FCC PART 15.247 & 15.407

EMI MEASUREMENT AND TEST REPORT

For

ZTE Corporation

ZTE Plaza, Hi-Tech Industrial Park, Shenzhen, P. R. China

FCC ID: Q78ZXR10W800A

2004-05-03

This Report Concerns:	**Equipment Type:**
☒ Original Report	W800A Wireless Access Point

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Report No.:	RSH04031611
Test Date:	2004-04-2 / 2004-04-09
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Note: This test report is specially limited to the above client company and product model only. It may not be duplicated without prior written consent of Bay Area Compliance Laboratory Corporation. This report **must not** be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *ZTE Corporation's*, model: *W800A*, or the "EUT" as referred to in this report is an W800A Wireless Access Point which measures approximately 34.5cm L x 30.0cm W x 8.0cm H, rated input voltage: DC 12V.

The EUT was fed by a adapter: M/N, NL20-1200150-11, input: 100-240V, 50/60Hz 1A, output: 12V 1.5A

Antenna: 1, Manufacturer: Joymax, M/N: TWM-614;
2, Manufacturer: Kenbotong, M/N: TQJ-5800BKC40-W;
3, Manufacturer: Kenbotong, M/N: TQJ-5800C-5;
4, Manufacturer: Kenbotong, M/N: TQJ-5800BKF8;
5, Manufacturer: Smartant, M/N: R0322-025

** The test data gathered are from production sample, serial number: 040360, provided by the manufacturer.*

Objective

This type approval report is prepared on behalf of *ZTE Corporation* in accordance with Part 2, Subpart J, Part 15, Subparts A, C, and E of the Federal Communication Commissions rules.

The objective of the manufacturer is to demonstrate compliance with FCC rules for Output Power, Antenna Requirements, 6 dB Bandwidth and 26 dB Bandwidth, power spectral density, 100 kHz Bandwidth of Band Edges Measurement, Out of Band Emission, Spurious Emission, Conducted and Spurious Radiated Emission, Discontinue Transmitting with Absence of Data or Operational Failure, The Ratio of the Peak Excursion of the Modulation Envelope to the Peak Transmit Power and Frequency Stability.

Related Submittal(s)/Grant(s)

No Related Submittals.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2001, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The open Area Test site used by Bay Area Compliance Laboratory Corporation to collect radiated electromagnetic disturbance and disturbance voltage measurement data is located in the No. 3 building JingHua Courtyard, Shennanzhong Rd ShenZhen, Guandong 518031, P.R. C.

Test site at BACL has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2001.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The scope of the accreditation covers the FCC Method – 47 CFR Part – Digital Devices, CISPER 22: 1997: Electromagnetic Interference – Limits and Methods of Measurement of Information Technology Equipment test methods.

Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
LEGEND	System PC	Qitian1200	N/A	DoC
Seagate	Hard Drive	ST 320410A	5FG2TFAX	DoC
Sony	3.5" Floppy Drive	FDD-MPF920-E	72930348	DoC
LITEON	WK-Rom Drive	XT-HD166S	N/A	DoC
LEGEND	Motherboard	MS-6395	N/A	DoC
TELTA	SPS	DPS-145PB-111F	Lup0219016447C	DoC

Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
HP	Laser Jet 5L Printer	C3941A	JPTV0132337	DoC
SAST	Modem	AEM-2100	0293	DoC
SAMSUNG	Monitor	550E	N/A	DoC
LEGEND	Keyboard	SK-1688	C205007790	DoC
LEGEND	Mouse	M-S61	LZA21702500	DoC

External I/O Cable

Cable Description	Length (M)	From/Port	To
Shielded Detachable LAN Cable	30.0	EUT	PC
Unshielded Detachable DC Cable	30.0	DC Power	EUT
Shielded Undetachable Lan Cable	1.60	EUT	Host PC
Shielded Detachable KB Cable	1.60	KB Port/Host	Keyboard
Shielded Detachable Mouse Cable	1.50	Mouse Port/Host	Mouse
Shielded Detachable Printer Cable	1.60	Parallel Port/Host	Printer
Shielded Detachable Serial Cable	1.60	Serial Port/Host	Modem
Shielded Detachable VGA Cable	1.50	VGA Port/Host	Monitor

SYSTEM TEST CONFIGURATION

Justification

The host system was configured for testing according to ANSI C63.4-2001.

The EUT was tested in the normal (native) operating mode to represent *worst*-case results during the final qualification test.

EUT Exercise Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the system components in a manner similar to a typical use. The test software, provided by the customer, is started the Windows terminal program under the Windows 98/2000/ME/XP operating system.

Once loaded, set the Tx channel to low, mid and high for testing.

Special Accessories

N/A

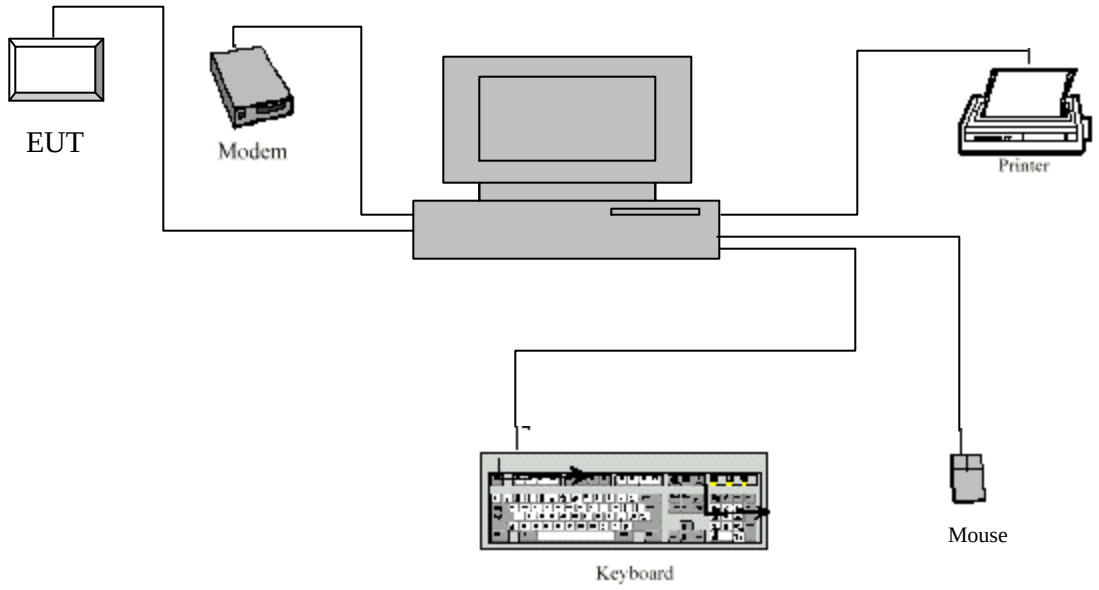
Schematics / Block Diagram

Please refer to Exhibit D.

