FCC Test Report

Product Name	Industrial 900MHz Access Point Confirmed
Model No	AWK-3191-xx-yy-z (x=0-9,A-Z,blank; y=0-9,A-Z,blank or dash;z can be T or blank; for marketing purpose and no impact safety related critical components and constructions)
FCC ID.	SLE-WFS001

Applicant	MOXA Inc.
Address	FL.4, NO. 135. LANE 235, BAOQIAO RD. XINDIAN DIST.,NEW TAIPEI CITY, TAIWAN

Date of Receipt	June 23, 2014
Issue Date	July 15, 2014
Report No.	1460553R-RFUSP25V00
Report Version	V1.0

Testing Laboratory
0914

Test Report

Issue Date: July 15, 2014
Report No.: 1460553R-RFUSP25V00

Product Name	Industrial 900MHz Access Point Confirmed
Applicant	MOXA Inc.
Address	FL.4, NO. 135. LANE 235, BAOQIAO RD. XINDIAN DIST.,NEW TAIPEI CITY, TAIWAN
Manufacturer	MOXA Inc.
Model No.	AWK-3191-xx-yy-z (x=0-9,A-Z,blank; y=0-9,A-Z,blank or dash;z can be T or blank; for marketing purpose and no impact safety related critical components and constructions)
FCC ID.	SLE-WFS001
EUT Rated Voltage	DC 3.3V
EUT Test Voltage	AC 120V/60Hz
Trade Name	MOXA
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2014 ANSI C63.10: 2009, KDB 558074
Test Result	Complied

Documented By : Genie Chang

(Senior Adm. Specialist / Genie Chang)

Tested By : Vincent chu

(Engineer / Vincent Chu)

Approved By :

(Manager / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Industrial 900MHz Access Point Confirmed
Trade Name	MOXA
Model No.	AWK-3191-xx-yy-z (x=0-9,A-Z,blank; y=0-9,A-Z,blank or dash;z can be T or blank; for marketing purpose and no impact safety related critical components and constructions)
FCC ID.	SLE-WFS001
Frequency Range	905.25 -924.75 MHz
Number of Channels	OFDM : 5MBW: 7, 10MBW: 3, 20MBW: 1 DSSS : 20MBW: 1
Data Speed	OFDM :5MBW: 1.5-13.5Mbps, 10MBW: 3-27Mbps, 20MBW: 6 to 54Mbps DSSS : 20MBW: 1 to 11Mbps
Type of Modulation	OFDM (BPSK, QPSK, 16QAM, 64QAM) DSSS (DBPSK, DQPSK, CCK)
Antenna Type	Dipole Antenna
Antenna Gain	Refer to the table “Antenna List”
Channel Control	Auto

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	Wanshih	QJ1MPA0003A	Dipole Antenna	2.37dBi for 902~928MHz

Note: The antenna of EUT is conform to FCC 15.203.

OFDM :5MBW Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 01:	905.25MHz	Channel 02:	908.5 MHz	Channel 03:	911.7 MHz	Channel 04:	915 MHz
Channel 05:	918.25 MHz	Channel 06:	921.5 MHz	Channel 07:	924.75 MHz		

OFDM :10MBW Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 02:	908.5 MHz	Channel 04:	915 MHz	Channel 06:	921.5 MHz

OFDM :20MBW Center Frequency of Each Channel:

Channel	Frequency
Channel 04:	915 MHz

DSSS :20MBW Center Frequency of Each Channel:

Channel	Frequency
Channel 04:	915 MHz

Note:

1. The EUT is an Industrial 900MHz Access Point Confirmed with a built-in 900MHz transceiver.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. Lowest and highest data rates are tested in each mode. Only worst case is shown in the report. (DSSS is 1Mbps、OFDM:5MBW is 13.5Mbps、10MBW is 27Mbps、20MBW is 54Mbps)
4. These tests are conducted on a sample for the purpose of demonstrating compliance of 900MHz transmitter with Part 15 Subpart C Paragraph 15.247 of spread spectrum devices.

Test Mode:	Mode 1: Transmit (5MBW)_OFDM
	Mode 2: Transmit (10MBW)_OFDM
	Mode 3: Transmit (20MBW)_OFDM
	Mode 4: Transmit (20MBW)_DSSS

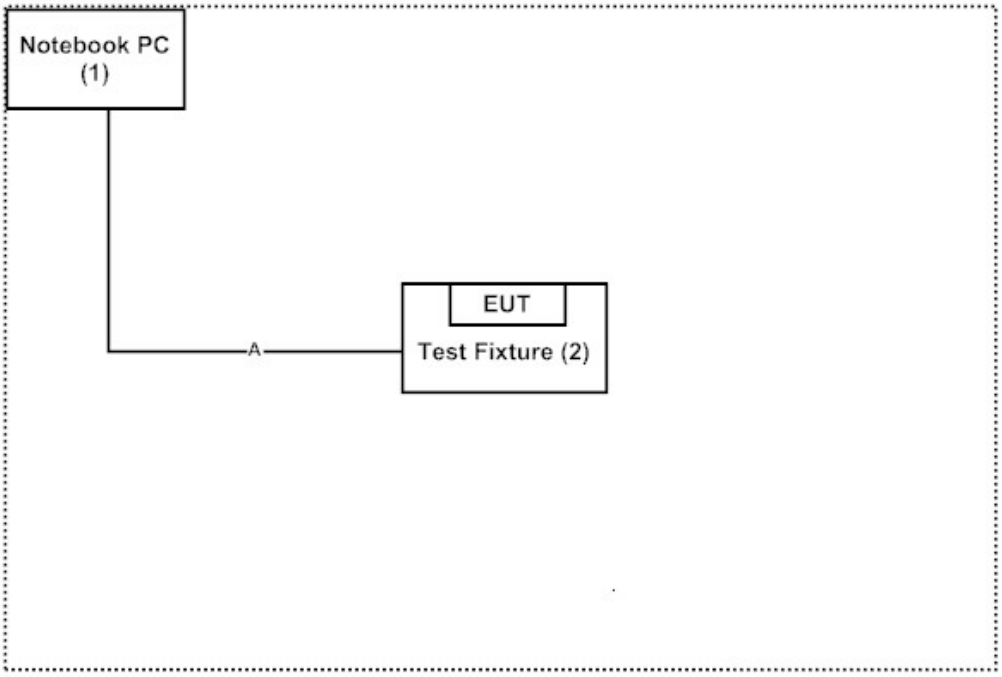
1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	DELL	PPT	N/A	Non-Shielded, 0.8m
2	Test Fixture	MOXA	N/A	N/A	N/A

Signal Cable Type		Signal cable Description
A	RJ45 Cable	Non-Shielded, 3.0m

1.4. Configuration of Tested System



1.5. EUT Exercise Software

(1) Setup the EUT as shown in Section 1.4

(2) Execute software “Tera Term v4.67” on the Notebook PC.

(3) Configure the test mode, the test channel, and the data rate.

(4) Press “OK” to start the continuous Transmit.

(5) Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

The related certificate for our laboratories about the test site and management system can be downloaded from QuieTek Corporation's Web Site: http://www.quietek.com/tw/ctg/cts/accreditations.htm
The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site: http://www.quietek.com/

Site Description: File on
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Registration Number: 92195

Site Name: Quietek Corporation
Site Address: No.5-22, Ruishukeng,
Linkou Dist. New Taipei City 24451,
Taiwan, R.O.C.
TEL: 886-2-8601-3788 / FAX : 886-2-8601-3789
E-Mail : service@quietek.com

FCC Accreditation Number: TW1014

2. Conducted Emission

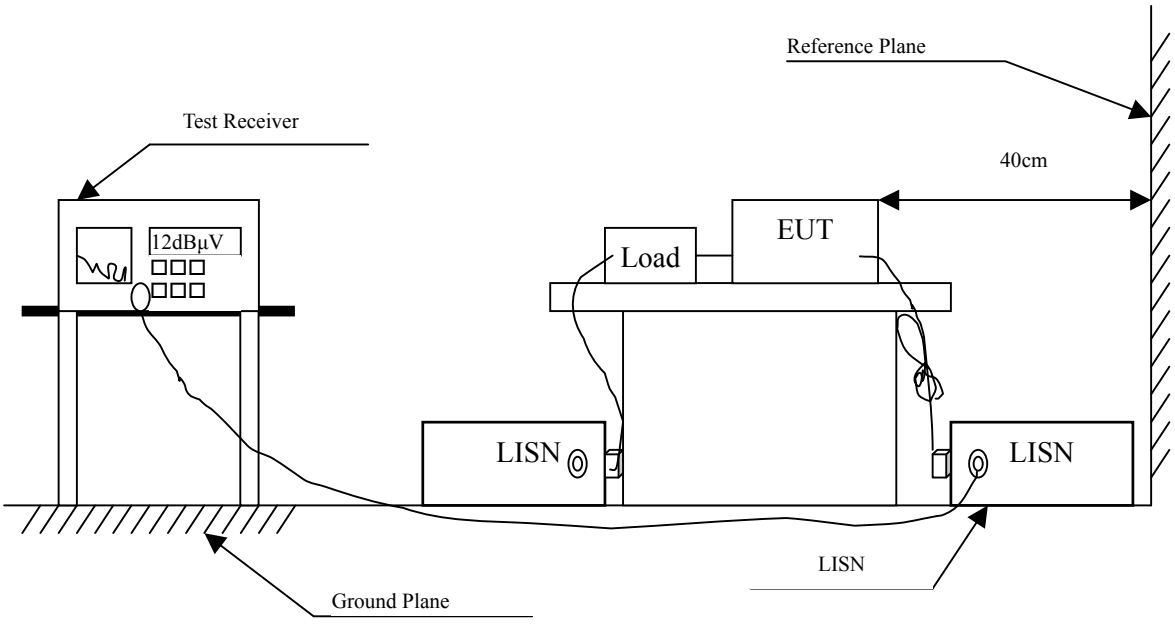
2.1. Test Equipment

	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.	Remark
X	Test Receiver	R & S	ESCS 30 / 825442/018	Sep., 2013	
X	Artificial Mains Network	R & S	ENV4200 / 848411/10	Feb., 2014	Peripherals
X	LISN	R & S	ESH3-Z5 / 825562/002	Feb., 2014	EUT
	DC LISN	Schwarzbeck	8226 / 176	Mar, 2014	EUT
X	Pulse Limiter	R & S	ESH3-Z2 / 357.8810.52	Feb., 2014	
	No.1 Shielded Room				

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked by "X" are used to measure the final test results.

2.2. Test Setup



2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBµV) Limit		
Frequency MHz	Limits	
	QP	AVG
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2009 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.5. Uncertainty

± 2.26 dB

2.6. Test Result of Conducted Emission

Product : Industrial 900MHz Access Point Confirmed
Test Item : Conducted Emission Test
Power Line : Line 1
Test Mode : Mode 3: Transmit (20MBW)_OFDM

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV	dB	dBµV
Line 1					
Quasi-Peak					
0.209	9.739	33.460	43.199	-21.115	64.314
0.279	9.742	27.830	37.572	-24.742	62.314
0.349	9.745	23.480	33.225	-27.089	60.314
0.560	9.755	25.630	35.385	-20.615	56.000
1.048	9.777	18.290	28.067	-27.933	56.000
1.466	9.806	19.450	29.256	-26.744	56.000
Average					
0.209	9.739	31.500	41.239	-13.075	54.314
0.279	9.742	26.960	36.702	-15.612	52.314
0.349	9.745	22.120	31.865	-18.449	50.314
0.560	9.755	21.180	30.935	-15.065	46.000
1.048	9.777	15.410	25.187	-20.813	46.000
1.466	9.806	16.740	26.546	-19.454	46.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Industrial 900MHz Access Point Confirmed
Test Item : Conducted Emission Test
Power Line : Line 2
Test Mode : Mode 3: Transmit (20MBW)_OFDM

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV	dB	dBµV
Line 2					
Quasi-Peak					
0.209	9.749	38.500	48.249	-16.065	64.314
0.279	9.752	35.060	44.812	-17.502	62.314
0.349	9.745	28.750	38.495	-21.819	60.314
0.556	9.755	31.630	41.385	-14.615	56.000
0.666	9.760	12.060	21.820	-34.180	56.000
1.462	9.806	21.640	31.446	-24.554	56.000
Average					
0.209	9.749	35.810	45.559	-8.755	54.314
0.279	9.752	33.650	43.402	-8.912	52.314
0.349	9.745	28.460	38.205	-12.109	50.314
0.556	9.755	28.870	38.625	-7.375	46.000
0.666	9.760	9.060	18.820	-27.180	46.000
1.462	9.806	19.390	29.196	-16.804	46.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

3. Peak Power Output

3.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Power Meter	Anritsu	ML2495A/6K00003357	May, 2014
X	Power Sensor	Anritsu	MA2411B/0738448	Jun, 2014

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with "X" are used to measure the final test results.

3.2. Test Setup

3.3. Limits

The maximum peak power shall be less 1 Watt.

3.4. Test Procedure

The EUT was tested according to DTS test procedure of KDB 558074 for compliance to FCC 47CFR 15.247 requirements. The maximum peak conducted output power using KDB 558074 section 9.1.3 PKPM1 Peak power meter method.

3.5. Uncertainty

± 1.27 dB

3.6. Test Result of Peak Power Output

Product : Industrial 900MHz Access Point Confirmed
Test Item : Peak Power Output Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (5MBW)_OFDM

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		1.5	2	3	4.5	6	9	12	13.5	13.5		
		Measurement Level (dBm)										
01	905.25	--	--	--	--	--	--	--	19.81	28.40	<30dBm	Pass
04	915.00	19.49	19.54	19.60	19.66	19.71	19.75	19.80	19.84	28.91	<30dBm	Pass
07	924.75	--	--	--	--	--	--	--	20.55	29.02	<30dBm	Pass

Note: Peak Power Output Value =Reading value on power meter + cable loss

Product : Industrial 900MHz Access Point Confirmed
Test Item : Peak Power Output Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (10MBW)_OFDM

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		3	4.5	6	9	12	18	24	27	27		
		Measurement Level (dBm)										
02	908.5	--	--	--	--	--	--	--	20.60	29.07	<30dBm	Pass
04	915.0	20.02	20.06	20.11	20.15	20.21	20.28	20.34	20.41	29.01	<30dBm	Pass
06	921.5	--	--	--	--	--	--	--	20.51	29.03	<30dBm	Pass

Note: Peak Power Output Value =Reading value on power meter + cable loss

Product : Industrial 900MHz Access Point Confirmed
Test Item : Peak Power Output Data
Test Site : No.3 OATS
Test Mode : Mode 3: Transmit (20MBW)_OFDM

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		6	9	12	18	24	36	48	54	54		
		Measurement Level (dBm)										
04	915	20.47	20.52	20.55	20.61	20.65	20.68	20.72	20.75	29.11	<30dBm	Pass

Note: Peak Power Output Value =Reading value on power meter + cable loss

Product : Industrial 900MHz Access Point Confirmed
Test Item : Peak Power Output Data
Test Site : No.3 OATS
Test Mode : Mode 4: Transmit (20MBW)_DSSS

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)				Peak Power	Required Limit	Result
		1	2	5.5	11	1		
		Measurement Level (dBm)						
04	915	14.51	14.38	14.25	14.15	17.52	<30dBm	Pass

Note: Peak Power Output Value =Reading value on power meter + cable loss

4. Radiated Emission

4.1. Test Equipment

The following test equipment are used during the radiated emission test:

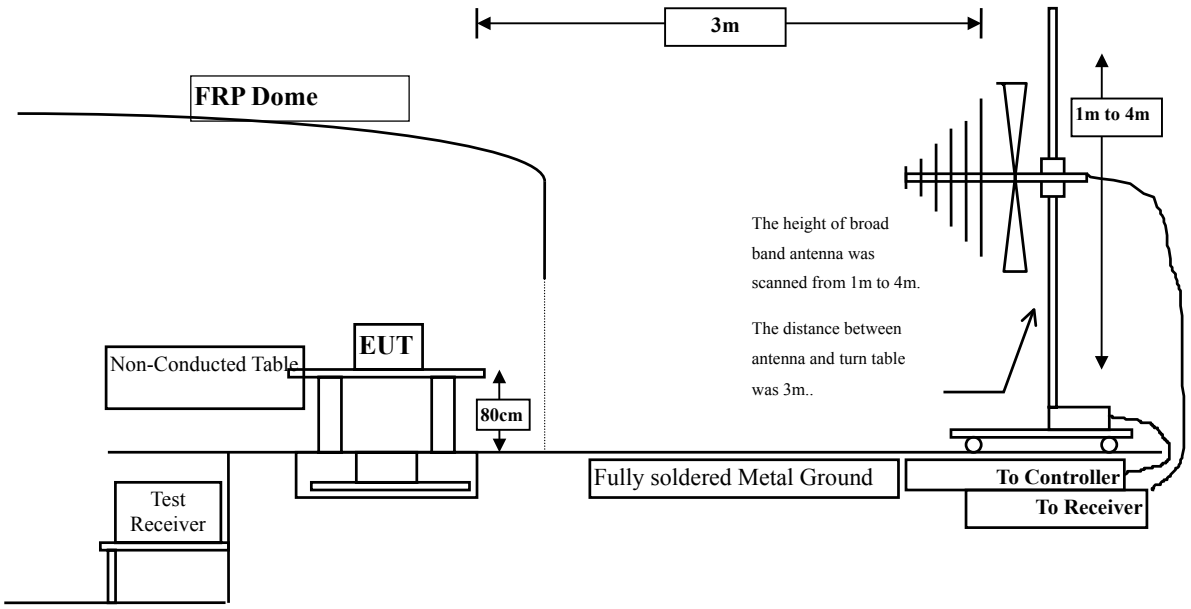
Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒Site # 3	X	Loop Antenna	Teseq	HLA6120 / 26739	Jul., 2014
	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2013
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2013
	X	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2014
	X	Pre-Amplifier	Agilent	8447D/2944A09549	Sep., 2013
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2014
	X	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2013
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2014
	X	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

