(m)	Results	Pass
80	12	Test Dista	ince (m)	3	Antenna H	leight(s)	1 to 4(m)	Results	Pass
Γ	12	Test Dista	ance (m)	3	Antenna H	leight(s)	1 to 4(m)	Results	Pass
80	12	Test Dista	ance (m),	3	Antenna H	leight(s)	1 to 4(m)	Results	Pass
80 70 60 50	12	Test Dista		3	Antenna H	leight(s)	1 to 4(m		Results	Pass
80 70 60 50	12	Test Dista		3	Antenna H		1 to 4(m		Results	Pass
80 70 60	12	Test Dista		3	Antenna H		1 to 4(m		Results	Pass
80 70 60 50		Test Dista		3	Antenna H					Pass
80 70 60 50 W/Angp		Test Dista		3	Antenna H				Results	Pass
80 70 60 50 50 40 30 20				3	Antenna H					Pass
80 70 60 50 50 40 30					Antenna H		1 to 4(m			Pass
80 70 60 50 50 40 30 20			Ince (m)	3	Antenna H		1 to 4(m)		Pass

Polarity/ Transduce Type Antenna Height External Attenuation Distance Adjustmen Compared to Spec. Freq Amplitude Azimuth Test Distance Spec. Limit Factor Detecto Adjusted (MHz) (dBuV) (dB) (meters) (degrees) (meters) (dB) (dB) (dBuV/m) (dBuV/m) (dB) Comments 4512.505 4.2 2.7 286.0 3.0 0.0 Horz AV 52.1 54.0 Low Channel, EUT Vertical 47.9 0.0 -1.9 4512.345 47.0 4.2 2.6 219.0 3.0 0.0 Horz AV 0.0 51.2 54.0 -2.8 Low Channel, EUT on Side 46.8 43.5 4.2 4.2 1.0 1.0 AV AV 54.0 Low Channel, EUT Horizontal 4512,430 268.0 3.0 0.0 Vert 0.0 51.0 -3.0 47.7 54.0 Low Channel, EUT Vertical 4512.550 58.0 3.0 0.0 Vert 0.0 -6.3 4512.435 42.9 4.2 1.0 275.0 3.0 0.0 Horz AV 0.0 47.1 54.0 -6.9 Low Channel, EUT Vertical AV AV 4574.925 41.6 4.3 1.0 256.0 3.0 0.0 Vert 0.0 45.9 54.0 -8.1 Mid Channel, EUT Horizontal 4574.842 4.3 309.0 54.0 Mid Channel, EUT Vertical 41.3 2.7 3.0 0.0 Horz 0.0 45.6 -8.4 4512.485 41.3 4.2 1.6 197.0 3.0 0.0 Vert AV 0.0 45.5 54.0 -8.5 Low Channel, EUT on Side 4637.417 38.7 4.4 2.7 299.0 3.0 0.0 Horz AV 0.0 43.1 54.0 -10.9 High Channel, EUT Vertical 4637.433 1.0 1.0 3.0 3.0 -11.2 -11.5 High Channel, EUT Horizontal 38.4 4.4 282.0 0.0 Vert AV 0.0 42.8 54.0 3709.975 2.5 AV 54.0 40.0 262.0 0.0 Vert 0.0 42.5 High Channel, EUT Horizontal 3660.025 37.3 2.1 3.2 235.0 3.0 0.0 Vert AV 0.0 39.4 54.0 -14.6 Mid Channel, EUT Horizontal AV AV 3610.025 36.6 1.9 1.0 178.0 3.0 0.0 Vert 0.0 38.5 54.0 -15.5 Low Channel, EUT Horizontal 3709.958 2.5 38.2 54.0 -15.8 High Channel, EUT Vertical 35.7 1.1 44.0 3.0 0.0 Horz 0.0 2782.442 1.1 AV High Channel, EUT Vertical 40.9 -2.8 329.0 3.0 0.0 Horz 0.0 38.1 54.0 -15.9 2707.408 39.8 -3.2 1.0 189.0 3.0 0.0 Vert AV 0.0 36.6 54.0 -17.4 Low Channel, EUT Horizontal 3659.992 34.0 2.1 3.4 278.0 3.0 0.0 Horz AV AV 0.0 36.1 54.0 -17.9 Mid Channel, EUT Vertical Mid Channel, EUT Vertical 2745.033 1.2 1.0 38.3 -3.0 106.0 3.0 0.0 Horz 0.0 35.3 54.0 -18.7 2745.058 38.1 -3.0 3.0 AV 0.0 54.0 -18.9 Mid Channel, EUT Horizontal 194.0 0.0 Vert 35.1 4512.325 50.9 4.2 2.7 286.0 3.0 0.0 Horz ΡK 0.0 55.1 74.0 -18.9 Low Channel, EUT Vertical 3609 942 19 AV Low Channel, EUT Vertical 327 1.1 52.0 3.0 0.0 Horz 0.0 34.6 54.0 -194 -19.7 Low Channel, EUT Horizontal 4512.750 1.0 ΡK 0.0 54.3 74.0 50.1 4.2 268.0 3.0 0.0 Vert

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
4512.435	49.9	4.2	2.6	219.0	3.0	0.0	Horz	PK	0.0	54.1	74.0	-19.9	Low Channel, EUT on Side
2707.492	36.3	-3.2	1.2	226.0	3.0	0.0	Horz	AV	0.0	33.1	54.0	-20.9	Low Channel, EUT Vertical
2782.417	35.0	-2.8	1.0	286.0	3.0	0.0	Vert	AV	0.0	32.2	54.0	-21.8	High Channel, EUT Horizontal
4512.815	47.6	4.2	1.0	58.0	3.0	0.0	Vert	PK	0.0	51.8	74.0	-22.2	Low Channel, EUT Vertical
4512.280	47.3	4.2	1.0	275.0	3.0	0.0	Horz	PK	0.0	51.5	74.0	-22.5	Low Channel, EUT Horizontal
4574.900	46.4	4.3	1.0	256.0	3.0	0.0	Vert	PK	0.0	50.7	74.0	-23.3	Mid Channel, EUT Horizontal
4575.142	46.1	4.4	2.7	309.0	3.0	0.0	Horz	PK	0.0	50.5	74.0	-23.5	Mid Channel, EUT Vertical
4512.325	46.2	4.2	1.6	197.0	3.0	0.0	Vert	PK	0.0	50.4	74.0	-23.6	Low Channel, EUT on Side
4637.550	45.4	4.4	2.7	299.0	3.0	0.0	Horz	PK	0.0	49.8	74.0	-24.2	High Channel, EUT Vertical
4637.292	45.2	4.4	1.0	282.0	3.0	0.0	Vert	PK	0.0	49.6	74.0	-24.4	High Channel, EUT Horizontal
3709.633	45.7	2.5	1.0	262.0	3.0	0.0	Vert	PK	0.0	48.2	74.0	-25.8	High Channel, EUT Horizontal
3660.183	44.8	2.1	3.2	235.0	3.0	0.0	Vert	PK	0.0	46.9	74.0	-27.1	Mid Channel, EUT Horizontal
3709.675	43.5	2.5	1.1	44.0	3.0	0.0	Horz	PK	0.0	46.0	74.0	-28.0	High Channel, EUT Vertical
3609.792	44.1	1.9	1.0	178.0	3.0	0.0	Vert	PK	0.0	46.0	74.0	-28.0	Low Channel, EUT Horizontal
3660.025	42.8	2.1	3.4	278.0	3.0	0.0	Horz	PK	0.0	44.9	74.0	-29.1	Mid Channel, EUT Vertical
3610.008	42.9	1.9	1.1	52.0	3.0	0.0	Horz	PK	0.0	44.8	74.0	-29.2	Low Channel, EUT Vertical
2782.650	46.2	-2.8	1.1	329.0	3.0	0.0	Horz	PK	0.0	43.4	74.0	-30.6	High Channel, EUT Vertical
2707.650	46.6	-3.2	1.0	189.0	3.0	0.0	Vert	PK	0.0	43.4	74.0	-30.6	Low Channel, EUT Horizontal
2745.192	45.6	-3.0	1.0	194.0	3.0	0.0	Vert	PK	0.0	42.6	74.0	-31.4	Mid Channel, EUT Horizontal
2744.933	45.2	-3.0	1.2	106.0	3.0	0.0	Horz	PK	0.0	42.2	74.0	-31.8	Mid Channel, EUT Vertical
2707.983	44.9	-3.2	1.2	226.0	3.0	0.0	Horz	PK	0.0	41.7	74.0	-32.3	Low Channel, EUT Vertical
2782.075	43.6	-2.8	1.0	286.0	3.0	0.0	Vert	PK	0.0	40.8	74.0	-33.2	High Channel, EUT Horizontal



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	Keysight	N5182B	TFU	27-Oct-15	27-Oct-18
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	30-May-17	30-May-18
Attenuator	S.M. Electronics	SA26B-10	AWR	24-Oct-17	24-Oct-18
Attenuator	Fairview Microwave	18B5W-26	RFZ	6-Sep-17	6-Sep-18
Block - DC	Fairview Microwave	SD3379	AMW	5-Jun-17	5-Jun-18
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	14-Aug-17	14-Aug-18

TEST DESCRIPTION

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

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

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

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

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



		TbtTx 2017.12.14	XMit 2017.12
EUT: Voyager Pro		er: POLR0007	
Serial Number: 1	Dat	e: 22-Jan-18	
Customer: Polaris Industries, Inc.	Temperatur	e: 22.3 °C	
Attendees: Stephen Reid and Ed Vaynberg	Humidit	y: 38.1% RH	
Project: None	Barometric Pres	s.: 1029 mbar	
Tested by: Jeff Alcoke Power: 14.0 VDC	Job Sit	e: EV06	
TEST SPECIFICATIONS Test Method			
FCC 15.247:2018 ANSI C63.10:2013			
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration # 1			
Signature			
	Number of Value	Limit	
Pulse Width Period	Pulses (%)	(%)	Results
FSK, Single Channel			
Low Channel, 902.5 MHz 22.818 ms 23.647 ms	1 96.5	N/A	N/A
Low Channel, 902.5 MHz N/A N/A	5 N/A	N/A	N/A
Mid Channel, 915 MHz 22.812 ms 23.64 ms	1 96.5	N/A	N/A
Mid Channel, 915 MHz N/A N/A	5 N/A	N/A	N/A
	1 92.8	N/A	
High Channel, 927.5 MHz 22.807 ms 24.579 ms	92.0		N/A
High Channel, 927.5 MHz 22.807 ms 24.579 ms High Channel, 927.5 MHz N/A N/A	5 N/A	N/A	



