

**ADC Broadband Communications
FCC Part 15, Certification Application
Local Status Monitor Controller (LSMC-01)**

April 23, 2000

MEASUREMENT/TECHNICAL REPORT

COMPANY NAME: **ADC Broadband Communications**

MODEL: **Local Status Monitor Controller (LSMC-01)**

FCC ID: **OW8LSMC01400**

DATE: **April 23, 2000**

This report concerns (check one): Original grant X
Class II change _____

Equipment type: _____

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? yes _____ No X

If yes, defer until: _____
date

N.A. agrees to notify the Commission by N.A.
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Report prepared by:

United States Technologies, Inc.
3505 Francis Circle
Alpharetta, GA 30004

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SECTION 1

GENERAL INFORMATION

GENERAL INFORMATION

1.1 Product Description

The Equipment Under Test (EUT) is an ADC Broadband Communications, Model Local Status Monitor Controller (LSMC-01). The ADC Broadband Communications LSMC-01 is a wireless communication module that is typically connected to a handheld smart terminal. The purpose of the LSMC is to become a two-way link between a ground located PC terminal (LST-Local Smart Terminal) and the ADC family of CATV RF Network Amplifiers so that technicians can monitor the network.

The EUT is designed to operate on one of two different channel sets. Please refer to the following letter from ADC Broadband Communications.



ADC BROADBAND COMMUNICATIONS
A Division of ADC Telecommunications, Inc.
4500 River Green Parkway
Suite 110
Duluth, GA. 30096

Federal Communications Commission
P.O. Box 429
Columbia, MD. 21045

Date: April 20, 2000

EXHIBIT:

Subject: Frequency planning for LSM-01 and LSMC-01

1)System A frequencies (in MHz) are:

$2400.5 + (\text{channel \#} - 1) * 1 \text{ MHz}$
range: 2401.5 - 2479.5 MHz

2)System B frequencies are:

$2401 + (\text{channel \#} - 1) * 1 \text{ MHz}$
range: 2402 – 2480 MHz

Channel # range from 2 to 80.

1.2 Related Submittal(s)/Grant(s)

The EUT will be used with part of a system to send/receive data. The transceiver presented in this report will be used with another transceiver, which has been submitted under FCC ID: OW8LSM01400

The EUT is subject to the following authorizations:

- a) Certification as a transmitter
- b) Verification as a digital device (Class A)

The information contained in this report is presented for the certification & verification authorization(s) for the EUT.

SECTION 2

TESTS AND MEASUREMENTS

TEST AND MEASUREMENTS

2.1 Configuration of Tested System

The sample was tested per ANSI C63.4, Methods of Measurement from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (1992). Conducted and radiated emissions data were taken with the test receiver or spectrum analyzer's resolution bandwidth adjusted to 9 kHz and 120 kHz, respectively. All measurements are peak unless stated otherwise. The video filter associated with the spectrum analyzer was off throughout the evaluation process. Interconnecting cables were manipulated as necessary to maximize emissions. Interconnecting cables were manipulated as necessary to maximize emissions. A block diagram of the tested system is shown in Figure 1. Test configuration photographs for spurious and digital device emissions are shown in Figure 2.

The sample used for testing was received by U.S. Technologies on February 23, 2000 in good condition.

2.2 Test Facility

Testing was performed at US Tech's measurement facility at 3505 Francis Circle, Alpharetta, GA. This site has been fully described and submitted to the FCC, and accepted in their letter marked 31040/SIT. Additionally this site has also been fully described and submitted to Industry Canada (IC), and has been approved under file number IC2982.

2.3 Test Equipment

Table 2 describes test equipment used to evaluate this product.

2.4 Modifications

Two modifications were made by ADC Broadband Communications in order to bring the EUT into compliance with FCC Part 15 limits for the transmitter portion of the EUT and the Class A Digital Device Requirements. Please refer to the following letter provided by ADC Broadband Communications.