Note: 1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

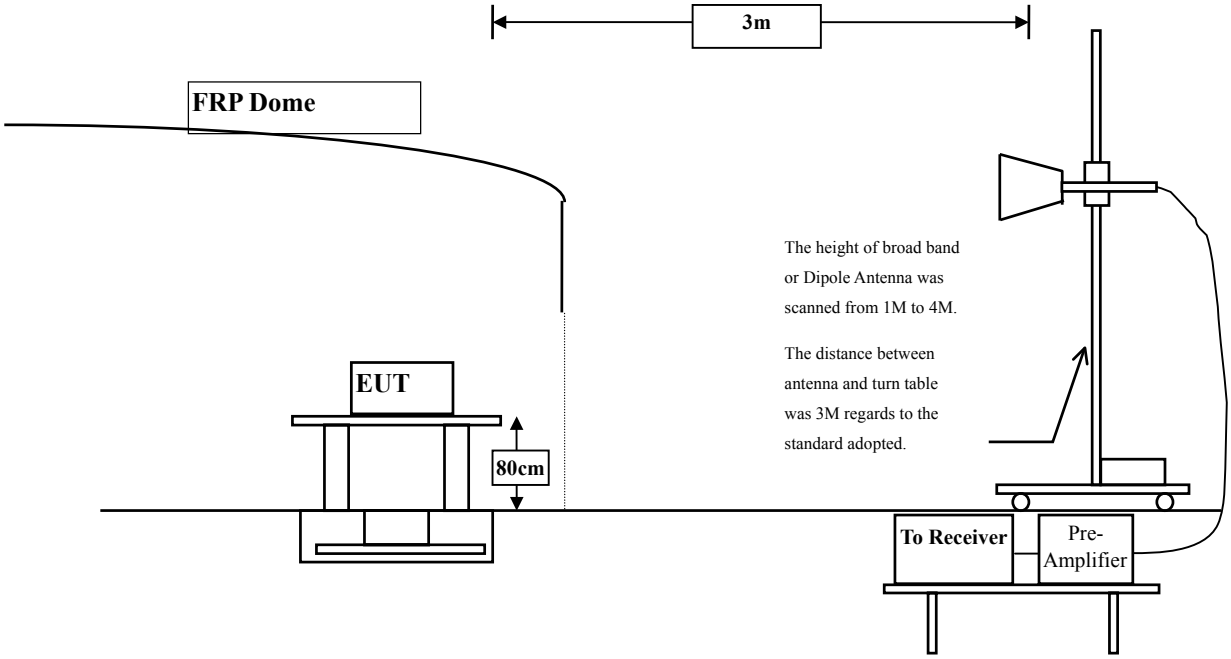
2. The test instruments marked with "X" are used to measure the final test results.

4.2. Test Setup

Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



4.3. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209(a) Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remarks: E field strength (dBμV/m) = 20 log E field strength (uV/m)

4.4. Test Procedure

The EUT was setup according to ANSI C63.10: 2009 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.
The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2009 on radiated measurement.
The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.
Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.
The measurement is divided into the Preliminary Measurement and the Final Measurement.
The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.
The worst radiated emission is measured in the Open Area Test Site on the Final Measurement.
The frequency range from 9kHz to 10th harmonics is checked.

4.5. Uncertainty

± 3.9 dB above 1GHz
± 3.8 dB below 1GHz

4.6. Test Result of Radiated Emission

Product : Industrial 900MHz Access Point Confirmed
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (5MBW)_OFDM (905.25MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector:					
1810.500	-1.152	56.490	55.338	-18.662	74.000
2715.750	-3.869	62.420	58.551	-15.449	74.000
3621.000	-3.398	52.900	49.501	-24.499	74.000
4526.250	-1.061	55.020	53.959	-20.041	74.000
5431.500	1.260	60.540	61.800	-12.200	74.000
6336.750	1.389	44.210	45.599	-28.401	74.000
7242.000	5.355	41.300	46.655	-27.345	74.000
8147.250	5.230	40.220	45.450	-28.550	74.000
9052.500	10.854	39.770	50.624	-23.376	74.000
Average Detector:					
1810.500	-1.152	43.020	41.868	-12.132	54.000
2715.750	-3.869	46.200	42.331	-11.669	54.000
5431.500	1.260	44.880	46.140	-7.860	54.000
Vertical					
Peak Detector:					
1810.500	-0.282	70.260	69.978	-4.022	74.000
2715.750	-4.706	72.490	67.784	-6.216	74.000
3621.000	-3.341	57.570	54.228	-19.772	74.000
4526.250	0.568	60.950	61.518	-12.482	74.000
5431.500	1.563	65.570	67.132	-6.868	74.000
6336.750	1.069	54.800	55.869	-18.131	74.000
7242.000	5.858	41.650	47.508	-26.492	74.000
8147.250	6.359	39.150	45.509	-28.491	74.000
9052.500	11.070	41.160	52.230	-21.770	74.000
Average Detector:					
1810.500	-0.282	53.720	53.438	-0.562	54.000
2715.750	-4.706	56.670	51.964	-2.036	54.000
3621.000	-3.341	41.170	37.828	-16.172	54.000
4526.250	0.568	41.720	42.288	-11.712	54.000
5431.500	1.563	48.410	49.972	-4.028	54.000
6336.750	1.069	37.550	38.619	-15.381	54.000

Note:
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Industrial 900MHz Access Point Confirmed
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (5MBW)_OFDM (915MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector:					
1830.000	-1.193	53.760	52.566	-21.434	74.000
2745.000	-1.929	62.600	60.671	-13.329	74.000
3660.000	-1.580	51.530	49.950	-24.050	74.000
4575.000	0.680	52.850	53.530	-20.470	74.000
5490.000	4.343	50.940	55.284	-18.716	74.000
6405.000	5.889	45.440	51.329	-22.671	74.000
7320.000	9.901	39.510	49.411	-24.589	74.000
8235.000	10.574	40.060	50.634	-23.366	74.000
9150.000	11.388	39.440	50.829	-23.171	74.000
Average Detector:					
2745.000	-1.929	46.120	44.191	-9.809	54.000
5490.000	4.343	35.390	39.734	-14.266	54.000
Vertical					
Peak Detector:					
1830.000	-0.544	67.100	66.555	-7.445	74.000
2745.000	-2.802	69.270	66.468	-7.532	74.000
3660.000	-1.375	55.550	54.175	-19.825	74.000
4575.000	2.296	59.050	61.346	-12.654	74.000
5490.000	4.357	60.980	65.337	-8.663	74.000
6405.000	6.015	52.560	58.575	-15.425	74.000
7320.000	10.505	39.930	50.435	-23.565	74.000
8235.000	11.466	39.560	51.027	-22.973	74.000
9150.000	11.497	39.940	51.437	-22.563	74.000
Average Detector:					
1830.000	-0.544	52.160	51.615	-2.385	54.000
2745.000	-2.802	53.690	50.888	-3.112	54.000
3660.000	-1.375	40.120	38.745	-15.255	54.000
4575.000	2.296	43.470	45.766	-8.234	54.000
5490.000	4.357	44.200	48.557	-5.443	54.000
6405.000	6.015	35.290	41.305	-12.695	54.000

Note:
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Industrial 900MHz Access Point Confirmed
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (5MBW)_OFDM (924.75 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector:					
1849.500	-2.152	53.180	51.028	-22.972	74.000
2774.250	-1.831	64.040	62.210	-11.790	74.000
3699.000	-2.109	52.330	50.222	-23.778	74.000
4623.750	0.694	52.810	53.504	-20.496	74.000
5548.500	4.479	48.750	53.230	-20.770	74.000
6473.250	6.456	45.690	52.146	-21.854	74.000
7398.000	10.470	40.010	50.481	-23.519	74.000
8322.750	11.129	39.260	50.389	-23.611	74.000
9247.500	11.120	39.350	50.470	-23.530	74.000
9247.500	11.120	39.430	50.550	-23.450	74.000
Average Detector:					
2774.250	-1.831	46.480	44.650	-9.350	54.000
Vertical					
Peak Detector:					
1849.500	-1.730	69.140	67.411	-6.589	74.000
2774.250	-2.741	70.960	68.220	-5.780	74.000
3699.000	-1.764	57.010	55.247	-18.753	74.000
4623.750	2.237	57.070	59.307	-14.693	74.000
5548.500	4.485	54.180	58.665	-15.335	74.000
6473.250	6.430	51.790	58.220	-15.780	74.000
7398.000	11.288	38.770	50.059	-23.941	74.000
8322.750	12.175	39.230	51.405	-22.595	74.000
9247.500	11.098	39.390	50.488	-23.512	74.000
Average Detector:					
1849.500	-1.730	54.330	52.601	-1.399	54.000
2774.250	-2.741	53.340	50.600	-3.400	54.000
3699.000	-1.764	42.110	40.347	-13.653	54.000
4623.750	2.237	41.330	43.567	-10.433	54.000
5548.500	4.485	37.780	42.265	-11.735	54.000
6473.250	6.430	32.390	38.820	-15.180	54.000

Note:
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Industrial 900MHz Access Point Confirmed
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (10MBW)_OFDM (908.5MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector:					
1817.000	-0.554	58.860	58.305	-15.695	74.000
2725.500	-2.120	61.280	59.160	-14.840	74.000
3634.000	-1.294	51.610	50.316	-23.684	74.000
4542.500	0.731	52.890	53.621	-20.379	74.000
5451.000	3.627	57.680	61.307	-12.693	74.000
6359.500	5.742	43.820	49.562	-24.438	74.000
7268.000	9.271	39.990	49.262	-24.738	74.000
8176.500	10.136	39.490	49.626	-24.374	74.000
9085.000	11.640	38.880	50.520	-23.480	74.000
Average Detector:					
1817.000	-0.554	43.810	43.255	-10.745	54.000
2725.500	-2.120	44.260	42.140	-11.860	54.000
5451.000	3.627	42.290	45.917	-8.083	54.000
Vertical					
Peak Detector:					
1817.000	0.245	66.710	66.954	-7.046	74.000
2725.500	-2.969	68.770	65.801	-8.199	74.000
3634.000	-1.187	53.290	52.102	-21.898	74.000
4542.500	2.356	57.320	59.676	-14.324	74.000
5451.000	3.832	63.090	66.922	-7.078	74.000
6359.500	5.589	52.370	57.959	-16.041	74.000
7268.000	9.792	41.930	51.723	-22.277	74.000
8176.500	11.099	39.690	50.789	-23.211	74.000
9085.000	11.859	39.280	51.140	-22.860	74.000
Average Detector:					
1817.000	0.245	51.880	52.124	-1.876	54.000
2725.500	-2.969	52.180	49.211	-4.789	54.000
4542.500	2.356	42.460	44.816	-9.184	54.000
5451.000	3.832	47.430	51.262	-2.738	54.000
6359.500	5.589	37.580	43.169	-10.831	54.000

Note:
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Industrial 900MHz Access Point Confirmed
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (10MBW)_OFDM (915MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector:					
1830.000	-1.193	56.480	55.286	-18.714	74.000
2745.000	-1.929	60.820	58.891	-15.109	74.000
3660.000	-1.580	49.680	48.100	-25.900	74.000
4575.000	0.680	50.920	51.600	-22.400	74.000
5490.000	4.343	53.380	57.724	-16.276	74.000
6405.000	5.889	43.360	49.249	-24.751	74.000
7320.000	9.901	39.710	49.611	-24.389	74.000
8235.000	10.574	39.130	49.704	-24.296	74.000
9150.000	11.388	40.120	51.509	-22.491	74.000
Average Detector:					
1830.000	-1.193	43.320	42.126	-11.874	54.000
2745.000	-1.929	46.060	44.131	-9.869	54.000
5490.000	4.343	38.460	42.804	-11.196	54.000
Vertical					
Peak Detector:					
1830.000	-0.544	67.730	67.185	-6.815	74.000
2745.000	-2.802	67.360	64.558	-9.442	74.000
3660.000	-1.375	53.140	51.765	-22.235	74.000
4575.000	2.296	56.540	58.836	-15.164	74.000
5490.000	4.357	60.060	64.417	-9.583	74.000
6405.000	6.015	52.410	58.425	-15.575	74.000
7320.000	10.505	39.850	50.355	-23.645	74.000
8235.000	11.466	39.380	50.847	-23.153	74.000
9150.000	11.497	40.100	51.597	-22.403	74.000
Average Detector:					
1830.000	-0.544	52.710	52.165	-1.835	54.000
2745.000	-2.802	52.240	49.438	-4.562	54.000
4575.000	2.296	41.740	44.036	-9.964	54.000
5490.000	4.357	45.240	49.597	-4.403	54.000
6405.000	6.015	36.100	42.115	-11.885	54.000

Note:
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Industrial 900MHz Access Point Confirmed
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (10MBW)_OFDM (921.5MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector:					
1843.000	-1.833	55.000	53.168	-20.832	74.000
2764.500	-1.847	55.800	53.953	-20.047	74.000
3686.000	-1.976	49.900	47.924	-26.076	74.000
4607.500	0.655	49.610	50.265	-23.735	74.000
5529.000	4.525	49.330	53.855	-20.145	74.000
6450.500	6.283	44.910	51.193	-22.807	74.000
7372.000	10.565	38.660	49.225	-24.775	74.000
8293.500	11.696	39.870	51.567	-2.433	54.000
9215.000	11.584	39.530	51.114	-2.886	54.000
Average Detector:					
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Vertical					
Peak Detector:					
1843.000	-1.334	65.200	63.866	-10.134	74.000
2764.500	-2.745	68.680	65.935	-8.065	74.000
3686.000	-1.671	54.350	52.679	-21.321	74.000
4607.500	2.243	57.570	59.812	-14.188	74.000
5529.000	4.512	57.990	62.502	-11.498	74.000
6450.500	6.309	52.280	58.589	-15.411	74.000
7372.000	11.328	38.970	50.298	-23.702	74.000
8293.500	11.696	39.410	51.107	-22.893	74.000
9215.000	11.584	40.560	52.144	-21.856	74.000
Average Detector:					
1843.000	-1.334	53.080	51.746	-2.254	54.000
2764.500	-2.745	53.600	50.855	-3.145	54.000
4607.500	2.243	42.210	44.452	-9.548	54.000
5529.000	4.512	42.610	47.122	-6.878	54.000
6450.500	6.309	36.000	42.309	-11.691	54.000

Note:
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Industrial 900MHz Access Point Confirmed
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 3: Transmit (20MBW)_OFDM(915MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector:					
1830.000	-1.193	55.390	54.196	-19.804	74.000
2745.000	-1.929	57.260	55.331	-18.669	74.000
3660.000	-1.580	47.050	45.470	-28.530	74.000
4575.000	0.680	48.130	48.810	-25.190	74.000
5490.000	4.343	51.570	55.914	-18.086	74.000
6405.000	5.889	41.980	47.869	-26.131	74.000
7320.000	9.901	39.710	49.611	-24.389	74.000
8235.000	10.574	39.290	49.864	-24.136	74.000
9150.000	11.388	39.920	51.309	-22.691	74.000
Average Detector:					
1830.000	-1.193	41.250	40.056	-13.944	54.000
2745.000	-1.929	42.960	41.031	-12.969	54.000
5490.000	4.343	35.300	39.644	-14.356	54.000
Vertical					
Peak Detector:					
1830.000	-0.544	65.030	64.485	-9.515	74.000
2745.000	-2.802	64.330	61.528	-12.472	74.000
3660.000	-1.375	51.540	50.165	-23.835	74.000
4575.000	2.296	54.440	56.736	-17.264	74.000
5490.000	4.357	57.690	62.047	-11.953	74.000
6405.000	6.015	49.530	55.545	-18.455	74.000
7320.000	10.505	39.470	49.975	-24.025	74.000
8235.000	11.466	39.490	50.957	-23.043	74.000
9150.000	11.497	39.980	51.477	-22.523	74.000
Average Detector:					
1830.000	-0.544	51.220	50.675	-3.325	54.000
2745.000	-2.802	49.090	46.288	-7.712	54.000
4575.000	2.296	39.720	42.016	-11.984	54.000
5490.000	4.357	42.790	47.147	-6.853	54.000
6405.000	6.015	33.220	39.235	-14.765	54.000

