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DATE: 19 November 2013

I.T.L. (PRODUCT TESTING) LTD.

FCC Radio Test Report

for

Cardo Peripheral Systems

Equipment under test:

Rider Communication System

Cardo SHO-1
2.4 GHz Bluetooth

Written by: _____
R. Pinchuck, Documentation

Approved by: _____
A. Sharabi, Test Engineer

Approved by: _____
I. Raz, EMC Laboratory Manager

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Measurement/Technical Report for
Cardo Peripheral Systems

Rider Communication System

Cardo SHO-1

FCC ID: Q95ER17

IC ID: 4668A-ER17

This report concerns:	Original Grant:	X
	Class I Change:	
	Class II Change:	
Equipment type:	Spread Spectrum Transmitter	
Limits used:	47CFR15 Section 15.247	

Measurement procedure used is Public Notice: DA 00-705 Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems and ANSI C63.4-2003.

Application for Certification
prepared by:
R. Pinchuck
ITL (Product Testing) Ltd.
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Lod 7116002
Israel
e-mail Rpinchuck@itl.co.il

Applicant for this device:
(different from "prepared by")
Avi Moato
Cardo Peripheral Systems
13 Hamifal St.,
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Tel: +972-3-735-3111
Fax: +972-3562-3360
e-mail: moato@cardosystems.com

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1. General Information

1.1 Administrative Information

Manufacturer:	Cardo Peripheral Systems
Manufacturer's Address:	13 Hamifal St., Or Yehuda, 60221 Israel Tel: +972-3-735-3111 Fax: +972-3562-3360
Manufacturer's Representative:	Avi Moato
Equipment Under Test (E.U.T):	Rider Communication System
Equipment Model No.:	Cardo SHO-1
Equipment Serial No.:	Not Designated
Date of Receipt of E.U.T:	09.09.13
Start of Test:	09.09.13
End of Test:	09.10.13
Test Laboratory Location:	I.T.L (Product Testing) Ltd. Kfar Bin Nun, ISRAEL 99780
Test Specifications:	FCC Part 15 Sub-Part C RSS-210, Issue 8, 2010

1.2 List of Accreditations

The EMC laboratory of I.T.L. is accredited by the following bodies:

1. The American Association for Laboratory Accreditation (A2LA) (U.S.A.), Certificate No. 1152.01.
2. The Federal Communications Commission (FCC) (U.S.A.), Registration No. 90715.
3. The Israel Ministry of the Environment (Israel), Registration No. 1104/01.
4. The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) (Japan), Registration Numbers: C-1350, R-1285.
5. Industry Canada (Canada), IC File No.: 46405-4025; Site No. IC 4025B-1.

I.T.L. Product Testing Ltd. is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this test report have been determined in accordance with I.T.L.'s terms of accreditation unless stated otherwise in the report.

1.3 Product Description

The Cardo SHO-1 was custom-designed to offer SHOEI enthusiasts a communication system that meets the highest standards.
Just like your trusted SHOEI helmet, the new Cardo SHO-1 is an extraordinary piece of equipment. With its unique and patented modular architecture, the SHO-1 integrates seamlessly with the SHOEI helmet design(1) .On the inside, the SHO-1 houses the most advanced communication technology, including an unmatched plethora of features and functions. On the outside, it offers a streamlined and discreet appearance, including a replaceable battery for those extra-long-riding tours.
SHOEI riders will appreciate the voice-controlled operation of the cardo SHO-1. Not only will their hands remain on the handlebar for extra safety, but using the system also means natural and intuitive operation of this extremely feature-rich device. Among others, the Cardo SHO-1 offers voice controlled intercom calls with up to 8 additional riders or 4-Way intercom conferencing within a 1.6 km(2) range.
And there is more: Riders can connect two mobile phones simultaneously and talk hands-free. Streaming stereo music from any *Bluetooth*® enabled smartphone or MP3 player is a breeze and so is the ability to receive in-the-ear navigation instructions from your GPS. With the built-in FM radio, you can also stay up-to-date with the latest traffic and weather reports from local radio stations.
The unique Cardo Community® web platform allows riders to invite fellow bikers for a ride, plan and join tours, and personalize the device settings to get the most out of your riding experience. When on the road, you can use Cardo's exclusive SmartSet Android™ app (available free via Google Play(3)) to easily modify your SHO-1 settings from any *Bluetooth*® enabled Android device.
Lastly, the Cardo SHO-1's upgradable software(4) will ensure you remain at the forefront of technology.

1.4 Test Methodology

Both conducted and radiated testing was performed according to the procedures in Public Notice: DA 00705 Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems and ANSI C63.4: 2003. Radiated testing was performed at an antenna to EUT distance of 3 meters.

1.5 Test Facility

The radiated emissions tests were performed at I.T.L.'s testing facility at Kfar Bin-Nun, Israel. This site is a FCC listed test laboratory (FCC Registration No. 90715, date of listing September 3, 2009).
I.T.L.'s EMC Laboratory is also accredited by A2LA, certificate No. 1152.01.

1.6 Measurement Uncertainty

Radiated Emission

Radiated Emission (CISPR 11, EN 55011, CISPR 22, EN 55022, ANSI C63.4) for open site 30-1000MHz:

Expanded Uncertainty (95% Confidence, K=2):

± 4.98 dB

Note: See ITL Procedure No. PM 198.

2. System Test Configuration

2.1 Justification

Unit was tested at installation position, transmitting continuously at the low channel (2402MHz) the middle channel (2441MHz) and the higher channel (2480MHz), modulated with two types of modulations: standard BlueTooth modulation and Extended Data Rate modulation.

2.2 EUT Exercise Software

No special exercise software was used.

2.3 Special Accessories

No special accessories were needed to achieve compliance.

2.4 Equipment Modifications

No modifications were needed to achieve compliance.

2.5 Configuration of Tested System

Figure 1. Configuration of Tested System

3. Radiated Measurement Test Set-up Photo

Figure 2. Radiated Emission Test

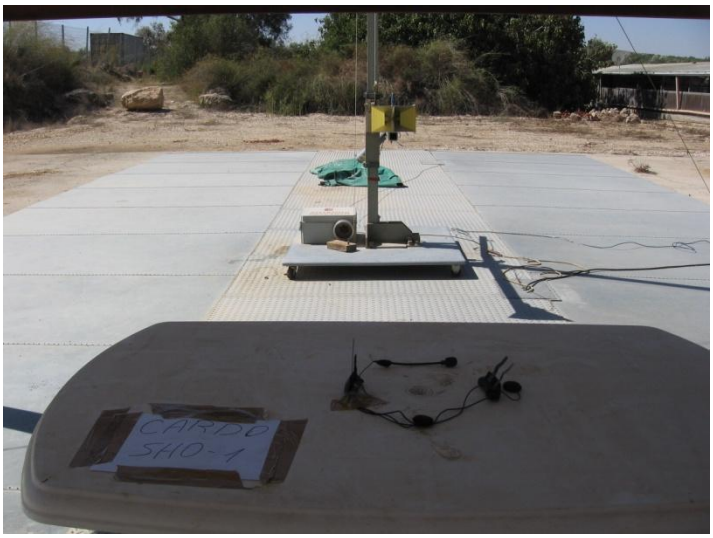

Figure 3. Radiated Emission Test

Figure 4. Radiated Emission Test

Figure 5. Radiated Emission Test

4. 6dB Minimum Bandwidth

4.1 Test Specification

F.C.C. Part 15, Subpart C: 15.247(a)(2)

4.2 Test procedure

The E.U.T was placed on a non-metallic table, 0.8 meters above the ground plane, on a remote-controlled turntable in the OATS. The test distance was 3 meters. The transmitter unit operated with normal modulation. The EMI receiver was set to 100 kHz resolution BW. The spectrum bandwidth of the transmitter unit was measured and recorded. The test was performed to measure the transmitter occupied bandwidth. The EUT was set up as shown in Figure 3, and its proper operation was checked. The transmitter occupied bandwidth was measured with the EMI receiver as frequency delta between reference points on modulation envelope. The E.U.T. was tested in three frequencies: Low, Mid and High.

