

2.10 Band Edge Measurements

Band Edge measurements were made at a Low Channel and High Channel peak at highest EUT related emission outside the occupied bandwidth. A peak measurement was made of the fundamental, and the emission was measured using a peak setting. A Resolution Bandwidth of $> 1\%$ of the emission bandwidth was used. This procedure was repeated for the high channel.

The plots shown were verified to be from the worst case antenna used (Parabolic Dish), using a 17 foot, Flexco cable and Horn Antenna. No preamp was used.

The limits were derived as follows:

High Bandedge

$$5000 \text{ uV/m} = -32.02 \text{ dBm}$$

$$-33.02 \text{ dBm} - 31.88 \text{ dB (antenna factor and cable loss)} = -64.9 \text{ dBm}$$

$$-64.9 \text{ dBm} + 9.54^* \text{ dB} = -55.36 \text{ dBm limit}$$

Low Bandedge

$$-33.02 \text{ dBm} - 32.03 \text{ dB (antenna factor and cable loss)} = 65.05 \text{ dBm}$$

$$-65.05 \text{ dBm} + 9.54^* \text{ dB} = -55.51 \text{ dBm limit}$$

* -9.54 dB correction from 3m to 1m distance.

Figure 6a. Band Edge Compliance
Antenna Conducted, High Channel

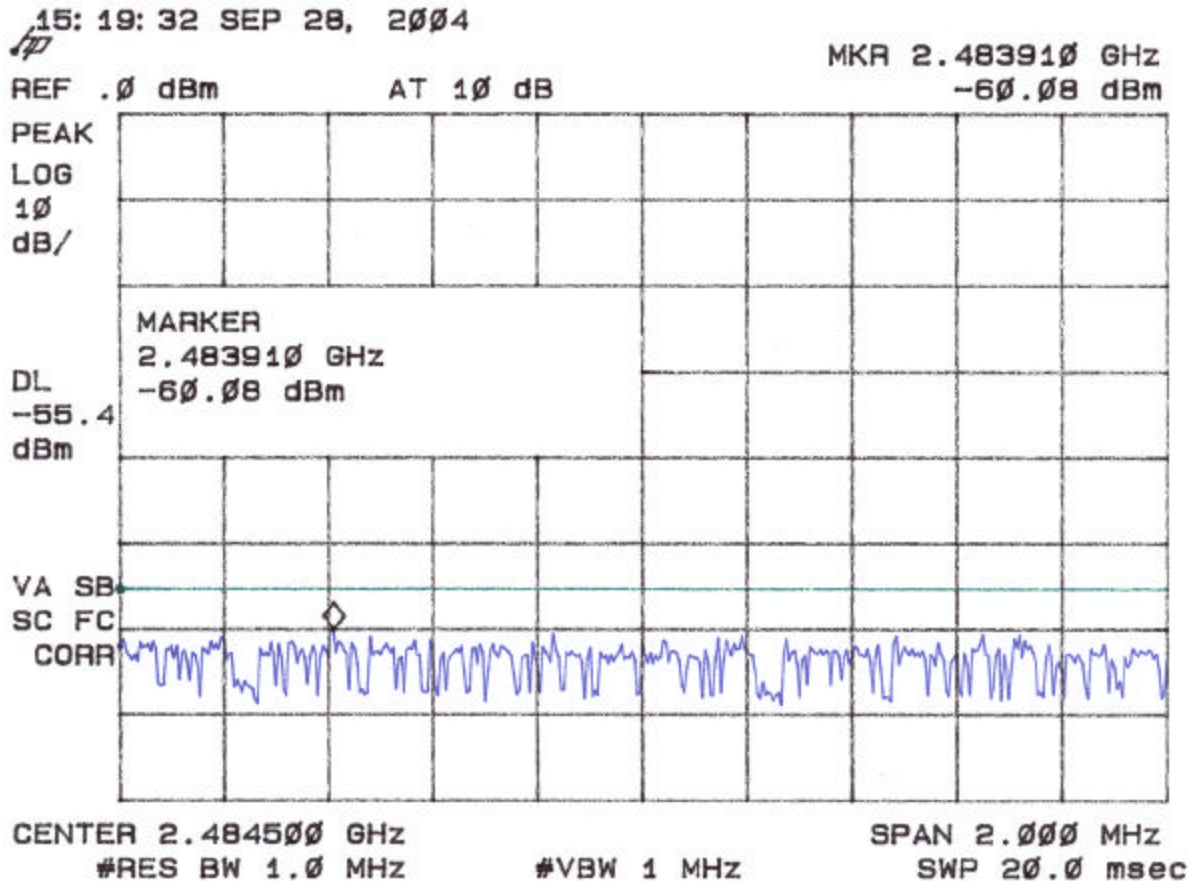
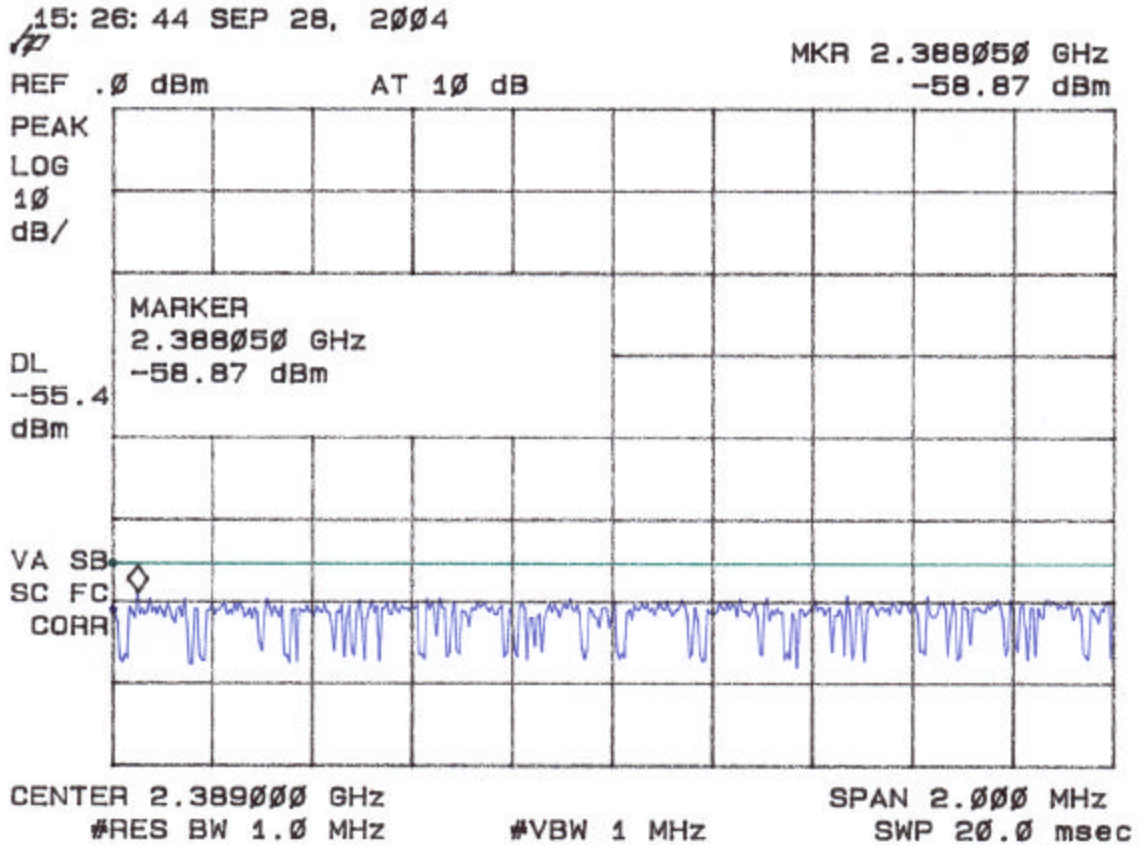


Figure 6b. Band Edge Compliance
Antenna Conducted, Low Channel



2.11 20 dB Bandwidth per FCC Section 15.247(a)(1)(ii)

The antenna port was connected to a spectrum analyzer that was set for a 50 Ω impedance with the RBW = approximately 1/100 of the manufacturers claimed RBW & VBW > RBW. The results of this test are given in Table 6 and Figure 7.

