



APPENDIX II

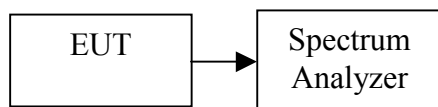
FCC PART 15.247 REQUIREMENTS

1.1 6DB BANDWIDTH

LIMIT

According to §15.247(a)(2), systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.

Test Configuration



TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 100 kHz, VBW = RBW, Span = 50 MHz, Sweep = auto.
4. Mark the peak frequency and -6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Result
Low	2412	8500	>500	PASS
Mid	2437	9920		PASS
High	2462	9500		PASS

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Result
Low	2412	16330	>500	PASS
Mid	2437	16330		PASS
High	2462	16250		PASS



Test Plot

IEEE 802.11b

6dB Bandwidth (CH Low)

Agilent 21:26:50 Apr 3, 2006

R L

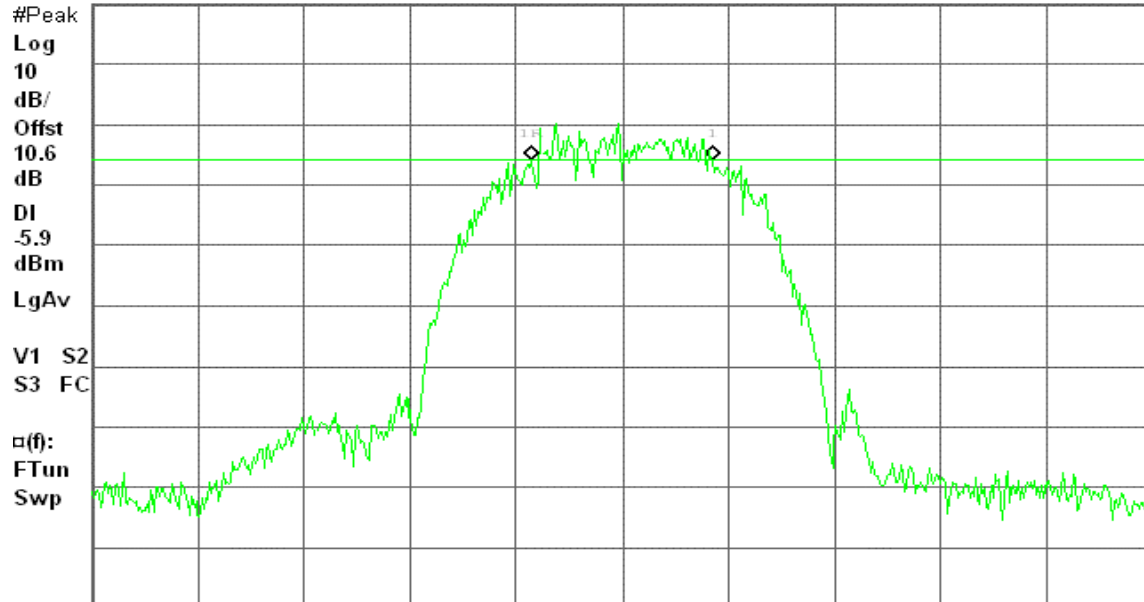
6dB BW, b Mode Low Ch.

Δ Mkr1 8.50 MHz

Ref 20 dBm

Atten 20 dB

-0.04 dB



Center 2.412 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

6dB Bandwidth (CH Mid)

Agilent 21:20:38 Apr 3, 2006

R L

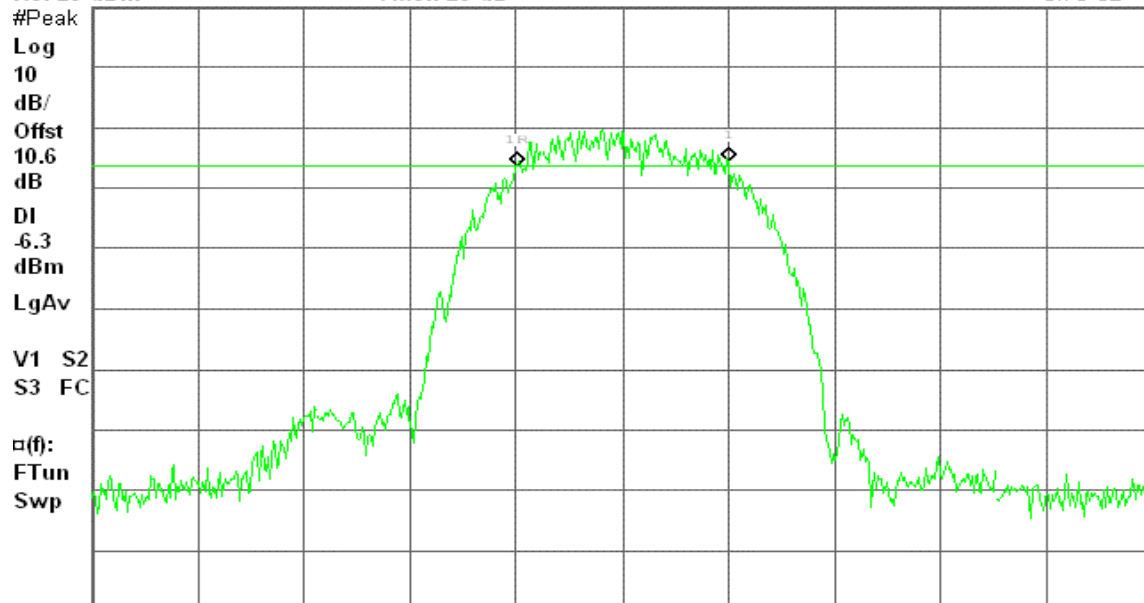
6dB BW, b Mode Mid Ch.

Δ Mkr1 9.92 MHz

Ref 20 dBm

Atten 20 dB

0.78 dB



Center 2.437 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)



6dB Bandwidth (CH High)

Agilent 21:08:25 Apr 3, 2006

R L

6dB BW, b Mode High Ch.

Δ Mkr1 9.50 MHz

Ref 20 dBm

Atten 20 dB

0.14 dB

#Peak

Log

10

dB/

Offst

10.6

dB

DI

-5.3

dBm

LgAv

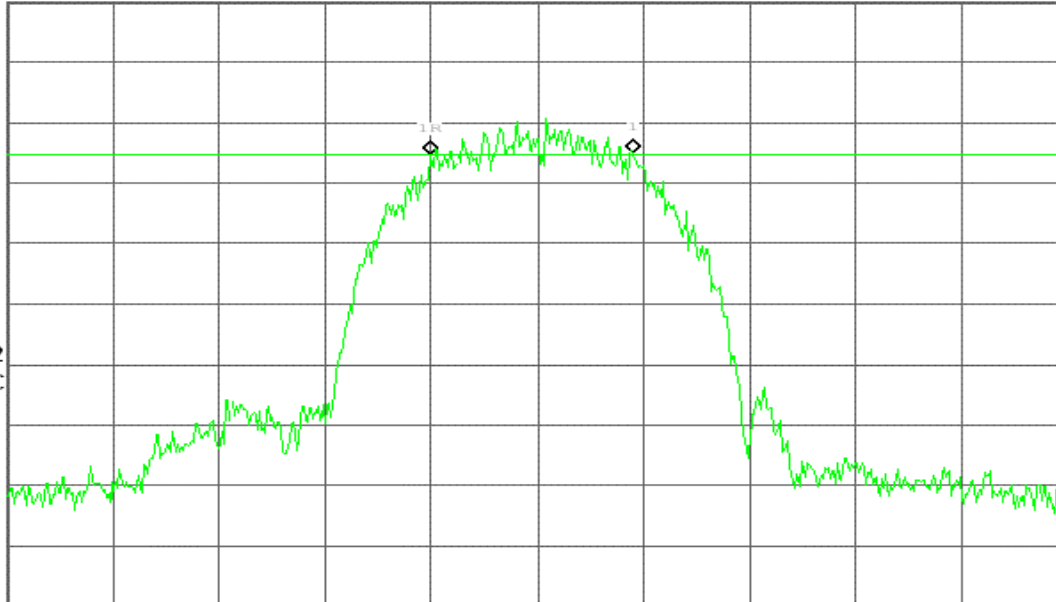
V1 S2

S3 FC

$\alpha(f)$:

FTun

Swp



Center 2.462 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

IEEE 802.11g

6dB Bandwidth (CH Low)

Agilent 21:34:22 Apr 3, 2006

R L

6dB BW, g Mode Low Ch.