			FSK, Single C						
	Dulco	Width	Period		nber of Ilses	Value (%)	Limit (%)	Results	
		18 ms	23.647 ms		1	96.5	N/A	N/A	1
	m Analyzer - Element M RF 50 Ω AC			SENSE:INT		ALIGN OFF		07:09:03 AM Jan 23, 2	2018
	10012 110				lay-1.000 ms		be: Log-Pwr	TRACE 1 2 3 4 TYPE WWW DET P P P	4 5 6
			PNO: Fast +++ IFGain:Low	#Atten	10 dB				-
R	ef Offset 37.63 di ef 35.00 dBm	в						Mkr1 24.96 n 11.08 dB	ns
Log	er 35.00 aBm							11.00 dE	
30.0									
25.0									3
15.0					1			¥	
10.0					_				
5.00								\$ ²	
0.00									
-5.00									
-10.0								TRIG	
Center 902.5			<i>4</i> 0 (5)			ana an Anna an	.	Span 0	Hz
Res BW 1.0				N/ 30 kH				50.24 ms (8192 p	ous)
MKR MODE TRC S	t	24.96 m 47.77 m	y s 11.08 s 4.45		FUNCTION F	UNCTION WIDTH	FUN	CTION VALUE	
2 N 1 7 3 N 1		47.77 m 48.60 m	s 4.45 s 18.45	dBm dBm					
4 5 6									H
7									
8									
8									
8 9 10				m		STATUS			
8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9									
8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9			FSK, Single C	Channel,		el, 902.5 MHz			
8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9		Width	Period	Channel, Nur	nber of Ilses	el, 902.5 MHz Value (%)	Limit (%)	Results	•
8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9				Channel, Nur	ber of	I, 902.5 MHz Value	Limit	Results N/A	
8 9 9 10 10 10 10 10 10 10 10 10 10 10 10 10	N	Width /A	Period N/A	Channel, Nur	nber of Ilses	el, 902.5 MHz Value (%)	Limit (%)	N/A	• •
8 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4		Width /A	Period N/A	Channel, Nur	nber of Ilses	I, 902.5 MHz Value (%) N/A	Limit (%) N/A	N/A	2018
8 9 10 11 11 11 11 11 11 11 11 11 11 11 11	n Analyzer - Element M	Width //A	Period N/A	Channel, Nur P	hber of Ilses 5	I, 902.5 MHz Value (%) N/A	Limit (%) N/A	N/A	2018
8 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	m Analyzer - Element M RF 50 Ω AC	Width //A	Period N/A	Channel, Nur P	hber of Ilses 5	I, 902.5 MHz Value (%) N/A	Limit (%) N/A	N/A	2018
8 9 9 10 10 10 10 10 10 10 10 10 10 10 10 10	n Analyzer - Element M	Width //A	Period N/A	Channel, Nur P	hber of Ilses 5	I, 902.5 MHz Value (%) N/A	Limit (%) N/A	N/A	2018
8 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	m Analyzer - Element M RF 50 Ω AC	Width //A	Period N/A	Channel, Nur P	hber of Ilses 5	I, 902.5 MHz Value (%) N/A	Limit (%) N/A	N/A	2018
8 9 9 10 10 10 10 10 10 10 10 10 10 10 10 10	m Analyzer - Element M RF 50 Ω AC	Width //A	Period N/A	Channel, Nur P	hber of Ilses 5	I, 902.5 MHz Value (%) N/A	Limit (%) N/A	N/A	2018
8 9 10 10 11 AISG AISG 5 dB/div R 30.0	m Analyzer - Element M RF 50 Ω AC ef Offset 37.63 dB ef 35.00 dBm	Width //A	Period N/A	Channel, Nur P	hber of Ilses 5	I, 902.5 MHz Value (%) N/A	Limit (%) N/A	N/A	2018
8 A A A A A A A A A A A A A A A A A A A	m Analyzer - Element M RF 50 Ω AC ef Offset 37.63 dB ef 35.00 dBm	Width /A	Period N/A	Channel, Nur P SENSE:INT Trig: V #Atten	hber of Ilses 5	I, 902.5 MHz Value (%) N/A	Limit (%) N/A	N/A	2018
8 9 10 10 11 AISG AISG 5 dB/div R 30.0	m Analyzer - Element M RF 50 Ω AC ef Offset 37.63 dB ef 35.00 dBm	Width /A	Period N/A	Channel, Nur P SENSE:INT Trig: V #Atten	hber of Ilses 5	I, 902.5 MHz Value (%) N/A	Limit (%) N/A	N/A	2018
8 9 10 11 11 11 ASG Keysight Spectrum X RL 5 dB/div R 30 0 25 0 20 0	m Analyzer - Element M RF 50 Ω AC ef Offset 37.63 dB ef 35.00 dBm	Width /A	Period N/A	Channel, Nur P SENSE:INT Trig: V #Atten	hber of Ilses 5	I, 902.5 MHz Value (%) N/A	Limit (%) N/A	N/A	2018
8 9 10 10 11 HSG Keysight Spectrum R RL 5 dB/div R 9 9 10 11 1 HSG 10 11 11 1 HSG 10 11 10 11	m Analyzer - Element M RF 50 Ω AC ef Offset 37.63 dB ef 35.00 dBm	Width /A	Period N/A	Channel, Nur P SENSE:INT Trig: V #Atten	hber of Ilses 5	I, 902.5 MHz Value (%) N/A	Limit (%) N/A	N/A	2018
8 9 10 11 1 1 AISG 4 AISG 4	m Analyzer - Element M RF 50 Ω AC ef Offset 37.63 dB ef 35.00 dBm	Width /A	Period N/A	Channel, Nur P SENSE:INT Trig: V #Atten	hber of Ilses 5	I, 902.5 MHz Value (%) N/A	Limit (%) N/A	N/A	2018
8 9 10 11 11 11 ASG Keysight Spectrum X RL 5 dB/div R 30 0 25 0 20 0	m Analyzer - Element M RF 50 Ω AC ef Offset 37.63 dB ef 35.00 dBm	Width /A	Period N/A	Channel, Nur P SENSE:INT Trig: V #Atten	hber of Ilses 5	I, 902.5 MHz Value (%) N/A	Limit (%) N/A	N/A	2018
8 9 10 11 1 1 AISG 4 AISG 4	m Analyzer - Element M RF 50 Ω AC ef Offset 37.63 dB ef 35.00 dBm	Width /A	Period N/A	Channel, Nur P SENSE:INT Trig: V #Atten	hber of Ilses 5	I, 902.5 MHz Value (%) N/A	Limit (%) N/A	N/A	2018
8 9 10 10 11 11 13 KsG Keysight Spectrum R L 5 dB/dly R L 20 0 15 0 10 0 5 00	m Analyzer - Element M RF 50 Ω AC ef Offset 37.63 dB ef 35.00 dBm	Width /A	Period N/A	Channel, Nur P SENSE:INT Trig: V #Atten	hber of Ilses 5	I, 902.5 MHz Value (%) N/A	Limit (%) N/A	N/A	2018
8 9 10 10 11 145G 445G 455 dB/dly R 5 dB/dly R 25.0 20.0 15.0 10.0 10.0 10.0 10.0 10.0 10.0 1	m Analyzer - Element M RF 50 Ω AC ef Offset 37.63 dB ef 35.00 dBm	Width /A	Period N/A	Channel, Nur P SENSE:INT Trig: V #Atten	hber of Ilses 5	I, 902.5 MHz Value (%) N/A	Limit (%) N/A	N/A	2018
8 9 10 10 11 11 13 KsG Keysight Spectrum R L 5 dB/dly R L 20 0 15 0 10 0 5 00	m Analyzer - Element M RF 50 Ω AC ef Offset 37.63 dB ef 35.00 dBm	Width /A	Period N/A	Channel, Nur P SENSE:INT Trig: V #Atten	hber of Ilses 5	I, 902.5 MHz Value (%) N/A	Limit (%) N/A	N/A	2018
8 9 10 11 11 11 ASG S dB/div R 25 dB/div R 30.0 25.0 20.0 15.0 10.0 5.00 0.00	m Analyzer - Element M RF 50 Ω AC ef Offset 37.63 dB ef 35.00 dBm	Width /A	Period N/A	Channel, Nur P SENSE:INT Trig: V #Atten	hber of Ilses 5	I, 902.5 MHz Value (%) N/A	Limit (%) N/A	N/A	2018

Center 902.500000 MHz Res BW 1.0 MHz

STATUS

#VBW 30 kHz

Span 0 Hz Sweep 106.5 ms (8192 pts)



FSK, Single Channel, Mid Channel, 915 MHz Number of Value Limit Pulse Width Period **(%)** 96.5 **(%)** N/A Pulses Results 22.812 ms 23.64 ms 1 N/A 03:35:22 AM Jan 23, 2018 TRACE 1 2 3 4 5 6 TYPE WWWWW DET P P P P P P Keysigh RL SENSE:INT ALIGN OFF Trig Delay-1.000 ms Trig: Video #Atten: 10 dB PNO: Fast +++ IFGain:Low Mkr1 24.95 ms 3.24 dBm Ref Offset 37.63 dB Ref 35.00 dBm 5 dB/di Log À 3 1 Center 915.000000 MHz Res BW 1.0 MHz Span 0 Hz Sweep 50.24 ms (8192 pts) #VBW 30 kHz 24.95 ms 47.76 ms 48.59 ms 3.24 dBm 22.51 dBm 6.06 dBm
 N
 1
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 N
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 t
 3 STATUS