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A Division of ADC Telecommunications, Inc.
4500 River Green Parkway
Suite 110
Duluth, GA. 30096

Federal Communications Commission
P.O. Box 429
Columbia, MD. 21045

Date: April 20, 2000

EXHIBIT:

Subject: LSMC-01 change requirements for FCC approval

In order to meet FCC requirements for certification, ADC Telecommunications, Inc. will incorporate the following changes before any production of the LSMC-01.

- 1) C150 will be changed from 0.75pF to 1.2pF to meet low channel spurious emissions limit at $f_c + 2 \times 281$ MHz where f_c is a transmit frequency.
- 2) The LSMC-01 housing shall be painted inside of the housing with a metallic paint to meet spurious emissions limit at the $2 \times f_c$ MHz where f_c is a transmit frequency. The metallic paint shall be either a copper, silver or nickel material to meet resistance of less than 2 Ohms between any point of the housing.

FIGURE 1a

TEST CONFIGURATION (TRANSMIT/RECEIVE CONFIGURATION)

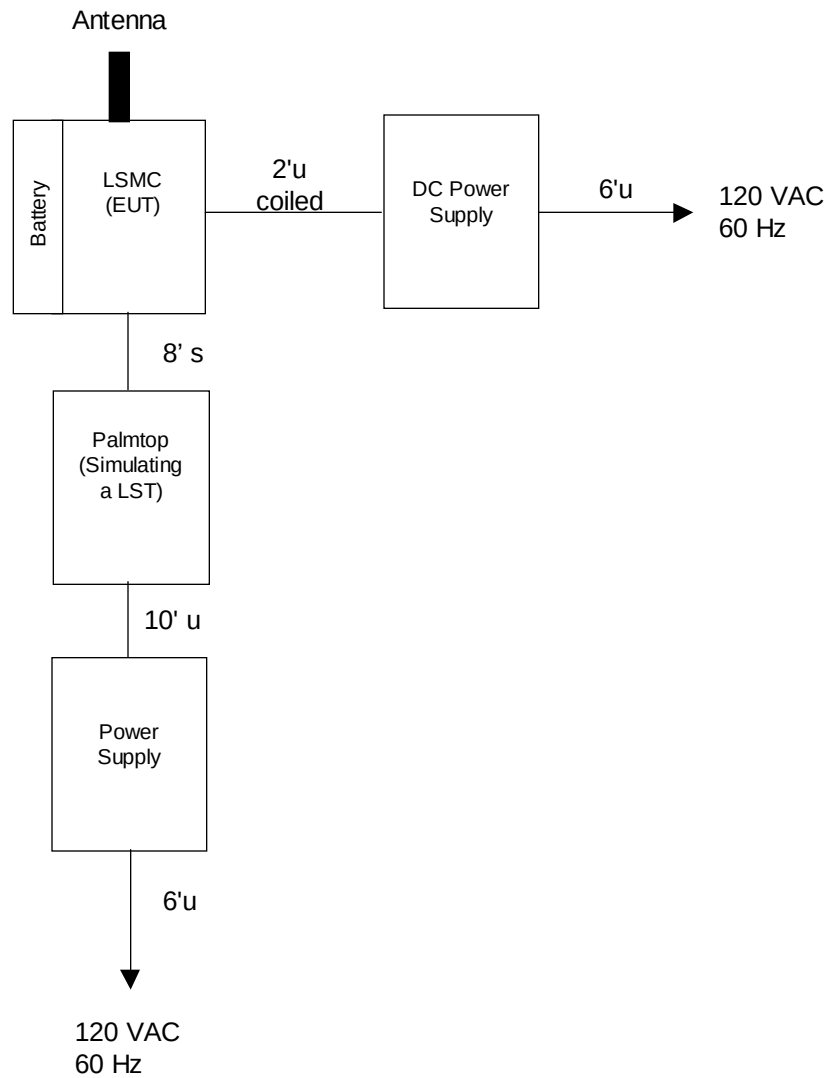
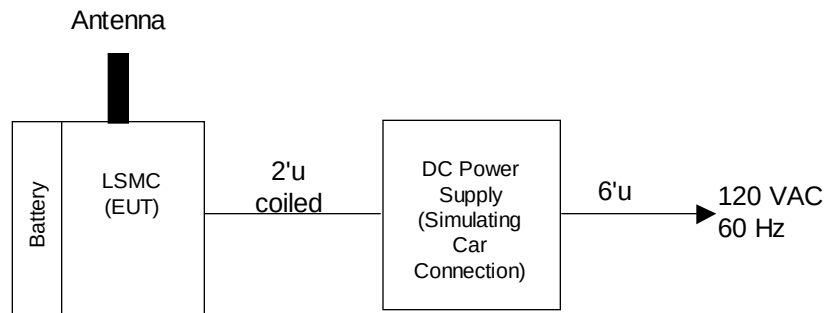


