

HARMONIC AND SPURIOUS RADIATED EMISSIONS

Test Engr: Chin Pang
Project #:03U1881-1
Company:Symbol Technologies EMEA
EUT Descr.:802.11b WLAN RF Port
EUT M/N:BYGA2
Test Target:FCC 15.247
Mode Oper: Tx

Test Equipment:

EMCO Horn 1-18GHz	Pre-amplifier 1-26GHz	Spectrum Analyzer	Horn > 18GHz
T73; S/N: 6717 @1m	Miteq NSP2600-44	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
Transmitting on Low Channel															
4.824	9.8	44.4	33.3	33.9	3.9	-36.1	0.0	1.0	47.1	36.0	74.0	54.0	-26.9	-18.0	V
4.824	9.8	44.5	33.3	33.9	3.9	-36.1	0.0	1.0	47.2	36.0	74.0	54.0	-26.8	-18.0	H
Transmitting on Mid Channel															
4.874	9.8	45.0	33.5	33.9	4.0	-36.1	0.0	1.0	47.8	36.3	74.0	54.0	-26.2	-17.7	V
4.824	9.8	44.5	33.3	33.9	3.9	-36.1	0.0	1.0	47.2	36.0	74.0	54.0	-26.8	-18.0	H
Transmitting on High Channel															
4.924	9.8	44.8	33.3	34.0	4.0	-36.1	0.0	1.0	47.7	36.1	74.0	54.0	-26.3	-17.9	V
4.924	9.8	44.3	33.2	34.0	4.0	-36.1	0.0	1.0	47.2	36.1	74.0	54.0	-26.8	-17.9	H

No other emissions were detected above the system noise floor.

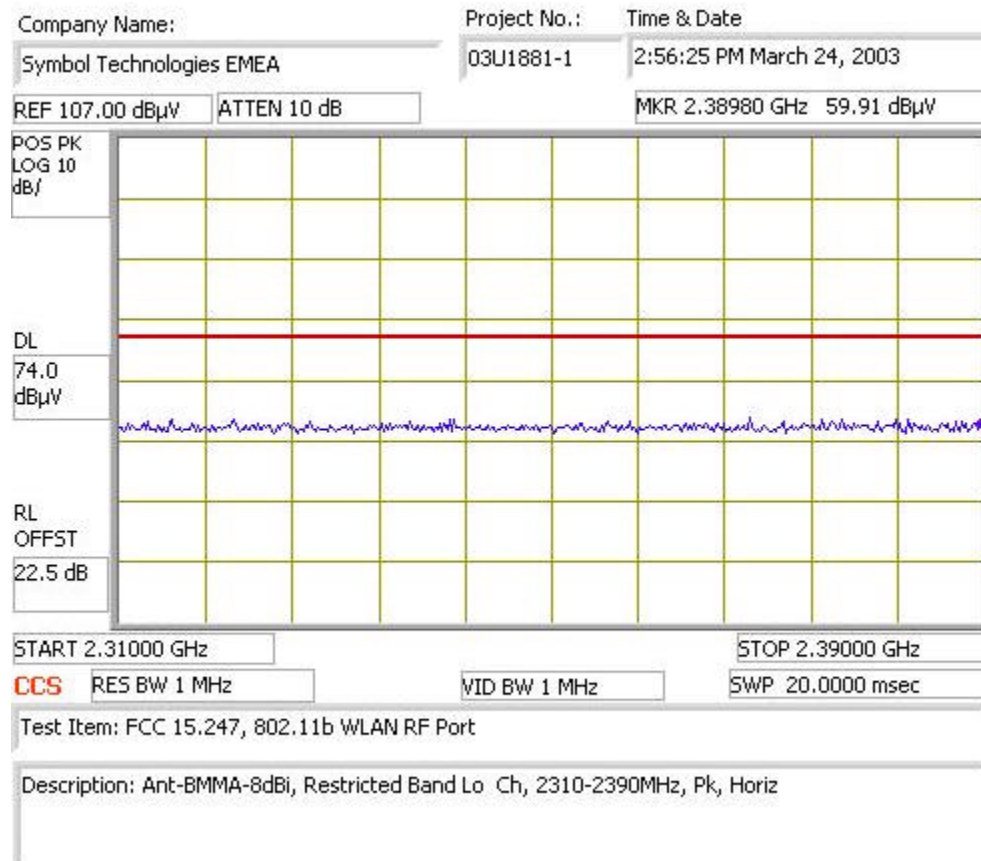
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