		FSK, Single C	hannel, Mid Char	nnel, 915 MHz		
			Number of	Value	Limit	
	Pulse Width	Period	Pulses	(%)	(%)	Results
	N/A	N/A	5	N/A	N/A	N/A

Keysight Spectrum Analyzer - Element Material					
RL RF 50 Ω AC	S	ENSE:INT	ALIGN OFF	_	03:35:40 AM Jan 23, 2018
	PNO: Fast ↔ IFGain:Low	Trig: Video #Atten: 10 dB	#Avg Type: L	og-Pwr	TRACE 1 2 3 4 5 TYPE WWWWW DET PPPPP
Ref Offset 37.63 dB dB/div Ref 35.00 dBm					
0.0					
5.0					
0.0					
5.0					
0.0					
.00					
.00					
00					
0.0					TRIG L'
enter 915.000000 MHz es BW 1.0 MHz	#VBV	V 30 kHz		Sweep	Span 0 H 106.5 ms (8192 pts
G			STATUS		نغ الشدهر جديدهم



FSK, Single Channel, High Channel, 927.5 MHz Number of Value Limit Pulse Width Pulses **(%)** 92.8 **(%)** N/A Period Results 22.807 ms 24.579 ms 1 N/A 04:01:45 AM Jan 23, 2018 TRACE 1 2 3 4 5 6 TYPE WWWWW DET P P P P P P Keysigh RL SENSE:INT ALIGN OFF Trig Delay-1.000 ms Trig: Video #Atten: 10 dB PNO: Fast +++ IFGain:Low Mkr1 24.97 ms 18.40 dBm Ref Offset 37.63 dB Ref 33.00 dBm 5 dB/di Log <u>^</u>2 1 Center 927.500000 MHz Res BW 1.0 MHz Span 0 Hz Sweep 50.24 ms (8192 pts) #VBW 30 kHz 24.97 ms 47.77 ms 49.54 ms 18.40 dBm 21.25 dBm 14.10 dBm N 1 t N 1 t N 1 t 3 STATUS

FSK, Single Channel, High Channel, 927.5 MHz									
	Number of Value Limit								
	Pulse Width	Period	Pulses	(%)	(%)	Results			
	N/A	N/A	5	N/A	N/A	N/A			

Keysight Spectrum Analyzer - Element Materials RE RF 50 Ω AC		NSE:INT	ALIGN OFF		04:01:55	AM Jan 23, 2018
	PNO: Fast ↔→ IFGain:Low	Trig: Video #Atten: 10 dB		e: Log-Pwr	TR T	ACE 1 2 3 4 5 YPE WWWW DET P P P P P
Ref Offset 37.63 dB dB/div Ref 33.00 dBm						
28.0						
23.0						
18.0						
13.0						
3.00						
3.00						
2.00						
r.oo						
2.0						TRIG LV
enter 927.500000 MHz es BW 1.0 MHz	#VBN	/ 30 kHz		Sweep	110.9 ms	Span 0 H (8192 pt
G			STATUS			

CARRIER FREQUENCY SEPARATION



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	Keysight	N5182B	TFU	27-Oct-15	27-Oct-18
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	30-May-17	30-May-18
Attenuator	S.M. Electronics	SA26B-10	AWR	24-Oct-17	24-Oct-18
Attenuator	Fairview Microwave	18B5W-26	RFZ	6-Sep-17	6-Sep-18
Block - DC	Fairview Microwave	SD3379	AMW	5-Jun-17	5-Jun-18
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	14-Aug-17	14-Aug-18

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The channel carrier frequencies in the 902 - 928 MHz band must be separated by 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Or, if the output power is less than 125 mW, the channel separation can be 25 kHz or 2/3 of the 20dB bandwidth. The EUT was operated in pseudorandom hopping mode. The spectrum was scanned across two adjacent peaks. The separation between the peaks of these channels was measured.

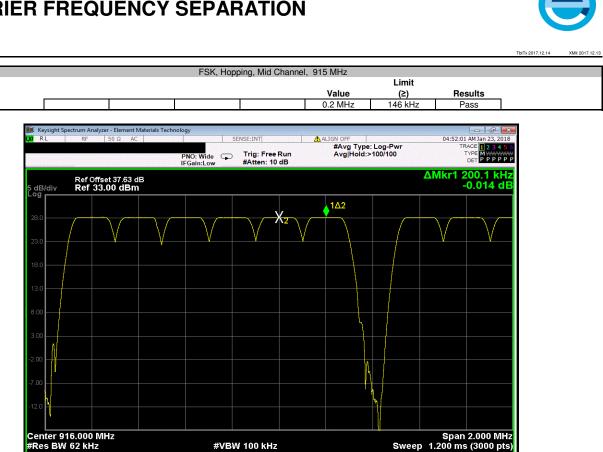
CARRIER FREQUENCY SEPARATION



			TbtTx 2017.12.14	XMit 2017.12.13
EUT:	Voyager Pro	Work Order:	POLR0007	
Serial Number:	1	Date:	22-Jan-18	
Customer:	Polaris Industries, Inc.	Temperature:	22.4 °C	
	Stephen Reid and Ed Vaynberg		37.6% RH	
Project:		Barometric Pres.:		
Tested by:	Jeff Alcoke Power: 14.0 VDC	Job Site:	EV06	
TEST SPECIFICAT	ONS Test Method			
FCC 15.247:2018	ANSI C63.10:2013			
COMMENTS	· · · · · · · · · · · · · · · · · · ·			
None				
DEVIATIONS FROM	I TEST STANDARD			
None				
Configuration #	1 Signature			
			Limit	
		Value	(≥)	Results
FSK, Hopping				
	Mid Channel, 915 MHz	0.2 MHz	146 kHz	Pass

Report No. POLR0007

CARRIER FREQUENCY SEPARATION



STATUS

#VBW 100 kHz

NUMBER OF HOPPING FREQUENCIES



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	Keysight	N5182B	TFU	27-Oct-15	27-Oct-18
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	30-May-17	30-May-18
Attenuator	S.M. Electronics	SA26B-10	AWR	24-Oct-17	24-Oct-18
Attenuator	Fairview Microwave	18B5W-26	RFZ	6-Sep-17	6-Sep-18
Block - DC	Fairview Microwave	SD3379	AMW	5-Jun-17	5-Jun-18
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	14-Aug-17	14-Aug-18

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The number of hopping frequencies was measured across the authorized band. The hopping function of the EUT was enabled.

NUMBER OF HOPPING FREQUENCIES



			TbtTx 2017.12.14	XMit 2017.12.13
EUT:	Voyager Pro	Work Order:		
Serial Number:			22-Jan-18	
Customer:	Polaris Industries, Inc.	Temperature:	22.4 °C	
	Stephen Reid and Ed Vaynberg		37.5% RH	
Project:		Barometric Pres.:		
	Jeff Alcoke Power: 14.0 VDC	Job Site:	EV06	
TEST SPECIFICAT	ONS Test Method			
FCC 15.247:2018	ANSI C63.10:2013			
COMMENTS				
None				
DEVIATIONS FROM	I TEST STANDARD			
None				
Configuration #	1 Signature			
		Number of	Limit	
		Channels	(≥)	Results
FSK, Hopping				
	Mid Channel, 915 MHz	60	50	Pass

Report No. POLR0007

NUMBER OF HOPPING FREQUENCIES



TbtTx 2017.12.14 XMit 2017.12.13 FSK, Hopping, Mid Channel, 915 MHz Number of Limit **(≥)** 50 Channels Results 60 Pass 04:32:23 AM Jan 23, 2018 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P P P P P P Keysight 🗥 AL #Avg Type: Log-Pwr Avg|Hold:>100/100 PNO: Fast Trig: Free Run IFGain:Low #Atten: 20 dB Ref Offset 37.63 dB Ref 33.00 dBm 5 dB/div Log TTT I mn m ł Start 902.00 MHz #Res BW 82 kHz Stop 928.00 MHz 1.200 ms (3000 pts) #VBW 100 kHz Sweep STATUS



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	N5183A	TID	25-Apr-17	25-Apr-19
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	30-May-17	30-May-18
Attenuator	Fairview Microwave	18B5W-26	RFZ	6-Sep-17	6-Sep-18
Attenuator	Fairview Microwave	SA26B-10	TWH	15-Apr-17	15-Apr-18
Block - DC	Fairview Microwave	SD3379	AMW	5-Jun-17	5-Jun-18
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	14-Aug-17	14-Aug-18

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The average dwell time per hopping channel was measured at one hopping channel in the middle of the authorized band. The hopping function of the EUT was enabled.

The average Dwell Time of any frequency shall not be greater than 0.4 seconds within a 20 second period.



