FCC PART 90
TEST AND MEASUREMENT REPORT

For

Cohda Wireless Pty Ltd

82-84 Melbourne Street,

North Adelaide, SA 5006, Australia

Model: MK5
FCC ID: 2AEGPMK5RSU

Report Type:	**Product Type:**
Original Report	DSRCS-RSU Radio Module

Prepared By	Chen Ge Test Engineer
Report Number	R1411254-90 Rev B
Report Date	2015-05-06
Reviewed By	Bo Li RF Lead
	Bay Area Compliance Laboratories Corp. 1274 Anvilwood Avenue, Sunnyvale, CA 94089, USA Tel: (408) 732-9162 Fax: (408) 732-9164

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1411254-90	Original Report	2015-02-20
1	R1411254-90 Rev A	Revised Report	2015-04-23
2	R1411254-90 Rev B	Revised Report	2015-05-06

1 General Description

1.1 Product Description for Equipment Under Test (EUT)

This test and measurement report was prepared on behalf of*, Cohda Wireless Pty Ltd*., and their product model: *MK5;* FCC ID: 2AEGPMK5RSU or the "EUT" as referred to in this report. The EUT's a DSRCS-RSU Radio Module operates in 5850-5925 MHz band.

1.2 Mechanical Description of EUT

The EUT measures 13cm (L), 8.3cm (W), 5cm (H), and weighs 0.05 kg.

The data gathered are from a production sample provided by the manufacturer, serial number: 04E548020174*, assigned by Client.*

1.3 Objective

This report is prepared on behalf of *Cohda Wireless Pty Ltd* in accordance with Part 2, Part 90. The objective is to determine compliance with FCC Part 90.

1.4 Related Submittal(s)/Grant(s)

N/A.

1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI TIA-603-D and ASTM E2213-03

1.6 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR16-4-2:2011, The Treatment of Uncertainty in EMC Measurements, the values ranging from $\pm$2.0 dB for Conducted Emissions tests and $\pm$4.0 dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BACL Corp.

1.7 Test Facility

Bay area compliance Laboratories Corp. (BACL) is:
1- An independent Commercial Test Laboratory accredited to **ISO 17025: 2005** by **A2LA**, in the fields of: Electromagnetic Compatibility & Telecommunications covering Emissions, Immunity, Radio, RF Exposure, Safety and Telecom. This includes NEBS (Network Equipment Building System), Wireless RF, Telecommunications Terminal Equipment (TTE); Network Equipment; Information Technology Equipment (ITE); Medical Electrical Equipment; Industrial, Commercial, and Medical Test Equipment; Professional Audio and Video Equipment; Electronic (Digital) Products; Industrial and Scientific Instruments; Cabled Distribution Systems and Energy Efficiency Lighting.

2- An ENERGY STAR Recognized Laboratory, for the LM80 Testing, a wide variety of Luminares and Computers.

3- A NIST Designated Phase-I and Phase-II CAB including: ACMA (Australian Communication and Media Authority), BSMI (Bureau of Standards, Metrology and Inspection of Taiwan), IDA (Infocomm Development Authority of Singapore), IC(Industry Canada), Korea (Ministry of Communications Radio Research Laboratory), NCC (Formerly DGT; Directorate General of Telecommunication of Chinese Taipei) OFTA (Office of the Telecommunications Authority of Hong Kong), Vietnam, VCCI - Voluntary Control Council for Interference of Japan and a designated EU CAB (Conformity Assessment Body) (Notified Body) for the EMC and R&TTE Directives.

4- A Product Certification Body accredited to **ISO Guide 65: 1996** by **A2LA** to certify:
1- Unlicensed, Licensed radio frequency devices and Telephone Terminal Equipment for the FCC. Scope A1, A2, A3, A4, B1, B2, B3, B4 & C.
2. Radio Standards Specifications (RSS) in the Category I Equipment Standards List and All Broadcasting Technical Standards (BETS) in Category I Equipment Standards List for Industry Canada.
3. Radio Communication Equipment for Singapore.
4. Radio Equipment Specifications, GMDSS Marine Radio Equipment Specifications, and Fixed Network Equipment Specifications for Hong Kong.
5. Japan MIC Telecommunication Business Law (A1, A2) and Radio Law (B1, B2 and B3).
6. Audio/Video, Battery Charging Systems, Computers, Displays, Enterprise Servers, Imaging Equipment, Set-Top Boxes, Telephony, Televisions, Ceiling Fans, CFLs (Including GU24s),Decorative Light Strings, Integral LED Lamps, Luminaires, Residential Ventilating Fans.

The test site used by BACL Corp. to collect radiated and conducted emissions measurement data is located at its facility in Sunnyvale, California, USA.

The test site at BACL Corp. has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997, and Article 8 of the VCCI regulations on December 25, 1997. The test site also complies with the test methods and procedures set forth in CISPR 22:2008 §10.4 for measurements below 1 GHz and §10.6 for measurements above 1 GHz as well as ANSI C63.4-2009, ANSI C63.4-2009, TIA/EIA-603 & CISPR 24:2010.

The Federal Communications Commission and Voluntary Control Council for Interference have the reports on file and they are listed under FCC registration number: 90464 and VCCI Registration No.: A-0027. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL Corp. is an American Association for Laboratory Accreditation (A2LA) accredited laboratory (Lab Code 3297-02). The current scope of accreditations can be found at

http://www.a2la.org/scopepdf/3297-02.pdf?CFID=1132286&CFTOKEN=e42a3240dac3f6ba-6DE17DCB-1851-9E57-477422F667031258&jsessionid=8430d44f1f47cf2996124343c704b367816b

2 System Test Configuration

2.1 Justification

The EUT was configured for testing according to TIA-603-D and ASTM E2213-03.

The EUT was tested in a testing mode to represent worst-case results during the final qualification test.

2.2 EUT Exercise Software

The test utility used was putty.

2.3 Special Equipment

There were no special accessories were required, included, or intended for use with EUT during these tests.

2.4 Equipment Modifications

No modifications were made to the EUT.

2.5 Local Support Equipment

Manufacturer	Description	Model	Part Number	Calibration Date
Dell	Laptop	Latitude E5420	-	N/A
BK PRECISION	DC Power Supply	E3	N/A	N/A
Fluke	Digital Voltmeter	189	N/A	2014-02-05

2.6 EUT Internal Configuration Details

EUT is a PCB board module.

3 Summary of Test Results

Results reported relate only to the product tested.

FCC Rules	Description of Test	Results
FCC §2.1091	RF Exposure	Compliant
FCC §2.1046, §90.377 & ASTM E2213-03 8.9.1	Output Power	Compliant
FCC §2.1049	Emission Bandwidth	Compliant
FCC §90.210 & ASTM E2213-03 8.9.1	Transmit Spectrum Mask	Compliant
FCC §2.1055 & ASTM E2213-03 8.9.5	Frequency Stability	Compliant
FCC §2.1051 & ASTM E2213-03 8.9.2	Transmit Spurious Emission-Conducted	Compliant
FCC §2.1053 & ASTM E2213-03 8.9.2	Transmit Spurious Emission-Radiated	Compliant

4 FCC §2.1091– RF Exposure

4.1 Applicable Standard

According to FCC §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minutes)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	* (100)	30
1.34-30	824/f	2.19/f	* ($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

4.2 MPE Prediction

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S = power density
P = power input to antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna

4.3 MPE Results

Maximum peak output power at antenna input terminal (dBm):	22.81
Maximum peak output power at antenna input terminal (mW):	190.98
Prediction distance (cm):	20
Prediction frequency (MHz):	5860
Maximum Antenna Gain, typical (dBi):	6
Maximum Antenna Gain (numeric):	3.98
Power density of prediction frequency at 20 cm (mW/cm^2):	0.15
MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1

The device compliances with FCC MPE limit at 20 cm distance.