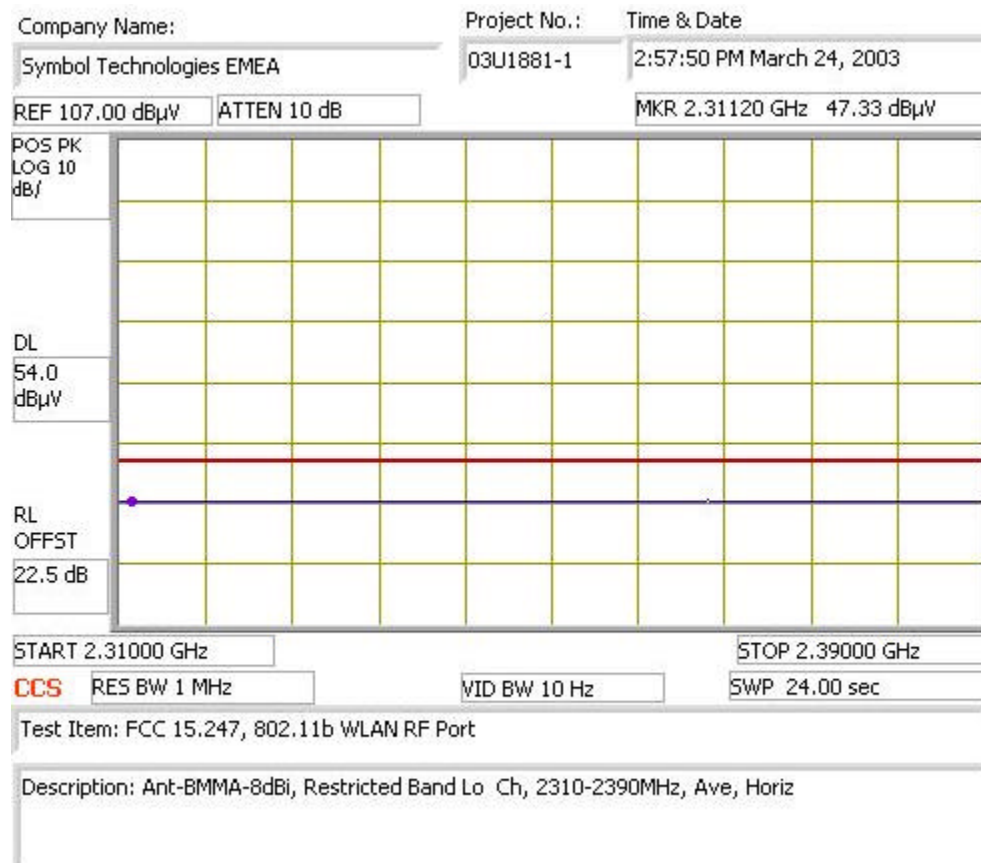
7.7.4. DIPOLE ANTENNA RESULTS

SETUP PHOTO

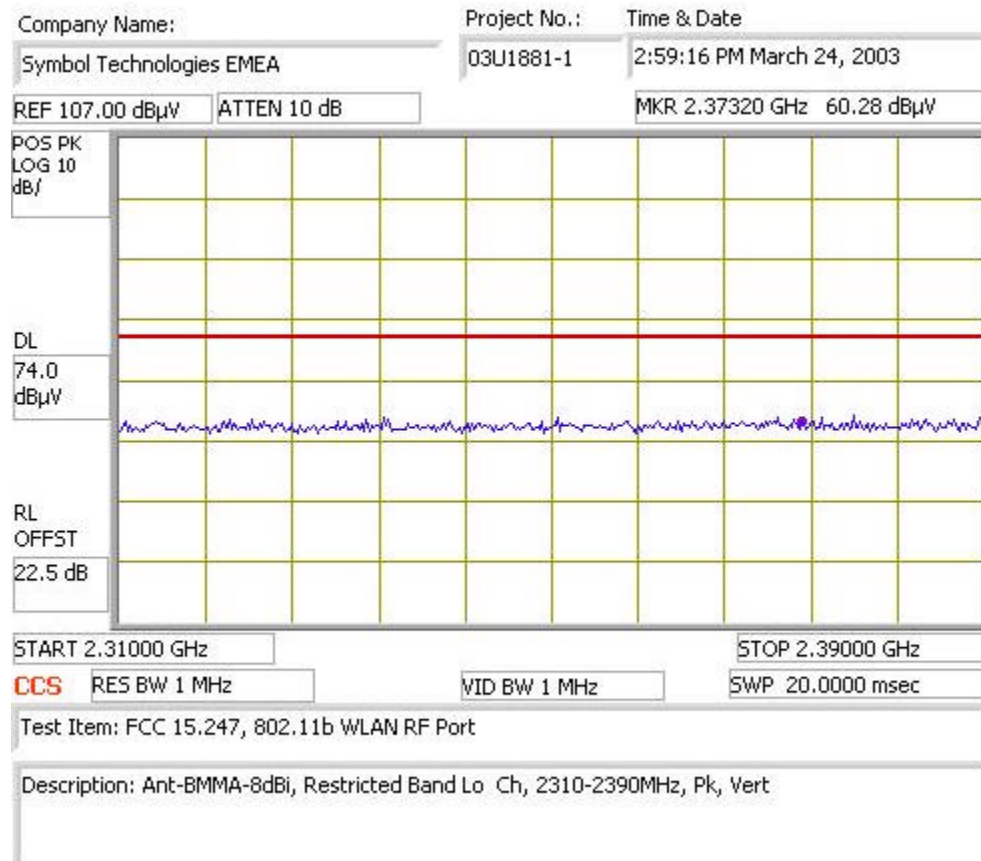


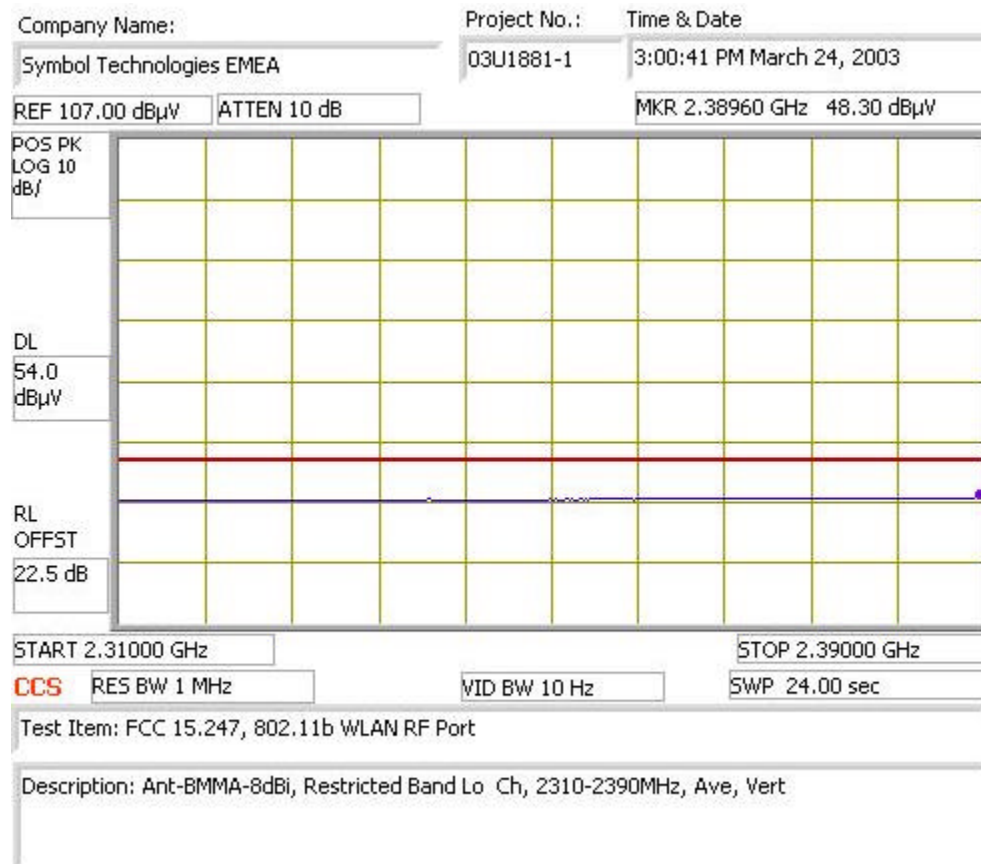
ADJACENT RESTRICTED BAND (LOW CHANNEL, HORIZONTAL)



