TEST REPORT

Report Number: 100329719MPK-003
Project Number: G100329719
Report Date: April 20, 2011

Testing performed on the
Golf Course GPS Device
Model: MX5911016
FCC ID: Y9F-MX5911016
IC ID: 9516A-MX591

to

FCC Part 15.247 and RSS-210 Issue 8

for

Callaway Golf

Test Performed by:	Test Authorized by:
Intertek	Callaway Golf
1365 Adams Court	5858 Dryden Place
Menlo Park, CA 94025 USA	Carlsbad, CA 92008 USA

Prepared by: _____ **Date:** April 20, 2011
Marcos Rodriguez

Reviewed by: _____ **Date:** April 20, 2011
Krishna K Vemuri

Report No. 100329719MPK-003

Equipment Under Test:	Golf Course GPS Device
Trade Name:	Callaway Golf
Model No.:	MX5911016
FCC ID:	Y9F-MX5911016
IC ID:	9516A-MX591
Applicant:	Callaway Golf
Contact:	Ms. Diana Plumey
Address:	5858 Dryden Place Carlsbad, CA 92008
Country	USA
Tel. Number:	(760) 931-1771
Fax number:	(760) 929-6844
Applicable Regulation:	FCC Part 15, Subpart C and RSS-210 Issue 8
Test Site Location:	ITS – Site 1 1365 Adams Drive Menlo Park, CA 94025
Date of Test:	February 10 to April 20, 2011

We attest to the accuracy of this report:

Marcos Rodriguez
EMC Test Engineer

Krishna K Vemuri
EMC Senior Staff Engineer

TABLE OF CONTENTS

1.0 Introduction

The Equipment Under Test (EUT) is a device with a DTS (Digital Transmission System) transceiver operating in the 2.4GHz frequency band.

This report is designed to show compliance of the 2.4 GHz transceiver with FCC Part 15.247 and RSS-210 requirements.

1.1 Summary of Tests

TEST	REFERENCE FCC 17.247	REFERENCE RSS-210	RESULTS
Output power	15.247(b)(3)	A8.4(4)	Complies
6-dB Bandwidth	15.247(a)(2)	A8.2(a)	Complies
Power Spectral Density	15.247(e)	A8.2(b)	Complies
Out-of-band Antenna Conducted Emission	15.247(d)	A8.5	The EUT has a permanently attached internal antenna. It does not contain an antenna port connector. Instead of Antenna Conducted measurements, Radiated measurements were performed.
Out-of-Band Radiated Emission (except emissions in Restricted Bands)	15.247(d)	A8.5	Complies
Radiated Emission in Restricted Bands	15.247(d), 15.205	2.2	Complies
RF exposure	15.247(i)	RSS-102	Complies
AC Conducted Emission	15.207	RSS-GEN	Complies
Radiated Emission from Digital Parts and receiver	15.109	ICES-003	Complies

2.0 General Description

2.1 Product Description

Overview of the EUT

Applicant	Callaway Golf 5858 Dryden Place Carlsbad, CA 92008 USA
Manufacturer Name & Address	Callaway Golf 5858 Dryden Place Carlsbad, CA 92008 USA
Model Number	MX5911016
FCC Identifier	Y9F-MX5911016
IC ID Number	9516A-MX591
Rated RF Output (EIRP)	2.7 mW
Frequency Range	2401-2402 MHz
Number of Channel(s)	2
Modulation Type	GFSK
Data Rate	2 Mbps
Antenna Type	Internal monopole, whip antenna, 0.5 dBi

A pre-production version of the sample was received on February 9, 2011 in good condition. As declared by the Applicant, it is identical to production units.

Test start date February 10, 2011
Test end date: April 20, 2011

2.2 Related Submittal(s) Grants

None.

2.3 Test Methodology

Radiated and AC Line conducted emissions measurements were performed according to the procedures in ANSI C63.4. Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the **"Data Sheet"** of this Application. All other measurements were made in accordance with the procedures described in the FCC guidance document, *Measurement of Digital Transmission Systems Operating under Section 15.247*.

2.4 Test Facility

The radiated emission test site and conducted measurement facility used to collect the data is 10m semi-anechoic chamber located in Menlo Park, California. This test facility and site measurement data have been fully placed on file with the FCC and Industry Canada (Site # 2042L-1).

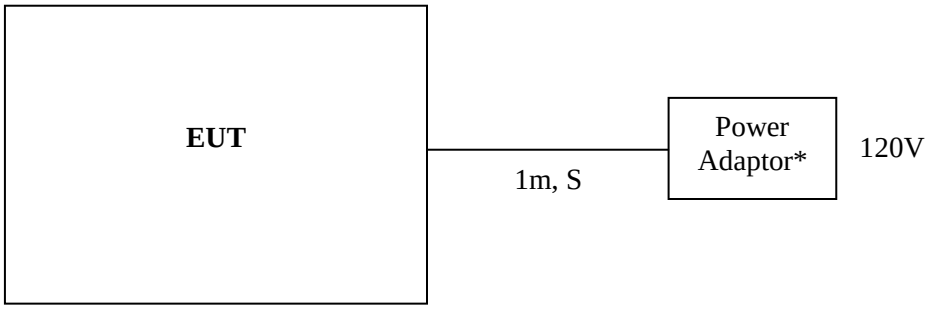
3.0 System Test Configuration

3.1 Support Equipment

None. The EUT is a stand-alone system.

3.2 Block Diagram of Test Setup

The diagram shown below details the interconnection of the EUT and support equipment. For specific layout, refer to the test configuration photograph in the relevant section of this report.



*Model: ND-0500500U.

S = Shielded **U** = Unshielded	**F** = With Ferrite **m** = Length in Meters

3.3 Justification

For radiated emission measurements the EUT is placed on a non-conductive table. The EUT is wired to transmit full power.

EUT was controlled manually to set the radio in different channels during the tests.

The following are the channel numbers and channel frequencies tested.

Channel Selected	Channel number	Frequency MHz
Lower Test Channel	Channel 01	2401 MHz
Upper Test Channel	Channel 02	2402 MHz

3.4 Software Exercise Program

None.

3.5 Mode of Operation During Test

The EUT was set at to operate at one of the channels (low or high) during the tests.

3.6 Modifications Required for Compliance

No modifications were installed by Intertek Testing Services during compliance testing in order to bring the product into compliance.

4.0 Measurement Results

4.1 Conducted Output Power at Antenna Terminals
FCC 15.247(b)(3)

Requirements

For systems operating in the 2400-2483.5 MHz band using digital modulation, the maximum peak output power is 1 watt (30 dBm), the conducted power limit is based on the use of antenna with directional gain that do not exceed 6dBi. If the transmitting antenna of directional gain greater than 6dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated value as in FCC 15.247(b)(4)(i).

Procedure

The EUT has a permanently attached internal antenna. It does not contain an antenna port connector. Instead of Antenna Conducted measurements, Radiated measurements were performed.

The maximum field strength of the fundamental was measured.

The transmitter's peak power was calculated using the following equation:

Where: E = the measured maximum field strength in V/m.

Set the RBW > 6dB bandwidth of the emission or use a peak power meter.

P = (E x d) squared / (30 x G).

G = the numeric gain of the transmitting antenna over an isotropic radiator.

d = the distance in meters from which the field strength was measured.

P = the power in watts for which you are solving.

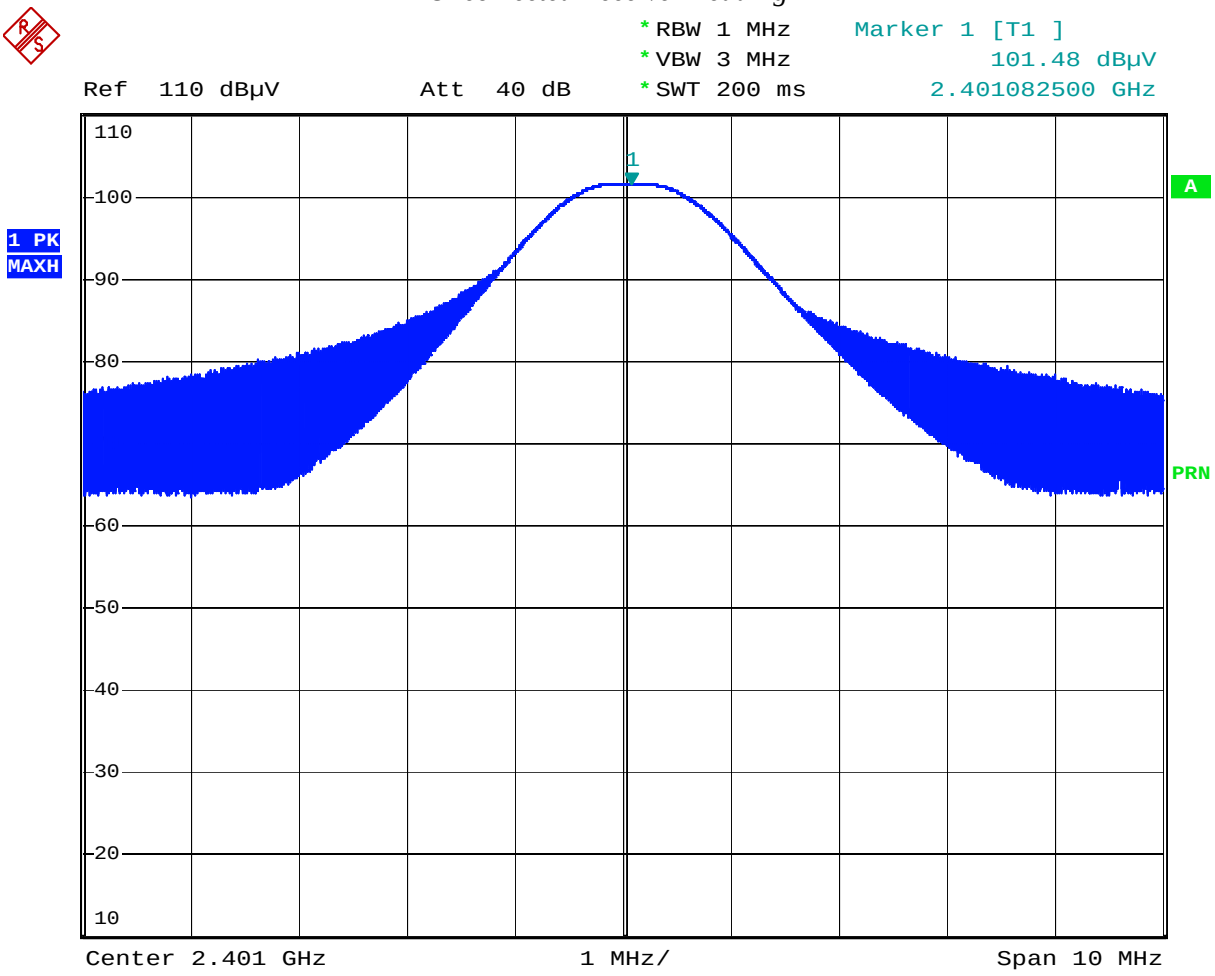
Test Results

Frequency (MHz)	Output in dBm	Output in mW	Plot number
2401	3.5	2.2	1.1
2402	4.3	2.7	1.2

Note: The EUT's antenna has less than 6 dBi gain.

Plot 1.1

Uncorrected Receiver Reading



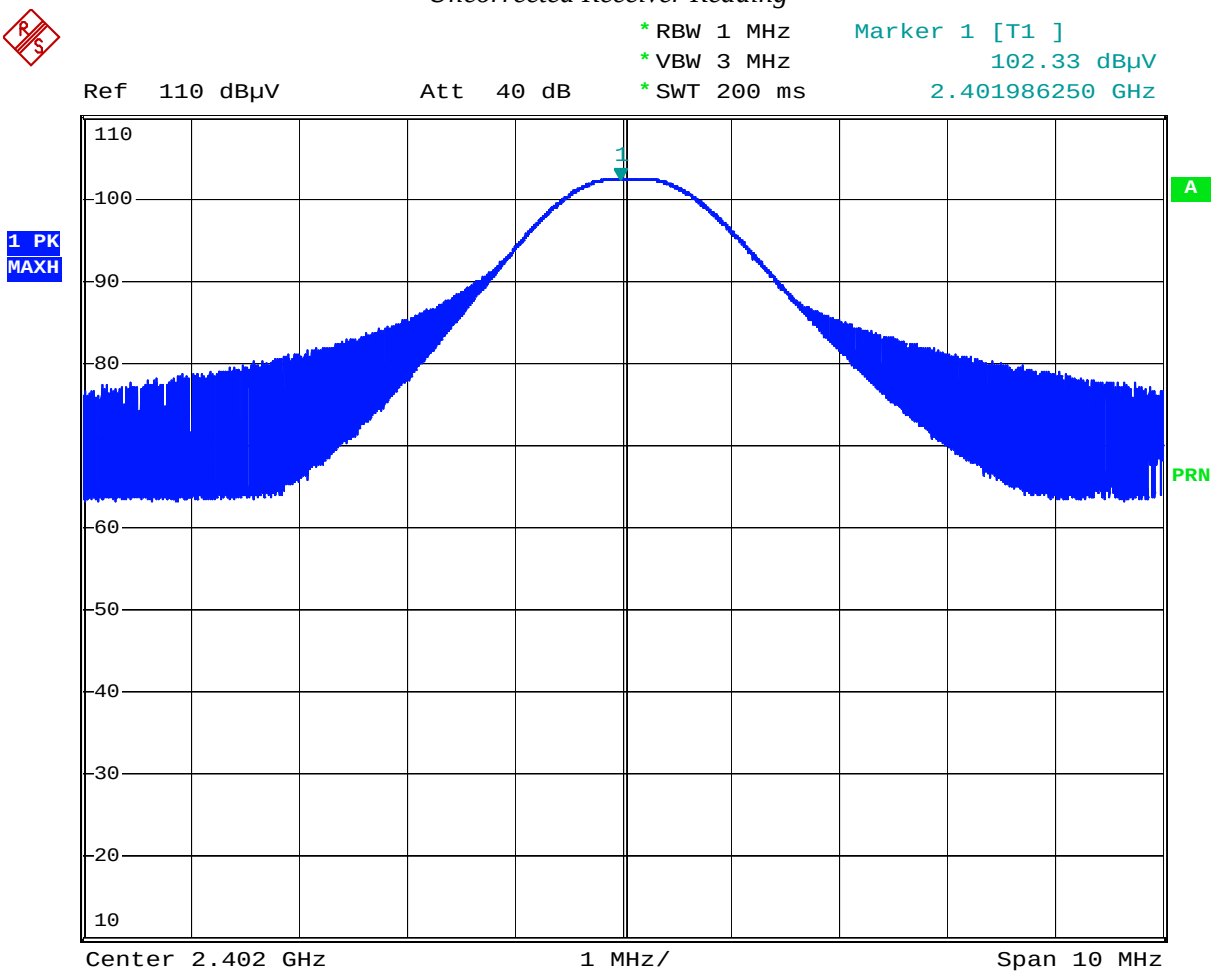
Date: 25.MAR.2011 12:12:30

Frequency	RA	AG	CF	AF	Final Field Strength	EIRP	EIRP
MHz	dB(uV)	dB	dB	dB(1/m)	dB(uV/m)	dBm	mW
2401.0	101.5	35.5	4.6	28.1	98.7	3.5	2.2

RA = Receiver Amplitude
AG = Amplifier Gain
CF = Cable Factor
AF = Antenna Factor

Plot 1.2

Uncorrected Receiver Reading



Date: 25.MAR.2011 11:58:15

Frequency	RA	AG	CF	AF	Final Field Strength	EIRP	EIRP
MHz	dB(uV)	dB	dB	dB(1/m)	dB(uV/m)	dBm	mW
2402.0	102.3	35.5	4.6	28.1	99.5	4.3	2.7

RA = Receiver Amplitude
AG = Amplifier Gain
CF = Cable Factor
AF = Antenna Factor

4.2 6-dB Bandwidth
FCC 15.247(a)(2)

Requirements

For systems operating in the 2400-2483.5 MHz band using digital modulation, the minimum 6-dB Bandwidth shall be at least 500kHz.

