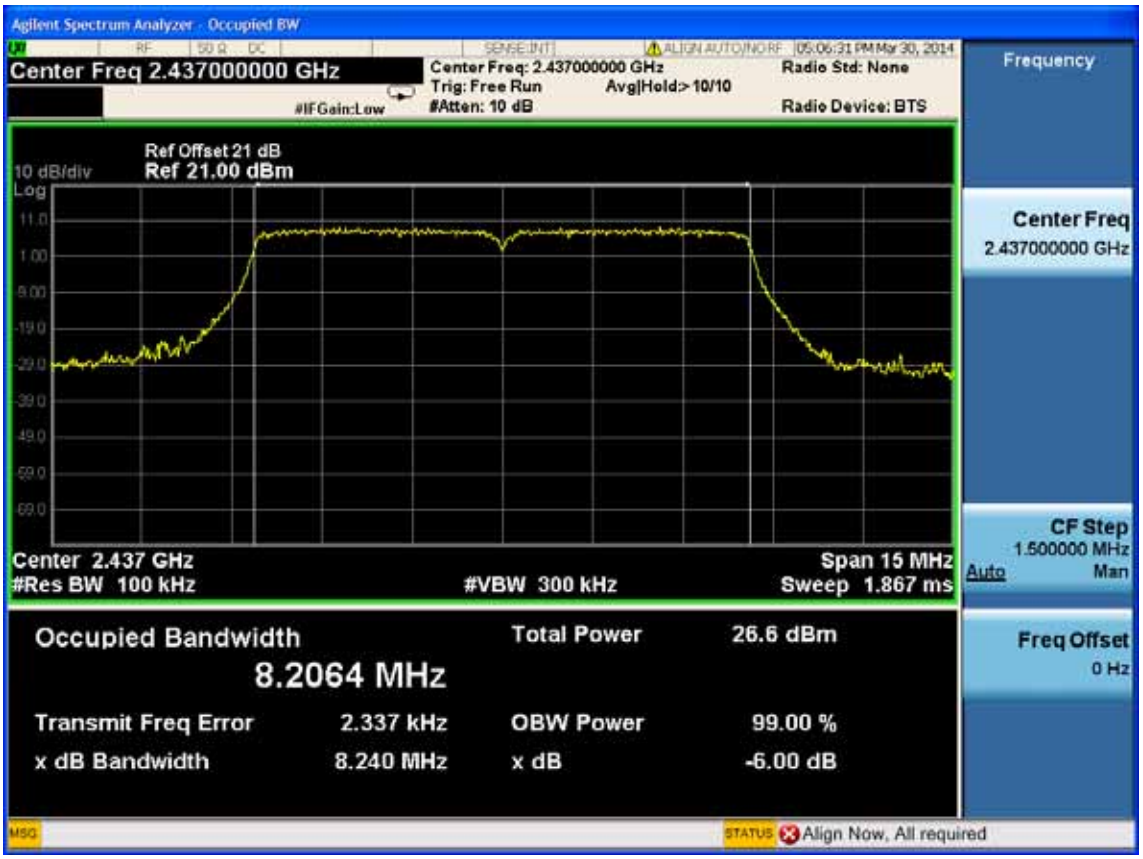
Test Mode: IEEE 802.11g
Test CH1: 2412MHz

Test CH6: 2437MHz



Test CH11: 2462MHz

Test Mode: IEEE 802.11n HT20

Test CH1: 2412MHz

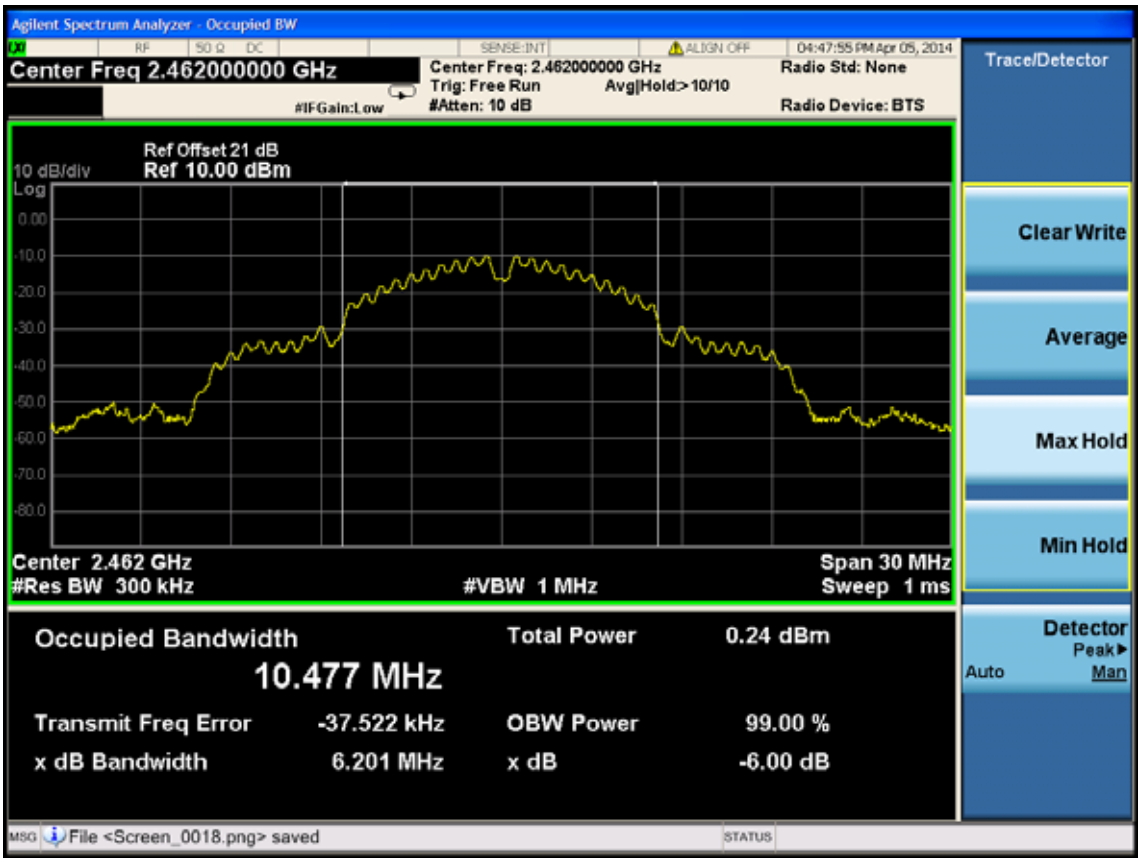
Test CH6: 2437MHz

Test CH11: 2462MHz

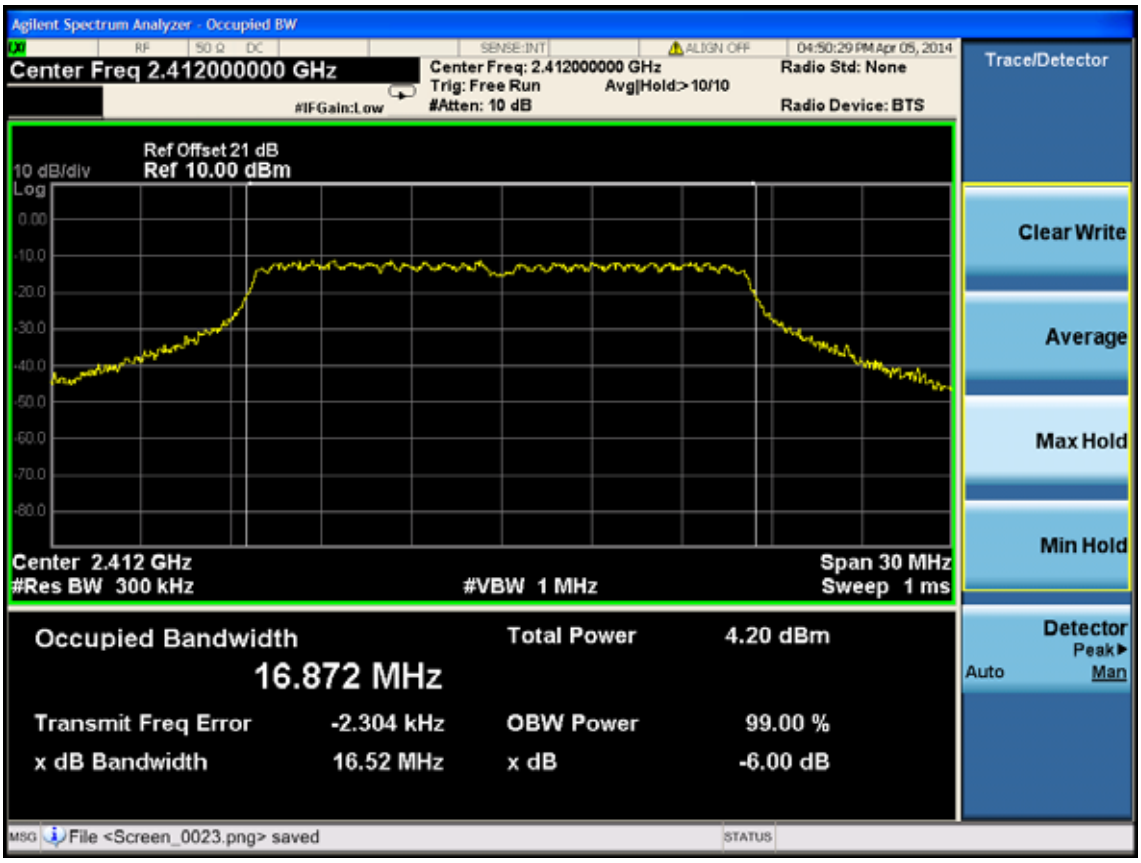
20MHz Antenna: J2
Test Mode: IEEE 802.11b
Test CH1: 2412MHz

Test CH6: 2437MHz

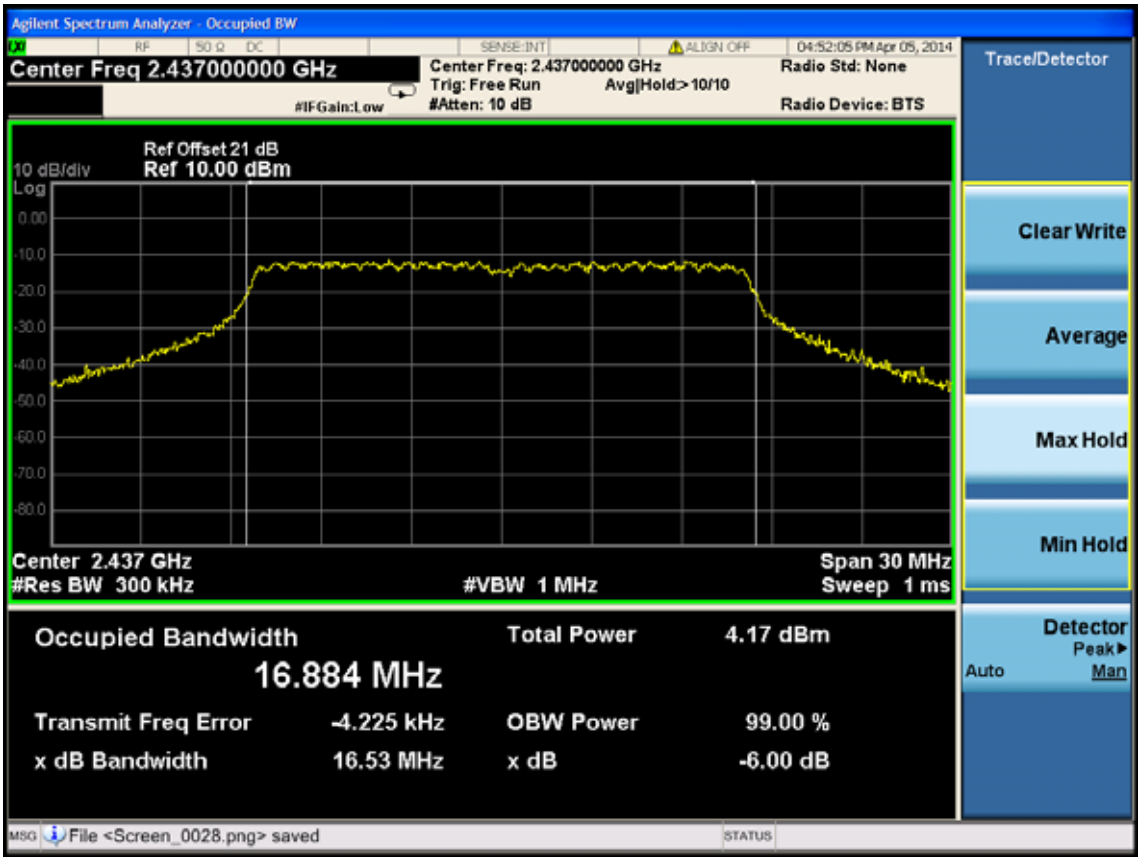
Test CH11: 2462MHz




Test Mode: IEEE 802.11g
Test CH1: 2412MHz

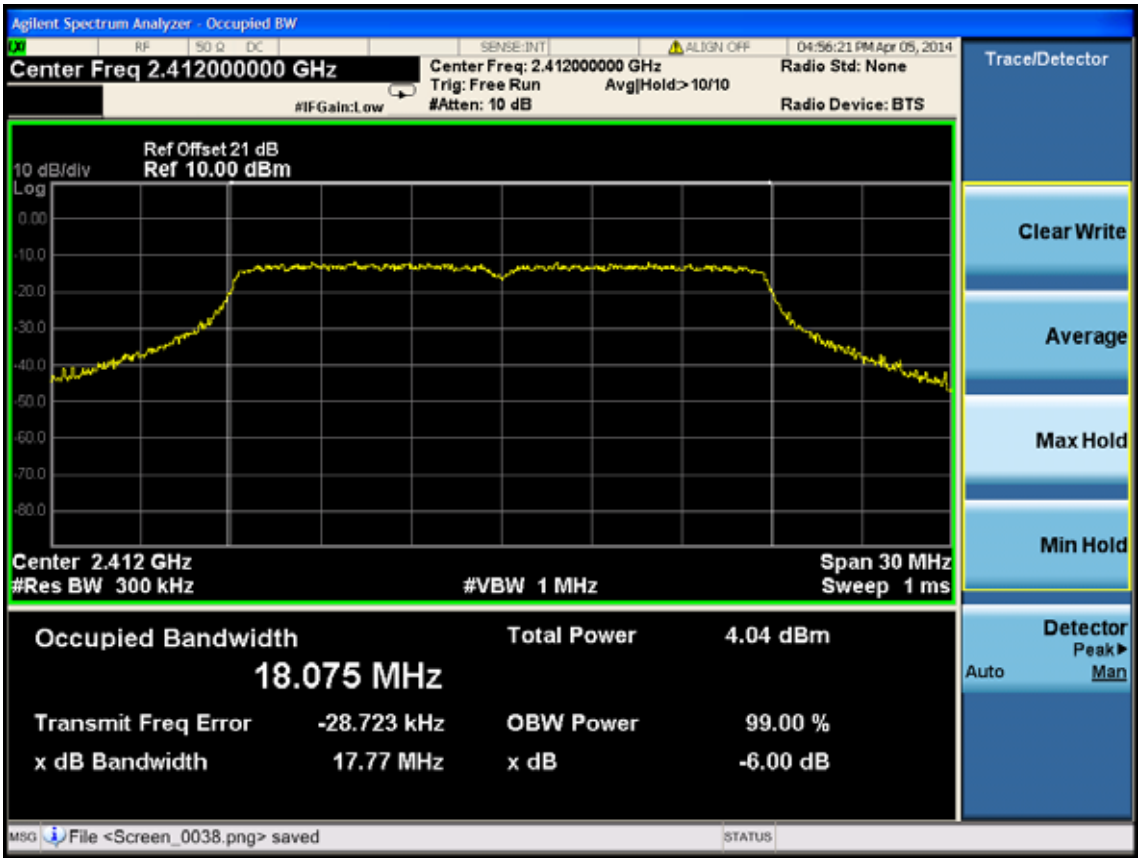


Test CH6: 2437MHz

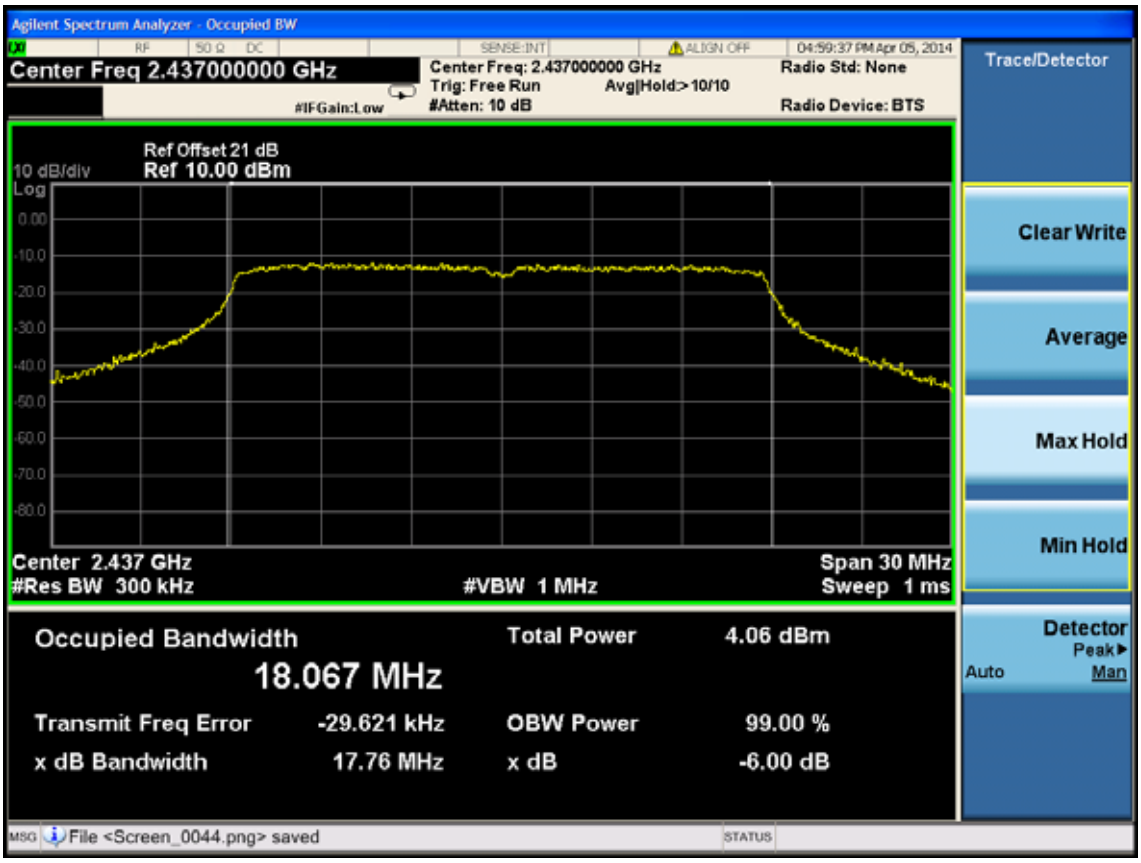



Test CH11: 2462MHz

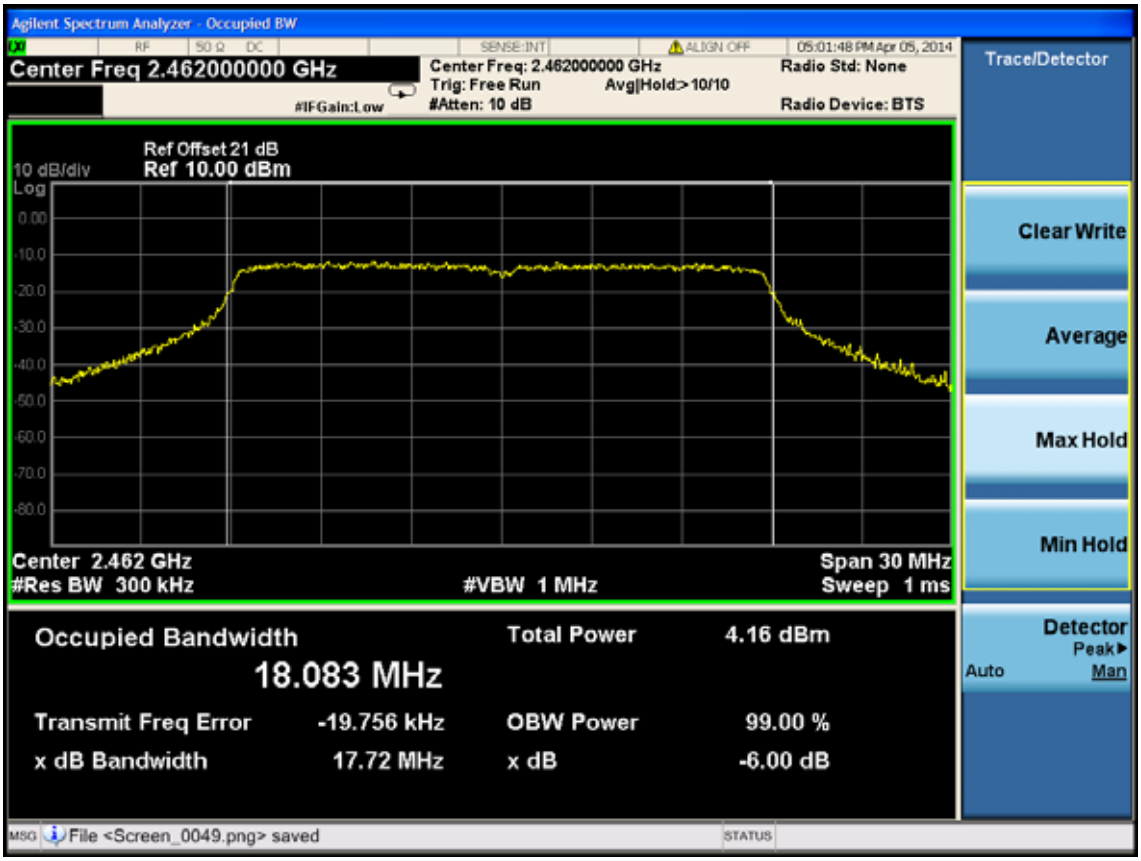
Test Mode: IEEE 802.11n HT20
Test CH1: 2412MHz




