



FCC PART 22H, PART 24E
MEASUREMENT AND TEST REPORT

For

HONG KONG IPRO TECHNOLOGY CO.,LIMITED

FLAT/RM A3, 9/F SILVERCORP INT TOWER 707-713 NATHAN RD MONGKOK, HONGKONG

FCC ID: PQ4IPROKYLIN40

| | |
|---|--------------------------------------|
| Report Type: Original Report | Product Type: Mobile Phone |
| Report Number: RDG160908009-00D | |
| Report Date: 2016-09-23 | |
| Reviewed By: Dean Liu RF Engineer | <i>Dean Liu</i> |
| Approved by: Sula Huang RF Leader | <i>Sula Huang</i> |
| Test Laboratory: Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn | |

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.(Dongguan). This report may contain data or test methods that are not covered by the NVLAP accreditation scope and shall be marked with an asterisk "*" and noted.

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *HONG KONG IPRO TECHNOLOGY CO., LIMITED*'s product, model number: *Kylin 4.0* (FCC ID: *PQ4IPROKYLIN40*) (the "EUT") in this report was a *Mobile Phone*, which was measured approximately: 12.1 cm (L) x 6.3cm (W) x 1.0 cm (H), rated input voltage: DC 3.7V rechargeable Li-ion battery or DC5.0V charging from adapter.

Adapter information:

Model: NTR-S01

Input: AC100-240V-50/60 Hz, 150mA

Output: DC5.0V, 700mA

All measurement and test data in this report was gathered from production sample serial number: 160908009 (Assigned by BACL, Dongguan). The EUT was received on 2016-09-09.

Objective

This report is prepared on behalf of *HONG KONG IPRO TECHNOLOGY CO., LIMITED* in accordance with: Part 2-Subpart J, Part 22-Subpart H, and Part 24-Subpart E of the Federal Communications Commission's rules.

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

Related Submittal(s)/Grant(s)

FCC Part 15B JBP submissions with FCC ID: PQ4IPROKYLIN40.

FCC Part 15C DSS submissions with FCC ID: PQ4IPROKYLIN40.

FCC Part 15C DTS submissions with FCC ID: PQ4IPROKYLIN40.

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 22 Subpart H - Public Mobile Services

Part 24 Subpart E - Personal Communication Services

Applicable Standards: TIA/EIA-603-D-2010.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratories Corp.(Dongguan).

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) has been fully described in reports submitted to the Federal Communications 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 February 06, 2015.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 273710. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

FUNVAL

SYSTEM TEST CONFIGURATION

Justification

The EUT was configured for testing according to TIA/EIA-603-D-2010.

The test items were performed with the EUT operating at testing mode.

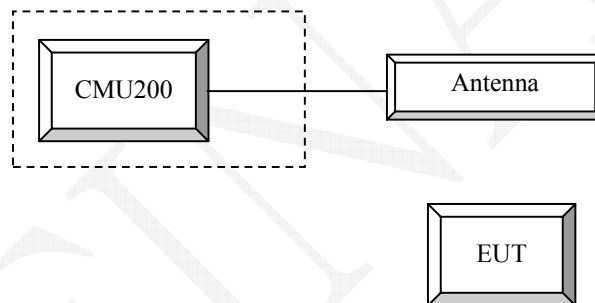
Equipment Modifications

No modification was made to the EUT.

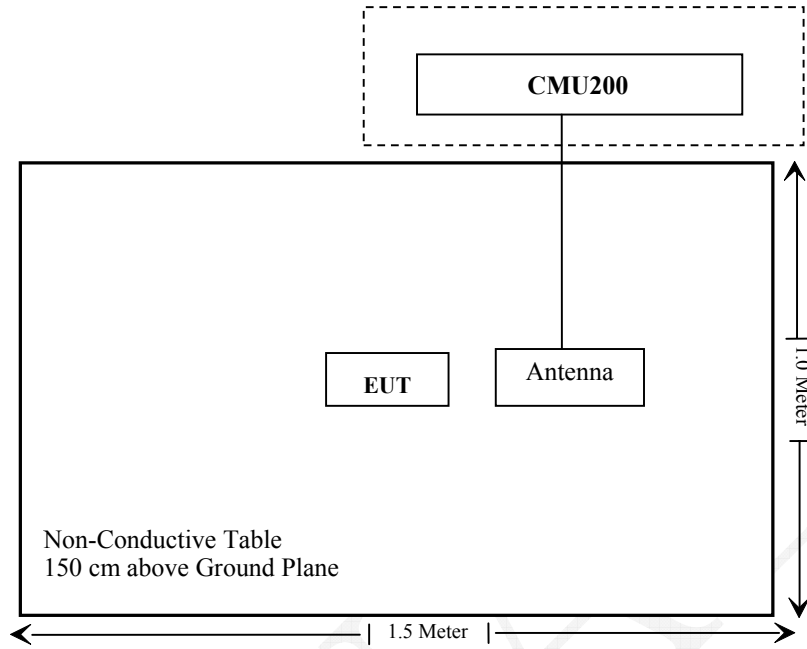
Support Equipment List and Details

| Manufacturer | Description | Model | Serial Number |
|--------------|--------------------------------------|--------|---------------|
| R&S | Universal Radio Communication Tester | CMU200 | 109 038 |

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

| FCC Rules | Description of Test | Result |
|--|--|----------------|
| §1.1310, §2.1093 | RF Exposure | Compliance |
| §2.1046; § 22.913 (a); § 24.232 (c) | RF Output Power | Compliance |
| § 2.1047 | Modulation Characteristics | Not Applicable |
| § 2.1049; § 22.905 § 22.917; § 24.238 | Occupied Bandwidth | Compliance |
| § 2.1051, § 22.917 (a); § 24.238 (a) | Spurious Emissions at Antenna Terminal | Compliance |
| § 2.1053 § 22.917 (a); § 24.238 (a) | Field Strength of Spurious Radiation | Compliance |
| § 22.917 (a); § 24.238 (a) | Out of band emission, Band Edge | Compliance |
| § 2.1055 § 22.355; § 24.235 | Frequency stability vs. temperature Frequency stability vs. voltage | Compliance |

Test Time: 2016-09-09 ~ 2016-09-23

FCC §1.1310 & §2.1093- RF EXPOSURE

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliant, please refer to the SAR report: RDG160908009-20.

FINAL

FCC §2.1047 - MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 22H & 24E, there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

FINAL

FCC § 2.1046, § 22.913 (a) & § 24.232 (c) - RF OUTPUT POWER

Applicable Standard

According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC §2.1046 and §24.232 (C), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications..

According to §24.232 (d) Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

Test Procedure

GSM/GPRS/EGPRS

Function: Menu select > GSM Mobile Station > GSM 850/1900

Press Connection control to choose the different menus

Press RESET > choose all the reset all settings

Connection Press Signal Off to turn off the signal and change settings

Network Support > GSM + GPRS or GSM + EGSM

Main Service > Packet Data

Service selection > Test Mode A – Auto Slot Config. off

MS Signal Press Slot Config Bottom on the right twice to select and change the number of time slots and power setting

> Slot configuration > Uplink/Gamma

> 33 dBm for GPRS 850

> 30 dBm for GPRS 1900

> 27 dBm for EGPRS 850

> 26 dBm for EGPRS 1900

BS Signal Enter the same channel number for TCH channel (test channel) and BCCH channel

Frequency Offset > + 0 Hz

Mode > BCCH and TCH

BCCH Level > -85 dBm (May need to adjust if link is not stable)

BCCH Channel > choose desire test channel [Enter the same channel number for TCH channel (test channel) and BCCH channel]

Channel Type > Off

P0 > 4 dB
 Slot Config > Unchanged (if already set under MS signal)
 TCH > choose desired test channel
 Hopping > Off
 Main Timeslot > 3
 Network Coding Scheme > CS4 (GPRS) and MCS5 (EGPRS)

Bit Stream > 2E9-1 PSR Bit Stream
 AF/RF Connection Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input
 Press Signal on to turn on the signal and change settings

WCDMA-Release 99

The following tests were conducted according to the test requirements outlines in section 5.2 of the 3GPP TS34.121-1 specification. The EUT has a nominal maximum output power of 24dBm (+1.7/-3.7).

| | | |
|-------------------------------|-------------------------|--------------|
| WCDMA General Settings | Loopback Mode | Test Mode 1 |
| | Rel99 RMC | 12.2kbps RMC |
| | Power Control Algorithm | Algorithm2 |
| | β_c / β_d | 8/15 |

WCDMA HSDPA

The following tests were conducted according to the test requirements outlines in section 5.2 of the 3GPP TS34.121-1 specification.

| | Mode | HSDPA | HSDPA | HSDPA | HSDPA |
|--------------------------------|---------------------------------|--------------|-------|-------|-------|
| | Subset | 1 | 2 | 3 | 4 |
| WCDMA General Settings | Loopback Mode | Test Mode 1 | | | |
| | Rel99 RMC | 12.2kbps RMC | | | |
| | HSDPA FRC | H-Set1 | | | |
| | Power Control Algorithm | Algorithm2 | | | |
| | β_c | 2/15 | 12/15 | 15/15 | 15/15 |
| | β_d | 15/15 | 15/15 | 8/15 | 4/15 |
| | β_d (SF) | 64 | | | |
| | β_c / β_d | 2/15 | 12/15 | 15/8 | 15/4 |
| | β_{hs} | 4/15 | 24/15 | 30/15 | 30/15 |
| | MPR(dB) | 0 | 0 | 0.5 | 0.5 |
| HSDPA Specific Settings | DACK | 8 | | | |
| | DNAK | 8 | | | |
| | DCQI | 8 | | | |
| | Ack-Nack repetition factor | 3 | | | |
| | CQI Feedback | 4ms | | | |
| | CQI Repetition Factor | 2 | | | |
| | $A_{hs} = \beta_{hs} / \beta_c$ | 30/15 | | | |

WCDMA HSUPA

The following tests were conducted according to the test requirements outlines in section 5.2 of the 3GPP TS34.121-1 specification.

| | Mode | HSUPA | HSUPA | HSUPA | HSUPA | HSUPA |
|--------------------------------|----------------------------------|--|--|--|--------------|--------------|
| | Subset | 1 | 2 | 3 | 4 | 5 |
| WCDMA General Settings | Loopback Mode | Test Mode 1 | | | | |
| | Rel99 RMC | 12.2kbps RMC | | | | |
| | HSDPA FRC | H-Set1 | | | | |
| | HSUPA Test | HSUPA Loopback | | | | |
| | Power Control Algorithm | Algorithm2 | | | | |
| | β_c | 11/15 | 6/15 | 15/15 | 2/15 | 15/15 |
| | β_d | 15/15 | 15/15 | 9/15 | 15/15 | 0 |
| | β_{ec} | 209/225 | 12/15 | 30/15 | 2/15 | 5/15 |
| | β_c/β_d | 11/15 | 6/15 | 15/9 | 2/15 | - |
| | β_{hs} | 22/15 | 12/15 | 30/15 | 4/15 | 5/15 |
| CM(dB) | 1.0 | 3.0 | 2.0 | 3.0 | 1.0 | |
| MPR(dB) | 0 | 2 | 1 | 2 | 0 | |
| HSDPA Specific Settings | DACK | 8 | | | | |
| | DNAK | 8 | | | | |
| | DCQI | 8 | | | | |
| | Ack-Nack repetition factor | 3 | | | | |
| | CQI Feedback | 4ms | | | | |
| | CQI Repetition Factor | 2 | | | | |
| | $A_{hs}=\beta_{hs}/\beta_c$ | 30/15 | | | | |
| HSUPA Specific Settings | DE-DPCCH | 6 | 8 | 8 | 5 | 7 |
| | DHARQ | 0 | 0 | 0 | 0 | 0 |
| | AG Index | 20 | 12 | 15 | 17 | 21 |
| | ETFCI | 75 | 67 | 92 | 71 | 81 |
| | Associated Max UL Data Rate kbps | 242.1 | 174.9 | 482.8 | 205.8 | 308.9 |
| | Reference E_FCI | E-TFCI 11 E E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO23 E-TFCI 75 E-TFCI PO26 E-TFCI 81 E-TFCI PO 27 | E-TFCI 11 E-TFCI PO4 E-TFCI 92 E-TFCI PO 18 | E-TFCI 11 E E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO23 E-TFCI 75 E-TFCI PO26 E-TFCI 81 E-TFCI PO 27 | | |

Radiated method:

ANSI/TIA-603-D section 2.2.17

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|----------------|-----------------------------|-------------|----------------|------------------|----------------------|
| R&S | EMI Test Receiver | ESCI | 100224 | 2016-09-01 | 2017-09-01 |
| Sunol Sciences | Antenna | JB3 | A060611-1 | 2014-11-06 | 2017-11-05 |
| HP | Amplifier | 8447E | 2434A02181 | 2016-09-01 | 2017-09-01 |
| Agilent | Spectrum Analyzer | E4440A | SG43360054 | 2015-11-23 | 2016-11-22 |
| ETS-Lindgren | Horn Antenna | 3115 | 000 527 35 | 2016-01-05 | 2019-01-04 |
| Mini-Circuit | Amplifier | ZVA-213-S+ | 54201245 | 2016-02-19 | 2017-02-19 |
| Agilent | MXG Vector Signal Generator | N5182B | MY5135014 2 | 2016-03-30 | 2017-03-29 |
| EMCO | Adjustable Dipole Antenna | 3121C | 9109-753 | N/A | N/A |
| TDK RF | Horn Antenna | HRN-0118 | 130 084 | 2015-09-06 | 2018-09-06 |
| N/A | Coaxial Cable | 14m | N/A | 2016-05-06 | 2017-05-06 |
| N/A | Coaxial Cable | 8m | N/A | 2016-05-06 | 2017-05-06 |
| E-Microwave | DC Blocking | EMDCB-00036 | 0E01201047 | 2016-05-06 | 2017-05-06 |
| E-Microwave | Attenuator | EMCA10-5RN | 0E01203239 | 2016-05-08 | 2017-05-08 |
| Pasternack | RF Coaxial Cable | RF-01 | N/A | 2016-05-06 | 2017-05-06 |
| Pasternack | RF Coaxial Cable | RF-02 | N/A | 2016-05-06 | 2017-05-06 |
| Pasternack | RF Coaxial Cable | RF-03 | N/A | 2016-05-06 | 2017-05-06 |
| N/A | Two-way Splitter | ODP-1-6-2S | OE0120142 | 2016-05-06 | 2017-05-06 |

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

Test Data**Environmental Conditions**

| | |
|---------------------------|-----------|
| Temperature: | 29.6 °C |
| Relative Humidity: | 52 % |
| ATM Pressure: | 100.2 kPa |

* The testing was performed by Robin Zheng on 2016-09-19.