Procedure

A measuring antenna was placed in close proximity to the EUT. The spectrum analyzer resolution bandwidth was set to approximately 1% of the total emission bandwidth, VBW>RBW. The 6-dB Bandwidth was measured by using the DELTA MARKER function of the analyzer.

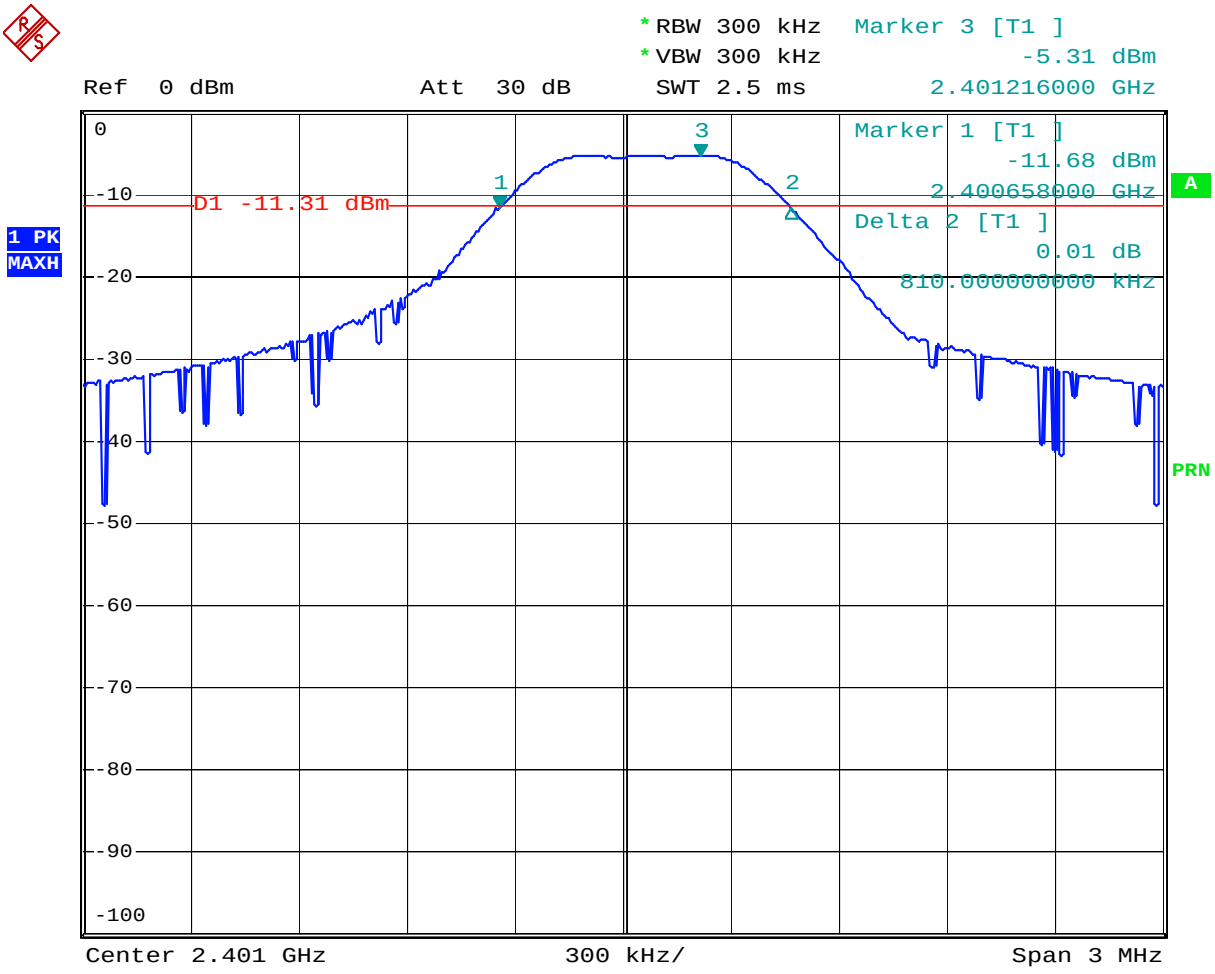
In addition, the Occupied Bandwidth (99%) was measured.

Test Results

Frequency (MHz)	6-dB Channel Bandwidth (kHz)	Plot
2401	810	2.1
2402	801	2.2

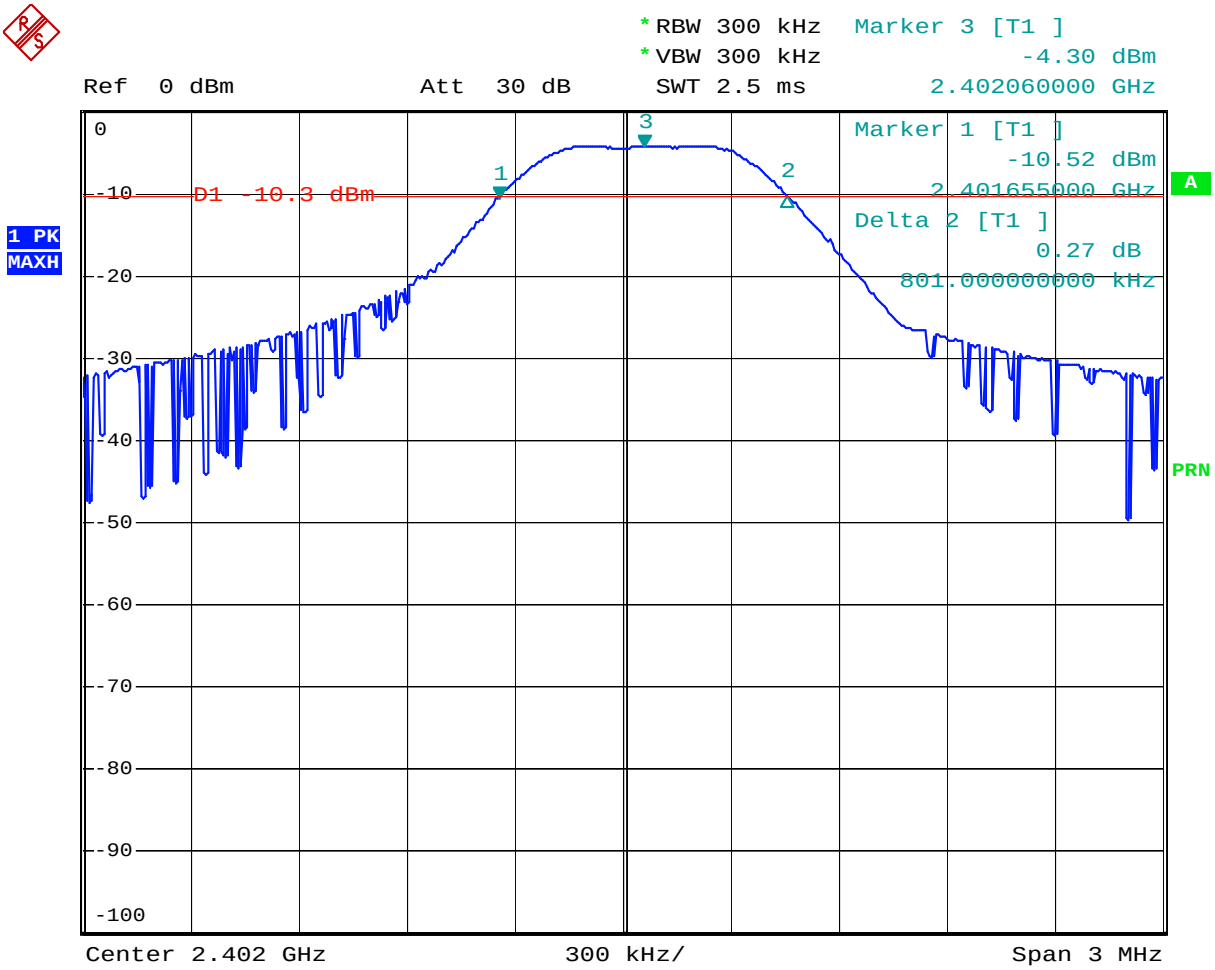
Frequency (MHz)	99% Occupied Bandwidth (MHz)	Plot
2401	1.36	2.3
2402	1.28	2.4

Plot 2. 1



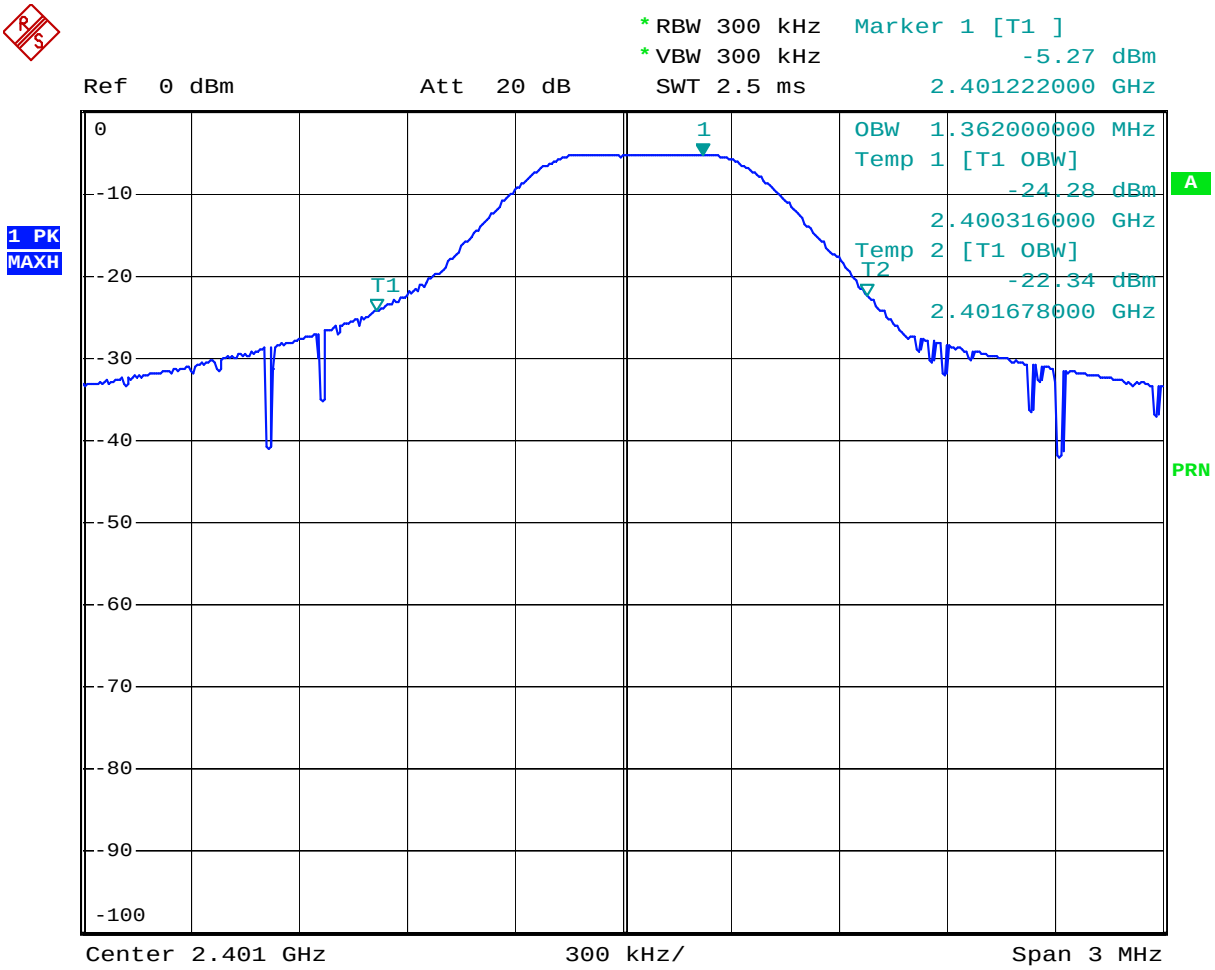
Comment: 6-dB Bandwidth
Date: 3.APR.2011 15:39:04