Test CH6: 2437MHz



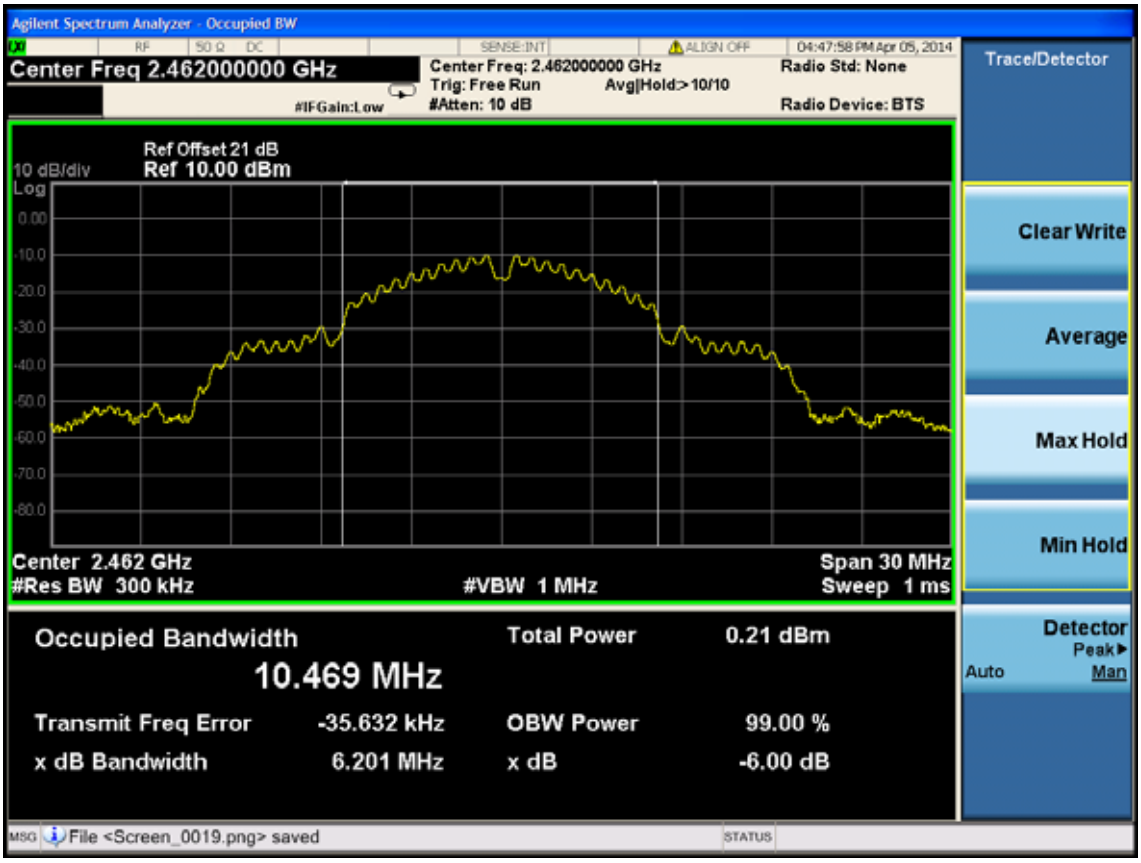
Test CH11: 2462MHz



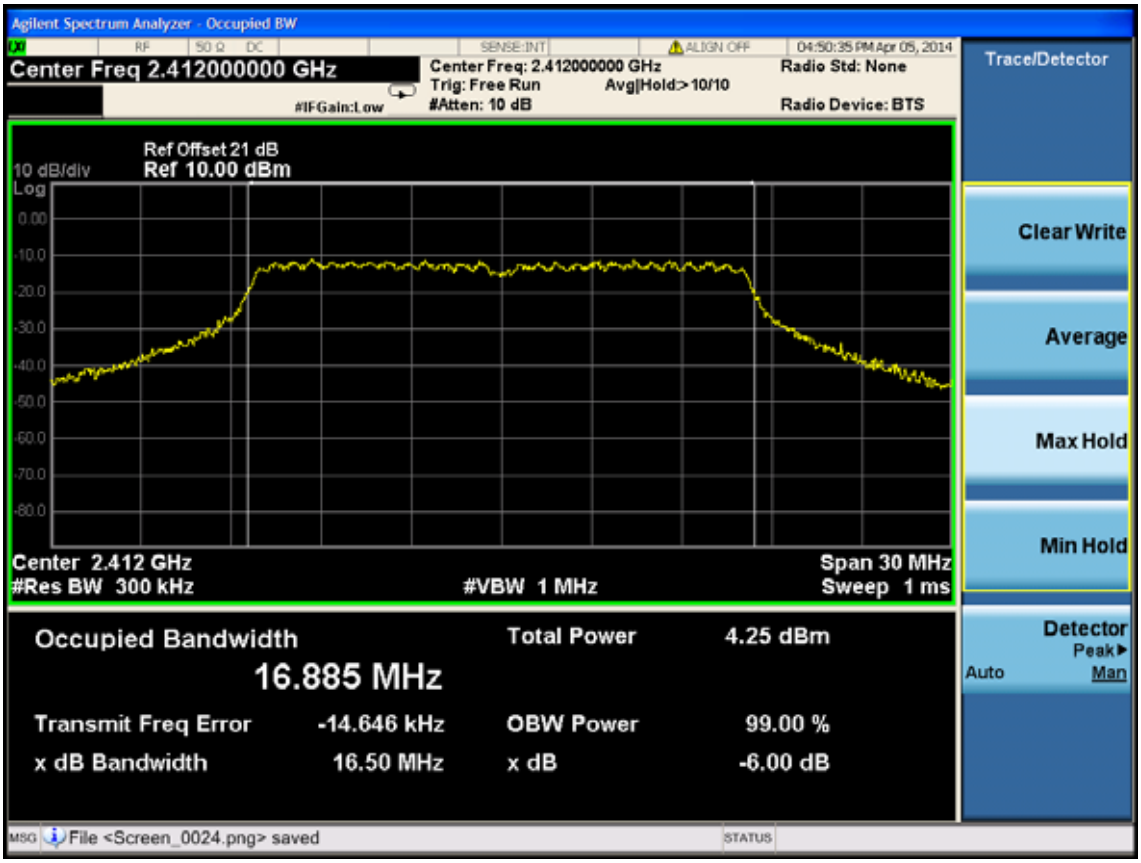

20MHz Antenna: J3
Test Mode: IEEE 802.11b
Test CH1: 2412MHz

Test CH6: 2437MHz

Test CH11: 2462MHz



Test Mode: IEEE 802.11g
Test CH1: 2412MHz

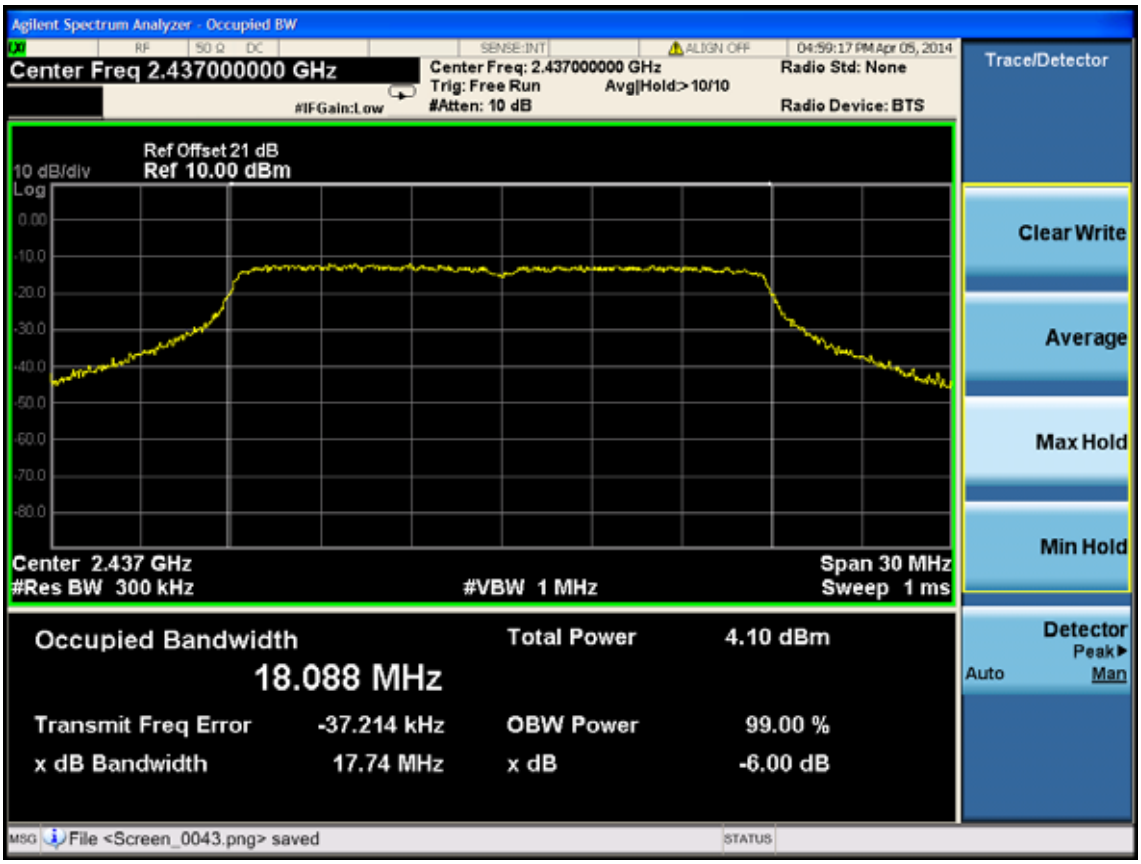



Test CH6: 2437MHz

Test CH11: 2462MHz

Test Mode: IEEE 802.11n HT20
Test CH1: 2412MHz

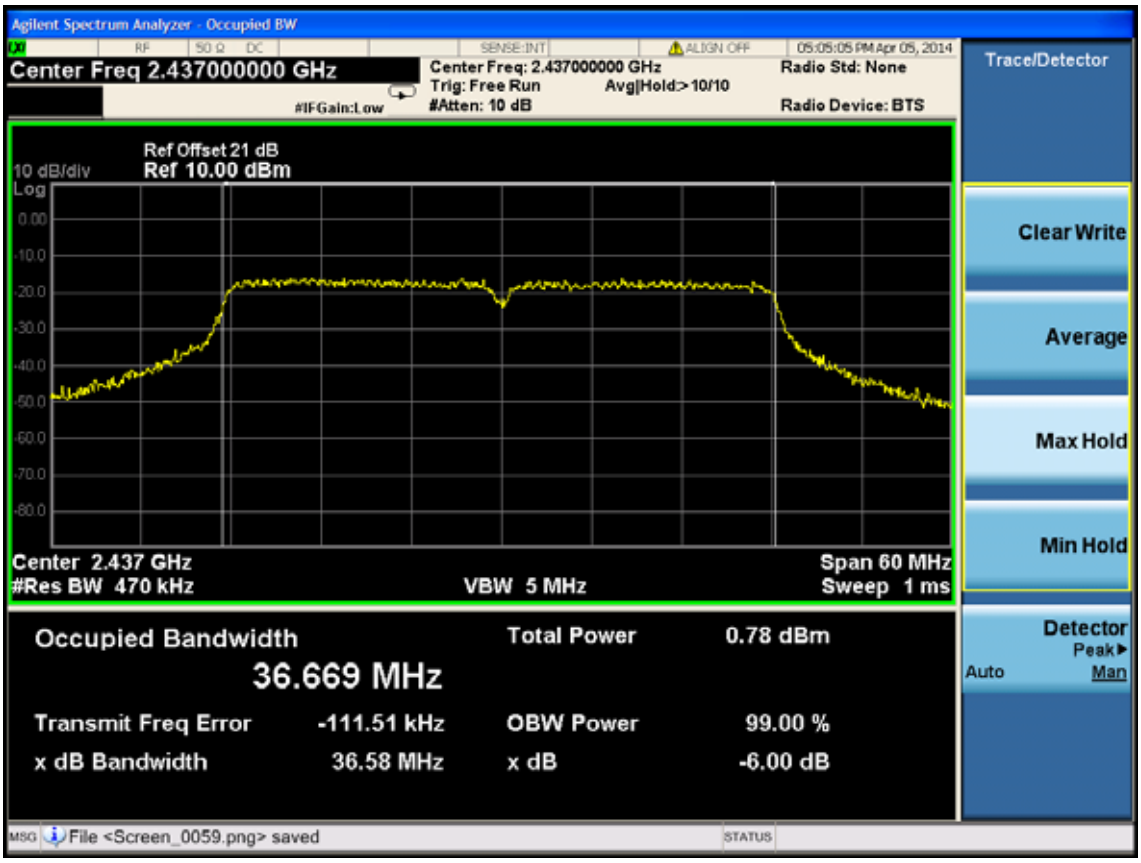
Test CH6: 2437MHz




Test CH11: 2462MHz

40MHz Antenna: J2
Test Mode: IEEE 802.11n HT40
Test CH1: 2422MHz

Test CH4: 2437MHz



Test CH7: 2452MHz

40MHz Antenna: J3
Test Mode: IEEE 802.11n HT40
Test CH1: 2422MHz

Test CH4: 2437MHz

Test CH7: 2452MHz

# 8. OUTPUT POWER TEST

## 8.1.Test Equipment

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | Spectrum Analyzer | Agilent | N9030A | MY51380221 | Oct.31, 13 | 1Year |
| 2. | Amp | HP | 8449B | 3008A08495 | May.08, 13 | 1 Year |
| 3. | Antenna | EMCO | 3115 | 9510-4580 | May.08, 13 | 1Year |
| 4. | HF Cable | Hubersuhne | Sucoflex104 | - | May.08, 13 | 1 Year |
| 5. | Power Meter | Anritsu | ML2487A | 6K00002472 | May.08, 13 | 1Year |
| 6. | Power Sensor | Anritsu | MA2491A | 033005 | May.08, 13 | 1Year |
| 7. | Spectrum Analyzer | Agilent | E4446A | US44300459 | May.08, 13 | 1 Year |

## 8.2.Limit (FCC Part 15C 15.247 b(3)

For systems using digital modulation in the 2400—2483.5MHz, The Peak out put Power shall not exceed 1W(30dBm)

## 8.3.Test Procedure

1, Connected the EUT's antenna port to measure device by 20dB attenuator.

2, For IEEE 802.11b/g and IEEE802.11n HT20 mode, use a PK power meter which's bandwidth is 20MHz and above 26dB bandwidth of signal to measure out each test modes' PK output power.

3, For IEEE802.11n HT40 mode, because the signal's bandwidth is about 40MHz and above 20MHz bandwidth of power sensor ML2491A. So used the test method per KDB558074.

1) Set the RBW=1MHz and VBW =3MHz
2) Set the span ≥1.5 x DTS bandwidth
3) Detector = peak
4) Sweep time = auto couple
5) Trace Mode = max hold
6) allow trace to fully stabilize
7) use the spectrum amalyser's integrated band power measurement function with band limits set equal to the DTS bandwidth edges.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

## 8.4.Test Results

**5MHz**

| | | | | | |
|---|---|---|---|---|---|
| EUT: 2.4GHz 300Mbps 9dBi Outdoor CPE | | | | | |
| M/N: CPE210 | | | | | |
| Test date: 2014-04-01 | Pressure: 101.2±1.0 kpa | | Humidity: 52.5±3.0% | | |
| Tested by: Leo-Li | Test site: RF site | | Temperature:21.7±0.6 ℃ | | |
| | | | | | |
| Cable loss: 1 dB | | Attenuator loss: 20 dB | | | |
| Test Mode | CH (MHz) | Peak output Power (dBm) | | | Limit (dBm) |
| | | J2 | J3 | Total | |
| 11b | CH1 | 24.44 | 24.24 | 27.36 | 29 |
| | CH6 | 24.18 | 24.64 | 27.43 | 29 |
| | CH11 | 23.95 | 23.83 | 26.91 | 29 |
| 11g | CH1 | 24.14 | 24.26 | 27.22 | 29 |
| | CH6 | 24.17 | 24.2 | 27.20 | 29 |
| | CH11 | 24.12 | 24.62 | 27.40 | 29 |
| 11nHT20 | CH1 | 24.32 | 24.82 | 27.60 | 28 |
| | CH6 | 24.25 | 24.63 | 27.46 | 28 |
| | CH11 | 24.19 | 24.36 | 27.29 | 28 |
| Conclusion: PASS | | | | | |

**10MHz**

| | | | | | |
|---|---|---|---|---|---|
| EUT: 2.4GHz 300Mbps 9dBi Outdoor CPE | | | | | |
| M/N: CPE210 | | | | | |
| Test date: 2014-04-01 | Pressure: 101.2±1.0 kpa | | Humidity: 51.2±3.0% | | |
| Tested by: Leo-Li | Test site: RF site | | Temperature:22.5±0.6 ℃ | | |
| | | | | | |
| Cable loss: 1 dB | | Attenuator loss: 20 dB | | | |
| Test Mode | CH (MHz) | Peak output Power (dBm) | | | Limit (dBm) |
| | | J2 | J3 | Total | |
| 11b | CH1 | 24.46 | 24.11 | 27.31 | 29 |
| | CH6 | 24.59 | 24.74 | 27.68 | 29 |
| | CH11 | 24.5 | 24.56 | 27.55 | 29 |
| 11g | CH1 | 24.19 | 24.25 | 27.24 | 29 |
| | CH6 | 24.32 | 24.42 | 27.39 | 29 |
| | CH11 | 24.31 | 24.26 | 27.30 | 29 |
| 11nHT20 | CH1 | 24.39 | 24.43 | 27.43 | 28 |
| | CH6 | 24.57 | 24.38 | 27.49 | 28 |
| | CH11 | 24.61 | 24.29 | 27.47 | 28 |
| Conclusion: PASS | | | | | |

**20MHz**

| | | |
|---|---|---|
| EUT: 2.4GHz 300Mbps 9dBi Outdoor CPE | | |
| M/N: CPE210 | | |
| Test date: 2014-3-25 | Pressure: 101.3±1.0 kpa | Humidity: 52.2±3.0% |
| Tested by: Leo-Li | Test site: RF site | Temperature:21.4±0.6 ℃ |

| Cable loss: 1 dB | | Attenuator loss: 20 dB | | | |
|---|---|---|---|---|---|
| Test Mode | CH (MHz) | Peak output Power (dBm) | | | Limit (dBm) |
| | | J2 | J3 | Total | |
| 11b | CH1 | 24.61 | 24.86 | 27.75 | 29 |
| | CH6 | 24.25 | 24.72 | 27.50 | 29 |
| | CH11 | 24.27 | 24.37 | 27.33 | 29 |
| 11g | CH1 | 24.19 | 25.55 | 27.93 | 29 |
| | CH6 | 24.27 | 25.24 | 27.79 | 29 |
| | CH11 | 24.44 | 25.31 | 27.91 | 29 |
| 11nHT20 | CH1 | 22.42 | 22.95 | 25.70 | 28 |
| | CH6 | 24.49 | 25.07 | 27.80 | 28 |
| | CH11 | 22.53 | 22.66 | 25.61 | 28 |
| Conclusion: PASS | | | | | |

**40MHz**

| | | |
|---|---|---|
| EUT: 2.4GHz 300Mbps 9dBi Outdoor CPE | | |
| M/N: CPE210 | | |
| Test date: 2014-3-25 | Pressure: 101.3±1.0 kpa | Humidity: 52.2±3.0% |
| Tested by: Leo-Li | Test site: RF site | Temperature:21.4±0.6 ℃ |

| Cable loss: 1 dB | | Attenuator loss: 20 dB | | | |
|---|---|---|---|---|---|
| Test Mode | CH (MHz) | Peak output Power (dBm) | | | Limit (dBm) |
| | | J2 | J3 | Total | |
| 11nHT40 | CH1 | 21.59 | 22.88 | 25.29 | 28 |
| | CH4 | 24.77 | 25.11 | 27.95 | 28 |
| | CH7 | 21.07 | 21.70 | 24.41 | 28 |
| Conclusion: PASS | | | | | |

Note: 1.IEEE802.11b/g use IDD Mode
the Directional (Gain=$G_{ANT}$+Array Gain(Array gain=0dB)
=9dBi
2. IEEE802.11n Mode
the Directional (Gain=$G_{ANT}$+10log($G_{ANT}$/$N_{SS}$)
=9dBi+10log2
=12dBi
3.This is Point to Point device so the power limit for 11b/g Mode is 29dBi and 11n Mode is 28dBi

40MHz Antenna: J2
Test Mode: IEEE 802.11n HT40
Test CH1: 2422MHz

Test CH4: 2437MHz

Test CH7: 2452MHz

40MHz Antenna: J3
Test Mode: IEEE 802.11n HT40
Test CH1: 2422MHz

Test CH4: 2437MHz

Test CH7: 2452MHz

# 9. POWER SPECTRAL DENSITY TEST

## 9.1.Test Equipment

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | Spectrum Analyzer | Agilent | N9030A | MY51380221 | Oct.31, 13 | 1 Year |
| 2. | Amp | HP | 8449B | 3008A08495 | May.08, 13 | 1 Year |
| 3. | Antenna | EMCO | 3115 | 9607-4580 | Aug.28, 13 | 1Year |
| 4. | HF Cable | Hubersuhne | Sucoflex104 | - | May.08, 13 | 1 Year |

## 9.2.Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

## 9.3.Test Procedure

1. Connected the EUT's antenna port to spectrum analyzer device by 20dB attenuator.

2. Set the test frequency as center frequency, Set RBW=3KHz,VBW=10KHz,Span large enough capture the entire frequency, Read out maximum peak level frequency

3. Set the frequency read from produce 2 as center frequency, then set the span= 300KHz, Sweep time=Span/RBW, Then Max hold, read out each mode and each chain's Power density.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude.