5 FCC §2.1046, §90.377 & ASTM E 2213-03 §8.9.1 – RF Output Power

5.1 Applicable Standards

FCC §2.1046, §90.377.

According to ASTM E2213-03 §8.9.1, Private OBU operations in Channels 172, 174, 176,178, and 184 shall not exceed 28.8 dBm antenna input power and 33 dBm EIRP. Private OBU operations in Channel 175 shall not exceed 10 dBm antenna input power and 23 dBm EIRP. Private OBU operations in Channels 180, 181, and 182 shall not exceed 20 dBm antenna input power and 23 dBm EIRP.

5.2 Test Procedure

TIA-603-D

5.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Spectrum Analyzer	E4446A	US44300386	2014-09-29	1 year

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

5.4 Test Environmental Conditions

Temperature:	22-26 °C
Relative Humidity:	42-46 %
ATM Pressure:	101-102 kPa

The testing was performed by Chen Ge from 2015-01-19 and 2015-01-23 at RF site.

5.5 Test Results

Channel	Frequency (MHz)	Conducted Output Power Chain 0 (dBm)	Conducted Output Power Chain 1 (dBm)	Total Conducted Output Power (dBm)	Antenna Gain (dBi)	Conducted Output Power Limit (dBm)	E.I.R.P (dBm)	E.I.R.P Limit (dBm)
172	5860	19.86	19.73	22.81	6	28.8	28.81	33
178	5890	19.32	19.26	22.30	6	28.8	28.30	33
180	5900	13.54	13.35	16.46	6	20	22.46	23
182	5910	13.74	13.58	16.67	6	20	22.67	23
184	5920	19.73	19.69	22.72	6	28.8	28.72	33

6 FCC §2.1049 - Emission Bandwidths

6.1 Applicable Standard

According to FCC §2.1049

6.2 Test Procedure

The transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used given that a peak or peak hold my produce a wider bandwidth than actual.

The trace data points are recovered and directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded. The span between two recorded frequencies is the occupied bandwidth.

6.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Spectrum Analyzer	E4446A	US44300386	2014-09-29	1 year

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

6.4 Test Environmental Conditions

Temperature:	22-26 °C
Relative Humidity:	42-46 %
ATM Pressure:	101-102 kPa

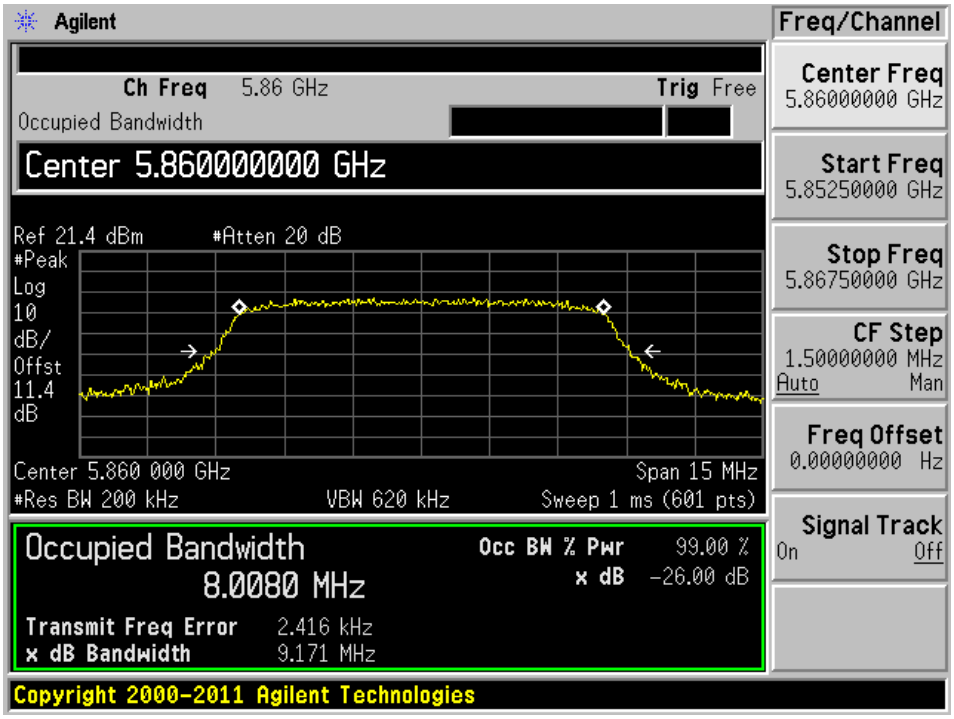
The testing was performed by Chen Ge from 2015-01-19 and 2015-01-23 at RF site.

6.5 Test Results

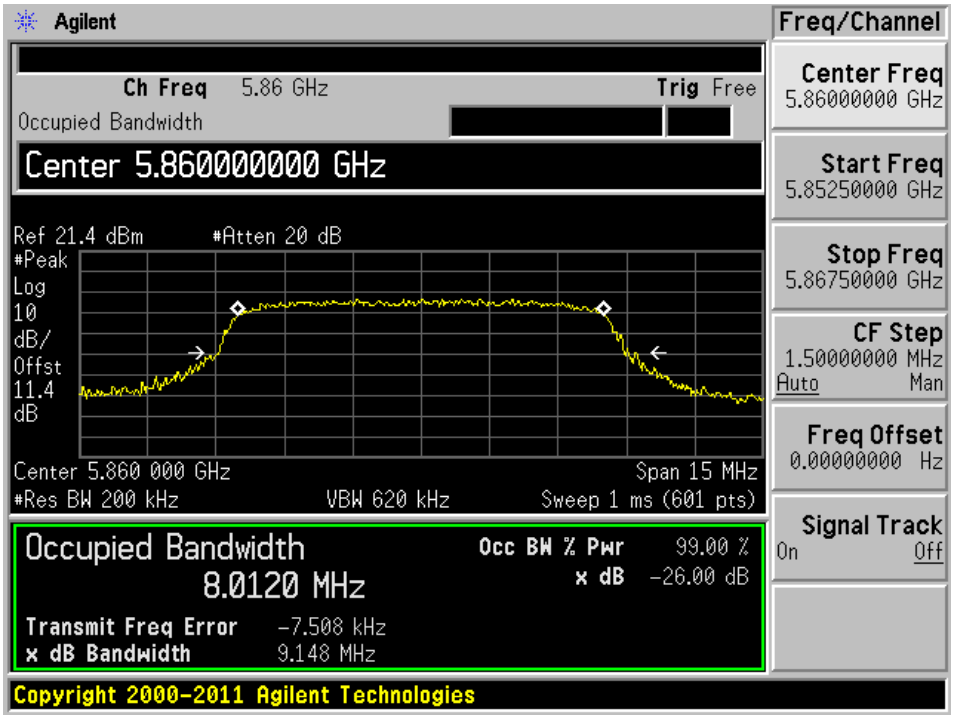
Channel	Frequency (MHz)	99% Emission Bandwidth (MHz) Chain 1	99% Emission Bandwidth (MHz) Chain 2
Low	5860	8.0080	8.0120
Middle	5890	8.0341	8.0262
High	5920	8.0354	8.0404