Plot 2. 2



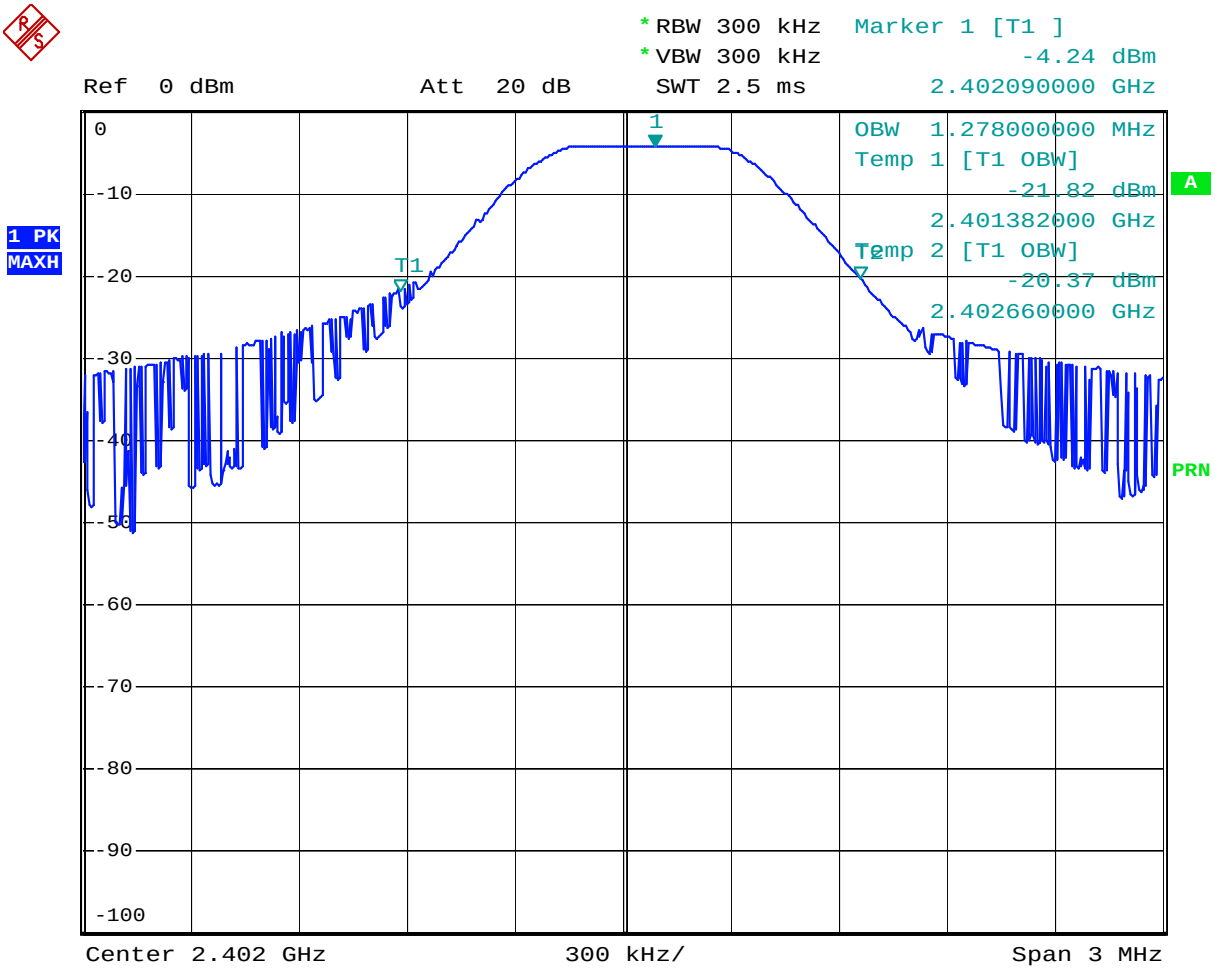
Comment: 6-dB Bandwidth
Date: 3.APR.2011 14:46:24

Plot 2. 3



Comment: Occupied Bandwidth
Date: 3.APR.2011 16:00:29

Plot 2. 4



Comment: Occupied Bandwidth
Date: 3.APR.2011 15:05:34

4.3 Out-of-Band Conducted Emissions
FCC 15.247(d)

Requirement

In any 100 kHz bandwidth outside the EUT pass-band, the RF power shall be at least 20 dB below that of the maximum in-band 100 kHz emission.

Procedure

The EUT has a permanently attached internal antenna. It does not contain an antenna port connector. Instead of Antenna Conducted measurements, Radiated measurements were performed. The out-of-band emissions were measured from 30 MHz to 25 GHz.

Test Result

Refer to the radiated emissions test data located in report section 4.5.

The attenuation of emissions outside the EUT pass-band is more than 20 dB.

4.4 Power Spectral Density
FCC 15.247 (e)

Requirement

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna should not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

Procedure

The EUT has a permanently attached internal antenna. It does not contain an antenna port connector. Instead of Antenna Conducted measurements, Radiated measurements were performed.

(A) Tune the analyzer to the highest point of the maximized fundamental emission.
Reset the analyzer to a RBW = 3 kHz, VBW > RBW, span = 300 kHz, sweep = 100 sec.

(B) From the peak level obtained in (A), derive the field strength, E, by applying the appropriate antenna factor, cable loss, pre-amp gain, etc.

The transmitter's peak power was calculated using the following equation:

Where: E = the measured maximum field strength in V/m.

Set the RBW > 6dB bandwidth of the emission or use a peak power meter.

P = (E x d) squared / (30 x G)

G = the numeric gain of the transmitting antenna over an isotropic radiator.

d = the distance in meters from which the field strength was measured.

P = the power in watts for which you are solving.

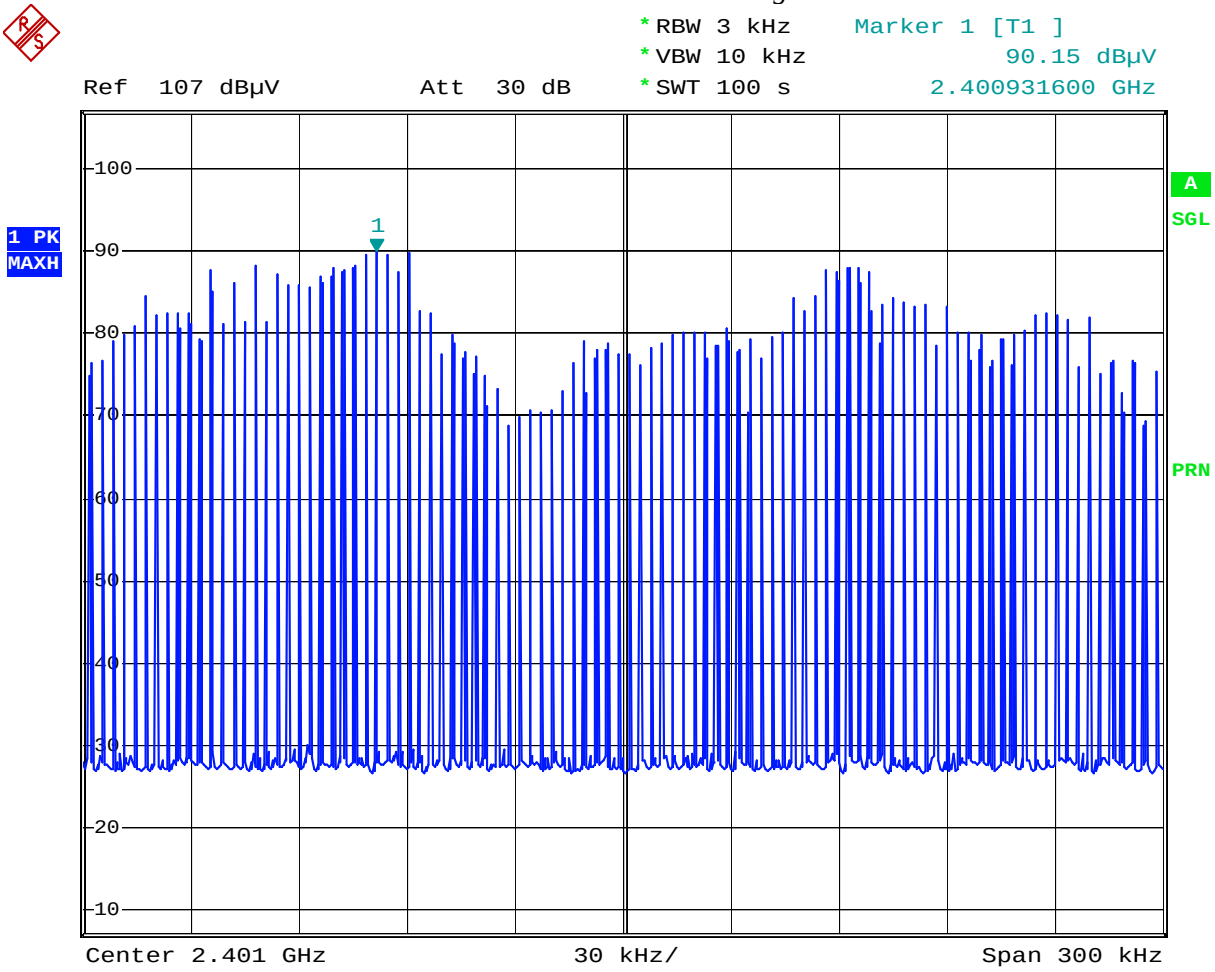
Test Result

Refer to the following plots for the test result:

Frequency (MHz)	Power Spectral Density (dBm)	Plot
2401	-7.8	4.1
2402	-7.6	4.2

Plot 4. 1

Uncorrected Receiver Reading



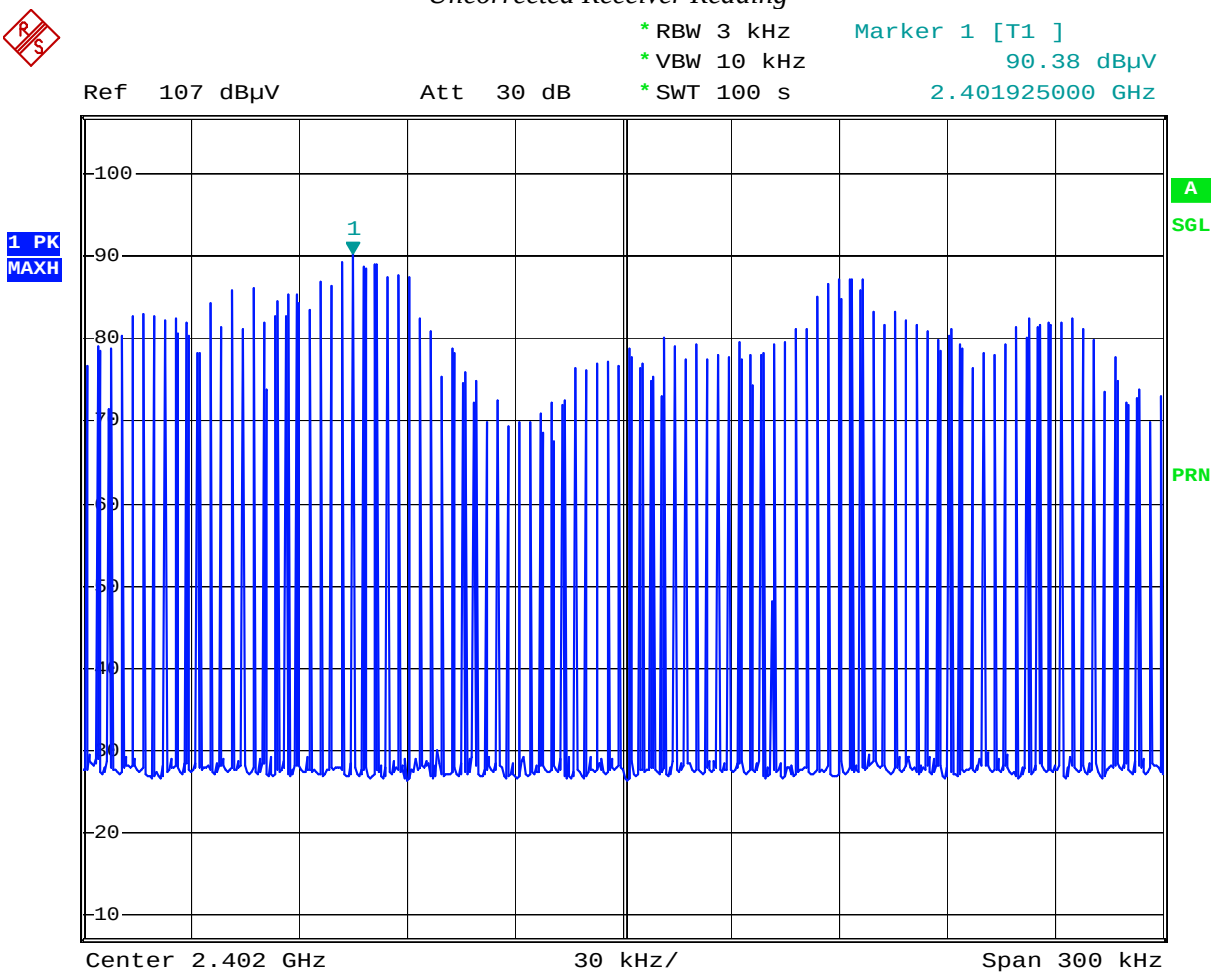
Comment: Power density
Date: 3.APR.2011 16:37:50

Frequency	RA	AG	CF	AF	Final Field Strength	EIRP	EIRP
MHz	dB(uV)	dB	dB	dB(1/m)	dB(uV/m)	dBm	mW
2401.0	90.2	35.5	4.6	28.1	87.4	-7.8	0.16

RA = Receiver Amplitude
AG = Amplifier Gain
CF = Cable Factor
AF = Antenna Factor

Plot 4. 2

Uncorrected Receiver Reading



Comment: Power density
Date: 3.APR.2011 16:44:14

Frequency	RA	AG	CF	AF	Final Field Strength	EIRP	EIRP
MHz	dB(uV)	dB	dB	dB(1/m)	dB(uV/m)	dBm	mW
2402.0	90.4	35.5	4.6	28.1	87.6	-7.6	0.11

RA = Receiver Amplitude
AG = Amplifier Gain
CF = Cable Factor
AF = Antenna Factor

4.5 Transmitter Radiated Emissions
FCC 15.247 (d), 15.205, 15.209

Procedure

Radiated emission measurements were performed from 30 MHz to 25,000 MHz. Spectrum Analyzer Resolution Bandwidth is 100 kHz or greater for frequencies 30 MHz to 1000 MHz, 1 MHz - for frequencies above 1000 MHz.

The EUT is placed on a non-conductive table. If the EUT attaches to peripherals, they are connected and operational (as typical as possible). During testing, all cables were manipulated to produce worst case emissions. The signal is maximized through rotation. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters.

Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. All readings are extrapolated back to the equivalent three-meter reading using inverse scaling with distance.

