



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

For

**G'FIVE MOBILE INTERNATIONAL (HK) LTD**

P.O.Box 957, Offshore Incorporations Centre, Tortola, British Virgin Islands, British, United Kingdom

**FCC ID: 2ACTQPRESIDENTA97**

<b>Report Type:</b> Original Report	<b>Product Type:</b> GFIVE President A97
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<b>Report Number:</b>	RDG150316001-00C
<b>Report Date:</b>	2015-04-10
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## **TABLE OF CONTENTS**

<b>GENERAL INFORMATION.....</b>	<b>4</b>
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) .....	4
OBJECTIVE .....	4
RELATED SUBMITTAL(S)/GRANT(S).....	4
TEST METHODOLOGY .....	4
TEST FACILITY .....	5
<b>SYSTEM TEST CONFIGURATION.....</b>	<b>6</b>
JUSTIFICATION .....	6
EQUIPMENT MODIFICATIONS .....	6
SUPPORT EQUIPMENT LIST AND DETAILS .....	6
CONFIGURATION OF TEST SETUP .....	6
BLOCK DIAGRAM OF TEST SETUP .....	7
<b>SUMMARY OF TEST RESULTS .....</b>	<b>8</b>
<b>FCC §1.1310 &amp; §2.1093- RF EXPOSURE .....</b>	<b>9</b>
APPLICABLE STANDARD .....	9
TEST RESULT .....	9
<b>FCC §2.1047 - MODULATION CHARACTERISTIC .....</b>	<b>10</b>
<b>FCC § 2.1046, § 22.913 (A) &amp; § 24.232 (C) - RF OUTPUT POWER.....</b>	<b>11</b>
APPLICABLE STANDARD .....	11
TEST PROCEDURE .....	11
TEST EQUIPMENT LIST AND DETAILS.....	13
TEST DATA .....	14
<b>FCC §2.1049, §22.917, §22.905 &amp; §24.238 - OCCUPIED BANDWIDTH .....</b>	<b>17</b>
APPLICABLE STANDARD .....	17
TEST PROCEDURE .....	17
TEST EQUIPMENT LIST AND DETAILS.....	17
TEST DATA .....	17
<b>FCC §2.1051, §22.917(A) &amp; §24.238(A) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS .....</b>	<b>22</b>
APPLICABLE STANDARD .....	22
TEST PROCEDURE .....	22
TEST EQUIPMENT LIST AND DETAILS.....	22
TEST DATA .....	22
<b>FCC §2.1053, §22.917 &amp; §24.238 - SPURIOUS RADIATED EMISSIONS .....</b>	<b>29</b>
APPLICABLE STANDARD .....	29
TEST PROCEDURE .....	29
TEST EQUIPMENT LIST AND DETAILS.....	29
TEST DATA .....	30
<b>FCC §22.917(A) &amp; §24.238(A) - BAND EDGES.....</b>	<b>32</b>
APPLICABLE STANDARD .....	32
TEST PROCEDURE .....	32
TEST EQUIPMENT LIST AND DETAILS.....	32
TEST DATA .....	32
<b>FCC §2.1055, §22.355 &amp; §24.235 - FREQUENCY STABILITY .....</b>	<b>41</b>

APPLICABLE STANDARD .....41

TEST PROCEDURE .....41

TEST EQUIPMENT LIST AND DETAILS.....42

TEST DATA .....42

FINAL

## GENERAL INFORMATION

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### Product Description for Equipment under Test (EUT)

The *G'FIVE MOBILE INTERNATIONAL (HK) LTD*'s product, model number: *President A97 (FCC ID: 2ACTQPPRESIDENTA97)* (the "EUT") in this report was a *GFIVE President A97*, which was measured approximately: 13.3 cm (L) x 6.6 cm (W) x 1.0 cm (H), rated input voltage: DC 3.7V rechargeable Li-ion battery or DC5V charging from adapter.

Adapter information:

Model: KT-002

Input: AC100-240V, 50/60Hz 0.15A

Output: DC5.0V, 1000 mA

*All measurement and test data in this report was gathered from production sample serial number: 863049021988 (Assigned by applicant). The EUT was received on 2015-03-16.*

### Objective

This report is prepared on behalf of *G'FIVE MOBILE INTERNATIONAL (HK) LTD* 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: 2ACTQPPRESIDENTA97

FCC Part 15.247 DSS submissions with FCC ID: 2ACTQPPRESIDENTA97

FCC Part15C DTS submissions with FCC ID: 2ACTQPPRESIDENTA97

### 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, ANSI C63.4-2009.

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 facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

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.

## 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.

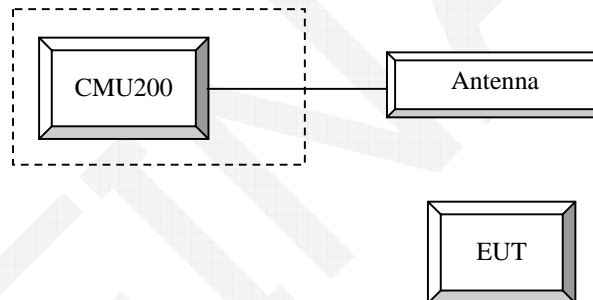
### Equipment Modifications

No modification was made to the EUT.

