Trimble Navigation Limited MCS

Bluetooth Radio Model cB-0939 in Yuma 2

FCC 15.247:2013

FCC 15.207:2013

Report #: TRPO0083

Report Prepared By Northwest EMC Inc.

NORTHWEST EMC – (888) 364-2378 – www.nwemc.com

California – Minnesota – Oregon – New York – Washington

CERTIFICATE OF TEST

WTD 12.5.23

Last Date of Test: February 19, 2013
Trimble Navigation Limited MCS
Model: Bluetooth Radio Model cB-0939 in Yuma 2

Emissions

Test Description	Specification	Test Method	Pass/Fail
Spurious Radiated Emissions	FCC 15.247:2013	ANSI C63.10:2009	Pass
AC Powerline Conducted Emissions	FCC 15.207:2013	ANSI C63.10:2009	Pass

Deviations From Test Standards

None

Approved By:

Tim O'Shea, Operations Manager

NVLAP Lab Code: 200630-0

Test Facility

The measurement facility used to collect the data is located at:

Northwest EMC, Inc.
22975 NW Evergreen Parkway, Suite 400
Hillsboro, OR 97124

Phone: (503) 844-4066 Fax: 844-3826

This site has been fully described in a report filed with and accepted by the FCC (Federal Communications Commission) and Industry Canada (Site filing #2834D-1).

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America.

Product compliance is the responsibility of the client, therefore the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. This Report may only be duplicated in its entirety. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test.

NORTHWEST EMC
REV 2012.08.02

REVISION HISTORY

Revision Number	Description	Date	Page Number
00	None		

Barometric Pressure

The recorded barometric pressure has been normalized to sea level.

NORTHWEST EMC

REV 2012.05.24

ACCREDITATIONS AND AUTHORIZATIONS

United States

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Accredited by A2LA to ISO / IEC Guide 65 as a product certifier. This allows Northwest EMC to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

IC - Recognized by Industry Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with IC.

European Union

European Commission – Validated by the European Commission as a Conformity Assessment Body (CAB) under the EMC directive and as a Notified Body under the R&TTE Directive.

Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

Korea

KCC / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

Singapore

IDA – Recognized by IDA as a CAB for the acceptance of test data.

Hong Kong

OFTA – Recognized by OFTA as a CAB for the acceptance of test data.

Vietnam

MIC – Recognized by MIC as a CAB for the acceptance of test data.

Russia

GOST – Accredited by Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC to perform EMC and Hygienic testing for Information Technology products to GOST standards.

SCOPE

For details on the Scopes of our Accreditations, please visit:
http://www.nwemc.com/accreditations/

MEASUREMENT UNCERTAINTY

Measurement Uncertainty

When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) for each test is on each data sheet. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-1 as applicable), and are available upon request.

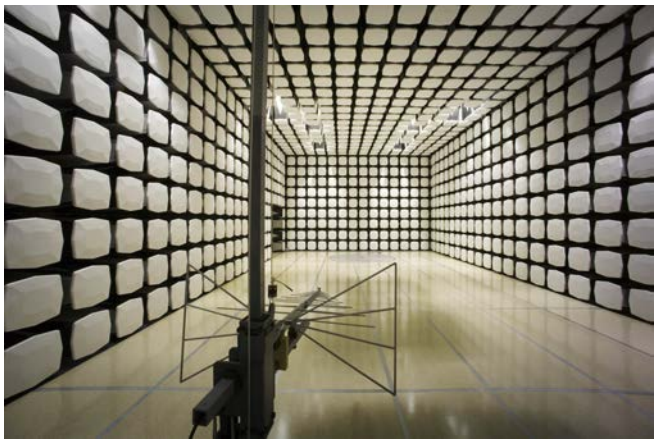
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

Test	+ MU	- MU
Frequency Accuracy (Hz)	0.12	-0.01
Amplitude Accuracy (dB)	0.49	-0.49
Conducted Power (dB)	0.41	-0.41
Radiated Power via Substitution (dB)	0.69	-0.68
Temperature (degrees C)	0.81	-0.81
Humidity (% RH)	2.89	-2.89
Field Strength (dB)	3.80	-3.80
AC Powerline Conducted Emissions (dB)	2.94	-2.94

LOCATIONS

REV 2013.01.07

Oregon	California	New York	Minnesota	Washington
Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs WA01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 685-0796	Labs MN01-08 9349 W Broadway Ave. Brooklyn Park, MN 55445 (763) 425-2281	Labs NC01-05,SU02,SU07 19201 120th Ave. NE Bothell, WA 98011 (425) 984-6600
VCCI				
A-0108	A-0029		A-0109	A-0110
Industry Canada				
2834D-1, 2834D-*2*	2834B-1, 2834B-2, 2834B-3		2834E-1	2834C-1



PRODUCT DESCRIPTION

WTD 12.5.23

Client and Equipment Under Test (EUT) Information

Company Name:	Trimble Navigation Limited MCS
Address:	345 SW Avery Ave
City, State, Zip:	Corvallis, OR 97333
Test Requested By:	Bob Grant
Model:	Bluetooth Radio Model cB-0939 in Yuma 2
First Date of Test:	February 18, 2012
Last Date of Test:	February 19, 2012
Receipt Date of Samples:	February 18, 2012
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):
New long range Bluetooth module to replace the Cirronet module

Testing Objective:
Class 2 permissive change for the Bluetooth Radio to qualify the new antenna and host configuration to meet FCC 15.247 requirements.

CONFIGURATIONS

Configuration TRPO0083- 1

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Bluetooth Module	connectBlue AB	cB-0939	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AC Adapter	LiteOn	PA-1061-0	L21225043118

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Power	No	1.5m	PA	AC Adapter	Bluetooth Module
AC Power	No	1.8m	No	AC Adapter	AC Mains
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

MODIFICATIONS

WTD 12.5.23

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2/18/2012	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	2/19/2012	AC Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

SPURIOUS RADIATED EMISSIONS

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Transmitting Bluetooth, GFSK, DH5
Transmitting Bluetooth, pi/4-DQPSK, 2DH5
Transmitting Bluetooth, 8-DPSK, 3DH5

CHANNELS TESTED

Low channel, 2402 MHz
Mid channel, 2441 MHz
High channel, 2480 MHz

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

TRPO0083 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26.5 GHz

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Cable	ESM Cable Corp.	KMKM-72	EVY	9/11/2012	12 mo
Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	9/11/2012	12 mo
Antenna, Horn	ETS Lindgren	3160-09	AIV	NCR	0 mo
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	2/28/2012	12 mo
Antenna, Horn	ETS	3160-08	AHV	NCR	0 mo
EV01 Cables	N/A	Standard Gain Horns Cables	EVF	2/28/2012	12 mo
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVC	2/28/2012	12 mo
Antenna, Horn	ETS	3160-07	AHU	NCR	0 mo
EV01 Cables	N/A	Double Ridge Horn Cables	EVB	6/27/2012	12 mo
Pre-Amplifier	Miteq	AMF-4D-010100-24-10P	APW	6/27/2012	12 mo
Antenna, Horn	ETS	3115	AIZ	1/24/2011	36 mo
EV01 Cables	N/A	Bilog Cables	EVA	6/26/2012	12 mo
Pre-Amplifier	Miteq	AM-1616-1000	AOL	6/26/2012	12 mo
Antenna, Biconilog	EMCO	3141	AXG	4/10/2012	12 mo
Spectrum Analyzer	Agilent	E4446A	AAQ	2/7/2012	24 mo

MEASUREMENT BANDWIDTHS

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

TEST DESCRIPTION

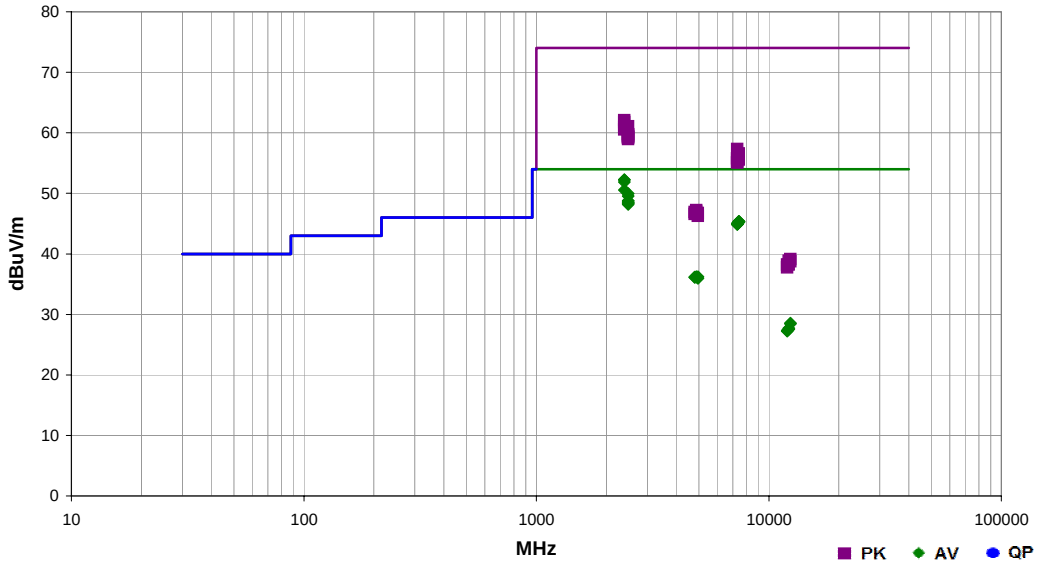
The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and the EUT antenna in three orthogonal axis, and adjusting measurement antenna height and polarization. A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

SPURIOUS RADIATED EMISSIONS

Work Order:	TRPO0083	**Date:**	02/18/13		
Project:	None	**Temperature:**	20.3 °C		
Job Site:	EV01	**Humidity:**	34% RH		
Serial Number:	None	**Barometric Pres.:**	1007 mbar	**Tested by:**	Carl Engholm, Rod Peloquin
EUT:	Bluetooth Radio Model cB-0939 in Yuma 2				
Configuration:	1				
Customer:	Trimble Navigation Limited MCS				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Continuous transmit, Bluetooth EDR				
Deviations:	None				
Comments:	See comments below for channel, frequency, data rate and EUT orientation.				