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

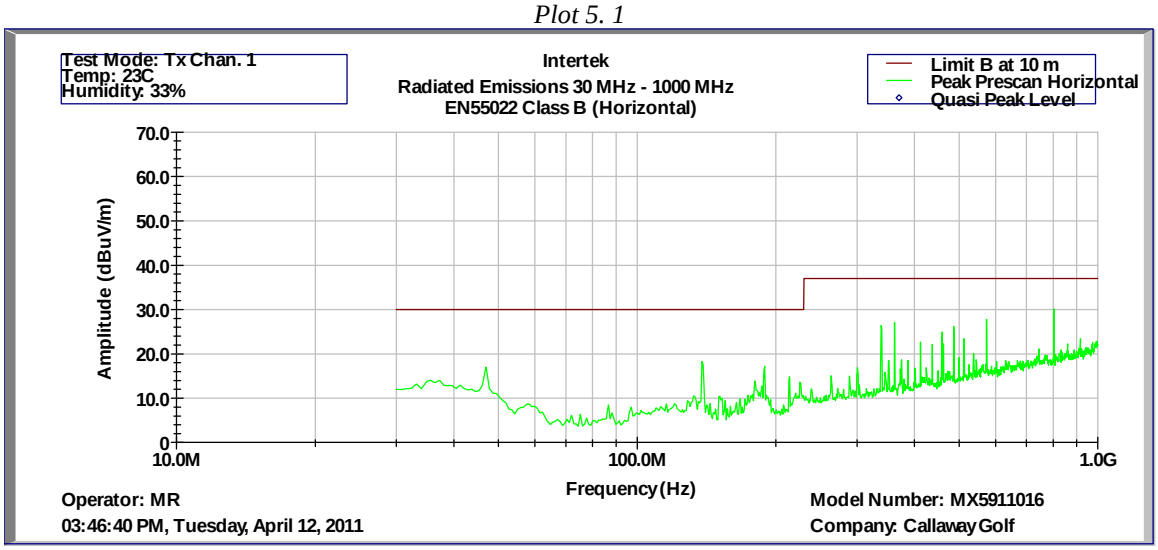
FS = RA + AF + CF - AG
Where FS = Field Strength in dB(μV/m)
RA = Receiver Amplitude (including preamplifier) in dB(μV)
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB

Assume a receiver reading of 52.0 dB(μV) is obtained. The antennas factor of 7.4 dB(1/m) and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving field strength of 32 dB(μV/m). This value in dB(μV/m) was converted to its corresponding level in μV/m.
RA = 52.0 dB(μV)
AF = 7.4 dB(1/m)
CF = 1.6 dB
AG = 29.0 dB
FS = 52.0+7.4+1.6-29.0 = 32 dB(μV/m)
Level in μV/m = Common Antilogarithm [(32 dBμV/m)/20] = 39.8 μV/m

Result

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance. The radiated emissions in the restricted bands are presented on the following Plots 5.1 – 5.20. The EUT passed by 5.9 dB.

Plot 5. 1



Intertek
Radiated Emissions 30 MHz - 1000 MHz
EN55022 Class B (Pk-Horizontal)

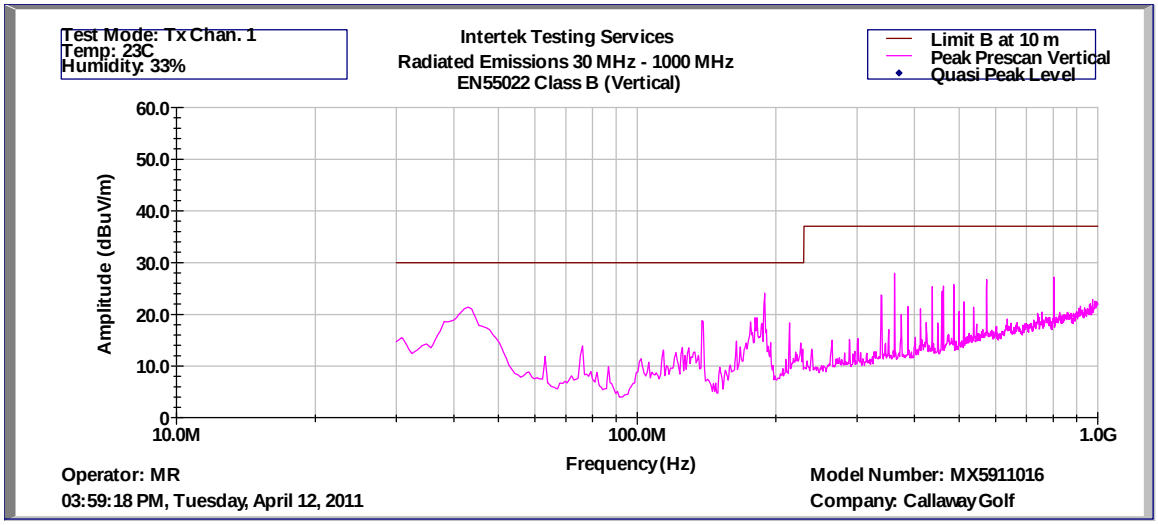
Operator: MR
12-Apr-11

Model Number: MX5911016
Company: Callaway Golf

Frequency	Peak FS	Limit@10m	Margin	RA	AG	AF	CF
(Hz)	dB(uV)	dB(uV/m)	dB	dB(uV)	dB	dB(1/m)	dB
4.698E+07	17.0	30.0	-13.0	32.9	31.9	15.2	0.8
1.383E+08	18.3	30.0	-11.7	39.6	31.9	9.2	1.4
1.892E+08	17.2	30.0	-12.8	37.8	31.9	9.7	1.6
2.143E+08	14.9	30.0	-15.1	34.3	31.9	10.8	1.7
3.388E+08	26.4	37.0	-10.6	41.7	31.8	14.4	2.2
3.622E+08	27.1	37.0	-9.9	42.1	31.8	14.5	2.2
4.123E+08	22.6	37.0	-14.4	36.2	31.9	15.9	2.4
4.374E+08	22.1	37.0	-14.9	35.7	31.9	15.9	2.5
4.592E+08	24.9	37.0	-12.1	38.1	31.9	16.2	2.5
4.625E+08	22.3	37.0	-14.7	35.1	31.9	16.6	2.5
4.867E+08	26.2	37.0	-10.8	38.7	31.9	16.8	2.6
5.126E+08	23.4	37.0	-13.6	35.6	31.9	17.1	2.7
5.732E+08	27.8	37.0	-9.2	38.4	32.0	18.6	2.8
8.028E+08	30.2	37.0	-6.8	38.3	32.0	20.4	3.4
9.167E+08	23.4	37.0	-13.6	29.3	31.5	22.0	3.6

Test Mode: Tx Chan. 1
Temp: 23C
Humidity: 33%

Plot 5. 2



Intertek
Radiated Emissions 30 MHz - 1000 MHz
EN55022 Class B (Pk-Vertical)

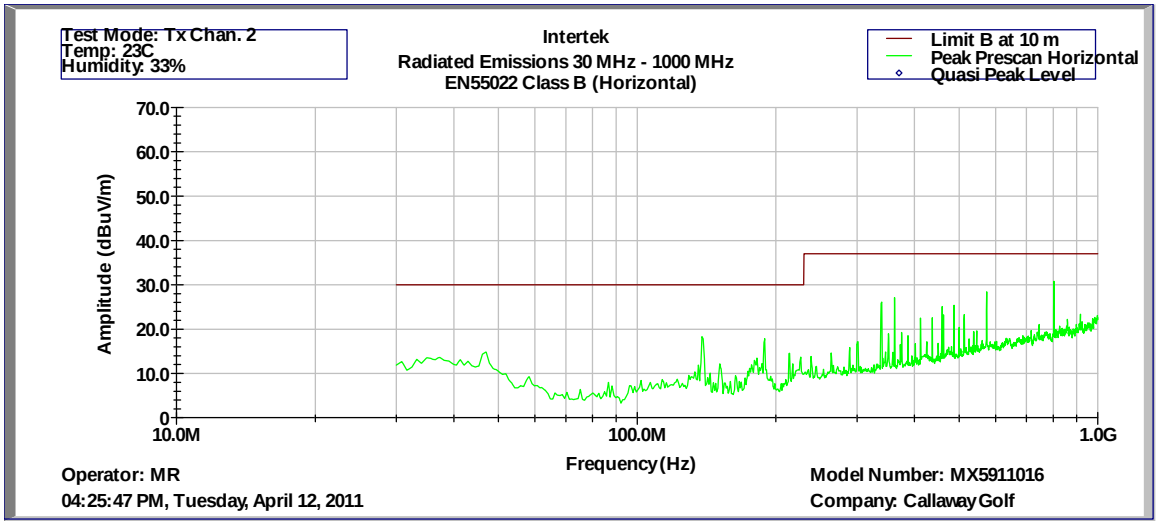
Operator: MR
12-Apr-11

Model Number: MX5911016
Company: Callaway Golf

Frequency	Peak FS	Limit@10m	Margin	RA	CF	AG	AF
(Hz)	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB(1/m)
4.293E+07	21.4	30.0	-8.6	36.5	0.8	31.9	16.0
1.383E+08	18.8	30.0	-11.2	40.1	1.4	31.9	9.2
1.892E+08	24.1	30.0	-5.9	44.7	1.6	31.9	9.7
2.143E+08	18.3	30.0	-11.7	37.8	1.7	31.9	10.8
3.388E+08	23.7	37.0	-13.3	39.1	2.2	31.8	14.4
3.622E+08	27.9	37.0	-9.1	42.9	2.2	31.8	14.5
3.873E+08	21.5	37.0	-15.5	36.2	2.3	31.8	14.8
4.374E+08	25.3	37.0	-11.7	38.9	2.5	31.9	15.9
4.592E+08	24.5	37.0	-12.5	37.6	2.5	31.9	16.2
4.625E+08	25.5	37.0	-11.5	38.3	2.5	31.9	16.6
4.867E+08	25.8	37.0	-11.2	38.3	2.6	31.9	16.8
5.126E+08	22.4	37.0	-14.6	34.6	2.7	31.9	17.1
5.376E+08	21.4	37.0	-15.6	32.9	2.7	32.0	17.7
5.740E+08	26.7	37.0	-10.3	37.3	2.8	32.0	18.6
8.028E+08	27.2	37.0	-9.8	35.4	3.4	32.0	20.4

Test Mode: Tx Chan. 1
Temp: 23C
Humidity: 33%

Plot 5. 3



Intertek
Radiated Emissions 30 MHz - 1000 MHz
EN55022 Class B (Pk-Horizontal)

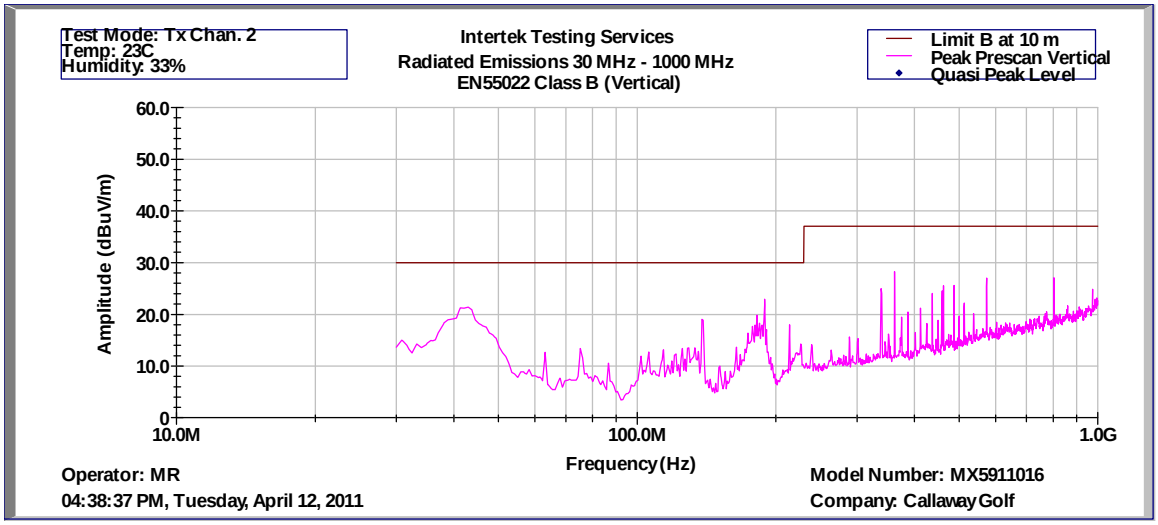
Operator: MR
04:25:47 PM, Tuesday, April 12, 2011

Model Number: MX5911016
Company: Callaway Golf

Frequency	Peak FS	Limit@10m	Margin	RA	AG	AF	CF
(Hz)	dB(uV)	dB(uV/m)	dB	dB(uV)	dB	dB(1/m)	dB
4.698E+07	14.8	30.0	-15.2	30.7	31.9	15.2	0.8
1.383E+08	18.3	30.0	-11.7	39.7	31.9	9.2	1.4
1.892E+08	17.8	30.0	-12.2	38.4	31.9	9.7	1.6
2.143E+08	14.6	30.0	-15.4	34.0	31.9	10.8	1.7
3.396E+08	26.1	37.0	-10.9	41.4	31.8	14.4	2.2
3.622E+08	27.1	37.0	-9.9	42.1	31.8	14.5	2.2
4.123E+08	22.5	37.0	-14.5	36.1	31.9	15.9	2.4
4.374E+08	22.5	37.0	-14.5	36.1	31.9	15.9	2.5
4.592E+08	25.1	37.0	-11.9	38.2	31.9	16.2	2.5
4.625E+08	23.2	37.0	-13.8	36.0	31.9	16.6	2.5
4.875E+08	25.4	37.0	-11.6	38.0	31.9	16.7	2.6
4.996E+08	20.4	37.0	-16.6	33.1	31.9	16.6	2.6
5.134E+08	23.3	37.0	-13.7	35.4	31.9	17.1	2.7
5.740E+08	28.4	37.0	-8.6	38.9	32.0	18.6	2.8
8.028E+08	30.8	37.0	-6.2	39.0	32.0	20.4	3.4

Test Mode: Tx Chan. 2
Temp: 23C
Humidity: 33%

Plot 5. 4



Intertek
Radiated Emissions 30 MHz - 1000 MHz
EN55022 Class B (Pk-Vertical)

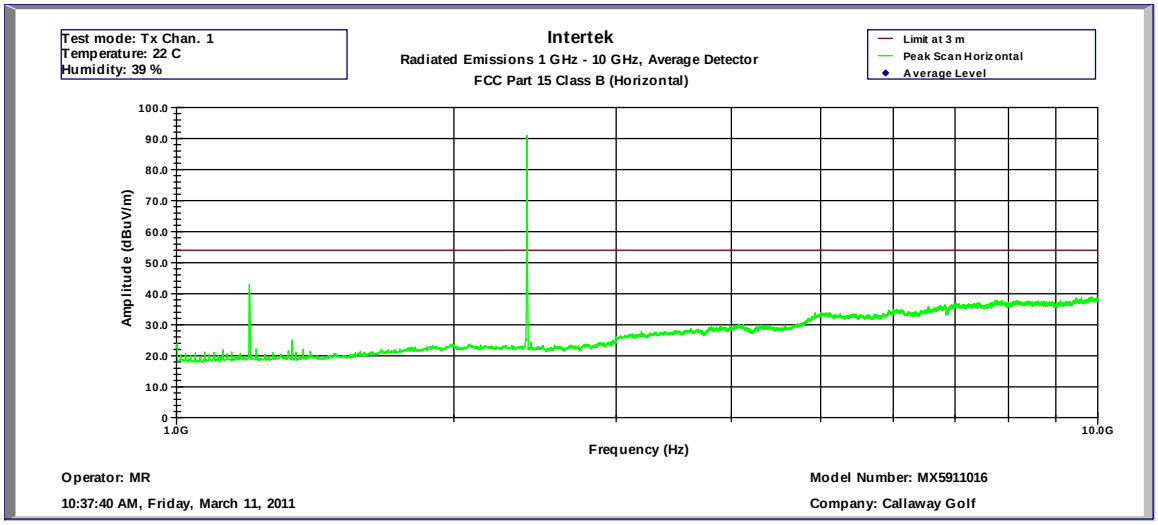
Operator: MR
04:38:36 PM, Tuesday, April 12, 2011

