

FCC PART 27

MEASUREMENT AND TEST REPORT

For

Baicells Technologies Co., Ltd.

3F, Hui Yuan Development Building, No.1 Shangdi Information Industry Base, Haidian Dist.,
Beijing, China

FCC ID: 2AG32BRU3510

Report Type: Original Report	Product Type: LTE-TDD Base Station
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Report Number: RSZ160517009-00B	
Report Date: 2016-06-27	
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Note: This test report is prepared for the customer shown above and for the equipment described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Baicells Technologies Co., Ltd.*'s product, model number: *BRU3510(FCC ID: 2AG32BRU3510)* or the "EUT" in this report was a *LTE-TDD Base Station*, which was measured approximately: 465 mm (L) × 390 mm (W) × 120 mm (H), rated with input voltage: rated with input voltage: -48V DC.

**All measurement and test data in this report was gathered from production sample serial number: 1602292 (Assigned by Shenzhen BACL).The EUT supplied by the applicant was received on 2016-05-17.*

Objective

This type approval report is prepared on behalf of *Baicells Technologies Co., Ltd.* in accordance with Part 27 of the Federal Communication Commission's rules.

The objective is to determine the compliance of EUT with FCC rules for output power, modulation characteristic, occupied bandwidth, and spurious emission at antenna terminal, spurious radiated emission, frequency stability, and band edge.

Related Submittal(s)/Grant(s)

N/A

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 27 – Miscellaneous wireless communications services

Applicable Standards: TIA/EIA 603-D.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement uncertainty with radiated emission is 5.81 dB for 30MHz-1GHz.and 4.88 dB for above 1GHz, 1.95dB for conducted measurement.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp.(Shenzhen) to collect test data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on October 31, 2103. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

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.

Equipment Modifications

No modifications were made to the EUT.

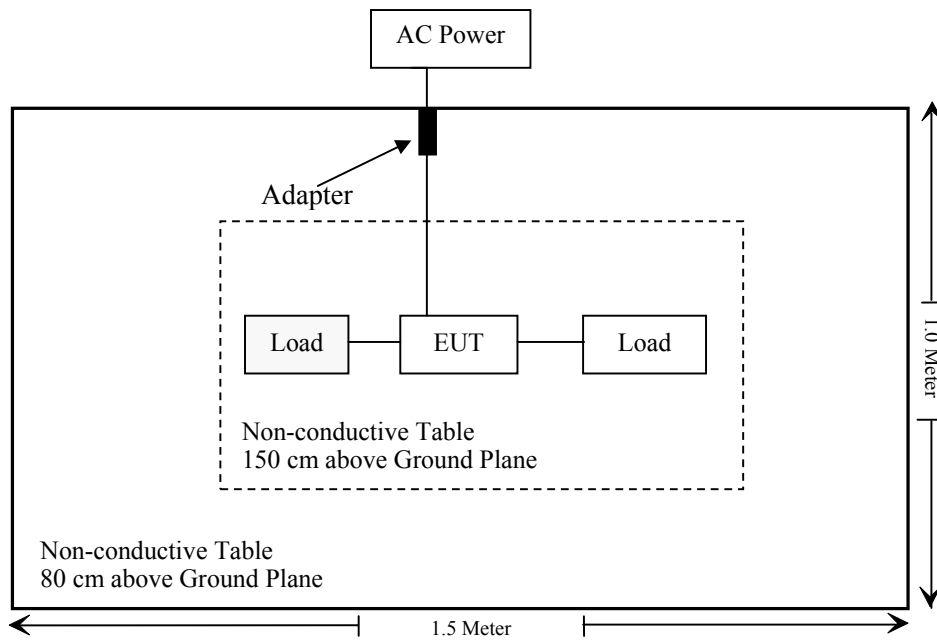
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
N/A	Load	N/A	N/A

External I/O Cable

Cable Description	Length (m)	From/Port	To
Un-shielding Un-detachable DC Power Cable	1.4	Adapter	EUT
Un-shielding Detachable AC Power Cable	1.8	AC Power	Adapter

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 2.1091&§27.52	Maximum Permissible exposure (MPE)	Compliance
§ 27.50(h) (4)	Spectral Power Density	Not Applicable
§27.50(h)	RF Output Power	Compliance
§ 2.1047	Modulation Characteristics	Not Applicable
§2.1049 &§27	Occupied Bandwidth	Compliance
§27.53(m) (2)	Spurious Emissions at Antenna Terminal	Compliance
§27.53 (m) (2)	Spurious Radiated Emissions	Compliance
§27.53 (m) (2)	Band Edge	Compliance
§27.54&§2.1055	Frequency stability	Compliance

FCC §1.1307 & §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247 (i) and subpart 1.1307 (b)(1), 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

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)
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

Result

Calculated Formulary:

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

For worst case:

Test Band	Frequency (MHz)	Tune-up power		Antenna Gain	Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBm)	(mW)				
TDD Band 41	2496-2690	43.0	19953	17	400	0.5	1.0

The Maximum Gain is 17.0 dBi

Note: To maintain compliance with the FCC’s RF exposure guidelines, place the equipment at least 400cm from nearby persons.

Result: Compliance

FCC §2.1047 - MODULATION CHARACTERISTIC

According to FCC § 2.1047(d) , Part 27 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

FCC § 27.50(h) - RF OUTPUT POWER

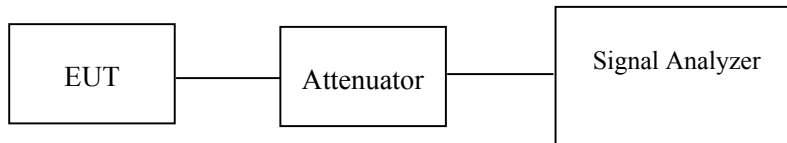
Applicable Standards

According to §27.50(h).

Test Procedure

Conducted method:

The RF output of the transmitter was connected to the Signal Analyzer through sufficient attenuation.



Radiated method:

TIA603-D section 2.2.17

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2015-12-11	2016-12-11
Ducommun technologies	RF Cable	RG-214	4	2015-06-15	2016-06-15
JFW	30dB Attenuator	50FH-030-100 RF	170006716507	2015-06-12	2016-06-12

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data**Environmental Conditions**

Temperature:	24 °C
Relative Humidity:	50 %
ATM Pressure:	101.0kPa

The testing was performed by Rocky Kang on 2016-06-01.

For QPSK:

Frequency (MHz)	Power (dBm)		Total power (dBm)	Antenna Gain (dBi)	Total EIRP (dBm)	Limit (dBm)	Margin (dB)
	Antenna 1	Antenna 2					
10 MHz Bandwidth							
2501	39.25	39.33	42.30	17	59.30	65.13	5.83
2593	38.77	39.55	42.19	17	59.19	64.75	5.56
2685	39.03	39.14	42.10	17	59.10	65.13	6.03
20MHz Bandwidth							
2506	39.37	39.26	42.33	17	59.33	68.14	8.81
2593	39.45	39.60	42.54	17	59.54	67.76	8.22
2680	39.16	38.88	42.03	17	59.03	68.14	9.11

For 64QAM:

Frequency (MHz)	Power (dBm)		Total power (dBm)	Antenna Gain (dBi)	Total EIRP (dBm)	Limit (dBm)	Margin (dB)
	Antenna 1	Antenna 2					
10 MHz Bandwidth							
2501	38.61	39.21	41.93	17	58.93	65.13	6.20
2593	39.03	39.14	42.10	17	59.10	64.75	5.65
2685	39.16	38.76	41.97	17	58.97	65.13	6.16
20MHz Bandwidth							
2506	39.63	39.28	42.47	17	59.47	68.14	8.67
2593	39.27	39.04	42.17	17	59.17	67.76	8.59
2680	38.87	39.08	41.99	17	58.99	68.14	9.15

Note:

1. $EIRP = 33 \text{ dBW} + 10 \log(X/Y) \text{ dBW} + 10 \log(360/\text{beamwidth}) \text{ dBW}$, where X is the actual channel width in MHz, Y is MBS (6MHz) or LBS & UBS (5.5MHz).
2. Lower Band Segment (LBS). Segment of the BRS/EBS band consisting of channels in the frequencies 2496-2572 MHz.
3. Middle Band Segment (MBS). Segment of the BRS/EBS band consisting of channels in the frequencies 2572-2614 MHz.
4. Upper Band Segment (UBS). Segment of the BRS/EBS band consisting of channels in the frequencies 2614-2690 MHz.
5. Beamwidth at 360 is the worst case.

FCC §2.1049&27.53- OCCUPIED BANDWIDTH

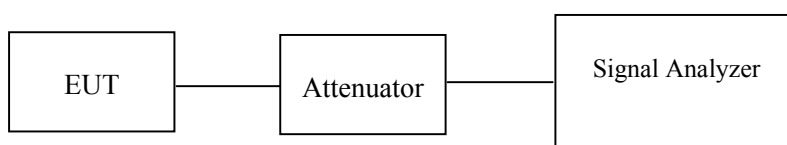
Applicable Standards

FCC 47 §2.1049

Test Procedure

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2015-12-11	2016-12-11
Ducommun technologies	RF Cable	RG-214	4	2015-06-15	2016-06-15
JFW	30dB Attenuator	50FH-030-100 RF	170006716507	2015-06-12	2016-06-12

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53 %
ATM Pressure:	101.0kPa

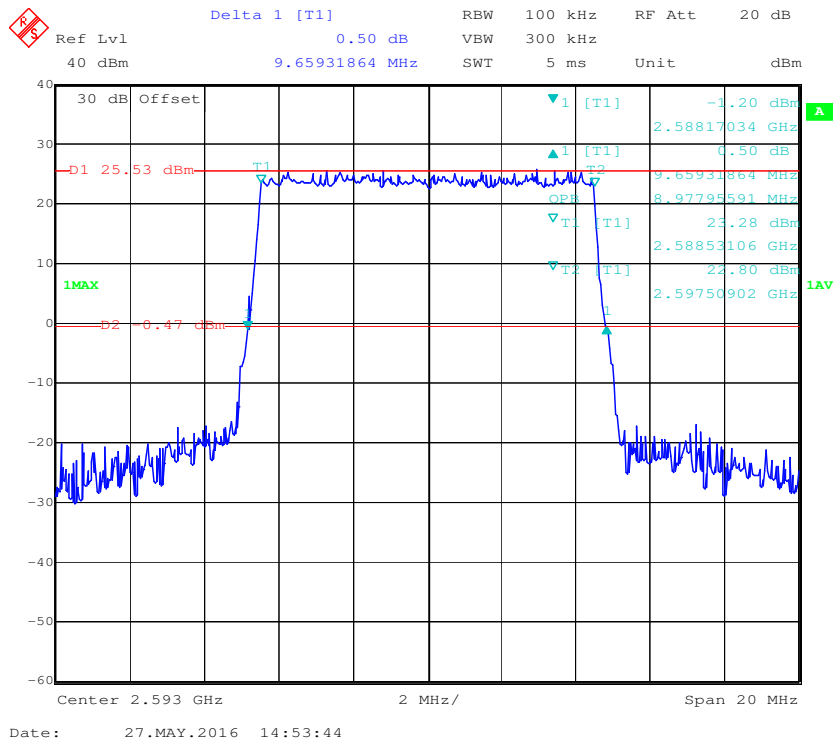
The testing was performed by Rocky Kang on 2016-05-27.