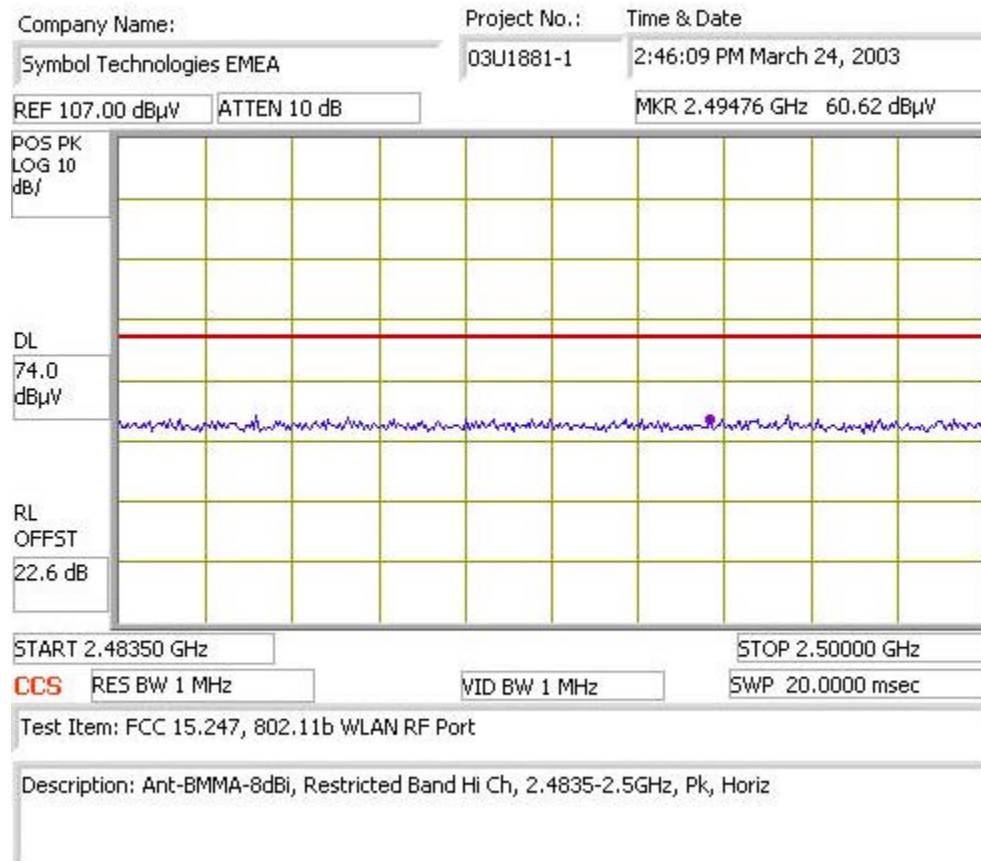


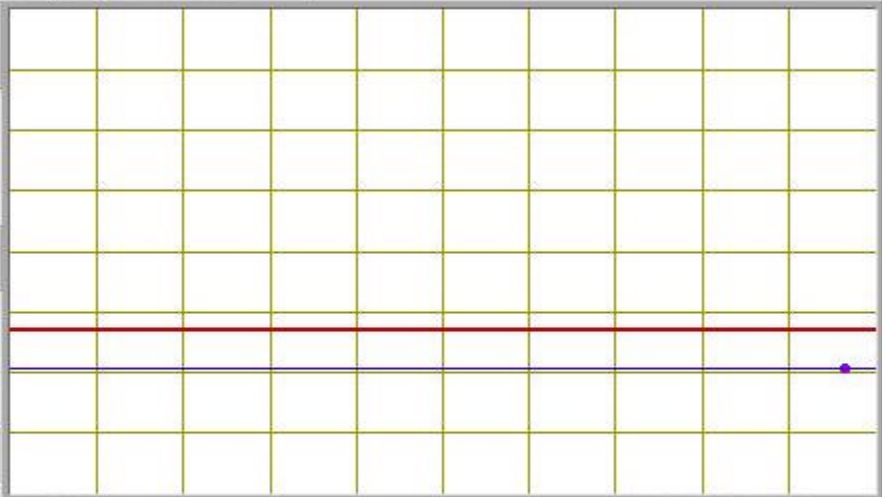
ADJACENT RESTRICTED BAND (LOW CHANNEL, VERTICAL)



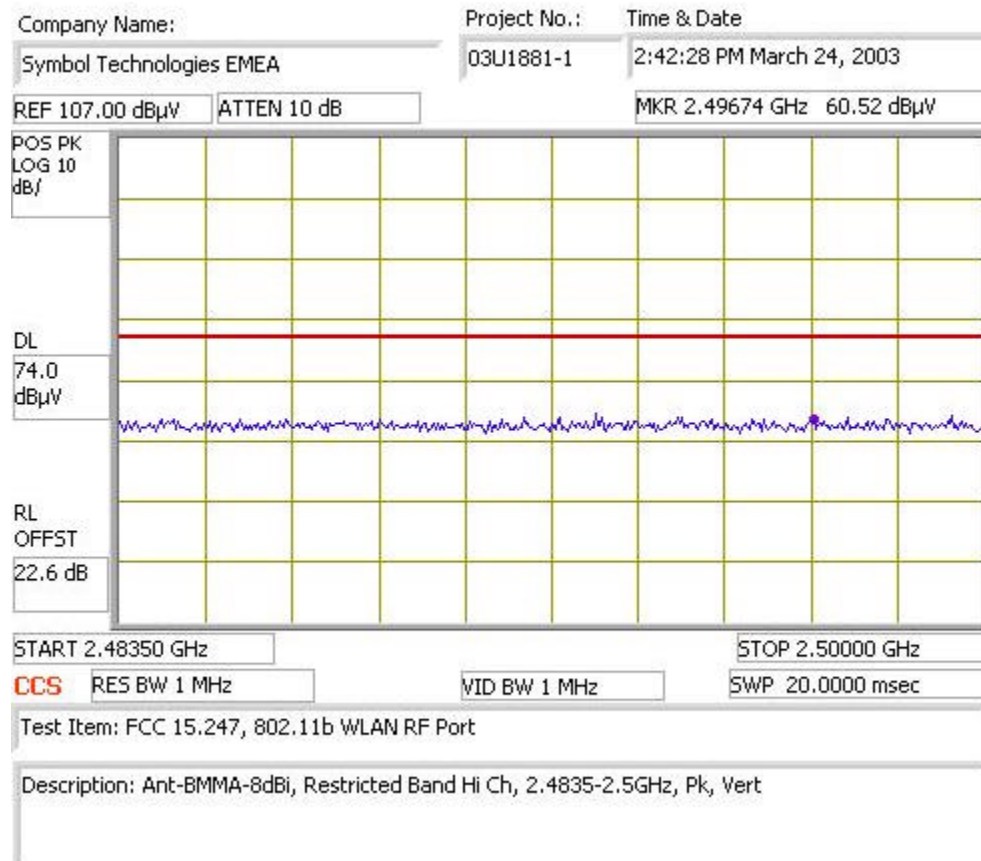


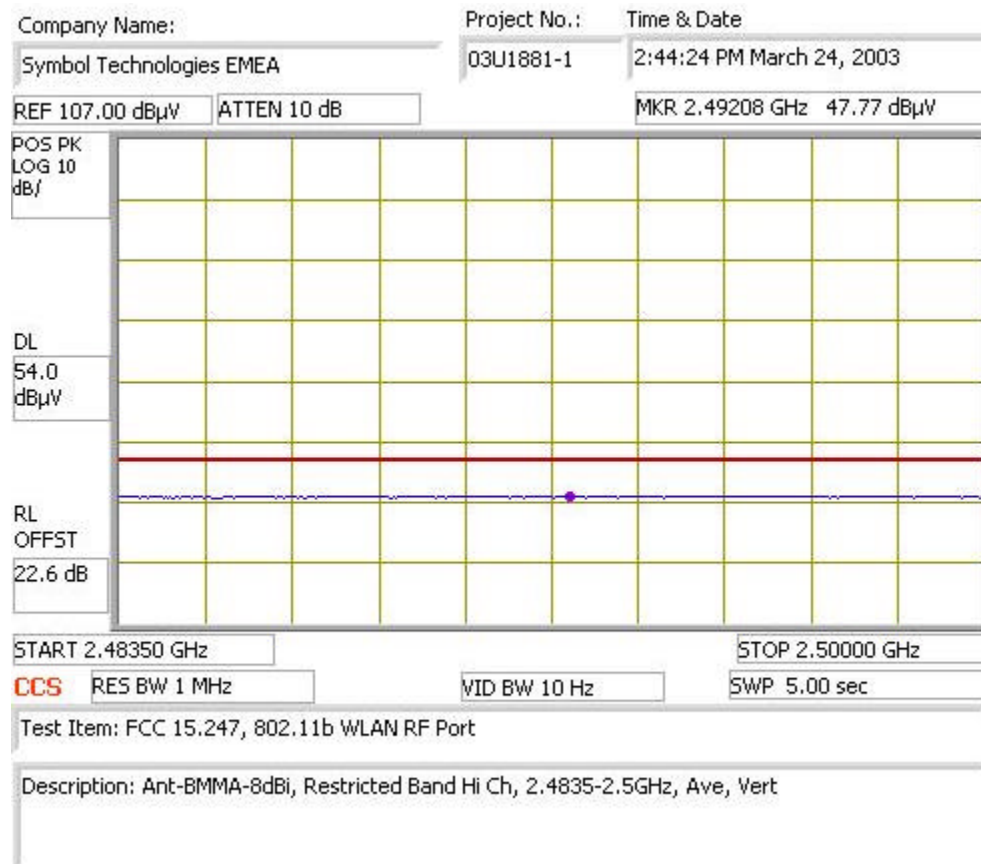
ADJACENT RESTRICTED BAND (HIGH CHANNEL, HORIZONTAL)