## 9.4.Test Results

**5MHz**

| | | |
|---|---|---|
| EUT: 2.4GHz 300Mbps 9dBi Outdoor CPE | | |
| M/N: CPE210 | | |
| Test date:2014-04-06 | Pressure: 101.7±1.0kpa | Humidity: 53.8±3.0 % |
| Tested by:Leo-Li | Test site: RF site | Temperature: 21.6±0.6℃ |

| Cable loss: 1 dB | | Attenuator loss: 20 dB | | | |
|---|---|---|---|---|---|
| Test Mode | CH | Result | | | Limit (dBm/3KHz) |
| | | Power density（dBm/3KHz） | | | |
| | | J2 | J3 | Total | |
| 11b | CH1 | -4.189 | -3.443 | -0.79 | 8 |
| | CH6 | -4.188 | -3.141 | -0.62 | 8 |
| | CH11 | -4.180 | -3.950 | -1.05 | 8 |
| 11g | CH1 | -6.197 | -5.786 | -2.98 | 8 |
| | CH6 | -5.658 | -5.169 | -2.40 | 8 |
| | CH11 | -5.473 | -4.926 | -2.18 | 8 |
| 11n HT20 | CH1 | -6.376 | -6.012 | -3.18 | 8 |
| | CH6 | -6.336 | -6.044 | -3.18 | 8 |
| | CH11 | -5.146 | -5.867 | -2.48 | 8 |
| Conclusion: PASS | | | | | |

**10MHz**

| | | |
|---|---|---|
| EUT: 2.4GHz 300Mbps 9dBi Outdoor CPE | | |
| M/N: CPE210 | | |
| Test date:2014-04-06 | Pressure: 101.7±1.0kpa | Humidity: 53.3±3.0 % |
| Tested by:Leo-Li | Test site: RF site | Temperature: 21.4±0.6℃ |

| Cable loss: 1 dB | | Attenuator loss: 20 dB | | | |
|---|---|---|---|---|---|
| Test Mode | CH | Result | | | Limit (dBm/3KHz) |
| | | Power density（dBm/3KHz） | | | |
| | | J2 | J3 | Total | |
| 11b | CH1 | -0.431 | -0.599 | 2.50 | 8 |
| | CH6 | 0.588 | 0.458 | 3.53 | 8 |
| | CH11 | 0.791 | 0.880 | 3.85 | 8 |
| 11g | CH1 | -9.283 | -9.280 | -6.27 | 8 |
| | CH6 | -8.032 | -8.137 | -5.07 | 8 |
| | CH11 | -8.039 | -8.185 | -5.10 | 8 |
| 11n HT20 | CH1 | -7.954 | -8.557 | -5.23 | 8 |
| | CH6 | -6.425 | -6.005 | -3.20 | 8 |
| | CH11 | -6.555 | -7.237 | -3.87 | 8 |
| Conclusion: PASS | | | | | |

**20MHz**

| | | |
|---|---|---|
| EUT: 2.4GHz 300Mbps 9dBi Outdoor CPE | | |
| M/N: CPE210 | | |
| Test date:2014-04-06 | Pressure: 101.6±1.0kpa | Humidity: 52.8±3.0 % |
| Tested by:Leo-Li | Test site: RF site | Temperature: 22.6±0.6℃ |

| Cable loss: 1 dB | | Attenuator loss: 20 dB | | | |
|---|---|---|---|---|---|
| Test Mode | CH | Result | | | Limit (dBm/3KHz) |
| | | Power density（dBm/3KHz） | | | |
| | | J2 | J3 | Total | |
| 11b | CH1 | -7.560 | -7.895 | -4.71 | 8 |
| | CH6 | -7.446 | -8.362 | -4.87 | 8 |
| | CH11 | -7.783 | -8.160 | -4.96 | 8 |
| 11g | CH1 | -14.546 | -15.196 | -11.85 | 8 |
| | CH6 | -9.509 | -9.569 | -6.53 | 8 |
| | CH11 | -14.577 | -14.961 | -11.75 | 8 |
| 11n HT20 | CH1 | -14.142 | -14.697 | -11.40 | 8 |
| | CH6 | -9.406 | -11.095 | -7.16 | 8 |
| | CH11 | -14.256 | -13.608 | -10.91 | 8 |
| Conclusion: PASS | | | | | |

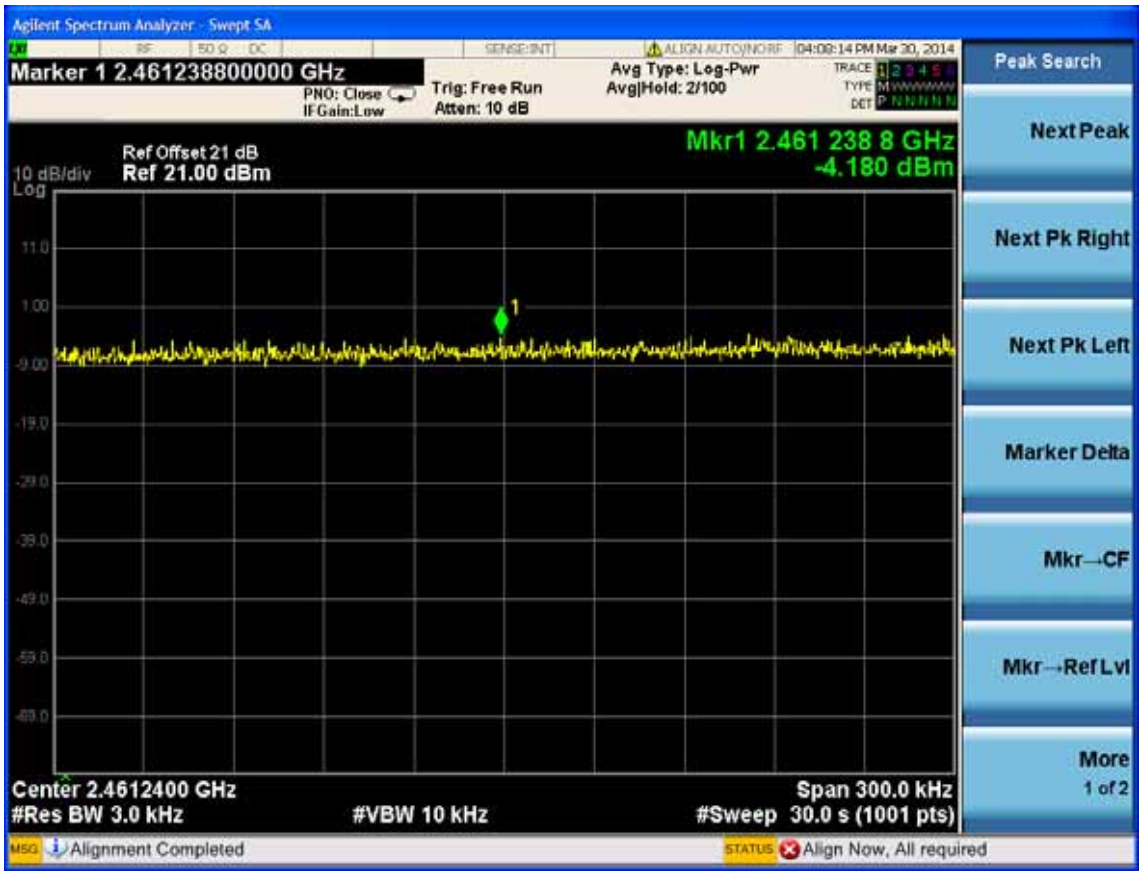
40MHz

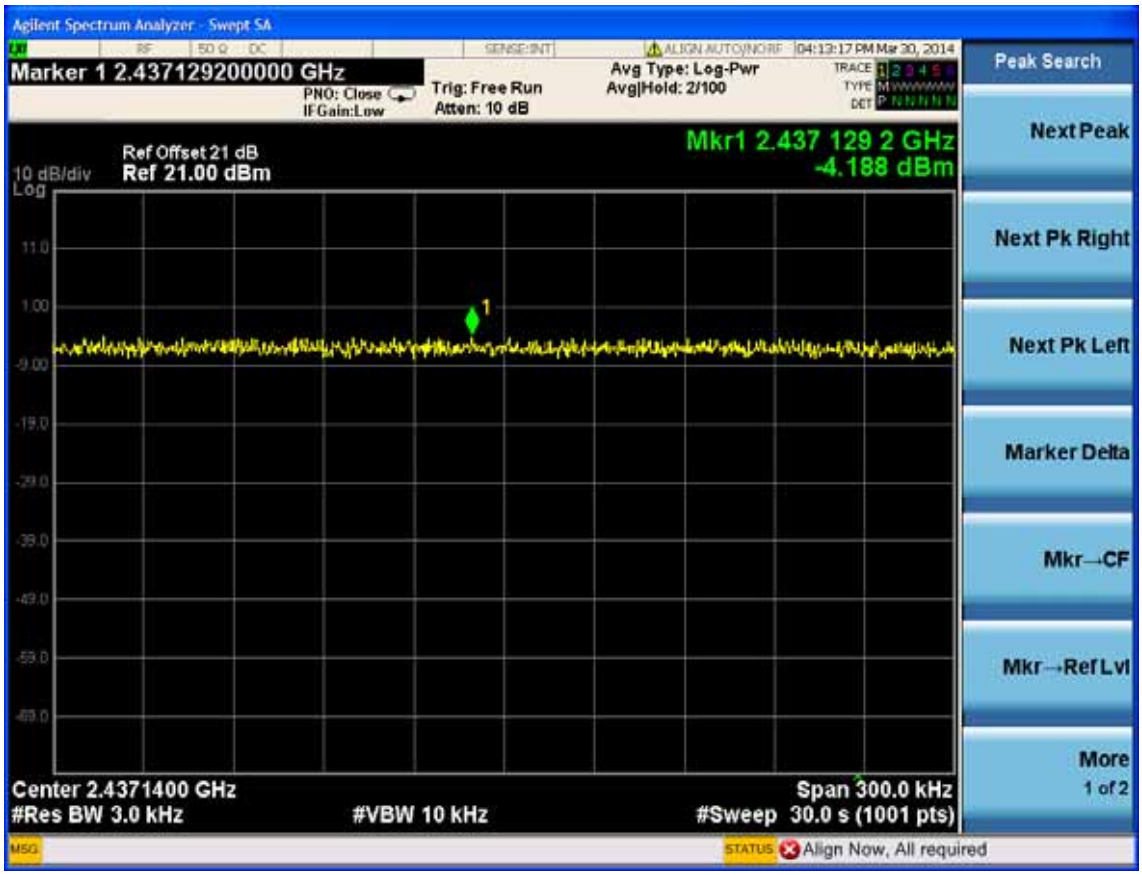
| | | |
|---|---|---|
| EUT: 2.4GHz 300Mbps 9dBi Outdoor CPE | | |
| M/N: CPE210 | | |
| Test date:2014-04-06 | Pressure: 101.6±1.0kpa | Humidity: 52.8±3.0 % |
| Tested by:Leo-Li | Test site: RF site | Temperature: 22.6±0.6℃ |

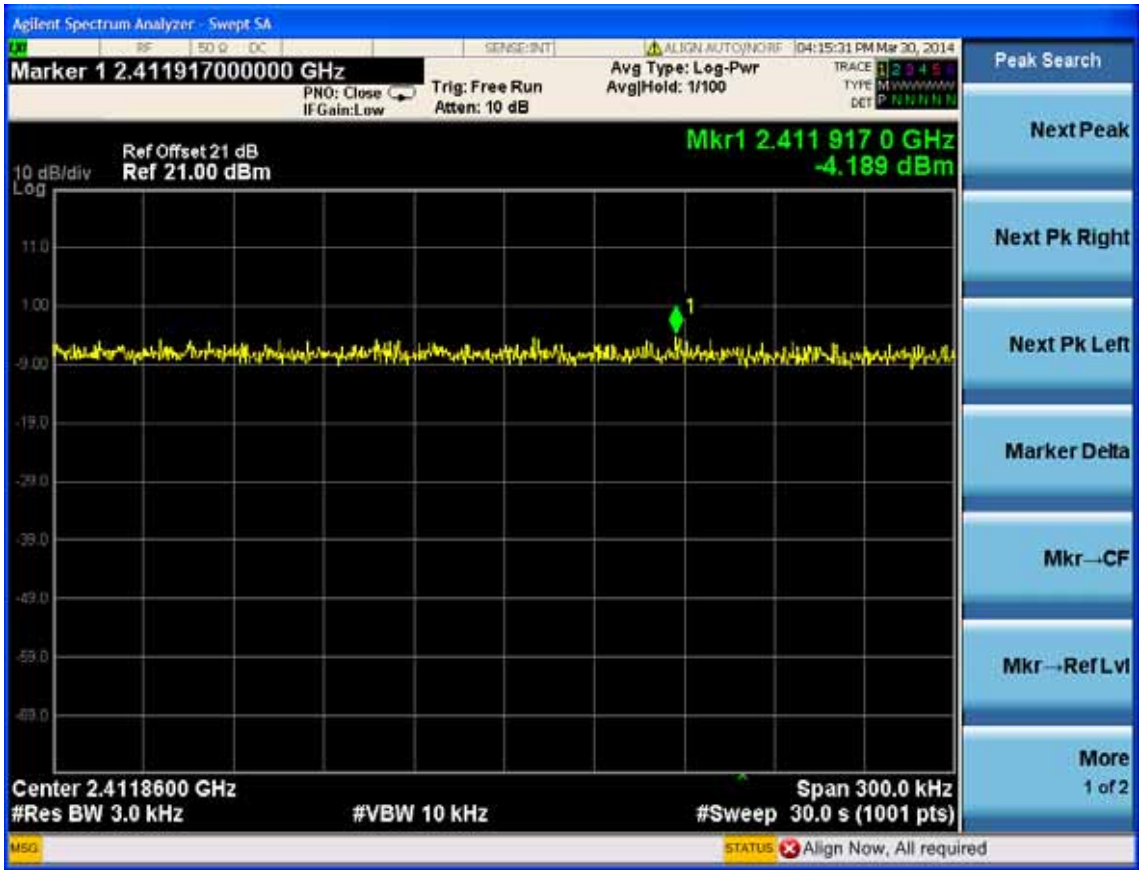
| Cable loss: 1 dB | | Attenuator loss: 20 dB | | | |
|---|---|---|---|---|---|
| Test Mode | CH | Result | | | Limit (dBm/3KHz) |
| | | Power density（dBm/3KHz） | | | |
| | | J2 | J3 | Total | |
| 11nHT40 | CH1 | -17.814 | -16.547 | -14.12 | 8 |
| | CH4 | -17.597 | -16.477 | -13.99 | 8 |
| | CH7 | -14.263 | -12.906 | -10.52 | 8 |
| Conclusion: PASS | | | | | |
| Note: According to KDB 662911. Directional<br>Gain= $G_{ANT}$ + Array =9dBi+10log2<br>=12dBi<br>This is Point to Point device, so the power density limit is 8 dBm/3KHz. | | | | | |

**5MHz Antenna: J2**

Test Mode: IEEE 802.11b






Test Mode: IEEE 802.11g

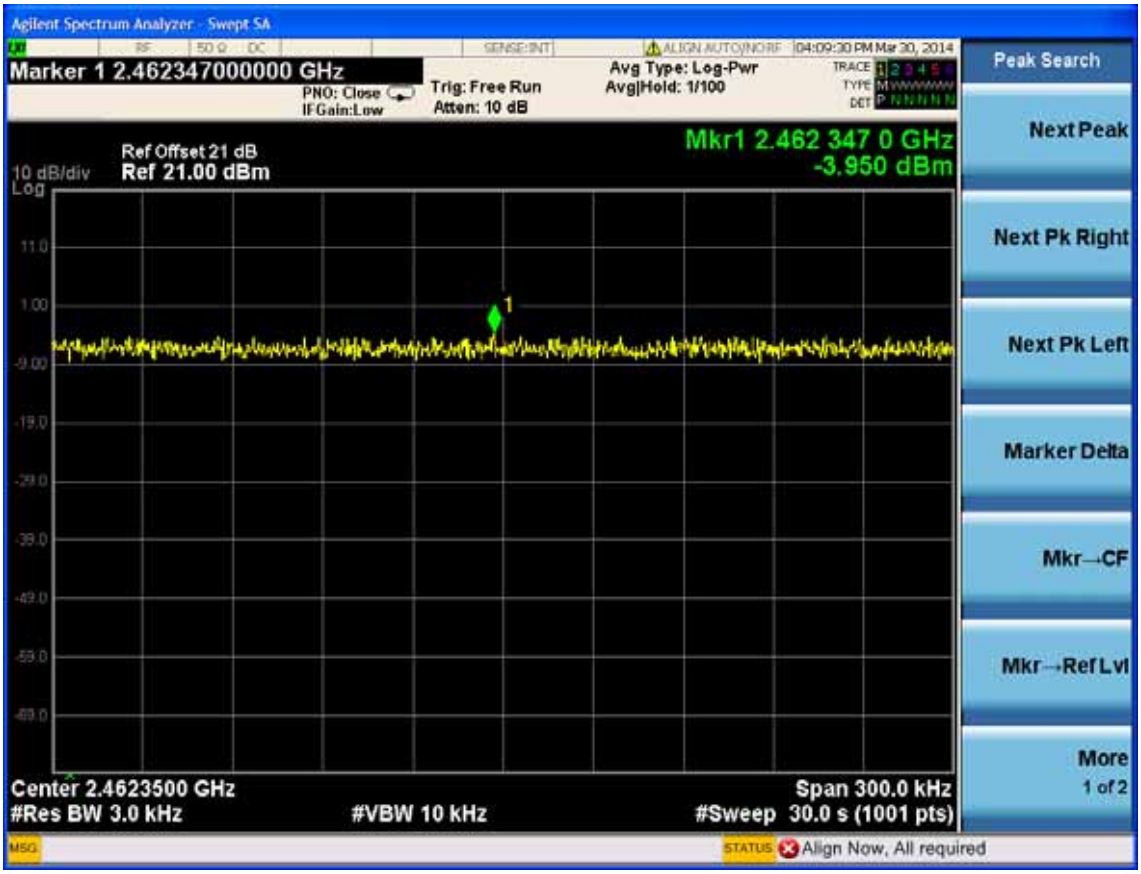
Agilent Spectrum Analyzer - Swept SA
Marker 1 2.438397200000 GHz
PNO: Close
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
Ref Offset 21 dB
10 dB/div
Ref 21.00 dBm
Log
Mkr1 2.438 397 2 GHz
-5.658 dBm
Center 2.4383000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 300.0 kHz
#Sweep 30.0 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required