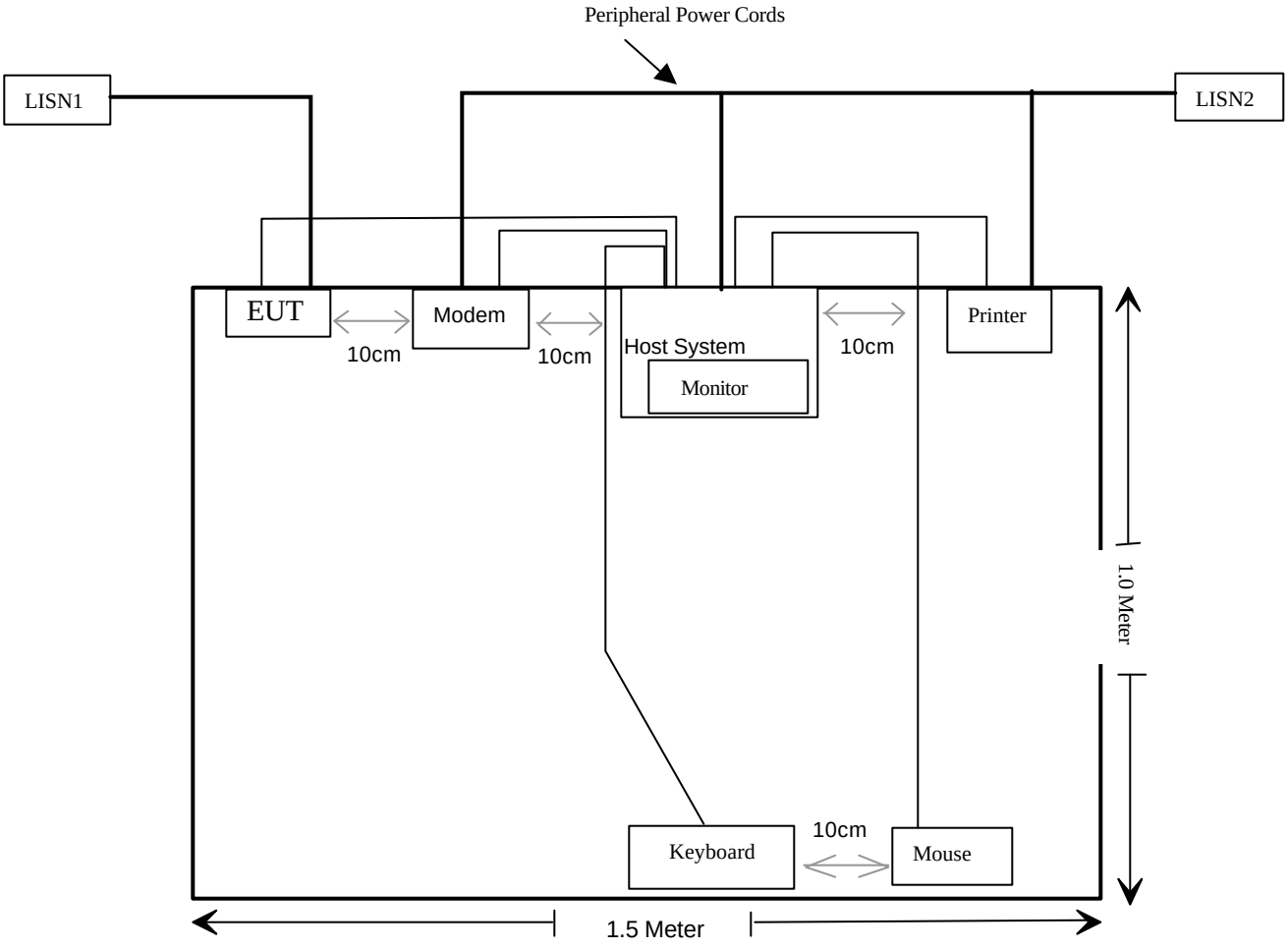
Equipment Modifications

No modifications were made to the EUT.

Configuration of EUT



Test Setup Block Diagram



SUMMARY OF TEST RESULTS

Results reported relate only to the product tested, serial number: 040360.

FCC RULES	DESCRIPTION OF TEST	RESULT
§2.1091	RF radiation exposure evaluation	Pass
§15.203	Antenna Requirement	Pass
§ 15.205	Restricted Bands	Pass
§15.209(a), §15.407(b)(5), §15.407(b)(6)	Radiated Emission	Pass
§ 15.207(a)	AC Line Conduction	Pass
§15.209(a), §15.247, §15.407	Spurious Emission	Pass
§15.247(a)(2), § 15.407	6 dB Bandwidth & 26 dB Bandwidth	Pass
§15.247(b)(3), §15.407(a)(2)	Maximum Peak Output Power	Pass
§15.247(b)(4), §15.407 (f)	RF Exposure Requirement	Pass
§ 15.247(c)	100 kHz Bandwidth of Frequency Band Edge	Pass
§15.247(d), §15.407(a)(2)	Peak Power Spectral Density	Pass
§15.407(a)(6)	The Ratio of the Peak Excursion of the Modulation Envelope to the Peak Transmit Power	Pass
§15.407(b)	Out of Band Emission	Pass
§15.407(c)	Discontinue Transmitting with Absence of Data or Operational Failure	Pass
§ 15.407(g)	Frequency Stability	Pass

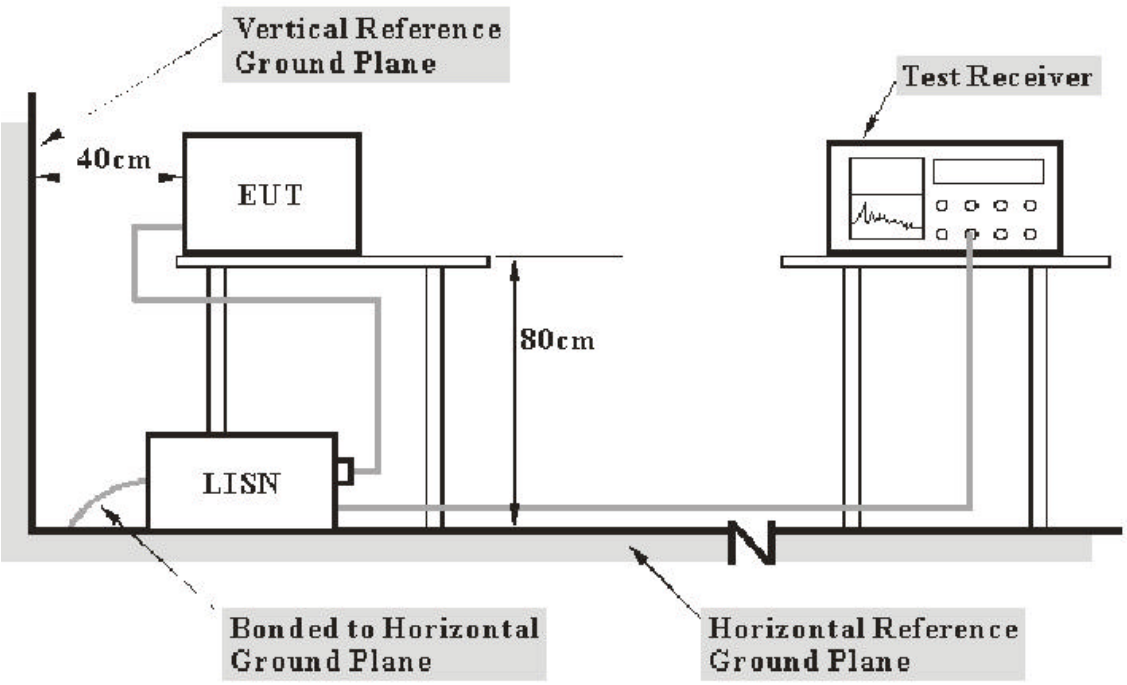
§15.207(a) - CONDUCTED EMISSIONS

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at BACL is ±2.4 dB.

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2001 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The Host PC was connected to a 120 VAC/ 60Hz power source.

Spectrum Analyzer Setup

The spectrum analyzer was set to investigate the spectrum from 150 KHz to 30MHz.

During the conducted emission test, the spectrum analyzer was set with the following configurations:

Frequency Range	***RBW***	***Video B/W***
150KHz - 30MHz	10KHz	10KHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
COM Power	LISN	LI-200	12208	2003-10-30	2004-10-29
COM Power	LISN	LI-200	12005	2003-10-30	2004-10-29
HP	Spectrum Analyzer	8568B	2517A01610	2003-10-30	2004-10-29
HP	Spectrum Analyzer Display Unit	8568B	2517A10039	2003-10-30	2004-10-29
HP	Quasi-Peak Adapter	8565A	3107A01572	2003-10-30	2004-10-29
R/S	Spectrum Analyzer	FSEM	849720/019	2003-10-30	2004-10-29
FLUKE	True RMS Multimeter	187	78540402	2004-3-23	2005-3-22

*** Statement of Traceability: BACL Corp.** certifies that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

During the conducted emission test, the EUT power cord was connected to the outlet of the first LISN, the Host PC and all other support equipment power cords connected to the outlet of the second LISN.

Maximizing procedure were performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak detection mode.

Test Data

Date of Test	:	April 2-9,2004	Temperature	:	25?
EUT	:	W800A Wireless Access Point	Humidity	:	70%
M/N	:	W800A	Operating Mode	:	Running
S/N	:	040360	Test Engineer:		Jandy SU

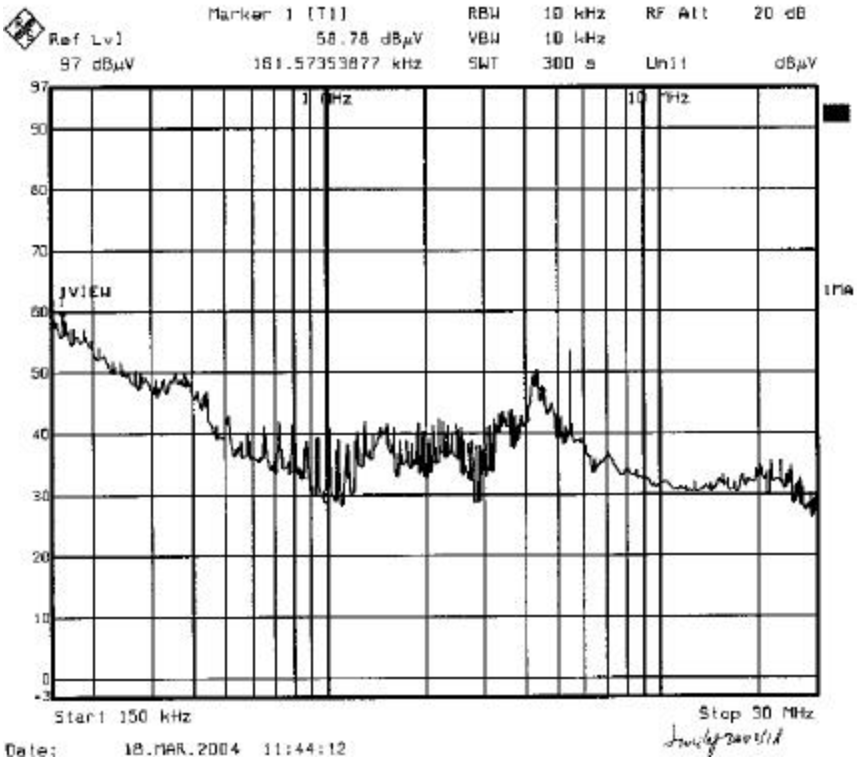
LINE CONDUCTED EMISSIONS				FCC	
Frequency MHz	Amplitude dBµV	Detector QP/AV/Peak	Phase Line/Neutral	Limit dBµV	Margin dB
4.30	42.2	AV	Line	46.00	-3.8
4.30	50.3	QP	Line	56.00	-5.7
0.35	43.2	AV	Neutral	48.96	-5.8
0.16	49.2	AV	Line	55.46	-6.3
0.15	49.6	AV	Neutral	56.00	-6.4
0.38	41.1	AV	Line	48.28	-7.2
0.16	58.3	QP	Line	65.46	-7.2
0.15	58.4	QP	Neutral	66.00	-7.6
0.35	51.1	QP	Neutral	58.96	-7.8
0.38	49.7	QP	Line	58.28	-8.6
4.34	32.6	AV	Neutral	46.00	-13.4
4.34	38.0	QP	Neutral	56.00	-18.0