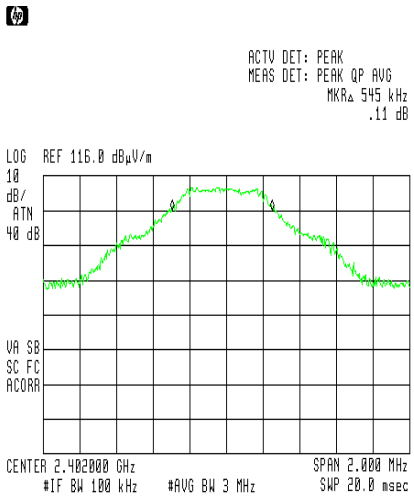

Figure 6. Low Channel , Standard Modulation

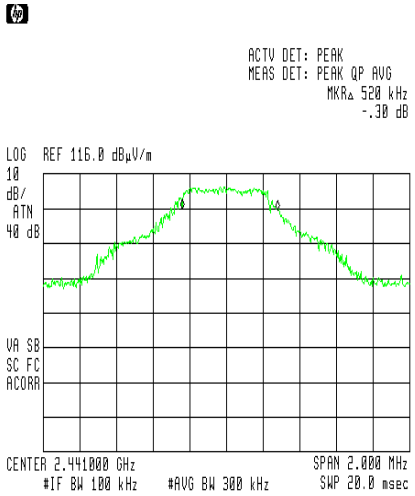

Figure 7. Mid Channel, Standard Modulation

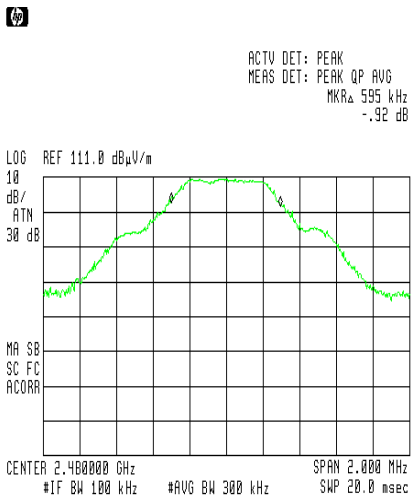

Figure 8. High Channel, Standard Modulation

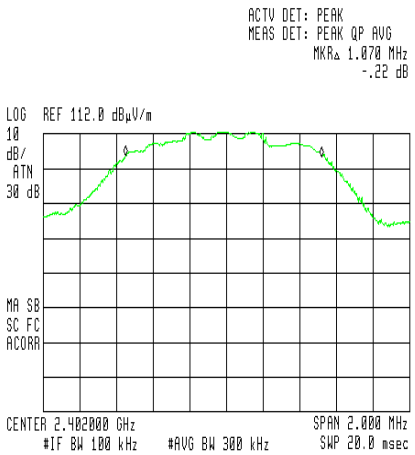

Figure 9. Low Channel , EDR Modulation

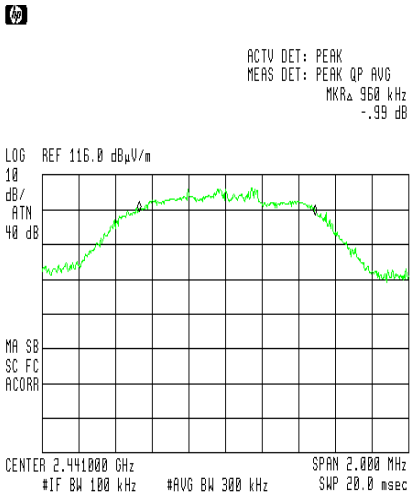

Figure 10. Mid Channel, EDR Modulation

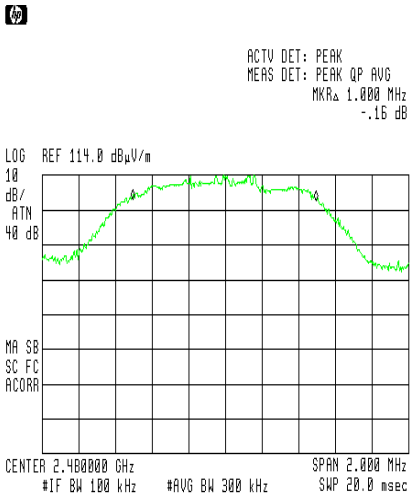

Figure 11. High Channel, EDR Modulation

4.3 Test Results

E.U.T Description: Rider Communication System
Model: Cardo SHO-1
Serial Number: Not Designated

Operation Frequency (MHz)	Modulation	Bandwidth Reading (MHz)	Specification (MHz)
Low	Standard	0.545	>0.5
Mid	Standard	0.520	>0.5
High	Standard	0.595	>0.5
Low	EDR	1.070	>0.5
Mid	EDR	0.960	>0.5
High	EDR	1.000	>0.5

Figure 12 Test Results

JUDGEMENT: Passed

TEST PERSONNEL:
Tester Signature: _____ Date: 14.01.13
Typed/Printed Name: A. Sharabi

4.4 Test Equipment Used. 6dB Bandwidth

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	February 26, 2013	1 year
RF Section	HP	85420E	3705A00248	February 26, 2013	1 year
Horn Antenna	ETS	3115	29845	March 14, 2012	2 Years
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKGC19982	N/A	N/A

Figure 13 Test Equipment Used

5. 26dB Bandwidth

5.1 Test Specification

F.C.C. Part 15, Subpart C: 15.247(a)(2)

5.2 Test procedure

The E.U.T was placed on a non-metallic table, 0.8 meters above the ground plane, on a remote-controlled turntable in the OATS. The test distance was 3 meters. The transmitter unit operated with normal modulation. The EMI receiver was set to 100 kHz resolution BW. The spectrum bandwidth of the transmitter unit was measured and recorded. The test was performed to measure the transmitter occupied bandwidth. The EUT was set up as shown in Figure 3, and its proper operation was checked. The transmitter occupied bandwidth was measured with the EMI receiver as frequency delta between reference points on modulation envelope. The E.U.T. was tested in three frequencies: Low, Mid and High

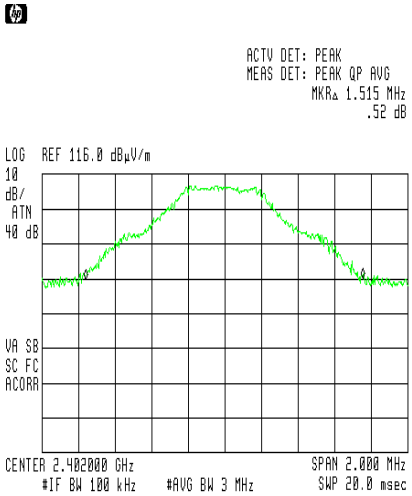

Figure 14. Low Channel , Standard Modulation

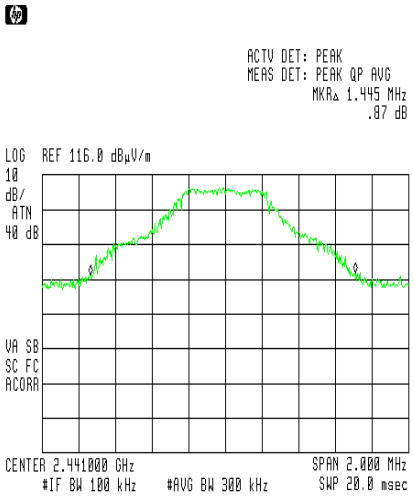

Figure 15. Mid Channel, Standard Modulation

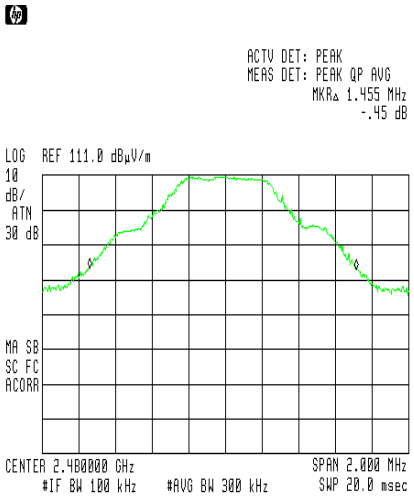

Figure 16. High Channel, Standard Modulation

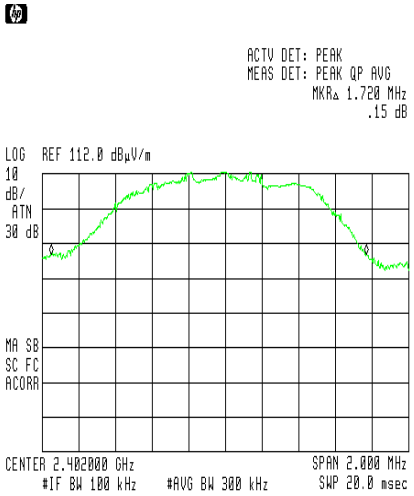

Figure 17. Low Channel , EDR Modulation

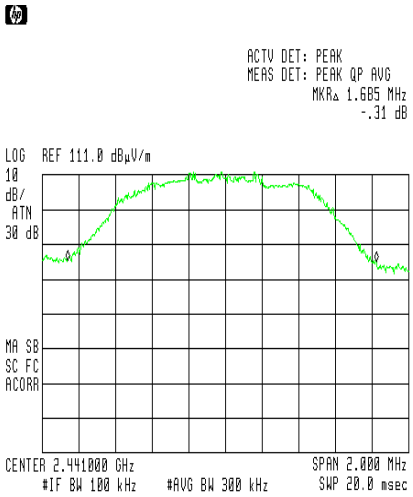

Figure 18. Mid Channel, EDR Modulation

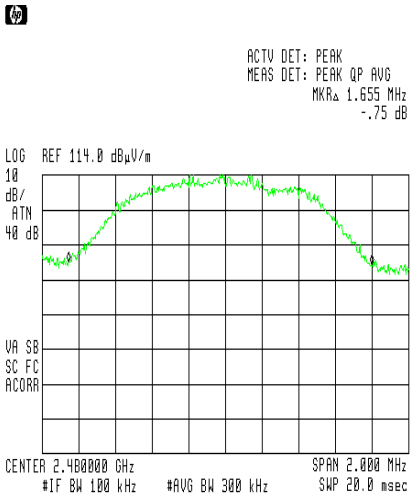

Figure 19. High Channel, EDR Modulation

5.3 Test Results

E.U.T Description: Rider Communication System
Model: Cardo SHO-1
Serial Number: Not Designated

Operation Frequency (MHz)	Modulation	Bandwidth Reading (MHz)
Low	Standard	1.515
Mid	Standard	1.445
High	Standard	1.455
Low	EDR	1.720
Mid	EDR	1.685
High	EDR	1.655

Figure 20 26 dB Minimum Bandwidth

JUDGEMENT: Passed

TEST PERSONNEL:

Tester Signature: _____ Date: 14.01.14

Typed/Printed Name: A. Sharabi

5.4 Test Equipment Used, 26 dB Bandwidth

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	February 26, 2013	1 year
RF Section	HP	85420E	3705A00248	February 26, 2013	1 year
Horn Antenna	ETS	3115	29845	March 14, 2012	2 Years
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKGC19982	N/A	N/A

Figure 21 Test Equipment Used

6. 20dB Bandwidth

6.1 Test Specification

Specification: FCC Part 15, Subpart C (15.247-a2)

6.2 Test procedure

The E.U.T was placed on a non-metallic table, 0.8 meters above the ground plane, on a remote-controlled turntable in the OATS. The test distance was 3 meters. The transmitter unit operated with normal modulation. The EMI receiver was set to 30 kHz resolution BW. The spectrum bandwidth of the transmitter unit was measured and recorded. The test was performed to measure the transmitter occupied bandwidth. The EUT was set up as shown in Figure 3, and its proper operation was checked. The transmitter occupied bandwidth was measured with the EMI receiver as frequency delta between reference points on modulation envelope. The E.U.T. was tested in three frequencies: Low, Middle and High.

