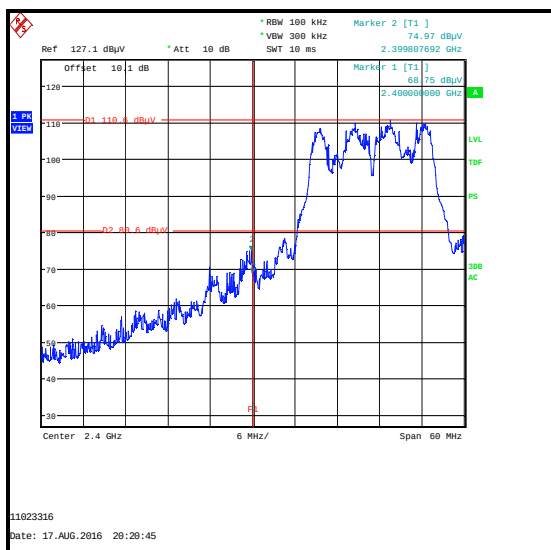
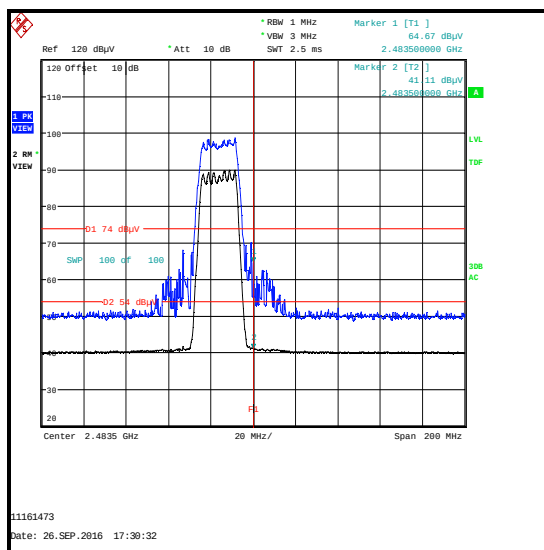


Transmitter Band Edge Radiated Emissions (continued)

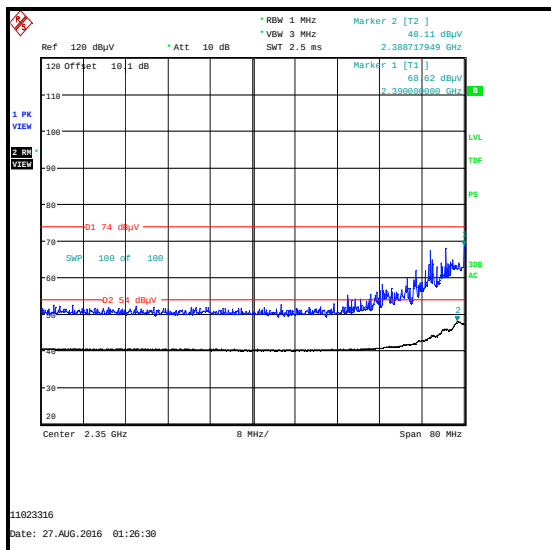
Results: 802.11n HT20 / MCS0 / MIMO (2Tx CDD) on Ports 2 & 3



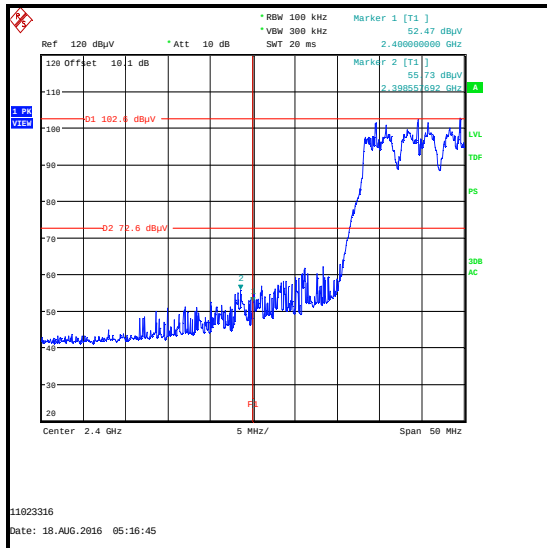
Lower Band Edge Peak Measurement Channel 2



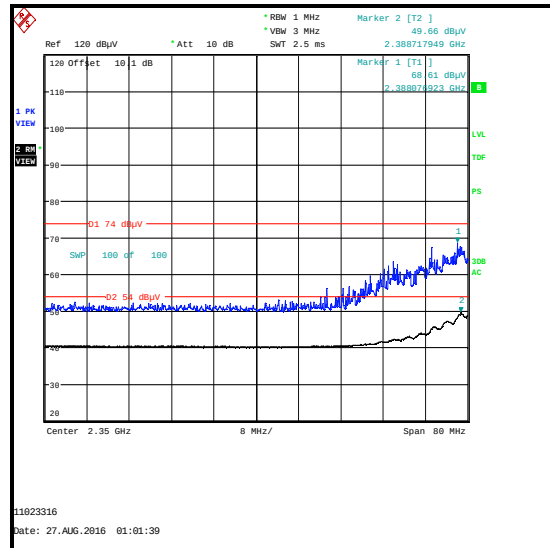
Upper Band Edge Peak & Average Measurements Channel 12