Δ Mkr1 16.33 MHz

Ref 20 dBm

Atten 20 dB

0.12 dB

#Peak

Log

10

dB/

Offst

10.6

dB

DI

-8.0

dBm

LgAv

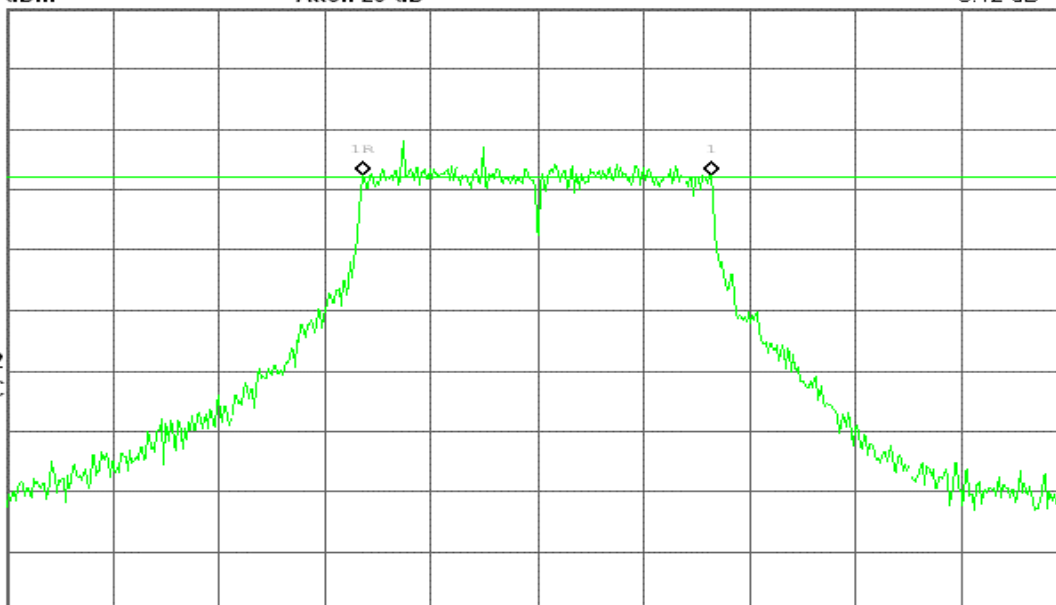
V1 S2

S3 FC

$\alpha(f)$:

FTun

Swp



Center 2.412 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)



6dB Bandwidth (CH Mid)

Agilent 21:42:23 Apr 3, 2006

R L

6dB BW, g Mode Mid Ch.

Δ Mkr1 16.33 MHz

Ref 20 dBm

Atten 20 dB

0.67 dB

#Peak

Log

10

dB/

Offst

10.6

dB

DI

-7.2

dBm

LgAv

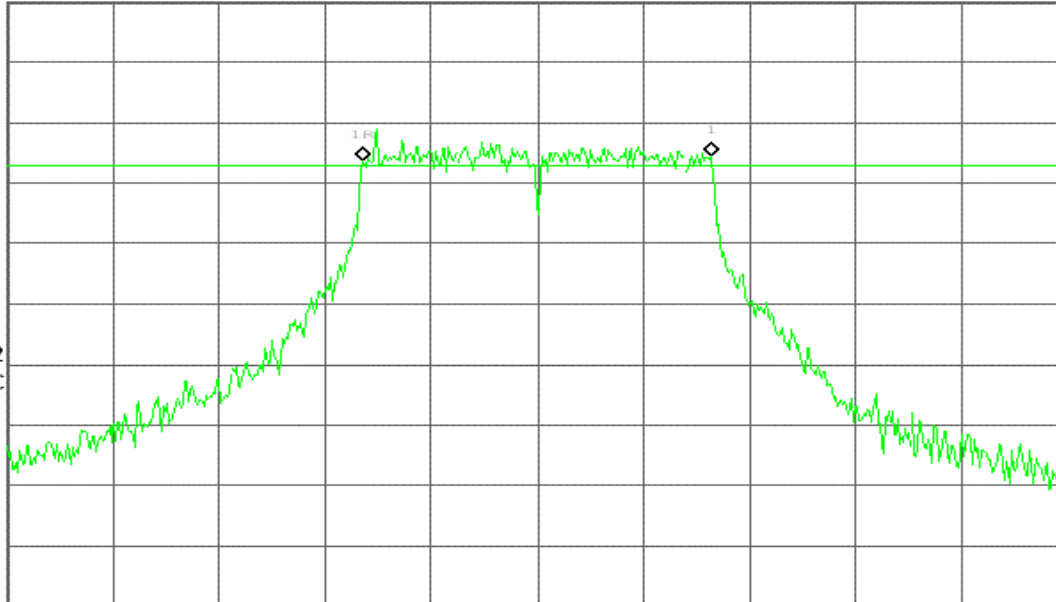
V1 S2

S3 FC

$\alpha(f)$:

FTun

Swp



Center 2.437 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

6dB Bandwidth (CH High)

Agilent 21:49:59 Apr 3, 2006

R L

6dB BW, g Mode High Ch.

Δ Mkr1 16.25 MHz

Ref 20 dBm

Atten 20 dB

1.18 dB

#Peak

Log

10

dB/

Offst

10.6

dB

DI

-6.2

dBm

LgAv

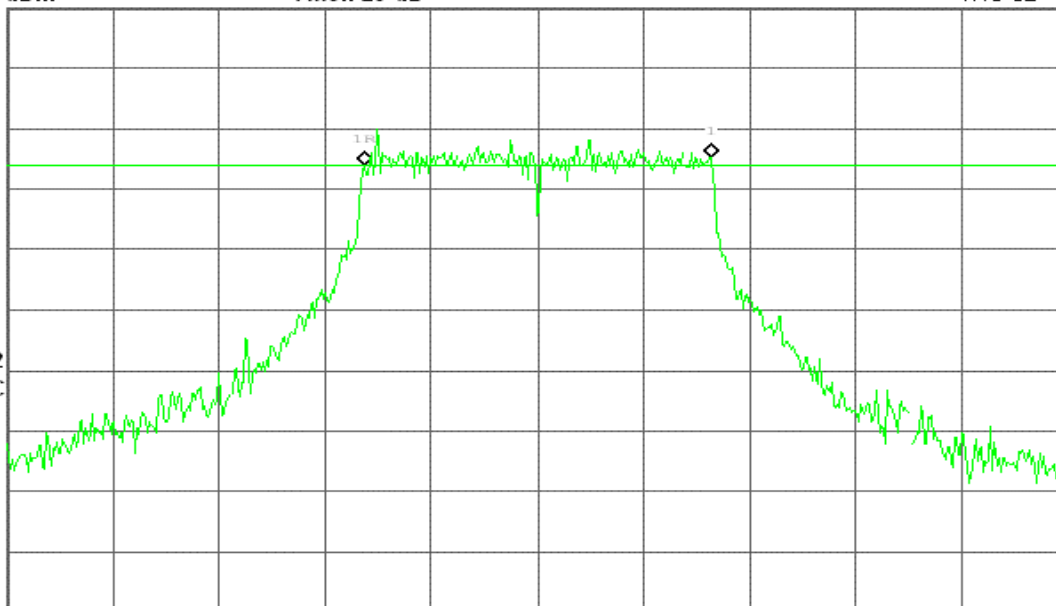
V1 S2

S3 FC

$\alpha(f)$:

FTun

Swp



Center 2.462 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)



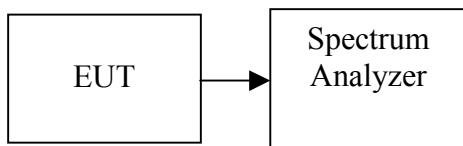
1.2 PEAK POWER

LIMIT

The maximum peak output power of the intentional radiator shall not exceed the following:

1. According to §15.247(b)(3), for systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 Watt.
2. According to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the Spectrum analyzer. The Spectrum analyzer is set to the peak power detection.

TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	13.06	0.02023	1.00	PASS
Mid	2437	13.11	0.02046		PASS
High	2462	13.20	0.02089		PASS

Test mode: IEEE 802.11g

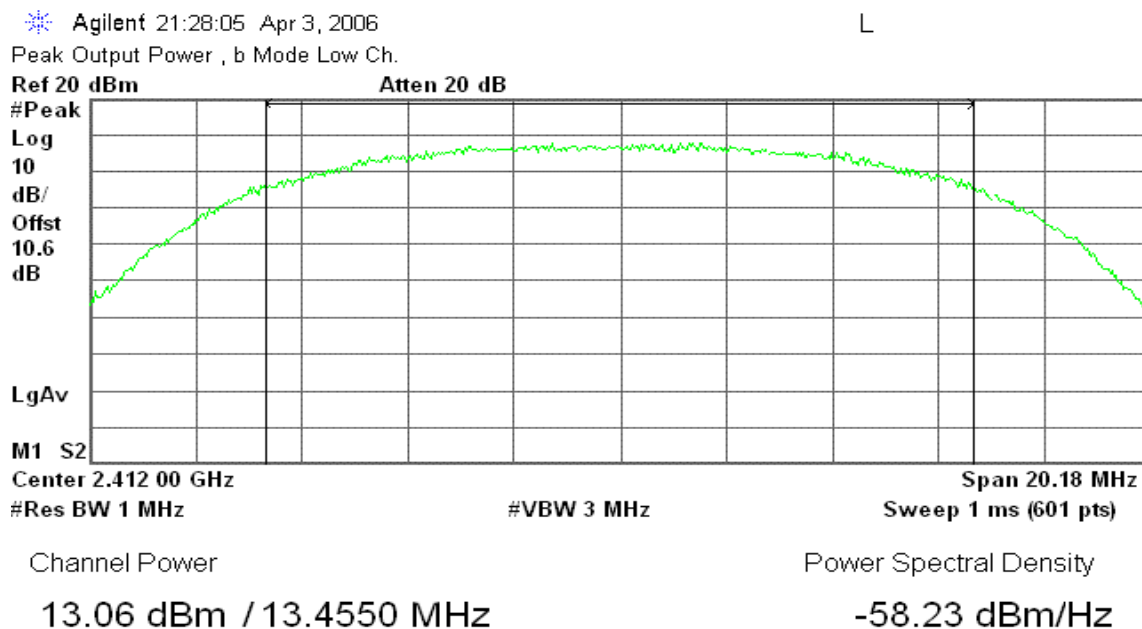
Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	13.19	0.02084	1.00	PASS
Mid	2437	13.17	0.02075		PASS
High	2462	13.23	0.02104		PASS



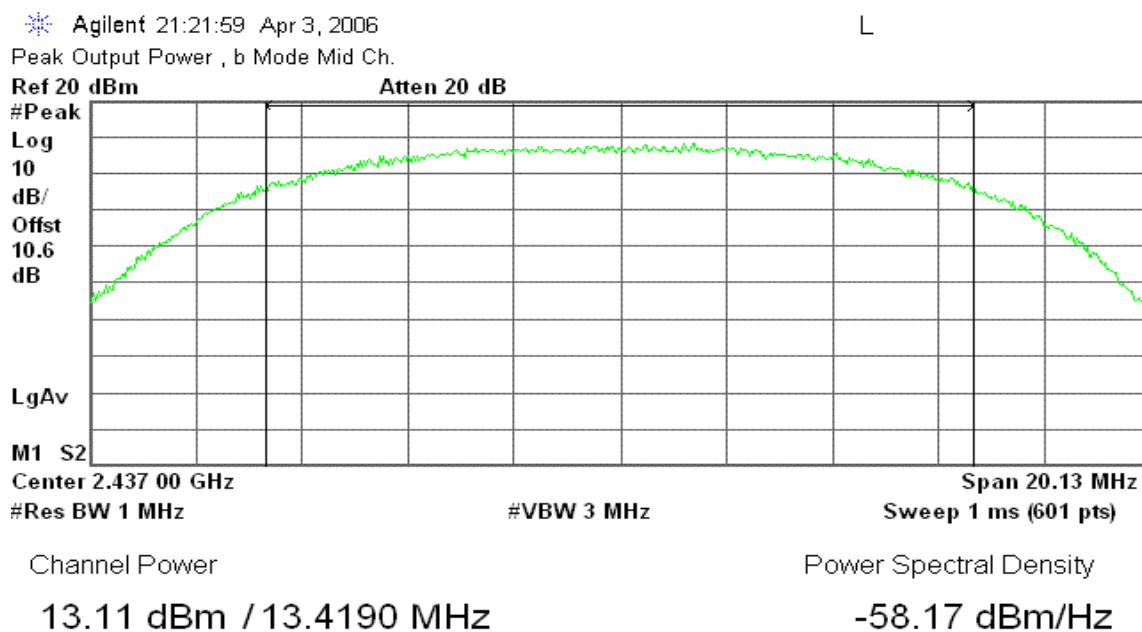
Test Plot

IEEE 802.11b

Peak Power (CH Low)



Peak Power (CH Mid)





Peak Power (CH High)

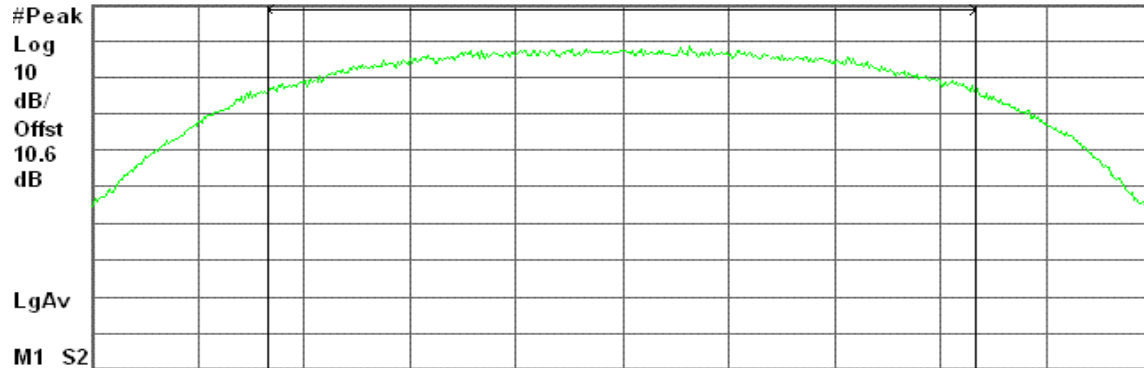
Agilent 21:10:24 Apr 3, 2006

L

Peak Output Power , b Mode High Ch.

Ref 20 dBm

Atten 20 dB



Center 2.462 00 GHz

Span 20.12 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

13.20 dBm / 13.4160 MHz

-58.07 dBm/Hz

IEEE 802.11g

Peak Power (CH Low)

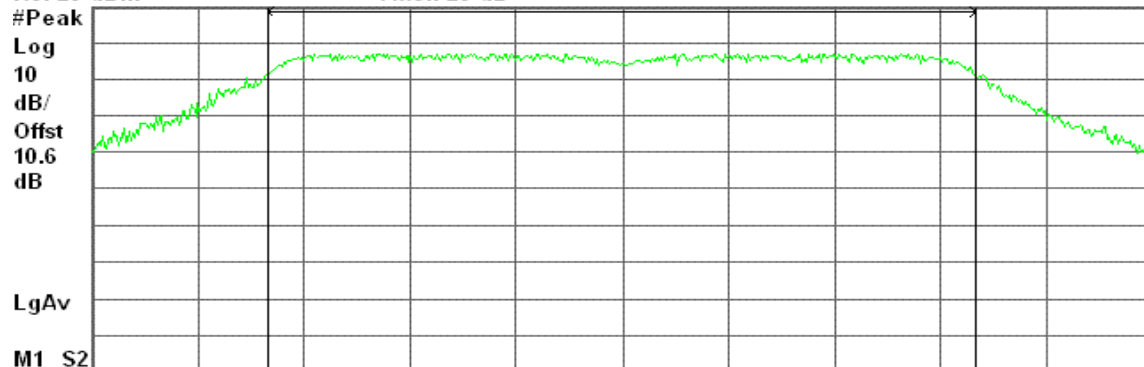
Agilent 21:37:22 Apr 3, 2006

L

Peak Output Power , g Mode Low Ch.

Ref 20 dBm

Atten 20 dB



Center 2.412 00 GHz

Span 24.7 MHz

#Res BW 1 MHz

#VBW 3 MHz

#Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

13.19 dBm / 16.4700 MHz

-58.97 dBm/Hz



Peak Power (CH Mid)

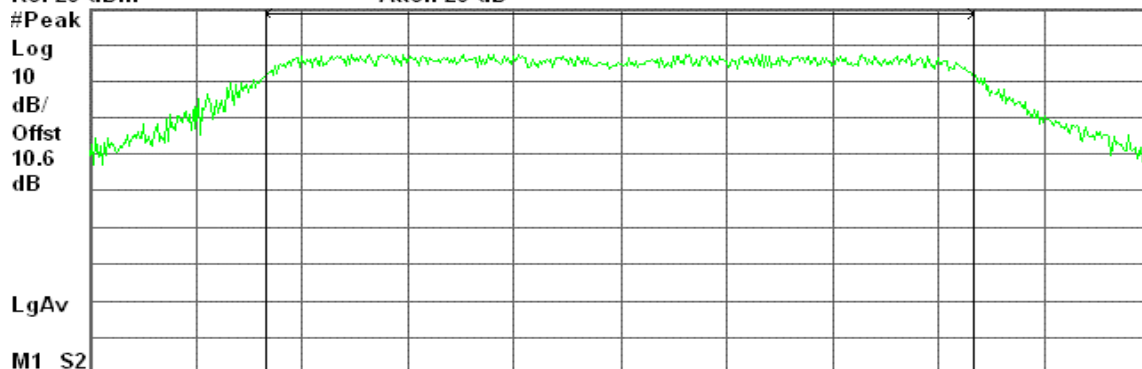
Agilent 21:43:30 Apr 3, 2006

L

Peak Output Power, g Mode Mid Ch.