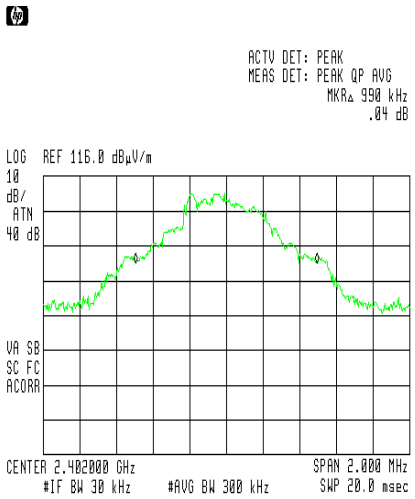

Figure 22. Low Channel , Standard Modulation

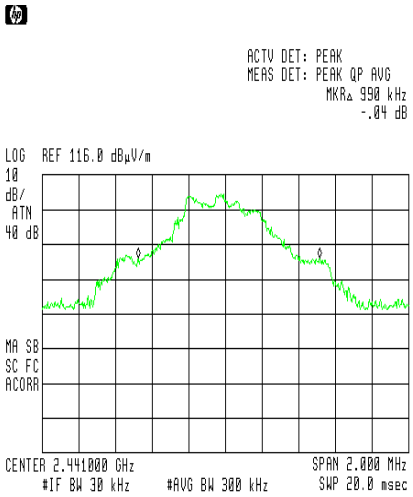

Figure 23. Mid Channel, Standard Modulation

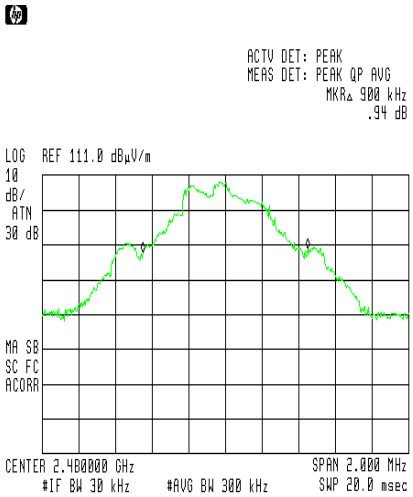

Figure 24. High Channel, Standard Modulation

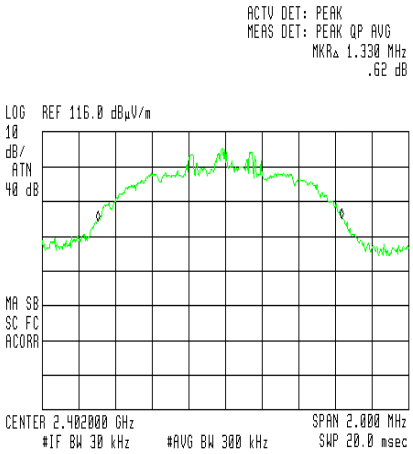

Figure 25. Low Channel , EDR Modulation

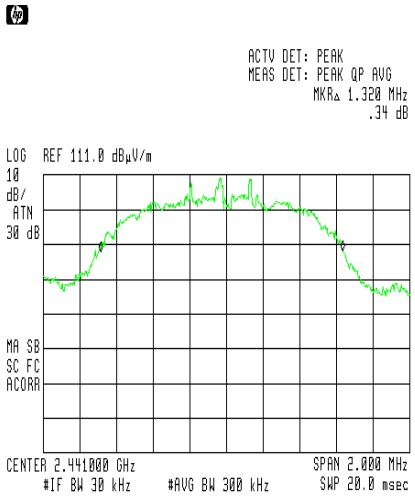

Figure 26. Mid Channel, EDR Modulation

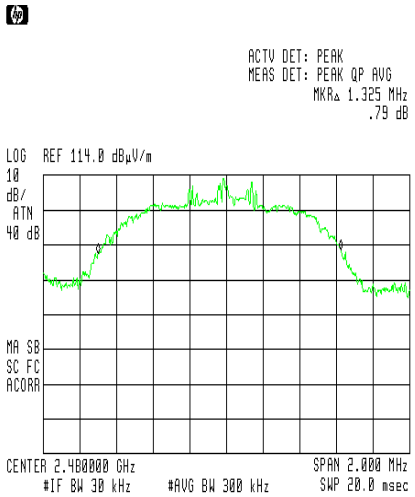

Figure 27. High Channel, EDR Modulation

6.3 Test Results

E.U.T Description: Rider Communication System
Model: Cardo SHO-1
Serial Number: Not Designated

Operation Frequency (MHz)	Modulation	Bandwidth Reading (MHz)
Low	Standard	0.99
Mid	Standard	0.99
High	Standard	0.90
Low	EDR	1.33
Mid	EDR	1.32
High	EDR	1.33

JUDGEMENT: Passed

TEST PERSONNEL:
Tester Signature: _____ Date: 14.01.14
Typed/Printed Name: A. Sharabi

6.4 Test Equipment Used.

20dB Bandwidth

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	February 26, 2013	1 year
RF Section	HP	85420E	3705A00248	February 26, 2013	1 year
Horn Antenna	ETS	3115	29845	March 14, 2012	2 Years
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKGC19982	N/A	N/A

Figure 28 Test Equipment Used

7. Number of Hopping Frequencies Section 15.247(a)(1)(iii)

7.1 Test Specification

F.C.C., Part 15, Subpart C

7.2 Test Procedure

The E.U.T. was set to hopping mode.
The spectrum analyzer was set to the following parameters:

Span: Every 40 MHz Frequency
Band of Operation: 2402-2481 MHz
RBW: 30kHz
VBW: 300kHz
Detector Function: Peak
Trace: Maximum Hold

The number of hopping frequencies is 79 (See plots).

Number of Hopping Frequencies

E.U.T Description	Rider Communication System
Type	Cardo SHO-1
Serial Number:	Not Designated

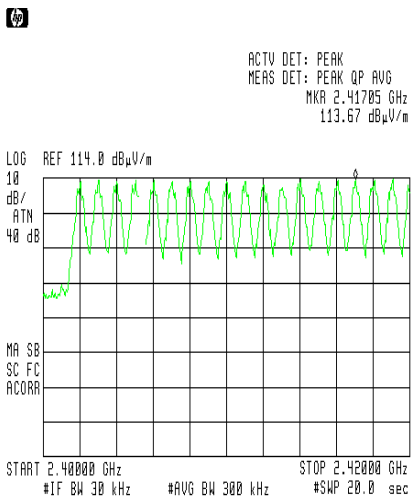

Figure 29. Frequency Hopping, Standard modulation

Number of Hopping Frequencies

E.U.T Description	Rider Communication System
Type	Cardo SHO-1
Serial Number:	Not Designated

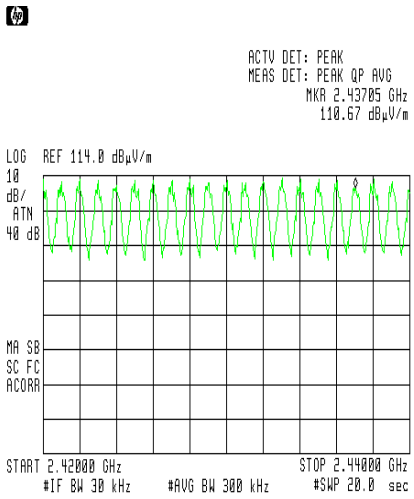

Figure 30. Frequency Hopping, Standard modulation

Number of Hopping Frequencies

E.U.T Description	Rider Communication System
Type	Cardo SHO-1
Serial Number:	Not Designated

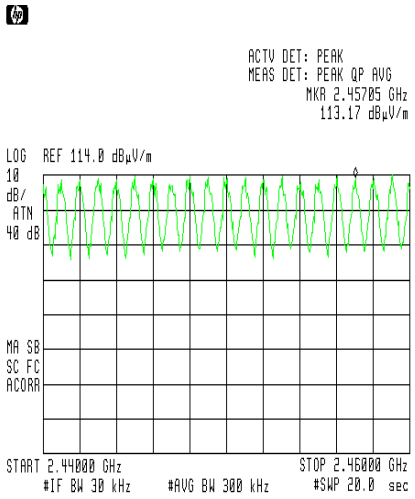

Figure 31. Frequency Hopping, Standard modulation

Number of Hopping Frequencies

E.U.T Description	Rider Communication System
Type	Cardo SHO-1
Serial Number:	Not Designated

