Nemko USA, Inc.
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CERTIFICATION TEST REPORT

PART 15.247C
IC RSS-210

For The Touch Pad Remote
Model: 161714

FCC ID: QVERC4U2
IC: 3683B-RC4U2

PREPARED FOR:

SMK Manufacturing, Inc
1055 Tierra Del Rey
Chula Vista, CA 91910

Prepared on: November 3, 2008

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DOCUMENT HISTORY

REVISION	DATE	COMMENTS
-	November 3, 2008	Prepared By: Alan Laudani
-	November 3, 2008	Initial Release: Alan Laudani

NOTE: Nemko USA, Inc. hereby makes the following statements so as to conform to Chapter 10 (Test Reports) Requirements of ANSI C63.4 (2003) "Methods and Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz":

- The unit described in this report was received at Nemko USA, Inc.'s facilities on October 22, 2008.
- Testing was performed on the unit described in this report on October 22, 2008.
- The Test Results reported herein apply only to the Unit actually tested, and to substantially identical Units.
- This report does not imply the endorsement of the Federal Communications Commission (FCC), Industry Canada, NVLAP or any other government agency.

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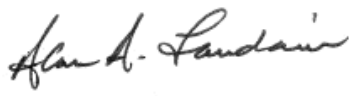
CERTIFICATION

Nemko USA, Inc., an independent Electromagnetic Compatibility (EMC) Test Laboratory, produced this Test Report and performed the Radio Frequency Interference (RFI) testing and data evaluation contained herein.

Nemko USA, Inc.'s measurement facility is currently registered with the United States Federal Communications Commission (FCC) in accordance with the provisions of 47 United States Code (CFR) Part 2, Subpart I, Section 2.948(a). A current description of Nemko USA, Inc.'s measurement facility is on file with the FCC. Nemko USA Inc. has additionally satisfied the FCC that it complies with the requirements set forth in 47 CFR Part 2, Subpart I, Section 2.948(d) regarding the accreditation of EMC laboratories.

The RFI testing, test data collection and test data evaluation were accomplished in accordance with the ANSI C63.4–2003 Standard, and in accordance with the applicable sections of the FCC rules (47 CFR Parts 2 and 15). The testing was also accomplished in accordance with Industry Canada's ICES-003 standard for unintentional radiating device per EMCAB-3, Issue 3 (May 1998). The administrative summary of this test report provides a description of the test sample.

I hereby certify that the test data, test data evaluation, and equipment configurations used to compile this test report are a true and accurate representation of the test sample's radio frequency interference characteristics as of the test date(s), and, for the design of the test sample.



Alan Laudani
EMC Engineer

1. ADMINISTRATIVE DATA AND TEST SUMMARY

1.1. Administrative Data

CLIENT:	SMK Manufacturing, Inc 1055 Tierra Del Rey Chula Vista, CA 91910
CONTACT: E-Mail:	Leon Gateno Lgateno@smkusa.com
DATE (S) OF TEST:	October 22, 2008
EQUIPMENT UNDER TEST (EUT):	Touch Pad Remote
MODEL: SERIAL NUMBER: CONDITION UPON RECEIPT:	161714 NA Suitable for Test
TEST SPECIFICATION:	FCC, Part 15.247, Subpart C Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5850 MHz and 24.0-24.25 GHz bands and RSS 210 (Issue 7, June 2007) Annex 8 - Frequency Hopping and Digital Modulation Systems Operating in the Bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

1.2. Test Summary

Specification	*Frequency Range*	*Compliance Status*
FCC, CFR 47, Section 15.207	0.15 MHz - 30.00 MHz	NA[1]
FCC, CFR 47, Section 15.109	30 MHz – 5th Harmonic	PASS
FCC, CFR 47, Section 15.209	30 MHz – 10th Harmonic	PASS
FCC CFR 47, §15.247 Plus Bandedge	2425 – 2475 MHz	PASS
RSS-210 - Low Power License Exempt Radio-communication Devices (All Frequency Bands)	2425 – 2475 MHz	PASS

[1] The EUT is powered by 2 AA batteries.
Testing was started at 30 MHz as there are no RF signals generated below this frequency.

Refer to the test results section for further details.

Alan Laudani
EMC Engineer

2. SYSTEM CONFIGURATION

2.1. Description and Method of Exercising the EUT

The 161714 is a Touch Pad Remote to be used as a remote control. The remote communicates with a unit inside of the set up box. The 161714 works on three frequencies, 2425, 2450 and 2475 MHz. The purpose for the unit is to control a set up box. This set up box is similar to a cable box. The unit can operate in IR (infra red) mode or in RF mode. The remote controls the volume, channel, record, fast forwards, etc.

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.

2.2. System Components and Power Cables

DEVICE	MANUFACTURER MODEL # SERIAL #	POWER CABLE
EUT - Touch Pad Remote	SMK Manufacturing, Inc Model: 161714 Serial #: NA	

2.3. Device Interconnection and I/O Cables

Connection	I/O Cable
No connections	None - wireless

2.4. Design Modifications for Compliance

The following design modifications were made to the EUT during testing.

No design modifications were made to the EUT during testing.

2.5. Technical Specifications of the EUT

Manufacturer:	SMK Manufacturing, Inc
Operating Frequencies:	2425, 2450, & 2475 MHz in the 2400-2483.5 MHz Band
Measured Maximum Radiated Emission Output:	91.0 dBµV/m @ 3 m
Modulation:	Digital
Antenna Connector:	Internal, integral.
Power Source:	3 Vdc (2) AA batteries

3. DESCRIPTION OF TEST SITE AND ENVIRONMENT

3.1. Description of Test Site

The test site is located at 11696 Sorrento Valley Road, Suite F, San Diego, CA 92121. The site is physically located 18 miles Northwest of downtown San Diego. The general area is a valley 1.5 miles east of the Pacific Ocean. This particular part of the valley tends to minimize ambient levels, i.e. radio and TV broadcast stations and land mobile communications. The three and ten-meter Open Area Test Site (OATS) is located behind the office/lab building. It conforms to the normalized site attenuation limits and construction specifications as set in the EN 55022 (1987), CISPR 16 and 22 (1985) and ANSI C63.4-2001 documents. The OATS normalized site attenuation characteristics are verified for compliance every year, and registered with the Federal Communications Commission under Registration Number 90579 and Industry Canada under 2040B-1 and 2040B-2.

3.2. Test Environment

All tests were performed under the following environmental conditions:

Temperature range	:	17 – 24 ^{o}C
Humidity range	:	29 - 35%
Pressure range	:	87 - 105 kPa

4. DESCRIPTION OF TESTING METHODS

4.1. Introduction

As required in 47 CFR, Parts 2 and 15, the methods employed to test the radiated and conducted emissions (as applicable) of the EUT are those contained within the American National Standards Institute (ANSI) document ANSI C63.4–2003, titled "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz." All applicable FCC Rule Sections that provide further guidance for performance of such testing are also observed.

For General Test Configuration please refer to Figure 1 on the following page.

Digital devices sold in Canada are required to comply with the Interference Causing Equipment Standard for Digital Apparatus, ICES-003. These test methods and limits are specified in the Canadian Standards Association's (CSA) Standard C108.8-M1983 (1-1-94 version) and are "essentially equivalent" with FCC, Part 15 and CISPR 22 (EN55022) rules for unintentional radiators per EMCAB-3, Issue 3 (May 1998). No further testing is required for compliance to ICES-003.

4.2. Configuration and Methods of Measurements for Conducted Emissions

Section 7 of ANSI C63.4 determines the general configuration of the EUT and associated equipment, as well as the test platform for conducted emissions testing. Tabletop devices are placed on a non-conducting surface 80 centimeters above the ground plane floor and 40 centimeters from the ground plane wall. The EUT and associated system are configured to operate continuously, representing a "normally operating" mode. The EUT is powered via a Line Impedance Stabilization Network (LISN). The emissions are recorded using the required bandwidth of 9 kHz in the quasi-peak mode. The average amplitude is also observed employing a 10 kHz bandwidth to determine the presence of broadband RFI. When such interference is caused by broadband sources (as defined by the FCC and ANSI Rules), the deviation guidelines contained in Section 11.3.1 of ANSI C63.4 are employed, which allows a correction factor of 13 dB to be subtracted from the quasi-peak reading. The emission levels are then compared to the applicable FCC limits to determine compliance.

4.3. Configuration and Methods of Measurements for Frequency Identification

When performing all testing of equipment, the actual emissions of the EUT are segregated from ambient signals present within the laboratory or the open-field test range. Preliminary testing is performed to ensure that ambient signals are sufficiently low to allow for proper observation of the emissions from the EUT. Incoming power lines are filtered using a 120 dB, 30-ampere; 115/208-volt filter to assist in reducing ambient signals for tests of levels of conducted emissions. Ambients within the laboratory are compared to those noted at the nearby open-field site to discriminate between signals produced from the EUT and ambient signals. In the event that a significant emission is produced by the EUT at a frequency which is also demonstrating significant ambient signals, the spectrum analyzer is placed in the peak mode, the bandwidth is narrowed, the EUT's signal is centered on the analyzer, the scan width is expanded to 50 kHz while monitoring the audio to ensure that only the EUT signal is present, the analyzer is switched to quasi-peak mode, and the level of the EUT signal is recorded.

4.4. Configuration and Methods of Measurements for Radiated Emissions

Section 8 of ANSI C63.4 determines the general configuration and procedures for measuring the radiated emissions of equipment under test. Initially, the primary emission frequencies are identified inside the test lab by positioning a broadband receive antenna one meter from the EUT to locate frequencies of significant radiation. Next, the EUT and associated system are placed on a turntable on a ten meter open area test site (registered with the FCC in accord with its Rules and ANSI C63.4) and the receive antenna is located at a distance of ten meters from the EUT.

The EUT and associated system are configured to operate continuously, representing a "normally operating" mode. All significant radiated emissions are recorded when maximum radiation on each frequency is observed, in accordance with part 8 of ANSI C63.4–2003 and Section 15.33 of the FCC Rules. To ensure that the maximum emission at each discrete frequency of interest is observed, the receive antenna is varied in height from one to four meters and rotated to horizontal and vertical polarities, and the turntable is also rotated to determine the worst emitting configuration. The numerical results of the test are included herein to demonstrate compliance.

