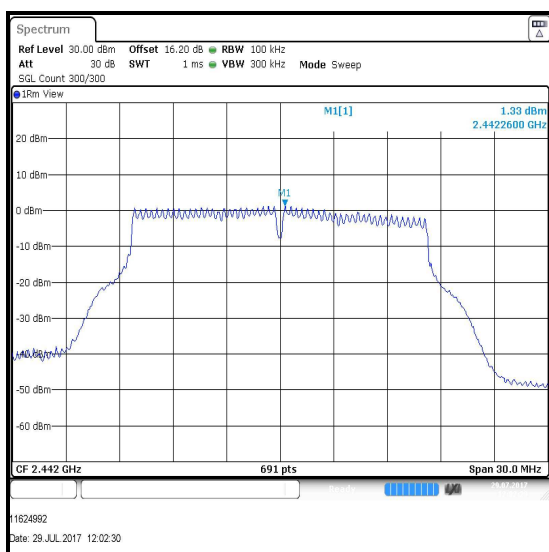
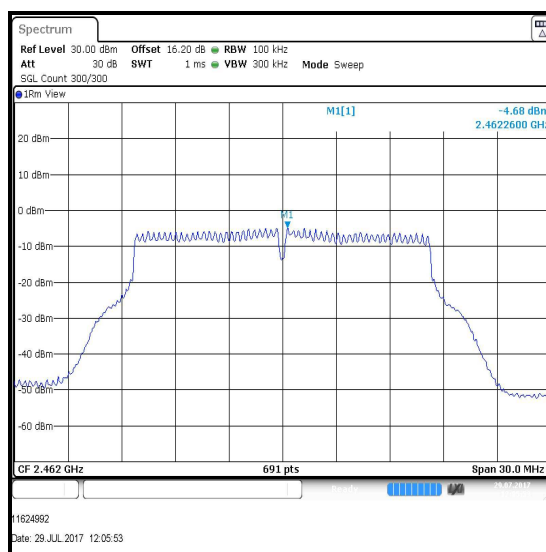
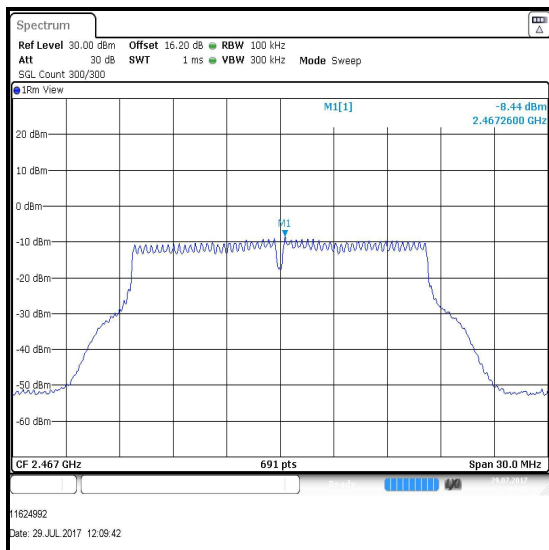
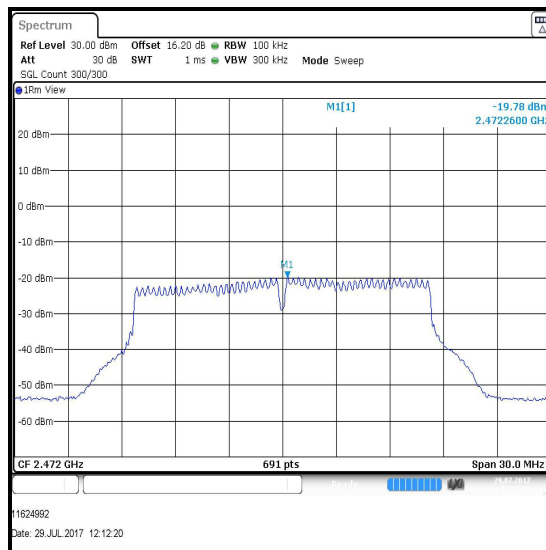
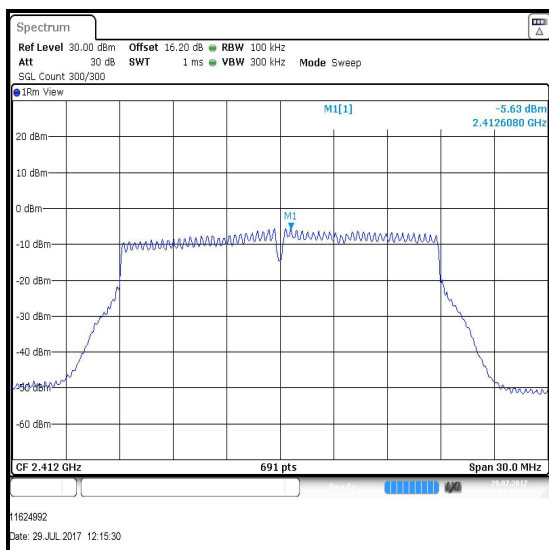
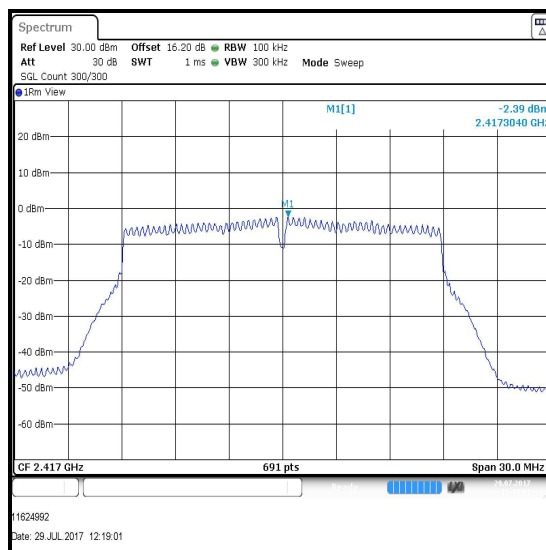
