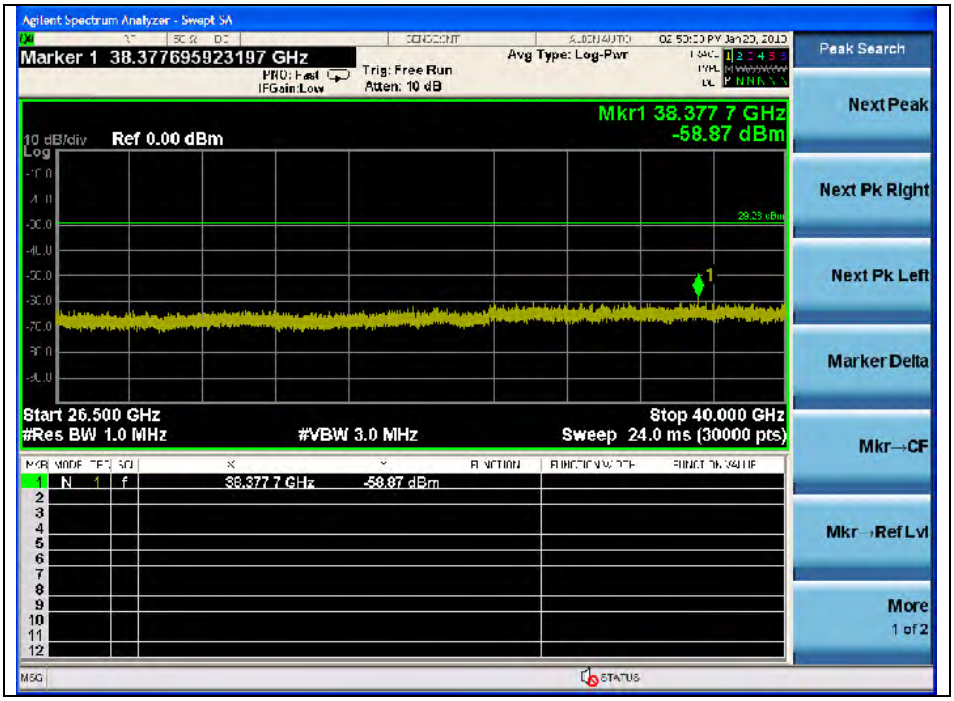
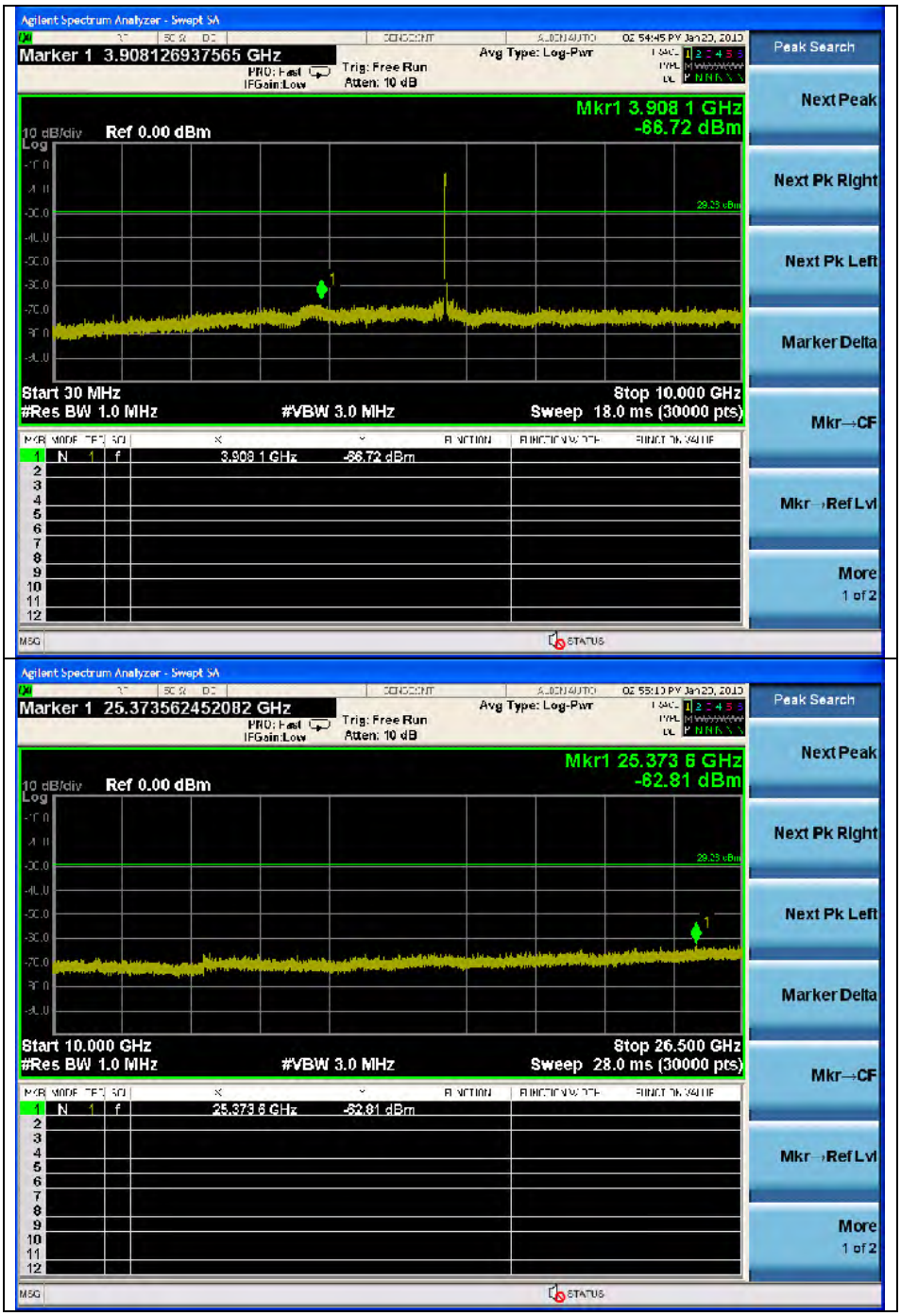
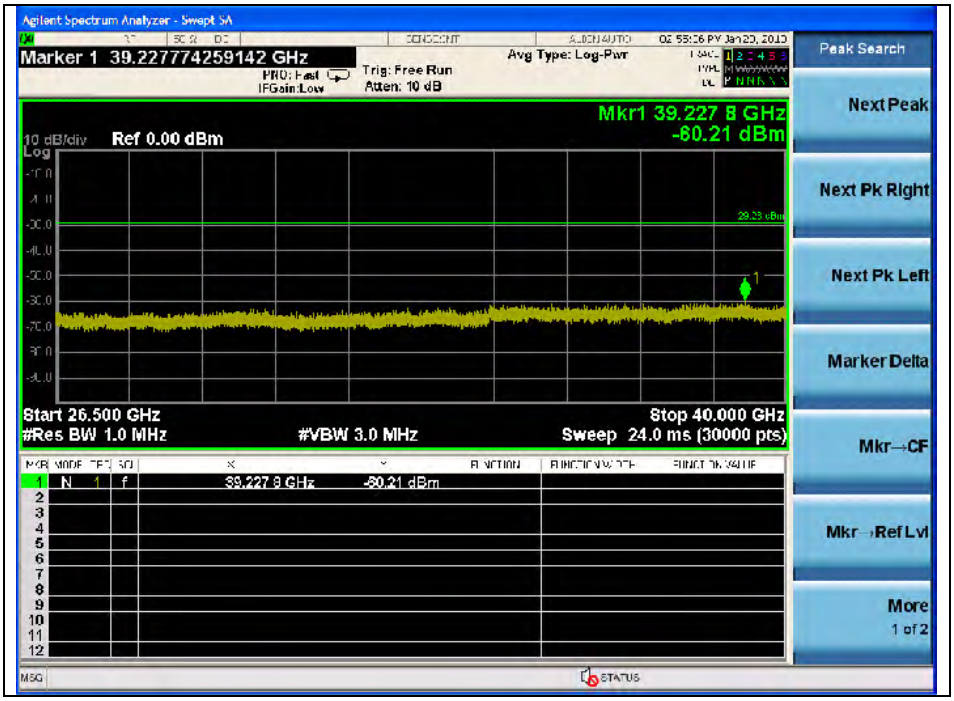



Note:
Offset (dB) = Attenuator(dB) + Cable loss (dB)
Result (dB m) = Spurious offset (dB) + Reading values (dB m)

| Frequency (MHz) | Reading values (dB m) | Spurious offset (dB) | Result (dB m) |
|---|---|---|---|
| 3 795.1 | Noise floor | - | - |
| 25 744.8 | Noise floor | - | - |
| 38 377.7 | Noise floor | - | - |

5 700 ㎒



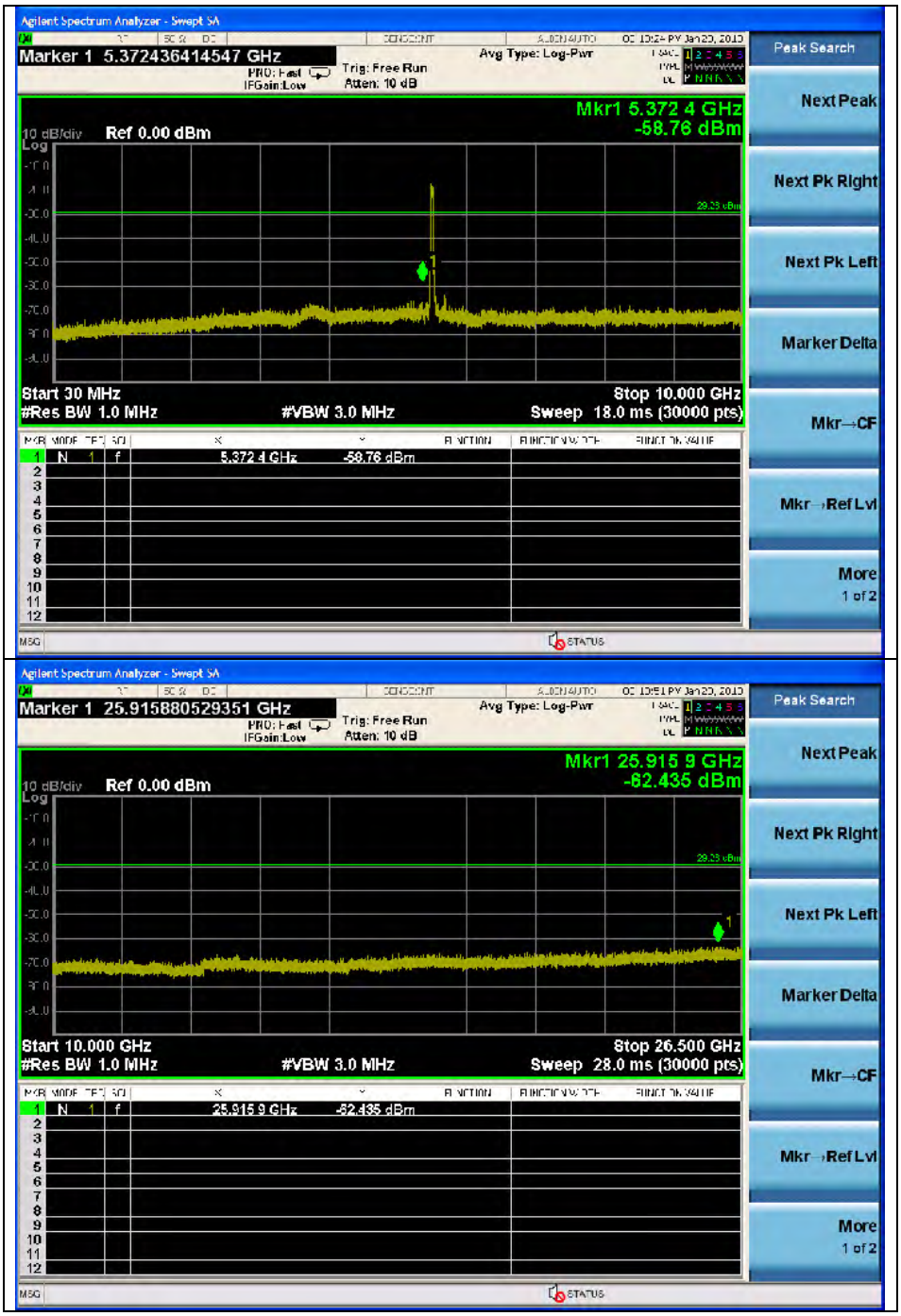


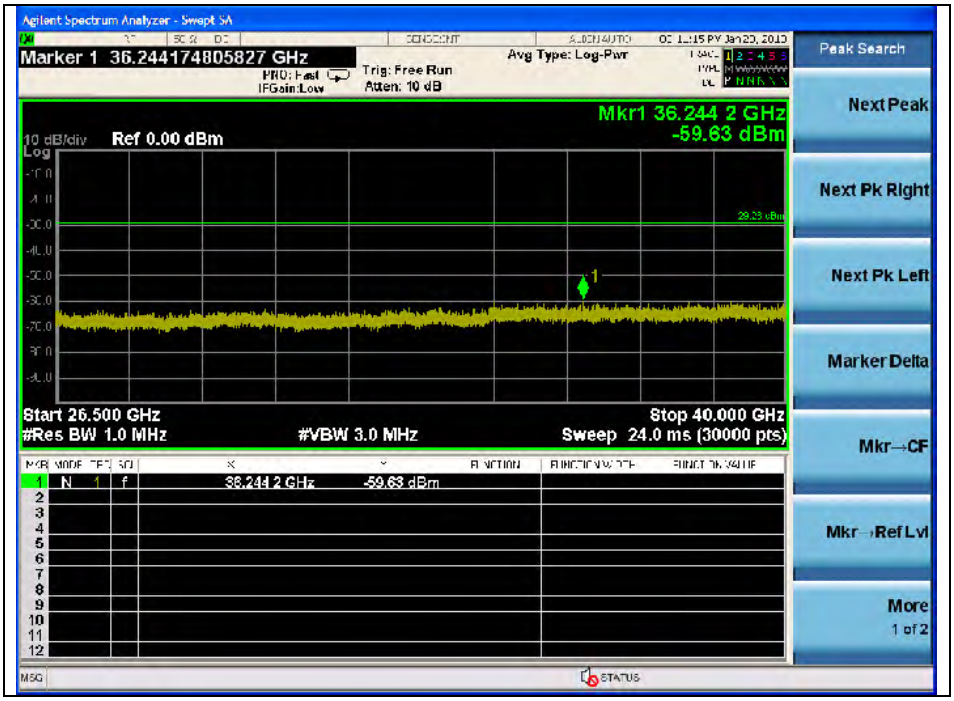

Note:
Offset (dB) = Attenuator(dB) + Cable loss (dB)
Result (dB m) = Spurious offset (dB) + Reading values (dB m)

| Frequency (MHz) | Reading values (dB m) | Spurious offset (dB) | Result (dB m) |
|---|---|---|---|
| 3 908.1 | Noise floor | - | - |
| 25 373.6 | Noise floor | - | - |
| 39 227.8 | Noise floor | - | - |

