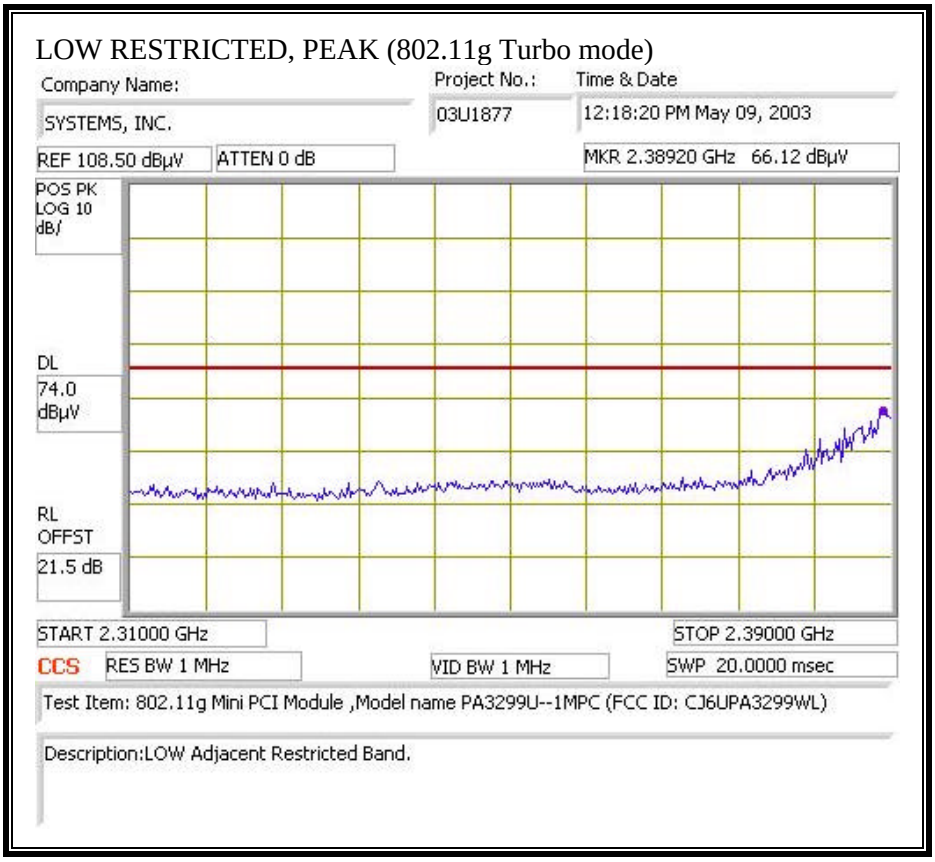
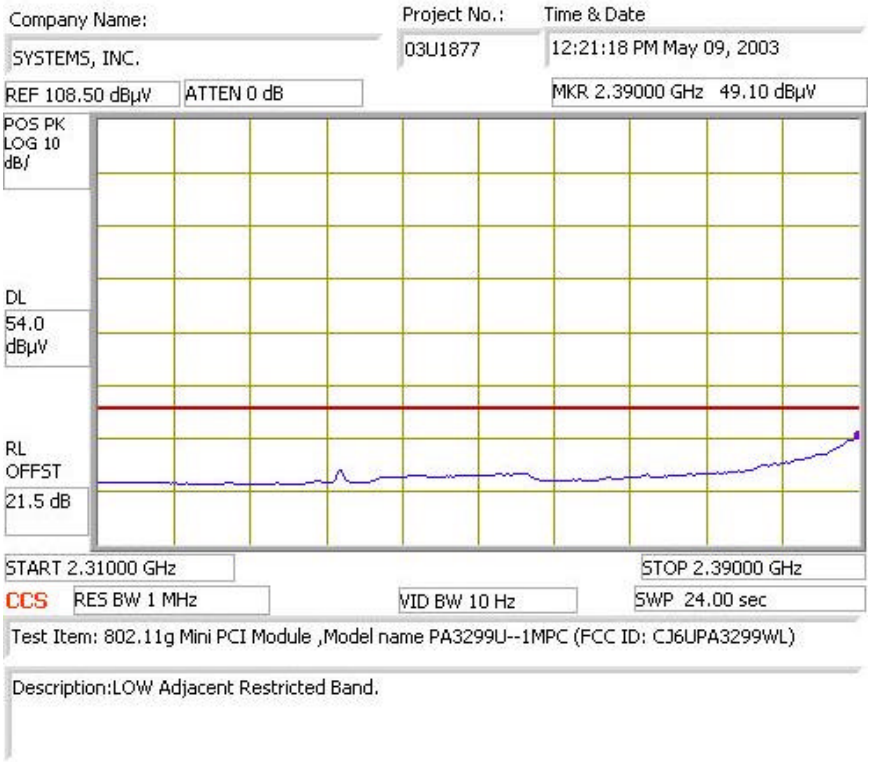
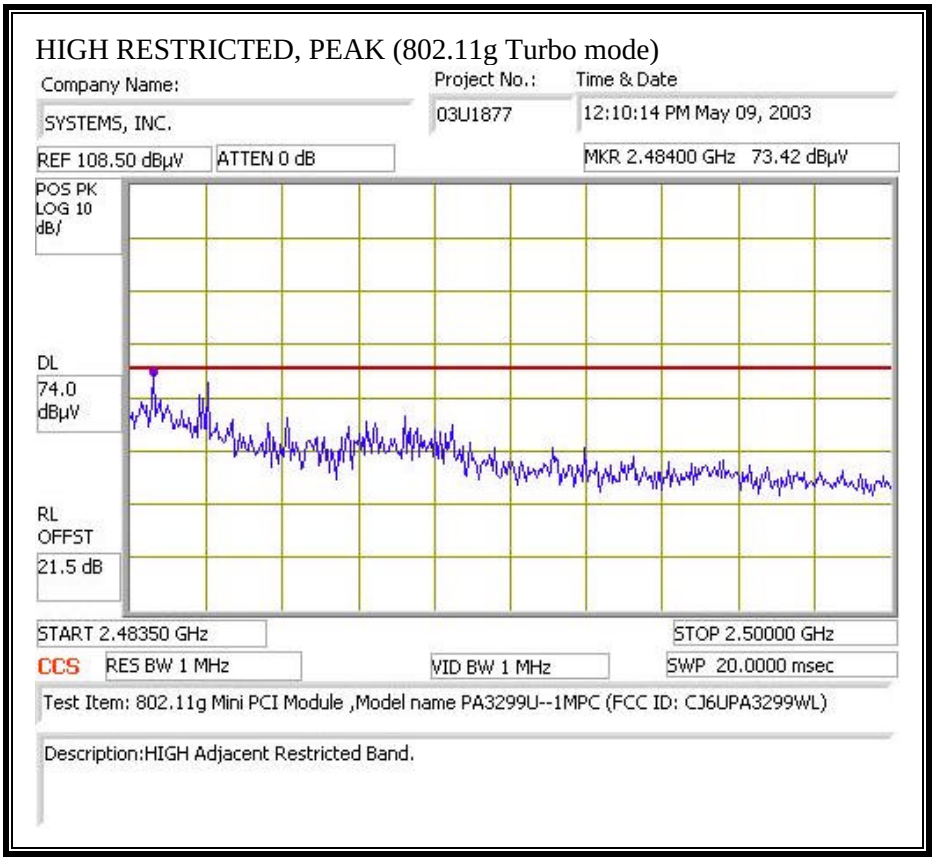
LOW RESTRICTED BANDEDGE (g TURBO MODE)



