Intertek Testing Services
ETL SEMKO

TEST REPORT

Report Number: 30332142
Project Number: 3033214

Report Date: October 14, 2002
Date of Test: September 5 – October 14, 2002

Testing performed on the

Model: AirMAX 580/5800
FCC ID: QGQ-AM581

to

FCC Part 15.247 Direct Sequence Spread Spectrum

for

Malibu Networks

Test Performed by:
Intertek Testing Services
1365 Adams Court
Menlo Park, CA 94025

Test Authorized by:
Malibu Networks
1107 Investment Blvd., Suite 250
El Dorado Hills, CA 95762

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David Chernomordik

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Ollie Moyrong

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TABLE OF CONTENTS

1.0 Summary of Tests

MODEL: AirMAX 580/5800
FCC ID: QGQ-AM581

TEST	REFERENCE	RESULTS
Output power	15.247(b)	Complies
6 dB Bandwidth	15.247(a)(2)	Complies
Power Density	15.247(d)	Complies
Out-of-band Antenna Conducted Emission	15.247(c)	Complies
Out-of-band Radiated Emission (except emissions in restricted bands)	15.247(c)	Not Applicable. The EUT passed out-of-band antenna conducted emission
Radiated Emission in Restricted Bands	15.209, 15.205	Complies
AC Line-conducted Emission	15.207	Complies
Digital part Radiated Emission	15.109	Complies
Radiated Emission from Receiver L.O.	15.109, 15.111	Not Applicable. The operating frequency is above 960 MHz
Radiation Exposure Requirement	2.1091	Complies, see exhibit “RF Exposure”
Antenna Requirement	15.203	Not applicable, The EUT requires professional installation

2.0 General Description

2.1 Product Description

The Malibu AirMAX™ System is made up of "Base Station Equipment" (BSE) radios and "Customer Premises Equipment" (CPE) radios. The BSE stations are considered point-to- multipoint systems because they communicate with several different CPE stations on a regular basis. The CPE stations are considered point-to-point because they only communicate back to a particular BSE station. Both the BSE and the CPE stations operate on the 5.8 GHz ISM band utilizing IEEE 802.11 protocol. Both the BSE and the CPE radio are identical. The only difference between the two stations, if any at all, will be the antenna that is used at the installation.

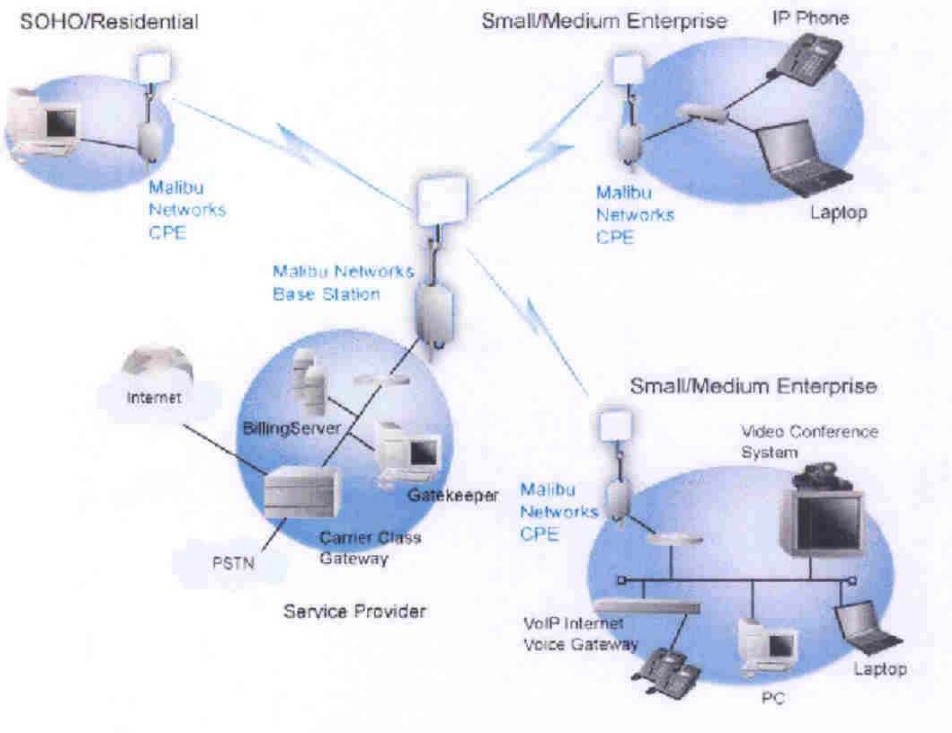
The BSE and CPE may utilize two types of high gain antennas up to and including, a 8/110 dBi Omni and a 11/14 dBi panel antenna. It is expected that in some cases, antennas with lower gains will be used, however the units were tested with these higher gain antennas to allow use of lower gain antennas.

Malibu Networks customers for the AirMAX system will typically be an ISP or a business who wishes to provide wireless Internet connectivity for their customers / employees. Malibu Networks will not be selling the products to the end user of the system. This being the case, both the BSE and the CPE radios are professionally installed and configured.

The transmitter in the AirMAX radio is used a previously certified Cisco 802.11 2.4 GHz PCMCIA card (FCC ID: LDK102040). The Unit is powered by a generic wall plug AC adapter and Power over Ethernet.

A functional diagram of the Malibu Networks wireless system is shown in the diagram to the right.

The diagram shows a AirMAX BSE station supporting 3 AirMAX CPE stations.



Overview of the EUT

Applicant	Malibu Networks
Trade Name & Model No.	AirMax 580/5800
FCC Identifier	QGQ-AM581
Use of Product	Point-to-multipoint wireless communication network
Rated RF Output	20 dBm
Frequency Range	5750 – 5800 MHz
Type of Transmission	TDD
Type of Modulation	DBPSK, DQPSK, CCK
Data Rate	11 Mbps
Number of Channel(s)	11
Antenna(s) & Gain	14 dBi Directional CPE Antenna, model ASTJ22 10 dBi Omni BTS Antenna, model 2360 13 dBi Directional BTS Antenna, model 12010V
Antenna Requirement	The EUT requires professional installation (supporting documentation is attached)
Manufacturer name & address	Malibu Networks 1107 Investment Blvd., Suite 250 El Dorado Hills, CA 95762

A prototype version of the device was received on September 5, 2002 in good operating condition.

2.2 Related Submittal(s) Grants

Part 15 Subpart E.

2.3 Test Methodology

Both AC mains line-conducted and radiated emissions measurements were performed according to the procedures in ANSI C63.4 (1992). 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 in parts 2 and 15 of CFR 47.

2.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is site 1. This test facility and site measurement data have been fully placed on file with the FCC and NVLAP accredited.

3.0 System Test Configuration

3.1 System Support Equipment

Table 1.3-1 contains the details of the support equipment associated with the Equipment Under Test.

Table 1.3-1: System Support Equipment

Item #	Description	Model No.	Serial No.
1	IBM Laptop	T21	75-0FX2F

Cables associated with EUT

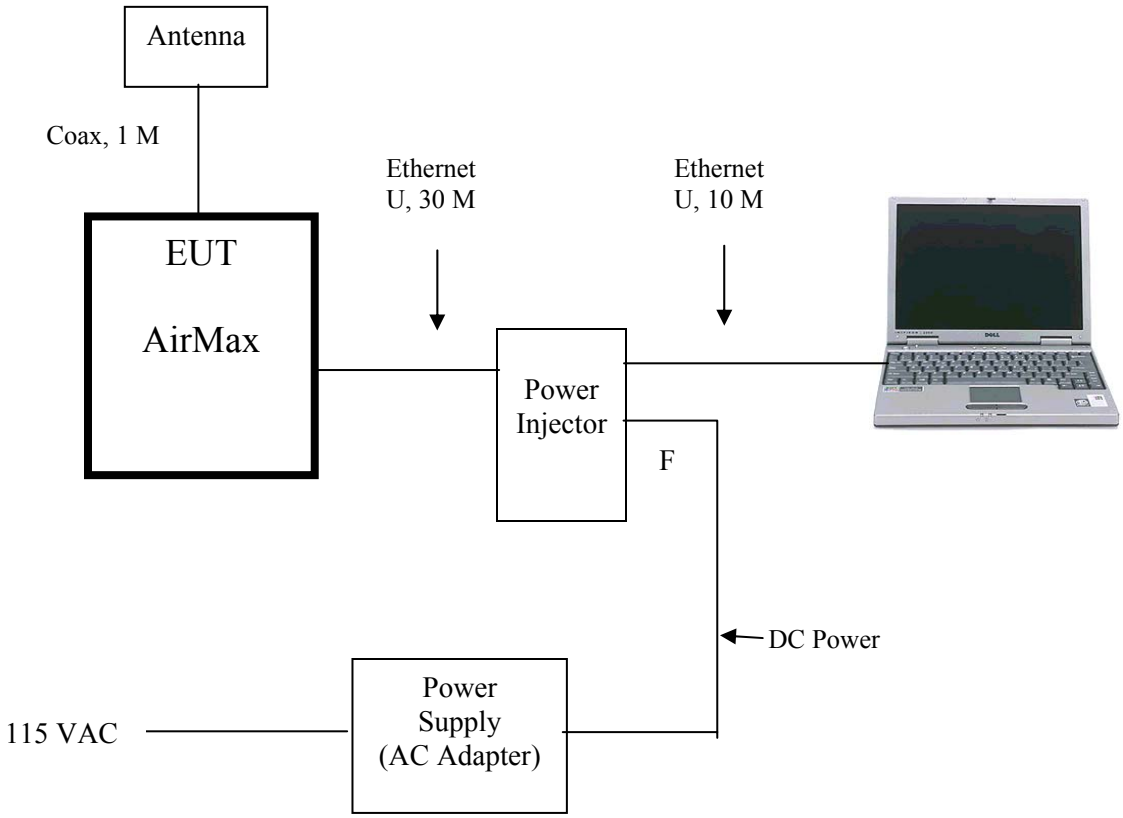
Table 1.3-2 contains the details of the cables associated with the EUT.

Table 1.3-2: Interconnecting cables associated with the EUT

Cables					
Description	Length	Shielding	Ferrites	Connection	
				From	To
Coaxial cable	1 meter	Yes	No	AirMax	Antenna
Ethernet cable	30 meters	No	No	AirMax	Power Injector
Ethernet cable	10 meters	No	No	Power Injector	Computer
DC power cable	1.5 meter	No	Yes	Power Injector	Power Adaptor
AC power cable	1.5 meter	No	No	Power Adaptor	AC Line

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.



S = Shielded	**F** = With Ferrite
U = Unshielded	**M** = Length in Meter

3.3 Justification

For emission testing, the Equipment Under Test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). During testing, all cables were manipulated to produce worst-case emissions.

For radiated emission measurements, the EUT is attached to a cardboard box (if necessary) and placed on the wooden turntable. If the EUT attaches to peripherals, they are connected and operational (as typical as possible). The EUT is wired to transmit full power.

The signal is maximized through rotation and placement in the three orthogonal axes. 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.

3.4 Software Exercise Program

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. For emissions testing, the units were setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing.

3.5 Mode of operation during test

Transmitting signal on low, middle and high channels.

3.6 Modifications required for Compliance

Intertek Testing Services installed no modifications during compliance testing in order to bring the product into compliance (Please note that this does not include changes made specifically by Proxim Corporation prior to compliance testing).

3.7 Additions, deviations and exclusions from standards

No additions, deviations or exclusion have been made from standard.

4.0 Measurement Results

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

Requirements

Maximum allowed peak output power is 1 watt (+30 dBm). If directional gain of transmitting antennas is greater than 6 dBi, than for systems, that are used for point-to-multipoint operations, the peak output power shall be reduced by the amount in dB that the gain of the antenna exceed 6 dBi.

Procedure

The antenna port of the EUT was connected to the input of a peak power meter. Power was read directly and cable loss correction was added to the reading to obtain the power at the EUT's antenna terminal.

Test Results

Base Station

Frequency MHz	Conducted Output Power mW	Conducted Output Power dBm	Calculated EIRP * dBm
5750	113	20.5	33.5
5775	88	19.4	32.4
5800	86	19.3	32.3

* Calculated for antenna Gain = 13 dBi

Subscriber Unit

Frequency MHz	Conducted Output Power mW	Conducted Output Power dBm	Calculated EIRP * dBm	EIRP Limit dBm
5750	113	20.5	34.5	36.0
5775	88	19.4	33.4	36.0
5800	86	19.3	33.3	36.0

* Calculated for antenna Gain = 14 dBi

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

Requirements

The minimum 6-dB bandwidth shall be at least 500 kHz

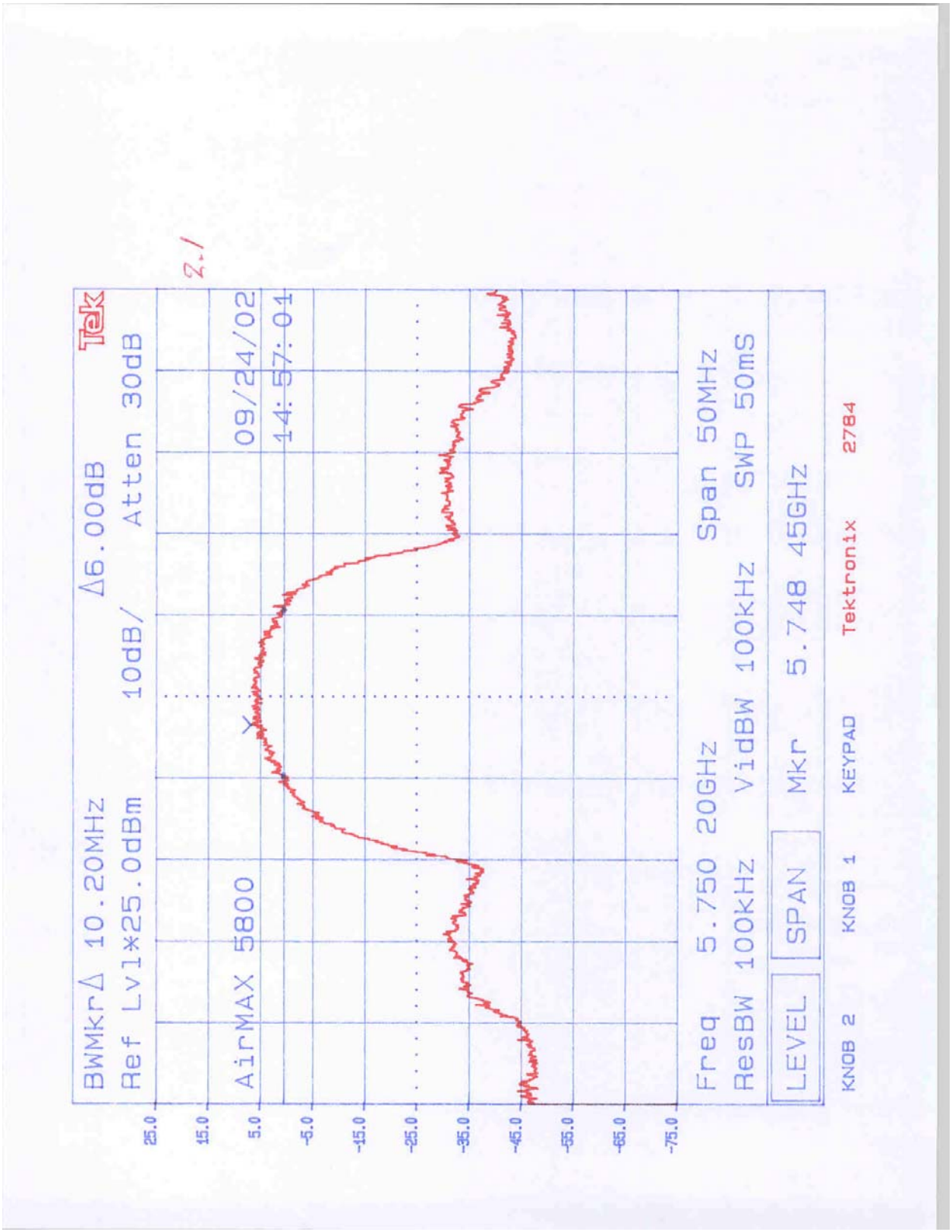
Procedure

The antenna port of the EUT was connected to the input of a spectrum analyzer. 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 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.