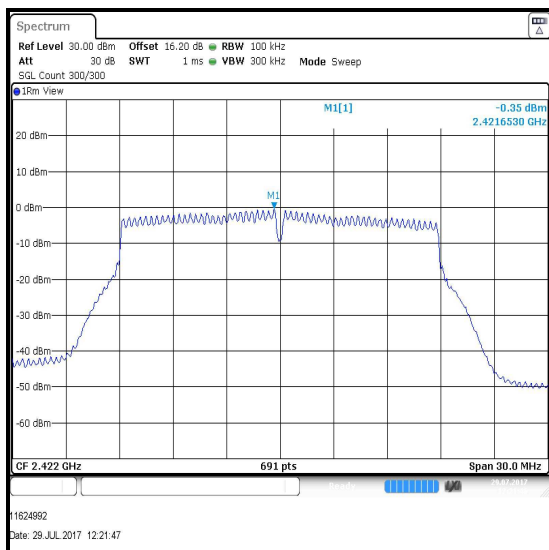
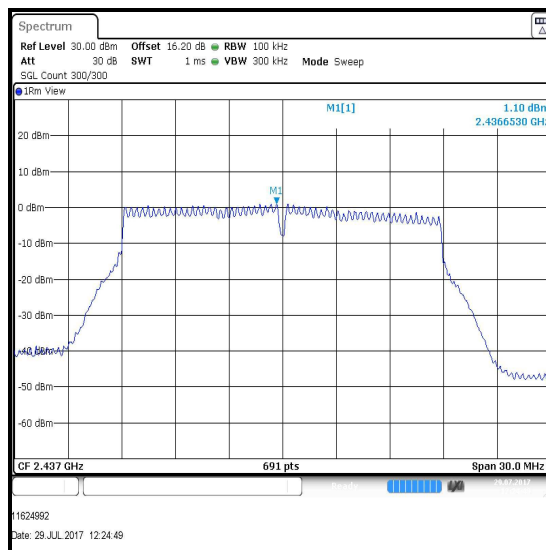
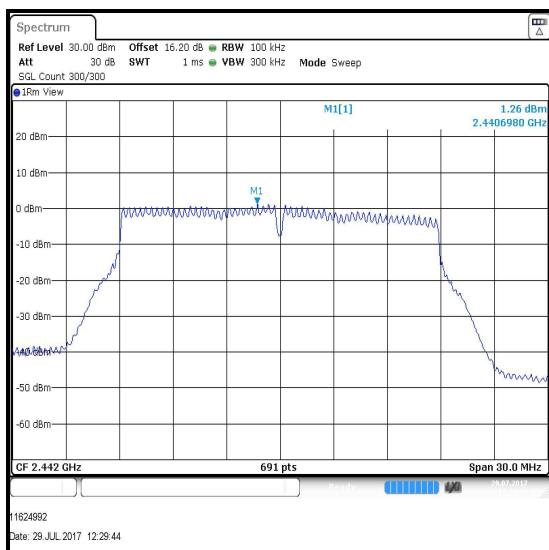
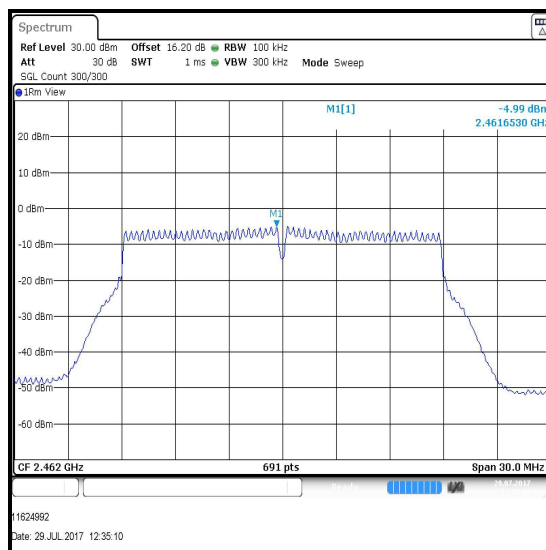
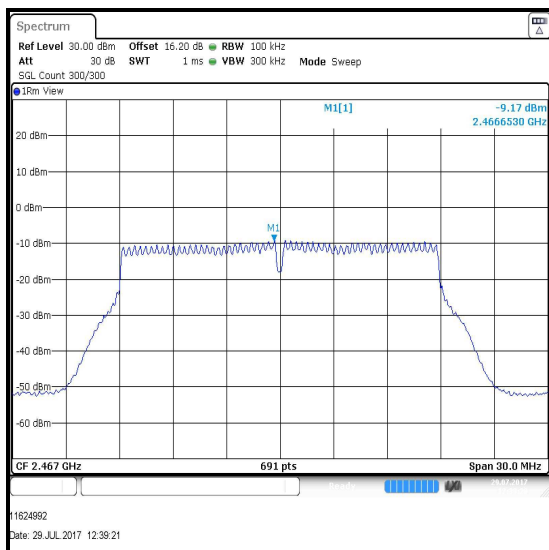
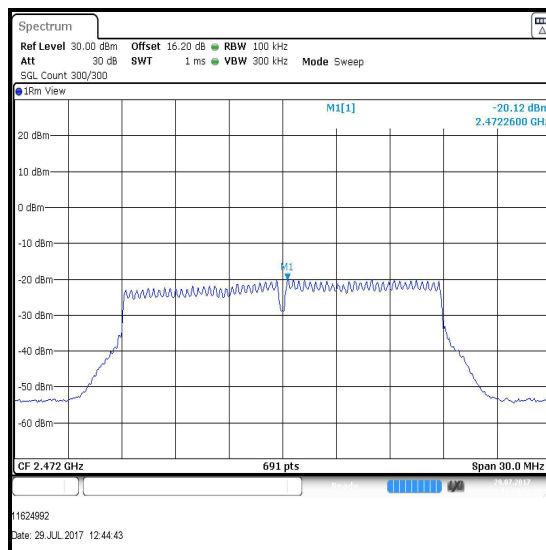