Company Name:		Project No.:	Time & Date
Symbol Technologies EMEA		03U1881-1	2:47:11 PM March 24, 2003
REF 107.00 dB μ V	ATTEN 10 dB	MKR 2.49942 GHz 47.57 dB μ V	
POS PK LOG 10 dB/			
DL 54.0 dB μ V			
RL OFFST 22.6 dB			
START 2.48350 GHz		STOP 2.50000 GHz	
CCS	RES BW 1 MHz	VID BW 10 Hz	SWP 5.00 sec
Test Item: FCC 15.247, 802.11b WLAN RF Port			
Description: Ant-BMMA-8dBi, Restricted Band Hi Ch, 2.4835-2.5GHz, Ave, Horiz			

ADJACENT RESTRICTED BAND (HIGH CHANNEL, VERTICAL)





HARMONIC AND SPURIOUS RADIATED EMISSIONS

03/26/03 High Frequency Measurement
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Chin Pang
Project #:03U1881-1
Company:Symbol Technologies EMEA
EUT Descrp.:802.11b WLAN RF Port
EUT M/N:BMMA1
Test Target:FCC 15.247
Mode Oper: Tx

Test Equipment:

EMCO Horn 1-18GHz	Pre-amplifier 1-26GHz	Spectrum Analyzer	Horn > 18GHz
T73; S/N: 6717 @1m	Miteq NSP2600-44	8593EM Analyzer	

Hi Frequency Cables

☒ (2 ft)	☐ (2 ~ 3 ft)	☐ (4 ~ 6 ft)	☒ (12 ft)
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Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1 MHz Resolution Bandwidth
10Hz Video Bandwidth

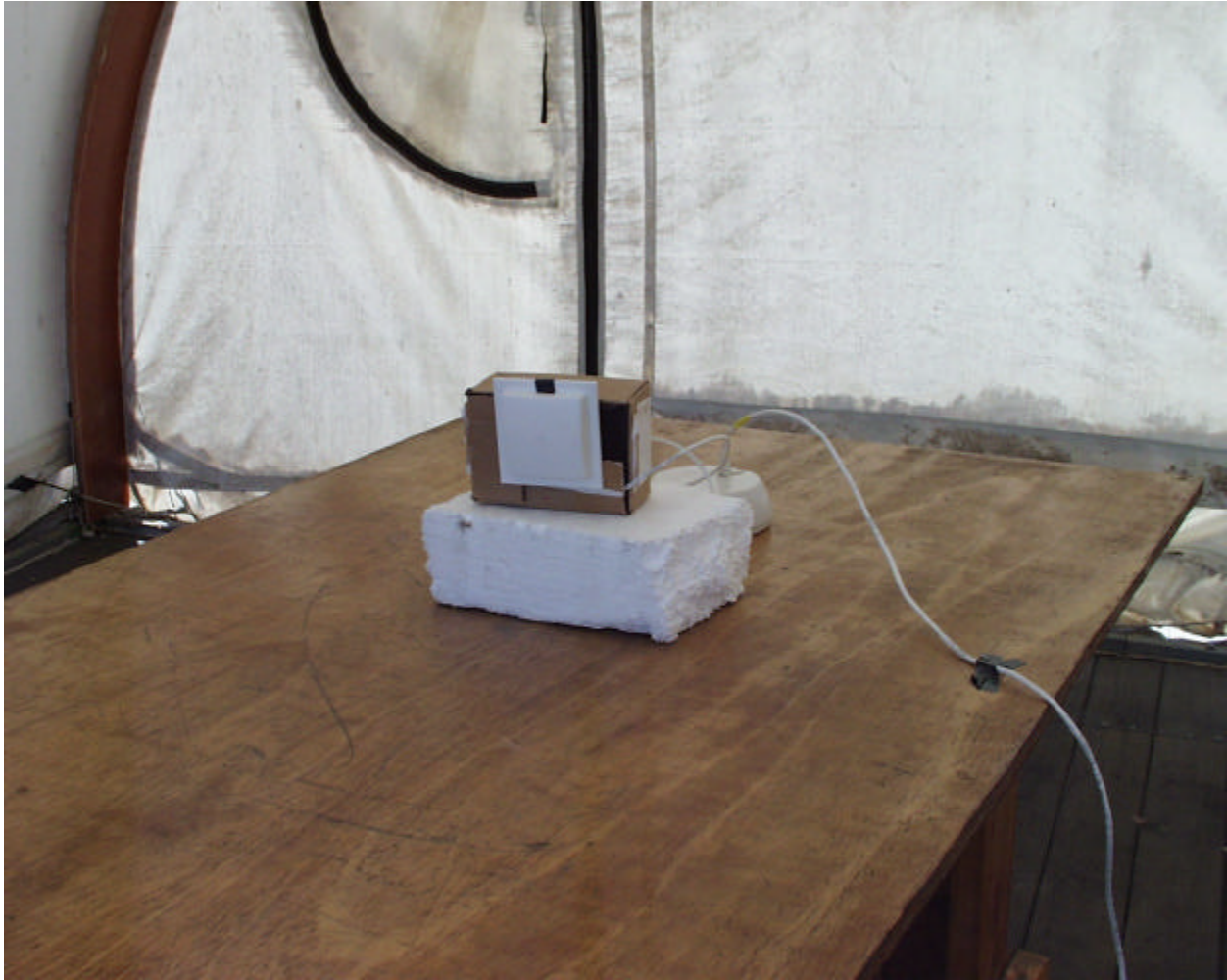
f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
Transmitting on Low Channel															
4.824	9.8	45.0	33.4	33.9	3.9	-36.1	0.0	1.0	47.7	36.1	74.0	54.0	-26.3	-17.9	V
4.824	9.8	44.3	33.3	33.9	3.9	-36.1	0.0	1.0	47.0	36.0	74.0	54.0	-27.0	-18.0	H
Transmitting on Mid Channel															
4.874	9.8	45.7	33.6	33.9	4.0	-36.1	0.0	1.0	48.5	36.4	74.0	54.0	-25.5	-17.6	V
4.824	9.8	45.2	33.2	33.9	3.9	-36.1	0.0	1.0	47.9	35.9	74.0	54.0	-26.1	-18.1	H
Transmitting on High Channel															
4.924	9.8	48.3	35.0	34.0	4.0	-36.1	0.0	1.0	51.2	37.9	74.0	54.0	-22.8	-16.1	V
4.924	9.8	44.4	33.3	34.0	4.0	-36.1	0.0	1.0	47.2	36.1	74.0	54.0	-26.8	-17.9	H

No other emissions were detected above the system noise floor.