Test Result

Frequency MHz	**6 dB Bandwidth MHz**
5750	10.2
5775	10.1
5800	9.6

Refer to the following plots 2.1-2.3 for 6 dB bandwidth:


2.1
BWMkrΔ 10.20MHz
Ref Lvl*25.0dBm
Δ6.00dB
10dB/
Atten 30dB
Tek
AirMAX 5800
09/24/02
14:57:01
Freq 5.750 20GHz
Span 50MHz
ResBW 100kHz
VidBW 100kHz
SWP 50mS
LEVEL
SPAN
Mkr 5.748 45GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784
25.0
15.0
5.0
-5.0
-15.0
-25.0
-35.0
-45.0
-55.0
-65.0
-75.0


2.2
Tek
BWMkrΔ 10.05MHz
Ref Lvl*30.0dBm
Δ6.00dB
10dB/
Atten 30dB
AirMAX 5800
30.0
20.0
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Freq 5.775 00GHz
ResBW 100kHz
VidBW 100kHz
Span 50MHz
SWP 50mS
LEVEL
SPAN
ResBW 100kHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784


2.3
Tek
BWMkrΔ 9.55MHz
Ref Lvl*35.0dBm
Δ6.00dB
10dB/
Atten 30dB
09/24/02
13:31:29
AirMAX 5800
Freq 5.800 00GHz
ResBW 100kHz
VidBW 100kHz
Span 50MHz
SWP 50mS
LEVEL
SPAN
Mkr 5.798 45GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix 2784
35.0
25.0
15.0
5.0
-5.0
-15.0
-25.0
-35.0
-45.0
-55.0
-65.0

4.3 Power Density
FCC 15.247(d)

Requirements

The peak power spectral density shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Procedure

The spectrum analyzer RES BW was set to 3 kHz. The START and STOP frequencies were set to the band edges of the maximum output passband. If there is no clear maximum amplitude in any given portion of the band, it may be necessary to make measurements at a number of bands defined by several START and STOP frequency pairs. Total SWEEP TIME is calculated as follows:

SWEEP TIME (SEC) = (Fstop, kHz - Fstart, kHz)/3 kHz

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

Test Result

Frequency MHz	**Power Density dBm**
5750	-6.8
5775	-8.3
5800	-8.5

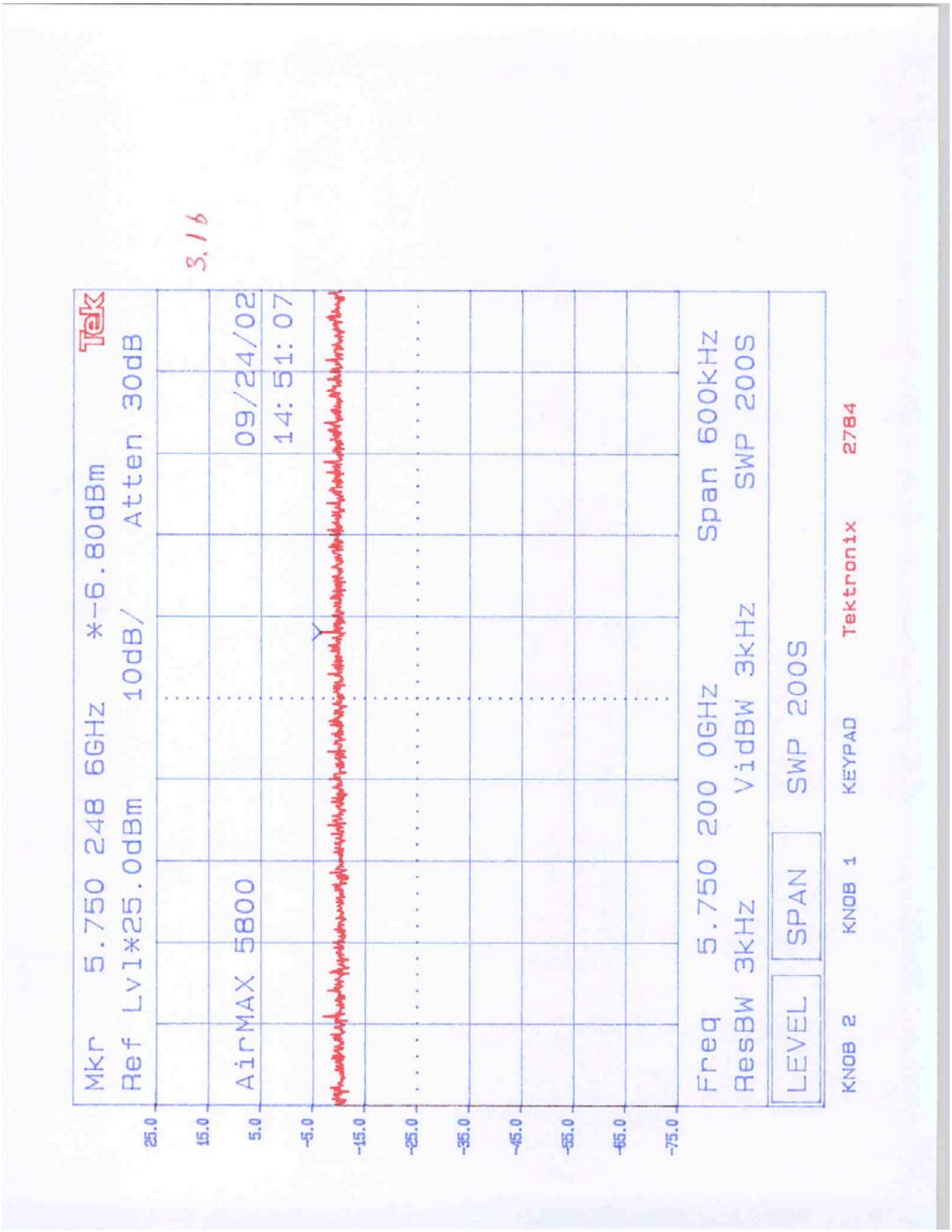
Frequency Span = 600 kHz

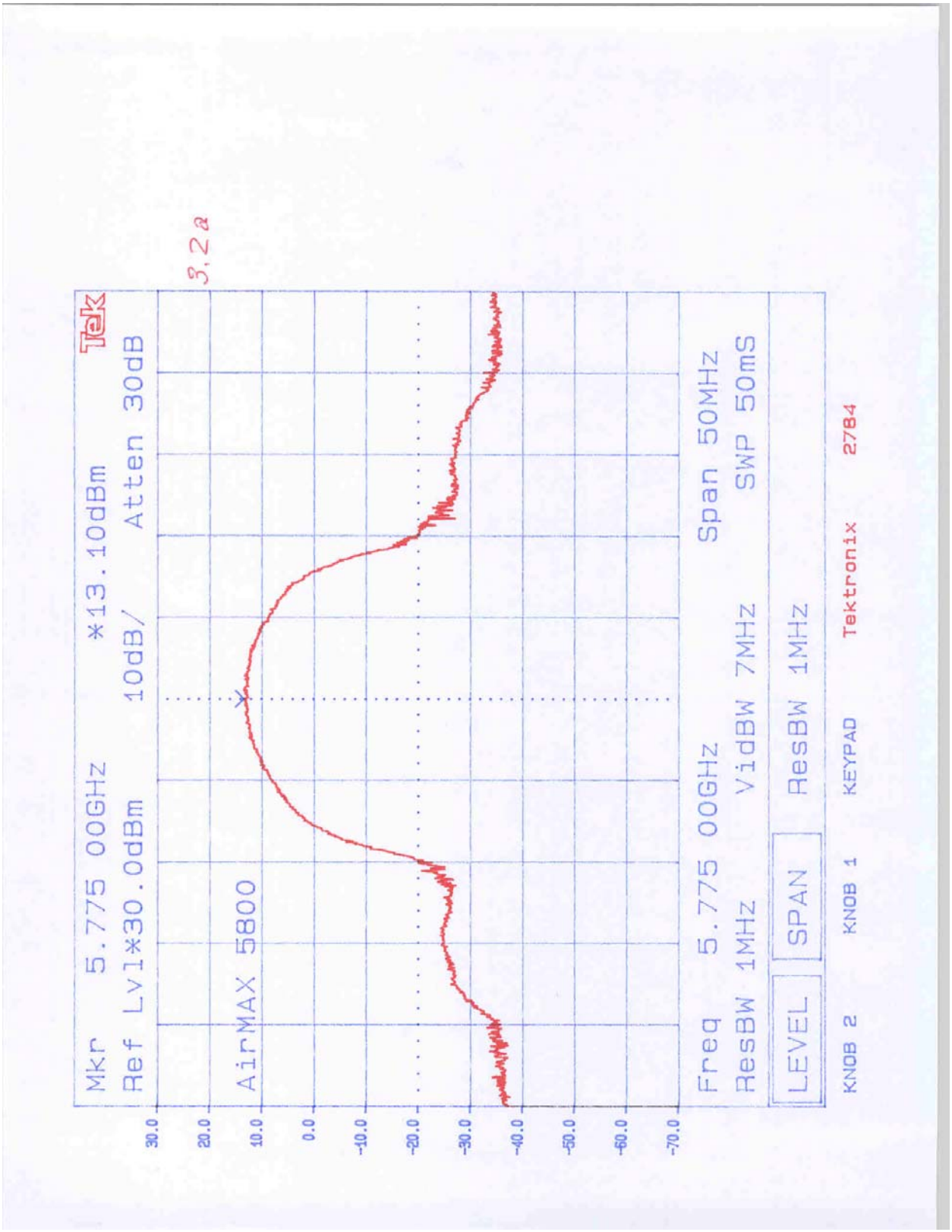
Sweep Time = Frequency Span/3 kHz = 200 Seconds

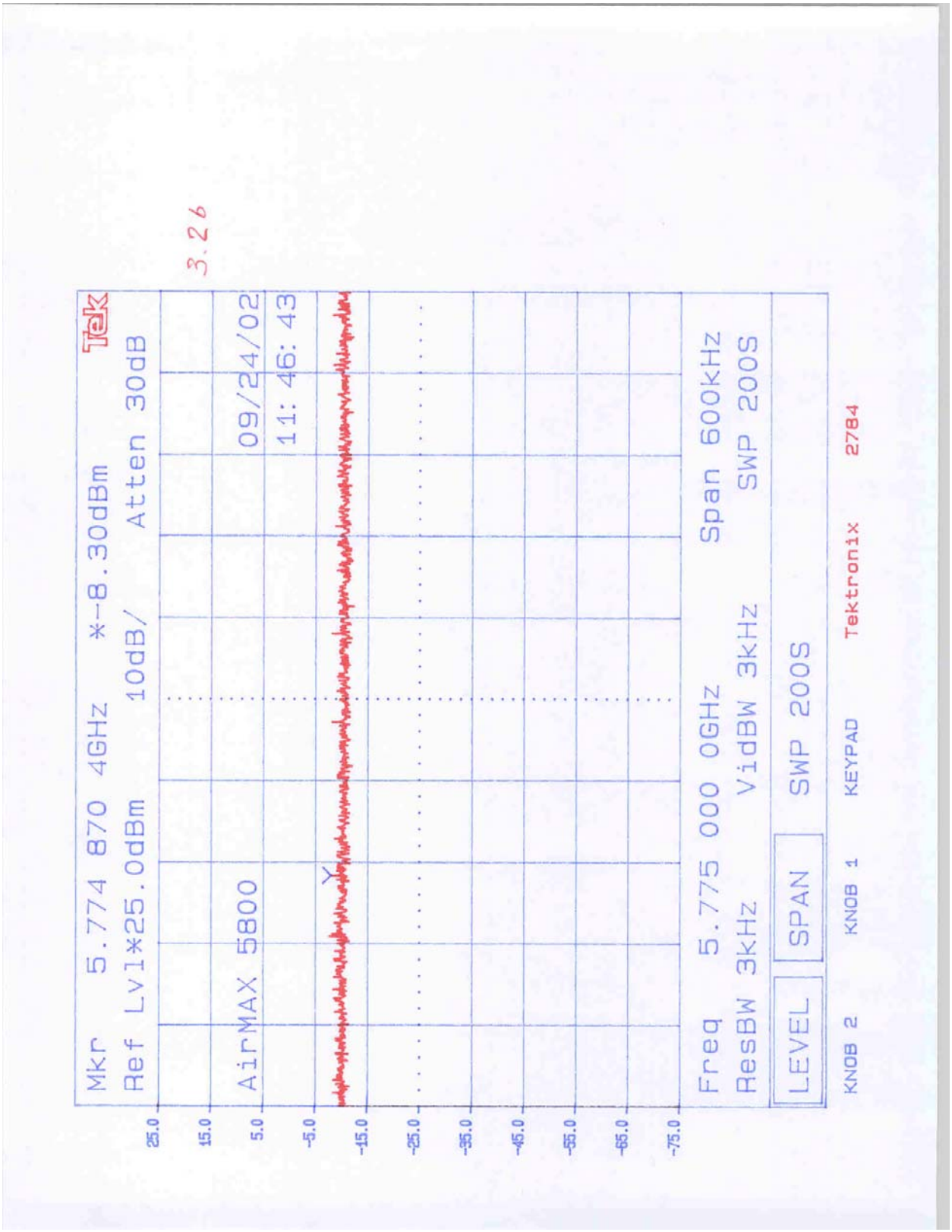
Refer to the following plots for power density data:

Plot 3.1a – 3.1b: Low Channel Power Density
Plot 3.2a – 3.2b: Middle Channel Power Density
Plot 3.3a – 3.3b: High Channel Power Density


3.1a
Tek
Mkr 5.750 20GHz
Ref Lvl*30.0dBm
*13.60dBm
10dB/ Atten 30dB
09/24/02
14: 42: 51
AirMAX 5800
Freq 5.750 00GHz
ResBW 1MHz
VidBW 7MHz
Span 50MHz
SWP 50mS
LEVEL
SPAN
ResBW 1MHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784
30.0
20.0
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0


3.16
Tek
Mkr 5.750 248 6GHz *-6.80dBm
Ref Lvl*25.0dBm 10dB/ Atten 30dB
AirMAX 5800
09/24/02
14:51:07
Freq 5.750 200 0GHz Span 600kHz
ResBW 3kHz VidBW 3kHz SWP 200S
LEVEL SPAN SWP 200S
KNOB 2 KNOB 1 KEYPAD Tektronix 2784
25.0
15.0
5.0
-5.0
-15.0
-25.0
-35.0
-45.0
-55.0
-65.0
-75.0


3.2a
Tek
Mkr 5.775 00GHz *13.10dBm
Ref Lvl*30.0dBm 10dB/ Atten 30dB
AirMAX 5800
Freq 5.775 00GHz Span 50MHz
ResBW 1MHz VidBW 7MHz SWP 50mS
LEVEL SPAN ResBW 1MHz
KNOB 2 KNOB 1 KEYPAD Tektronix 2784
30.0
20.0
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0


