FCC PART 22H

TEST AND MEASUREMENT REPORT

For

Intelibs, Inc.

1500 Stony Brook Road,

Stony Brook, NY 11794, USA

FCC ID: Z69D01T4JX4

Report Type:	Product Type:
Original Report	Radio Hub Unit

Prepared By:	Todd Moy Test Engineer
Report Number:	R1602024-22
Report Date:	2016-02-24
Reviewed By:	Simon Ma RF Lead

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1602024-22	Initial	2016-02-24

1 General Information

1.1 Product Description for Equipment under Test (EUT)

This test and measurement report was prepared on behalf of *Intelibs Inc.* and their product model: RHU, FCC ID: Z69D01T4JX4, which will henceforth be referred to as the EUT (Equipment under Test). The EUT was a radio hub unit with GPS service. The EUT operated in the uplink frequency band of 850 MHz for LTE, GSM, CDMA and WCDMA.

1.2 Mechanical Description

The EUT measured approximately 51 cm (L) x 43.5 cm (W) x 34.5 cm (H) and weighs 28.58 kg.

The test data gathered were from typical production sample, serial number: R1602024-1, assigned by BACL.

1.3 Objective

This type approval report was prepared on behalf of *Intelibs, Inc.* in accordance with Part 2, Subpart J, Part 20.21, Part 22 Subpart H, of the Federal Communication Commission's rules.

The objective was to determine compliance with FCC rules for RF output power, occupied bandwidth, spurious emissions at antenna terminal, field strength of spurious radiation and band edge.

1.4 Related Submittal(s)/Grant(s)

No Related Submittals

1.5 Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the following parts:

Part 20.21 - Signal Boosters
Part 22 Subpart H - Public Mobile Services

Applicable Standards: TIA/EIA603-D, FCC KDB 935210.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

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 ±2.0 dB for Conducted Emissions tests and ±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/EIA-603-D.
The final qualification test was performed with the EUT operating at normal mode.

2.2 EUT Exercise Software

There was no exercise software with the EUT; signal was sent through EUT using a signal generator.

2.3 Equipment Modifications

No modifications were made to the EUT.

2.4 EUT Internal Configuration

Manufacturer	Description	Model	Serial Number
Intelibs	850 MHz RHM_RFU	-	-
Intelibs	850 MHz RHM_ Duplexer Filter	-	-
Intelibs	1900 MHz RHM_RFU	-	-
Intelibs	1900 MHz RHM_ Duplexer Filter	-	-
Intelibs	GPS FEM Unit	-	-
Intelibs	RHOM (Optical Transceiver) Unit	-	-
Intelibs	GPS Controller Unit	-	-
Intelibs	RF Controller Unit	-	-
TDK-Lambda	AC/DC Converter	DPP120-24-1	-

2.5 Local Support Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers
Dell	Laptop	Latitude D600	CN-0X2034-48643-3A6-8307
Lenovo	Laptop	Lenovo G560	CB08585694

2.6 Power Supply and Line Filters

Manufacturers	Descriptions	Models	Serial Numbers
-	POE Splitter	MET-26-8024DH	158000002ASC00

2.7 Interface Ports and Cabling

Cable Description	Length (m)	From	To
RF cable	< 1	Signal Generator	Support Equipment
RF cable	< 1	EUT Output	Spectrum Analyzer
Fiber Optic Cable	1	Support Equipment	EUT Input

3 Summary of Test Results

FCC Rules	Description of Tests	Results
§2.1091	RF Exposure	Compliant
§2.1046, §22.913(a)	Output Power	Compliant
§2.1049	Occupied Bandwidth	Compliant
§2.1053, §22.917(a)	Spurious Radiated Emissions	Compliant
§2.1053, §22.917(a)	Spurious Emissions at Antenna Terminals	Compliant
§2.1053, §22.917(b)	Band Edge & Intermodulation	Compliant
§2.1055, §22.355	Frequency Stability	N/A[1]
§20.21	Out of Band Rejection	Compliant

[1] The EUT is a signal booster.

4 FCC §2.1091 - RF Exposure

4.1 Applicable Standards

According to §2.1091 (Mobile Devices) RF exposure is calculated.

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 (minute)
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

Note: 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 Test Results

MPE Calculation with a 13 dBi antenna gain

Maximum peak output power at antenna input terminal (dBm):	20.09
Maximum peak output power at antenna input terminal (mW):	102.09
Prediction distance (cm):	20
Prediction frequency (MHz):	835.42
Antenna Gain, typical (dBi):	13
Maximum Antenna Gain (numeric):	19.95
Power density at predication frequency and distance (mW/cm^2):	0.405
MPE limit for uncontrolled exposure at predication frequency (mW/cm^2):	0.56

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MPE Calculation with an 18 dBi antenna gain

Maximum peak output power at antenna input terminal (dBm):	20.09
Maximum peak output power at antenna input terminal (mW):	102.09
Prediction distance (cm):	35
Prediction frequency (MHz):	835.42
Antenna Gain, typical (dBi):	18
Maximum Antenna Gain (numeric):	63.10
Power density at predication frequency and distance (mW/cm^2):	0.418
MPE limit for uncontrolled exposure at predication frequency (mW/cm^2):	0.56

Results

The highest power density levels at 35 cm are below the MPE uncontrolled exposure limit with an 18 dBi antenna gain.

5 FCC §2.1046 & §22.913(a) - Effective Radiated Power

5.1 Applicable Standards

According to FCC §22.913 (a), the maximum effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts.

5.2 Test Procedure

Conducted:

The signal generator was connected to the support equipment and the support equipment was connected to the EUT through a fiber cable. The output of the EUT was connected to a signal generator.

5.3 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Dates	Calibration Interval
Agilent	Analyzer, Spectrum	E4446A	US44300386	2015-10-22	1 year
Rohde & Schwarz	Generator, Signal	SMIQ03	849192/0085	2014-07-15	2 year
Keysight Technologies	Vector Signal Generator	N5182B	MY51350070	2015-11-18	1 year
-	10 dB attenuator	-	-	Each Time[1]	Each Time[1]
-	SMA cable	-	C0001	Each Time[1]	Each Time[1]
-	SMA cable	-	C0002	Each Time[1]	Each Time[1]

[1]*Note: This equipment was calibrated for each test.*

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:	21-23° C
Relative Humidity:	42-48 %
ATM Pressure:	101.4-102 kPa

The testing was performed by Todd Moy 2016-02-19 in the RF Site.

5.5 Test Results

Signal Type	AGC	Input Power (dBm)	Output Power (dBm)	Gain (dB)	Output ERP (dBm)
Broadband	Off	-55.16	19.04	74.2	34.89
	On	-51.86	20.09	71.95	35.94
Narrowband	Off	-54.12	20.08	74.2	35.93
	On	-50.95	19.94	70.89	35.79

Note: ERP=Conducted Output Power (dBm) + Antenna Gain (dBi) -2.15 dB, gain of the antenna that applies to this device is 18 dBi.

ERP Limit: 500 Watts (57 dBm)

6 FCC §2.1049 - Occupied Bandwidth

6.1 Applicable Standards

Requirements: FCC §2.1049

6.2 Test Procedure

The signal generator was connected to the support equipment and the support equipment was connected to the EUT through a fiber cable. The output of the EUT was connected to a signal generator.

The resolution bandwidth of the spectrum analyzer was set to at least 1to 5% of the OBW and the 26 dB & 99% bandwidth was recorded.

