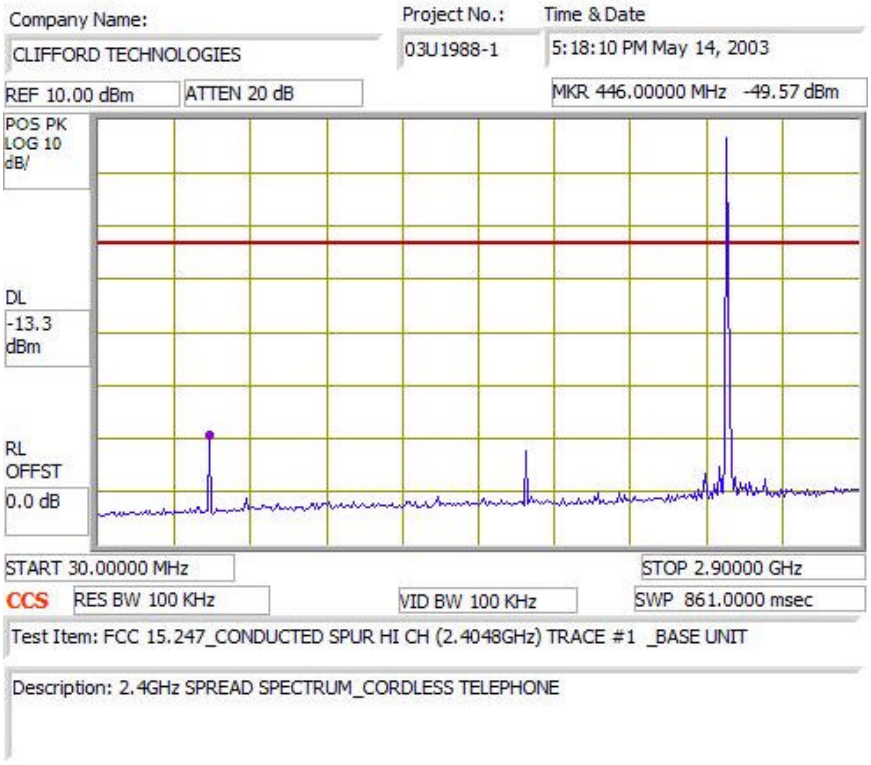
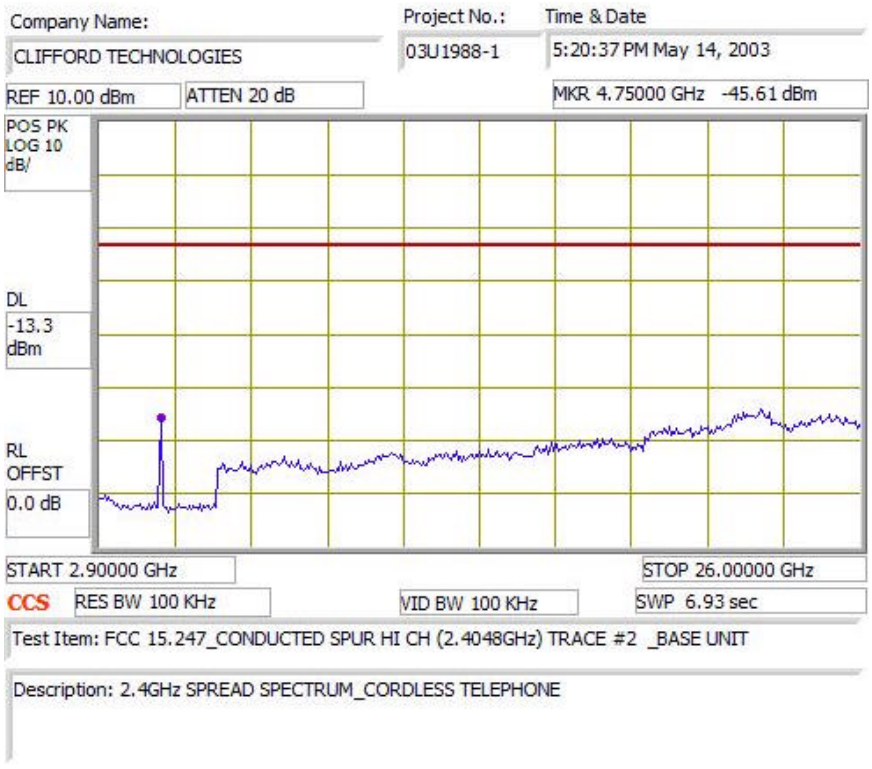
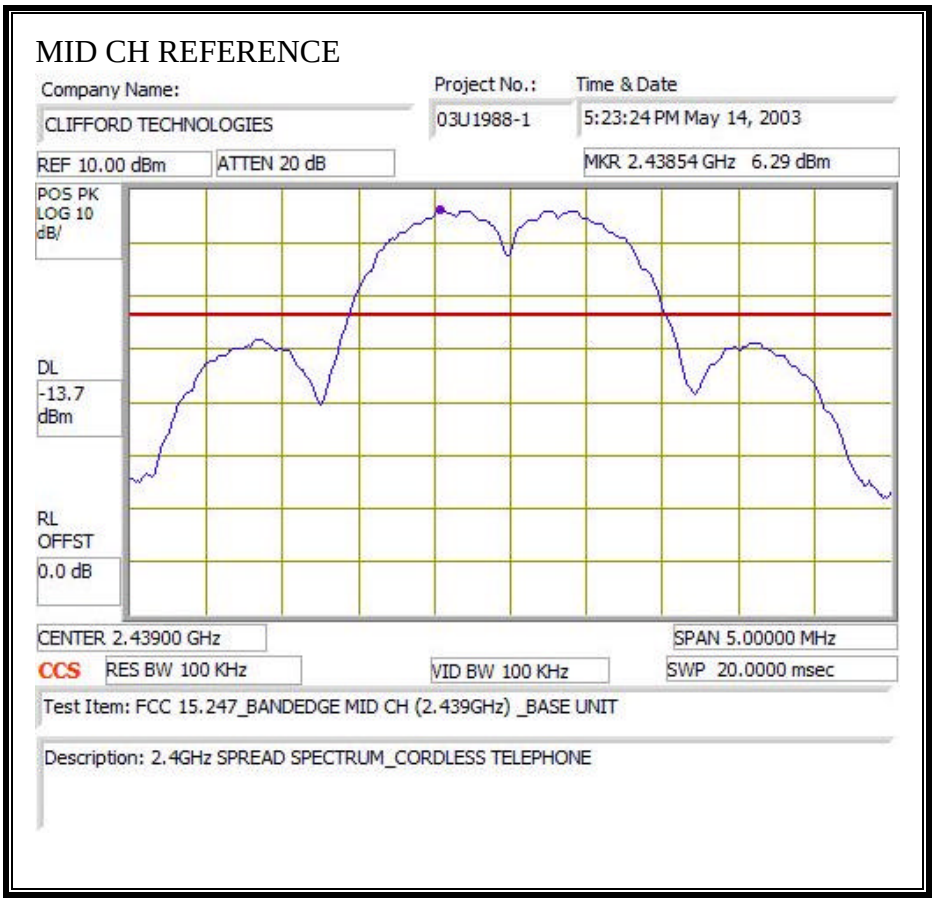
LOW CH SPURIOUS