The numerical results that are applied to the emissions limits are arrived at by the following method:
Example: A=RR+CL+AF
A = Amplitude dBuV/m
RR = Receiver Reading dBuV
CL = cable loss dB
AF = antenna factor dB/m

Example Frequency = 110MHz
18.5 dBuV (spectrum analyzer reading)
+3.0 dB (cable loss @ frequency)
21.5 dBuV
+15.4 dB/m (antenna factor @ frequency)
36.9 dBuV/m Final adjusted value

The final adjusted value is then compared to the appropriate emission limit to determine compliance.

5. Test Results

5.1. Radiated Emissions

Clause 15.247(d) Radiated Emissions Not in Restricted Bands

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Additional Observations:

- Emissions were searched over a range of 30 MHz to 25000 MHz while in transmit mode on each of the three channels. No other emissions found within 20 dB of the limit.
- Emissions were searched over a range of 30 MHz to 25000 MHz while in receive mode on each of the three channels. No emissions found within 20 dB of the limit.
- Investigations were made at 3 meters. Each channel investigated was maximized in the OATS.
- A correction factor was added to compensate for antenna factor and cable loss at the fundamental frequencies, example below.
- Measurements were made after fresh batteries were installed.

Correction Factor for measurement at 2425 MHz = 33.2

(27.3 dB/m Antenna factor + 5.9 dB Cable loss)

Corrected Reading = Max Reading + Correction Factor

= 59.8dBµV + 33.2 db

= 91.0 dBµV/m

RXT9000-0701E as a model number has been revised to 161714.

Radiated Emissions Data

Job # : 13395-1 Date : 1630pm Page 1 of 1
NEX #: 115461 Time : 10-22-08
Staff : aal

Client Name : SMK Manufacturing INC
EUT Name : Touch Pad Remote
EUT Model # : RXT9000-0701E
EUT Serial # : NA
EUT Config. : Transmit-- test configuation

Specification : CFR47 Part 15C 15.249 15.209

EUT Voltage :
EUT Frequency : dc
Phase: 1
NOATS X
SOATS
Distance < 1000 MHz: 3 m
Distance > 1000 MHz: 3 m

Loop Ant. #: NA
Bicon Ant.#: 114
Log Ant.#: 110
DRG Ant. # 752
Cable LF#: NOATS
Cable HF#: 40ft
Preamp LF#: NA
Preamp HF# 317

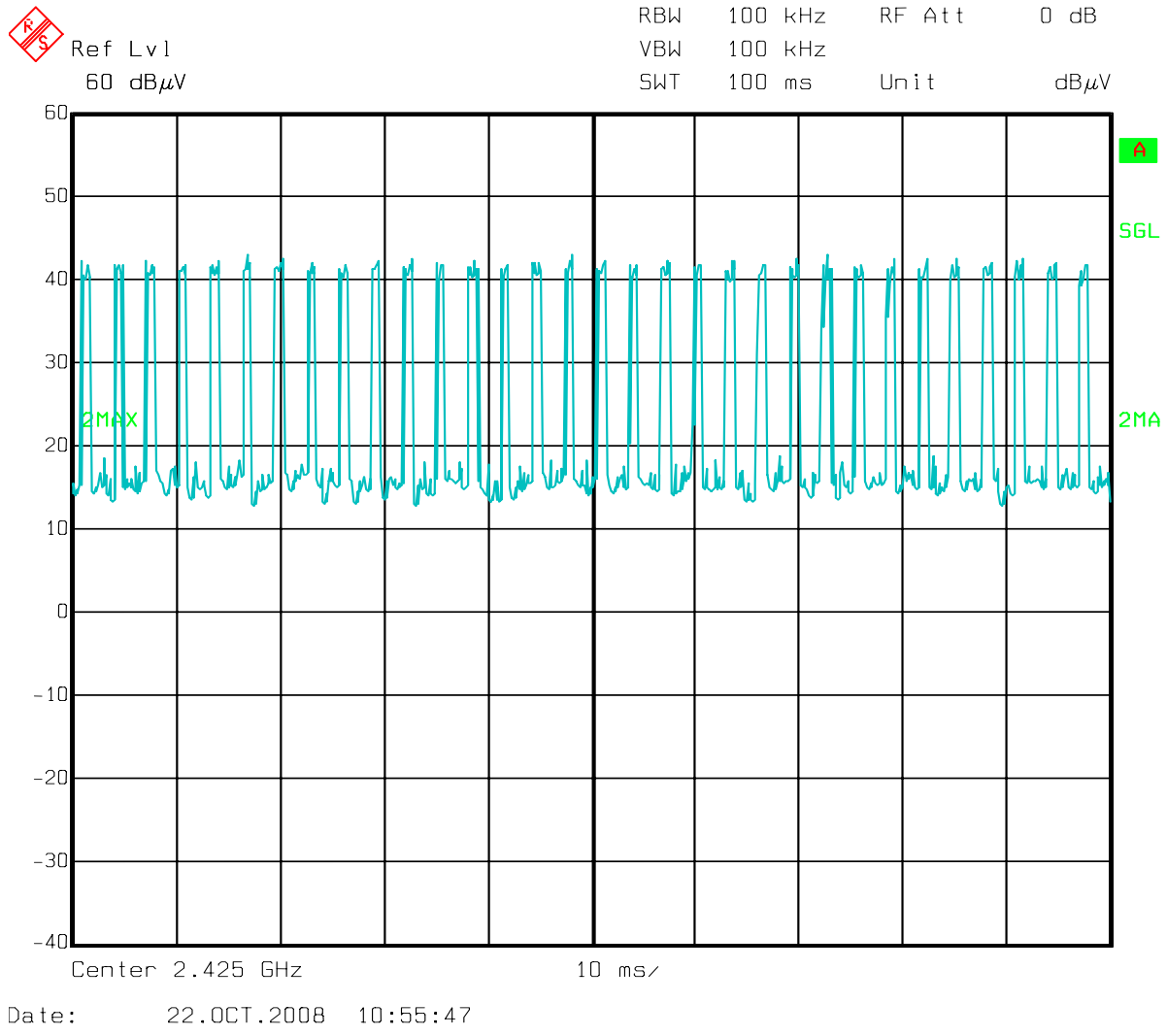
Temp. (°C) : 24
Humidity (%) : 34
Spec. An.#2 835
Spec. An.#1: 898
Spec An. Display #: 898
QP #: 898
PreSelect#: 899
DCF -10.2

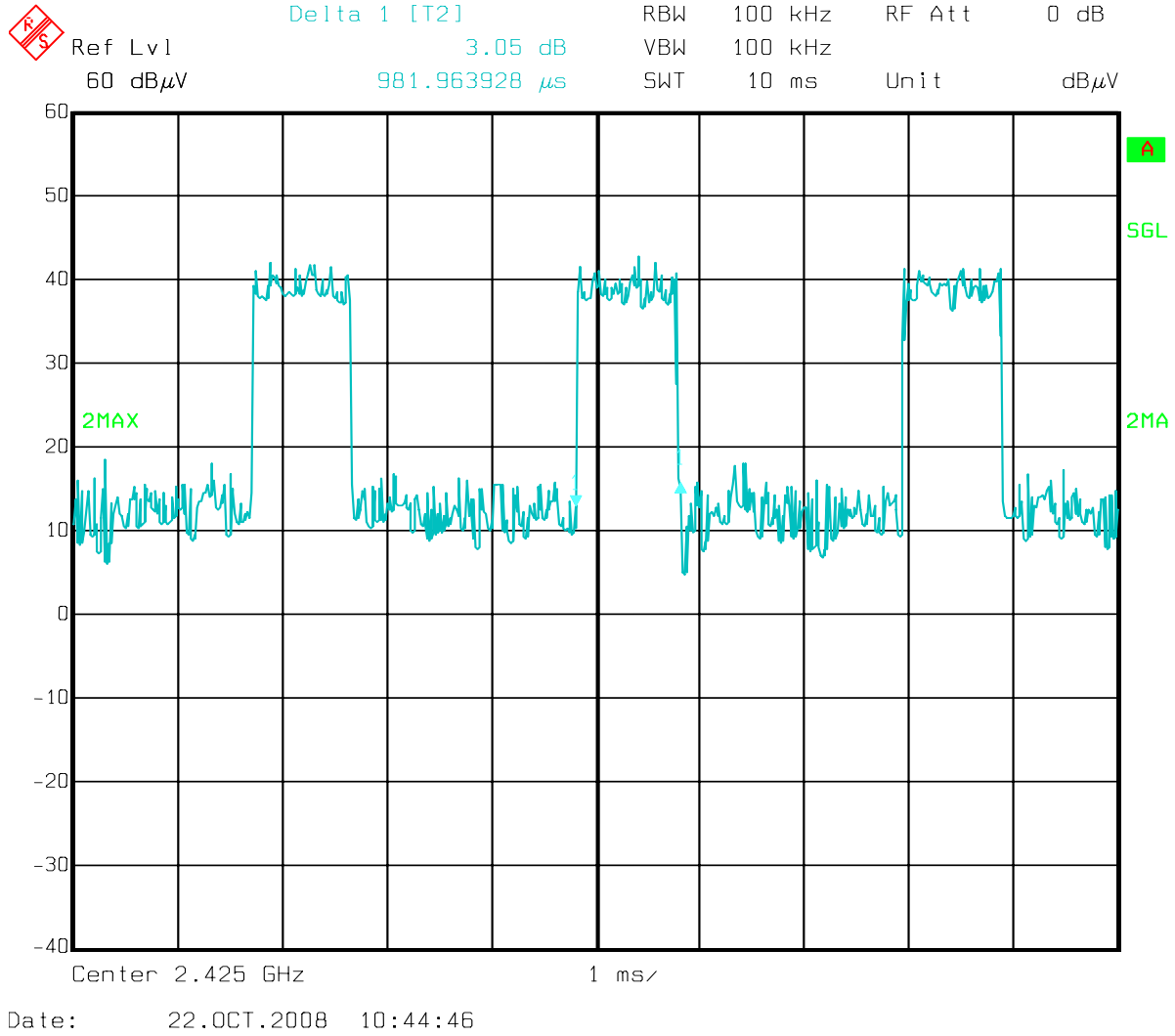
Quasi-Peak	RBW: 120 kHz
	Video Bandwidth 300 kHz
Peak (Fundamental)	RBW: 3 MHz
	Video Bandwidth 3 MHz
Peak	RBW: 1 MHz
	Video Bandwidth 3 MHz
Average = Peak + Duty Cycle Factor	