Model Number: MX5911016
Company: Callaway Golf

Frequency	Peak FS	Limit@10m	Margin	RA	CF	AG	AF
(Hz)	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB(1/m)
4.293E+07	21.4	30.0	-8.6	36.5	0.8	31.9	16.0
1.383E+08	19.0	30.0	-11.0	40.3	1.4	31.9	9.2
1.892E+08	22.9	30.0	-7.1	43.5	1.6	31.9	9.7
2.143E+08	17.9	30.0	-12.1	37.4	1.7	31.9	10.8
3.388E+08	24.9	37.0	-12.1	40.3	2.2	31.8	14.4
3.622E+08	28.3	37.0	-8.7	43.3	2.2	31.8	14.5
4.123E+08	21.2	37.0	-15.8	34.8	2.4	31.9	15.9
4.374E+08	24.0	37.0	-13.0	37.6	2.5	31.9	15.9
4.592E+08	24.5	37.0	-12.5	37.7	2.5	31.9	16.2
4.625E+08	25.5	37.0	-11.5	38.3	2.5	31.9	16.6
4.875E+08	25.6	37.0	-11.4	38.2	2.6	31.9	16.7
5.134E+08	22.2	37.0	-14.8	34.3	2.7	31.9	17.1
5.740E+08	27.0	37.0	-10.0	37.6	2.8	32.0	18.6
8.028E+08	27.1	37.0	-9.9	35.2	3.4	32.0	20.4
9.741E+08	24.8	37.0	-12.2	30.0	3.7	31.1	22.1

Test Mode: Tx Chan. 2
Temp: 23C
Humidity: 33%

Plot 5. 5



Intertek Testing Services
Radiated Emissions 1 GHz - 10 GHz, Average Detector
FCC Part 15 Class B (Horizontal)

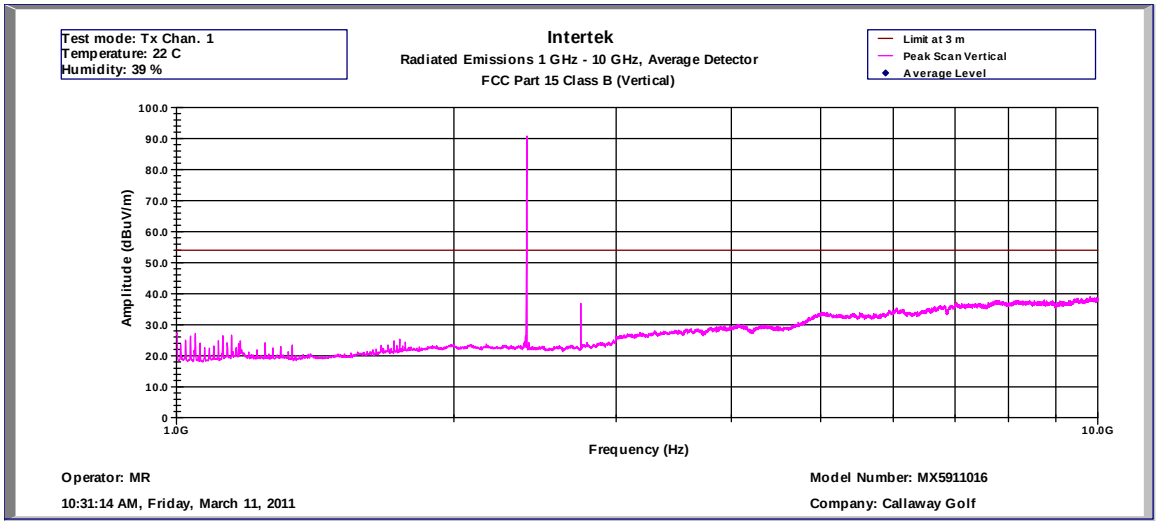
Operator: MR
11-Mar-11

Model Number: MX5911016
Company: Callaway Golf

Frequency	Av Level	Limit@3m	Margin	Raw	Cable	Preamp	AF
(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(dB)	(dB)	dB(1/m)
1.0011E+09	23.9	54.0	-30.1	32.9	2.6	35.2	23.6
1.2003E+09	42.9	54.0	-11.1	50.9	2.9	35.2	24.4
1.3341E+09	25.0	54.0	-29.0	32.3	3.1	35.3	24.9
9.8470E+09	38.9	54.0	-15.1	22.7	11.6	34.1	38.7

Test mode: Tx Chan. 1
Temperature: 22 C
Humidity: 39 %

Plot 5. 6



Intertek Testing Services
Radiated Emissions 1 GHz - 10 GHz, Average Detector
FCC Part 15 Class B (Vertical)

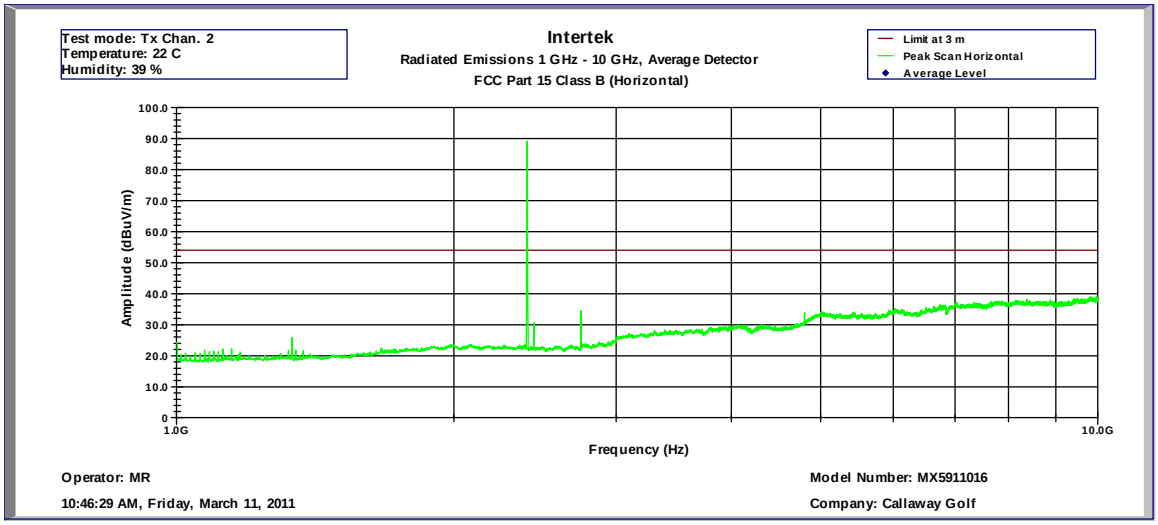
Operator: MR
11-Mar-11

Model Number: MX5911016
Company: Callaway Golf

Frequency	Av Level	Limit@3m	Margin	Raw	Cable	Preamp	AF
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(dB)	(dB)	dB(1/m)
1.0011E+09	27.4	54.0	-26.6	36.4	2.6	35.2	23.6
1.0225E+09	25.0	54.0	-29.0	33.9	2.6	35.2	23.7
1.0360E+09	26.3	54.0	-27.7	35.2	2.6	35.2	23.7
1.0484E+09	27.1	54.0	-26.9	35.9	2.6	35.2	23.8
1.1103E+09	24.8	54.0	-29.2	33.2	2.7	35.2	24.0
1.1226E+09	26.5	54.0	-27.5	34.8	2.8	35.2	24.1
1.1474E+09	26.7	54.0	-27.3	34.9	2.8	35.2	24.2
9.8065E+09	39.0	54.0	-15.0	22.9	11.5	34.2	38.7

Test mode: Tx Chan. 1
Temperature: 22 C
Humidity: 39 %

Plot 5. 7



Intertek Testing Services
Radiated Emissions 1 GHz - 10 GHz, Average Detector
FCC Part 15 Class B (Horizontal)

Operator: MR
10:46:29 AM, Friday, March 11, 2011

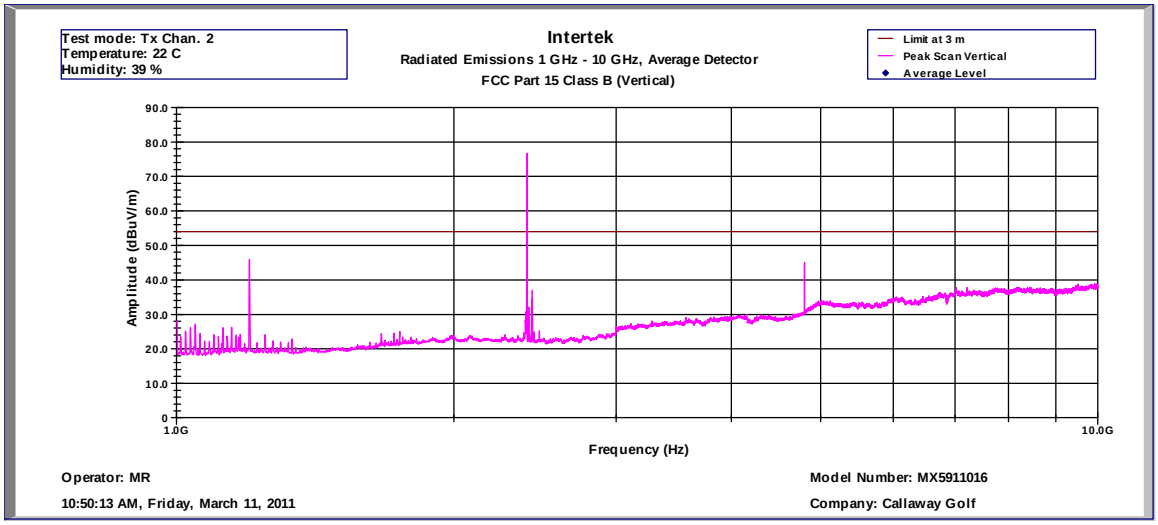
Model Number: MX5911016
Company: Callaway Golf

Frequency	Av Level	Limit@3m	Margin	Raw	Cable	Preamp	AF
(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(dB)	(dB)	dB(1/m)
1.0000E+09	24.3	54.0	-29.7	33.3	2.5	35.2	23.6
1.3341E+09	25.8	54.0	-28.2	33.1	3.1	35.3	24.9
9.9775E+09	39.1	54.0	-14.9	22.2	12.1	34.0	38.8

Test mode: Tx Chan. 2
Temperature: 22 C
Humidity: 39 %

Emission at the Restricted Bandedge 2390MHz = 22.5 dBuV/m

Plot 5. 8



Intertek Testing Services
Radiated Emissions 1 GHz - 10 GHz, Average Detector
FCC Part 15 Class B (Vertical)

Operator: MR
10:50:13 AM, Friday, March 11, 2011

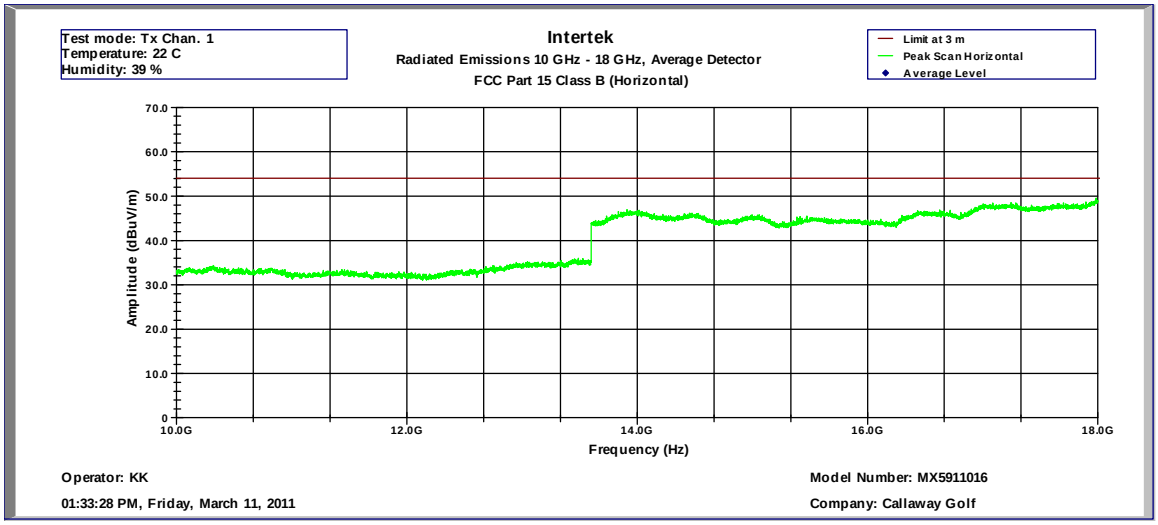
Model Number: MX5911016
Company: Callaway Golf

Frequency (MHz)	Av Level (dBuV/m)	Limit@3m (dBuV/m)	Margin (dB)	Raw (dBuV)	Cable (dB)	Preamp (dB)	AF dB(1/m)
1.0011E+09	28.0	54.0	-26.0	37.0	2.6	35.2	23.6
1.0225E+09	25.1	54.0	-28.9	34.0	2.6	35.2	23.7
1.0360E+09	26.1	54.0	-27.9	35.0	2.6	35.2	23.7
1.0484E+09	27.2	54.0	-26.8	35.9	2.6	35.2	23.8
1.0608E+09	24.4	54.0	-29.6	33.2	2.7	35.2	23.8
1.1226E+09	26.1	54.0	-27.9	34.5	2.8	35.2	24.1
1.1474E+09	26.2	54.0	-27.8	34.5	2.8	35.2	24.2
1.2003E+09	45.9	54.0	-8.1	53.9	2.9	35.2	24.4
2.3961E+09	30.9	54.0	-23.1	33.8	4.4	35.5	28.2
4.8048E+09	45.1	54.0	-8.9	38.4	8.4	34.9	33.2
9.9246E+09	38.8	54.0	-15.2	22.2	11.9	34.0	38.8