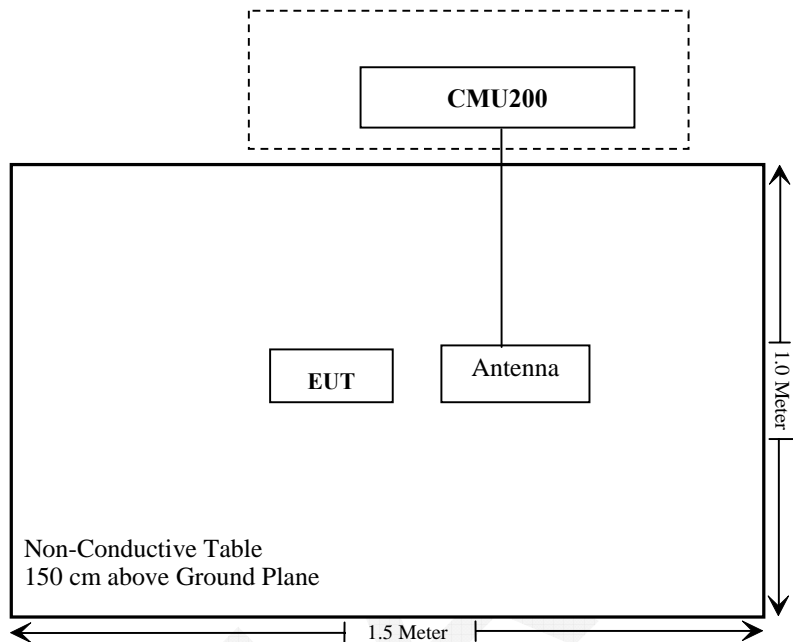
### Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
R&S	Universal Radio Communication Tester	CMU200	109038
N/A	ANTENNA	N/A	N/A

### 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



## **FCC §1.1310 & §2.1093- RF EXPOSURE**

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### **Applicable Standard**

FCC§1.1310 and §2.1093.

### **Test Result**

Compliant, please refer to the SAR report: RDG150316001-20.

FINAL

## **FCC §2.1047 - MODULATION CHARACTERISTIC**

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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..

**Test Procedure****GSM**

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 + only  
MS Signal  
    > 33 dBm for GSM 850  
    > 30 dBm for GSM 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  
TCH > choose desired test channel  
Hopping > Off  
AF/RF Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input  
Connection Press Signal on to turn on the signal and change settings

**GPRS**

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

## UMTS Rel 99

	Mode	Rel99
	Subtest	-
WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	HSDPA FRC	Not Applicable
	HSUPA Test	Not Applicable
	Power Control Algorithm	Algorithm2
	$\beta_c$	Not Applicable
	$\beta_d$	Not Applicable
	$\beta_{ec}$	Not Applicable
	$\beta_c/\beta_d$	8/15
	$\beta_{hs}$	Not Applicable
	$\beta_{ed}$	Not Applicable

## UMTS Rel 6 HSDPA

	Mode	Rel6 HSDPA	Rel6 HSDPA	Rel6 HSDPA	Rel6 HSDPA
	Subtest	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	HSUPA Test	Not Applicable			
	Power Control Algorithm	Algorithm 2			
	$\beta_c$	2/15	12/15	15/15	15/15
	$\beta_d$	15/15	15/15	8/15	4/15
	$\beta_{ec}$	-	-	-	-
	$\beta_c/\beta_d$	2/15	12/15	15/8	15/4
	$\beta_{hs}$	4/15	24/15	30/15	30/15
HSDPA Specific Settings	$\beta_{ed}$	Not Applicable			
	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	$A_{hs} = \beta_{hs}/\beta_c$	30/15			

*UMTS Rel 6 HSPA (HSDPA & HSUPA)*

	Mode	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA
	Subtest	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				
	$\beta_c$	11/15	6/15	15/15	2/15	15/15
	$\beta_d$	15/15	15/15	9/15	15/15	0
	$\beta_{ec}$	209/225	12/15	30/15	2/15	5/15
	$\beta_c/\beta_d$	11/15	6/15	15/9	2/15	-
	$\beta_{hs}$	22/15	12/15	30/15	4/15	5/15
	$\beta_{ed}$	1309/225	94/75	47/15	56/75	47/15
HSDPA Specific Settings	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
	$A_{hs} = \beta_{hs}/\beta_c$	30/15				
HSUPA Specific Settings	D E-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	12
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	67
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E_TFCIs	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO 4 E-TFCI 92 E-TFCI PO 18		E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 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	2014-05-09	2015-05-09
Sunol Sciences	Antenna	JB3	A060611-3	2014-07-28	2017-07-27
HP	Amplifier	8447E	2434A02181	2014-09-01	2015-09-01
R&S	Spectrum Analyzer	FSEM	DE31388	2014-05-09	2015-05-09
ETS LINDGREN	Horn Antenna	3115	000 527 35	2012-09-06	2015-09-06
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2015-02-19	2016-02-19
Giga	Signal Generator	1026	320408	2014-05-09	2015-05-09
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
TDK RF	Horn Antenna	HRN-0118	130 084	2012-09-06	2015-09-06

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

## Test Data

### Environmental Conditions

Temperature:	25.1 °C
Relative Humidity:	74 %
ATM Pressure:	101.9 kPa

*The testing was performed by Allen Qiao on 2015-03-26.*

**Conducted 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	31.25	31.14	30.48	28.85	27.79	25.21	23.77	22.16	21.58
	190	31.33	31.27	30.52	28.94	27.83	24.78	23.23	21.86	21.14
	251	31.37	31.32	30.59	28.95	27.88	24.37	23.02	21.38	21.04
PCS	512	30.68	26.26	26.13	25.96	25.75	25.97	25.14	23.08	22.21
	661	30.56	26.31	26.15	25.99	25.78	25.45	24.11	22.89	21.98
	810	30.43	26.43	26.25	25.97	25.80	24.98	23.43	22.45	21.72

**WCDMA Band V**

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	21.82	7.85	21.27	8.22	21.80	7.84
HSDPA	1	20.75	8.39	20.30	8.71	20.77	8.67
	2	20.87	7.88	20.26	7.68	20.80	7.81
	3	20.98	8.54	20.41	9.08	20.64	8.48
	4	20.82	8.03	20.34	8.00	20.53	8.15
HSUPA	1	20.81	8.32	20.28	8.27	20.73	8.2
	2	20.73	8.81	20.17	7.76	20.68	8.43
	3	20.65	8.81	20.14	8.72	20.42	8.78
	4	20.95	6.99	20.26	7.62	20.83	8.19
	5	20.78	8.23	20.36	7.60	20.58	7.92

