

## 8.4 Conducted Spurious Emissions

### Test requirements and limit, §15.247(d) & RSS-210 [A8.5]

§15.247(d) specifies that in any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions:

If **the peak output power procedure** is used to measure the fundamental emission power to demonstrate compliance to **15.247(b)(3)** requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated **by at least 20 dB** relative to the maximum measured in-band peak PSD level.

If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to **15.247(b)(3)** requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured inband average PSD level.

In either case, attenuation to levels below the general emission limits specified in §15.209(a) is not required.

#### ■ TEST CONFIGURATION

Refer to the APPENDIX I.

#### ■ TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer.

##### - Measurement Procedure 1 – Reference Level

1. Set instrument center frequency to DTS channel center frequency.
2. Set the span to  $\geq 1.5$  times the DTS bandwidth.
3. Set the RBW = 100 kHz.
4. Set the VBW  $\geq 3 \times$  RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum PSD level

##### - Measurement Procedure 2 - Unwanted Emissions

1. Set the center frequency and span to encompass frequency range to be measured.
2. Set the RBW = **100 kHz. ( Actual 1 MHz , See below note)**
3. Set the VBW  $\geq 3 \times$  RBW. **(Actual 3 MHz, See below note)**
4. Detector = **peak**.
5. Ensure that the number of measurement points  $\geq$  span/RBW
6. Sweep time = **auto couple**.
7. Trace mode = **max hold**.
8. **Allow the trace to stabilize** (this may take some time, depending on the extent of the span).
9. Use the peak marker function to determine the maximum amplitude level.

Note : The conducted unwanted emission was tested using S/A's measurement function with total 12 sub ranges.  
The each sub ranges were set as below.

**RBW= 1 MHz, VBW= 3 MHz, SWEEP TIME = AUTO, DETECTOR = PEAK, TRACE = MAX HOLD, SPAN = MAX 3 GHz for Below 10 GHz and MAX 5 GHz for Above 10 GHz , BINS = 10001 for Each sub range below 10 GHz and 20001 for Each sub range above 10 GHz**

If the emission level with above setting was close to the limit (ie, less than 3 dB margin) then zoom scan is required using RBW = 100 KHz, VBW = 300 KHz, SAPN = 100 MHz and BINS = 2001 to get accurate emission level within 100 KHz BW.

Also the path loss for conducted measurement setup was used as described on the Appendix I of this test report.

#### ■ TEST RESULTS: **Comply**

RESULT PLOTS

Test Mode: Chain 0 & 802.11b & 11Mbps & 2412MHz

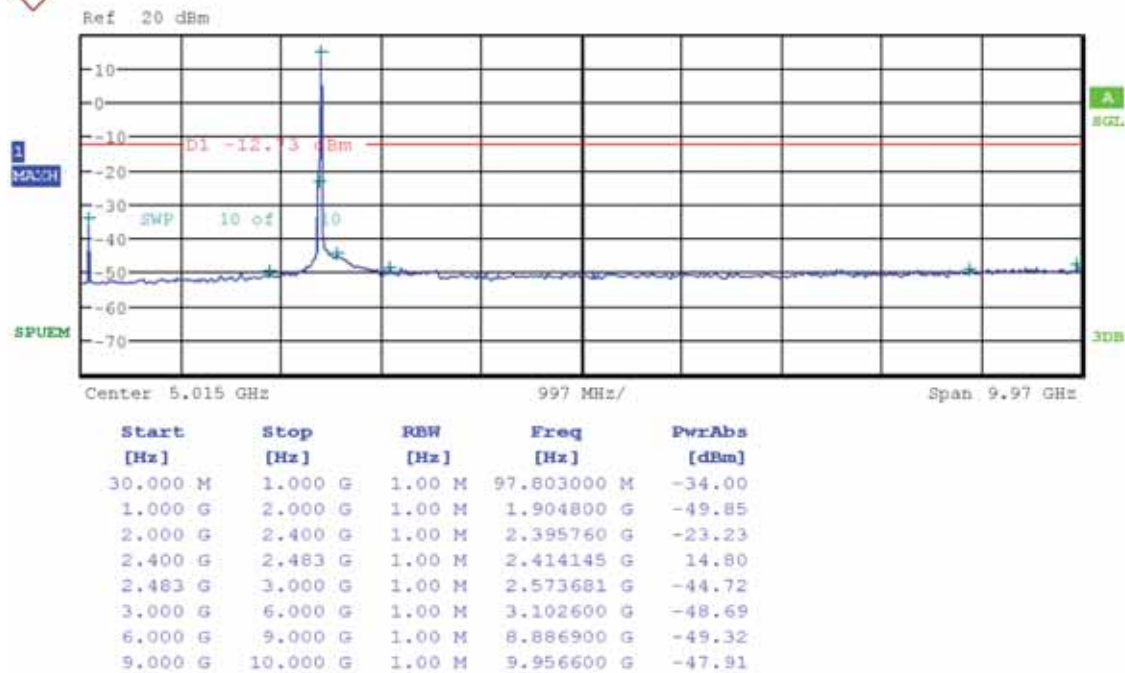
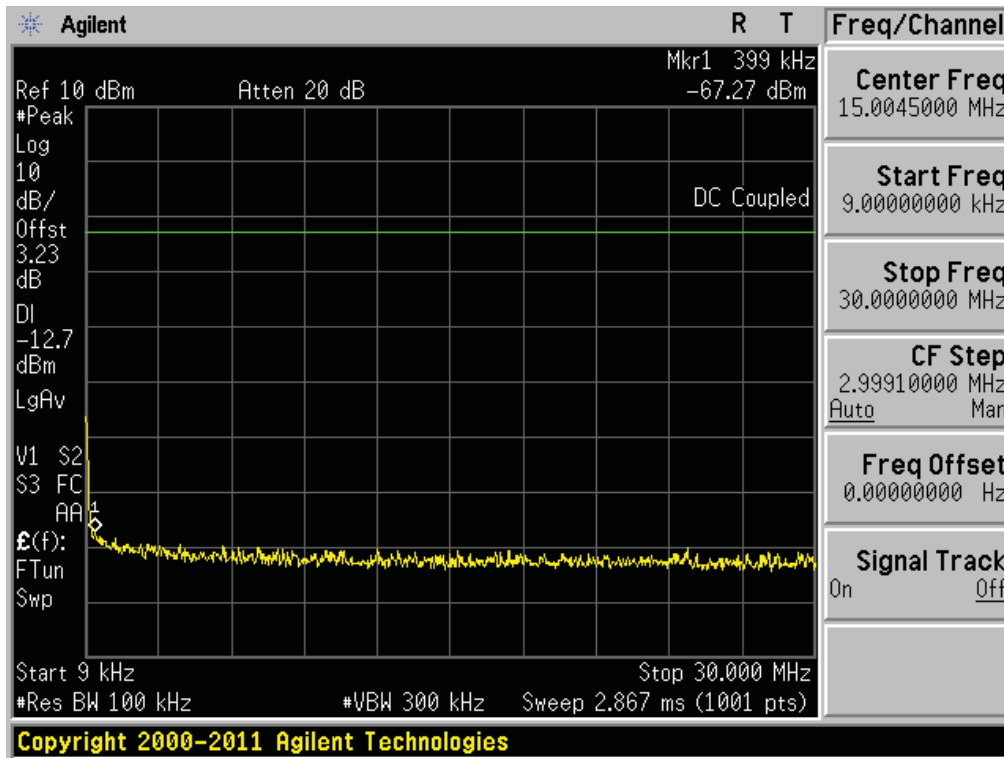
Reference



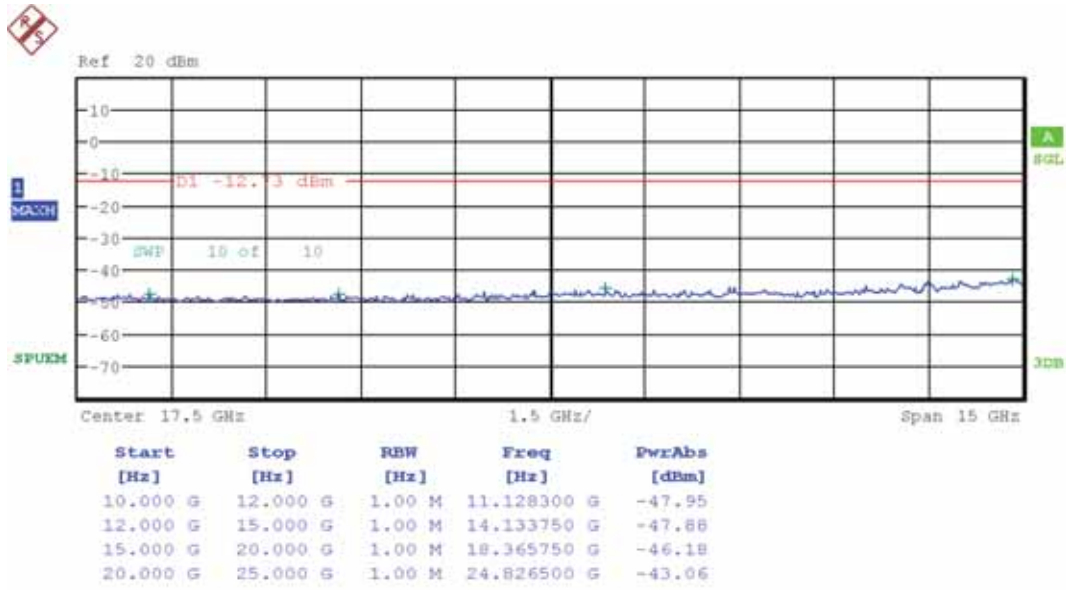
Low Band-edge



### Conducted Spurious Emissions



### Conducted Spurious Emissions

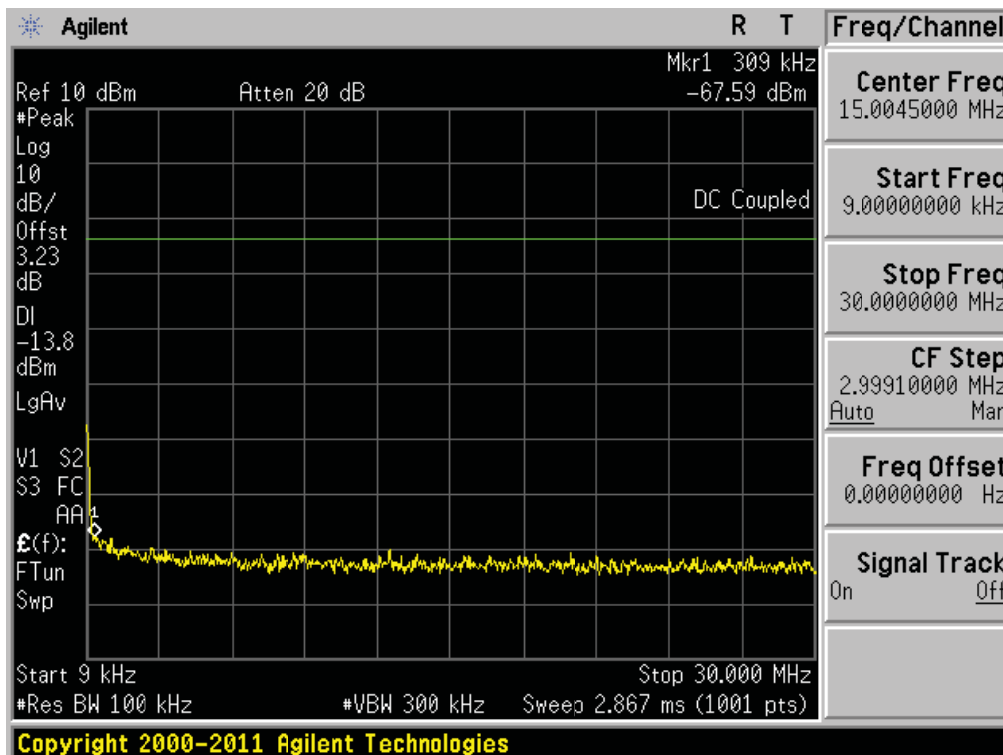


Test Mode: Chain 0 & 802.11b & 11Mbps & 2437MHz

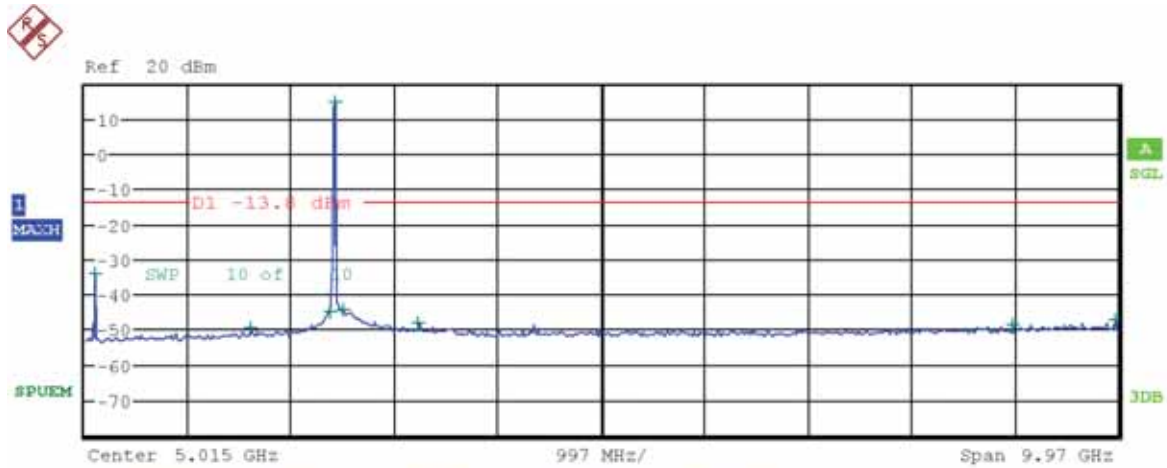
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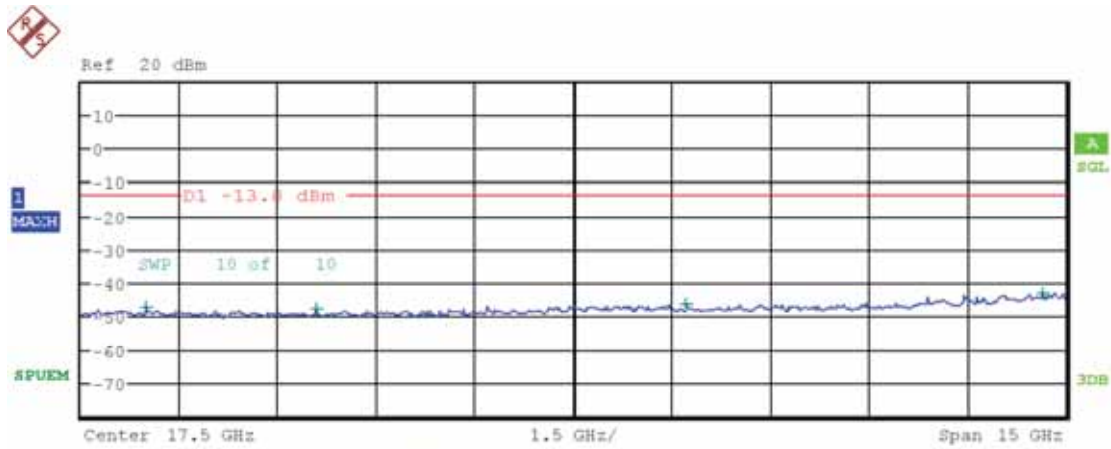
Conducted Spurious Emissions



### Conducted Spurious Emissions



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]
30.000 M	1.000 G	1.00 M	122.829000 M	-34.29
1.000 G	2.000 G	1.00 M	1.620100 G	-49.75
2.000 G	2.400 G	1.00 M	2.396920 G	-45.15
2.400 G	2.483 G	1.00 M	2.437592 G	14.56
2.483 G	3.000 G	1.00 M	2.522702 G	-44.60
3.000 G	6.000 G	1.00 M	3.249300 G	-48.48
6.000 G	9.000 G	1.00 M	8.970000 G	-48.96
9.000 G	10.000 G	1.00 M	9.975700 G	-47.22

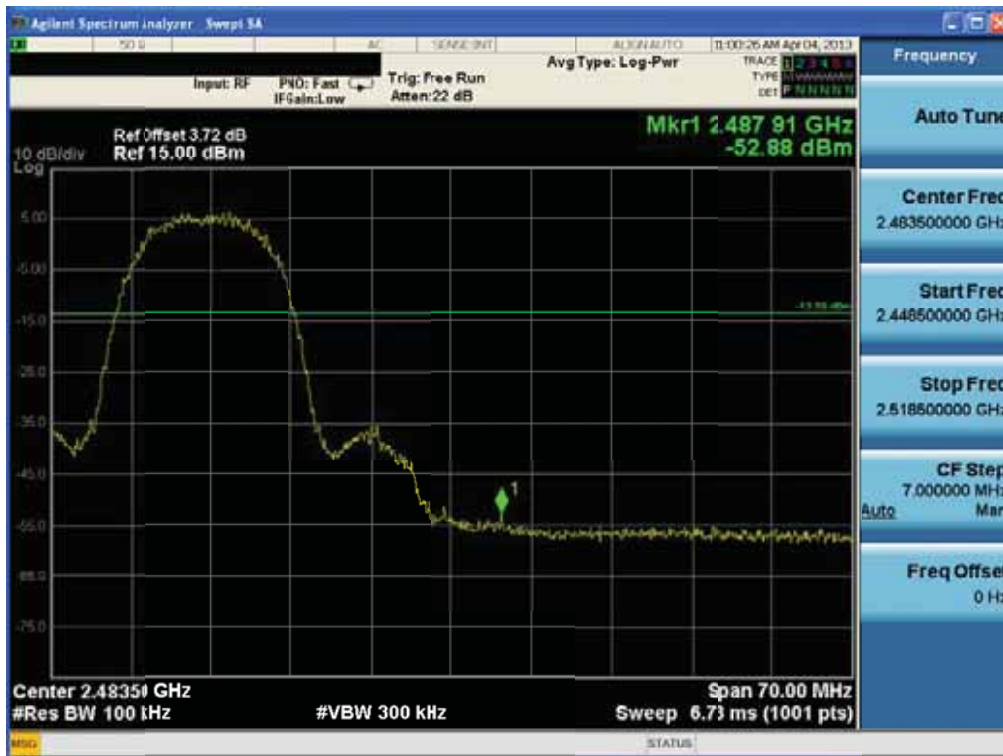


Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]
10.000 G	12.000 G	1.00 M	10.985200 G	-47.18
12.000 G	15.000 G	1.00 M	13.573050 G	-47.67
15.000 G	20.000 G	1.00 M	19.211750 G	-46.63
20.000 G	25.000 G	1.00 M	24.634750 G	-42.93

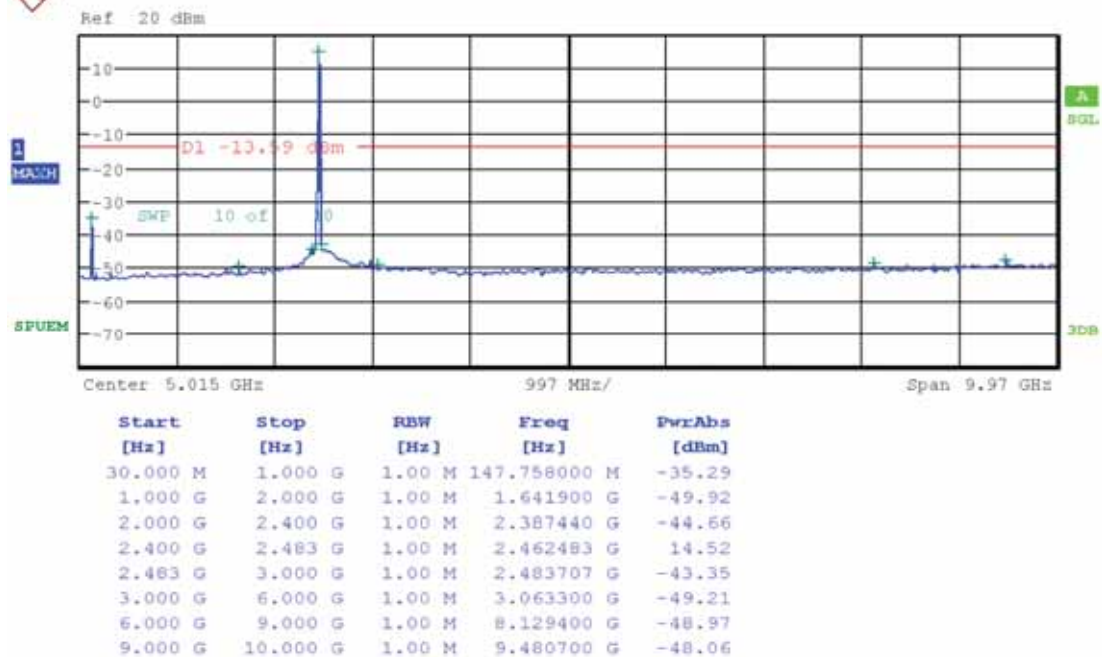
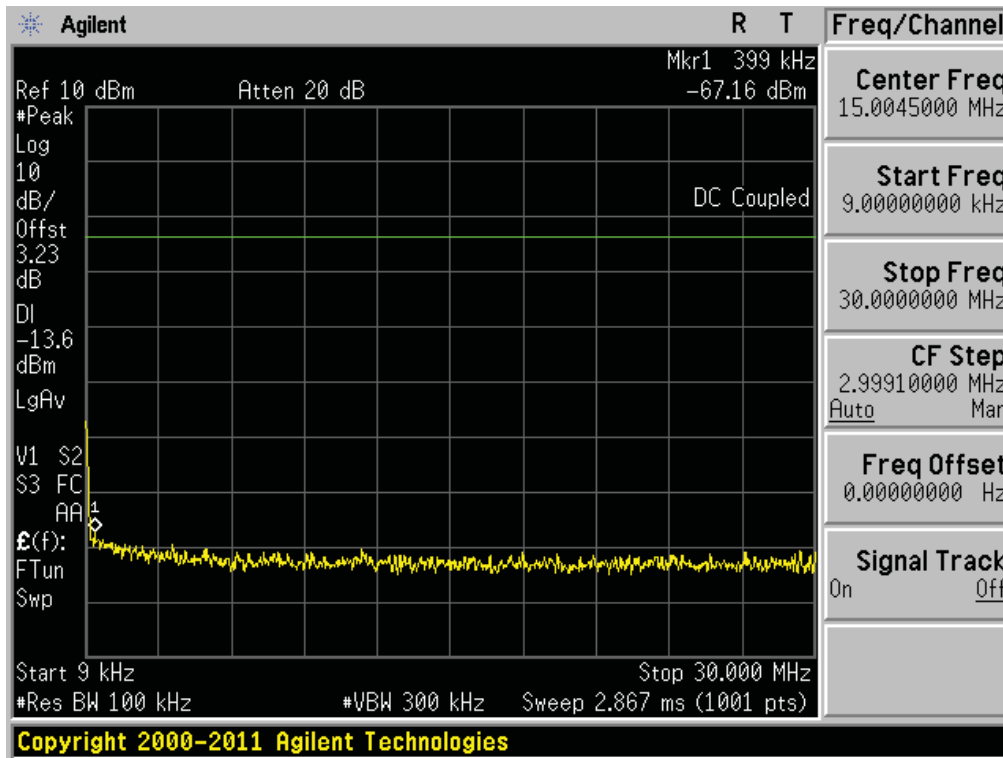
Test Mode: Chain 0 & 802.11b & 11Mbps & 2462MHz  
Reference



Low Band-edge



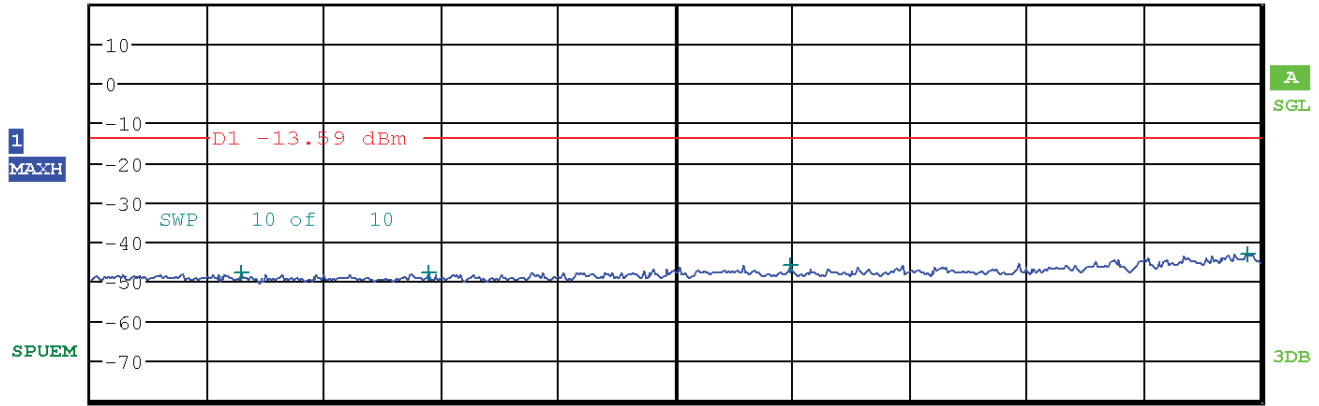
### Conducted Spurious Emissions



### Conducted Spurious Emissions



Ref 20 dBm



Center 17.5 GHz

1.5 GHz/

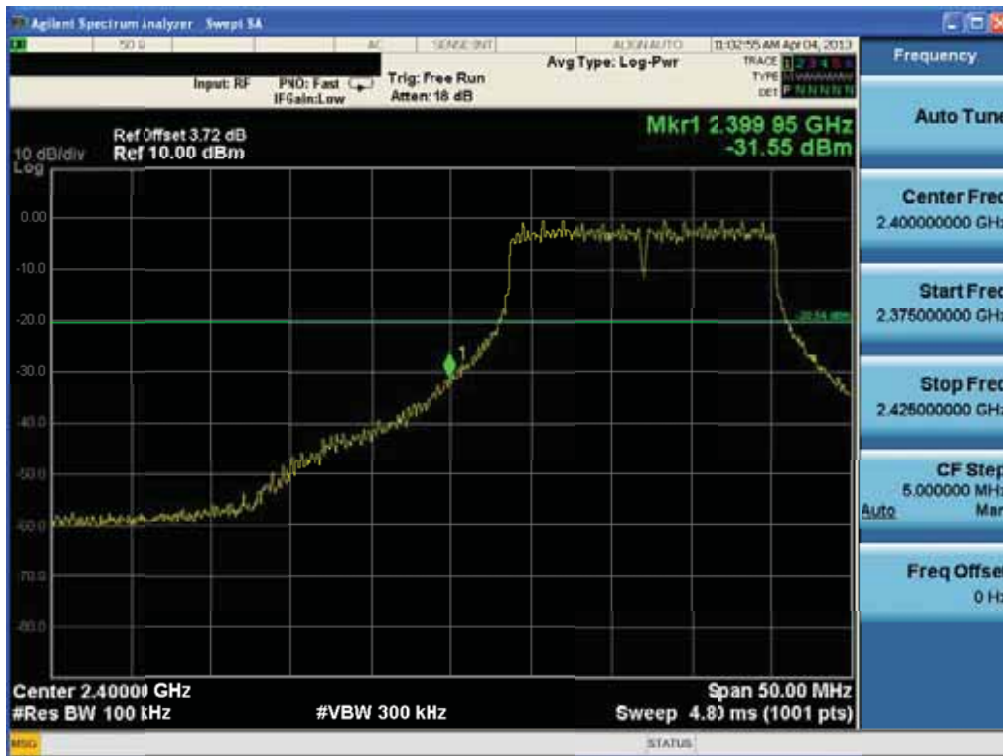
Span 15 GHz

Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]
10.000 G	12.000 G	1.00 M	11.923100 G	-47.91
12.000 G	15.000 G	1.00 M	14.317650 G	-47.89
15.000 G	20.000 G	1.00 M	18.972250 G	-46.15
20.000 G	25.000 G	1.00 M	24.827000 G	-42.96

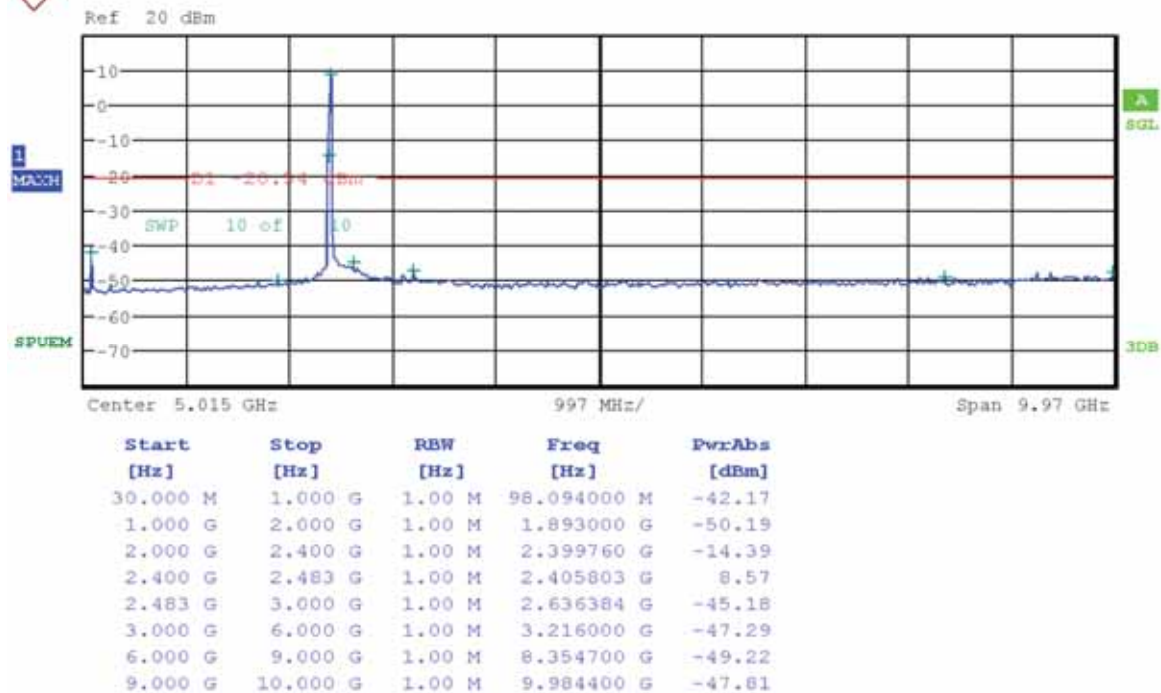
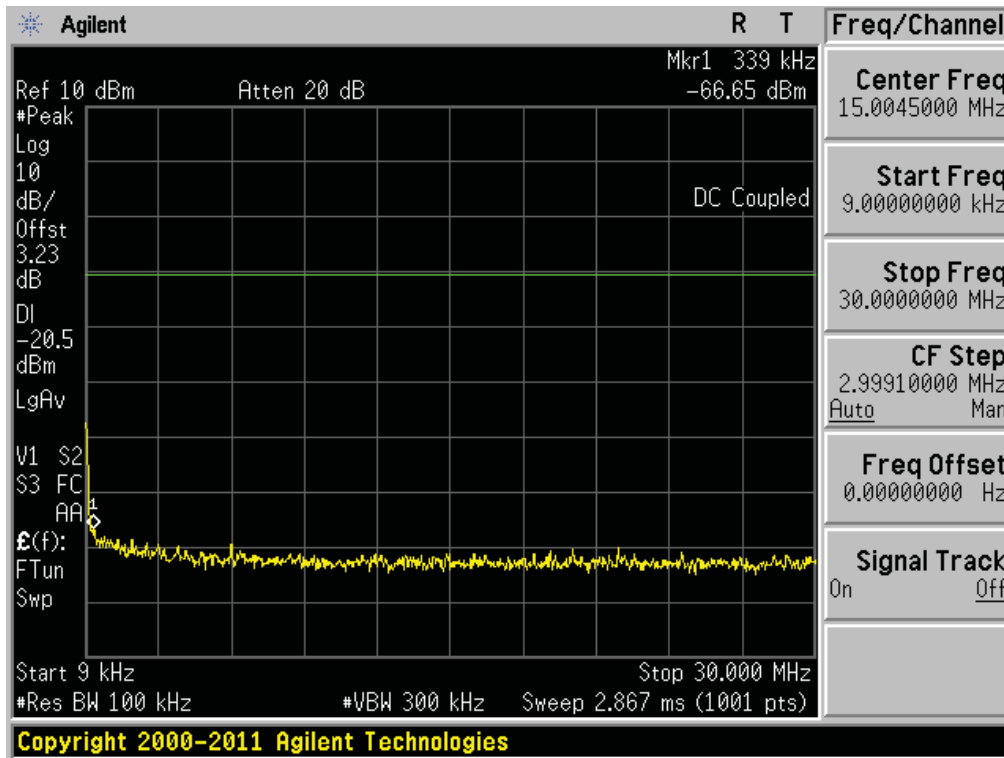
Test Mode: Chain 0 & 802.11g & 24Mbps & 2412MHz  
Reference



