5.2.5. Transmitter Maximum Conducted Output Power

Test Summary:

Test Engineers:	Nick Steele & Georgios Vrezas	**Test Dates:**	25 July 2014 to 17 August 2014
Test Sample IMEI:	352025060005387		

FCC Reference:	Part 15.407(a)(1)(iv)
Test Method Used:	As detailed in KDB 789033 D02 Section II.E.2.b) and II.E.2.d)

Environmental Conditions:

Temperature (°C):	22 to 25
Relative Humidity (%):	39 to 45

Note(s):

1. For conducted power tests where the duty cycle is >98%, the measurements were performed using a signal analyser in accordance with FCC KDB 789033 II.E.2.b) Method SA-1. Where the duty cycle is <98%, the measurements were performed in accordance with FCC KDB 789033 II.E.2.d) Method SA-2.
2. Measurements were performed on the bottom, middle and top channels. The customer declared the following data rates to be used for all measurements as:
    - 802.11a – BPSK / 6 Mbps
    - 802.11n HT20 SISO – BPSK / 6.5 Mbps / MCS0
    - 802.11n HT40 SISO – BPSK / 13.5 Mbps / MCS0
    - 802.11n HT20 MIMO – BPSK / 6.5 Mbps / MCS0
    - 802.11n HT40 MIMO – BPSK / 13.5 Mbps / MCS0
3. For 802.11a, power was measured on both ports, Port 1 produced the highest power and was therefore deemed worst case. Results for Port 1 are recorded in the tables below.
4. For 802.11n the EUT can transmit from both antennas, therefore conducted measurements were performed on both ports. For SISO, Port 1 produced the highest power and was therefore deemed worst case. Results for Port 1 are recorded in the tables below. For MIMO both ports are recorded in the tables below.
5. For 802.11n MIMO mode, conducted power was measured on both ports and then combined using the measure-and-sum method stated in FCC KDB 662911.
6. For 802.11a and 802.11n SISO modes, the EUT antenna gain is <6 dBi.
7. For 802.11n MIMO mode, the data stream is correlated as it is single stream with CDD on. The directional antenna gain has been calculated in accordance with KDB 662911 D01 Section F)2)f)(ii). The EUT antenna has a gain of 0.0 dBi for Port 1 and 3.1 dBi for Port 2, in the frequency range 5.15 GHz to 5.25 GHz.

$$\text{Directional Gain} = 10\log\left[\frac{\sum_{j=1}^{N_{SS}}\left(\sum_{k=1}^{N_{ANT}} g_{j,k}\right)^2}{N_{ANT}}\right]$$

the equation above gives the following result:

$$\text{Directional Gain} = 10\log\left[\frac{\left(10^{\frac{0.0}{20}} + 10^{\frac{3.1}{20}}\right)^2}{2}\right] = 4.7\ dBi$$

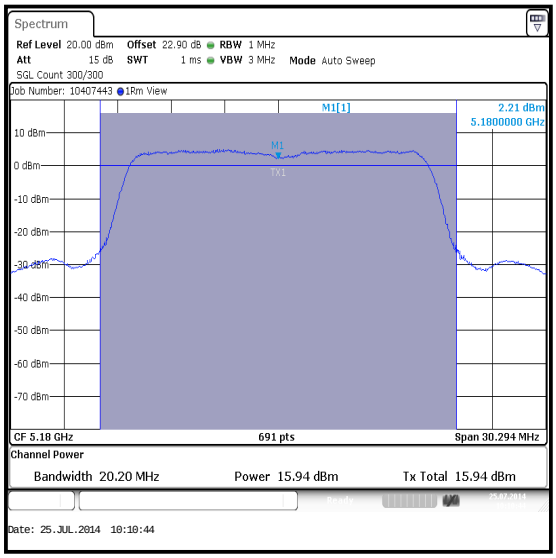
As the calculated directional gain is less than 6 dBi, the limit remains unchanged.

8. For data rates where the EUT was transmitting at <98% duty cycle, the calculated duty cycle in section 5.2.4 was added to the measured power in order to compute the average power during the actual transmission time.
9. The signal analyser was connected to the RF port on the EUT using suitable attenuation and RF cable. An RF level offset was entered on the signal analyser to compensate for the loss of the attenuator and RF cable.
10. The Part 15.407(a)(1)(iv) limit shall not exceed 250 mW (24.0 dBm).

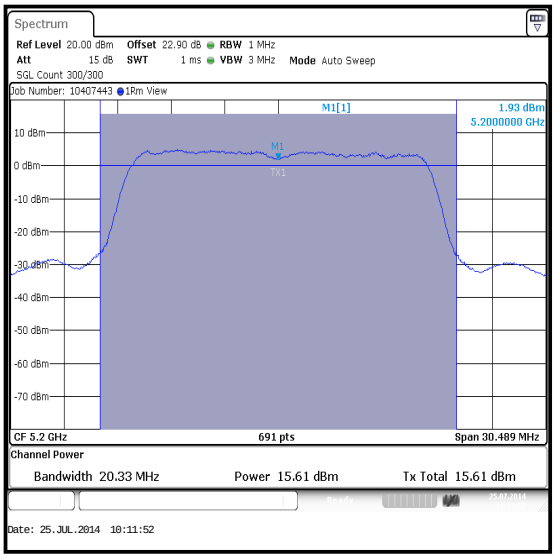
Transmitter Maximum Conducted Output Power (5.15-5.25 GHz band) (continued)

Results: 802.11a / 20 MHz / BPSK / 6 Mbps / Port 1

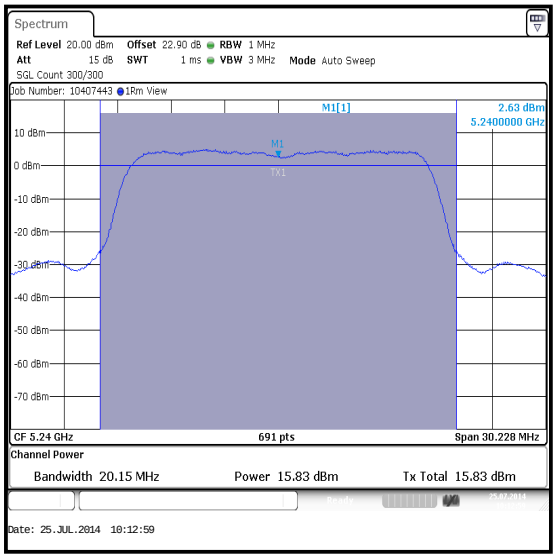
Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5180	15.9	24.0	8.1	Complied
Middle	5200	15.6	24.0	8.4	Complied
Top	5240	15.8	24.0	8.2	Complied



Bottom Channel



Middle Channel

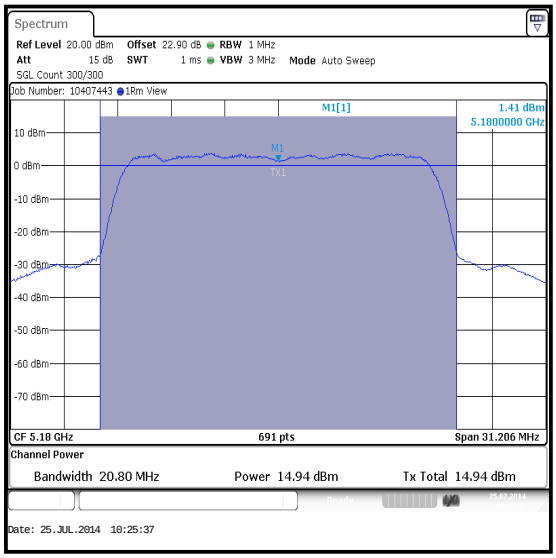


Top Channel

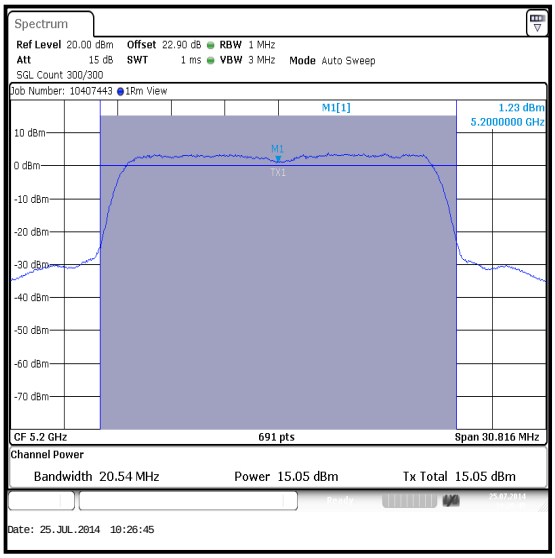
Transmitter Maximum Conducted Output Power (5.15-5.25 GHz band) (continued)

Results: 802.11n / 20 MHz / BPSK / MCS0 / SISO / Port 1

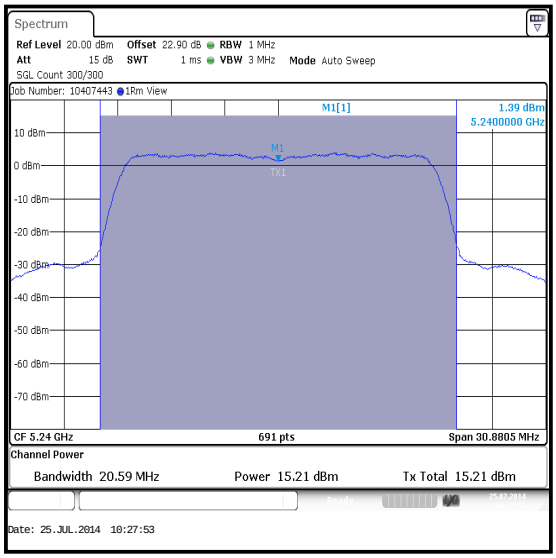
Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5180	14.9	24.0	9.1	Complied
Middle	5200	15.1	24.0	8.9	Complied
Top	5240	15.2	24.0	8.8	Complied



Bottom Channel



Middle Channel

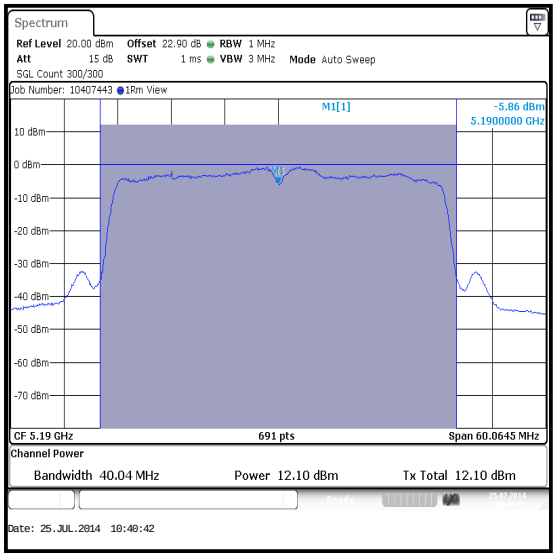


Top Channel

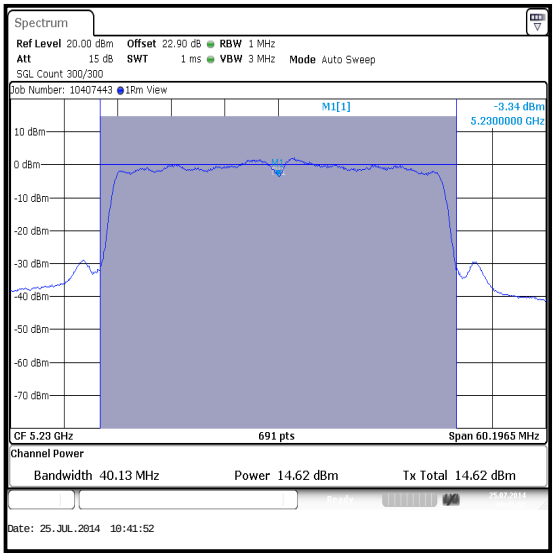
Transmitter Maximum Conducted Output Power (5.15-5.25 GHz band) (continued)

Results: 802.11n / 40 MHz / BPSK / MCS0 / SISO / Port 1

Channel	Conducted Power (dBm)	Duty Cycle Correction (dB)	Corrected Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
Bottom	12.1	0.1	12.2	24.0	11.8	Complied
Top	14.6	0.1	14.7	24.0	9.3	Complied



Bottom Channel



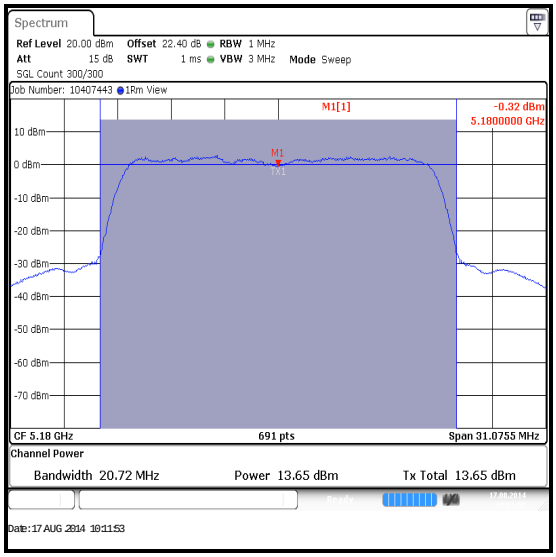
Top Channel

Transmitter Maximum Conducted Output Power (5.15-5.25 GHz band) (continued)

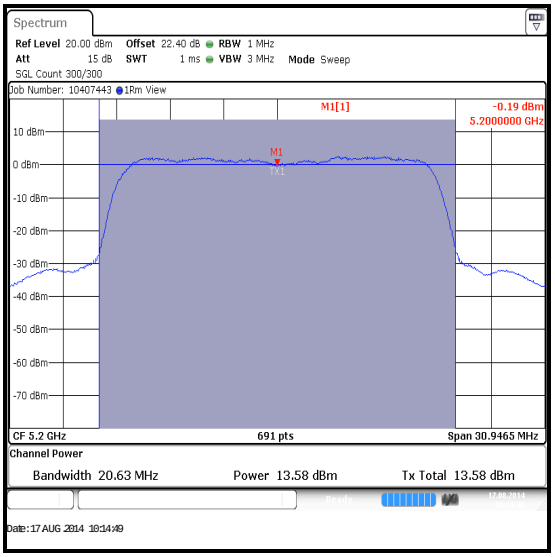
Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO

Channel	Frequency (MHz)	Conducted Power Port 1 (dBm)	Conducted Power Port 2 (dBm)	Combined Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5180	13.7	12.7	16.2	24.0	7.8	Complied
Middle	5200	13.6	12.6	16.1	24.0	7.9	Complied
Top	5240	13.5	12.7	16.1	24.0	7.9	Complied

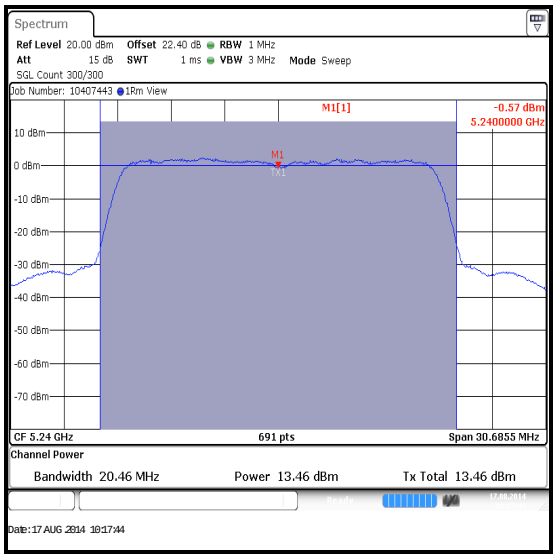
Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / Port 1



Bottom Channel



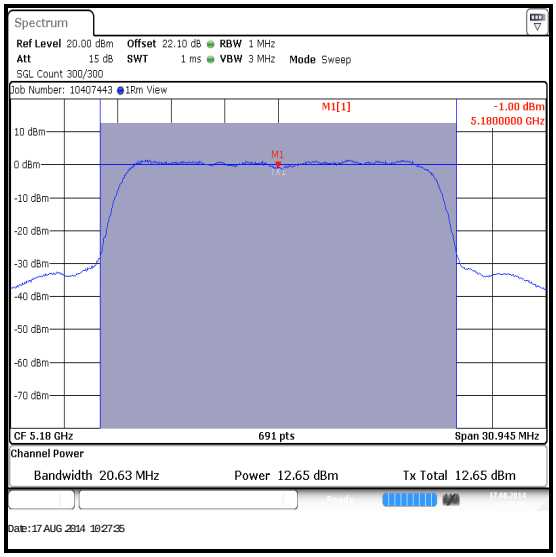
Middle Channel



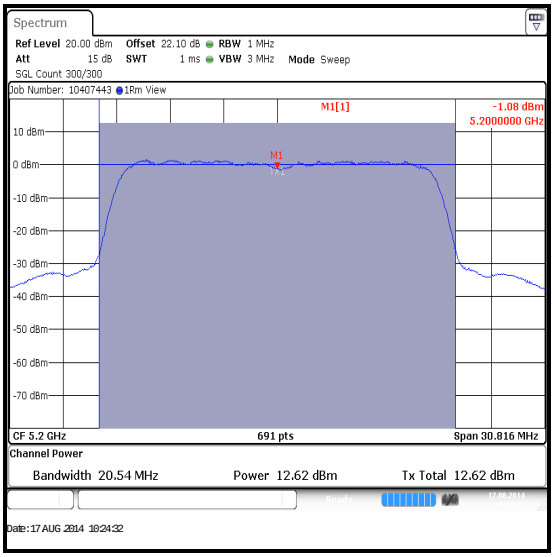
Top Channel

Transmitter Maximum Conducted Output Power (5.15-5.25 GHz band) (continued)

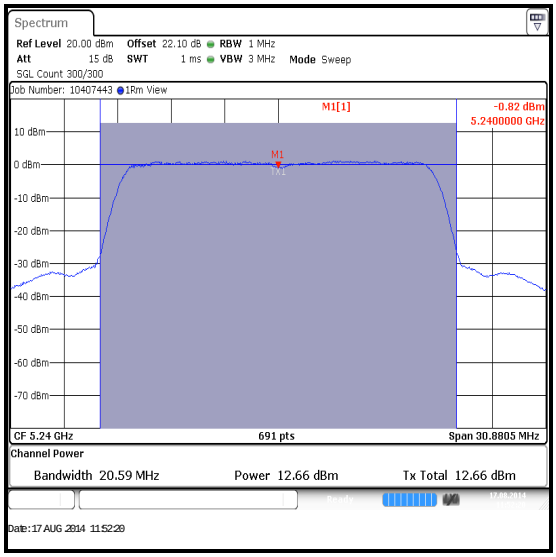
Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / Port 2



Bottom Channel



Middle Channel



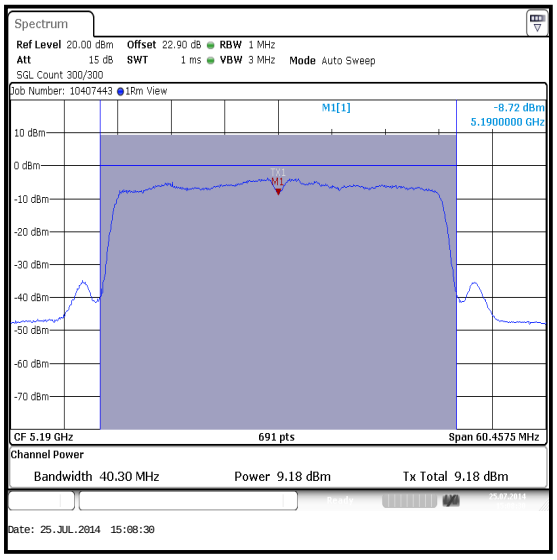
Top Channel

Transmitter Maximum Conducted Output Power (5.15-5.25 GHz band) (continued)

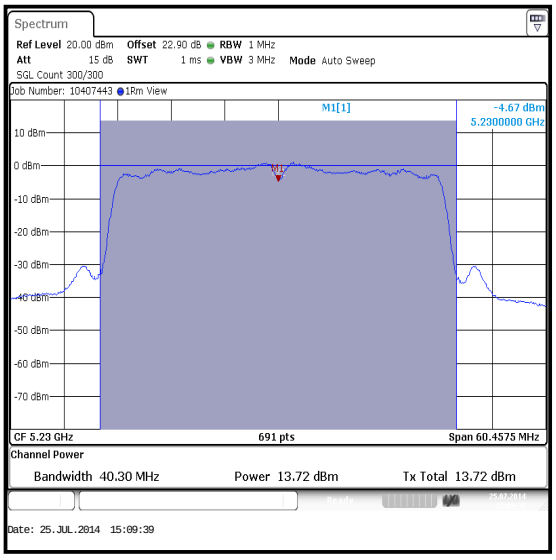
Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO

Channel	Frequency (MHz)	Conducted Power Port 1 (dBm)	Conducted Power Port 2 (dBm)	Combined Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5190	9.2	7.1	11.2	24.0	12.8	Complied
Top	5230	13.7	12.1	16.0	24.0	8.0	Complied

Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / Port 1

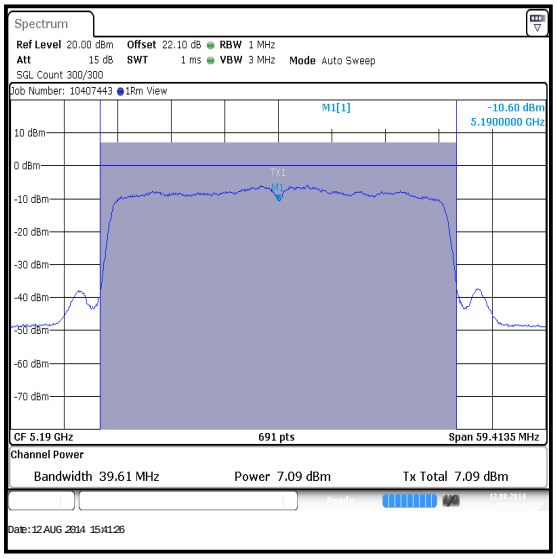


Bottom Channel

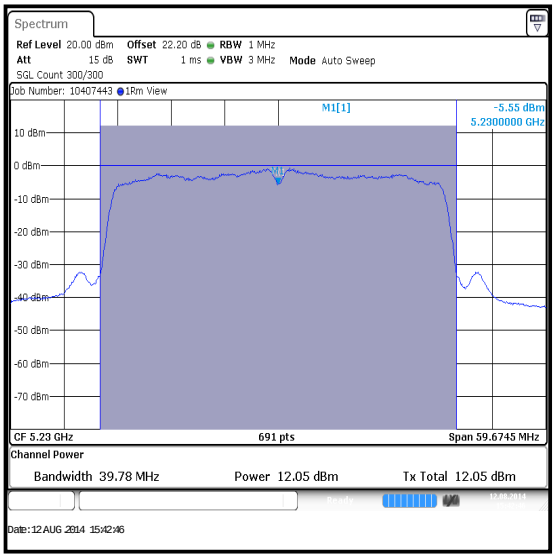


Top Channel

Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / Port 2



Bottom Channel



Top Channel

Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands)

Test Summary:

Test Engineers:	Nick Steele & Georgios Vrezas	**Test Dates:**	25 July 2014 to 12 August 2014
Test Sample IMEI:	352025060005387		

FCC Reference:	Part 15.407(a)(2)
Test Method Used:	As detailed in KDB 789033 D02 Section II.E.2.b) and II.E.2.d)

Environmental Conditions:

Temperature (°C):	22 to 25
Relative Humidity (%):	39 to 45

Note(s):

1. The FCC Part 15.407(a)(2) limit is the lesser of 250 mW (24.0 dBm) or 11 dBm + 10 $\log_{10}$ B, where B is the previously measured 26 dB emission bandwidth in MHz. The limit for each channel was calculated as below:

5.25-5.35 GHz band

802.11a 20 MHz channel width / Bottom channel = *11 dBm + 10 $\log_{10}$ 20.413 = 24.1 dBm*
802.11a 20 MHz channel width / Middle channel = *11 dBm + 10 $\log_{10}$ 20.240 = 24.1 dBm*
802.11a 20 MHz channel width / Top channel = *11 dBm + 10 $\log_{10}$ 20.370 = 24.1 dBm*
802.11n 20 MHz channel width SISO / Bottom channel = *11 dBm + 10 $\log_{10}$ 20.630 = 24.1 dBm*
802.11n 20 MHz channel width SISO/ Middle channel = *11 dBm + 10 $\log_{10}$ 20.630 = 24.1 dBm*
802.11n 20 MHz channel width SISO / Top channel = *11 dBm + 10 $\log_{10}$ 20.544 = 24.1 dBm*
802.11n 40 MHz channel width SISO / Bottom channel = *11 dBm + 10 $\log_{10}$ 40.043 = 27.0 dBm*
802.11n 40 MHz channel width SISO / Top channel = *11 dBm + 10 $\log_{10}$ 40.218 = 27.0 dBm*
802.11n 20 MHz channel width MIMO / Bottom channel = *11 dBm + 10 $\log_{10}$ 20.456 = 24.1 dBm*
802.11n 20 MHz channel width MIMO / Middle channel = *11 dBm + 10 $\log_{10}$ 20.587 = 24.1 dBm*
802.11n 20 MHz channel width MIMO / Top channel = *11 dBm + 10 $\log_{10}$ 20.500 = 24.1 dBm*
802.11n 40 MHz channel width MIMO / Bottom channel = *11 dBm + 10 $\log_{10}$ 40.218 = 27.0 dBm*
802.11n 40 MHz channel width MIMO / Top channel = *11 dBm + 10 $\log_{10}$ 40.391 = 27.1 dBm*

5.47-5.725 GHz band

802.11a 20 MHz channel width / Bottom channel = *11 dBm + 10 $\log_{10}$ 20.240 = 24.1 dBm*
802.11a 20 MHz channel width / Middle channel = *11 dBm + 10 $\log_{10}$ 20.196 = 24.1 dBm*
802.11a 20 MHz channel width / Top channel = *11 dBm + 10 $\log_{10}$ 20.283 = 24.1 dBm*
802.11n 20 MHz channel width SISO / Bottom channel = *11 dBm + 10 $\log_{10}$ 20.543 = 24.1 dBm*
802.11n 20 MHz channel width SISO / Middle channel = *11 dBm + 10 $\log_{10}$ 20.456 = 24.1 dBm*
802.11n 20 MHz channel width SISO / Top channel = *11 dBm + 10 $\log_{10}$ 20.413 = 24.1 dBm*
802.11n 40 MHz channel width SISO / Bottom channel = *11 dBm + 10 $\log_{10}$ 40.131 = 27.0 dBm*
802.11n 40 MHz channel width SISO / Middle channel = *11 dBm + 10 $\log_{10}$ 40.043 = 27.0 dBm*
802.11n 40 MHz channel width SISO / Top channel = *11 dBm + 10 $\log_{10}$ 40.131 = 27.0 dBm*
802.11n 20 MHz channel width MIMO / Bottom channel = *11 dBm + 10 $\log_{10}$ 20.543 = 24.1 dBm*
802.11n 20 MHz channel width MIMO / Middle channel = *11 dBm + 10 $\log_{10}$ 20.500 = 24.1 dBm*
802.11n 20 MHz channel width MIMO / Top channel = *11 dBm + 10 $\log_{10}$ 20.500 = 24.1 dBm*
802.11n 40 MHz channel width MIMO / Bottom channel = *11 dBm + 10 $\log_{10}$ 40.304 = 27.1 dBm*
802.11n 40 MHz channel width MIMO / Middle channel = *11 dBm + 10 $\log_{10}$ 40.218 = 27.0 dBm*
802.11n 40 MHz channel width MIMO / Top channel = *11 dBm + 10 $\log_{10}$ 40.218 = 27.0 dBm*

The lesser of the two limits is the fixed limit of 250 mW (24.0 dBm). This was applied to the results.

2. For 802.11n MIMO mode, the data stream is correlated as it is single stream with CDD on. The directional antenna gain has been calculated in accordance with KDB 662911 D01 Section F)2)f)(ii). The EUT antenna has a gain of 0.8 dBi for Port 1 and 3.3 dBi for Port 2, in the frequency range 5.25 GHz to 5.35 GHz.

$$\text{Directional Gain} = 10\log\left[\frac{\sum_{j=1}^{N_{SS}}\left(\sum_{k=1}^{N_{ANT}} g_{j,k}\right)^2}{N_{ANT}}\right]$$

the equation above gives the following result:

$$\text{Directional Gain} = 10\log\left[\frac{\left(10^{\frac{0.8}{20}} + 10^{\frac{3.3}{20}}\right)^2}{2}\right] = 5.1\ dBi$$

3. The EUT antenna has a gain of 2.4 dBi for Port 1 and 4.3 dBi for Port 2, in the frequency range 5.47 GHz to 5.725 GHz.

$$\text{Directional Gain} = 10\log\left[\frac{\sum_{j=1}^{N_{SS}}\left(\sum_{k=1}^{N_{ANT}} g_{j,k}\right)^2}{N_{ANT}}\right]$$

the equation above gives the following result:

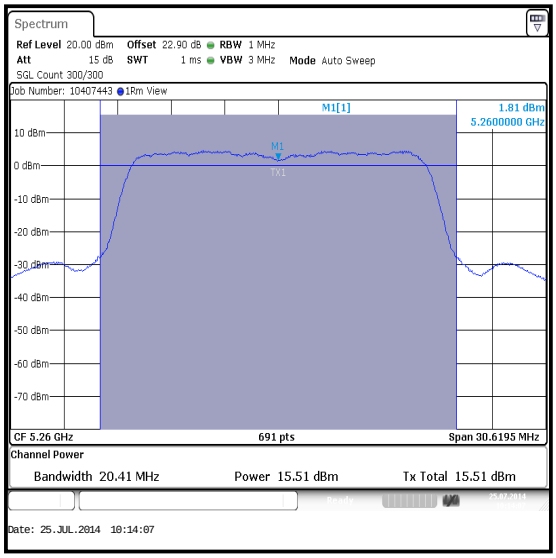
$$\text{Directional Gain} = 10\log\left[\frac{\left(10^{\frac{2.4}{20}} + 10^{\frac{4.3}{20}}\right)^2}{2}\right] = 6.4\ dBi$$

4. For 802.11n MIMO, in the 5.47 to 5.725 GHz band, the EUT antenna has a combined gain of 6.4 dBi. In accordance with 15.407(a)(2), the limit was reduced by the amount in dB the antenna gain exceeds 6 dBi. Therefore the limit of 24 dBm has been reduced by 0.4 dB to 23.6 dBm.

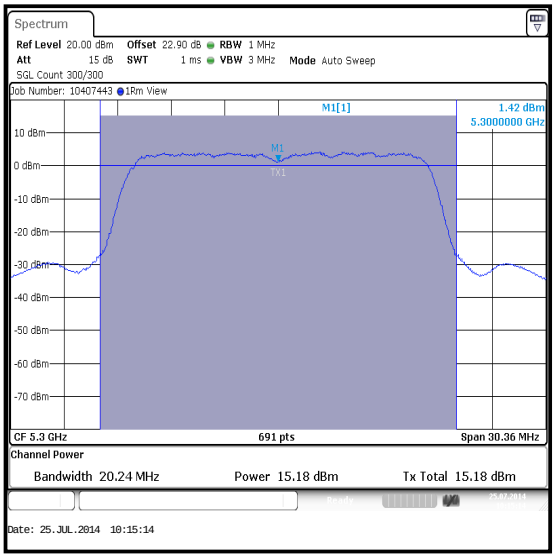
Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11a / 20 MHz / BPSK / 6 Mbps / 5.25-5.35 GHz band / Port 1

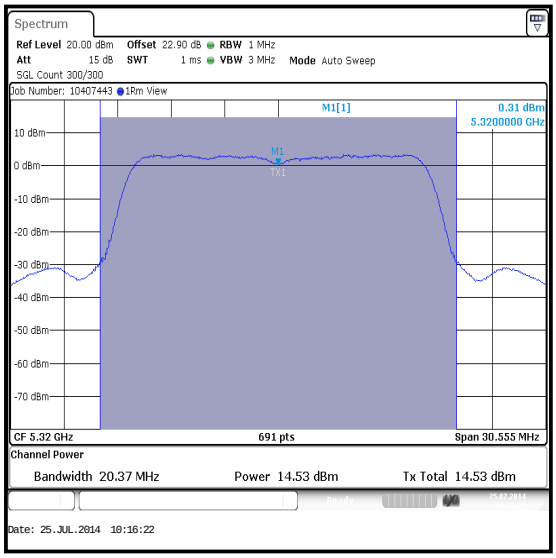
Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5260	15.5	24.0	8.5	Complied
Middle	5300	15.2	24.0	8.8	Complied
Top	5320	14.5	24.0	9.5	Complied



Bottom Channel



Middle Channel

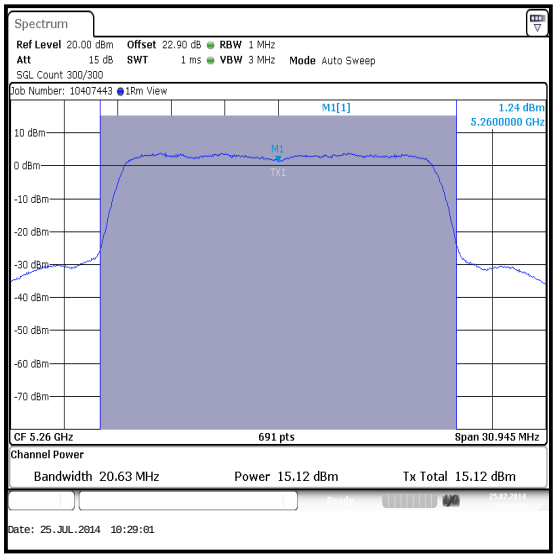


Top Channel

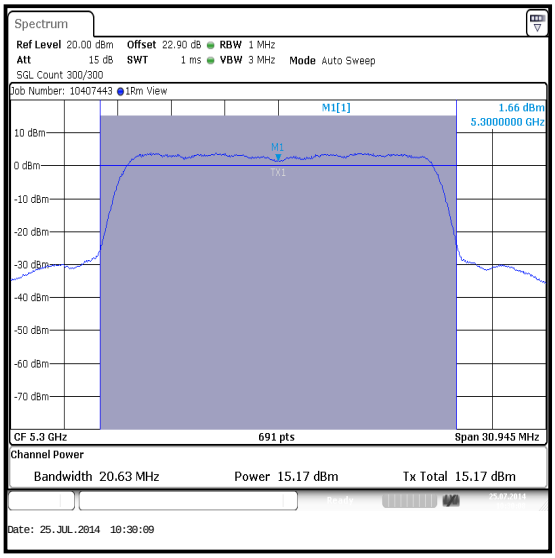
Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11n / 20 MHz / BPSK / MCS0 / SISO / 5.25-5.35 GHz band / Port 1

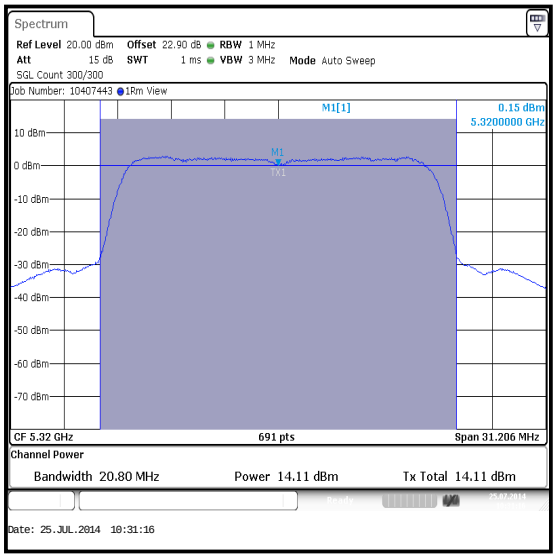
Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5260	15.1	24.0	8.9	Complied
Middle	5300	15.2	24.0	8.8	Complied
Top	5320	14.1	24.0	9.9	Complied



Bottom Channel



Middle Channel

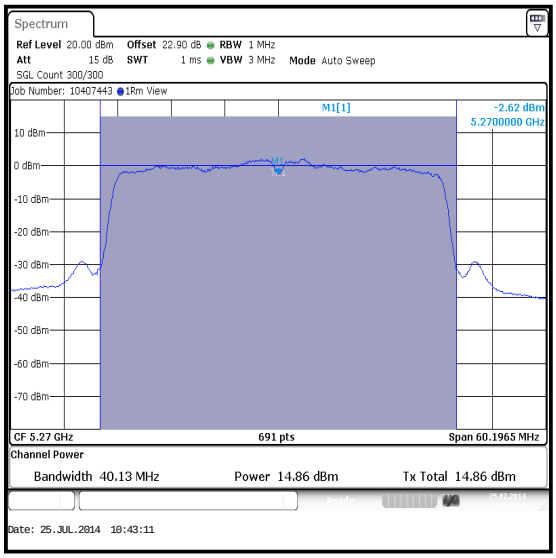


Top Channel

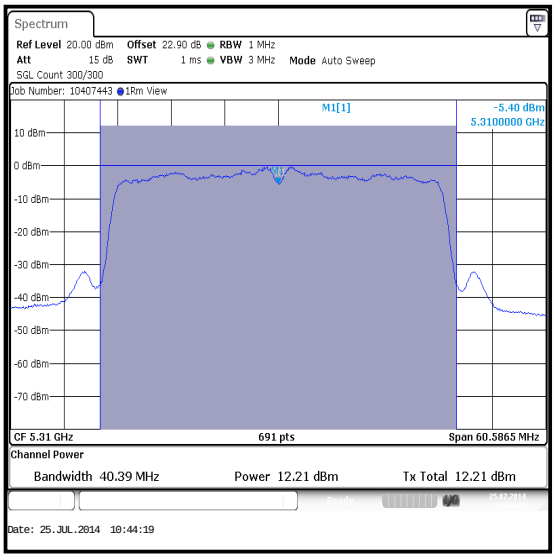
Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11n / 40 MHz / BPSK / MCS0 / SISO / 5.25-5.35 GHz band / Port 1