Please refer to the following plots for the test results

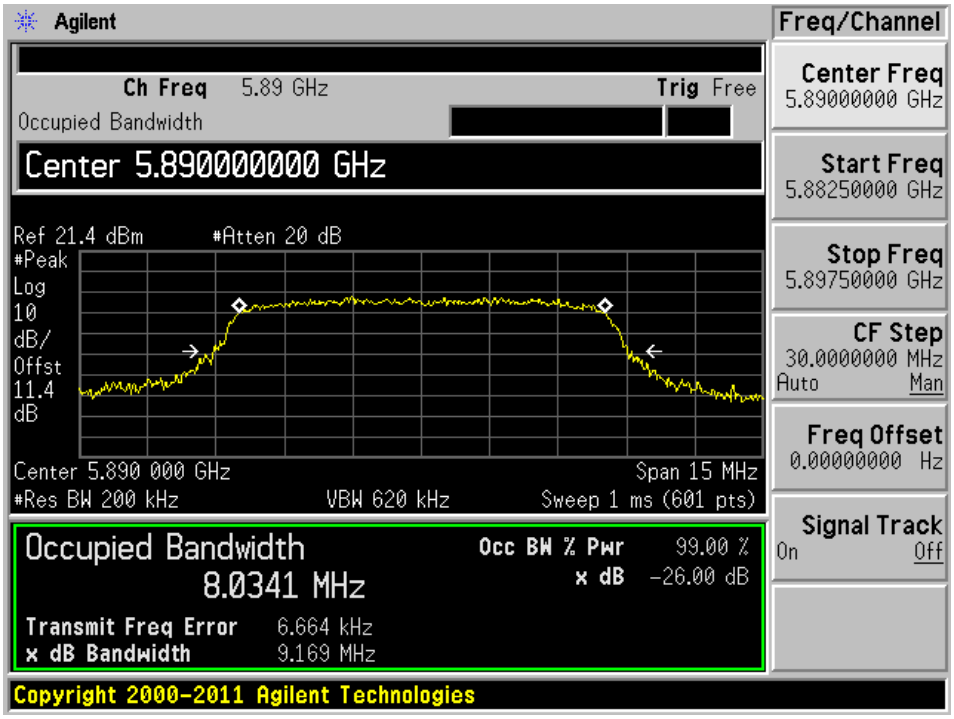
Low Channel, 5860 MHz Chain 1



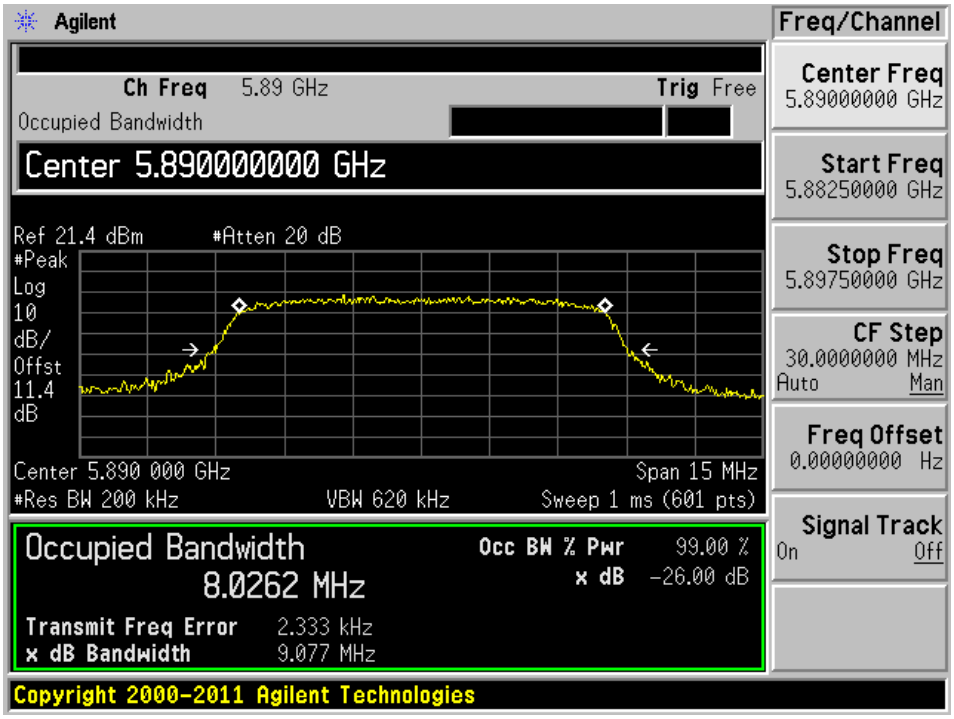
Low Channel, 5860 MHz Chain 2



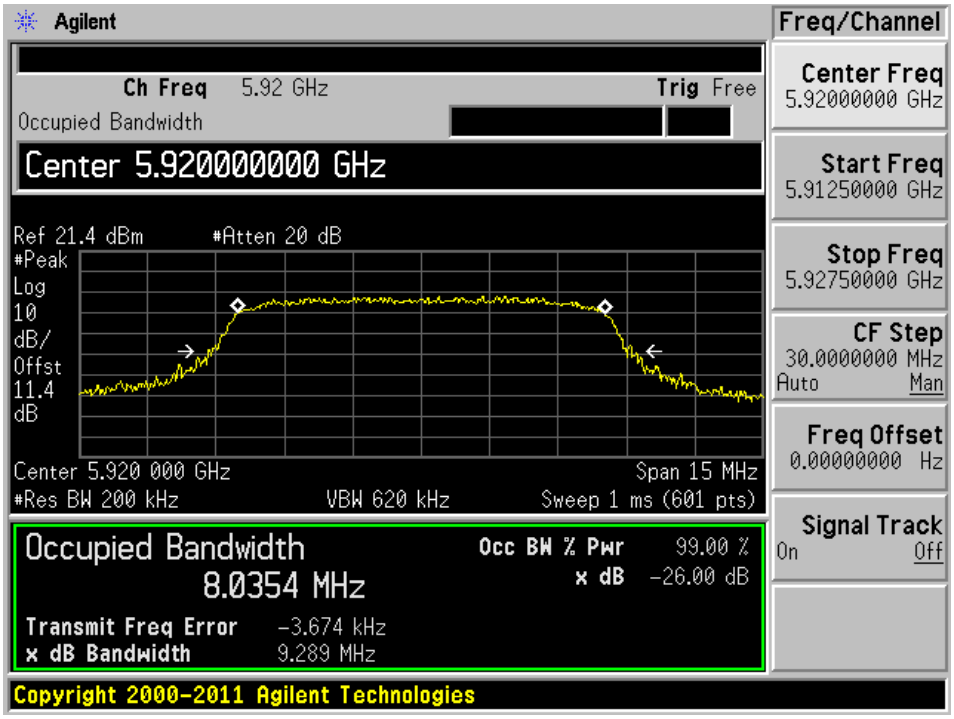
Middle Channel, 5890 MHz Chain 1



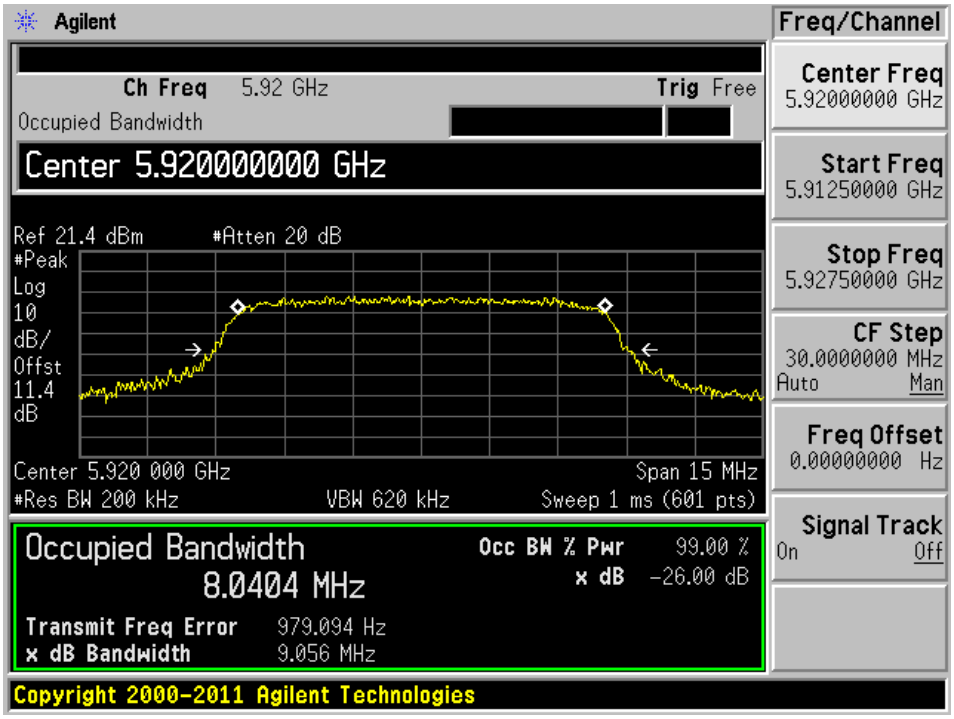
Middle Channel, 5890 MHz Chain 2



High Channel, 5920 MHz Chain 1



High Channel, 5920 MHz Chain 2



7 FCC §90.210 & ASTM E 2213-03 §8.9.1 – Transmit Spectrum Mask

7.1 Applicable Standards

FCC §90.210, ASTME 2213-03 §8.9.1

TABLE 10 DSRC Spectrum Mask[A]

NOTE—Reduction in Power Spectral Density, dBr.

Class	± 4.5-MHz Offset	± 5.0-MHz Offset	± 5.5-MHz Offset	± 10-MHz Offset	± 15-MHz Offset
Class A	0	-10	-20	-28	-40
Class B	0	-16	-20	-28	-40
Class C	0	-26	-32	-40	-50
Class D	0	-35	-45	-55	-65

[A] From IEEE 802.11a. Copyright 1999 IEEE. All rights reserved.

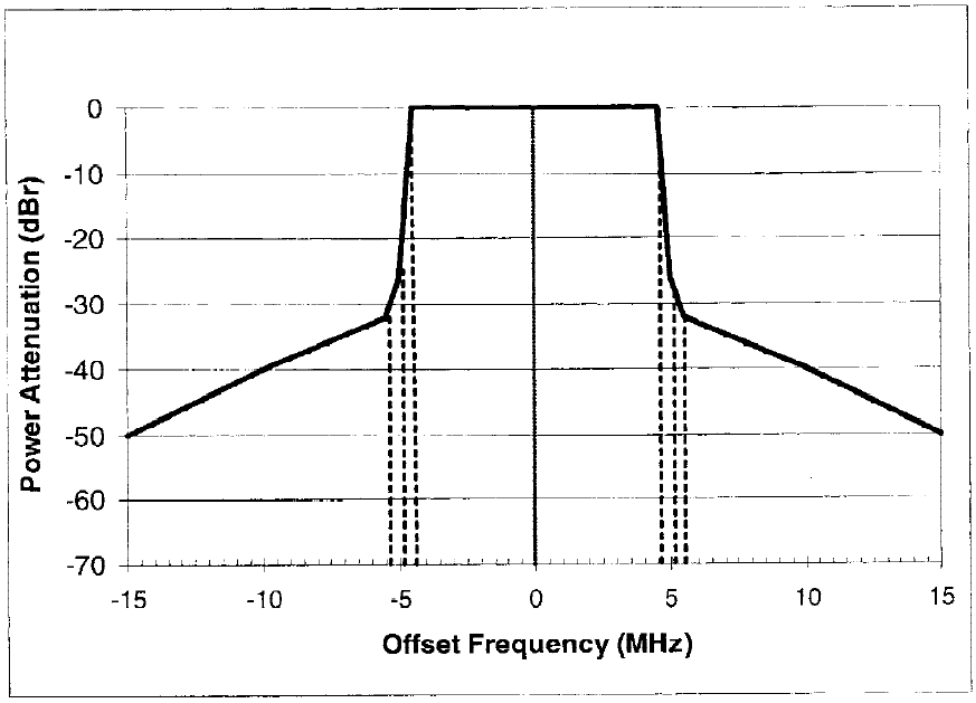


FIG. 14 Class C Transmit Spectrum Mask

7.2 Test Procedure