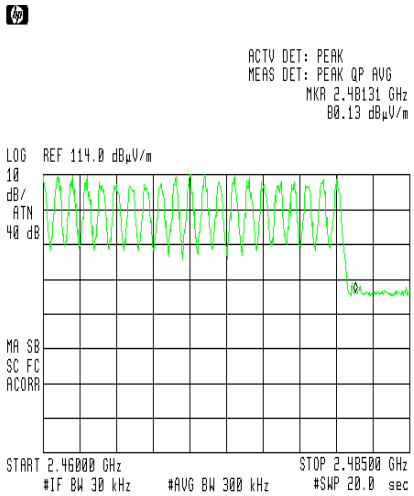

Figure 32. Frequency Hopping, Standard modulation

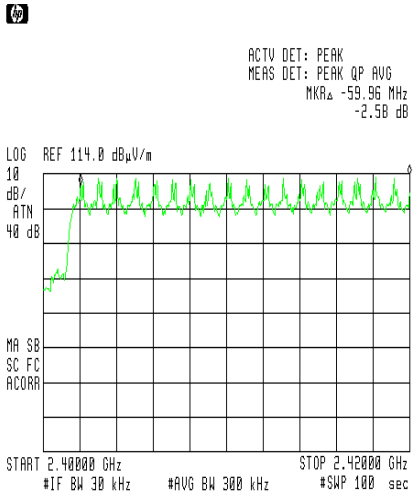

Figure 33. Frequency Hopping, EDR modulation

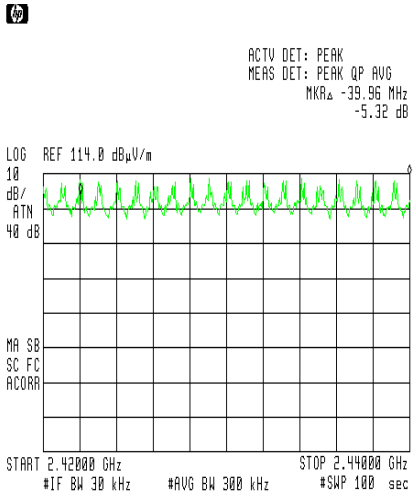

Figure 34. Frequency Hopping, EDR modulation

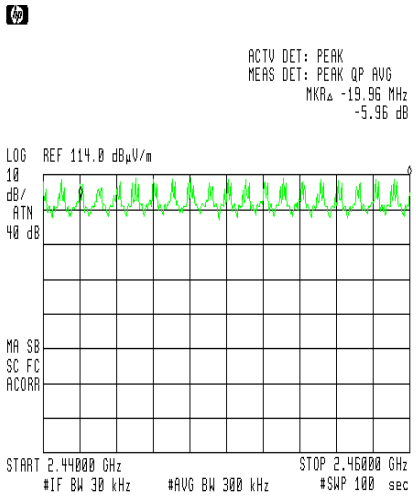

Figure 35. Frequency Hopping, EDR modulation

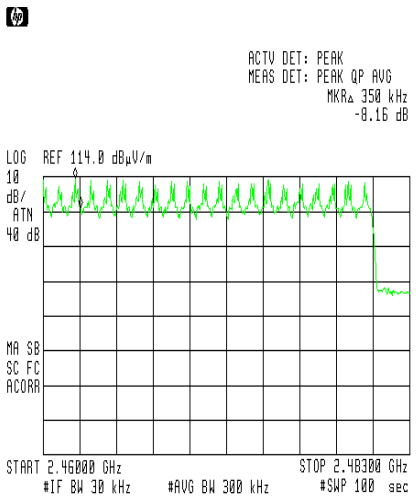

Figure 36. Frequency Hopping, EDR modulation

7.3 Results table

E.U.T. Description: Rider Communication System
Model No.: Cardo SHO-1

Serial Number: Not Designated

Specification: FCC Part 15, Subpart C, 15.247(a)(1)(iii)

Modulation	Number of Hopping Frequencies	Specification
Standard	79	>75
EDR	79	>75

Figure 37 Number of Hopping Frequencies

TEST PERSONNEL:

Tester Signature: _____ Date: 14.01.14

Typed/Printed Name: A. Sharabi

7.4 Test Instrumentation Used

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibration Date	Period
Spectrum Analyzer	HP	8564E	3442A00275	February 28, 2013	1 year
Cable	Rhophase	KPS-5000-KPS	A1674	September 9, 2013	1 year

8. Channel Frequency Separation

8.1 Test Specification

Specification: FCC Part 15, Subpart C, 15.247(a) (1)

8.2 Test procedure

The E.U.T. was set to hopping mode.
The spectrum analyzer was set to the following parameters:

Span: 2 MHz
RBW: 10kHz
VBW: 10kHz
Detector Function: Peak
Trace: Maximum Hold

The marker delta function to determine the separation between the peaks of the adjacent channels was used.

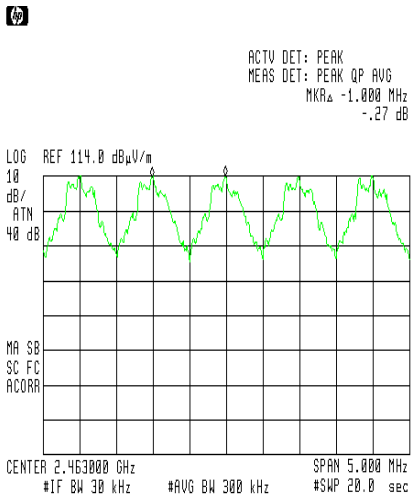

Figure 38. Standard Modulation

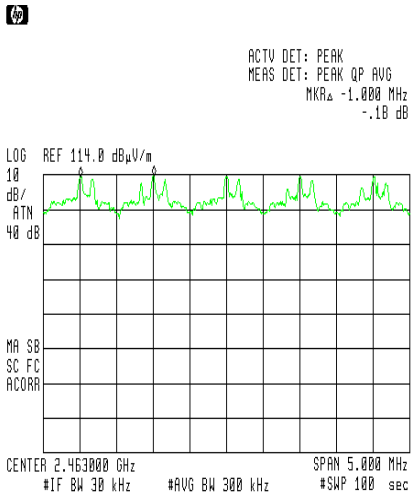

Figure 39. EDR Modulation

8.3 Results table

E.U.T. Description: Rider Communication SystemModel No.: Cardo SHO-1
Serial Number: Not Designated
Specification: FCC Part 15, Subpart C, 15.247(a) (1)

Modulation	Channel Frequency Separation (kHz)	Specification (kHz)	Margin (kHz)
Standard	1000.0	990.0	10.0
EDR	1000.0	886.0	114.0

Figure 40 Channel Frequency Separation

JUDGEMENT: Passed by 10.0 kHz

TEST PERSONNEL:
Tester Signature: _____ Date: 14.01.14
Typed/Printed Name: A. Sharabi

8.4 Test Instrumentation Used

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibration Date	Period
Spectrum Analyzer	HP	8564E	3442A00275	February 28, 2013	1 year
Cable	Rhophase	KPS-5000-KPS	A1674	September 9, 2013	1 year

9. Radiated Power Output

9.1 Test Specification

F.C.C. Part 15, Subpart C: 15.247(b)

9.2 Test procedure

The E.U.T was placed on a non-metallic table, 0.8 meters above the ground plane, on a remote-controlled turntable in the OATS. The test distance was 3 meters.
The transmitter unit operated with normal modulation. The EMI receiver was set to 1 MHz resolution BW. The EUT was set up as shown in Figure 3, and its proper operation was checked.

The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.

The E.U.T. was tested in three operating channels and frequencies
(1 (2.402 GHz); 8 (2.441 GHz); 14 (2.480 GHz)).

Radiated output power levels were measured at selected operation frequencies and the results were converted to power level according to the formula as shown below:

$$P = \frac{(E_{V/m} \times d)^2}{(30 \times G)} \text{ [W]}$$

E- Field Strength (v/m)

d- Distance from transmitter (m)

G- Antenna gain

P- Peak power (W)