Test Result: Pass

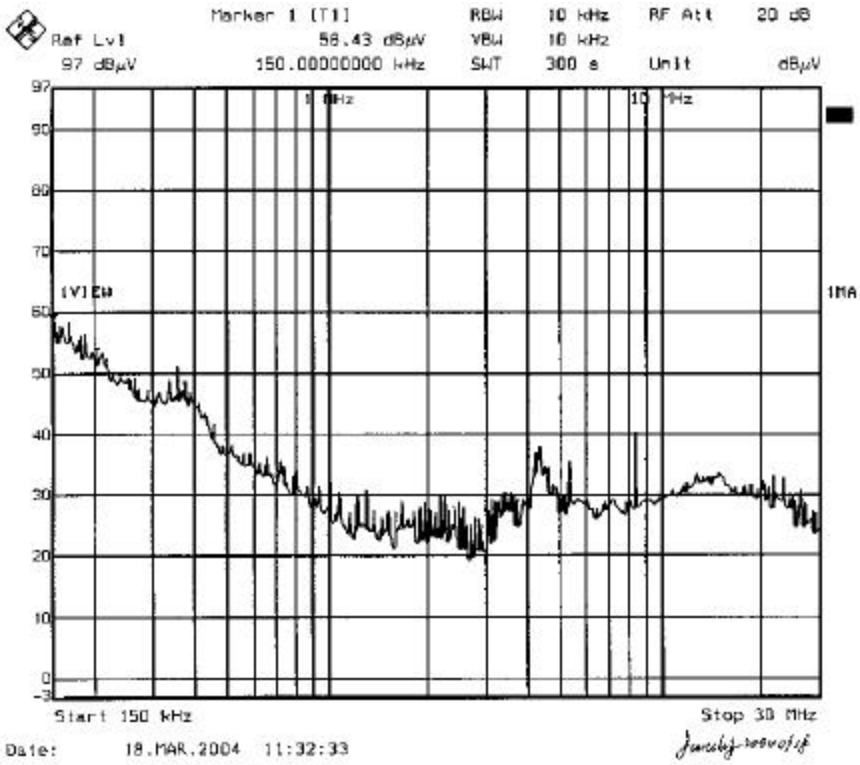
Plot(s) of Test Data

Plot(s) of Test Data is presented hereinafter as reference.

Line:



Neutral:



§15.209(a) - ANTENNA PORT CONDUCTED SPURIOUS EMISSION TEST (30M-40G)

Standard Applicable

According to §15.209 (a), except as provided elsewhere in the subpart of 15.209, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Measurement Field strength (microvolts/meter)
0.009-0.490	2400/F(kHz)
0.490-1.705	24000/F(kHz)
1.705-30.0	30
30-88	100 **
88-216	150 **
216-960	200 **
Above 960	500

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241

Measurement Procedure

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 4 without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set the SA on Max-Hold Mode, and then keep the EUT in transmitting mode. Record all the signals from each channel until each one has been recorded.
4. Set the SA on View mode and then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date
R/S	Spectrum Analyzer	FSEM	849720/019	2003-10-30

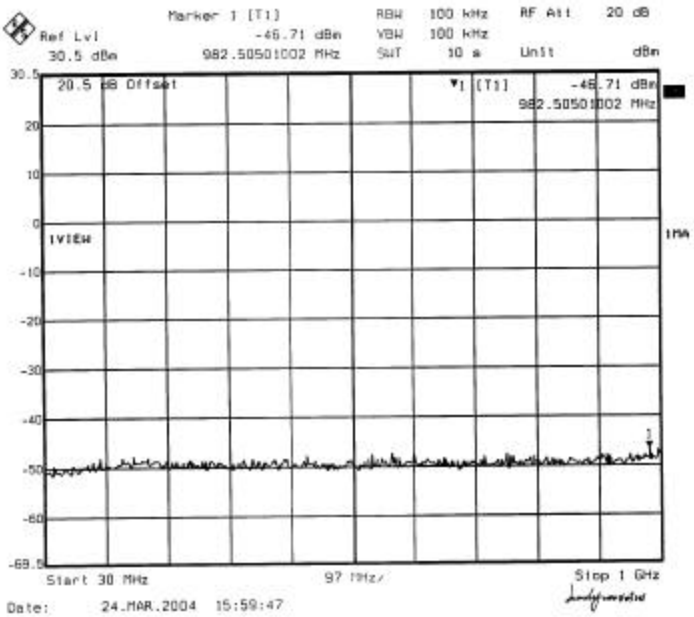
Measurement Result

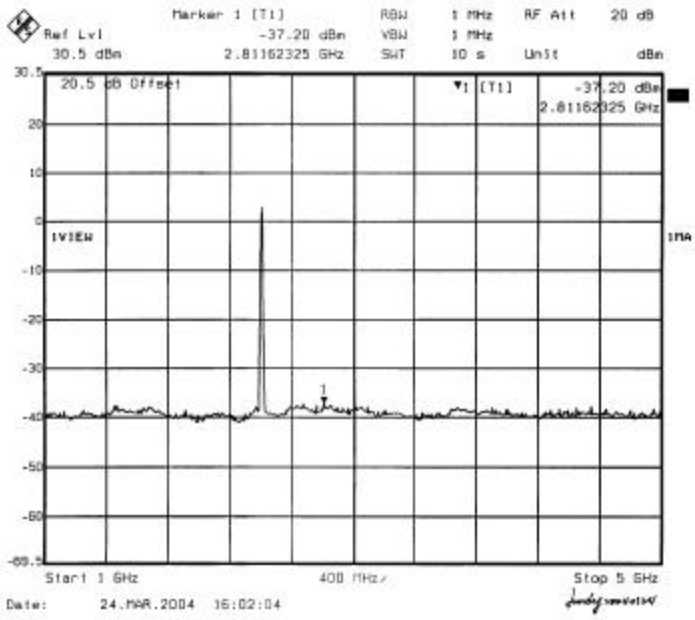
Environmental Conditions

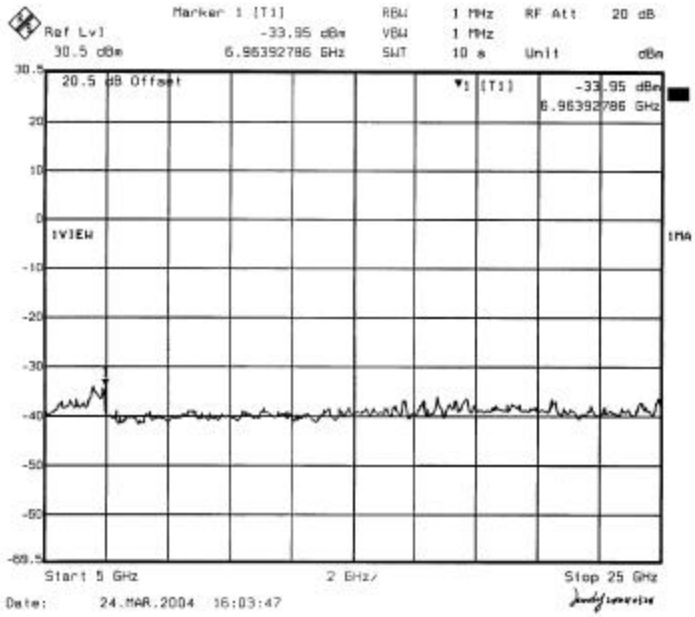
Temperature:	24° C
Relative Humidity:	63%
ATM Pressure:	1100 mbar

Please refer to following pages for plots of spurious emission.