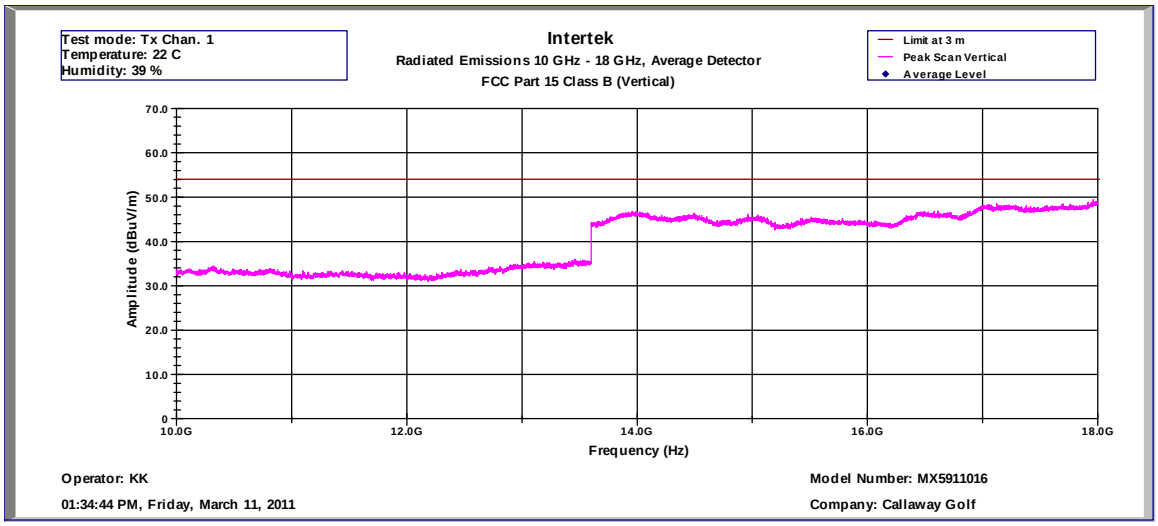
Test mode: Tx Chan. 2
Temperature: 22 C
Humidity: 39 %

Emission at the Restricted Bandedge 2390MHz = 23.0 dBuV/m

Plot 5. 9

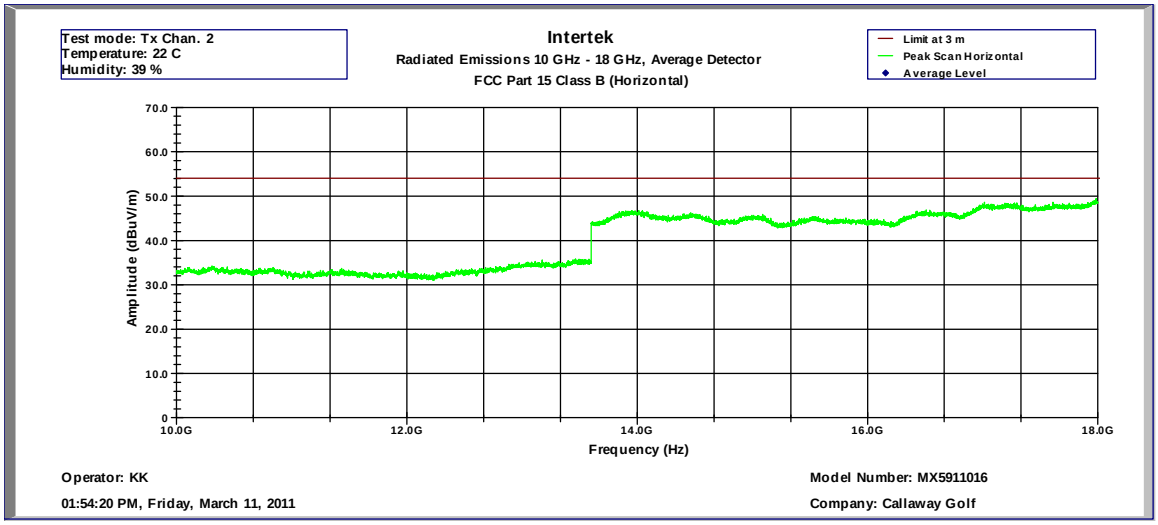


Plot 5. 10

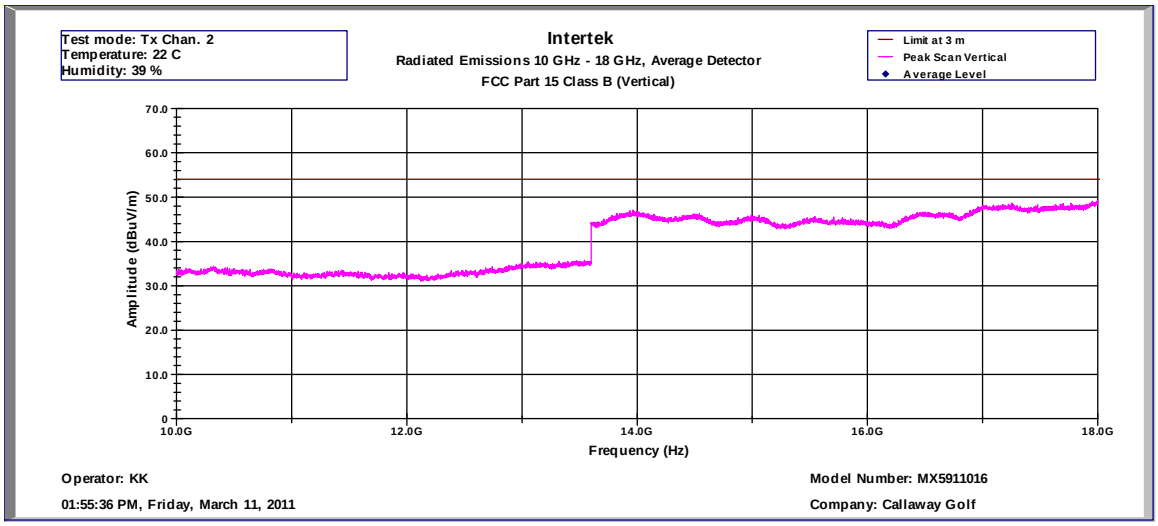


Note: No emissions were detected above the noise floor in the range of 18GHz – 25GHz.

Plot 5. 11

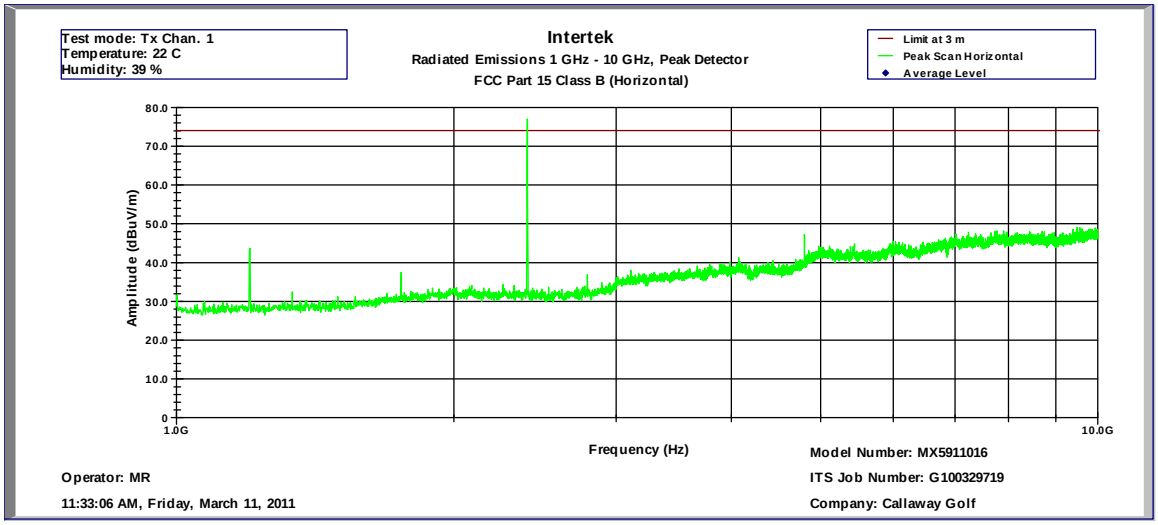


Plot 5. 12



Note: No emissions were detected above the noise floor in the range of 18GHz – 25GHz.

Plot 5. 13



Intertek Testing Services
Radiated Emissions 1 GHz - 10 GHz, Peak Detector
FCC Part 15 Class B (Horizontal)

Operator: MR
11-Mar-11

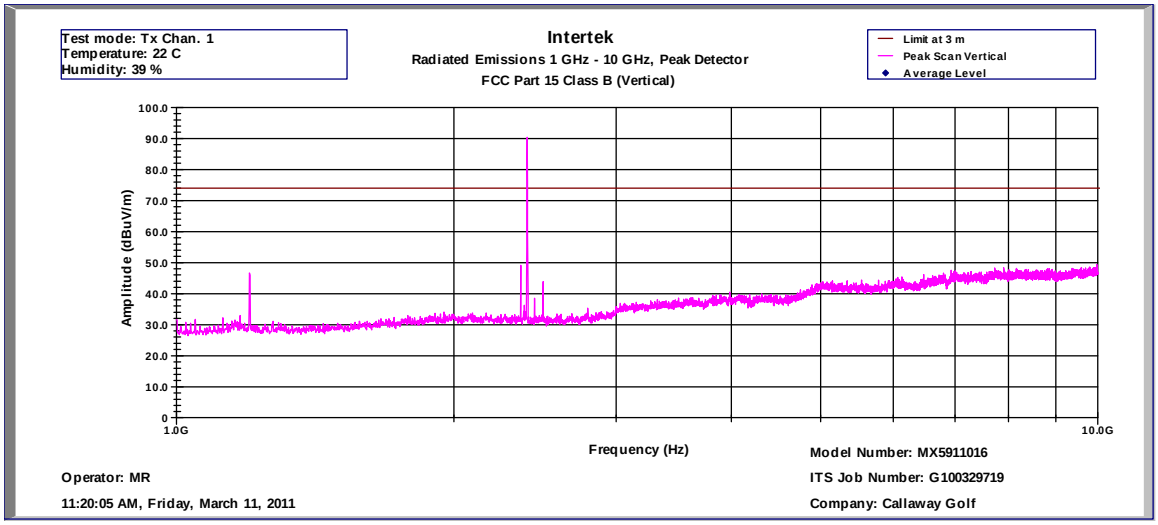
Model Number: MX5911016
Company: Callaway Golf

Frequency	Pk Level	Limit@3m	Margin	Raw	Cable	Preamp	AF
(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(dB)	(dB)	dB(1/m)
1.20E+09	43.7	74.0	-30.3	51.6	2.9	35.2	24.4
1.75E+09	37.5	74.0	-36.5	42.0	3.7	35.4	27.2
4.80E+09	47.2	74.0	-26.8	40.6	8.4	34.9	33.2
9.49E+09	49.0	74.0	-25.0	32.9	11.9	34.2	38.5

Test mode: Tx Chan. 1
Temperature: 22 C
Humidity: 39 %

Emission at the Restricted Bandedge 2390MHz = 33.0 dBuV/m

Plot 5. 14



Intertek Testing Services
Radiated Emissions 1 GHz - 10 GHz, Peak Detector
FCC Part 15 Class B (Vertical)

Operator: MR
11-Mar-11

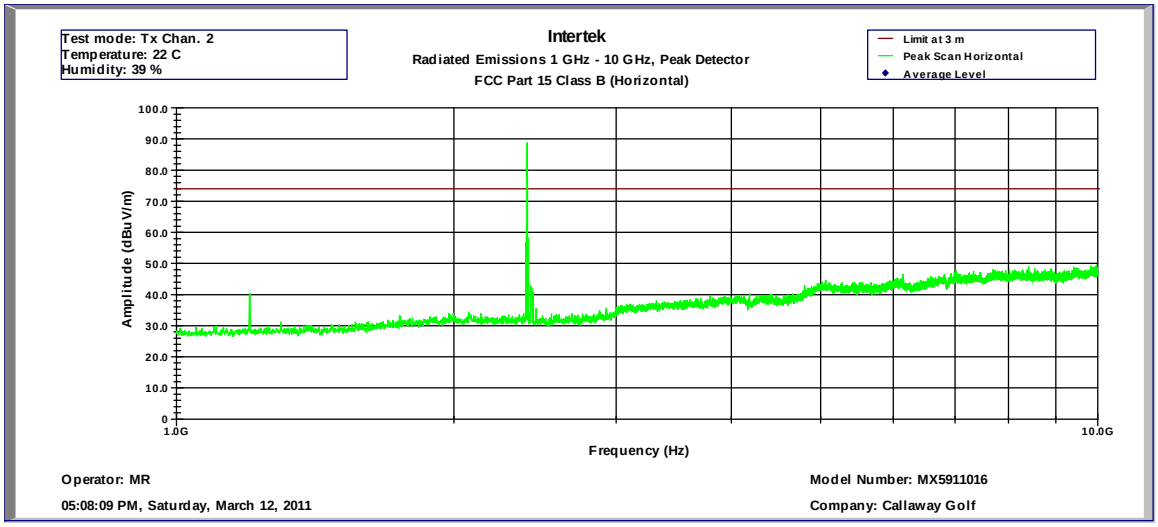
Model Number: MX5911016
Company: Callaway Golf

Frequency	Pk Level	Limit@3m	Margin	Raw	Cable	Preamp	AF
(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(dB)	(dB)	dB(1/m)
1.20E+09	46.6	74.0	-27.4	54.6	2.9	35.2	24.4
2.36E+09	49.1	74.0	-24.9	52.0	4.3	35.5	28.3
9.97E+09	49.4	74.0	-24.6	32.5	12.1	34.0	38.8

Test mode: Tx Chan. 1
Temperature: 22 C
Humidity: 39 %

Emission at the Restricted Bandedge of 2390MHz = 33.1 dBuV/m

Plot 5. 15



Intertek Testing Services
Radiated Emissions 1 GHz - 10 GHz, Peak Detector
FCC Part 15 Class B (Horizontal)