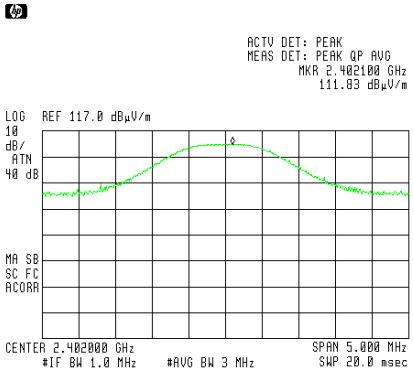

Figure 41 2402.00 MHz – Vertical, Standard Modulation

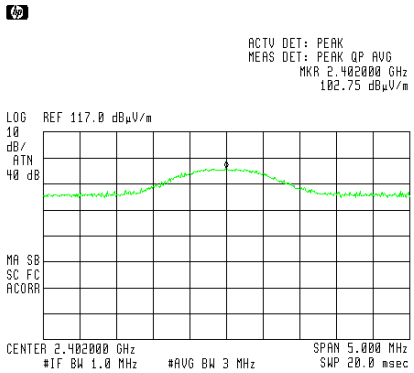

Figure 42 2402.00 MHz – Horizontal, Standard Modulation

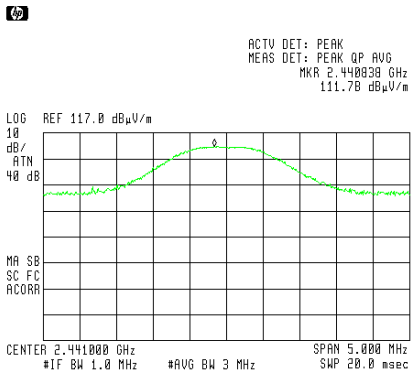

Figure 43 2441.00 MHz – Vertical, Standard Modulation

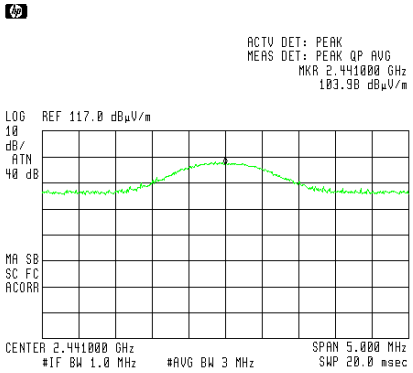

Figure 44 2441.00 MHz – Horizontal, Standard Modulation

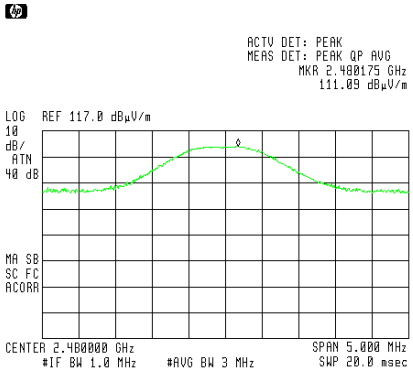

Figure 45 2480.00 MHz – Vertical, Standard Modulation

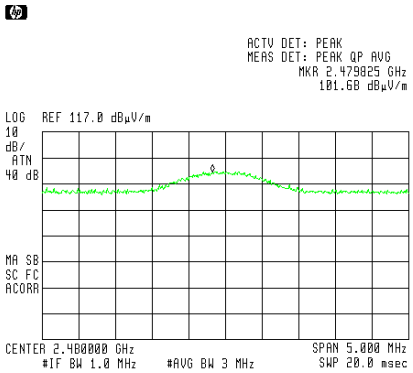

Figure 46 2480.00 MHz – Horizontal, Standard Modulation

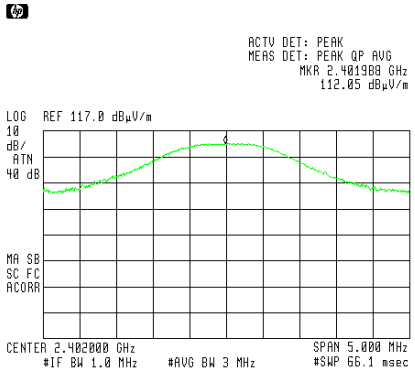

Figure 47 2402.00 MHz – Vertical, EDR Modulation

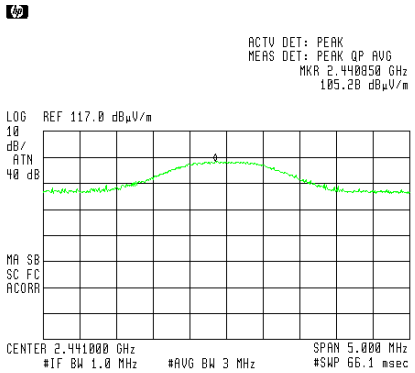

Figure 48 2402.00 MHz – Horizontal, EDR Modulation

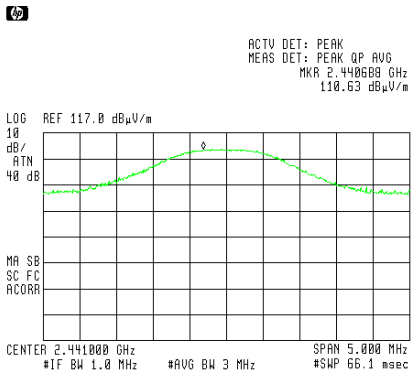

Figure 49 2441.00 MHz – Vertical, EDR Modulation

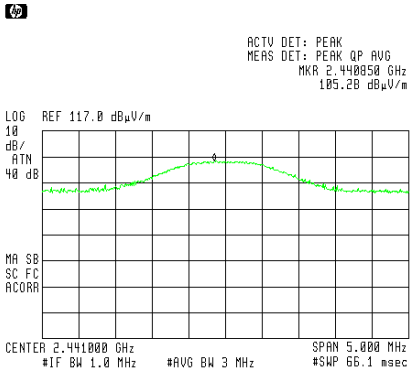

Figure 50 2441.00 MHz – Horizontal, EDR Modulation

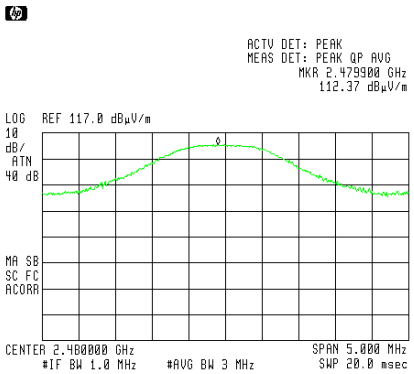

Figure 51 2480.00 MHz – Vertical, EDR Modulation

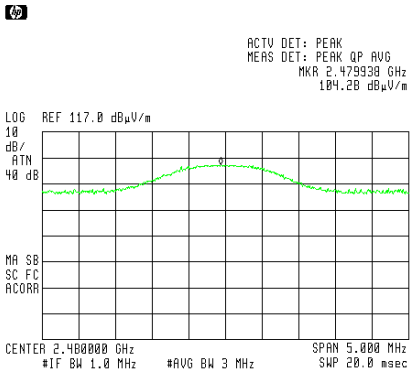

Figure 52 2480.00 MHz – Horizontal, EDR Modulation

9.3 Results Calculation

E.U.T. Description: Rider Communication System
Model No.: Cardo SHO-1
Serial Number: Not Designated
Specification: F.C.C. Part 15, Subpart C

The following calculations were used to determine maximum radiated power output.

$$P = \frac{(E_{V/m} \times d)^2}{(30 \times G)} \text{ [W]}$$

Operation Frequency (MHz)	Modulation	Polarization	Power (dBuV/m)	Power (W)	Power (mW)	Specification (mW)	Margin (mW)
Low	Standard	V	111.83	0.0288	28.8	1000	-971.2
Low	Standard	H	102.75	0.0035	3.5	1000	-996.5
Mid	Standard	V	111.78	0.0285	8.5	1000	-991.5
Mid	Standard	H	103.98	0.0047	4.7	1000	-995.3
High	Standard	V	111.09	0.0244	24.4	1000	-975.6
High	Standard	H	101.68	0.0027	2.7	1000	-997.3
Low	EDR	V	112.05	0.0303	30.3	1000	-969.7
Low	EDR	H	105.28	0.0064	6.4	1000	-993.6
Mid	EDR	V	110.63	0.0219	21.9	1000	-978.1
Mid	EDR	H	105.28	0.0064	6.4	1000	-993.6
High	EDR	V	112.37	0.0327	32.7	1000	-967.3
High	EDR	H	104.28	0.0051	5.1	1000	-994.9

Figure 53 Radiated Power Output

JUDGEMENT: Passed by 967.3 mW

TEST PERSONNEL:
Tester Signature: _____ Date: 14.01.14
Typed/Printed Name: A. Sharabi

9.4 Test Equipment Used, Radiated Maximum Power Output

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
Receiver	HP	85422E	3906A00276	February 26, 2013	1 year
RF Section	HP	85420E	3705A00248	February 26, 2013	1 year
Horn Antenna	ETS	3115	29845	March 14, 2012	2 Years
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKGC19982	N/A	N/A

Figure 54 Test Equipment Used

10. Dwell Time on Each Channel

10.1 Test Specification

FCC Part 15, Section 15.247(a)(1)(iii)

10.2 Test Procedure

The E.U.T. was tested in radiated mode using the substitutional antenna. The spectrum analyzer was set to 30 kHz RBW and 300 kHz VBW.

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

10.3 Test Results

The E.U.T met the requirements of the FCC Part 15, Section 15.247(a)(1)(iii).

JUDGEMENT: Passed

TEST PERSONNEL:

Tester Signature: _____ Date: 14.01.14

Typed/Printed Name: A. Sharabi

Additional information of the results is given in *Figure 55* to *Figure 58.*

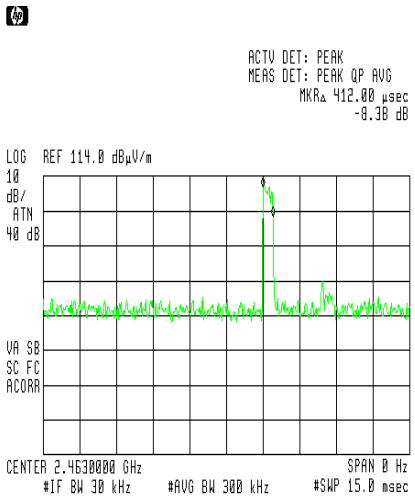

Figure 55 — Ton=412usec , standard Modulation

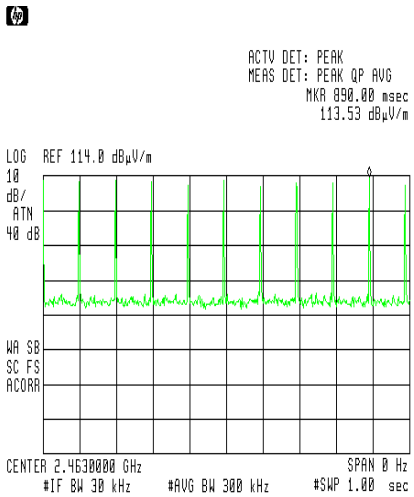

Figure 56 — Dwell time at 2.463GHz , standard Modulation

[11 X 412usecX31.6 =143 , limit 400msec]

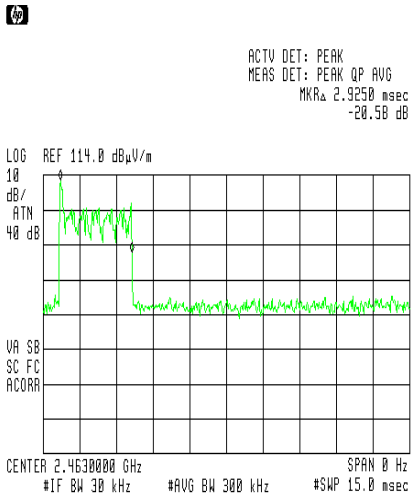

Figure 57 — Ton=2.9msec , EDR Modulation

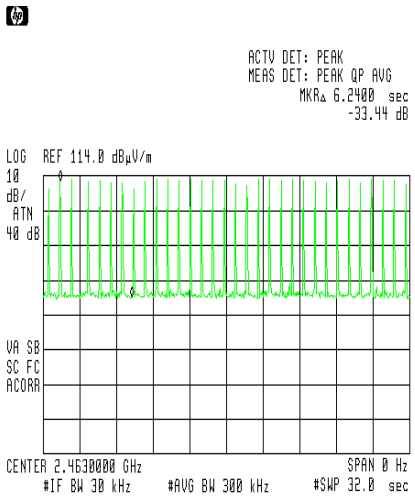

Figure 58 — Dwell time at 2.480GHz , EDR Modulation

[32 X 2.9msec =92.8, limit 400msec]

10.4 Test Equipment Used, Dwell Time.

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibration Date	Period
Spectrum Analyzer	HP	8564E	3442A00275	February 28, 2013	1 year

Figure 59 Test Equipment Used

11. Band Edge

[In Accordance with section 15.247(d)]

11.1 Test procedure

The E.U.T was placed on a non-metallic table, 0.8 meters above the ground plane, on a remote-controlled turntable in the OATS. The test distance was 3 meters. The transmitter unit operated with normal modulation. The EMI receiver was set to 1 MHz resolution BW. The EUT was set up as shown in Figure 3, and its proper operation was checked.

The EMI receiver was adjusted to the transmission channel at the maximum radiated level. The display line was set to 20 dBc and the EMI receiver was set to the band edge frequencies.
Maximum power level below 2400 MHz and above 2483.5 MHz was measured relative to power level at the Low and the High channels correspondingly.