Low Band-edge



### Conducted Spurious Emissions



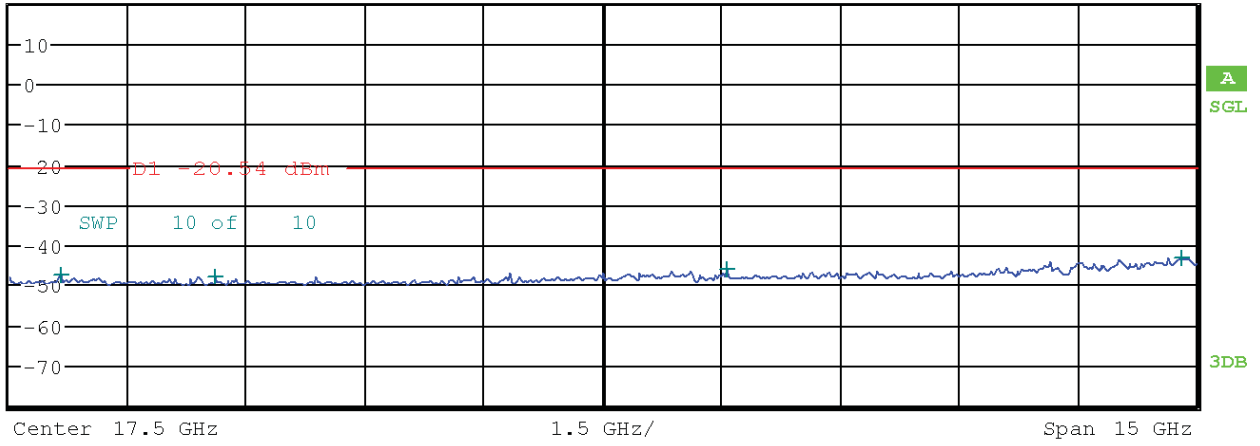
### Conducted Spurious Emissions



Ref 20 dBm

1  
MAXH

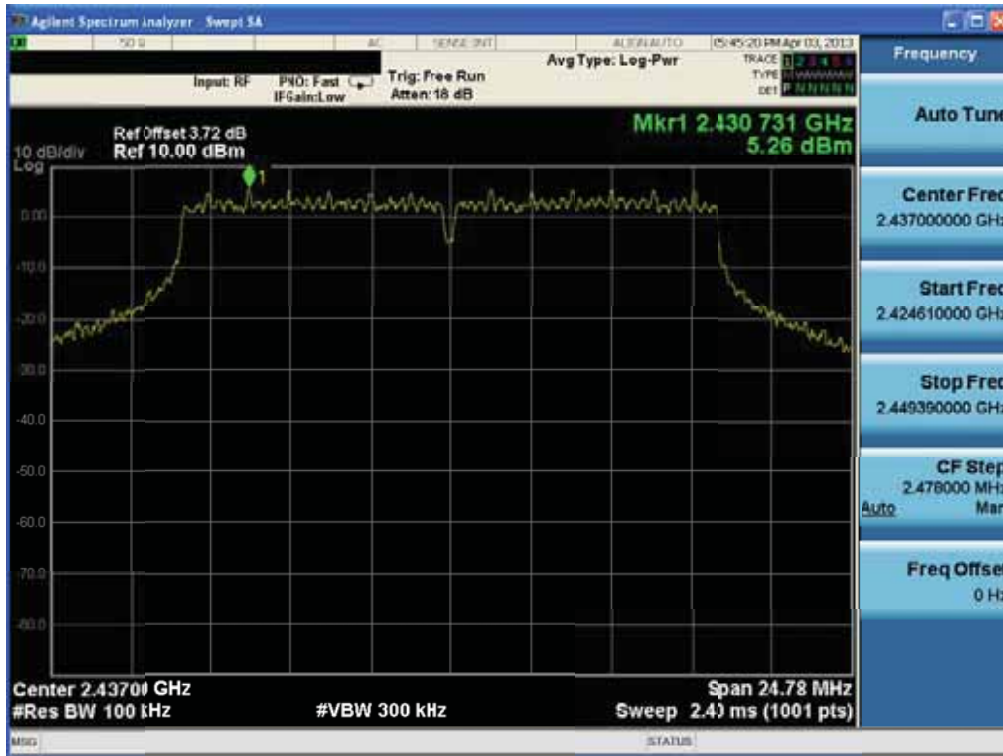
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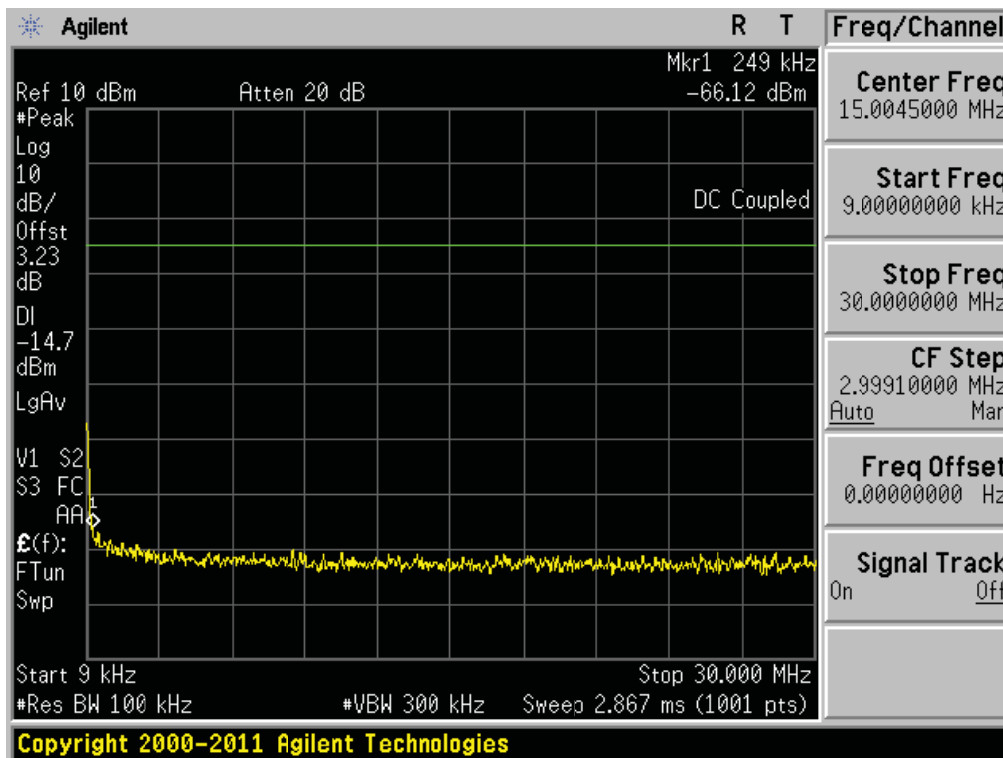
Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]
10.000 G	12.000 G	1.00 M	10.640800 G	-47.51
12.000 G	15.000 G	1.00 M	12.604050 G	-47.79
15.000 G	20.000 G	1.00 M	19.073750 G	-45.79
20.000 G	25.000 G	1.00 M	24.810250 G	-43.10

Test Mode: Chain 0 & 802.11g & 24Mbps & 2437MHz

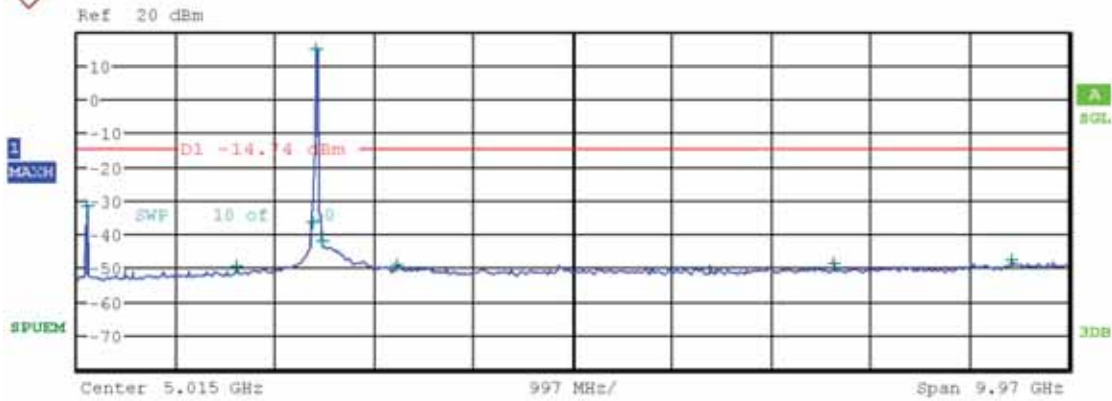
Reference



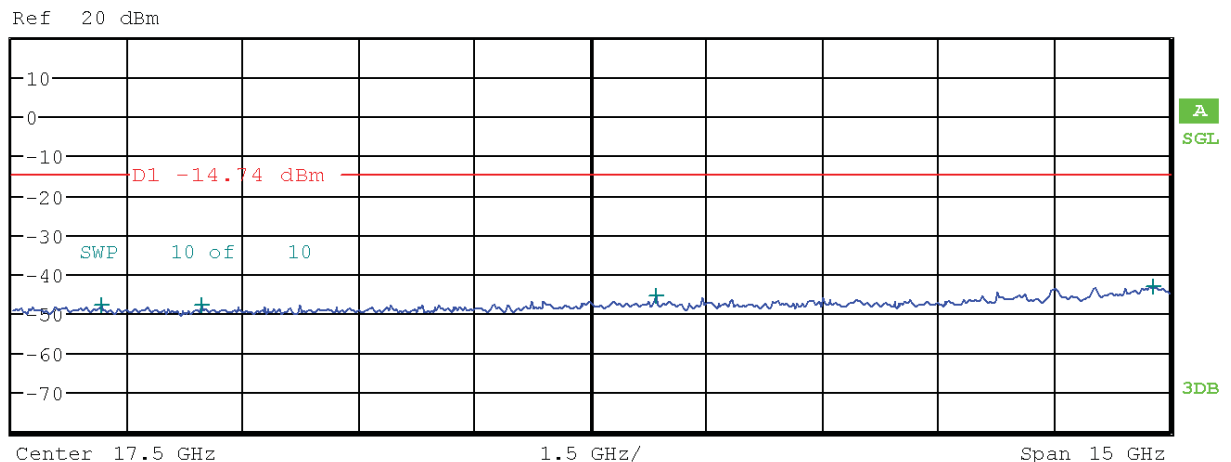
Conducted Spurious Emissions



### Conducted Spurious Emissions



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]
30.000 M	1.000 G	1.00 M	123.411000 M	-32.03
1.000 G	2.000 G	1.00 M	1.624700 G	-49.94
2.000 G	2.400 G	1.00 M	2.399640 G	-36.54
2.400 G	2.483 G	1.00 M	2.430828 G	14.62
2.483 G	3.000 G	1.00 M	2.484378 G	-42.30
3.000 G	6.000 G	1.00 M	3.249300 G	-49.20
6.000 G	9.000 G	1.00 M	7.628100 G	-48.81
9.000 G	10.000 G	1.00 M	9.428200 G	-47.75

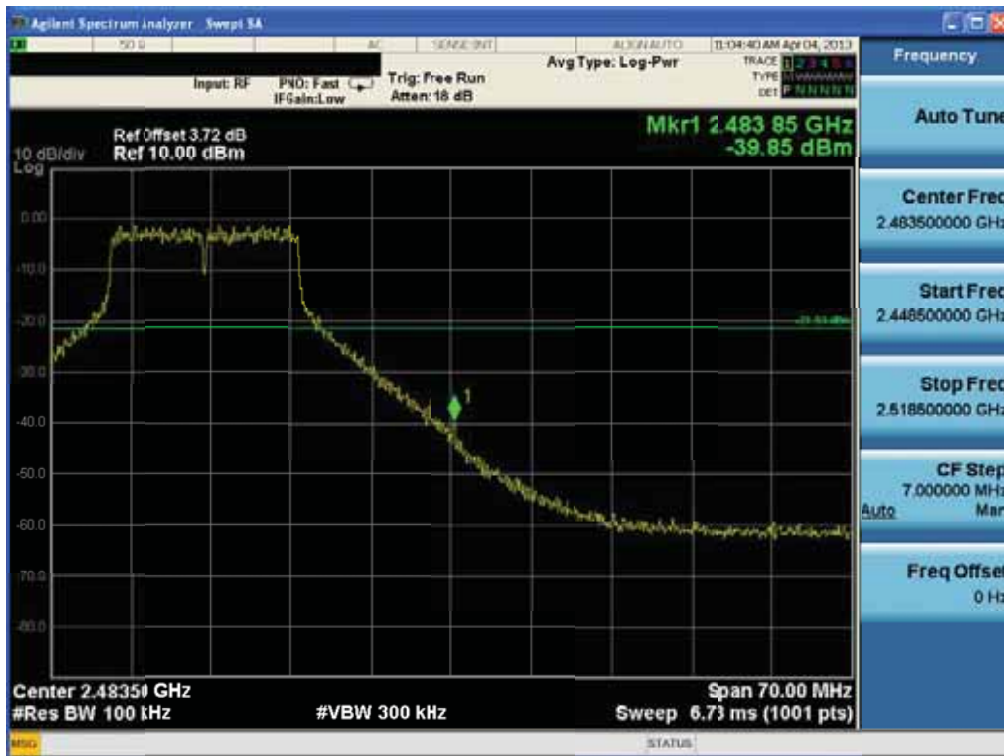


Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]
10.000 G	12.000 G	1.00 M	11.142700 G	-47.84
12.000 G	15.000 G	1.00 M	12.455850 G	-47.87
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20.000 G	25.000 G	1.00 M	24.785250 G	-43.19

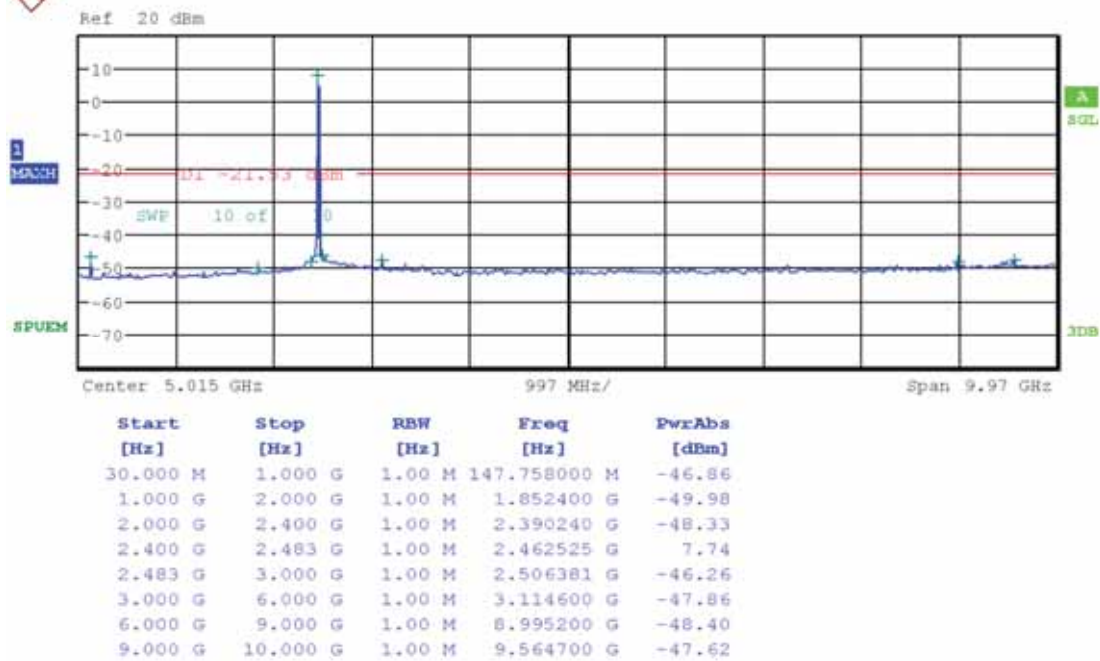
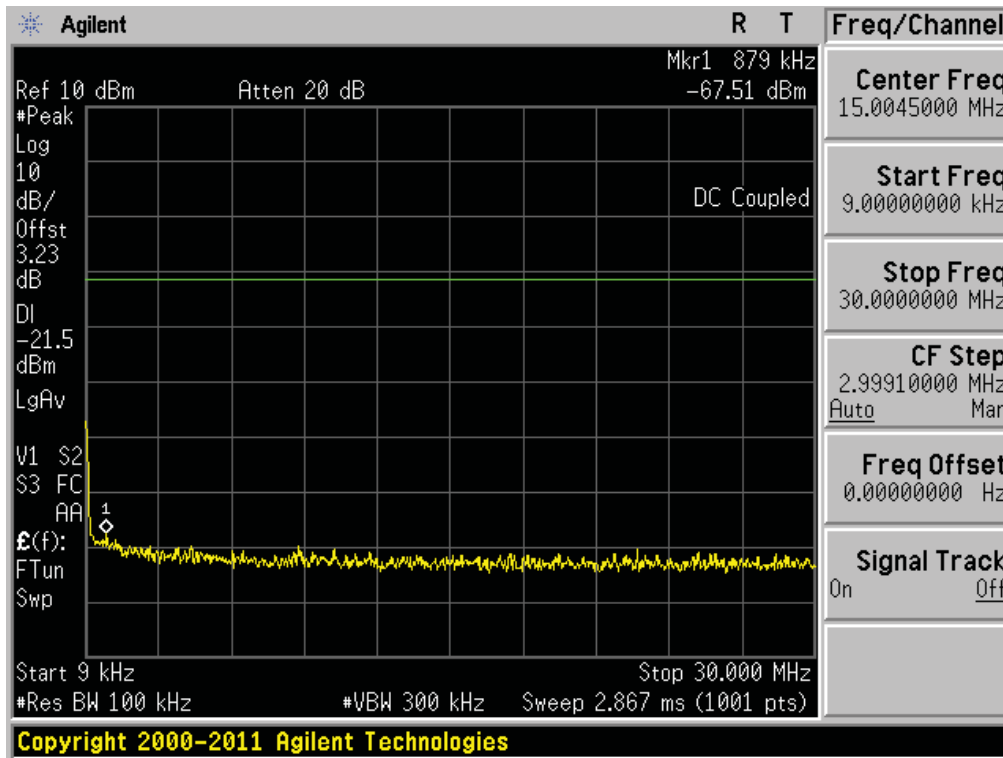
Test Mode: Chain 0 & 802.11g & 24Mbps & 2462MHz  
Reference



Low Band-edge



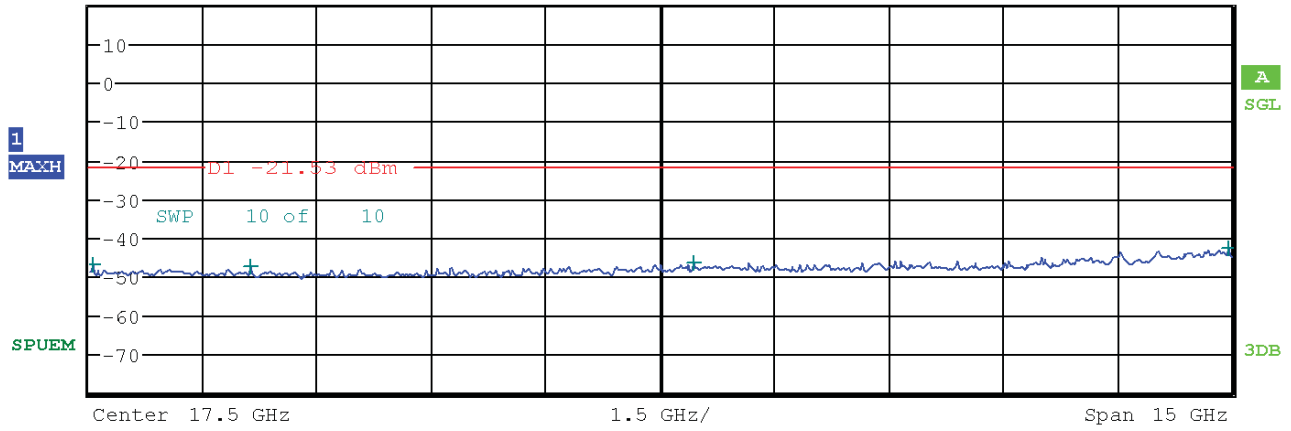
### Conducted Spurious Emissions



### Conducted Spurious Emissions



Ref 20 dBm



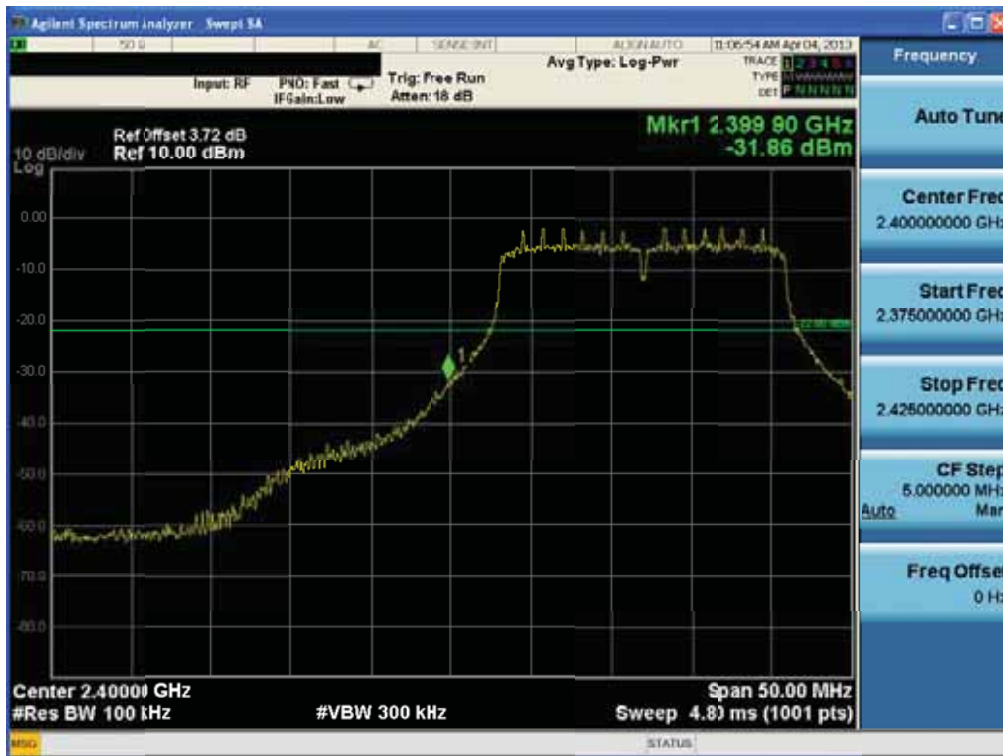
Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]
10.000 G	12.000 G	1.00 M	10.054100 G	-47.09
12.000 G	15.000 G	1.00 M	12.114900 G	-47.37
15.000 G	20.000 G	1.00 M	17.937250 G	-46.37
20.000 G	25.000 G	1.00 M	24.944750 G	-42.84

Test Mode: Chain 0 & 802.11n HT20 & MCS 8 & 2412MHz

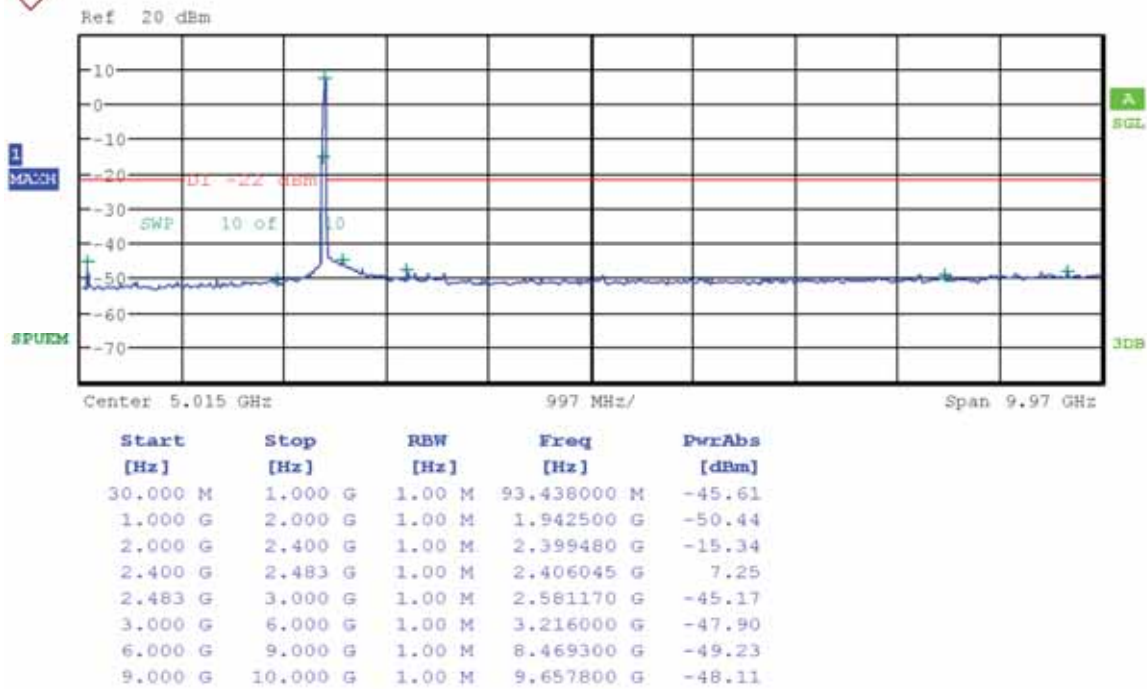
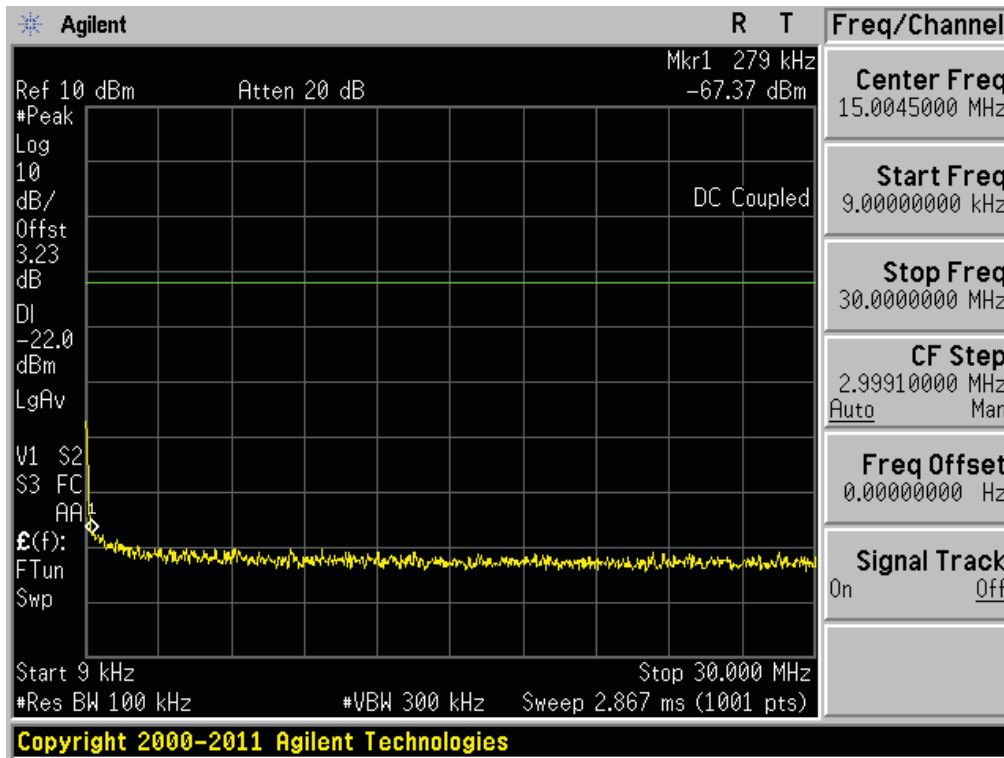
Reference



Low Band-edge



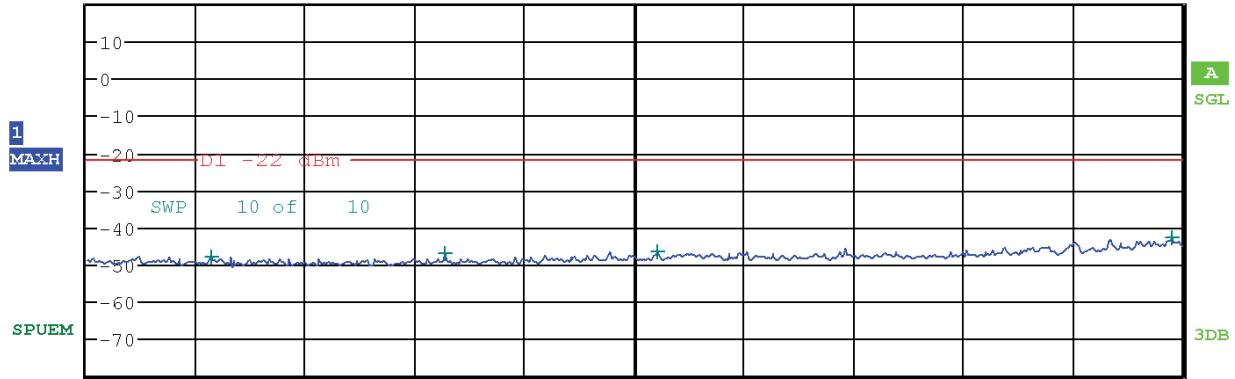
### Conducted Spurious Emissions



### Conducted Spurious Emissions



Ref 20 dBm



Center 17.5 GHz

1.5 GHz/

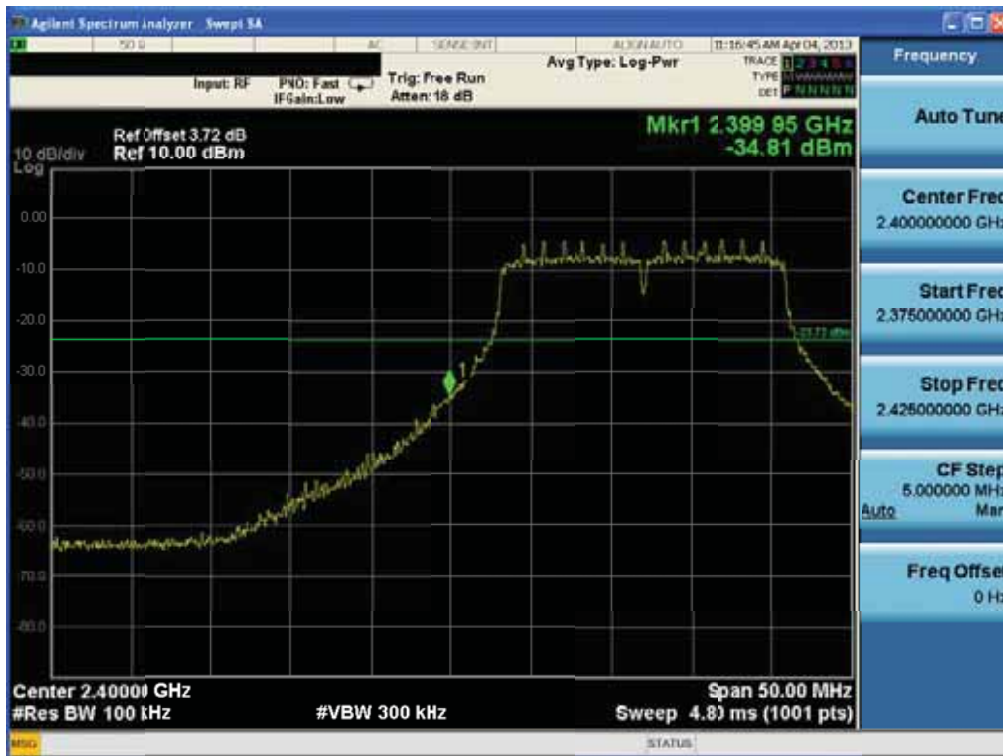
Span 15 GHz

Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]
10.000 G	12.000 G	1.00 M	11.713300 G	-47.61
12.000 G	15.000 G	1.00 M	14.895450 G	-46.68
15.000 G	20.000 G	1.00 M	17.821250 G	-46.51
20.000 G	25.000 G	1.00 M	24.861500 G	-42.71

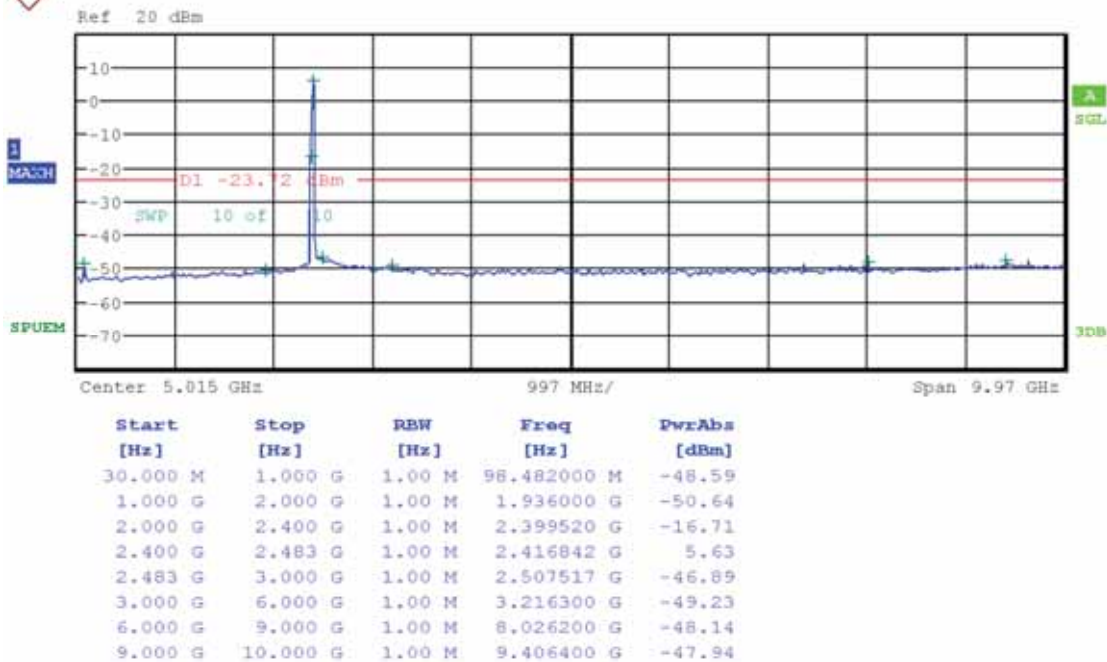
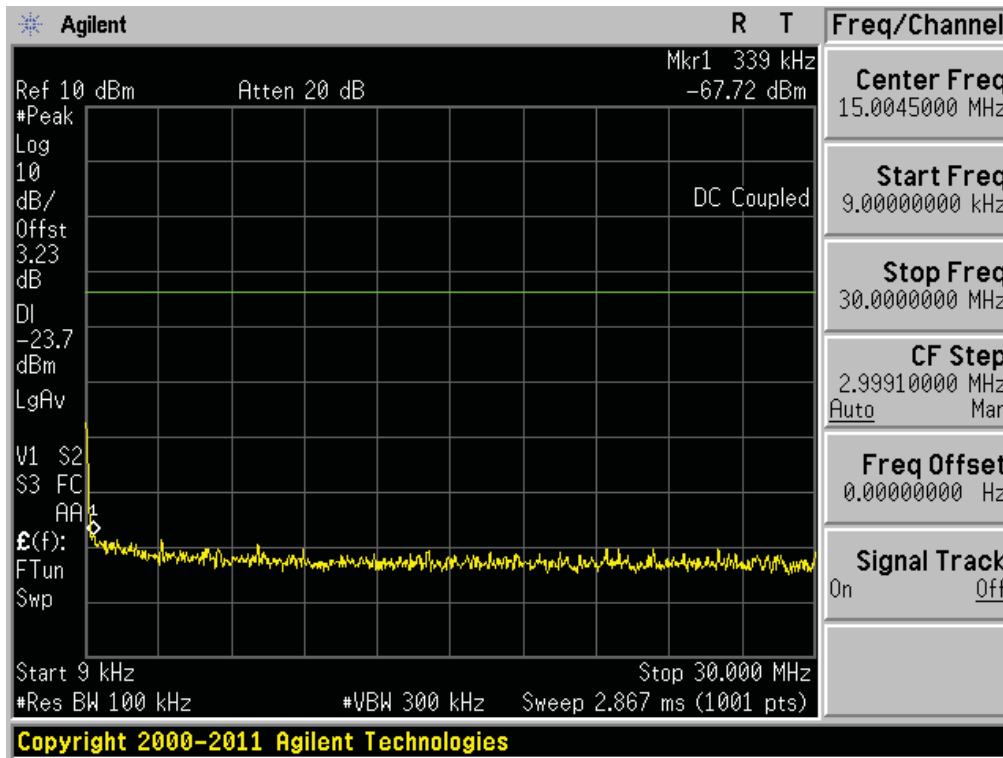
Test Mode: Chain 1 & 802.11n HT20 & MCS 8 & 2412MHz  
Reference



