



Nemko

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CERTIFICATION TEST REPORT

Report Number: 2011 0710211696 FCC

Project Number: 10211696

Nex Number: 180182

Applicant: SMK MANUFACTURING
12264 EL CAMINO REAL, STE. 203
San Diego, CA 92130

Equipment Under Test (EUT): REMOTE

Model: 186217

FCC ID: QVE4XIPR

In Accordance With: FCC Part 15 Subpart C, 15.249

Tested By: Nemko USA Inc.
11696 Sorrento Valley Road, Suite F
San Diego, CA 92121

Authorized By: Alan Laudani, EMC/RF Test Engineer

Date: JULY 29, 2011

Total Number of Pages: 18



Section1: Summary of Test Results

General

All measurements are traceable to national standards

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 15; Subpart C and IC RSS-210. Radiated tests were conducted in accordance with ANSI C63.4-2003. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC and IC.

The assessment summary is as follows:

Apparatus Assessed: Remote

Model: 186217

Specification: FCC Part 15 Subpart C, 15.249

Date Received in Laboratory: July 27, 2011

Compliance Status: Complies

Exclusions: None

Non-compliances: None



1.1 Report Release History

REVISION	DATE	COMMENTS	
-	July 29, 2011	Prepared By:	Alan Laudani
-	July 29, 2011	Initial Release:	Alan Laudani

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025.

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TESTED BY: 
Date: July 29, 2011
Alan, EMC Test Engineer

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Section 2: Equipment Under Test

2.1 Product Identification

The Equipment Under Test was identified as follows:

SMK Manufacturing 186217 Remote



2.2 Samples Submitted for Assessment

The following sample of the apparatus has been submitted for type assessment:

Sample No.	Description	Serial No.
180182-1	186217 REMOTE	9



2.3 Theory of Operation

The 186217 is a Remote control. The purpose for the unit is to control a set up box. This set up box is similar to a cable box. This unit is operated from 4 AAA batteries. The IC's have an internal regulator. The Remote works on three channels only. There is an external regulator that supplies 3.3 Volts to all the circuits.

The EUT's performance during test was evaluated against the performance criterion specified by applicable test standards. Performance results are detailed in the test results section of this report.

2.4 Technical Specifications of the EUT

Manufacturer:	SMK Manufacturing
Operating Frequency:	2425.0 MHz, 2450 MHz, 2475.0 MHz in the 2400-2483.5 MHz Band
Number of Operating Frequencies:	3
Rated Field Strength:	73.9 dB _μ V/m @ 3 meters Or 5 mV/m
Modulation:	QPSK
Antenna Type:	Trace on PCB, -2 dBi gain (typ)
Antenna Connector:	None
Power Source:	4 AAA batteries in series, nominal 6 VDC



Section 3: Test Conditions

3.1 Specifications

The apparatus was assessed against the following specifications:

FCC Part 15 Subpart C, 15.249

Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5850 MHz and 24.0-24.25 GHz bands.

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3.2 Deviations From Laboratory Test Procedures

No deviations from Laboratory Test Procedure

3.3 Test Environment

All tests were performed under the following environmental conditions:

Temperature range	18-23 °C
Humidity range	40-60%

3.4 Test Equipment

Nemko ID	Device	Manufacturer	Model	Serial Number	Cal Date	Cal Due Date
110	Antenna, LPA	Electrometrics	LPA-25	1217	4/1/2011	4/1/2012
116	Antenna, Bicon	EMCO	3104	1297	12/2/2010	12/2/2011
317	Preamplifier	HP	8449A	2749A00167	5/16/2011	5/16/2012
835	Spectrum Analyzer	Rohde & Schwarz	RHDFSEK	829058/005	7/12/2011	7/12/2012
877	Antenna, DRG Horn, .7-18GHz	AH Systems	SAS-571	688	8/16/2010	8/16/2011
897	9kHz to 7GHz Spectrum Analyzer	Rohde & Schwarz	FSP7	837620/009	10/27/2010	10/27/2011
901	pre amp	Sonoma	310 N	130607	1/7/2011	1/7/2012
E1013	DRG Horn (Small)	EMCO	3116	00119488	12/23/2009	12/23/2011

Registration of the OATS are on file with the Federal Communications Commission, under Registration Number 90579.