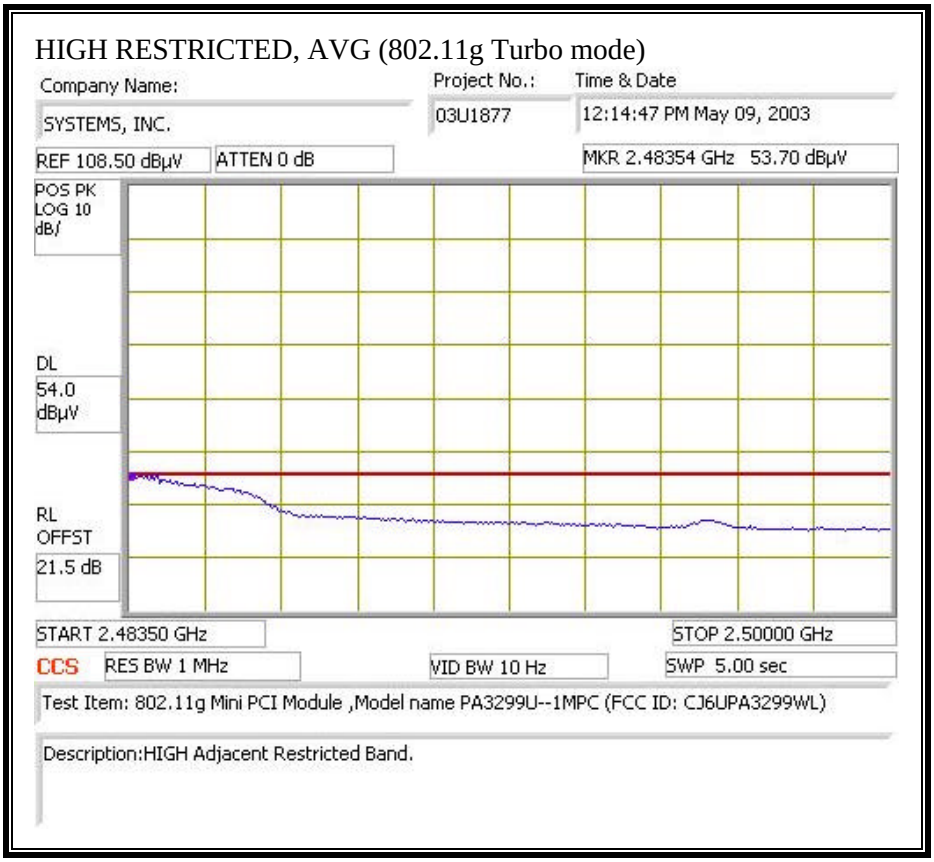
LOW RESTRICTED, AVG (802.11g Turbo mode)



HIGH RESTRICTED BANDEDGE (g TURBO MODE)



HIGH RESTRICTED, AVG (802.11g Turbo mode)



HARMONICS AND SPURIOUS EMISSIONS

05/07/03 **High Frequency Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr:Thanh Nguyen
Project #: 03U1877
Company: TOSHIBA AMERICA INFORMATION SYSTEMS, INC.
EUT Descrip.: 802.11b/g Mini PCI Module
EUT M/N: PA3299U-1MPC (FCC ID: CJ6UPA3299WL)

Mode Oper:Transmit at LOW , MID, HIGH Channel,b/g normal& Turbo mode.

Test Equipment:

EMCO Horn 1-18GHz	Pre-amplifer 1-26GHz	Spectrum Analyzer	Horn > 18GHz
T73; S/N: 6717 @3m	T63 Miteq 646456	HP 8593EM Analyzer	T87; ARA 18-26GHz; S/N:1049

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
No Spurious Emissions was detected up to 10th Harmonic, above the system noise floor.															

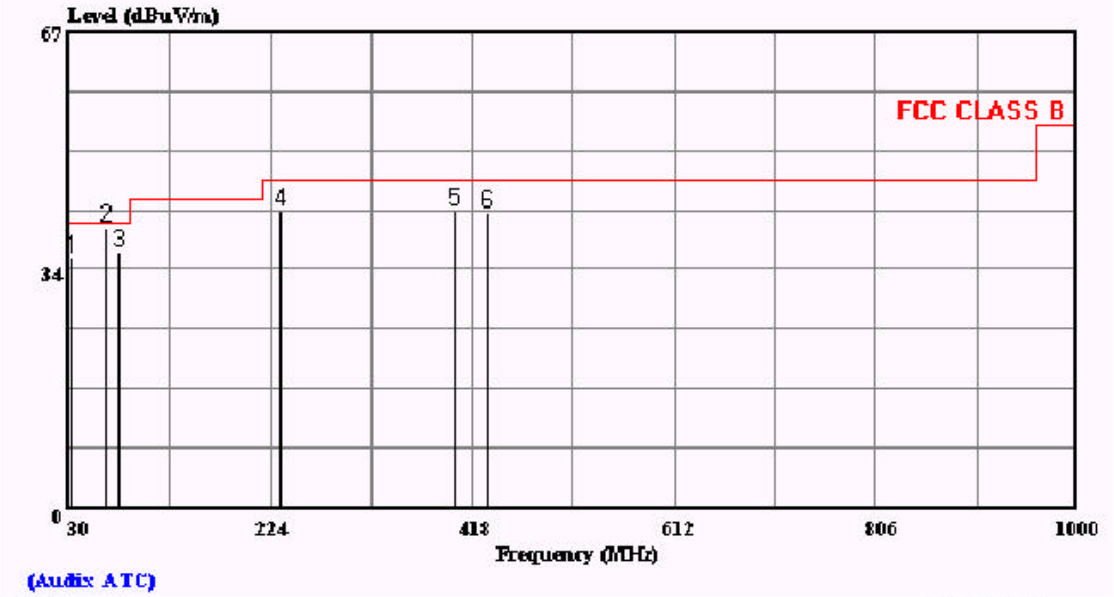
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

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

COMPLIANCE Engineering Services, Inc.
FCC,VCCI,IC,SPR,CE
CL,CSA,TUV

561F Monterey Road
Morgan Hill, CA 95037, U.S.A.
Tel: (408) 463-0885
Fax:(408) 463-0888

