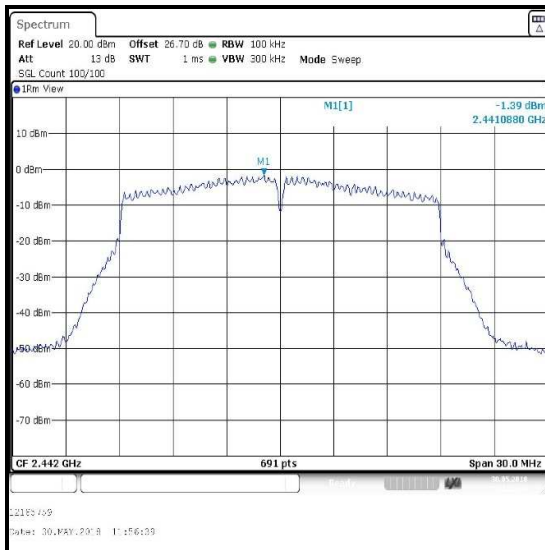
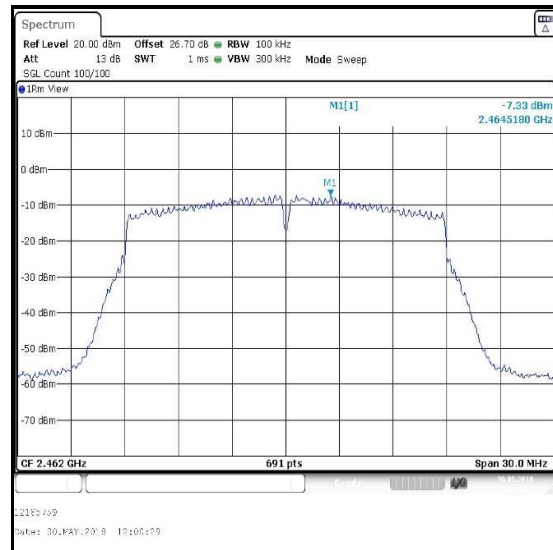
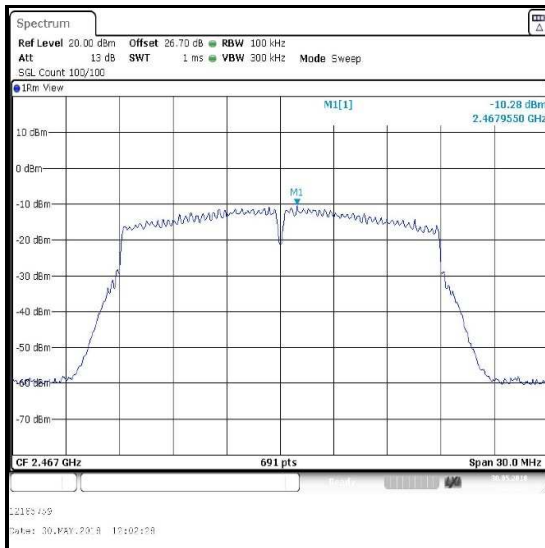
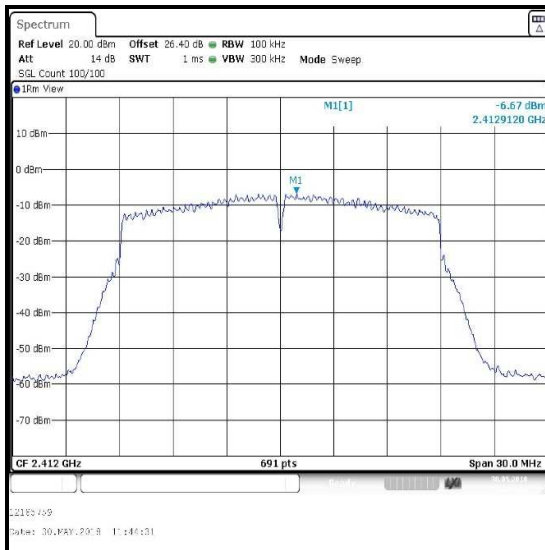
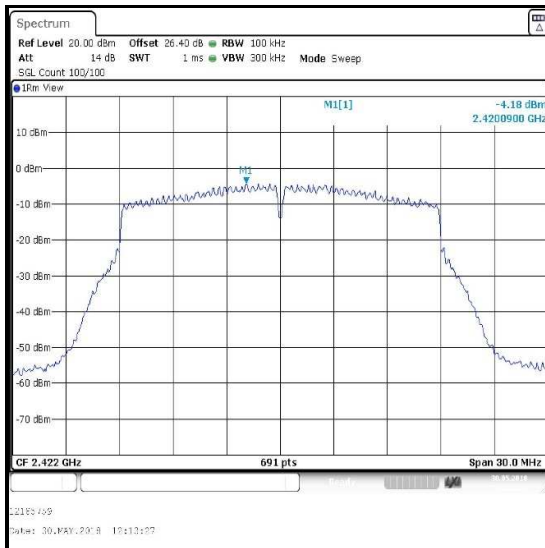
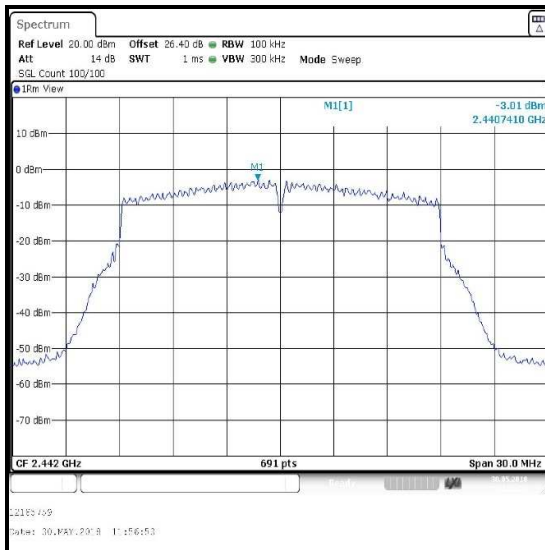
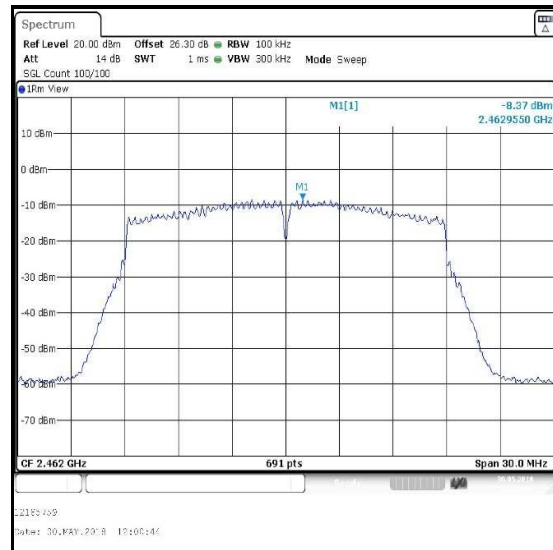
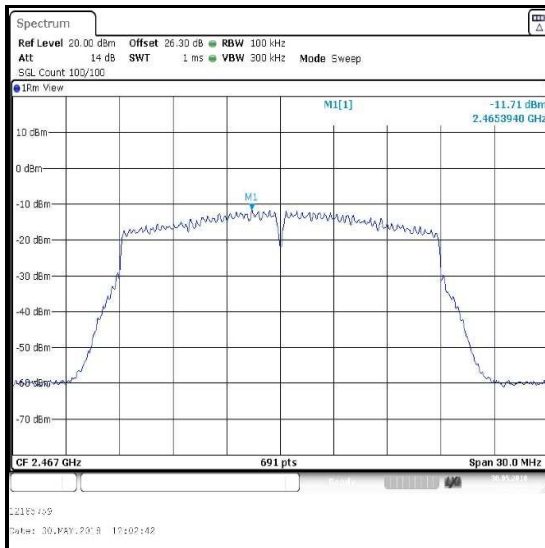


Transmitter Power Spectral Density (continued)**Results: 802.11n / HT20 / MIMO / 3Tx TXBF / BPSK / MCS0 / Core 1****Channel 7****Channel 11****Channel 12****Channel 13**

Transmitter Power Spectral Density (continued)**Results: 802.11n / HT20 / MIMO / 3Tx TXBF / BPSK / MCS0 / Core 2****Channel 1****Channel 2****Channel 3****Channel 6**

Transmitter Power Spectral Density (continued)**Results: 802.11n / HT20 / MIMO / 3Tx TXBF / BPSK / MCS0 / Core 2****Channel 7****Channel 11****Channel 12****Channel 13**

4.4. Transmitter Maximum (Average) Output Power

Test Summary:

Test Engineers:	Andrew Edwards, Stefan Ho & Max Passell	Test Dates:	20 May 2018 to 30 May 2018
Test Sample Serial Number:	C02WC003JMFN		

FCC Reference:	Part 15.247(b)(3)
Test Method Used:	FCC KDB 558074 Sections 9.2.2.2 & 9.2.2.4

Environmental Conditions:

Temperature (°C):	23 to 25
Relative Humidity (%):	34 to 63

Note(s):

