Dwell Time & Frequency Occupation Time
Modulation OFDM ,Mode 146 Dwell time

Modulation OFDM ,Mode 146 Hop Return to Channel Time

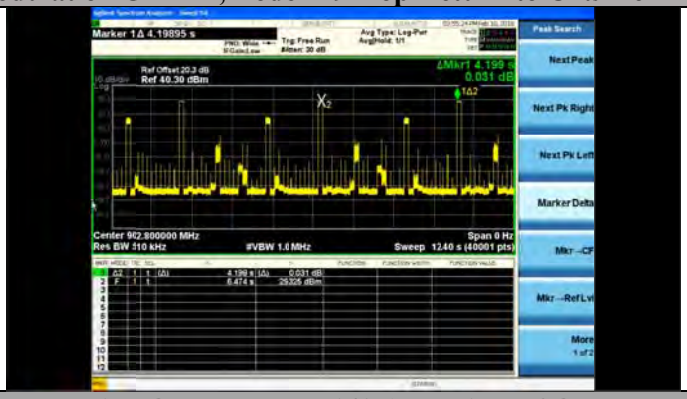
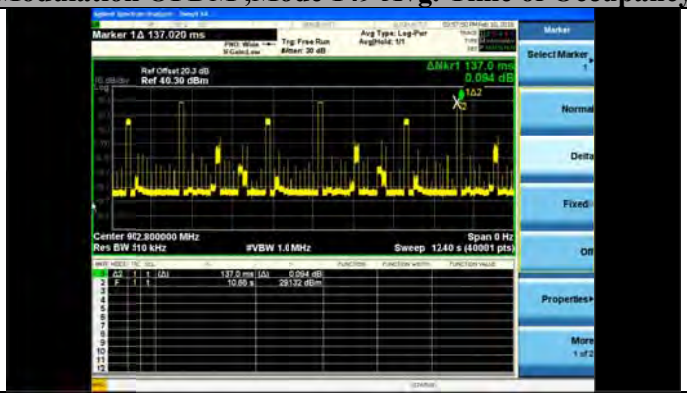
Modulation OFDM ,Mode 146 Avg. Time of Occupancy


Dwell Time & Frequency Occupation Time
Modulation OFDM ,Mode 147 Dwell time

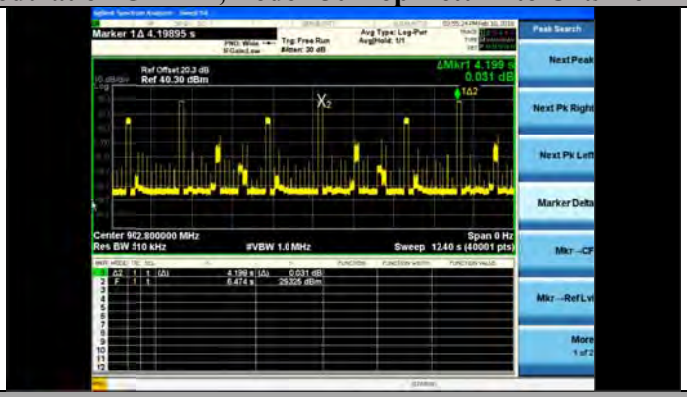
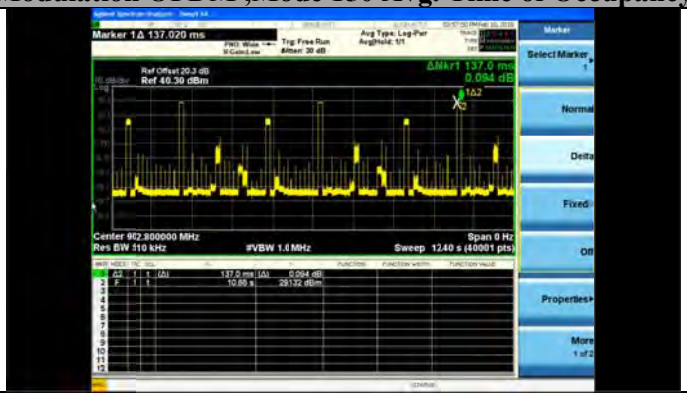
Modulation OFDM ,Mode 147 Hop Return to Channel Time

Modulation OFDM ,Mode 147 Avg. Time of Occupancy


Dwell Time & Frequency Occupation Time
Modulation OFDM ,Mode 149 Dwell time

Modulation OFDM ,Mode 149 Hop Return to Channel Time

Modulation OFDM ,Mode 149 Avg. Time of Occupancy


Dwell Time & Frequency Occupation Time
Modulation OFDM ,Mode 150 Dwell time

Modulation OFDM ,Mode 150 Hop Return to Channel Time

Modulation OFDM ,Mode 150 Avg. Time of Occupancy


A.6 Conducted Band Edge Measurements

A.6.1 Limits

15.247 (d) & RSS-247 (5.5)

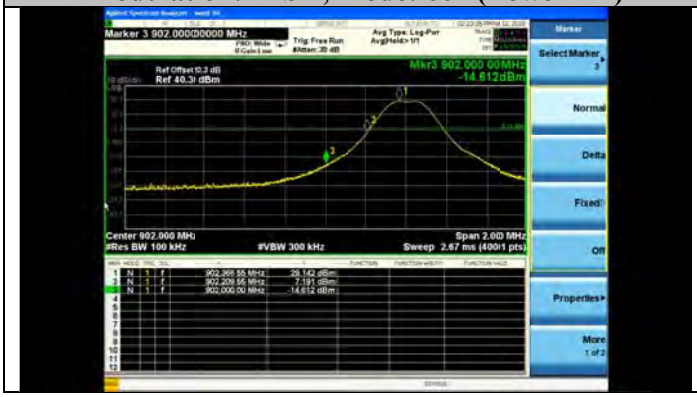
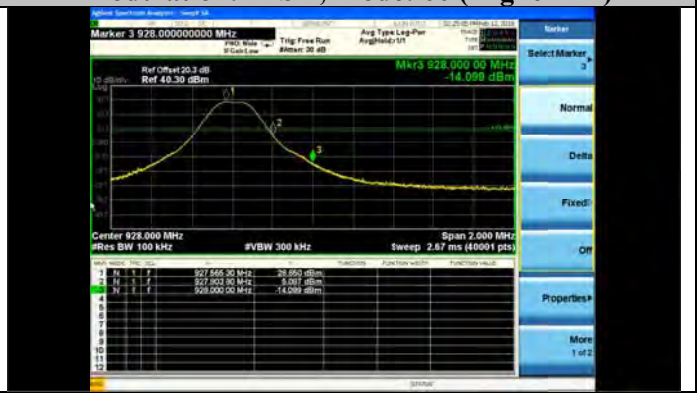
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in FCC §15.209(a) & RSS-Gen is not required.

A.6.2 Test Procedure

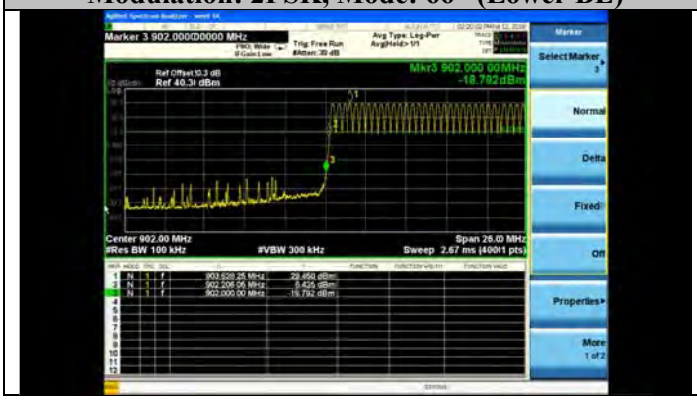
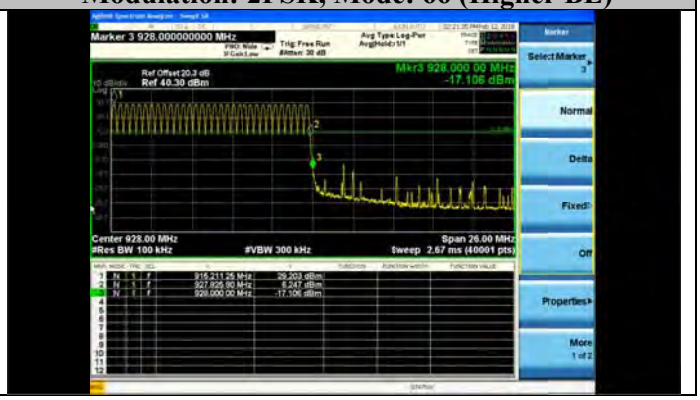
Refer to Public notice DA-00 705

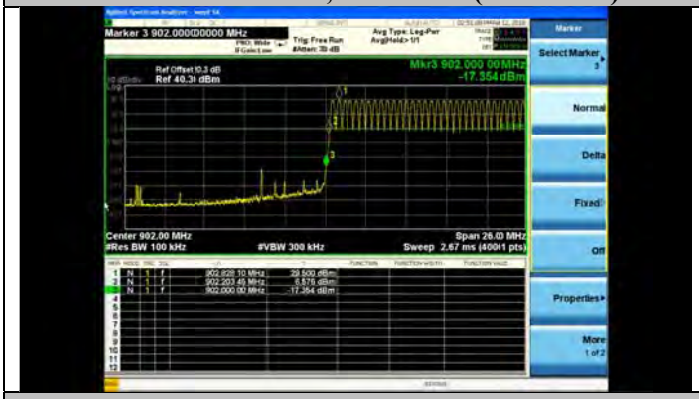
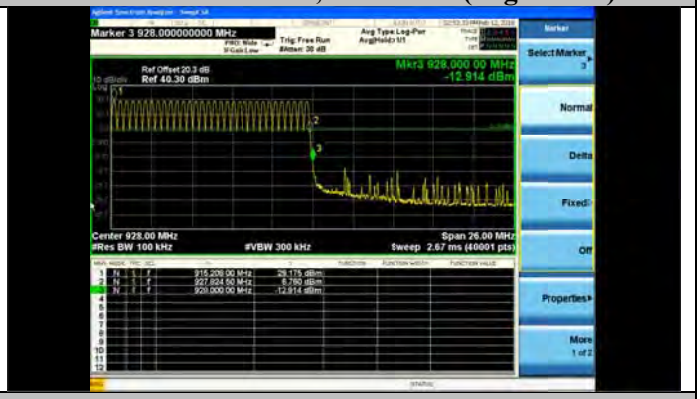
- Use the following spectrum analyzer settings:
- Span = wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products which fall outside of the authorized band of operation
- RBW ≥ 1% of the span
- VBW ≥ RBW
- Sweep = auto
- Detector function = peak
- Trace = max hold
- Allow the trace to stabilize. Set the marker on the emission at the band edge, or on the highest modulation product outside of the band, if this level is greater than that at the band edge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. The marker-delta value now displayed must comply with the limit specified in this Section. Submit this plot.
- Now, using the same instrument settings, enable the hopping function of the EUT. Allow the trace to stabilize. Follow the same procedure listed above to determine if any spurious emissions caused by the hopping function also comply with the specified limit. Submit this plot.

A.6.3 Conducted Band Edge Graphical Test Results (2FSK and OQPSK 20dBc)

Conducted Band Edge (Hoping Disable)	
Modulation: 2FSK, Mode: 64 (Lower BE)	**Modulation: 2FSK, Mode: 64 (Higher BE)**
	
Modulation: 2FSK, Mode: 96 (Lower BE)	**Modulation: 2FSK, Mode: 96(Higher BE)**
	
Modulation: 2FSK, Mode: 66 (Lower BE)	**Modulation: 2FSK, Mode: 66 (Higher BE)**
	

Conducted Band Edge (Hoping Disable)	
Modulation: 2FSK, Mode: 98 (Lower BE)	**Modulation: 2FSK, Mode: 98 (Higher BE)**
	
Modulation: O-QPSK, Mode: 192 (Lower BE)	**Modulation: O-QPSK, Mode: 192 (Higher BE)**
	

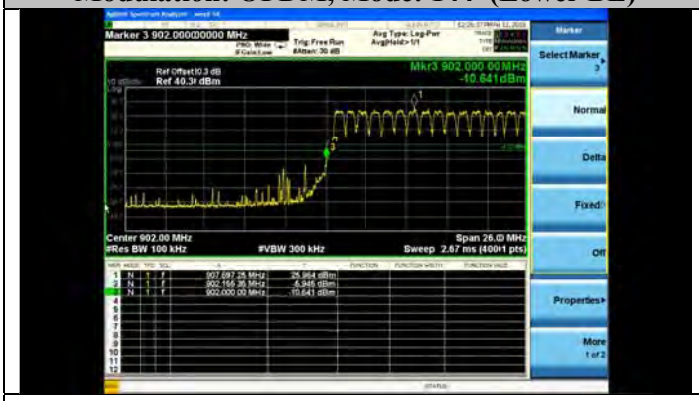
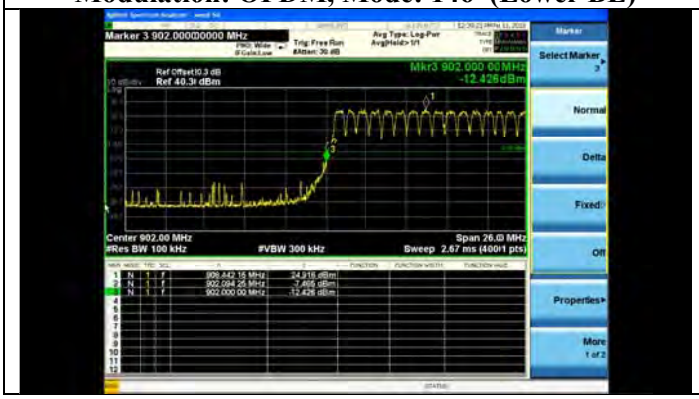
Conducted Band Edge (Hoping Enable)	
Modulation: 2FSK, Mode: 64 (Lower BE)	**Modulation: 2FSK, Mode: 64 (Higher BE)**
	
Modulation: 2FSK, Mode: 96 (Lower BE)	**Modulation: 2FSK, Mode: 96(Higher BE)**
	
Modulation: 2FSK, Mode: 66 (Lower BE)	**Modulation: 2FSK, Mode: 66 (Higher BE)**
	

Conducted Band Edge (Hoping Enable)	
Modulation: 2FSK, Mode: 98 (Lower BE)	**Modulation: 2FSK, Mode: 98 (Higher BE)**
	
Modulation: O-QPSK, Mode: 192 (Lower BE)	**Modulation: O-QPSK, Mode: 192 (Higher BE)**
	

A.6.4 Conducted Band Edge Graphical Test Results (OFDM Modes 30dBc)

Conducted Band Edge (Hoping Disable)	
Modulation: OFDM, Mode: 144 (Lower BE)	**Modulation: OFDM, Mode: 144 (Higher BE)**
	
Modulation: OFDM, Mode: 146 (Lower BE)	**Modulation: OFDM, Mode: 146 (Higher BE)**
	

Note: All the OFDM Modes have same channel spacing of 800 kHz and therefore only first two Mode with Highest power have been shown here and rest of the modes represents the same results

Conducted Band Edge (Hoping Enable)	
Modulation: OFDM, Mode: 144 (Lower BE)	**Modulation: OFDM, Mode: 144 (Higher BE)**
	
Modulation: OFDM, Mode: 146 (Lower BE)	**Modulation: OFDM, Mode: 146 (Higher BE)**
	

A.7 Emissions in Non-Restricted Bands

A.7.1 Limits

15.247 (d) & RSS-247 (5.5)
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in FCC §15.209(a) & RSS-Gen is not required.