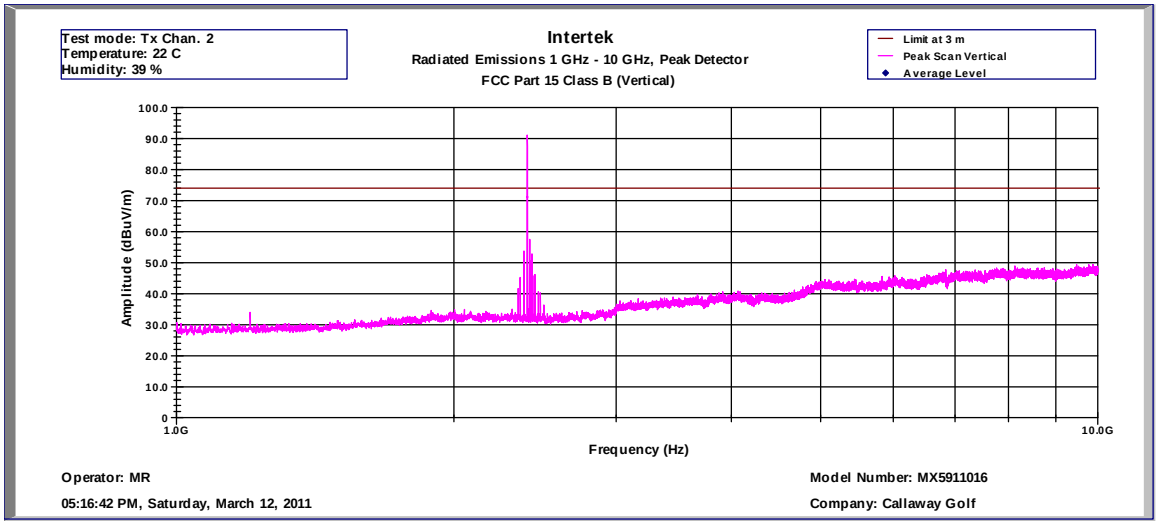
Operator: MR
12-Mar-11

Model Number: MX5911016
Company: Callaway Golf

Frequency	Pk Level	Limit@3m	Margin	Raw	Cable	Preamp	AF
(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(dB)	(dB)	dB(1/m)
1.20E+09	40.4	74.0	-33.6	48.4	2.9	35.2	24.4
9.97E+09	49.4	74.0	-24.6	32.6	12.0	34.0	38.8

Test mode: Tx Chan. 2
Temperature: 22 C
Humidity: 39 %

Plot 5. 16



Intertek Testing Services
Radiated Emissions 1 GHz - 10 GHz, Peak Detector
FCC Part 15 Class B (Vertical)

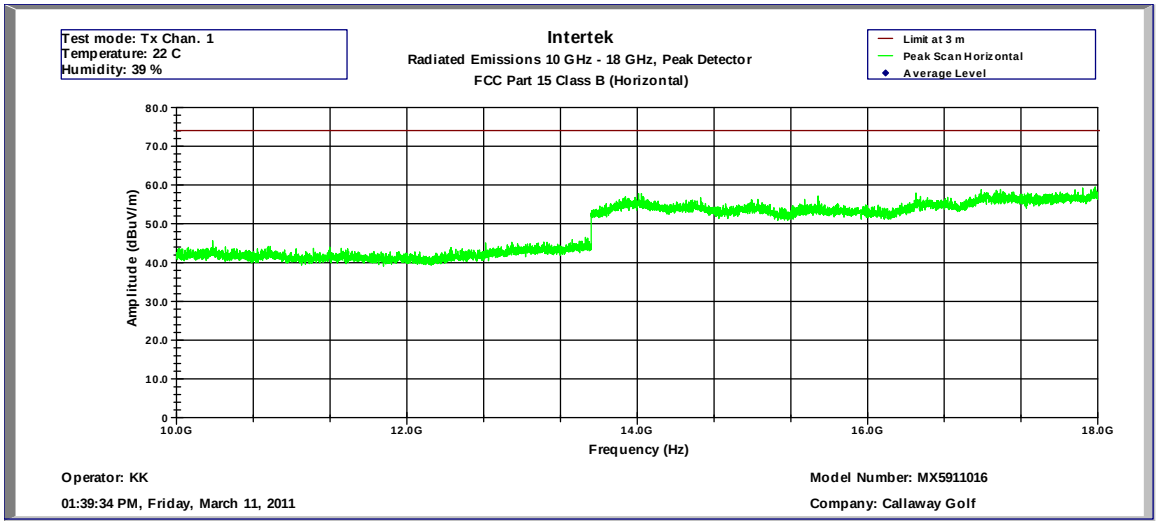
Operator: MR
12-Mar-11

Model Number: MX5911016
Company: Callaway Golf

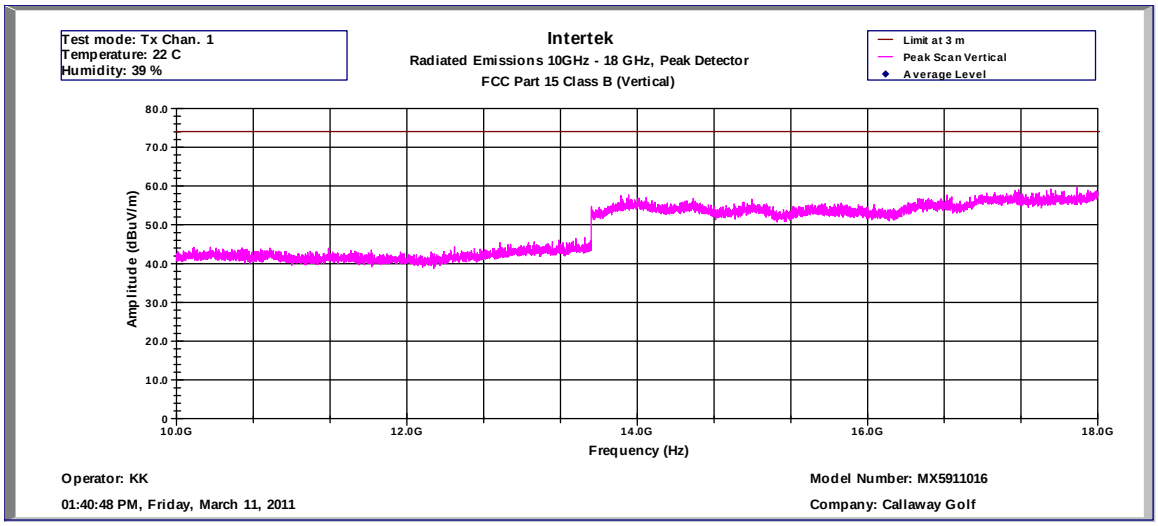
Frequency	Pk Level	Limit@3m	Margin	Raw	Cable	Preamp	AF
(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(dB)	(dB)	dB(1/m)
1.20E+09	33.9	74.0	-40.1	41.9	2.9	35.2	24.4
2.35E+09	41.6	74.0	-32.4	44.5	4.3	35.5	28.3
2.36E+09	45.2	74.0	-28.8	48.1	4.3	35.5	28.3
2.38E+09	53.7	74.0	-20.3	56.6	4.4	35.5	28.3
6.84E+09	47.7	74.0	-26.3	34.8	9.5	33.7	37.2
9.88E+09	49.4	74.0	-24.6	33.0	11.7	34.1	38.7

Test mode: Tx Chan. 2
Temperature: 22 C
Humidity: 39 %

Plot 5. 17

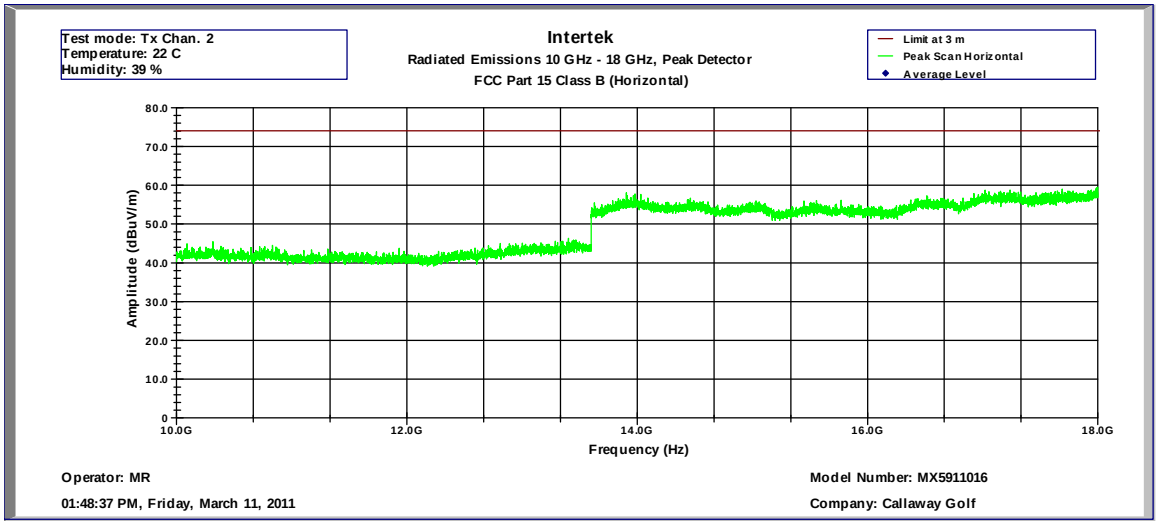


Plot 5. 18

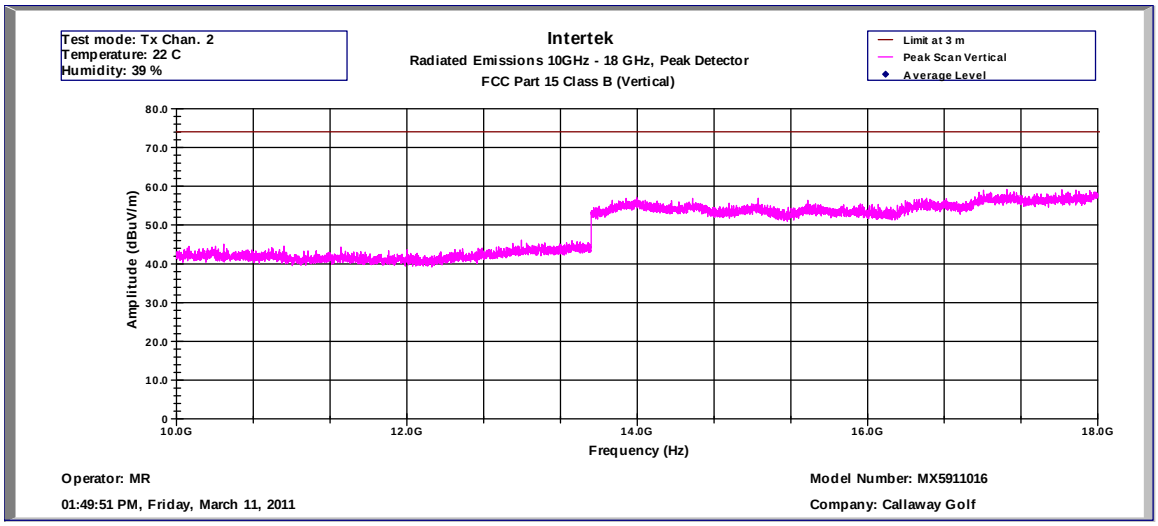


Note: No emissions were detected above the noise floor in the range of 18GHz – 25GHz.

Plot 5. 19



Plot 5. 20



Note: No emissions were detected above the noise floor in the range of 18GHz – 25GHz.

4.6 Radiated Emissions from Digital Parts and Receiver
FCC Ref: 15.109

Test Limit

Limits for Electromagnetic Radiated Emissions, FCC Section 15.109(b) and ICES 003*

Frequency (MHz)	**Class A at 10m dB(µV/m)**	**Class B at 3m dB(µV/m)**
30-88	39	40.0
88-216	43.5	43.5
216-960	46.4	46.0
Above 960	49.5	54.0

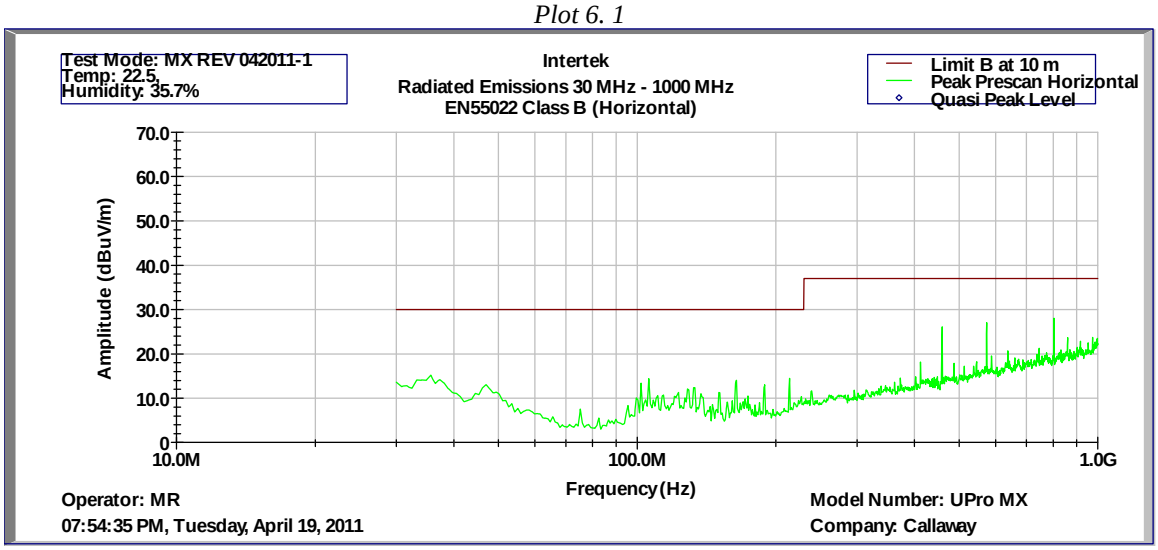
* According to FCC Part 15.109(g) an alternative to the radiated emission limits shown above, digital devices may be shown to comply with the limit of CISPR Pub. 22

Test Results

Radiated emission measurements were performed from 30 MHz to 1000 MHz. The data on the following pages list the significant emission frequencies, the limit and the margin of compliance. The results are presented on the following Plots 6.1 – 6.2.

The EUT passed by 9.0 dB.