EUT:	Voyager Pro						Work Order:	POLR0007	
Serial Number:	1							14-Feb-18	
	Polaris Industries, Inc.						Temperature:		
Attendees:							Humidity:		
Project: None						E	Barometric Pres.:		
Tested by:	Jeff Alcoke		Power:	14.0 VDC			Job Site:	EV06	
EST SPECIFICATI	IONS			Test Method					
CC 15.247:2018				ANSI C63.10:2013					
OMMENTS									
one									
EVIATIONS FROM	M TEST STANDARD								
one									
				- Ma					
onfiguration #	1	Signature	Vet	1/2					
		olghalaic	Duration	Count	Count	Dwell Time (ms)	Avg Dwell	Limit	
			(ms)	Pulse 1	Pulse 2	20 sec period	Time (ms)	(ms)	Result
SK, Hopping			X -7				- (-/	(- <i>/</i>	
	Mid Channel, 915 MHz								
	Pulse 1		22.83					-	
	Pulse 2		381.2	-	-	-	-	-	-
	20 sec Duration 1		-	9	0	205.47	-	-	-
	20 sec Duration 2		-	3	1	449.69	-	-	-
	20 sec Duration 3		-	0	2	762.40	-	-	-
	20 sec Duration 4		-	6	0	136.98	-	-	-
	20 sec Duration 5		-	6	0	136.98	-	-	-
	20 sec Duration 6		-	3	1	449.69	-	-	-
	20 sec Duration 7		-	6	1	518.18	-	-	-
	20 sec Duration 8		-	9	0	205.47	-	-	-
	20 sec Duration 9		-	9	0	205.47	-	-	-
	20 sec Duration 10		-	6	1	518.18	-	-	-
	20 sec Duration 11		-	3	1	449.69	-	-	-
	20 sec Duration 12		-	9	0	205.47	-	-	-
	20 sec Duration 13		-	6	0	136.98	-	-	-
	20 sec Duration 14		-	6	1	518.18	-	-	-
	20 sec Duration 15		-	9	0	205.47	-	-	-
			-	6	0	136.98	-	-	-
	20 sec Duration 16			3	0	68.49	-	-	-
	20 sec Duration 17		-						
	20 sec Duration 17 20 sec Duration 18		-	6	0	136.98	-	-	-
	20 sec Duration 17 20 sec Duration 18 20 sec Duration 19		-	9	0 0	205.47	-	-	-
	20 sec Duration 17 20 sec Duration 18		-	•	0		- - - 289.46	-	- - Pass



(Mit 2017.12.13

FSK, Hopping, Mid Channel, 915 MHz, Pulse 1 Duration Count Count Dwell Time (ms) Avg Dwell Limit (ms) 22.83 Pulse 1 Pulse 2 20 sec period Time (ms) (ms) Result 08:18:56 AM Feb 15, 2018 TRACE 1 2 3 4 5 6 TYPE WWWWW DET P P P P P P Keysight Sp RL NBE:INT ALIGN O Trig Delay-5.000 ms Av Trig: Video #Atten: 10 dB Avg Type: Log-Pwr PNO: Wide +++ ΔMkr1 22.83 ms 3.59 dB Ref Offset 37.42 dB Ref 37.00 dBm 5 dB/div unununununun kununun tinteration kanaa 1<u>∆</u>2 X2 Center 915.000000 MHz Res BW 100 kHz Span 0 Hz Sweep 100.2 ms (8172 pts) #VBW 100 kHz STATUS FSK, Hopping, Mid Channel, 915 MHz, Pulse 2 Duration Count Dwell Time (ms) Limit Count Avg Dwell Pulse 1 Pulse 2 Time (ms) Result (ms) 20 sec period (ms) 381.2

Keysight Spectrum Analyzer - Element Materials Techno X RL RF 50 Ω AC			08:28:30 AM Feb 15, 2018
KL RF SUSZ AC	PNO: Wide + Trig Delay-5.000 ms IFGain:Low #Atten: 10 dB	ALIGN OFF Avg Type: Log-Pwr	08:28:30 AM Feb 15, 2018 TRACE 1 2 3 4 5 6 TYPE WWWWW DET P P P P P P
Ref Offset 37.42 dB 5 dB/div Ref 37.00 dBm			ΔMkr1 381.2 ms -5.35 dB
32.0			
27.0 -			
22.0 X 2		11/10/10/10/10/10/10/10/10/10/10/10/10/1	2
17.0		• • • • • • • • • • • • • • • • • • •	
12.0			
7.00			
2.00			
-3.00			
-8.00			TRIG LVL
Center 915.000000 MHz Res BW 100 kHz	#VBW 100 kHz	Swee	Span 0 Hz p 500.1 ms (8172 pts)
MSG		STATUS	



XMit 2017.12.13 FSK, Hopping, Mid Channel, 915 MHz, 20 sec Duration 1 Duration Count Count Dwell Time (ms) Avg Dwell Limit Pulse 2 20 sec period 205.47 Time (ms) (ms) Pulse 1 (ms) Result 9 0 Element Materials Tec 08:30:18 AM Feb 15, 2018 TRACE 1 2 3 4 5 6 TYPE WWWWW DET P P P P P P Keysight Sp ctrum Analyze SENSE:INT Trig Delay-5.000 ms PNO: Wide IFGain:Low #Atten: 10 dB Ref Offset 37.42 dB Ref 37.42 dBm 2 dB/div Log Center 915.000000 MHz Res BW 100 kHz Span 0 Hz Sweep 20.00 s (8172 pts) #VBW 100 kHz STATUS ESK Hopping Mid Channel 915 MHz 20 sec Dura

Duration	Count	Count	Dwell Time (ms)	Avg Dwell	Limit	
(ms)	Pulse 1	Pulse 2	20 sec period	Time (ms)	(ms)	Result
-	3	1	449.69	-	-	-

Keysight Spectrum Analyzer - Element Materials RL RF 50 Ω AC		-ucr.turl	NUTCH OFF	08:31:08 AM Feb 15, 2018
KL KF 50 Ω AC	PNO: Wide ↔ IFGain:Low	Trig Delay-5.000 ms Trig: Video #Atten: 10 dB	ALIGN OFF Avg Type: Log-Pwr	08:31:08 AM Feb 15, 201 TRACE 1 2 3 4 5 TYPE WWWWW DET P P P P P
Ref Offset 37.42 dB dB/div Ref 37.42 dBm				
5.4				
3.4				
1.4				
3.4				
7.4				
5.4				
3.4				
1.4				
3.4				
enter 915.000000 MHz				
es BW 100 kHz	#VBV	/ 100 kHz	Swe	Span 0 H ep 20.00 s (8172 pt
G			STATUS	



VMR 2017 12 1

	Duration	Count	Count	d Channel, 915 MH: Dwell Time (ms)	Avg Dwell	Limit	
	(ms)	Pulse 1	Pulse 2	20 sec period	Time (ms)	(ms)	Result
	-	0	2	762.4	-	-	-
		Ŭ	-	702.1			1
Keysig		er - Element Materials Tech 50 Ω AC		SENSE:INT	ALIGN OFF		08:32:04 AM Feb 15, 2018
				Trig Delay-5.000 ms		: Log-Pwr	TRACE 1 2 3 4 5 6
			PNO: Wide ↔→ IFGain:Low	Trig: Video #Atten: 10 dB			TYPE WWWWWWW DET P P P P P P
2 dB/di	Ref Offs Ref 37.	et 37.42 dB . 42 dBm					
35.4							
33.4							
33.4							
31.4							
3184							
29.4							
20.4							
27.4							
25.4							
23.4							
21.4							
19.4							
Cente	r 915.00000	0 MHz					Span 0 Hz
Res B	W 100 kHz	<u></u>	#VB	W 100 kHz		Sweep	20.00 s (8172 pts)
MSG					STATUS		
				d Channel, 915 MH			
	Duration	Count	Count	Dwell Time (ms)	Avg Dwell	Limit	Bernh
	(ms)	Pulse 1 6	Pulse 2	20 sec period 136.98	Time (ms)	(ms)	Result

RL RF 50 Ω AC	SEI	NSE:INT	ALIGN OFF	08:33:11 AM Feb 15, 201
	PNO: Wide +++	Trig Delay-5.000 ms Trig: Video #Atten: 10 dB	Avg Type: Log-Pwr	TRACE 1 2 3 4 9 TYPE WWWW DET P P P P P
Ref Offset 37.42 dB dB/div Ref 37.42 dBm	1			
5.4				
3.4				
.4				
3.4				
.4				
.4				
3.4				
.4				
3.4				
enter 915.000000 MHz				TRIG L Span 0 H
es BW 100 kHz	#\/B\A	100 kHz	Swaa	ep 20.00 s (8172 pt



		F	SK, Hopping, Mi	d Channel, 915 MHz	, 20 sec Duratio	on 5	
Durat	ion	Count	Count	Dwell Time (ms)	Avg Dwell	Limit	
(ms	s)	Pulse 1	Pulse 2	20 sec period	Time (ms)	(ms)	Result
-		6	0	136.98	-	-	-
		lement Materials Tec					
(XIRL	RF 50	Ω AC		SENSE:INT Trig Delay-5.000 ms	ALIGN OFF Avg Type	l og Dur	08:33:53 AM Feb 15, 2018
			PNO: Wide 🔸	Trig: Video	Avg Type	. Log-F Wi	TRACE 1 2 3 4 5 6 TYPE WWWWWW
			IFGain:Low	#Atten: 10 dB			DET PPPPP
2 dB/div 💦	ef Offset 3 ef 37.42	87.42 dB dBm					
Log							
05.4							
35.4							
22.4							
33.4							
31.4							
29.4							
27.4					1		
25.4							
23.4							
21.4							
21.41							
19.4							
10.4							
							TRIG LVL
Center 915.0		/IHz				_	Span 0 Hz
Res BW 100	kHz		#VB	W 100 kHz	1	Sweep	20.00 s (8172 pts)
MSG					STATUS		
				d Channel, 915 MHz			
Durat		Count	Count	Dwell Time (ms)	Avg Dwell	Limit	
(ms	5)	Pulse 1 3	Pulse 2	20 sec period 449.69	Time (ms)	(ms)	Result

Keysight Spectrum Analyzer - Element Materials				
X RL RF 50Ω AC		Trig Delay-5.000 ms	ALIGN OFF Avg Type: Log-Pwr	08:38:33 AM Feb 15, 2018 TRACE 1 2 3 4 5 6
	PNO: Wide +++ IFGain:Low	Trig: Video #Atten: 10 dB	Avg Type. Log-I wi	TYPE WWWWWW DET P P P P P
Ref Offset 37.42 dB 2 dB/div Ref 37.42 dBm				
35.4				
33.4				
31.4				
29.4				
27.4				
25.4				
23.4				
21.4				
19.4				
Center 915.000000 MHz Res BW 100 kHz	#VB\	₩ 100 kHz	Sv	Span 0 Hz veep 20.00 s (8172 pts)
ISG			STATUS	