Note:
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Industrial 900MHz Access Point Confirmed
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 4: Transmit (20MBW)_DSSS (915MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector:					
1830.000	-4.316	44.572	40.255	-33.745	74.000
2745.000	-0.944	43.906	42.961	-31.039	74.000
3660.000	-0.665	37.786	37.120	-36.880	74.000
4575.000	1.976	36.860	38.836	-35.164	74.000
5490.000	4.745	41.627	46.372	-27.628	74.000
6405.000	6.886	37.679	44.565	-29.435	74.000
7320.000	11.769	33.466	45.235	-28.765	74.000
8235.000	15.855	33.622	49.477	-24.523	74.000
9150.000	13.113	33.744	46.857	-27.143	74.000
Average Detector:					
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Vertical					
Peak Detector:					
1830.000	-2.761	53.683	50.922	-23.078	74.000
2745.000	-1.110	51.499	50.388	-23.612	74.000
3660.000	0.279	41.310	41.589	-32.411	74.000
4575.000	5.669	41.868	47.537	-26.463	74.000
5490.000	6.244	46.070	52.314	-21.686	74.000
6405.000	8.327	36.748	45.075	-28.925	74.000
7320.000	12.639	33.916	46.555	-27.445	74.000
8235.000	15.783	33.084	48.867	-25.133	74.000
9150.000	13.052	33.505	46.557	-27.443	74.000
Average Detector:					
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Note:
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Industrial 900MHz Access Point Confirmed
Test Item : General Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (5MBW)_OFDM(915MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
293.840	-4.940	39.160	34.220	-11.780	46.000
443.220	-0.031	35.749	35.718	-10.282	46.000
594.540	3.555	33.851	37.406	-8.594	46.000
687.660	3.302	36.194	39.496	-6.504	46.000
838.980	6.031	33.152	39.183	-6.817	46.000
996.120	8.107	33.633	41.740	-12.260	54.000
Vertical					
86.260	-4.042	31.676	27.634	-12.366	40.000
249.220	-5.096	40.765	35.669	-10.331	46.000
418.000	-6.531	39.042	32.511	-13.489	46.000
594.540	0.175	35.153	35.328	-10.672	46.000
726.460	-0.788	38.379	37.591	-8.409	46.000
838.980	1.961	33.376	35.337	-10.663	46.000

Note:
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : Industrial 900MHz Access Point Confirmed
Test Item : General Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (10MBW)_OFDM(915MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
206.540	-10.529	46.585	36.056	-7.444	43.500
367.560	0.592	35.402	35.993	-10.007	46.000
460.680	4.030	32.979	37.009	-8.991	46.000
604.240	4.289	33.061	37.351	-8.649	46.000
866.140	6.240	32.709	38.949	-7.051	46.000
992.240	7.354	32.134	39.488	-14.512	54.000
Vertical					
130.880	-3.777	34.006	30.228	-13.272	43.500
249.220	-5.096	40.006	34.910	-11.090	46.000
377.260	0.647	35.007	35.654	-10.346	46.000
600.360	1.302	33.591	34.893	-11.107	46.000
693.480	1.748	34.552	36.300	-9.700	46.000
842.860	2.378	34.238	36.616	-9.384	46.000

Note:
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : Industrial 900MHz Access Point Confirmed
Test Item : General Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 3: Transmit (20MBW)_OFDM(915MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
103.720	-8.230	34.059	25.828	-17.672	43.500
286.080	-5.619	39.328	33.709	-12.291	46.000
460.680	4.030	32.063	36.093	-9.907	46.000
573.200	2.691	35.348	38.038	-7.962	46.000
726.460	3.832	35.541	39.373	-6.627	46.000
821.520	7.116	33.315	40.431	-5.569	46.000
Vertical					
55.220	-10.927	41.301	30.374	-9.626	40.000
152.220	-5.306	40.910	35.604	-7.896	43.500
282.200	-5.794	41.276	35.482	-10.518	46.000
439.340	-6.981	42.316	35.335	-10.665	46.000
652.740	-3.101	41.626	38.525	-7.475	46.000
994.180	-1.415	41.009	39.594	-14.406	54.000

Note:
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : Industrial 900MHz Access Point Confirmed
Test Item : General Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 4: Transmit (20MBW)_DSSS (915MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
131.850	-10.195	40.611	30.416	-13.084	43.500
230.790	-8.210	41.953	33.743	-12.257	46.000
461.650	1.521	35.467	36.988	-9.012	46.000
528.580	1.848	33.730	35.578	-10.422	46.000
703.180	2.649	41.042	43.690	-2.310	46.000
877.780	5.679	32.330	38.009	-7.991	46.000
Vertical					
218.180	-8.589	40.837	32.247	-13.753	46.000
395.690	-4.191	42.086	37.895	-8.105	46.000
439.340	-8.669	43.078	34.409	-11.591	46.000
527.610	-0.448	39.367	38.919	-7.081	46.000
660.500	-2.233	39.834	37.601	-8.399	46.000
743.920	1.246	37.649	38.895	-7.105	46.000

Note:
1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

5. RF antenna conducted test

5.1. Test Equipment

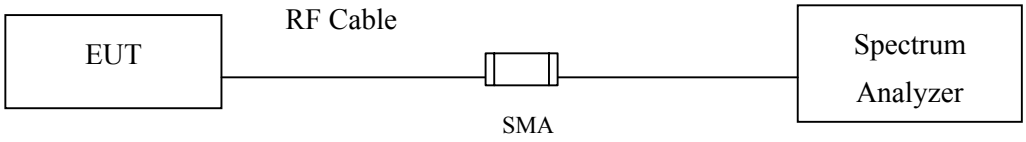
	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2014
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2014
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2014

Note: 1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

2. The test instruments marked with "X" are used to measure the final test results.

5.2. Test Setup

RF antenna Conducted Measurement:



5.3. Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

5.4. Test Procedure

The EUT was tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Set VBW> RBW, scan up through 10th harmonic.

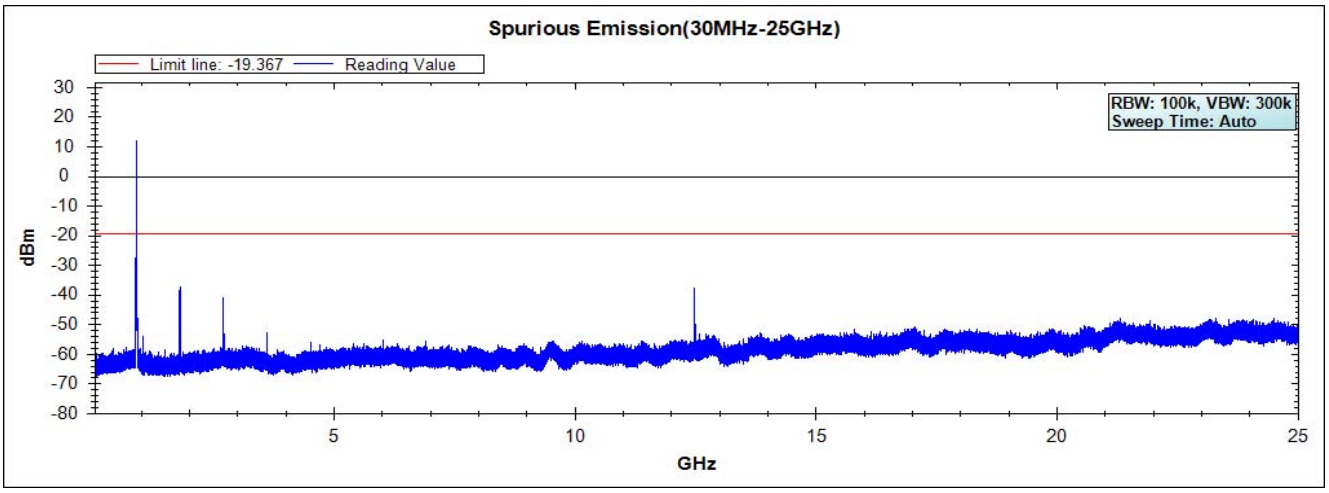
5.5. Uncertainty

The measurement uncertainty
Conducted is defined as ± 1.27dB

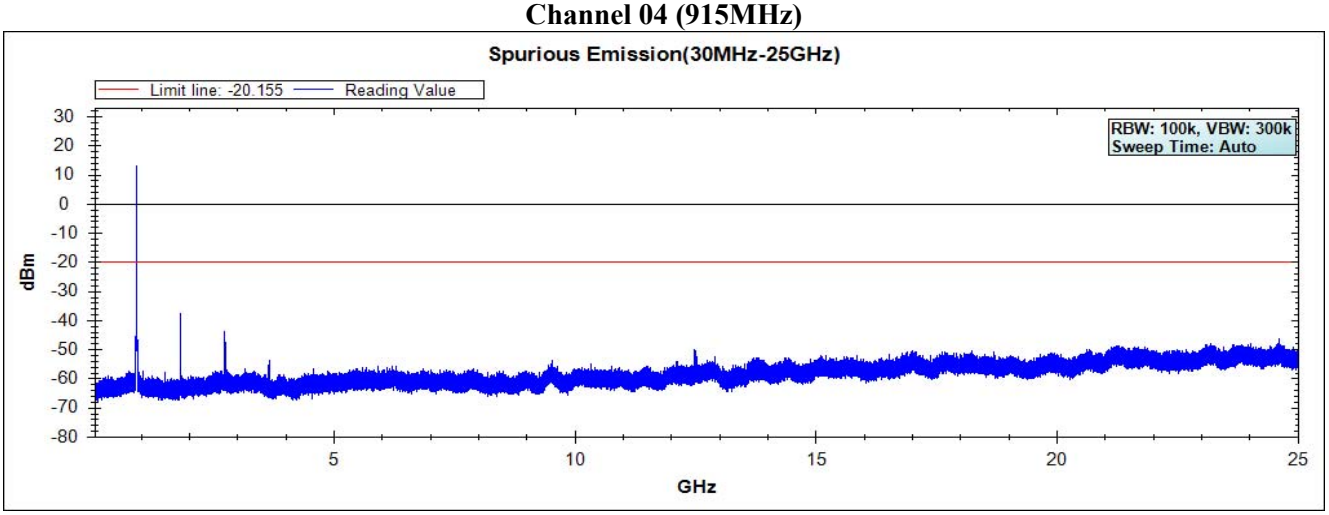
5.6. Test Result of RF antenna conducted test

Product : Industrial 900MHz Access Point Confirmed
Test Item : RF antenna conducted test
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (5MBW)_OFDM

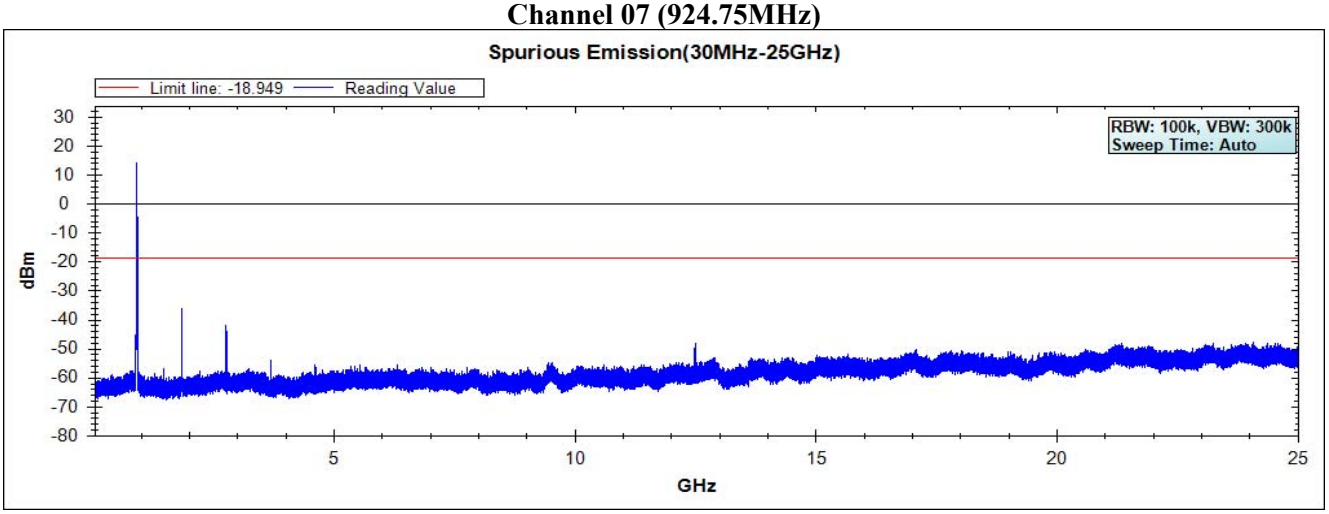
Channel 01 (905.25MHz)



Channel 04 (915MHz)



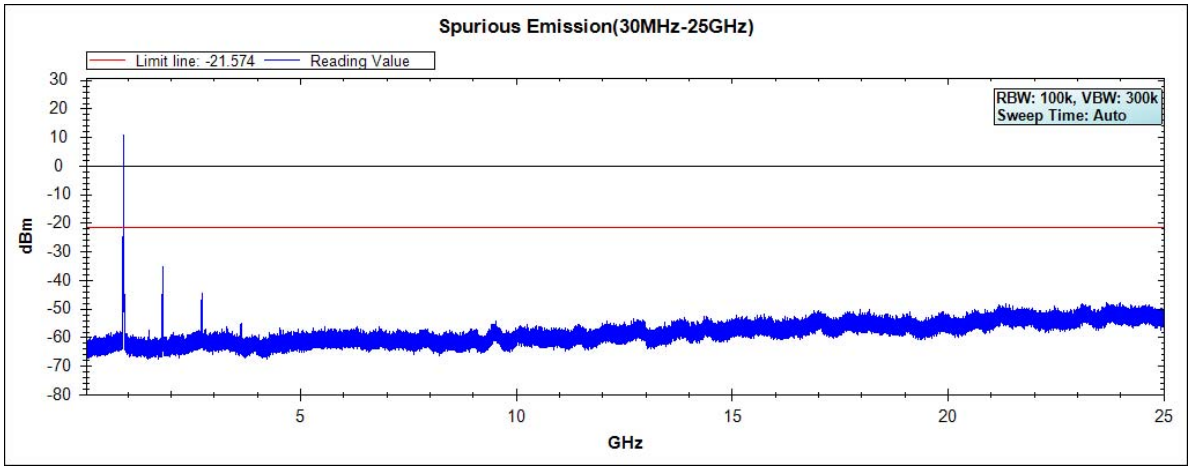
Channel 07 (924.75MHz)



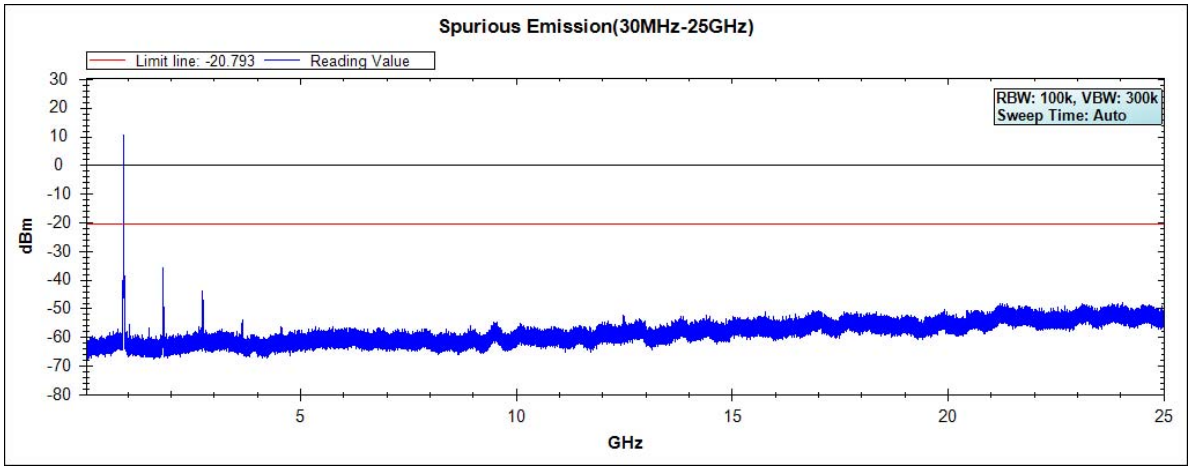
Note: The above test pattern is synthesized by multiple of the frequency range.

