



**FCC CFR47 PART 15 SUBPART C  
CLASS II PERMISSIVE CHANGE  
TEST REPORT**

**Per**

**FCC PART 15 SUBPART C TECHNICAL REQUIREMENT**

**RF BASE STATION**

**MODEL NAME: B552**

**FCC ID: JWSB551**

**REPORT NUMBER: 04U2812-1**

**ISSUE DATE: JULY 27, 2004**

*Prepared for*  
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623 SWIFT ST.  
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## 1. TEST RESULT CERTIFICATION

**COMPANY NAME:** WORTH DATA, INC.  
623 SWIFT ST.  
SANTA CRUZ, CA 95060, USA

**EUT DESCRIPTION:** RF BASE STATION

**MODEL:** B552

**MODEL DIFFERENCE:** N/A

**DATE TESTED:** July 19, 2004

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C	NO NON-COMPLIANCE NOTED

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** This document reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document.

Approved & Released For CCS By:

Tested By:



THU CHAN  
EMC SUPERVISOR  
COMPLIANCE CERTIFICATION SERVICES

THANH NGUYEN  
EMC TECHNICIAN  
COMPLIANCE CERTIFICATION SERVICES

## 2. EUT DESCRIPTION

The EUT is a RF base station operating in the 902-928 MHz band.

## 3. CLASS II PERMISSIVE CHANGE DESCRIPTION

This is a Class II permissive change for FCC ID: JWSB551, originally granted on December 2, 2003.

The major change filed under this application includes:

1. Added RS-422 I/F circuit and connector.

## 4. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4/2001, FCC CFR 47 Part 2 and FCC CFR 47 Part 15.

## 5. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.



No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government.

## 6. CALIBRATION AND UNCERTAINTY

### 6.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### 6.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Power Line Conducted Emission	+/- 2.9 dB

Uncertainty figures are valid to a confidence level of 95%.

### 6.3. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
RF Preselector, 20 Hz ~ 2 GHz	HP	85685A	2817A00756	8/22/2004
SA RF Section, 1.5 GHz	HP	85680B	2814A04227	2/22/2005
Site B Preamplifier, 1300MHz	HP	8447D	2944A06589	8/18/2004
Site B Antenna, Bilog	Chase	CBL6112B	2586	3/8/2005
SA Display Section 2	HP	85662A	2816A16696	5/24/2005
Quasi-Peak Adaptor	HP	85650A	2811A01155	5/24/2005
LISN, 10 kHz ~ 30 MHz	FCC	50/250-25-2	114	10/13/2004
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	8379443	10/13/2004
Site A Line Stabilizer / Conditioner	Tripplite	LC-1800a	A0051681	CNR
EMI Receiver, 9 kHz ~ 2.9 GHz	HP	8542E	3942A00286	11/21/2004
RF Filter Section	HP	85420E	3705A00256	11/21/2004

## 7. EQUIPMENT MODIFICATIONS

To achieve compliance to FCC Section 15.247 technical limits, the following change(s) were made during compliance testing:

N/A.