Test Specifications	**Test Method**
FCC 15.247:2013	ANSI C63.10:2009

Run #	21	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2389.293	30.7	1.5	1.0	287.0	3.0	20.0	Horz	AV	0.0	52.2	54.0	-1.8	Low Ch. (2402 MHz), 2DH5, EUT Horizontal
2389.210	30.7	1.5	1.0	287.0	3.0	20.0	Horz	AV	0.0	52.2	54.0	-1.8	Low Ch. (2402 MHz), 3DH5, EUT Horizontal
2388.970	30.3	1.5	1.0	287.0	3.0	20.0	Horz	AV	0.0	51.8	54.0	-2.2	Low Ch. (2402 MHz), DH5, EUT Horizontal
2389.157	29.0	1.5	1.1	284.0	3.0	20.0	Vert	AV	0.0	50.5	54.0	-3.5	Low Ch. (2402 MHz), DH5, EUT Vertical
2485.360	28.1	1.9	1.0	101.0	3.0	20.0	Vert	AV	0.0	50.0	54.0	-4.0	High Ch. (2480 MHz), DH5, EUT Vertical
2485.400	27.7	1.9	1.0	98.0	3.0	20.0	Horz	AV	0.0	49.6	54.0	-4.4	High Ch. (2480 MHz), DH5, EUT Horizontal
2485.347	26.9	1.9	1.0	101.0	3.0	20.0	Vert	AV	0.0	48.8	54.0	-5.2	High Ch. (2480 MHz), 2DH5, EUT Vertical
2485.290	26.9	1.9	1.0	101.0	3.0	20.0	Vert	AV	0.0	48.8	54.0	-5.2	High Ch. (2480 MHz), 3DH5, EUT Vertical
2485.133	26.6	1.9	1.0	173.0	3.0	20.0	Horz	AV	0.0	48.5	54.0	-5.5	High Ch. (2480 MHz), DH5, EUT On Side
2484.940	26.5	1.9	1.0	33.0	3.0	20.0	Vert	AV	0.0	48.4	54.0	-5.6	High Ch. (2480 MHz), DH5, EUT Horizontal
2484.960	26.5	1.9	1.0	293.0	3.0	20.0	Vert	AV	0.0	48.4	54.0	-5.6	High Ch. (2480 MHz), DH5, EUT On Side
2484.830	26.3	1.9	1.0	107.0	3.0	20.0	Horz	AV	0.0	48.2	54.0	-5.8	High Ch. (2480 MHz), DH5, EUT Vertical
7438.167	25.9	19.5	1.0	247.0	3.0	0.0	Horz	AV	0.0	45.4	54.0	-8.6	High Ch. (2480 MHz), DH5, EUT Vertical
7438.060	25.9	19.5	1.0	247.0	3.0	0.0	Horz	AV	0.0	45.4	54.0	-8.6	High Ch. (2480 MHz), 3DH5, EUT Vertical
7438.680	25.8	19.5	1.0	247.0	3.0	0.0	Horz	AV	0.0	45.3	54.0	-8.7	High Ch. (2480 MHz), 2DH5, EUT Vertical
7438.240	25.8	19.5	1.0	33.0	3.0	0.0	Vert	AV	0.0	45.3	54.0	-8.7	High Ch. (2480 MHz), DH5, EUT Vertical
7322.720	26.0	19.0	1.0	159.0	3.0	0.0	Vert	AV	0.0	45.0	54.0	-9.0	Mid Ch. (2441 MHz), DH5, EUT Horizontal
7322.360	26.0	19.0	1.0	12.0	3.0	0.0	Horz	AV	0.0	45.0	54.0	-9.0	Mid Ch. (2441 MHz), DH5, EUT Vertical
7321.893	26.0	19.0	1.0	262.0	3.0	0.0	Vert	AV	0.0	45.0	54.0	-9.0	Mid Ch. (2441 MHz), DH5, EUT Vertical
7322.233	25.9	19.0	2.1	93.0	3.0	0.0	Horz	AV	0.0	44.9	54.0	-9.1	Mid Ch. (2441 MHz), DH5, EUT Horizontal
7321.533	25.9	19.0	1.0	239.0	3.0	0.0	Vert	AV	0.0	44.9	54.0	-9.1	Mid Ch. (2441 MHz), DH5, EUT On Side
7321.127	25.9	19.0	1.0	134.0	3.0	0.0	Horz	AV	0.0	44.9	54.0	-9.1	Mid Ch. (2441 MHz), DH5, EUT On Side
2389.553	40.5	1.5	1.0	287.0	3.0	20.0	Horz	PK	0.0	62.0	74.0	-12.0	Low Ch. (2402 MHz), 3DH5, EUT Horizontal
2389.240	40.2	1.5	1.0	287.0	3.0	20.0	Horz	PK	0.0	61.7	74.0	-12.3	Low Ch. (2402 MHz), 2DH5, EUT Horizontal
2485.457	39.2	1.9	1.0	101.0	3.0	20.0	Vert	PK	0.0	61.1	74.0	-12.9	High Ch. (2480 MHz), DH5, EUT Vertical
2389.313	39.4	1.5	1.0	287.0	3.0	20.0	Horz	PK	0.0	60.9	74.0	-13.1	Low Ch. (2402 MHz), DH5, EUT Horizontal
2389.280	39.0	1.5	1.1	284.0	3.0	20.0	Vert	PK	0.0	60.5	74.0	-13.5	Low Ch. (2402 MHz), DH5, EUT Vertical
2485.023	37.9	1.9	1.0	101.0	3.0	20.0	Vert	PK	0.0	59.8	74.0	-14.2	High Ch. (2480 MHz), 2DH5, EUT Vertical
2484.467	37.9	1.9	1.0	98.0	3.0	20.0	Horz	PK	0.0	59.8	74.0	-14.2	High Ch. (2480 MHz), DH5, EUT Horizontal
2484.170	37.6	1.9	1.0	33.0	3.0	20.0	Vert	PK	0.0	59.5	74.0	-14.5	High Ch. (2480 MHz), DH5, EUT Horizontal
2484.907	37.5	1.9	1.0	293.0	3.0	20.0	Vert	PK	0.0	59.4	74.0	-14.6	High Ch. (2480 MHz), DH5, EUT On Side
2484.897	37.4	1.9	1.0	173.0	3.0	20.0	Horz	PK	0.0	59.3	74.0	-14.7	High Ch. (2480 MHz), DH5, EUT On Side
2484.937	37.3	1.9	1.0	101.0	3.0	20.0	Vert	PK	0.0	59.2	74.0	-14.8	High Ch. (2480 MHz), 3DH5, EUT Vertical
2484.750	37.1	1.9	1.0	107.0	3.0	20.0	Horz	PK	0.0	59.0	74.0	-15.0	High Ch. (2480 MHz), DH5, EUT Vertical

