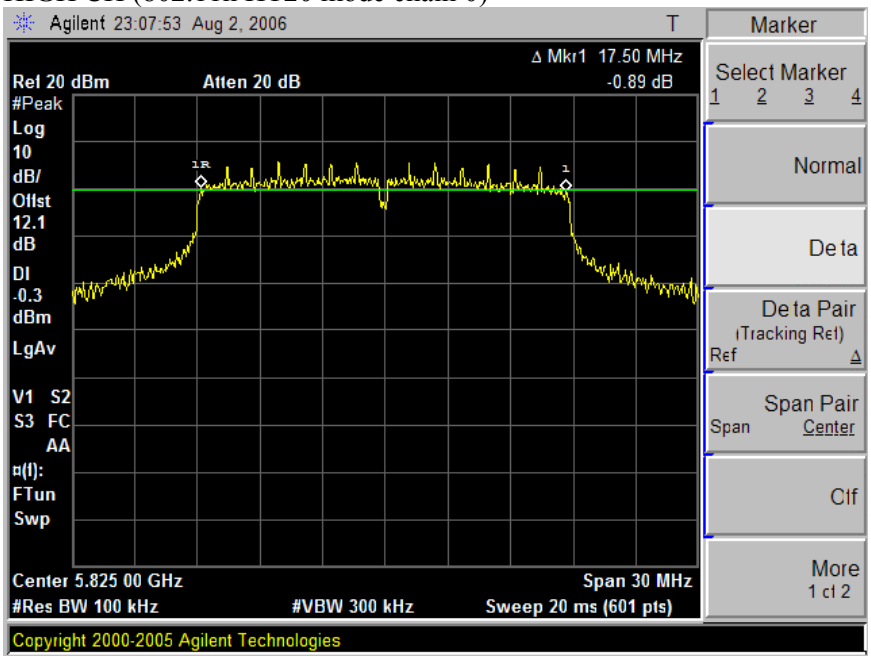
HIGH CH (802.11n HT20 mode chain 0)



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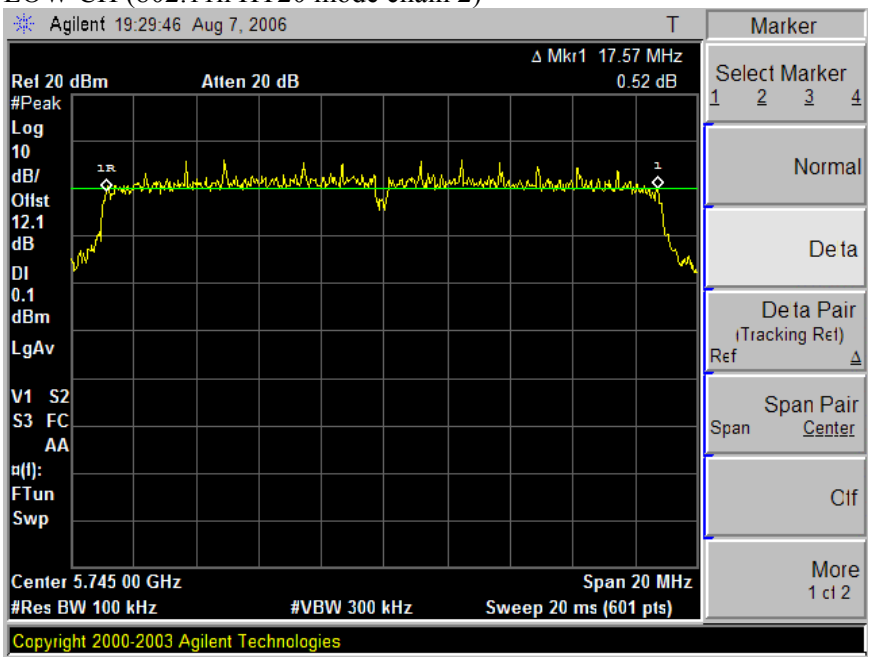
(802.11 HT20 MODE CHAIN 2)

LOW CH (802.11n HT20 mode chain 2)



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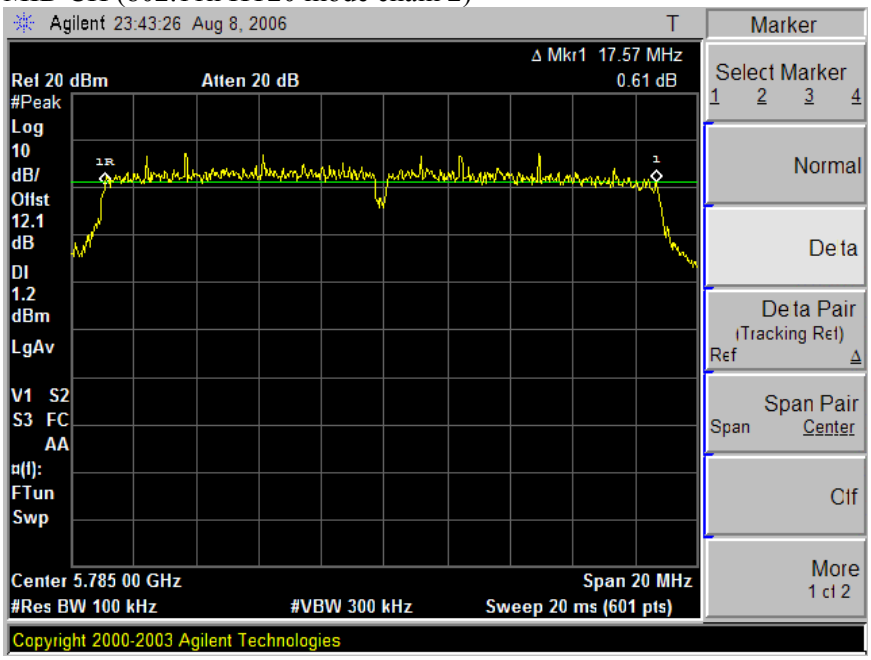
MID CH (802.11n HT20 mode chain 2)



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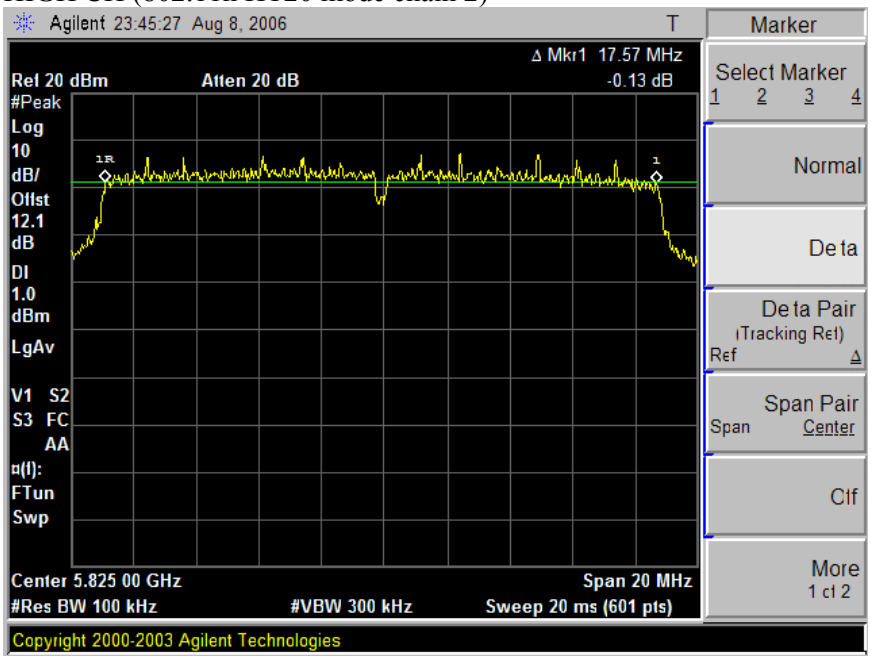
HIGH CH (802.11n HT20 mode chain 2)



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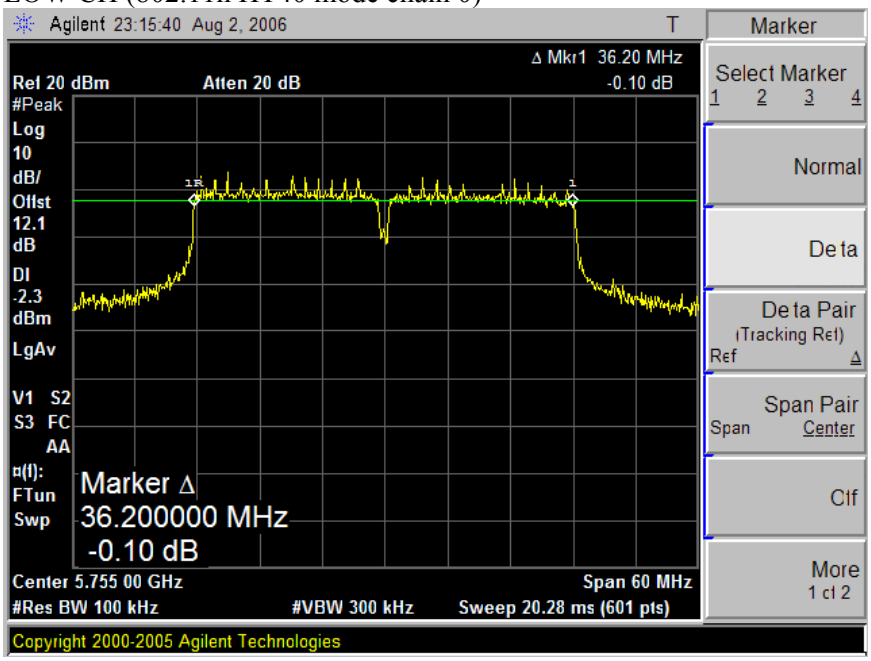
(802.11 HT40 MODE CHAIN 0)

LOW CH (802.11n HT40 mode chain 0)



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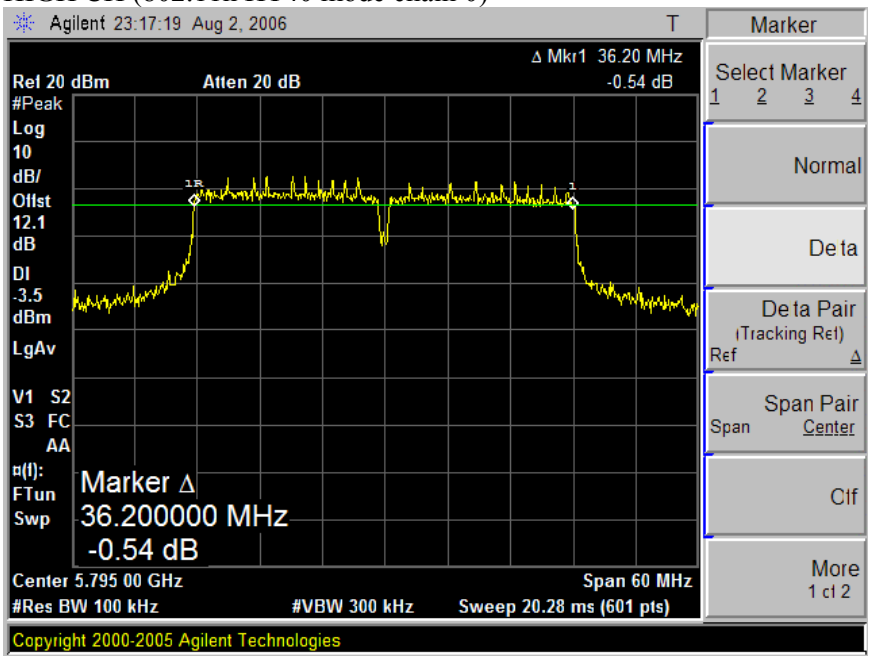
HIGH CH (802.11n HT40 mode chain 0)



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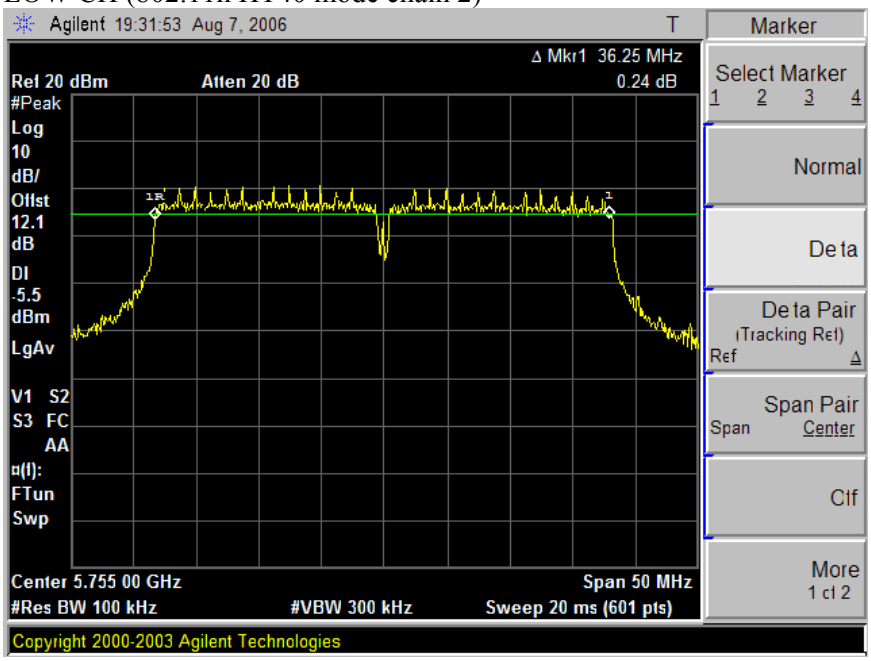
(802.11 HT40 MODE CHAIN 2)

LOW CH (802.11n HT40 mode chain 2)



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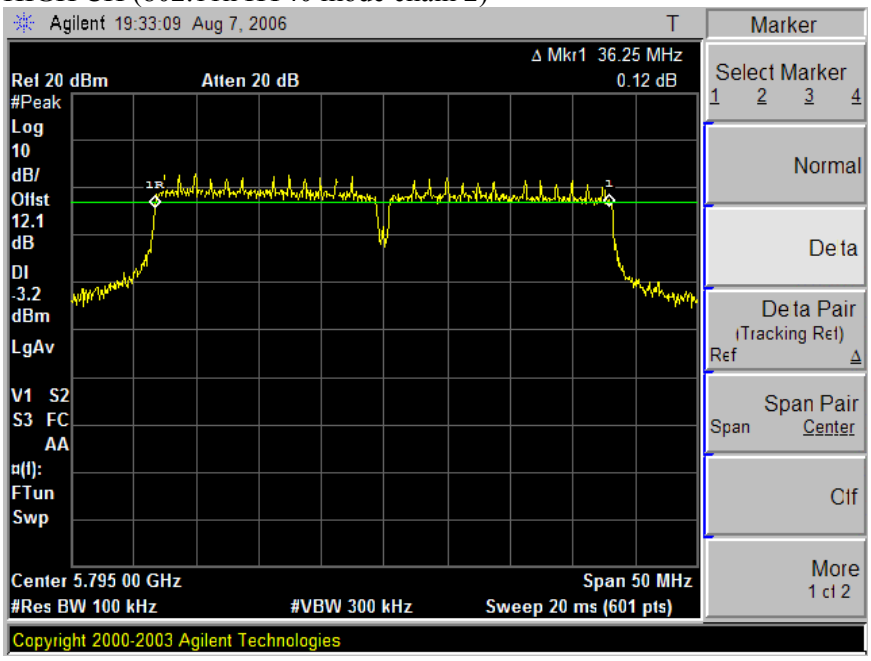
HIGH CH (802.11n HT40 mode chain 2)



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7.2.2. 99% BANDWIDTH AND 26 dB BANDWIDTH

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth and 26 dB bandwidth functions are utilized.

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RESULTS

No non-compliance noted:

Mode Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 2 (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 2 (MHz)
802.11a Mode					
Low	5745	16.477	16.519	21.926	21.98
Middle	5785	16.5979	16.6877	21.508	21.82
High	5825	16.6357	16.6125	21.457	21.85
802.11n HT20 Mode					
Low	5745	17.4792	17.776	21.37	21.85
Mid	5785	17.686	17.6889	21.935	21.90
High	5825	17.8395	17.7358	21.902	21.87
802.11n HT40 Mode					
Low	5755	36.2952	36.3789	47.622	45.48
High	5795	36.6087	36.0145	45.965	47.32

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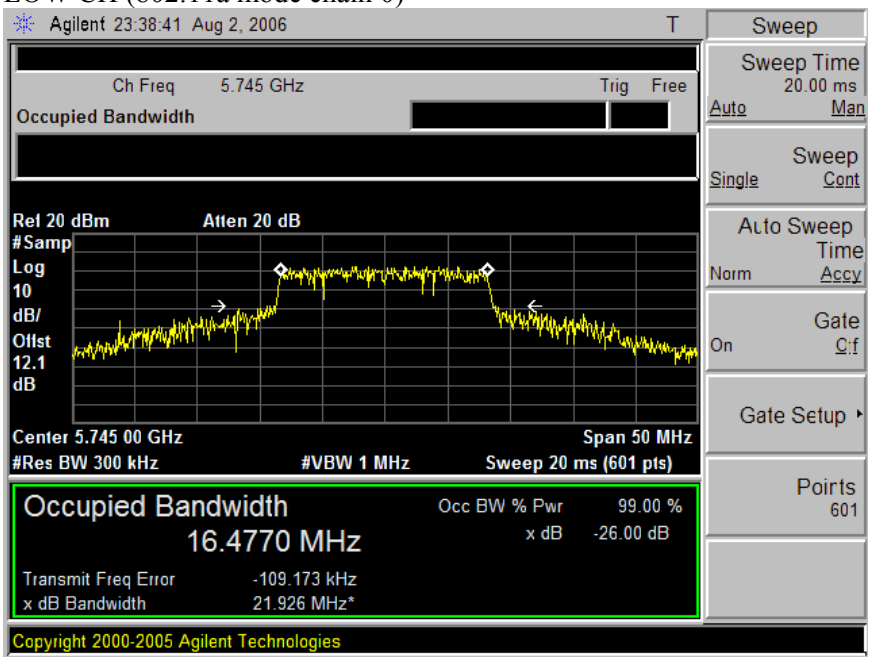
(802.11a MODE CHAIN 0)

LOW CH (802.11a mode chain 0)



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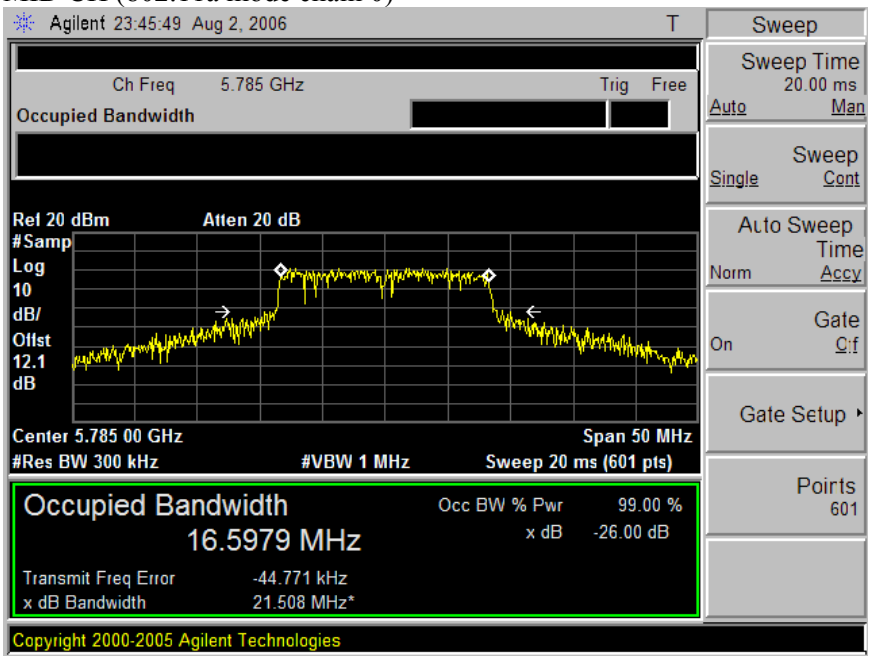
MID CH (802.11a mode chain 0)



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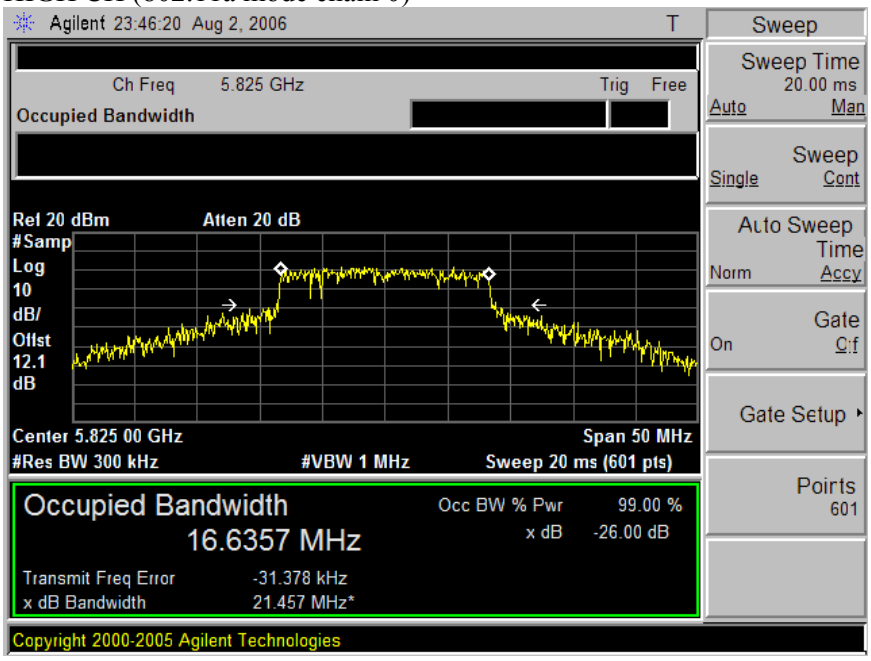
HIGH CH (802.11a mode chain 0)



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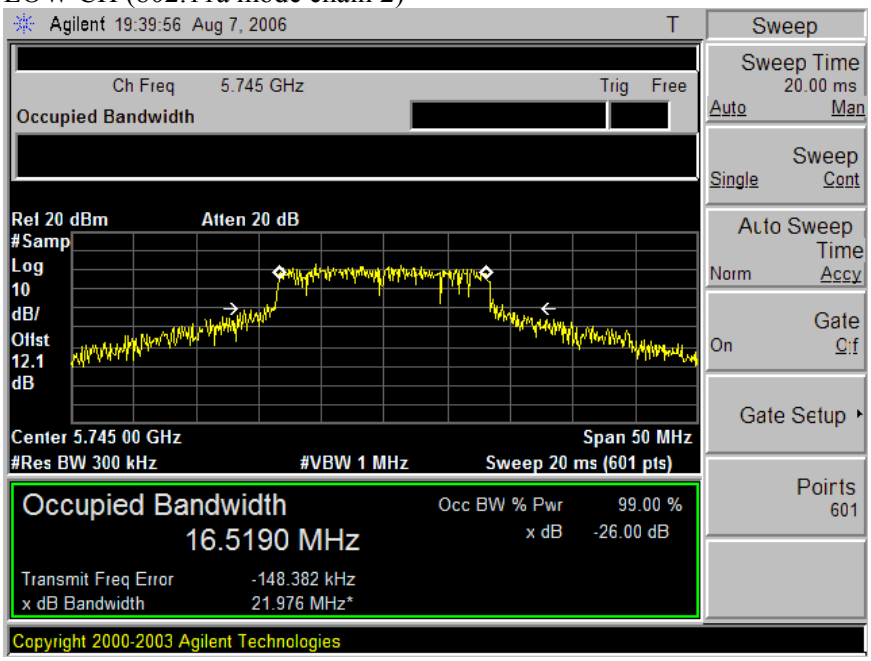
(802.11a MODE CHAIN 2)

LOW CH (802.11a mode chain 2)



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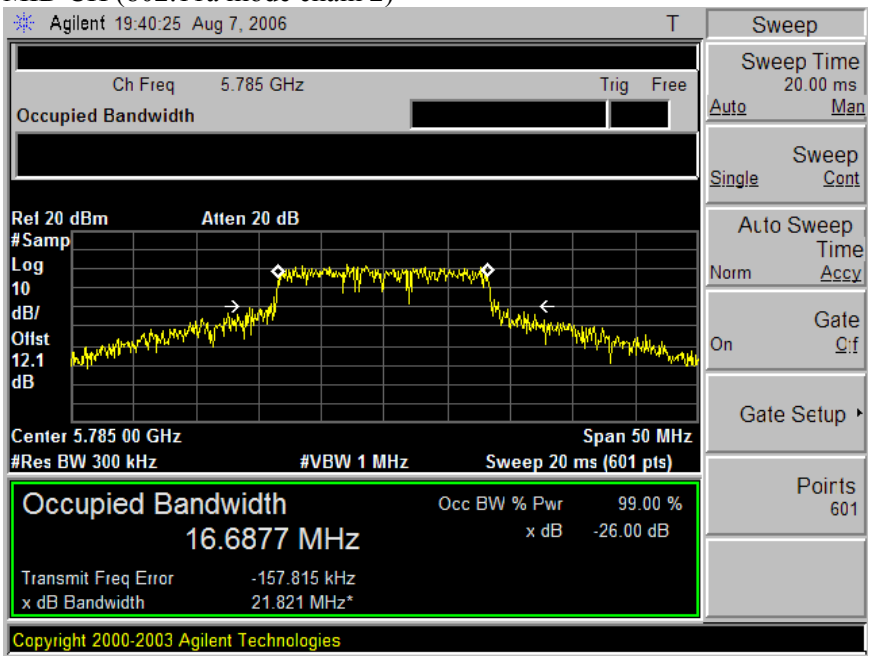
MID CH (802.11a mode chain 2)



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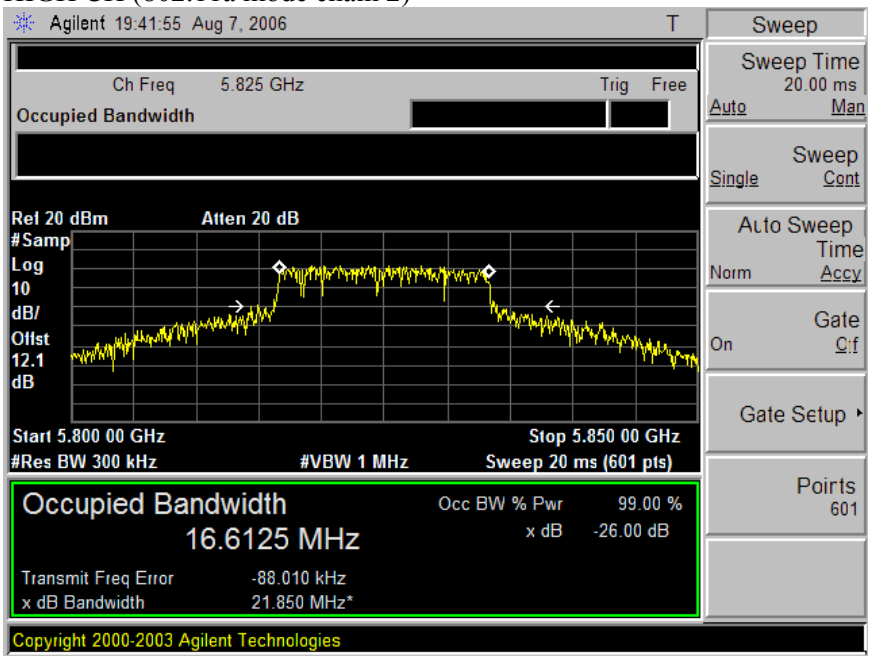
HIGH CH (802.11a mode chain 2)



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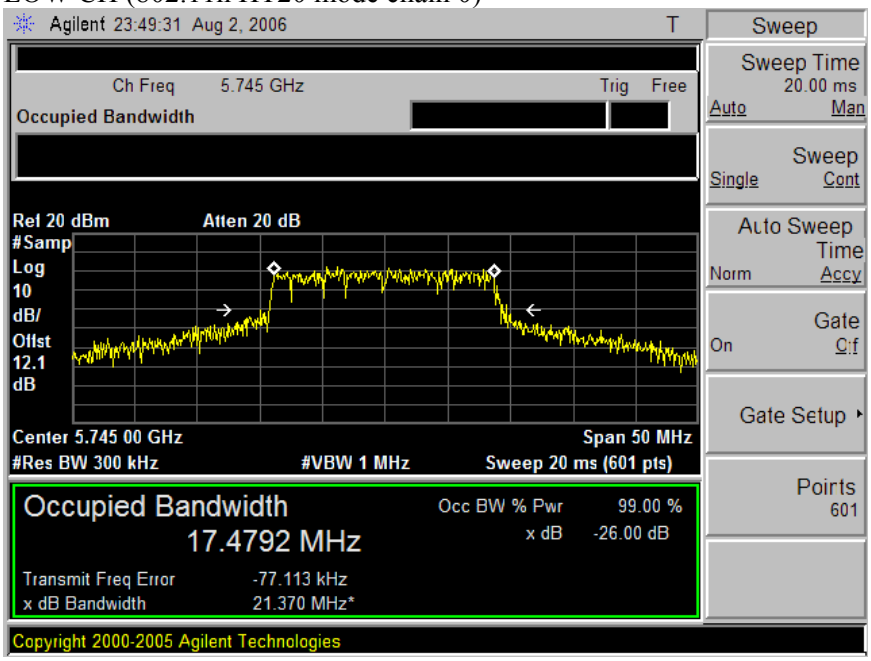
(802.11n HT20 MODE CHAIN 0)

LOW CH (802.11n HT20 mode chain 0)



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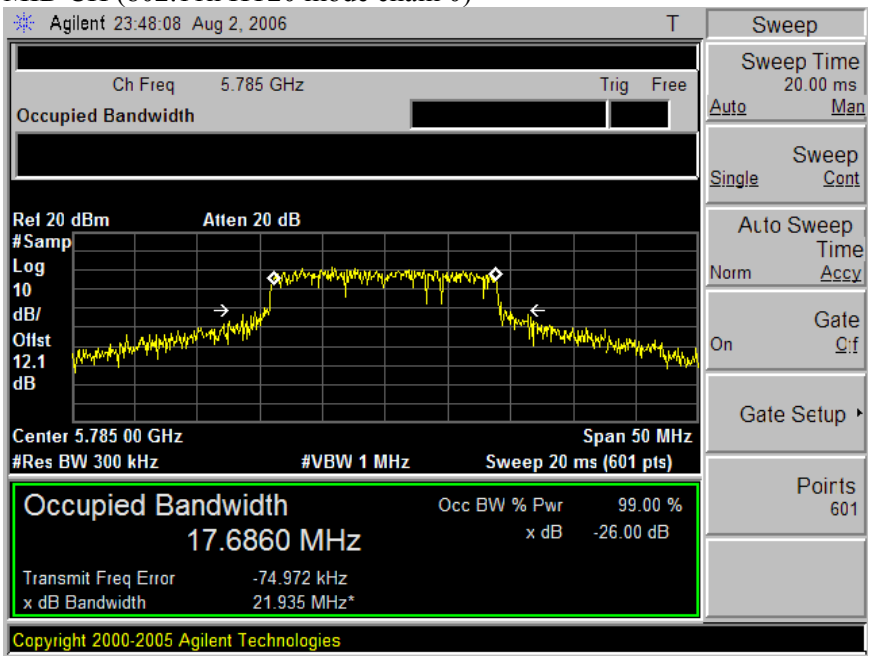
MID CH (802.11n HT20 mode chain 0)



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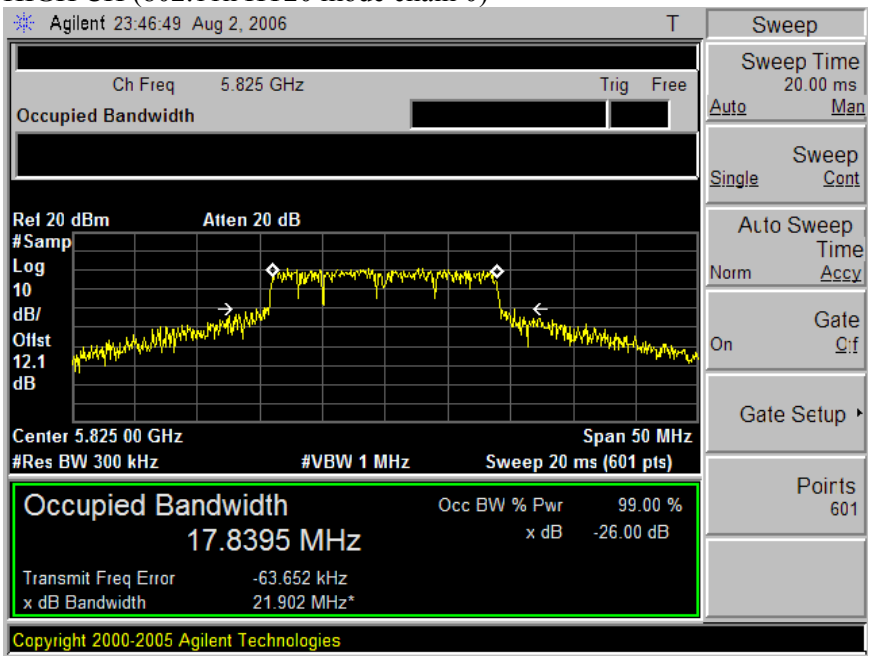
HIGH CH (802.11n HT20 mode chain 0)



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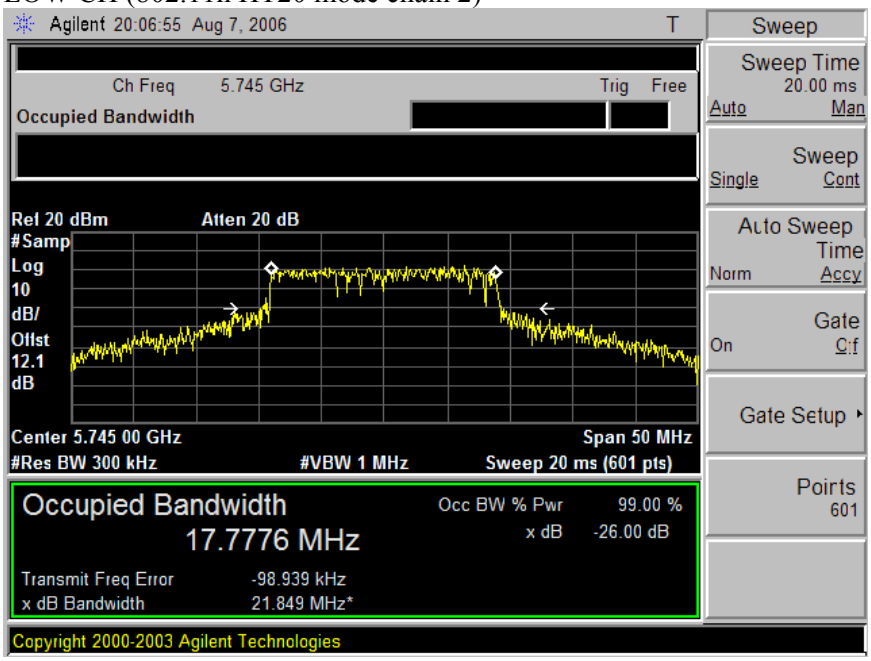
(802.11 HT20 MODE CHAIN 2)

LOW CH (802.11n HT20 mode chain 2)