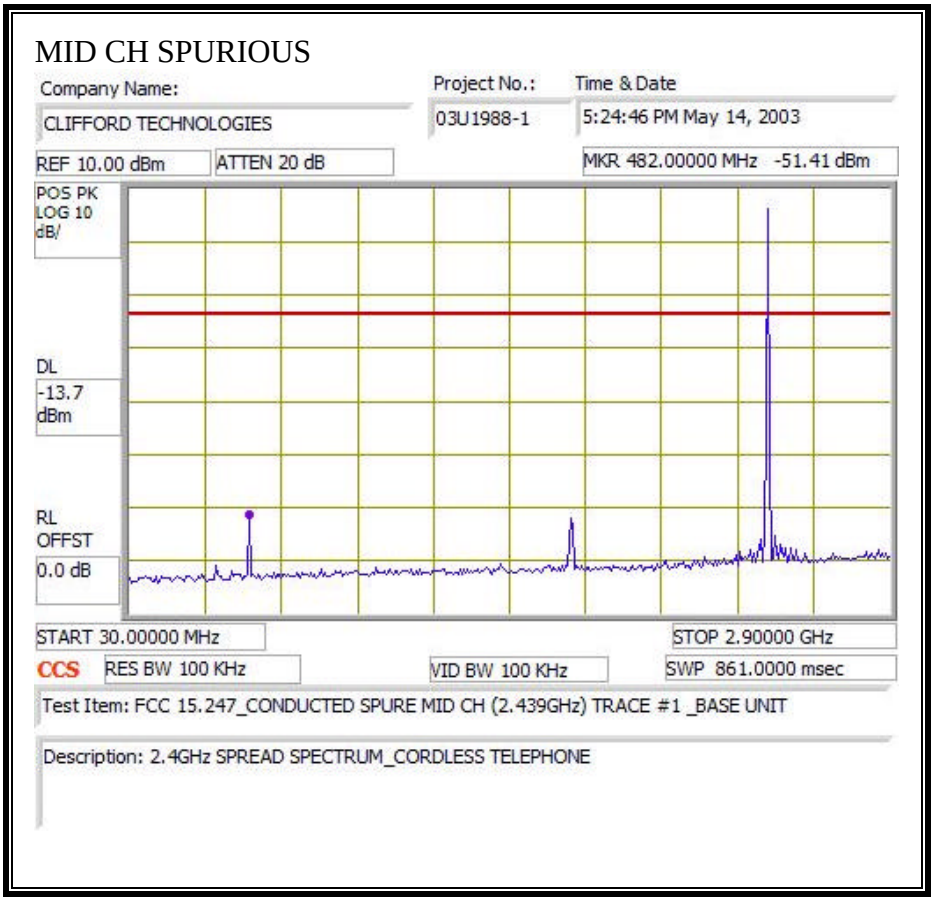


LOW CHANNEL SPURIOUS

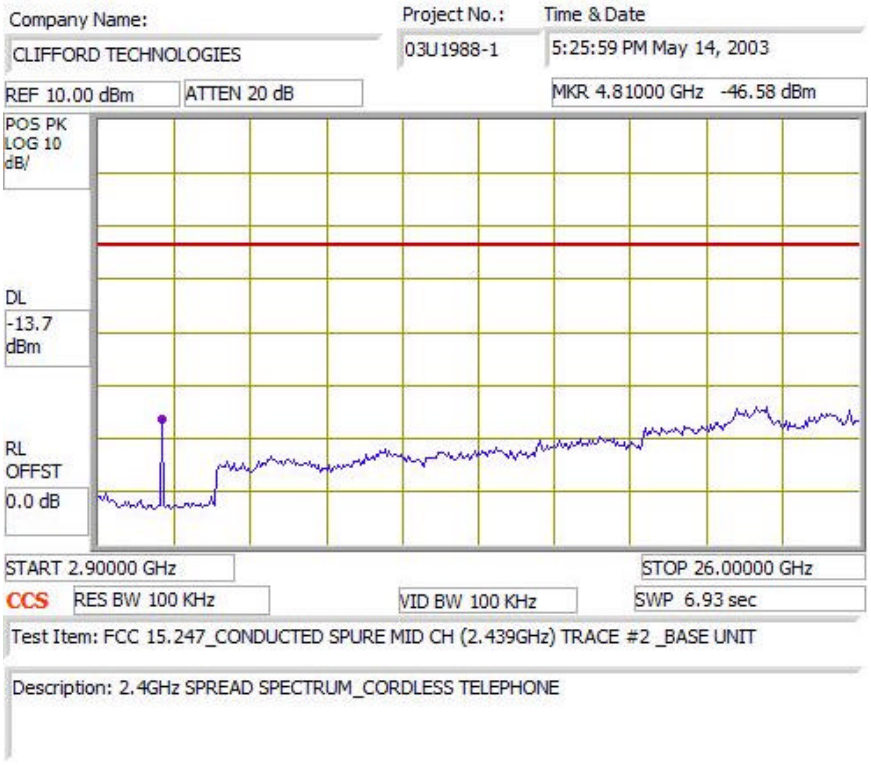


SPURIOUS EMISSIONS, MID CHANNEL – BASE UNIT

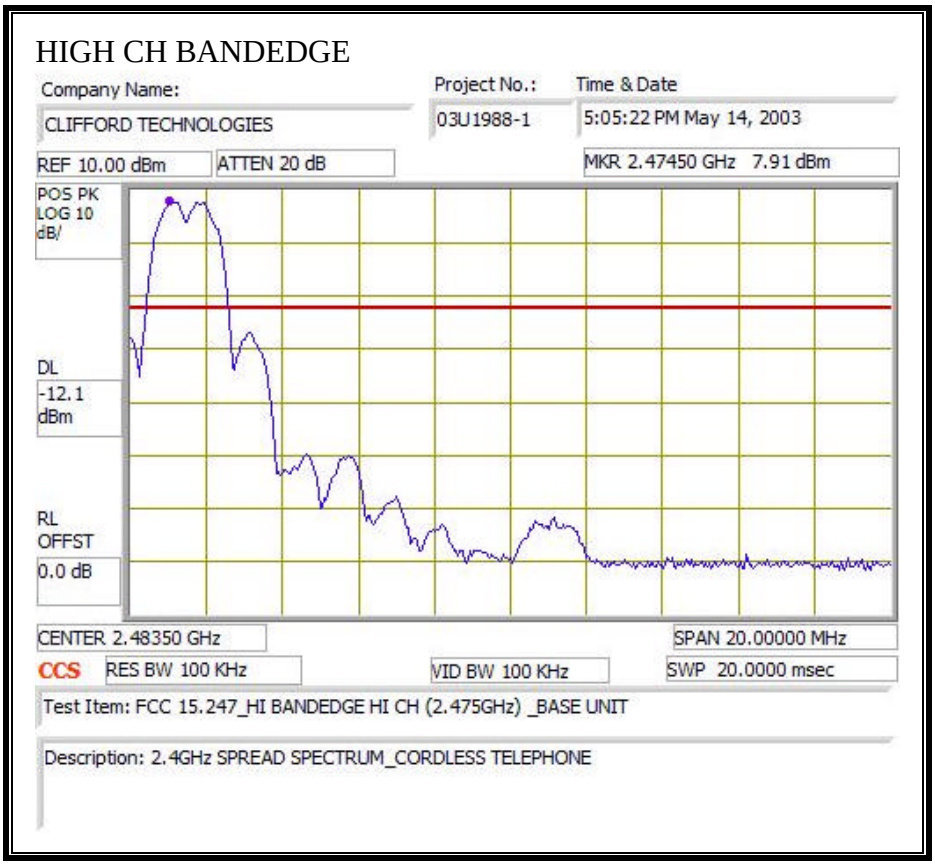


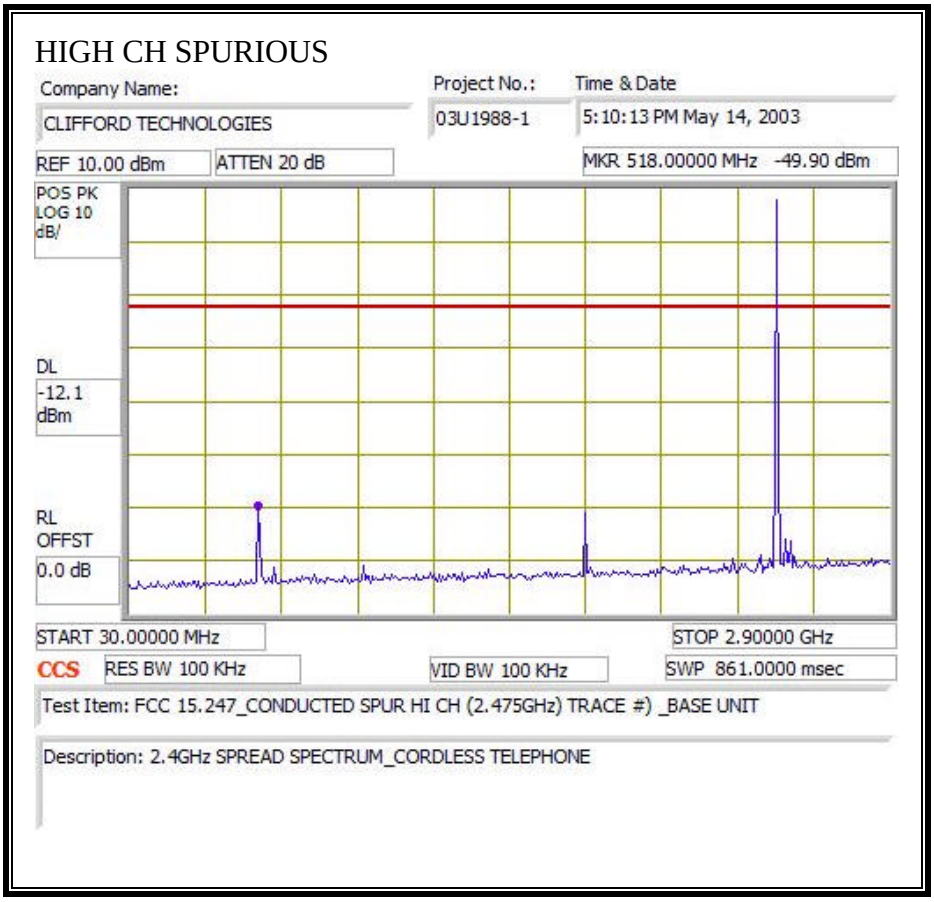


MID CHANNEL SPURIOUS

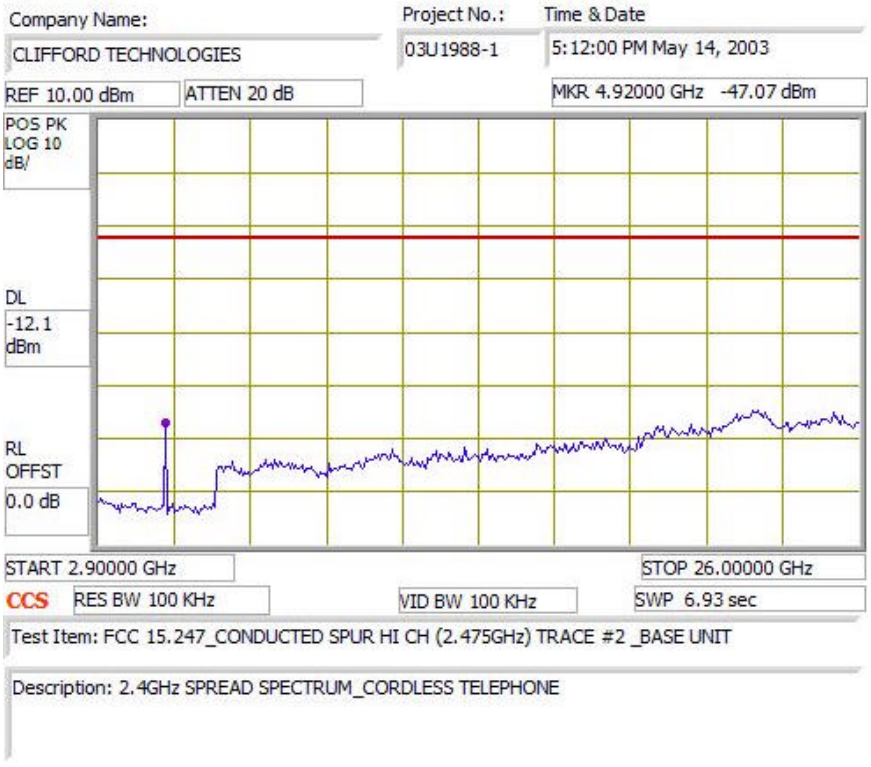


SPURIOUS EMISSIONS, HIGH CHANNEL – BASE UNIT