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7322.773	38.3	19.0	2.1	93.0	3.0	0.0	Horz	PK	0.0	57.3	74.0	-16.7	Mid Ch. (2441 MHz), DH5, EUT Horizontal
7438.693	37.1	19.5	1.0	247.0	3.0	0.0	Horz	PK	0.0	56.6	74.0	-17.4	High Ch. (2480 MHz), 3DH5, EUT Vertical
7440.713	36.8	19.5	1.0	33.0	3.0	0.0	Vert	PK	0.0	56.3	74.0	-17.7	High Ch. (2480 MHz), DH5, EUT Vertical
4882.233	25.8	10.4	1.0	332.0	3.0	0.0	Vert	AV	0.0	36.2	54.0	-17.8	Mid Ch. (2441 MHz), DH5, EUT Vertical
4960.047	25.5	10.7	1.0	186.0	3.0	0.0	Vert	AV	0.0	36.2	54.0	-17.8	High Ch. (2480 MHz), DH5, EUT Vertical
4804.080	26.0	10.2	1.0	356.0	3.0	0.0	Vert	AV	0.0	36.2	54.0	-17.8	Low Ch. (2402 MHz), DH5, EUT Vertical
4882.540	25.7	10.4	1.0	90.0	3.0	0.0	Horz	AV	0.0	36.1	54.0	-17.9	Mid Ch. (2441 MHz), DH5, EUT Vertical
4805.340	25.9	10.2	1.0	299.0	3.0	0.0	Horz	AV	0.0	36.1	54.0	-17.9	Low Ch. (2402 MHz), DH5, EUT Vertical
4958.793	25.2	10.7	1.0	87.0	3.0	0.0	Horz	AV	0.0	35.9	54.0	-18.1	High Ch. (2480 MHz), DH5, EUT Vertical
7322.013	36.8	19.0	1.0	159.0	3.0	0.0	Vert	PK	0.0	55.8	74.0	-18.2	Mid Ch. (2441 MHz), DH5, EUT Horizontal
7323.293	36.7	19.0	1.0	239.0	3.0	0.0	Vert	PK	0.0	55.7	74.0	-18.3	Mid Ch. (2441 MHz), DH5, EUT On Side
7440.820	36.2	19.5	1.0	247.0	3.0	0.0	Horz	PK	0.0	55.7	74.0	-18.3	High Ch. (2480 MHz), 2DH5, EUT Vertical
7440.233	36.1	19.5	1.0	247.0	3.0	0.0	Horz	PK	0.0	55.6	74.0	-18.4	High Ch. (2480 MHz), DH5, EUT Vertical
7324.593	36.3	19.0	1.0	134.0	3.0	0.0	Horz	PK	0.0	55.3	74.0	-18.7	Mid Ch. (2441 MHz), DH5, EUT On Side
7324.227	36.1	19.0	1.0	12.0	3.0	0.0	Horz	PK	0.0	55.1	74.0	-18.9	Mid Ch. (2441 MHz), DH5, EUT Vertical
7321.940	36.1	19.0	1.0	262.0	3.0	0.0	Vert	PK	0.0	55.1	74.0	-18.9	Mid Ch. (2441 MHz), DH5, EUT Vertical
12398.180	31.4	-2.9	1.0	291.0	3.0	0.0	Horz	AV	0.0	28.5	54.0	-25.5	High Ch. (2480 MHz), DH5, EUT Vertical
12400.330	31.3	-2.9	1.0	107.0	3.0	0.0	Vert	AV	0.0	28.4	54.0	-25.6	High Ch. (2480 MHz), DH5, EUT Vertical
12203.290	31.9	-4.2	1.0	266.0	3.0	0.0	Horz	AV	0.0	27.7	54.0	-26.3	Mid Ch. (2441 MHz), DH5, EUT Vertical
12203.160	31.7	-4.2	1.0	143.0	3.0	0.0	Vert	AV	0.0	27.5	54.0	-26.5	Mid Ch. (2441 MHz), DH5, EUT Vertical
12011.310	32.8	-5.5	1.0	127.0	3.0	0.0	Horz	AV	0.0	27.3	54.0	-26.7	Low Ch. (2402 MHz), DH5, EUT Vertical
4880.013	36.8	10.4	1.0	90.0	3.0	0.0	Horz	PK	0.0	47.2	74.0	-26.8	Mid Ch. (2441 MHz), DH5, EUT Vertical
12008.960	32.7	-5.5	1.0	115.0	3.0	0.0	Vert	AV	0.0	27.2	54.0	-26.8	Low Ch. (2402 MHz), DH5, EUT Vertical
4880.300	36.5	10.4	1.0	332.0	3.0	0.0	Vert	PK	0.0	46.9	74.0	-27.1	Mid Ch. (2441 MHz), DH5, EUT Vertical
4805.360	36.7	10.2	1.0	356.0	3.0	0.0	Vert	PK	0.0	46.9	74.0	-27.1	Low Ch. (2402 MHz), DH5, EUT Vertical
4959.540	36.0	10.7	1.0	186.0	3.0	0.0	Vert	PK	0.0	46.7	74.0	-27.3	High Ch. (2480 MHz), DH5, EUT Vertical
4802.733	36.4	10.2	1.0	299.0	3.0	0.0	Horz	PK	0.0	46.6	74.0	-27.4	Low Ch. (2402 MHz), DH5, EUT Vertical
4961.187	35.5	10.7	1.0	87.0	3.0	0.0	Horz	PK	0.0	46.2	74.0	-27.8	High Ch. (2480 MHz), DH5, EUT Vertical
12400.880	42.0	-2.9	1.0	107.0	3.0	0.0	Vert	PK	0.0	39.1	74.0	-34.9	High Ch. (2480 MHz), DH5, EUT Vertical
12205.640	43.0	-4.2	1.0	266.0	3.0	0.0	Horz	PK	0.0	38.8	74.0	-35.2	Mid Ch. (2441 MHz), DH5, EUT Vertical
12400.750	41.6	-2.9	1.0	291.0	3.0	0.0	Horz	PK	0.0	38.7	74.0	-35.3	High Ch. (2480 MHz), DH5, EUT Vertical
12205.730	42.4	-4.2	1.0	143.0	3.0	0.0	Vert	PK	0.0	38.2	74.0	-35.8	Mid Ch. (2441 MHz), DH5, EUT Vertical
12008.170	43.7	-5.5	1.0	115.0	3.0	0.0	Vert	PK	0.0	38.2	74.0	-35.8	Low Ch. (2402 MHz), DH5, EUT Vertical
12011.290	43.2	-5.5	1.0	127.0	3.0	0.0	Horz	PK	0.0	37.7	74.0	-36.3	Low Ch. (2402 MHz), DH5, EUT Vertical

AC POWERLINE CONDUCTED EMISSIONS

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

MODES OF OPERATION

Continuous transmit, Bluetooth 3DH5, Low channel (2402 MHz)
Continuous transmit, Bluetooth 2DH5, Low channel (2402 MHz)
Continuous transmit, Bluetooth DH5, High channel (2480 MHz)
Continuous transmit, Bluetooth DH5, Mid channel (2441 MHz)
Continuous transmit, Bluetooth DH5, Low channel (2402 MHz)

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

TRPO0083 - 1

SAMPLE CALCULATIONS

Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
LISN	Solar	9252-50-R-24-BNC	LIN	4/16/2012	12 mo
High Pass Filter	TTE	H97-100K-50-720B	HHD	2/1/2012	24 mo
Attenuator	Coaxicom	66702 2910-20	RBR	8/7/2012	12 mo
EV07 Cables	N/A	Conducted Cables	EVG	4/27/2012	12 mo
Spectrum Analyzer	Agilent	E4407B	AAU	10/23/2012	24 mo

MEASUREMENT BANDWIDTHS

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

Measurements were made using the bandwidths and detectors specified. No video filter was used.

TEST DESCRIPTION

The EUT will be powered either directly or indirectly from the AC power line. Therefore, conducted emissions measurements were made on the AC input of the EUT, or on the AC input of the device used to power the EUT. The AC power line conducted emissions were measured with the EUT operating at the lowest, the highest, and a middle channel in the operational band. The EUT was tested while transmitting at three data rates, including its maximum rate. For each mode, the spectrum was scanned from 150 kHz to 30 MHz. The test setup and procedures were in accordance with ANSI C63.10-2009.

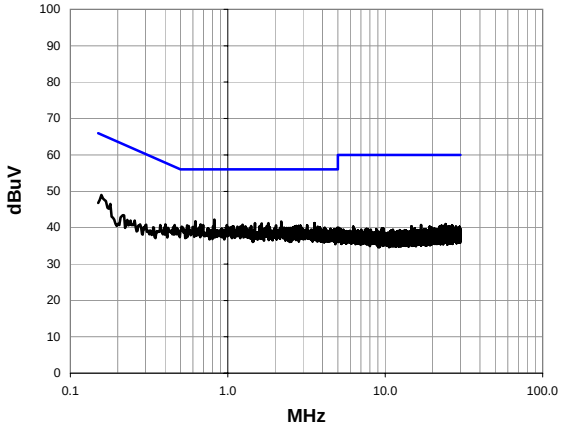
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	TRPO0083	**Date:**	02/19/13		
Project:	None	**Temperature:**	20.3 °C		
Job Site:	EV02	**Humidity:**	34% RH		
Serial Number:	None	**Barometric Pres.:**	1007 mbar	**Tested by:**	Carl Engholm, Rod Peloquin
EUT:	Bluetooth Radio Model cB-0939 in Yuma 2				
Configuration:	1				
Customer:	Trimble Navigation Limited MCS				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Continuous transmit, Bluetooth DH5, Low channel (2402 MHz)				
Deviations:	None				
Comments:	None				

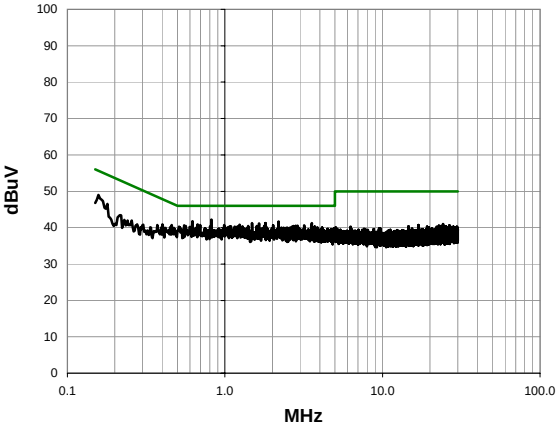
Test Specifications	**Test Method**
FCC 15.207:2013	ANSI C63.10:2009