FIGURE 1b

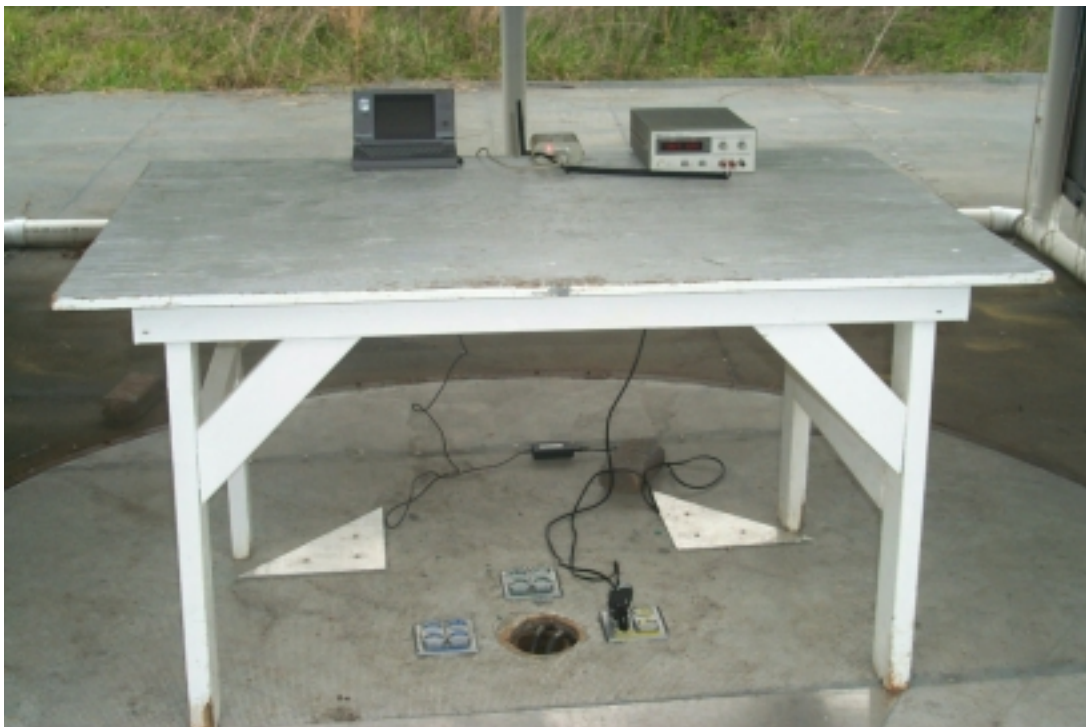
TEST CONFIGURATION (CHARGE MODE CONFIGURATION)



Test Date: April 7 & 19, 2000
UST Project: 00-0002
Customer: ADC Broadband Communications
Model: Local Status Monitor Controller (LSMC-01)