Channel	Frequency (MHz)	Conducted Power (dBm)	Duty Cycle Correction (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5270	14.9	0.1	15.0	24.0	9.0	Complied
Top	5310	12.2	0.1	12.3	24.0	11.7	Complied



Bottom Channel



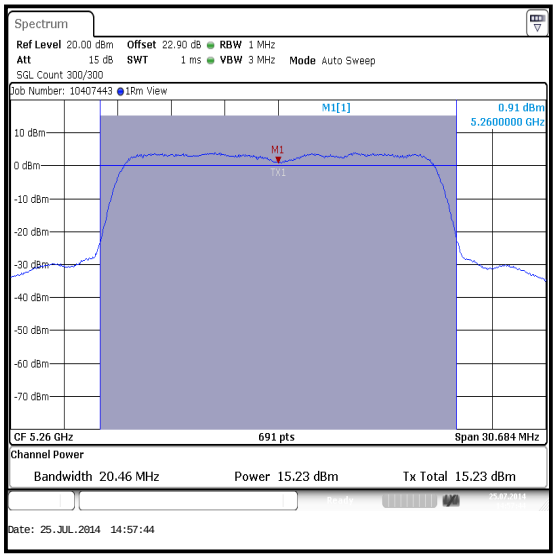
Top Channel

Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

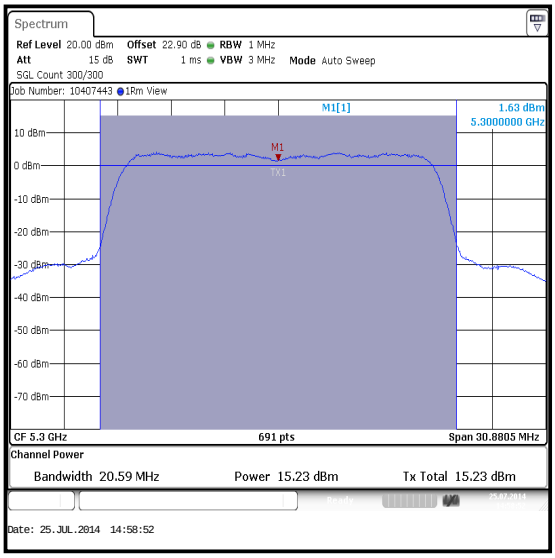
Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / 5.25-5.35 GHz band

Channel	Frequency (MHz)	Conducted Power Port 1 (dBm)	Conducted Power Port 2 (dBm)	Combined Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5260	15.2	14.4	17.8	24.0	6.2	Complied
Middle	5300	15.2	14.3	17.8	24.0	6.2	Complied
Top	5320	12.7	11.7	15.2	24.0	8.8	Complied

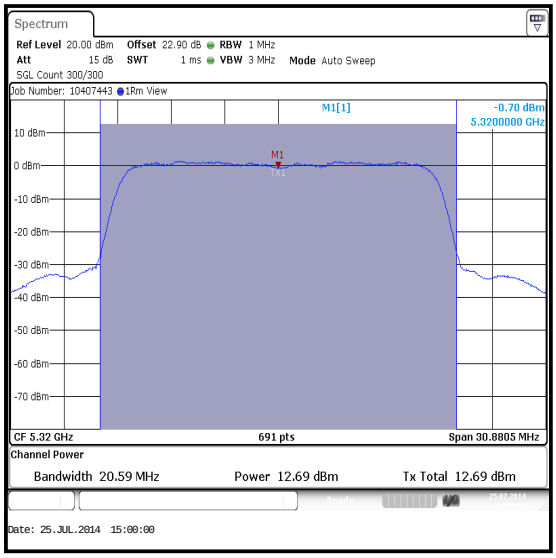
Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / 5.25-5.35 GHz band / Port 1



Bottom Channel



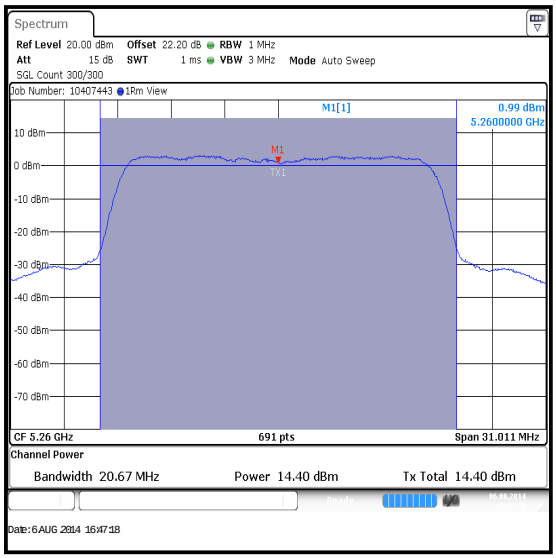
Middle Channel



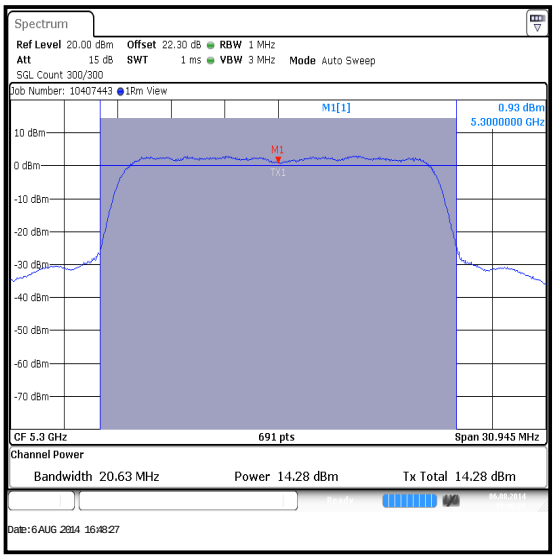
Top Channel

Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

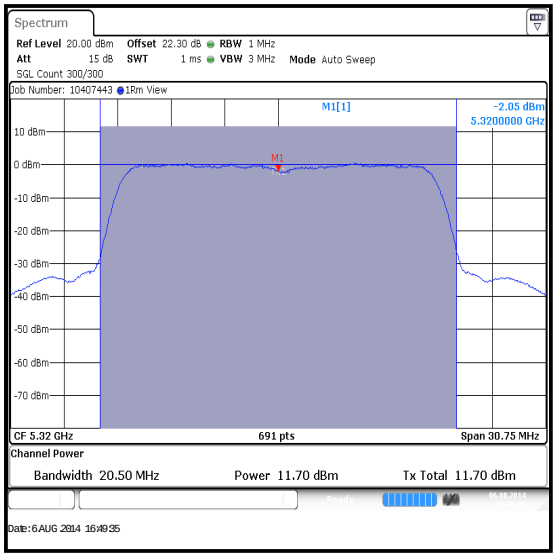
Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / 5.25-5.35 GHz band / Port 2



Bottom Channel



Middle Channel



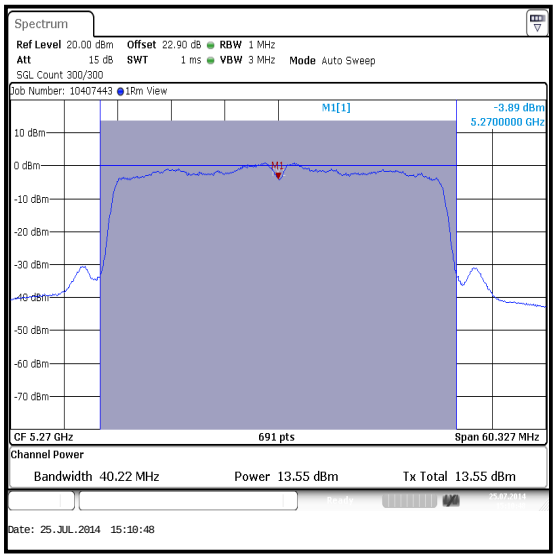
Top Channel

Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

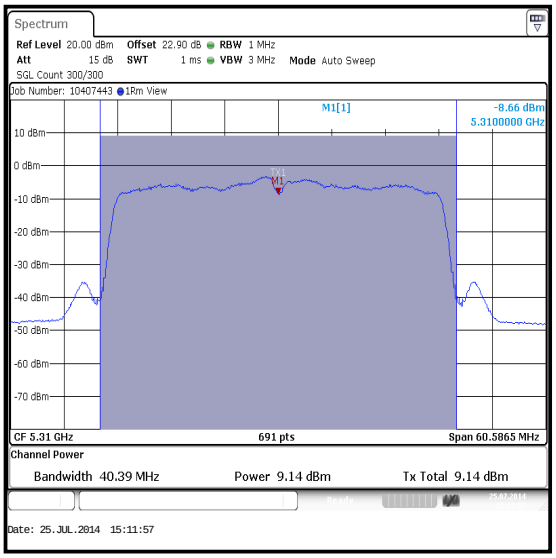
Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / 5.25-5.35 GHz band

Channel	Frequency (MHz)	Conducted Power Port 1 (dBm)	Conducted Power Port 2 (dBm)	Combined Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5270	13.6	12.9	16.3	24.0	7.7	Complied
Top	5310	9.1	7.8	11.5	24.0	12.5	Complied

Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / 5.25-5.35 GHz band / Port 1

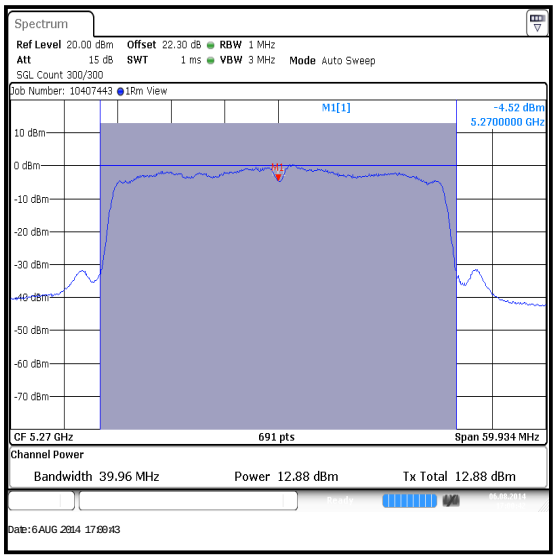


Bottom Channel

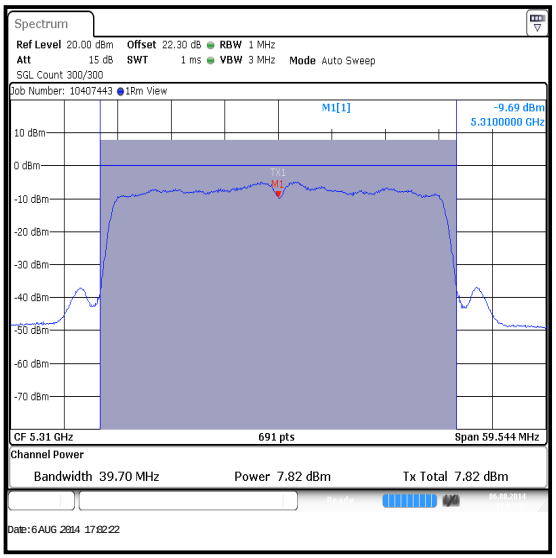


Top Channel

Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / 5.25-5.35 GHz band / Port 2



Bottom Channel

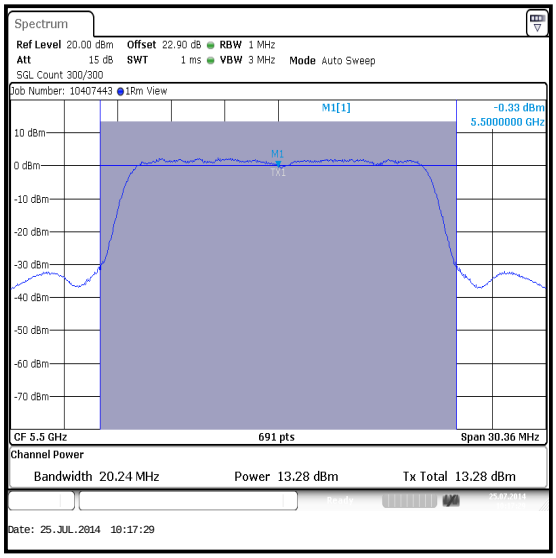


Top Channel

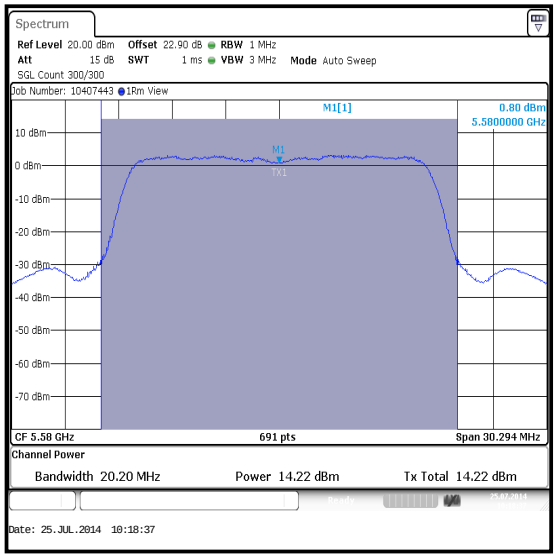
Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11a / 20 MHz / BPSK / 6 Mbps / 5.47-5.725 GHz band / Port 1

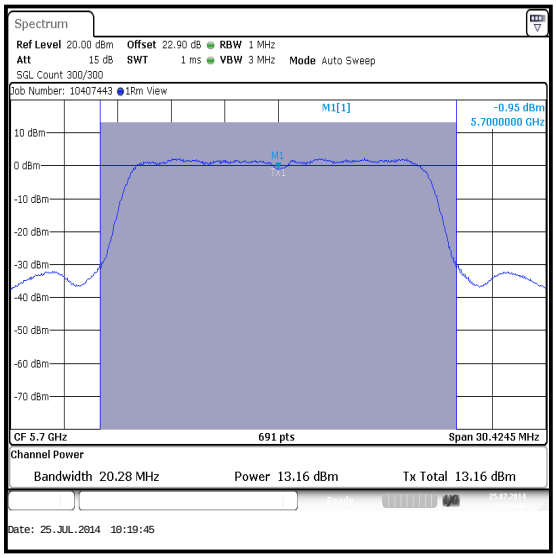
Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5500	13.3	24.0	10.7	Complied
Middle	5580	14.2	24.0	9.8	Complied
Top	5700	13.2	24.0	10.8	Complied



Bottom Channel



Middle Channel

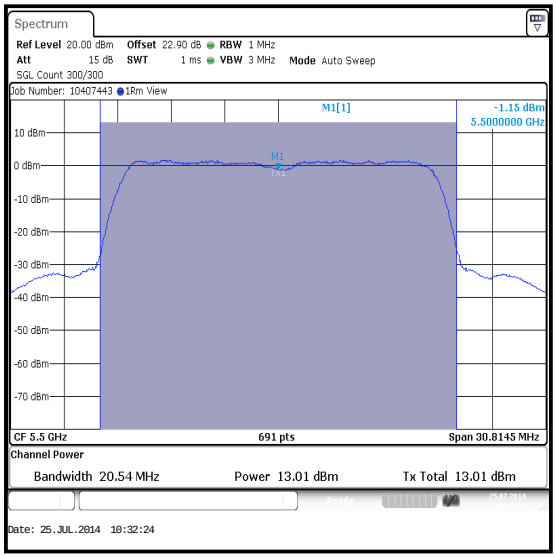


Top Channel

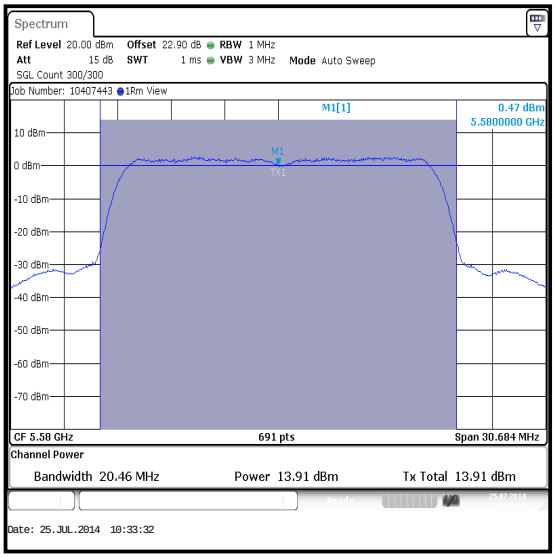
Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11n / 20 MHz / BPSK / MCS0 / SISO / 5.47-5.725 GHz band / Port 1

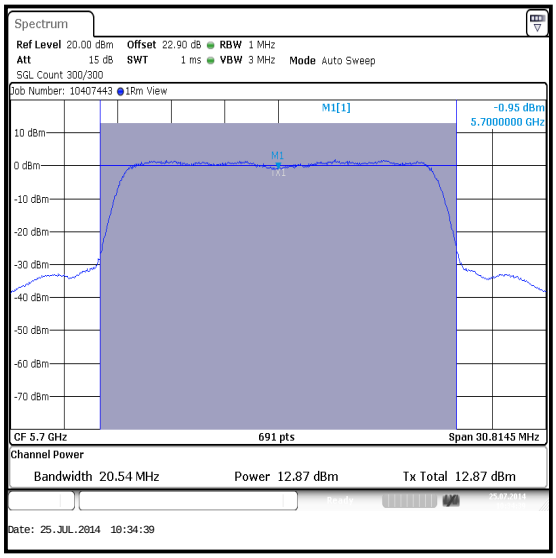
Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5500	13.0	24.0	11.0	Complied
Middle	5580	13.9	24.0	10.1	Complied
Top	5700	12.9	24.0	11.1	Complied



Bottom Channel



Middle Channel

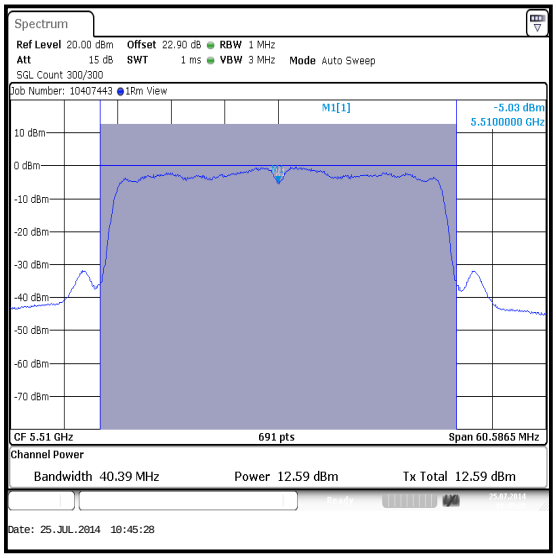


Top Channel

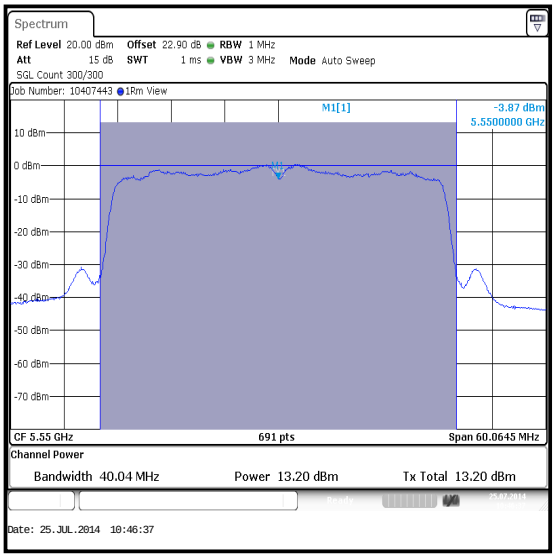
Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11n / 40 MHz / BPSK / MCS0 / SISO / 5.47-5.725 GHz band / Port 1

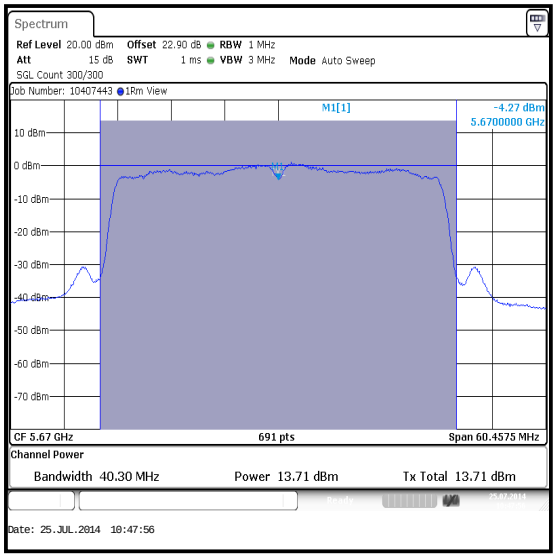
Channel	Frequency (MHz)	Conducted Power (dBm)	Duty cycle correction factor (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5510	12.6	0.1	12.7	24.0	11.3	Complied
Middle	5550	13.2	0.1	13.3	24.0	10.7	Complied
Top	5670	13.7	0.1	13.8	24.0	10.2	Complied



Bottom Channel



Middle Channel



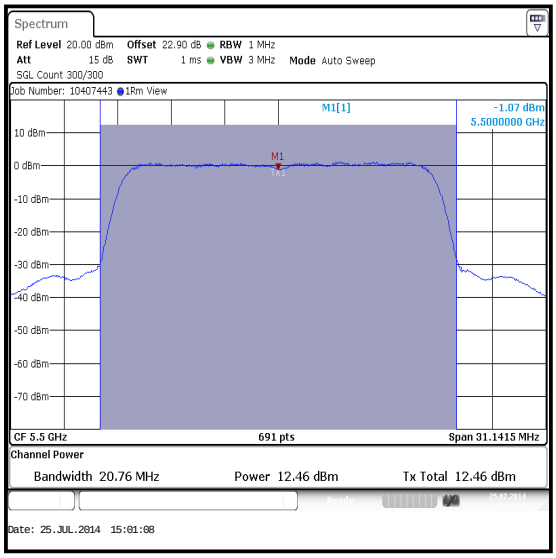
Top Channel

Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

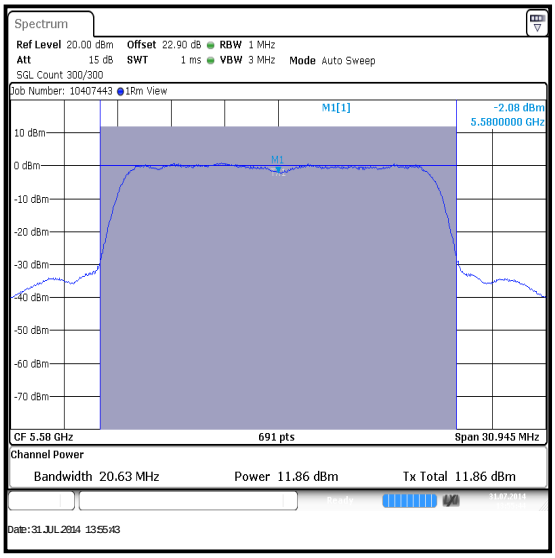
Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / 5.47-5.725 GHz band

Channel	Frequency (MHz)	Conducted Power Port 1 (dBm)	Conducted Power Port 2 (dBm)	Combined Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5500	12.5	11.8	15.2	23.6	8.4	Complied
Middle	5580	11.9	11.9	14.9	23.6	8.7	Complied
Top	5700	11.4	11.4	14.4	23.6	9.2	Complied

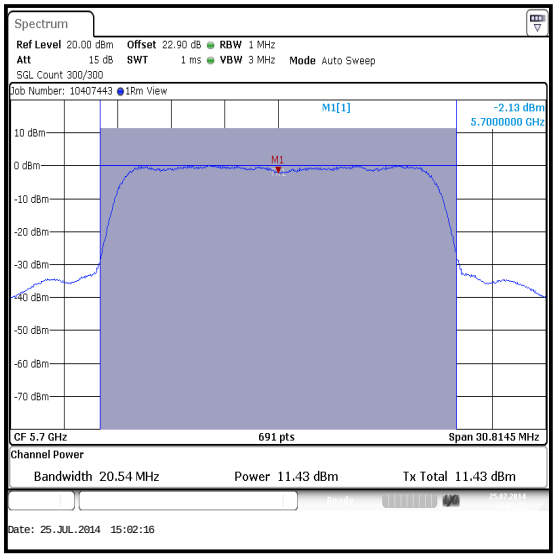
Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / 5.47-5.725 GHz band / Port 1



Bottom Channel



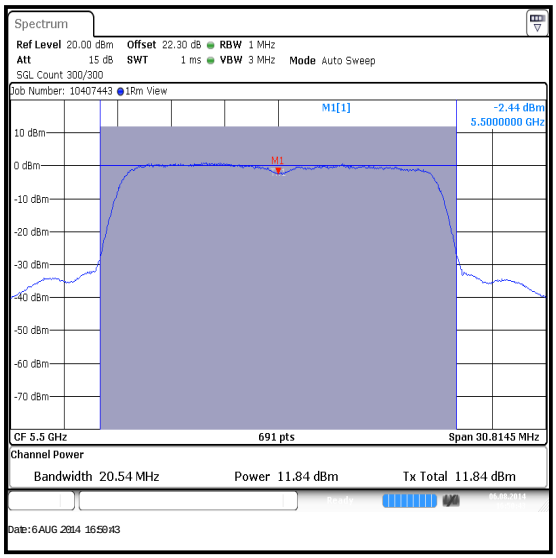
Middle Channel



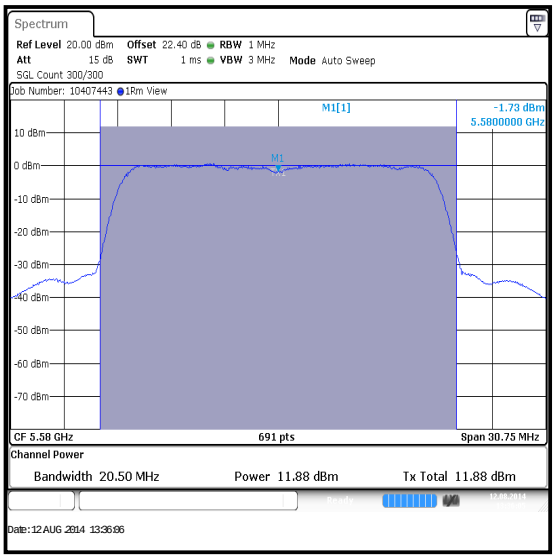
Top Channel

Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

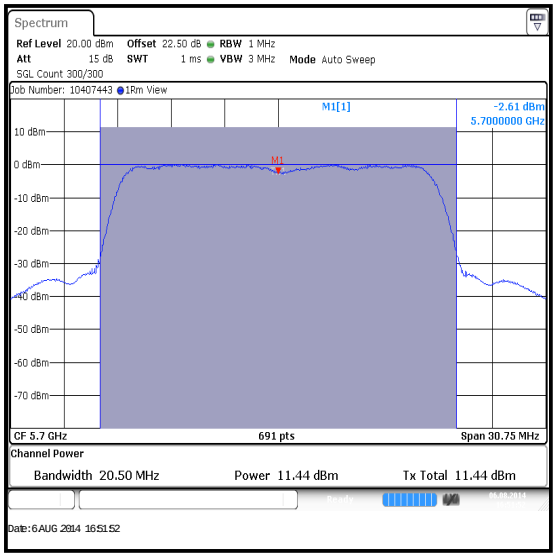
Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / 5.47-5.725 GHz band / Port 2



Bottom Channel



Middle Channel



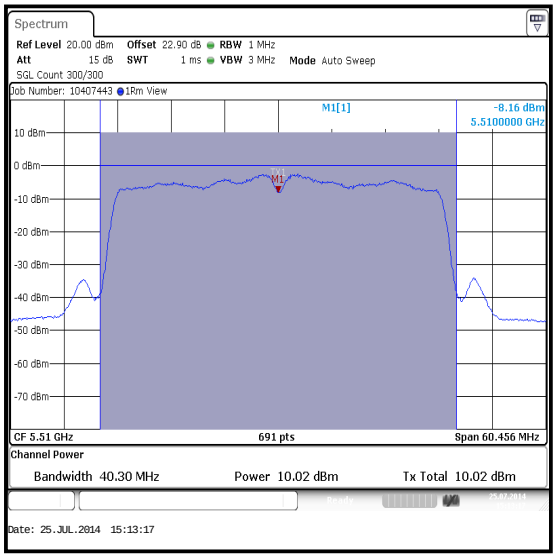
Top Channel

Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

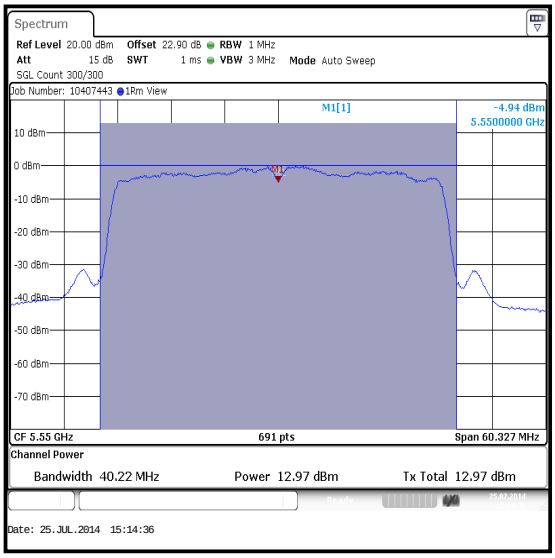
Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / 5.47-5.725 GHz band

Channel	Frequency (MHz)	Conducted Power Port 1 (dBm)	Conducted Power Port 2 (dBm)	Combined Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5510	10.0	9.2	12.6	23.6	11.0	Complied
Middle	5550	13.0	12.4	15.7	23.6	7.9	Complied
Top	5670	12.8	12.5	15.7	23.6	7.9	Complied

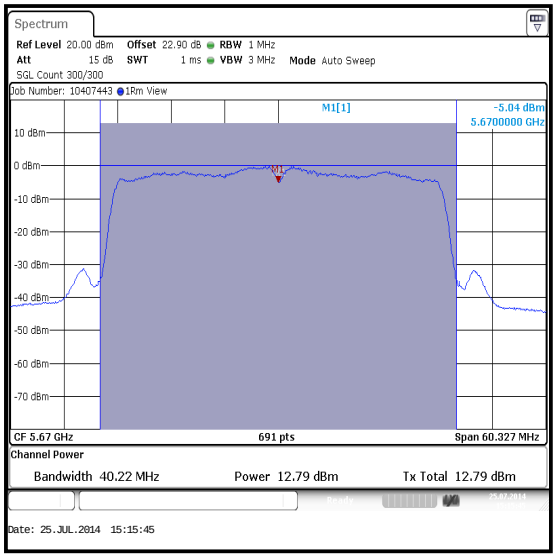
Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / 5.47-5.725 GHz band / Port 1



Bottom Channel



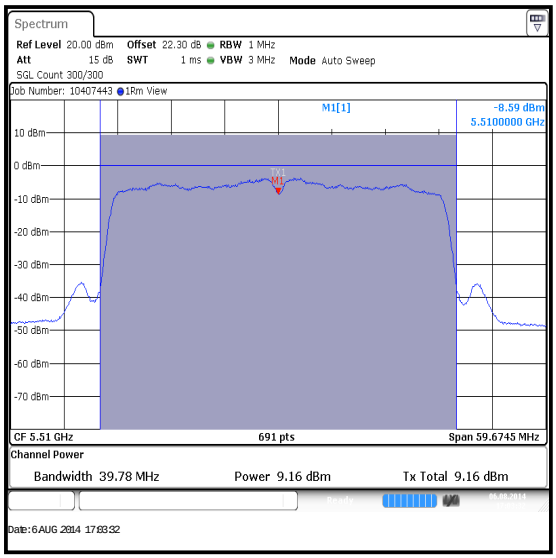
Middle Channel



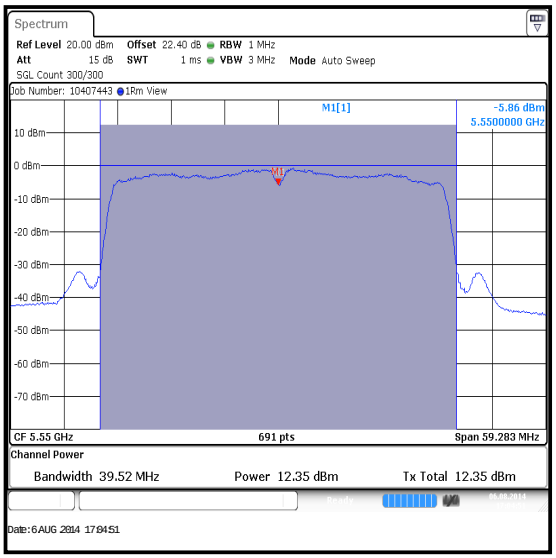
Top Channel

Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

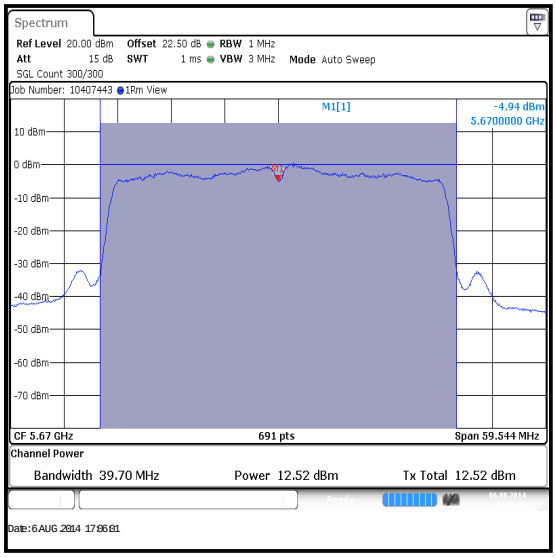
Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / 5.47-5.725 GHz band / Port 2



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Conducted Output Power (5.725-5.85 GHz band)

Test Summary:

Test Engineers:	Nick Steele & Georgios Vrezas	**Test Dates:**	25 July 2014 & 06 August 2014
Test Sample IMEI:	352025060005387		

FCC Reference:	Part 15.407(a)(3)
Test Method Used:	As detailed in KDB 789033 D02 Section II.E.2.b) and II.E.2.d)

Environmental Conditions:

Temperature (°C):	23 to 25
Relative Humidity (%):	41 to 44

Note(s):

1. The FCC Part 15.407(a)(3) limit shall not exceed 1 W (30.0 dBm).
2. For 802.11n MIMO mode, the data stream is correlated as it is single stream with CDD on. The directional antenna gain has been calculated in accordance with KDB 662911 D01 Section F)2)f)(ii). The EUT antenna has a gain of 2.7 dBi for Port 1 and 3.8 dBi for Port 2, in the frequency range 5.725 GHz to 5.85 GHz.

$$\text{Directional Gain} = 10\log\left[\frac{\sum_{j=1}^{N_{SS}}\left(\sum_{k=1}^{N_{ANT}} g_{j,k}\right)^2}{N_{ANT}}\right]$$

the equation above gives the following result:

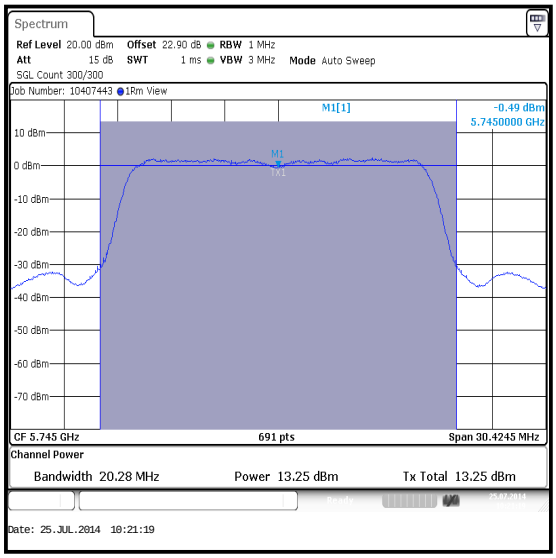
$$\text{Directional Gain} = 10\log\left[\frac{\left(10^{\frac{2.7}{20}} + 10^{\frac{3.8}{20}}\right)^2}{2}\right] = 6.3\ dBi$$

3. For 802.11n MIMO mode, in the 5.725 to 5.85 GHz band, the EUT antenna has a combined gain of 6.3 dBi. In accordance with 15.407(a)(3), the limit was reduced by the amount in dB the antenna gain exceeds 6dBi. Therefore the limit of 30 dBm has been reduced by 0.3 dB to 29.7 dBm.