2310 MHz to 2390 MHz Restricted Band Channel 2

Transmitter Band Edge Radiated Emissions (continued)**Results: 802.11n HT20 / MCS0 / MIMO (2Tx CDD) on Ports 2 & 3**

**Lower Band Edge Peak Measurement
Channel 3**



**2310 MHz to 2390 MHz Restricted Band
Channel 3**

Transmitter Band Edge Radiated Emissions (continued)**Results: 802.11n HT20 / MCS0 / MIMO (3Tx CDD) on Ports 1, 2 & 3****Results: Lower Band Edge**

Transmit Channel	Frequency (MHz)	Level (dB μ V/m)	-30 dBc Limit (dB μ V/m)	Margin (dB)	Result
1	2397.276	64.2	71.4	7.2	Complied
2	2399.519	63.2	74.1	10.9	Complied
3	2398.878	65.5	76.4	10.9	Complied

Results: Restricted Band / Lower Band Edge / Peak

Transmit Channel	Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
1	2388.333	67.3	74.0	6.7	Complied
2	2387.949	68.9	74.0	5.1	Complied
3	2389.615	68.4	74.0	5.6	Complied

Results: Restricted Band / Lower Band Edge / Average

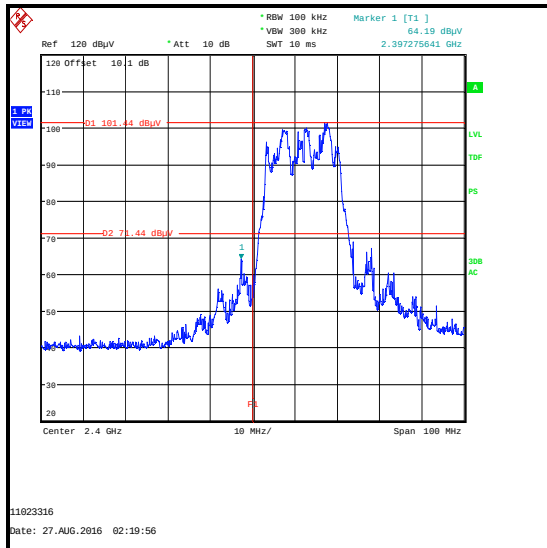
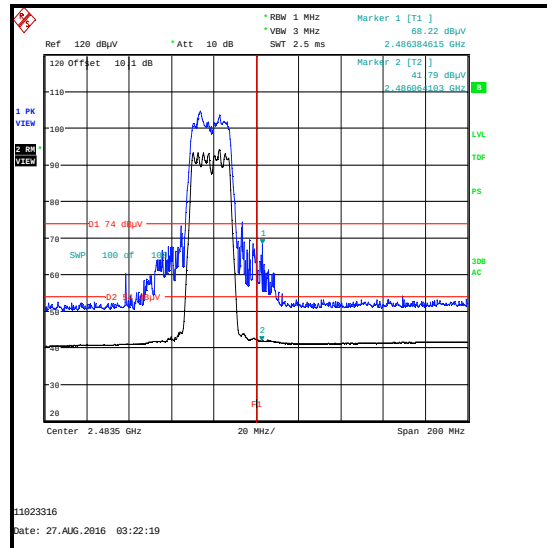
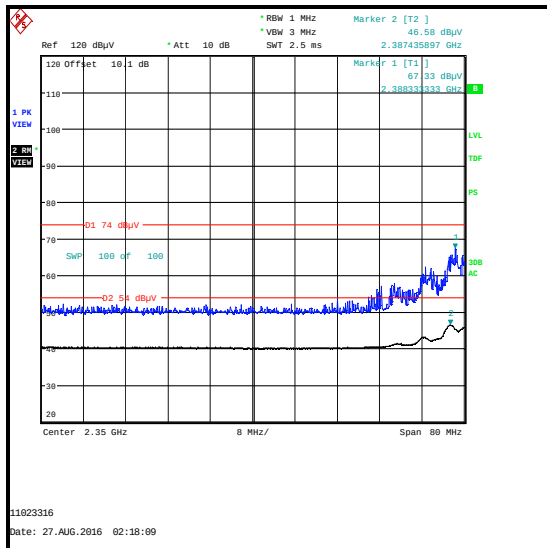
Transmit Channel	Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
1	2387.436	46.6	54.0	7.4	Complied
2	2389.103	45.7	54.0	8.3	Complied
3	2389.487	48.3	54.0	5.7	Complied