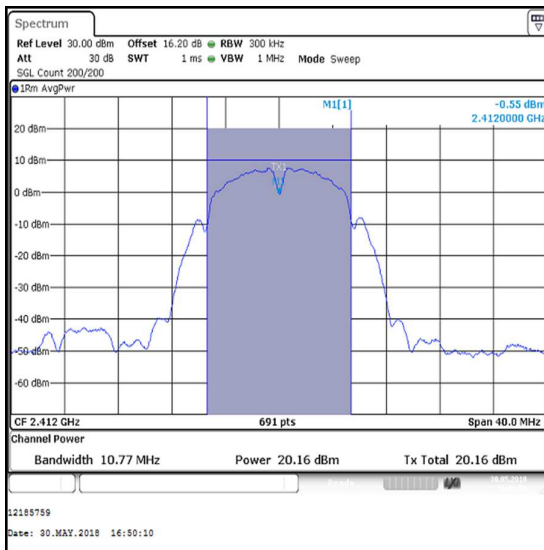
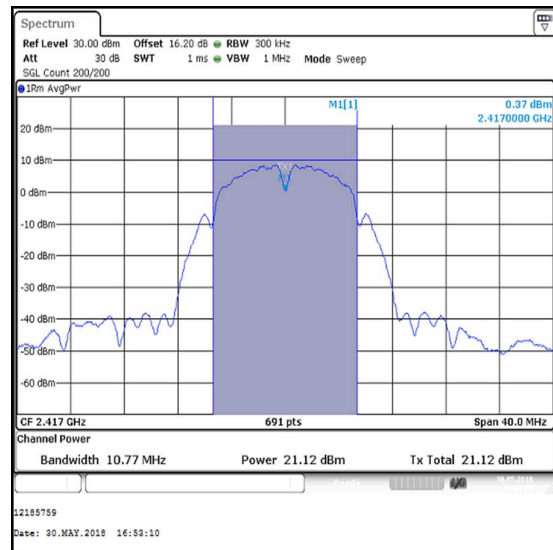
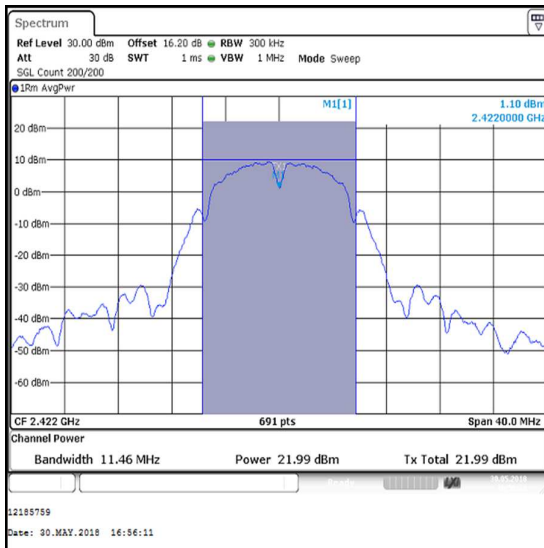
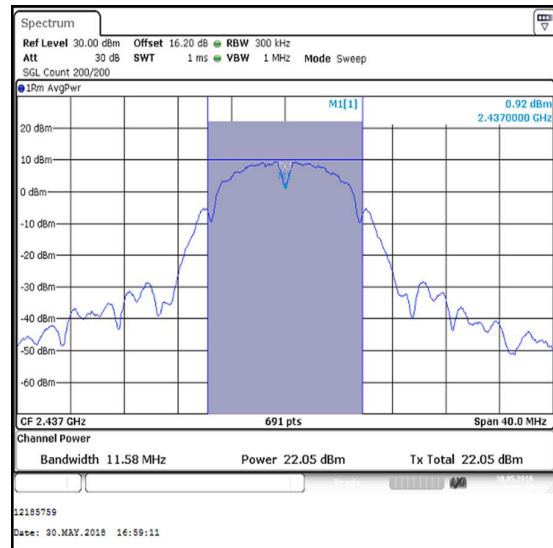
- The customer declared the following data rates to be used for all measurements as:
 - 802.11b – DBPSK / 1 Mbps / SISO / Core 0
 - 802.11g – BPSK / 6 Mbps / SISO / Core 0
 - 802.11n HT20 – BPSK / MCS0 / SISO / Core 0
 - 802.11b – MIMO / 2Tx CDD / DBPSK / 1 Mbps / Core 0 & Core 1
 - 802.11b – MIMO / 3Tx CDD / DBPSK / 1 Mbps / Core 0, Core 1 & Core 2
 - 802.11n HT20 / MIMO / 2Tx CDD / BPSK / MCS0 / Core 0 & Core 1
 - 802.11n HT20 / MIMO / 3Tx CDD / BPSK / MCS0 / Core 0, Core 1 & Core 2
 - 802.11n HT20 / MIMO / 2Tx TxBF / BPSK / MCS0 / Core 0 & Core 1
 - 802.11n HT20 / MIMO / 3Tx TxBF / BPSK / MCS0 / Core 0, Core 1 & Core 2
- Final measurements were performed using the above configurations on the relevant 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.
- For non TxBF modes, the EUT was transmitting at <98% duty cycle and testing was performed in accordance with KDB 558074 Section 9.2.2.4 Method AVGSA-2. The signal analyser's integration function was used to integrate across the 99% occupied bandwidth. The signal analyser resolution bandwidth was set to 300 kHz and video bandwidth 1 MHz. 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. The calculated duty cycle in section 4.1 was added to the measured power in order to compute the average power during the actual transmission time.
- For MIMO modes, 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. Detailed calculations can be found in Appendix 1.
- The signal analyser was connected to the RF port on the EUT using an RF switch, suitable attenuation and RF cables. An RF offset was entered on the signal analyser to compensate for the loss of the switch, attenuator and RF cables.
- For 3Tx MIMO modes, the limit for conducted output power has been reduced by the same amount in dB that the directional gain of the antennas exceeds 6 dBi, in accordance with 15.247(b)(4).

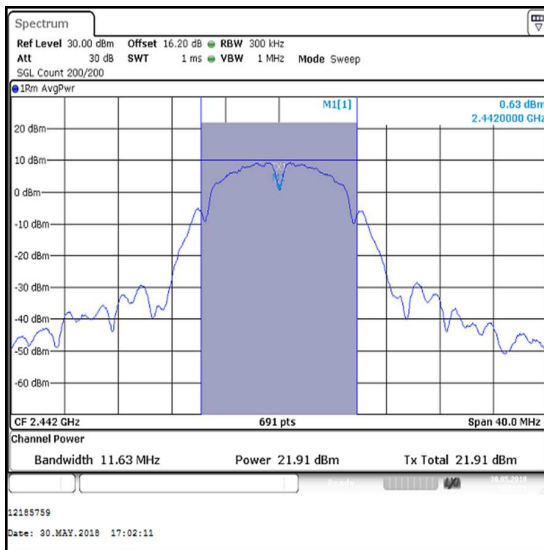
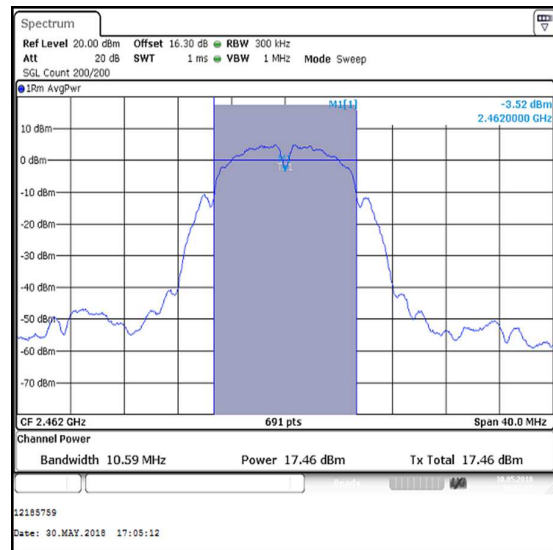
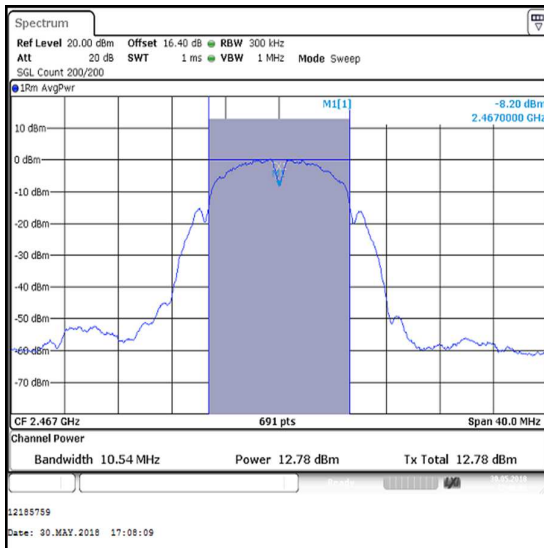
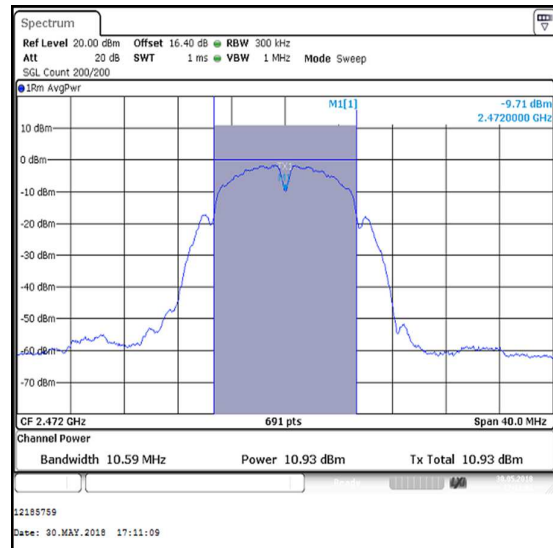
Transmitter Maximum (Average) Output Power (continued)**Results: 802.11b / 20 MHz / DBPSK / 1 Mbps / SISO / Core 0****Conducted Peak Limit Comparison**

Channel	Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
1	20.2	30.0	9.8	Complied
2	21.1	30.0	8.9	Complied
3	22.0	30.0	8.0	Complied
6	22.1	30.0	7.9	Complied
7	21.9	30.0	8.1	Complied
11	17.5	30.0	12.5	Complied
12	12.8	30.0	17.2	Complied
13	10.9	30.0	19.1	Complied

EIRP Limit Comparison

Channel	Conducted Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
1	20.2	3.3	23.5	36.0	12.5	Complied
2	21.1	3.3	24.4	36.0	11.6	Complied
3	22.0	3.3	25.3	36.0	10.7	Complied
6	22.1	3.3	25.4	36.0	10.6	Complied
7	21.9	3.3	25.2	36.0	10.8	Complied
11	17.5	3.3	20.8	36.0	15.2	Complied
12	12.8	3.3	16.1	36.0	19.9	Complied
13	10.9	3.3	14.2	36.0	21.8	Complied

Transmitter Maximum (Average) Output Power (continued)**Results: 802.11b / 20 MHz / DBPSK / 1 Mbps / Core 0****Channel 1****Channel 2****Channel 3****Channel 6**

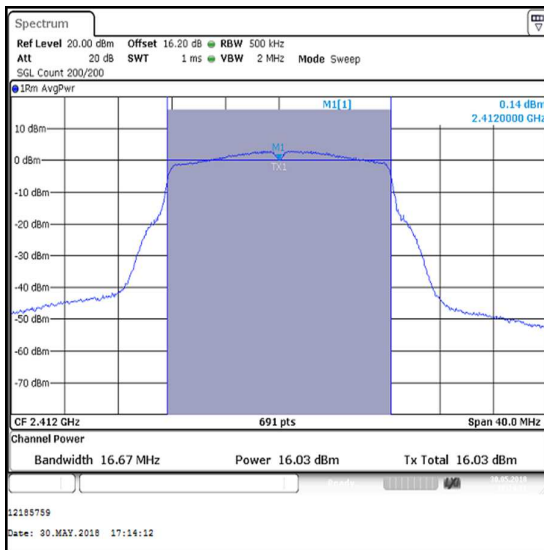
Transmitter Maximum (Average) Output Power (continued)**Results: 802.11b / 20 MHz / DBPSK / 1 Mbps / Core 0****Channel 7****Channel 11****Channel 12****Channel 13**

Transmitter Maximum (Average) Output Power (continued)**Results: 802.11g / 20 MHz / BPSK / 6 Mbps / Core 0****Conducted Peak Limit Comparison**

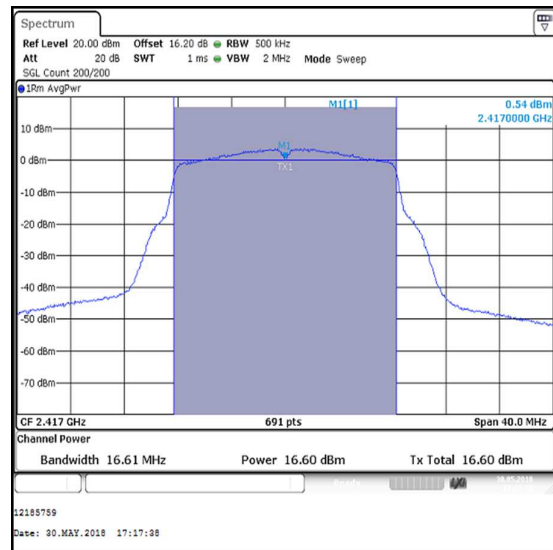
Channel	Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
1	16.0	30.0	14.0	Complied
2	16.6	30.0	13.4	Complied
3	17.9	30.0	12.1	Complied
6	22.0	30.0	8.0	Complied
7	22.1	30.0	7.9	Complied
11	13.9	30.0	16.1	Complied
12	11.0	30.0	19.0	Complied
13	3.0	30.0	27.0	Complied