**Transmitter Power Spectral Density (continued)****Results: 802.11g / 20 MHz / BPSK / 6 Mbit/s / Port 1****Channel 7****Channel 11****Channel 12****Channel 13**

**Transmitter Power Spectral Density (continued)****Results: 802.11n / 20 MHz / BPSK / MCS0 / SISO / Port 1**

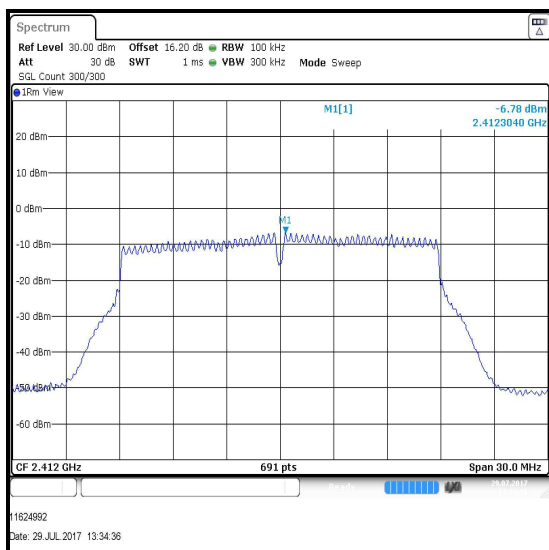
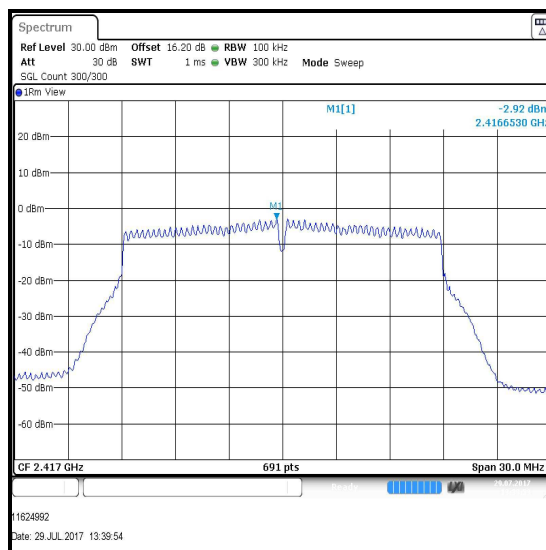
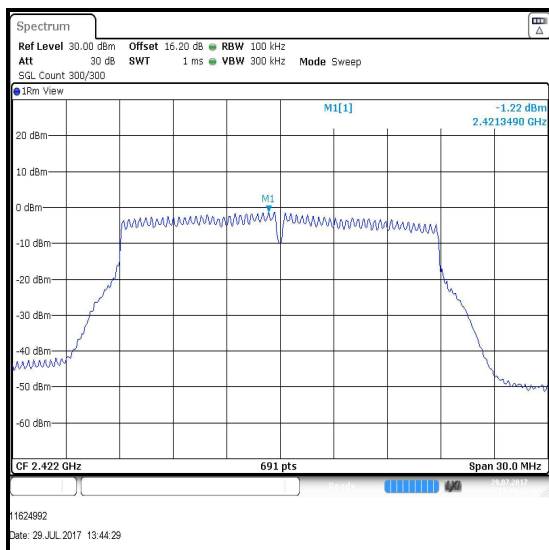
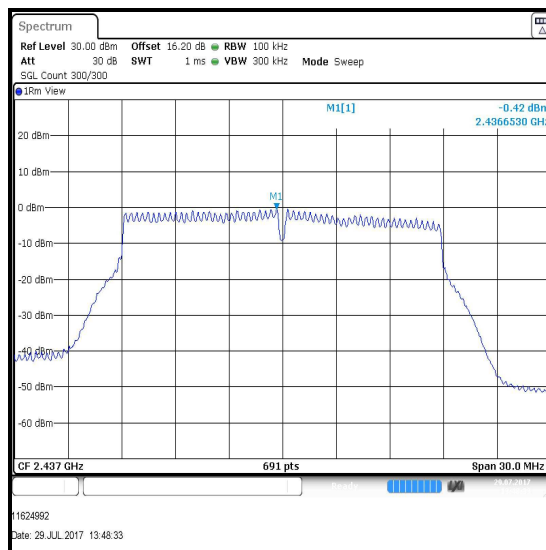
Channel	Output Power (dBm/100 kHz)	Limit (dBm/3 kHz)	Margin (dB)	Result
1	-5.6	8.0	13.6	Complied
2	-2.4	8.0	10.4	Complied
3	-0.3	8.0	8.3	Complied
6	1.1	8.0	6.9	Complied
7	1.3	8.0	6.7	Complied
11	-5.0	8.0	13.0	Complied
12	-9.2	8.0	17.2	Complied
13	-20.1	8.0	28.1	Complied

