2.8 SPURIOUS RADIATED EMISSIONS

EUT Nomenclature	Wireless Gateway	**Test Request No.**	EMC-1259-1
Model No.	FWSG	**Serial No.**	05303
Test Start Date	2-Sep-2013	**Temperature (°C)**	23.5
Test End Date	14-Dec-2013	**Humidity RH (%)**	55.2
Tested By	Sasikala Subramani	**Pressure (mbar)**	NR
Input Voltage / Freq	24 Vdc		
Operating Mode	Refer Page 5 for Operating Mode Table		
Test configuration	Refer Page 5 for Test Configuration Table		
Deviation from Std	NA		
Comment			

TEST FREQUENCY RANGE

Start Frequency	9 KHz	**Stop Frequency**	10 GHz

MAXIMUM OPERATING FREQUENCY

902 MHz – 928 MHz

TEST PARAMETERS

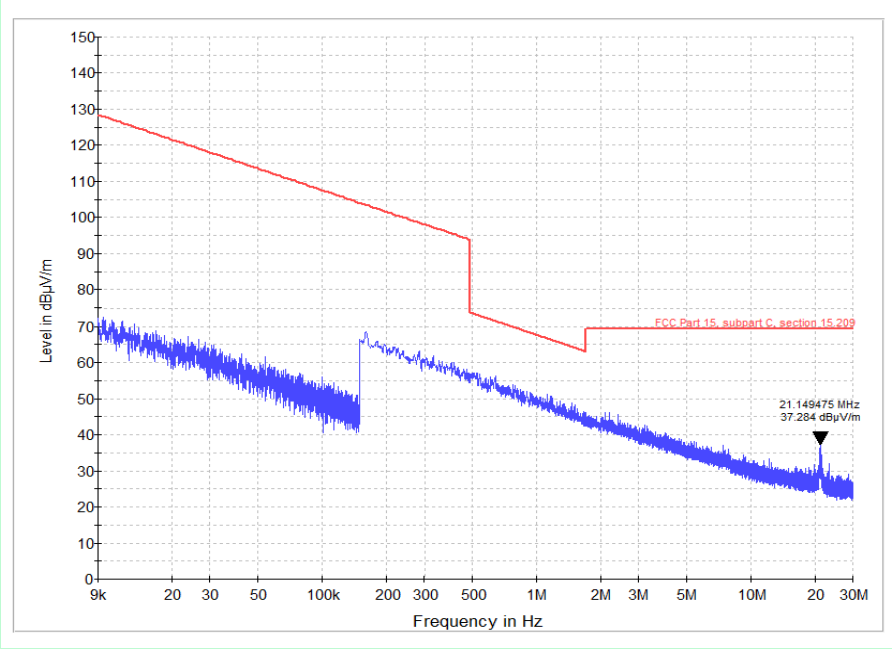
Antenna Height	1m to 4m	**Turntable Rotation**	0° to 360°
Applicable standard	FCC Part 15.247 & 15.209	**Test Method**	DA 00-705
Equipment Class	NA	**Measurement Distance**	3m

TEST EQUIPMENT

Y/N	Equipment	Make	Model	Sl. No.	Cal Due Date
Y	EMI Test Receiver	R&S	ESU26	100229	04-Feb-2014
Y	3m Semi Anechoic Chamber	ETS Lindgren	DKE 6X7 DBL.DR	1625	31-Dec-2013
Y	Double Ridge Guide Horn Antenna	ETS Lindgren	3117	00064055	07-Nov-2013
Y	Bilog Antenna	ETS Lindgren	HLP3003C	130525	30-Nov-2013
Y	Loop Antenna	ETS Lindgren	6507	000103694	12-Mar-2014
Y	RF cable (9KHz to 1GHz)	COLEMAN	RG214	RE-1A	09-May-2014
Y	RF cable (9KHz to 1GHz)	COLEMAN	RG214	RE-1B	09-May-2014
Y	RF cable (1GHz to 18GHz)	AH Systems	SAC-18G-06	RE-2A	09-May-2014
Y	RF cable (1GHz to 18GHz)	AH Systems	SAC-18G-06	RE-2B	09-May-2014
Y	Signal Conditioning unit	R&S	SCU-18	10178	13-June-2014
Y	High Pass Filter	Wainwright	WHKX1.5/15G-12ST	1	09-May-2014
Y	EMC32 Software	R&S	8.30.0	820-OT101248	NA

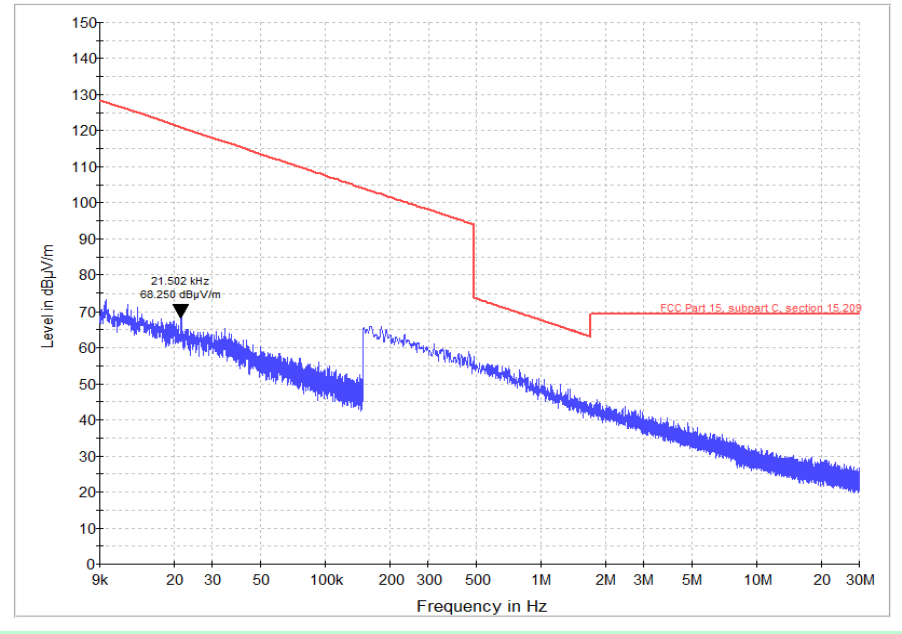
Note: Switch ON/OFF the Internal Preamplifier based on carrier level and or noise floor without overloading the receiver

TEST GRAPHS – 9 KHz to 30 MHz



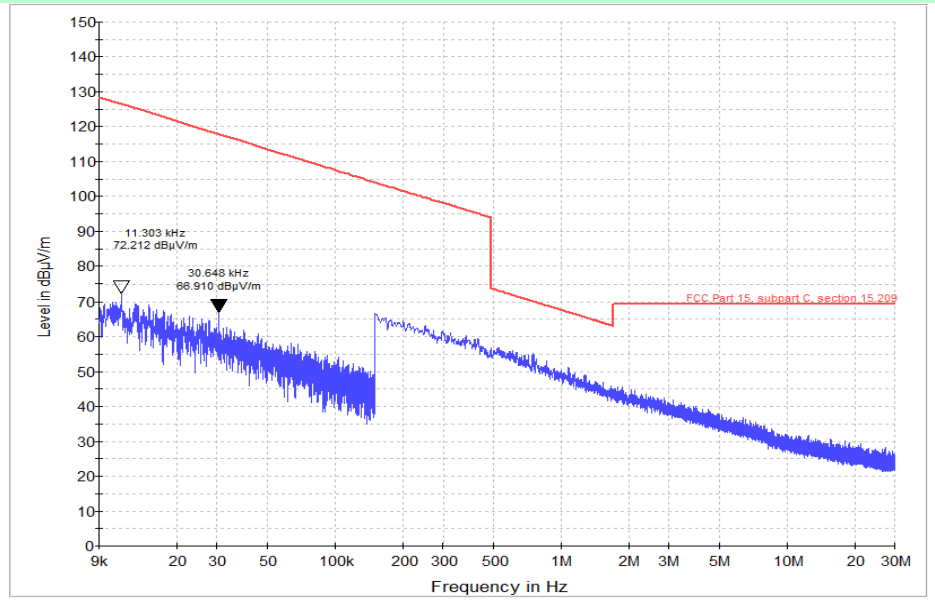
Channel 1 (903.55 MHz)

Note : Peak Graph - Parallel



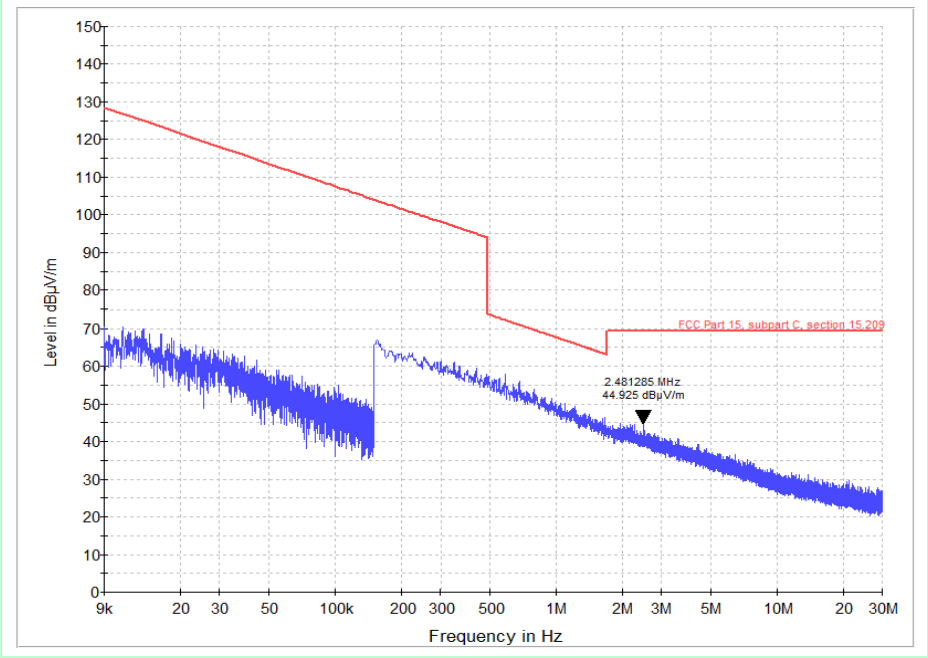
Channel 1 (903.55 MHz)

Note : Peak Graph - Perpendicular



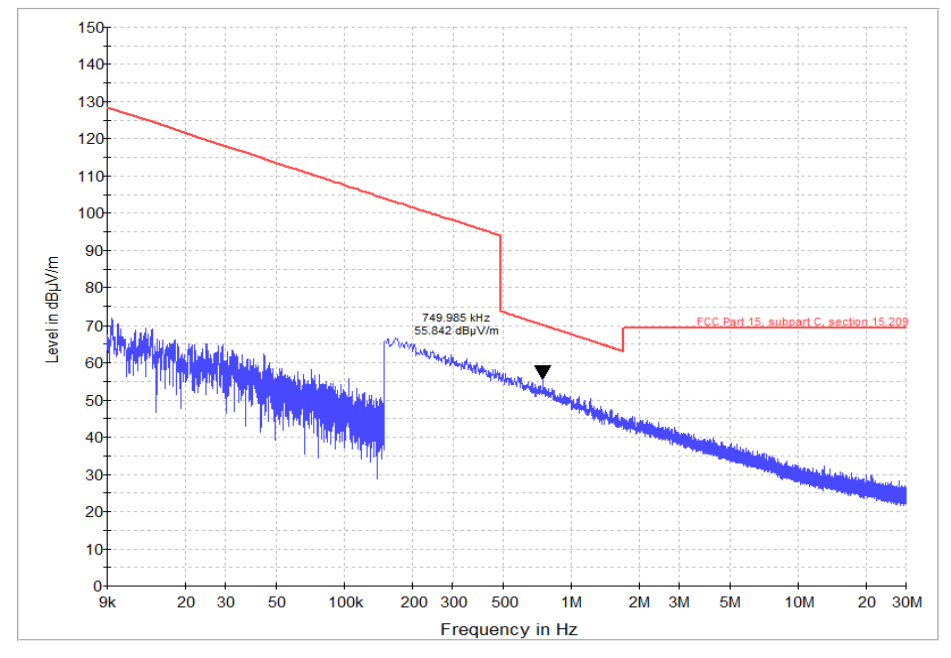
Channel 27 (916.35 MHz)

Note : Peak Graph - Parallel



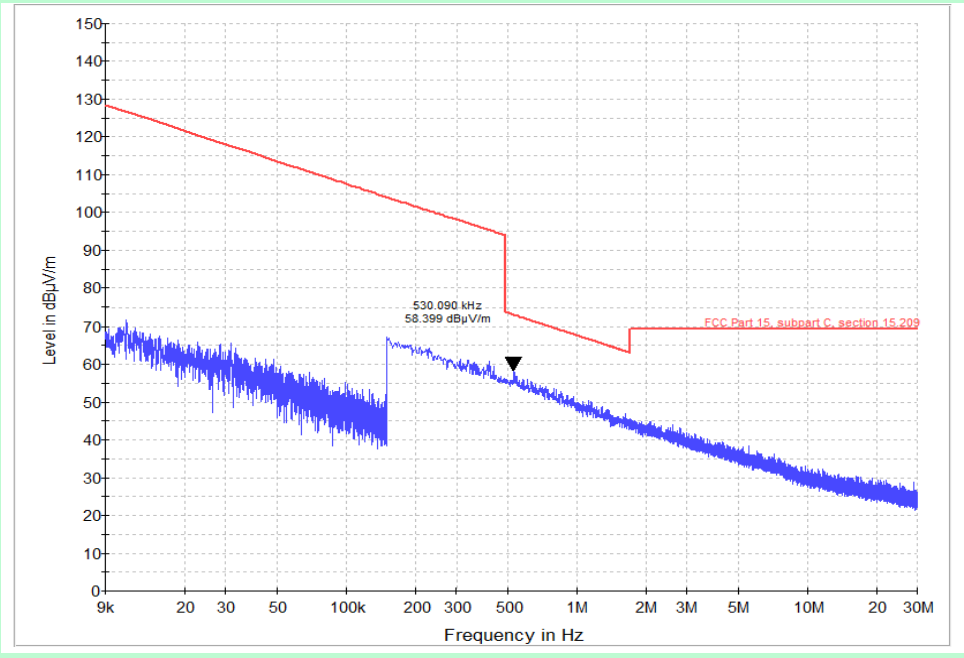
Channel 27 (916.35 MHz)

Note : Peak Graph - Perpendicular



Channel 52 (926.45 MHz)

Note : Peak Graph - Parallel



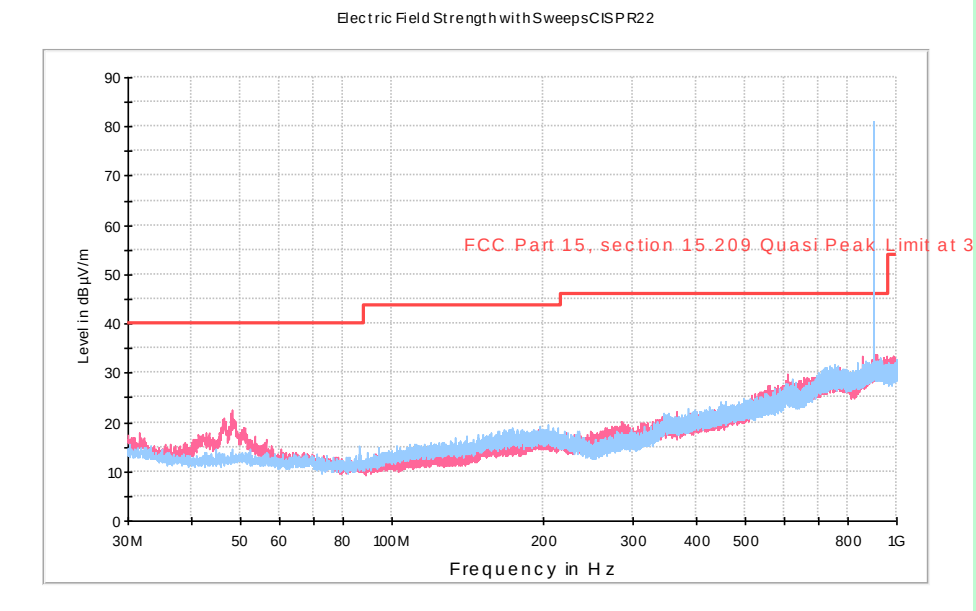
Channel 52 (926.45 MHz)

Note : Peak Graph - Perpendicular

TEST RESULT – 9 KHz to 30 MHz									
Channel	Channel Frequency	Measured Spurious	Peak	Height	Ant Pol	Azimuth	Margin	Limit @ 3m Distance	Results
#	KHz	MHz	dBµV/m	cm	Parallel / Perpendicular	deg	dB	dBµV/m	
1	903.55	21149.48	37.284	100	Parallel	30	89.716	127	PASS
1	903.55	21.508	68.25	100	Perpendicular	30	58.75	127	PASS
27	916.35	11.303	72.212	100	Parallel	60	54.788	127	PASS
27	916.35	30.648	66.91	100	Parallel	60	60.09	127	PASS
27	916.35	2481.285	44.925	100	Perpendicular	30	25.075	70	PASS
52	926.45	749.985	55.842	100	Parallel	30	14.158	70	PASS
52	926.45	530.09	58.399	100	Perpendicular	30	11.601	70	PASS

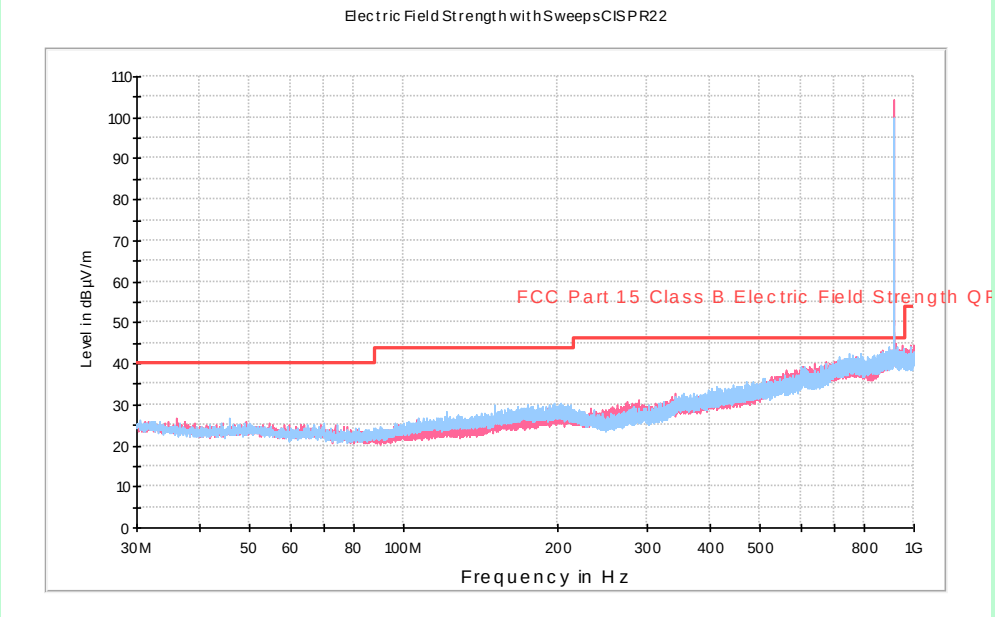
Note : Measured Field Strength –dBuV/m = Receiver Readings (dBuV) + Antenna Factor (dB/m) + Cable loss (dB)

TEST GRAPHS – 30 MHz to 1 GHz



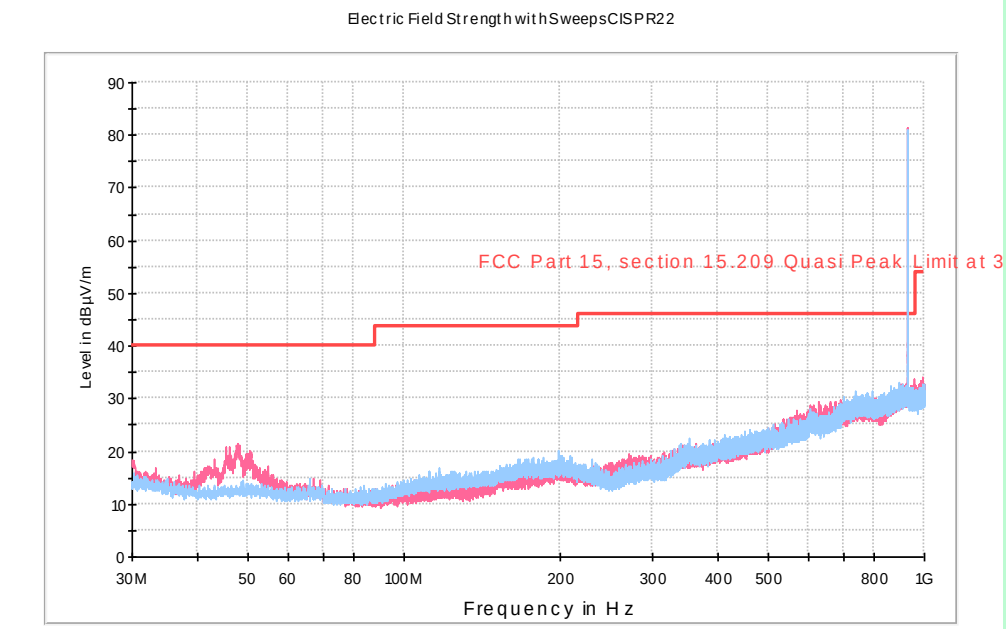
Channel 1 (903.55 MHz)