EIRP Limit Comparison

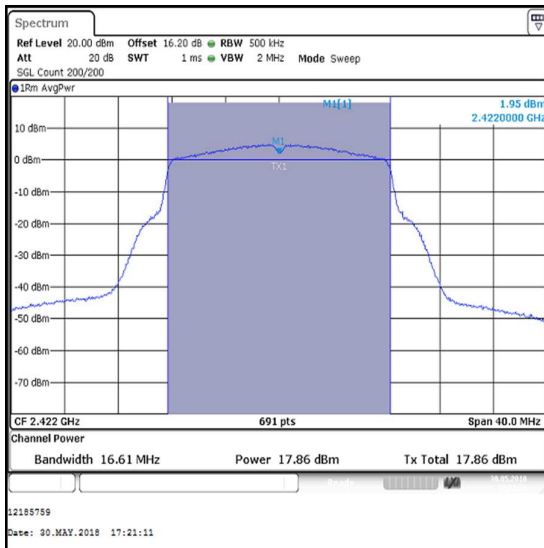
Channel	Conducted Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
1	16.0	3.3	19.3	36.0	16.7	Complied
2	16.6	3.3	19.9	36.0	16.1	Complied
3	17.9	3.3	21.2	36.0	14.8	Complied
6	22.0	3.3	25.3	36.0	10.7	Complied
7	22.1	3.3	25.4	36.0	10.6	Complied
11	13.9	3.3	17.2	36.0	18.8	Complied
12	11.0	3.3	14.3	36.0	21.7	Complied
13	3.0	3.3	6.3	36.0	29.7	Complied

Transmitter Maximum (Average) Output Power (continued)**Results: 802.11g / 20 MHz / BPSK / 6 Mbps / Core 0**

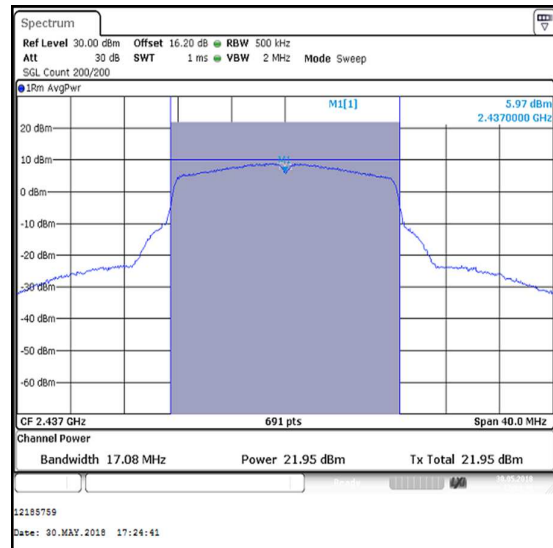
Channel 1



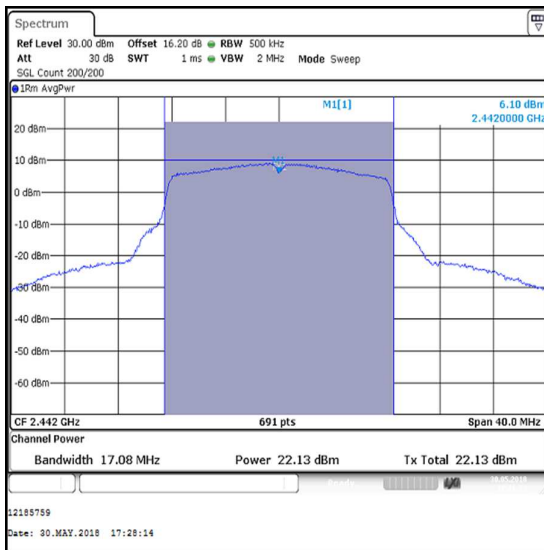
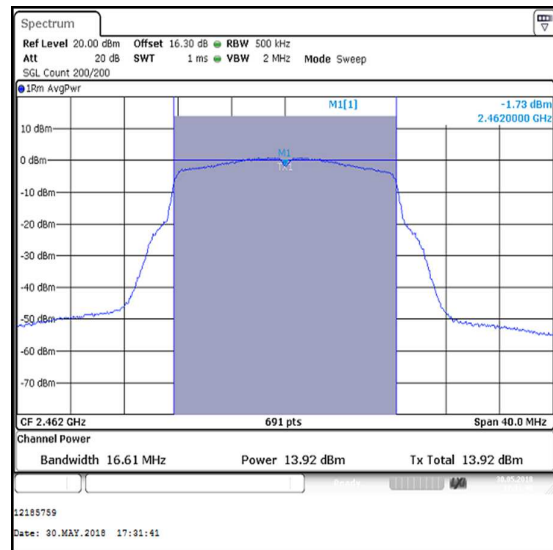
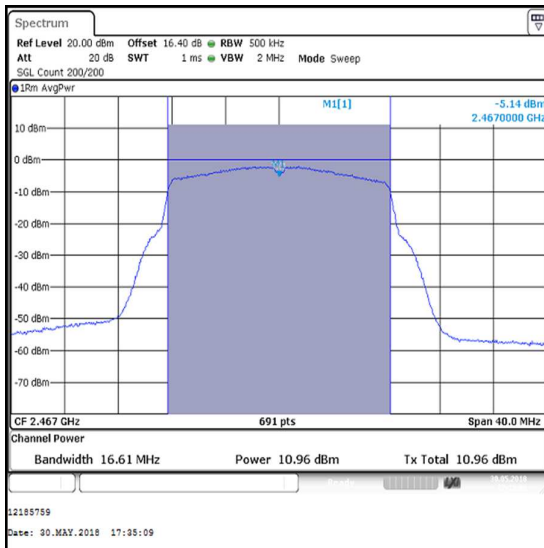
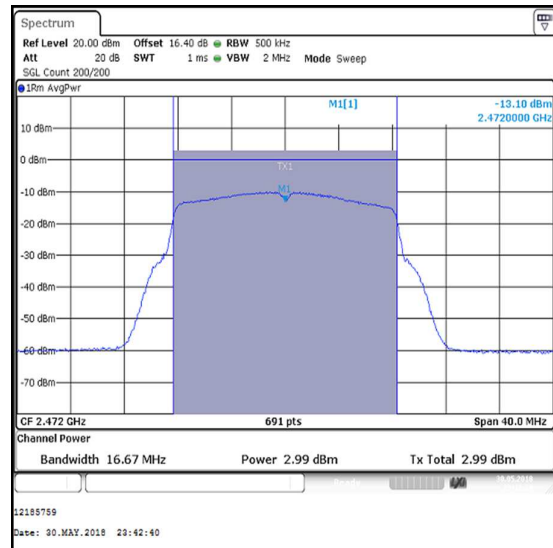
Channel 2



Channel 3



Channel 6

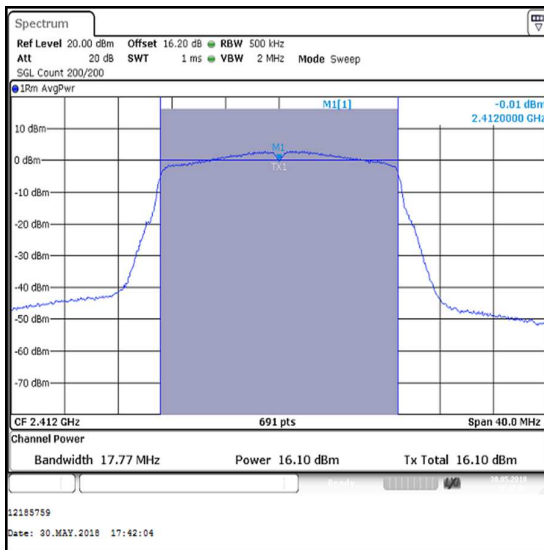
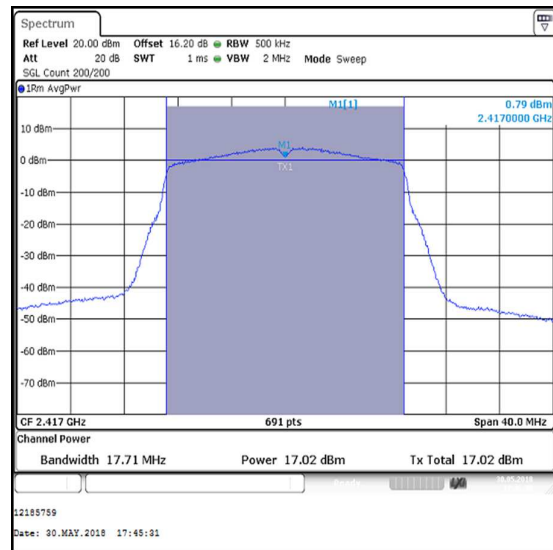
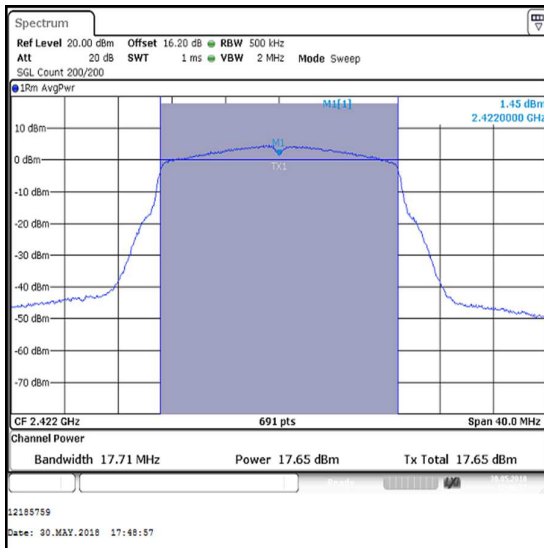
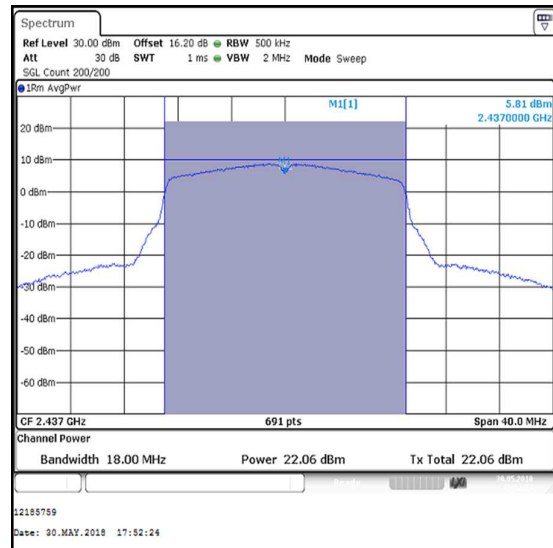
Transmitter Maximum (Average) Output Power (continued)**Results: 802.11g / 20 MHz / BPSK / 6 Mbps / Core 0****Channel 7****Channel 11****Channel 12****Channel 13**