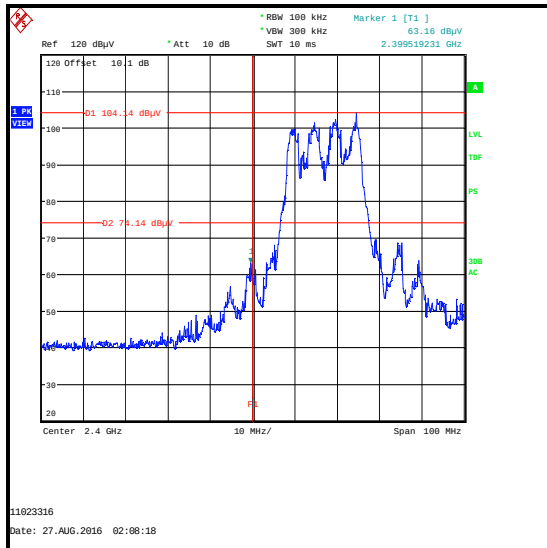
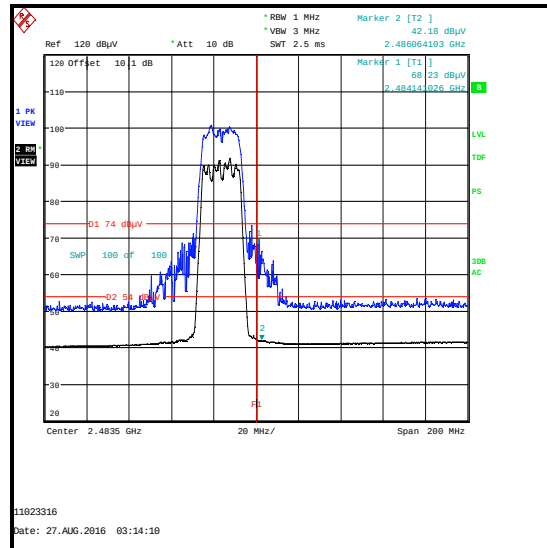
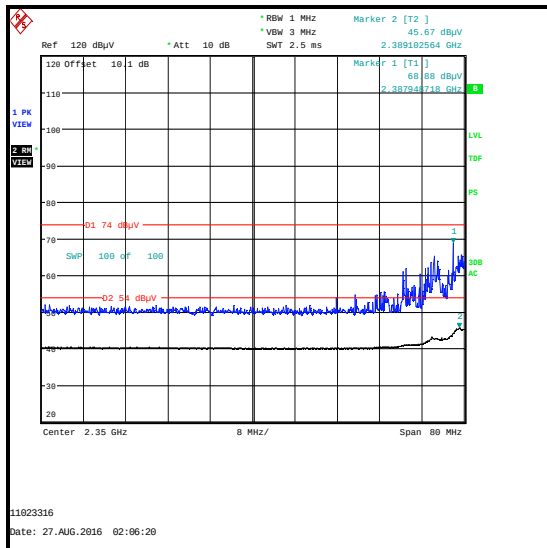
Results: Upper Band Edge / Restricted Band / Peak

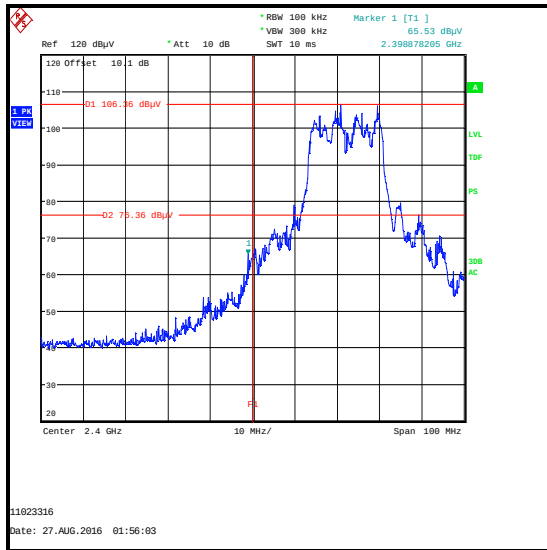
Transmit Channel	Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
11	2486.385	68.2	74.0	5.8	Complied
12	2484.141	68.2	74.0	5.8	Complied

Results: Upper Band Edge / Restricted Band / Average

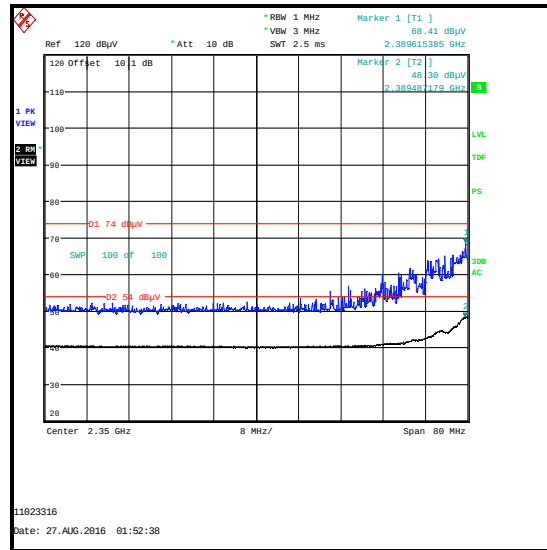
Transmit Channel	Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
11	2486.064	41.8	54.0	12.2	Complied
12	2486.064	42.2	54.0	11.8	Complied