EUT operation mode: Transmitting

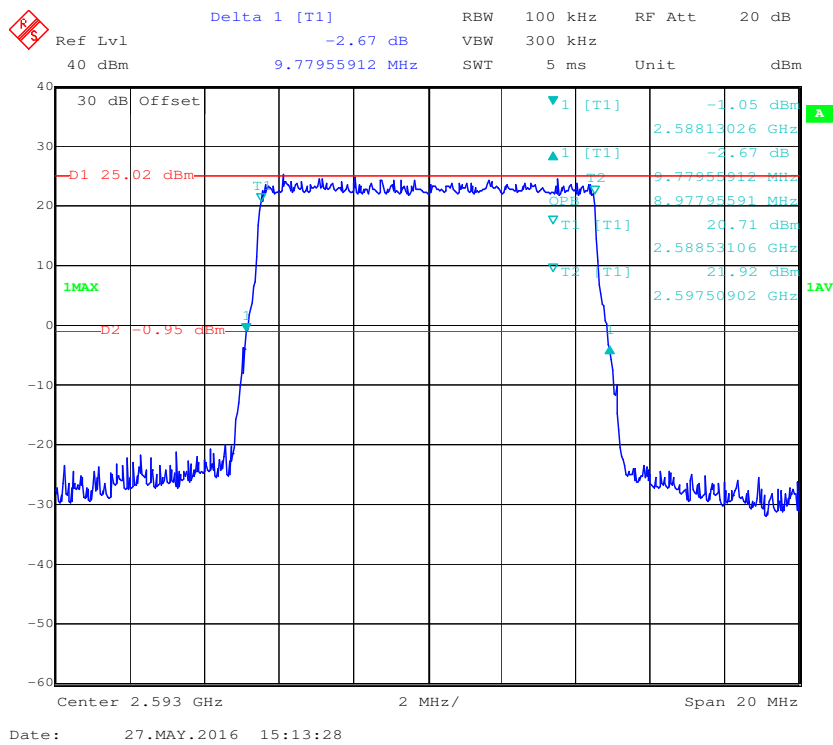
Test Result: Compliance. Please refer to the following tables and plots.

Bandwidth (MHz)	Frequency (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
Antenna 1				
10.0	2593	QPSK	8.98	9.66
	2596	64QAM	8.98	9.78
20.0	2593	QPSK	17.96	18.92
	2596	64QAM	17.88	18.92
Antenna 2				
10.0	2593	QPSK	8.98	9.82
	2596	64QAM	8.98	9.70
20.0	2593	QPSK	17.88	18.76
	2596	64QAM	17.96	18.84

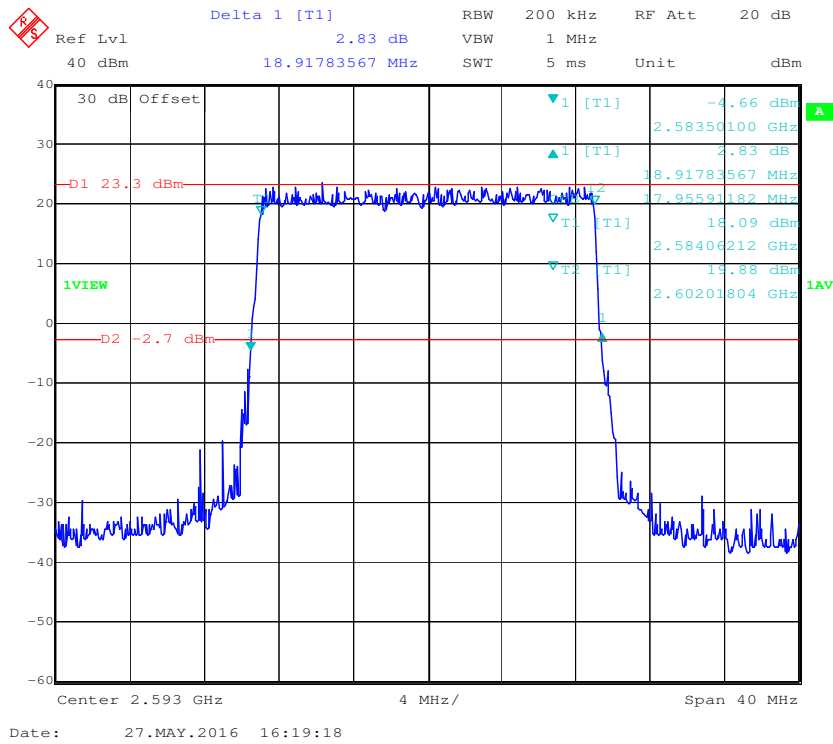
QPSK (10.0 MHz) - 99% Occupied & 26 dB Bandwidth for Antenna 1



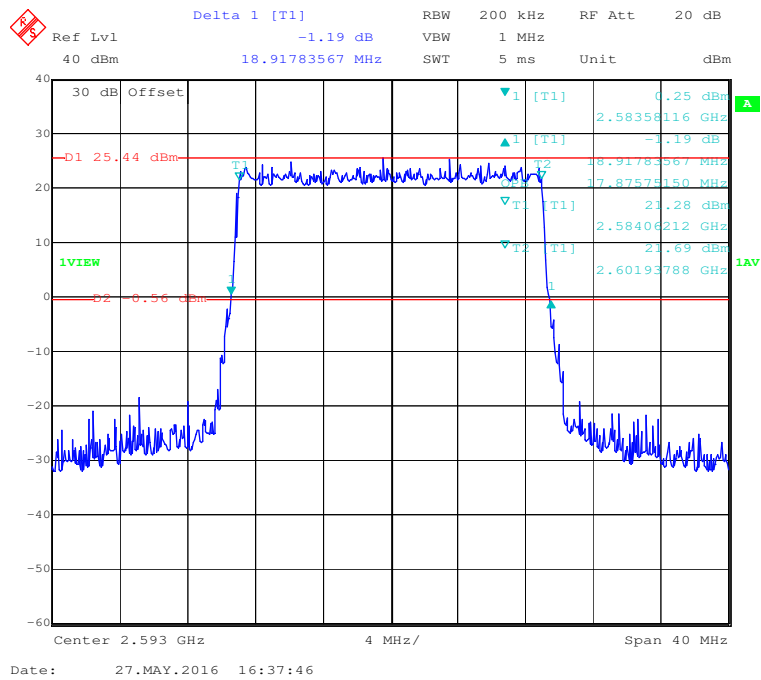
64-QAM (10.0 MHz) - 99% Occupied & 26 dB Bandwidth for Antenna 1



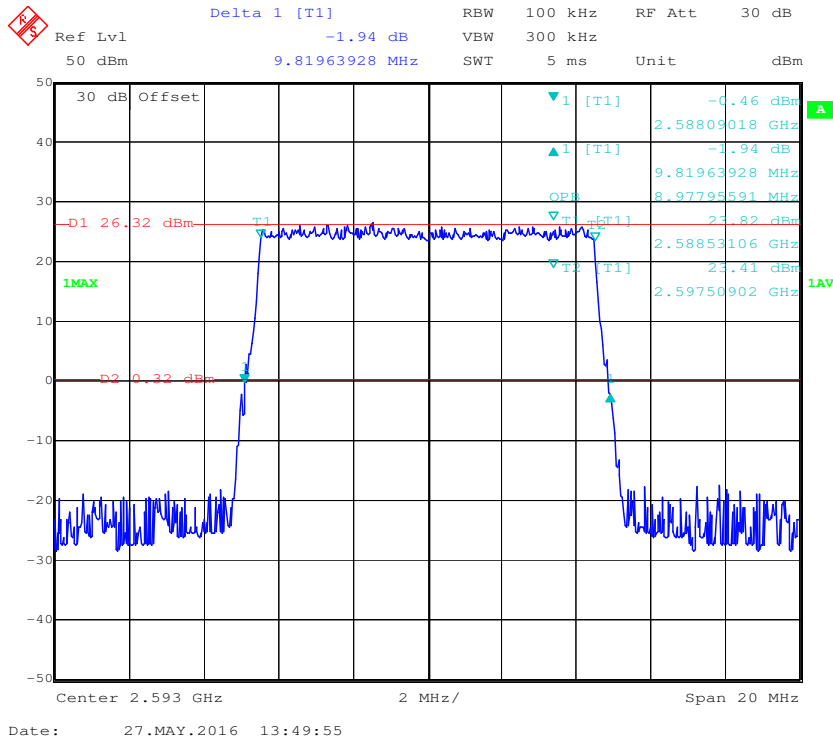
QPSK (20.0 MHz) - 99% Occupied & 26 dB Bandwidth, for Antenna 1



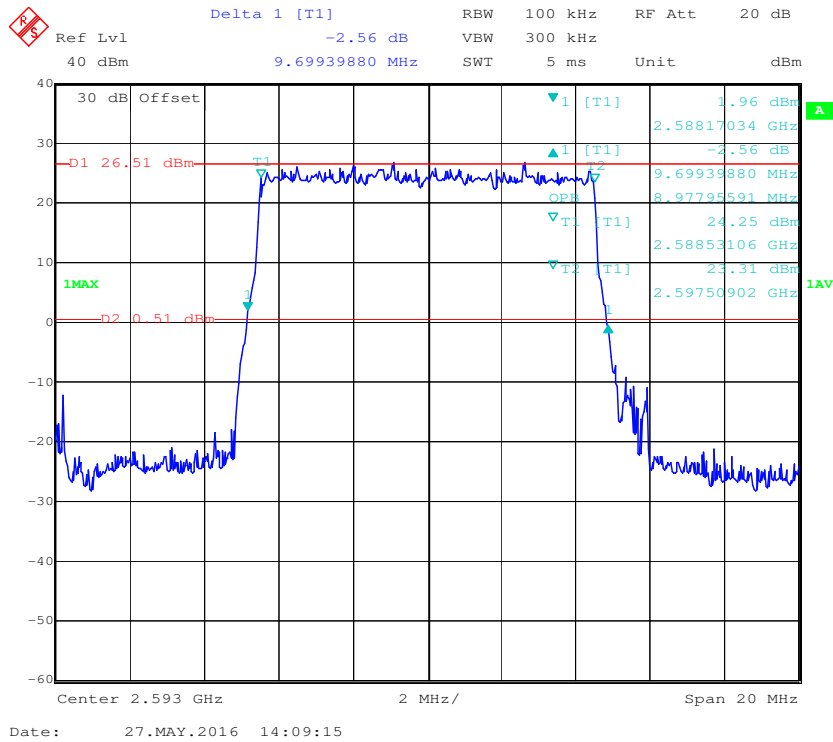
64-QAM (20.0 MHz) - 99% Occupied & 26 dB Bandwidth, for Antenna 1