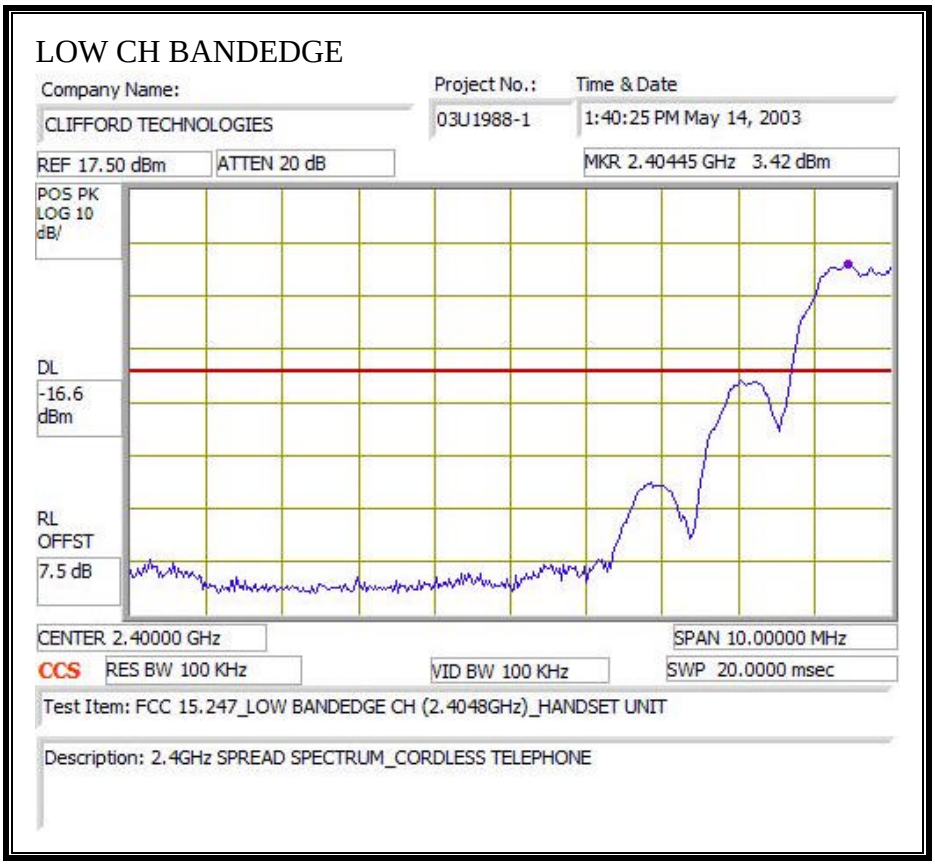


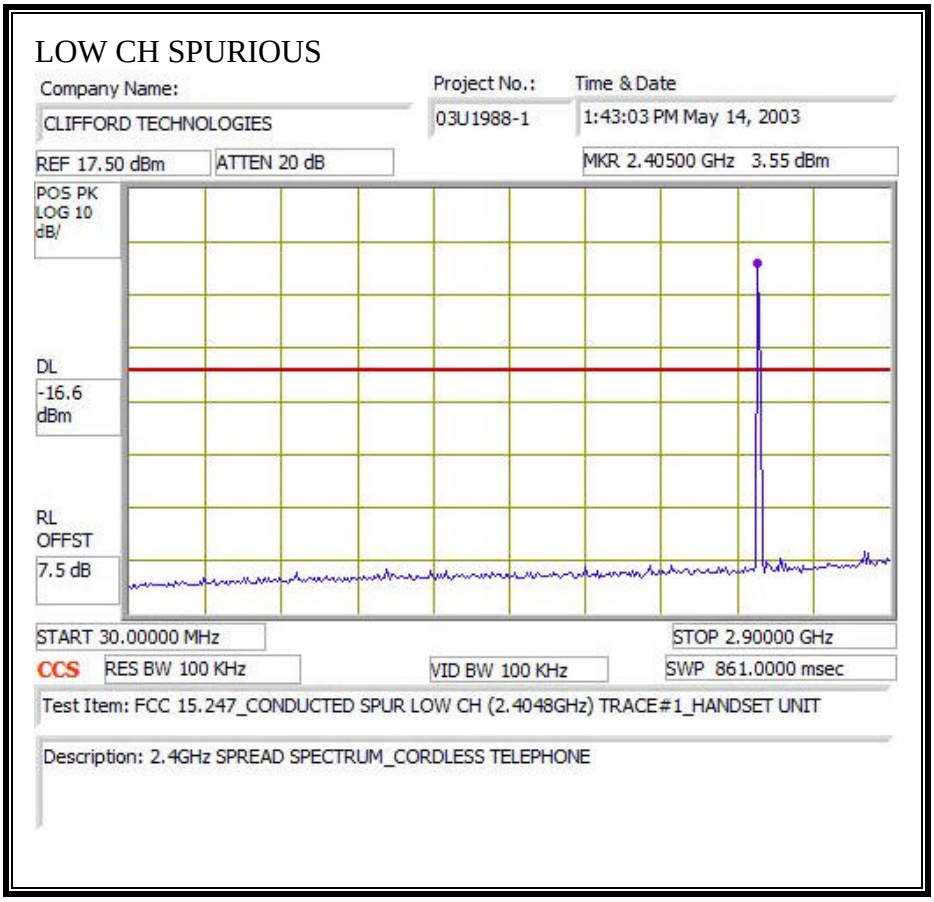


HIGH CHANNEL SPURIOUS

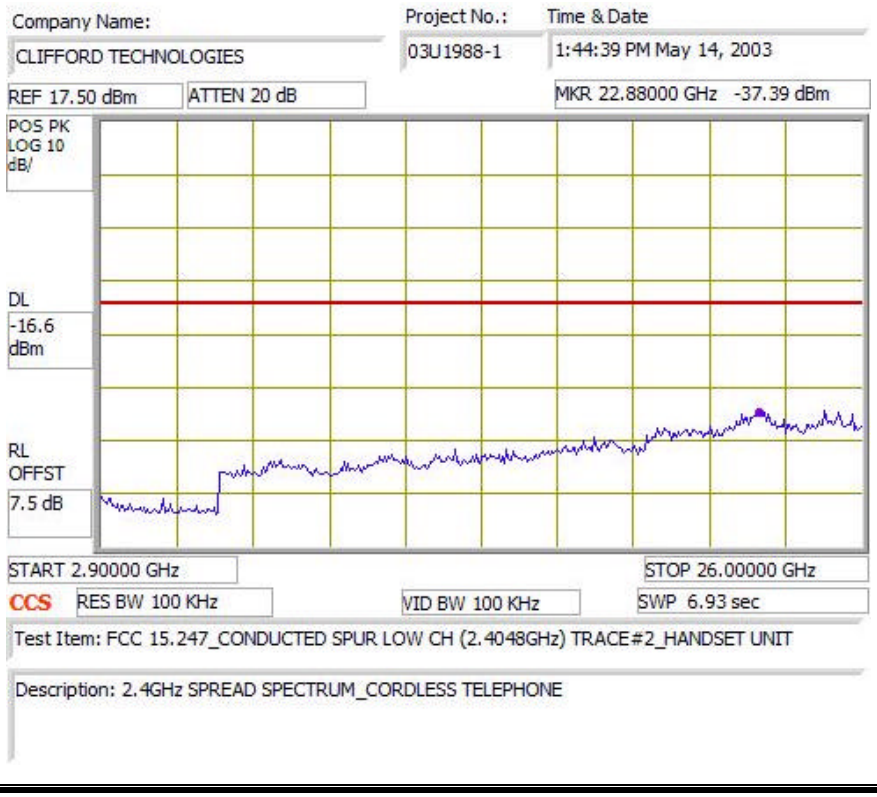


SPURIOUS EMISSIONS, LOW – HANDSET UNIT

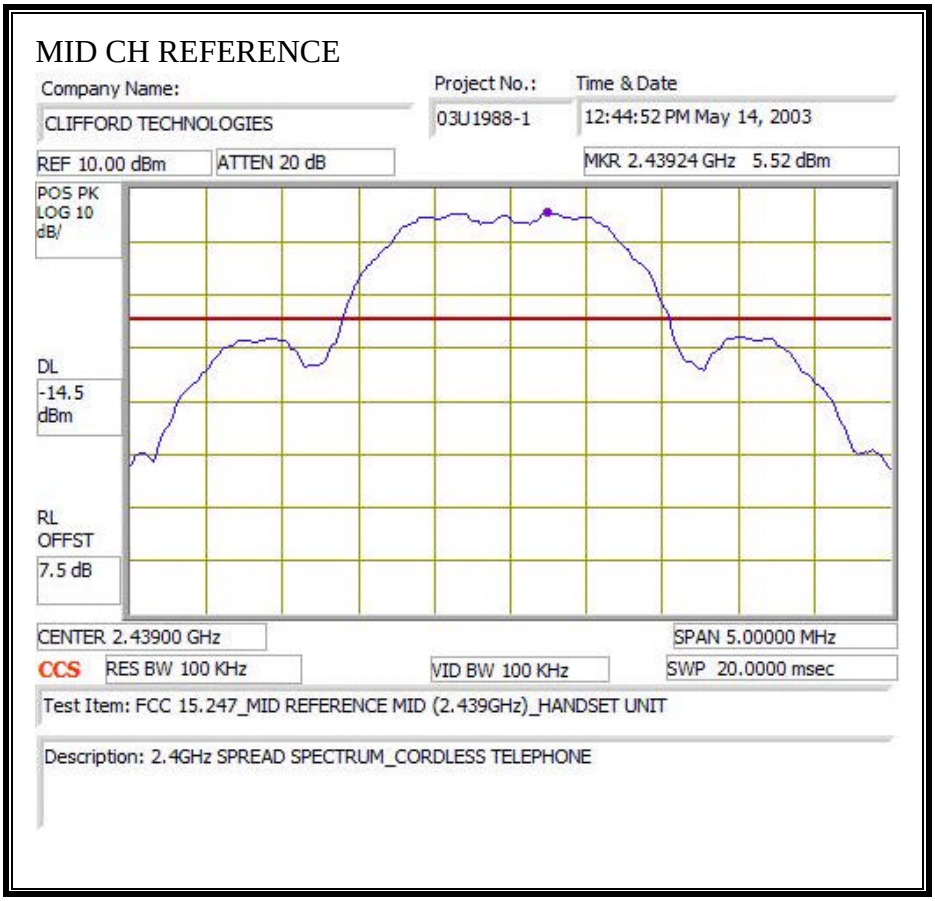




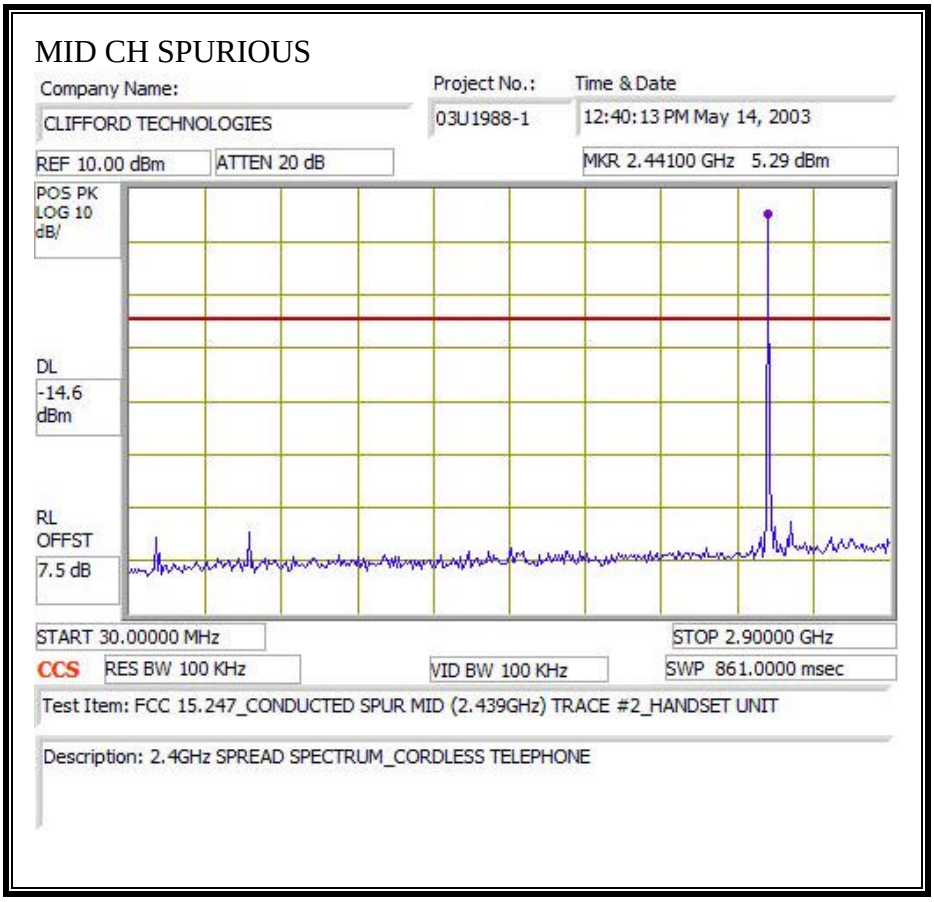
LOW CHANNEL SPURIOUS



