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DATE: 27 April 2017

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

IC/FCC Radio Test Report

For

Cardo Systems, Inc.

Equipment under test:

Bluetooth Communication System for Motorcycles

cardo SMARTH
(2.4 GHz Bluetooth Standard/EDR)

Tested by: _____
A. Yizhak

Approved by: _____
For: D. Shidlowsky

Measurement/Technical Report for

Cardo Systems, Inc.

Bluetooth Communication System for Motorcycles

cardo SMARTH

FCC ID: Q95ER21

IC: 4668A-ER21

This report concerns:	Original Grant:	X
	Class I Change:	
	Class II Change:	

Equipment type: DSS Part 15 Spread Spectrum Transmitter

Limits used: FCC Part 15, Sub-part C, Section 15.247
RSS 247, Issue 1: 2015
RSS Gen, Issue 4: 2014

Measurement procedures used are FCC Public Notice DA-00-705 and ANSI C63.10: 2013.

Application for Certification
prepared by:
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Applicant for this device:
(different from "prepared by")
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1. General Information

1.1 Administrative Information

Manufacturer:	Cardo Systems, Inc.
Manufacturer's Address:	1204 Parkway View Drive Pittsburgh, Pennsylvania, 15205 USA Tel: +972-3-735-3111 Fax: +972-3-562-3360
Manufacturer's Representative:	Avi Moato
Equipment Under Test (E.U.T):	Bluetooth Communication System for Motorcycles
Product Marketing Name (PMN):	cardo SMARTH
Equipment Serial No.:	Not designated
HVIN:	3
Date of Receipt of E.U.T:	November 1, 2016
Start of Test:	November 2, 2016
End of Test:	November 23, 2016
Test Laboratory Location:	I.T.L (Product Testing) Ltd. 1 Batsheva St., Lod ISRAEL 7120101
Test Specifications:	FCC Part 15, Subpart C, Section 15.247 RSS 247, Issue 1: 2015 RSS Gen, Issue 4: 2014

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.), FCC Designation No. IL1005.
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-3006, R-2729, T-1877, G-2245.
5. Industry Canada (Canada), IC File No.: 46405-4025; Site Nos. IC 4025A-1, IC 4025A-2.

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

EUT is a class 1 Bluetooth headset, Bluetooth intercom for motorbikes and FM radio receiver.

PMN	Cardo SMARTH
Working voltage	Li Polymer battery 600mA 4.2V
Mode of operation	Transmission
Modulation	Bluetooth Ver. 3.0, EDR class 1
Assigned Frequency Range	2400-2483.5MHz
Operating Frequency Range	2402-2480MHz
Transmit power	~18dBm
Antenna Gain	1.7dBi

1.4 Test Methodology

Radiated testing was performed according to the procedures in FCC Public Notice DA 00-705 and ANSI C63.10: 2013. Radiated testing was performed at an antenna to EUT distance of 3 meters.

1.5 Test Facility

Emissions tests were performed at I.T.L.'s testing facility in Lod, Israel. I.T.L.'s EMC Laboratory is accredited by A2LA, certificate No. 1152.01 and its FCC Designation Number is IL1005.

1.6 Measurement Uncertainty

Conducted Emission

Conducted Emission (CISPR 11, EN 55011, CISPR 22, EN 55022, ANSI C63.4) 0.15 – 30 MHz:

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

± 3.6 dB

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):

± 4.96 dB

2. System Test Configuration

2.1 Justification

Exploratory emission testing was performed in 3 orthogonal polarities to determine the "worst case" polarity for full testing. (Pursuant to OET Knowledge Base Inquiry Confirmation, Tracking Number 688137.) Based on the below results the X axis was the "worst case".

Frequency	X				Y				Z			
	Field Strength (dBuV/m)	2rd H (dBuV/m)	3th H (dBuV/m)	Band Edge (dBuV/m)	Field Strength (dBuV/m)	2rd H (dBuV/m)	3th H (dBuV/m)	Band Edge (dBuV/m)	Field Strength (dBuV/m)	2rd H (dBuV/m)	3th H (dBuV/m)	Band Edge (dBuV/m)
2402.0	103.8	57.7	62.0	52.2	100.2	62.4	58.1	51.9	99.4	57.4	60.3	51.9
2441.0	104.8	63.8	64.6	-	100.1	64.9	62.0	-	99.9	57.0	63.9	-
2480.0	103.5	68.8	69.0	50.1	99.5	64.5	60.0	50.1	100.2	66.9	70.5	50.1

Figure 1. Screening Results

The E.U.T. was evaluated when transmitting at the Low (2402MHz), Mid (2441MHz) and High (2480MHz) channels in the installation position.
All tests, other than spurious radiated emissions, were performed conducted.

2.2 EUT Exercise Software

No special exercise software was used.

2.3 Special Accessories

No special accessories were needed in order to achieve compliance.

2.4 Equipment Modifications

No modifications were needed in order to achieve compliance.

2.5 Configuration of Tested System

Figure 2. Configuration of Tested System – Conducted Emission on Antenna Ports

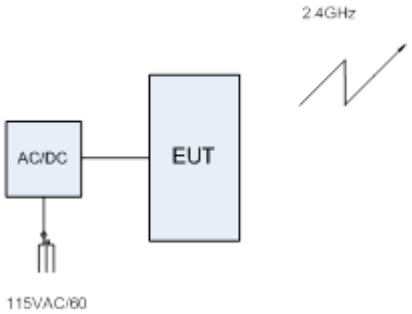

Figure 3. Configuration of Tested System – Conducted Emission on AC Line

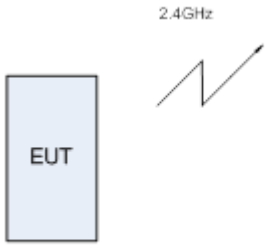

Figure 4. . Configuration of Tested System – Radiated Emission

3. Conducted & Radiated Measurement Test Set-Up Photos

Figure 5. Conducted Emission From Antenna Ports Test

Figure 6. Conducted Emission From AC Mains

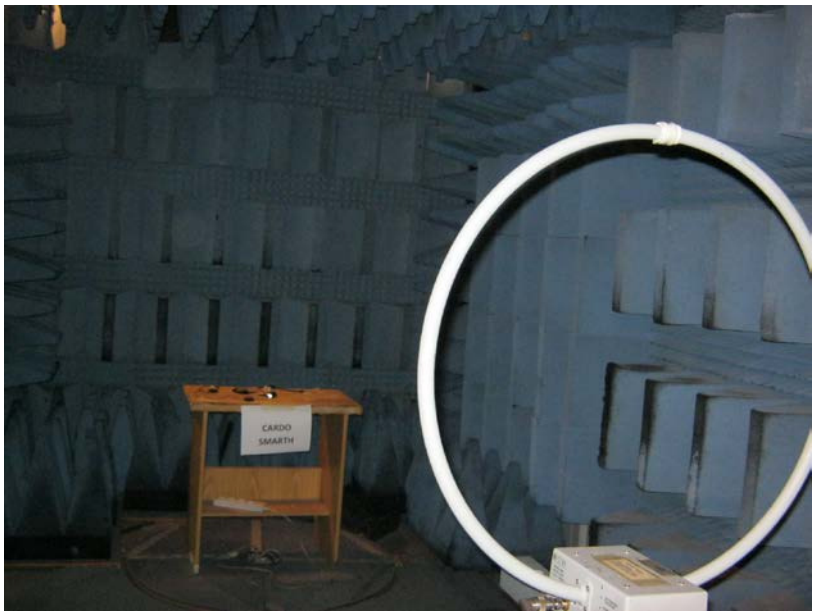

Figure 7. Radiated Emission Test

Figure 8. Radiated Emission Test

Figure 9. Radiated Emission Test

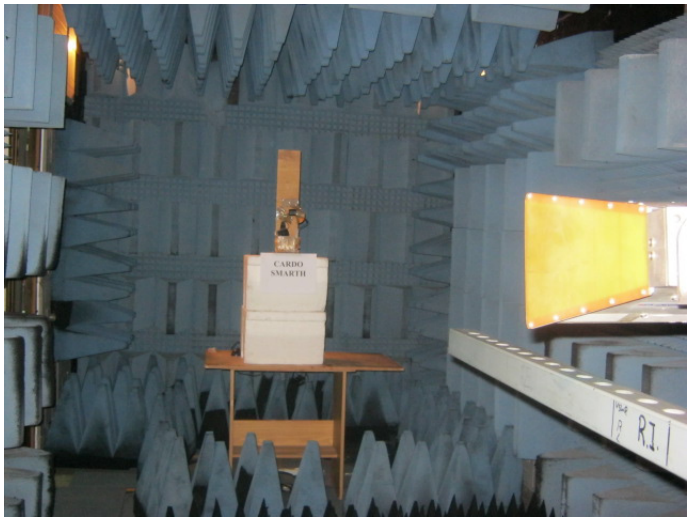

Figure 10. Radiated Emission Test Above 1GHz

4. Conducted Emission From AC Mains

4.1 Test Specification

FCC Part 15, Subpart C, Section 15.207
RSS Gen, Issue 4, Clause 8.8

4.2 Test Procedure

(Temperature (24°C)/ Humidity (40%RH))

The E.U.T operation mode and test setup are as described in Section 2 of this report. In order to minimize background noise interference, the conducted emission testing was performed inside a shielded room, with the E.U.T placed on a 0.8 meter high wooden table, 0.4 meter from the room's vertical wall. In the case of a floor-standing E.U.T., it was placed on the horizontal ground plane.

The E.U.T was powered from 115 V AC / 60 Hz via 50 Ohm / 50 µHn Line Impedance Stabilization Network (LISN) on the phase and neutral lines. The LISN's were grounded to the shielded room ground plane (floor), and were kept at least 0.8 meters from the nearest boundary of the E.U.T

The center of the E.U.T.'s AC cable was folded back and forth, in order to form a bundle less than 0.40 meters and a total cable length of 1 meter.

The effect of varying the position of the cables was investigated to find the configuration that produces maximum emission. The configuration tested is shown in the photograph, *Figure 6. Conducted Emission From AC Mains.*

The emission voltages at the LISN's outputs were measured using a computerized receiver, complying with CISPR 16 requirements. The specification limits are loaded to the receiver and are displayed on the receiver's spectrum display.

The E.U.T was evaluated in TX operation mode.

A frequency scan between 0.15 and 30 MHz was performed at 9 kHz I.F. band width, using peak detection.

The spectral components having the highest level on each line were measured using a quasi-peak and average detector.

4.3 Test Limit

Frequency of emission (MHz)	Conducted limit (dBµV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

4.4 Test Results

JUDGEMENT: Passed by 24.92 dB

The margin between the emission levels and the specification limit is, in the worst case, 24.92 dB for the phase line at 17.78 MHz and 25.35 dB at 17.78 MHz for the neutral line.

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

The details of the highest emissions are given in *Figure 11* to *Figure 14*.

Conducted Emission

E.U.T Description	Bluetooth Communication System for Motorcycles
Type	cardo SMARTH
Serial Number:	Not designated

Specification:	FCC Part 15, Subpart C
Lead:	Phase
Detectors: :	Peak, Quasi-peak, Average
Power Operation	AC/DC adapter

EDIT PEAK LIST (Final Measurement Results)

Trace1: CE22BQP
Trace2: CE22BAP
Trace3: ---

	TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1	Quasi Peak	770 kHz	25.26	-30.73
2	Average	770 kHz	19.10	-26.89
1	Quasi Peak	790 kHz	20.75	-35.24
2	Average	790 kHz	14.88	-31.11
1	Quasi Peak	890 kHz	22.99	-33.00
2	Average	890 kHz	18.17	-27.82
1	Quasi Peak	914 kHz	21.08	-34.91
2	Average	914 kHz	15.26	-30.73
1	Quasi Peak	962 kHz	20.35	-35.65
2	Average	966 kHz	15.71	-30.28
1	Quasi Peak	1.542 MHz	20.56	-35.43
1	Quasi Peak	10.742 MHz	10.71	-49.28
2	Average	13.334 MHz	20.92	-29.07
1	Quasi Peak	17.778 MHz	25.54	-34.45
2	Average	17.778 MHz	25.07	-24.92
2	Average	22.222 MHz	20.79	-29.20
2	Average	22.906 MHz	23.89	-26.10
1	Quasi Peak	23.138 MHz	28.93	-31.07
1	Quasi Peak	24.494 MHz	19.50	-40.49
2	Average	26.666 MHz	19.05	-30.94

Date: 16.NOV.2016 12:19:04

Figure 11. Detectors: Peak, Quasi-peak, Average

Note: QP Delta/Av Delta 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.

Conducted Emission

E.U.T Description	Bluetooth Communication System for Motorcycles
Type	cardo SMARTH
Serial Number:	Not designated

Specification:	FCC Part 15, Subpart C
Lead:	Phase
Detectors:	Peak, Quasi-peak, Average
Power Operation	AC/DC adapter

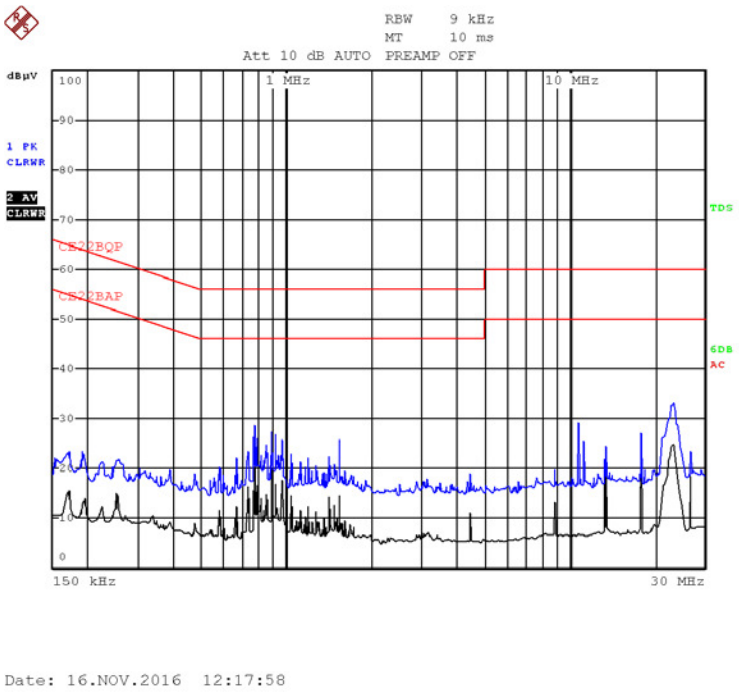

Figure 12. Detectors: Peak, Quasi-peak, Average

Conducted Emission

E.U.T Description	Bluetooth Communication System for Motorcycles
Type	cardo SMARTH
Serial Number:	Not designated

Specification:	FCC Part 15, Subpart C
Lead:	Neutral
Detectors:	Peak, Quasi-peak, Average
Power Operation	AC/DC adapter

EDIT PEAK LIST (Final Measurement Results)

Trace1: CE22BQP
Trace2: CE22BAP
Trace3: ---

TRACE		FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2	Average	254 kHz	14.70	-36.92
1	Quasi Peak	262 kHz	15.39	-45.97
1	Quasi Peak	770 kHz	22.94	-33.05
2	Average	770 kHz	16.96	-29.03
1	Quasi Peak	890 kHz	20.73	-35.26
2	Average	890 kHz	16.01	-29.99
1	Quasi Peak	914 kHz	18.99	-37.00
2	Average	962 kHz	13.80	-32.19
1	Quasi Peak	4.446 MHz	18.87	-37.12
2	Average	4.446 MHz	16.91	-29.08
1	Quasi Peak	13.334 MHz	22.65	-37.34
2	Average	13.334 MHz	21.65	-28.34
1	Quasi Peak	17.778 MHz	25.16	-34.83
2	Average	17.778 MHz	24.64	-25.35
1	Quasi Peak	21.902 MHz	14.86	-45.13
2	Average	22.222 MHz	21.05	-28.94
2	Average	23.33 MHz	10.31	-39.68
1	Quasi Peak	23.486 MHz	17.34	-42.65
1	Quasi Peak	26.666 MHz	22.81	-37.18
2	Average	26.666 MHz	20.53	-29.47

Date: 16.NOV.2016 12:24:16

Figure 13. Detectors: Peak, Quasi-peak, Average

Note: QP Delta/Av Delta 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.