The DSRC transmitted spectrum mask is relative to the device class of operation. The power in the transmitted spectrum for all DSRC devices shall be −25 dBm or less within 100 kHz outside all channel and band edges. This will be accomplished by attenuating the transmitted signal 100 kHz outside the channel and band edges by 55 + 10log(*P*) dB, where *P* is the total transmitted power in watts. The transmitted spectral density of the transmitted signal for all devices shall fall within the spectral mask, as detailed in Table 10.5 The measurements shall be made using a 100 kHz resolution bandwidth and a 30 kHz video bandwidth.

7.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Spectrum Analyzer	E4446A	US44300386	2014-09-29	1 year

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

7.4 Test Environmental Conditions

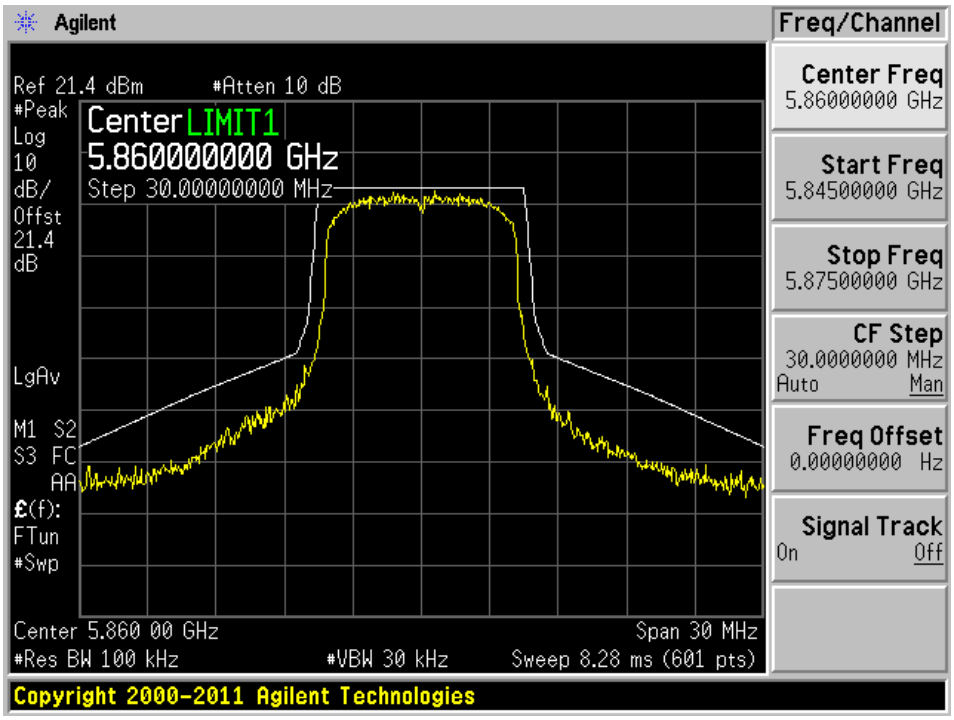
Temperature:	22-26 °C
Relative Humidity:	42-46 %
ATM Pressure:	101-102 kPa

The testing was performed by Chen Ge from 2015-01-19 and 2015-01-23 at RF site.

