

TEST REPORT
FROM
SIEMIC

For
RW-ZBR3 Bluetooth Radio Module w/ CQ17715-G1 Antenna
To
47 CFR 15.247

Test Report Serial No.:
SL06021401-ZBRA-001

This report supersedes None

Remarks:

Equipment complied with the specification [X]
Equipment did not comply with the specification []

This Test Report is Issued Under the Authority of:



.....
Tested by: Alvin Ilarina, Test Engineer



.....
Reviewed by: Leslie Bai, Lab Manager

Issue date: 14 February 2006

Equipment Details:

Manufacturer: Zebra Technologies Corporation



Registration No. 783147



Registration No. 4842



Lab Code: KR0032



RTA No. D23/16V



Registration No. 2195



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Executive Summary

The purpose of this test programme was to demonstrate compliance of the Zebra Technologies Corporation, RW-ZBR3 Bluetooth Radio Module w/ CQ17715-G1 Antenna against the current 47 CFR 15.247 as a Class II Permissive change. The RW-ZBR3 Bluetooth Radio Module w/ CQ17715-G1 Antenna demonstrated compliance with the 47 CFR 15.247.

Zebra Technologies Corporation is the applicant and claimed manufacturer of this tested product. For the detailed description of this product, please refer to the User Manual.

The unit was tested with the following antenna that becomes integral to the host unit:

CA17715-G1

The test has demonstrated that this unit complies with stipulated standards.



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1 Technical Details

Purpose	Compliance testing of RW-ZBR3 Bluetooth Radio Module w/ CQ17715-G1 Antenna with 47 CFR 15.247
Applicant / Client	Zebra Technologies Corporation 333 Corporate Wood Parkway Vernon Hills, IL 60061
Manufacturer	Zebra Technologies Corporation
Laboratory performing the tests	SIEMIC Labs 2206 Ringwood Avenue San Jose, CA 95131
Test location(s)	SIEMIC Labs 2206 Ringwood Avenue San Jose, CA 95131
Test report reference number	SL06021401-ZBRA-001
Date EUT received	6 February 2006
Standard applied	47 CFR 15.247
No of Units:	1
Equipment Category:	DSS
Trade/Product Name:	RW-ZBR3 Bluetooth Radio Module
Type/Model Name/No:	RW-ZBR3 Bluetooth Radio Module
Technical Variants:	None
FCC ID No.	I28MD-BTC2TY3



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2 Tests Required

The product was tested in accordance with the following specifications.
The test results recorded in this Test Report are exclusively referred to the tested sample(s).

Test Standard	Description	Pass / Fail
47CFR Part 15, §15.247		
15.247(c)	Radiated Spurious Emissions	Pass
15.205	Radiated Spurious Emissions Bandedge	Pass
ANSI C63.4: 2001		

Notes: *Deviations to above standards are outlined in specific test sections if applicable.
Cable loss and external attenuation are compensated for in the measurement system when applicable.*



3 Measurements, Examinations and Derived Results

3.1 General observations

Equipment serial number(s)		
Module:	Part number:	Serial number:
RW-ZBR3 Bluetooth Radio Module w/ CQ17715-G1 Antenna	RW-ZBR3 Bluetooth Radio Module w/ CQ17715-G1 Antenna	None



3.2 Test Results

3.2.1 Radiated Spurious Emissions > 1 GHz

Requirement(s): 47 CFR §15.247(c)

Procedures: Equipment was setup in a semi-anechoic chamber. For measurements above 1 GHz an average measurement was taken with a 1MHz resolution bandwidth was used.

Results:

Channel	Frequency (GHz)	Detector	Azimuth (Degrees)	Antenna Polarity (H/V)	Height (m)	EUT Field Strength Final Amp. (dBuV/m)	FS Limit @ 3m (dBuV/m)	Margin (dBuV/m)
hi	4.96	Pk	0	H/V				noise floor
hi	7.44	Pk	0	H/V				noise floor
hi	9.92	Pk	0	H/V				noise floor
lo	1.8	Pk	0	H/V				noise floor
lo	1.8	Pk	0	H/V				noise floor
lo	2.7	Pk	0	H/V				noise floor
mid	1.83	Pk	0	H/V				noise floor
mid	1.83	Pk	0	H/V				noise floor
mid	2.74	Pk	0	H/V				noise floor

Sample Calculation:

$$\text{EUT Field Strength} = \text{Antenna Factor(dB)} + \text{Cable Loss(dB)} - \text{Amplifier Gain(dB)} + \text{Filter Attenuation(dB, if used)}$$



3.2.2 Radiated Spurious Emissions Restricted Bandedges

Requirement(s): 47 CFR §15.205

Procedures: Equipment was setup in a semi-anechoic chamber. For measurements above 1 GHz peak and average measurements were taken with a 1MHz resolution bandwidth.