–			I Channel, 915 MHz,			
Duration	Count	Count	Dwell Time (ms)	Avg Dwell	Limit	Desult
(ms)	Pulse 1	Pulse 2	20 sec period	Time (ms)	(ms)	Result
-	6	1	518.18	-	-	-
📜 Keysight Spectrum Analyze	Element Materials To	ale a la su				
	50 Ω AC		ENSE:INT	ALIGN OFF		08:39:26 AM Feb 15, 2018
			Trig Delay-5.000 ms	Avg Type:	Log-Pwr	TRACE 1 2 3 4 5 6
		PNO: Wide	Trig: Video #Atten: 10 dB			DET P P P P P
Pof Offe	et 37.42 dB					
2 dB/div Ref 37.	.42 dBm					
Log						
35.4						
33.4						
31.4						
29.4						
27.4						
25.4						
23.4						
21.4						
19.4						
						TRIG LVL
Center 915.00000	0 MHz					Span 0 Hz
Res BW 100 kHz		#VB\	V 100 kHz		Sweep	20.00 s (8172 pts)
MSG				STATUS		
		SK Hopping Mid	I Channel, 915 MHz	20 sec Durotic	n 8	
Duration	Count	Count	Dwell Time (ms)	Avg Dwell	Limit	
(ms)	Pulse 1	Pulse 2	20 sec period	Time (ms)	(ms)	Result

🗾 Keysight Spectrum Analyzer - Element Materials Tech				
LX RL RF 50 Ω AC	SI	Trig Delay-5.000 ms	ALIGN OFF Avg Type: Log-Pwr	08:40:20 AM Feb 15, 2018 TRACE 1 2 3 4 5 6
	PNO: Wide ↔ IFGain:Low	Trig: Video #Atten: 10 dB		
Ref Offset 37.42 dB 2 dB/div Ref 37.42 dBm Log				
35.4				
33.4				
31.4				
29.4				
27.4				
25.4				
23.4				
21.4				
19.4				
Center 915.000000 MHz Res BW 100 kHz	#\/B\/	/ 100 kHz		TRIGLVL Span 0 Hz Sweep 20.00 s (8172 pts)
MSG	#VDV		STATUS	Sweep 20.00 S (817 2 pts)



Duration (ms)	Count Pulse 1	Count Pulse 2	Dwell Time (ms) 20 sec period	Avg Dwell Time (ms)	Limit (ms)	Result
(IIIS) -	9	0	205.47	-	-	
	Ŭ		200117			
Keysight Spectrum Analyze	r - Element Materials Tech	noloav				
LXI RL RF			SENSE:INT			08:41:07 AM Feb 15, 2018
		PNO: Wide 🔸	Trig Delay-5.000 ms Trig: Video	Avg Type:	Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWW DET P P P P P
		IFGain:Low	#Atten: 10 dB			DET PPPPP
Pef Offe	et 37.42 dB					
2 dB/div Ref 37.	42 dBm					
Log						
05.4						
35.4						
33.4						
33.4						
31.4						
31.4						
29.4						
29.4						
27.4						
27.4			l l			
25.4						
20.4						
23.4						
10.1						
21.4						
19.4						
						TRIG LVL
Center 915.00000) MHz	40 (F	W 400 LUL-		•••••	Span 0 Hz 20.00 s (8172 pts)
Res BW 100 kHz		#VE	W 100 kHz		sweep	20.00 s (8172 pts)
MSG				STATUS		
	50	K Hanning Mi		00 and Duration	- 10	
Duration	Count	K, Hopping, Mic Count	d Channel, 915 MHz, Dwell Time (ms)	20 sec Duration	110 Limit	
(ms)	Pulse 1	Pulse 2	20 sec period	Time (ms)	(ms)	Result
(115)	6	1	518.18		-	-
			510.10		1	I L
-	r - Element Materials Tech					

Keysight Spectrum Analyzer - Element Materials M RL RF 50 Ω AC	lectiliology	SENSE:INT	ALIGN OFF	08:41:44 AM Feb 15, 2018
	PNO: Wide ↔ IFGain:Low	Trig Delay-5.000 ms	Avg Type: Log-Pwr	TRACE 2 3 4 5 TYPE WWWWWW DET PPPP
Ref Offset 37.42 dB dB/div Ref 37.42 dBm		1		
33.4				
31.4				
29.4				
77.4				
25.4				
3.4				
19.4				
				TRIGL
enter 915.000000 MHz tes BW 100 kHz	#VB	W 100 kHz	Sw	Span 0 H eep 20.00 s (8172 pts
SG			STATUS	



Dur	tion	Count	Count	Dwell Time (m	Hz, 20 sec Duratio s) Avg Dwell	Limit	
	is)	Pulse 1	Pulse 2	20 sec period		(ms)	Result
		3	1	449.69	-	-	-
		-		1			
Keysight Spect	um Analyzer	Element Materials Tecl	anology				
K RL		0Ω AC		SENSE:INT	ALIGN OFF		08:42:44 AM Feb 15, 2018
				Trig Delay-5.000 Trig: Video	ms Avg Type	: Log-Pwr	TRACE 1 2 3 4 5 TYPE WWWWW
			PNO: Wide	#Atten: 10 dB			DET PPPP
		37.42 dB					
2 dB/div Log	Ref 37.4	2 dBm					
05.4							
35.4							
33.4							
31.4							
29.4							
27.4							
25.4							
23.4							
23.4							
21.4							
21.4							
19.4							
13.4							
							TRIG LVL
Center 915.		MHz				-	Span 0 Hz
Res BW 10) KHZ		#VB	W 100 kHz		Sweep	20.00 s (8172 pts
MSG					STATUS		
					L 00 D	. 10	
D	tion	FS Count	K, Hopping, Mic Count		Hz, 20 sec Duratio		
		Count Pulse 1	Pulse 2	Dwell Time (ma 20 sec period		Limit	Result
(m	is)	9	0	20 sec period 205.47	Time (ms)	(ms)	nesuit

Keysight Spectrum Analyzer - Element Materials Δ// RL RF 50 Ω AC		SENSE:INT	ALIGN OFF	08:43:31 AM Feb 15, 2018
KL NF 5032 AC	PNO: Wide ↔→ IFGain:Low	Trig Delay-5.000 ms	Avg Type: Log-Pwr	08:43:31 AMPED 15, 2018 TRACE 1 2 3 4 5 6 TYPE WWWWWW DET PPPPP
Ref Offset 37.42 dB 2 dB/div Ref 37.42 dBm Log				
35.4				
33.4				
31.4				
29.4				
27.4				
25.4				
23.4				
19.4				
Center 915.000000 MHz				
Res BW 100 kHz	#VB	W 100 kHz		Span 0 Hz weep 20.00 s (8172 pts)
IISG			STATUS	



Duration	Count	Count	Dwell Time (ms)	Avg Dwell	Limit	
(ms)	Pulse 1	Pulse 2	20 sec period	Time (ms)	(ms)	Result
-	6	0	136.98	-	-	-
Keysight Spectrum Analyzer	- Element Materials Tech	nology				
K RL RF .	50 Ω AC		SENSE:INT Trig Delay-5.000 ms	ALIGN OFF Avg Type:	Log Pur	08:44:52 AM Feb 15, 2018
		PNO: Wide ↔→ IFGain:Low		Avg Type.		TRACE 1 2 3 4 5 6 TYPE DET P P P P P P
Ref Offse	t 37.42 dB					
2 dB/div Ref 37.4	12 dBm					
25.4						
35.4						
33.4						
31.4						
29.4						
27.4			Π			
25,4						
25.4						
23.4						
21.4						
19.4						
Center 915.00000	MHz				I	Span 0 Hz
Res BW 100 kHz		#VB	W 100 kHz		Sweep	20.00 s (8172 pts)
MSG				STATUS		
			l Channel, 915 MHz,			
Duration	Count	Count	Dwell Time (ms)	Avg Dwell	Limit	Beault
(ms)	Pulse 1 6	Pulse 2 1	20 sec period 518.18	Time (ms)	(ms) -	Result
I	Ŭ		0.0.10			I

RL RF	50 Ω AC		SENSE:INT		LIGN OFF			AM Feb 15, 201
		PNO: Wide ↔ IFGain:Low	Trig Delay-5.00 → Trig: Video #Atten: 10 dB	0 ms	Avg Type: L	.og-Pwr	T	RACE 1 2 3 4 5 TYPE WWWW DET P P P P P
Ref Offs dB/div Ref 37	et 37.42 dB . 42 dBm				1			1
35.4								
3.4								
11.4								
9.4								
27.4							n	
5.4								
3.4								
1.4								
9.4								
enter 915.0000	0 MHz							TRIG L Span 0 H
es BW 100 kHz		#V	BW 100 kHz			Swe	ep 20.00	s (8172 pt
G					STATUS			

DWELL TIME



	Duration	Count	Count	Channel, 915 MHz, Dwell Time (ms)	Avg Dwell	Limit	
	(ms)	Pulse 1	Pulse 2	20 sec period	Time (ms)	(ms)	Result
	-	9	0	205.47	-	-	-
		•					
Keysia	aht Spectrum Analyze	er - Element Materials Tec	hnology				
IXI RL		50 Ω AC		ENSE:INT	ALIGN OFF		08:47:11 AM Feb 15, 2018
			PNO: Wide ↔→ IFGain:Low	Trig Delay-5.000 ms Trig: Video #Atten: 10 dB	Avg Type:	Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWW DET P P P P P
2 dB/di	Ref Offso Ref 37.	et 37.42 dB 42 dBm					
35.4							
33.4							
33.4							
31.4							
31.4							
29.4							
2011							
27.4							
25.4 —							
23.4							
21.4							
10.1							
19.4 —							
							TRIG LVL
	r 915.00000	0 MHz					Span 0 Hz
PRODUCTION ADDRESS	W 100 kHz		#VB\	№ 100 kHz		Sweep	20.00 s (8172 pts)
MSG					STATUS		
		FS		Channel, 915 MHz,			
	Duration	Count	Count	Dwell Time (ms)	Avg Dwell	Limit	
	(ms)	Pulse 1 6	Pulse 2	20 sec period 136.98	Time (ms)	(ms)	Result