Product : Industrial 900MHz Access Point Confirmed
Test Item : RF Antenna Conducted Spurious
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (10MBW)_OFDM

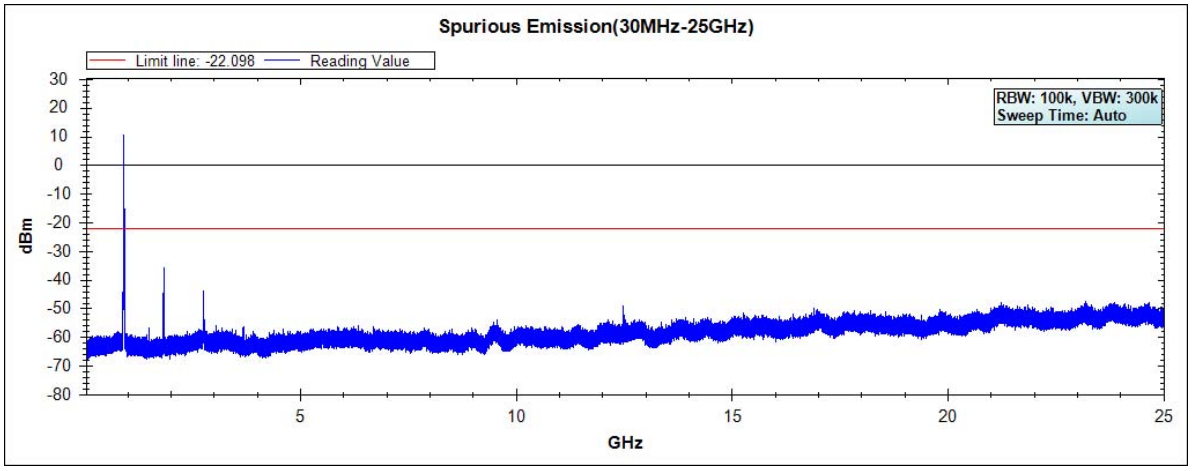
Channel 02 (908.5MHz)



Channel 04 (915MHz)



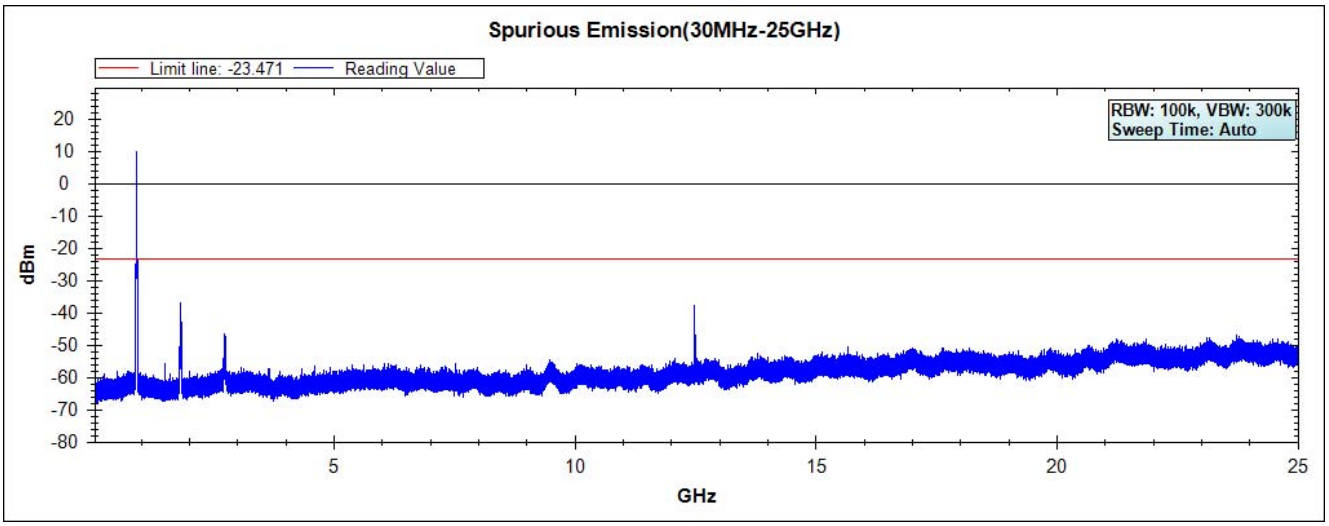
Channel 06 (921.5MHz)



Note: The above test pattern is synthesized by multiple of the frequency range.

Product	:	Industrial 900MHz Access Point Confirmed
Test Item	:	RF Antenna Conducted Spurious
Test Site	:	No.3 OATS
Test Mode	:	Mode 3: Transmit (20MBW)_OFDM

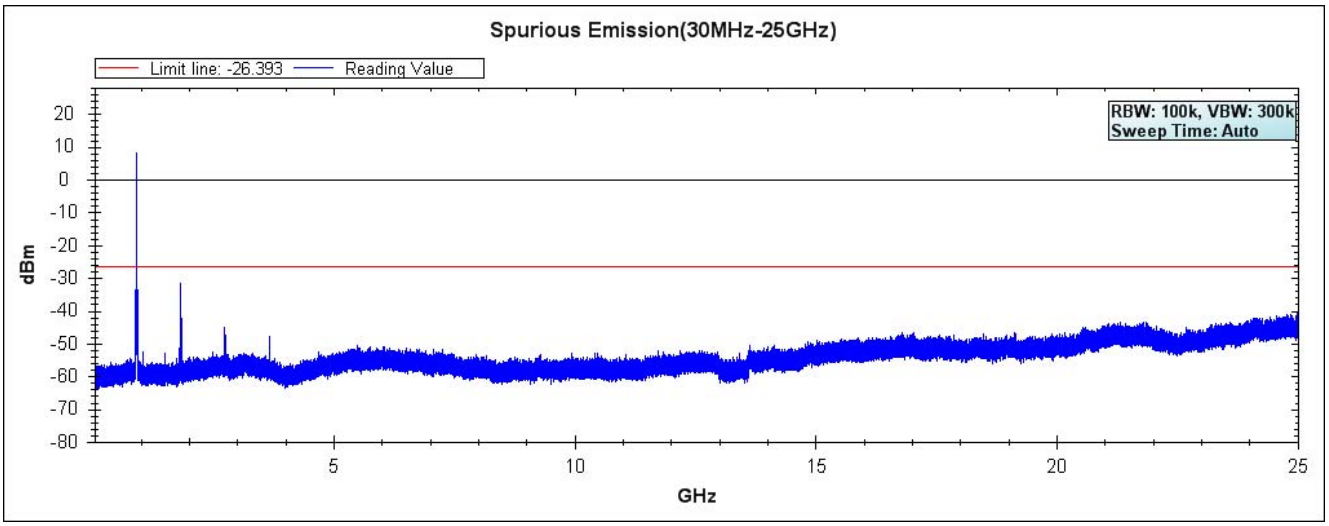
Channel 04 (915MHz)



Note: The above test pattern is synthesized by multiple of the frequency range.

Product	:	Industrial 900MHz Access Point Confirmed
Test Item	:	RF Antenna Conducted Spurious
Test Site	:	No.3 OATS
Test Mode	:	Mode 4: Transmit (20MBW)_DSSS

Channel 04 (915MHz)



Note: The above test pattern is synthesized by multiple of the frequency range.

6. Band Edge

6.1. Test Equipment

RF Radiated Measurement:

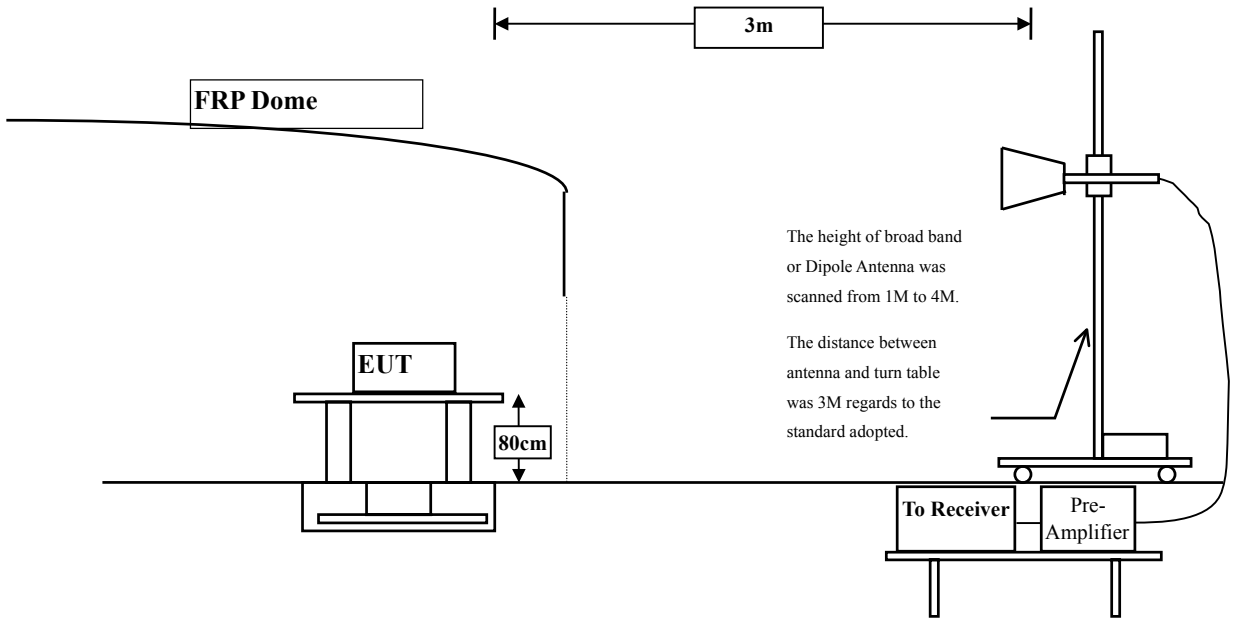
The following test equipments are used during the band edge tests:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒Site # 3		Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2013
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2013
		Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2014
	X	Pre-Amplifier	Agilent	8447D/2944A09549	Sep., 2013
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2014
		Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2013
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2014
	X	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

Note: 1. All instruments are calibrated every one year.
2. The test instruments marked by "X" are used to measure the final test results.

6.2. Test Setup

RF Radiated Measurement:



6.3. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

6.4. Test Procedure

The EUT was setup according to ANSI C63.10: 2009 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.
The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2009 on radiated measurement.

6.5. Uncertainty

± 3.9 dB above 1GHz
± 3.8 dB below 1GHz

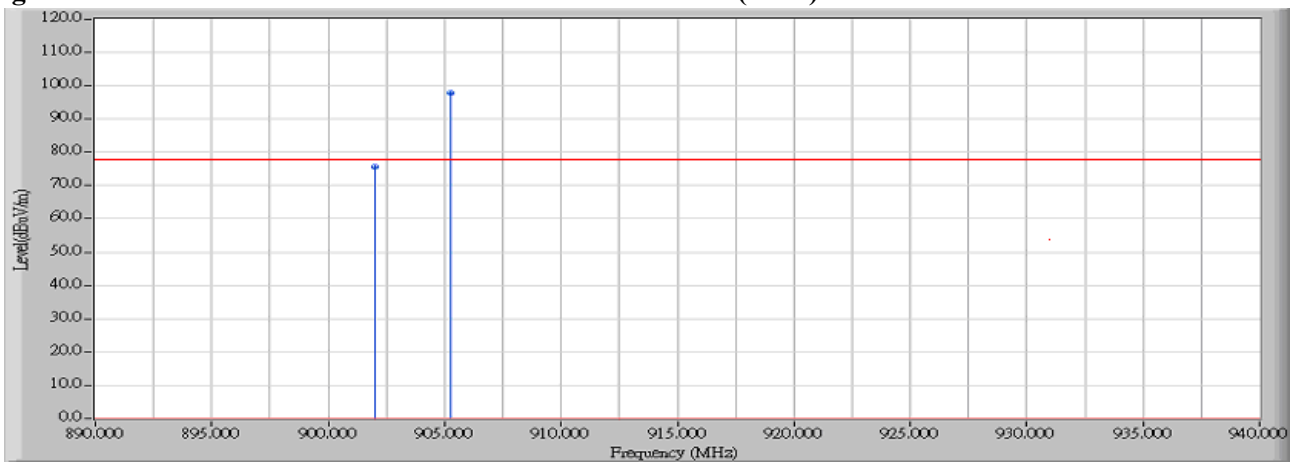
6.6. Test Result of Band Edge

Product : Industrial 900MHz Access Point Confirmed
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (5MBW)_OFDM

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Quasi-Peak Limit (dBuV/m)	Result
01 (Quasi-Peak)	902.000	27.982	47.600	75.582	77.951	Pass
01 (Quasi-Peak)	905.250	27.951	70.000	97.951	--	--

Figure Channel 01: Horizontal (Peak)



Note:

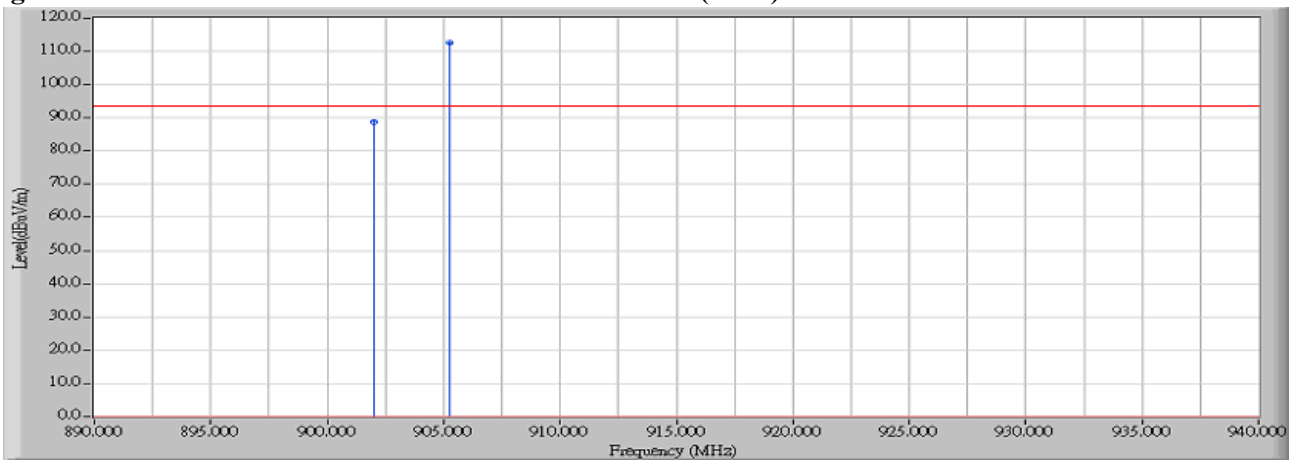
1. Quasi-Peak measurements: RBW=100kHz,VBW=1MHz,Sweep: Auto.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Product : Industrial 900MHz Access Point Confirmed
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (5MBW)_OFDM

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Quasi-Peak Limit (dBuV/m)	Result
01 (Quasi-Peak)	902.000	27.982	60.800	88.782	92.588	Pass
01 (Quasi-Peak)	905.250	29.088	83.500	112.588	--	--

Figure Channel 01: Vertical (Peak)



Note:

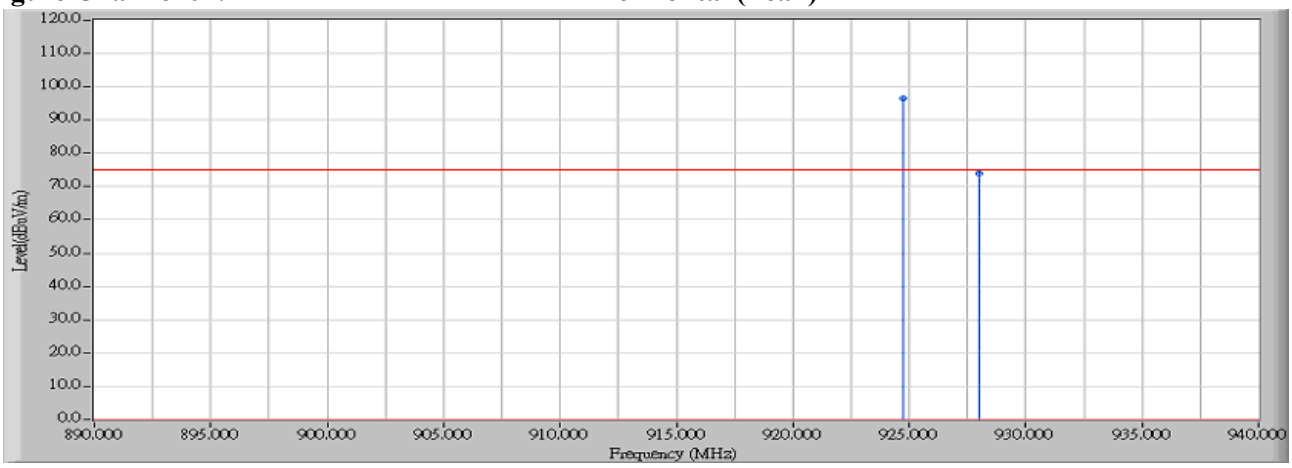
1. Quasi-Peak measurements: RBW=100kHz,VBW=1MHz,Sweep: Auto.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Product : Industrial 900MHz Access Point Confirmed
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (5MBW)_OFDM

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Quasi-Peak Limit (dBuV/m)	Result
07 (Quasi-Peak)	924.750	27.921	68.700	96.621	--	--
07 (Quasi-Peak)	928.000	27.924	46.100	74.024	76.621	Pass

Figure Channel 07: Horizontal (Peak)



Note:

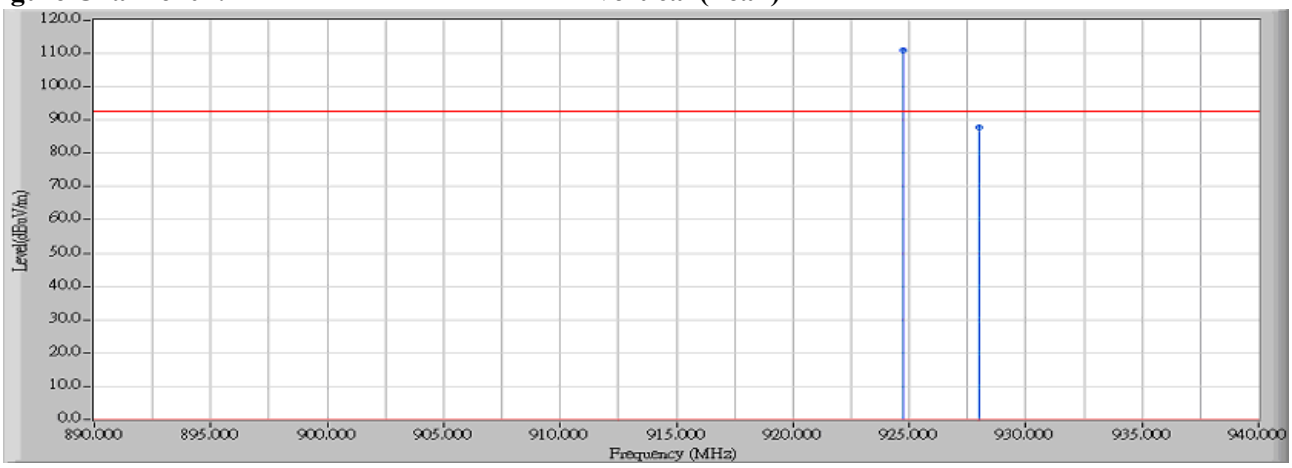
1. Quasi-Peak measurements: RBW=100kHz,VBW=1MHz,Sweep: Auto.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Product : Industrial 900MHz Access Point Confirmed
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (5MBW)_OFDM

