

TR3882-Antenna

Equipment Under Test:	Polaris Ride Command
Requirement(s):	eCFR 47 Part 15.247 RSS-247
Test Date(s):	07/08/2025-09/05/2025
Prepared for:	Polaris Industries Inc. Attn: Laura Zehnder 2100 Highway 55 Medina, MN 55340

Report Issued by: Dylan Rosenfeldt, EMC Engineer	
Signature: 	Date: 11/21/2025
Report Reviewed by: Adam Alger, Sr. Manager EMC Laboratory	
Signature: 	Date: 09/26/2025
Report Constructed by: Dylan Rosenfeldt, EMC Engineer	
Signature: 	Date: 09/24/2025

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Company: Polaris Industries Inc.	Page 1 of 22	Name: Polaris Ride Command
Report: TR3882-Antenna		Model: RCIP-1040
Quote: NBO-01-2024-006931		Serial: Conducted Sample 1&2, Radiated Sample 1 & 2

CONTENTS

Contents.....	2
Ezurio Test Services in Review	3
1 Test Report Summary	4
2 Client Information.....	5
2.1 Equipment Under Test (EUT) Information.....	5
2.2 Product Description.....	5
2.3 Modifications Incorporated for Compliance	5
2.4 Deviations and Exclusions from Test Specifications.....	5
2.5 EUT Information	6
2.6 Test Channels - BLE.....	6
2.7 Test Channels – Bluetooth Classic (Infineon)	6
2.8 Test Channels – Bluetooth Classic (Murata).....	6
2.9 Test Channels – WLAN.....	6
2.10 Power Table and Reduced Video Bandwidth for Average Measurements	7
3 References	8
4 Uncertainty Summary	9
5 Test Data	10
5.1 Antenna Port Conducted Emissions	10
5.2 Radiated Emissions.....	18
6 Revision History	22

Ezurio Test Services in Review

The Ezurio laboratory located at W66 N220 Commerce Court Cedarburg, Wisconsin, 53012 USA is recognized through the following organizations:



A2LA – American Association for Laboratory Accreditation

Accreditation based on ISO/IEC 17025:2017 with Electrical (EMC) Scope

A2LA Certificate Number: 1255.01

Scope of accreditation includes all test methods listed herein unless otherwise noted



Federal Communications Commission (FCC) – USA

Accredited Test Firm Registration Number: 953492

Recognition of two 3 meter Semi-Anechoic Chambers



Innovation, Science and Economic Development Canada

Accredited U.S. Identification Number: US0218

Recognition of two 3 meter Semi-Anechoic Chambers

Company: Polaris Industries Inc.	Page 3 of 22	Name: Polaris Ride Command
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1 TEST REPORT SUMMARY

During **07/08/2025-09/05/2025** the Equipment Under Test (EUT), **Polaris Ride Command**, as provided by **Polaris Industries Inc.**, was tested to the following requirements:

FCC 15.247 | RSS-247

Requirements	Description	Method	Compliant
15.247 RSS-247	Radiated Field Strength Measurement for determining antenna gain	ANSI C63.10	Yes
15.247(b)(3) RSS-247 Clause 5.4 (d)	RF Output Power	ANSI C63.10	Yes

Notice:

The results relate only to the item tested as configured and described in this report. Any additional configurations, modes of operation, or modifications made to the equipment under test after the specified test date(s) are at the decision of the client and may not apply to the data seen in this test report.