Ref 20 dBm

Atten 20 dB



Center 2.437 00 GHz

Span 24.74 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

13.17 dBm / 16.4940 MHz

-59.01 dBm/Hz

Peak Power (CH High)

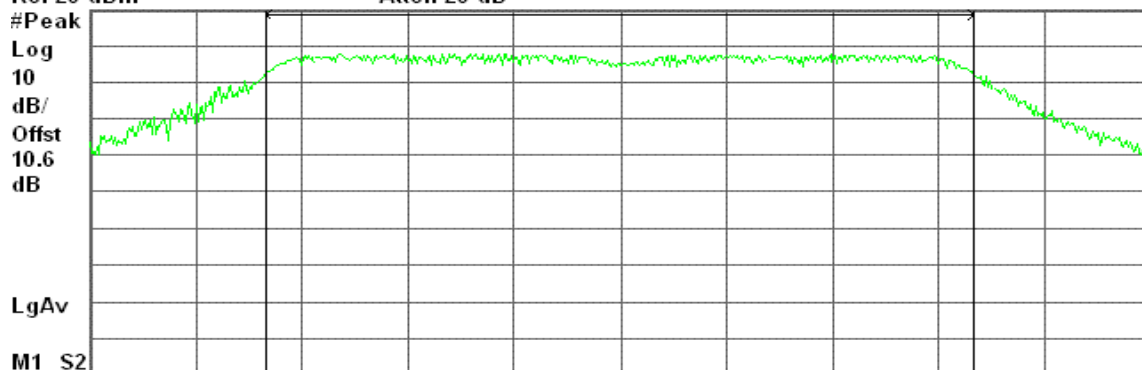
Agilent 21:52:37 Apr 3, 2006

L

Peak Output Power, g Mode High Ch.

Ref 20 dBm

Atten 20 dB



Center 2.462 00 GHz

Span 24.64 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

13.23 dBm / 16.4300 MHz

-58.93 dBm/Hz

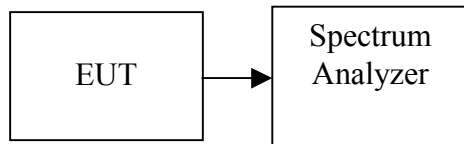


1.3 AVERAGE POWER

LIMIT

None; for reporting purposes only.

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the Spectrum analyzer. The Spectrum analyzer is set to the average power detection.

TEST RESULTS

No non-compliance noted.

Test Data

Test mode: IEEE 802.11b mode

Channel	Frequency (MHz)	Output Power (dBm)
Low	2412	10.16
Mid	2437	10.43
High	2462	10.64

Test mode: IEEE 802.11g mode

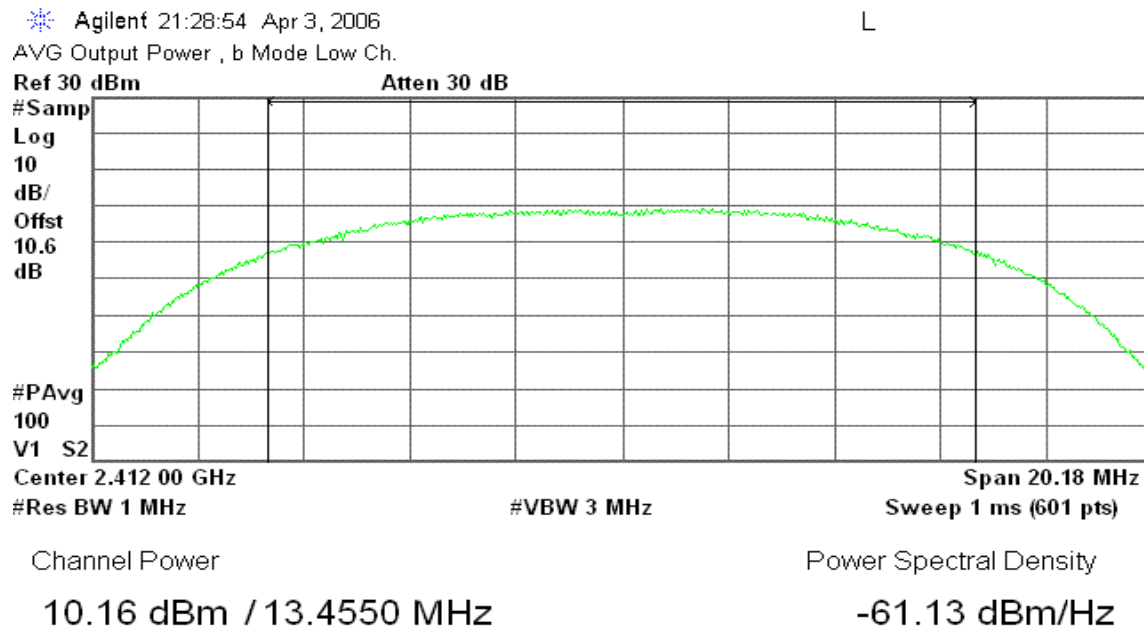
Channel	Frequency (MHz)	Output Power (dBm)
Low	2412	9.49
Mid	2437	9.37
High	2462	9.85



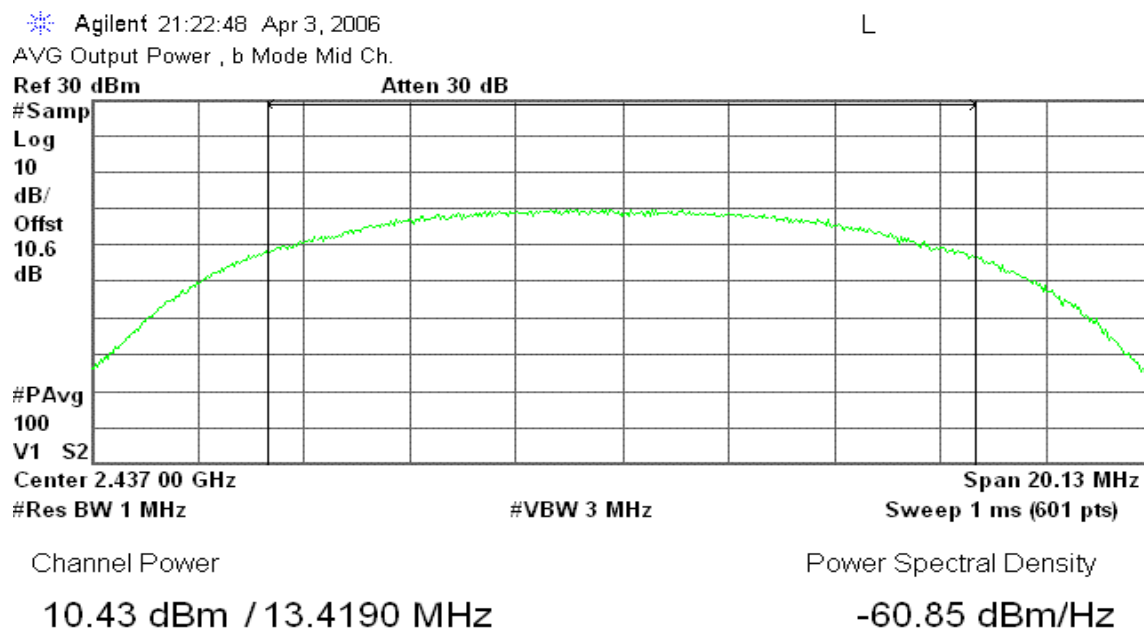
Test Plot

IEEE 802.11b

CH Low



CH Mid

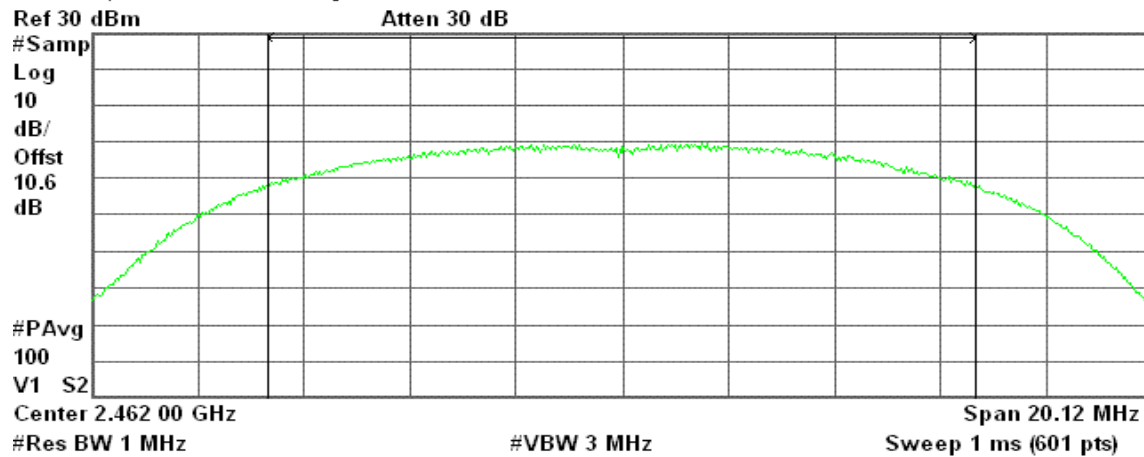




CH High

Agilent 21:11:06 Apr 3, 2006
AVG Output Power, b Mode High Ch.