Transmitter Band Edge Radiated Emissions (continued)**Results: 802.11n HT20 / MCS0 / MIMO (3Tx CDD) on Ports 1, 2 & 3****Lower Band Edge Peak Measurement
Channel 1****Upper Band Edge Peak & Average Measurements
Channel 11****2310 MHz to 2390 MHz Restricted Band
Channel 1**

Transmitter Band Edge Radiated Emissions (continued)**Results: 802.11n HT20 / MCS0 / MIMO (3Tx CDD) on Ports 1, 2 & 3****Lower Band Edge Peak Measurement
Channel 2****Upper Band Edge Peak & Average Measurements
Channel 12****2310 MHz to 2390 MHz Restricted Band
Channel 2**

Transmitter Band Edge Radiated Emissions (continued)**Results: 802.11n HT20 / MCS0 / MIMO (3Tx CDD) on Ports 1, 2 & 3**

**Lower Band Edge Peak Measurement
Channel 3**



**2310 MHz to 2390 MHz Restricted Band
Channel 3**

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M2003	Thermohygrometer	Testo	608-H1	45046641	22 Apr 2017	12
K0017	3m RSE Chamber	Rainford EMC	N/A	N/A	19 May 2017	12
M1995	Test Receiver	Rohde & Schwarz	ESU40	100428	21 Mar 2017	12
A2890	Antenna	Schwarzbeck	HWRD 750	014	06 May 2017	12
A2891	Pre Amplifier	Schwarzbeck	BBV 9718	9718-306	07 Apr 2017	12
M1656	Thermohygrometer	JM Handelspunkt	30.5015.13	Not stated	07 Apr 2017	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	21 Dec 2016	12
M1886	Test Receiver	Rohde & Schwarz	ESU26	100554	21 Mar 2017	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	19 Dec 2016	12
A1818	Antenna	EMCO	3115	00075692	17 Dec 2016	12
A1396	Attenuator	Huber & Suhner	6810.17.B	757987	26 Apr 2017	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
Minimum 6 dB Bandwidth	2.4 GHz to 2.4835 GHz	95%	±4.59%
Duty Cycle	2.4 GHz to 2.4835 GHz	95%	±1.14%
Spectral Power Density	2.4 GHz to 2.4835 GHz	95%	±1.13 dB
Conducted Maximum Output Power	2.4 GHz to 2.4835 GHz	95%	±1.13 dB
Radiated Spurious Emissions	30 MHz to 1 GHz	95%	±5.65 dB
Radiated Spurious Emissions	1 GHz to 25 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

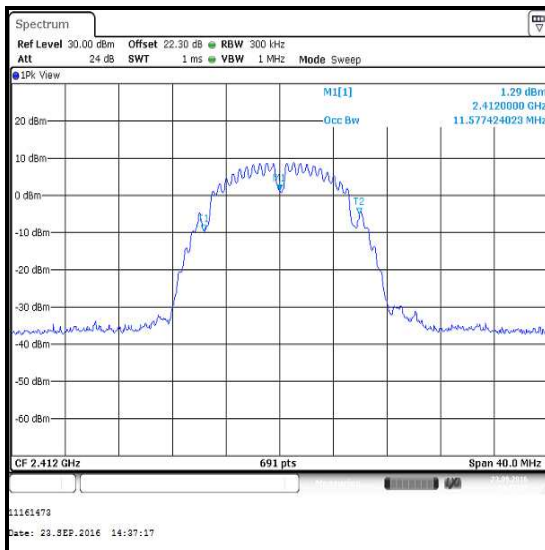
Version Number	Revision Details		
	Page No(s)	Clause	Details
1.0	-	-	Initial Version

8. Appendix 1

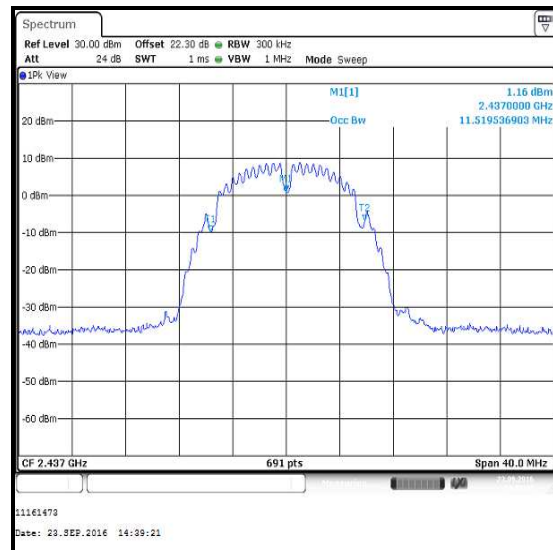
Transmitter 99% Emission Bandwidth Reference Plots