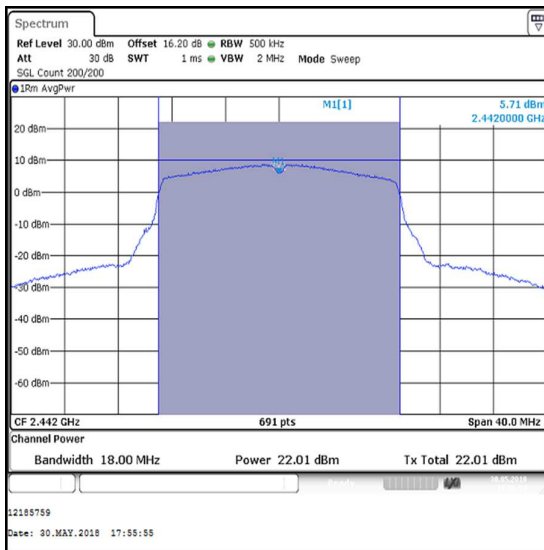
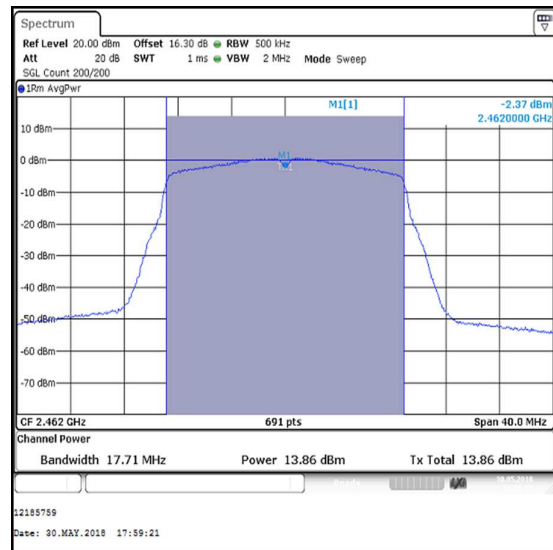
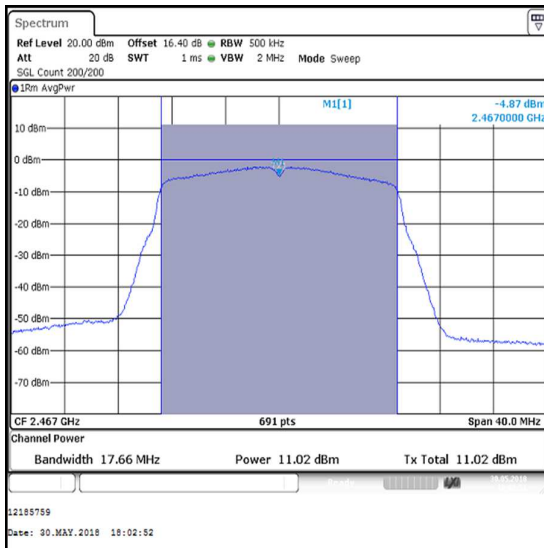
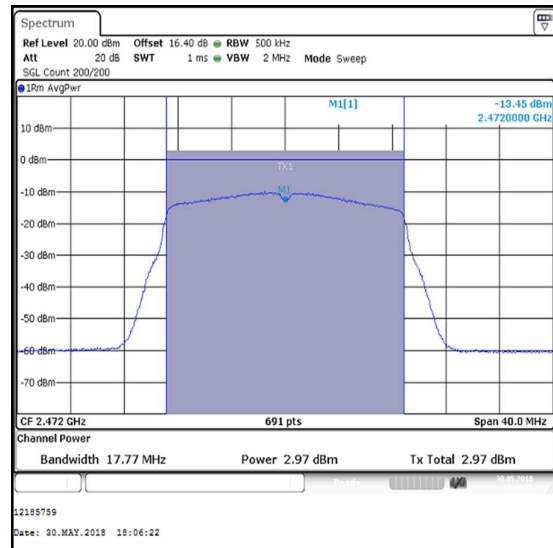
Transmitter Maximum (Average) Output Power (continued)**Results: 802.11n / HT20 / SISO / BPSK / MCS0 / Core 0****Conducted Peak Limit Comparison**

Channel	Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
1	16.1	30.0	13.9	Complied
2	17.0	30.0	13.0	Complied
3	17.7	30.0	12.3	Complied
6	22.1	30.0	7.9	Complied
7	22.0	30.0	8.0	Complied
11	13.9	30.0	16.1	Complied
12	11.0	30.0	19.0	Complied
13	3.0	30.0	27.0	Complied

EIRP Limit Comparison

Channel	Conducted Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
1	16.1	3.3	19.4	36.0	16.6	Complied
2	17.0	3.3	20.3	36.0	15.7	Complied
3	17.7	3.3	21.0	36.0	15.0	Complied
6	22.1	3.3	25.4	36.0	10.6	Complied
7	22.0	3.3	25.3	36.0	10.7	Complied
11	13.9	3.3	17.2	36.0	18.8	Complied
12	11.0	3.3	14.3	36.0	21.7	Complied
13	3.0	3.3	6.3	36.0	29.7	Complied

Transmitter Maximum (Average) Output Power (continued)**Results: 802.11n / HT20 / SISO / BPSK / MCS0 / Core 0****Channel 1****Channel 2****Channel 3****Channel 6**

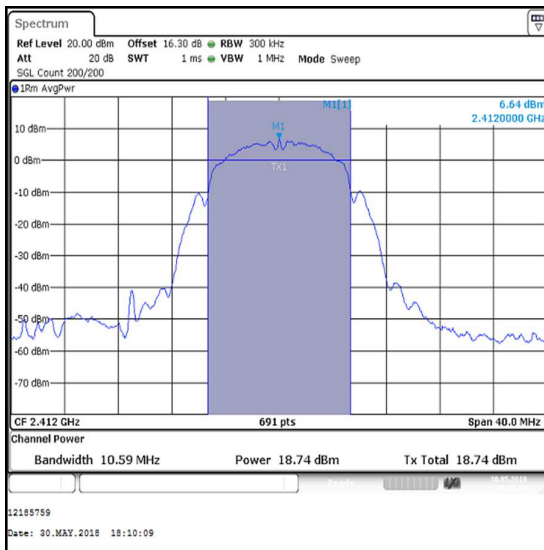
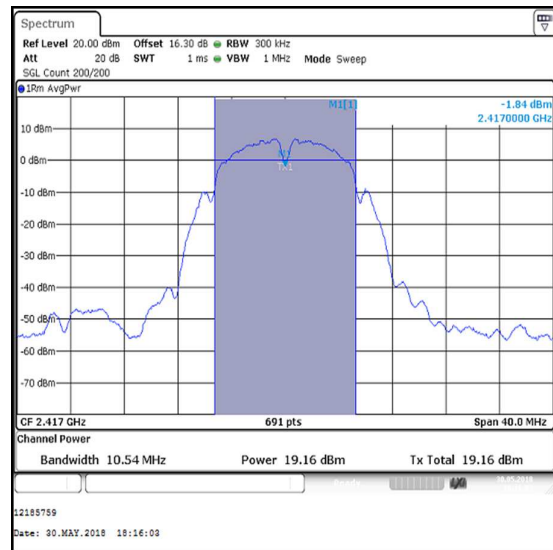
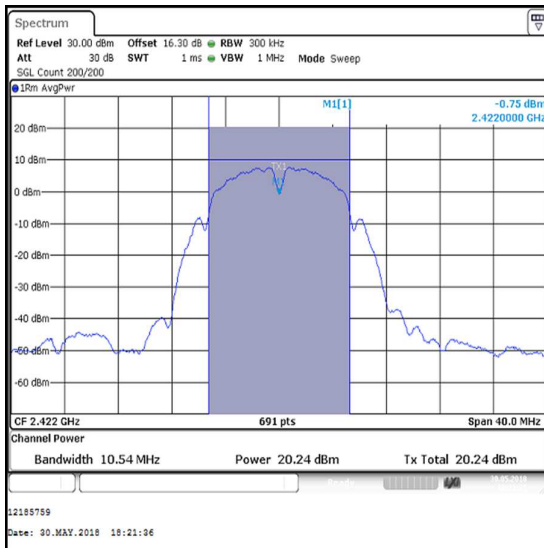
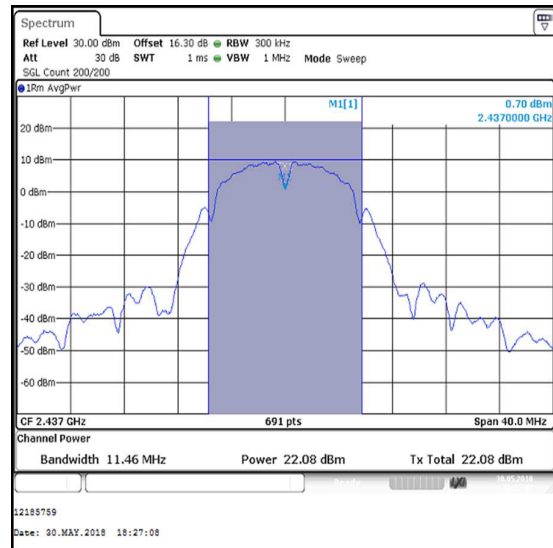
Transmitter Maximum (Average) Output Power (continued)**Results: 802.11n / HT20 / SISO / BPSK / MCS0 / Core 0****Channel 7****Channel 11****Channel 12****Channel 13**

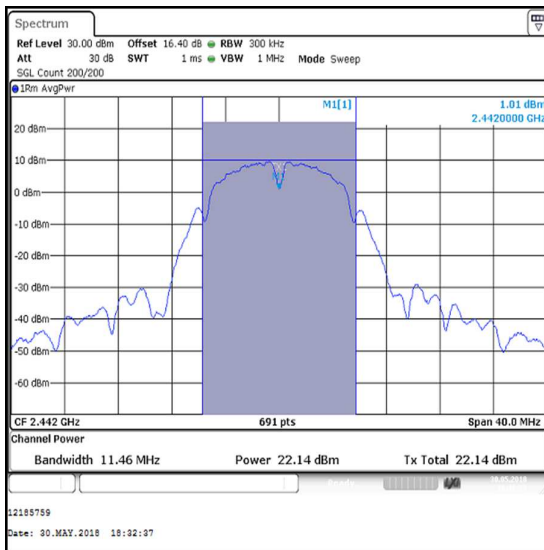
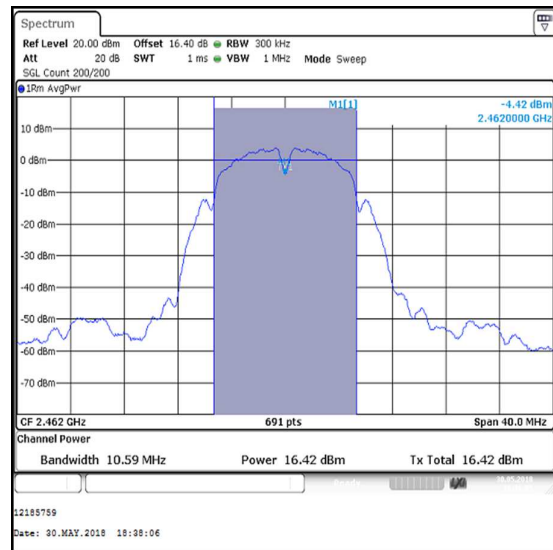
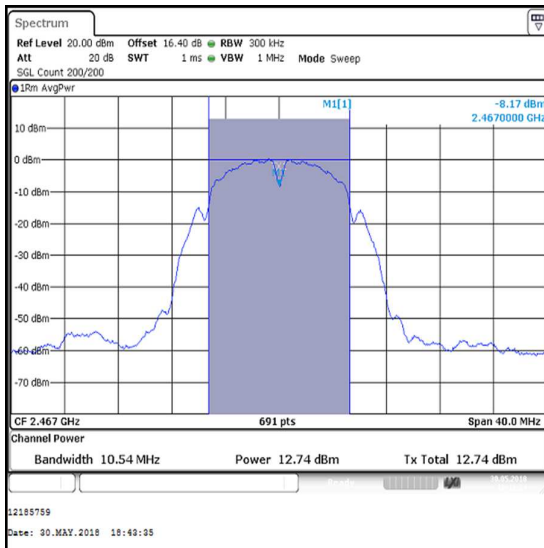
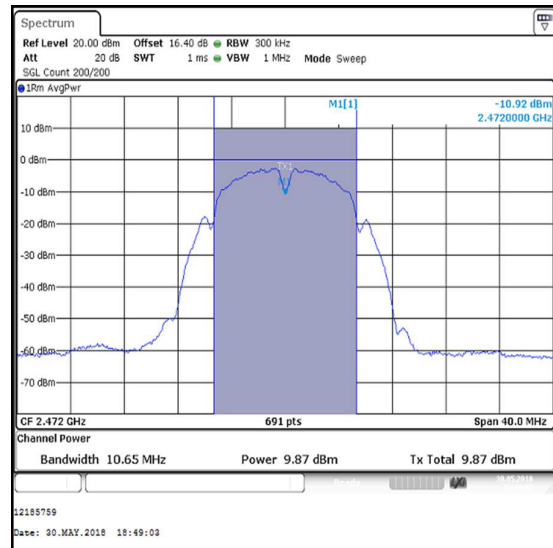
Transmitter Maximum (Average) Output Power (continued)**Results: 802.11b / 20 MHz / MIMO / 2Tx CDD / DBPSK / 1 Mbps****Conducted Peak Limit Comparison**