**802.11n-HT40 (DFS)_MCS0**

5 510 ㎒

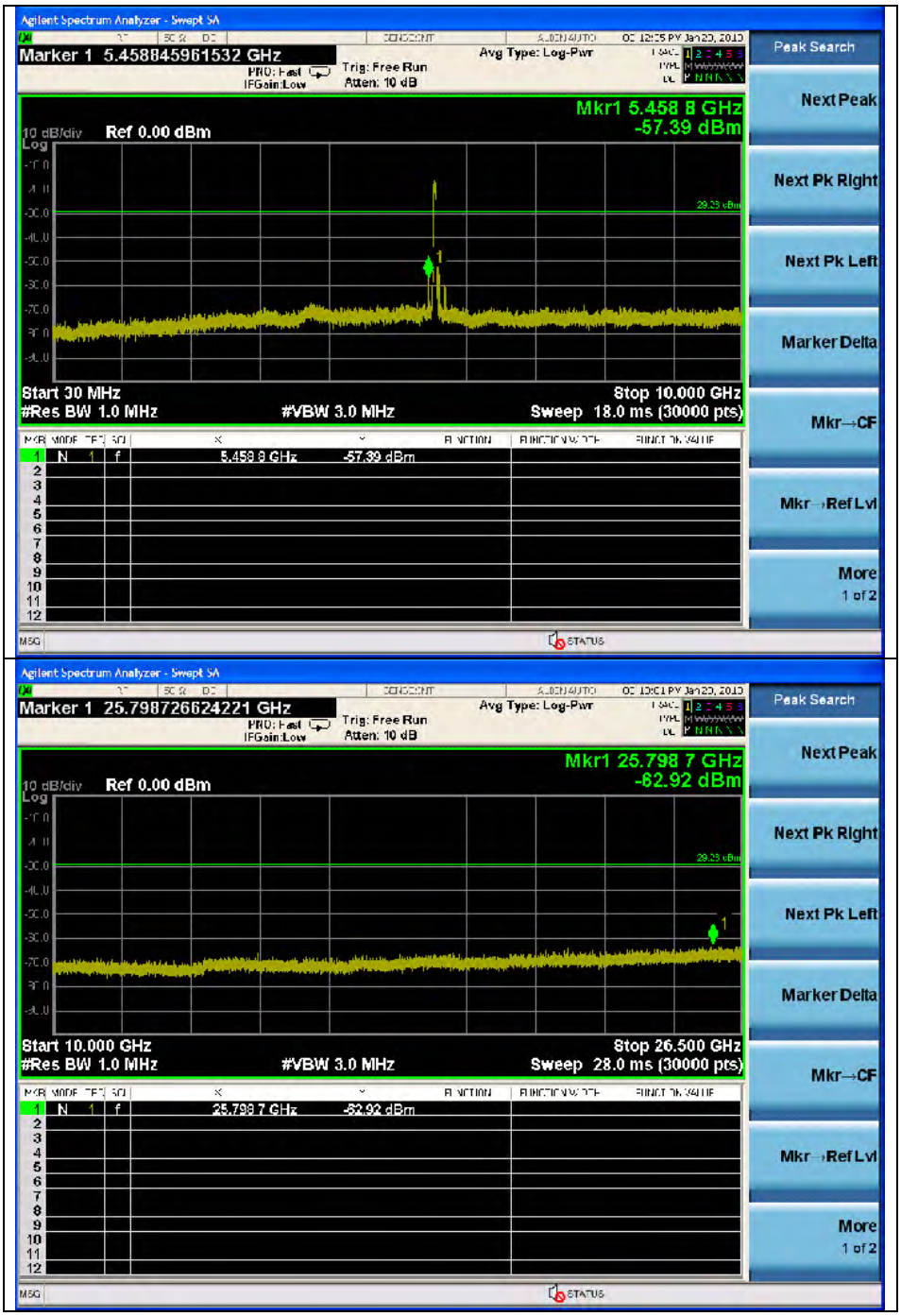


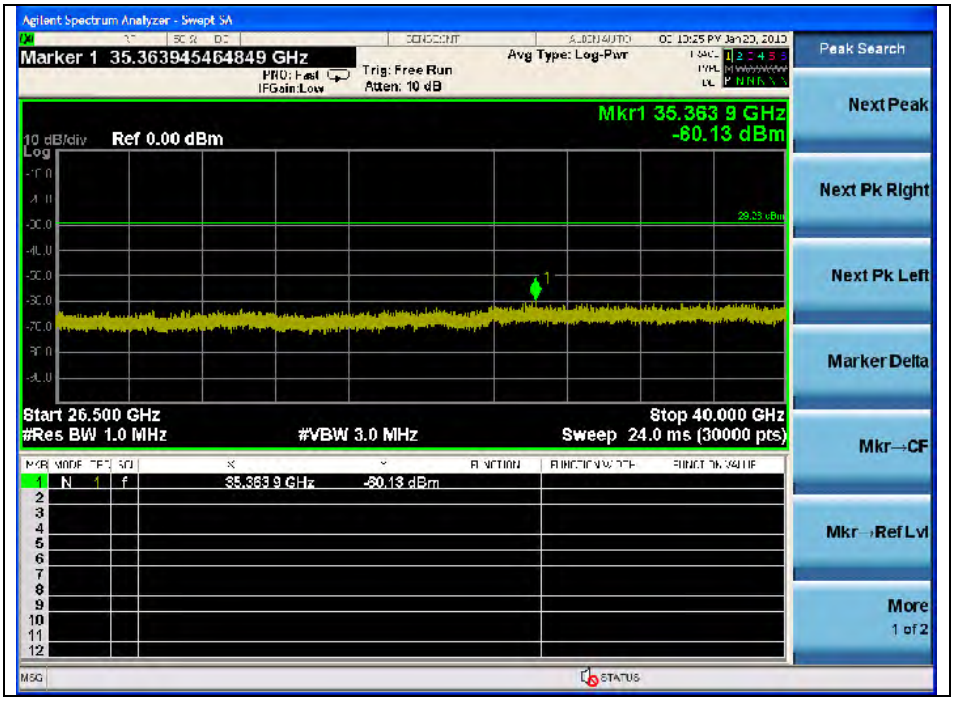



Note:
Offset (dB) = Attenuator(dB) + Cable loss (dB)
Result (dB m) = Spurious offset (dB) + Reading values (dB m)

| Frequency (MHz) | Reading values (dB m) | Spurious offset (dB) | Result (dB m) |
|---|---|---|---|
| 5 372.4 | -58.76 | 20.95 | -37.81 |
| 25 915.9 | Noise floor | - | - |
| 36 244.2 | Noise floor | - | - |

5 550 ㎒

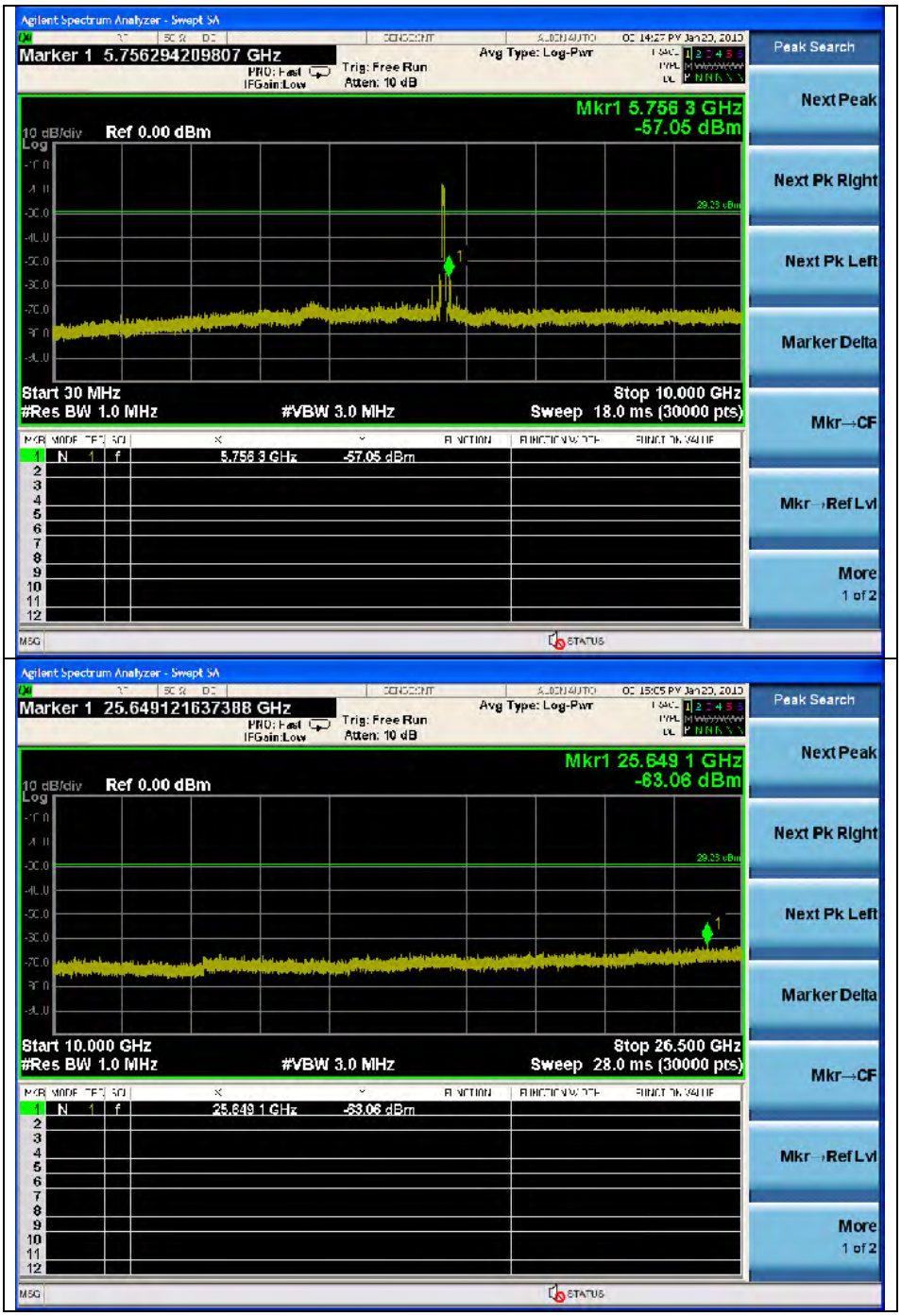


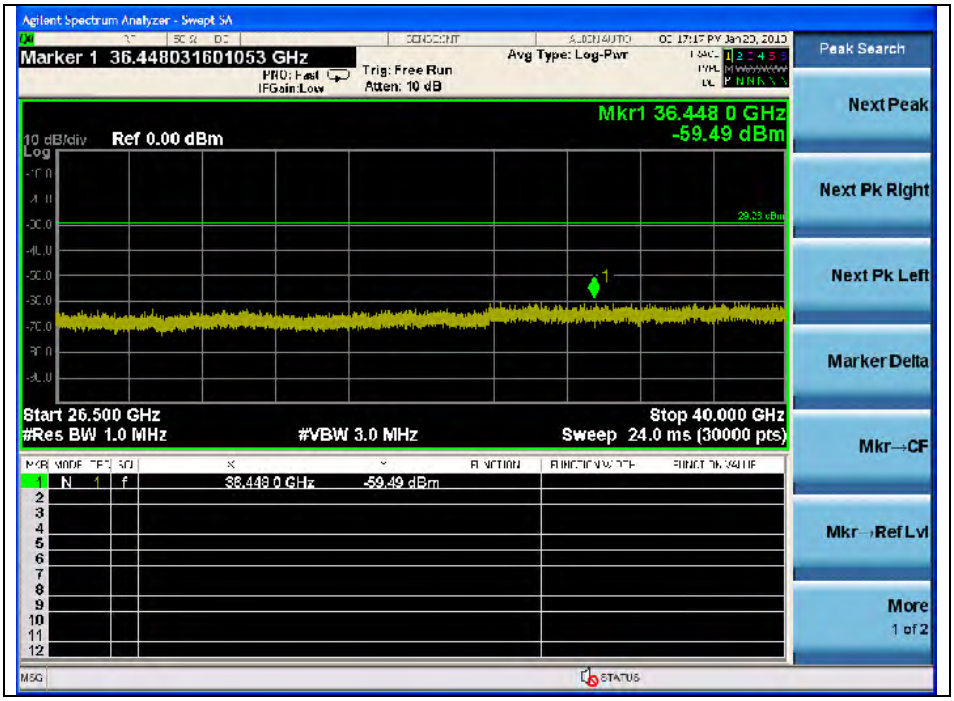



Note:
Offset (dB) = Attenuator(dB) + Cable loss (dB)
Result (dB m) = Spurious offset (dB) + Reading values (dB m)

| Frequency (MHz) | Reading values (dB m) | Spurious offset (dB) | Result (dB m) |
|---|---|---|---|
| 5 458.8 | -57.39 | 21.04 | -36.35 |
| 25 798.7 | Noise floor | - | - |
| 35 363.9 | Noise floor | - | - |

5 670 ㎒



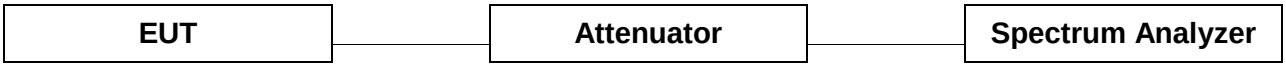



Note:
Offset (dB) = Attenuator(dB) + Cable loss (dB)
Result (dB m) = Spurious offset (dB) + Reading values (dB m)

| Frequency (MHz) | Reading values (dB m) | Spurious offset (dB) | Result (dB m) |
|---|---|---|---|
| 5 756.3 | -57.05 | 21.13 | -35.92 |
| 25 649.1 | Noise floor | - | - |
| 36 448.0 | Noise floor | - | - |

# 3. 26 dB bandwidth and 99 % Occupied bandwidth

## 3.1. Test setup




## 3.2. Limit

None; for reporting purpose only

## 3.3. Test procedure

All data rates and modes were investigated for this test. The full data for the worst case data rate are reported in this section.

### 3.3.1. 26 dB Bandwidth

1. This measurement settings are specified in section D of KDB 789033.
2. Set RBW: approximately 1% of the emission bandwidth.
3. Set the VBW > RBW.
4. Detector = Peak
5. Trace mode = max hold.
6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1 %

### 3.3.2. 99% Bandwidth

The test follows section 4.6.1 of RSS-Gen

1. Set the spectrum analyzer as SPAN = 2 or 3 times necessary bandwidth
2. RBW = approximately 1 % of the SPAN
3. VBW is set to 3 times RBW
4. Detector = sampling
5. Trace mode = max hold.
6. Measure lowest and highest frequencies are placed in a running sum until 0.5 % and 99.5 % of the total is reached.
7. Record 99% occupied bandwidth between the lowest and the highest frequencies repeat measurement for all the test channels.

Note: The automatic bandwidth measurement capability of a spectrum analyzer may be employed if it implements the functionality described above.

## 3.4. Test result

Ambient temperature : (24 ± 2) ℃
Relative humidity : 49 % R.H.