6.3 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Dates	Calibration Interval
Agilent	Analyzer, Spectrum	E4446A	US44300386	2015-10-22	1 year
Rohde & Schwarz	Generator, Signal	SMIQ03	849192/0085	2014-07-15	2 year
Keysight Technologies	Vector Signal Generator	N5182B	MY51350070	2015-11-18	1 year
-	10 dB attenuator	-	-	Each Time[1]	Each Time[1]
-	SMA cable	-	C0001	Each Time[1]	Each Time[1]
-	SMA cable	-	C0002	Each Time[1]	Each Time[1]

[1]*Note: This equipment was calibrated for each test.*

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:	21-23° C
Relative Humidity:	42-48 %
ATM Pressure:	101.4-102 kPa

The testing was performed by Todd Moy 2016-02-19 in the RF Site.

6.5 Test Results

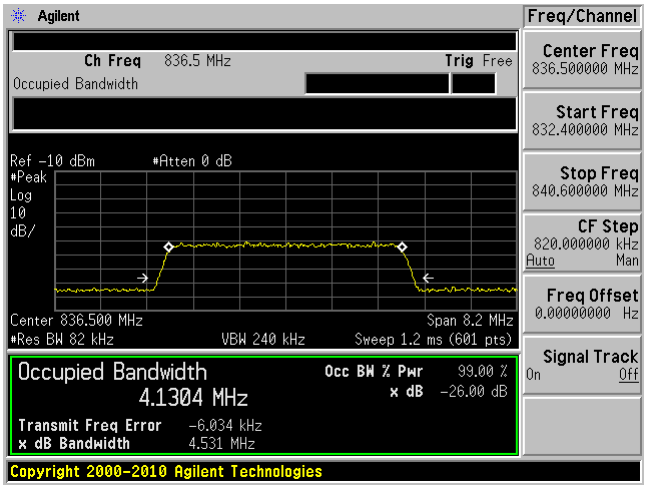
Please refer to the following table and plots.

Signal Type	AGC	Input		Output	
		99 % OBW (kHz)	26 dB OBW (kHz)	99 % OBW (kHz)	26 dB OBW (kHz)
Broadband	off	4130.4	4531	4104.5	4509
	on	4130.4	4531	4093.8	4499
Narrowband	off	240.36	319.48	241.86	317.88
	on	240.36	319.48	240.26	315.58

Broadband Signal

AGC off

Input



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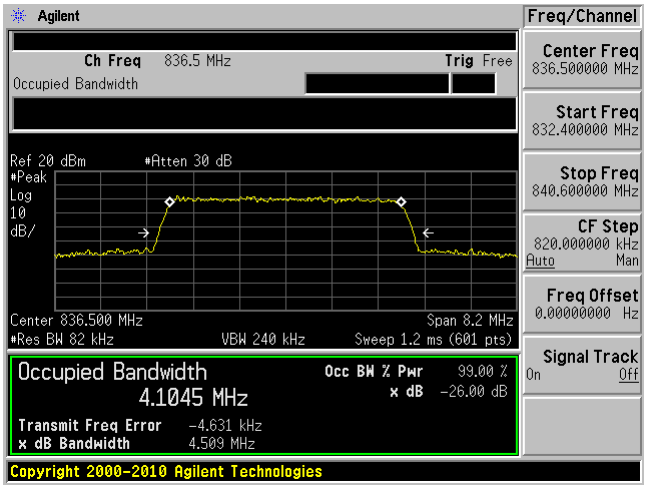
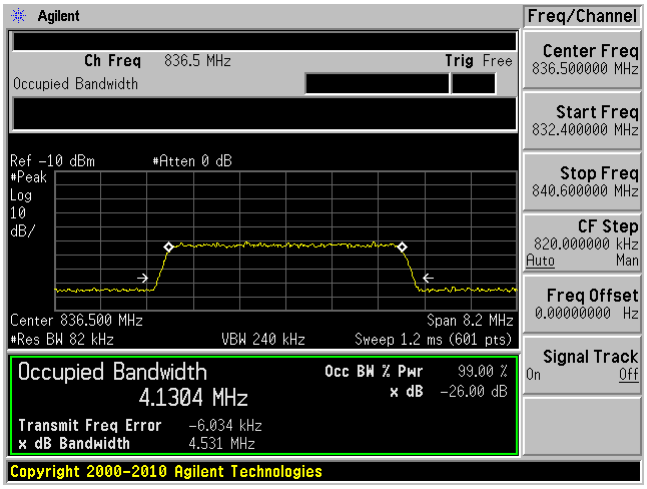
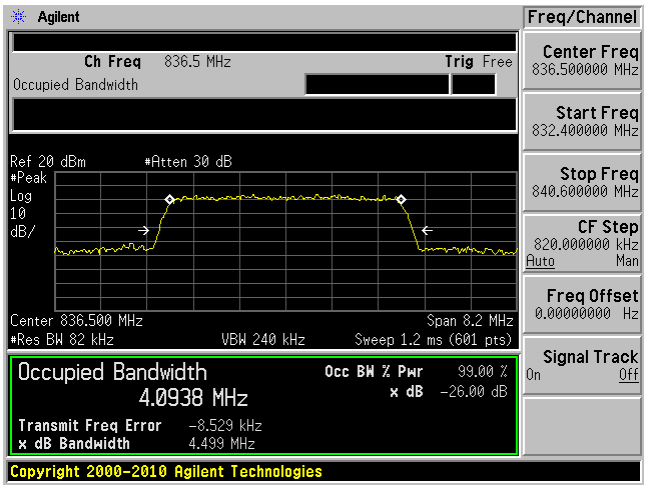