3.26
Tek
Mkr 5.774 870 4GHz *-8.30dBm
Ref Lvl*25.0dBm 10dB/ Atten 30dB
AirMAX 5800
09/24/02
11: 46: 43
Freq 5.775 000 0GHz Span 600kHz
ResBW 3kHz VidBW 3kHz SWP 200S
LEVEL SPAN SWP 200S
KNOB 2 KNOB 1 KEYPAD Tektronix 2784
25.0
15.0
5.0
-5.0
-15.0
-25.0
-35.0
-45.0
-55.0
-65.0
-75.0


3,3 a
Tek
Mkr 5.798 95GHz *12.20dBm
Ref Lvl*35.0dBm 10dB/ Atten 30dB
AirMAX 5800
09/24/02
13: 37: 21
Freq 5.800 00GHz Span 50MHz
ResBW 1MHz VidBW 7MHz SWP 50mS
LEVEL SPAN Mkr 5.798 95GHz
KNOB 2 KNOB 1 KEYPAD
Tektronix 2784
35.0
25.0
15.0
5.0
-5.0
-15.0
-25.0
-35.0
-45.0
-55.0
-65.0


3.36
Tek
Mkr 5.799 055 6GHz *-8.50dBm
Ref Lvl*25.0dBm 10dB/ Atten 30dB
AirMAX 5800
09/24/02
13: 48: 14
Freq 5.798 950 0GHz Span 600kHz
ResBW 3kHz VidBW 3kHz SWP 200S
LEVEL SPAN SWP 200S
KNOB 2 KNOB 1 KEYPAD Tektronix 2784
25.0
15.0
5.0
-5.0
-15.0
-25.0
-35.0
-45.0
-55.0
-65.0
-75.0

4.4 Out-of-Band Conducted Emissions
FCC 15.247(c)

Requirements

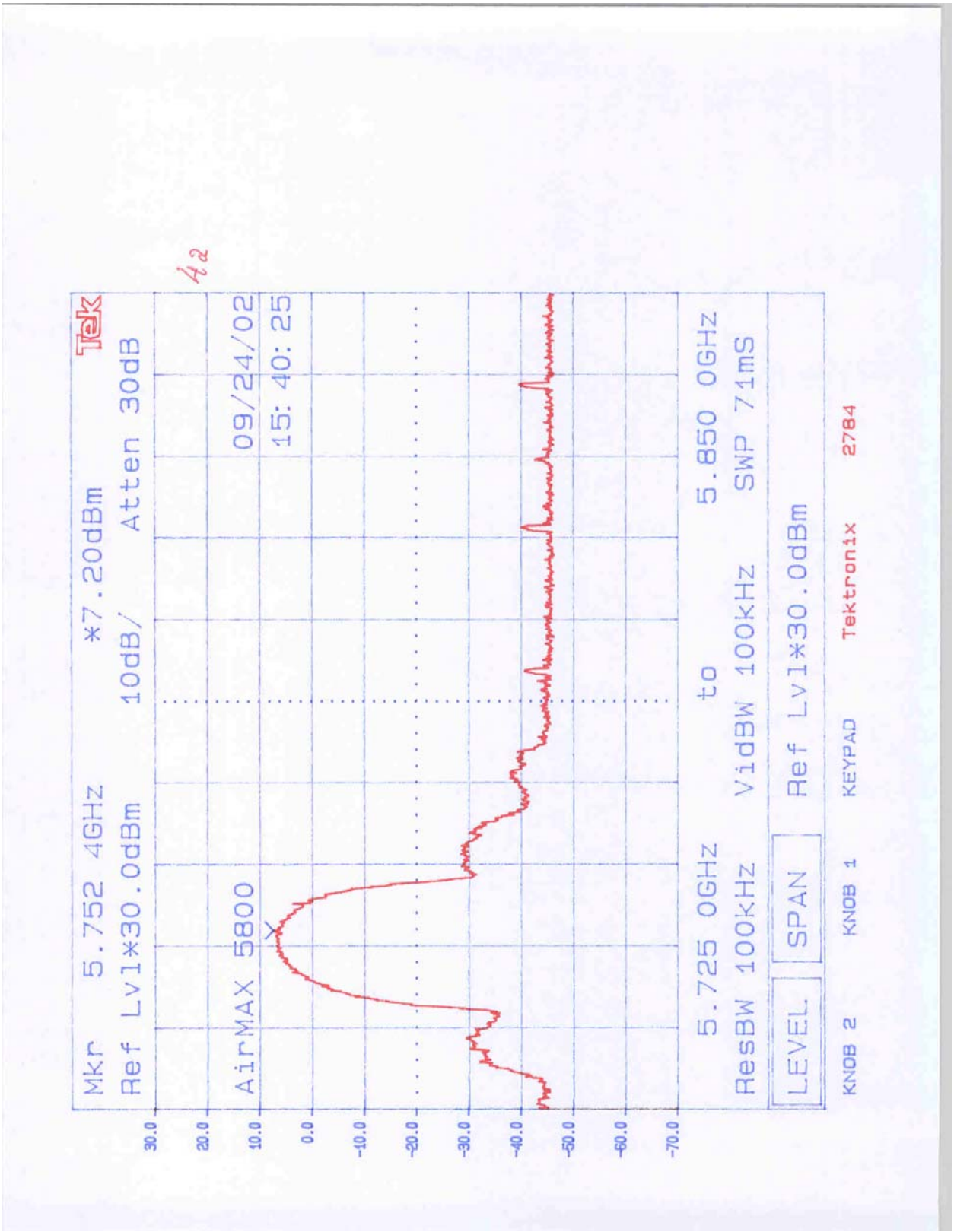
In any 100 kHz bandwidth outside the EUT passband, the RF power shall be at least 20 dB below that of the maximum in-band 100 kHz emission.

Procedure

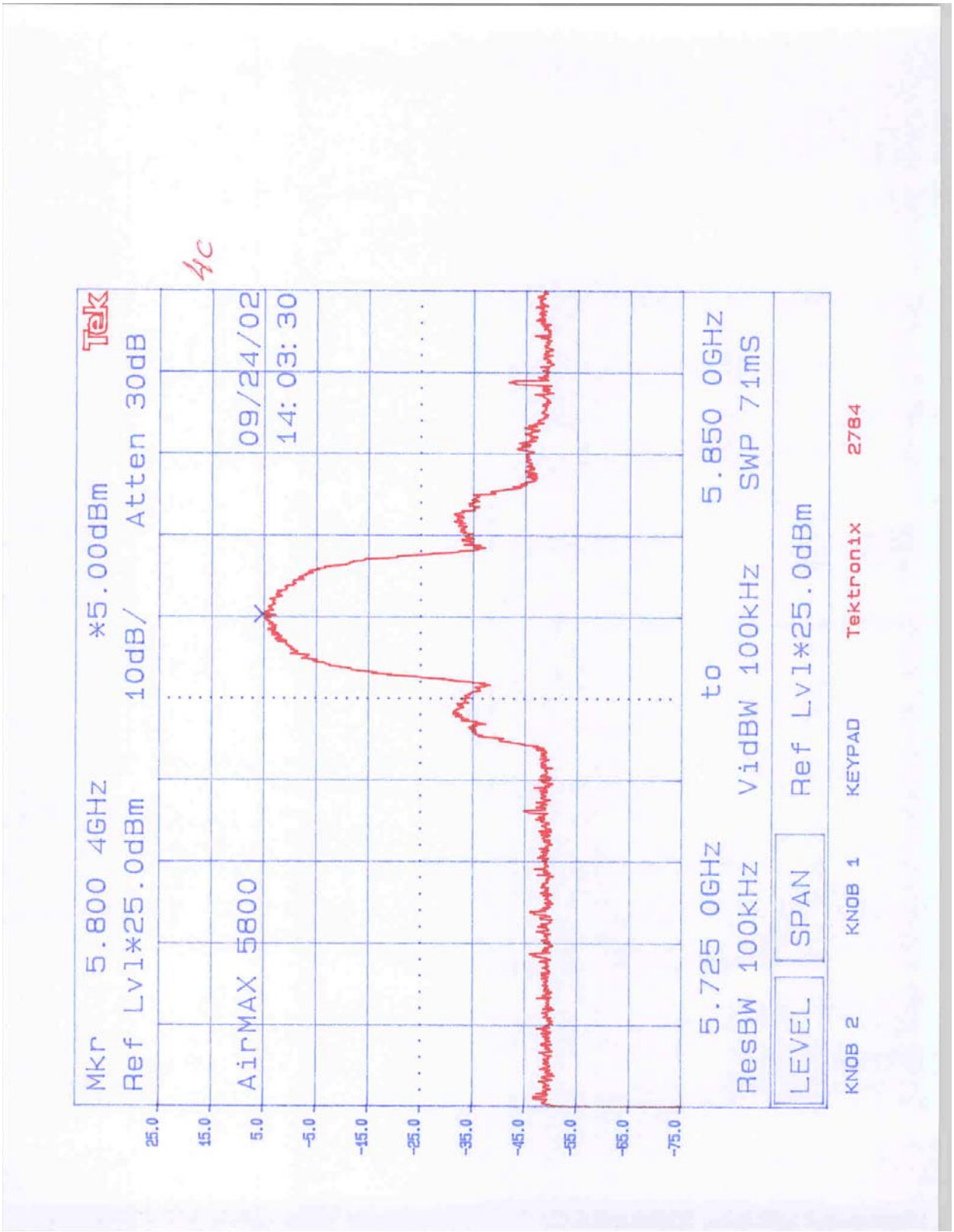
A spectrum analyzer was connected to the antenna port of the transmitter. Analyzer Resolution Bandwidth was set to 100 kHz. For each channel investigated, the in-band and out-of-band emission measurements were performed. The out-of-band emissions were measured from 10 MHz to 40 GHz.

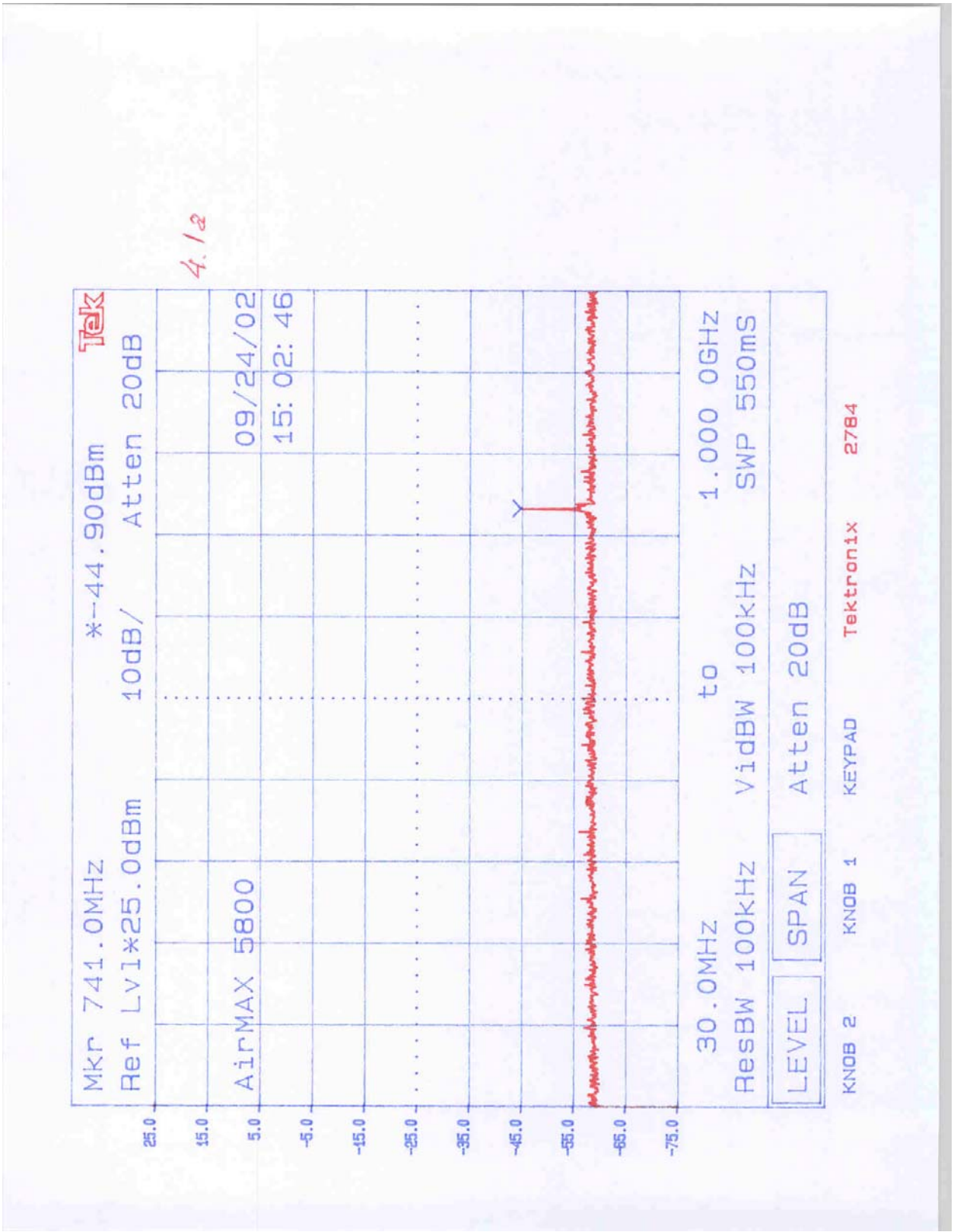
Test Result

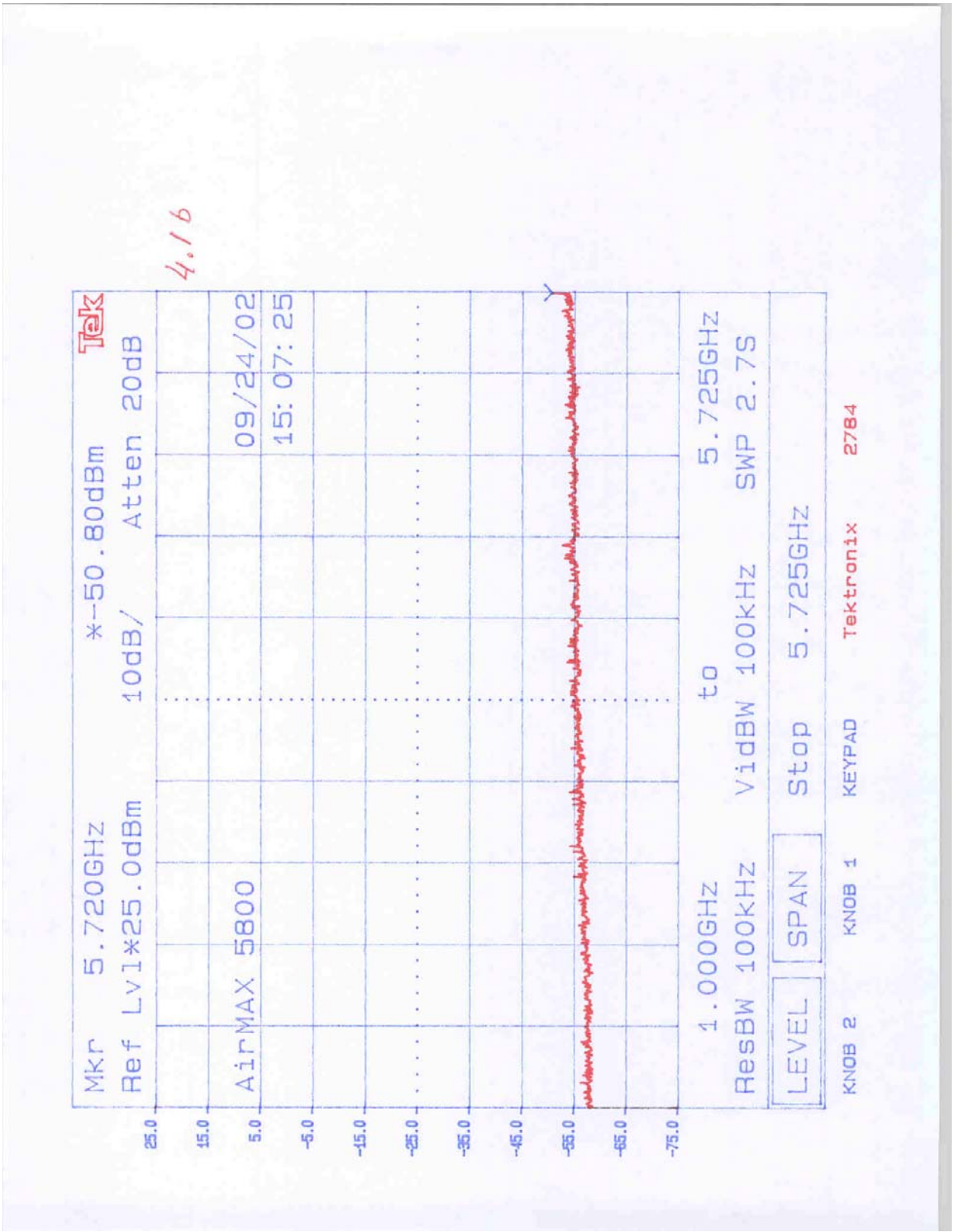
Frequency, MHz	Plot	Description
5750	Plot 4a	In-band Emissions
5775	Plot 4b	In-band Emissions
5800	Plot 4c	In-band Emissions
5750	Plots 4.1a – 4.1d	Out-of-band Emissions
5775	Plots 4.2a – 4.2d	Out-of-band Emissions
5800	Plots 4.3a – 4.3d	Out-of-band Emissions