**Mode: 11a**

| Operating mode | Data Rate (Mbps) | Frequency (㎒) | 26 ㏈ bandwidth (㎒) | 99% bandwidth (㎒) |
|---|---|---|---|---|
| Non - DFS | 6 | 5 180 | 21.20 | 16.59 |
| | 6 | 5 220 | 21.13 | 16.60 |
| | 6 | 5 240 | 21.56 | 16.57 |
| DFS | 6 | 5 260 | 21.15 | 16.58 |
| | 6 | 5 300 | 21.13 | 16.56 |
| | 6 | 5 320 | 21.28 | 16.60 |
| DFS | 6 | 5 500 | 21.54 | 16.52 |
| | 6 | 5 580 | 21.53 | 16.58 |
| | 6 | 5 700 | 21.36 | 16.57 |

**Mode: 11n_HT20**

| Operating mode | Data Rate (Mbps) | Frequency (㎒) | 26 ㏈ bandwidth (㎒) | 99% bandwidth (㎒) |
|---|---|---|---|---|
| Non - DFS | 6 | 5 180 | 22.29 | 17.72 |
| | 6 | 5 220 | 21.90 | 17.72 |
| | 6 | 5 240 | 22.30 | 17.72 |
| DFS | 6 | 5 260 | 22.34 | 17.75 |
| | 6 | 5 300 | 22.14 | 17.70 |
| | 6 | 5 320 | 22.18 | 17.70 |
| DFS | 6 | 5 500 | 21.92 | 17.71 |
| | 6 | 5 580 | 22.34 | 17.71 |
| | 6 | 5 700 | 21.86 | 17.69 |

**Mode: 11n_HT40**

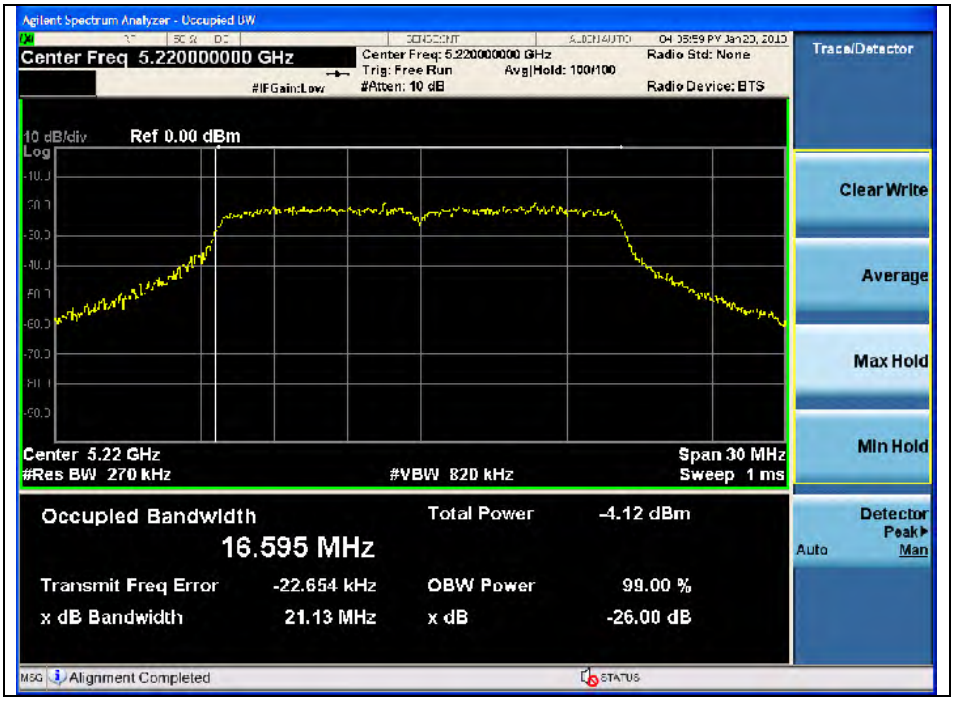
| Operating mode | Data Rate (Mbps) | Frequency (㎒) | 26 ㏈ bandwidth (㎒) | 99% bandwidth (㎒) |
|---|---|---|---|---|
| Non - DFS | MCS0 | 5 190 | 43.86 | 36.31 |
| | MCS0 | 5 230 | 43.74 | 36.28 |
| DFS | MCS0 | 5 270 | 44.57 | 36.28 |
| | MCS0 | 5 310 | 45.14 | 36.26 |
| DFS | MCS0 | 5 510 | 44.88 | 36.26 |
| | MCS0 | 5 550 | 44.48 | 36.24 |
| | MCS0 | 5 670 | 43.79 | 36.28 |

## 26 dB bandwidth and 99 % Occupied bandwidth

**802.11a (Non-DFS)**

Low Channel (5 180 ㎒)


Middle Channel (5 220 ㎒)



High Channel (5 240 ㎒)


**802.11a (DFS)**

Low Channel (5 260 ㎒)

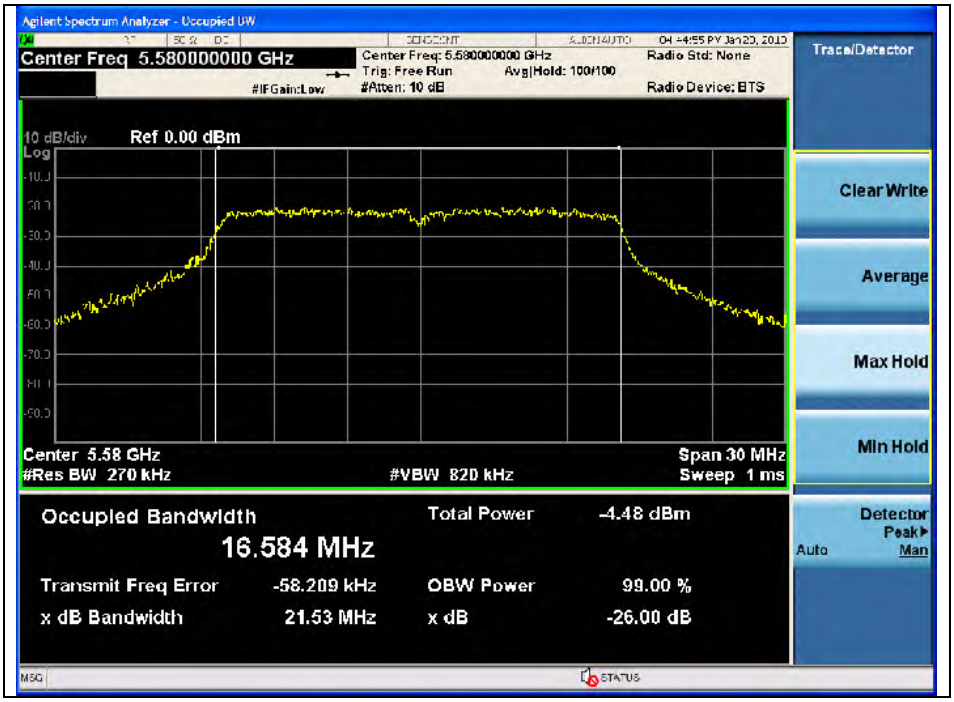
Middle Channel (5 300 ㎒)


High Channel (5 320 ㎒)

**802.11a (DFS)**

Low Channel (5 500 ㎒)


Middle Channel (5 580 ㎒)

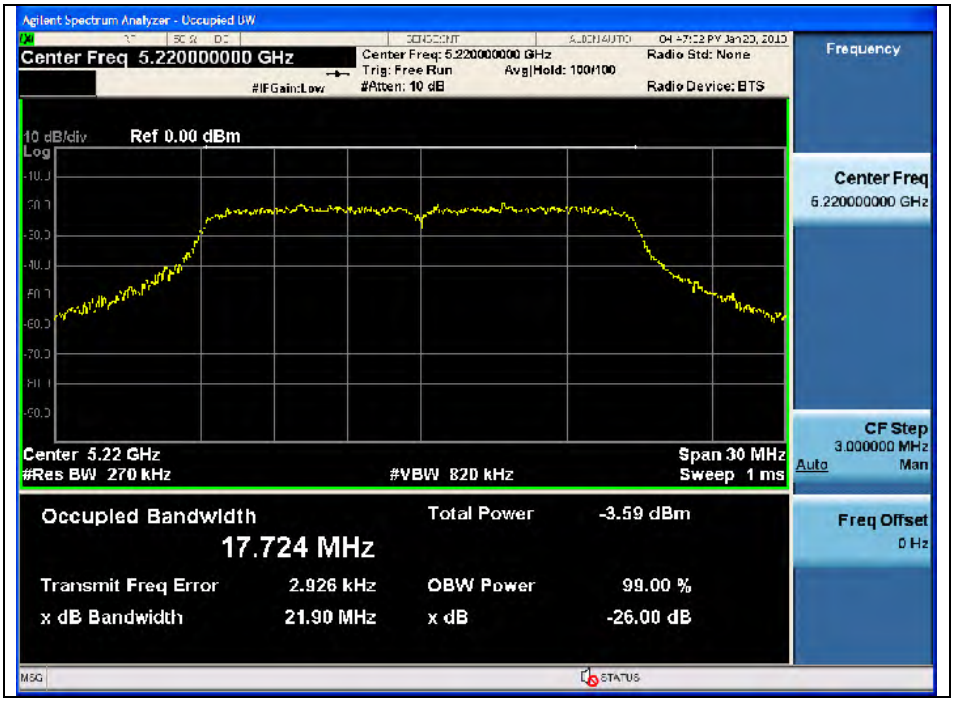


High Channel (5 700 ㎒)

**802.11n-HT20 (Non-DFS)**

Low Channel (5 180 ㎒)

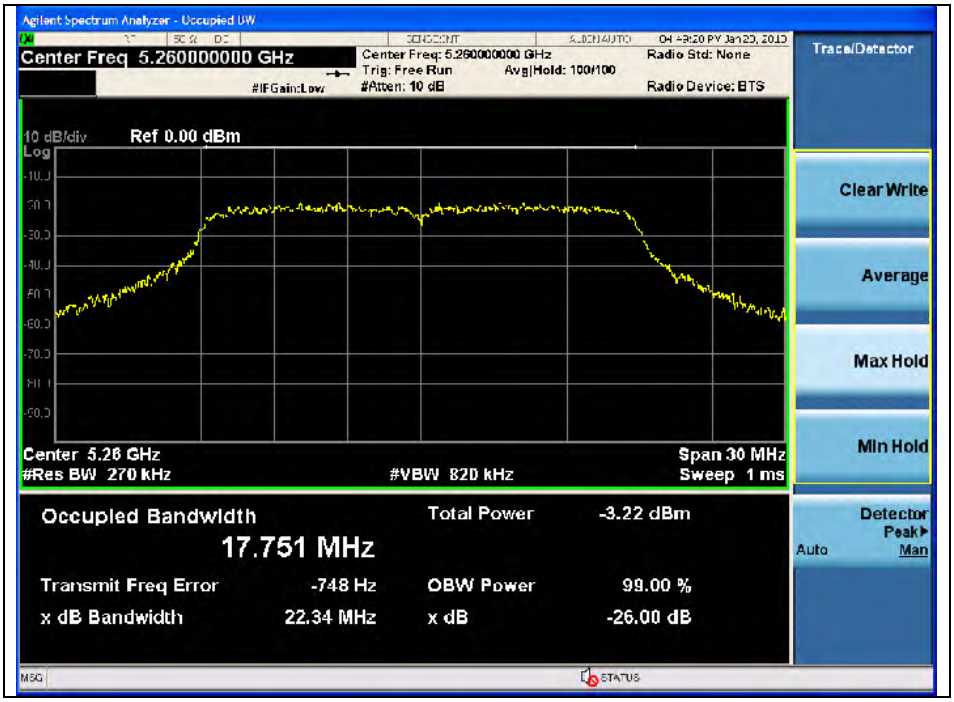

Middle Channel (5 220 ㎒)



High Channel (5 240 ㎒)


**802.11n-HT20 (DFS)**

Low Channel (5 260 ㎒)



Middle Channel (5 300 ㎒)

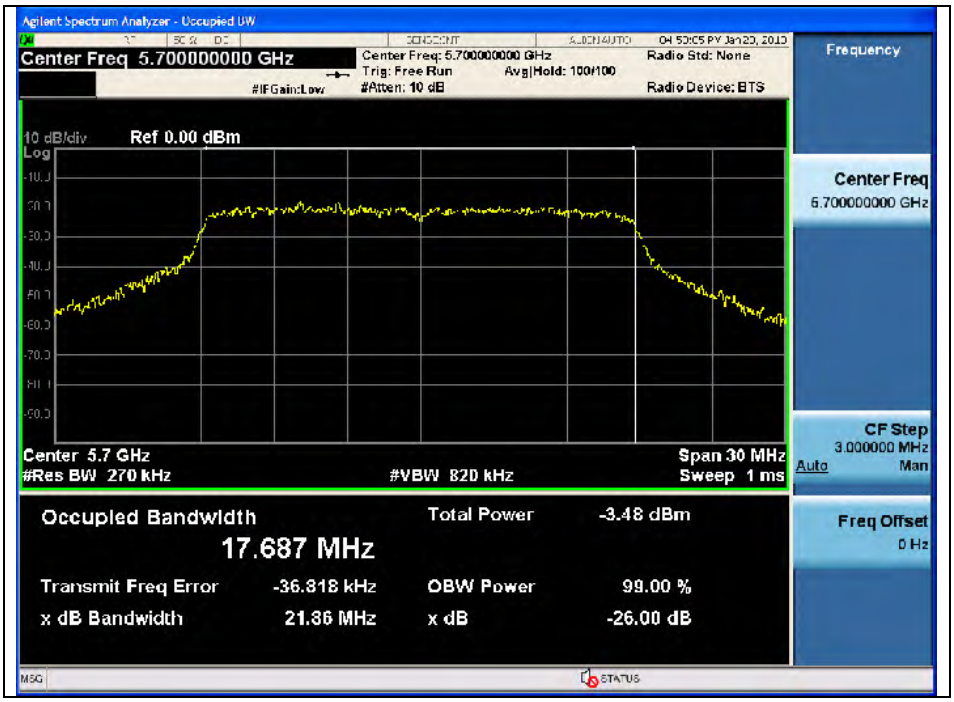

High Channel (5 320 ㎒)

**802.11n-HT20 (DFS)**

Low Channel (5 500 ㎒)

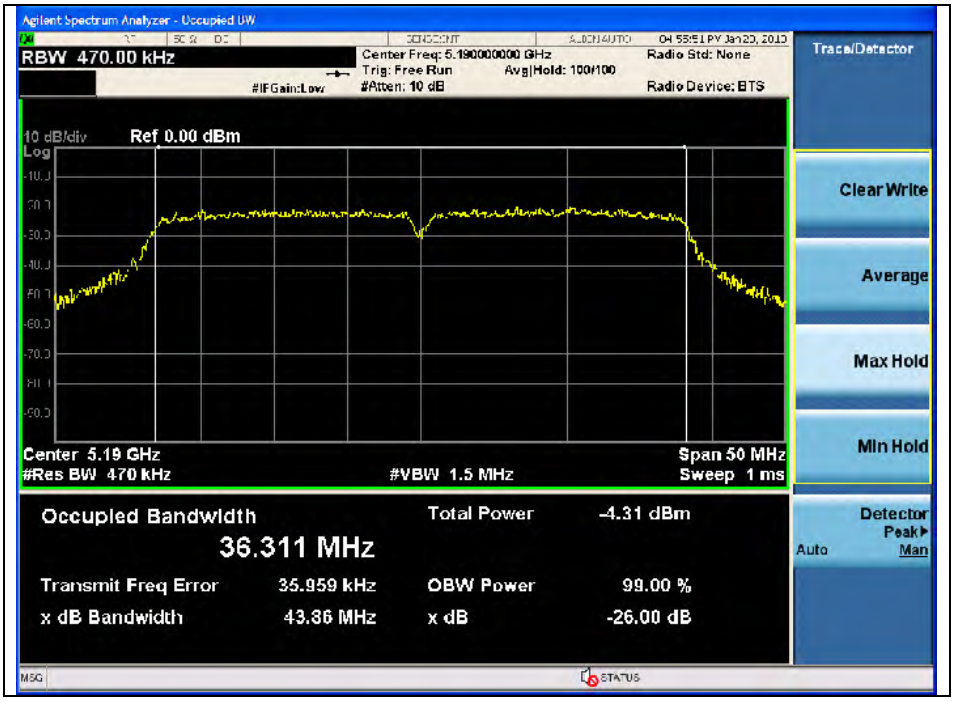

Middle Channel (5 580 ㎒)