Conducted Emission

E.U.T Description	Bluetooth Communication System for Motorcycles
Type	cardo SMARTH
Serial Number:	Not designated

Specification:	FCC Part 15, Subpart C
Lead:	Neutral
Detectors:	Peak, Quasi-peak, Average
Power Operation	AC/DC adapter

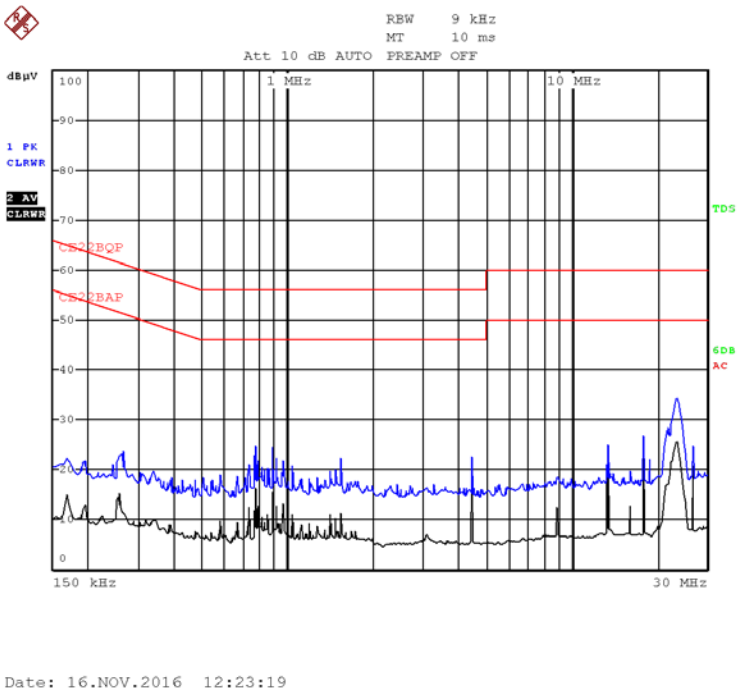

Figure 14 Detectors: Peak, Quasi-peak, Average

4.5 Test Equipment Used; Conducted Emission

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
LISN	Fischer	FCC-LISN-25A	127	June 23, 2016	June 23, 2017
Transient Limiter	HP	11947A	3107A03041	June 15, 2016	June 15, 2017
EMI Receiver	Rohde & Schwarz	ESCI7	100724	February 29, 2016	March 1, 2017
Low Loss Cable	Huber Suner		705A009301 EIM	May 30, 2016	May 30, 2017

Figure 15 Test Equipment Used

5. 20dB Minimum Bandwidth

5.1 Test Specification

F.C.C. Part 15, Subpart C: section 15.247(a)(1)
RSS 247 Section 5.1(1)

5.2 Test Procedure

(Temperature (22°C)/ Humidity (41%RH))
The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator and an appropriate coaxial cable .The transmitter unit operated with normal modulation. The spectrum analyzer was set to the following parameters:
Span = ~ 2 to 3 times the 20 dB bandwidth, centered on a hopping channel RBW ≥ 1% of the 20 dB bandwidth
Detector Function: Peak, Trace: Maximum Hold.
The E.U.T. was tested at Low, Mid and High channels.

5.3 Test Limit

N/A

5.4 Test Results

Operation Frequency	Modulation	Bandwidth Reading
(MHz)		(MHz)
2402	Standard	1.114
2441	Standard	1.102
2480	Standard	1.102
2402	EDR	1.389
2441	EDR	1.389
2480	EDR	1.401

Figure 16 — Test Results

JUDGEMENT: Passed

For additional information see *Figure 17* to *Figure 22.*

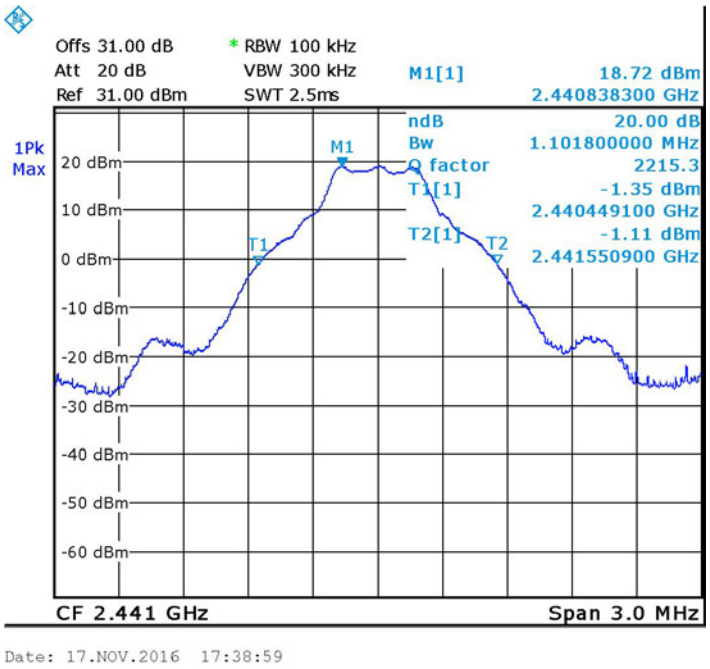

Figure 17. —2402 MHz – Low Standard Modulation

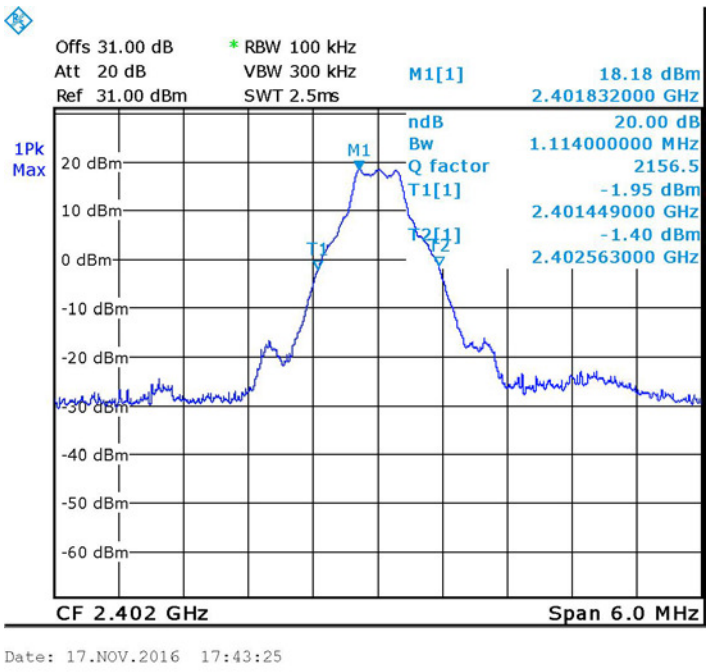

Figure 18. 2441 MHz - Mid Standard Modulation

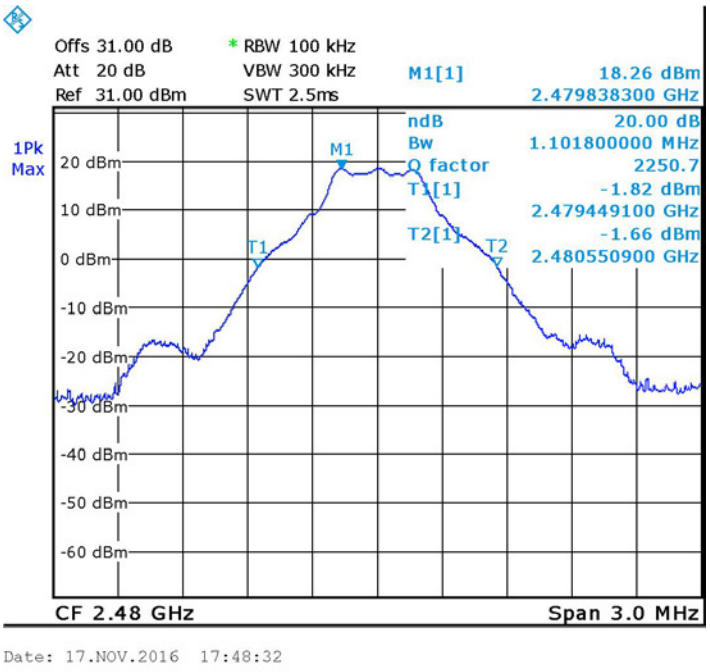

Figure 19. 2480- High Standard Modulation

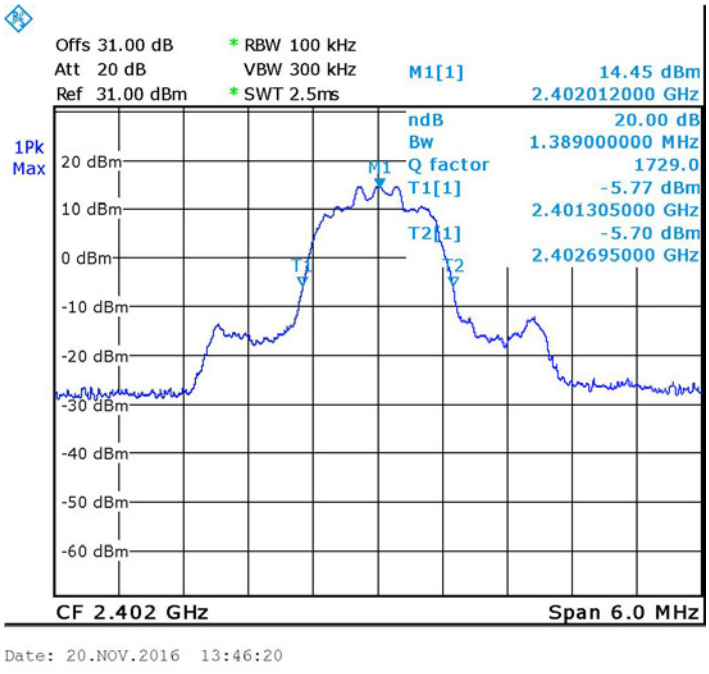

Figure 20. —2402 MHz – Low EDR Modulation

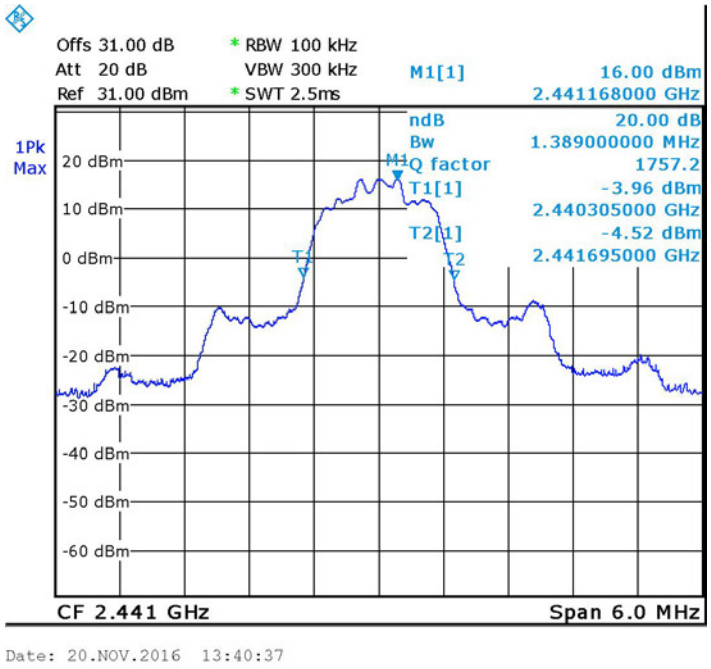

Figure 21. 2441 MHz - Mid EDR Modulation

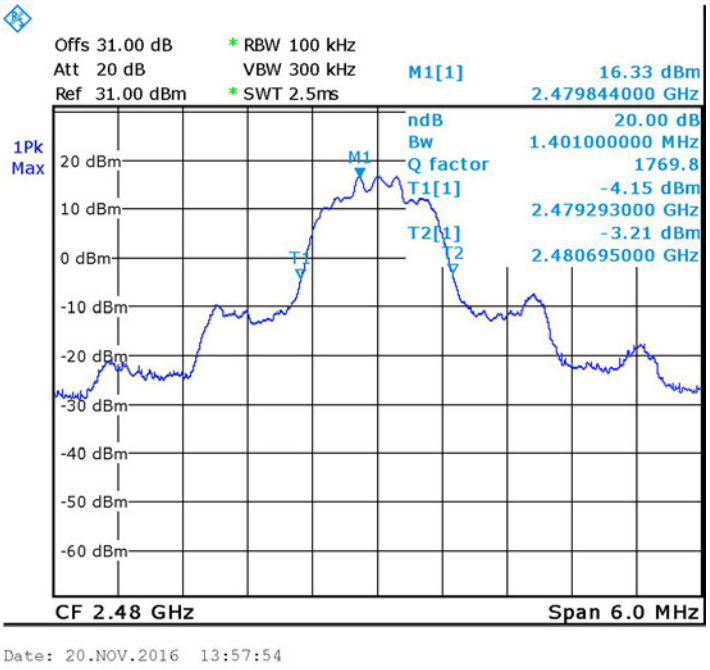

Figure 22. 2480- High EDR Modulation

5.5 Test Equipment Used, 20 dB Minimum Bandwidth

Instrument	Manufacturer	Model	Serial Number	Last Calibration Date	Next Calibration Due
Spectrum Analyzer	Rodhe & Schwarz	FSL6	100194	February 29, 2016	March 1, 2017
30dB Attenuator	MCL	BW-S30W5	533	July 5, 2016	July 5, 2017

Figure 23 Test Equipment Used

6. 26dB Minimum Bandwidth

6.1 Test Specification

F.C.C. Part 15, Subpart C, Section 15.247(a)
RSS Gen, Issue 4: 2014, Section 6.6

6.2 Test Procedure

(Temperature (24°C)/ Humidity (41%RH))
The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator and an appropriate coaxial cable .The transmitter unit operated with normal modulation. The spectrum analyzer was set to the following parameters:
Span = ~ 2 to 3 times the 20 dB bandwidth, centered on a hopping channel RBW ≥ 1% of the 20 dB bandwidth
Detector Function: Peak, Trace: Maximum Hold.
The E.U.T. was tested at Low, Mid and High channels.

6.3 Test Limit

N/A

6.4 Test Results

Operation Frequency	Modulation	Bandwidth Reading
(MHz)		(MHz)
2402	Standard	1.281
2441	Standard	1.281
2480	Standard	1.269
2402	EDR	1.485
2441	EDR	1.533
2480	EDR	1.605