Section 4: Observations

4.1 Modifications Performed During Assessment

No modifications were performed during assessment.

4.2 Record Of Technical Judgements

No technical judgements were made during the assessment.

4.3 EUT Parameters Affecting Compliance

The user of the apparatus could not alter parameters that would affect compliance.

4.4 Test Deleted

No Tests were deleted from this assessment.

4.5 Additional Observations

There were no additional observations made during this assessment.



Section 5: Results Summary

This section contains the following:

FCC Part 15 Subpart C: §15.249

The column headed "Required" indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

N No: not applicable / not relevant

Y Yes: Mandatory i.e. the apparatus shall conform to these tests.

N/T Not Tested, mandatory but not assessed. (See section 4.4 Test deleted)

The results contained in this section are representative of the operation of the apparatus as originally submitted.

5.1 Test Results

Part 15C	Test Description	Required	Result
15.207 (a)	Conducted Emission Limit	N*	
15.215(c)	20 dB Bandwidth	Y	Pass
15.249 (a)	Field Strength of Emissions	Y	Pass
15.249 (d) & 15.209 (a)	Spurious Emissions Outside of the band	Y	Pass
15.249 (b)	Fixed Point-to-Point Operation	N	
15.109 (a)	Receiver Spurious Emissions	N/T*	

N* = *EUT only employ battery power for operation and doesn't operate from the AC power lines or contain provisions for operation while connected to the AC power lines.*

N/T* = *EUT does not have a separate receive mode. Configured to transmit only.*

Appendix A: Test Results

Section 15.215(c) – Occupied Bandwidth

(c) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

Test Conditions:

Sample Number:	186217	Temperature:	22 °C
Date:	July 28, 2011	Humidity:	45 %
Modification State:	Low, Middle and High Channels	Tester:	Alan Laudani
		Laboratory:	Nemko

Test Results:

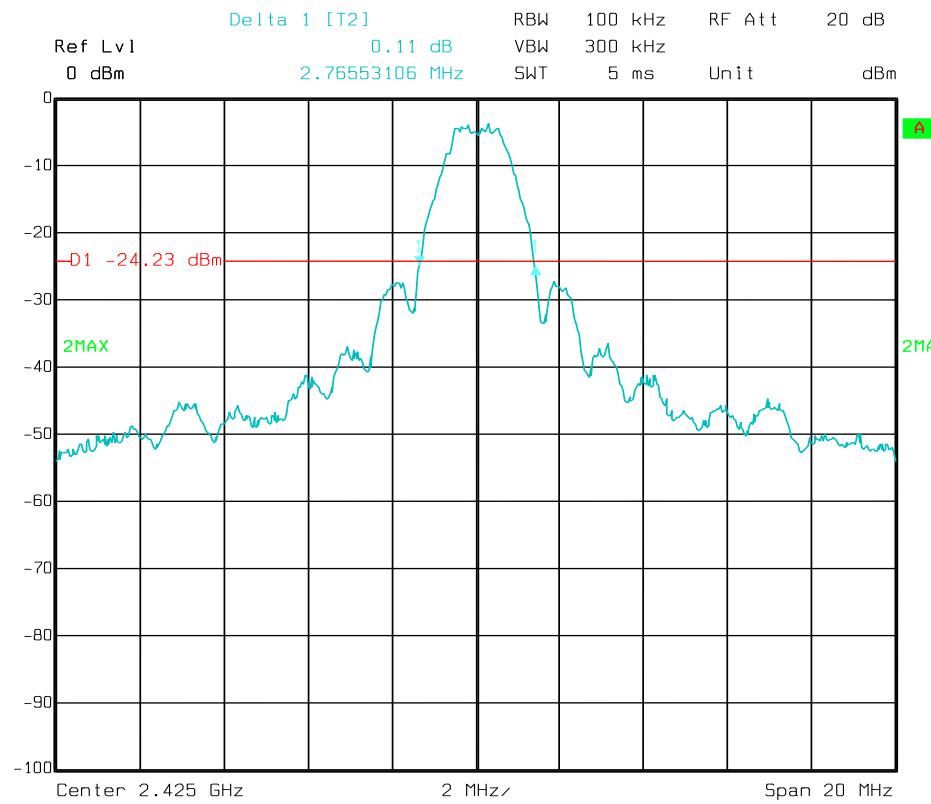
See attached plots

Additional Observations:

- Span is wide enough to capture the channel transmission
- RBW is 1% of the span or worst case
- VBW is 3X RBW
- Sweep is auto
- Detector is Peak
- Trace is Max Hold
- A peak output max hold reading was taken; a display line was drawn 20 dB lower than peak level. The 20 dB bandwidth was determined from where the channel output spectrum intersected the display line.
- Observed maximum occupied BW is 2.76 MHz.
- $2425 \text{ MHz} - 2.76/2 \text{ MHz} = 2423.62 \text{ MHz}$ (within the frequency band)
- $2475 \text{ MHz} + 2.76/2 \text{ MHz} = 2476.38 \text{ MHz}$ (within the frequency band)



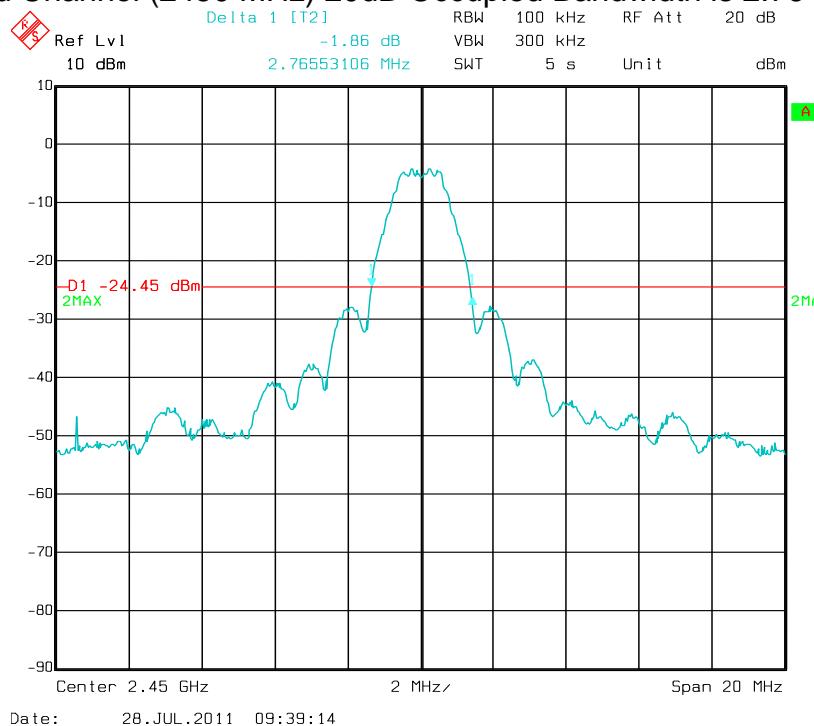
Low Channel (2425 MHz) 20dB Occupied Bandwidth is 2.76 MHz