Meas. Freq. (MHz)	Meter Reading **Vertical**	Meter Reading **Horizontal**	Det.	EUT Side F/L/R/B	Ant. Height m	Max. Reading (dBµV)	Corrected Reading (dBµV/m)	Spec. limit (dBµV/m)	CR/SL Diff. (dB)	Pass Fail	Comment
2400.0	25.2	24.9	P		1.0	25.2	58.4	74.0	-15.6	Pass	upright worst case
2400.0	15.0	14.7	A		1.0	15.0	48.1	54.0	-5.8	Pass	
2425.0	**56.7**	**56.5**	**P**		**1.0**	**56.7**	**89.9**	**125.23**	**-35.4**	Pass	upright
2425.0	56.4	52.7	P		1.2	56.4	89.6	125.23	-35.7	Pass	side
2425.0	55.3	55.8	P		1.5	55.8	89.0	125.23	-36.3	Pass	back
2425.0	42.1		PSD		1.0	42.1	75.3	103.23	-28.0	Pass	power spectral density
4850.0	46.4	45.0	P		1.0	46.4	52.0	74.0	-22.0	Pass	upright
4850.0	36.2	34.8	A		1.0	36.2	41.8	54.0	-12.2	Pass	
4850.0	46.7	48.4	P		1.0	48.4	54.0	74.0	-20.0	Pass	side
4850.0	36.5	38.2	A		1.0	38.2	43.8	54.0	-10.2	Pass	
4850.0	45.6	44.6	P		1.0	45.6	51.2	74.0	-22.8	Pass	back
4850.0	35.4	34.4	A		1.0	35.4	41.0	54.0	-13.0	Pass	
2450.0	**54.9**	**57.8**	**P**		**1.0**	**57.8**	**91.0**	**125.23**	**-34.3**	Pass	upright
2450.0	55.5	53.7	P		1.0	55.5	88.7	125.23	-36.6	Pass	side
2450.0	54.0	55.6	P		1.0	55.6	88.8	125.23	-36.5	Pass	back
2450.0		44.4	PSD		1.0	44.4	77.6	103.23	-25.7	Pass	power spectral density
4900.0	50.8	47.4	P		1.0	50.8	56.6	74.0	-17.4	Pass	side worst case
4900.0	40.6	37.2	A		1.0	40.6	46.4	54.0	-7.6	Pass	
4900.0	50.7	51.5	P		1.0	51.5	57.3	74.0	-16.7	Pass	
4900.0	**40.5**	**41.3**	**A**		**1.0**	**41.3**	**47.1**	**54.0**	**-6.9**	Pass	
4900.0	48.0	50.9	P		1.0	50.9	56.7	74.0	-17.3	Pass	
4900.0	37.8	40.7	A		1.0	40.7	46.5	54.0	-7.5	Pass	
2475.0	**52.3**	**55.5**	**P**		**1.0**	**55.5**	**88.7**	**125.23**	**-36.6**	Pass	**upright**
2475.0	53.5	52.5	P		1.0	53.5	86.7	125.23	-38.6	Pass	side
2475.0	52.0	52.7	P		1.2	52.7	85.9	125.23	-39.4	Pass	back
2475.0		43.2	PSD		1.0	43.2	76.4	103.23	-26.9	Pass	power spectral density
2483.5	25.2	26.9	P		1.0	26.9	60.1	74.0	-13.9	Pass	upright worst case
2483.5	15.0	16.7	A		1.0	16.7	49.8	54.0	-4.1	Pass	
4950.0	47.9	46.1	P		1.0	47.9	53.7	74.0	-20.3	Pass	upright worst case
4950.0	37.7	35.9	A		1.0	37.7	43.5	54.0	-10.5	Pass	
4950.0	45.7	44.8	P		1.0	45.7	51.5	74.0	-22.5	Pass	
4950.0	35.5	34.6	A		1.0	35.5	41.3	54.0	-12.7	Pass	
4950.0	45.2	46.6	P		1.0	46.6	52.4	74.0	-21.6	Pass	
4950.0	35.0	36.4	A		1.0	36.4	42.2	54.0	-11.8	Pass	

5.2. Duty Cycle Factor

32 emissions in 100 ms





32 x 0.981 uS = 31.4 ms

31.4 ms in 100ms = 31.4%

DCF = 20 x log (.314) = -10.1 dB

5.3. Bandwidth

RSS-Gen 4.6.1

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.

The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

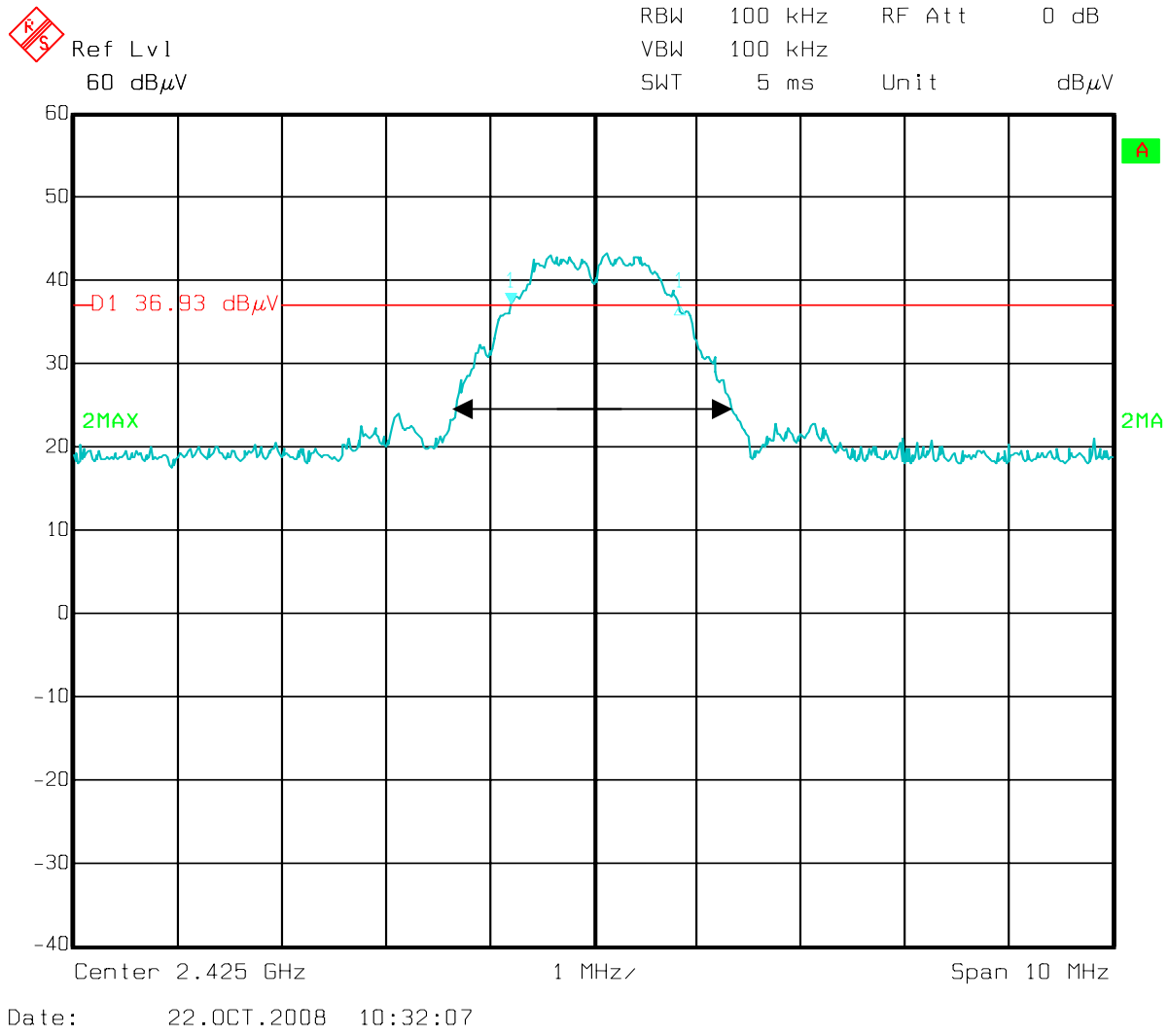
Sample Number:	161714	**Temperature:**	24 °C
Date:	10-22-08	**Humidity:**	34%
Modification State:	Lo/Mid/High Channels	**Tester:**	Alan Laudani
		Laboratory:	NOATS

15.247(a)(1)

Measurements were made at 1 meter. Analyzer RES BW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a double arrowed line was drawn 20 dB lower than PEAK level. The bandwidth was determined from where the channel output spectrum intersected the display line.