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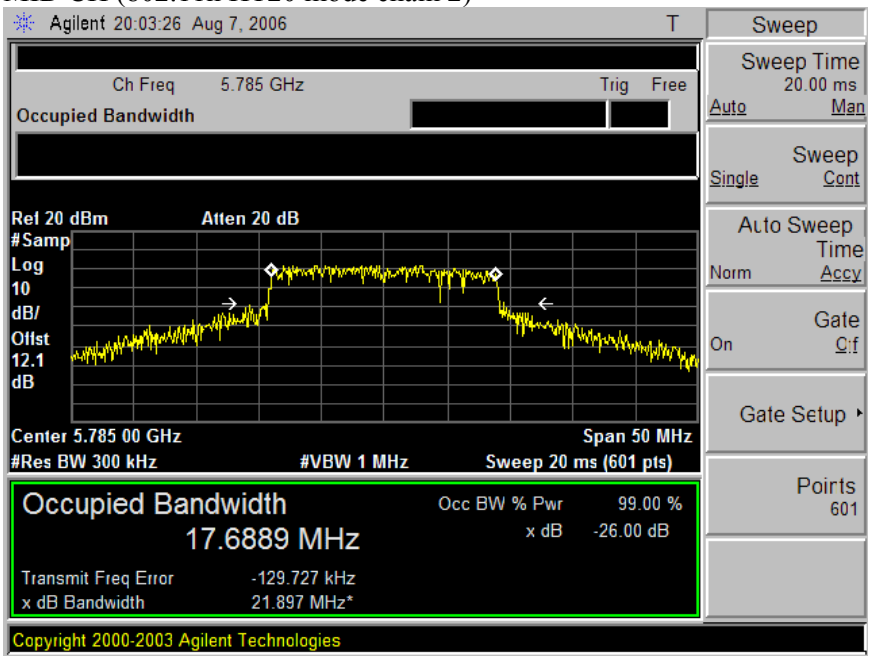
MID CH (802.11n HT20 mode chain 2)



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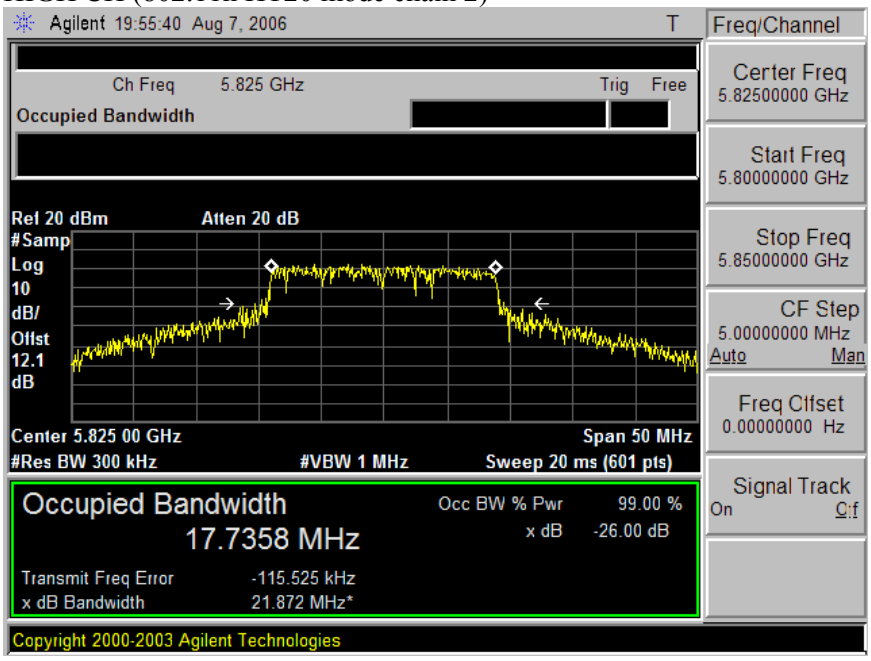
HIGH CH (802.11n HT20 mode chain 2)



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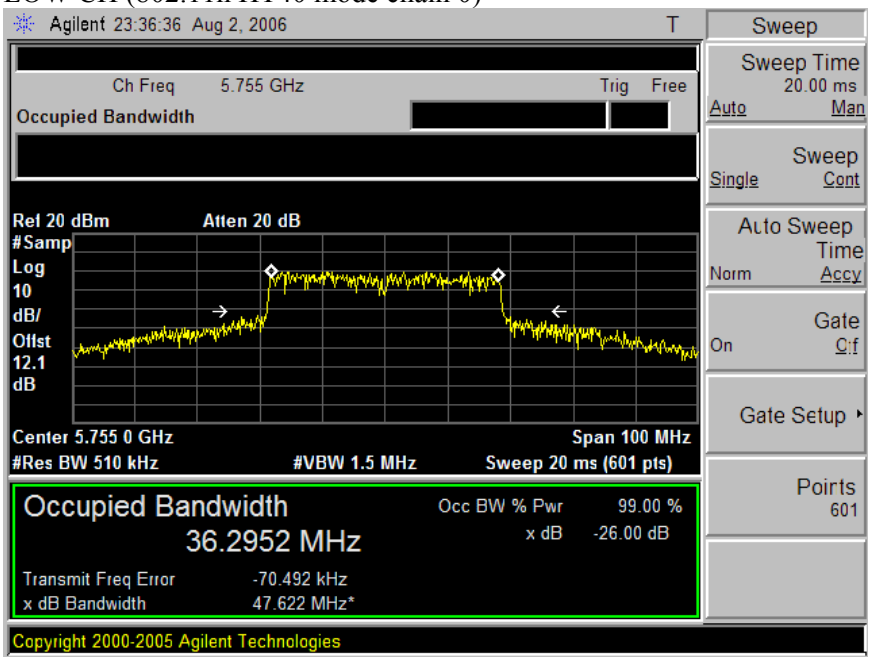
(802.11 HT40 MODE CHAIN 0)

LOW CH (802.11n HT40 mode chain 0)



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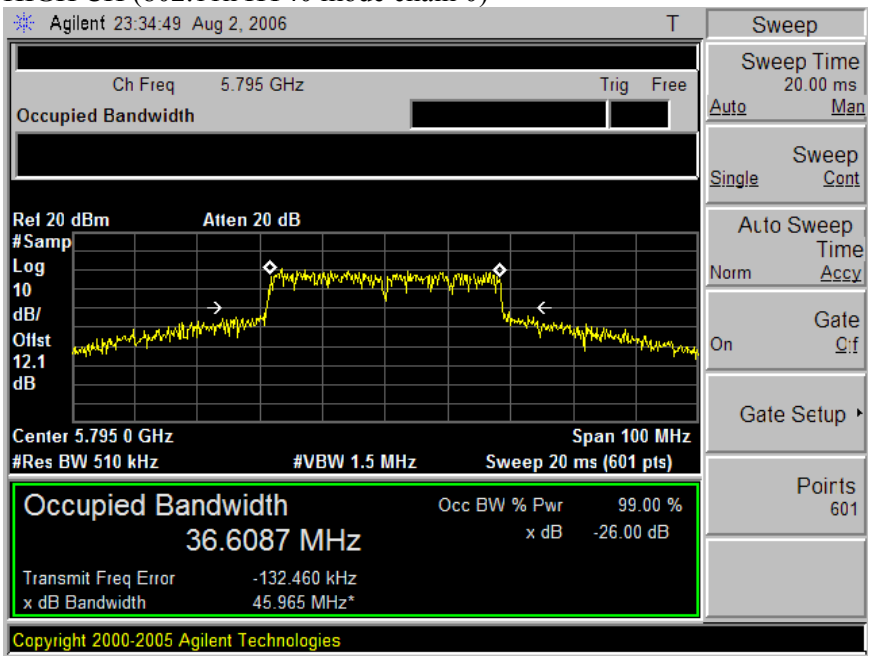
HIGH CH (802.11n HT40 mode chain 0)



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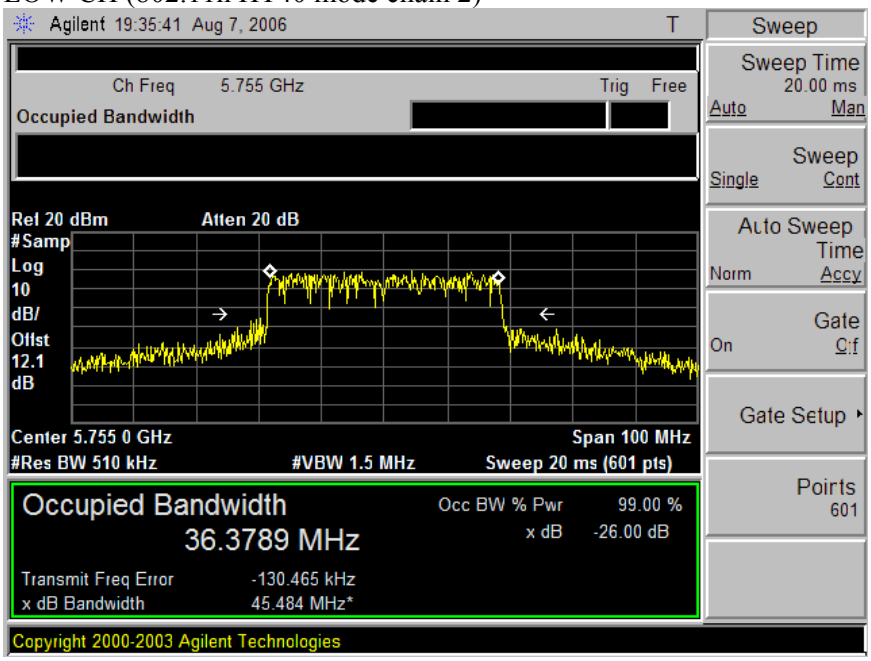
(802.11 HT40 MODE CHAIN 2)

LOW CH (802.11n HT40 mode chain 2)



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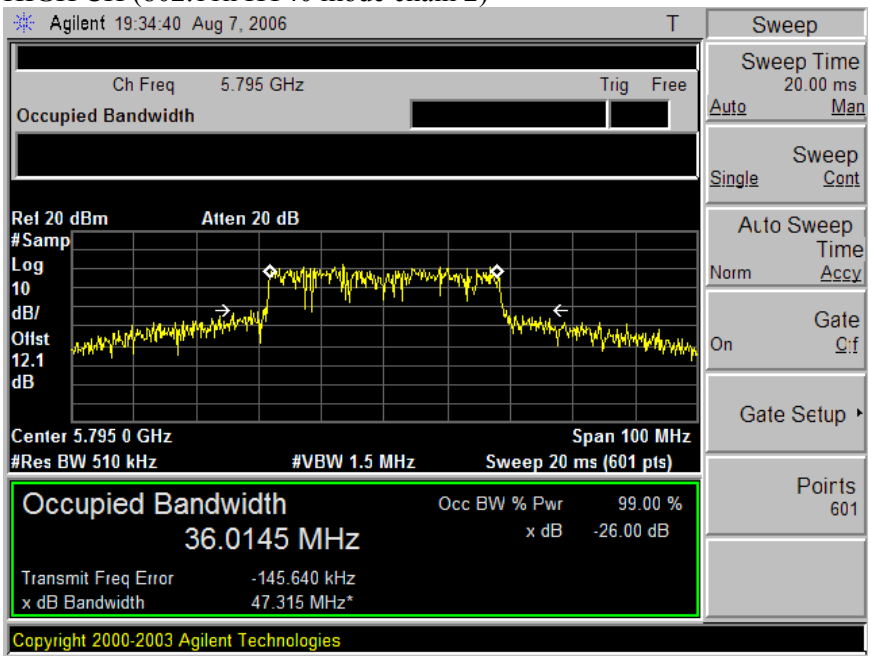
HIGH CH (802.11n HT40 mode chain 2)



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7.2.3. MAXIMUM OUTPUT POWER

LIMIT

§15.247 (b) The maximum peak output power of the intentional radiator shall not exceed the following:

§15.247 (b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz , and 5725-5850 MHz bands: 1 watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The test is performed in accordance with Option 2 procedures in FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005. The transmitter operates continuously therefore Method # 1 is used.

Each chain is measured separately and the total power is calculated using:

Total Power = 10 log (10^ (Chain 0 Power / 10) + 10^ (Chain 2 Power / 10))

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RESULTS

No non-compliance noted:

Fixed Limit (dBm)	17
Antenna Gain (dBi)	1.5
10 Log (# Tx Chains)	3.01
Effective Legacy Gain	4.51

Mode Channel	Frequency (MHz)	Max Power Chain 0 (dBm)	Max Power Chain 2 (dBm)	Max Power Total (dBm)	Limit (dBm)	Margin (dB)
802.11a Mode						
Low	5745	17.44	17.75	20.61	30.00	-9.39
Middle	5785	17.47	18.04	20.77	30.00	-9.23
High	5825	17.53	18.19	20.88	30.00	-9.12
802.11n HT20 Mode						
Low	5745	16.94	17.62	20.30	30.00	-9.70
Mid	5785	16.74	17.52	20.16	30.00	-9.84
High	5825	17.05	17.86	20.48	30.00	-9.52
802.11n HT40 Mode						
Low	5755	14.82	15.57	18.22	30.00	-11.78
High	5795	16.71	18.00	20.41	30.00	-9.59

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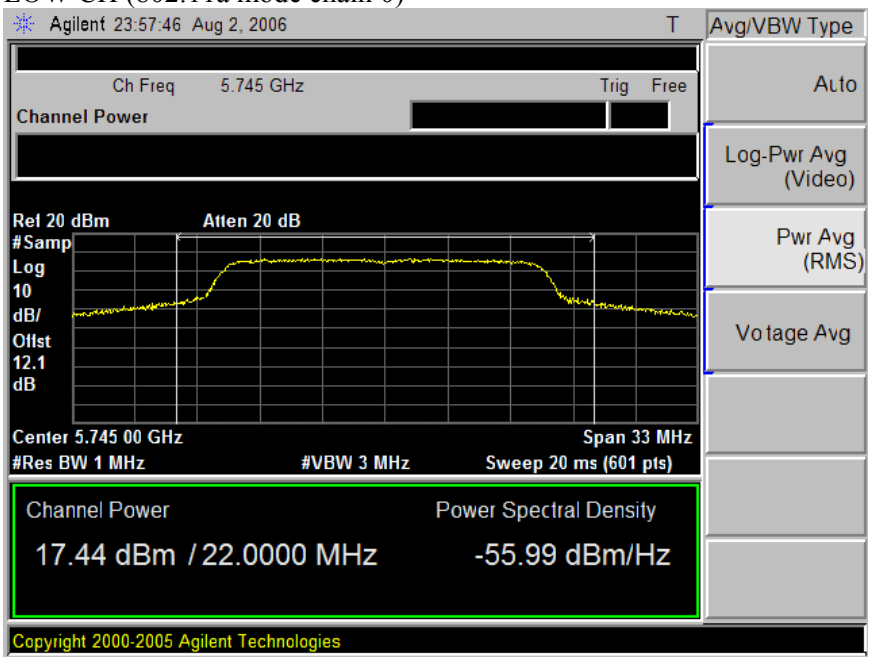
(802.11a MODE CHAIN 0)

LOW CH (802.11a mode chain 0)



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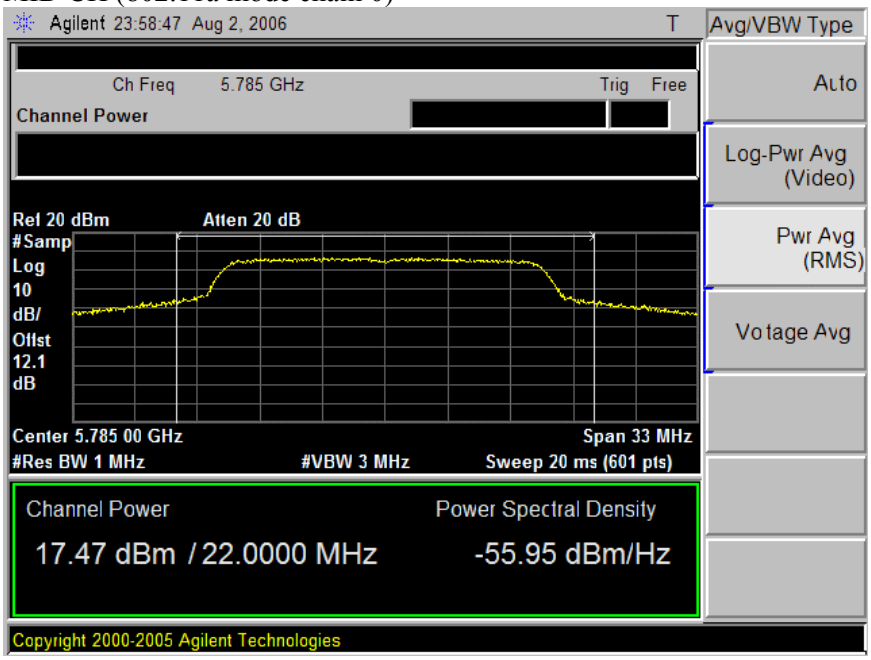
MID CH (802.11a mode chain 0)



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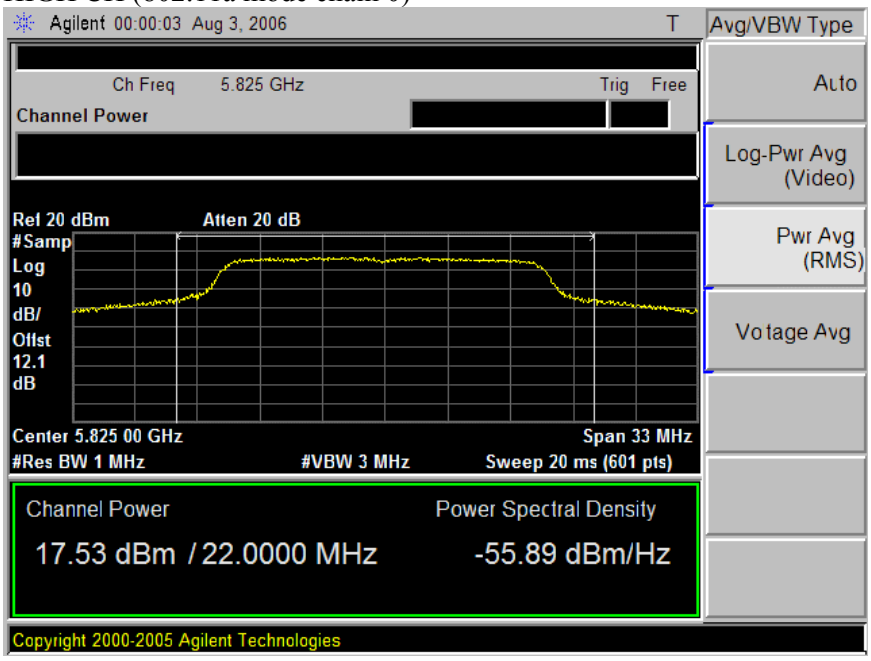
HIGH CH (802.11a mode chain 0)



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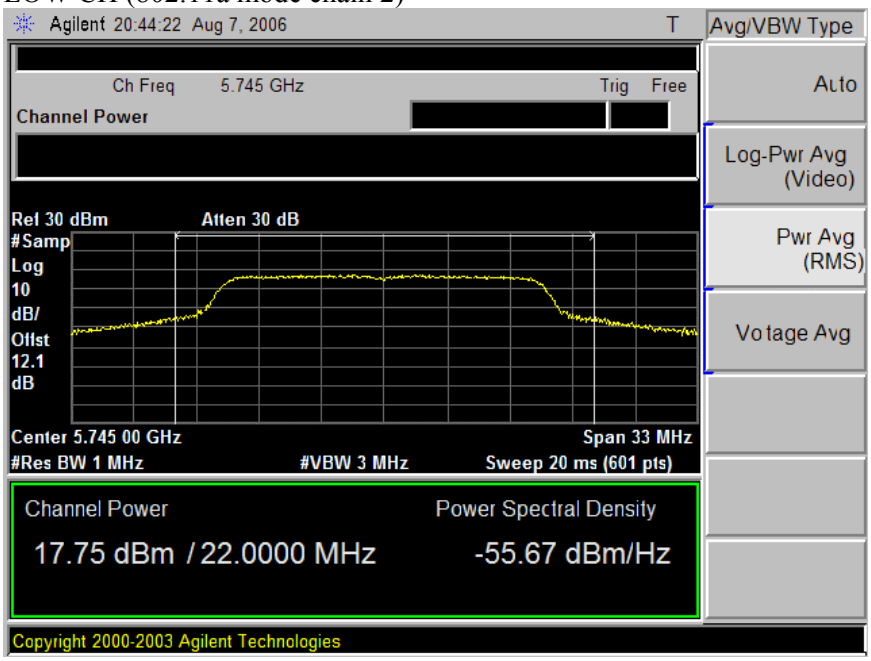
(802.11a MODE CHAIN 2)

LOW CH (802.11a mode chain 2)



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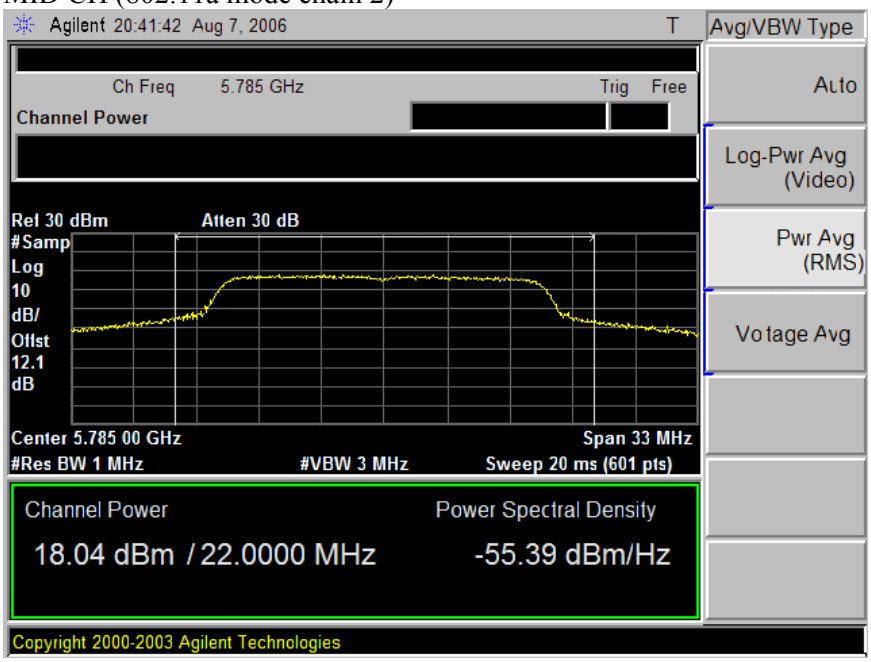
MID CH (802.11a mode chain 2)



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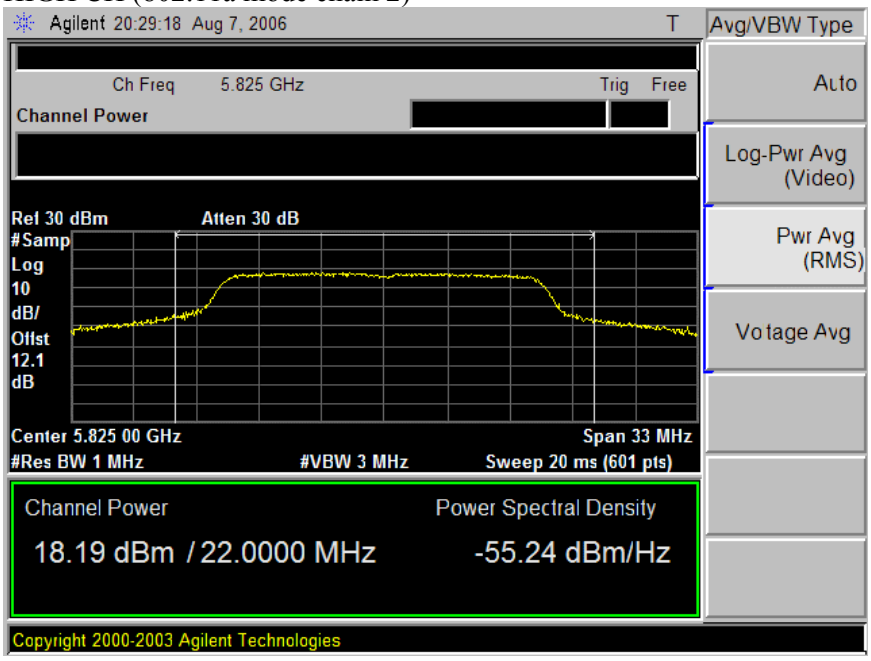
HIGH CH (802.11a mode chain 2)



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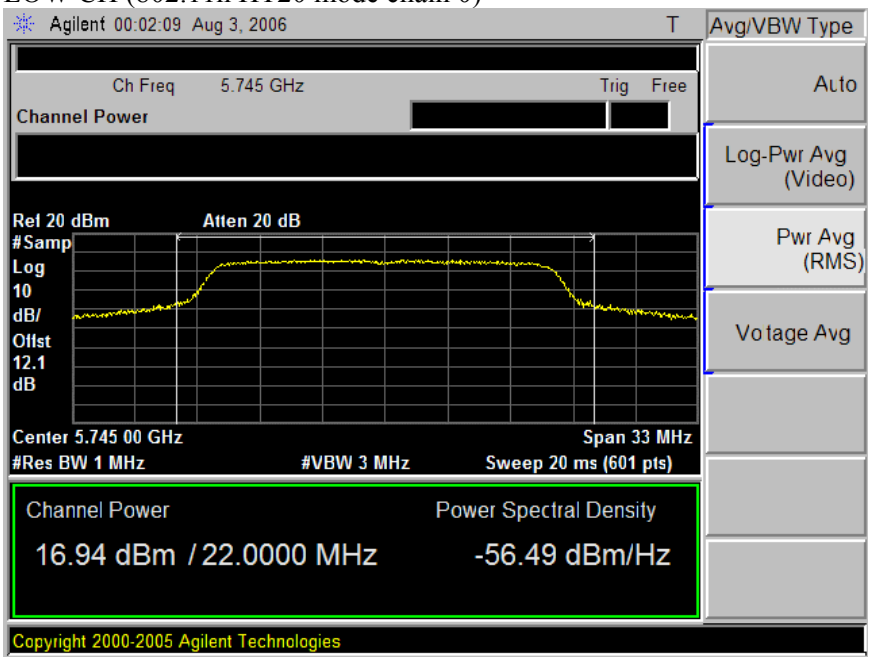
(802.11n HT20 MODE CHAIN 0)

LOW CH (802.11n HT20 mode chain 0)



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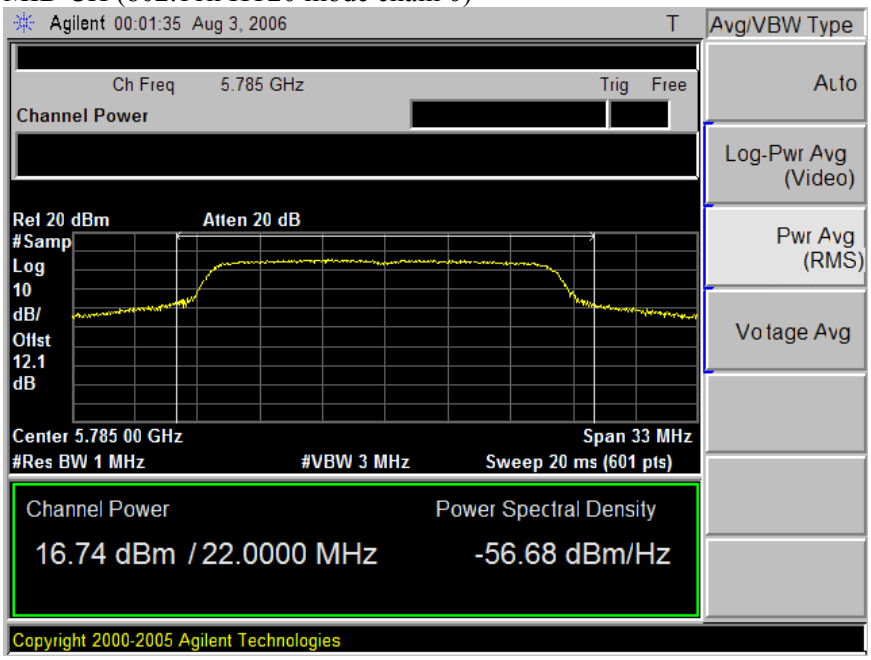
MID CH (802.11n HT20 mode chain 0)



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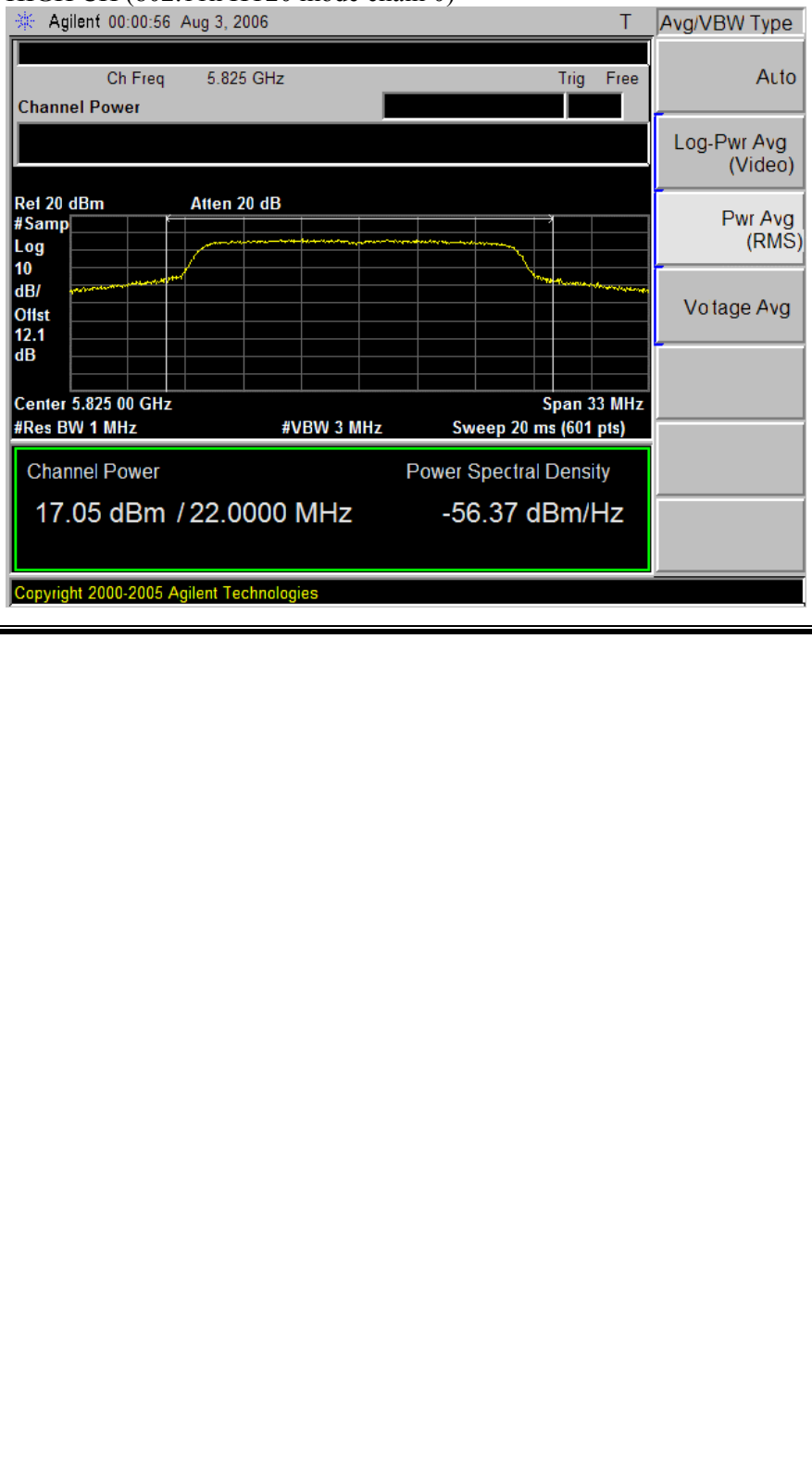
HIGH CH (802.11n HT20 mode chain 0)



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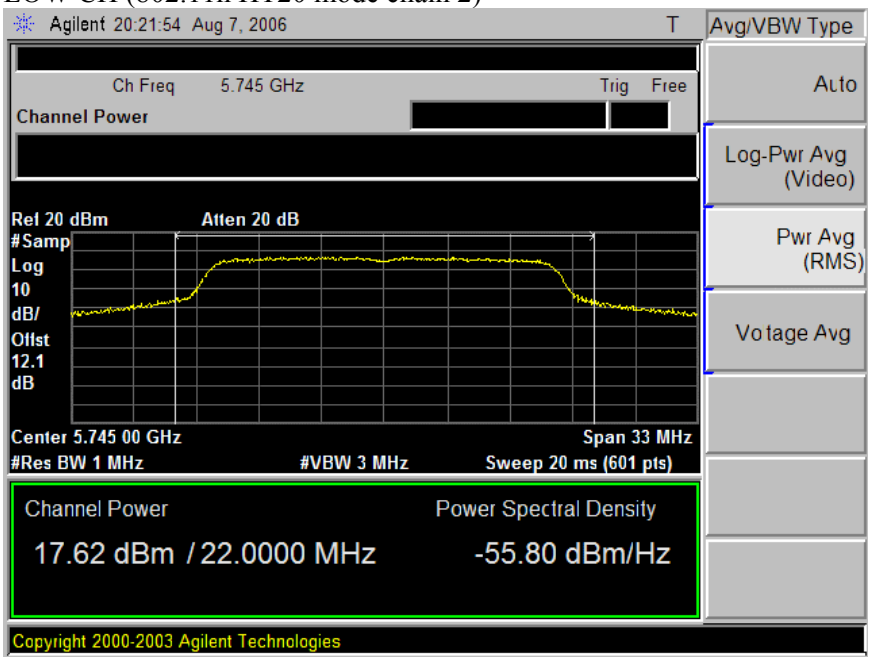
(802.11 HT20 MODE CHAIN 2)

LOW CH (802.11n HT20 mode chain 2)



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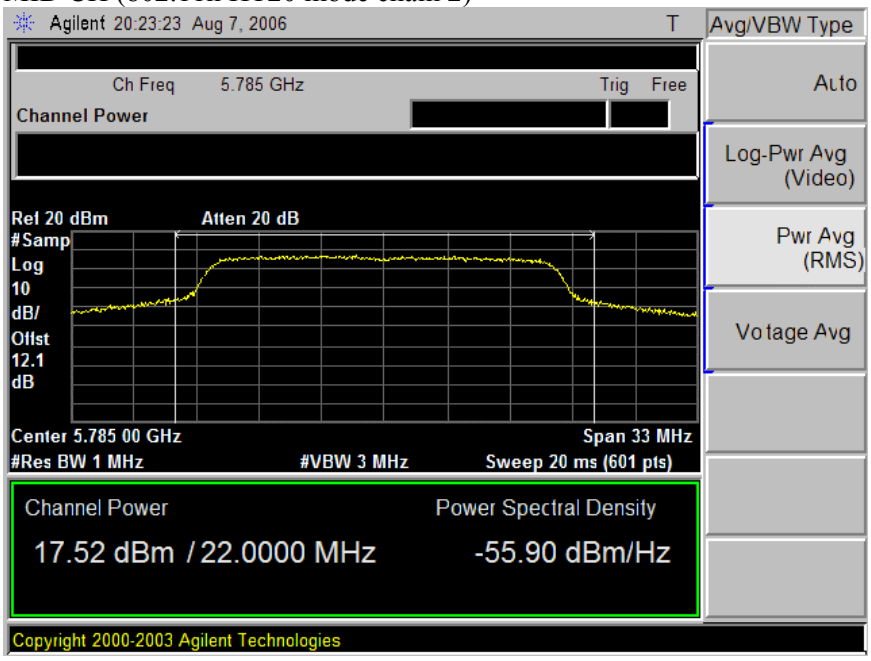
MID CH (802.11n HT20 mode chain 2)