TABLE 6
20 dB Bandwidth

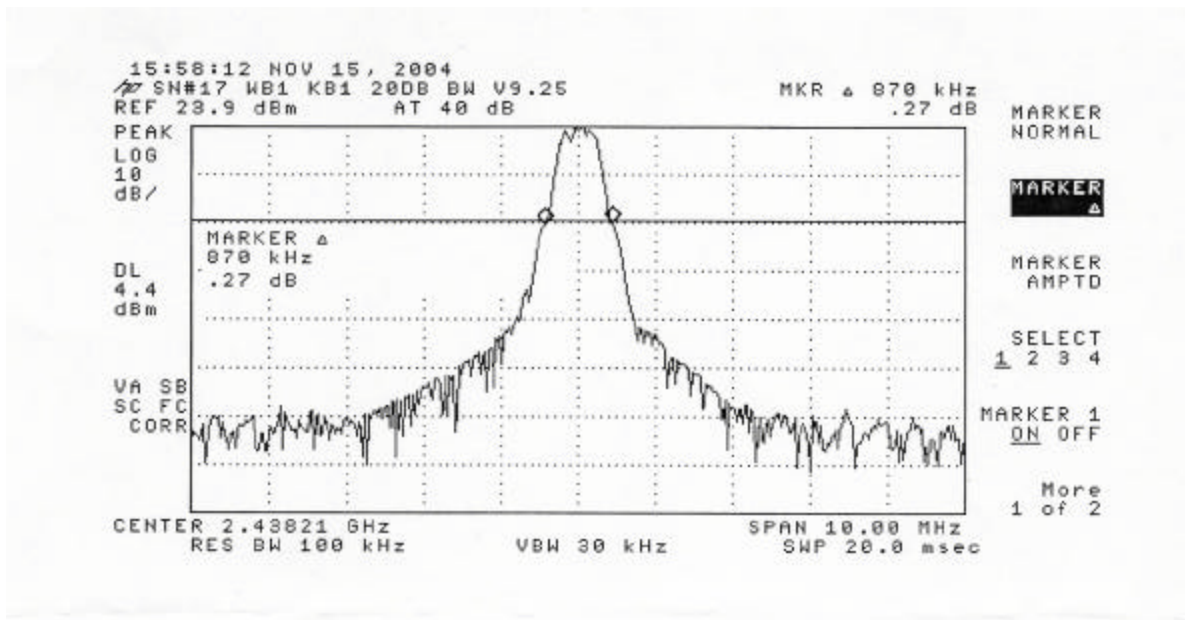
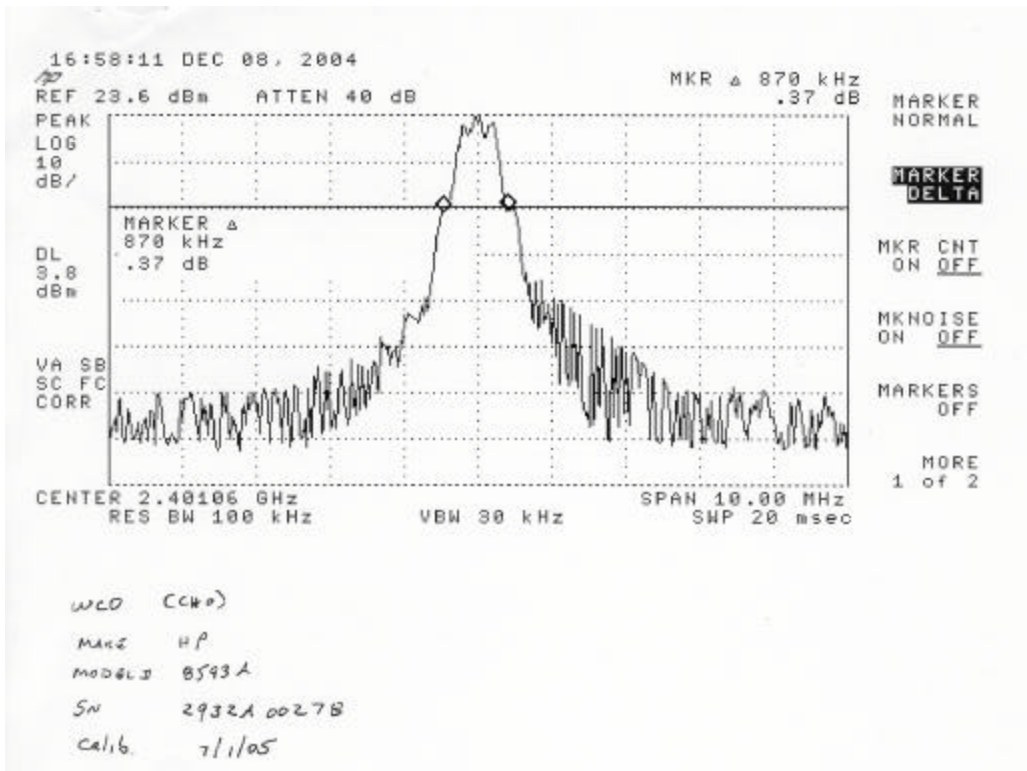
Test Date: September 28, 2004
 UST Project: 04-0176
 Customer: Cirronet
 Model: WIT2450