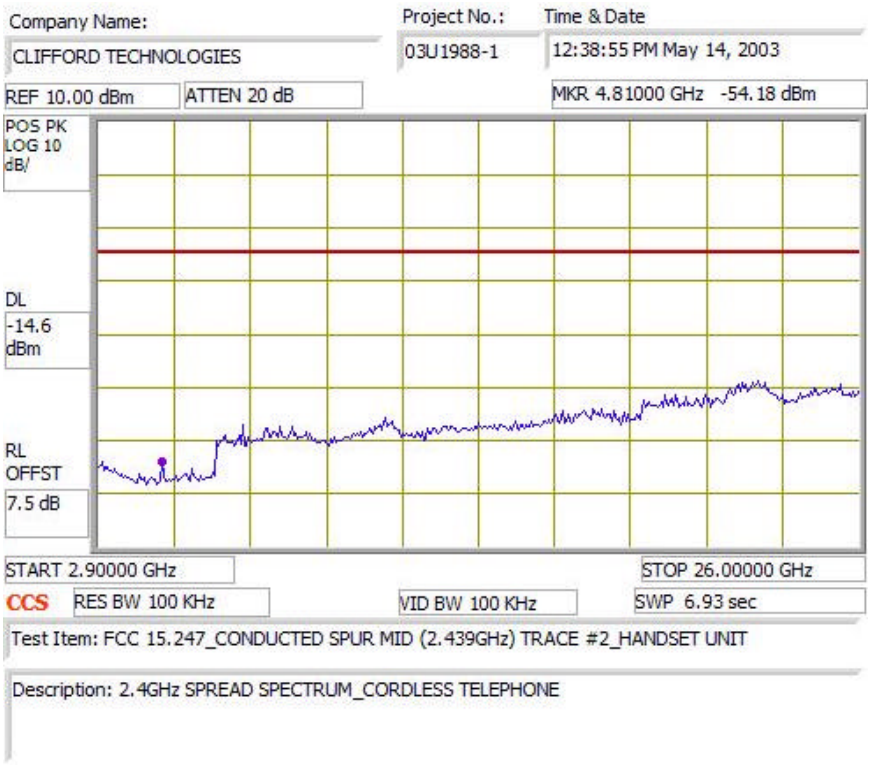
SPURIOUS EMISSIONS, MID CHANNEL – HANDSET UNT



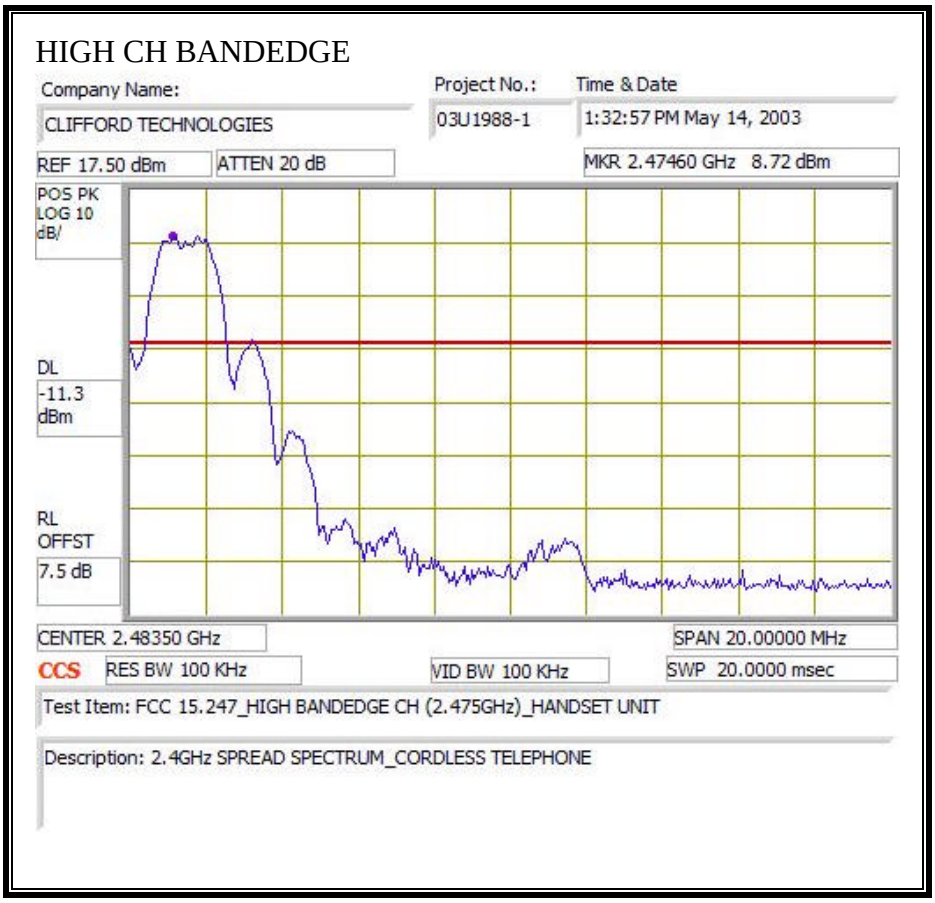
MID CH SPURIOUS

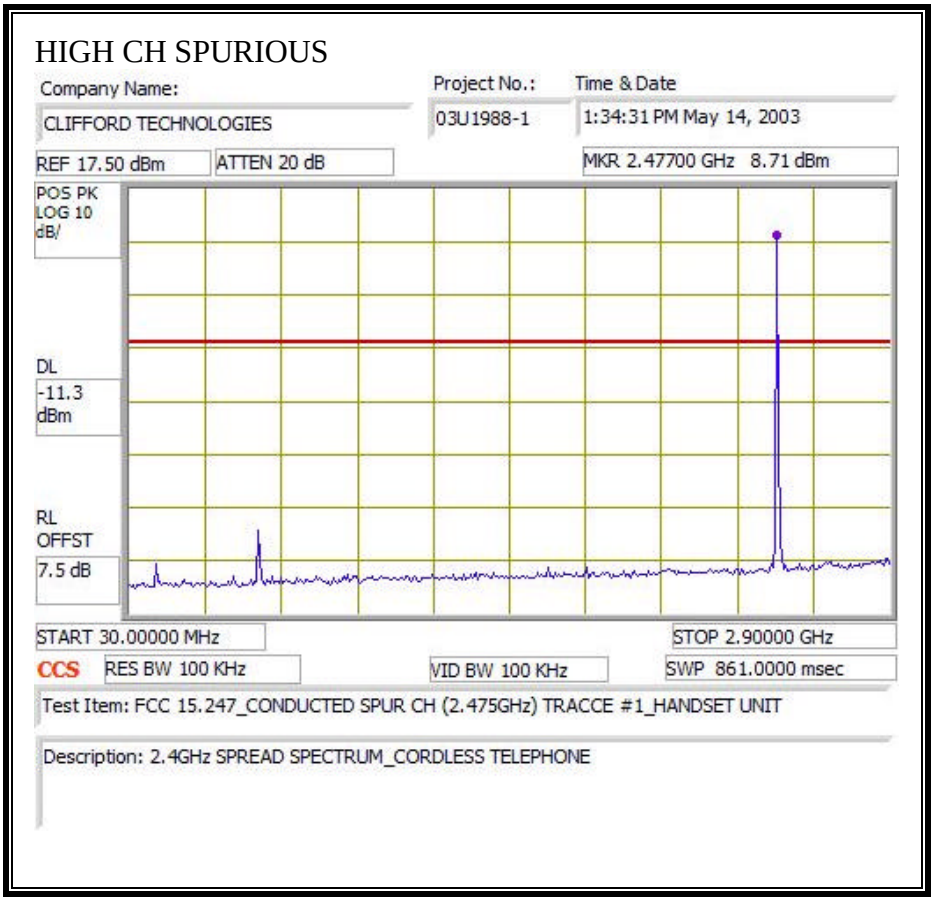


MID CHANNEL SPURIOUS

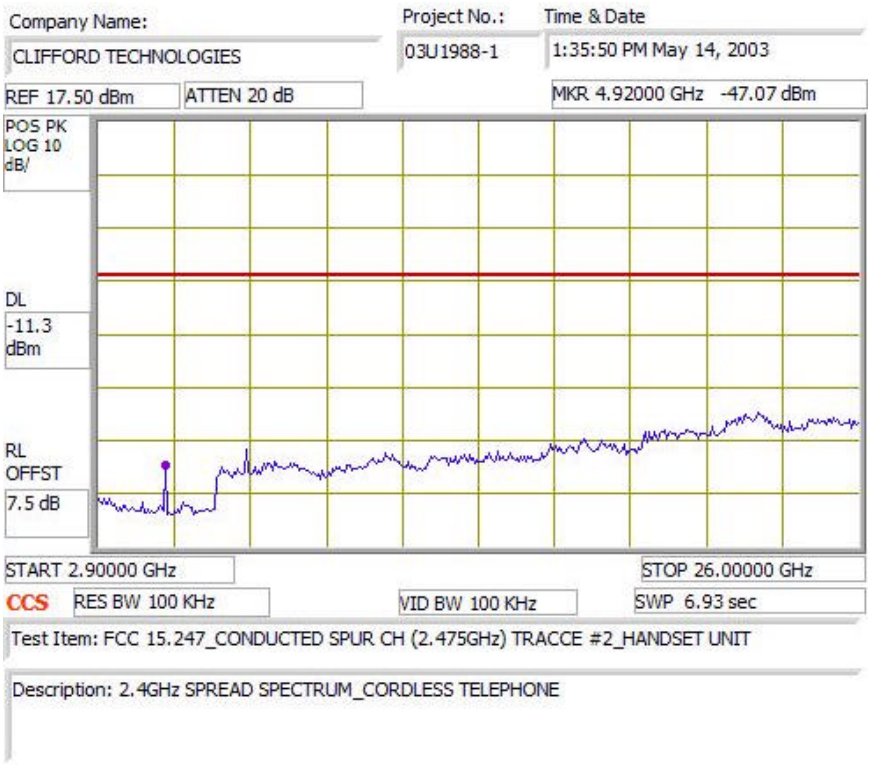


SPURIOUS EMISSIONS, HIGH CHANNEL – HANDSET UNIT





HIGH CHANNEL SPURIOUS



7.6 RADIATED EMISSIONS

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
[1]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 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	([2])
13.36 - 13.41	322 - 335.4		

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2] 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.