Note : Peak Graph Vertical (Red), Peak Graph Horizontal (Blue)



Channel 27 (916.35 MHz)

Note : Peak Graph Vertical (Red), Peak Graph Horizontal (Blue)



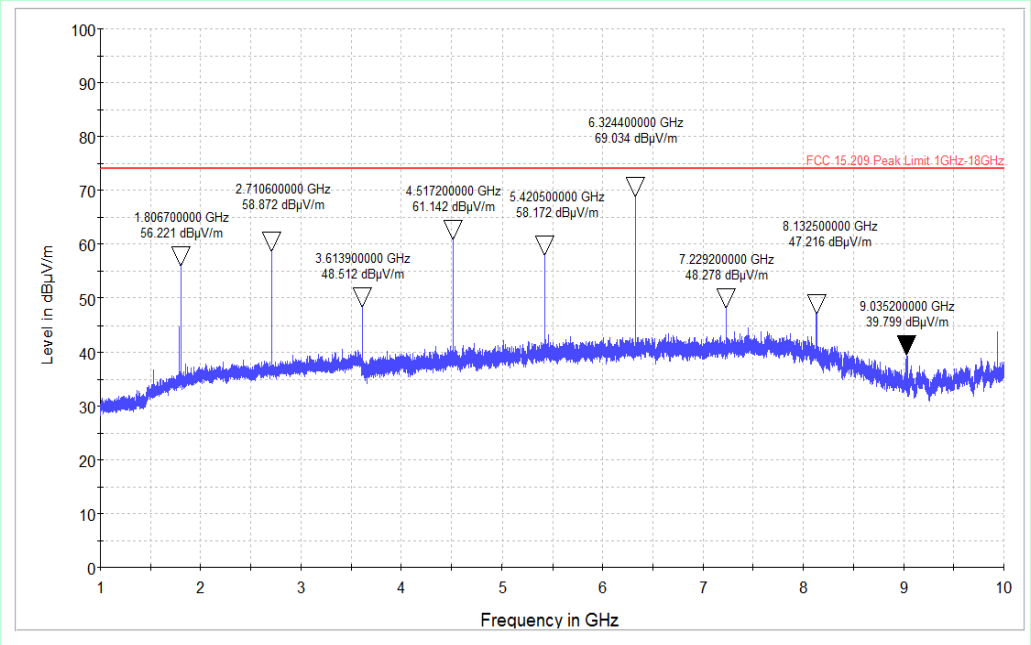
Channel 52 (926.45 MHz)

Note : Peak Graph Vertical (Red), Peak Graph Horizontal (Blue)

TEST RESULT – 30 MHz to 1 GHz								
Channel	Measured Spurious	Quasi Peak	Height	Ant Pol	Azimuth	Margin	Limit @ 3m Distance	Results
#	MHz	dBµV/m	cm	H / V	deg	dB	dBµV/m	
1	32.57	9.0	400.0	H	120.0	31.0	40	PASS
1	47.87	14.4	100.0	V	0.0	25.6	40	PASS
1	62.82	7.3	400.0	H	330.0	32.7	40	PASS
1	85.47	7.2	400.0	H	240.0	32.8	40	PASS
1	172.24	12.8	200.0	H	150.0	30.7	44	PASS
1	205.14	12.9	200.0	H	120.0	30.6	44	PASS
1	345.16	15.3	200.0	H	60.0	30.7	46	PASS
1	459.38	17.9	300.0	H	30.0	28.1	46	PASS
1	701.67	24.1	400.0	H	0.0	21.9	46	PASS
1	903.6	97.7	100.0	V	240.0	-51.7	46	Intended Frequency
27	35.5	18.7	400.0	V	0.0	21.3	40	PASS
27	45.99	18.4	100.0	V	0.0	21.6	40	PASS
27	69.93	18.2	200.0	V	210.0	21.8	40	PASS
27	120.63	20.5	300.0	H	270.0	23.0	44	PASS
27	151.1	22.2	200.0	H	120.0	21.3	44	PASS
27	197.82	23.5	200.0	H	180.0	20.0	44	PASS
27	342	25.4	100.0	V	210.0	20.6	46	PASS
27	485.13	28.9	400.0	H	30.0	17.1	46	PASS
27	673.28	33.7	400.0	V	0.0	12.3	46	PASS
52	916.3	108.4	100.0	H	270.0	-62.4	46	Intended Frequency
52	30.01	13.1	100.0	V	300.0	26.9	40	PASS
52	47.8	18.3	100.0	V	270.0	21.7	40	PASS
52	67.33	7.8	200.0	V	30.0	32.2	40	PASS
52	116.34	9.8	300.0	H	300.0	33.7	44	PASS
52	167.01	12.4	300.0	H	300.0	31.1	44	PASS
52	197.14	13.0	400.0	H	240.0	30.5	44	PASS
52	342.52	15.1	100.0	H	150.0	30.9	46	PASS
52	495.39	18.5	200.0	H	120.0	27.5	46	PASS
52	696.98	23.9	400.0	H	270.0	22.1	46	PASS
52	926.51	97.0	100.0	V	330.0	-51.0	46	Intended Frequency

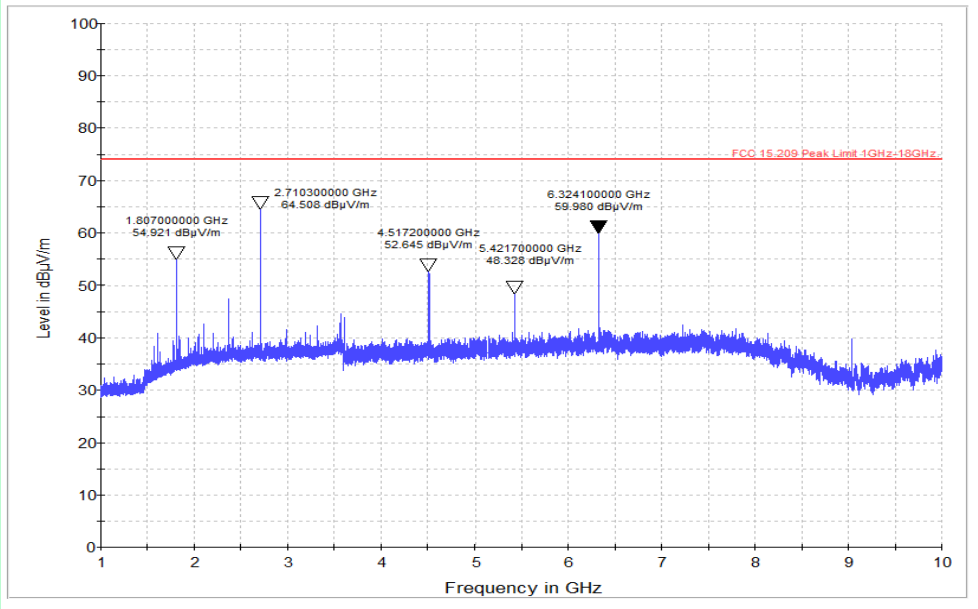
NOTE: Measured Field Strength –dBuV/m (9 KHz to 1GHz) = Receiver Readings (dBuV) + Antenna Factor (dB/m) + Cable loss (dB)

TEST GRAPHS – 1 GHz to 10 GHz



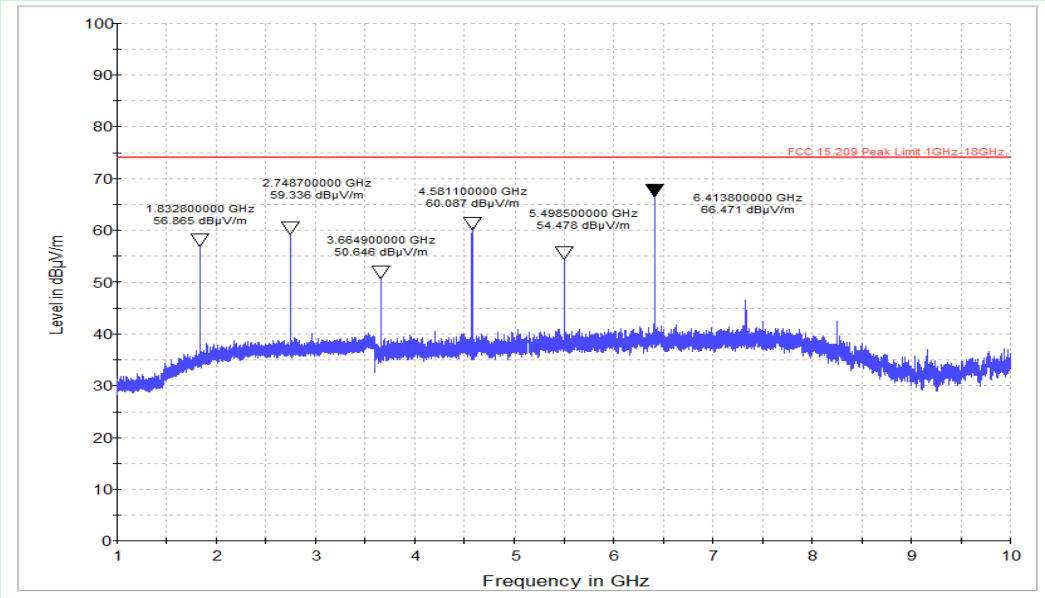
Channel 1 (903.55 MHz)

Note : Peak Graph - Horizontal



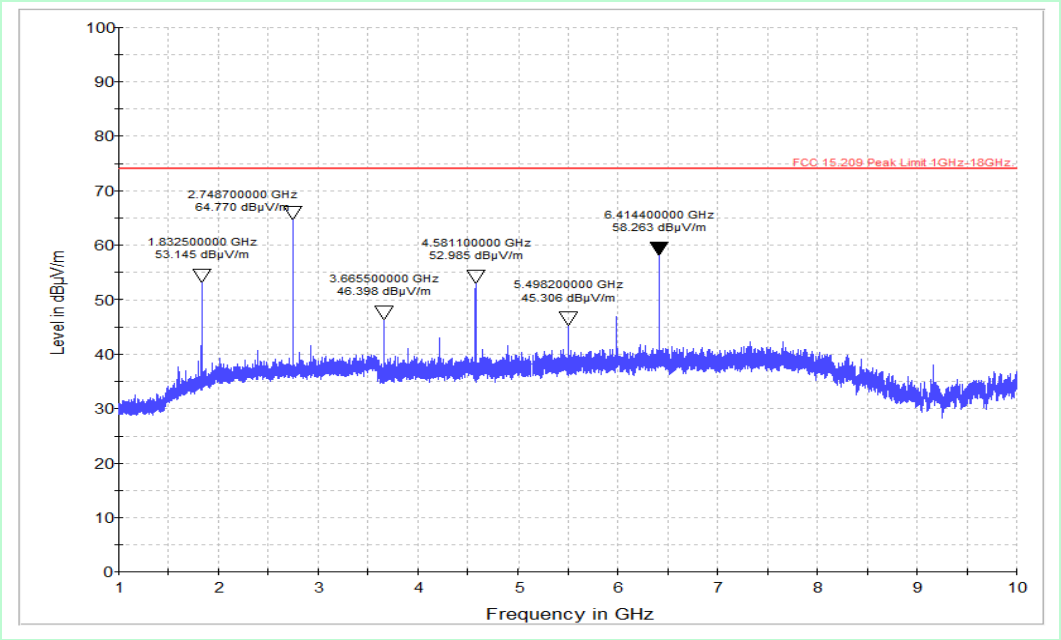
Channel 1 (903.55 MHz)

Note : Peak Graph - Vertical



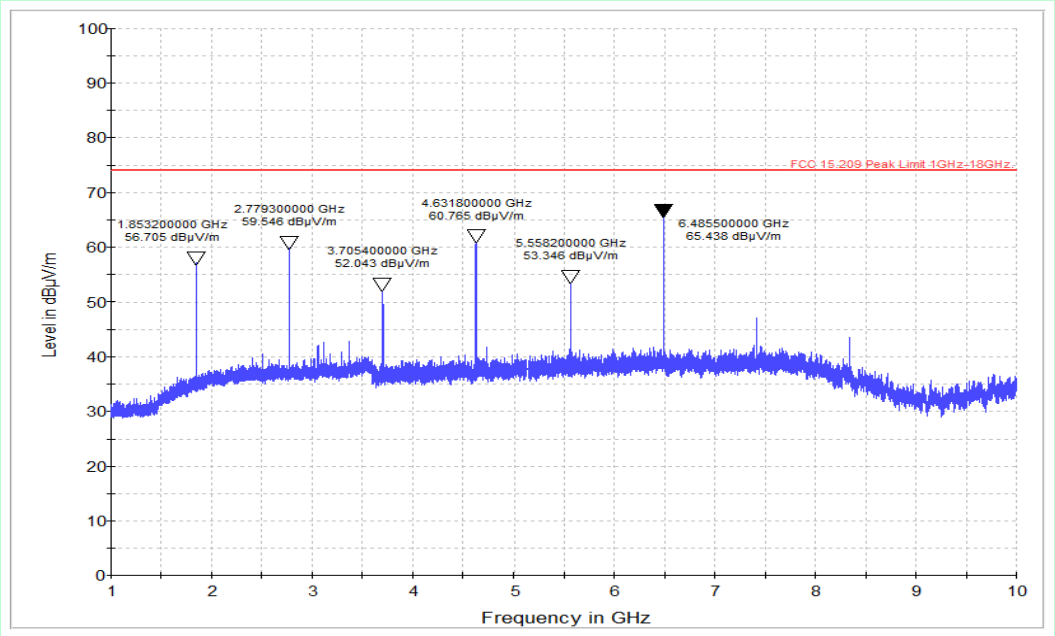
Channel 27 (916.35 MHz)

Note : Peak Graph - Horizontal



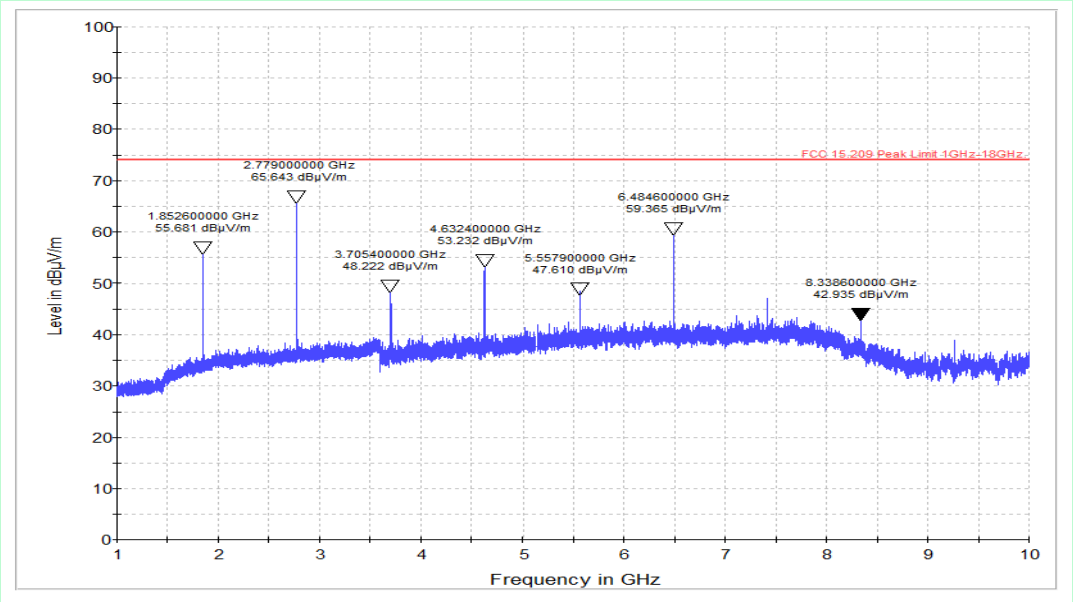
Channel 27 (916.35 MHz)

Note : Peak Graph - Vertical



Channel 52 (926.45 MHz)

Note : Peak Graph - Horizontal



Channel 52 (926.45 MHz)

Note : Peak Graph - Vertical

TEST RESULT – 1 GHz to 10 GHz							RESTRICTED BAND – PEAK & AVERAGE			
Channel	Spurious Frequency	Spurious Peak Level	Height	Ant Pol	Peak Limit	Peak Margin	Calculated Average Reading [Peak – Duty cycle]	Average Limit	Margin	Results
#	GHz	dBµV/m	cm	H / V	dBµV/m	dB	dBµV/m	dBµV/m	dB	
1.0	2.7	58.9	100.0	H	74.0	15.1	40.8	54.0	13.2	PASS
1.0	3.6	48.5	100.0	H	74.0	25.5	30.4	54.0	23.6	PASS
1.0	4.5	61.1	100.0	H	74.0	12.9	43.1	54.0	10.9	PASS
1.0	5.4	58.2	100.0	H	74.0	15.8	40.1	54.0	13.9	PASS
1.0	6.3	69.0	100.0	H	74.0	5.0	51.0	54.0	3.0	PASS
1.0	7.2	48.3	100.0	H	74.0	25.7	30.2	54.0	23.8	PASS
1.0	8.1	47.2	100.0	H	74.0	26.8	29.1	54.0	24.9	PASS
1.0	9.0	39.8	100.0	H	74.0	34.2	21.7	54.0	32.3	PASS
27.0	2.7	64.5	100.0	V	74.0	9.5	46.4	54.0	7.6	PASS
27.0	4.5	52.6	100.0	V	74.0	21.4	34.6	54.0	19.4	PASS
27.0	5.4	48.3	100.0	V	74.0	25.7	30.2	54.0	23.8	PASS
27.0	6.3	60.0	100.0	V	74.0	14.0	41.9	54.0	12.1	PASS
27.0	2.7	59.3	100.0	H	74.0	14.7	41.3	54.0	12.7	PASS
27.0	3.7	50.6	100.0	H	74.0	23.4	32.6	54.0	21.4	PASS
27.0	4.6	60.1	100.0	H	74.0	13.9	42.0	54.0	12.0	PASS
27.0	5.5	54.5	100.0	H	74.0	19.5	36.4	54.0	17.6	PASS
27.0	6.4	66.5	100.0	H	74.0	7.5	48.4	54.0	5.6	PASS
27.0	2.7	64.8	100.0	V	74.0	9.2	46.7	54.0	7.3	PASS
27.0	3.7	46.4	100.0	V	74.0	27.6	28.3	54.0	25.7	PASS
27.0	4.6	53.0	100.0	V	74.0	21.0	34.9	54.0	19.1	PASS
27.0	5.5	45.3	100.0	V	74.0	28.7	27.2	54.0	26.8	PASS
27.0	6.4	58.3	100.0	V	74.0	15.7	40.2	54.0	13.8	PASS
52.0	1.9	56.7	100.0	H	74.0	17.3	38.6	54.0	15.4	PASS
52.0	2.8	59.5	100.0	H	74.0	14.5	41.5	54.0	12.5	PASS
52.0	3.7	52.0	100.0	H	74.0	22.0	34.0	54.0	20.0	PASS
52.0	4.6	60.8	100.0	H	74.0	13.2	42.7	54.0	11.3	PASS
52.0	5.6	53.3	100.0	H	74.0	20.7	35.3	54.0	18.7	PASS
52.0	6.5	65.4	100.0	H	74.0	8.6	47.4	54.0	6.6	PASS
52.0	2.8	65.6	100.0	V	74.0	8.4	47.6	54.0	6.4	PASS
52.0	3.7	48.2	100.0	V	74.0	25.8	30.1	54.0	23.9	PASS
52.0	4.6	53.2	100.0	V	74.0	20.8	35.2	54.0	18.8	PASS
52.0	6.5	59.4	100.0	V	75.0	15.6	41.3	55.0	13.7	PASS