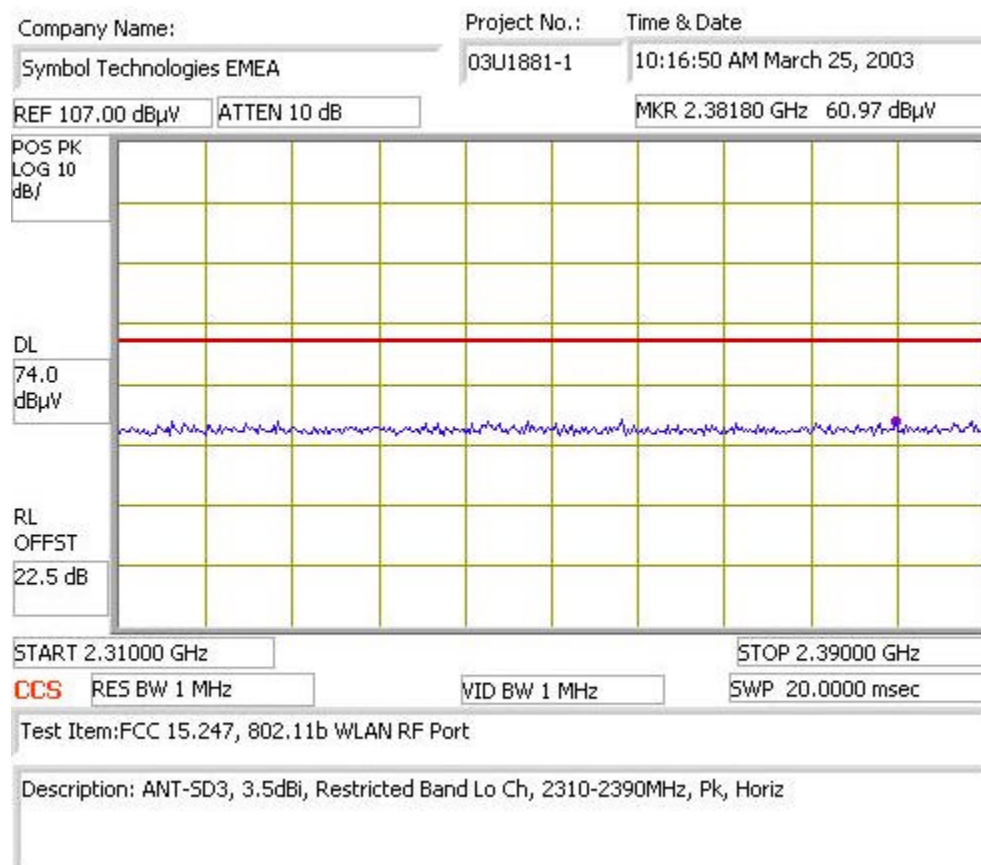
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