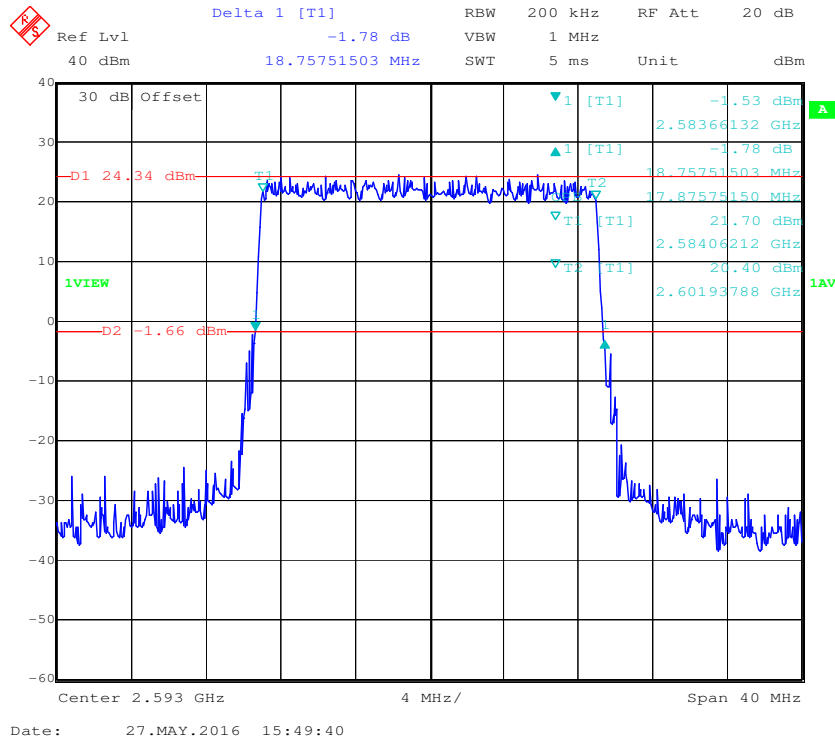
QPSK (10.0 MHz) - 99% Occupied & 26 dB Bandwidth for Antenna 2



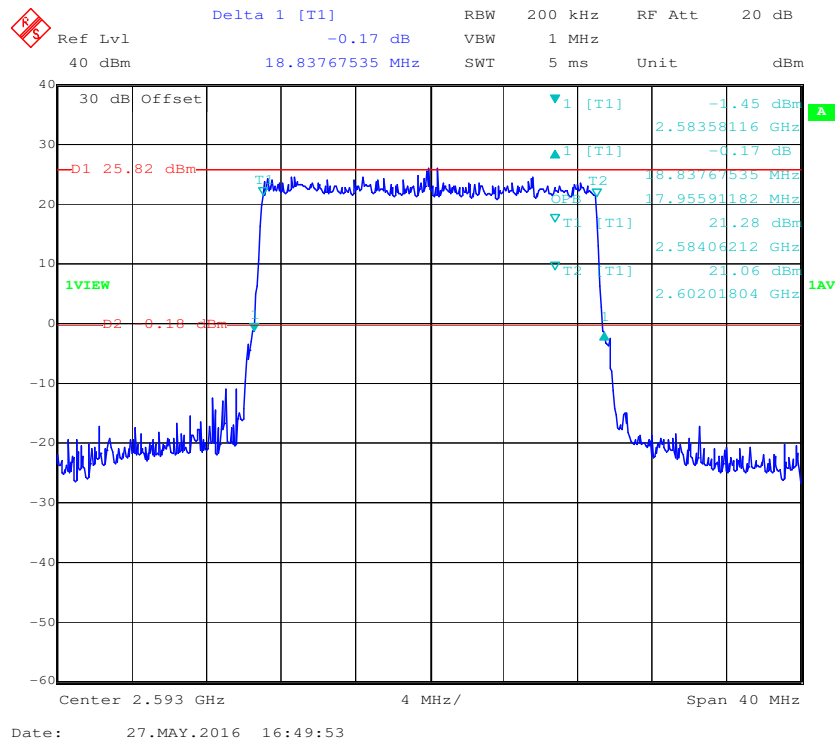
64-QAM (10.0 MHz) - 99% Occupied & 26 dB Bandwidth for Antenna 2



QPSK (20.0 MHz) - 99% Occupied & 26 dB Bandwidth, for Antenna 2



64-QAM (20.0 MHz) - 99% Occupied & 26 dB Bandwidth, for Antenna 2



FCC §27.53(m) (2) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

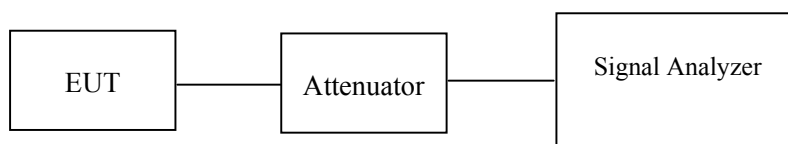
Applicable Standards

FCC§27.53(m) (2)

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1051.

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2015-12-11	2016-12-11
Ducommun technologies	RF Cable	RG-214	4	2015-06-15	2016-06-15
	Notch filter				
JFW	30dB Attenuator	50FH-030-100 RF	170006716507	2015-06-12	2016-06-12

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

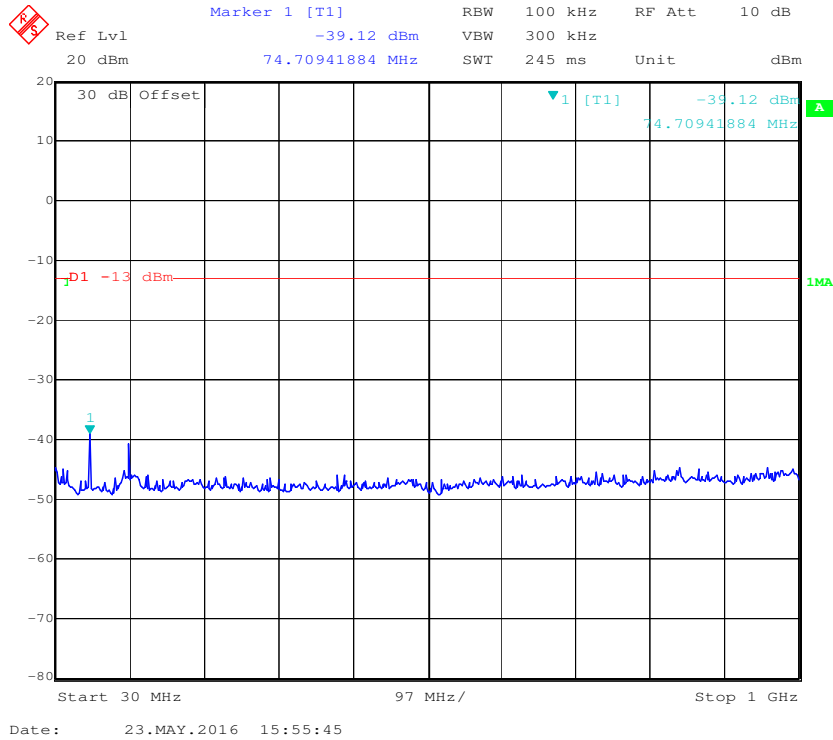
Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	101.0kPa

The testing was performed by Rocky Kang on 2016-05-23.

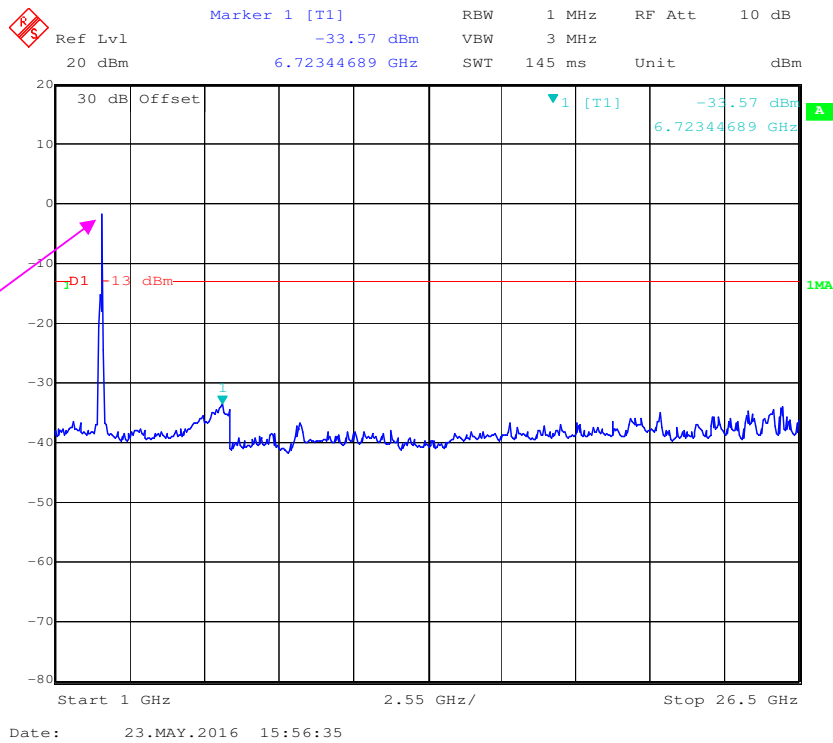
Please refer to the following plots.