(2.4GHz-2.4835GHz) Low Channel BPSK 802.11g



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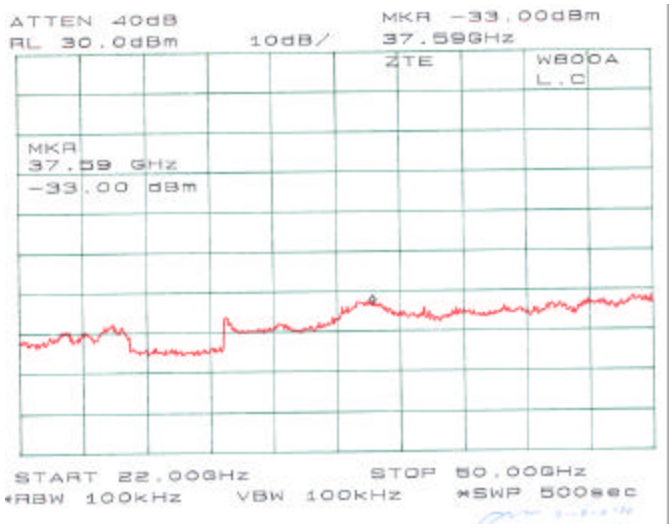
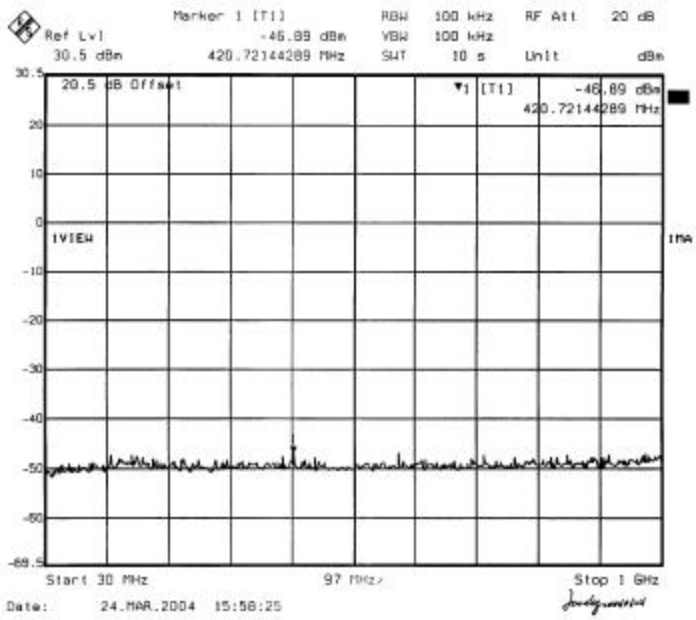
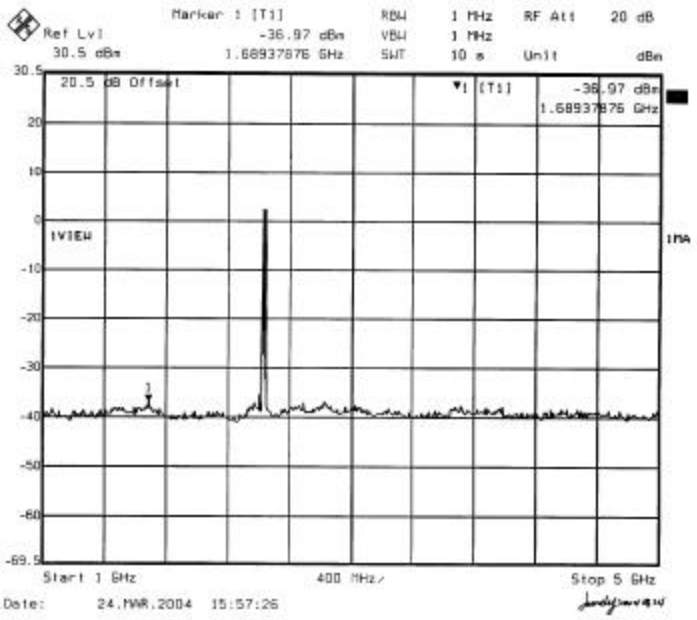
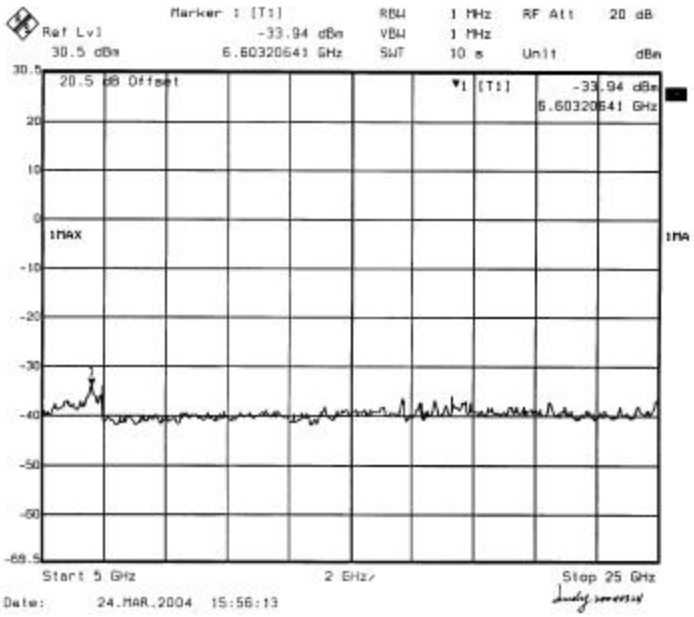
Ref Lvl
30.5 dBm
-33.95 dBm
6.96392786 GHz
RBW 1 MHz
VBW 1 MHz
SWT 10 s
RF Att 20 dB
Unit dBm
20.5 dB Offset
▼1 [T1] -33.95 dBm
6.96392786 GHz
1VIEW
1MA
Start 5 GHz
2 GHz/
Stop 25 GHz
Date: 24.MAR.2004 16:03:47

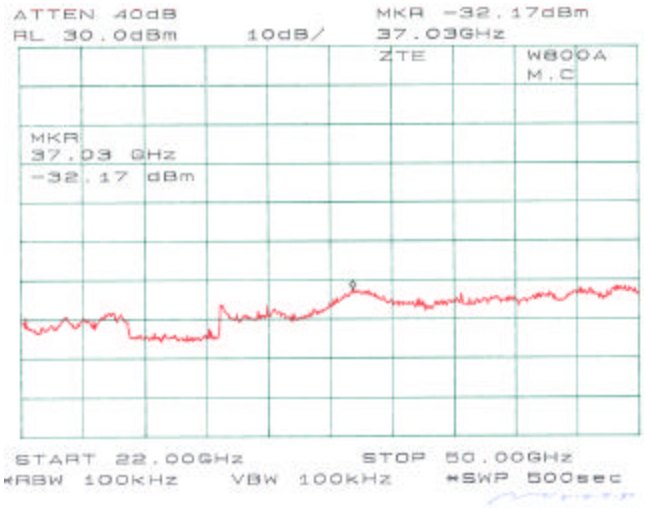

ATTEN 40dB
RL 30.0dBm
10dB/
MKR -33.00dBm
37.59GHz
ZTE
W800A
L.C
MKR
37.59 GHz
-33.00 dBm
START 22.00GHz
STOP 50.00GHz
*RBW 100kHz
VBW 100kHz
*SWP 500sec