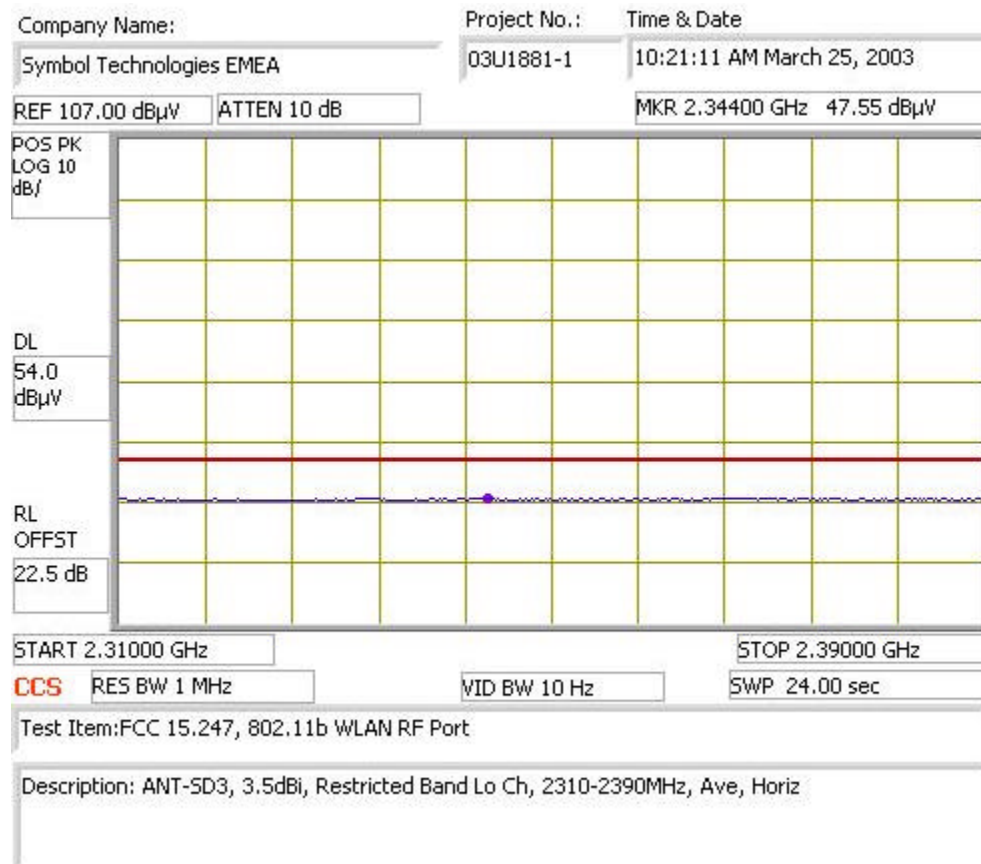
7.7.5. PATCH ANTENNA RESULTS

SETUP PHOTO

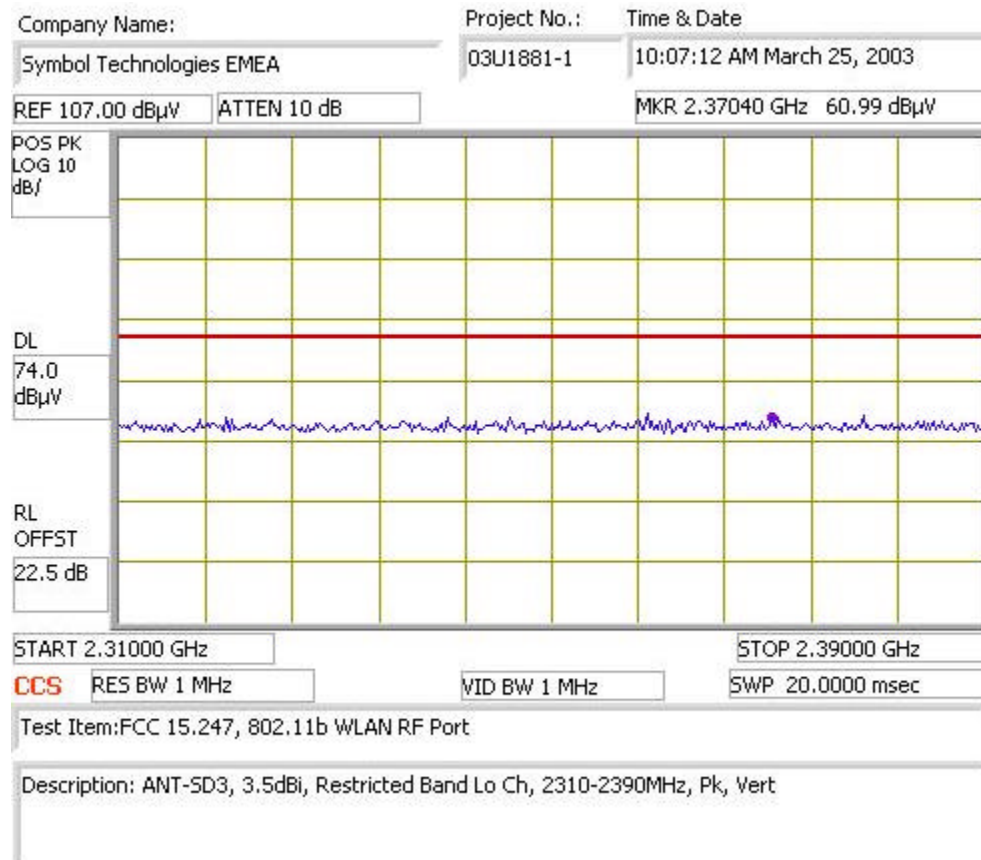


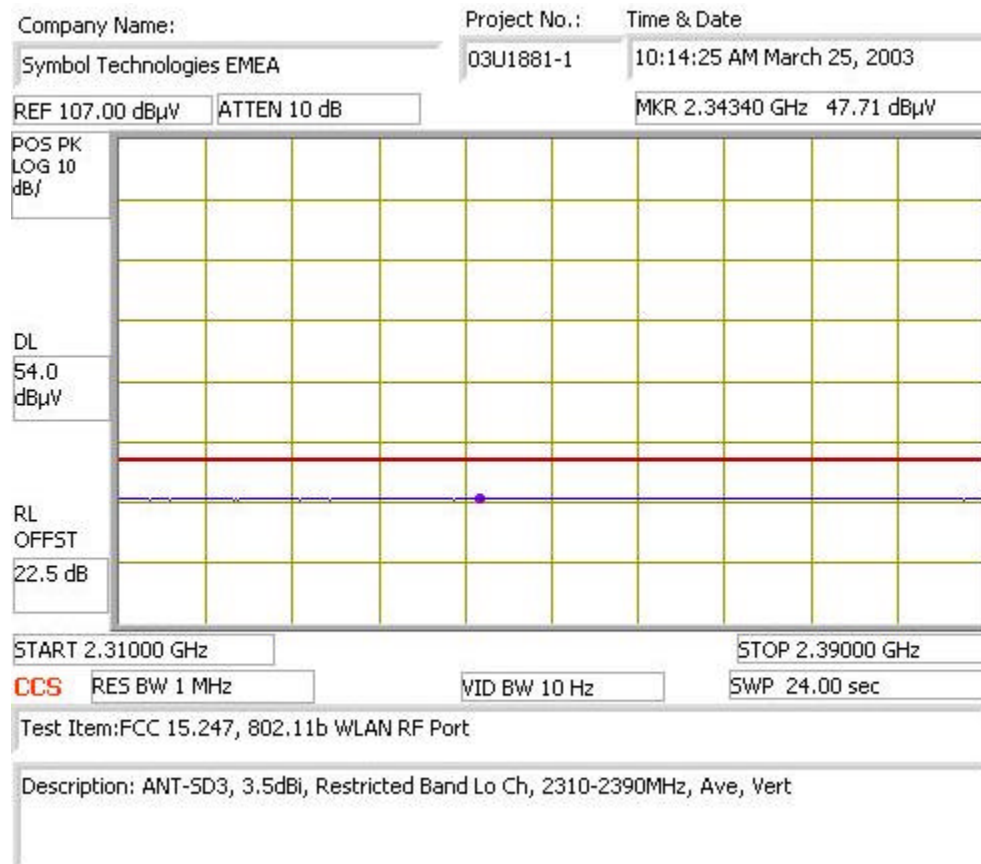
ADJACENT RESTRICTED BAND (LOW CHANNEL, HORIZONTAL)



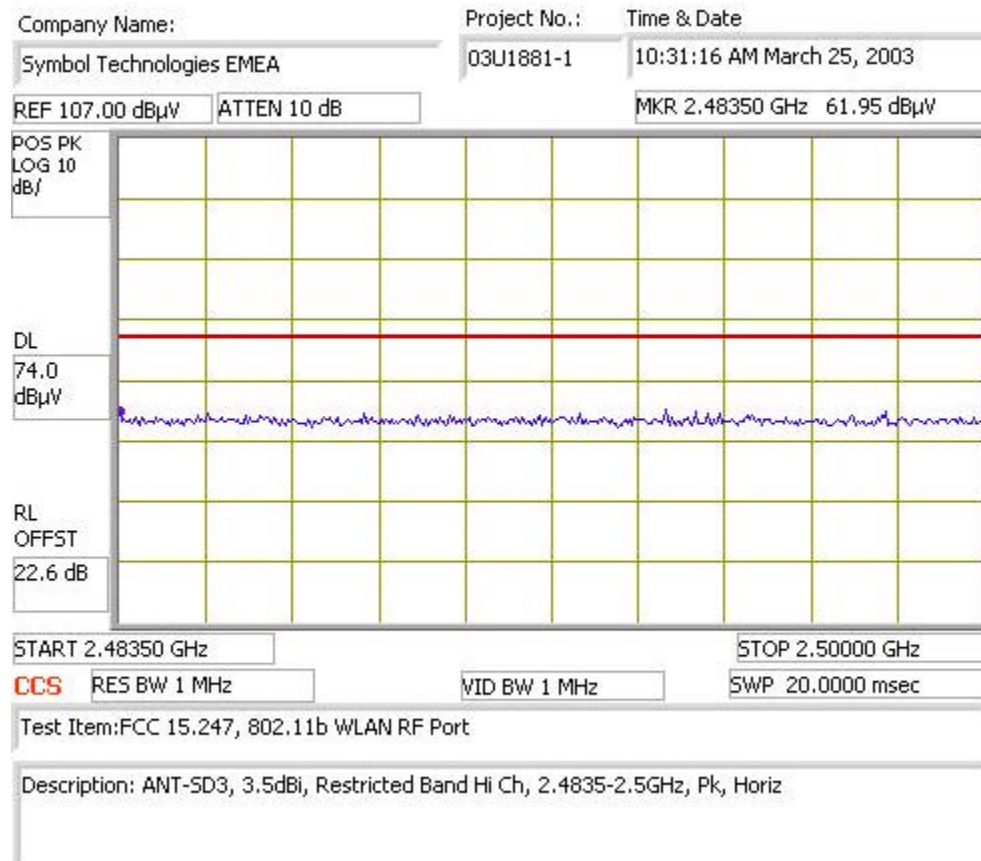


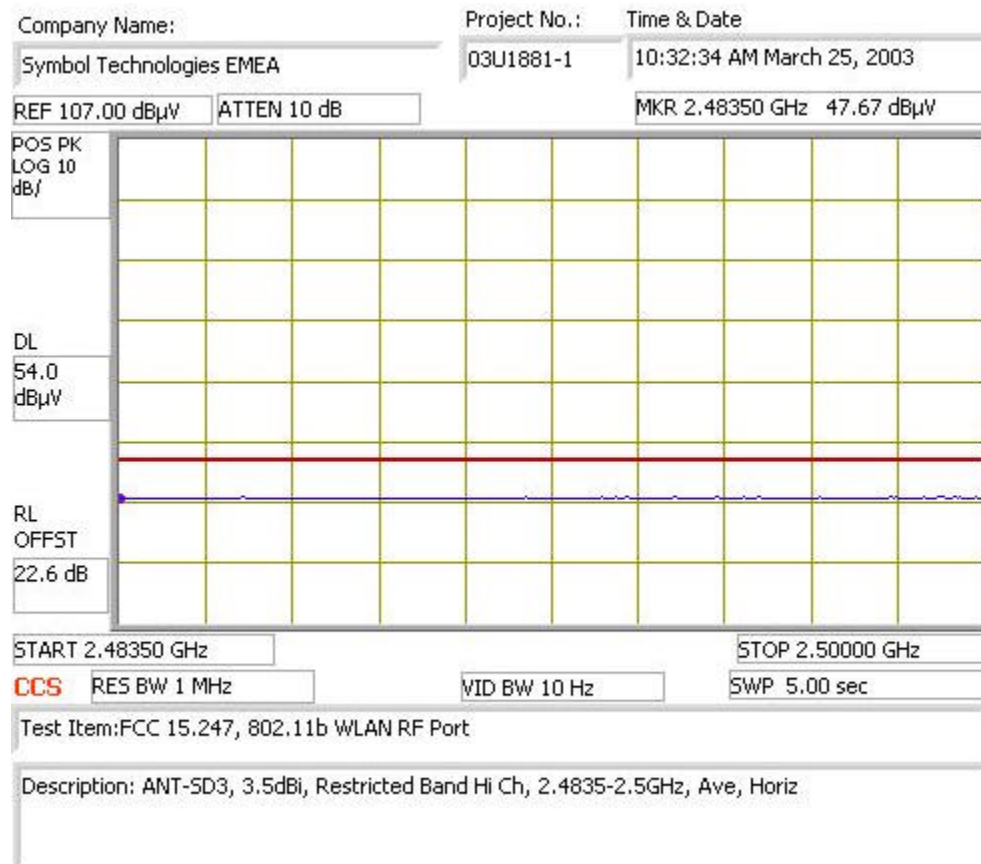
ADJACENT RESTRICTED BAND (LOW CHANNEL, VERTICAL)