Note: peak-to-average ratio (PAR) &lt;13 dB

## ERP &amp; EIRP

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								
824.200	H	95.49	20.5	0.0	1.0	19.5	38.5	19.0
824.200	V	102.52	30.6	0.0	1.0	29.6	38.5	8.9
836.600	H	95.58	20.7	0.0	1.0	19.7	38.5	18.8
836.600	V	103.37	31.6	0.0	1.0	30.6	38.5	7.9
848.800	H	96.59	21.8	0.0	1.0	20.8	38.5	17.7
848.800	V	102.48	30.8	0.0	1.0	29.8	38.5	8.7
EGPRS 850								
824.200	H	89.11	14.1	0.0	1.0	13.1	38.5	25.4
824.200	V	97.19	25.3	0.0	1.0	24.3	38.5	14.2
836.600	H	89.1	14.2	0.0	1.0	13.2	38.5	25.3
836.600	V	97.84	26	0.0	1.0	25.0	38.5	13.5
848.800	H	89.22	14.4	0.0	1.0	13.4	38.5	25.1
848.800	V	98.07	26.4	0.0	1.0	25.4	38.5	13.1
WCDMA Band V								
826.400	H	87.30	12.3	0.0	1.0	11.3	38.5	27.2
826.400	V	94.50	22.6	0.0	1.0	21.6	38.5	16.9
836.600	H	87.69	12.8	0.0	1.0	11.8	38.5	26.7
836.600	V	94.10	22.3	0.0	1.0	21.3	38.5	17.2
846.600	H	87.26	12.4	0.0	1.0	11.4	38.5	27.1
846.600	V	93.89	22.2	0.0	1.0	21.2	38.5	17.3
PCS 1900								
1850.200	H	86.57	14.7	11.4	1.4	24.7	33.0	8.3
1850.200	V	90.04	18.1	11.4	1.4	28.1	33.0	4.9
1880.000	H	86.91	15.3	11.7	1.4	25.6	33.0	7.4
1880.000	V	89.34	17.9	11.7	1.4	28.2	33.0	4.8
1909.800	H	84.11	12.8	11.8	1.4	23.2	33.0	9.8
1909.800	V	88.73	17.7	11.8	1.4	28.1	33.0	4.9
EGPRS 1900								
1850.200	H	83.03	11.2	11.4	1.4	21.2	33.0	11.8
1850.200	V	85.29	13.4	11.4	1.4	23.4	33.0	9.6
1880.000	H	83.37	11.8	11.7	1.4	22.1	33.0	10.9
1880.000	V	85.42	14	11.7	1.4	24.3	33.0	8.7
1909.800	H	83.21	11.9	11.8	1.4	22.3	33.0	10.7
1909.800	V	85.27	14.2	11.8	1.4	24.6	33.0	8.4



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

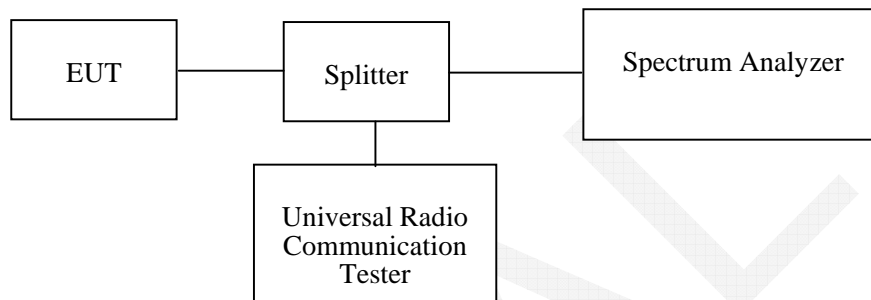
### Applicable Standard

FCC §2.1049, §22.917, §22.905 and §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	2014-05-09	2015-05-09

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

### Test Data

#### Environmental Conditions

Temperature:	23.4 °C
Relative Humidity:	60 %
ATM Pressure:	101.9 kPa

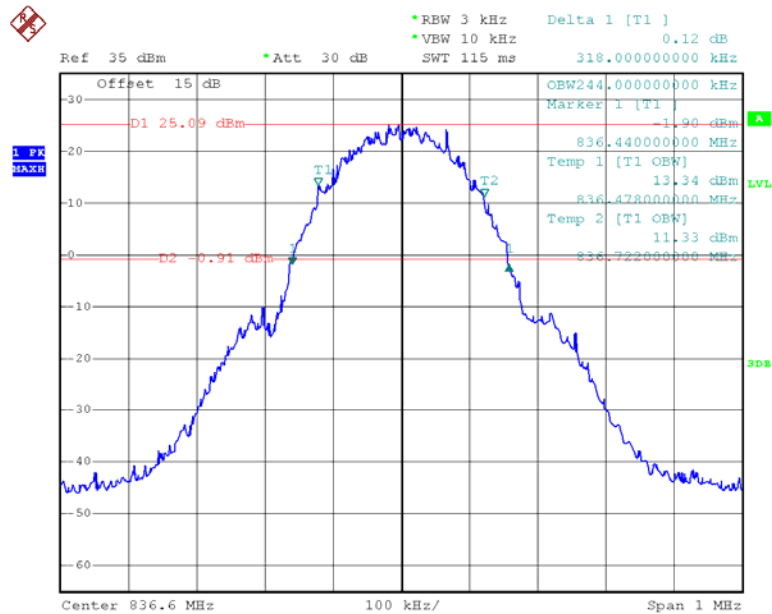
*The testing was performed by Allen Qiao on 2015-03-26.*