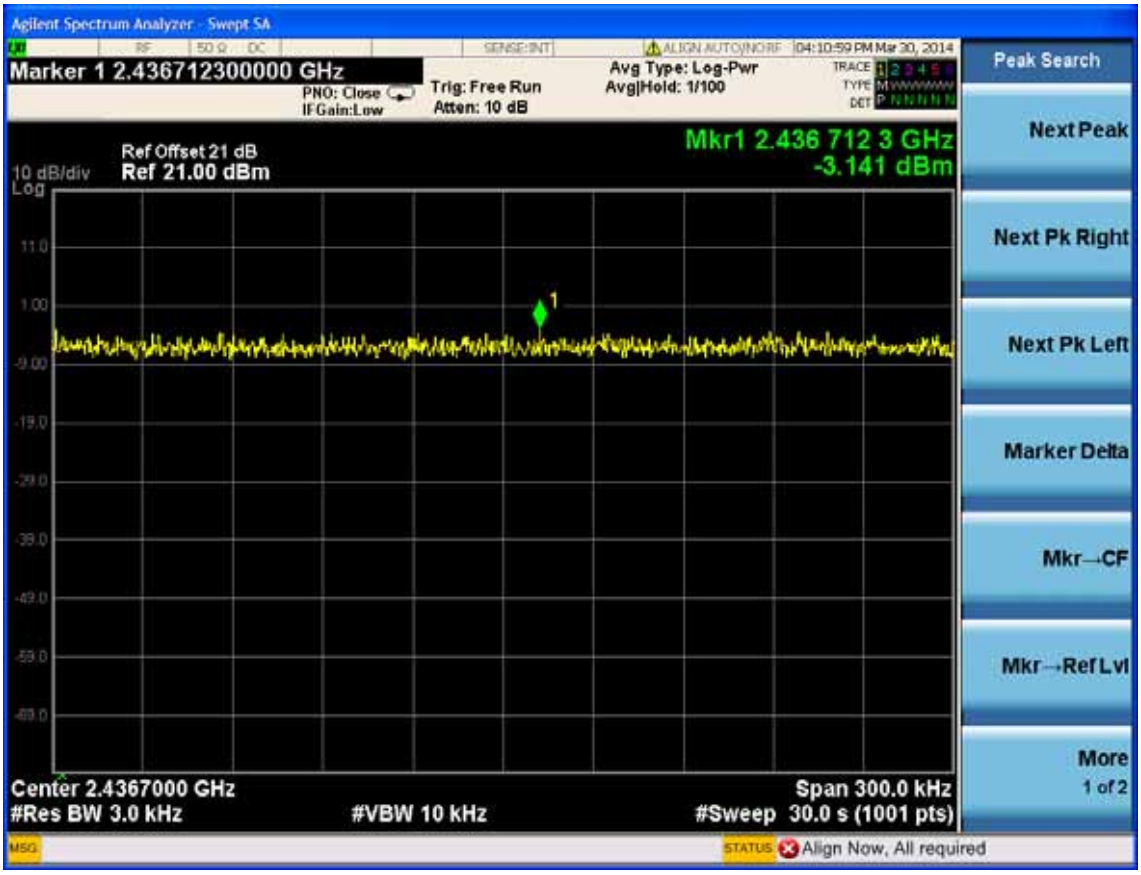
Agilent Spectrum Analyzer - Swept SA
Marker 1 2.461365500000 GHz
PNO: Close
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
Ref Offset 21 dB
10 dB/div
Ref 21.00 dBm
Log
Mkr1 2.461 365 5 GHz
-5.473 dBm
Center 2.4613700 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 300.0 kHz
#Sweep 30.0 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required

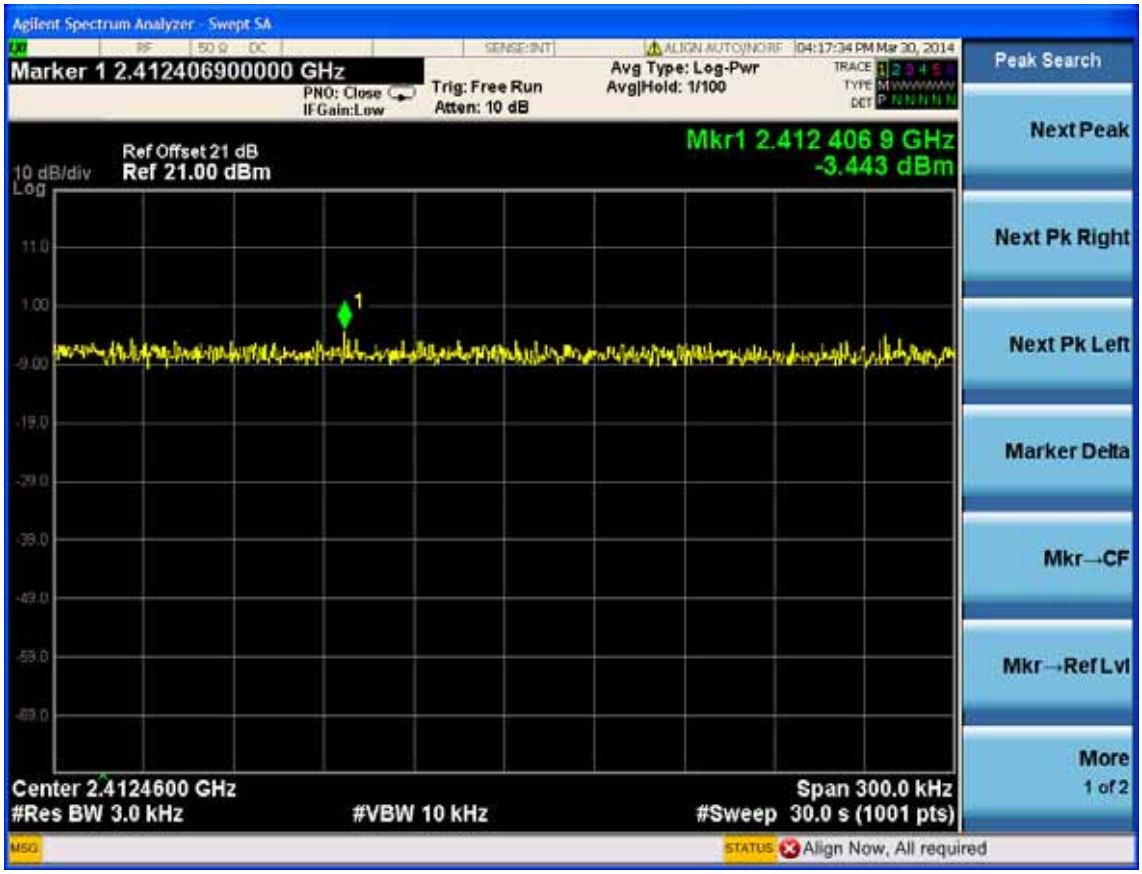
Test Mode: IEEE 11nHT20

**5MHz Antenna: J3**

Test Mode: IEEE 802.11b




Agilent Spectrum Analyzer - Swept SA
Marker 1 2.436712300000 GHz
PNO: Close
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
04:10:59 PM Mar 30, 2014
Ref Offset 21 dB
10 dB/div
Ref 21.00 dBm
Log
Mkr1 2.436 712 3 GHz
-3.141 dBm
Center 2.4367000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 300.0 kHz
#Sweep 30.0 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.412406900000 GHz
PNO: Close
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
04:17:34 PM Mar 30, 2014
Ref Offset 21 dB
10 dB/div
Ref 21.00 dBm
Log
Mkr1 2.412 406 9 GHz
-3.443 dBm
Center 2.4124600 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 300.0 kHz
#Sweep 30.0 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required

Test Mode: IEEE 802.11g

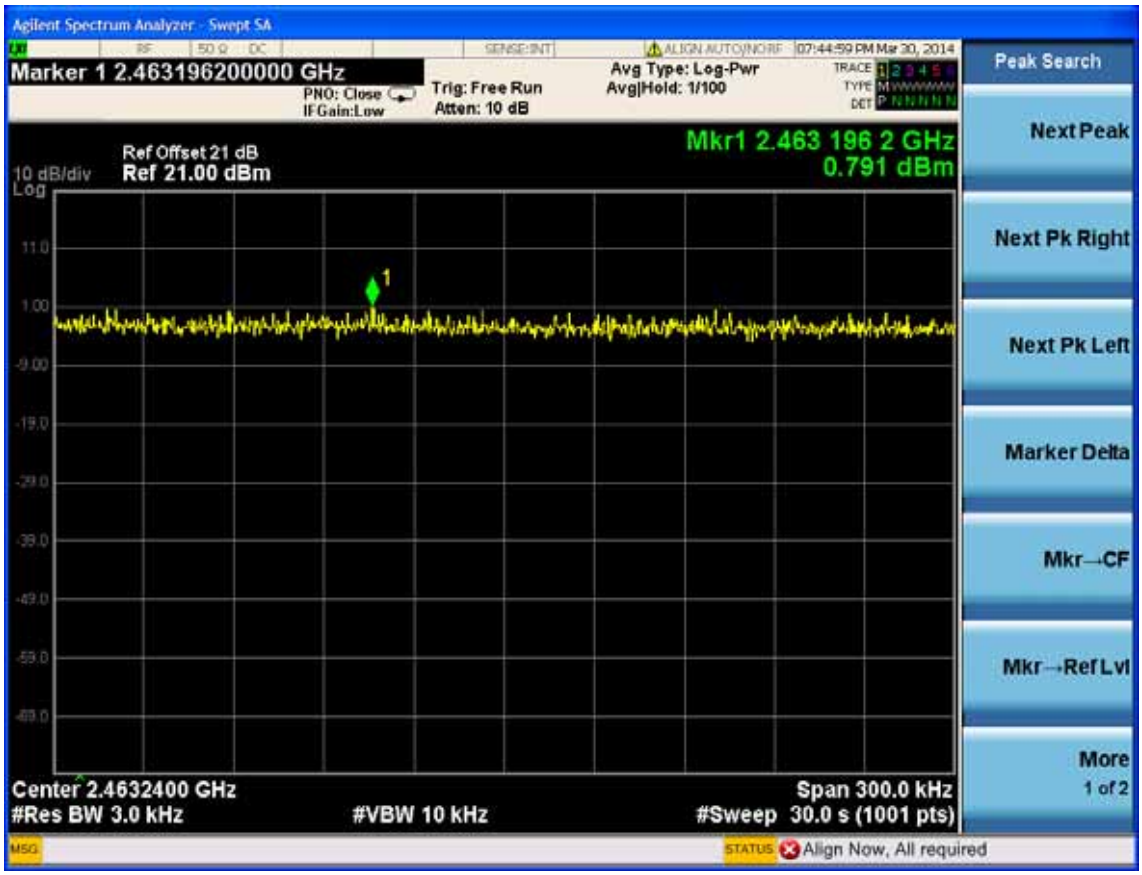
Test Mode: IEEE 11nHT20

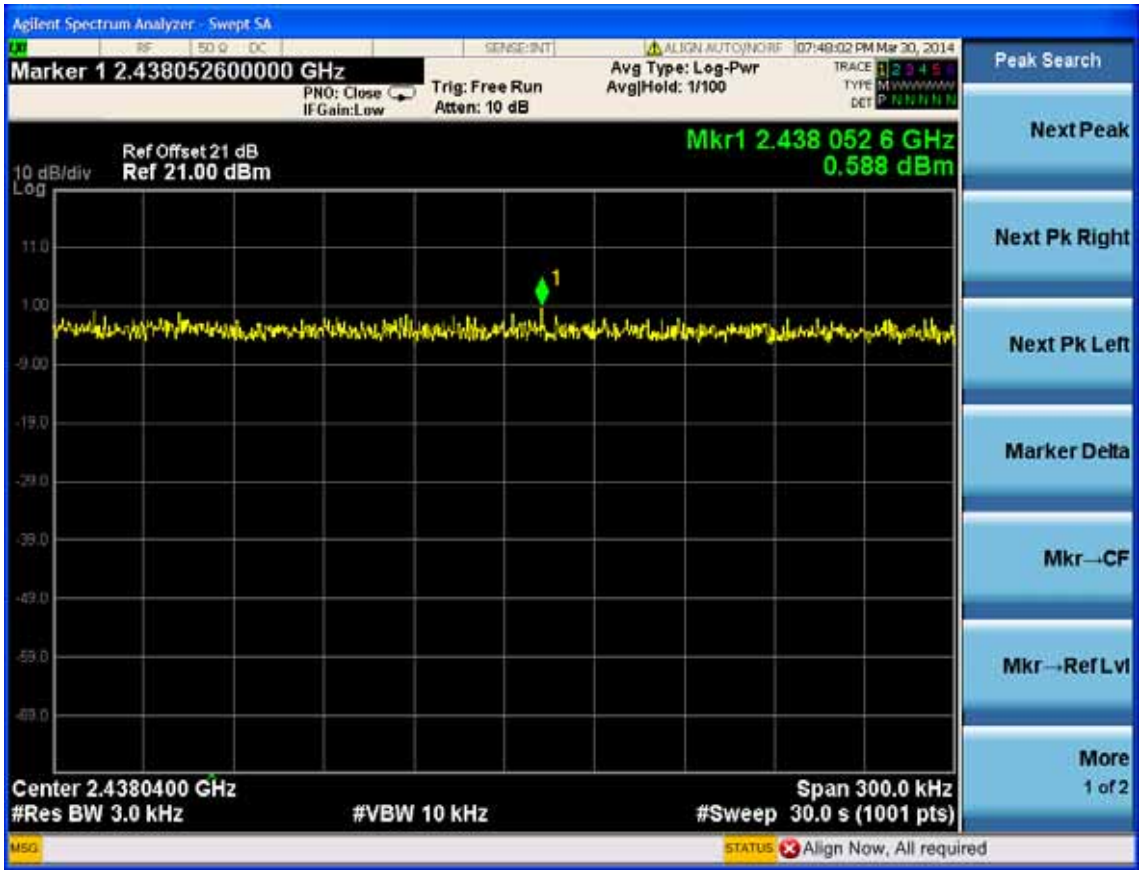
Agilent Spectrum Analyzer - Swept SA
Marker 1 2.437551800000 GHz
PNO: Close
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
Ref Offset 21 dB
10 dB/div
Ref 21.00 dBm
Mkr1 2.437 551 8 GHz
-6.044 dBm
Center 2.4376100 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 300.0 kHz
#Sweep 30.0 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required

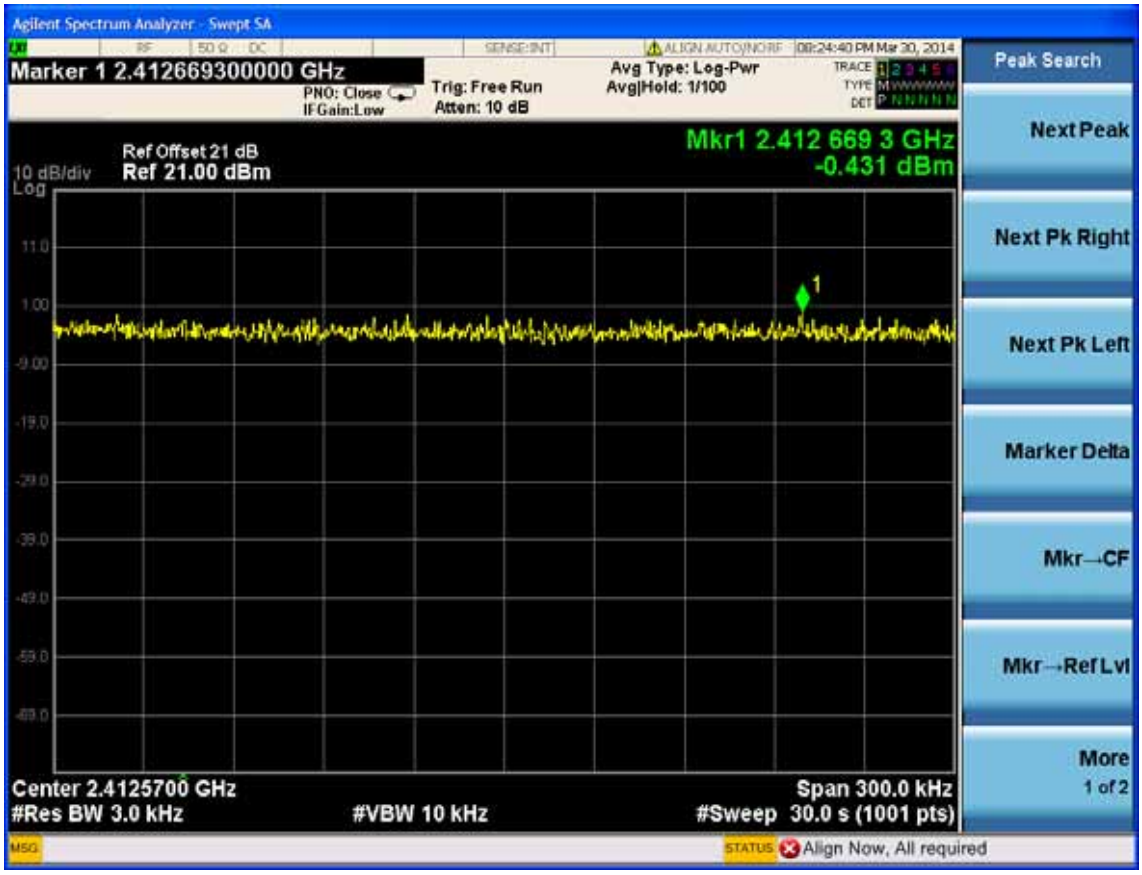
Agilent Spectrum Analyzer - Swept SA
Marker 1 2.413239100000 GHz
PNO: Close
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
Ref Offset 21 dB
10 dB/div
Ref 21.00 dBm
Mkr1 2.413 239 1 GHz
-6.012 dBm
Center 2.4132400 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 300.0 kHz
#Sweep 30.0 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required

**10MHz Antenna: J2**

Test Mode: IEEE 802.11b






Test Mode: IEEE 802.11g

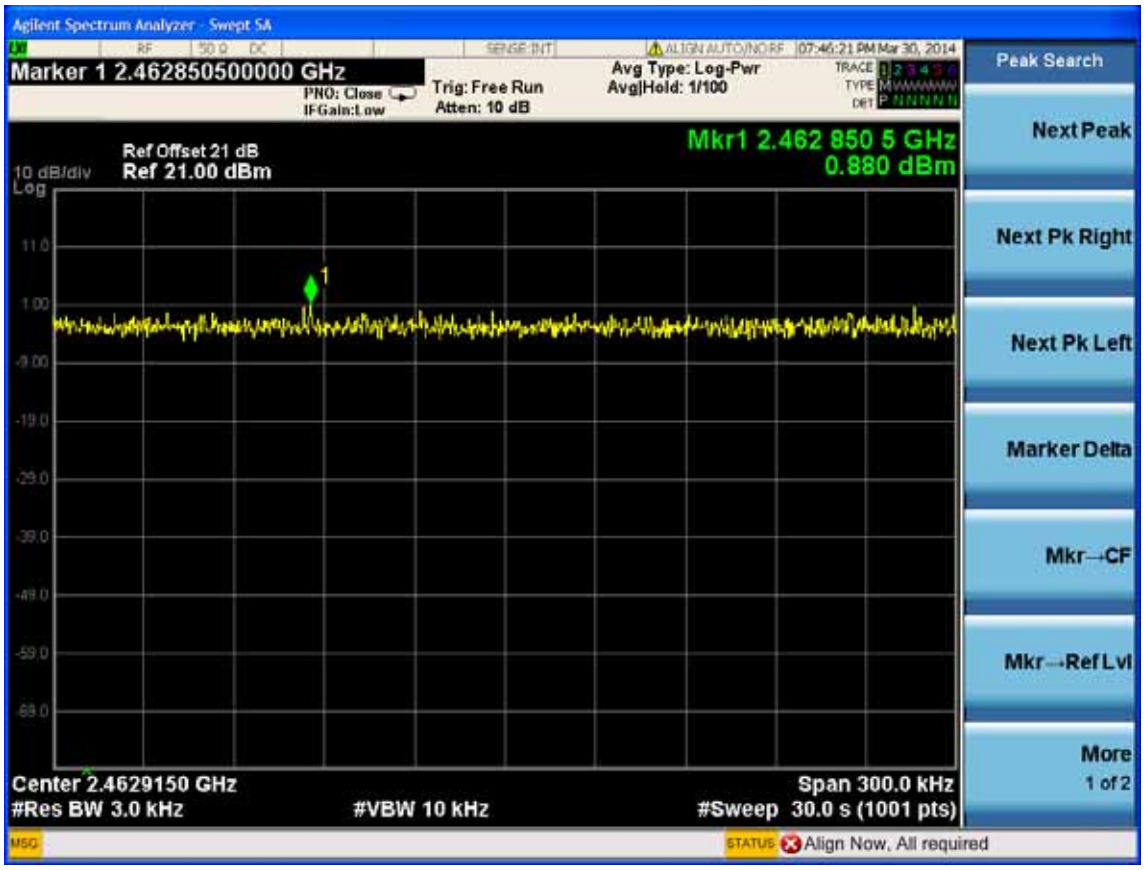
Agilent Spectrum Analyzer - Swept SA
Marker 1 2.437302500000 GHz
PNO: Close
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
07:59:07 PM Mar 30, 2014
Ref Offset 21 dB
10 dB/div
Ref 21.00 dBm
Log
Mkr1 2.437 302 5 GHz
-8.032 dBm
Center 2.4373100 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 300.0 kHz
#Sweep 30.0 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required