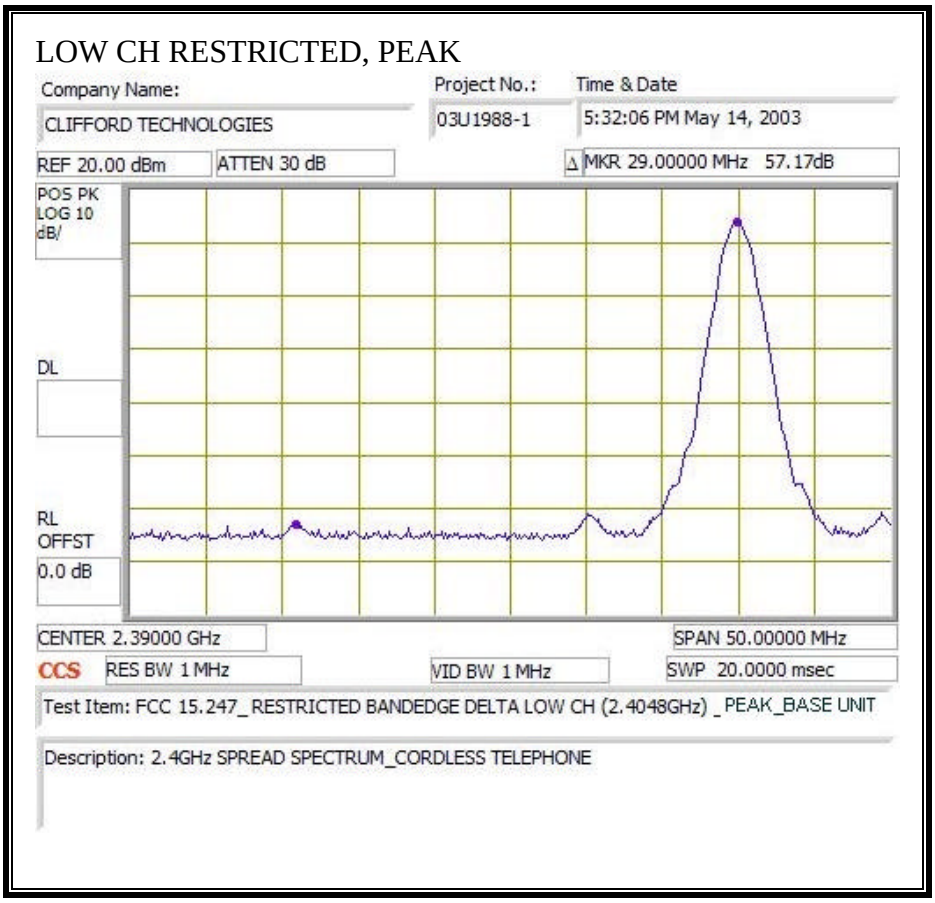
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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.

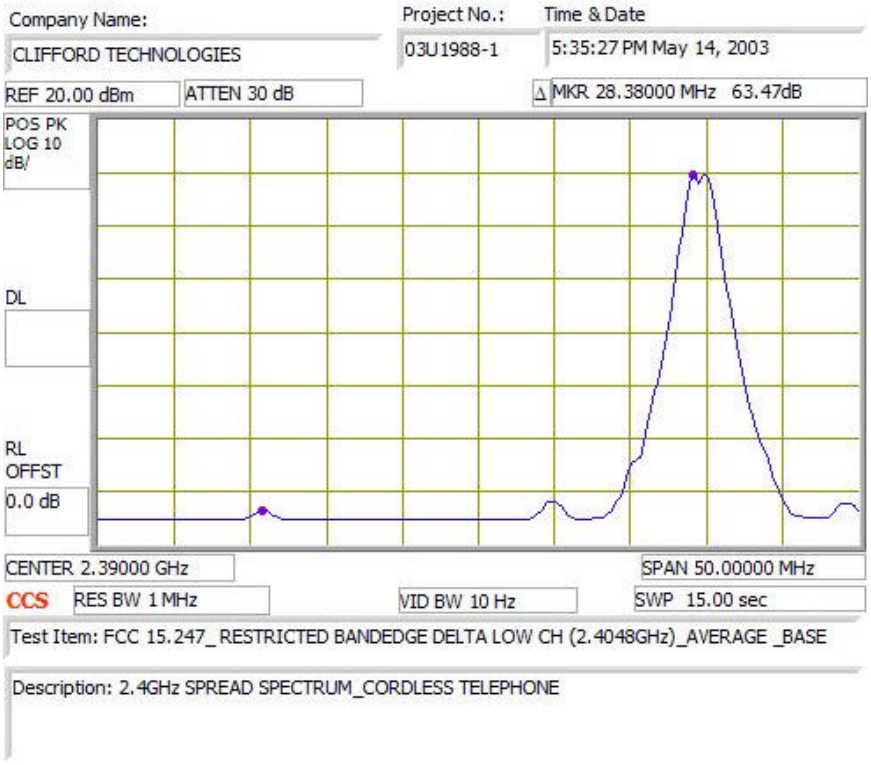
RESULTS

No non-compliance noted:

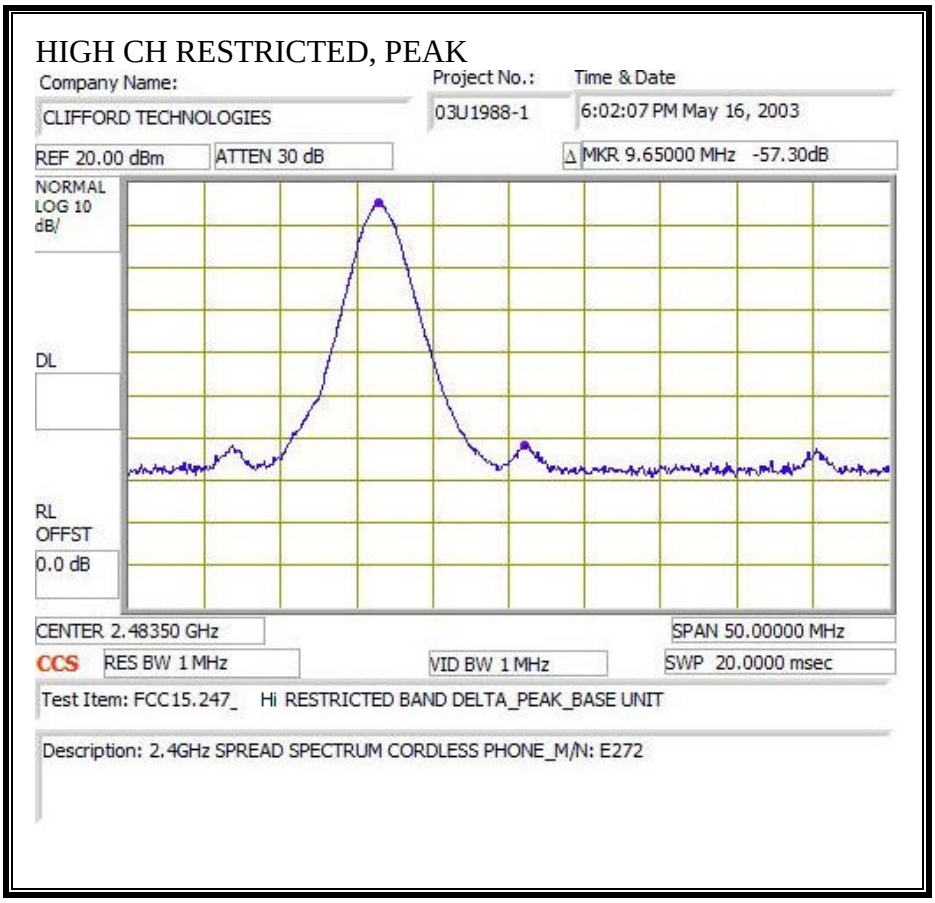
RESTRICTED BANDEDGE - LOW CHANNEL - BASE UNIT



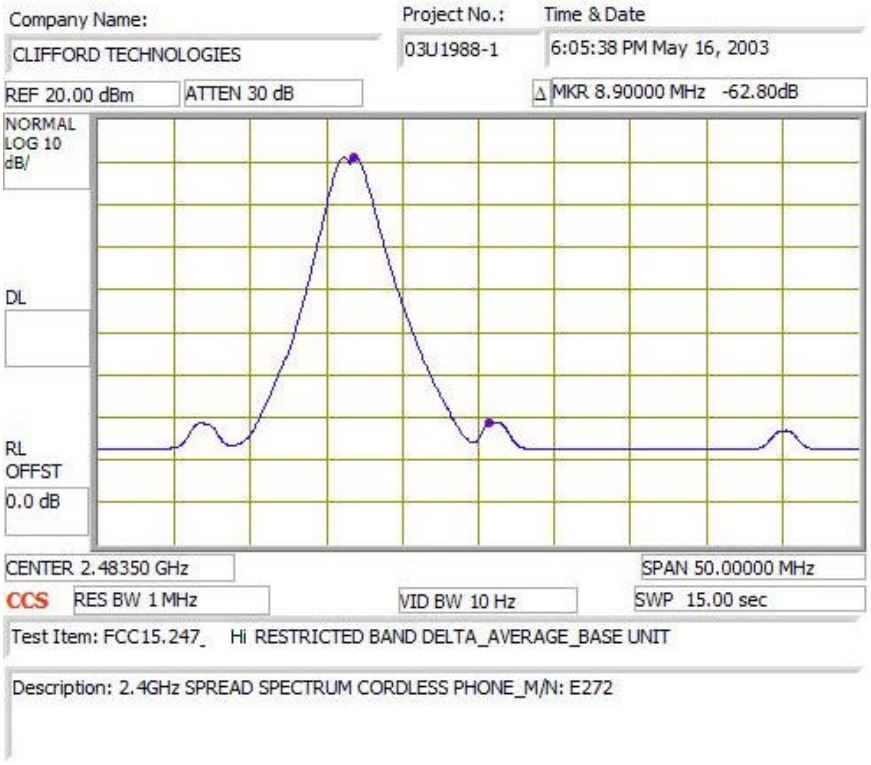
LOW CH RESTRICTED, AVG .