LTE Band 41:

30 MHz - 1 GHz (10.0 MHz, Antenna1)

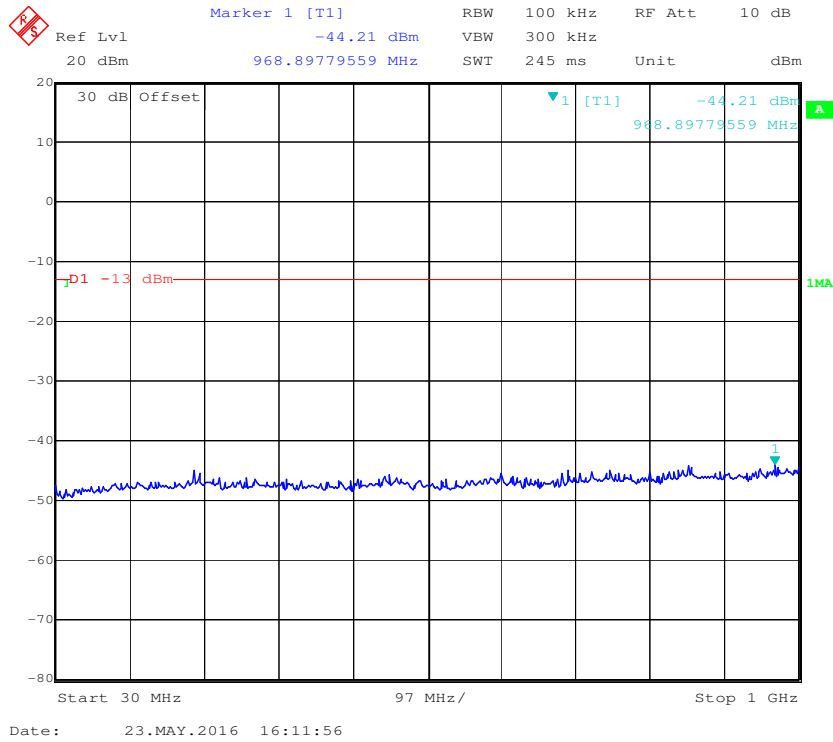


1 GHz - 26.5 GHz (10.0 MHz, Antenna1)



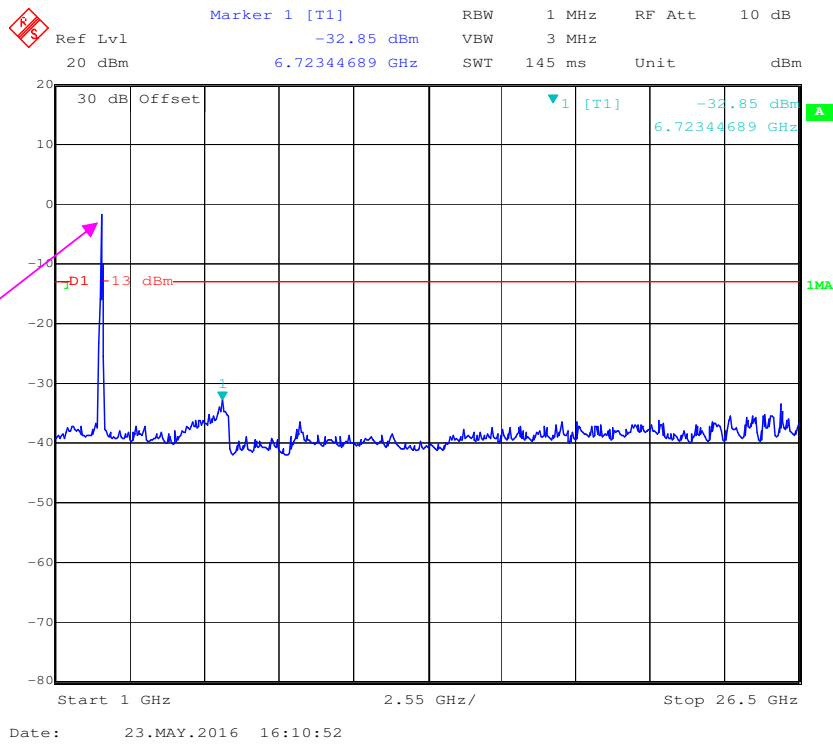
Fundamental with notch filter test

30 MHz - 1 GHz (20.0 MHz, Antenna1)

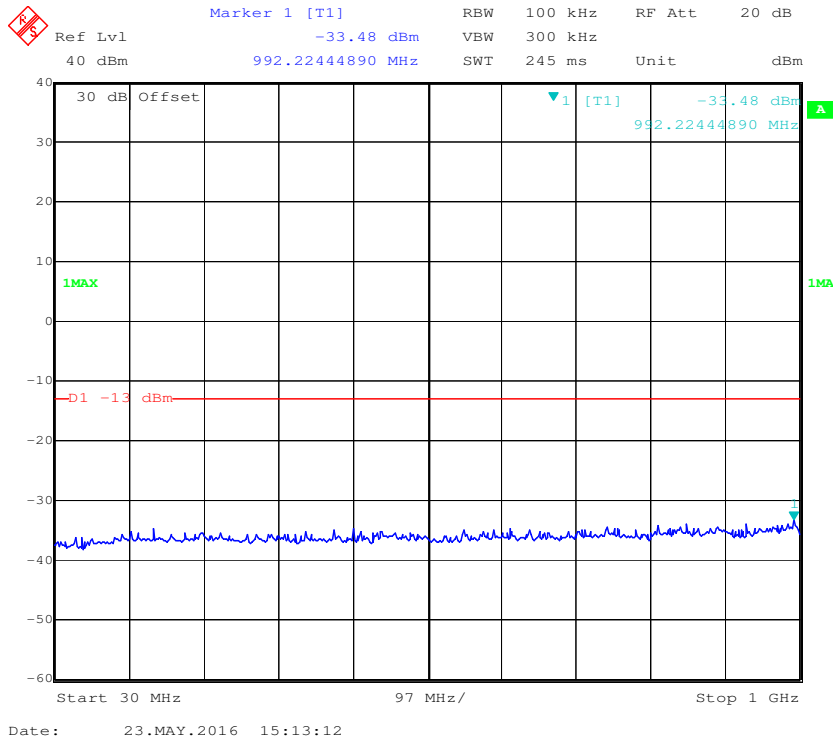


1 GHz - 26.5 GHz (20.0 MHz, Antenna1)

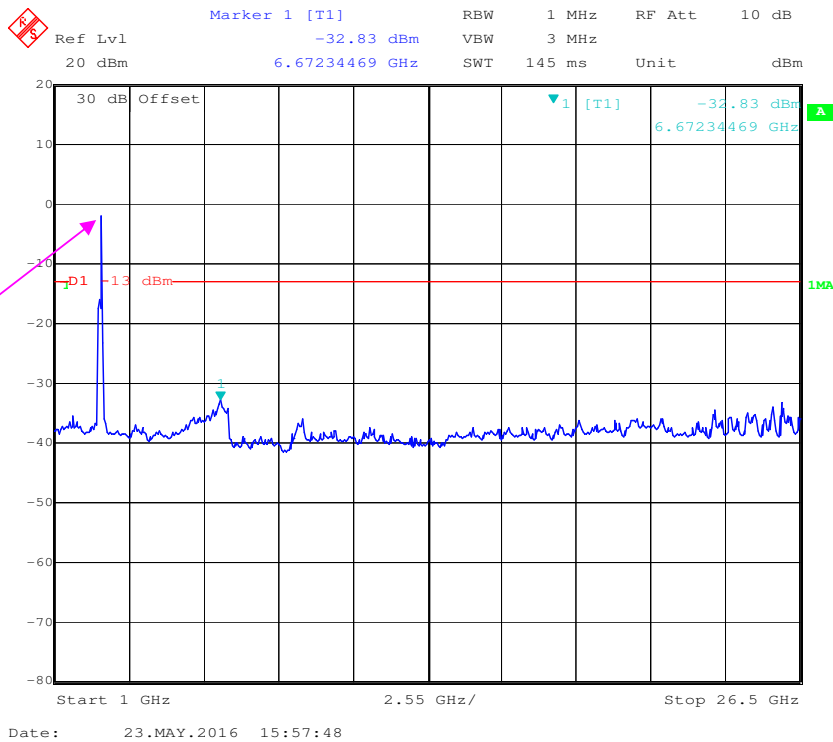
Fundamental with notch filter test



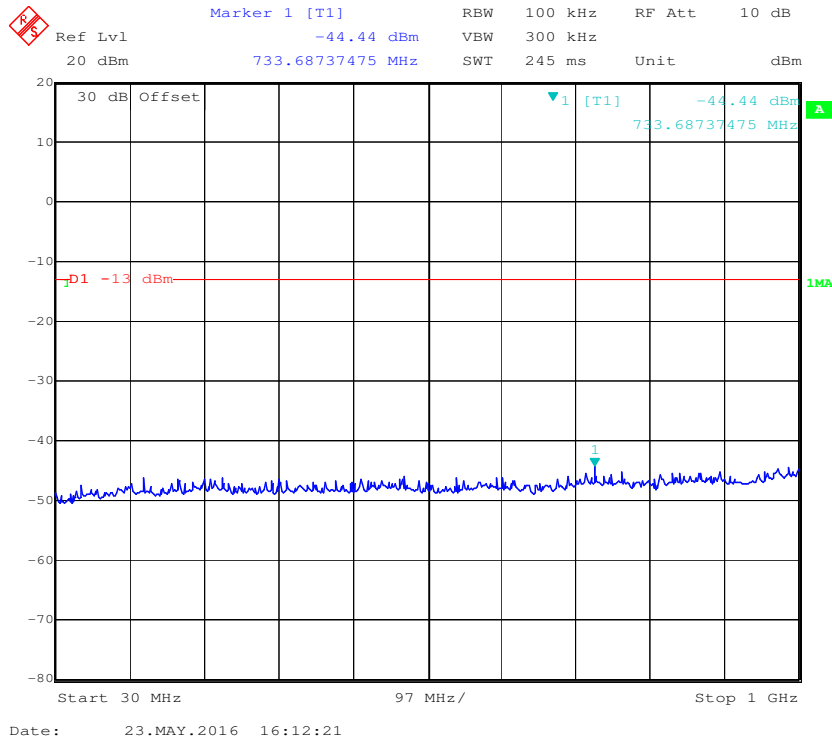
30 MHz - 1 GHz (10.0 MHz, Antenna2)



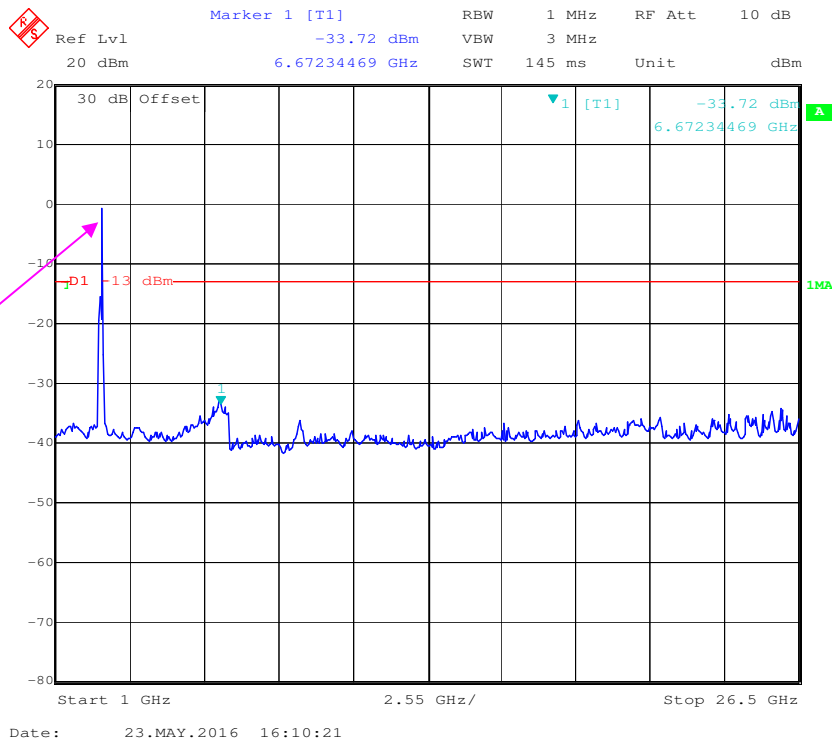
1 GHz - 26.5 GHz (10.0 MHz, Antenna2)