Note :
Field Strength –dBuV/m = Receiver Readings (dBuV) + Antenna Factor (dB/m) + Cable loss (dB) + Filter Insertion loss – Ext. Pre amplifier Gain (dB)

Duty Cycle Correction Factor is calculated using the guidelines provided in DA 00-705 (Spurious Radiated Emissions)

Duty Cycle correction Factor =20 log (1.560*8/100) = -18.08dB
Duty Cycle Factor =20*log (Dwell time /100msec) , Number of Transmission for 100msec: 8, Dwell time per Transmission: 1.560msec

Test Result – 1 GHz to 10 GHz								NON-RESTRICTED BAND - PEAK
Channel	Measured Fundamental	Spurious Emission	Measured Harmonic	Height	Ant Pol	Limit [Fundamental – 20dBc]	Margin	Results
#	dBµV/m	GHz	dBµV/m	cm	H / V	dBuV/m	dB	
1	97.70	1.81	56.22	100.00	H	77.70	21.48	PASS
1	97.70	1.81	54.92	100.00	V	77.70	22.78	PASS
27	108.40	1.83	56.87	100.00	H	88.40	31.54	PASS
27	108.40	1.83	53.15	100.00	V	88.40	35.26	PASS
52	97.00	1.85	56.71	100.00	H	77.00	20.30	PASS
52	97.00	1.85	55.68	100.00	V	77.00	21.32	PASS

Note :
Field Strength –dBuV/m = Receiver Readings (dBuV) + Antenna Factor (dB/m) + Cable loss (dB) + Filter Insertion loss - Pre amplifier Gain (dB)

TEST SETUP PHOTOGRAPHS

Refer Annexure -1

Radiated Emission Test Setup

3 DTS CHANNELS

3.1 DTS 6dB BANDWIDTH

EUT Nomenclature	Wireless Gateway	**Test Request No.**	EMC-1259-1
Model No.	FWSG	**Serial No.**	05303
Test Start Date	15-Aug-2013	**Temperature (˚C)**	23.2
Test End Date	15-Aug-2013	**Humidity RH (%)**	55.1
Tested By	Loganathan Joghee	**Pressure (mbar)**	NR
Input Voltage / Freq	24 Vdc		
Operating Mode	Refer Page 5 for Operating Mode Table		
Test configuration	Refer Page 5 for Test Configuration Table		
Deviation from Std	NA		
Applicable standard	FCC Part 15.247		
Test Method	KDB 558074		
Comment			

TEST DETAILS

Method	☒ Conducted , ☐ Radiated

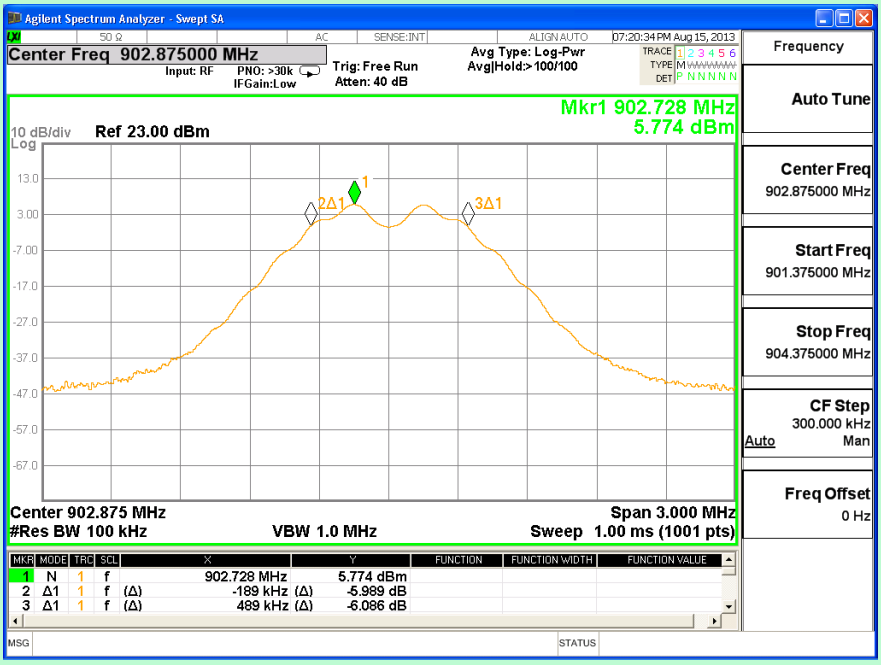
TEST PARAMETERS

Antenna Height	NA	**Turntable Rotation**	NA
Equipment Class	NA	**Measurement Distance**	NA

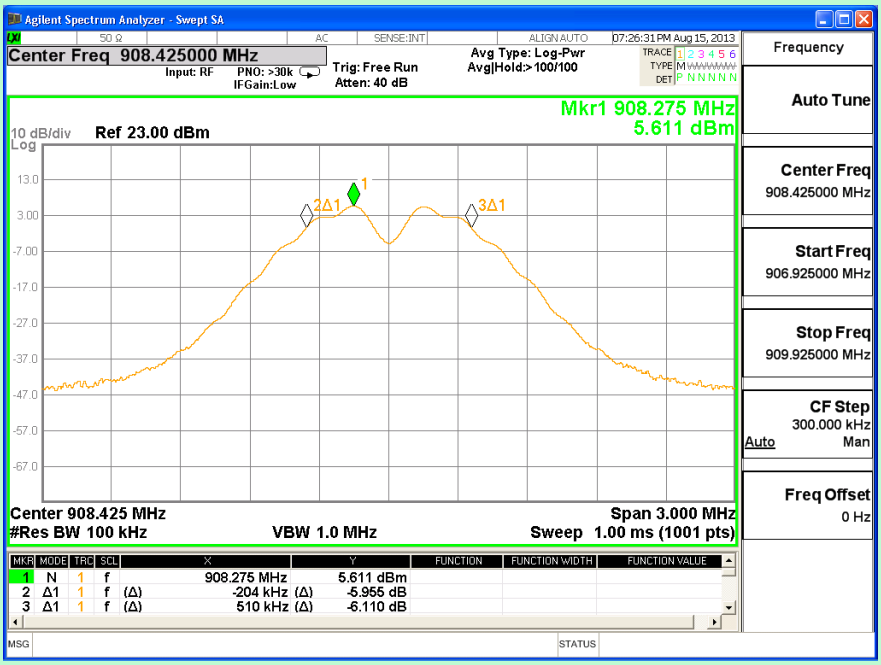
TEST EQUIPMENT

Y/N	Equipment	Make	Model	Serial Number	Cal Due Date
Y	Spectrum Analyzer	Agilent	N9010A	MY48031005	28-Nov-2014
Y	RF Cable	Huber- Suhner	SF104/2X11PC3542/500	NA	NA

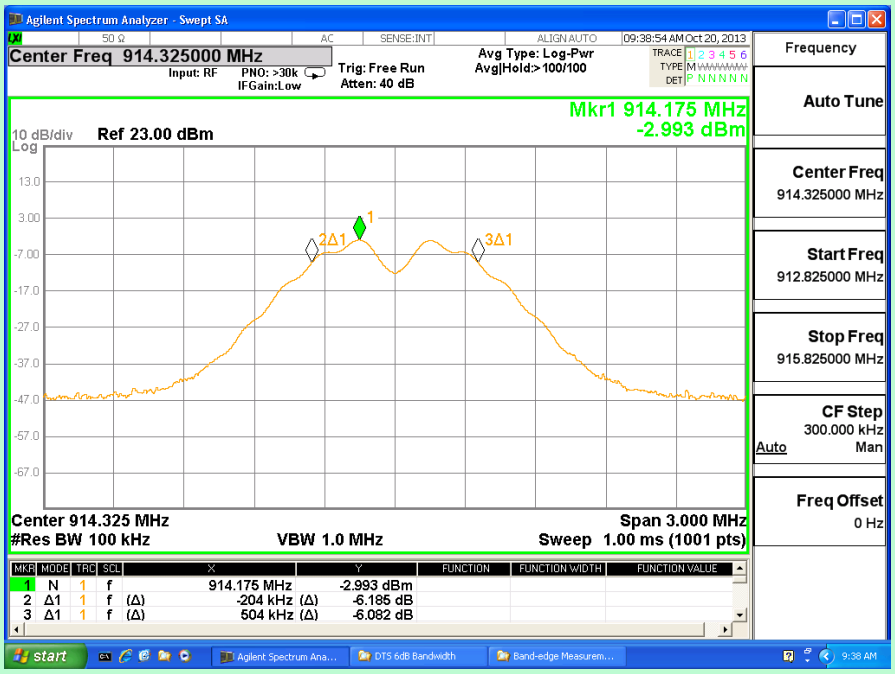
TEST GRAPHS



Channel 1 (902.875 MHz)

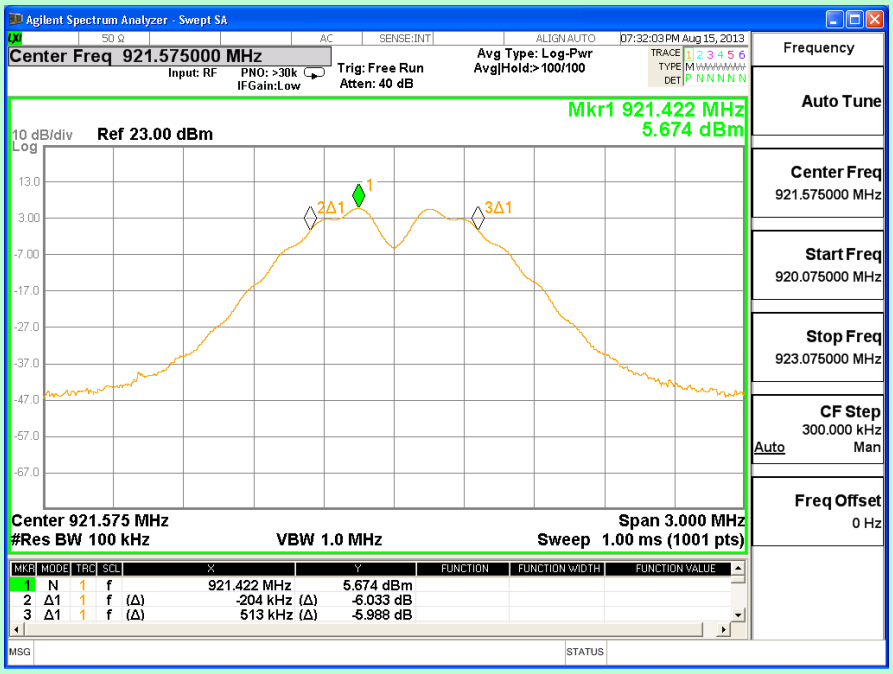


Channel 2 (908.425 MHz)

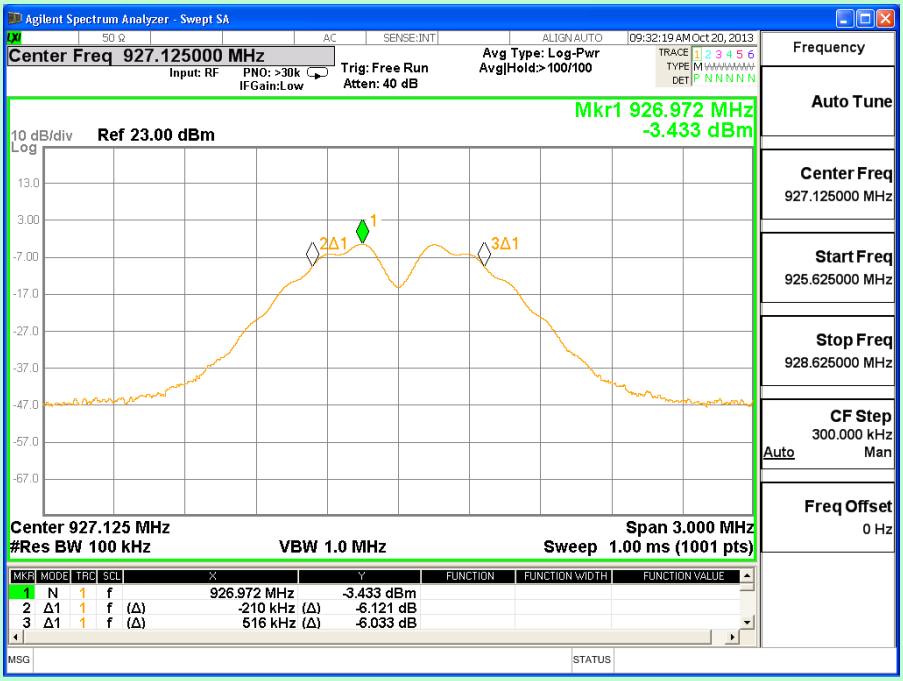


Channel 3 (914.325 M Hz)

Channel 4 (915.325 M Hz)



Channel 5 (921.575 M Hz)



Channel 6 (927.125 M Hz)

TEST RESULT

Channel #	Frequency MHz	Measured Value KHz	Limit KHz	Result
1	902.875	678	>500	PASS
2	908.425	714	>500	PASS
3	914.325	708	>500	PASS
4	915.325	696	>500	PASS
5	921.575	717	>500	PASS
6	927.125	726	>500	PASS

TEST SETUP PHOTOGRAPHS

Refer Annexure-1

Conducted RF Test Setup

3.2 MAXIMUM PEAK CONDUCTED OUTPUT POWER

EUT Nomenclature	Wireless Gateway	**Test Request No.**	EMC-1259-1
Model No.	FWSG	**Serial No.**	05303
Test Start Date	15-Aug-2013	**Temperature (°C)**	23.1
Test End Date	20-Oct-2013	**Humidity RH (%)**	55.1
Tested By	Loganathan Joghee	**Pressure (mbar)**	NR
Input Voltage / Freq	24 Vdc		
Operating Mode	Refer Page 5 for Operating Mode Table		
Test configuration	Refer Page 5 for Test Configuration Table		
Deviation from Std	NA		
Applicable standard	FCC Part 15.247		
Test Method	KDB 558074		
Comment			

TEST DETAILS

Method	☒ Conducted , ☐ Radiated	**DTS - Bandwidth**	☒ RBW ≥ DTS ☐ RBW ≤ DTS

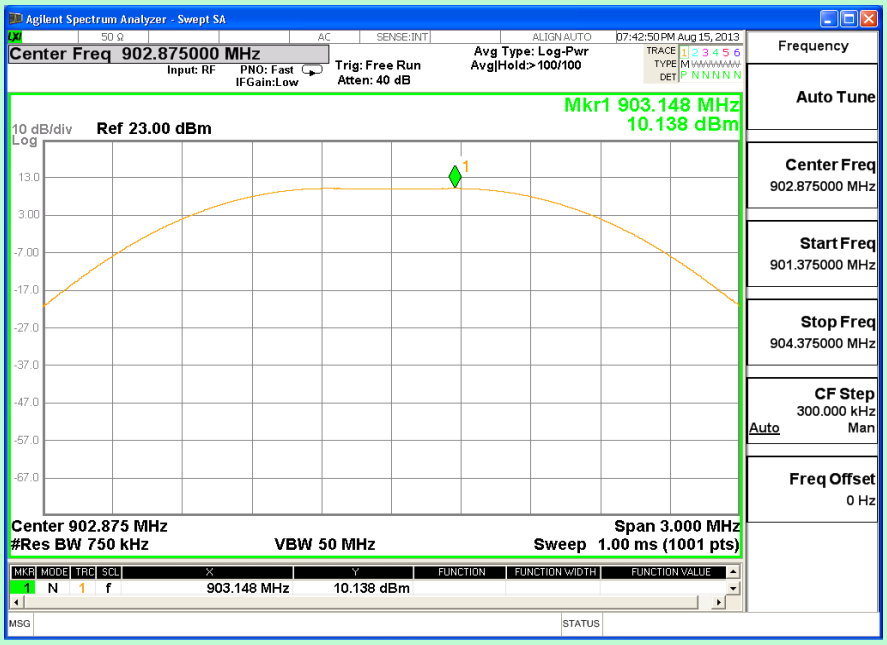
TEST PARAMETERS

Antenna Height	NA	**Turntable Rotation**	NA
Equipment Class	NA	**Measurement Distance**	NA

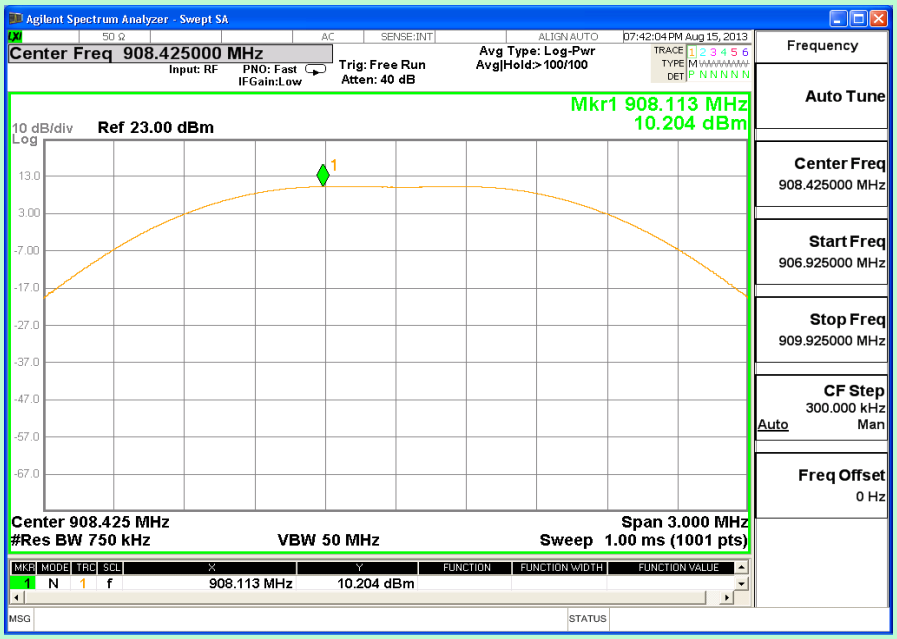
TEST EQUIPMENT

Y/N	Equipment	Make	Model	Sl. No.	Cal Due Date
Y	Spectrum Analyzer	Agilent	N9010A	MY48031005	28-Nov-2014
Y	RF Cable	Huber- Suhner	SF104/2X11PC3542/500	NA	NA

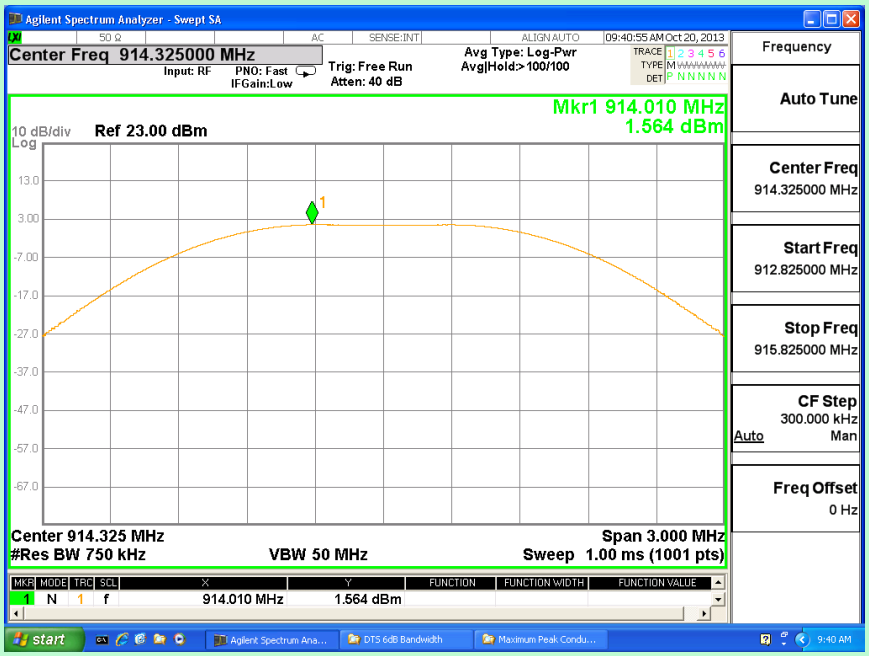
TEST GRAPHS



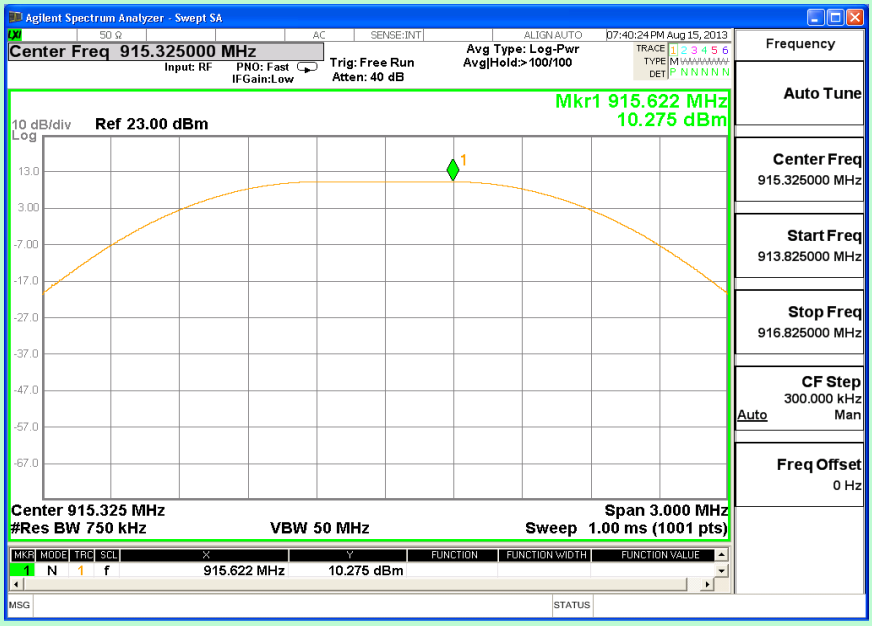
Channel 1 (902.875 MHz)