Data#: 6 File#: 03u1877A.EMI Date: 05-14-2003 Time: 16:27:32



Trace: Ref Trace:

Condition: FCC CLASS B 3m CHAMBER 030306 1185 VERTICAL
Company : TOSHIBA AMERICA INFORMATION SYSTEMS, INC
EUT Description : 802.11b/g Mini PCI Module
Model Number : PA3299U-1MPC (FCC ID: CJ6UPA3299WL
Test Configurtion: EUT is Plug in the extended card to LapT
Test Target : FCC Class B, IC, DGT
Mode of Operation: Transmit worst Case
Project No : 03U1877

Page: 1

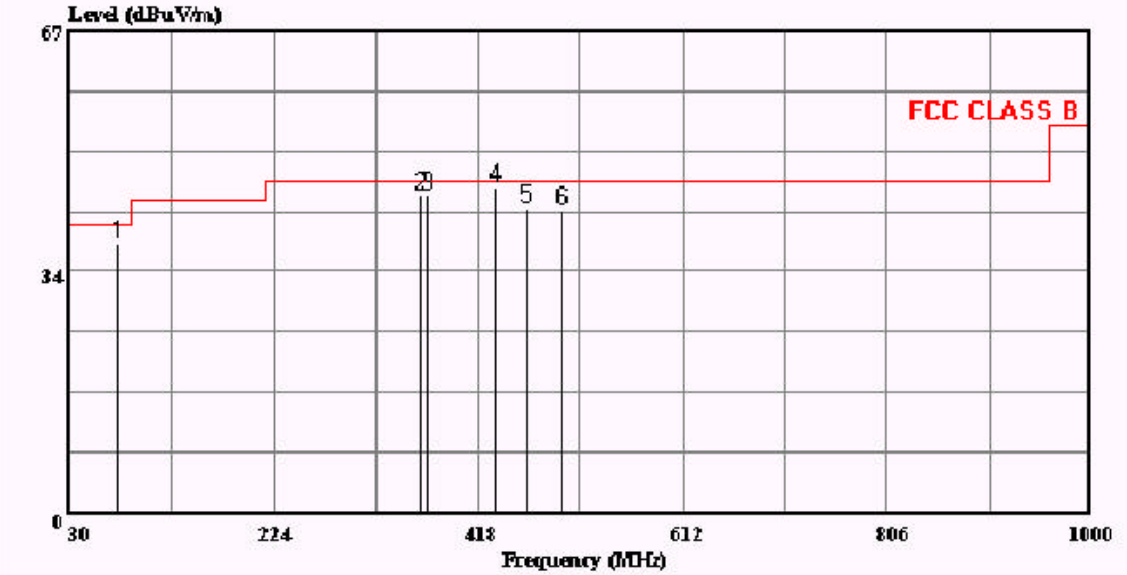
	Freq	Read Level	Probe Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	31.940	17.58	16.97	0.56	0.00	35.11	40.00	-4.89	Peak
2	65.890	29.24	9.38	0.77	0.00	39.39	40.00	-0.61	Peak
3	77.530	28.20	6.87	0.84	0.00	35.91	40.00	-4.09	Peak
4	232.730	29.51	10.85	1.50	0.00	41.86	46.00	-4.14	Peak
5	400.540	25.28	14.45	2.01	0.00	41.74	46.00	-4.26	Peak
6	431.580	24.20	15.16	2.15	0.00	41.51	46.00	-4.49	Peak

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

COMPLIANCE Engineering Services, Inc.
FCC,VCCI,CISPR,CE
UL,CSA,TUV

561F Monterey Road
Morgan Hill, CA 95037, U.S.A.
Tel: (408) 463-0885
Fax:(408) 463-0888

Data#: 3 File#: 03u1877A.EMI Date: 05-14-2003 Time: 16:17:31



Trace: Ref Trace:

Condition: FCC CLASS B 3m CHAMBER 030306 1185 HORIZONTAL
Company : TOSHIBA AMERICA INFORMATION SYSTEMS, INC
EUT Description : 802.11b/g Mini PCI Module
Model Number : PA3299U-1MPC (FCC ID: CJ6UPA3299WL
Test Configurtion: EUT is Plug in the extended card to LapT
Test Target : FCC Class B, IC, DGT
Mode of Operation: Transmit worst Case
Project No : 03U1877

Page: 1

	Freq	Read Level	Probe Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	75.590	29.30	7.24	0.80	0.00	37.34	40.00	-2.66	Peak
2	363.680	28.37	13.66	1.91	0.00	43.94	46.00	-2.06	Peak
3	368.530	28.31	13.77	1.96	0.00	44.04	46.00	-1.96	Peak
4	434.490	27.97	15.23	2.12	0.00	45.32	46.00	-0.68	Peak
5	463.590	24.25	15.84	2.22	0.00	42.31	46.00	-3.69	Peak
6	497.540	23.39	16.50	2.29	0.00	42.18	46.00	-3.82	Peak

7.7. CO-LOCATED RADIATED EMISSIONS

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.

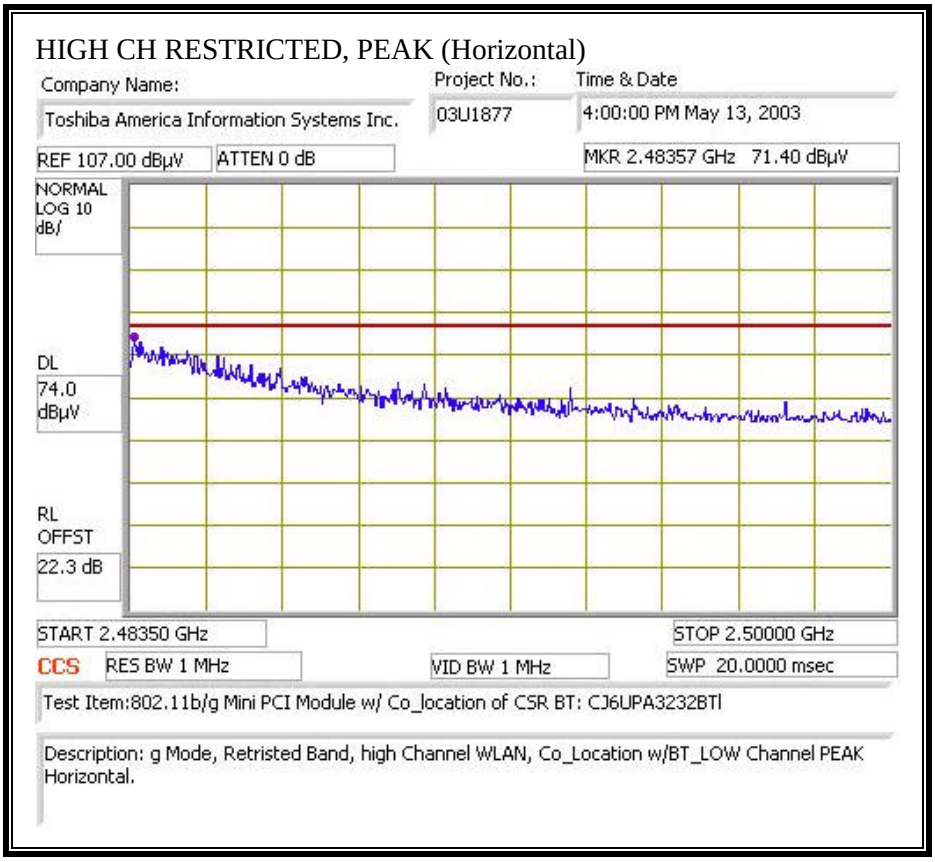
The dominant transmitter (WLAN) is set to the worst case (high) channel. The spurious emissions performance of the dominant transmitter is investigated as the non-dominant transmitter is tuned to its low, middle, and high channels.