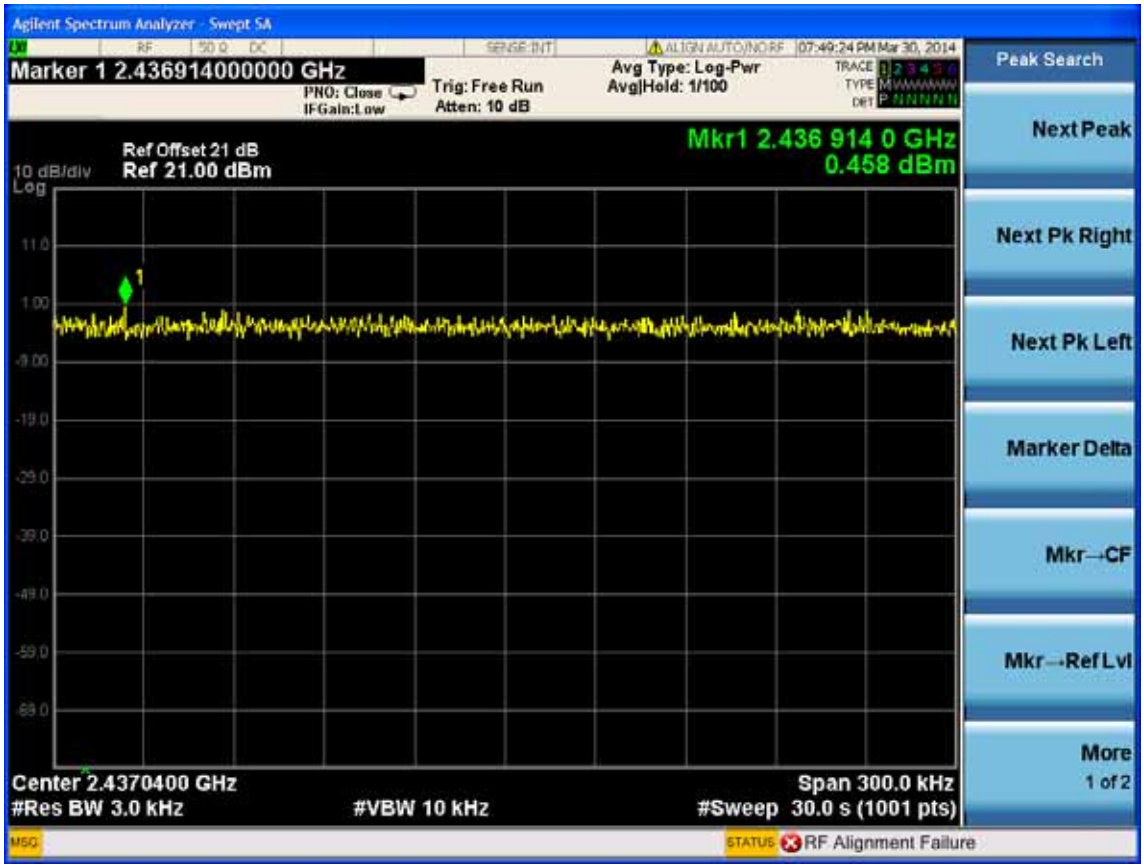
Agilent Spectrum Analyzer - Swept SA
Marker 1 2.412115800000 GHz
PNO: Close
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
08:02:51 PM Mar 30, 2014
Ref Offset 21 dB
10 dB/div
Ref 21.00 dBm
Log
Mkr1 2.412 115 8 GHz
-9.283 dBm
Center 2.4121500 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 300.0 kHz
#Sweep 30.0 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required

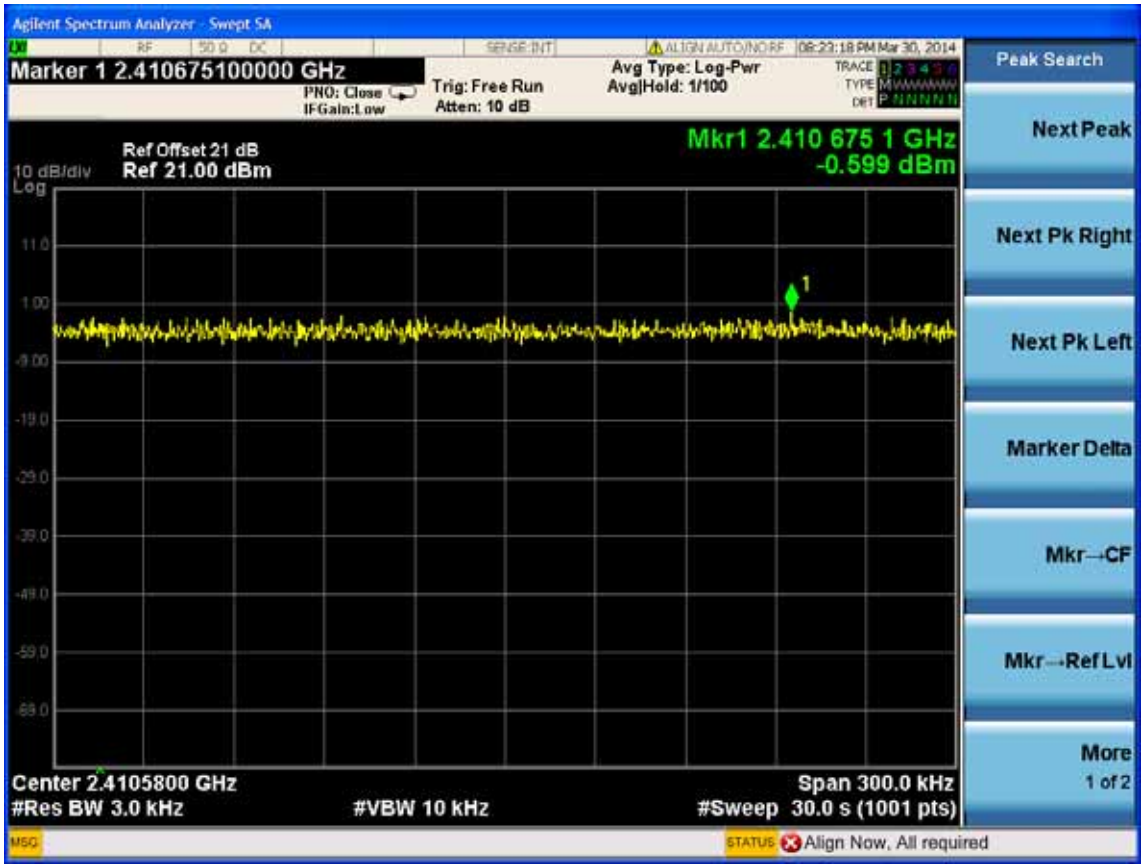
Test Mode: IEEE 11nHT20

**10MHz Antenna: J3**

Test Mode: IEEE 802.11b




Agilent Spectrum Analyzer - Swept SA
Marker 1 2.436914000000 GHz
PNO: Close
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
07:49:24 PM Mar 30, 2014
Ref Offset 21 dB
10 dB/div
Ref 21.00 dBm
Log
Mkr1 2.436 914 0 GHz
0.458 dBm
Center 2.4370400 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 300.0 kHz
#Sweep 30.0 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
RF Alignment Failure


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.410675100000 GHz
PNO: Close
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
06:23:18 PM Mar 30, 2014
Ref Offset 21 dB
10 dB/div
Ref 21.00 dBm
Log
Mkr1 2.410 675 1 GHz
-0.599 dBm
Center 2.4105800 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 300.0 kHz
#Sweep 30.0 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required

Test Mode: IEEE 802.11g

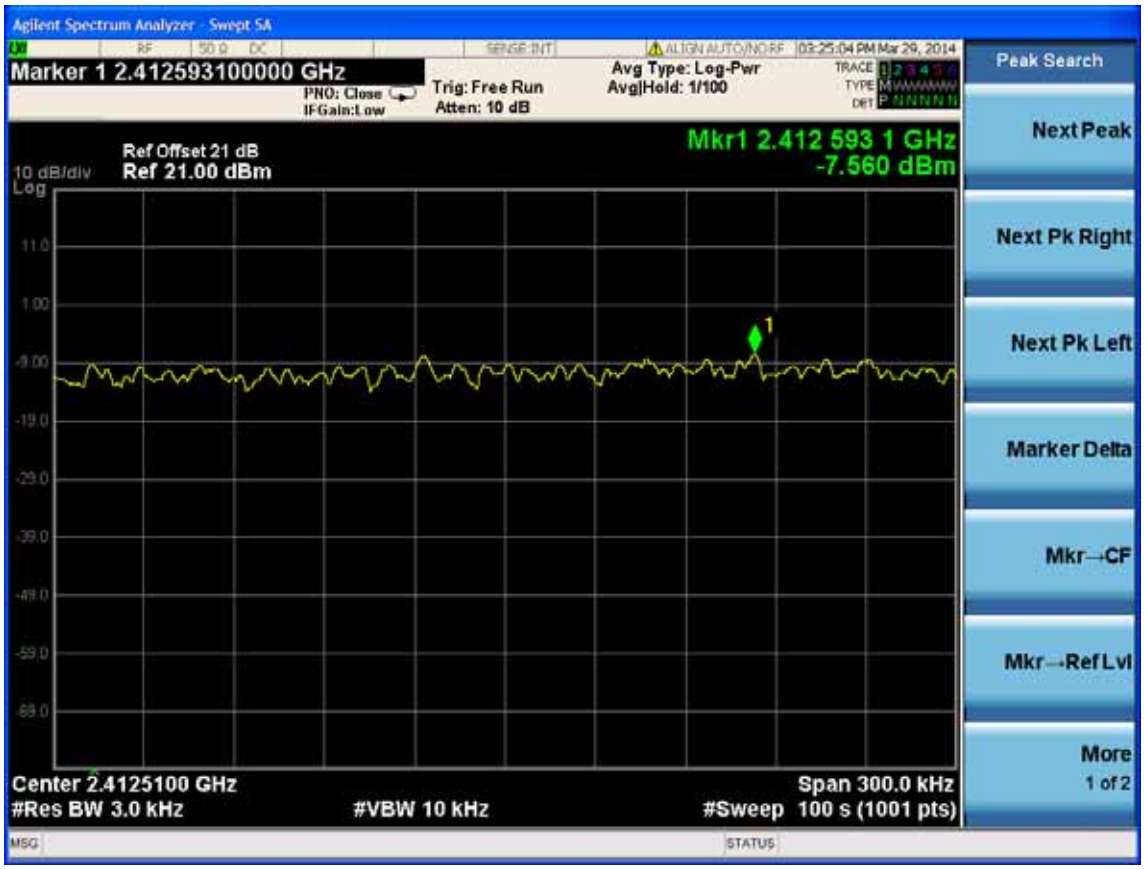
Test Mode: IEEE 11nHT20

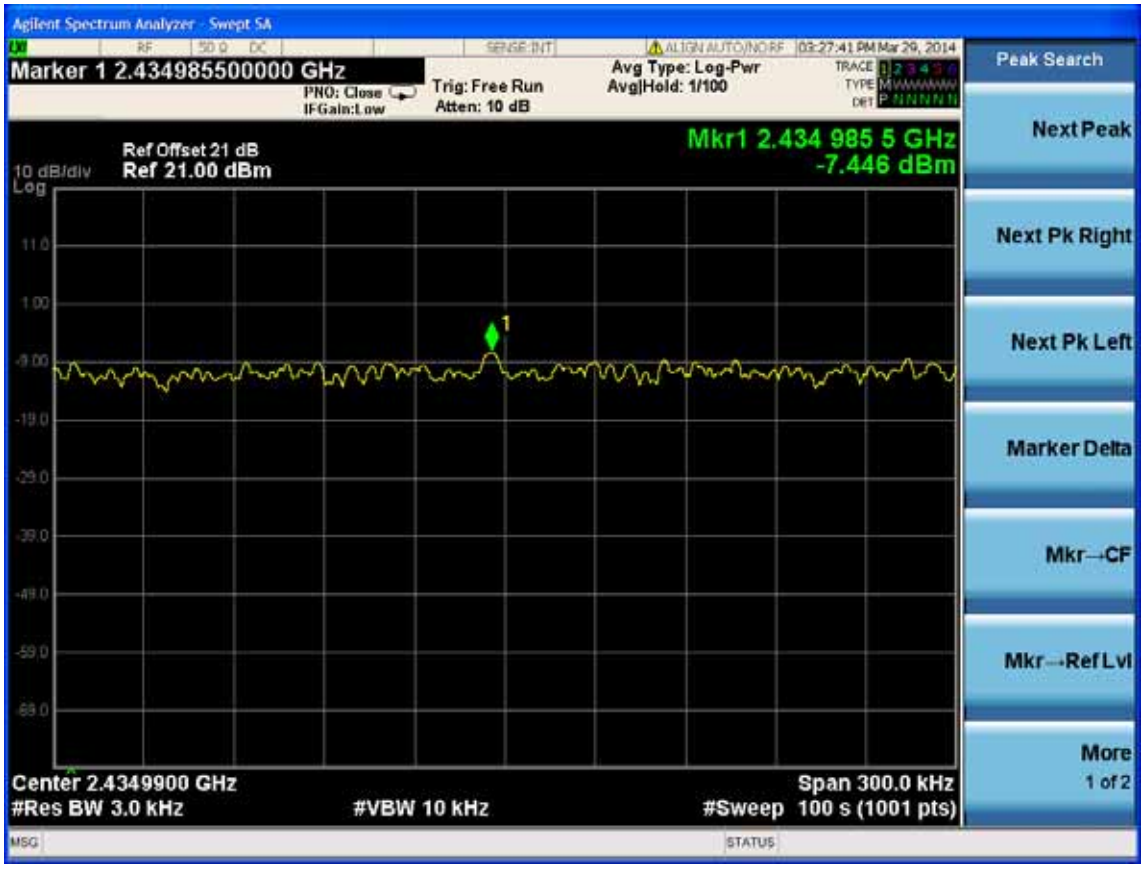
Agilent Spectrum Analyzer - Swept SA
Marker 1 2.435428000000 GHz
PNO: Close
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
08:08:02 PM Mar 30, 2014
Ref Offset 21 dB
10 dB/div
Ref 21.00 dBm
Log
Mkr1 2.435 428 0 GHz
-6.005 dBm
Center 2.4354100 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 300.0 kHz
#Sweep 30.0 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required

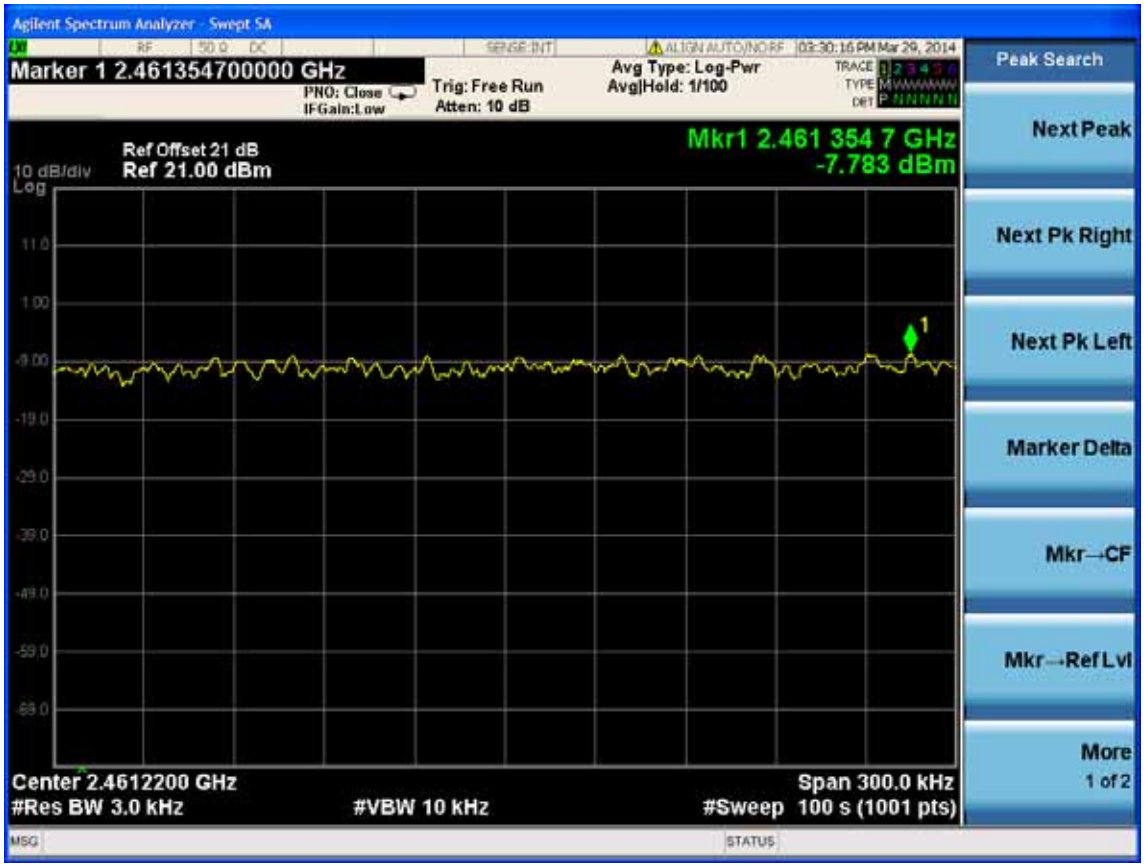
Agilent Spectrum Analyzer - Swept SA
Marker 1 2.458114600000 GHz
PNO: Close
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
08:11:22 PM Mar 30, 2014
Ref Offset 21 dB
10 dB/div
Ref 21.00 dBm
Log
Mkr1 2.458 114 6 GHz
-7.273 dBm
Center 2.4582400 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 300.0 kHz
#Sweep 30.0 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required