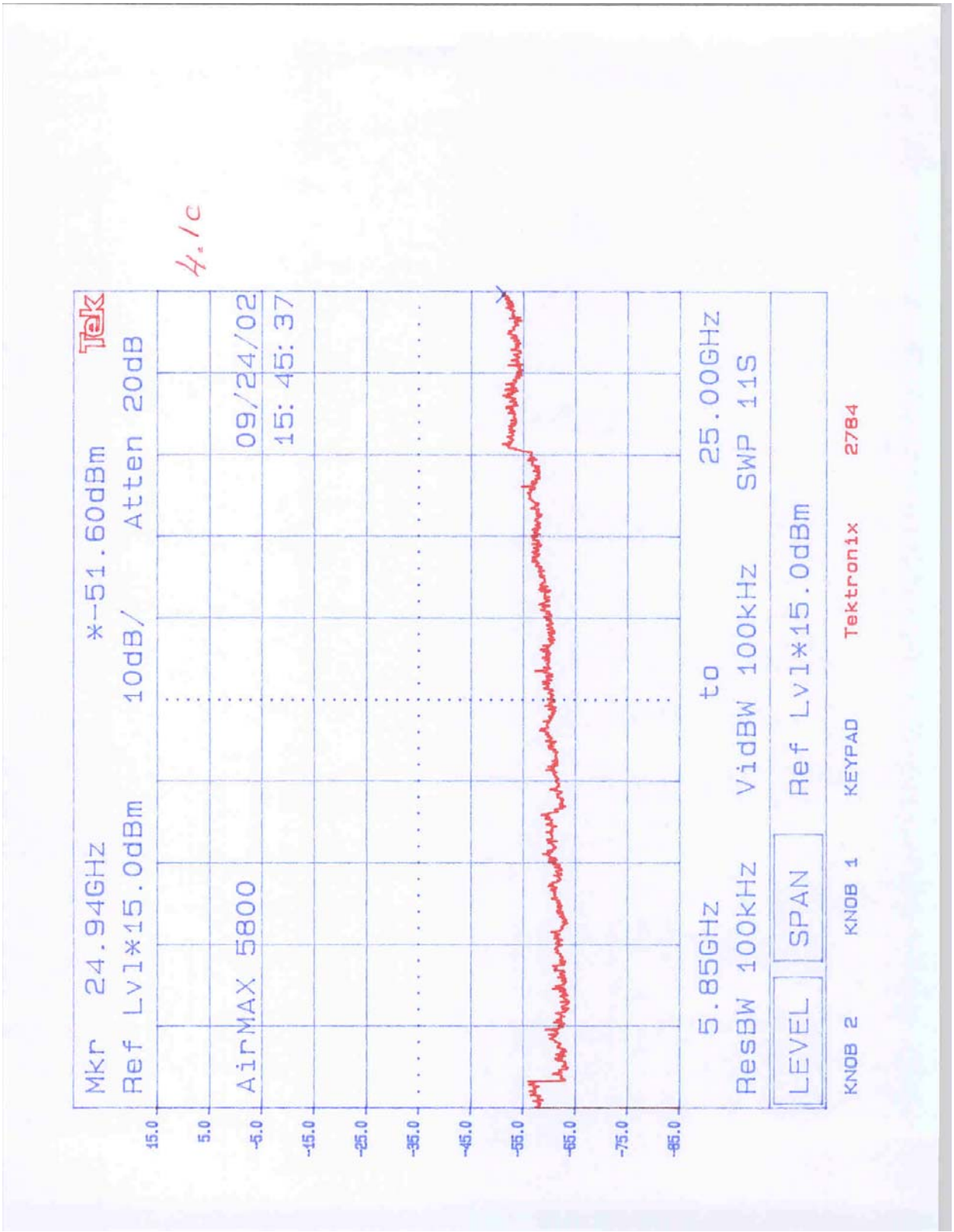

42
Tek
Mkr 5.752 4GHz
Ref Lvl*30.0dBm
*7.20dBm
10dB/ Atten 30dB
09/24/02
15: 40: 25
AirMAX 5800
30.0
20.0
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
5.725 0GHz
ResBW 100kHz
to
5.850 0GHz
VidBW 100kHz
SWP 71mS
LEVEL
SPAN
Ref Lvl*30.0dBm
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784


A6
Tek
Mkr 5.775 8GHz
Ref Lvl*25.0dBm
*6.10dBm
10dB/ Atten 30dB
AirMAX 5800
09/24/02
11: 55: 02
5.725 0GHz
ResBW 100kHz
to
5.850 0GHz
VidBW 100kHz
SWP 71mS
LEVEL
SPAN
SWP 71mS
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784
25.0
15.0
5.0
-5.0
-15.0
-25.0
-35.0
-45.0
-55.0
-65.0
-75.0

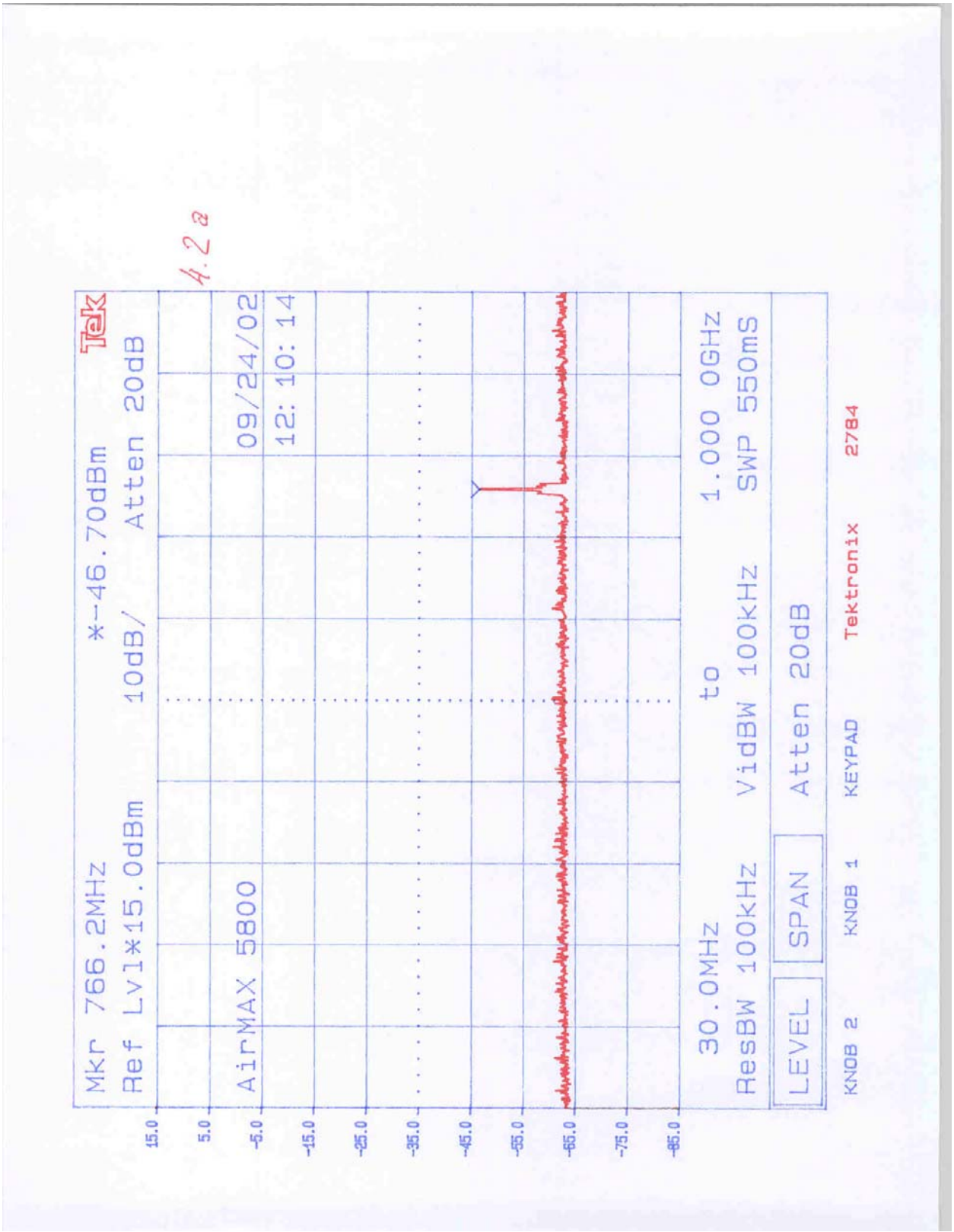

4c
Tek
Mkr 5.800 4GHz
Ref Lvl*25.0dBm
*5.00dBm
10dB/ Atten 30dB
AirMAX 5800
09/24/02
14:03:30
25.0
15.0
5.0
-5.0
-15.0
-25.0
-35.0
-45.0
-55.0
-65.0
-75.0
5.725 0GHz
ResBW 100KHz
to
5.850 0GHz
VidBW 100KHz
SWP 71mS
LEVEL
SPAN
Ref Lvl*25.0dBm
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

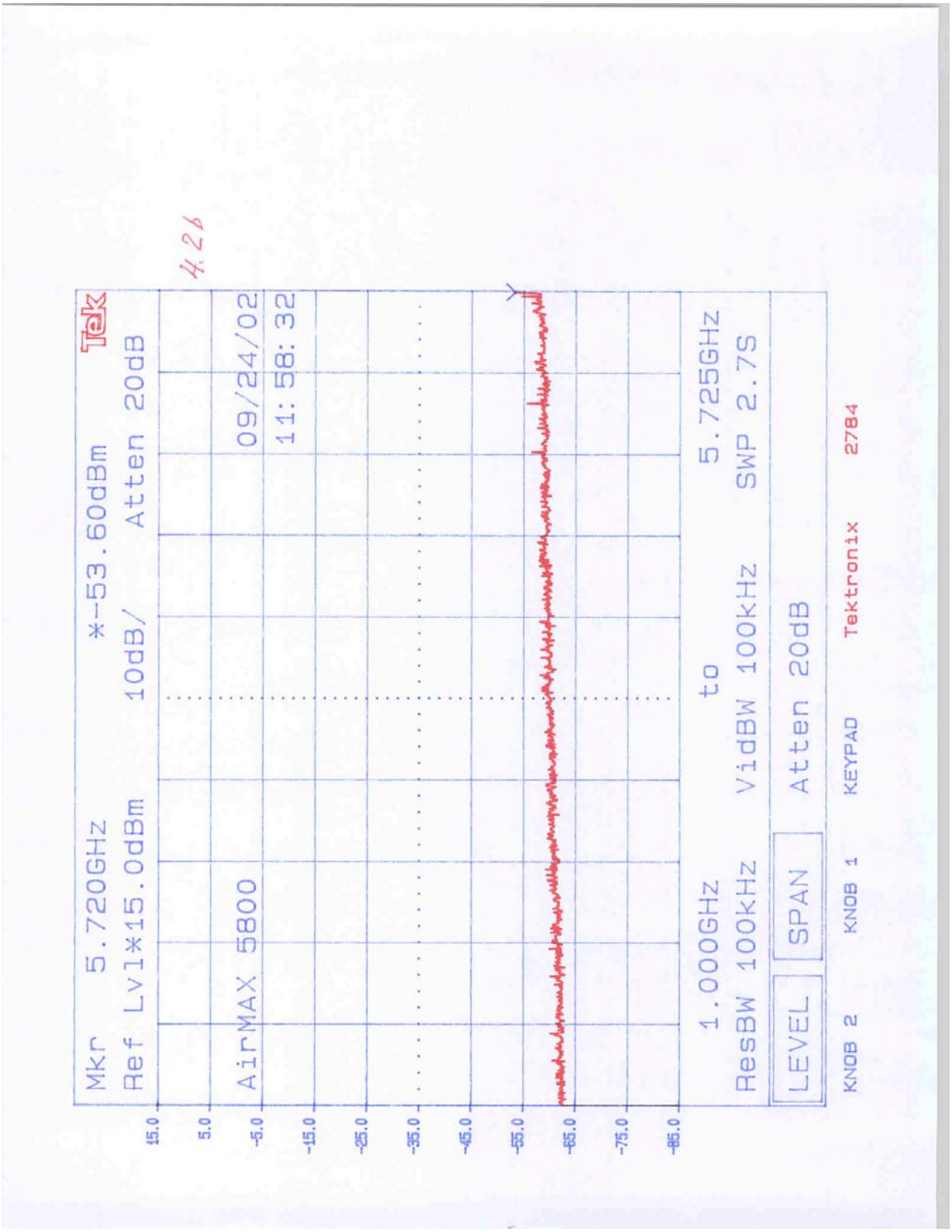

4.12
Mkr 741.0MHz
*-44.90dBm
Ref Lvl*25.0dBm
10dB/
Atten 20dB
Tek
AirMAX 5800
09/24/02
15: 02: 46
25.0
15.0
5.0
-5.0
-15.0
-25.0
-35.0
-45.0
-55.0
-65.0
-75.0
30.0MHz
to
1.000 0GHz
ResBW 100KHz
VidBW 100KHz
SWP 550mS
LEVEL
SPAN
Atten 20dB
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784


4.16
Tek
Mkr 5.720GHz
Ref Lvl*25.0dBm
*-50.80dBm
10dB/
Atten 20dB
09/24/02
15:07:25
AirMAX 5800
25.0
15.0
5.0
-5.0
-15.0
-25.0
-35.0
-45.0
-55.0
-65.0
-75.0
1.000GHz
ResBW 100kHz
to
5.725GHz
VidBW 100kHz
SWP 2.7S
LEVEL
SPAN
Stop 5.725GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784