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Quasi-Peak Limit (dBuV/m)	Result
07 (Quasi-Peak)	924.750	28.927	82.100	111.027	--	--
07 (Quasi-Peak)	928.000	28.904	58.900	87.804	91.027	Pass

Figure Channel 07: Vertical (Peak)



Note:

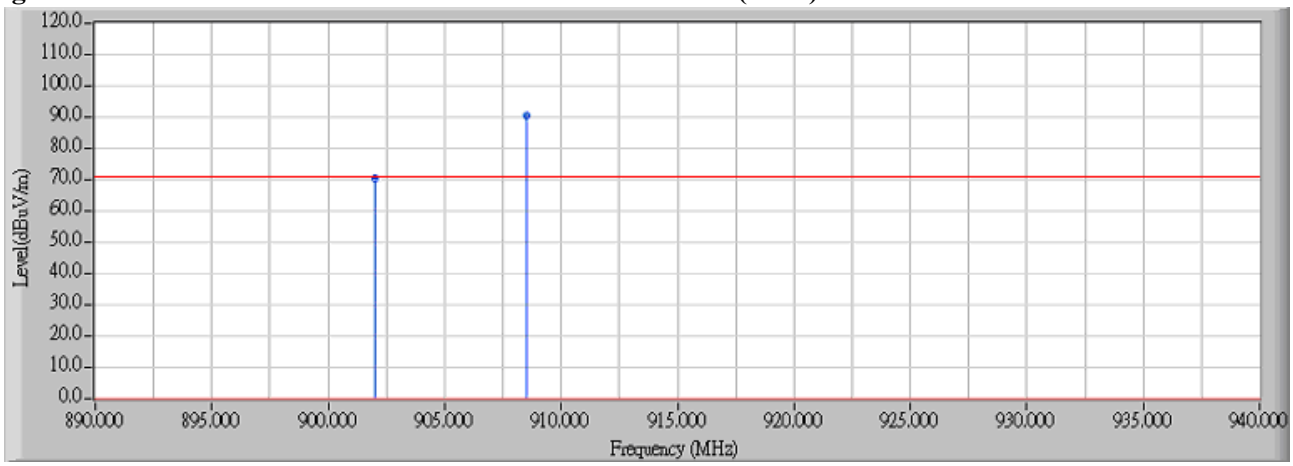
1. Quasi-Peak measurements: RBW=100kHz,VBW=1MHz,Sweep: Auto.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Product : Industrial 900MHz Access Point Confirmed
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (10MBW)_OFDM

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Quasi-Peak Limit (dBuV/m)	Result
02 (Quasi-Peak)	902.000	27.982	42.300	70.282	70.624	Pass
02 (Quasi-Peak)	908.500	27.924	62.700	90.624	--	--

Figure Channel 02: Horizontal (Peak)



Note:

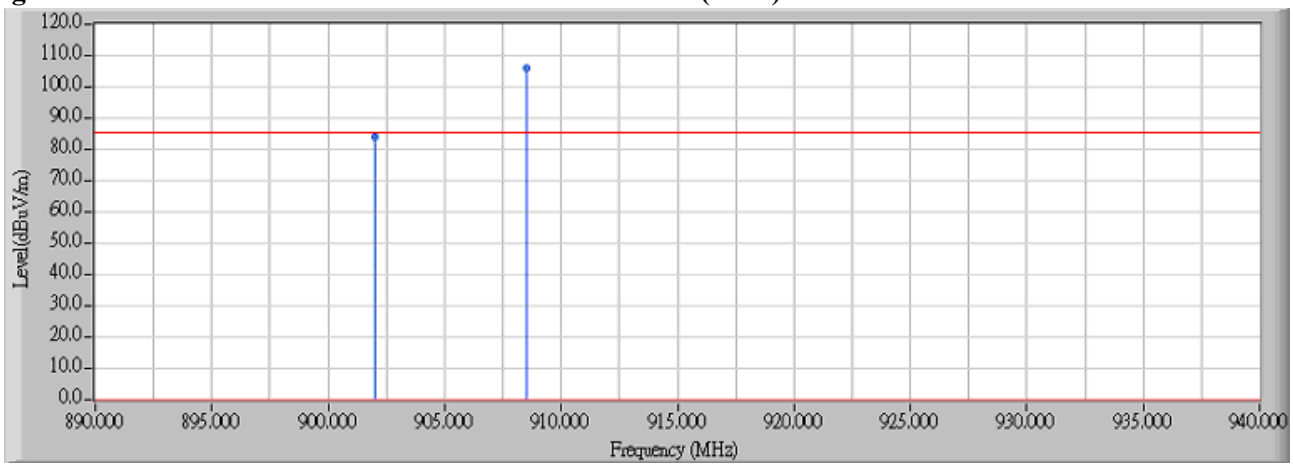
1. Quasi-Peak measurements: RBW=100kHz,VBW=1MHz,Sweep: Auto.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Product : Industrial 900MHz Access Point Confirmed
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (10MBW)_OFDM

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Quasi-Peak Limit (dBuV/m)	Result
02 (Quasi-Peak)	902.000	27.982	56.200	84.182	85.934	Pass
02 (Quasi-Peak)	908.500	29.034	76.900	105.934	--	--

Figure Channel 01: Vertical (Peak)



Note:

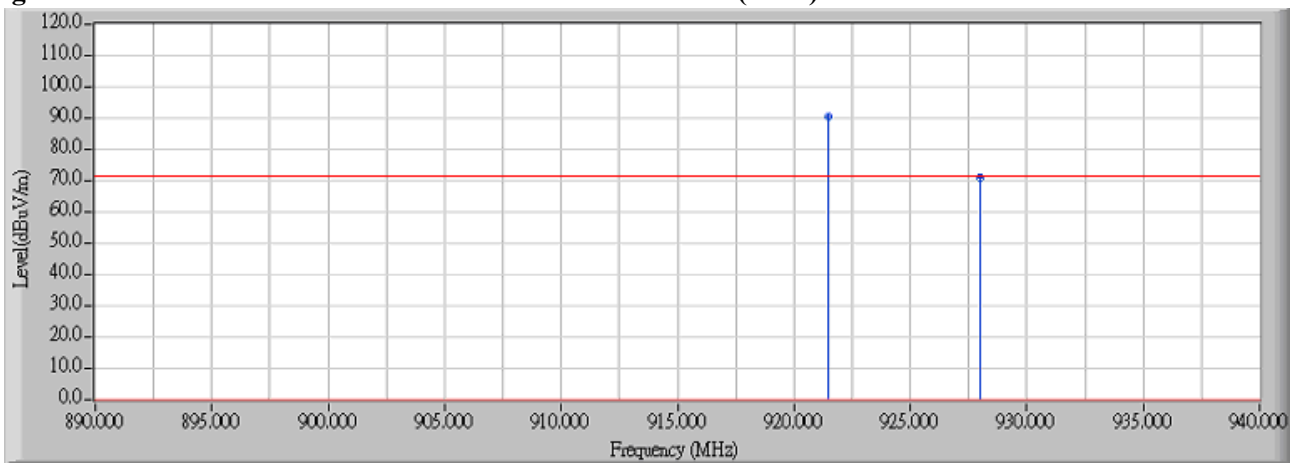
1. Quasi-Peak measurements: RBW=100kHz,VBW=1MHz,Sweep: Auto.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Product : Industrial 900MHz Access Point Confirmed
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (10MBW)_OFDM

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Quasi-Peak Limit (dBuV/m)	Result
06 (Quasi-Peak)	921.500	27.922	62.999	90.921	--	--
06 (Quasi-Peak)	928.000	28.904	41.900	70.804	70.921	Pass

Figure Channel 06: Horizontal (Peak)



Note:

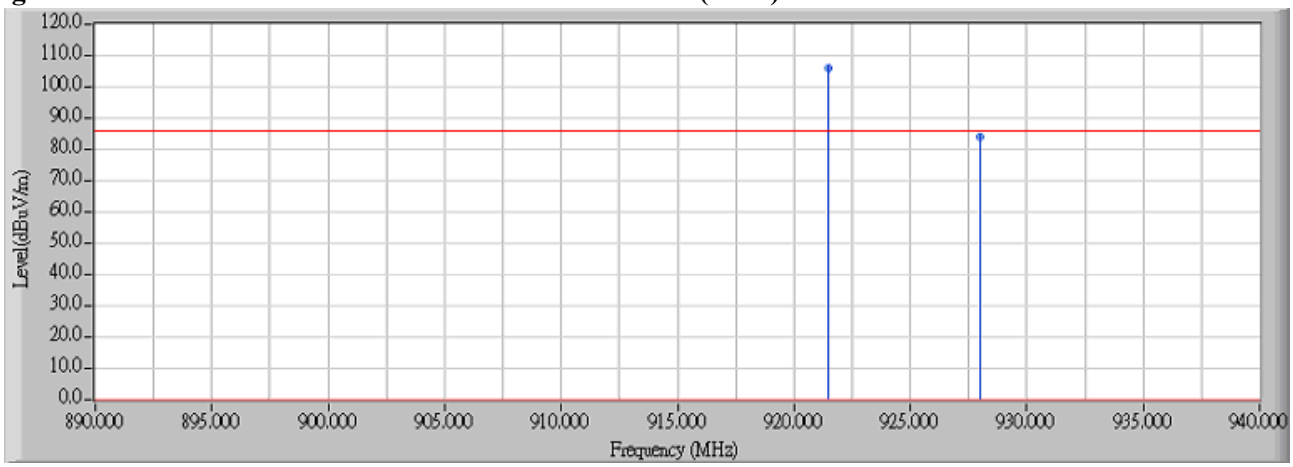
1. Quasi-Peak measurements: RBW=100kHz,VBW=1MHz,Sweep: Auto.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Product : Industrial 900MHz Access Point Confirmed
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (10MBW)_OFDM

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Quasi-Peak Limit (dBuV/m)	Result
06 (Quasi-Peak)	921.500	28.941	77.200	106.141	--	--
06 (Quasi-Peak)	928.000	28.904	55.000	83.904	86.141	Pass

Figure Channel 11: Vertical (Peak)



Note:

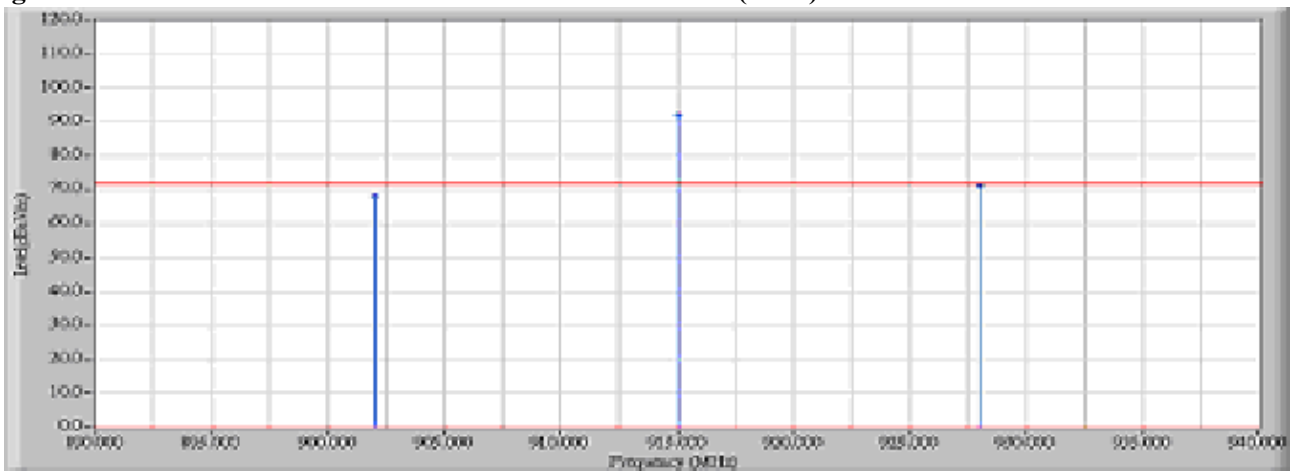
1. Quasi-Peak measurements: RBW=100kHz,VBW=1MHz,Sweep: Auto.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Product : Industrial 900MHz Access Point Confirmed
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 3: Transmit (20MBW)_OFDM

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Quasi-Peak Limit (dBuV/m)	Result
04 (Quasi-Peak)	902.000	27.982	40.300	68.282	72.111	Pass
04 (Quasi-Peak)	915.000	27.912	64.200	92.111	--	--
04 (Quasi-Peak)	928.000	27.924	43.100	71.024	72.111	Pass

Figure Channel 04: Horizontal (Peak)



Note:

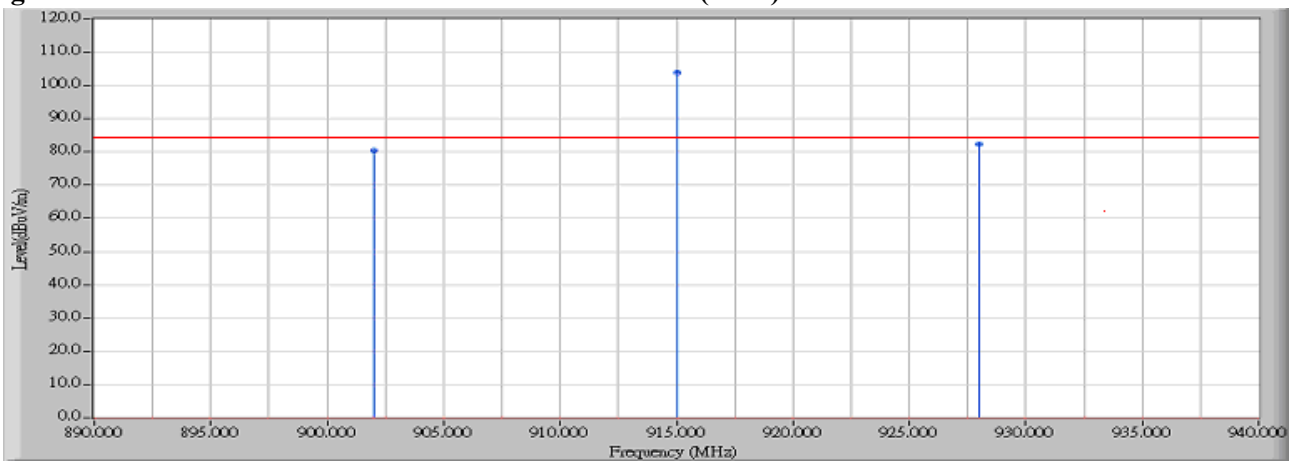
1. Quasi-Peak measurements: RBW=100kHz,VBW=1MHz,Sweep: Auto.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Product : Industrial 900MHz Access Point Confirmed
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 3: Transmit (20MBW)_OFDM

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Quasi-Peak Limit (dBuV/m)	Result
04 (Quasi-Peak)	902.000	29.132	51.400	80.532	83.878	Pass
04 (Quasi-Peak)	915.000	28.978	74.900	103.878	--	--
04 (Quasi-Peak)	928.000	28.904	53.600	82.504	83.878	Pass

Figure Channel 04: Vertical (Peak)



Note:

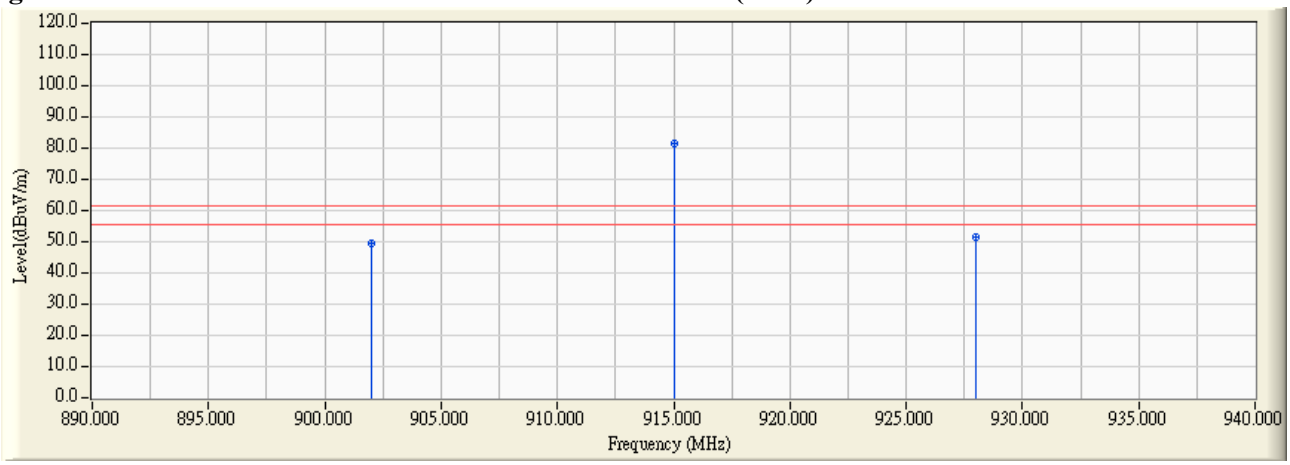
1. Quasi-Peak measurements: RBW=100kHz,VBW=1MHz,Sweep: Auto.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Product : Industrial 900MHz Access Point Confirmed
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 4: Transmit (20MBW)_DSSS