The decision rule for Pass / Fail assessment to the specification or standard listed in this test report has been agreed upon by the client and laboratory to be as follows:

Measurement Type	Rule
Emissions – Amplitude	1.0 dB below specified limit
Emissions – Frequency	1% less than the specification
Immunity	Tested at specified level

2 CLIENT INFORMATION

Company Name	Polaris Industries Inc.
Contact Person	Laura Zehnder
Address	2100 Highway 55 Medina, MN 55340

2.1 Equipment Under Test (EUT) Information

The following information has been supplied by the client

Product Name	Polaris Ride Command
Model Number	RCIP-1040
Serial Number	Conducted Sample 1 & 2, Radiated Sample 1 & 2
FCC ID	2A0W7-RCIP-1040V1
IC ID	5966A-RCIP1040V1
Modules	Murata LBEE6ZZ1ZD – WLAN, Murata Bluetooth Classic Infineon CYW89072BRFB5GT – Infineon Bluetooth Classic and BLE

2.2 Product Description

The Polaris Ride Command RCIP-1040 is an infotainment display. The display supports AM/FM/WB radio, Bluetooth connectivity, Wi-Fi connectivity, vehicle health/performance information, buddy tracking system [V2V] using LoRa Technology, GPS, maps, and camera output.

2.3 Modifications Incorporated for Compliance

None noted at time of test

2.4 Deviations and Exclusions from Test Specifications

None noted at time of test

2.5 EUT Information

Power Supply – 12V Automotive Battery or 13V supplied via Variable Power Supply

Firmware - Compliance HMI v1.5.1 & v1.7.0

Ancillary Equipment

HP Elitebook 840G1

2.6 Test Channels - BLE

Channel	Frequency (MHz)	Data Rates
0	2402	1M
19	2440	
39	2480	

2.7 Test Channels – Bluetooth Classic (Infineon)

Channel	Frequency (MHz)	Data Rates
0	2402	1Mbps, 2Mbps, 3Mbps
39	2441	
78	2480	

2.8 Test Channels – Bluetooth Classic (Murata)

Channel	Frequency (MHz)	Data Rates
0	2402	1Mbps, 2Mbps, 3Mbps
39	2441	
78	2480	

2.9 Test Channels – WLAN

Channel	Frequency (MHz)	Bandwidth (MHz)	Data Rates
1	2412	20	802.11b – 1 and 11 Mbps
6	2437	20	802.11g – 6 and 54 Mbps
11	2462	20	802.11n – MCS0 and MCS7

2.10 Power Table and Reduced Video Bandwidth for Average Measurements

Mode	Data Rate	Power Setting	Minimum Average VBW (Hz)
BLE	1M	4	469
802.11b	1 Mbps	14	81
802.11b	11 Mbps	14	829
802.11g	6 Mbps	11	484
802.11g	54 Mbps	11	4032
802.11n	MCS0	10	522
802.11n	MCS7	10	4384
BTC (Infineon)	1Mbps	2	10
BTC (Infineon)	2Mbps	6	10
BTC (Infineon)	3Mbps	6	10
BTC (Murata)	1Mbps	12	10
BTC (Murata)	2Mbps	12	10
BTC (Murata)	3Mbps	12	10

3 REFERENCES

Publication	Edition	Date	AMD 1	AMD 2
FCC eCFR 47 Part 15	-	2025	-	-
ANSI C63.10	-	2020	-	-
RSS-247	3	2023	-	-

4 UNCERTAINTY SUMMARY

Using the guidance of the following publications the calculated measurement uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level, using a coverage factor of $k = 2$.

References

CISPR 16-4-1

CISPR 16-4-2

CISPR 32

ANSI C63.23

A2LA P103

A2LA P103c

ETSI TR 100-028

Measurement Type	Configuration	Uncertainty $\pm$
Radiated Emissions	Biconical Antenna	5.0 dB
Radiated Emissions	Log Periodic Antenna	5.3 dB
Radiated Emissions	Horn Antenna	4.7 dB
AC Line Conducted Emissions	Artificial Mains Network	3.4 dB
Telecom Conducted Emissions	Asymmetric Artificial Network	4.9 dB
Disturbance Power Emissions	Absorbing Clamp	4.1 dB
Radiated Immunity	3 Volts/meter	2.2 dB
Conducted Immunity	CDN/EM/BCI	2.4/3.5/3.4 dB
EFT Burst/Surge	Peak pulse voltage	164 volts
ESD Immunity	15 kV level	1377 Volts