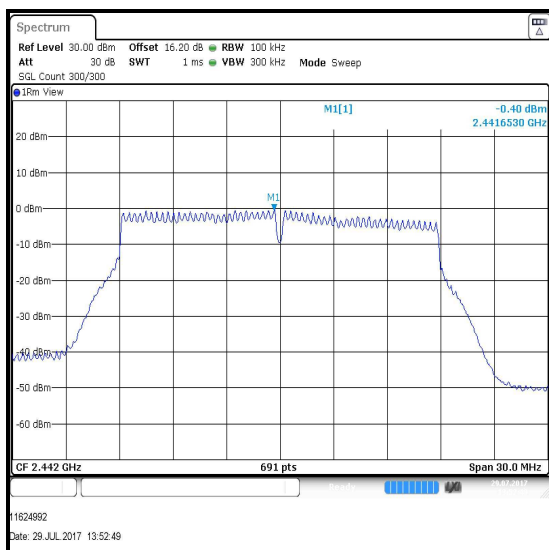
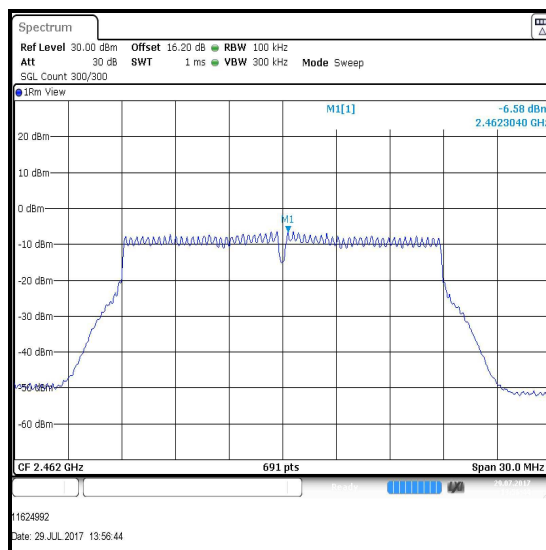
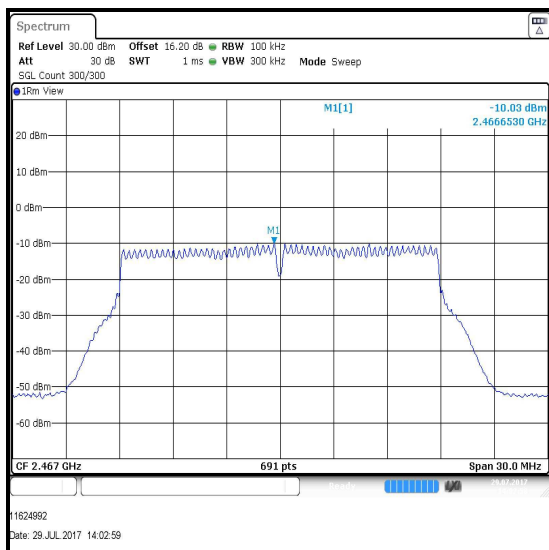
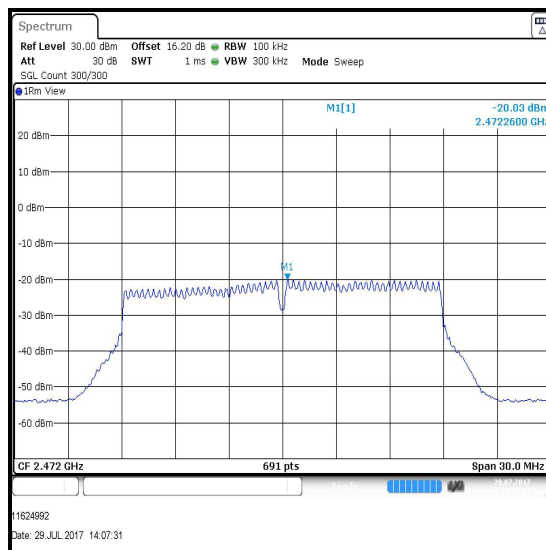
**Transmitter Power Spectral Density (continued)****Results: 802.11n / 20 MHz / BPSK / MCS0 / SISO / Port 1****Channel 1****Channel 2****Channel 3****Channel 6**