High Channel (5 700 ㎒)

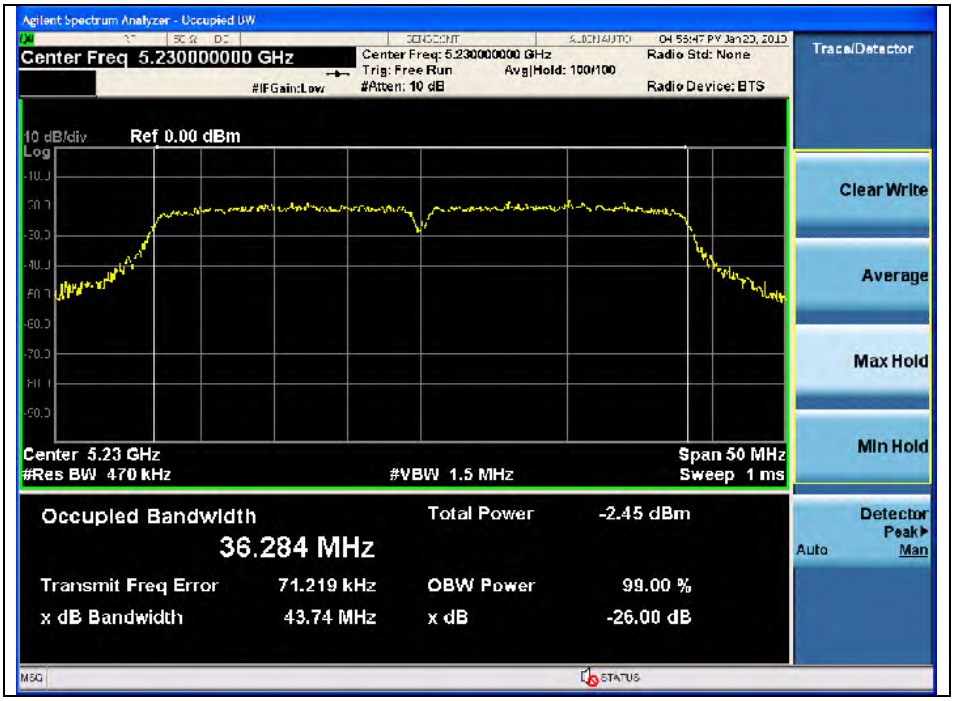


**802.11n-HT40 (Non-DFS)**

Low Channel (5 190 ㎒)

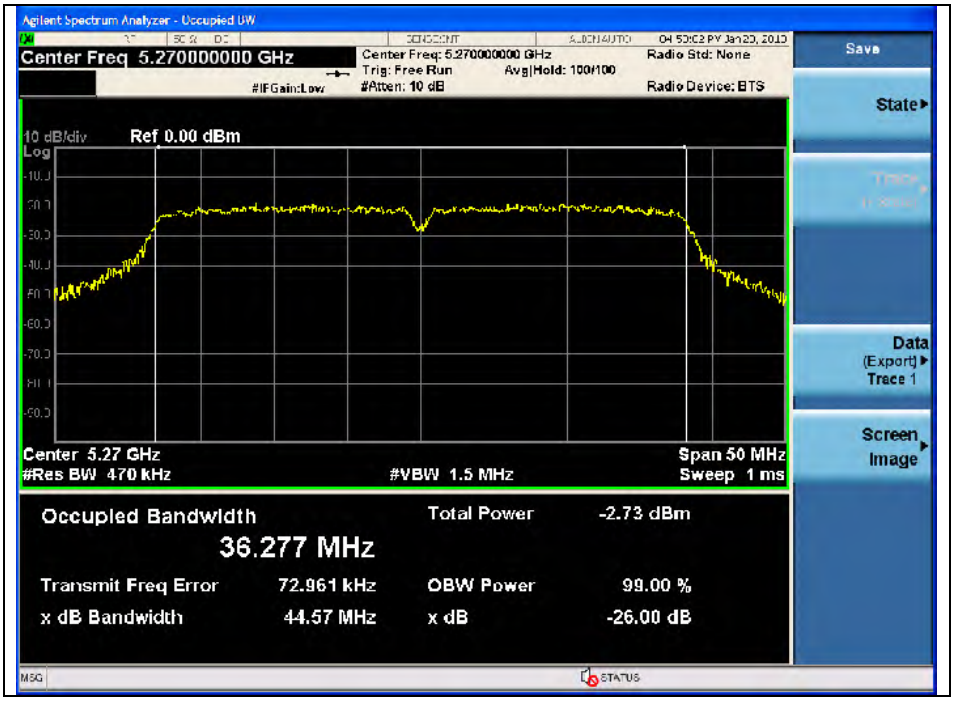



High Channel (5 230 ㎒)

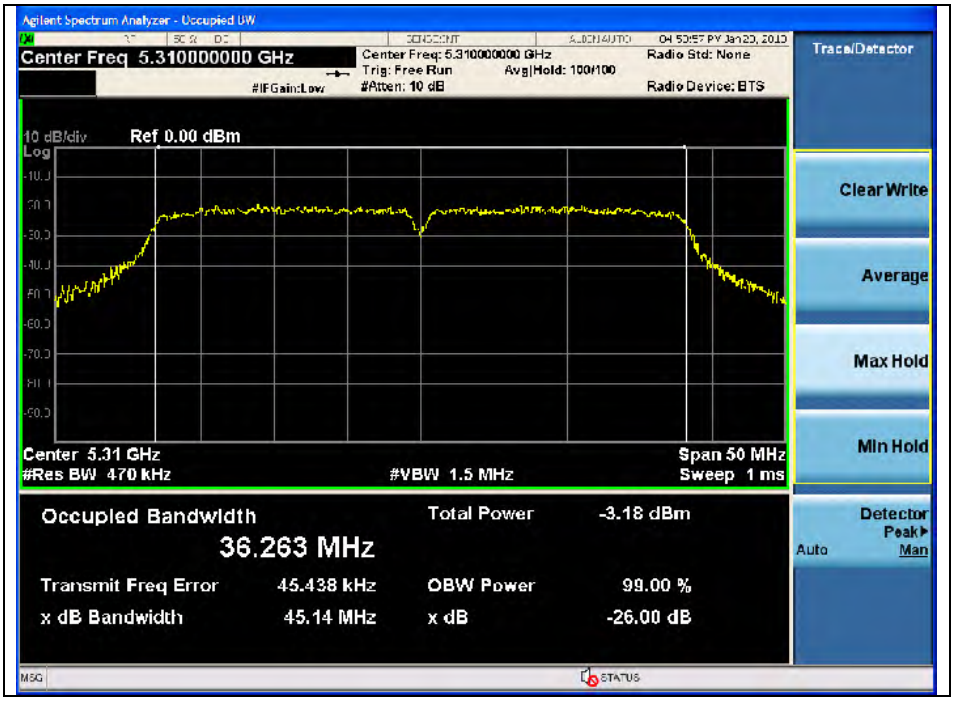


**802.11n-HT40 (DFS)**

Low Channel (5 270 ㎒)

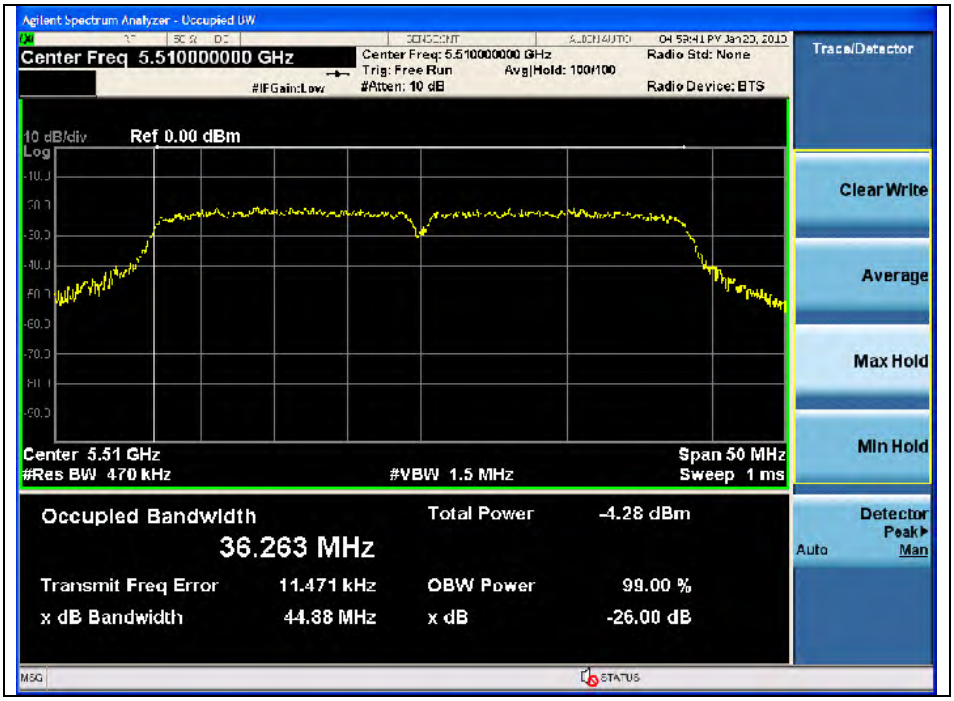



High Channel (5 310 ㎒)

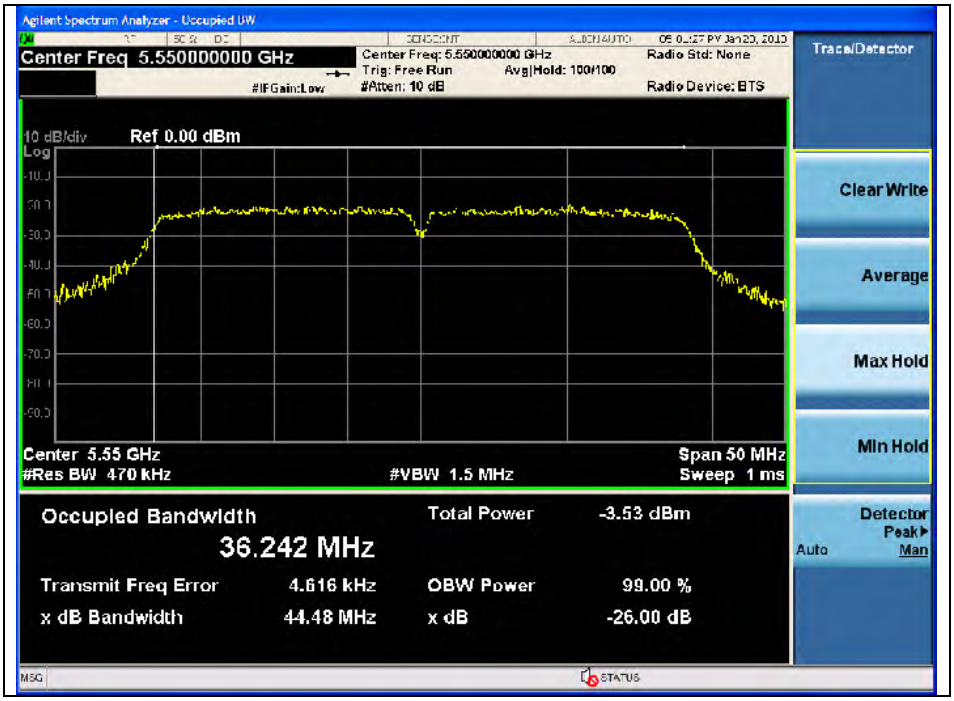


**802.11n-HT40 (DFS)**

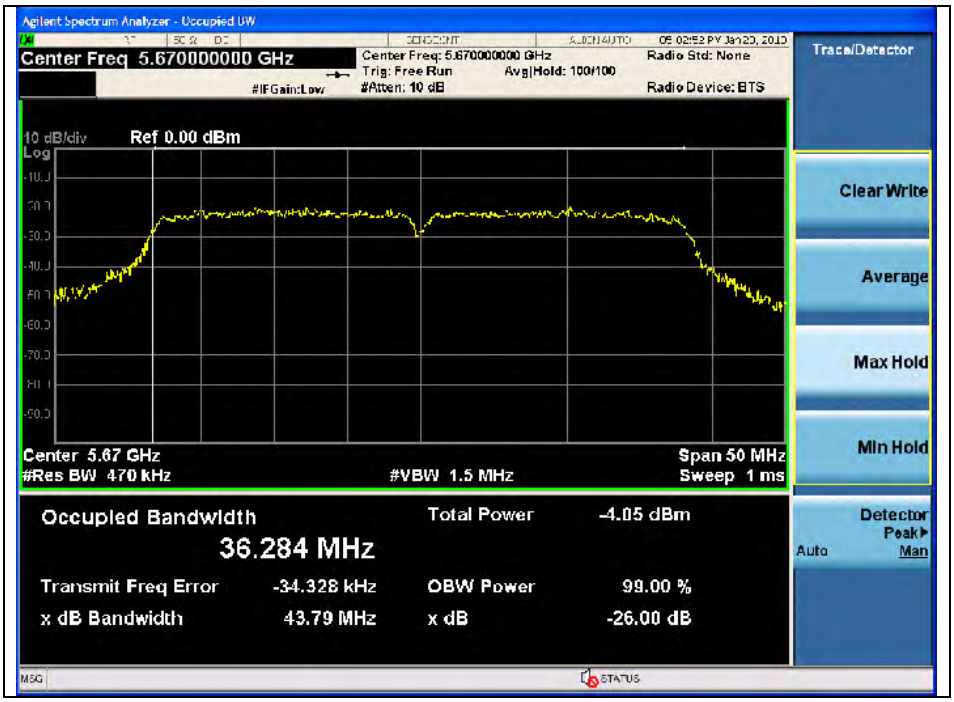
Low Channel (5 510 ㎒)




Low Channel (5 550 ㎒)

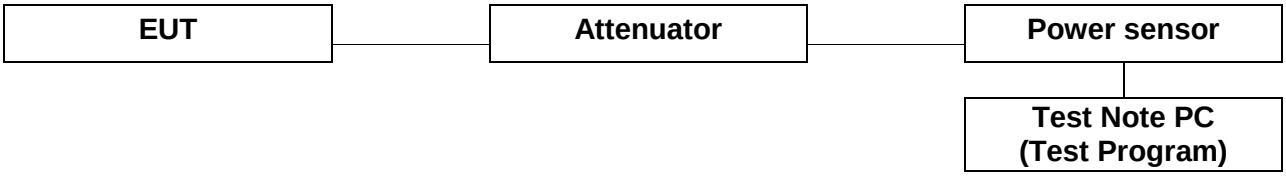


High Channel (5 670 ㎒)



# 4. Output power

## 4.1. Test setup




## 4.2. Limit

### 4.2.1. FCC 15.407

**(a)(1)**

For the 5.15-5.25 ㎓ band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 ㎽ or 4 ㏈m + 10 log B, where B is the 26-㏈ emission bandwidth in ㎒. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i.