4.1c
Tek
Mkr 24.94GHz
*-51.60dBm
Ref Lvl*15.0dBm
10dB/
Atten 20dB
AirMAX 5800
09/24/02
15: 45: 37
5.85GHz
to
25.00GHz
ResBW 100KHz
VidBW 100KHz
SWP 11S
LEVEL
SPAN
Ref Lvl*15.0dBm
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784
15.0
5.0
-5.0
-15.0
-25.0
-35.0
-45.0
-55.0
-65.0
-75.0
-85.0

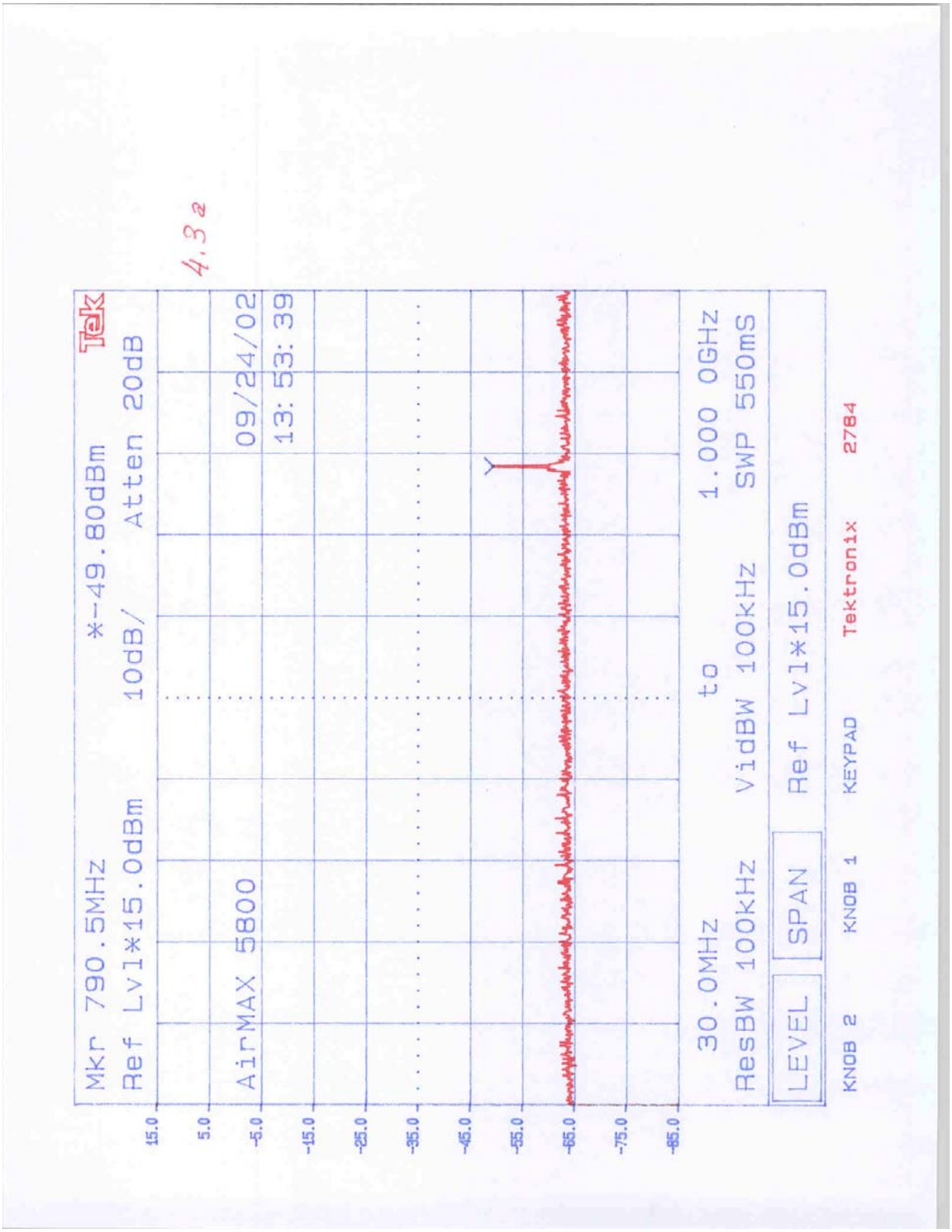

4.1d
Tek
Mkr 37.54GHz
Ref Lvl*15.0dBm
*-44.70dBm
10dB/
Atten 10dB
AirMAX 5800
09/24/02
15:49:09
15.0
5.0
-5.0
-15.0
-25.0
-35.0
-45.0
-55.0
-65.0
-75.0
-85.0
25.00GHz
ResBW 100KHz
to
40.00GHz
VidBW 100KHz
SWP 8.6S
LEVEL
SPAN
Atten 10dB
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

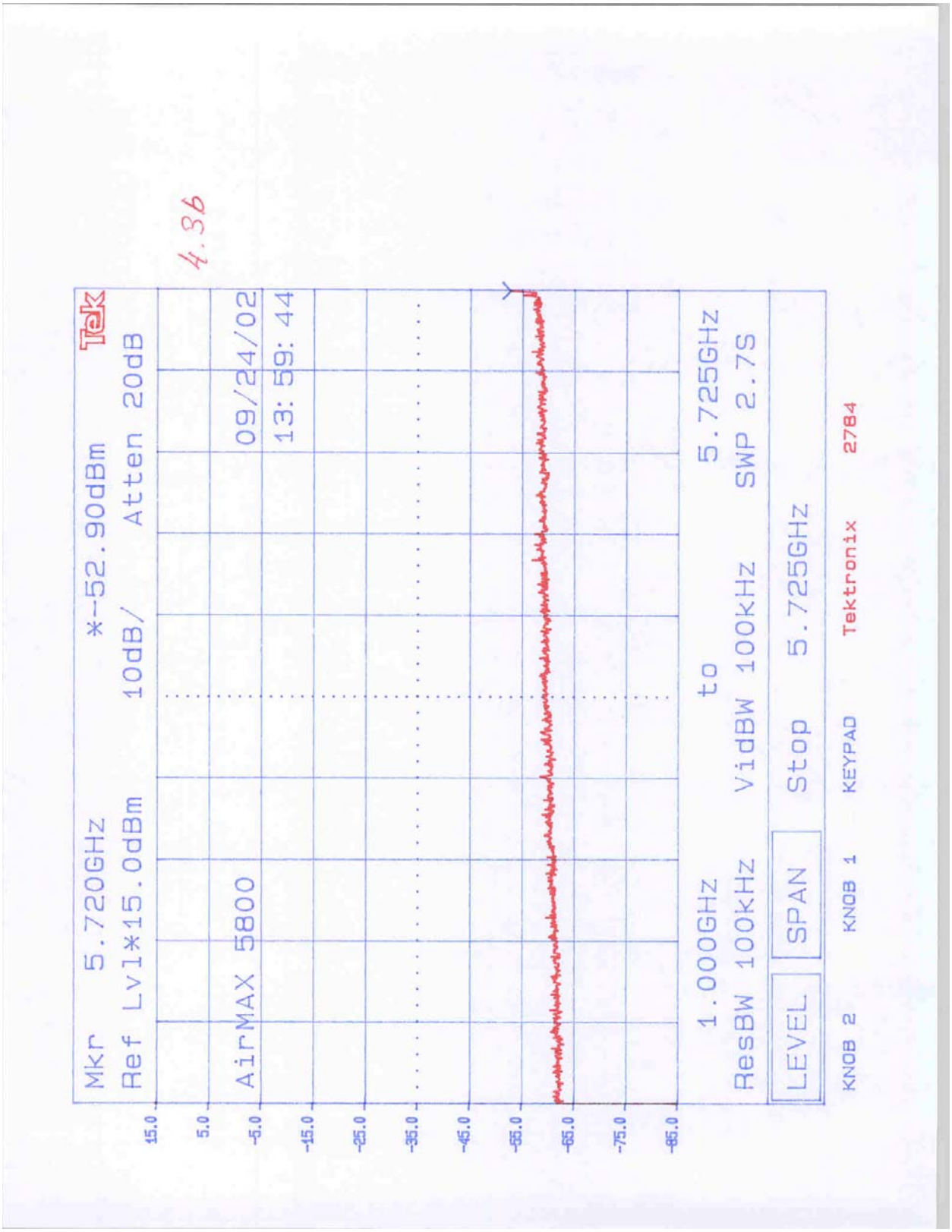

4.2a
Tek
Mkr 766.2MHz
*-46.70dBm
Ref Lvl*15.0dBm
10dB/
Atten 20dB
AirMAX 5800
09/24/02
12: 10: 14
15.0
5.0
-5.0
-15.0
-25.0
-35.0
-45.0
-55.0
-65.0
-75.0
-85.0
30.0MHz
to
1.000 0GHz
ResBW 100kHz
VidBW 100kHz
SWP 550mS
LEVEL
SPAN
Atten 20dB
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

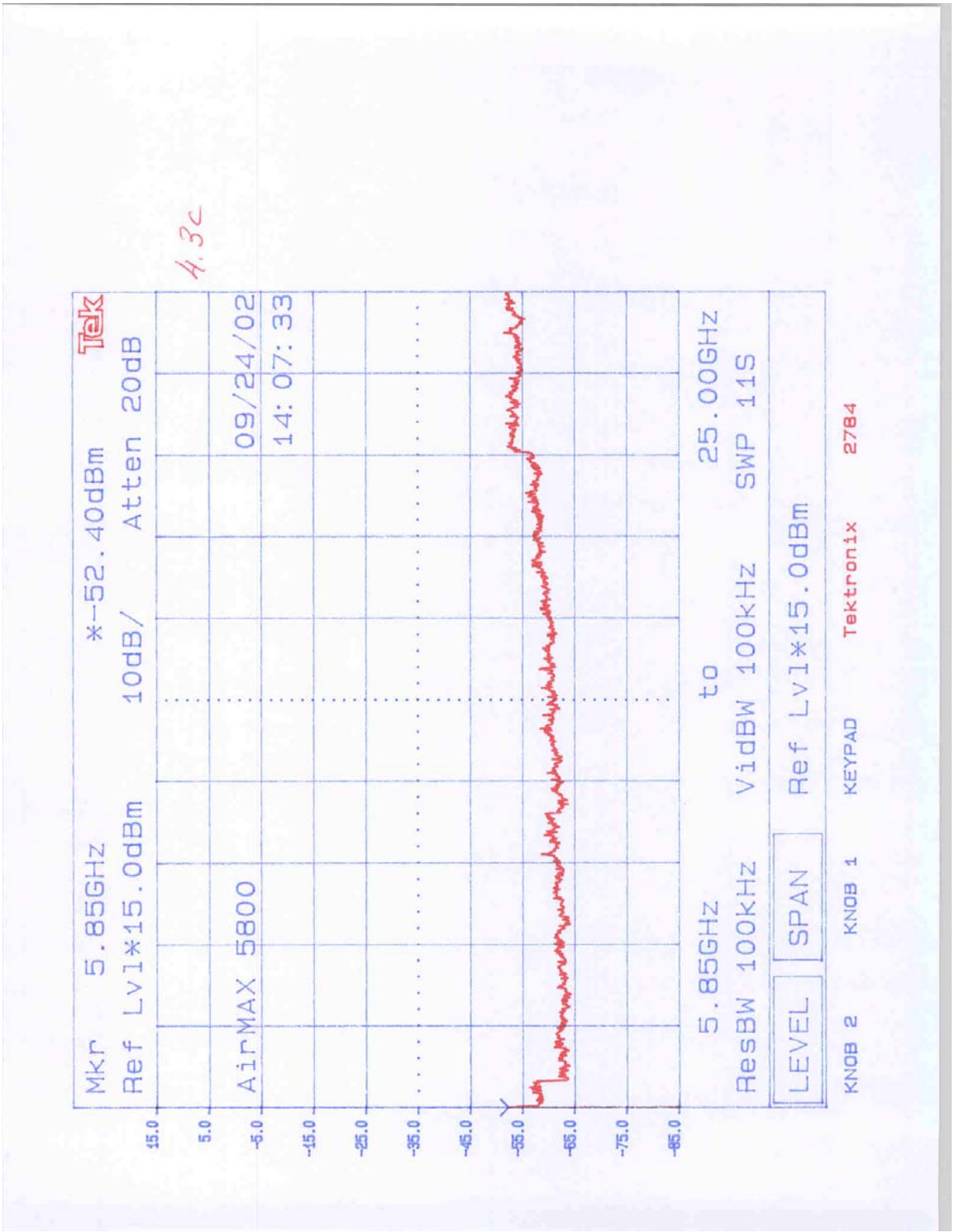

4.26
Tek
Mkr 5.720GHz *-53.60dBm
Ref Lvl*15.0dBm 10dB/ Atten 20dB
AirMAX 5800
09/24/02
11:58:32
15.0
5.0
-5.0
-15.0
-25.0
-35.0
-45.0
-55.0
-65.0
-75.0
-85.0
1.000GHz to 5.725GHz
ResBW 100KHz VidBW 100KHz SWP 2.7S
LEVEL SPAN Atten 20dB
KNOB 2 KNOB 1 KEYPAD Tektronix 2784


4.2c
Tek
Mkr 21.71GHz
*-52.30dBm
Ref Lvl*15.0dBm
10dB/
Atten 20dB
AirMAX 5800
09/24/02
12: 02: 09
5.85GHz
to
25.00GHz
ResBW 100KHz
VidBW 100KHz
SWP 11S
LEVEL
SPAN
Stop 25.00GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784
15.0
5.0
-5.0
-15.0
-25.0
-35.0
-45.0
-55.0
-65.0
-75.0
-85.0


4.2d
Tek
Mkr 37.39GHz
Ref Lvl*15.0dBm
AirMAX 5800
*-45.40dBm
10dB/ Atten 10dB
09/24/02
12: 05: 38
25.00GHz
ResBW 100KHz
to
40.00GHz
VidBW 100KHz
SWP 8.6S
LEVEL
SPAN
Atten 10dB
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784
15.0
5.0
-5.0
-15.0
-25.0
-35.0
-45.0
-55.0
-65.0
-75.0
-85.0


4.3.2
Mkr 790.5MHz
Ref Lvl*15.0dBm
*-49.80dBm
10dB/
Atten 20dB
Tek
AirMAX 5800
09/24/02
13:53:39
15.0
5.0
-5.0
-15.0
-25.0
-35.0
-45.0
-55.0
-65.0
-75.0
-85.0
30.0MHz
ResBW 100kHz
to
1.000 0GHz
VidBW 100kHz
SWP 550mS
LEVEL
SPAN
Ref Lvl*15.0dBm
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784


4.36
Tek
Mkr 5.720GHz
Ref Lvl*15.0dBm
*-52.90dBm
10dB/
Atten 20dB
09/24/02
13: 59: 44
AirMAX 5800
15.0
5.0
-5.0
-15.0
-25.0
-35.0
-45.0
-55.0
-65.0
-75.0
-85.0
1.000GHz
ResBW 100KHz
to
5.725GHz
VidBW 100KHz
SWP 2.7S
LEVEL
SPAN
Stop 5.725GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784