(2.4GHz-2.4835GHz) Middle Channel BPSK 802.11g

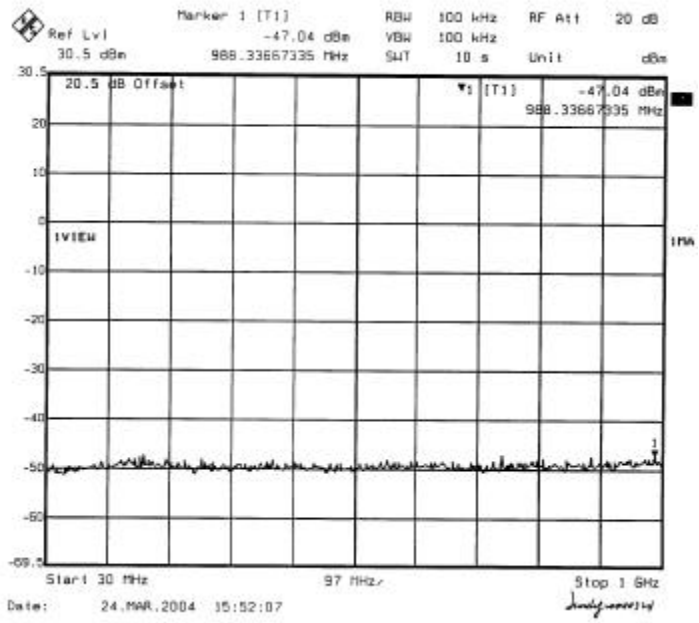


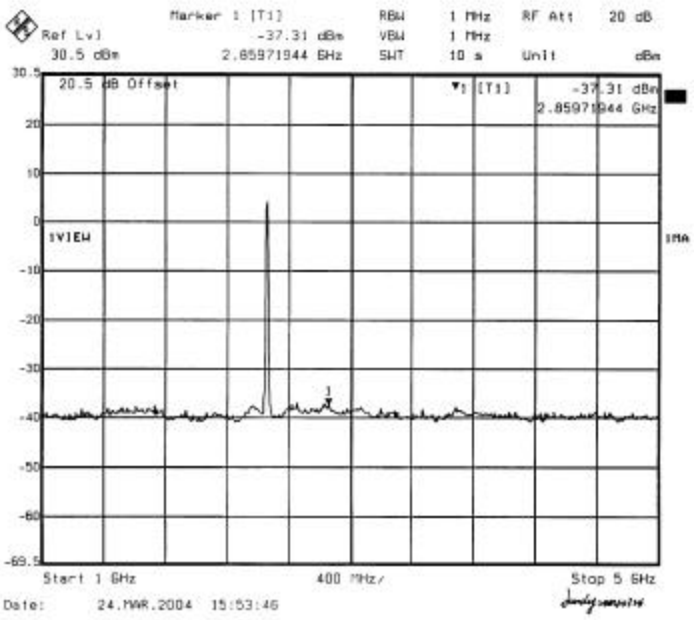


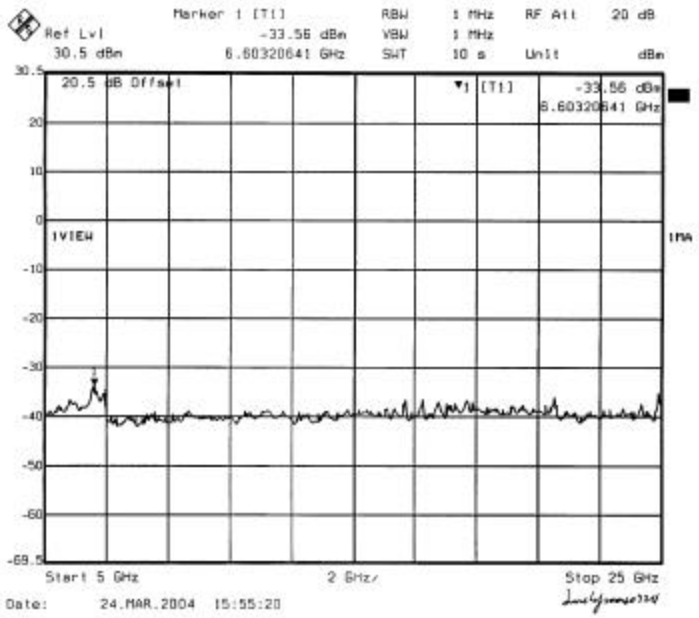

Marker 1 [T1]
Ref Lvl
30.5 dBm
-33.94 dBm
6.60320641 GHz
RBW 1 MHz
VBW 1 MHz
SWT 10 s
RF Att 20 dB
Unit dBm
20.5 dB Offset
1MAX
1MA
Start 5 GHz
2 GHz/
Stop 25 GHz
Date: 24.MAR.2004 15:56:13

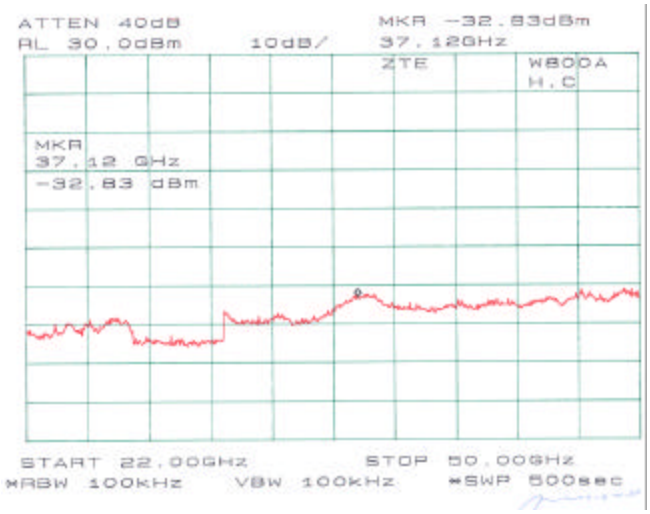

ATTEN 40dB
RL 30.0dBm
10dB/
MKR -32.17dBm
37.03GHz
ZTE
W800A
M.C
MKR
37.03 GHz
-32.17 dBm
START 22.00GHz
STOP 50.00GHz
*RBW 100kHz
VBW 100kHz
*SWP 500sec

(2.4GHz-2.4835GHz) High Channel BPSK 802.11g

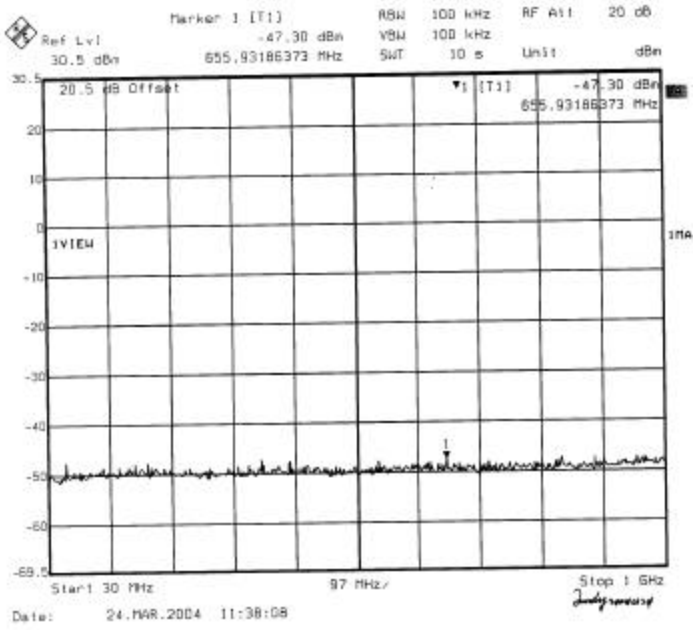


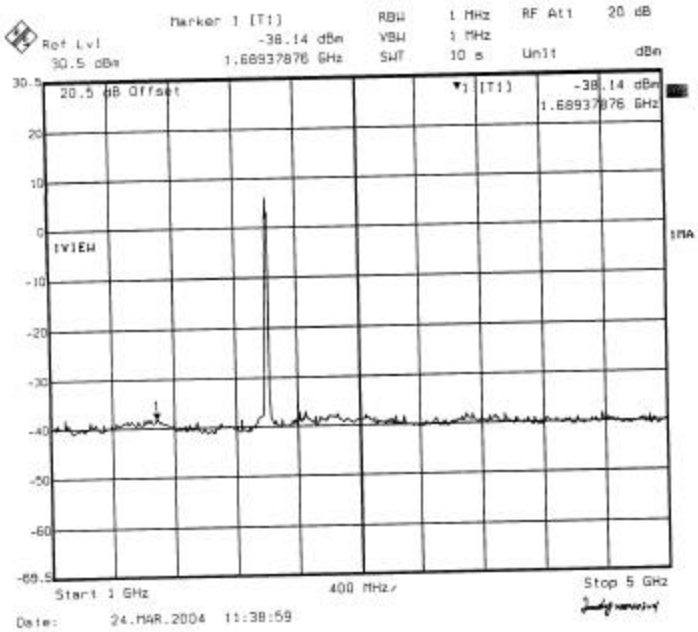


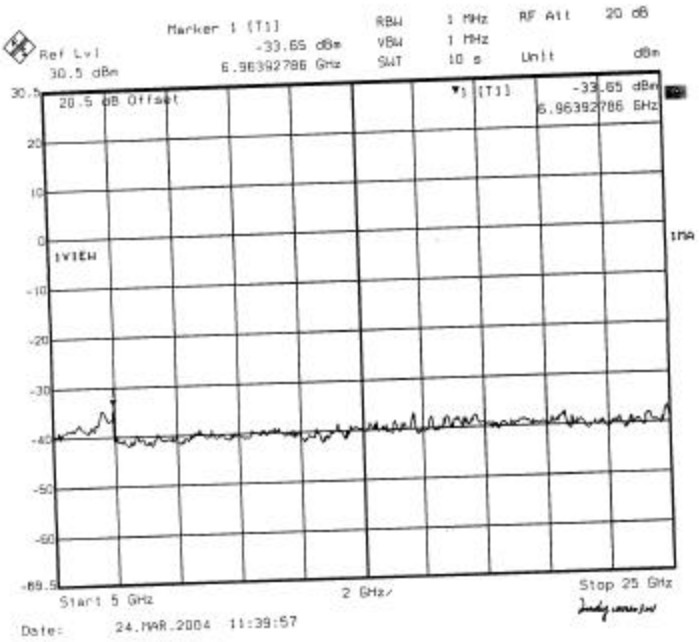

Marker 1 [T1]
-33.56 dBm
6.60320641 GHz
RBW 1 MHz
VBW 1 MHz
SWT 10 s
RF Att 20 dB
Unit dBm
Ref Lvl
30.5 dBm
20.5 dB Offset
1VIEW
1MA
Start 5 GHz
2 GHz/
Stop 25 GHz
Date: 24.MAR.2004 15:55:20