Figure 24 — Test Results

JUDGEMENT: Passed

For additional information see *Figure 25* to *Figure 30.*

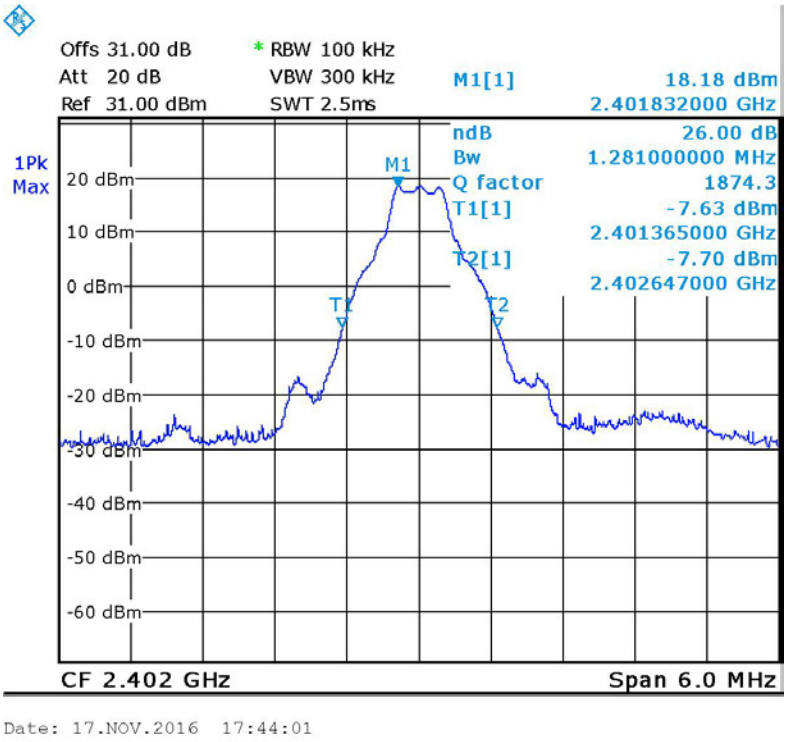

Figure 25. —2402 MHz - Low Standard Modulation

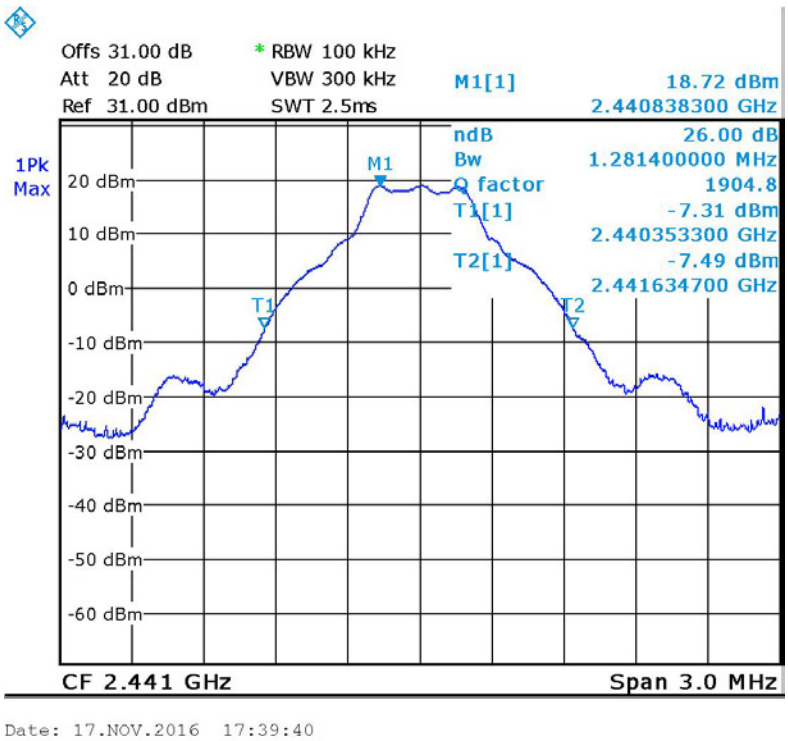

Figure 26. 2441 MHz - Mid Standard Modulation

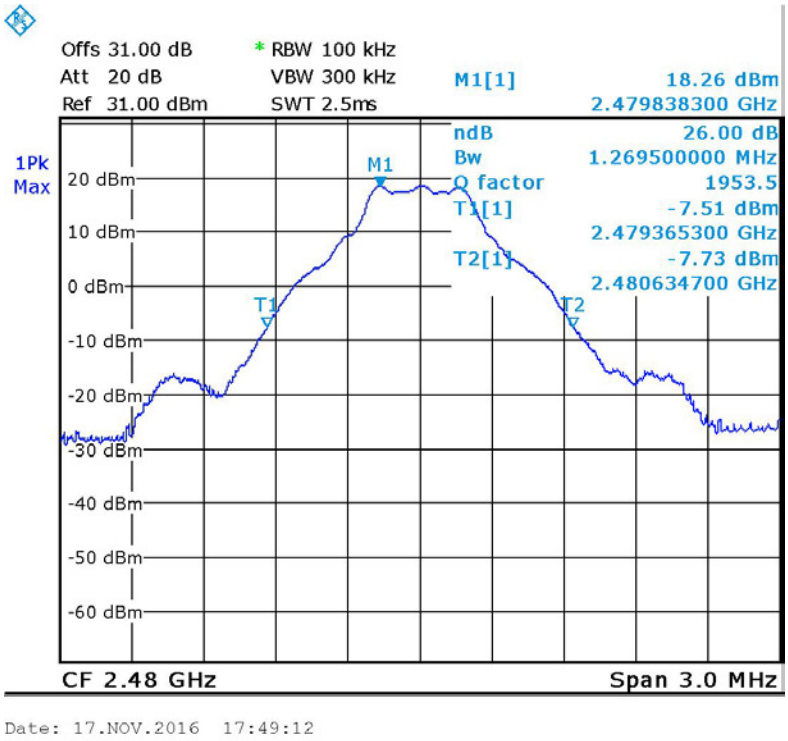

Figure 27. 2480- High Standard Modulation

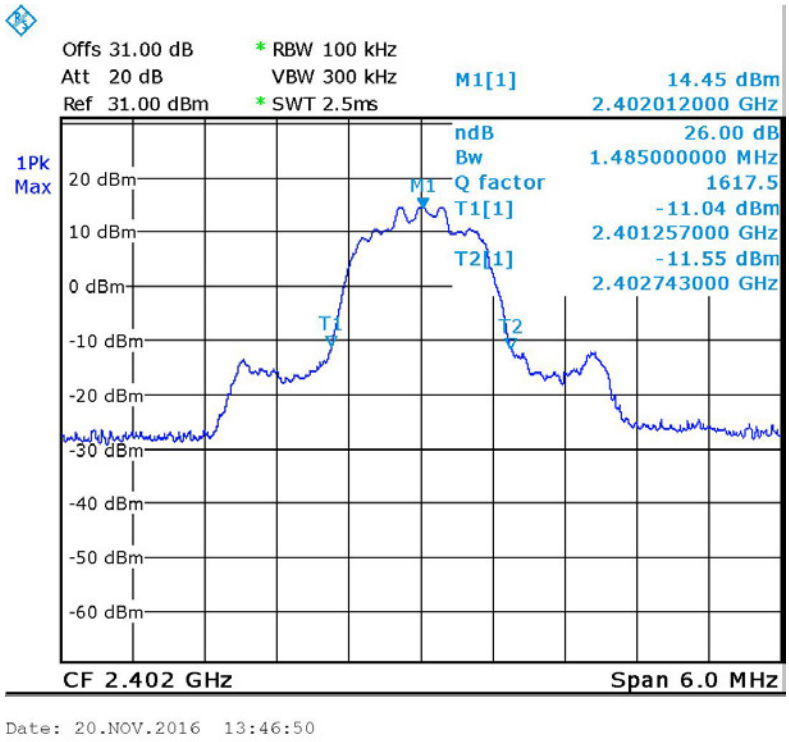

Figure 28. —2402 MHz - Low EDR Modulation

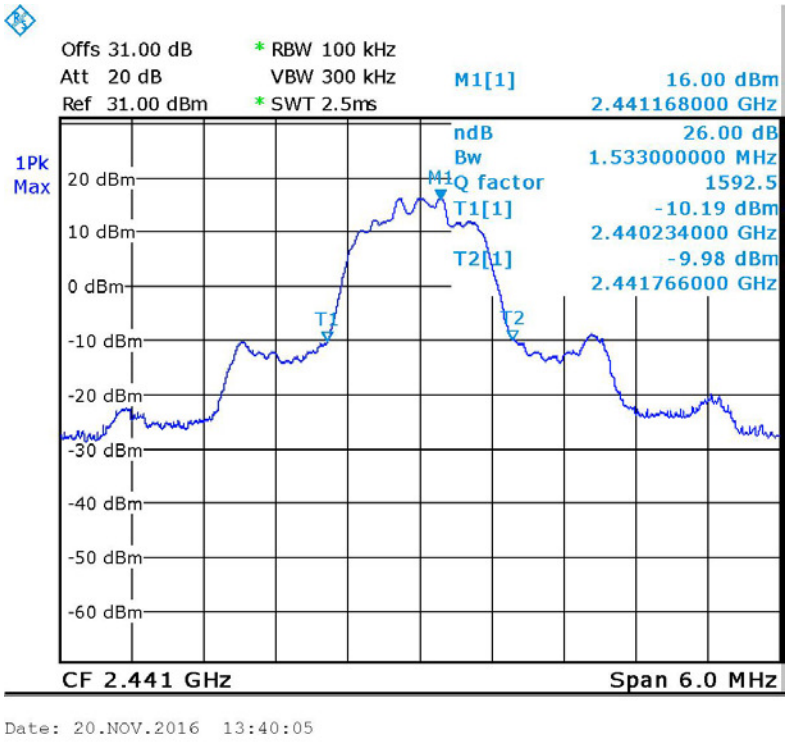

Figure 29. 2441 MHz - Mid EDR Modulation

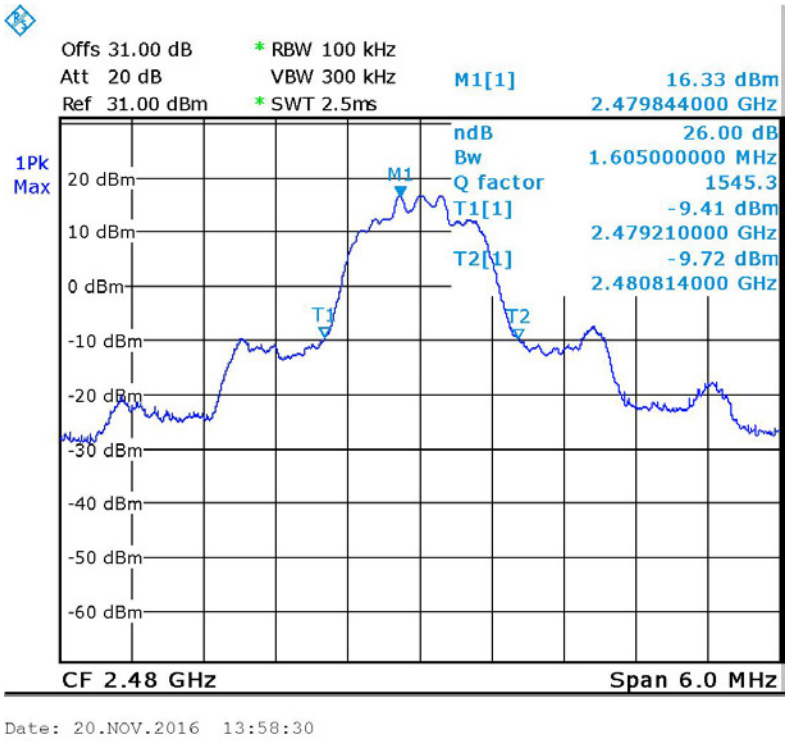

Figure 30. 2480- High EDR Modulation

6.5 Test Equipment Used, 26 dB Minimum Bandwidth

Instrument	Manufacturer	Model	Serial Number	Last Calibration Date	Next Calibration Due
Spectrum Analyzer	Rodhe & Schwarz	FSL6	100194	February 29, 2016	March 1, 2017
30dB Attenuator	MCL	BW-S30W5	533	July 5, 2016	July 5, 2017

Figure 31 Test Equipment Used

7. Number of Hopping Frequencies

7.1 Test Specification

F.C.C., Part 15, Subpart C Section 15.247(a)(1)(iii)

RSS Section 5.1(4)

7.2 Test Procedure

(Temperature (23°C)/ Humidity (40%RH))
The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator and an appropriate coaxial cable.

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

Band of Operation: 2400M-2483.5 MHz
RBW: 30 kHz, VBW: 100 kHz
Detector Function: Peak, Trace: Maximum Hold

7.3 Test Limit

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

7.4 Test Results

Number of Hopping Frequencies	Specification
79	≥75

Figure 32 Test Results

JUDGEMENT: Passed

For additional information see *Figure 33* to *Figure 38*.

Number of Hopping Frequencies

E.U.T Description	Bluetooth Communication System for Motorcycles
Type	cardo SMARTH
Serial Number:	Not designated

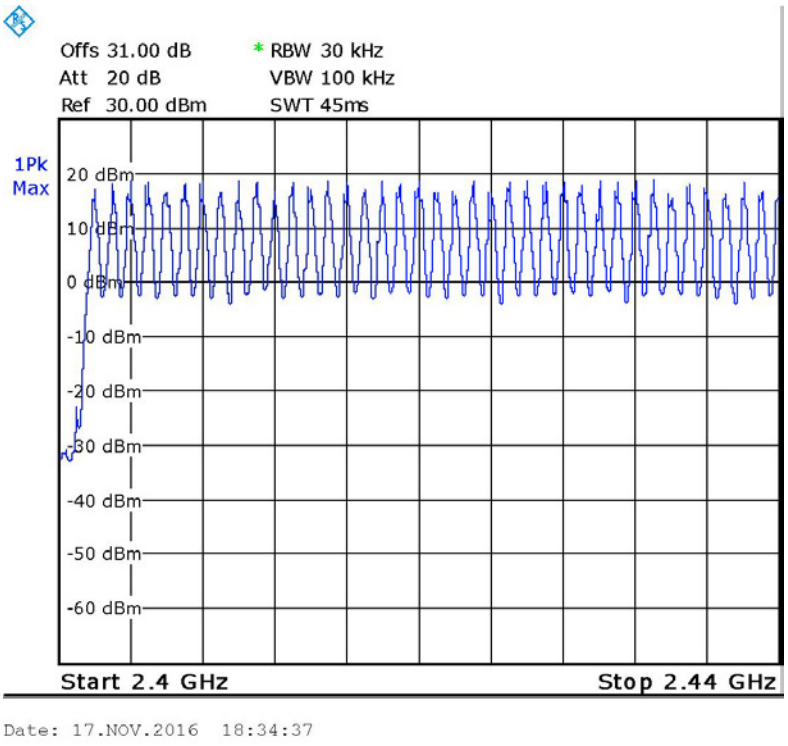

Figure 33. Number of Channels Standard Modulation = 39

Number of Hopping Frequencies

E.U.T Description	Bluetooth Communication System for Motorcycles
Type	cardo SMARTH
Serial Number:	Not designated

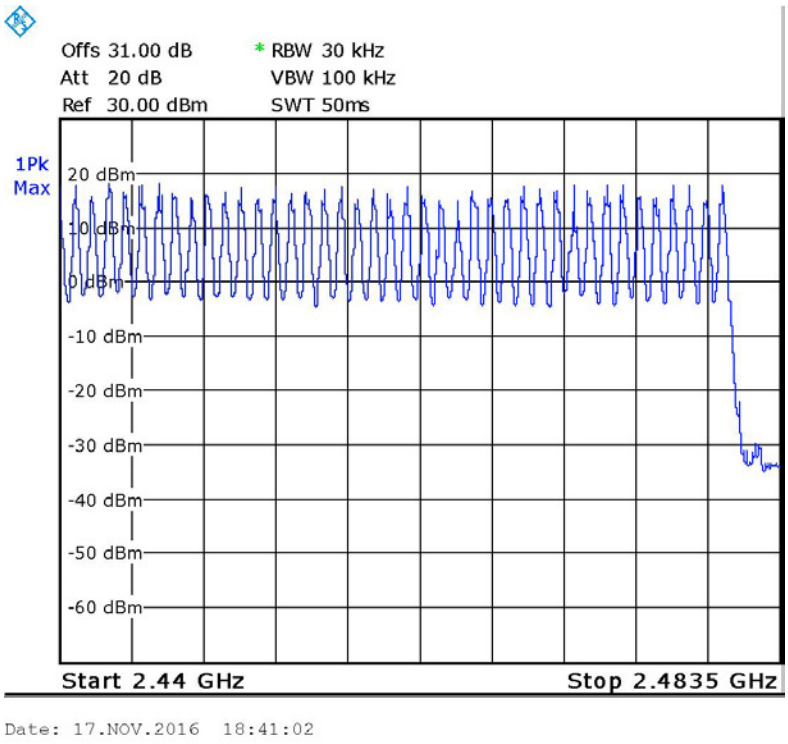

Figure 34. Number of Channels Standard Modulation=40

Number of Hopping Frequencies

E.U.T Description	Bluetooth Communication System for Motorcycles
Type	cardo SMARTH
Serial Number:	Not designated

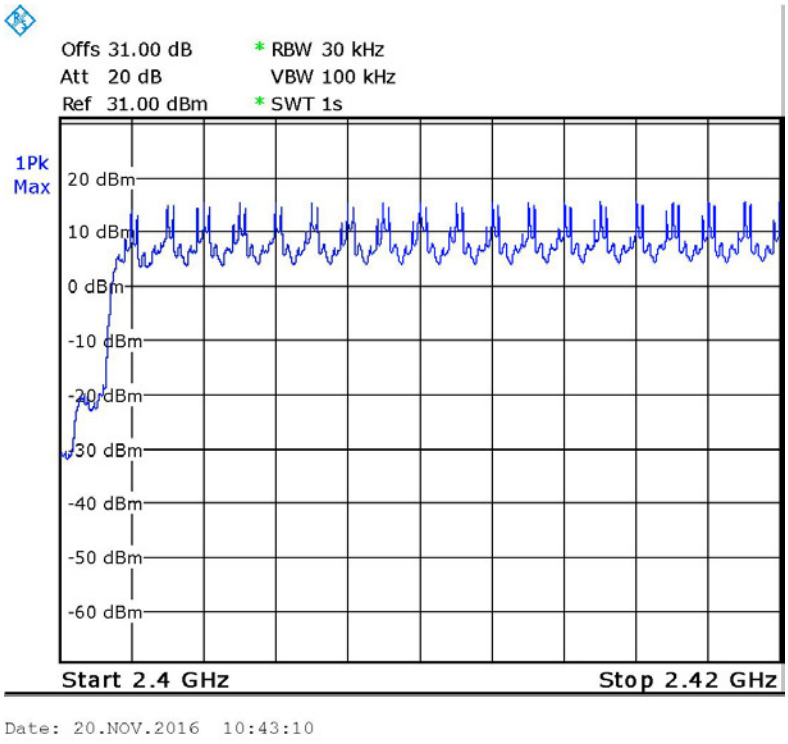

Figure 35. Number of Channels EDR Modulation=19

Number of Hopping Frequencies

E.U.T Description	Bluetooth Communication System for Motorcycles
Type	cardo SMARTH
Serial Number:	Not designated