4.3c
Tek
Mkr 5.85GHz
Ref Lvl*15.0dBm
*-52.40dBm
10dB/ Atten 20dB
AirMAX 5800
09/24/02
14:07:33
5.85GHz
ResBW 100KHz
to
25.00GHz
VidBW 100KHz
SWP 11S
LEVEL
SPAN
Ref Lvl*15.0dBm
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784
15.0
5.0
-5.0
-15.0
-25.0
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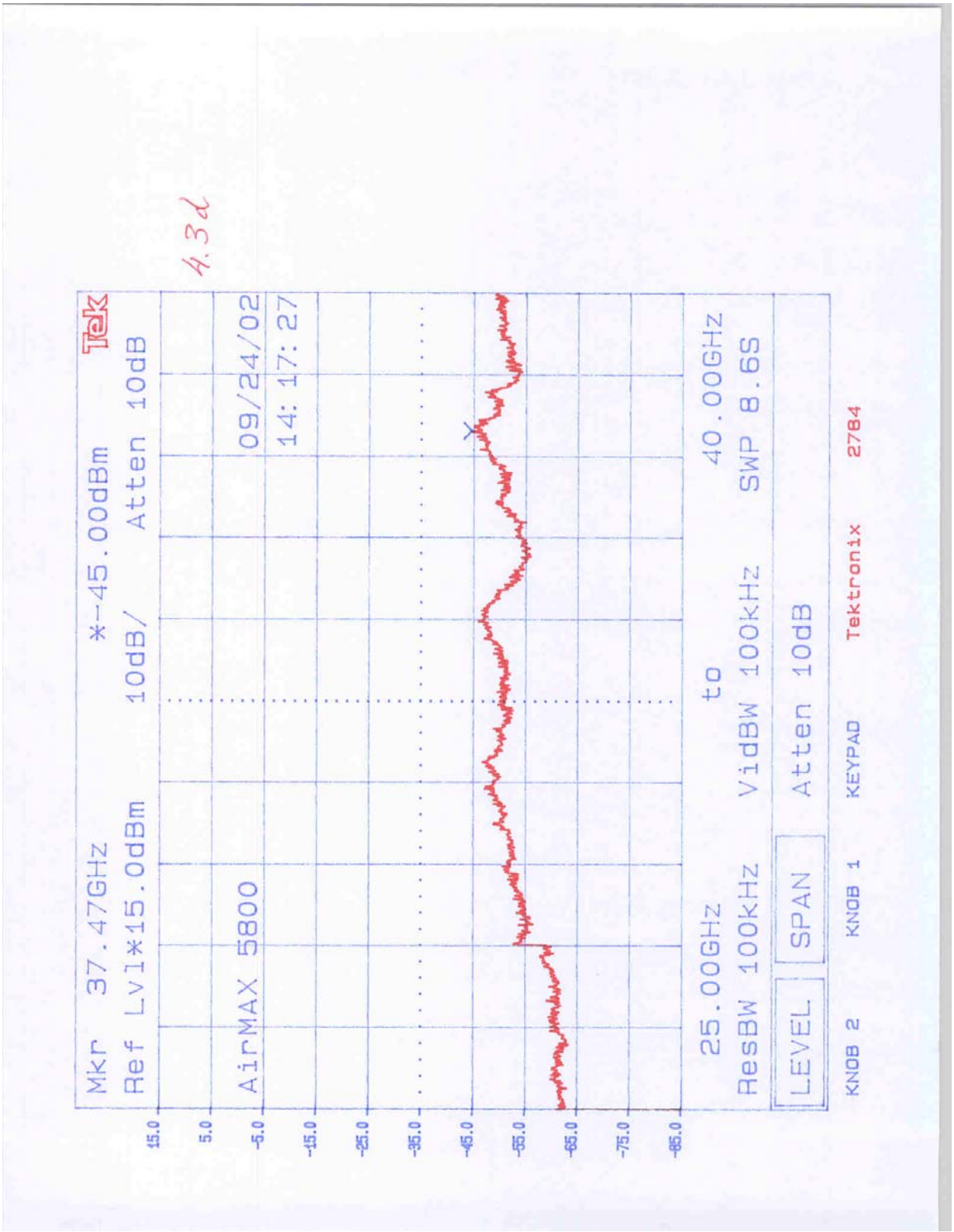
-45.0
-55.0
-65.0
-75.0
-85.0


4.3d
Mkr 37.47GHz
Ref Lvl*15.0dBm
AirMAX 5800
*-45.00dBm
10dB/
Atten 10dB
09/24/02
14: 17: 27
Tek
25.00GHz
ResBW 100KHz
to
40.00GHz
VidBW 100KHz
SWP 8.6S
LEVEL
SPAN
Atten 10dB
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784
15.0
5.0
-5.0
-15.0
-25.0
-35.0
-45.0
-55.0
-65.0
-75.0
-85.0

4.5 Radiated Emissions in restricted bands
FCC 15.247 (c), 15.205, 15.209

Procedure

Radiated emission measurements were performed from 30 MHz to 40,000 MHz. Spectrum Analyzer Resolution Bandwidth is 100 kHz or greater for frequencies from 30 MHz to 1000 MHz, 1 MHz - for frequencies above 1000 MHz.

The EUT is placed on the wooden turntable. 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. All measurements were performed with peak detection unless otherwise specified.

The measurements were performed for three fundamental frequencies with three transmitting antennas: ASTJ22, 12010V, 2360.

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 + Att
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(1/m)
AG = Amplifier Gain in dB
Att = External attenuator (if used)

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 29.0 dB is subtracted, giving field strength of 32.0 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
CF = 1.6 dB
AG = 29.0 dB
Att = 0 dB
FS = 52+7.4+1.6-29.0+0 = 32.0 dB(μV/m)
Level in μV/m = Common Antilogarithm [(32.0 dBμV/m)/20] = 39.8 μV/m

Test Result

The data on the following pages shows the measured Field Strength. The EUT complies with the Field Strength requirement in restricted bands by 1.2 dB.

Company:	MALIBU NETWORKS	**Model #:**	AirMax 580/5800	**Standard_**	**FCC § 15B**
EUT:	UNII Radio	**S/N #:**	none	**Limits_**	2
Project #:	3033217	**Test Date:**	October 11, 2002	**Test Distance_**	1 meter
Test Mode:	TX at 5800 MHz with antenna ASTJ22	**Engineer:**	Bruce G.	**Duty Relaxation**	0 dB

	Antenna Used			Pre-Amp Used			Cable Used			
Number:	14	21	22	9	4	13	10	0	0	0
Model:	EMCO 3115	3160-9	3160-10	Miteq	None	ACO/400	NPS72-1	None	None	None

Frequency	Reading	Detector	Ant.	Amp.	Ant. Pol.	Ant. Factor	Pre-Amp	Insert. Loss	D. C. F.	Net	Limit @3m	Margin
MHz	dB(µV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB	dB(µV/m)	dB(µV/m)	dB
11600	57.6	Peak	14	9	V	41.2	36.8	5.1	-9.5	57.6	74.0	-16.4
11600	38.8	Ave.	14	9	V	41.2	36.8	5.1	-9.5	38.8	54.0	-15.2
11600	58.9	Peak	14	9	H	41.9	36.8	5.1	-9.5	59.6	74.0	-15.4
11600	49.0	Ave.	14	9	H	41.9	36.8	5.1	-9.5	49.7	54.0	-4.3

Notes:

a) D.C.F.:Distance Correction Factor
b) Insert. Loss (dB) = Cable A + Cable B + Cable C .
c) Net (dB) = Reading + Antenna Factor - Pre-amp + Insert. Loss. - Duty Relaxation (transmitter only).
d) Negative signs (-) in Margin column signify levels below the limits.
e) All other emissions not reported are below the equipment noise floor which is at least 6 dB below the limits.
* noise floor level

Company:	MALIBU NETWORKS	**Model #:**	AirMax 580/5800	**Standard_**	**FCC § 15B**
EUT:	UNII Radio	**S/N #:**		**Limits_**	2
Project #:	3033217	**Test Date:**	October 11 2002	**Test Distance_**	1 meter
Test Mode:	TX at 5775 MHz with antenna ASTJ22	**Engineer:**	Bruce G.	**Duty Relaxation**	0 dB

	Antenna Used			Pre-Amp Used			Cable Used			
Number:	14	21	22	9	4	13	10	0	0	0
Model:	EMCO 3115	3160-9	3160-10	Miteq	None	ACO/400	NPS72-1	None	None	None

Frequency	**Reading**	**Detector**	**Ant.**	**Amp.**	**Ant. Pol.**	**Ant. Factor**	**Pre-Amp**	**Insert. Loss**	**D. C. F.**	**Net**	**Limit @3m**	**Margin**
MHz	dB(μV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB	dB(μV/m)	dB(μV/m)	dB
11550	54.7	Peak	14	9	V	41.2	36.8	5.1	-9.5	54.7	74.0	-19.3
11550	38.5	Ave.	14	9	V	41.2	36.8	5.1	-9.5	38.5	54.0	-15.5
11550	60.1	Peak	14	9	H	41.9	36.8	5.1	-9.5	60.8	74.0	-13.2
11550	50.0	Ave.	14	9	H	41.9	36.8	5.1	-9.5	50.7	54.0	-3.3
23100	35.0*	Peak	21	13	V/H	40.4	23.3	2.2	-9.5	44.8	74.0	-29.8
23100	26.4*	Ave.	21	13	V/H	40.4	23.3	2.2	-9.5	36.2	54.0	-17.8

Notes:

a) D.C.F.:Distance Correction Factor
b) Insert. Loss (dB) = Cable A + Cable B + Cable C .
c) Net (dB) = Reading + Antenna Factor - Pre-amp + Insert. Loss. - Duty Relaxation (transmitter only).
d) Negative signs (-) in Margin column signify levels below the limits.
e) All other emissions not reported are below the equipment noise floor which is at least 6 dB below the limits.
* noise floor level

Company:	MALIBU NETWORKS	**Model #:**	AirMax 580/5800	**Standard_**	**FCC § 15B**
EUT:	UNII Radio	**S/N #:**		**Limits_**	2
Project #:	3033217	**Test Date:**	October 11, 2002	**Test Distance_**	1 meter
Test Mode:	TX at 5750 MHz with antenna ASTJ22	**Engineer:**	Bruce G.	**Duty Relaxation**	0 dB

	Antenna Used			Pre-Amp Used			Cable Used			
Number:	14	21	22	9	4	13	10	0	0	0
Model:	EMCO 3115	3160-9	3160-10	Miteq	None	ACO/400	NPS72-1	None	None	None

Frequency	**Reading**	**Detector**	**Ant.**	**Amp.**	**Ant. Pol.**	**Ant. Factor**	**Pre-Amp**	**Insert. Loss**	**D. C. F.**	**Net**	**Limit @3m**	**Margin**
MHz	dB(μV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB	dB(μV/m)	dB(μV/m)	dB
11500	57.3	Peak	14	9	V	41.2	36.8	5.1	-9.5	57.3	74.0	-16.7
11500	50.5	Ave.	14	9	V	41.2	36.8	5.1	-9.5	50.5	54.0	-3.5
11500	61.9	Peak	14	9	H	41.9	36.8	5.1	-9.5	62.6	74.0	-11.4
11500	52.1	Ave.	14	9	H	41.9	36.8	5.1	-9.5	52.8	54.0	-1.2
23000	35.6*	Peak	21	13	V/H	40.4	23.3	2.2	-9.5	45.4	74.0	-28.6
23000	27.0*	Ave.	21	13	V/H	40.4	23.3	2.2	-9.5	36.8	54.0	-17.2

Notes:

a) D.C.F.:Distance Correction Factor
b) Insert. Loss (dB) = Cable A + Cable B + Cable C .
c) Net (dB) = Reading + Antenna Factor - Pre-amp + Insert. Loss. - Duty Relaxation (transmitter only).
d) Negative signs (-) in Margin column signify levels below the limits.
e) All other emissions not reported are below the equipment noise floor which is at least 6 dB below the limits.
* noise floor level

Company:	MALIBU NETWORKS	**Model #:**	AirMax 580/5800	**Standard_**	**FCC § 15B**
EUT:	UNII Radio	**S/N #:**	none	**Limits_**	2
Project #:	3033217	**Test Date:**	October 11, 2002	**Test Distance_**	1 meter
Test Mode:	TX at 5800 MHz with antenna 12010V	**Engineer:**	Bruce G.	**Duty Relaxation**	0 dB

	Antenna Used			Pre-Amp Used			Cable Used			
Number:	14	21	22	9	4	13	10	0	0	0
Model:	EMCO 3115	3160-9	3160-10	Miteq	None	ACO/400	NPS72-1	None	None	None

Frequency	**Reading**	**Detector**	**Ant.**	**Amp.**	**Ant. Pol.**	**Ant. Factor**	**Pre-Amp**	**Insert. Loss**	**D. C. F.**	**Net**	**Limit @3m**	**Margin**
MHz	dB(μV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB	dB(μV/m)	dB(μV/m)	dB
11600	54.6	Peak	14	9	V	41.2	36.8	5.1	-9.5	54.6	74.0	-19.4
11600	45.3	Ave.	14	9	V	41.2	36.8	5.1	-9.5	45.3	54.0	-8.7
11600	55.5	Peak	14	9	H	41.9	36.8	5.1	-9.5	56.2	74.0	-17.8
11600	45.8	Ave.	14	9	H	41.9	36.8	5.1	-9.5	46.5	54.0	-7.5

Notes:

a) D.C.F.:Distance Correction Factor
b) Insert. Loss (dB) = Cable A + Cable B + Cable C .
c) Net (dB) = Reading + Antenna Factor - Pre-amp + Insert. Loss. - Duty Relaxation (transmitter only).
d) Negative signs (-) in Margin column signify levels below the limits.
e) All other emissions not reported are below the equipment noise floor which is at least 6 dB below the limits.
* noise floor level

Company:	MALIBU NETWORKS	**Model #:**	AirMax 580/5800	**Standard_**	**FCC § 15B**
EUT:	UNII Radio	**S/N #:**		**Limits_**	2
Project #:	3033217	**Test Date:**	October 11 2002	**Test Distance_**	1 meter
Test Mode:	TX at 5775 MHz with antenna 12010V	**Engineer:**	Bruce G.	**Duty Relaxation**	0 dB

	Antenna Used			Pre-Amp Used			Cable Used			
Number:	14	21	22	9	4	13	10	0	0	0
Model:	EMCO 3115	3160-9	3160-10	Miteq	None	ACO/400	NPS72-1	None	None	None

Frequency	**Reading**	**Detector**	**Ant.**	**Amp.**	**Ant. Pol.**	**Ant. Factor**	**Pre-Amp**	**Insert. Loss**	**D. C. F.**	**Net**	**Limit @3m**	**Margin**
MHz	dB(μV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB	dB(μV/m)	dB(μV/m)	dB
11550	54.3	Peak	14	9	V	41.2	36.8	5.1	-9.5	54.3	74.0	-19.3
11550	45.2	Ave.	14	9	V	41.2	36.8	5.1	-9.5	45.2	54.0	-8.8
11550	56.0	Peak	14	9	H	41.9	36.8	5.1	-9.5	56.7	74.0	-17.3
11550	46.4	Ave.	14	9	H	41.9	36.8	5.1	-9.5	47.1	54.0	-6.9
23100	35.0*	Peak	21	13	V/H	40.4	23.3	2.2	-9.5	44.8	74.0	-29.2
23100	26.4*	Ave.	21	13	V/H	40.4	23.3	2.2	-9.5	36.2	54.0	-17.8

Notes:

a) D.C.F.:Distance Correction Factor
b) Insert. Loss (dB) = Cable A + Cable B + Cable C .
c) Net (dB) = Reading + Antenna Factor - Pre-amp + Insert. Loss. - Duty Relaxation (transmitter only).
d) Negative signs (-) in Margin column signify levels below the limits.
e) All other emissions not reported are below the equipment noise floor which is at least 6 dB below the limits.
* noise floor level