Parameter	ETSI U.C. $\pm$	U.C. $\pm$
Radio Frequency, from F0	1×10^{-7}	0.55×10^{-7}
Occupied Channel Bandwidth	5 %	2 %
RF conducted Power (Power Meter)	1.5 dB	1.2 dB
RF conducted emissions (Spectrum Analyzer)	3.0 dB	1.7 dB
All emissions, radiated	6.0 dB	5.3 dB
Temperature	1° C	0.65° C
Humidity	5 %	2.9 %
Supply voltages	3 %	1 %

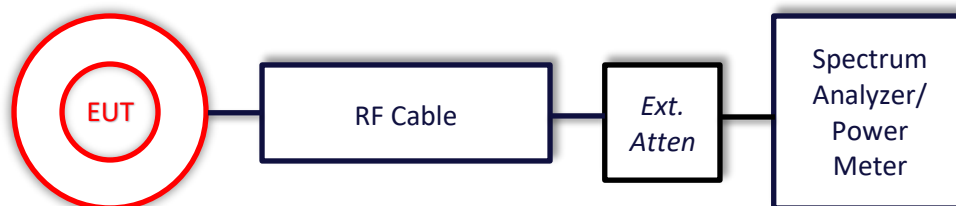
Company: Polaris Industries Inc.	Page 9 of 22	Name: Polaris Ride Command
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5 TEST DATA

5.1 Antenna Port Conducted Emissions

Description of Measurement	The direct measurement of emissions at the antenna port of the EUT is achieved by use of a RF connection to a spectrum analyzer or power meter. The cable and attenuator factors are loaded into the analyzer or power meter allowing for direct measurement readings without the need for further corrections.
Example Calculations	Measurement (dBm) + Cable factor (dB) + External Attenuator (dB) = Corrected Reading (dBm) Margin (dB) = Limit (dBm) – Corrected Reading (dBm)

Block Diagram



5.1.1 RF Output Power – BLE

Operator	Dylan Rosenfeldt	QA	Jon Dilley
Temperature	22.8°C	R.H. %	55.8%
Test Date	9/3/2025	Location	Conducted RF Bench
Requirement	15.247 (b)(3) RSS-247 Clause 5.4 (d)	Method	ANSI C63.10 11.9.1.1

Limit: The maximum peak conducted output power of the intentional radiator shall not exceed 1 Watt.

Test Parameters

Frequency	2400-2483.5 MHz	Setup	Antenna Port
RBW	3MHz	VBW	50MHz
Detector(s)	Peak	Settings	Max Hold

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960172	Cable	A.H. Systems, Inc.	SAC-26G-1	387	1/28/2025	1/28/2026	Active Verification
EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	6/1/2025	6/1/2026	Active Calibration

EUT Parameters

Input Power	12VDC	Mode	BLE Tx
Frequency	2400-2483.5 MHz	Channel	See 2.6

Tables

Mode	Rate	Channel	Peak Output Power (dBm)	Limit (dBm)	Margin (dB)	Power Setting
BLE	1M	1	1.2	30	28.8	4
		6	2.5	30	27.5	4
		11	3.0	30	27.0	4

5.1.2 RF Output Power – WLAN

Operator	Anthony Smith, Dylan Rosenfeldt	QA	Dylan Rosenfeldt, Anthony Smith
Temperature	22.0°C, 22.7°C	R.H. %	49.1%, 54.8%
Test Date	7/14/2025, 8/21/2025	Location	RF Bench
Requirement	15.247 (b)(3) RSS-247 Clause 5.4 (d)	Method	ANSI C63.10 11.9.2.2.4 AVGSA-2

Limit: The maximum peak conducted output power of the intentional radiator shall not exceed 1 Watt.