AGC on

Input



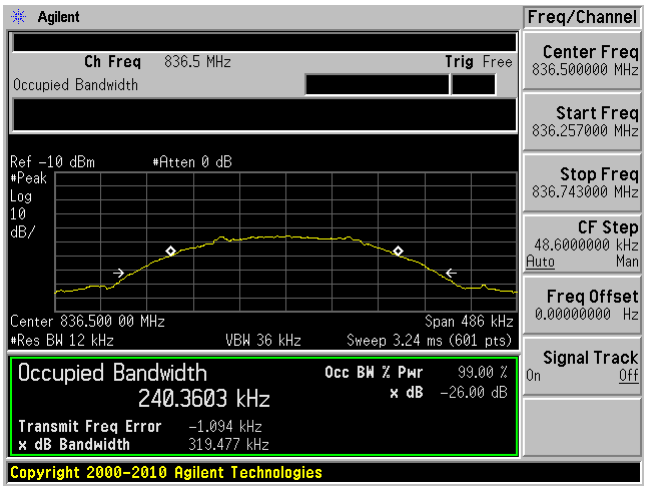
Output



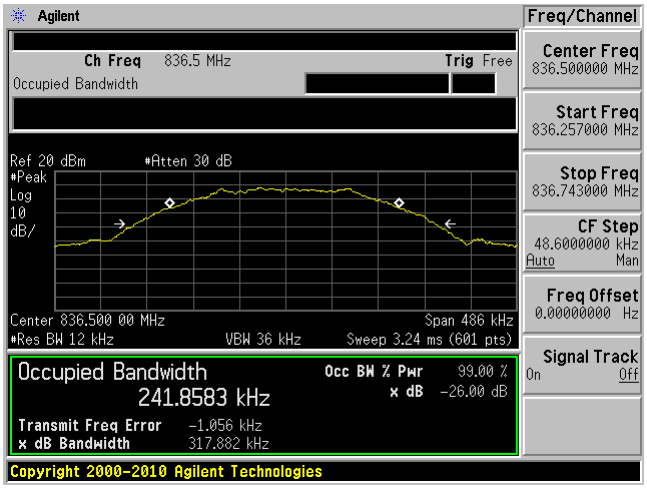
Narrowband Signal

AGC off

Input

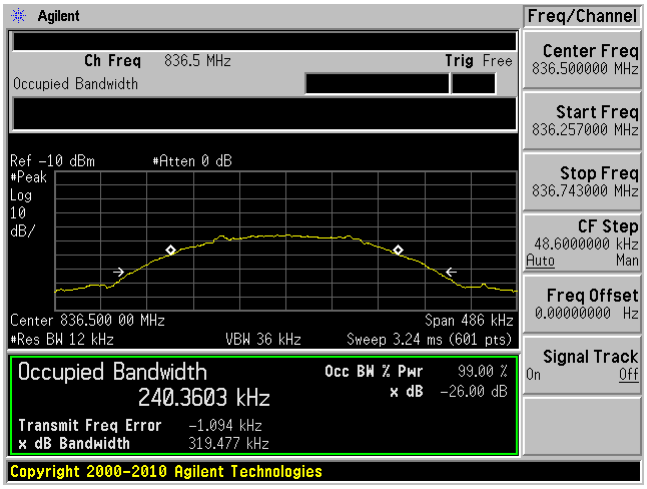


Output

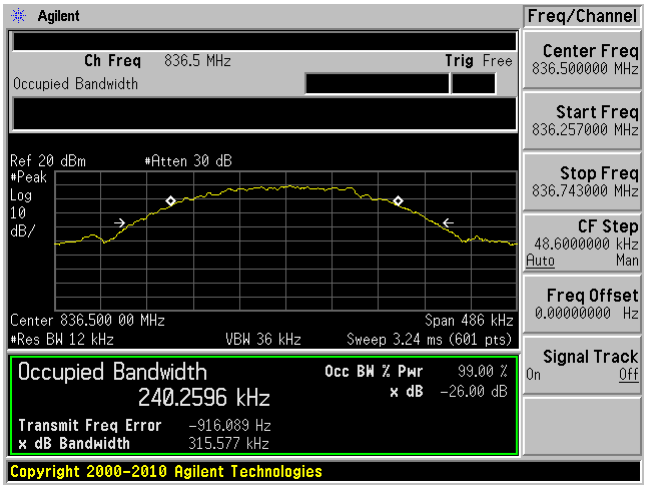


AGC on

Input



Output



7 FCC §2.1053 & §22.917(a) - Spurious Radiated Emissions

7.1 Applicable Standards

According to FCC §22.917 the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

7.2 Test Procedure

The transmitter was placed on the turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = 10 log (TX Power in Watts/0.001) – the absolute level
Spurious attenuation limit in dB = 43 + 10 Log_{10} (power out in Watts)

7.3 Test Equipment List and Details

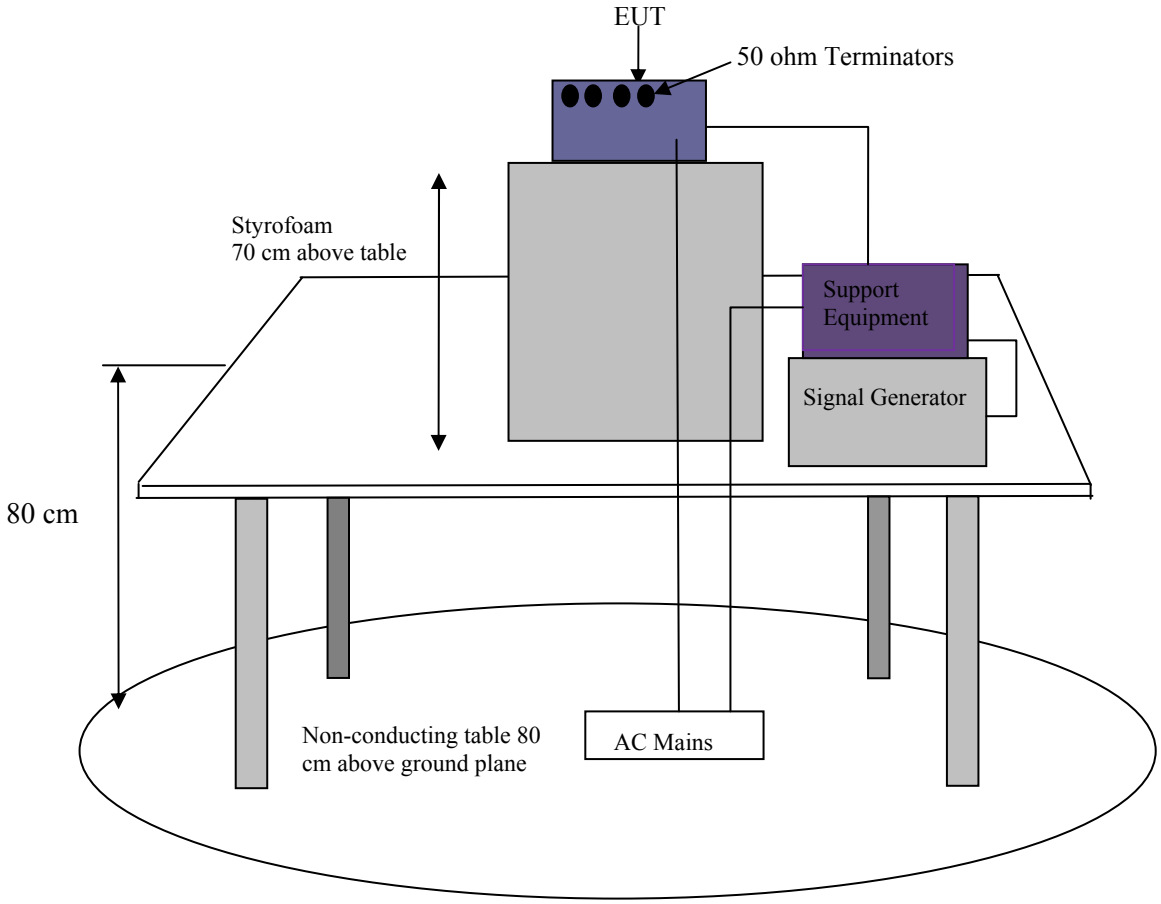
Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Analyzer, Spectrum	E4440A	MY44303352	2015-06-22	1 year
Sunol Science Corp	System Controller	SC99V	122303-1	N/R	N/R
Sunol Sciences	Antenna, Biconi-Log	JB3	A020106-2	2015-07-11	2 Years
Agilent	Amplifier, Pre	8447D	2944A10187	2015-03-20	1 year
HP/ Agilant	Pre Amplifier	8449B OPT HO2	3008A0113	2015-05-19	1year
EMCO	Antenna, Horn	3115	9511-4627	2016-01-28	2 years
A.R.A.	Antenna, Horn	DRG-118/A	1132	2015-09-21	2 year
Agilent	Generator, Signal	E4438C	MY45091309	2015-08-21	1 year
COM-POWER	Antenna, Dipole	AD-100	721033DB1/2/3/4	2014-11-03	2 year
-	SMA cable	-	C0001	Each Time[1]	Each Time[1]
-	SMA cable	-	C0002	Each Time[1]	Each Time[1]

[1]*Note: This equipment was calibrated for each test.*

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

7.4 Test Setup Block Diagram

Radiated Emissions Testing



7.5 Test Environmental Conditions

Temperature:	20-21°C
Relative Humidity:	47-49 %
ATM Pressure:	101.4-101.6 kPa

The testing was performed by Jason Qian on 2016-02-22 in 5 Meter Chamber 3.

