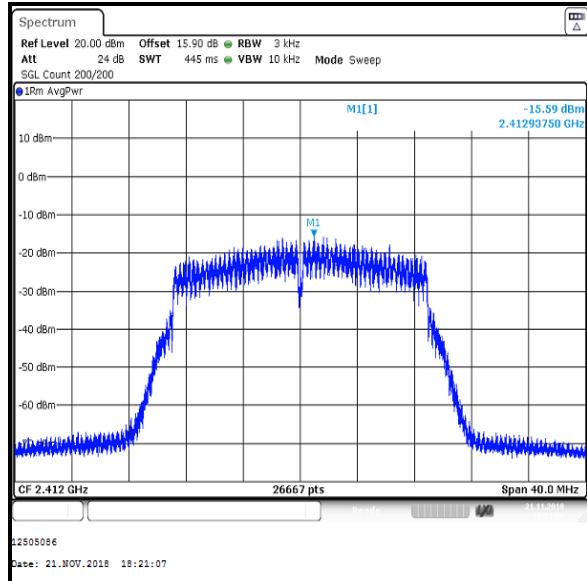
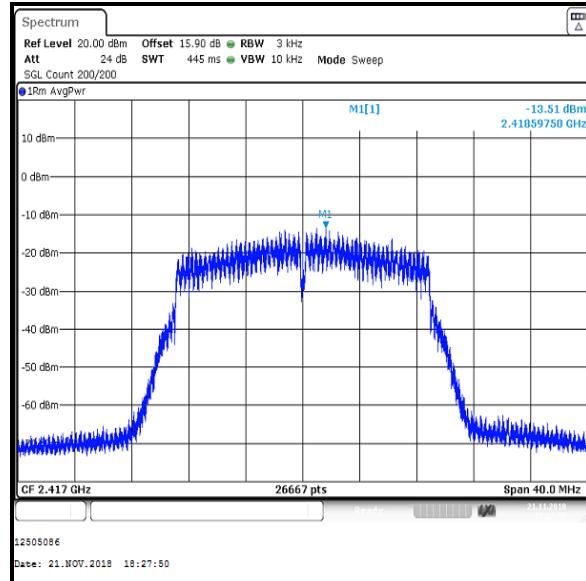
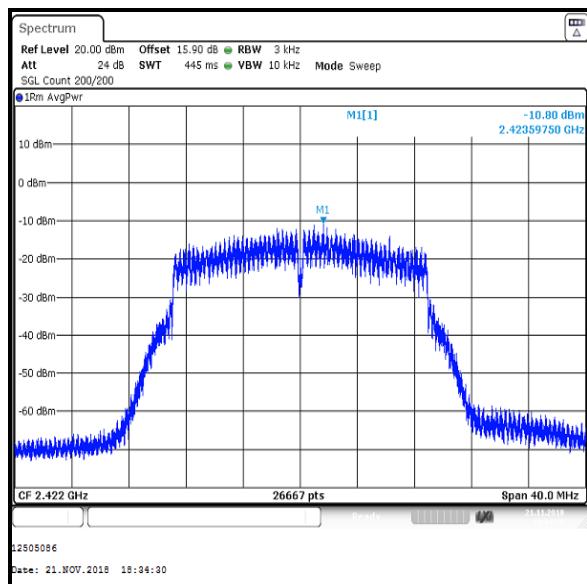


Transmitter Power Spectral Density (continued)**Results: 802.11n / HT20 / MIMO / 2Tx CDD / BPSK / MCS0 / Core 1**

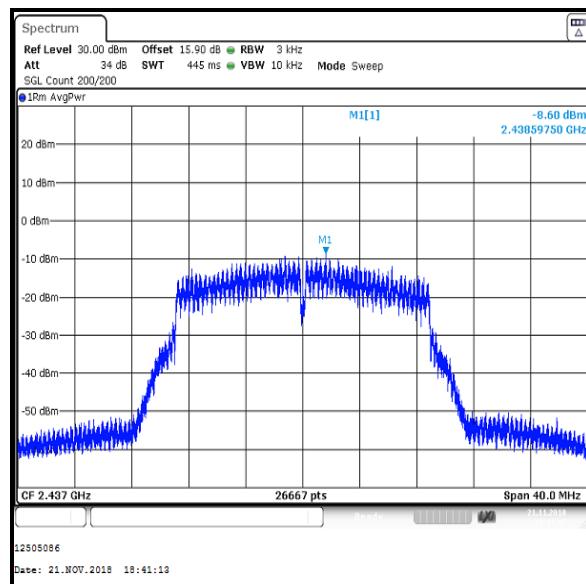
Channel 1



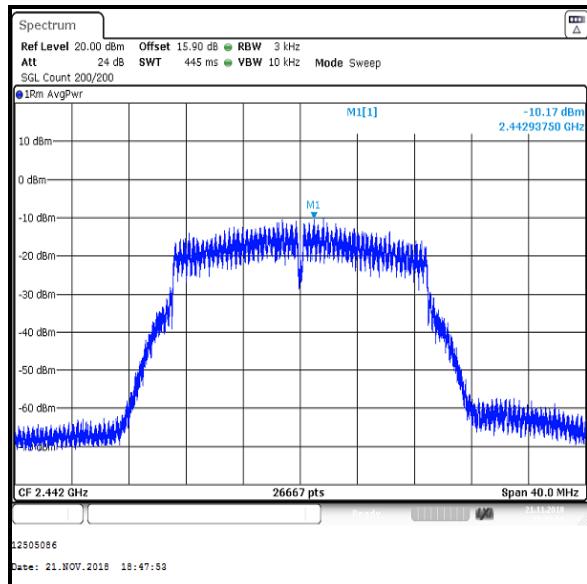
Channel 2



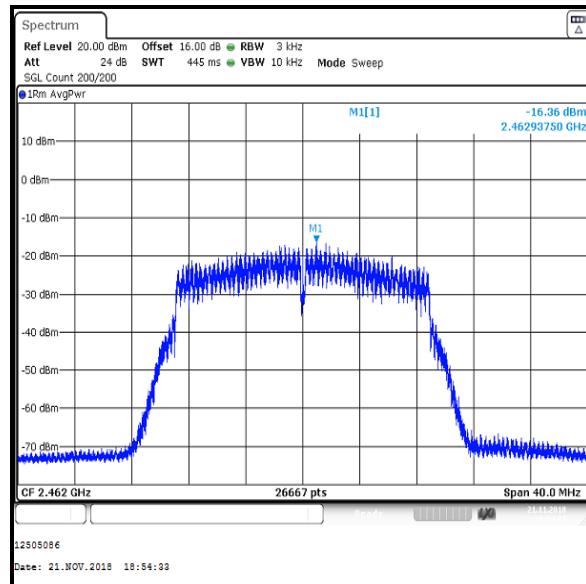
Channel 3



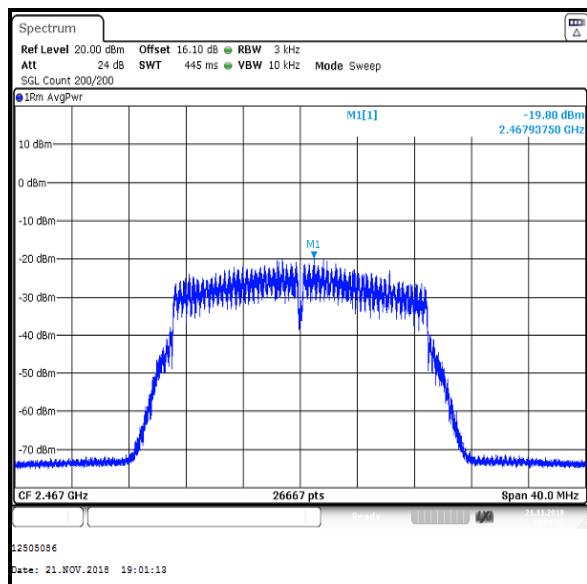
Channel 6

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

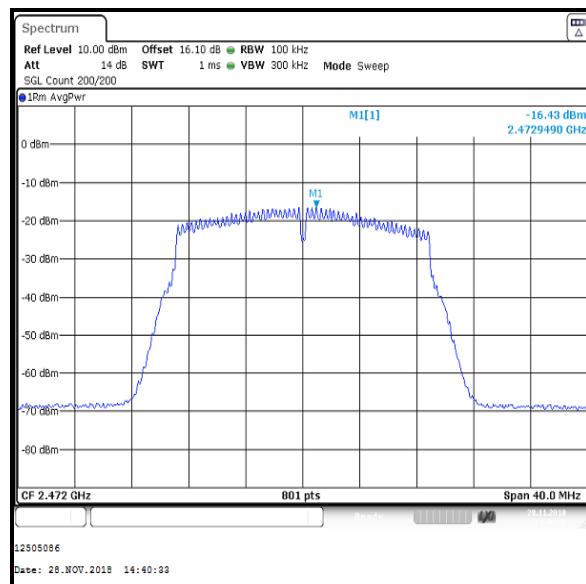
Channel 7



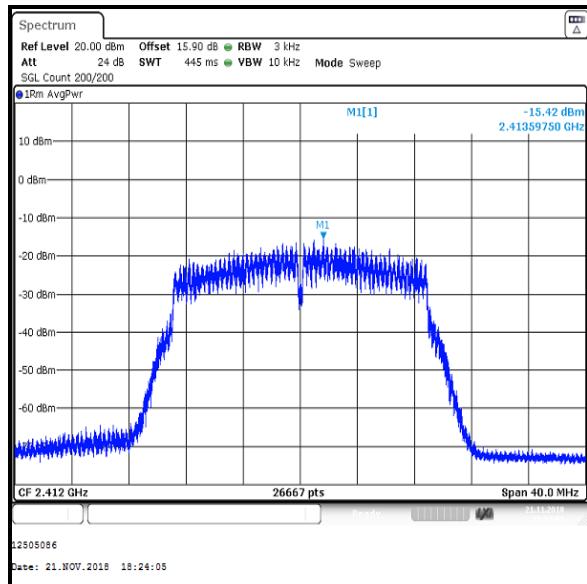
Channel 11



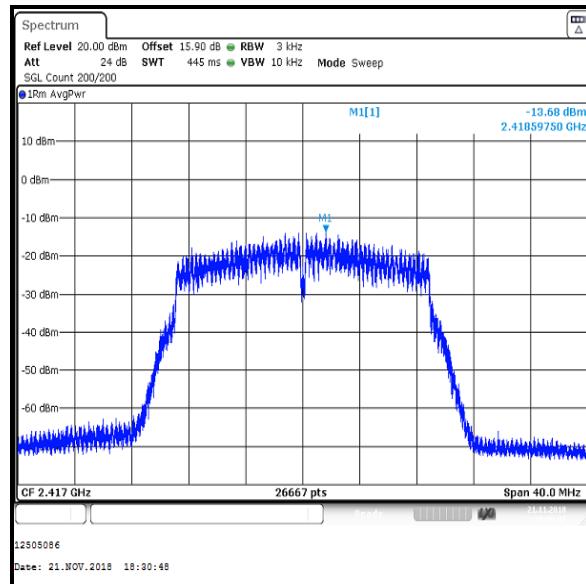
Channel 12



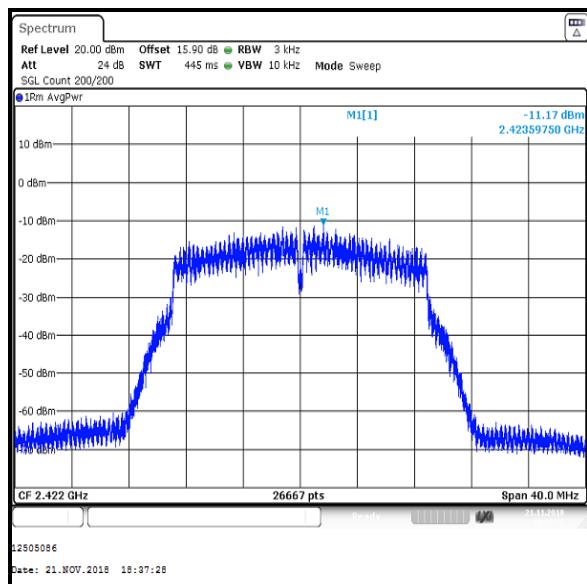
Channel 13

Transmitter Power Spectral Density (continued)**Results: 802.11n / HT20 / MIMO / 2Tx CDD / BPSK / MCS0 / Core 2**