## 8. SETUP OF EQUIPMENT UNDER TEST

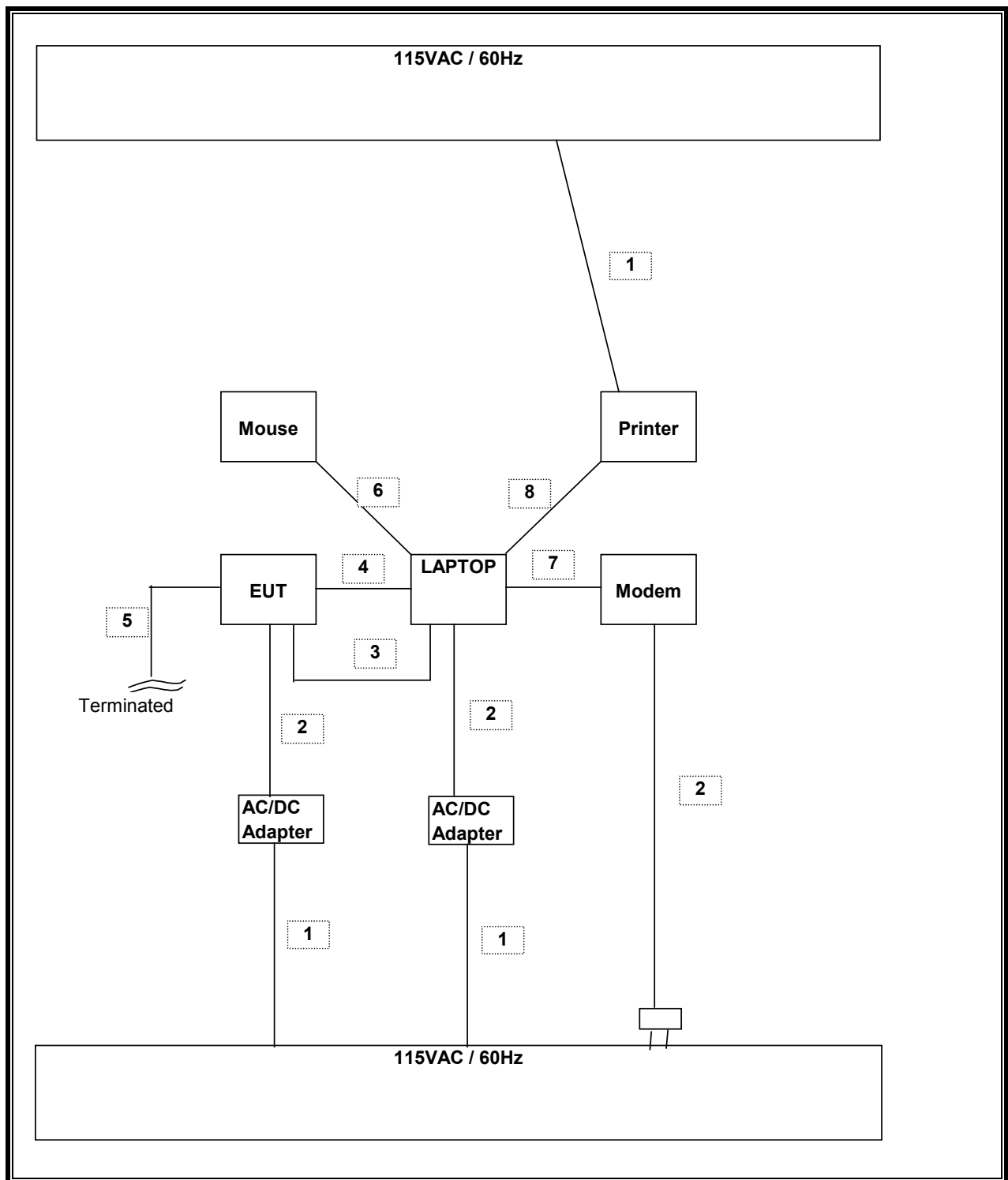
### SUPPORT EQUIPMENT

TEST PERIPHERALS				
Device Type	Manufacturer	Model Number	Serial Number	FCC ID
PRINTER	HP	2225C	2541S41679	BS46XU2225C
MODEM	ACEEX	1414	9013537	IFAXDM1414
LapTop	HP	5375	CNF3262SD8	MCLT60842400
Mouse	Creative	OMC90S	ADAC131802876	DoC

### I/O CABLES

TEST I/O CABLES								
Cable No	I/O Port	# of I/O Port	Connector Type	Type of Cable	Cable Length	Data Traffic	Bundled	Remark
1	AC	3	US 115V	Un-shielded	2m	No	No	N/A
2	DC	3	DC	Un-shielded	1.5m	No	No	
3	Ethernet	1	RJ45	Un-shielded	1m	Yes	No	Crosoever cable
4	Serial	1	DB9	Un-shielded	1m	No	No	
5	R422	1	R422	Un-shielded	1m	No	No	Teminated
6	Mouse	1	PS2	Un-shielded	1.5m	No	No	
7	USB	1	USB	Shielded	2m	No	No	use USB to Serial connector
8	Parallel	1	DB25	Un-shielded	2m	No	Yes	N/A