Low Band-edge



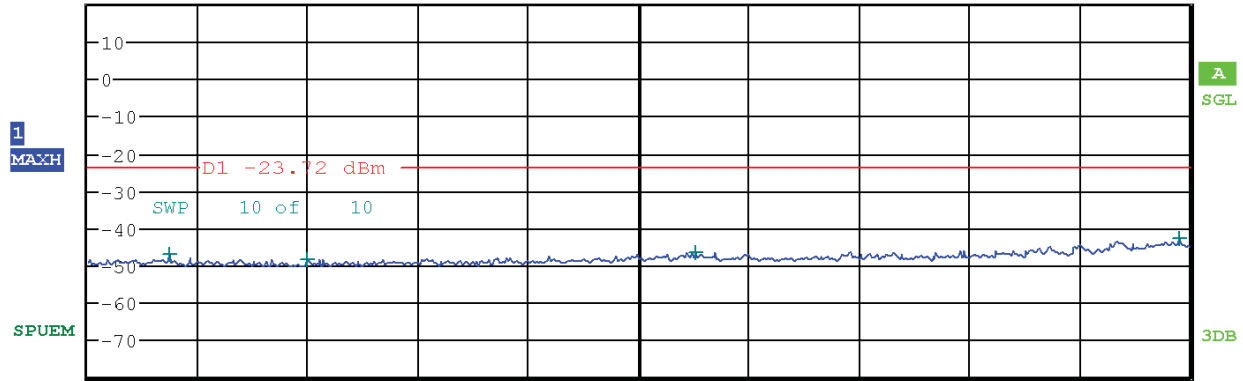
### Conducted Spurious Emissions



### Conducted Spurious Emissions



Ref 20 dBm



Center 17.5 GHz

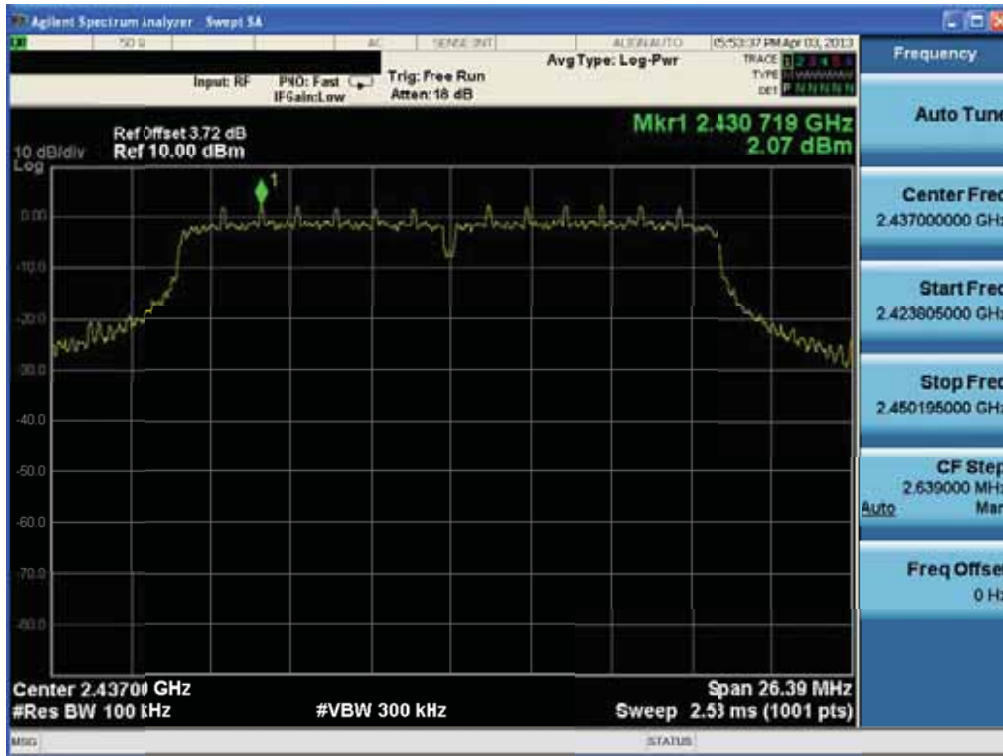
1.5 GHz/

Span 15 GHz

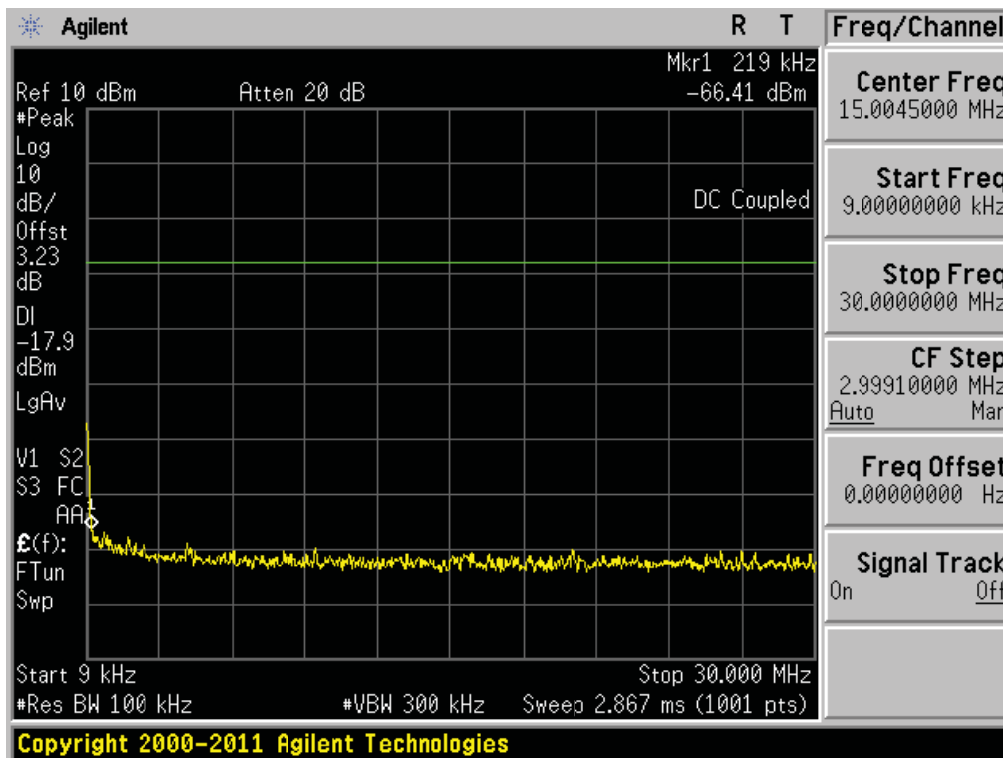
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12.000 G	15.000 G	1.00 M	12.991950 G	-48.19
15.000 G	20.000 G	1.00 M	18.272500 G	-46.26
20.000 G	25.000 G	1.00 M	24.857750 G	-42.81

Test Mode: Chain 0 & 802.11n HT20 & MCS 8 & 2437MHz

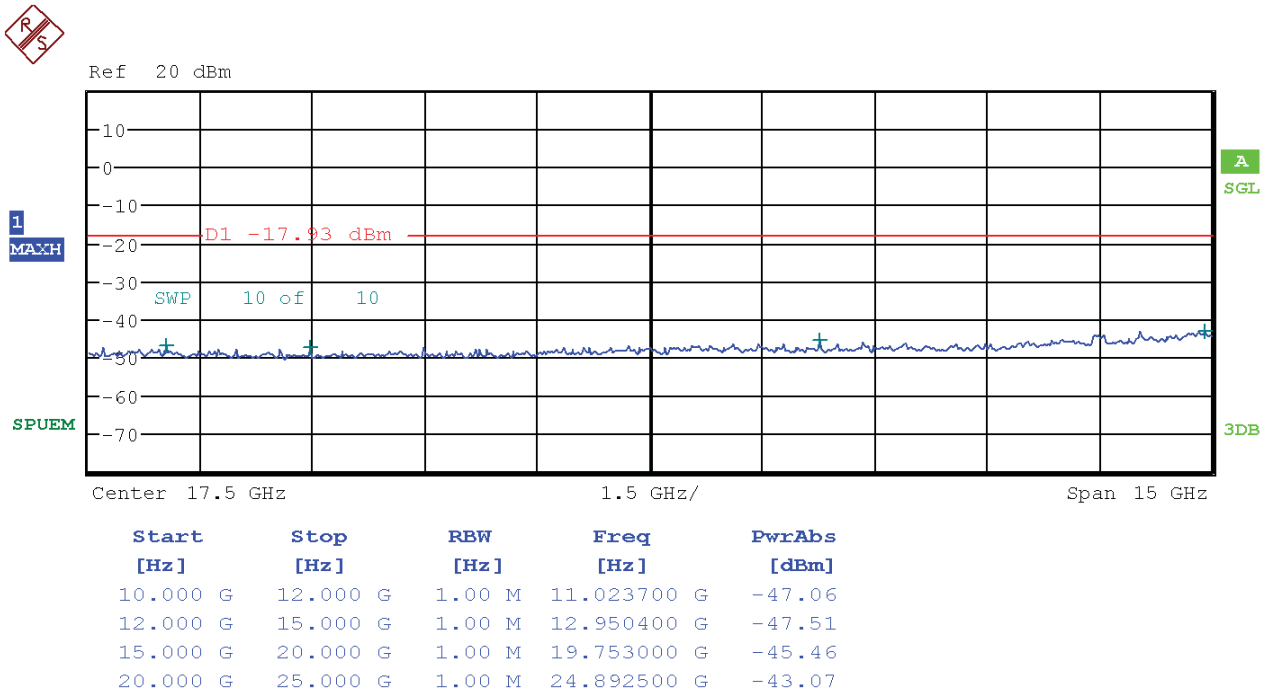
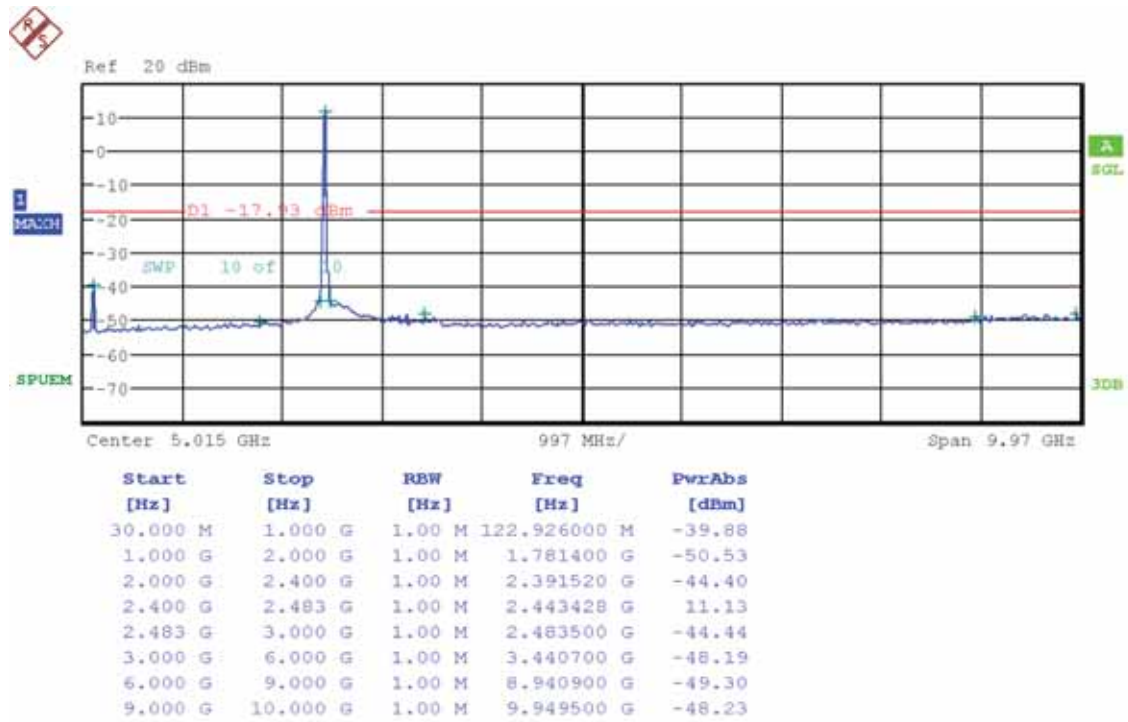
Reference



Conducted Spurious Emissions



### Conducted Spurious Emissions

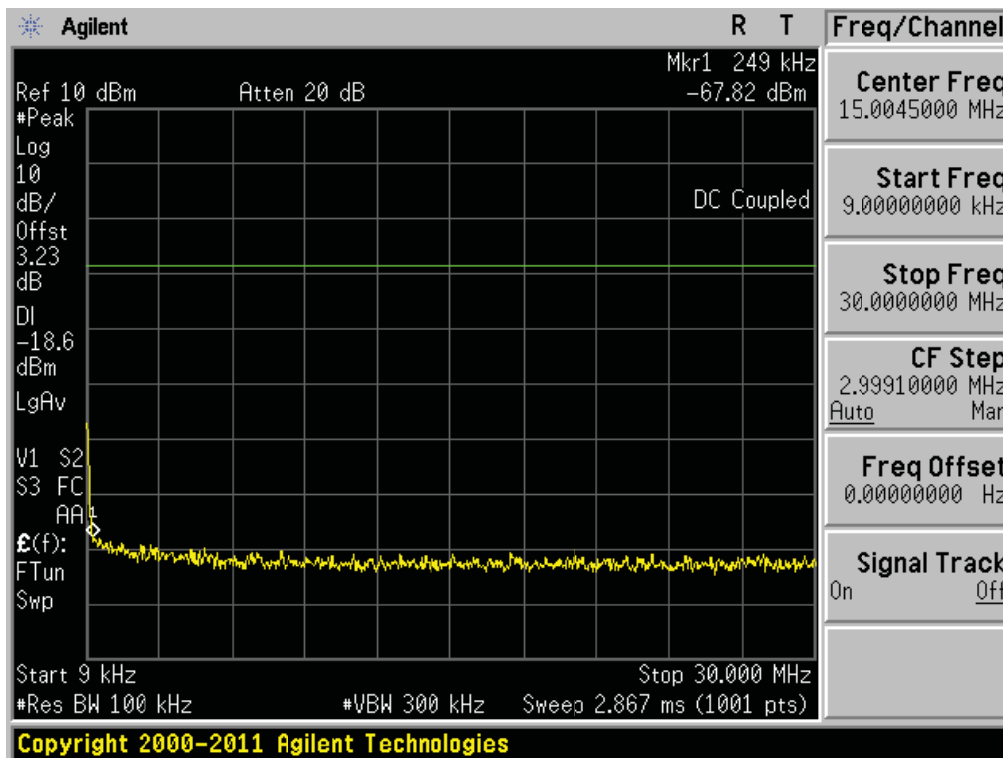


**Test Mode: Chain 1 & 802.11n HT20 & MCS 8 & 2437MHz**

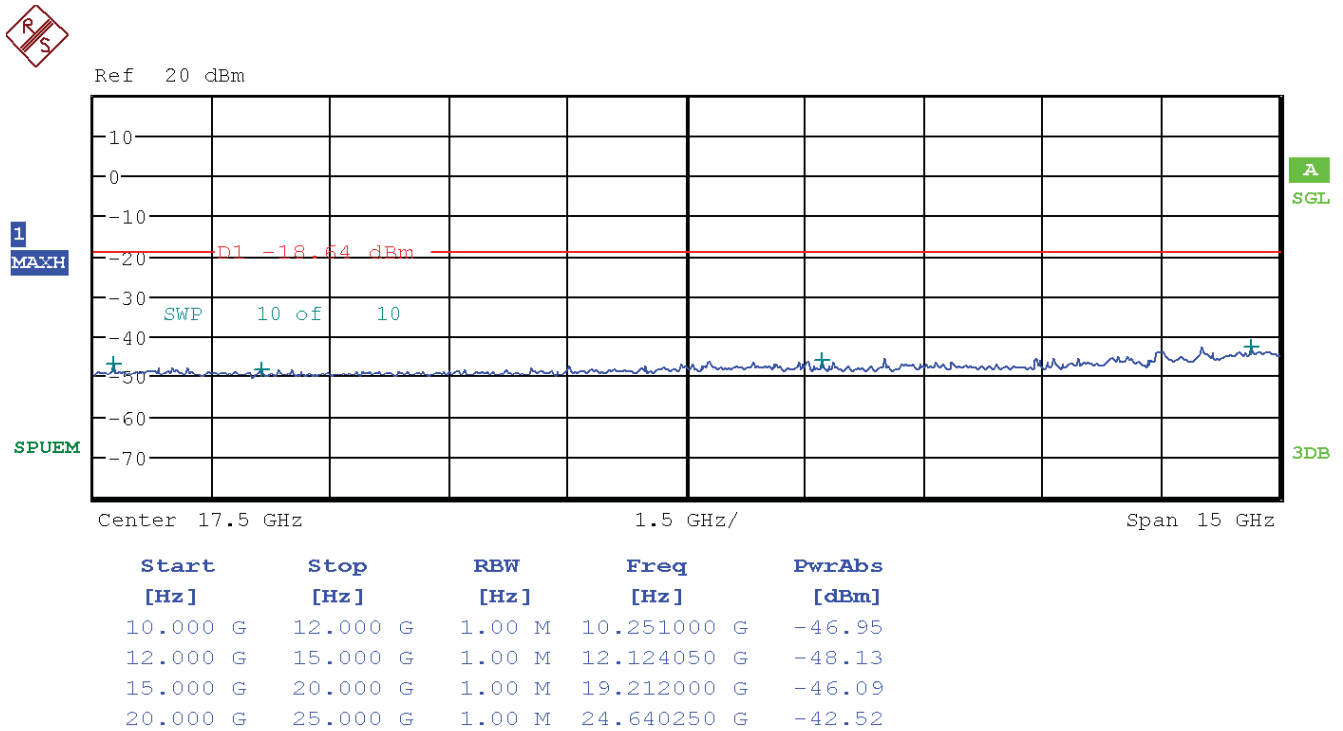
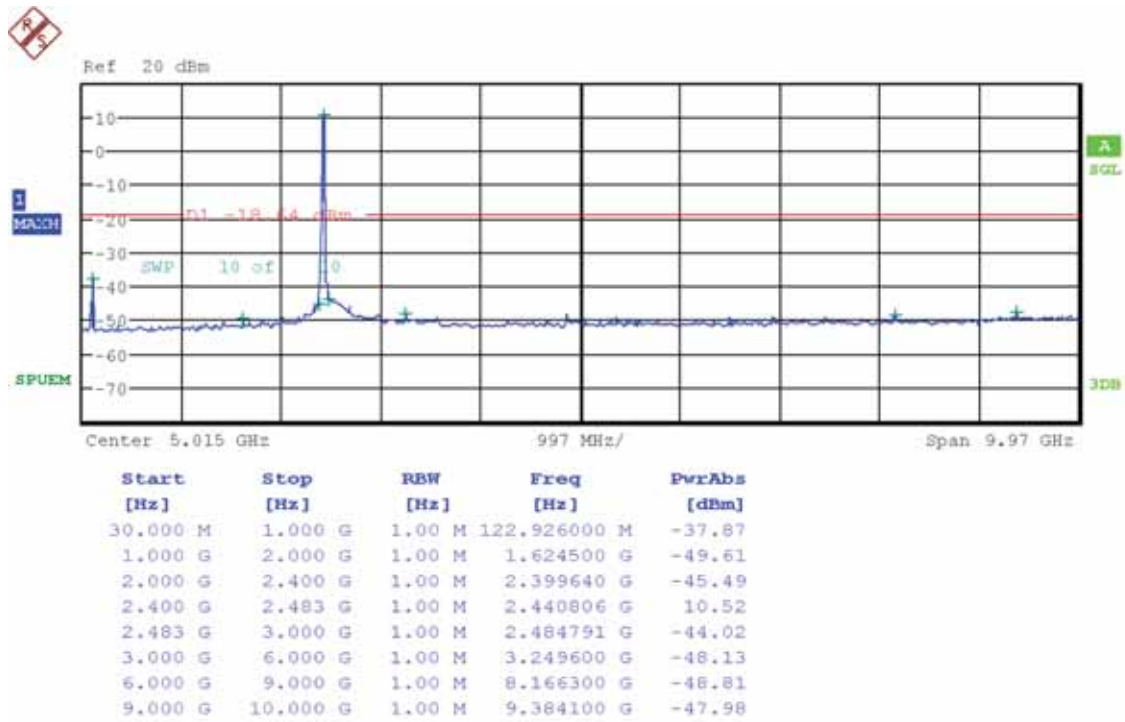
**Reference**



**Conducted Spurious Emissions**



### Conducted Spurious Emissions

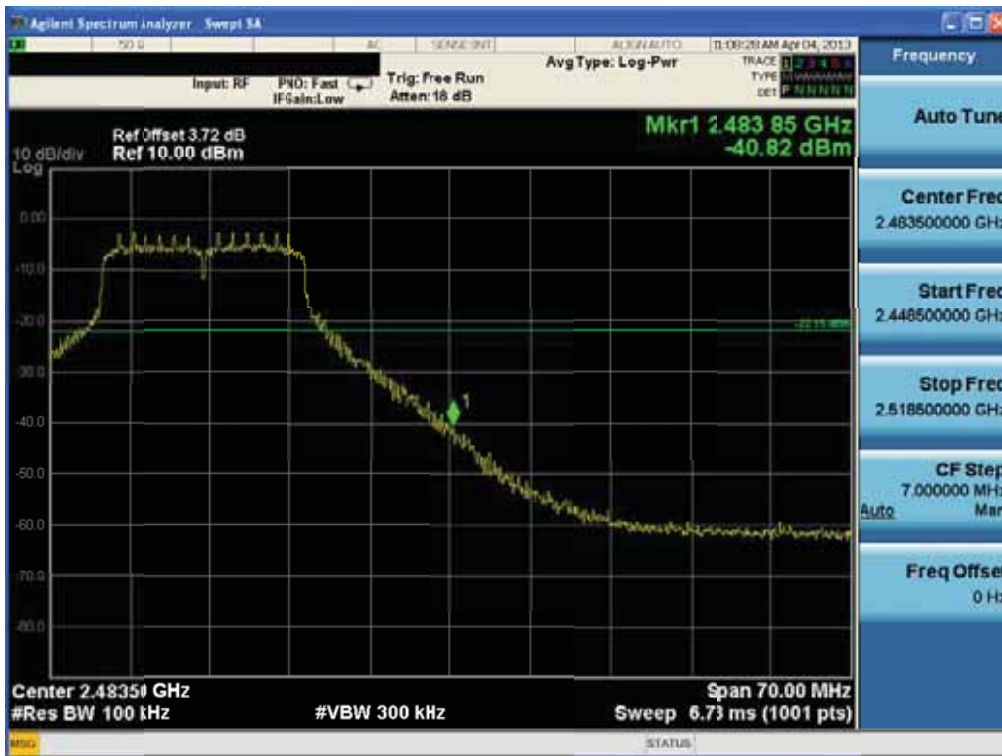


Test Mode: Chain 0 & 802.11n HT20 & MCS 8 & 2462MHz

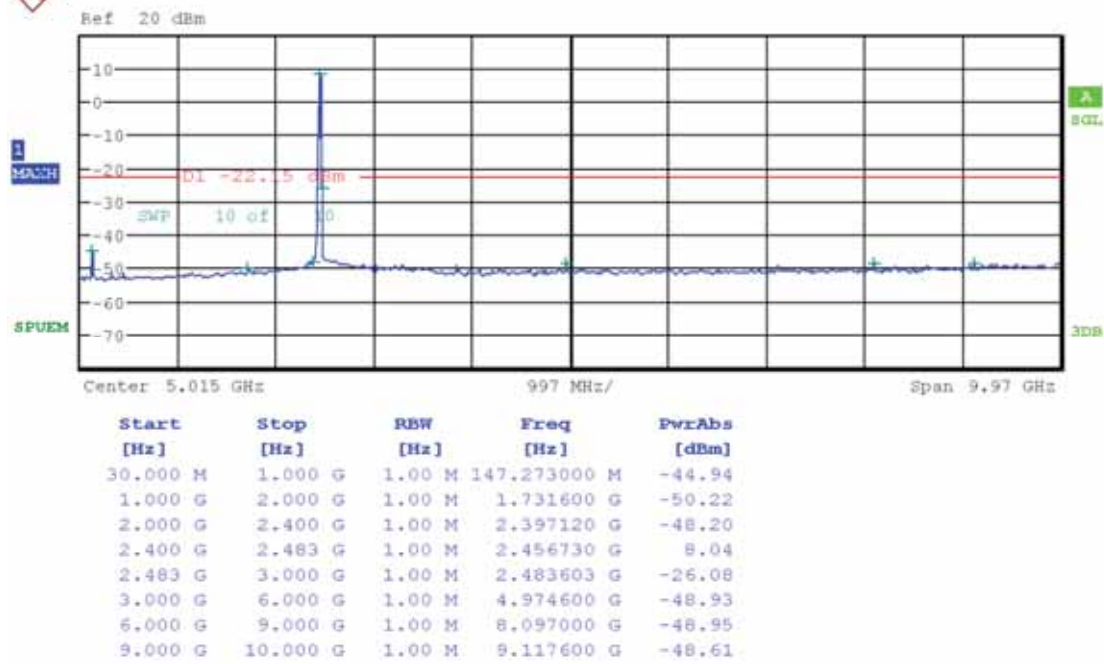
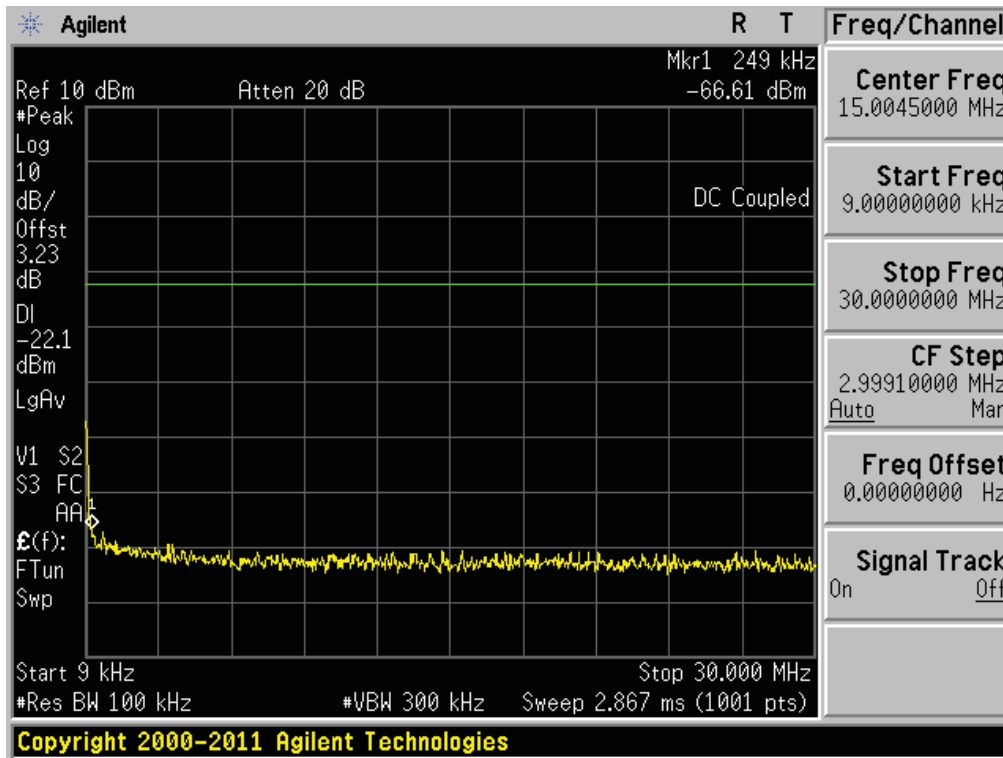
Reference



Low Band-edge



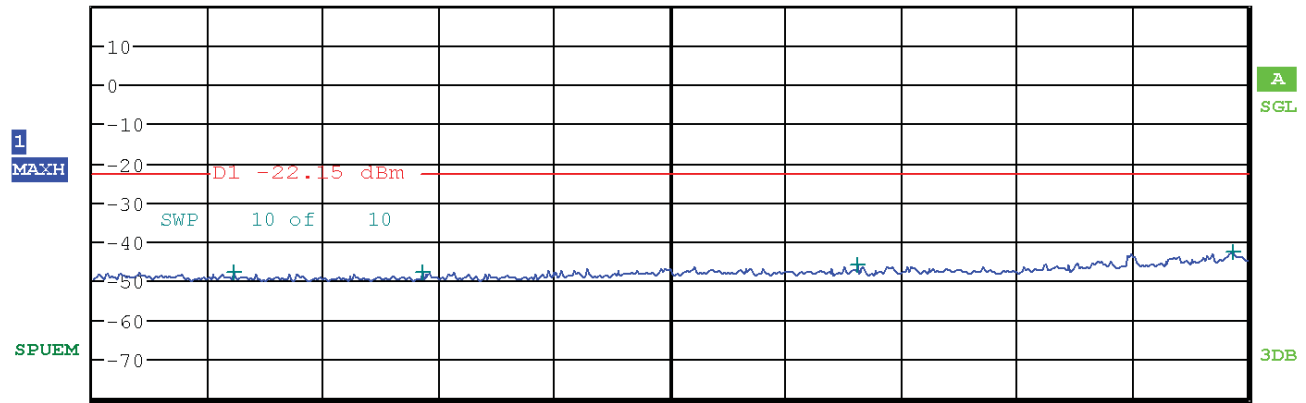
### Conducted Spurious Emissions



### Conducted Spurious Emissions



Ref 20 dBm



Center 17.5 GHz

1.5 GHz/

Span 15 GHz

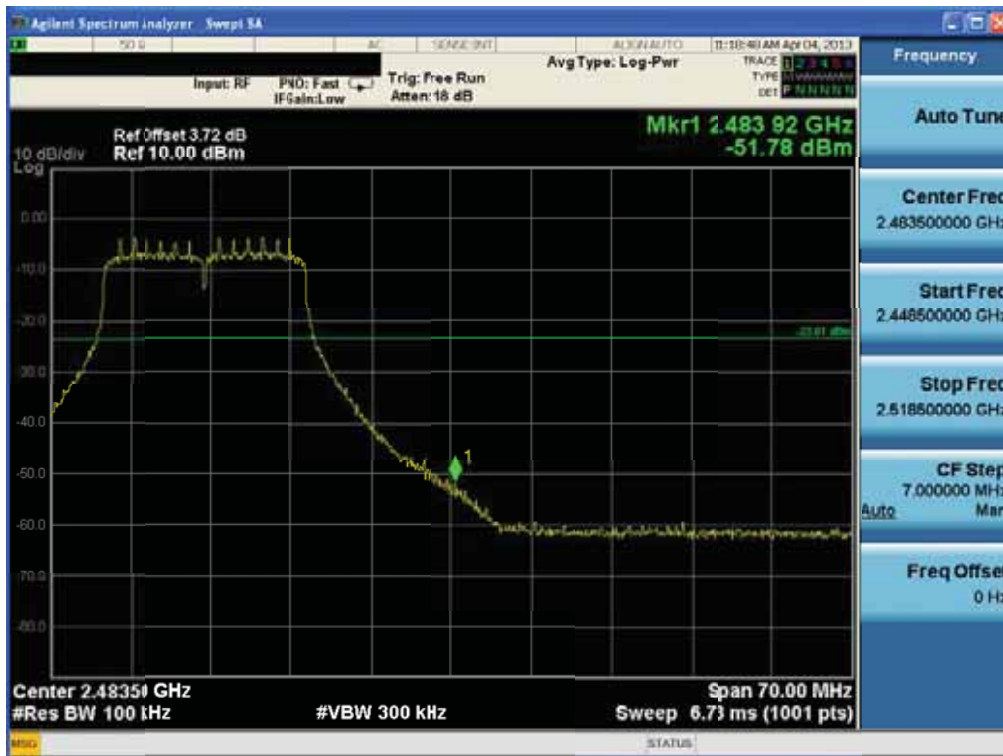
Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]
10.000 G	12.000 G	1.00 M	11.822300 G	-47.73
12.000 G	15.000 G	1.00 M	14.278800 G	-47.75
15.000 G	20.000 G	1.00 M	19.930500 G	-45.96
20.000 G	25.000 G	1.00 M	24.797500 G	-42.86