Conducted Output Power

Cellular Band (Part 22H) & PCS Band (Part 24E)

| Band | Channel No. | Peak Output Power (dBm) | | | | | | | | |
|----------|-------------|-------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | | GSM | GPRS 1 TX Slot | GPRS 2 TX Slot | GPRS 3 TX Slot | GPRS 4 TX Slot | EDGE 1 TX Slot | EDGE 2 TX Slot | EDGE 3 TX Slot | EDGE 4 TX Slot |
| Cellular | 128 | 31.30 | 31.52 | 30.75 | 29.26 | 27.51 | / | / | / | / |
| | 190 | 31.20 | 31.42 | 30.95 | 29.44 | 27.72 | / | / | / | / |
| | 251 | 31.30 | 31.54 | 31.12 | 29.62 | 27.89 | / | / | / | / |
| PCS | 512 | 28.30 | 28.15 | 26.52 | 25.21 | 23.38 | / | / | / | / |
| | 661 | 28.20 | 28.09 | 26.50 | 25.21 | 23.41 | / | / | / | / |
| | 810 | 28.00 | 27.95 | 26.39 | 25.06 | 23.32 | / | / | / | / |

WCDMA Band II (PART 24E)

| Mode | 3GPP Sub Test | Average Output Power (dBm) | | | | | |
|---------------|---------------|----------------------------|-------------------|-----------------------------|----------------------|---------------------------|--------------------|
| | | Low Channel (Ave. Power) | Low Channel (PAR) | Middle Channel (Ave. Power) | Middle Channel (PAR) | High Channel (Ave. Power) | High Channel (PAR) |
| Rel 99 | 1 | 22.17 | 3.20 | 21.84 | 3.40 | 22.20 | 2.68 |
| HSDPA | 1 | 20.41 | 2.68 | 21.42 | 2.91 | 21.59 | 2.74 |
| | 2 | 20.38 | 2.54 | 21.43 | 2.85 | 21.55 | 2.59 |
| | 3 | 20.40 | 2.65 | 21.39 | 2.94 | 21.61 | 2.68 |
| | 4 | 20.39 | 2.72 | 21.41 | 2.89 | 21.51 | 2.54 |
| HSUPA | 1 | 21.64 | 2.61 | 22.59 | 2.81 | 22.32 | 2.49 |
| | 2 | 21.60 | 2.68 | 22.60 | 2.79 | 22.29 | 2.67 |
| | 3 | 21.64 | 2.75 | 22.58 | 2.85 | 22.35 | 2.59 |
| | 4 | 21.59 | 2.71 | 22.61 | 2.69 | 22.27 | 2.71 |
| | 5 | 21.68 | 2.81 | 22.57 | 2.79 | 22.34 | 2.68 |
| HSPA+ (16QAM) | 1 | 20.82 | 2.73 | 20.79 | 2.91 | 20.81 | 2.61 |

WCDMA Band V (PART 22H)

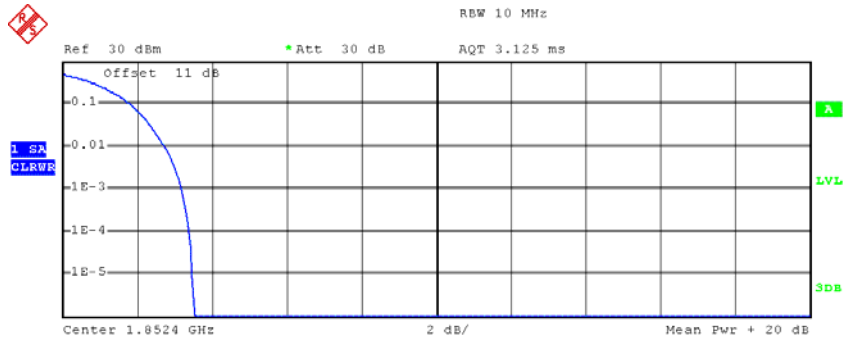
| Mode | 3GPP Sub Test | Average Output Power (dBm) | | | | | |
|---------------|---------------|----------------------------|-------------------|-----------------------------|----------------------|---------------------------|--------------------|
| | | Low Channel (Ave. Power) | Low Channel (PAR) | Middle Channel (Ave. Power) | Middle Channel (PAR) | High Channel (Ave. Power) | High Channel (PAR) |
| Rel 99 | 1 | 22.77 | 2.88 | 22.55 | 3.12 | 22.81 | 2.80 |
| HSDPA | 1 | 22.11 | 2.52 | 20.19 | 2.68 | 20.01 | 2.51 |
| | 2 | 22.09 | 2.49 | 20.20 | 2.64 | 20.09 | 2.54 |
| | 3 | 22.08 | 2.53 | 20.18 | 2.68 | 20.10 | 2.37 |
| | 4 | 22.13 | 2.47 | 20.16 | 2.65 | 20.07 | 2.49 |
| HSUPA | 1 | 22.04 | 2.59 | 23.96 | 2.63 | 21.71 | 2.39 |
| | 2 | 22.01 | 2.56 | 23.94 | 2.70 | 21.69 | 2.48 |
| | 3 | 22.09 | 2.39 | 23.89 | 2.58 | 21.74 | 2.45 |
| | 4 | 22.10 | 2.51 | 23.87 | 2.71 | 21.75 | 2.47 |
| | 5 | 22.07 | 2.57 | 23.91 | 2.56 | 21.67 | 2.50 |
| HSPA+ (16QAM) | 1 | 21.64 | 2.50 | 21.67 | 2.59 | 21.67 | 2.41 |

Note: peak-to-average ratio (PAR) <13 dB.

Peak-to-average ratio (PAR)

WCDMA Band II (PART 24E)

Low Channel



Complementary Cumulative Distribution Function (100000 samples)

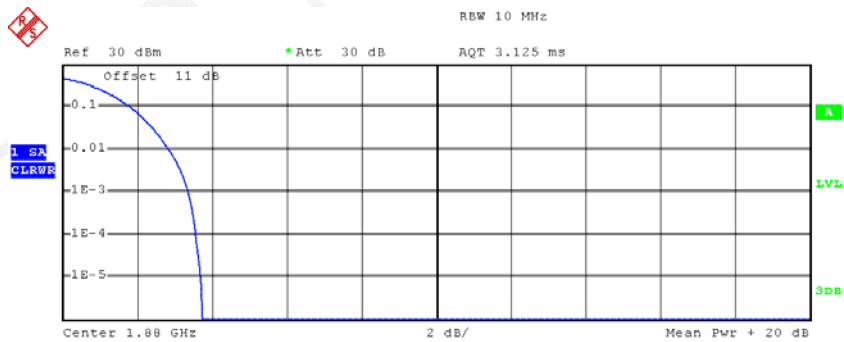
Trace 1

Mean 21.75 dBm
 Peak 25.28 dBm
 Crest 3.53 dB

 10% @ 1.84 dB
 1% @ 2.76 dB
 .1% @ 3.20 dB

Date: 19.SEP.2016 11:41:10

Middle Channel



Complementary Cumulative Distribution Function (100000 samples)

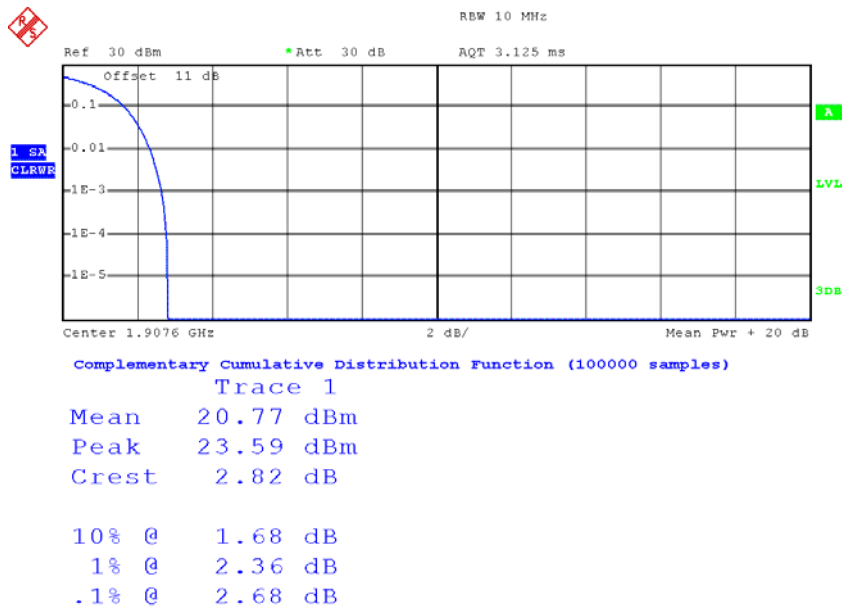
Trace 1

Mean 20.34 dBm
 Peak 24.08 dBm
 Crest 3.74 dB

 10% @ 1.84 dB
 1% @ 2.88 dB
 .1% @ 3.40 dB

Date: 19.SEP.2016 11:40:10

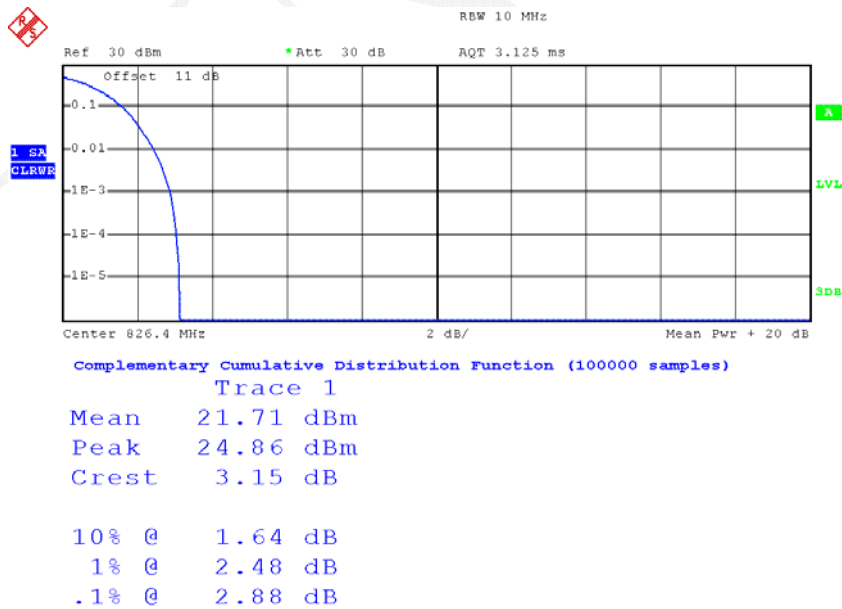
High Channel



Date: 19.SEP.2016 11:38:51

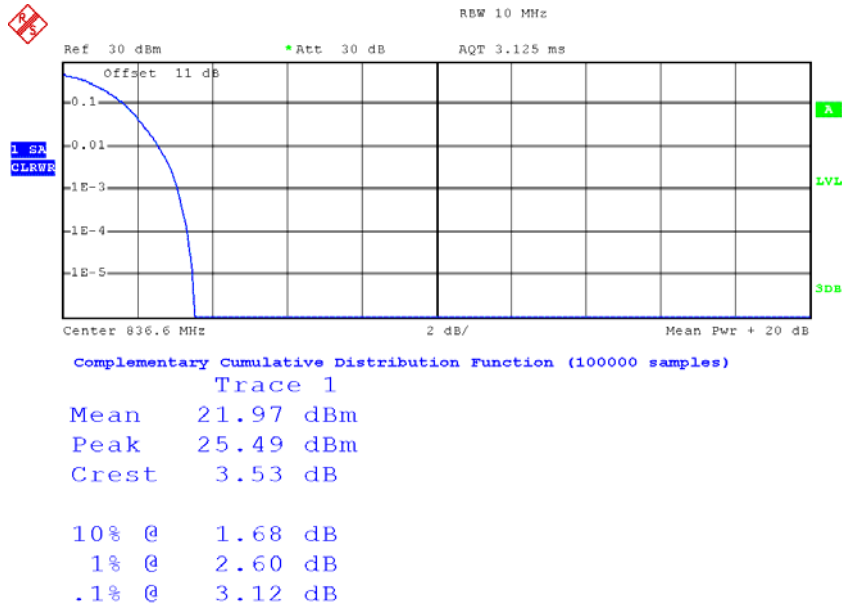
WCDMA Band V (PART 22H)

Low Channel



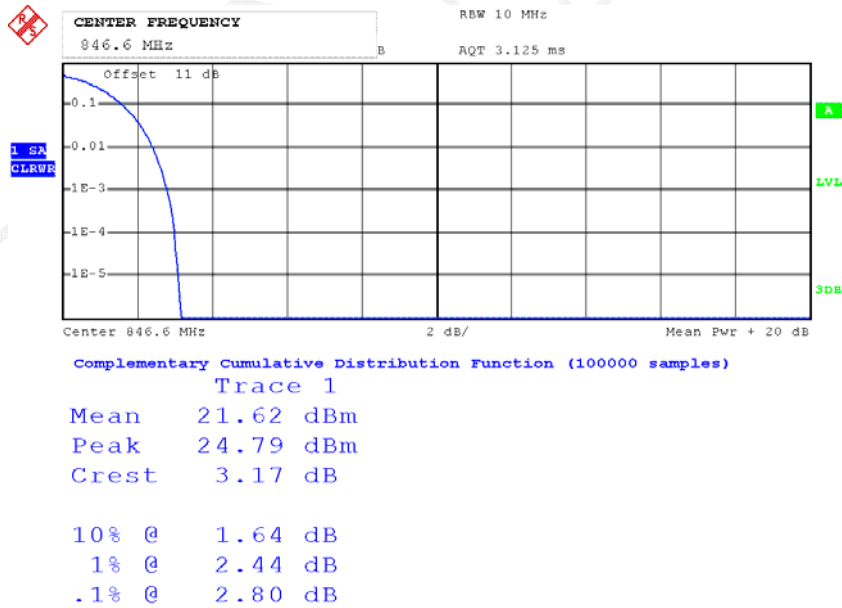
Date: 19.SEP.2016 11:42:45

Middle Channel



Date: 19.SEP.2016 11:43:46

High Channel



Date: 19.SEP.2016 11:44:32

ERP & EIRP

Part 22H

| Frequency (MHz) | Polar (H/V) | Receiver Reading (dBµV) | Substituted Method | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|------------------------------------|-------------|-------------------------|--------------------|------------------------|-----------------|----------------------|-------------|-------------|
| | | | S.G. Level (dBm) | Antenna Gain (dBd/dBi) | Cable Loss (dB) | | | |
| GSM 850_Middle Channel | | | | | | | | |
| 836.600 | H | 91.40 | 16.5 | 0.0 | 1 | 15.5 | 38.5 | 23.0 |
| 836.600 | V | 102.10 | 30.3 | 0.0 | 1 | 29.3 | 38.5 | 9.2 |
| WCDMA Band V_Middle Channel | | | | | | | | |
| 836.600 | H | 80.30 | 5.4 | 0.0 | 1 | 4.4 | 38.5 | 34.1 |
| 836.600 | V | 93.20 | 21.4 | 0.0 | 1 | 20.4 | 38.5 | 18.1 |