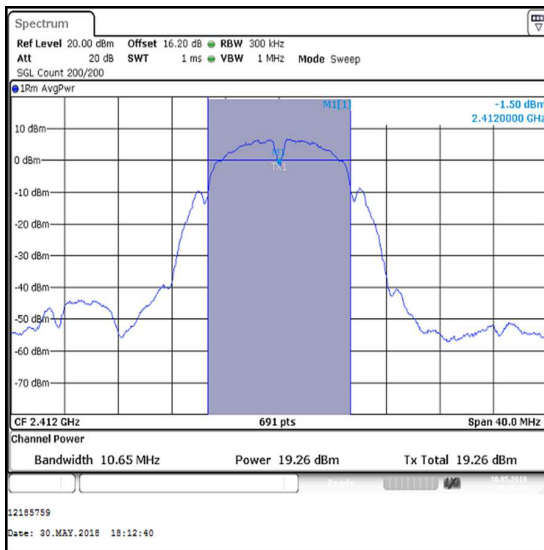
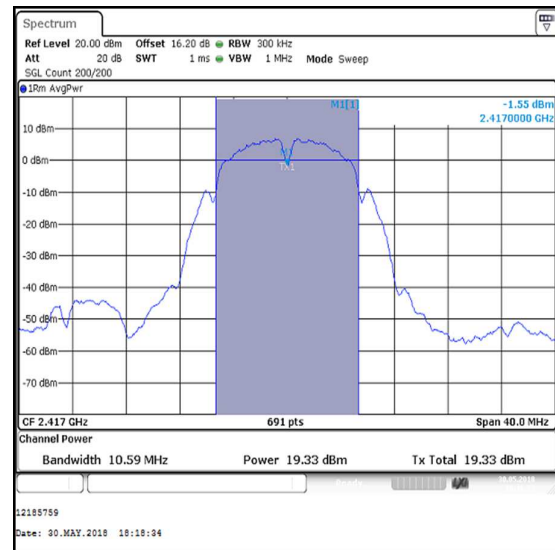
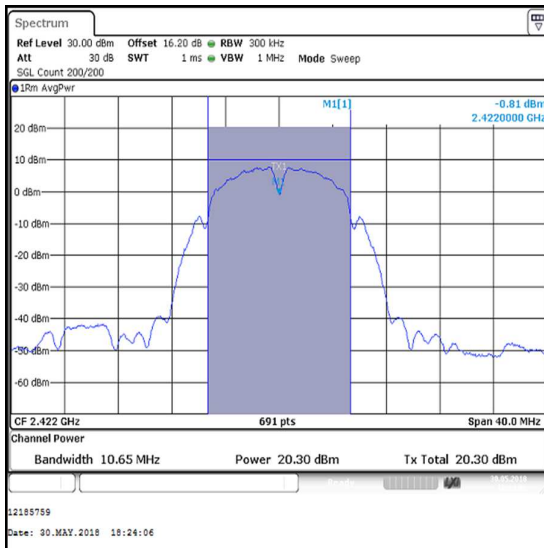
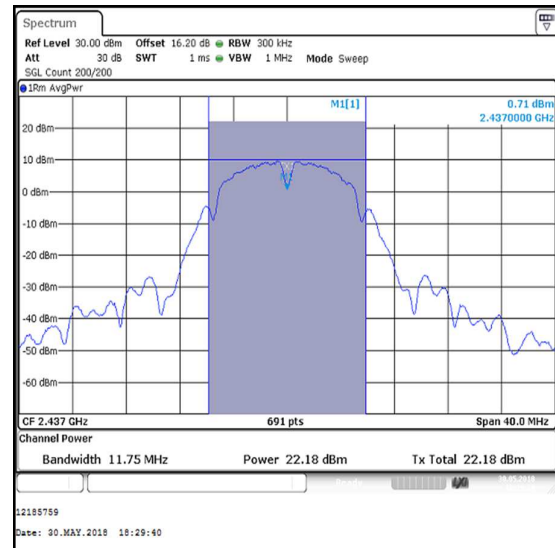
Channel	Conducted Peak Power Core 1 (dBm)	Conducted Peak Power Core 0 (dBm)	Combined Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
1	18.7	19.3	22.0	30.0	8.0	Complied
2	19.2	19.3	22.3	30.0	7.7	Complied
3	20.2	20.3	23.3	30.0	6.7	Complied
6	22.1	22.2	25.2	30.0	4.8	Complied
7	22.1	22.1	25.1	30.0	4.9	Complied
11	16.4	16.3	19.4	30.0	10.6	Complied
12	12.7	13.0	15.9	30.0	14.1	Complied
13	9.9	9.7	12.8	30.0	17.2	Complied

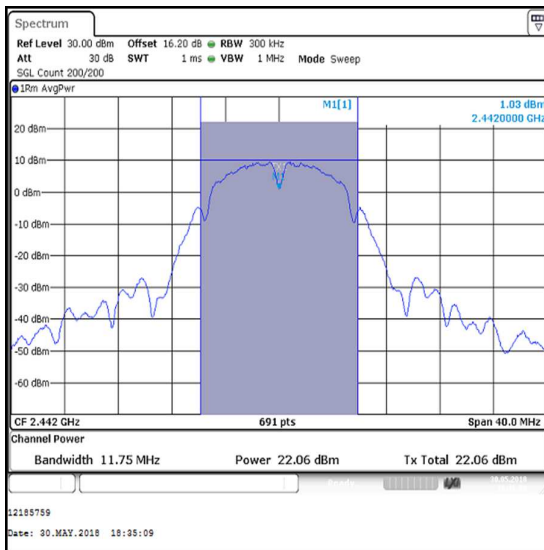
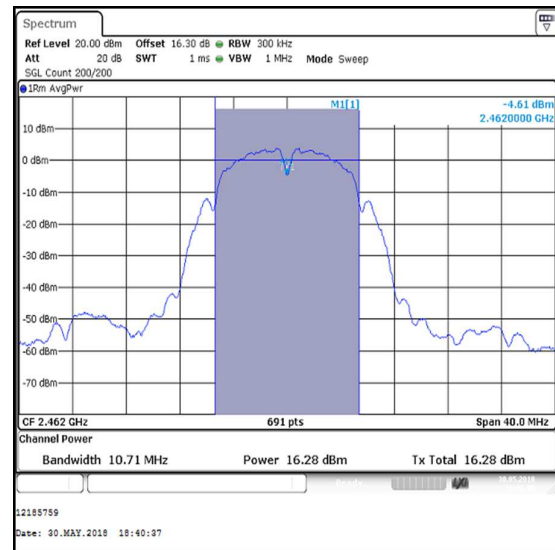
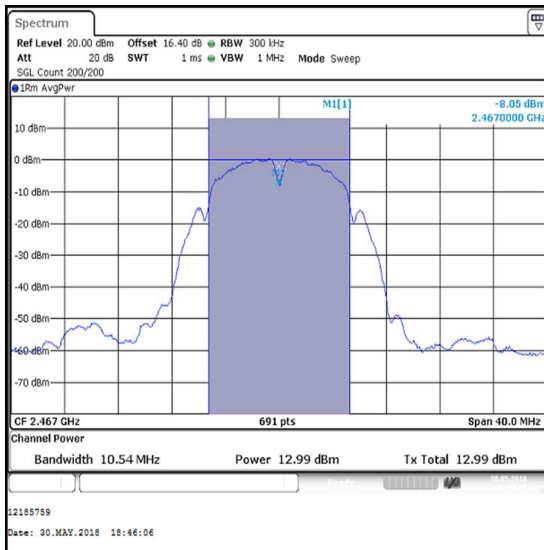
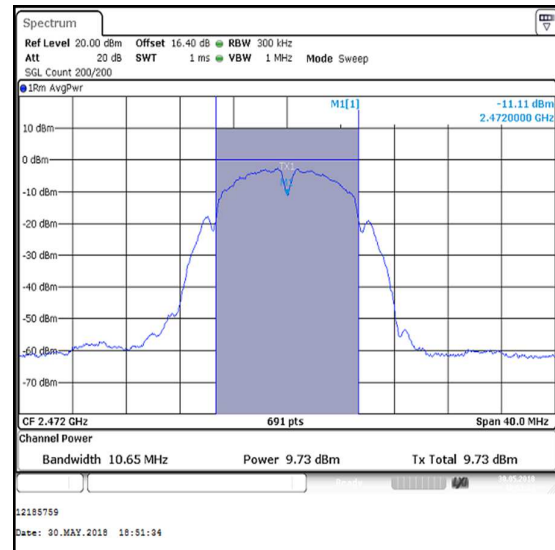
EIRP Limit Comparison

Channel	Combined Conducted Peak Power (dBm)	Directional Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
1	22.0	5.7	27.7	36.0	8.3	Complied
2	22.3	5.7	28.0	36.0	8.0	Complied
3	23.3	5.7	29.0	36.0	7.0	Complied
6	25.2	5.7	30.9	36.0	5.1	Complied
7	25.1	5.7	30.8	36.0	5.2	Complied
11	19.4	5.7	25.1	36.0	10.9	Complied
12	15.9	5.7	21.6	36.0	14.4	Complied
13	12.8	5.7	18.5	36.0	17.5	Complied

Transmitter Maximum (Average) Output Power (continued)**Results: 802.11b / 20 MHz / MIMO / 2Tx CDD / DBPSK / 1 Mbps / Core 1****Channel 1****Channel 2****Channel 3****Channel 6**

Transmitter Maximum (Average) Output Power (continued)**Results: 802.11b / 20 MHz / MIMO / 2Tx CDD / DBPSK / 1 Mbps / Core 1****Channel 7****Channel 11****Channel 12****Channel 13**

Transmitter Maximum (Average) Output Power (continued)**Results: 802.11b / 20 MHz / MIMO / 2Tx CDD / DBPSK / 1 Mbps / Core 0****Channel 1****Channel 2****Channel 3****Channel 6**

Transmitter Maximum (Average) Output Power (continued)**Results: 802.11b / 20 MHz / MIMO / 2Tx CDD / DBPSK / 1 Mbps / Core 0****Channel 7****Channel 11****Channel 12****Channel 13**

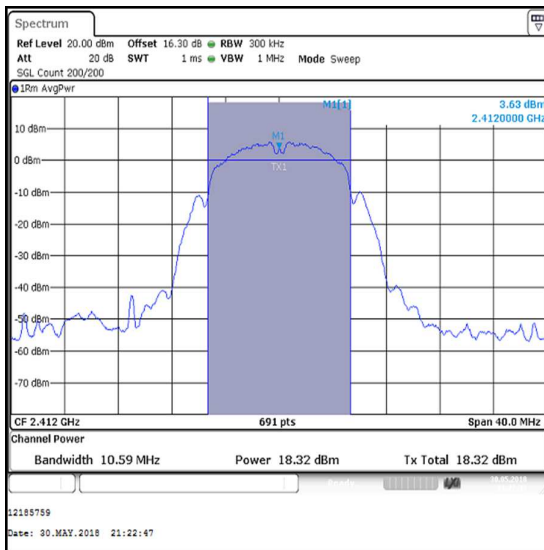
Transmitter Maximum (Average) Output Power (continued)**Results: 802.11b / 20 MHz / MIMO / 3Tx CDD / DBPSK / 1 Mbps****Conducted Peak Limit Comparison**