FIGURE 2a

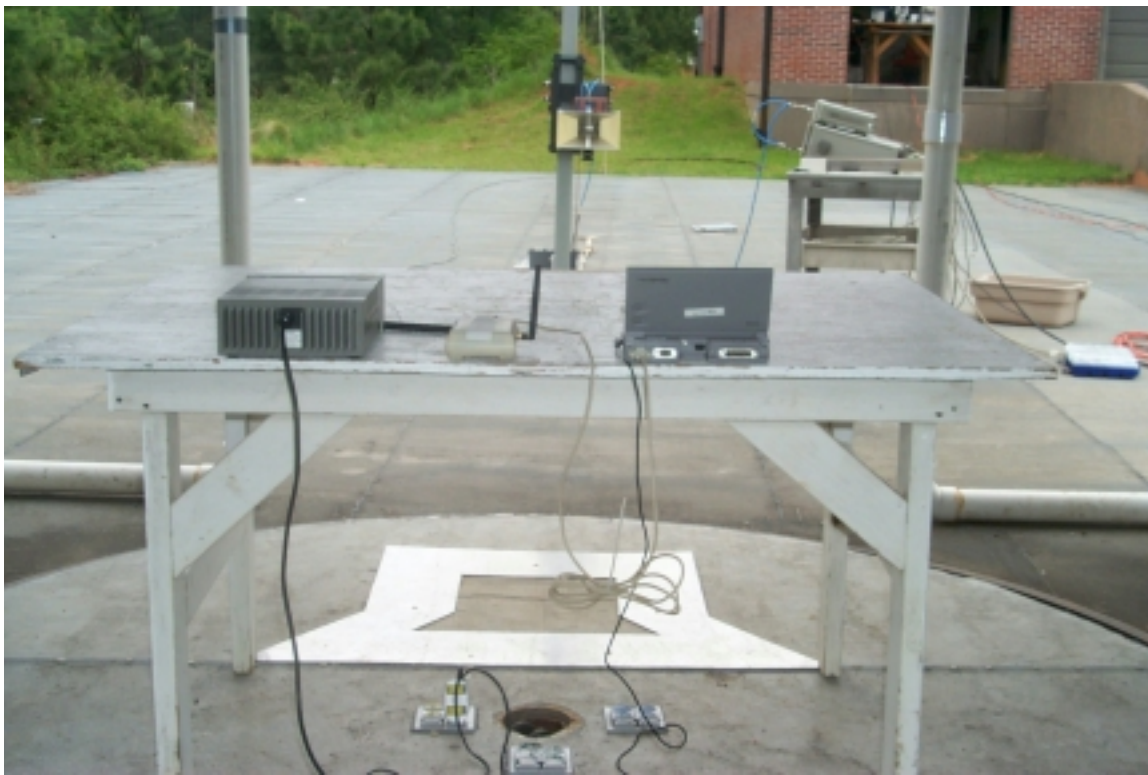
Photograph(s) for Spurious Emissions (Front)



Test Date: April 7 & 19, 2000
UST Project: 00-0002
Customer: ADC Broadband Communications
Model: Local Status Monitor Controller (LSMC-01)

FIGURE 2b

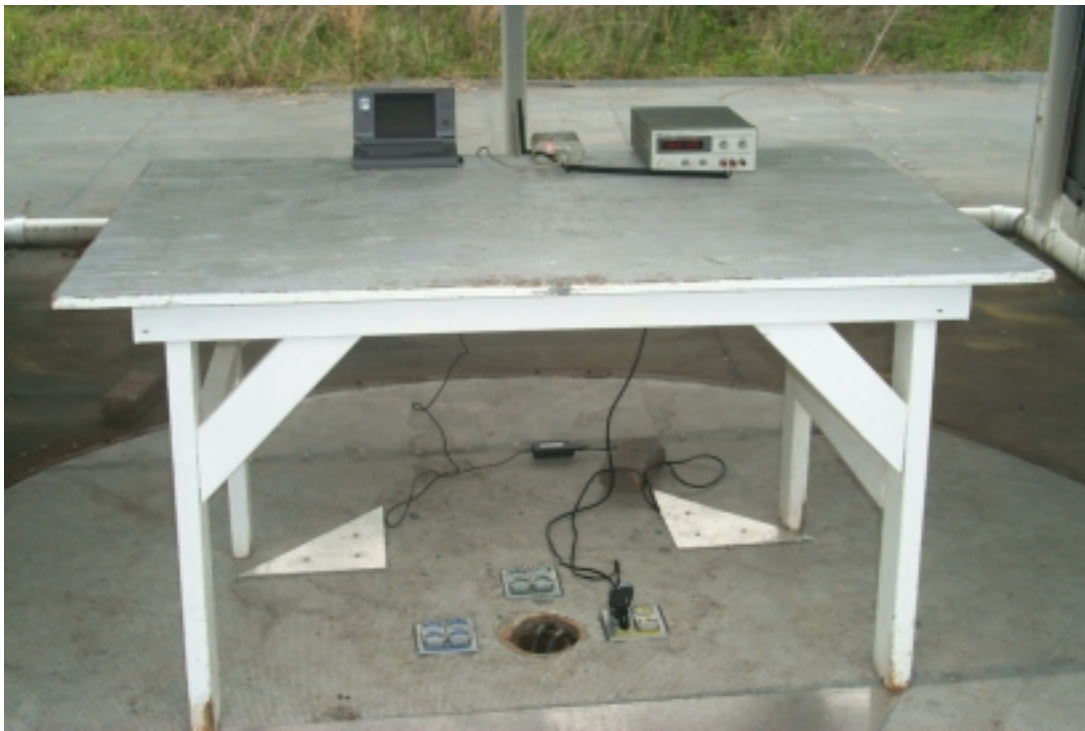
Photograph(s) for Spurious Emissions (Back)