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.

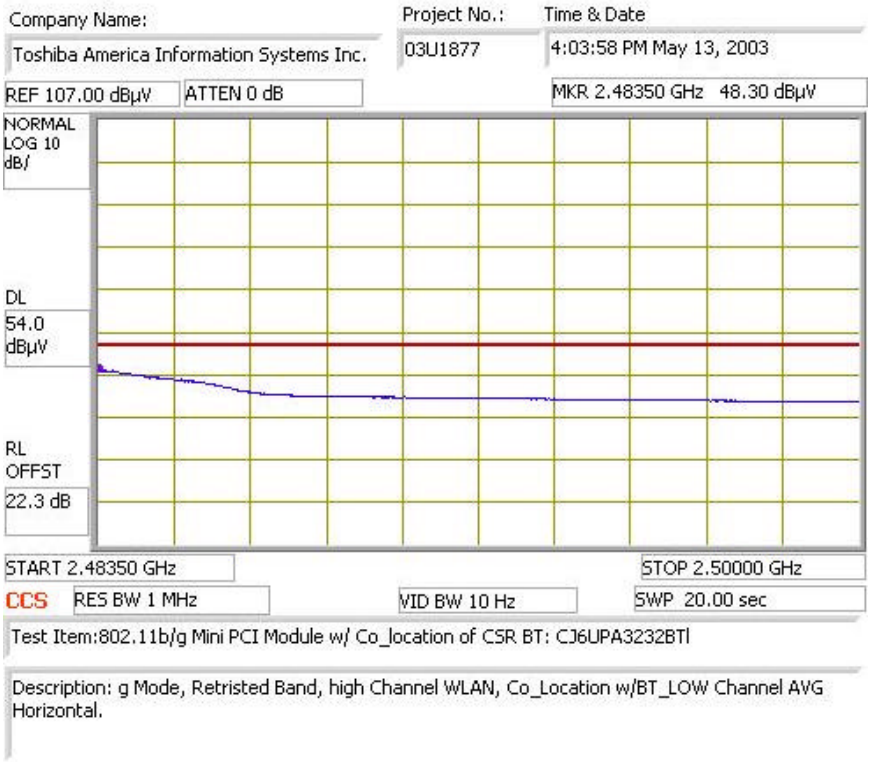
RESULTS

No non-compliance noted:

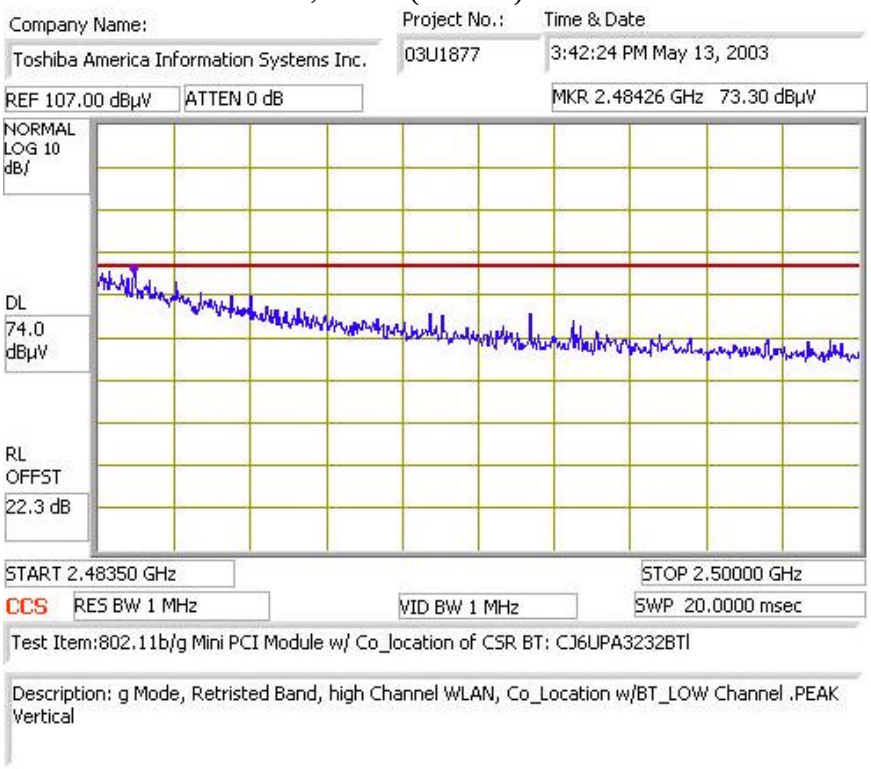
WORST-CASE RESTRICTED BANDEDGE (WITH BLUETOOTH AT LOW CHANNEL)