*Test Mode: Transmitting*

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

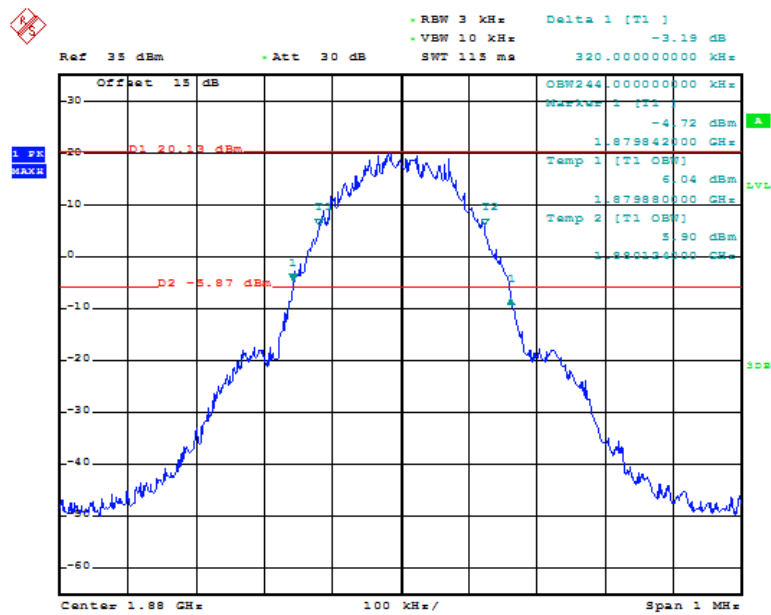
Band	Channel No.	Mode	99% Occupied Bandwidth (kHz)	26 dB Occupied Bandwidth (kHz)
Cellular	190	GSM	244	318
		EGPRS	246	318
PCS	661	PCS	244	320
		EGPRS	244	314
WCDMA Band V	4183	Rel 99	4180	4700
	4183	HSDPA	4180	4720
	4183	HSUPA	4180	4700

### GMSK 850 Cellular Band



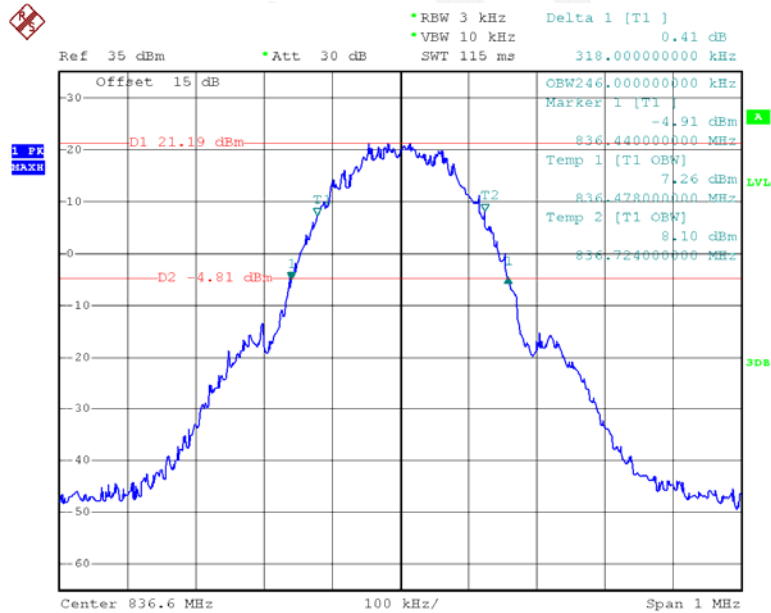
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## GMSK PCS Band



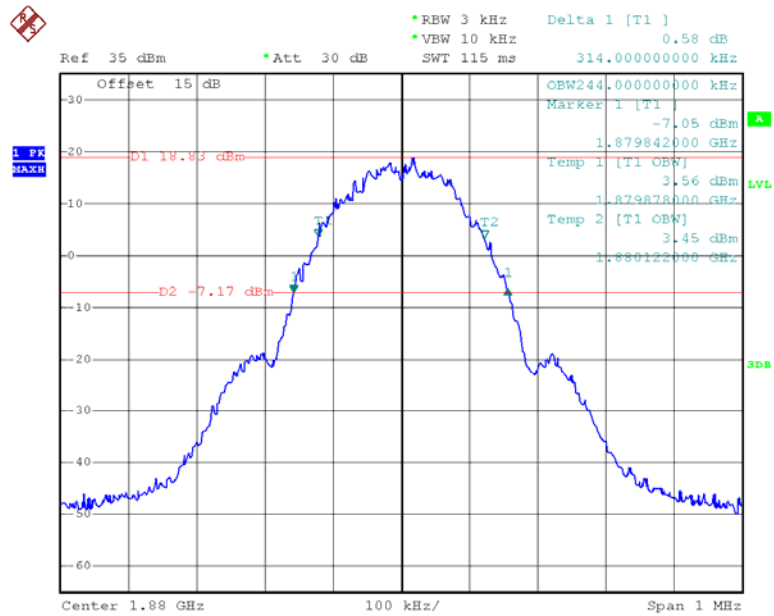
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## EGPRS 850 Cellular Band