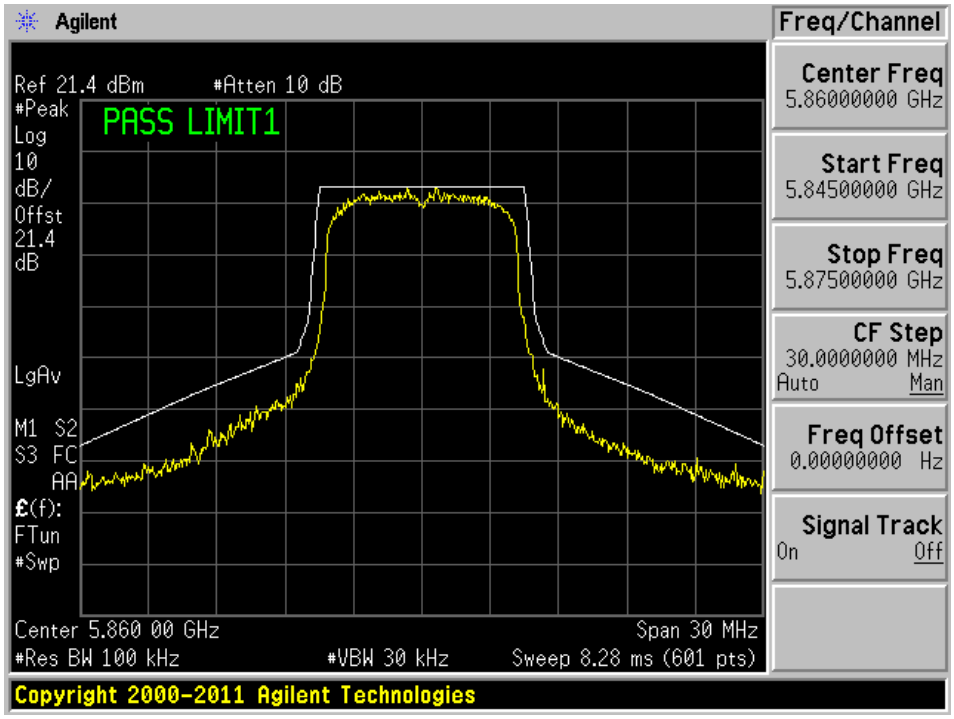
7.5 Test Results

Please refer to the following plots for the test result

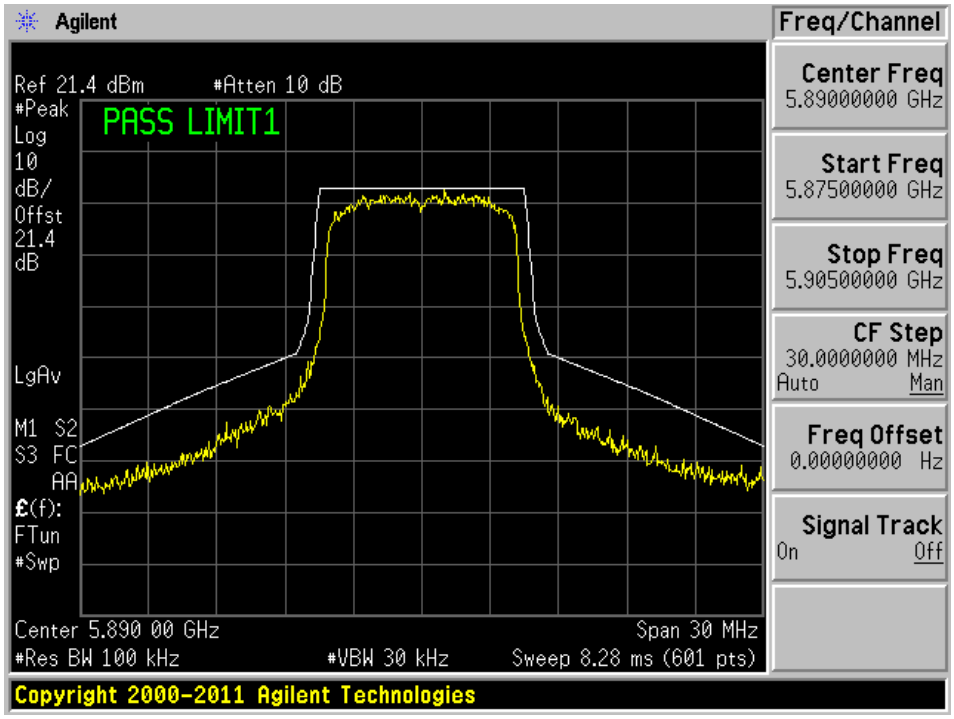
Low Channel, 5860 MHz Chain 1



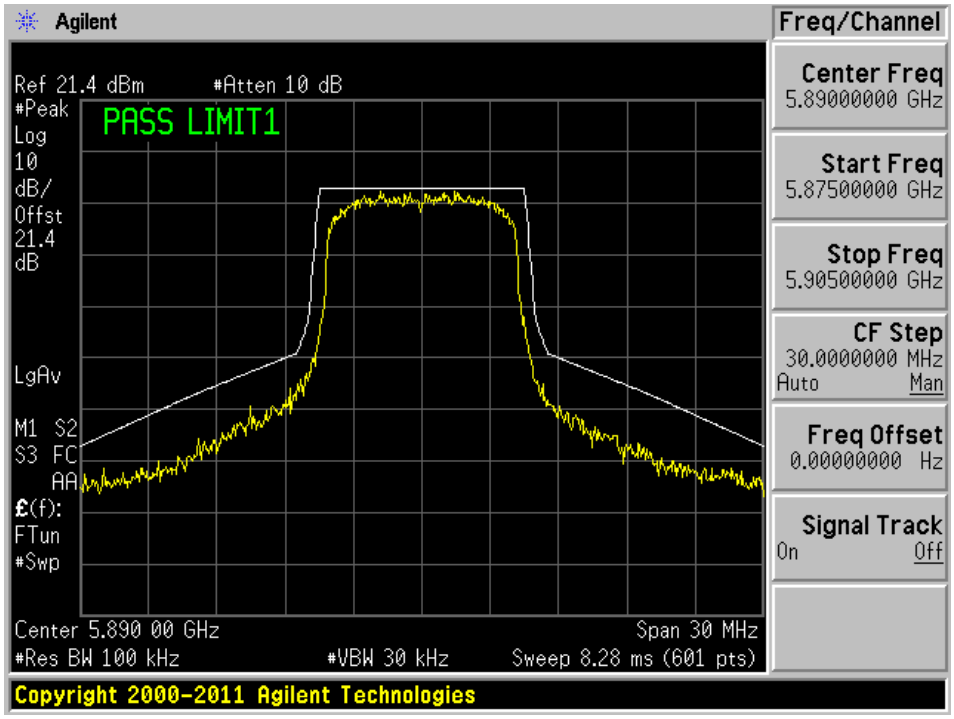
Low Channel, 5860 MHz Chain 2



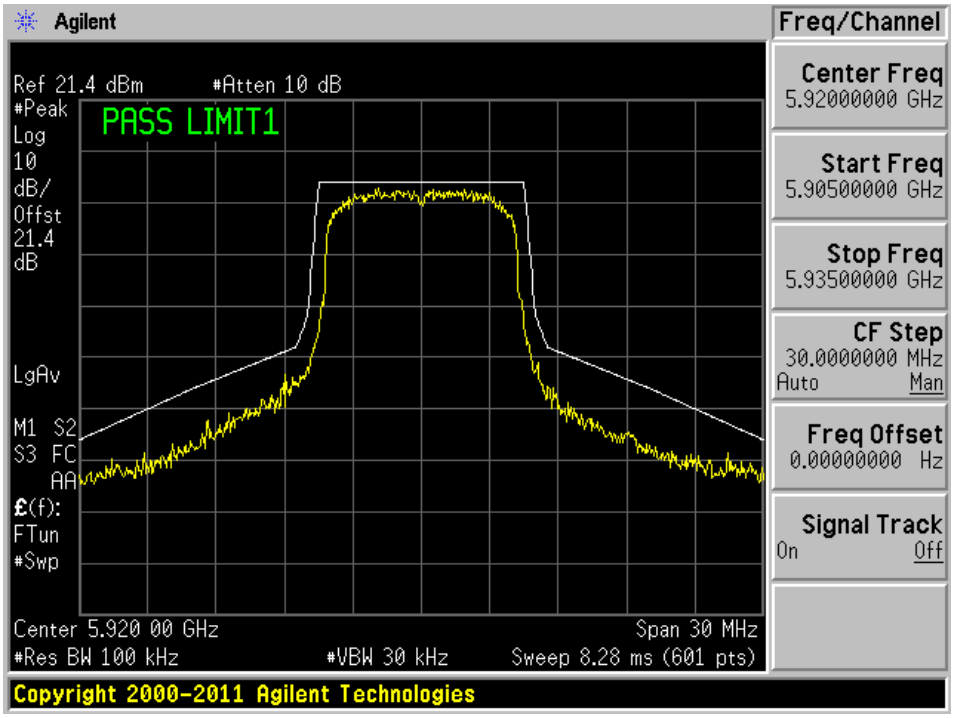
Middle Channel, 5890 MHz Chain 1



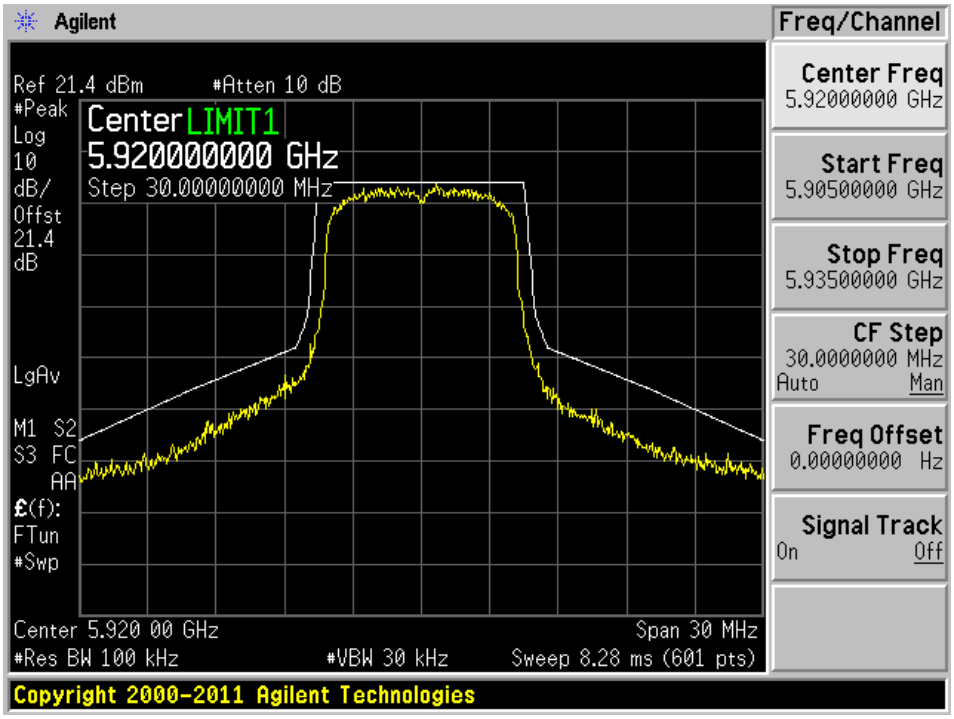
Middle Channel, 5890 MHz Chain 2



High Channel, 5920 MHz Chain 1



High Channel, 5920 MHz Chain 2



8 FCC §2.1055 & ASTM E 2213-03 §8.9.4 - Frequency Tolerance

8.1 Applicable Standards

According to FCC §2.1055 and ASTM E2213-03 8.9.4

8.2 Measurement Procedure

According to ANSI/TIA-D 2010 section 2.2.2, the carrier frequency stability is the ability of the transmitter to maintain an assigned carrier frequency.

The measurement method is as following:

- Operate the equipment in standby conditions for 15 minutes before proceeding.
- Record the carrier frequency of the transmitter as MCF MHz.
- Calculate the ppm frequency error by the following:

  Ppm error = ((MCF/ACF) - 1) * 10^6

  Where

  MCF is the Measured Carrier Frequency in MHz
  ACF is the Assigned Carrier Frequency in MHz

- The value recorded above is the carrier frequency stability.

According to RSS-Gen issue 3 Section 4.7, frequency stability is a measure of frequency drift due to temperature and supply voltage variations with reference to the frequency measurement at an appropriate reference temperature and the rated supply voltage.

Unless specified otherwise in the RSS that is applicable to the device, the reference temperature for transmitters is +20℃.

A hand-held device that is only capable of operating using internal batteries shall be tested using a new battery without any further requirement to vary the supply voltage. Alternatively, an external supply voltage can be used and set at the battery nominal voltage, and again at the battery operating end point voltage which must be specified by the equipment manufacturer.