7.6 Test Results

Carrier Wave Signal

Indicated		Azimuth (degree)	Test Antenna		Substituted					Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polarity (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain Correction (dB)	Cable Loss (dB)	Absolute Level (dBm)		
Low Channel 824.2 MHz											
97.9	64.72	220	200	H	97.9	-40.42	0	0.2	-40.62	-13	-27.62
97.9	60.32	220	100	V	97.9	-43.53	0	0.2	-43.73	-13	-30.73
198.1	56.3	190	260	H	198.1	-49.07	0	0.2	-49.27	-13	-36.27
198.1	51.37	190	220	V	198.1	-51.73	0	0.2	-51.93	-13	-38.93
1648.4	47.22	0	100	H	1648.4	-62.23	8.893	0.8	-54.137	-13	-41.137
1648.4	48.3	0	100	V	1648.4	-60.97	8.893	0.8	-52.877	-13	-39.877
2472.6	45.7	0	100	H	2472.6	-59.42	9.631	1	-50.789	-13	-37.789
2472.6	46.22	0	100	V	2472.6	-58.37	9.631	1	-49.739	-13	-36.739

Indicated		Azimuth (degree)	Test Antenna		Substituted					Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polarity (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain Correction (dB)	Cable Loss (dB)	Absolute Level (dBm)		
Middle Channel 836.5 MHz											
97.9	64.79	200	250	H	97.9	-40.35	0	0.2	-40.55	-13	-27.55
97.9	58.59	210	280	V	97.9	-45.26	0	0.2	-45.46	-13	-32.46
198.1	56.54	195	260	H	198.1	-48.83	0	0.2	-49.03	-13	-36.03
198.1	53.54	200	100	V	198.1	-49.56	0	0.2	-49.76	-13	-36.76
1673	47.4	0	100	H	1673	-62.05	8.893	0.8	-53.957	-13	-40.957
1673	47.1	0	100	V	1673	-62.17	8.893	0.8	-54.077	-13	-41.077
2509.5	46.68	0	100	H	2509.5	-58.44	9.631	1	-49.809	-13	-36.809
2509.5	46.49	0	100	V	2509.5	-58.1	9.631	1	-49.469	-13	-36.469

Indicated		Azimuth (degree)	Test Antenna		Substituted					Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Amp. (dBuV)		Height (cm)	Polarity (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain Correction (dB)	Cable Loss (dB)	Absolute Level (dBm)		
High Channel 848.8 MHz											
97.9	64.94	220	250	H	97.9	-40.2	0	0.2	-40.4	-13	-27.4
97.9	60.49	200	100	V	97.9	-43.36	0	0.2	-43.56	-13	-30.56
198.1	56.42	180	255	H	198.1	-48.95	0	0.2	-49.15	-13	-36.15
198.1	53.42	175	195	V	198.1	-49.68	0	0.2	-49.88	-13	-36.88
1697.6	46.8	0	100	H	1697.6	-62.65	8.893	0.8	-54.557	-13	-41.557
1697.6	47.55	0	100	V	1697.6	-61.72	8.893	0.8	-53.627	-13	-40.627
2546.4	46.06	0	100	H	2546.4	-59.06	9.631	1	-50.429	-13	-37.429
2546.4	46.29	0	100	V	2546.4	-58.3	9.631	1	-49.669	-13	-36.669

8 FCC §2.1051 & §22.917(a) - Spurious Emissions at Antenna Terminals

8.1 Applicable Standards

According to FCC §22.917 the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

8.2 Test Procedure

The signal generator was connected to the support equipment and the support equipment was connected to the EUT through a fiber cable. The output of the EUT was connected to a signal generator.

The resolution bandwidth of the spectrum analyzer was set at 100 kHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

8.3 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Dates	Calibration Interval
Agilent	Analyzer, Spectrum	E4446A	US44300386	2015-10-22	1 year
Rohde & Schwarz	Generator, Signal	SMIQ03	849192/0085	2014-07-15	2 year
Keysight Technologies	Vector Signal Generator	N5182B	MY51350070	2015-11-18	1 year
-	10 dB attenuator	-	-	Each Time[1]	Each Time[1]
-	SMA cable	-	C0001	Each Time[1]	Each Time[1]
-	SMA cable	-	C0002	Each Time[1]	Each Time[1]

[1]*Note: This equipment was calibrated for each test.*

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

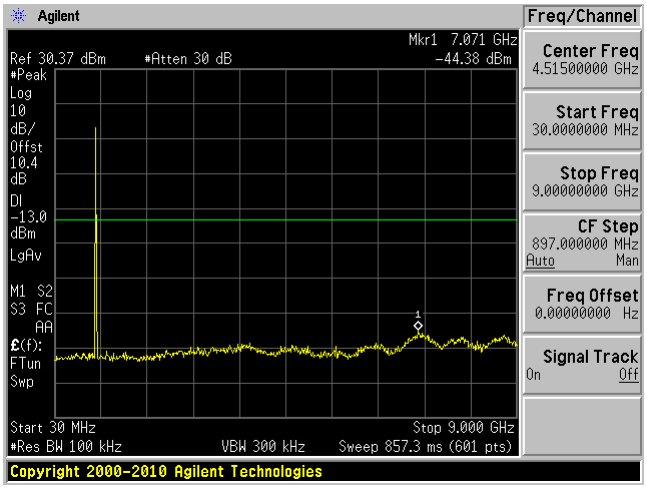
Temperature:	21-23° C
Relative Humidity:	42-48 %
ATM Pressure:	101.4-102 kPa

The testing was performed by Todd Moy 2016-02-19 in the RF Site.