Company:	MALIBU NETWORKS	**Model #:**	AirMax 580/5800	**Standard_**	**FCC § 15B**	
EUT:	UNII Radio	**S/N #:**		**Limits_**	2	
Project #:	3033217	**Test Date:**	October 11, 2002	**Test Distance_**	1	meter
Test Mode:	TX at 5750 MHz with antenna 12010V	**Engineer:**	Bruce G.	**Duty Relaxation**	0	dB

	Antenna Used			Pre-Amp Used			Cable Used			
Number:	14	21	22	9	4	13	10	0	0	0
Model:	EMCO 3115	3160-9	3160-10	Miteq	None	ACO/400	NPS72-1	None	None	None

Frequency	**Reading**	**Detector**	**Ant.**	**Amp.**	**Ant. Pol.**	**Ant. Factor**	**Pre-Amp**	**Insert. Loss**	**D. C. F.**	**Net**	**Limit @3m**	**Margin**
MHz	dB(μV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB	dB(μV/m)	dB(μV/m)	dB
11500	57.0	Peak	14	9	V	41.2	36.8	5.1	-9.5	57.0	74.0	-17.0
11500	47.5	Ave.	14	9	V	41.2	36.8	5.1	-9.5	47.5	54.0	-6.5
11500	60.0	Peak	14	9	H	41.9	36.8	5.1	-9.5	60.9	74.0	-13.1
11500	50.8	Ave.	14	9	H	41.9	36.8	5.1	-9.5	51.6	54.0	-2.4
23000	35.6*	Peak	21	13	V/H	40.4	23.3	2.2	-9.5	45.4	74.0	-28.6
23000	27.0*	Ave.	21	13	V/H	40.4	23.3	2.2	-9.5	36.8	54.0	-17.2

Notes:

a) D.C.F.:Distance Correction Factor
b) Insert. Loss (dB) = Cable A + Cable B + Cable C .
c) Net (dB) = Reading + Antenna Factor - Pre-amp + Insert. Loss. - Duty Relaxation (transmitter only).
d) Negative signs (-) in Margin column signify levels below the limits.
e) All other emissions not reported are below the equipment noise floor which is at least 6 dB below the limits.
* noise floor level

Company:	MALIBU NETWORKS	**Model #:**	AirMax 580/5800	**Standard_**	**FCC § 15B**	
EUT:	UNII Radio	**S/N #:**	none	**Limits_**	2	
Project #:	3033217	**Test Date:**	October 11, 2002	**Test Distance_**	1	meter
Test Mode:	TX at 5800 MHz with antenna 2360	**Engineer:**	Bruce G.	**Duty Relaxation**	0	dB

	Antenna Used			Pre-Amp Used			Cable Used			
Number:	14	21	22	9	4	13	10	0	0	0
Model:	EMCO 3115	3160-9	3160-10	Miteq	None	ACO/400	NPS72-1	None	None	None

Frequency	**Reading**	**Detector**	**Ant.**	**Amp.**	**Ant. Pol.**	**Ant. Factor**	**Pre-Amp**	**Insert. Loss**	**D. C. F.**	**Net**	**Limit @3m**	**Margin**
MHz	dB(μV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB	dB(μV/m)	dB(μV/m)	dB
11600	56.2	Peak	14	9	V	41.2	36.8	5.1	-9.5	56.2	74.0	-17.8
11600	44.9	Ave.	14	9	V	41.2	36.8	5.1	-9.5	44.9	54.0	-9.1
11600	58.5	Peak	14	9	H	41.9	36.8	5.1	-9.5	59.2	74.0	-14.8
11600	47.0	Ave.	14	9	H	41.9	36.8	5.1	-9.5	47.7	54.0	-6.3

Notes:

a) D.C.F.:Distance Correction Factor
b) Insert. Loss (dB) = Cable A + Cable B + Cable C .
c) Net (dB) = Reading + Antenna Factor - Pre-amp + Insert. Loss. - Duty Relaxation (transmitter only).
d) Negative signs (-) in Margin column signify levels below the limits.
e) All other emissions not reported are below the equipment noise floor which is at least 6 dB below the limits.
* noise floor level

Company:	MALIBU NETWORKS	**Model #:**	AirMax 580/5800	**Standard_**	**FCC § 15B**
EUT:	UNII Radio	**S/N #:**		**Limits_**	2
Project #:	3033217	**Test Date:**	October 11 2002	**Test Distance_**	1 meter
Test Mode:	TX at 5775 MHz with antenna 2360	**Engineer:**	Bruce G.	**Duty Relaxation**	0 dB

	Antenna Used			Pre-Amp Used			Cable Used			
Number:	14	21	22	9	4	13	10	0	0	0
Model:	EMCO 3115	3160-9	3160-10	Miteq	None	ACO/400	NPS72-1	None	None	None

Frequency	**Reading**	**Detector**	**Ant.**	**Amp.**	**Ant. Pol.**	**Ant. Factor**	**Pre-Amp**	**Insert. Loss**	**D. C. F.**	**Net**	**Limit @3m**	**Margin**
MHz	dB(µV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB	dB(µV/m)	dB(µV/m)	dB
11550	53.5	Peak	14	9	V	41.2	36.8	5.1	-9.5	53.5	74.0	-20.5
11550	42.4	Ave.	14	9	V	41.2	36.8	5.1	-9.5	42.4	54.0	-11.6
11550	60.7	Peak	14	9	H	41.9	36.8	5.1	-9.5	61.4	74.0	-12.6
11550	49.2	Ave.	14	9	H	41.9	36.8	5.1	-9.5	49.9	54.0	-4.1
23100	35.0*	Peak	21	13	V/H	40.4	23.3	2.2	-9.5	44.8	74.0	-29.2
23100	26.4*	Ave.	21	13	V/H	40.4	23.3	2.2	-9.5	36.2	54.0	-17.8

Notes:

a) D.C.F.:Distance Correction Factor
b) Insert. Loss (dB) = Cable A + Cable B + Cable C .
c) Net (dB) = Reading + Antenna Factor - Pre-amp + Insert. Loss. - Duty Relaxation (transmitter only).
d) Negative signs (-) in Margin column signify levels below the limits.
e) All other emissions not reported are below the equipment noise floor which is at least 6 dB below the limits.
* noise floor level

Company:	MALIBU NETWORKS	**Model #:**	AirMax 580/5800	**Standard_**	**FCC § 15B**	
EUT:	UNII Radio	**S/N #:**		**Limits_**	2	
Project #:	3033217	**Test Date:**	October 11, 2002	**Test Distance_**	1	meter
Test Mode:	TX at 5750 MHz with antenna 2360	**Engineer:**	Bruce G.	**Duty Relaxation**	0	dB

	Antenna Used			Pre-Amp Used			Cable Used			
Number:	14	21	22	9	4	13	10	0	0	0
Model:	EMCO 3115	3160-9	3160-10	Miteq	None	ACO/400	NPS72-1	None	None	None

Frequency	**Reading**	**Detector**	**Ant.**	**Amp.**	**Ant. Pol.**	**Ant. Factor**	**Pre-Amp**	**Insert. Loss**	**D. C. F.**	**Net**	**Limit @3m**	**Margin**
MHz	dB(μV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB	dB(μV/m)	dB(μV/m)	dB
11500	59.4	Peak	14	9	V	41.2	36.8	5.1	-9.5	59.4	74.0	-14.6
11500	48.1	Ave.	14	9	V	41.2	36.8	5.1	-9.5	48.1	54.0	-5.9
11500	60.0	Peak	14	9	H	41.9	36.8	5.1	-9.5	60.7	74.0	-13.3
11500	48.4	Ave.	14	9	H	41.9	36.8	5.1	-9.5	49.1	54.0	-4.9
23000	35.6*	Peak	21	13	V/H	40.4	23.3	2.2	-9.5	45.4	74.0	-28.6
23000	27.0*	Ave.	21	13	V/H	40.4	23.3	2.2	-9.5	36.8	54.0	-17.2

Notes:

a) D.C.F.:Distance Correction Factor
b) Insert. Loss (dB) = Cable A + Cable B + Cable C .
c) Net (dB) = Reading + Antenna Factor - Pre-amp + Insert. Loss. - Duty Relaxation (transmitter only).
d) Negative signs (-) in Margin column signify levels below the limits.
e) All other emissions not reported are below the equipment noise floor which is at least 6 dB below the limits.
* noise floor level

4.6 Digital part Radiated Emission
FCC 15.109

The CISPR 22 Limit and test procedure were user. Test was performed at 10 m distance.

The data on the following pages list the significant emission frequencies, the limit and the margin of Compliance. The EUT complies with the 15.109 requirement by 1.8 dB.

Intertek Testing Services
Radiated Emissions 30 MHz - 1000 MHz
EN55022 Class B (QP-Horizontal)

Operator: krishna

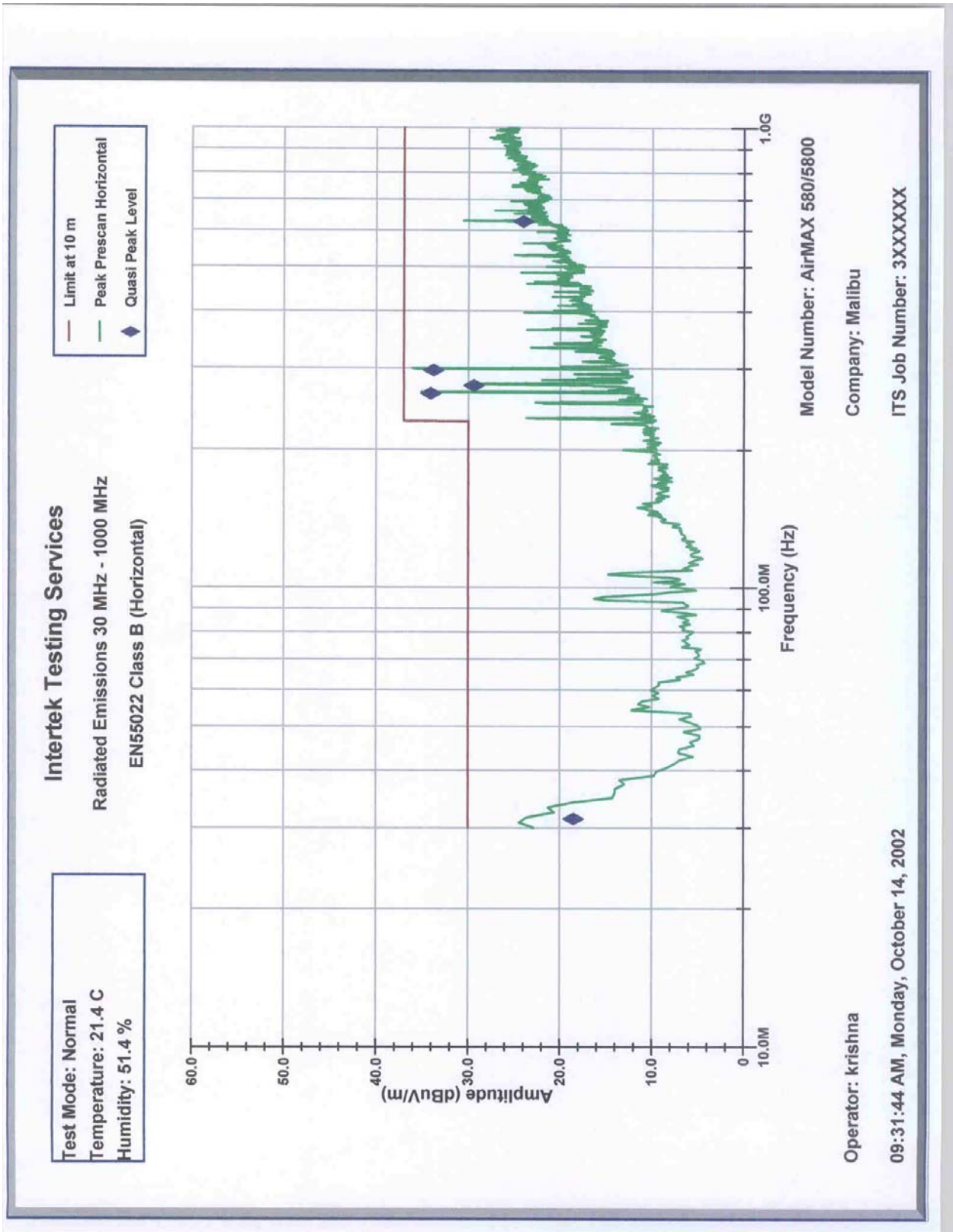
10:13:51 AM, Monday, October 14, 2002

Model Number: AirMAX 580/5800
ITS Job Number: 3XXXXXX
Company: Malibu

	1	2	3	4	5	6	7
Frequency	Quasi Pk FS	Limit@10m	Margin	RA	CF	AG	AF
MHz	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB(1/m)
31.3738 MHz	18.5	30.0	-11.5	28.0	3.5	25.3	12.4
264.0718 MHz	34.1	37.0	-2.9	42.0	5.1	24.8	11.9
275.0043 MHz	29.4	37.0	-7.6	36.4	5.1	24.8	12.7
297.08 MHz	33.8	37.0	-3.2	40.6	5.1	24.8	12.8
627.1688 MHz	24.1	37.0	-12.9	21.9	6.4	24.6	20.4

Test Mode: Normal
Temperature: 21.4 C
Humidity: 51.4 %

Page 1


Intertek Testing Services
Radiated Emissions 30 MHz - 1000 MHz
EN55022 Class B (Horizontal)
Limit at 10 m
Peak Prescan Horizontal
Quasi Peak Level
Test Mode: Normal
Temperature: 21.4 C
Humidity: 51.4 %
Amplitude (dBuV/m)
60.0
50.0
40.0
30.0
20.0
10.0
0
10.0M
100.0M
1.0G
Frequency (Hz)
Model Number: AirMAX 580/5800
Company: Malibu
ITS Job Number: 3XXXXXX
Operator: krishna
09:31:44 AM, Monday, October 14, 2002

Intertek Testing Services
Radiated Emissions 30 MHz - 1000 MHz
EN55022 Class B (QP-Vertical)