RESTRICTED BANDEDGE - HIGH CHANNEL – BASE UNIT



HIGH CH RESTRICTED, AVG



05/16/03 **High Frequency Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: VIEN TRAN
Project #: 03U1988-1
Company: CLIFFORD TECHNOLOGIES
EUT Descrip.: 2.4GHz SPREAD SPECTRUM CORDLESS PHONE_M/N: D727
EUT M/N: D272
Test Target: FCC15.247
Mode Oper: Tx at L/H_ Fundamental_EUT in X,Y,Z Orientation_BASE UNIT

Test Equipment:

EMCO Horn 1-18GHz	Pre-amplifer 1-26GHz	Spectrum Analyzer	Horn > 18GHz
T72; S/N: 6739 @3m		8593EM Analyzer	

Hi Frequency Cables
☐ (2 ft) ☐ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1 MHz Resolution Bandwidth
10Hz Video Bandwidth

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
LOW CH_X ORIENTATION															
2.405	9.8	78.2	67.1	29.3	1.5	0.0	0.0	1.0	109.9	98.8	74.0	54.0			V
2.405	9.8	77.2	66.7	29.3	1.5	0.0	0.0	1.0	108.9	98.4	74.0	54.0			H
LOW CH_Y ORIENTATION															
2.405	9.8	81.1	70.6	29.3	1.5	0.0	0.0	1.0	112.8	102.3	74.0	54.0			V
2.405	9.8	84.0	73.8	29.3	1.5	0.0	0.0	1.0	115.7	105.5	74.0	54.0			H
LOW CH_Z ORIENTATION															
2.405	9.8	82.9	71.5	29.3	1.5	0.0	0.0	1.0	114.6	103.2	74.0	54.0			V
2.405	9.8	83.5	73.0	29.3	1.5	0.0	0.0	1.0	115.2	104.7	74.0	54.0			H
HI CH_Y ORIENTATION															
2.475	9.8	82.3	71.3	29.4	1.6	0.0	0.0	1.0	114.2	103.3	74.0	54.0			H
AVERAGE READING MINUS 6dB DUE TO 50% DUTY CYCLE OF THE EUT.															
WORST CASE RESTRICTED BAND:															
LOW CH CONDUCTED RESTRICTED BAND EDGE DELTA:									-57.2	-63.5					
HI CH CONDUCTED RESTRICTED BAND EDGE DELTA:									-57.8	-63.6					
2.405	9.8	86.4	81.5						51.7	35.0	74.0	54.0	-22.3	-19.0	H
2.475	9.8	88.1	83.3						56.5	39.7	74.0	54.0	-17.5	-14.3	H

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

HARMONICS AND SPURIOUS EMISSIONS – LOW, MID, HIGH CHANNEL – BASE UNIT

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EUT Descrip.: 2.4GHz SPREAD SPECTRUM CORDLESS PHONE_M/N: D727
EUT M/N: D272
Test Target: FCC15.247
Mode Oper: Tx at L/M/H_Harmonic & Spur_EUT in Y Orientation_Base Unit

Test Equipment:

EMCO Horn 1-18GHz	Pre-amplifer 1-26GHz	Spectrum Analyzer	Horn > 18GHz	Limit
T72; S/N: 6739 @3m	Miteq NSP2600-44	8593EM Analyzer		FCC 15.209

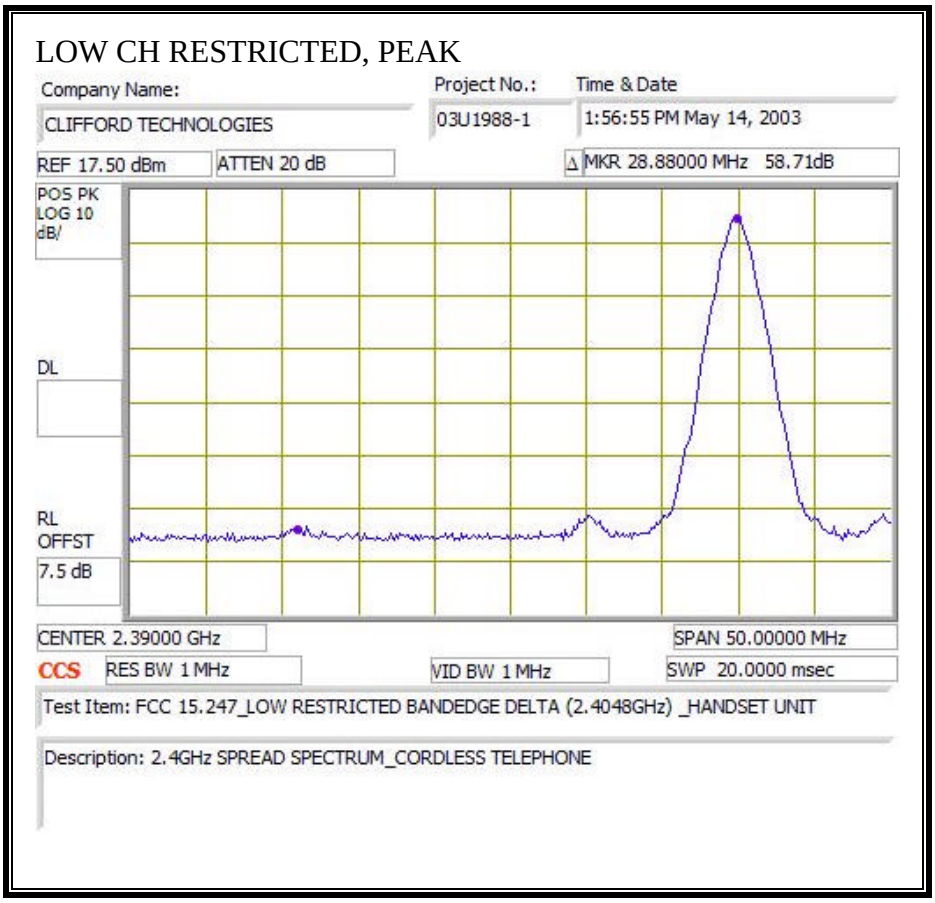
Hi Frequency Cables: ☐ (2 ft) ☐ (2 ~ 3 ft) ☑ (4 ~ 6 ft) ☑ (12 ft)

Peak Measurements: 1 MHz Resolution Bandwidth; 1MHz Video Bandwidth
Average Measurements: 1 MHz Resolution Bandwidth; 10Hz Video Bandwidth

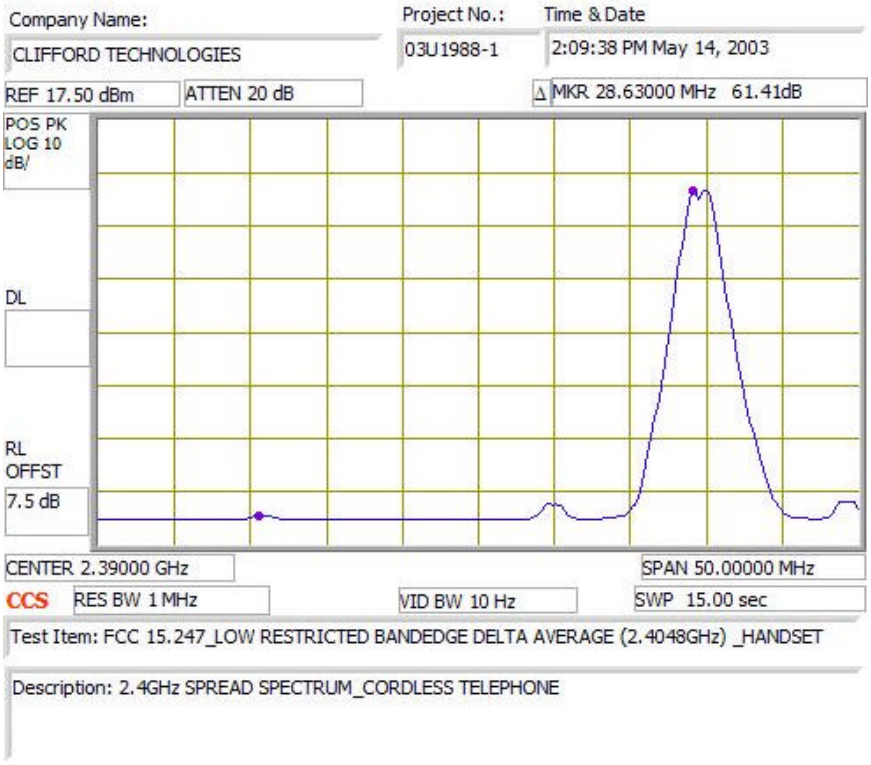
f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
LOW															
4.810	9.8	51.8	41.5	33.2	3.4	-36.1	0.0	1.0	53.3	43.0	74.0	54.0	-20.7	-11.0	V
4.810	9.8	50.9	41.3	33.2	3.4	-36.1	0.0	1.0	52.4	42.8	74.0	54.0	-21.6	-11.2	H
MID															
4.878	9.8	51.1	39.3	33.3	3.4	-36.1	0.0	1.0	52.7	40.9	74.0	54.0	-21.3	-13.1	V
4.878	9.8	50.6	40.7	33.3	3.4	-36.1	0.0	1.0	52.2	42.4	74.0	54.0	-21.8	-11.6	H
HI															
4.950	9.8	50.2	39.5	33.5	3.5	-36.1	0.0	1.0	51.9	41.2	74.0	54.0	-22.1	-12.8	V
4.950	9.8	48.8	37.8	33.5	3.5	-36.1	0.0	1.0	50.5	39.5	74.0	54.0	-23.5	-14.5	H
NO OTHER EMISSION FOUND AFTER 2nd HARMONIC															
AVERAGE MINUS 6 dB DUE TO 50% DUTY CYCLE															