A.7.2 Test Procedure

Ref. 558074 D01 DTS Meas Guidance v04 Section 11.2

Reference Level Measurement:

Establish a reference level by using the following procedure:

- Set instrument center frequency to DTS channel center frequency.
- Set the span to ≥ 1.5 × DTS bandwidth.
- Set the RBW = 100 kHz.
- Set the VBW ≥ 3 × RBW.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum PSD level.

Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

Emission level measurement

- Set the center frequency and span to encompass frequency range to be measured.
- Set the RBW = 100 kHz.
- Set the VBW ≥ 3 × RBW.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band. Report the three highest emissions relative to the limit.

Note: Mode 96 represents worst-case mode for 2FSK Modulations
Mode 192 represents worst-case mode for OQPSK Modulations
Mode 144 represents worst-case mode for OFDM Modulations

A.7.3 Emissions in non-Restricted Bands Results (2FSK and OQPSK Modes 20dBc)

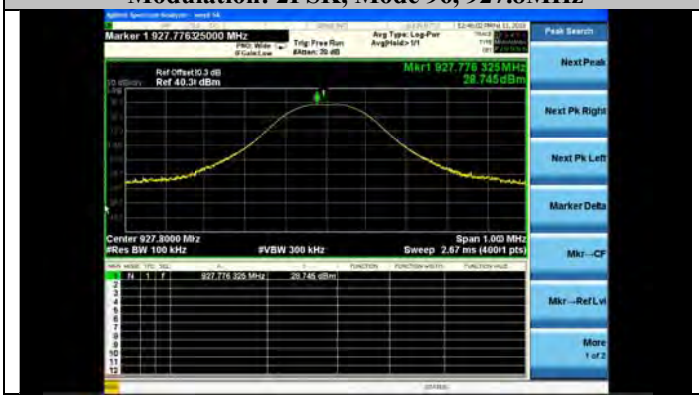
Frequency (MHz)	Mode	Reference Level (dBm)	Data Rate (Kbps)	Highest Emissions (dBc)	Limit (20dBc)	Margin (dB)
Mode 96 2FSK	902.2MHz	29.115	50.00	-26.345	9.115	17.230
	915.0MHz	28.931	50.00	-27.193	9.115	18.078
	927.8MHz	28.745	50.00	-28.395	9.115	19.280

Frequency (MHz)	Mode	Reference Level (dBm)	Data Rate (Kbps)	Highest Emissions (dBc)	Limit (20dBc)	Margin (dB)
Mode 192 OQPSK	902.2MHz	29.106	6.2	-26.435	9.106	17.329
	915.0MHz	28.929	6.2	-27.003	9.106	17.897
	927.8MHz	28.787	6.2	-28.341	9.106	19.235

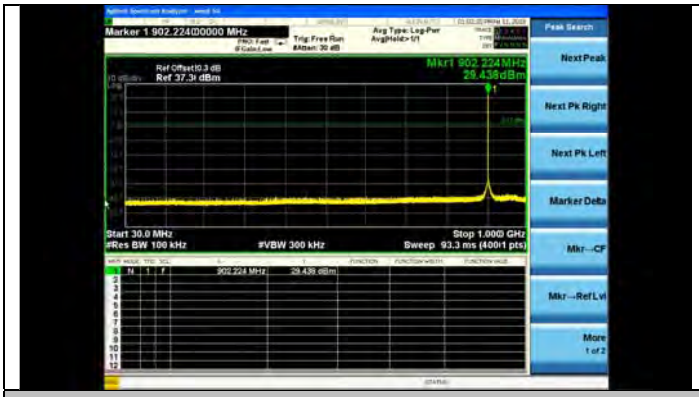
Emissions in non-Restricted Bands Results (2FSK and OQPSK Modes 30dBc)

Frequency (MHz)	Mode	Reference Level (dBm)	Data Rate (Kbps)	Highest Emissions (dBc)	Limit (30dBc)	Margin (dB)
Mode 144 OFDM	902.8MHz	25.380	50	-36.430	-1.669	38.099
	914.8MHz	28.331	50	-30.744	-1.669	32.413
	926.8MHz	28.149	50	-31.519	-1.669	33.188

A.7.4 Emissions in non-Restricted Bands Test Results (2FSK and OQPSK Modes 20dBc)

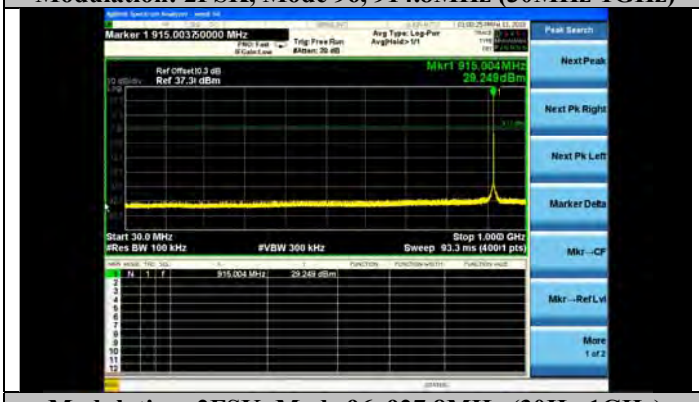
Reference level measurement	
Modulation: 2FSK, Mode 96, 902.2MHz	**Modulation: OQPSK, Mode 192, 902.2MHz**
	
Modulation: 2FSK, Mode 96, 915MHz	**Modulation: OQPSK, Mode 192, 914.8MHz**
	
Modulation: 2FSK, Mode 96, 927.8MHz	**Modulation: OQPSK, Mode 192, 927.8MHz**
	

Emissions level measurement	
Modulation: 2FSK, Mode 96, 902.2MHz (30MHz-1GHz)	**Modulation: 2FSK, Mode 96, 902.2MHz (1-10GHz)**



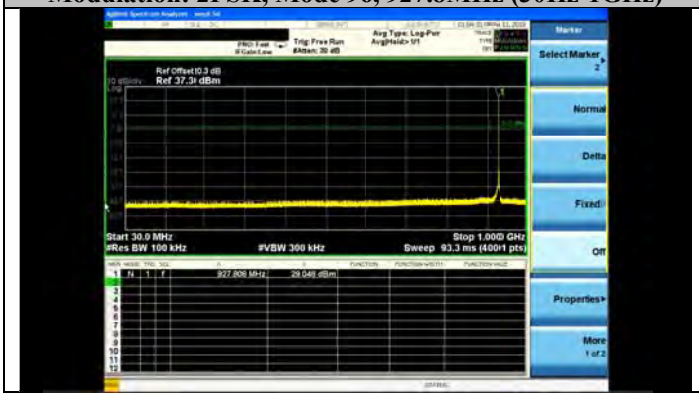
Modulation: 2FSK, Mode 96, 914.8MHz (30MHz-1GHz)

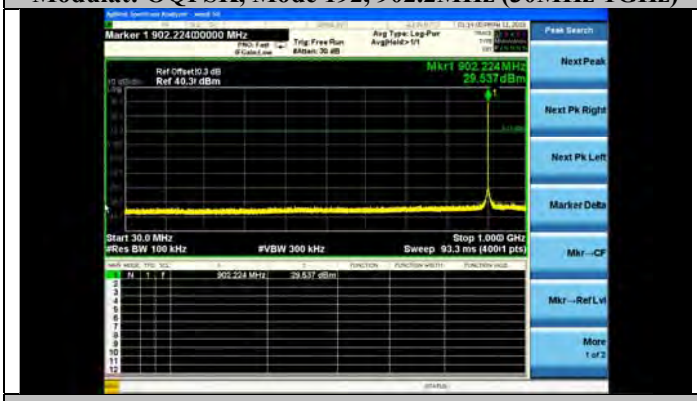
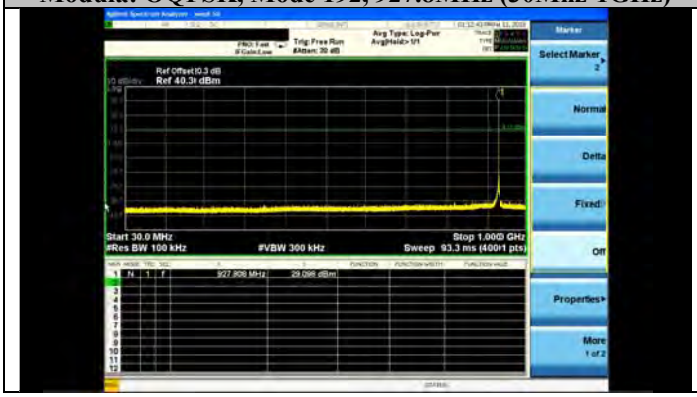
Modulation: 2FSK, Mode 96, 914.8MHz (1-10GHz)



Modulation: 2FSK, Mode 96, 927.8MHz (30Hz-1GHz)

Modulation: 2FSK, Mode 96, 927.8MHz (1-10GHz)



Emissions level measurement	
Modulat: OQPSK, Mode 192, 902.2MHz (30MHz-1GHz)	**Modulation: OQPSK, Mode 192, 902.2MHz (1-10GHz)**
	
Modulat: OQPSK, Mode 192, 915MHz (30MHz-1GHz)	**Modulation: OQPSK, Mode 192, 915MHz (1-10GHz)**
	
Modula: OQPSK, Mode 192, 927.8MHz (30Mhz-1GHz)	**Modulation: OQPSK, Mode 192, 927.8MHz (1-10GHz)**
	

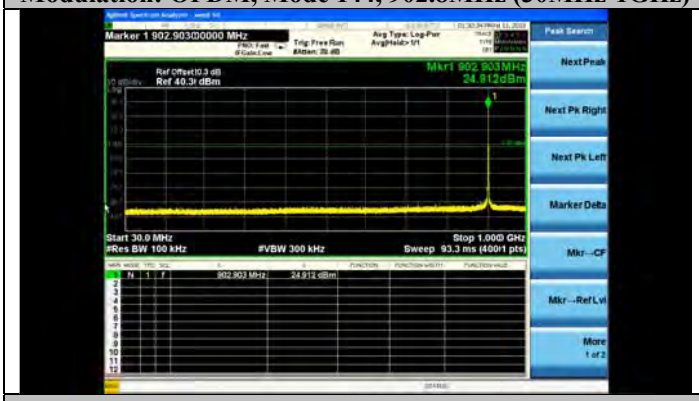
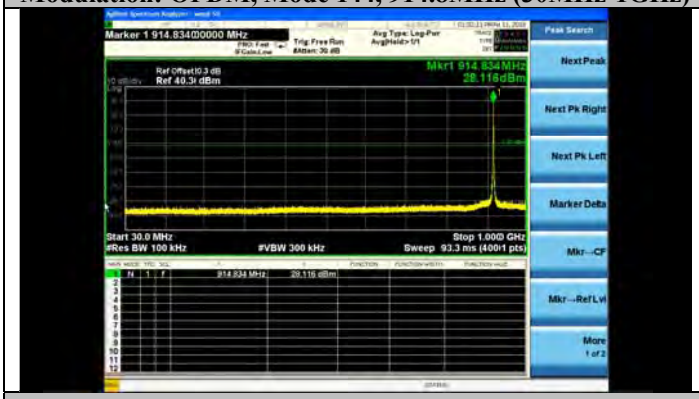
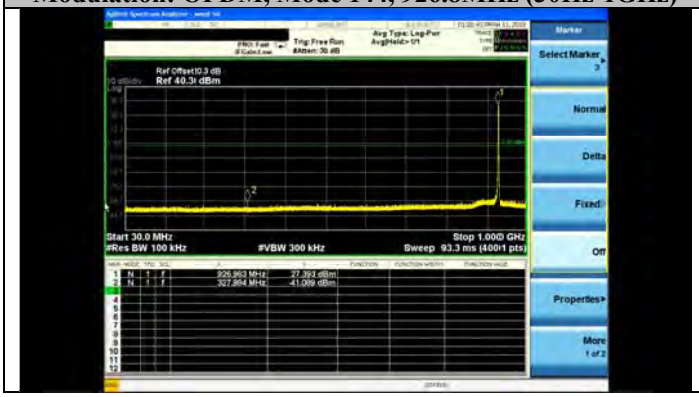
- 2nd Harmonics of all three channels falls under non-restricted bands and so limit of 20dBc satisfies
- Third Harmonics of all three channels falls under restricted bands so general limit of 15.209 needs to be satisfied. This is demonstrated in next section
- Sixth Harmonics of Channel 0 falls under restricted band so general limit of -41.2 and -21.2 Average and peak needs to be satisfied. This is demonstrated in next section
- 6th Harmonics of middle channel and last channel doesn't fall under restricted bands so limit of 20dBc needs to be satisfies

A.7.5 Emissions in non - Restricted Bands Graphical Test Results (OFDM Modes 30dBc)

Reference level measurement
Modulation: OFDM, Mode 144, 902.8MHz

Modulation: OFDM, Mode 144, 914.8MHz

Modulation: OFDM, Mode 144, 926.8MHz


Emissions level measurement	
Modulation: OFDM, Mode 144, 902.8MHz (30MHz-1GHz)	**Modulation: OFDM, Mode 144, 902.8MHz (1-10GHz)**
	
Modulation: OFDM, Mode 144, 914.8MHz (30MHz-1GHz)	**Modulation: OFDM, Mode 144, 914.8MHz (1-10GHz)**
	
Modulation: OFDM, Mode 144, 926.8MHz (30Hz-1GHz)	**Modulation: OFDM, Mode 144, 926.8MHz (1-10GHz)**
	

- 2nd Harmonics of all three channels falls under non-restricted bands and so limit of 20dBc satisfies
- Third Harmonics of all three channels falls under restricted bands so general limit of 15.209 needs to be satisfied. This is demonstrated in next section
- Sixth Harmonics of Channel 0 falls under restricted band so general limit of -41.2 and -21.2 Average and peak respectively needs to be satisfied. This is demonstrated in next section
- 6th Harmonics of middle channel and last channel doesn't fall under restricted bands so limit of 20dBc needs to be satisfies

A.8 Emissions in Restricted Bands

A.8.1 Limits

FCC 15.247(e); RSS-Gen 7.2.2(b)

FCC: Radiated emissions, which fall in the restricted bands, as, defined in FCC §15.205(a), must also comply with the radiated emission limits specified in Sec. 15.209(a).