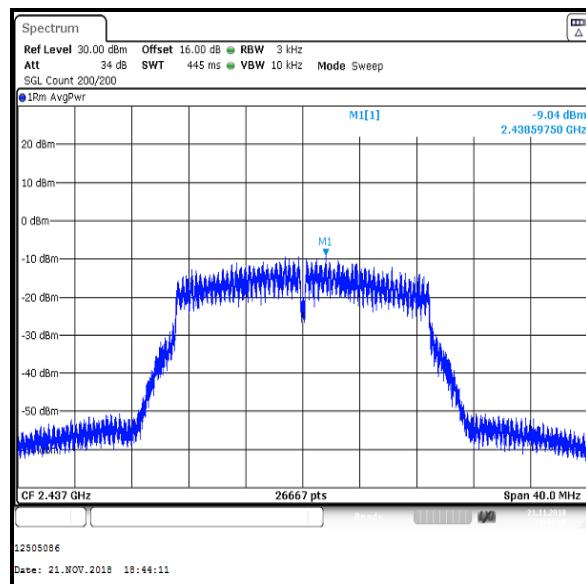
Channel 1



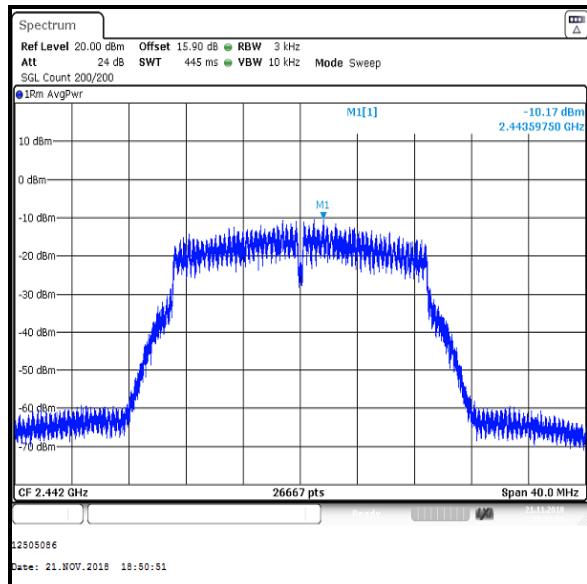
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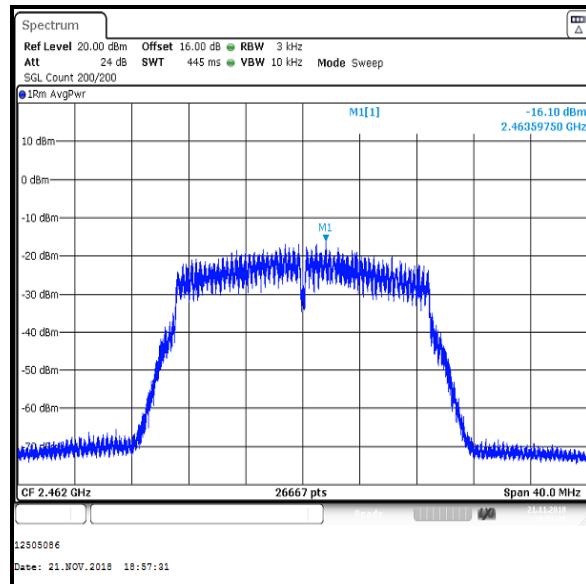
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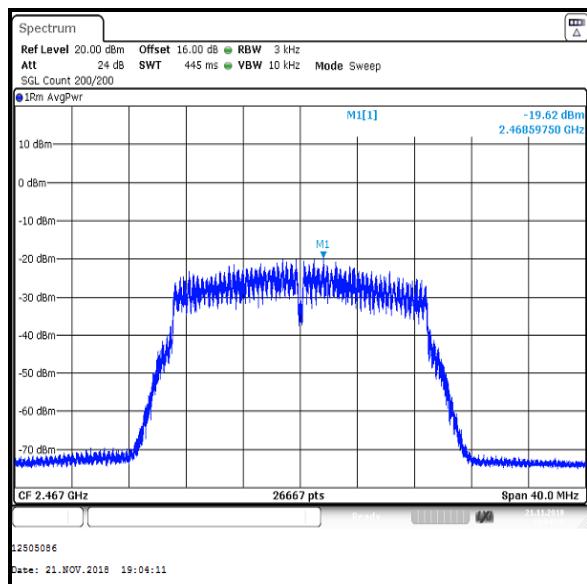
Channel 6

Transmitter Power Spectral Density (continued)**Results: 802.11n / HT20 / MIMO / 2Tx CDD / BPSK / MCS0 / Core 2**

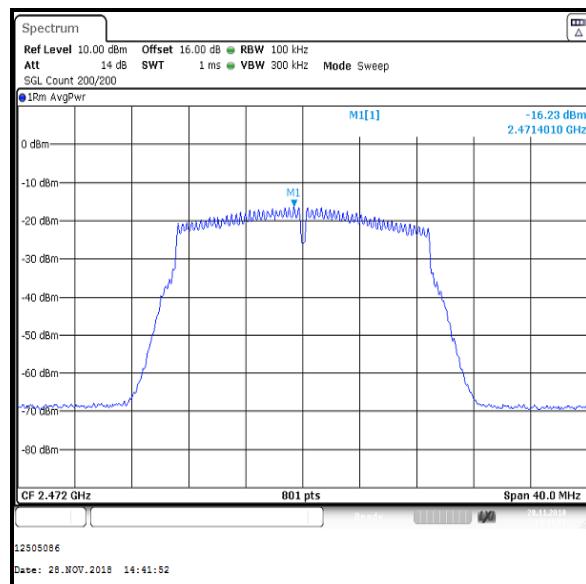
Channel 7



Channel 11



Channel 12



Channel 13

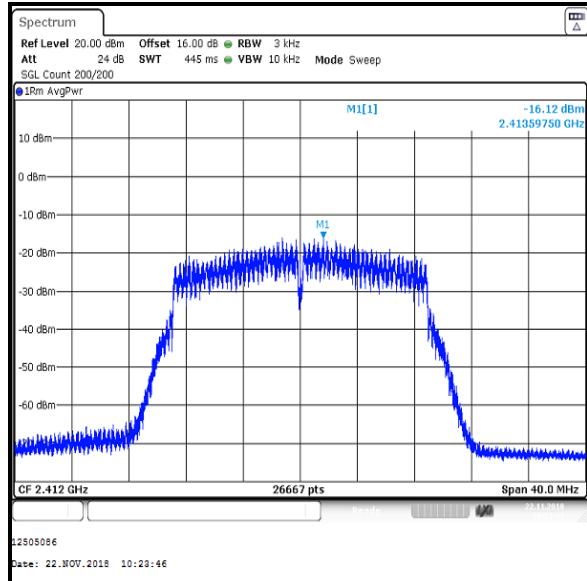
Transmitter Power Spectral Density (continued)**Results: 802.11n / HT20 / MIMO / 3Tx CDD / BPSK / MCS0**

Channel	PSD on Core 0 (dBm / 3 kHz)	PSD on Core 1 (dBm / 3 kHz)	PSD on Core 2 (dBm / 3 kHz)
1	-16.1	-16.1	-16.2
2	-13.1	-13.3	-13.2
3	-11.9	-12.2	-11.7
6	-10.1	-10.7	-10.2
7	-9.8	-10.4	-10.2
11	-17.2	-17.4	-17.3
12	-19.9	-20.5	-20.2

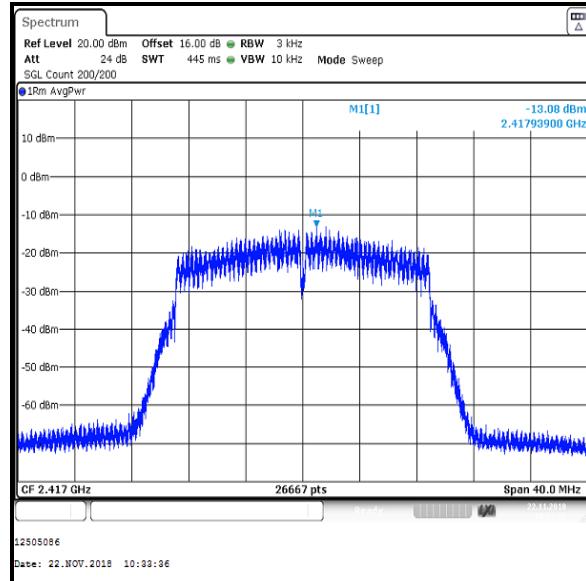
Channel	Combined PSD (dBm / 3 kHz)	PSD Limit (dBm / 3 kHz)	Margin (dB)	Result
1	-11.5	8.0	19.5	Complied
2	-8.5	8.0	16.5	Complied
3	-7.1	8.0	15.1	Complied
6	-5.7	8.0	13.7	Complied
7	-5.4	8.0	13.4	Complied
11	-12.6	8.0	20.6	Complied
12	-15.4	8.0	23.4	Complied

Channel	PSD on Core 0 (dBm / 100 kHz)	PSD on Core 1 (dBm / 100 kHz)	PSD on Core 2 (dBm / 100 kHz)
13	-16.2	-16.2	-16.4

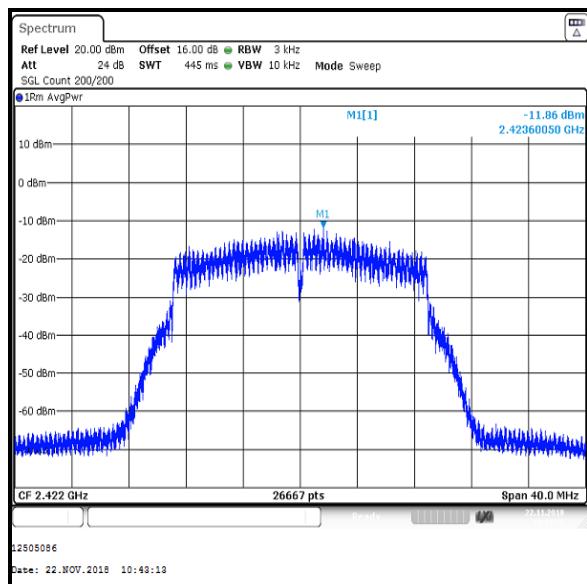
Channel	Combined PSD (dBm / 100 kHz)	PSD Limit (dBm / 3 kHz)	Margin (dB)	Result
13	-11.6	8.0	19.6	Complied

Transmitter Power Spectral Density (continued)**Results: 802.11n / HT20 / MIMO / 3Tx CDD / BPSK / MCS0 / Core 0**