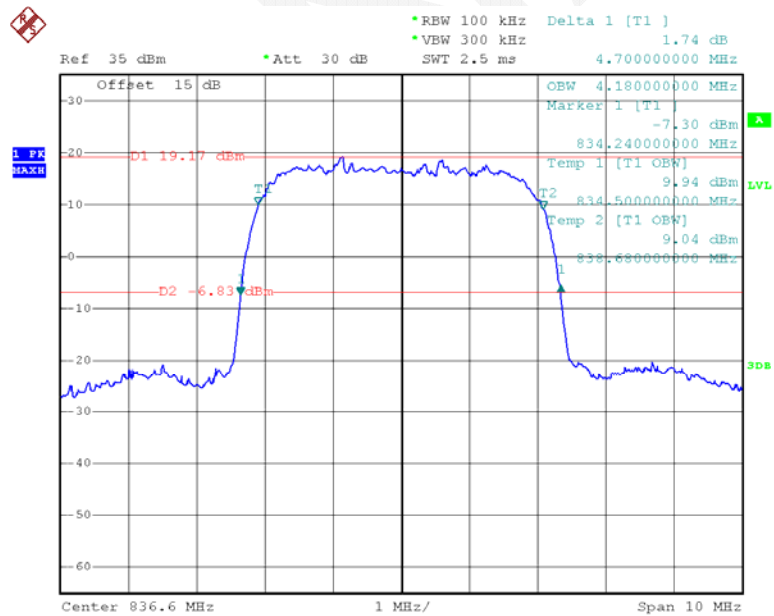
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## EGPRS PCS Band



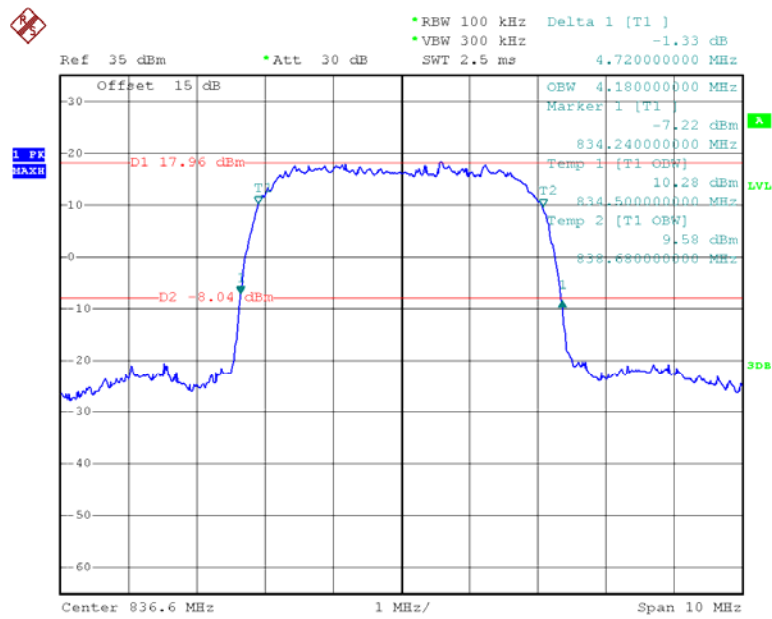
Date: 4.APR.2015 08:27:40

## REL 99 Band V



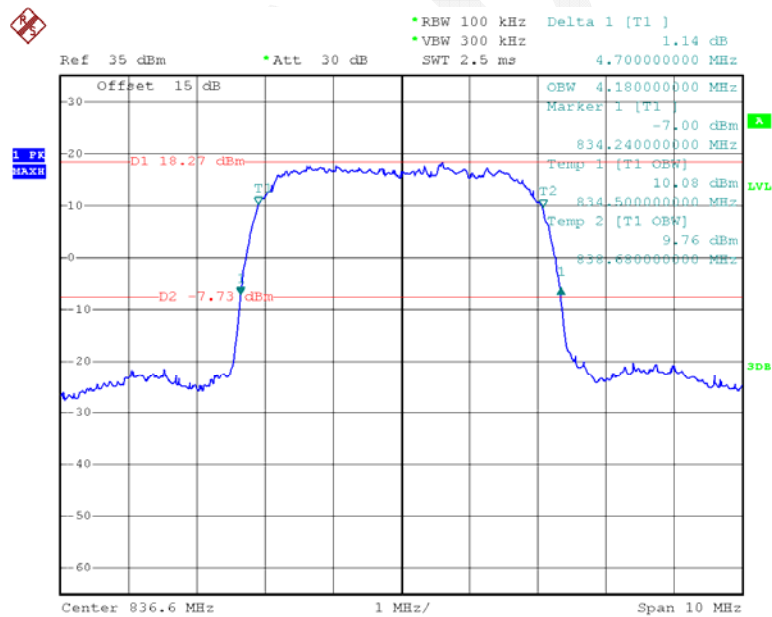
Date: 4.APR.2015 08:55:38

### HSUDA Band V



Date: 4.APR.2015 08:57:08

### HSUPA Band V



Date: 4.APR.2015 08:58:33

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

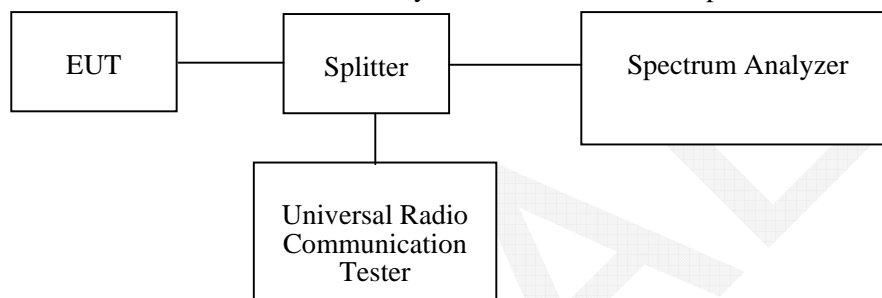
### Applicable Standard

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 10<sup>th</sup> harmonic.



### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2014-05-09	2015-05-09

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

### Test Data

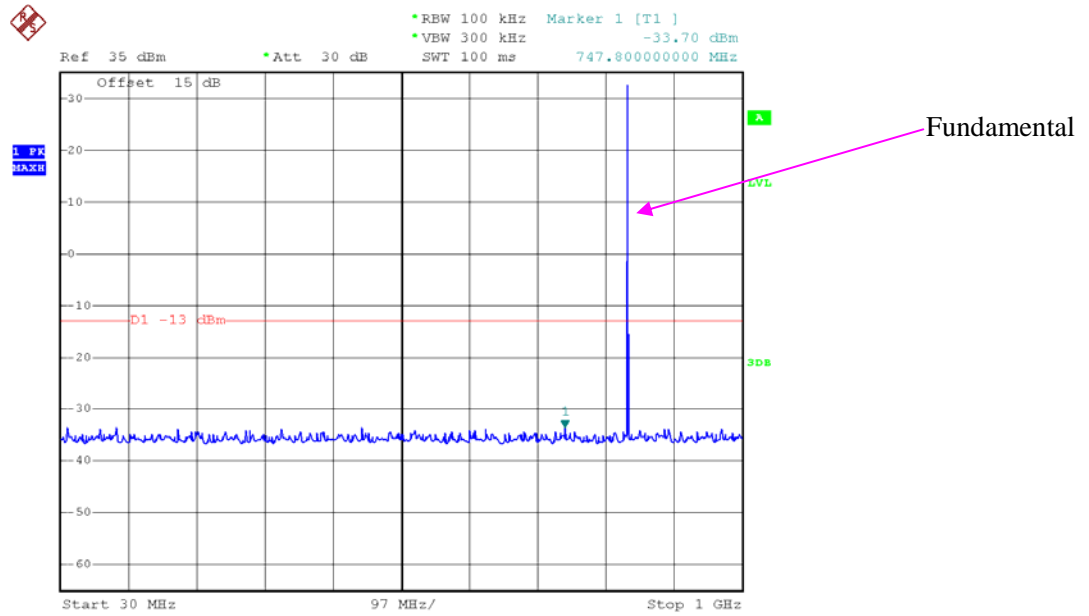
#### Environmental Conditions

Temperature:	24.2 °C
Relative Humidity:	74 %
ATM Pressure:	100.5 kPa

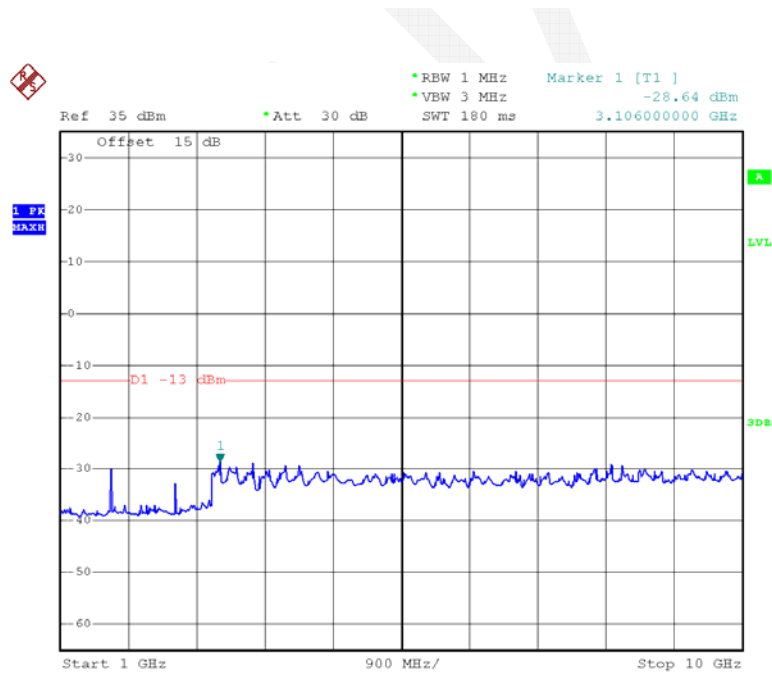
*The testing was performed by Allen Qiao on 2015-03-18.*

Please refer to the following plots.