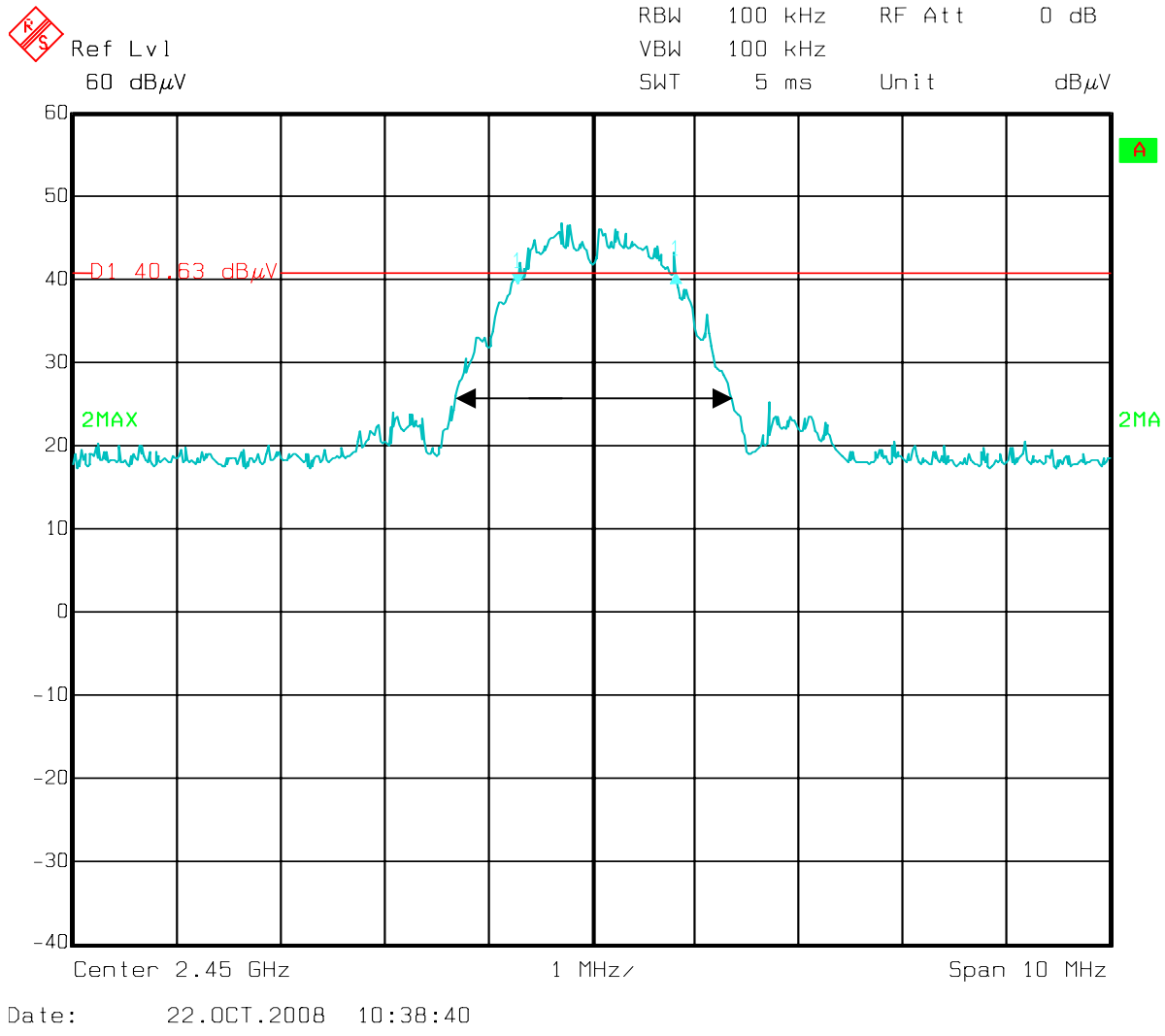
Test Results:

	20 dB Bandwidth		
	Low Channel	**Mid Channel**	**High Channel**
Original Data	2.70 MHz	2.70 MHz	2.70 MHz



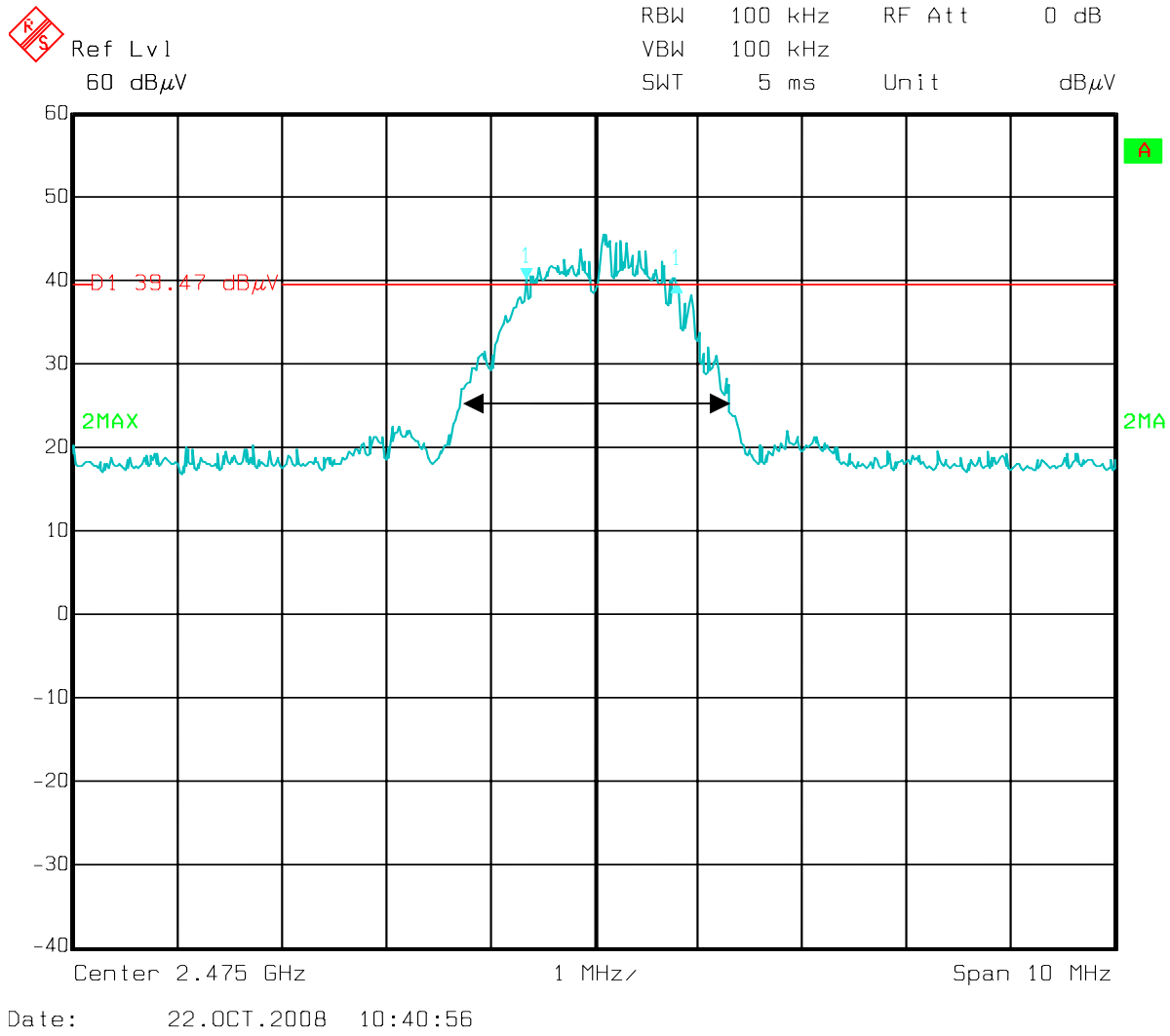
Low Channel

2.70 MHz



Mid Channel

2.70 MHz



High Channel

2.70 MHz

5.4. Out-of-band Emissions / Radiated Emissions within Restricted Bands

(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (uV/meter)	Measurement Distance (meter)
0.009-0.490	2400/F (kHz)	300
0.490-1.705	24000/F (kHz)	30
1.705-30.0	30	3
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Sec. 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Sec. 15.205(a), must also comply with the radiated emission limits specified in Sec. 15.209(a) (see Sec. 15.205(c)).

A8.5 Out-of-band Emissions

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under Section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required.

Sample Number:	161714	**Temperature:**	24°C
Date:		**Humidity:**	34 %
Modification State:	Lo/Mid/High Channels	**Tester:**	Alan Laudani
		Laboratory:	NOATS

Test Results:

See Table.

Additional Observations:

- The Spectrum was searched from 30MHz to the 10th Harmonic, 25000 MHz. There are no emissions found that do not comply to the restricted bands defined in FCC Part 15 Subpart C, 15.205 or Part 15.247(d).
- The EUT was measured on three orthogonal axes.
- Radiated Measurements below 1GHz were performed at 3m with a Quasi-Peak detector (RBW 120kHz/VBW 300kHz) while Radiated Peak (RBW 1MHz/VBW 3MHz) measurements conducted above 1GHz.
- Average = Peak – Duty Cycle Factor
- The device has an integral antenna with no conducted emissions measurement capability.
- RXT9000-0701E as a model number has been revised to 161714.
- Measurements were made after fresh batteries were installed.