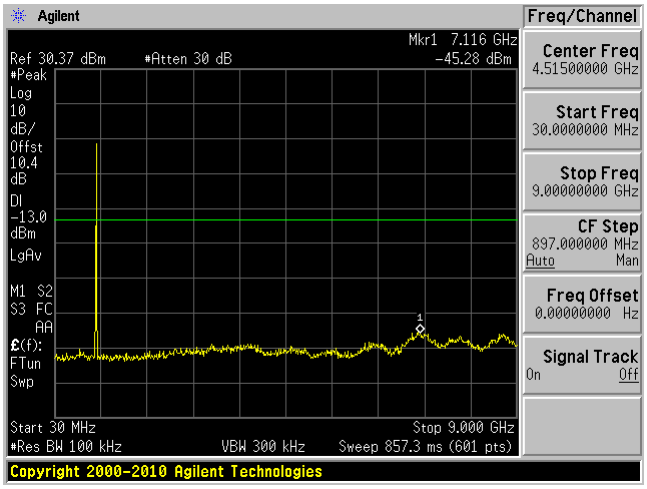
Broadband Signal

AGC Off

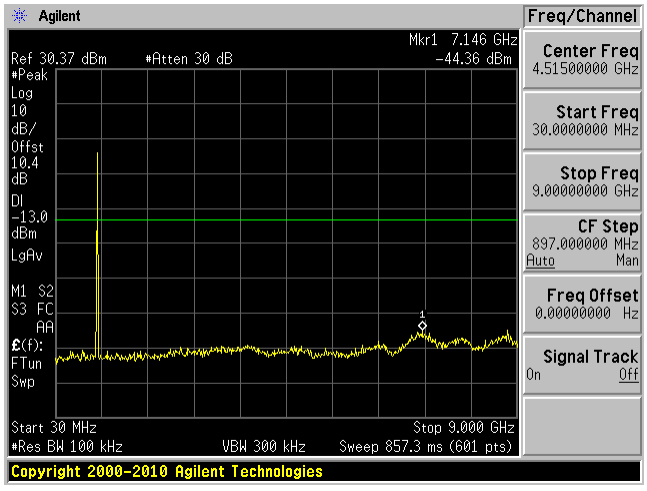
Low Channel: 826.5 MHz



Middle Channel: 836.5 MHz

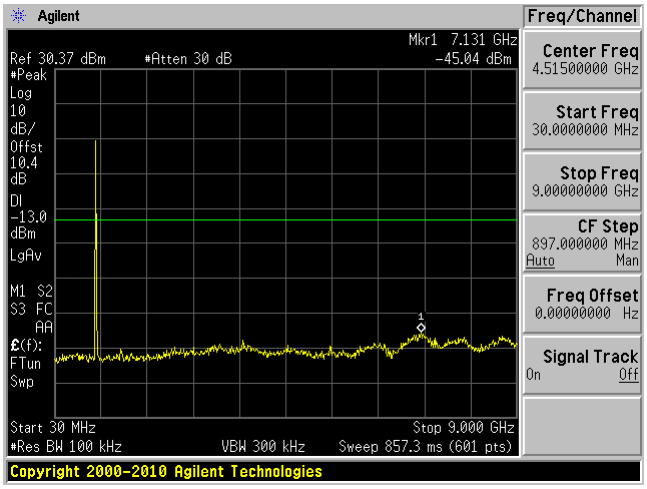


High Channel: 846.5 MHz

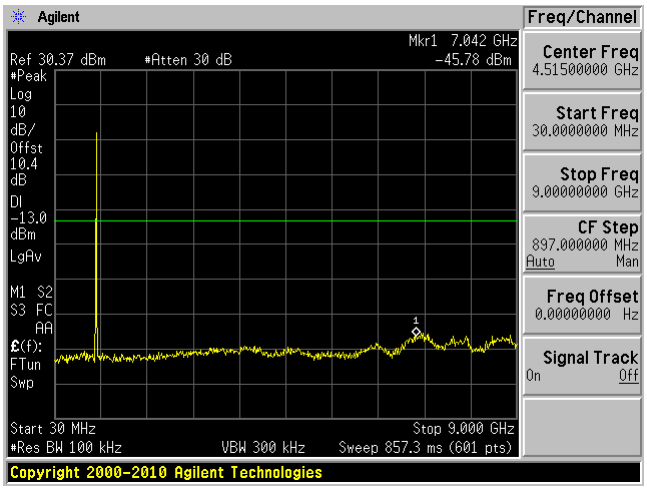


AGC On

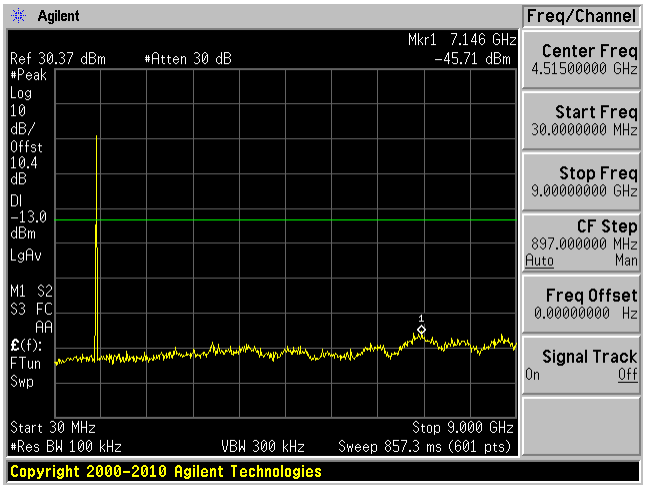
Low Channel: 826.5 MHz



Middle Channel: 836.5 MHz



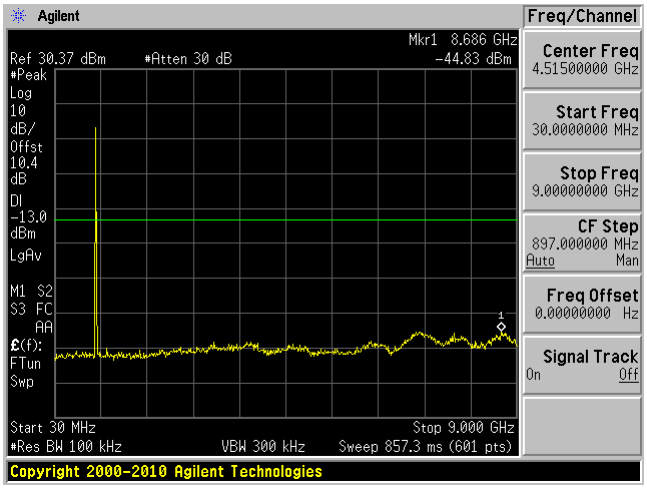
High Channel: 846.5 MHz



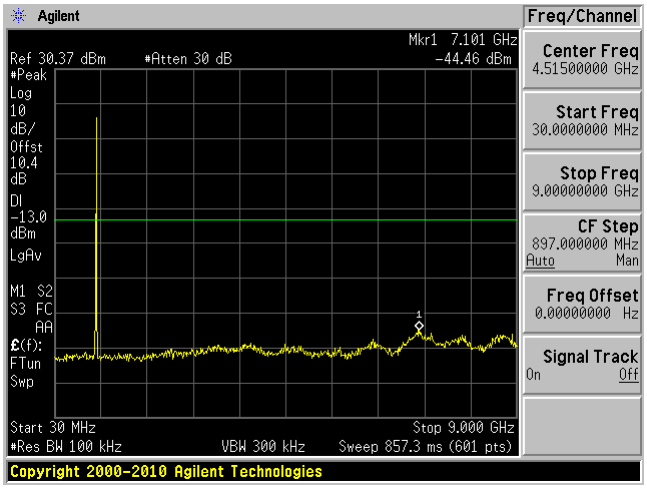
Narrowband signal

AGC Off

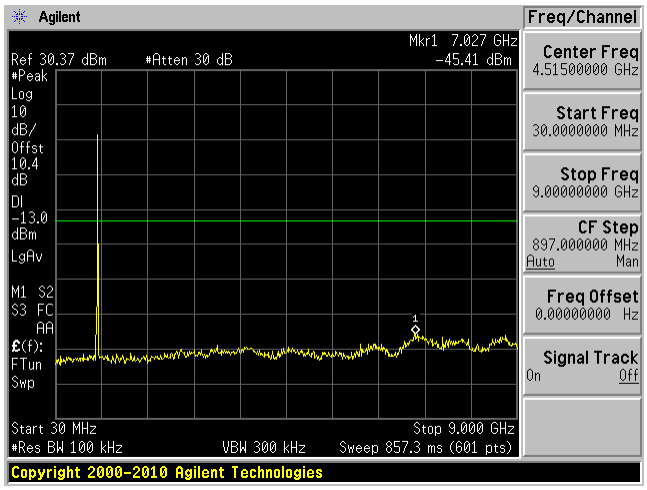
Low Channel: 824.2 MHz



Middle Channel: 836.5 MHz

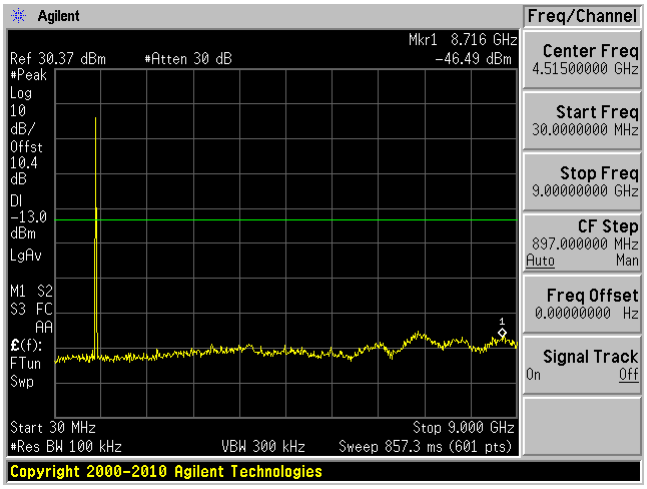


High Channel: 848.8 MHz

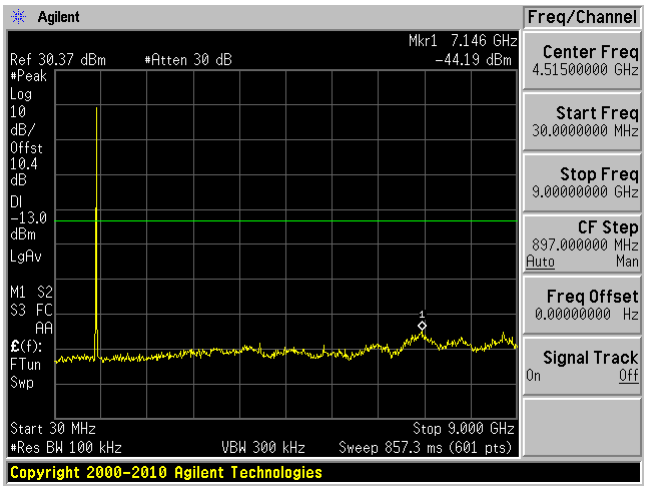


AGC On

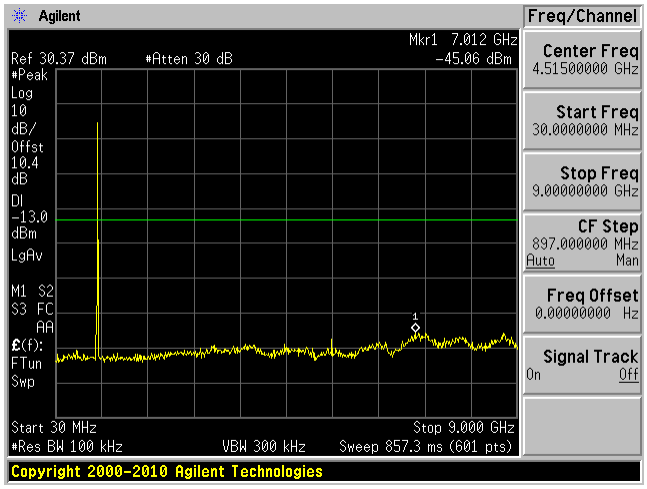
Low Channel: 824.2 MHz



Middle Channel: 836.5 MHz



High Channel: 849.8 MHz



9 FCC §22.917(a) (b) - Band Edge & Intermodulation

9.1 Applicable Standards

According to FCC §22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

9.2 Test Procedure