**(a)(2)**

For the 5.25–5.35 ㎓ and 5.47–5.725 ㎓ bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 ㎽ or 11 ㏈m + 10 log B, where B is the 26 ㏈ emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 ㏈m in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i.

### 4.2.2. IC RSS-210

**A9.2(1) Band 5150-5250 ㎒**

The maximum e.i.r.p.. shall not exceed 200 ㎽ or 10 + 10 log10 B, ㏈m, whichever power is less. B is the 99% emission bandwidth in ㎒.

**A9.2(2) Band 5250-5350 ㎒**

The maximum conducted output power shall not exceed 250 ㎽ or 11 + 10 log10 B, ㏈m, whichever power is less. The maximum e.i.r.p.. shall not exceed 1.0 W or 17 + 10 log10 B, ㏈m, whichever power is less. B is the 99% emission bandwidth in ㎒. Note that devices with a maximum e.i.r.p.. greater than 500 ㎽ shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p.. of 1 W.

**A9.2(3) Band 5600-5650 ㎒**

The maximum conducted output power shall not exceed 250 ㎽ or 11 + 10 log10 B, ㏈m, whichever power is less. The maximum e.i.r.p.. shall not exceed 1.0 W or 17 + 10 log10 B, ㏈m, whichever power is less. B is the 99% emission bandwidth in ㎒. Note that devices with a maximum e.i.r.p.. greater than 500 ㎽ shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p.. of 1 W.

## 4.3. Test procedure

1. This measurement settings are specified in clause 4) of section C of KDB 789033.
2. As an alternative to spectrum analyzer measurements, measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied.
- The EUT is configured to transmit continuously or to transmit with a consistent duty factor.
-At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.
-The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
3. If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in section B).
4. Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
5. Adjust the measurement in ㏈m by adding 10 log (1/x) where x is the duty cycle (e.g., 10 log(1/0.25) if the duty cycle is 25 percent).

## 4.4. Test result

Ambient temperature : (24 ± 2) ℃
Relative humidity : 49 % R.H.

### 4.4.1. FCC Limit

**-11a**

| Mode | Frequency (㎒) | Data Rate (Mbps) | Fixed Limit (dB m) | 26 dB BW (㎒) | 4+10LogB (dB m) | Antenna gain (dB i) | Limit (dB m) |
|---|---|---|---|---|---|---|---|
| 11a | 5 180 | 6 | 17 | 21.20 | 17.26 | 3.75 | 17 |
| | 5 220 | 6 | 17 | 21.13 | 17.25 | 3.75 | 17 |
| | 5 240 | 6 | 17 | 21.56 | 17.34 | 3.75 | 17 |
| **Mode** | **Frequency (㎒)** | **Data Rate (Mbps)** | **Fixed Limit (dB m)** | **26 dB BW (㎒)** | **11+10LogB (dB m)** | **Antenna gain (dB i)** | **Limit (dB m)** |
| 11a | 5 260 | 6 | 24 | 21.15 | 24.25 | 3.75 | 24 |
| | 5 300 | 6 | 24 | 21.13 | 24.25 | 3.75 | 24 |
| | 5 320 | 6 | 24 | 21.28 | 24.28 | 3.75 | 24 |
| | 5 500 | 6 | 24 | 21.54 | 24.33 | 2.26 | 24 |
| | 5 580 | 6 | 24 | 21.53 | 24.33 | 2.26 | 24 |
| | 5 700 | 6 | 24 | 21.36 | 24.30 | 2.26 | 24 |

**-11n_HT20**

| Mode | Frequency (㎒) | Data Rate (Mbps) | Fixed Limit (dB m) | 26 dB BW (㎒) | 4+10LogB (dB m) | Antenna gain (dB i) | Limit (dB m) |
|---|---|---|---|---|---|---|---|
| 11n_HT20 | 5 180 | MCS0 | 17 | 22.29 | 17.48 | 3.75 | 17 |
| | 5 220 | MCS0 | 17 | 21.90 | 17.40 | 3.75 | 17 |
| | 5 240 | MCS0 | 17 | 22.30 | 17.48 | 3.75 | 17 |
| **Mode** | **Frequency (㎒)** | **Data Rate (Mbps)** | **Fixed Limit (dB m)** | **26 dB BW (㎒)** | **11+10LogB (dB m)** | **Antenna gain (dB i)** | **Limit (dB m)** |
| 11n_HT20 | 5 260 | MCS0 | 24 | 22.34 | 24.49 | 3.75 | 24 |
| | 5 300 | MCS0 | 24 | 22.14 | 24.45 | 3.75 | 24 |
| | 5 320 | MCS0 | 24 | 22.18 | 24.46 | 3.75 | 24 |
| | 5 500 | MCS0 | 24 | 21.92 | 24.41 | 2.26 | 24 |
| | 5 580 | MCS0 | 24 | 22.34 | 24.49 | 2.26 | 24 |
| | 5 700 | MCS0 | 24 | 21.86 | 24.40 | 2.26 | 24 |

**-11n_HT40**

| Mode | Frequency (㎒) | Data Rate (Mbps) | Fixed Limit (dB m) | 26 dB BW (㎒) | 4+10LogB (dB m) | Antenna gain (dB i) | Limit (dB m) |
|---|---|---|---|---|---|---|---|
| 11n_HT40 | 5 190 | MCS0 | 17 | 43.86 | 20.42 | 3.75 | 17 |
| | 5 230 | MCS0 | 17 | 43.74 | 20.41 | 3.75 | 17 |
| **Mode** | **Frequency (㎒)** | **Data Rate (Mbps)** | **Fixed Limit (dB m)** | **26 dB BW (㎒)** | **11+10LogB (dB m)** | **Antenna gain (dB i)** | **Limit (dB m)** |
| 11n_HT40 | 5 270 | MCS0 | 24 | 44.57 | 27.49 | 3.75 | 24 |
| | 5 310 | MCS0 | 24 | 45.14 | 27.55 | 3.75 | 24 |
| | 5 510 | MCS0 | 24 | 44.88 | 27.52 | 2.26 | 24 |
| | 5 550 | MCS0 | 24 | 44.48 | 27.48 | 2.26 | 24 |
| | 5 670 | MCS0 | 24 | 43.79 | 27.41 | 2.26 | 24 |

## 4.4.2. IC Limit

### -11a

| Mode | Frequency (㎒) | Data Rate (Mbps) | Fixed Limit (dB m) | 99 % BW (㎒) | 10+10LogB (dB m) | Antenna gain (dB i) | Limit (dB m) |
|---|---|---|---|---|---|---|---|
| 11a | 5 180 | 6 | 23 | 16.59 | 22.20 | 3.75 | 22.20 |
| | 5 220 | 6 | 23 | 16.60 | 22.20 | 3.75 | 22.20 |
| | 5 240 | 6 | 23 | 16.57 | 22.19 | 3.75 | 22.19 |
| **Mode** | **Frequency (㎒)** | **Data Rate (Mbps)** | **Fixed Limit (dB m)** | **99 % BW (㎒)** | **11+10LogB (dB m)** | **Antenna gain (dB i)** | **Limit (dB m)** |
| 11a | 5 260 | 6 | 24 | 16.58 | 23.20 | 3.75 | 23.20 |
| | 5 300 | 6 | 24 | 16.56 | 23.19 | 3.75 | 23.19 |
| | 5 320 | 6 | 24 | 16.60 | 23.20 | 3.75 | 23.20 |
| | 5 500 | 6 | 24 | 16.52 | 23.18 | 2.26 | 23.18 |
| | 5 580 | 6 | 24 | 16.58 | 23.20 | 2.26 | 23.20 |
| | 5 700 | 6 | 24 | 16.57 | 23.19 | 2.26 | 23.19 |

### -11n_HT20

| Mode | Frequency (㎒) | Data Rate (Mbps) | Fixed Limit (dB m) | 99 % BW (㎒) | 10+10LogB (dB m) | Antenna gain (dB i) | Limit (dB m) |
|---|---|---|---|---|---|---|---|
| 11n_HT20 | 5 180 | MCS0 | 23 | 17.72 | 22.48 | 3.75 | 22.48 |
| | 5 220 | MCS0 | 23 | 17.72 | 22.48 | 3.75 | 22.48 |
| | 5 240 | MCS0 | 23 | 17.72 | 22.48 | 3.75 | 22.48 |
| **Mode** | **Frequency (㎒)** | **Data Rate (Mbps)** | **Fixed Limit (dB m)** | **99 % BW (㎒)** | **11+10LogB (dB m)** | **Antenna gain (dB i)** | **Limit (dB m)** |
| 11n_HT20 | 5 260 | MCS0 | 24 | 17.75 | 23.49 | 3.75 | 23.49 |
| | 5 300 | MCS0 | 24 | 17.70 | 23.48 | 3.75 | 23.48 |
| | 5 320 | MCS0 | 24 | 17.70 | 23.48 | 3.75 | 23.48 |
| | 5 500 | MCS0 | 24 | 17.71 | 23.48 | 2.26 | 23.48 |
| | 5 580 | MCS0 | 24 | 17.71 | 23.48 | 2.26 | 23.48 |
| | 5 700 | MCS0 | 24 | 17.69 | 23.48 | 2.26 | 23.48 |

## -11n_HT40

| Mode | Frequency (㎒) | Data Rate (Mbps) | Fixed Limit (dB m) | 99 % BW (㎒) | 10+10LogB (dB m) | Antenna gain (dB i) | Limit (dB m) |
|---|---|---|---|---|---|---|---|
| 11n_HT40 | 5 190 | MCS0 | 23 | 36.31 | 25.60 | 3.75 | 23 |
| | 5 230 | MCS0 | 23 | 36.28 | 25.60 | 3.75 | 23 |
| **Mode** | **Frequency (㎒)** | **Data Rate (Mbps)** | **Fixed Limit (dB m)** | **99 % BW (㎒)** | **11+10LogB (dB m)** | **Antenna gain (dB i)** | **Limit (dB m)** |
| 11n_HT40 | 5 270 | MCS0 | 24 | 36.28 | 26.60 | 3.75 | 24 |
| | 5 310 | MCS0 | 24 | 36.26 | 26.59 | 3.75 | 24 |
| | 5 510 | MCS0 | 24 | 36.26 | 26.59 | 2.26 | 24 |
| | 5 550 | MCS0 | 24 | 36.24 | 26.59 | 2.26 | 24 |
| | 5 670 | MCS0 | 24 | 36.28 | 26.60 | 2.26 | 24 |

### 4.4.3. Result

### -11a

| Operation Mode | Channel | Data rate | Channel Frequency (㎒) | Result (㏈ m) | Limit (㏈ m) | |
|---|---|---|---|---|---|---|
| | | | | | FCC | IC |
| Non DFS 11a | Low | 6 | 5 180 | 10.15 | 17 | 22.20 |
| | | 9 | | 10.13 | | |
| | | 12 | | 10.26 | | |
| | | 18 | | 10.31 | | |
| | | 24 | | 10.24 | | |
| | | 36 | | 10.25 | | |
| | | 48 | | **10.38** | | |
| | | 54 | | 10.36 | | |
| | Middle | 6 | 5 220 | **9.78** | 17 | 22.20 |
| | | 9 | | 9.75 | | |
| | | 12 | | 9.74 | | |
| | | 18 | | 9.65 | | |
| | | 24 | | 9.62 | | |
| | | 36 | | 9.71 | | |
| | | 48 | | 9.59 | | |
| | | 54 | | 9.59 | | |
| | High | 6 | 5 240 | **10.89** | 17 | 22.19 |
| | | 9 | | 10.86 | | |
| | | 12 | | 10.85 | | |
| | | 18 | | 10.80 | | |
| | | 24 | | 10.75 | | |
| | | 36 | | 10.76 | | |
| | | 48 | | 10.72 | | |
| | | 54 | | 10.74 | | |

| Operation Mode | Channel | Data rate | Channel Frequency (㎒) | Result (㏈ m) | Limit (㏈ m) | |
|---|---|---|---|---|---|---|
| | | | | | FCC | IC |
| DFS 11a | Lower Band | 6 | 5 260 | **10.41** | 24 | 23.20 |
| | | 9 | | 10.31 | | |
| | | 12 | | 10.33 | | |
| | | 18 | | 10.25 | | |
| | | 24 | | 10.24 | | |
| | | 36 | | 10.21 | | |
| | | 48 | | 10.18 | | |
| | | 54 | | 10.16 | | |
| | | 6 | 5 300 | 10.18 | 24 | 23.19 |
| | | 9 | | **10.21** | | |
| | | 12 | | 10.15 | | |
| | | 18 | | 10.11 | | |
| | | 24 | | 10.09 | | |
| | | 36 | | 9.94 | | |
| | | 48 | | 9.85 | | |
| | | 54 | | 9.72 | | |
| | | 6 | 5 320 | 10.08 | 24 | 23.20 |
| | | 9 | | **10.11** | | |
| | | 12 | | 10.05 | | |
| | | 18 | | 10.01 | | |
| | | 24 | | 9.98 | | |
| | | 36 | | 9.97 | | |
| | | 48 | | 9.94 | | |
| | | 54 | | 9.95 | | |

| Operation Mode | Channel | Data rate | Channel Frequency (㎒) | Result (㏈m) | Limit (㏈m) | |
|---|---|---|---|---|---|---|
| | | | | | FCC | IC |
| DFS 11a | Upper Band | 6 | 5 500 | 9.83 | 24 | 23.18 |
| | | 9 | | **9.95** | | |
| | | 12 | | 9.89 | | |
| | | 18 | | 9.85 | | |
| | | 24 | | 9.83 | | |
| | | 36 | | 9.75 | | |
| | | 48 | | 9.78 | | |
| | | 54 | | 9.82 | | |
| | | 6 | 5 580 | **9.51** | 24 | 23.20 |
| | | 9 | | 9.45 | | |
| | | 12 | | 9.37 | | |
| | | 18 | | 9.39 | | |
| | | 24 | | 9.27 | | |
| | | 36 | | 9.35 | | |
| | | 48 | | 9.36 | | |
| | | 54 | | 9.38 | | |
| | | 6 | 5 700 | **9.96** | 24 | 23.19 |
| | | 9 | | 9.91 | | |
| | | 12 | | 9.95 | | |
| | | 18 | | 9.87 | | |
| | | 24 | | 9.85 | | |
| | | 36 | | 9.84 | | |
| | | 48 | | 9.85 | | |
| | | 54 | | 9.81 | | |