Radiated Emissions Data

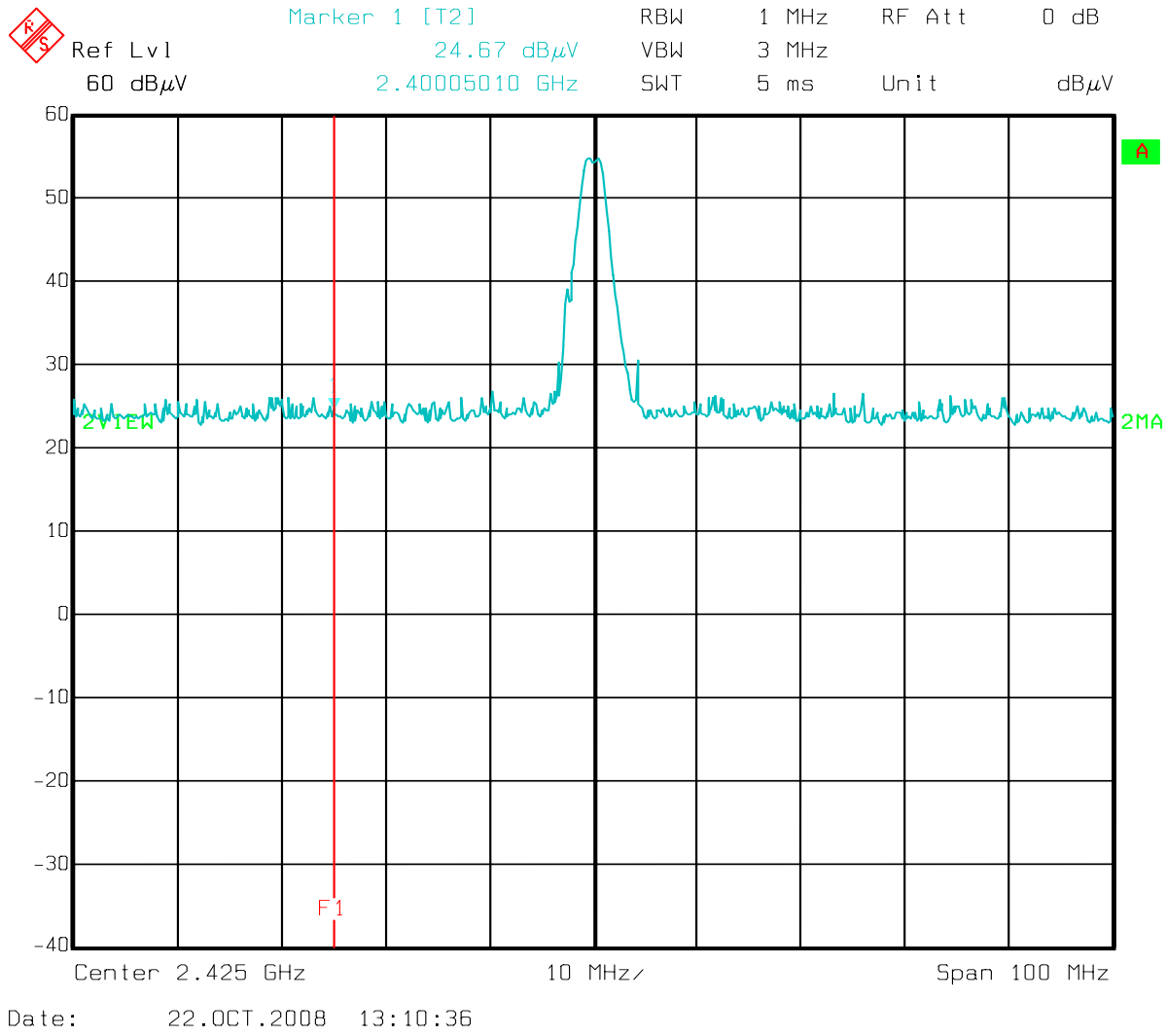
Job # :	13395-1	Date :	1630pm	Page	1 of 1
NEX #:	115461	Time :	10-22-08		
		Staff :	aal		
Client Name :	SMK Manufacturing INC			EUT Voltage :	
EUT Name :	Touch Pad Remote			EUT Frequency :	dc
EUT Model # :	RXT9000-0701E			Phase:	1
EUT Serial # :	NA			NOATS	X
EUT Config. :	Transmit-- test configuation			SOATS	
				Distance < 1000 MHz:	3 m
Specification :	CFR47 Part 15C 15.249 15.209			Distance > 1000 MHz:	3 m

Loop Ant. #:	NA	Temp. (°C) :	24
Bicon Ant.#:	114	Humidity (%) :	34
Log Ant.#:	110	Spec. An.#2	835
DRG Ant. #	752	Spec. An.#1:	898
Cable LF#:	NOATS	Spec An. Display #:	898
Cable HF#:	40ft	QP #:	898
Preamp LF#:	NA	PreSelect#:	899
Preamp HF#	317	DCF	-10.2

Quasi-Peak	RBW: 120 kHz
	Video Bandwidth 300 kHz
Peak (Fundamental) RBW:	3 MHz
	Video Bandwidth 3 MHz
Peak	RBW: 1 MHz
	Video Bandwidth 3 MHz
Average = Peak + Duty Cycle Factor	

Meas. Freq. (MHz)	Meter Reading **Vertical**	Meter Reading **Horizontal**	Det.	EUT Side F/L/R/B	Ant. Height m	Max. Reading (dBµV)	Corrected Reading (dBµV/m)	Spec. limit (dBµV/m)	CR/SL Diff. (dB)	Pass Fail	Comment
2400.0	25.2	24.9	P		1.0	25.2	58.4	74.0	-15.6	Pass	upright worst case
2400.0	15.0	14.7	A		1.0	15.0	48.1	54.0	-5.8	Pass	
2425.0	**56.7**	**56.5**	**P**		**1.0**	**56.7**	**89.9**	**125.23**	**-35.4**	Pass	upright
2425.0	56.4	52.7	P		1.2	56.4	89.6	125.23	-35.7	Pass	side
2425.0	55.3	55.8	P		1.5	55.8	89.0	125.23	-36.3	Pass	back
2425.0	42.1		PSD		1.0	42.1	75.3	103.23	-28.0	Pass	power spectral density
4850.0	46.4	45.0	P		1.0	46.4	52.0	74.0	-22.0	Pass	upright
4850.0	36.2	34.8	A		1.0	36.2	41.8	54.0	-12.2	Pass	
4850.0	46.7	48.4	P		1.0	48.4	54.0	74.0	-20.0	Pass	side
4850.0	36.5	38.2	A		1.0	38.2	43.8	54.0	-10.2	Pass	
4850.0	45.6	44.6	P		1.0	45.6	51.2	74.0	-22.8	Pass	back
4850.0	35.4	34.4	A		1.0	35.4	41.0	54.0	-13.0	Pass	
2450.0	**54.9**	**57.8**	**P**		**1.0**	**57.8**	**91.0**	**125.23**	**-34.3**	Pass	upright
2450.0	55.5	53.7	P		1.0	55.5	88.7	125.23	-36.6	Pass	side
2450.0	54.0	55.6	P		1.0	55.6	88.8	125.23	-36.5	Pass	back
2450.0		44.4	PSD		1.0	44.4	77.6	103.23	-25.7	Pass	power spectral density
4900.0	50.8	47.4	P		1.0	50.8	56.6	74.0	-17.4	Pass	side worst case
4900.0	40.6	37.2	A		1.0	40.6	46.4	54.0	-7.6	Pass	
4900.0	50.7	51.5	P		1.0	51.5	57.3	74.0	-16.7	Pass	
4900.0	**40.5**	**41.3**	**A**		**1.0**	**41.3**	**47.1**	**54.0**	**-6.9**	Pass	
4900.0	48.0	50.9	P		1.0	50.9	56.7	74.0	-17.3	Pass	
4900.0	37.8	40.7	A		1.0	40.7	46.5	54.0	-7.5	Pass	
2475.0	**52.3**	**55.5**	**P**		**1.0**	**55.5**	**88.7**	**125.23**	**-36.6**	Pass	**upright**
2475.0	53.5	52.5	P		1.0	53.5	86.7	125.23	-38.6	Pass	side
2475.0	52.0	52.7	P		1.2	52.7	85.9	125.23	-39.4	Pass	back
2475.0		43.2	PSD		1.0	43.2	76.4	103.23	-26.9	Pass	power spectral density
2483.5	25.2	26.9	P		1.0	26.9	60.1	74.0	-13.9	Pass	upright worst case
2483.5	15.0	16.7	A		1.0	16.7	49.8	54.0	-4.1	Pass	
4950.0	47.9	46.1	P		1.0	47.9	53.7	74.0	-20.3	Pass	upright worst case
4950.0	37.7	35.9	A		1.0	37.7	43.5	54.0	-10.5	Pass	
4950.0	45.7	44.8	P		1.0	45.7	51.5	74.0	-22.5	Pass	
4950.0	35.5	34.6	A		1.0	35.5	41.3	54.0	-12.7	Pass	
4950.0	45.2	46.6	P		1.0	46.6	52.4	74.0	-21.6	Pass	
4950.0	35.0	36.4	A		1.0	36.4	42.2	54.0	-11.8	Pass	

5.5. Bandedge Measurements



Low Channel 2425 MHz (Peak Measurement)

Frequency line is 2400MHz

Measurement 24.7 dBµV/m

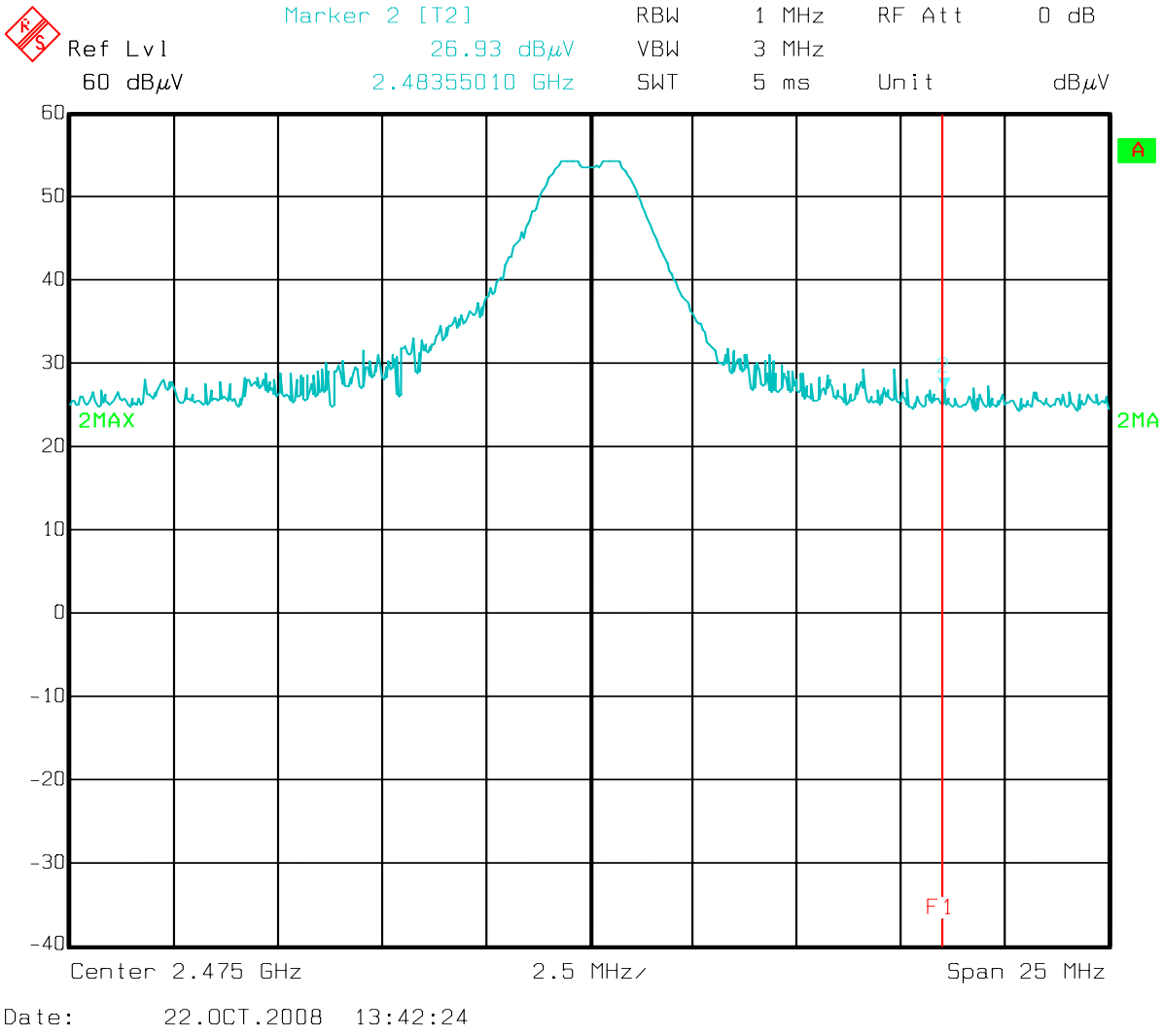
+ 27.3 Antenna factor

+5.9 Cable loss

= 57.9 dBµV/m complies with 74 dBµV/m

Average = Peak – 10.2 dB DCF

= 47.7 dBµV/m complies with 54 dBµV/m



High Channel 2475 MHz (Peak Measurement)