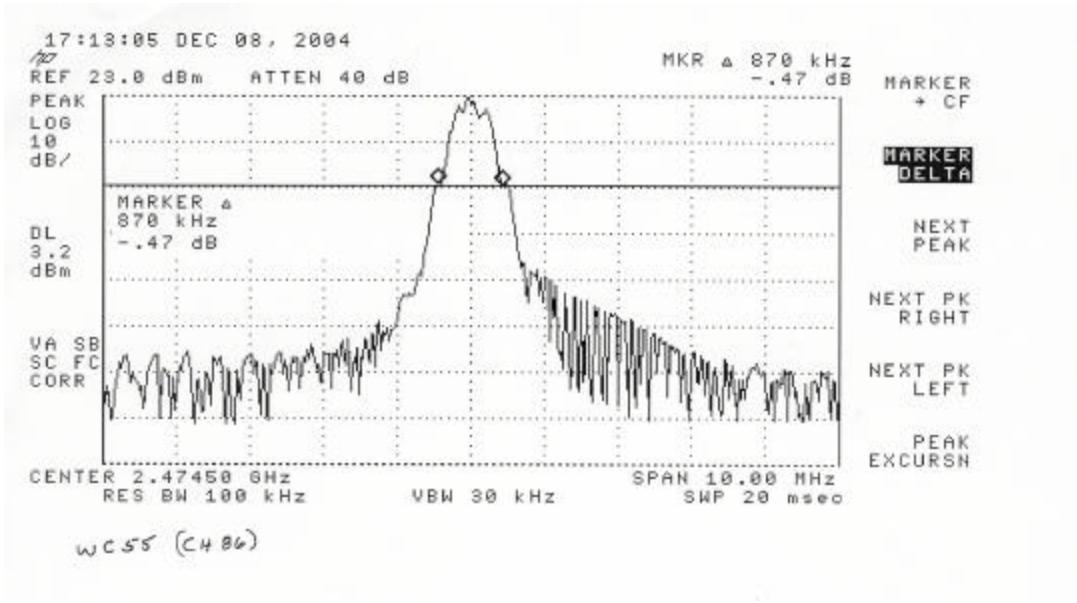
Frequency (GHz)	20 dB Bandwidth (MHz)	MAXIMUM FCC LIMIT (MHz)
2.40106	0.870	1.0
2.43821	0.870	1.0
2.47450	0.870	1.0

Tester
 Signature:  Name: David Blethen

Figure 7.
20 dB Bandwidth per FCC Section 15.247(a)(1)(ii)

Customer supplied Data





2.12 Number of Hopping Channels FCC Section 15.247(a)(1)(ii)

The transmitter was placed into a typical frequency hopping mode of operation. The 2400 – 2483.5 MHz band was centered on the screen and the RBW and VBW chosen such that the individual channels could be discerned. The trace capture time was a minimum of 5 minutes.

The results of this test are given in Table 7 and Figures 8a through 8c.