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Quasi-Peak Limit (dBuV/m)	Result
04 (Quasi-Peak)	902.000	27.982	21.748	49.730	81.354	Pass
04 (Quasi-Peak)	915.000	27.912	53.442	81.354	--	--
04 (Quasi-Peak)	928.000	27.924	23.454	51.378	81.354	Pass

Figure Channel 04: Horizontal (Peak)



Note:

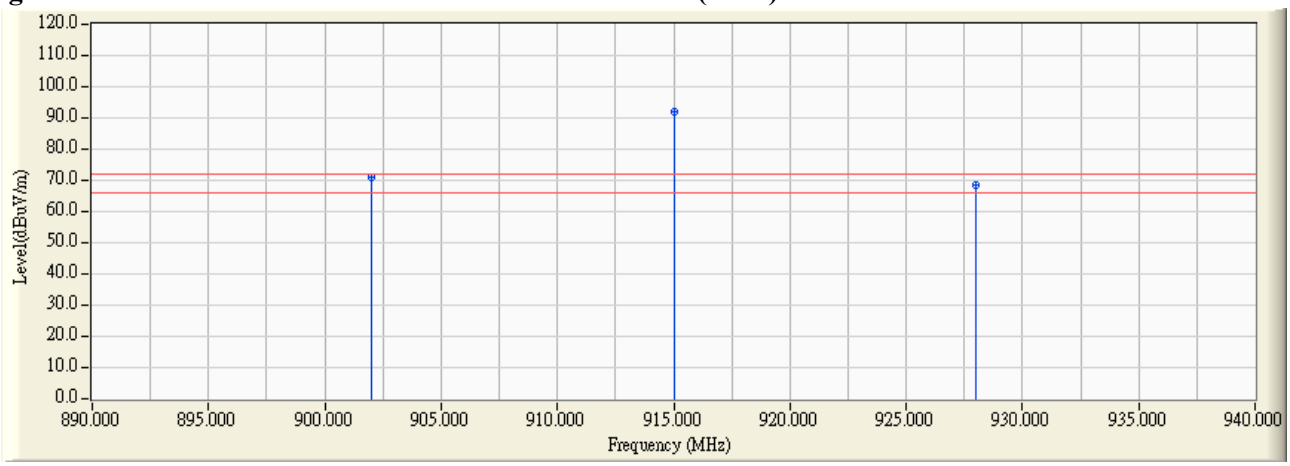
1. Quasi-Peak measurements: RBW=100kHz,VBW=1MHz,Sweep: Auto.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Product : Industrial 900MHz Access Point Confirmed
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 4: Transmit (20MBW)_DSSS

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Quasi-Peak Limit (dBuV/m)	Result
04 (Quasi-Peak)	902.000	29.132	41.898	71.030	71.754	Pass
04 (Quasi-Peak)	915.000	28.978	62.776	91.754	--	--
04 (Quasi-Peak)	928.000	28.904	39.374	68.278	71.754	Pass

Figure Channel 04: Vertical (Peak)



Note:

1. Quasi-Peak measurements: RBW=100kHz,VBW=1MHz,Sweep: Auto.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

7. Occupied Bandwidth

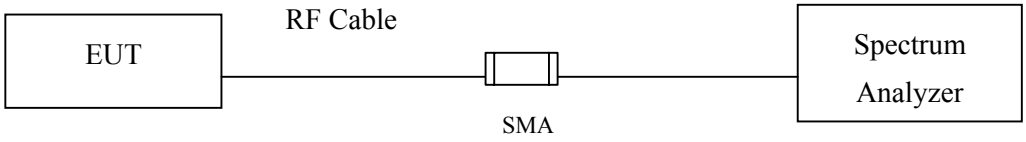
7.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2014
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2014
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2014

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with "X" are used to measure the final test results.

7.2. Test Setup



7.3. Limits

The minimum bandwidth shall be at least 500 kHz.

7.4. Test Procedure

The EUT was setup according to ANSI C63.10: 2009; tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

7.5. Uncertainty

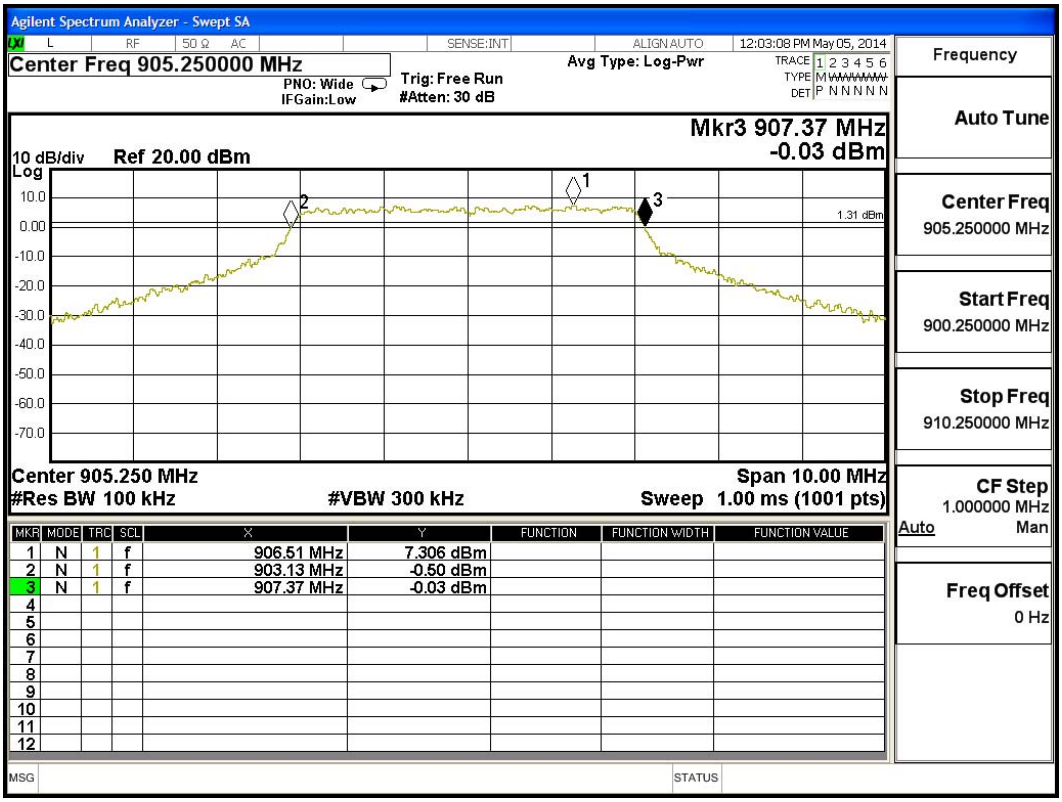
± 150Hz

7.6. Test Result of Occupied Bandwidth

Product : Industrial 900MHz Access Point Confirmed
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (5MBW)_OFDM (905.25MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
1	905.25	4240	>500	Pass

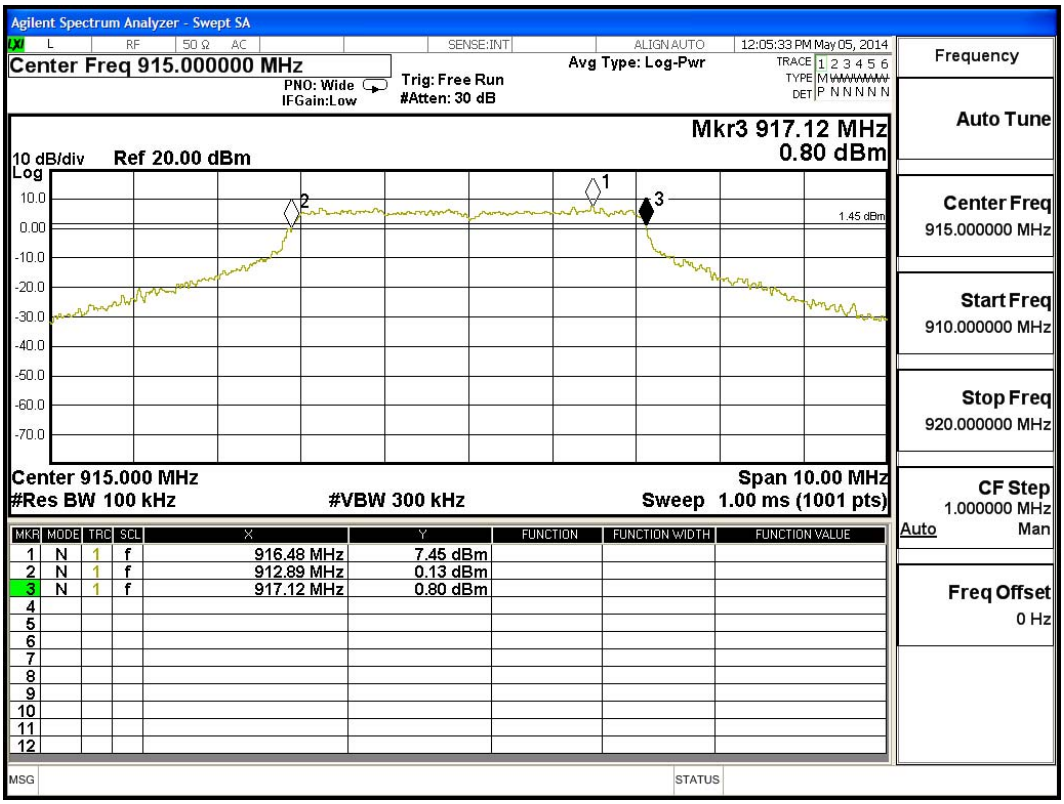
Figure Channel 1:



Product : Industrial 900MHz Access Point Confirmed
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (5MBW)_OFDM (915MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
4	915	4230	>500	Pass

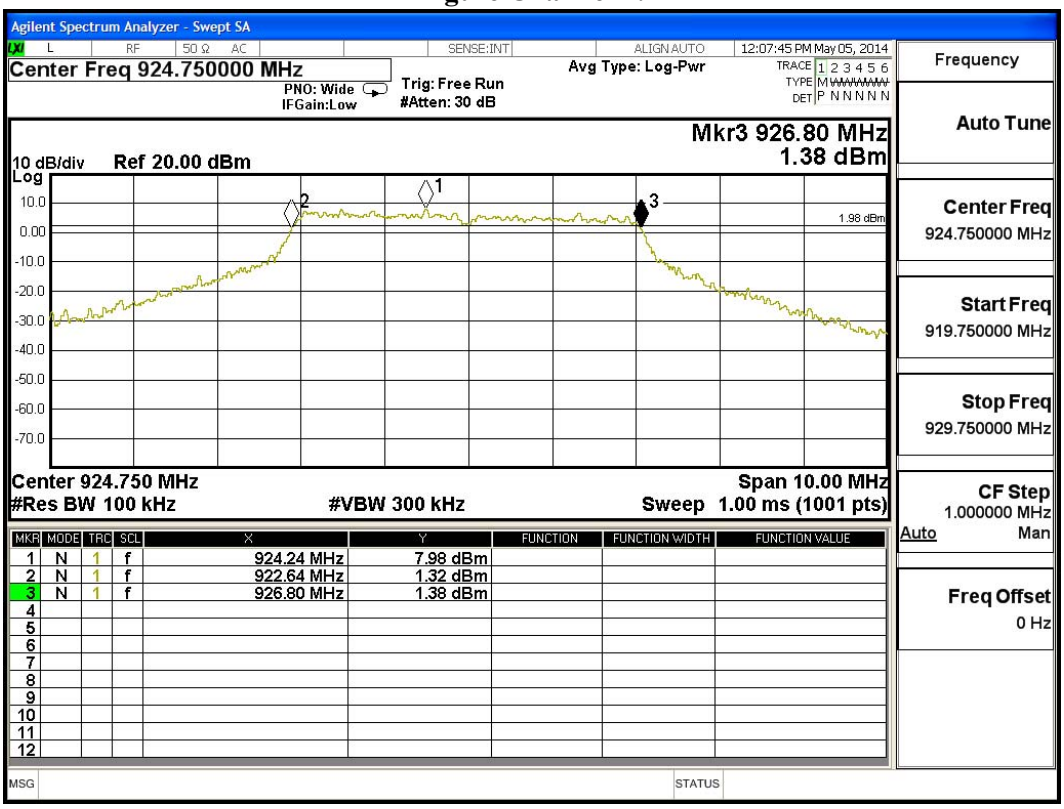
Figure Channel 4:



Product : Industrial 900MHz Access Point Confirmed
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (5MBW)_OFDM (924.75MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
7	924.75	4160	>500	Pass

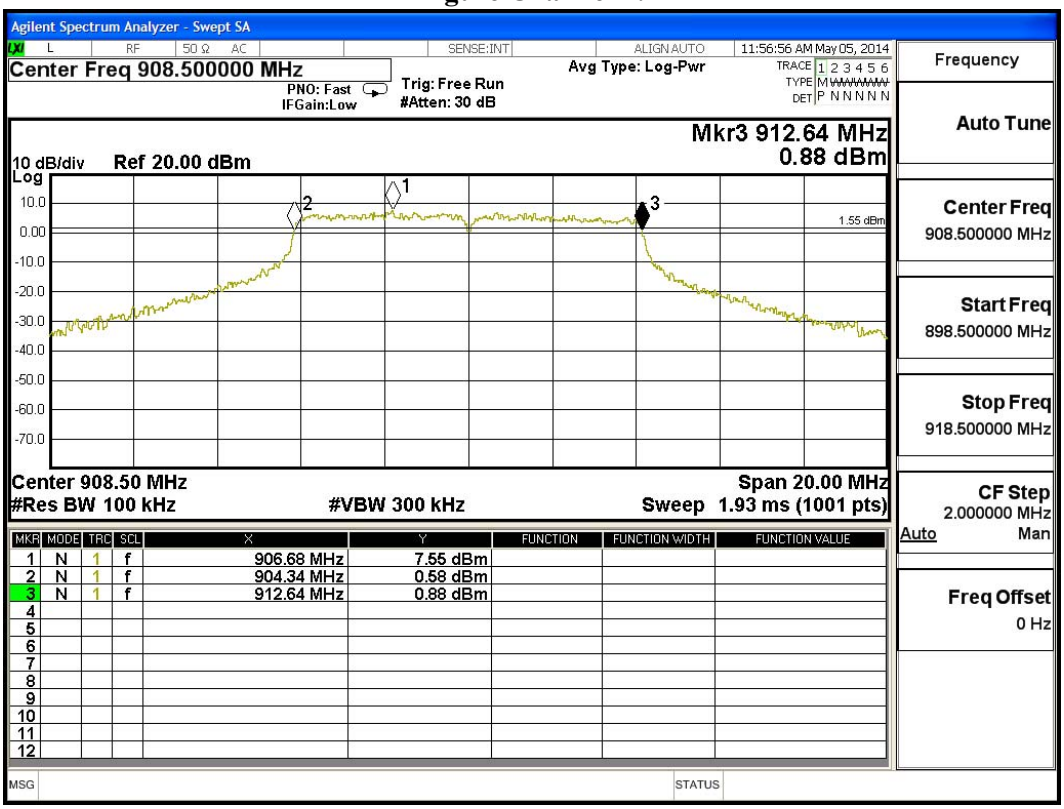
Figure Channel 7:



Product : Industrial 900MHz Access Point Confirmed
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (10MBW)_OFDM (908.5MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
2	908.5	8300	>500	Pass

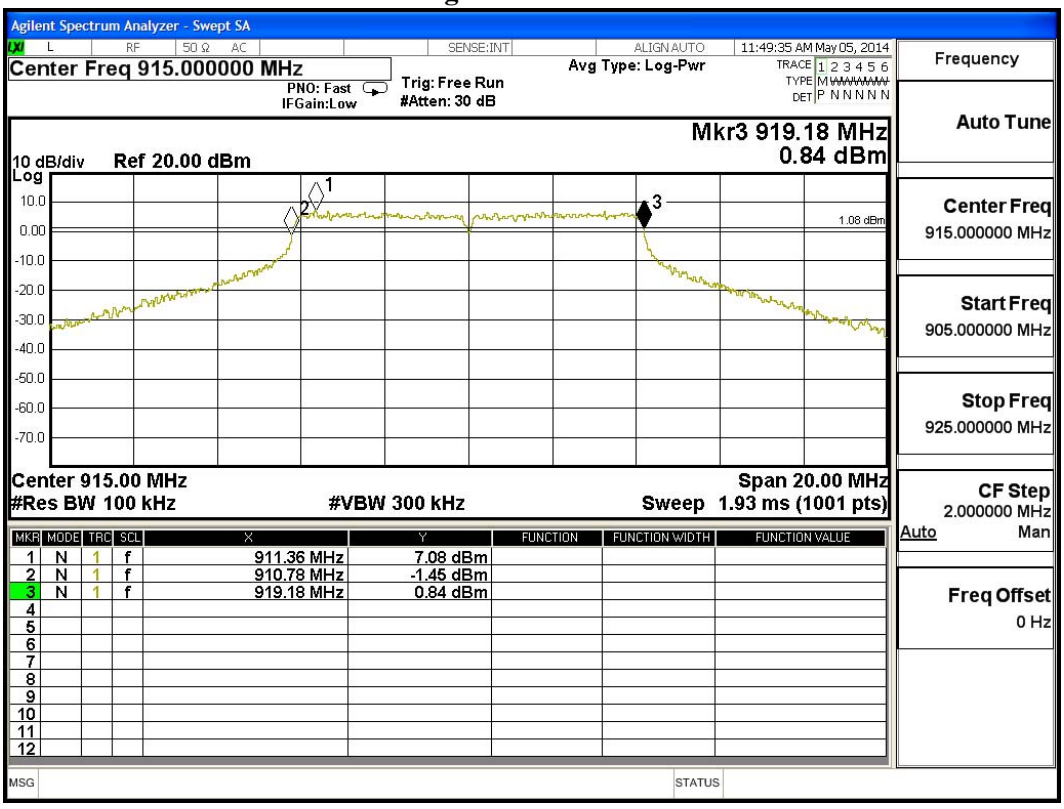
Figure Channel 2:



Product : Industrial 900MHz Access Point Confirmed
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (10MBW)_OFDM (915MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
4	915	8400	>500	Pass

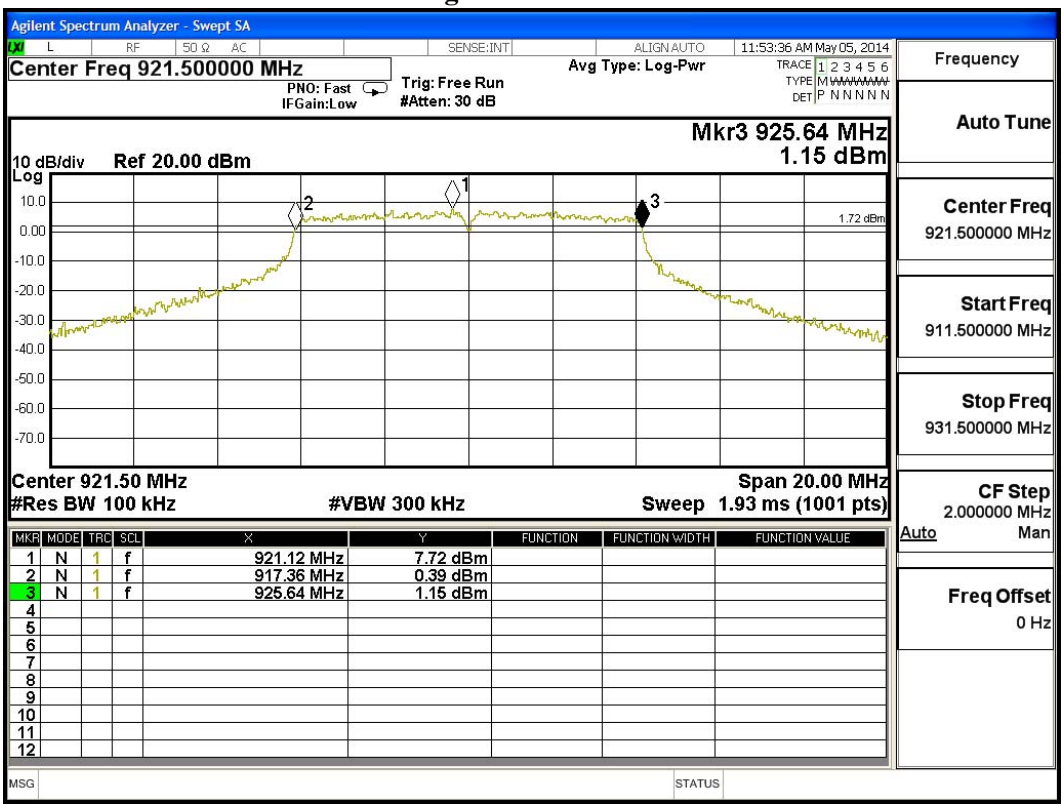
Figure Channel 4:



Product : Industrial 900MHz Access Point Confirmed
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (10MBW)_OFDM (921.5MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
6	921.5	8280	>500	Pass

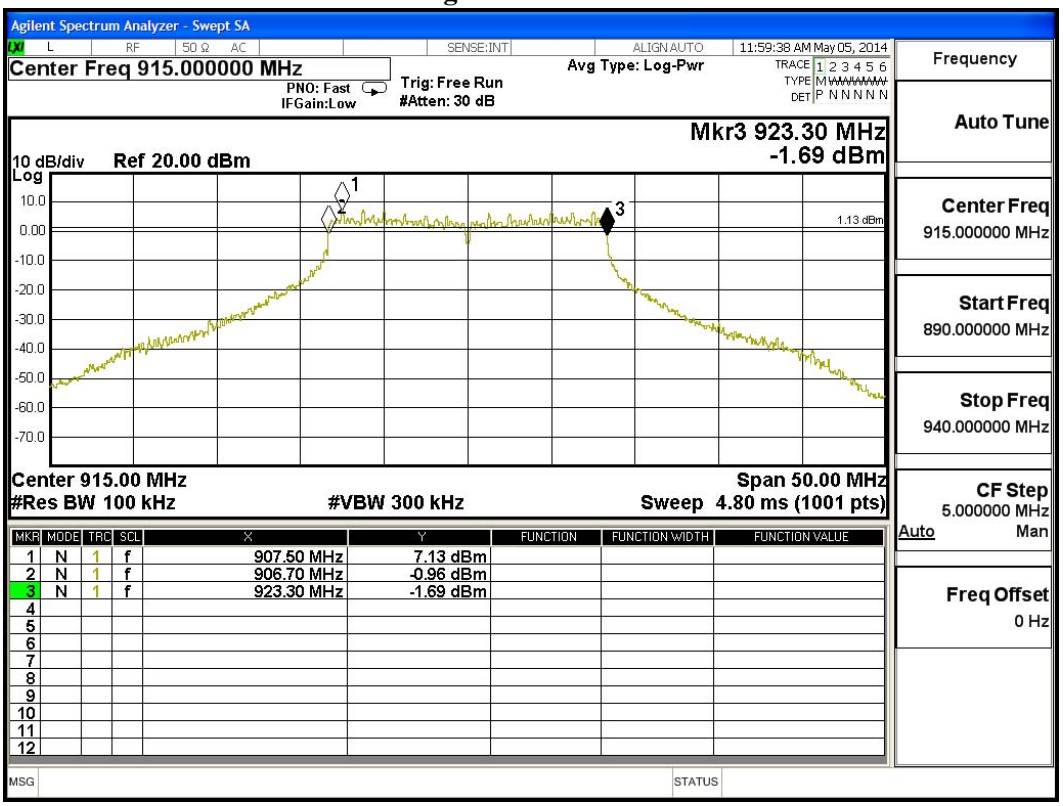
Figure Channel 6:



Product : Industrial 900MHz Access Point Confirmed
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 3: Transmit (20MBW)_OFDM (915MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
4	915	16600	>500	Pass

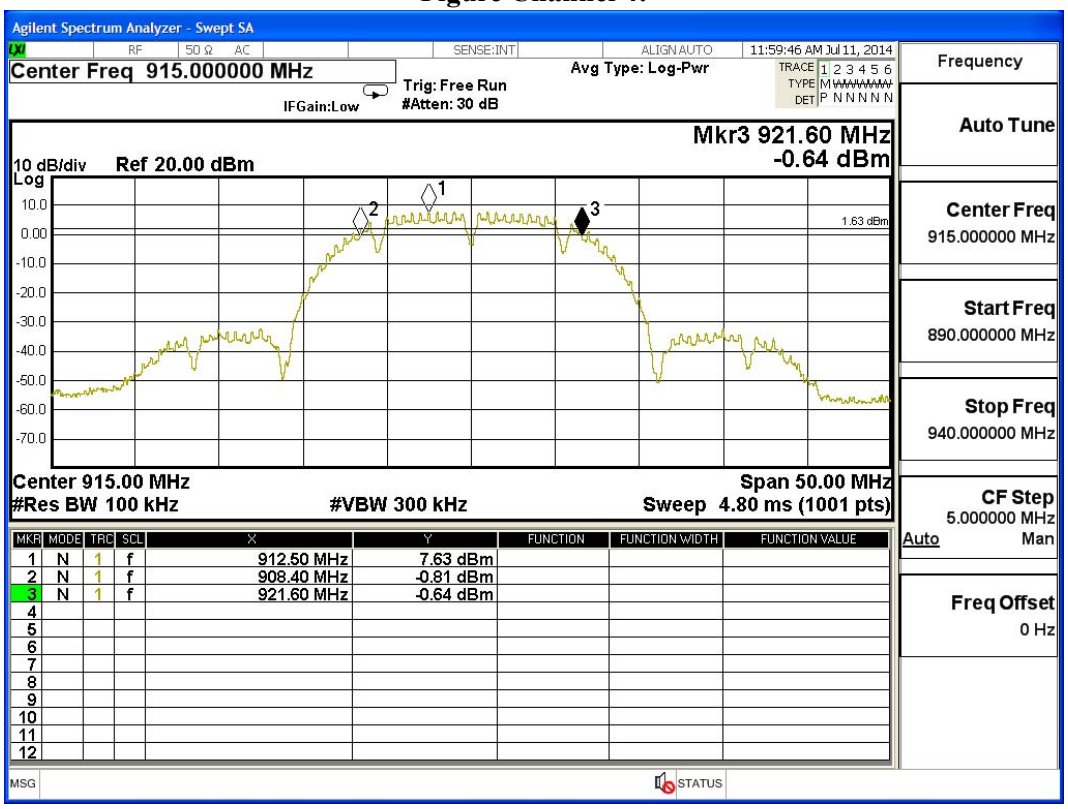
Figure Channel 4:



Product : Industrial 900MHz Access Point Confirmed
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 4: Transmit (20MBW)_DSSS (915MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
4	915	13200	>500	Pass

Figure Channel 4:



8. Power Density

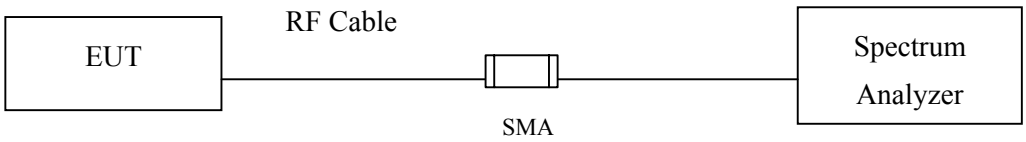
8.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2014
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2014
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2014

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with "X" are used to measure the final test results.

8.2. Test Setup



8.3. Limits

The transmitted power density averaged over any 1 second interval shall not be greater +8dBm in any 3kHz bandwidth.

8.4. Test Procedure

The EUT was setup according to ANSI C63.10, 2009; tested according to DTS test procedure of KDB 558074 for compliance to FCC 47CFR 15.247 requirements.
The maximum power spectral density using KDB 558074 section 10.2 PKPSD (peak PSD) method.

8.5. Uncertainty

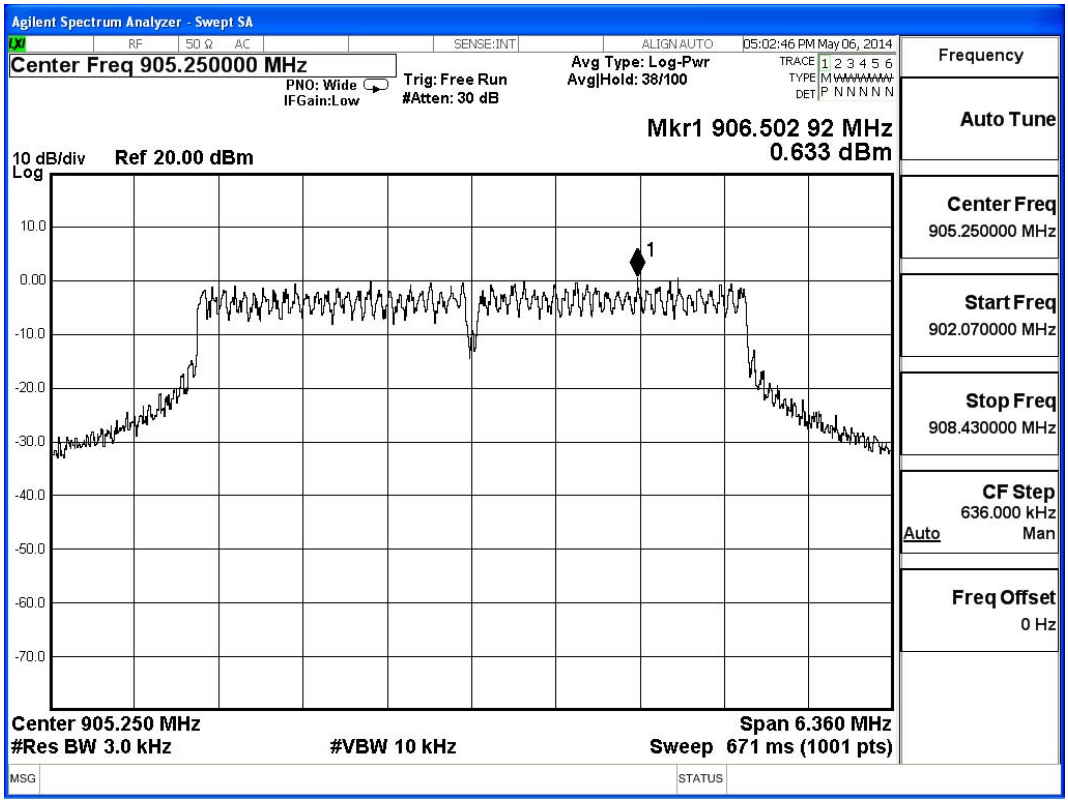
± 1.27 dB

8.6. Test Result of Power Density

Product : Industrial 900MHz Access Point Confirmed
Test Item : Power Density Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (5MBW)_OFDM (905.25MHz)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1	905.25	0.633	< 8dBm	Pass

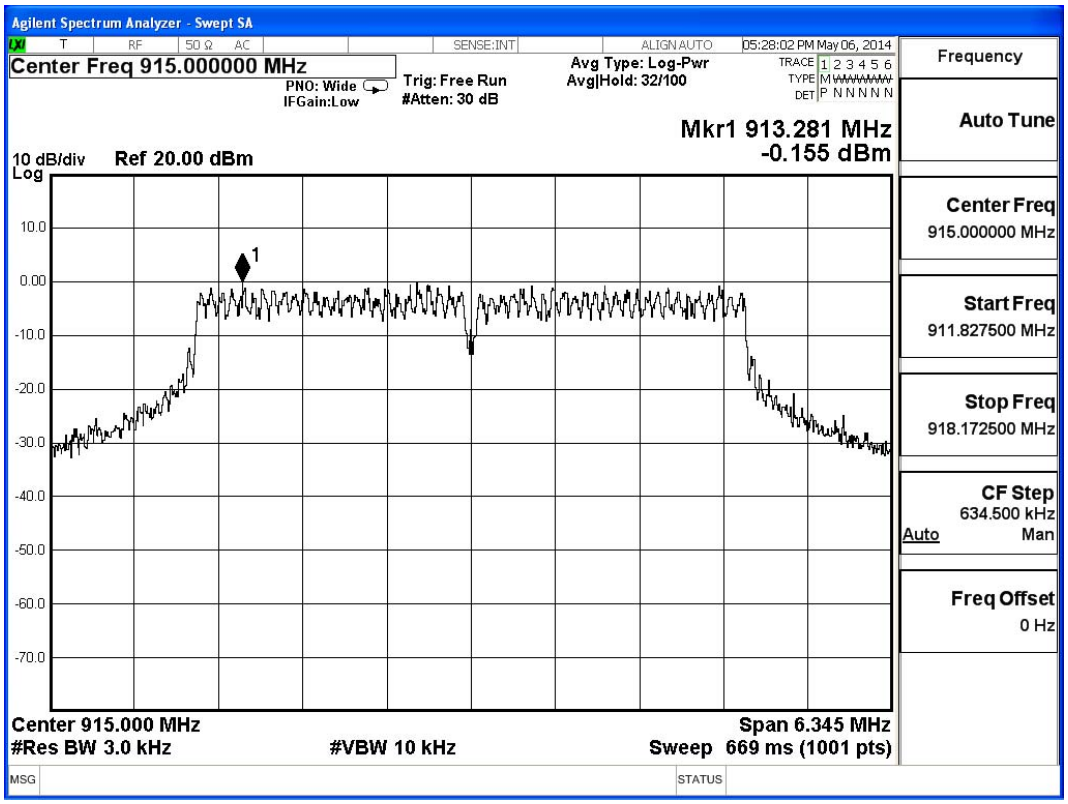
Figure Channel 1:



Product : Industrial 900MHz Access Point Confirmed
Test Item : Power Density Data
Test Site : No.3OATS
Test Mode : Mode 1: Transmit (5MBW)_OFDM (915MHz)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
4	915	-0.155	< 8dBm	Pass