Part 24E

| Frequency (MHz) | Polar (H/V) | Receiver Reading (dBµV) | Substituted Method | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|-------------------------------------|-------------|-------------------------|--------------------|------------------------|-----------------|----------------------|-------------|-------------|
| | | | S.G. Level (dBm) | Antenna Gain (dBd/dBi) | Cable Loss (dB) | | | |
| PCS 1900_Middle Channel | | | | | | | | |
| 1880.000 | H | 93.03 | 21.4 | 11.7 | 1.4 | 31.7 | 33.0 | 1.3 |
| 1880.000 | V | 92.95 | 21.5 | 11.7 | 1.4 | 31.8 | 33.0 | 1.2 |
| WCDMA Band II_Middle Channel | | | | | | | | |
| 1880.000 | H | 85.38 | 13.8 | 11.7 | 1.4 | 24.1 | 33.0 | 8.9 |
| 1880.000 | V | 85.67 | 14.2 | 11.7 | 1.4 | 24.5 | 33.0 | 8.5 |

Note:

- 1) The unit of Antenna Gain is dBd for frequency below 1GHz, and the unit of Antenna Gain is dBi for frequency above 1GHz.
- 2) Absolute Level = SG Level - Cable loss + Antenna Gain
- 3) Margin = Limit-Absolute Level

FCC §2.1049, §22.917, §22.905 & §24.238 - OCCUPIED BANDWIDTH

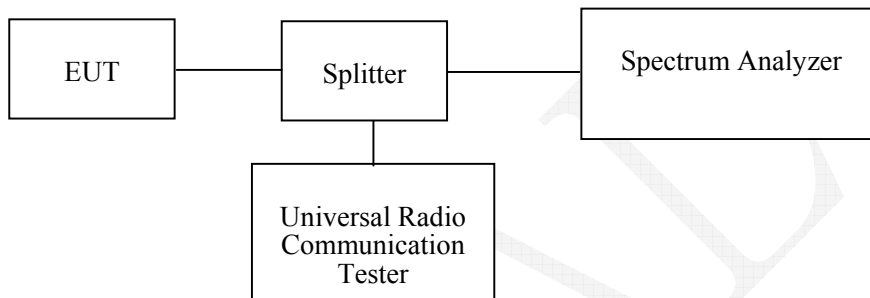
Applicable Standard

FCC §2.1049, §22.917 and §22.905, §24.238.

Test Procedure

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

The 26 dB & 99% bandwidth was recorded.



Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|--------------|--------------------------------------|-------------|---------------|------------------|----------------------|
| R&S | Spectrum Analyzer | FSP 38 | 100478 | 2015-11-23 | 2016-11-22 |
| R&S | Universal Radio Communication Tester | CMU200 | 109 038 | 2016-07-11 | 2017-07-11 |
| E-Microwave | DC Blocking | EMDCB-00036 | 0E01201047 | 2016-05-06 | 2017-05-06 |
| E-Microwave | Attenuator | EMCA10-5RN | OE01203239 | 2016-05-08 | 2017-05-08 |
| Pasternack | RF Coaxial Cable | RF-01 | N/A | 2016-05-06 | 2017-05-06 |
| Pasternack | RF Coaxial Cable | RF-02 | N/A | 2016-05-06 | 2017-05-06 |
| Pasternack | RF Coaxial Cable | RF-03 | N/A | 2016-05-06 | 2017-05-06 |
| N/A | Two-way Splitter | ODP-1-6-2S | OE0120142 | 2016-05-06 | 2017-05-06 |

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

Test Data**Environmental Conditions**

| | |
|---------------------------|-------------------|
| Temperature: | 28 ~ 29.3°C |
| Relative Humidity: | 37 ~ 38 % |
| ATM Pressure: | 100.2 ~ 100.3 kPa |

* The testing was performed by Robin Zheng from 2016-09-17 to 2016-09-18.

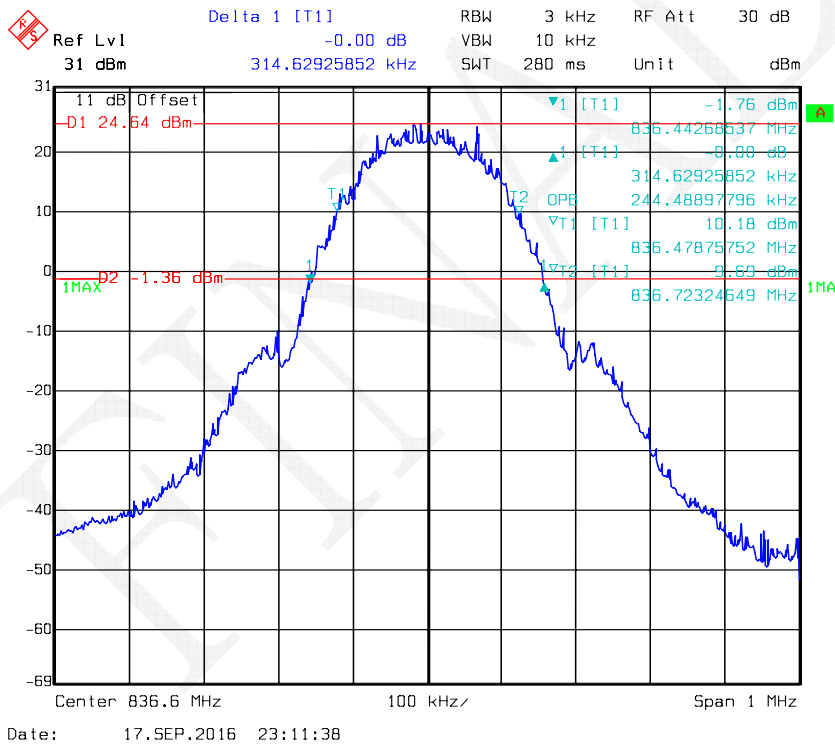
Test Mode: Transmitting

Test Result: Compliant. Please refer to the following table and plots.

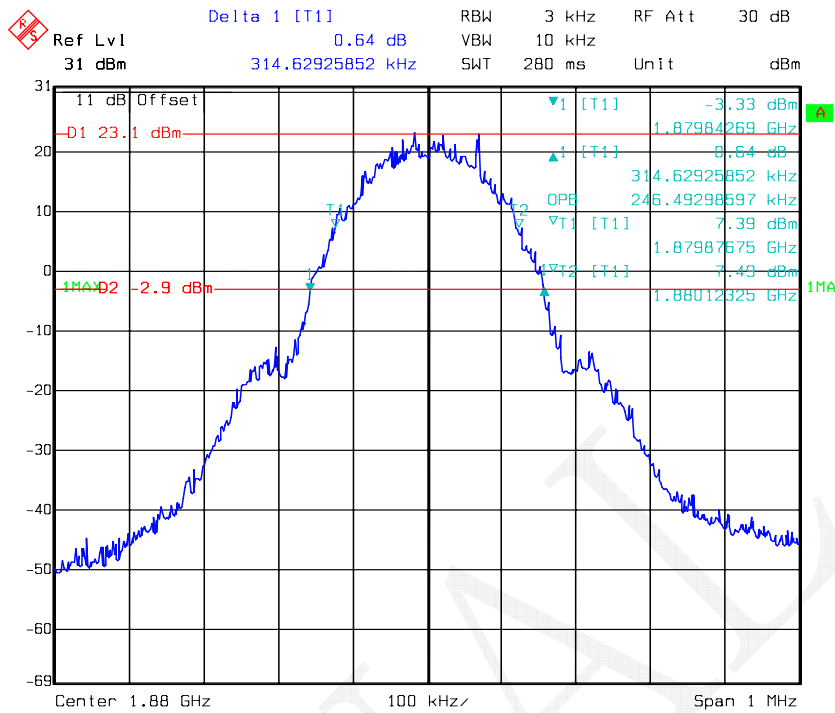
FUNIVAL

| Band | Channel No. | Mode | 99% Occupied Bandwidth | 26 dB Occupied Bandwidth |
|---------------|-------------|--------|------------------------|--------------------------|
| | | | kHz | kHz |
| Cellular | 190 | GSM | 244.49 | 314.63 |
| PCS | 661 | PCS | 246.49 | 314.63 |
| WCDMA Band II | 9400 | Rel 99 | 4088.18 | 4649.29 |
| | 9400 | HSDPA | 4108.22 | 4709.42 |
| | 9400 | HSUPA | 4088.18 | 4669.34 |
| WCDMA Band V | 4183 | Rel 99 | 4088.18 | 4669.34 |
| | 4183 | HSDPA | 4108.22 | 4689.38 |
| | 4183 | HSUPA | 4108.22 | 4689.38 |