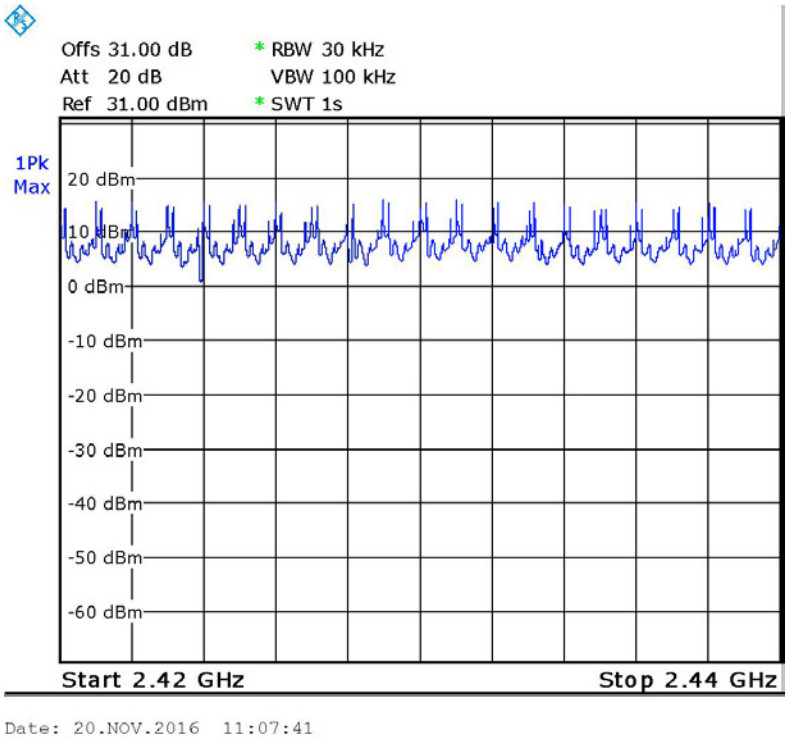

Figure 36. Number of Channels EDR Modulation=20

Number of Hopping Frequencies

E.U.T Description	Bluetooth Communication System for Motorcycles
Type	cardo SMARTH
Serial Number:	Not designated

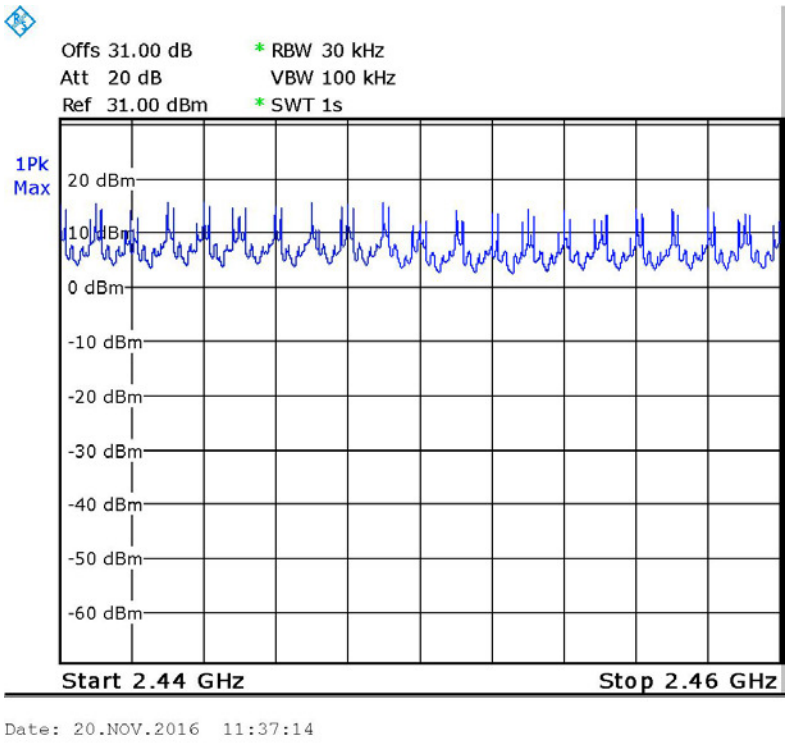

Figure 37. Number of Channels EDR Modulation=20

Number of Hopping Frequencies

E.U.T Description	Bluetooth Communication System for Motorcycles
Type	cardo SMARTH
Serial Number:	Not designated

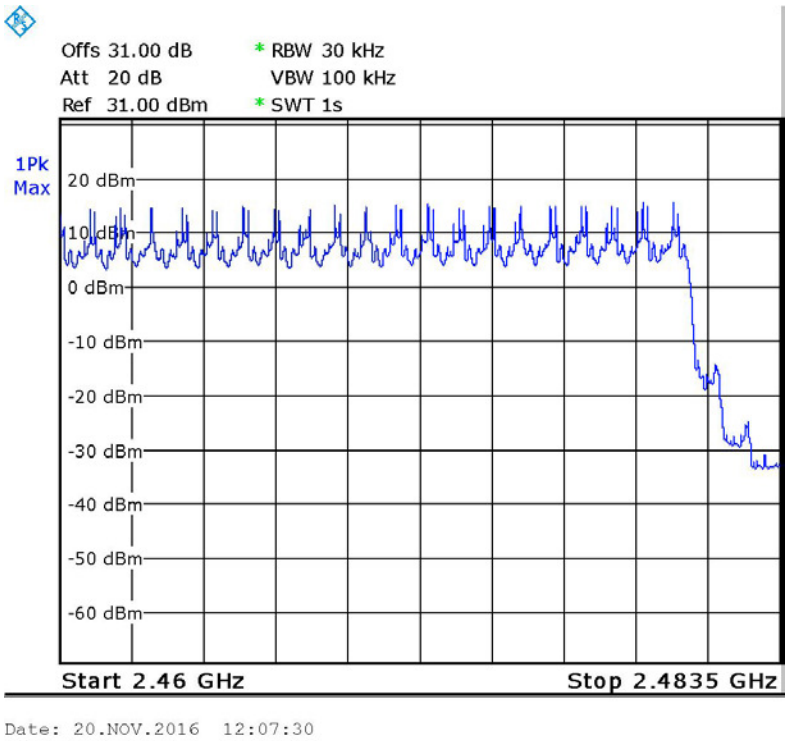

Figure 38. Number of Channels EDR Modulation=20

7.5 Test Equipment Used, Number of Hopping Frequencies

Instrument	Manufacturer	Model	Serial Number	Last Calibration Date	Next Calibration Due
Spectrum Analyzer	Rodhe & Schwarz	FSL6	100194	February 29, 2016	March 1, 2017
30dB Attenuator	MCL	BW-S30W5	533	July 5, 2016	July 5, 2017

Figure 39 Test Equipment Used

8. Channel Frequency Separation

8.1 Test Specification

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

RSS 247, Issue 1, Section 5.1(2)

8.2 Test Procedure

(Temperature (25°C)/ Humidity (42%RH))
The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator and an appropriate coaxial cable.

The E.U.T. was set to hopping mode.

The spectrum analyzer was set to the following parameters:
Span = wide enough to capture two adjacent channels, RBW≥ 1% of the span
Detector Function: Peak, Trace: Maximum Hold.

8.3 Test Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

8.4 Test Results

Channel Frequency Separation	Specification	Modulation	Margin
(MHz)	(MHz)		(kHz)
1.0	>0.745	Standard	-255.0
1.0	>0.926	EDR	-74.0

Figure 40 Test Results

JUDGEMENT: Passed by 74.0 kHz

For additional information see *Figure 41* to *Figure 42*.

Channel Frequency Separation

E.U.T Description	Bluetooth Communication System for Motorcycles
Type	cardo SMARTH
Serial Number:	Not designated

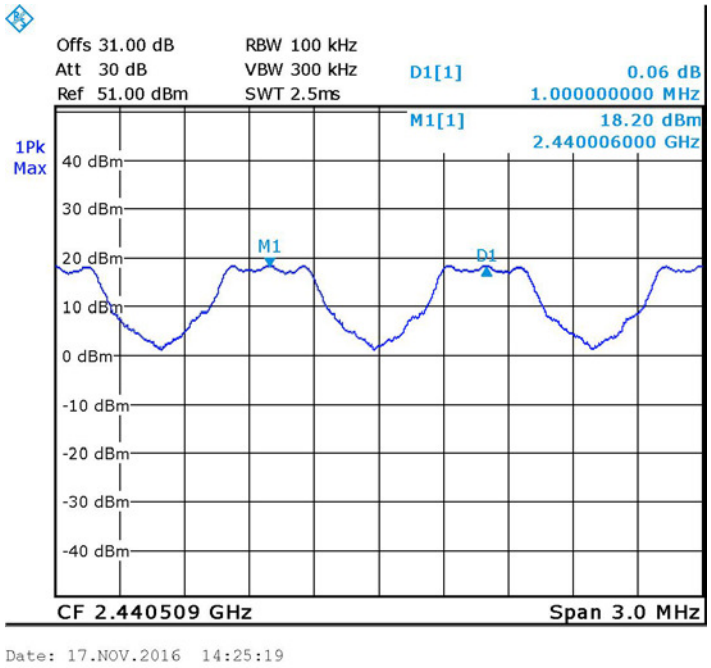

Figure 41. Channel Frequency Separation Standard Modulation

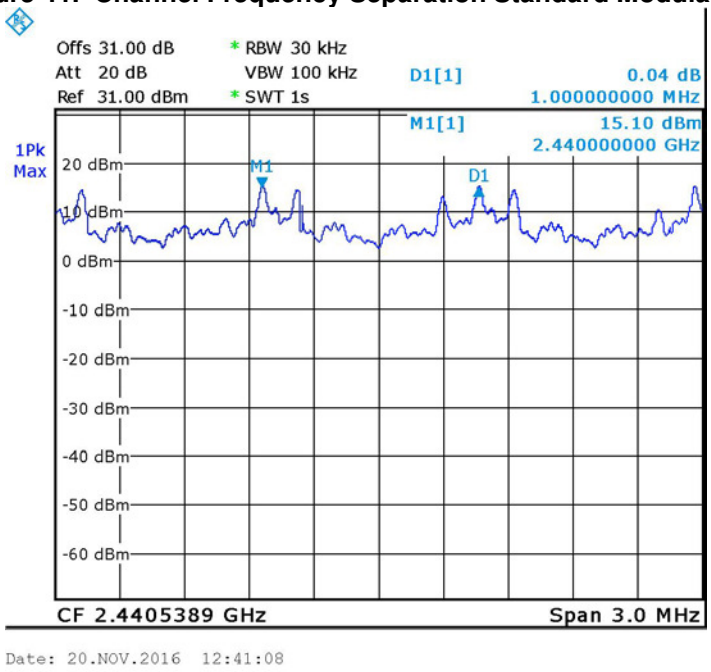

Figure 42. Channel Frequency Separation EDR Modulation

8.5 Test Equipment Used, Channel Frequency Separation Test

Instrument	Manufacturer	Model	Serial Number	Last Calibration Date	Period Next Calibration Due
Spectrum Analyzer	Rodhe & Schwarz	FSL6	100194	February 29, 2016	March 1, 2017
30dB Attenuator	MCL	BW-S30W5	533	July 5, 2016	July 5, 2017

Figure 43 Test Equipment Used

9. Peak Output Power

9.1 Test Specification

F.C.C. Part 15, Subpart C: section 15.247(b)(1)
RSS 247, Issue 1, Section 5.4(2)

9.2 Test Procedure

(Temperature (23°C)/ Humidity (40%RH))
The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator and an appropriate coaxial cable (total loss= 31.0dB).
The spectrum analyzer was set to the following parameters:
Span = ~5 times the 20 dB bandwidth, centered on a hopping channel RBW ≥ of the 20 dB bandwidth of the emission being measured
Detector Function: Peak, Trace: Maximum Hold.

The E.U.T. was tested at the Low (2402MHz), Mid (2441MHz) and High (2480 MHz) channels with modulation.

9.3 Test Limit

The maximum peak conducted output power of the intentional radiator shall not exceed the following:
For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels: 1 watt.
For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 W
(The limits above applies to antenna gain until 6dBi).

9.4 Test Results

Operation Frequency	Power	Power	Modulation	Limit	Margin
(MHz)	(dBm)	(mW)		(mW)	(mW)
2402	18.40	69.18	Standard	125.0	-55.82
2441	18.84	76.56	Standard	125.0	-48.44
2480	18.39	69.02	Standard	125.0	-55.98
2402	16.49	44.57	EDR	125.0	-80.43
2441	17.67	58.48	EDR	125.0	-66.52
2480	17.49	56.10	EDR	125.0	-68.90

Figure 44 Radiated Power Output Test Results

JUDGEMENT: Passed by 48.44 mW

For additional information see *Figure 45* to *Figure 50*.

Peak Output Power

E.U.T Description	Bluetooth Communication System for Motorcycles
Type	cardo SMARTH
Serial Number:	Not designated

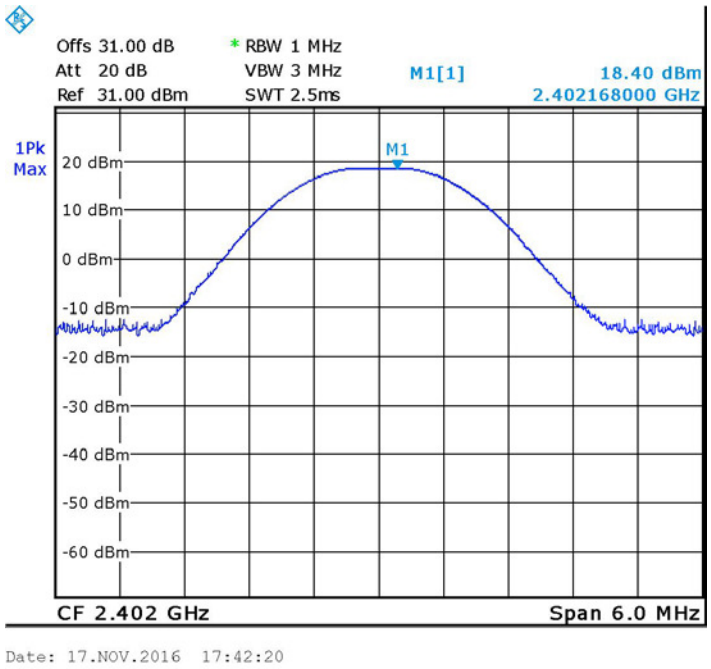

Figure 45 — 2402 MHz - Low Standard Modulation

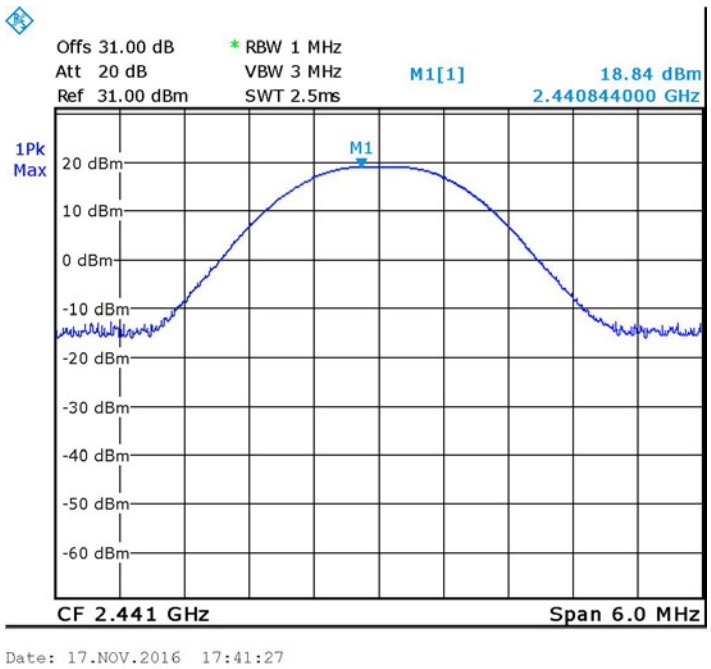

Figure 46 — 2441 - Mid Standard Modulation

Peak Output Power

E.U.T Description	Bluetooth Communication System for Motorcycles
Type	cardo SMARTH
Serial Number:	Not designated

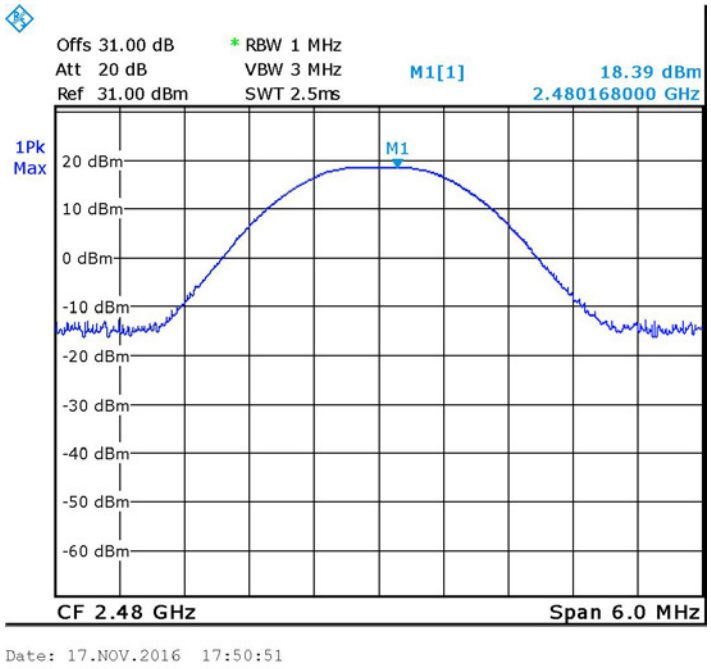

Figure 47 — 2480MHz - High Standard Modulation

Peak Output Power

E.U.T Description	Bluetooth Communication System for Motorcycles
Type	cardo SMARTH
Serial Number:	Not designated