30 MHz - 1 GHz (20.0 MHz, Antenna2)



1 GHz - 26.5 GHz (20.0 MHz, Antenna2)



Fundamental with notch filter test

FCC§27.53 (m) (2) - SPURIOUS RADIATED EMISSIONS

Applicable Standards

FCC §27.53 (m) (2)

Test Procedure

The transmitter was placed on a wooden 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 = $10 \lg(\text{TX pwr in Watts}/0.001)$ – the absolute level

Spurious attenuation limit in dB = $43 + 10 \text{Log}_{10}(\text{power out in Watts})$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Horn Antenna	DRH-118	A052604	2014-12-29	2017-12-28
Sunol Sciences	Bi-log Antenna	JB1	A040904-2	2014-12-07	2017-12-06
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2015-12-11	2016-12-11
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2016-04-23	2017-04-23
HP	Amplifier	HP8447E	1937A01046	2016-05-06	2017-05-06
HP	Signal Generator	HP 8341B	2624A00116	2015-07-02	2016-07-01
COM POWER	Dipole Antenna	AD-100	041000	2015-08-18	2016-08-18
A.H. System	Horn Antenna	SAS-200/571	135	2015-08-18	2018-08-17
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2015-12-15	2016-12-14
the electro-Mechanics Co.	Horn Antenna	3116	9510-2270	2013-10-14	2016-10-13
Ducommun technologies	RF Cable	UFA210A-1-4724-30050U	MFR64369 223410-001	2015-06-15	2016-06-15
Ducommun technologies	RF Cable	104PEA	218124002	2015-06-15	2016-06-15
Ducommun technologies	RF Cable	RG-214	1	2015-06-15	2016-06-15
Ducommun technologies	RF Cable	RG-214	2	2015-06-15	2016-06-15

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	24 °C
Relative Humidity:	50 %
ATM Pressure:	101.0kPa

The testing was performed by Rocky Kang on 2016-05-27.

Test mode: Transmitting (Pre-scan with all the bandwidth, and worse case as below)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)			
QPSK 10M										
143.99	35.69	343	2.3	H	-61.3	0.26	0	-61.56	-13	48.56
143.99	36.26	215	1.7	V	-60.7	0.26	0	-60.96	-13	47.96
5186.00	41.39	93	1.9	H	-52.5	1.80	10.10	-44.20	-13	31.20
5186.00	42.89	243	1.4	V	-50.3	1.80	10.10	-42.00	-13	29.00
QPSK 20M										
143.99	36.58	330	1.7	H	-60.4	0.26	0	-60.66	-13	47.66
143.99	36.21	115	2.1	V	-60.8	0.26	0	-61.06	-13	48.06
5186.00	41.49	277	1.4	H	-52.4	1.80	10.10	-44.10	-13	31.10
5186.00	41.15	60	2.5	V	-52.0	1.80	10.10	-43.70	-13	30.70

Note:

- 1) Absolute Level = SG Level - Cable loss + Antenna Gain
- 2) Margin = Limit- Absolute Level

FCC §27.53 (m) (2)- BAND EDGES

Applicable Standards

According to FCC §27.53(m) (2), For BRS and EBS stations, the power of any emissions outside the licensee's frequency bands of operation shall be attenuated below the transmitter power (P) measured in watts in accordance with the standards below. If a licensee has multiple contiguous channels, out-of-band emissions shall be measured from the upper and lower edges of the contiguous channels.

For digital base stations, the attenuation shall be not less than $43 + 10 \log (P)$ dB, unless a documented interference complaint is received from an adjacent channel licensee with an overlapping Geographic Service Area. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS No. 1 on the same terms and conditions as adjacent channel BRS or EBS licensees. Provided that a documented interference complaint cannot be mutually resolved between the parties prior to the applicable deadline, then the following additional attenuation requirements shall apply:

(i) If a pre-existing base station suffers harmful interference from emissions caused by a new or modified base station located 1.5 km or more away, within 24 hours of the receipt of a documented interference complaint the licensee of the new or modified base station must attenuate its emissions by at least $67 + 10 \log (P)$ dB measured at 3 megahertz, above or below, from the channel edge of its frequency block and shall immediately notify the complaining licensee upon implementation of the additional attenuation. No later than 60 days after the implementation of such additional attenuation, the licensee of the complaining base station must attenuate its base station emissions by at least $67 + 10 \log (P)$ dB measured at 3 megahertz, above or below, from the channel edge of its frequency block of the new or modified base station.

(ii) If a pre-existing base station suffers harmful interference from emissions caused by a new or modified base station located less than 1.5 km away, within 24 hours of receipt of a documented interference complaint the licensee of the new or modified base station must attenuate its emissions by at least $67 + 10 \log (P) - 20 \log (D\text{km}/1.5)$ dB measured at 3 megahertz, above or below, from the channel edge of its frequency block of the complaining licensee, or if both base stations are co-located, limit its undesired signal level at the pre-existing base station receiver(s) to no more than -107 dBm measured in a 5.5 megahertz bandwidth and shall immediately notify the complaining licensee upon such reduction in the undesired signal level. No later than 60 days after such reduction in the undesired signal level, the complaining licensee must attenuate its base station emissions by at least $67 + 10 \log (P)$ dB measured at 3 megahertz, above or below, from the channel edge of its frequency block of the new or modified base station.

(iii) If a new or modified base station suffers harmful interference from emissions caused by a pre-existing base station located 1.5 km or more away, within 60 days of receipt of a documented interference complaint the licensee of each base station must attenuate its base station emissions by at least $67 + 10 \log (P)$ dB measured at 3 megahertz, above or below, from the channel edge of its frequency block of the other licensee.

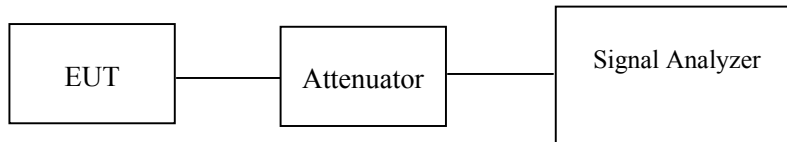
(iv) If a new or modified base station suffers harmful interference from emissions caused by a pre-existing base station located less than 1.5 km away, within 60 days of receipt of a documented interference complaint: (a) The licensee of the new or modified base station must attenuate its OOB by at least $67 + 10 \log (P) - 20 \log (D\text{km}/1.5)$ measured 3 megahertz above or below, from the channel edge of its frequency block of the other licensee, or if the base stations are co-located, limit its undesired signal level at the other base station receiver(s) to no more than -107 dBm measured in a 5.5-megahertz bandwidth; and (b) the licensee causing the interference must attenuate its emissions by at least $67 + 10 \log (P)$ dB measured at 3 megahertz, above or below, from the channel edge of its frequency block of the new or modified base station.

(v) For all fixed digital user stations, the attenuation factor shall be not less than $43 + 10 \log (P)$ dB at the channel edge.

Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2015-12-11	2016-12-11
Ducommun technologies	RF Cable	RG-214	4	2016-06-15	2017-06-15
JFW	30dB Attenuator	50FH-030-100 RF	170006716507	2016-06-12	2017-06-12

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

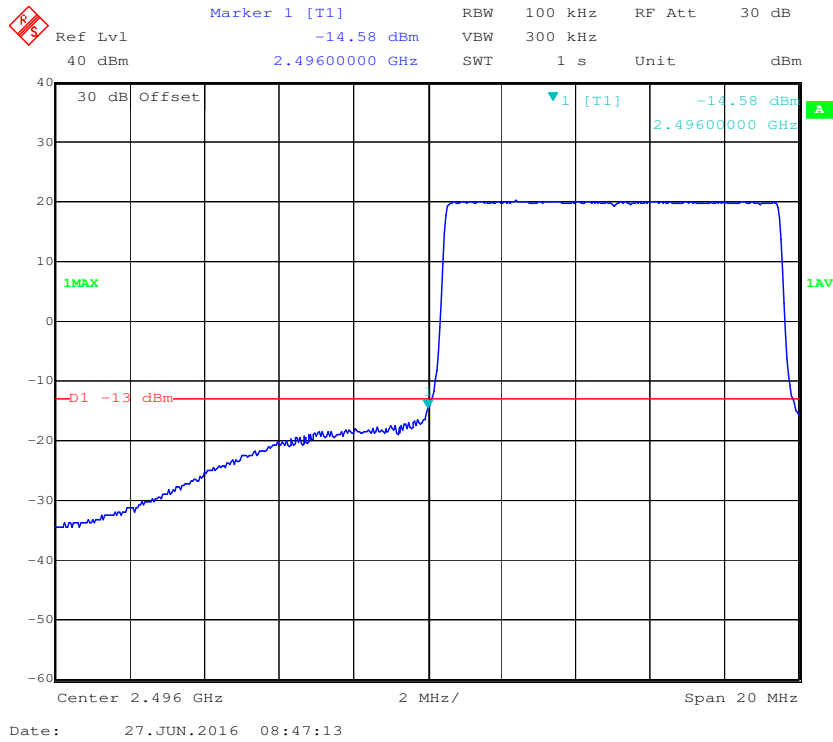
Temperature:	24-25 °C
Relative Humidity:	50-53 %
ATM Pressure:	101.0kPa

The testing was performed by Rocky Kang on 2016-06-27.

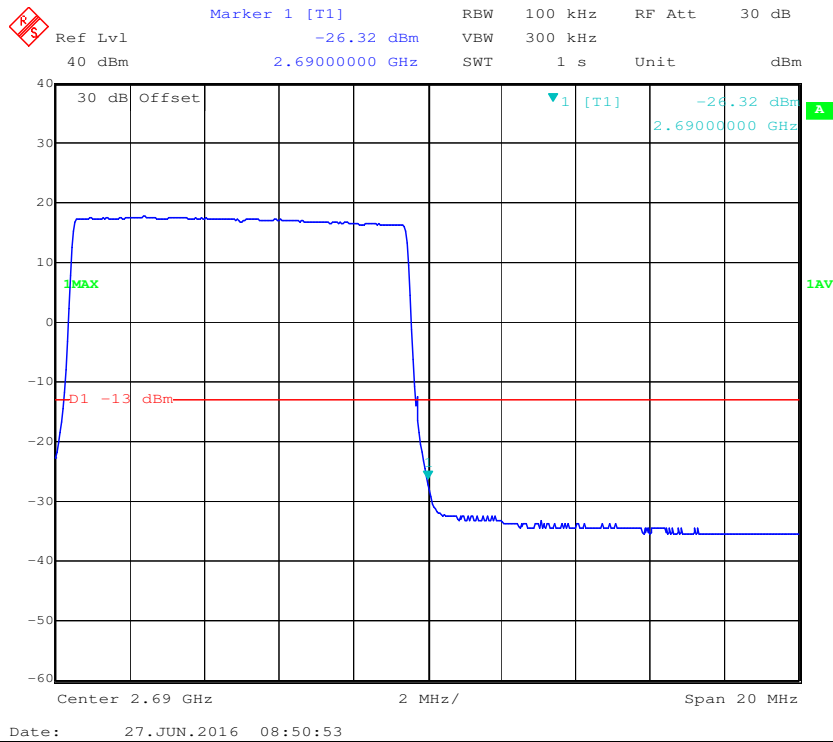
EUT operation mode: Transmitting

Test Result: Compliance. Please refer to the following plots.