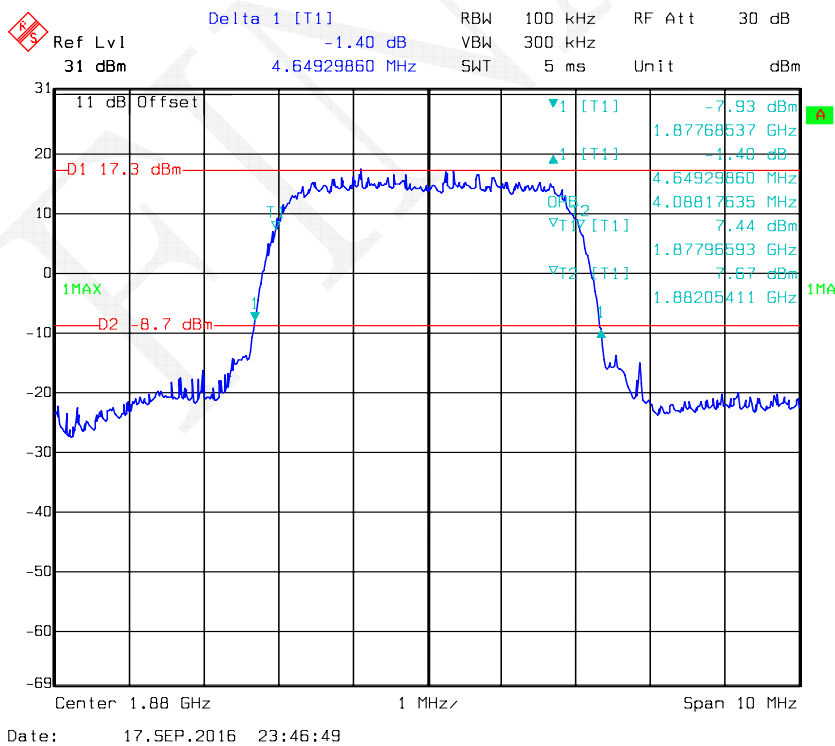
GMSK 850 Cellular Band



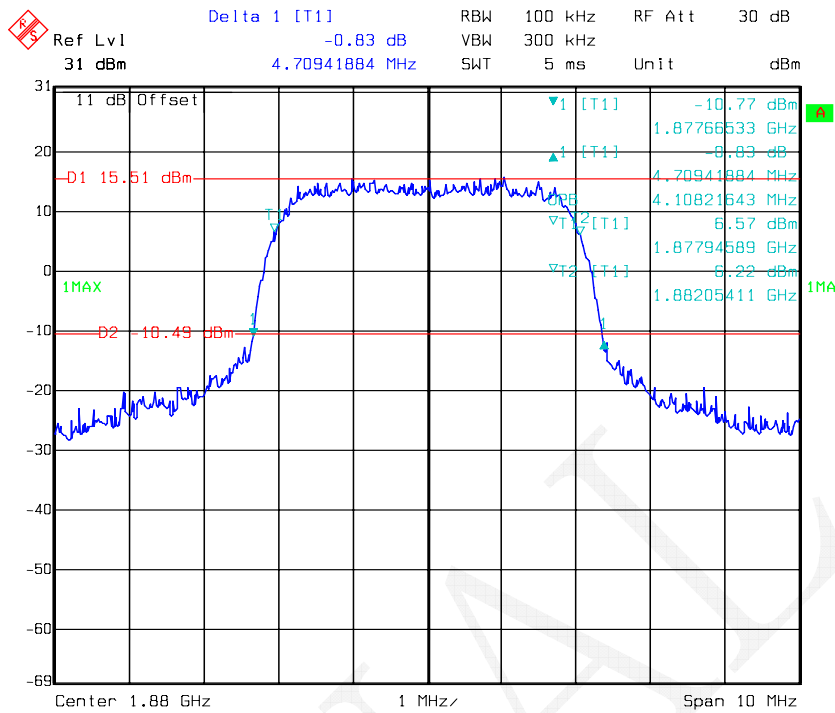
GMSK PCS Band



REL99 Band II

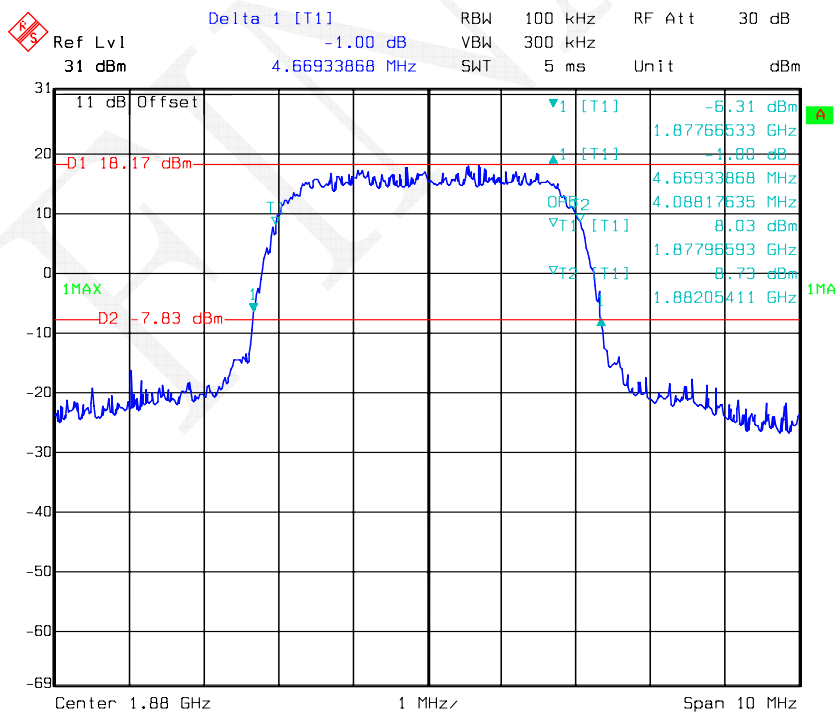


HSDPA Band II



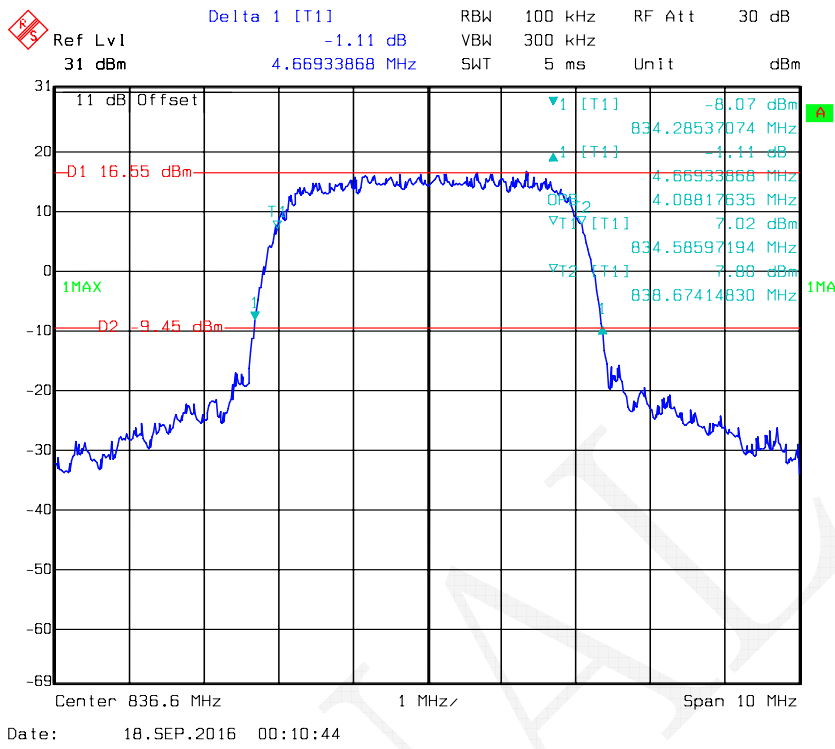
Date: 17.SEP.2016 23:43:23

HSUPA Band II

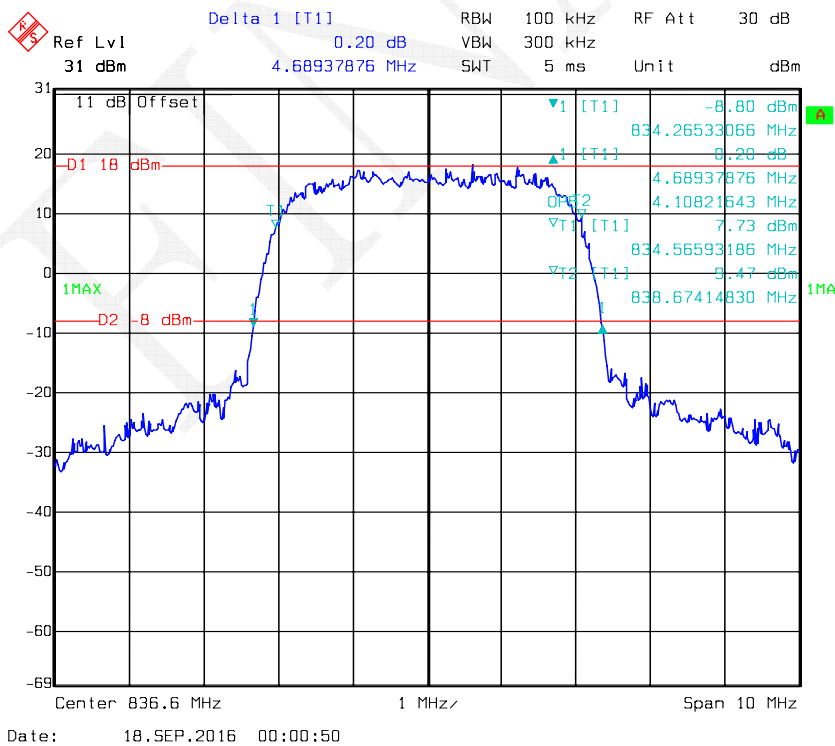


Date: 17.SEP.2016 23:38:18

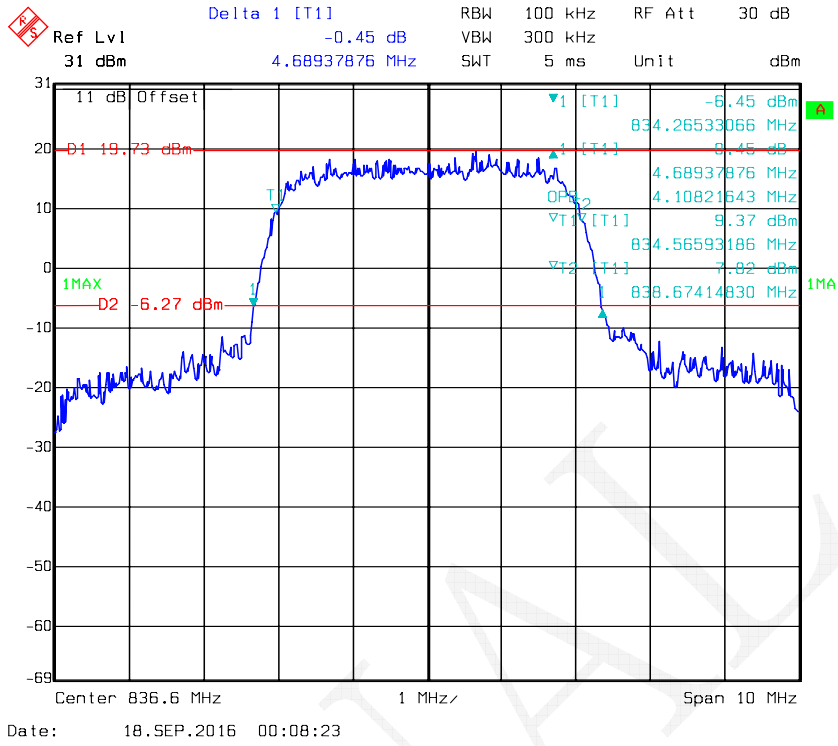
REL99 Band V



HSDPA Band V



HSUPA Band V



FCC §2.1051, §22.917(a) & §24.238(a) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

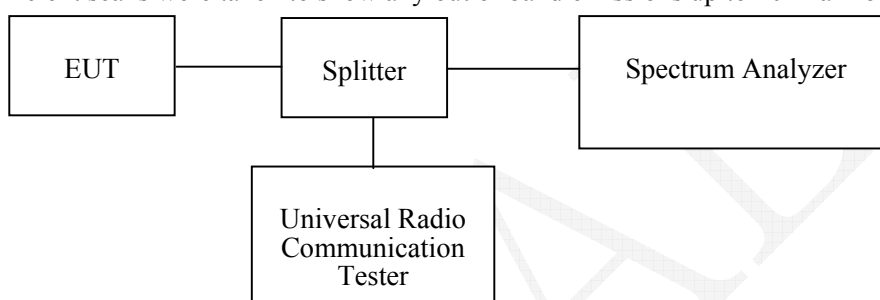
Applicable Standard

FCC §2.1051, §22.917(a) and §24.238(a).

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. 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 |
|--------------|--------------------------------------|-------------|---------------|------------------|----------------------|
| R&S | Spectrum Analyzer | FSP 38 | 100478 | 2015-11-23 | 2016-11-22 |
| R&S | Universal Radio Communication Tester | CMU200 | 109 038 | 2016-07-11 | 2017-07-11 |
| E-Microwave | DC Blocking | EMDCB-00036 | 0E01201047 | 2016-05-06 | 2017-05-06 |
| E-Microwave | Attenuator | EMCA10-5RN | 0E01203239 | 2016-05-08 | 2017-05-08 |
| Pasternack | RF Coaxial Cable | RF-01 | N/A | 2016-05-06 | 2017-05-06 |
| Pasternack | RF Coaxial Cable | RF-02 | N/A | 2016-05-06 | 2017-05-06 |
| Pasternack | RF Coaxial Cable | RF-03 | N/A | 2016-05-06 | 2017-05-06 |
| N/A | Two-way Splitter | ODP-1-6-2S | 0E0120142 | 2016-05-06 | 2017-05-06 |

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

Test Data

Environmental Conditions

| | |
|---------------------------|-----------|
| Temperature: | 29.3°C |
| Relative Humidity: | 37 % |
| ATM Pressure: | 100.2 kPa |

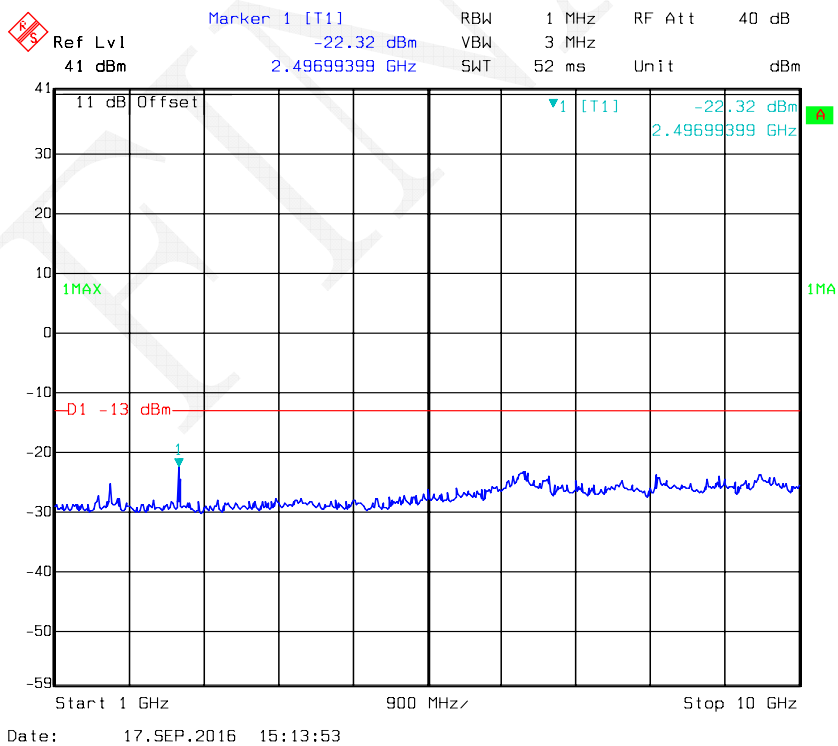
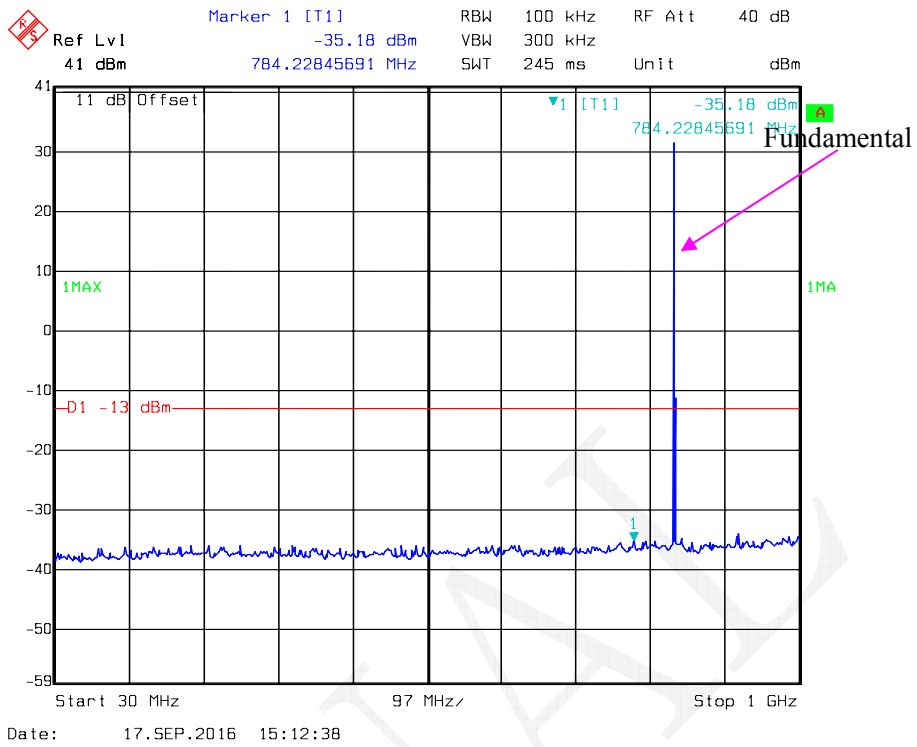
The testing was performed by Robin Zheng on 2016-09-17.

Please refer to the following plots.