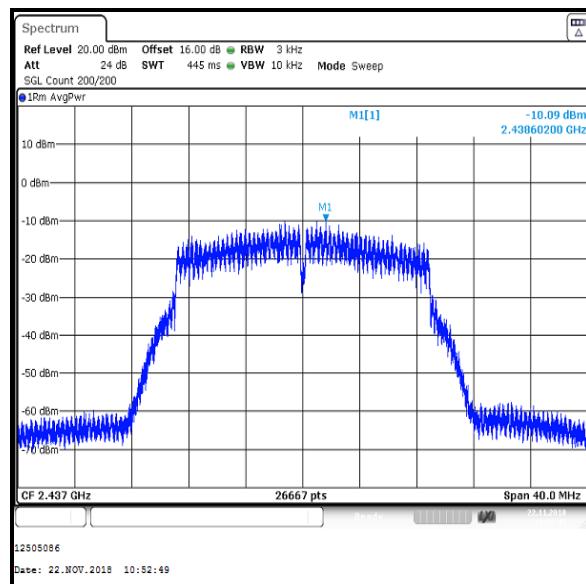
Channel 1



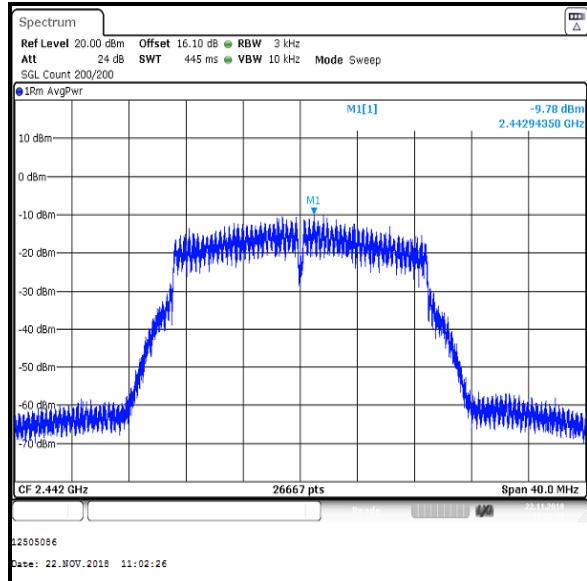
Channel 2



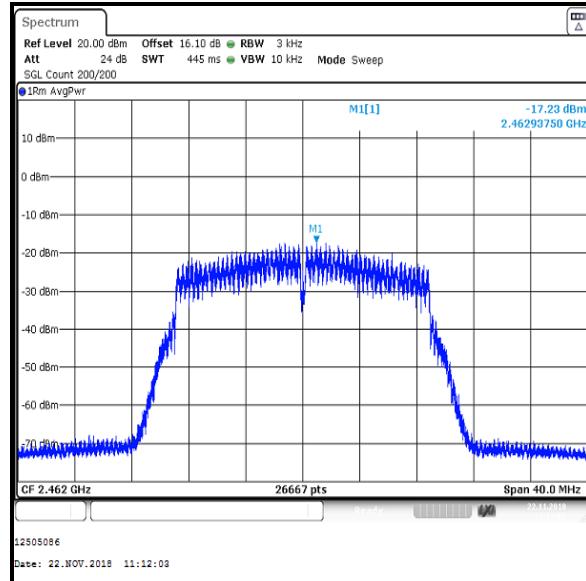
Channel 3



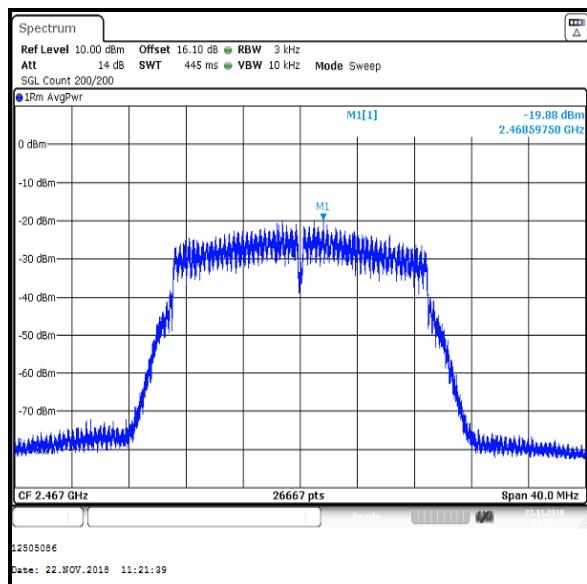
Channel 6

Transmitter Power Spectral Density (continued)**Results: 802.11n / HT20 / MIMO / 3Tx CDD / BPSK / MCS0 / Core 0**

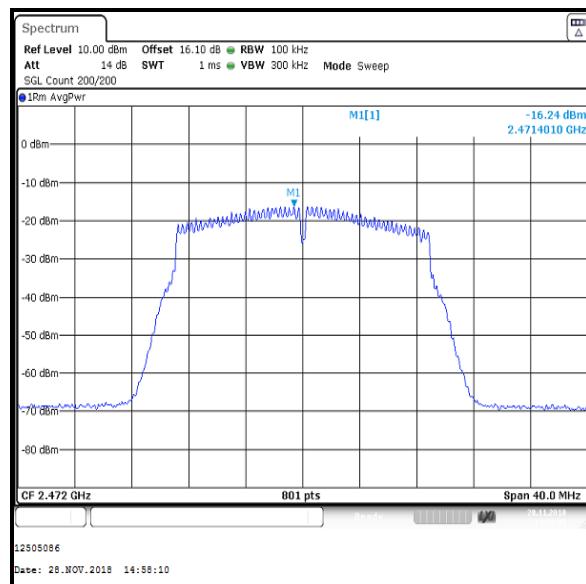
Channel 7



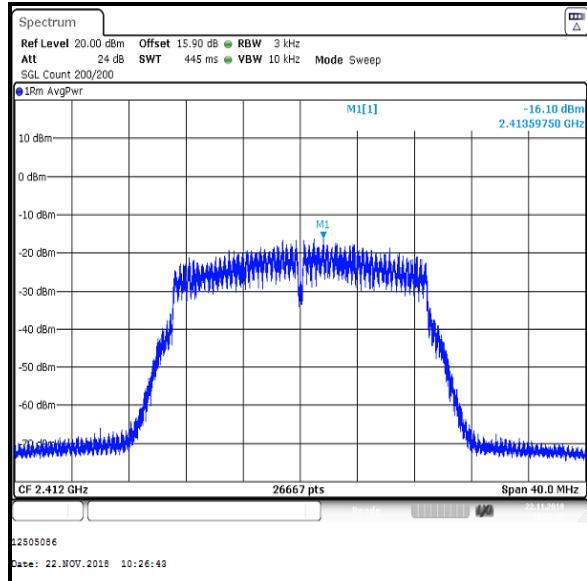
Channel 11



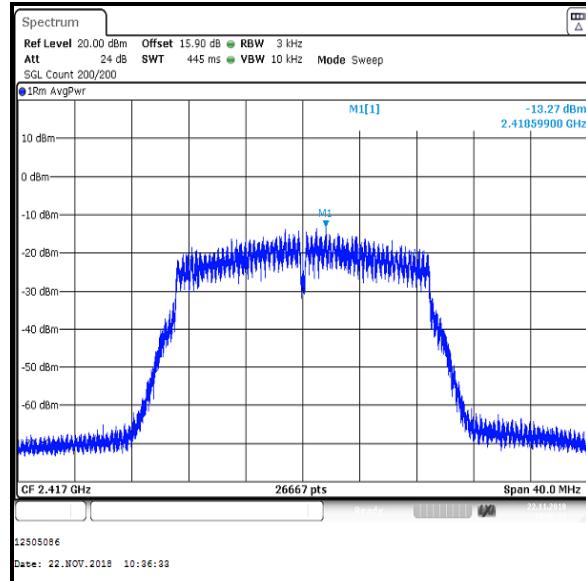
Channel 12



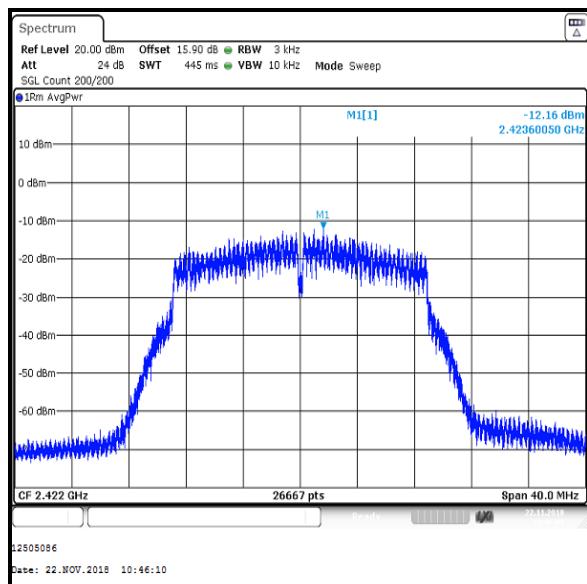
Channel 13

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

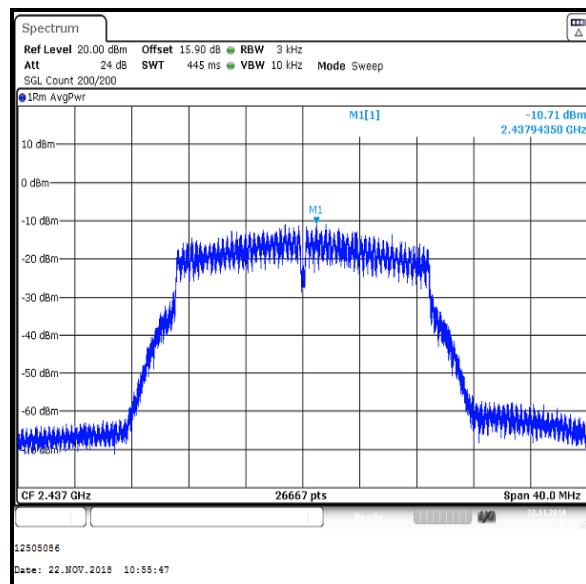
Channel 1



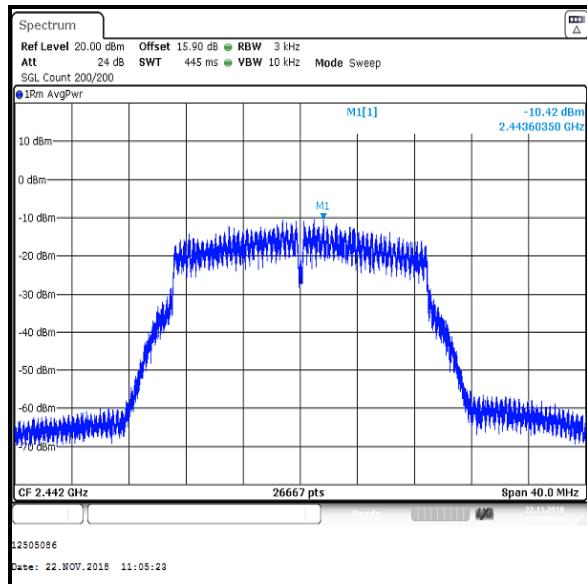
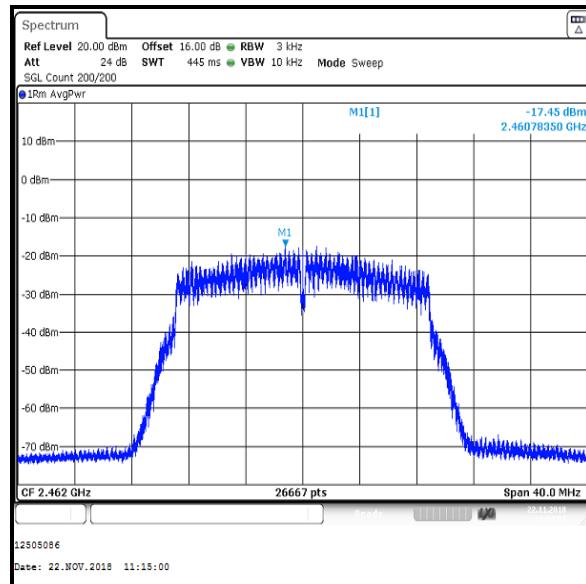
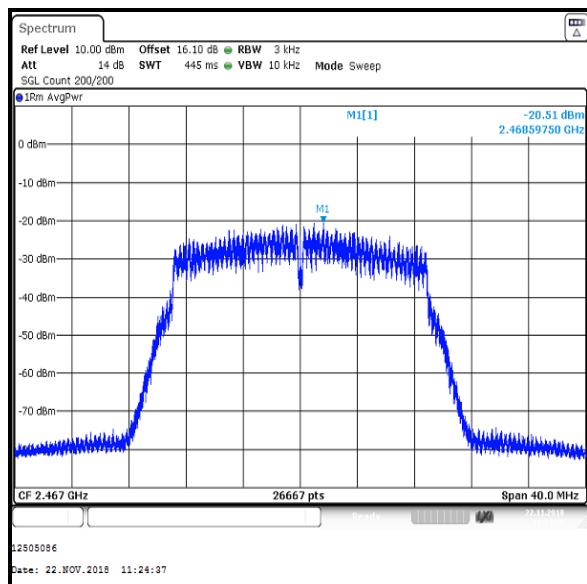
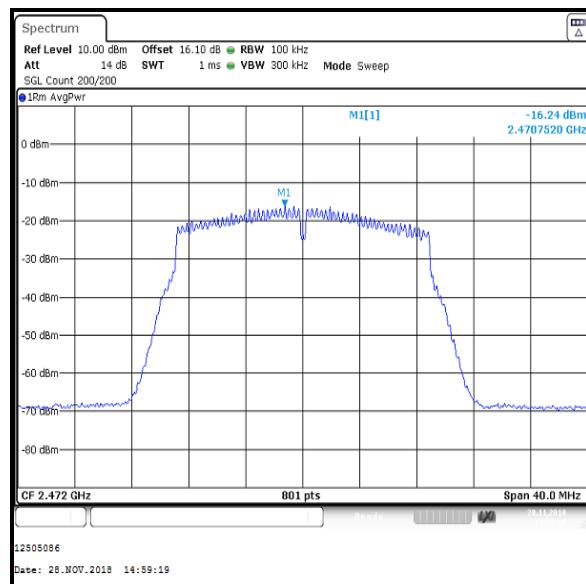
Channel 2