Test Mode: Chain 1 & 802.11n HT20 & MCS 8 & 2462MHz

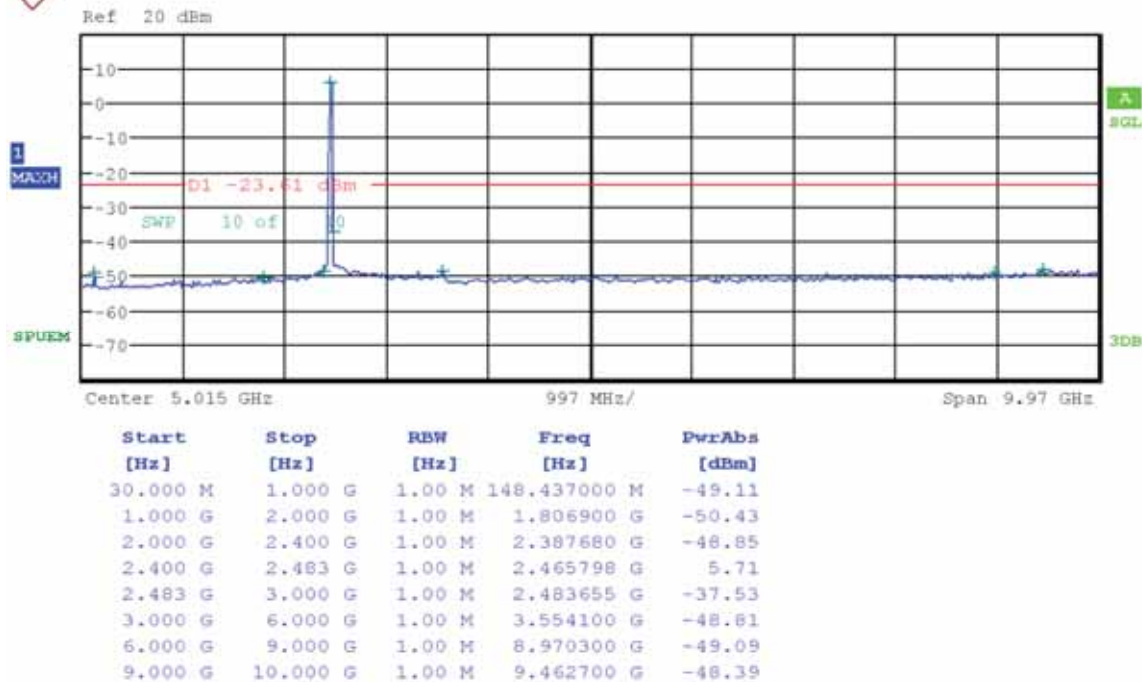
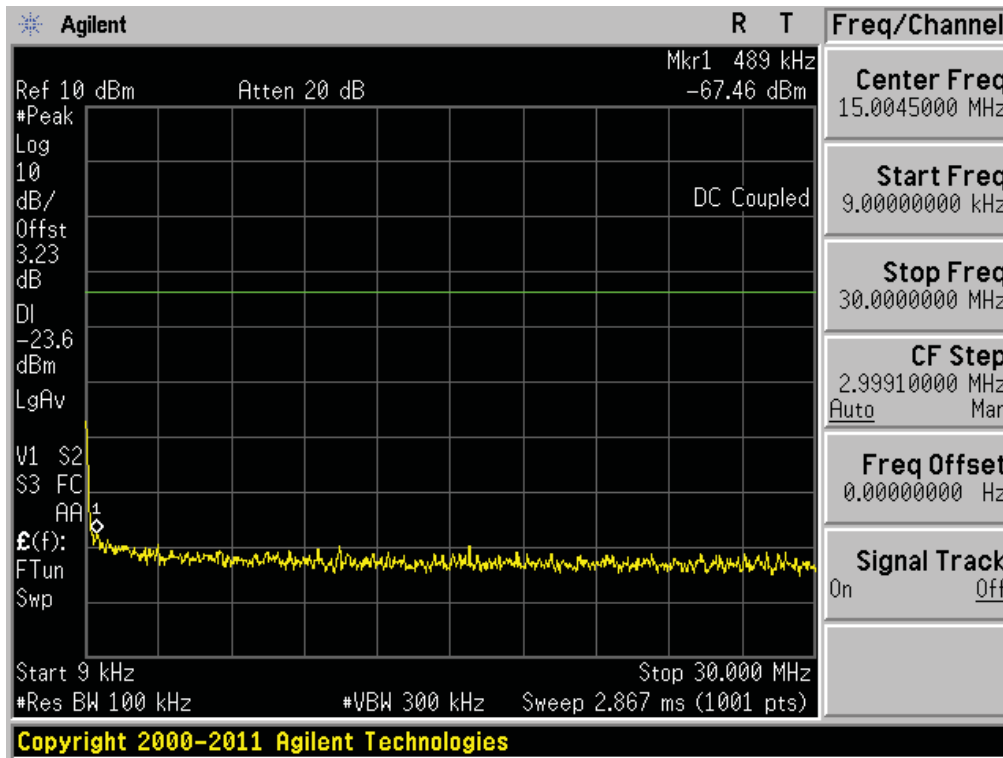
Reference



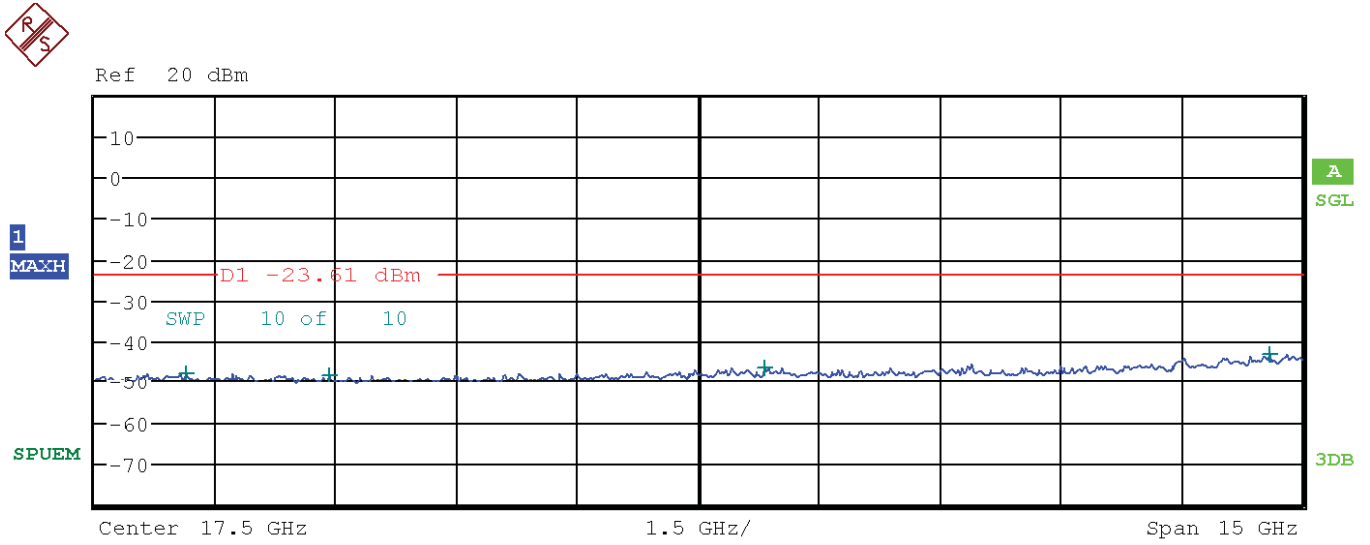
Low Band-edge



### Conducted Spurious Emissions



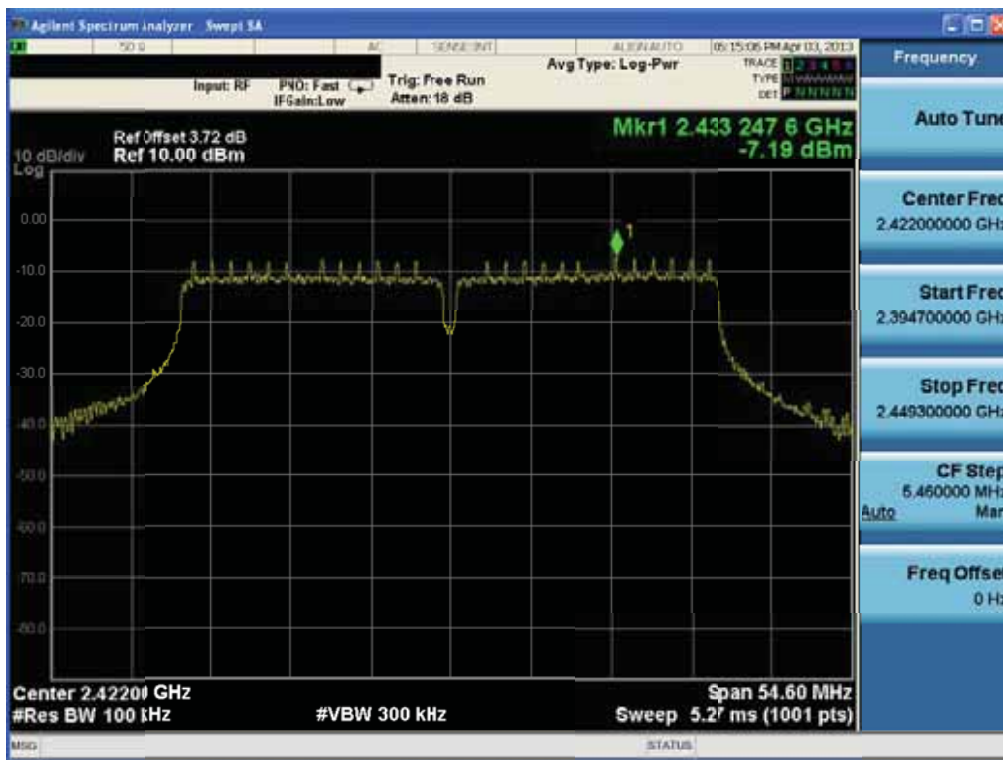
### Conducted Spurious Emissions



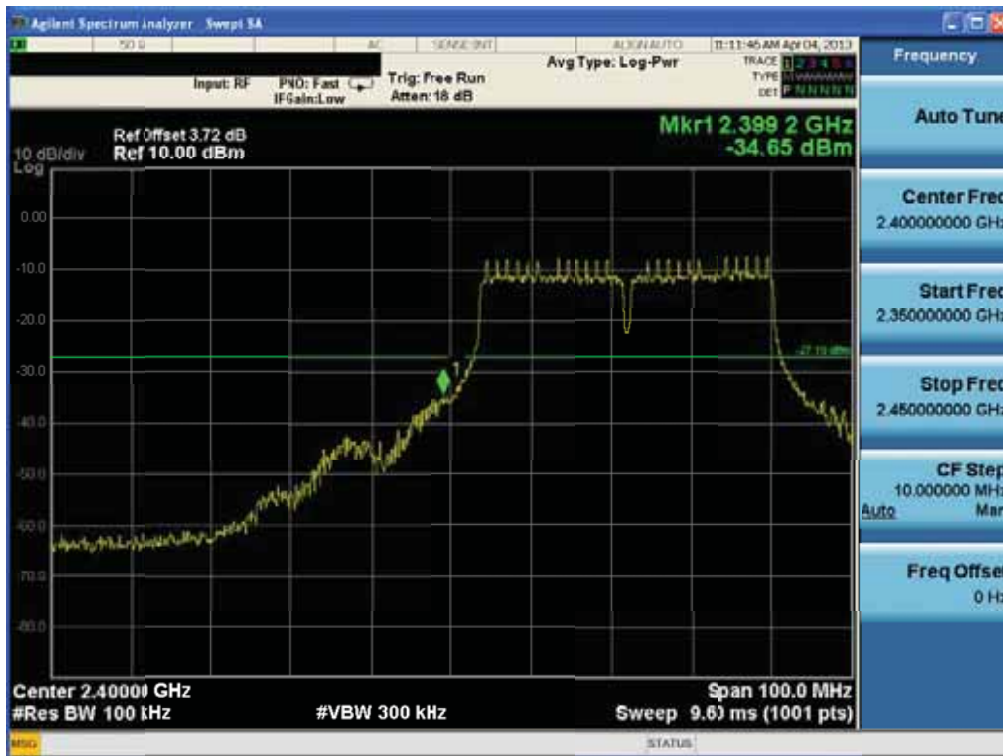
Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]
10.000 G	12.000 G	1.00 M	11.124300 G	-47.90
12.000 G	15.000 G	1.00 M	12.910200 G	-48.17
15.000 G	20.000 G	1.00 M	18.322500 G	-46.20
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Test Mode: Chain 0 & 802.11n HT40 & MCS 8 & 2422MHz

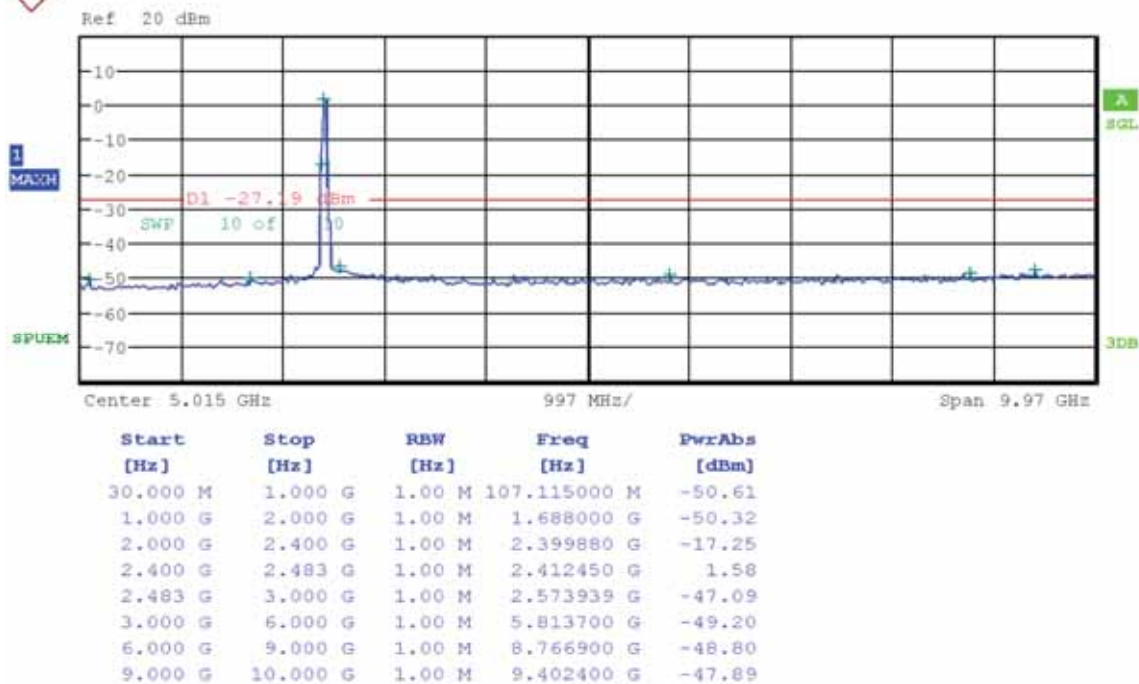
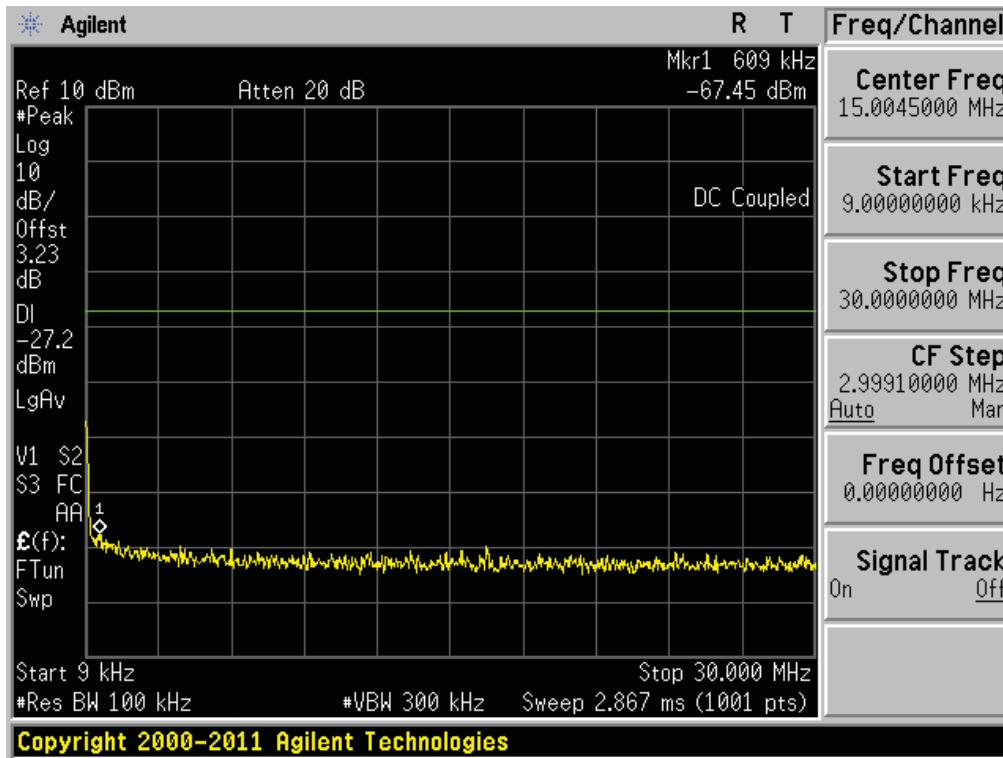
Reference



Low Band-edge



### Conducted Spurious Emissions



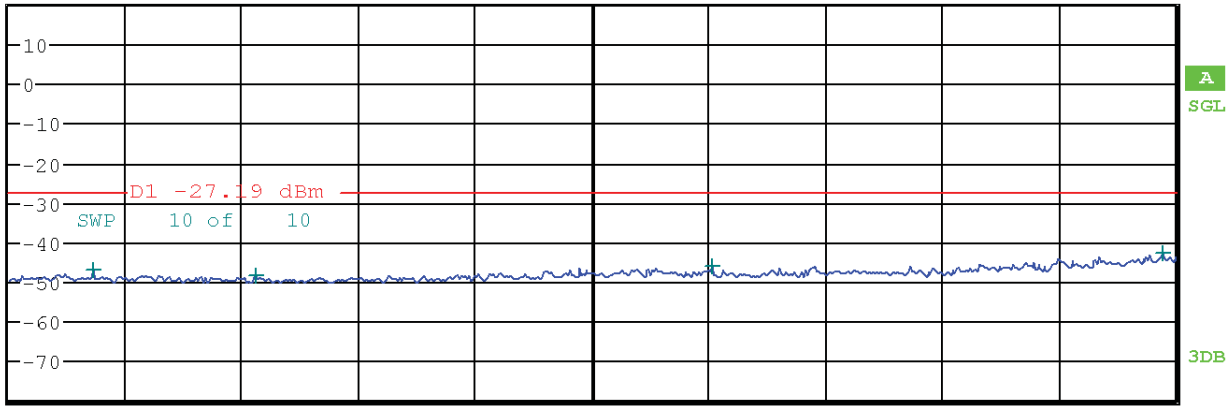
### Conducted Spurious Emissions



Ref 20 dBm

1  
MAXH

SPUEM

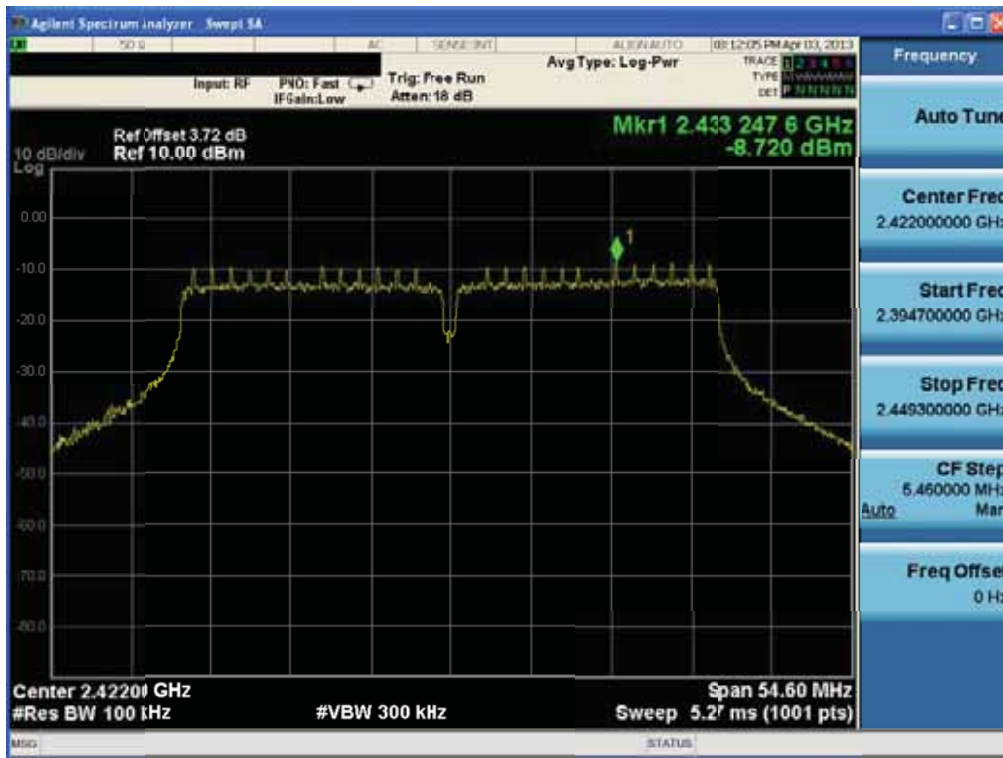


Center 17.5 GHz                      1.5 GHz/                      Span 15 GHz

Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]
10.000 G	12.000 G	1.00 M	11.077400 G	-46.89
12.000 G	15.000 G	1.00 M	13.171350 G	-48.23
15.000 G	20.000 G	1.00 M	19.035500 G	-46.02
20.000 G	25.000 G	1.00 M	24.825750 G	-42.48

Test Mode: Chain 1 & 802.11n HT40 & MCS 8 & 2422MHz

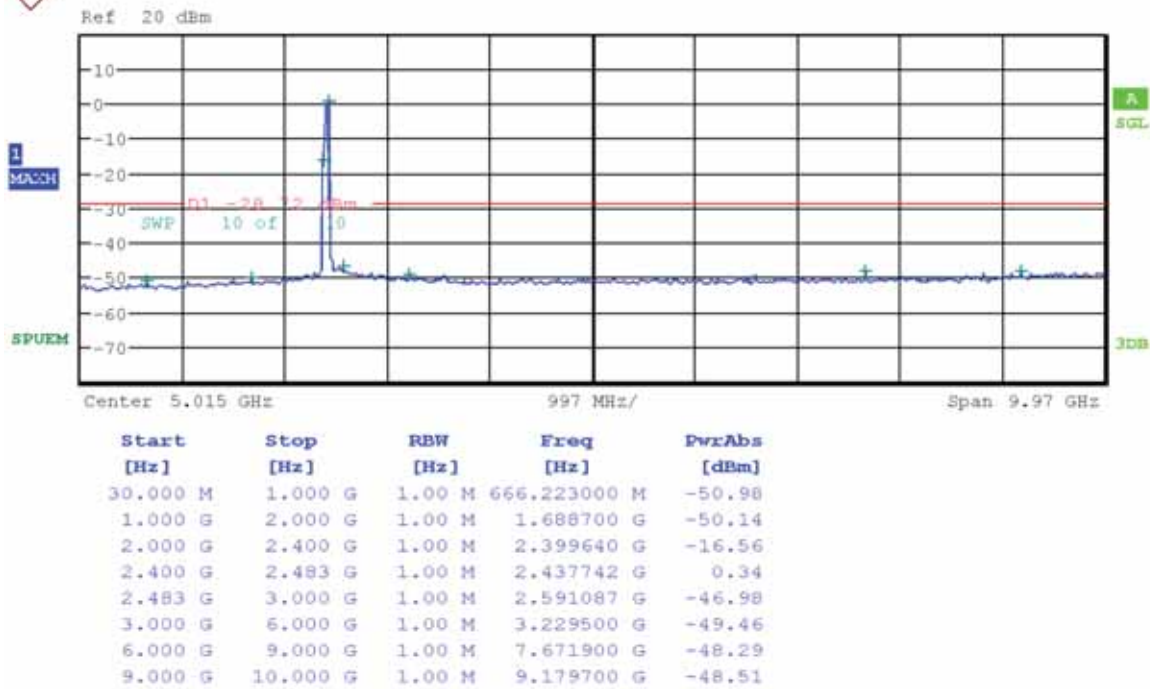
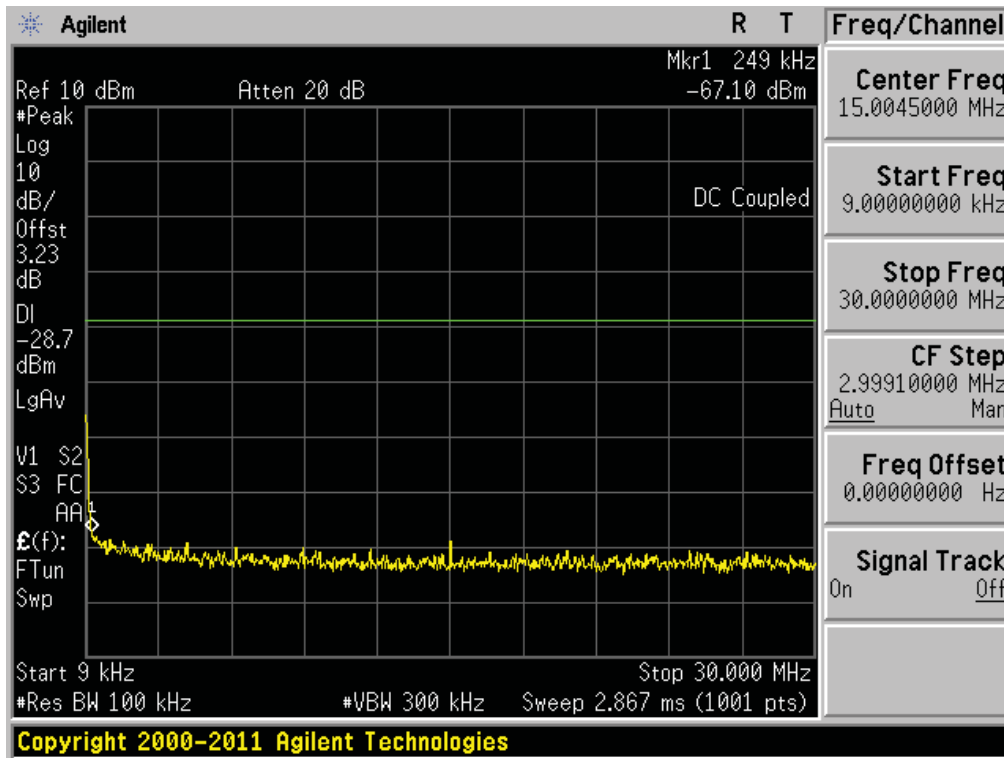
### Reference



### Low Band-edge



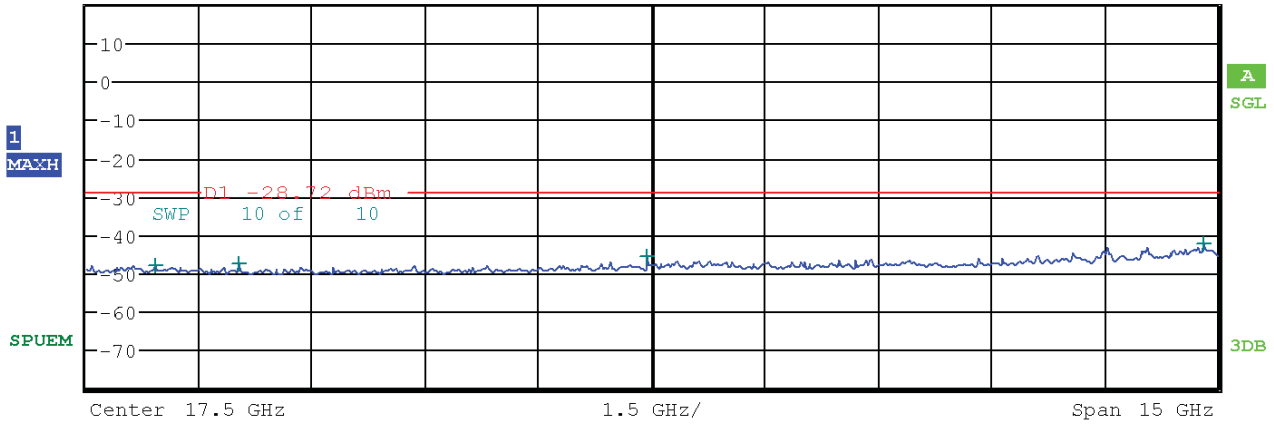
### Conducted Spurious Emissions



### Conducted Spurious Emissions



Ref 20 dBm



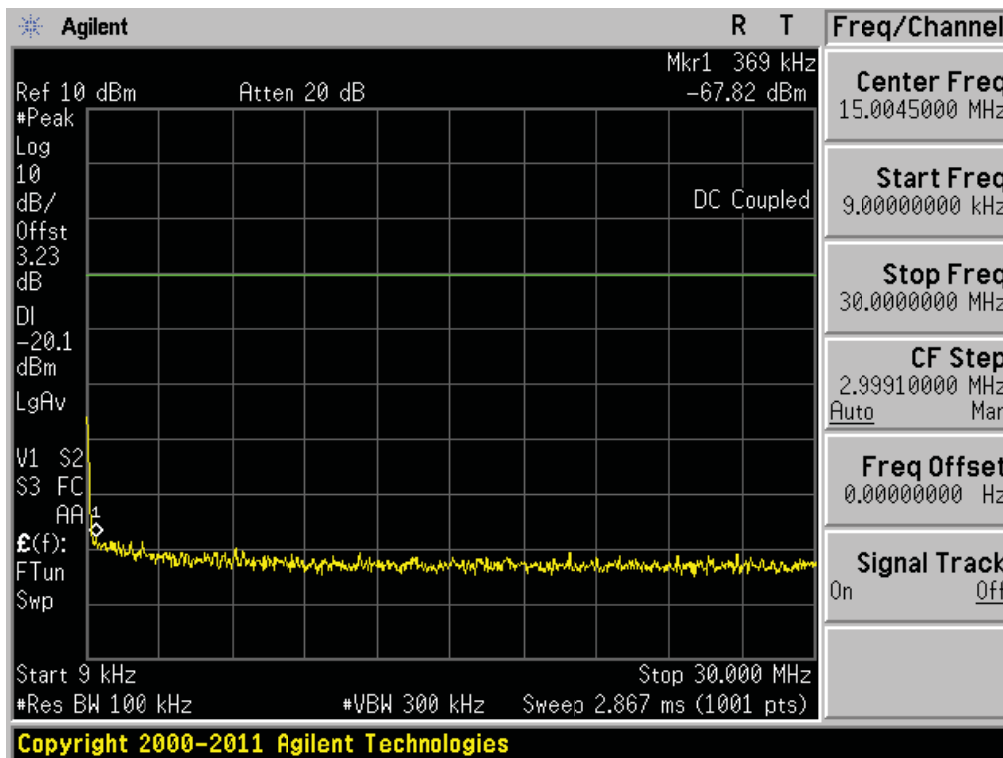
Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]
10.000 G	12.000 G	1.00 M	10.913600 G	-47.82
12.000 G	15.000 G	1.00 M	12.020700 G	-47.59
15.000 G	20.000 G	1.00 M	17.429750 G	-45.71
20.000 G	25.000 G	1.00 M	24.811500 G	-42.08

**Test Mode: Chain 0 & 802.11n HT40 & MCS 8 & 2437MHz**

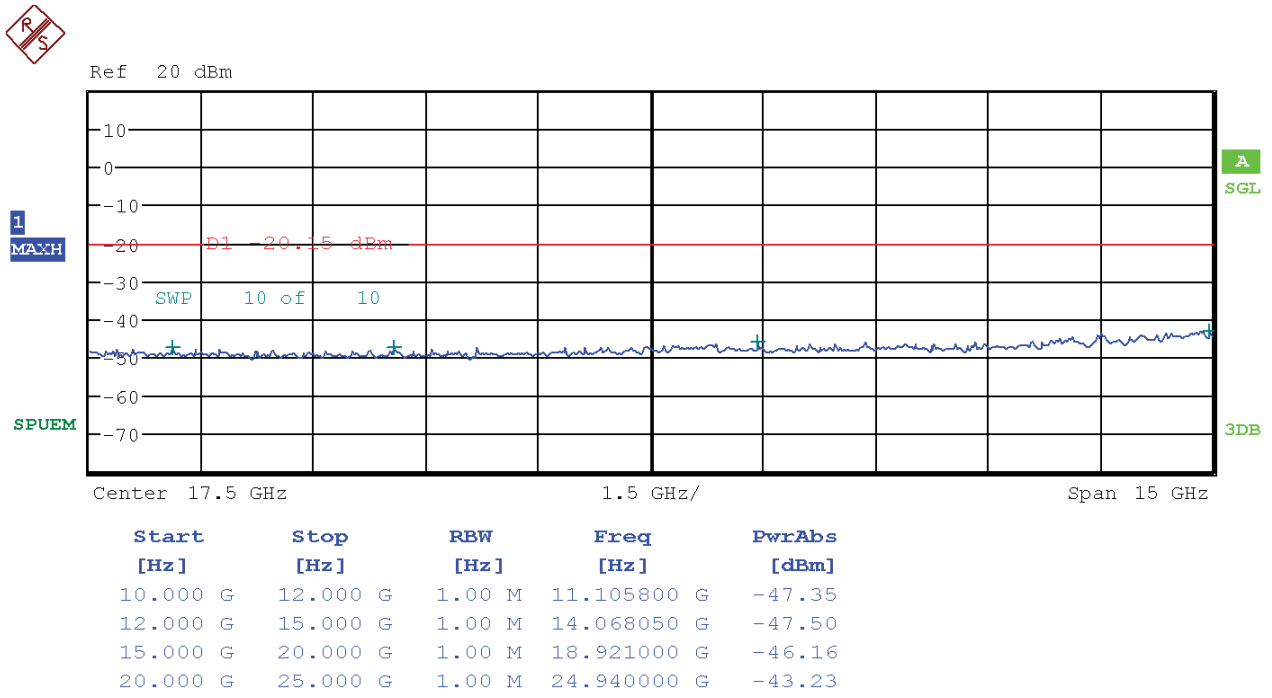
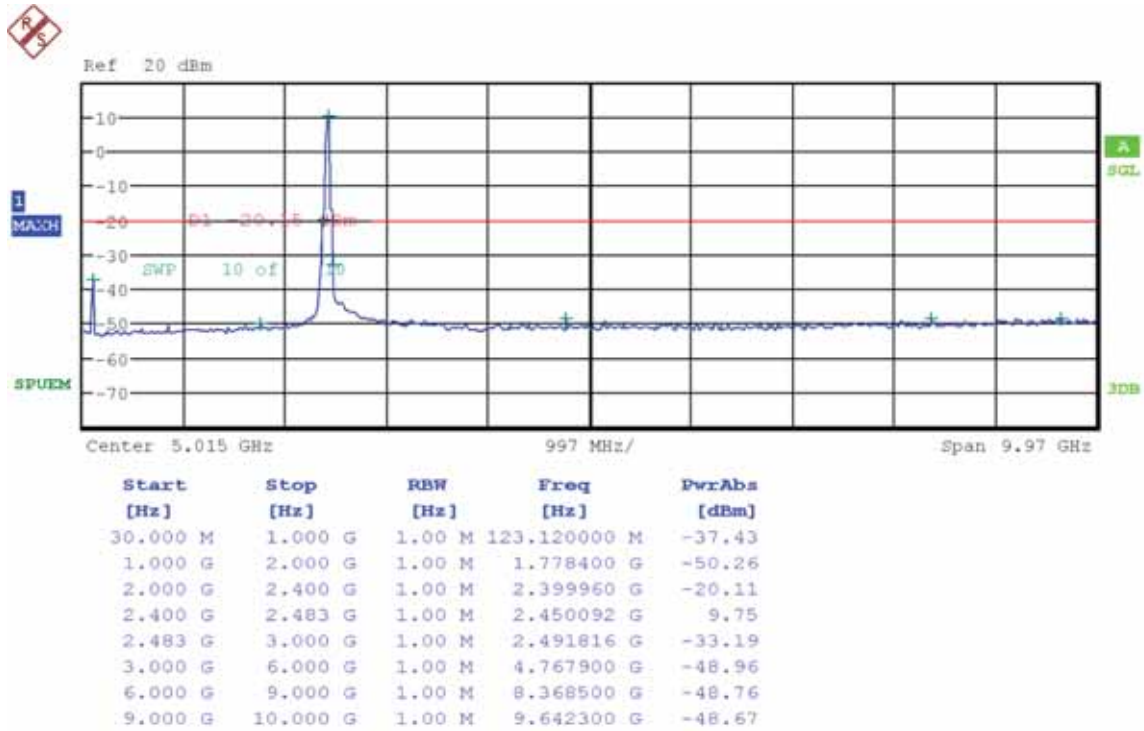
**Reference**