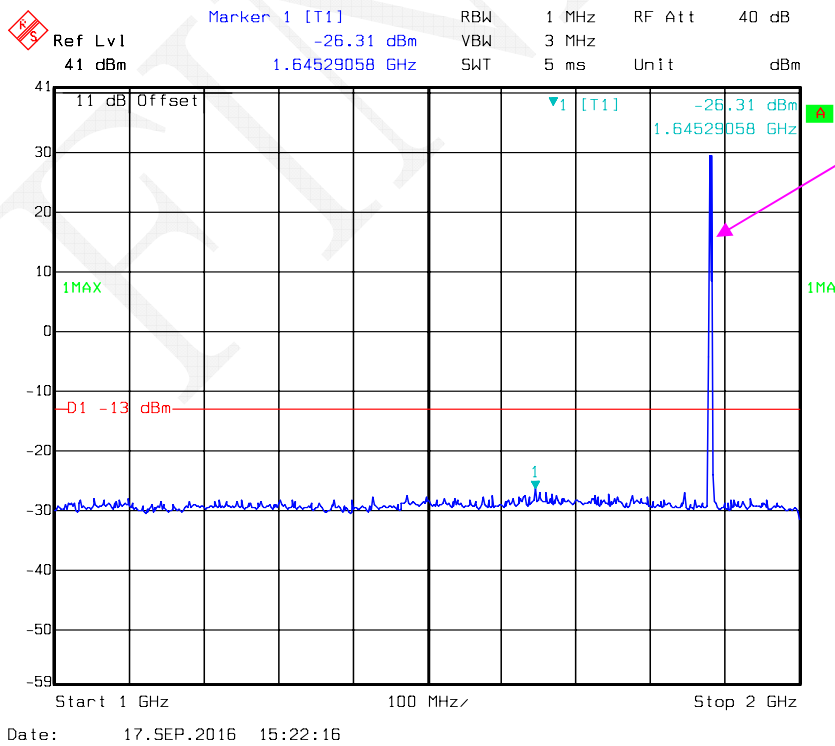
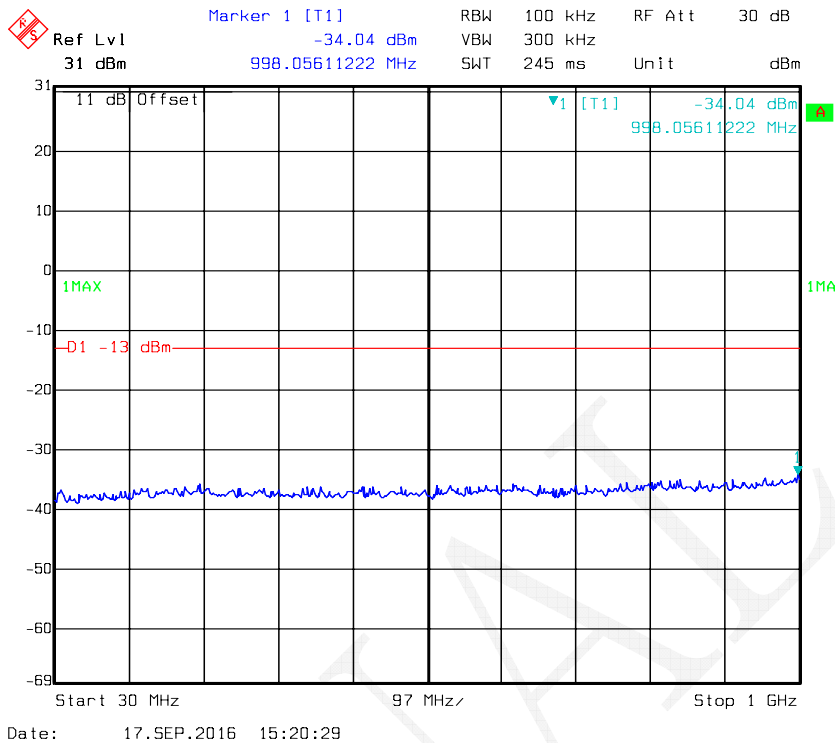
Test Mode: Transmitting.

FUNVAL

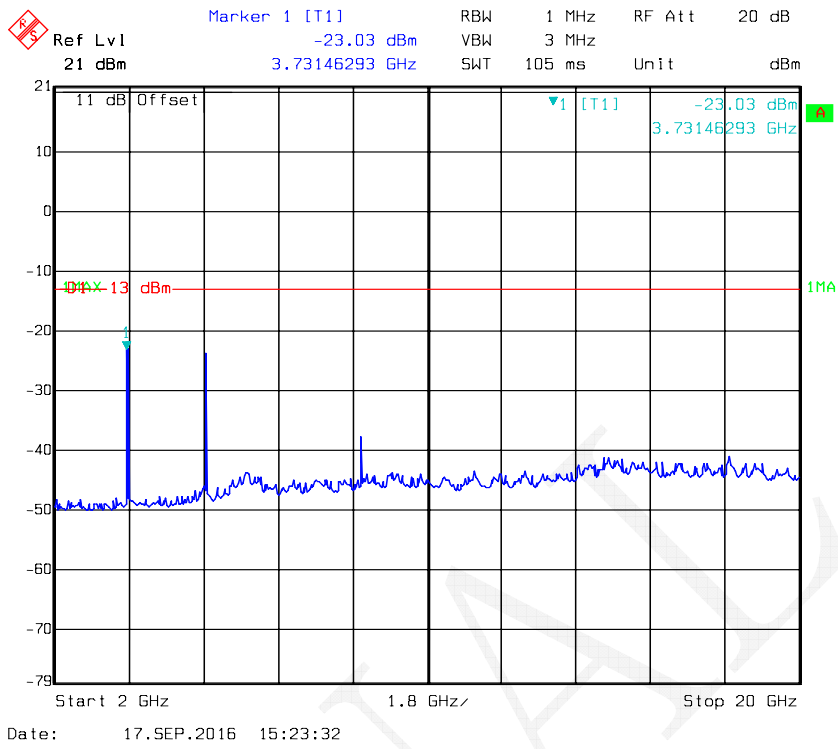
GSM850_Middle Channel



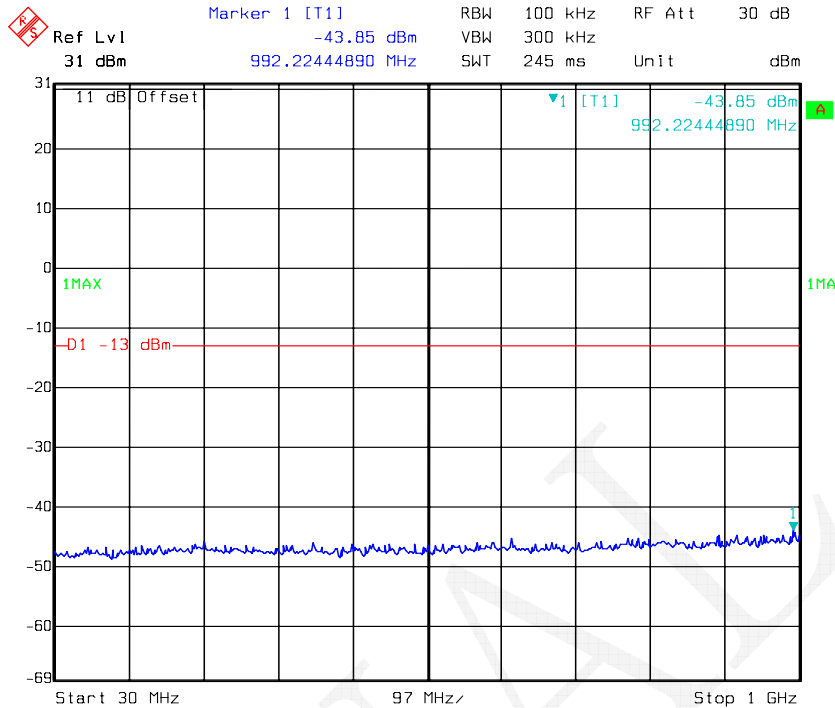
PCS 1900_ Middle Channel



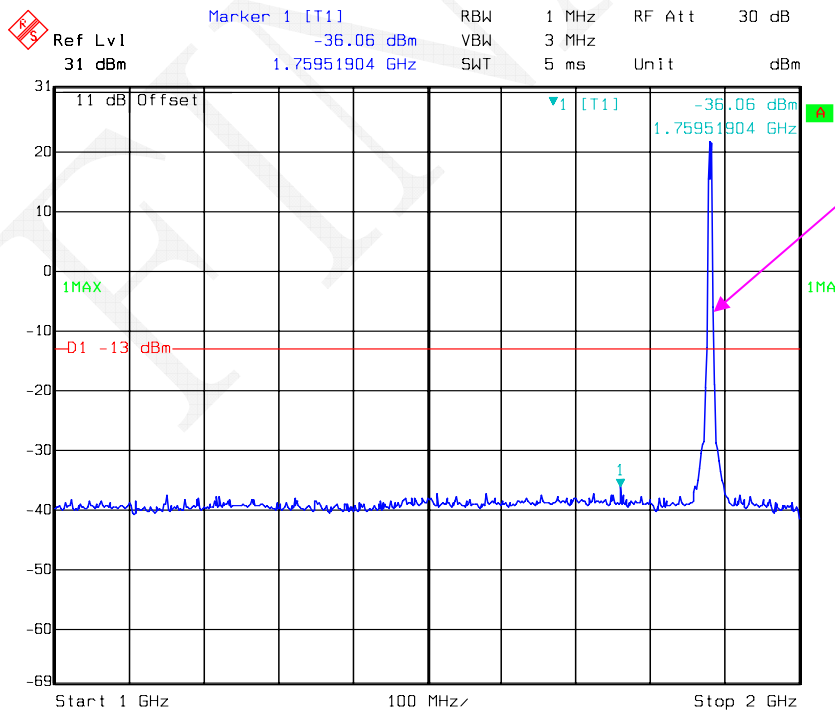
Fundamental



REL99 Band II_ Middle Channel

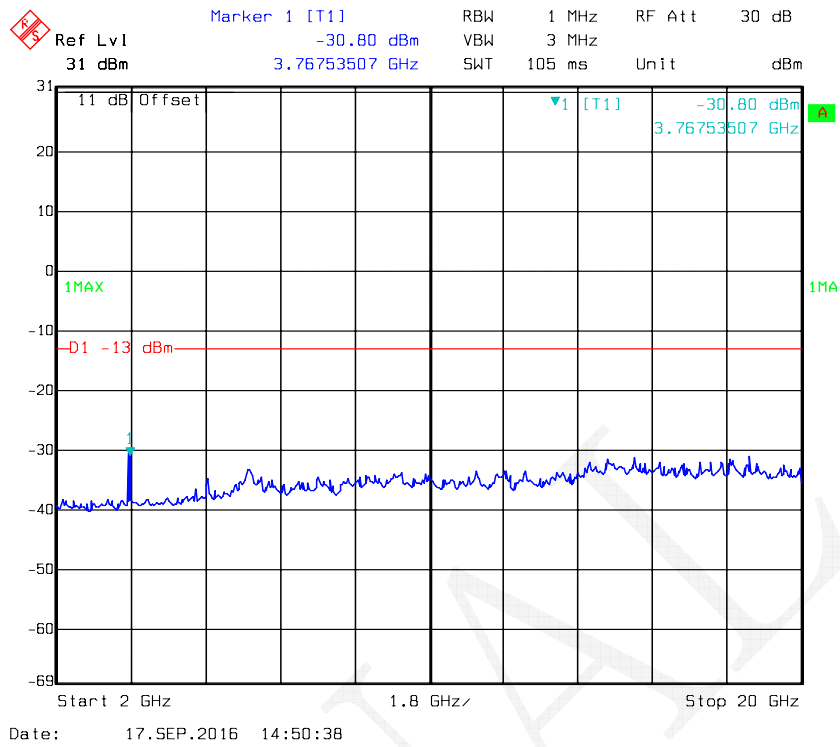


Date: 17.SEP.2016 14:48:37

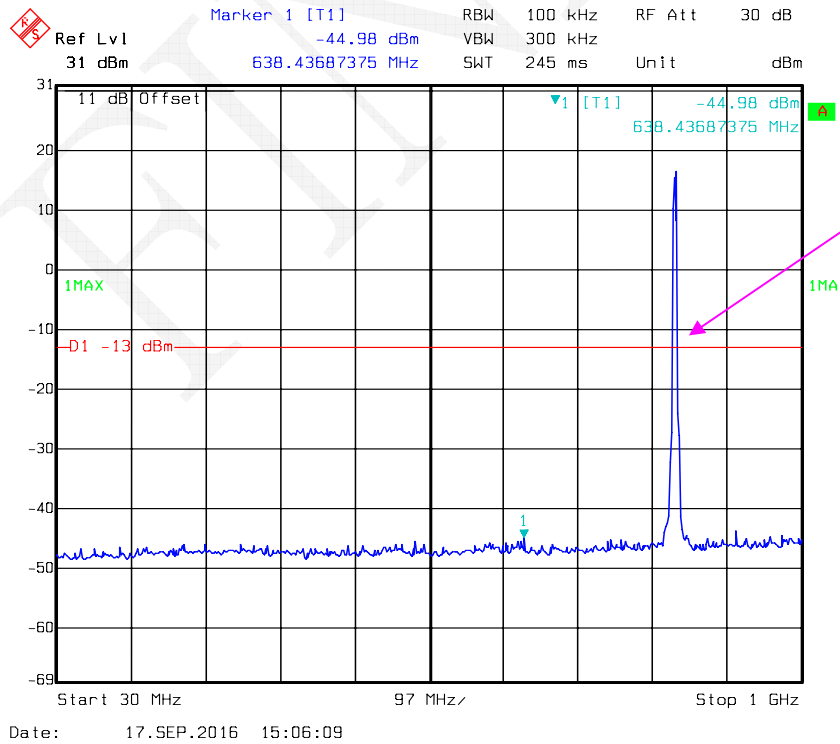


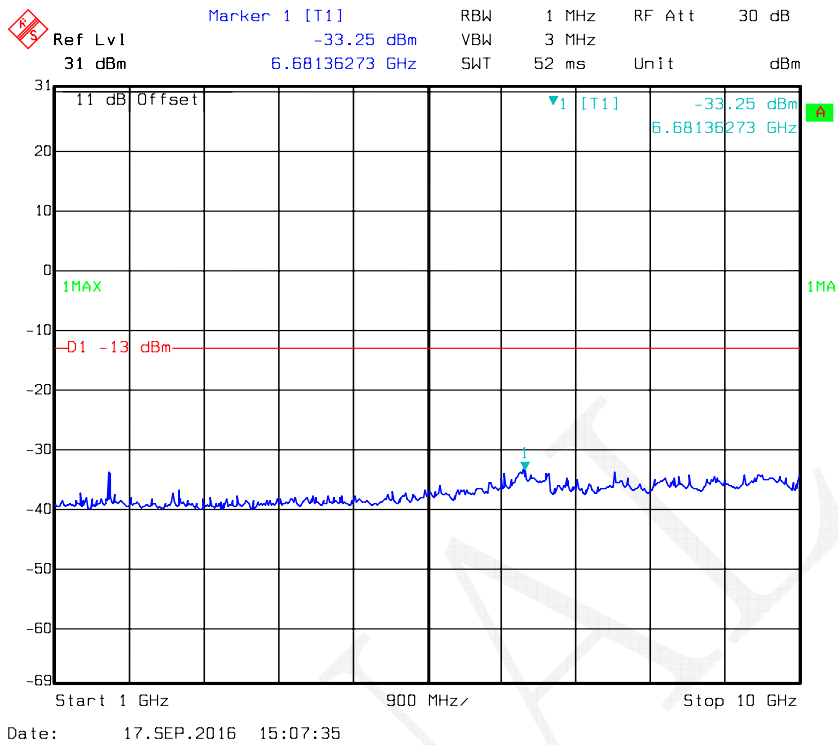
Fundamental

Date: 17.SEP.2016 14:49:47



REL99 Band V_ Middle Channel





FCC §2.1053, §22.917 & §24.238 - SPURIOUS RADIATED EMISSIONS

Applicable Standard

FCC § 2.1053, §22.917 and § 24.238.