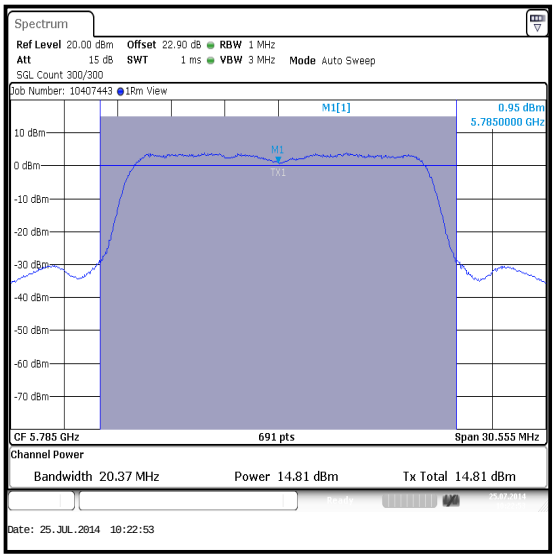
Transmitter Maximum Conducted Output Power (5.725-5.85 GHz band) (continued)

Results: 802.11a / 20 MHz / BPSK / 6 Mbps / Port 1

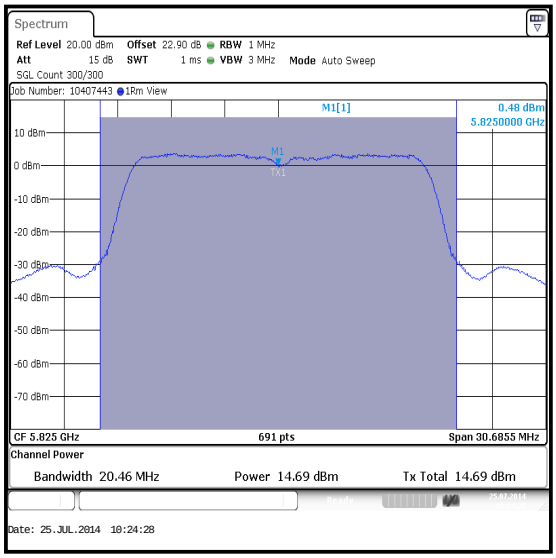
Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5745	13.3	30.0	16.7	Complied
Middle	5785	14.8	30.0	15.2	Complied
Top	5825	14.7	30.0	15.3	Complied



Bottom Channel



Middle Channel

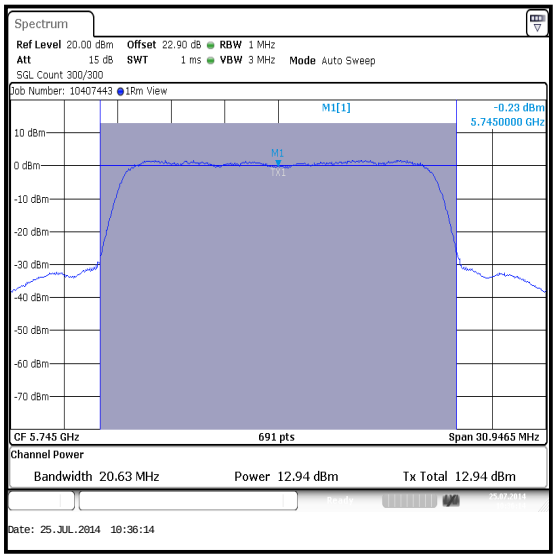


Top Channel

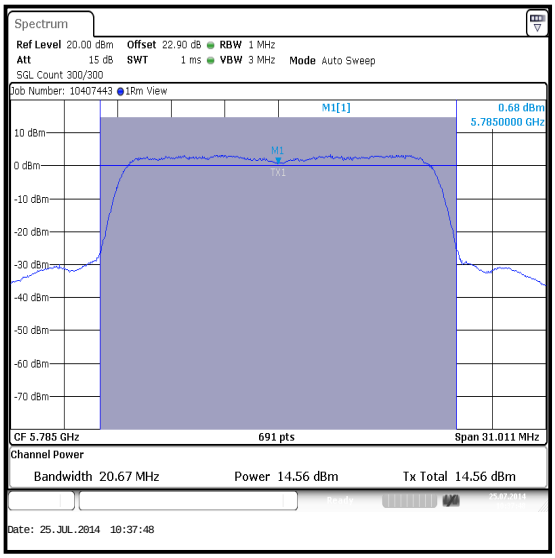
Transmitter Maximum Conducted Output Power (5.725-5.85 GHz band) (continued)

Results: 802.11n / 20 MHz / BPSK / MCS0 / SISO / Port 1

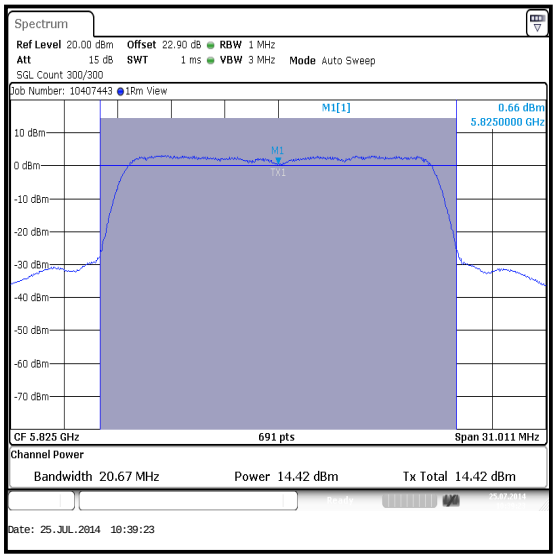
Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5745	12.9	30.0	17.1	Complied
Middle	5785	14.6	30.0	15.4	Complied
Top	5825	14.4	30.0	15.6	Complied



Bottom Channel



Middle Channel

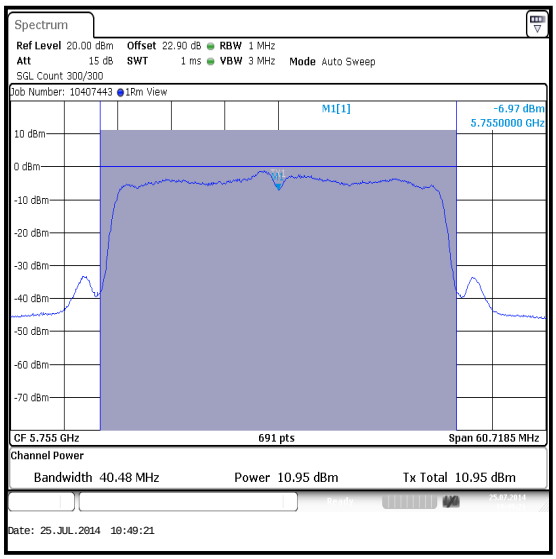


Top Channel

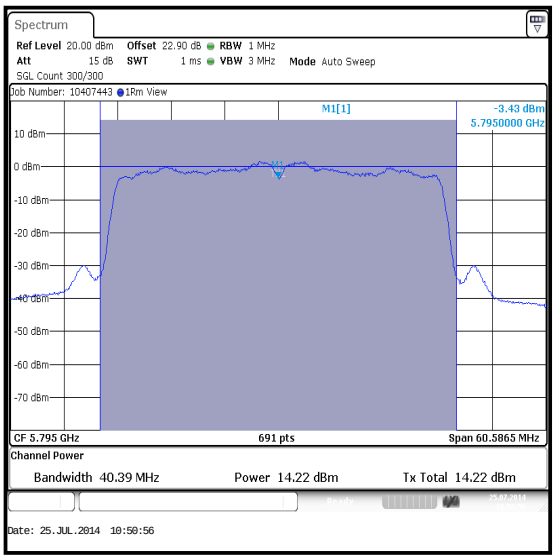
Transmitter Maximum Conducted Output Power (5.725-5.85 GHz band) (continued)

Results: 802.11n / 40 MHz / BPSK / MCS0 / SISO / Port 1

Channel	Frequency (MHz)	Conducted Power (dBm)	Duty cycle correction factor (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5755	11.0	0.1	11.1	30.0	18.9	Complied
Top	5795	14.2	0.1	14.3	30.0	15.7	Complied



Bottom Channel



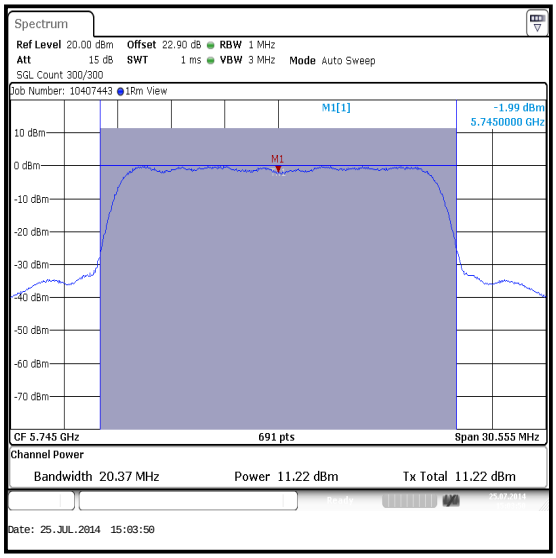
Top Channel

Transmitter Maximum Conducted Output Power (5.725-5.85 GHz band) (continued)

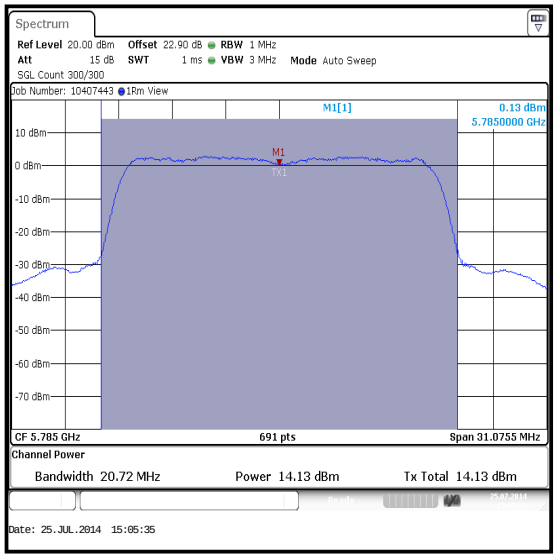
Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO

Channel	Frequency (MHz)	Conducted Power Port 1 (dBm)	Conducted Power Port 2 (dBm)	Combined Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5745	11.2	11.4	14.3	29.7	15.4	Complied
Middle	5785	14.1	14.2	17.2	29.7	12.5	Complied
Top	5825	14.3	13.9	17.1	29.7	12.6	Complied

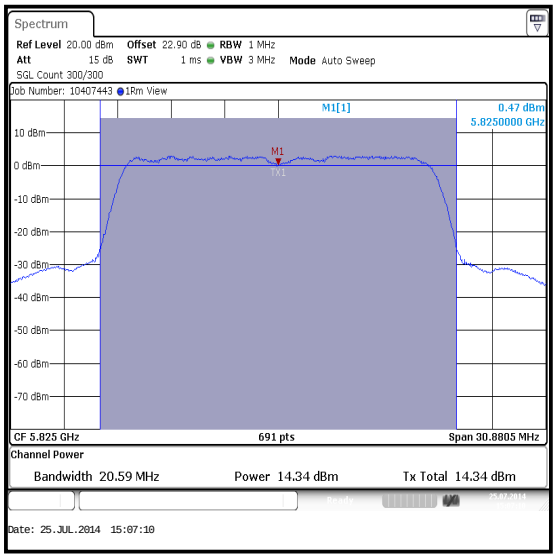
Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / Port 1



Bottom Channel



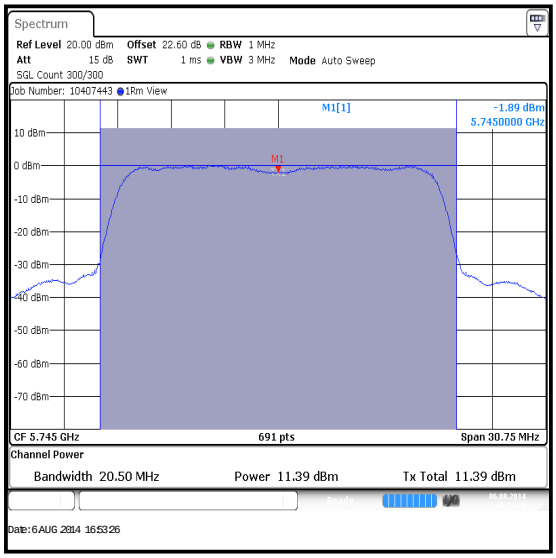
Middle Channel



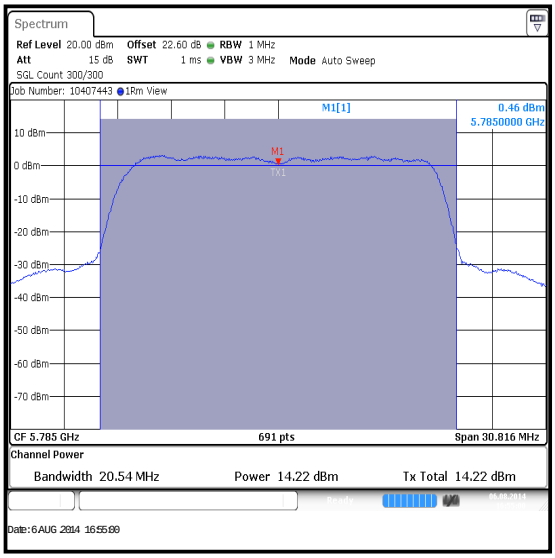
Top Channel

Transmitter Maximum Conducted Output Power (5.725-5.85 GHz band) (continued)

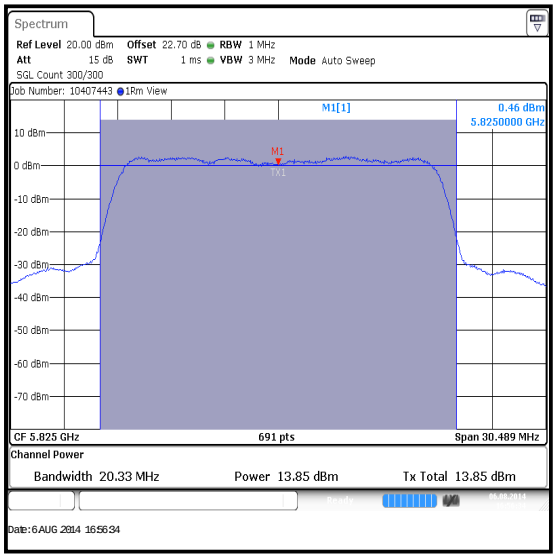
Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / Port 2



Bottom Channel



Middle Channel



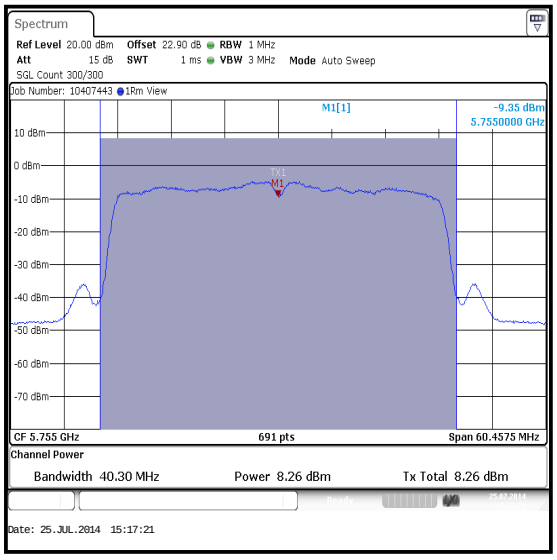
Top Channel

Transmitter Maximum Conducted Output Power (5.725-5.85 GHz band) (continued)

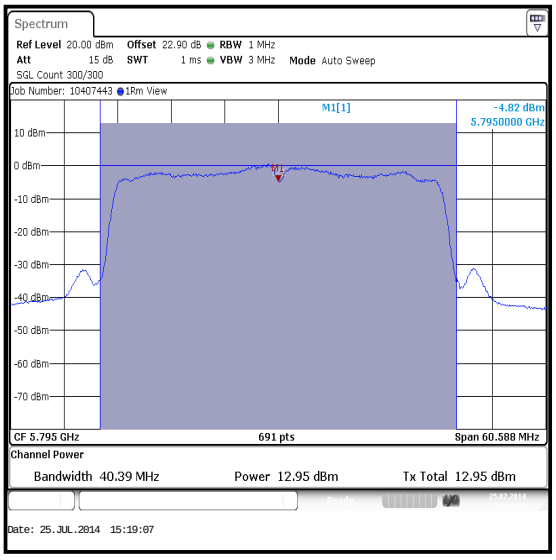
Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO

Channel	Frequency (MHz)	Conducted Power Port 1 (dBm)	Conducted Power Port 2 (dBm)	Combined Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5755	8.3	8.2	11.3	29.7	18.4	Complied
Top	5795	13.0	12.8	15.9	29.7	13.8	Complied

Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / Port 1

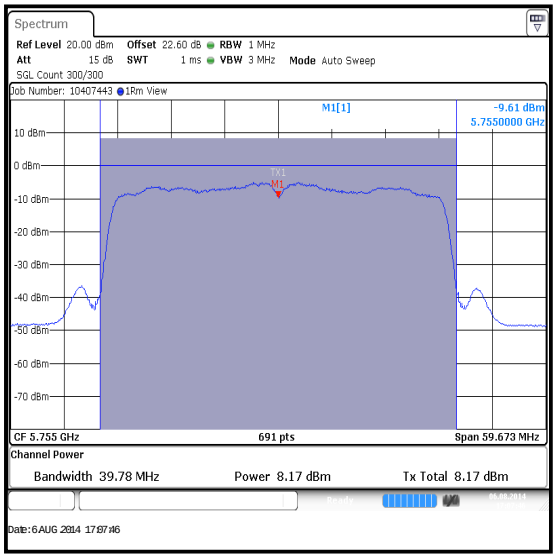


Bottom Channel

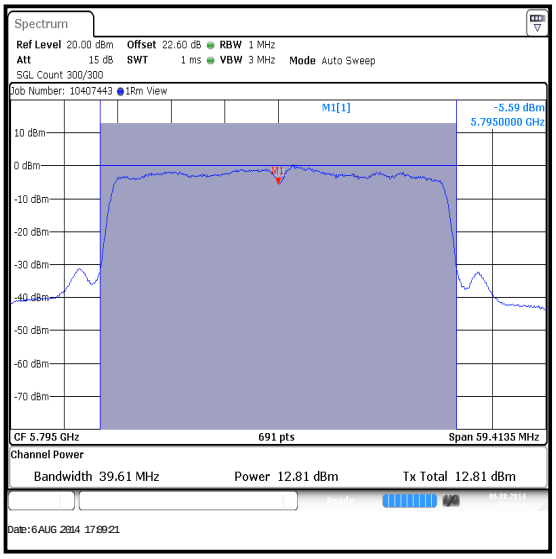


Top Channel

Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / Port 2



Bottom Channel



Top Channel

Transmitter Maximum Conducted Output Power (5.725-5.85 GHz band) (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1658	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	14 Mar 2015	12
L1128	Signal Analyser	Rohde & Schwarz	FSV13	101835	25 Apr 2015	12
M1873	Signal Analyser	Rohde & Schwarz	FSV30	103074	15 May 2015	12
A1998	Attenuator	Huber & Suhner	6820.17.B	07101	Calibrated before use	-
S0558	DC Power Supply	TTI	EL 303R	395825	Calibrated before use	-
M1251	Multimeter	Fluke	175	89170179	19 May 2015	12
G0608	Signal Generator	Rohde & Schwarz	SMIQ 06B	838341/033	14 Feb 2015	12
M199	Power Meter	Rohde & Schwarz	NRVS	827023/075	08 Apr 2016	24
M1267	Power Sensor	Rohde & Schwarz	NRV-Z52	100155	23 Apr 2016	24

5.2.6. Transmitter Maximum Power Spectral Density

Test Summary:

Test Engineer:	Georgios Vrezas	**Test Dates:**	16 August 2014 & 17 August 2014
Test Sample IMEI:	352025060005387		

FCC Reference:	Part 15.407(a)(1)(iv)
Test Method Used:	As detailed in KDB 789033 D02 Section II.F. referencing II.E.2.b) and II.E.2.d)

Environmental Conditions:

Temperature (°C):	24 to 25
Relative Humidity (%):	39 to 40

Note(s):

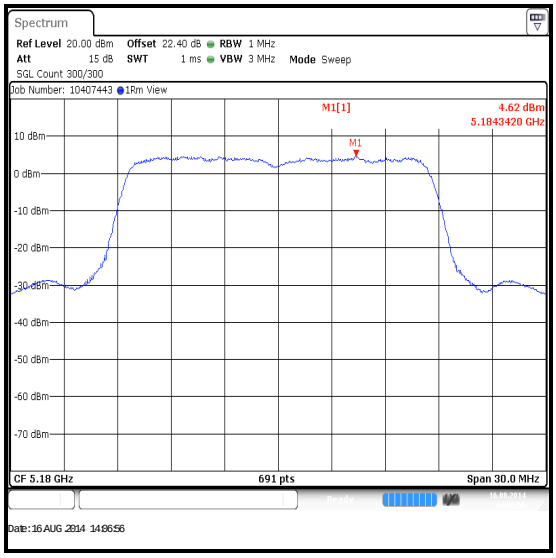
1. Transmitter Maximum Power Spectral Density tests in all bands were performed using a signal analyser in accordance with KDB 789033 II. F referencing II.E.2.b) Method SA-1 and II.E.2.d) Method SA-2.
2. The customer declared the following data rates to be used for all measurements as:
    - 802.11a – BPSK / 6 Mbps
    - 802.11n HT20 SISO – BPSK / 6.5 Mbps / MCS0
    - 802.11n HT40 SISO – BPSK / 13.5 Mbps / MCS0
    - 802.11n HT20 MIMO – BPSK / 6.5 Mbps / MCS0
    - 802.11n HT40 MIMO – BPSK / 13.5 Mbps / MCS0

    Measurements were then performed in these modes on bottom, middle and top channels in all operating bands.
3. For data rates where the EUT was transmitting at <98% duty cycle, the calculated duty cycle in section 5.2.4 was added to the measured maximum power spectral density in order to compute the average maximum power spectral density during the actual transmission time.
4. For 802.11a and 802.11n SISO modes, power spectral density was measured on both ports, Port 1 produced the highest power and was therefore deemed worst case. Results for Port 1 are recorded in the tables below.
5. For 802.11n MIMO mode, conducted power spectral density was measured on both ports and then combined using the measure-and-sum method stated in FCC KDB 662911.
6. The EUT antenna has a gain of <6 dBi in the 5.15-5.25 GHz band.
7. The signal analyser was connected to the RF port on the EUT using suitable attenuation and RF cable. An RF level offset was entered on the signal analyser to compensate for the loss of the attenuator and RF cable.

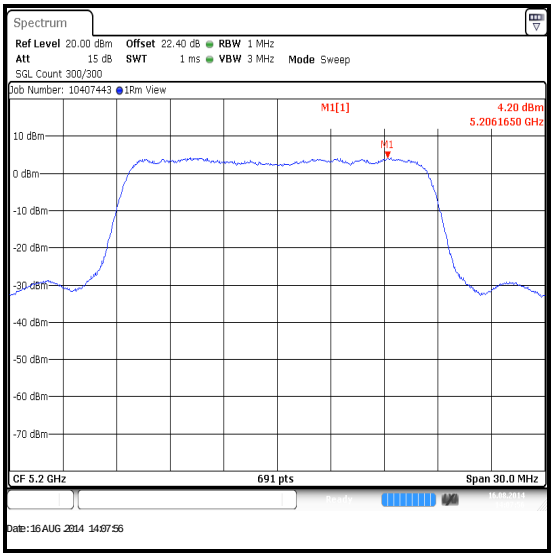
Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: 802.11a / 20 MHz / BPSK / 6 Mbps / Port 1

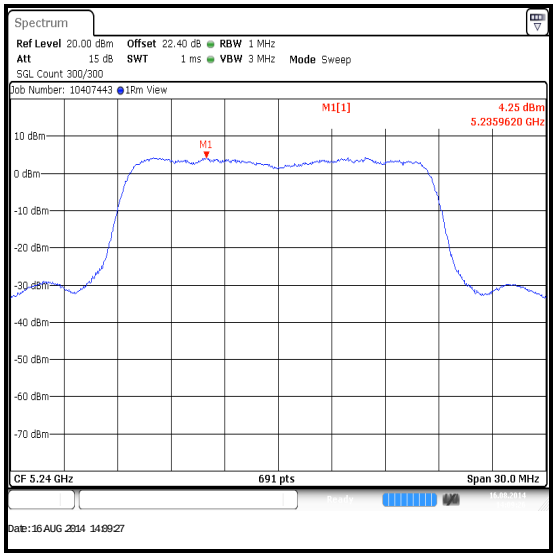
Channel	Frequency (MHz)	PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5180	4.6	11.0	6.4	Complied
Middle	5200	4.2	11.0	6.8	Complied
Top	5240	4.3	11.0	6.7	Complied



Bottom Channel



Middle Channel

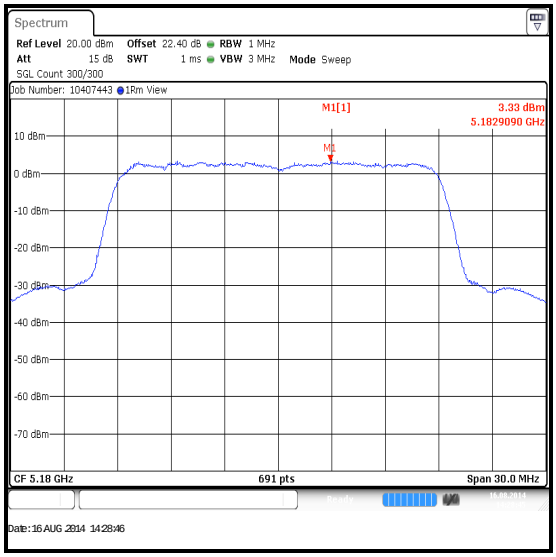


Top Channel

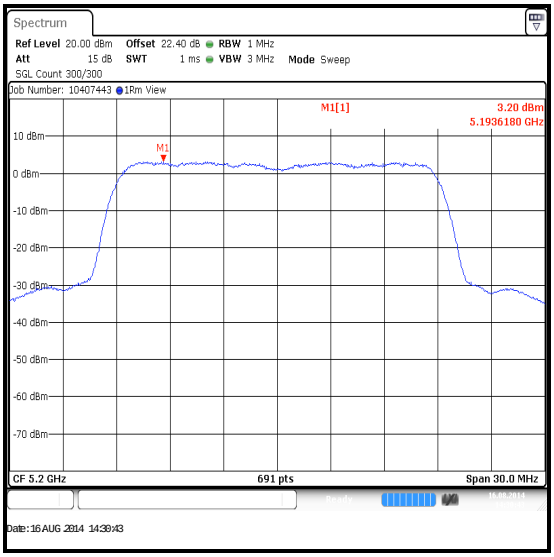
Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: 802.11n / 20 MHz / BPSK / MCS0 / SISO / Port 1

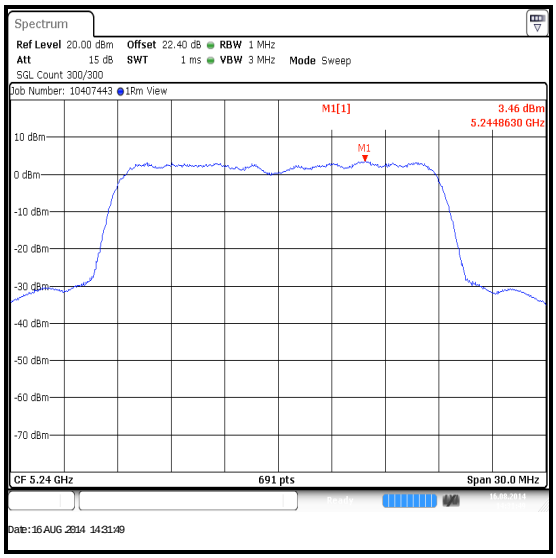
Channel	Frequency (MHz)	PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5180	3.3	11.0	7.7	Complied
Middle	5200	3.2	11.0	7.8	Complied
Top	5240	3.5	11.0	7.5	Complied



Bottom Channel



Middle Channel

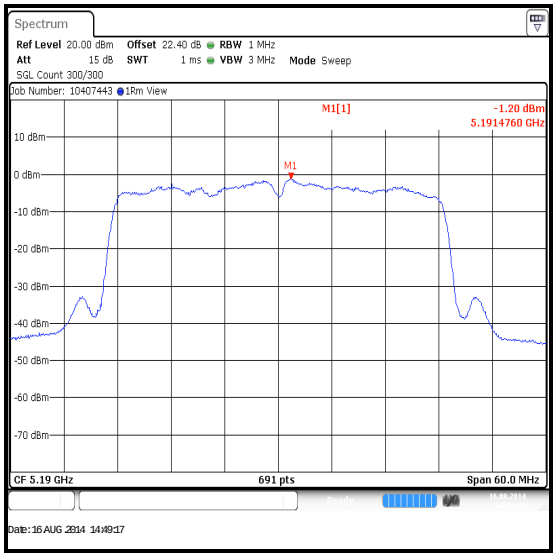


Top Channel

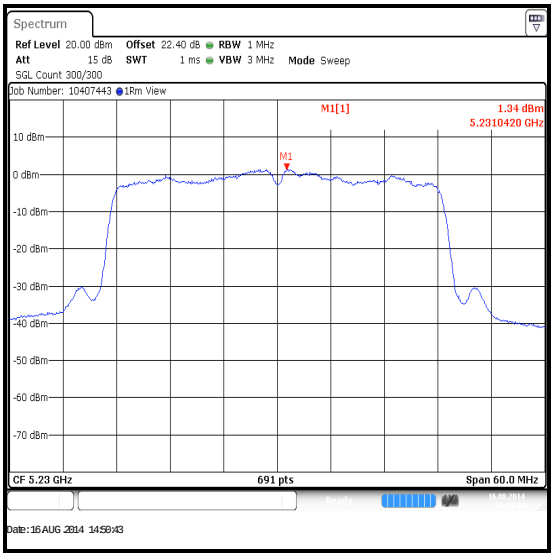
Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Results: 802.11n / 40 MHz / BPSK / MCS0 / SISO / Port 1

Channel	Frequency (MHz)	PPSD (dBm /MHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /MHz)	Limit (dBm)	Margin (dB)	Result
Bottom	5190	-1.2	0.1	-1.1	11.0	12.1	Complied
Top	5230	1.3	0.1	1.4	11.0	9.6	Complied



Bottom Channel



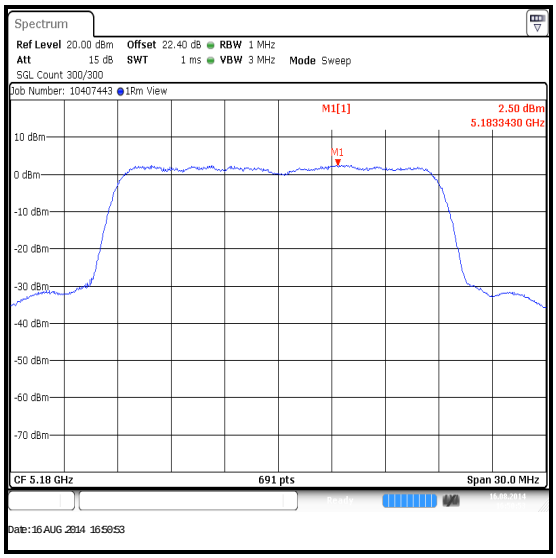
Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

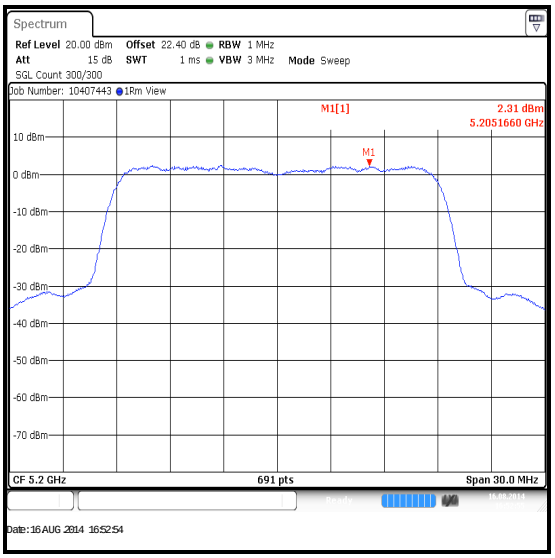
Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO

Channel	Frequency (MHz)	PPSD Port 1 (dBm /MHz)	PPSD Port 2 (dBm /MHz)	Combined PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5180	2.5	1.1	4.8	11.0	6.2	Complied
Middle	5200	2.3	1.2	4.8	11.0	6.2	Complied
Top	5240	2.2	1.3	4.8	11.0	6.2	Complied

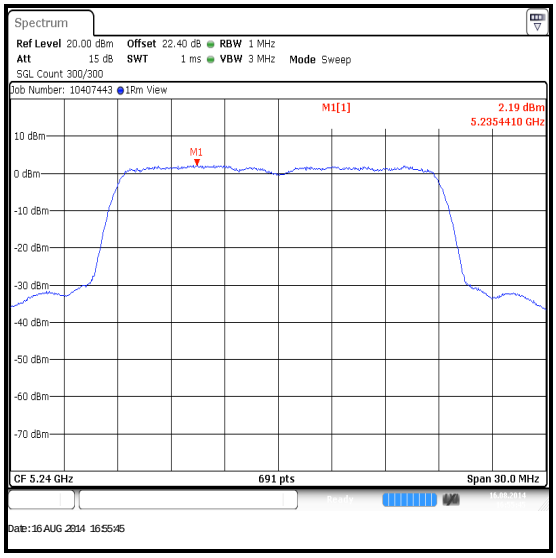
Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / Port 1



Bottom Channel



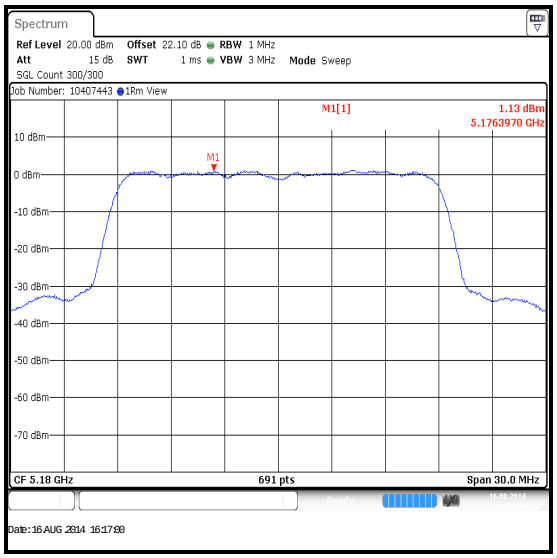
Middle Channel



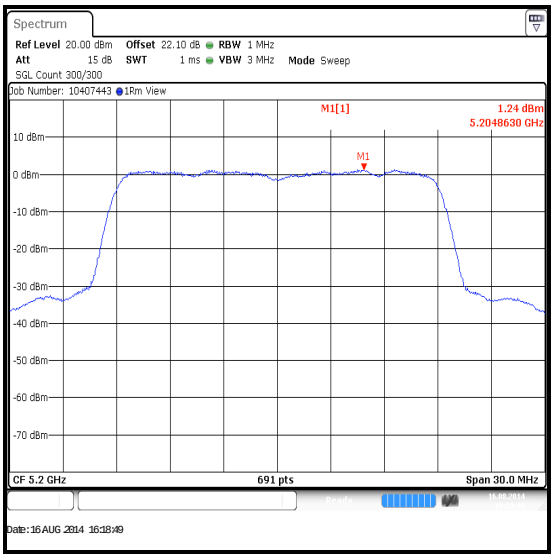
Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

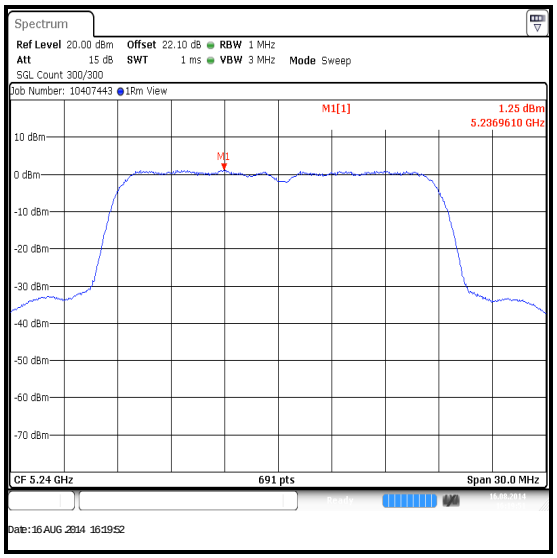
Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / Port 2