FCC ID: QVE4XIPR

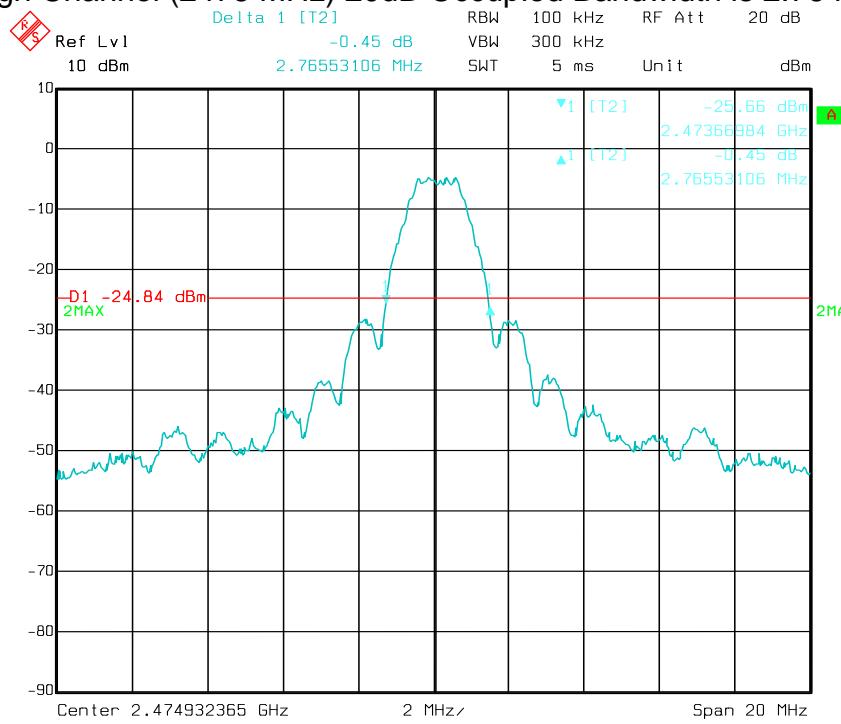
Report Number: 2011 0710211696 FCC
Specification: FCC Part 15 Subpart C, 15.249

Mid Channel (2450 MHz) 20dB Occupied Bandwidth is 2.76 MHz



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High Channel (2475 MHz) 20dB Occupied Bandwidth is 2.76 MHz



**Section 15.249(a) – Field Strength of Emissions**

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

Test Conditions:

Sample Number:	186217	Temperature:	19 °C
Date:	July 27, 2011	Humidity:	45 %
Modification State:	Low, Middle and High Channels	Tester:	Alan Laudani
		Laboratory:	SOATS

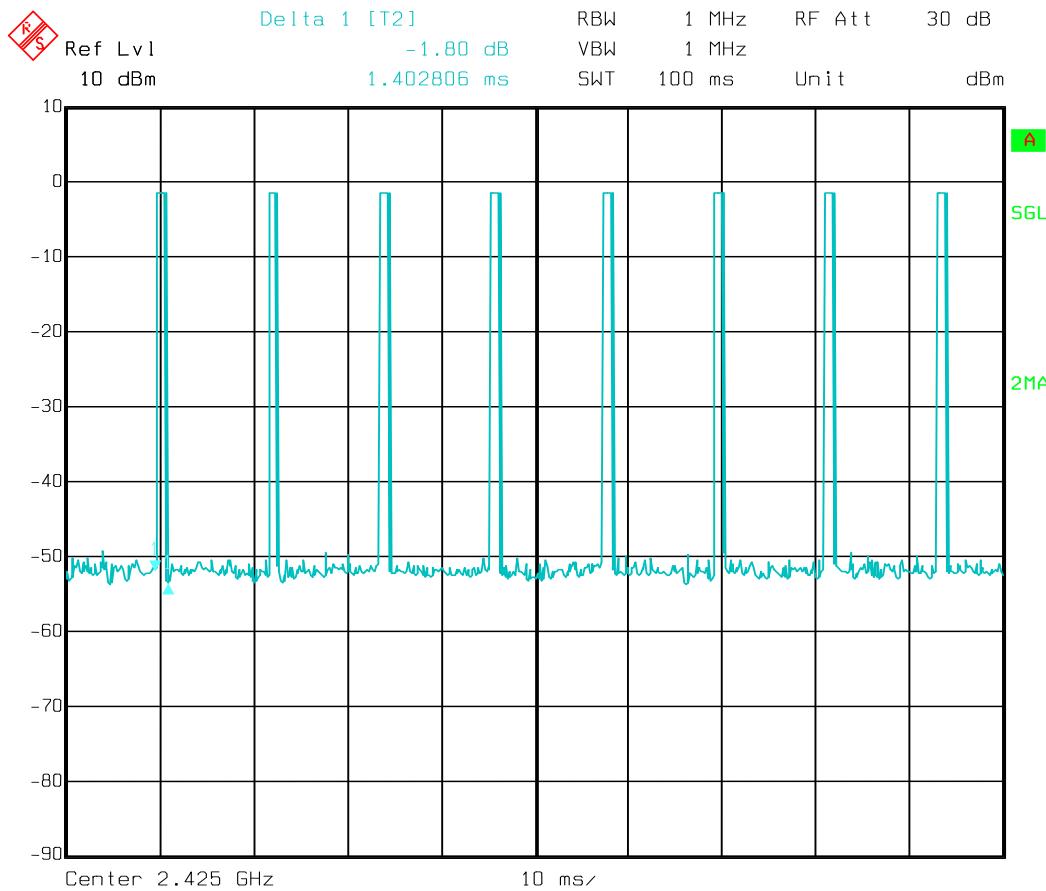
Test Results: See attached table and plots.