Channel	Conducted Peak Power Core 1 (dBm)	Conducted Peak Power Core 0 (dBm)	Conducted Peak Power Core 2 (dBm)
1	18.3	18.1	18.0
2	19.2	19.2	19.2
3	19.0	19.3	19.3
6	19.8	19.9	20.0
7	20.2	20.2	20.3
11	15.4	15.5	15.6
12	12.9	13.0	13.1
13	8.8	8.8	9.0

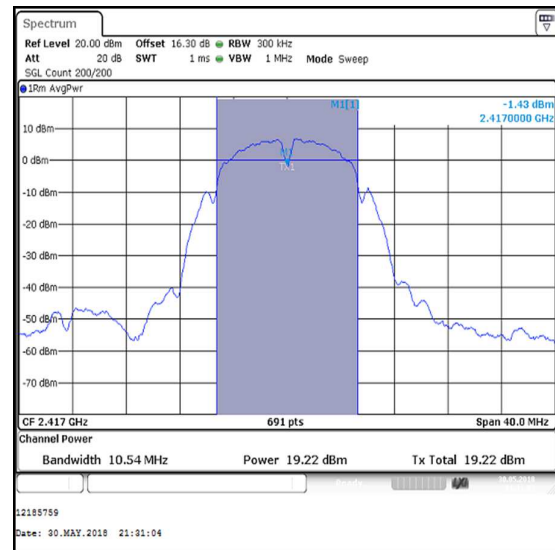
Channel	Combined Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
1	22.9	30.0	7.1	Complied
2	24.0	30.0	6.0	Complied
3	24.0	30.0	6.0	Complied
6	24.7	30.0	5.3	Complied
7	25.0	30.0	5.0	Complied
11	20.3	30.0	9.7	Complied
12	17.8	30.0	12.2	Complied
13	13.6	30.0	16.4	Complied

EIRP Limit Comparison

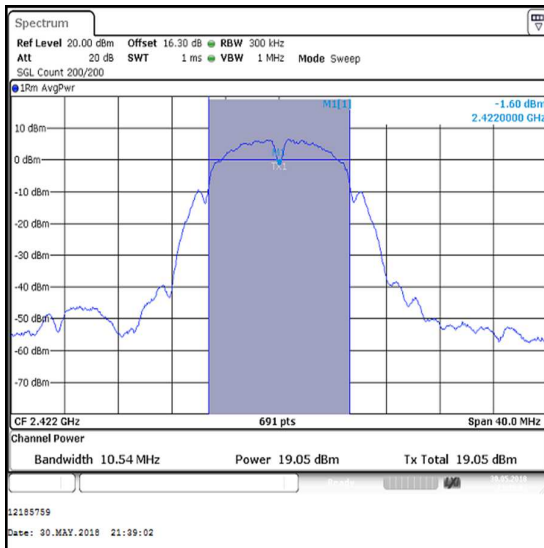
Channel	Combined Conducted Peak Power (dBm)	Directional Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
1	22.9	7.3	30.2	36.0	5.8	Complied
2	24.0	7.3	31.3	36.0	4.7	Complied
3	24.0	7.3	31.3	36.0	4.7	Complied
6	24.7	7.3	32.0	36.0	4.0	Complied
7	25.0	7.3	32.3	36.0	3.7	Complied
11	20.3	7.3	27.6	36.0	8.4	Complied
12	17.8	7.3	25.1	36.0	10.9	Complied
13	13.6	7.3	20.9	36.0	15.1	Complied

Transmitter Maximum (Average) Output Power (continued)**Results: 802.11b / 20 MHz / MIMO / 3Tx CDD / DBPSK / 1 Mbps / Core 1**

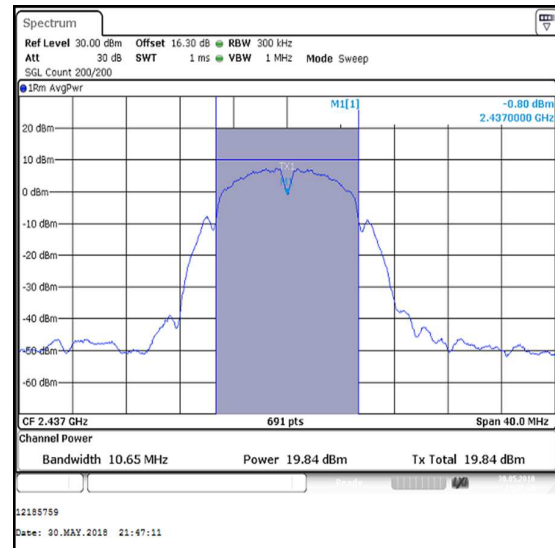
Channel 1



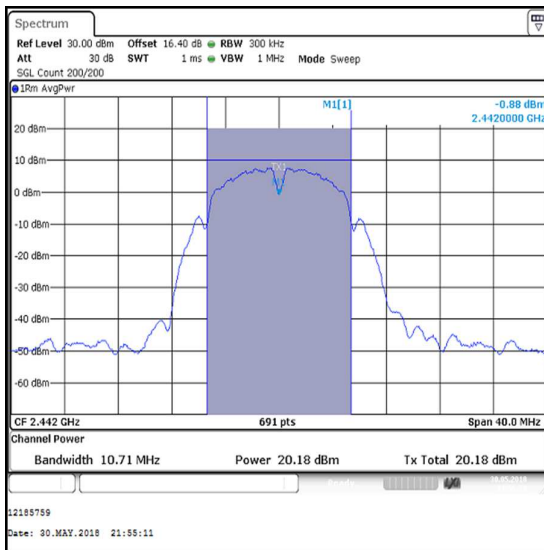
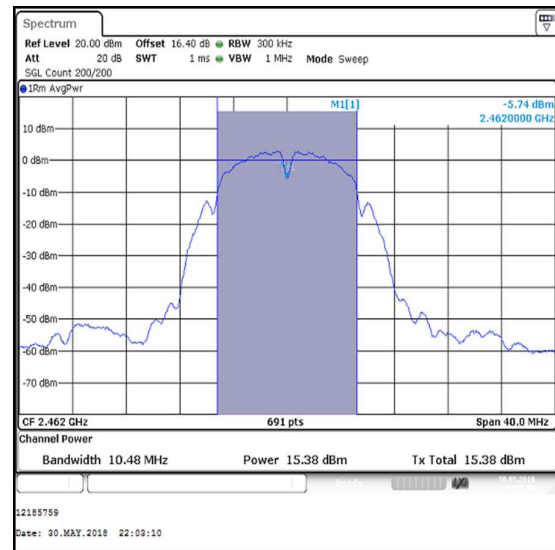
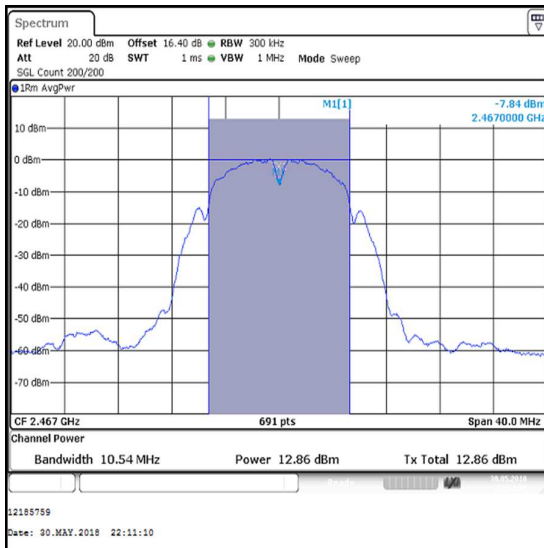
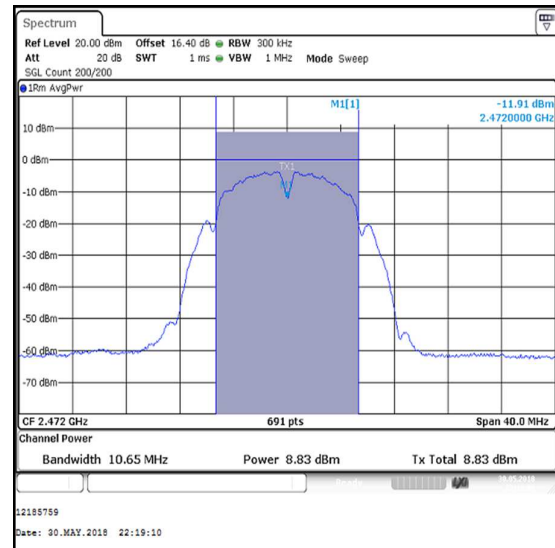
Channel 2

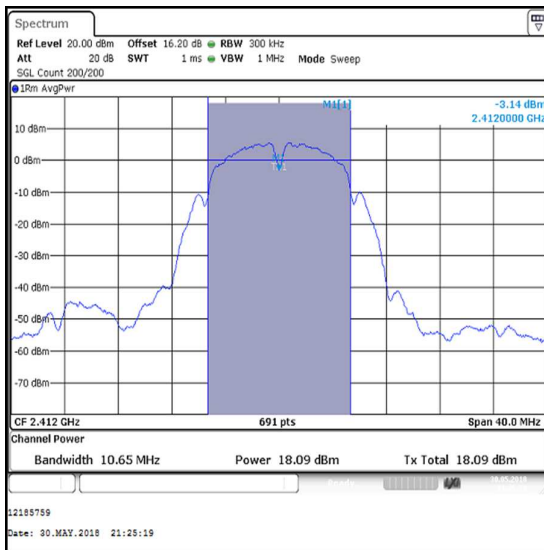
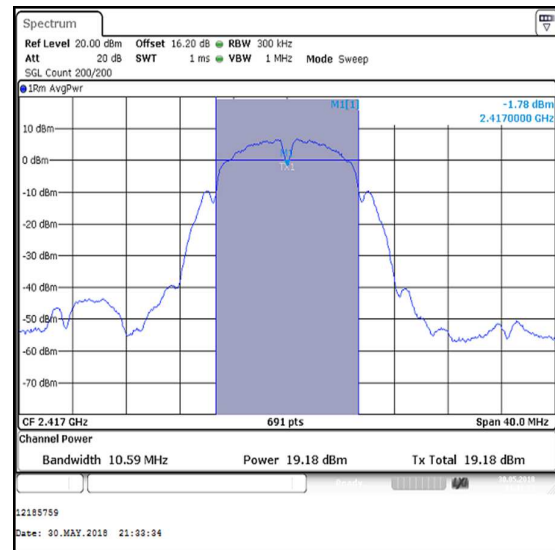
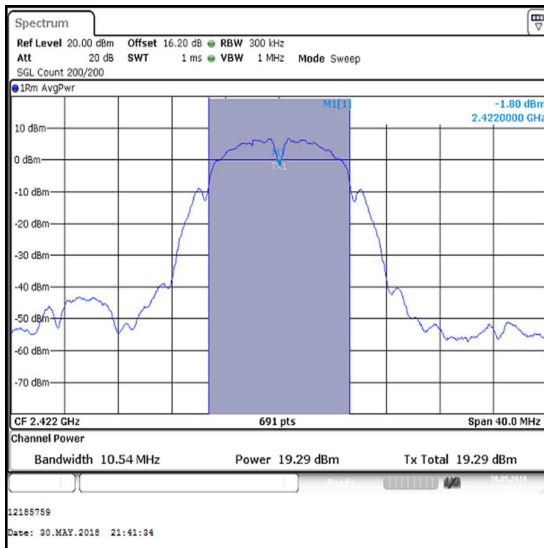
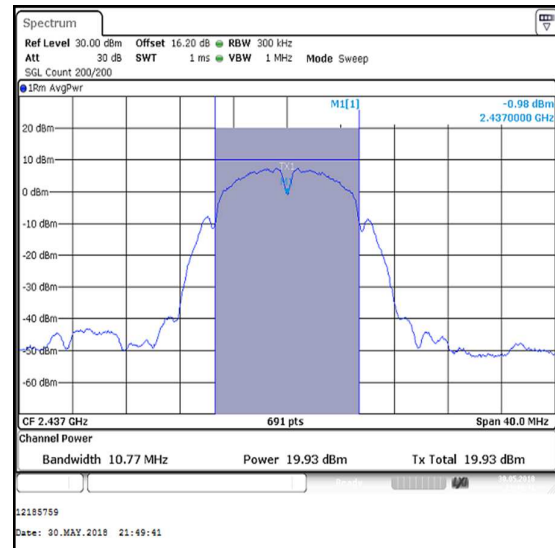