Run #	1	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.821	21.9	20.3	42.2	56.0	-13.8
0.624	21.5	20.3	41.8	56.0	-14.2
2.187	21.2	20.5	41.7	56.0	-14.3
1.808	20.8	20.5	41.3	56.0	-14.7
3.557	20.7	20.6	41.3	56.0	-14.7
1.487	20.8	20.4	41.2	56.0	-14.8
1.644	20.7	20.4	41.1	56.0	-14.9
0.671	20.6	20.3	40.9	56.0	-15.1
1.240	20.4	20.4	40.8	56.0	-15.2
0.988	20.3	20.4	40.7	56.0	-15.3
2.023	20.2	20.5	40.7	56.0	-15.3
3.189	20.1	20.5	40.6	56.0	-15.4
0.551	20.3	20.3	40.6	56.0	-15.4
2.890	20.0	20.5	40.5	56.0	-15.5
1.593	20.0	20.4	40.4	56.0	-15.6
2.818	19.9	20.5	40.4	56.0	-15.6
1.407	20.0	20.4	40.4	56.0	-15.6
2.723	19.9	20.5	40.4	56.0	-15.6
1.291	20.0	20.4	40.4	56.0	-15.6
1.090	20.0	20.4	40.4	56.0	-15.6

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.821	21.9	20.3	42.2	46.0	-3.8
0.624	21.5	20.3	41.8	46.0	-4.2
2.187	21.2	20.5	41.7	46.0	-4.3
1.808	20.8	20.5	41.3	46.0	-4.7
3.557	20.7	20.6	41.3	46.0	-4.7
1.487	20.8	20.4	41.2	46.0	-4.8
1.644	20.7	20.4	41.1	46.0	-4.9
0.671	20.6	20.3	40.9	46.0	-5.1
1.240	20.4	20.4	40.8	46.0	-5.2
0.988	20.3	20.4	40.7	46.0	-5.3
2.023	20.2	20.5	40.7	46.0	-5.3
3.189	20.1	20.5	40.6	46.0	-5.4
0.551	20.3	20.3	40.6	46.0	-5.4
2.890	20.0	20.5	40.5	46.0	-5.5
1.593	20.0	20.4	40.4	46.0	-5.6
2.818	19.9	20.5	40.4	46.0	-5.6
1.407	20.0	20.4	40.4	46.0	-5.6
2.723	19.9	20.5	40.4	46.0	-5.6
1.291	20.0	20.4	40.4	46.0	-5.6
1.090	20.0	20.4	40.4	46.0	-5.6

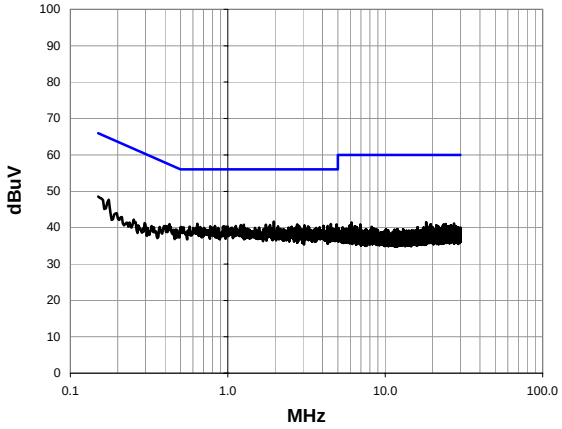
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	TRPO0083	**Date:**	02/19/13		
Project:	None	**Temperature:**	20.3 °C		
Job Site:	EV02	**Humidity:**	34% RH		
Serial Number:	None	**Barometric Pres.:**	1007 mbar	**Tested by:**	Carl Engholm, Rod Peloquin
EUT:	Bluetooth Radio Model cB-0939 in Yuma 2				
Configuration:	1				
Customer:	Trimble Navigation Limited MCS				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Continuous transmit, Bluetooth DH5, Low channel (2402 MHz)				
Deviations:	None				
Comments:	None				

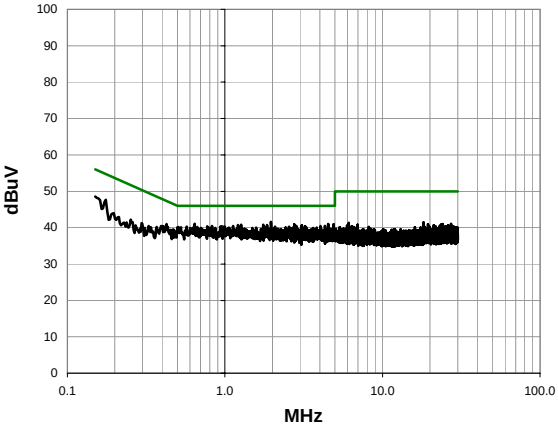
Test Specifications	**Test Method**
FCC 15.207:2013	ANSI C63.10:2009

Run #	2	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
1.961	21.1	20.5	41.6	56.0	-14.4
0.642	20.8	20.3	41.1	56.0	-14.9
4.523	20.3	20.7	41.0	56.0	-15.0
2.756	20.4	20.5	40.9	56.0	-15.1
4.898	20.2	20.7	40.9	56.0	-15.1
1.746	20.4	20.5	40.9	56.0	-15.1
1.265	20.4	20.4	40.8	56.0	-15.2
1.852	20.3	20.5	40.8	56.0	-15.2
1.210	20.3	20.4	40.7	56.0	-15.3
3.080	20.0	20.5	40.5	56.0	-15.5
3.065	20.0	20.5	40.5	56.0	-15.5
4.315	19.8	20.7	40.5	56.0	-15.5
4.049	19.8	20.7	40.5	56.0	-15.5
0.828	20.1	20.3	40.4	56.0	-15.6
2.836	19.9	20.5	40.4	56.0	-15.6
2.799	19.9	20.5	40.4	56.0	-15.6
0.952	20.0	20.4	40.4	56.0	-15.6
3.233	19.8	20.5	40.3	56.0	-15.7
0.999	19.9	20.4	40.3	56.0	-15.7
2.085	19.8	20.5	40.3	56.0	-15.7

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
1.961	21.1	20.5	41.6	46.0	-4.4
0.642	20.8	20.3	41.1	46.0	-4.9
4.523	20.3	20.7	41.0	46.0	-5.0
2.756	20.4	20.5	40.9	46.0	-5.1
4.898	20.2	20.7	40.9	46.0	-5.1
1.746	20.4	20.5	40.9	46.0	-5.1
1.265	20.4	20.4	40.8	46.0	-5.2
1.852	20.3	20.5	40.8	46.0	-5.2
1.210	20.3	20.4	40.7	46.0	-5.3
3.080	20.0	20.5	40.5	46.0	-5.5
3.065	20.0	20.5	40.5	46.0	-5.5
4.315	19.8	20.7	40.5	46.0	-5.5
4.049	19.8	20.7	40.5	46.0	-5.5
0.828	20.1	20.3	40.4	46.0	-5.6
2.836	19.9	20.5	40.4	46.0	-5.6
2.799	19.9	20.5	40.4	46.0	-5.6
0.952	20.0	20.4	40.4	46.0	-5.6
3.233	19.8	20.5	40.3	46.0	-5.7
0.999	19.9	20.4	40.3	46.0	-5.7
2.085	19.8	20.5	40.3	46.0	-5.7

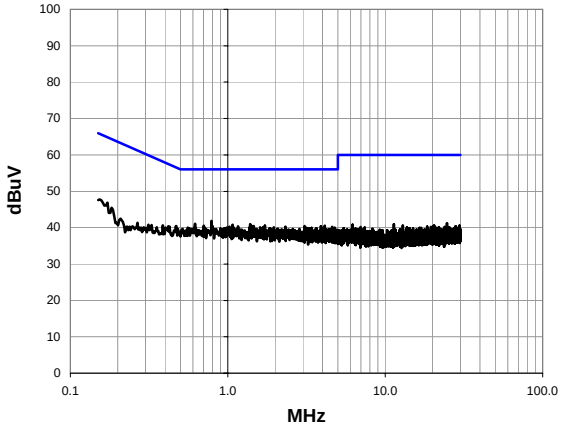
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	TRPO0083	**Date:**	02/19/13		
Project:	None	**Temperature:**	20.3 °C		
Job Site:	EV02	**Humidity:**	34% RH		
Serial Number:	None	**Barometric Pres.:**	1007 mbar	**Tested by:**	Carl Engholm, Rod Peloquin
EUT:	Bluetooth Radio Model cB-0939 in Yuma 2				
Configuration:	1				
Customer:	Trimble Navigation Limited MCS				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Continuous transmit, Bluetooth DH5, Mid channel (2441 MHz)				
Deviations:	None				
Comments:	None				