Additional Observations:

- Fresh batteries was used during assessment.
- All measurements were performed using a peak detector, max hold.
- RBW is 1MHz while VBW is 3MHz for band edge measurements
- RBW is 3MHz while VBW is 10MHz for fundamental field strength measurements as occupied band width is 2.76 MHz.
- Average data are calculated from Peak measurements plus Duty Cycle Correction Factor (DCCF).

Sample Computation (Radiated Emissions Data Sheet):

$$\begin{aligned}\text{Measured @ 2475MHz} &= 56.0 \text{ dB}\mu\text{V/m} \\ &= \text{Antenna factor} + \text{Cable loss} - \text{Preamplifier gain} + \text{DCCF} \\ &= 56.0 \text{ dB}\mu\text{V} + 29.18 \text{ dB}\mu\text{V/m} + 7.7 \text{ dB} - 0 - 19 \text{ dB} \\ &= 72.9 \text{ dB}\mu\text{V/m}\end{aligned}$$

**Duty Cycle Correction Factor Calculations**

Eight (8) data packets in 100ms sweep

Each data packet is 1.4 mS long

$$\begin{aligned}\text{Duty Cycle} &= 1.4 \text{ ms} \times 8 / 100 \text{ ms} \\ &= 0.112\end{aligned}$$

$$\begin{aligned}\text{DCCF} &= 20 \log (0.112) \\ &= -19.0 \text{ dB}\end{aligned}$$

Radiated Emissions Data

Job #: 10211696 Date : 7-27-2011
NEX #: 180182 Time : 08:41
Staff : aal

Page 1 of 1

Client Name :	SMK
EUT Name :	Handheld Remote XIP
EUT Model # :	186217
EUT Serial # :	9
EUT Config. :	Transmit continuous modulated
	Limit 50 mV/m = 94.0 dB _µ V/m average

EUT Voltage : battery
EUT Frequency :
Phase:
NOATS
SOATS
Distance < 1000 MHz:
Distance > 1000 MHz:

Specification :	CFR47 Part 15.249	
Loop Ant. #:	NA	
Bicon Ant. #:	NA	Temp. (°C) : 19
Log Ant. #:	NA	Humidity (%) : 45
DRG Ant. #	877	Spec Analyzer # : 835
Cable LF#:	SOATS	Analyzer Display # : 835
Cable HF#:	40ft_blue	Quasi-Peak Detector # : NA
Preamp LF#:	NA	Duty Cycle (%): 11.2
Preamp HF#	NA	Measur...

R	Quasi-Peak	RBW: 120 kHz
	Peak	RBW: 3 MHz
	Average	Peak + Duty Cycle Factor
	DCF	= $20 \times \log(\text{duty cycle})$
	Video Bandwidth	300 kHz
	Video Bandwidth	10 MHz

Measurements below 1 GHz are Quasi-Peak values, unless otherwise stated
Measurements above 1 GHz are Average values, unless otherwise stated

**Section 15.249 (d) – Spurious Emissions Outside of the band**

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

Test Conditions:

Sample Number:	186217	Temperature:	19 °C
Date:	July 27, 2011	Humidity:	45 %
Modification State:	Low, Middle and High Channels	Tester:	Alan Laudani