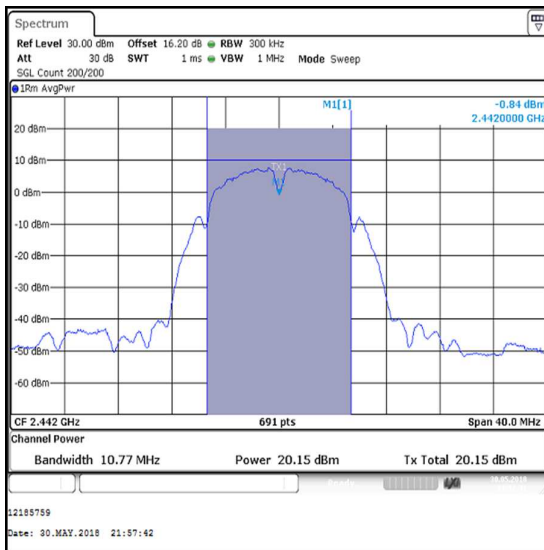
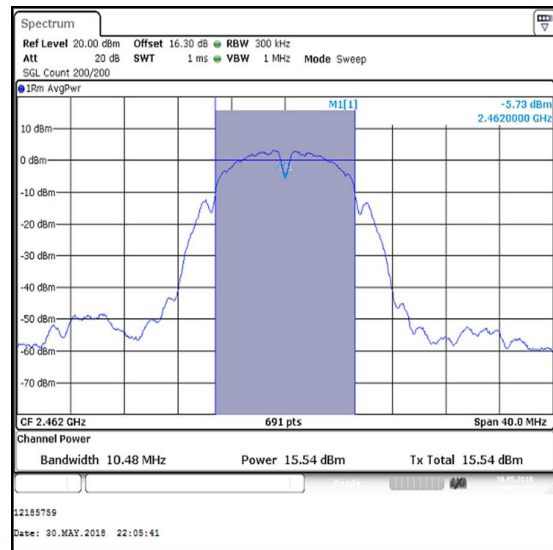
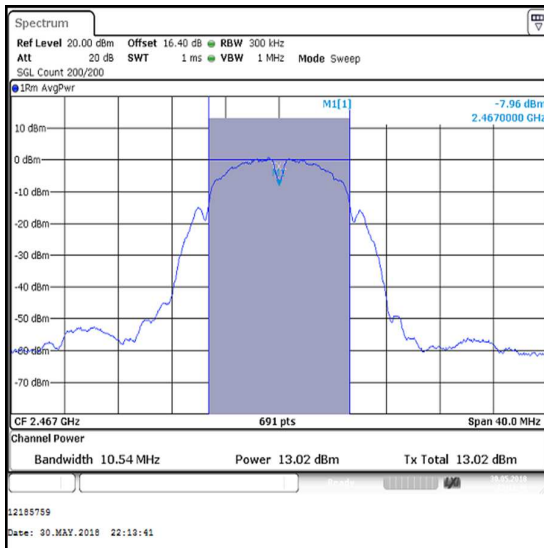
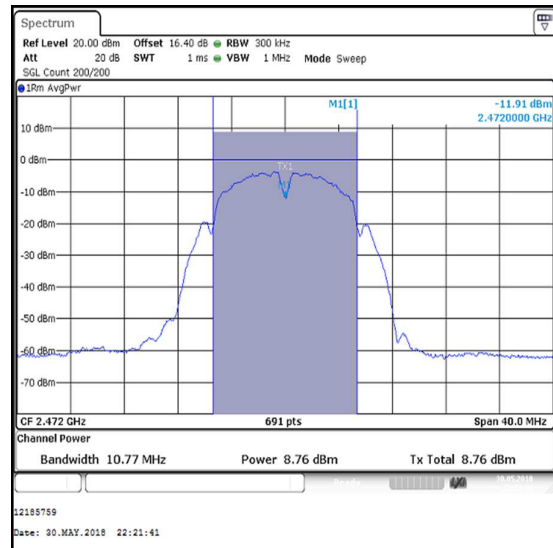
Channel 3

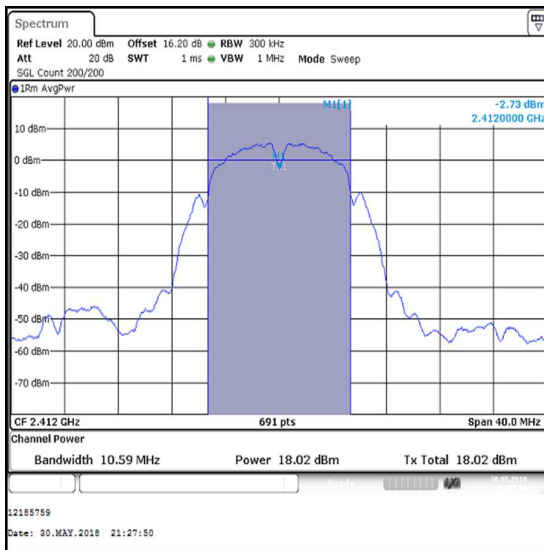
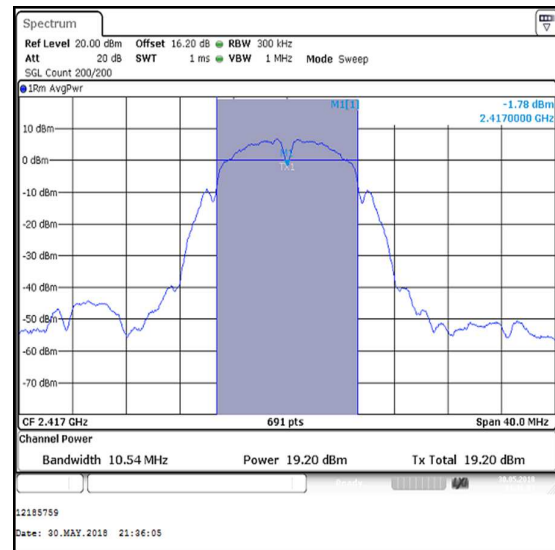
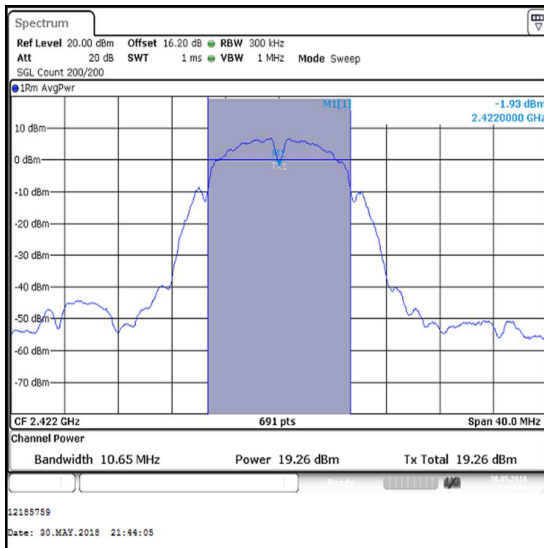
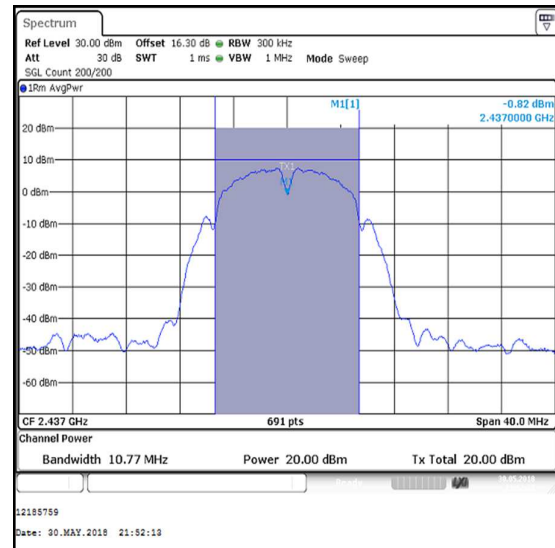


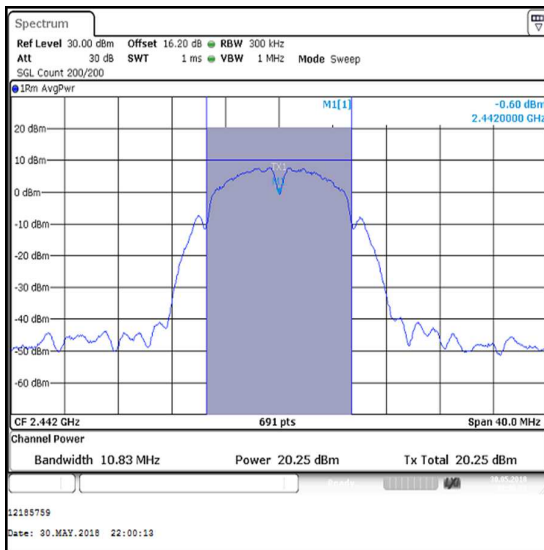
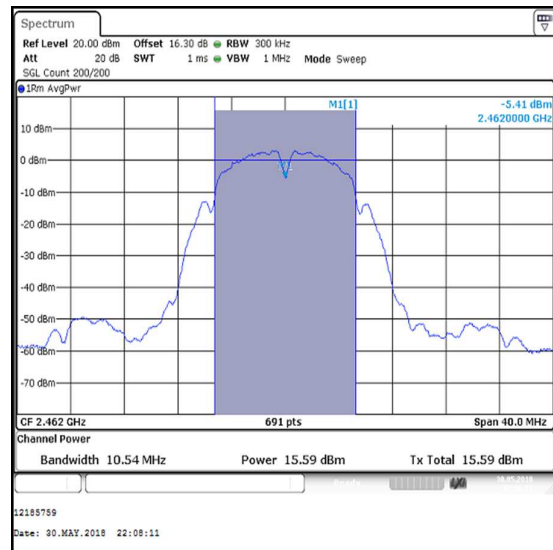
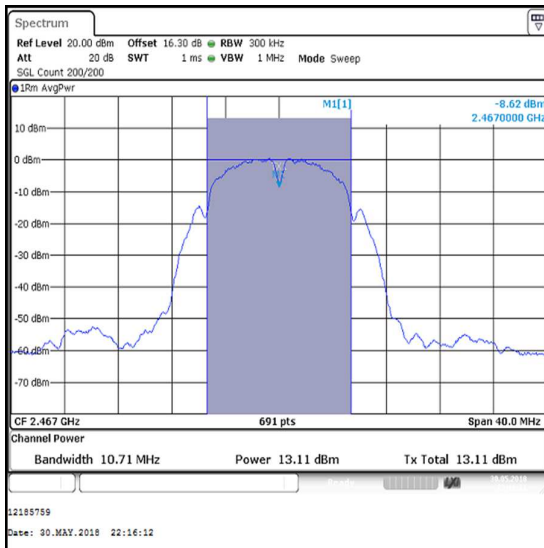
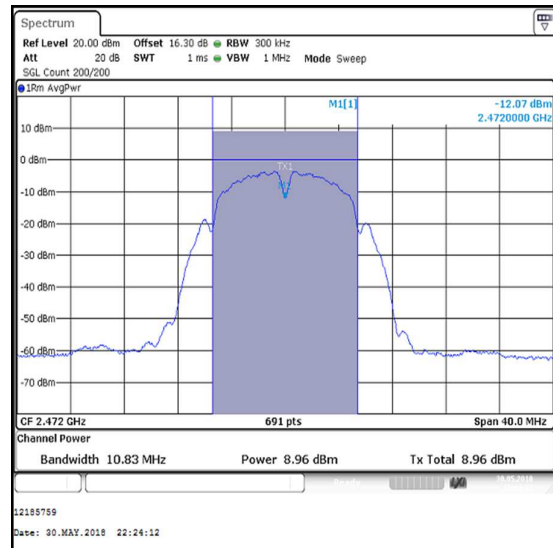
Channel 6