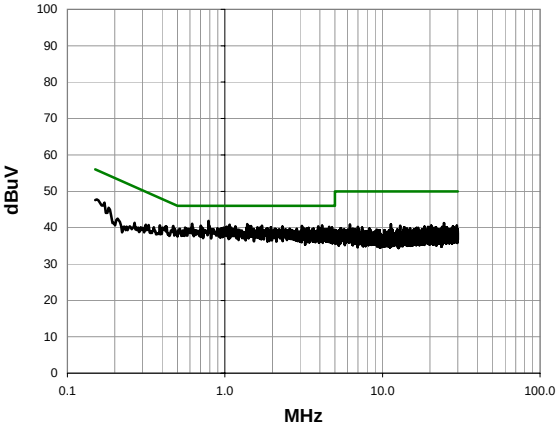
Test Specifications	**Test Method**
FCC 15.207:2013	ANSI C63.10:2009

Run #	3	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.788	21.5	20.3	41.8	56.0	-14.2
0.620	20.8	20.3	41.1	56.0	-14.9
1.385	20.6	20.4	41.0	56.0	-15.0
1.072	20.4	20.4	40.8	56.0	-15.2
4.137	19.9	20.7	40.6	56.0	-15.4
1.721	20.1	20.4	40.5	56.0	-15.5
0.704	20.2	20.3	40.5	56.0	-15.5
3.080	19.9	20.5	40.4	56.0	-15.6
1.462	20.0	20.4	40.4	56.0	-15.6
1.163	20.0	20.4	40.4	56.0	-15.6
3.904	19.7	20.6	40.3	56.0	-15.7
2.318	19.8	20.5	40.3	56.0	-15.7
1.025	19.9	20.4	40.3	56.0	-15.7
4.592	19.5	20.7	40.2	56.0	-15.8
1.608	19.7	20.4	40.1	56.0	-15.9
1.958	19.6	20.5	40.1	56.0	-15.9
1.673	19.6	20.4	40.0	56.0	-16.0
4.782	19.3	20.7	40.0	56.0	-16.0
3.404	19.4	20.5	39.9	56.0	-16.1
3.160	19.4	20.5	39.9	56.0	-16.1

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.788	21.5	20.3	41.8	46.0	-4.2
0.620	20.8	20.3	41.1	46.0	-4.9
1.385	20.6	20.4	41.0	46.0	-5.0
1.072	20.4	20.4	40.8	46.0	-5.2
4.137	19.9	20.7	40.6	46.0	-5.4
1.721	20.1	20.4	40.5	46.0	-5.5
0.704	20.2	20.3	40.5	46.0	-5.5
3.080	19.9	20.5	40.4	46.0	-5.6
1.462	20.0	20.4	40.4	46.0	-5.6
1.163	20.0	20.4	40.4	46.0	-5.6
3.904	19.7	20.6	40.3	46.0	-5.7
2.318	19.8	20.5	40.3	46.0	-5.7
1.025	19.9	20.4	40.3	46.0	-5.7
4.592	19.5	20.7	40.2	46.0	-5.8
1.608	19.7	20.4	40.1	46.0	-5.9
1.958	19.6	20.5	40.1	46.0	-5.9
1.673	19.6	20.4	40.0	46.0	-6.0
4.782	19.3	20.7	40.0	46.0	-6.0
3.404	19.4	20.5	39.9	46.0	-6.1
3.160	19.4	20.5	39.9	46.0	-6.1

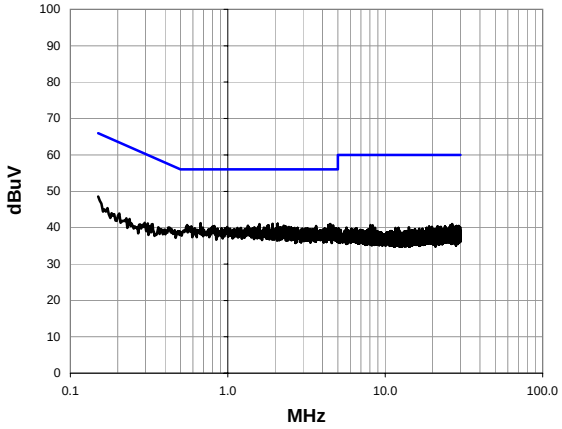
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	TRPO0083	**Date:**	02/19/13		
Project:	None	**Temperature:**	20.3 °C		
Job Site:	EV02	**Humidity:**	34% RH		
Serial Number:	None	**Barometric Pres.:**	1007 mbar	**Tested by:**	Carl Engholm, Rod Peloquin
EUT:	Bluetooth Radio Model cB-0939 in Yuma 2				
Configuration:	1				
Customer:	Trimble Navigation Limited MCS				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Continuous transmit, Bluetooth DH5, Mid channel (2441 MHz)				
Deviations:	None				
Comments:	None				

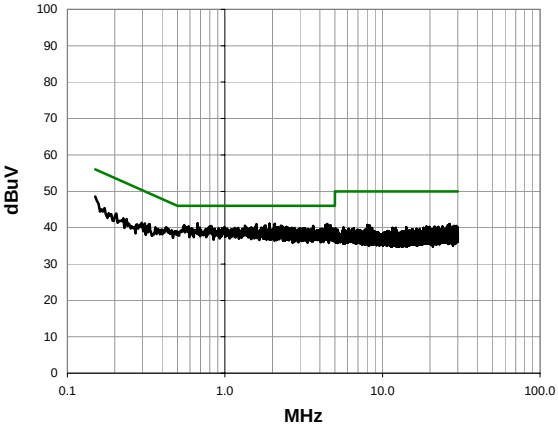
Test Specifications	**Test Method**
FCC 15.207:2013	ANSI C63.10:2009

Run #	4	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.671	20.9	20.3	41.2	56.0	-14.8
2.074	20.6	20.5	41.1	56.0	-14.9
1.921	20.6	20.5	41.1	56.0	-14.9
4.465	20.3	20.7	41.0	56.0	-15.0
1.586	20.5	20.4	40.9	56.0	-15.1
0.551	20.4	20.3	40.7	56.0	-15.3
4.352	20.0	20.7	40.7	56.0	-15.3
1.812	20.2	20.5	40.7	56.0	-15.3
4.673	19.9	20.7	40.6	56.0	-15.4
2.271	20.1	20.5	40.6	56.0	-15.4
1.342	20.1	20.4	40.5	56.0	-15.5
3.634	19.9	20.6	40.5	56.0	-15.5
0.821	20.1	20.3	40.4	56.0	-15.6
2.322	19.9	20.5	40.4	56.0	-15.6
2.450	19.7	20.5	40.2	56.0	-15.8
0.992	19.8	20.4	40.2	56.0	-15.8
1.473	19.7	20.4	40.1	56.0	-15.9
2.140	19.6	20.5	40.1	56.0	-15.9
1.699	19.6	20.4	40.0	56.0	-16.0
2.526	19.5	20.5	40.0	56.0	-16.0

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.671	20.9	20.3	41.2	46.0	-4.8
2.074	20.6	20.5	41.1	46.0	-4.9
1.921	20.6	20.5	41.1	46.0	-4.9
4.465	20.3	20.7	41.0	46.0	-5.0
1.586	20.5	20.4	40.9	46.0	-5.1
0.551	20.4	20.3	40.7	46.0	-5.3
4.352	20.0	20.7	40.7	46.0	-5.3
1.812	20.2	20.5	40.7	46.0	-5.3
4.673	19.9	20.7	40.6	46.0	-5.4
2.271	20.1	20.5	40.6	46.0	-5.4
1.342	20.1	20.4	40.5	46.0	-5.5
3.634	19.9	20.6	40.5	46.0	-5.5
0.821	20.1	20.3	40.4	46.0	-5.6
2.322	19.9	20.5	40.4	46.0	-5.6
2.450	19.7	20.5	40.2	46.0	-5.8
0.992	19.8	20.4	40.2	46.0	-5.8
1.473	19.7	20.4	40.1	46.0	-5.9
2.140	19.6	20.5	40.1	46.0	-5.9
1.699	19.6	20.4	40.0	46.0	-6.0
2.526	19.5	20.5	40.0	46.0	-6.0

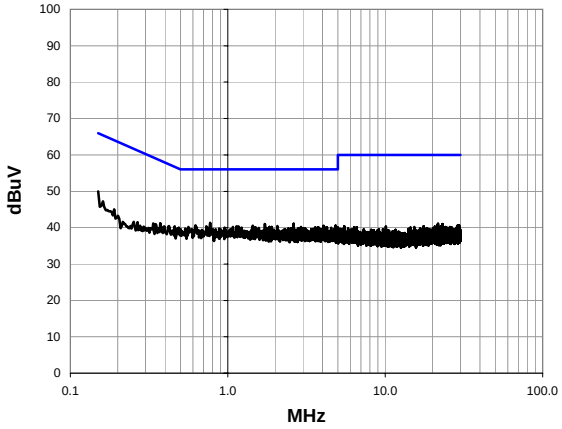
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	TRPO0083	**Date:**	02/19/13		
Project:	None	**Temperature:**	20.3 °C		
Job Site:	EV02	**Humidity:**	34% RH		
Serial Number:	None	**Barometric Pres.:**	1007 mbar	**Tested by:**	Carl Engholm, Rod Peloquin
EUT:	Bluetooth Radio Model cB-0939 in Yuma 2				
Configuration:	1				
Customer:	Trimble Navigation Limited MCS				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Continuous transmit, Bluetooth DH5, High channel (2480 MHz)				
Deviations:	None				
Comments:	None				