**SETUP DIAGRAM FOR TESTS**



## 9. APPLICABLE LIMITS AND TEST RESULTS

### 9.1. RADIATED EMISSIONS

#### 9.1.1. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz

##### LIMITS

§15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	( <sup>2</sup> )
13.36 - 13.41			

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> Above 38.6

§15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§15.209 (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 (microvolts/meter)	Measurement Distance (meters)
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

\*\* 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., Sections 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

## **TEST PROCEDURE**

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels of the 2.4 GHz band.

The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels of the 5.8 GHz band.


The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

## **RESULTS**

No non-compliance noted:

**WORST-CASE RADIATED EMISSIONS BELOW 1 GHz**

**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)**

		<b>Project #:</b> 04U2812-1 <b>Report #:</b> 040719B1 <b>Date &amp; Time:</b> 07/19/04 9:57 AM <b>Test Engr:</b> Thanh Nguyen	
FCC, VCCI, CISPR, CE, AUSTEL, NZ UL, CSA, TUV, BSMI, DHHS, NVLAP 561F MONTEREY ROAD, SAN JOSE, CA 95037-9001 PHONE: (408) 463-0885 FAX: (408) 463-0888			
<b>Company:</b> WORTH DATA INC. <b>EUT Description:</b> 900MHz RF Base Station <b>Test Configuration :</b> EUT and the basic peripheral <b>Type of Test:</b> FCC Part 15 Class B, Digital part, Class II Perm Change. <b>Mode of Operation:</b> Rx mode, Network activated.		<a href="#">&lt;&lt; Main Sheet</a>	

Freq. (MHz)	Reading (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit FCC_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)	Mark (P/Q/A)
543.85	40.40	17.97	5.80	29.21	34.96	46.00	-11.04	3mV	0.00	1.50	P
30.74	39.00	18.09	1.11	29.36	28.84	40.00	-11.16	3mV	0.00	1.00	P
33.29	40.00	16.85	1.20	29.32	28.72	40.00	-11.28	3mV	0.00	1.00	P
447.41	41.00	16.62	5.24	29.03	33.83	46.00	-12.17	3mV	0.00	1.50	P
310.27	44.70	12.92	4.10	28.43	33.29	46.00	-12.71	3mH	180.00	2.00	P
137.63	44.50	11.98	2.57	28.95	30.10	43.50	-13.40	3mV	0.00	1.00	P
6 Worst Data											

## 9.2. POWERLINE CONDUCTED EMISSIONS

### LIMIT

§15.207 (a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

The lower limit applies at the boundary between the frequency ranges.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\* Decreases with the logarithm of the frequency.

### TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The resolution bandwidth is set to 9 kHz for both peak detection and quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

Line conducted data is recorded for both NEUTRAL and HOT lines.