TABLE 7
NUMBER OF HOPPING CHANNELS

Test Date: September 28, 2004
UST Project: 04-0176
Customer: Cirronet
Model: WIT2450

Number of Hopping Frequencies Measured	FCC Limit (Minimum Number of Channels)
86	75

Figure 8a
Number of Hopping Channels FCC Section 15.247(a)(1)(ii)

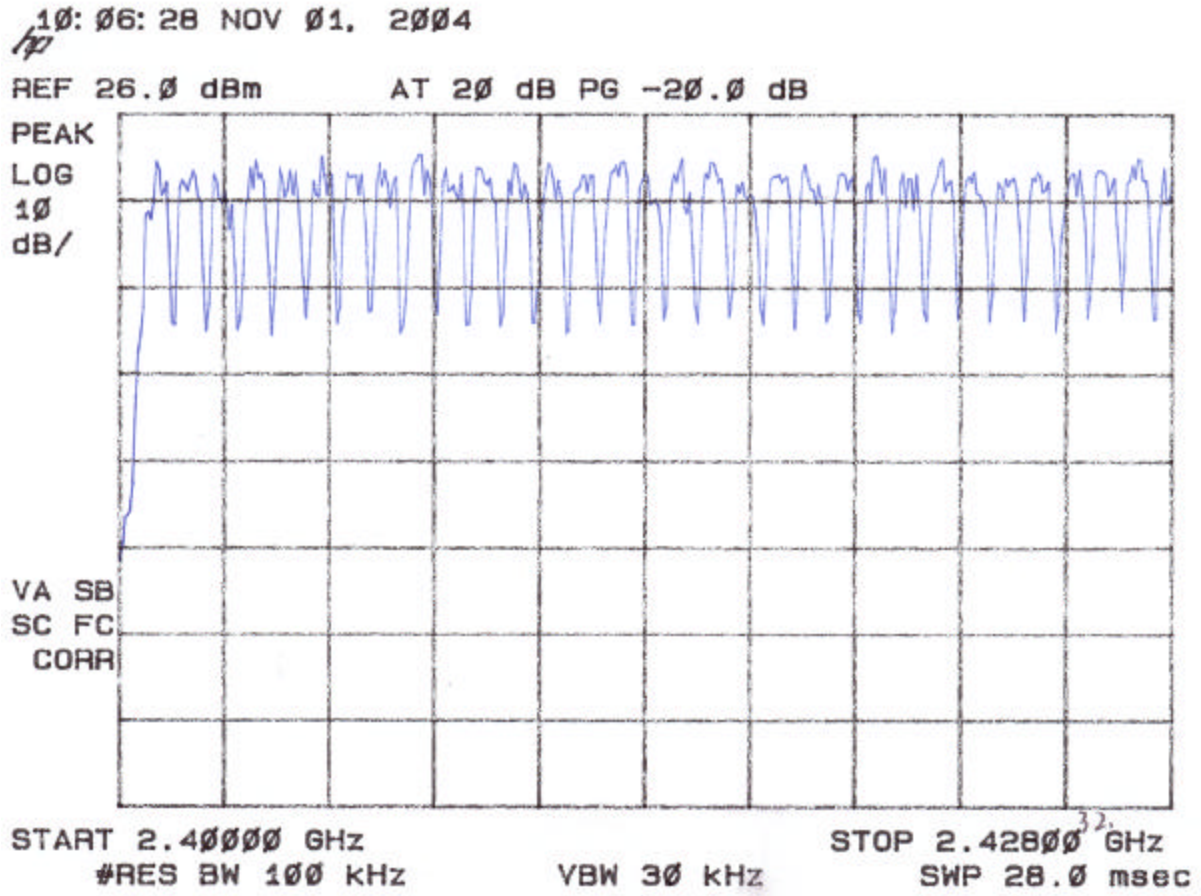


Figure 8b
Number of Hopping Channels FCC Section 15.247(a)(1)(ii)