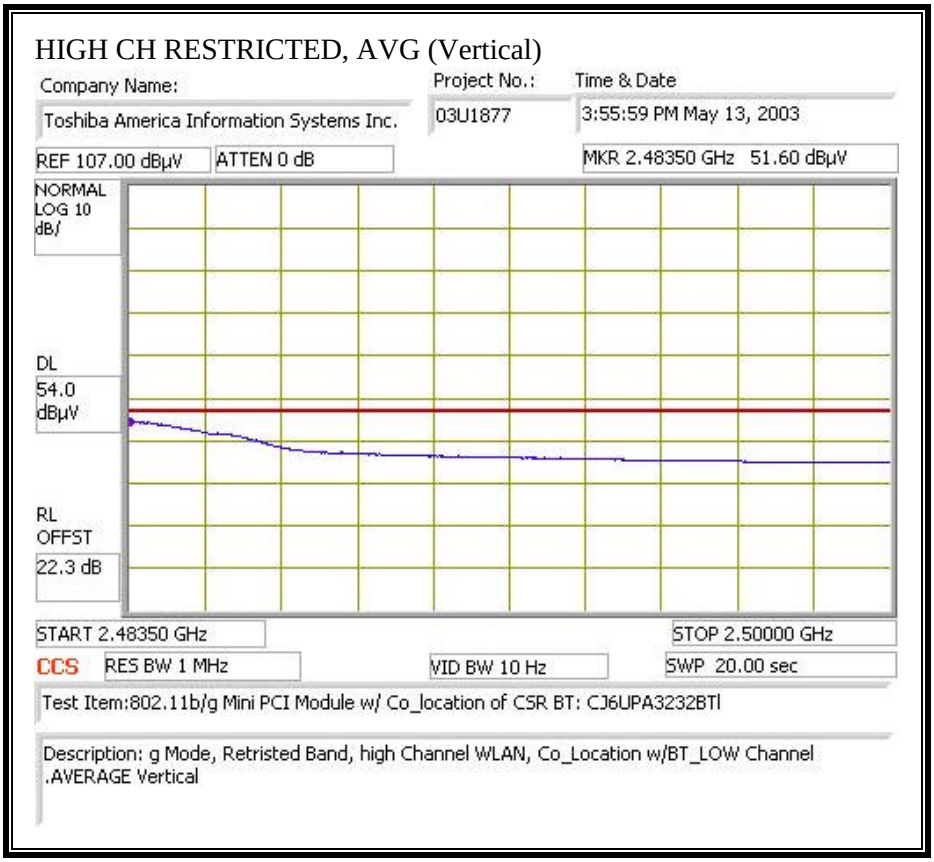


HIGH CH RESTRICTED, AVG (Horizontal)

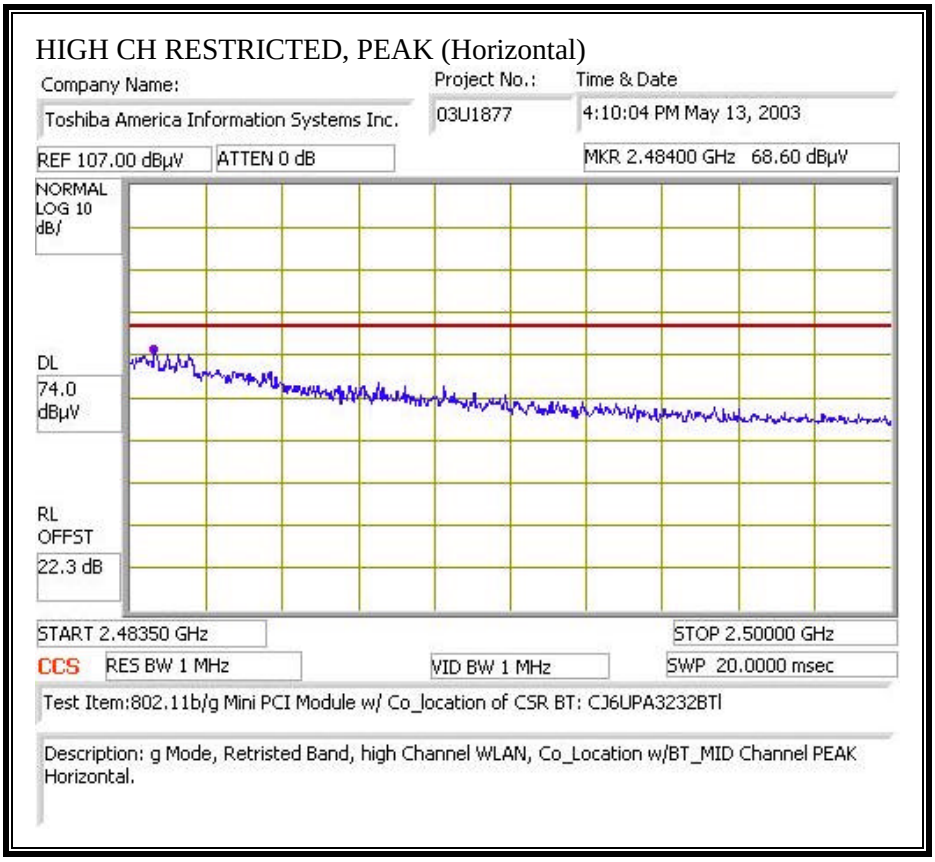


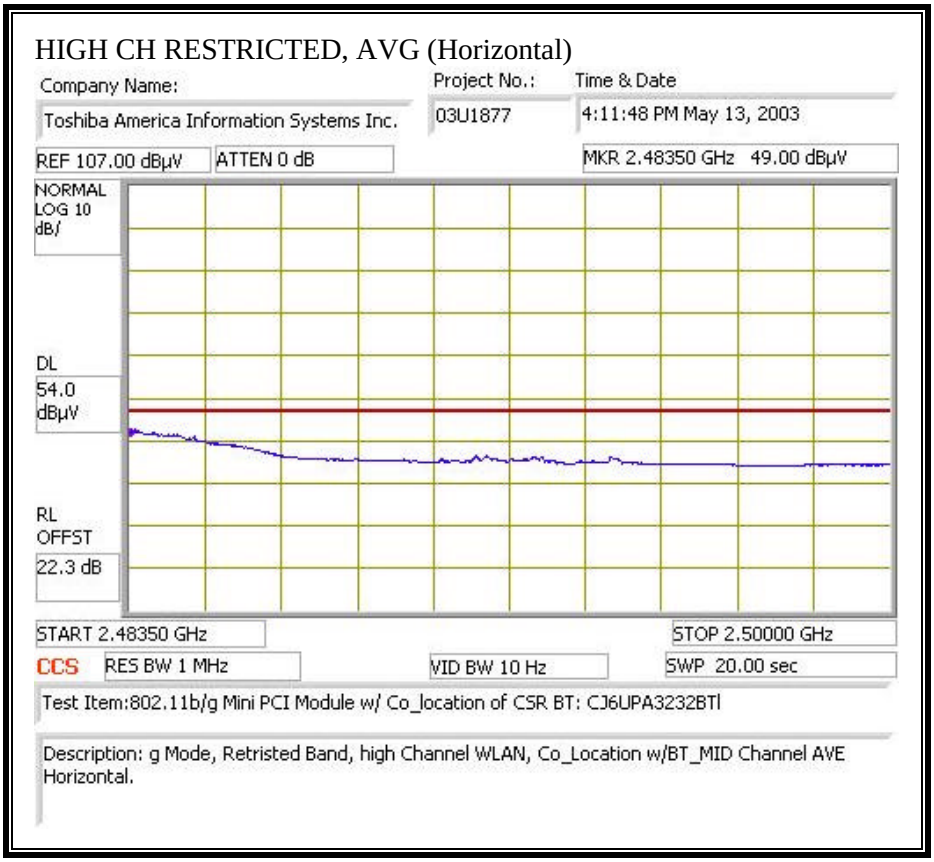
HIGH CH RESTRICTED, PEAK (Vertical)