Bottom Channel



Middle Channel



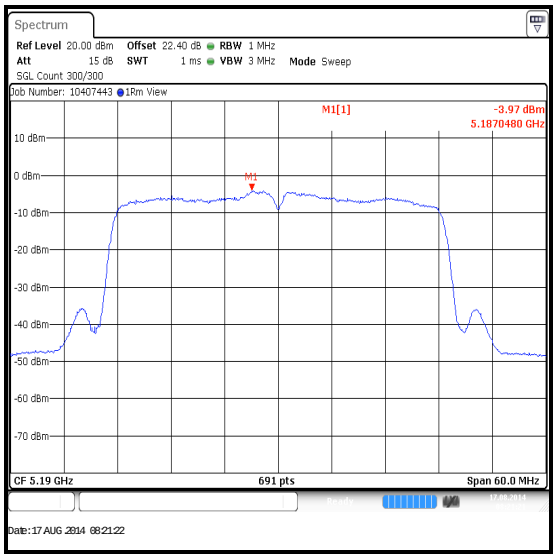
Top Channel

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

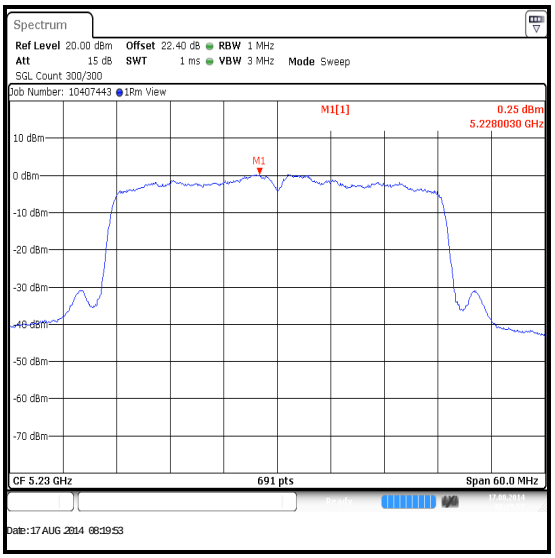
Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO

Channel	Frequency (MHz)	PPSD Port 1 (dBm /MHz)	PPSD Port 2 (dBm /MHz)	Combined PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5190	-4.0	-5.3	-1.6	11.0	12.6	Complied
Top	5230	0.3	-0.9	2.7	11.0	8.3	Complied

Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / Port 1

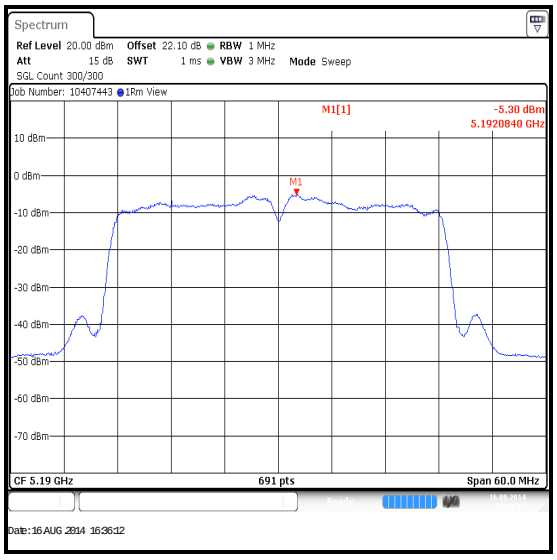


Bottom Channel

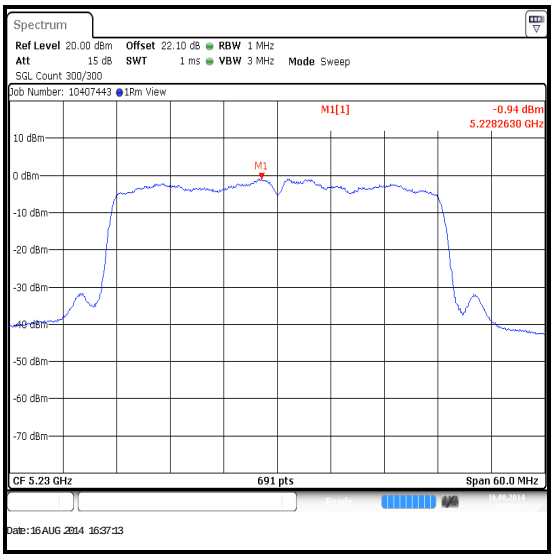


Top Channel

Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / Port 2



Bottom Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands)

Test Summary:

Test Engineer:	Georgios Vrezas	**Test Dates:**	16 August 2014 & 17 August 2014
Test Sample IMEI:	352025060005387		

FCC Reference:	Part 15.407(a)(2)
Test Method Used:	As detailed in KDB 789033 D02 Section II.F. referencing II.E.2.b) and II.E.2.d)

Environmental Conditions:

Temperature (°C):	24 to 25
Relative Humidity (%):	39 to 40

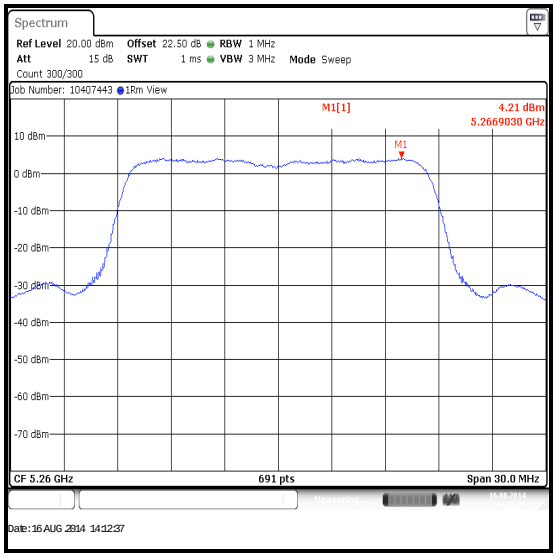
Note(s):

1. FCC Part 15.407(a)(2) limit for PPSD in the 5.25-5.35 GHz and 5.47-5.725 GHz operating bands is <11 dBm/MHz.
2. For 802.11a and 802.11n SISO mode, the EUT antenna has a gain of <6 dBi.
3. For 802.11n MIMO mode in the 5.25-5.35 GHz band, the EUT antenna has a directional gain of <6 dBi.
4. For 802.11n MIMO mode in the 5.47-5.725 GHz band, the EUT antenna has a combined gain of 6.4 dBi. In accordance with 15.407(a)(2), the limit was reduced by the amount in dB the antenna gain exceeds 6 dBi. Therefore the limit of 11 dBm/MHz has been reduced by 0.4 dB to 10.6 dBm/MHz.

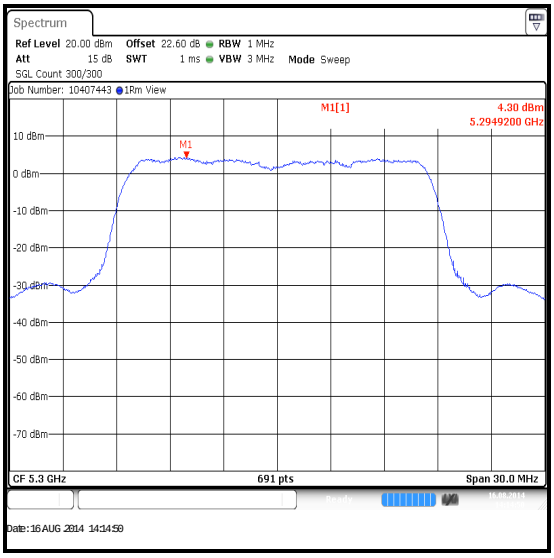
Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11a / 20 MHz / BPSK / 6 Mbps / 5.25-5.35 GHz band/ Port 1

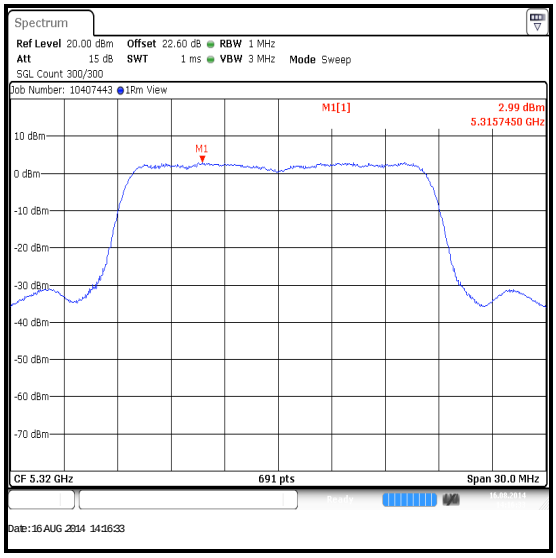
Channel	Frequency (MHz)	PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5260	4.2	11.0	6.8	Complied
Middle	5300	4.3	11.0	6.7	Complied
Top	5320	3.0	11.0	8.0	Complied



Bottom Channel



Middle Channel

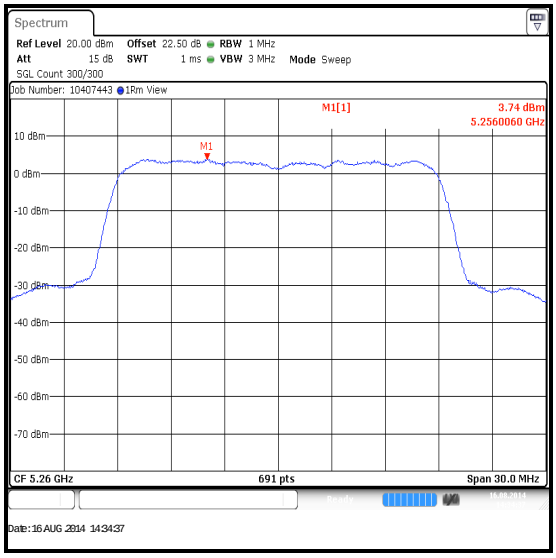


Top Channel

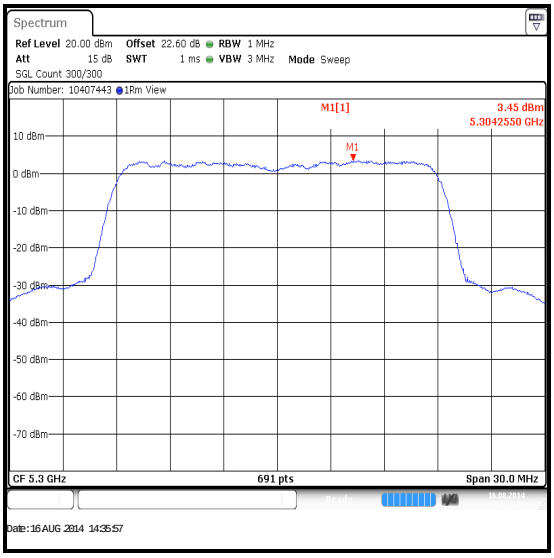
Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11n / 20 MHz / BPSK / MCS0 / SISO / 5.25-5.35 GHz band / Port 1

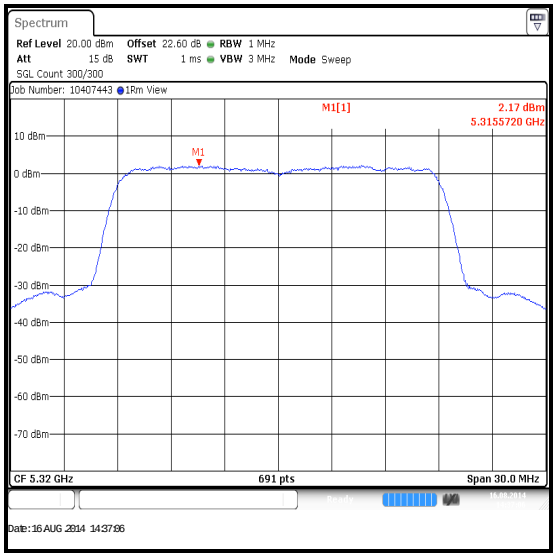
Channel	Frequency (MHz)	PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5260	3.7	11.0	7.3	Complied
Middle	5300	3.5	11.0	7.5	Complied
Top	5320	2.2	11.0	8.8	Complied



Bottom Channel



Middle Channel

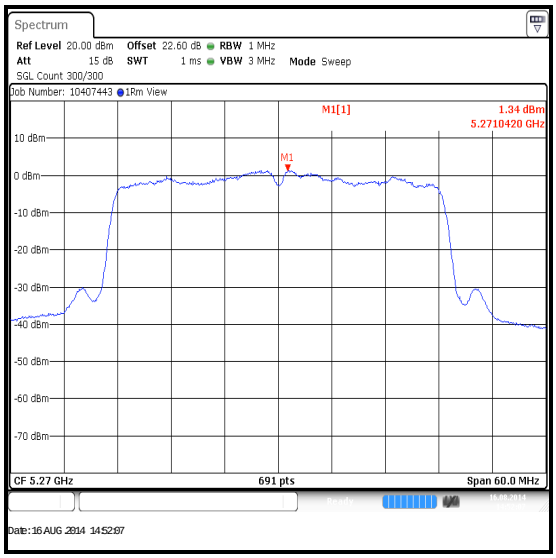


Top Channel

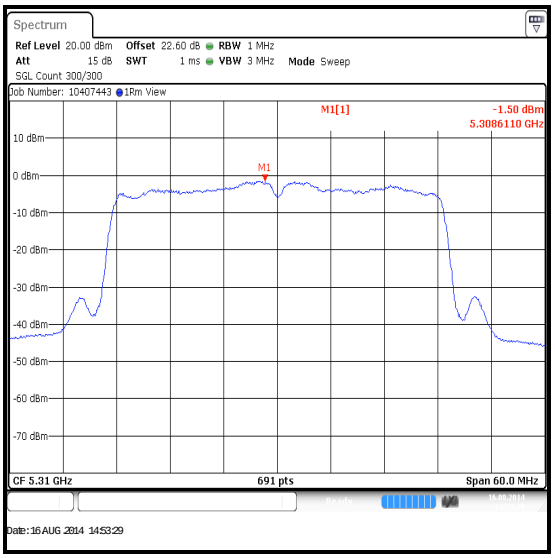
Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11n / 40 MHz / BPSK / MCS0 / SISO / 5.25-5.35 GHz band / Port 1

Channel	Frequency (MHz)	PPSD (dBm /MHz)	Duty cycle correction (dB)	Corrected PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5270	1.3	0.1	1.4	11.0	9.6	Complied
Top	5310	-1.5	0.1	-1.4	11.0	12.4	Complied



Bottom Channel



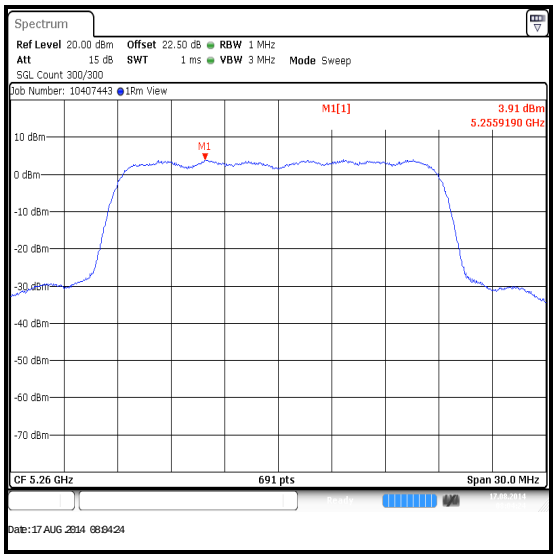
Top Channel

Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

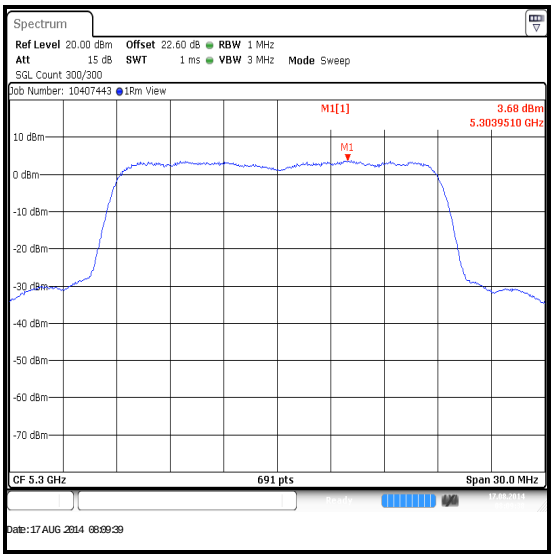
Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / 5.25-5.35 GHz band

Channel	Frequency (MHz)	PPSD Port 1 (dBm /MHz)	PPSD Port 2 (dBm /MHz)	Combined PPSD (dBm/MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5260	3.9	2.6	6.3	11.0	4.7	Complied
Middle	5300	3.7	2.8	6.3	11.0	4.7	Complied
Top	5320	1.0	0.2	3.6	11.0	7.4	Complied

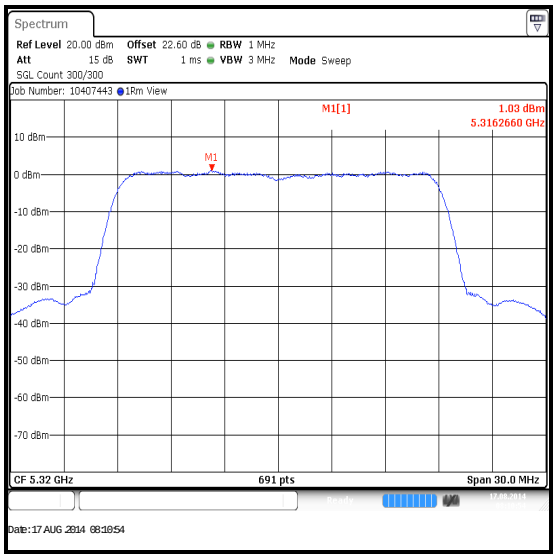
Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / 5.25-5.35 GHz band/ Port 1



Bottom Channel



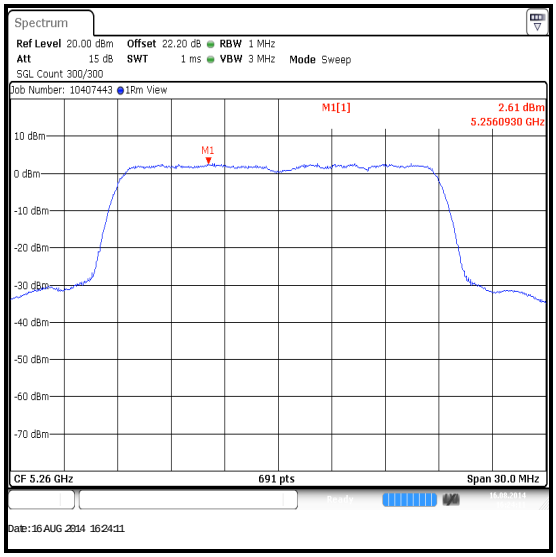
Middle Channel



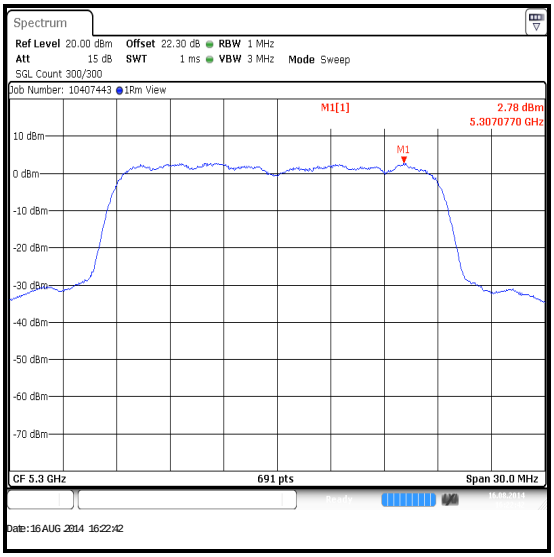
Top Channel

Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

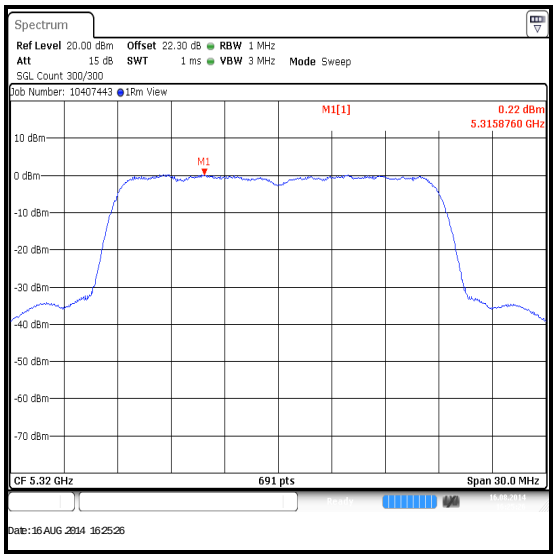
Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / 5.25-5.35 GHz band / Port 2



Bottom Channel



Middle Channel



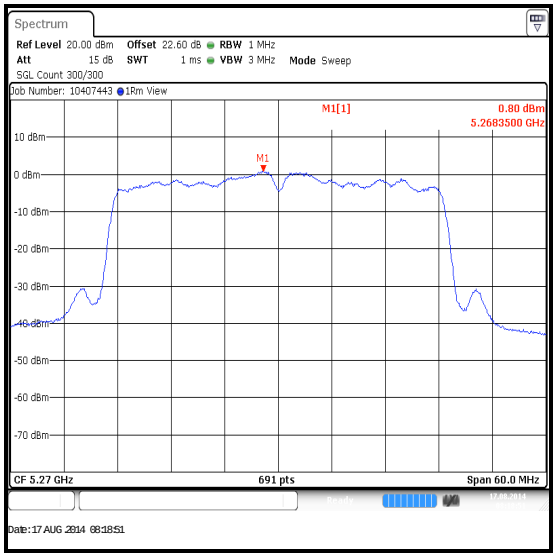
Top Channel

Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

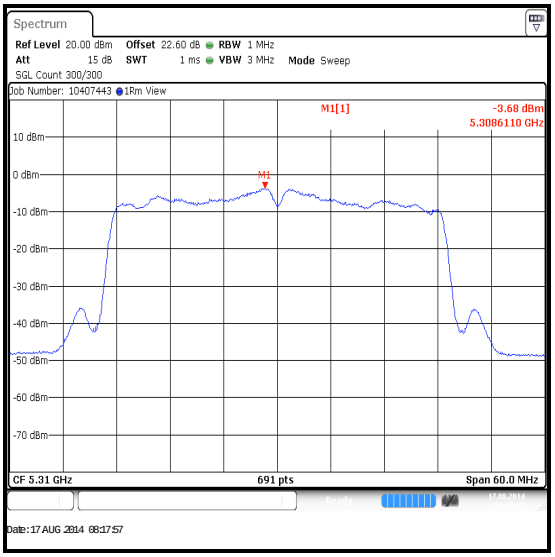
Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / 5.25-5.35 GHz band

Channel	Frequency (MHz)	PPSD Port 1 (dBm /MHz)	PPSD Port 2 (dBm /MHz)	Combined PPSD (dBm/MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5270	0.8	-1.3	2.8	11.0	8.2	Complied
Top	5310	0.0	-4.9	0.9	11.0	10.1	Complied

Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / 5.25-5.35 GHz band / Port 1

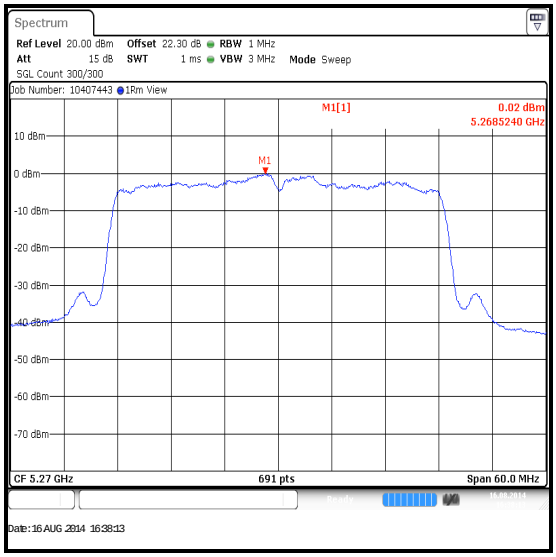


Bottom Channel

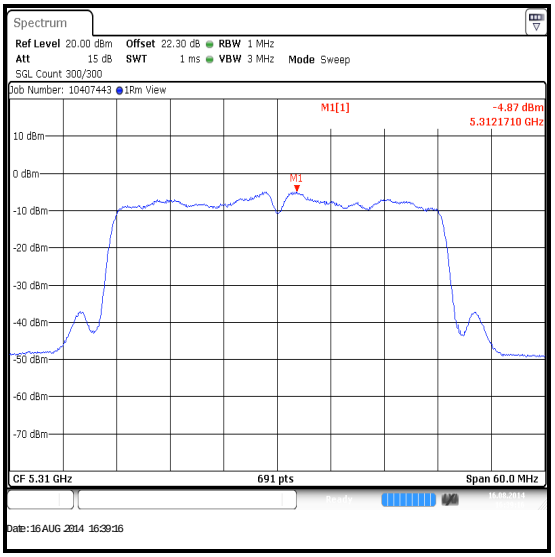


Top Channel

Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / 5.25-5.35 GHz band / Port 2



Bottom Channel

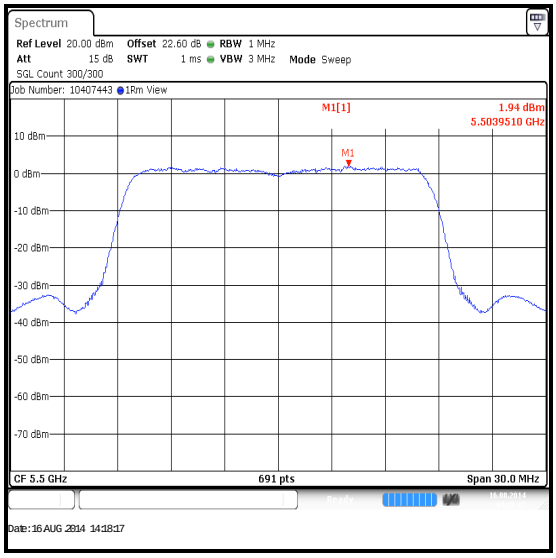


Top Channel

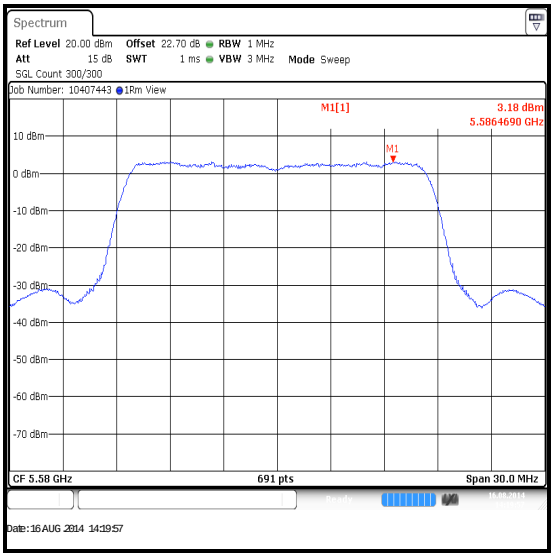
Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11a / 20 MHz / BPSK / 6 Mbps / 5.47-5.725 GHz band / Port 1

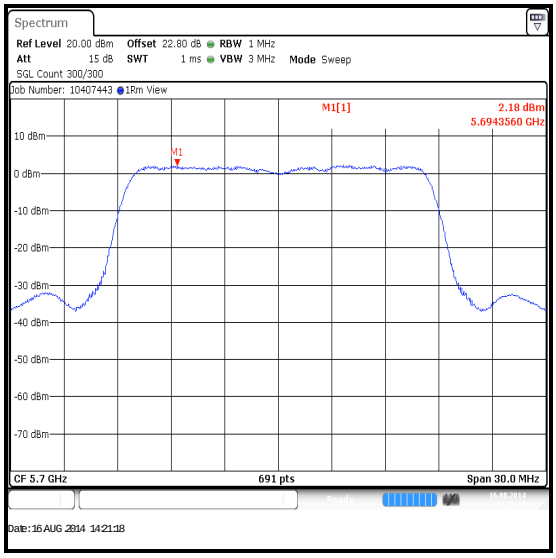
Channel	Frequency (MHz)	PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5500	1.9	11.0	9.1	Complied
Middle	5580	3.2	11.0	7.8	Complied
Top	5700	2.2	11.0	8.8	Complied



Bottom Channel



Middle Channel

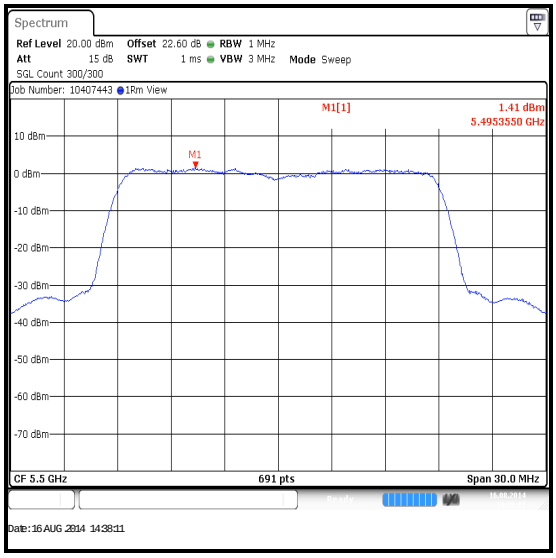


Top Channel

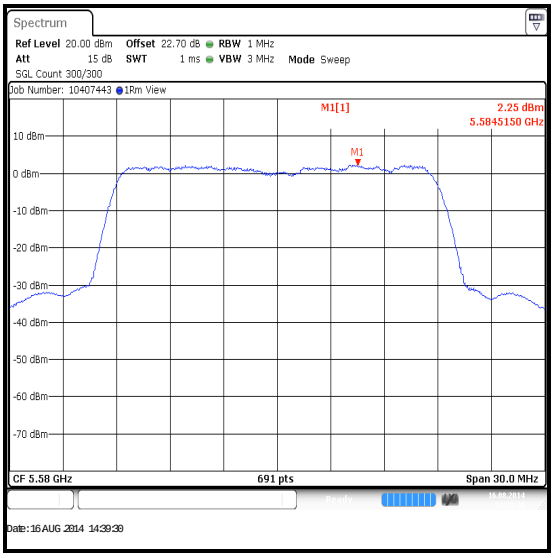
Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11n / 20 MHz / BPSK / MCS0 / SISO / 5.47-5.725 GHz band / Port 1

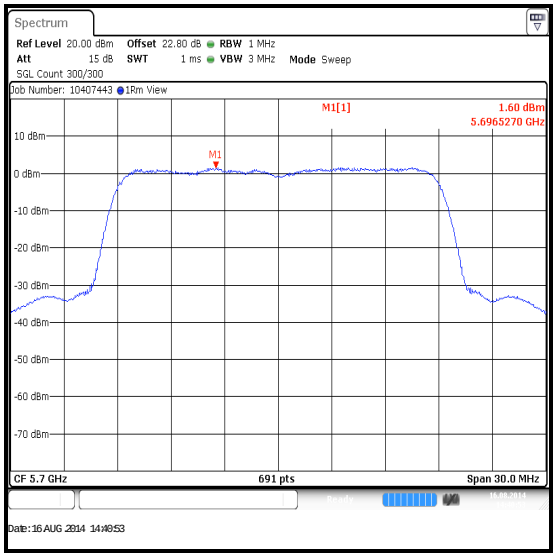
Channel	Frequency (MHz)	PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5500	1.4	11.0	9.6	Complied
Middle	5580	2.3	11.0	8.7	Complied
Top	5700	1.6	11.0	9.4	Complied



Bottom Channel



Middle Channel

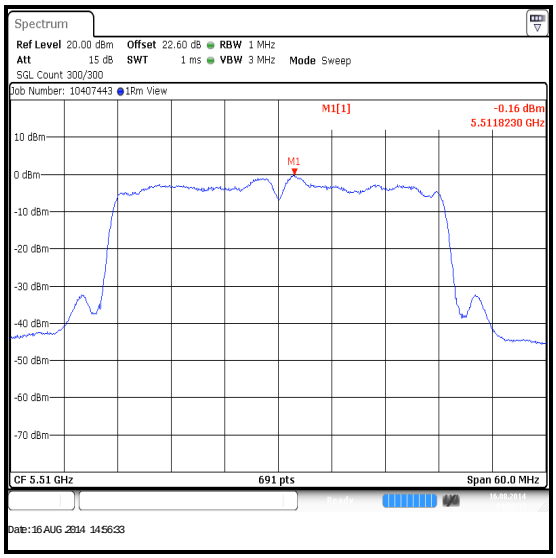


Top Channel

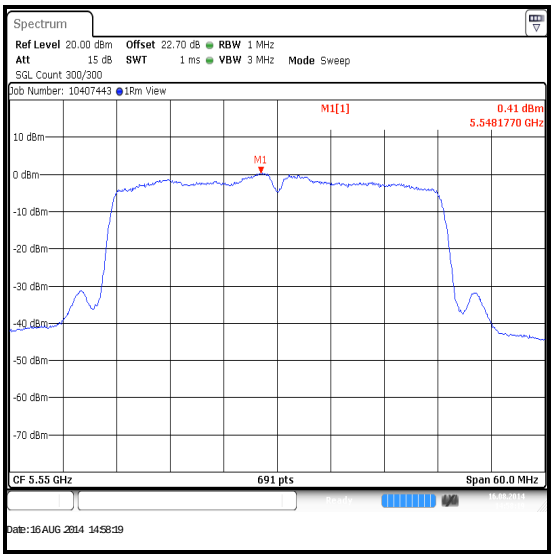
Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11n / 40 MHz / BPSK / MCS0 / SISO / 5.47-5.725 GHz band / Port 1

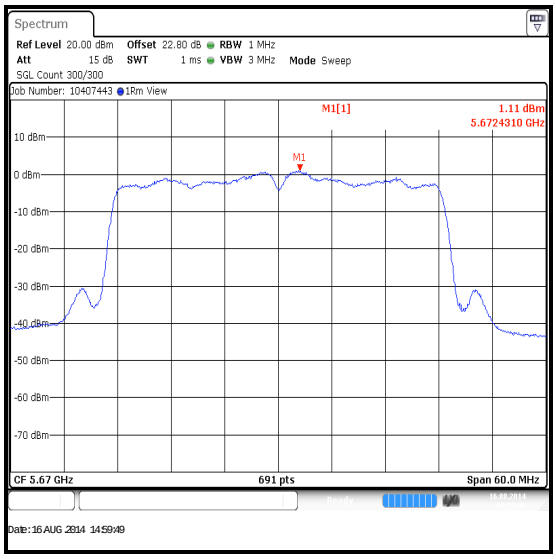
Channel	Frequency (MHz)	PPSD (dBm /MHz)	Duty cycle correction (dB)	Corrected PPSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5510	-0.2	0.1	-0.1	11.0	11.1	Complied
Middle	5550	0.4	0.1	0.5	11.0	10.5	Complied
Top	5670	1.1	0.1	1.2	11.0	9.8	Complied



Bottom Channel



Middle Channel



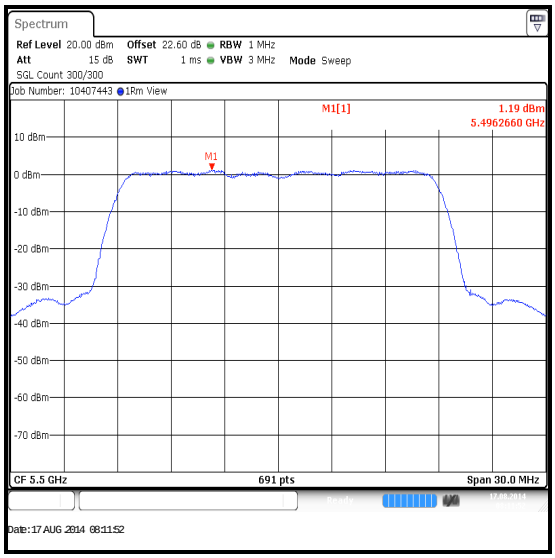
Top Channel

Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

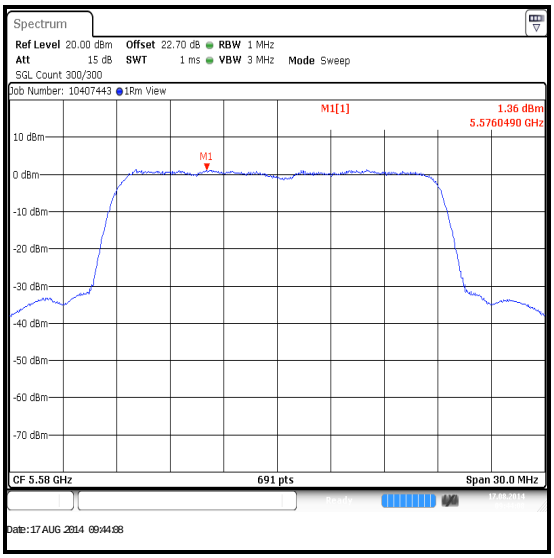
Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / 5.47-5.725 GHz band

Channel	Frequency (MHz)	PPSD Port 1 (dBm /MHz)	PPSD Port 2 (dBm /MHz)	Combined PPSD (dBm/MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5500	1.2	0.7	4.0	10.6	6.6	Complied
Middle	5580	1.4	0.8	4.1	10.6	6.5	Complied
Top	5700	-0.1	0.1	3.0	10.6	7.6	Complied

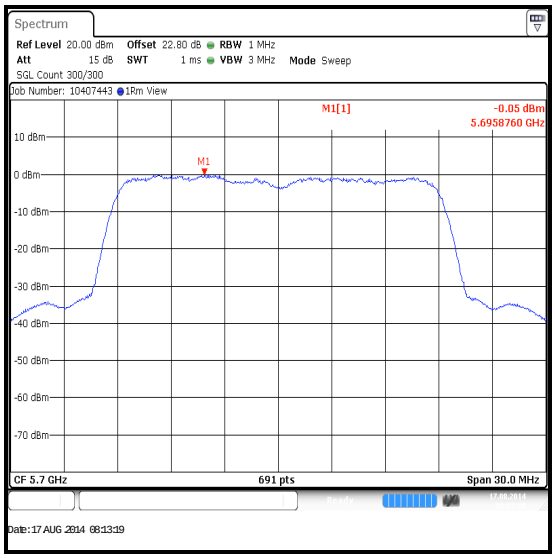
Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / 5.47-5.725 GHz band / Port 1