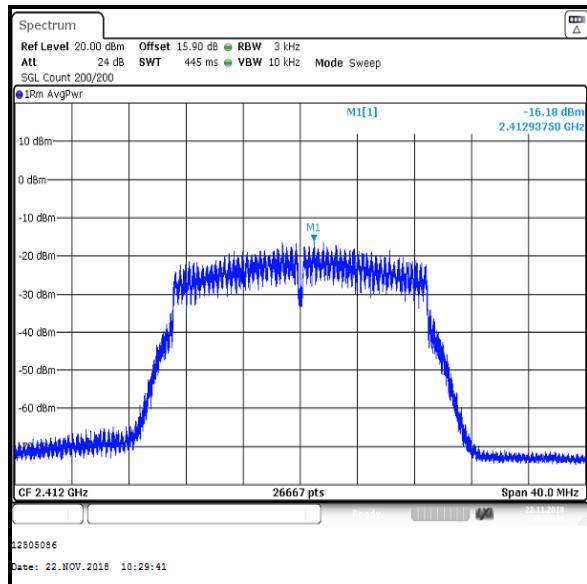


Channel 3

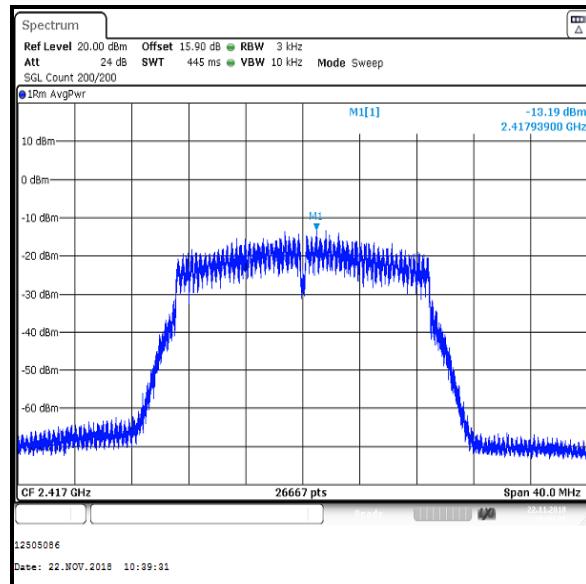


Channel 6

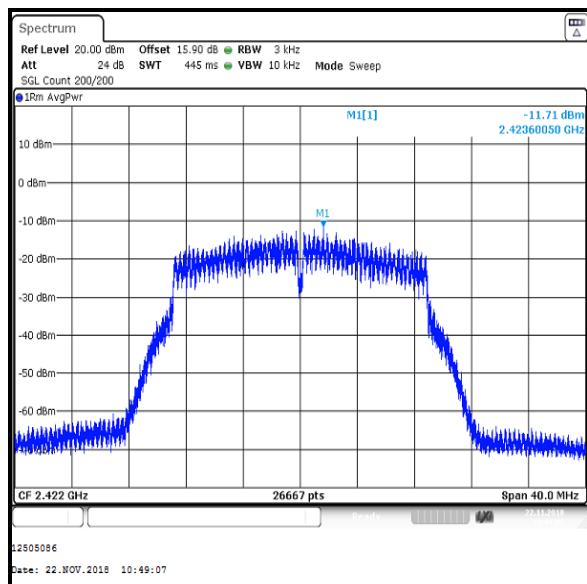
Transmitter Power Spectral Density (continued)**Results: 802.11n / HT20 / MIMO / 3Tx CDD / BPSK / MCS0 / Core 1****Channel 7****Channel 11****Channel 12****Channel 13**

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

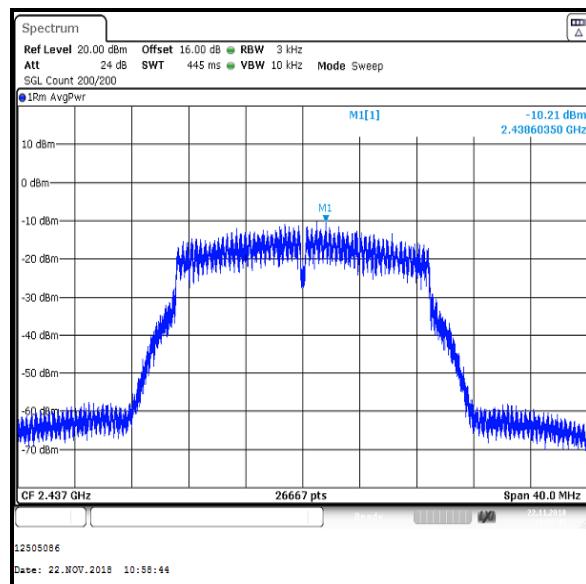
Channel 1



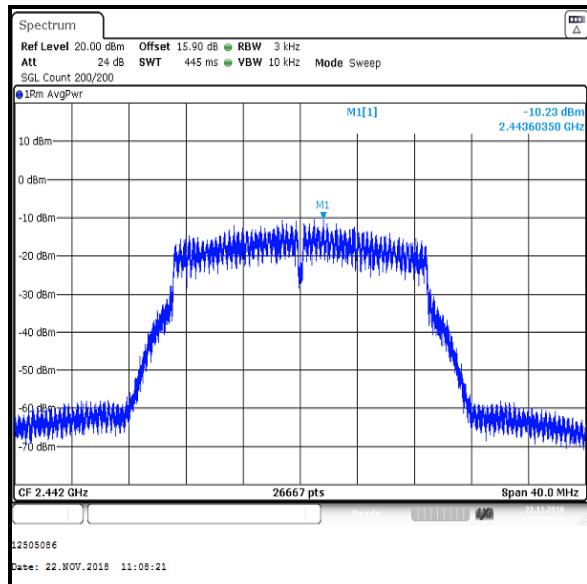
Channel 2



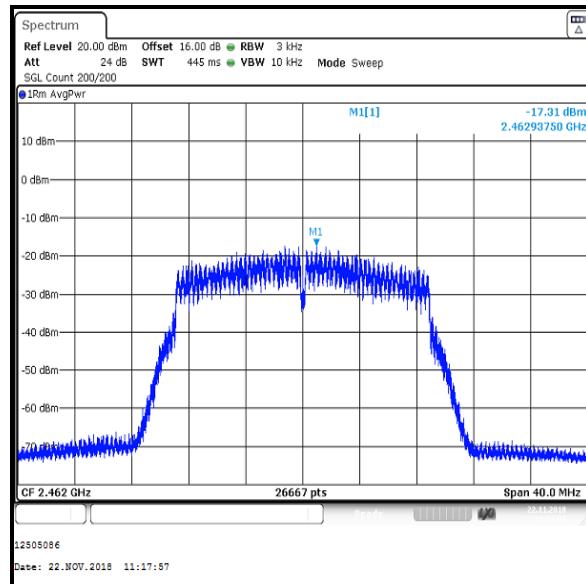
Channel 3



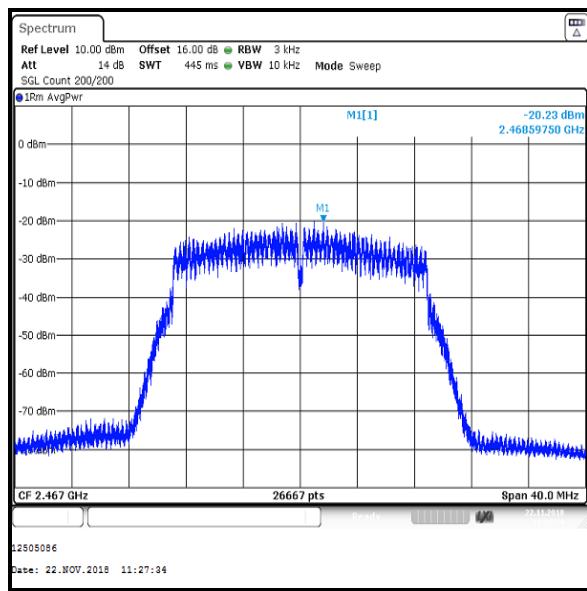
Channel 6

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

Channel 7



Channel 11



Channel 12

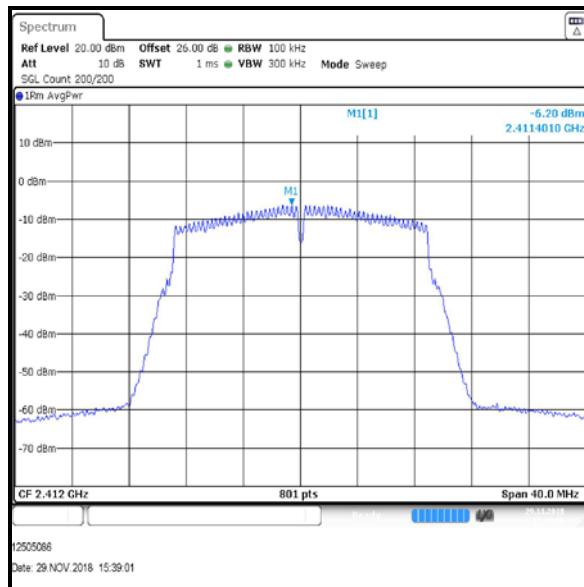
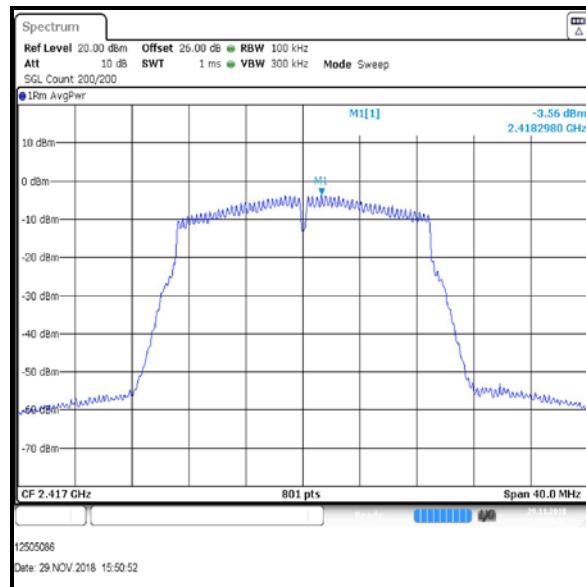
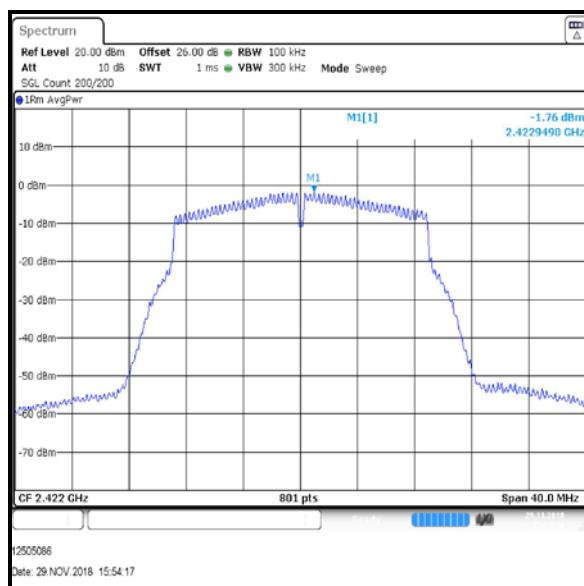
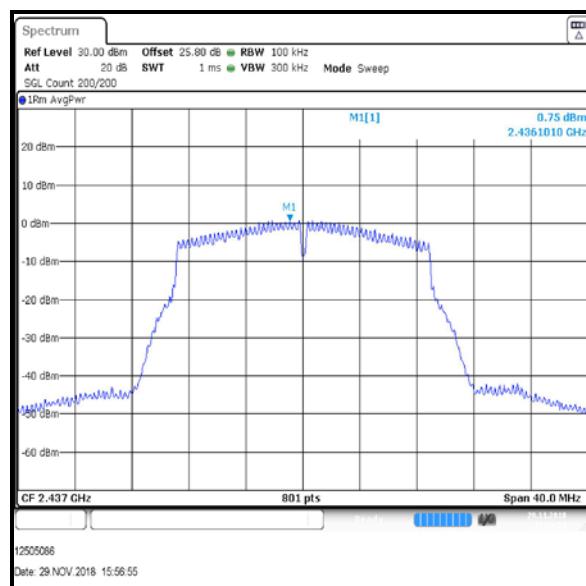