RSS: Unwanted emissions falling into restricted bands of Table 6 shall comply with the limits specified in RSS-Gen

A.8.2 Test Procedure

Refer to ANSI C63.10-2013 Section 12.2

Peak Power measurement procedure:
Peak emission levels are measured by setting the instrument as follows:

- RBW = 100 kHz for below 1GHz and 1MHz for above 1GHz.
- VBW ≥ 3 × RBW.
- Detector = Peak.
- Sweep time = auto.
- Trace mode = max hold.
- Allow sweeps to continue until the trace stabilizes. (Note that the required measurement time may be longer for low duty cycle applications).

Average Power measurement procedure:
If the EUT can be configured or modified to transmit continuously (duty cycle ≥ 98 % then the average emission levels shall be measured using the following method (with EUT transmitting continuously).

- RBW = 1 MHz (unless otherwise specified).
- VBW ≥ 3 × RBW.
- Detector = RMS, if span/(# of points in sweep) ≤ (RBW/2). Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.
- Averaging type = power (i.e., RMS).
  - As an alternative, the detector and averaging type may be set for linear voltage averaging.
  - Some instruments require linear display mode in order to use linear voltage averaging. Log or dB averaging shall not be used.
- Sweep time = auto.
  Perform a trace average of at least 100 traces.

A.8.3 Emissions in Restricted Bands Results (2FSK and OQPSK)

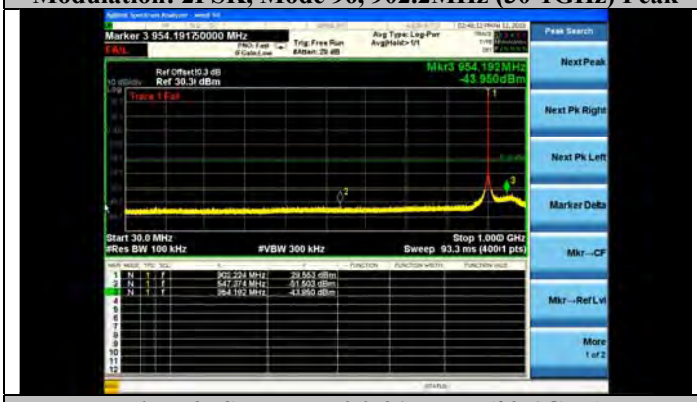
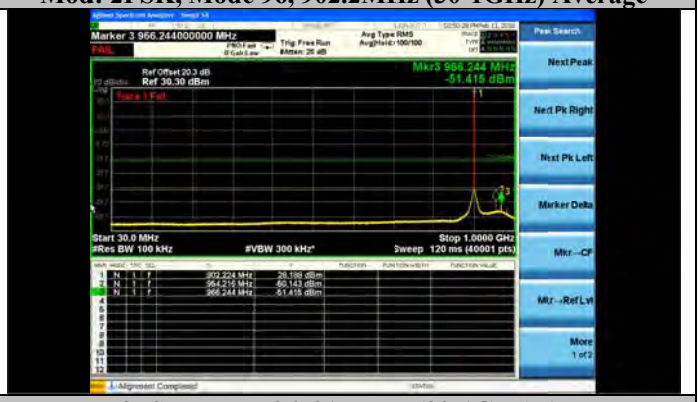
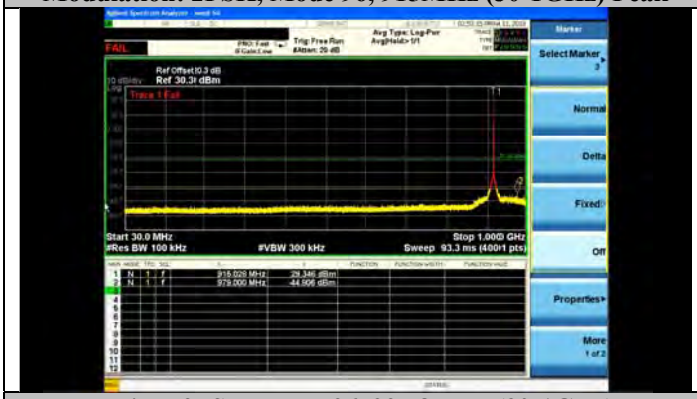
Frequency (MHz)	Data Rate (kbps)	A.G (dBi)	Restricted Bands (MHz)	Max. Emissions Level (dBm)	E.I.R.P (dBm)	Limit (dBm)	Result
Mode 96: 2FSK							
902.2	**50**	5.6	2600–2900	-49.316	-43.716	-21.2	Pass
			2600-2900	-52.365	-46.765	-41.2	Pass
		5.6	4500-5150	-53.831	-48.231	-21.2	Pass
			4500-5150	-59.446	-53.846	-41.2	Pass
		3.0	5350-5460	-43.250	-40.250	-21.2	Pass
			5350-5460	**-45.063**	**-42.063**	**-41.2**	**Pass**
915.0	**50**	5.6	2600–2900	-50.716	-45.116	-21.2	Pass
			2600-2900	**-53.564**	**-47.964**	**-41.2**	**Pass**
		5.6	4500-5150	-54.080	-48.480	-21.2	Pass
			4500-5150	-60.116	-54.516	-41.2	Pass
927.8	**50**	5.6	2600–2900	-51.445	-45.845	-21.2	Pass
			2600-2900	**-54.130**	**-48.530**	**-41.2**	**Pass**
		5.6	4500-5150	-52.872	-47.272	-21.2	Pass
			4500-5150	-57.902	-52.302	-41.2	Pass

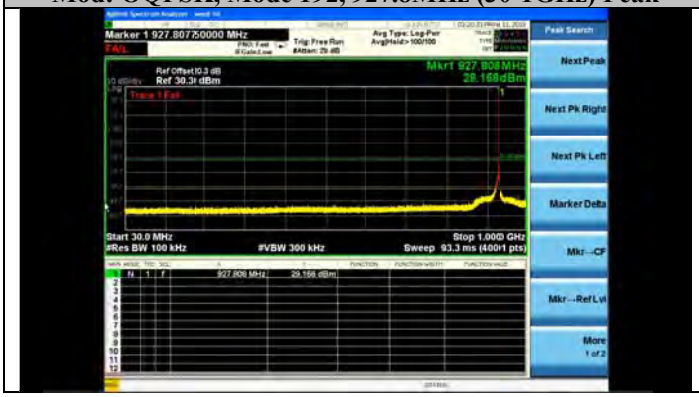
Mode 192: OQPSK							
902.2	**6.2**	5.6	2600–2900	-49.974	-44.374	-21.2	Pass
			2600-2900	-52.809	-47.209	-41.2	Pass
		5.6	4500-5150	-54.663	-49.063	-21.2	Pass
			4500-5150	-59.252	-53.652	-41.2	Pass
		3.0	5350-5460	-43.136	-40.136	-21.2	Pass
			5350-5460	**-44.732**	**-41.732**	**-41.2**	**Pass**
915.0	**6.2**	5.6	2600–2900	-50.411	-44.811	-21.2	Pass
			2600-2900	**-53.632**	**-48.032**	**-41.2**	**Pass**
		5.6	4500-5150	-54.045	-48.445	-21.2	Pass
			4500-5150	-59.246	-53.646	-41.2	Pass
927.8	**6.2**	5.6	2600–2900	-51.496	-45.896	-21.2	Pass
			2600-2900	**-55.361**	**-49.761**	**-41.2**	**Pass**
		5.6	4500-5150	-53.694	-48.094	-21.2	Pass
			4500-5150	-58.109	-52.509	-41.2	Pass

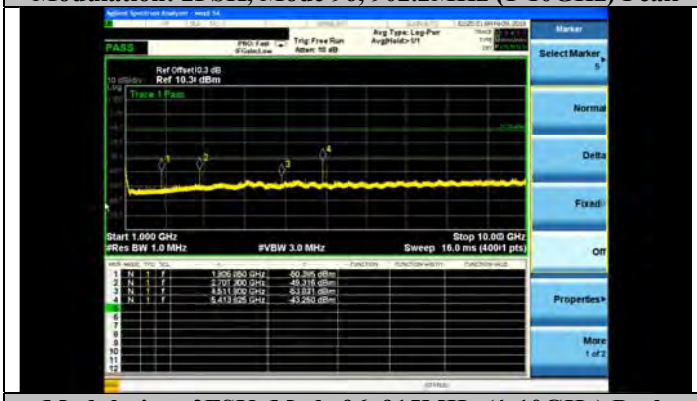
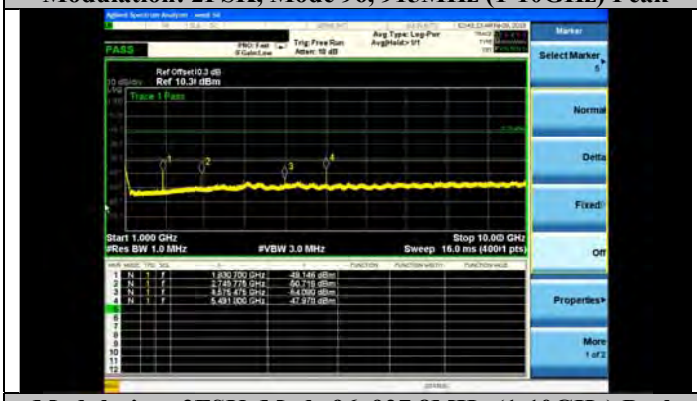
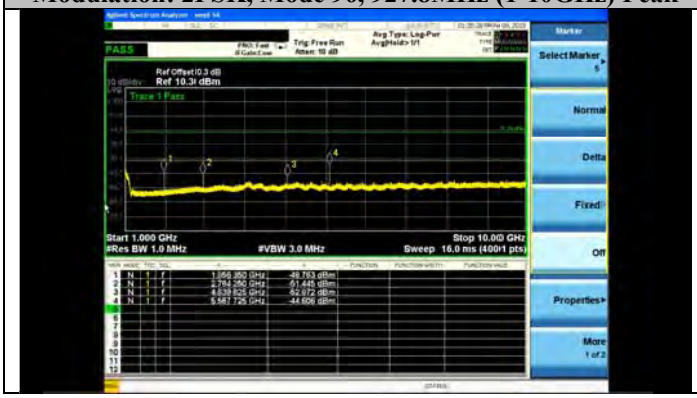
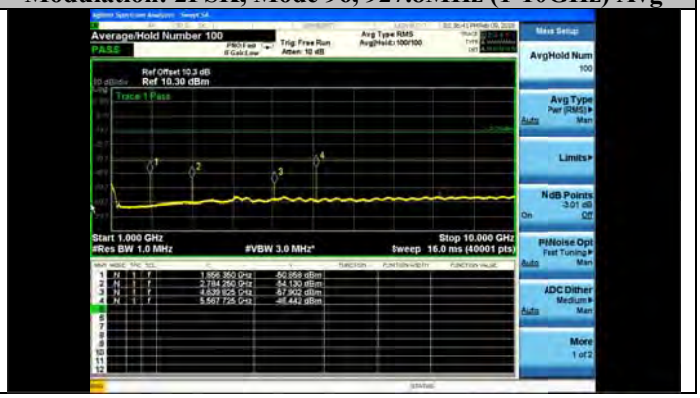
Mode 144: OFDM							
902.8	**50**	5.6	2600–2900	-54.670	-49.070	-21.2	Pass
			2600-2900	-61.998	-56.398	-41.2	Pass
		5.6	4500-5150	-54.560	-48.960	-21.2	Pass
			4500-5150	-63.410	-57.810	-41.2	Pass
		3.0	5350-5460	-39.382	-36.382	-21.2	Pass
			5350-5460	**-48.846**	**-45.846**	**-41.2**	**Pass**
914.8	**50**	5.6	2600–2900	-48.552	-42.952	-21.2	Pass
			2600-2900	**-56.166**	**-50.566**	**-41.2**	**Pass**
		5.6	4500-5150	-51.803	-46.203	-21.2	Pass
			4500-5150	-61.419	-55.819	-41.2	Pass
926.8	**50**	5.6	2600–2900	-51.018	-45.418	-21.2	Pass
			2600-2900	**-59.137**	**-53.537**	**-41.2**	**Pass**
		5.6	4500-5150	-54.281	-48.681	-21.2	Pass
			4500-5150	-61.587	-55.987	-41.2	Pass

As per below plot the normalized antenna gain for Channel 0 6th Harmonics is 3dBi.