 Laboratory: | SOATS |

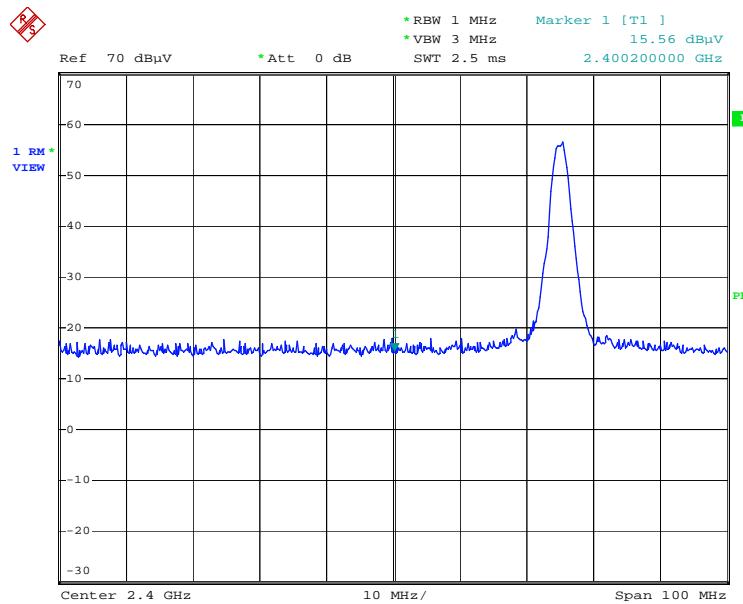
Test Results: No emissions found. Band edge plots below.

Additional Observations:

- Fresh batteries were used during assessment.
- All measurements below 1 GHz were performed at 3m employing a CISPR quasi-peak detector.
- Peak measurements above 1 GHz utilize a RBW of 1 MHz and a VBW of 3 MHz
- The Spectrum was searched from 30MHz to 25 GHz.
- There were no emissions found other than the fundamental and the second harmonic (Section 15.249(a)).
- Measurements max hold.
- There are no emissions found as harmonics of the fundamental.
- There are no emissions found as digital emissions of the circuitry.
- Band Edge plots shown below. Table on Page 16.

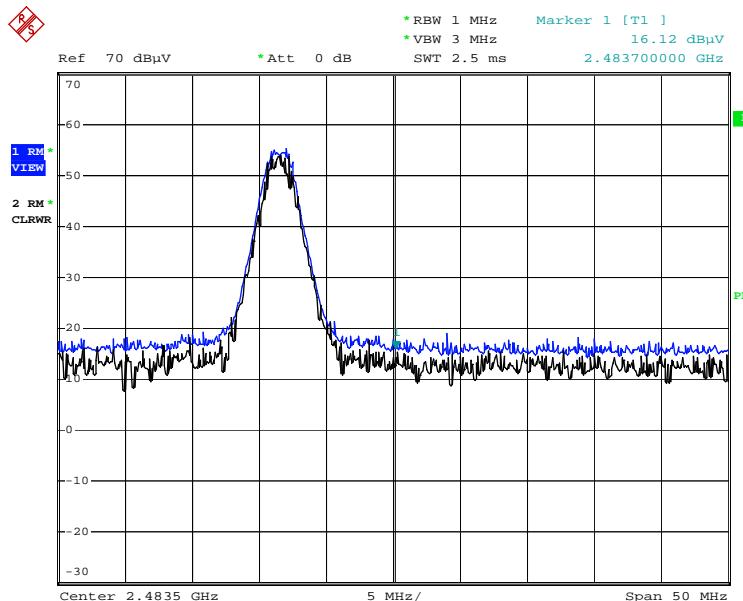
FCC ID: QVE4XIPR

Report Number: 2011 0710211696 FCC
Specification: FCC Part 15 Subpart C, 15.249



Date: 27.JUL.2011 09:46:50

Lower band edge. Frequency 2400 MHz, max hold peak.
Average = Peak -19 dB (DCCF), EUT complies.



Date: 27.JUL.2011 10:27:17

Upper band edge. Frequency 2483.5 MHz, max hold peak.
Average = Peak -19 dB (DCCF), EUT complies

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