The operating carrier frequency shall be set up in accordance with the manufacturer's published operation and instruction manual prior to the commencement of these tests. No adjustment of any frequency-determining circuit element shall be made subsequent to this initial set-up.

With the transmitter installed in an environment test chamber, the unmodulated carrier frequency shall be measured under the conditions specified below. A sufficient stabilization period at each temperature shall be used prior to each frequency measurement. The following temperatures and supply voltage ranges apply, unless specified otherwise in the applicable RSS.

(a) At temperature of -30℃, +20℃ and +50℃, and at the manufacturer's rated supply voltage; and
(b) At a temperature of +20℃ and at ±15 percent of the manufacturer's rated supply voltage.

If the frequency stability limits are only met at a different temperature range than specified in (a), the frequency stability requirement will be deemed met if the transmitter is automatically inhibited from operating outside this

different temperature range and the published equipment operating characteristics are revised to reflect this different temperature range.

If an unmodulated carrier is not available, the measurement method shall be described in the test report.

8.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Spectrum Analyzer	E4446A	US44300386	2014-09-29	1 year
Tenney	Temperature Chamber	TUJR	27445-06	2014-07-09	1 year
BK PRECISION	DC Power Supply	E3	N/A	N/A	N/A
Fluke	Digital Voltmeter	189	N/A	2014-02-05	1 Year

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

8.4 Test Environmental Conditions

Temperature:	22-26 °C
Relative Humidity:	42-46 %
ATM Pressure:	101-102 kPa

The testing was performed by Chen Ge from 2015-01-19 and 2015-01-23 at RF site.