PNO: Wide IFGain:Low Trig Delay-5.000 ms Trig: Video #Atten: 10 dB Avg Type: Log-Pwr Der TRACE TYPE DET 2 3 4 TYPE DET BdB/div Ref Offset 37.42 dB Image: String of the strin		ectrum Analyzer - Element Materials T							
PRO: Wide IFGain:Low Trig: Video #Atten: 10 dB Trig: Video B Ref Offset 37.42 dB Image: Comparison of the set	XI RL	RF 50 Ω AC		SENSE:INT			og-Pwr		
dB/div Ref 37.42 dBm 364			PNO: Wide ↔ IFGain:Low	. Trig: Video	•		- g	TYPE WW	www.
364	2 dB/div								
33 4									
31.4									
22.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2.7.4 2									
27 4 27 4 27 4 27 4 27 4 27 4 27 4 27 4	31.4								
25 4 25 4 25 4 25 4 25 4 25 4 25 4 25 4	29.4								
223.4 221.4 19.4 Exenter 915.000000 MHz Span 0 H	27.4								
21.4 19.4 Senter 915.00000 MHz Span 0 H	25.4								
19.4 enter 915.000000 MHz Span 0 H	23.4								
enter 915.000000 MHz Span 0 H	21.4								
enter 915.000000 MHz Span 0 H	19.4								
tes BW 100 kHz #VBW 100 kHz Sweep 20.00 s (8172 pt								Span	0 H
SG STATUS	tes BW 1	100 kHz	#VB	W 100 kHz		2	Swe	ep 20.00 s (817)	2 pts

DWELL TIME



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Duration	Count	Count	Dwell Time (ms)	Avg Dwell	Limit	
(ms)	Pulse 1	Pulse 2	20 sec period	Time (ms)	(ms)	Result
-	3	0	68.49	-	-	-
Keysight Spectrum Anal	yzer - Element Materials Tec	hnology	en paren paren paren paren paren paren			
W RL RF	50 Ω AC		SENSE:INT	ALIGN OFF		08:49:25 AM Feb 15, 2018
			Trig Delay-5.000 m Trig: Video	Avg Type:	Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWW DET P P P P P
		PNO: Wide +++ IFGain:Low	#Atten: 10 dB			DET PPPPP
RefOff 2 dB/div Ref 3	⁻ set 37.42 dB 7.42 dBm					
	7.42 abiii					
35.4						
33.4						
31.4						
J1.4						
29.4						
27.4						
25.4						
23.4						
21.4						
19.4						
						TRIG LVL
Center 915.0000					_	Span 0 Hz
Res BW 100 kHz		#VB	W 100 kHz		Sweep	20.00 s (8172 pts)
MSG				STATUS		
	FS	SK, Hopping, Mid	Channel, 915 MHz	, 20 sec Duration	n 18	
Duration	Count	Count	Dwell Time (ms)	Avg Dwell	Limit	
(ms)	Pulse 1	Pulse 2	20 sec period	Time (ms)	(ms)	Result
	6	0	136.98		-	_

	ectrum Analyzer - Ele		echnology					
RL	RF 50 Ω	AC		SENSE:INT		LIGN OFF		:04 AM Feb 15, 201
			PNO: Wide ↔ IFGain:Low	Trig Delay Trig: Video #Atten: 10	•	Avg Type: Log-Pw	<i>i</i> r	TRACE 1 2 3 4 5 TYPE WWWW DET P P P P
dB/div	Ref Offset 37 Ref 37.42	7.42 dB d Bm		1	1			
.4								
.4								
.4								
.4								
.4								
.4								
4								
.4								
.4								
	15.000000 M 100 kHz	Hz	#\/E	3W 100 kHz			Sweep 20.0	Span 0 H
SEW			#VE				Sweep 20.0	л 5 (8172 рі

DWELL TIME



Duration	Count	Count	Dwell Time (ms)	Avg Dwell	Limit	
(ms)	Pulse 1	Pulse 2	20 sec period	Time (ms)	(ms)	Result
-	9	0	205.47	-	-	-
De- c						
Keysight Spectrum Analyzer - E R R RF 50	lement Materials Techn Ω AC		ENSE:INT	ALIGN OFF		08:51:04 AM Feb 15, 2018
	SE AC	3	Trig Delay-5.000 ms	Avg Type:	Log-Pwr	TRACE 1 2 3 4 5 6
		PNO: Wide +++	Trig: Video #Atten: 10 dB			TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P P P P P P
		IFGain:Low	#Atten: To ub			
Ref Offset 3 2 dB/div Ref 37.42	7.42 dB					
	чып					1
35.4						
33.4						
31.4						
29.4						
27.4		l l		n		
25.4						
22.4						
23.4						
21.4						
19.4						
						TRIG LVL
Center 915.000000 N	/IHz	#\(D)(V 100 kHz		Sureen	Span 0 Hz
Res BW 100 kHz		#VBV		1	Sweep	20.00 s (8172 pts)
MSG				STATUS		

	F.5r	 Hopping, Ivila 	Channel, 915 MHz	, 20 sec Duration	120	
Duration	Count	Count	Dwell Time (ms)	Avg Dwell	Limit	
(ms)	Pulse 1	Pulse 2	20 sec period	Time (ms)	(ms)	Result
-	6	0	136.98	-	-	-

Keysight Spectrum Analyzer - Element Materia RL RF 50 Ω AC		ENSE:INT	ALIGN OFF	08:51:51 AM Feb 15, 2018
	PNO: Wide ↔ IFGain:Low	Trig Delay-5.000 ms Trig: Video #Atten: 10 dB	Avg Type: Log-Pwr	TRACE 1 2 3 4 5 TYPE WWWW DET P P P P P
Ref Offset 37.42 dB dB/div Ref 37.42 dBm				
5.4				
3.4				
1.4				
3.4				
7.4				
5.4				
3.4				
1.4				
3.4				
				TRIG L
enter 915.000000 MHz es BW 100 kHz	#VBV	V 100 kHz	Swe	Span 0 H ep 20.00 s (8172 pt
3			STATUS	



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	Keysight	N5182B	TFU	27-Oct-15	27-Oct-18
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	30-May-17	30-May-18
Attenuator	S.M. Electronics	SA26B-10	AWR	24-Oct-17	24-Oct-18
Attenuator	Fairview Microwave	18B5W-26	RFZ	6-Sep-17	6-Sep-18
Block - DC	Fairview Microwave	SD3379	AMW	5-Jun-17	5-Jun-18
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	14-Aug-17	14-Aug-18

TEST DESCRIPTION

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

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

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

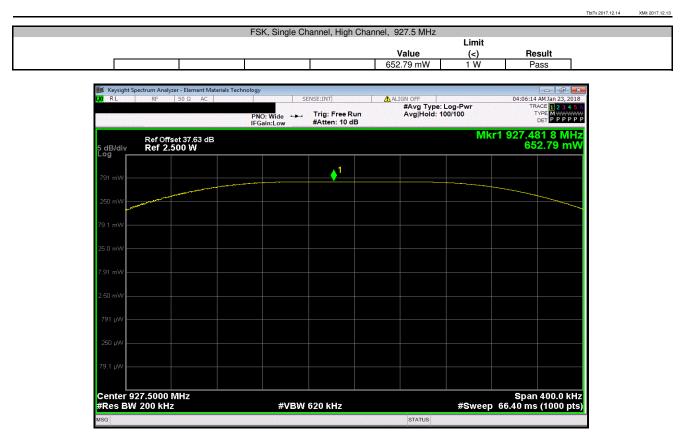


			TbtTx 2017.12.14	XMit 2017
FUT: Vov	yager Pro	Work Order:		XMIL 2017
Serial Number: 1	Hader to		22-Jan-18	
	laris Industries, Inc.	Temperature:		
	ephen Reid and Ed Vaynberg		37.8% RH	
Project: Non		Barometric Pres.:		
Tested by: Jeff	ff Alcoke Power: 14.0 VDC	Job Site:	EV06	
EST SPECIFICATIONS	S Test Method			
CC 15.247:2018	ANSI C63.10:2013			
COMMENTS lone				
lone	ST STANDARD			
	IST STANDARD			
Ione DEVIATIONS FROM TES	1 Signature			
one EVIATIONS FROM TES	1 Jack		Limit	
one EVIATIONS FROM TES one onfiguration #	1 Jack	Value	Limit (<)	Result
one EVIATIONS FROM TES one onfiguration #	1 Jack	Value		Result
one EVIATIONS FROM TES one onfiguration # SK, Single Channel Low	1 Signature	Value 641.41 mW		Result Pass
Ione SeviATIONS FROM TES Ione Configuration # SK, Single Channel Low Mid	1 Signature		(<)	



TbtTx 2017.12.14 XMit 2017.12.13 FSK, Single Channel, Low Channel, 902.5 MHz Limit Value (<) 1 W Result 641.41 mW Pass 03:29:02 AM Jan 23, 2018 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P P P P P P Keysight ! RL ALIGN O #Avg Type: Log-Pwr Avg|Hold: 100/100 PNO: Wide +++ Trig: Free Run IFGain:Low #Atten: 10 dB Mkr1 902.546 6 MHz 641.41 mW Ref Offset 37.63 dB Ref 2.500 W 5 dB/div Log I Center 902.5000 MHz #Res BW 240 kHz Span 450.0 kHz #Sweep 66.40 ms (1000 pts) #VBW 750 kHz STATUS FSK, Single Channel, Mid Channel, 915 MHz Limit Result Value (<) 1 W 657.79 mW Pass Keysight Spectrum Analyzer - Element Materials Technology
RL RF 50 Ω AC 06:57:11 AM Jan 23, 2018 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P P P P P ALIGN OFF #Avg Type: Log-Pwr Avg|Hold: 100/100 PNO: Wide --- Trig: Free Run IFGain:Low #Atten: 10 dB Mkr1 914.985 8 MH Ref Offset 37.63 dB

5 dB/div Ref 2.500 W					657.79 mW
		1			
791 mW					
250 mW					
9.1 mW					
5.0 mW					
.91 mW					
50 mW					
791 µW					
250 μW					
79.1 μW					
enter 915.0000 MHz Res BW 200 kHz	#VB1	W 620 kHz		Sweep 1.	Span 400.0 kH 066 ms (1000 pts
SG			STATUS		





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	Keysight	N5182B	TFU	27-Oct-15	27-Oct-18
Attenuator	Fairview Microwave	18B5W-26	RFZ	6-Sep-17	6-Sep-18
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	30-May-17	30-May-18
Attenuator	S.M. Electronics	SA26B-10	AWR	24-Oct-17	24-Oct-18
Block - DC	Fairview Microwave	SD3379	AMW	5-Jun-17	5-Jun-18
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	14-Aug-17	14-Aug-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 band were measured with the EUT set to low and high transmit frequencies. The EUT was transmitting at the data rate(s) listed in the datasheet in a no hop mode. The channels closest to the band edges were selected.