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 (TXpwr in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 Log₁₀ (power out in Watts)

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|---------------------|-----------------------------|--------------|----------------------|-------------------------|-----------------------------|
| R&S | EMI Test Receiver | ESCI | 100224 | 2016-09-01 | 2017-09-01 |
| Sunol Sciences | Antenna | JB3 | A060611-1 | 2014-11-06 | 2017-11-05 |
| HP | Amplifier | 8447E | 2434A02181 | 2016-09-01 | 2017-09-01 |
| Agilent | Spectrum Analyzer | E4440A | SG43360054 | 2015-11-23 | 2016-11-22 |
| ETS-Lindgren | Horn Antenna | 3115 | 000 527 35 | 2016-01-05 | 2019-01-04 |
| Mini-Circuit | Amplifier | ZVA-213-S+ | 54201245 | 2016-02-19 | 2017-02-19 |
| Agilent | MXG Vector Signal Generator | N5182B | MY51350142 | 2016-03-30 | 2017-03-29 |
| EMCO | Adjustable Dipole Antenna | 3121C | 9109-753 | N/A | N/A |
| TDK RF | Horn Antenna | HRN-0118 | 130 084 | 2015-09-06 | 2018-09-06 |
| N/A | Coaxial Cable | 14m | N/A | 2016-05-06 | 2017-05-06 |
| N/A | Coaxial Cable | 8m | N/A | 2016-05-06 | 2017-05-06 |

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

Test Data**Environmental Conditions**

| | |
|---------------------------|-----------|
| Temperature: | 29.6 °C |
| Relative Humidity: | 52 % |
| ATM Pressure: | 100.2 kPa |

The testing was performed by Robin Zheng on 2016-09-13.

EUT Operation Mode: Transmitting (GMSK & REL99 are the worst case)

Cellular Band GMSK (PART 22H)**30 MHz-10 GHz:**

| Frequency (MHz) | Polar (H/V) | Receiver Reading (dBμV) | Substituted Method | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------------------|-------------|-------------------------|--------------------|------------------------|-----------------|----------------------|-------------|-------------|
| | | | S.G. Level (dBm) | Antenna Gain (dBd/dBi) | Cable Loss (dB) | | | |
| Frequency: 836.6 MHz | | | | | | | | |
| 1673.200 | H | 57.54 | -43.5 | 10.6 | 1.5 | -34.4 | -13.0 | 21.4 |
| 1673.200 | V | 63.08 | -38.3 | 10.6 | 1.5 | -29.2 | -13.0 | 16.2 |
| 2509.800 | H | 46.33 | -51.7 | 13.1 | 2.8 | -41.4 | -13.0 | 28.4 |
| 2509.800 | V | 46.08 | -51 | 13.1 | 2.8 | -40.7 | -13.0 | 27.7 |
| 3346.400 | H | 41.61 | -55.8 | 13.8 | 1.7 | -43.7 | -13.0 | 30.7 |
| 3346.400 | V | 42.64 | -54.5 | 13.8 | 1.7 | -42.4 | -13.0 | 29.4 |
| 322.500 | H | 32.14 | -72.6 | 0.0 | 0.5 | -73.1 | -13.0 | 60.1 |
| 325.500 | V | 31.27 | -70.6 | 0.0 | 0.5 | -71.1 | -13.0 | 58.1 |

WCDMA Band V REL99 (PART 22H)

| Frequency (MHz) | Polar (H/V) | Receiver Reading (dBμV) | Substituted Method | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------------------|-------------|-------------------------|--------------------|------------------------|-----------------|----------------------|-------------|-------------|
| | | | S.G. Level (dBm) | Antenna Gain (dBd/dBi) | Cable Loss (dB) | | | |
| Frequency: 836.6 MHz | | | | | | | | |
| 1673.200 | H | 36.03 | -65 | 10.6 | 1.5 | -55.9 | -13.0 | 42.9 |
| 1673.200 | V | 42.27 | -59.1 | 10.6 | 1.5 | -50.0 | -13.0 | 37.0 |
| 2509.800 | H | 34.04 | -64 | 13.1 | 2.8 | -53.7 | -13.0 | 40.7 |
| 2509.800 | V | 34.15 | -62.9 | 13.1 | 2.8 | -52.6 | -13.0 | 39.6 |
| 322.500 | H | 32.57 | -72.1 | 0.0 | 0.5 | -72.6 | -13.0 | 59.6 |
| 325.500 | V | 31.23 | -70.6 | 0.0 | 0.5 | -71.1 | -13.0 | 58.1 |

PCS Band GMSK (PART 24E)**30 MHz-20 GHz:**

| Frequency (MHz) | Polar (H/V) | Receiver Reading (dB μ V) | Substituted Method | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|----------------------------|-------------|-------------------------------|--------------------|------------------------|-----------------|----------------------|-------------|-------------|
| | | | S.G. Level (dBm) | Antenna Gain (dBd/dBi) | Cable Loss (dB) | | | |
| Frequency: 1880 MHz | | | | | | | | |
| 3760.000 | H | 49.36 | -44.9 | 13.8 | 2.9 | -34.0 | -13.0 | 21.0 |
| 3760.000 | V | 47.95 | -45.1 | 13.8 | 2.9 | -34.2 | -13.0 | 21.2 |
| 5640.000 | H | 56.14 | -35.6 | 14.0 | 2.1 | -23.7 | -13.0 | 10.7 |
| 5640.000 | V | 55.64 | -36 | 14.0 | 2.1 | -24.1 | -13.0 | 11.1 |
| 7520.000 | H | 42.21 | -45.4 | 13.2 | 2.9 | -35.1 | -13.0 | 22.1 |
| 7520.000 | V | 41.14 | -46.3 | 13.2 | 2.9 | -36.0 | -13.0 | 23.0 |
| 9400.000 | H | 40.24 | -43.1 | 13.3 | 3.5 | -33.3 | -13.0 | 20.3 |
| 9400.000 | V | 40.91 | -41.4 | 13.3 | 3.5 | -31.6 | -13.0 | 18.6 |
| 322.500 | H | 32.08 | -72.6 | 0.0 | 0.5 | -73.1 | -13.0 | 60.1 |
| 325.500 | V | 32.35 | -69.5 | 0.0 | 0.5 | -70.0 | -13.0 | 57.0 |

WCDMA Band II REL99 (PART 24E)

| Frequency (MHz) | Polar (H/V) | Receiver Reading (dB μ V) | Substituted Method | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|----------------------------|-------------|-------------------------------|--------------------|------------------------|-----------------|----------------------|-------------|-------------|
| | | | S.G. Level (dBm) | Antenna Gain (dBd/dBi) | Cable Loss (dB) | | | |
| Frequency: 1880 MHz | | | | | | | | |
| 3760.000 | H | 51.79 | -42.5 | 13.8 | 2.9 | -31.6 | -13.0 | 18.6 |
| 3760.000 | V | 53.42 | -39.6 | 13.8 | 2.9 | -28.7 | -13.0 | 15.7 |
| 5640.000 | H | 50.12 | -41.6 | 14.0 | 2.1 | -29.7 | -13.0 | 16.7 |
| 5640.000 | V | 48.01 | -43.7 | 14.0 | 2.1 | -31.8 | -13.0 | 18.8 |
| 7520.000 | H | 33.50 | -54.1 | 13.2 | 2.9 | -43.8 | -13.0 | 30.8 |
| 7520.000 | V | 33.20 | -54.3 | 13.2 | 2.9 | -44.0 | -13.0 | 31.0 |
| 322.500 | H | 32.38 | -72.3 | 0.0 | 0.5 | -72.8 | -13.0 | 59.8 |
| 325.500 | V | 31.05 | -70.8 | 0.0 | 0.5 | -71.3 | -13.0 | 58.3 |

Note:

- 1) The unit of Antenna Gain is dBd for frequency below 1GHz, and the unit of Antenna Gain is dBi for frequency above 1GHz.
- 2) Absolute Level = SG Level - Cable loss + Antenna Gain
- 3) Margin = Limit - Absolute Level

FCC §22.917(a) & §24.238(a) - BAND EDGES

Applicable Standard

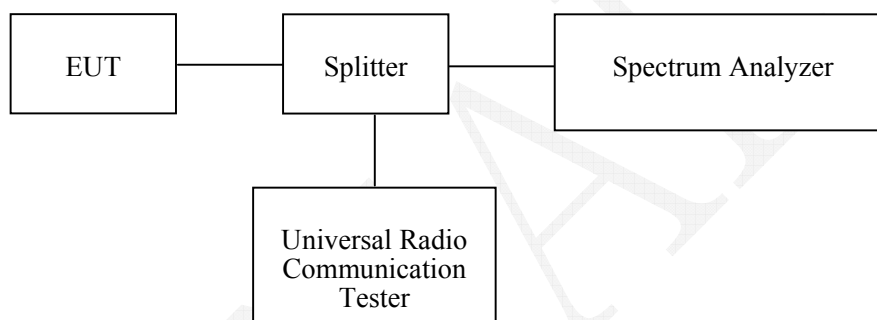
According to § 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to §24.238(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.

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 |
|--------------|--------------------------------------|-------------|---------------|------------------|----------------------|
| R&S | Spectrum Analyzer | FSP 38 | 100478 | 2015-11-23 | 2016-11-22 |
| R&S | Universal Radio Communication Tester | CMU200 | 109 038 | 2016-07-11 | 2017-07-11 |
| E-Microwave | DC Blocking | EMDCB-00036 | 0E01201047 | 2016-05-06 | 2017-05-06 |
| E-Microwave | Attenuator | EMCA10-5RN | 0E01203239 | 2016-05-08 | 2017-05-08 |
| Pasternack | RF Coaxial Cable | RF-01 | N/A | 2016-05-06 | 2017-05-06 |
| Pasternack | RF Coaxial Cable | RF-02 | N/A | 2016-05-06 | 2017-05-06 |
| Pasternack | RF Coaxial Cable | RF-03 | N/A | 2016-05-06 | 2017-05-06 |
| N/A | Two-way Splitter | ODP-1-6-2S | 0E0120142 | 2016-05-06 | 2017-05-06 |

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

Test Data**Environmental Conditions**

| | |
|---------------------------|-----------|
| Temperature: | 29.3°C |
| Relative Humidity: | 37 % |
| ATM Pressure: | 100.2 kPa |

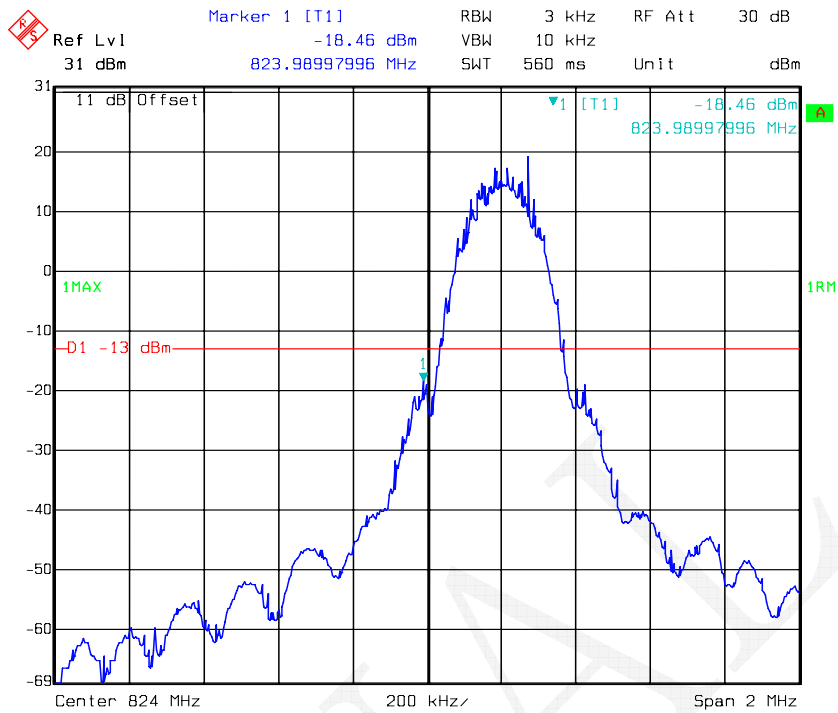
** The testing was performed by Robin Zheng on 2016-09-17.*

Test Mode: Transmitting

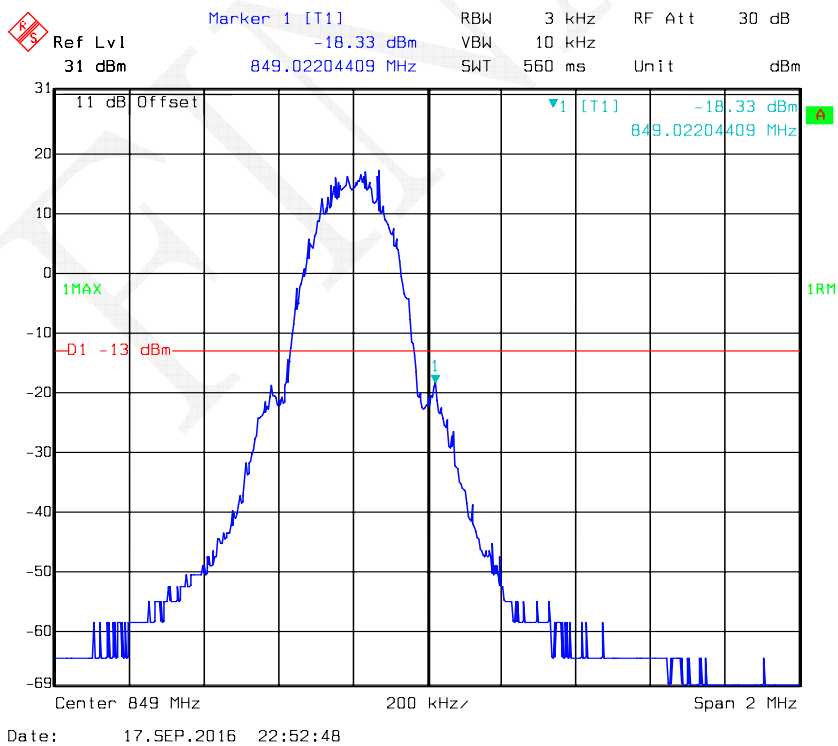
Test Result: Compliant. Please refer to the following plots.