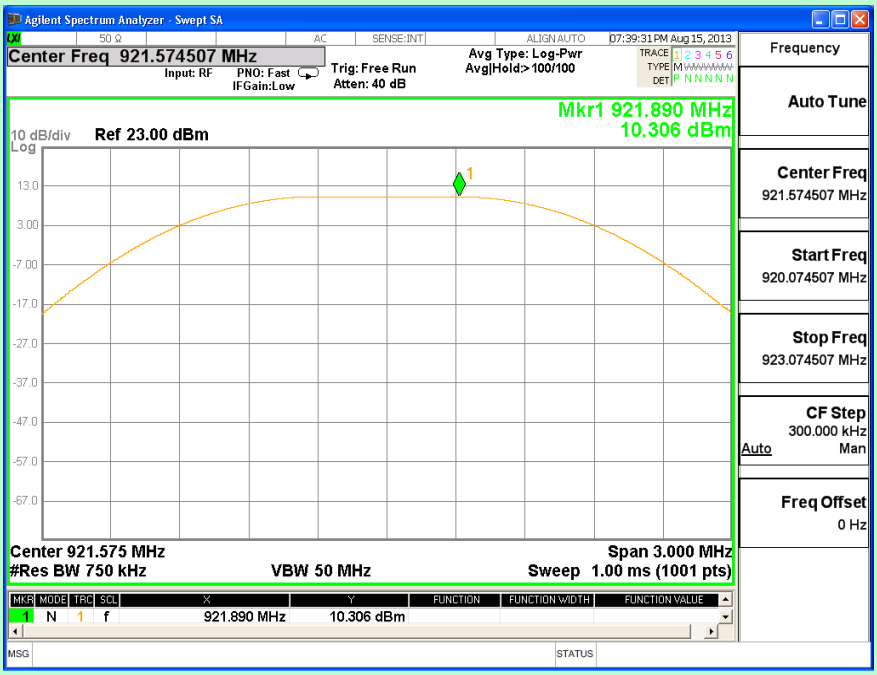
Channel 2 (908.425 MHz)



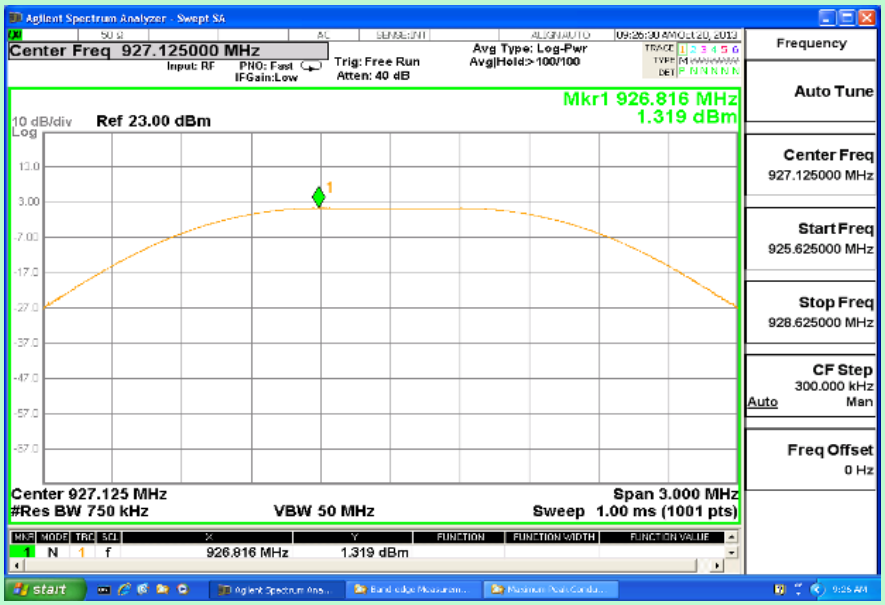
Channel 3 (914.325 MHz)



Channel 4 (915.325 MHz)



Channel 5 (921.575 MHz)



Channel 6 (927.125 MHz)

TEST RESULT						
Channel	Frequency	Measured Level	Azimuth	Measured Level	Limit	Result
#	MHz	dBm	deg	KHz	KHz	
1	902.875	10.138	0.5	10.638	≤30	PASS
2	908.425	10.204	0.5	10.704	≤30	PASS
3	914.325	1.564	0.5	2.064	≤30	PASS
4	915.325	10.275	0.5	10.775	≤30	PASS
5	921.575	10.306	0.5	10.806	≤30	PASS
6	927.125	1.319	0.5	1.819	≤30	PASS

3.3 MAXIMUM POWER SPECTRAL DENSITY

EUT Nomenclature	Wireless Gateway	**Test Request No.**	EMC-1259-1
Model No.	FWSG	**Serial No.**	05303
Test Start Date	15-Aug-2013	**Temperature (°C)**	23.1
Test End Date	20-Oct-2013	**Humidity RH (%)**	55.2
Tested By	Loganathan Joghee	**Pressure (mbar)**	NR
Input Voltage / Freq	24 Vdc		
Operating Mode	Refer Page 5 for Operating Mode Table		
Test configuration	Refer Page 5 for Test Configuration Table		
Deviation from Std	NA		
Applicable standard	FCC Part 15.247		
Test Method	KDB 558074		
Comment			

TEST DETAILS

Method	☒ Conducted ☐ Radiated

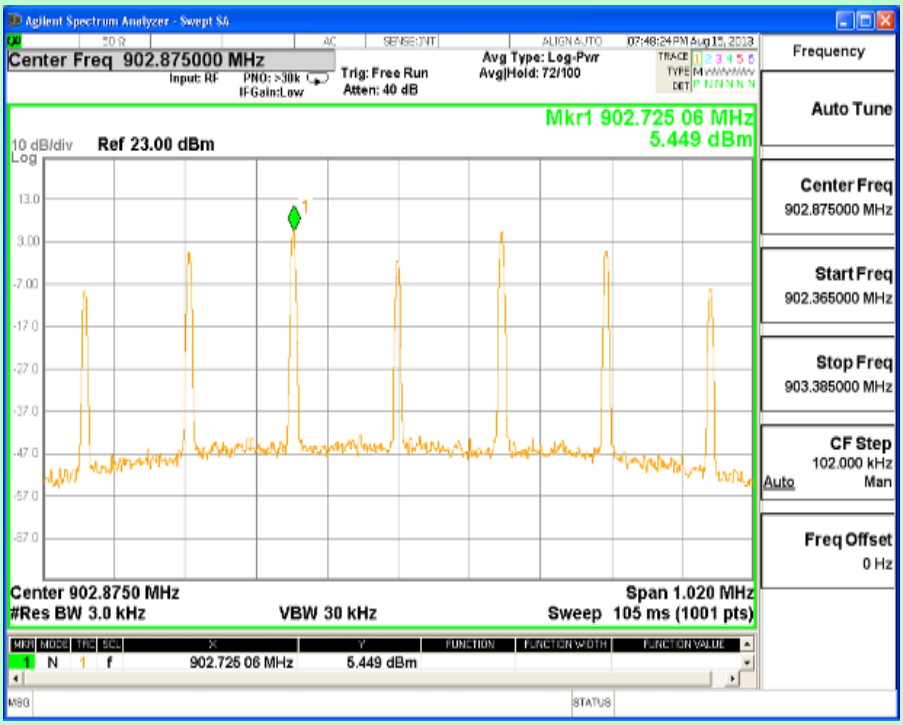
TEST PARAMETERS

Antenna Height	NA	**Turntable Rotation**	NA
Equipment Class	NA	**Measurement Distance**	NA

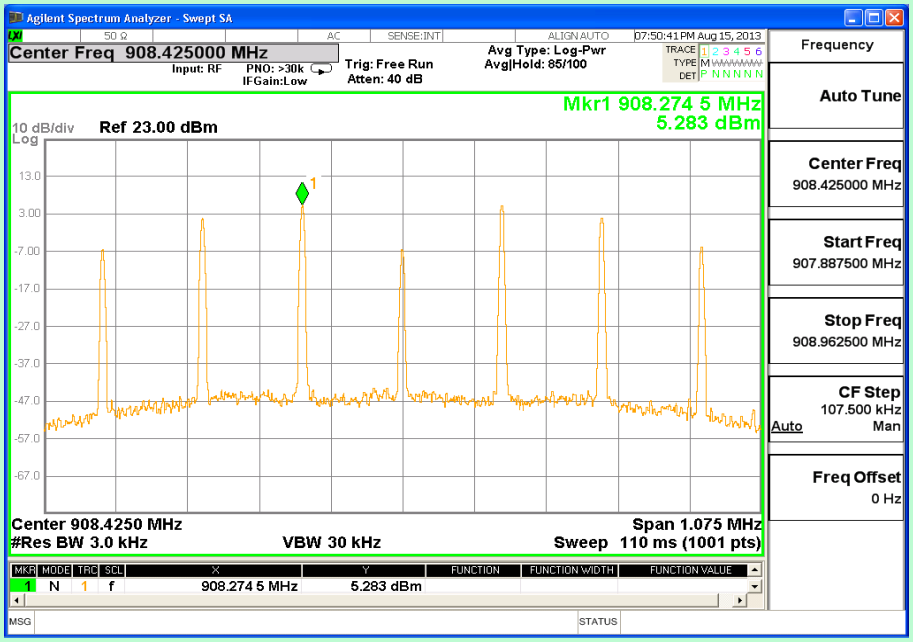
TEST EQUIPMENT

Y/N	Equipment	Make	Model	Serial Number	Cal Due Date
Y	Spectrum Analyzer	Agilent	N9010A	MY48031005	28-Nov-2014
Y	RF Cable	Huber- Suhner	SF104/2X11PC3542/500	NA	NA

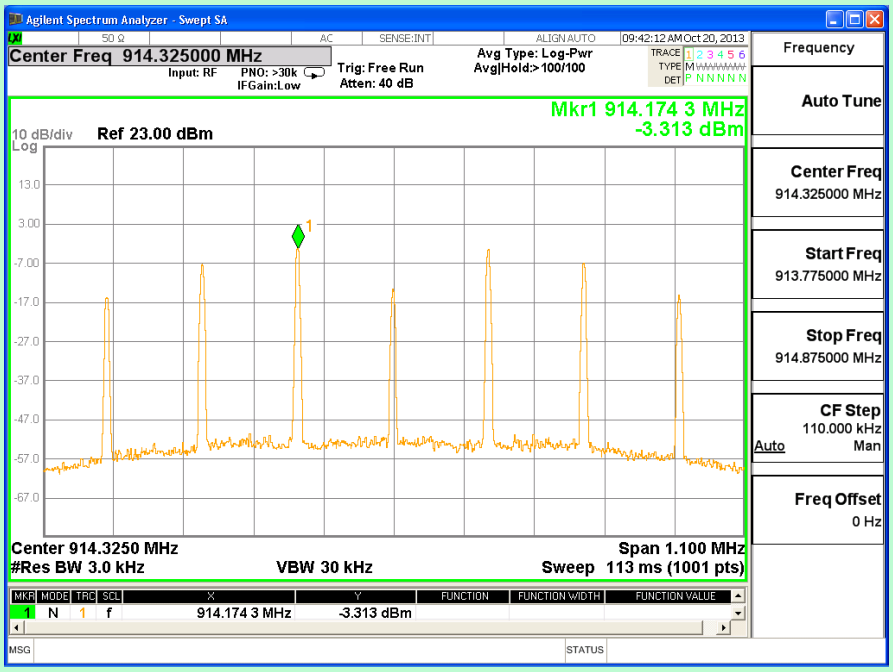
TEST GRAPHS



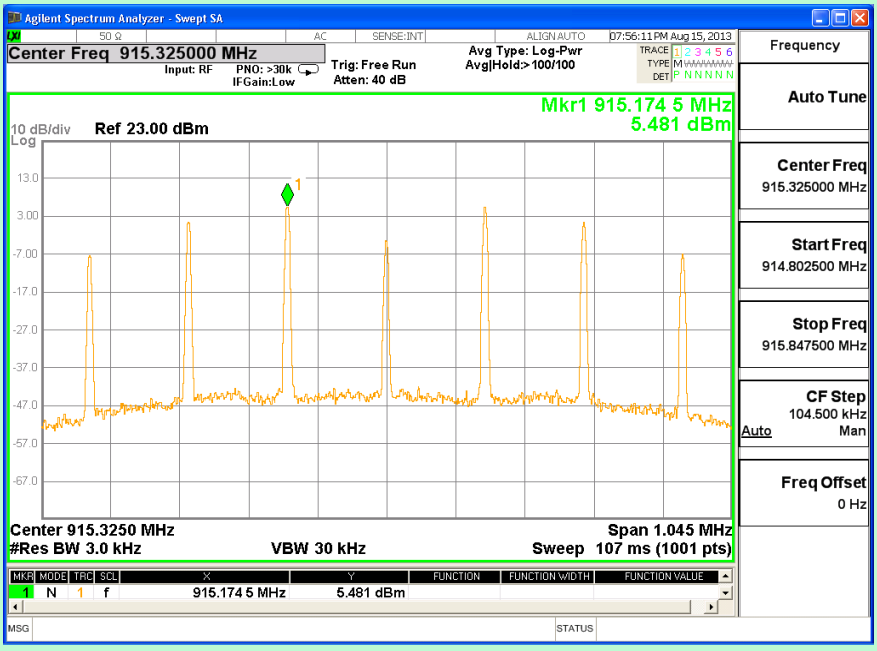
Channel 1 (902.875 MHz)



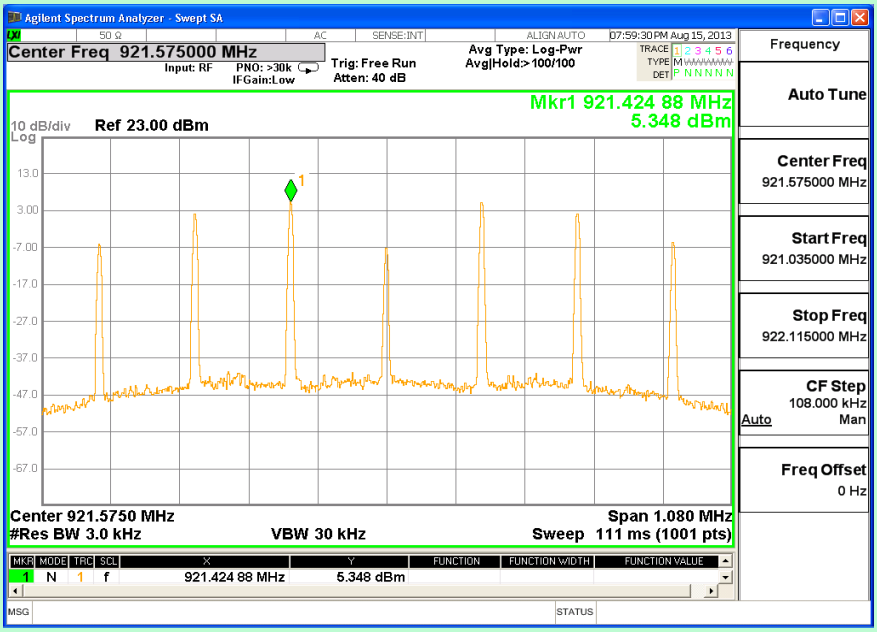
Channel 2 (908.425 MHz)



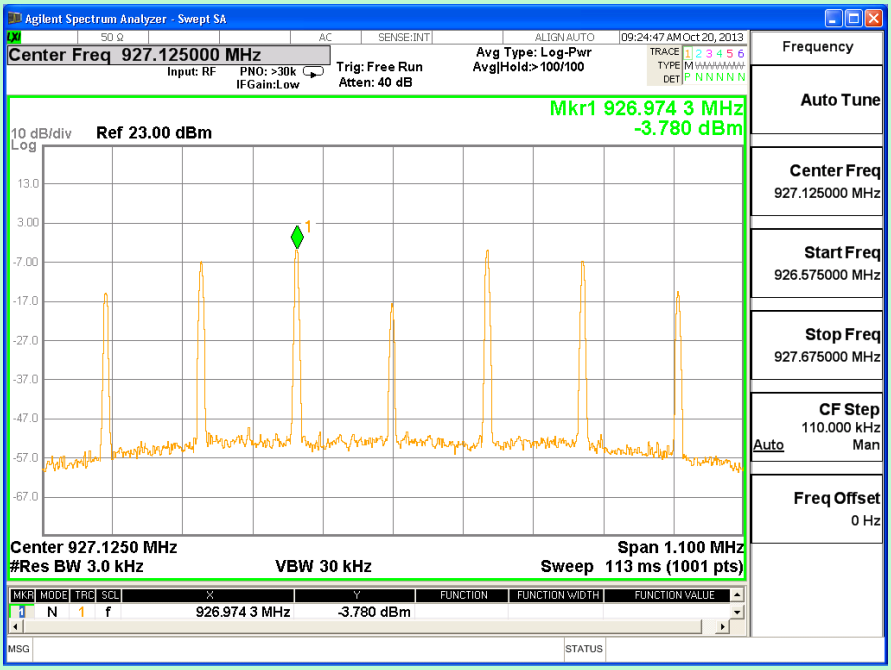
Channel 3 (914.325 M Hz)



Channel 4 (915.325 M Hz)



Channel 5 (921.575 M Hz)



Channel 6 (927.125 M Hz)

TEST RESULT

Channel #	Freq MHz	Measured Level dBm/3KHz	Limit dBm/ 3KHz	Result
1	902.875	5.449	<8	PASS
2	908.425	5.283	<8	PASS
3	914.325	-3.313	<8	PASS
4	915.325	5.481	<8	PASS
5	921.575	5.348	<8	PASS
6	927.125	-3.780	<8	PASS

TEST SETUP PHOTOGRAPHS

Refer Annexure-1

Conducted RF Test Setup

3.4 BAND-EDGE MEASUREMENTS

EUT Nomenclature	Wireless Gateway	**Test Request No.**	EMC-1259-2
Model No.	FWSG	**Serial No.**	05303
Test Start Date	15-Aug-2013	**Temperature (°C)**	23.1
Test End Date	15-Aug-2013	**Humidity RH (%)**	55.1
Tested By	Loganathan Joghee	**Pressure (mbar)**	NR
Input Voltage / Freq	24 Vdc		
Operating Mode	Refer Page 5 for Operating Mode Table		
Test configuration	Refer Page 5 for Test Configuration Table		
Deviation from Std	NA		
Applicable standard	FCC Part 15.247		
Test Method	KDB 558074		
Comment			