The signal generator was connected to the support equipment and the support equipment was connected to the EUT through a fiber cable. The output of the EUT was connected to a signal generator.

The center of the spectrum analyzer was set according to center frequency of the EUT to be transmitted and resolution bandwidth was set to at least 100 kHz or 1% of the emission bandwidth.

9.3 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Dates	Calibration Interval
Agilent	Analyzer, Spectrum	E4446A	US44300386	2015-10-22	1 year
Rohde & Schwarz	Generator, Signal	SMIQ03	849192/0085	2014-07-15	2 year
Keysight Technologies	Vector Signal Generator	N5182B	MY51350070	2015-11-18	1 year
-	10 dB attenuator	-	-	Each Time[1]	Each Time[1]
-	SMA cable	-	C0001	Each Time[1]	Each Time[1]
-	SMA cable	-	C0002	Each Time[1]	Each Time[1]

[1]*Note: This equipment was calibrated for each test.*

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

9.4 Test Environmental Conditions

Temperature:	21-23° C
Relative Humidity:	42-48 %
ATM Pressure:	101.4-102 kPa

The testing was performed by Todd Moy 2016-02-19 in the RF Site.

9.5 Test Results

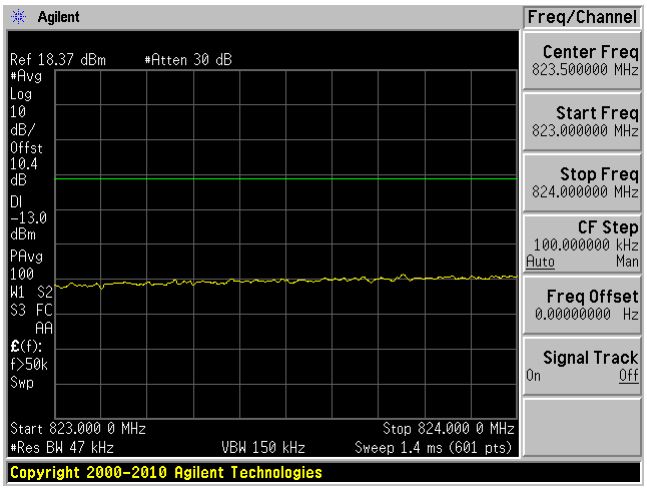
Please refer to the following plots.