### GSM850\_High Channel

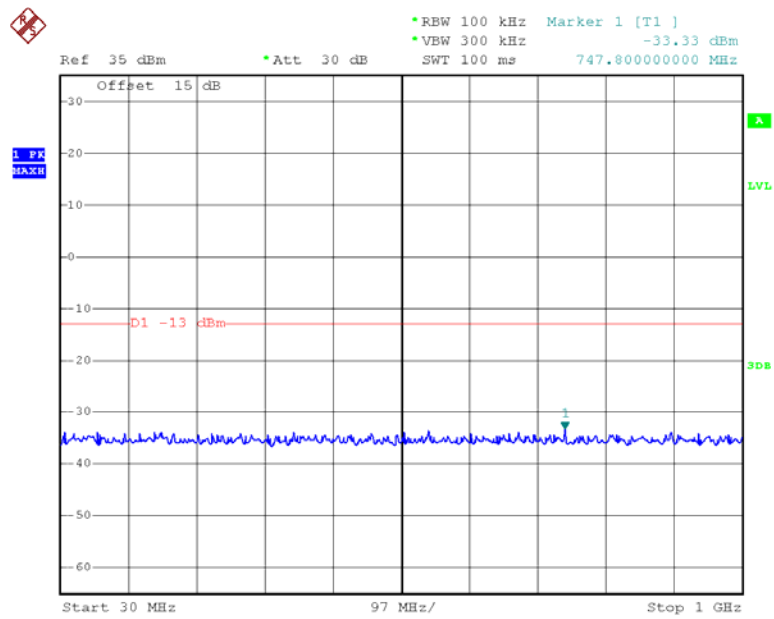


Date: 4.APR.2015 09:32:38

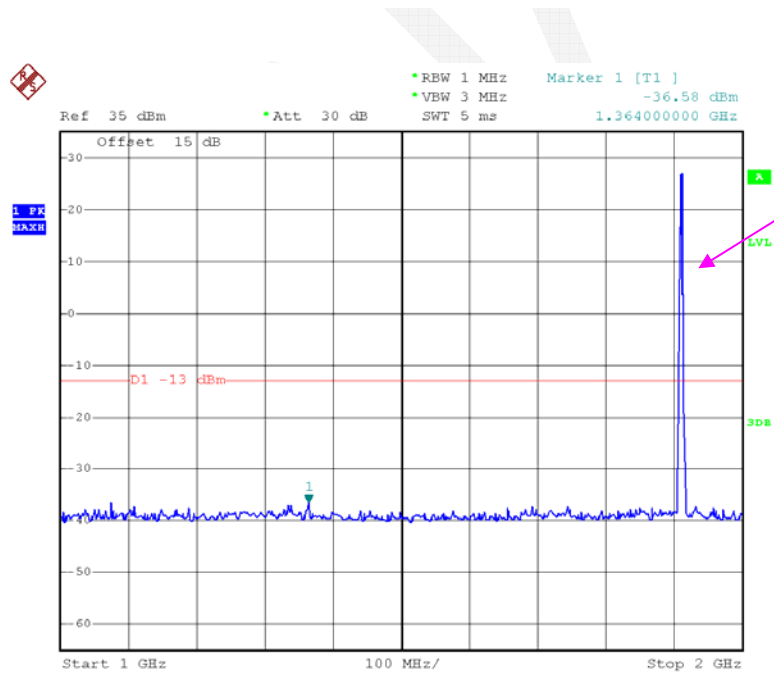


Date: 4.APR.2015 09:33:32

### PCS 1900\_Low Channel

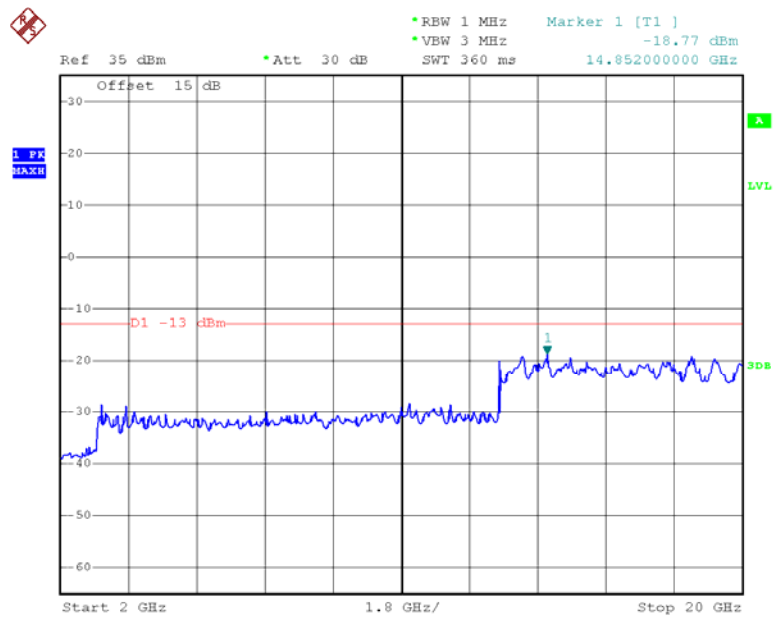


Date: 4.APR.2015 09:24:03



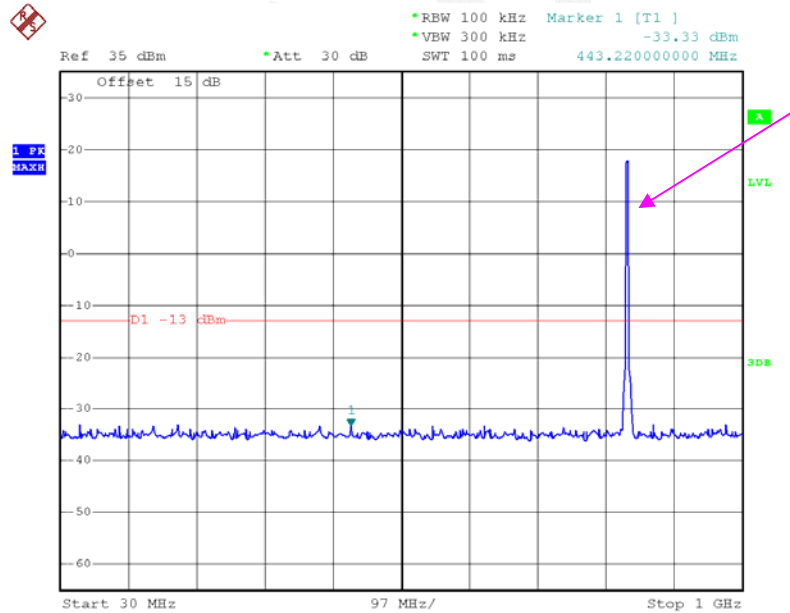
Date: 4.APR.2015 09:26:29