Frequency line is 2483.5 MHz

Measurement 26.9 dBµV/m

+ 27.3 Antenna factor

+5.9 Cable loss

= 60.1 dBµV/m complies with 74 dBµV/m

Average = Peak – 10.2 dB DCF

= 49.8 dBµV/m complies with 54 dBµV/m

5.6. Minimum 6dB RF Bandwidth

(a)(2) Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

A8.2 (a) The minimum 6 dB bandwidth shall be at least 500 kHz.

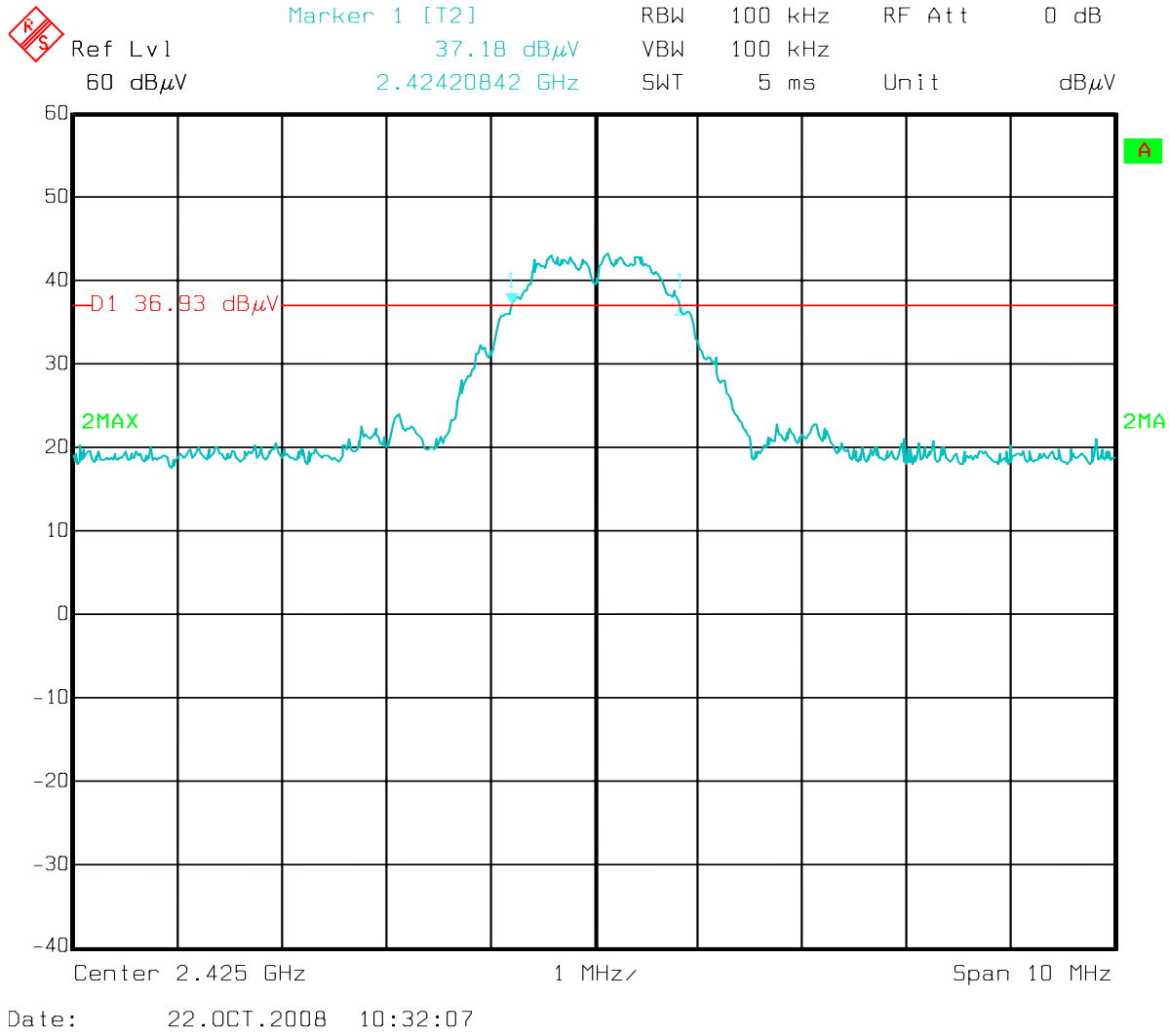
Sample Number:	161714	**Temperature:**	24°C
Date:	10-22-08	**Humidity:**	34 %
Modification State:	Lo/Mid/High Channels	**Tester:**	Alan Laudani
		Laboratory:	SOATS

Test Results:

6dB Bandwidth:

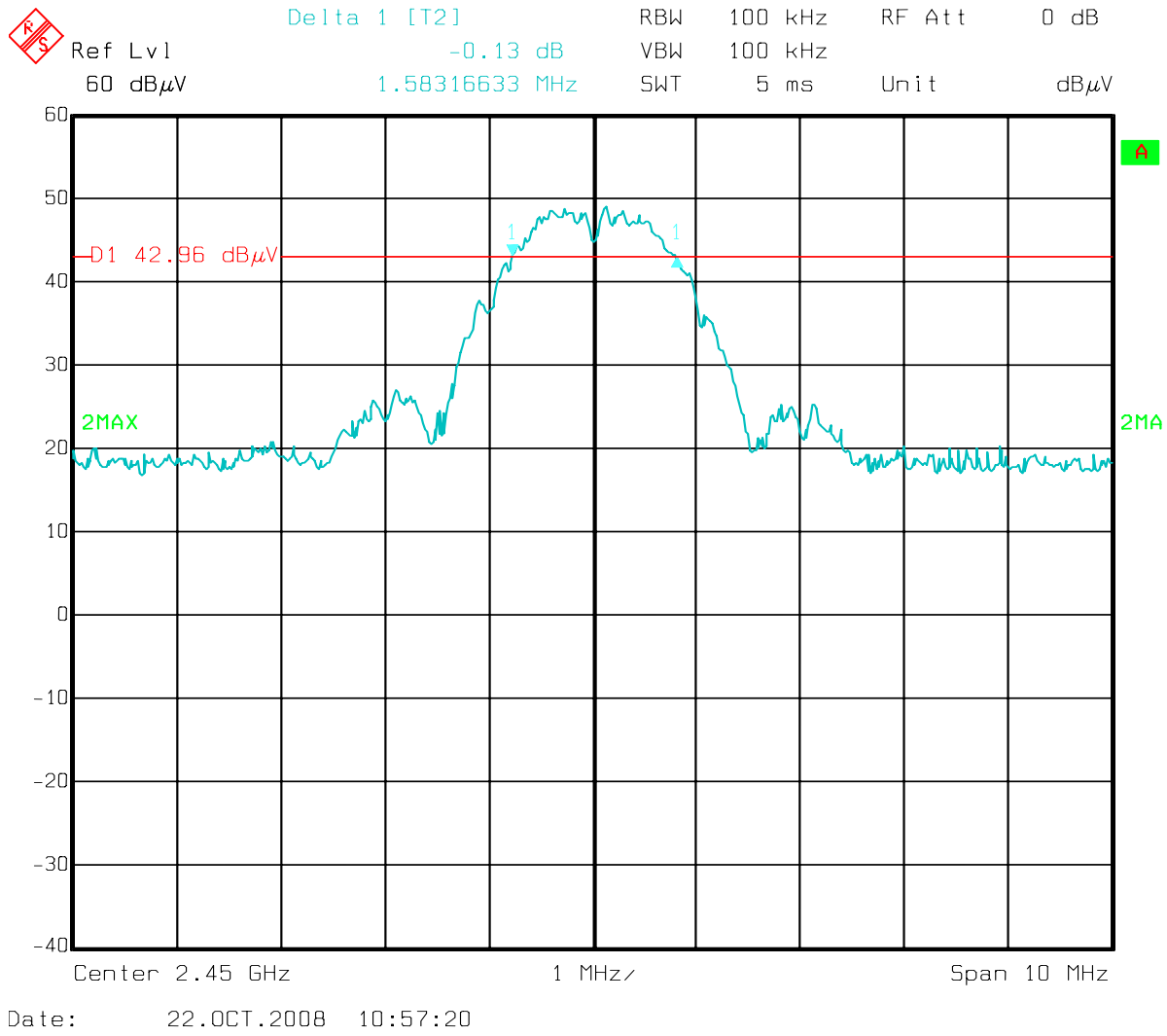
Measurements were made at 3 meters. Each channel investigated was maximized in the OATS before any reading was made. Analyzer RES BW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was plotted, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6 dB bandwidth was determined from where the channel output spectrum intersected the display line.