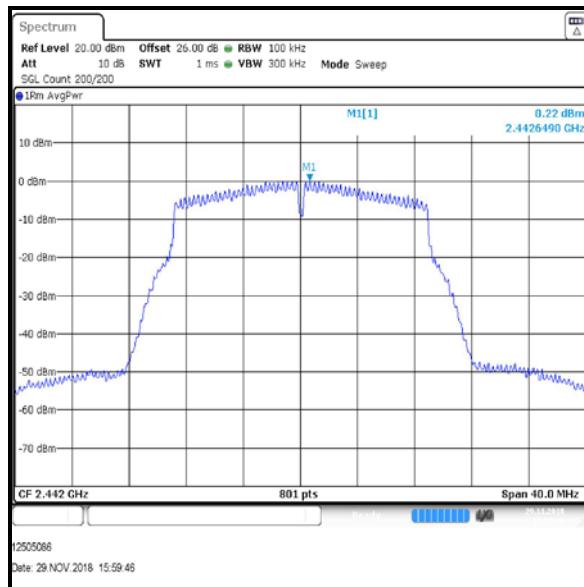
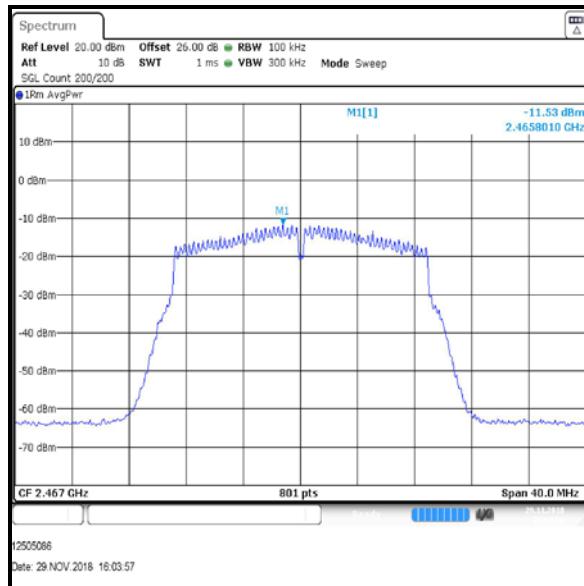
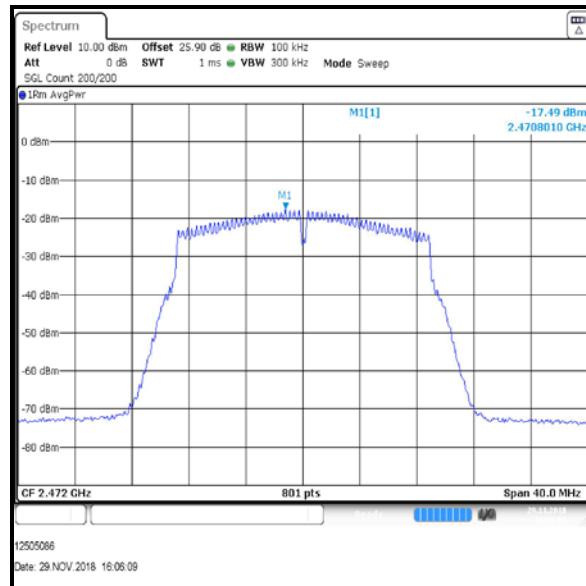
Channel 13

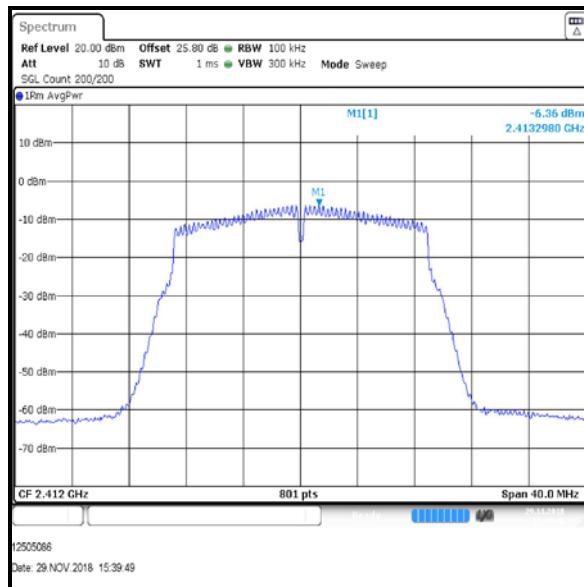
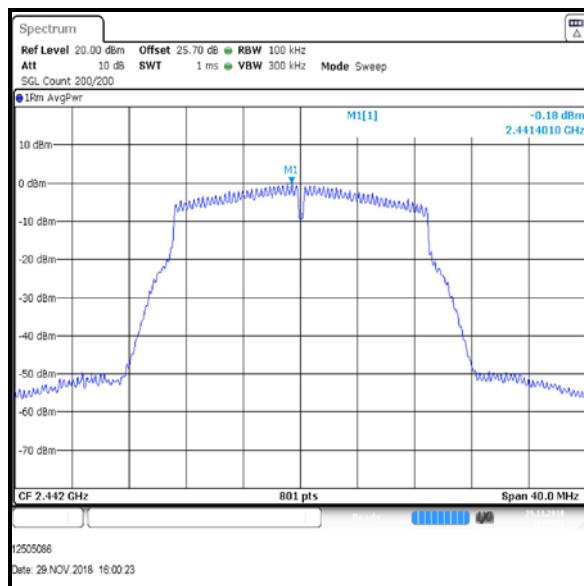
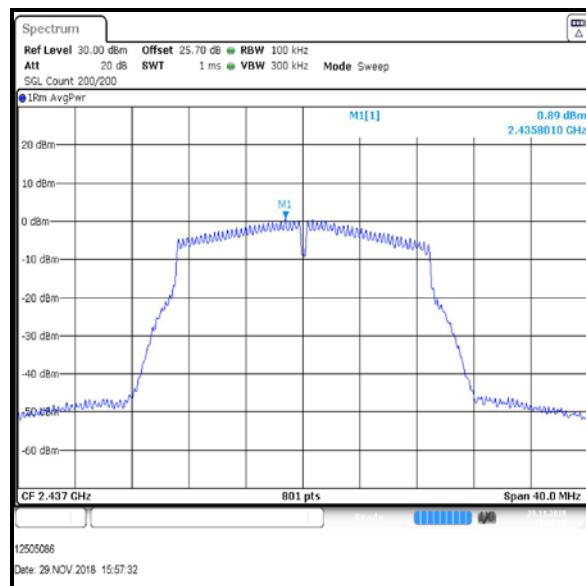
Transmitter Power Spectral Density (continued)**Results: 802.11n / HT20 / MIMO / 2Tx TxBF / BPSK / MCS0**

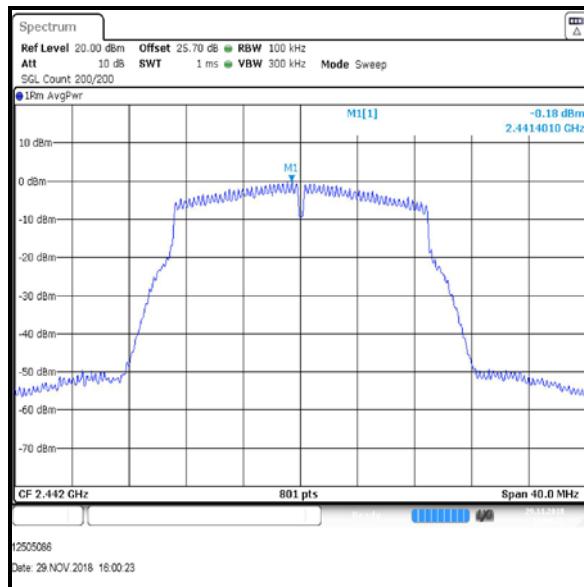
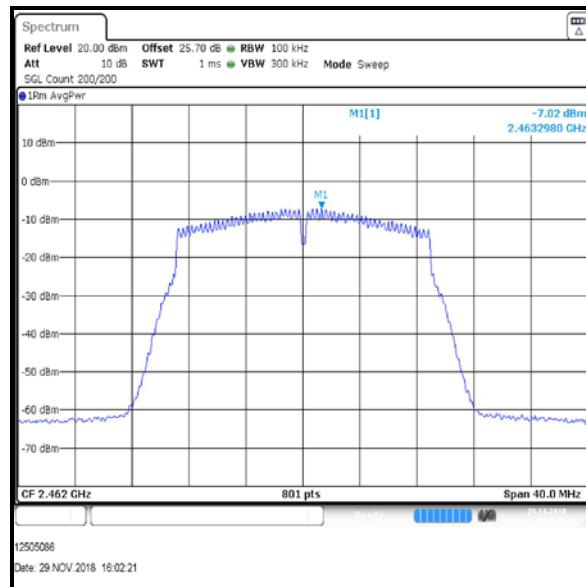
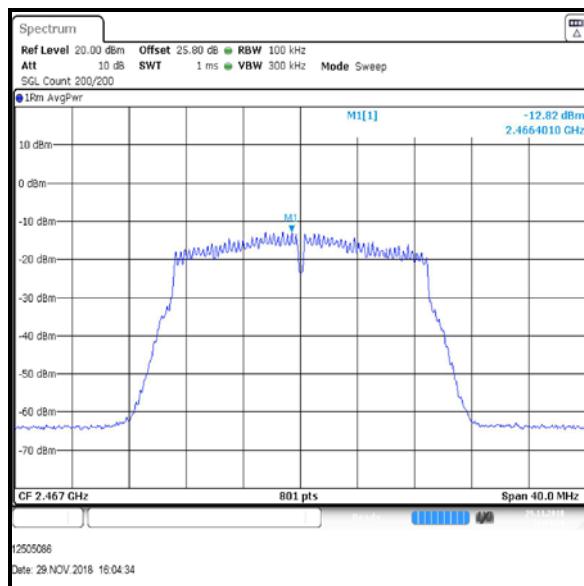
Channel	Core 1			Core 2		
	PSD (dBm / 100 kHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm / 100 kHz)	PSD (dBm / 100 kHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm / 100 kHz)
1	-6.2	0.1	-6.1	-6.4	0.1	-6.3
2	-3.6	0.1	-3.5	-3.9	0.1	-3.8
3	-1.8	0.1	-1.7	-0.2	0.1	-0.1
6	0.8	0.1	0.9	0.9	0.1	1.0
7	0.2	0.1	0.3	-0.2	0.1	-0.1
11	-6.8	0.1	-6.7	-7.0	0.1	-6.9
12	-11.5	0.1	-11.4	-12.8	0.1	-12.7
13	-17.5	0.1	-17.4	-18.4	0.1	-18.3

Channel	Corrected PSD Core 1 (dBm / 100 kHz)	Corrected PSD Core 2 (dBm / 100 kHz)	Combined PSD (dBm / 100 kHz)	Limit (dBm / 3 kHz)	Margin (dB)	Result
1	-6.1	-6.3	-3.2	8.0	11.2	Complied
2	-3.5	-3.8	-0.6	8.0	8.6	Complied
3	-1.7	-0.1	2.2	8.0	5.8	Complied
6	0.9	1.0	4.0	8.0	4.0	Complied
7	0.3	-0.1	3.1	8.0	4.9	Complied
11	-6.7	-6.9	-3.8	8.0	11.8	Complied
12	-11.4	-12.7	-9.0	8.0	17.0	Complied
13	-17.4	-18.3	-14.8	8.0	22.8	Complied

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

Transmitter Power Spectral Density (continued)**Results: 802.11n / HT20 / MIMO / 2Tx TxBF / BPSK / MCS0 / Core 1****Channel 7****Channel 11****Channel 12****Channel 13**

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

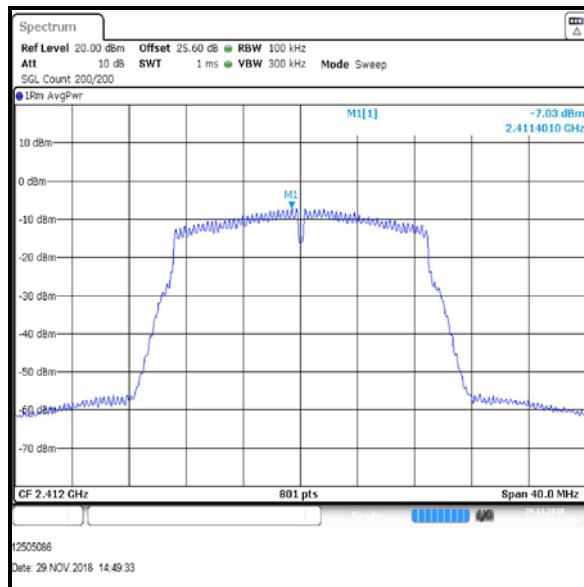
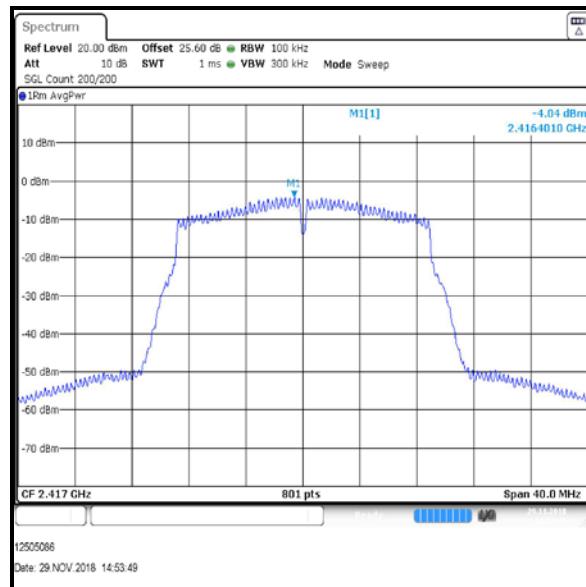
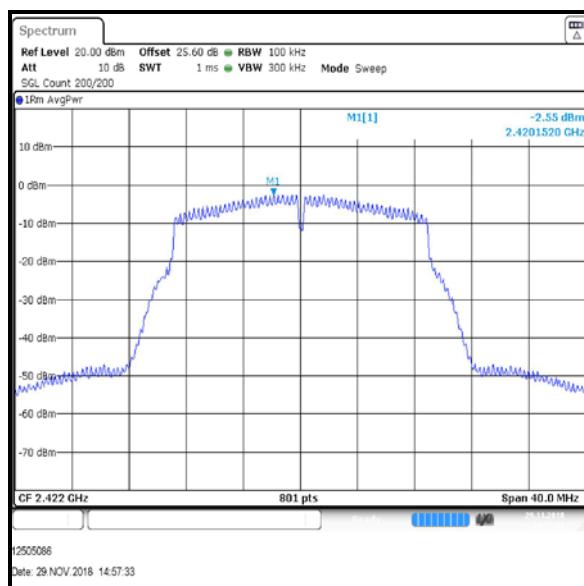
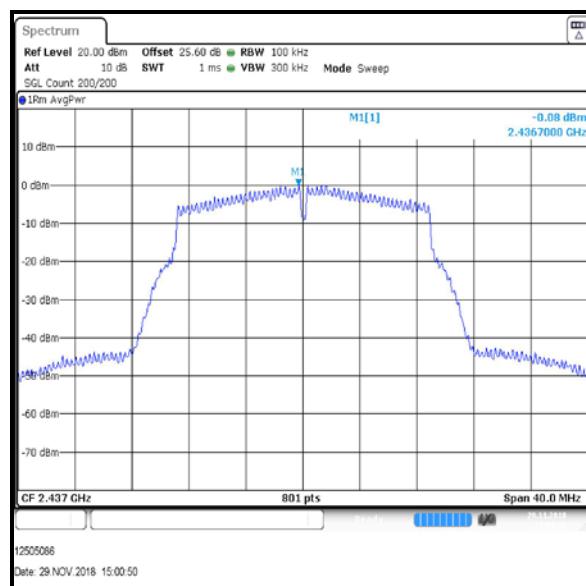
Transmitter Power Spectral Density (continued)**Results: 802.11n / HT20 / MIMO / 2Tx TxBF / BPSK / MCS0 / Core 2****Channel 7****Channel 11****Channel 12****Channel 13**