**20MHz Antenna: J2**

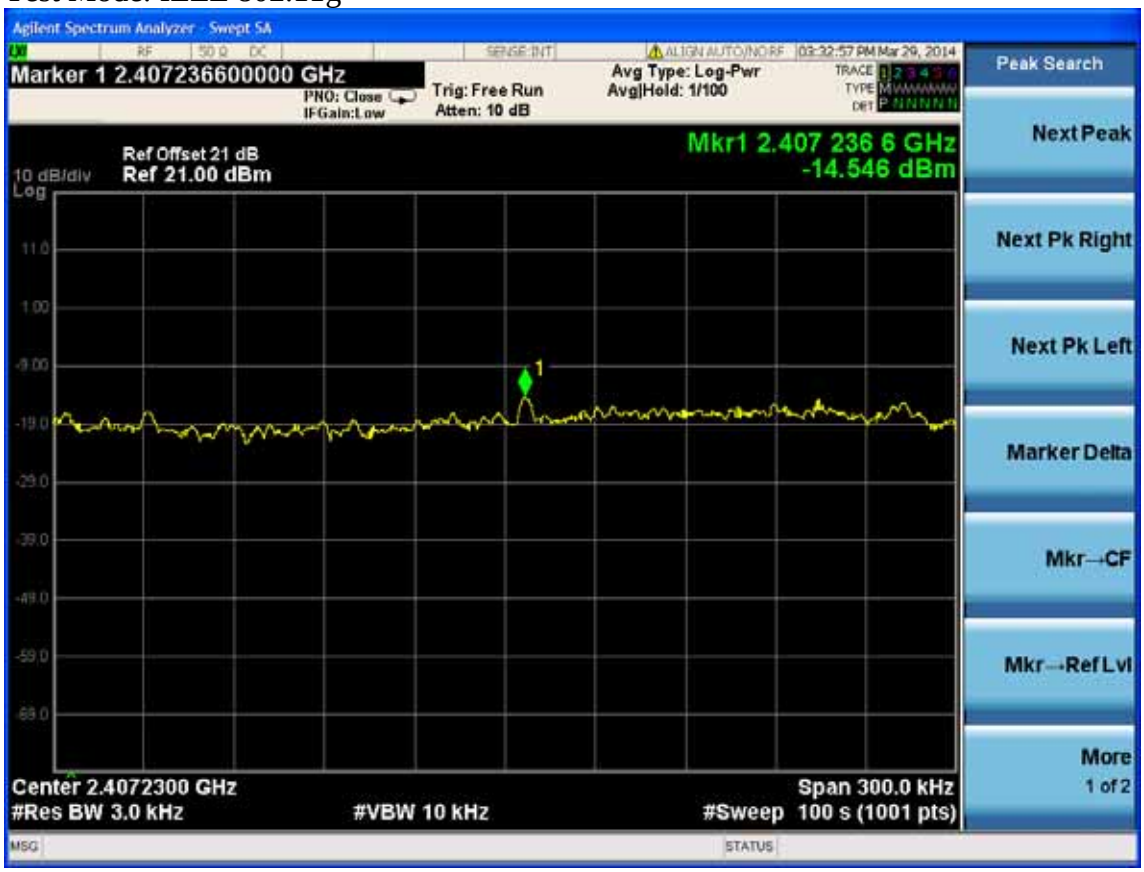
Test Mode: IEEE 802.11b

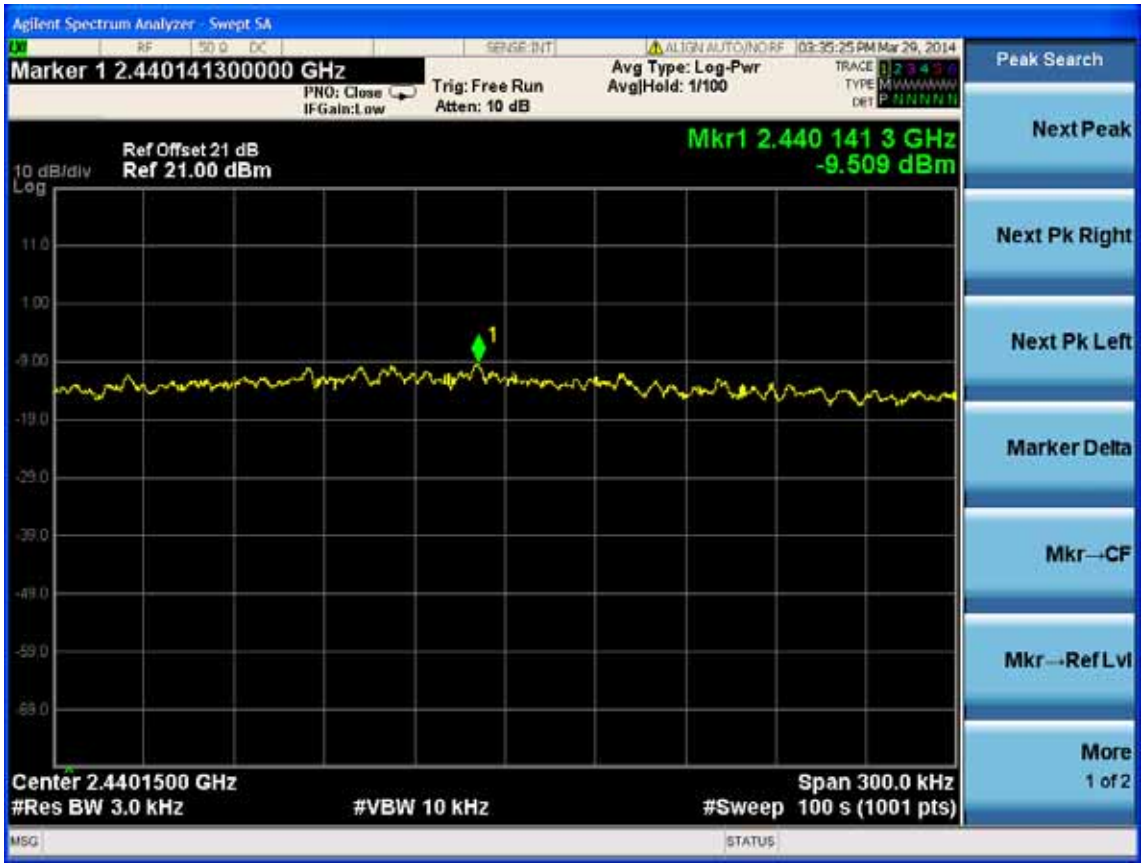


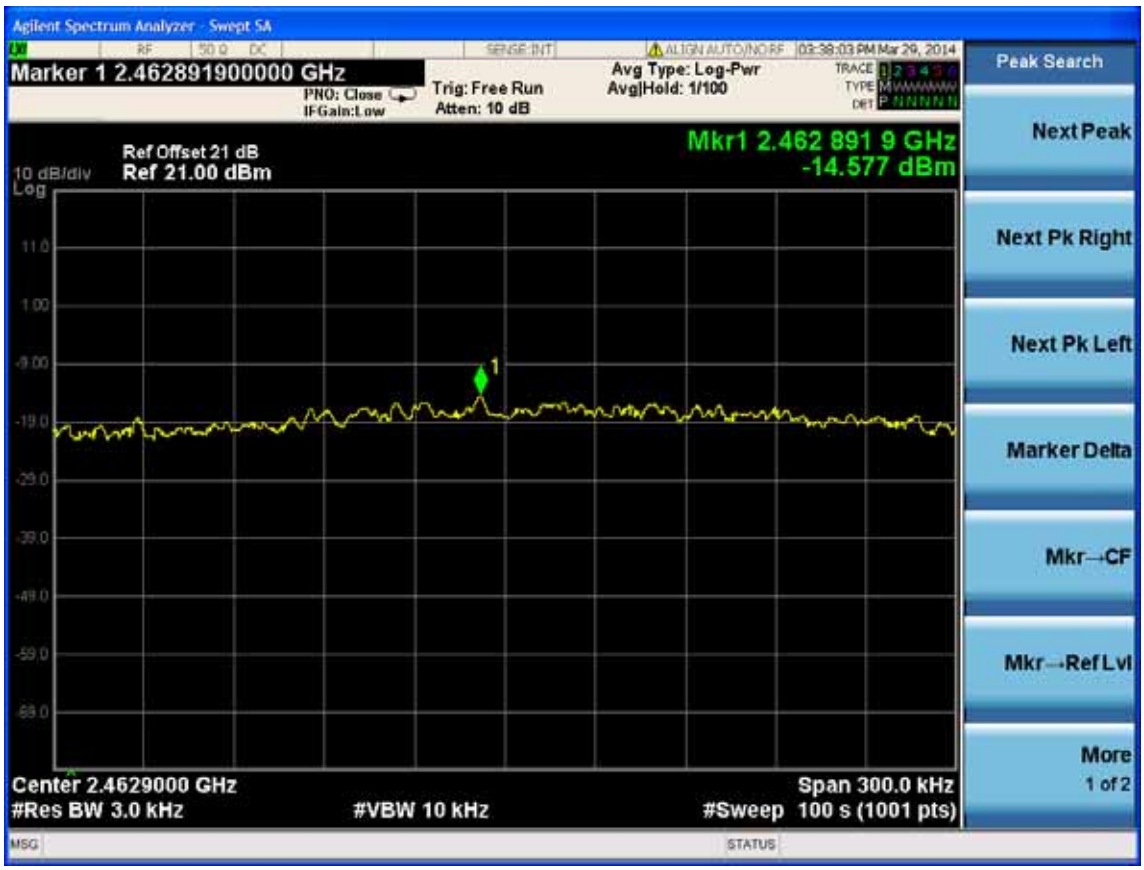






Test Mode: IEEE 802.11g



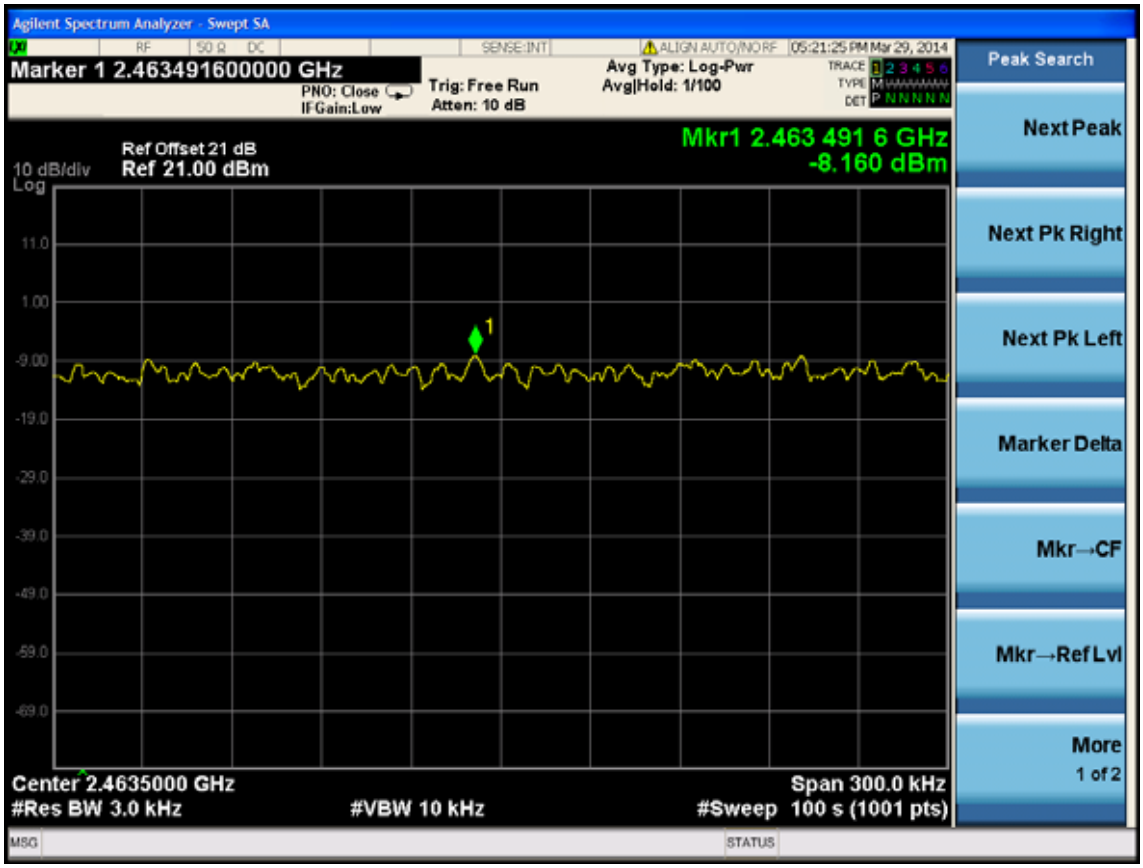

Agilent Spectrum Analyzer - Swept SA
Marker 1 2.440141300000 GHz
PNO: Close
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
03:35:25 PM Mar 29, 2014
Ref Offset 21 dB
10 dB/div
Ref 21.00 dBm
Log
Mkr1 2.440 141 3 GHz
-9.509 dBm
Center 2.4401500 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 300.0 kHz
#Sweep 100 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

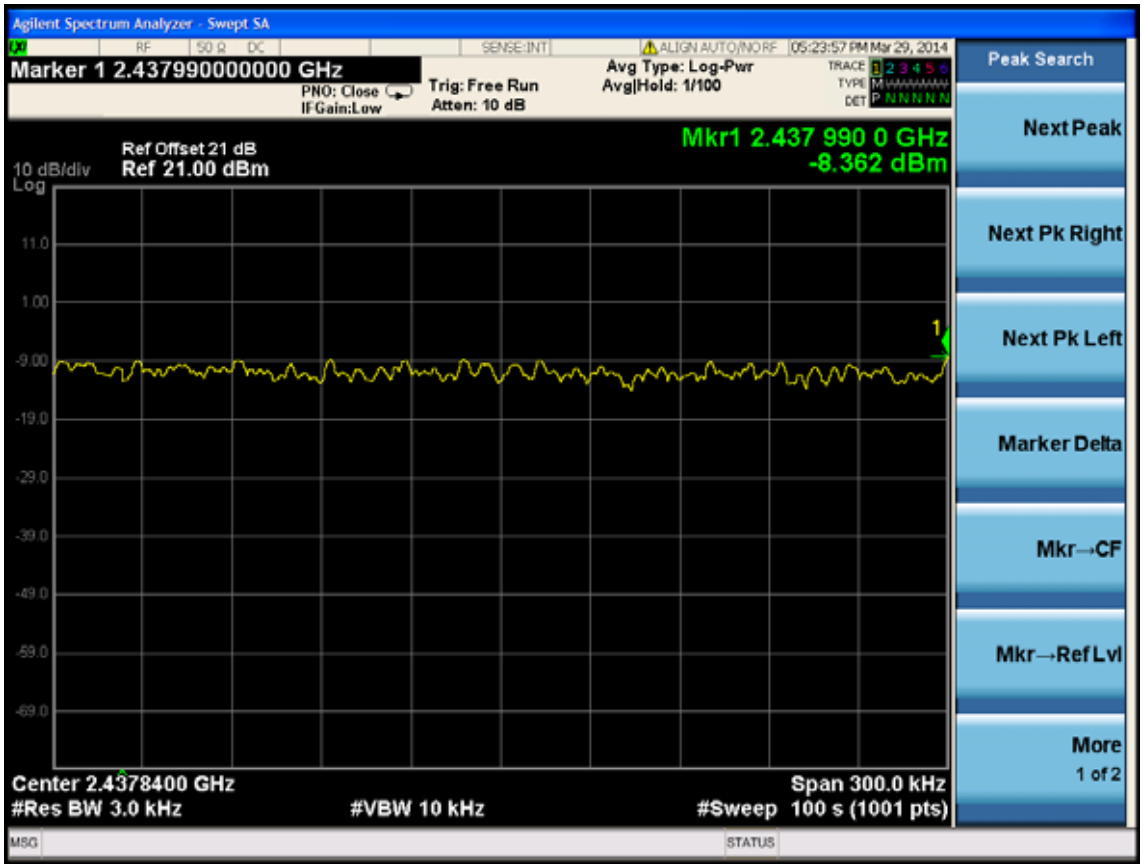

Agilent Spectrum Analyzer - Swept SA
Marker 1 2.462891900000 GHz
PNO: Close
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
03:38:03 PM Mar 29, 2014
Ref Offset 21 dB
10 dB/div
Ref 21.00 dBm
Log
Mkr1 2.462 891 9 GHz
-14.577 dBm
Center 2.4629000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 300.0 kHz
#Sweep 100 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