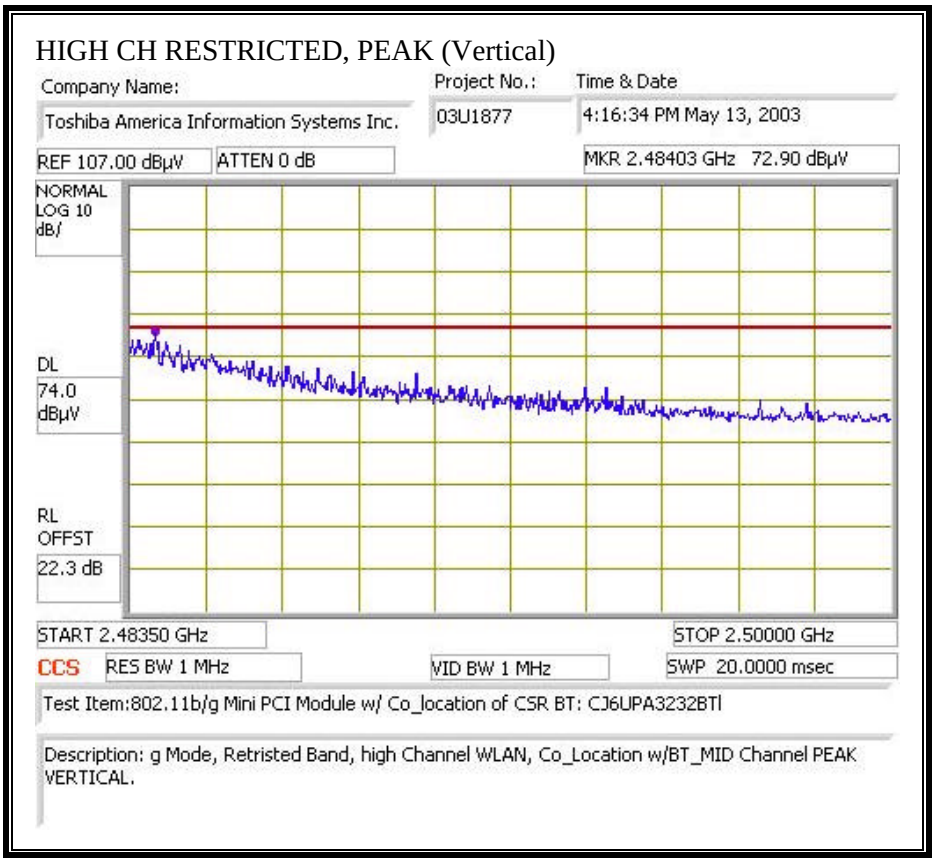


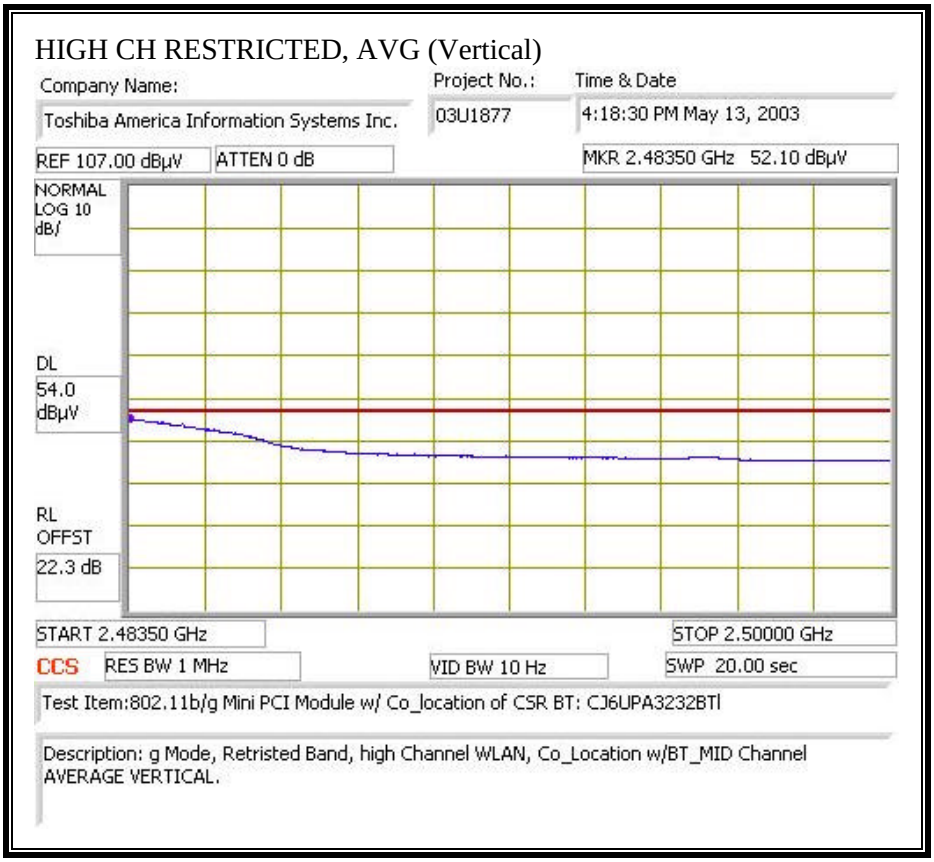


WORST-CASE RESTRICTED BANDEDGE (WITH BLUETOOTH AT MID CHANNEL)