Results:

Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Height (m)	Raw Amp @ 1m	ACF (dB)	Cable Loss (dB)	DCF (dB)	EUT Field Strength Amp. (dBuV/m)	Limit @ 3m (dBuV/m)	Delta (dBuV/m)
2.4835	0	H	1.2	35.14	28.7	2.5	9.54	56.8	74	-17.2
2.4835	0	H	1.2	23.34	28.7	2.5	9.54	45	54	-9
2.4835	0	V	1.2	35.14	28.7	2.5	9.54	56.8	74	-17.2
2.4835	0	V	1.2	23.34	28.7	2.5	9.54	45	54	-9
2.390	0	H	1.2	33.84	28.7	2.5	9.54	55.5	74	-18.5
2.390	0	H	1.2	22.64	28.7	2.5	9.54	44.3	54	-9.7
2.390	0	V	1.2	33.14	28.7	2.5	9.54	54.8	74	-19.2
2.390	0	V	1.2	22.64	28.7	2.5	9.54	44.3	54	-9.7

Sample Calculation: Corrected Amplitude = Raw + ACF + Cable Loss - DCF

Plots #	Channel	Detector	Polarity	Pass/Fail
1	Hi	Peak	Horizontal	Pass
2	Hi	Average	Horizontal	Pass
3	Hi	Peak	Vertical	Pass
4	Hi	Average	Vertical	Pass
5	Low	Peak	Horizontal	Pass
6	Low	Average	Horizontal	Pass
7	Low	Peak	Vertical	Pass
8	Low	Average	Vertical	Pass

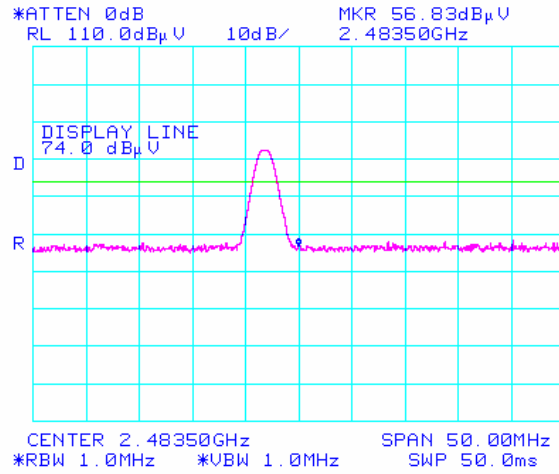


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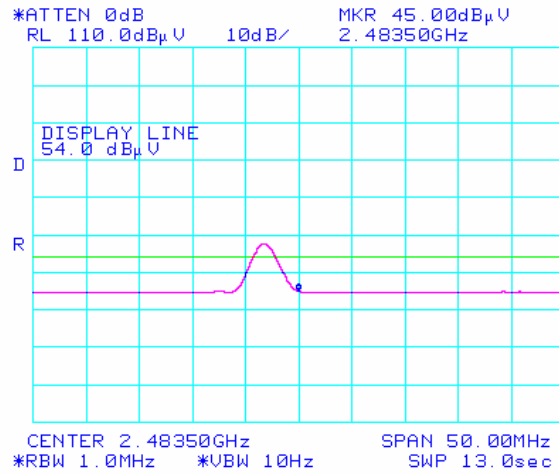
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Plot 1: High Bandedge Peak Horizontal



Plot 2: High Bandedge Average Horizontal

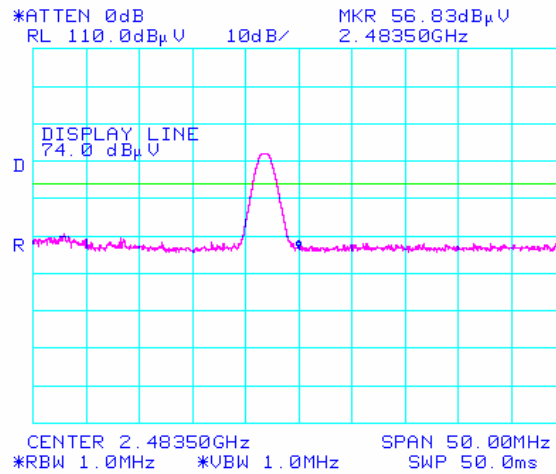


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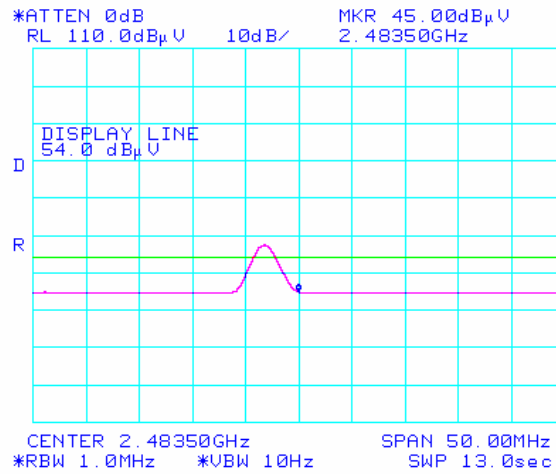
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Plot 3: High Bandedge Peak Vertical