## -11n_HT20

| Operation Mode | Channel | Data rate | Channel Frequency (㎒) | Result (㏈m) | Limit (㏈m) | |
|---|---|---|---|---|---|---|
| | | | | | FCC | IC |
| Non DFS 11a | Low | 6 | 5 180 | 9.48 | 17 | 22.48 |
| | | 9 | | 9.42 | | |
| | | 12 | | 9.45 | | |
| | | 18 | | 9.32 | | |
| | | 24 | | 9.46 | | |
| | | 36 | | **9.52** | | |
| | | 48 | | 9.51 | | |
| | | 54 | | 9.50 | | |
| | Middle | 6 | 5 220 | **10.21** | 17 | 22.48 |
| | | 9 | | 10.21 | | |
| | | 12 | | 10.19 | | |
| | | 18 | | 10.15 | | |
| | | 24 | | 10.14 | | |
| | | 36 | | 10.19 | | |
| | | 48 | | 10.17 | | |
| | | 54 | | 10.17 | | |
| | High | 6 | 5 240 | **10.52** | 17 | 22.48 |
| | | 9 | | 10.48 | | |
| | | 12 | | 10.44 | | |
| | | 18 | | 10.37 | | |
| | | 24 | | 10.35 | | |
| | | 36 | | 10.29 | | |
| | | 48 | | 10.25 | | |
| | | 54 | | 10.24 | | |

| Operation Mode | Channel | Data rate | Channel Frequency (㎒) | Result (㏈m) | Limit (㏈m) | |
|---|---|---|---|---|---|---|
| | | | | | FCC | IC |
| DFS 11a | Lower Band | 6 | 5 260 | **10.17** | 24 | 23.49 |
| | | 9 | | 10.11 | | |
| | | 12 | | 10.14 | | |
| | | 18 | | 10.05 | | |
| | | 24 | | 10.09 | | |
| | | 36 | | 10.11 | | |
| | | 48 | | 10.10 | | |
| | | 54 | | 10.09 | | |
| | | 6 | 5 300 | **9.83** | 24 | 23.48 |
| | | 9 | | 9.82 | | |
| | | 12 | | 9.78 | | |
| | | 18 | | 9.74 | | |
| | | 24 | | 9.76 | | |
| | | 36 | | 9.71 | | |
| | | 48 | | 9.65 | | |
| | | 54 | | 9.53 | | |
| | | 6 | 5 320 | **9.96** | 24 | 23.48 |
| | | 9 | | 9.94 | | |
| | | 12 | | 9.92 | | |
| | | 18 | | 9.83 | | |
| | | 24 | | 9.79 | | |
| | | 36 | | 9.74 | | |
| | | 48 | | 9.76 | | |
| | | 54 | | 9.75 | | |

| Operation Mode | Channel | Data rate | Channel Frequency (㎒) | Result (㏈m) | Limit (㏈m) | |
|---|---|---|---|---|---|---|
| | | | | | FCC | IC |
| DFS 11a | Upper Band | 6 | 5 500 | **9.44** | 24 | 23.48 |
| | | 9 | | 9.43 | | |
| | | 12 | | 9.35 | | |
| | | 18 | | 9.37 | | |
| | | 24 | | 9.31 | | |
| | | 36 | | 9.30 | | |
| | | 48 | | 9.28 | | |
| | | 54 | | 9.28 | | |
| | | 6 | 5 580 | **9.35** | 24 | 23.48 |
| | | 9 | | 9.34 | | |
| | | 12 | | 9.31 | | |
| | | 18 | | 9.28 | | |
| | | 24 | | 9.24 | | |
| | | 36 | | 9.18 | | |
| | | 48 | | 9.11 | | |
| | | 54 | | 9.05 | | |
| | | 6 | 5 700 | **9.56** | 24 | 23.48 |
| | | 9 | | 9.37 | | |
| | | 12 | | 9.38 | | |
| | | 18 | | 9.31 | | |
| | | 24 | | 9.29 | | |
| | | 36 | | 9.20 | | |
| | | 48 | | 9.21 | | |
| | | 54 | | 9.18 | | |

## -11n_HT40

| Operation Mode | Channel | Data rate | Channel Frequency (㎒) | Result (㏈m) | Limit (㏈m) | |
|---|---|---|---|---|---|---|
| | | | | | FCC | IC |
| Non DFS 11n_HT40 | Low | MCS0 | 5 190 | 9.53 | 17 | 23 |
| | | MCS1 | | 9.67 | | |
| | | MCS2 | | 9.78 | | |
| | | MCS3 | | 9.98 | | |
| | | MCS4 | | 10.28 | | |
| | | MCS5 | | **10.45** | | |
| | | MCS6 | | 10.32 | | |
| | | MCS7 | | 10.42 | | |
| | High | MCS0 | 5 230 | **11.01** | 17 | 23 |
| | | MCS1 | | 10.94 | | |
| | | MCS2 | | 10.89 | | |
| | | MCS3 | | 10.81 | | |
| | | MCS4 | | 10.67 | | |
| | | MCS5 | | 10.72 | | |
| | | MCS6 | | 10.64 | | |
| | | MCS7 | | 10.66 | | |

| Operation Mode | Channel | Data rate | Channel Frequency (㎒) | Result (㏈m) | Limit (㏈m) | |
|---|---|---|---|---|---|---|
| | | | | | FCC | IC |
| Non DFS 11n_HT40 | Lower Band | MCS0 | 5 270 | **10.55** | 24 | 24 |
| | | MCS1 | | 10.54 | | |
| | | MCS2 | | 10.28 | | |
| | | MCS3 | | 10.22 | | |
| | | MCS4 | | 10.04 | | |
| | | MCS5 | | 10.02 | | |
| | | MCS6 | | 10.06 | | |
| | | MCS7 | | 10.05 | | |
| | | MCS0 | 5 310 | **10.16** | 24 | 24 |
| | | MCS1 | | 9.95 | | |
| | | MCS2 | | 9.88 | | |
| | | MCS3 | | 9.81 | | |
| | | MCS4 | | 9.68 | | |
| | | MCS5 | | 9.62 | | |
| | | MCS6 | | 9.51 | | |
| | | MCS7 | | 9.37 | | |

| Operation Mode | Channel | Data rate | Channel Frequency (㎒) | Result (㏈m) | Limit (㏈m) | |
|---|---|---|---|---|---|---|
| | | | | | FCC | IC |
| DFS 11n_HT40 | Upper Band | MCS0 | 5 510 | **10.07** | 24 | 24 |
| | | MCS1 | | 9.84 | | |
| | | MCS2 | | 9.71 | | |
| | | MCS3 | | 9.64 | | |
| | | MCS4 | | 9.51 | | |
| | | MCS5 | | 9.44 | | |
| | | MCS6 | | 9.35 | | |
| | | MCS7 | | 9.28 | | |
| | | MCS0 | 5 550 | **10.14** | 24 | 24 |
| | | MCS1 | | 10.11 | | |
| | | MCS2 | | 9.92 | | |
| | | MCS3 | | 9.89 | | |
| | | MCS4 | | 9.74 | | |
| | | MCS5 | | 9.68 | | |
| | | MCS6 | | 9.54 | | |
| | | MCS7 | | 9.45 | | |
| | | MCS0 | 5 670 | **8.95** | 24 | 24 |
| | | MCS1 | | 8.68 | | |
| | | MCS2 | | 8.61 | | |
| | | MCS3 | | 8.52 | | |
| | | MCS4 | | 8.40 | | |
| | | MCS5 | | 8.32 | | |
| | | MCS6 | | 8.24 | | |
| | | MCS7 | | 8.14 | | |

# 5. Peak power spectral density

## 5.1. Test setup


## 5.2. Limit

### 5.2.1. FCC 15.407

**(a)(1)**

For the band 5.15-5.25 ㎓ band, the peak power spectral density shall not exceed 4 ㏈m in any 1 ㎒ band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i.

**(a)(2)**

For the band 5.25–5.35 ㎓ and 5.47–5.725 ㎓ bands, the peak power spectral density shall not exceed 11 ㏈m in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i.

### 5.2.2. IC RSS-210

**A9.2(1) Band 5150-5250 MHz**

The e.i.r.p.. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

**A9.2(2) Band 5250-5350 MHz**

The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

**A9.2(3) Band 5600-5650 MHz**

The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

## 5.3. Test procedure

All data rates and modes were investigated for this test. The full data for the worst case data rate are reported in this section.

1. This measurement settings are specified in clause b) of section C of KDB 789033.
2. Set span to encompass the entire emission bandwidth (EBW) of the signal.
3. Set RBW = 1 ㎒
4. Set VBW ≥ 3 ㎒
5. Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
6. Sweep time = auto.
7. Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
8. if transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run”.
9. Trace average at least 100 traces in power averaging (i.e., RMS) mode.
10. Use the peak search function on the spectrum analyzer to find the peak of the spectrum.
11. The result is the PPSD.

## 5.4. Test result

Ambient temperature : (24 ± 2) ℃
Relative humidity : 49 % R.H.

### 5.4.1. Non-DFS Band

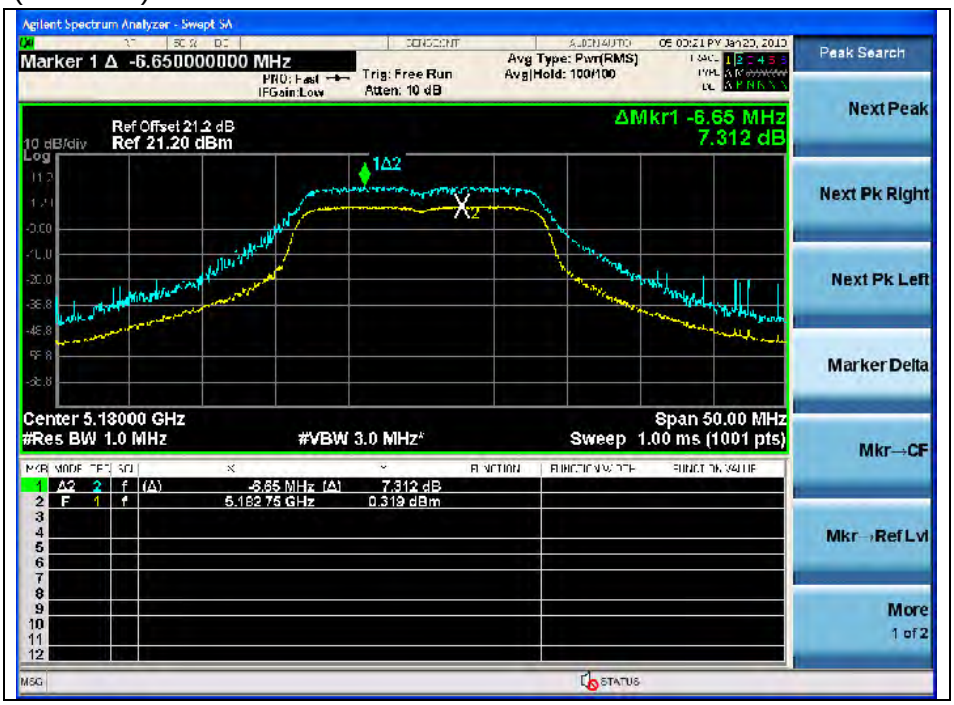
| Operation Mode | Channel | Data Rate (Mbps) | Channel Frequency (㎒) | Peak power spectral density (㏈m) | Limit (㏈m) |
|---|---|---|---|---|---|
| 11a | Low | 6 | 5 180 | 0.319 | 4 |
| | Middle | 6 | 5 220 | 0.354 | |
| | High | 6 | 5 240 | 0.933 | |
| 11n_HT20 | Low | MCS0 | 5 180 | -0.115 | |
| | Middle | MCS0 | 5 220 | 0.528 | |
| | High | MCS0 | 5 240 | 0.858 | |
| 11n_HT40 | Low | MCS0 | 5 190 | -3.672 | |
| | High | MCS0 | 5 230 | -1.564 | |

### 5.4.2. DFS Band

| Operation Mode | Channel | Data Rate (Mbps) | Channel Frequency (㎒) | Peak power spectral density (㏈m) | Limit (㏈m) |
|---|---|---|---|---|---|
| 11a | Lower Band | 6 | 5 260 | 0.829 | 11 |
| | | 6 | 5 300 | 0.228 | |
| | | 6 | 5 320 | 0.423 | |
| | Upper Band | 6 | 5 500 | -0.629 | |
| | | 6 | 5 580 | -0.202 | |
| | | 6 | 5 700 | 1.060 | |
| 11n_HT20 | Lower Band | MCS0 | 5 260 | 0.636 | |
| | | MCS0 | 5 300 | -0.140 | |
| | | MCS0 | 5 320 | 0.252 | |
| | Upper Band | MCS0 | 5 500 | -0.599 | |
| | | MCS0 | 5 580 | -0.484 | |
| | | MCS0 | 5 700 | 0.234 | |
| 11n_HT40 | Lower Band | MCS0 | 5 270 | -2.445 | |
| | | MCS0 | 5 310 | -2.807 | |
| | Upper Band | MCS0 | 5 510 | -3.493 | |
| | | MCS0 | 5 550 | -2.667 | |
| | | MCS0 | 5 670 | -3.271 | |

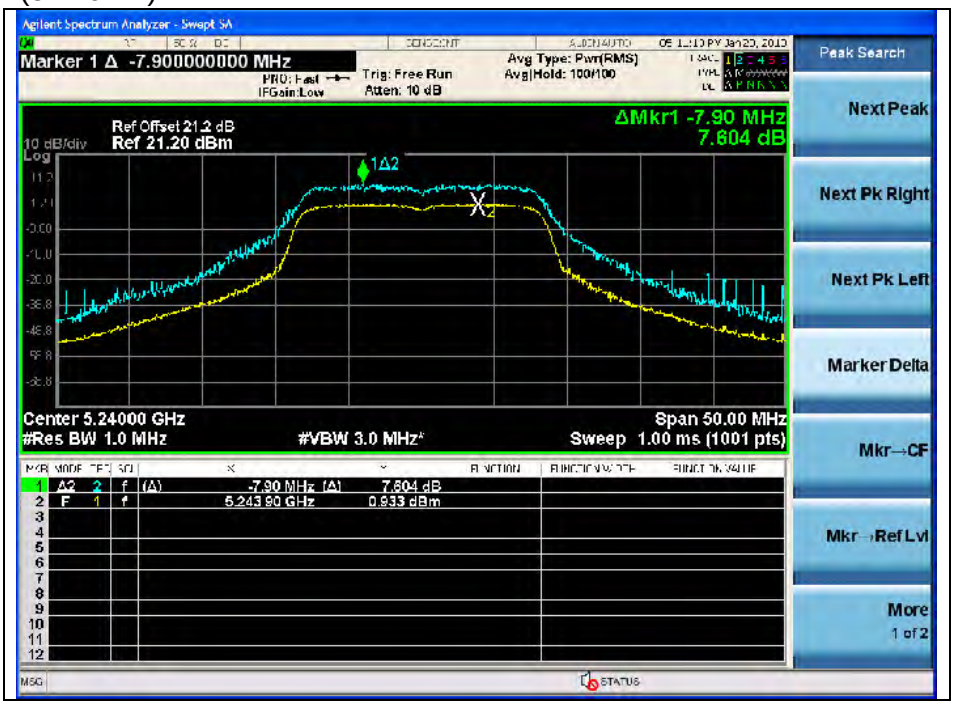
**802.11a (Non-DFS)**

Low Channel (5 180 ㎒)




Middle Channel (5 220 ㎒)

High Channel (5 240 ㎒)