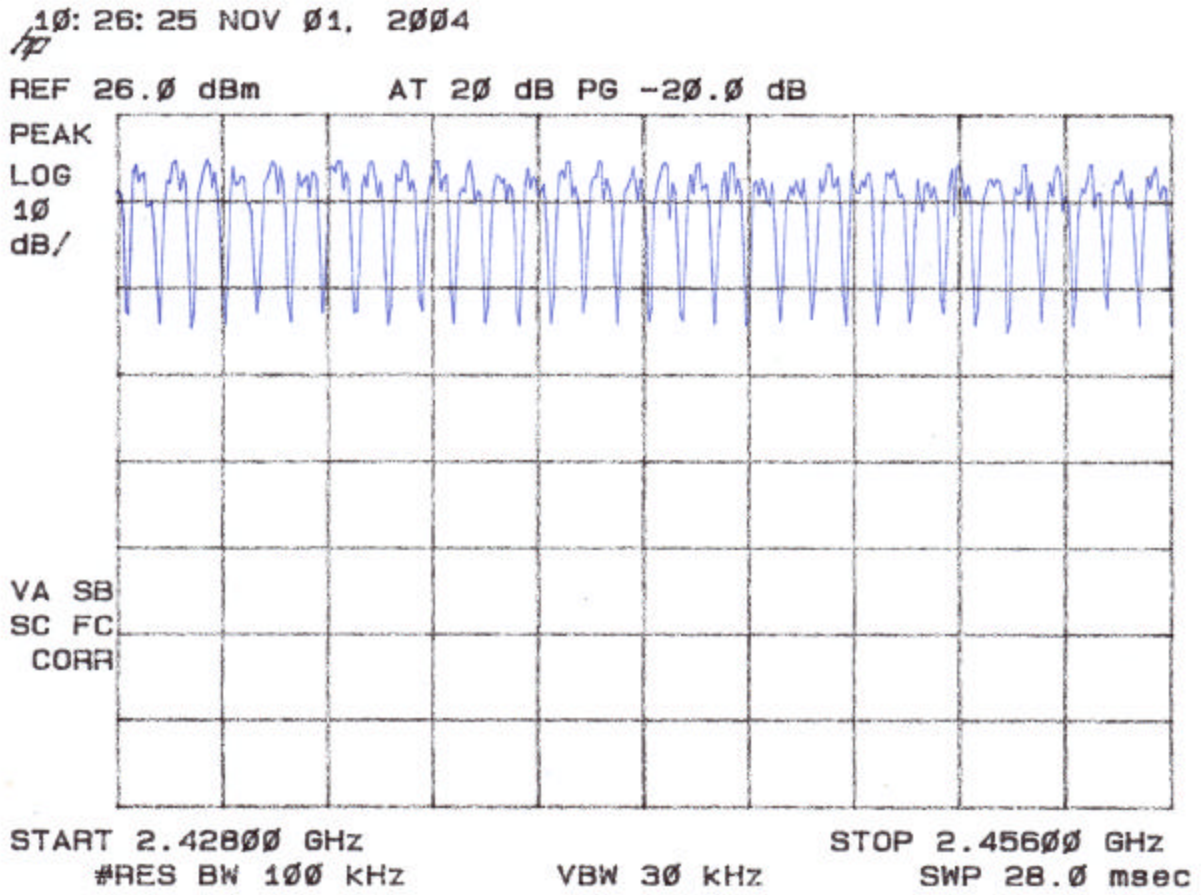
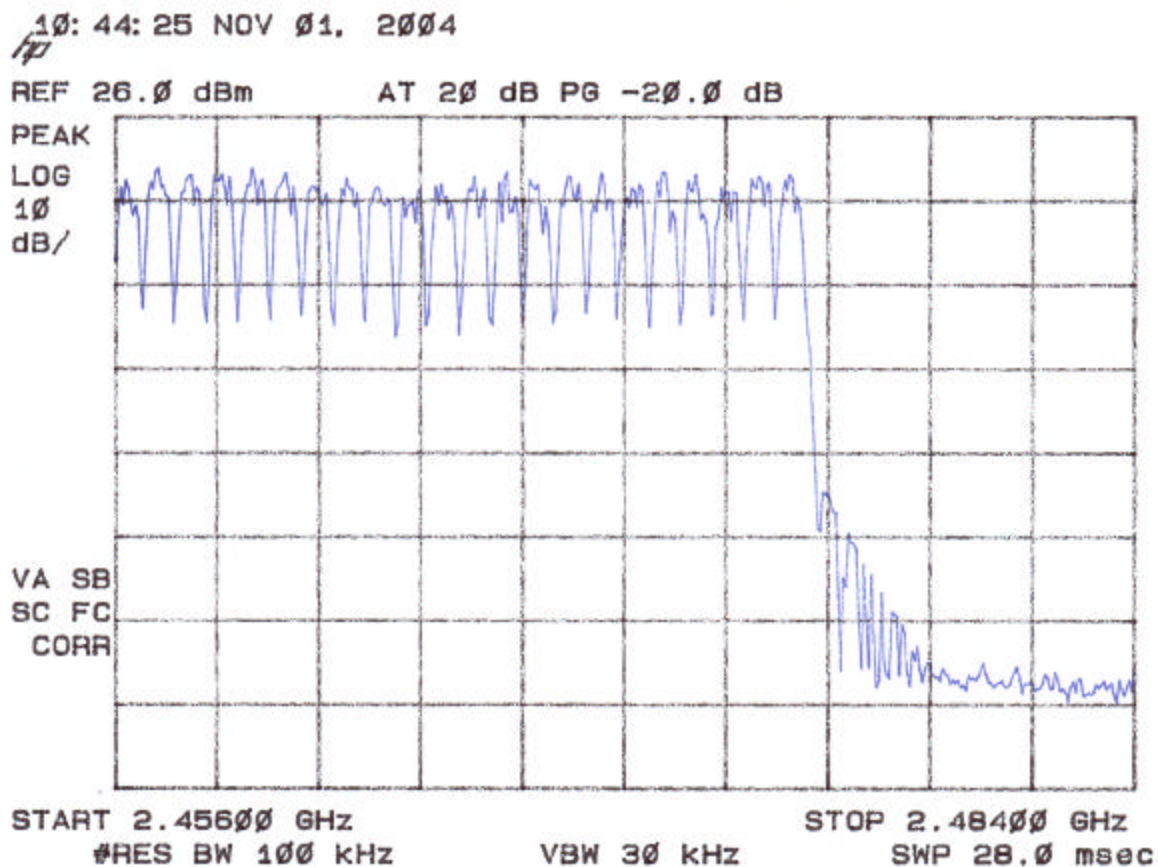