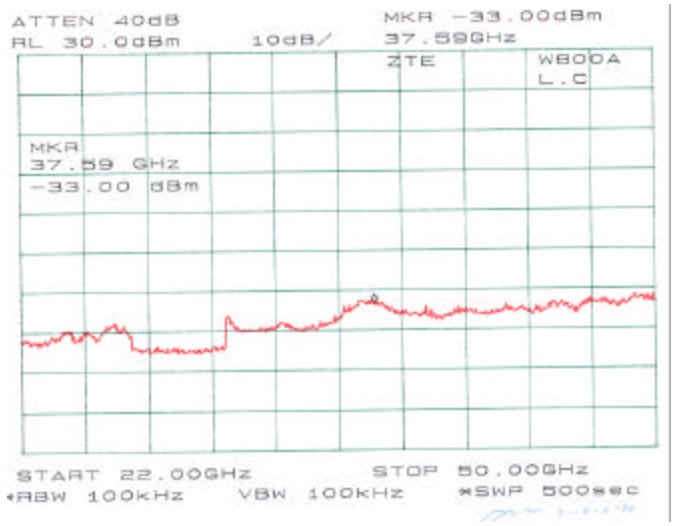

ATTEN 40dB
RL 30.0dBm
10dB/
MKR -32.83dBm
37.12GHz
ZTE
W800A
H.C
MKR
37.12 GHz
-32.83 dBm
START 22.00GHz
STOP 50.00GHz
RBW 100kHz
VBW 100kHz
SWP 500sec

(2.4GHz-2.4835GHz) Low Channel BPSK 802.11b

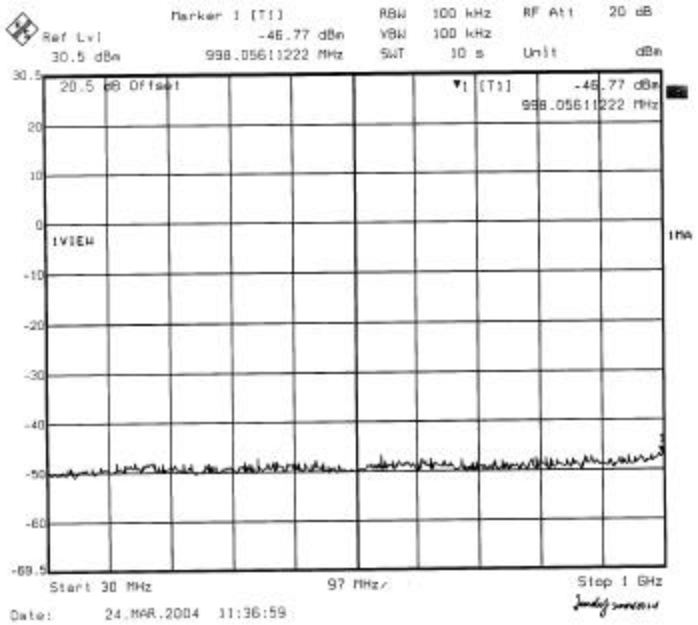


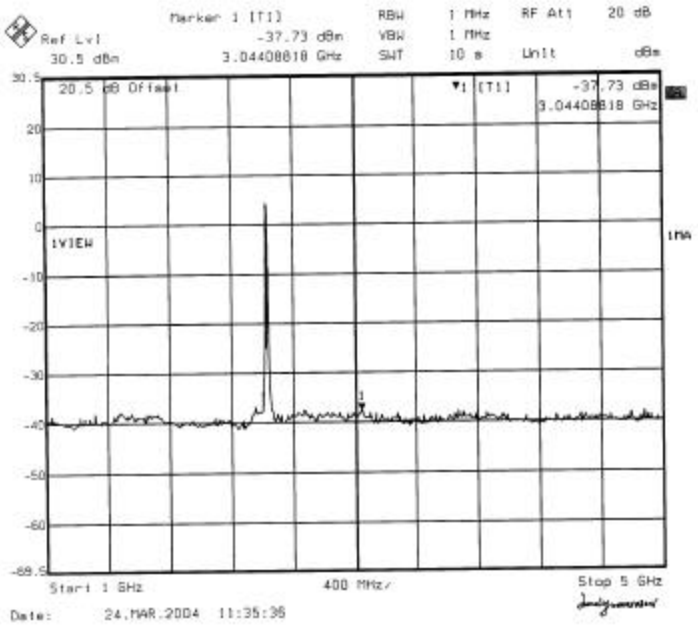


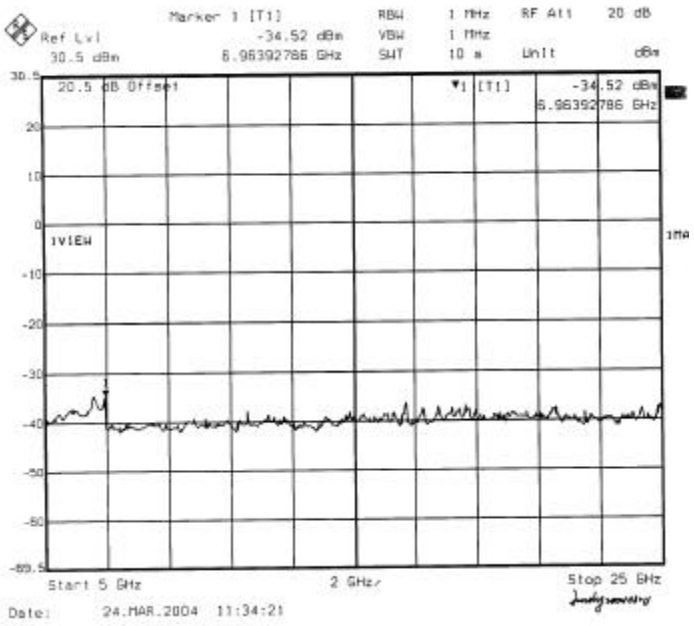

Marker 1 [T1]
-33.65 dBm
6.96392786 GHz
RBW 1 MHz
VBW 1 MHz
SWT 10 s
RF Att 20 dB
Unit dBm
Ref Lvl
30.5 dBm
20.5 dB Offset
1VIEW
Start 5 GHz
2 GHz/
Stop 25 GHz
Date: 24.MAR.2004 11:39:57

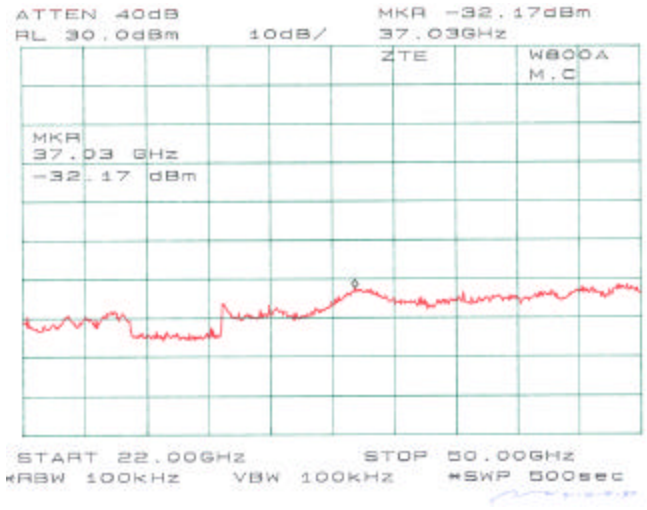

ATTEN 40dB
RL 30.0dBm
10dB/
MKR -33.00dBm
37.59GHz
ZTE
W800A
L.C
MKR
37.59 GHz
-33.00 dBm
START 22.00GHz
STOP 50.00GHz
*RBW 100kHz
VBW 100kHz
*SWP 500sec