Plot 4: High Bandedge Average Vertical

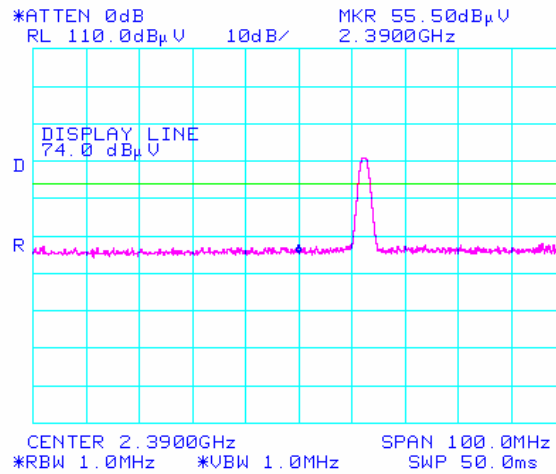


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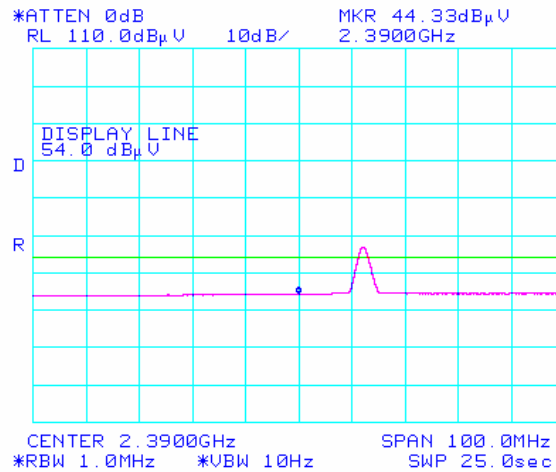
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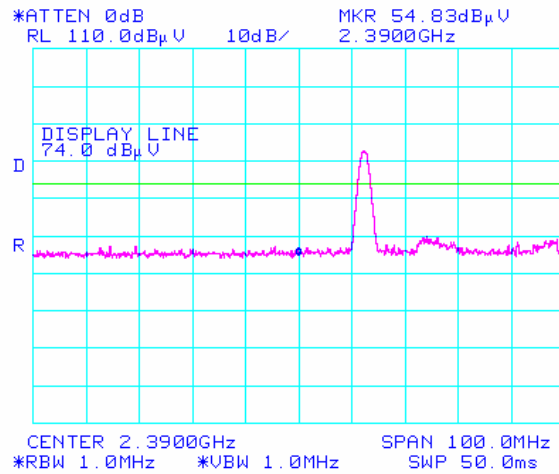
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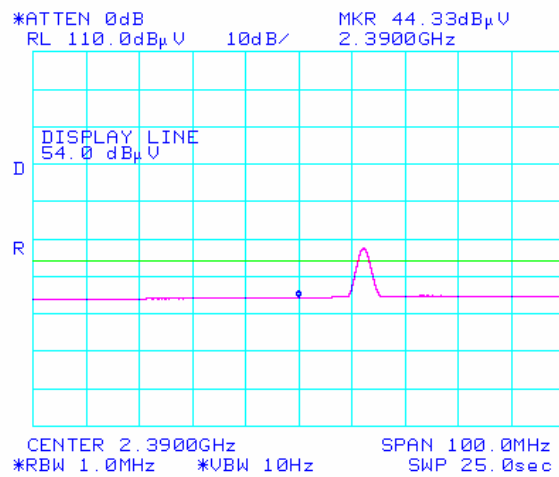
Plot 5: Low Bandedge Peak Horizontal



Plot 6: Low Bandedge Average Horizontal



Plot 7: Low Bandedge Peak Vertical



Plot 8: Low Bandedge Average Vertical



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The following is the description of supporting equipment and details of cables used with the EUT.

Equipment Description (Including Brand Name)	Cable Description
PC Laptop	None

EUT Description	: RW-ZBR3 Bluetooth Radio Module w/ CQ17715-G1 Antenna
Model No	: RW-ZBR3 Bluetooth Radio Module w/ CQ17715-G1 Antenna

The following is the description of how the EUT is exercised during testing.

Test	Description Of Operation
	The EUT was controlled and monitored via custom programming box.



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APPENDIX B: External Photos

See Attachment



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APPENDIX C: CIRCUIT/BLOCK DIAGRAMS

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APPENDIX D: Internal Photos

See Attachment



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APPENDIX F: PRODUCT DESCRIPTION

Detail description of this product is shown in the User's Guide.



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APPENDIX H: FCC LABEL LOCATION

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APPENDIX I: USER MANUAL

See Attachment