Test Date: February 24, 2000 and March 7, 2000
UST Project: 00-0002
Customer: ADC Broadband Communications
Model: Local Status Monitor Controller (LSMC-01)

FIGURE 2c

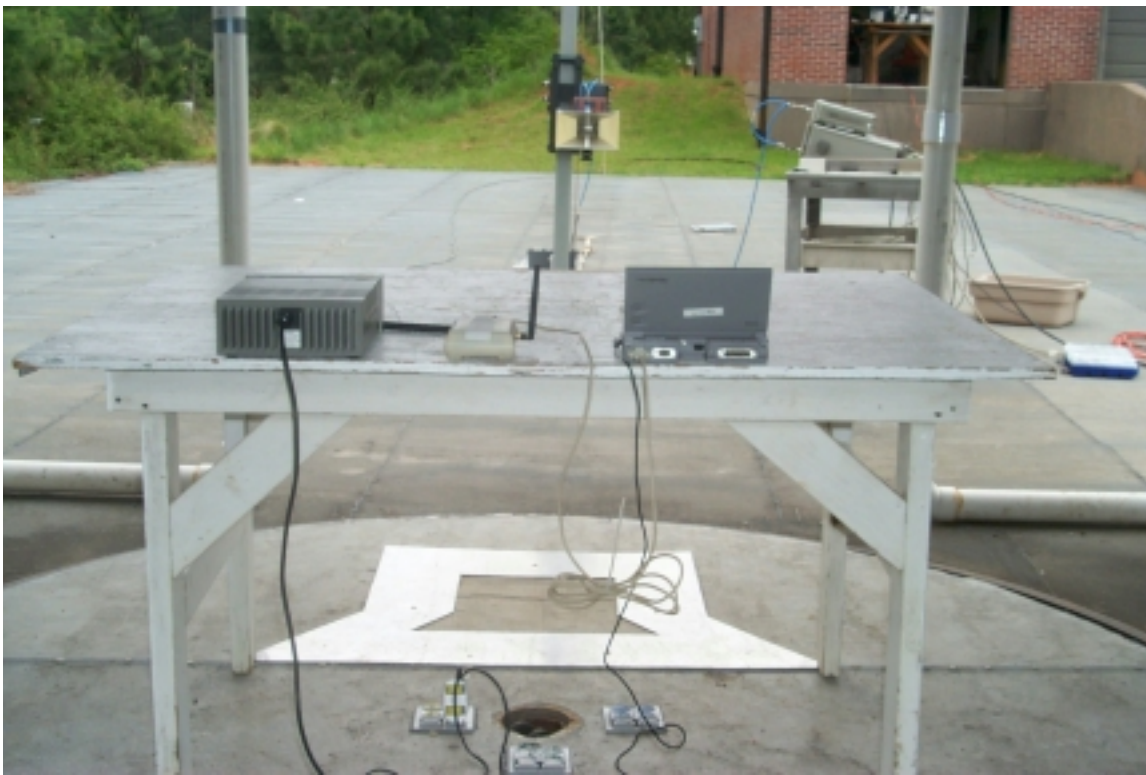
Photograph(s) for Digital Device Emissions (Front)