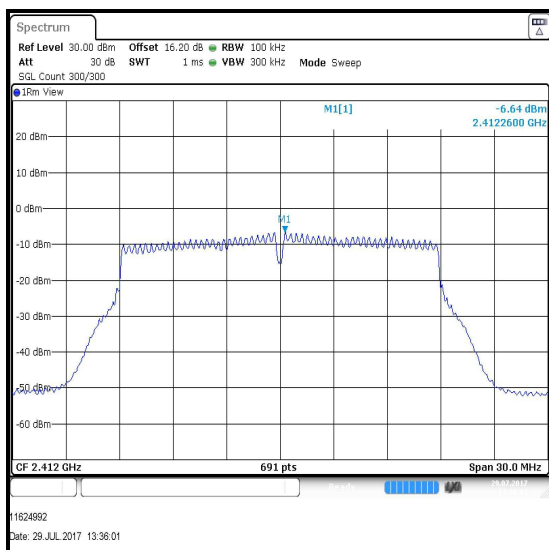
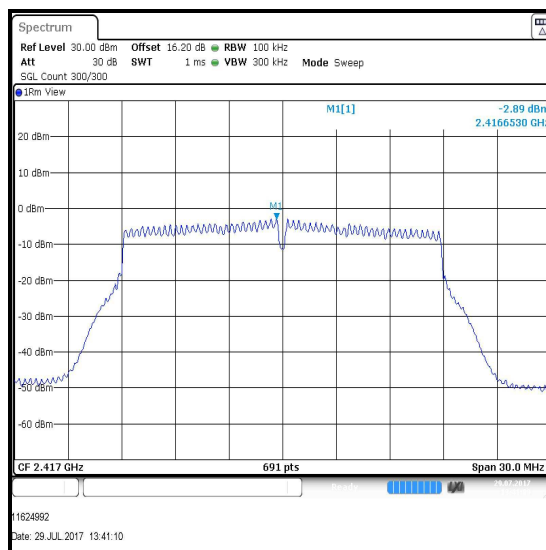
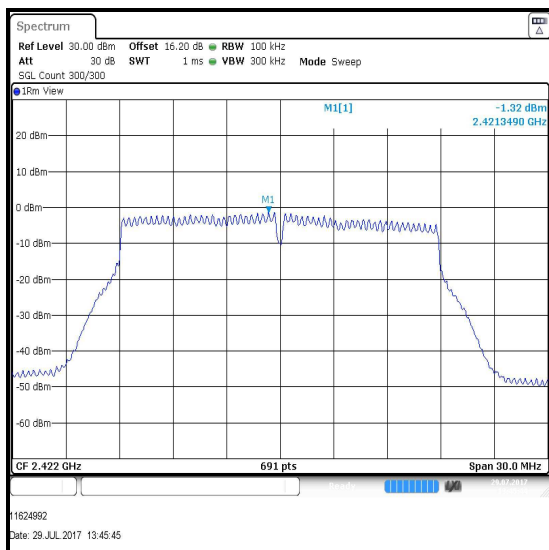
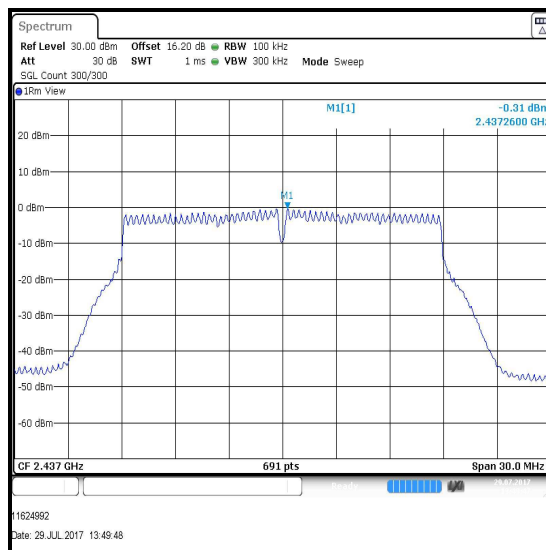
**Transmitter Power Spectral Density (continued)****Results: 802.11n / 20 MHz / BPSK / MCS0 / SISO / Port 1****Channel 7****Channel 11****Channel 12****Channel 13**

**Transmitter Power Spectral Density (continued)****Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO (2Tx CDD)**

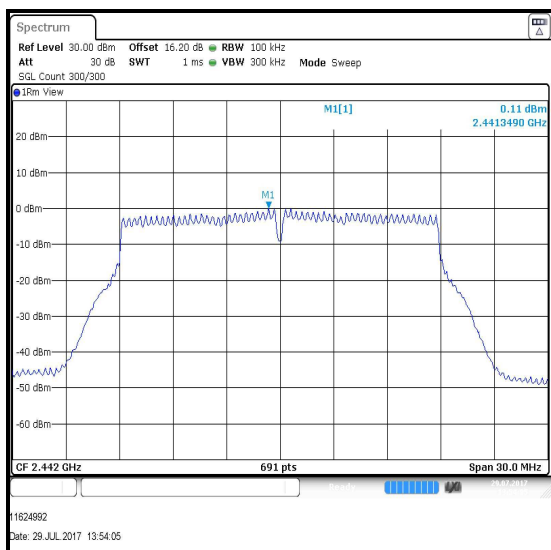
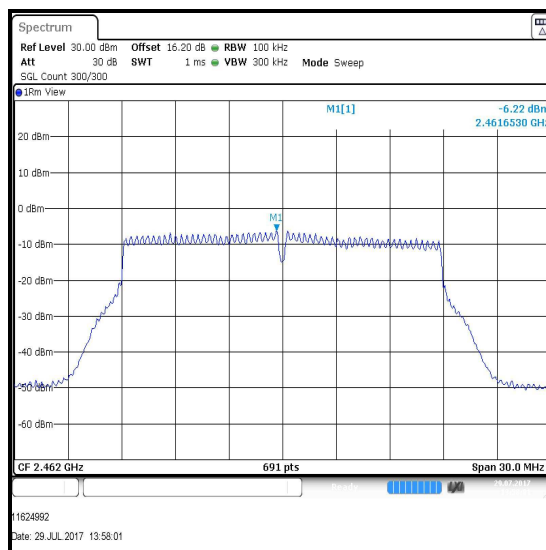
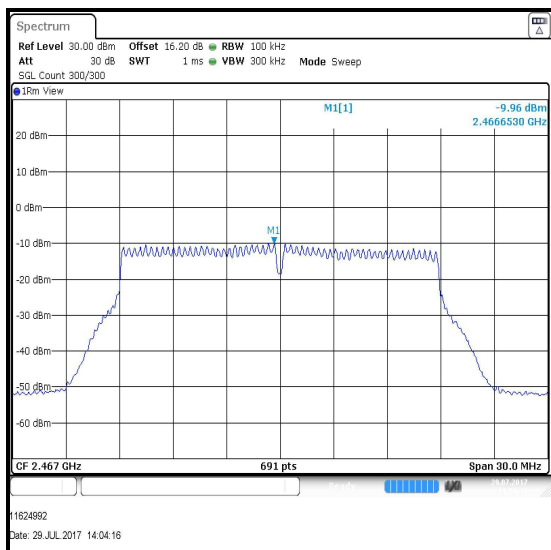
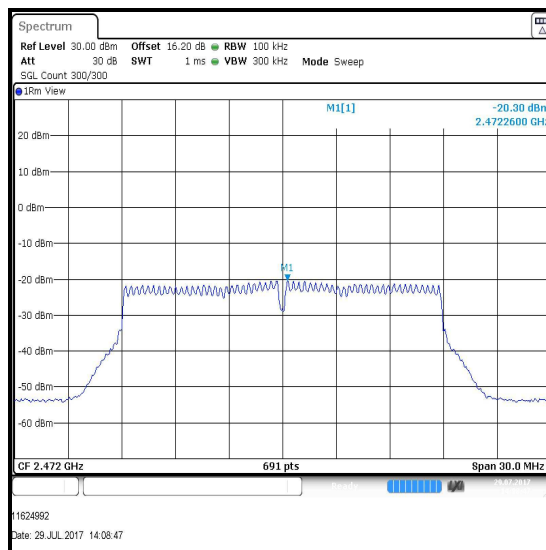
Channel	PSD at Port 1 (dBm / 100 kHz)	PSD at Port 2 (dBm / 100 kHz)	Combined PSD (dBm / 3 kHz)	PSD Limit (dBm / 3 kHz)	Margin (dB)	Result
1	-6.8	-6.6	-3.7	8.0	11.7	Complied
2	-2.9	-2.9	0.1	8.0	7.9	Complied
3	-1.2	-1.3	1.8	8.0	6.2	Complied
6	-0.4	-0.3	2.7	8.0	5.3	Complied
7	-0.4	0.1	2.9	8.0	5.1	Complied
11	-6.6	-6.2	-3.4	8.0	11.4	Complied
12	-10.0	-10.0	-7.0	8.0	15.0	Complied
13	-20.0	-20.3	-17.1	8.0	25.1	Complied