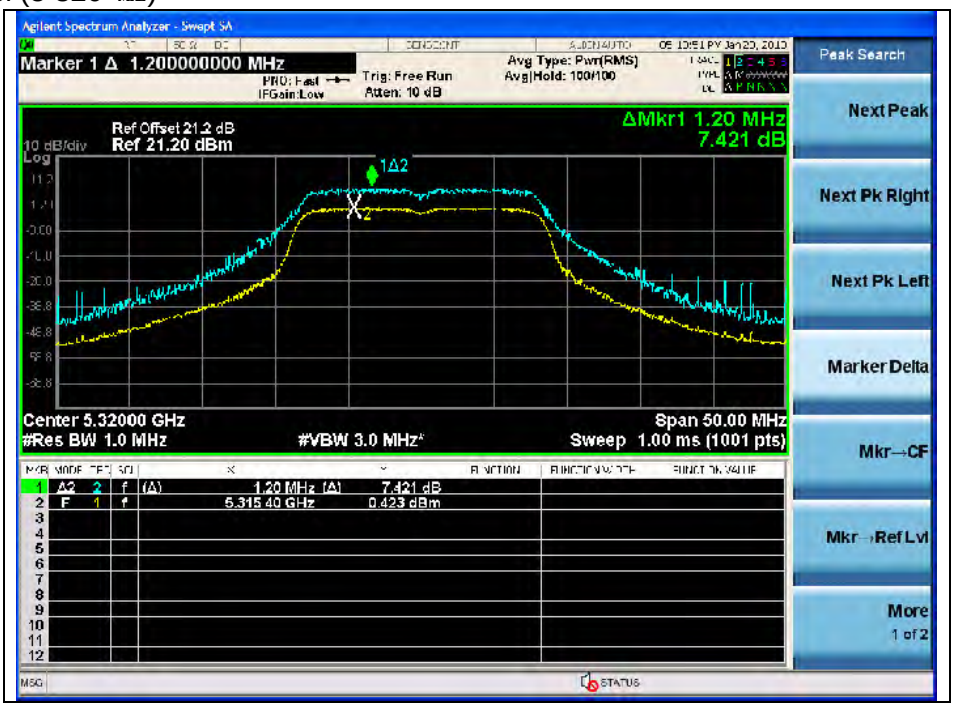



**802.11a (DFS)**

Low Channel (5 260 ㎒)

Middle Channel (5 300 ㎒)


High Channel (5 320 ㎒)

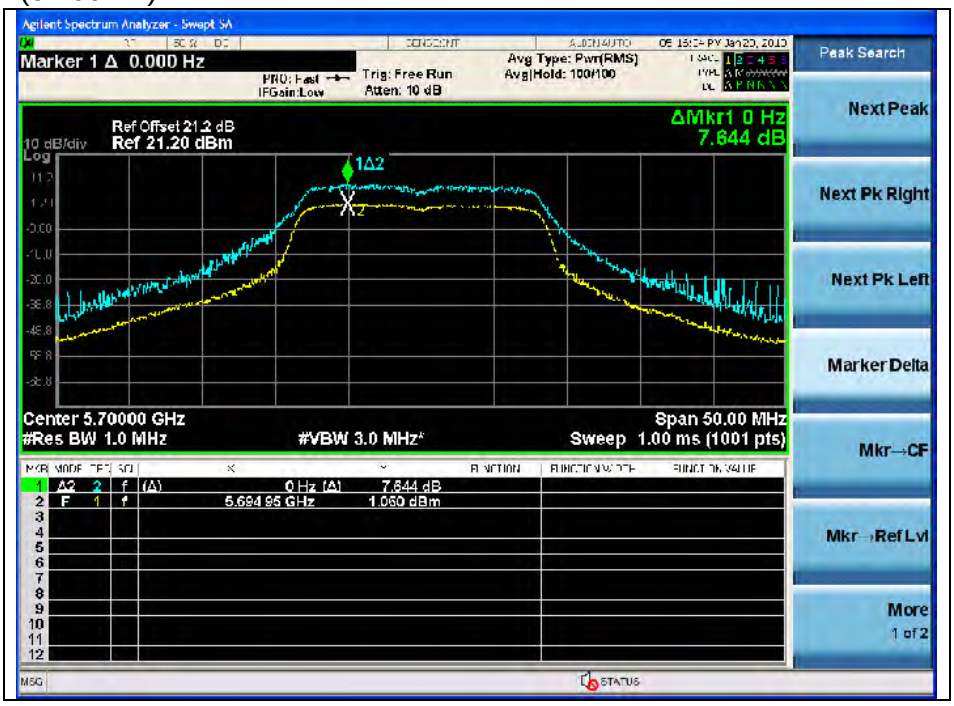


**802.11a (DFS)**

Low Channel (5 500 ㎒)

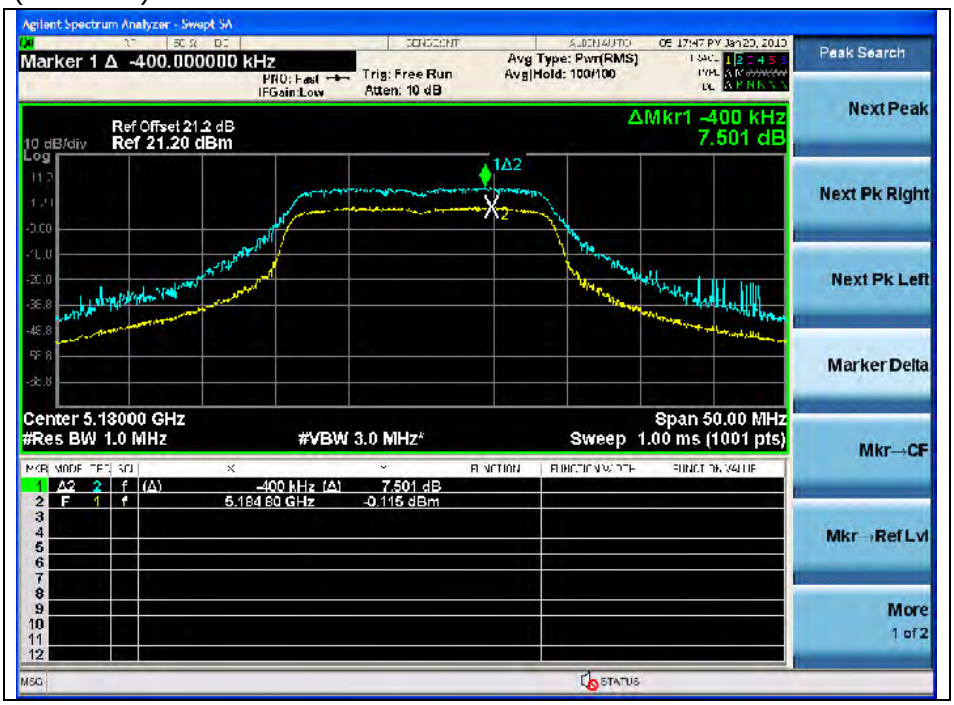

Middle Channel (5 580 ㎒)

High Channel (5 700 ㎒)

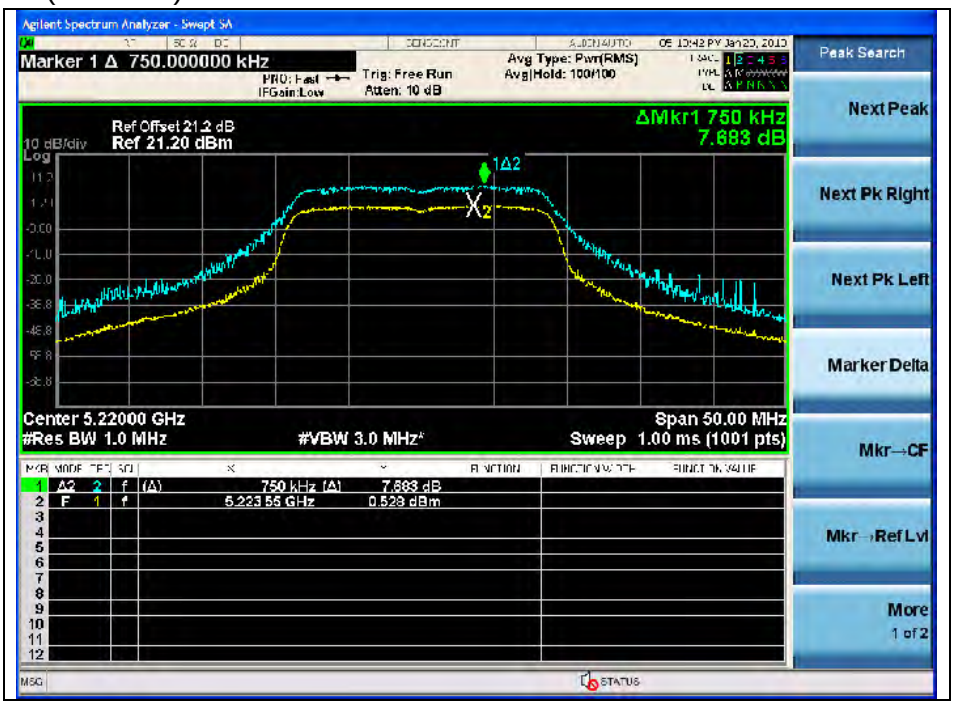


**802.11n-HT20 (Non-DFS)**

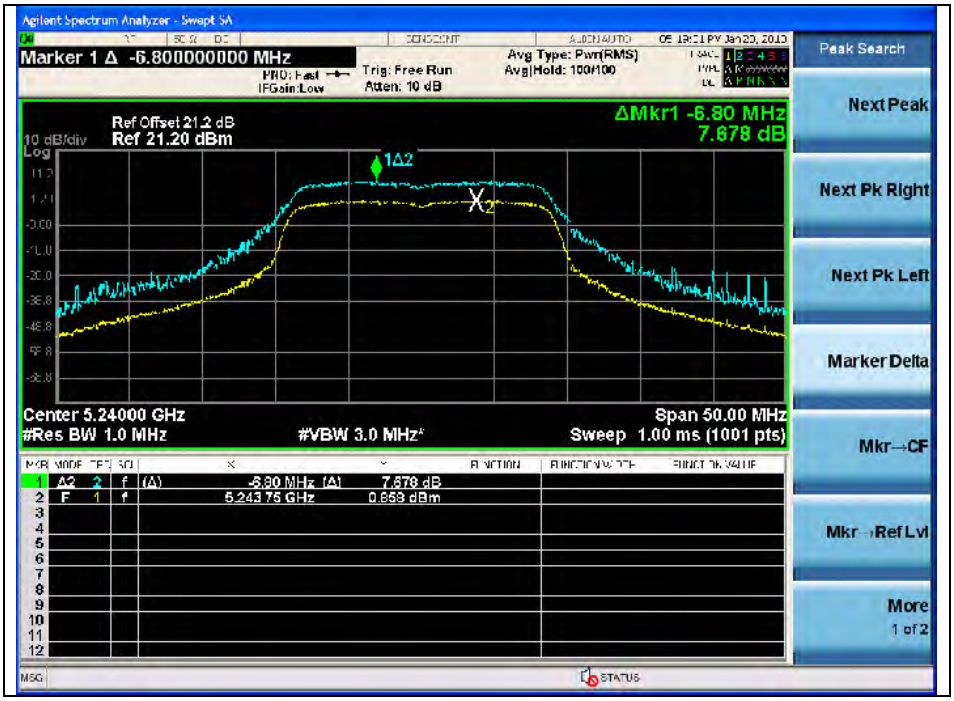
Low Channel (5 180 ㎒)




Middle Channel (5 220 ㎒)

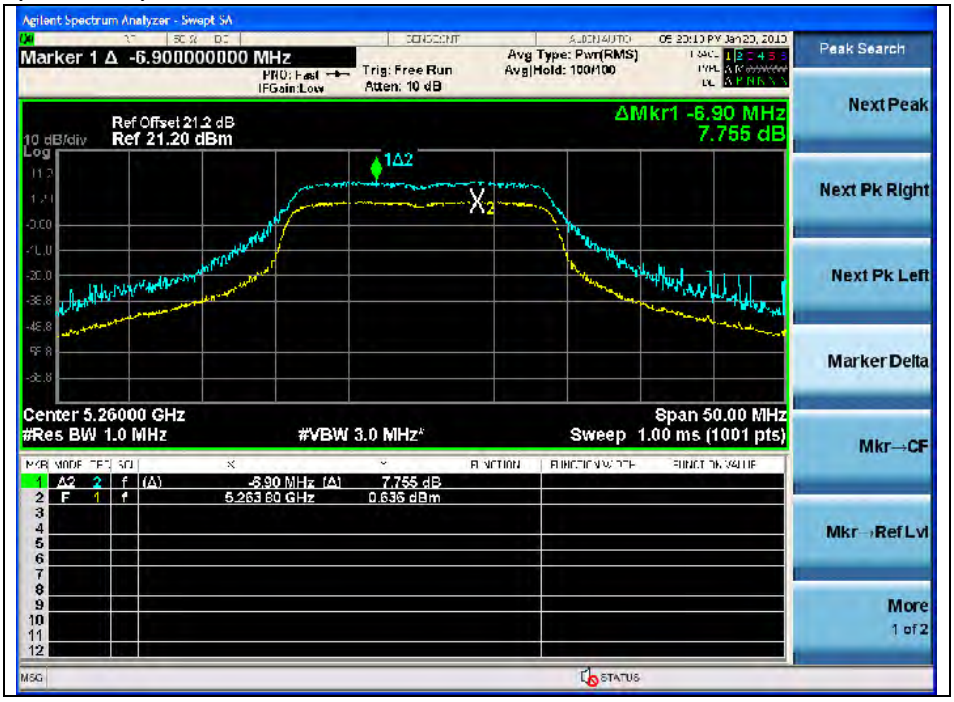



High Channel (5 240 ㎒)

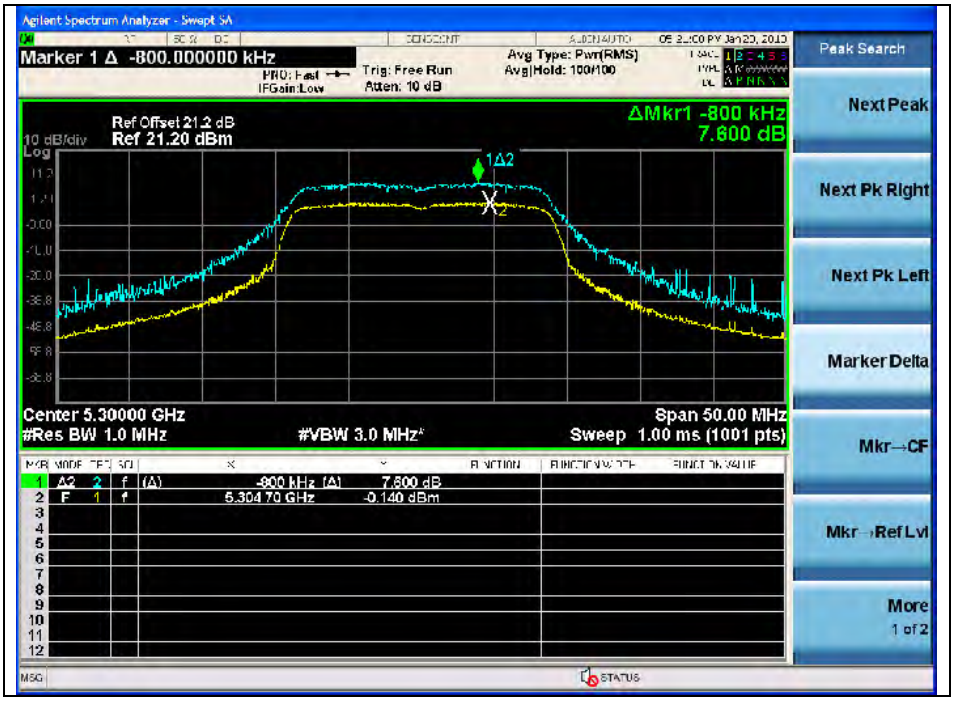



**802.11-HT20 (DFS)**

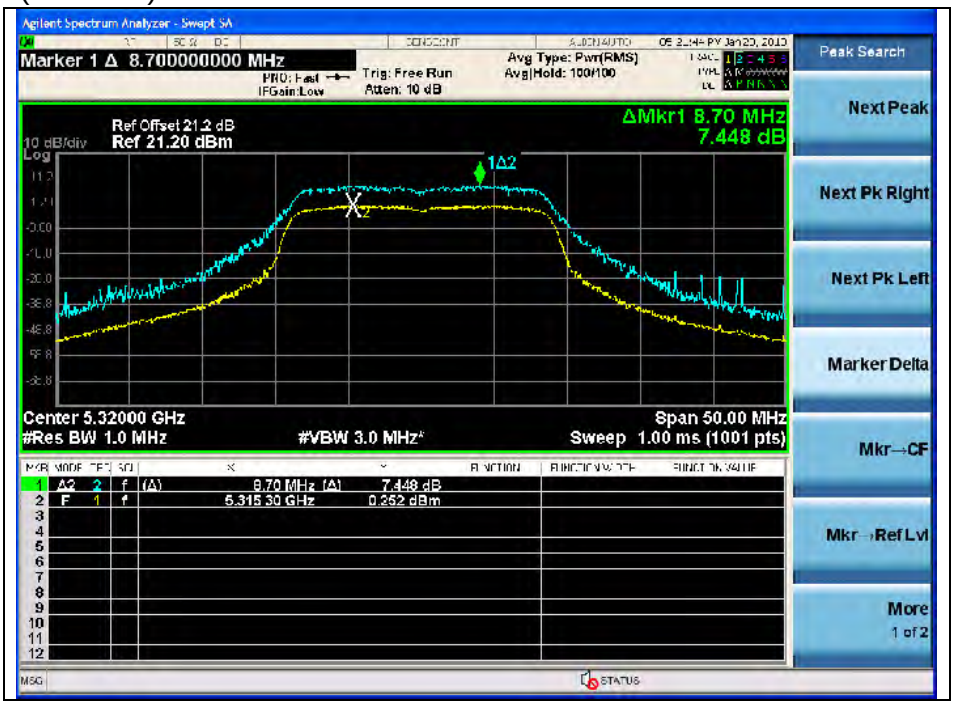
Low Channel (5 260 ㎒)