Test Date: February 24, 2000 and March 7, 2000
UST Project: 00-0002
Customer: ADC Broadband Communications
Model: Local Status Monitor Controller (LSMC-01)

FIGURE 2d

Photograph(s) for Digital Device Emissions (Back)



Test Date: N/A
UST Project: 00-0002
Customer: ADC Broadband Communications
Model: Local Status Monitor Controller (LSMC-01)

FIGURE 2e

Photograph(s) for Digital Device Conducted Emissions

The EUT is designed to operate on battery power, therefore conducted emissions were considered not applicable

TABLE 1**EUT and Peripherals**

PERIPHERAL MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID:	CABLES P/D
Transceiver (EUT) ADC Broadband Communications	LSMC	FCC-01	OW8LSMC01400 (Pending)	8's 2'u coiled
DC Power Supply Hewlett Packard	E3610A	KR41808243	N/A	6' u Power Cord
Power Supply Toshiba	None	None	None	6'u
Palmtop Toshiba	Libretto	Unknown	DoC Approved	10'u

PERIPHERAL MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID:	CABLES P/D
Transceiver (EUT) ADC Broadband Communications	LSMC	FCC-01	OW8LSMC01400 (Pending)	8's 2'u coiled
DC Power Supply Hewlett Packard	E3610A	KR41808243	N/A	6' u Power Cord

TABLE 2
TEST INSTRUMENTS

TYPE	MANUFACTURER	MODEL	SN.
SPECTRUM ANALYZER	HEWLETT-PACKARD	8593E	3205A00124
SPECTRUM ANALYZER	HEWLETT-PACKARD	8558B	2332A09900
S A DISPLAY	HEWLETT-PACKARD	853A	2404A02387
COMB GENERATOR	HEWLETT-PACKARD	8406A	1632A01519
RF PREAMP	HEWLETT-PACKARD	8447D	1937A03355
RF PREAMP	HEWLETT-PACKARD	8449B	3008A00480
HORN ANTENNA	EMCO	3115	3723
BICONICAL ANTENNA	EMCO	3110	9307-1431
LOG PERIODIC ANTENNA	EMCO	3146	9110-3600
LISN	SOLAR ELE.	8012	865577
LISN	SOLAR ELE.	8028	910494
LISN	SOLAR ELE.	8028	910495
THERMOMETER	FLUKE	52	5215250
MULTIMETER	FLUKE	85	53710469
FUNCTION GENERATOR	TEKTRONIX	CFG250	CFG250TW15059
PLOTTER	HEWLETT-PACKARD	7475A	2325A65394

2.6 Antenna Description (Paragraph 15.203)

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

The Model ADC Broadband Communications Local Status Monitor Controller (LSMC-01) incorporates the following antenna only.

Manufacturer:	MVA-Com, Inc.
Type:	Dipole
Model Number:	ANDC-107B-X-O-SZ
Gain:	1.9 dBi
Connector:	Reverse SMA

(Please refer to the following letter from ADC Broadband Communications).



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A Division of AD Telecommunications, Inc.
4500 River Green Parkway
Suite 110
Duluth, GA. 30096

Federal Communications Commission
P.O. Box 429
Columbia, MD. 21045

Date: February 25, 2000

EXHIBIT:

Subject: LSMC Antenna Description

The antenna for LSMC-01 is a 2.4 GHz to 2.48 GHz half wave dipole antenna with 1.9 dBi peak gain. M/A-Com, Inc. manufactures the antenna under part number ANDC-107B-X-O-SZ

2.7 Peak power within the band 2400 – 2483.5 GHz per FCC Section 15.247(b)

Peak power within the band 2400-2483.5 GHz has been measured with a spectrum analyzer by connecting the spectrum analyzer directly via a short cable to the antenna output terminals or across the antenna leads on the PCB as specified by the manufacturer. The spectrum analyzer was set for a 50 Ω impedance with the VBW $\geq$ RBW 6 dB bandwidth. The results of the measurements are given in Table 3 and Figure 3a through Figure 3c.