L



Channel Power

10.64 dBm / 13.4160 MHz

Power Spectral Density

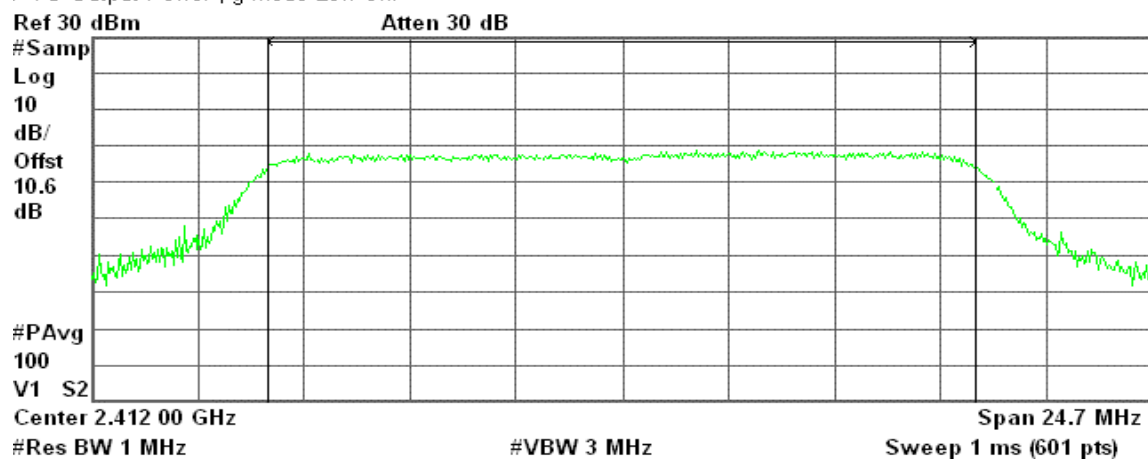
-60.64 dBm/Hz

IEEE 802.11g

CH Low

Agilent 21:38:18 Apr 3, 2006
AVG Output Power, g Mode Low Ch.

L



Channel Power

9.49 dBm / 16.4700 MHz

Power Spectral Density

-62.67 dBm/Hz



CH Mid

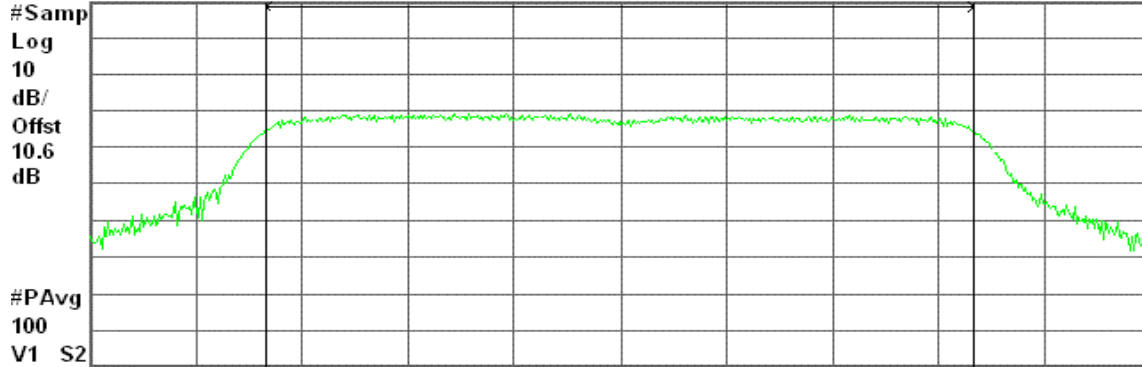
Agilent 21:44:16 Apr 3, 2006

R L

AVG Output Power , g Mode Mid Ch.

Ref 30 dBm

Atten 30 dB



Center 2.437 00 GHz

Span 24.74 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

9.37 dBm / 16.4940 MHz

-62.81 dBm/Hz

CH High

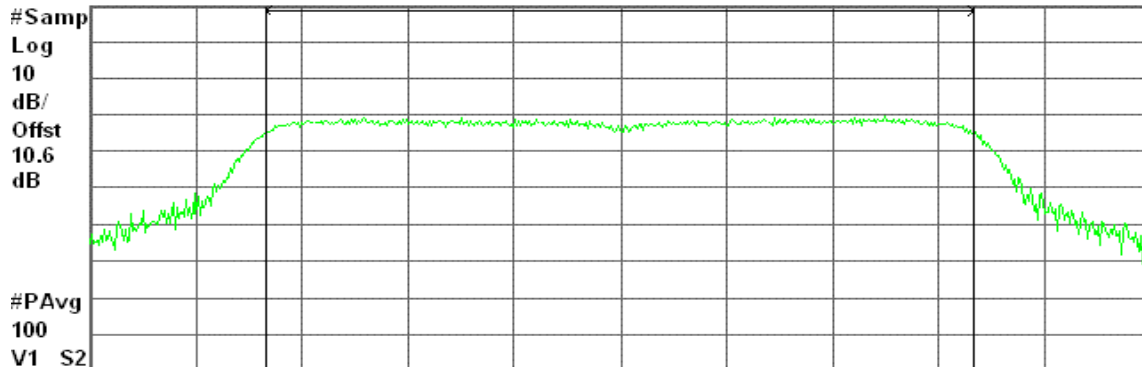
Agilent 21:54:03 Apr 3, 2006

L

AVG Output Power , g Mode High Ch.

Ref 30 dBm

Atten 30 dB



Center 2.462 00 GHz

Span 24.64 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

9.85 dBm / 16.4300 MHz

-62.31 dBm/Hz

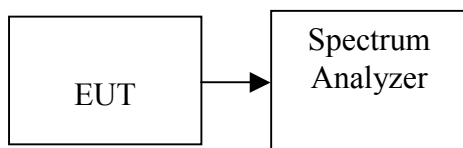


1.4 PEAK POWER SPECTRAL DENSITY

LIMIT

1. According to §15.247(e), for digitally modulated systems, the 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.
2. According to §15.247(f), the digital modulation operation of the hybrid system, with the frequency hopping turned off, shall comply with the power density requirements of paragraph (d) of this section.

Test Configuration



TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 3 kHz, VBW = 10 kHz, Span = 300 kHz, Sweep = 100 s
3. Record the max reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.



TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	0.53	8.00	PASS
Mid	2437	-0.79		PASS
High	2462	0.29		PASS

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-16.05	8.00	PASS
Mid	2437	-14.73		PASS
High	2462	-14.27		PASS



Test Plot

IEEE 802.11b

PPSD (CH Low)

Agilent 12:58:04 Apr 4, 2006

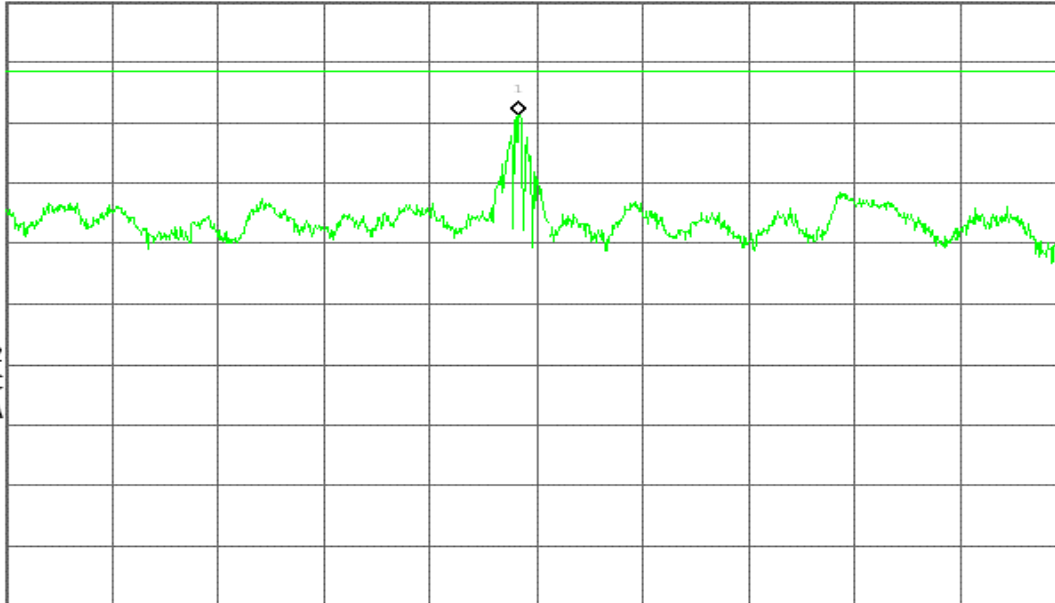
L

Mkr1 2.411 653 0 GHz
0.53 dBm

Ref 19.4 dBm

Atten 20 dB

#Peak
Log
10
dB/
Offst
10.6
dB
DI
8.0
dBm
LgAv
M1 S2
S3 FC
AA
□(f):
f>50k
Swp



Center 2.411 658 1 GHz

#Res BW 3 kHz

#VBW 10 kHz

Span 300 kHz
#Sweep 100 s (1001 pts)