**Transmitter Power Spectral Density (continued)****Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO (2Tx CDD) / Port 1****Channel 1****Channel 2****Channel 3****Channel 6**

**Transmitter Power Spectral Density (continued)****Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO (2Tx CDD) / Port 1****Channel 7****Channel 11****Channel 12****Channel 13**

**Transmitter Power Spectral Density (continued)****Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO (2Tx CDD) / Port 2****Channel 1****Channel 2****Channel 3****Channel 6**



**Transmitter Power Spectral Density (continued)****Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO (2Tx CDD) / Port 2****Channel 7****Channel 11****Channel 12****Channel 13**

### 4.3. Transmitter Maximum (Average) Output Power

#### Test Summary:

Test Engineer:	Georgios Vrezas	Test Date:	29 July 2017
Test Sample Serial Number:	C07TK02MJ4C7		

FCC Reference:	Part 15.247(b)(3)
Test Method Used:	FCC KDB 558074 Section 9.2.2.2 and Notes below

#### Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	42

#### Note(s):

- The customer requested the following data rates to be used for all measurements:
  - 802.11b – 1 Mbit/s / SISO on Port 1
  - 802.11g – 6 Mbit/s / SISO on Port 1
  - 802.11n HT20 – MCS0 / SISO on Port 1
  - 802.11n HT20 – MCS0 / MIMO (2Tx CDD)
- Final measurements were performed using the above configurations on the bottom, middle and top channels. Additional channels were tested as requested by the customer.
- The power has been integrated over the 99% emission bandwidth. Plots for the occupied bandwidth are archived on the UL VS LTD IT server and available for inspection upon request.
- The EUT was transmitting at > 98% duty cycle and testing was performed in accordance with KDB 558074 Section 9.2.2.2 Method AVGSA-1. The signal analyser's integration function was used to integrate across the OBW. The signal analyser resolution bandwidth was set to 1-5% of the OBW and video bandwidth to at least 3 times the resolution bandwidth. An RMS detector was used and sweep time set manually to perform trace averaging over 300 traces. The span was set to at least 1.5 times the 99% occupied emission bandwidth.
- For 802.11n MIMO, conducted power was measured on all ports and then combined using the measure-and-sum technique stated in FCC KDB 662911 D01 Section E)1). For EIRP, the directional antenna gain was added to the conducted output power. This was calculated in accordance with FCC KDB 662911 D01 Section F)2)f)(ii) and for  $N_{SS}=1$ ,  $N_{ANT}=2$ ,  $G_1 = G_{Antenna1} = 0.9$  dBi,  $G_2 = G_{Antenna2} = -0.12$  dBi as:

$$\begin{aligned}
 \text{Directional Gain} &= 10 \log \left[ \frac{\sum_{j=1}^{N_{SS}} \left( \sum_{k=1}^{N_{ANT}} g_{j,k} \right)^2}{N_{ANT}} \right] = 10 \log \left[ \frac{\sum_{j=1}^1 \left( \sum_{k=1}^2 g_{j,k} \right)^2}{2} \right] \\
 &= 10 \log \left[ \frac{(g_{1,1} + g_{1,2})^2}{2} \right] = 10 \log \left[ \frac{\left( \frac{G_1}{10^{0.9/10}} + \frac{G_2}{10^{-0.12/10}} \right)^2}{2} \right] = 10 \log \left[ \frac{\left( \frac{0.9}{10^{0.9/10}} + \frac{-0.12}{10^{-0.12/10}} \right)^2}{2} \right] = 3.4 \text{ dBi}
 \end{aligned}$$