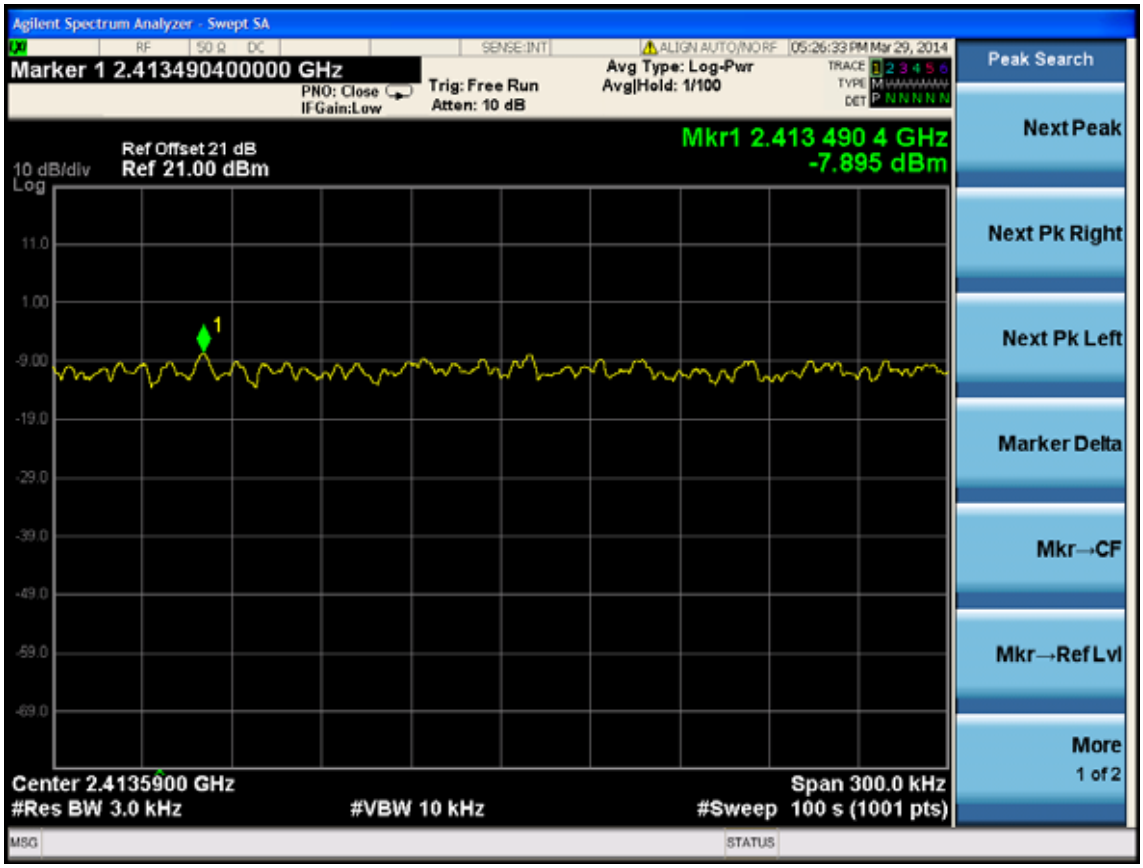
Test Mode: IEEE 11nHT20

**20MHz Antenna: J3**

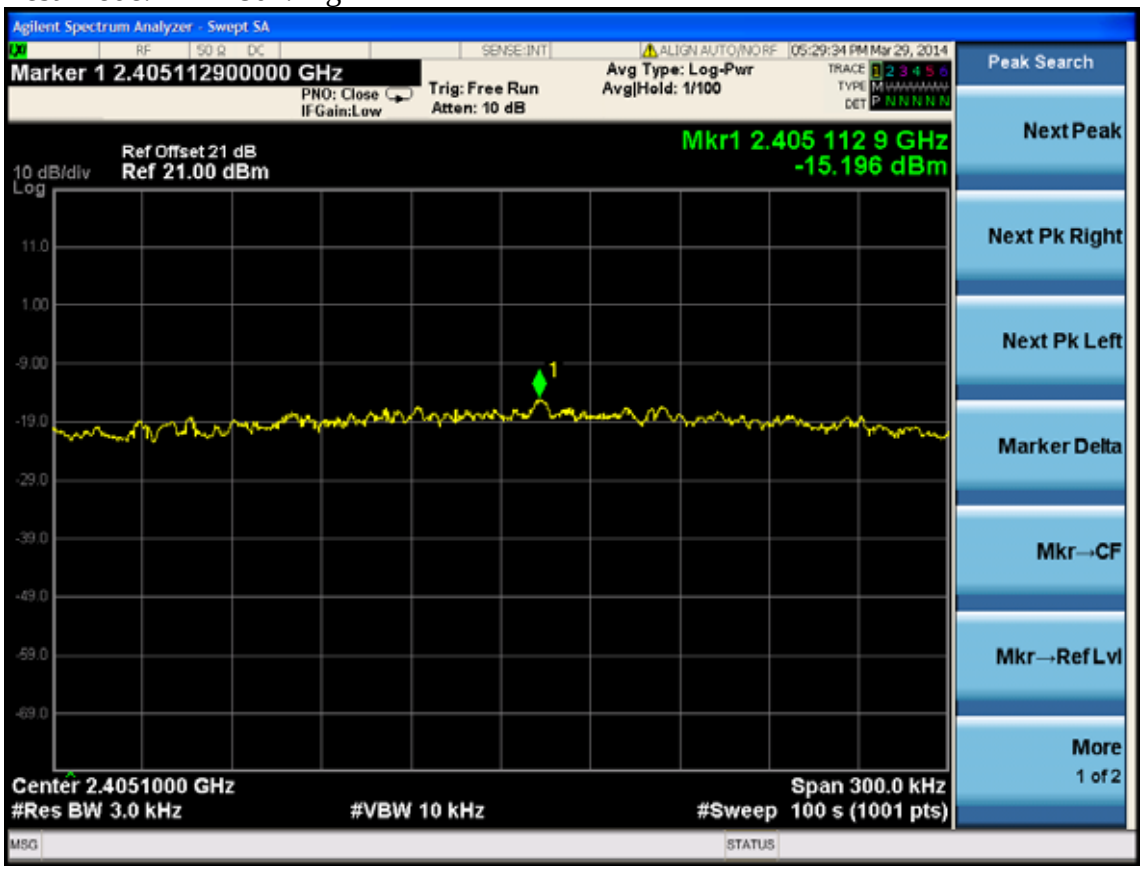
Test Mode: IEEE 802.11b

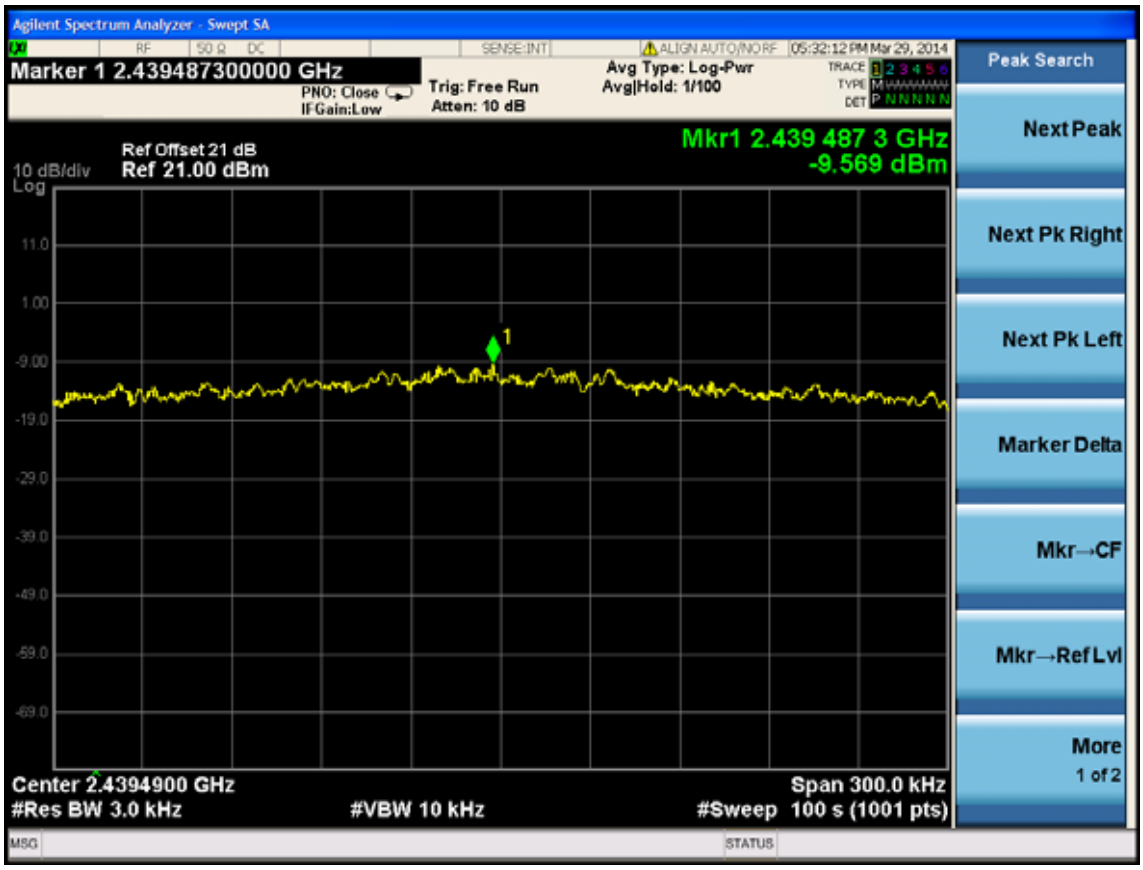


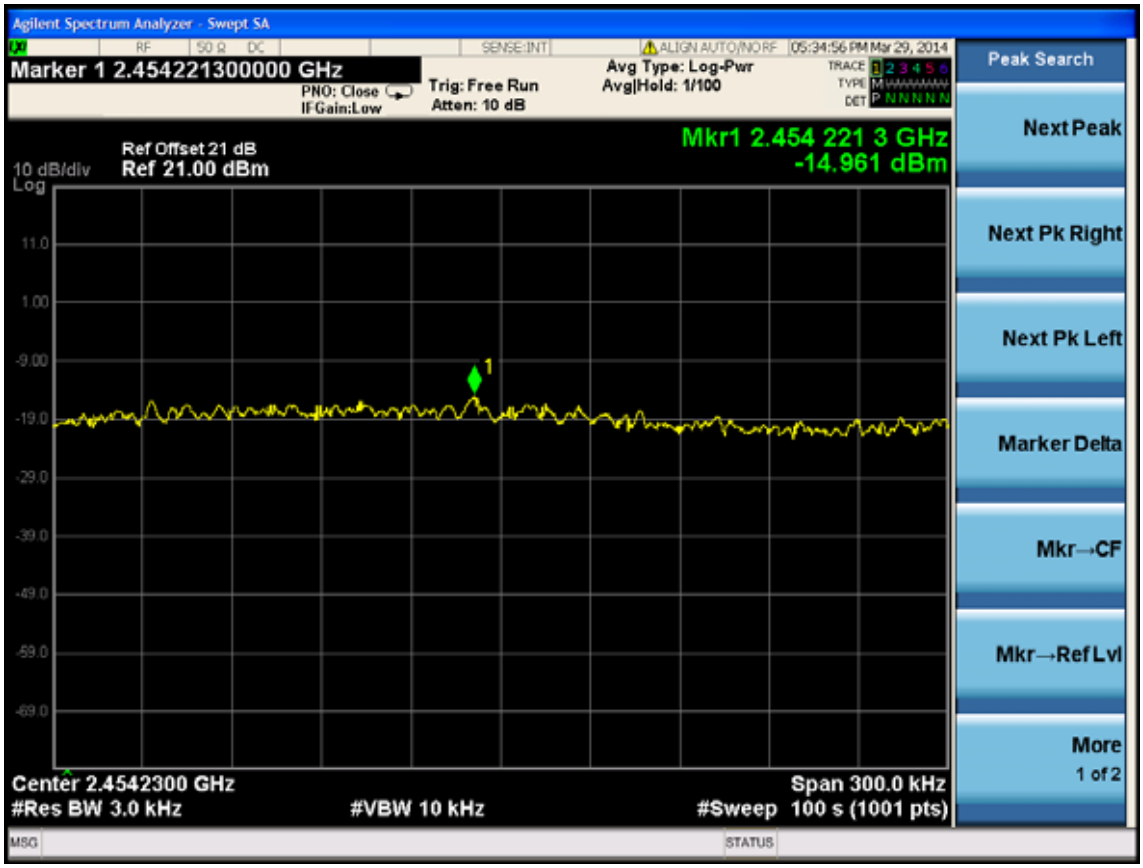

Agilent Spectrum Analyzer - Swept SA
Marker 1 2.437990000000 GHz
PNO: Close
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
05:23:57 PM Mar 29, 2014
Ref Offset 21 dB
10 dB/div
Ref 21.00 dBm
Log
Mkr1 2.437 990 0 GHz
-8.362 dBm
Center 2.4378400 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 300.0 kHz
#Sweep 100 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.413490400000 GHz
PNO: Close
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
05:26:33 PM Mar 29, 2014
Ref Offset 21 dB
10 dB/div
Ref 21.00 dBm
Log
Mkr1 2.413 490 4 GHz
-7.895 dBm
Center 2.4135900 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 300.0 kHz
#Sweep 100 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

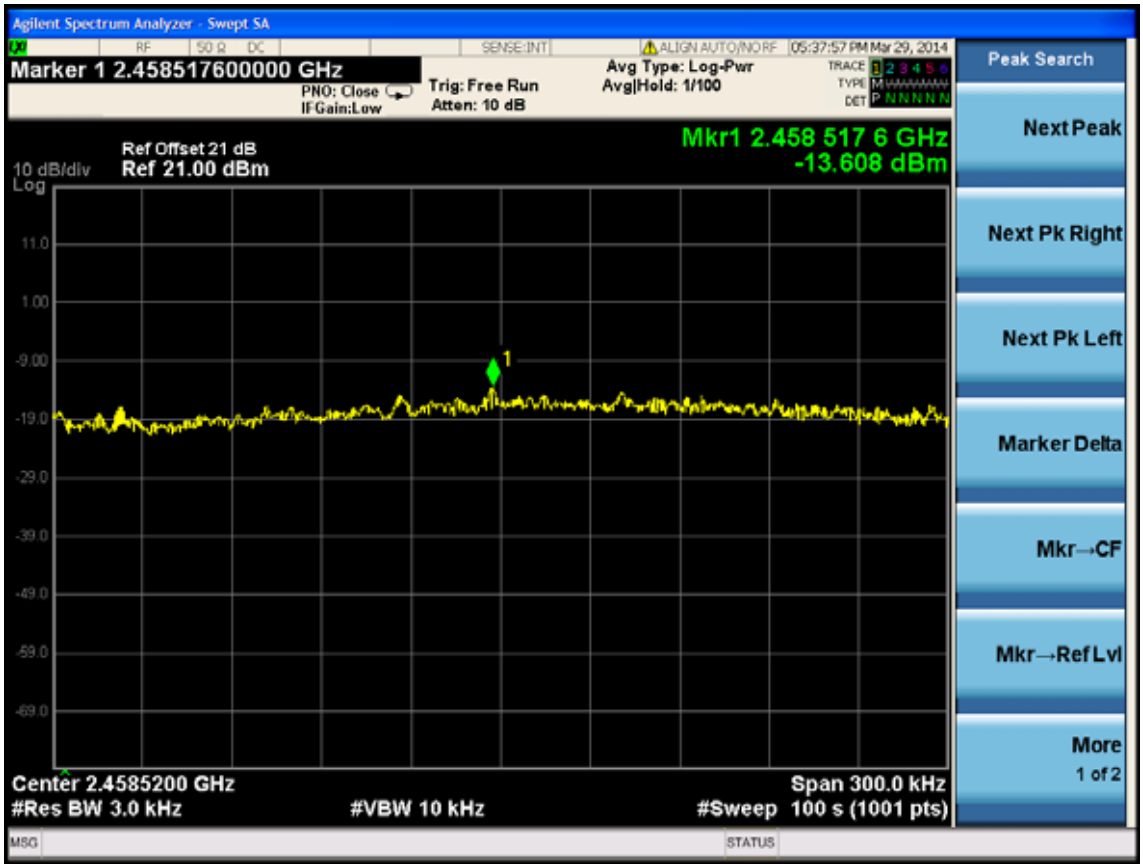
Test Mode: IEEE 802.11g

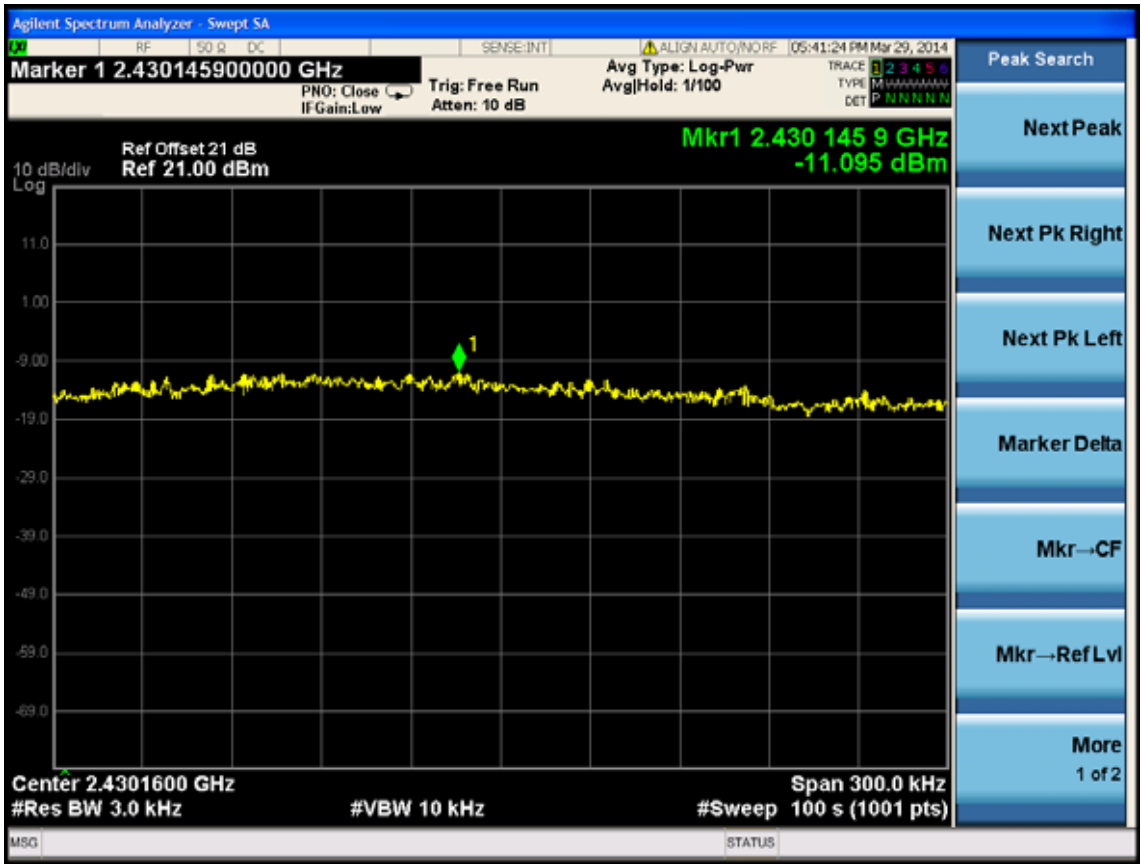


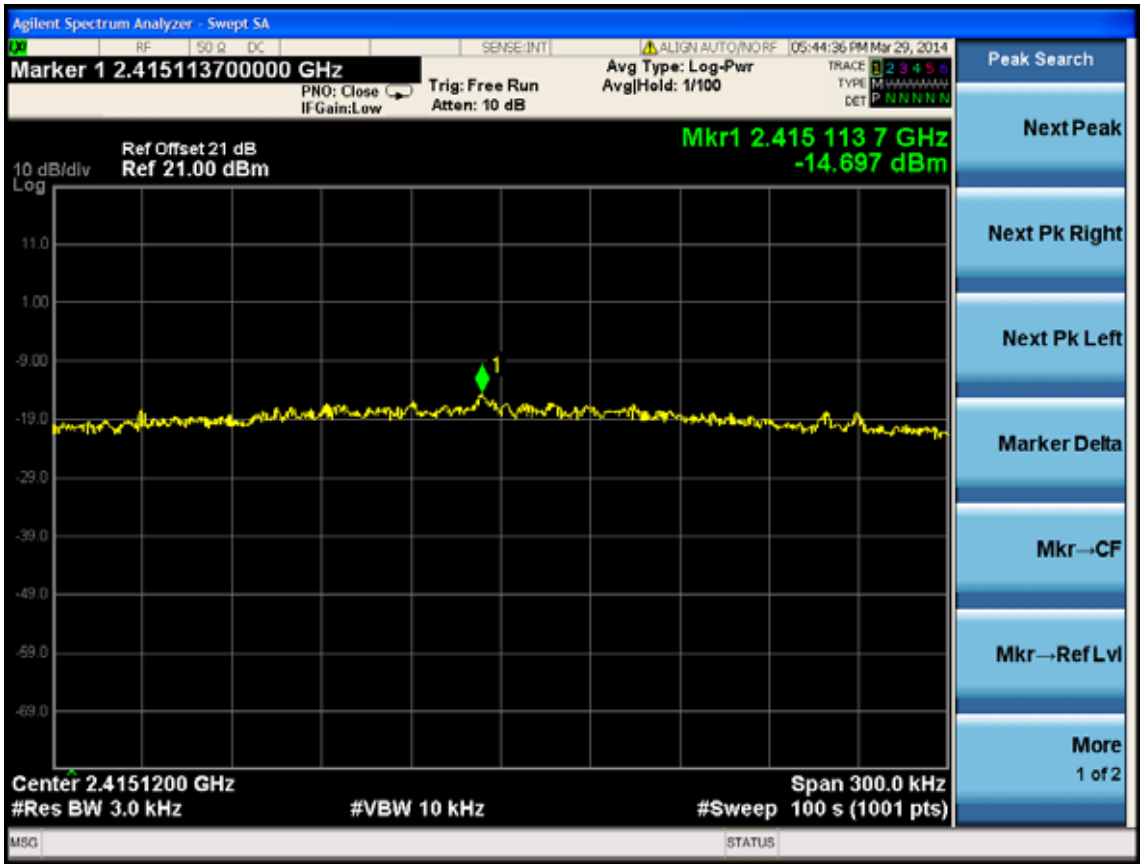






Test Mode: IEEE 11nHT20

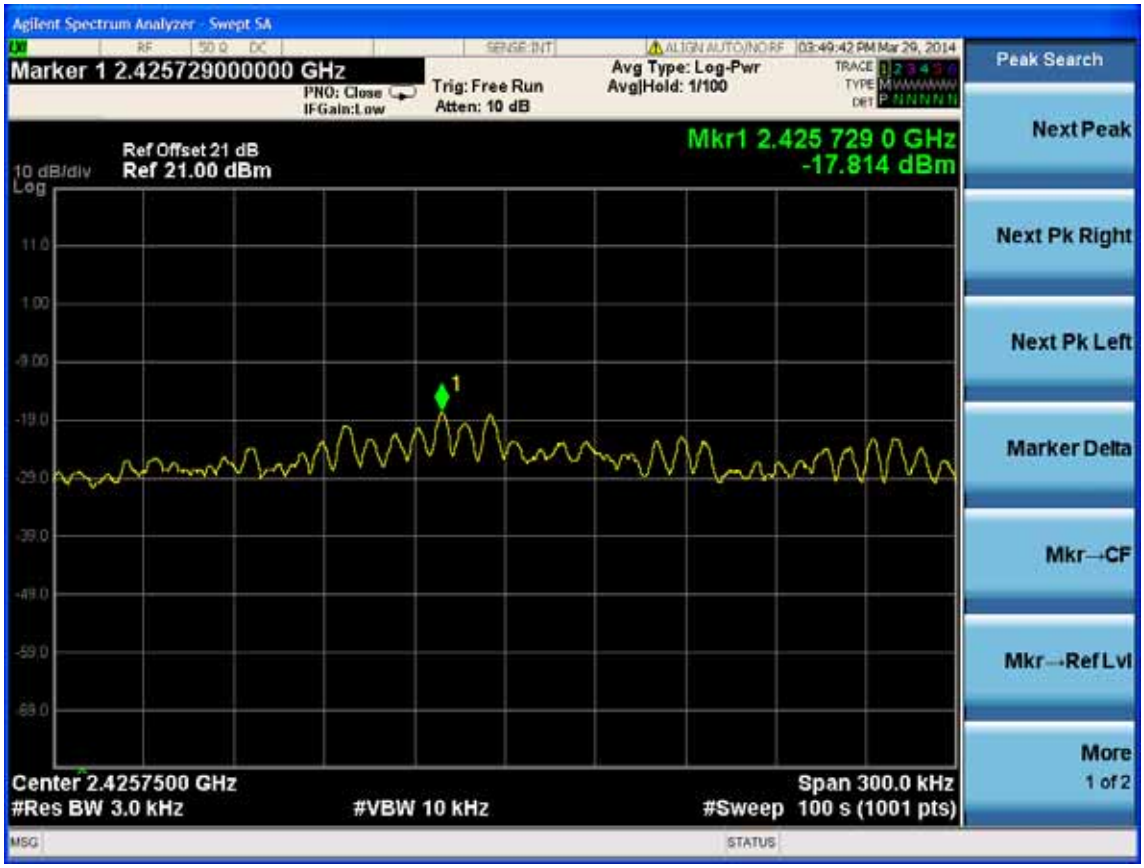


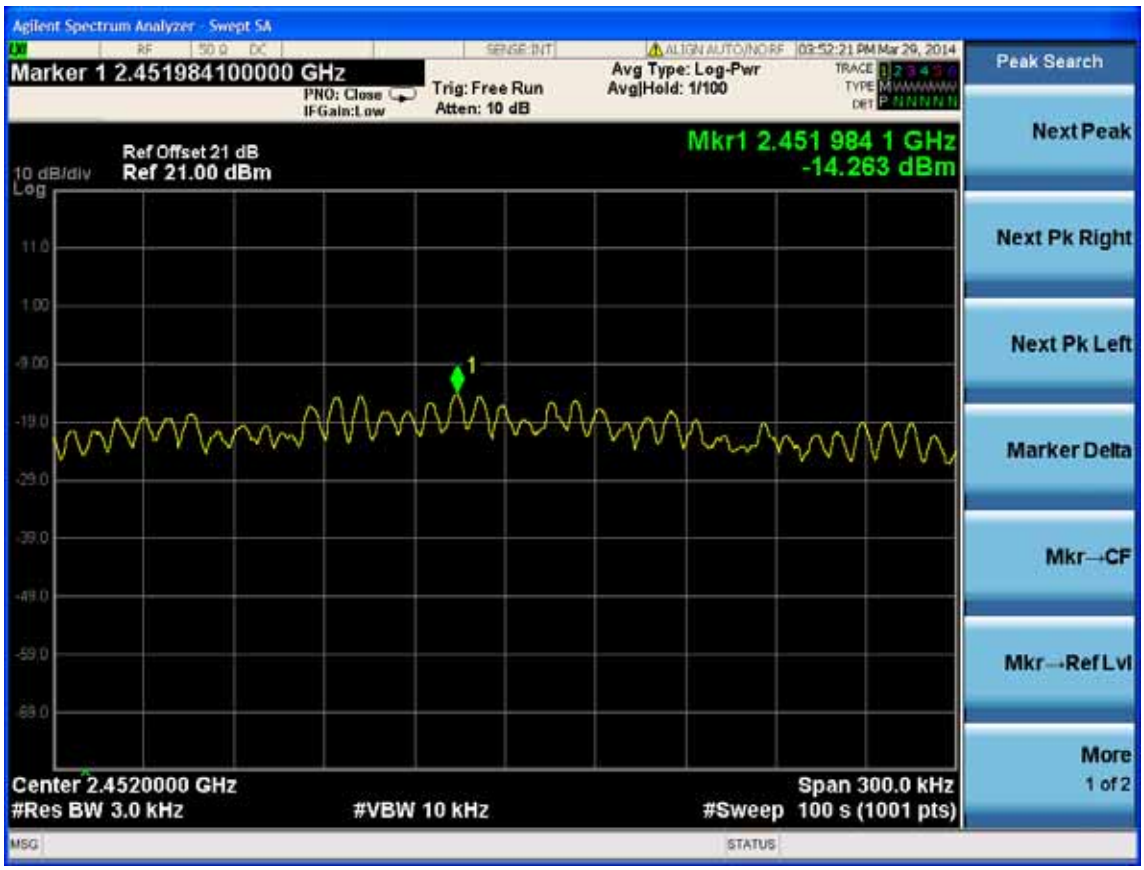

Agilent Spectrum Analyzer - Swept SA
Marker 1 2.430145900000 GHz
PNO: Close
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
05:41:24 PM Mar 29, 2014
Ref Offset 21 dB
10 dB/div
Ref 21.00 dBm
Log
Mkr1 2.430 145 9 GHz
-11.095 dBm
Center 2.4301600 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 300.0 kHz
#Sweep 100 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