Test Parameters

Frequency	2400-2483.5 MHz	Setup	Antenna Port
RBW	300 kHz	VBW	1.0 MHz
Detector(s)	RMS	Settings	Trace Average Span: 30 MHz
Example Calculations	Average Output Power = Measured Power + 10*log(1/D) where D is the duty cycle.		

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960172	Cable	A.H. Systems, Inc.	SAC-26G-1	387	1/28/2025	1/28/2026	Active Verification
EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	6/1/2025	6/1/2026	Active Calibration

EUT Parameters

Input Power	120 VAC @ 60 Hz	Mode	2.4 GHz WLAN Tx
Frequency	2400-2483.5 MHz	Channel	See 2.9

Tables

Channel	Mode	Avg Measured Output Power (dBm)	Duty Cycle Correction (dB)	Corrected Avg Output Power (dBm)	Limit (dBm)	Margin (dB)	Power Setting
1	802.11b 1M	13.1	0.0	13.1	30	16.9	14
6	802.11b 1M	13.4	0.0	13.4	30	16.6	14
11	802.11b 1M	13.5	0.0	13.5	30	16.5	14
1	802.11b 11M	12.9	0.1	13.0	30	17.0	14
6	802.11b 11M	13.3	0.1	13.4	30	16.6	14
11	802.11b 11M	13.3	0.1	13.4	30	16.6	14
1	802.11g 6M	10.4	0.0	10.4	30	19.6	11
6	802.11g 6M	10.5	0.0	10.5	30	19.5	11
11	802.11g 6M	10.5	0.0	10.5	30	19.5	11
1	802.11g 54M	9.6	0.4	10.0	30	20.0	11
6	802.11g 54M	9.7	0.4	10.1	30	19.9	11
11	802.11g 54M	9.7	0.4	10.1	30	19.9	11
1	802.11n MCS0	9.5	0.1	9.6	30	20.4	10
6	802.11n MCS0	9.6	0.1	9.7	30	20.3	10
11	802.11n MCS0	9.6	0.1	9.7	30	20.3	10
1	802.11n MCS7	8.7	0.4	9.1	30	20.9	10
6	802.11n MCS7	8.9	0.4	9.3	30	20.7	10
11	802.11n MCS7	9.0	0.4	9.4	30	20.6	10

5.1.3 RF Output Power – BTC Infineon

Operator	Dylan Rosenfeldt	QA	Jon Dilley
Temperature	23.2°C	R.H. %	47.80%
Test Date	7/8/2025	Location	Conducted RF Bench
Requirement	15.247 (b)(2) RSS-247 6.2.2.2	Method	ANSI C63.10 7.8.5

Limit: The maximum peak conducted output power of the intentional radiator shall not exceed 1 Watt.

Test Parameters

Frequency	2400-2483.5 MHz	Setup	Antenna Port
RBW	3MHz	VBW	3MHz
Detector(s)	Peak	Settings	Max Hold

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960172	Cable	A.H. Systems, Inc.	SAC-26G-1	387	1/28/2025	1/28/2026	Active Verification
EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	6/1/2025	6/1/2026	Active Calibration

EUT Parameters

Input Power	12VDC	Mode	BTC Tx
Frequency	2400-2483.5 MHz	Channel	See 2.7

Tables

Channel	Mode	Pk Output Power (dBm)	Limit (dBm)	Margin (dB)	Power Setting
0	BR	-0.8	30	30.8	2
0	EDR2	1.4	30	28.6	6
0	EDR3	1.9	30	28.1	6
39	BR	-0.3	30	30.3	2
39	EDR2	1.8	30	28.2	6
39	EDR3	2.3	30	27.7	6
78	BR	-0.7	30	30.7	2
78	EDR2	1.4	30	28.6	6
78	EDR3	1.8	30	28.2	6

5.1.4 RF Output Power – BTC Murata

Operator	Dylan Rosenfeldt	QA	Jon Dilley
Temperature	23.2°C	R.H. %	47.80%
Test Date	7/8/2025	Location	Conducted RF Bench
Requirement	15.247 (b)(2) RSS-247 6.2.2.2	Method	ANSI C63.10 7.8.5

Limit: The maximum peak conducted output power of the intentional radiator shall not exceed 1 Watt.