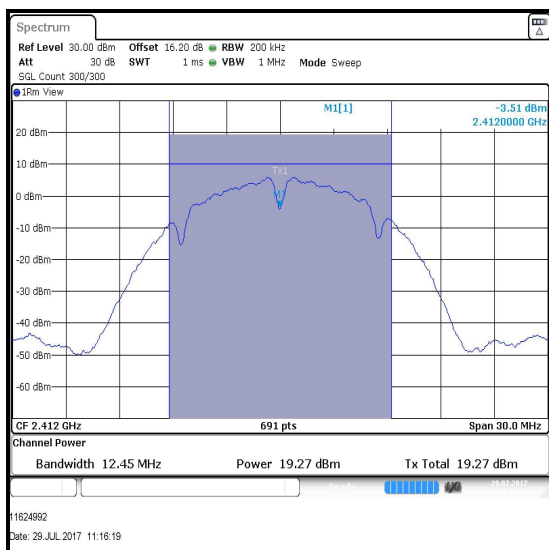
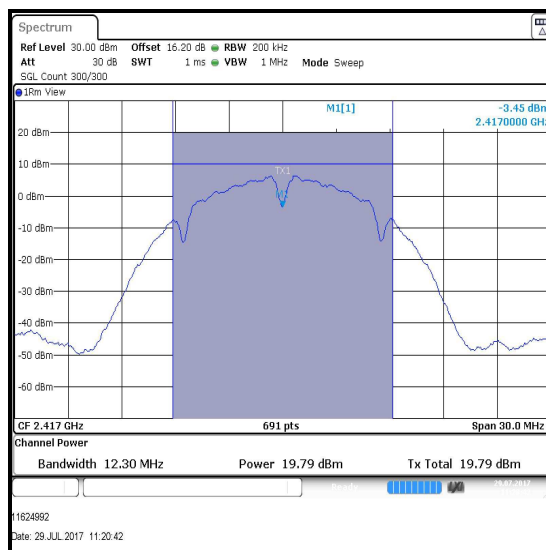
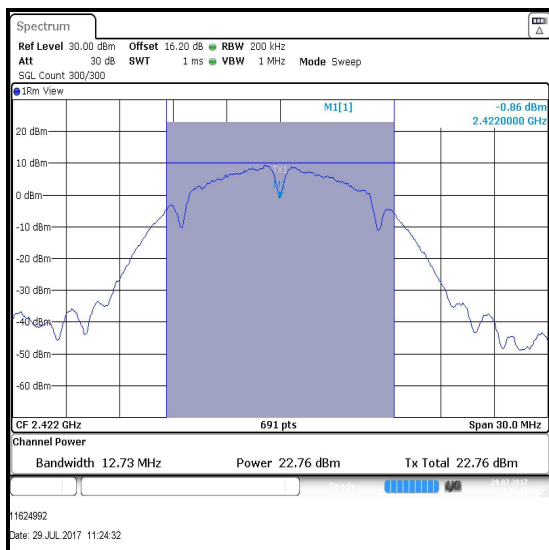
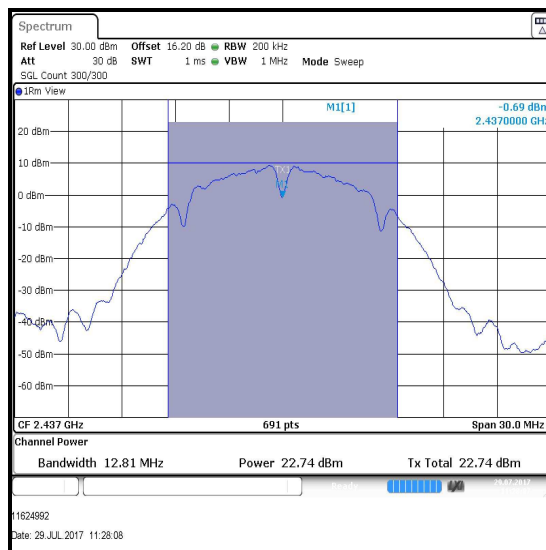
- The signal analyser was connected to the RF ports on the EUT using an RF switch, suitable attenuation and RF cables. An RF level offset was entered on the signal analyser to compensate for the loss of the switch, attenuators and RF cables.