FUNVAL

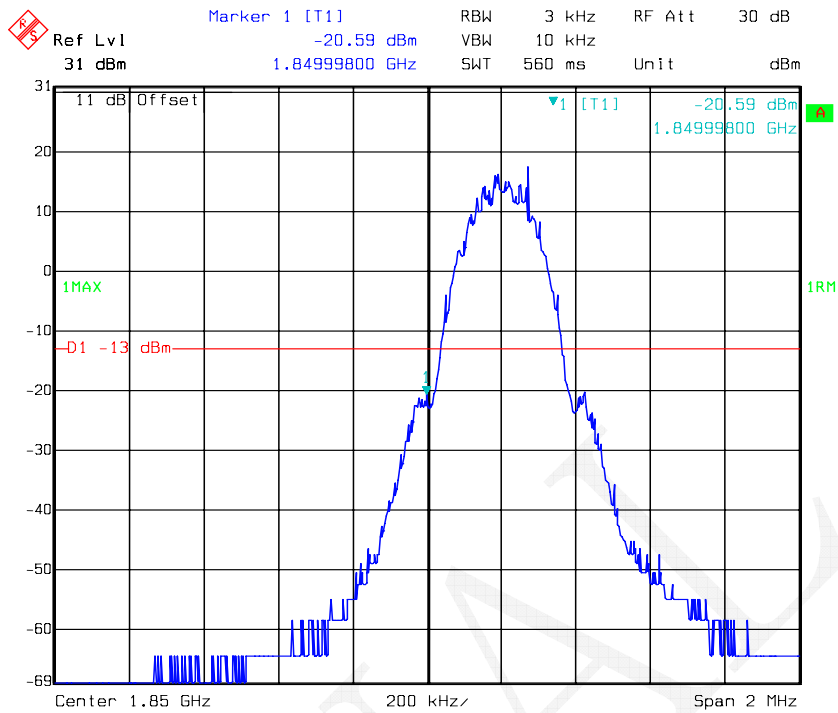
GSM 850, Left Band Edge



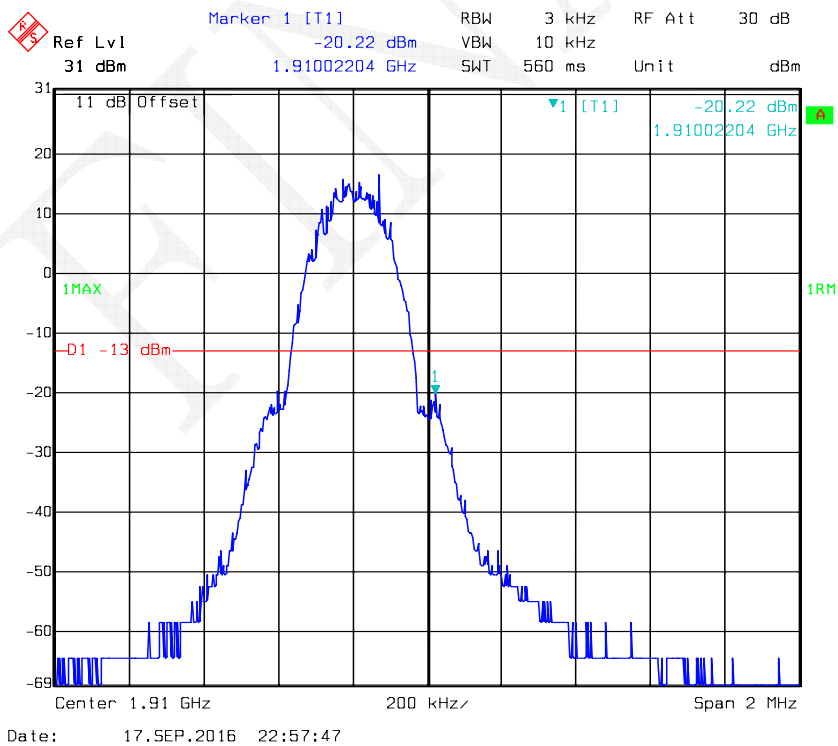
GSM 850, Right Band Edge



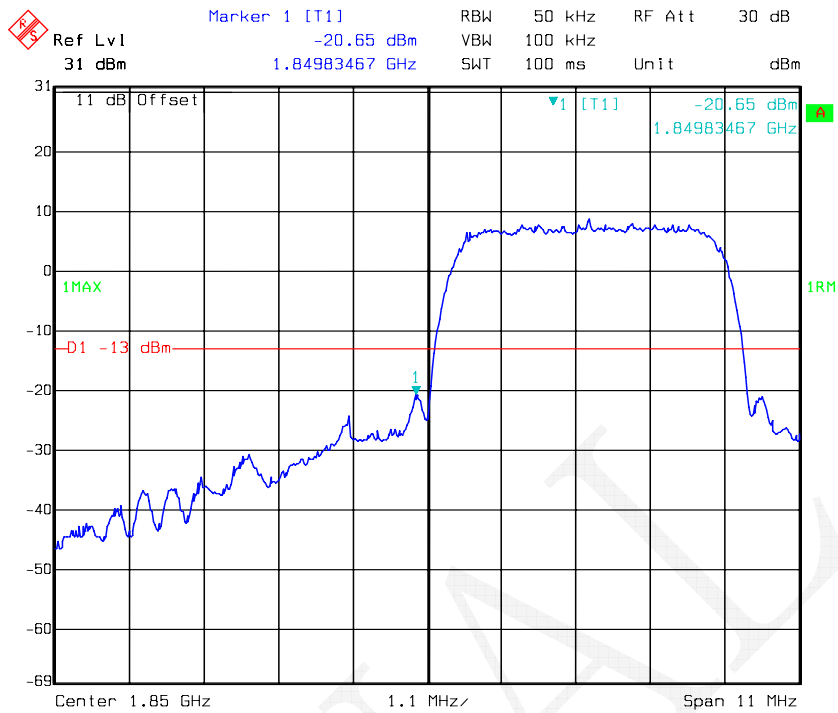
PCS 1900, Left Band Edge



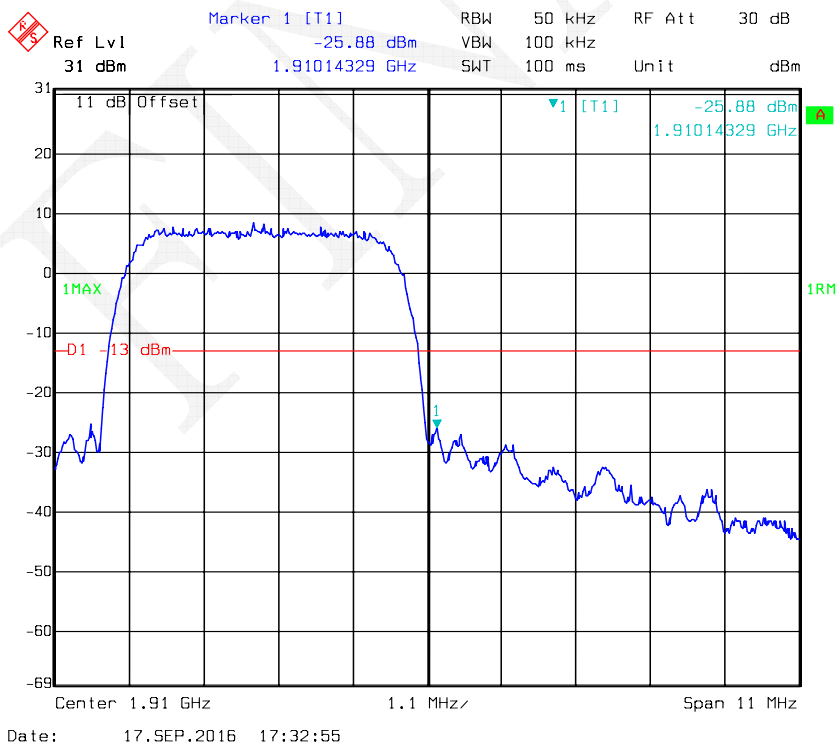
PCS 1900, Right Band Edge



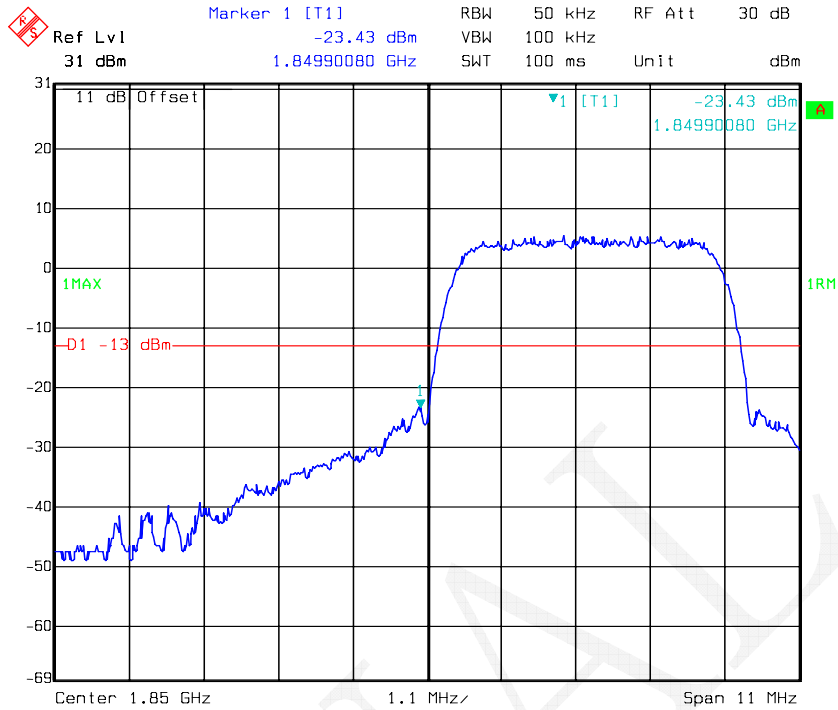
REL99 Band II, Left Band Edge



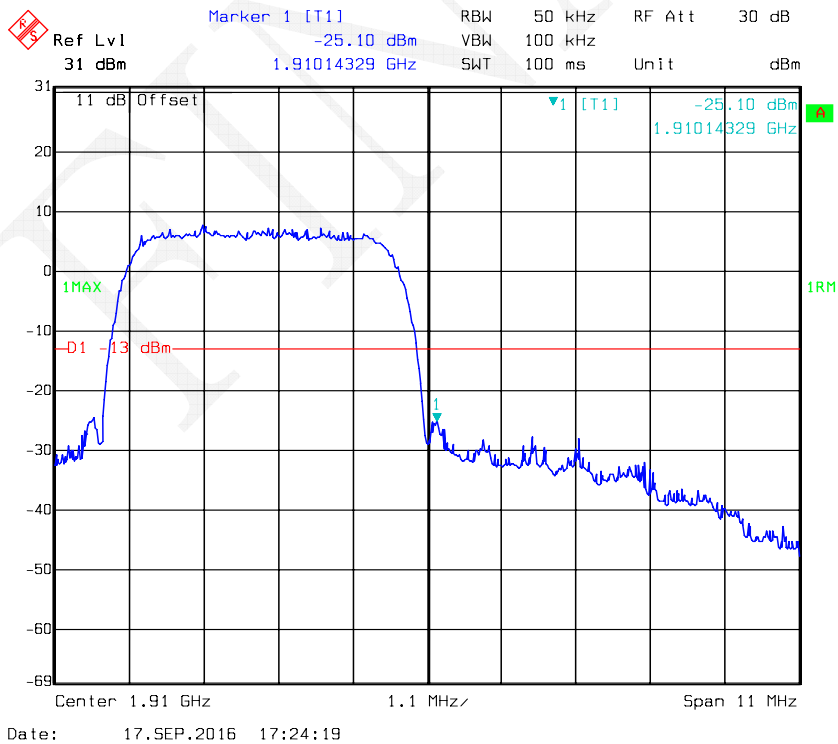
REL99 Band II, Right Band Edge



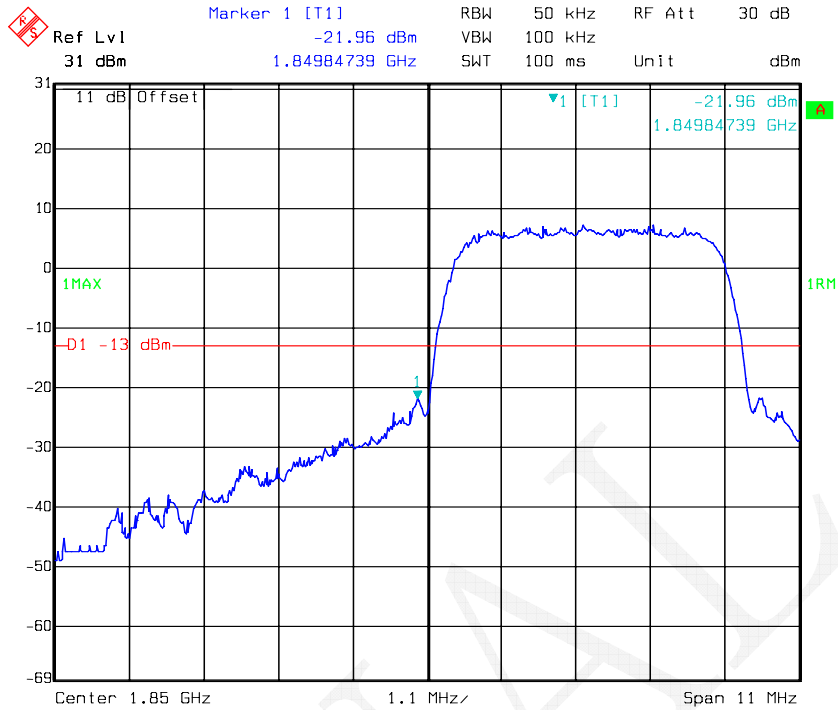
HSDPA Band II, Left Band Edge



HSDPA Band II, Right Band Edge



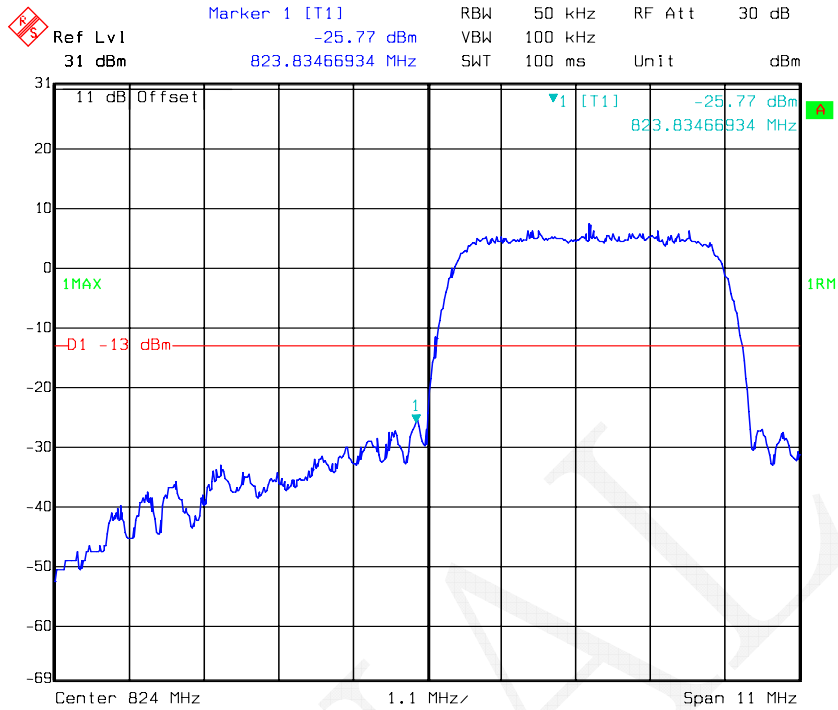
HSUPA Band II, Left Band Edge



HSUPA Band II, Right Band Edge



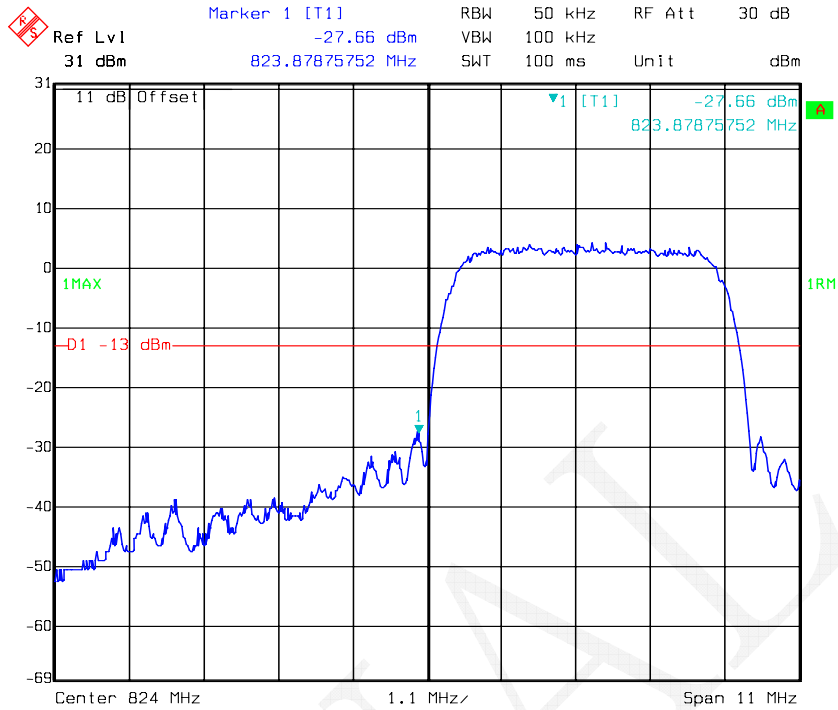
REL99 Band V, Left Band Edge



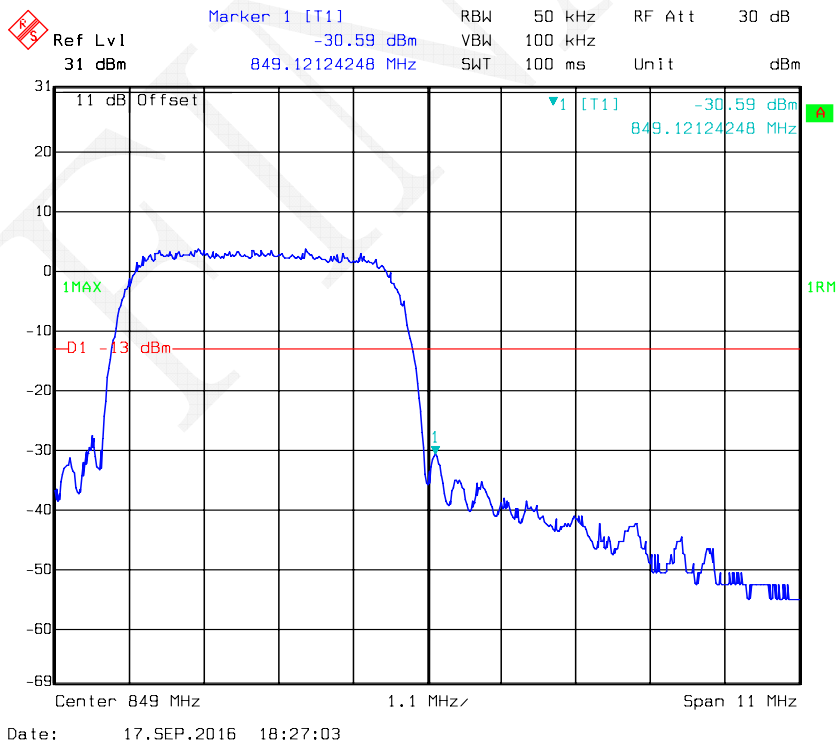
REL99 Band V Right Band Edge



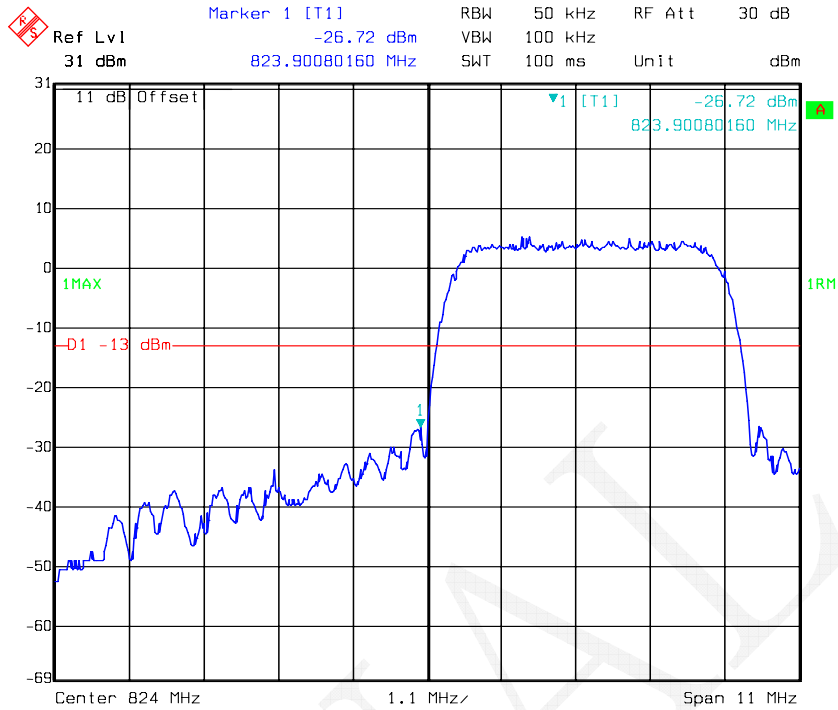
HSDPA Band V, Left Band Edge



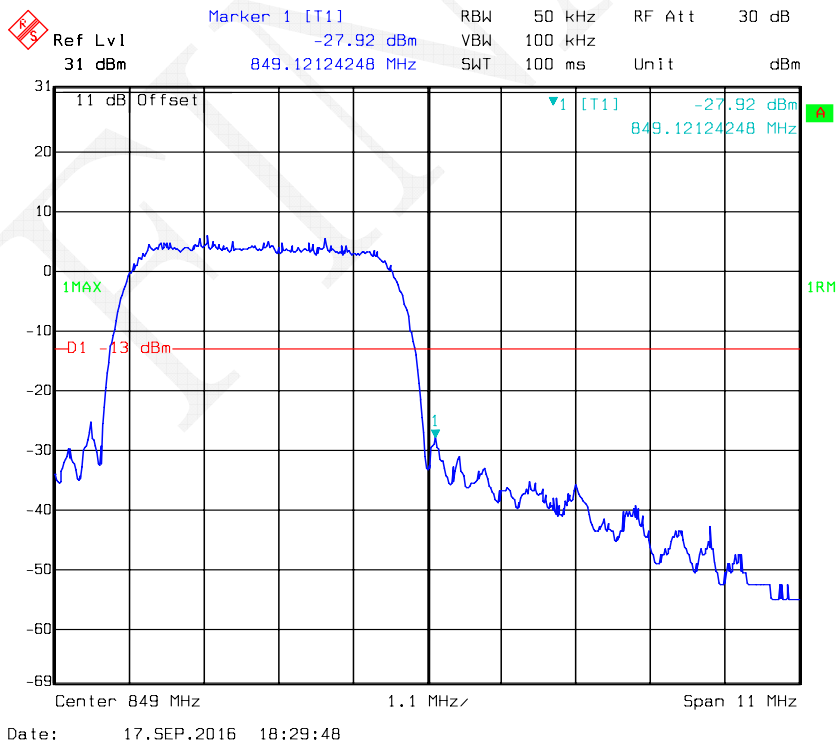
HSDPA Band V, Right Band Edge



HSUPA Band V, Left Band Edge



HSUPA Band V, Right Band Edge



FCC §2.1055, §22.355 & §24.235 - FREQUENCY STABILITY

Applicable Standard

FCC § 2.1055 (a), § 2.1055 (d), §22.355, §24.235

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:

Frequency Tolerance for Transmitters in the Public Mobile Services

| Frequency Range (MHz) | Base, fixed (ppm) | Mobile > 3 watts (ppm) | Mobile ≤ 3 watts (ppm) |
|-----------------------|-------------------|------------------------|------------------------|
| 25 to 50 | 20.0 | 20.0 | 50.0 |
| 50 to 450 | 5.0 | 5.0 | 50.0 |
| 450 to 512 | 2.5 | 5.0 | 5.0 |
| 821 to 896 | 1.5 | 2.5 | 2.5 |
| 928 to 929. | 5.0 | N/A | N/A |
| 929 to 960. | 1.5 | N/A | N/A |
| 2110 to 2220 | 10.0 | N/A | N/A |

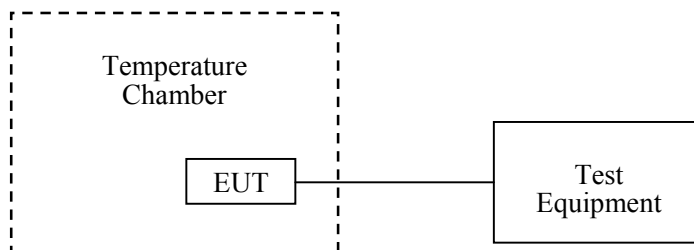
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

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: An external variable DC power supply was connected to the battery terminals of the equipment under test. The voltage was set from 85% to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the battery end point. The output frequency was recorded for each battery voltage.



Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|--------------|--------------------------------------|-------------|---------------|------------------|----------------------|
| Dongzhixu | High Temperature Test Chamber | DP1000 | 201105083-3 | 2016-09-10 | 2017-09-09 |
| R&S | Universal Radio Communication Tester | CMU200 | 109 038 | 2016-07-11 | 2017-07-11 |
| E-Microwave | DC Blocking | EMDCB-00036 | 0E01201047 | 2016-05-06 | 2017-05-06 |
| E-Microwave | Attenuator | EMCA10-5RN | OE01203239 | 2016-05-08 | 2017-05-08 |