A.8.4 Emissions in Restricted Bands Graphical Test Results (2FSK and OQPSK)

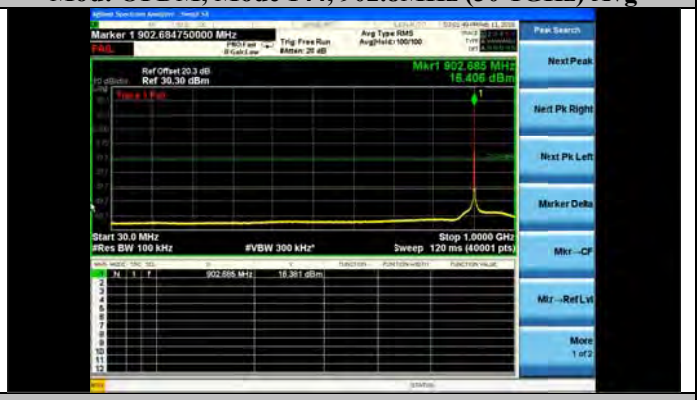
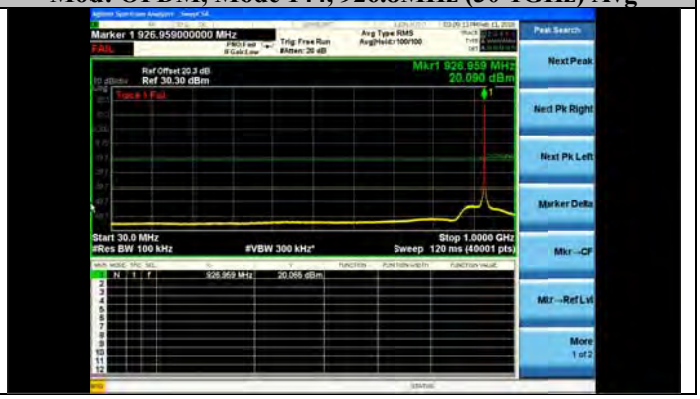
Emissions in restricted bands	
Modulation: 2FSK, Mode 96, 902.2MHz (30-1GHz) Peak	**Mod: 2FSK, Mode 96, 902.2MHz (30-1GHz) Average**
	
Modulation: 2FSK, Mode 96, 915MHz (30-1GHz) Peak	**Mod: 2FSK, Mode 96, 915MHz (30-1GHz) Average**
	
Modulation: 2FSK, Mode 96, 927.8MHz (30-1GHz) Peak	**Mod: 2FSK, Mode 96, 927.8MHz (30-1GHz) Average**
	

Emissions in restricted bands	
Mod: OQPSK, Mode 192, 902.2MHz (30-1GHz) Peak	**Mod: OQPSK, Mode 192, 902.2MHz (30-1GHz) Average**
	
Mod: OQPSK, Mode 192, 915MHz (30-1GHz) Peak	**Mod: OQPSK, Mode 192, 915MHz (30-1GHz) Average**
	
Mod: OQPSK, Mode 192, 927.8MHz (30-1GHz) Peak	**Mod: OQPSK, Mode 192, 927.8MHz (30-1GHz) Average**
	

Emissions in restricted bands	
Modulation: 2FSK, Mode 96, 902.2MHz (1-10GHz) Peak	**Modulation: 2FSK, Mode 96, 902.2MHz (1-10GHz) Avg**
	
Modulation: 2FSK, Mode 96, 915MHz (1-10GHz) Peak	**Modulation: 2FSK, Mode 96, 915MHz (1-10GHz) Avg**
	
Modulation: 2FSK, Mode 96, 927.8MHz (1-10GHz) Peak	**Modulation: 2FSK, Mode 96, 927.8MHz (1-10GHz) Avg**
	

Emissions in restricted bands	
Mod: OQPSK, Mode 192, 902.2MHz (1-10GHz) peak	**Mod: OQPSK, Mode 192, 902.2MHz (1-10GHz) Avg**
	
Mod: OQPSK, Mode 192, 915MHz (1-10GHz) Peak	**Mod: OQPSK, Mode 192, 915MHz (1-10GHz) Avg**
	
Mod: OQPSK, Mode 192, 927.8MHz (1-10GHz) Peak	**Mod: OQPSK, Mode 192, 927.8MHz (1-10GHz) Avg**
	

A.8.4 Emissions in Restricted Bands Graphical Test Results (OFDM Modes)

Emissions in restricted bands	
Mod: OFDM, Mode 144, 902.8MHz (30-1GHz) Peak	**Mod: OFDM, Mode 144, 902.8MHz (30-1GHz) Avg**
	
Mod: OFDM, Mode 144, 914.8MHz (30-1GHz) Peak	**Mod: OFDM, Mode 144, 914.8MHz (30-1GHz) Avg**
	
Mod: OFDM, Mode 144, 926.8MHz (30-1GHz) Peak	**Mod: OFDM, Mode 144, 926.8MHz (30-1GHz) Avg**
	

Emissions in restricted bands	
Mod: OFDM, Mode 144, 902.8MHz (1-10GHz) peak	**Mod: OFDM, Mode 144, 902.8MHz (1-10GHz) Avg**
	
Mod: OFDM, Mode 144, 914.8MHz (1-10GHz) Peak	**Mod: OFDM, Mode 144, 914.8MHz (1-10GHz) Avg**
	
Mod: OFDM, Mode 144, 926.8MHz (1-10GHz) Peak	**Mod: OFDM, Mode 144, 926.8MHz (1-10GHz) Avg**
	

Appendix B: Radiated Test Results

B.1 Radiated Spurious Emissions & Restricted Bands

FCC 15.209; RSS-Gen 8.9 Issue 4

The level of any unwanted emissions from an intentional radiator operating under these general provisions shall not exceed the level of the fundamental emission. Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the table specified in the table in FCC§15.209(a) and in RSS-Gen 8.9.

B.1.1 Limits

Radiated emissions which fall in the restricted bands, as defined in FCC Section 15.205(a) and RSS-Gen Section 8.9, must also comply with the radiated emission limits specified in FCC Section 15.209(a) and RSS-Gen Section 8.9.

15.209 (a) except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (uV/meter)	Field strength (dBuV/meter)	Measurement distance (meters)
30-88	100**	40 Qp	3
88-216	150**	43.5 Qp	3
216-960	200**	46 Qp	3
Above 960	500	54 Av / 74 Pk	3

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz However, operation within These frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz Radiated emission limits in these three bands are based on measurements employing an average detector

B.1.2 Test Procedure

Ref. C63.10-2013 section 6.5 & 6.6

Test Procedure
1. Using Vasona software, configure the spectrum analyzer as shown above (be sure to enter all losses between the transmitter output and the spectrum analyzer). 2. Place the radio in continuous transmit mode. Maximize Turntable (find worst case table angle) and maximize Antenna (find worst case height). 3. Use the peak marker function to determine the maximum amplitude level. 4. Center marker frequency and perform final measurement in Quasi-peak (≤ 1Ghz) and Average (above 1 GHz) 4. Record at least 6 highest readings for the worst case operating mode.

Ref. C63.10-2013 section 4 / CISPR16-1-1

Test Parameters
Span = Entire frequency range or segment if necessary. Reference Level = 80 dBuV RBW = 100 kHz (less than or equal to 1 GHz); 1 MHz (above 1 GHz) VBW ≥ 3 x RBW Detector = Peak & Quasi-Peak (frequency range 30 MHz to 1 GHz); Peak & Average (frequency range above 1 GHz); Changing VBW to 10 Hz for average measurement Sweep Time = Couple

. The system was evaluated up to 10 GHz
. These data represent the worst case mode data for all supported operating modes and antennas.

- For emissions below 1000 MHz, measurements shall be performed using a CISPR quasi-peak detector and the related measurement bandwidth. As an alternative to CISPR quasi-peak measurement, compliance with the emission limit can be demonstrated using measuring equipment employing a peak detector function properly adjusted for factors such as pulse desensitization as required, with an equal or greater measurement bandwidth relative to the applicable CISPR quasi-peak bandwidth.
- Above 1000 MHz, measurements shall be performed using an average detector with a minimum Resolution bandwidth of 1 MHz

B.1.3 Transmitter Radiated Spurious Emissions Graphical Data Results

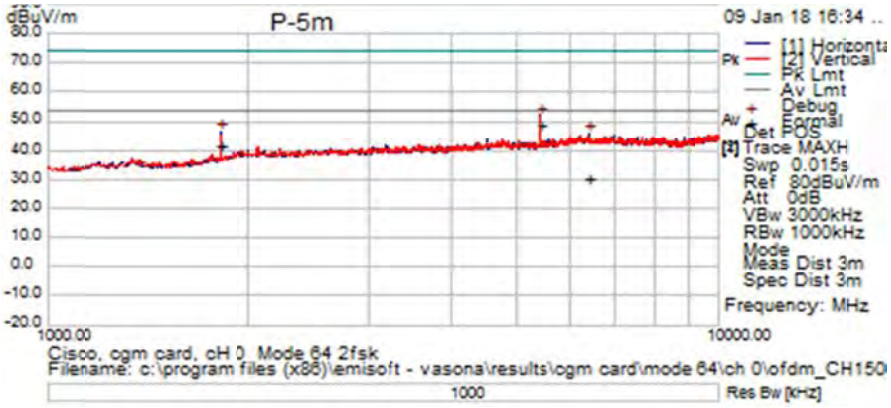
Subtest Date:	**11th Jan 2018**
Engineer	Ronak Patel
Lab Information	Building P, 5m Anechoic
Subtest Title	Transmitter Spurious Emissions

Frequency Range	30MHz-1GHz
Comments on the above Test Results	2FSK/Mode 96, Tx Channel 0 (902.2 MHz)

Title: **TX Spurious Emissions from 30MHz-1GHz – Ch0 (902.2 MHz)**

Frequency (MHz)	Raw (dBuV)	Cab Loss (dB)	AF (dB)	Level (dBuV)	Detector	Polarity	Height (cm)	Azt (Deg)	Limit (dBuV)	Margin (dB)	Results Pass / Fail	Comments
902.3938	39.8	2.79	13.11	55.7	Peak	H	150	0	46	9.7	Pass	Channel 0
109.8697	22.47	0.96	3.13	26.56	Quasi Peak	V	100	0	43.5	-16.94	Pass	
33.91625	18.37	0.53	8.89	27.79	Quasi Peak	V	100	0	40	-12.21	Pass	
86.31594	25.33	0.84	-2.03	24.14	Quasi Peak	V	100	0	40	-15.86	Pass	
77.38844	23.76	0.8	-1.69	22.87	Quasi Peak	V	100	0	40	-17.13	Pass	
131.0175	6.54	1.04	4.2	11.78	Quasi Peak	H	100	0	43.5	-31.72	Pass	

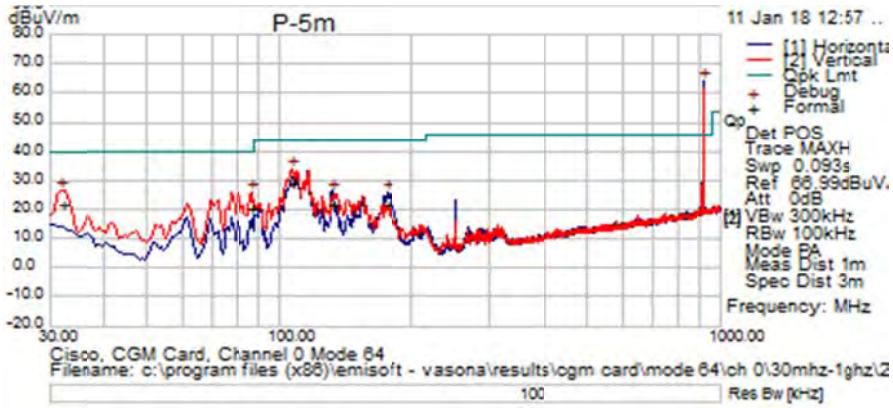
Subtest Date:	**9th Jan 2018**
Engineer	Ronak Patel
Lab Information	Building P, 5m Anechoic
Subtest Title	Transmitter Spurious Emissions
Frequency Range	1-10GHz
Comments on the above Test Results	2FSK/Mode 96, Tx Channel 0 (902.2 MHz)



Title: **TX Spurious Emissions from 1-10GHz – Ch0 (902.2 MHz)**

Frequency (MHz)	Raw (dBuV)	Cab Loss (dB)	AF (dB)	Level (dBuV)	Detector	Polarity	Height (cm)	Azt (Deg)	Limit (dBuV)	Margin (dB)	Results Pass / Fail	Comments
5413.419	49.19	7.33	-7.39	49.12	Average	H	99	360	54	-4.88	Pass	6th Harmonics
1804.383	51.15	4.03	-13.47	41.71	Average	H	400	60	54	-12.29	Pass	2nd Harmonics
6382.545	27.18	8.11	-4.62	30.67	Average	H	350	188	54	-23.33	Pass	

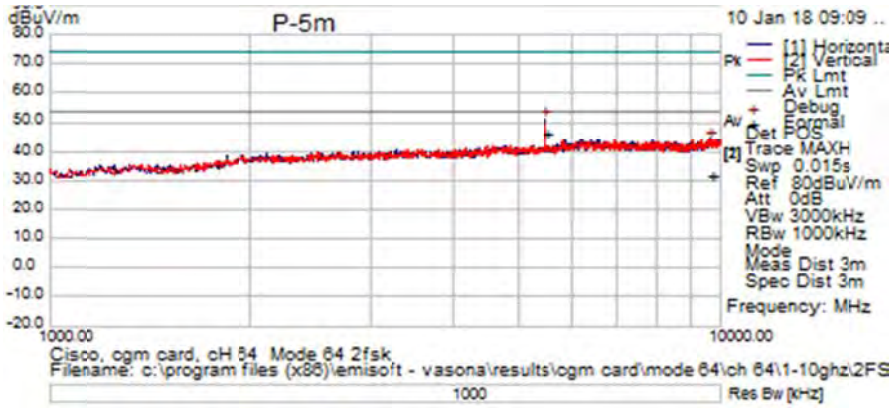
Subtest Date:	**11th Jan 2018**
Engineer	Ronak Patel
Lab Information	Building P, 5m Anechoic
Subtest Title	Transmitter Spurious Emissions
Frequency Range	30MHz-1GHz
Comments on the above Test Results	2FSK/Mode 96, Tx Channel 64 (915 MHz)