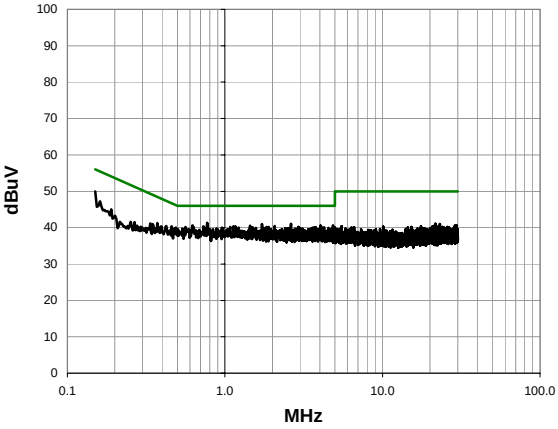
Test Specifications	**Test Method**
FCC 15.207:2013	ANSI C63.10:2009

Run #	5	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.773	21.0	20.3	41.3	56.0	-14.7
2.624	20.6	20.5	41.1	56.0	-14.9
1.721	20.5	20.4	40.9	56.0	-15.1
0.624	20.3	20.3	40.6	56.0	-15.4
4.046	19.9	20.7	40.6	56.0	-15.4
1.444	20.1	20.4	40.5	56.0	-15.5
4.844	19.8	20.7	40.5	56.0	-15.5
2.067	20.0	20.5	40.5	56.0	-15.5
1.134	20.0	20.4	40.4	56.0	-15.6
4.086	19.6	20.7	40.3	56.0	-15.7
2.927	19.7	20.5	40.2	56.0	-15.8
1.899	19.7	20.5	40.2	56.0	-15.8
1.837	19.7	20.5	40.2	56.0	-15.8
1.502	19.7	20.4	40.1	56.0	-15.9
4.264	19.4	20.7	40.1	56.0	-15.9
3.718	19.5	20.6	40.1	56.0	-15.9
3.590	19.5	20.6	40.1	56.0	-15.9
1.480	19.6	20.4	40.0	56.0	-16.0
4.997	19.3	20.7	40.0	56.0	-16.0
3.769	19.4	20.6	40.0	56.0	-16.0

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.773	21.0	20.3	41.3	46.0	-4.7
2.624	20.6	20.5	41.1	46.0	-4.9
1.721	20.5	20.4	40.9	46.0	-5.1
0.624	20.3	20.3	40.6	46.0	-5.4
4.046	19.9	20.7	40.6	46.0	-5.4
1.444	20.1	20.4	40.5	46.0	-5.5
4.844	19.8	20.7	40.5	46.0	-5.5
2.067	20.0	20.5	40.5	46.0	-5.5
1.134	20.0	20.4	40.4	46.0	-5.6
4.086	19.6	20.7	40.3	46.0	-5.7
2.927	19.7	20.5	40.2	46.0	-5.8
1.899	19.7	20.5	40.2	46.0	-5.8
1.837	19.7	20.5	40.2	46.0	-5.8
1.502	19.7	20.4	40.1	46.0	-5.9
4.264	19.4	20.7	40.1	46.0	-5.9
3.718	19.5	20.6	40.1	46.0	-5.9
3.590	19.5	20.6	40.1	46.0	-5.9
1.480	19.6	20.4	40.0	46.0	-6.0
4.997	19.3	20.7	40.0	46.0	-6.0
3.769	19.4	20.6	40.0	46.0	-6.0

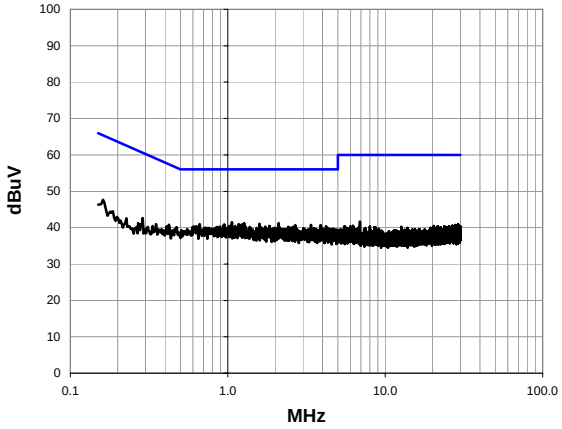
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	TRPO0083	**Date:**	02/19/13		
Project:	None	**Temperature:**	20.3 °C		
Job Site:	EV02	**Humidity:**	34% RH		
Serial Number:	None	**Barometric Pres.:**	1007 mbar	**Tested by:**	Carl Engholm, Rod Peloquin
EUT:	Bluetooth Radio Model cB-0939 in Yuma 2				
Configuration:	1				
Customer:	Trimble Navigation Limited MCS				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Continuous transmit, Bluetooth DH5, High channel (2480 MHz)				
Deviations:	None				
Comments:	None				

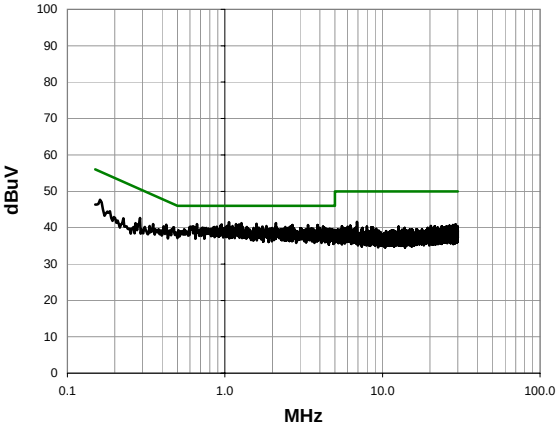
Test Specifications	**Test Method**
FCC 15.207:2013	ANSI C63.10:2009

Run #	6	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
1.061	21.1	20.4	41.5	56.0	-14.5
2.107	20.8	20.5	41.3	56.0	-14.7
1.272	20.8	20.4	41.2	56.0	-14.8
1.586	20.6	20.4	41.0	56.0	-15.0
0.664	20.7	20.3	41.0	56.0	-15.0
1.174	20.6	20.4	41.0	56.0	-15.0
1.232	20.5	20.4	40.9	56.0	-15.1
0.952	20.5	20.4	40.9	56.0	-15.1
3.375	20.2	20.5	40.7	56.0	-15.3
3.878	20.1	20.6	40.7	56.0	-15.3
2.679	20.2	20.5	40.7	56.0	-15.3
1.116	20.1	20.4	40.5	56.0	-15.5
1.837	20.0	20.5	40.5	56.0	-15.5
0.631	20.1	20.3	40.4	56.0	-15.6
2.606	19.8	20.5	40.3	56.0	-15.7
1.294	19.9	20.4	40.3	56.0	-15.7
4.202	19.6	20.7	40.3	56.0	-15.7
1.732	19.8	20.5	40.3	56.0	-15.7
1.378	19.8	20.4	40.2	56.0	-15.8
2.420	19.7	20.5	40.2	56.0	-15.8

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
1.061	21.1	20.4	41.5	46.0	-4.5
2.107	20.8	20.5	41.3	46.0	-4.7
1.272	20.8	20.4	41.2	46.0	-4.8
1.586	20.6	20.4	41.0	46.0	-5.0
0.664	20.7	20.3	41.0	46.0	-5.0
1.174	20.6	20.4	41.0	46.0	-5.0
1.232	20.5	20.4	40.9	46.0	-5.1
0.952	20.5	20.4	40.9	46.0	-5.1
3.375	20.2	20.5	40.7	46.0	-5.3
3.878	20.1	20.6	40.7	46.0	-5.3
2.679	20.2	20.5	40.7	46.0	-5.3
1.116	20.1	20.4	40.5	46.0	-5.5
1.837	20.0	20.5	40.5	46.0	-5.5
0.631	20.1	20.3	40.4	46.0	-5.6
2.606	19.8	20.5	40.3	46.0	-5.7
1.294	19.9	20.4	40.3	46.0	-5.7
4.202	19.6	20.7	40.3	46.0	-5.7
1.732	19.8	20.5	40.3	46.0	-5.7
1.378	19.8	20.4	40.2	46.0	-5.8
2.420	19.7	20.5	40.2	46.0	-5.8

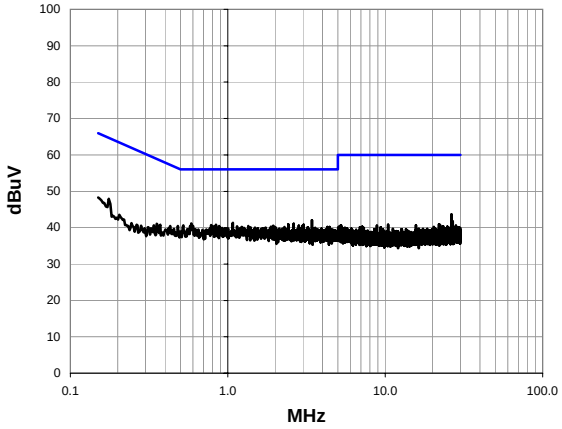
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	TRPO0083	**Date:**	02/19/13		
Project:	None	**Temperature:**	20.3 °C		
Job Site:	EV02	**Humidity:**	34% RH		
Serial Number:	None	**Barometric Pres.:**	1007 mbar	**Tested by:**	Carl Engholm, Rod Peloquin
EUT:	Bluetooth Radio Model cB-0939 in Yuma 2				
Configuration:	1				
Customer:	Trimble Navigation Limited MCS				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Continuous transmit, Bluetooth 2DH5, Low channel (2402 MHz)				
Deviations:	None				
Comments:	None				