TEST DETAILS

Method	☒ Conducted ☐ Radiated

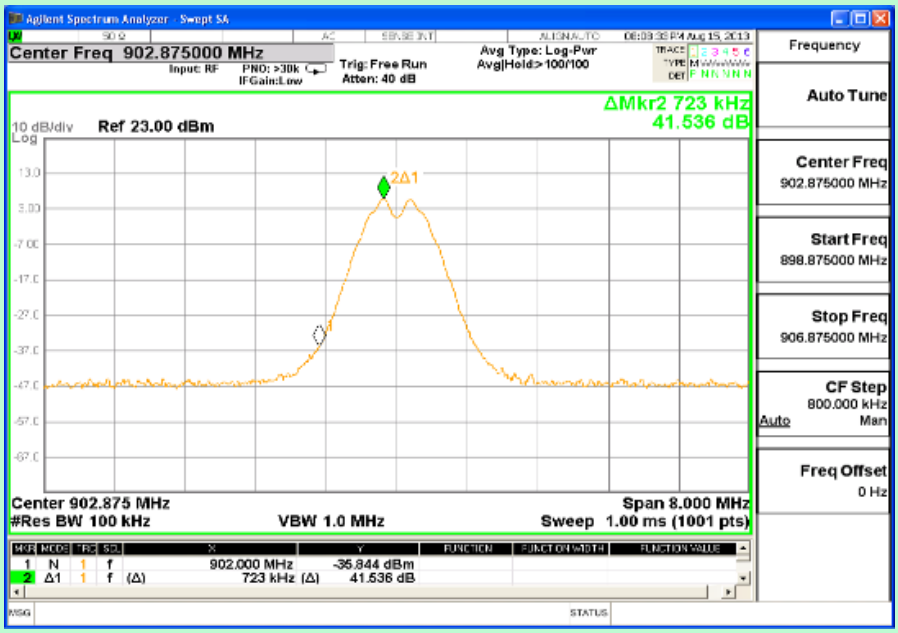
TEST PARAMETERS

Antenna Height	NA	**Turntable Rotation**	NA
Equipment Class	NA	**Measurement Distance**	NA

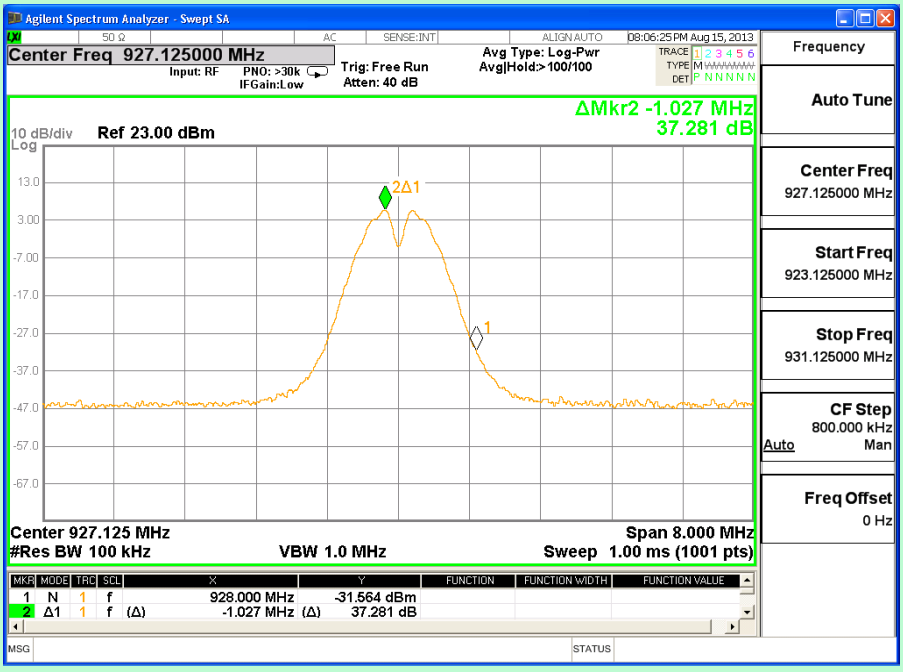
TEST EQUIPMENT

Y/N	Equipment	Make	Model	Serial Number	Cal Due Date
Y	Spectrum Analyzer	Agilent	N9010A	MY48031005	28-Nov-2014
Y	RF Cable	Huber- Suhner	SF104/2X11PC3542/500	NA	NA

TEST GRAPHS



Channel 1 (902.875 MHz)



Channel 6 (927.125 MHz)

TEST RESULT

Channel	Frequency	Measured Level	Limit	Results
#	MHz	dB	dBc	
1	902.875	41.536	>20	PASS
2	927.125	37.281	>20	PASS

TEST SETUP PHOTOGRAPHS

Refer Annexure-1

Conducted RF Test Setup

3.5 SPURIOUS RADIATED EMISSIONS

EUT Nomenclature	Wireless Gateway	**Test Request No.**	EMC-1210-1
Model No.	FWSG	**Serial No.**	05303
Test Start Date	02-Sep-2013	**Temperature (°C)**	23.1
Test End Date	14-Dec-2013	**Humidity RH (%)**	57.2
Tested By	Loganathan Joghee	**Pressure (mbar)**	NR
Input Voltage / Freq	24 Vdc		
Operating Mode	Refer Page 5 for Operating Mode Table		
Test configuration	Refer Page 5 for Test Configuration Table		
Deviation from Std	NA		
Comment			

TEST FREQUENCY RANGE

Start Frequency	9 KHz	**Stop Frequency**	10 GHz

MAXIMUM OPERATING FREQUENCY

902 MHz to 928 MHz

TEST PARAMETERS

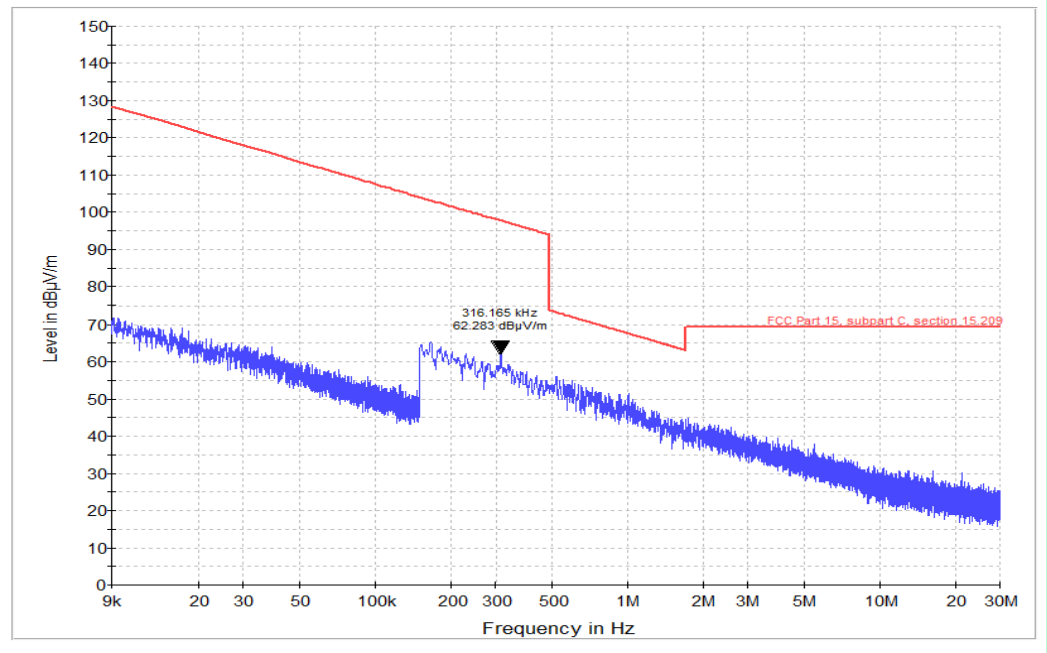
Antenna Height	1m to 4m	**Turntable Rotation**	0° to 360°
Applicable standard	FCC Part 15.247 & 15.209	**Test Method**	KDB 558074
Equipment Class	NA	**Measurement Distance**	3m

TEST EQUIPMENT

Y/N	Equipment	Make	Model	Sl. No.	Cal Due Date
Y	EMI Test Receiver	R&S	ESU26	100229	04-Feb-2014
Y	3m Semi Anechoic Chamber	ETS Lindgren	DKE 6X7 DBL.DR	1625	31-Dec-2013
Y	Double Ridge Guide Horn Antenna	ETS Lindgren	3117	00064055	07-Nov-2013
Y	Bilog Antenna	ETS Lindgren	HLP3003C	130525	30-Nov-2013
Y	Loop Antenna	ETS Lindgren	6507	000103694	12-Mar-2014
Y	RF cable (9KHz to 1GHz)	COLEMAN	RG214	RE-1A	09-May-2014
Y	RF cable (9KHz to 1GHz)	COLEMAN	RG214	RE-1B	09-May-2014
Y	RF cable (1GHz to 18GHz)	AH Systems	SAC-18G-06	RE-2A	09-May-2014
Y	RF cable (1GHz to 18GHz)	AH Systems	SAC-18G-06	RE-2B	09-May-2014
Y	Signal Conditioning unit	R&S	SCU-18	10178	13-June-2014
Y	High Pass Filter	Wainwright	WHKX1.5/15G-12ST	1	09-May-2014
Y	EMC32 Software	R&S	8.30.0	820-OT101248	NA

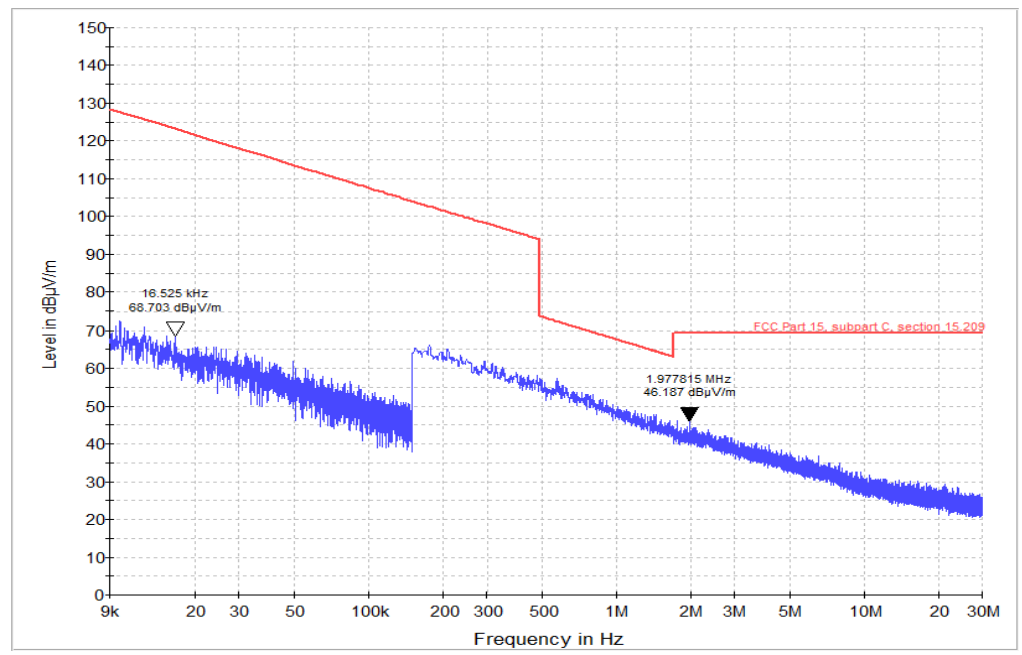
Note: Switch ON/OFF the Internal Preamplifier based on carrier level and or noise floor without overloading the receiver

TEST GRAPHS – 9 KHz to 30 MHz



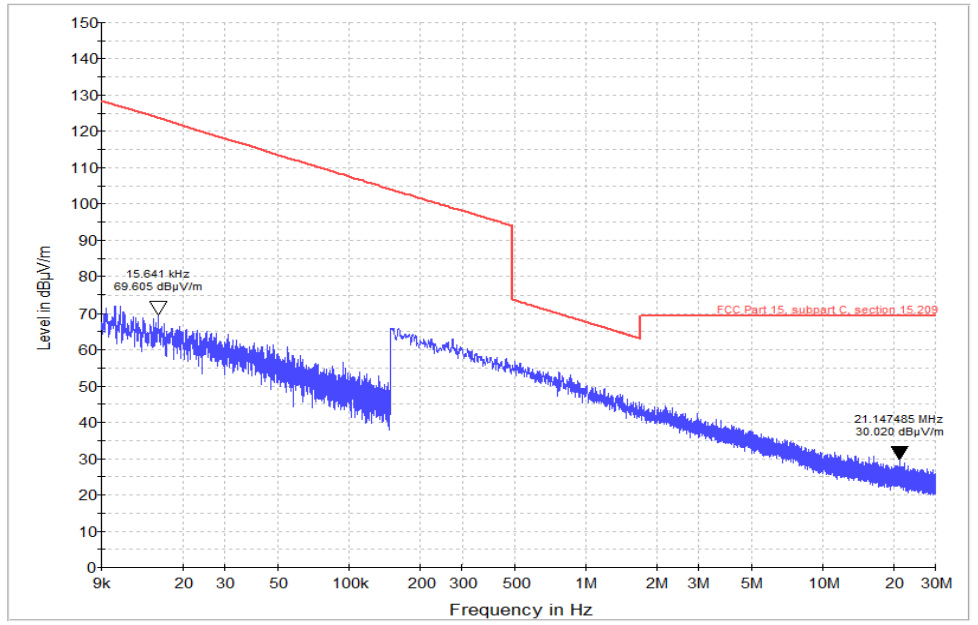
Channel 1 (902.875 MHz)

Note : Peak Graph - Parallel



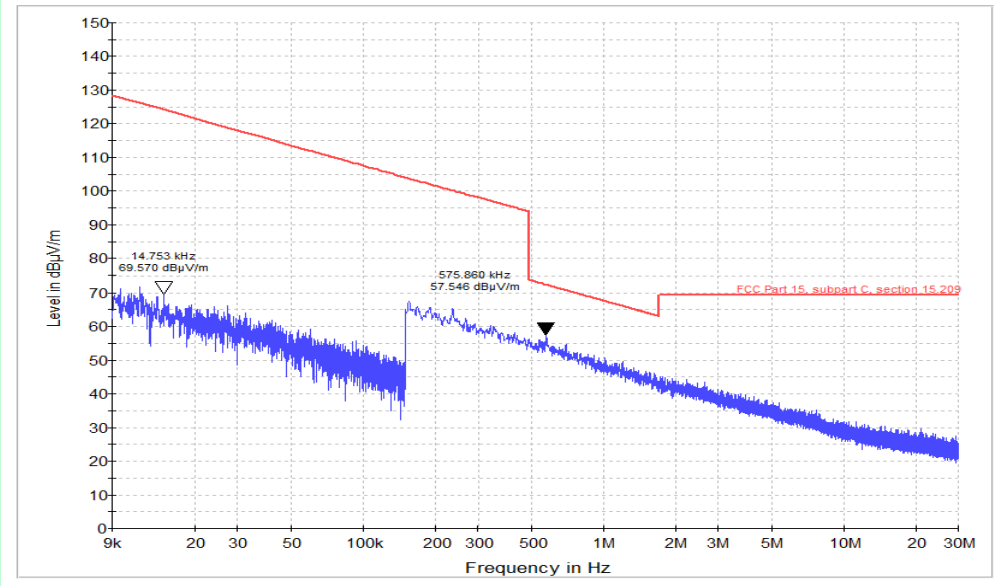
Channel 1 (902.875 MHz)

Note : Peak Graph - Perpendicular



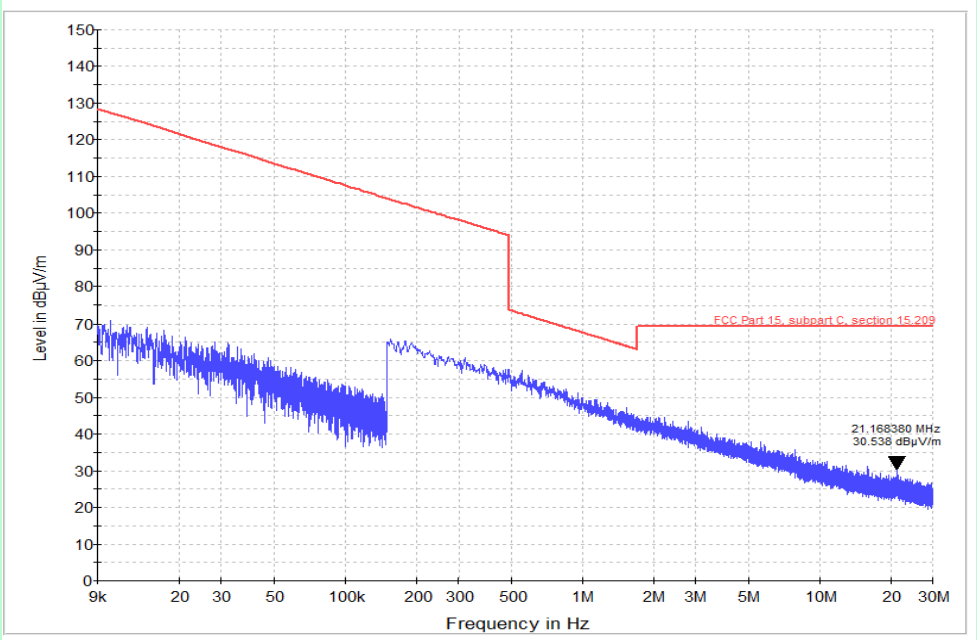
Channel 2 (908.425 MHz)

Note : Peak Graph - Parallel



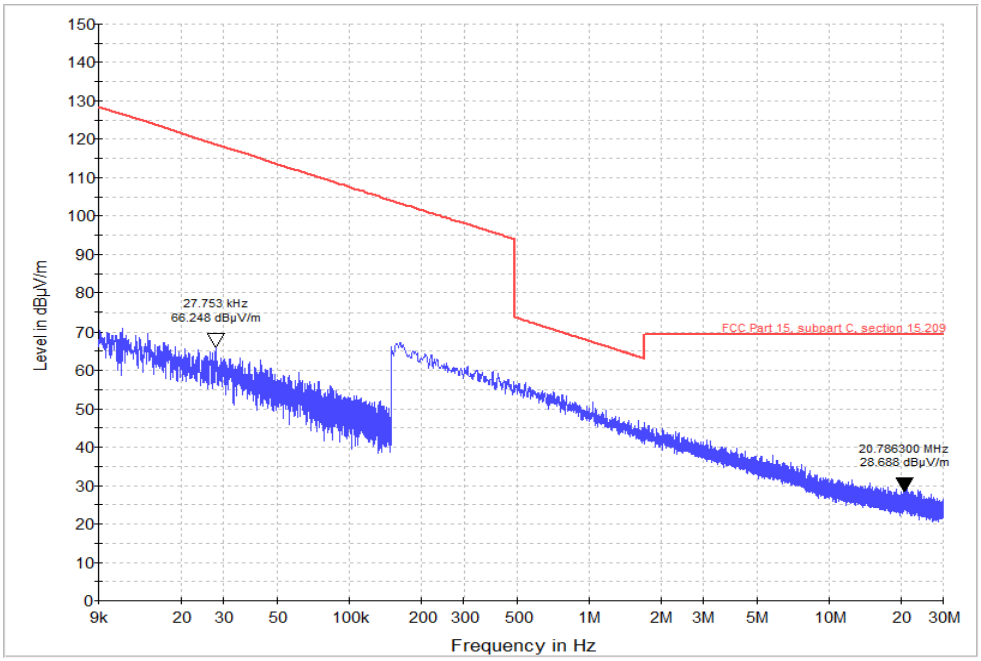
Channel 2 (908.425 MHz)

Note : Peak Graph - Perpendicular



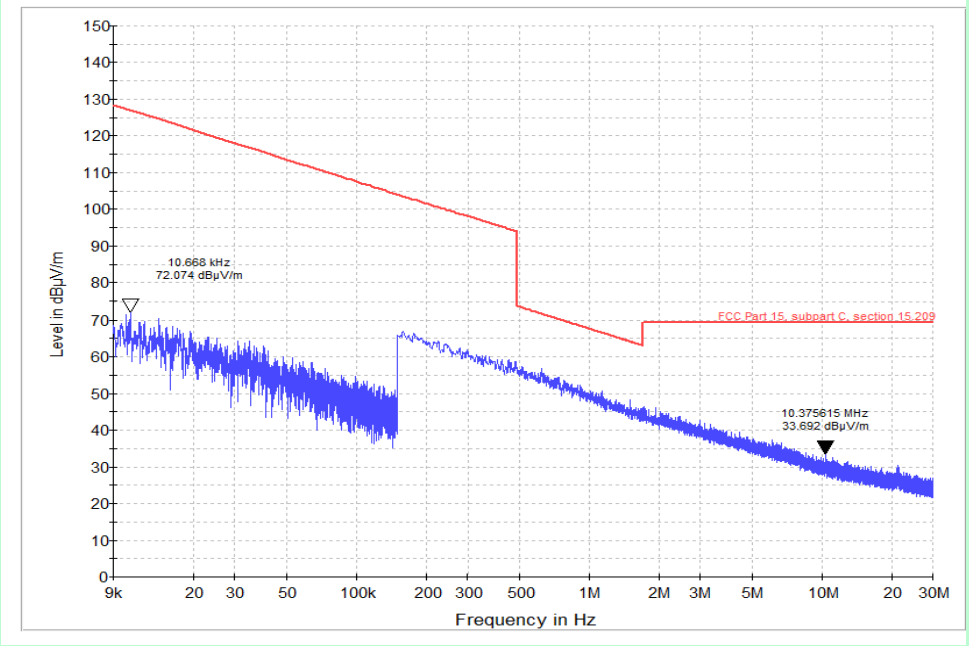
Channel 3 (914.325 MHz)