Title: **TX Spurious Emissions from 30MHz-1GHz – Ch64 (915 MHz)**

Frequency (MHz)	Raw (dBuV)	Cab Loss (dB)	AF (dB)	Level (dBuV)	Detector	Polarity	Height (cm)	Azt (Deg)	Limit (dBuV)	Margin (dB)	Results Pass / Fail	Comments
915.125	48.3	2.82	13.26	64.38	Peak	H	150	0	46	18.38	Pass	Channel 64
106.91	25.6	0.94	2.55	29.09	Quasi Max	V	101	134	43.5	-14.42	Pass	
32.03375	11.33	0.51	10.23	22.07	Quasi Max	V	105	19	40	-17.93	Pass	
86.37	21.83	0.84	-2.03	20.64	Quasi Max	V	123	292	40	-19.36	Pass	
130.9344	16.52	1.04	4.2	21.77	Quasi Max	H	126	88	43.5	-21.74	Pass	
174.68	19.05	1.21	1.88	22.14	Quasi Max	H	273	92	43.5	-21.36	Pass	

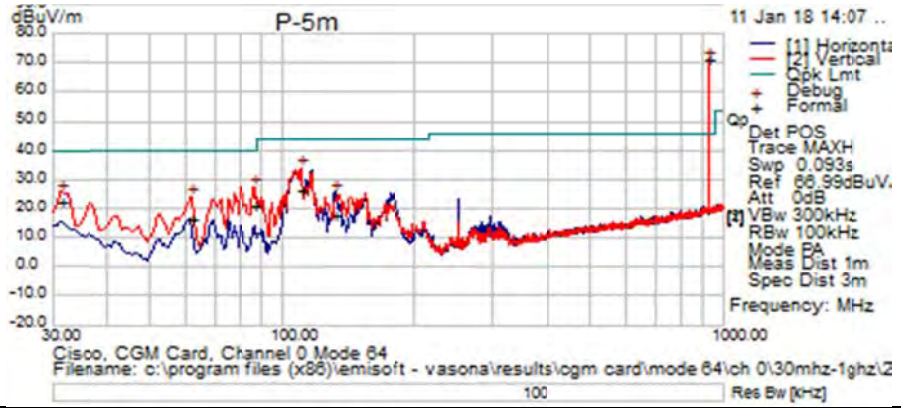
Subtest Date:	**10th Jan 2018**
Engineer	Ronak Patel
Lab Information	Building P, 5m Anechoic
Subtest Title	Transmitter Spurious Emissions
Frequency Range	1-10GHz
Comments on the above Test Results	2FSK/Mode 96, Tx Channel 64 (915 MHz)



Title: **TX Spurious Emissions from 1-10GHz – Ch64 (915 MHz)**

Frequency (MHz)	Raw (dBuV)	Cab Loss (dB)	AF (dB)	Level (dBuV)	Detector	Polarity	Height (cm)	Azt (Deg)	Limit (dBuV)	Margin (dB)	Results Pass / Fail	Comments
5489.99	45.84	7.37	-7.03	46.17	Average	H	210	357	54	-7.83	Pass	6th Harmonics
9708.52	24.52	10.45	-3.4	31.57	Average	H	250	360	54	-22.43	Pass	

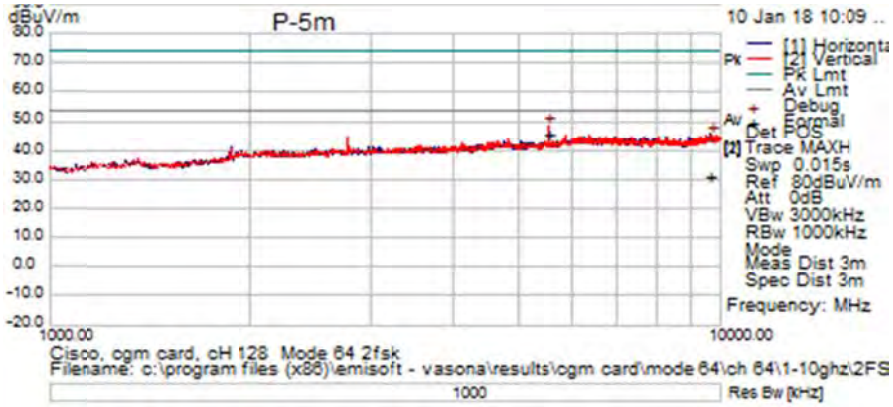
Subtest Date:	**11th Jan 2018**
Engineer	Ronak Patel
Lab Information	Building P, 5m Anechoic
Subtest Title	Transmitter Spurious Emissions
Frequency Range	30MHz-1GHz
Comments on the above Test Results	2FSK/Mode 96, Tx Channel 128 (927.8 MHz)



Title: **TX Spurious Emissions from 30MHz-1GHz – Ch128 (927.8 MHz)**

Frequency (MHz)	Raw (dBuV)	Cab Loss (dB)	AF (dB)	Level (dBuV)	Detector	Polarity	Height (cm)	Azt (Deg)	Limit (dBuV)	Margin (dB)	Results Pass / Fail	Comments
109.7669	22.57	0.95	3.11	26.64	Quasi Max	H	177	73	43.5	-16.86	Pass	
86.29031	22.62	0.84	-2.04	21.42	Quasi Max	V	139	239	40	-18.58	Pass	
31.16688	11.53	0.5	10.87	22.9	Quasi Max	V	105	154	40	-17.1	Pass	
61.45344	18.03	0.73	-1.82	16.94	Quasi Max	V	162	168	40	-23.06	Pass	
131.3684	13.01	1.04	4.17	18.23	Quasi Max	H	105	261	43.5	-25.27	Pass	
927.8563	55.32	2.84	13.06	71.22	Peak	V	100	0	46	25.22	Fail	Channel 128

Subtest Date:	**10th Jan 2018**
Engineer	Ronak Patel
Lab Information	Building P, 5m Anechoic
Subtest Title	Transmitter Spurious Emissions
Frequency Range	1-10GHz
Comments on the above Test Results	2FSK/Mode 96, Tx Channel 128 (927.8 MHz)



Title: **TX Spurious Emissions from 1-10GHz – Ch128 (927.8 MHz)**

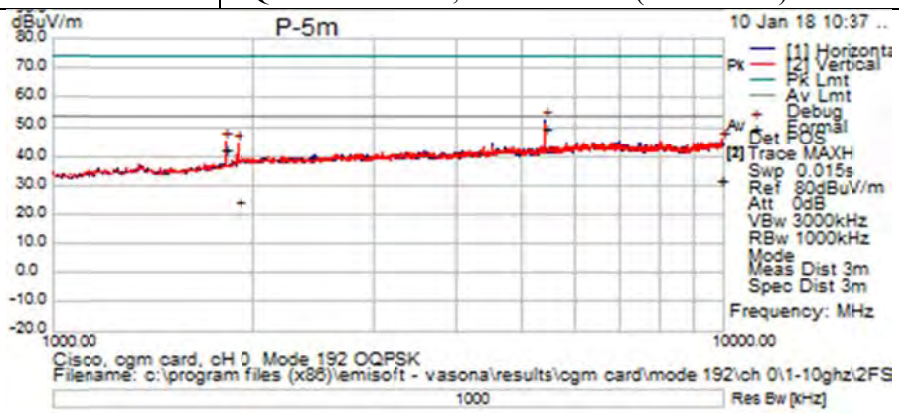
Frequency (MHz)	Raw (dBuV)	Cab Loss (dB)	AF (dB)	Level (dBuV)	Detector	Polarity	Height (cm)	Azt (Deg)	Limit (dBuV)	Margin (dB)	Results Pass / Fail	Comments
5566.792	44.82	7.4	-6.62	45.6	Average	V	200	359	54	-8.41	Pass	6th Harmonics
9645.89	24.19	10.4	-3.14	31.45	Average	H	400	104	54	-22.56	Pass	

Subtest Date:	**11th Jan 2018**
Engineer	Ronak Patel
Lab Information	Building P, 5m Anechoic
Subtest Title	Transmitter Spurious Emissions
Frequency Range	30MHz-1GHz
Comments on the above Test Results	OQPSK/Mode 192, Tx Channel 0 (902.2 MHz)

Title: **TX Spurious Emissions from 30MHz-1GHz – Ch0 (902.2 MHz)**

Frequency (MHz)	Raw (dBuV)	Cab Loss (dB)	AF (dB)	Level (dBuV)	Detector	Polarity	Height (cm)	Azt (Deg)	Limit (dBuV)	Margin (dB)	Results Pass / Fail	Comments
902.3938	37.99	2.79	13.11	53.89	Peak	H	300	0	46	7.89	Fail	Channel 0
115.4522	8.9	0.98	3.89	13.78	Quasi Peak	H	150	0	43.5	-29.72	Pass	
86.22438	21.41	0.84	-2.04	20.21	Quasi Peak	V	100	0	40	-19.79	Pass	
32.32156	12.84	0.51	10.02	23.38	Quasi Peak	V	100	0	40	-16.63	Pass	
131.3775	6.42	1.04	4.17	11.64	Quasi Peak	H	100	0	43.5	-31.86	Pass	
153.4534	18.98	1.13	2.69	22.8	Quasi Peak	V	250	0	43.5	-20.7	Pass	

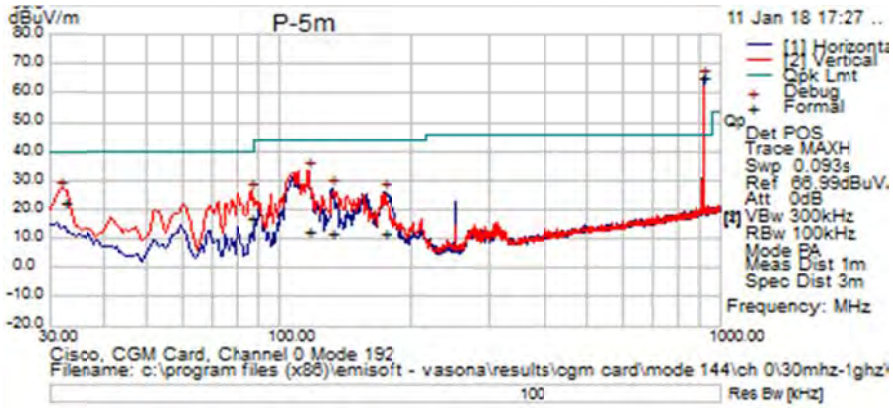
Subtest Date:	**10th Jan 2018**
Engineer	Ronak Patel
Lab Information	Building P, 5m Anechoic
Subtest Title	Transmitter Spurious Emissions
Frequency Range	1-10GHz
Comments on the above Test Results	OQPSK/Mode 192, Tx Channel 0 (902.2 MHz)



Title: **TX Spurious Emissions from 1-10GHz – Ch0 (902.2 MHz)**

Frequency (MHz)	Raw (dBuV)	Cab Loss (dB)	AF (dB)	Level (dBuV)	Detector	Polarity	Height (cm)	Azt (Deg)	Limit (dBuV)	Margin (dB)	Results Pass / Fail	Comments
5413.387	49.94	7.33	-7.39	49.87	Average	H	100	358	54	-4.13	Pass	6th Harmonics
9952.81	24.15	10.68	-2.84	31.99	Average	V	400	49	54	-22.01	Pass	
1804.525	51.6	4.03	-13.47	42.16	Average	H	300	219	54	-11.84	Pass	2nd Harmonics
1892.1	33	4.13	-12.42	24.71	Average	V	350	307	54	-29.29	Pass	

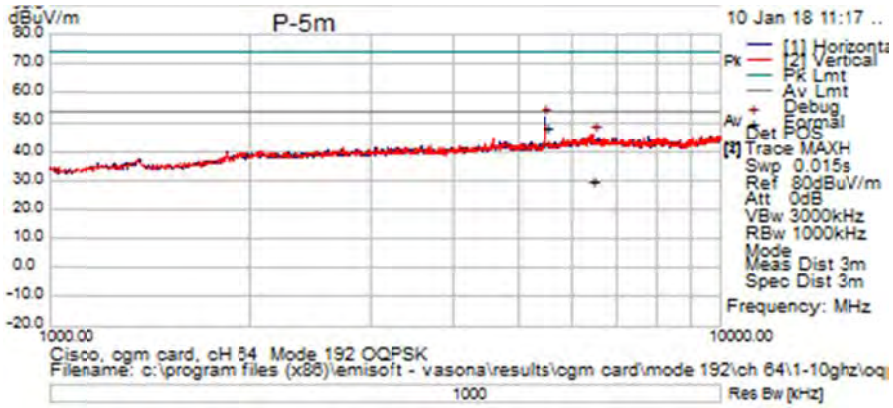
Subtest Date:	**11th Jan 2018**
Engineer	Ronak Patel
Lab Information	Building P, 5m Anechoic
Subtest Title	Transmitter Spurious Emissions
Frequency Range	30MHz-1GHz
Comments on the above Test Results	OQPSK/Mode 192, Tx Channel 64 (915 MHz)



Title: **TX Spurious Emissions from 30MHz-1GHz – Ch64 (915 MHz)**

Frequency (MHz)	Raw (dBuV)	Cab Loss (dB)	AF (dB)	Level (dBuV)	Detector	Polarity	Height (cm)	Azt (Deg)	Limit (dBuV)	Margin (dB)	Results Pass / Fail	Comments
915.125	49.18	2.82	13.26	65.26	Peak	H	150	0	46	19.26	Pass	Channel 64
116.0141	7.64	0.98	3.94	12.56	Quasi Peak	H	150	0	43.5	-30.94	Pass	
32.48	12.49	0.51	9.9	22.91	Quasi Peak	V	100	0	40	-17.09	Pass	
86.19969	18.66	0.84	-2.04	17.46	Quasi Peak	V	150	0	40	-22.54	Pass	
131.1434	6.53	1.04	4.19	11.76	Quasi Peak	H	100	0	43.5	-31.74	Pass	
172.1878	8.71	1.21	2.03	11.94	Quasi Peak	H	100	0	43.5	-31.56	Pass	