(2.4GHz-2.4835GHz) Middle Channel BPSK 802.11b

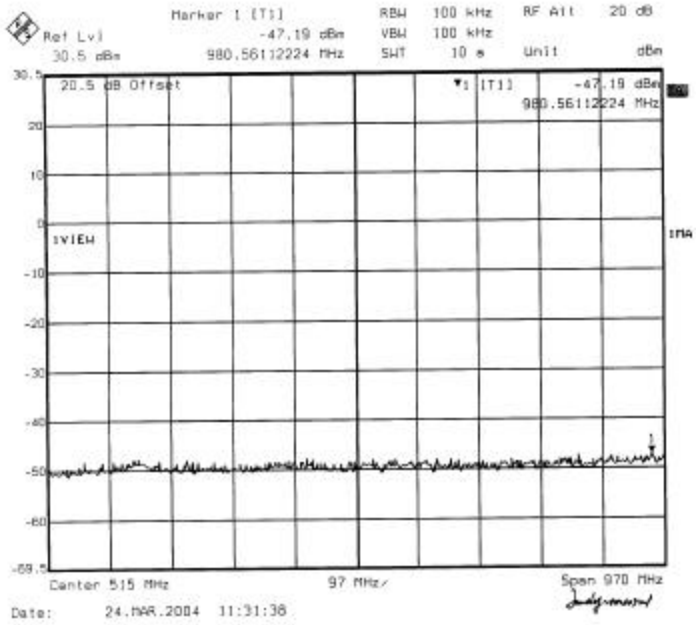


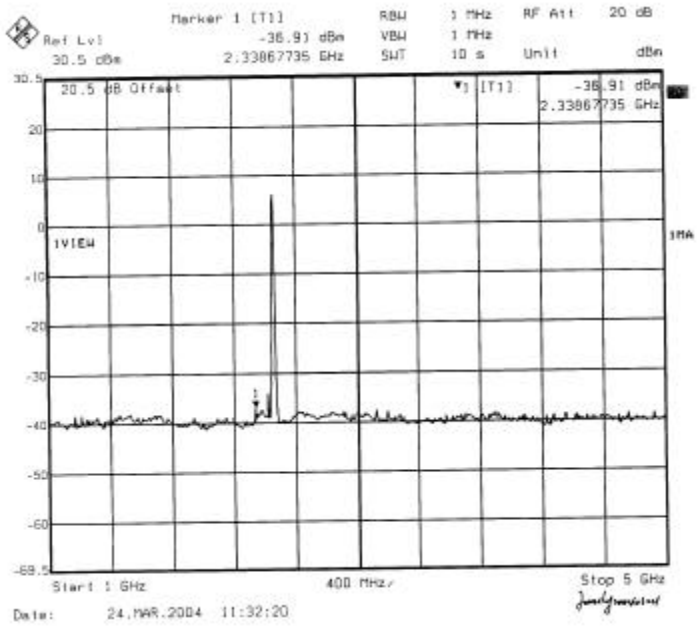


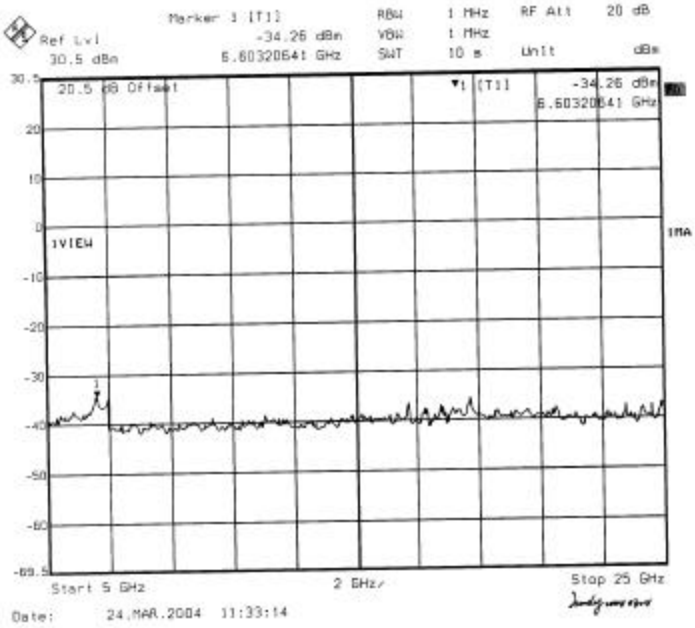

Marker 1 [T1]
Ref Lvl
30.5 dBm
-34.52 dBm
5.96392786 GHz
RBW 1 MHz
VBW 1 MHz
SWT 10 s
RF Att 20 dB
Unit dBm
20.5 dB Offset
▼1 [T1] -34.52 dBm
5.96392786 GHz
1MA
1VIEW
Start 5 GHz
2 GHz/
Stop 25 GHz
Date: 24.MAR.2004 11:34:21

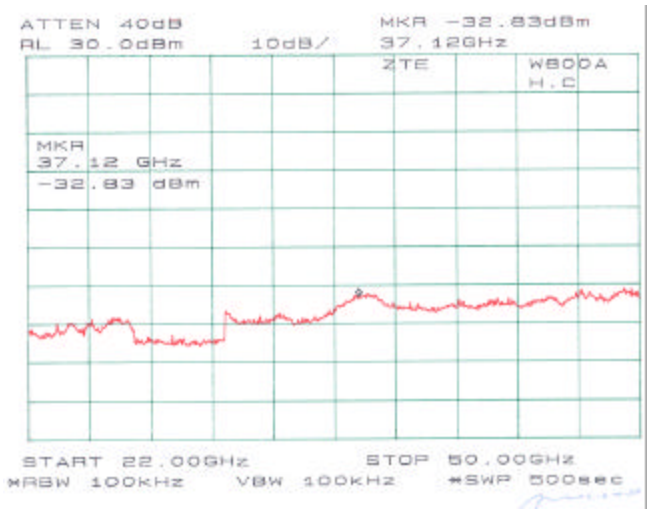

ATTEN 40dB
RL 30.0dBm
10dB/
MKR -32.17dBm
37.03GHz
ZTE
W800A
M.C
MKR
37.03 GHz
-32.17 dBm
START 22.00GHz
STOP 50.00GHz
*RBW 100kHz
VBW 100kHz
*SWP 500sec

(2.4GHz-2.4835GHz) High Channel BPSK 802.11b

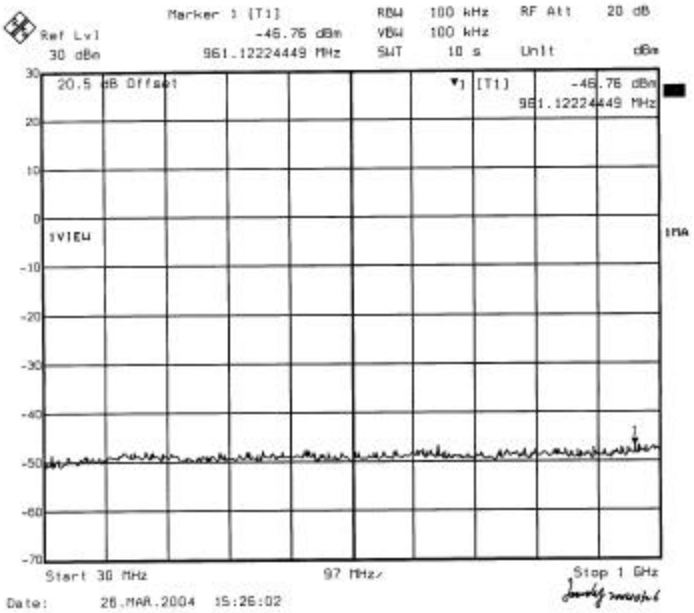


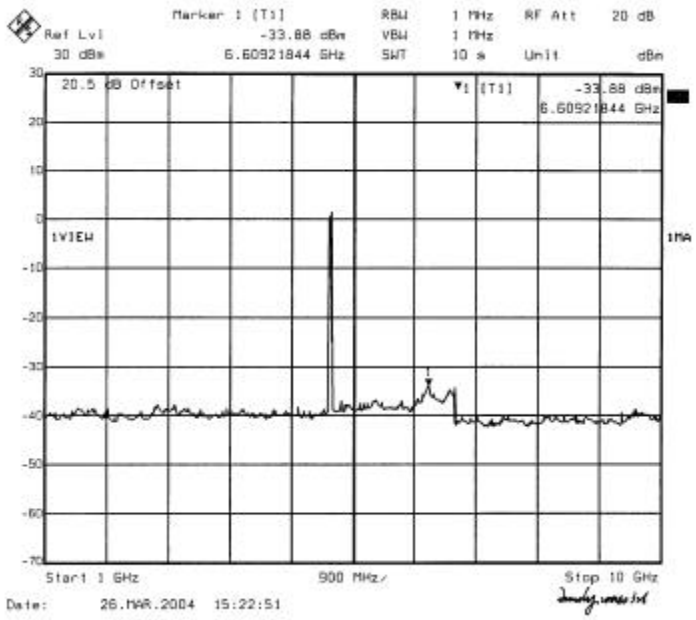


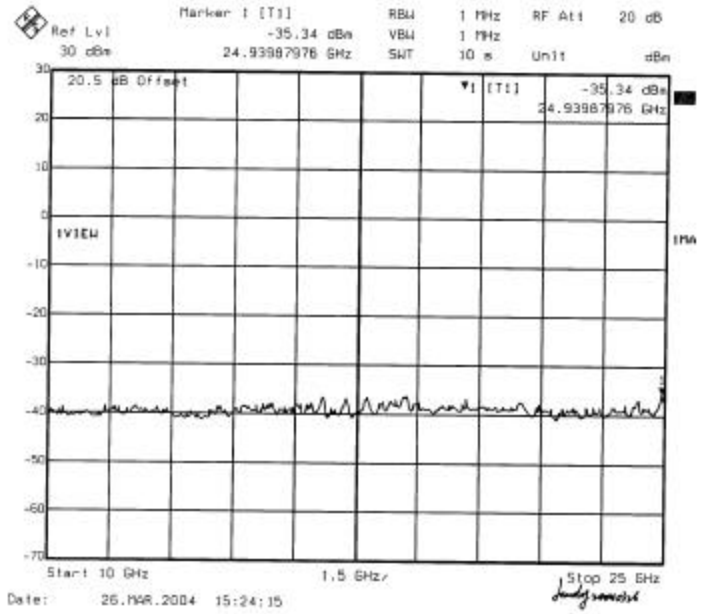

Marker 1 [T1]
-34.26 dBm
6.60320641 GHz
RBW 1 MHz
VBW 1 MHz
SWT 10 s
RF Att 20 dB
Unit dBm
Ref Lvl
30.5 dBm
20.5 dB Offset
1VIEW
1MA
Start 5 GHz
2 GHz/
Stop 25 GHz
Date: 24.MAR.2004 11:33:14