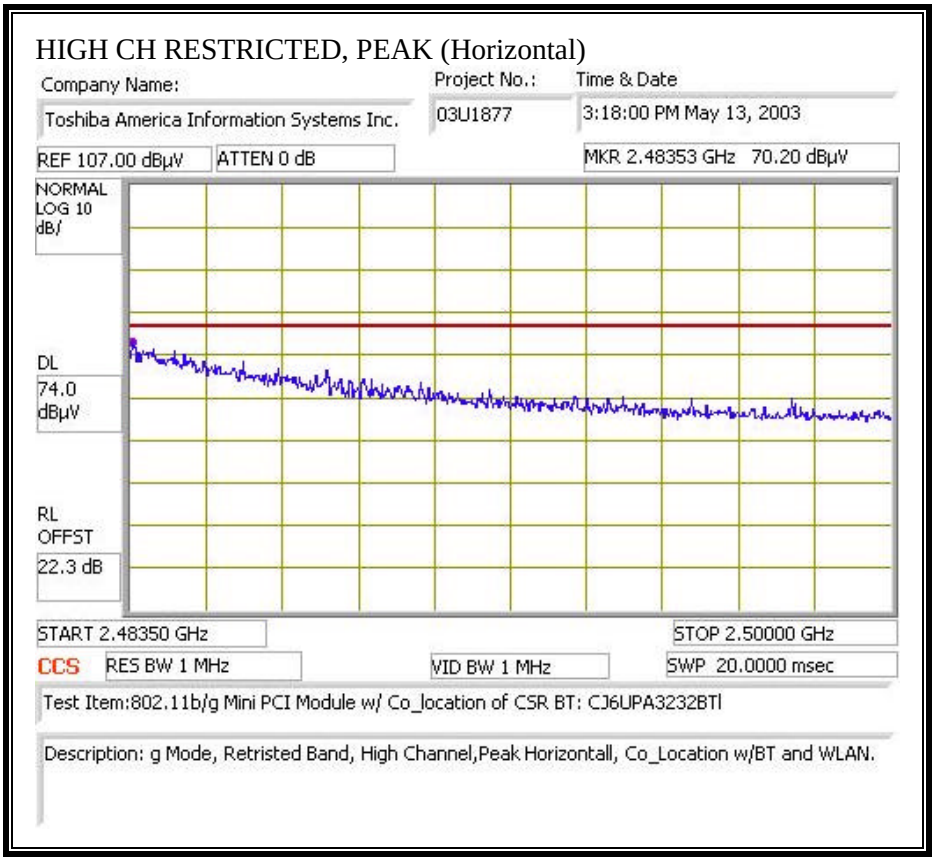




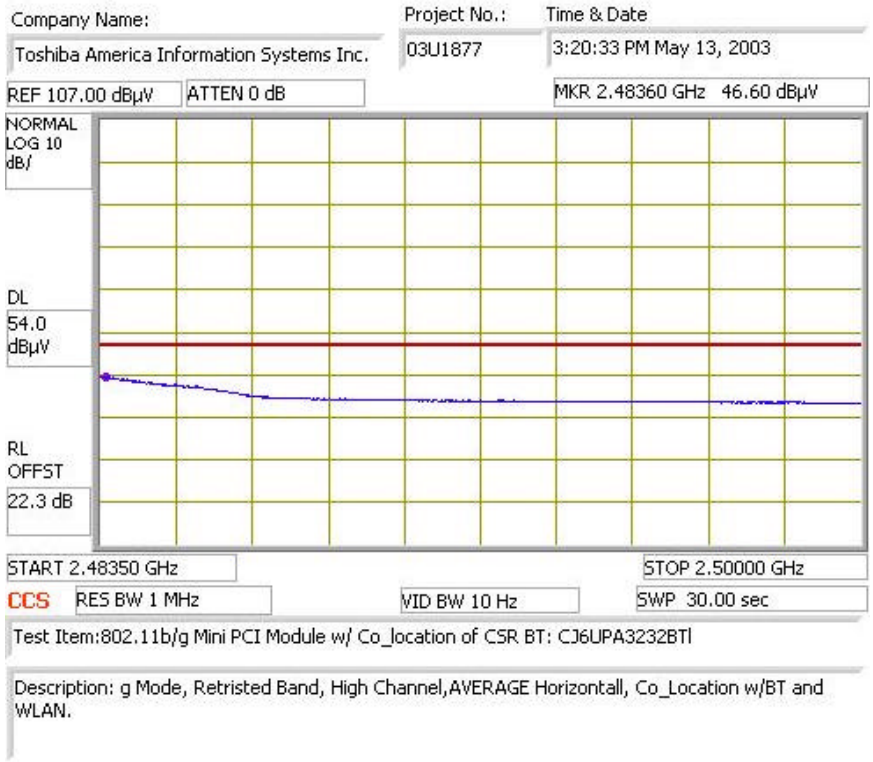


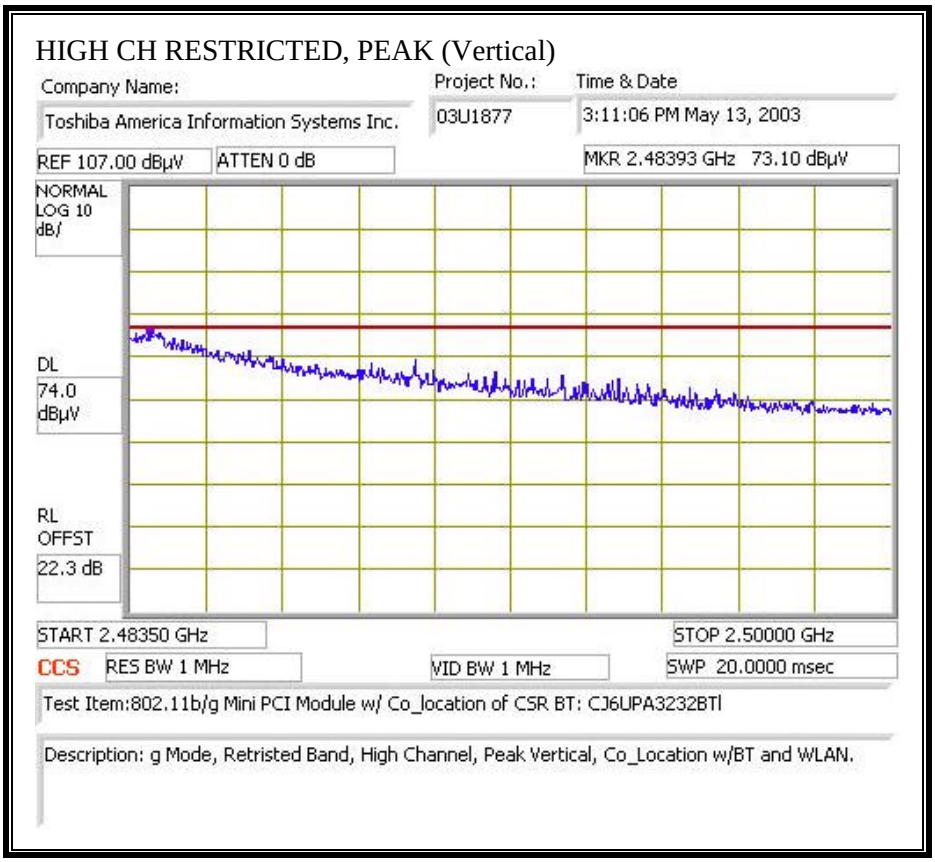


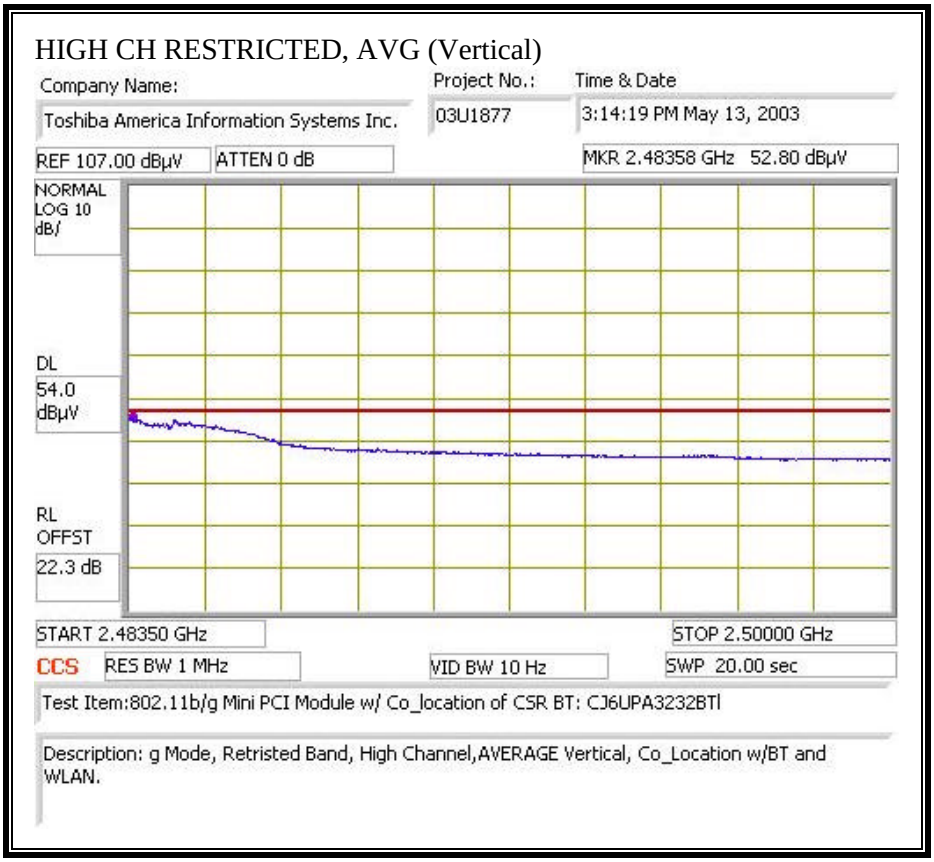
WORST-CASE RESTRICTED BANDEDGE (WITH BLUETOOTH AT HIGH CHANNEL)



HIGH CH RESTRICTED, AVG (Horizontal)







WORST-CASE HARMONICS AND SPURIOUS EMISSIONS

05/15/03 **High Frequency Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr:Thanh Test Target:FCC 15.247, IC, DGT.
Project #: 03U1877
Company: TOSHIBA AMERICA INFORMATION SYSTEMS, INC.
EUT Descrip.: 802.11b/g Mini PCI Module with Co_Location of CSR BT: CJ6UPA3232BT.
EUT M/N: PA3299U-1MPC (FCC ID: CJ6UPA3299WL)

Mode Oper: TX

Test Equipment:

EMCO Horn 1-18GHz	Pre-amplifer 1-26GHz	Spectrum Analyzer	Horn > 18GHz
T72; S/N: 6739 @1m	T87 Miteq 924342	HP 8566B 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
WLAN Hi with BT low, Mid, High.															
4.924	9.8	49.5	37.8	34.1	2.5	-44.8	0.0	1.0	42.3	30.6	74.0	54.0	-31.7	-23.4	Noise Floor/V
4.924	9.8	50.5	37.8	34.1	2.5	-44.8	0.0	1.0	43.3	30.6	74.0	54.0	-30.7	-23.4	Noise Floor/H
No more spurious Emissions above noise floor up to 10th Harmonic,Test BT High, Mid and Low															