Subtest Date:	**10th Jan 2018**
Engineer	Ronak Patel
Lab Information	Building P, 5m Anechoic
Subtest Title	Transmitter Spurious Emissions
Frequency Range	1-10GHz
Comments on the above Test Results	OQPSK/Mode 192, Tx Channel 64 (915 MHz)



Title: **TX Spurious Emissions from 1-10GHz – Ch64 (915 MHz)**

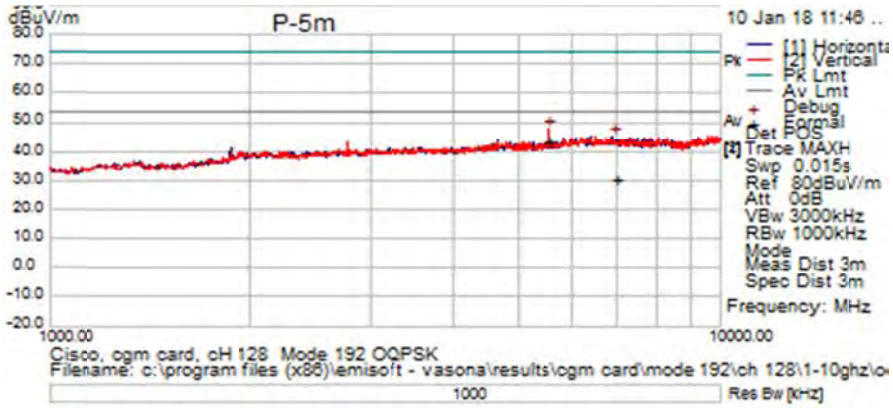
Frequency (MHz)	Raw (dBuV)	Cab Loss (dB)	AF (dB)	Level (dBuV)	Detector	Polarity	Height (cm)	Azt (Deg)	Limit (dBuV)	Margin (dB)	Results Pass / Fail	Comments
5489.767	47.74	7.37	-7.03	48.08	Average	H	150	350	54	-5.92	Pass	6th Harmonics
6468.418	26.68	8.23	-4.86	30.05	Average	V	300	100	54	-23.95	Pass	

Subtest Date:	**11th Jan 2018**
Engineer	Ronak Patel
Lab Information	Building P, 5m Anechoic
Subtest Title	Transmitter Spurious Emissions
Frequency Range	30MHz-1GHz
Comments on the above Test Results	OQPSK/Mode 192, Tx Channel 128(927.8 MHz)

Title: **TX Spurious Emissions from 30MHz-1GHz – Ch128 (927.8 MHz)**

Frequency (MHz)	Raw (dBuV)	Cab Loss (dB)	AF (dB)	Level (dBuV)	Detector	Polarity	Height (cm)	Azt (Deg)	Limit (dBuV)	Margin (dB)	Results Pass / Fail	Comments
927.8563	56.41	2.84	13.06	72.31	Peak	H	100	0	46	26.31	Pass	Channel 128
107.0631	22.86	0.94	2.58	26.38	Quasi Peak	V	101	0	43.5	-17.13	Pass	
115.8159	19.27	0.98	3.92	24.18	Quasi Peak	V	99	0	43.5	-19.33	Pass	
31.89281	11.46	0.51	10.33	22.3	Quasi Peak	V	99	0	40	-17.7	Pass	
80.70094	17.52	0.82	-1.89	16.45	Quasi Peak	V	99	0	40	-23.55	Pass	
86.30906	15.87	0.84	-2.04	14.68	Quasi Peak	V	200	0	40	-25.32	Pass	

Subtest Date:	**10th Jan 2018**
Engineer	Ronak Patel
Lab Information	Building P, 5m Anechoic
Subtest Title	Transmitter Spurious Emissions
Frequency Range	1-10GHz
Comments on the above Test Results	OQPSK/Mode 192, Tx Channel 128 (927.8 MHz)



Title: **TX Spurious Emissions from 1-10GHz – Ch128 (927.8 MHz)**

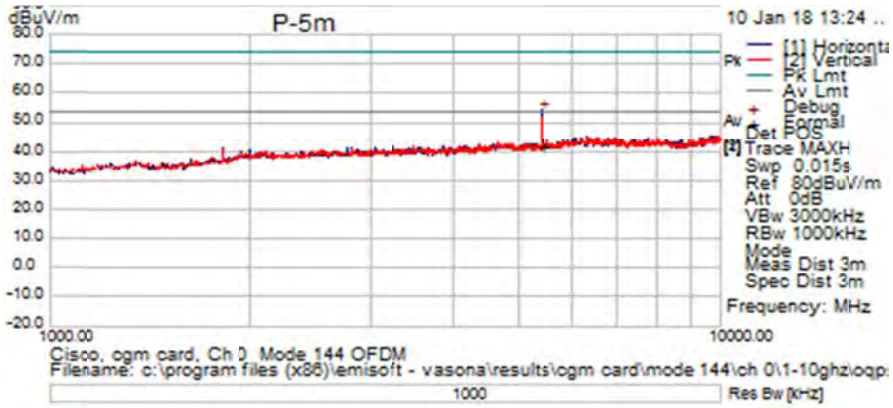
Frequency (MHz)	Raw (dBuV)	Cab Loss (dB)	AF (dB)	Level (dBuV)	Detector	Polarity	Height (cm)	Azt (Deg)	Limit (dBuV)	Margin (dB)	Results Pass / Fail	Comments
5567.063	43.05	7.4	-6.62	43.83	Average	V	200	358	54	-10.17	Pass	6th Harmonics
6960.648	26.79	8.58	-4.97	30.4	Average	H	100	166	54	-23.6	Pass	

Subtest Date:	**11th Jan 2018**
Engineer	Ronak Patel
Lab Information	Building P, 5m Anechoic
Subtest Title	Transmitter Spurious Emissions
Frequency Range	30MHz-1GHz
Comments on the above Test Results	OFDM/Mode 144, Tx Channel 0(902.8 MHz)

Title: **TX Spurious Emissions from 30MHz-1GHz – Ch0(902.8 MHz)**

Frequency (MHz)	Raw (dBuV)	Cab Loss (dB)	AF (dB)	Level (dBuV)	Detector	Polarity	Height (cm)	Azt (Deg)	Limit (dBuV)	Margin (dB)	Results Pass / Fail	Comments
903	37.96	2.79	13.12	53.87	Peak	H	100	0	46	7.87	Pass	Channel 0
106.5981	20.77	0.94	2.48	24.19	Quasi Peak	V	100	0	43.5	-19.31	Pass	
32.34969	11.59	0.51	10	22.1	Quasi Peak	V	100	0	40	-17.9	Pass	
79.99625	18.4	0.81	-1.84	17.37	Quasi Peak	V	100	0	40	-22.63	Pass	
153.0291	6.42	1.13	2.7	10.25	Quasi Peak	H	100	0	43.5	-33.25	Pass	
133.8084	14.68	1.05	4.03	19.76	Quasi Peak	V	200	0	43.5	-23.74	Pass	

Subtest Date:	**10th Jan 2018**
Engineer	Ronak Patel
Lab Information	Building P, 5m Anechoic
Subtest Title	Transmitter Spurious Emissions
Frequency Range	1-10GHz
Comments on the above Test Results	OFDM/Mode 144, Tx Channel 0 (902.8 MHz)



Title: **TX Spurious Emissions from 1-10GHz – Ch0 (902.8 MHz)**

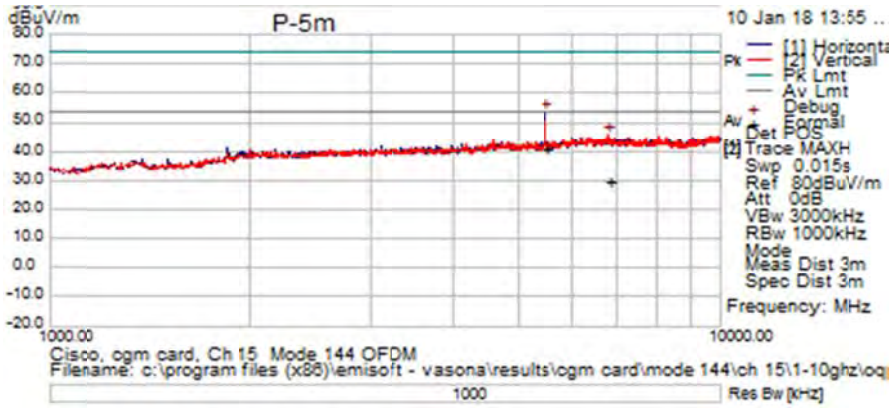
Frequency (MHz)	Raw (dBuV)	Cab Loss (dB)	AF (dB)	Level (dBuV)	Detector	Polarity	Height (cm)	Azt (Deg)	Limit (dBuV)	Margin (dB)	Results Pass / Fail	Comments
5416.789	42.03	7.33	-7.38	41.98	Average	H	250	358	54	-12.02	Pass	6th Harmonics

Subtest Date:	**11th Jan 2018**
Engineer	Ronak Patel
Lab Information	Building P, 5m Anechoic
Subtest Title	Transmitter Spurious Emissions
Frequency Range	30MHz-1GHz
Comments on the above Test Results	OFDM/Mode 144, Tx Channel 15(902.8 MHz)

Title: **TX Spurious Emissions from 30MHz-1GHz – Ch15(914.8 MHz)**

Frequency (MHz)	Raw (dBuV)	Cab Loss (dB)	AF (dB)	Level (dBuV)	Detector	Polarity	Height (cm)	Azt (Deg)	Limit (dBuV)	Margin (dB)	Results Pass / Fail	Comments
914.5188	48.33	2.82	13.26	64.4	Peak	H	150	0	46	18.4	Pass	Channel 15
107.1206	23.64	0.94	2.59	27.17	Quasi Peak	V	100	0	43.5	-16.33	Pass	
88.68063	19.86	0.85	-1.85	18.87	Quasi Peak	V	250	0	43.5	-24.63	Pass	
31.89719	10.38	0.51	10.33	21.21	Quasi Peak	V	100	0	40	-18.79	Pass	
72.06156	15.93	0.77	-1.48	15.22	Quasi Peak	V	100	0	40	-24.78	Pass	
178.335	8.84	1.23	1.66	11.72	Quasi Peak	H	100	0	43.5	-31.78	Pass	

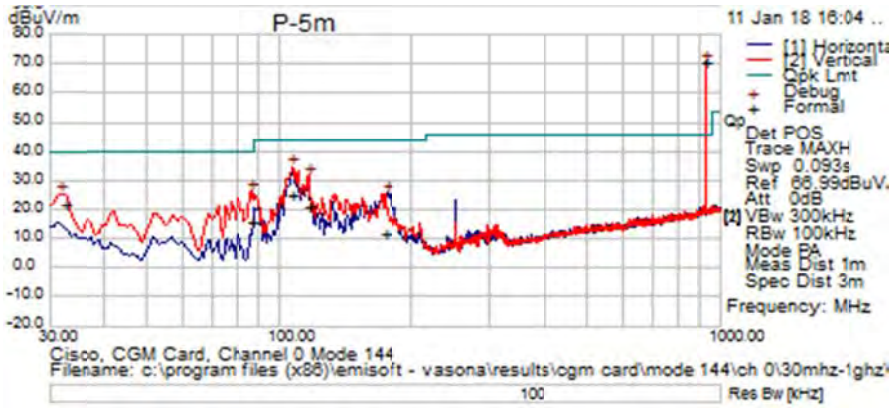
Subtest Date:	**10th Jan 2018**
Engineer	Ronak Patel
Lab Information	Building P, 5m Anechoic
Subtest Title	Transmitter Spurious Emissions
Frequency Range	1-10GHz
Comments on the above Test Results	OFDM/Mode 144, Tx Channel 15(914.8 MHz)



Title: **TX Spurious Emissions from 1-10GHz – Ch15 (914.8 MHz)**

Frequency (MHz)	Raw (dBuV)	Cab Loss (dB)	AF (dB)	Level (dBuV)	Detector	Polarity	Height (cm)	Azt (Deg)	Limit (dBuV)	Margin (dB)	Results Pass / Fail	Comments
5489.617	40.85	7.37	-7.03	41.19	Average	H	200	40	54	-12.81	Pass	6th Harmonics
6835.678	26.8	8.48	-5.2	30.09	Average	V	100	315	54	-23.92	Pass	

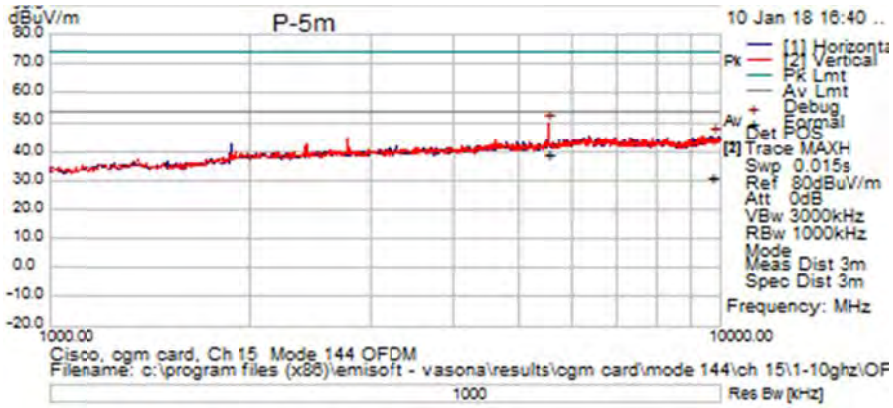
Subtest Date:	**11th Jan 2018**
Engineer	Ronak Patel
Lab Information	Building P, 5m Anechoic
Subtest Title	Transmitter Spurious Emissions
Frequency Range	30MHz-1GHz
Comments on the above Test Results	OFDM/Mode 144, Tx Channel 30(926.8 MHz)



Title: **TX Spurious Emissions from 30MHz-1GHz – Ch30(926.8 MHz)**

Frequency (MHz)	Raw (dBuV)	Cab Loss (dB)	AF (dB)	Level (dBuV)	Detector	Polarity	Height (cm)	Azt (Deg)	Limit (dBuV)	Margin (dB)	Results Pass / Fail	Comments
926.6438	54.78	2.84	13.06	70.68	Peak	H	100	0	46	24.68	Pass	Channel 30
106.9831	22	0.94	2.56	25.5	Quasi Peak	V	101	0	43.5	-18	Pass	
115.6956	16.45	0.98	3.91	21.34	Quasi Peak	V	99	0	43.5	-22.16	Pass	
86.10656	16.94	0.84	-2.05	15.73	Quasi Peak	V	150	0	40	-24.27	Pass	
32.35406	11.14	0.51	9.99	21.65	Quasi Peak	V	100	0	40	-18.35	Pass	
172.3516	8.73	1.21	2.02	11.95	Quasi Peak	H	300	0	43.5	-31.55	Pass	

Subtest Date:	**10th Jan 2018**
Engineer	Ronak Patel
Lab Information	Building P, 5m Anechoic
Subtest Title	Transmitter Spurious Emissions
Frequency Range	1-10GHz
Comments on the above Test Results	OFDM/Mode 144, Tx Channel 30(926.8 MHz)



Title: **TX Spurious Emissions from 1-10GHz – Ch30(926.8 MHz)**

Frequency (MHz)	Raw (dBuV)	Cab Loss (dB)	AF (dB)	Level (dBuV)	Detector	Polarity	Height (cm)	Azt (Deg)	Limit (dBuV)	Margin (dB)	Results Pass / Fail	Comments
5560.113	38.07	7.38	-6.65	38.8	Average	V	150	1	54	-15.2	Pass	6th Harmonics
9732.578	24.38	10.47	-3.43	31.42	Average	H	350	8	54	-22.58	Pass	

Appendix C: AC Power Line Conducted Emissions

FCC 15.207

Except when the requirements applicable to a given device state otherwise, for any radio apparatus equipped to operate from the public utility AC power supply, either directly or indirectly (such as with a battery charger), the radio frequency voltage of emissions conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in the table in these sections. The more stringent limit applies at the frequency range boundaries.