Note : Peak Graph - Parallel



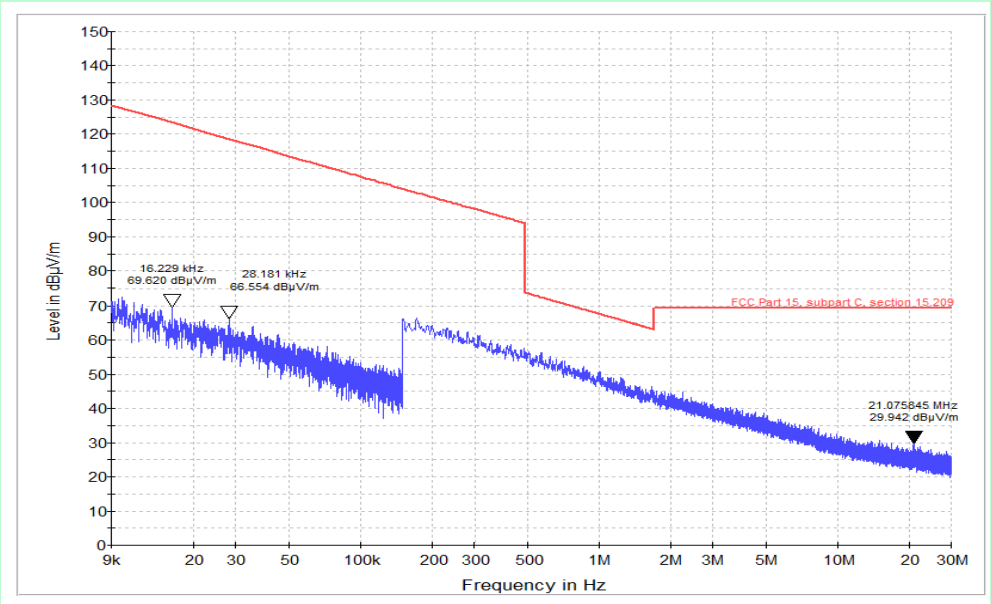
Channel 3 (914.325 MHz)

Note : Peak Graph - Perpendicular



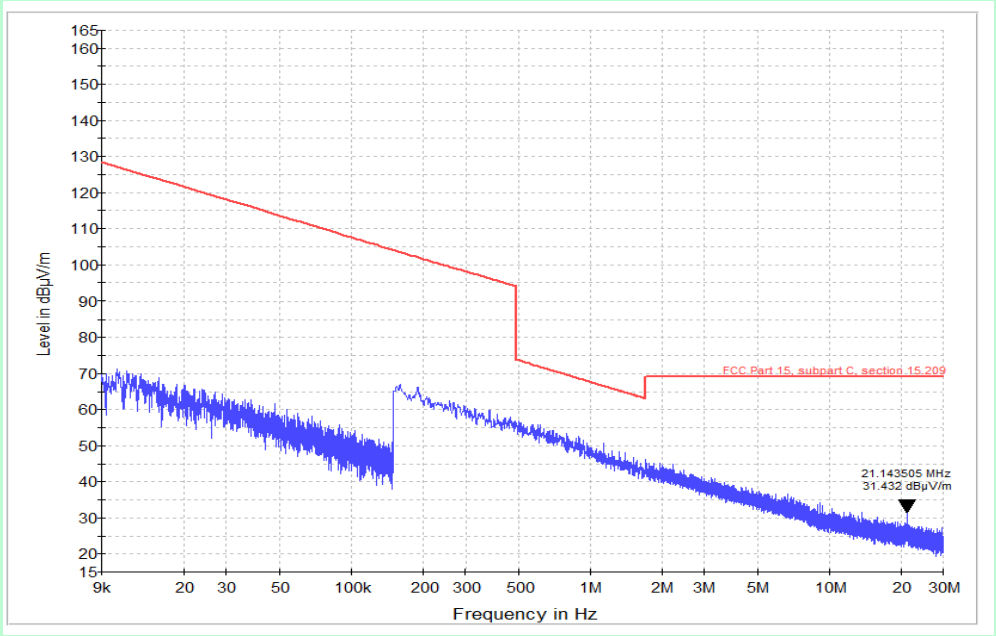
Channel 4 (915.325 MHz)

Note : Peak Graph - Parallel



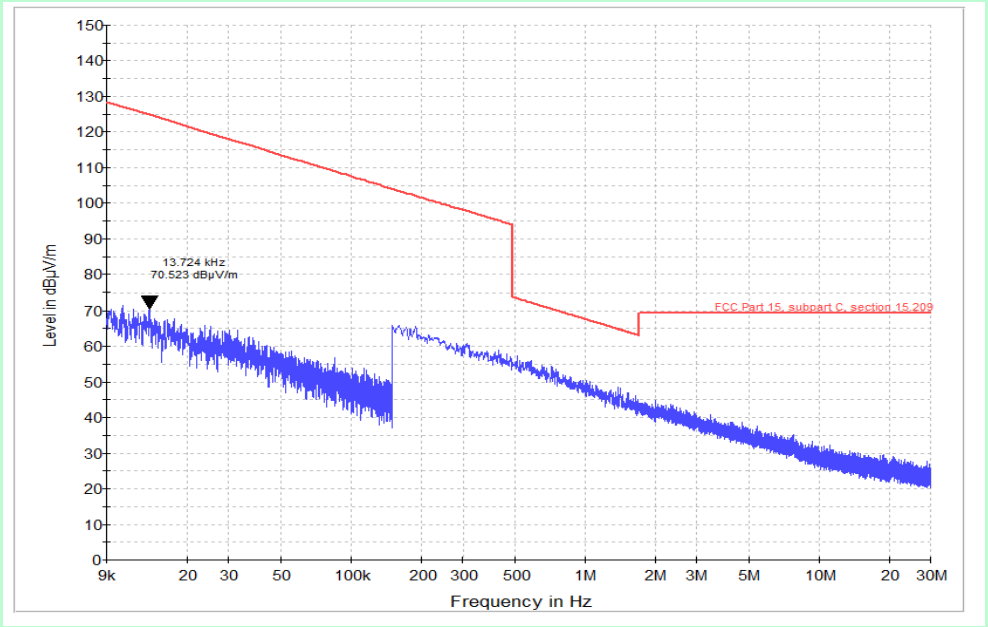
Channel 4 (915.325 MHz)

Note : Peak Graph - Perpendicular



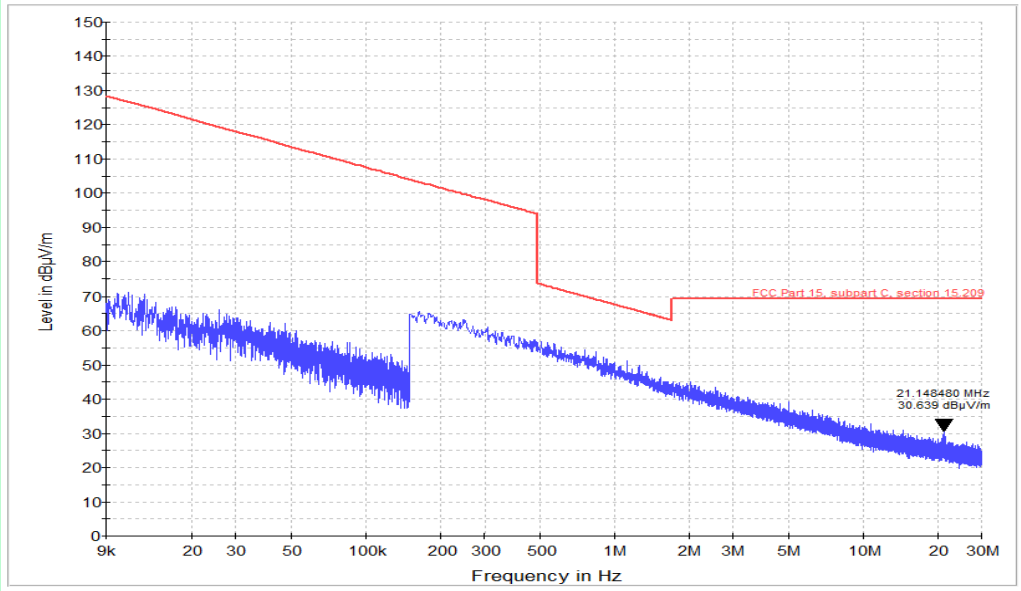
Channel 5 (921.575 MHz)

Note : Peak Graph - Perpendicular



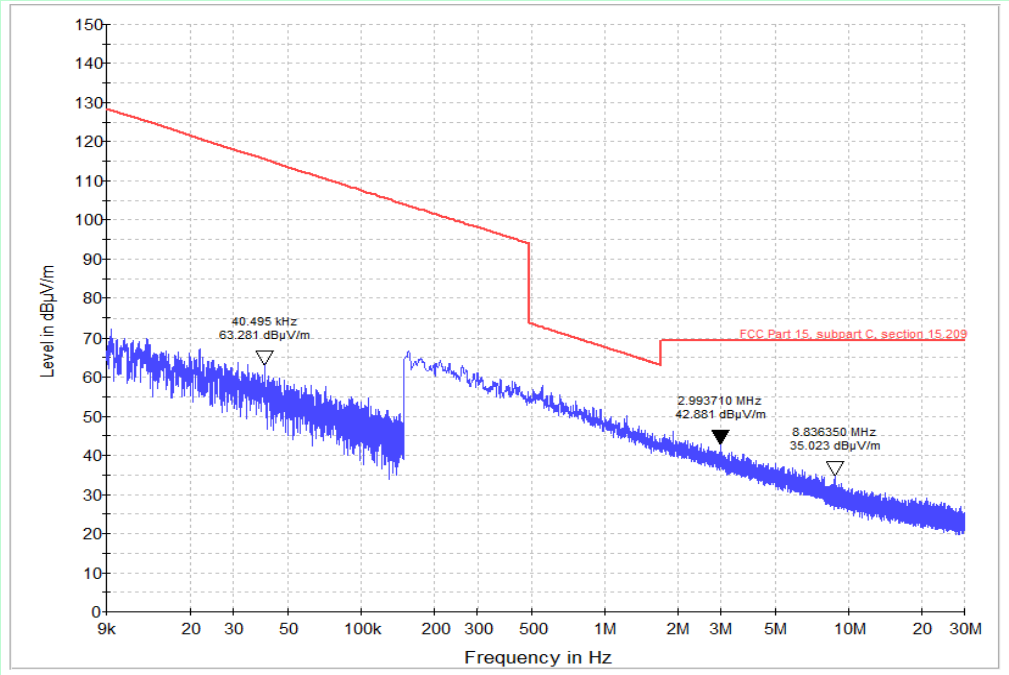
Channel 5 (921.575 MHz)

Note : Peak Graph - Parallel



Channel 6 (927.125 MHz)

Note : Peak Graph - Perpendicular



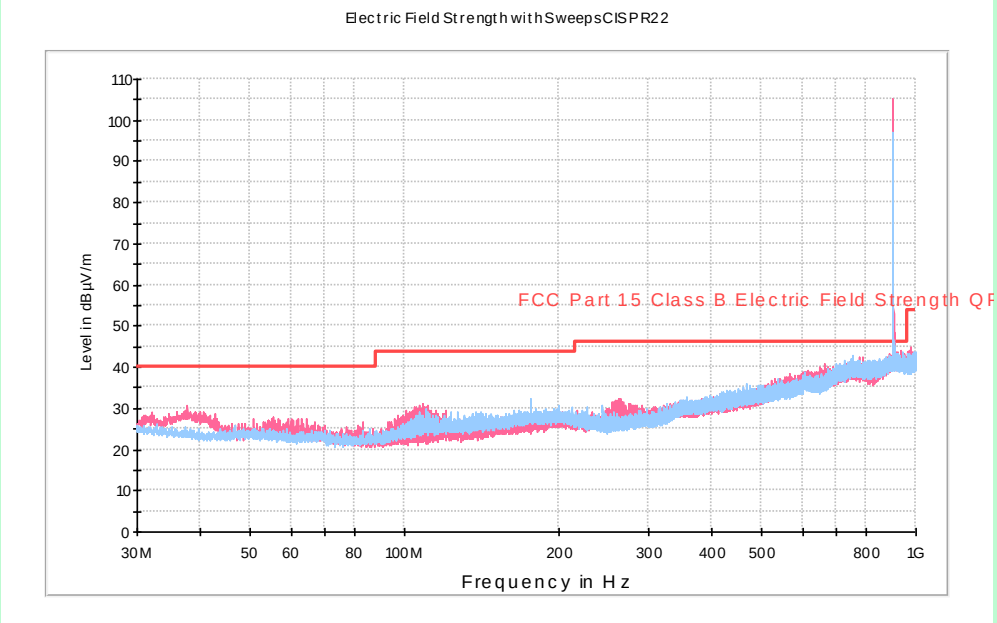
Channel 6 (927.125 MHz)

Note : Peak Graph - Parallel

TEST RESULT – 9 KHz to 30 MHz									
Channel	Channel Frequency	Measured Spurious	Quasi Peak	Height	Ant Pol	Azimuth	Margin	Limit @ 3m Distance	Results
#	MHz	MHz	dBµV/m	cm	Parallel / Perpendicular	deg	dB	dBµV/m	
1	902.875	316.165	62.283	100	Parallel	0	64.717	127	PASS
1	902.875	16.525	68.703	100	Perpendicular	30	58.297	127	PASS
1	902.875	1.977815	46.187	100	Perpendicular	60	80.813	127	PASS
2	908.425	15.641	69.605	100	Parallel	0	57.395	127	PASS
2	908.425	21147.485	30.02	100	Parallel	30	39.98	70	PASS
2	908.425	14.753	69.57	100	Perpendicular	60	57.43	127	PASS
2	908.425	57.86	57.546	100	Perpendicular	0	12.454	70	PASS
3	914.325	21168.3	30.538	100	Parallel	25	39.462	70	PASS
3	914.325	27.753	66.248	100	Perpendicular	0	60.752	127	PASS
4	915.325	10.668	72.074	100	Parallel	30	54.926	127	PASS
4	915.325	10375.615	33.692	100	Parallel	25	36.308	70	PASS
4	915.325	16.229	69.62	100	Perpendicular	0	57.38	127	PASS
4	915.325	28.181	66.554	100	Perpendicular	25	60.446	127	PASS
4	915.325	21075.845	29.942	100	Perpendicular	0	40.058	70	PASS
5	921.575	13.724	70.523	100	Perpendicular	30	56.477	127	PASS
6	927.125	21148.48	30.639	100	Parallel	60	39.361	70	PASS
6	927.125	40.495	63.281	100	Perpendicular	0	63.719	127	PASS
6	927.125	2993.71	42.881	100	Perpendicular	25	27.119	70	PASS
6	927.125	8836.35	35.023	100	Perpendicular	0	34.977	70	PASS

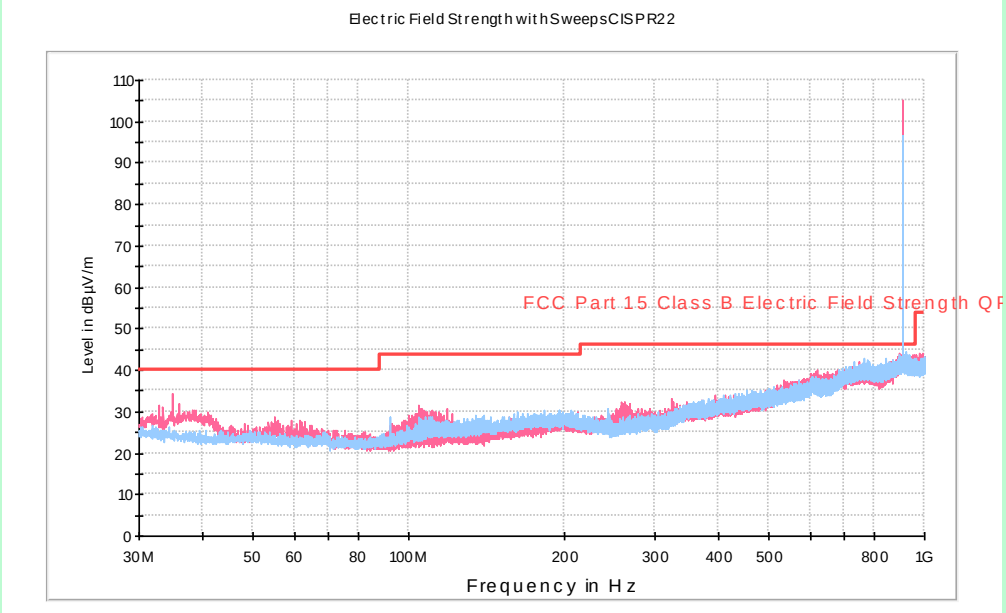
Note : Measured Field Strength –dBuV/m = Receiver Readings (dBuV) + Antenna Factor (dB/m) + Cable loss (dB)

TEST GRAPHS – 30 MHz to 1 GHz



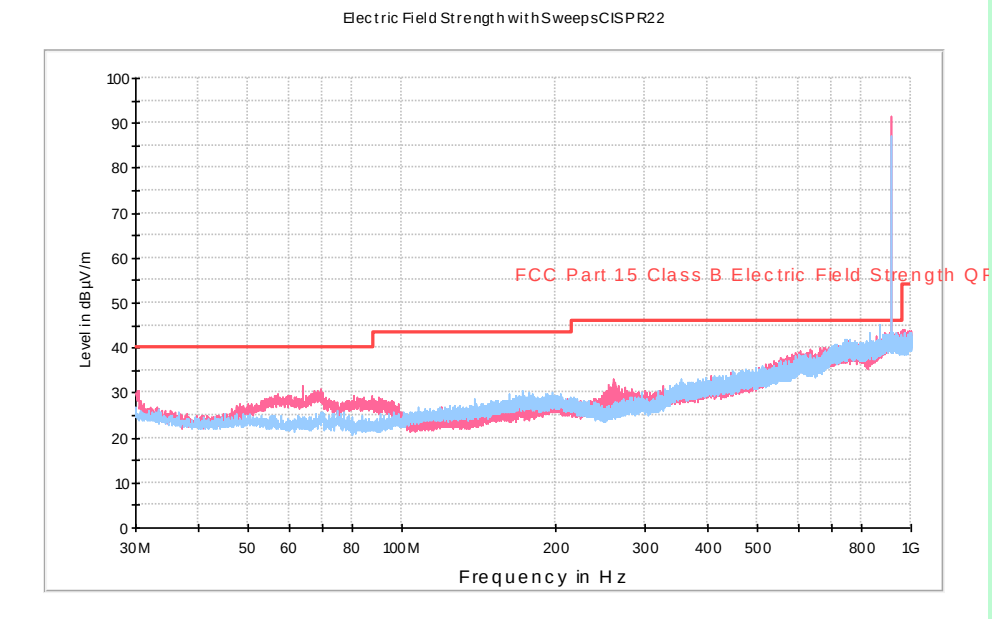
Channel 1 (902.875 MHz)

Note : Peak Graph Vertical (Red), Peak Graph Horizontal (Blue)



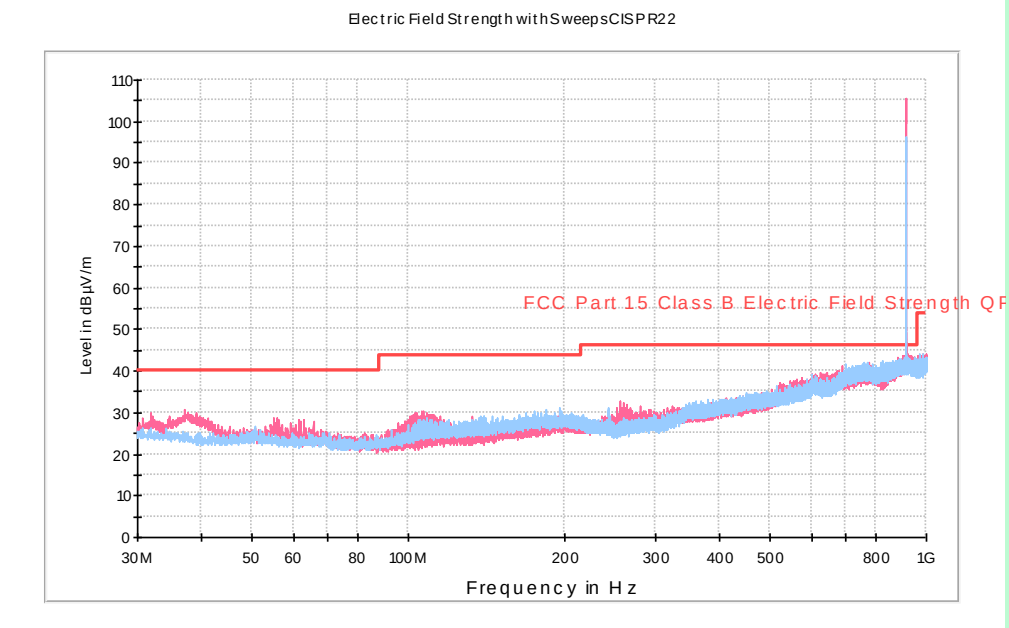
Channel 2 (908.425 MHz)