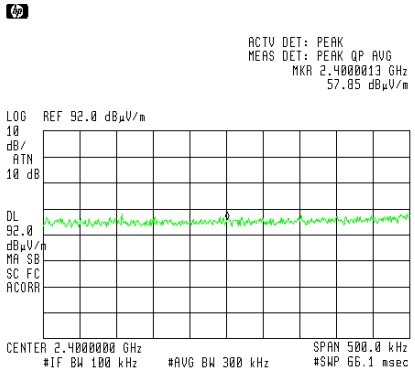

Figure 60 — Lower Band Edge ,Standard Modulation

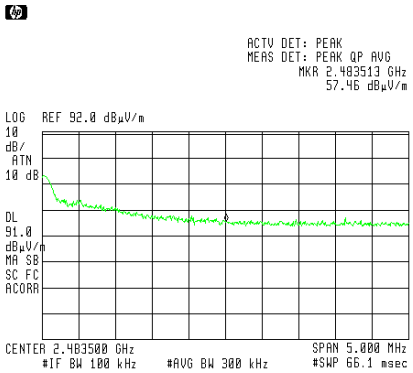

Figure 61 — Upper Band Edge, Standard Modulation

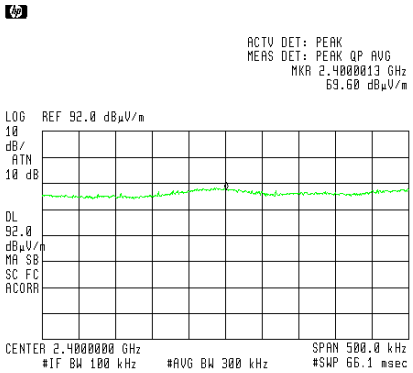

Figure 62 — Lower Band Edge, EDR Modulation

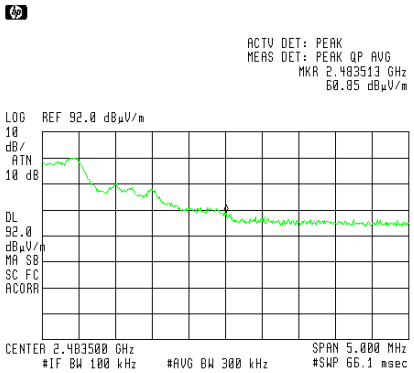

Figure 63 — Upper Band Edge, EDR Modulation

11.2 Results table

E.U.T. Description: Rider Communication System
Model No.: Cardo SHO-1
Serial Number: Not Designated
Specification: F.C.C. Part 15, Subpart C (15.247 (d))

Operation Frequency (MHz)	Modulation	Band Edge Frequency (MHz)	Spectrum Level (dBuV/m)	Specification (dBuV/m)	Margin (dB)
2402	Standard	2400.0	57.85	92.0	-34.15
2480	Standard	2483.5	57.46	91.0	-33.54
2402	EDR	2400.0	69.60	92.0	-22.40
2480	EDR	2483.5	60.85	92.0	-31.15

Figure 64 Band Edge

JUDGEMENT: Passed by 22.4 dB

TEST PERSONNEL:
Tester Signature: _____ Date: 14.01.14
Typed/Printed Name: A. Sharabi

11.3 Test Equipment Used, Band edge Spectrum

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
Receiver	HP	85422E	3906A00276	February 26, 2013	1 year
RF Section	HP	85420E	3705A00248	February 26, 2013	1 year
Horn Antenna	ETS	3115	29845	March 14, 2012	2 Years
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKGC19982	N/A	N/A
Antenna-Log Periodic	A.H.System	SAS-200/511	253	April 2, 2013	2 years

Figure 65 Test Equipment Used

12. Radiated Emission, 9 kHz – 30 MHz

12.1 Test Specification

9 kHz-30 MHz, FCC, Part 15, Subpart C, Section 209

12.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 3.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The configuration tested is shown in Figure 3.1.

The frequency range 9 kHz-30 MHz was scanned.

The emissions were measured using a computerized EMI receiver complying with CISPR 16 requirements. The specification limits and applicable correction factors are loaded to the receiver via a 3.5" floppy disk.

In the frequency range 9 kHz-30MHz, the loop antenna was rotated on its vertical axis. The antenna height (center of loop) was 1 meter at a distance of 3 meters.

12.3 Measured Data

JUDGEMENT: Passed

The EUT met the requirements of the F.C.C. Part 15, Subpart C, Section 209 specification.

The results for all three channels were the same.

No signals were detected in the frequency range of 9 kHz – 30 MHz.

TEST PERSONNEL:

Tester Signature: _____ Date: 14.01.14

Typed/Printed Name: A. Sharabi

12.4 Test Instrumentation Used, Radiated Measurements

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	February 26, 2013	1 year
RF Section	HP	85420E	3705A00248	February 26, 2013	1 year
Active Loop Antenna	EMCO	6502	9506-2950	October 21, 2012	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKGC19982	N/A	N/A

Figure 66 Test Equipment Used

12.5 Field Strength Calculation

The field strength is calculated directly by the EMI Receiver software, and a "Correction Factors" data disk, using the following equation:

$$FS = RA + AF + CF$$

FS:	Field Strength [dBμv/m]
RA:	Receiver Amplitude [dBμv]
AF:	Receiving Antenna Correction Factor [dB/m]
CF:	Cable Attenuation Factor [dB]

Example: FS = 30.7 dBμV (RA) + 14.0 dB (AF) + 0.9 dB (CF) = 45.6 dBμV

No external pre-amplifiers are used.

13. Spurious Radiated Emission 30 – 25,000 MHz

13.1 Test Specification

30 MHz- 25,000 MHz, F.C.C., Part 15, Subpart C

13.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 3.

See Section 3.1 Justification of the System Test Configuration concerning the E.U.T. orientation for this test.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground.

The frequency range 30 MHz-1000 MHz was scanned and the list of the highest emissions was verified and updated accordingly.

The levels of the emissions within the frequency ranges of the restricted bands (Section 15.205 of FCC Part 15) were compared to the limits of the table in Section 15.209 (a), General Requirements.

The emissions were measured using a computerized EMI receiver complying with CISPR 16 requirements. The specification limits and applicable correction factors are loaded to the receiver via a 3.5" floppy disk.

In the frequency range 30-1000 MHz, the readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.

In the frequency range 1-2.9 GHz, a computerized EMI receiver complying with CISPR 16 requirements was used.
In the frequency range 2.9-25.0 GHz, a spectrum analyzer including a low noise amplifier was used. During average measurements the IF bandwidth was 1 MHz and the video bandwidth was 100Hz. During peak measurements the IF bandwidth was 1 MHz and the video bandwidth was 3 MHz.
The test distance was 3 meters.
The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.
Verification of the E.U.T emissions was based on the following methods: turning the E.U.T on and off; using a frequency span less than 10 MHz; observation of the signal level during turntable rotation. (Background noise is not affected by the rotation of the E.U.T.)

13.3 Test Data

JUDGEMENT: Passed

The EUT met the requirements of the F.C.C. Part 15, Subpart C, specification.

For the operation channel 1 (2.402 GHz), the margin between the emission level and the specification limit is 1.3 db in the worst case at the frequency of 4804.00 MHz, vertical polarization.

For the operation channel 8 (2.441 GHz), the margin between the emission level and the specification limit is 1.1 db in the worst case at the frequency of 4882.00 MHz, horizontal polarization.

For the operation channel 14 (2.480 GHz), the margin between the emission level and the specification limit is 4.6 db in the worst case at the frequency of 7440.00 MHz, vertical polarization.

TEST PERSONNEL:

Tester Signature: _____ Date: 14.01.14

Typed/Printed Name: A. Sharabi

Radiated Emission

E.U.T Description Rider Communication System
Type Cardo SHO-1
Serial Number: Not Designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 1.0 GHz to 25.0 GHz
Test Distance: 3 meters Detector: Peak

Operation Frequency (MHz)	Modulation	Freq. (MHz)	Polarity (H/V)	Peak Reading (dBµV/m)	Peak. Specification (dB µV/m)	Peak. Margin (dB)
2402.0	Standard	2390.0	H	54.6	74.0	-19.4
2402.0	Standard	2390.0	V	56.6	74.0	-17.4
2402.0	Standard	4804.0	H	59.5	74.0	-14.5
2402.0	Standard	4804.0	V	63.3	74.0	-10.7
2402.0	Standard	7206.0	H	61.0	74.0	-13.0
2402.0	Standard	7206.0	V	62.3	74.0	-11.7
2441.0	Standard	4882.0	H	63.5	74.0	-10.5
2441.0	Standard	4882.0	V	63.0	74.0	-11.0
2441.0	Standard	7323.0	H	59.0	74.0	-15.0
2441.0	Standard	7323.0	V	59.4	74.0	-14.6
2480.0	Standard	4960.0	H	56.0	74.0	-18.0
2480.0	Standard	4960.0	V	58.9	74.0	-15.1
2480.0	Standard	7440.0	H	59.2	74.0	-14.8
2480.0	Standard	7440.0	V	60.0	74.0	-14.0
2480.0	Standard	2483.5	H	57.8	74.0	-16.2
2480.0	Standard	2483.5	V	58.8	74.0	-15.2

Figure 67. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL. Detector: Peak

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

"Peak Amp" includes correction factor.