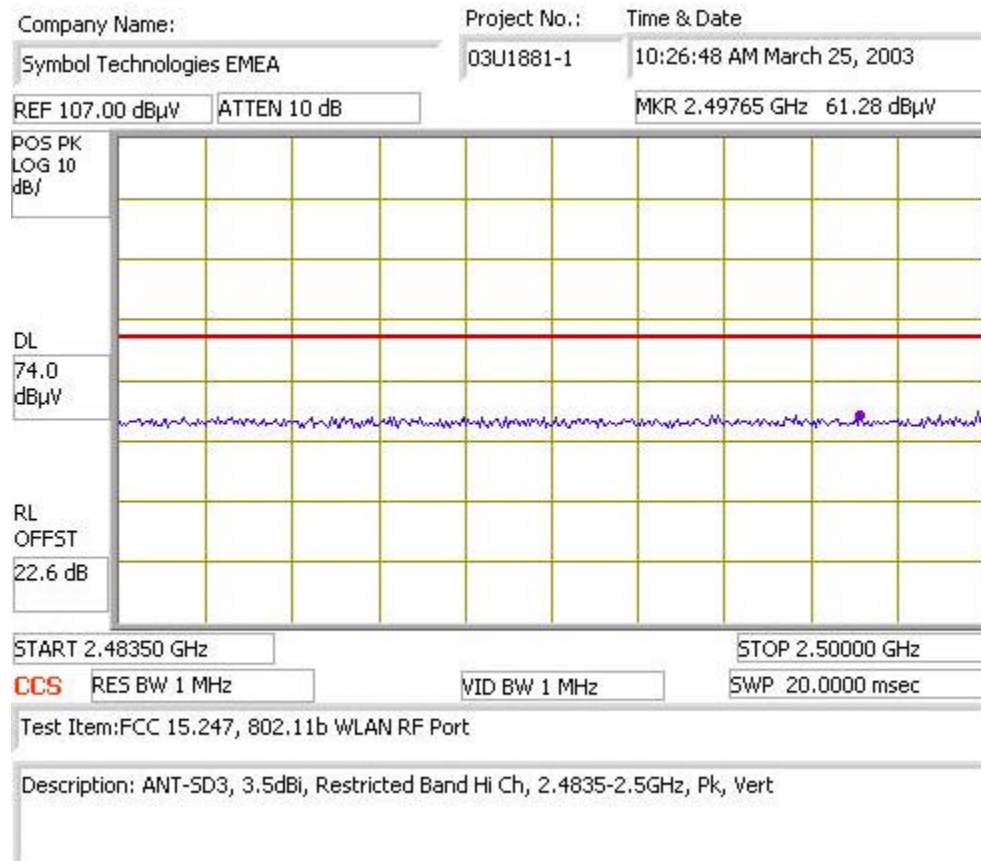


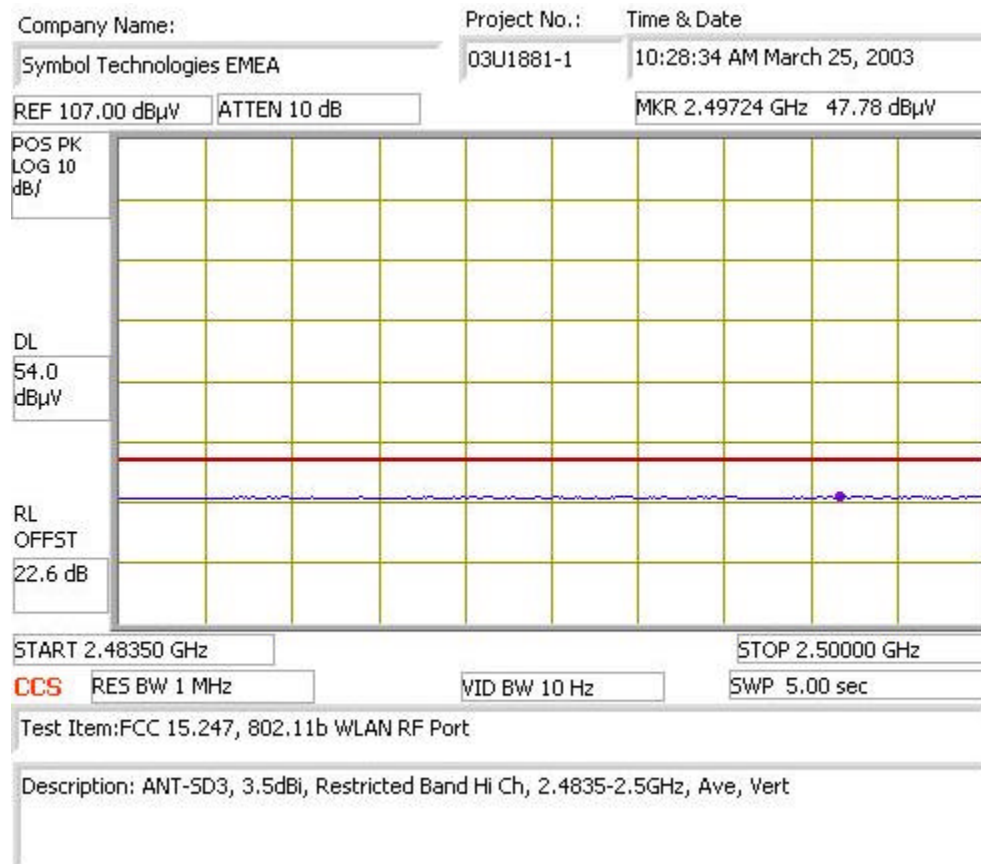
ADJACENT RESTRICTED BAND (HIGH CHANNEL, HORIZONTAL)





ADJACENT RESTRICTED BAND (HIGH CHANNEL, VERTICAL)





HARMONIC AND SPURIOUS RADIATED EMISSIONS

Project #:03U1881-1
Company:Symbol Technologies EMEA
EUT Descr:802.11b WLAN RF Port
EUT M/N:SD3
Test Target:FCC 15.247
Mode Oper: Tx

Test Equipment:

EMCO Horn 1-18GHz	Pre-amplifier 1-26GHz	Spectrum Analyzer	Horn > 18GHz
T73; S/N: 6717 @1m	Miteq NSP2600-44	8593EM Analyzer	

Hi Frequency Cables

☒ (2 ft) ☐ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☒ (12 ft)

Peak Measurements:
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1MHz Video Bandwidth

Average Measurements:
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10Hz Video Bandwidth