Results: 802.11b / 20 MHz / DBPSK / 1 Mbps / Port 2

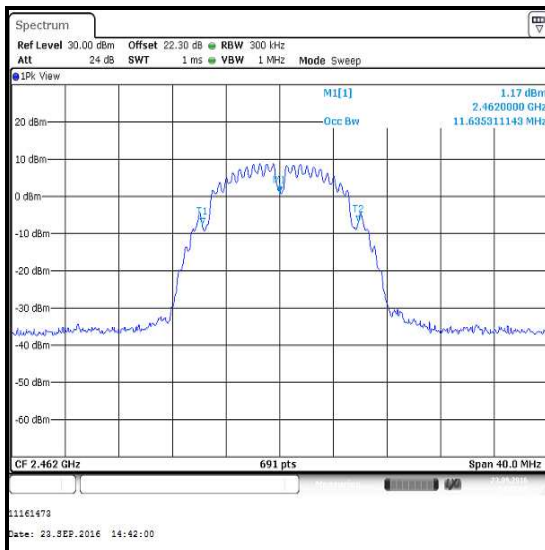
Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)
1	2412	11.577
6	2437	11.520
11	2462	11.635



Channel 1



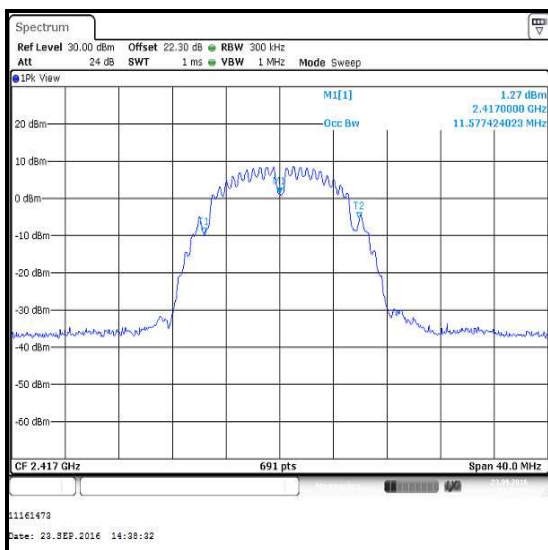
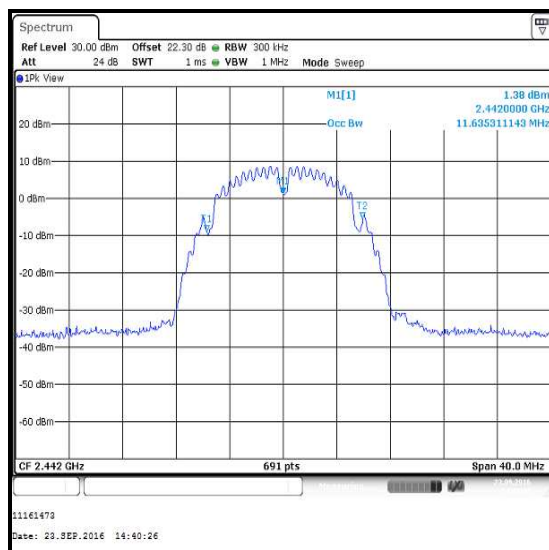
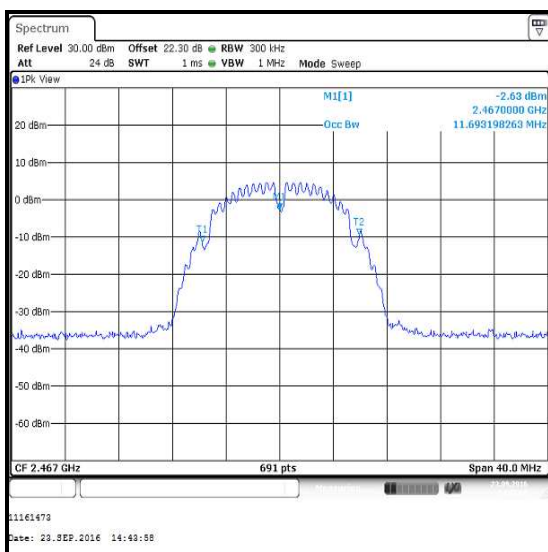
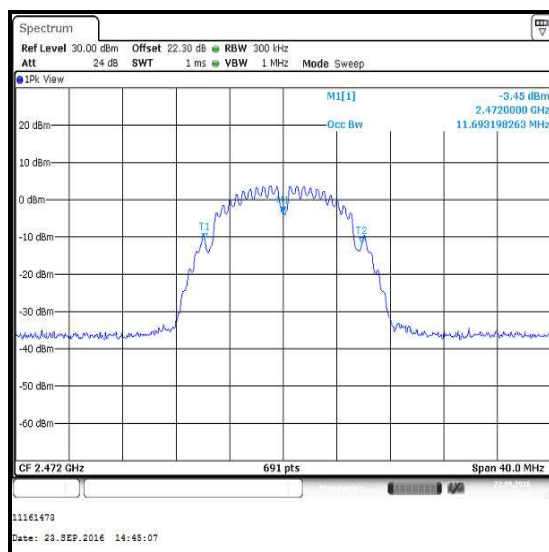
Channel 6