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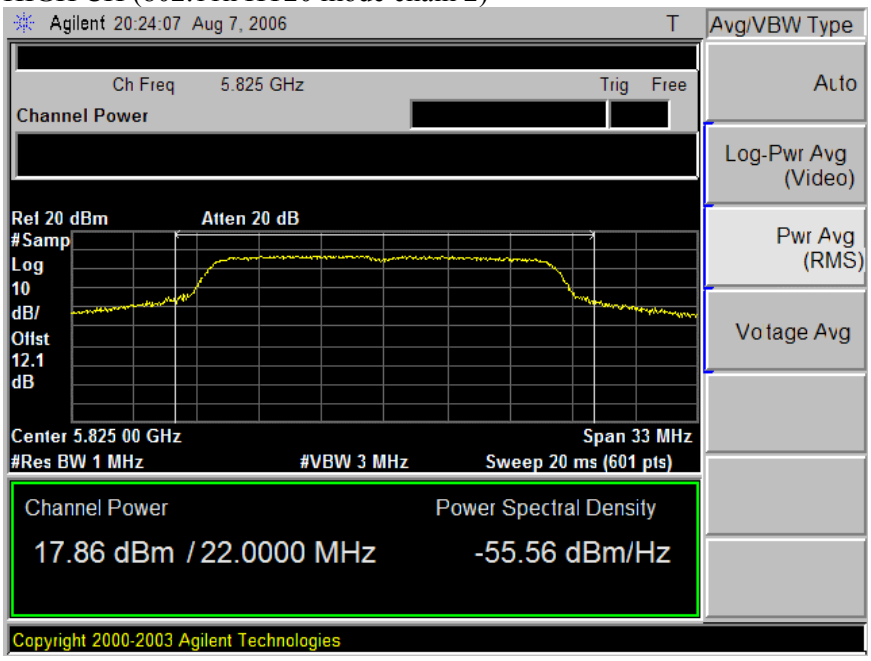
HIGH CH (802.11n HT20 mode chain 2)



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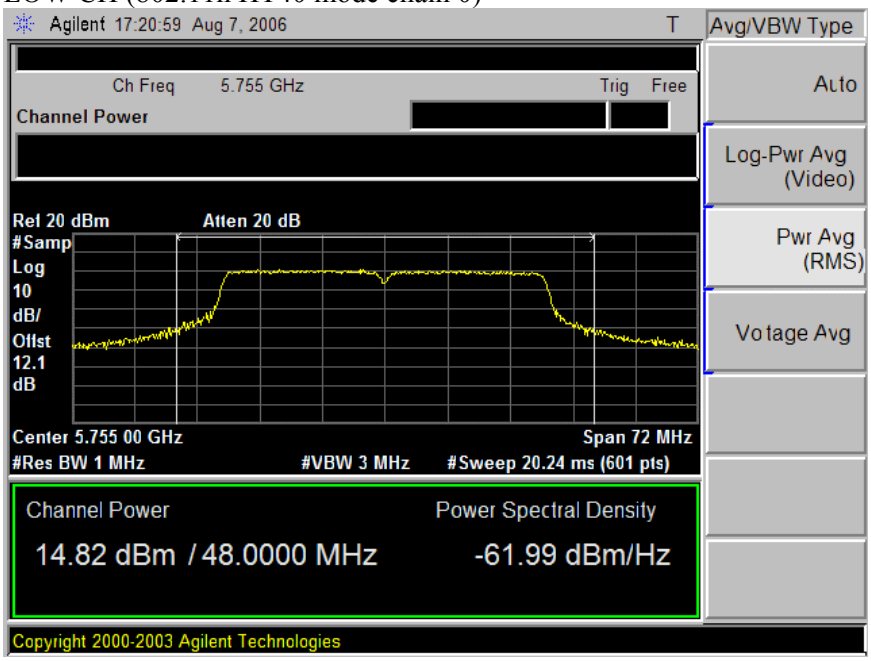
(802.11 HT40 MODE CHAIN 0)

LOW CH (802.11n HT40 mode chain 0)



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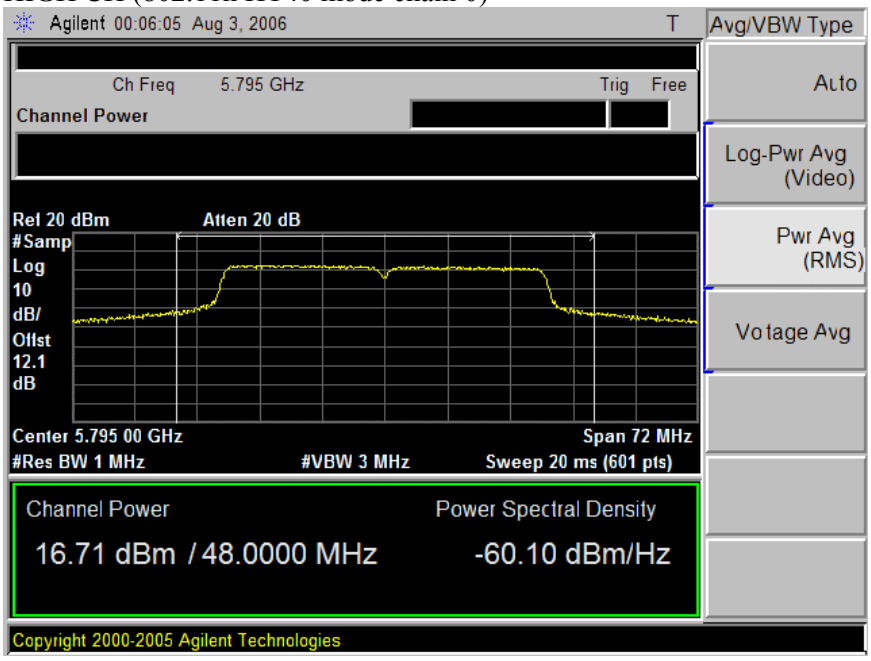
HIGH CH (802.11n HT40 mode chain 0)



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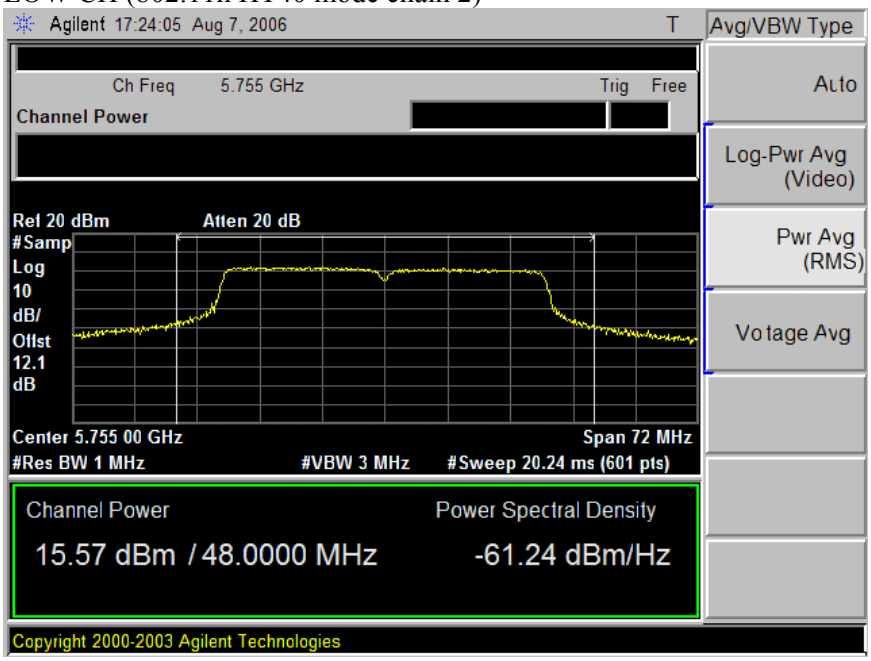
(802.11 HT40 MODE CHAIN 2)

LOW CH (802.11n HT40 mode chain 2)



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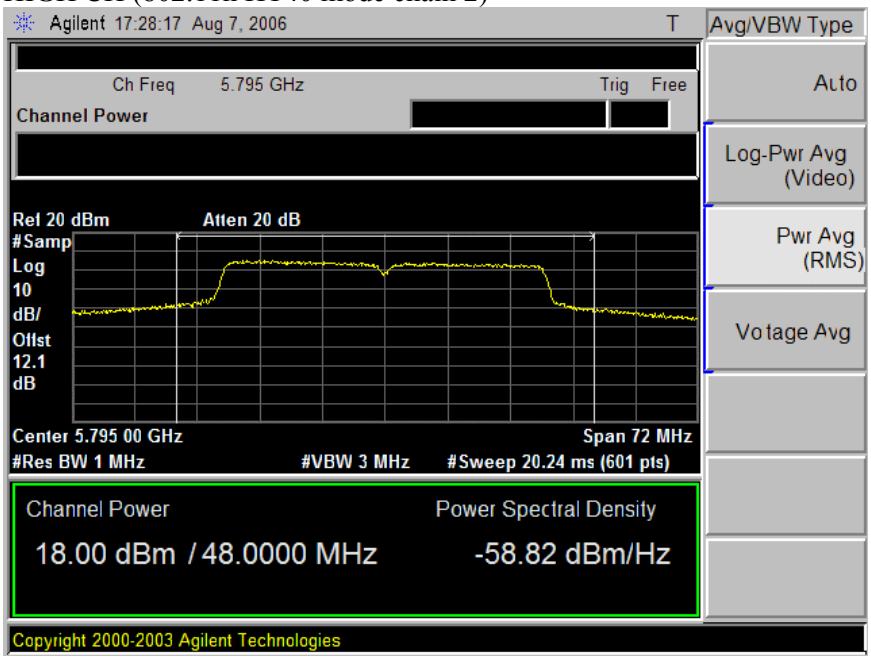
HIGH CH (802.11n HT40 mode chain 2)



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7.2.4. AVERAGE POWER

AVERAGE POWER LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

Each chain is measured separately and the total power is calculated using:

Total Power = 10 log (10^ (Chain 0 Power / 10) + 10^ (Chain 2 Power / 10))

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RESULTS

No non-compliance noted:

The cable assembly insertion loss of 12.1 dB (including 10 dB pad and 2.1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Mode Channel	Frequency (MHz)	Average Power Chain 0 (dBm)	Average Power Chain 2 (dBm)	Average Power Total (dBm)
802.11a Mode				
Low	5745	17.4	17.4	20.4
Middle	5785	17.3	17.7	20.5
High	5825	17.5	17.9	20.7
802.11n HT20 Mode				
Low	5745	16.9	17.0	20.0
Middle	5785	16.6	17.0	19.8
High	5825	17.0	17.5	20.3
802.11n HT40 Mode				
Low	5755	14.0	15.2	17.7
High	5795	16.7	18.0	20.4

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7.2.5. PEAK POWER SPECTRAL DENSITY

LIMIT

§15.247 (d) For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The test is performed in accordance with Option 2 procedures in FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005. The conditions for sample detection are satisfied. The PPSD is the highest level found across the emission in any 3 kHz band.

Each chain is measured separately and the total PPSD is calculated using:

Total PPSD = 10 log (10^ (Chain 0 PPSD / 10) + 10^ (Chain 2 PPSD / 10))

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RESULTS

No non-compliance noted:

Mode Channel	Frequency (MHz)	PPSD Chain 0 (dBm)	PPSD Chain 2 (dBm)	PPSD Total (dBm)	Limit (dBm)	Margin (dB)
802.11a Mode						
Low	5745	-19.11	-18.33	-15.69	8	-23.69
Middle	5785	-19.59	-17.75	-15.56	8	-23.56
High	5825	-18.87	-17.55	-15.15	8	-23.15
802.11n HT20 Mode						
Low	5745	-19.83	-18.95	-16.36	8	-24.36
Middle	5785	-20.16	-18.80	-16.42	8	-24.42
High	5825	-19.68	-19.18	-16.41	8	-24.41
802.11n HT40 Mode						
Low	5755	-24.90	-24.04	-21.44	8	-29.44
High	5795	-23.48	-22.17	-19.76	8	-27.76

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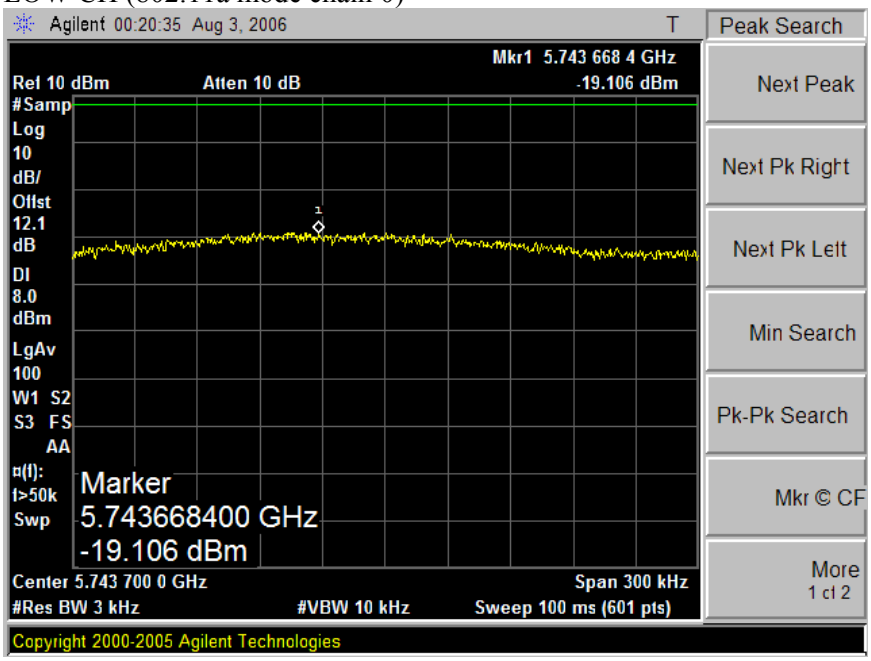
(802.11a MODE CHAIN 0)

LOW CH (802.11a mode chain 0)



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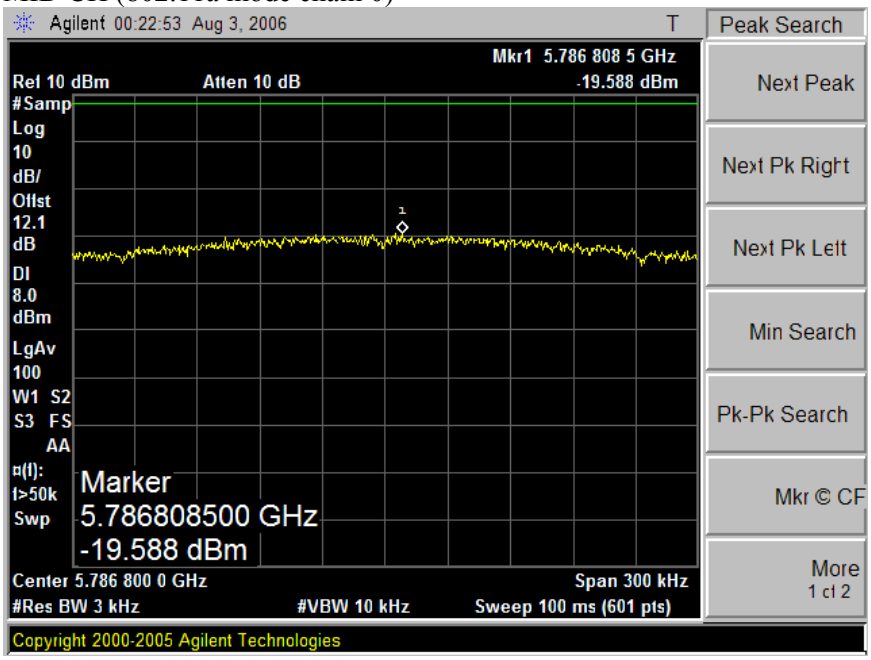
MID CH (802.11a mode chain 0)



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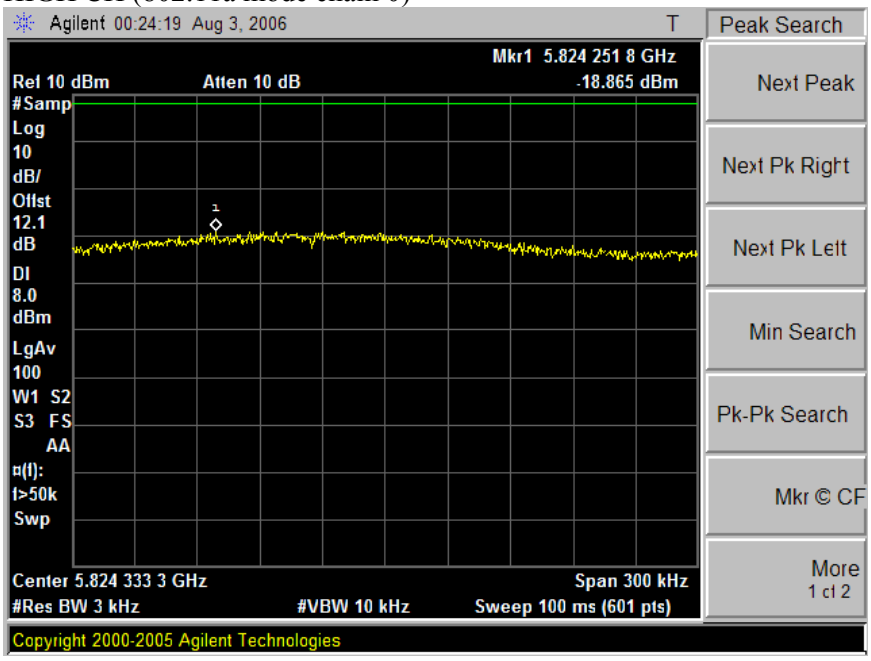
HIGH CH (802.11a mode chain 0)



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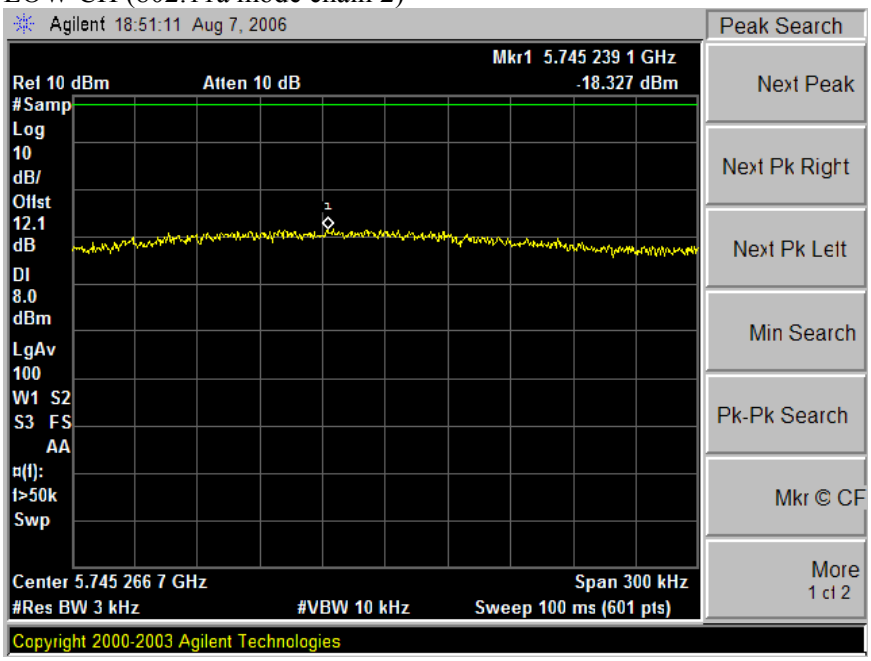
(802.11a MODE CHAIN 2)

LOW CH (802.11a mode chain 2)



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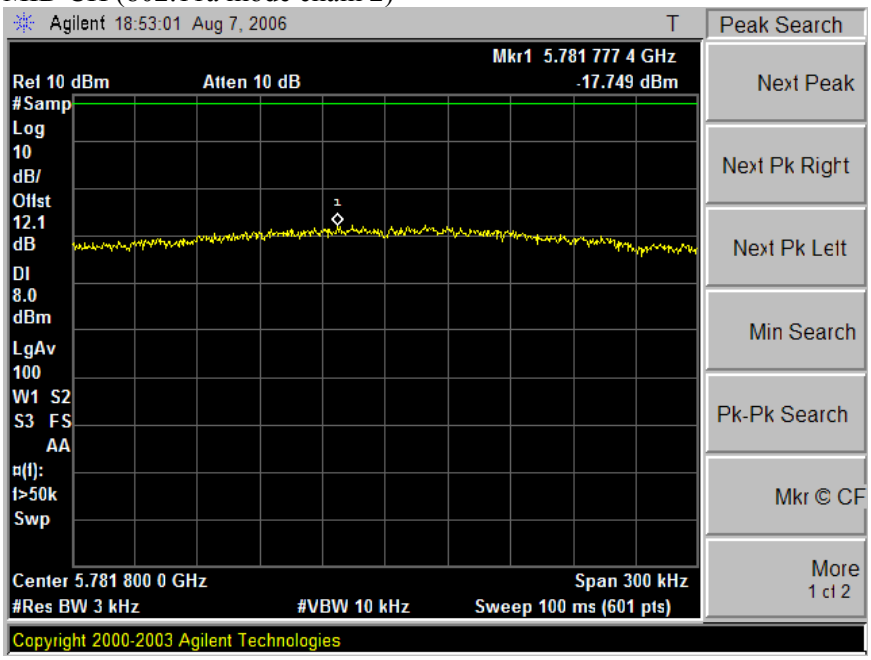
MID CH (802.11a mode chain 2)



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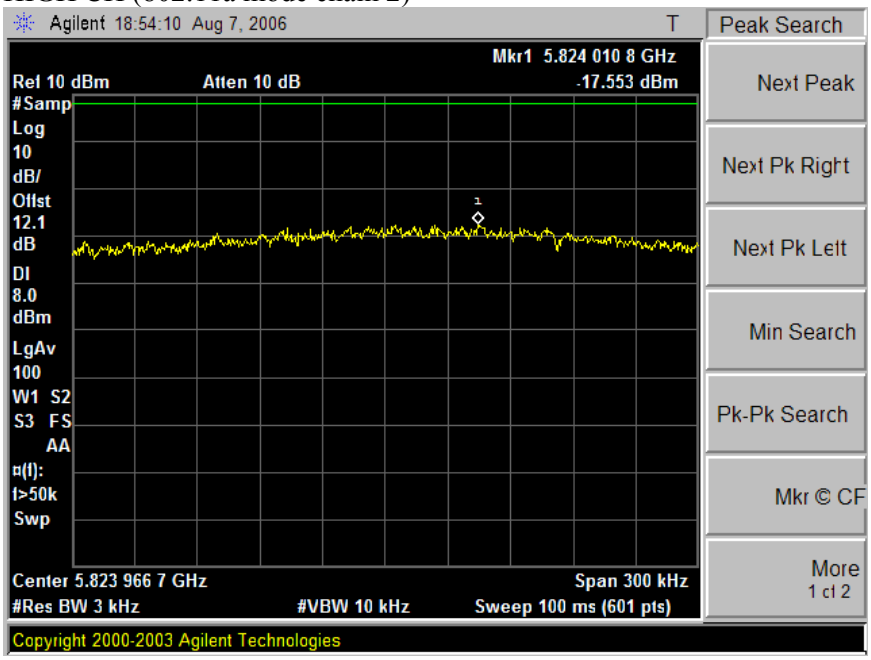
HIGH CH (802.11a mode chain 2)



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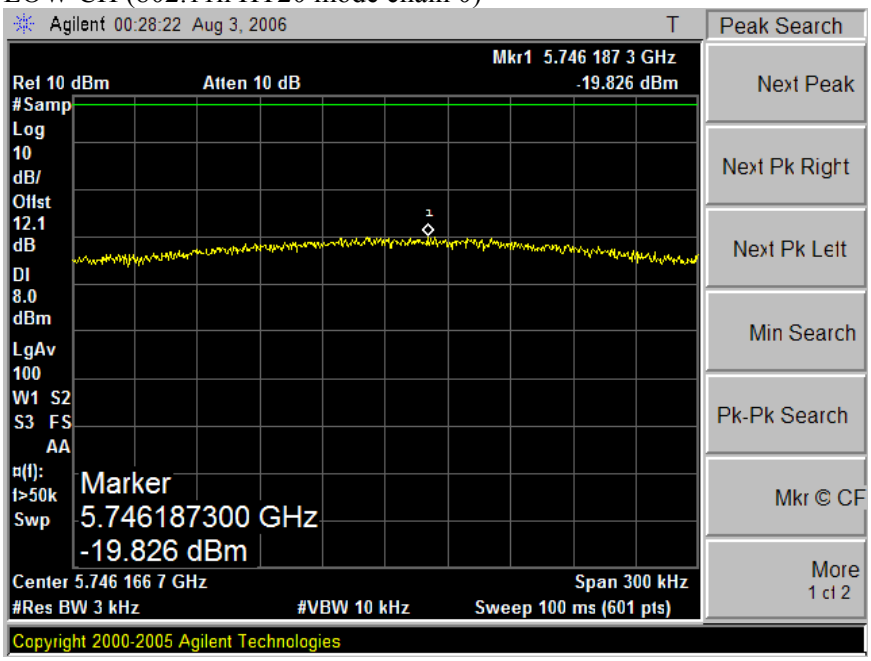
(802.11n HT20 MODE CHAIN 0)

LOW CH (802.11n HT20 mode chain 0)



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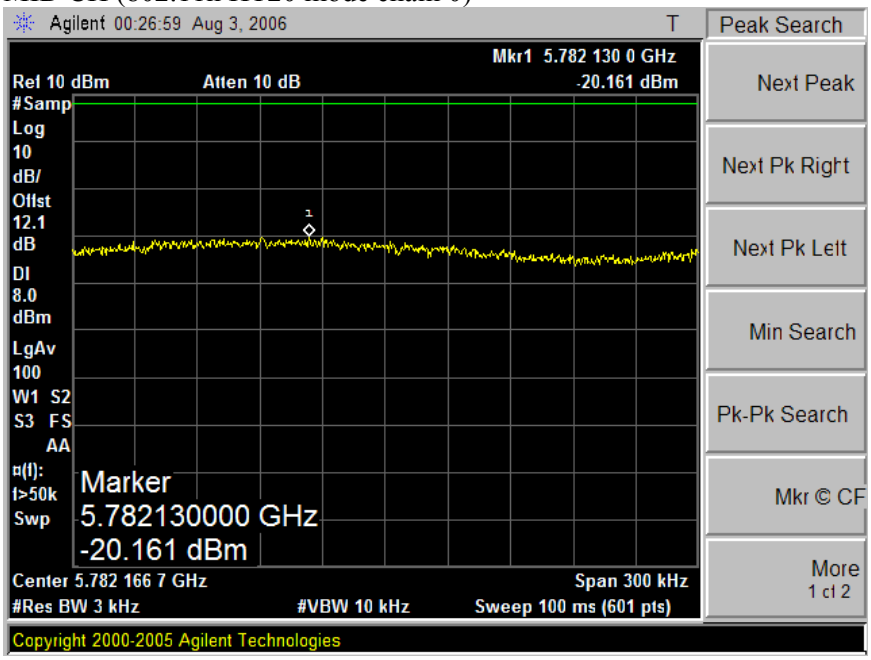
MID CH (802.11n HT20 mode chain 0)



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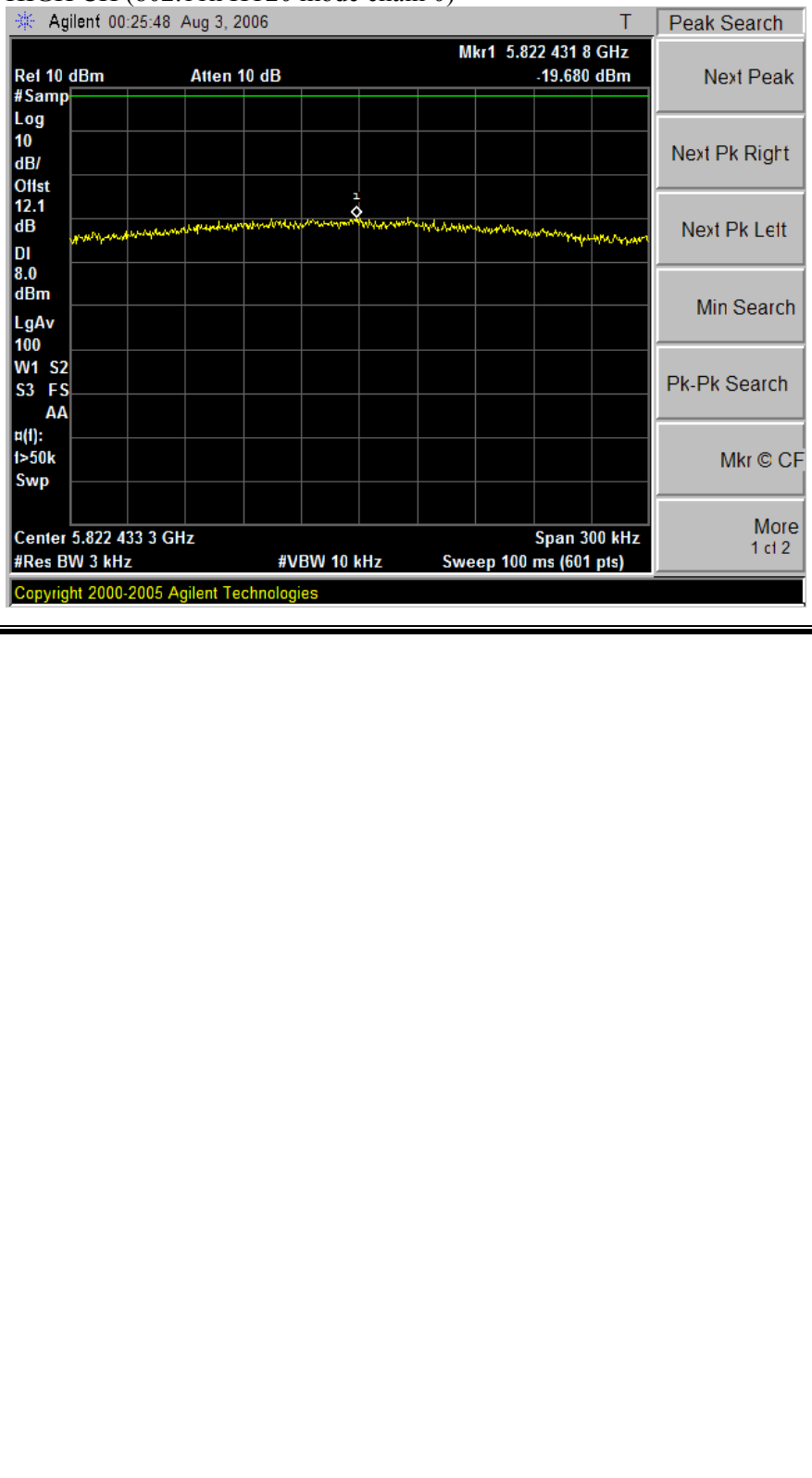
HIGH CH (802.11n HT20 mode chain 0)



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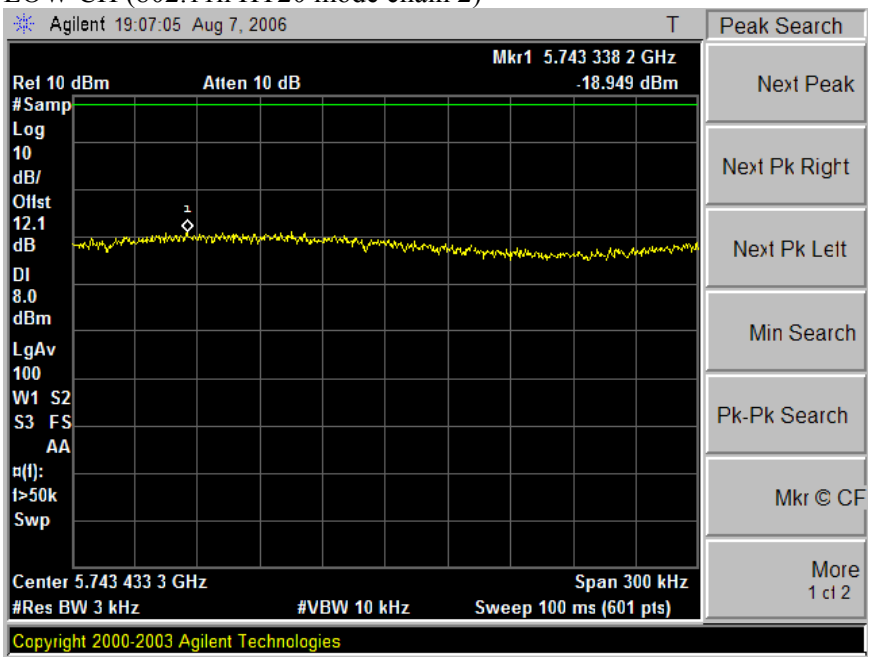
(802.11 HT20 MODE CHAIN 2)

LOW CH (802.11n HT20 mode chain 2)



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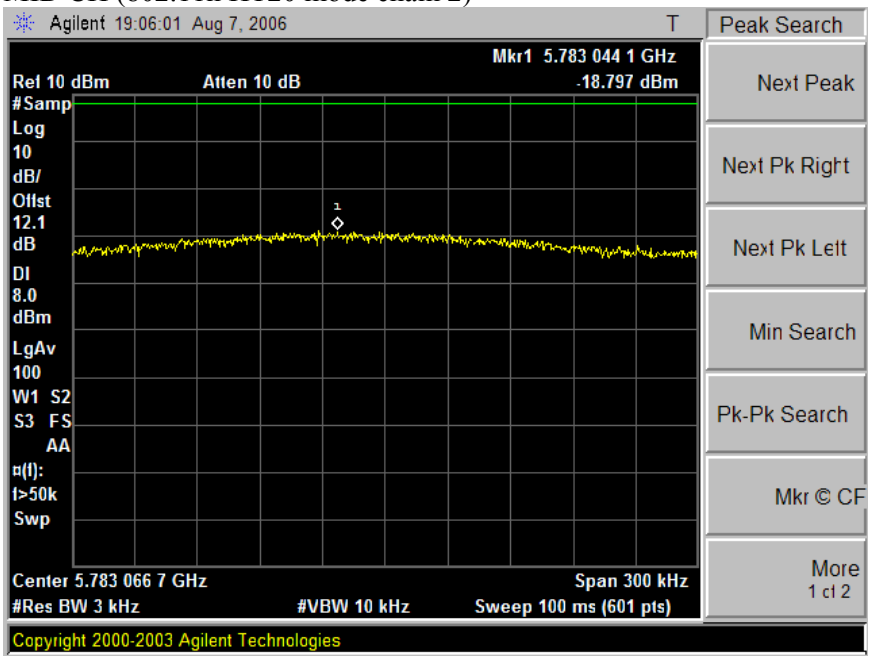
MID CH (802.11n HT20 mode chain 2)