PPSD (CH Mid)

Agilent 21:25:02 Apr 3, 2006

R L

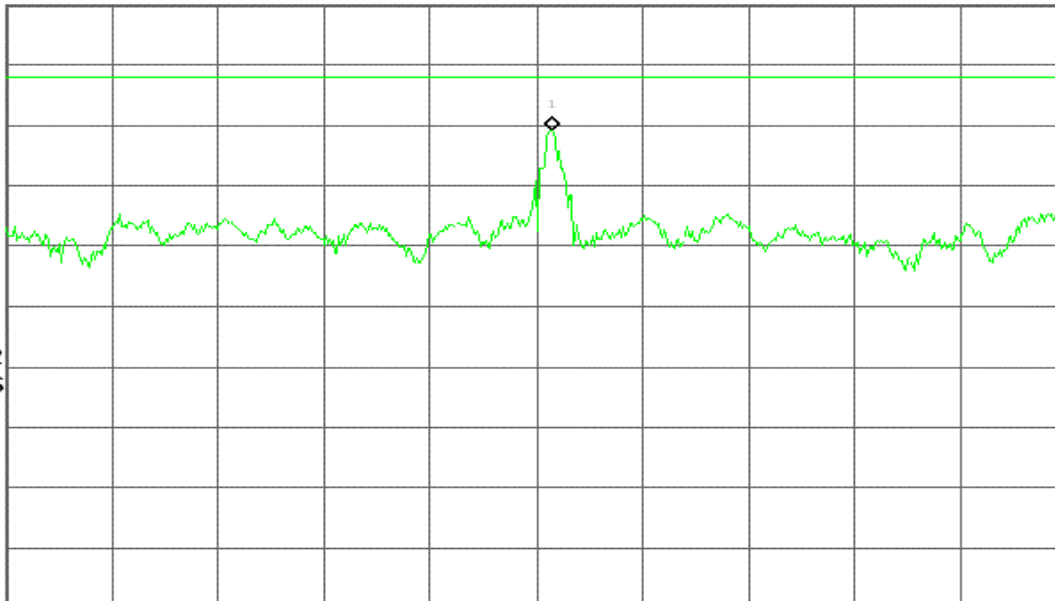
Mkr1 2.433 904 5 GHz
-0.79 dBm

Peak Power Spectral Density, b Mode Mid Ch.

Ref 20 dBm

Atten 20 dB

#Peak
Log
10
dB/
Offst
10.6
dB
DI
8.0
dBm
LgAv
W1 S2
S3 FS
□(f):
f>50k
Swp



Center 2.433 900 0 GHz

#Res BW 3 kHz

#VBW 10 kHz

Span 300 kHz
#Sweep 100 s (601 pts)

**PPSD (CH High)**

* Agilent 21:13:19 Apr 3, 2006

R L

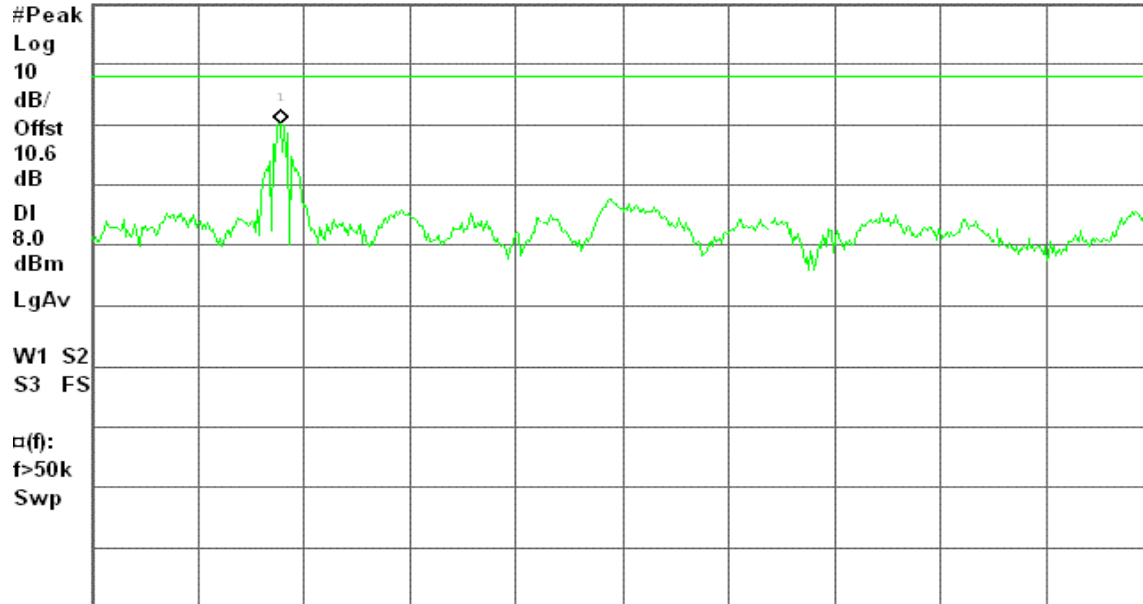
Peak Power Spectral Density, b Mode High Ch.

Mkr1 2.461 653 4 GHz

Ref 20 dBm

Atten 20 dB

0.29 dBm



Center 2.461 750 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

IEEE 802.11g**PPSD (CH Low)**

* Agilent 21:40:38 Apr 3, 2006

R L

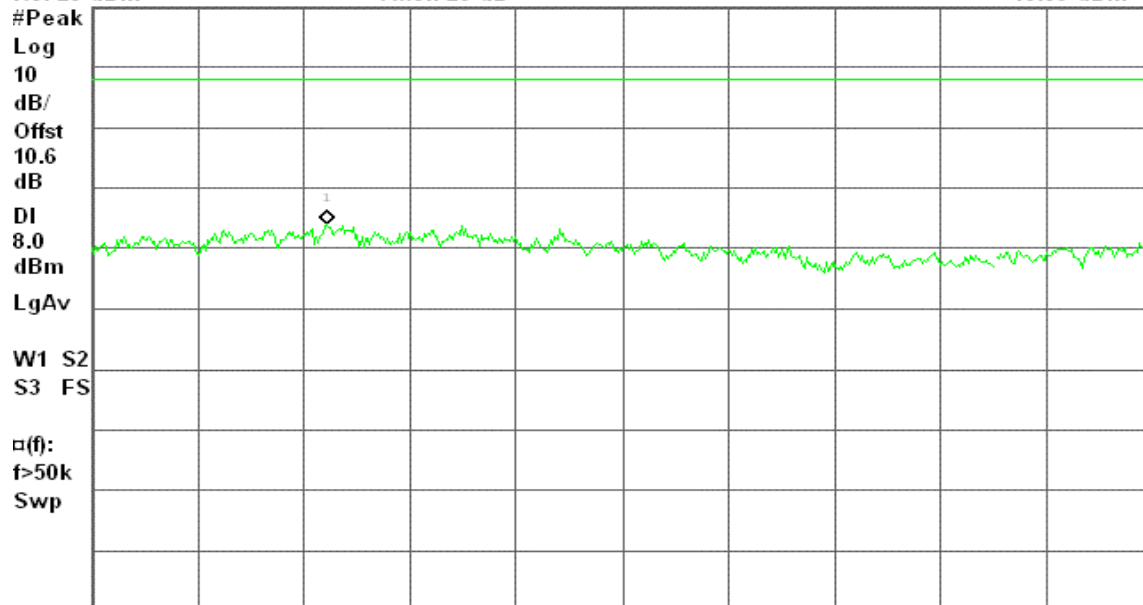
Peak Power Spectral Density, g Mode Low Ch.