Band Edge

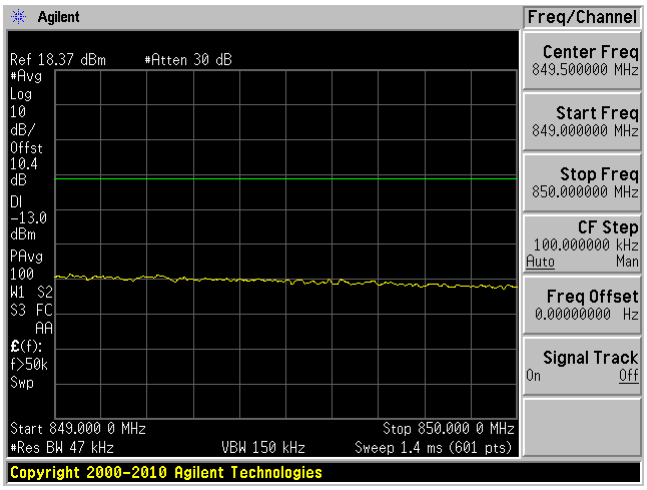
Broadband Signal

AGC off

Lower Band Edge

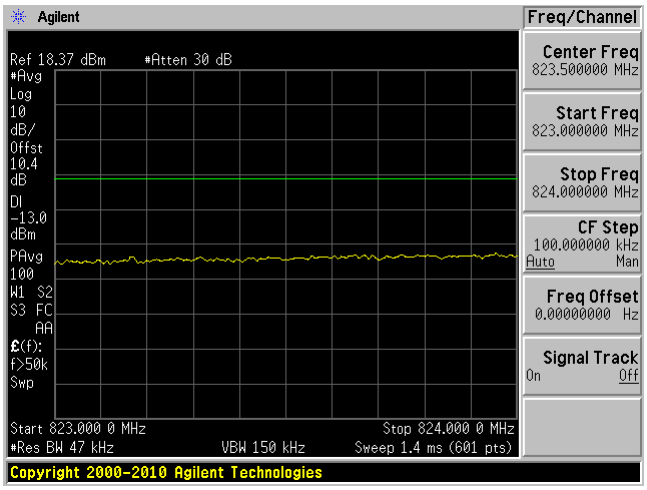


Upper Band Edge

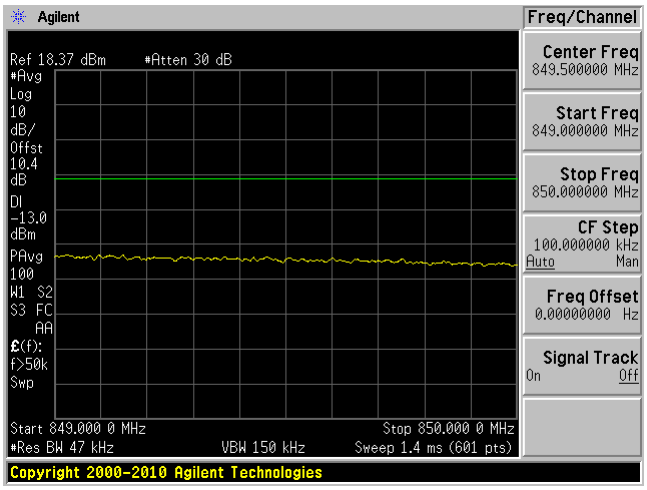


AGC on

Lower Band Edge



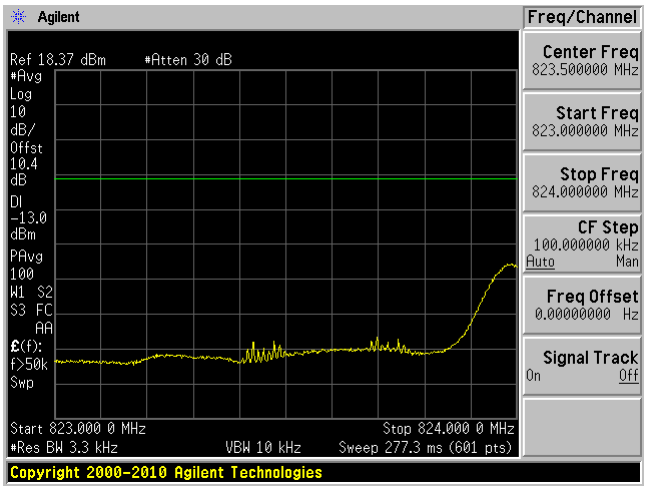
Upper Band Edge



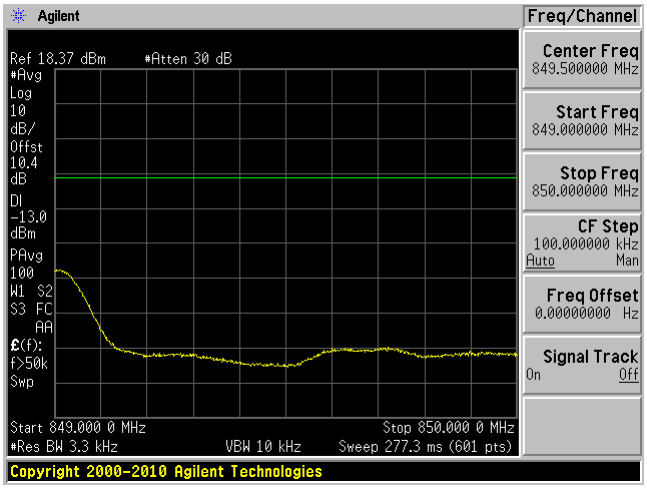
Narrowband Signal

AGC off

Lower Band Edge

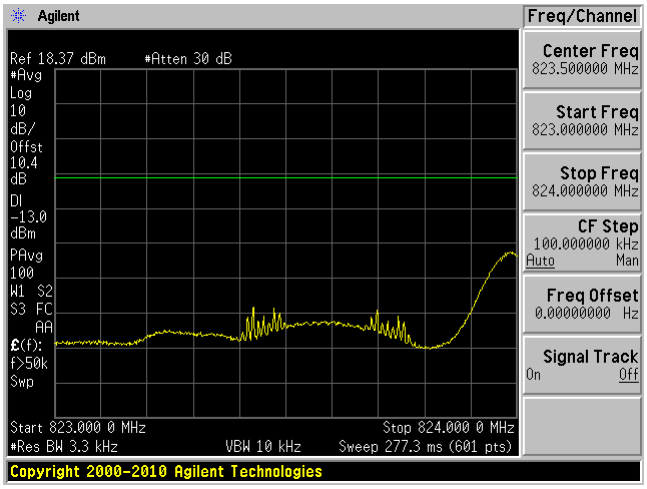


Upper Band Edge

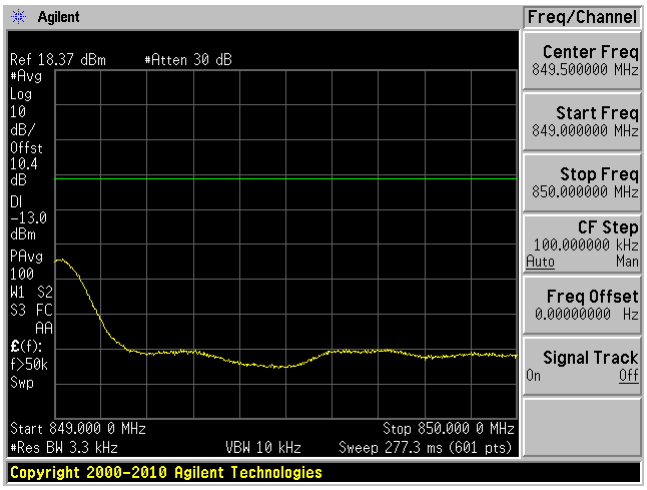


AGC on

Lower Band Edge



Upper Band Edge

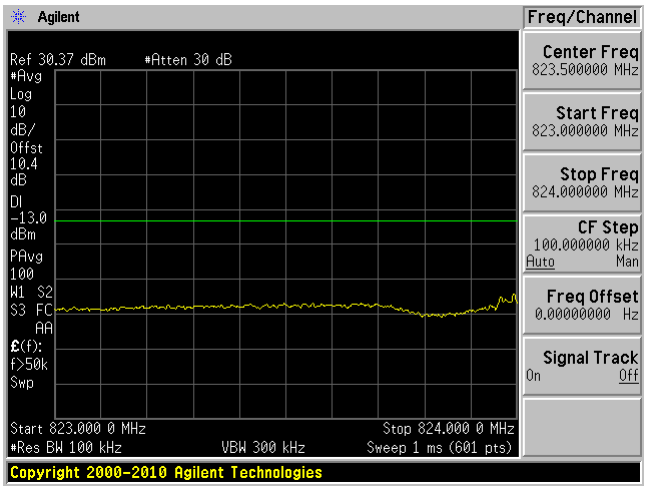


Intermodulation

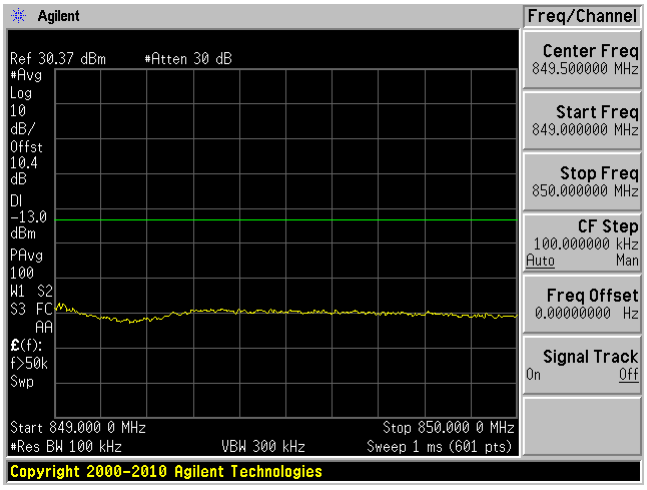
Broadband Signal

AGC off

Low Channel

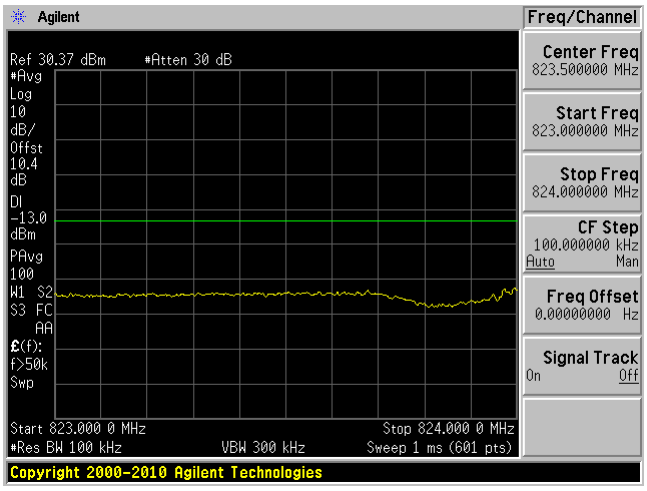


High Channel

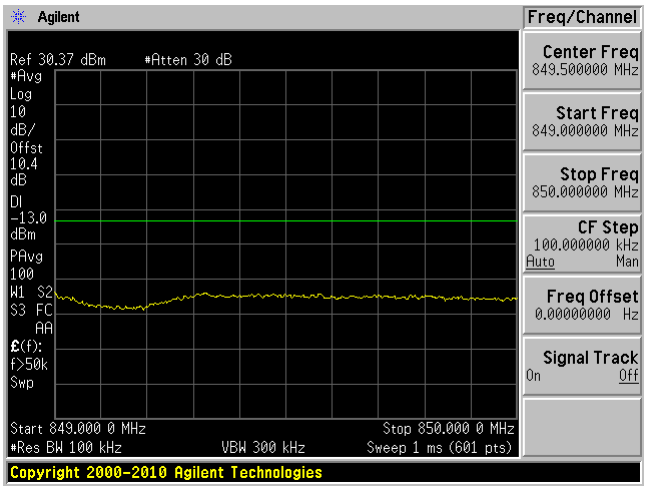


AGC on

Low Channel



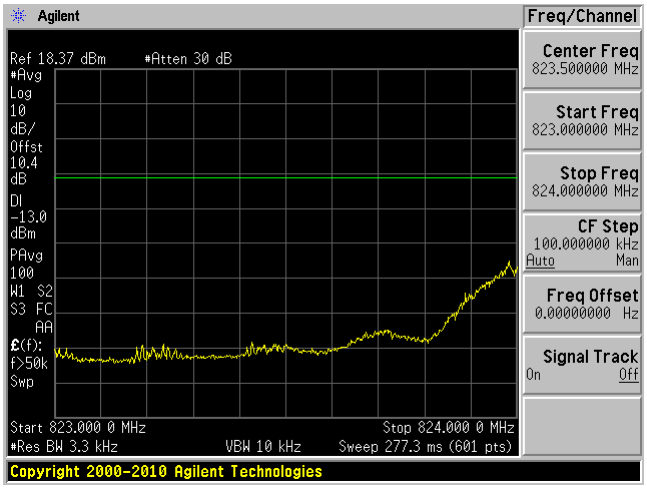
High Channel



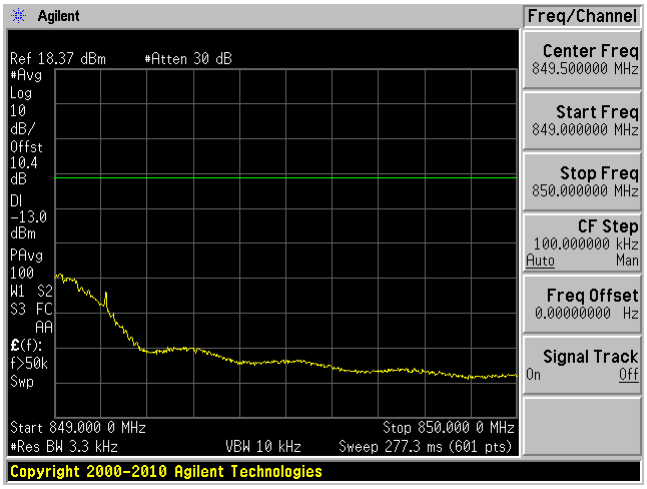
Narrowband Signal

AGC off

Low Channel

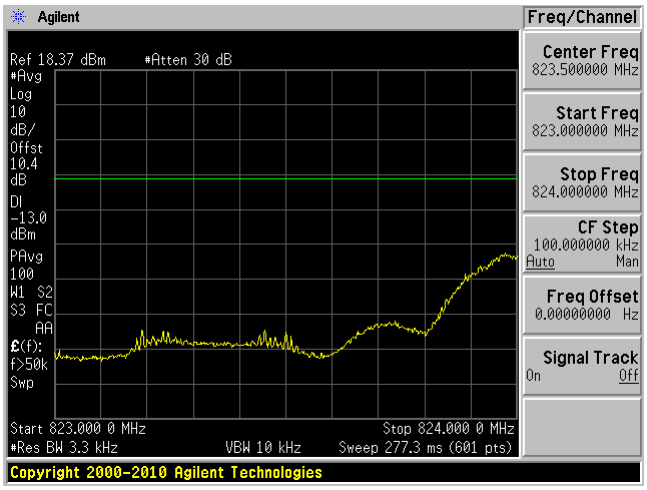


High Channel

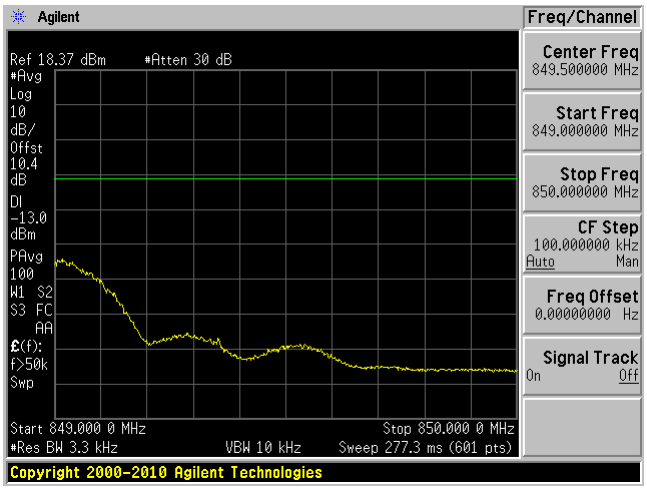


AGC on

Low Channel



High Channel



10 FCC §20.21 - Out of Band Rejection

10.1 Applicable Standard

According to FCC Part 20.21, a frequency selective booster shall have −20 dB at the band edge referenced to the gain in the center of the pass band of the booster, where band edge is the end of the licensee's allocated spectrum.

10.2 Test Procedure

KDB 935210 D05, Section 3.3.

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The span of the spectrum analyzer was set to be wide enough in order to capture the spectrum of entire operating band.

10.3 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Dates	Calibration Interval
Agilent	Analyzer, Spectrum	E4446A	US44300386	2015-10-22	1 year
Rohde & Schwarz	Generator, Signal	SMIQ03	849192/0085	2014-07-15	2 year
Keysight Technologies	Vector Signal Generator	N5182B	MY51350070	2015-11-18	1 year
-	SMA cable	-	C0001	Each Time[1]	Each Time[1]
-	SMA cable	-	C0002	Each Time[1]	Each Time[1]

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:	21-23° C
Relative Humidity:	42-48 %
ATM Pressure:	101.4-102 kPa

The testing was performed by Todd Moy 2016-02-19 in the RF Site.

10.5 Test Results

Please refer to the following plot,

824 – 849 MHz