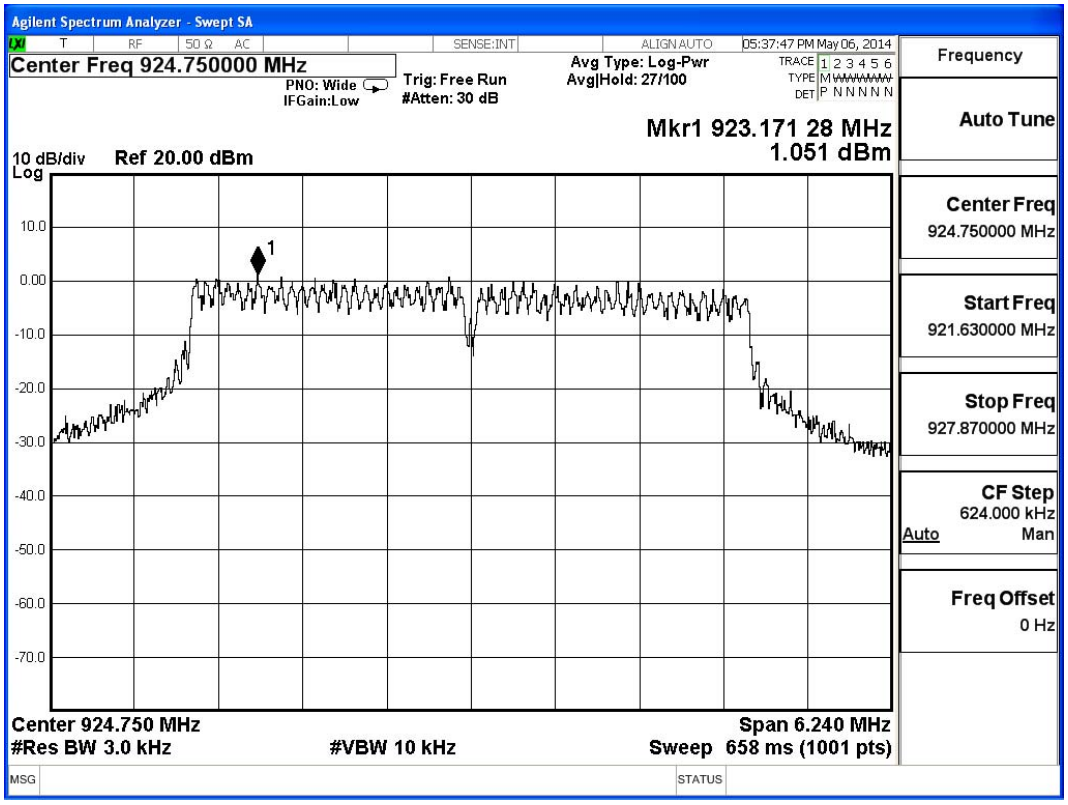
Figure Channel 4:



Product : Industrial 900MHz Access Point Confirmed
Test Item : Power Density Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (5MBW)_OFDM (924.75MHz)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
7	924.75	1.051	< 8dBm	Pass

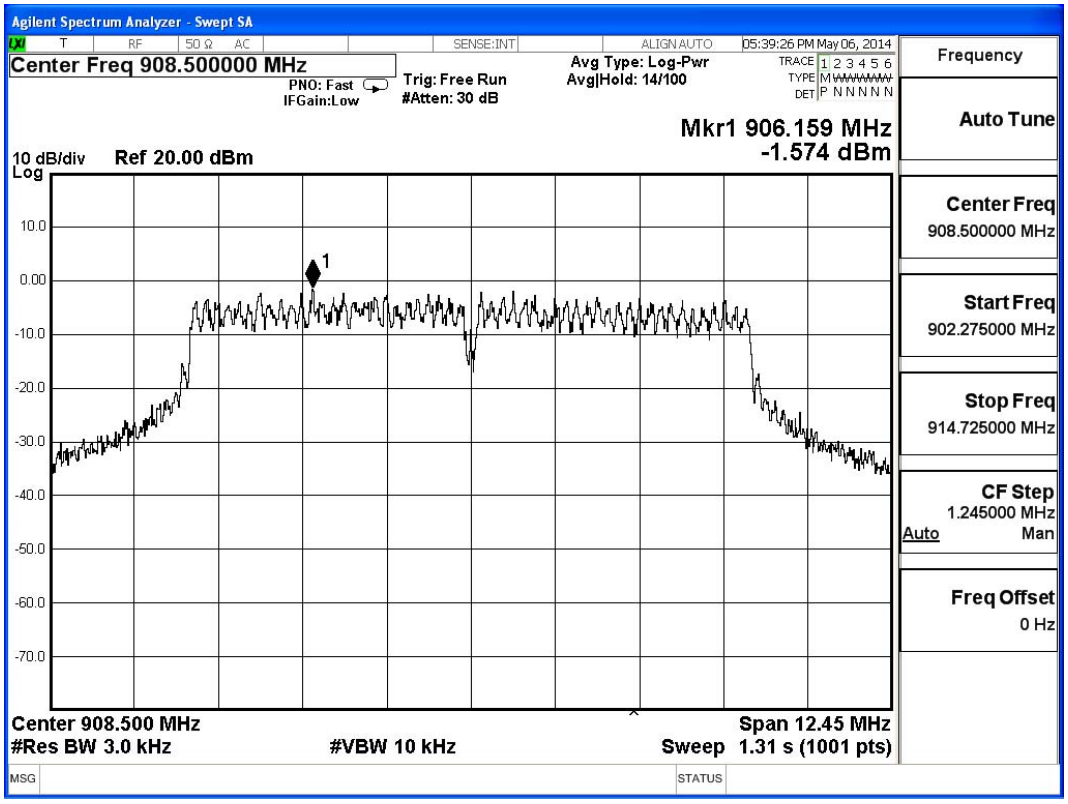
Figure Channel 7:



Product : Industrial 900MHz Access Point Confirmed
Test Item : Power Density Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (10MBW)_OFDM (908.5MHz)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
2	908.5	-1.574	< 8dBm	Pass

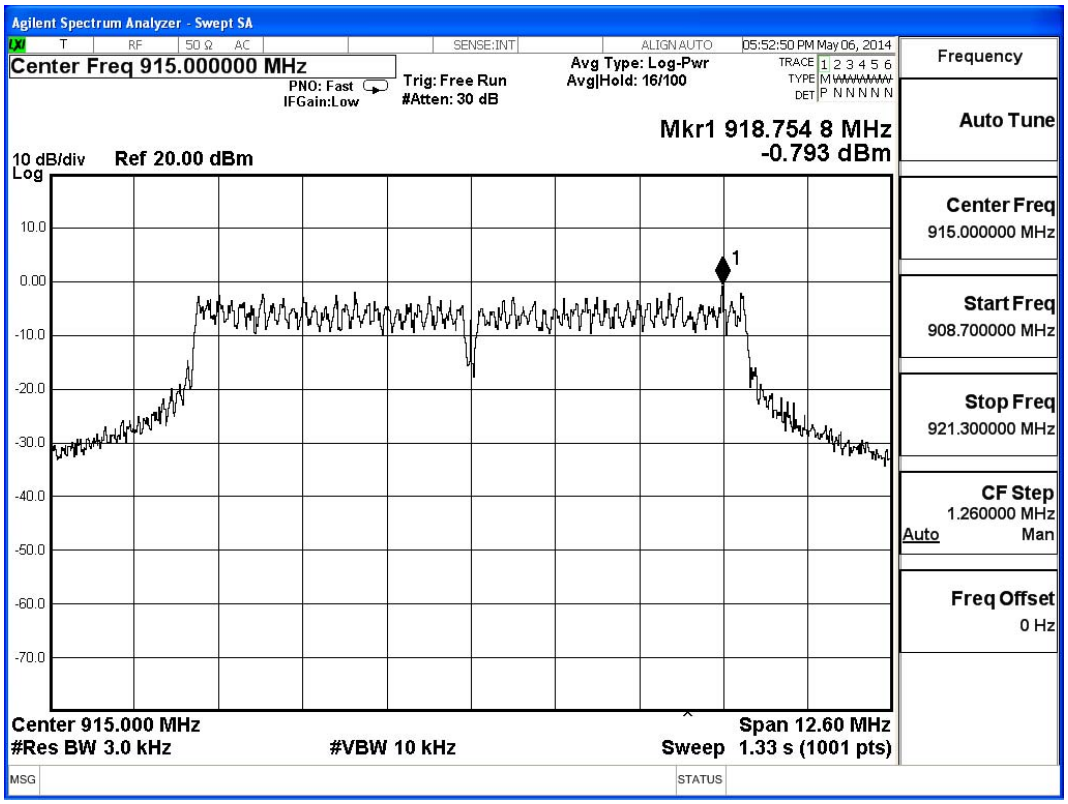
Figure Channel 2:



Product : Industrial 900MHz Access Point Confirmed
Test Item : Power Density Data
Test Site : No.3OATS
Test Mode : Mode 2: Transmit (10MBW)_OFDM (915MHz)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
4	915	-0.793	< 8dBm	Pass

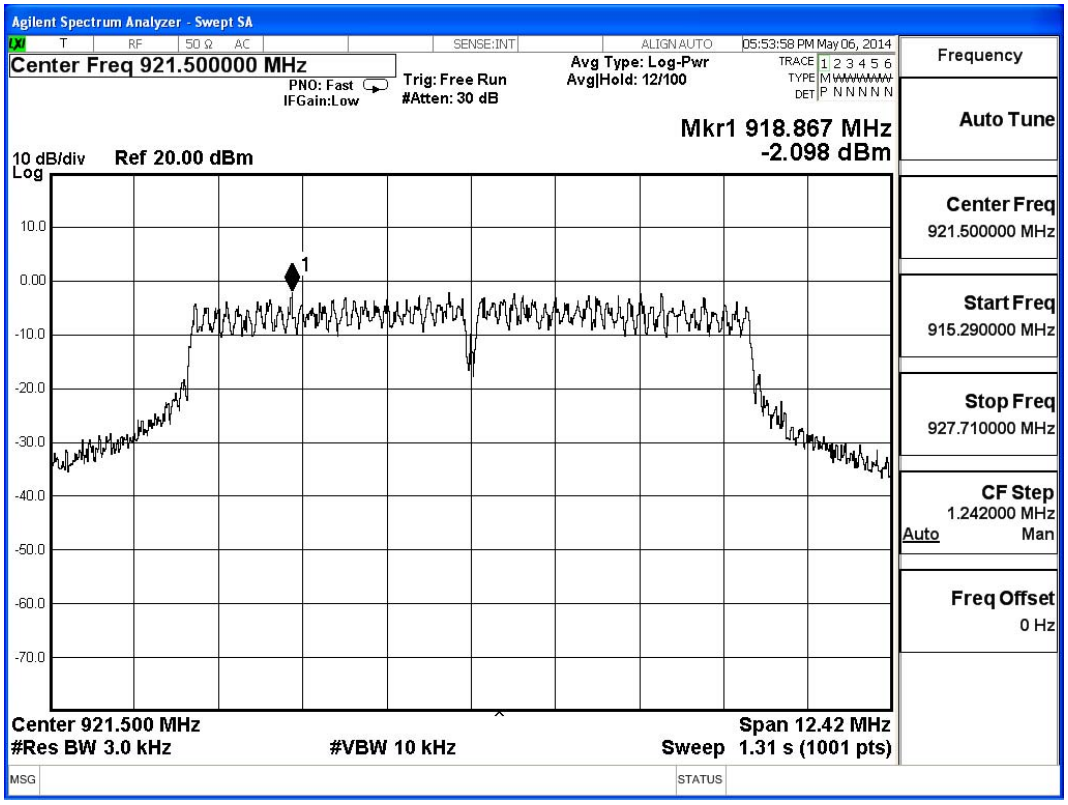
Figure Channel 4:



Product : Industrial 900MHz Access Point Confirmed
Test Item : Power Density Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (10MBW)_OFDM (921.5MHz)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
6	921.5	-2.098	< 8dBm	Pass

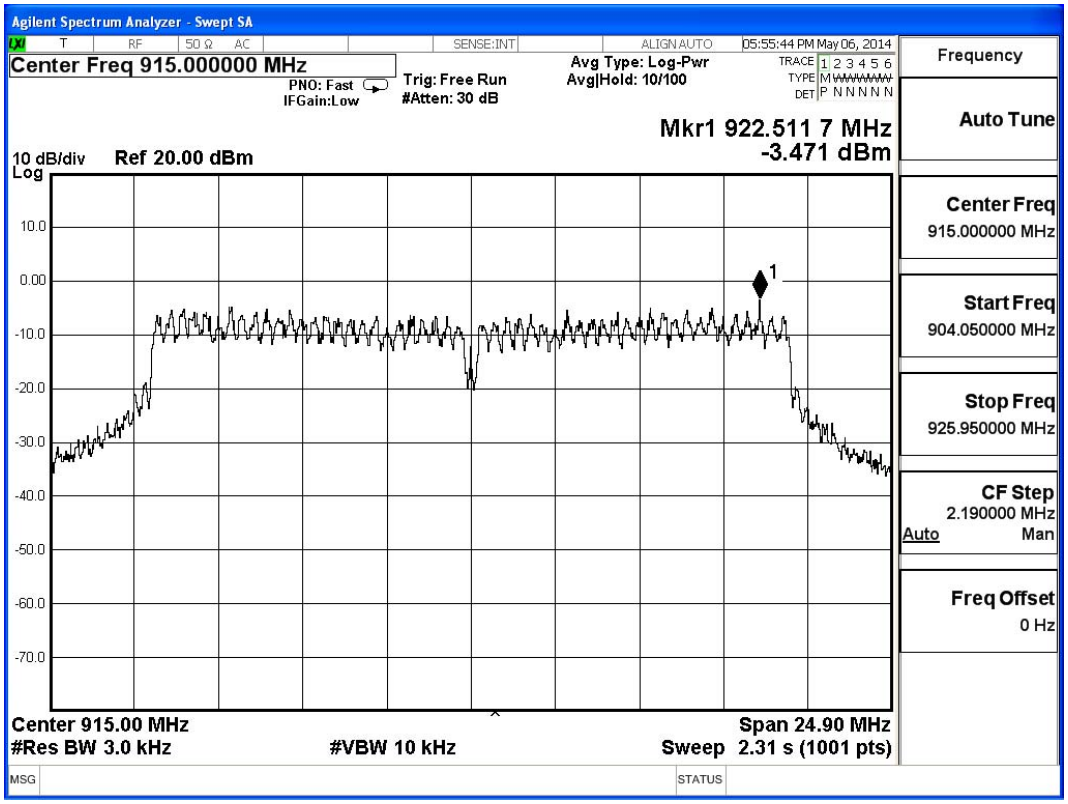
Figure Channel 6:



Product : Industrial 900MHz Access Point Confirmed
Test Item : Power Density Data
Test Site : No.3 OATS
Test Mode : Mode 3: Transmit (20MBW)_OFDM (915MHz)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
4	915	-3.471	< 8dBm	Pass

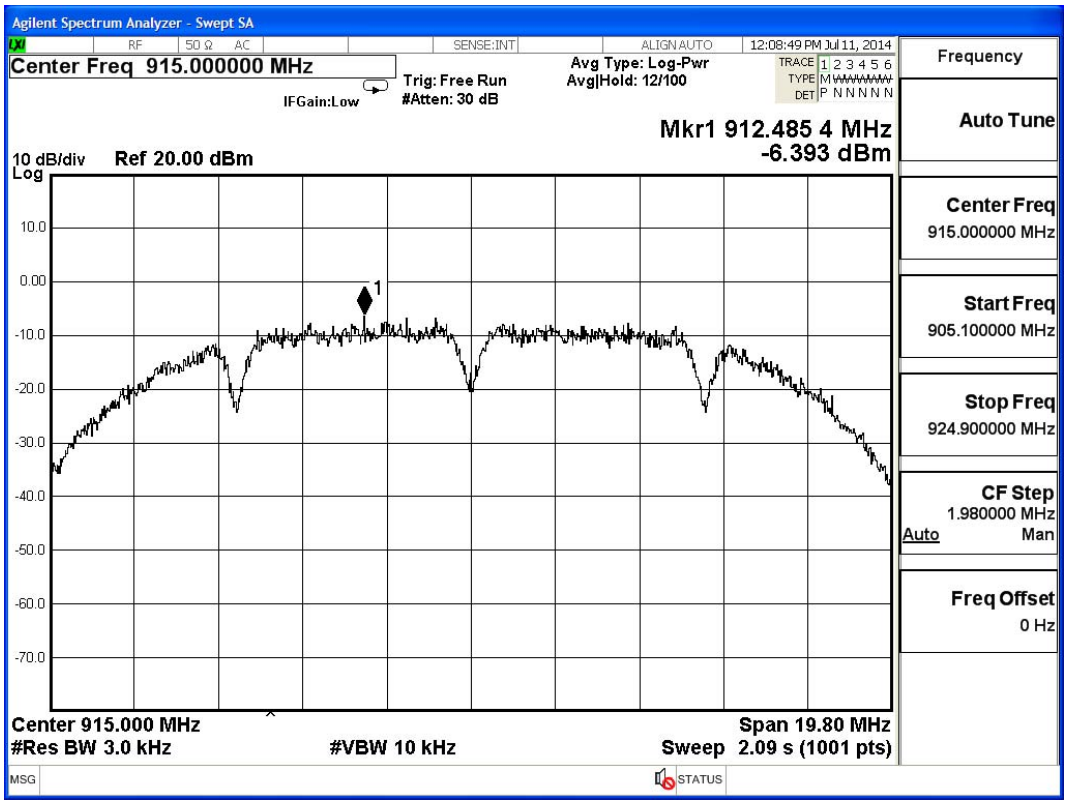
Figure Channel 4:



Product : Industrial 900MHz Access Point Confirmed
Test Item : Power Density Data
Test Site : No.3 OATS
Test Mode : Mode 4: Transmit (20MBW)_DSSS (915MHz)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
4	915	-6.393	< 8dBm	Pass

Figure Channel 4:



9. EMI Reduction Method During Compliance Testing

No modification was made during testing.