The EUT did not incorporate any antennas of directional gain greater than 6 dBi, therefore the output power has not been reduced as required by 15.247(b)(3).

TABLE 3
PEAK POWER OUTPUT

Test Date: April 20, 2000
UST Project: 00-0002
Customer: ADC Broadband Communications
Model: Local Status Monitor Controller (LSMC-01)

Frequency of Fundamental (MHz)	Measurement (dBm)*	Measurement (Watt)*	FCC Limit (Watt)
2401.4	15.7	0.0372	1.0
2440.6	17.0	0.0501	1.0
2479.6	17.3	0.0537	1.0

*** Measurement includes 0.5 dB cable loss**

Tester
Signature: _____ **Name:** Tim R. Johnson

Figure 3a.
Peak Power per FCC Section 15.247(b) (Low)

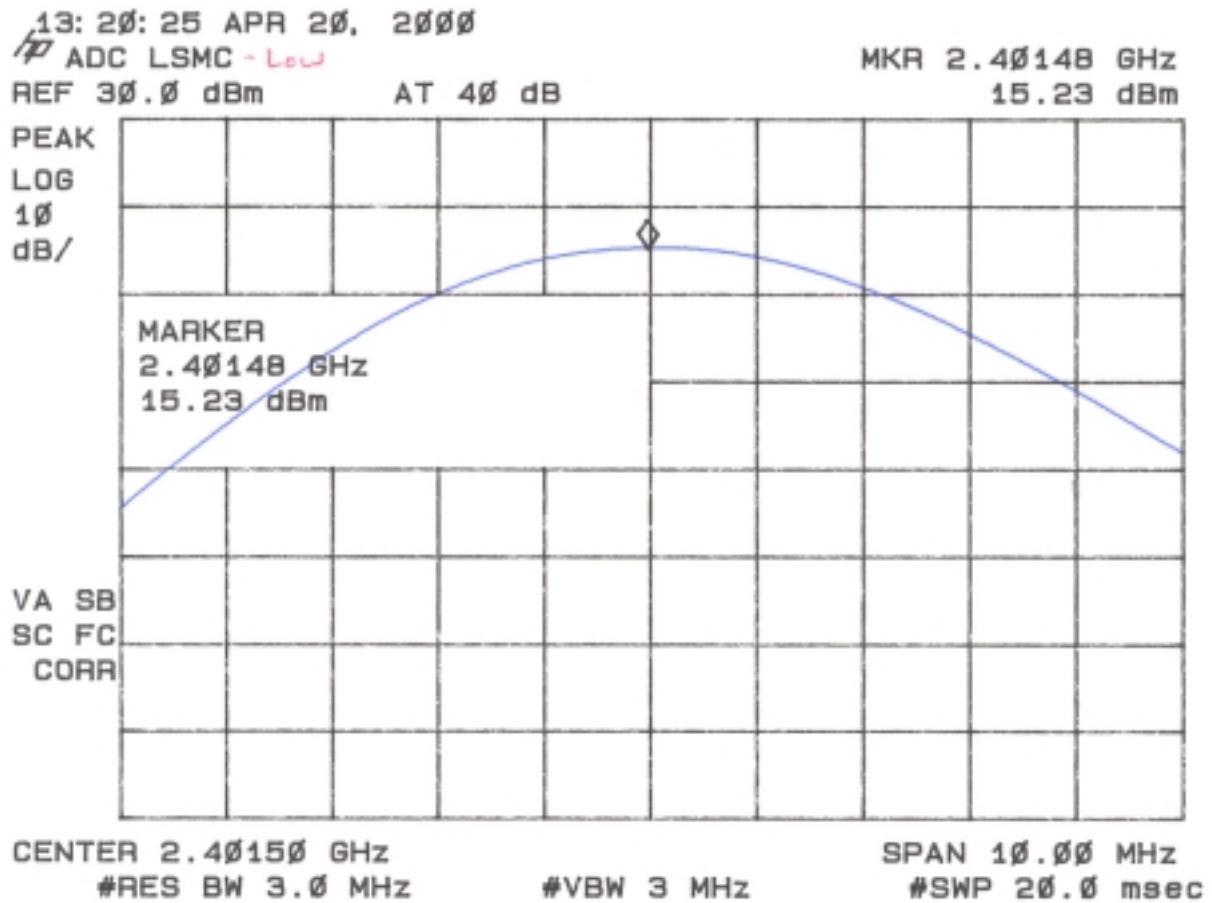


Figure 3b.
Peak Power per FCC Section 15.247(b) (Mid)