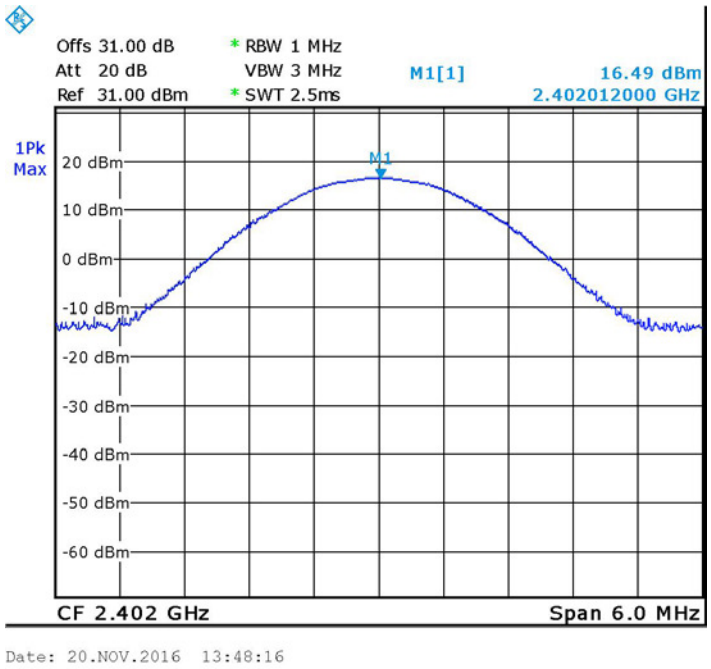

Figure 48 — 2402 MHz - Low EDR Modulation

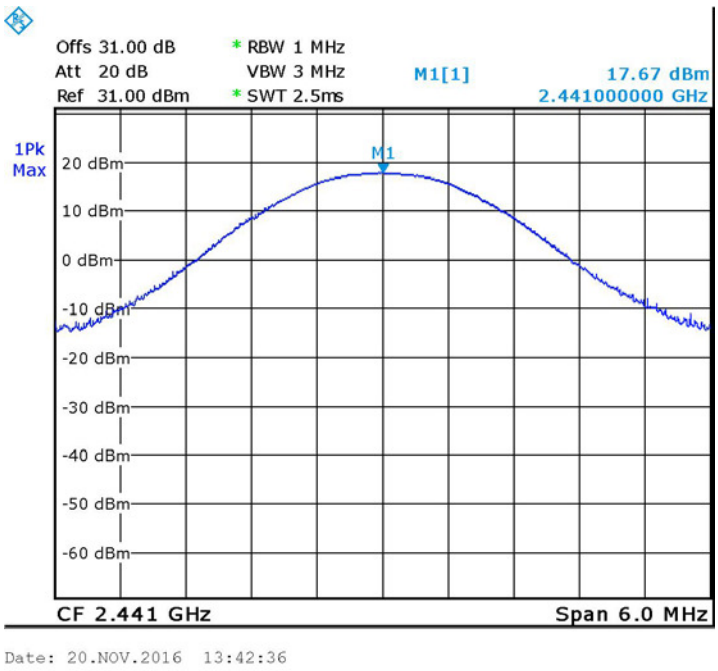

Figure 49 — 2441 - Mid EDR Modulation

Peak Output Power

E.U.T Description	Bluetooth Communication System for Motorcycles
Type	cardo SMARTH
Serial Number:	Not designated

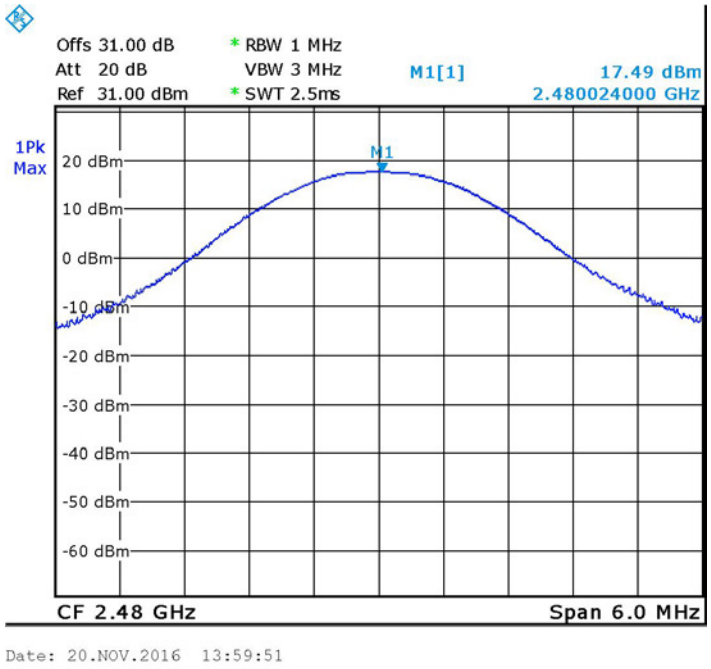

Figure 50 — 2480MHz - High EDR Modulation

9.5 Test Equipment Used, Radiated Maximum Power Output

Instrument	Manufacturer	Model	Serial Number	Last Calibration Date	Next Calibration Due
Spectrum Analyzer	Rodhe & Schwarz	FSL6	100194	February 29, 2016	March 1, 2017
30dB Attenuator	MCL	BW-S30W5	533	July 5, 2016	July 5, 2017

Figure 51 Test Equipment Used

10. Dwell Time on Each Channel

10.1 Test Specification

FCC Part 15, sub part C, Section 15.247(a)(1)(iii)

RSS-247, Issue 1, Section 5.1(4)

10.2 Test Procedure

(Temperature (25°C)/ Humidity (40%RH))
The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator and an appropriate coaxial cable.
The spectrum analyzer was set to the following parameters:
Span = zero span, centered on a hopping channel, RBW≥ 1MHz.
Detector Function: Peak, Trace: Maximum Hold

10.3 Test Limit

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.

10.4 Test Results

JUDGEMENT: Passed

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

Additional information of the results is given in *Figure 52* to *Figure 55.*

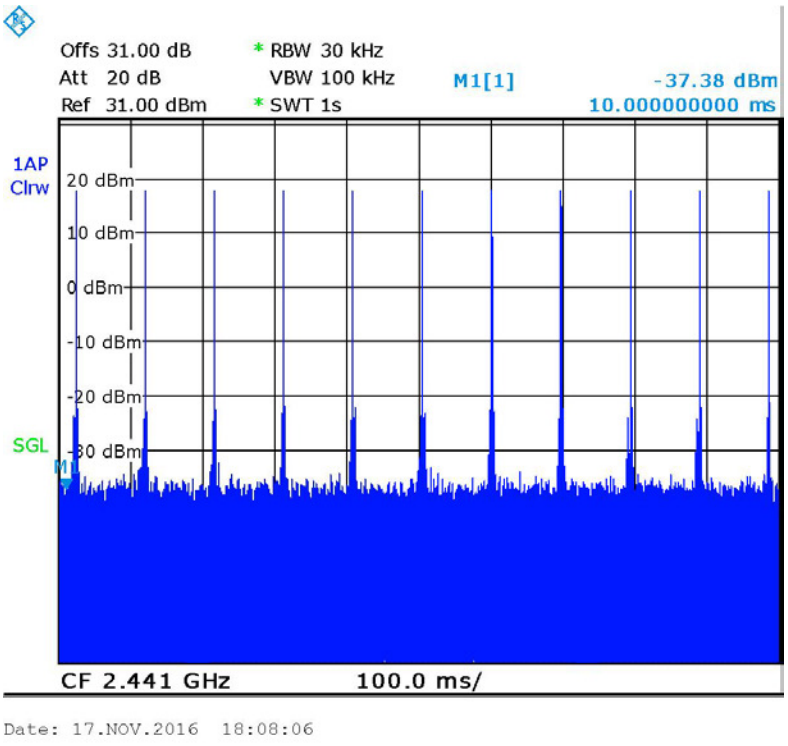

Figure 52 — Number of Bursts in 1 sec = 11 standard modulation

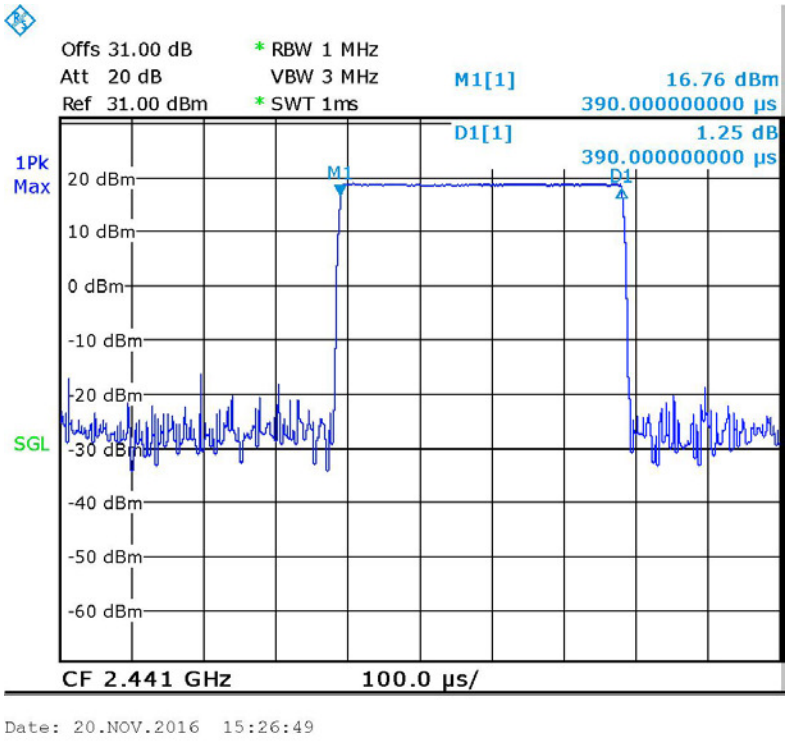

Figure 53 — Burst Duration =.390mS standard modulation

DWELL TIME = 0.390m *11*31.6= 135.56msec=0.136s<0.4s

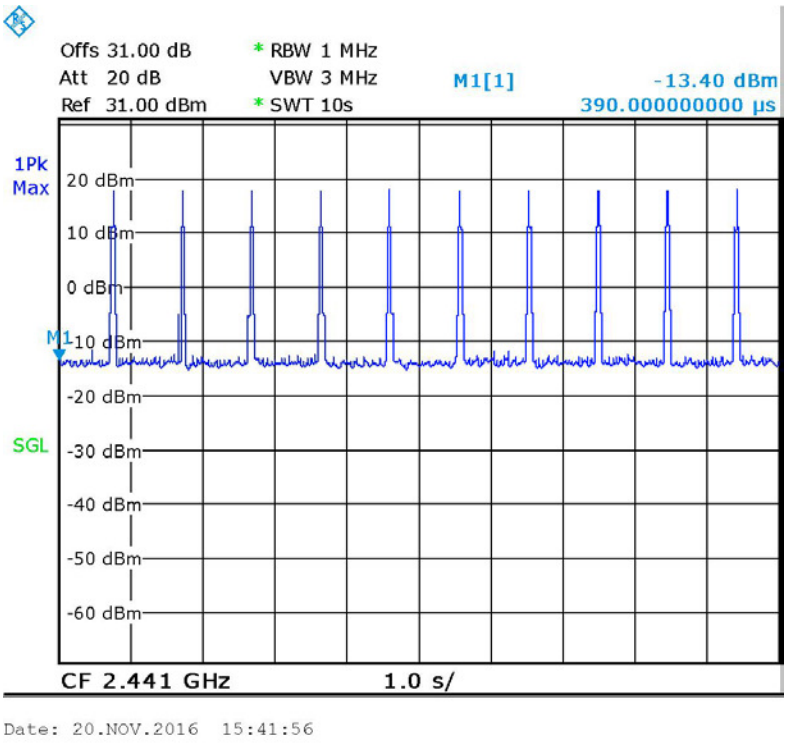

Figure 54 — Number of Bursts in 10 sec=10 EDR modulation

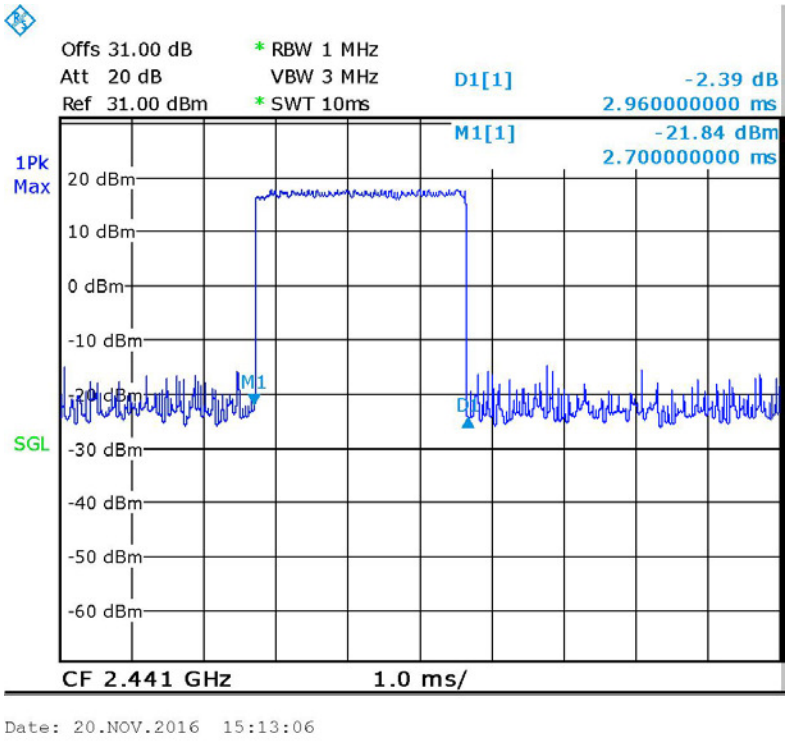

Figure 55 — Burst Duration =2.960ms EDR modulation

DWELL TIME =2.960ms *1*31.6=93.536msec=0.094s<0.4s

10.5 Test Equipment Used, Dwell Time on Each Channel

Instrument	Manufacturer	Model	Serial Number	Last Calibration Date	Next Calibration Due
Spectrum Analyzer	HP	8564E	3442A00275	March 11, 2016	March 10, 2017
30dB Attenuator	MCL	BW-S30W5	533	July 5, 2016	July 5, 2017

Figure 56 Test Equipment Used

11. Band Edge

11.1 Test Specification

FCC Part 15, Section 15.247(d)

RSS-247, Issue 1, Section 5.5

11.2 Test Procedure

(Temperature (23°C)/ Humidity (41%RH))
The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator and an appropriate coaxial cable.
The transmitter unit operated in 2 modes: hopping enabled and hopping disabled.
The RBW was set to 100 kHz.

The EMI receiver was adjusted to the transmission channel at the maximum level.
The display line was set to 20 dBc and the EMC analyzer was set to the band edge frequencies.

The E.U.T. was tested at the lower and the upper channels.