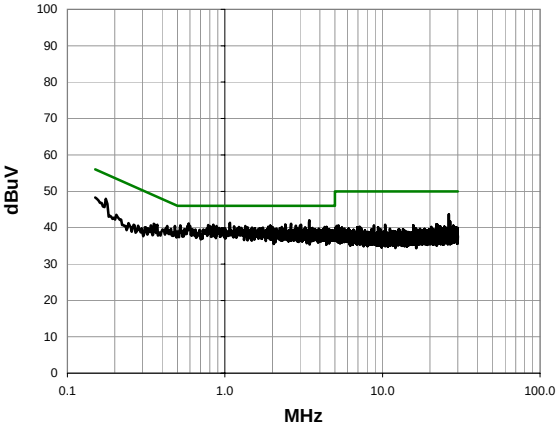
Test Specifications	**Test Method**
FCC 15.207:2013	ANSI C63.10:2009

Run #	7	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.426	21.5	20.5	42.0	56.0	-14.0
1.076	20.9	20.4	41.3	56.0	-14.7
0.587	20.9	20.3	41.2	56.0	-14.8
2.624	20.6	20.5	41.1	56.0	-14.9
2.420	20.4	20.5	40.9	56.0	-15.1
0.842	20.5	20.4	40.9	56.0	-15.1
3.033	20.3	20.5	40.8	56.0	-15.2
0.784	20.4	20.3	40.7	56.0	-15.3
1.939	20.1	20.5	40.6	56.0	-15.4
2.993	20.0	20.5	40.5	56.0	-15.5
2.825	20.0	20.5	40.5	56.0	-15.5
0.882	20.1	20.4	40.5	56.0	-15.5
1.349	20.0	20.4	40.4	56.0	-15.6
1.885	19.8	20.5	40.3	56.0	-15.7
4.425	19.5	20.7	40.2	56.0	-15.8
2.293	19.7	20.5	40.2	56.0	-15.8
4.286	19.5	20.7	40.2	56.0	-15.8
1.987	19.7	20.5	40.2	56.0	-15.8
3.222	19.6	20.5	40.1	56.0	-15.9
1.393	19.7	20.4	40.1	56.0	-15.9

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.426	21.5	20.5	42.0	46.0	-4.0
1.076	20.9	20.4	41.3	46.0	-4.7
0.587	20.9	20.3	41.2	46.0	-4.8
2.624	20.6	20.5	41.1	46.0	-4.9
2.420	20.4	20.5	40.9	46.0	-5.1
0.842	20.5	20.4	40.9	46.0	-5.1
3.033	20.3	20.5	40.8	46.0	-5.2
0.784	20.4	20.3	40.7	46.0	-5.3
1.939	20.1	20.5	40.6	46.0	-5.4
2.993	20.0	20.5	40.5	46.0	-5.5
2.825	20.0	20.5	40.5	46.0	-5.5
0.882	20.1	20.4	40.5	46.0	-5.5
1.349	20.0	20.4	40.4	46.0	-5.6
1.885	19.8	20.5	40.3	46.0	-5.7
4.425	19.5	20.7	40.2	46.0	-5.8
2.293	19.7	20.5	40.2	46.0	-5.8
4.286	19.5	20.7	40.2	46.0	-5.8
1.987	19.7	20.5	40.2	46.0	-5.8
3.222	19.6	20.5	40.1	46.0	-5.9
1.393	19.7	20.4	40.1	46.0	-5.9

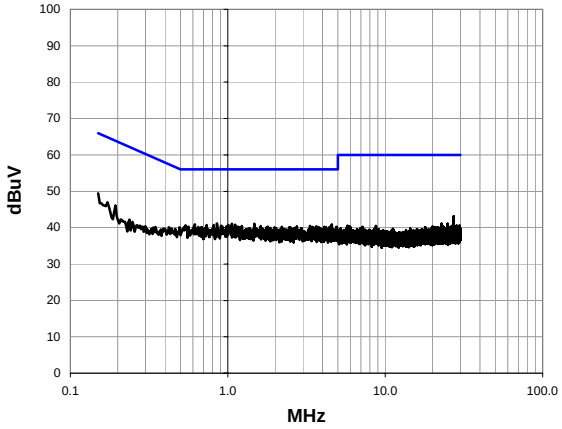
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	TRPO0083	**Date:**	02/19/13		
Project:	None	**Temperature:**	20.3 °C		
Job Site:	EV02	**Humidity:**	34% RH		
Serial Number:	None	**Barometric Pres.:**	1007 mbar	**Tested by:**	Carl Engholm, Rod Peloquin
EUT:	Bluetooth Radio Model cB-0939 in Yuma 2				
Configuration:	1				
Customer:	Trimble Navigation Limited MCS				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Continuous transmit, Bluetooth 2DH5, Low channel (2402 MHz)				
Deviations:	None				
Comments:	None				

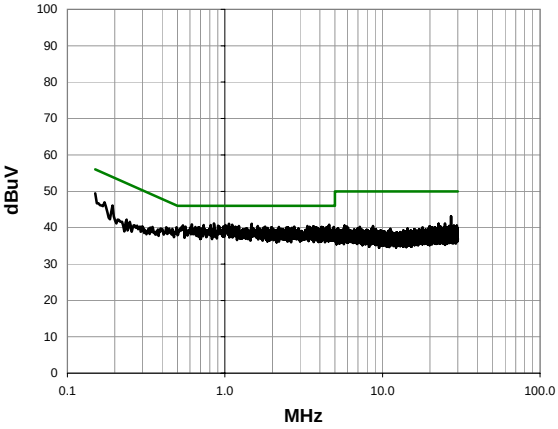
Test Specifications	**Test Method**
FCC 15.207:2013	ANSI C63.10:2009

Run #	8	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.853	20.8	20.4	41.2	56.0	-14.8
1.061	20.7	20.4	41.1	56.0	-14.9
1.477	20.6	20.4	41.0	56.0	-15.0
0.616	20.6	20.3	40.9	56.0	-15.1
1.112	20.4	20.4	40.8	56.0	-15.2
4.578	20.1	20.7	40.8	56.0	-15.2
0.813	20.4	20.3	40.7	56.0	-15.3
0.733	20.4	20.3	40.7	56.0	-15.3
0.540	20.3	20.3	40.6	56.0	-15.4
0.904	20.2	20.4	40.6	56.0	-15.4
1.229	20.1	20.4	40.5	56.0	-15.5
3.331	19.9	20.5	40.4	56.0	-15.6
1.619	20.0	20.4	40.4	56.0	-15.6
4.512	19.7	20.7	40.4	56.0	-15.6
3.648	19.8	20.6	40.4	56.0	-15.6
2.748	19.8	20.5	40.3	56.0	-15.7
1.797	19.8	20.5	40.3	56.0	-15.7
4.906	19.5	20.7	40.2	56.0	-15.8
2.205	19.7	20.5	40.2	56.0	-15.8
4.115	19.5	20.7	40.2	56.0	-15.8

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.853	20.8	20.4	41.2	46.0	-4.8
1.061	20.7	20.4	41.1	46.0	-4.9
1.477	20.6	20.4	41.0	46.0	-5.0
0.616	20.6	20.3	40.9	46.0	-5.1
1.112	20.4	20.4	40.8	46.0	-5.2
4.578	20.1	20.7	40.8	46.0	-5.2
0.813	20.4	20.3	40.7	46.0	-5.3
0.733	20.4	20.3	40.7	46.0	-5.3
0.540	20.3	20.3	40.6	46.0	-5.4
0.904	20.2	20.4	40.6	46.0	-5.4
1.229	20.1	20.4	40.5	46.0	-5.5
3.331	19.9	20.5	40.4	46.0	-5.6
1.619	20.0	20.4	40.4	46.0	-5.6
4.512	19.7	20.7	40.4	46.0	-5.6
3.648	19.8	20.6	40.4	46.0	-5.6
2.748	19.8	20.5	40.3	46.0	-5.7
1.797	19.8	20.5	40.3	46.0	-5.7
4.906	19.5	20.7	40.2	46.0	-5.8
2.205	19.7	20.5	40.2	46.0	-5.8
4.115	19.5	20.7	40.2	46.0	-5.8