Channel 11

Transmitter 99% Bandwidth (continued)**Results: 802.11b / 20 MHz / DBPSK / 1 Mbps / Port 2**

Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)
2	2417	11.577
7	2442	11.635
12	2467	11.693
13	2472	11.693

**Channel 2****Channel 7****Channel 12****Channel 13**

Transmitter 99% Bandwidth (continued)**Results: 802.11g / 20 MHz / BPSK / 6 Mbps / Port 2**

Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)
1	2412	17.192
6	2437	17.135
11	2462	17.192



Channel 1



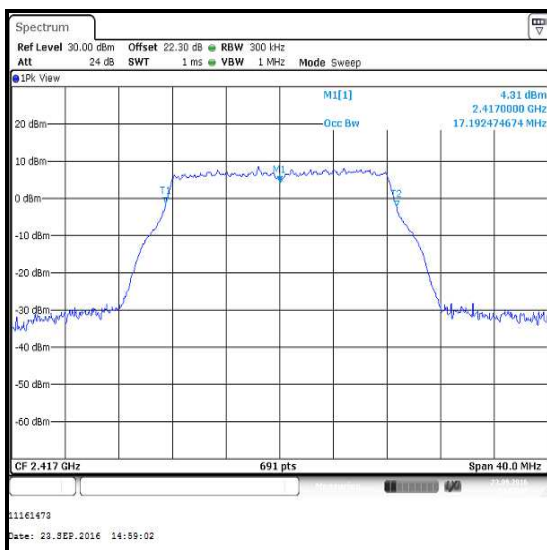
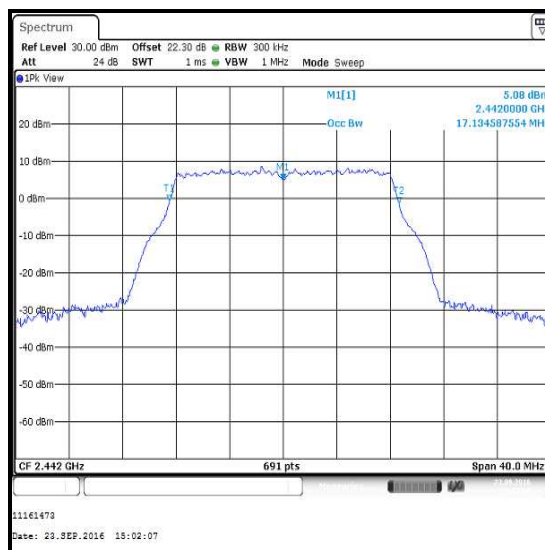
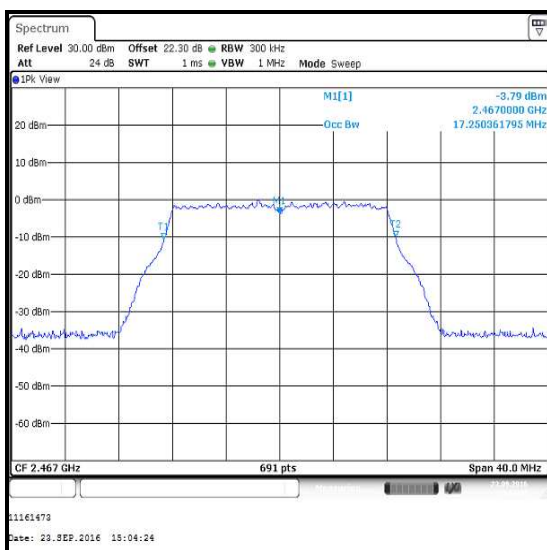
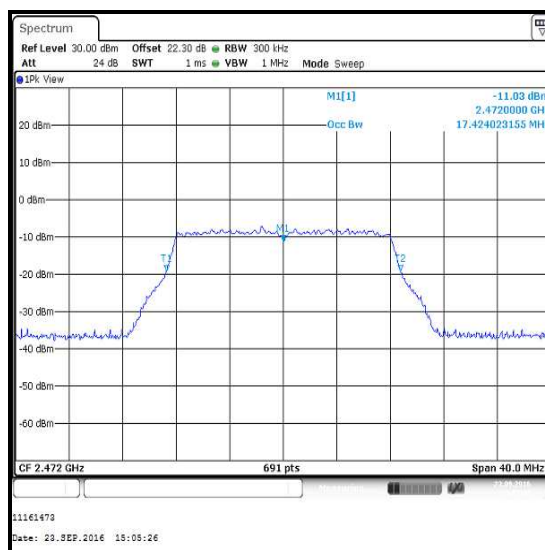
Channel 6