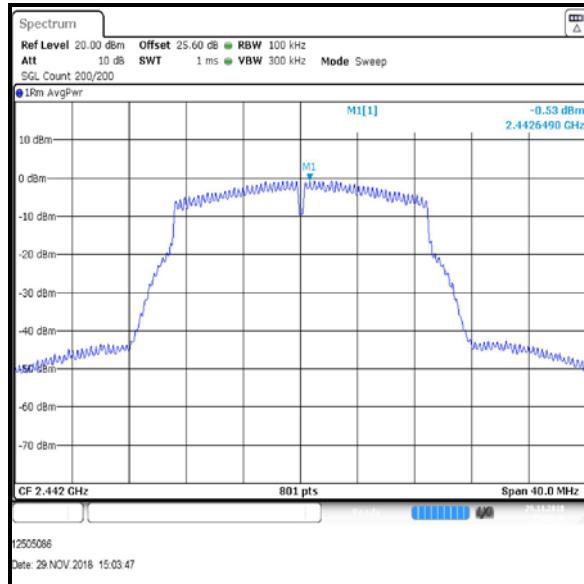
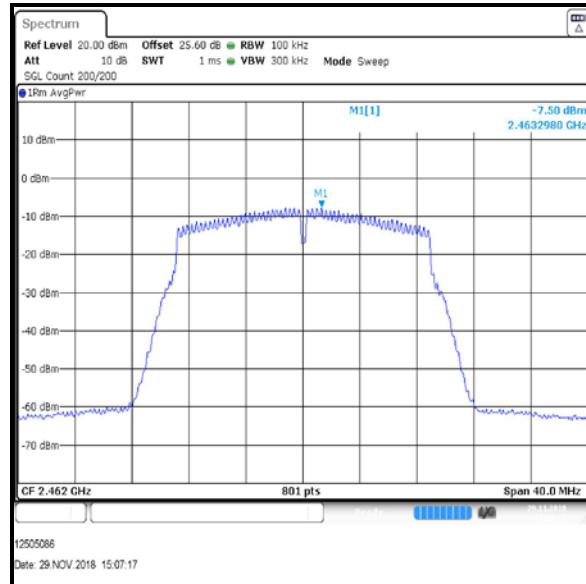
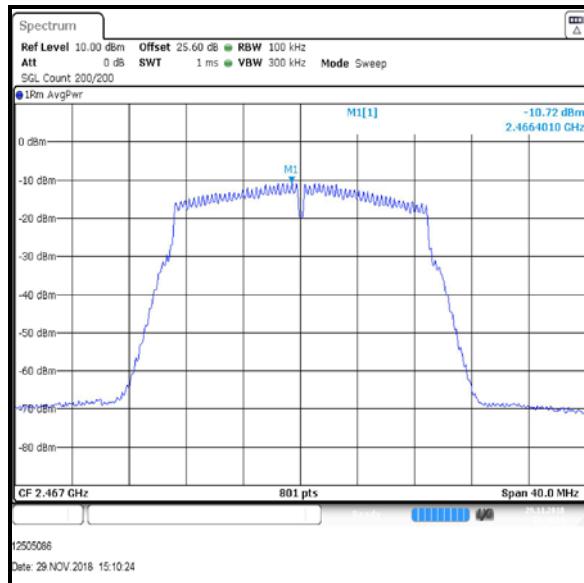
Transmitter Power Spectral Density (continued)**Results: 802.11n / HT20 / MIMO / 3Tx TxBF / BPSK / MCS0**

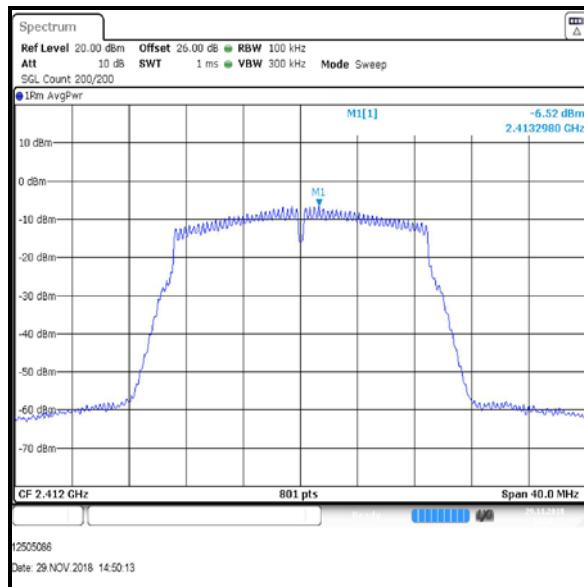
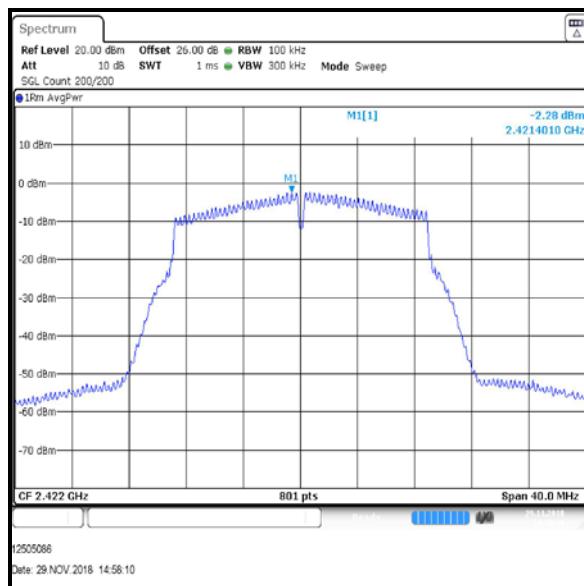
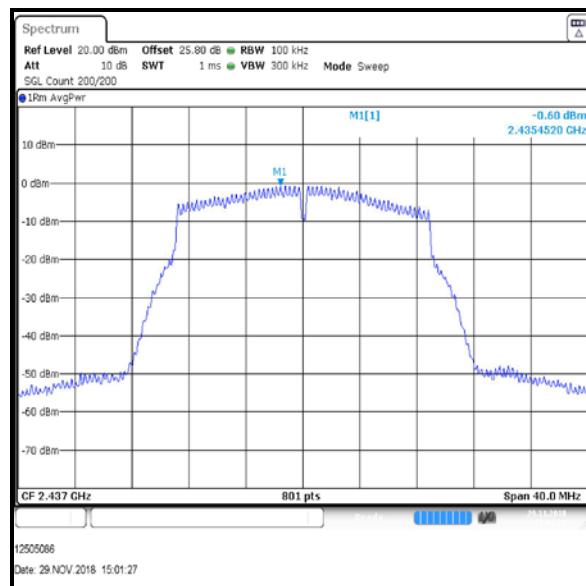
Channel	Core 0			Core 1		
	PSD (dBm / 100 kHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm / 100 kHz)	PSD (dBm / 100 kHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm / 100 kHz)
1	-7.0	0.1	-6.9	-6.5	0.1	-6.4
2	-4.0	0.1	-3.9	-4.6	0.1	-4.5
3	-2.5	0.1	-2.4	-2.3	0.1	-2.2
6	-0.1	0.1	0.0	-0.6	0.1	-0.5
7	-0.5	0.1	-0.4	-0.6	0.1	-0.5
11	-7.5	0.1	-7.4	-7.7	0.1	-7.6
12	-10.7	0.1	-10.6	-10.5	0.1	-10.4
13	-17.6	0.1	-17.5	-17.6	0.1	-17.5

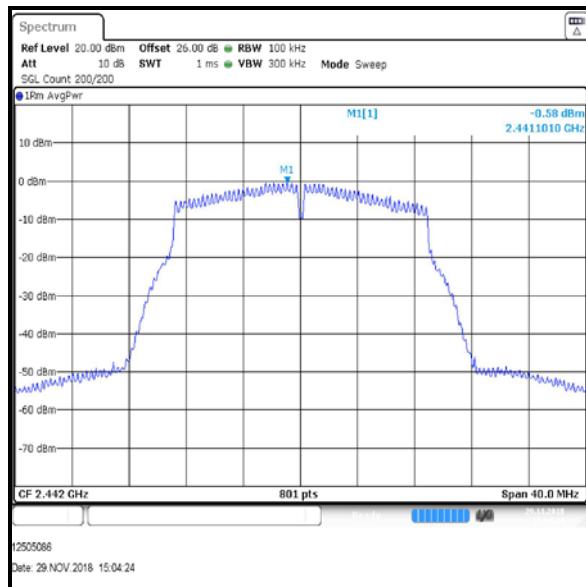
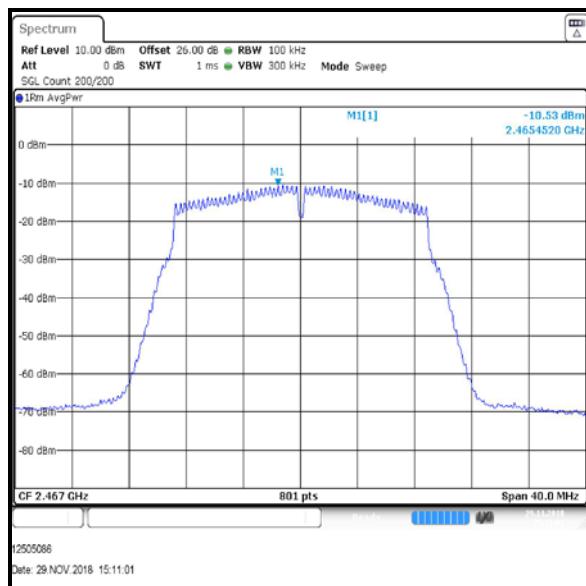
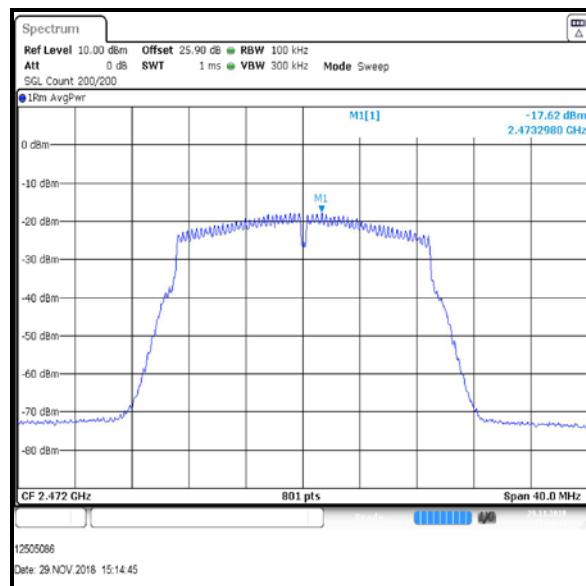
Channel	Core 2			Core 0, Core 1 & Core 2		
	PSD (dBm / 100 kHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm / 100 kHz)	Corrected PSD at Core 0 (dBm / 100 kHz)	Corrected PSD at Core 1 (dBm / 100 kHz)	Corrected PSD at Core 2 (dBm / 100 kHz)
1	-7.3	0.1	-7.2	-6.9	-6.4	-7.2
2	-4.3	0.1	-4.2	-3.9	-4.5	-4.2
3	-2.3	0.1	-2.2	-2.4	-2.2	-2.2
6	-1.0	0.1	-0.9	0.0	-0.5	-0.9
7	-1.0	0.1	-0.9	-0.4	-0.5	-0.9
11	-8.2	0.1	-8.1	-7.4	-7.6	-8.1
12	-11.4	0.1	-11.3	-10.6	-10.4	-11.3
13	-18.3	0.1	-18.2	-17.5	-17.5	-18.2