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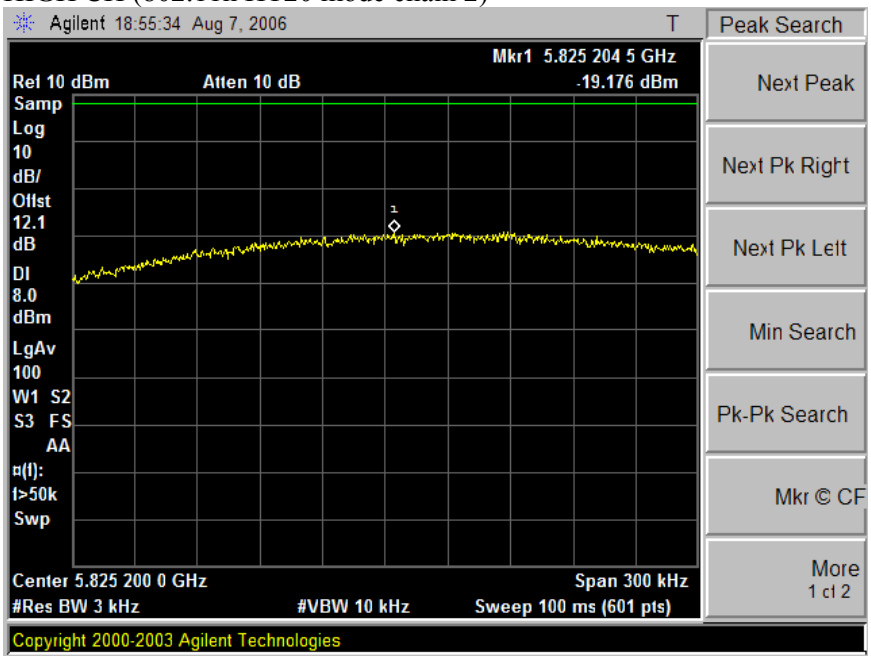
HIGH CH (802.11n HT20 mode chain 2)



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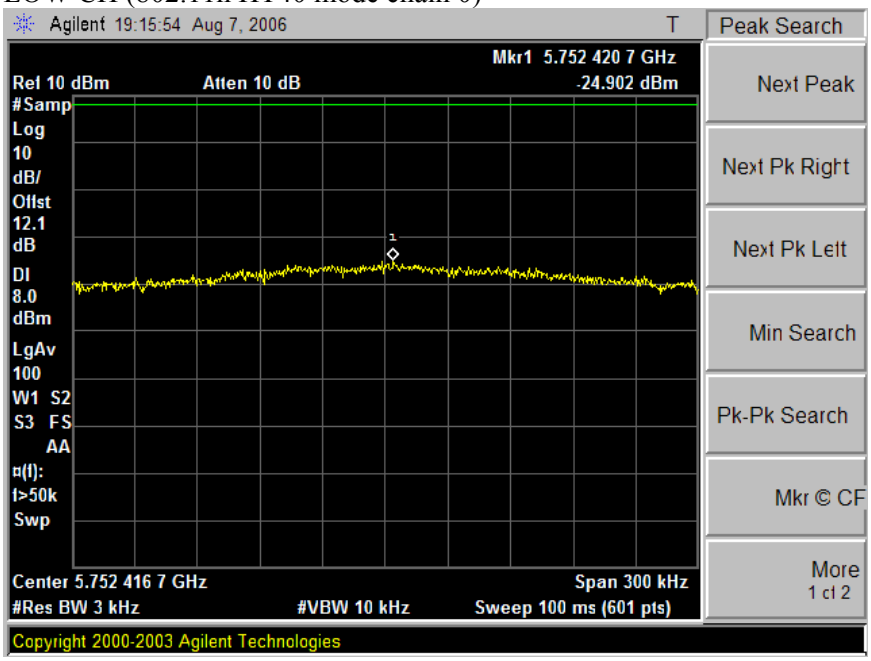
(802.11 HT40 MODE CHAIN 0)

LOW CH (802.11n HT40 mode chain 0)



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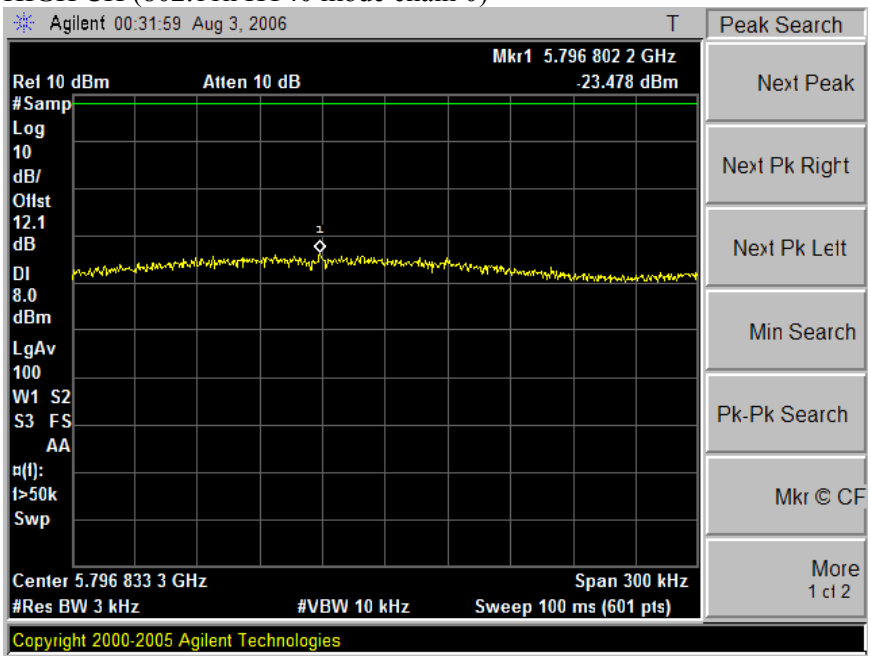
HIGH CH (802.11n HT40 mode chain 0)



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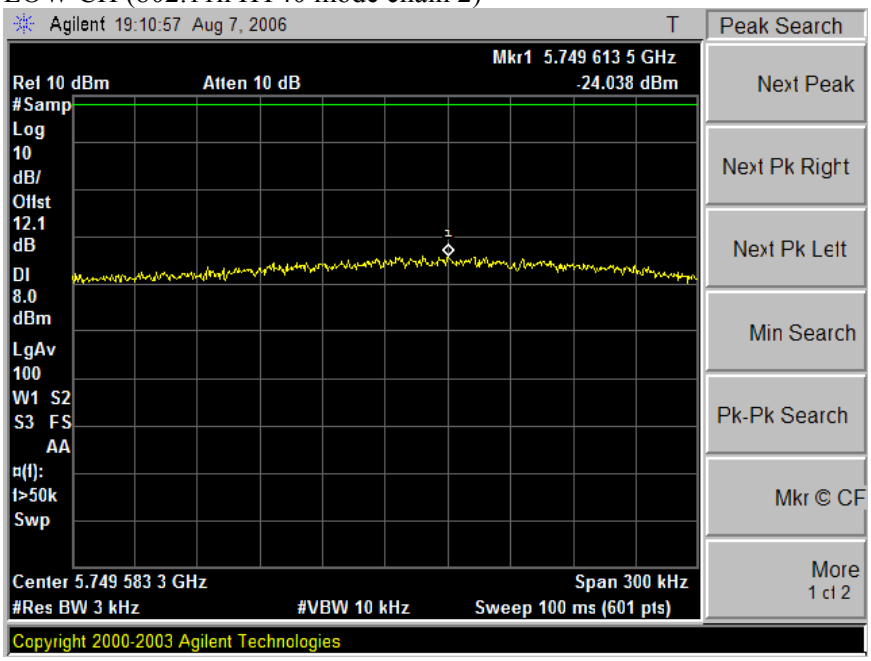
(802.11 HT40 MODE CHAIN 2)

LOW CH (802.11n HT40 mode chain 2)



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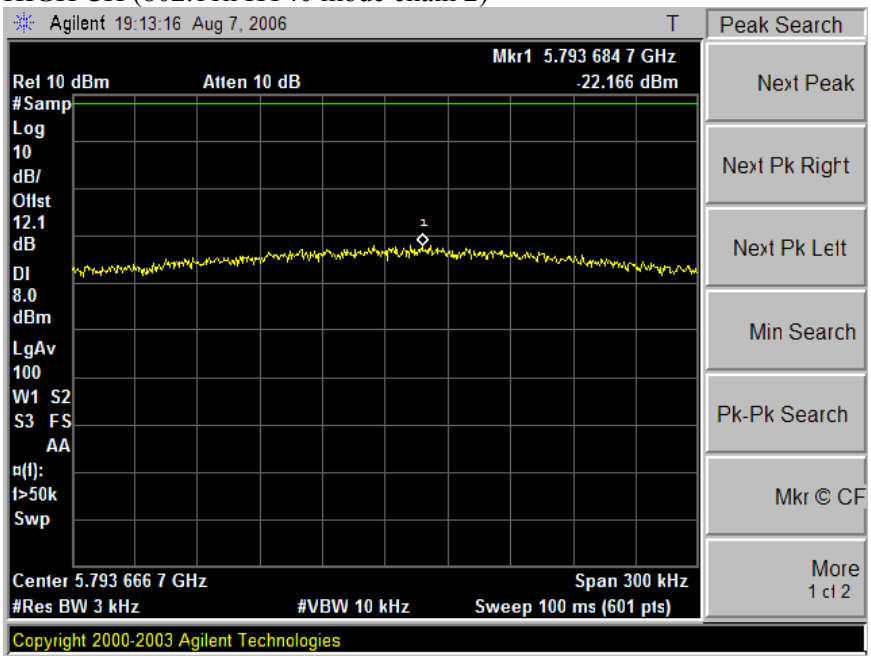
HIGH CH (802.11n HT40 mode chain 2)



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7.2.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

§15.247 (c) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in§15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Conducted power was measured using the Option 2 procedures, therefore the required attenuation is 30 dB.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

RESULTS

No non-compliance noted:

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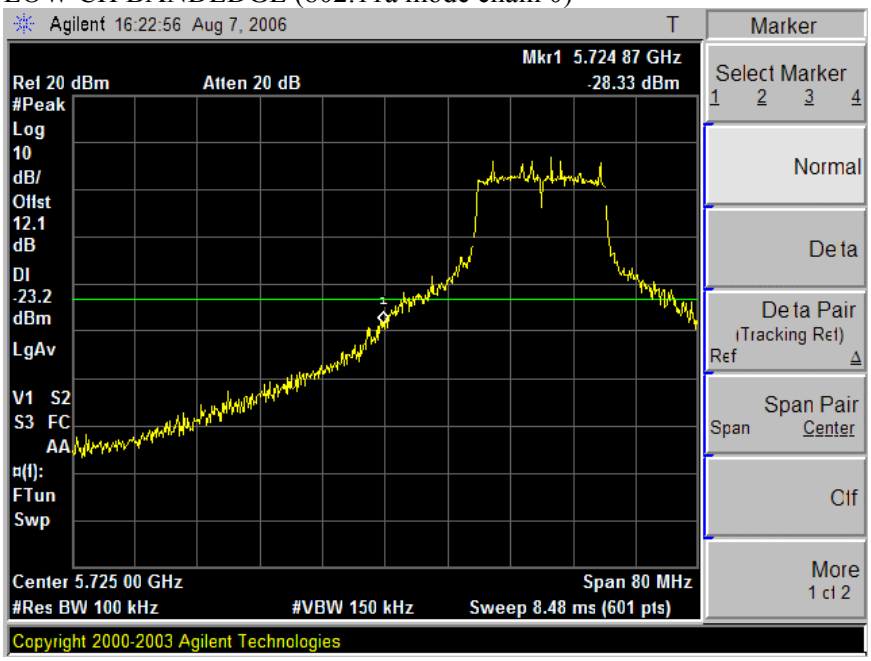
SPURIOUS EMISSIONS (802.11a MODE CHAIN 0)

LOW CH BANDEDGE (802.11a mode chain 0)



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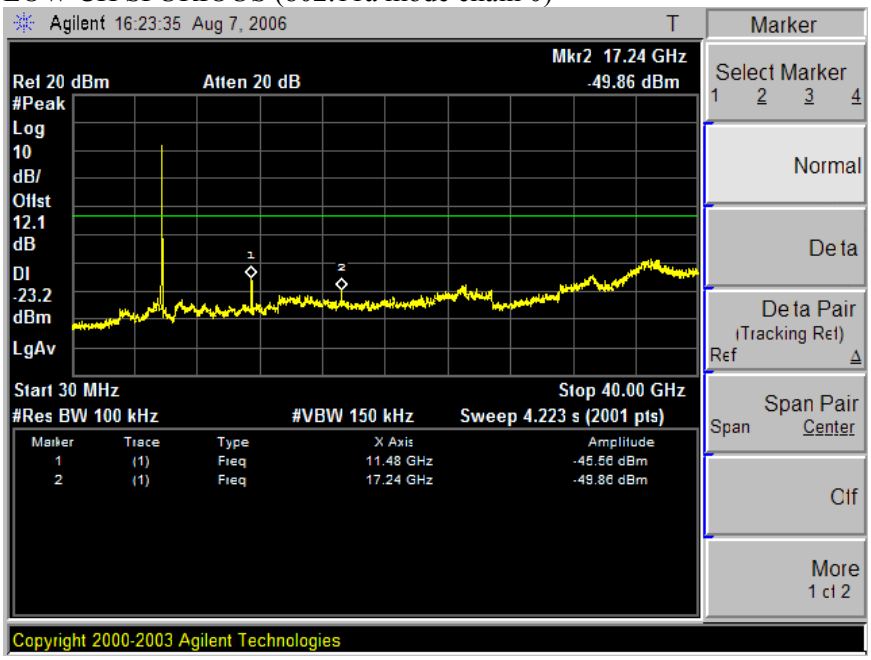
LOW CH SPURIOUS (802.11a mode chain 0)



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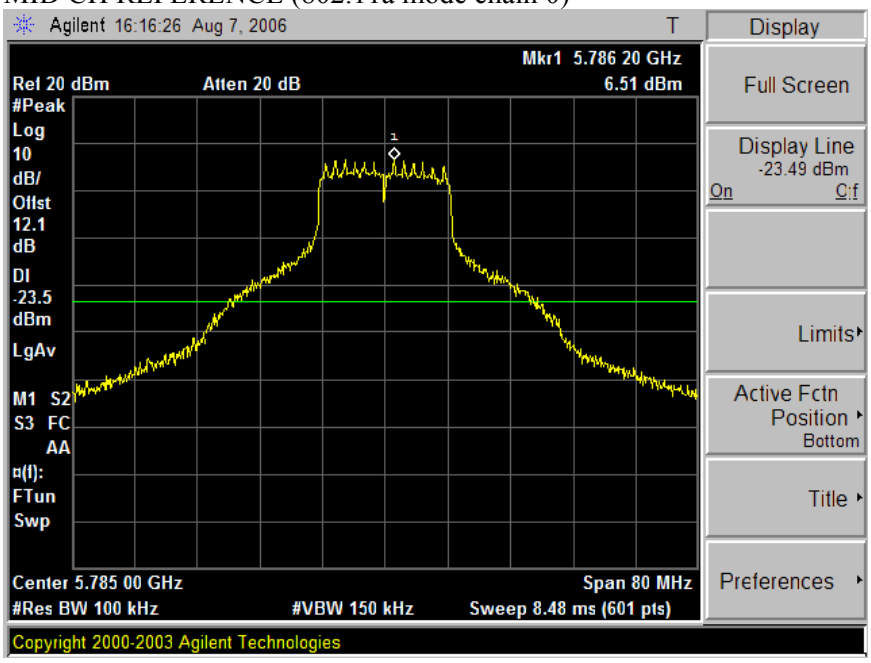
MID CH REFERENCE (802.11a mode chain 0)



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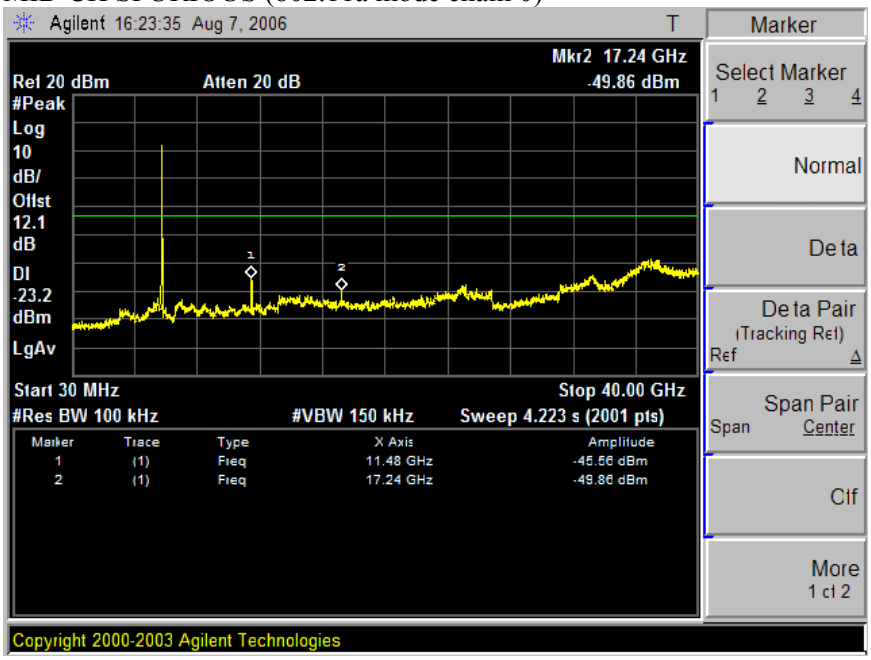
MID CH SPURIOUS (802.11a mode chain 0)



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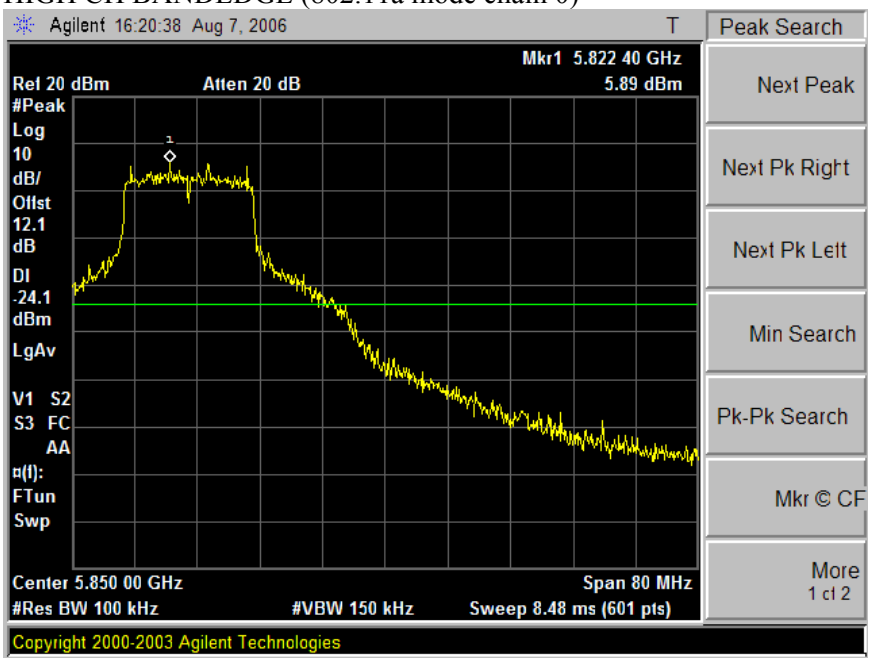
HIGH CH BANDEDGE (802.11a mode chain 0)



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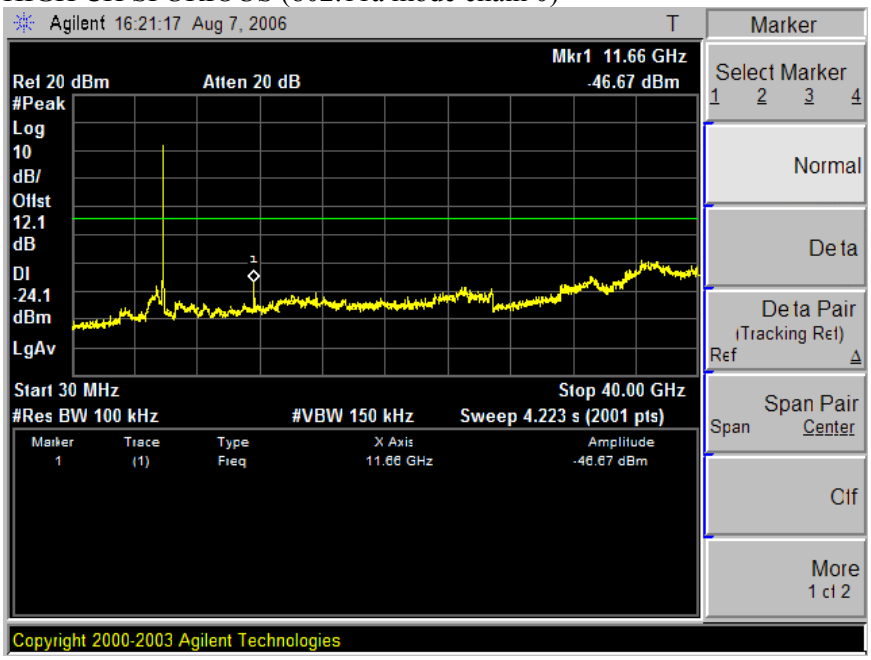
HIGH CH SPURIOUS (802.11a mode chain 0)



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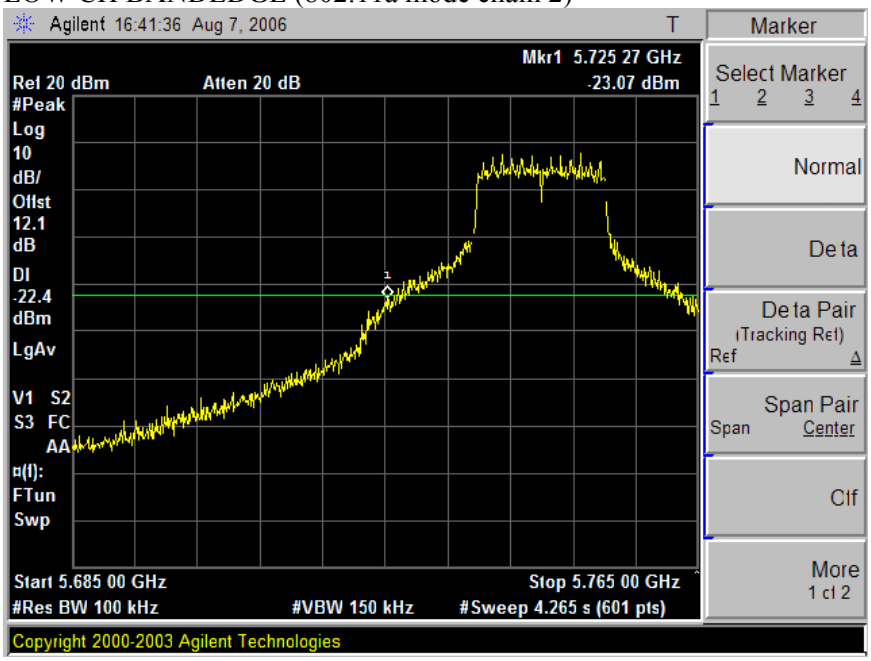
SPURIOUS EMISSIONS (802.11a MODE CHAIN 2)

LOW CH BANDEDGE (802.11a mode chain 2)



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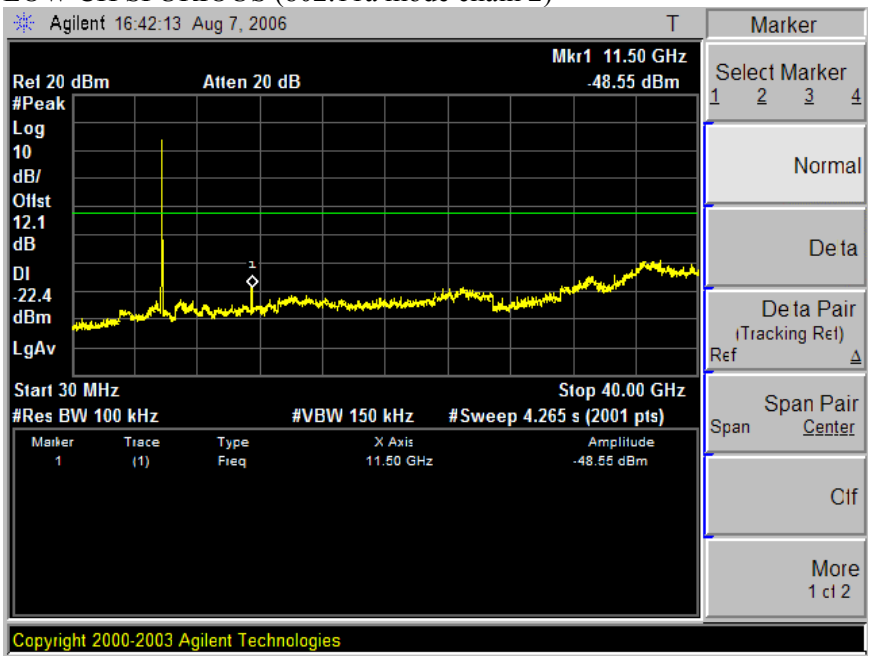
LOW CH SPURIOUS (802.11a mode chain 2)



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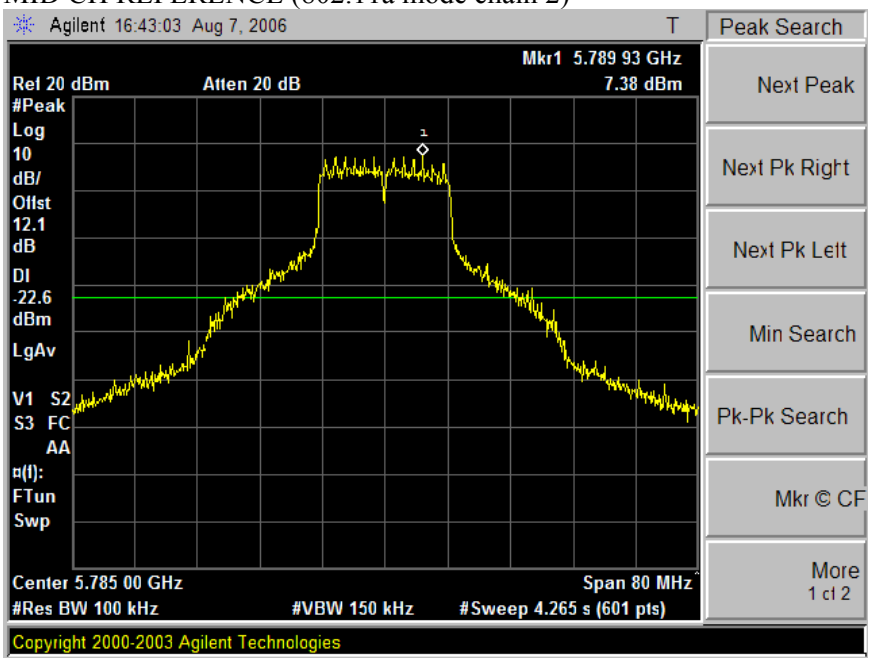
MID CH REFERENCE (802.11a mode chain 2)



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MID CH SPURIOUS (802.11a mode chain 2)

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HIGH CH BANDEDGE (802.11a mode chain 2)

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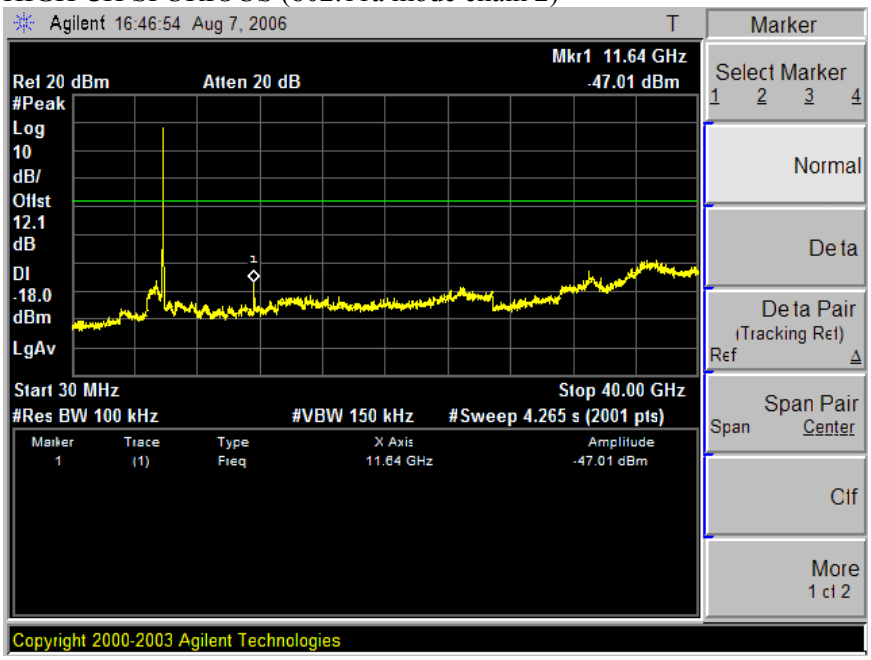
HIGH CH SPURIOUS (802.11a mode chain 2)



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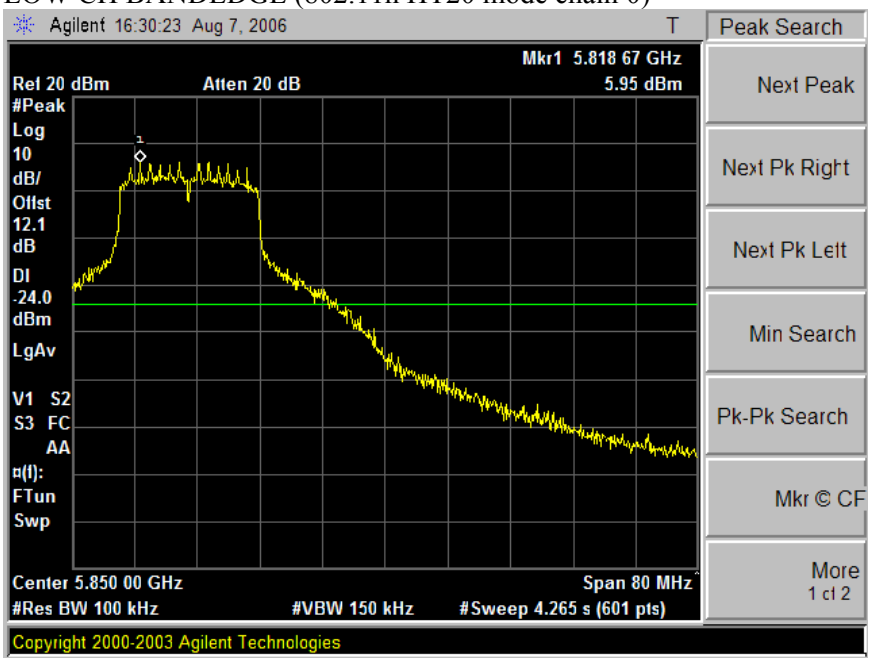
SPURIOUS EMISSIONS (802.11n HT20 MODE CHAIN 0)

LOW CH BANDEDGE (802.11n HT20 mode chain 0)



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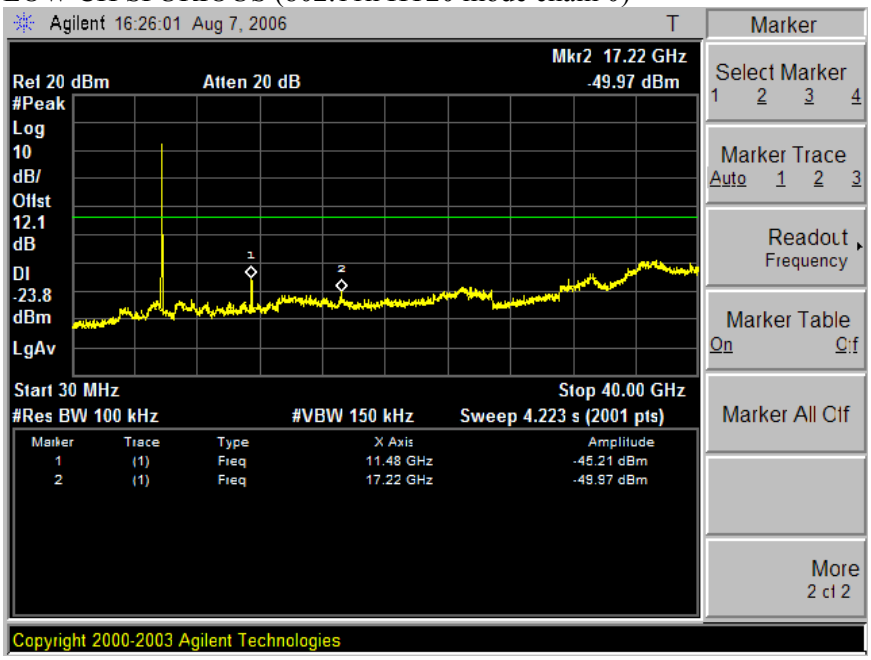
LOW CH SPURIOUS (802.11n HT20 mode chain 0)



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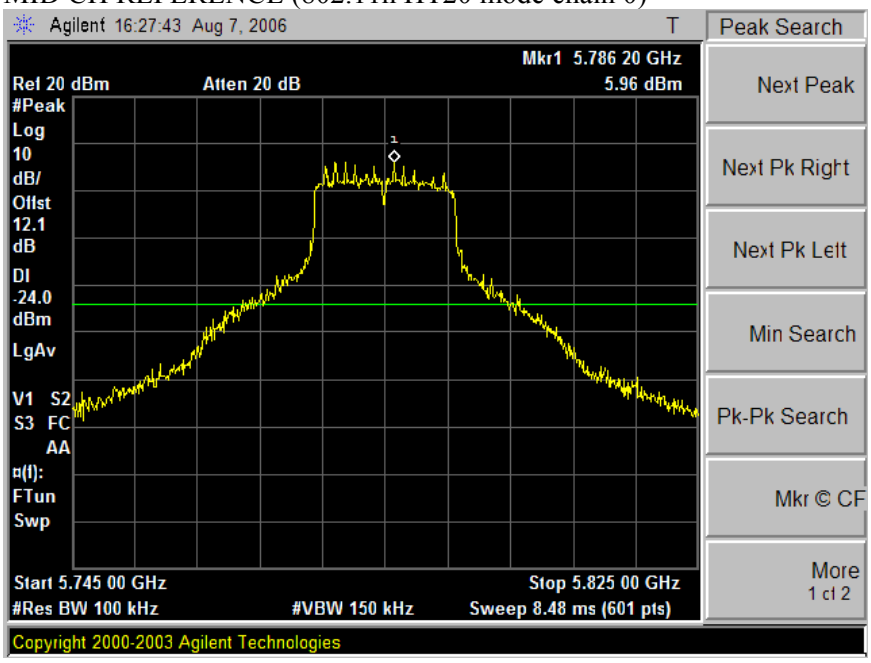
MID CH REFERENCE (802.11n HT20 mode chain 0)



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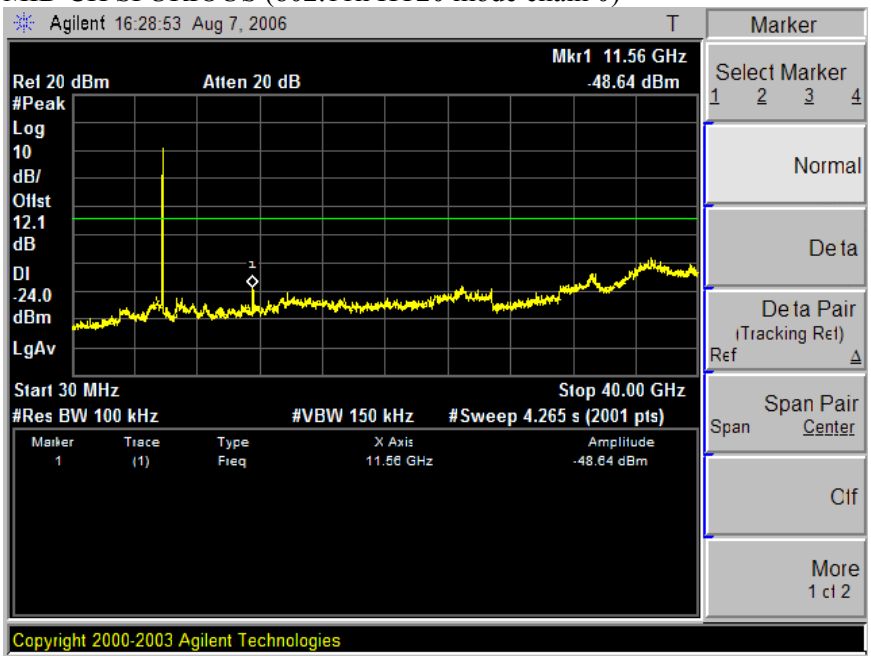
MID CH SPURIOUS (802.11n HT20 mode chain 0)