11.3 Test Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

11.4 Test Results

Mode	Operation Frequency	Band Edge Frequency	Spectrum Level	Limit	Margin
	(MHz)	(MHz)	(dBm)	(dBm)	(dB)
Hopping	Low	2400.0	-27.74	-4.2	-23.5
	High	2483.49	-29.06	-4.0	-25.1
Non-Hopping	Low	2400.0	-26.05	-1.2	-24.9
	High	2483.5	-28.67	-1.7	-27.0
Hopping	Low	2400.0	-27.07	-4.1	-23.0
	High	2483.49	-27.98	-3.7	-24.3
Non-Hopping	Low	2400.0	-26.64	-4.5	-22.1
	High	2483.5	-29.25	-3.6	-25.7

Figure 57 Band Edge Test Results

JUDGEMENT: Passed by 22.1 dB

For additional information see *Figure 58* to *Figure 65.*

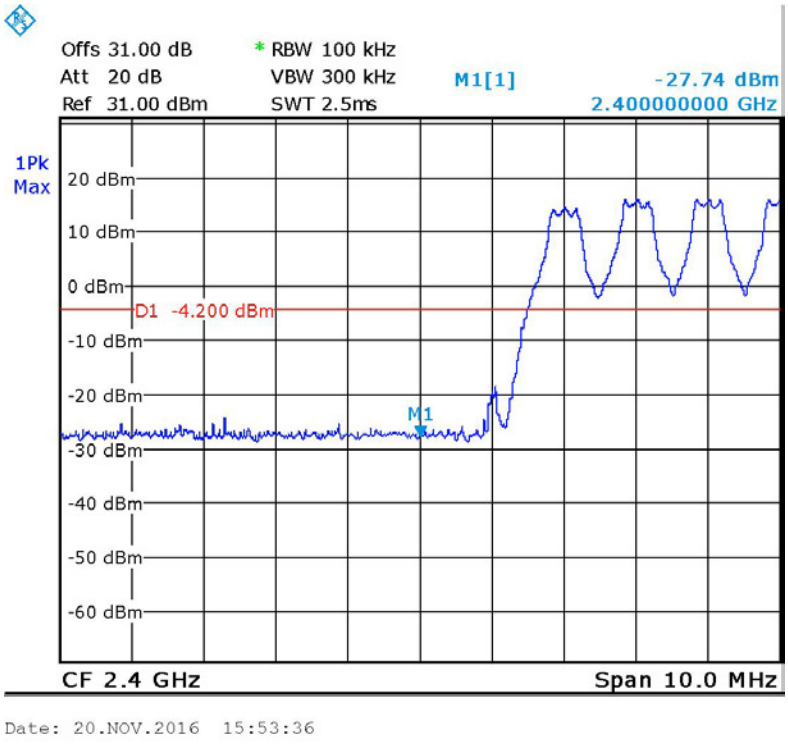

Figure 58 — Hopping - Low Standard Modulation

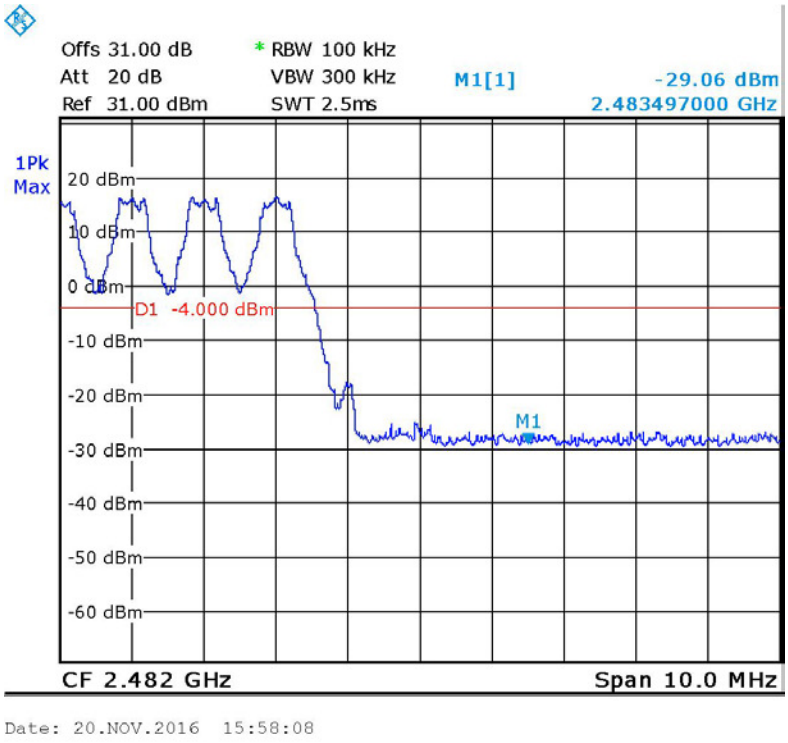

Figure 59 — Hopping - High Standard Modulation

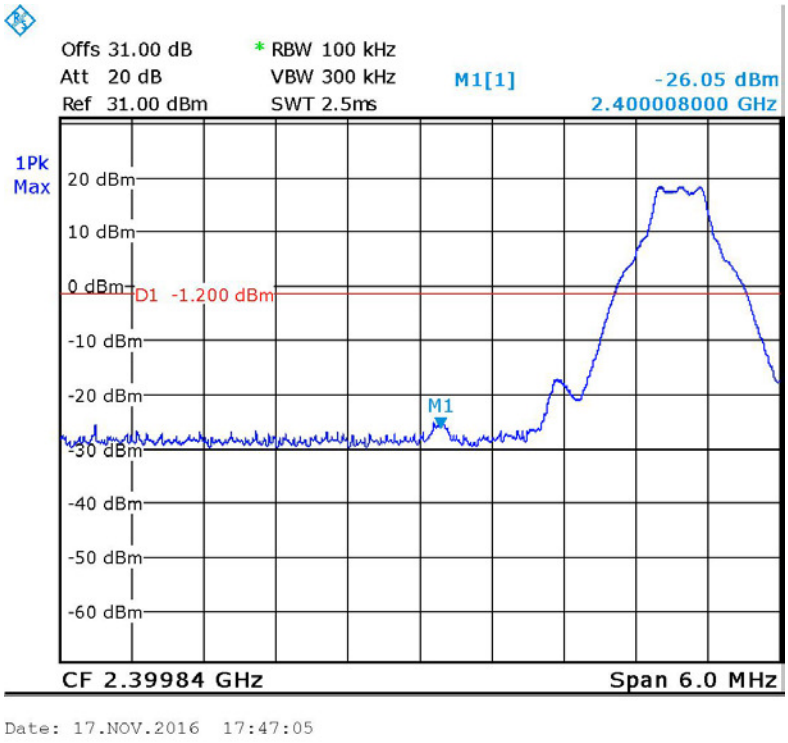

Figure 60 — Non-Hopping - Low Standard Modulation

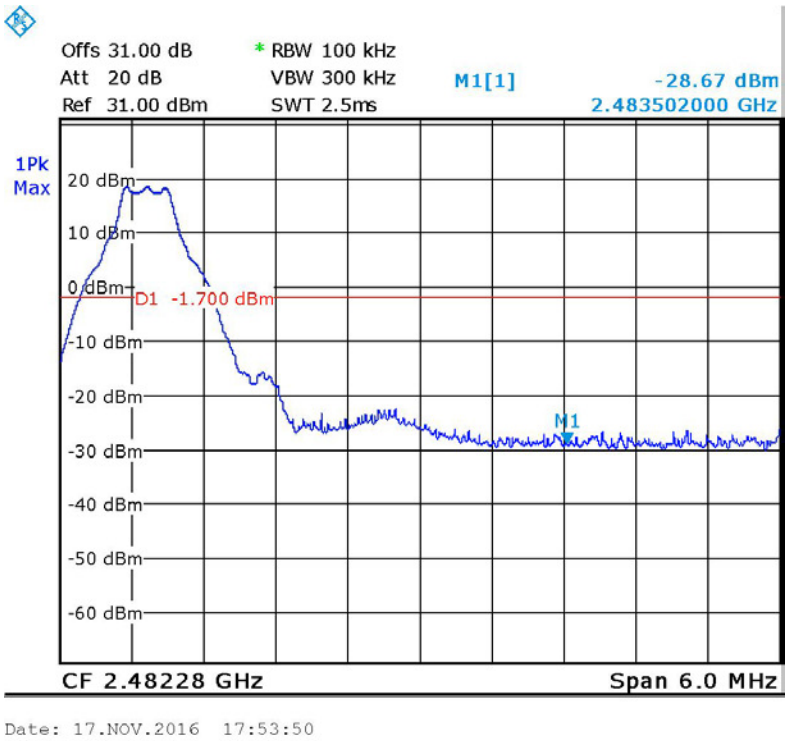

Figure 61 — Non-Hopping – High Standard Modulation

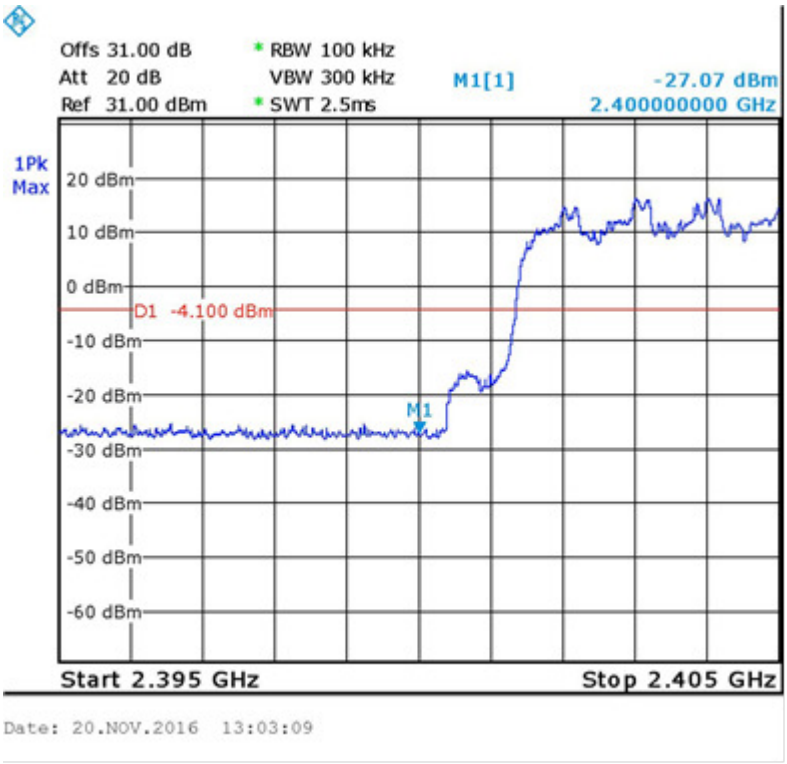

Figure 62 — Hopping - Low EDR Modulation

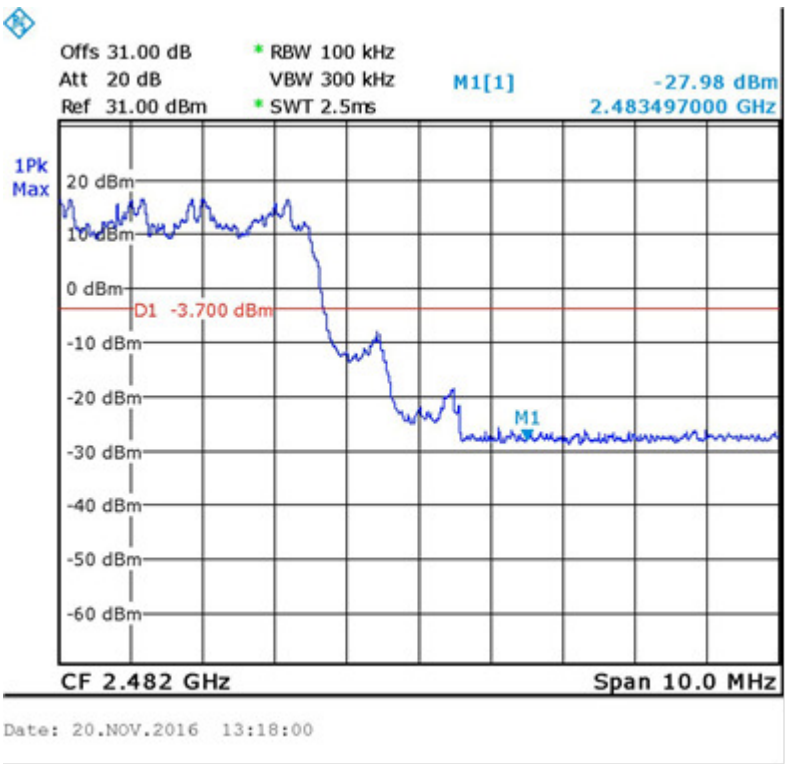

Figure 63 — Hopping - High EDR Modulation

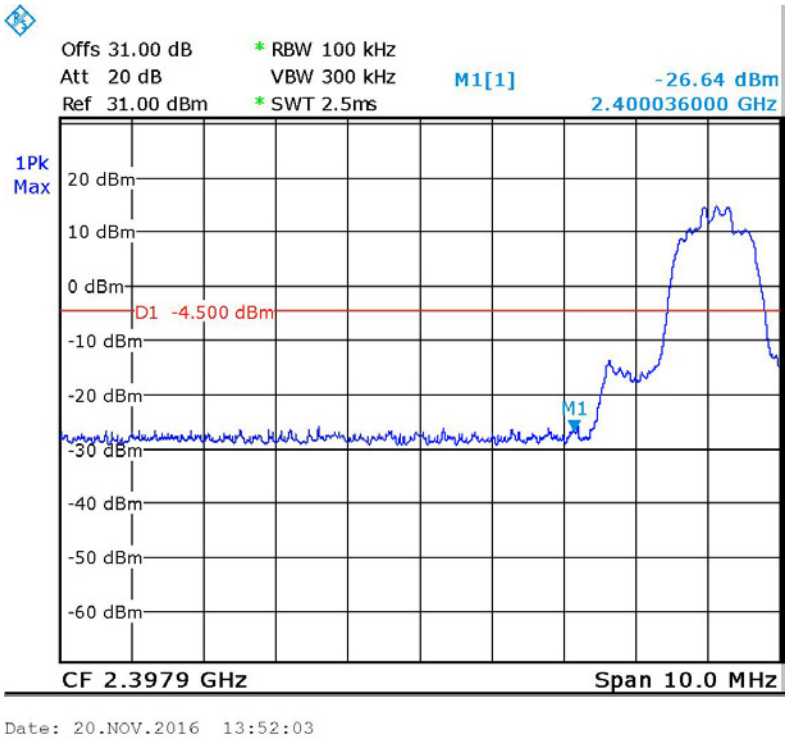

Figure 64 — Non-Hopping - Low EDR Modulation

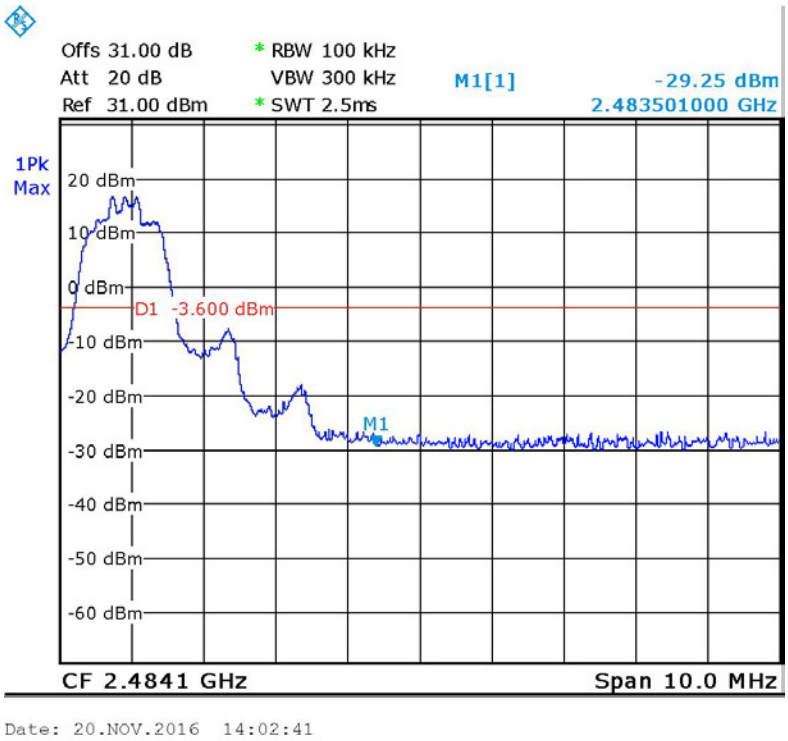

Figure 65 — Non-Hopping – High EDR Modulation

11.5 Test Equipment Used, Band Edge Spectrum

Instrument	Manufacturer	Model	Serial Number	Last Calibration Date	Next Calibration Due
Spectrum Analyzer	Rodhe & Schwarz	FSL6	100194	February 29, 2016	March 1, 2017
30dB Attenuator	MCL	BW-S30W5	533	July 5, 2016	July 5, 2017

Figure 66 Test Equipment Used

12. Emissions in Non-Restricted Frequency Bands

12.1 Test Specification

FCC, Part 15, Subpart C, Section 247(d)

RSS 247, Issue 1, Section 5.5

12.2 Test Procedure

(Temperature (24°C)/ Humidity (40%RH))
The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator and an appropriate coaxial cable.

The frequency range 0.009-25,000.0 MHz was scanned to find other emissions that don't fall in the restricted band.
RBW was set to 100 kHz, detector set to max peak and trace to "max hold"

The E.U.T. was operated at the following frequencies: Low (2402 MHz), Mid (2440 MHz) and High (2480 MHz).
These frequencies were measured using a peak detector.

12.3 Test Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

12.4 Test Results

JUDGEMENT: Passed

The EUT met the requirements of the F.C.C. Part 15, Subpart C, Section 247 (d) specification.