Mkr1 2.406 366 0 GHz

Ref 20 dBm

Atten 20 dB

-16.05 dBm



Center 2.406 450 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)



PPSD (CH Mid)

Agilent 21:47:05 Apr 3, 2006

R L

Peak Power Spectral Density, g Mode Mid Ch.

Mkr1 2.429 540 5 GHz

Ref 20 dBm

Atten 20 dB

-14.73 dBm

#Peak

Log

10

dB/

Offst

10.6

dB

DI

8.0

dBm

LgAv

W1 S2

S3 FS

$\alpha(f)$:

f>50k

Swp

Center 2.429 550 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

PPSD (CH High)

Agilent 21:56:26 Apr 3, 2006

R L

Peak Power Spectral Density, g Mode High Ch.

Mkr1 2.465 707 5 GHz

Ref 20 dBm

Atten 20 dB

-14.27 dBm

#Peak

Log

10

dB/

Offst

10.6

dB

DI

8.0

dBm

LgAv

W1 S2

S3 FS

$\alpha(f)$:

f>50k

Swp

Center 2.465 700 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)



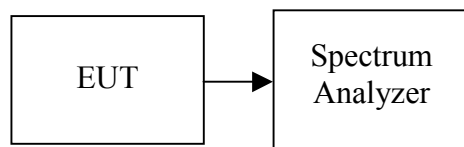
1.5 SPURIOUS EMISSIONS

1.5.1 Conducted Measurement

LIMIT

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands 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, provided the transmitter demonstrates compliance with the peak conducted power limits. 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 Section 15.205(c)).

Test Configuration



TEST PROCEDURE

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

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

Measurements are made over the 30MHz to 26GHz range with the transmitter set to the lowest, middle, and highest channels.

TEST RESULTS

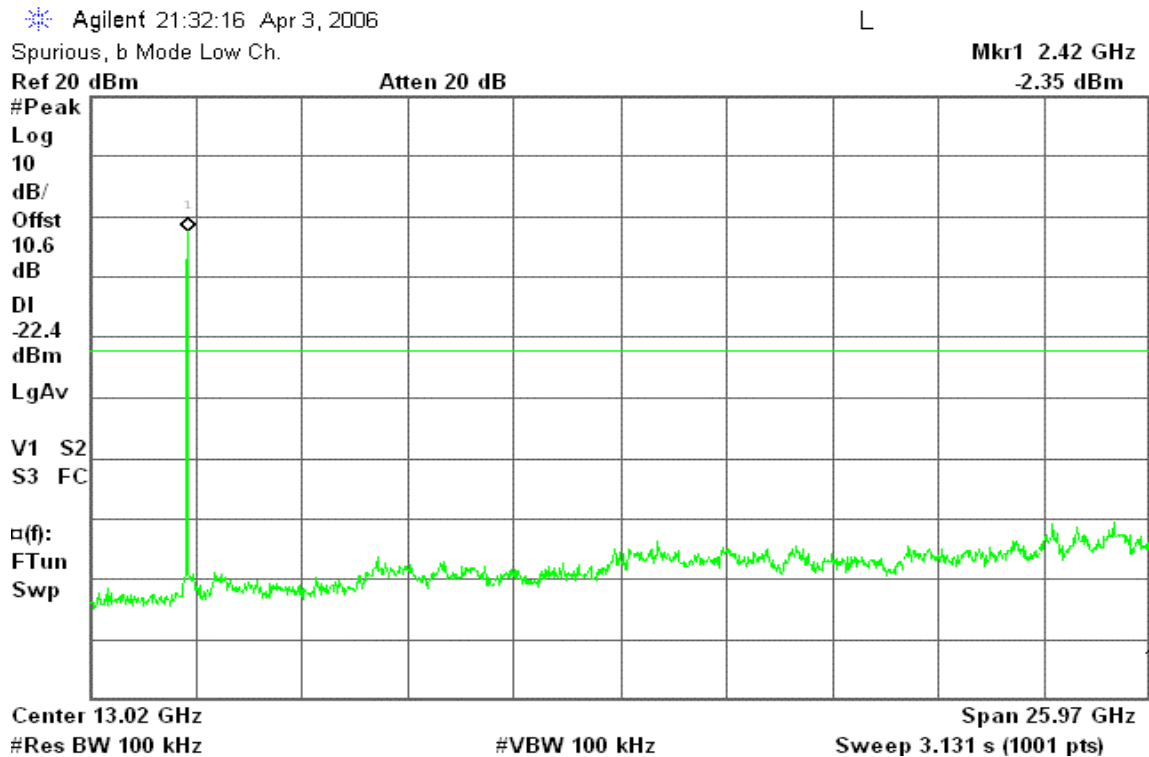
No non-compliance noted



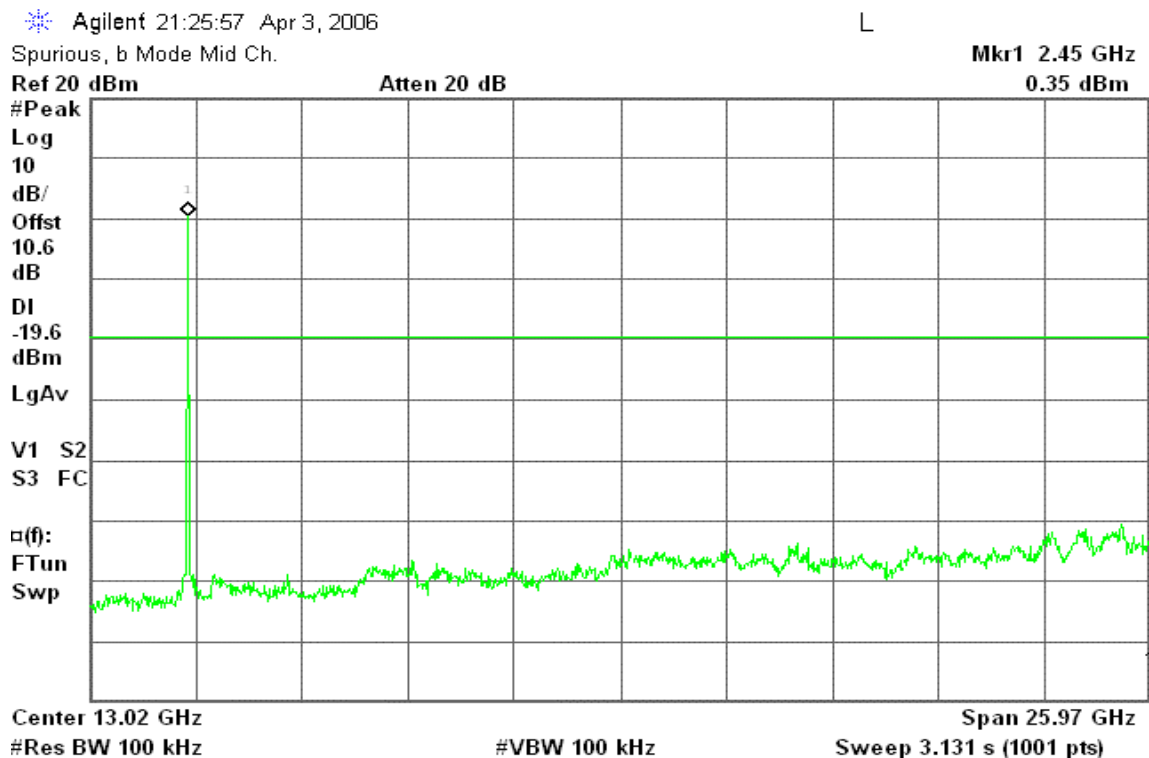
Test Plot

IEEE 802.11b

CH Low



CH Mid





CH High

Agilent 21:14:24 Apr 3, 2006

L

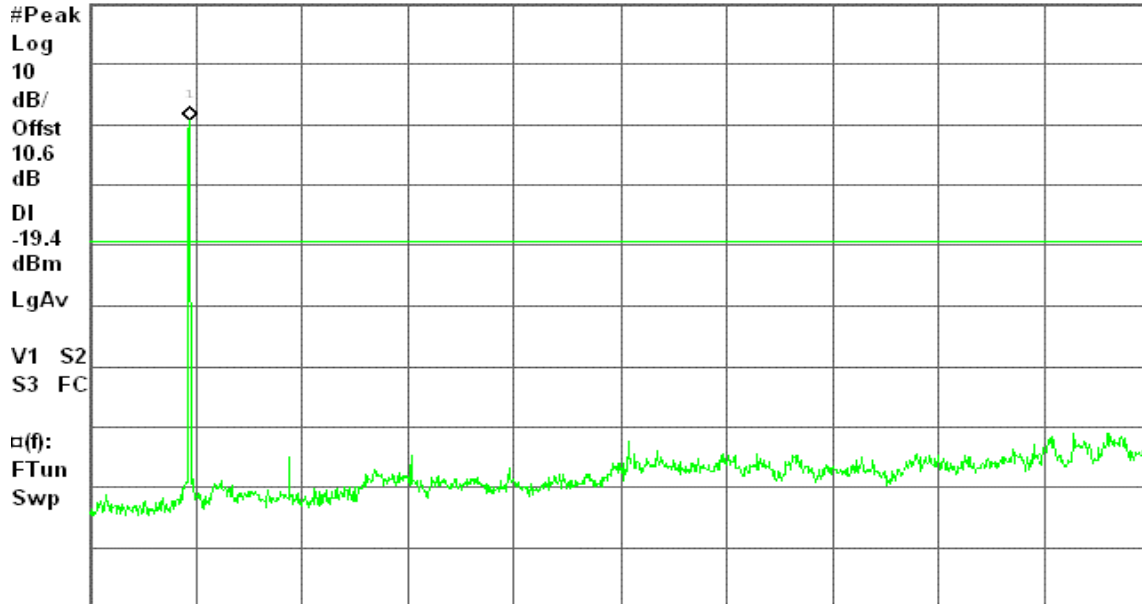
Spurious, b Mode High Ch.