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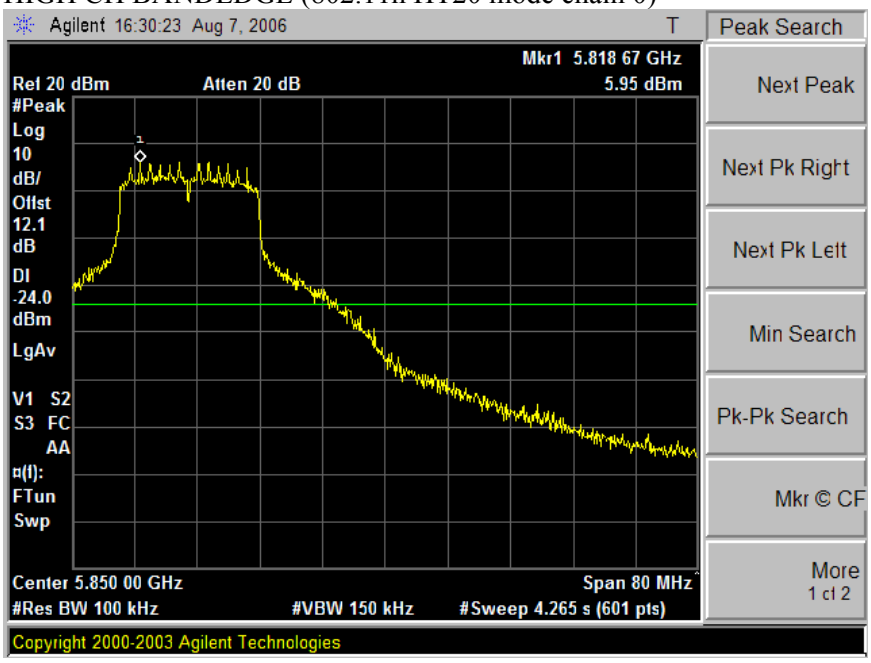
HIGH CH BANDEDGE (802.11n HT20 mode chain 0)



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HIGH CH SPURIOUS (802.11n HT20 mode chain 0)

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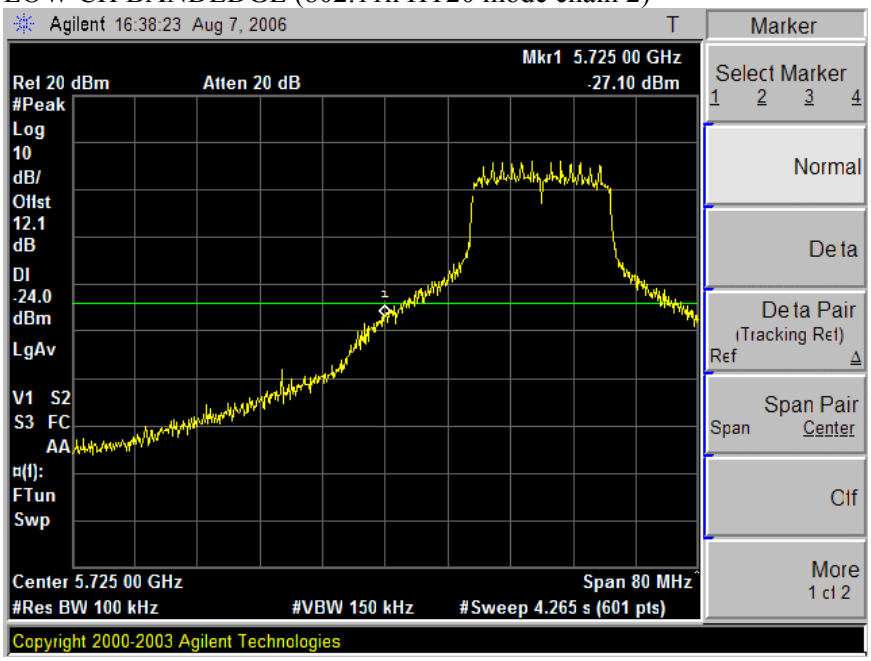
SPURIOUS EMISSIONS (802.11 HT20 MODE CHAIN 2)

LOW CH BANDEDGE (802.11n HT20 mode chain 2)



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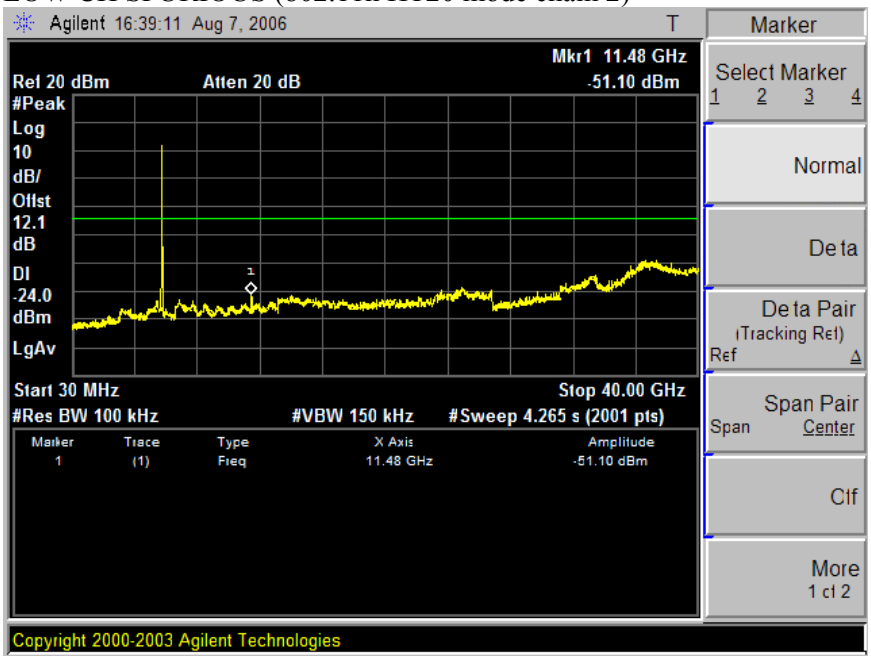
LOW CH SPURIOUS (802.11n HT20 mode chain 2)



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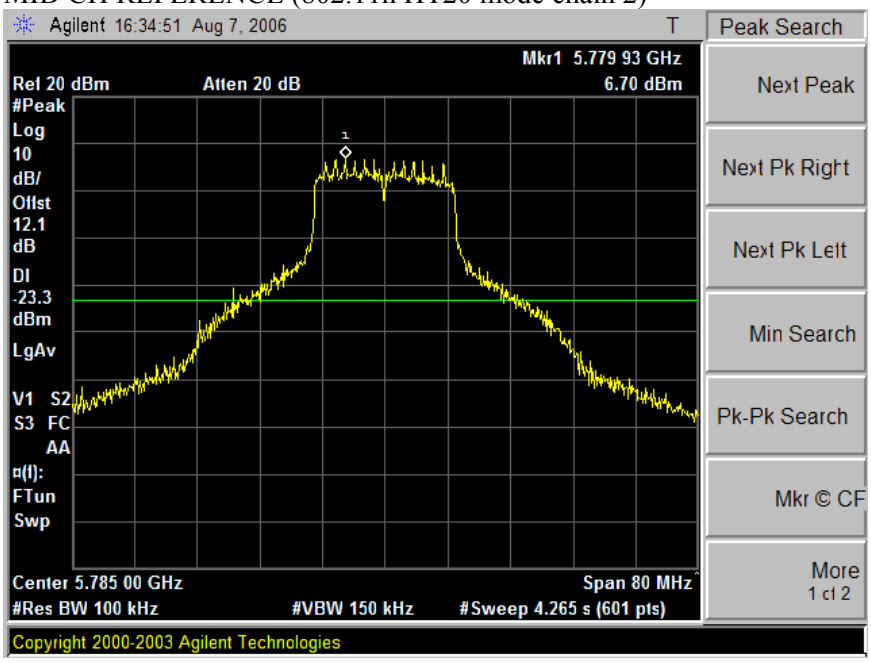
MID CH REFERENCE (802.11n HT20 mode chain 2)



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MID CH SPURIOUS (802.11n HT20 mode chain 2)

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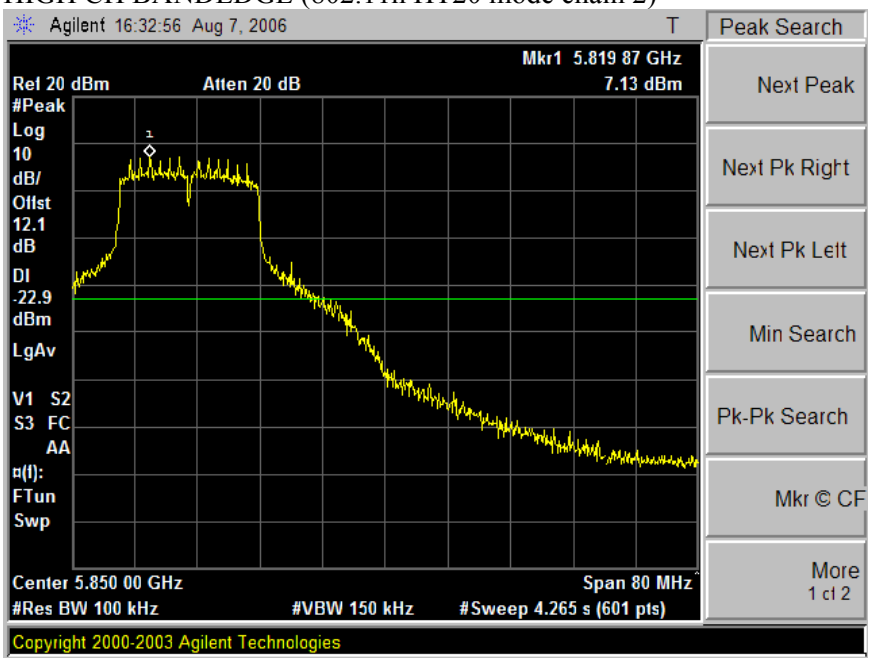
HIGH CH BANDEDGE (802.11n HT20 mode chain 2)



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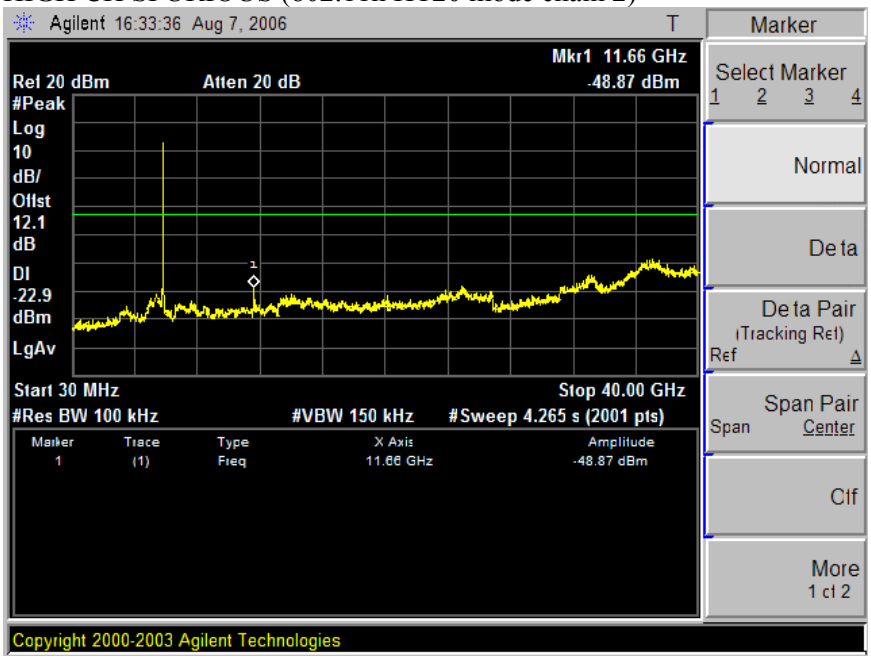
HIGH CH SPURIOUS (802.11n HT20 mode chain 2)



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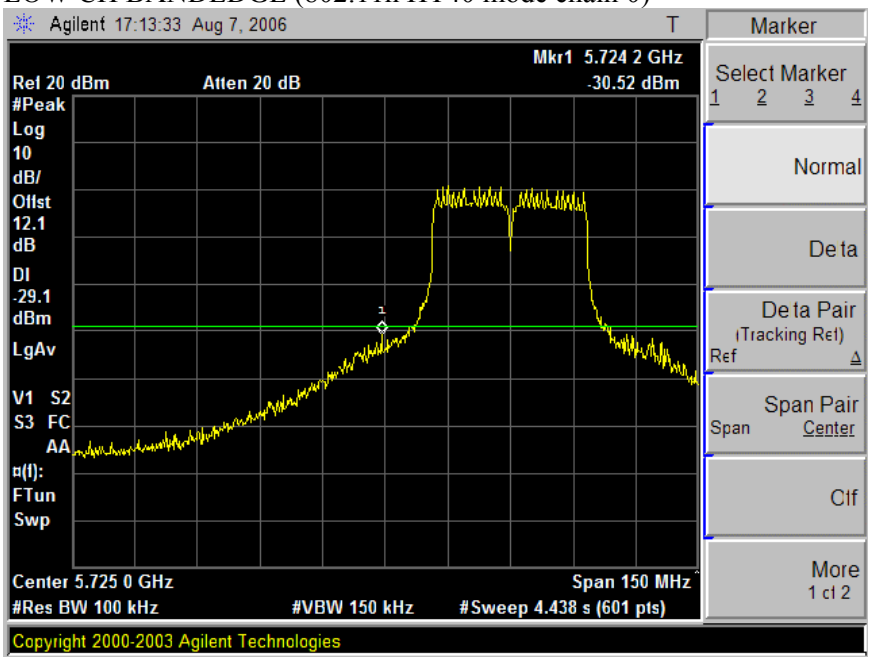
SPURIOUS EMISSIONS (802.11 HT40 MODE CHAIN 0)

LOW CH BANDEDGE (802.11n HT40 mode chain 0)



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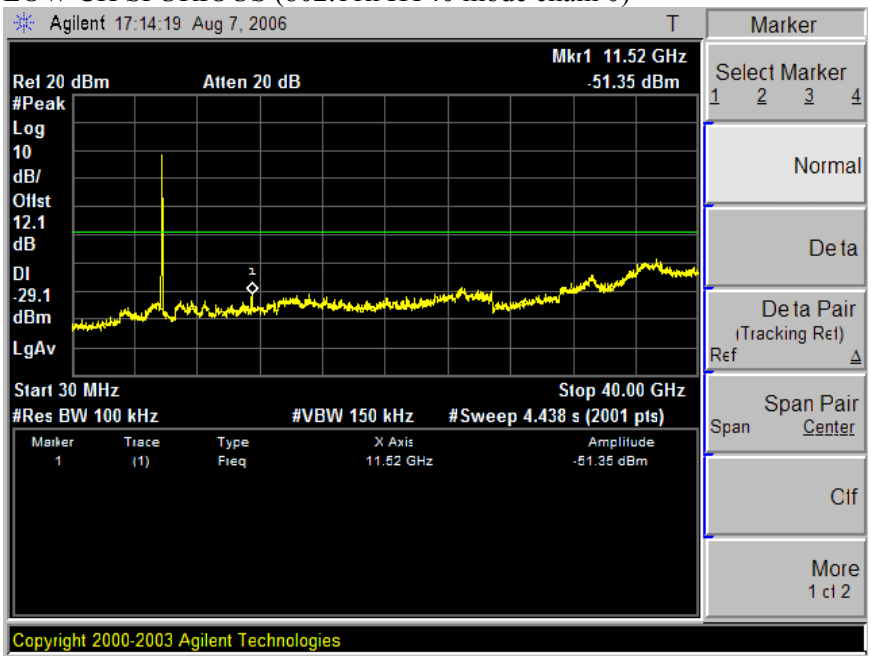
LOW CH SPURIOUS (802.11n HT40 mode chain 0)



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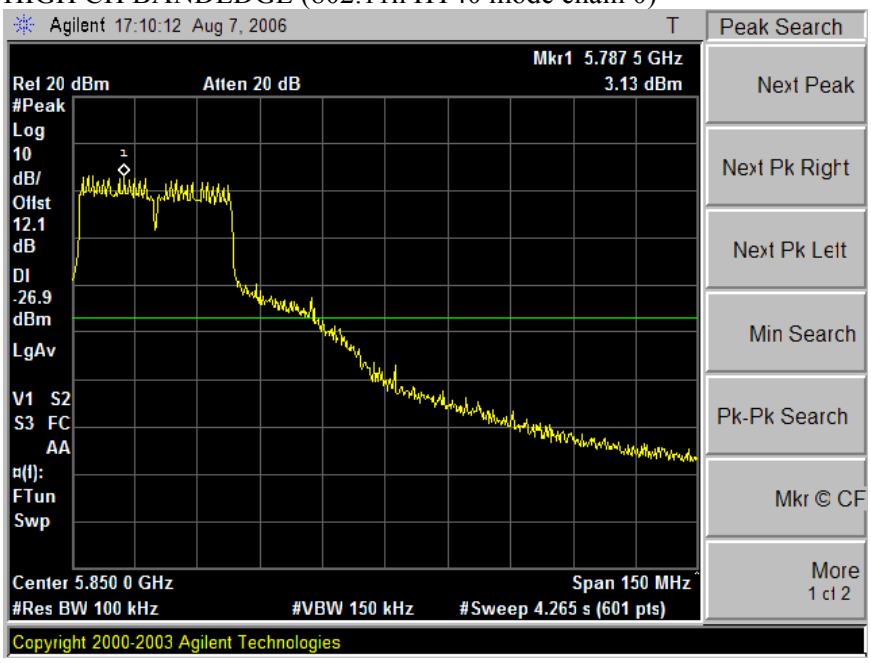
HIGH CH BANDEDGE (802.11n HT40 mode chain 0)



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HIGH CH SPURIOUS (802.11n HT40 mode chain 0)

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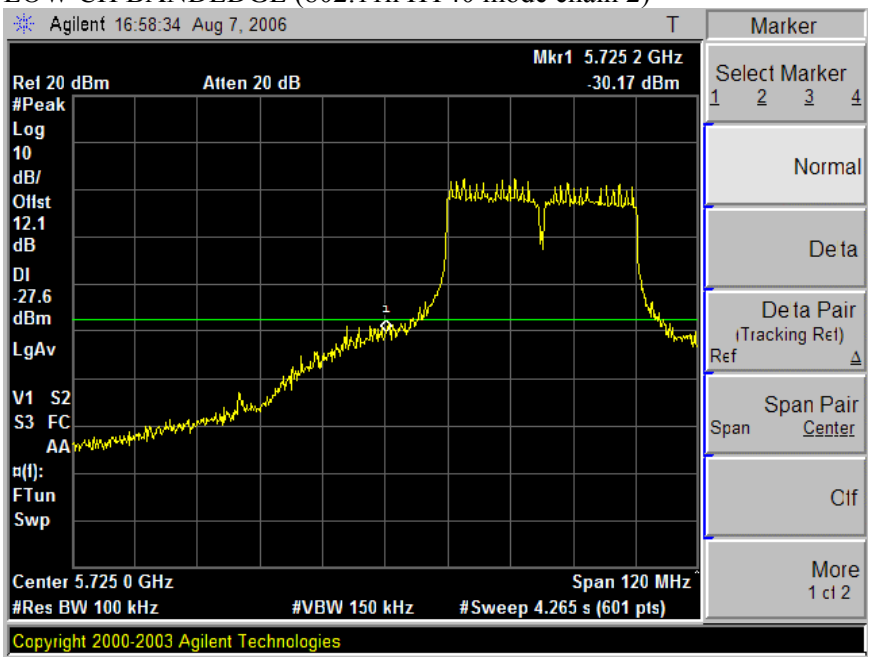
SPURIOUS EMISSIONS (802.11 HT40 MODE CHAIN 2)

LOW CH BANDEDGE (802.11n HT40 mode chain 2)



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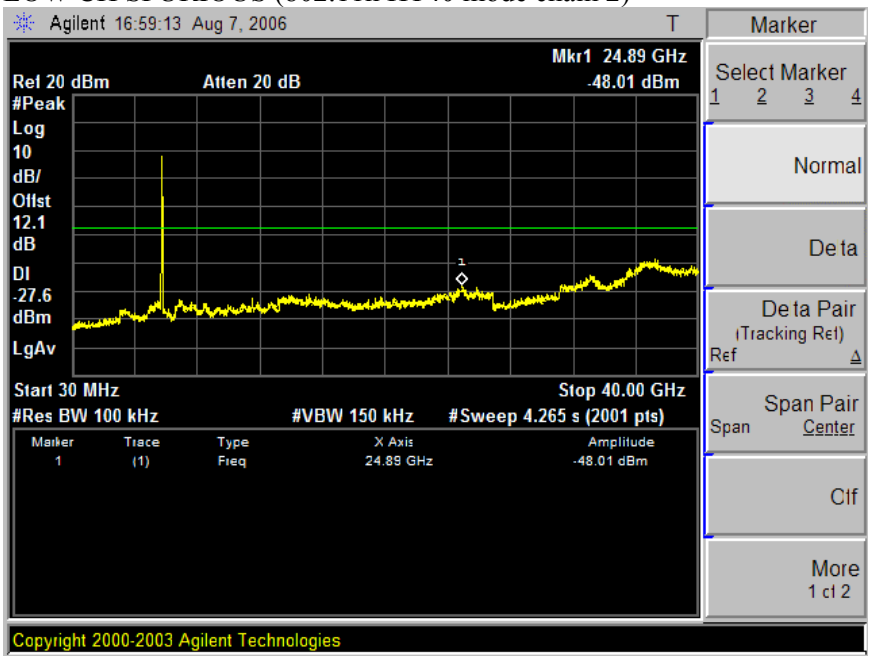
LOW CH SPURIOUS (802.11n HT40 mode chain 2)



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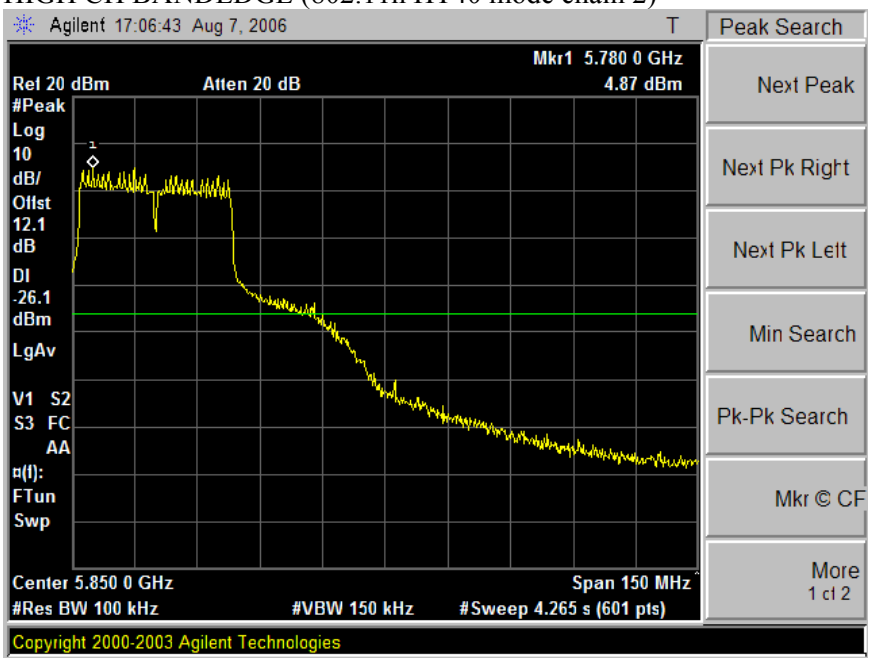
HIGH CH BANDEDGE (802.11n HT40 mode chain 2)



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HIGH CH SPURIOUS (802.11n HT40 mode chain 2)

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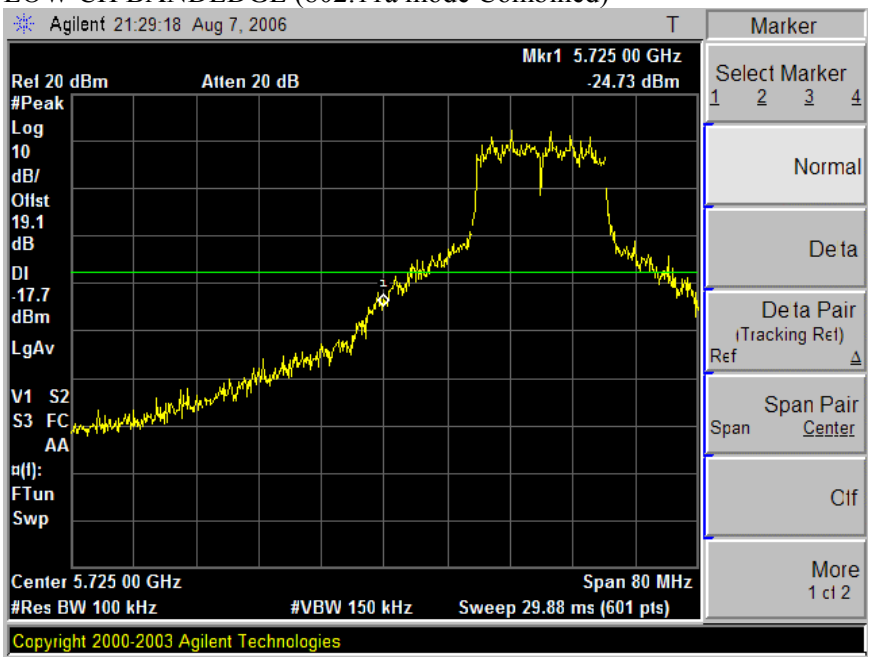
COMBINED SPURIOUS EMISSIONS (802.11a MODE)

LOW CH BANDEDGE (802.11a mode Combined)



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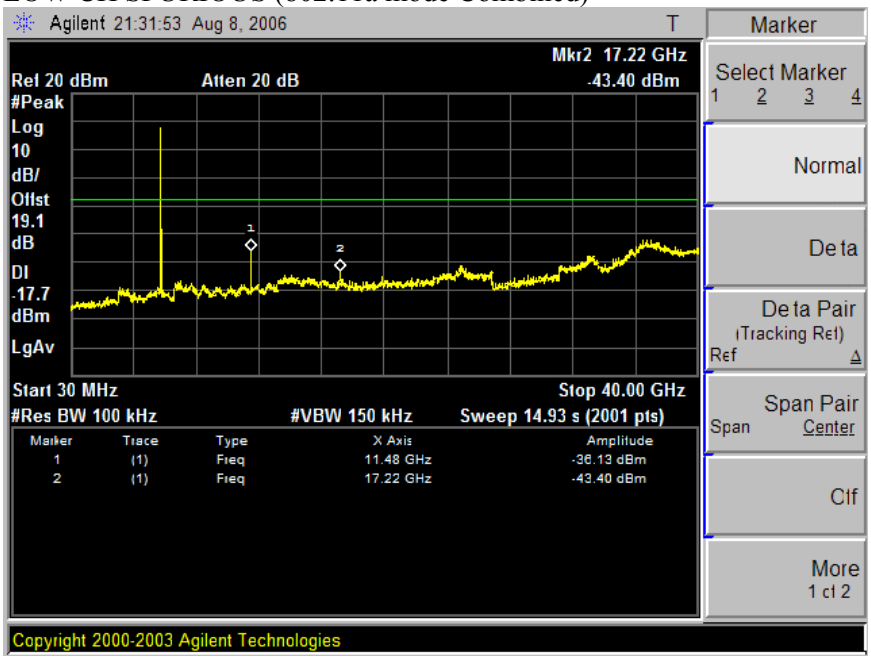
LOW CH SPURIOUS (802.11a mode Combined)



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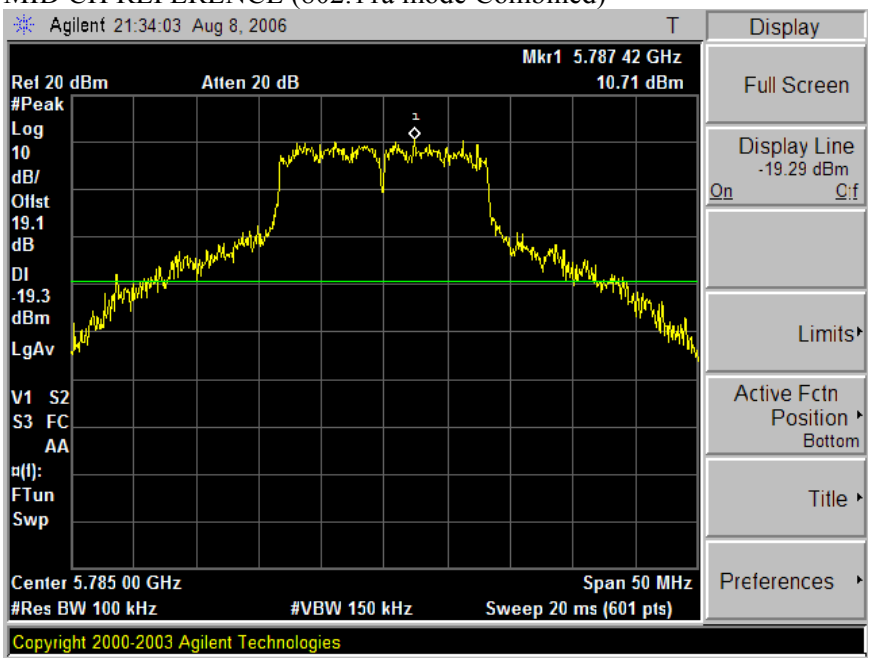
MID CH REFERENCE (802.11a mode Combined)



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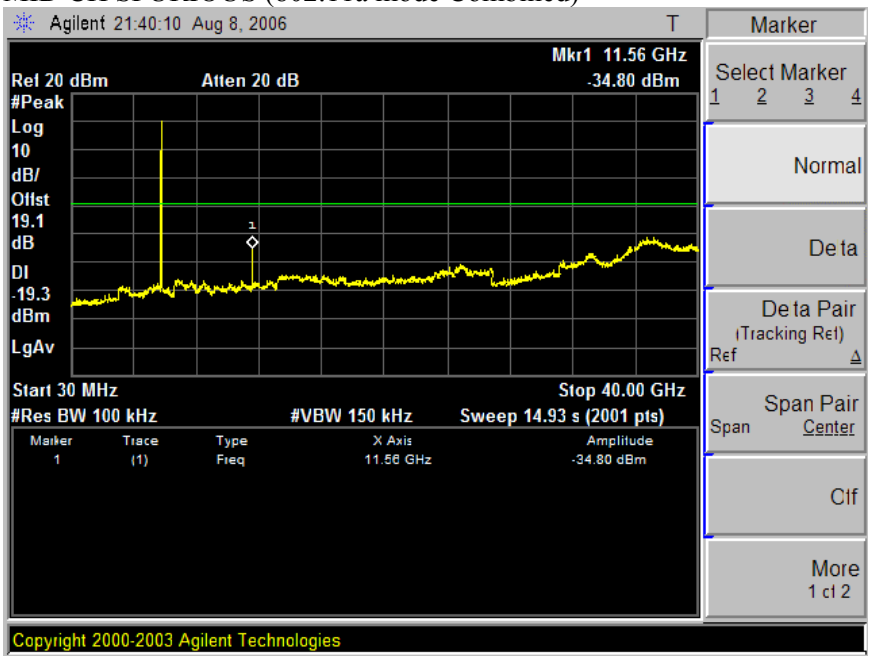
MID CH SPURIOUS (802.11a mode Combined)



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HIGH CH BANDEDGE (802.11a mode Combined)

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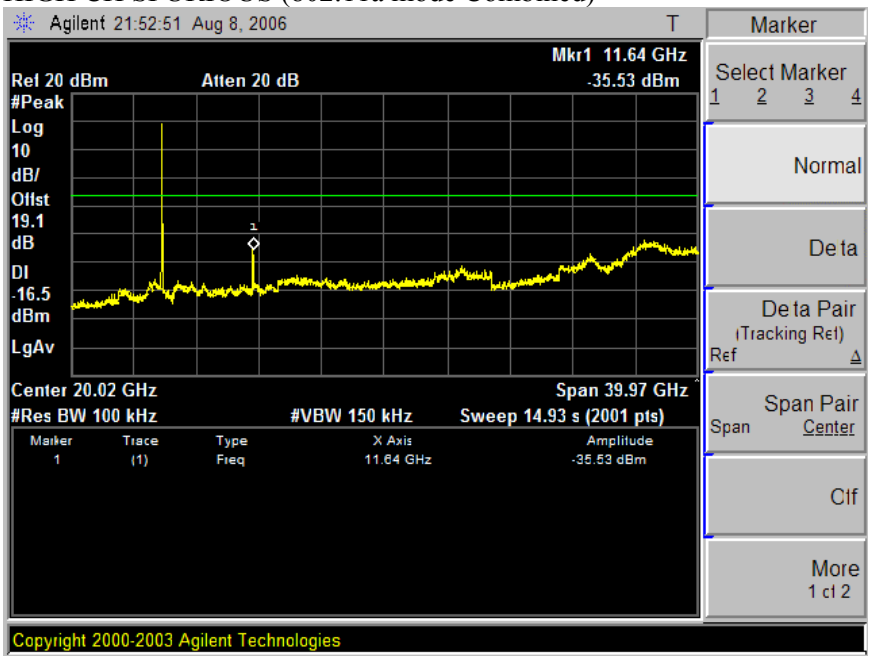
HIGH CH SPURIOUS (802.11a mode Combined)



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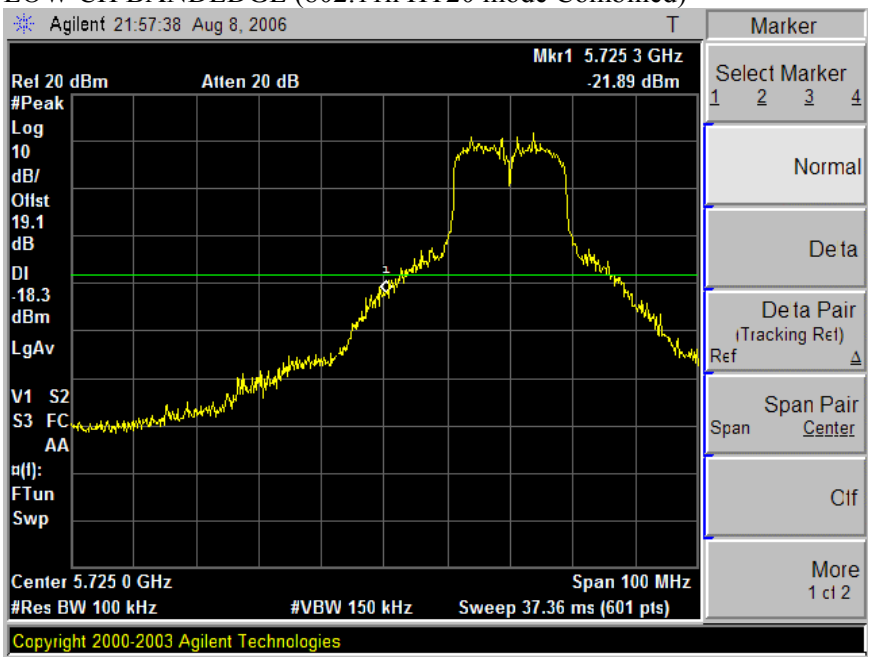
COMBINED SPURIOUS EMISSIONS (802.11n HT20 MODE)