Channel Range	6 dB Bandwidth
Low (2425 MHz)	1.58 MHz
Mid (2450 MHz)	1.58 MHz
High (2475 MHz)	1.44 MHz

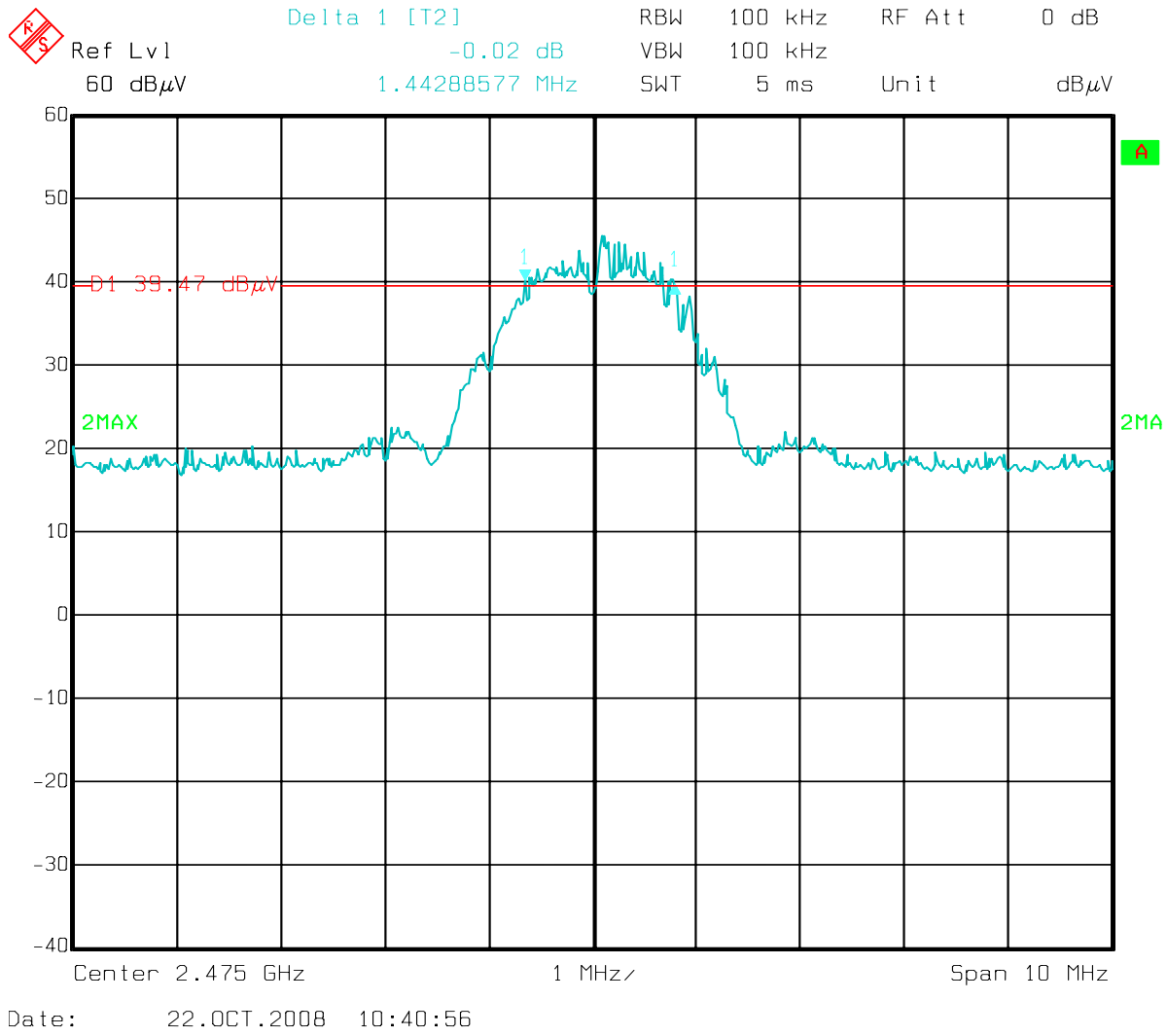


LOW Channel (2405 MHz)

(1.58 = 2 x 2425.0 - 2424.208)



MID Channel (2440 MHz)



HIGH Channel (2480 MHz)

5.7. Maximum peak output power

(b) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signalling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

A8.5
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under Section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required.

Sample Number:	161714	**Temperature:**	24°C
Date:	10-22-08	**Humidity:**	34 %
Modification State:	Lo/Mid/High Channels	**Tester:**	Alan Laudani
		Laboratory:	SOATS

Test Results: Using values from table Radiated Emissions, page 14.

Channel	Frequency (MHz)	Measured Output Power (dBµV/m)	Measured Output Power (mW)	Measured Output Power (dBm)	Calculated Output Power (-2 dBi gain) (W)
Low	2425	89.9	0.293mW	-5.3	0.00046
Mid	2450	91.0	0.378 mW	-4.2	0.00060
High	2475	88.7	0.222 mW	-6.5	0.00035

Additional Observations:

- **Investigations were made at 3 meters. Each channel investigated was maximized in the OATS. Analyzer RES BW was set to 3 MHz and VBW to 3 MHz for fundamental power level measurements.**
- **A correction factor of 33.2 dB was added to compensate for antenna factor and cable loss at the fundamental frequencies.**
- **Measurements were made after fresh batteries were installed.**
- **The peak level measured was converted to mW using the formula:**
- **Manufacturer's antenna gain: -2 dBi gain**

$E = 10^{((dB\mu V/m-120/20)}$
$0.0355 = 10^{((91.0-120)/20)}$

$G = 10(2dBi/10) = 1.58$
$P = (E \times d)^2 / (30 \times 1.58)$
$(0.0355 \times 3)^2 / 30 / 1.58 = 0.000597$ or 0.0006 W

Where: P = Power in watts
E = measured maximum field strength in V/m
d =distance in meters during measurement
G = numeric gain of the transmitting antenna over an isotropic radiator (assume 1.)

Correction Factor for all measurements = 33.2 (27.3 Antenna factor + 5.9 Cable loss)
Corrected Reading = Max Reading + Correction Factor
= 59.8 + 33.2
= 91.0 dBuV/m

5.8. Power Spectral Density

(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.
A8.2(b) The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission or over 1.0 second if the transmission exceeds 1.0-second duration. This power spectral density shall be determined in accordance with the provisions of Section A8.4(4); (i.e. the power spectral density shall be determined using the same method for determining the conducted output power).

Sample Number:	161714	**Temperature:**	
Date:	10-22-08	**Humidity:**	
Modification State:	Lo/Mid/High Channels	**Tester:**	Alan Laudani
		Laboratory:	SOATS

Test Results:

Measurements were made at 3 meters. Each channel investigated was maximized in the OATS before any reading was made. Analyzer RES BW was set to3 kHz and the Span was set to 1.5 MHz. Sweep was 600 seconds For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. Measurements were made after fresh batteries were installed.

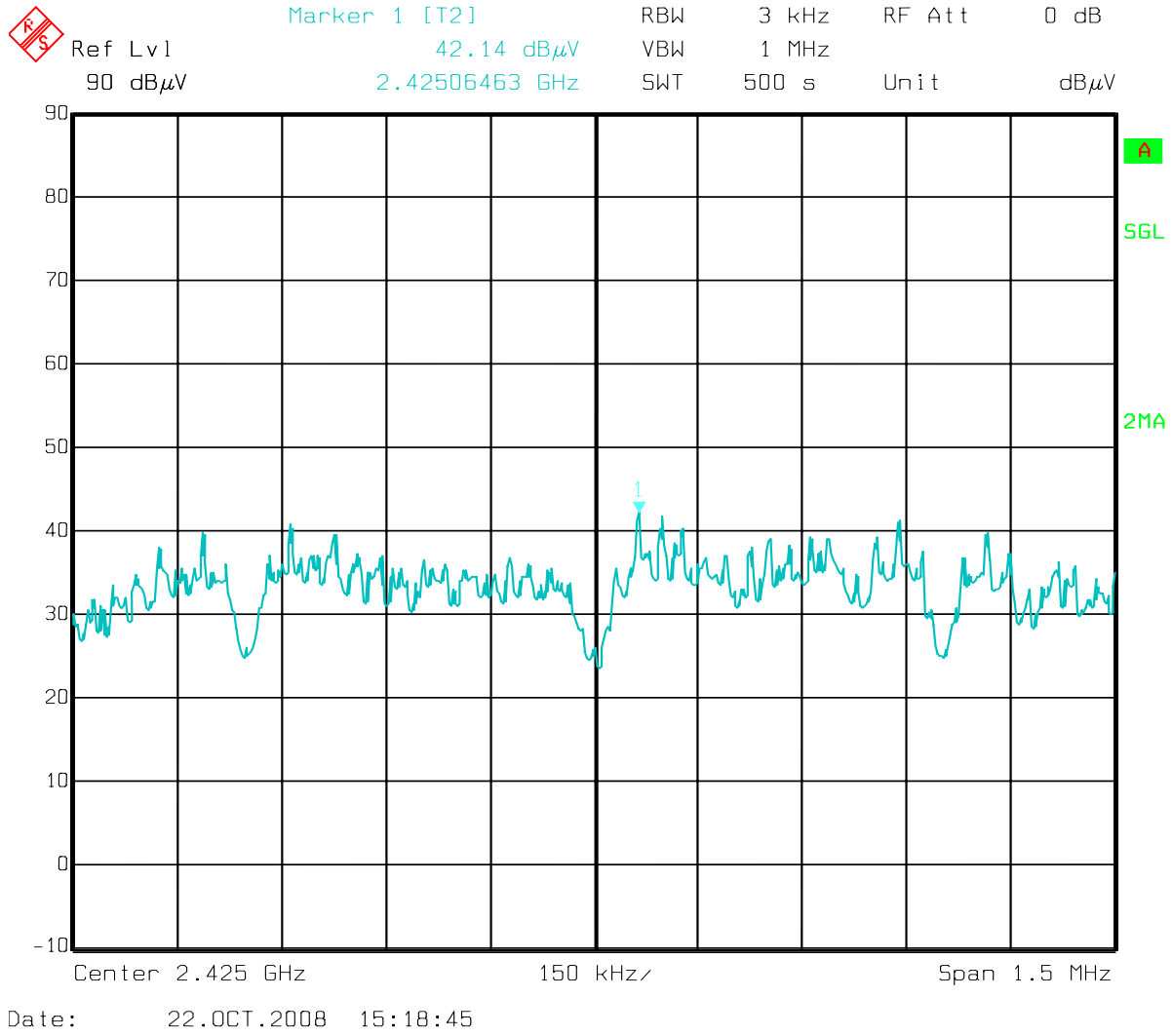
Channel Frequency (MHz)	RF Field Strength (dBuV/m)	Calculated Output Power (-2 dBi gain) (dBm)	Maximum Limit (dBm)	PASS/ FAIL
2425	75.3	-16.0	8	Pass
2450	77.6	-13.7	8	Pass
2475	76.4	-14.9	8	Pass