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

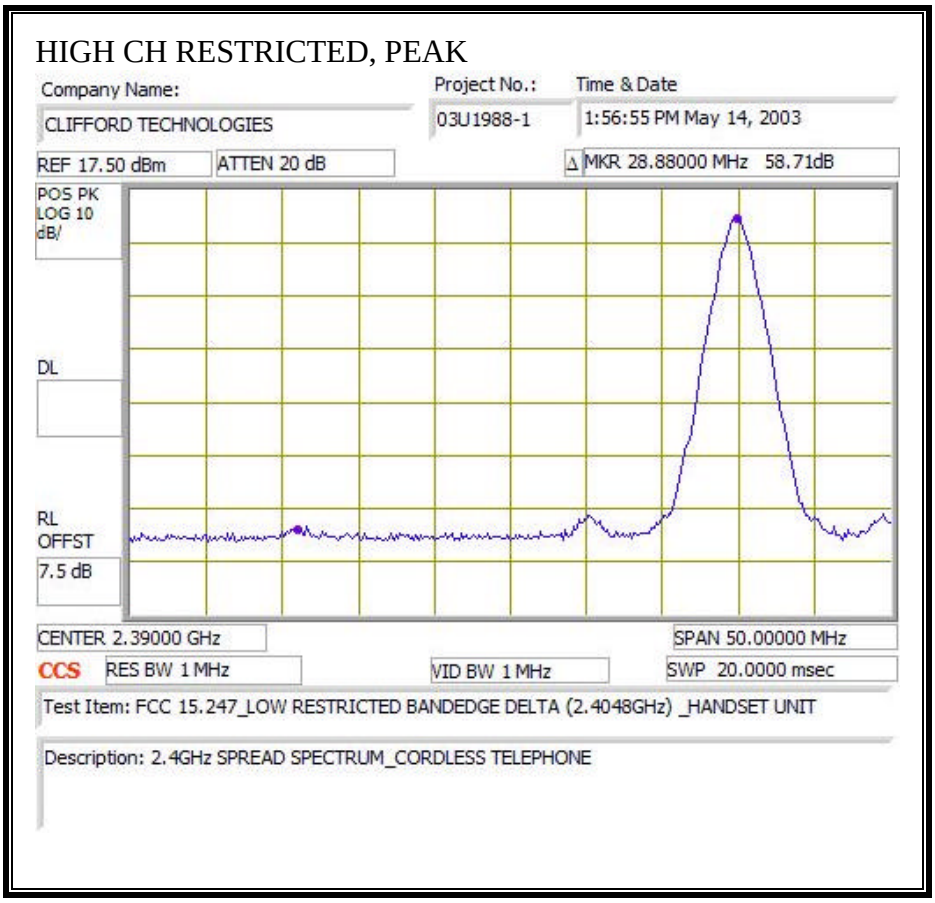
RESTRICTED BANDEDGE - LOW CHANNEL – HANDSET UNIT



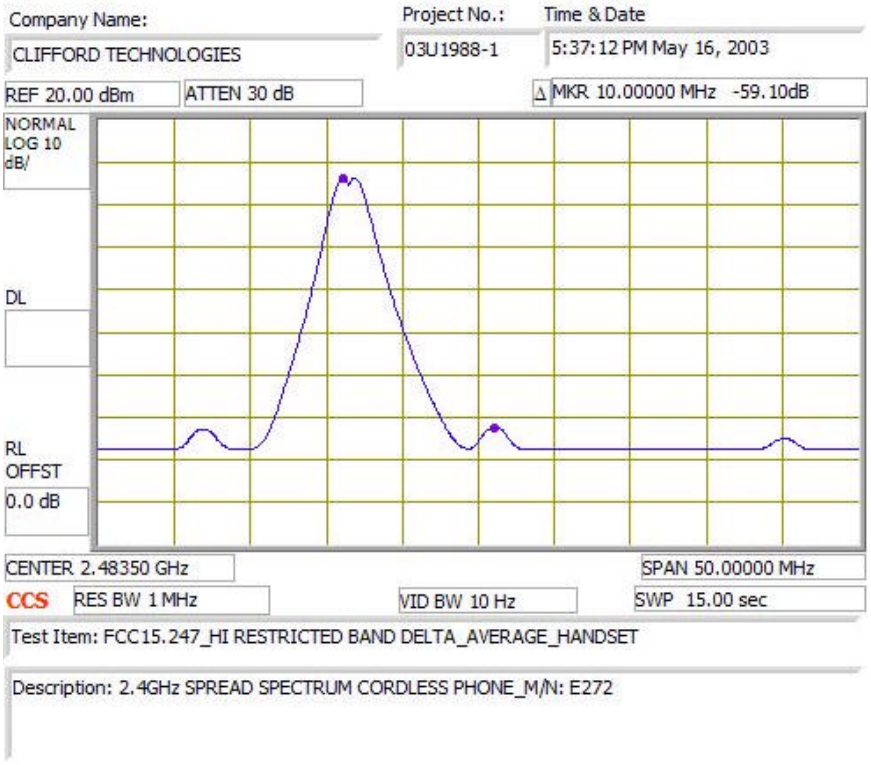
LOW CH RESTRICTED, AVG



RESTRICTED BANDEDGE - HIGH CHANNEL – HANDSET UNIT



HIGH CH RESTRICTED, AVG



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Test Target: FCC15.247
Mode Oper: Tx at L_ Fundamental_EUT in X,Y,Z Orientation_Hand Set

Test Equipment:

EMCO Horn 1-18GHz	Pre-amplifer 1-26GHz	Spectrum Analyzer	Horn > 18GHz
T72; S/N: 6739 @3m		8593EM Analyzer	

Hi Frequency Cables: ☐ (2 ft) ☐ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1 MHz Resolution Bandwidth
10Hz Video Bandwidth

4

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
LOW CH_Y ORIENTATION															
2.405	9.8	83.2	71.0	29.3	1.5	0.0	0.0	1.0	114.9	102.7	74.0	54.0			V
2.405	9.8	86.4	75.5	29.3	1.5	0.0	0.0	1.0	118.1	107.2	74.0	54.0			H
LOW CH_X ORIENTATION															
2.405	9.8	81.4	69.4	29.3	1.5	0.0	0.0	1.0	113.1	101.1	74.0	54.0			V
2.405	9.8	86.1	81.0	29.3	1.5	0.0	0.0	1.0	117.8	112.7	74.0	54.0			H
LOW CH_Z ORIENTATION															
2.405	9.8	81.4	70.0	29.3	1.5	0.0	0.0	1.0	113.1	101.7	74.0	54.0			V
2.405	9.8	82.7	71.3	29.3	1.5	0.0	0.0	1.0	114.4	103.0	74.0	54.0			H
HI CH_Y ORIENTATION															
2.475	9.8	88.1	71.5	29.4	1.6	0.0	0.0	1.0	120.1	103.5	74.0	54.0			H
AVERAGE READING MINUS 6dB DUE TO 50% DUTY CYCLE OF THE EUT.															
WORST CASE RESTRICTED BAND:															
LOW CH CONDUCTED RESTRICTED BAND EDGE DELTA:									-58.7	-61.4					
HI CH CONDUCTED RESTRICTED BAND EDGE DELTA:									-55.1	-58.1					
2.405	9.8	86.4	75.5						59.4	45.8	74.0	54.0	-14.6	-8.2	H
2.475	9.8	88.1	71.5						65.0	45.4	74.0	54.0	-9.0	-8.6	H

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		