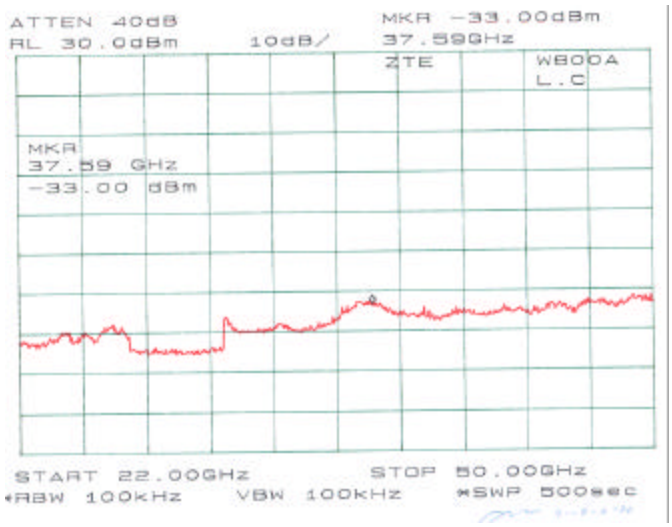

ATTEN 40dB
RL 30.0dBm
10dB/
MKR -32.83dBm
37.12GHz
ZTE
W800A
H.C
MKR
37.12 GHz
-32.83 dBm
START 22.00GHz
STOP 50.00GHz
*RBW 100kHz
VBW 100kHz
*SWP 500sec

(5.15GHz-5.25GHz) Low Channel BPSK 802.11a

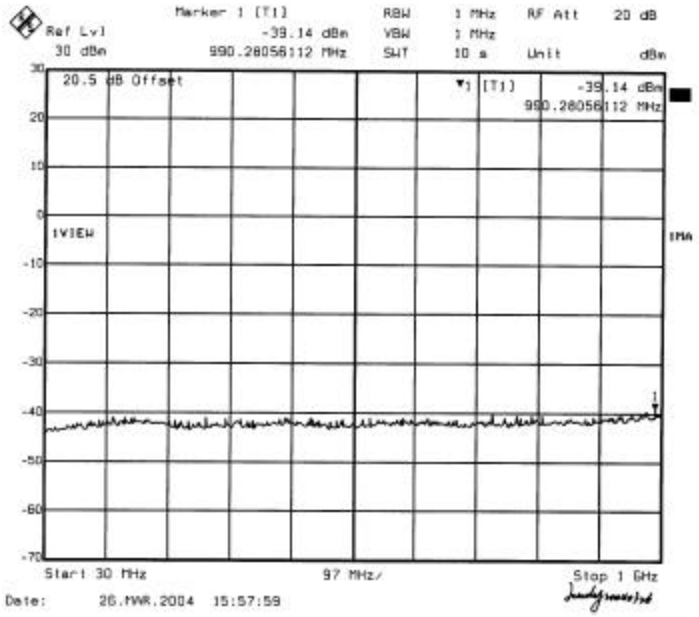


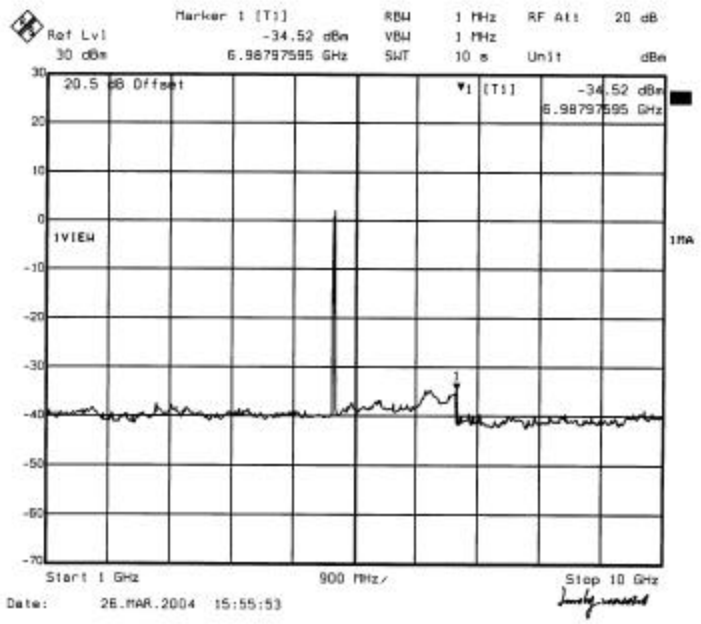


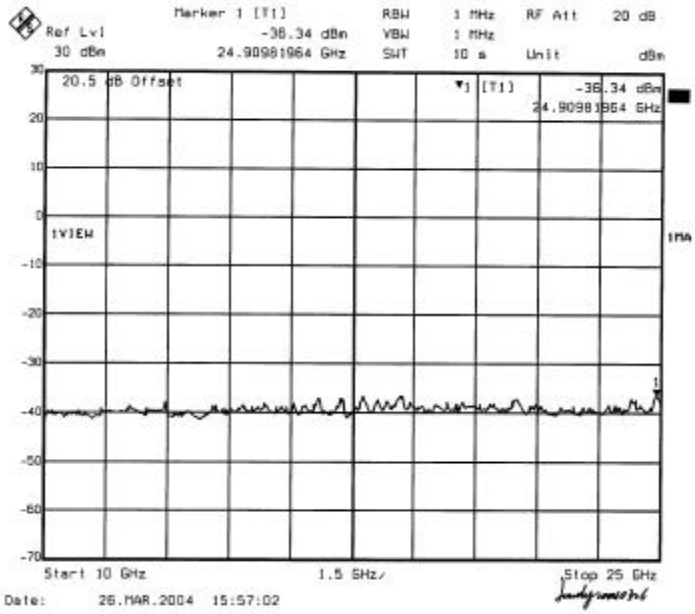

Ref Lvl
30 dBm
Marker 1 [T1]
-35.34 dBm
24.93987976 GHz
RBW 1 MHz
VBW 1 MHz
SWT 10 s
RF Att 20 dB
Unit dBm
20.5 dB Offset
VIEW
1MA
Start 10 GHz
1.5 GHz/
Stop 25 GHz
Date: 26.MAR.2004 15:24:15

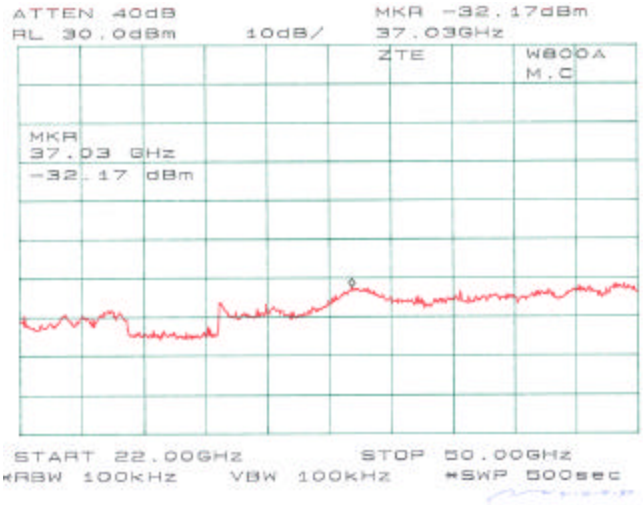

ATTEN 40dB
RL 30.0dBm
10dB/
MKR -33.00dBm
37.59GHz
ZTE
W800A
L.C
MKR
37.59 GHz
-33.00 dBm
START 22.00GHz
STOP 50.00GHz
*RBW 100kHz
VBW 100kHz
*SWP 500sec

(5.15GHz-5.25GHz) Middle Channel BPSK 802.11a






Marker 1 [T1]
-36.34 dBm
24.90981964 GHz
RBW 1 MHz
VBW 1 MHz
SWT 10 s
RF Att 20 dB
Unit dBm
Ref Lvl
30 dBm
20.5 dB Offset
▼1 [T1] -36.34 dBm
24.90981964 GHz
1VIEW
1MA
Start 10 GHz
1.5 GHz/
Stop 25 GHz
Date: 26.MAR.2004 15:57:02


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -32.17dBm
37.03GHz
ZTE
W800A
M.C
MKR
37.03 GHz
-32.17 dBm
START 22.00GHz
STOP 50.00GHz
RBW 100kHz
VBW 100kHz
SWP 500sec