For additional information see *Figure* 67 to *Figure 72.*

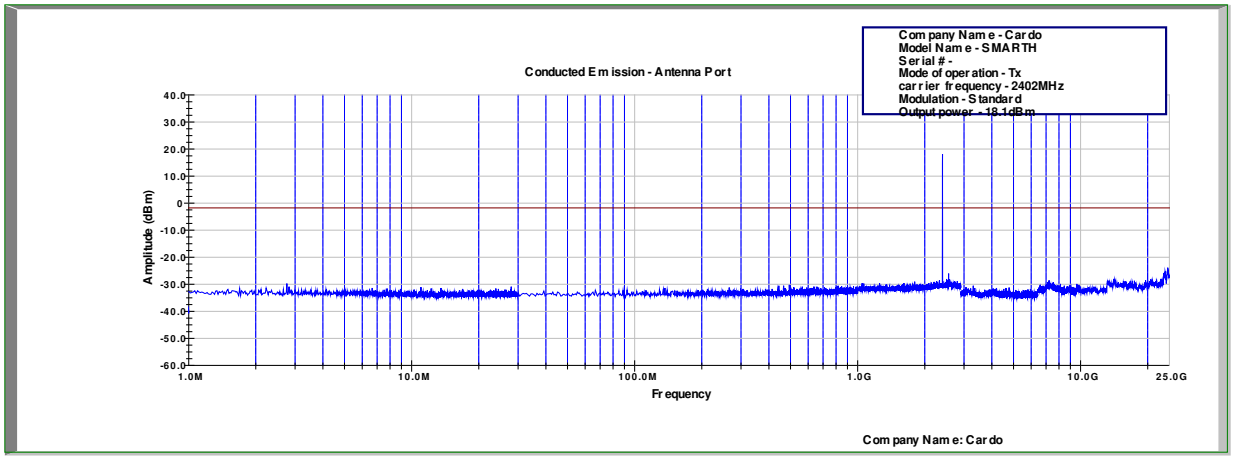

Figure 67 Conducted Spurious Emission – 2402 MHz Standard modulation

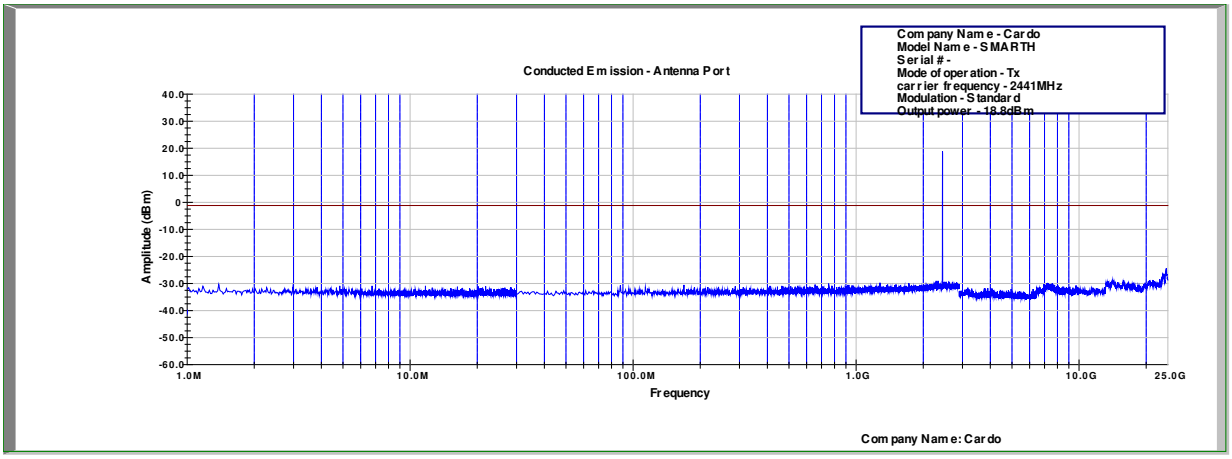

Figure 68 Conducted Spurious Emission - 2441 MHz Standard modulation

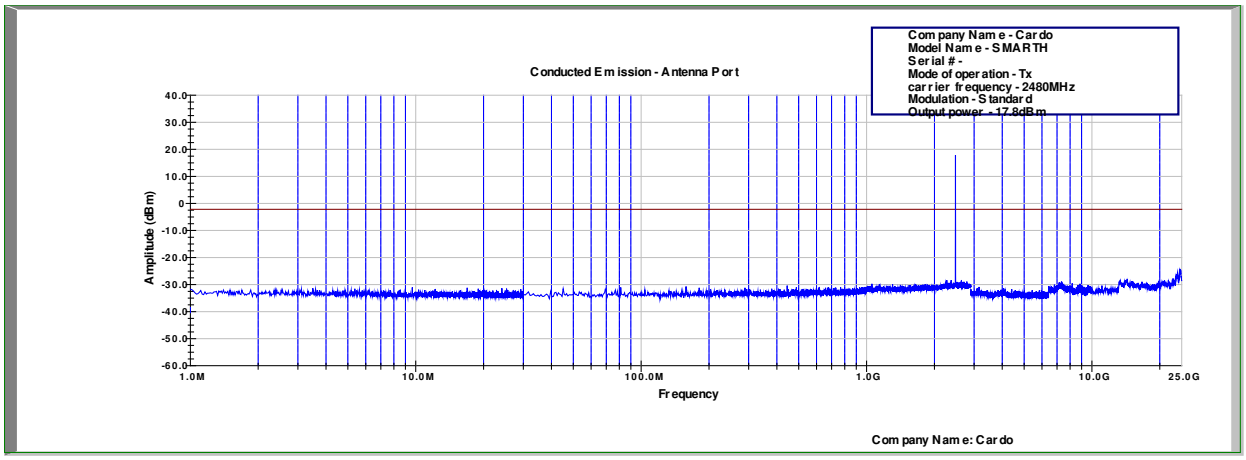

Figure 69 Conducted Spurious Emission – 2480 MHz Standard modulation

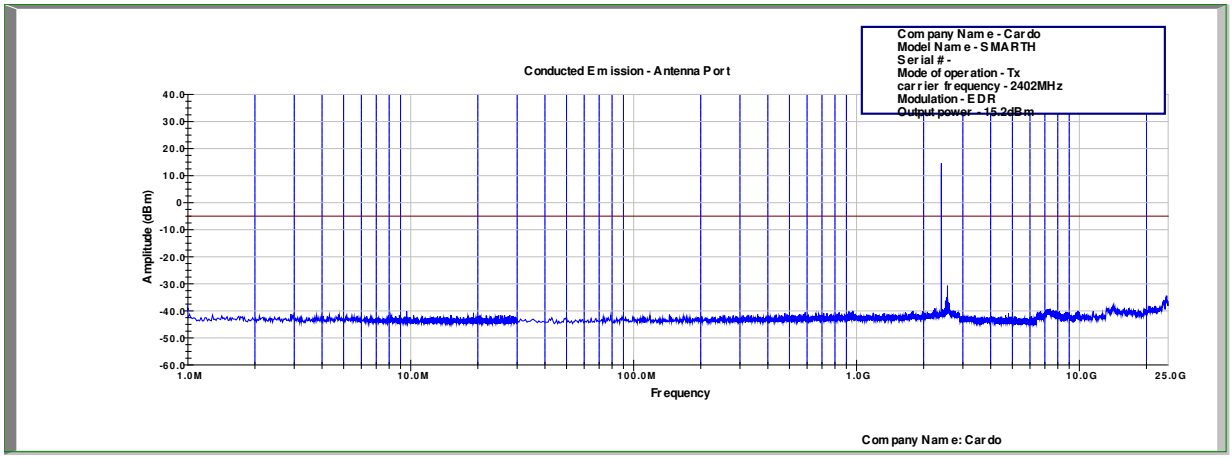

Figure 70 Conducted Spurious Emission – 2402 MHz EDR modulation

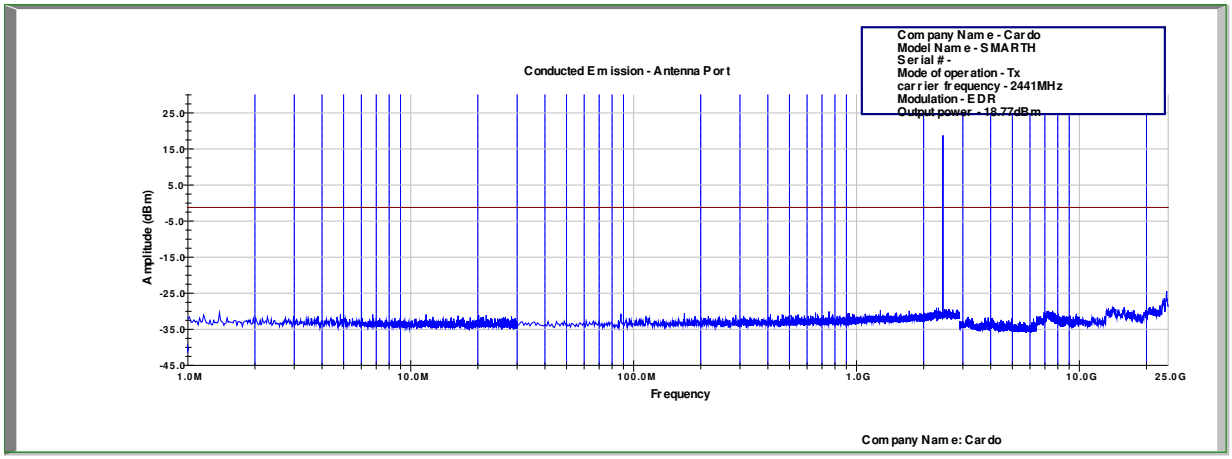

Figure 71 Conducted Spurious Emission - 2441 MHz EDR modulation

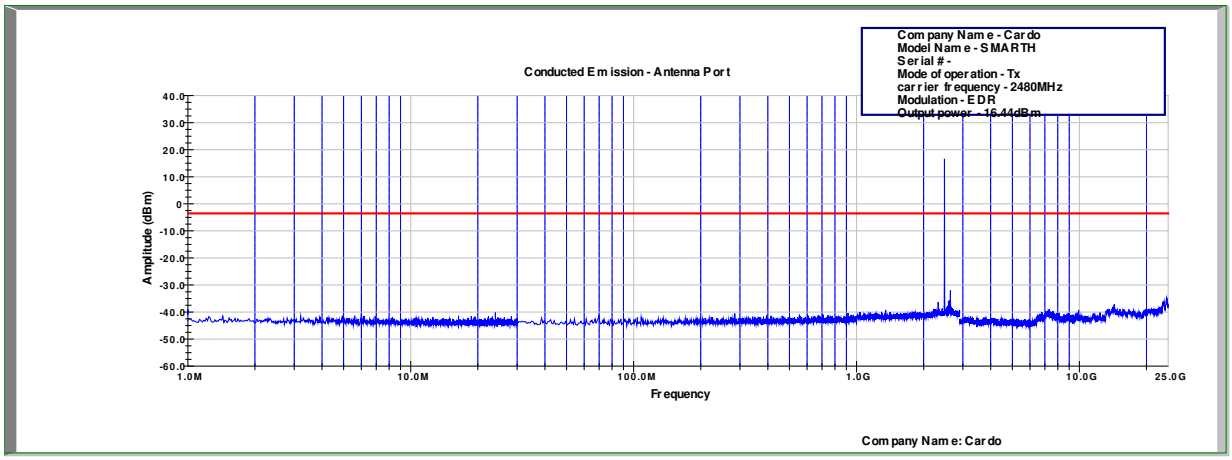

Figure 72 Conducted Spurious Emission – 2480 MHz EDR modulation

12.5 Test Equipment Used, Emissions in Non-Restricted Frequency Bands

Instrument	Manufacturer	Model	Serial Number	Last Calibration Date	Next Calibration Due
Spectrum Analyzer	Rodhe & Schwarz	FSL6	100194	February 29, 2016	March 1, 2017
30dB Attenuator	MCL	BW-S30W5	533	July 5, 2016	July 5, 2017

Figure 73 Test Equipment Used

13. Emissions in Restricted Frequency Bands

13.1 Test Specification

FCC, Part 15, Subpart C, Sections 247(d), 15.205, 15.209
RSS Gen, Issue 4: 2014 Section 8.9, 8.10

13.2 Test Procedure

(Temperature (23°C)/ Humidity (40%RH))

For measurements between 0.009MHz-30MHz:

The E.U.T was tested inside the shielded room at a distance of 3 meters and the E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The frequency range 0.009MHz-30MHz was scanned. The readings were maximized by the turntable azimuth between 0-360°, and the antenna polarization.
The emissions were measured at a distance of 3 meters.

For measurements between 30.0MHz-1.0GHz:
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 30.0MHz -1.0GHz was scanned and the list of the highest emissions was verified and updated accordingly.
The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.
The emissions were measured at a distance of 3 meters.

For measurements between 1.0GHz-25.0GHz:

The E.U.T was tested inside the shielded room at a distance of 3 meters and the E.U.T was placed on a non-metallic table, 1.5 meters above the ground. The frequency range 1.0GHz -25.0GHz was scanned. The readings were maximized by the turntable azimuth between 0-360°, and the antenna polarization.
The emissions were measured at a distance of 3 meters.

The E.U.T. was operated at the low, mid and high channels. (2402, 2441, 2480 MHz).

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.

13.3 Test Limit

Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c))

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)	Field strength* (dBµV/m)	Field strength* (dBµV/m)@3m
0.009-0.490	2400/F(kHz)	300	48.5-13.8	128.5-73.8
0.490-1.705	24000/F(kHz)	30	33.8-23.0	73.8-63.0
1.705-30.0	30	30	29.5	69.5
30-88	100	3	40.0	40.0
88-216	150	3	43.5	43.5
216-960	200	3	46.0	46.0
Above 960	500	3	54.0	54.0

*The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector. For average radiated emission measurements above 1000 MHz, there is also a limit corresponding to 20 dB above the indicated values in the table is specified when measuring with peak detector function.

13.4 Test Results

JUDGEMENT: Passed

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

For additional information see *Figure 74* and *Figure* 75.

Radiated Emission

E.U.T Description Bluetooth Communication System for Motorcycles
Type cardo SMARTH
Serial Number: Not designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 9 kHz to 25.0 GHz
Test Distance: 3 meters Detector: Peak

Operation Frequency (MHz)	Freq. (MHz)	Polarity (H/V)	Peak Reading (dBµV/m)			Peak Limit (dB µV/m)	Peak Margin (dB)
			X axis	Y axis	Z axis		
2402.0	2390.0	H	51.9	51.9	**51.9**	74.0	-22.1
2402.0	2390.0	V	52.2	52.2	**52.2**	74.0	-21.8
2402.0	4804.0	H	53.7	**62.4**	57.4	74.0	-11.6
2402.0	4804.0	V	57.7	53.7	**57.7**	74.0	-16.3
2402.0	7206.0	H	60.5	54.4	**63.6**	74.0	-10.4
2402.0	7206.0	V	**62.0**	58.1	60.3	74.0	-12.0
2402.0	9608.0	H	56.7	52.3	**59.4**	74.0	-14.6
2402.0	9608.0	V	**56.6**	55.9	56.5	74.0	-17.4
2441.0	4882.0	H	54.4	54.9	**57.0**	74.0	-17.0
2441.0	4882.0	V	63.8	**64.9**	53.6	74.0	-9.1
2441.0	7323.0	H	60.9	**65.9**	63.9	74.0	-8.1
2441.0	7323.0	V	**64.6**	61.2	63.5	74.0	-9.4
2441.0	9766.0	H	63.4	62.0	**63.9**	74.0	-10.1
2441.0	9766.0	V	**58.9**	58.0	54.0	74.0	-15.1
2480.0	4960.3	H	61.0	66.1	**66.9**	74.0	-7.1
2480.0	4960.0	V	**68.8**	57.3	61.4	74.0	-5.2
2480.0	7439.2	H	69.6	64.5	**70.0**	74.0	-4.0
2480.0	7439.4	V	69.0	62.9	**70.5**	74.0	-3.5
2480.0	9920.0	H	**62.4**	60.8	60.0	74.0	-11.6
2480.0	9920.0	V	**66.0**	59.4	65.4	74.0	-8.0
2480.0	2483.5	H	49.2	49.0	**49.5**	74.0	-24.5
2480.0	2483.5	V	50.1	50.1	**50.1**	74.0	-23.9

Figure 74. Radiated Emission, 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 Reading" includes correction factor.