**Conducted Spurious Emissions**



### Conducted Spurious Emissions

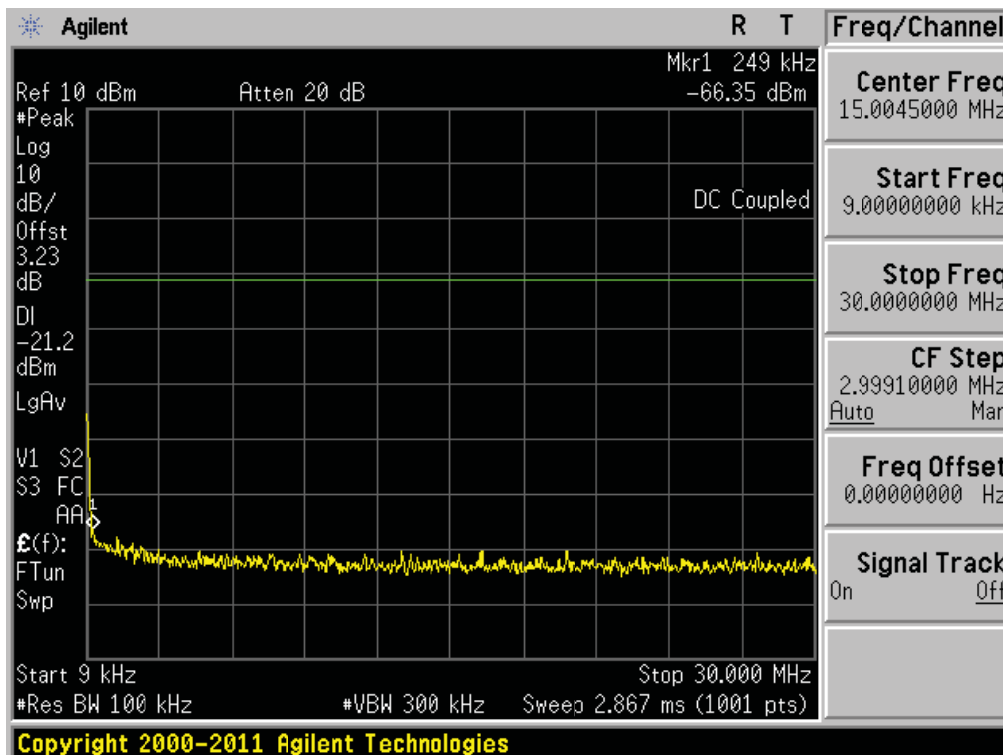


**Test Mode: Chain 1 & 802.11n HT40 & MCS 8 & 2437MHz**

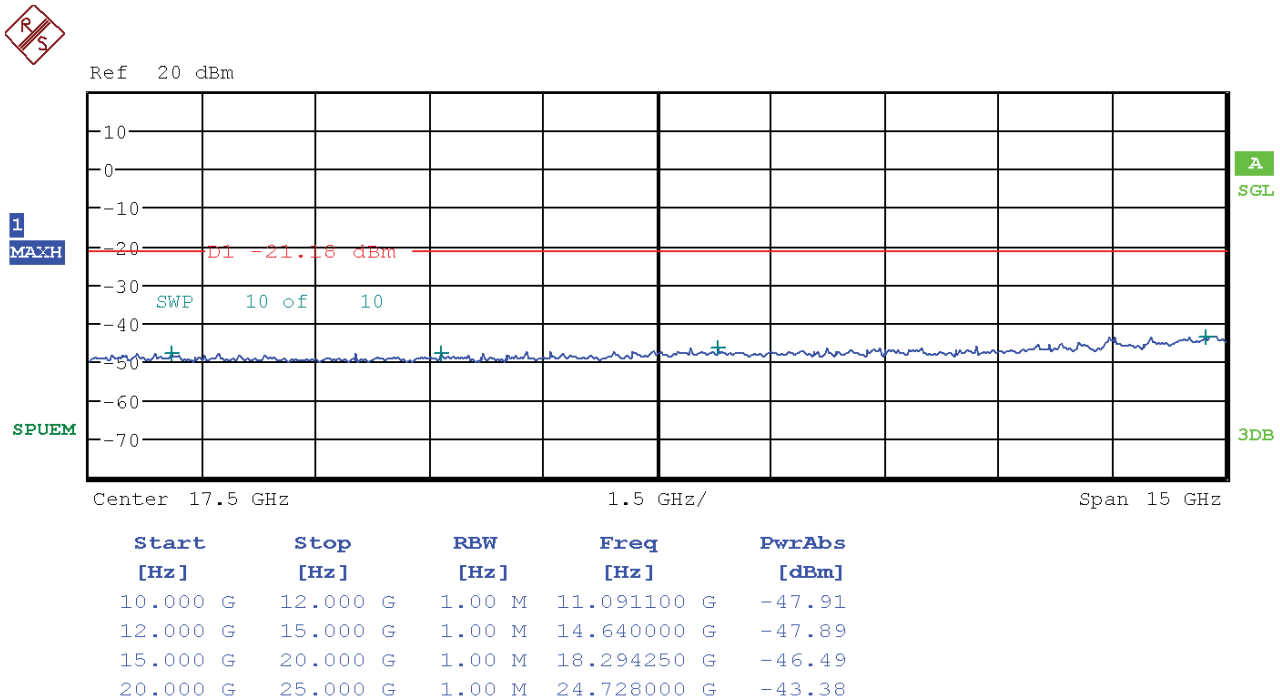
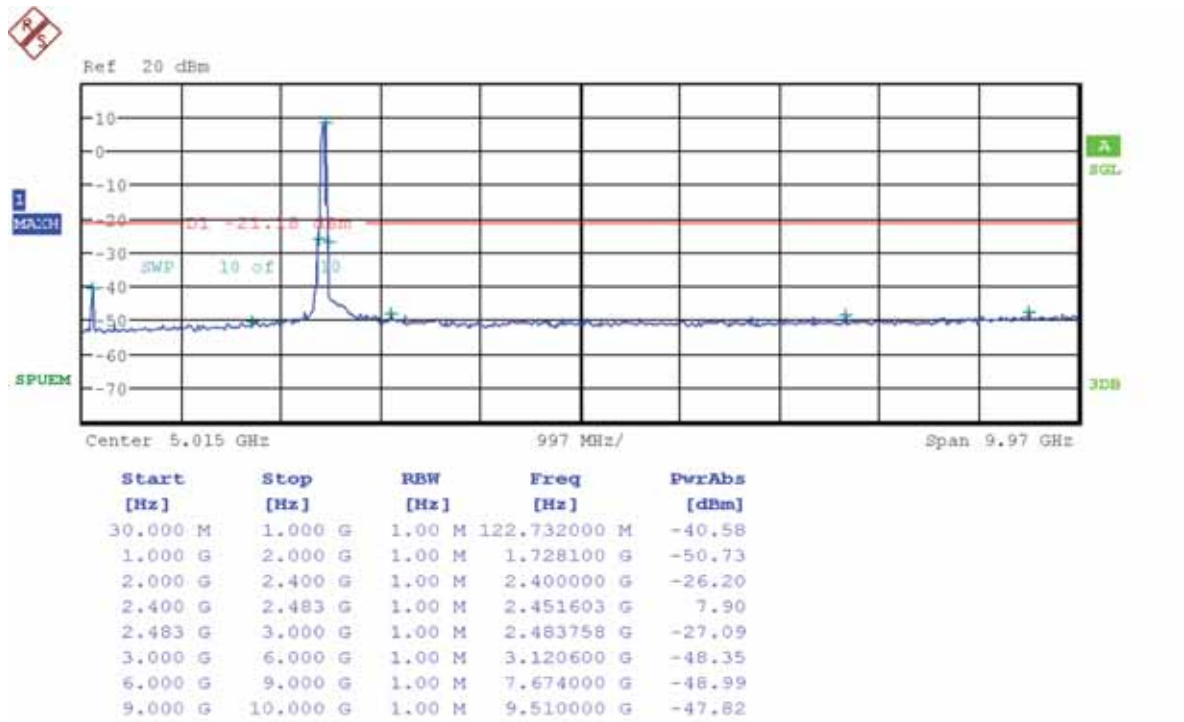
**Reference**



**Conducted Spurious Emissions**



### Conducted Spurious Emissions



Test Mode: Chain 0 & 802.11n HT40 & MCS 8 & 2452MHz

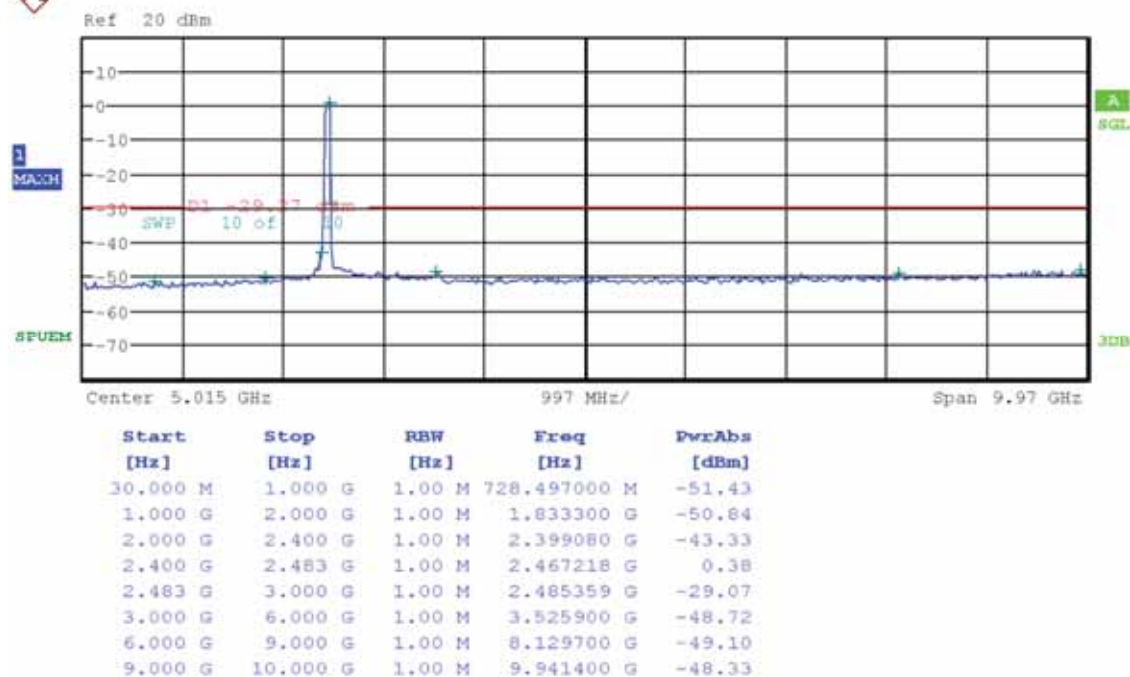
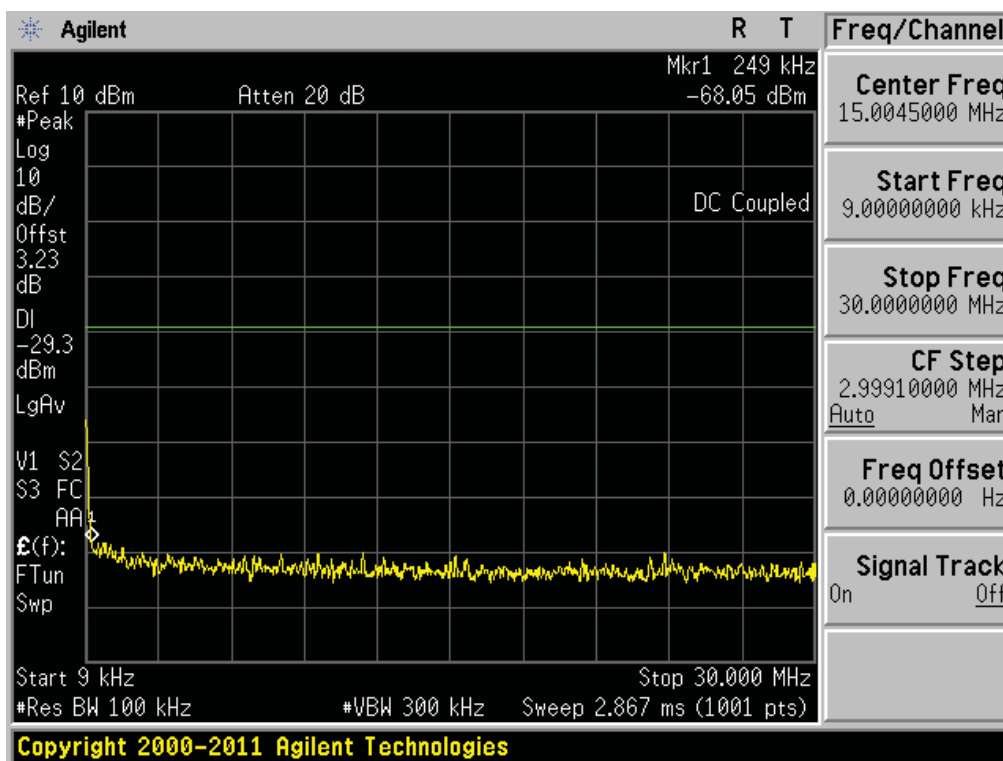
### Reference



### Low Band-edge



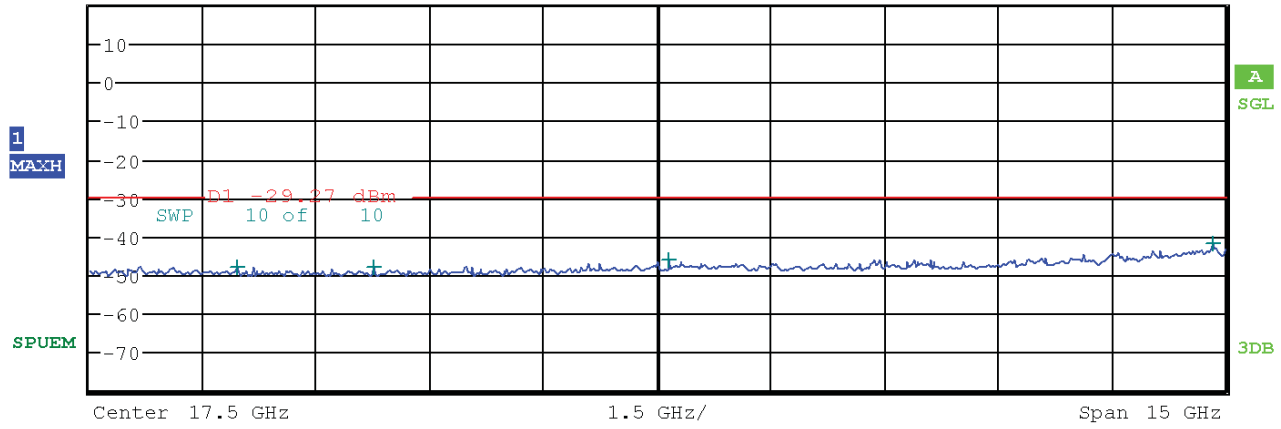
### Conducted Spurious Emissions



### Conducted Spurious Emissions



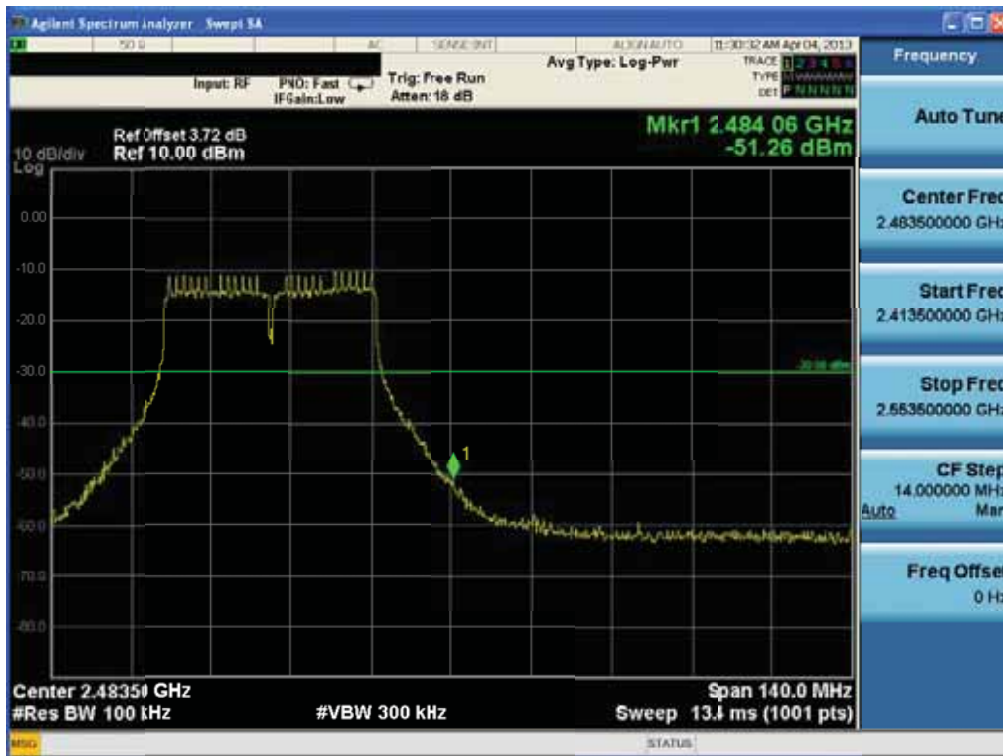
Ref 20 dBm



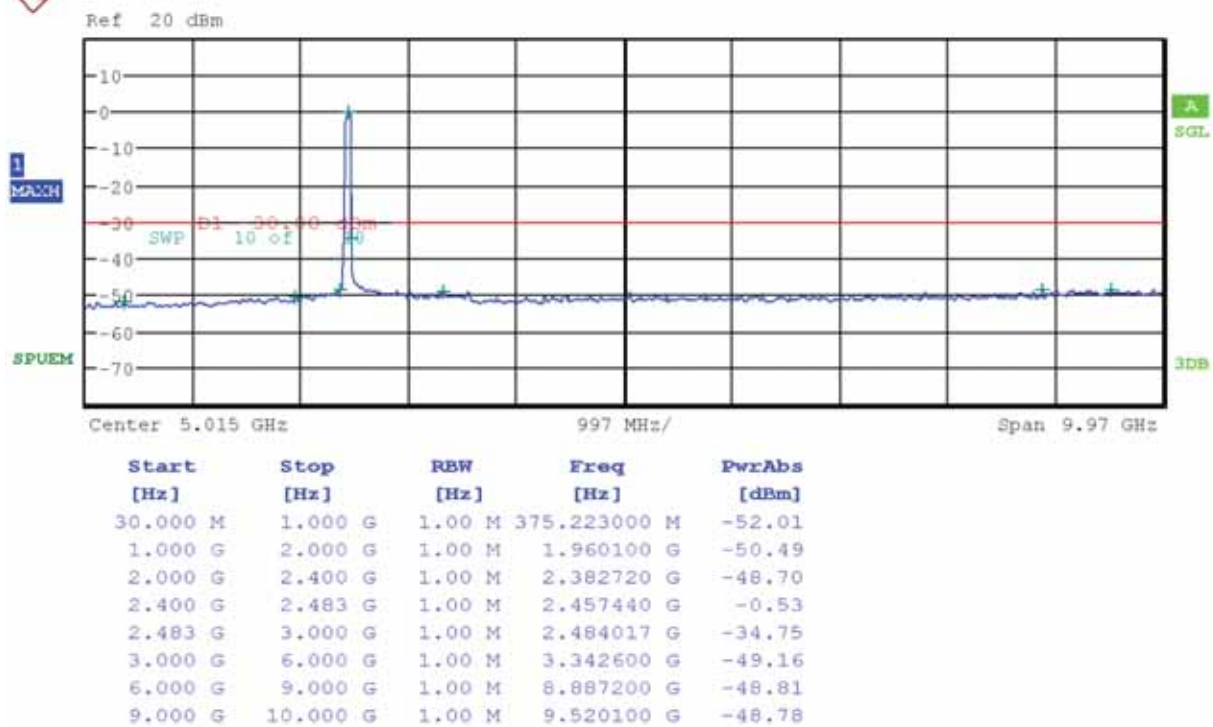
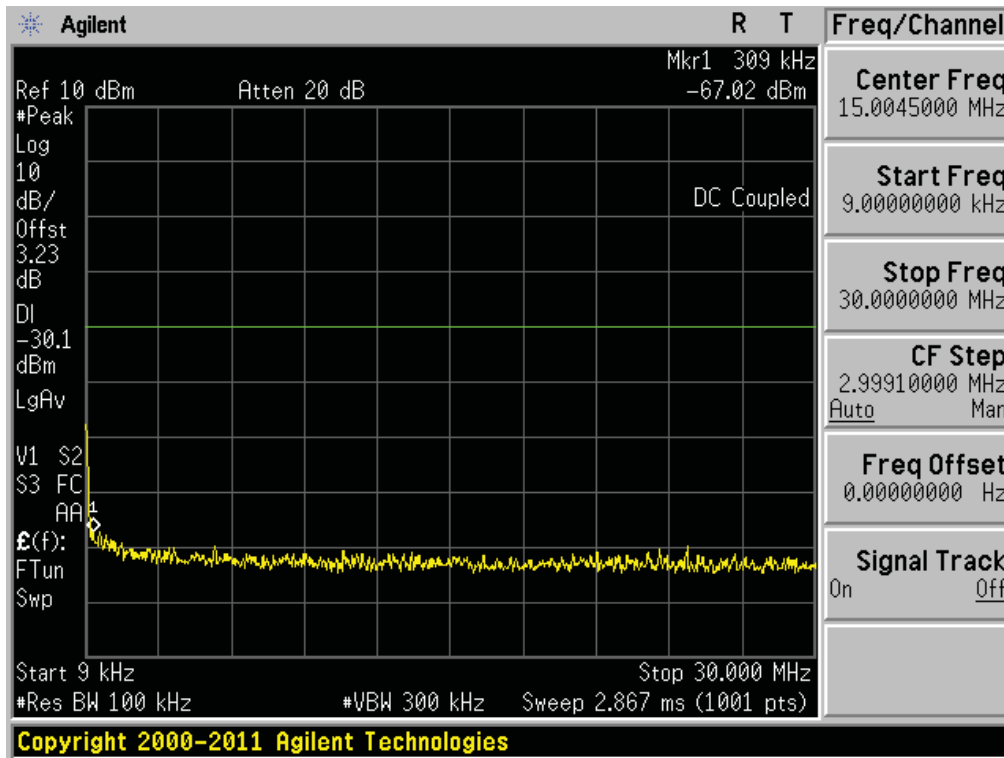
Test Mode: Chain 1 & 802.11n HT40 & MCS 8 & 2452MHz  
Reference



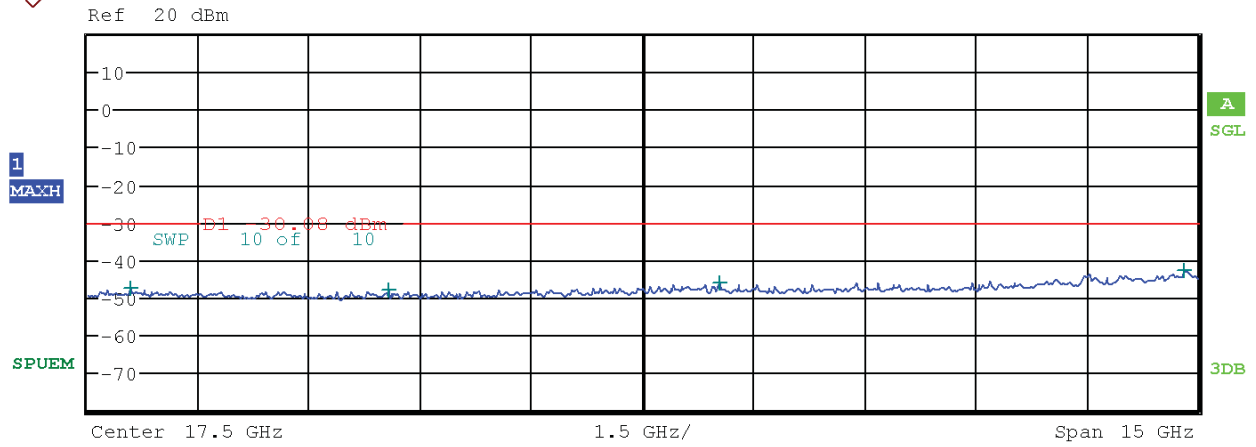
Low Band-edge



### Conducted Spurious Emissions

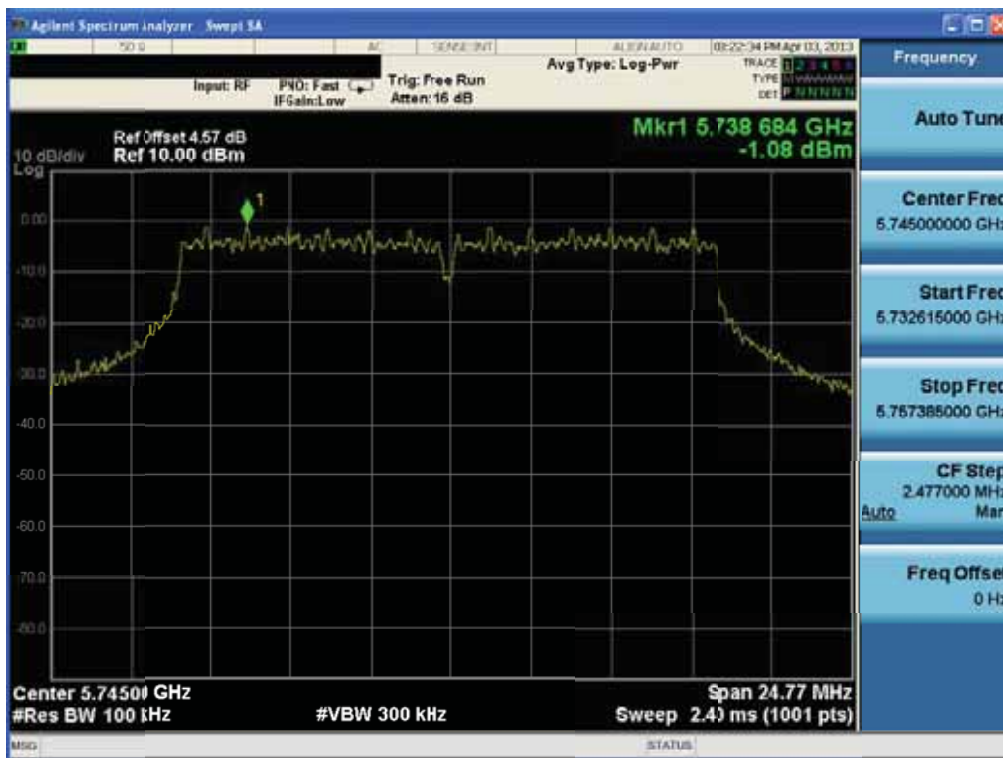


### Conducted Spurious Emissions

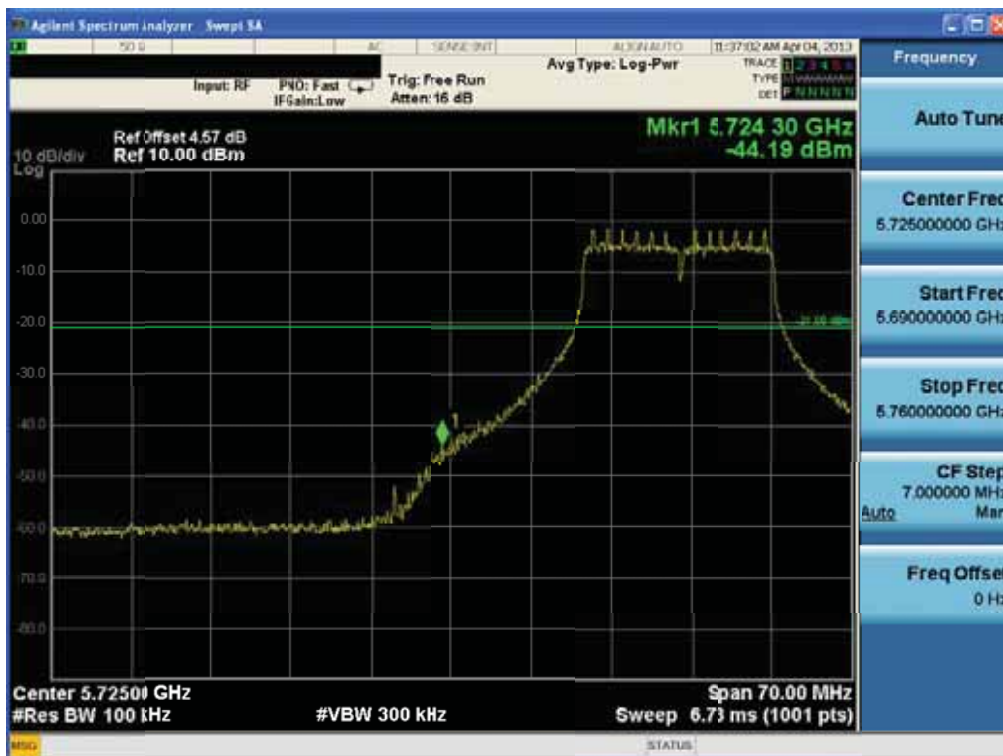


Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]
10.000 G	12.000 G	1.00 M	10.585000 G	-47.40
12.000 G	15.000 G	1.00 M	14.069100 G	-48.05
15.000 G	20.000 G	1.00 M	18.534250 G	-46.19
20.000 G	25.000 G	1.00 M	24.810250 G	-42.79

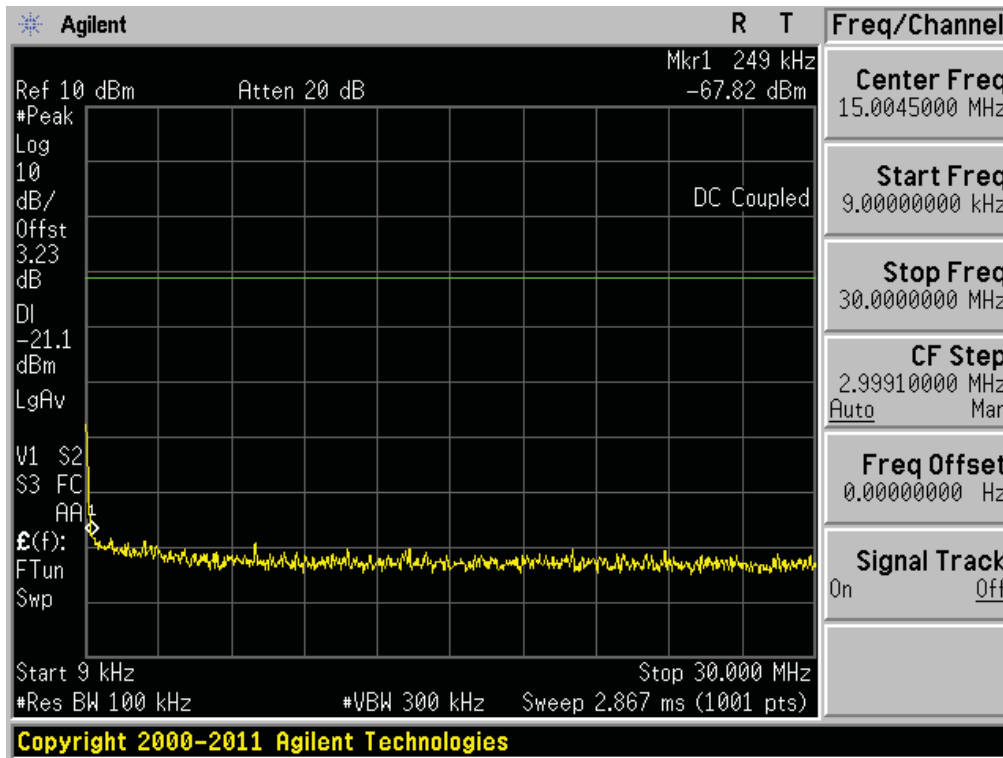
Test Mode: Chain 0 & 802.11a & 24Mbps & 5745MHz  
Reference