Figure 8c
Number of Hopping Channels FCC Section 15.247(a)(1)(ii)



2.13 Average Time of Occupancy per Channel FCC Section 15.247(a)(1)(ii)

Please refer to the theory of operation portion of the report for this.

2.14 Power Line Conducted Emissions for Transmitter FCC Section 15.207

The conducted voltage measurements have been carried out in accordance with FCC Section 15.207, with a spectrum analyzer connected to a LISN and the EUT placed into a continuous mode of transmit. The results are given in Tables 8a-8b and Figures 9a-9c.

TABLE 8a. CONDUCTED EMISSIONS DATA

CLASS B

Test Date: August 3, 2004
 UST Project: 04-0176
 Customer: Cirronet
 Model: WIT2450

Worse Case Mode of Operaton (TX – Low channel)

(Peak vs Average Limits) PHASE DATA

FREQUENCY (MHz)	TEST DATA (dBuV) PHASE	AF + CA - AMP	RESULTS (dBuV) PHASE	EN55022 CLASS B LIMITS (dBuV)	MARGIN BELOW LIMIT (dB) PHASE
0.2	41.7	0.2	41.9	54.6	12.7
0.3	33.0	0.2	33.2	51.7	18.5
0.7	28.1	0.2	28.3	46.0	17.7
7.52	38.2	0.5	38.7	50.0	11.3
8.42	38.2	0.5	38.7	50.0	11.3
9.932	37.3	0.5	37.5	50.0	12.5

SAMPLE CALCULATIONS: $41.7 + 0.2 = 41.9$ dBuV

Test Date: August 3, 2004

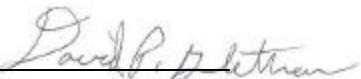
Tested by
 Signature:  Name: David Blethen

TABLE 8b. CONDUCTED EMISSIONS DATA

CLASS B

Test Date: August 3, 2004
 UST Project: 04-0176
 Customer: Cirronet
 Model: WIT2450


Worse Case Mode of Operaton (TX – Low channel)

(Peak vs Average Limits) NEUTRAL DATA

FREQUENCY (MHz)	TEST DATA NEUTRAL	AF + CA - AMP	RESULTS (dBuV) NEUTRAL	EN55022 CLASS B LIMITS (dBuV)	MARGIN BELOW LIMIT (dB) NEUTRAL
0.2	42.8	0.2	43.0	54.6	11.6
0.3	35.2	0.2	35.4	51.7	16.3
0.4	30.5	0.2	30.7	48.9	18.2
7.52	36.7	0.5	37.2	50.0	12.8
9.232	36.6	0.5	37.1	50.0	12.9
9.535	36.0	0.5	36.5	50.0	13.5