* "Correction Factor" = Antenna Factor + Cable Loss- Low Noise Amplifier Gain

Radiated Emission

E.U.T Description Rider Communication System
Type Cardo SHO-1
Serial Number: Not Designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical
Frequency range: 1.0 GHz to 25.0 GHz
Test Distance: 3 meters
Detector: Average

Operation Frequency (MHz)	Modulation	Freq. (MHz)	Polarity (H/V)	Average Reading (dBµV/m)	Average Specification (dB µV/m)	Average Margin (dB)
2402.0	Standard	2390.0	H	44.0	54.0	-10.0
2402.0	Standard	2390.0	V	46.0	54.0	-8.0
2402.0	Standard	4804.0	H	48.9	54.0	-5.1
2402.0	Standard	4804.0	V	52.7	54.0	-1.3
2402.0	Standard	7206.0	H	50.4	54.0	-3.6
2402.0	Standard	7206.0	V	51.7	54.0	-2.3
2441.0	Standard	4882.0	H	52.9	54.0	-1.1
2441.0	Standard	4882.0	V	52.4	54.0	-1.6
2441.0	Standard	7323.0	H	48.4	54.0	-5.6
2441.0	Standard	7323.0	V	48.8	54.0	-5.2
2480.0	Standard	4960.0	H	45.4	54.0	-8.6
2480.0	Standard	4960.0	V	48.3	54.0	-5.7
2480.0	Standard	7440.0	H	48.6	54.0	-5.4
2480.0	Standard	7440.0	V	49.4	54.0	-4.6
2480.0	Standard	2483.5	H	47.2	54.0	-6.8
2480.0	Standard	2483.5	V	48.2	54.0	-5.8

Figure 68. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL. Detector: Average

Notes:

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

"Average Amp" includes correction factor.

* Correction Factor = Antenna Factor + Cable Loss- Low Noise Amplifier Gain
* Avg. Factor calculation:

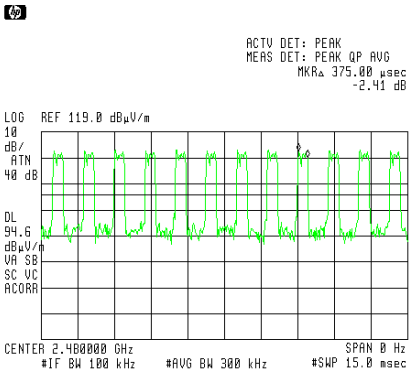

Figure 69. Avg. Factor – burst duration 0.375usec

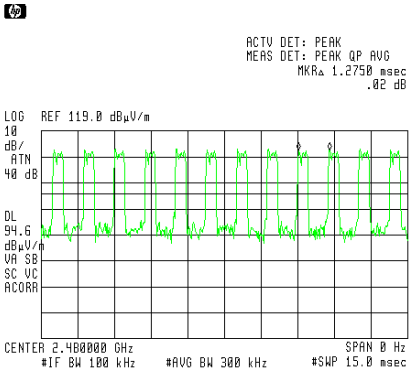

Figure 70. Avg. Factor – transmission =20log (0.375/1.275)= -10.6dB

Radiated Emission

E.U.T Description	Rider Communication System
Type	Cardo SHO-1
Serial Number:	Not Designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical
Frequency range: 1.0 GHz to 25.0 GHz
Test Distance: 3 meters
Detector: Peak

Operation Frequency (MHz)	Modulation	Freq. (MHz)	Polarity (H/V)	Peak Reading (dBµV/m)	Peak. Specification (dB µV/m)	Peak. Margin (dB)
2402.0	EDR	2390.0	H	55.6	74.0	-18.4
2402.0	EDR	2390.0	V	56.5	74.0	-17.5
2402.0	EDR	4804.0	H	60.4	74.0	-13.6
2402.0	EDR	4804.0	V	61.8	74.0	-12.2
2402.0	EDR	7206.0	H	58.9	74.0	-15.1
2402.0	EDR	7206.0	V	56.7	74.0	-17.3
2441.0	EDR	4882.0	H	57.5	74.0	-16.5
2441.0	EDR	4882.0	V	58.9	74.0	-15.1
2441.0	EDR	7323.0	H	57.6	74.0	-16.4
2441.0	EDR	7323.0	V	57.6	74.0	-16.4
2480.0	EDR	4960.0	H	57.0	74.0	-17.0
2480.0	EDR	4960.0	V	52.2	74.0	-21.8
2480.0	EDR	7440.0	H	56.8	74.0	-17.2
2480.0	EDR	7440.0	V	55.6	74.0	-18.4
2480.0	EDR	2483.5	H	57.9	74.0	-16.1
2480.0	EDR	2483.5	V	58.8	74.0	-15.2

Figure 71. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL. Detector: Peak

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

"Peak Amp" includes correction factor.

* “Correction Factor” = Antenna Factor + Cable Loss- Low Noise Amplifier Gain

Radiated Emission

E.U.T Description Rider Communication System
Type Cardo SHO-1
Serial Number: Not Designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 1.0 GHz to 25.0 GHz
Test Distance: 3 meters Detector: Average

Operation Frequency (MHz)	Modulation	Freq. (MHz)	Polarity (H/V)	Average Reading (dBµV/m)	Average Specification (dB µV/m)	Average Margin (dB)
2402.0	EDR	2390.0	H	43.6	54.0	-10.4
2402.0	EDR	2390.0	V	44.5	54.0	-9.5
2402.0	EDR	4804.0	H	48.4	54.0	-5.6
2402.0	EDR	4804.0	V	49.8	54.0	-4.2
2402.0	EDR	7206.0	H	46.9	54.0	-7.1
2402.0	EDR	7206.0	V	44.7	54.0	-9.3
2441.0	EDR	4882.0	H	45.5	54.0	-8.5
2441.0	EDR	4882.0	V	46.9	54.0	-7.1
2441.0	EDR	7323.0	H	45.6	54.0	-8.4
2441.0	EDR	7323.0	V	45.6	54.0	-8.4
2480.0	EDR	4960.0	H	45.0	54.0	-9.0
2480.0	EDR	4960.0	V	40.2	54.0	-13.8
2480.0	EDR	7440.0	H	44.8	54.0	-9.2
2480.0	EDR	7440.0	V	43.6	54.0	-10.4
2480.0	EDR	2483.5	H	45.9	54.0	-8.1
2480.0	EDR	2483.5	V	46.8	54.0	-7.2

Figure 72. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL. Detector: Average

Notes:

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

"Average Amp" includes correction factor.

* Correction Factor = Antenna Factor + Cable Loss- Low Noise Amplifier Gain
* Avg. Factor calculation:

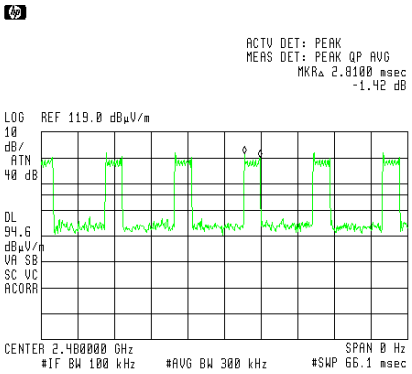

Figure 73. Avg. Factor – burst duration 2.81msec

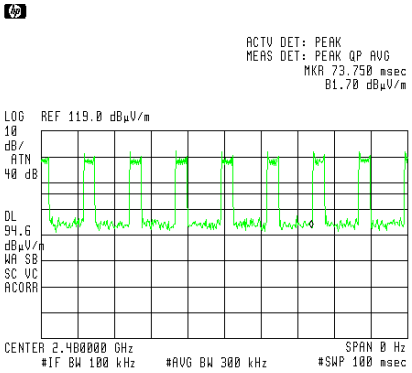

Figure 74. Avg. Factor – transmission within 100msec =20log ((8X2.81)100)= -12.0dB

Test Instrumentation Used, Radiated Measurements

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Period
EMI Receiver	HP	85422E	3906A00276	February 26, 2013	1Year
RF Filter Section	HP	85420E	3705A00248	February 26, 2013	1Year
Antenna Biconical	EMCO	3104	2606	August 30, 2013	1Year
Antenna Log Periodic	ARA	LPD-2010/A	1038	April 2, 2013	1 Year
Double Ridged Waveguide Horn Antenna	EMCO	3115	29845	March 14, 2012	2 Years
Horn Antenna	ARA	SWH-28	1007	January 26, 2011	3 Years
Horn Antenna	ETS	3115	29845	March 14, 2012	2 Years
Low Noise Amplifier	DBS MICROWAVE	LNA-DBS-0411N313	013	August 21, 2013	1 Year
Low Noise Amplifier	Sophia Wireless	LNA 28-B	232	August 28, 2013	1 Year
Spectrum Analyzer	HP	8592L	3826A01204	February 28, 2013	1 Year
Spectrum Analyzer	HP	8564E	3442A00275	February 28, 2013	1 Year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKGC19982	N/A	N/A

13.4 Field Strength Calculation 30 – 1000 MHz

The field strength is calculated directly by the EMI Receiver software, and a "Correction Factors" data disk, using the following equation:

$$[dB\mu v/m]\ FS = RA + AF + CF$$

FS:	Field Strength [dBμv/m]
RA:	Receiver Amplitude [dBμv]
AF:	Receiving Antenna Correction Factor [dB/m]
CF:	Cable Attenuation Factor [dB]

Example: FS = 30.7 dBμV (RA) + 14.0 dB (AF) + 0.9 dB (CF) = 45.6 dBμV

No external pre-amplifiers are used.

14. Antenna Gain/Information

The antenna gain is 2 dBi, integral.

15. R.F Exposure/Safety

Typical use of the E.U.T. is as a Rider Communication System. The typical placement of the E.U.T. is on a motorcycle helmet. See photo on next page. The distance between the E.U.T. and the user in the worst case application, is 3 cm.

Per information from the customer:

As written in the Bluetooth standard – CORE 3.0+HS- the maximum SCO channels that could be activated on a single Bluetooth product is 3.

In the SHO-1, only one SCO channel is used when communicating between headsets. Every SCO channel is 1/3 of time, and on each channel, every unit transmits half of the time, because every channel consists of two participants (voice transfer), every unit is on Tx the 1/6 part of the time, which is 16.66%. So the theoretical maximum duty cycle is 16.66%, effectively, is less, due to Tx and Rx and Rx to Tx transfer time.

Calculation of Maximum Permissible Exposure (MPE)

Based on Section 1.1310 Requirements

(a) FCC limits at 2480 MHz is: $1\frac{mW}{cm^2}$

Using table 1 of Section 1.1310 limit for general population/uncontrolled exposures, the above level is an average over 30 minutes.