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

BAND EDGE COMPLIANCE

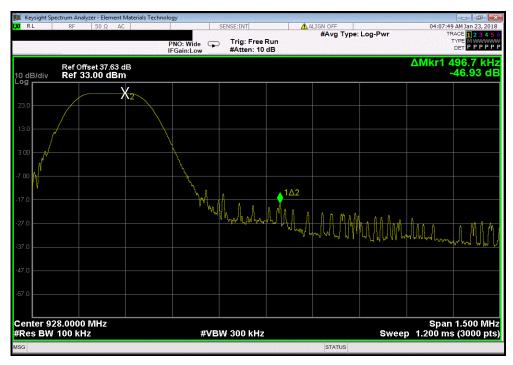


EUT. Ve						TbtTx 2017.12.14	XMit 2017.12
	oyager Pro					r: POLR0007	
Serial Number: 1					Date	22-Jan-18	
Customer: Po	olaris Industries, Inc.				Temperature	e: 22.1 °C	
Attendees: St	tephen Reid and Ed Vaynberg					/: 37.6% RH	
Project: No					Barometric Pres		
Tested by: Je	eff Alcoke		Pov	ver: 14.0 VDC	Job Site	: EV06	
TEST SPECIFICATION	1S			Test Method			
FCC 15.247:2018				ANSI C63.10:2013			
COMMENTS							
None							
NOTIC							
DEVIATIONS FROM T	EST STANDARD						
DEVIATIONS FROM T	EST STANDARD						
DEVIATIONS FROM T	EST STANDARD			A			
None	EST STANDARD			7 M			
	EST STANDARD	0/	TA				
None	EST STANDARD	Signature	TA				
None	EST STANDARD	Signature	Telf		Value	Limit	
None Configuration #	EST STANDARD	Signature	Tæl		Value (dBc)	Limit ≤ (dBc)	Result
None Configuration # FSK, Single Channel	1	Signature	TA		(dBc)	≤ (dBc)	
None Configuration # FSK, Single Channel	EST STANDARD 1	Signature	Tæl				Result Pass

BAND EDGE COMPLIANCE



	FSK, Single Ch	annel, High Chan	nel, 927.5 MHz			
			Value	Limit		
			(dBc)	≤ (dBc)	Result	
			-46.93	-20	Pass	



BAND EDGE COMPLIANCE - HOPPING MODE



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	Keysight	N5182B	TFU	27-Oct-15	27-Oct-18
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	30-May-17	30-May-18
Attenuator	S.M. Electronics	SA26B-10	AWR	24-Oct-17	24-Oct-18
Attenuator	Fairview Microwave	18B5W-26	RFZ	6-Sep-17	6-Sep-18
Block - DC	Fairview Microwave	SD3379	AMW	5-Jun-17	5-Jun-18
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	14-Aug-17	14-Aug-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 band were measured with the EUT set to its normal pseudo-random hopping sequence. 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 - HOPPING MODE



		TbtTx 2017.12.14	XMit 2017.12.13
EUT: Voyager Pro	Work Order:	POLR0007	
Serial Number: 1		22-Jan-18	
Customer: Polaris Industries, Inc.	Temperature: 2	22.2 °C	
Attendees: Stephen Reid and Ed Vaynberg	Humidity:		
Project: None	Barometric Pres.:		
Tested by: Jeff Alcoke Power: 14.0 VDC	Job Site:	EV06	
TEST SPECIFICATIONS Test Method			
FCC 15.247:2018 ANSI C63.10:2013			
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration # 1 Signature			
Ognatore	Value	Limit	
	(dBc)	≤ (dBc)	Result
FSK, Hopping			
Low Channel, 902.5 MHz	-48.62	-20	Pass
High Channel, 927.5 MHz	-53.36	-20	Pass

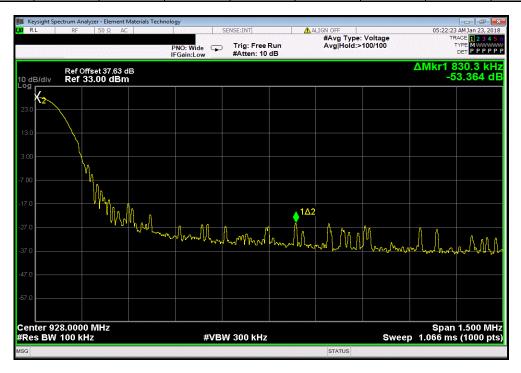
BAND EDGE COMPLIANCE - HOPPING MODE



TbtTx 2017.12.14 XMit 2017.12.13









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	Keysight	N5182B	TFU	27-Oct-15	27-Oct-18
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	30-May-17	30-May-18
Attenuator	S.M. Electronics	SA26B-10	AWR	24-Oct-17	24-Oct-18
Attenuator	Fairview Microwave	18B5W-26	RFZ	6-Sep-17	6-Sep-18
Block - DC	Fairview Microwave	SD3379	AMW	5-Jun-17	5-Jun-18
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	14-Aug-17	14-Aug-18

TEST DESCRIPTION

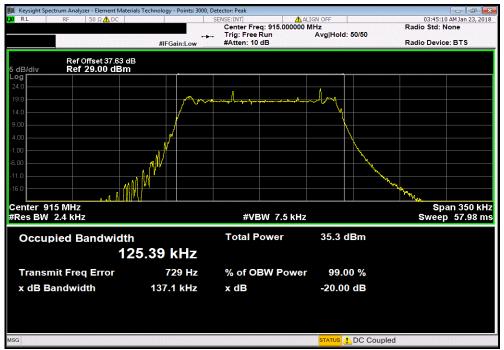
The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The 20 dB occupied bandwidth was measured with the EUT set to low, medium and high transmit frequencies in the band. The EUT was transmitting at the data rate(s) listed in the datasheet in a no-hop mode.



			TbtTx 2017.12.14	XMit 2017.12.1
	Voyager Pro	Work Order:		
Serial Number:	1	Date:	22-Jan-18	
Customer:	Polaris Industries, Inc.	Temperature:	22.4 °C	
Attendees:	Stephen Reid and Ed Vaynberg	Humidity:	37.6% RH	
Project:		Barometric Pres.:	1029 mbar	
Tested by:	Jeff Alcoke Power: 14.0 VDC	Job Site:		
TEST SPECIFICATI				
FCC 15.247:2018	ANSI C63.10:2013			
COMMENTS				
None				
DEVIATIONS FROM	TEST STANDARD			
None				
Configuration #	1 Signature			
	· · · · · · · · · · · · · · · · · · ·		Limit	
		Value	(≤)	Result
FSK, Single Channel				
	Low Channel, 902.5 MHz	146.315 kHz	500 kHz	Pass
	Mid Channel, 915 MHz	137.141 kHz	500 kHz	Pass
	High Channel, 927.5 MHz	140.196 kHz	500 kHz	Pass



TbtTx 2017.12.14 XMit 2017.12.13 FSK, Single Channel, Low Channel, 902.5 MHz Limit Value (≤) Result 146.315 kHz 500 kHz Pass NSE:INT ALIGN OFF Center Freq: 902.500000 MHz Trig: Free Run Avg|Hold: 50/50 #Atten: 10 dB 03:18:56 AM Jan 23, 2018 RL Radio Std: None Radio Device: BTS #IFGain:Low Ref Offset 37.63 dB Ref 29.00 dBm dBid A I'I I a MUT Center 902.5 MHz #Res BW 2.4 kHz Span 350 kHz Sweep 57.97 ms #VBW 7.5 kHz Total Power 35.3 dBm **Occupied Bandwidth** 126.87 kHz 493 Hz Transmit Freq Error % of OBW Power 99.00 % 146.3 kHz x dB Bandwidth x dB -20.00 dB DC Coupled FSK, Single Channel, Mid Channel, 915 MHz Limit Value (≤) Result 137.141 kHz 500 kHz Pass





TbtTx 2017.12.14 XMit 2017.12.13





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	Keysight	N5182B	TFU	27-Oct-15	27-Oct-18
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	30-May-17	30-May-18
Attenuator	S.M. Electronics	SA26B-10	AWR	24-Oct-17	24-Oct-18
Attenuator	Fairview Microwave	18B5W-26	RFZ	6-Sep-17	6-Sep-18
Block - DC	Fairview Microwave	SD3379	AMW	5-Jun-17	5-Jun-18
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	14-Aug-17	14-Aug-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 in a no-hop mode. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.