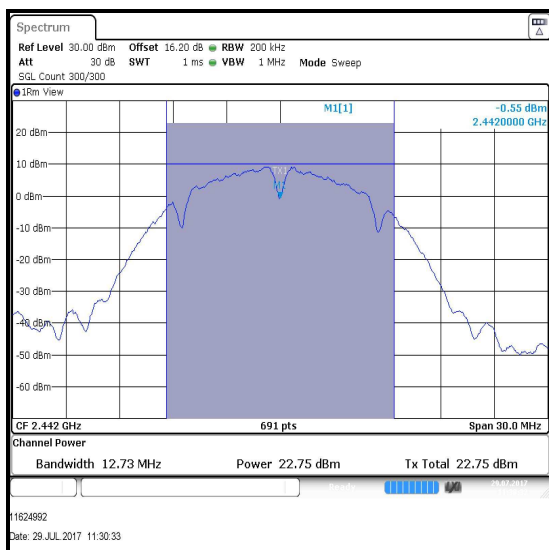
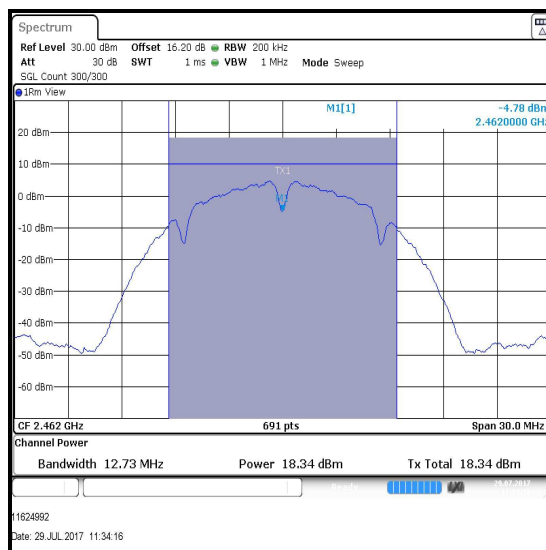
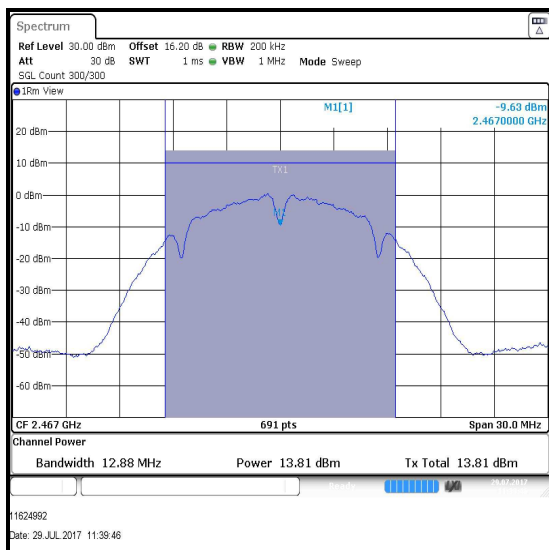
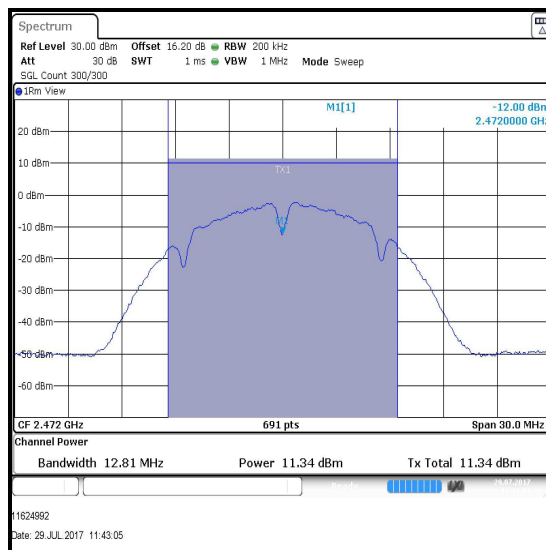
**Transmitter Maximum (Average) Output Power (continued)****Results: 802.11b / 20 MHz / DBPSK / 1 Mbit/s / Port 1****Conducted Peak Limit Comparison**

Channel	Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
1	19.3	30.0	10.7	Complied
2	19.8	30.0	10.2	Complied
3	22.8	30.0	7.2	Complied
6	22.7	30.0	7.3	Complied
7	22.8	30.0	7.2	Complied
11	18.3	30.0	11.7	Complied
12	13.8	30.0	16.2	Complied
13	11.3	30.0	18.7	Complied

**EIRP Limit Comparison**

Channel	Conducted Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
1	19.3	0.9	20.2	36.0	15.8	Complied
2	19.8	0.9	20.7	36.0	15.3	Complied
3	22.8	0.9	23.7	36.0	12.3	Complied
6	22.7	0.9	23.6	36.0	12.4	Complied
7	22.8	0.9	23.7	36.0	12.3	Complied
11	18.3	0.9	19.2	36.0	16.8	Complied
12	13.8	0.9	14.7	36.0	21.3	Complied
13	11.3	0.9	12.2	36.0	23.8	Complied

**Transmitter Maximum (Average) Output Power (continued)****Results: 802.11b / 20 MHz / DBPSK / 1 Mbit/s / Port 1****Channel 1****Channel 2****Channel 3****Channel 6**

**Transmitter Maximum (Average) Output Power (continued)****Results: 802.11b / 20 MHz / DBPSK / 1 Mbit/s / Port 1****Channel 7****Channel 11****Channel 12****Channel 13**

**Transmitter Maximum (Average) Output Power (continued)****Results: 802.11g / 20 MHz / BPSK / 6 Mbit/s / Port 1****Conducted Peak Limit Comparison**

Channel	Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
1	14.0	30.0	16.0	Complied
2	17.3	30.0	12.7	Complied
3	18.7	30.0	11.3	Complied
6	20.9	30.0	9.1	Complied
7	20.6	30.0	9.4	Complied
11	14.7	30.0	15.3	Complied
12	10.6	30.0	19.4	Complied
13	-0.3	30.0	30.3	Complied

**EIRP Limit Comparison**

Channel	Conducted Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
1	14.0	0.9	14.9	36.0	21.1	Complied
2	17.3	0.9	18.2	36.0	17.8	Complied
3	18.7	0.9	19.6	36.0	16.4	Complied
6	20.9	0.9	21.8	36.0	14.2	Complied
7	20.6	0.9	21.5	36.0	14.5	Complied
11	14.7	0.9	15.6	36.0	20.4	Complied
12	10.6	0.9	11.5	36.0	24.5	Complied
13	-0.3	0.9	0.6	36.0	35.4	Complied