8.5 Test Results

Reference Frequency, Middle Channel, 5890 MHz

Temperature (°C)	Voltage (V)	Measured Frequency		Limit (ppm)
		(MHz)	ppm	
-40	12	5890.033	5.60	± 10
-30	12	5890.031	5.26	± 10
-20	12	5890.057	9.68	± 10
-10	12	5890.051	8.66	± 10
0	12	5890.050	8.49	± 10
10	12	5890.044	7.47	± 10
20	10.8	5890.054	9.17	± 10
20	12	5890.038	6.45	± 10
20	13.2	5890.035	5.94	± 10
30	12	5890.043	7.30	± 10
40	12	5890.046	7.81	± 10
50	12	5890.032	5.43	± 10
60	12	5890.040	6.79	± 10
70	12	5890.037	6.28	± 10
80	12	5890.041	6.96	± 10
85	12	5890.041	6.96	± 10

Note: 1) Test is based on Chain 2, which is the worst case.
2) The Temperature range was declared by client.

9 FCC §2.1051 & ASTM E2213-03 §8.9.2 - Transmit Conducted Spurious Emissions

9.1 Applicable Standards

According to ASTM EN2213-03 8.9.2:

8.9.2.2 The transmitted spectral mask for class A, B, C, and D devices are shown in Figs. 12-15. In addition, all DSRC site installations shall limit the EIRP in the transmitted spectrum to −25 dBm or less in the 100 kHz at the channel edges and the band edges. Additional filtering that supplements the filtering provided by the transmitter may be needed for some antenna/transmitter combinations.

9.2 Measurement Procedure

The DSRC transmitted spectrum mask is relative to the device class of operation. The power in the transmitted spectrum for all DSRC devices shall be −25 dBm or less within 100 kHz outside all channel and band edges. This will be accomplished by attenuating the transmitted signal 100 kHz outside the channel and band edges by $55 + 10\log(P)$ dB, where P is the total transmitted power in watts. The transmitted spectral density of the transmitted signal for all devices shall fall within the spectral mask, as detailed in Table 10.5 The measurements shall be made using a 100 kHz resolution bandwidth and a 30 kHz video bandwidth.

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9.4 Test Environmental Conditions

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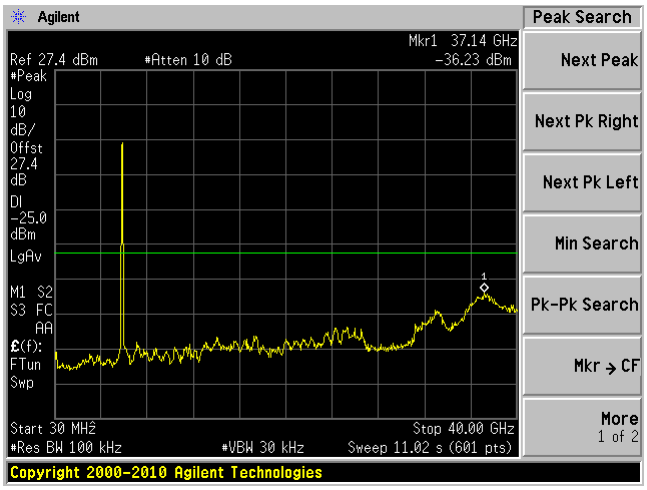
Relative Humidity:	42-46 %
ATM Pressure:	101-102 kPa

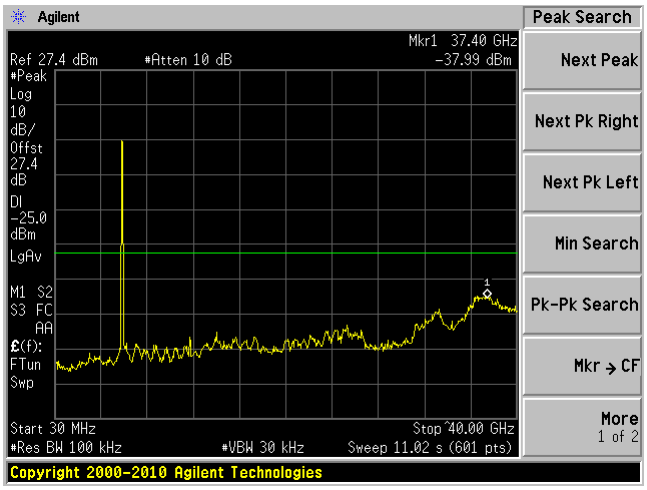
The testing was performed by Chen Ge from 2015-01-19 and 2015-01-23 at RF site.

9.5 Test Results

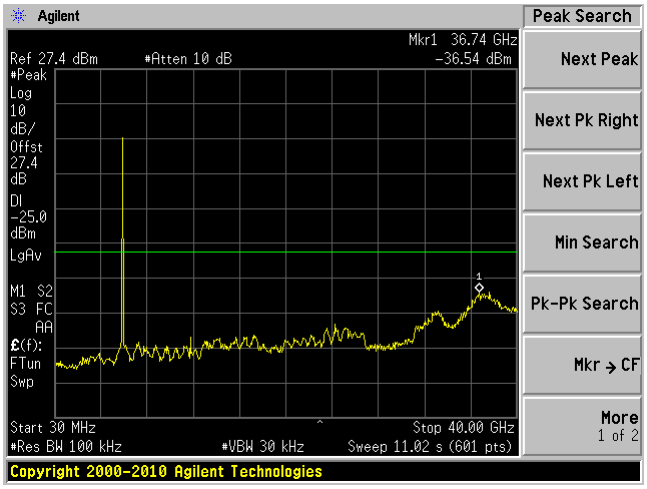
Low Channel 5860 MHz Chain 1, 30MHz – 40GHz



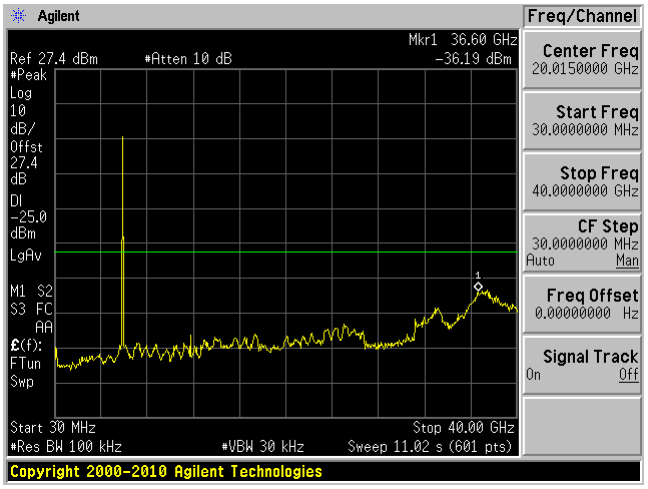
Low Channel 5860 MHz Chain 2, 30MHz – 40GHz



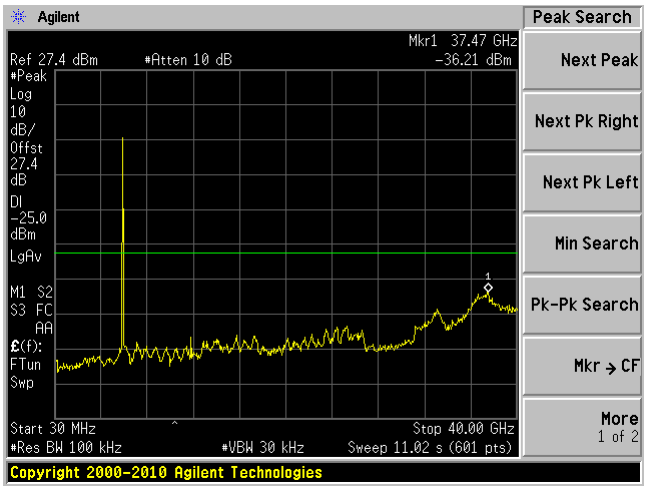
Middle Channel 5890 MHz Chain 1, 30MHz – 40GHz