Operator: krishna

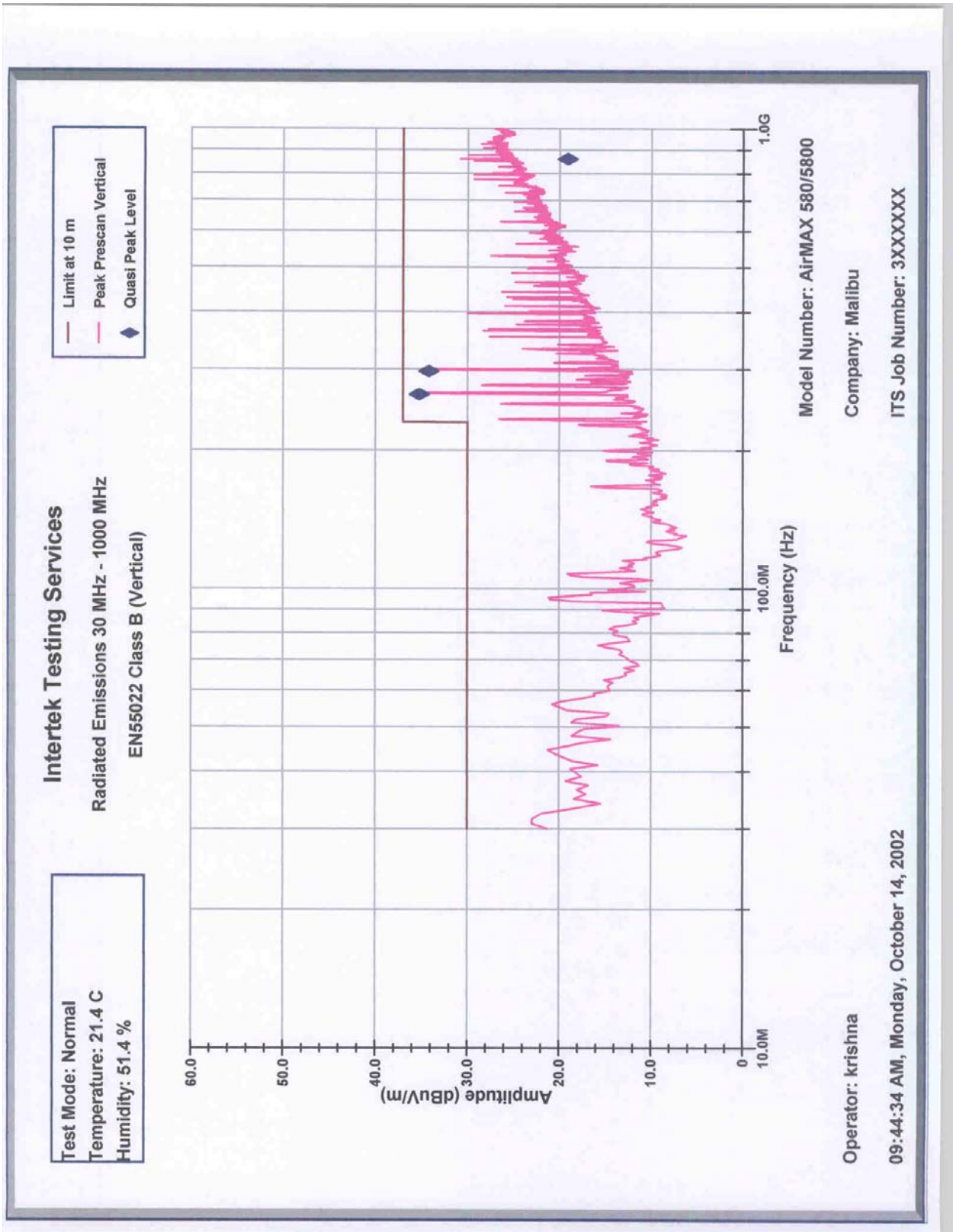
10:27:58 AM, Monday, October 14, 2002

Model Number: AirMAX 580/5800
ITS Job Number: 3XXXXXX
Company: Malibu

	1	2	3	4	5	6	7
Frequency	Quasi Pk FS	Limit@10m	Margin	RA	CF	AG	AF
MHz	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB(1/m)
264.0705 MHz	35.2	37.0	-1.8	42.3	5.1	24.8	12.6
297.08 MHz	34.2	37.0	-2.8	41.1	5.1	24.8	12.8
859.3943 MHz	19.1	37.0	-17.9	13.2	7.2	24.2	22.9

Test Mode: Normal
Temperature: 21.4 C
Humidity: 51.4 %

Page 1

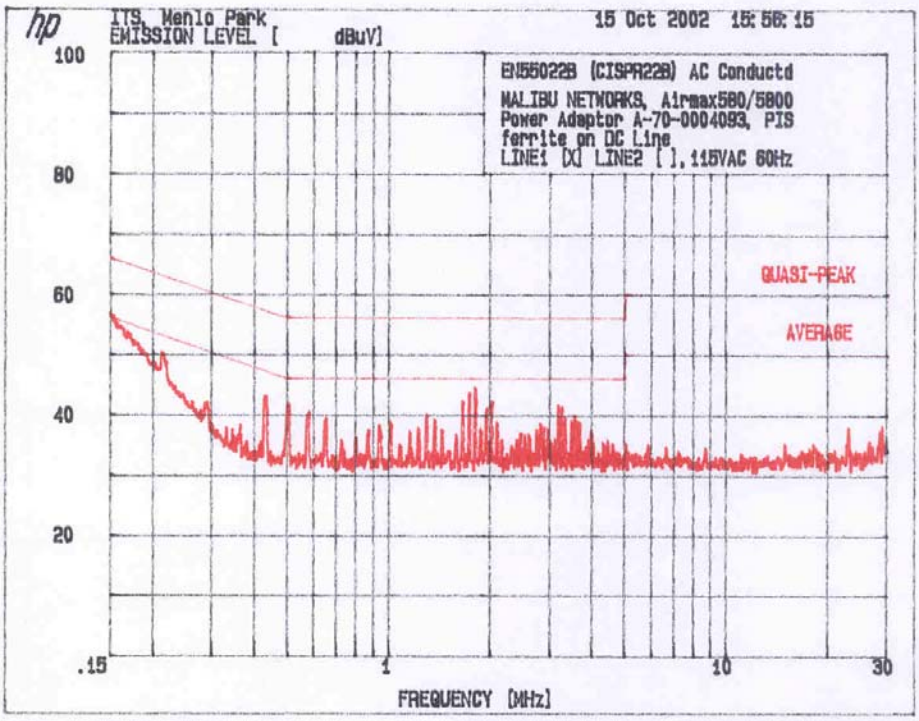

Intertek Testing Services
Radiated Emissions 30 MHz - 1000 MHz
EN55022 Class B (Vertical)
Limit at 10 m
Peak Prescan Vertical
Quasi Peak Level
Test Mode: Normal
Temperature: 21.4 C
Humidity: 51.4 %
Amplitude (dBuV/m)
60.0
50.0
40.0
30.0
20.0
10.0
0
10.0M
100.0M
1.0G
Frequency (Hz)
Model Number: AirMAX 580/5800
Company: Malibu
ITS Job Number: 3XXXXXX
Operator: krishna
09:44:34 AM, Monday, October 14, 2002

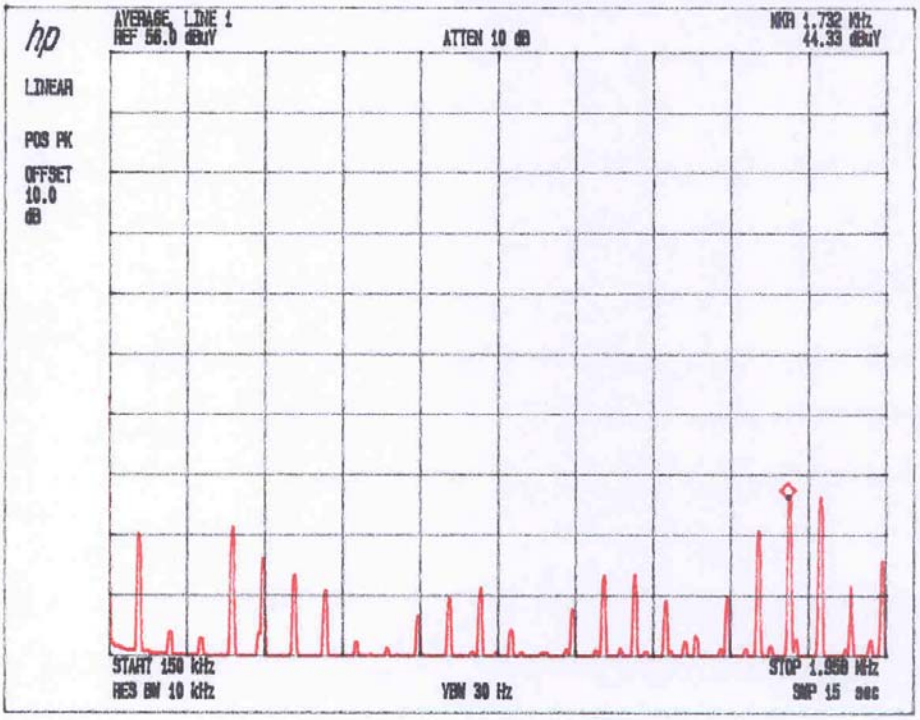
4.7 AC Line Conducted Emission
FCC 15.207

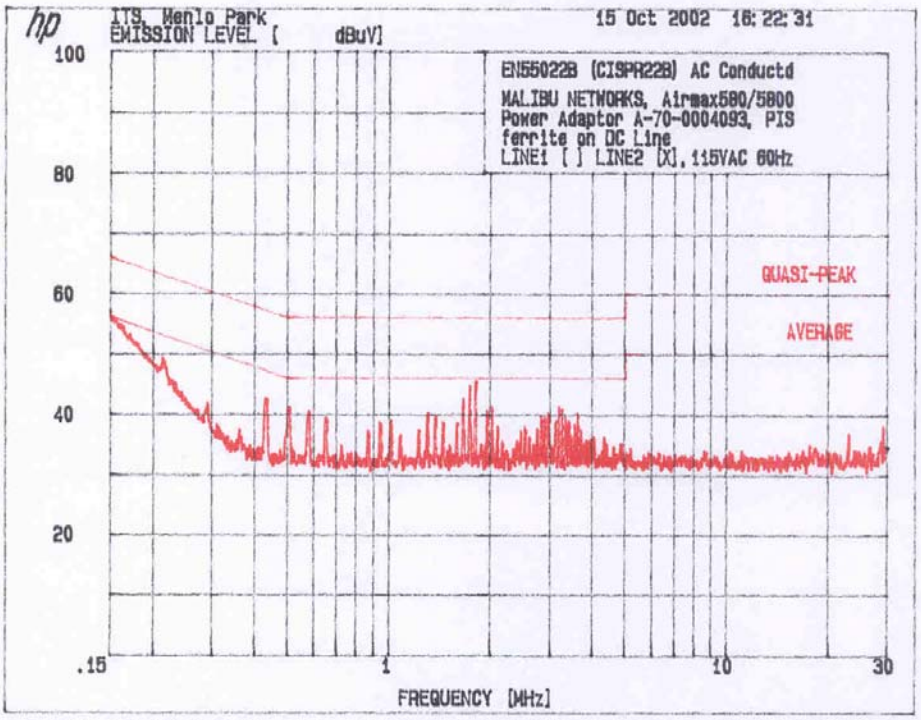
AC line conducted emission test was performed according the ANSI C63.4 standard. The CISPR 22 Limit was used. The EUT was connected to DC Power Supply which was connected to AC Line through the LISNs.

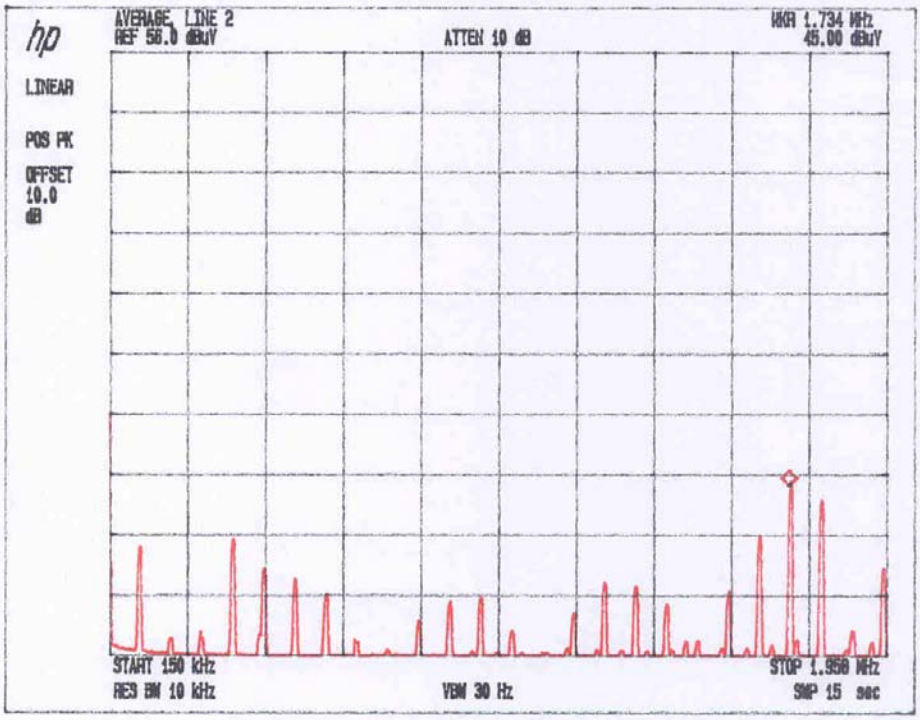
For the test result, see attached plots. The Fair-Rite Snap-its ferrite, p/n 0443167251 with 2 turns was used on DC power cable.

EUT passed by 1 dB.


ITS, Menlo Park
EMISSION LEVEL [dBuV]
15 Oct 2002 15:58:15
EN55022B (CISPR22B) AC Conductd
MALIBU NETWORKS, Airmax580/5800
Power Adaptor A-70-0004093, PIS
ferrite on DC Line
LINE1 [X] LINE2 [ ], 115VAC 60Hz
QUASI-PEAK
AVERAGE
100
80
60
40
20
.15
1
10
30
FREQUENCY [MHz]


AVERAGE, LINE 1
REF 56.0 dBuV
ATTEN 10 dB
MKR 1.732 MHz
44.33 dBuV
LINEAR
POS PK
OFFSET
10.0
dB
START 150 kHz
RES BW 10 kHz
VBW 30 Hz
STOP 1.950 MHz
SWP 15 sec


ITS Menlo Park
EMISSION LEVEL [dBuV]
15 Oct 2002 16:22:31
EN55022B (CISPR22B) AC Conductd
MALIBU NETWORKS, Airmax580/5800
Power Adaptor A-70-0004093, PIS
ferrite on DC Line
LINE1 [ ] LINE2 [X], 115VAC 60Hz
QUASI-PEAK
AVERAGE
100
80
60
40
20
.15
1
10
30
FREQUENCY [MHz]


AVERAGE LINE 2
REF 56.0 dBuV
ATTEN 10 dB
MKR 1.734 MHz
45.00 dBuV
LINEAR
POS PK
OFFSET
10.0
dB
START 150 kHz
RES BW 10 kHz
VBW 30 Hz
STOP 1.950 MHz
SWP 15 sec

5.0 List of test Equipment

Equipment	Manufacturer	Model/Type	Serial #	Cal Int	Cal Due
BI-Log Antenna	EMCO	3143	9509-1164	12	3/04/03
Pre-Amplifier	Sonoma Inst.	310	185634	12	01/10/03
RF Filter Section	Hewlett Packard	85460A	3448A00267	12	7/16/03
EMI Receiver	Hewlett Packard	8546A	3710A00373	12	7/16/03
Spectrum Analyzer	Tektronix	2784	B3020108	12	8/08/03
Spectrum Analyzer w/8650 QP Adapter	Hewlett Packard	8568B	1912A0053 2521A01021	12	3/15/03
Double-ridged Horn Antenna	EMCO	3115	8812-3049	12	4/03/03
Horn Antenna	EMCO	3160-09	-	#	#
Horn Antenna	EMCO	3160-10	-	#	#
Pre-Amplifier	Miteq	AMF-4D-001180-24-10P	799159	12	04/05/03
Pre-amplifier	CTT	ACO/400	47526	12	10/5/02
Pre-Amplifier	Avantek	AFT-18855	8723H705	12	10/5/02
Power Meter	Hewlett Packard	8900D	3607U00673	12	7/8/03
LISN	FCC	FCC-LISN-50-50-M-H	2011	12	1/02/03

No calibration required

6.0 Document History

Revision/ Job Number	Writer Initials	Date	Change
1.0 / 30332142	SS	September 30 , 2002	Original document