Channel 11

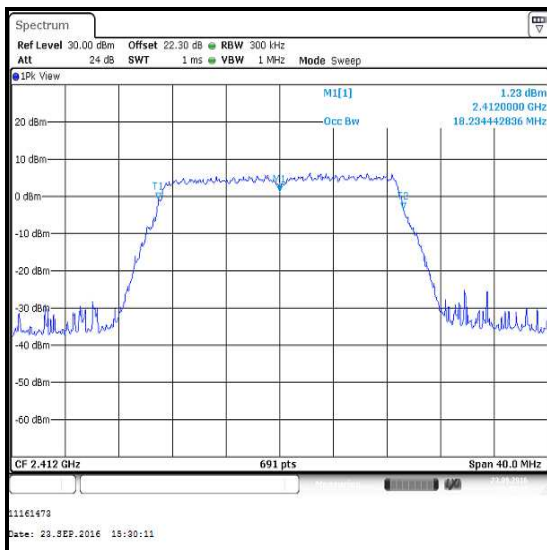
Transmitter 99% Bandwidth (continued)**Results: 802.11g / 20 MHz / BPSK / 6 Mbps / Port 2**

Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)
2	2417	17.192
7	2442	17.135
12	2467	17.250
13	2472	17.424

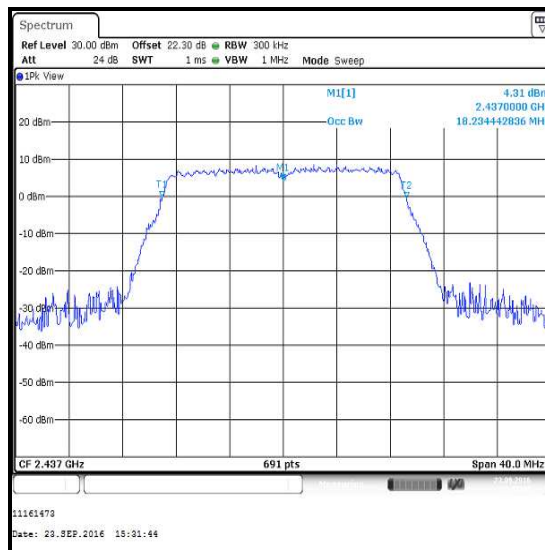
**Channel 2****Channel 7****Channel 12****Channel 13**

Transmitter 99% Bandwidth (continued)**Results: 802.11n / 20 MHz / BPSK / MCS0 / Port 2**

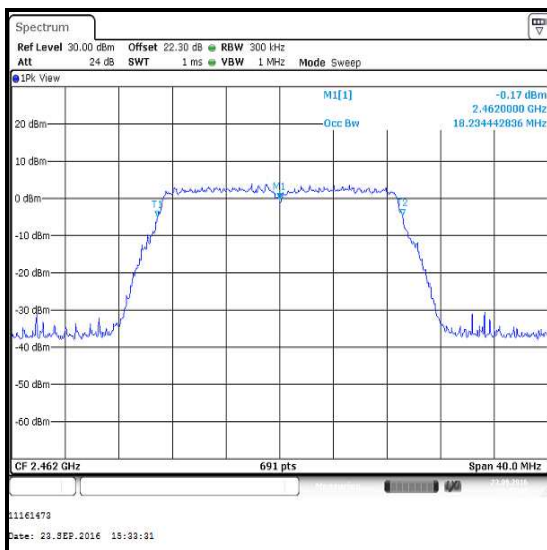
Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)
1	2412	18.234
6	2437	18.234
11	2462	18.234



Channel 1



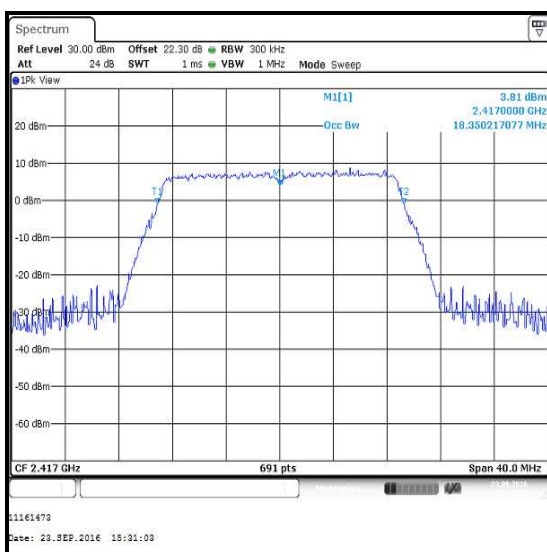
Channel 6



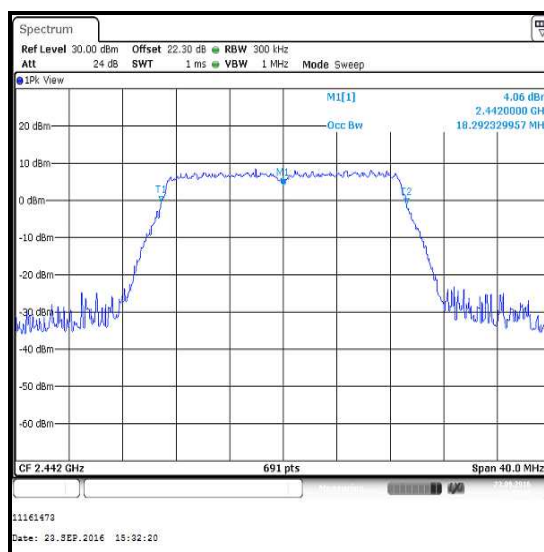
Channel 11

Transmitter 99% Bandwidth (continued)**Results: 802.11n / 20 MHz / BPSK / MCS0 / Port 2**