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Transmitting at Low Channel															
4.824	9.8	42.7	31.3	33.9	3.9	-36.1	0.0	1.0	45.4	34.0	74.0	54.0	-28.6	-20.0	V
4.824	9.8	43.7	31.3	33.9	3.9	-36.1	0.0	1.0	46.4	34.0	74.0	54.0	-27.6	-20.0	H
Transmitting at Mid Channel															
4.874	9.8	43.3	31.3	33.9	4.0	-36.1	0.0	1.0	46.1	34.1	74.0	54.0	-27.9	-19.9	V
4.874	9.8	42.9	31.2	33.9	4.0	-36.1	0.0	1.0	45.7	34.0	74.0	54.0	-28.3	-20.0	H
Transmitting at High Channel															
4.924	9.8	43.9	31.5	34.0	4.0	-36.1	0.0	1.0	46.8	34.3	74.0	54.0	-27.2	-19.7	V
4.924	9.8	42.5	31.2	34.0	4.0	-36.1	0.0	1.0	45.4	34.1	74.0	54.0	-28.6	-19.9	H

No other emissions were detected above the system noise floor

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		

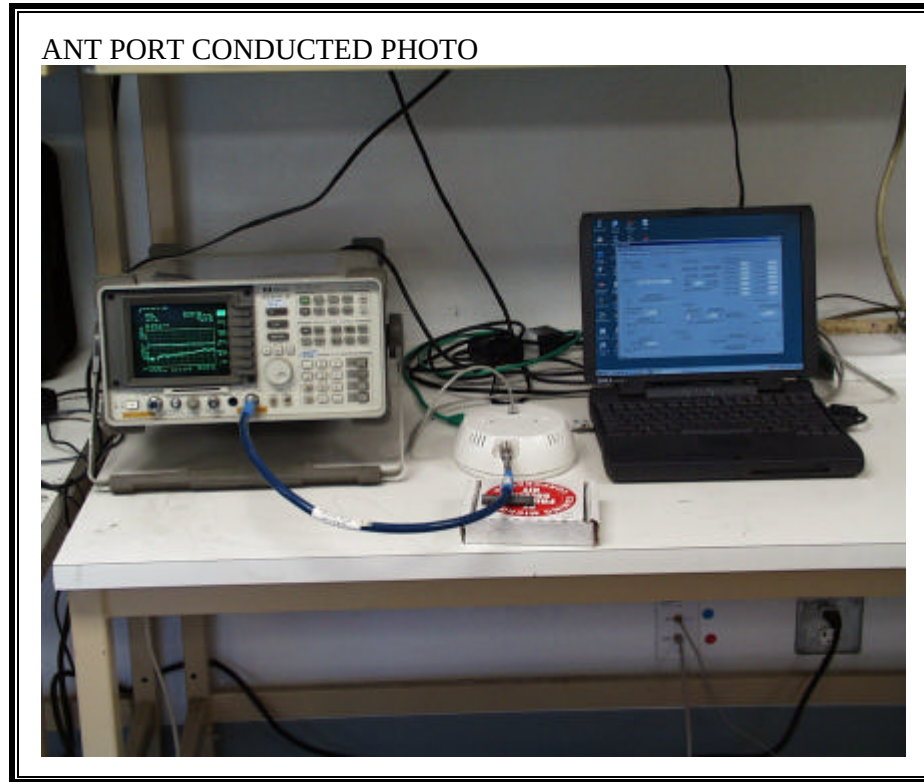
7.7.6. WORST-CASE EMISSIONS 30 TO 1000 MHz

RESULTS

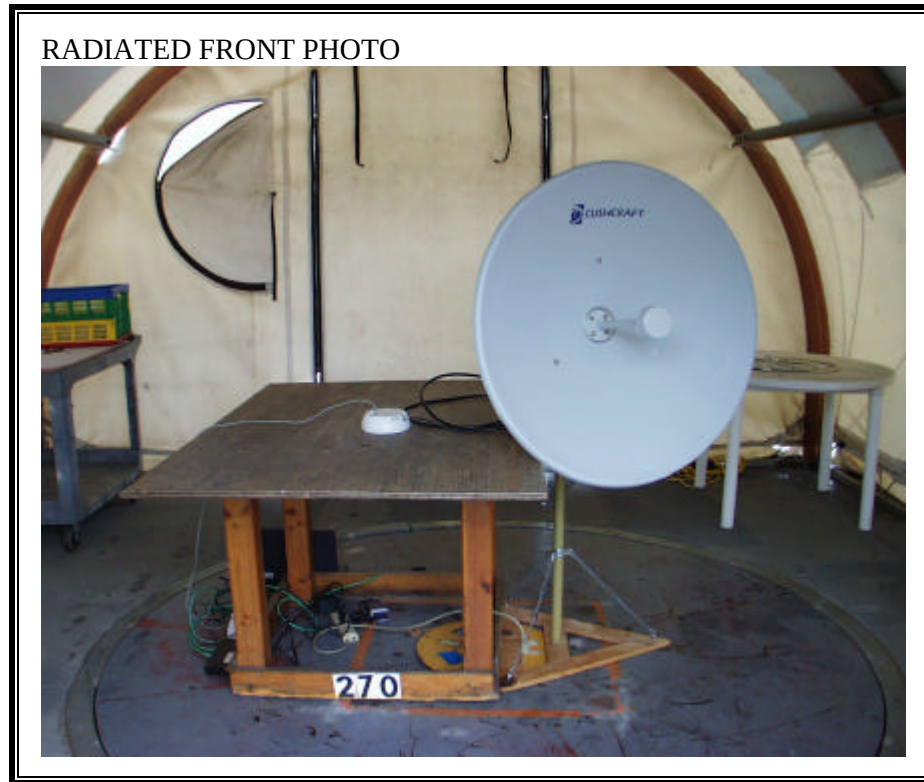
						Project #: 030425A1 Report #: 030425A1 Date & Time: 04/25/03 2:48 PM Test Engr: Chin Pang					
FCC, VCCI, CISPR, CE, AUSTEL, NZ UL, CSA, TUV, BSMI, DHHS, NVLAP 561F MONTEREY ROAD, SAN JOSE, CA 95037-9001 PHONE: (408) 463-0885 FAX: (408) 463-0888											
Company: Symbol EUT Description: 802.11b WLAN RF Port. M/N: CCRF-5020, Class II Change Test Configuration: EUT/Support Equipment Type of Test: FCC 15.209 Mode of Operation: TX											
<< Main Sheet											
Freq.	Reading	AF	Closs	Pre-amp	Level	Limit	Margin	Pol	Az	Height	Mark
(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	FCC B	(dB)	(H/V)	(Deg)	(Meter)	(P/Q/A)
500.00	50.90	17.47	3.68	27.71	44.34	46.00	-1.66	3mV	0.00	1.00	P
500.00	50.70	17.47	3.68	27.71	44.14	46.00	-1.86	3mH	0.00	1.50	P
200.00	48.60	17.38	2.23	26.67	41.54	43.50	-1.96	3mV	0.00	1.00	P
120.00	56.00	10.70	1.71	26.93	41.48	43.50	-2.02	3mH	0.00	2.00	P
250.00	55.00	12.22	2.53	26.52	43.23	46.00	-2.77	3mH	0.00	2.00	P
450.00	50.30	16.67	3.47	27.49	42.95	46.00	-3.05	3mH	0.00	2.00	P
6 Worst Data											

7.8. SETUP PHOTOS

ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP



RADIATED RF MEASUREMENT SETUP



RADIATED BACK PHOTO



POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP

LINE CONDUCTED FRONT PHOTO



LINE CONDUCTED BACK PHOTO



END OF REPORT