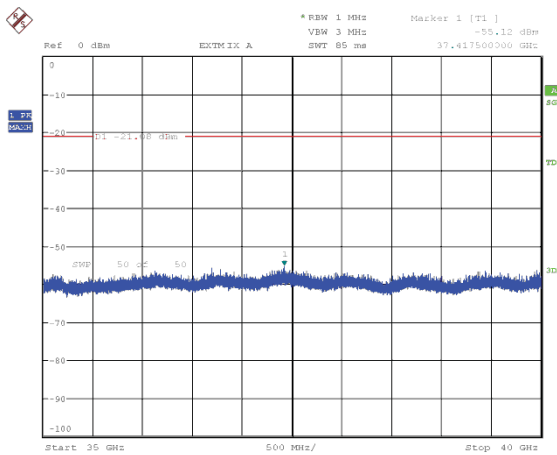
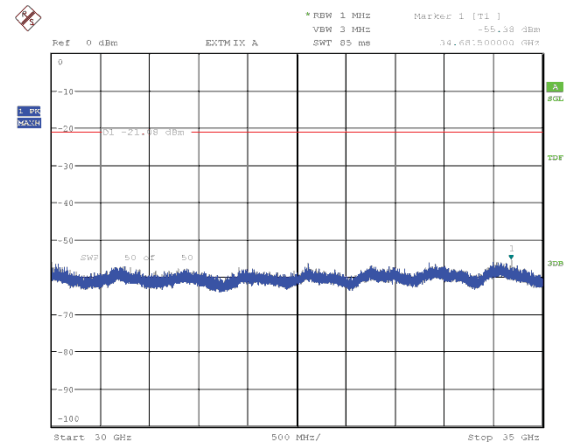
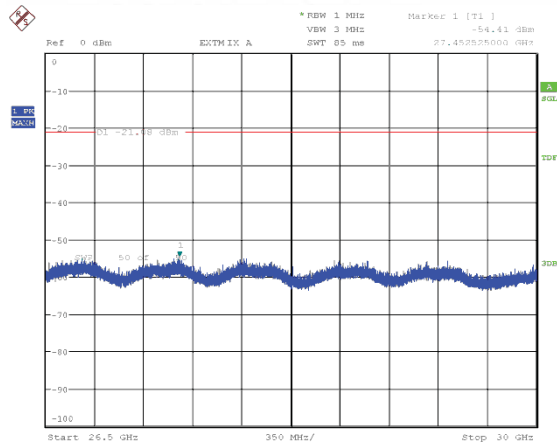
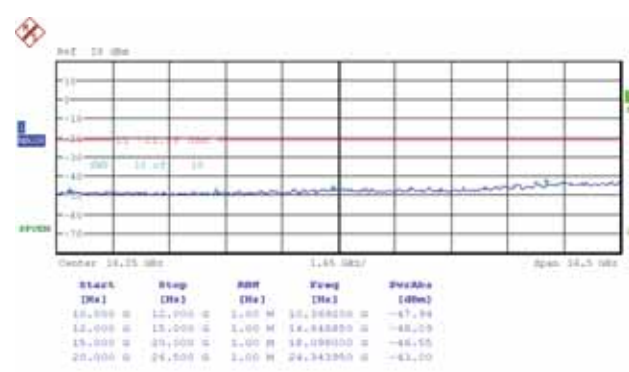
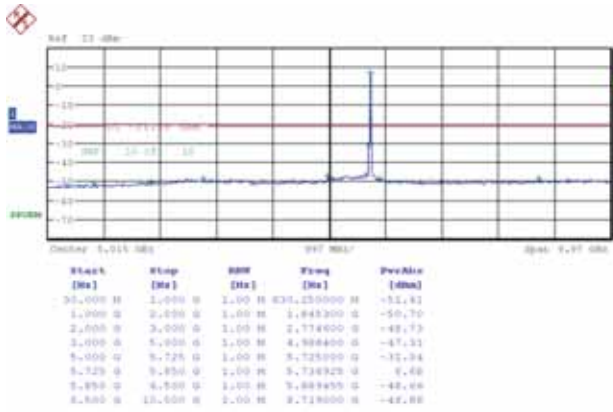
Low Band-edge



### Conducted Spurious Emissions

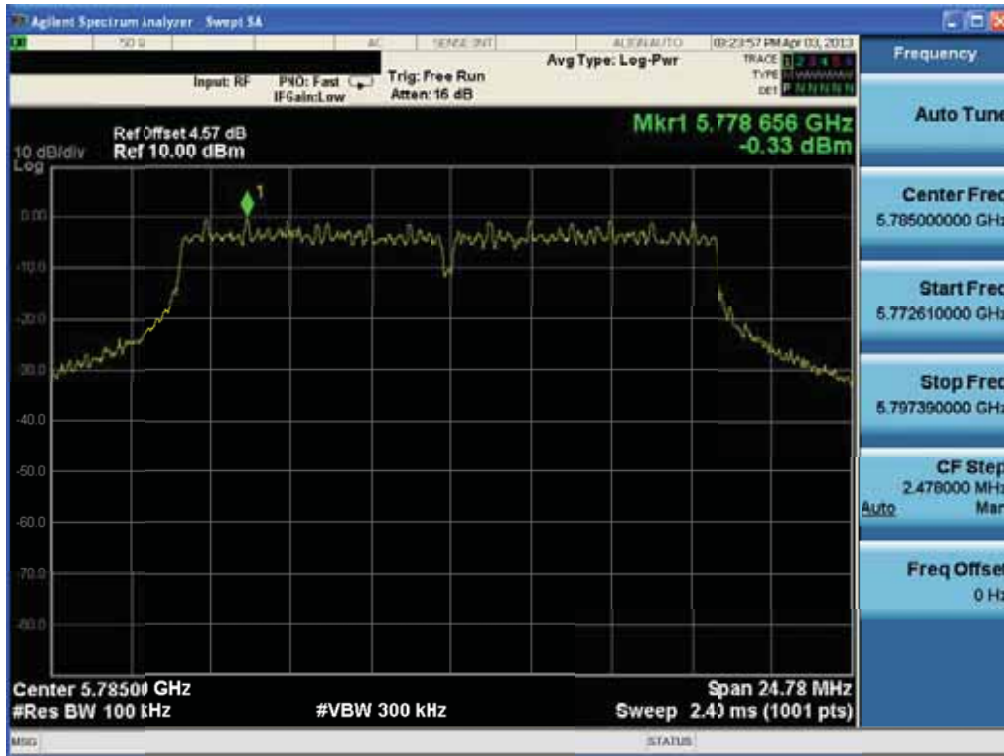


### Conducted Spurious Emissions

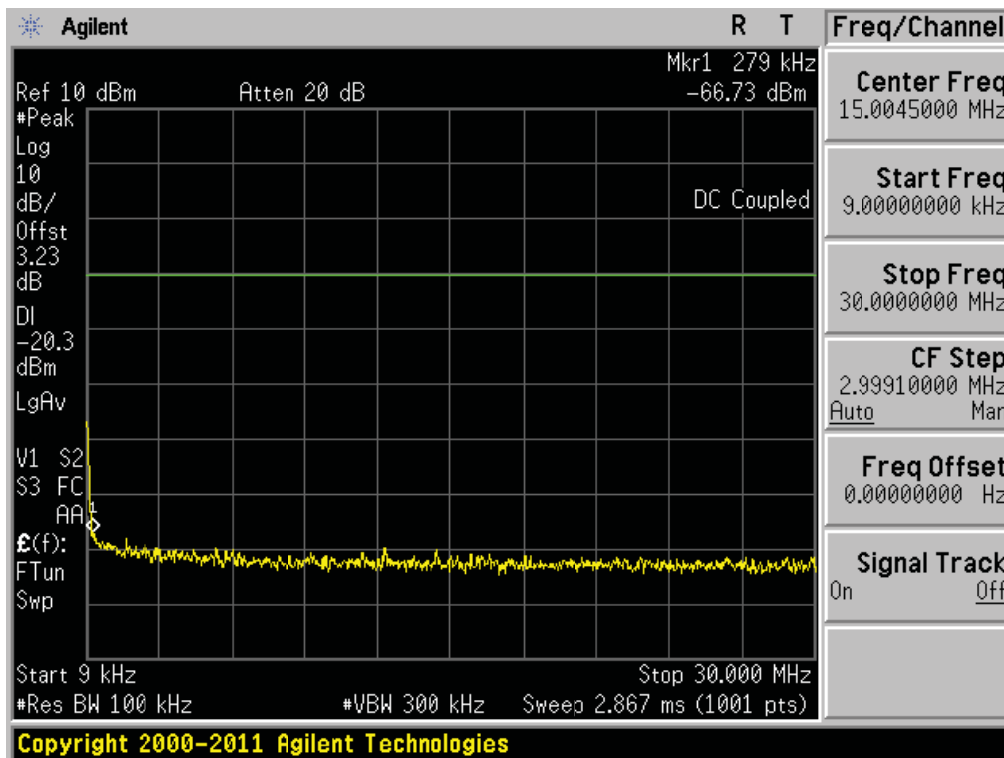


Test Mode: Chain 0 & 802.11a & 24Mbps & 5785MHz

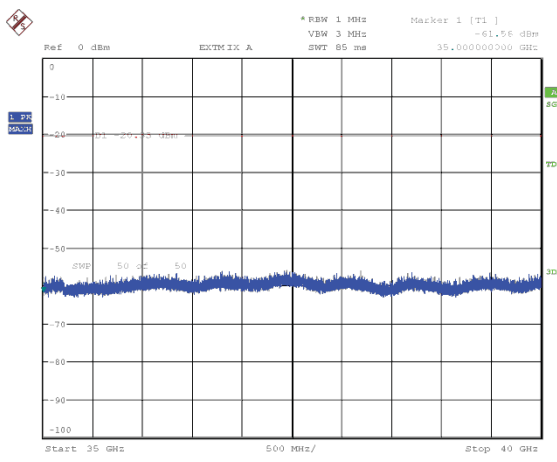
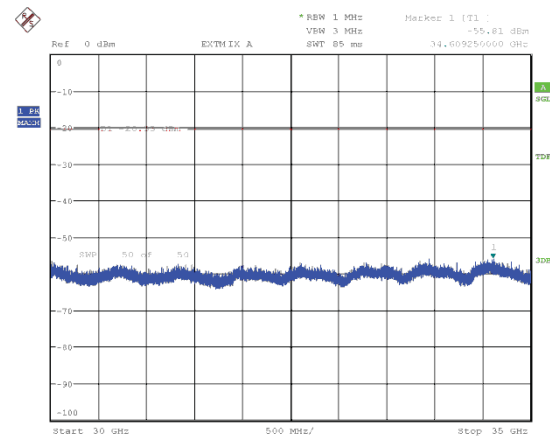
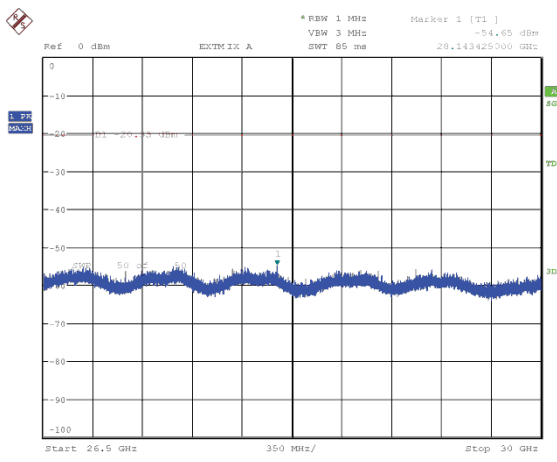
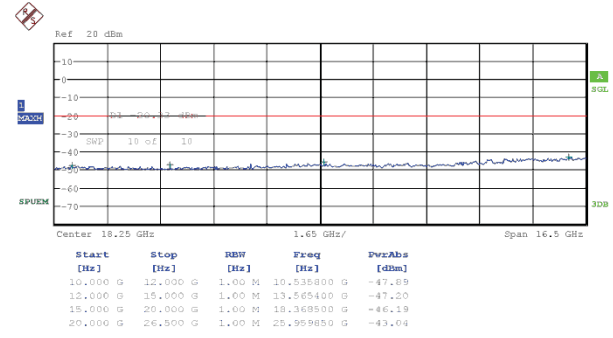
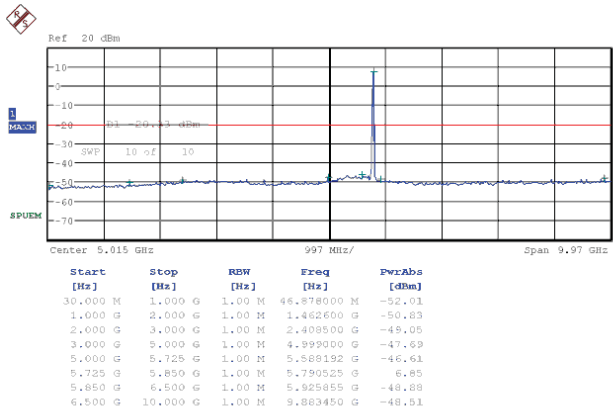
Reference



Conducted Spurious Emissions



### Conducted Spurious Emissions



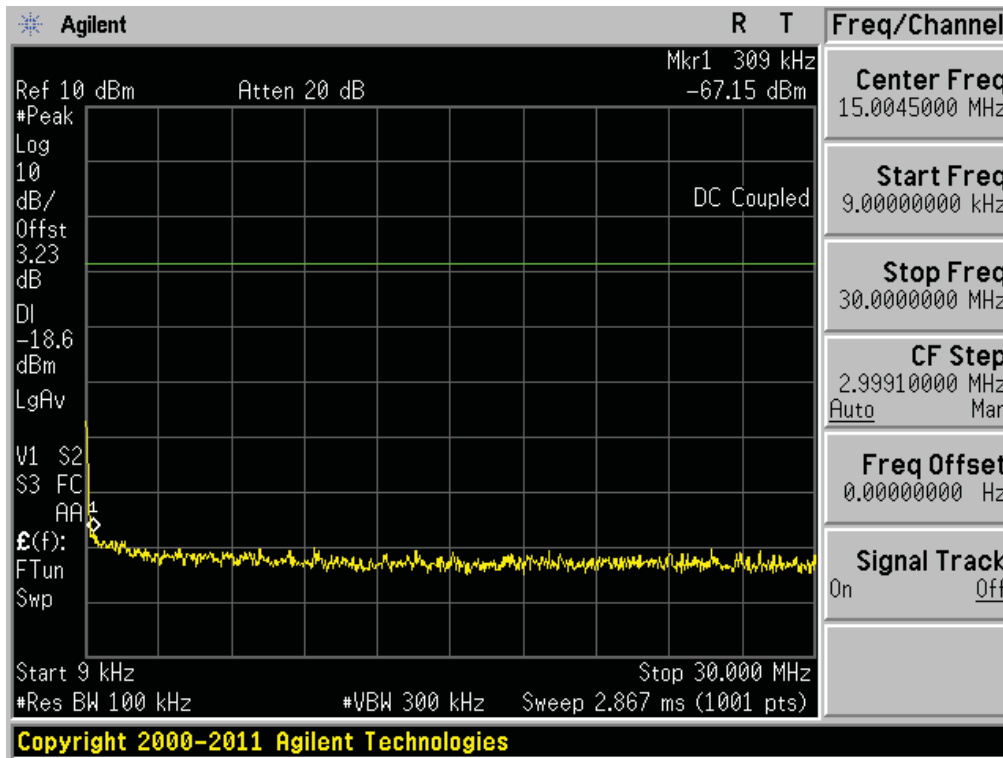
Test Mode: Chain 0 & 802.11a & 24Mbps & 5825MHz  
Reference



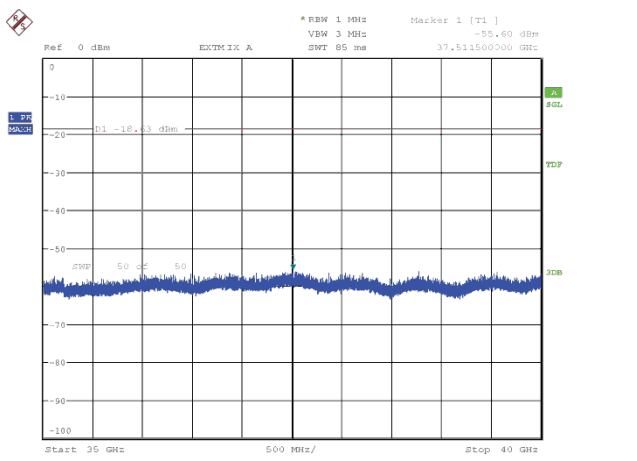
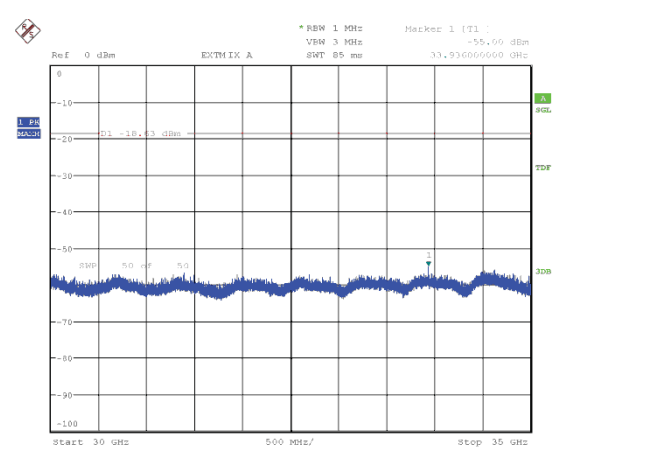
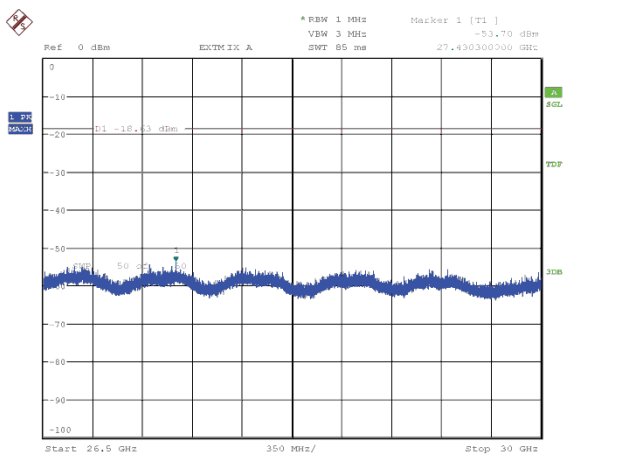
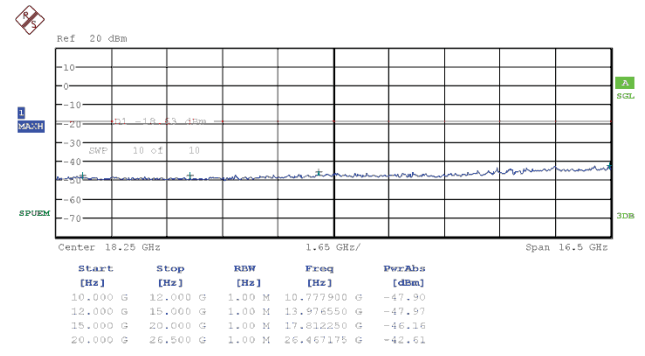
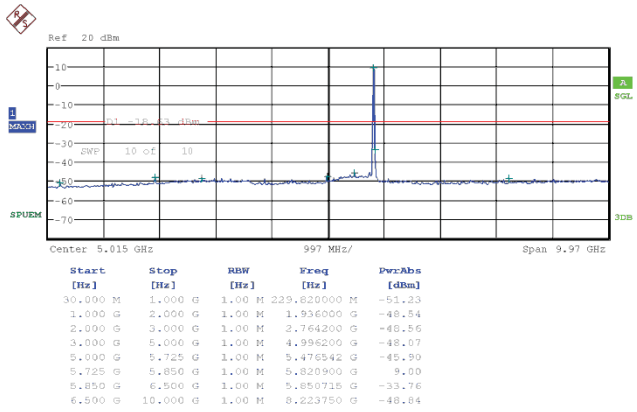
Low Band-edge



### Conducted Spurious Emissions



### Conducted Spurious Emissions

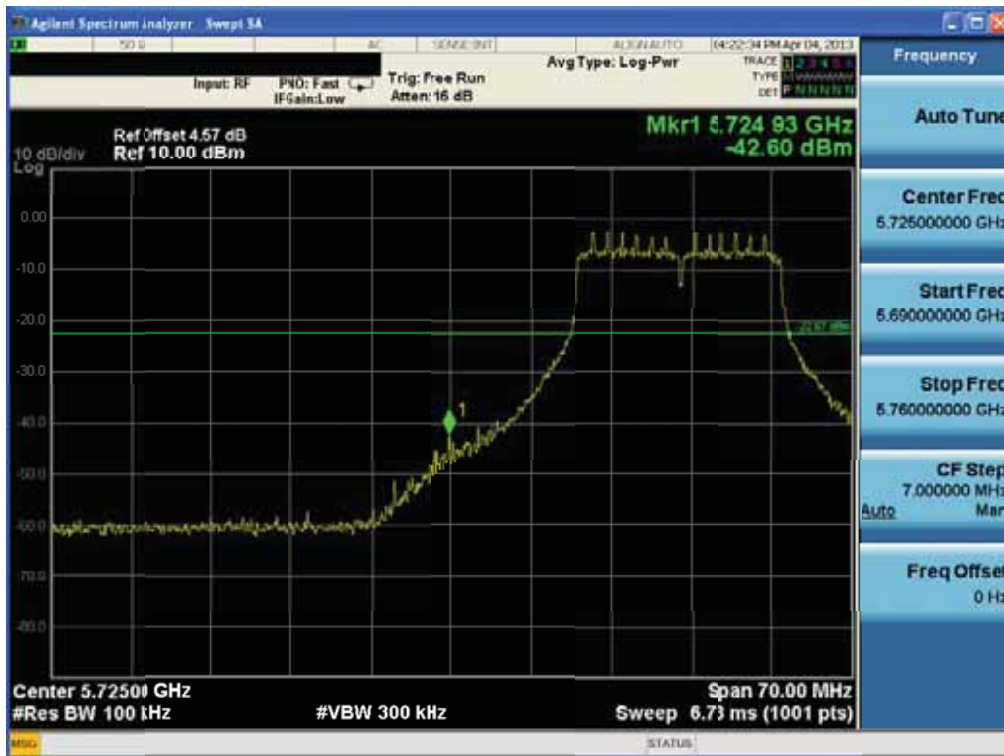


Test Mode: Chain 0 & 802.11n HT20 & MCS 8 & 5745MHz

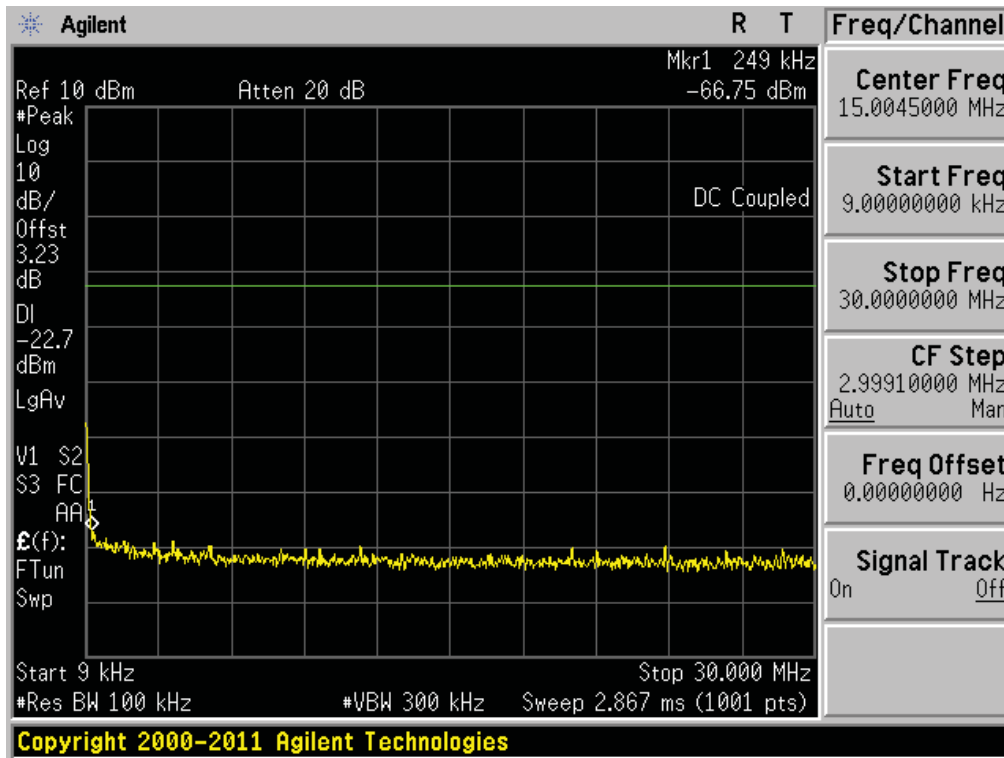
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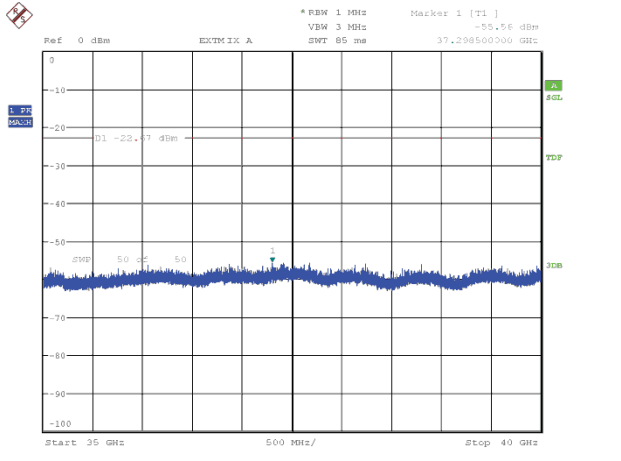
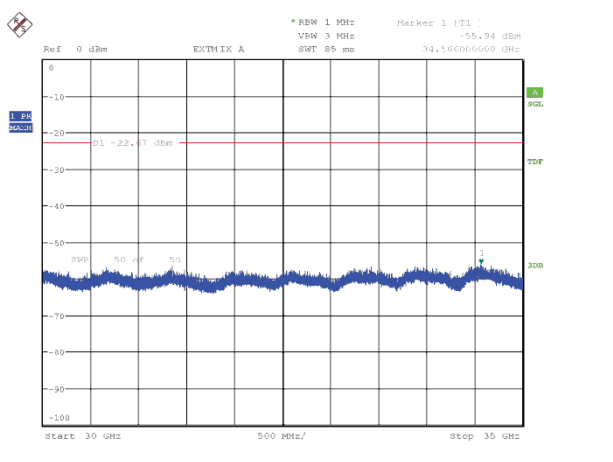
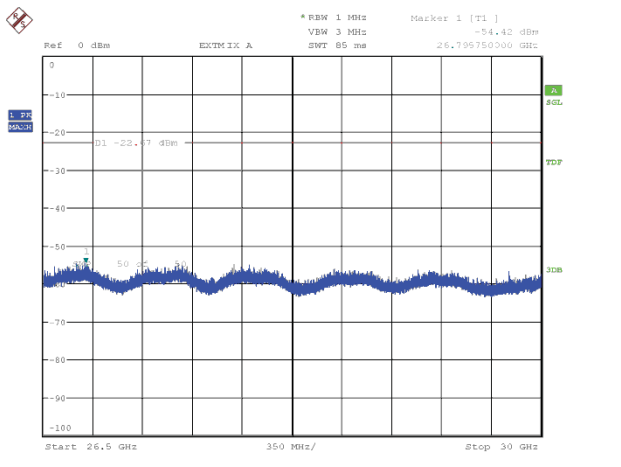
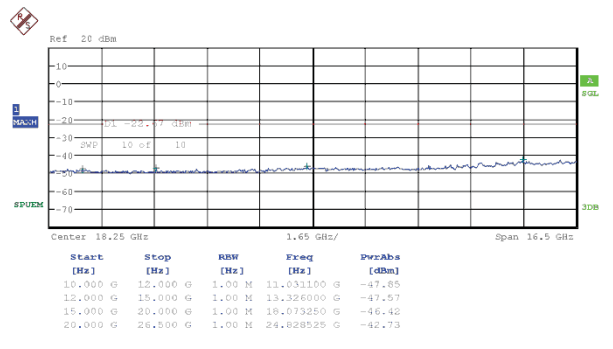
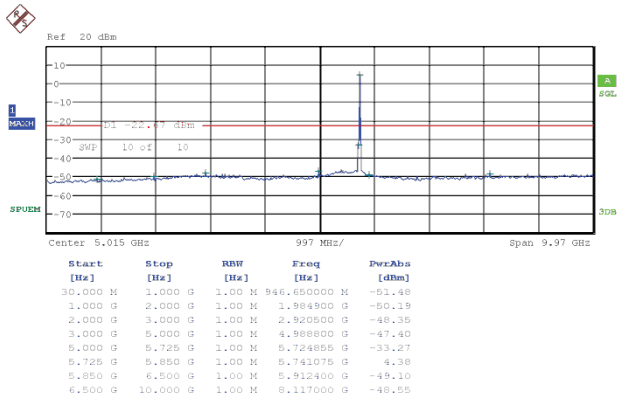
Low Band-edge



**Conducted Spurious Emissions**



### Conducted Spurious Emissions



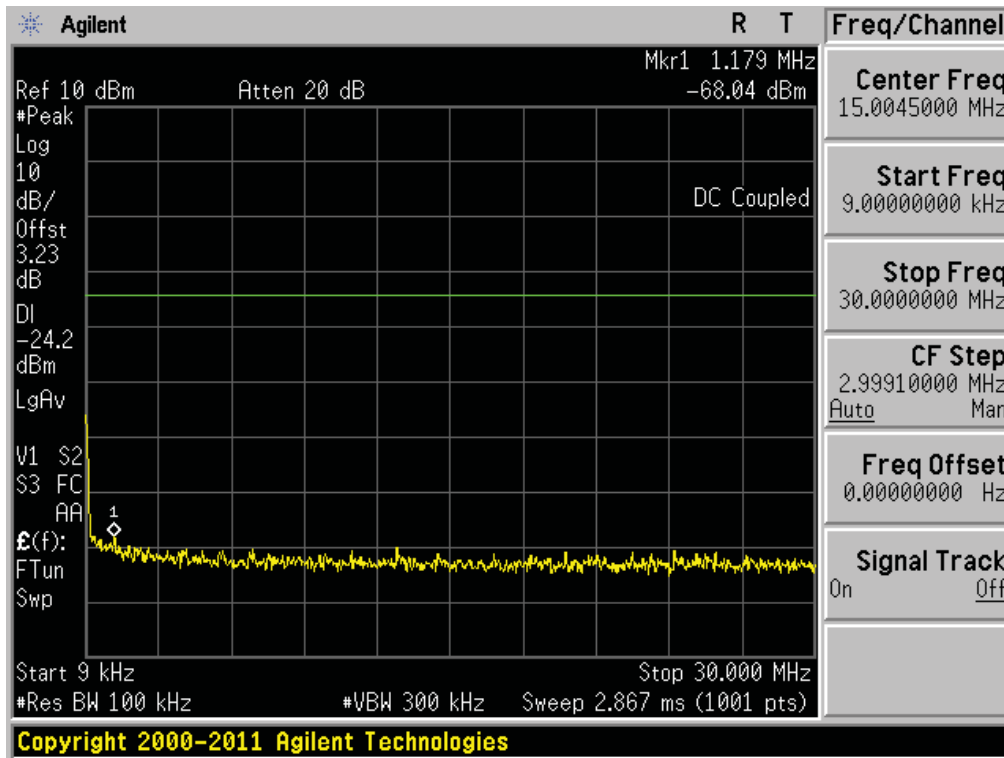
Test Mode: Chain 1 & 802.11n HT20 & MCS 8 & 5745MHz  
Reference



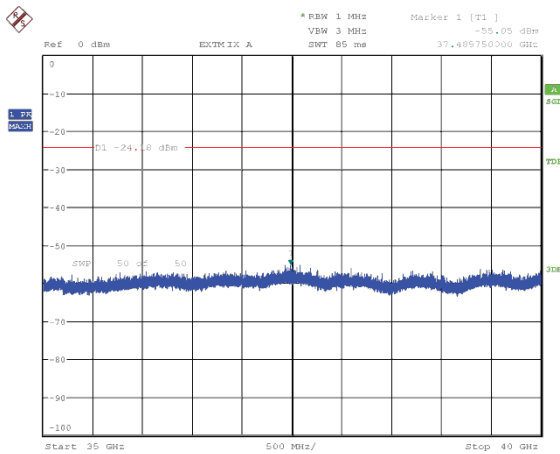
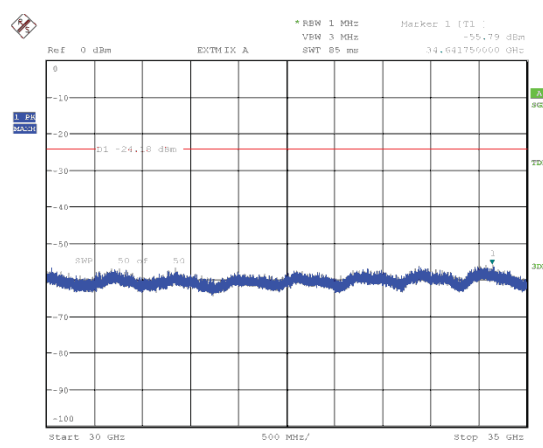
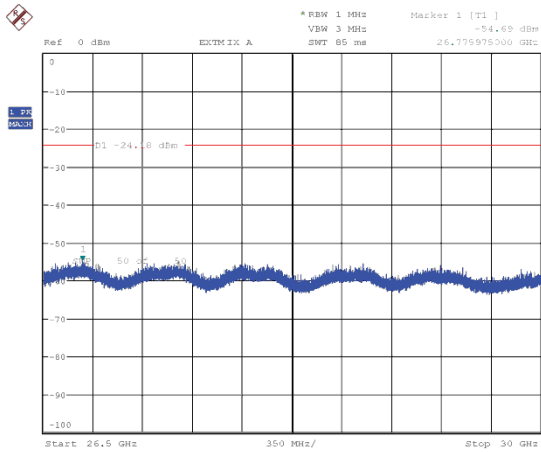
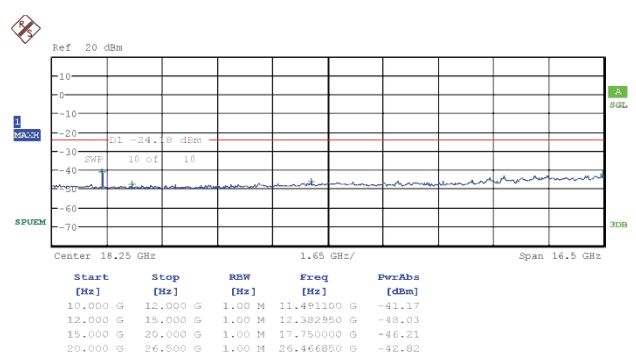
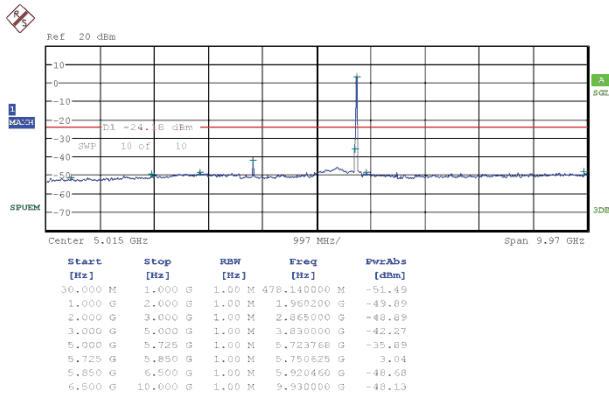
Low Band-edge