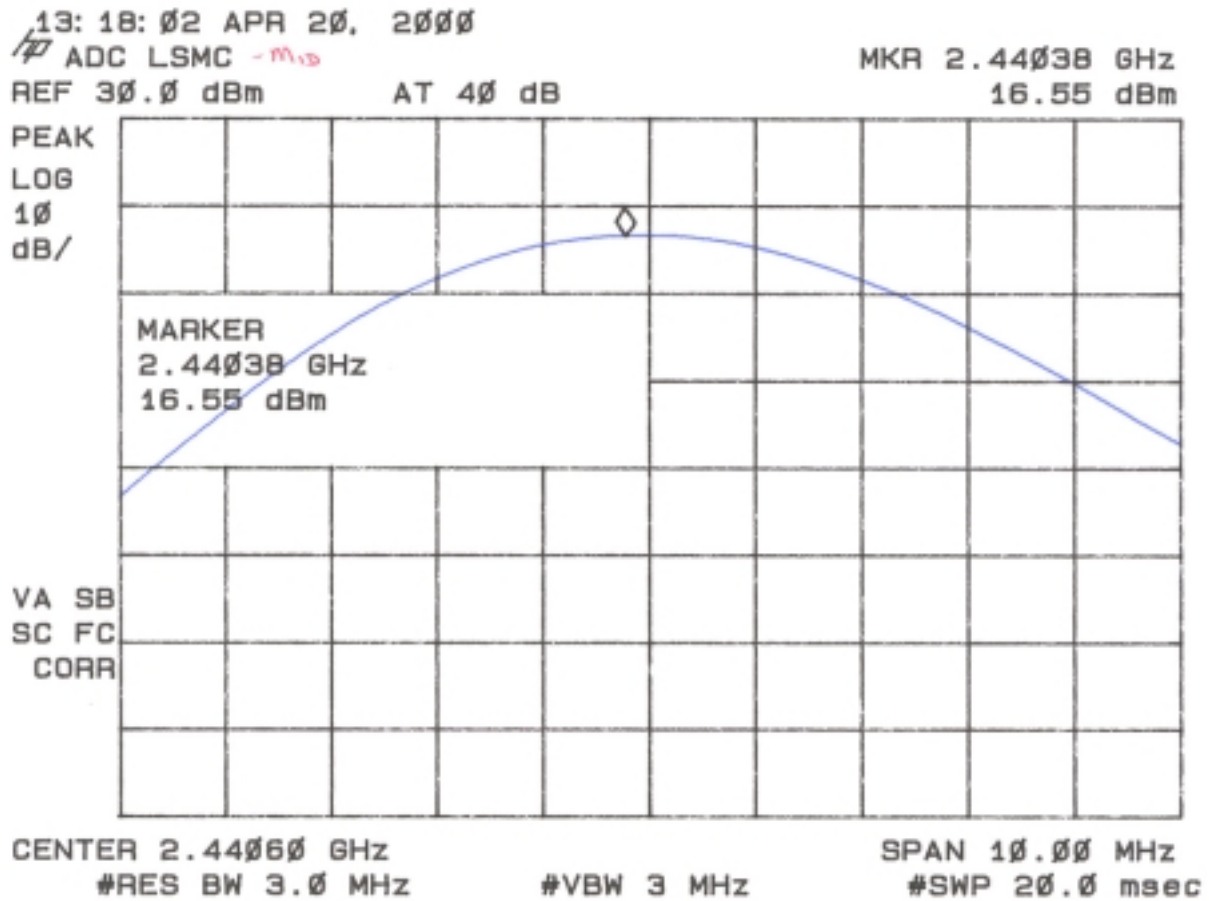


Figure 3c.
Peak Power per FCC Section 15.247(b) (High)