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

Radiated Emission

E.U.T Description	Bluetooth Communication System for Motorcycles
Type	cardo SMARTH
Serial Number:	Not designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical
Test Distance: 3 meters

Frequency range: 9 kHz to 25.0 GHz
Detector: Average

Operation Frequency (MHz)	Freq. (MHz)	Polarity (H/V)	Average Reading (dBµV/m)			Average Limit (dB µV/m)	Average Margin (dB)
			X axis	Y axis	Z axis		
2402.0	2390.0	H	39.8	39.8	**39.8**	54.0	-14.2
2402.0	2390.0	V	39.6	39.6	**39.6**	54.0	-14.4
2402.0	4804.0	H	42.7	**48.3**	47.0	54.0	-5.7
2402.0	4804.0	V	**47.9**	41.0	45.4	54.0	-6.1
2402.0	7206.0	H	49.5	**52.5**	51.7	54.0	-1.5
2402.0	7206.0	V	50.1	49.0	**50.3**	54.0	-3.7
2402.0	9608.0	H	**49.0**	47.5	48.1	54.0	-5.0
2402.0	9608.0	V	**47.1**	44.0	45.3	54.0	-6.9
2440.0	4882.0	H	46.4	**50.6**	49.7	54.0	-3.4
2440.0	4882.0	V	**50.9**	43.9	44.1	54.0	-3.1
2441.0	7323.0	H	**50.9**	50.8	50.8	54.0	-3.1
2441.0	7323.0	V	49.1	**52.6**	51.4	54.0	-1.4
2480.0	4960.3	H	**51.7**	50.3	51.0	54.0	-2.3
2480.0	4960.0	V	50.0	49.6	**50.6**	54.0	-3.4
2480.0	7440.	H	49.7	**50.5**	47.8	54.0	-3.5
2480.0	7440.	V	51.5	**51.9**	50.5	54.0	-2.1
2480.0	9920.0	H	48.8	**51.5**	50.5	54.0	-2.5
2480.0	9920.0	V	47.5	**49.3**	48.1	54.0	-4.7
2480.0	2483.5	H	38.7	38.7	**38.7**	54.0	-15.3
2480.0	2483.5	V	38.7	38.7	**38.7**	54.0	-15.3

Figure 75. Radiated Emission, 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.

"Avg Reading" includes Avg factor.

Intermodulation Radiated Emission

E.U.T Description	Bluetooth Communication System for Motorcycles
Type	cardo SMARTH
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
Frequency: 2405 MHz + 2402 MHz

Frequency (MHz)	Polarity (H/V)	Peak Reading (dBµV/m)	Peak Limit (dB µV/m)	Peak Margin (dB)
2399	H	38.7	74.0	-35.3
2399	V	36.5	74.0	-37.5
2396	H	34.1.	74.0	-39.9
2396	V	32.0	74.0	-42.0
2393	H	31.0	74.0	-43.0
2393	V	35.0	74.0	-39.0
2390	H	35.9	74.0	-38.1
2390	V	33.0	74.0	-41.0

Figure 76. 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

Intermodulation Radiated Emission

E.U.T Description	Bluetooth Communication System for Motorcycles
Type	cardo SMARTH
Serial Number:	Not designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical
Test Distance: 3 meters
Frequency: 2405 MHz + 2402 MHz

Frequency range: 1.0 GHz to 25.0 GHz
Detector: Average

Frequency (MHz)	Polarity (H/V)	AVG. Reading (dBµV/m)	AVG. Limit (dB µV/m)	AVG. Margin (dB)
2399	H	N/A	54.0	N/A
2399	V	N/A	54.0	N/A
2396	H	N/A	54.0	N/A
2396	V	N/A	54.0	N/A
2393	H	N/A	54.0	N/A
2393	V	N/A	54.0	N/A
2390	H	45.9	54.0	-8.1
2390	V	43.0	54.0	-11.0

Figure 77. 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

13.5 Field Strength Calculation

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

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

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.

13.6 Test Equipment Used, Emissions in Restricted Frequency Bands

Instrument	Manufacturer	Model	Serial Number	Last Calibration Date	Next Calibration Due
EMI Receiver	R&S	ESCI7	100724	February 29, 2016	March 1, 2017
Spectrum Analyzer	HP	8592L	3826A01204	March 13, 2016	March 13, 2017
EMI Receiver	HP	8542E	3906A00276	March 3, 2016	March 3, 2017
RF Filter section	HP	85420E	3705A00248	March 3, 2016	March 3, 2017
Horn Antenna	ETS	3115	29845	May 19, 2015	May 19, 2018
Log Periodic Antenna	EMCO	3146	9505-4081	April 23, 2016	April 23, 2017
Biconical Antenna	EMCO	3110B	9912-3337	March 24, 2016	March 24, 2018
Active Loop Antenna	EMCO	6502	9506-2950	November 4, 2015*	November 30, 2016*
Low Noise Amplifier	DBS MICROWAVE	LNA-DBS-0411N313	013	August 8, 2016	August 8, 2017
Low Noise Amplifier	Sophia Wireless	LNA 28-B	232	August 8, 2016	August 8, 2017
Spectrum Analyzer	HP	8593EM	3536A00120ADI	March 10, 2016**	March 10, 2017**
Semi Anechoic Civil Chamber	ETS	S81	SL 11643	N/A	N/A
Antenna Mast	ETS	2070-2	9608-1497	N/A	N/A
Turntable	ETS	2087	-	N/A	N/A
Mast & Table Controller	ETS/EMCO	2090	9608-1456	N/A	N/A

*Calibration dates for April 26, 2017 re-testing of radiated emissions measurements below 30MHz: September 12, 2016 to September 12, 2017.

**Calibration dates for April 26, 2017 re-testing of radiated emissions measurements below 30MHz: February 28, 2017 to February 28, 2018.

Figure 78 Test Equipment Used

14. Avg. Factor Calculation

1. Pulse period = 1msec (worst scenario)
2. Pulse duration = 1 msec (worst scenario)
3. Burst duration of Standard modulation =.390msec
4. Burst duration of EDR modulation =2.93msec

5. $$\text{Average Factor} = 20\log\left[\frac{\text{Pulse duration}}{\text{Pulse period}} \times \frac{\text{burst duration}}{100\text{msec}} \times \text{Num of burst within } 100\text{msec}\right]$$

$$\text{Average Factor} = 20\log\left[1 * \frac{.390}{100} * 2\right] = -42.2dB \text{ for Standard modulation}$$

$$\text{Average Factor} = 20 * \log\left[\frac{2.96}{100} * 1\right] = -30.57dB \text{ for EDR modulation}$$

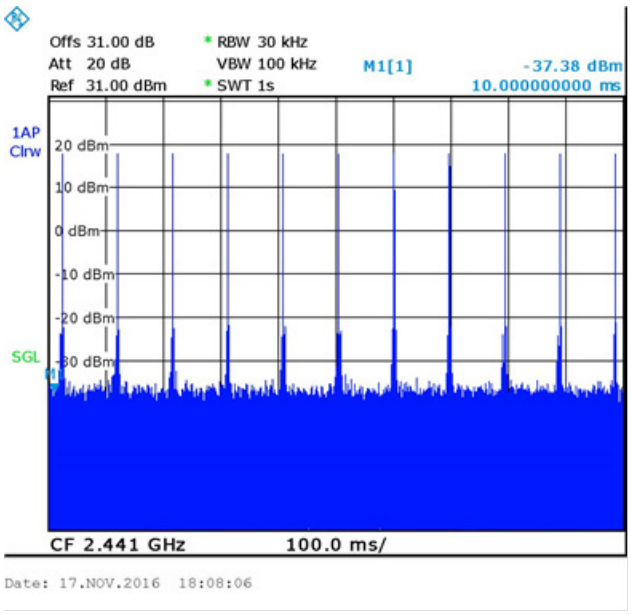

Figure 79 — Number of Bursts in 100m sec=2 standard modulation

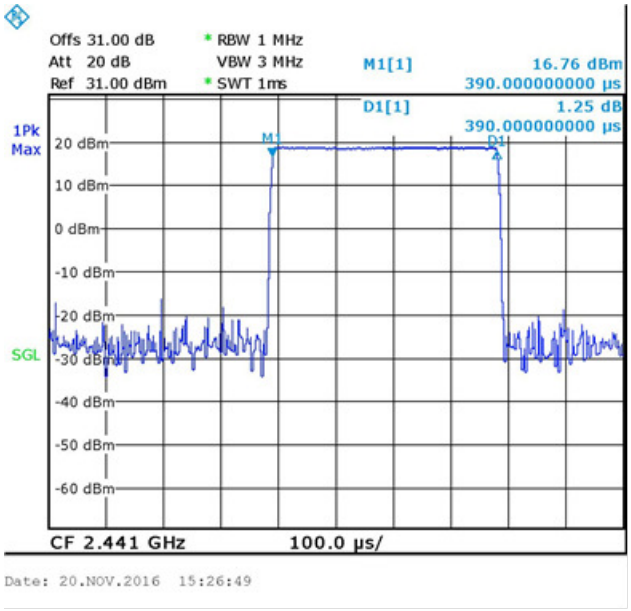

Figure 80 — Burst Duration =.390mS standard modulation

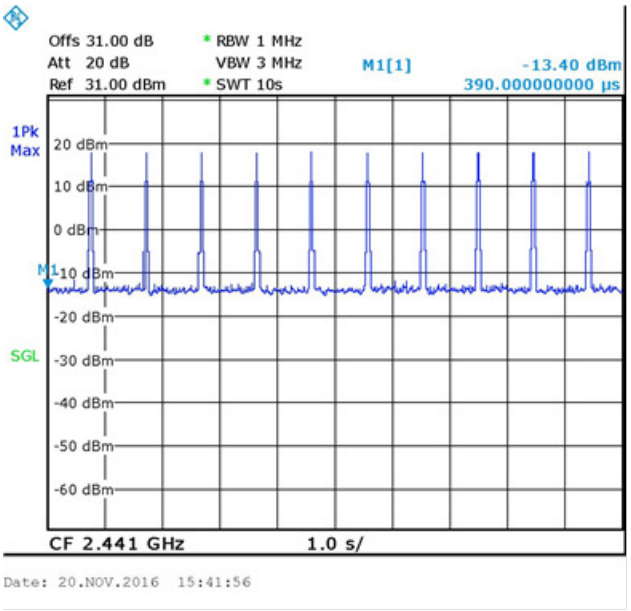

Figure 81 — Number of Bursts in 10 sec=10 EDR modulation

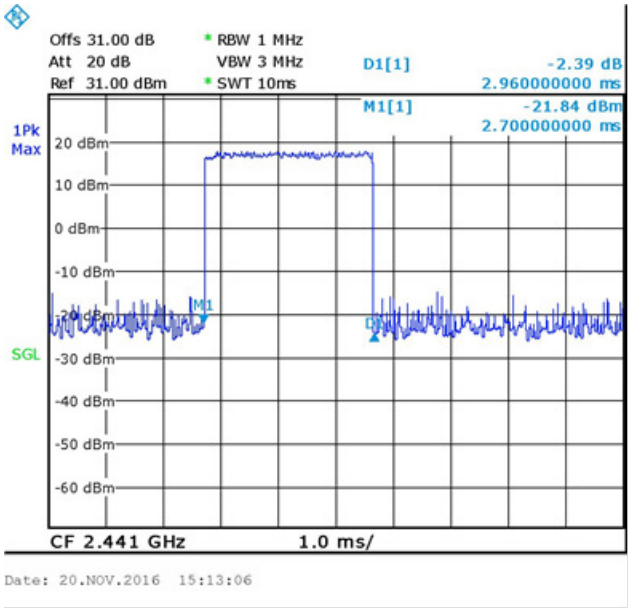

Figure 82 — Burst Duration =2.96ms EDR modulation

14.1 Test Equipment Used, Average Factor

Instrument	Manufacturer	Model	Serial Number	Last Calibration Date	Next Calibration Due
Spectrum Analyzer	Rodhe & Schwarz	FSL6	100194	February 29, 2016	March 1, 2017
30dB Attenuator	MCL	BW-S30W5	533	July 5, 2016	July 5, 2017

Figure 83 Test Equipment Used

15. Antenna Gain/Information

The antenna gain is 1.7 dBi.

Fractus Compact Reach Xtend™

Bluetooth®, 802.11b/g WLAN

Chip Antenna

16. R.F Exposure/Safety

The typical placement of the E.U.T. is on a motorcycle helmet. The minimal distance between the E.U.T. and the user is 2.0cm. See photos below.

SAR Testing Exclusion Based on Section 4.3.1 and Appendix A of KDB447498 D01 V05 and RSS 102, Issue 5, Section 2.5.2 Requirements

For FCC

Section 4.3.1 and Appendix A of KDB447498 D01 V05 was used as the guidance as follows:

Peak power output (standard) = 18.84 dBm=76.56mW.

Taking into account the -42.2dB AVG factor (page 69)
peak power = 18.84- 42.2= -23.36dBm =0.005mW

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] *· [√f(GHz)]

=0.005/15 * 1.55= 5.166 x 10^{-4} this value is less than 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR.

The SAR measurement is not necessary

For IC

For IC per Table 1 of RSS 102 Issue 5, SAR exemption based on IC limit of 30mW at a separation distance of 20mm= 2.0cm at 2450 MHz.
EUT power transmission is 18.84 dBm=76.56mW.

Taking into account the -42.2dB AVG factor (page 69)
peak power = 18.84- 42.2= -23.36dBm =0.005mW

This is below the 30mW SAR exemption limits.

EUT

17. APPENDIX A - CORRECTION FACTORS

17.1 Correction factors for RF OATS Cable 35m

ITL #1784

Frequency (MHz)	Cable loss (dB)
10.0	0.3
20.0	0.2
50.0	-0.1
100.0	-0.6
200.0	-1.2
500.0	-2.3
1000.0	-3.6

17.2 Correction factors for RF OATS Cable 10m

ITL #1794

Frequency(MHz)	Cable loss(dB)
10.0	-0.3
20.0	-0.3
50.0	-0.5
100.0	-0.7
200.0	-1.1
500.0	-1.8
1000.0	-2.7

17.3 Correction factor for RF CABLE for Semi Anechoic Chamber

ITL # 1841

FREQ (MHz)	LOSS (dB)
1000.0	1.5
2000.0	2.1
3000.0	2.7
4000.0	3.1
5000.0	3.5
6000.0	4.1
7000.0	4.6
8000.0	4.9
9000.0	5.7
10000.0	5.7
11000.0	6.1
12000.0	6.1
13000.0	6.2
14000.0	6.7
15000.0	7.4
16000.0	7.5
17000.0	7.9
18000.0	8.1
19000.0	8.8
20000.0	9.1

NOTES:

1. *The cable is manufactured by Commscope*
2. *The cable type is 0623 WBC-400, serial # G020132 and 10m long*

17.4 Correction factors for biconical antenna – ITL # 1356

Model: EMCO 3110B

Serial No.:9912-3337

Frequency [MHz]	AF [dB/m]
30.0	14.18
35.0	13.95
40.0	12.84
45.0	11.23
50.0	11.10
60.0	10.39
70.0	9.34
80.0	9.02
90.0	9.31
100.0	8.95
120.0	11.53
140.0	12.20
160.0	12.56
180.0	13.49
200.0	15.27

17.5 Correction factors for log periodic antenna – ITL # 1349

Model: EMCO 3146

Serial No.:9505-4081

Frequency [MHz]	AF [dB/m]
200.0	11.47
250.0	12.06
300.0	14.77
400.0	15.77
500.0	18.01
600.0	18.84
700.0	20.93
800.0	21.27
900.0	22.44
1000.0	24.10

17.6 Correction factors for ACTIVE LOOP ANTENNA ITL # 1075:

Model 6502 S/N 9506-2950

f(MHz)	MAF(dBs/m)	AF(dB/m)
0.01	-33.1	18.4
0.02	-37.2	14.3
0.03	-38.2	13.3
0.05	-39.8	11.7
0.1	-40.1	11.4
0.2	-40.3	11.2
0.3	-40.3	11.2
0.5	-40.3	11.2
0.7	-40.3	11.2
1	-40.1	11.4
2	-40	11.5
3	-40	11.5
4	-40.1	11.4
5	-40.2	11.3
6	-40.4	11.1
7	-40.4	11.1
8	-40.4	11.1
9	-40.5	11
10	-40.5	11
20	-41.5	10
30	-43.5	8

17.7 Correction factors for Horn ANTENNA

Model: 3115 ITL # 1352
Antenna serial number: 6142
3 meter range

f(GHz)	AF(dB/m)	GA(dB)
0.75	25	3
1G	23.5	7
1.5G	26	8
2G	29	7
2.5G	27.5	10
3G	30	10
3.5G	31.5	10
4G	32.5	9.5
4.5G	32.5	10.5
5G	33	10.5
5.5G	35	10.5
6G	36.5	9.5
6.5G	36.5	10
7G	37.5	10
7.5G	37.5	10
8G	37.5	11
8.5G	38	11
9G	37.5	11.5
9.5G	38	11.5
10G	38.5	11.5
10.5G	38.5	12
11G	38.5	12.5
11.5G	38.5	13
12G	38	13.5
12.5G	38.5	13
13G	40	12
13.5G	41	12
14G	40	13
14.5G	39	14
15G	38	15.5
15.5G	37.5	16
16G	37.5	16
16.5G	39	15
17G	40	15
17.5G	42	13.5
18G	42.5	13