Bottom Channel



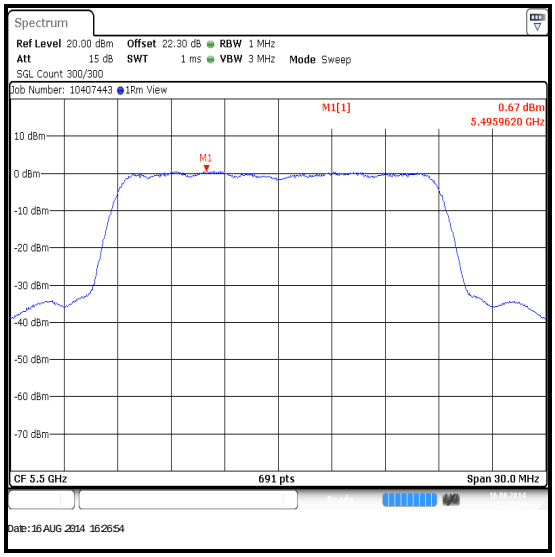
Middle Channel



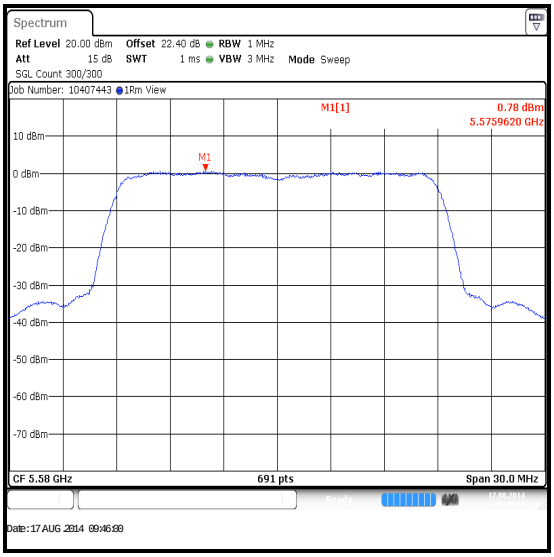
Top Channel

Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

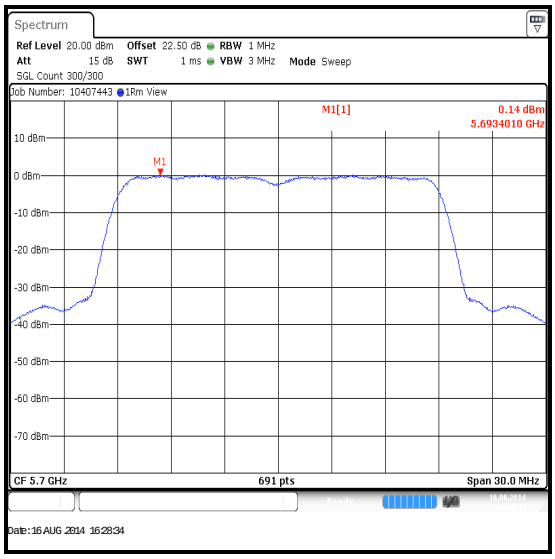
Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / 5.47-5.725 GHz band / Port 2



Bottom Channel



Middle Channel



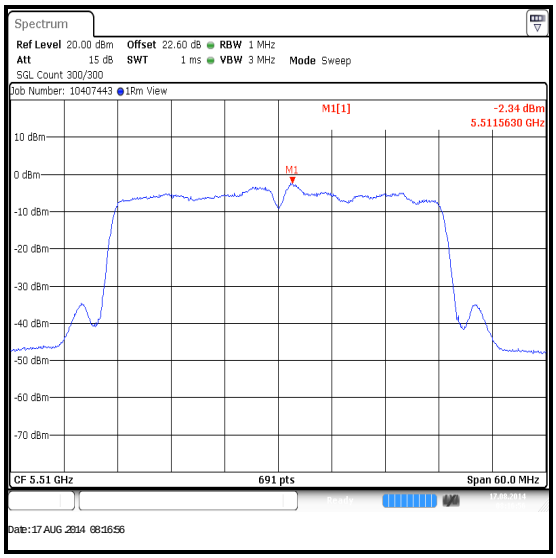
Top Channel

Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

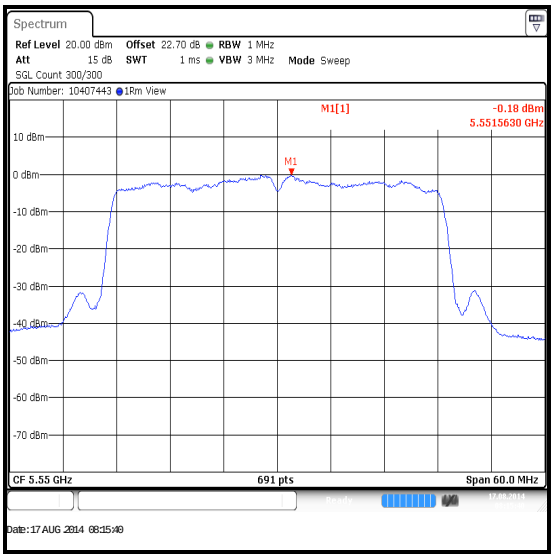
Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / 5.47-5.725 GHz band

Channel	Frequency (MHz)	PPSD Port 1 (dBm /MHz)	PPSD Port 2 (dBm /MHz)	Combined PPSD (dBm/MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5510	-2.3	-4.2	-0.2	10.6	10.8	Complied
Middle	5550	-0.2	-0.5	2.7	10.6	7.9	Complied
Top	5670	-0.2	-0.1	2.9	10.6	7.7	Complied

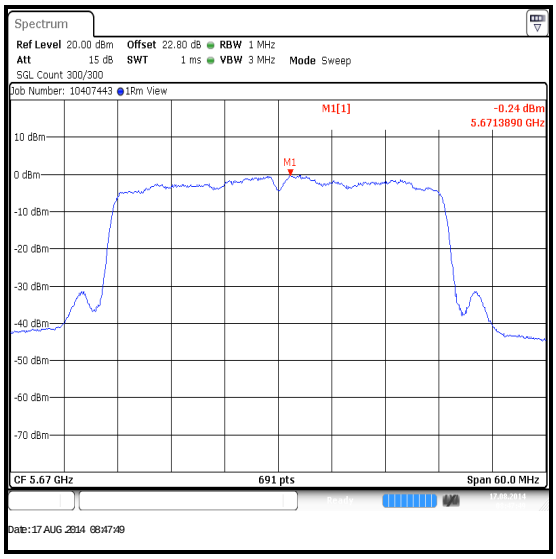
Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / 5.47-5.725 GHz band / Port 1



Bottom Channel



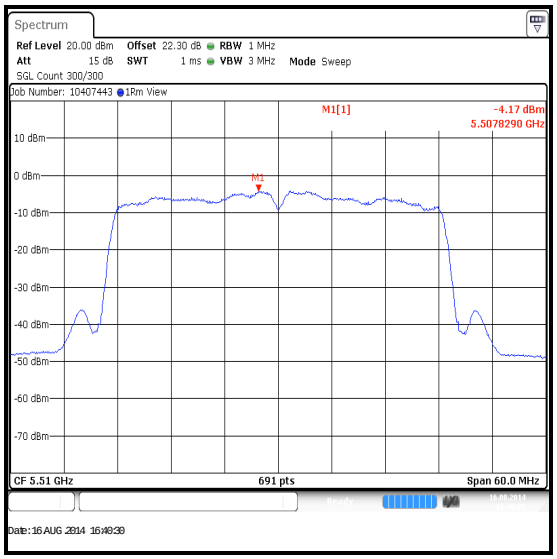
Middle Channel



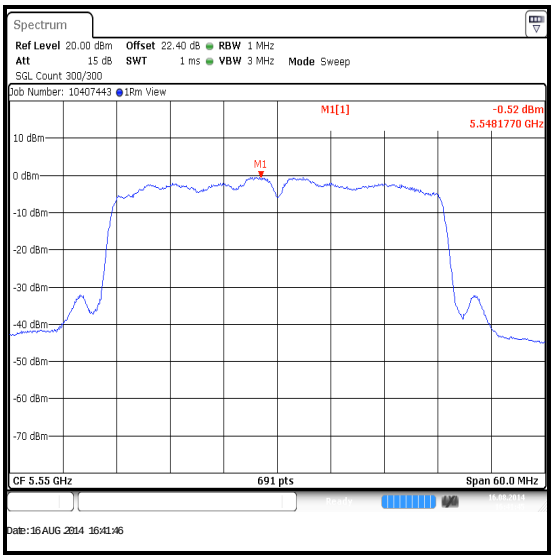
Top Channel

Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

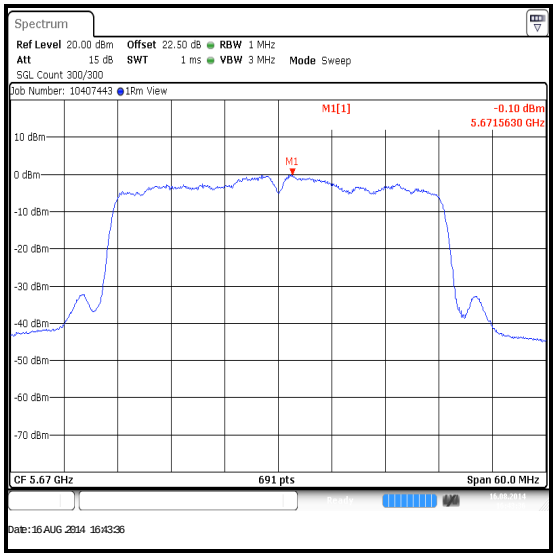
Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / 5.47-5.725 GHz band / Port 2



Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.725-5.85 GHz band)

Test Summary:

Test Engineer:	Georgios Vrezas	**Test Date:**	17 August 2014
Test Sample IMEI:	352025060005387		

FCC Reference:	Part 15.407(a)(3)
Test Method Used:	As detailed in KDB 789033 D02 Section II.F. referencing II.E.2.b) and II.E.2.d)

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	40

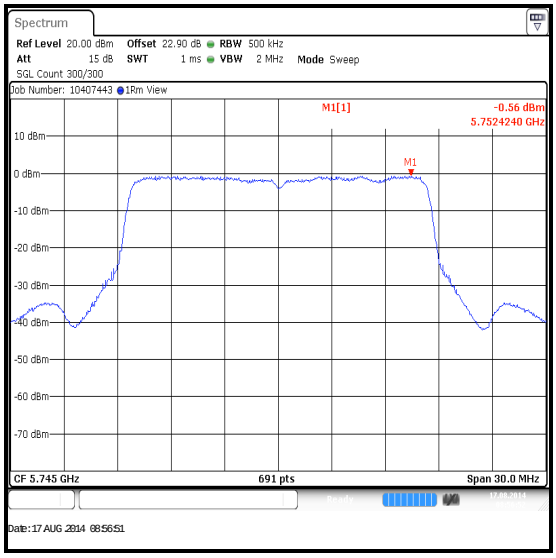
Note(s):

1. FCC Part 15.407(a)(3) limit for PPSD in the 5.725-5.85 GHz operating band is <30 dBm/500 kHz.
2. For 802.11a and 802.11n SISO mode, the EUT antenna has a gain of <6dBi.
3. For 802.11n MIMO mode, the EUT antenna has a combined gain of 6.3 dBi. According to 15.407(a)(3), the limit was reduced by the amount in dB the antenna gain exceeds 6 dBi. Therefore the limit of 30 dBm/500 kHz has been reduced by 0.3 dB to 29.7 dBm/500 kHz.

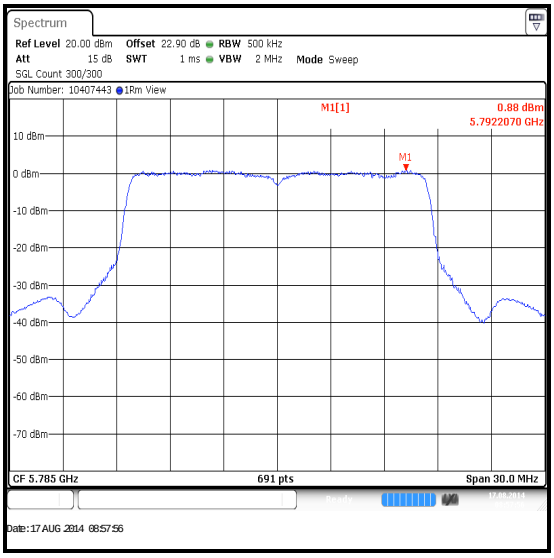
Transmitter Maximum Power Spectral Density (5.725-5.85 GHz band) (continued)

Results: 802.11a / 20 MHz / BPSK / 6 Mbps / Port 1

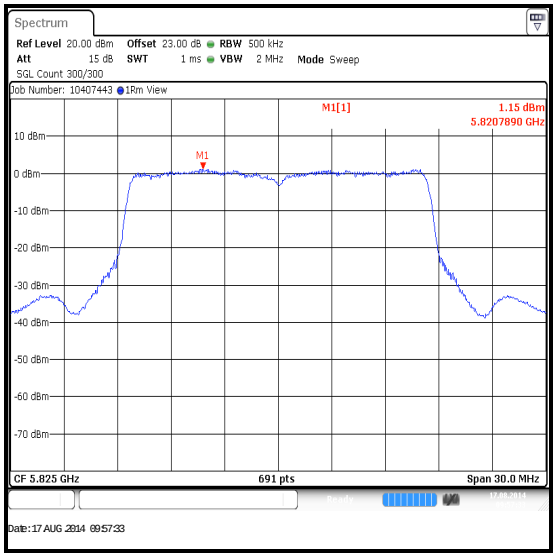
Channel	Frequency (MHz)	PPSD (dBm / 500 kHz)	Limit (dBm / 500 kHz)	Margin (dB)	Result
Bottom	5745	-0.6	30.0	30.6	Complied
Middle	5785	0.9	30.0	29.1	Complied
Top	5825	1.2	30.0	28.8	Complied



Bottom Channel



Middle Channel

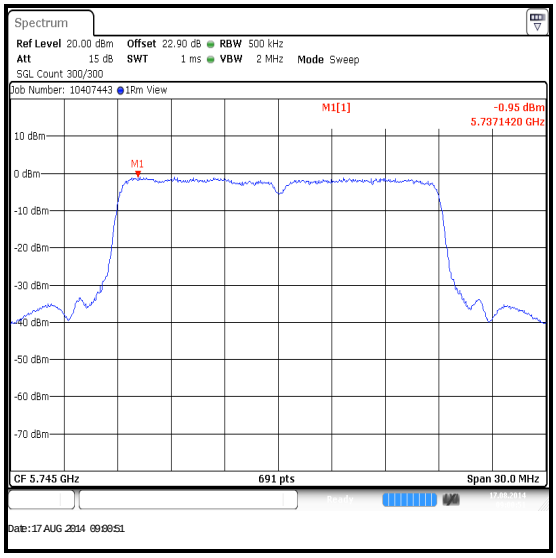


Top Channel

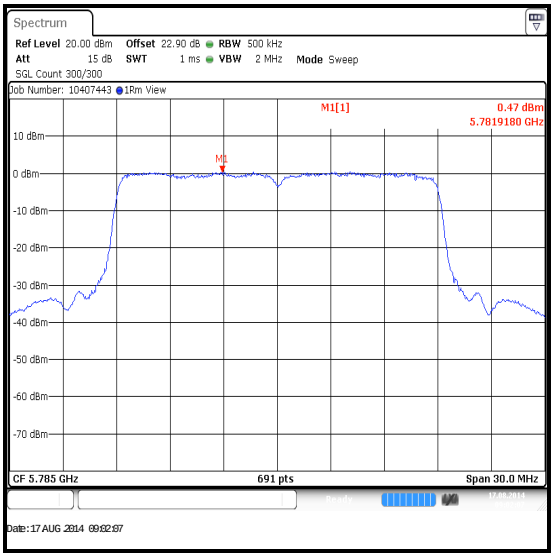
Transmitter Maximum Power Spectral Density (5.725-5.85 GHz band) (continued)

Results: 802.11n / 20 MHz / BPSK / MCS0 / SISO / Port 1

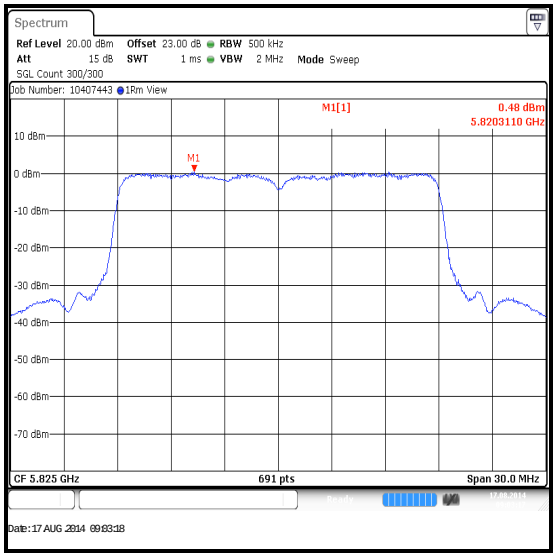
Channel	Frequency (MHz)	PPSD (dBm / 500 kHz)	Limit (dBm / 500 kHz)	Margin (dB)	Result
Bottom	5745	-1.0	30.0	31.0	Complied
Middle	5785	0.5	30.0	29.5	Complied
Top	5825	0.5	30.0	29.5	Complied



Bottom Channel



Middle Channel

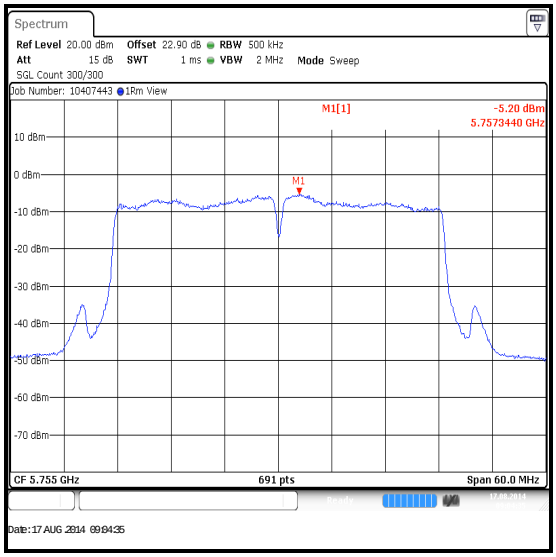


Top Channel

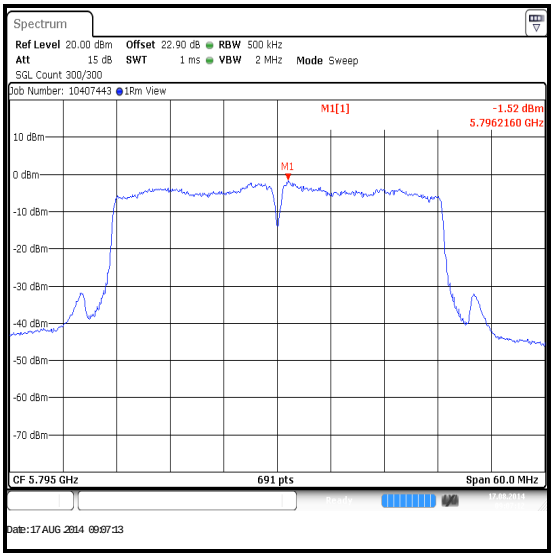
Transmitter Maximum Power Spectral Density (5.725-5.85 GHz band) (continued)

Results: 802.11n / 40 MHz / BPSK / MCS0 / SISO / Port 1

Channel	Frequency (MHz)	PPSD (dBm / 500 kHz)	Duty cycle correction (dB)	Corrected PPSD (dBm / 500 kHz)	Limit (dBm / 500 kHz)	Margin (dB)	Result
Bottom	5755	-5.2	0.1	-5.1	30.0	35.1	Complied
Top	5795	-1.5	0.1	-1.4	30.0	31.4	Complied



Bottom Channel



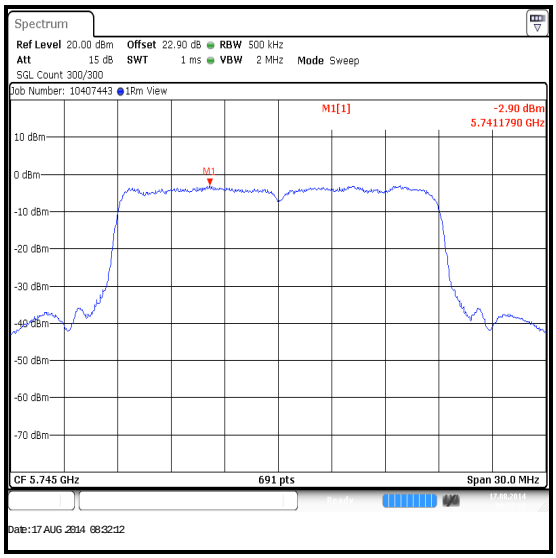
Top Channel

Transmitter Maximum Power Spectral Density (5.725-5.85 GHz band) (continued)

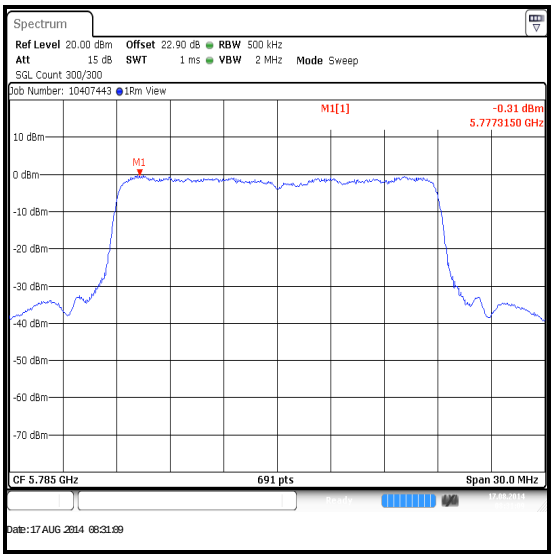
Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO

Channel	Frequency (MHz)	PPSD Port 1 (dBm / 500 kHz)	PPSD Port 2 (dBm / 500 kHz)	Combined PPSD (dBm / 500 kHz)	Limit (dBm / 500 kHz)	Margin (dB)	Result
Bottom	5745	-2.9	-3.0	1.5	29.7	28.2	Complied
Middle	5785	-0.3	-0.2	2.8	29.7	26.9	Complied
Top	5825	-0.3	0.0	2.9	29.7	26.8	Complied

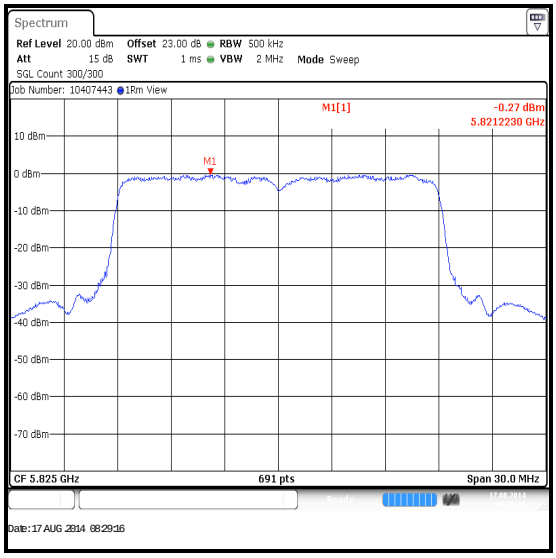
Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / Port 1



Bottom Channel



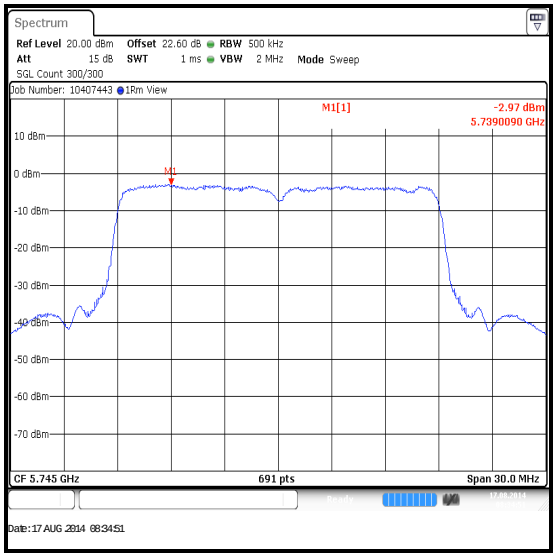
Middle Channel



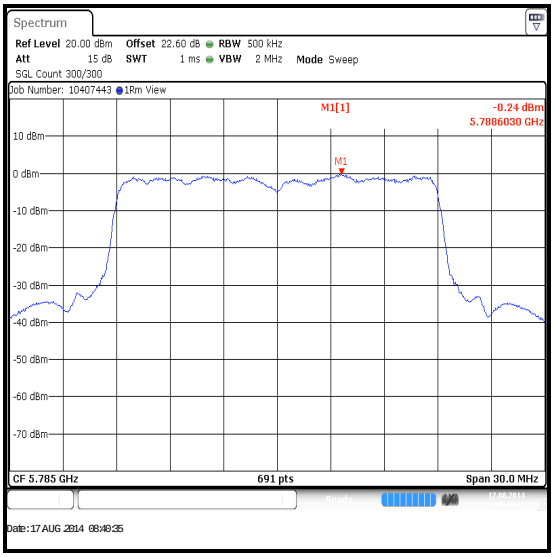
Top Channel

Transmitter Maximum Power Spectral Density (5.725-5.85 GHz band) (continued)

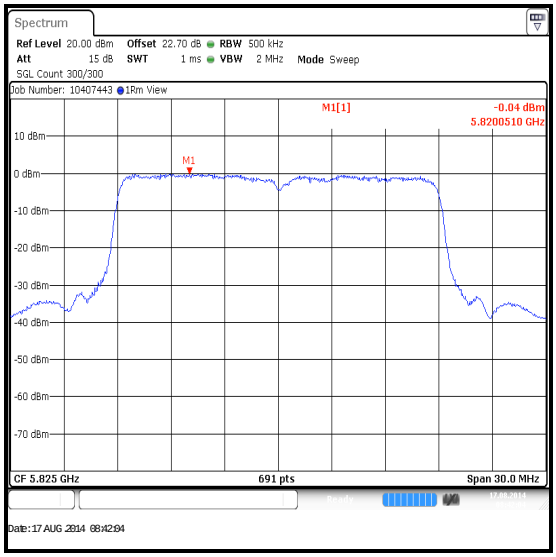
Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / Port 2



Bottom Channel



Middle Channel



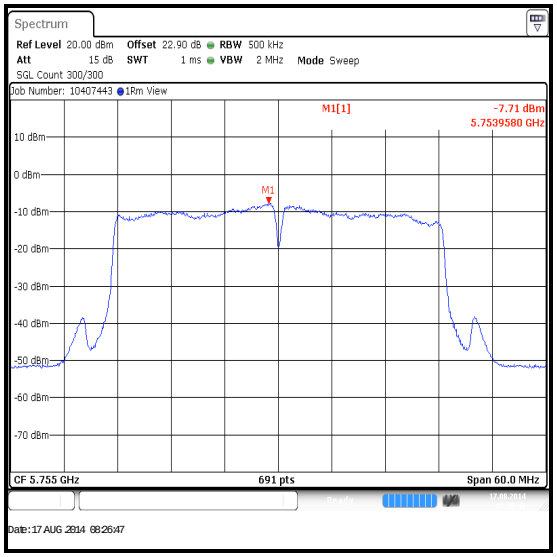
Top Channel

Transmitter Maximum Power Spectral Density (5.725-5.85 GHz band) (continued)

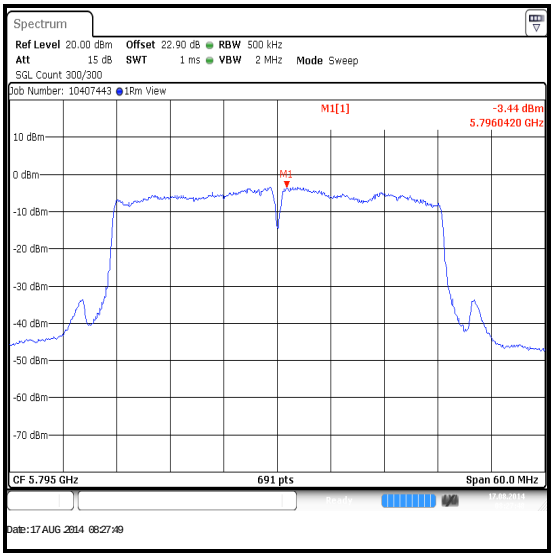
Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO

Channel	Frequency (MHz)	PPSD Port 1 (dBm / 500 kHz)	PPSD Port 2 (dBm / 500 kHz)	Combined PPSD (dBm/ 500 kHz)	Limit (dBm / 500 kHz)	Margin (dB)	Result
Bottom	5755	-7.7	-8.5	-5.1	29.7	34.8	Complied
Top	5795	-3.4	-3.0	-0.2	29.7	29.9	Complied

Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / Port 1

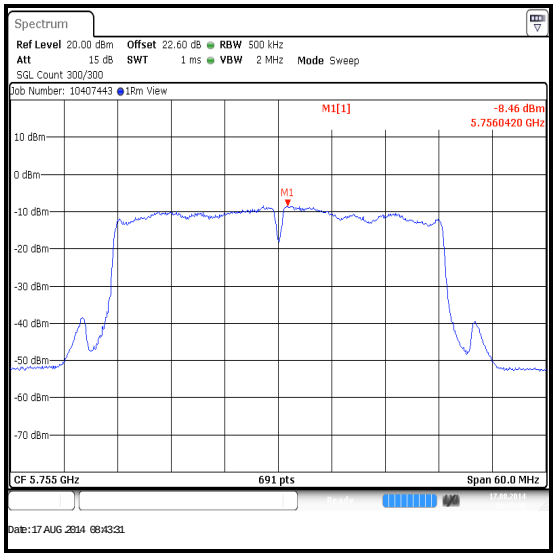


Bottom Channel

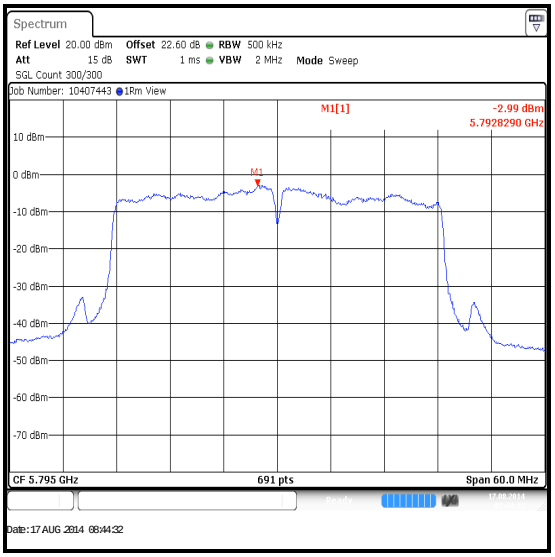


Top Channel

Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / Port 2



Bottom Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.725-5.85 GHz band) (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1658	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	14 Mar 2015	12
M1873	Signal Analyser	Rohde & Schwarz	FSV30	103074	15 May 2015	12
A1998	Attenuator	Huber & Suhner	6820.17.B	07101	Calibrated before use	-
S0558	DC Power Supply	TTI	EL 303R	395825	Calibrated before use	-
M1251	Multimeter	Fluke	175	89170179	19 May 2015	12
M260	Signal Generator	Rohde & Schwarz	SMP02	829076/008	24 Apr 2015	12
M1009	Power Meter	Hewlett Packard	437B	3125U13706	04 Feb 2015	12
M1592	Power Sensor	Hewlett Packard	8487A	3318A02094	28 Aug 2014	12

5.2.7. Transmitter Out of Band Radiated Emissions

Test Summary:

Test Engineer:	Georgios Vrezas	**Test Date:**	04 August 2014
Test Sample IMEI:	352025060307270		

FCC Reference:	Parts 15.407(b)(2),(6),(7) & 15.209(a)
Test Method Used:	As detailed in KDB 789033 II.G. & ANSI C63.10 Sections 6.3 and 6.5
Frequency Range:	30 MHz to 1000 MHz

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	31

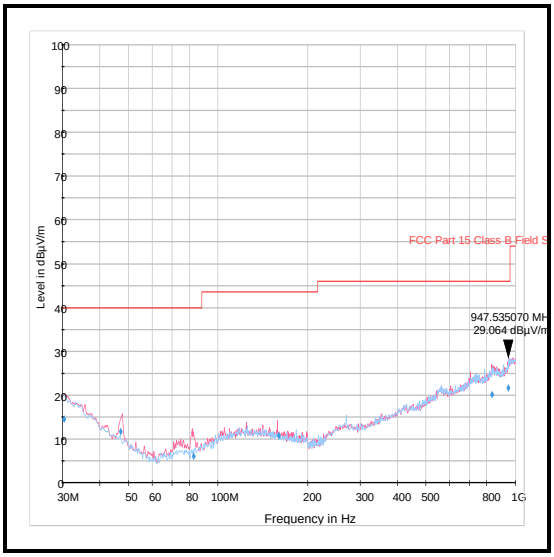
Note(s):

1. Measurements below 1 GHz were limited to the 5.25-5.35 GHz band, the EUT was transmitting with a data rate of 6.5 Mbps (802.11n HT20 / MIMO) as it produced the highest conducted output power and was therefore deemed worst case.
2. Pre-scans with the EUT transmitting on the top channel were measured according to FCC Part 15.407(b)(2) which states for transmitters operating in the band 5.25 to 5.35 GHz: all emissions outside of the band 5.15-5.35 GHz band shall not exceed -27 dBm/MHz. Part(b)(6) states unwanted emissions below 1 GHz must comply with the general field strength limits set forth in 15.209. Part(b)(7) states the provisions of 15.205 apply, e.g. restricted bands of operation.
3. The final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
4. The preliminary scans showed similar emission levels below 1 GHz, for each channel of operation. Therefore final radiated emissions measurements were performed with the EUT set to the top channel only.
5. All emissions shown on the pre-scan plots were found to be below the measurement system noise floor or ambient, therefore the highest peak noise floor reading of the measuring receiver was recorded in the table below.
6. Measurements below 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Results: Top Channel / Field Strength

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
947.535	Vertical	29.1	46.0	16.9	Complied

Transmitter Out of Band Radiated Emissions (5.25-5.35 GHz band operation) (continued)



Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1622	Thermohygrometer	JM Handelspunkt	30.5015.06	None stated	31 Dec 2014	12
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	26 Nov 2014	12
A1834	Attenuator	Hewlett Packard	8491B	10444	15 Nov 2014	12
G0543	Amplifier	Sonoma	310N	230801	19 Aug 2014	3
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	15 Feb 2015	12
A490	Antenna	Chase	CBL6111A	1590	29 Apr 2015	12

Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band operation) (continued)

Test Summary:

Test Engineer:	Andrew Edwards	**Test Date:**	30 July 2014
Test Sample IMEI:	352025060307270		

FCC Reference:	Part 15.407(b)(1),(7) & 15.209(a)
Test Method Used:	As detailed in KDB 789033 II.G. & ANSI C63.10 Sections 6.3 and 6.6
Frequency Range:	1 GHz to 40 GHz

Environmental Conditions:

Temperature (°C):	22
Relative Humidity (%):	41

Note(s):

1. FCC Part 15.407(b)(1) states for transmitters operating in the band 5.15 to 5.25 GHz: all emissions outside of the band will not exceed -27 dBm/MHz. Part(b)(7) states the provisions of 15.205 apply e.g. restricted bands of operation.
2. Pre-scans were performed with the EUT transmitting on top channel in the 5.25 to 5.35 GHz band. An inquiry was made to the FCC and the response was pre-scans could be performed in the band with the highest conducted output power and all final measurements should be performed on any emissions seen in each band.
3. The final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
4. Appropriate RF filters and attenuators were used during pre-scans and final measurements. Insertion losses were entered on the spectrum analyser as RF levels offsets.
5. *In accordance with KDB 789033 Section II.G.1.c) if the peak measurement is below the average limit, it is not necessary to perform a separate average measurement.
6. All other emissions shown on the pre-scan plots were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
7. Pre-scans above 1 GHz were performed in a fully anechoic chamber (Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band operation) (continued)

Results: Bottom Channel / EIRP

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
4756.167	Horizontal	-43.5	-27.0	16.5	Complied
4964.160	Horizontal	-39.6	-27.0	12.6	Complied
5025.589	Horizontal	-40.1	-27.0	13.1	Complied
5394.551	Horizontal	-38.1	-27.0	11.1	Complied
5485.288	Horizontal	-41.4	-27.0	14.4	Complied
5604.667	Horizontal	-40.5	-27.0	13.5	Complied

Results: Bottom Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
4756.167	Horizontal	51.7	54.0*	2.3	Complied
4964.160	Horizontal	55.6	74.0	18.4	Complied
5025.589	Horizontal	55.1	74.0	18.9	Complied
5394.551	Horizontal	57.1	74.0	16.9	Complied