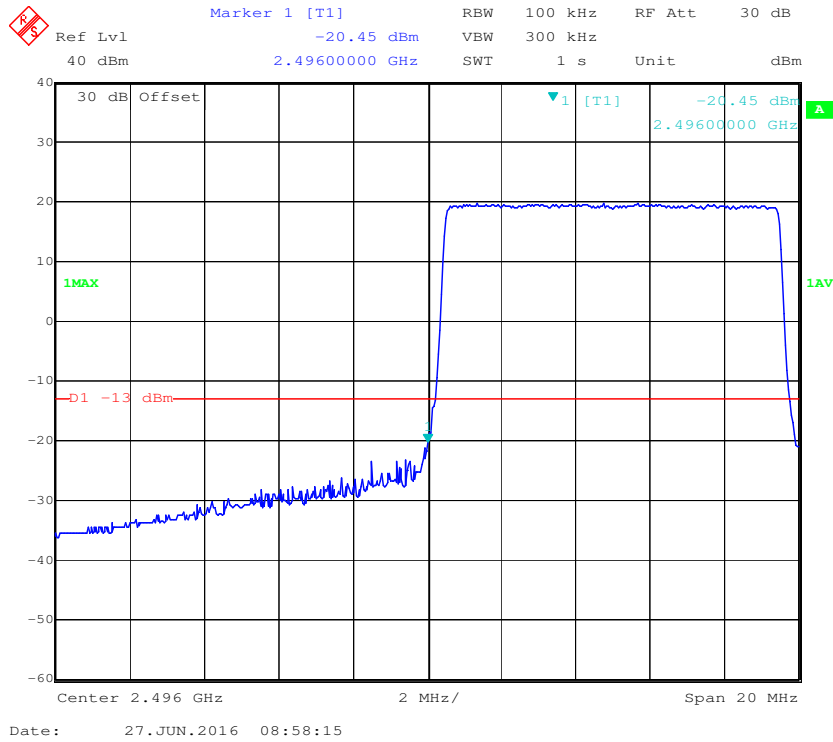
Band 41: QPSK (10.0 MHz, FULL RB) - Left Band Edge for Antenna1



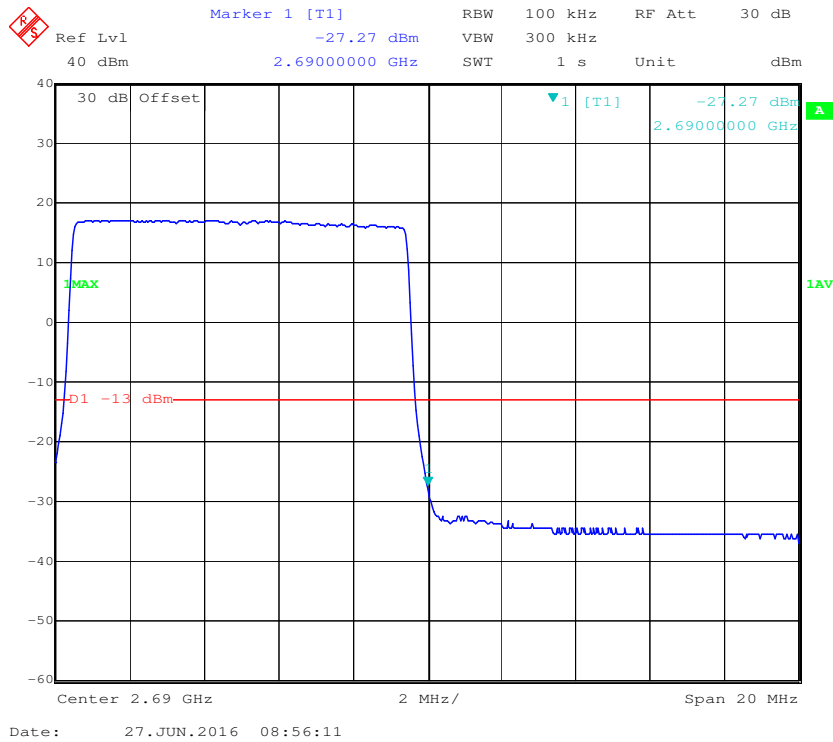
QPSK (10.0 MHz, FULL RB) - Right Band Edge for Antenna1



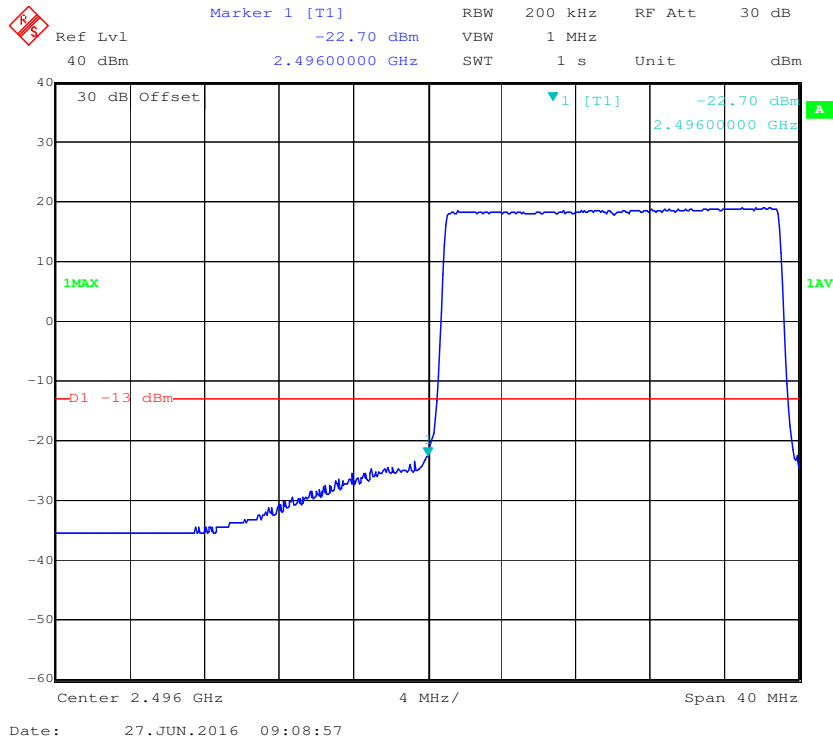
64-QAM (10.0 MHz, FULL RB) - Left Band Edge for Antenna1



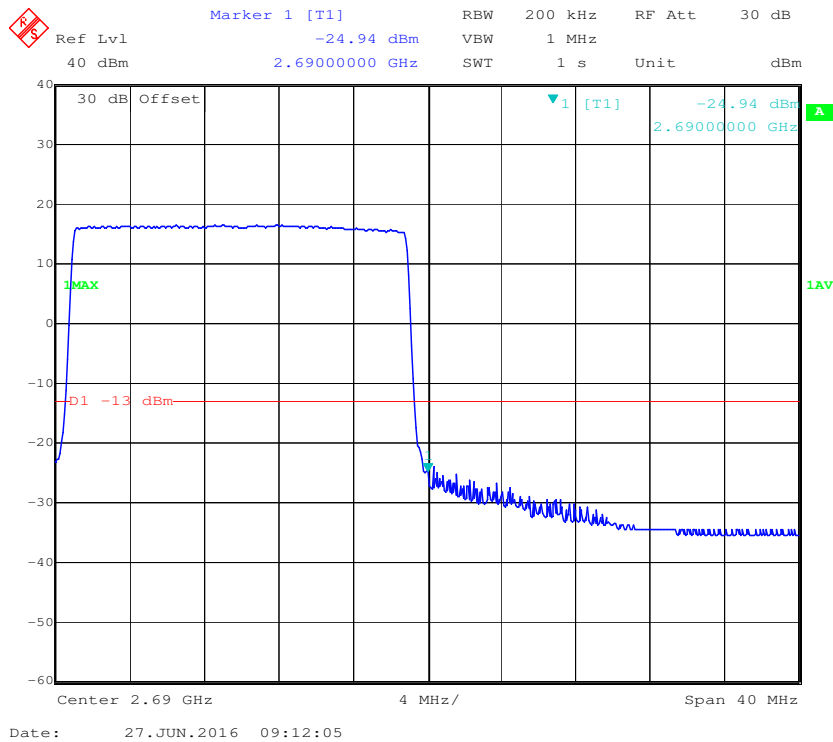
64-QAM (10.0 MHz, FULL RB) - Right Band Edge for Antenna1



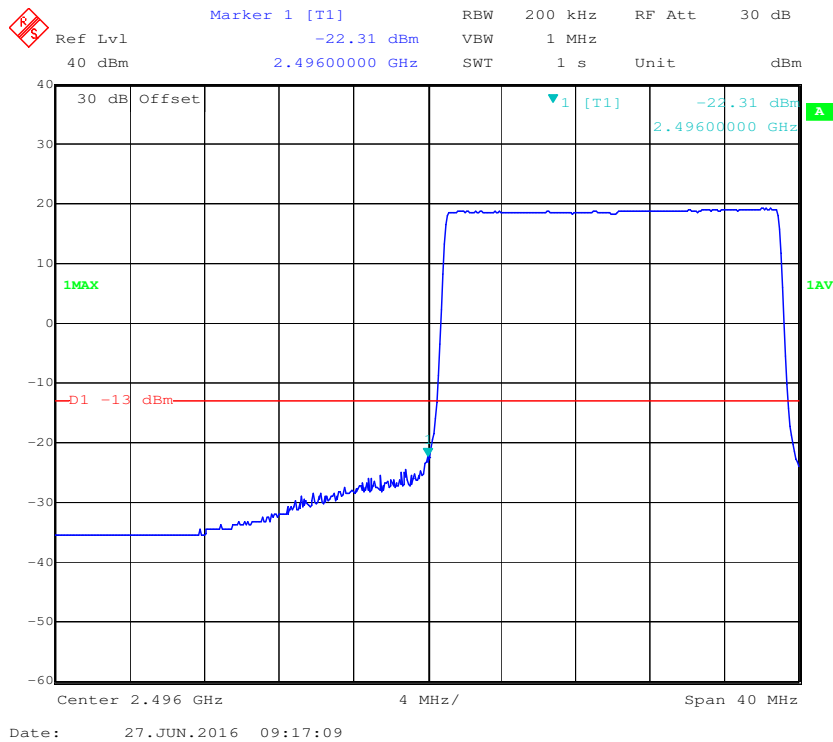
QPSK (20.0 MHz, FULL RB) - Left Band Edge for Antenna1