Transmitter Maximum (Average) Output Power (continued)**Results: 802.11b / 20 MHz / MIMO / 3Tx CDD / DBPSK / 1 Mbps / Core 1****Channel 7****Channel 11****Channel 12****Channel 13**

Transmitter Maximum (Average) Output Power (continued)**Results: 802.11b / 20 MHz / MIMO / 3Tx CDD / DBPSK / 1 Mbps / Core 0****Channel 1****Channel 2****Channel 3****Channel 6**

Transmitter Maximum (Average) Output Power (continued)**Results: 802.11b / 20 MHz / MIMO / 3Tx CDD / DBPSK / 1 Mbps / Core 0****Channel 7****Channel 11****Channel 12****Channel 13**

Transmitter Maximum (Average) Output Power (continued)**Results: 802.11b / 20 MHz / MIMO / 3Tx CDD / DBPSK / 1 Mbps / Core 2****Channel 1****Channel 2****Channel 3****Channel 6**

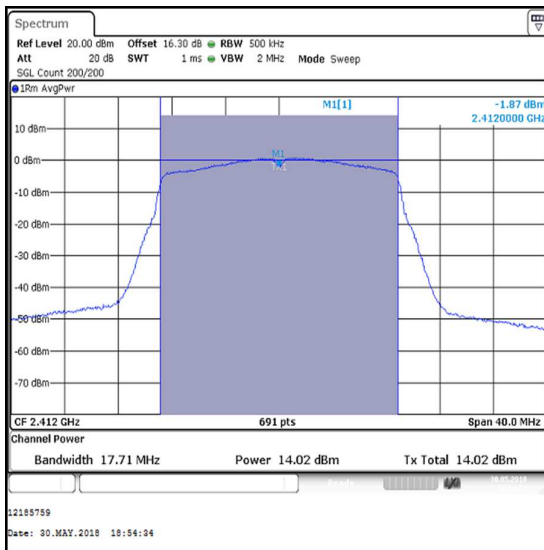
Transmitter Maximum (Average) Output Power (continued)**Results: 802.11b / 20 MHz / MIMO / 3Tx CDD / DBPSK / 1 Mbps / Core 2****Channel 7****Channel 11****Channel 12****Channel 13**

Transmitter Maximum (Average) Output Power (continued)**Results: 802.11n / HT20 / MIMO / 2Tx CDD / BPSK / MCS0****Conducted Peak Limit Comparison**

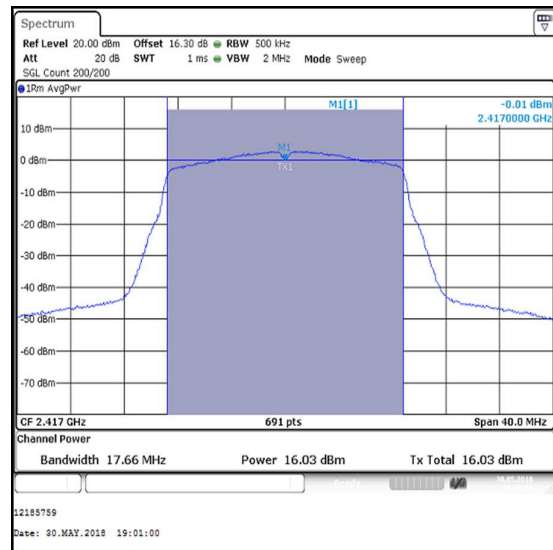
Channel	Conducted Peak Power Core 1 (dBm)	Conducted Peak Power Core 0 (dBm)	Combined Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
1	14.0	13.9	17.0	30.0	13.0	Complied
2	16.0	16.1	19.1	30.0	10.9	Complied
3	16.5	16.7	19.6	30.0	10.4	Complied
6	21.8	21.7	24.8	30.0	5.2	Complied
7	20.2	20.0	23.1	30.0	6.9	Complied
11	12.1	11.9	15.0	30.0	15.0	Complied
12	9.2	9.1	12.2	30.0	17.8	Complied
13	0.8	0.7	3.8	30.0	26.2	Complied

EIRP Limit Comparison

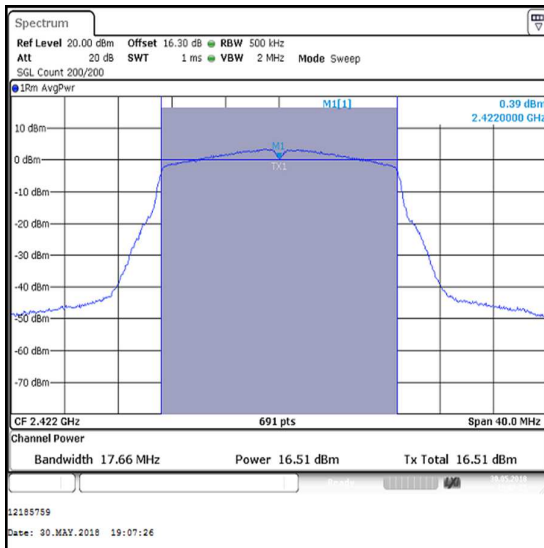
Channel	Combined Conducted Peak Power (dBm)	Directional Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
1	17.0	5.7	22.7	36.0	13.3	Complied
2	19.1	5.7	24.8	36.0	11.2	Complied
3	19.6	5.7	25.3	36.0	10.7	Complied
6	24.8	5.7	30.5	36.0	5.5	Complied
7	23.1	5.7	28.8	36.0	7.2	Complied
11	15.0	5.7	20.7	36.0	15.3	Complied
12	12.2	5.7	17.9	36.0	18.1	Complied
13	3.8	5.7	9.5	36.0	26.5	Complied

Transmitter Maximum (Average) Output Power (continued)**Results: 802.11n / HT20 / MIMO / 2Tx CDD / BPSK / MCS0 / Core 1**

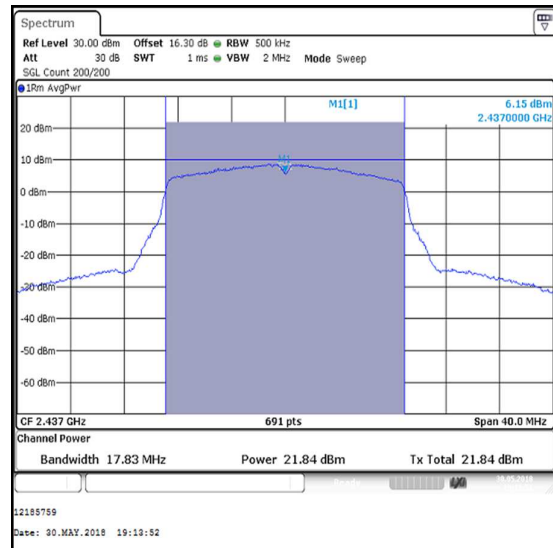
Channel 1



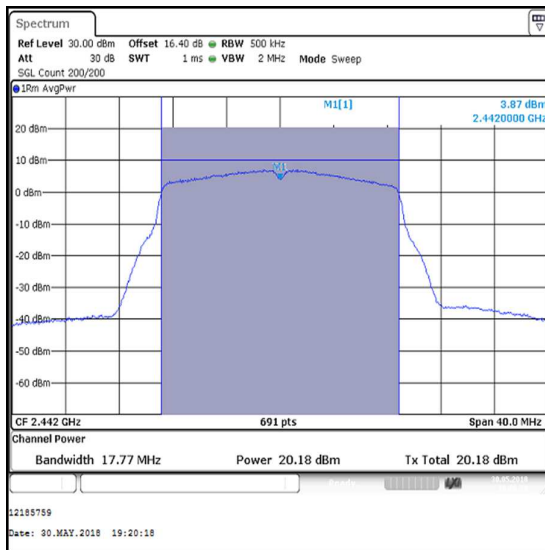
Channel 2



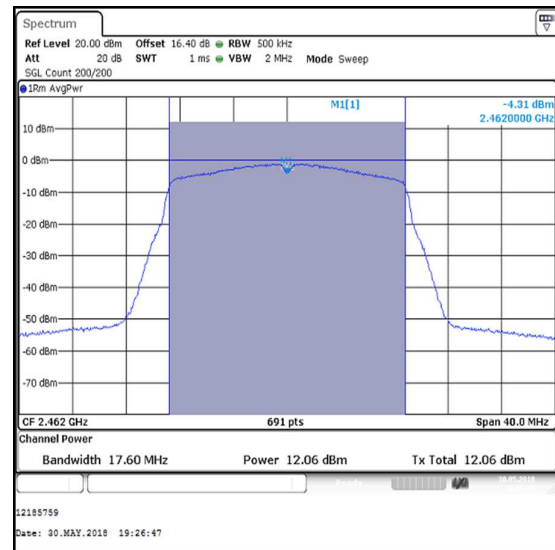
Channel 3



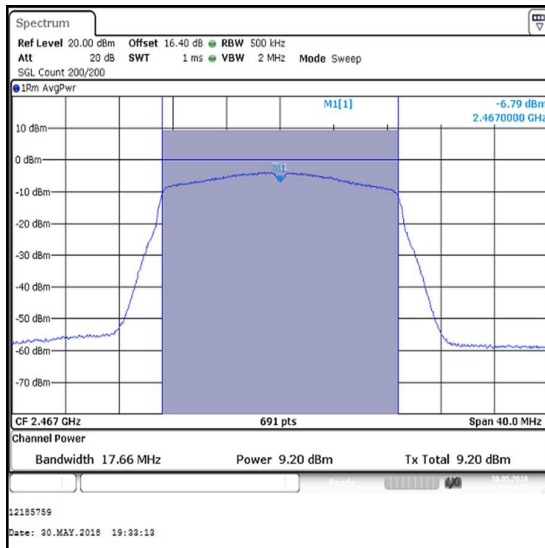
Channel 6

Transmitter Maximum (Average) Output Power (continued)**Results: 802.11n / HT20 / MIMO / 2Tx CDD / BPSK / MCS0 / Core 1**

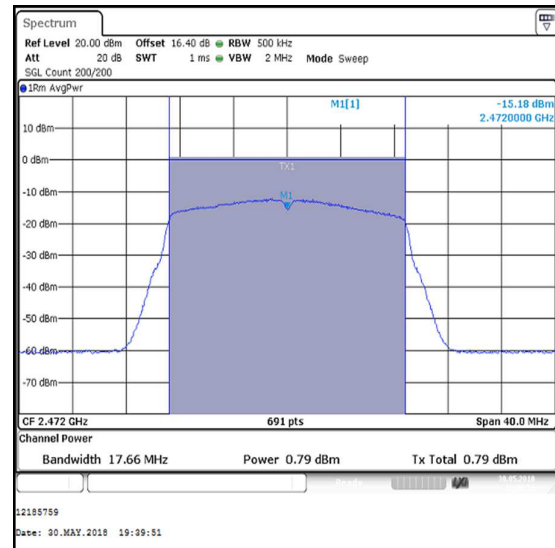
Channel 7



Channel 11



Channel 12



Channel 13