Mkr1 2.47 GHz

Ref 20 dBm

Atten 20 dB

0.57 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

IEEE 802.11g

CH Low

Agilent 21:41:28 Apr 3, 2006

L

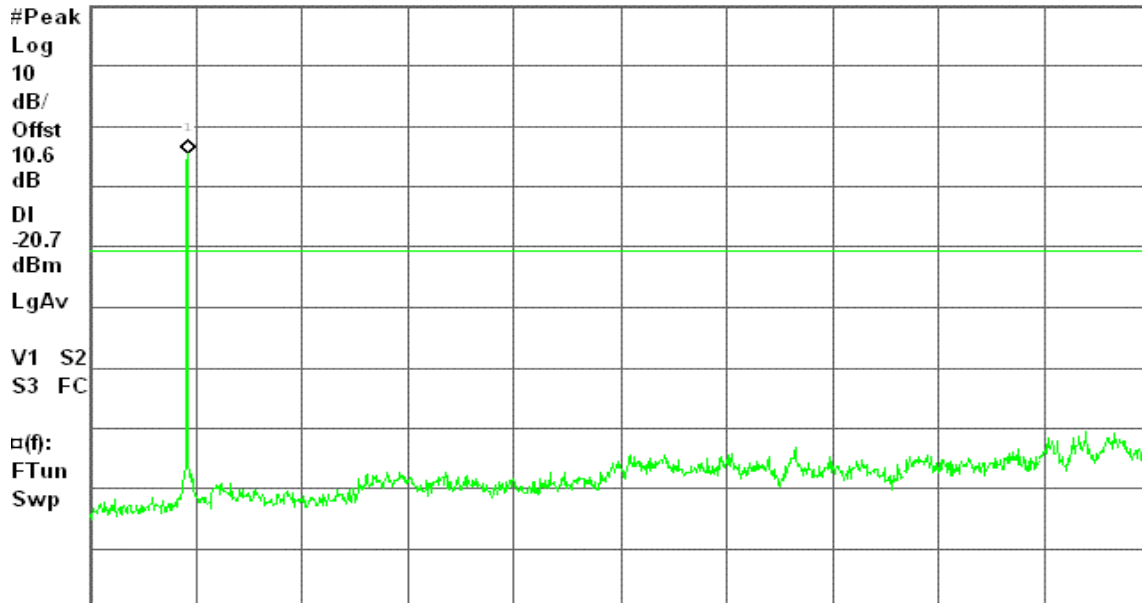
Spurious, g Mode Low Ch.

Mkr1 2.42 GHz

Ref 20 dBm

Atten 20 dB

-4.46 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)



CH Mid

Agilent 21:47:55 Apr 3, 2006

L

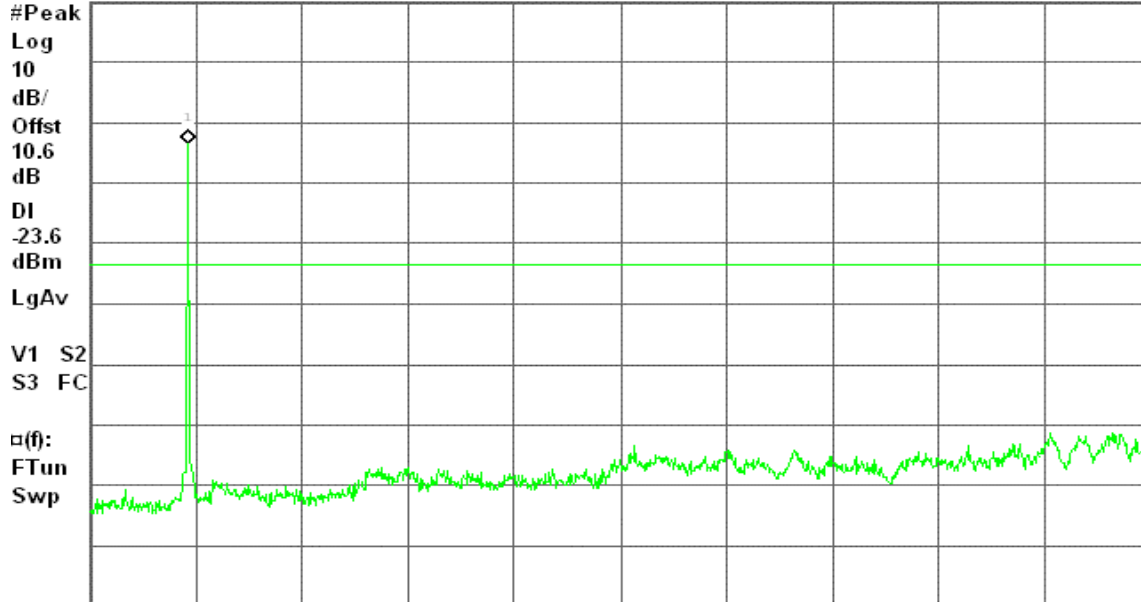
Spurious, g Mode Mid Ch.

Mkr1 2.45 GHz

Ref 20 dBm

Atten 20 dB

-3.61 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

CH High

Agilent 21:57:14 Apr 3, 2006

L

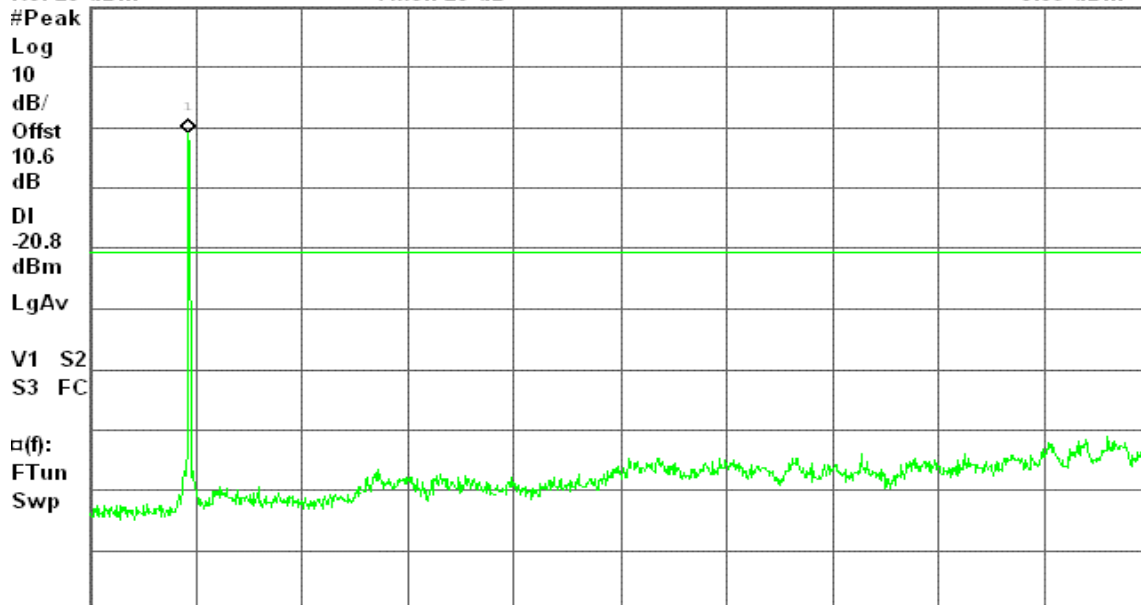
Spurious, g Mode High Ch.

Mkr1 2.45 GHz

Ref 20 dBm

Atten 20 dB

-0.83 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)