### Conducted Spurious Emissions



### Conducted Spurious Emissions

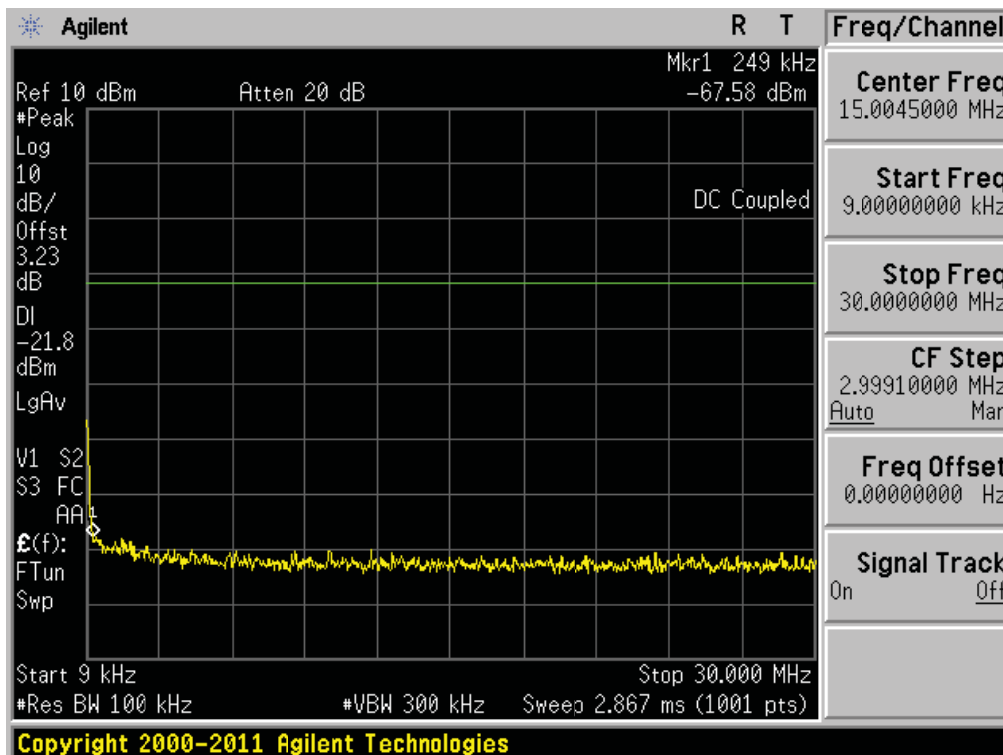


**Test Mode: Chain 0 & 802.11n HT20 & MCS 8 & 5785MHz**

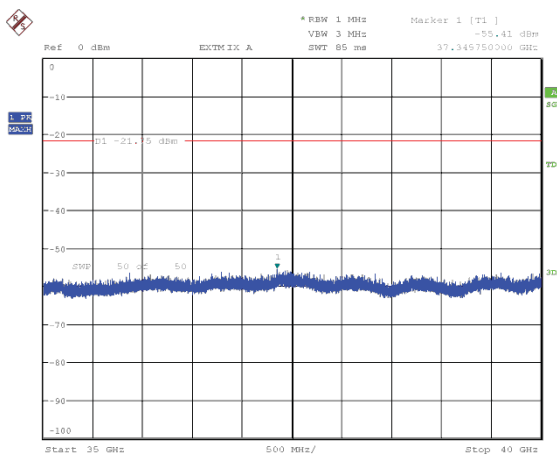
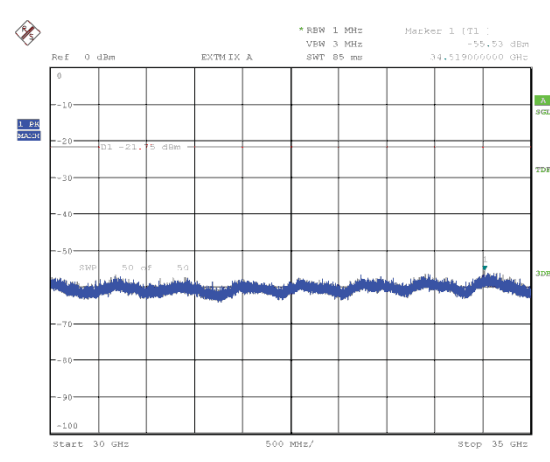
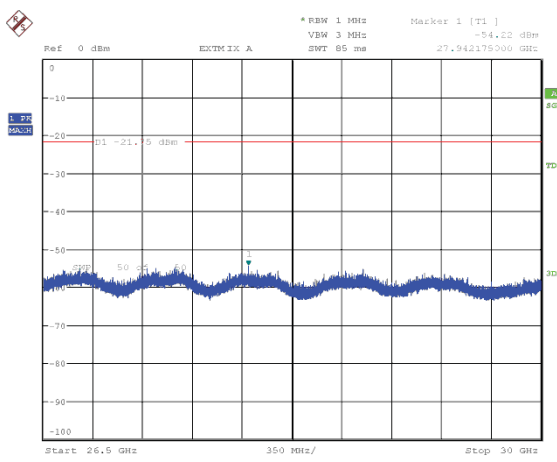
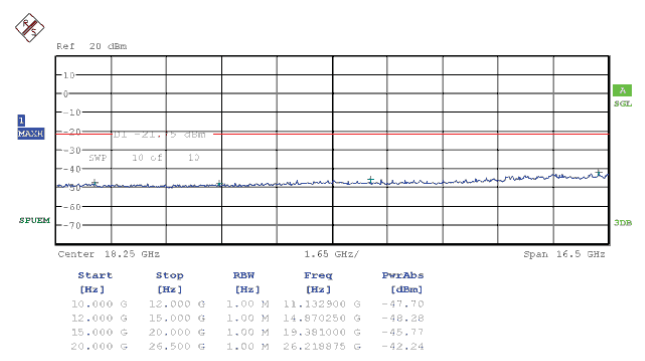
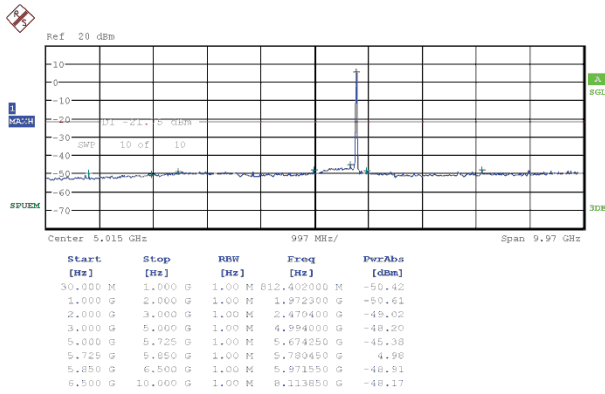
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**Conducted Spurious Emissions**



### Conducted Spurious Emissions

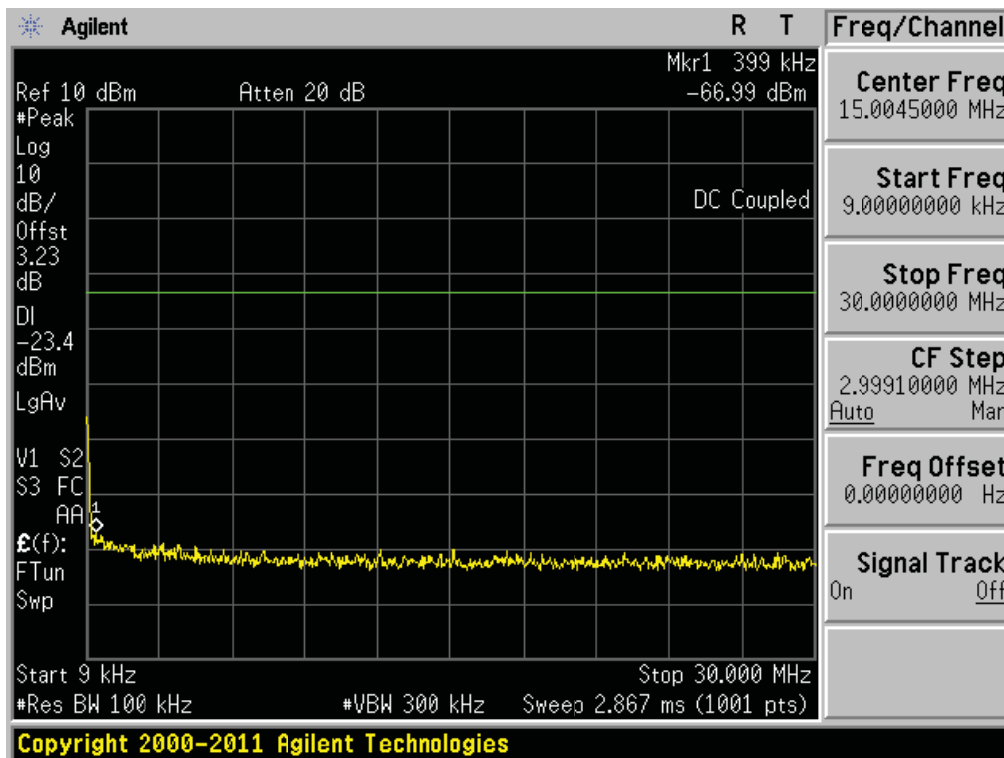


**Test Mode: Chain 1 & 802.11n HT20 & MCS 8 & 5785MHz**

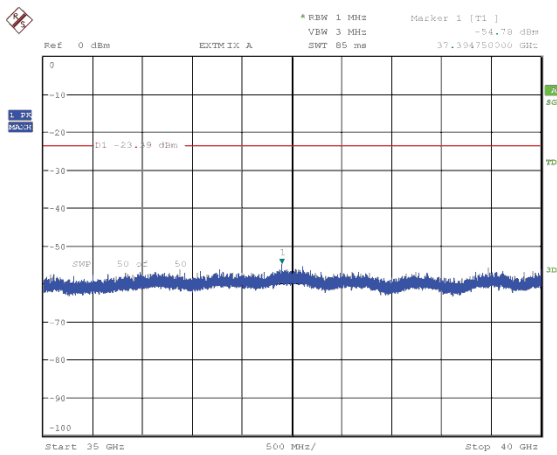
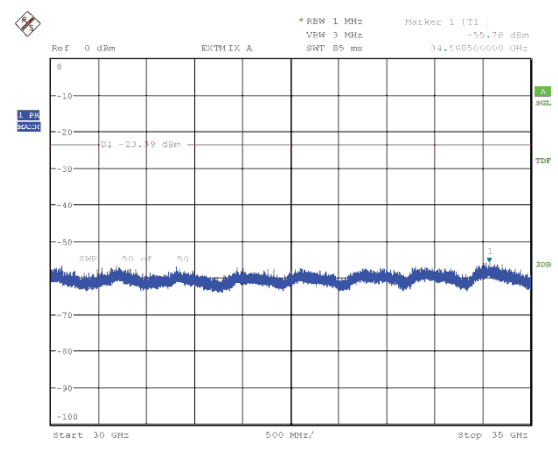
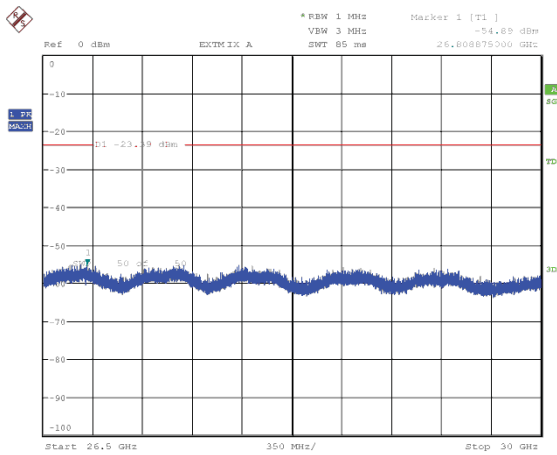
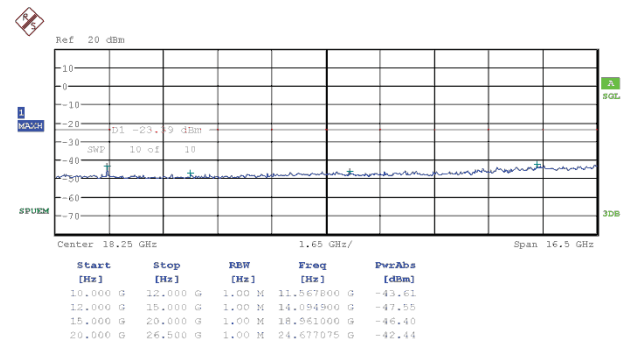
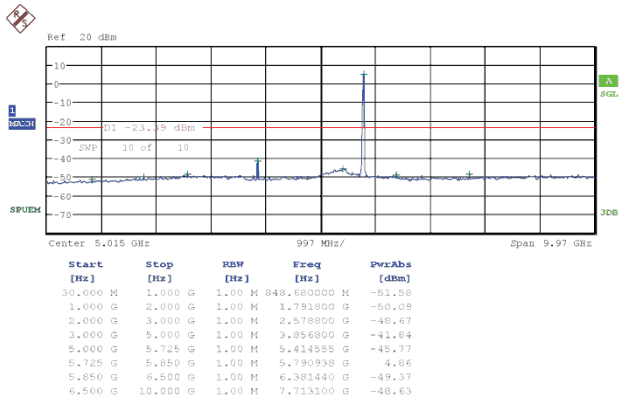
**Reference**



**Conducted Spurious Emissions**



### Conducted Spurious Emissions

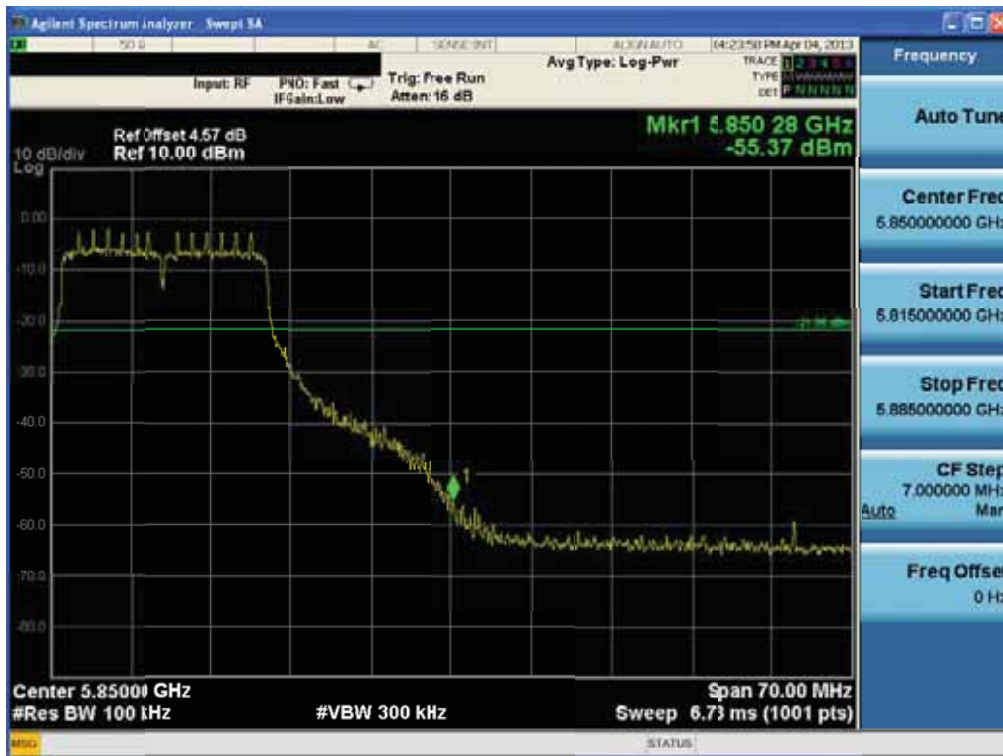


Test Mode: Chain 0 & 802.11n HT20 & MCS 8 & 5825MHz

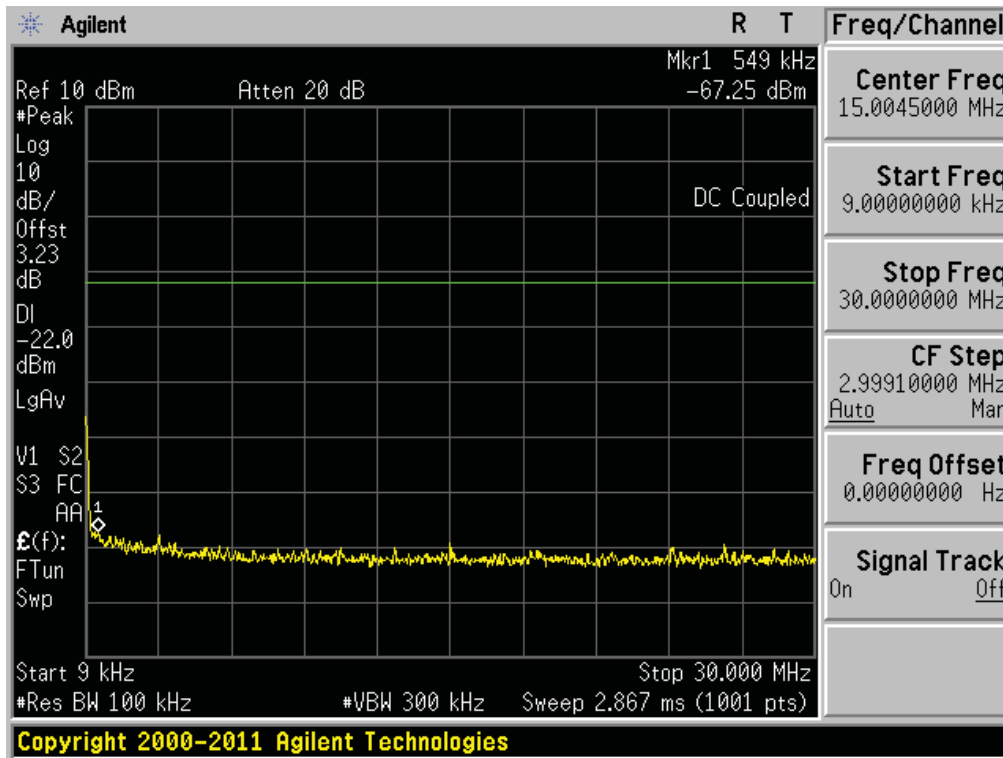
### Reference



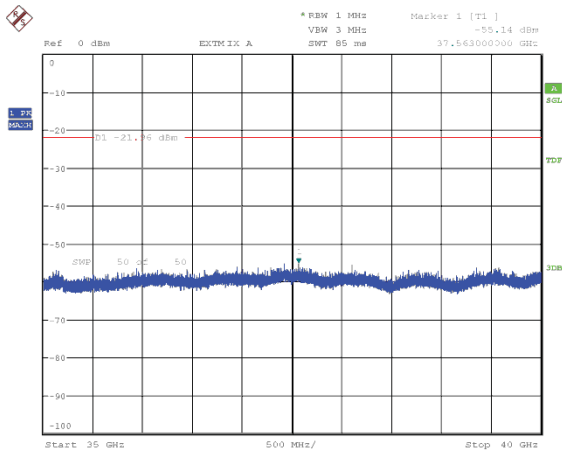
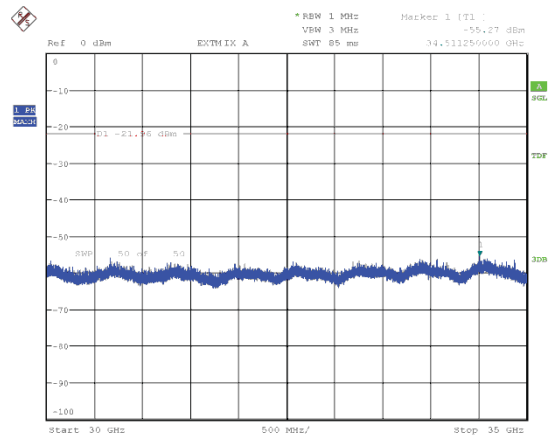
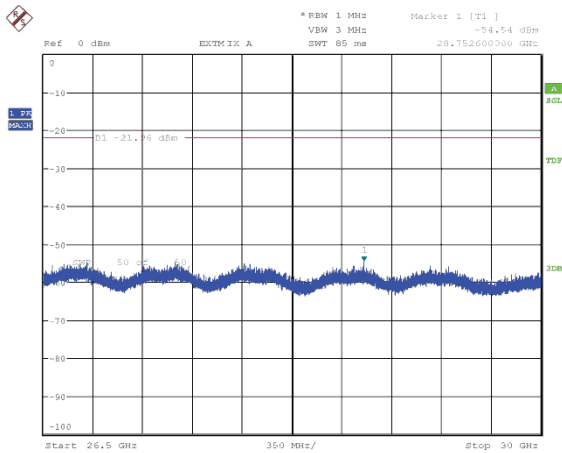
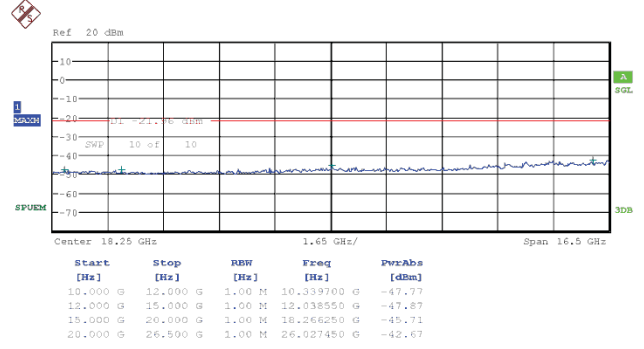
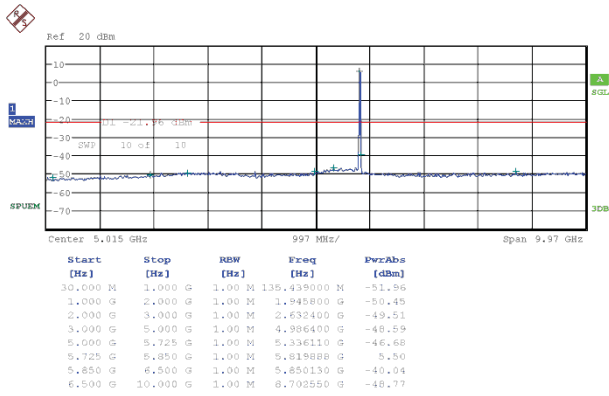
### Low Band-edge



### Conducted Spurious Emissions



### Conducted Spurious Emissions



Test Mode: Chain 1 & 802.11n HT20 & MCS 8 & 5825MHz

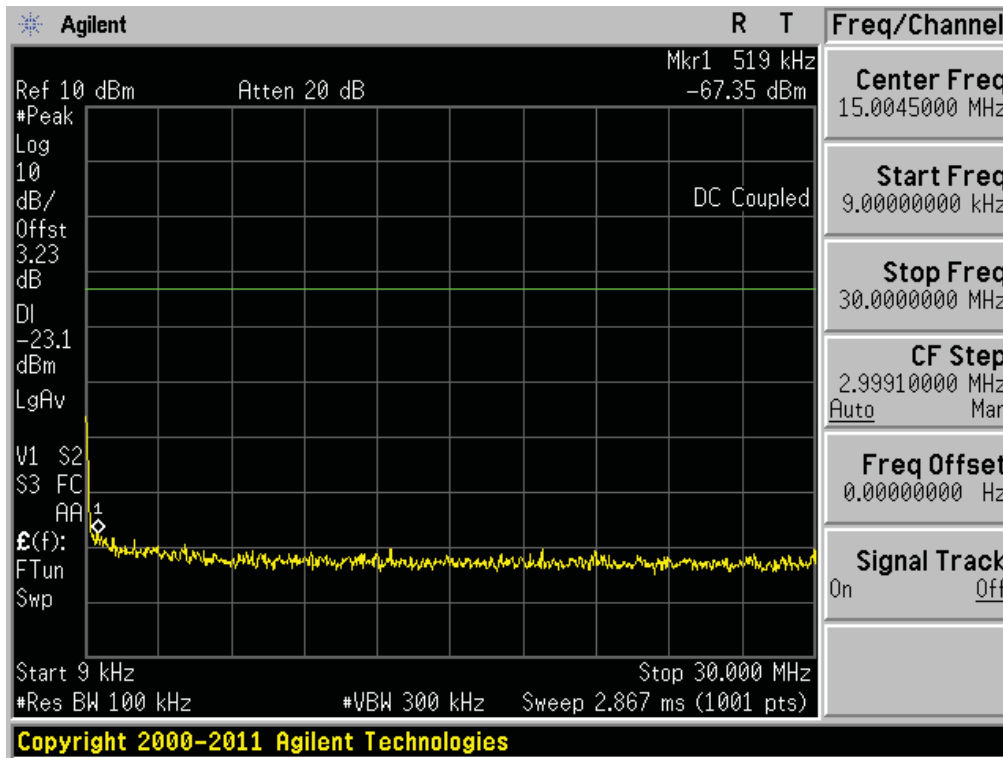
### Reference



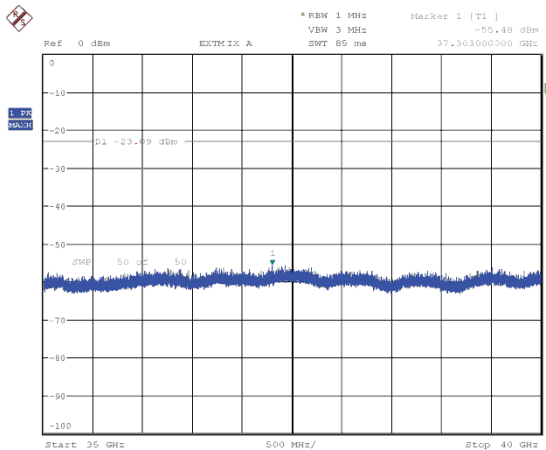
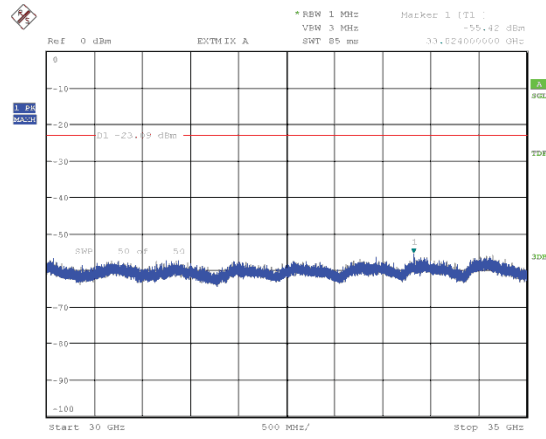
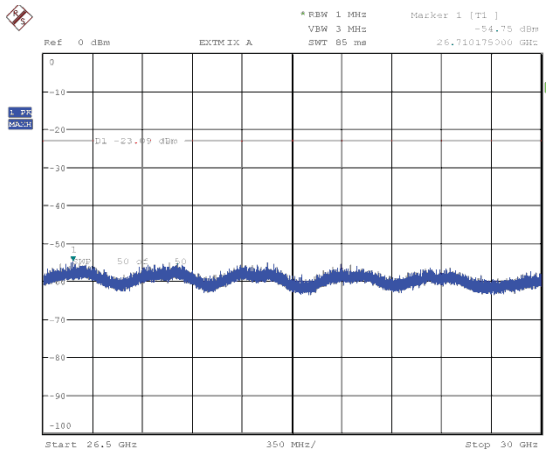
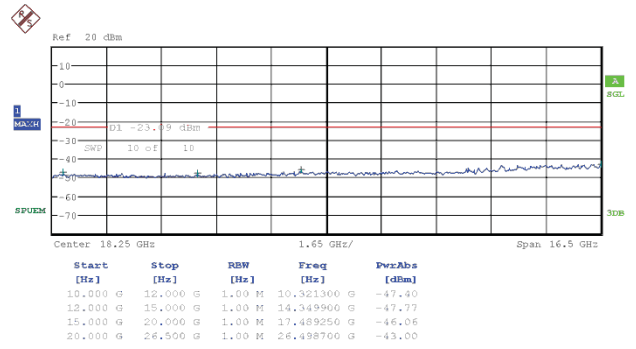
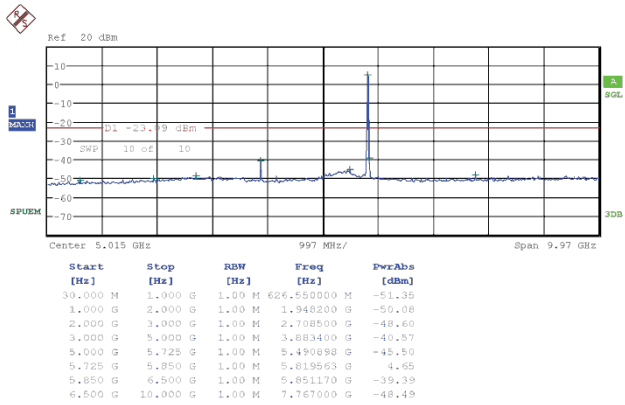
### Low Band-edge



### Conducted Spurious Emissions

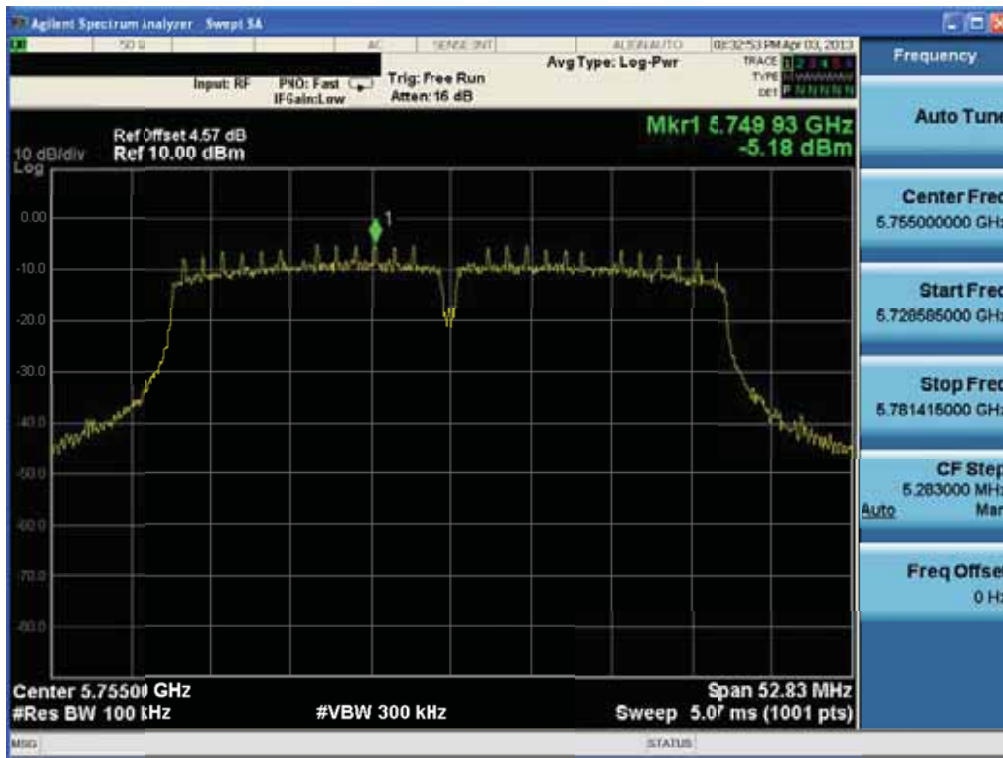


### Conducted Spurious Emissions



Test Mode: Chain 0 & 802.11n HT40 & MCS 11 & 5755MHz

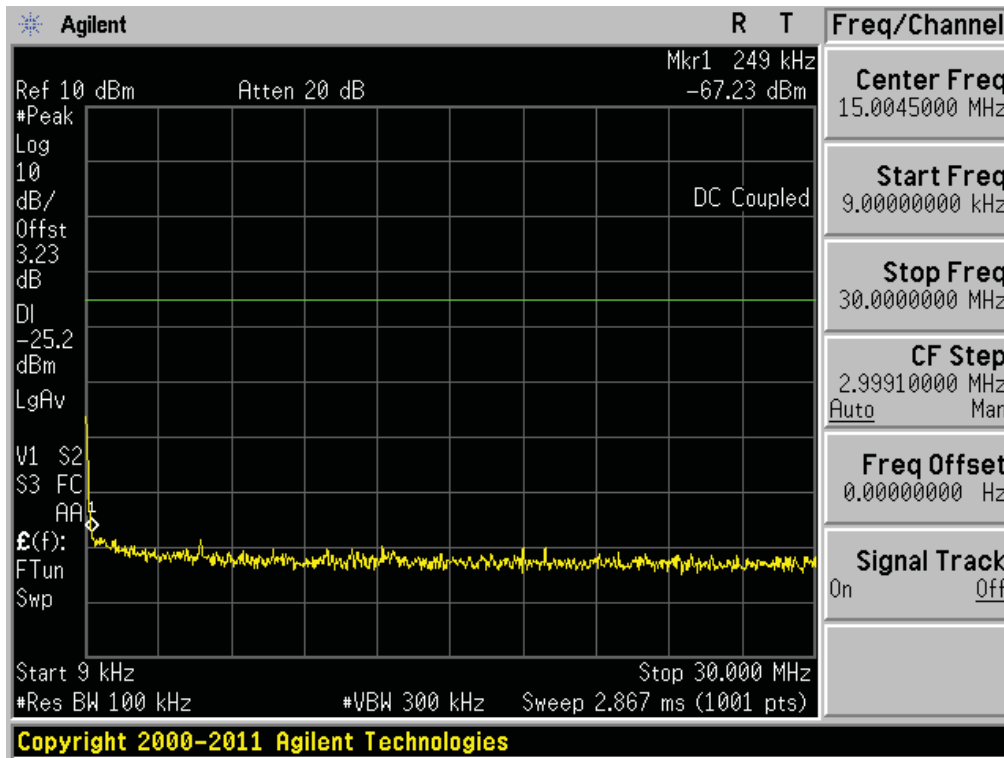
### Reference



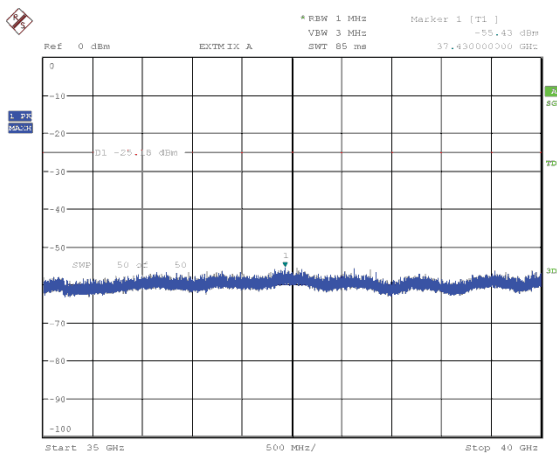
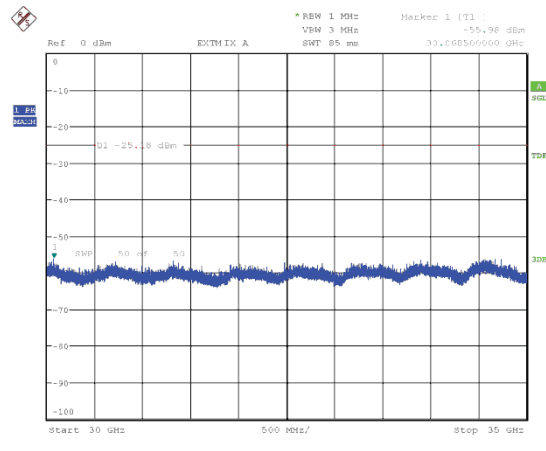
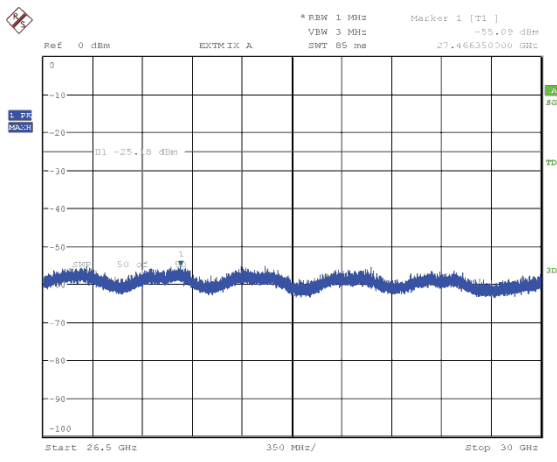
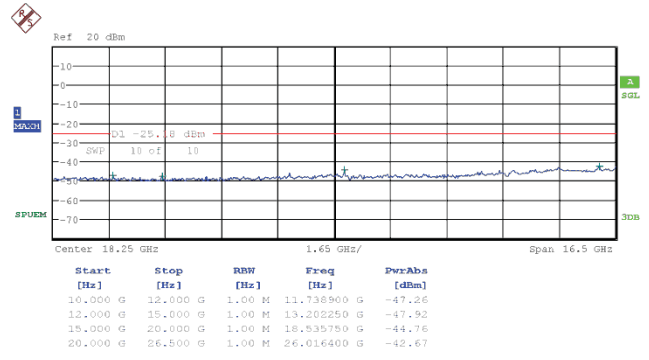
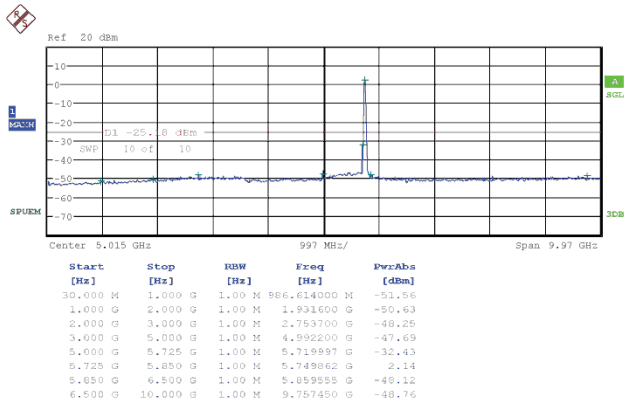
### Low Band-edge