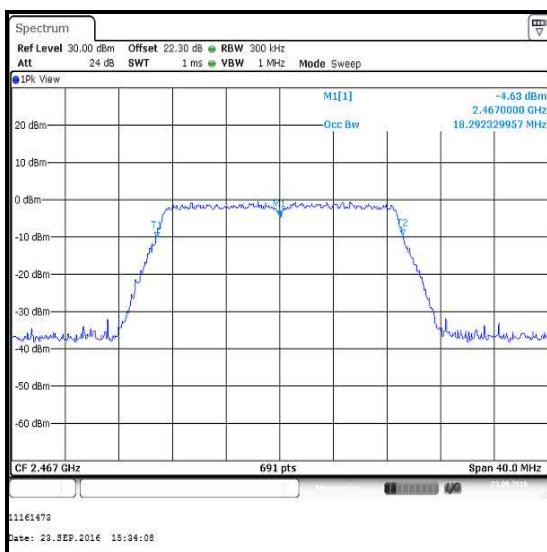
Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)
2	2417	18.350
7	2442	18.292
12	2467	18.292
13	2472	18.350



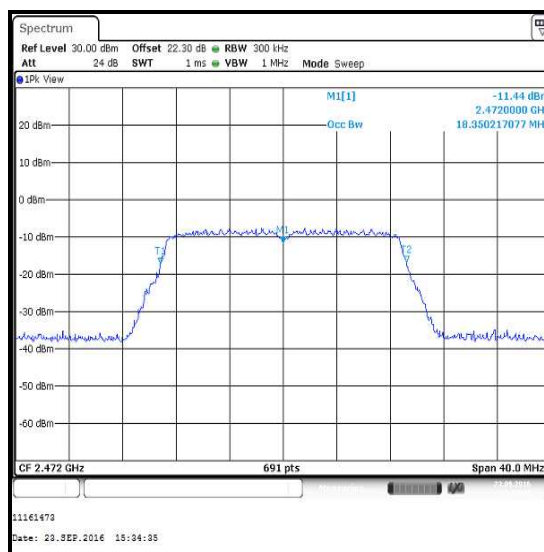
Channel 2



Channel 7



Channel 12



Channel 13

9. Appendix 2.

Directional Antenna Gain Calculations

For 2Tx CDD modes, in accordance with KDB 662911 D01 v02r01 Section F)2)f)(ii) and for $N_{SS}=1$, $N_{ANT}=2$,

$G_1 = G_{ANTENNA\ 2} = 3.3$ dBi, $G_2 = G_{ANTENNA\ 3} = 2.3$ dBi:

$$\begin{aligned} \text{Directional Gain} &= 10 \log \left[\frac{\sum_{j=1}^{N_{SS}} \left(\sum_{k=1}^{N_{ANT}} g_{j,k} \right)^2}{N_{ANT}} \right] = 10 \log \left[\frac{\sum_{j=1}^1 \left(\sum_{k=1}^2 g_{j,k} \right)^2}{2} \right] = \\ &= 10 \log \left[\frac{(g_{1,1} + g_{1,2})^2}{2} \right] = 10 \log \left[\frac{\left(10^{\frac{3.3}{20}} + 10^{\frac{2.3}{20}} \right)^2}{2} \right] = 10 \log \left[\frac{\left(10^{\frac{3.3}{20}} + 10^{\frac{2.3}{20}} \right)^2}{2} \right] = 5.8 \text{ dBi} \end{aligned}$$

For 3Tx CDD modes, in accordance with KDB 662911 D01 v02r01 Section F)2)f)(ii) and for $N_{SS}=1$, $N_{ANT}=3$,

$G_1 = G_{ANTENNA\ 1} = 2.0$ dBi, $G_2 = G_{ANTENNA\ 2} = 3.3$ dBi, $G_3 = G_{ANTENNA\ 3} = 2.3$ dBi:

$$\begin{aligned} \text{Directional Gain} &= 10 \log \left[\frac{\sum_{j=1}^{N_{SS}} \left(\sum_{k=1}^{N_{ANT}} g_{j,k} \right)^2}{N_{ANT}} \right] = 10 \log \left[\frac{\sum_{j=1}^1 \left(\sum_{k=1}^3 g_{j,k} \right)^2}{3} \right] = \\ &= 10 \log \left[\frac{(g_{1,1} + g_{1,2} + g_{1,3})^2}{3} \right] = 10 \log \left[\frac{\left(10^{\frac{2.0}{20}} + 10^{\frac{3.3}{20}} + 10^{\frac{2.3}{20}} \right)^2}{3} \right] = 10 \log \left[\frac{\left(10^{\frac{2.0}{20}} + 10^{\frac{3.3}{20}} + 10^{\frac{2.3}{20}} \right)^2}{3} \right] \\ &= 7.3 \text{ dBi} \end{aligned}$$

--- END OF REPORT ---