### RESULTS

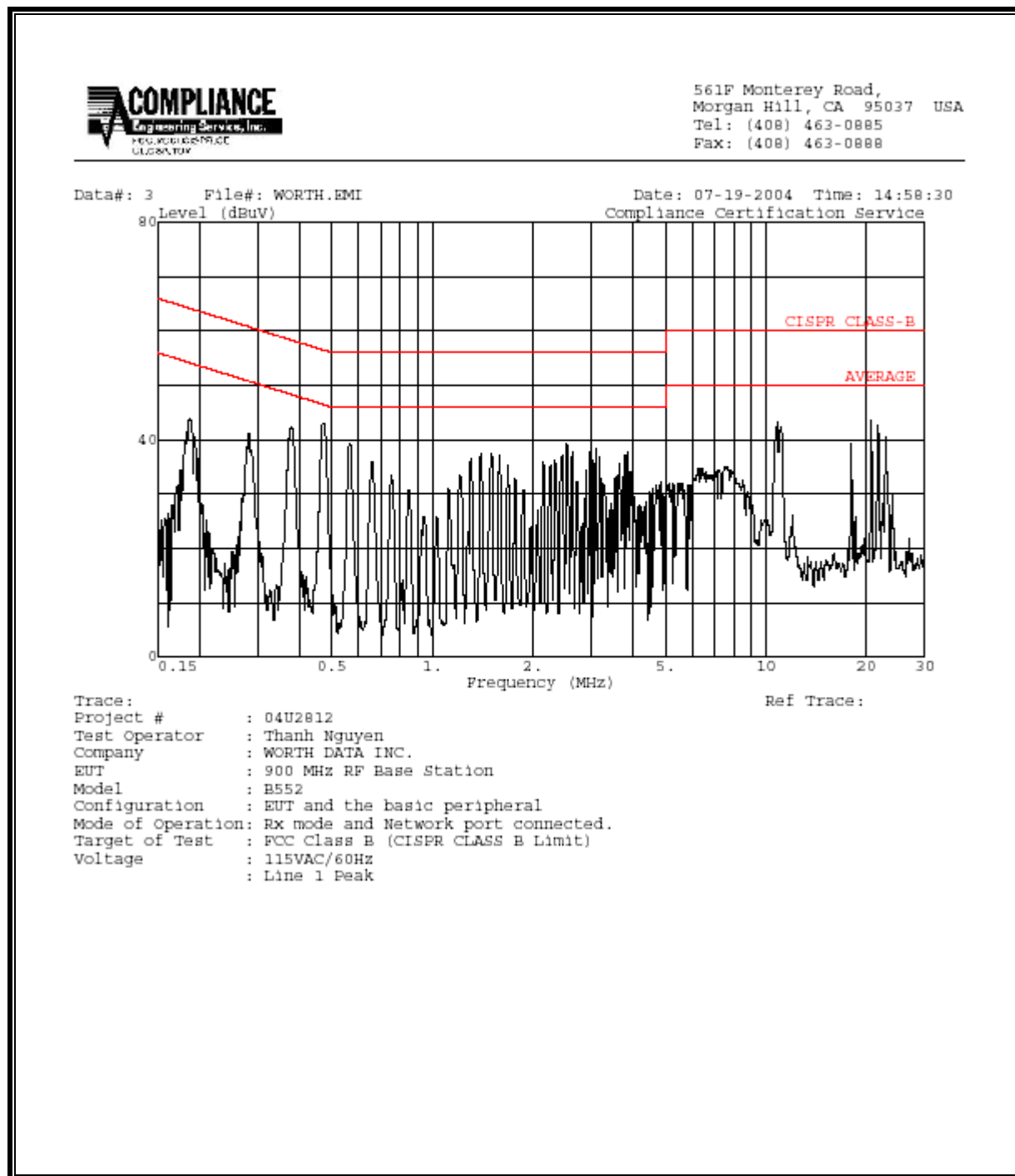
No non-compliance noted:

# **6 WORST EMISSIONS**

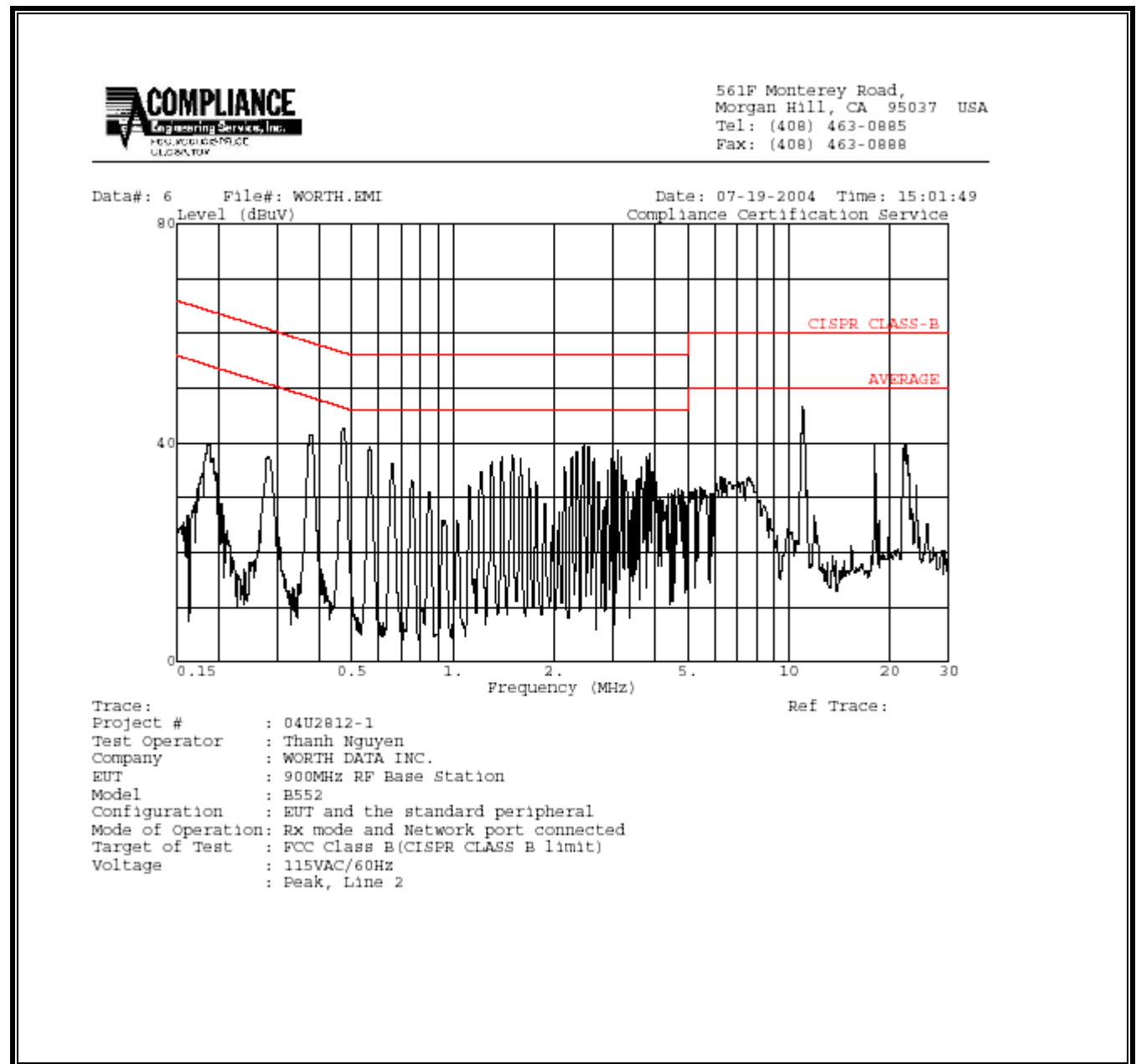
CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	EN B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.47	43.06	--	--	0.00	56.89	46.89	-13.83	-3.83	L1
20.70	43.51	--	--	0.00	60.00	50.00	-16.49	-6.49	L1
10.85	43.20	--	--	0.00	60.00	50.00	-16.80	-6.80	L1
11.02	46.50	--	--	0.00	60.00	50.00	-13.50	-3.50	L2
0.47	42.76	--	--	0.00	56.74	46.74	-13.98	-3.98	L2
2.45	39.33	--	--	0.00	56.00	46.00	-16.67	-6.67	L2
6 Worst Data									



**LINE 1 RESULT**



**LINE 2 RESULTS**



## 10. SETUP PHOTOS

### RADIATED RF MEASUREMENT SETUP



RADIATED BACK PHOTO



**POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP**



LINE CONDUCTED BACK PHOTO



**END OF REPORT**