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		

7.8. 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 µH/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:

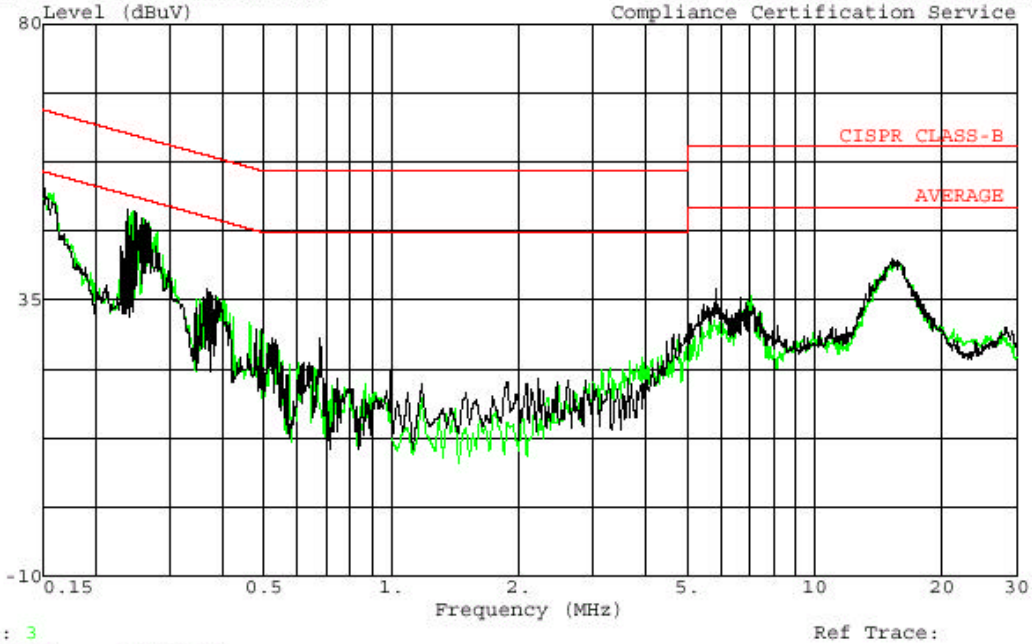
6 WORST EMISSIONS

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
0.16	52.38	--	--	0.00	65.83	55.83	-13.45	-3.45	L1
0.25	49.56	--	--	0.00	63.26	53.26	-13.70	-3.70	L1
15.80	41.04	--	--	0.00	60.00	50.00	-18.96	-8.96	L1
0.15	55.60	--	--	0.00	65.97	55.97	-10.37	-0.37	L2
0.25	49.56	--	--	0.00	63.23	53.23	-13.67	-3.67	L2
15.31	41.74	--	--	0.00	60.00	50.00	-18.26	-8.26	L2
6 Worst Data									

LINE 1 AND LINE 2 (LINE AND NEUTRAL) RESULTS

COMPLIANCE Engineering Services, Inc.
561F Monterey Road,
San Jose, CA 95037 USA
Tel: (408) 463-0885
Fax: (408) 463-0888

Data#: 7 File#: 03U1877.EMI Date: 05-13-2003 Time: 10:39:46



Trace: 3 Ref Trace:
Project # : 03U1877
Test Engineer : Thanh Nguyen
Company : TOSHIBA AMERICA INFORMATION SYSTEMS, INC
EUT : 802.11b/g Mini PCI Module
Model : PA3299U-1MPC (FCC ID: CJ6UPA3299WL)
Configuration : EUT , LapTop
Target of Test: FCC Class B
: Peak Line 1(Green), Line 2 (Black)
: 115Vac, 60Hz