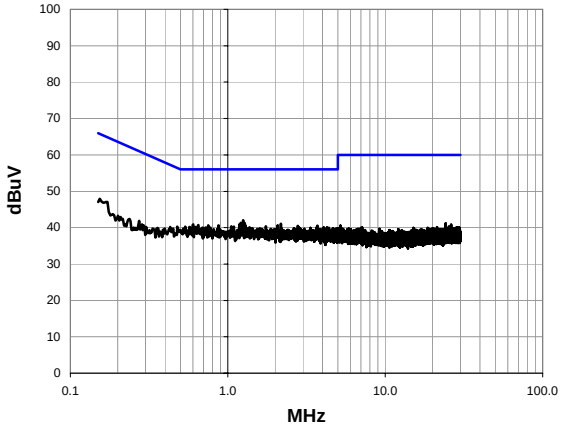
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	TRPO0083	**Date:**	02/19/13		
Project:	None	**Temperature:**	20.3 °C		
Job Site:	EV02	**Humidity:**	34% RH		
Serial Number:	None	**Barometric Pres.:**	1007 mbar	**Tested by:**	Carl Engholm, Rod Peloquin
EUT:	Bluetooth Radio Model cB-0939 in Yuma 2				
Configuration:	1				
Customer:	Trimble Navigation Limited MCS				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Continuous transmit, Bluetooth 3DH5, Low channel (2402 MHz)				
Deviations:	None				
Comments:	None				

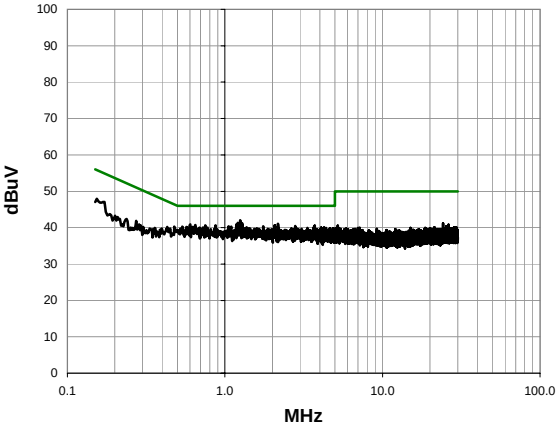
Test Specifications	**Test Method**
FCC 15.207:2013	ANSI C63.10:2009

Run #	9	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
1.251	21.6	20.4	42.0	56.0	-14.0
1.210	20.9	20.4	41.3	56.0	-14.7
1.283	20.8	20.4	41.2	56.0	-14.8
2.173	20.6	20.5	41.1	56.0	-14.9
0.602	20.6	20.3	40.9	56.0	-15.1
0.649	20.4	20.3	40.7	56.0	-15.3
2.071	20.2	20.5	40.7	56.0	-15.3
0.872	20.3	20.4	40.7	56.0	-15.3
0.751	20.3	20.3	40.6	56.0	-15.4
3.714	20.0	20.6	40.6	56.0	-15.4
2.788	19.9	20.5	40.4	56.0	-15.6
1.054	20.0	20.4	40.4	56.0	-15.6
1.746	19.9	20.5	40.4	56.0	-15.6
3.685	19.7	20.6	40.3	56.0	-15.7
4.261	19.3	20.7	40.0	56.0	-16.0
4.075	19.3	20.7	40.0	56.0	-16.0
3.342	19.4	20.5	39.9	56.0	-16.1
4.385	19.2	20.7	39.9	56.0	-16.1
2.635	19.3	20.5	39.8	56.0	-16.2
4.877	19.1	20.7	39.8	56.0	-16.2

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
1.251	21.6	20.4	42.0	46.0	-4.0
1.210	20.9	20.4	41.3	46.0	-4.7
1.283	20.8	20.4	41.2	46.0	-4.8
2.173	20.6	20.5	41.1	46.0	-4.9
0.602	20.6	20.3	40.9	46.0	-5.1
0.649	20.4	20.3	40.7	46.0	-5.3
2.071	20.2	20.5	40.7	46.0	-5.3
0.872	20.3	20.4	40.7	46.0	-5.3
0.751	20.3	20.3	40.6	46.0	-5.4
3.714	20.0	20.6	40.6	46.0	-5.4
2.788	19.9	20.5	40.4	46.0	-5.6
1.054	20.0	20.4	40.4	46.0	-5.6
1.746	19.9	20.5	40.4	46.0	-5.6
3.685	19.7	20.6	40.3	46.0	-5.7
4.261	19.3	20.7	40.0	46.0	-6.0
4.075	19.3	20.7	40.0	46.0	-6.0
3.342	19.4	20.5	39.9	46.0	-6.1
4.385	19.2	20.7	39.9	46.0	-6.1
2.635	19.3	20.5	39.8	46.0	-6.2
4.877	19.1	20.7	39.8	46.0	-6.2

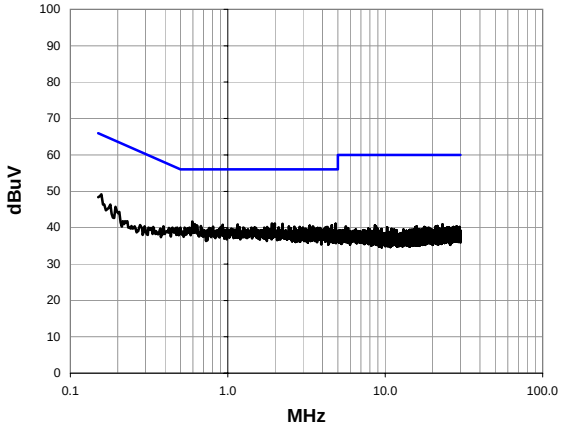
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	TRPO0083	**Date:**	02/19/13		
Project:	None	**Temperature:**	20.3 °C		
Job Site:	EV02	**Humidity:**	34% RH		
Serial Number:	None	**Barometric Pres.:**	1007 mbar	**Tested by:**	Carl Engholm, Rod Peloquin
EUT:	Bluetooth Radio Model cB-0939 in Yuma 2				
Configuration:	1				
Customer:	Trimble Navigation Limited MCS				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Continuous transmit, Bluetooth 3DH5, Low channel (2402 MHz)				
Deviations:	None				
Comments:	None				

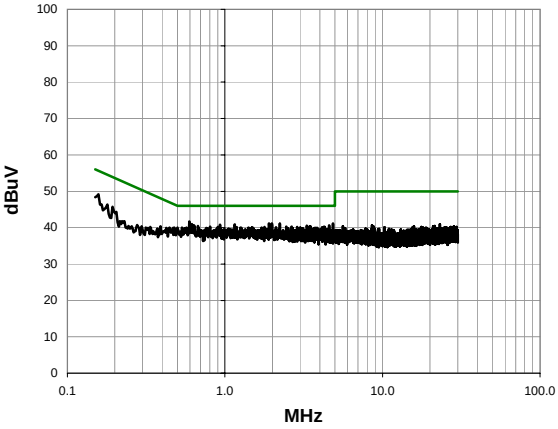
Test Specifications	**Test Method**
FCC 15.207:2013	ANSI C63.10:2009

Run #	10	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.595	21.4	20.3	41.7	56.0	-14.3
1.987	20.7	20.5	41.2	56.0	-14.8
1.907	20.7	20.5	41.2	56.0	-14.8
4.847	20.4	20.7	41.1	56.0	-14.9
2.231	20.6	20.5	41.1	56.0	-14.9
1.156	20.5	20.4	40.9	56.0	-15.1
0.930	20.4	20.4	40.8	56.0	-15.2
4.578	19.9	20.7	40.6	56.0	-15.4
3.313	20.0	20.5	40.5	56.0	-15.5
3.477	19.8	20.6	40.4	56.0	-15.6
2.650	19.8	20.5	40.3	56.0	-15.7
2.446	19.8	20.5	40.3	56.0	-15.7
3.335	19.7	20.5	40.2	56.0	-15.8
0.806	19.9	20.3	40.2	56.0	-15.8
2.869	19.7	20.5	40.2	56.0	-15.8
4.297	19.5	20.7	40.2	56.0	-15.8
4.239	19.5	20.7	40.2	56.0	-15.8
1.779	19.7	20.5	40.2	56.0	-15.8
1.484	19.7	20.4	40.1	56.0	-15.9
2.107	19.6	20.5	40.1	56.0	-15.9

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.595	21.4	20.3	41.7	46.0	-4.3
1.987	20.7	20.5	41.2	46.0	-4.8
1.907	20.7	20.5	41.2	46.0	-4.8
4.847	20.4	20.7	41.1	46.0	-4.9
2.231	20.6	20.5	41.1	46.0	-4.9
1.156	20.5	20.4	40.9	46.0	-5.1
0.930	20.4	20.4	40.8	46.0	-5.2
4.578	19.9	20.7	40.6	46.0	-5.4
3.313	20.0	20.5	40.5	46.0	-5.5
3.477	19.8	20.6	40.4	46.0	-5.6
2.650	19.8	20.5	40.3	46.0	-5.7
2.446	19.8	20.5	40.3	46.0	-5.7
3.335	19.7	20.5	40.2	46.0	-5.8
0.806	19.9	20.3	40.2	46.0	-5.8
2.869	19.7	20.5	40.2	46.0	-5.8
4.297	19.5	20.7	40.2	46.0	-5.8
4.239	19.5	20.7	40.2	46.0	-5.8
1.779	19.7	20.5	40.2	46.0	-5.8
1.484	19.7	20.4	40.1	46.0	-5.9
2.107	19.6	20.5	40.1	46.0	-5.9