Using formulae: $V = 10^{\wedge(dB\mu V/m-120)/20)}$ and $P = (E \times d)^2 / (30 \times G)$

$V = 10^{\wedge(75.3\ dB\mu V/m-120)/20)}$

$= (0.0076 \times 3)^2 / 30 / 1.58$

$= -13.7$ dBm

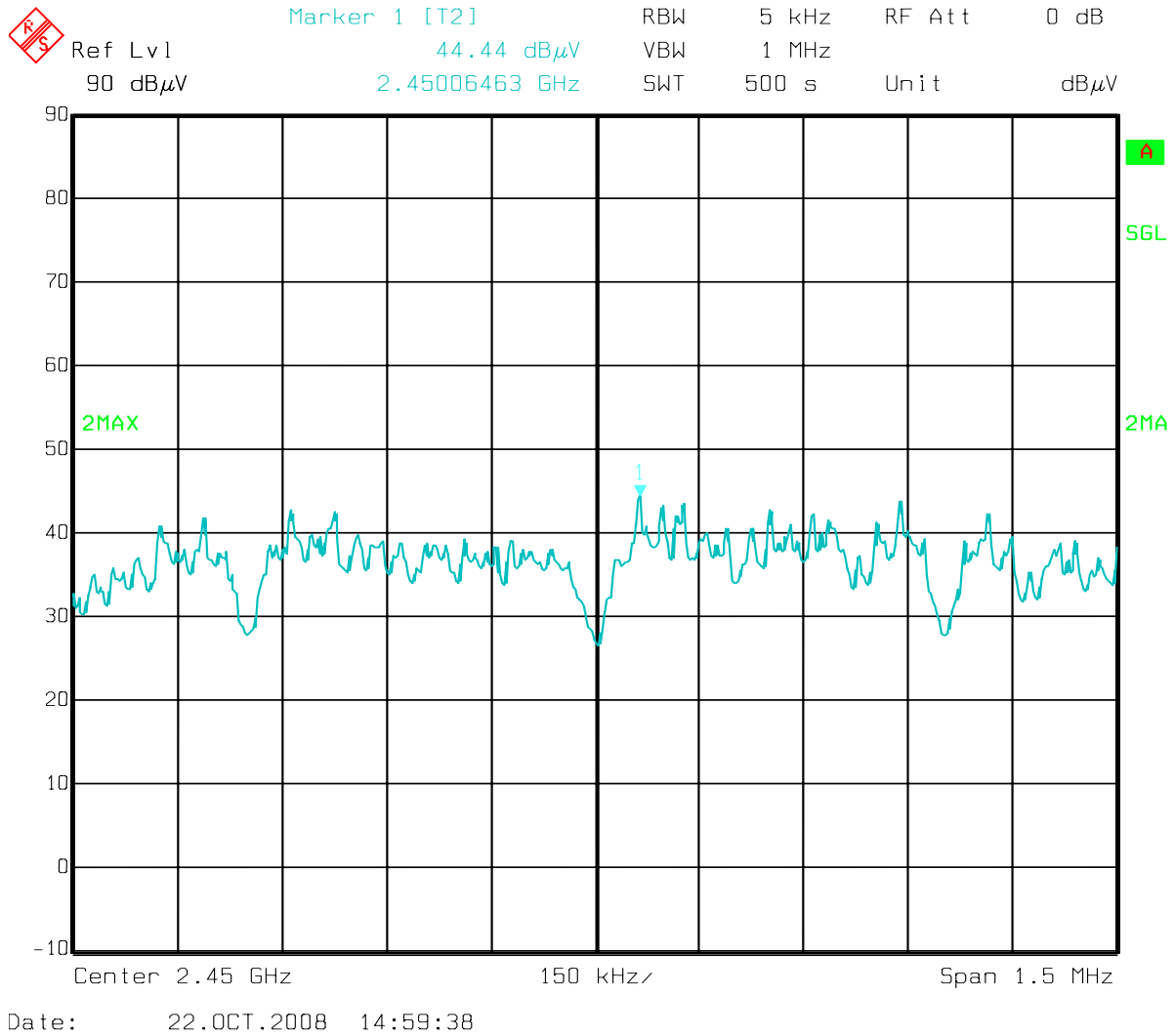


Low Channel 2425 MHz

Raw Measurement 42.1

Antenna Factor and Cable Loss – Add 33.2 dB

Corrected Measurement 75.3

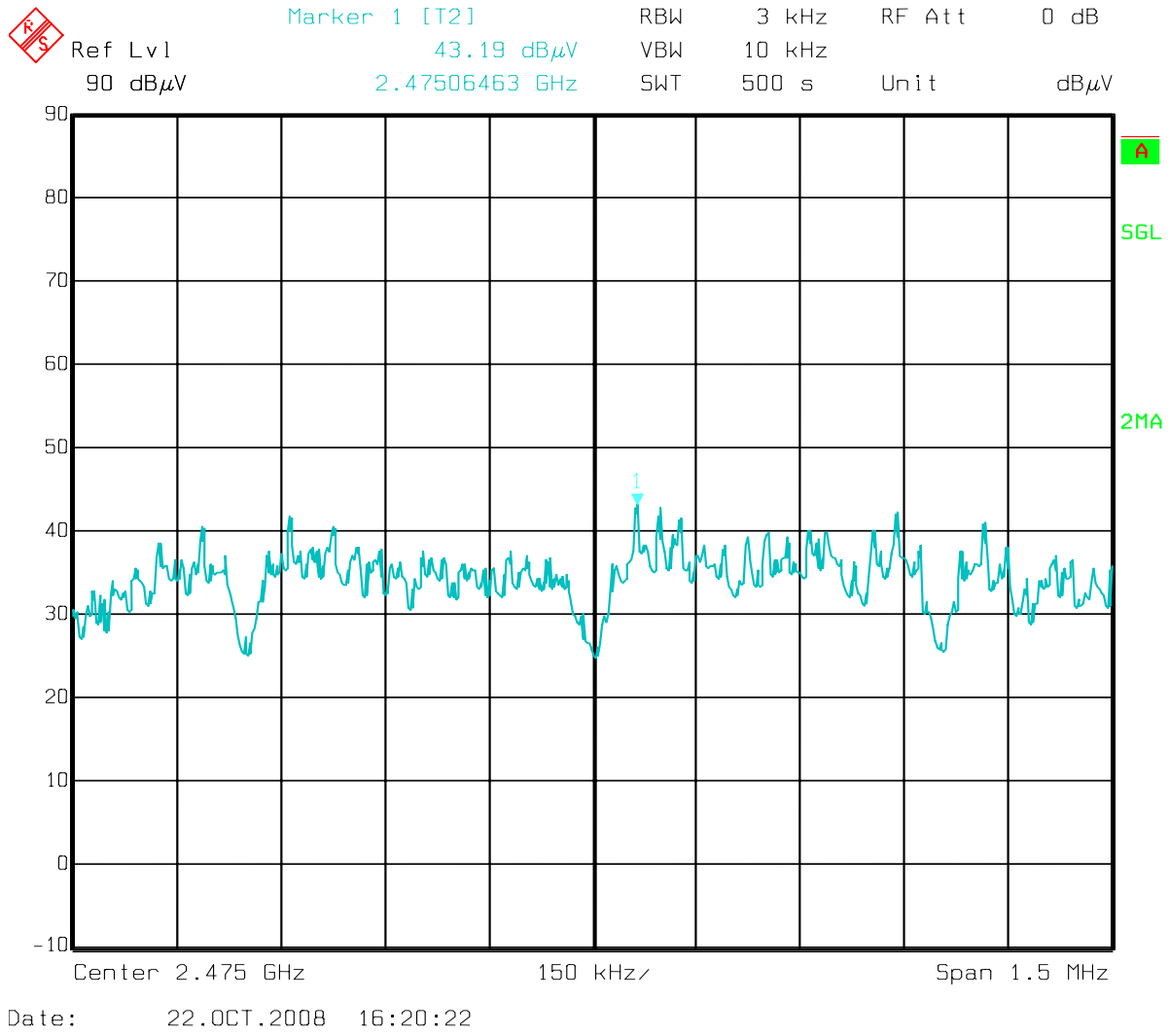


Mid Channel 2450 MHz

Raw Measurement 44.4

Antenna Factor and Cable Loss – Add 33.2 dB

Corrected Measurement 77.6



High Channel 2440 MHz

Raw Measurement 43.2

Antenna Factor and Cable Loss – Add 33.2 dB

Corrected Measurement 76.4

5.9. Test Equipment

Nemko ID	Device	Manufacturer	Model	Serial Number	Cal Date	Cal Due Date
114	Antenna, Bicon	EMCO	3104	2997	10-Jan-08	10-Jan-09
111	Antenna, LPA	EMCO	3146	1382	20-Oct-08	20-Oct-10
317	Preamplifier	HP	8449A	2749A00167	31-Mar-08	31-Mar-09
625	Antenna, Dbl Ridge Horn	EMCO	3116	2325	01-Apr-08	01-Apr-09
752	Antenna, DRWG	EMCO	3115	4943	31-Oct-06	31-Oct-07
835	Spectrum Analyzer	Rohde & Schwarz	RHDFSEK	829058/005	27-Jun-08	27-Jun-09
898	EMI Receiver & filter set	HP	8546A	3625A00348	09-May-08	09-May-09
899	Filter Section	HP	85460A	3448A00288	09-May-08	09-May-09