| Pasternack | RF Coaxial Cable | RF-03 | N/A | 2016-05-06 | 2017-05-06 |
| UNI-T | Multimeter | UT39A | M130199938 | 2016-04-10 | 2017-04-10 |

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

Test Data

Environmental Conditions

| | |
|---------------------------|-----------|
| Temperature: | 29.3°C |
| Relative Humidity: | 37 % |
| ATM Pressure: | 100.2 kPa |

* *The testing was performed by Robin Zheng on 2016-09-17.*

Cellular Band (Part 22H)

| GMSK, Middle Channel, $f_c = 836.6$ MHz | | | | |
|---|-----------------|-----------------|-----------------|-------|
| Temperature | Voltage | Frequency Error | Frequency Error | Limit |
| °C | V _{DC} | Hz | ppm | ppm |
| -30 | 3.7 | -3 | -0.004 | 2.5 |
| -20 | | -5 | -0.006 | |
| -10 | | -1 | -0.001 | |
| 0 | | -2 | -0.002 | |
| 10 | | -4 | -0.005 | |
| 20 | | -2 | -0.002 | |
| 30 | | -3 | -0.004 | |
| 40 | | 1 | 0.001 | |
| 50 | | -7 | -0.008 | |
| 25 | | 3.5 | -1 | |
| | 4.2 | -2 | -0.002 | |

WCDMA Band V: Re199

| Middle Channel, $f_c = 836.6$ MHz | | | | |
|-----------------------------------|-----------------|-----------------|-----------------|-------|
| Temperature | Voltage | Frequency Error | Frequency Error | Limit |
| °C | V _{DC} | Hz | ppm | ppm |
| -30 | 3.7 | 3 | 0.004 | 2.5 |
| -20 | | 2 | 0.002 | |
| -10 | | -2 | -0.002 | |
| 0 | | -1 | -0.001 | |
| 10 | | -2 | -0.002 | |
| 20 | | 1 | 0.001 | |
| 30 | | 5 | 0.006 | |
| 40 | | -3 | -0.004 | |
| 50 | | 4 | 0.005 | |
| 25 | | 3.5 | -2 | |
| | 4.2 | 2 | 0.002 | |

PCS Band (Part 24E)

| GMSK, Middle Channel, $f_c = 1880.0$ MHz | | | | |
|--|-----------------|-----------------|-----------------|------------|
| Temperature | Voltage | Frequency Error | Frequency Error | Result |
| °C | V _{DC} | Hz | ppm | |
| -30 | 3.7 | 6 | 0.003 | Compliance |
| -20 | | 4 | 0.002 | |
| -10 | | 5 | 0.003 | |
| 0 | | 7 | 0.004 | |
| 10 | | 8 | 0.004 | |
| 20 | | 5 | 0.003 | |
| 30 | | 9 | 0.005 | |
| 40 | | 3 | 0.002 | |
| 50 | | 5 | 0.003 | |
| 25 | 3.5 | 4 | 0.002 | |
| | 4.2 | 7 | 0.004 | |

WCDMA Band II: Re199

| Middle Channel, $f_c = 1880.0$ MHz | | | | |
|------------------------------------|-----------------|-----------------|-----------------|------------|
| Temperature | Voltage | Frequency Error | Frequency Error | Result |
| °C | V _{DC} | Hz | ppm | |
| -30 | 3.7 | -1 | -0.001 | Compliance |
| -20 | | 5 | 0.003 | |
| -10 | | 3 | 0.002 | |
| 0 | | 6 | 0.003 | |
| 10 | | 4 | 0.002 | |
| 20 | | 1 | 0.001 | |
| 30 | | 2 | 0.001 | |
| 40 | | 3 | 0.002 | |
| 50 | | 4 | 0.002 | |
| 25 | | 3.5 | -1 | |
| | 4.2 | 2 | 0.001 | |

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