LOW CH BANDEDGE (802.11n HT20 mode Combined)



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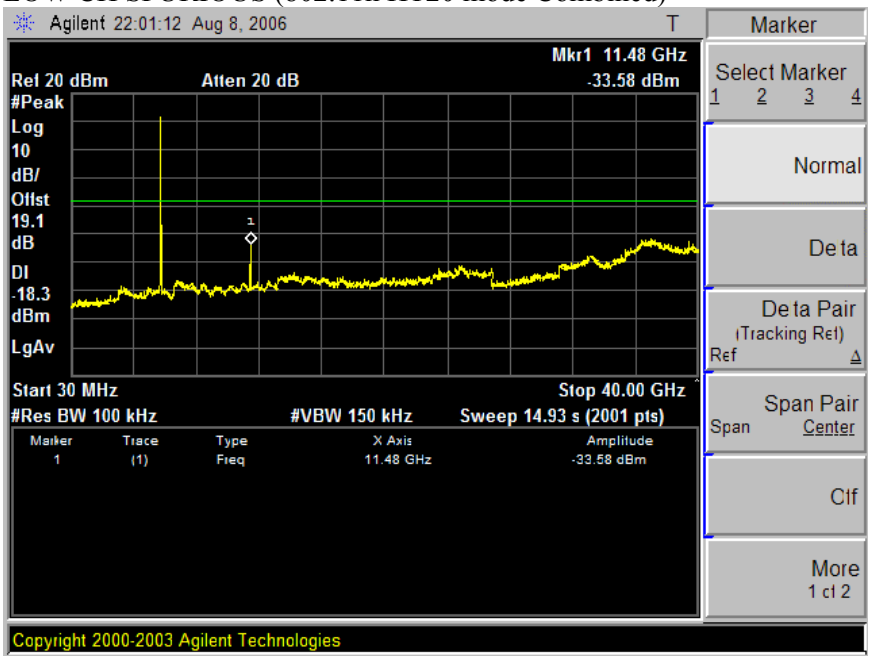
LOW CH SPURIOUS (802.11n HT20 mode Combined)



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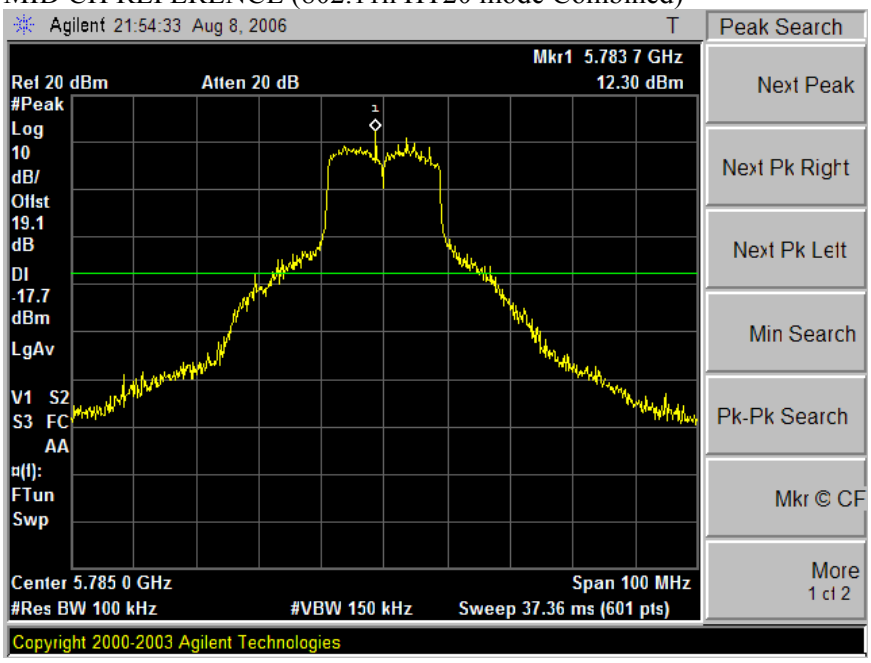
MID CH REFERENCE (802.11n HT20 mode Combined)



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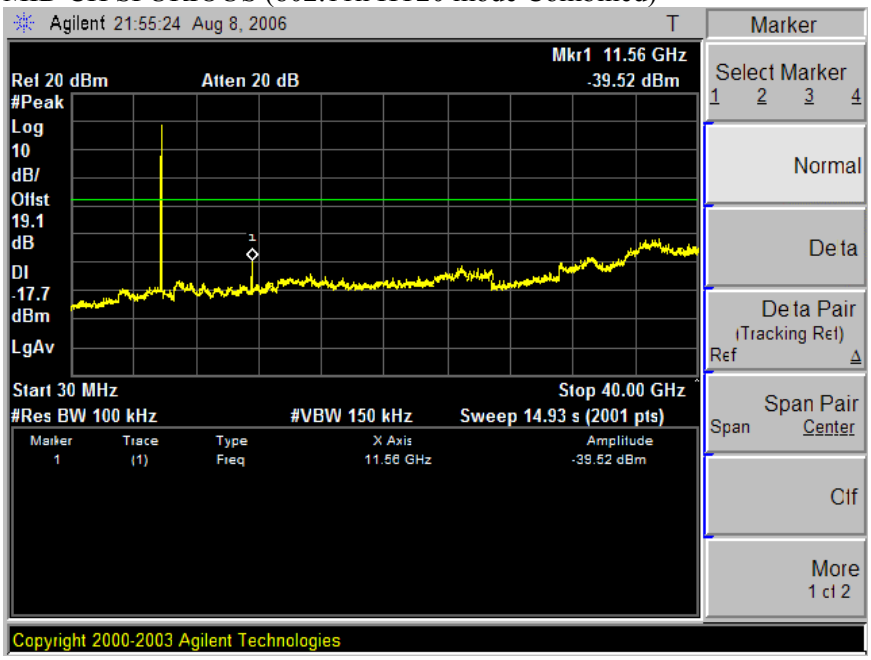
MID CH SPURIOUS (802.11n HT20 mode Combined)



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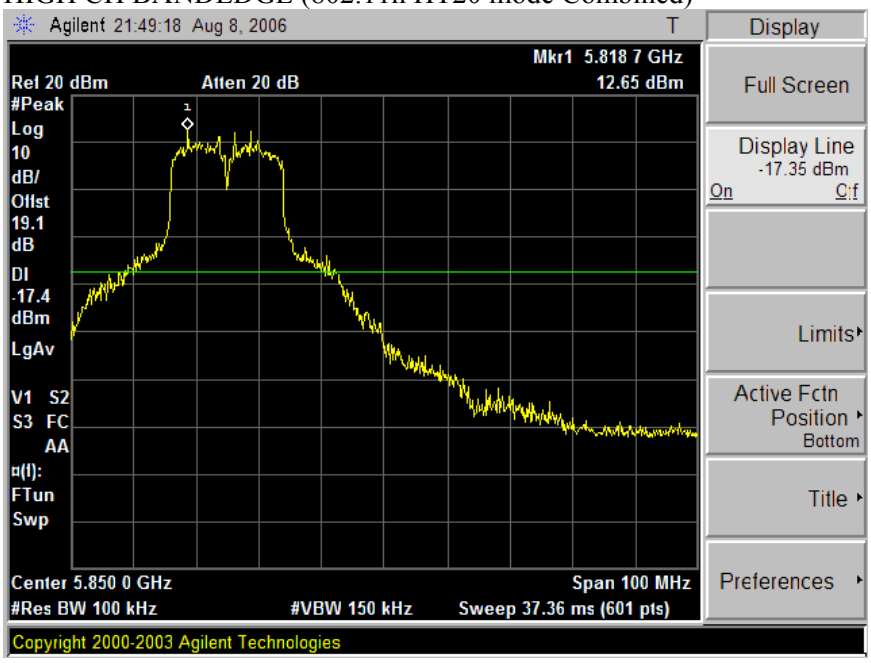
HIGH CH BANDEDGE (802.11n HT20 mode Combined)



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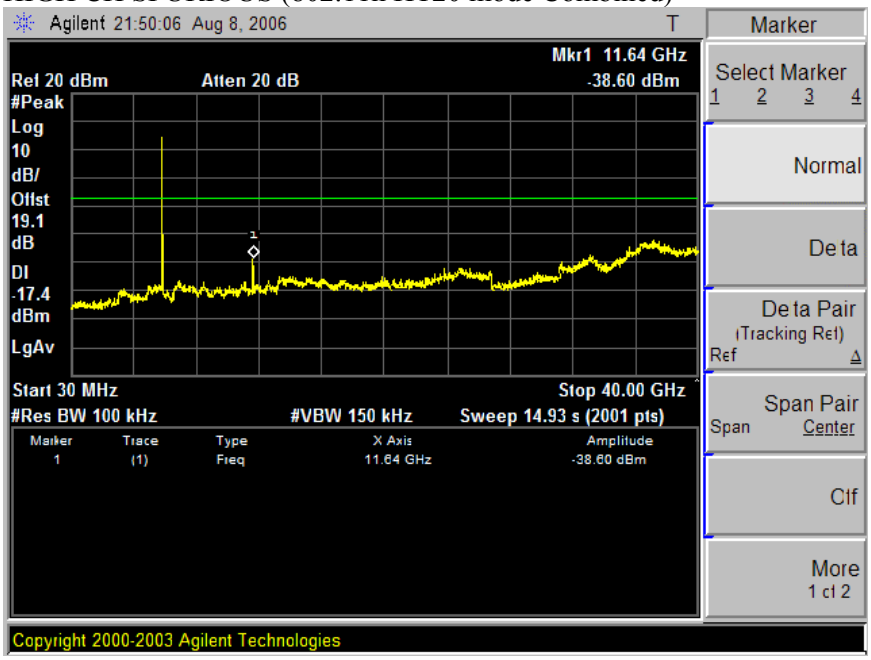
HIGH CH SPURIOUS (802.11n HT20 mode Combined)



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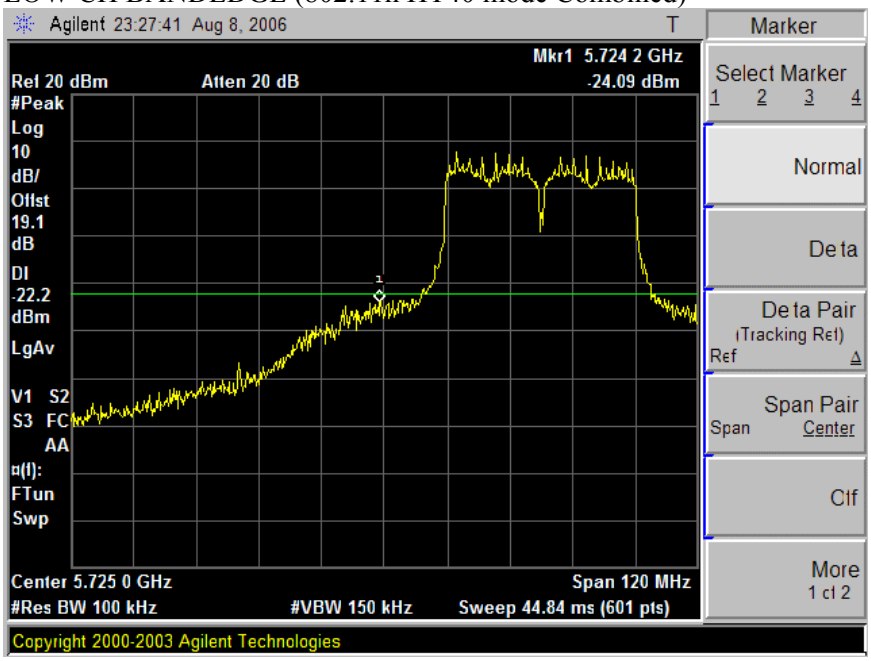
COMBINED SPURIOUS EMISSIONS (802.11 HT40 MODE)

LOW CH BANDEDGE (802.11n HT40 mode Combined)



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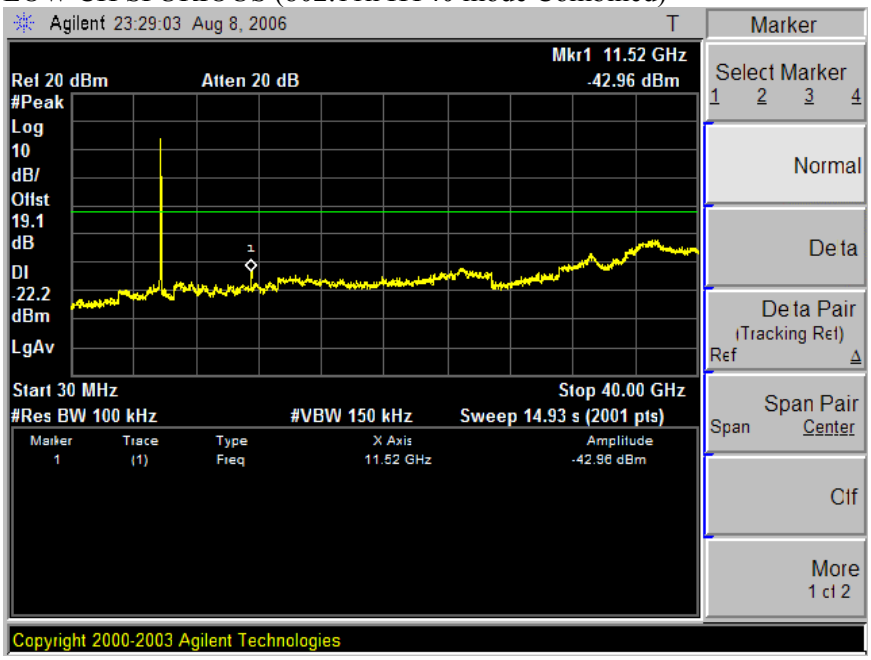
LOW CH SPURIOUS (802.11n HT40 mode Combined)



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HIGH CH BANDEDGE (802.11n HT40 mode Combined)

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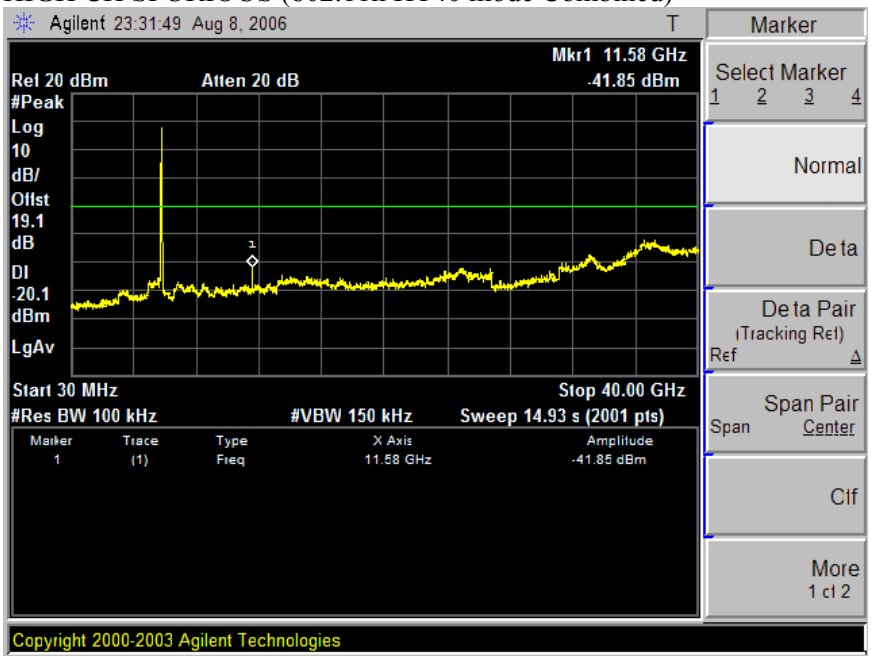
HIGH CH SPURIOUS (802.11n HT40 mode Combined)



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7.3. MAXIMUM PERMISSIBLE EXPOSURE

LIMITS

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*($900/f^2$)	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*($180/f^2$)	30

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)—Continued

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
30–300	27.5	0.073	0.2	30
300–1500			f/1500	30
1500–100,000			1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density
NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.
NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

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CALCULATIONS

Given

$E = \sqrt{(30 * P * G)} / d$

and

$S = E \wedge 2 / 3770$

where

E = Field Strength in Volts/meter
P = Power in Watts
G = Numeric antenna gain
d = Distance in meters
S = Power Density in milliwatts/square centimeter

Combining equations and rearranging the terms to express the distance as a function of the remaining variables yields:

$d = \sqrt{((30 * P * G) / (3770 * S))}$

Changing to units of Power to mW and Distance to cm, using:

P (mW) = P (W) / 1000 and
d (cm) =100 * d (m)

yields

$d = 100 * \sqrt{((30 * (P / 1000) * G) / (3770 * S))}$
$d = 0.282 * \sqrt{(P * G / S)}$

where

d = distance in cm
P = Power in mW
G = Numeric antenna gain
S = Power Density in mW/cm^2

Substituting the logarithmic form of power and gain using:

P (mW) = 10 ^ (P (dBm) / 10) and
G (numeric) = 10 ^ (G (dBi) / 10)

yields

$d = 0.282 * 10 \wedge ((P + G) / 20) / \sqrt{S}$

where

d = MPE distance in cm
P = Power in dBm
G = Antenna Gain in dBi
S = Power Density Limit in mW/cm^2

Rearranging terms to calculate the power density at a specific distance yields

$S = 0.0795 * 10 \wedge ((P + G) / 10) / (d^2)$

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LIMITS

From §1.1310 Table 1 (B), the maximum value of S = 1.0 mW/cm^2

RESULTS

No non-compliance noted: (MPE distance equals 20 cm)

Band (GHz)	MPE Distance (cm)	Total Power (dBm)	Antenna Gain (dBi)	Power Density (mW/cm^2)
2.4	20.0	23.56	-1.20	0.03
5.8	20.0	20.88	1.50	0.03

NOTE: For mobile or fixed location transmitters, the minimum separation distance is 20 cm, even if calculations indicate that the MPE distance would be less.

No non-compliance noted: (MPE distance is greater than 20 cm)

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7.4. RADIATED EMISSIONS

7.4.1. TRANSMITTER RADIATED SPURIOUS 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 - 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	([2])
13.36 - 13.41			

[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.

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§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.

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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 in 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 in each 5 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.

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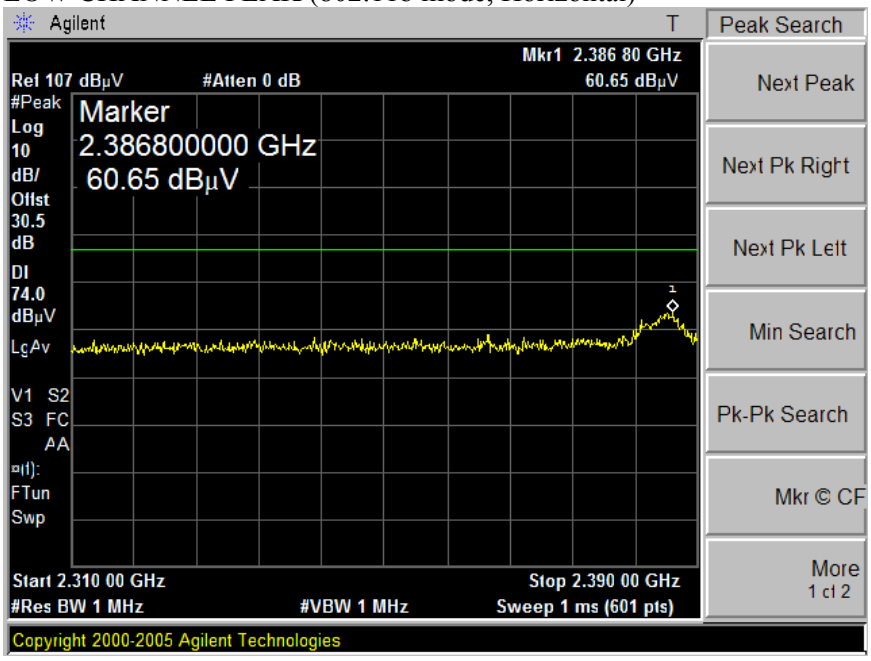
7.4.2. TRANSMITTER ABOVE 1 GHz FOR 2400 TO 2483.5 MHz BAND

RESTRICTED BANDEDGE (802.11b MODE, LOW CHANNEL)

LOW CHANNEL PEAK (802.11b mode, Horizontal)



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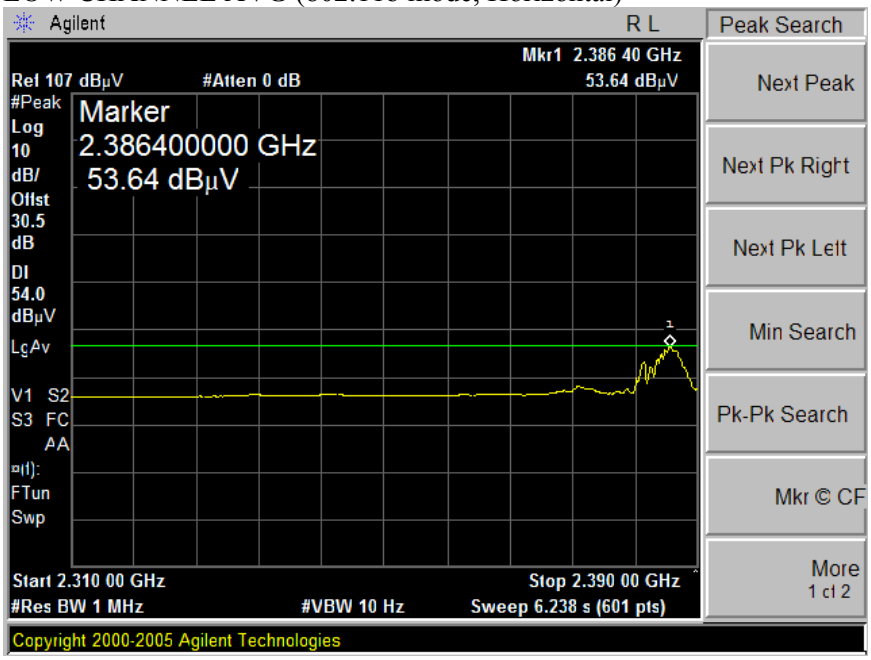
LOW CHANNEL AVG (802.11b mode, Horizontal)



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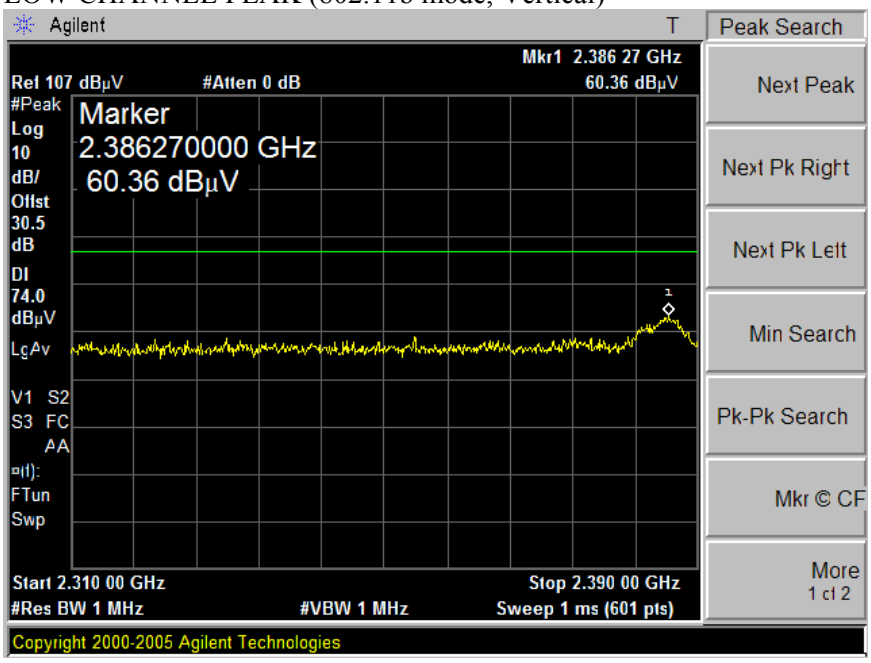
LOW CHANNEL PEAK (802.11b mode, Vertical)



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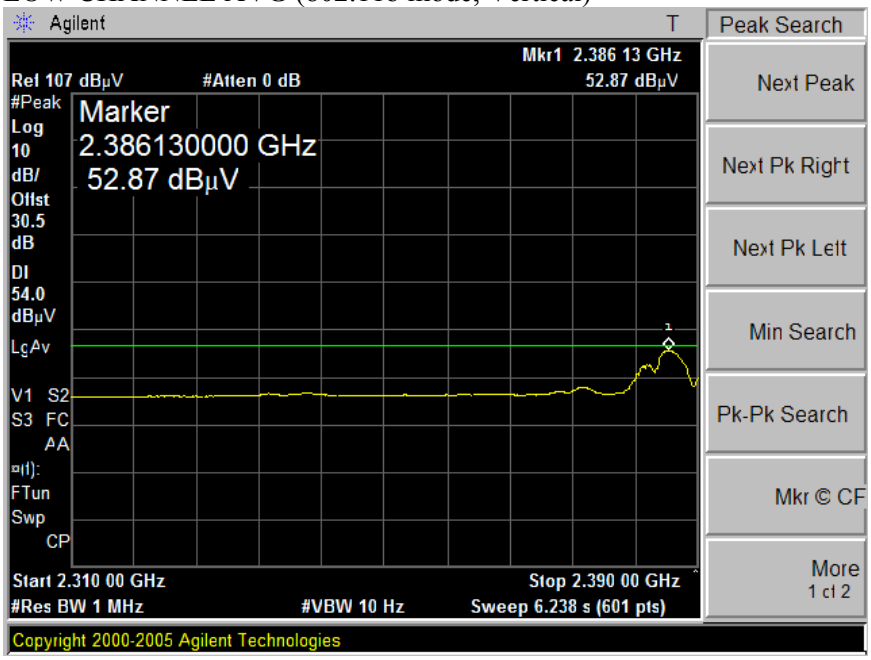
LOW CHANNEL AVG (802.11b mode, Vertical)



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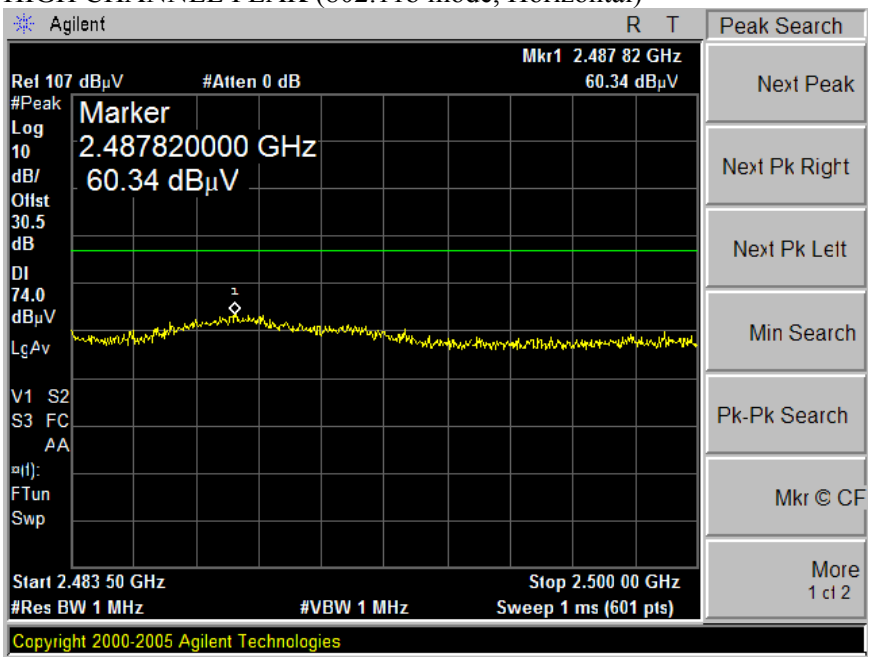
RESTRICTED BANDEDGE (802.11b MODE, HIGH CHANNEL)

HIGH CHANNEL PEAK (802.11b mode, Horizontal)



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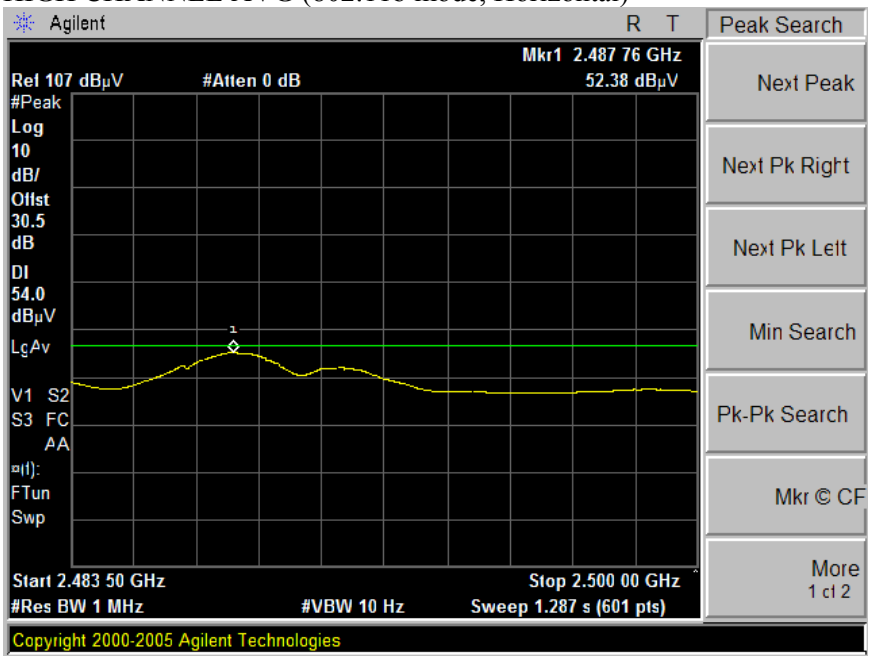
HIGH CHANNEL AVG (802.11b mode, Horizontal)



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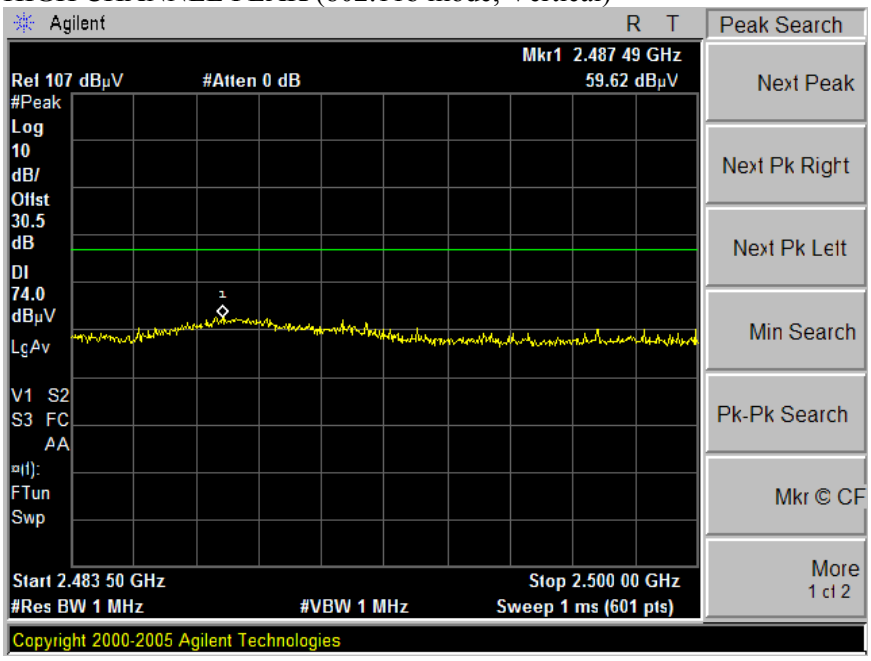
HIGH CHANNEL PEAK (802.11b mode, Vertical)



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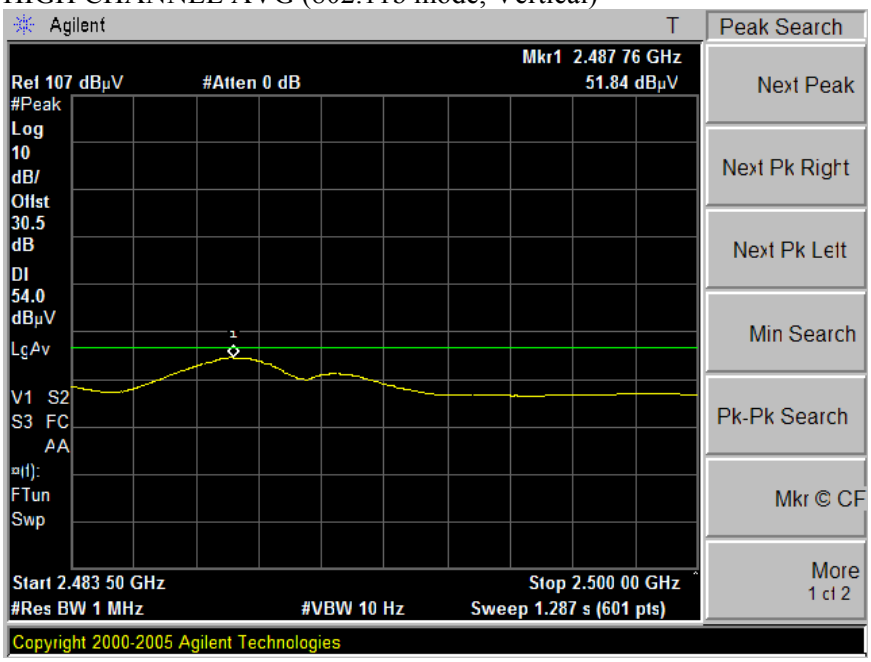
HIGH CHANNEL AVG (802.11b mode, Vertical)



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HARMONICS AND SPURIOUS EMISSIONS (802.11b MODE)

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

Company:Atheros
Project #:06U10485
Date:8/2/2006
Test Engineer:Chin Pang
Configuration:EUT/Laptop
Mode:TX, b mode

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T145 Agilent 3008A005(			FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
	Chin 197538001	Chin 200354001		R_001

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch, 2412MHz															
3rd card, base cover removed															
4.824	3.0	51.7	49.0	33.3	3.2	-34.8	0.0	0.0	53.4	50.7	74	54	-20.6	-3.3	V
4.824	3.0	52.0	47.0	33.3	3.2	-34.8	0.0	0.0	53.7	48.7	74	54	-20.3	-5.3	H
Mid h, 2437MHzC															
4.874	3.0	53.5	51.0	33.4	3.2	-34.9	0.0	0.0	55.2	52.7	74	54	-18.8	-1.3	V
7.311	3.0	51.0	38.0	35.0	3.6	-34.7	0.0	0.0	54.9	41.9	74	54	-19.1	-12.1	V
4.874	3.0	50.5	44.6	33.4	3.2	-34.9	0.0	0.0	52.2	46.3	74	54	-21.8	-7.7	H
7.311	3.0	52.5	39.6	35.0	3.6	-34.7	0.0	0.0	56.4	43.5	74	54	-17.6	-10.5	H
High Ch, 2462MHz															
4.924	3.0	51.6	49.0	33.4	3.2	-34.9	0.0	0.0	53.4	50.8	74	54	-20.6	-3.2	V
7.386	3.0	50.0	37.2	35.0	3.6	-34.6	0.0	0.0	54.0	41.2	74	54	-20.0	-12.8	V
4.924	3.0	53.0	50.5	33.4	3.2	-34.9	0.0	0.0	54.8	52.3	74	54	-19.2	-1.7	H
7.386	3.0	50.1	37.3	35.0	3.6	-34.6	0.0	0.0	54.1	41.3	74	54	-19.9	-12.7	H