Plot 6. 1



Intertek
Radiated Emissions 30 MHz - 1000 MHz
EN55022 Class B (Pk-Horizontal)

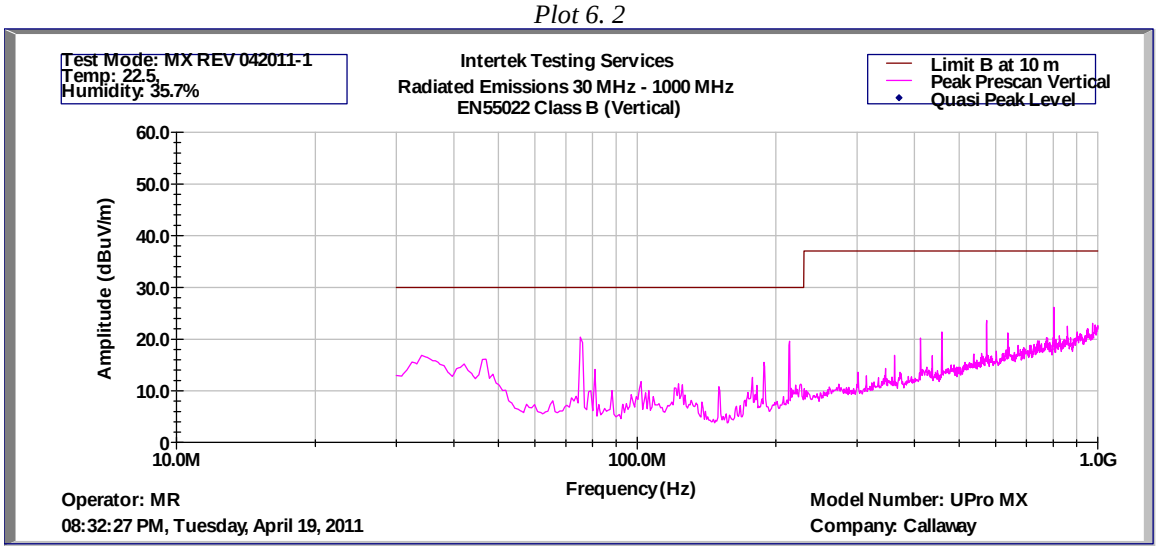
Operator: MR
07:54:35 PM, Tuesday, April 19, 2011

Model Number: UPro MX
Company: Callaway

Frequency (MHz)	Peak FS dB(uV)	Limit@10m dB(uV/m)	Margin dB	RA dB(uV)	AG dB	AF dB(1/m)	CF dB
35.7	15.2	30.0	-14.8	29.3	31.9	17.0	0.7
101.9	13.4	30.0	-16.6	33.7	32.1	10.6	1.2
106.0	14.4	30.0	-15.6	34.6	32.0	10.6	1.2
150.4	11.3	30.0	-18.7	33.8	31.9	7.9	1.4
164.2	14.1	30.0	-15.9	36.0	31.9	8.4	1.5
189.2	13.0	30.0	-17.0	33.6	31.9	9.7	1.6
214.3	14.5	30.0	-15.5	33.9	31.9	10.8	1.7
412.3	18.2	37.0	-18.8	31.8	31.9	15.9	2.4
459.2	26.1	37.0	-10.9	39.2	31.9	16.2	2.5
574.0	27.0	37.0	-10.0	37.6	32.0	18.6	2.8
802.8	28.0	37.0	-9.0	36.2	32.0	20.4	3.4
974.1	23.7	37.0	-13.3	28.9	31.1	22.1	3.7

Test Mode: MX REV 042011-1
Temp: 22.5C
Humidity: 35.7%

Plot 6. 2



Intertek
Radiated Emissions 30 MHz - 1000 MHz
EN55022 Class B (Pk-Vertical)

Operator: MR
08:32:26 PM, Tuesday, April 19, 2011

Model Number: UPro MX
Company: Callaway

Frequency (MHz)	Peak FS dB(uV/m)	Limit@10m dB(uV/m)	Margin dB	RA dB(uV)	CF dB	AG dB	AF dB(1/m)
34.0	16.9	30.0	-13.1	30.9	0.7	31.9	17.1
75.3	20.4	30.0	-9.6	44.9	1.0	32.1	6.6
80.9	14.2	30.0	-15.8	38.2	1.0	32.1	7.0
101.9	11.8	30.0	-18.2	32.1	1.2	32.1	10.6
150.4	10.8	30.0	-19.2	33.3	1.4	31.9	7.9
188.4	15.5	30.0	-14.5	36.1	1.6	31.9	9.7
214.3	19.6	30.0	-10.4	39.0	1.7	31.9	10.8
362.2	16.9	37.0	-20.1	31.9	2.2	31.8	14.5
412.3	20.2	37.0	-16.8	33.8	2.4	31.9	15.9
458.4	21.3	37.0	-15.7	34.6	2.5	31.9	16.1
574.0	23.6	37.0	-13.4	34.2	2.8	32.0	18.6
802.8	26.2	37.0	-10.8	34.3	3.4	32.0	20.4

Test Mode: MX REV 042011-1
Temp: 22.5C
Humidity: 35.7%

4.7 AC Line Conducted Emission
FCC 15.207

Test Limit

Frequency Band MHz	Class B Limit dB (μV)	
	Quasi-Peak	Average
0.15-0.50	66 to 56 Decreases linearly with the logarithm of the frequency	56 to 46 Decreases linearly with the logarithm of the frequency
0.50-5.00	56	46
5.00-30.00	60	50

Note: At the transition frequency the lower limit applies.

Test Procedure

Measurements are carried out using quasi-peak and average detector receivers in accordance with CISPR 16. An AMN is required to provide a defined impedance at high frequencies across the power feed at the point of measurement of terminal voltage and also to provide isolation of the circuit under test from the ambient noise on the power lines. An AMN as defined in CISPR 16 shall be used.

The EUT is located so that the distance between the boundary of the EUT and the closest surface of the AMN is 0.8m.

Where a flexible mains cord is provided by the manufacturer, this shall be 1m long or if in excess of 1m, the excess cable is folded back and forth as far as possible so as to form a bundle not exceeding 0.4m in length.

The EUT is arranged and connected with cables terminated in accordance with the product specification.

Conducted disturbance is measured between the phase lead and the reference ground, and between the neutral lead and the reference ground. Both measured values are reported.

The EUT, where intended for tabletop use, is placed on a table whose top is 0.8m above the ground plane. A vertical, metal reference plane is placed 0.4m from the EUT. The vertical metal reference-plane is at least 2m by 2m. The EUT shall be kept at least 0.8m from any other metal surface or other ground plane not being part of the EUT. The table is constructed of non-conductive materials. Its dimensions are 1m by 1.5m, but may be extended for larger EUT.

Floor standing EUT are placed on a horizontal metal ground plane and isolated from the ground plane by resting on an insulating material. The metal ground plane extends at least 0.5m beyond the boundaries of the EUT and has minimum dimensions of 2m by 2m.

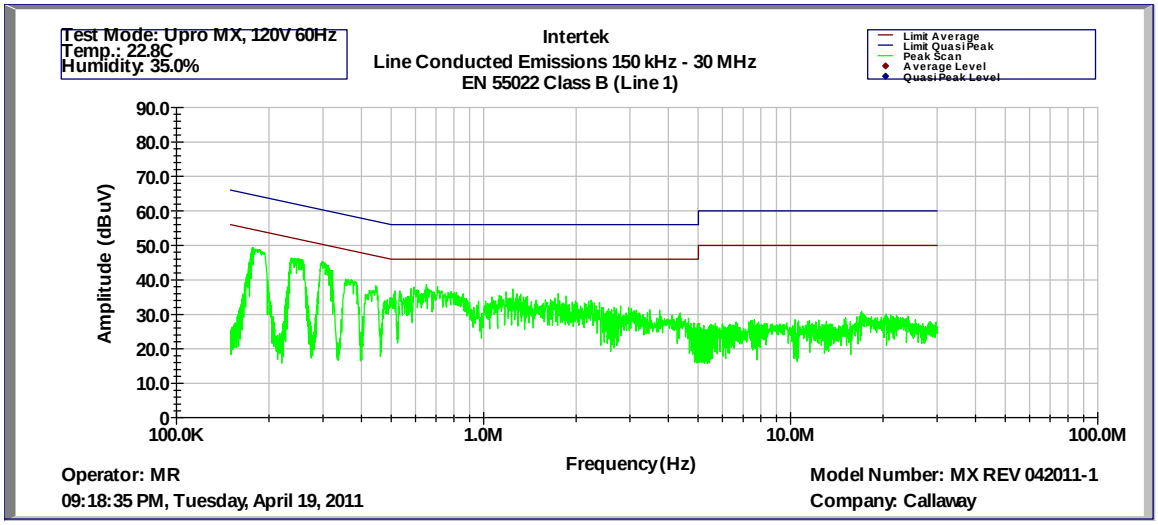
Equipment setup for conducted disturbance tests followed the guidelines of ANSI C63.4.

Test Results

AC Line Conducted emission measurements were performed from 0.15 MHz to 30 MHz. The data on the following pages list the significant emission frequencies, the limit and the margin of compliance. The results are presented on the following Plots 7.1 – 7.2.

The EUT passed by 5.1 dB.

Plot 7. 1



Intertek Testing Services
Line Conducted Emissions 150 kHz - 30 MHz
EN 55022 Class B (Line 1)

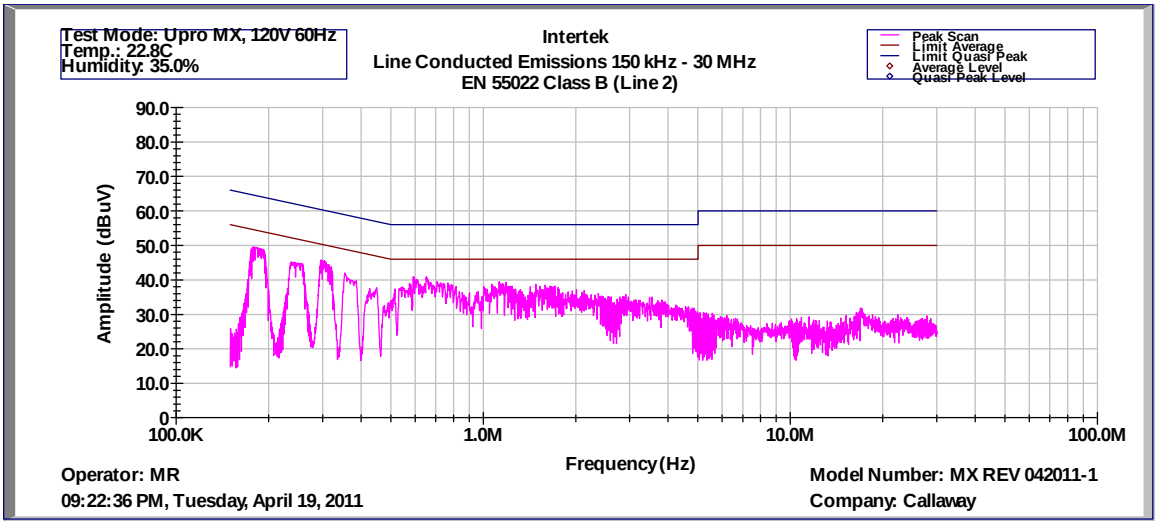
Operator: MR
April 19, 2011

Model Number: MX REV 042011-1
Company: Callaway

Frequency	Pk Level	Av Limit	QP Limit	Margin
MHz	dBuV	dBuV	dBuV	dB
0.167	39.3	55.5	65.5	-16.2
0.173	45.1	55.4	65.4	-10.3
0.175	47.8	55.3	65.3	-7.5
0.177	49.4	55.2	65.2	-5.8
0.198	39.8	54.6	64.6	-14.8
0.233	42.4	53.6	63.6	-11.3
0.237	46.4	53.5	63.5	-7.1
0.297	45.2	51.8	61.8	-6.6
0.319	42.5	51.2	61.2	-8.7
0.322	42.6	51.1	61.1	-8.5
0.356	40.2	50.1	60.1	-9.9
0.445	38.3	47.6	57.6	-9.3
0.593	37.9	46.0	56.0	-8.1
0.651	38.6	46.0	56.0	-7.4
0.708	38.0	46.0	56.0	-8.0

Test Mode: Upro MX, 120V 60Hz
Temp.: 22.8C
Humidity: 35.0%

Plot 7. 2



Intertek
Line Conducted Emissions 150 kHz - 30 MHz
EN 55022 Class B (Line 2)

Operator: MR
April 19, 2011

Model Number: MX REV 042011-1
Company: Callaway

Frequency	Pk Level	Av Limit	QP Limit	Margin
MHz	dBuV	dBuV	dBuV	dB
0.171	40.1	55.4	65.4	-15.3
0.176	48.8	55.3	65.3	-6.4
0.178	49.5	55.2	65.2	-5.7
0.237	45.2	53.5	63.5	-8.3
0.263	38.7	52.8	62.8	-14.1
0.296	45.8	51.8	61.8	-6.0
0.354	42.0	50.2	60.2	-8.2
0.575	39.0	46.0	56.0	-7.0
0.652	40.9	46.0	56.0	-5.1
0.767	39.1	46.0	56.0	-6.9
1.066	38.8	46.0	56.0	-7.2
1.128	39.4	46.0	56.0	-6.6
1.187	39.3	46.0	56.0	-6.7
1.482	38.8	46.0	56.0	-7.2
1.591	38.5	46.0	56.0	-7.5

Test Mode: Upro MX, 120V 60Hz
Temp.: 22.8C
Humidity: 35.0%

5.0 RF Exposure Evaluation

SAR Evaluation

The EUT is a handheld device used in a portable application, which will be located less than 20 cm from any body part of the user or near by persons; therefore, it must comply with SAR requirement.

The EIRP is 2.7 mW.

Since that level is less than the threshold level which is 25 mW for 2.4 GHz, the device is considered to be in compliance with the SAR requirement without testing.

MPE Evaluation

The EUT is a handheld device used in a portable application, which will be located at least 1 cm from any body part of the user or near by persons.

The maximum Peak EIRP calculated is 4.3 dBm or 2.7 mW; therefore, to comply with RF Exposure Requirement, the MPE is calculated.

The Power Density can be calculated using the formula

$$S = EIRP/ 4\pi D^2$$

Where: S is Power Density in W/m^2
D is the distance from the antenna.

It is considered that 1 cm is the minimum distance that user can go closest to the EUT.

At 1 cm, $S = 2.15\ W/m^2$, which is below the MPE Limit of $10\ W/m^2$

6.0 List of Test Equipment

Measurement equipment used for emission compliance testing utilized the equipment on the following list:

Equipment	Manufacturer	Model/Type	Serial #	Cal Int	Cal Due
RF Filter Section	Hewlett Packard	85460A	3448A00267	12	12/08/11
EMI Receiver	Hewlett Packard	8546A	3710A00373	12	12/08/11
Spectrum Analyzer	Rohde&Schwarz	FSP40	036612004	12	11/04/11
BI-Log Antenna	ARA	LPB-2513/A	1154	12	06/29/11
Pre-Amplifier	Sonoma	310N	185634	12	12/01/11
Pre-Amplifier	Miteq	AMF-4D-001180-24-10P	799159	12	08/05/11
Vector Signal Generator	Rohde&Schwarz	SMU200A	102499	12	04/28/11
Spectrum Analyzer	Rohde&Schwarz	FSU	200482	12	03/23/12
Horn Antenna	EMCO	3115	00126795	12	10/28/11
LISN	FCC	FCC-LISN-50-50-M-H	2012	12	08/04/11

7.0 Document History

Revision/ Job Number	Writer Initials	Date	Change
1.0 / G100329719	MR	April 15, 2011	Original document