(b) The power density produced by the E.U.T. is

$$S = \frac{P_t G_t}{4\pi R^2}$$

P_t- Transmitted Power 112.37 dBuV/m = 32.7 mW

G_T- Antenna Gain, 2 dBi = 1.58 numeric

R- Distance from Transmitter using 3 cm worst case

(c) The AVG power density is :

$$S_{avg} = \frac{32.7 \times 0.16 \times 1.58}{4\pi(3)^2} = 0.073\frac{mW}{cm^2}$$

(d) This is below the FCC limit.

16.

16. APPENDIX B - CORRECTION FACTORS

16.1 Correction factors for CABLE

from EMI receiver to test antenna at 3 meter range.

FREQUENCY (MHz)	CORRECTION FACTOR (dB)
10.0	0.3
20.0	0.6
30.0	0.8
40.0	0.9
50.0	1.1
60.0	1.2
70.0	1.3
80.0	1.4
90.0	1.6
100.0	1.7
150.0	2.0
200.0	2.3
250.0	2.7
300.0	3.1
350.0	3.4
400.0	3.7
450.0	4.0
500.0	4.3
600.0	4.7
700.0	5.3
800.0	5.9
900.0	6.3
1000.0	6.7

FREQUENCY (MHz)	CORRECTION FACTOR (dB)
1200.0	7.3
1400.0	7.8
1600.0	8.4
1800.0	9.1
2000.0	9.9
2300.0	11.2
2600.0	12.2
2900.0	13.0

NOTES:

1. The cable type is RG-214.

2. The overall length of the cable is 27 meters.

3. The above data is located in file 27MO3MO.CBL on the disk marked "Radiated Emission Tests EMI Receiver".

16.2 Correction factors for CABLE

from EMI receiver to test antenna at 3 meter range.

FREQUENCY (GHz)	CORRECTION FACTOR (dB)
1.0	1.2
2.0	1.6
3.0	2.0
4.0	2.4
5.0	3.0
6.0	3.4
7.0	3.8
8.0	4.2
9.0	4.6
10.0	5.0
12.0	5.8

NOTES:

1. The cable type is RG-8.

2. The overall length of the cable is 10 meters.

16.3 Correction factors for CABLE

from spectrum analyzer to test antenna above 2.9 GHz

FREQUENCY (GHz)	CORRECTION FACTOR (dB)	FREQUENCY (GHz)	CORRECTION FACTOR (dB)
1.0	1.9	14.0	9.1
2.0	2.7	15.0	9.5
3.0	3.5	16.0	9.9
4.0	4.2	17.0	10.2
5.0	4.9	18.0	10.4
6.0	5.5	19.0	10.7
7.0	6.0	20.0	10.9
8.0	6.5	21.0	11.2
9.0	7.0	22.0	11.6
10.0	7.5	23.0	11.9
11.0	7.9	24.0	12.3
12.0	8.3	25.0	12.6
13.0	8.7	26.0	13.0

NOTES:

1. The cable type is SUCOFLEX 104 E manufactured by SUHNER.

2. The cable is used for measurements above 2.9 GHz.

3. The overall length of the cable is 10 meters.

16.4 Correction factors for LOG PERIODIC ANTENNA

Type LPD 2010/A
at 3 and 10 meter ranges.

Distance of 3 meters

FREQUENCY (MHz)	AFE (dB/m)
200.0	9.1
250.0	10.2
300.0	12.5
400.0	15.4
500.0	16.1
600.0	19.2
700.0	19.4
800.0	19.9
900.0	21.2
1000.0	23.5

Distance of 10 meters

FREQUENCY (MHz)	AFE (dB/m)
200.0	9.0
250.0	10.1
300.0	11.8
400.0	15.3
500.0	15.6
600.0	18.7
700.0	19.1
800.0	20.2
900.0	21.1
1000.0	23.2

NOTES:

1. *Antenna serial number is 1038.*
2. *The above lists are located in file number 38M3O.ANT for a 3 meter range, and file number 38M100.ANT for a 10 meter range.*
3. *The files mentioned above are located on the disk marked "Radiated Emission Test EMI Receiver".*

16.5 Correction factors for LOG PERIODIC ANTENNA

Type SAS-200/511
at 3 meter range.

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
1.0	24.9
1.5	27.8
2.0	29.9
2.5	31.2
3.0	32.8
3.5	33.6
4.0	34.3
4.5	35.2
5.0	36.2
5.5	36.7
6.0	37.2
6.5	38.1

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
7.0	38.6
7.5	39.2
8.0	39.9
8.5	40.4
9.0	40.8
9.5	41.1
10.0	41.7
10.5	42.4
11.0	42.5
11.5	43.1
12.0	43.4
12.5	44.4
13.0	44.6

NOTES:

1. Antenna serial number is 253.

2. The above lists are located in file number SAS3M0.ANT for a 3 meter range.

3. The files mentioned above are located on the disk marked "Antenna Factors".

16.6 Correction factors for BICONICAL ANTENNA

Type BCD-235/B,
at 3 meter range

FREQUENCY (MHz)	AFE (dB/m)
20.0	19.4
30.0	14.8
40.0	11.9
50.0	10.2
60.0	9.1
70.0	8.5
80.0	8.9
90.0	9.6
100.0	10.3
110.0	11.0
120.0	11.5
130.0	11.7
140.0	12.1
150.0	12.6
160.0	12.8
170.0	13.0
180.0	13.5
190.0	14.0
200.0	14.8
210.0	15.3
220.0	15.8
230.0	16.2
240.0	16.6
250.0	17.6
260.0	18.2
270.0	18.4
280.0	18.7
290.0	19.2
300.0	19.9
310	20.7
320	21.9
330	23.4
340	25.1
350	27.0

NOTES:

1. Antenna serial number is 1041.

2. The above list is located in file 19BC10M1.ANT on the disk marked "Radiated Emissions Tests EMI Receiver".

16.7 Correction factors for Double-Ridged Waveguide Horn

Model: 3115, S/N 29845
at 3 meter range.

FREQUENCY (GHz)	ANTENNA FACTOR (dB 1/m)	ANTENNA Gain (dBi)	FREQUENCY (GHz)	ANTENNA FACTOR (dB 1/m)	ANTENNA Gain (dBi)
1.0	24.8	5.4	10.0	38.8	11.4
1.5	26.1	7.6	10.5	38.9	11.8
2.0	28.6	7.7	11.0	39.0	12.1
2.5	29.8	8.4	11.5	39.6	11.8
3.0	31.4	8.4	12.0	39.8	12.0
3.5	32.4	8.7	12.5	39.6	12.5
4.0	33.7	8.6	13.0	40.0	12.5
4.5	33.4	9.9	13.5	39.8	13.0
5.0	34.5	9.7	14.0	40.2	13.0
5.5	35.1	9.9	14.5	40.6	12.9
6.0	35.4	10.4	15.0	41.3	12.4
6.5	35.6	10.8	15.5	39.5	14.6
7.0	36.2	10.9	16.0	38.8	15.5
7.5	37.3	10.4	16.5	40.0	14.6
8.0	37.7	10.6	17.0	41.4	13.4
8.5	38.3	10.5	17.5	44.8	10.3
9.0	38.5	10.8	18.0	47.2	8.1
9.5	38.7	11.1			

16.8 Correction factors for ***Horn Antenna***

Model: SWH-28
at 1 meter range.

FREQUENCY (GHz)	AFE (dB /m)	Gain (dB1)
18.0	40.3	16.1
19.0	40.3	16.3
20.0	40.3	16.1
21.0	40.3	16.3
22.0	40.4	16.8
23.0	40.5	16.4
24.0	40.5	16.6
25.0	40.5	16.7
26.0	40.6	16.4

16.9 Correction factors for ***Horn Antenna***

Model: V637

FREQUENCY (GHz)	AFE (dB /m)	Gain (dB1)
26.0	43.6	14.9
27.0	43.7	15.1
28.0	43.8	15.3
29.0	43.9	15.5
30.0	43.9	15.8
31.0	44.0	16.0
32.0	44.1	16.2
33.0	44.1	16.4
34.0	44.1	16.7
35.0	44.2	16.9
36.0	44.2	17.1
37.0	44.2	17.4
38.0	44.2	17.6
39.0	44.2	17.8
40.0	44.2	18.0

16.10 Correction factors for ACTIVE LOOP ANTENNA

Model 6502
S/N 9506-2950

FREQUENCY	Magnetic Antenna Factor	Electric Antenna Factor
(MHz)	(dB)	(dB)
.009	-35.1	16.4
.010	-35.7	15.8
.020	-38.5	13.0
.050	-39.6	11.9
.075	-39.8	11.8
.100	-40.0	11.6
.150	-40.0	11.5
.250	-40.0	11.6
.500	-40.0	11.5
.750	-40.1	11.5
1.000	-39.9	11.7
2.000	-39.5	12.0
3.000	-39.4	12.1
4.000	-39.7	11.9
5.000	-39.7	11.8
10.000	40.2	11.3
15.000	-40.7	10.8
20.000	-40.5	11.0
25.000	-41.3	10.2
30.000	42.3	9.2

17. Comparison Industry Canada Requirements With FCC

Cardo Peripheral Systems M/N: Cardo SHO-1
IC: 4668A-ER17 FCC ID: Q95ER17

Test	FCC	IC
❑ Radiated Emission	15.209	RSS 210 Issue 8 Clause 2.5
❑ Max power / Peak power	15.247(b)(3)	RSS 210 Issue 8 A8.4(4)
❑ 6dB BW	15.247(a)2	RSS 210 Issue 8 A8.2a
❑ Power density	15.247(e)	RSS 210 Issue 8 A8.2b
❑ Spurious radiated emission in the restricted band	15.205(c)	RSS 210 Issue 8 2.5 RSS Gen 7.2.2 (Table 1)
❑ Band edge spectrum	15.247(d)	RSS 210 Issue 8 A8.5
❑ RF Exposure Limits	1.1310	RSS 102 4.4