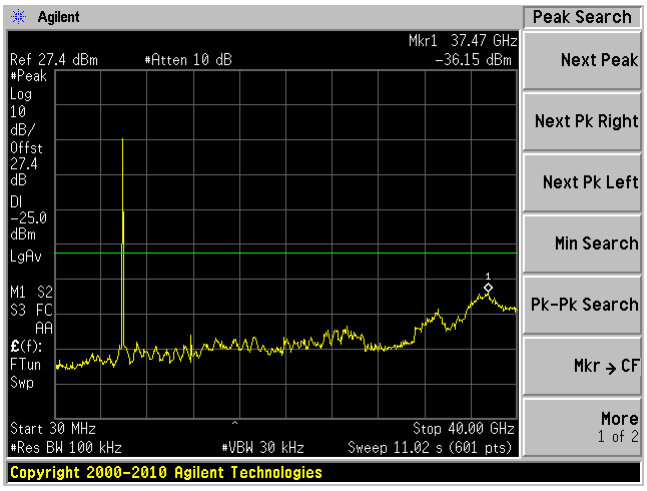
Middle Channel 5890 MHz Chain 2, 30MHz – 40GHz



High Channel 5920 MHz Chain 1, 30MHz – 40GHz



High Channel 5920 MHz Chain 2, 30MHz – 40GHz



10 FCC §2.1053 & ASTM E2213-03 §8.9.2 – Field Strength of Spurious Emissions

10.1 Applicable Standard

According to ASTM EN2213-03 8.9.2, the transmitted spectral mask for class A, B, C, and D devices are shown in Figs. 12-15. In addition, all DSRC site installations shall limit the EIRP in the transmitted spectrum to −25 dBm or less in the 100 kHz at the channel edges and the band edges. Additional filtering that supplements the filtering provided by the transmitter may be needed for some antenna/transmitter combinations.

10.2 Measurement Procedure

The DSRC transmitted spectrum mask is relative to the device class of operation. The power in the transmitted spectrum for all DSRC devices shall be −25 dBm or less within 100 kHz outside all channel and band edges. This will be accomplished by attenuating the transmitted signal 100 kHz outside the channel and band edges by $55 + 10\log(P)$ dB, where P is the total transmitted power in watts. The transmitted spectral density of the transmitted signal for all devices shall fall within the spectral mask, as detailed in Table 10.5 The measurements shall be made using a 100 kHz resolution bandwidth and a 30 kHz video bandwidth.

10.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Sunol Science Corp	System Controller	SC99V	122303-1	N/R	N/R
Sunol Science Corp	Combination Antenna	JB3	A020106-3	2014-06-18	1 year
Hewlett Packard	Pre-amplifier	8447D	2944A06639	2014-06-09	1 year
Mini-Circuits	Pre-amplifier	ZVA-183-S	570400946	2014-05-09	1 year
Agilent	Spectrum Analyzer	E4446A	US44300386	2014-09-29	1 year
EMCO	Horn Antenna	3315	9511-4627	2014-10-17	1 year
Eaton	Antenna, Horn	96001	2617	2014-11-18	1 year
Com-Power	Antenna, Dipole	AD-100	2229	2014-08-26	2 year
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	2014-03-28	1 year

Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

10.4 Test Environmental Conditions

Temperature:	22-26 °C
Relative Humidity:	42-46 %
ATM Pressure:	101-102 kPa

The testing was performed by Chen Ge from 2015-01-19 and 2015-01-23 at 5 meter chamber 3.

10.5 Test Results

Low Channel Frequency: 5860 MHz

Freq. (MHz)	S.A. Amp. (dBµV)	Table Azimuth Degrees	Test Antenna		Substitution				Absolute Level (dBm)	FCC	
			Height (m)	Polar (H/ V)	S.G Freq. (MHz)	S.G Level (dBm)	Ant. Gain (dB)	Cable Loss (dB)		Limit (dBm)	Margin (dB)
198	59.32	57	100	V	198	-50.46	0	0.1	-50.56	-25	-25.56
228.1	60.02	92	100	H	228.1	-43.11	0	0.2	-43.31	-25	-18.31
142.6	55.6	114	100	V	142.6	-54.49	0	0.1	-54.59	-25	-29.59
263	56.99	109	100	H	263	-45.13	0	0.2	-45.33	-25	-20.33
2433	42.12	210	150	V	2433	-63.36	9.421	0.51	-54.449	-25	-29.449
1188	35.62	115	150	H	1188	-73.79	5.341	0.25	-68.699	-25	-43.699
8946	34.2	0	150	V	8946	-57.93	11.314	1.14	-47.756	-25	-22.756
10673	33.6	0	150	H	10673	-56.36	11.495	1.43	-46.295	-25	-21.295

Middle Channel Frequency: 5890 MHz

Freq. (MHz)	S.A. Amp. (dBµV)	Table Azimuth Degrees	Test Antenna		Substitution				Absolute Level (dBm)	FCC	
			Height (m)	Polar (H/ V)	S.G Freq. (MHz)	S.G Level (dBm)	Ant. Gain (dB)	Cable Loss (dB)		Limit (dBm)	Margin (dB)
196	60.53	196	100	V	196	-50.25	0	0.1	-50.35	-25	-25.35
229	60.96	70	100	H	229	-47.17	0	0.2	-47.37	-25	-22.37
96	54.8	306	100	V	96	-56.91	0	0.08	-56.99	-25	-31.99
265	56.61	272	100	H	265	-50.59	0	0.2	-50.79	-25	-25.79
1187	38.1	309	150	V	1187	-71.31	5.324	0.25	-66.236	-25	-41.236
1961	34.2	0	150	H	1961	-72.92	8.457	0.4	-64.863	-25	-39.863
9736	34.56	0	150	V	9736	-57.53	11.908	1.18	-46.802	-25	-21.802
10096	33.89	0	150	H	10096	-57.31	11.336	1.41	-47.384	-25	-22.384

High Channel Frequency: 5920 MHz

Freq. (MHz)	S.A. Amp. (dBµV)	Table Azimuth Degrees	Test Antenna		Substitution				Absolute Level (dBm)	FCC	
			Height (m)	Polar (H/ V)	S.G Freq. (MHz)	S.G Level (dBm)	Ant. Gain (dB)	Cable Loss (dB)		Limit (dBm)	Margin (dB)
198.9	59	59	100	V	198.9	-51.78	0	0.1	-51.88	-25	-26.88
223.2	59.37	261	100	H	223.2	-49.03	0	0.2	-49.23	-25	-24.23
325.2	40.9	73	100	V	325.2	-64.7	0	0.3	-65	-25	-40
151.4	50.82	77	100	H	151.4	-58.37	0	0.1	-58.47	-25	-33.47
1187	36.01	0	150	V	1187	-73.4	5.324	0.25	-68.326	-25	-43.326
1735	33.94	0	150	H	1735	-74.49	8.98	0.35	-65.86	-25	-40.86
10258	33.82	0	150	V	10258	-56.91	11.293	1.4	-47.017	-25	-22.017
10655	33.56	0	150	H	10655	-56.4	11.495	1.45	-46.355	-25	-21.355