Middle Channel (5 300 ㎒)




High Channel (5 320 ㎒)



**802.11-HT20 (DFS)**

Low Channel (5 500 ㎒)


Middle Channel (5 580 ㎒)


High Channel (5 700 ㎒)

**802.11n-HT40 (Non-DFS)**

Low Channel (5 190 ㎒)


High Channel (5 230 ㎒)

**802.11-HT40 (DFS)**

Low Channel (5 270 ㎒)


High Channel (5 310 ㎒)

**802.11-HT40 (DFS)**

Low Channel (5 510 ㎒)


Middle Channel (5 550 ㎒)

High Channel (5 670 ㎒)

# 6. Peak excursion

## 6.1. Test setup


## 6.2. Limit

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 ㏈ across any 1 ㎒ bandwidth or the emission bandwidth whichever is less.

## 6.3. Test procedure

All data rates and modes were investigated for this test. The full data for the worst case data rate are reported in this section.

1. This measurement settings are specified in section F of KDB 789033.
2. Set the spectrum analyzer span to view the entire emission bandwidth.
3. Find the maximum of the peak-max-hold spectrum.
4. Set RBW = 1 ㎒.
5. Set VBW ≥ 3 ㎒.
6. Detector = Peak.
7. Trace mode = max-hold.
8. Allow the sweeps to continue until the trace stabilizes.
9. Use the peak search function to find the peak of the spectrum.
10. Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD.

## 6.4. Test result

Ambient temperature : (24 ± 2) ℃
Relative humidity : 49 % R.H.

### 6.4.1. Non-DFS Band

| Operation Mode | Channel | Data Rate (Mbps) | Channel Frequency (㎒) | Peak excursion (㏈) | Limit (㏈) |
|---|---|---|---|---|---|
| 11a | Low | 6 | 5 180 | 7.312 | 13 |
| | Middle | 6 | 5 220 | 7.345 | |
| | High | 6 | 5 240 | 7.604 | |
| 11n_HT20 | Low | MCS0 | 5 180 | 7.501 | |
| | Middle | MCS0 | 5 220 | 7.683 | |
| | High | MCS0 | 5 240 | 7.678 | |
| 11n_HT40 | Low | MCS0 | 5 190 | 8.389 | |
| | High | MCS0 | 5 230 | 7.785 | |

### 6.4.2. DFS Band

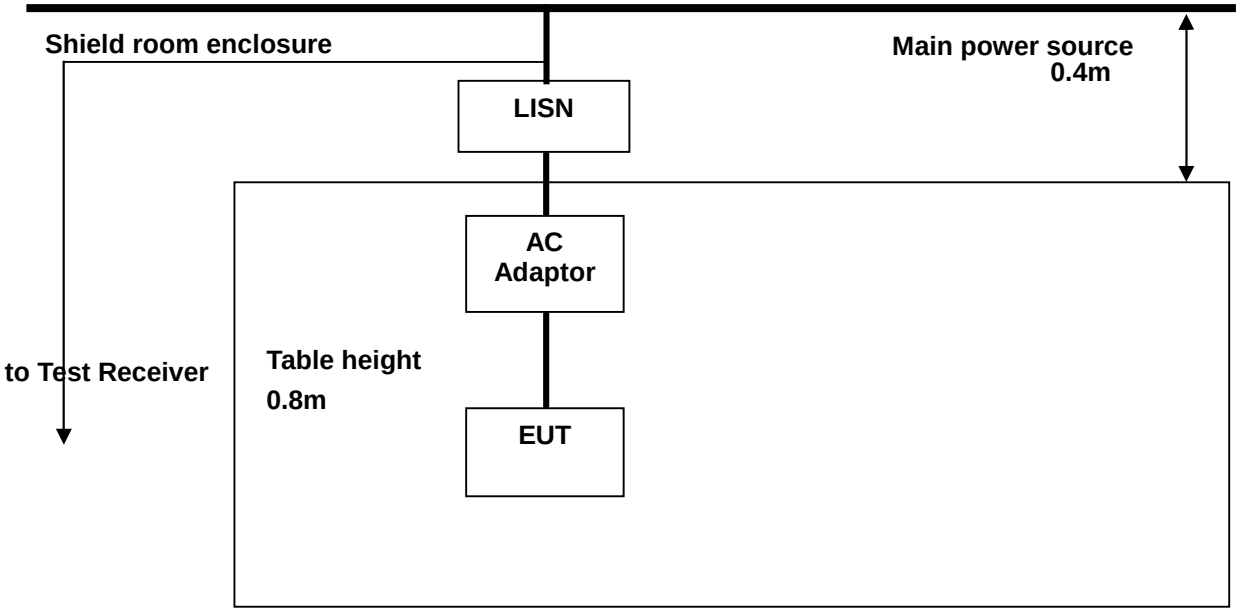
| Operation Mode | Channel | Data Rate (Mbps) | Channel Frequency (㎒) | Peak excursion (㏈) | Limit (㏈) |
|---|---|---|---|---|---|
| 11a | Lower Band | 6 | 5 260 | 7.604 | 13 |
| | | 6 | 5 300 | 7.460 | |
| | | 6 | 5 320 | 7.421 | |
| | Upper Band | 6 | 5 500 | 7.711 | |
| | | 6 | 5 580 | 7.589 | |
| | | 6 | 5 700 | 7.644 | |
| 11n_HT20 | Lower Band | MCS0 | 5 260 | 7.755 | |
| | | MCS0 | 5 300 | 7.600 | |
| | | MCS0 | 5 320 | 7.448 | |
| | Upper Band | MCS0 | 5 500 | 7.811 | |
| | | MCS0 | 5 580 | 7.521 | |
| | | MCS0 | 5 700 | 7.663 | |
| 11n_HT40 | Lower Band | MCS0 | 5 270 | 7.695 | |
| | | MCS0 | 5 310 | 7.659 | |
| | Upper Band | MCS0 | 5 510 | 7.781 | |
| | | MCS0 | 5 550 | 7.724 | |
| | | MCS0 | 5 670 | 7.928 | |

**Captured images**

**Please refer to the PPSD captured image as above.**

# 7. Transmitter AC Power Line Conducted Emission

## 7.1. Test Setup




## 7.2. Limit

According to §15.207(a) for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 ㎑ to 30 ㎒, shall not exceed the limits in the following table, as measured using a 50 uH/50 ohm line impedance stabilization network(LISN).
Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequency ranges.

| Frequency of Emission (㎒) | Conducted limit (dB㎶) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15 – 0.50 | 66 - 56* | 56 - 46* |
| 0.50 – 5.00 | 56 | 46 |
| 5.00 – 30.0 | 60 | 50 |

* Decreases with the logarithm of the frequency.

## 7.3. Test Procedures

All data rates and modes were investigated for this test. The full data for the worst case data rate are reported in this section.
AC line conducted emissions from the EUT were measured according to the dictates of ANSI C63.4-2003

1. The test procedure is performed in a 6.5m × 3.6m× 3.6m (L × W × H) shielded room. The EUT along with its peripherals were placed on a 1.0 m(W)× 1.5 m(L) and 0.8 m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.
2. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room.
3. The excess power cable between the EUT and the LISN was bundled. All connecting cables of EUT were moved to find the maximum emission.

## 7.4. Test Results (Worst case configuration_ 11n_HT40 mode, MCS0)

The following table shows the highest levels of conducted emissions on both phase of Hot and Neutral line.

Ambient temperature : (24 ± 2) ℃
Relative humidity : 47 % R.H.

Frequency range : 0.15 ㎒ – 30 ㎒
Measured Bandwidth : 9 ㎑

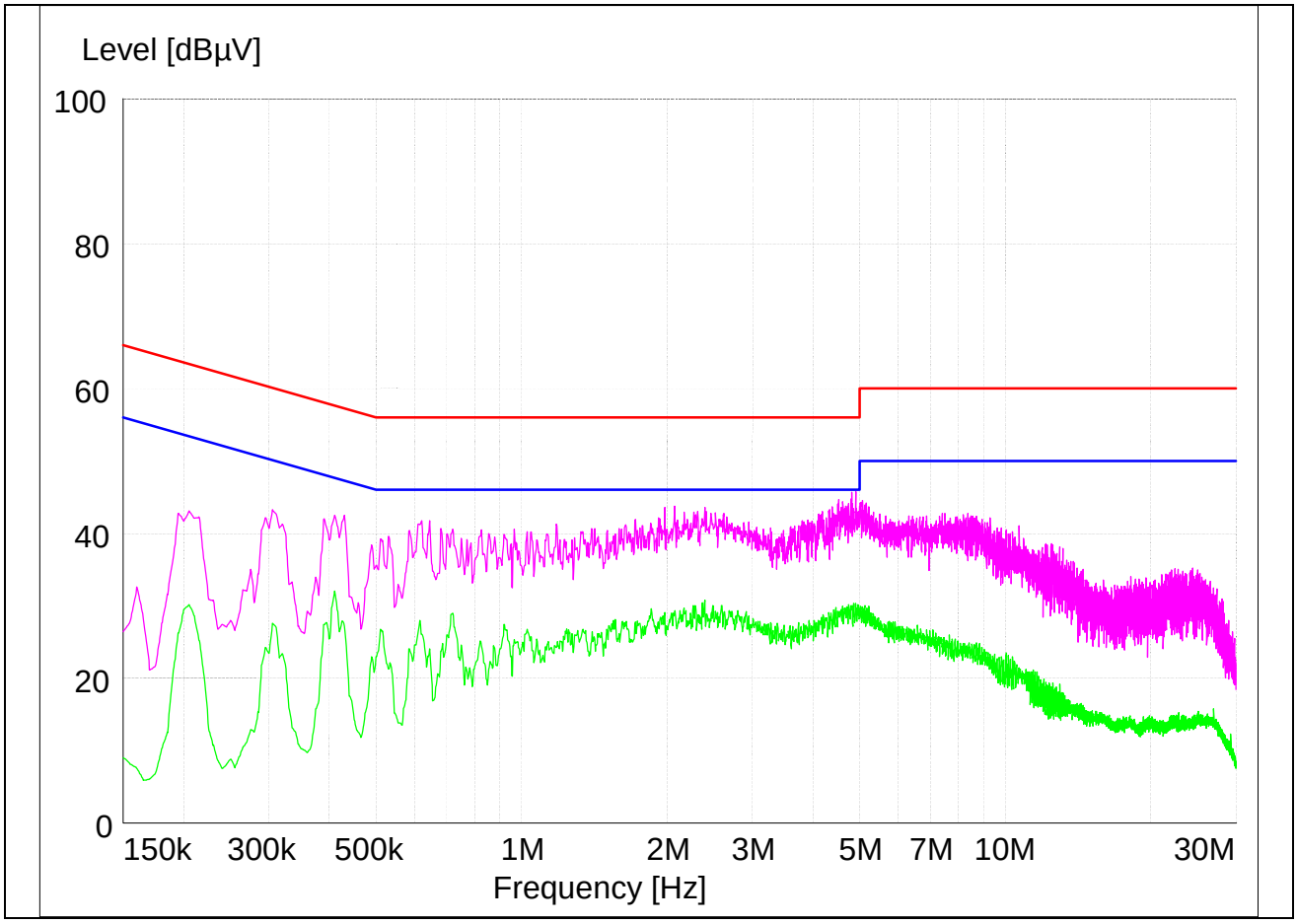
| FREQ. | LEVEL(dB㎶) | | LINE | LIMIT(dB㎶) | | MARGIN(dB) | |
|---|---|---|---|---|---|---|---|
| (㎒) | Q-Peak | Average | | Q-Peak | Average | Q-Peak | Average |
| 0.21 | 40.36 | 28.66 | N | 63.41 | 53.41 | 23.05 | 24.75 |
| 0.31 | 39.06 | 25.36 | N | 60.11 | 50.11 | 21.05 | 24.75 |
| 0.41 | 39.22 | 29.32 | N | 57.65 | 47.65 | 18.43 | 18.33 |
| 0.72 | 35.25 | 26.95 | N | 56.00 | 46.00 | 20.75 | 19.05 |
| 1.88 | 34.57 | 27.37 | N | 56.00 | 46.00 | 21.43 | 18.63 |
| 4.64 | 33.86 | 26.66 | N | 56.00 | 46.00 | 22.14 | 19.34 |
| 0.21 | 40.68 | 30.88 | H | 63.41 | 53.41 | 22.73 | 22.53 |
| 0.31 | 39.38 | 28.48 | H | 60.11 | 50.11 | 20.73 | 21.63 |
| 0.41 | 40.04 | 32.64 | H | 57.65 | 47.65 | 17.61 | 15.01 |
| 2.39 | 37.77 | 30.87 | H | 56.00 | 46.00 | 18.23 | 15.13 |
| 4.82 | 38.68 | 30.08 | H | 56.00 | 46.00 | 17.32 | 15.92 |
| 4.91 | 38.88 | 30.18 | H | 56.00 | 46.00 | 17.12 | 15.82 |

Note ;

1. Line ( H ): Hot, Line ( N ): Neutral
2. All modes of operation were investigated and the worst-case emissions are reported using 11n_HT40 MCS0
3. The limit for Class B device(s) from 150 ㎑ to 30 ㎒ are specified in Section of the Title 47 CFR.
4. Traces shown in plot mad using a peak detector and average detector
5. Deviations to the Specifications: None.

**Plot of Conducted Power line**

Test mode : (Hot)



Test mode : (Neutral)