Test Parameters

Frequency	2400-2483.5 MHz	Setup	Antenna Port
RBW	3MHz	VBW	3MHz
Detector(s)	Peak	Settings	Max Hold

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960172	Cable	A.H. Systems, Inc.	SAC-26G-1	387	1/28/2025	1/28/2026	Active Verification
EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	6/1/2025	6/1/2026	Active Calibration

EUT Parameters

Input Power	12VDC	Mode	BTC Tx
Frequency	2400-2483.5 MHz	Channel	See 2.7

Tables

Channel	Mode	Pk Output Power (dBm)	Limit (dBm)	Margin (dB)	Power Setting
0	BR	0.0	30	30.0	12
0	EDR2	2.8	30	27.2	12
0	EDR3	3.2	30	26.8	12
39	BR	0.1	30	29.9	12
39	EDR2	2.8	30	27.2	12
39	EDR3	3.2	30	26.8	12
78	BR	0.4	30	29.6	12
78	EDR2	2.9	30	27.1	12
78	EDR3	3.3	30	26.7	12

5.2 Radiated Emissions

Description of Measurement	The frequency spectrum is investigated for intentional and / or unintentional signals emanating from the EUT by use of a standardized test site and measurement antenna. The antenna, cable, pre-amp, and other necessary measurement system correction factors are loaded onto the EMI receiver / spectrum analyzer when the measurements are performed allowing the data to be gathered and reported as corrected values. The maximum emissions from the EUT are determined by turn-table azimuth rotation (360°) and scanning of the measurement antenna. Maximized levels are noted at degree values of azimuth, measurement antenna height, and measurement antenna polarity.
Example Calculations	Measurement (dBμV) + Cable factor (dB) + Other (dB) + Antenna Factor (dB/m) = Corrected Reading (dBμV/m) Margin (dB) = Limit (dBμV/m) - Corrected Reading (dBμV/m) Example at 4000 MHz: Reading = 40 dBμV + 3.4 dB + 0.9 dB + 6.5 dB/m = 50.8 dBμV/m Average Limit = 20 log (500) = 54 dBμV/m Margin = 54 dBμV/m - 50.8 dBμV/m = 3.2 dB

Block Diagram



5.2.1 Antenna Gain

Operator	Dylan Rosenfeldt	QA	Mitchell Freund
Temperature	23.8°C	R.H. %	42.60%
Test Date	9/5/2025	Location	Chamber 5
Requirement	15.247 RSS-247	Method	ANSI C63.10

Test Parameters

Frequency	30-25000 MHz	Distance	3 m
Detector(s)	Peak – BTC & BLE RMS Average – WLAN	Table height	150 cm
RBW	3MHz – BTC & BLE 300kHz – WLAN	VBW	50MHz– BTC & BLE 1MHz – WLAN