### Conducted Spurious Emissions

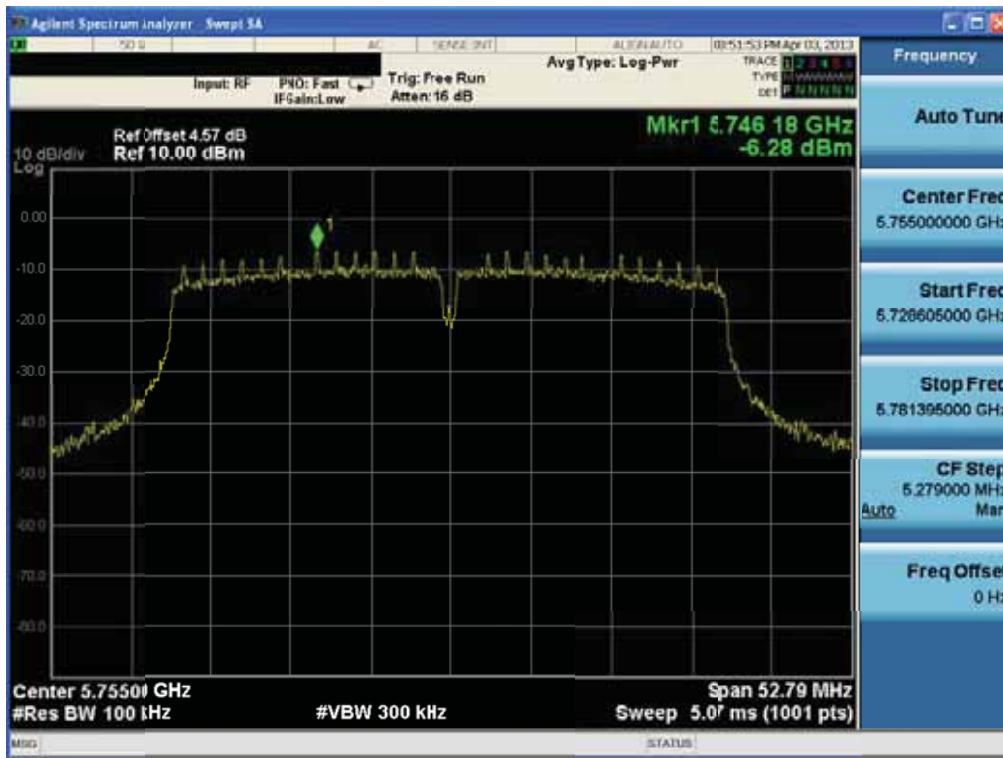


### Conducted Spurious Emissions

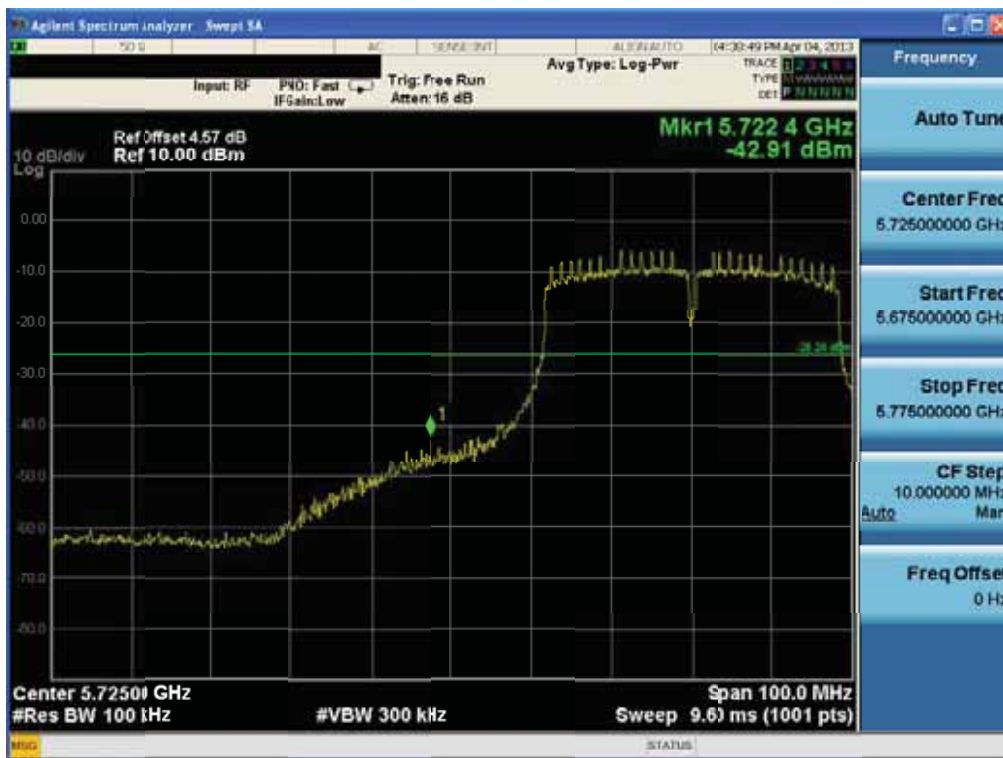


Test Mode: Chain 1 & 802.11n HT40 & MCS 11 & 5755MHz

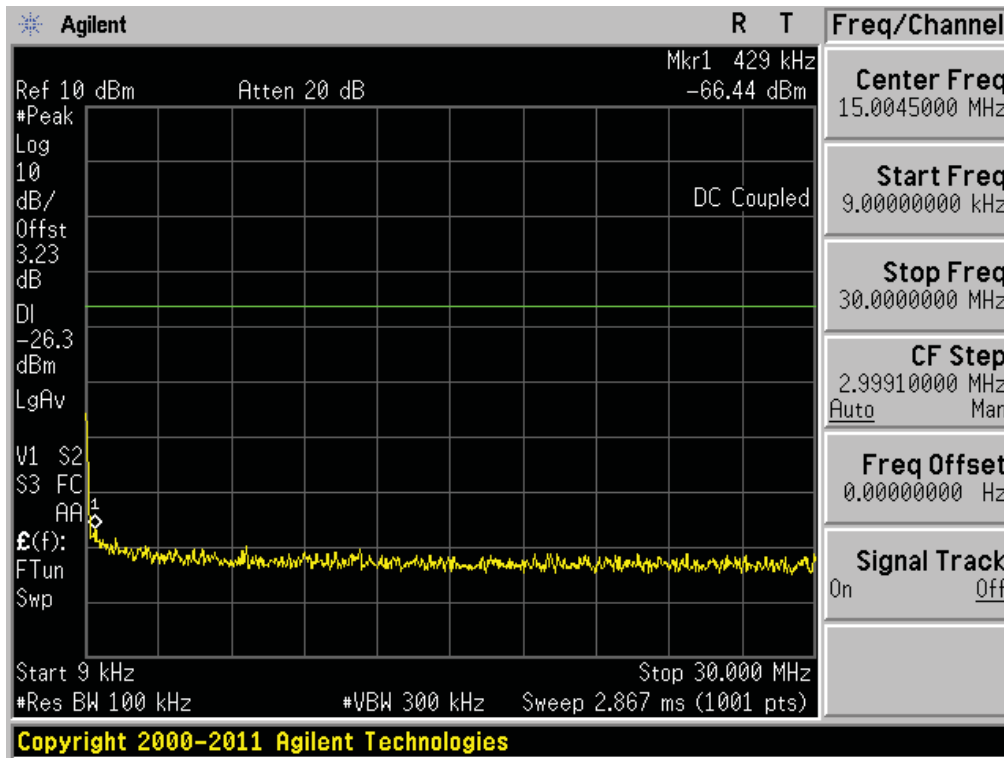
### Reference



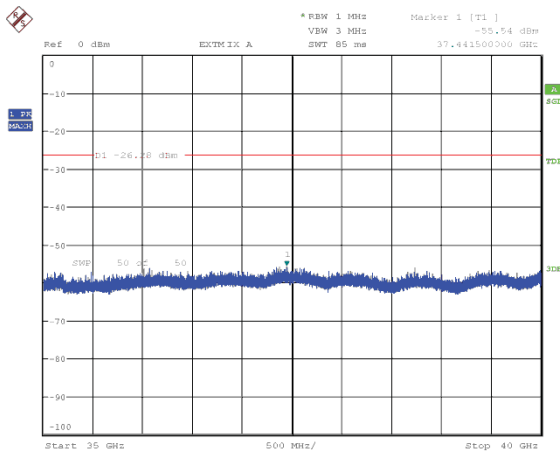
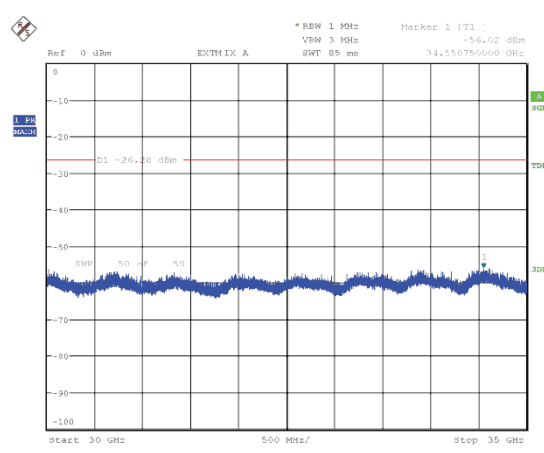
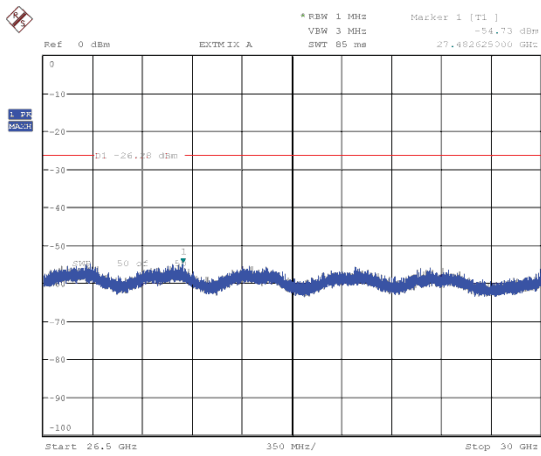
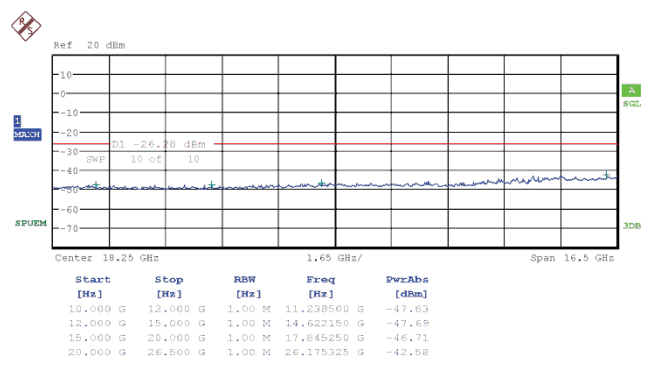
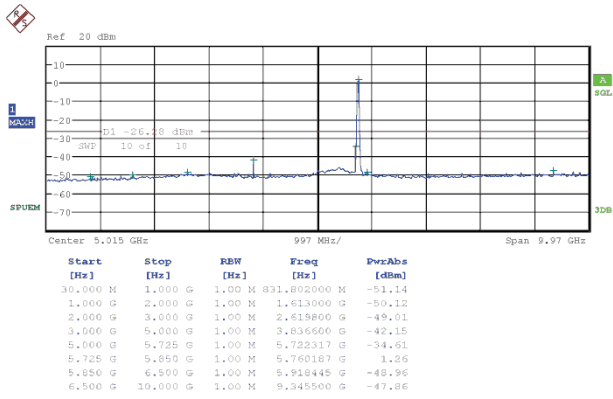
### Low Band-edge



### Conducted Spurious Emissions

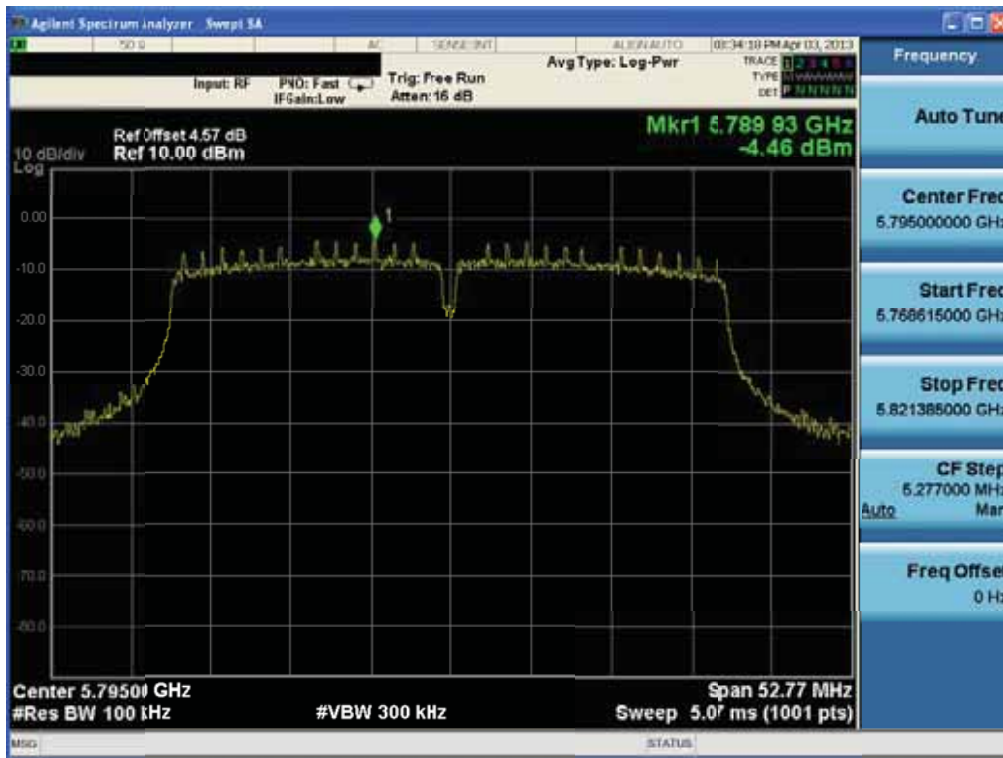


### Conducted Spurious Emissions

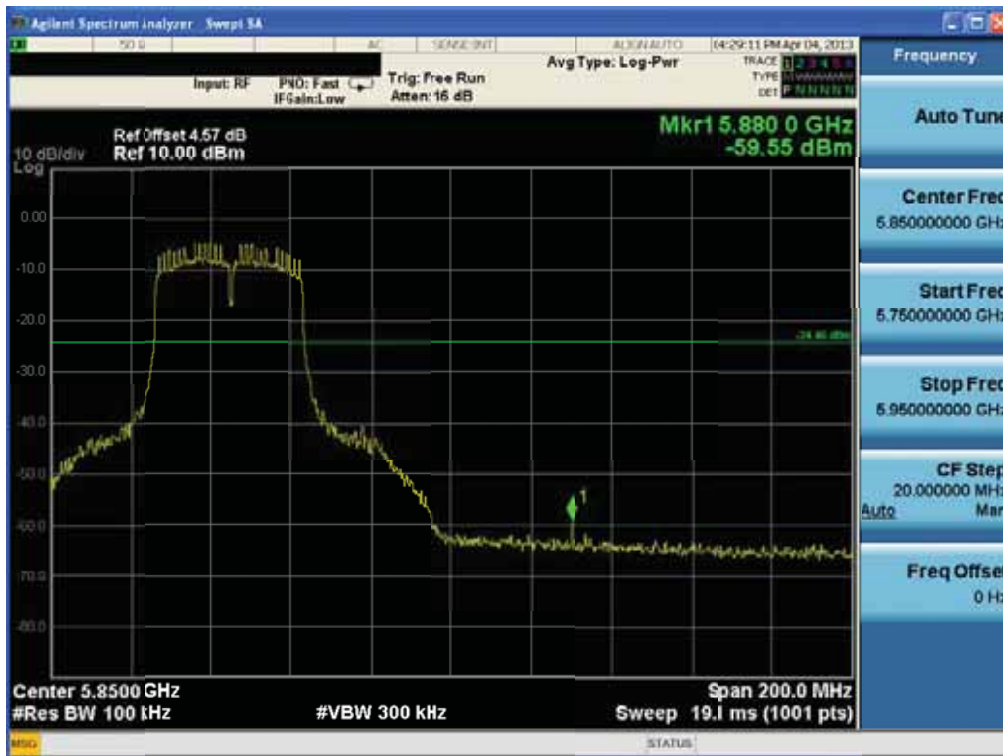


Test Mode: Chain 0 & 802.11n HT40 & MCS 11 & 5795MHz

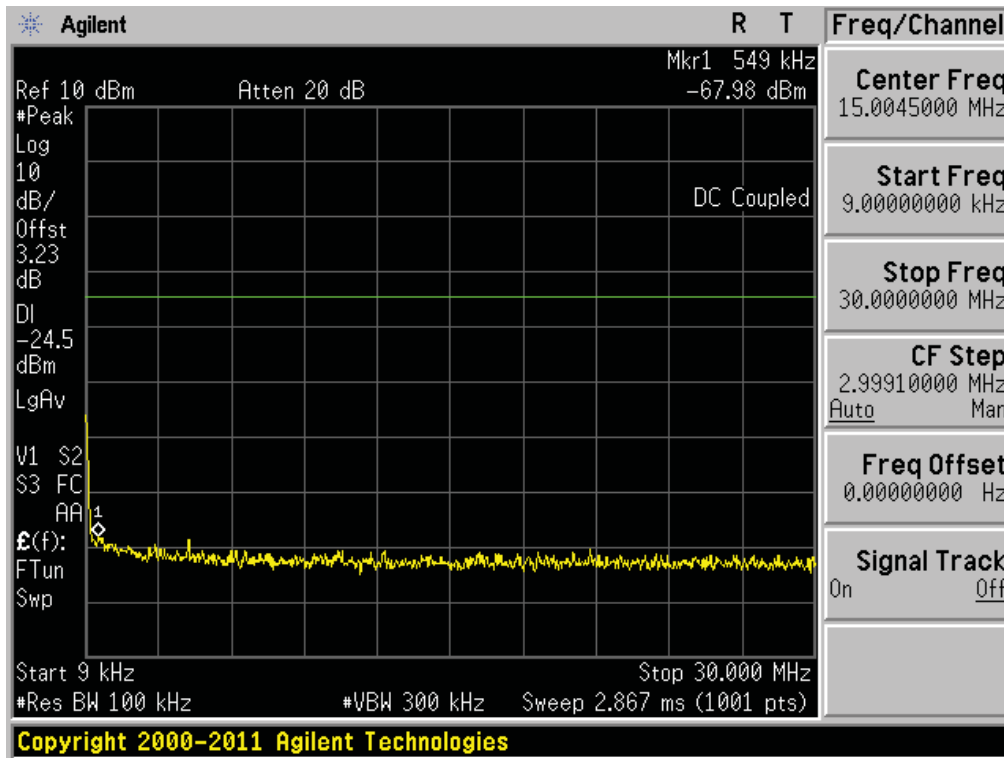
### Reference



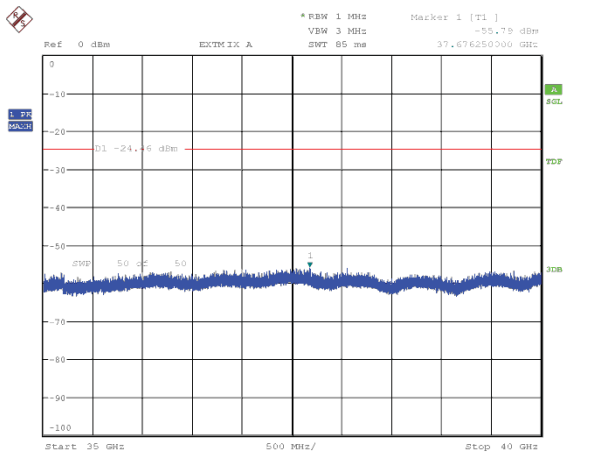
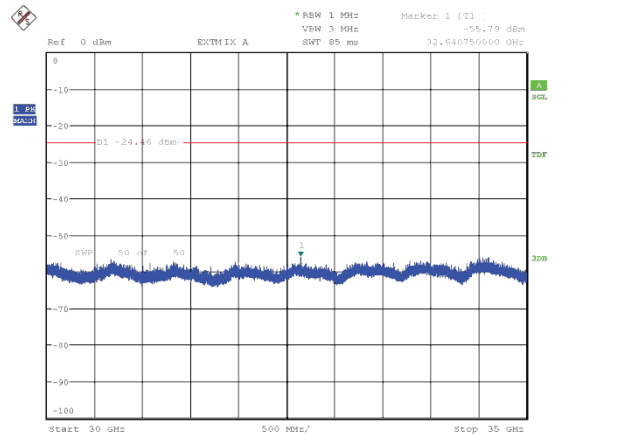
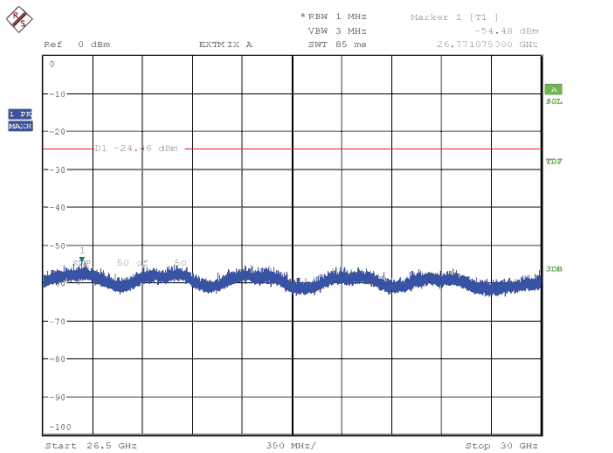
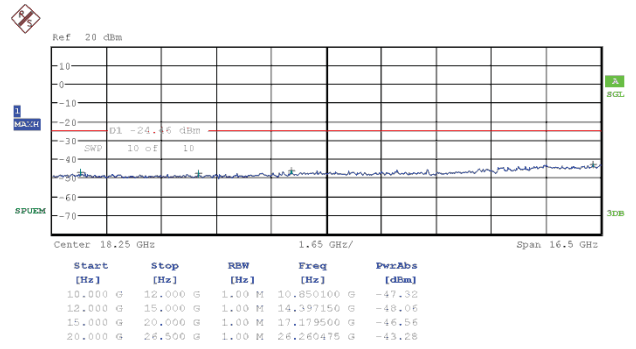
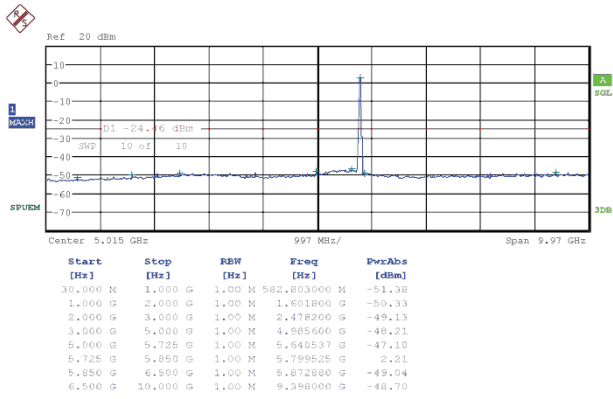
### Low Band-edge



### Conducted Spurious Emissions

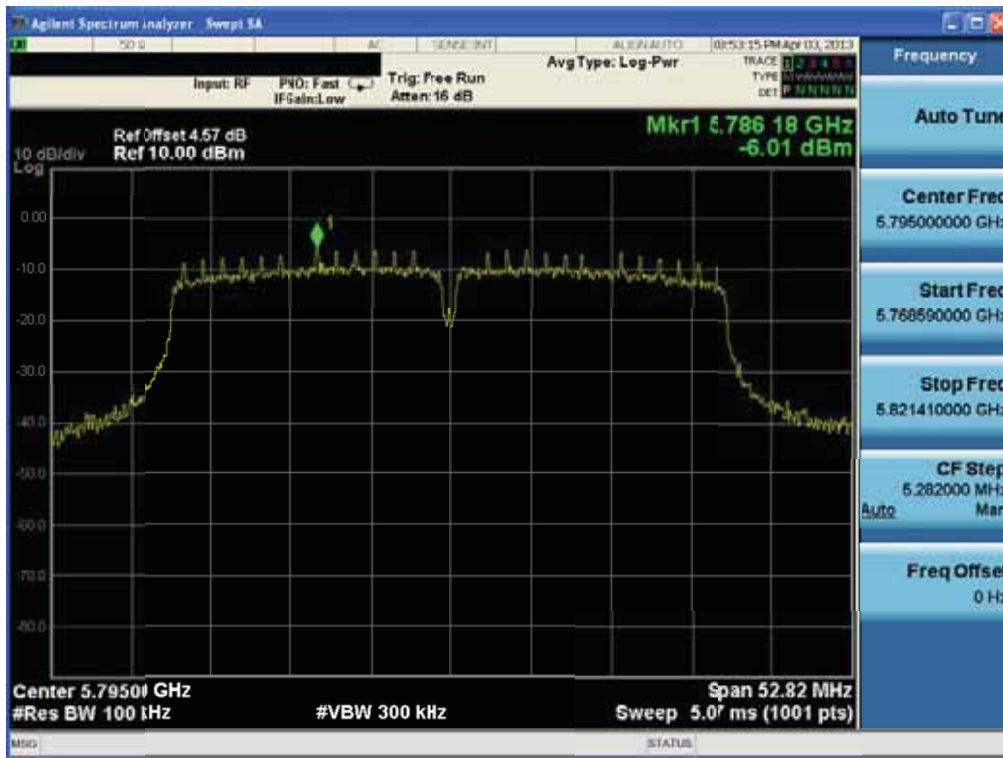


### Conducted Spurious Emissions

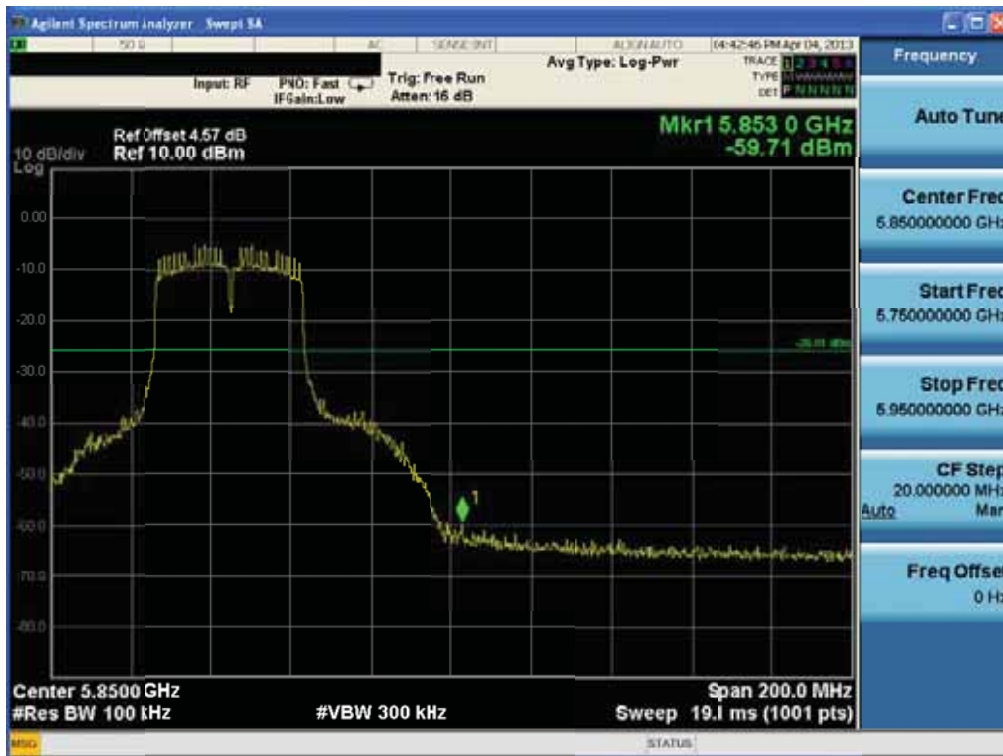


Test Mode: Chain 1 & 802.11n HT40 & MCS 11 & 5795MHz

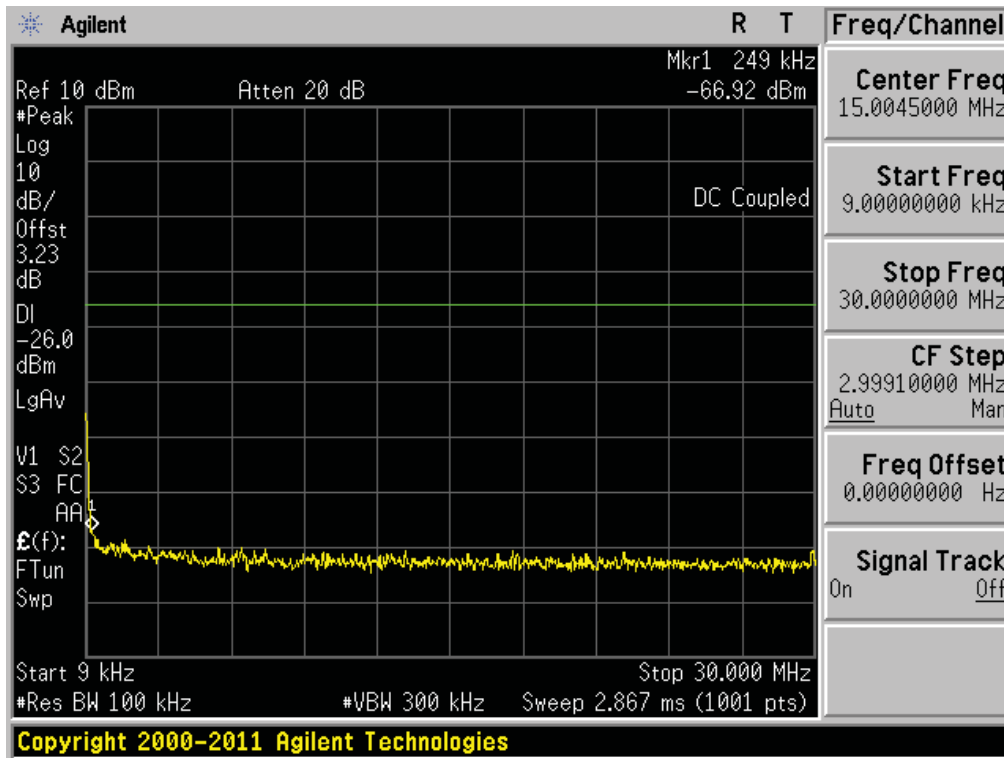
Reference



Low Band-edge



**Conducted Spurious Emissions**



### Conducted Spurious Emissions