Results: Bottom Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
4964.240	Horizontal	44.2	54.0	9.8	Complied
5025.990	Horizontal	43.4	54.0	10.6	Complied
5395.994	Horizontal	45.5	54.0	8.5	Complied

Results: Middle Channel / EIRP

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
4983.333	Horizontal	-40.2	-27.0	13.2	Complied
5048.333	Horizontal	-39.3	-27.0	12.3	Complied
5113.673	Horizontal	-39.4	-27.0	12.4	Complied
5352.721	Horizontal	-38.6	-27.0	11.6	Complied
5416.881	Horizontal	-37.7	-27.0	10.7	Complied
5499.463	Horizontal	-40.8	-27.0	13.8	Complied
5635.763	Horizontal	-40.5	-27.0	13.5	Complied

Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band operation) (continued)

Results: Middle Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
4983.333	Horizontal	55.0	74.0	19.0	Complied
5048.333	Horizontal	55.9	74.0	18.1	Complied
5113.673	Horizontal	55.8	74.0	18.2	Complied
5352.721	Horizontal	56.6	74.0	17.4	Complied
5416.881	Horizontal	57.5	74.0	16.5	Complied

Results: Middle Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
4983.333	Horizontal	44.9	54.0	9.1	Complied
5045.833	Horizontal	43.8	54.0	10.2	Complied
5123.208	Horizontal	44.1	54.0	9.9	Complied
5352.481	Horizontal	44.7	54.0	9.3	Complied
5416.721	Horizontal	48.3	54.0	5.7	Complied

Results: Top Channel / EIRP

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5022.051	Horizontal	-39.6	-27.0	12.6	Complied
5095.615	Horizontal	-39.5	-27.0	12.5	Complied
5387.423	Horizontal	-39.6	-27.0	12.6	Complied
5456.272	Horizontal	-39.4	-27.0	12.4	Complied
5532.788	Horizontal	-41.0	-27.0	14.0	Complied
5669.628	Horizontal	-40.5	-27.0	13.5	Complied

Results: Top Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5022.051	Horizontal	55.6	74.0	18.4	Complied
5095.615	Horizontal	55.7	74.0	18.3	Complied
5387.423	Horizontal	55.6	74.0	18.4	Complied
5456.272	Horizontal	55.8	74.0	18.2	Complied

Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band operation) (continued)

Results: Top Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5021.731	Horizontal	44.3	54.0	9.7	Complied
5086.160	Horizontal	43.5	54.0	10.5	Complied
5395.115	Horizontal	43.7	54.0	10.3	Complied
5458.436	Horizontal	44.3	54.0	9.7	Complied

Transmitter Out of Band Radiated Emissions (5.25-5.35 GHz band operation) (continued)

Test Summary:

Test Engineer:	Andrew Edwards	**Test Dates:**	30 July 2014 & 31 July 2014
Test Sample IMEI:	352025060307270		

FCC Reference:	Part 15.407(b)(2),(7) & 15.209(a)
Test Method Used:	As detailed in KDB 789033 II.G. & ANSI C63.10 Sections 6.3 and 6.6
Frequency Range:	1 GHz to 40 GHz

Environmental Conditions:

Temperature (°C):	22 to 23
Relative Humidity (%):	43 to 49

Note(s):

1. FCC Part 15.407(b)(2) states for transmitters operating in the band 5.25 to 5.35 GHz: all emissions outside of the 5.15-5.35 GHz band will not exceed -27 dBm/MHz. Part(b)(7) states the provisions of 15.205 apply e.g. restricted bands of operation.
2. Pre-scans were performed with the EUT transmitting on the top channel in this band. An inquiry was made to the FCC and the response was pre-scans could be performed in the band with the highest conducted output power (802.11n HT20 – 6.5 Mbps / MCS0 / MIMO) and all final measurements should be performed on any emission seen for each band.
3. The final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
4. Appropriate RF filters and attenuators were used during pre-scans and final measurements. Insertion losses were entered on the spectrum analyser as RF levels offsets.
5. The emission shown on the 4 GHz to 6 GHz plot is the EUT fundamental.
6. *In accordance with KDB 789033 Section II.G.1.c) if the peak measurement is below the average limit, it is not necessary to perform a separate average measurement.
7. All other emissions shown on the pre-scan plot were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
8. Pre-scan plots 4 to 6 GHz and the two restricted band plots (4.5 to 5.15 and 5.35 to 5.46 GHz) were performed with 4001 Sweep points and 100 sweep points in accordance with KDB 789033 II.G.6.c)(iii). All other meausrments were performed with the instruments default setting of 625 sweep points.
9. Measurements were performed across the two restricted bands closest to the bands of operation with the EUT transmitting on the top channel in the 5.25 to 5.35 GHz band. Plots are included in this section of the test report. Peak and average measurements were made.
10. Pre-scans above 1 GHz were performed in a fully anechoic chamber (Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Transmitter Out of Band Radiated Emissions (5.25-5.35 GHz band operation) (continued)

Results: Bottom Channel / EIRP

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
4827.067	Horizontal	-43.2	-27.0	16.2	Complied
4958.496	Horizontal	-42.5	-27.0	15.5	Complied
5041.169	Horizontal	-38.3	-27.0	11.3	Complied
5107.982	Horizontal	-40.2	-27.0	13.2	Complied
5479.554	Horizontal	-38.4	-27.0	11.4	Complied
5551.720	Horizontal	-41.2	-27.0	14.2	Complied
5693.625	Horizontal	-40.9	-27.0	13.9	Complied

Results: Bottom Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
4827.067	Horizontal	52.0	54.0*	2.0	Complied
4958.496	Horizontal	52.7	54.0*	1.3	Complied
5041.169	Horizontal	56.9	74.0	17.1	Complied
5107.982	Horizontal	55.0	54.0	19.0	Complied

Results: Bottom Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5040.849	Horizontal	46.2	54.0	7.8	Complied
5106.059	Horizontal	43.6	54.0	10.4	Complied

Results: Middle Channel / EIRP

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
4857.997	Horizontal	-43.3	-27.0	16.3	Complied
5079.038	Horizontal	-38.3	-27.0	11.3	Complied
5384.686	Horizontal	-37.2	-27.0	10.2	Complied
5521.000	Horizontal	-38.9	-27.0	11.9	Complied
5599.519	Horizontal	-41.0	-27.0	14.0	Complied
5741.279	Horizontal	-40.1	-27.0	13.1	Complied

Transmitter Out of Band Radiated Emissions (5.25-5.35 GHz band operation) (continued)

Results: Middle Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
4857.997	Horizontal	51.9	54.0*	2.1	Complied
5079.038	Horizontal	56.9	74.0	17.1	Complied
5384.686	Horizontal	58.0	74.0	16.0	Complied

Results: Middle Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
5079.119	Horizontal	45.2	54.0	8.8	Complied
5372.667	Horizontal	45.3	54.0	8.7	Complied

Results: Top Channel / EIRP

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
4869.429	Horizontal	-42.7	-27.0	15.7	Complied
5098.553	Horizontal	-39.4	-27.0	12.4	Complied
5378.366	Horizontal	-33.7	-27.0	6.7	Complied
5537.673	Horizontal	-39.1	-27.0	12.1	Complied
5768.923	Horizontal	-41.6	-27.0	14.6	Complied

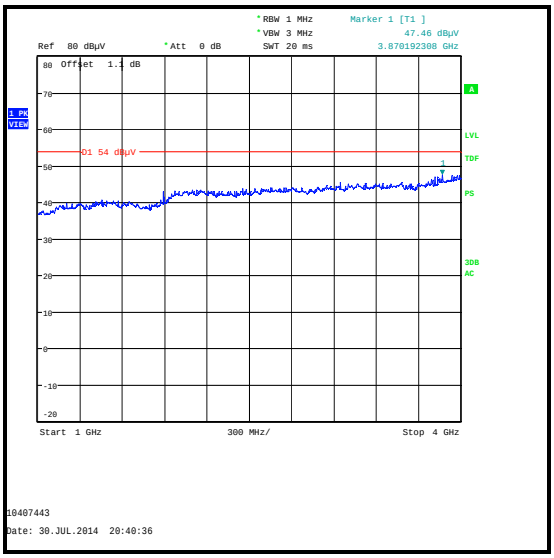
Results: Top Channel / Field Strength / Peak

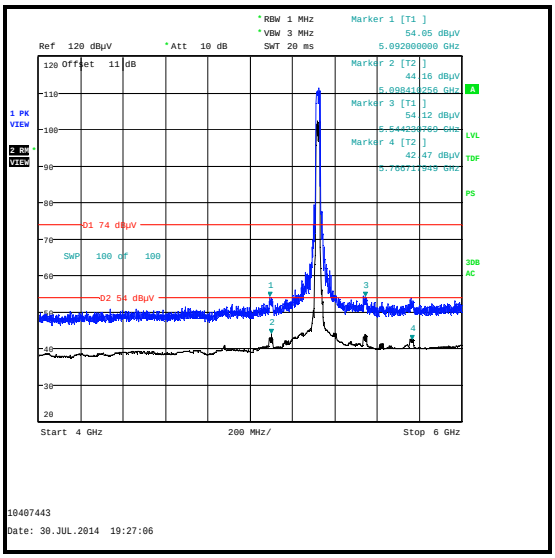
Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
4869.429	Horizontal	52.5	54.0*	1.5	Complied
5098.553	Horizontal	55.8	74.0	18.2	Complied
5378.366	Horizontal	61.5	74.0	12.5	Complied

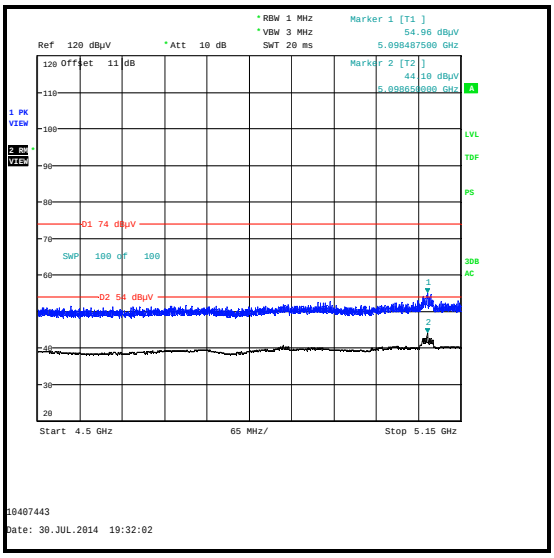
Results: Top Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5098.440	Horizontal	44.3	54.0	9.7	Complied
5400.160	Horizontal	44.5	54.0	9.5	Complied

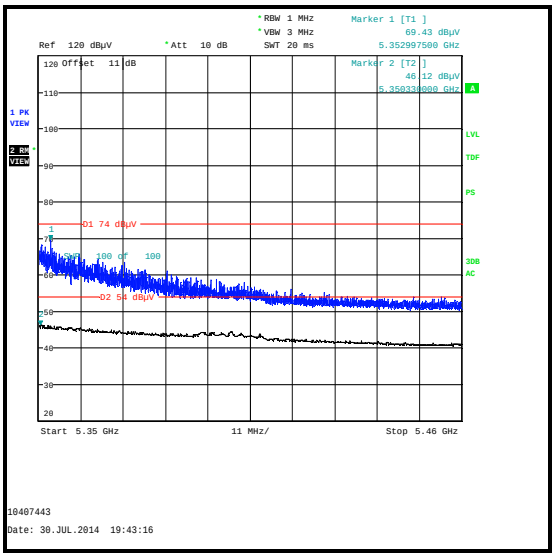
Transmitter Out of Band Radiated Emissions (5.25-5.35 GHz band operation) (continued)





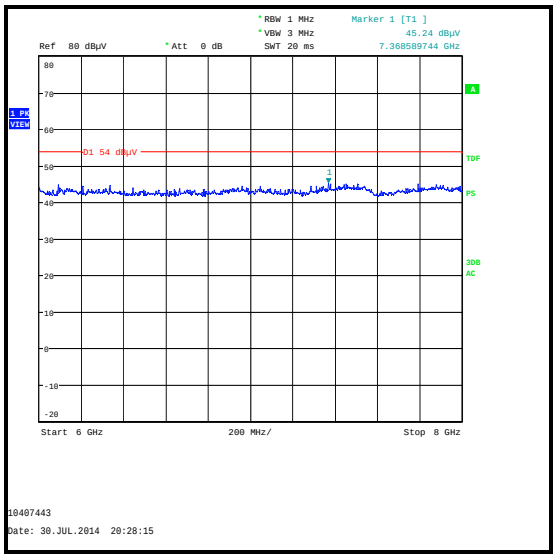


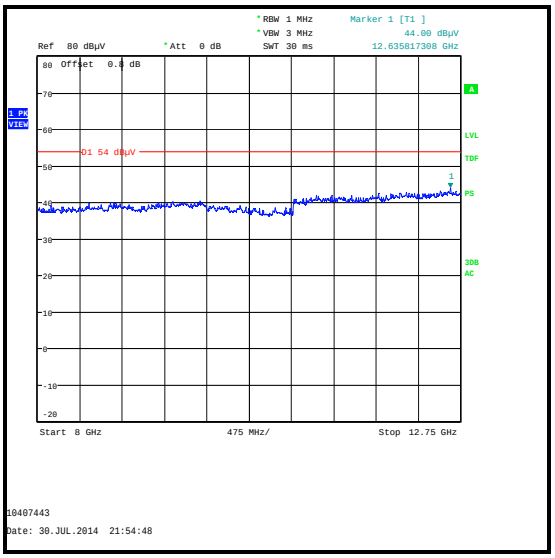
Restricted Band 4.5 GHz to 5.15 GHz

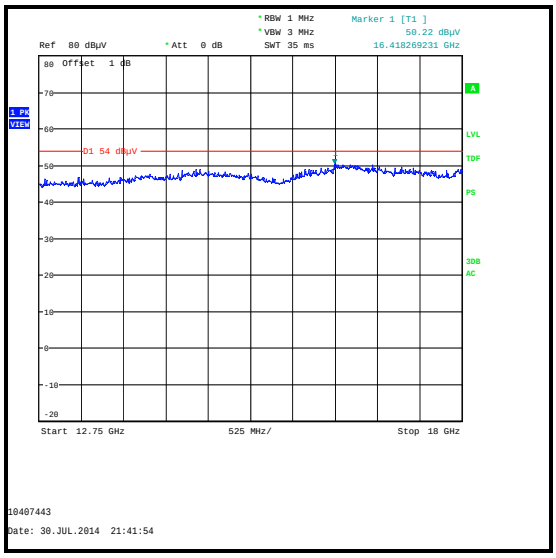


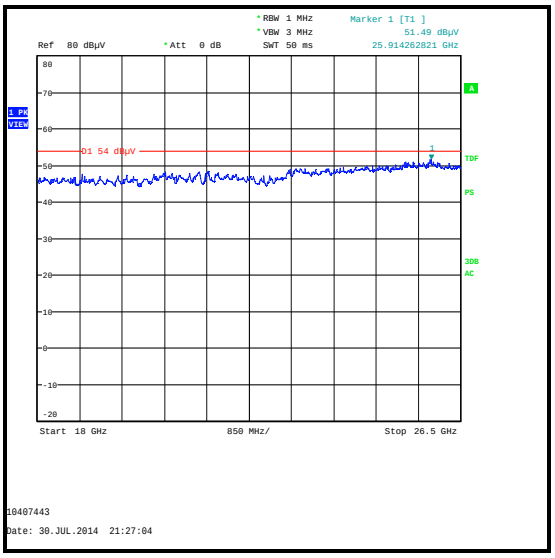
Restricted Band 5.35 GHz to 5.46 GHz

Transmitter Out of Band Radiated Emissions (5.25-5.35 GHz band operation) (continued)

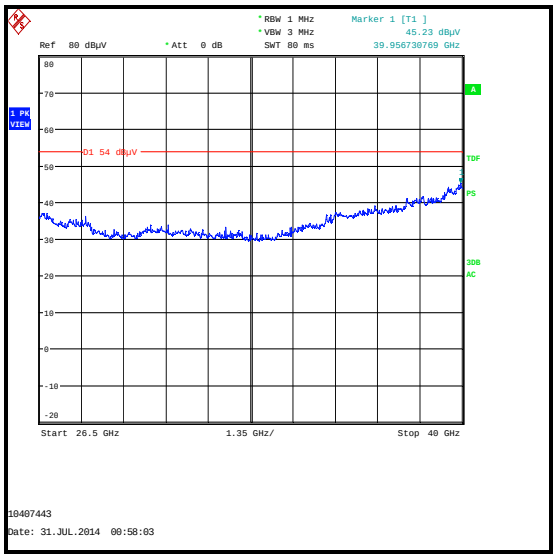








Transmitter Out of Band Radiated Emissions (5.25-5.35 GHz band operation) (continued)



Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Transmitter Out of Band Radiated Emissions (5.47-5.725 GHz band operation) (continued)

Test Summary:

Test Engineer:	Andrew Edwards	**Test Dates:**	30 July 2014 & 31 July 2014
Test Sample IMEI:	352025060307270		

FCC Reference:	Part 15.407(b)(3),(7) & 15.209(a)
Test Method Used:	As detailed in KDB 789033 II.G. & ANSI C63.10 Sections 6.3 and 6.6
Frequency Range:	1 GHz to 40 GHz

Environmental Conditions:

Temperature (°C):	22 to 23
Relative Humidity (%):	43 to 45

Note(s):

1. FCC Part 15.407(b)(3) states for transmitters operating in the band 5.47 to 5.725 GHz: all emissions outside of the band will not exceed -27 dBm/MHz. Part(b)(7) states the provisions of 15.205 apply e.g. restricted bands of operation.
2. Pre-scans were performed with the EUT transmitting on top channel in the 5.25 to 5.35 GHz band. An inquiry was made to the FCC and the response was pre-scans could be performed in the band with the highest conducted output power and all final measurements should be performed on any emissions seen in each band.
3. The final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
4. Appropriate RF filters and attenuators were used during pre-scans and final measurements. Insertion losses were entered on the spectrum analyser as RF levels offsets.
5. All other emissions shown on the pre-scan plot were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
6. Pre-scans above 1 GHz were performed in a fully anechoic chamber (Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Results: Bottom Channel / EIRP

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5085.817	Horizontal	-41.1	-27.0	14.1	Complied
5208.929	Horizontal	-41.3	-27.0	14.3	Complied
5333.026	Horizontal	-38.8	-27.0	11.8	Complied
5703.561	Horizontal	-37.8	-27.0	10.8	Complied
5799.160	Horizontal	-40.8	-27.0	13.8	Complied
5907.279	Horizontal	-40.0	-27.0	13.0	Complied

Transmitter Out of Band Radiated Emissions (5.47-5.725 GHz band operation) (continued)

Results: Bottom Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5085.817	Horizontal	54.1	74.0	19.9	Complied

Results: Bottom Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5092.628	Horizontal	43.0	54.0	11.0	Complied

Results: Middle Channel / EIRP

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5174.391	Horizontal	-40.0	-27.0	13.0	Complied
5288.131	Horizontal	-41.0	-27.0	14.0	Complied
5373.561	Horizontal	-36.5	-27.0	9.5	Complied
5426.250	Horizontal	-40.0	-27.0	13.0	Complied
5786.721	Horizontal	-37.5	-27.0	10.5	Complied
5900.621	Horizontal	-40.9	-27.0	13.9	Complied
5985.096	Horizontal	-38.1	-27.0	11.1	Complied

Results: Middle Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5373.561	Horizontal	58.7	74.0	15.3	Complied
5426.250	Horizontal	55.2	74.0	18.8	Complied

Results: Middle Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5373.401	Horizontal	48.6	54.0	5.4	Complied
5412.949	Horizontal	43.2	54.0	10.8	Complied

Transmitter Out of Band Radiated Emissions (5.47-5.725 GHz band operation) (continued)

Results: Top Channel / EIRP

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5275.000	Horizontal	-40.9	-27.0	13.9	Complied
5401.283	Horizontal	-40.6	-27.0	13.6	Complied
5777.310	Horizontal	-38.9	-27.0	11.9	Complied
5919.135	Horizontal	-39.4	-27.0	12.4	Complied
6001.122	Horizontal	-39.7	-27.0	12.7	Complied
6121.759	Horizontal	-39.0	-27.0	12.0	Complied

Results: Top Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5401.283	Horizontal	54.6	74.0	19.4	Complied

Results: Top Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5408.333	Horizontal	42.6	54.0	11.4	Complied

Transmitter Out of Band Radiated Emissions (5.725-5.85 GHz band operation) (continued)

Test Summary:

Test Engineer:	Andrew Edwards	**Test Date:**	31 July 2014
Test Sample IMEI:	352025060307270		

FCC Reference:	Part 15.407(b)(4),(7) & 15.209(a)
Test Method Used:	As detailed in KDB 789033 II.G. & ANSI C63.10 Sections 6.3 and 6.6
Frequency Range:	1 GHz to 40 GHz

Environmental Conditions:

Temperature (°C):	22
Relative Humidity (%):	43

Note(s):

1. FCC Part 15.407(b)(4) states for transmitters operating in the band 5.725 to 5.85 GHz: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge will not exceed -27 dBm/MHz. Part(b)(7) states the provisions of 15.205 apply e.g. restricted bands of operation.
2. Pre-scans were performed with the EUT transmitting on top channel in 5.25 to 5.35 GHz band. An inquiry was made to the FCC and the response was pre-scans could be performed in the band with the highest conducted output power and all final measurements should be performed on any emissions seen in each band.
3. The final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
4. Appropriate RF filters and attenuators were used during pre-scans and final measurements. Insertion losses were entered on the spectrum analyser as RF levels offsets.
5. All other emissions shown on the pre-scan plot were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
6. Pre-scans above 1 GHz were performed in a fully anechoic chamber (Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Transmitter Out of Band Radiated Emissions (5.725-5.85 GHz band operation) (continued)

Results: Bottom Channel / EIRP

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5319.375	Horizontal	-40.4	-27.0	13.4	Complied
5452.567	Horizontal	-40.4	-27.0	13.4	Complied
5578.308	Horizontal	-40.6	-27.0	13.6	Complied
5657.907	Horizontal	-39.3	-27.0	12.3	Complied
5958.221	Horizontal	-38.2	-27.0	11.2	Complied
6044.000	Horizontal	-39.0	-27.0	12.0	Complied
6170.377	Horizontal	-39.2	-27.0	12.2	Complied

Results: Bottom Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5452.567	Horizontal	54.8	74.0	19.2	Complied

Results: Bottom Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5453.288	Horizontal	42.5	54.0	11.5	Complied

Results: Middle Channel / EIRP

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5364.310	Horizontal	-38.7	-27.0	11.7	Complied
5490.846	Horizontal	-39.3	-27.0	12.3	Complied
5568.317	Horizontal	-35.6	-27.0	8.6	Complied
5864.715	Horizontal	-37.5	-27.0	10.5	Complied
5940.074	Horizontal	-39.0	-27.0	12.0	Complied
6007.324	Horizontal	-36.3	-27.0	9.3	Complied
6084.199	Horizontal	-39.0	-27.0	12.0	Complied
6207.628	Horizontal	-38.7	-27.0	11.7	Complied

Results: Middle Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5364.310	Horizontal	56.5	74.0	17.5	Complied

Transmitter Out of Band Radiated Emissions (5.725-5.85 GHz band operation) (continued)

Results: Middle Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5359.654	Horizontal	45.2	54.0	8.8	Complied

Results: Top Channel / EIRP

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5436.699	Horizontal	-37.4	-27.0	10.4	Complied
5532.891	Horizontal	-38.3	-27.0	11.3	Complied
5631.077	Horizontal	-35.6	-27.0	8.6	Complied
5899.507	Horizontal	-38.4	-27.0	11.4	Complied
6019.319	Horizontal	-36.3	27.0	9.3	Complied
6047.097	Horizontal	-38.5	-27.0	11.5	Complied
6126.308	Horizontal	-37.6	-27.0	10.6	Complied
6213.059	Horizontal	-38.1	-27.0	11.1	Complied

Results: Top Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5436.699	Horizontal	57.8	74.0	16.2	Complied

Results: Top Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5436.698	Horizontal	48.6	54.0	5.4	Complied

Transmitter Out of Band Radiated Emissions (5.725-5.85 GHz band operation) (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1656	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	14 Mar 2015	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	14 Nov 2014	12
M1874	Test Receiver	Rohde & Schwarz	ESU26	100553	13 May 2015	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	18 May 2015	12
A1818	Antenna	EMCO	3115	00075692	14 Nov 2014	12
A253	Antenna	Flann Microwave	12240-20	128	14 Nov 2014	12
A254	Antenna	Flann Microwave	14240-20	139	14 Nov 2014	12
A255	Antenna	Flann Microwave	16240-20	519	14 Nov 2014	12
A256	Antenna	Flann Microwave	18240-20	400	14 Nov 2014	12
A436	Antenna	Flann Microwave	20240-20	330	14 Nov 2014	12
A203	Antenna	Flann Microwave	22240-20	343	19 May 2016	36
A1396	Attenuator	Huber & Suhner	6810.17.B	757987	02 May 2015	12
A2133	Low Pass Filter	AtlanTecRF	AFL-04000	JFB1006-002	25 Apr 2015	12
A2176	High Pass Filter	AtlanTecRF	AFH-07000	800980	12 Apr 2015	12
M1630	Test Receiver	Rohde & Schwarz	ESU40	100233	13 Mar 2015	12
A1785	Pre Amplifier	Farran Technology	FLNA-28-30	FTL 6483	13 Jan 2015	12
M1229	Digital Multimeter	Fluke	179	87640015	24 Apr 2015	12
S0557	DC Power Supply	TTI	EL303R	395819	Calibrated before use	-

5.2.8. Transmitter Band Edge Radiated Emissions

Test Summary:

Test Engineer:	Andrew Edwards	**Test Dates:**	25 July 2014 to 31 July 2014
Test Sample IMEI:	352025060307270		

FCC Reference:	Parts 15.407(b)(1),(7), 15.205 & 15.209(a)
Test Method Used:	ANSI C63.10 Section 6.9.2 & KDB 789033 II.G.

Environmental Conditions:

Temperature (°C):	23 to 24
Relative Humidity (%):	48 to 53

Note(s):

1. An Inquiry was made to the FCC and the response confirmed band edge measurements need only be performed in the EUT modes that produce the highest power and the widest bandwidths. The modes that produced the highest power and widest bandwidth were:
    - 802.11a – BPSK / 6 Mbps
    - 802.11n HT20 SISO – BPSK / 6.5 Mbps / MCS0
    - 802.11n HT40 SISO – BPSK / 13.5 Mbps / MCS0
    - 802. 11n HT20 MIMO – BPSK / 6.5 Mbps / MCS0
    - 802. 11n HT40 MIMO – BPSK / 13.5 Mbps / MCS0
2. Lower band edge measurements were performed with the EUT transmitting on the bottom channel. Upper band edge measurements were performed with the EUT transmitting on the top channel.
3. For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. However, there are restricted bands of operation below the lower band edge at 4.5-5.15 GHz and also above the upper band edge at 5.35-5.46 GHz therefore the provisions of FCC Part 15.205 apply.
4. Field strength measurements using peak and average detectors were performed in the restricted bands below 5.15 GHz and above 5.35 GHz. Field strength and EIRP results were found to be compliant with the restricted band limits and Part 15.407 out-of-band limits.
5. In accordance with KDB 789033 Section II.G.6.c) Method AD (vi), the average measurements were performed using an increased number of sweeps as calculated below:
    - 802.11a – 6 Mbps – 100 sweeps
    - 802.11n HT20 – MCS0 / SISO – 100 sweeps
    - 802.11n HT40 – MCS0 / SISO – 104 sweeps
    - 802.11n HT20 – MCS0 / MIMO – 100 sweeps
    - 802.11n HT40 – MCS0 / MIMO – 100 sweeps
6. In accordance with KDB 789033 Section II.G.6.c) Method AD (vii), for average measurements, data rates where the EUT was transmitting <98% duty cycle, the duty cycle correction factor calculated in section 5.2.4 was added to the measured result.

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)

Results: 802.11a / 20 MHz / BPSK / 6 Mbps / Peak

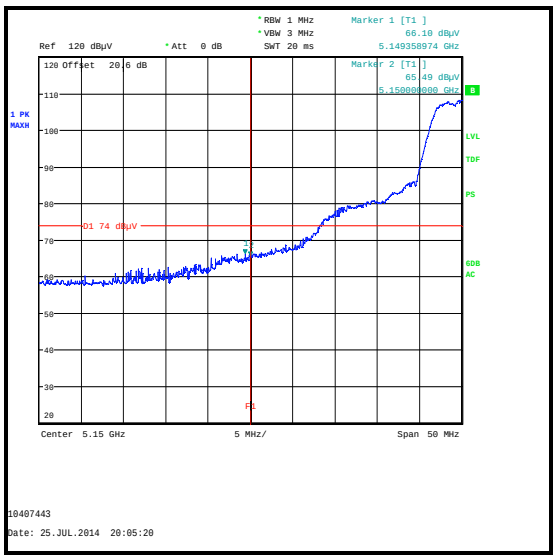
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5149.359	66.1	74.0	7.9	Complied
5150	65.5	74.0	8.5	Complied
5350	58.4	74.0	15.6	Complied
5359.215	59.5	74.0	14.5	Complied

Results: 802.11a / 20 MHz / BPSK / 6 Mbps / Average

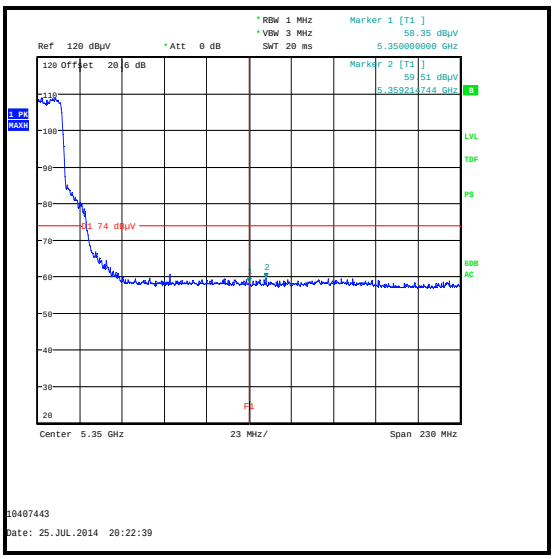
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5150	48.6	54.0	5.4	Complied
5350	46.9	54.0	7.1	Complied
5394.968	47.3	54.0	6.7	Complied

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)

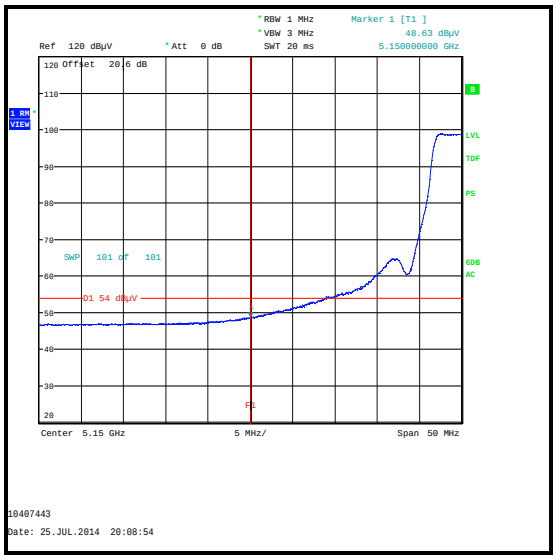
Results: 802.11a / 20 MHz / BPSK / 6 Mbps



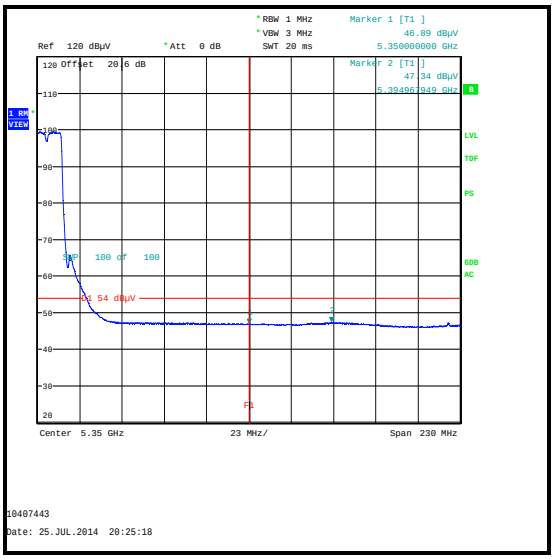
Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Lower Band Edge Average Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)

Results: 802.11n HT20 / BPSK / MCS0 / SISO / Peak

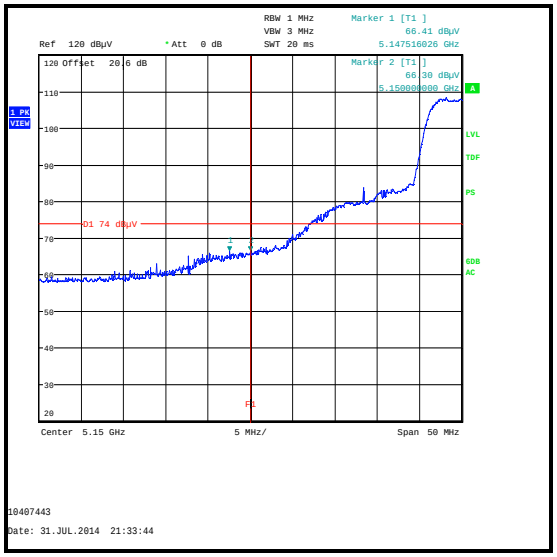
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5147.516	66.4	74.0	7.6	Complied
5150	66.3	74.0	7.7	Complied
5350	60.1	74.0	13.9	Complied
5393.862	61.4	74.0	12.6	Complied

Results: 802.11n HT20 / BPSK / MCS0 / SISO / Average

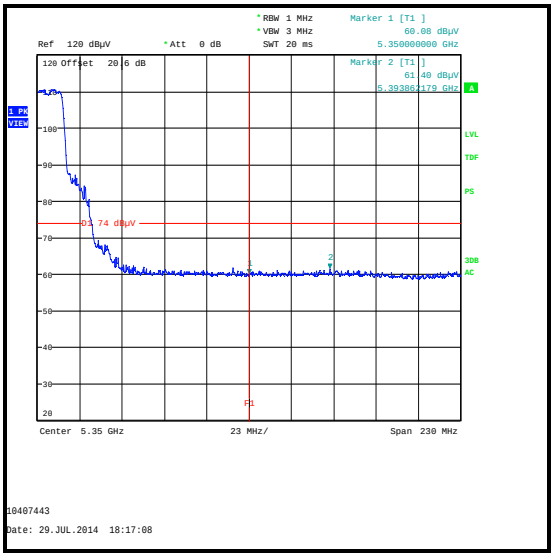
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5150	51.5	54.0	2.5	Complied
5350	48.9	54.0	5.1	Complied
5391.651	49.2	54.0	4.8	Complied

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)

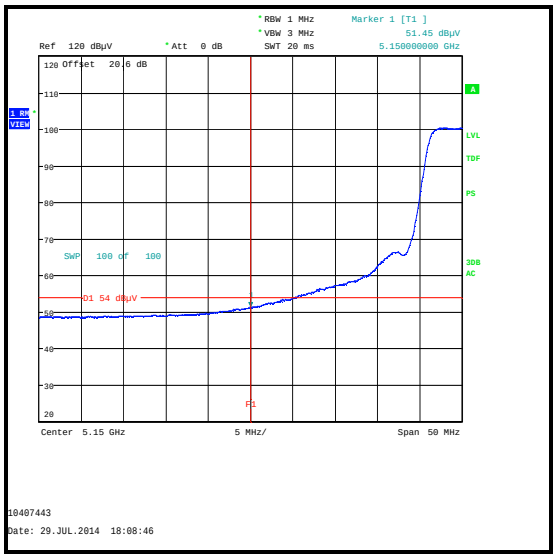
Results: 802.11n HT20 / BPSK / MCS0 / SISO



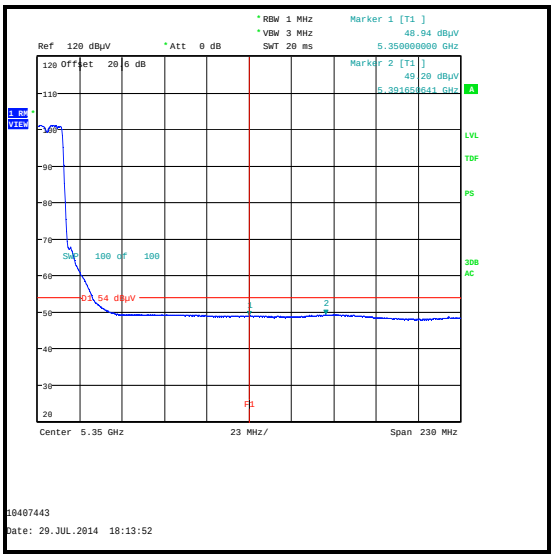
Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Lower Band Edge Average Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)