RSS-Gen 8.8 Issue 4

A radio apparatus that is designed to be connected to the public utility (AC) power line shall ensure that the radio frequency voltage, which is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz-30 MHz, shall not exceed the limits .

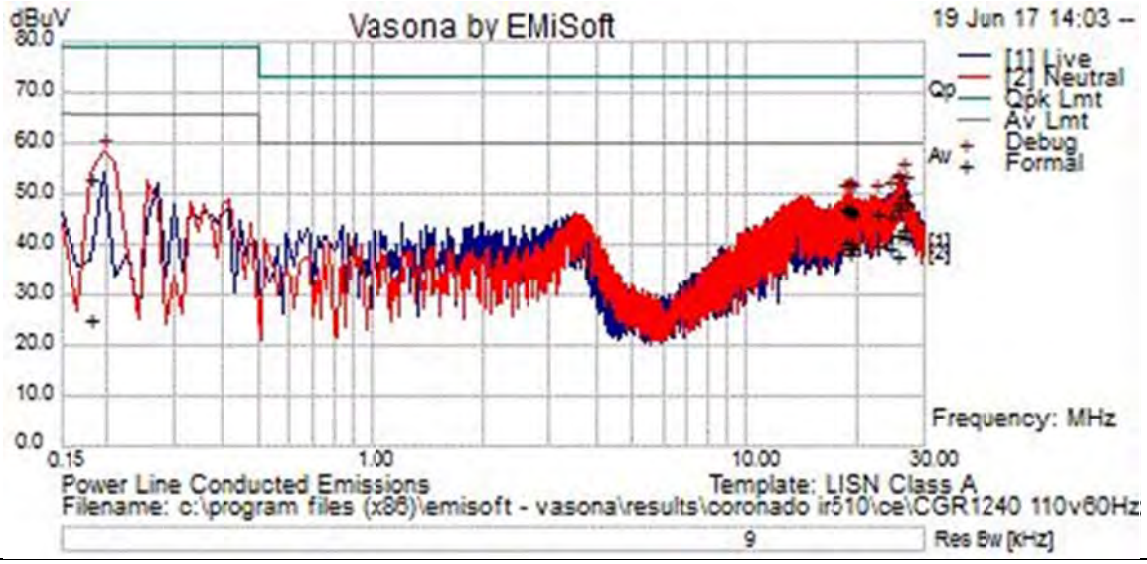
Unless the requirements applicable to a given device state otherwise, for any radio apparatus equipped to operate from the public utility AC power supply either directly or indirectly (such as with a battery charger), the radio frequency voltage of emissions conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown below. The more stringent limit applies at the frequency range boundaries.

Test Number: 201996 **Spec ID:** 2680				
Basic Standard	**Applied to**	**Class**	**Freq Range**	**Test Details / Comments**
CFR47 Part 15 Subpart B	AC Power Line	A	0.15MHz - 30MHz	U.S line voltages must be used. 110V 60Hz and/or 208V 60Hz (only when the product has a dedicated 208V input). FCC test method ANSI C63-4 2014.
Operating Mode	**Mode :** 1, CGM - WW Formal Test			
Power Input	110, 60Hz (+/-20%)			
Overall Result	Pass			
Comments	No further comments			
Deviation	There were no deviations from the specification			

System Number	Description	Samples	System under test	Support equipment
1	EUT - CGM	S03 and S04	☑	☐
2	Support Equipment (IR510, IR530, ASR1k switch, Isolator switch, Rackmount computer with Monitor, Laptop, Keyboard and Mouse)	S01, S02, S06, S07, S08, S09, S10, S11, S12, S13 and S14	☐	☑
3	Ixia Traffic Generator	S05	☐	☑

Subtest Number: 201996 - 1	**Subtest Date:** 31-Jul-2017
Engineer	Chakravarthy Sulva
Lab Information	Building P, Shield Room 1
Subtest Results	
Line Under Test	[L] AC Power
Transducer	LISN
Subtest Result	Pass
Highest Frequency	30.0
Lowest Frequency	0.15
Comments on the above Test Results	EUT powered by 110V/60Hz.
Environmental Conditions:	
Temperature: (59 to 95)F	68.5F
Humidity: (10 to 75)%:	48.6%

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Title: CE 150K-30MHz, 110V/60Hz

Frequency MHz	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement Type	Line	Limit dBuV	Margin dB	Pass /Fail	Comments
26.137	22.4	20.6	0.3	43.3	Av	L	60	-16.7	Pass	
25.338	21.1	20.6	0.2	41.9	Av	L	60	-18.1	Pass	
26.668	20.7	20.6	0.3	41.6	Av	N	60	-18.4	Pass	
18.782	19.9	20.4	0.2	40.5	Av	N	60	-19.5	Pass	
18.363	19.9	20.4	0.2	40.5	Av	N	60	-19.5	Pass	
22.293	19.3	20.5	0.2	40	Av	N	60	-20	Pass	
18.55	19	20.4	0.2	39.6	Av	N	60	-20.4	Pass	
19.283	18.8	20.4	0.2	39.4	Av	N	60	-20.6	Pass	
24.305	18.6	20.5	0.2	39.4	Av	L	60	-20.6	Pass	
18.942	17.8	20.4	0.2	38.4	Av	N	60	-21.6	Pass	
25.423	16.7	20.6	0.2	37.6	Av	L	60	-22.4	Pass	
26.137	29	20.6	0.3	49.9	Qp	L	73	-23.1	Pass	
25.338	27.6	20.6	0.2	48.4	Qp	L	73	-24.6	Pass	
26.668	27.5	20.6	0.3	48.4	Qp	N	73	-24.6	Pass	
18.782	26.8	20.4	0.2	47.4	Qp	N	73	-25.6	Pass	
25.423	26.6	20.6	0.2	47.4	Qp	L	73	-25.6	Pass	
18.363	26.6	20.4	0.2	47.2	Qp	N	73	-25.8	Pass	
0.178935	31.9	21	0	52.9	Qp	N	79	-26.1	Pass	
18.942	26.2	20.4	0.2	46.8	Qp	N	73	-26.2	Pass	
18.55	26	20.4	0.2	46.6	Qp	N	73	-26.4	Pass	
22.293	25.8	20.5	0.2	46.5	Qp	N	73	-26.5	Pass	
19.283	25.5	20.4	0.2	46.1	Qp	N	73	-26.9	Pass	
24.305	25.1	20.5	0.2	45.8	Qp	L	73	-27.2	Pass	
0.178935	3.9	21	0	24.9	Av	N	66	-41.1	Pass	

Appendix D: List of Test Equipment Used to perform the test

Radiated Testing

Equip#	Manufacturer/ Model	Description	Last Cal	Next Due
42013	ETS Lindgren/3117	Double Ridged Horn Antenna	04th May 2017	04th May 2018
45096	CISCO/TH0118	Mast Mount Preamplifier Array, 1-18GHz	31st Oct 2017	31st Oct 2018
47300	Keysight (Agilent/HP)/ N9038A	EMI Receiver	28th Mar 2017	28th Mar 2018
49563	HUBER + SUHNER/ Sucoflex 106A	Coaxial Cable, 8m	21st Aug 2017	21st Aug 2018
21117	MICRO-COAX/UFB311A-0-2484-520520	Coaxial Cable-18Ghz	16th Aug 2017	16th Aug 2018
25662	MICRO-COAX/UFB311A-1-0840-504504	Coaxial Cable, 84.0 in. to 18GHz	21st Aug 2017	21st Aug 2018
56128	PASTERNACK/PE6072	SMA 50 Ohm Termination	1st Dec 2017	1st Dec 2018
35235	LUFKIN/HY1035CME	Tape Measure	n/a	n/a
30654	SUNOL SCIENCES/JB1	Combination Antenna, 30MHz-2GHz	19th Jan 2018	19th Jan 2019
40597	CISCO/Above 1GHz Site Cal	1GHz Cispr Site Verification	26th Sep 2017	26th Sep 2018
8448	CISCO/NSA CAL	NSA Chamber	06th Oct 2017	06th Oct 2018
8171	Keysight (Agilent/HP)/ 8491B Opt 010	ATTENUATOR	26th April 2017	26th April 2018

Conducted testing				
49516	Keysight (Agilent/HP)/ N9030A-550	PXA Signal Analyzer, 3Hz to 50GHz	02nd Nov 2017	02nd Nov 2018
54402	HUBER + SUHNER/Sucoflex 102	RF Cable 2.4mm - N Type 18GHz	20th Apr 2017	20th Apr 2018
55603	MINI-CIRCUITS/BW-S10-2W263	SMA 10dB Attenuator	31st Aug 2017	31st Aug 2018
54367	AEROFLEX/ 40AH2W-20	SMA Attenuator, 20 dB 40GHz	21st Apr 2017	21st Apr 2018
46385	Micro-Tronics/HPM16310	Highpass Filter	26th Jun 2017	26th Jun 2018

Equipment used: Conducted Emissions					
Equipment No	Manufacturer	Model	Description	Last Cal	Next Cal Due Date
CIS002464	Fischer Custom Communications	FCC-801-M2-16	CDN, 2-LINE, 16A	10-MAR-17	10-MAR-18
CIS005687	Fluke	73 III	Digital Multimeter	03-NOV-16	03-NOV-17
CIS007704	Fischer Custom Communications	FCC-LISN-50/250-50-2-01	LISN	05-MAY-17	05-MAY-18
CIS007705	Fischer Custom Communications	FCC-LISN-50/250-50-2-01	LISN	02-JUN-17	02-JUN-18
CIS018963	York	CNE V	Comparison Noise Emitter, 30 - 1000MHz	Cal Not Required	N/A
CIS020913	Fischer Custom Communications	FCC-LISN-PA-NEMA-5-15	AC Adapter	05-MAY-17	05-MAY-18
CIS021135	Fischer Custom Communications	FCC-LISN-PA-NEMA-5-15	AC Adapter	02-JUN-17	02-JUN-18
CIS029960	Fischer Custom Communications	FCC-LISN-50/250-50-2-01	LISN	09-MAR-17	09-MAR-18
CIS029962	Fischer Custom Communications	FCC-LISN-PA-NEMA-5-15	Power Adaptor, Polarized 120VAC	09-MAR-17	09-MAR-18
CIS035236	Stanley	33-696	5 Meter Tape Measure	Cal Not Required	N/A
CIS045050	Rohde & Schwarz	ESCI	EMI Test Receiver	09-NOV-16	09-NOV-17
CIS046719	Bird	5-T-MB	5W 50 Ohm BNC Termination 4GHz	28-NOV-16	28-NOV-17
CIS047408	Teseq	CCN 1000-1	Harmonic/Flicker Test System -AC Power Analyzer	04-JAN-17	04-JAN-18
CIS047409	Teseq	NSG 1007	Harmonic/Flicker Test System -AC Power Source	04-JAN-17	04-JAN-18
CIS049468	Coleman	RG223	BNC 25 ft Cable	10-MAR-17	10-MAR-18
CIS049481	Coleman	RG223	BNC 2ft Cable	12-APR-17	12-APR-18
CIS049532	TTE	H785-150K-50-21378	High Pass Filter	03-MAY-17	03-MAY-18
CIS049555	Bird	5-T-MB	5W 50 Ohm BNC Termination 4GHz	10-AUG-16	10-AUG-17
CIS049560	Bird	5-T-MB	5W 50 Ohm BNC Termination 4GHz	10-AUG-16	10-AUG-17
CIS051750	Bird	5-T-MB	5W 50 Ohm BNC Termination 4GHz	10-AUG-16	10-AUG-17
CIS054231	Newport	iBTHP-5-DB9	5 inch Temp/RH/Press Sensor w/20ft cable	09-FEB-17	09-FEB-18

Appendix E: Abbreviation Key and Definitions

The following table defines abbreviations used within this test report.