Rev. 5.1.6
Note: 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		

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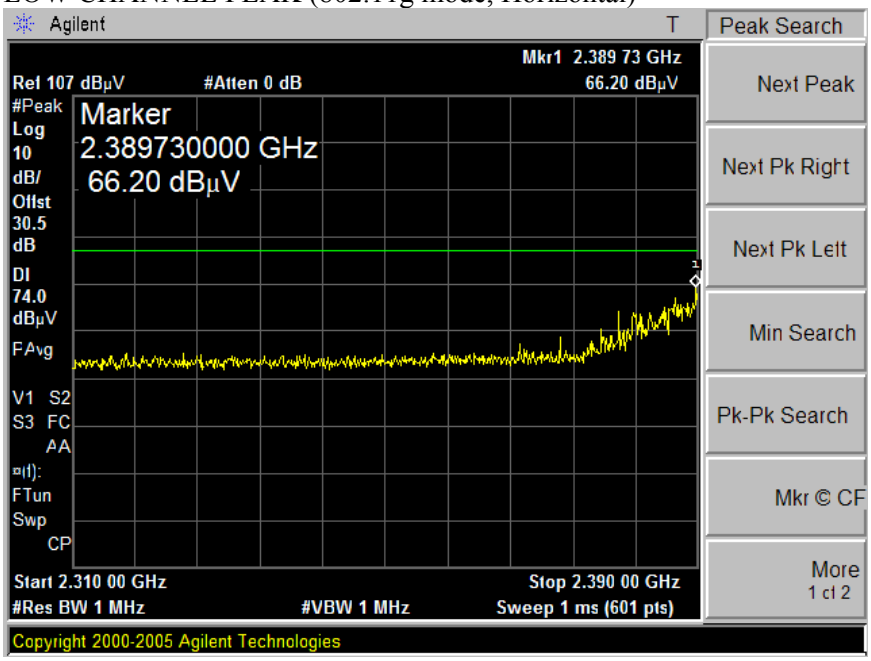
RESTRICTED BANDEDGE (802.11g MODE, LOW CHANNEL)

LOW CHANNEL PEAK (802.11g mode, Horizontal)



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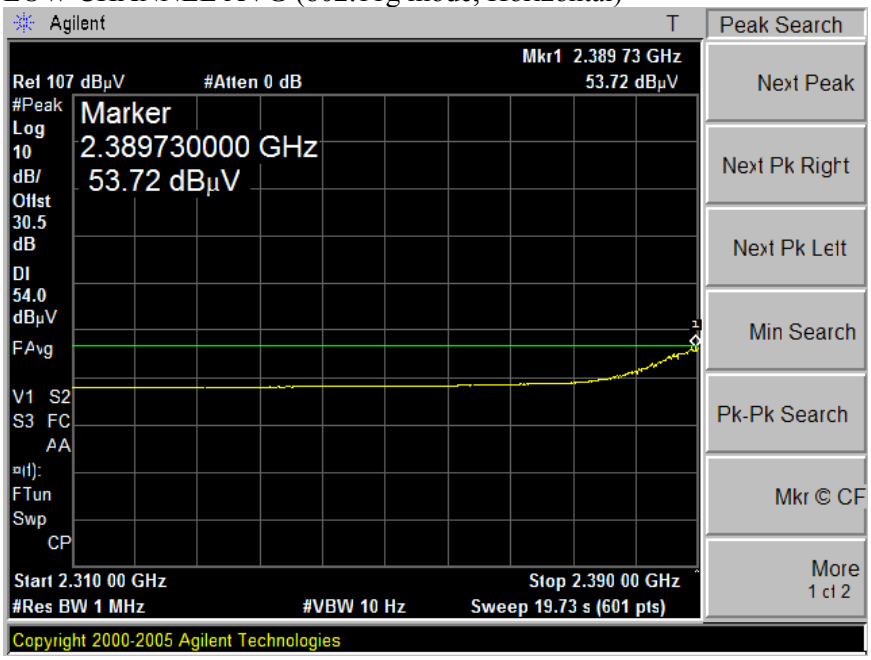
LOW CHANNEL AVG (802.11g mode, Horizontal)



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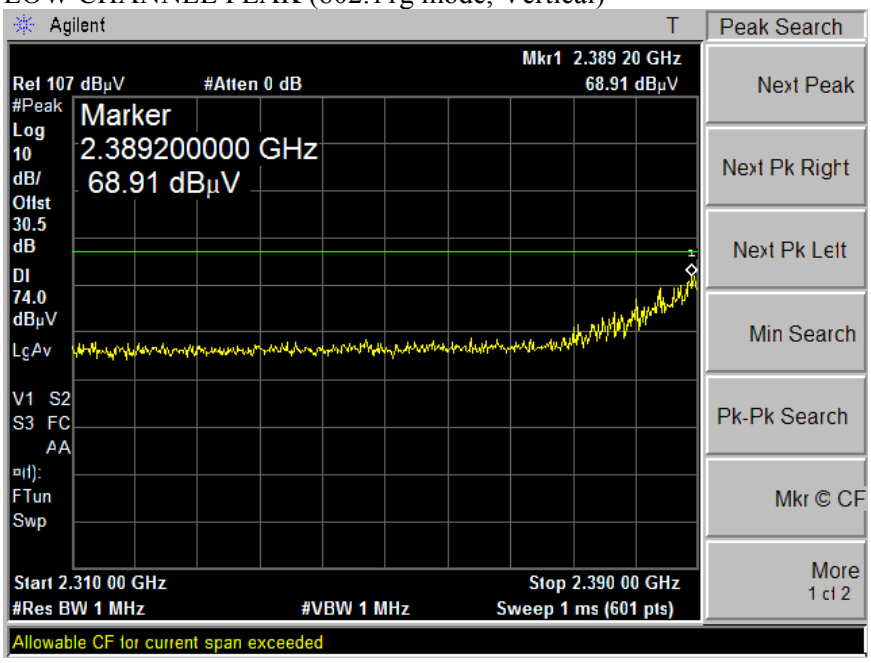
LOW CHANNEL PEAK (802.11g mode, Vertical)



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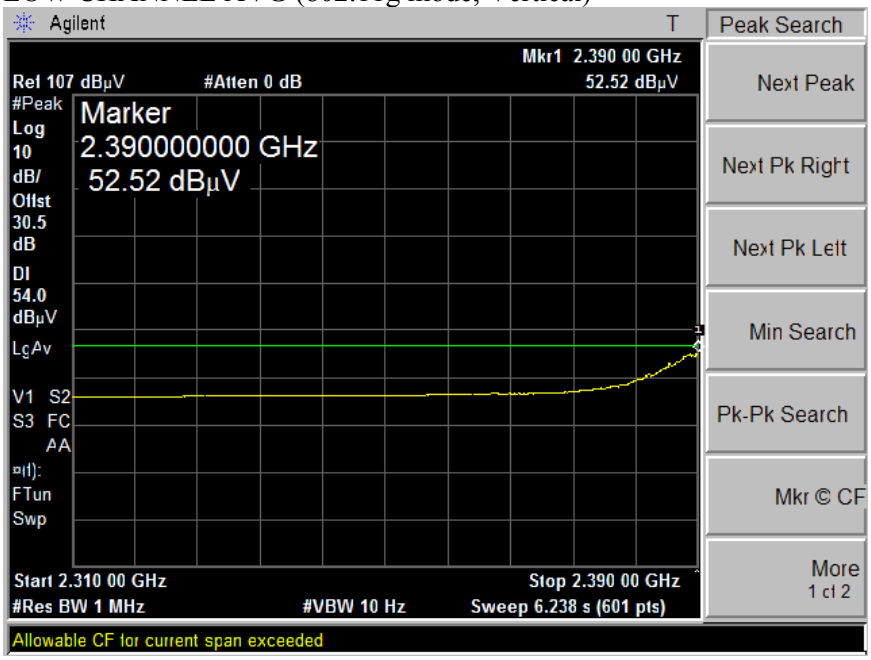
LOW CHANNEL AVG (802.11g mode, Vertical)



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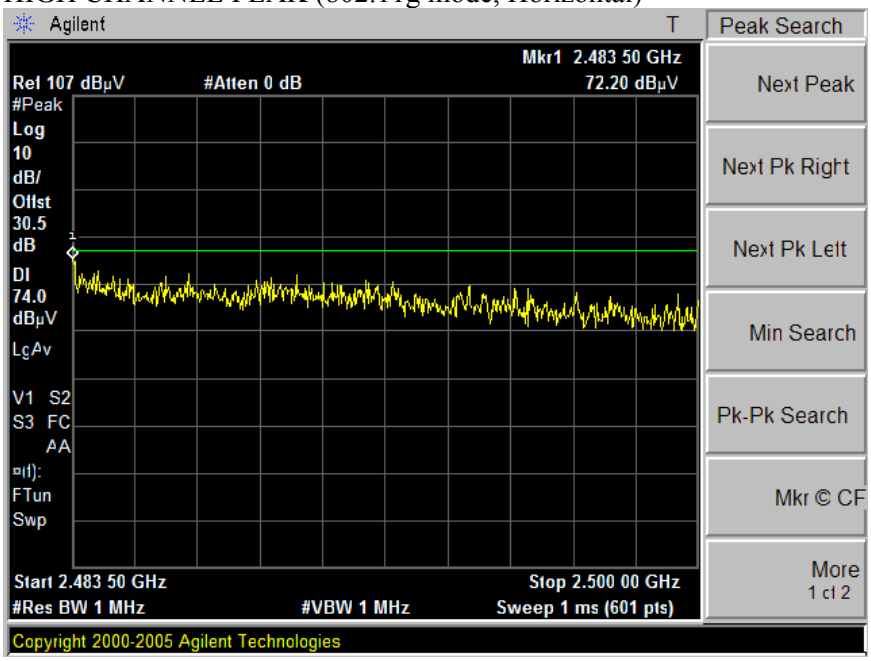
RESTRICTED BANDEDGE (802.11g MODE, HIGH CHANNEL)

HIGH CHANNEL PEAK (802.11g mode, Horizontal)



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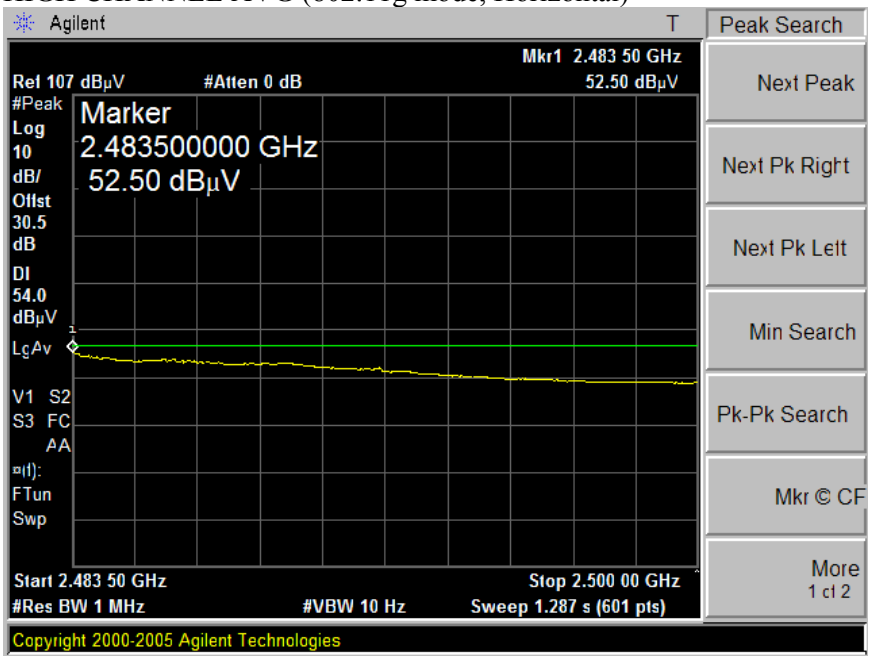
HIGH CHANNEL AVG (802.11g mode, Horizontal)



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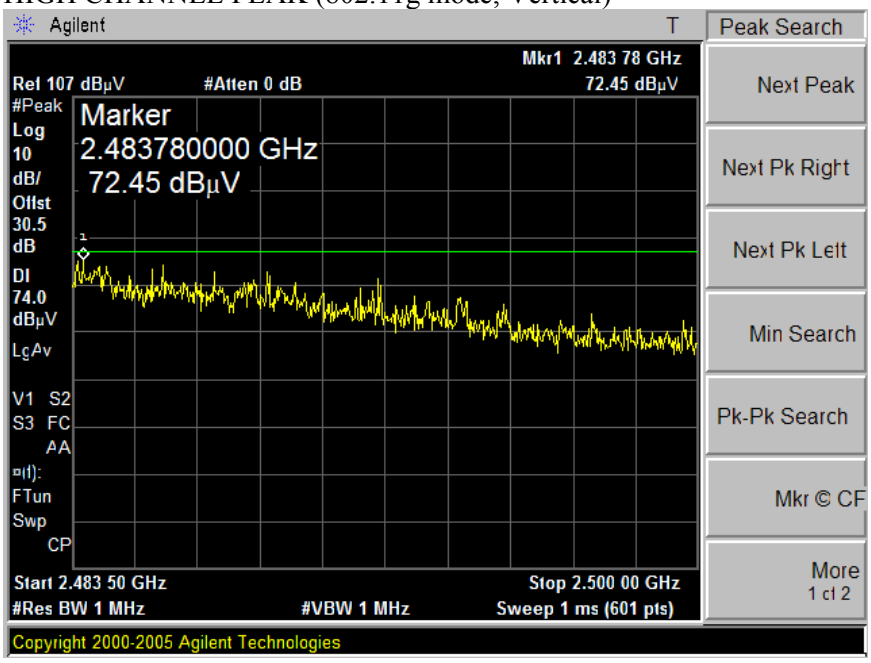
HIGH CHANNEL PEAK (802.11g mode, Vertical)



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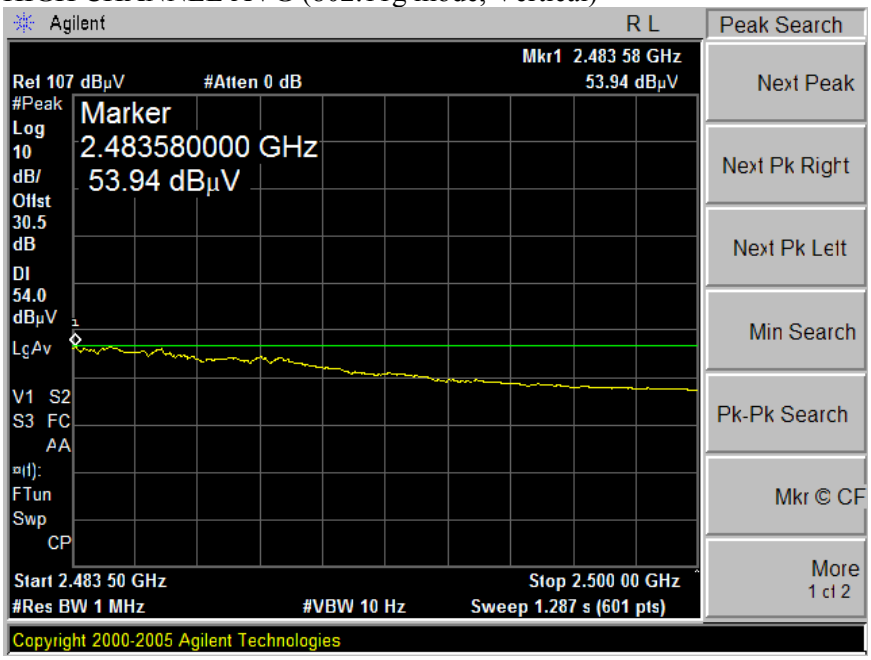
HIGH CHANNEL AVG (802.11g mode, Vertical)



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HARMONICS AND SPURIOUS EMISSIONS (802.11g MODE)

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

Company:Atheros
Project #:06U10485
Date:8/2/2006
Test Engineer:Chin Pang
Configuration:EUT/Laptop
Mode:TX, g mode

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T145 Agilent 3008A005(			FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
	Chin 197538001	Chin 200354001		R_001

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch, 2412MHz															
4.824	3.0	58.0	43.5	33.3	3.2	-34.8	0.0	0.0	59.7	45.2	74	54	-14.3	-8.8	V
4.824	3.0	59.4	45.0	33.3	3.2	-34.8	0.0	0.0	61.1	46.7	74	54	-12.9	-7.3	H
Mid h, 2437MHzC															
4.874	3.0	59.0	45.5	33.4	3.2	-34.9	0.0	0.0	60.7	47.2	74	54	-13.3	-6.8	V
7.311	3.0	50.0	34.0	35.0	3.6	-34.7	0.0	0.0	53.9	37.9	74	54	-20.1	-16.1	V
4.874	3.0	63.3	50.0	33.4	3.2	-34.9	0.0	0.0	65.0	51.7	74	54	-9.0	-2.3	H
7.311	3.0	52.0	34.3	35.0	3.6	-34.7	0.0	0.0	55.9	38.2	74	54	-18.1	-15.8	H
High Ch, 2462MHz															
4.924	3.0	59.5	45.0	33.4	3.2	-34.9	0.0	0.0	61.3	46.8	74	54	-12.7	-7.2	V
7.386	3.0	52.0	36.0	35.0	3.6	-34.6	0.0	0.0	56.0	40.0	74	54	-18.0	-14.0	V
4.924	3.0	62.0	48.5	33.4	3.2	-34.9	0.0	0.0	63.8	50.3	74	54	-10.2	-3.7	H
7.386	3.0	53.0	35.2	35.0	3.6	-34.6	0.0	0.0	57.0	39.2	74	54	-17.0	-14.8	H

Rev. 5.1.6
Note: 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		

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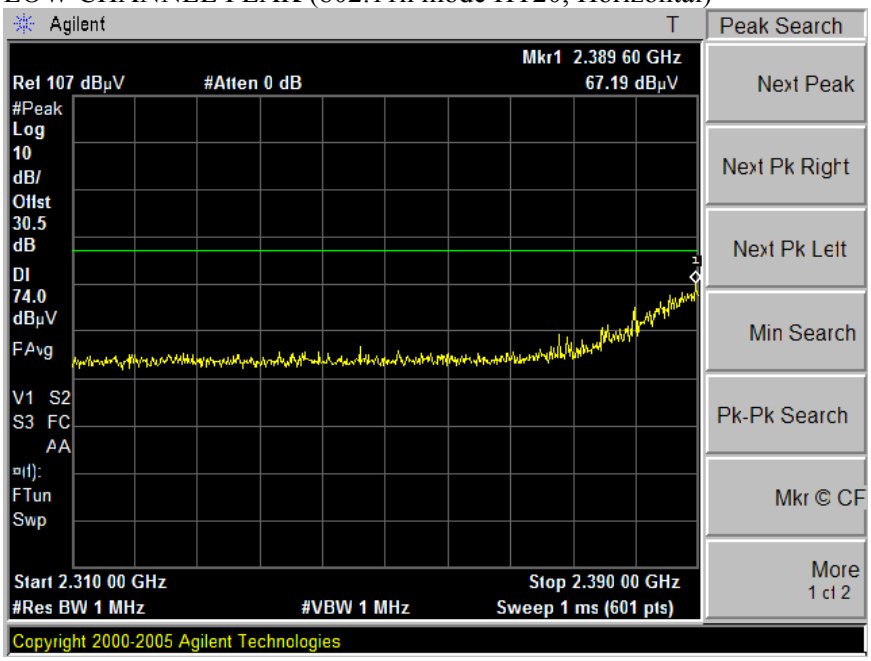
RESTRICTED BANDEDGE (802.11n MODE HT20, LOW CHANNEL)

LOW CHANNEL PEAK (802.11n mode HT20, Horizontal)



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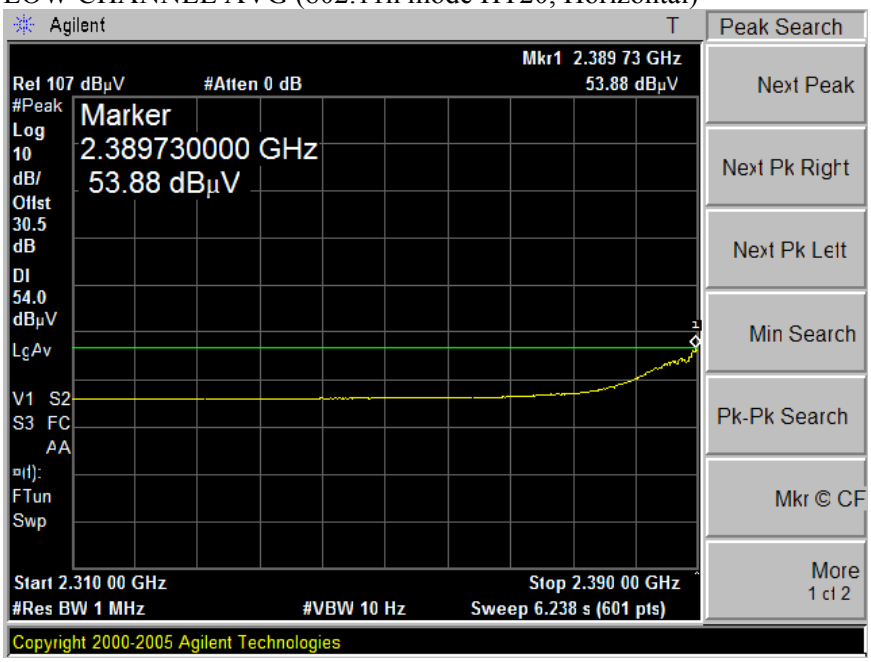
LOW CHANNEL AVG (802.11n mode HT20, Horizontal)



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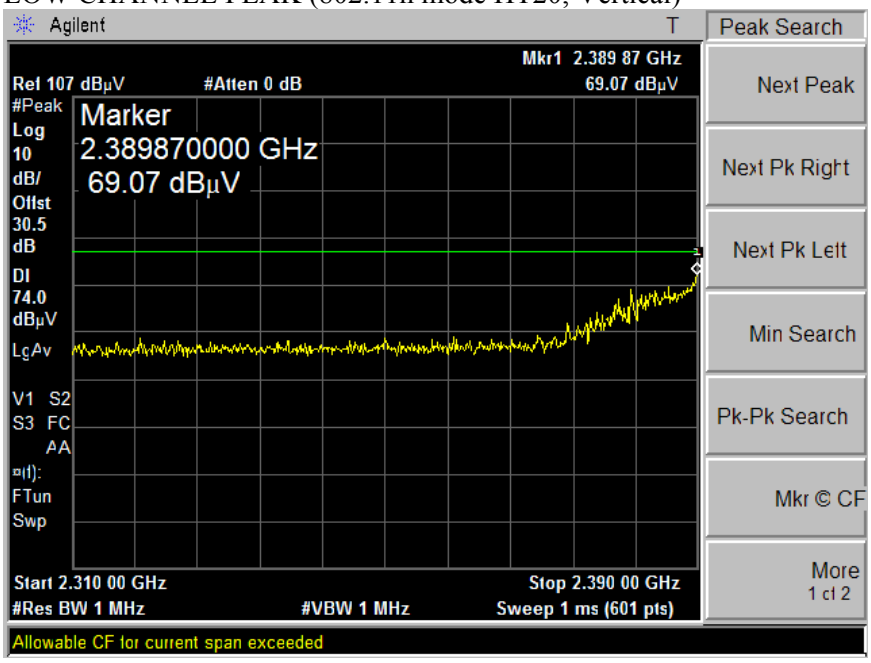
LOW CHANNEL PEAK (802.11n mode HT20, Vertical)



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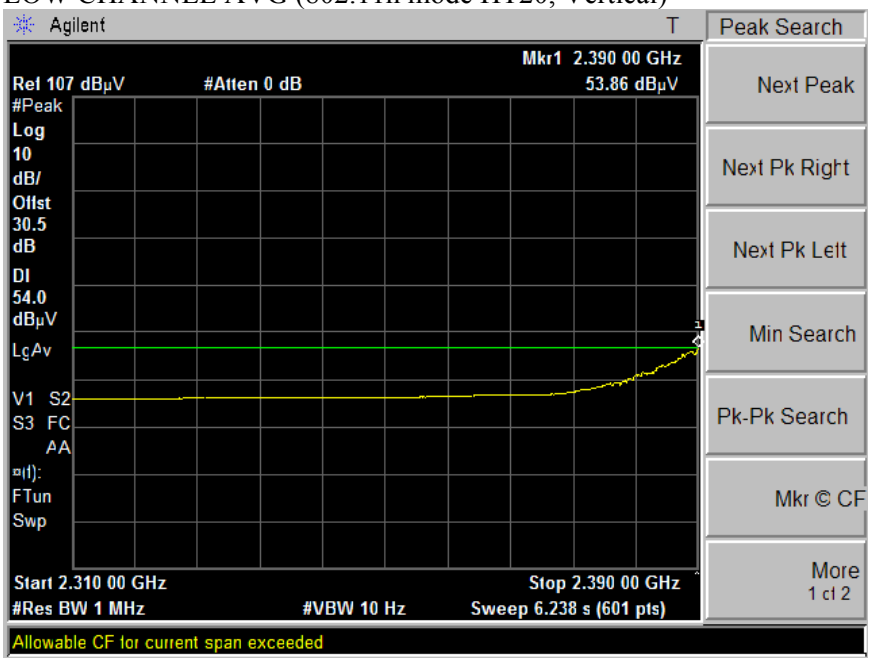
LOW CHANNEL AVG (802.11n mode HT20, Vertical)



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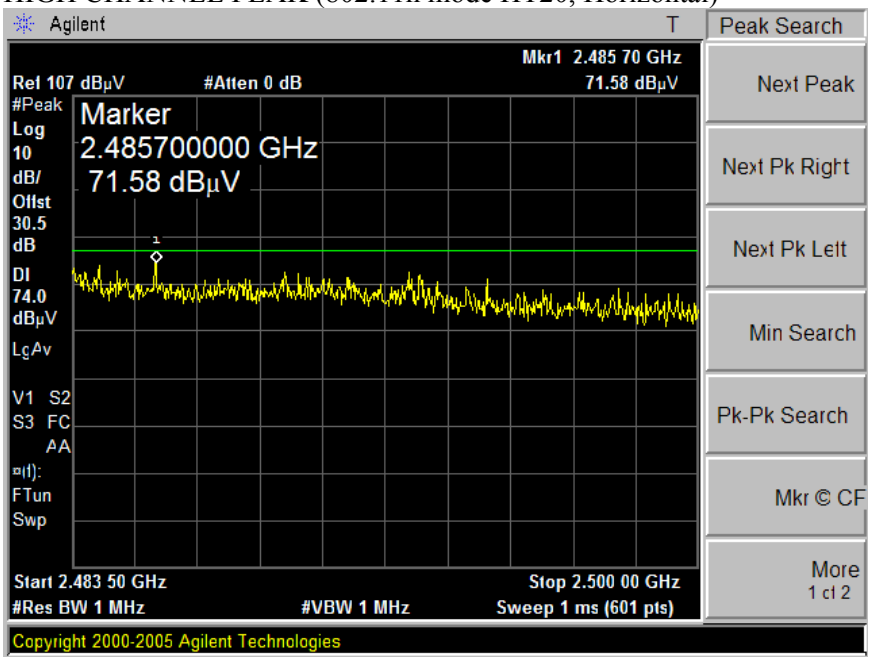
RESTRICTED BANDEDGE (802.11n MODE HT20, HIGH CHANNEL)

HIGH CHANNEL PEAK (802.11n mode HT20, Horizontal)



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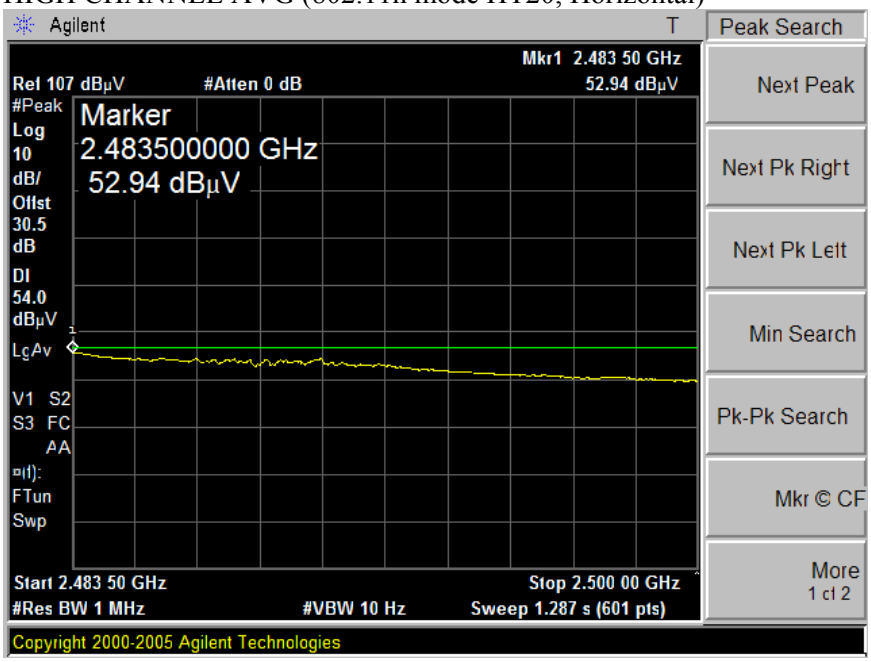
HIGH CHANNEL AVG (802.11n mode HT20, Horizontal)



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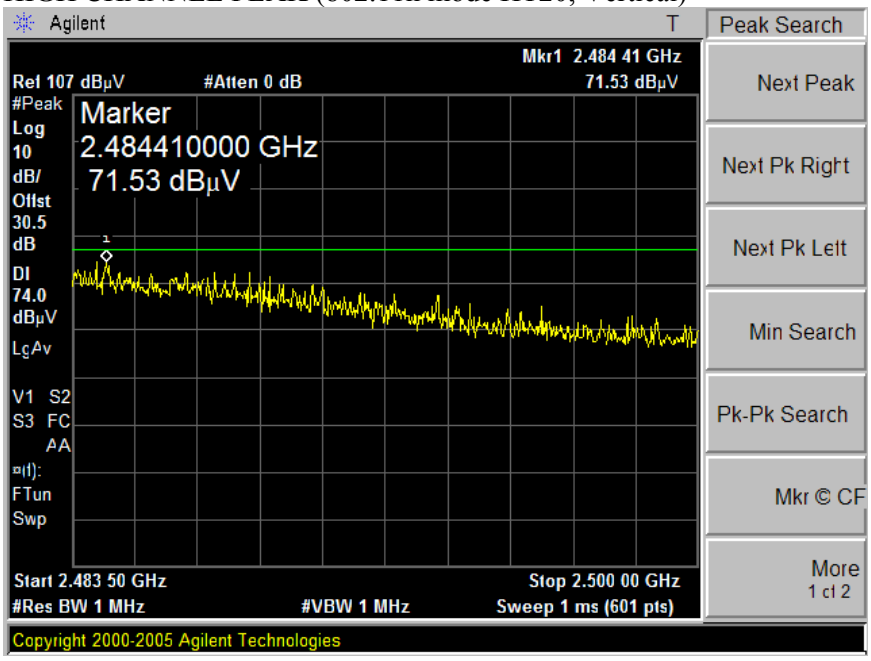
HIGH CHANNEL PEAK (802.11n mode HT20, Vertical)



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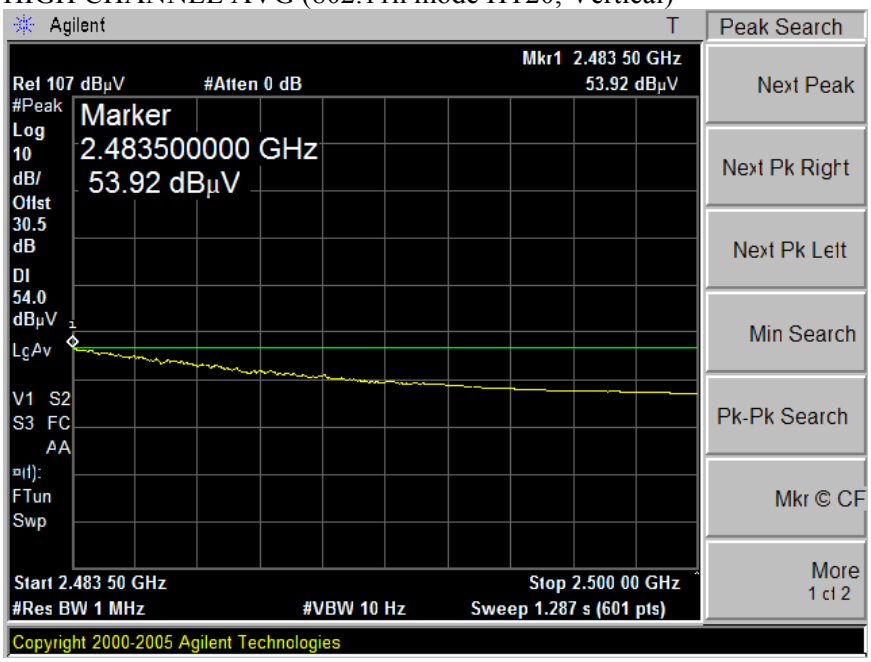
HIGH CHANNEL AVG (802.11n mode HT20, Vertical)



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HARMONICS AND SPURIOUS EMISSIONS (802.11n MODE HT20)

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

Company:Atheros
Project #:06U10485
Date:8/2/2006
Test Engineer:Chin Pang
Configuration:EUT/Laptop
Mode:TX, HT20 mode

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T145 Agilent 3008A005(			FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
	Chin 197538001	Chin 200354001		R_001

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch, 2412MHz															
4.824	3.0	57.0	41.0	33.3	3.2	-34.8	0.0	0.0	58.7	42.7	74	54	-15.3	-11.3	V
4.824	3.0	61.3	46.0	33.3	3.2	-34.8	0.0	0.0	63.0	47.7	74	54	-11.0	-6.3	H
Mid h, 2437MHzC															
4.874	3.0	59.0	45.5	33.4	3.2	-34.9	0.0	0.0	60.7	47.2	74	54	-13.3	-6.8	V
7.311	3.0	50.0	34.0	35.0	3.6	-34.7	0.0	0.0	53.9	37.9	74	54	-20.1	-16.1	V
4.874	3.0	63.0	49.0	33.4	3.2	-34.9	0.0	0.0	64.7	50.7	74	54	-9.3	-3.3	H
7.311	3.0	51.3	34.0	35.0	3.6	-34.7	0.0	0.0	55.2	37.9	74	54	-18.8	-16.1	H
High Ch, 2462MHz															
4.924	3.0	60.0	45.6	33.4	3.2	-34.9	0.0	0.0	61.8	47.4	74	54	-12.2	-6.6	V
7.386	3.0	50.6	35.0	35.0	3.6	-34.6	0.0	0.0	54.6	39.0	74	54	-19.4	-15.0	V
4.924	3.0	63.5	48.0	33.4	3.2	-34.9	0.0	0.0	65.3	49.8	74	54	-8.7	-4.2	H
7.386	3.0	52.0	34.4	35.0	3.6	-34.6	0.0	0.0	56.0	38.4	74	54	-18.0	-15.6	H