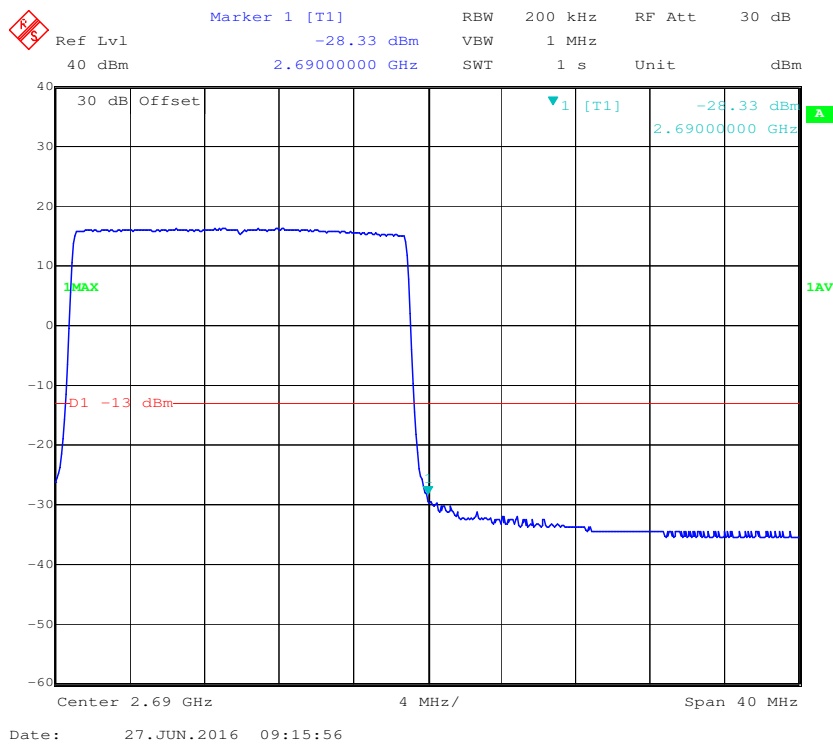
QPSK (20.0 MHz, FULL RB) - Right Band Edge for Antenna1



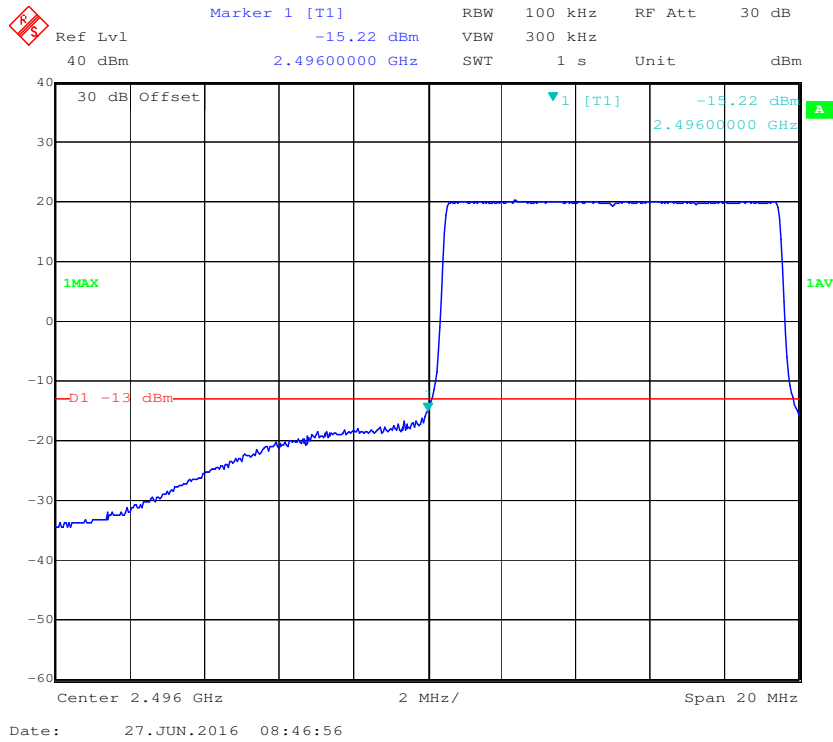
64-QAM (20.0 MHz, FULL RB) - Left Band Edge for Antenna1



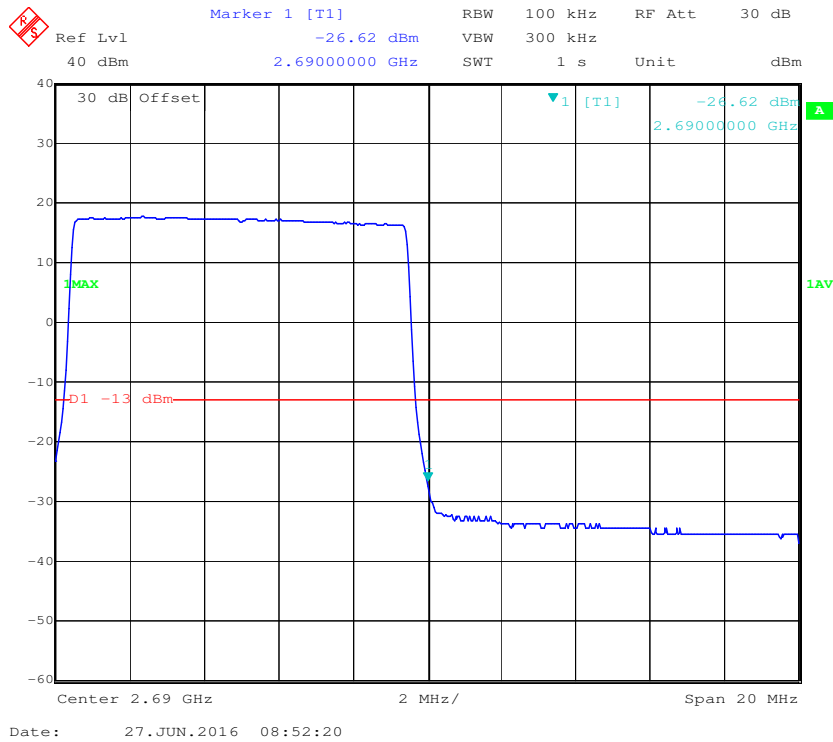
64-QAM (20.0 MHz, FULL RB) - Right Band Edge for Antenna1



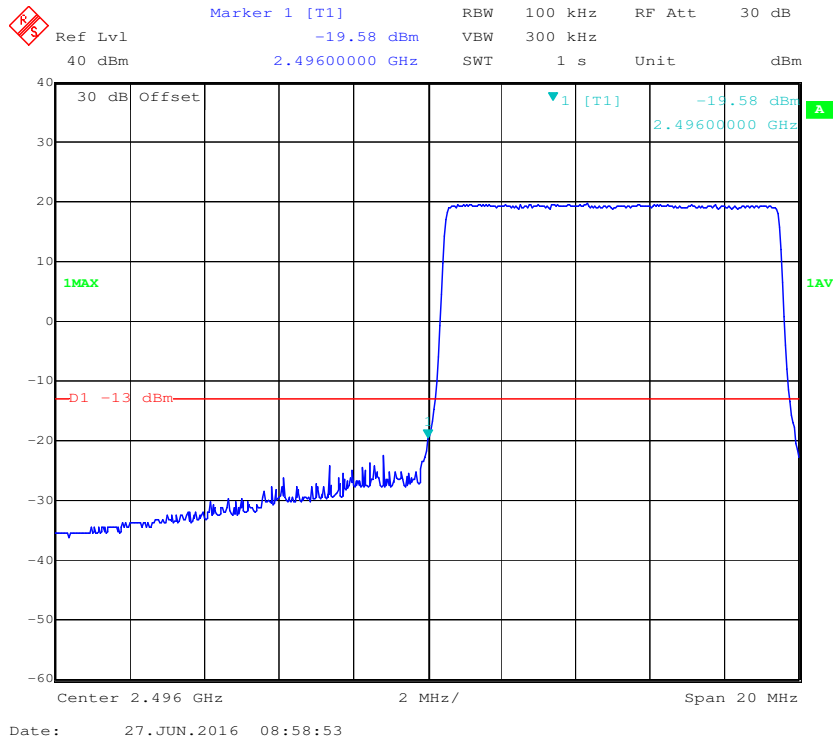
QPSK (10.0 MHz, FULL RB) - Left Band Edge for Antenna2



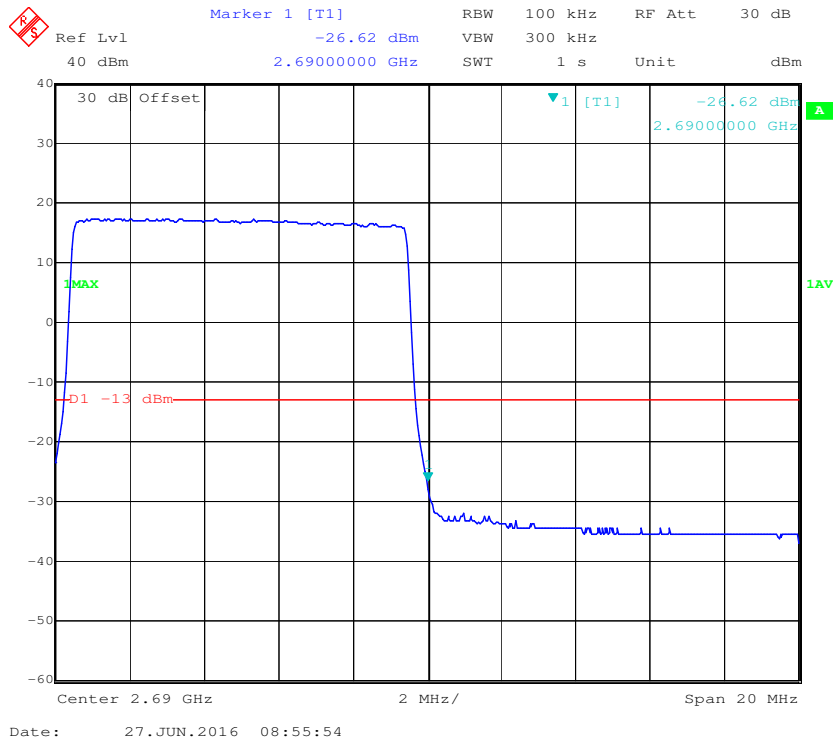
QPSK (10.0 MHz, FULL RB) - Right Band Edge for Antenna2