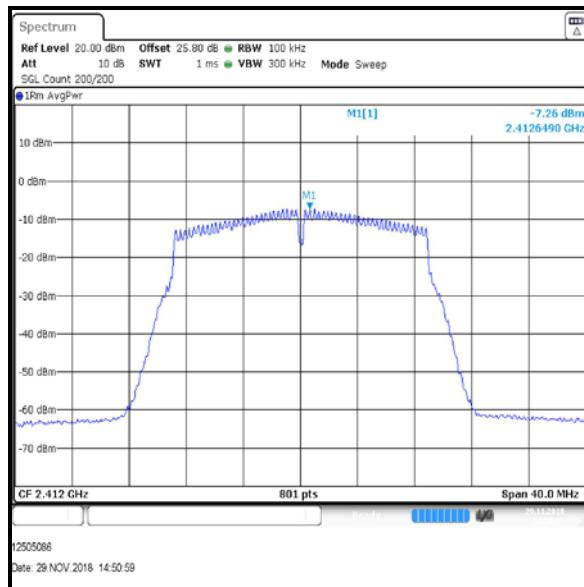
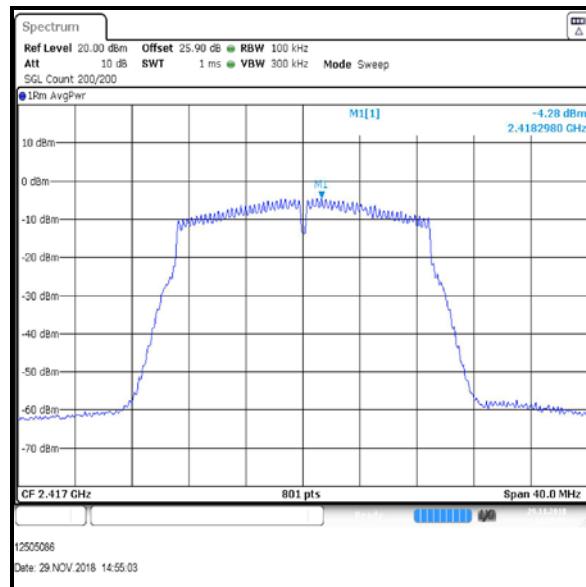
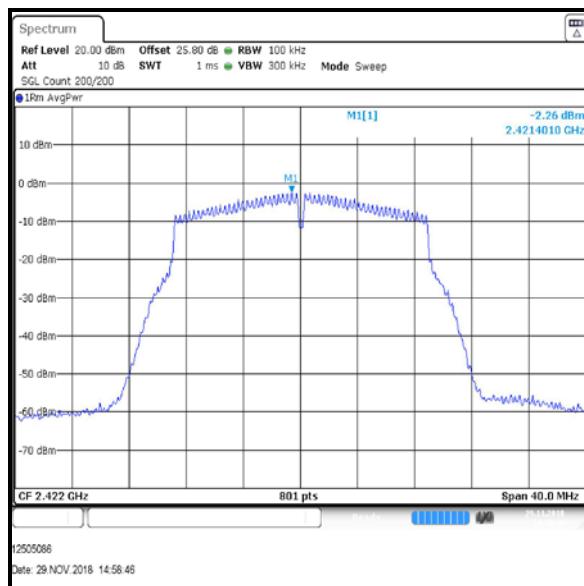
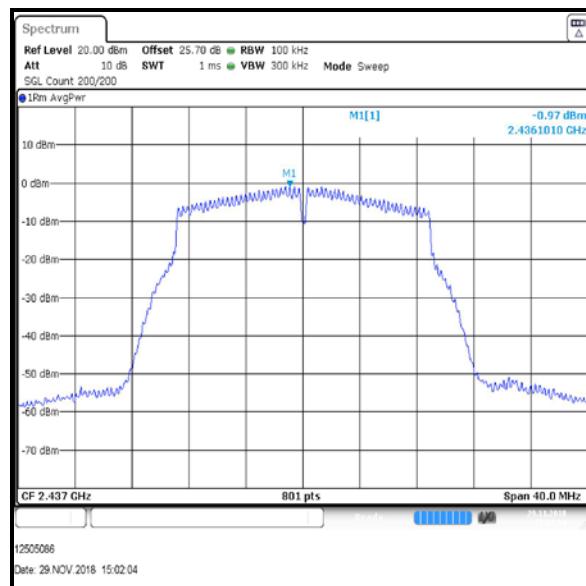
Channel	Combined PSD (dBm / 100 kHz)	Limit (dBm / 3 kHz)	Margin (dB)	Result
1	-2.0	8.0	10.0	Complied
2	0.6	8.0	7.4	Complied
3	2.5	8.0	5.5	Complied
6	4.3	8.0	3.7	Complied
7	4.2	8.0	3.8	Complied
11	-2.9	8.0	10.9	Complied
12	-6.0	8.0	14.0	Complied
13	-12.9	8.0	20.9	Complied

Transmitter Power Spectral Density (continued)**Results: 802.11n / HT20 / MIMO / 3Tx TxBF / BPSK / MCS0 / Core 0****Channel 1****Channel 2****Channel 3****Channel 6**

Transmitter Power Spectral Density (continued)**Results: 802.11n / HT20 / MIMO / 3Tx TxBF / BPSK / MCS0 / Core 0****Channel 7****Channel 11****Channel 12****Channel 13**

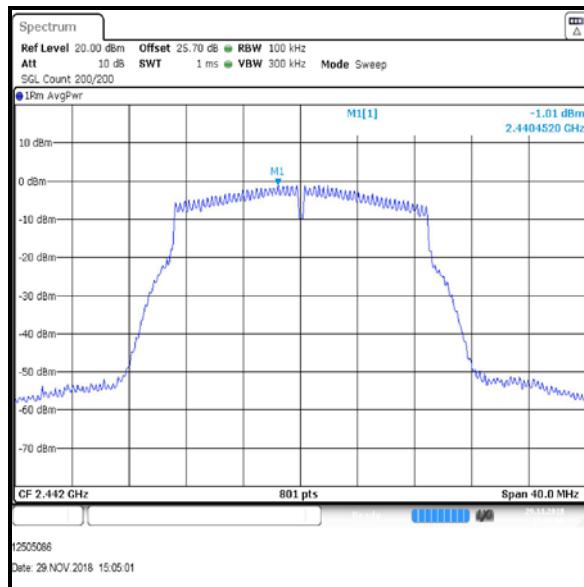
Transmitter Power Spectral Density (continued)**Results: 802.11n / HT20 / MIMO / 3Tx TxBF / BPSK / MCS0 / Core 1****Channel 1****Channel 2****Channel 3****Channel 6**

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

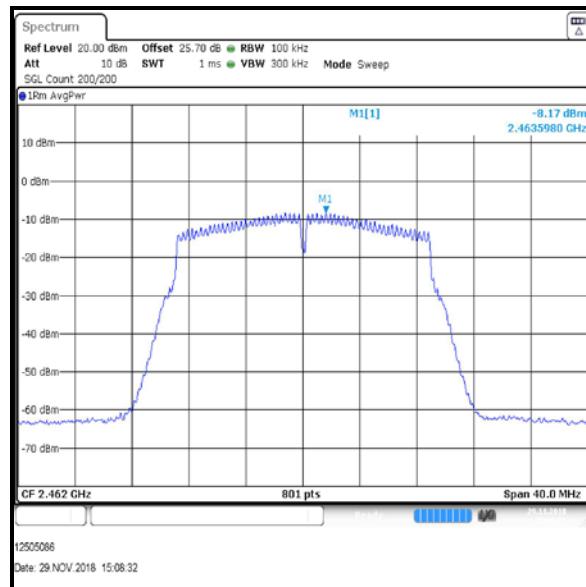
Transmitter Power Spectral Density (continued)**Results: 802.11n / HT20 / MIMO / 3Tx TxBF / BPSK / MCS0 / Core 2****Channel 1****Channel 2****Channel 3****Channel 6**

Transmitter Power Spectral Density (continued)

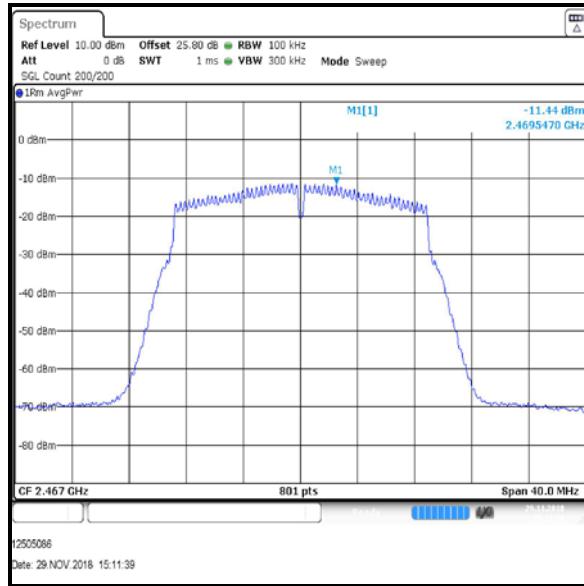
Results: 802.11n / HT20 / MIMO / 3Tx TxBF / BPSK / MCS0 / Core 2



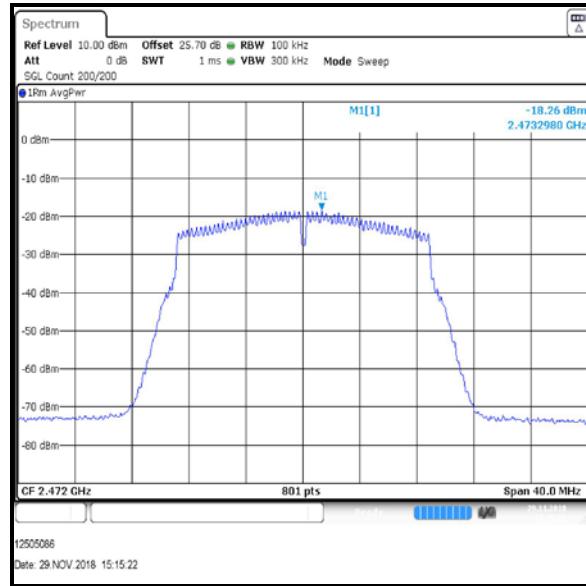
Channel 7



Channel 11



Channel 12



Channel 13

4.4. Transmitter Maximum (Average) Output Power

Test Summary:

Test Engineers:	Max Passell, Victor Carmon & Matthew Botfield	Test Dates:	21 November 2018 to 30 November 2018
Test Sample Serial Numbers:	C02X2007KFLX & C02WW00WKFMM		

FCC Reference:	Part 15.247(b)(3)
Test Method Used:	FCC KDB 558074 Section 8.3.2.2 referencing ANSI C63.10 Sections 11.9.2.2.2 & 11.9.2.2.4

Environmental Conditions:

Temperature (°C):	20 to 23
Relative Humidity (%):	38 to 51

Transmitter Maximum (Average) Output Power (continued)**Note(s):**

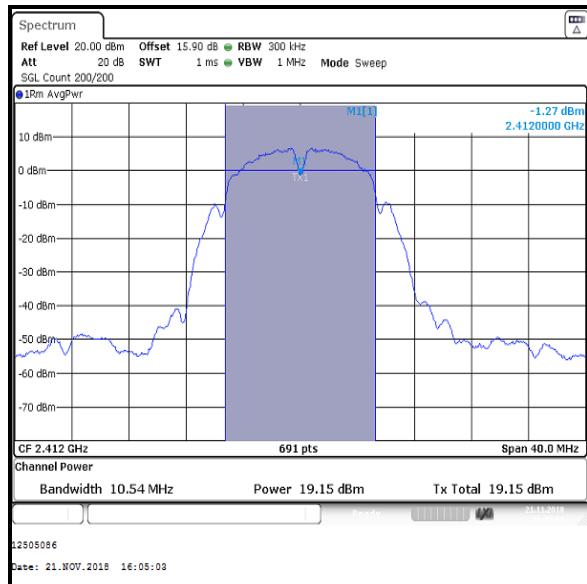
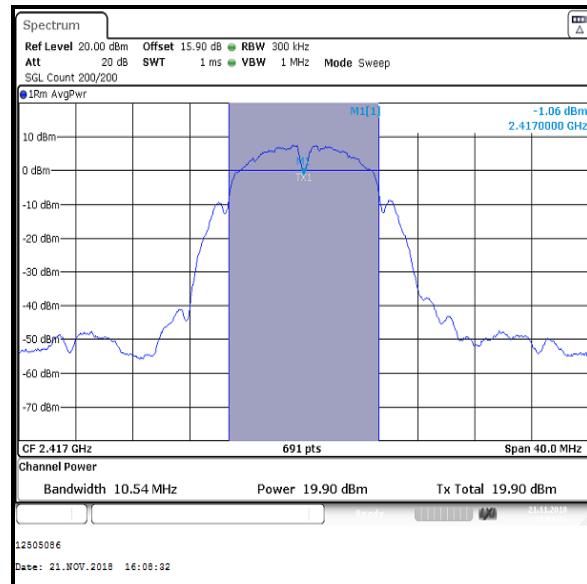
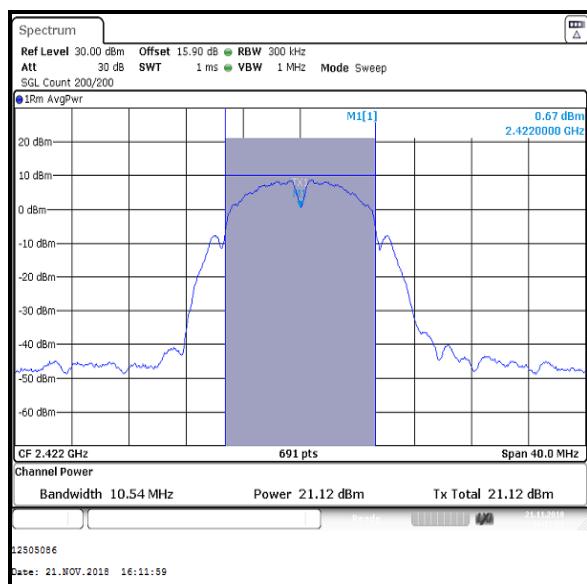
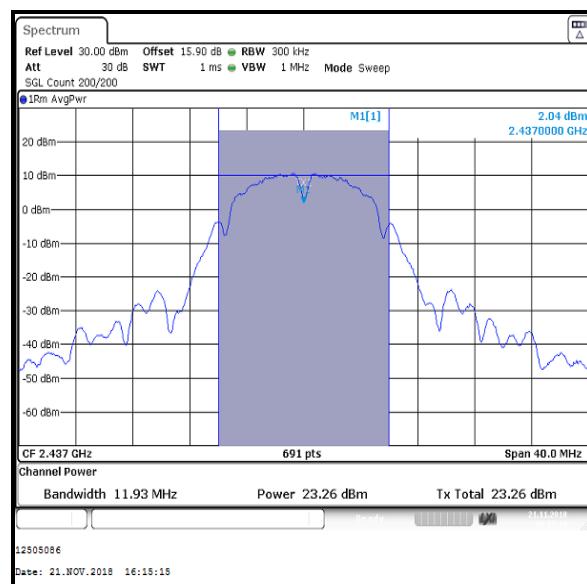
1. The customer declared the following data rates to be used for all measurements as:
 - o 802.11b – DBPSK / 1 Mbps / SISO / Core 1
 - o 802.11g – BPSK / 6 Mbps / SISO / Core 1
 - o 802.11n HT20 – BPSK / MCS0 / SISO / Core 1
 - o 802.11b – MIMO / 2Tx CDD / DBPSK / 1 Mbps / Core 1 & Core 2
 - o 802.11b – MIMO / 3Tx CDD / DBPSK / 1 Mbps / Core 0, Core 1 & Core 2
 - o 802.11n HT20 / MIMO / 2Tx CDD / BPSK / MCS0 / Core 1 & Core 2
 - o 802.11n HT20 / MIMO / 3Tx CDD / BPSK / MCS0 / Core 0, Core 1 & Core 2
 - o 802.11n HT20 / MIMO / 2Tx TxBF / BPSK / MCS0 / Core 1 & Core 2
 - o 802.11n HT20 / MIMO / 3Tx TxBF / BPSK / MCS0 / Core 0, Core 1 & Core 2
2. Final measurements were performed using the above configurations on the relevant channels. Additional channels were tested as requested by the customer.
3. The power has been integrated over the 99% emission bandwidth. Plots for the occupied bandwidth are archived on the company server and available for inspection upon request.
4. For 802.11b non-TxBF modes, the EUT was transmitting at >98% duty cycle and testing was performed in accordance with ANSI C63.10 Section 11.9.2.2.2 Method AVGSA-1. 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 200 traces. The span was set to at least 1.5 times the 99% occupied emission bandwidth.
5. For 802.11g and 802.11n HT20 non-TxBF modes, the EUT was transmitting at >98% duty cycle and testing was performed in accordance with ANSI C63.10 Section 11.9.2.2.2 Method AVGSA-1. The signal analyser's integration function was used to integrate across the 99% occupied bandwidth. The signal analyser resolution bandwidth was set to 500 kHz and video bandwidth 2 MHz. An RMS detector was used and sweep time set manually to perform trace averaging over 200 traces. The span was set to at least 1.5 times the 99% occupied emission bandwidth.
6. For TxBF modes, the EUT was transmitting at <98% duty cycle and testing was performed in accordance with ANSI C63.10 Section 11.9.2.2.4 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 500 kHz and video bandwidth 2 MHz. An RMS detector was used and sweep time set manually to perform trace averaging over 200 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.
7. 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 E1). For EIRP, the directional antenna gain was added to the conducted output power. Detailed calculations can be found in Appendix 1.
8. 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.
9. For 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).

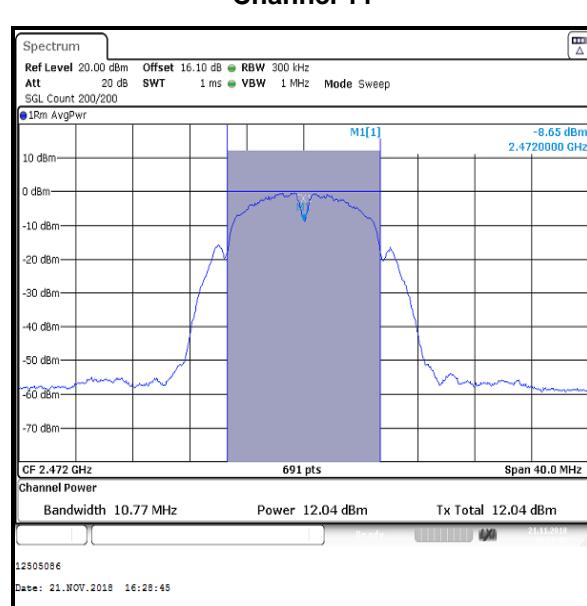
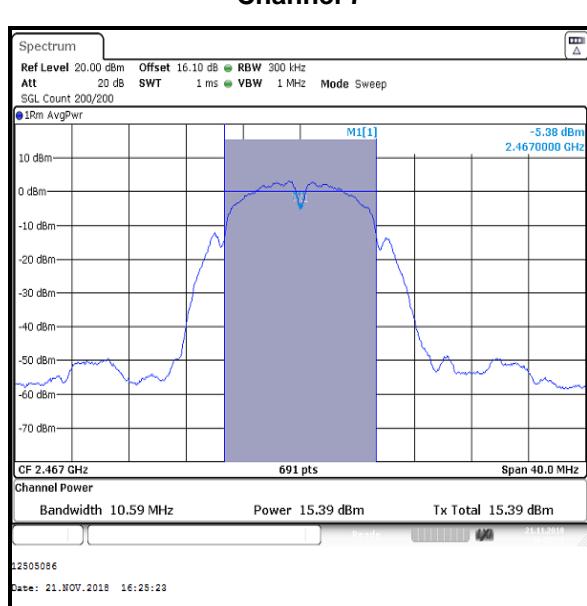
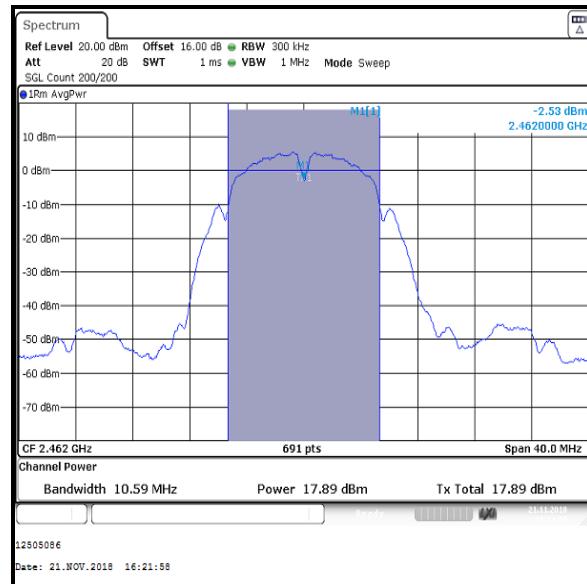
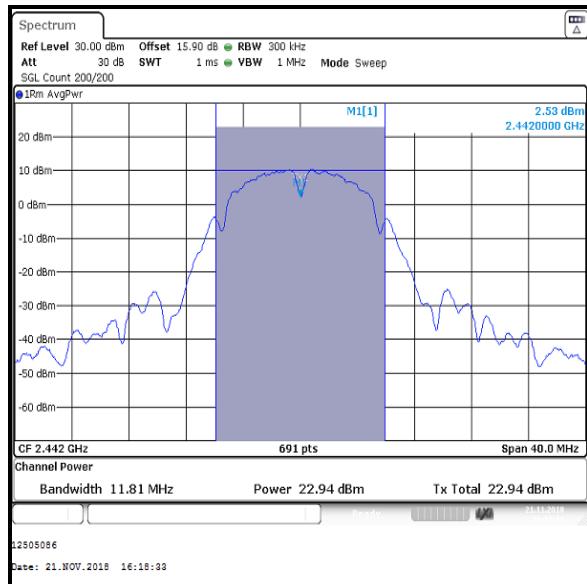
Transmitter Maximum (Average) Output Power (continued)**Results: 802.11b / 20 MHz / DBPSK / 1 Mbps / SISO / Core 1****Conducted Peak Limit Comparison**

Channel	Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
1	19.2	30.0	10.8	Complied
2	19.9	30.0	10.1	Complied
3	21.1	30.0	8.9	Complied
6	23.3	30.0	6.7	Complied
7	22.9	30.0	7.1	Complied
11	17.9	30.0	12.1	Complied
12	15.4	30.0	14.6	Complied
13	12.0	30.0	18.0	Complied

EIRP Limit Comparison

Channel	Conducted Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
1	19.2	4.8	24.0	36.0	12.0	Complied
2	19.9	4.8	24.7	36.0	11.3	Complied
3	21.1	4.8	25.9	36.0	10.1	Complied
6	23.3	4.8	28.1	36.0	7.9	Complied
7	22.9	4.8	27.7	36.0	8.3	Complied
11	17.9	4.8	22.7	36.0	13.3	Complied
12	15.4	4.8	20.2	36.0	15.8	Complied
13	12.0	4.8	16.8	36.0	19.2	Complied

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

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

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

Channel	Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
1	14.5	30.0	15.5	Complied
2	16.4	30.0	13.6	Complied
3	19.0	30.0	11.0	Complied
6	22.7	30.0	7.3	Complied
7	21.1	30.0	8.9	Complied
11	14.5	30.0	15.5	Complied
12	12.0	30.0	18.0	Complied
13	2.8	30.0	27.2	Complied

EIRP Limit Comparison

Channel	Conducted Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
1	14.5	4.8	19.3	36.0	16.7	Complied
2	16.4	4.8	21.2	36.0	14.8	Complied
3	19.0	4.8	23.8	36.0	12.2	Complied
6	22.7	4.8	27.5	36.0	8.5	Complied
7	21.1	4.8	25.9	36.0	10.1	Complied
11	14.5	4.8	19.3	36.0	16.7	Complied
12	12.0	4.8	16.8	36.0	19.2	Complied
13	2.8	4.8	7.6	36.0	28.4	Complied

Transmitter Maximum (Average) Output Power (continued)**Results: 802.11g / 20 MHz / BPSK / 6 Mbps / Core 1**