Results: 802.11n HT40 / BPSK / MCS0 / SISO / Peak

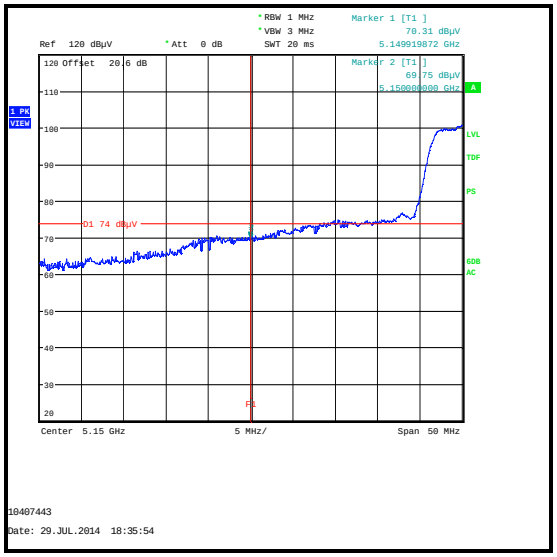
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5149.920	70.3	74.0	3.7	Complied
5150	69.8	74.0	4.2	Complied
5350	58.6	74.0	15.4	Complied
5400.128	59.7	74.0	14.3	Complied

Results: 802.11n HT40 / BPSK / MCS0 / SISO / Average

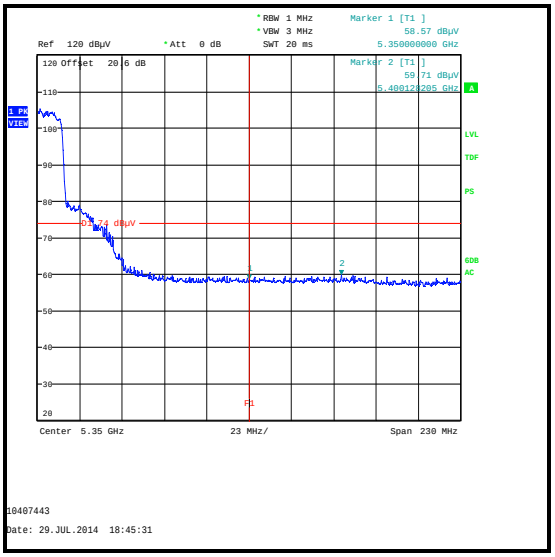
Frequency (MHz)	Level (dBµV/m)	Duty Cycle correction (dB)	Corrected Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5150	50.8	0.1	50.9	54.0	3.1	Complied
5350	47.1	0.1	47.2	54.0	6.8	Complied
5383.542	47.3	0.1	47.4	54.0	6.6	Complied

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)

Results: 802.11n HT40 / BPSK / MCS0 / SISO

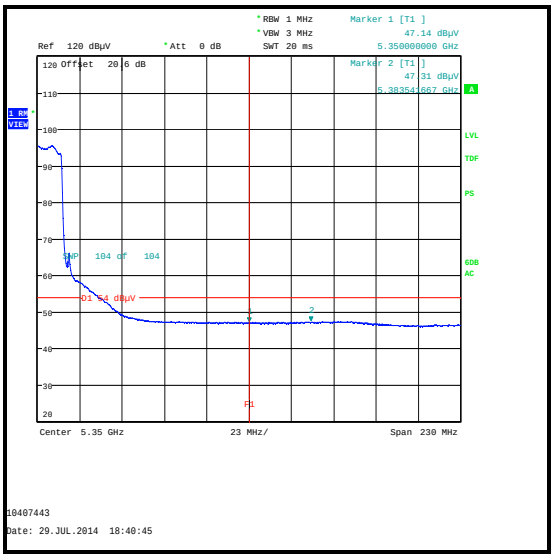


Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement

Lower Band Edge Average Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)

Results: 802.11n HT20 / BPSK / MCS0 / MIMO / Peak

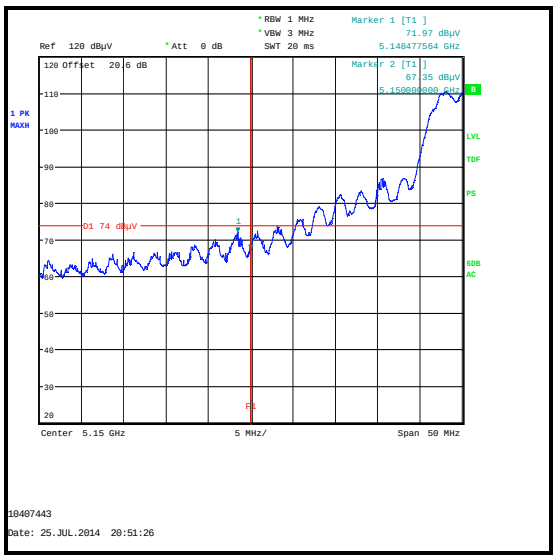
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5148.478	72.0	74.0	2.0	Complied
5150	67.4	74.0	6.6	Complied
5350	58.9	74.0	15.1	Complied
5405.288	59.8	74.0	14.2	Complied

Results: 802.11n HT20 / BPSK / MCS0 / MIMO / Average

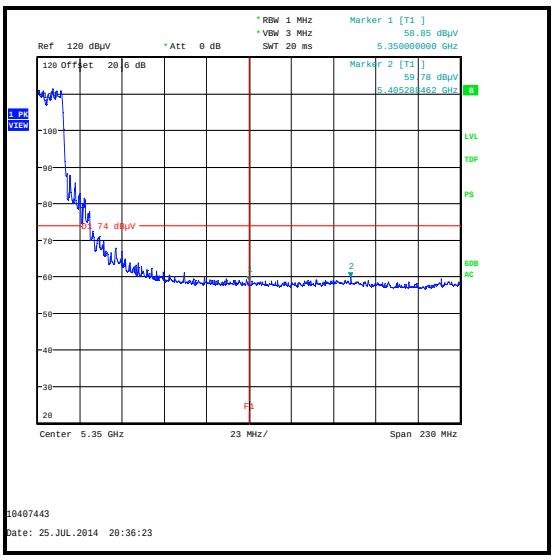
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5150	50.2	54.0	3.8	Complied
5350	47.0	54.0	7.0	Complied
5397.548	47.6	54.0	6.4	Complied

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)

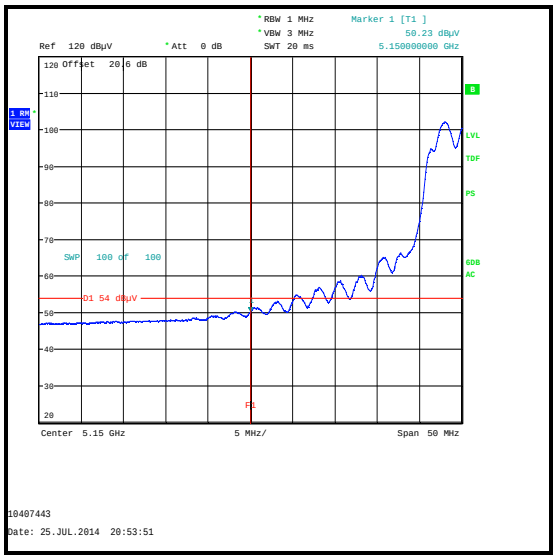
Results: 802.11n HT20 / BPSK / MCS0 / MIMO



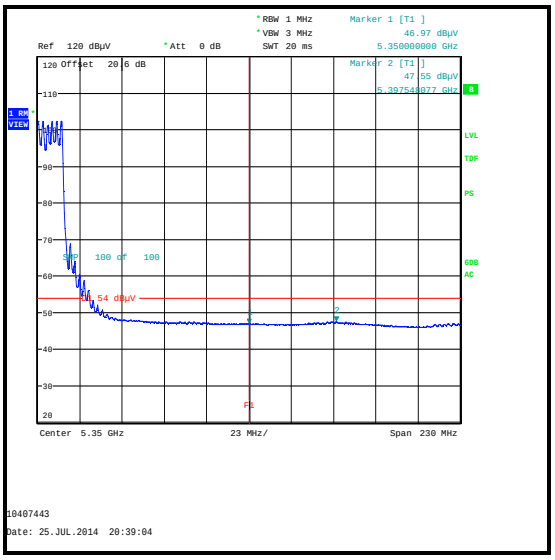
Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Lower Band Edge Average Measurement



Upper Band Edge Peak Measurement

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)

Results: 802.11n HT40 / BPSK / MCS0 / MIMO / Peak

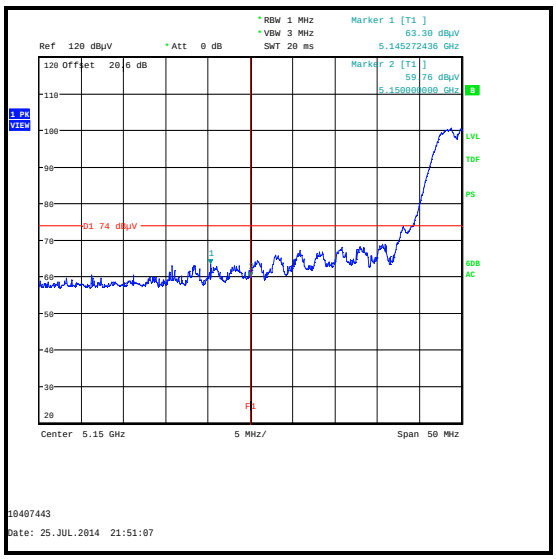
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5145.272	63.3	74.0	10.7	Complied
5150	59.8	74.0	14.2	Complied
5350	57.8	74.0	16.2	Complied
5357.003	59.9	74.0	14.1	Complied

Results: 802.11n HT40 / BPSK / MCS0 / MIMO / Average

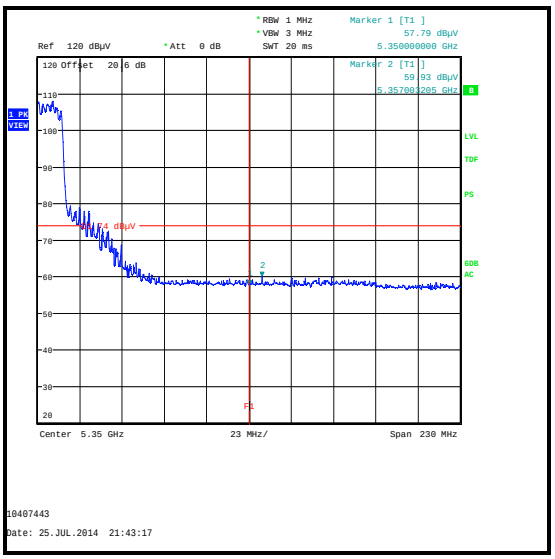
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5148.558	47.2	54.0	6.8	Complied
5150	46.8	54.0	7.2	Complied
5350	47.2	54.0	6.8	Complied
5387.596	47.6	54.0	6.4	Complied

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)

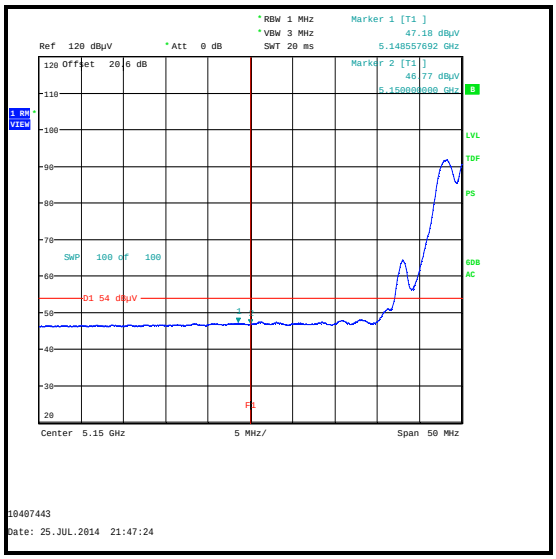
Results: 802.11n HT40 / BPSK / MCS0 / MIMO



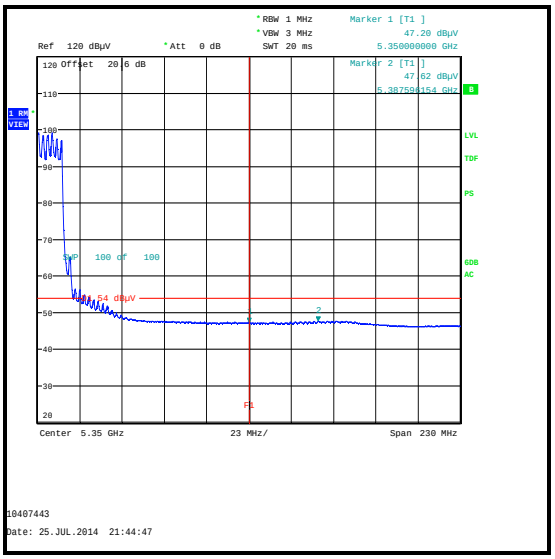
Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Lower Band Edge Average Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band)

Test Summary:

Test Engineer:	Andrew Edwards	**Test Date:**	29 July 2014
Test Sample IMEI:	352025060307270		

FCC Reference:	Parts 15.407(b)(2),(7), 15.205 & 15.209(a)
Test Method Used:	ANSI C63.10 Section 6.9.2 & KDB 789033 II.G.

Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	50

Note(s):

1. An Inquiry was made to the FCC and the response confirmed band edge measurements need only be performed in the EUT modes that produce the highest power and the widest bandwidths. The modes that produced the highest power and widest bandwidth were:
    - 802.11a – BPSK / 6 Mbps.
    - 802.11n HT20 SISO – BPSK / 6.5 Mbps / MCS0
    - 802.11n HT40 SISO – BPSK / 13.5 Mbps / MCS0
    - 802. 11n HT20 MIMO – BPSK / 6.5 Mbps / MCS0
    - 802. 11n HT40 MIMO – BPSK / 13.5 Mbps / MCS0
2. Lower band edge measurements were performed with the EUT transmitting on the bottom channel. Upper band edge measurements were performed with the EUT transmitting on the top channel.
3. For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. However, there are restricted bands of operation below the lower band edge at 4.5-5.15 GHz and also above the upper band edge at 5.35-5.46 GHz therefore the provisions of FCC Part 15.205 apply. Tests were performed in these restricted bands of operation with the EUT transmitting on the bottom and top channels within 5.25-5.35 GHz band, the results are included in the transmitter 5.25-5.35 GHz band radiated spurious emissions section of this test report.
4. Field strength measurements using peak and average detectors were performed in the restricted bands below 5.15 GHz and above 5.35 GHz. Field strength and EIRP results were found to be compliant with the restricted band limits and Part 15.407 out-of-band limits.
5. In accordance with KDB 789033 Section II.G.1.c) if the peak measurement is below the average limit, it is not necessary to perform a separate average measurement.
6. In accordance with KDB 789033 Section II.G.6.c) Method AD (vi), the average measurements were performed using an increased number of sweeps as calculated below:
    - 802.11a – 6 Mbps – 100 sweeps
    - 802.11n HT20 – MCS0 / SISO – 100 sweeps
    - 802.11n HT40 – MCS0 / SISO – 104 sweeps
    - 802.11n HT20 – MCS0 / MIMO – 100 sweeps
    - 802.11n HT40 – MCS0 / MIMO – 100 sweeps
7. In accordance with KDB 789033 Section II.G.6.c) Method AD (vii), for average measurements, data rates where the EUT was transmitting <98% duty cycle, the duty cycle correction factor calculated in section 5.2.4 was added to the measured result.

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)

Results: 802.11a / 20 MHz / BPSK / 6 Mbps / Peak

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	59.6	74.0	14.4	Complied
5351.266	61.3	74.0	12.7	Complied

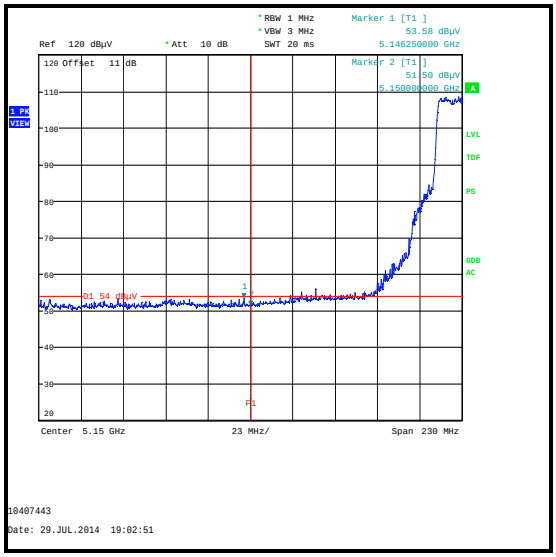
Frequency (MHz)	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
5146.250	53.6	54.0	0.4	Complied
5150	51.5	54.0	2.5	Complied

Results: 802.11a / 20 MHz / BPSK / 6 Mbps / Average

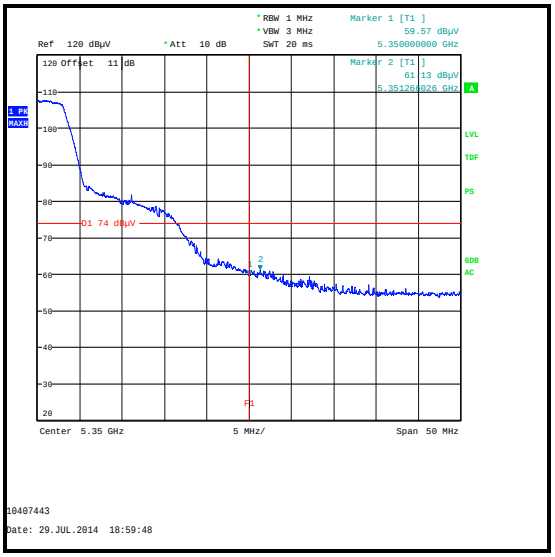
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	44.4	54.0	9.6	Complied
5350.465	44.6	54.0	9.4	Complied

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)

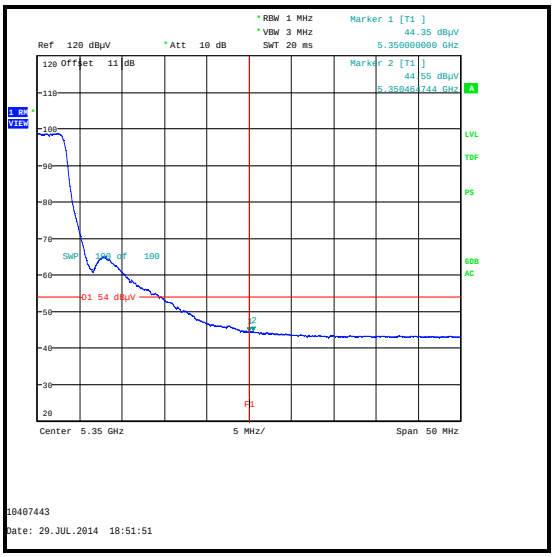
Results: 802.11a / 20 MHz / BPSK / 6 Mbps



Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)

Results: 802.11n HT20 / BPSK / MCS0 / SISO / Peak

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	60.8	74.0	13.2	Complied
5350.481	61.6	74.0	12.4	Complied

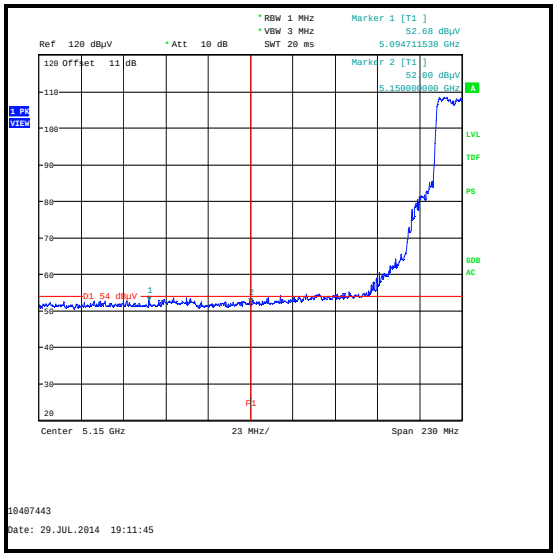
Frequency (MHz)	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
5094.712	52.7	54.0	1.3	Complied
5150	52.0	54.0	2.0	Complied

Results: 802.11n HT20 / BPSK / MCS0 / SISO / Average

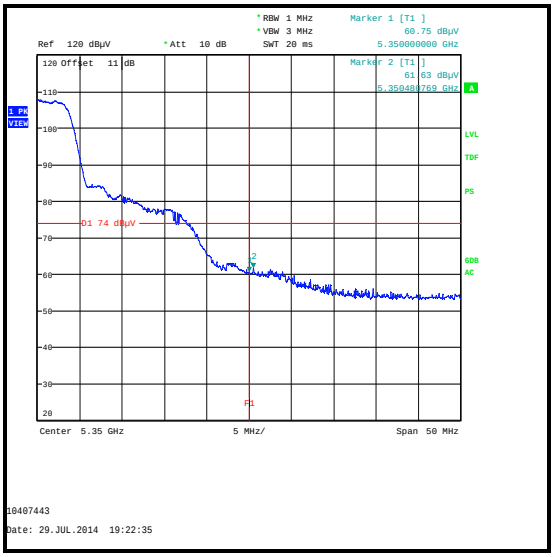
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	43.8	54.0	10.2	Complied
5350.401	44.0	54.0	10.0	Complied

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)

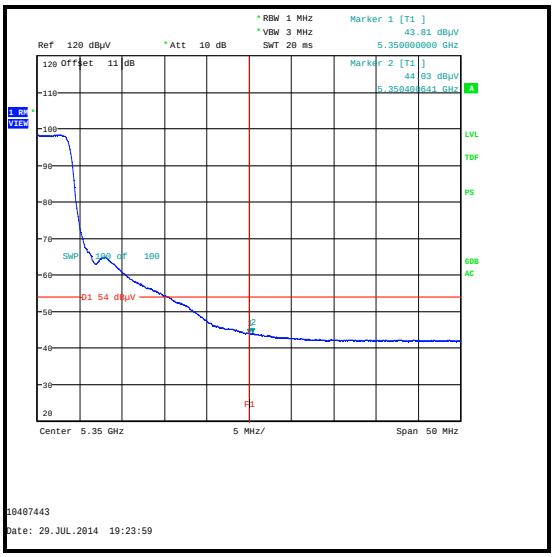
Results: 802.11n HT20 / BPSK / MCS0 / SISO



Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)

Results: 802.11n HT40 / BPSK / MCS0 / SISO / Peak

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	66.6	74.0	7.4	Complied
5352.644	68.1	74.0	5.9	Complied

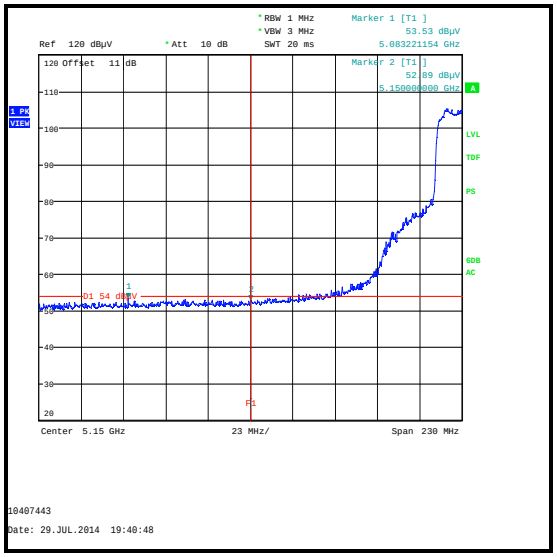
Frequency (MHz)	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
5083.221	53.5	54.0	0.5	Complied
5150	52.9	54.0	1.1	Complied

Results: 802.11n HT40 / BPSK / MCS0 / SISO / Average

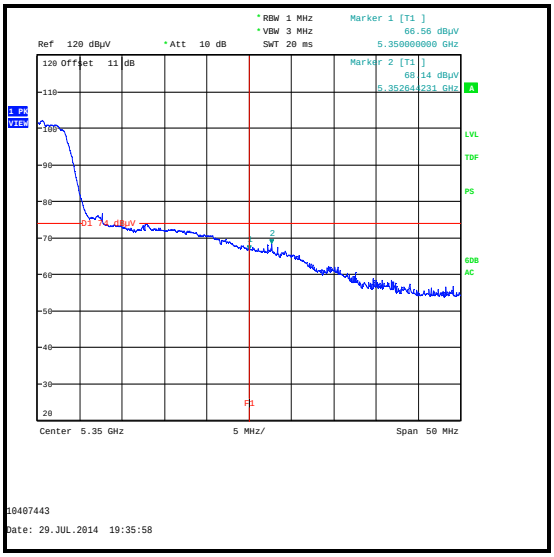
Frequency (MHz)	Level (dBµV/m)	Duty Cycle correction (dB)	Corrected Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	46.4	0.1	46.5	54.0	7.5	Complied
5350.641	46.6	0.1	46.7	54.0	7.3	Complied

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)

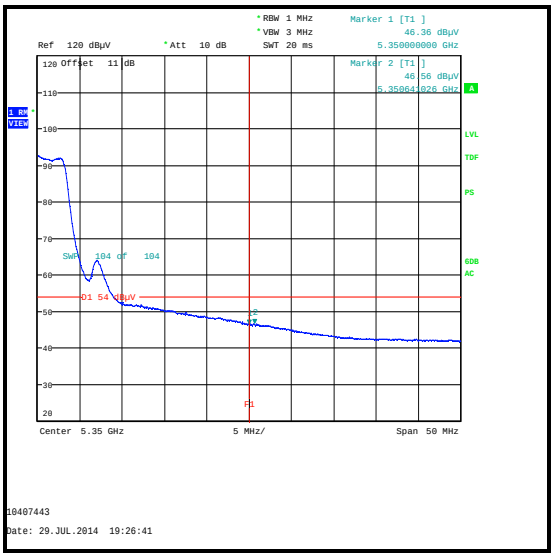
Results: 802.11n HT40 / BPSK / MCS0 / SISO



Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)

Results: 802.11n HT20 / BPSK / MCS0 / MIMO / Peak

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5040.833	55.6	74.0	18.4	Complied
5350	61.6	74.0	12.4	Complied
5350.481	61.6	74.0	12.4	Complied

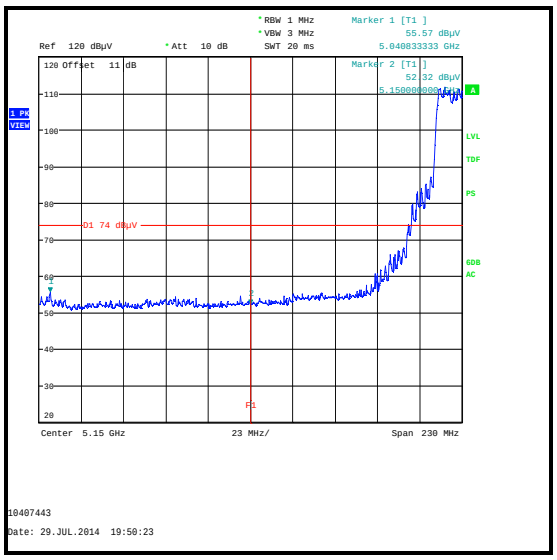
Frequency (MHz)	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
5150	52.3	54.0	1.7	Complied

Results: 802.11n HT20 / BPSK / MCS0 / MIMO / Average

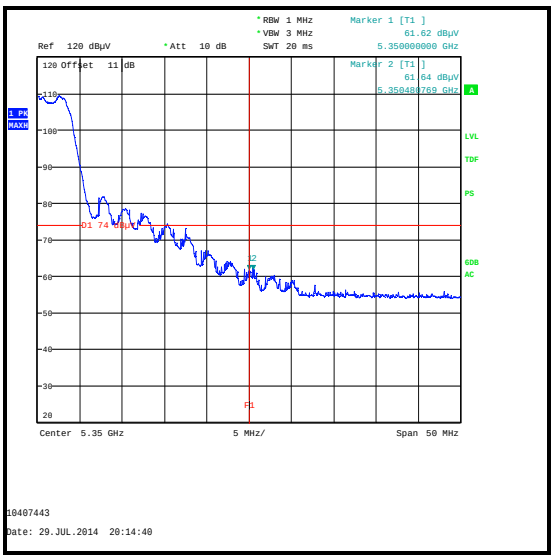
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5040.833	45.6	54.0	8.4	Complied
5350	43.8	54.0	10.2	Complied
5350.160	43.9	54.0	10.1	Complied

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)

Results: 802.11n HT20 / BPSK / MCS0 / MIMO

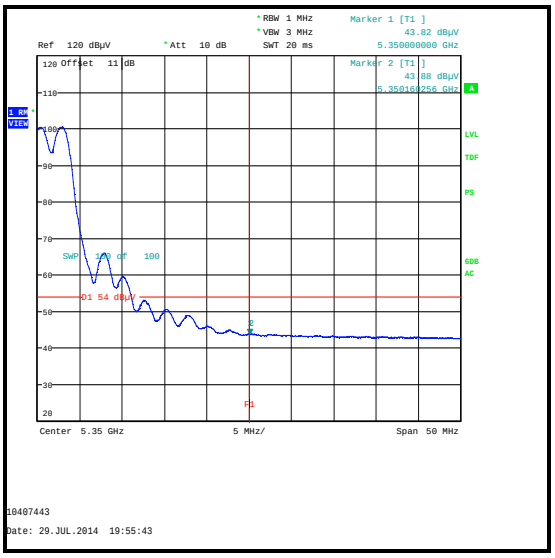


Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement

Lower Band Edge Average Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)

Results: 802.11n HT40 / BPSK / MCS0 / MIMO / Peak

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	63.2	74.0	10.8	Complied
5350.304	64.9	74.0	9.1	Complied

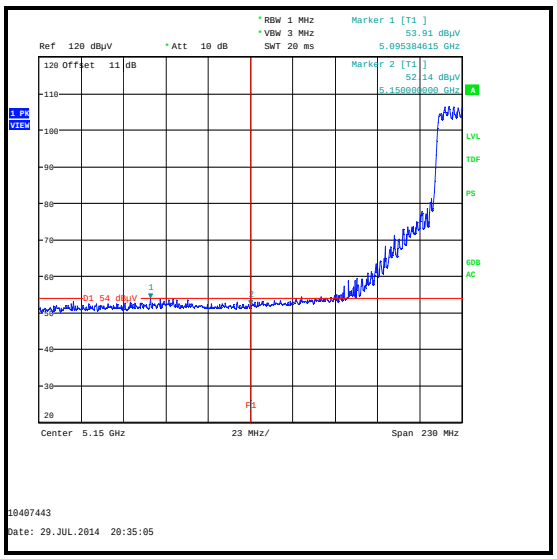
Frequency (MHz)	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
5095.385	53.9	54.0	0.1	Complied
5150	52.1	54.0	1.9	Complied

Results: 802.11n HT40 / BPSK / MCS0 / MIMO / Average

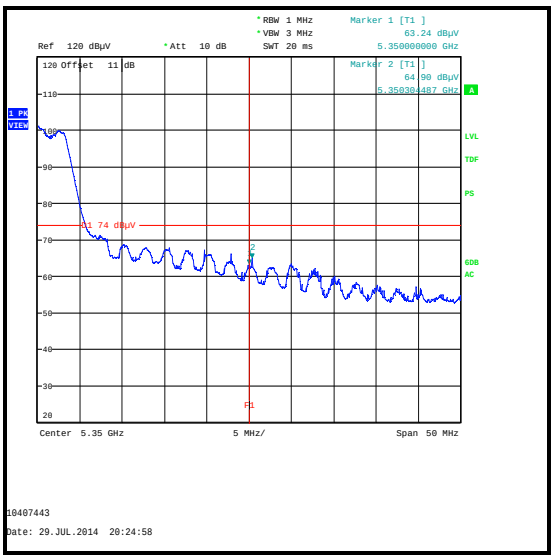
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	42.6	54.0	11.4	Complied
5352.628	43.2	54.0	10.8	Complied

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)

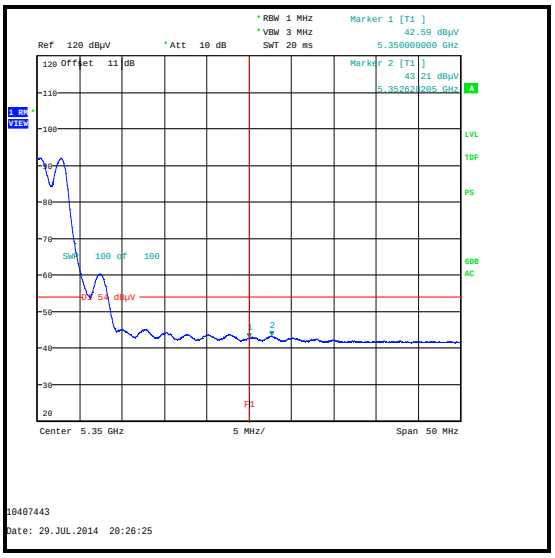
Results: 802.11n HT40 / BPSK / MCS0 / MIMO



Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band)

Test Summary:

Test Engineer:	Andrew Edwards	**Test Dates:**	28 July 2014 & 29 July 2014
Test Sample IMEI:	352025060307270		

FCC Reference:	Parts 15.407(b)(3),(7), 15.205 & 15.209(a)
Test Method Used:	ANSI C63.10 Section 6.9.2 & KDB 789033 II.G.

Environmental Conditions:

Temperature (°C):	23 to 24
Relative Humidity (%):	44 to 52

Note(s):

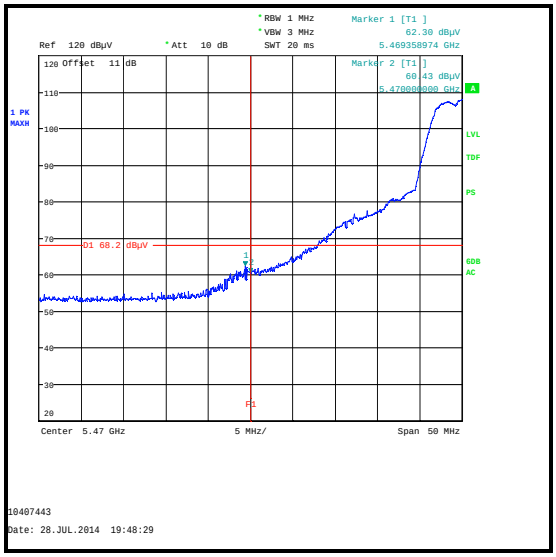
1. An Inquiry was made to the FCC and the response confirmed band edge measurements need only be performed in the EUT modes that produce the highest power and the widest bandwidths. The modes that produced the highest power and widest bandwidth were:
    - 802.11a – BPSK / 6 Mbps.
    - 802.11n HT20 SISO – BPSK / 6.5 Mbps / MCS0
    - 802.11n HT40 SISO – BPSK / 13.5 Mbps / MCS0
    - 802. 11n HT20 MIMO – BPSK / 6.5 Mbps / MCS0
    - 802. 11n HT40 MIMO – BPSK / 13.5 Mbps / MCS0
2. Lower band edge measurements were performed with the EUT transmitting on the bottom channel. Upper band edge measurements were performed with the EUT transmitting on the top channel.
3. For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz. However, there are restricted bands of operation below the lower band edge at 4.5-5.15 GHz and also at 5.35-5.46 GHz therefore the provisions of FCC Part 15.205 apply. Tests were performed in these restricted bands of operation with the EUT transmitting on the bottom and top channels within 5.47-5.725 GHz band, the results are included in the transmitter 5.25-5.35 GHz band radiated spurious emissions section of this test report.
4. For completeness, results are also shown as EIRP in dBm and also as field strength in dBµV/m. Measured field strength was converted to EIRP in accordance with KDB 789033 II.G.2.d.(iii) using a conversion factor of 95.2.
5. * The Integration method was used in accordance with KDB 789033 II.G.3.d (ii).

Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)

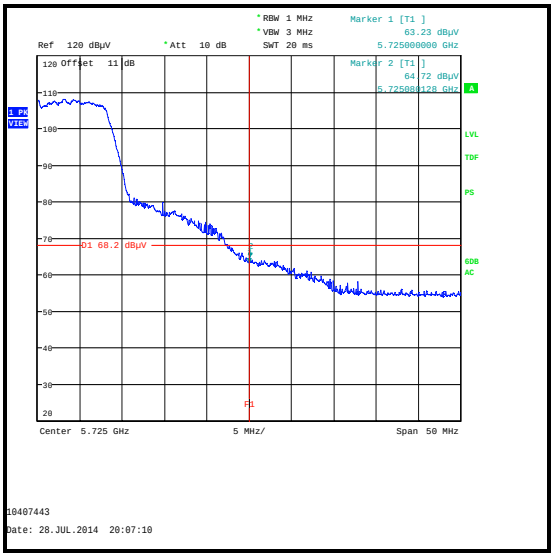
Results: 802.11a / 20 MHz / BPSK / 6 Mbps / Peak

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5469.359	-32.9	-27.0	5.9	Complied
5470	-34.8	-27.0	7.8	Complied
5725	-32.0	-27.0	5.0	Complied
5725.080	-30.5	-27.0	3.5	Complied

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5469.359	62.3	68.2	5.9	Complied
5470	60.4	68.2	7.8	Complied
5725	63.2	68.2	5.0	Complied
5725.080	64.7	68.2	3.5	Complied



Lower Band Edge Measurement



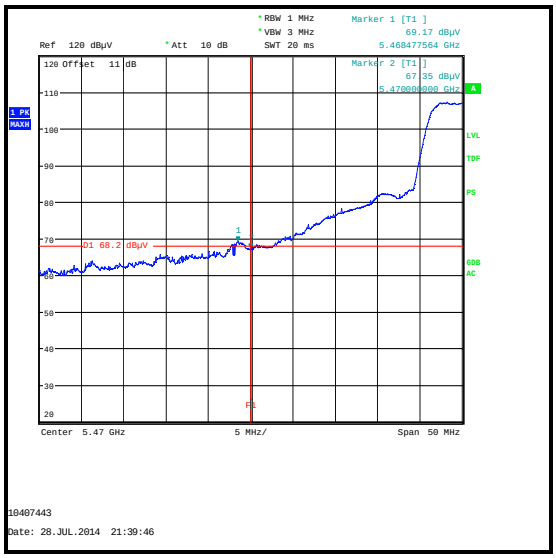
Upper Band Edge Measurement

Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)

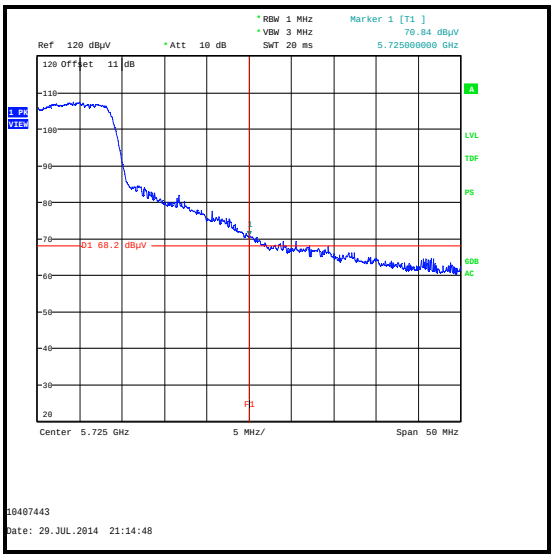
Results: 802.11n HT20 / BPSK / MCS0 / SISO / Peak

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5468.478	-34.9*	-27.0	7.9	Complied
5470	-34.4*	-27.0	7.4	Complied
5725	-33.8*	-27.0	6.8	Complied

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5468.478	60.3*	68.2	7.9	Complied
5470	60.8*	68.2	7.4	Complied
5725	61.4*	68.2	6.8	Complied



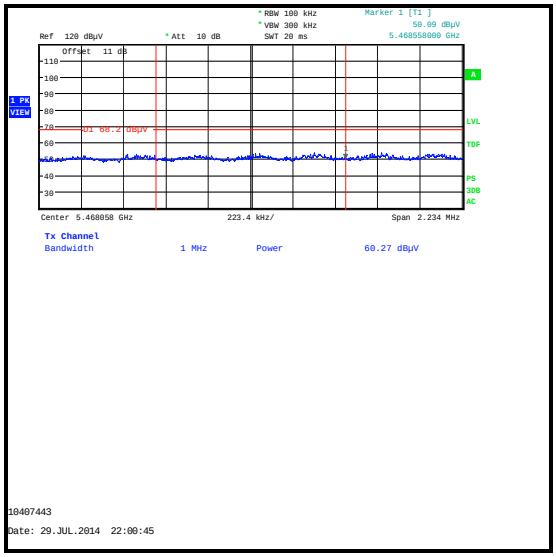
Lower Band Edge Measurement



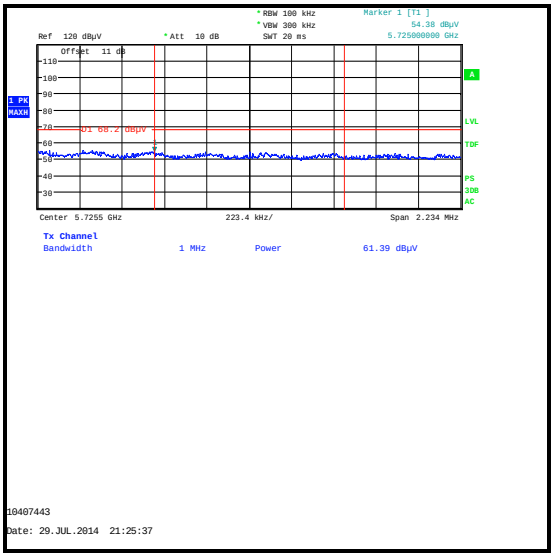
Upper Band Edge Measurement

Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)

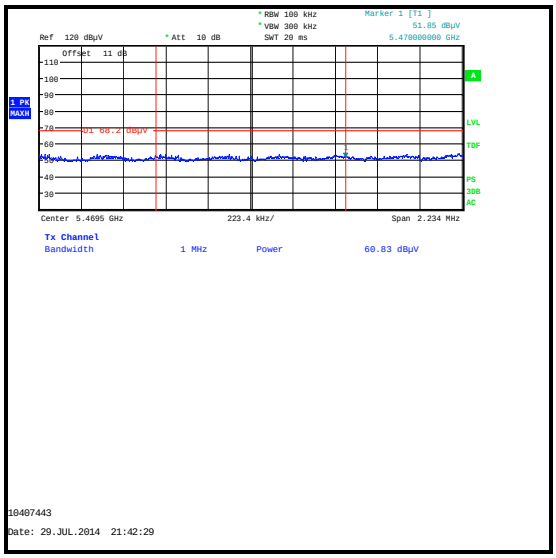
Results: 802.11n HT20 / BPSK / MCS0 / SISO / Peak



Lower Band Edge Integration Measurement method (emission at 5468.478 MHz)



Upper Band Edge Integration Measurement method (emission at 5725 MHz)



Lower Band Edge Integration Measurement method (emission at 5470 MHz)

Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)

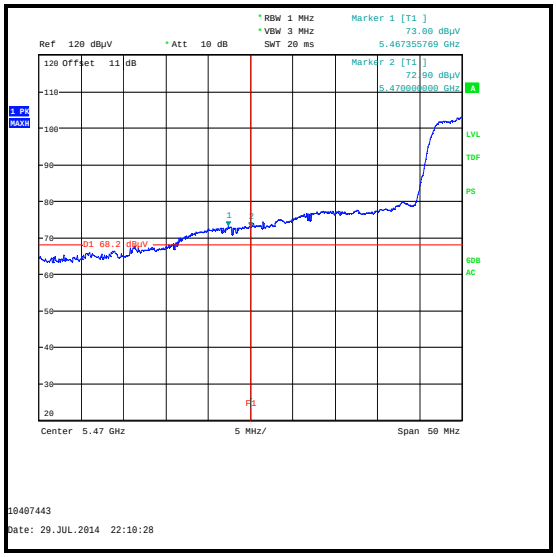
Results: 802.11n HT40 / BPSK / MCS0 / SISO / Peak

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5467.356	-33.9*	-27.0	6.9	Complied
5470	-33.0*	-27.0	6.0	Complied
5725	-34.2	-27.0	7.2	Complied
5726.763	-32.0	-27.0	5.0	Complied

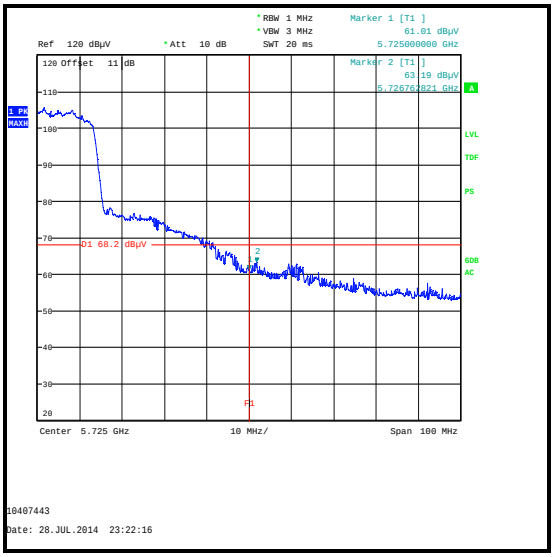
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5467.356	61.3*	68.2	6.9	Complied
5470	62.2*	68.2	6.0	Complied
5725	61.0	68.2	7.2	Complied
5726.763	63.2	68.2	5.0	Complied

Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)

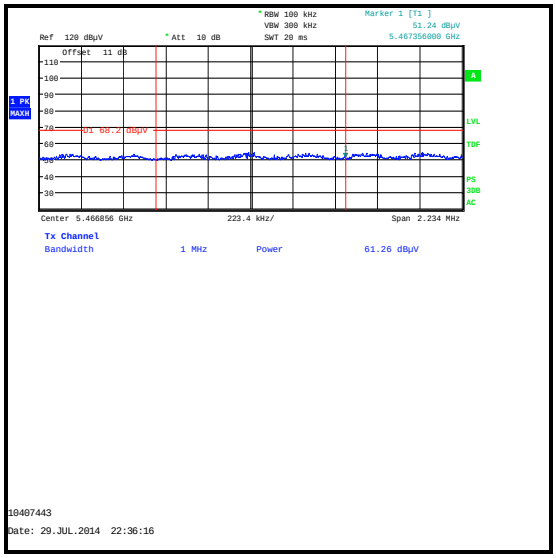
Results: 802.11n HT40 / BPSK / MCS0 / SISO / Peak



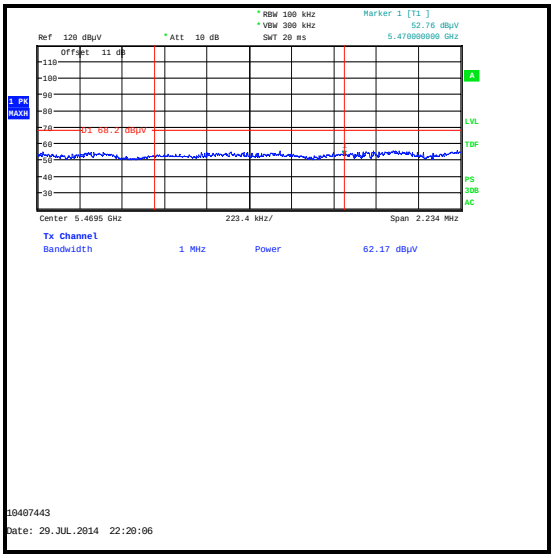
Lower Band Edge Measurement



Upper Band Edge Measurement



Lower Band Edge Integration Measurement method (emission at 5467.356 MHz)



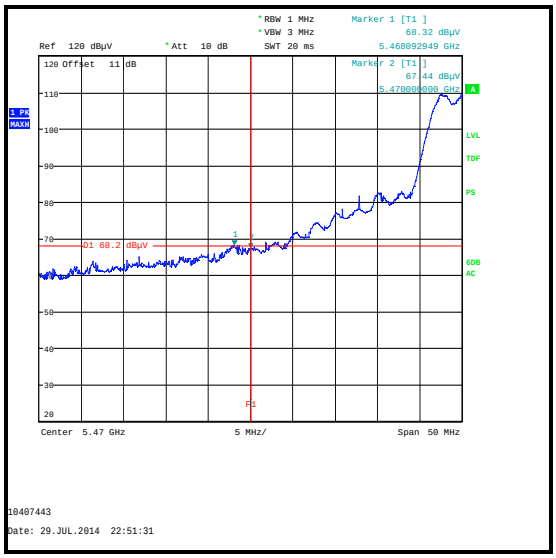
Lower Band Edge Integration Measurement method (emission at 5470 MHz)

Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)

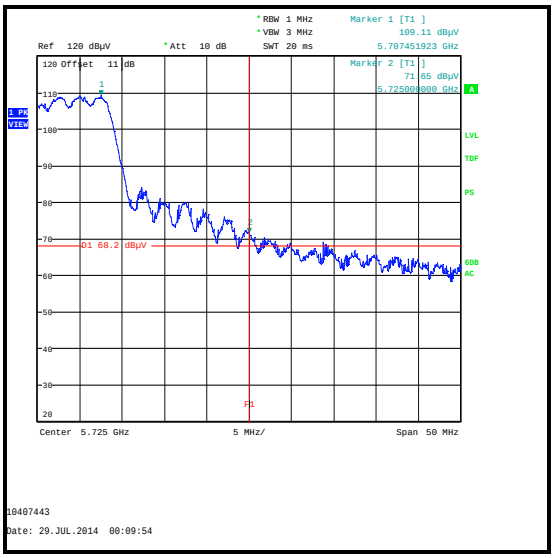
Results: 802.11n HT20 / BPSK / MCS0 / MIMO / Peak

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5468.093	-38.2*	-27.0	11.2	Complied
5470	-37.9*	-27.0	10.9	Complied
5725	-34.0*	-27.0	7.0	Complied

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5468.093	57.0*	68.2	11.2	Complied
5470	57.3*	68.2	10.9	Complied
5725	61.2*	68.2	7.0	Complied



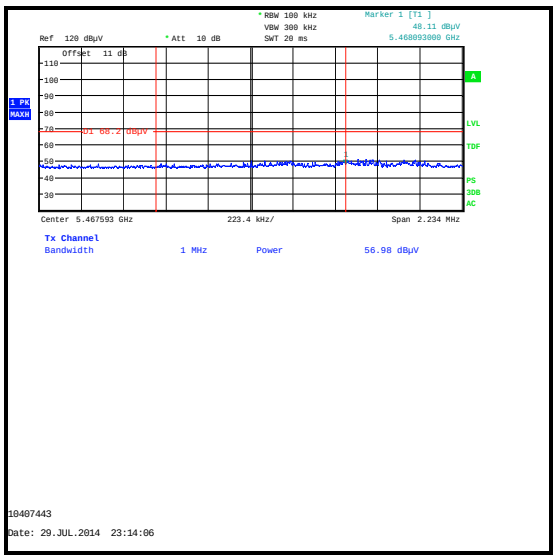
Lower Band Edge Measurement



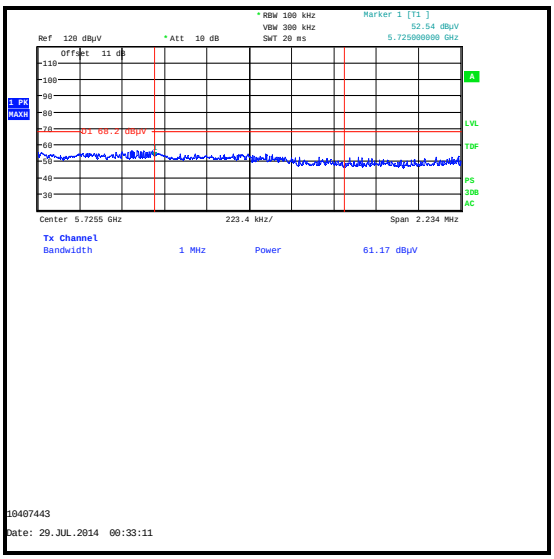
Upper Band Edge Measurement

Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)

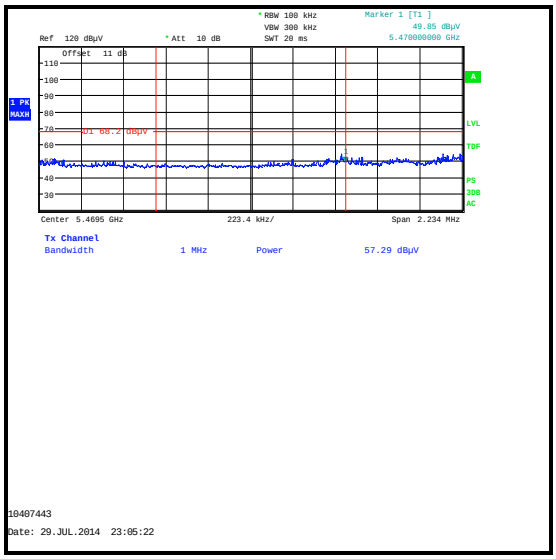
Results: 802.11n HT20 / BPSK / MCS0 / MIMO / Peak



Lower Band Edge Integration Measurement method (emission at 5468.093 MHz)



Upper Band Edge Integration Measurement method(emission at 5725 MHz)



Lower Band Edge Integration Measurement method (emission at 5470 MHz)

Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)

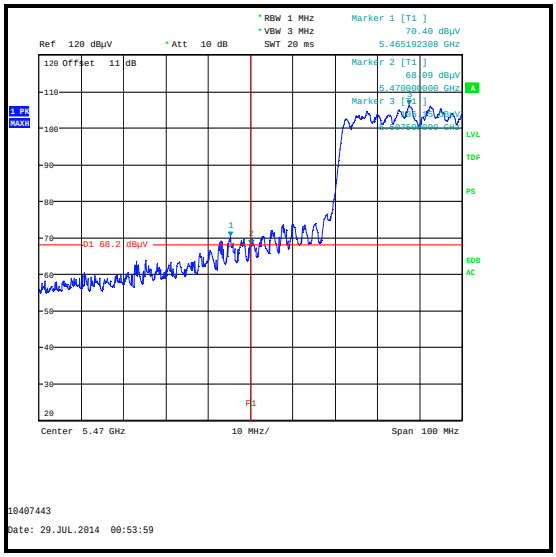
Results: 802.11n HT40 / BPSK / MCS0 / MIMO / Peak

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5465.192	-36.9*	-27.0	9.9	Complied
5470	-36.4*	-27.0	9.4	Complied
5725	-32.1	-27.0	5.1	Complied
5727.051	-28.4	-27.0	1.4	Complied

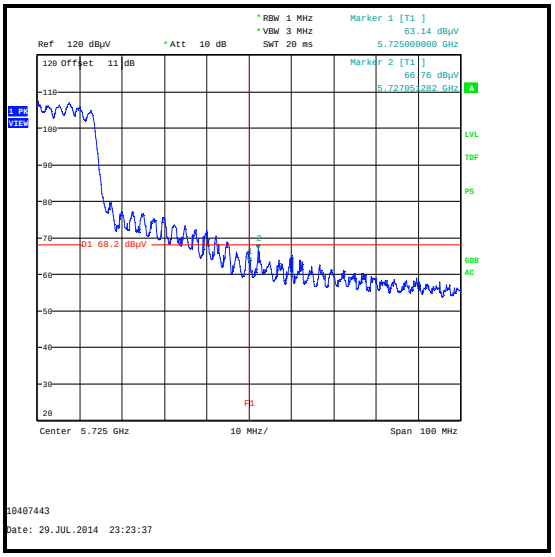
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5465.192	58.3*	68.2	9.9	Complied
5470	58.8*	68.2	9.4	Complied
5725	63.1	68.2	5.1	Complied
5727.051	66.8	68.2	1.4	Complied

Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)

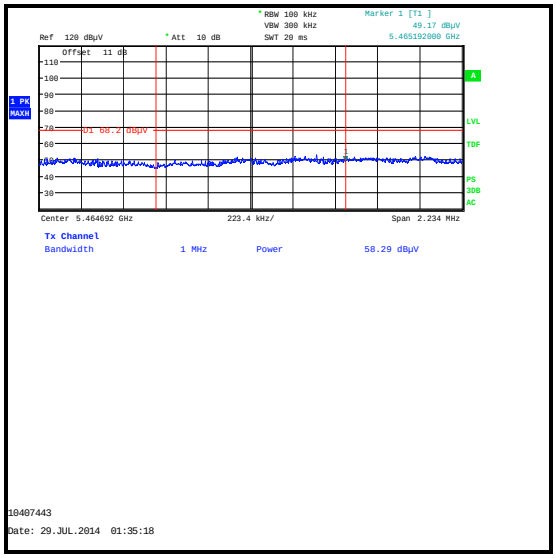
Results: 802.11n HT40 / BPSK / MCS0 / MIMO / Peak



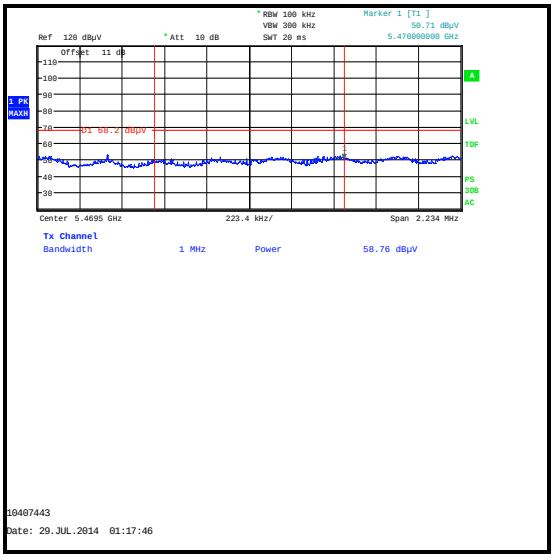
Lower Band Edge Measurement



Upper Band Edge Measurement



Lower Band Edge Integration Measurement method (emission at 5465.192 MHz)



Lower Band Edge Integration Measurement method (emission at 5470 MHz)

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band)

Test Summary:

Test Engineer:	Andrew Edwards	**Test Dates:**	28 July 2014 & 30 July 2014
Test Sample IMEI:	352025060307270		

FCC Reference:	Parts 15.407(b)(4),(7), 15.205 & 15.209(a)
Test Method Used:	ANSI C63.10 Section 6.9.2 & KDB 789033 II.G.

Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	44 to 49

Note(s):

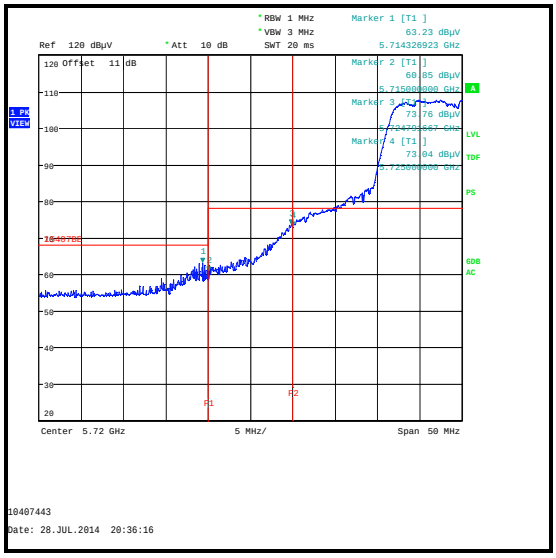
1. An Inquiry was made to the FCC and the response confirmed band edge measurements need only be performed in the EUT modes that produce the highest power and the widest bandwidths. The modes that produced the highest power and widest bandwidth were:
    - 802.11a – BPSK / 6 Mbps.
    - 802.11n HT20 SISO – BPSK / 6.5 Mbps / MCS0
    - 802.11n HT40 SISO – BPSK / 13.5 Mbps / MCS0
    - 802. 11n HT20 MIMO – BPSK / 6.5 Mbps / MCS0
    - 802. 11n HT40 MIMO – BPSK / 13.5 Mbps / MCS0
2. Lower band edge measurements were performed with the EUT transmitting on the bottom channel. Upper band edge measurements were performed with the EUT transmitting on the top channel.
3. For completeness, results are also shown as EIRP in dBm and also as field strength in dBµV/m. Measured field strength was converted to EIRP in accordance with KDB 789033 G.2.d)(iii) using a conversion factor of 95.2.

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band operation) (continued)

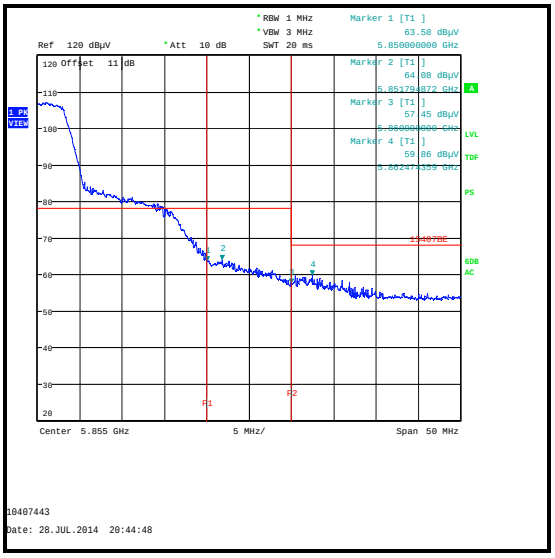
Results: 802.11a / 20 MHz / BPSK / 6 Mbps / Peak

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5714.327	-32.0	-27.0	5.0	Complied
5715	-34.3	-27.0	7.3	Complied
5724.794	-21.4	-17.0	4.4	Complied
5725	-22.2	-17.0	5.2	Complied
5850	-31.6	-17.0	14.6	Complied
5851.795	-31.1	-17.0	14.1	Complied
5860	-37.7	-27.0	10.7	Complied
5862.474	-35.3	-27.0	8.3	Complied

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5714.327	63.2	68.2	5.0	Complied
5715	60.9	68.2	7.3	Complied
5724.794	73.8	78.2	4.4	Complied
5725	73.0	78.2	5.2	Complied
5850	63.6	78.2	14.6	Complied
5851.795	64.1	78.2	14.1	Complied
5860	57.5	68.2	10.7	Complied
5862.474	59.9	68.2	8.3	Complied



Lower Band Edge Measurement



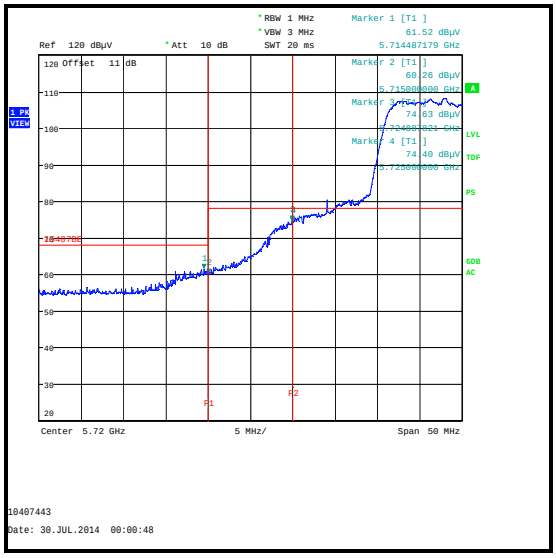
Upper Band Edge Measurement

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band operation) (continued)

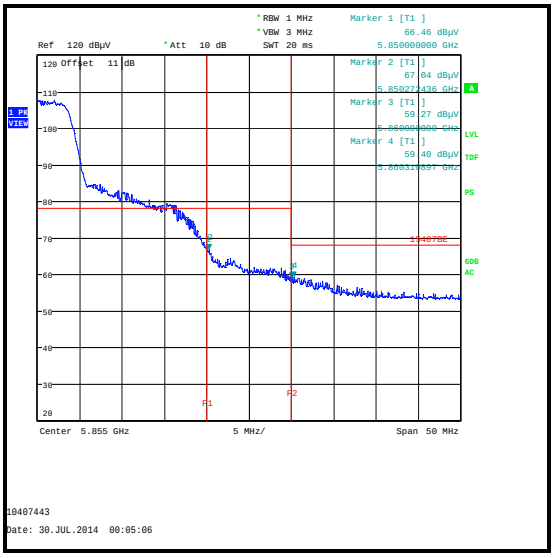
Results: 802.11n HT20 / BPSK / MCS0 / SISO / Peak

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5714.487	-33.7	-27.0	6.7	Complied
5715	-34.9	-27.0	7.9	Complied
57248.878	-20.6	-17.0	3.6	Complied
5725	-20.8	-17.0	3.8	Complied
5850	-28.7	-17.0	11.7	Complied
5850.272	-28.2	-17.0	11.2	Complied
5860	-35.9	-27.0	8.9	Complied
5860.311	-35.8	-27.0	8.8	Complied

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5714.487	61.5	68.2	6.7	Complied
5715	60.3	68.2	7.9	Complied
5724.888	74.6	78.2	3.6	Complied
5725	74.4	78.2	3.8	Complied
5850	66.5	78.2	11.7	Complied
5850.272	67.0	78.2	11.2	Complied
5860	59.3	68.2	8.9	Complied
5860.311	59.4	68.2	8.8	Complied



Lower Band Edge Measurement



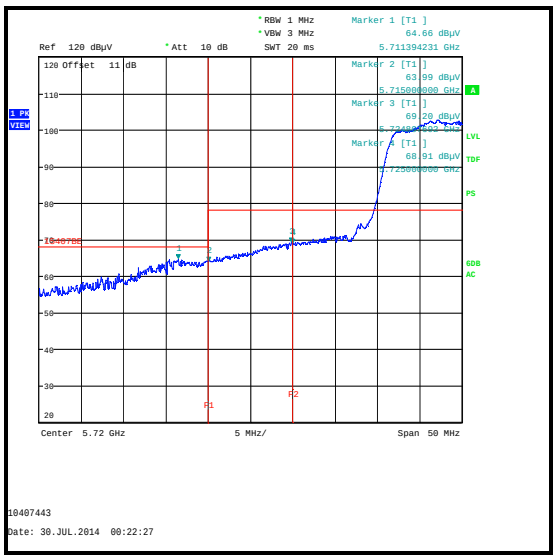
Upper Band Edge Measurement

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band operation) (continued)

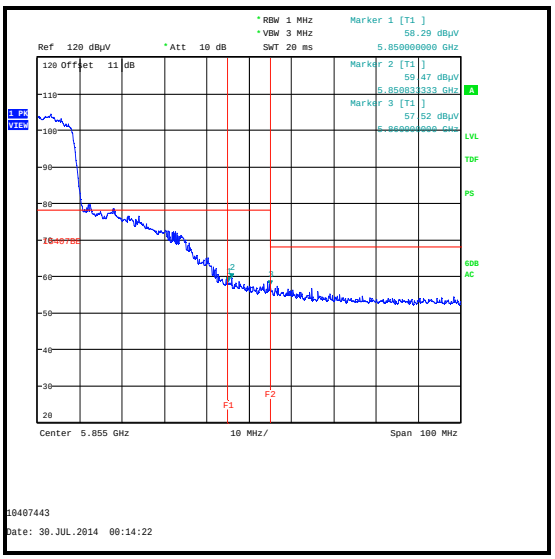
Results: 802.11n HT40 / BPSK / MCS0 / SISO / Peak

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5711.394	-30.5	-27.0	3.5	Complied
5715	-31.2	-27.0	4.2	Complied
5724.808	-26.0	-17.0	9.0	Complied
5725	-26.3	-17.0	9.3	Complied
5850	-36.9	-17.0	19.9	Complied
5850.833	-35.7	-17.0	18.7	Complied
5860	-37.7	-27.0	10.7	Complied

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5711.394	64.7	68.2	3.5	Complied
5715	64.0	68.2	4.2	Complied
5724.808	69.2	78.2	9.0	Complied
5725	68.9	78.2	9.3	Complied
5850	58.3	78.2	19.9	Complied
5850.833	59.5	78.2	18.7	Complied
5860	57.5	68.2	10.7	Complied



Lower Band Edge Measurement



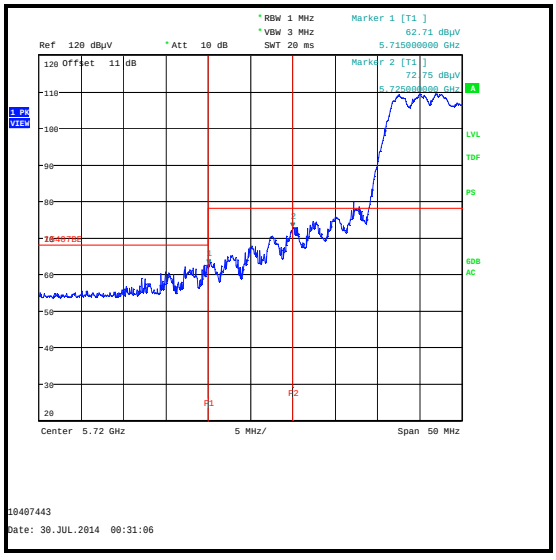
Upper Band Edge Measurement

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band operation) (continued)

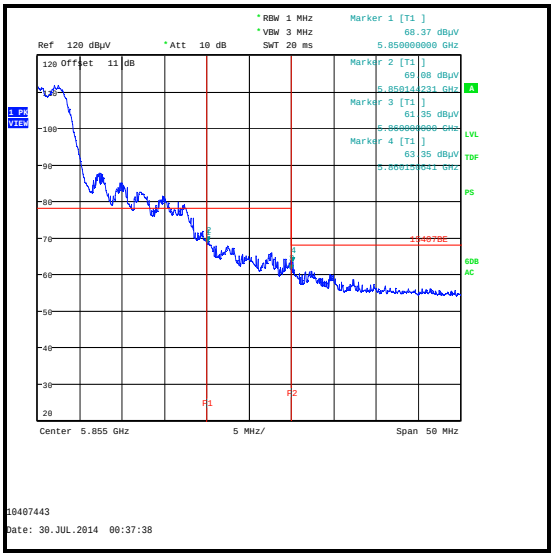
Results: 802.11n HT20 / BPSK / MCS0 / MIMO / Peak

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5715	-32.5	-27.0	5.5	Complied
5725	-22.4	-17.0	5.4	Complied
5850	-26.8	-17.0	9.8	Complied
5850.144	-26.1	-17.0	9.1	Complied
5860	-33.8	-27.0	6.8	Complied
5860.151	-31.8	-27.0	4.8	Complied

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5715	62.7	68.2	5.5	Complied
5725	72.8	78.2	5.4	Complied
5850	68.4	78.2	9.8	Complied
5850.144	69.1	78.2	9.1	Complied
5860	61.4	68.2	6.8	Complied
5860.151	63.4	68.2	4.8	Complied



Lower Band Edge Measurement



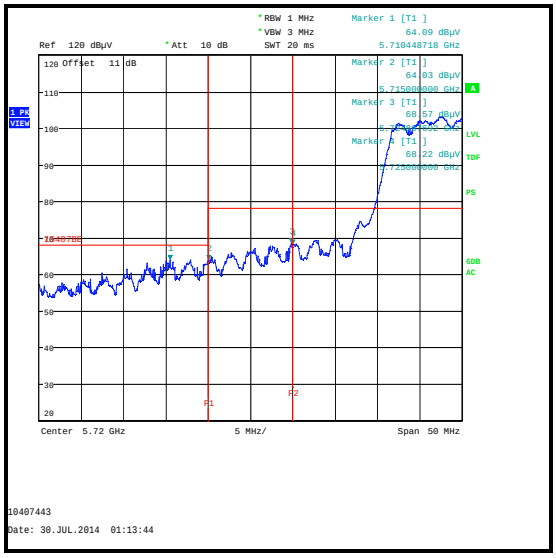
Upper Band Edge Measurement

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz operation) (continued)

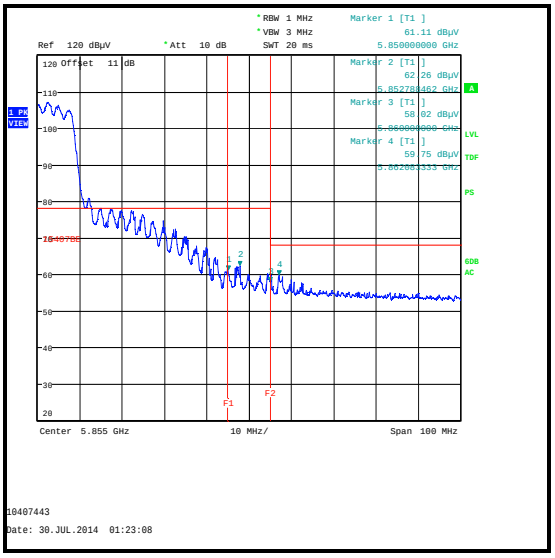
Results: 802.11n HT40 / BPSK / MCS0 / MIMO / Peak

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5710.449	-31.1	-27.0	4.1	Complied
5715	-31.2	-27.0	4.2	Complied
5724.808	-26.6	-17.0	9.6	Complied
5725	-27.0	-17.0	10.0	Complied
5850	-34.1	-17.0	17.1	Complied
5852.788	-32.9	-17.0	15.9	Complied
5860	-37.2	-27.0	10.2	Complied
5862.083	-35.4	-27.0	8.4	Complied

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5710.449	64.1	68.2	4.1	Complied
5715	64.0	68.2	4.2	Complied
5724.808	68.6	78.2	9.6	Complied
5725	68.2	78.2	10.0	Complied
5850	61.1	78.2	17.1	Complied
5852.788	62.3	78.2	15.9	Complied
5860	58.0	68.2	10.2	Complied
5862.083	59.8	68.2	8.4	Complied



Lower Band Edge Measurement



Upper Band Edge Measurement

Transmitter Band Edge Radiated Emissions (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1656	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	14 Mar 2015	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	14 Nov 2014	12
M1874	Test Receiver	Rohde & Schwarz	ESU26	100553	13 May 2015	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	18 May 2015	12
A253	Antenna	Flann Microwave	12240-20	128	14 Nov 2014	12
A1393	Attenuator	Huber & Suhner	6820.17.B	757456	02 May 2015	12
A1396	Attenuator	Huber & Suhner	6810.17.B	757987	02 May 2015	12

6. Measurement Uncertainty

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor such that a confidence level of approximately 95% is maintained. For the purposes of this document “approximately” is interpreted as meaning “effectively” or “for most practical purposes”.

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	±4.69 dB
Maximum Conducted Output Power	5.15 GHz to 5.850 GHz	95%	±1.13 dB
Maximum Power Spectral Density	5.15 GHz to 5.850 GHz	95%	±1.13 dB
Minimum 6 dB Emission Bandwidth	5.15 GHz to 5.850 GHz	95%	±3.92 %
26 dB Emission Bandwidth	5.15 GHz to 5.850 GHz	95%	±3.92 %
Radiated Spurious Emissions	30 MHz to 1 GHz	95%	±5.65 dB
Radiated Spurious Emissions	1 GHz to 40 GHz	95%	±2.94 dB

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty the published guidance of the appropriate accreditation body is followed.

7. Report Revision History

Version Number	Revision Details		
	Page No(s)	Clause	Details
1.0	-	-	Initial Version
2.0	97 - 103	-	Updated table headings within PSD result section.
3.0	-	-	Admin updates

--- END OF REPORT ---