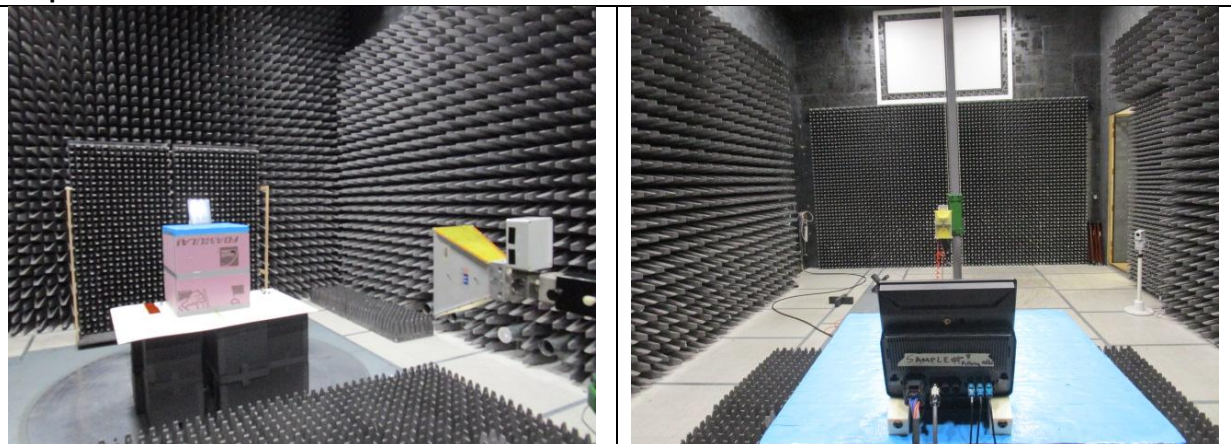
Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960081	Antenna - Double Ridge Horn	EMCO	3115	6907	1/8/2025	1/8/2026	Active Calibration
LSC-500	Cable	Chamber 5 Emissions	-	-	1/27/2025	1/27/2026	Active Verification
EE 960085	Analyzer - EMI Receiver	Agilent	N9038A	MY51210148	4/3/2025	4/3/2026	Active Calibration

EUT Parameters

Input Power	13VDC	Mode	Tx
AE	Cameras, AM/FM Antenna, USB cable	Channels	See 2.6-2.10
Notes	Cameras not connected during testing, power supplied by variable DC supply		

Setup Photos



Semi-Anechoic Chamber with RF Absorbers on the RGP

Maximum Radiated Field Strength Table – Infineon BLE

Channel	Mode	Pk Output Power (dBuV/m)	Power Setting
0	1M	101.6	4
19	1M	103.3	4
39	1M	105.6	4

Antenna Gain Table – Infineon BTC & BLE

Channel	Mode	Radiated Pk Output Power (dBuV/m)	Conducted Pk Output Power (dBm)	Antenna Gain (dBi)
0	1M	101.6	1.2	5.2
19	1M	103.3	2.5	5.6
39	1M	105.6	3.0	7.4

Maximum Radiated Field Strength Table – Murata BTC

Channel	Mode	Pk Output Power (dBuV/m)	Power Setting
0	BR	99.9	12
39	BR	99.0	12
78	BR	100.1	12

Antenna Gain Table – Murata BTC

Channel	Mode	Radiated Pk Output Power (dBuV/m)	Conducted Pk Output Power (dBm)	Antenna Gain (dBi)
0	BR	99.9	0.0	4.7
39	BR	99.0	0.1	3.7
78	BR	100.1	0.4	4.5

Maximum Radiated Field Strength Table – WLAN

Channel	Mode	Pk Output Power (dBuV/m)	Power Setting
1	802.11b 1Mbps	113.0	14
6	802.11b 1Mbps	111.3	14
11	802.11b 1Mbps	113.2	14

Antenna Gain Table – WLAN

Channel	Mode	Radiated Pk Output Power (dBuV/m)	Conducted Pk Output Power (dBm)	Antenna Gain (dBi)
1	802.11b 1Mbps	113.0	13.1	4.7
6	802.11b 1Mbps	111.3	13.4	2.7
11	802.11b 1Mbps	113.2	13.5	4.5

Example Calculation:

Antenna Gain (dBi) = Radiated Field Strength (dBμV/m @ 3m) – [Output Power (dBm) + 95.2 (conversion to dBμV/m @ 3m)]

6 REVISION HISTORY

Version	Date	Notes	Person
0	9/24/2025	Initial Draft	Dylan Rosenfeldt
1	9/29/2025	Final Draft	Dylan Rosenfeldt
2	10/15/2025	Added Radiated Emissions Pictures and updated Example Calculation	Dylan Rosenfeldt
3	11/21/2025	Updated Customer Address and added modules to section 2	Dylan Rosenfeldt

END OF REPORT