Note : Peak Graph Vertical (Red), Peak Graph Horizontal (Blue)



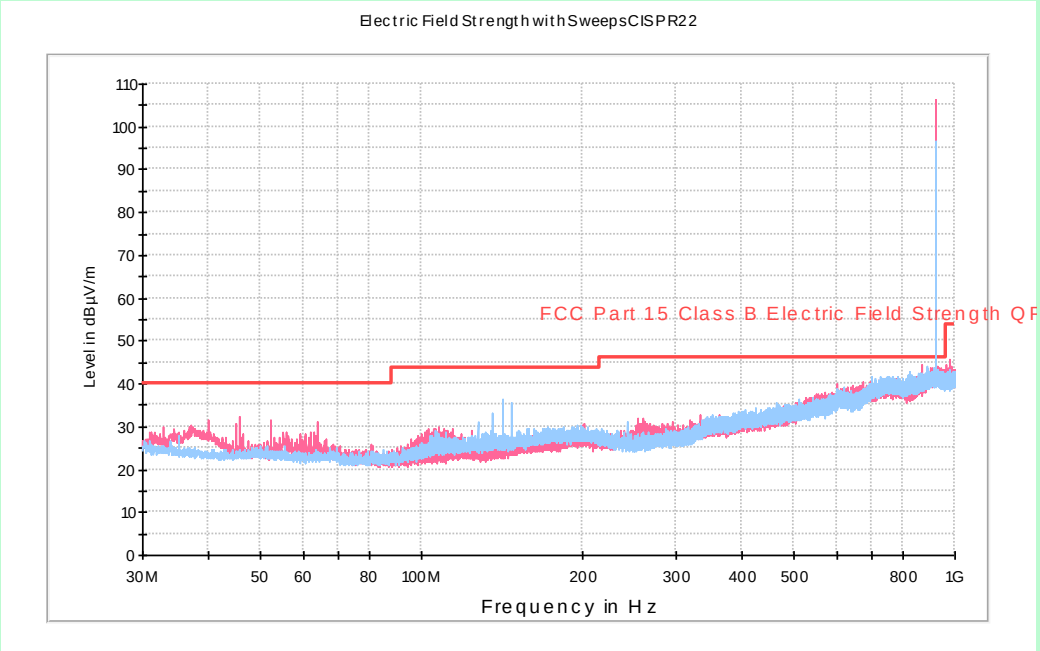
Channel 3 (914.325 MHz)

Note : Peak Graph Vertical (Red), Peak Graph Horizontal (Blue)



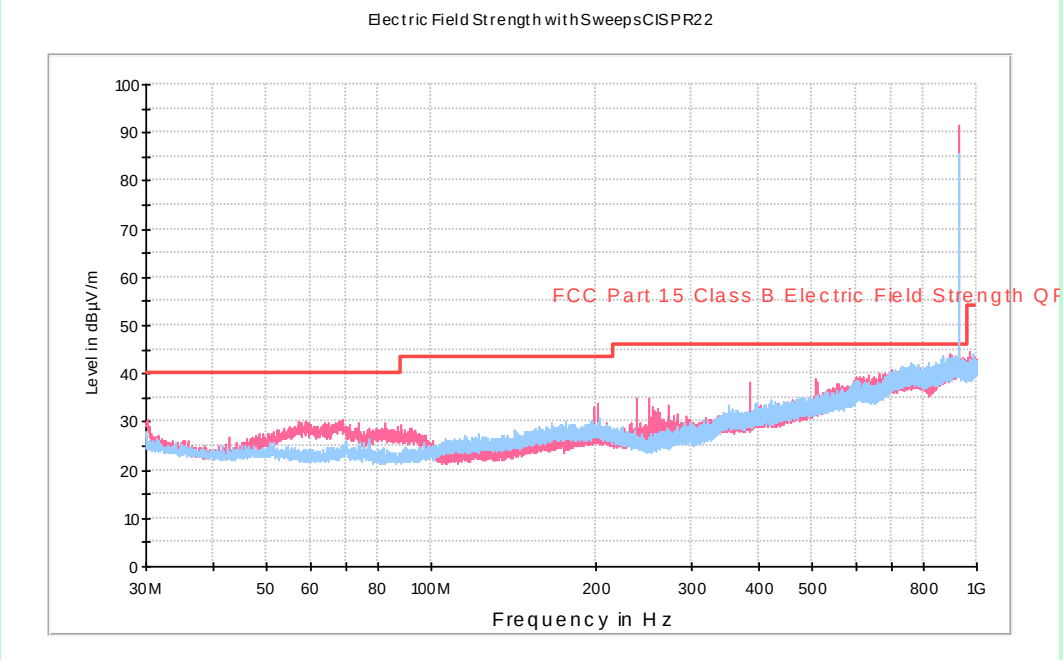
Channel 4 (915.325 MHz)

Note : Peak Graph Vertical (Red), Peak Graph Horizontal (Blue)



Channel 5 (921.575 MHz)

Note : Peak Graph Vertical (Red), Peak Graph Horizontal (Blue)



Channel 6 (927.125 MHz)

Note : Peak Graph Vertical (Red), Peak Graph Horizontal (Blue)

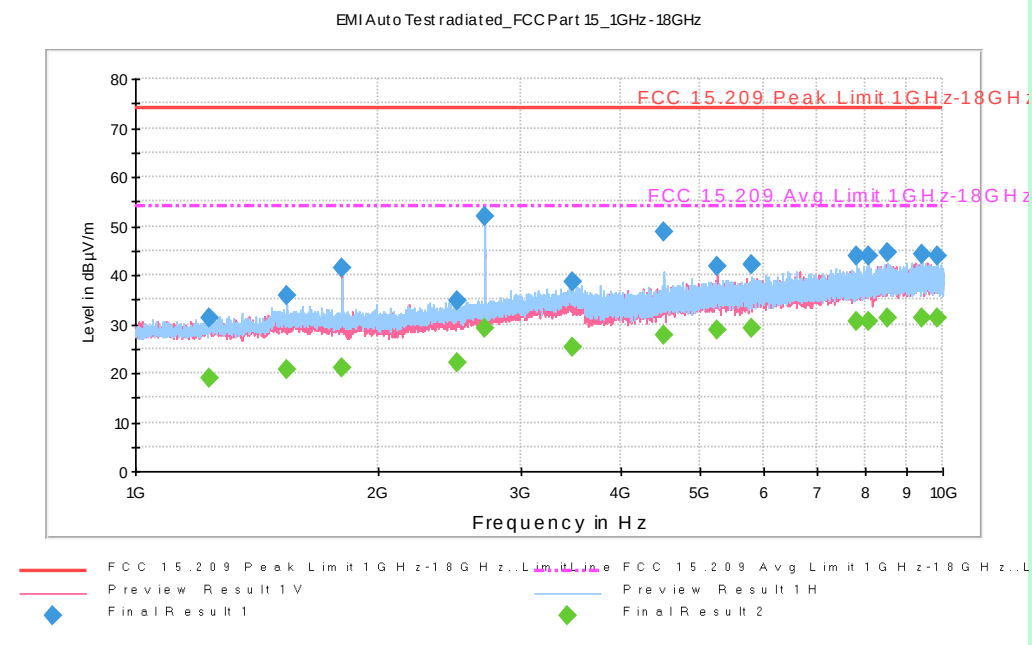
TEST RESULT – 30 MHz to 1 GHz								
Channel	Measured Spurious	Quasi Peak	Height	Ant Pol	Azimuth	Margin	Limit @ 3m Distance	
#	MHz	dBµV/m	cm	H / V	deg	dB	dBµV/m	Results
1	37.29	25.9	100.0	V	330.0	14.1	40	PASS
1	43	23.1	100.0	V	300.0	16.9	40	PASS
1	61.33	24.7	100.0	V	300.0	15.3	40	PASS
1	103.62	28.3	100.0	V	270.0	15.2	44	PASS
1	167.63	23.5	200.0	H	120.0	20.0	44	PASS
1	176.98	23.9	200.0	H	90.0	19.6	44	PASS
1	261.96	27.5	100.0	V	90.0	18.5	46	PASS
1	465.25	28.5	100.0	H	180.0	17.5	46	PASS
1	662.49	33.4	400.0	V	120.0	12.6	46	PASS
1	902.72	116.2	100.0	V	300.0	-70.2	46	Intended Frequency
2	34.55	25.4	100.0	V	180.0	14.6	40	PASS
2	54.92	22.7	100.0	V	330.0	17.3	40	PASS
2	61.32	24.2	100.0	V	0.0	15.8	40	PASS
2	105	27.8	100.0	V	240.0	15.7	44	PASS
2	119.83	25.5	100.0	V	300.0	18.0	44	PASS
2	162.25	22.6	200.0	H	210.0	20.9	44	PASS
2	196.07	27.4	100.0	H	60.0	16.1	44	PASS
2	324.35	24.5	100.0	H	120.0	21.5	46	PASS
2	481.42	28.8	200.0	H	30.0	17.2	46	PASS
2	694.31	33.8	300.0	V	30.0	12.2	46	PASS
2	866.73	36.2	400.0	H	330.0	9.8	46	PASS
2	908.27	115.7	100.0	V	300.0	-69.7	46	Intended Frequency
3	30.05	24.6	100.0	V	150.0	15.4	40	PASS
3	56.98	26.7	100.0	V	300.0	13.3	40	PASS
3	64.81	26.2	100.0	V	330.0	13.8	40	PASS
3	86.68	25.2	100.0	V	180.0	14.8	40	PASS
3	172.19	21.6	100.0	V	0.0	21.9	44	PASS
3	198.48	23.8	100.0	H	60.0	19.7	44	PASS
3	259.7	29.1	100.0	V	60.0	16.9	46	PASS
3	493.48	28.8	390.0	H	180.0	17.2	46	PASS
3	703.89	34.5	100.0	H	150.0	11.5	46	PASS
3	867.49	36.2	200.0	H	300.0	9.8	46	PASS
3	914.33	89.8	100.0	V	210.0	-43.8	46	INTENDED FREQUENCY

NOTE: Measured Field Strength –dBuV/m (9 KHz to 1GHz) = Receiver Readings (dBuV) + Antenna Factor (dB/m) + Cable loss (dB)

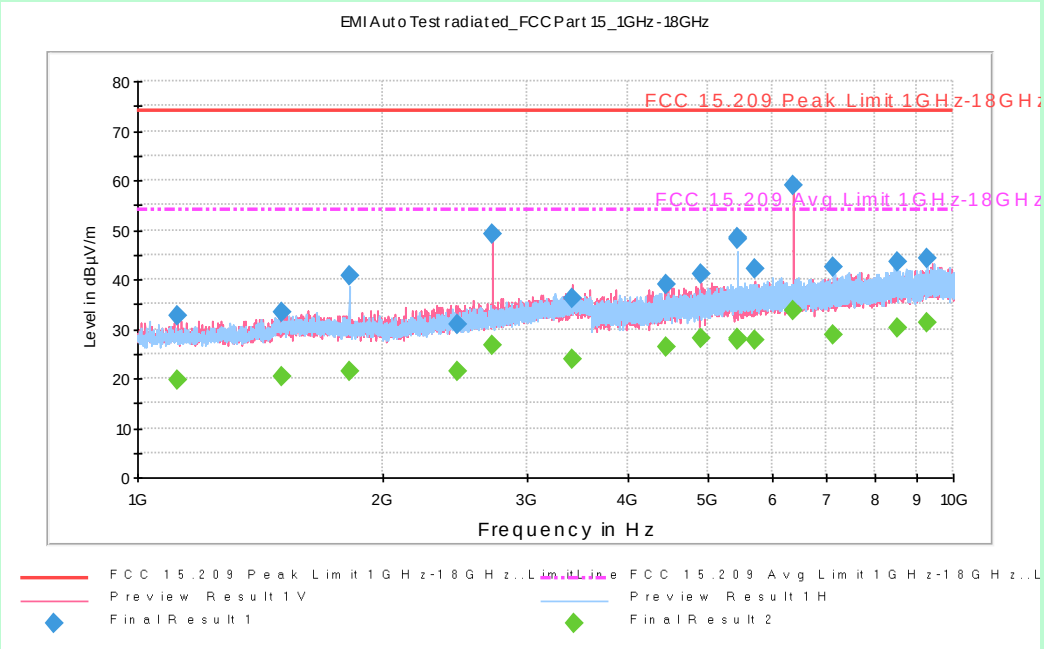
TEST RESULT – 30 MHz to 1 GHz								
Channel	Measured Spurious	Quasi Peak	Height	Ant Pol	Azimuth	Margin	Limit @ 3m Distance	
#	MHz	dBµV/m	cm	H / V	deg	dB	dBµV/m	Results
4	36.45	24.3	100.0	V	240.0	15.7	40	PASS
4	54.96	23.0	100.0	V	30.0	17.0	40	PASS
4	62.73	25.7	100.0	V	300.0	14.3	40	PASS
4	106.45	27.6	100.0	V	300.0	15.9	44	PASS
4	168.65	23.1	200.0	H	0.0	20.4	44	PASS
4	196.2	27.4	100.0	H	60.0	16.1	44	PASS
4	257.06	26.2	100.0	V	120.0	19.8	46	PASS
4	490.1	28.4	200.0	V	30.0	17.6	46	PASS
4	700.3	34.7	100.0	H	330.0	11.3	46	PASS
4	915.18	116.9	100.0	V	300.0	-70.9	46	Intended Frequency
5	39.45	24.2	100.0	V	0.0	15.8	40	PASS
5	45.06	20.2	100.0	V	60.0	19.8	40	PASS
5	107.13	26.5	100.0	V	270.0	17.0	44	PASS
5	143.11	24.1	200.0	H	90.0	19.4	44	PASS
5	148.02	24.9	200.0	H	270.0	18.6	44	PASS
5	201.34	23.6	400.0	H	240.0	19.9	44	PASS
5	333.72	24.9	100.0	H	150.0	21.1	46	PASS
5	464.71	27.9	300.0	V	300.0	18.1	46	PASS
5	700.1	34.6	400.0	H	90.0	11.4	46	PASS
5	864.82	36.2	400.0	H	240.0	9.8	46	PASS
5	921.42	103.8	100.0	V	300.0	-69.8	46	Intended Frequency
6	30.08	26.1	100.0	V	180.0	13.9	40	PASS
6	58.78	26.5	100.0	V	330.0	13.6	40	PASS
6	68	26.9	100.0	V	330.0	13.1	40	PASS
6	86.38	25.0	100.0	V	180.0	15.0	40	PASS
6	166.34	23.5	200.0	H	60.0	20.0	44	PASS
6	199.86	22.5	100.0	V	330.0	21.0	44	PASS
6	200.94	23.7	200.0	H	210.0	19.8	44	PASS
6	251.81	25.8	100.0	V	0.0	20.2	46	PASS
6	383.22	26.4	390.0	H	60.0	19.6	46	PASS
6	507.28	29.1	390.0	H	180.0	16.9	46	PASS
6	510.27	29.1	390.0	H	120.0	16.9	46	PASS
6	696.48	33.8	300.0	V	60.0	12.2	46	PASS
6	865.78	35.8	300.0	V	270.0	10.2	46	PASS
6	927.12	89.9	100.0	V	210.0	-43.9	46	Intended Frequency

NOTE: Measured Field Strength –dBuV/m (9 KHz to 1GHz) = Receiver Readings (dBuV) + Antenna Factor (dB/m) + Cable loss (dB)

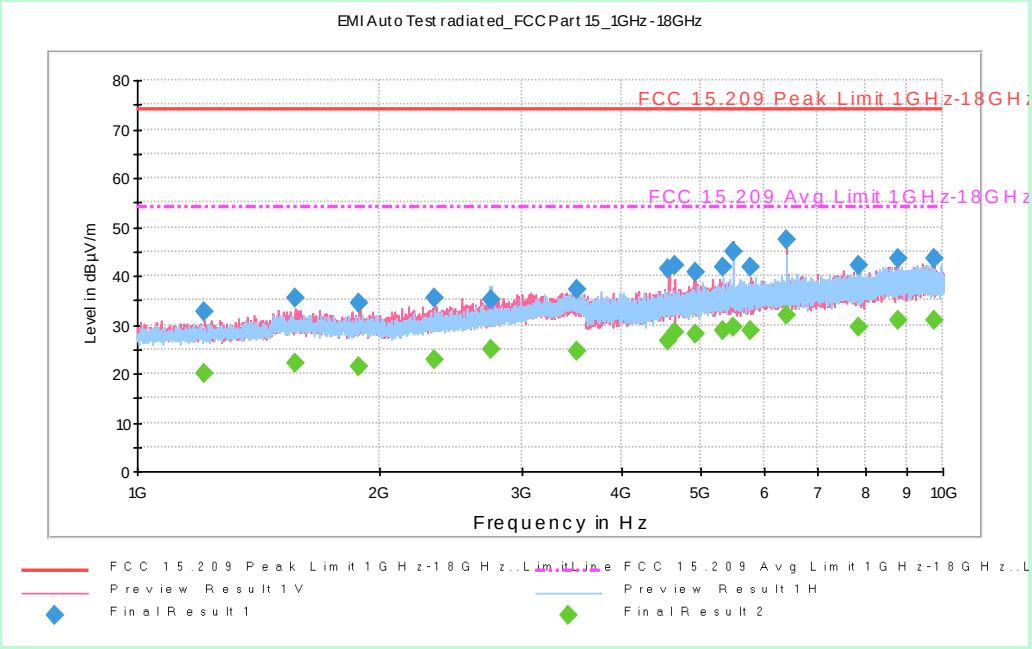
TEST GRAPHS – 1 GHz to 10 GHz



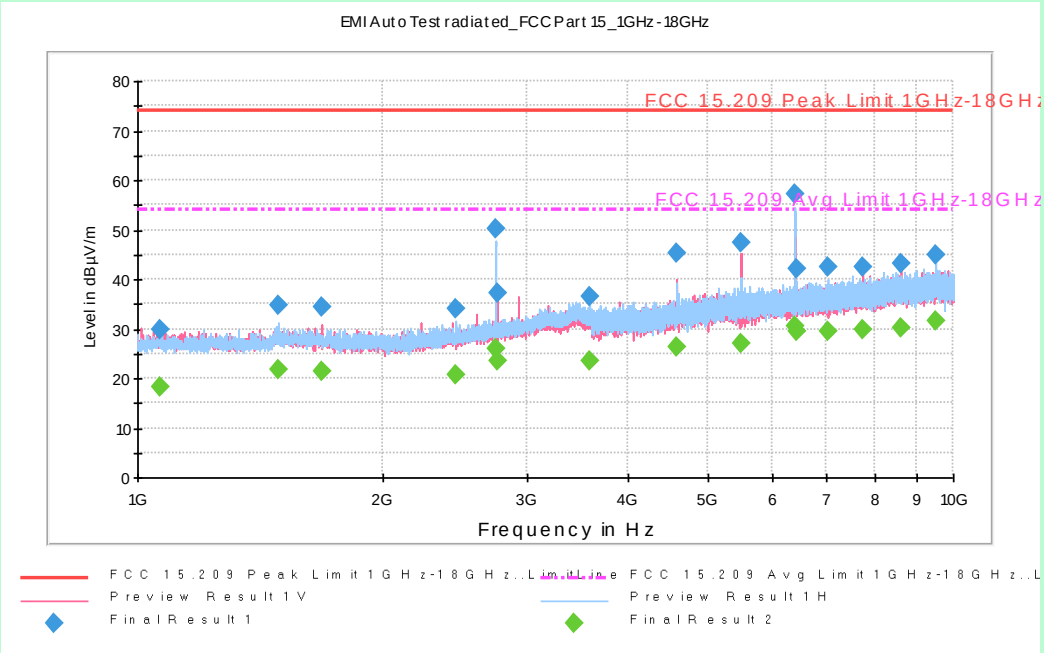
Channel 1 (902.875 MHz)