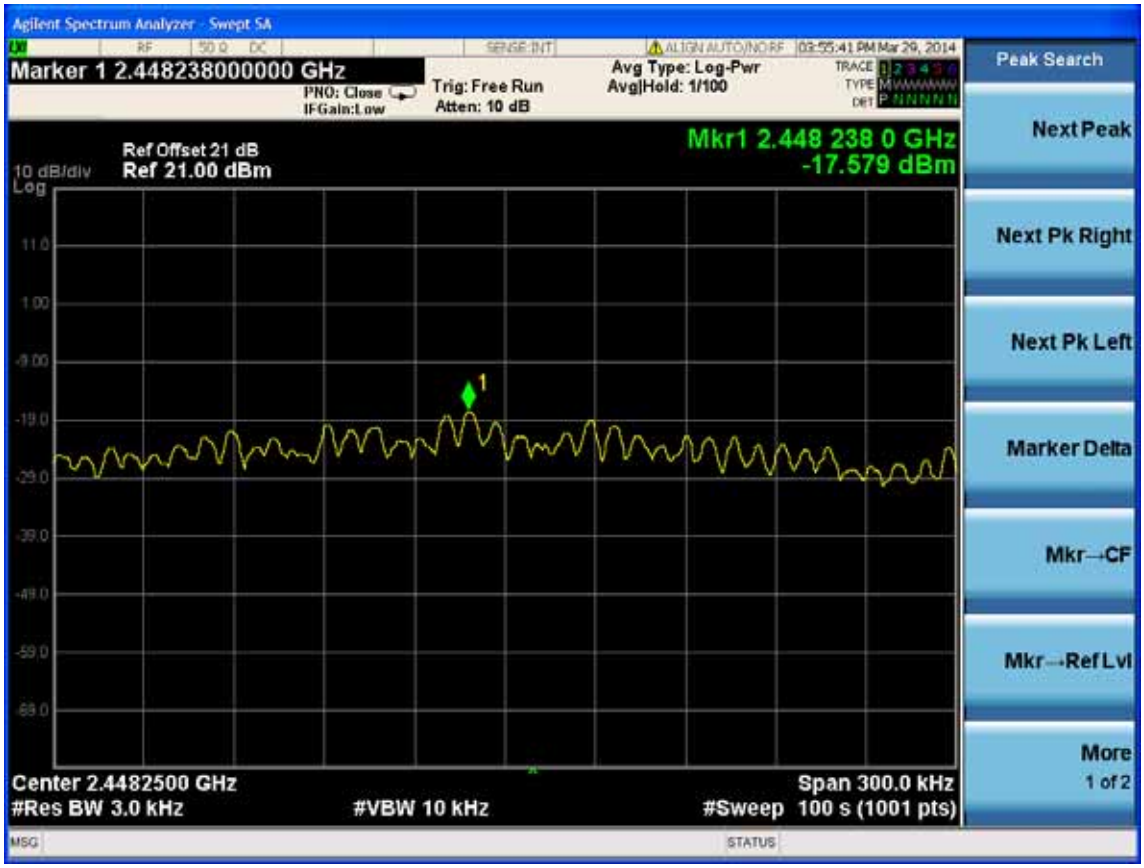

Agilent Spectrum Analyzer - Swept SA
Marker 1 2.415113700000 GHz
PNO: Close
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
05:44:36 PM Mar 29, 2014
Ref Offset 21 dB
10 dB/div
Ref 21.00 dBm
Log
Mkr1 2.415 113 7 GHz
-14.697 dBm
Center 2.4151200 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 300.0 kHz
#Sweep 100 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

**40MHz Antenna: J2**

Test Mode: IEEE 11nHT40

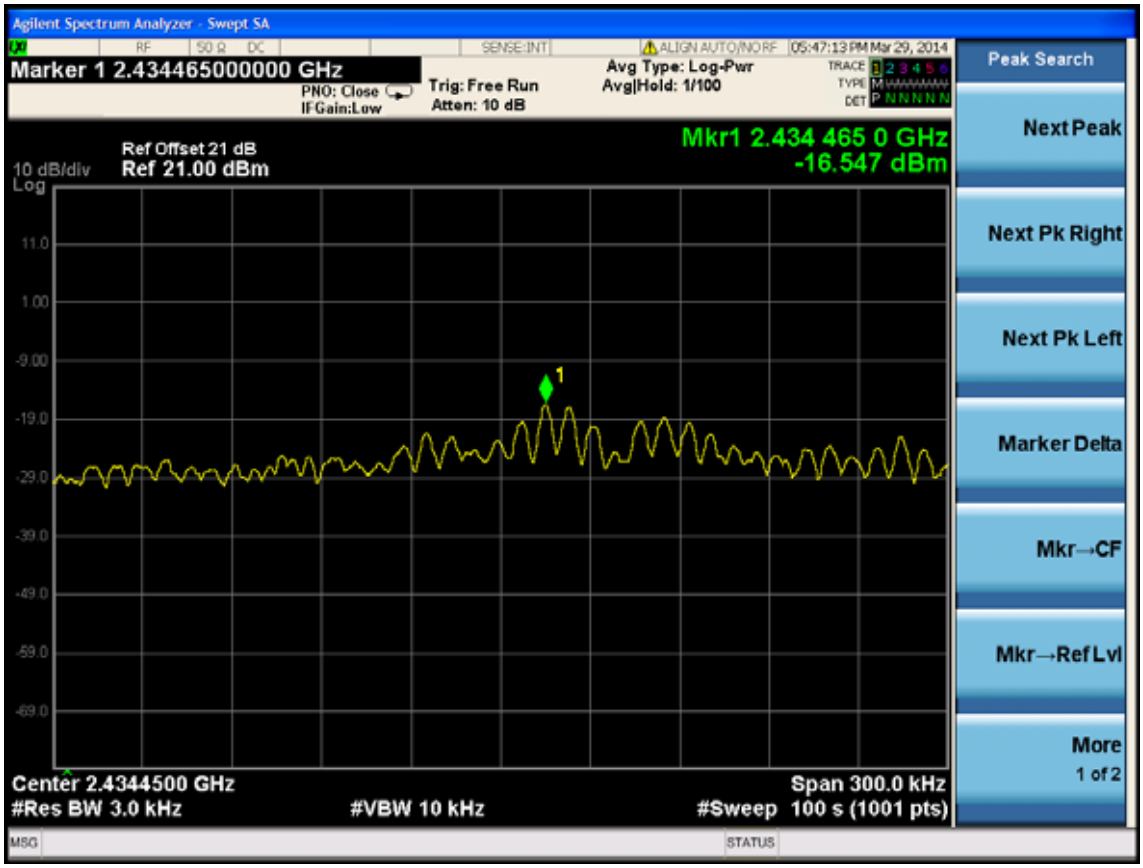


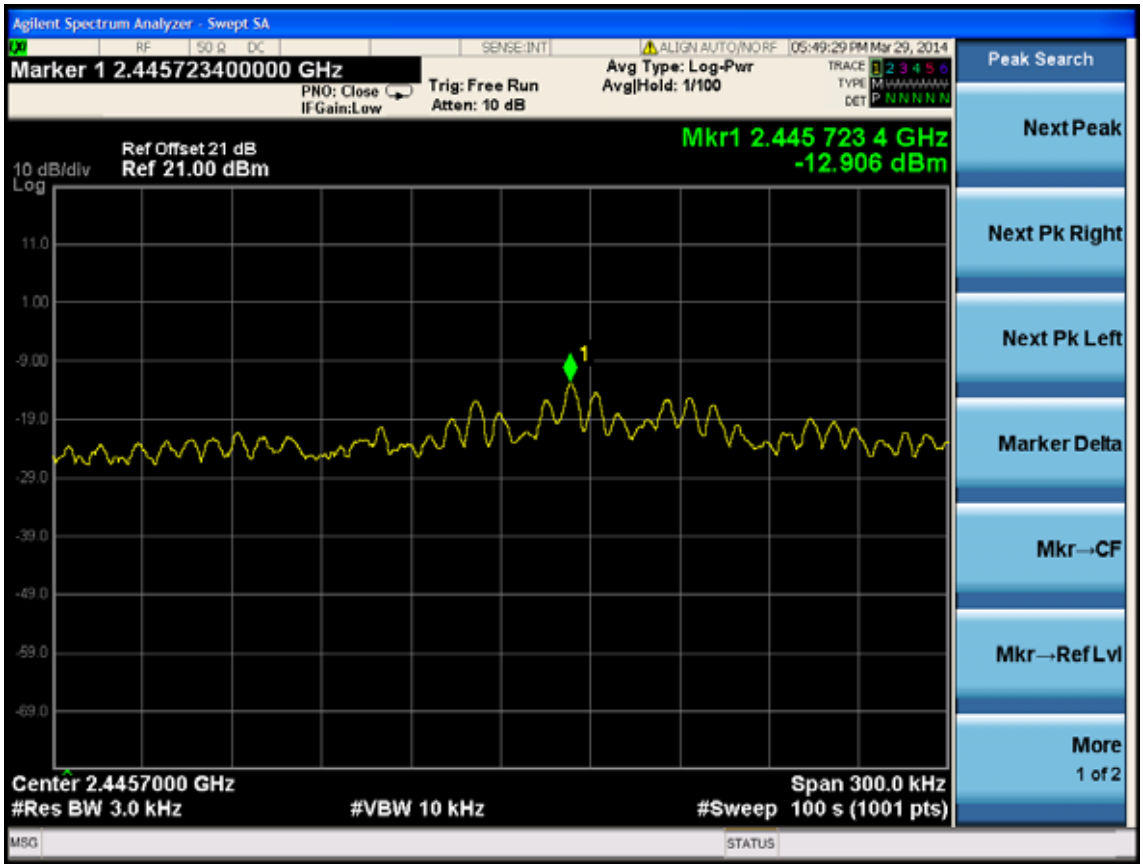



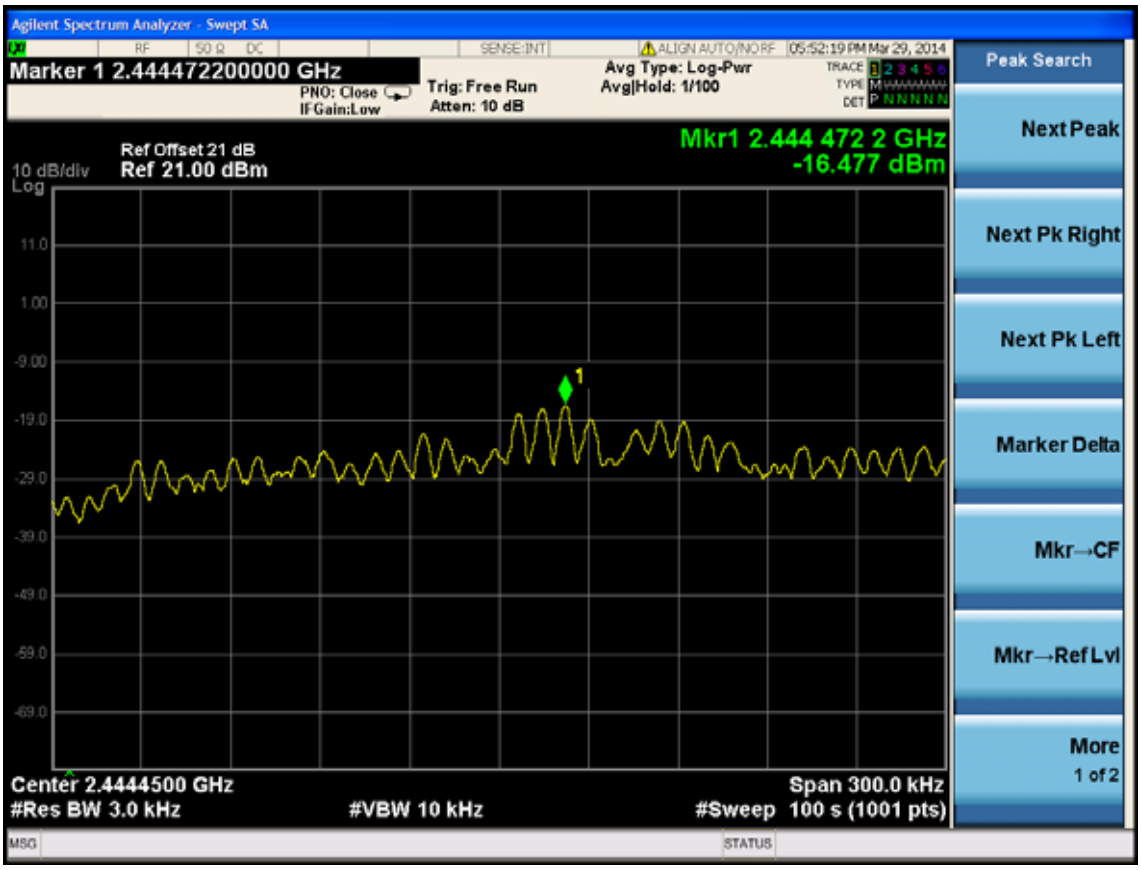



**40MHz Antenna: J3**

Test Mode: IEEE 11nHT40




Agilent Spectrum Analyzer - Swept SA
Marker 1 2.445723400000 GHz
PNO: Close
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
05:49:29 PM Mar 29, 2014
Ref Offset 21 dB
10 dB/div
Ref 21.00 dBm
Log
Mkr1 2.445 723 4 GHz
-12.906 dBm
Center 2.4457000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 300.0 kHz
#Sweep 100 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.444472200000 GHz
PNO: Close
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
05:52:19 PM Mar 29, 2014
Ref Offset 21 dB
10 dB/div
Ref 21.00 dBm
Log
Mkr1 2.444 472 2 GHz
-16.477 dBm
Center 2.4444500 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 300.0 kHz
#Sweep 100 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

# 10.MPE ESTIMATION

## 10.1.Limit for General Population/ Uncontrolled Exposures

| Frequency | **Power density (mW/ cm$^2$ )** | **Averaging time(minutes)** |
|---|---|---|
| 300MHz----1.5GHz | F/1500 | 30 |
| 1.5GHz---100GHz | 1.0 | 30 |

| Frequency(MHz) | **Power density (mW/ cm$^2$ )** | **Averaging time(minutes)** |
|---|---|---|
| 2412 | 1 | 30 |
| 2437 | 1 | 30 |
| 2462 | 1 | 30 |

Note: F= Frequency in MHz Estimation Result

**5MHz**

| | | |
|---|---|---|
| EUT: 2.4GHz 300Mbps 9dBi Outdoor CPE | | |
| M/N: CPE210 | | |
| Test date: 2014-04-01 | Pressure: 101.3±1.0 kpa | Humidity: 52.3±3.0% |
| Tested by: Leo-Li | Test site: RF site | Temperature: 21.9±0.6 ℃ |

| Cable loss: 1 dB | | Attenuator loss: 20 dB | | | | Antenna Gain: 9dBi | |
|---|---|---|---|---|---|---|---|
| Test Mode | CH | Frequency (MHz) | Peak Output Power (dBm) | Output Power (mW) | Antenna Gain (dBi) | Antenna Gain (Linear) | MPE |
| 11b | CH1 | 2412 | 27.36 | 544.50 | 9 | 7.94 | 0.8609 |
| | CH6 | 2437 | 27.43 | 553.35 | 9 | 7.94 | 0.8749 |
| | CH11 | 2462 | 26.91 | 490.91 | 9 | 7.94 | 0.7762 |
| 11g | CH1 | 2412 | 27.22 | 527.23 | 9 | 7.94 | 0.8336 |
| | CH6 | 2437 | 27.20 | 524.81 | 9 | 7.94 | 0.8298 |
| | CH11 | 2462 | 27.40 | 549.54 | 9 | 7.94 | 0.8689 |
| 11n HT20 | CH1 | 2412 | 27.60 | 575.44 | 9 | 7.94 | 0.9098 |
| | CH6 | 2437 | 27.46 | 557.19 | 9 | 7.94 | 0.8809 |
| | CH11 | 2462 | 27.29 | 535.80 | 9 | 7.94 | 0.8471 |

**10MHz**

| | | |
|---|---|---|
| EUT: 2.4GHz 300Mbps 9dBi Outdoor CPE | | |
| M/N: CPE210 | | |
| Test date: 2014-04-01 | Pressure: 101.3±1.0 kpa | Humidity: 52.6±3.0% |
| Tested by: Leo-Li | Test site: RF site | Temperature: 22.4±0.6 ℃ |

| Cable loss: 1 dB | | Attenuator loss: 20 dB | | | | Antenna Gain: 9dBi | |
|---|---|---|---|---|---|---|---|
| Test Mode | CH | Frequency (MHz) | Peak Output Power (dBm) | Output Power (mW) | Antenna Gain (dBi) | Antenna Gain (Linear) | MPE |
| 11b | CH1 | 2412 | 27.31 | 538.27 | 9 | 7.94 | 0.8510 |
| | CH6 | 2437 | 27.68 | 586.14 | 9 | 7.94 | 0.9267 |
| | CH11 | 2462 | 27.55 | 568.85 | 9 | 7.94 | 0.8994 |
| 11g | CH1 | 2412 | 27.24 | 529.66 | 9 | 7.94 | 0.8374 |
| | CH6 | 2437 | 27.39 | 548.28 | 9 | 7.94 | 0.8669 |
| | CH11 | 2462 | 27.30 | 537.03 | 9 | 7.94 | 0.8491 |
| 11n HT20 | CH1 | 2412 | 27.43 | 553.35 | 9 | 7.94 | 0.8749 |
| | CH6 | 2437 | 27.49 | 561.05 | 9 | 7.94 | 0.8871 |
| | CH11 | 2462 | 27.47 | 558.47 | 9 | 7.94 | 0.8830 |

**20MHz**

| | | |
|---|---|---|
| EUT: 2.4GHz 300Mbps 9dBi Outdoor CPE | | |
| M/N: CPE210 | | |
| Test date: 2014-3-25 | Pressure: 101.3±1.0kpa | Humidity: 52.2±3.0% |
| Tested by: Leo-Li | Test site: RF site | Temperature: 21.4±0.6 ℃ |

| Cable loss: 1 dB | | Attenuator loss: 20 dB | | | | Antenna Gain: 9dBi | |
|---|---|---|---|---|---|---|---|
| Test Mode | CH | Frequency (MHz) | Peak Output Power (dBm) | Output Power (mW) | Antenna Gain (dBi) | Antenna Gain (Linear) | MPE |
| 11b | CH1 | 2412 | 27.75 | 595.66 | 9 | 7.94 | 0.9418 |
| | CH6 | 2437 | 27.50 | 562.34 | 9 | 7.94 | 0.8891 |
| | CH11 | 2462 | 27.33 | 540.75 | 9 | 7.94 | 0.8550 |
| 11g | CH1 | 2412 | 27.93 | 620.87 | 9 | 7.94 | 0.9816 |
| | CH6 | 2437 | 27.79 | 601.17 | 9 | 7.94 | 0.9505 |
| | CH11 | 2462 | 27.91 | 618.02 | 9 | 7.94 | 0.9771 |
| 11n HT20 | CH1 | 2412 | 25.70 | 371.54 | 9 | 7.94 | 0.5874 |
| | CH6 | 2437 | 27.80 | 602.56 | 9 | 7.94 | 0.9527 |
| | CH11 | 2462 | 25.61 | 363.92 | 9 | 7.94 | 0.5754 |

**40MHz**

| | | |
|---|---|---|
| EUT: 2.4GHz 300Mbps 9dBi Outdoor CPE | | |
| M/N: CPE210 | | |
| Test date: 2014-3-25 | Pressure: 101.3±1.0 kpa | Humidity: 52.2±3.0% |
| Tested by: Leo-Li | Test site: RF site | Temperature:21.4±0.6 ℃ |

| Cable loss: 1 dB | | Attenuator loss: 20 dB | | | | Antenna Gain: 9dBi | |
|---|---|---|---|---|---|---|---|
| Test Mode | CH | Frequency (MHz) | Peak Output Power (dBm) | Output Power (mW) | Antenna Gain (dBi) | Antenna Gain (Linear) | MPE |
| 11n HT40 | CH1 | 2422 | 25.29 | 338.06 | 9 | 7.94 | 0.5345 |
| | CH4 | 2437 | 27.95 | 623.73 | 9 | 7.94 | 0.9862 |
| | CH7 | 2452 | 24.41 | 276.06 | 9 | 7.94 | 0.4365 |

# 11. ANTENNA REQUIREMENT

## 11.1. STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

## 11.2. ANTENNA CONNECTED CONSTRUCTION

The antennas used for this product are Horizontal & Vertical antenna that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is 9dBi.

# 12.DEVIATION TO TEST SPECIFICATIONS

[ NONE]