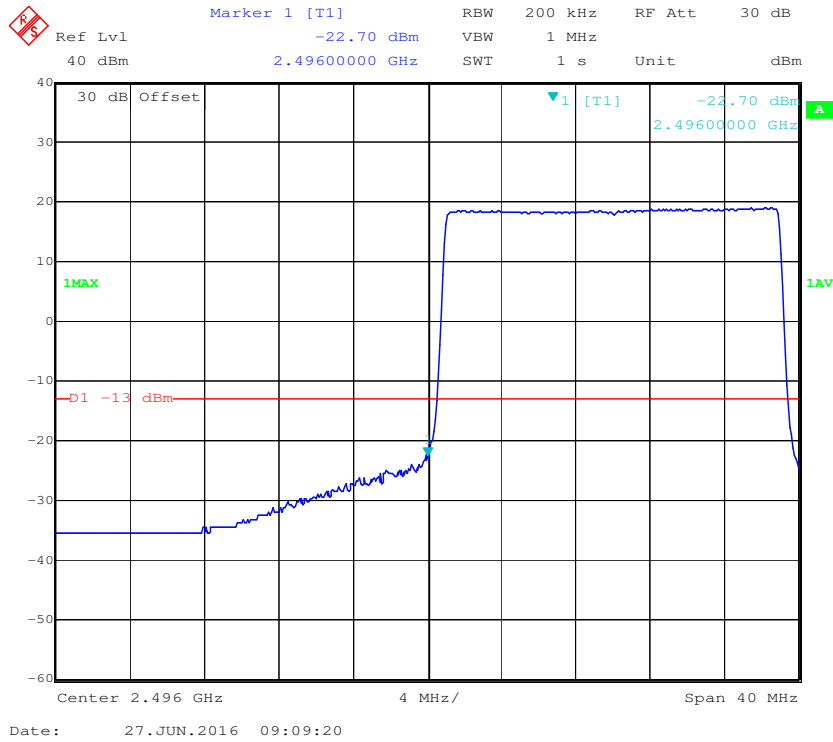
64-QAM (10.0 MHz, FULL RB) - Left Band Edge for Antenna2



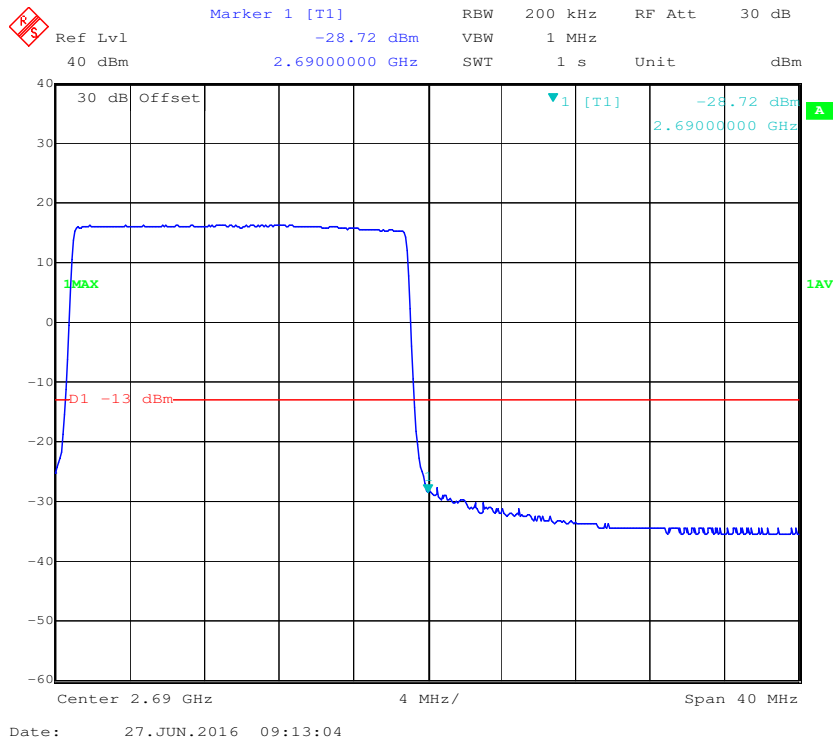
64-QAM (10.0 MHz, FULL RB) - Right Band Edge for Antenna2



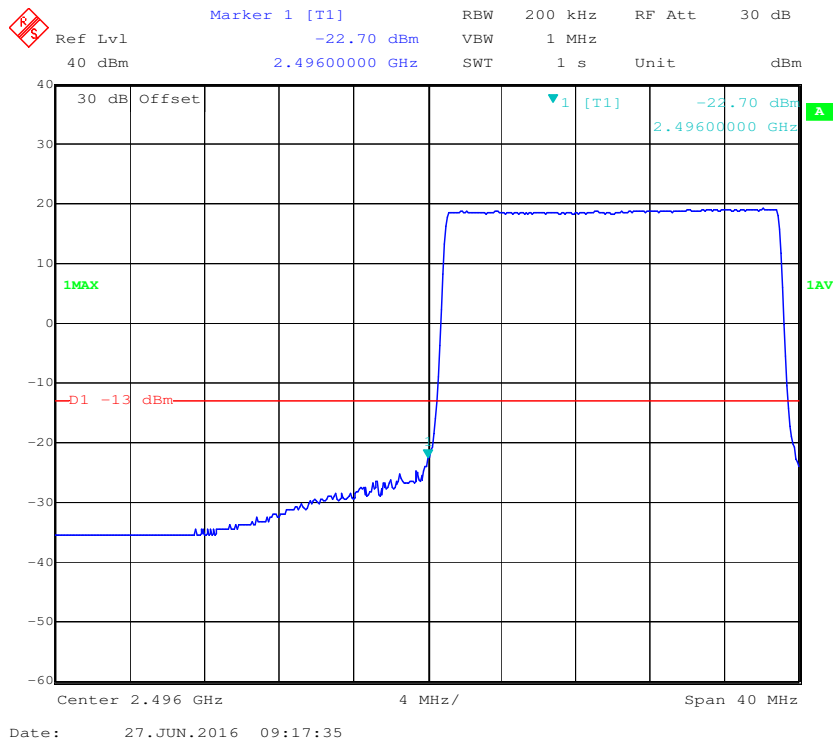
QPSK (20.0 MHz, FULL RB) - Left Band Edge for Antenna2



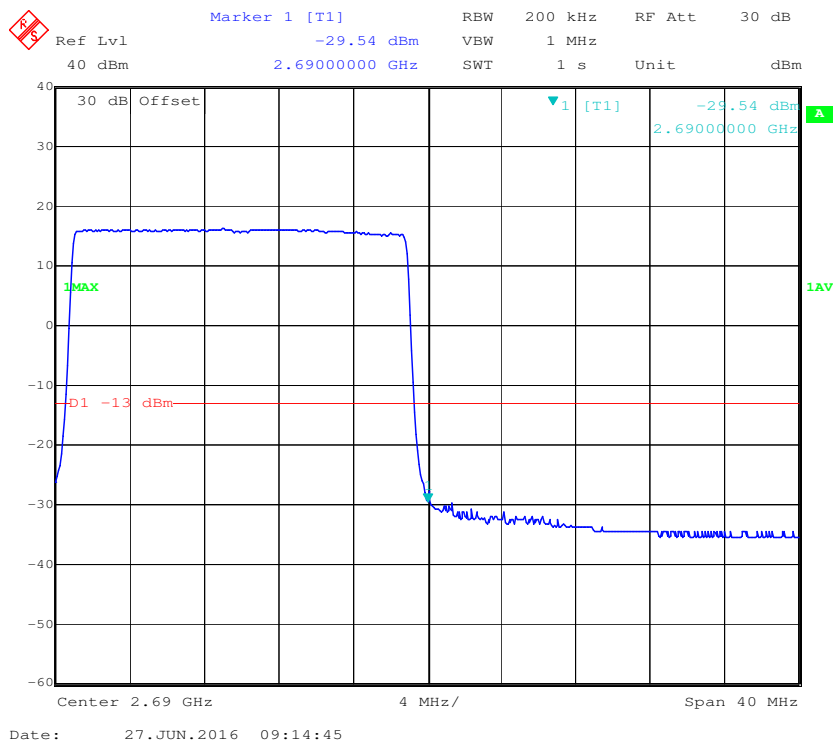
QPSK (20.0 MHz, FULL RB) - Right Band Edge for Antenna2



64-QAM (20.0 MHz, FULL RB) - Left Band Edge for Antenna2



64-QAM (20.0 MHz, FULL RB) - Right Band Edge for Antenna2



FCC§27.54&§2.1055 - FREQUENCY STABILITY

Applicable Standards

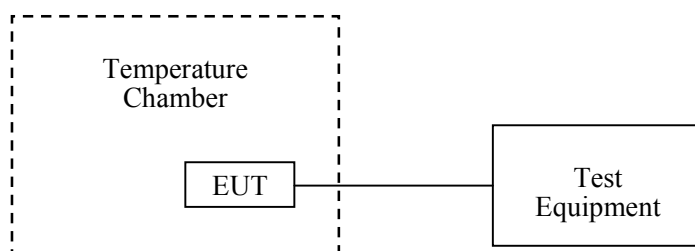
According to FCC §27.54., the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: For hand carried, battery powered equipment; reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
ESPEC	Temperature & Humidity Chamber	EL-10KA	09107726	2015-11-01	2016-10-31
Ducommun technologies	RF Cable	RG-214	4	2015-06-15	2016-06-15
JFW	30dB Attenuator	50FH-030-100 RF	17000671650 7	2015-06-12	2016-06-12

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	24 °C
Relative Humidity:	50 %
ATM Pressure:	101.0kPa

The testing was performed by Rocky Kang on 2016-06-02.

EUT operation mode: Transmitting

Test Result: Compliance. Please refer to the following tables.

	Temperature (°C)	Power Supplied (DC V)	Measured Low Frequency (MHz)	Measured High Frequency (MHz)	Low frequency (MHz)	High frequency (MHz)	Result
10.0 MHz, Middle Channel	-30	-48V	2500.999992	2684.979952	2496	2690	Pass
	-20		2500.999993	2684.979951	2496	2690	Pass
	-10		2500.999997	2684.979959	2496	2690	Pass
	0		2500.999991	2684.979952	2496	2690	Pass
	10		2500.999992	2684.979956	2496	2690	Pass
	20		2500.999999	2684.979959	2496	2690	Pass
	30		2500.999997	2684.979957	2496	2690	Pass
	40		2500.999999	2684.979952	2496	2690	Pass
	50		2500.999989	2684.979953	2496	2690	Pass
	25	-43.2V	2500.999993	2684.97995	2496	2690	Pass
	25	-52.8V	2500.999995	2684.979954	2496	2690	Pass

	Temperature (°C)	Power Supplied (DC V)	Measured Low Frequency (MHz)	Measured High Frequency (MHz)	Low frequency (MHz)	High frequency (MHz)	Result
20.0 MHz, Middle Channel	-30	-48V	2506.080151	2679.919836	2496	2690	Pass
	-20		2506.080154	2679.919833	2496	2690	Pass
	-10		2506.080156	2679.919831	2496	2690	Pass
	0		2506.080158	2679.919837	2496	2690	Pass
	10		2506.080157	2679.919837	2496	2690	Pass
	20		2506.080158	2679.919838	2496	2690	Pass
	30		2506.080155	2679.919831	2496	2690	Pass
	40		2506.08015	2679.919828	2496	2690	Pass
	50		2506.080151	2679.919838	2496	2690	Pass
	25	-43.2V	2506.080149	2679.919833	2496	2690	Pass
	25	-52.8V	2506.080157	2679.919834	2496	2690	Pass

***** END OF REPORT *****