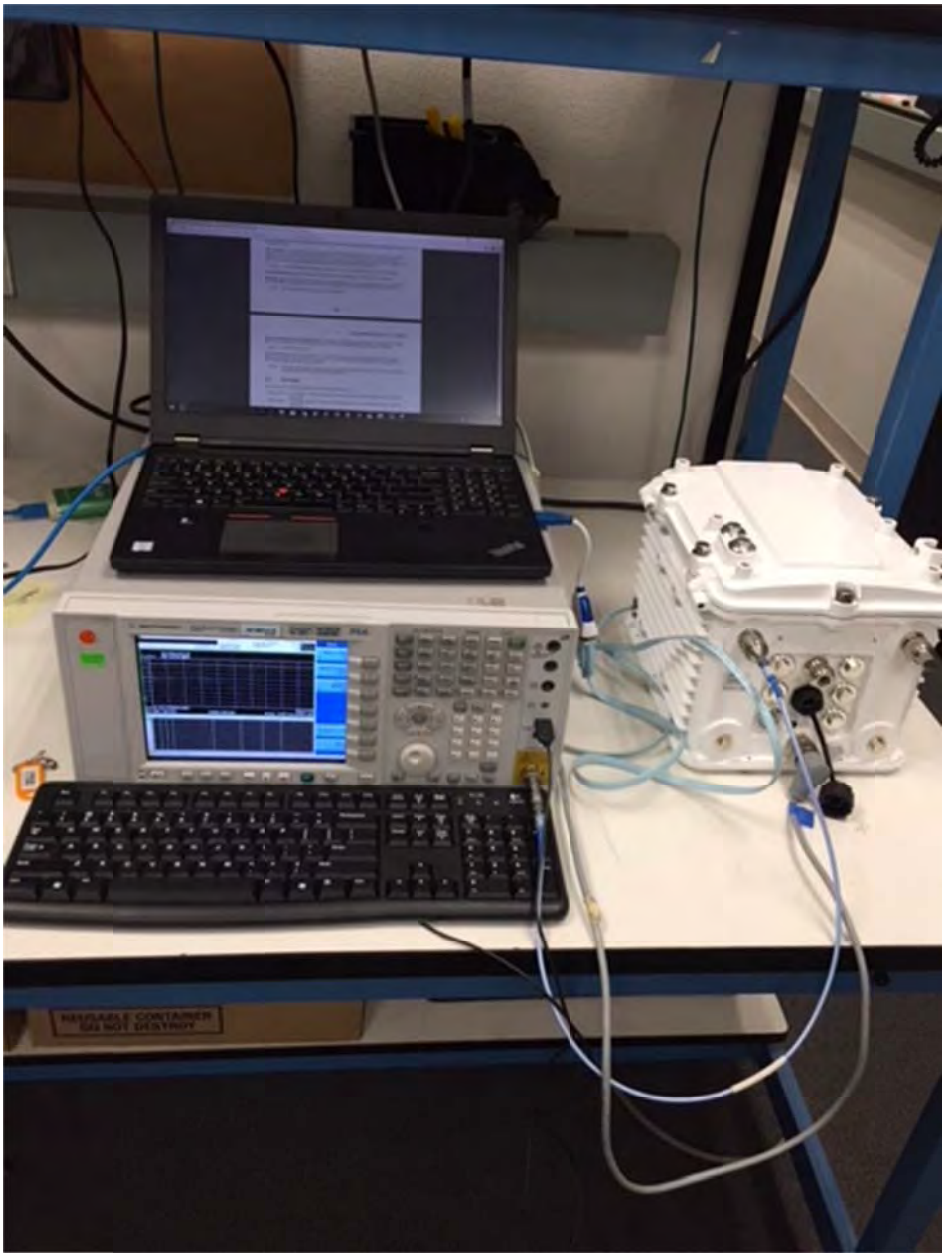
Abbreviation	Description	Abbreviation	Description
EMC	Electro Magnetic Compatibility	°F	Degrees Fahrenheit
EMI	Electro Magnetic Interference	°C	Degrees Celsius
EUT	Equipment Under Test	Temp	Temperature
ITE	Information Technology Equipment	S/N	Serial Number
TAP	Test Assessment Schedule	Qty	Quantity
ESD	Electro Static Discharge	Emf	Electromotive force
EFT	Electric Fast Transient	RMS	Root mean square
EDCS	Engineering Document Control System	Qp	Quasi Peak
Config	Configuration	Av	Average
CIS#	Cisco Number (unique identification number for Cisco test equipment)	Pk	Peak
Cal	Calibration	kHz	Kilohertz ($1x10^3$)
EN	European Norm	MHz	MegaHertz ($1x10^6$)
IEC	International Electro technical Commission	GHz	Gigahertz ($1x10^9$)
CISPR	International Special Committee on Radio Interference	H	Horizontal
CDN	Coupling/Decoupling Network	V	Vertical
LISN	Line Impedance Stabilization Network	dB	decibel
PE	Protective Earth	V	Volt
GND	Ground	kV	Kilovolt ($1x10^3$)
L1	Line 1	µV	Microvolt ($1x10^{-6}$)
L2	Line2	A	Amp
L3	Line 3	µA	Micro Amp ($1x10^{-6}$)
DC	Direct Current	mS	Milli Second ($1x10^{-3}$)
RAW	Uncorrected measurement value, as indicated by the measuring device	µS	Micro Second ($1x10^{-6}$)
RF	Radio Frequency	µS	Micro Second ($1x10^{-6}$)
SLCE	Signal Line Conducted Emissions	M	Meter
Meas dist	Measurement distance	Spec dist	Specification distance
N/A or NA	Not Applicable	SL	Signal Line (or Telecom Line)
P	Power Line	L	Live Line
N	Neutral Line	R	Return
S	Supply	AC	Alternating Current

Appendix F: Software Used to Perform Testing

EMIsoft Vasona, version 6.024

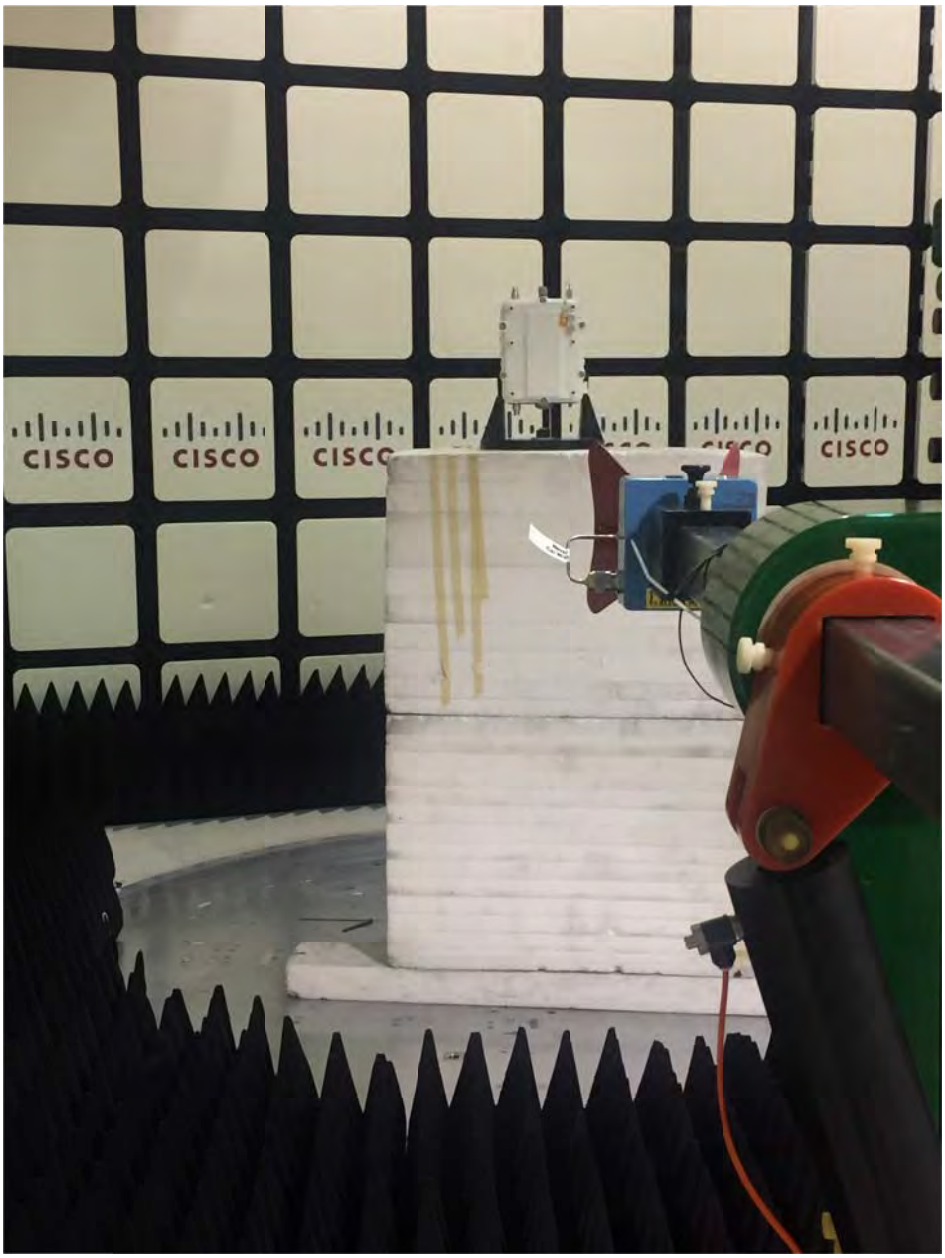
Appendix G: Test setup photos

Conducted test setup photos

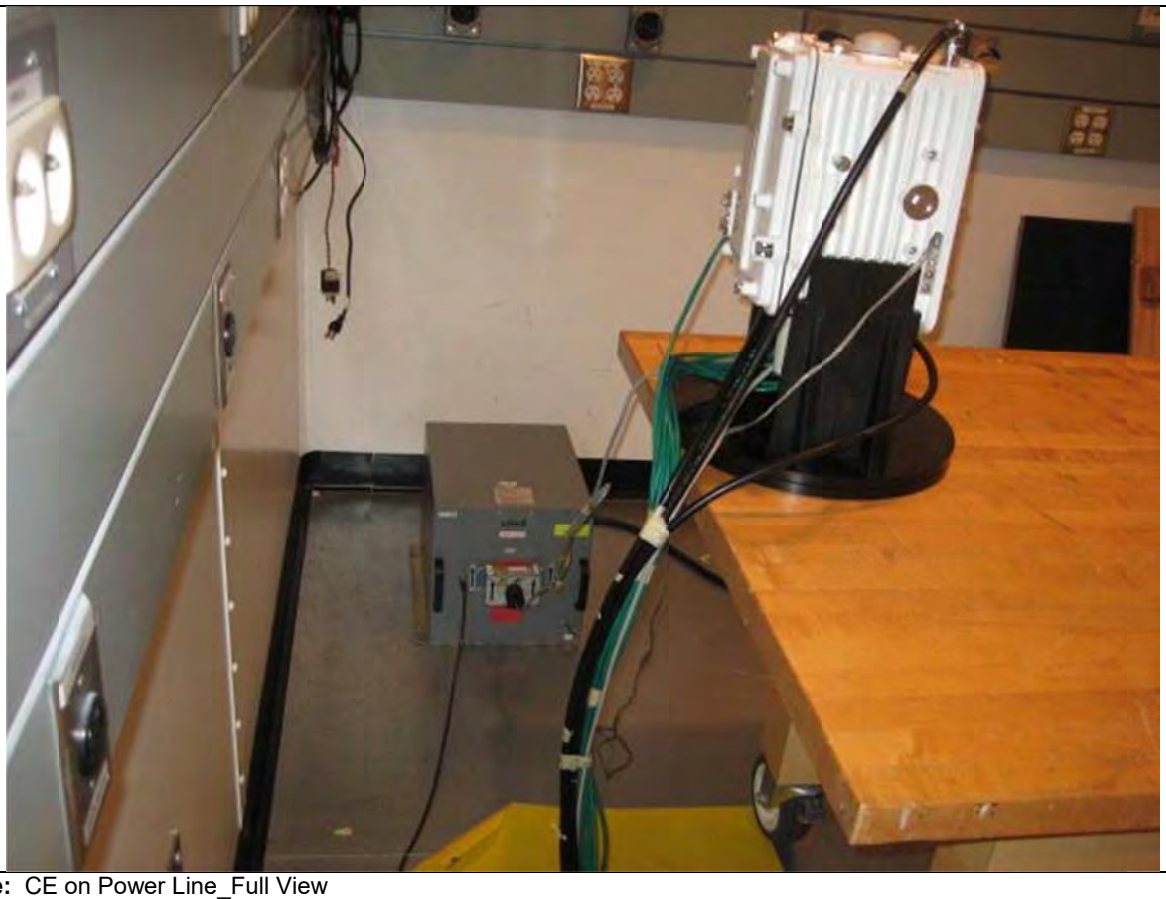


Radiated Test setup below 1GHz

Radiated Test setup above 1GHz



AC Line Conducted test setup



Title: CE on Power Line_Full View

EUT Photos
CGM card in CGR1240/K9


EUT Photos
CGM card in CGR1240/K9 Internal


EUT Photos
CGM card in CGR1240/K9 Internal

Appendix H: Test Procedures

Measurements were made in accordance with

- ANSI C63.10:2013,
- 558074 D01 DTS Meas Guidance v04
- RSS Gen Issue 4
- Public Notice DA Public notice DA-00 705

Appendix I: Scope of Accreditation (A2LA certificate number 1178-01)

The scope of accreditation of Cisco Systems, Inc. can be found on the A2LA web page at:

http://www.a2la.org/scopepdf/1178-01.pdf

Appendix J: Worst Case Justification

Worst case modes were selected by ANSI C63.10 2013 Section **5.6.2.2**

For devices with multiple operating modes, measurements on the middle channel can be used to determine the worst-case mode(s). The worst-case modes are as follows:

a) Band edge requirements—Measurements on the mode with the widest bandwidth can be used to cover the same channel (center frequency) on modes with narrower bandwidth that have the same or lower output power for each modulation family (e.g., OFDM and direct sequence spread spectrum).

b) Spurious emissions—Measure the mode with the highest output power and the mode with the highest output power spectral density for each modulation family (e.g., OFDM and direct sequence spread spectrum).

c) In-band PSD—Measurements on the mode with the narrowest bandwidth can be used to cover all modes within the same modulation family of an equal or lower output power provided the result is less than 50% of the limit.