SAMPLE CALCULATIONS: $42.8 + 0.2 = 43.0$ dBuV

Test Date: August 3, 2004

Tested by
Signature:  Name: David Blethen

2.15 Radiated Emissions for Digital Device & Receiver (47 CFR 15.109a)

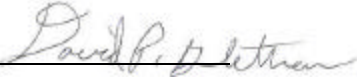
Radiated emissions were evaluated from 30 to 14500 MHz while the EUT was placed into a Receive mode of operation. Measurements were made with the analyzer's bandwidth set to 120 kHz measurements made less than 1 GHz and 1 MHz for measurements made greater than or equal to 1 GHz. The results for less than 1 GHz are shown in Table 9.

**TABLE 9. RADIATED EMISSIONS DATA
(Digital Device & Receiver)**

CLASS B

Test Date: August 1, 2004
 UST Project: 04-0176
 Customer: Cirronet
 Product: WIT2450

Frequency (MHz)	Receiver Reading (dBm) @3m	Correction Factor (dB)	Corrected Reading (uV/m)	FCC Limit (uV/m) @3m
No Emissions detected within 20 dB of the FCC limit				

Tested by
 Signature: 

Name: David Blethen

**2.16 Power Line Conducted Emissions for Digital Device and Receiver
FCC Section 15.107**

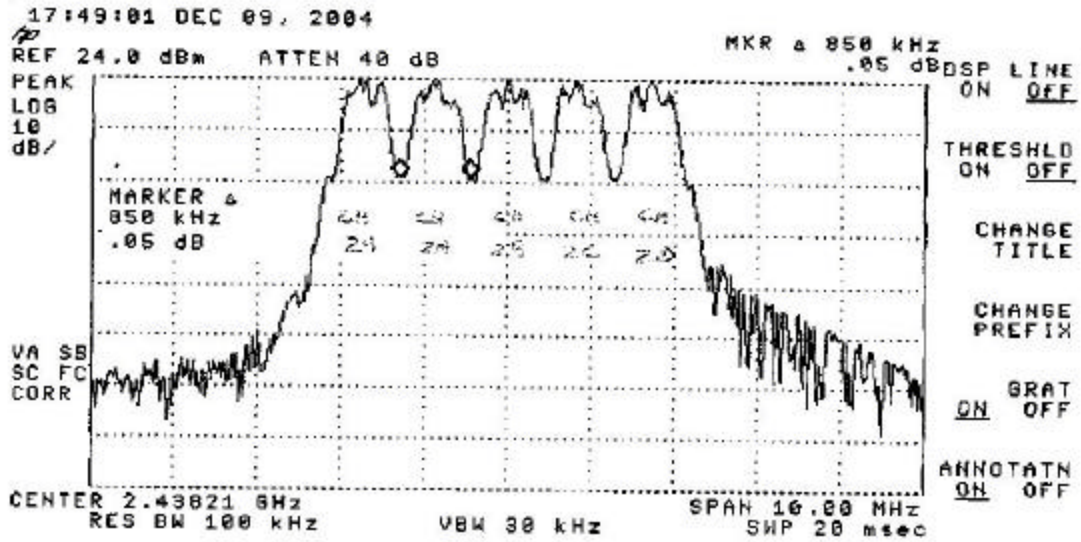
The conducted voltage measurements have been carried out in accordance with FCC Section 15.107, with a spectrum analyzer connected to a LISN and the EUT placed into an idle condition or a continuous mode of receive. Similar results were seen as compared to the EUT in a transmit mode of operation. **Therefore, please refer to the results as shown in Table 8.**

2.17 Channel Separation (15.247(a)(1))

The transmitter was placed into a typical frequency hopping mode of operation. The 2388 – 2488 MHz band was centered on the screen and the RBW and VBW chosen such that the individual channels could be discerned. The trace capture time was a minimum of 20msec.

Results are shown in Figure 9

Figure 9



Channel separation: 2.4-2.8 GHz