	oyager Pro			Work Order:		
Serial Number: 1					22-Jan-18	
	plaris Industries, Inc.			Temperature:		
	ephen Reid and Ed Vay	berg			37.9% RH	
Project: No				Barometric Pres.:		
Tested by: Je			Power: 14.0 VDC	Job Site:	EV06	
EST SPECIFICATION	15		Test Method			
CC 15.247:2018			ANSI C63.10:2013			
COMMENTS						
lone						
DEVIATIONS FROM T	EST STANDARD					
DEVIATIONS FROM TO	EST STANDARD					
lone	EST STANDARD	Signature	TAT //			
	EST STANDARD	Signature	TA //	Max Value	Limit	
lone	EST STANDARD	Signature	Frequency Range	Max Value (dBc)	Limit ≤ (dBc)	Result
Ione Configuration #	1	Signature	Range	(dBc)	≤ (dBc)	Result
tone configuration # SK, Single Channel	1 two Channel, 902.5 MHz	Signature				Result N/A
Ione Configuration # SK, Single Channel Lo Lo	1 w Channel, 902.5 MHz w Channel, 902.5 MHz	Signature	Range	 (dBc) N/A -54.74	≤ (dBc)	
Ione Configuration # SK, Single Channel Lo Lo	1 w Channel, 902.5 MHz w Channel, 902.5 MHz w Channel, 902.5 MHz	Signature	Range Fundamental 30 MHz - 12 GHz 12 GHz - 25 GHz	 (dBc) N/A -54.74 -50.89	≤ (dBc) N/A -20 -20	N/A Pass Pass
one onfiguration # SK, Single Channel Lo Lo Mi	1 w Channel, 902.5 MHz w Channel, 902.5 MHz w Channel, 902.5 MHz d Channel, 915 MHz	Signature	Range Fundamental 30 MHz - 12 GHz 12 GHz - 25 GHz Fundamental	 (dBc) N/A -54.74 -50.89 N/A	≤ (dBc) N/A -20	N/A Pass Pass N/A
ione configuration # SK, Single Channel Lo Lo Mii Mi	1 w Channel, 902.5 MHz w Channel, 902.5 MHz id Channel, 915 MHz id Channel, 915 MHz	Signature	Range Fundamental 30 MHz - 12 GHz 12 GHz - 25 GHz Fundamental 30 MHz - 12 GHz	 (dBc) N/A -54.74 -50.89 N/A -58.15	≤ (dBc) N/A -20 -20	N/A Pass Pass N/A Pass
ione configuration # SK, Single Channel Lo Lo Mii Mi	1 w Channel, 902.5 MHz w Channel, 902.5 MHz w Channel, 902.5 MHz d Channel, 915 MHz	Signature	Range Fundamental 30 MHz - 12 GHz 12 GHz - 25 GHz Fundamental	(dBc) N/A -54.74 -50.89 N/A	≤ (dBc) N/A -20 -20 N/A	N/A Pass Pass N/A
one onfiguration # SK, Single Channel Lo Lo Lo Mii Mii Mii	1 w Channel, 902.5 MHz w Channel, 902.5 MHz id Channel, 915 MHz id Channel, 915 MHz	Signature	Range Fundamental 30 MHz - 12 GHz 12 GHz - 25 GHz Fundamental 30 MHz - 12 GHz	(dBc) N/A -54.74 -50.89 N/A -58.15	≤ (dBc) N/A -20 -20 N/A -20	N/A Pass Pass N/A Pass
ione configuration # SK, Single Channel Lo Lo Lo Mii Mii Hit	1 w Channel, 902.5 MHz w Channel, 902.5 MHz w Channel, 915 MHz id Channel, 915 MHz id Channel, 915 MHz	Signature	Range Fundamental 30 MHz - 12 GHz 12 GHz - 25 GHz Fundamental 30 MHz - 12 GHz 12 GHz - 25 GHz	(dBc) N/A -54.74 -50.89 N/A -58.15 -50.09	≤ (dBc) N/A -20 -20 N/A -20 -20 -20	N/A Pass Pass N/A Pass Pass



TbtTx 2017.12.14 XMit 2017.12.13

	Frequency Range			Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental			N/A	<u>S (UBC)</u> N/A	N/A
	rundamentar			19/75	N/A	N/A
📜 Keysight Spectrum A	nalyzer - Element Materials Technolo	ypy				
	50 Ω AC		SENSE:INT	ALIGN OFF #Avg Type:		04:14:51 AM Jan 23, 2018
		PNO: Wide 🖵 FGain:Low	Trig: Free Run #Atten: 10 dB	#Avg Type:	Log-Pwr	TRACE 1 2 3 4 5 6 TYPE M WWWW DET PPPPP
10 dB/div Ref	Offset 37.63 dB 33.00 dBm					Mkr1 310.8 µs 28.070 dBm
Log		1				
23.0						
13.0						
3.00						
-7.00						
-17.0						
-17.0						
-27.0						
-37.0						
-47 በ						
-47.0						
-57.0						
Center 902.500	0000 MHz					Span 0 Hz
Res BW 100 kl	Hz	#VB\	N 300 kHz		Sweep	1.092 ms (8192 pts)
MSG				STATUS		
		FSK, Single C	hannel, Low Ch	nannel, 902.5 MHz		
	Frequency			Max Value	Limit	
	Range			(dBc)	<u>≤ (dBc)</u>	Result
l	30 MHz - 12 GHz			-54.74	-20	Pass

RL	RF 50 Ω A	(C		SENSE:INT	<u>^</u> A	LIGN OFF	_		3 AM Jan 23, 2018
			PNO: Fast 🖵 Gain:Low	Trig: Free I #Atten: 10		#Avg Type:	Log-Pwr	TF	ACE 1 2 3 4 5 TYPE MWWW DET PPPPP
0 dB/div	Ref Offset 37.63 Ref 33.00 dBi	dB M						Mkr1 2.4 -20	63 2 GH 6.67 dBn
°g									
3.0									
3.0									
.00									
00									
7.0		. 1							
7.0		<u> </u>							
7.0	الإيارانية والمراجع والمراجع	وينابغ أنجر ومخالبا أوليه	أالصدوللعل وبالمليد أواالجوا	The second s			1		at a subs
7.0									
7.0									
tart 0.03 Res BW			#VB	W 300 kHz			Sweep	Stop ' 39.32 ms	12.000 GH
G						STATUS			



XMit 2017.12.13

TbtTx 2017.12.14

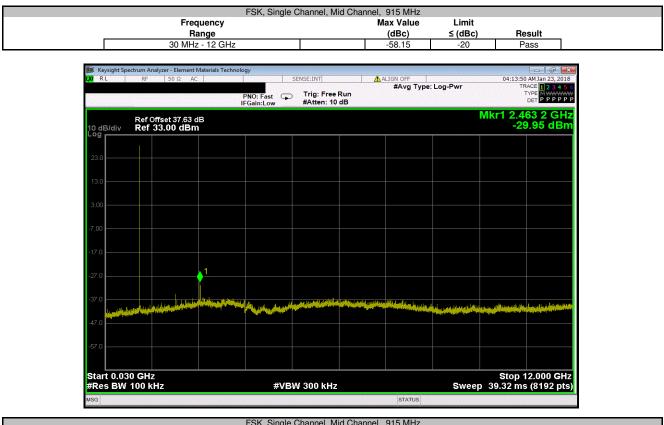
FSK, Single Channel, Low Channel, 902.5 MHz Frequency Max Value Limit Range 12 GHz - 25 GHz (dBc) ≤ (dBc) Result -50.89 -20 Pass ment Materials Tech 04:15:35 AM Jan 23, 2018 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P P P P P P Keysight GN OFF #Avg Type: Log-Pwr ALI PNO: Fast Trig: Free Run IFGain:Low #Atten: 10 dB Mkr1 24.958 7 GHz -22.82 dBm Ref Offset 37.63 dB Ref 33.00 dBm 10 dB/div Log the week Stop 25.000 GHz Sweep 42.59 ms (8192 pts) Start 12.000 GHz #Res BW 100 kHz #VBW 300 kHz STATUS

	FSK, Single C	hannel, Mid Char	nnel, 915 MHz		
Frequency			Max Value	Limit	
Range			(dBc)	≤ (dBc)	Result
Fundamental			N/A	N/A	N/A

	ENSE:INT	ALIGN OFF			2 AM Jan 23, 2018
PNO: Wide 🖵 IFGain:Low	Trig: Free Run #Atten: 10 dB	#Avg Type	: Log-Pwr	T	RACE 1 2 3 4 5 TYPE MWWW DET PPPPP
				Mkr1 28.	971.1 μ 199 dBn
				•	1
#VBV	V 300 kHz		Sweep	0 1.092 mg	Span 0 H s (8192 pts
	IFGain:Low		PN0: Wide #Atten: 10 dB	PNO: Wide Free Run #Atten: 10 dB	PN0: Wide IFGein:Low Trig: Free Run #Atten: 10 dB



TbtTx 2017.12.14 XMit 2017.12.13



FSK, Single C	hannel, Mid Channel, 915 MHz		
Frequency	Max Value	Limit	
Range	(dBc)	≤ (dBc)	Result
12 GHz - 25 GHz	-50.09	-20	Pass





FSK, Single Channel, High Channel, 927.5 MHz Frequency Max Value Limit Range (dBc) ≤ (dBc) Result Fundamental N/A N/A N/A 04:10:47 AM Jan 23, 2018 RL ALI TRACE 1 2 3 4 5 6 TYPE M WWWW DET P P P P P #Avg Type: Log-Pwr PNO: Wide Trig: Free Run IFGain:Low #Atten: 10 dB Mkr1 651.6 μs 28.121 dBm Ref Offset 37.63 dB Ref 33.00 dBm 10 dB/div Center 927.500000 MHz Res BW 100 kHz Span 0 Hz Sweep 1.092 ms (8192 pts) #VBW 300 kHz STATUS FSK, Single Channel, High Channel, 927.5 MHz Frequency Max Value Limit (dBc) ≤ (dBc) Range Result 30 MHz - 12 GHz -56.77 -20 Pass