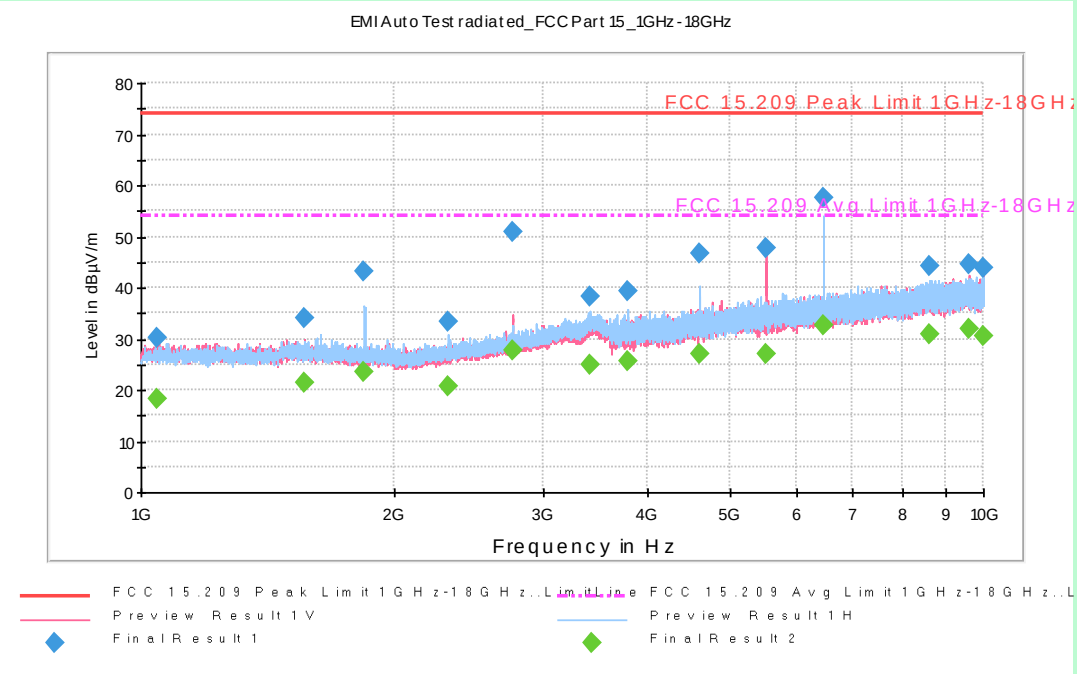
Channel 2 (908.425 MHz)



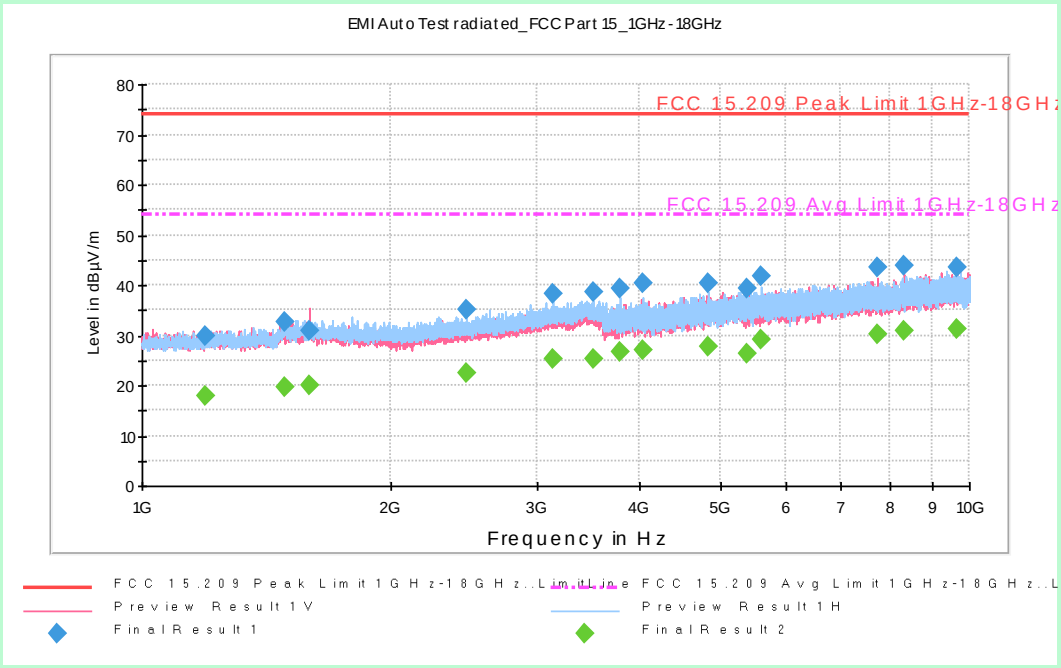
Channel 3 (914.325 MHz)



Channel 4 (915.325 MHz)



Channel 5 (921.575 MHz)



Channel 6 (927.125 MHz)

TEST RESULT – 1GHz to 10GHz						RESTRICTED BAND – PEAK	
Channel	Frequency	MaxPeak	Height	Ant Pol	Azimuth	Margin	Limit
#	(MHz)	(dBµV/m)	(cm)	H /V	(deg)	(dB)	(dBµV/m)
1	1805.1	41.3	300.0	H	22.0	32.7	74.0
1	2499.9	34.9	400.0	V	22.0	39.1	74.0
1	2709.6	51.8	200.0	H	0.0	25.9	74.0
1	3485.8	38.5	400.0	V	22.0	35.5	74.0
1	4513.2	48.7	100.0	V	0.0	25.3	74.0
1	5264.2	41.8	400.0	V	22.0	32.2	74.0
1	5805.6	42.1	400.0	V	66.0	31.9	74.0
1	7832.4	43.8	400.0	H	110.0	30.2	74.0
1	8084.4	43.9	400.0	V	66.0	30.1	74.0
1	8529.0	44.6	400.0	V	22.0	29.4	74.0
1	9412.3	44.1	400.0	V	0.0	29.9	74.0
1	9850.2	44.0	400.0	V	110.0	30.0	74.0
2	1817.2	40.5	100.0	H	0.0	33.5	74.0
2	2473.8	30.9	400.0	V	286.0	43.1	74.0
2	2724.4	49.1	200.0	H	0.0	24.9	74.0
2	3408.0	36.3	400.0	V	22.0	37.7	74.0
2	4437.6	39.1	400.0	V	66.0	34.9	74.0
2	4916.4	41.2	400.0	V	242.0	32.8	74.0
2	5449.2	48.0	100.0	V	0.0	26.0	74.0
2	5451.9	48.6	100.0	V	0.0	25.4	74.0
2	5702.5	42.0	400.0	V	110.0	32.0	74.0
2	6356.8	59.1	100.0	V	0.0	16.2	74.0
2	7129.5	42.4	400.0	V	22.0	31.6	74.0
2	8542.5	43.6	300.0	H	352.0	30.4	74.0
2	9279.6	44.2	400.0	H	286.0	29.8	74.0
3	1880.7	34.2	400.0	V	66.0	39.8	74.0
3	2332.9	35.4	400.0	V	66.0	38.6	74.0
3	2743.8	35.2	400.0	V	22.0	38.8	74.0
3	3511.9	37.2	400.0	H	22.0	36.8	74.0
3	4569.9	41.5	100.0	V	0.0	32.5	74.0
3	4658.5	42.1	400.0	V	110.0	31.9	74.0
3	4939.3	40.7	400.0	V	22.0	33.3	74.0
3	5335.8	41.8	400.0	H	154.0	32.2	74.0
3	5487.0	45.0	100.0	V	0.0	29.0	74.0
3	5770.5	41.7	400.0	V	330.0	32.3	74.0
3	6402.3	47.3	100.0	V	0.0	26.7	74.0
3	7847.7	42.3	400.0	V	154.0	31.7	74.0
3	8780.5	43.3	400.0	V	22.0	30.7	74.0
3	9743.5	43.5	400.0	V	198.0	30.5	74.0

Note :
Field Strength –dBuV/m = Receiver Readings (dBuV) + Antenna Factor (dB/m) + Cable loss (dB) + Filter Insertion loss - Pre amplifier Gain (dB)

TEST RESULT – 1 GHz to 10 GHz						RESTRICTED BAND – PEAK	
Channel	Frequency	MaxPeak	Height	Ant Pol	Azimuth	Margin	Limit
#	(MHz)	(dBµV/m)	(cm)		(deg)	(dB)	(dBµV/m)
4	1229.5	29.8	400.0	V	22.0	44.2	74.0
4	1540.5	31.1	400.0	V	66.0	42.9	74.0
4	1830.3	40.6	100.0	V	0.0	33.4	74.0
4	2411.2	32.5	400.0	H	44.0	41.5	74.0
4	2745.1	41.0	100.0	V	0.0	33.0	74.0
4	3168.6	36.5	100.0	H	0.0	37.5	74.0
4	4578.4	43.0	200.0	H	286.0	31.0	74.0
4	5491.9	45.4	200.0	H	264.0	28.6	74.0
4	6405.4	50.0	200.0	H	22.0	24.0	74.0
4	8236.0	45.9	100.0	H	286.0	28.1	74.0
4	1236.3	30.1	400.0	V	66.0	43.9	74.0
4	1489.6	31.7	100.0	H	0.0	42.3	74.0
5	1719.6	31.7	100.0	H	0.0	42.3	74.0
5	1842.9	42.6	300.0	H	0.0	31.4	74.0
5	2355.4	32.4	100.0	H	0.0	41.6	74.0
5	2765.4	45.5	200.0	H	22.0	28.5	74.0
5	3484.5	37.1	100.0	H	0.0	36.9	74.0
5	4609.0	44.6	200.0	H	330.0	29.4	74.0
5	5531.1	45.8	200.0	H	286.0	28.2	74.0
5	6449.1	54.1	100.0	H	44.0	19.9	74.0
5	6453.6	52.3	100.0	H	22.0	21.7	74.0
5	8291.4	46.4	100.0	V	0.0	27.6	74.0
6	1166.5	31.7	400.0	V	154.0	42.3	74.0
6	1475.2	33.1	200.0	H	132.0	41.0	74.0
6	1854.6	39.3	100.0	V	0.0	34.7	74.0
6	2481.0	33.3	200.0	H	132.0	40.7	74.0
6	2825.2	34.7	200.0	H	132.0	39.3	74.0
6	3971.8	38.6	400.0	H	132.0	35.4	74.0
6	4816.5	41.8	400.0	V	286.0	32.2	74.0
6	5564.4	44.7	100.0	H	308.0	29.3	74.0
6	6492.3	53.1	100.0	H	44.0	20.9	74.0
6	9223.3	43.9	400.0	V	198.0	30.1	74.0

Note :
Field Strength –dBuV/m = Receiver Readings (dBuV) + Antenna Factor (dB/m) + Cable loss (dB) + Filter Insertion loss - Pre amplifier Gain (dB)

TEST RESULT – 1 GHz to 10 GHz						RESTRICTED BAND – AVERAGE	
Channel	Frequency	Average	Height	Polarization	Azimuth	Margin	Limit
#	(MHz)	(dBµV/m)	(cm)		(deg)	(dB)	(dBµV/m)
1	1805.1	20.9	300.0	H	22.0	33.1	54.0
1	2499.9	22.1	400.0	V	22.0	31.9	54.0
1	2709.6	29.1	200.0	H	0.0	28.1	54.0
1	3485.8	25.2	400.0	V	22.0	28.8	54.0
1	4513.2	27.9	100.0	V	0.0	26.1	54.0
1	5264.2	28.9	400.0	V	22.0	25.1	54.0
1	5805.6	29.0	400.0	V	66.0	25.0	54.0
1	7832.4	30.6	400.0	H	110.0	23.4	54.0
1	8084.4	30.6	400.0	V	66.0	23.4	54.0
1	8529.0	31.2	400.0	V	22.0	22.8	54.0
1	9412.3	31.1	400.0	V	0.0	22.9	54.0
1	9850.2	31.1	400.0	V	110.0	22.9	54.0
2	1817.2	21.5	100.0	H	0.0	32.5	54.0
2	2473.8	21.3	400.0	V	286.0	32.7	54.0
2	2724.4	26.8	200.0	H	0.0	27.2	54.0
2	3408.0	23.7	400.0	V	22.0	30.3	54.0
2	4437.6	26.4	400.0	V	66.0	27.6	54.0
2	4916.4	28.2	400.0	V	242.0	25.8	54.0
2	5449.2	28.0	100.0	V	0.0	26.0	54.0
2	5451.9	27.9	100.0	V	0.0	26.1	54.0
2	5702.5	27.8	400.0	V	110.0	26.2	54.0
2	6356.8	33.8	100.0	V	0.0	22.4	54.0
2	7129.5	28.8	400.0	V	22.0	25.2	54.0
2	8542.5	30.3	300.0	H	352.0	23.7	54.0
2	9279.6	31.4	400.0	H	286.0	22.6	54.0
3	1880.7	21.4	400.0	V	66.0	32.6	54.0
3	2332.9	22.8	400.0	V	66.0	31.2	54.0
3	2743.8	24.8	400.0	V	22.0	29.2	54.0
3	3511.9	24.5	400.0	H	22.0	29.5	54.0
3	4569.9	26.7	100.0	V	0.0	27.3	54.0
3	4658.5	28.5	400.0	V	110.0	25.5	54.0
3	4939.3	28.1	400.0	V	22.0	25.9	54.0
3	5335.8	28.8	400.0	H	154.0	25.2	54.0
3	5487.0	29.6	100.0	V	0.0	24.4	54.0
3	5770.5	28.9	400.0	V	330.0	25.1	54.0
3	6402.3	31.9	100.0	V	0.0	22.1	54.0
3	7847.7	29.4	400.0	V	154.0	24.6	54.0
3	8780.5	30.9	400.0	V	22.0	23.1	54.0
3	9743.5	30.8	400.0	V	198.0	23.2	54.0

Note :
Field Strength –dBuV/m = Receiver Readings (dBuV) + Antenna Factor (dB/m) + Cable loss (dB) + Filter Insertion loss - Pre amplifier Gain (dB)

TEST RESULT – 1 GHz to 10 GHz						RESTRICTED BAND – AVERAGE	
Channel	Frequency	Average	Height	Polarization	Azimuth	Margin	Limit
#	(MHz)	(dBµV/m)	(cm)		(deg)	(dB)	(dBµV/m)
4	1229.5	16.3	400.0	V	22.0	37.7	54.0
4	1540.5	17.9	400.0	V	66.0	36.1	54.0
4	1830.3	20.0	100.0	V	0.0	34.0	54.0
4	2411.2	19.8	400.0	H	44.0	34.2	54.0
4	2745.1	21.3	100.0	V	0.0	32.7	54.0
4	3168.6	22.4	100.0	H	0.0	31.6	54.0
4	4578.4	26.9	200.0	H	286.0	27.1	54.0
4	5491.9	27.8	200.0	H	264.0	26.2	54.0
4	6405.4	29.5	200.0	H	22.0	24.5	54.0
4	8236.0	30.2	100.0	H	286.0	23.8	54.0
4	1236.3	17.4	400.0	V	66.0	36.6	54.0
4	1489.6	18.6	100.0	H	0.0	35.4	54.0
5	1719.6	18.7	100.0	H	0.0	35.3	54.0
5	1842.9	23.2	300.0	H	0.0	30.8	54.0
5	2355.4	19.6	100.0	H	0.0	34.4	54.0
5	2765.4	25.9	200.0	H	22.0	28.1	54.0
5	3484.5	24.1	100.0	H	0.0	29.9	54.0
5	4609.0	27.2	200.0	H	330.0	26.8	54.0
5	5531.1	28.2	200.0	H	286.0	25.8	54.0
5	6449.1	30.6	100.0	H	44.0	23.4	54.0
5	6453.6	29.3	100.0	H	22.0	24.7	54.0
5	8291.4	30.2	100.0	V	0.0	23.8	54.0
6	1166.5	19.0	400.0	V	154.0	35.0	54.0
6	1475.2	19.8	200.0	H	132.0	34.2	54.0
6	1854.6	25.3	100.0	V	0.0	28.7	54.0
6	2481.0	20.7	200.0	H	132.0	33.3	54.0
6	2825.2	21.9	200.0	H	132.0	32.1	54.0
6	3971.8	25.8	400.0	H	132.0	28.2	54.0
6	4816.5	28.9	400.0	V	286.0	25.2	54.0
6	5564.4	29.9	100.0	H	308.0	24.1	54.0
6	6492.3	33.9	100.0	H	44.0	20.1	54.0
6	9223.3	31.2	400.0	V	198.0	22.8	54.0

Note :
Field Strength –dBuV/m = Receiver Readings (dBuV) + Antenna Factor (dB/m) + Cable loss (dB) + Filter Insertion loss - Pre amplifier Gain (dB)

Test Result – 1 GHz to 10 GHz							NON RESTRICTED BAND - PEAK		
Channel	Measured Fundamental	Spurious Emission	Measured Harmonic	Height	Ant Pol	Azimath	Limit [Fundamental – 20 dBc]	Margin	Results
#	dBµV/m	MHz	dBµV/m	cm	H / V		dBuV/m	dB	
1	116.2	1805.1	41.3	300.0	H	88.0	96.20	54.90	PASS
2	115.7	1817.2	40.5	100.0	H	66.0	95.70	55.20	PASS
3	89.8	1880.7	34.2	400.0	V	88.0	69.80	35.60	PASS
4	116.9	1830.3	40.6	100.0	V	44.0	96.90	56.30	PASS
5	103.8	1842.9	42.6	300.0	H	66.0	83.80	41.20	PASS
6	89.9	1854.6	39.3	100.0	V	88.0	69.90	30.60	PASS

Note :
Field Strength –dBuV/m = Receiver Readings (dBuV) + Antenna Factor (dB/m) + Cable loss (dB) + Filter Insertion loss - Pre amplifier Gain (dB)

TEST SETUP PHOTOGRAPHS

Refer Annexure -1

Radiated Emission Test Setup

Annexure - 1

CONDUCTED RF TEST SETUP

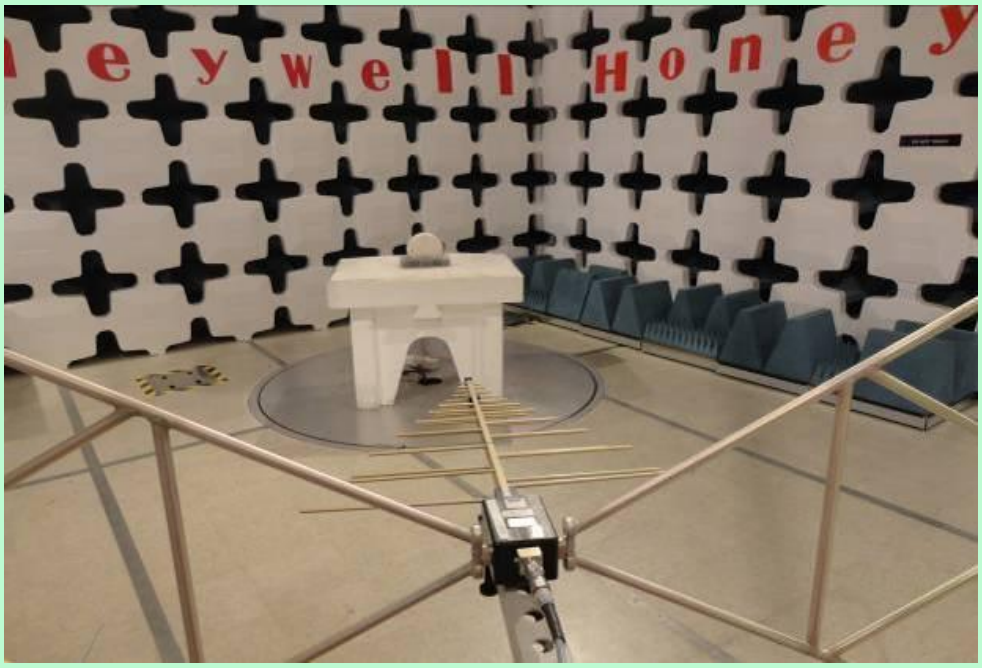
RADIATED TEST SETUP

EUT

AUXILIARY SETUP

Radiated Emission Setup – 9 KHz to 30 MHz [Parallel]

Radiated Emission Setup – 9 KHz to 30 MHz [Perpendicular]



Radiated Emission Setup – 30 KHz to 1 GHz [Horizontal Polarization]

Radiated Emission Setup – 30 MHz to 1 GHz [Perpendicular Polarization]

Radiated Emission Setup – 1 GHz to 10 GHz [Horizontal Polarization]

Radiated Emission Setup – 1 GHz to 10 GHz [Perpendicular Polarization]