Rev. 5.1.6
Note: 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		

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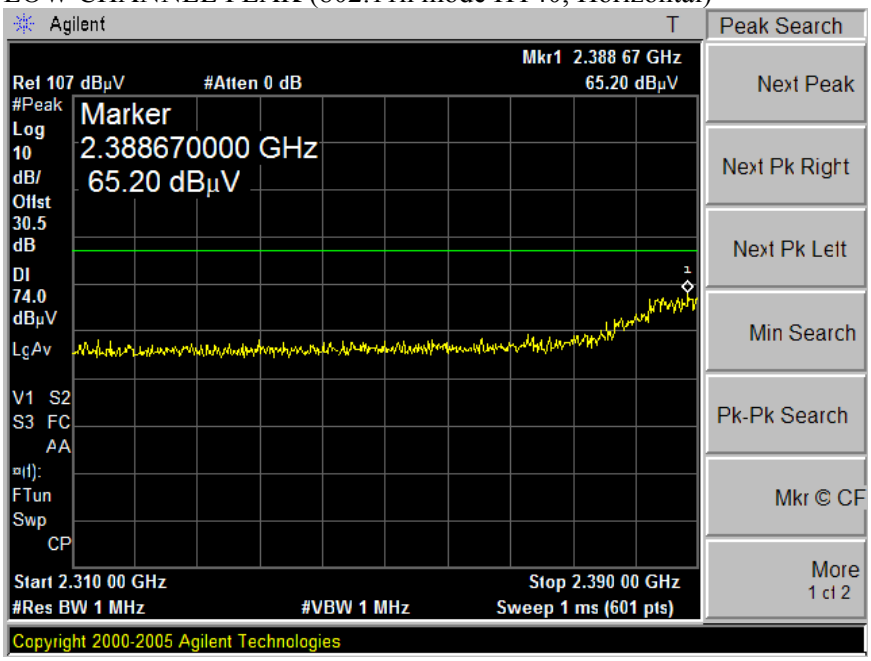
RESTRICTED BANDEDGE (802.11n MODE HT40, LOW CHANNEL)

LOW CHANNEL PEAK (802.11n mode HT40, Horizontal)



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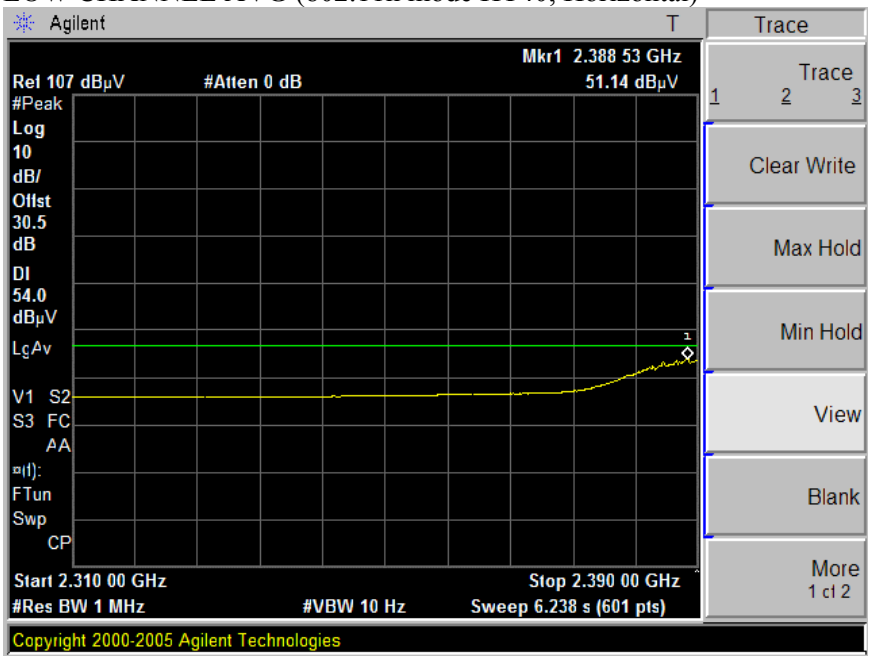
LOW CHANNEL AVG (802.11n mode HT40, Horizontal)



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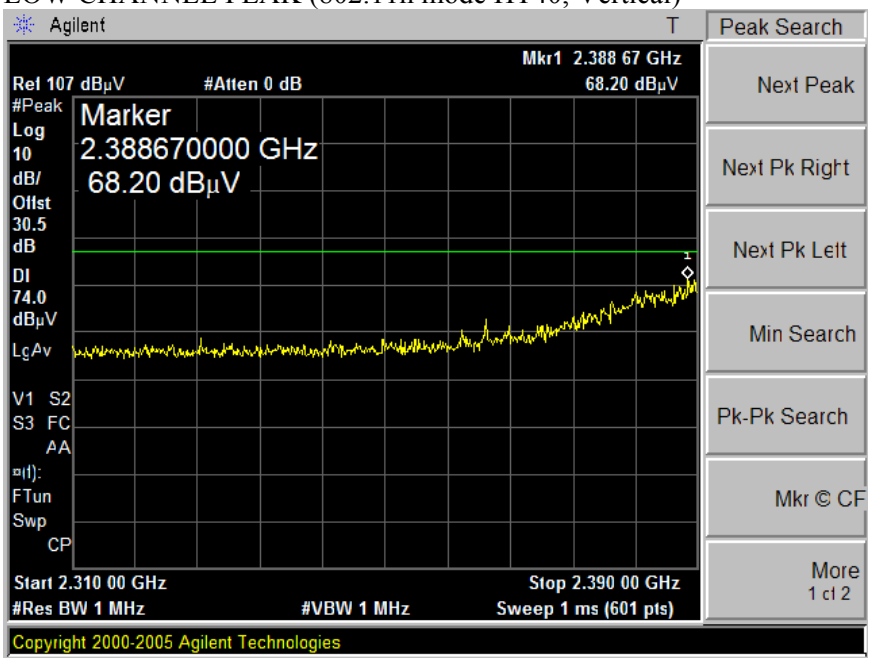
LOW CHANNEL PEAK (802.11n mode HT40, Vertical)



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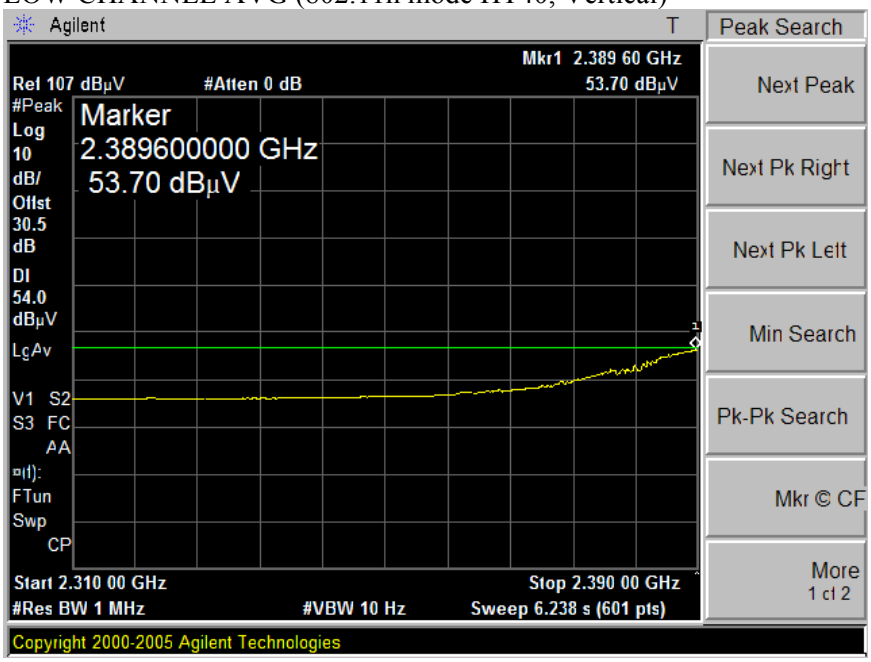
LOW CHANNEL AVG (802.11n mode HT40, Vertical)



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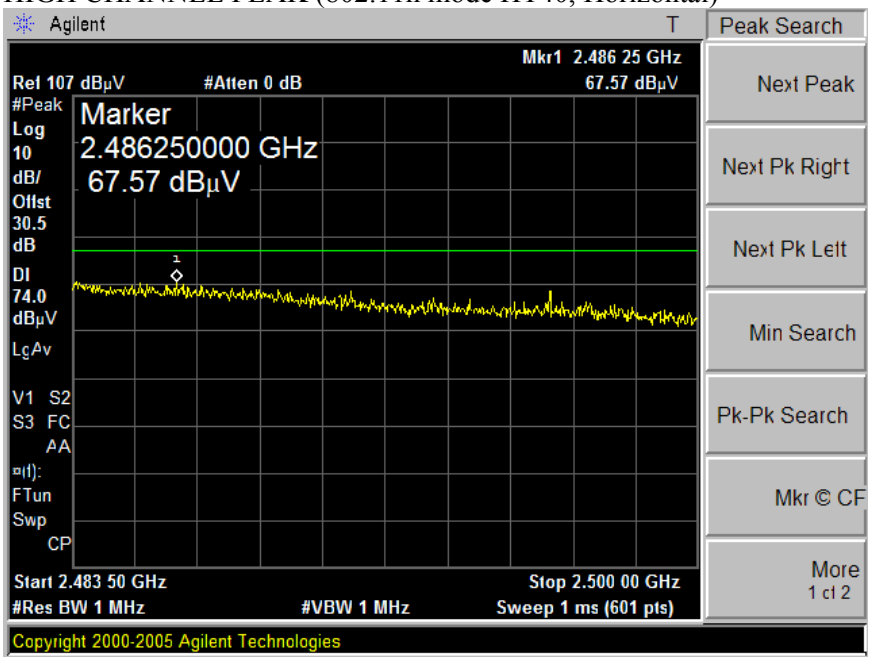
RESTRICTED BANDEDGE (802.11n MODE HT40, HIGH CHANNEL)

HIGH CHANNEL PEAK (802.11n mode HT40, Horizontal)



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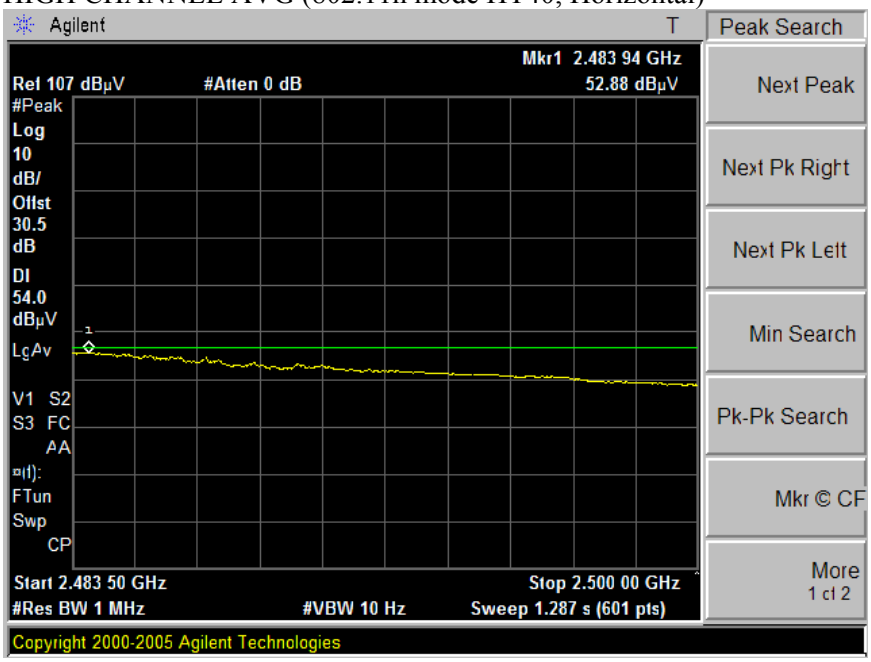
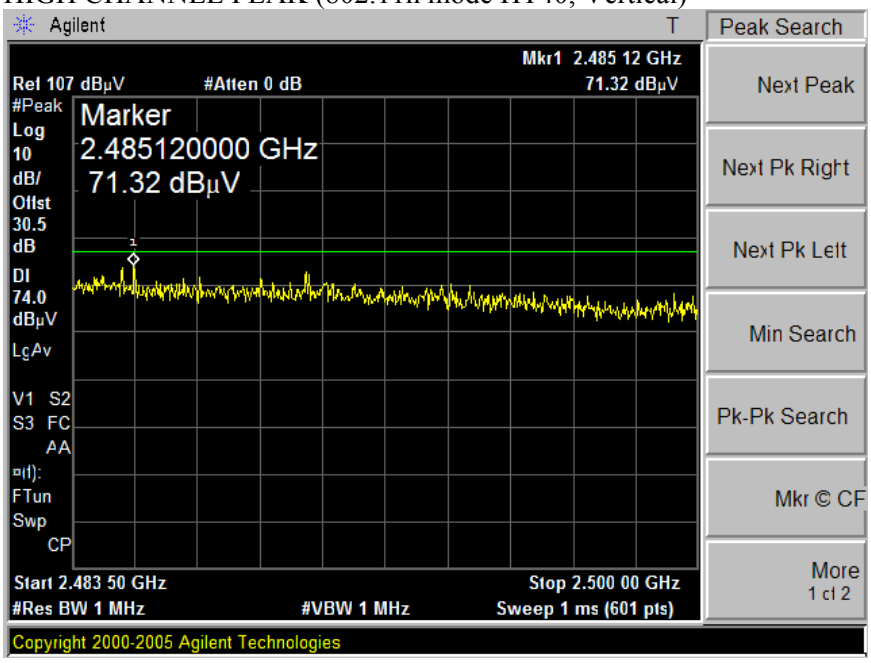
HIGH CHANNEL AVG (802.11n mode HT40, Horizontal)



This report shall not be reproduced except in full, without the written approval of CCS.

HIGH CHANNEL PEAK (802.11n mode HT40, Vertical)



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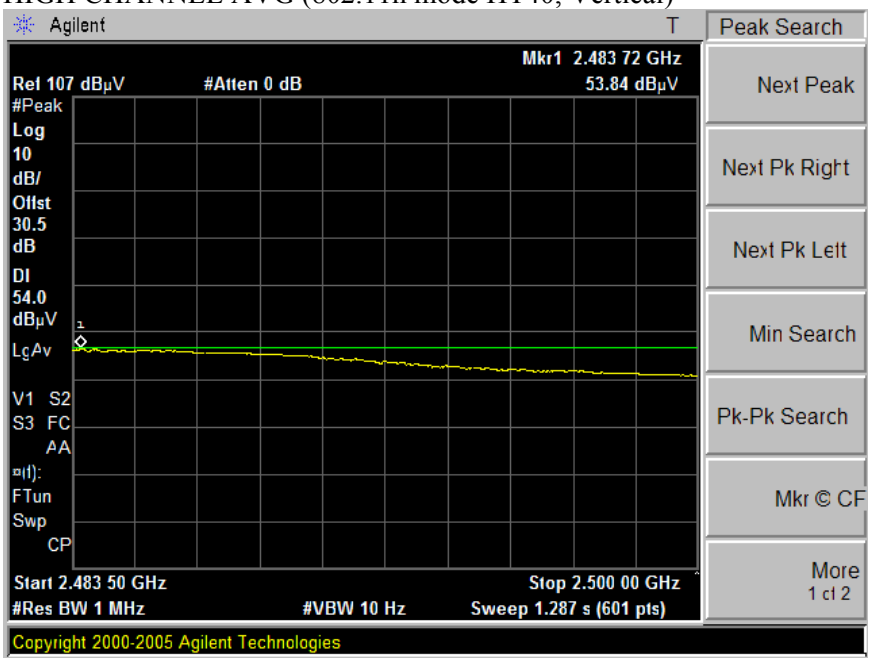
HIGH CHANNEL AVG (802.11n mode HT40, Vertical)



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HARMONICS AND SPURIOUS EMISSIONS (802.11n MODE HT40)

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

Company:Atheros
Project #:06U10485
Date:8/2/2006
Test Engineer:Chin Pang
Configuration:EUT/Laptop
Mode:TX, HT40 mode

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T145 Agilent 3008A005(			FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
	Chin 197538001	Chin 200354001		R_001

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch, 2422MHz															
4.844	3.0	55.0	42.0	33.3	3.2	-34.8	0.0	0.0	56.7	43.7	74	54	-17.3	-10.3	V
4.844	3.0	59.0	45.0	33.3	3.2	-34.8	0.0	0.0	60.7	46.7	74	54	-13.3	-7.3	H
Mid h, 2437MHzC															
4.874	3.0	59.0	44.0	33.4	3.2	-34.9	0.0	0.0	60.7	45.7	74	54	-13.3	-8.3	V
7.311	3.0	48.0	34.0	35.0	3.6	-34.7	0.0	0.0	51.9	37.9	74	54	-22.1	-16.1	V
4.874	3.0	60.3	45.7	33.4	3.2	-34.9	0.0	0.0	62.0	47.4	74	54	-12.0	-6.6	H
7.311	3.0	49.5	34.7	35.0	3.6	-34.7	0.0	0.0	53.4	38.6	74	54	-20.6	-15.4	H
High Ch, 2452MHz															
4.904	3.0	56.0	42.0	33.4	3.2	-34.9	0.0	0.0	57.8	43.8	74	54	-16.2	-10.2	V
7.356	3.0	48.5	34.5	35.0	3.6	-34.6	0.0	0.0	52.5	38.5	74	54	-21.5	-15.5	V
4.924	3.0	60.0	46.0	33.4	3.2	-34.9	0.0	0.0	61.8	47.8	74	54	-12.2	-6.2	H
7.356	3.0	48.0	34.0	35.0	3.6	-34.6	0.0	0.0	52.0	38.0	74	54	-22.0	-16.0	H

Rev. 5.1.6
Note: 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		

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7.4.3. TRANSMITTER ABOVE 1 GHz FOR 5725 TO 5850 MHz BAND

HARMONICS AND SPURIOUS EMISSIONS (802.11a MODE)

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

Company:Atheros
Project #:06U10485
Date: 8/02/2006
Test Engineer:Chin Pang
Configuration:EUT/Laptop
Mode:Legacy mode, 5.8GHz Band

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T145 Agilent 3008A005(	T88 Miteq 26-40GHz	T89; ARA 18-26GHz; S/N:1049	FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
	Chin 197538001	Chin 200354001	HPF_7.6GHz	

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch, 5745MHz															
11.490	3.0	55.0	42.0	37.5	4.4	-33.1	0.0	0.7	64.5	51.5	74	54	-9.5	-2.5	V
11.490	3.0	49.5	36.4	37.5	4.4	-33.1	0.0	0.7	59.0	45.9	74	54	-15.0	-8.1	H
Mid Ch, 5785MHz															
11.570	3.0	53.0	41.5	37.5	4.4	-33.0	0.0	0.7	62.6	51.1	74	54	-11.4	-2.9	V
11.570	3.0	50.0	37.6	37.5	4.4	-33.0	0.0	0.7	59.6	47.2	74	54	-14.4	-6.8	H
High Ch, 5825MHz															
11.650	3.0	50.0	38.0	37.5	4.4	-32.9	0.0	0.7	59.8	47.8	74	54	-14.2	-6.2	V
11.650	3.0	49.0	36.5	37.5	4.4	-32.9	0.0	0.7	58.8	46.3	74	54	-15.2	-7.7	H

Rev. 5.1.6
Note: 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		

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HARMONICS AND SPURIOUS EMISSIONS (802.11n MODE HT20)

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

Company:Atheros
Project #:06U10485
Date:8/02/2006
Test Engineer:Chin Pang
Configuration:EUT/Laptop
Mode:a mode, HT20, 5.8GHz Band

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T145 Agilent 3008A005(	T88 Miteq 26-40GHz	T89; ARA 18-26GHz; S/N:1049	FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
	Chin 197538001	Chin 200354001	HPF_7.6GHz	

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch, 5745MHz															
11.490	3.0	56.0	42.6	37.5	4.4	-33.1	0.0	0.7	65.5	52.1	74	54	-8.5	-1.9	V
11.490	3.0	54.8	42.0	37.5	4.4	-33.1	0.0	0.7	64.3	51.5	74	54	-9.7	-2.5	H
Mid Ch, 5785MHz															
11.570	3.0	53.7	41.5	37.5	4.4	-33.0	0.0	0.7	63.3	51.1	74	54	-10.7	-2.9	V
11.570	3.0	54.0	41.0	37.5	4.4	-33.0	0.0	0.7	63.6	50.6	74	54	-10.4	-3.4	H
High Ch, 5825MHz															
11.650	3.0	56.6	43.0	37.5	4.4	-32.9	0.0	0.7	66.4	52.8	74	54	-7.6	-1.2	V
11.650	3.0	56.2	42.0	37.5	4.4	-32.9	0.0	0.7	66.0	51.8	74	54	-8.0	-2.2	H

Rev. 5.1.6
Note: 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		

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HARMONICS AND SPURIOUS EMISSIONS (802.11n MODE HT40)

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

Company:Atheros
Project #:06U10485
Date:8/02/2006
Test Engineer:Chin Pang
Configuration:EUT/Laptop
Mode:a mode, HT40, 5.8GHz Band

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T145 Agilent 3008A005(	T88 Miteq 26-40GHz	T89; ARA 18-26GHz; S/N:1049	FCC 15.205

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
	Chin 197538001	Chin 200354001	HPF_7.6GHz	

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch, 5755MHz															
11.510	3.0	55.4	42.4	37.5	4.4	-33.1	0.0	0.7	64.9	51.9	74	54	-9.1	-2.1	V
11.510	3.0	54.0	41.6	37.5	4.4	-33.1	0.0	0.7	63.5	51.1	74	54	-10.5	-2.9	H
High Ch, 5795MHz															
11.590	3.0	54.0	40.0	37.5	4.4	-33.0	0.0	0.7	63.7	49.7	74	54	-10.3	-4.3	V
11.650	3.0	53.0	39.7	37.5	4.4	-32.9	0.0	0.7	62.8	49.5	74	54	-11.2	-4.5	H

Rev. 5.1.6
Note: 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		

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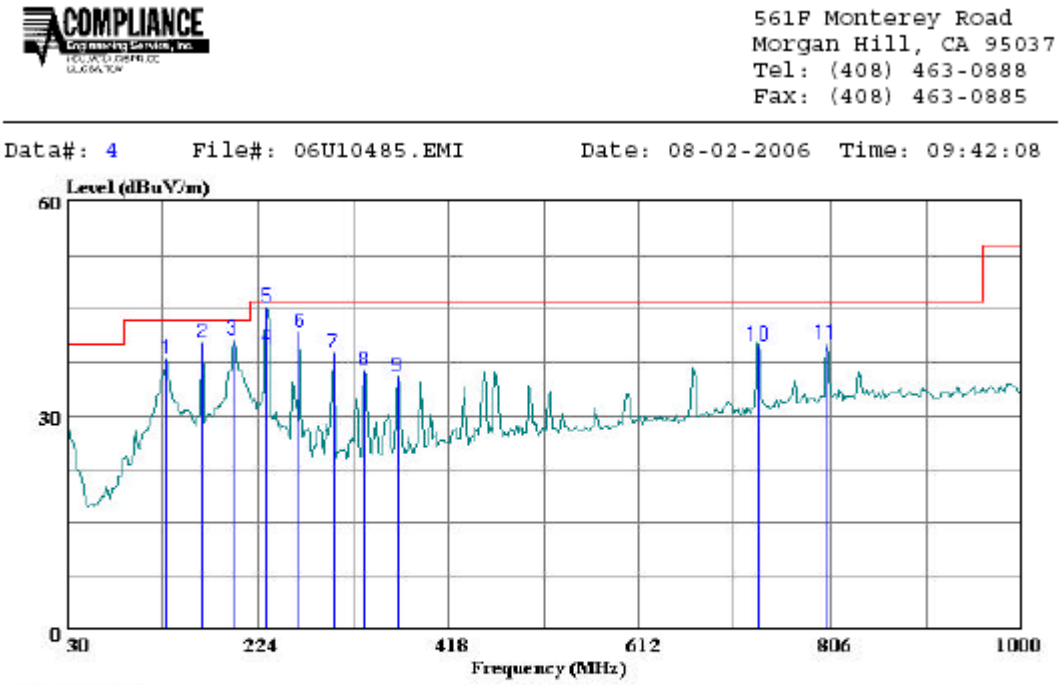
7.4.4. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz

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

HORIZONTAL PLOT



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HORIZONTAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	130.880	23.92	14.16	38.08	43.50	-5.42	Peak
2	167.740	27.91	12.41	40.32	43.50	-3.18	Peak
3	198.780	27.61	13.19	40.80	43.50	-2.70	Peak
4	232.730	27.50	11.86	39.36	46.00	-6.64	QP
5	232.730	33.48	11.86	45.34	46.00	-0.66	Peak
6	266.680	28.69	13.07	41.76	46.00	-4.24	Peak
7	300.630	24.76	14.13	38.89	46.00	-7.11	Peak
8	332.640	21.45	14.89	36.34	46.00	-9.66	Peak
9	366.590	19.97	15.63	35.60	46.00	-10.40	Peak
10	733.250	18.82	21.13	39.95	46.00	-6.05	Peak
11	800.180	18.18	21.91	40.09	46.00	-5.91	Peak

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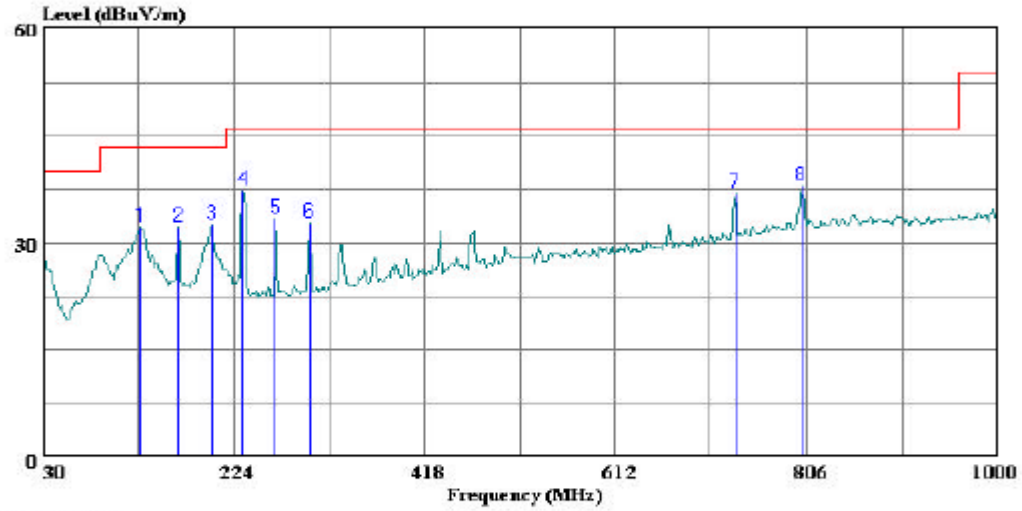
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)

VERTICAL PLOT

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

Data#: 6 File#: 06U10485.EMI Date: 08-02-2006 Time: 09:51:51



(Audix ATC)

Trace: 5 Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator: : Chin Pang
Company: : Atheros
Project #: : 06U10485
Configuration: : EUT/Laptop
Mode of Operation: TX(Worst Case)
: CB72

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VERTICAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	128.940	17.98	14.22	32.20	43.50	-11.30	Peak
2	167.740	19.82	12.41	32.23	43.50	-11.27	Peak
3	201.690	19.46	13.11	32.57	43.50	-10.93	Peak
4	232.730	25.46	11.86	37.32	46.00	-8.68	Peak
5	266.680	20.43	13.07	33.50	46.00	-12.50	Peak
6	300.630	18.67	14.13	32.80	46.00	-13.20	Peak
7	735.190	15.72	21.15	36.87	46.00	-9.13	Peak
8	800.180	16.01	21.91	37.92	46.00	-8.08	Peak

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7.5. 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:

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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
0.21	53.00	--	41.83	0.00	63.37	53.37	-10.37	-11.54	L1
0.27	44.86	--	34.62	0.00	61.03	51.03	-16.17	-16.41	L1
0.34	41.92	--	33.85	0.00	59.18	49.18	-17.26	-15.33	L1
0.20	52.50	--	40.85	0.00	63.45	53.45	-10.95	-12.60	L2
0.27	42.98	--	33.34	0.00	61.00	51.00	-18.02	-17.66	L2
14.75	31.32	--	26.92	0.00	60.00	50.00	-28.68	-23.08	L2
6 Worst Data									

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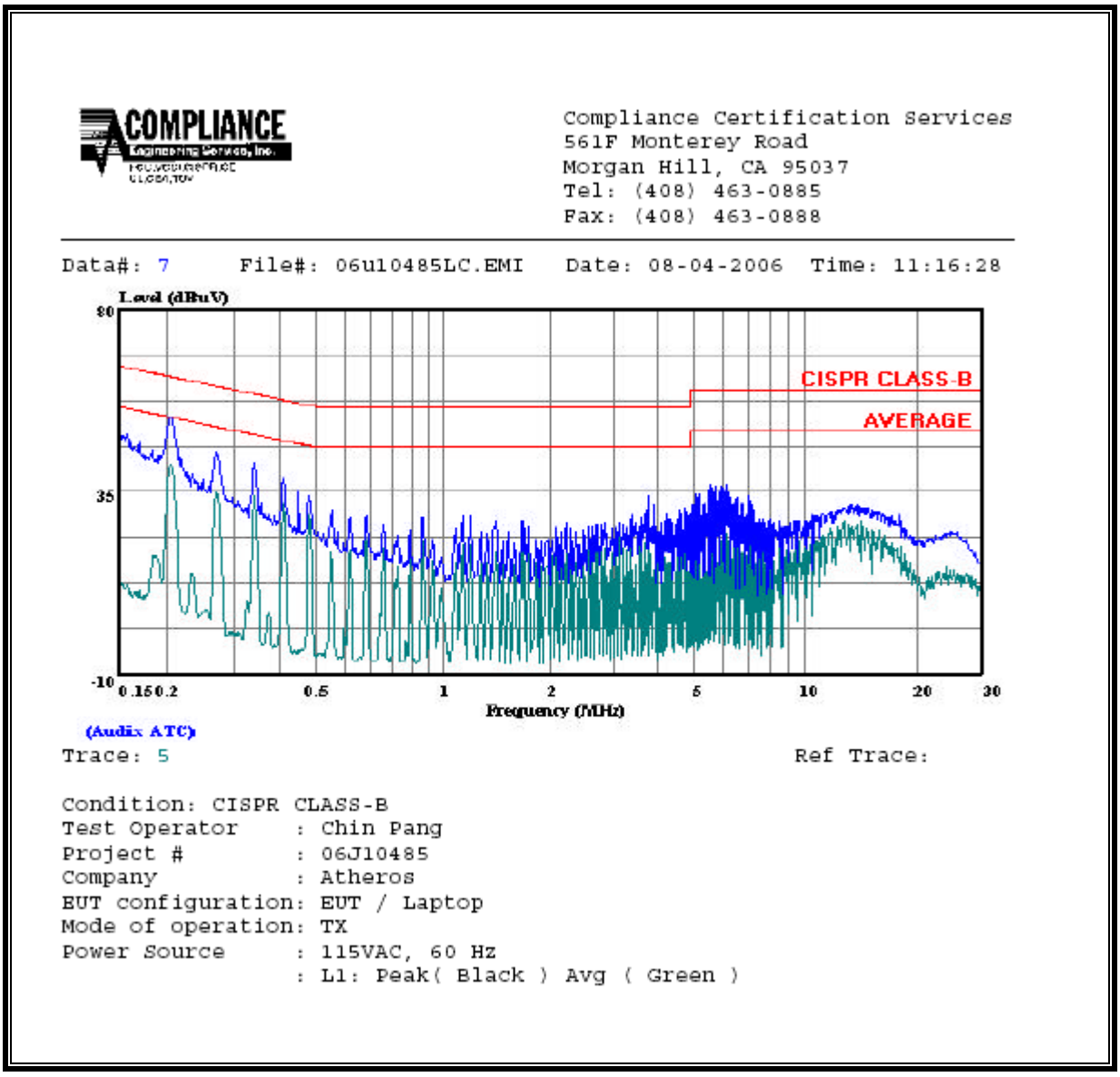
LINE 1 RESULTS



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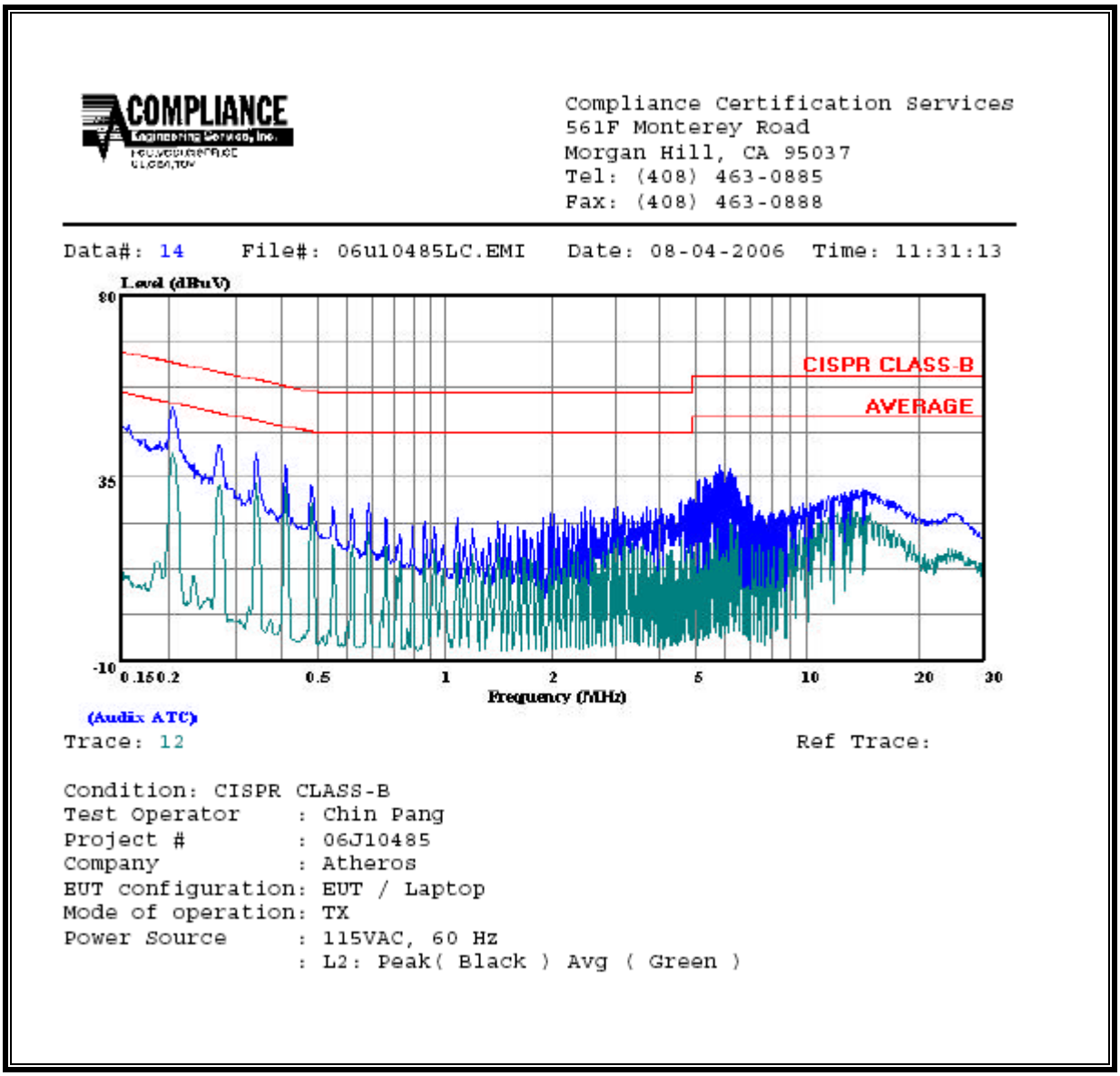
LINE 2 RESULTS



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