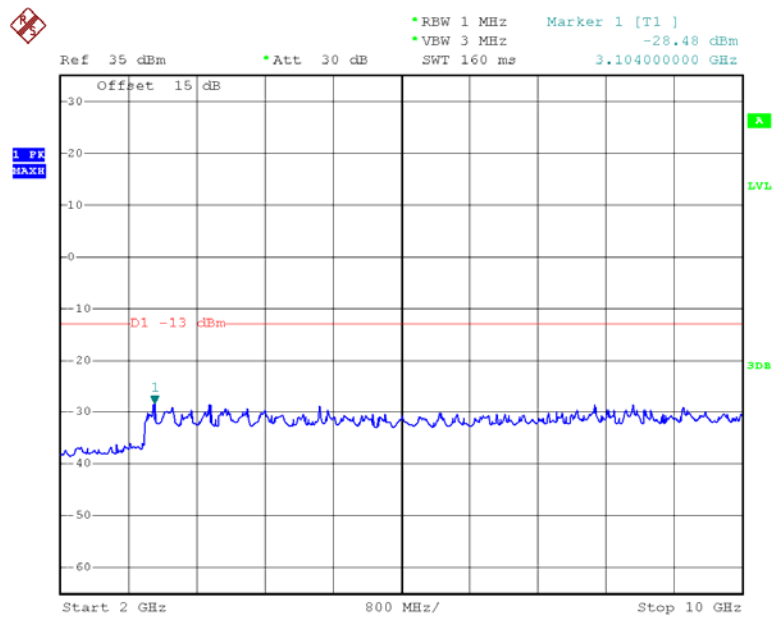
Date: 4.APR.2015 09:27:00

### REL 99 Band V



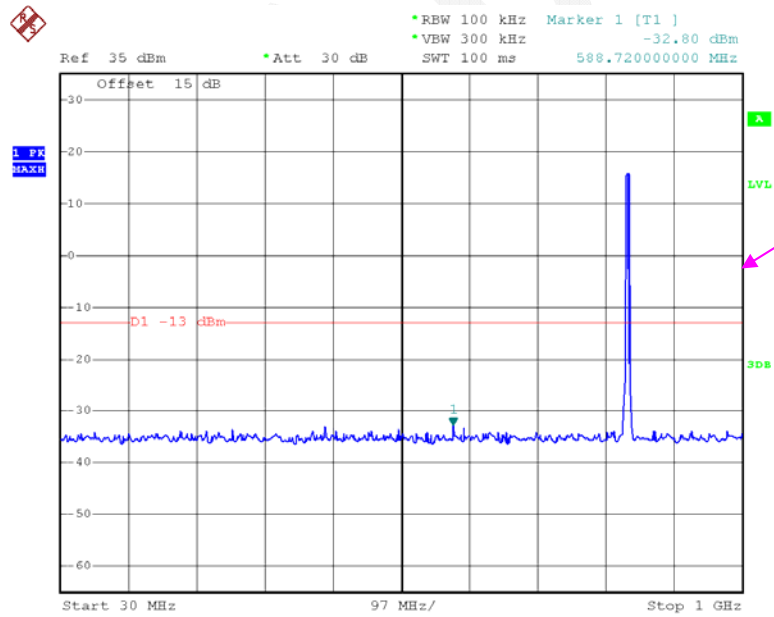
Fundamental

Date: 4.APR.2015 09:46:40



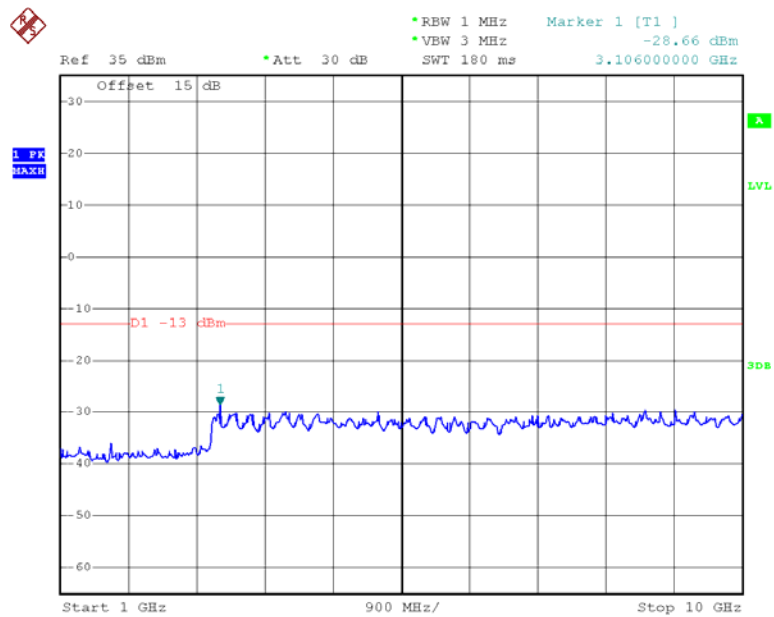
Date: 4.APR.2015 09:48:39

### HSDPA Band V



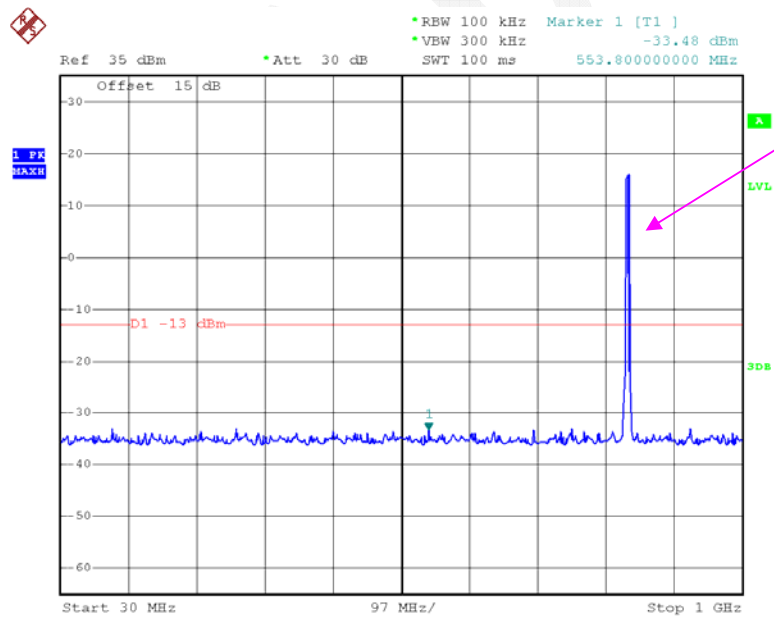
Fundamental

Date: 4.APR.2015 09:52:26



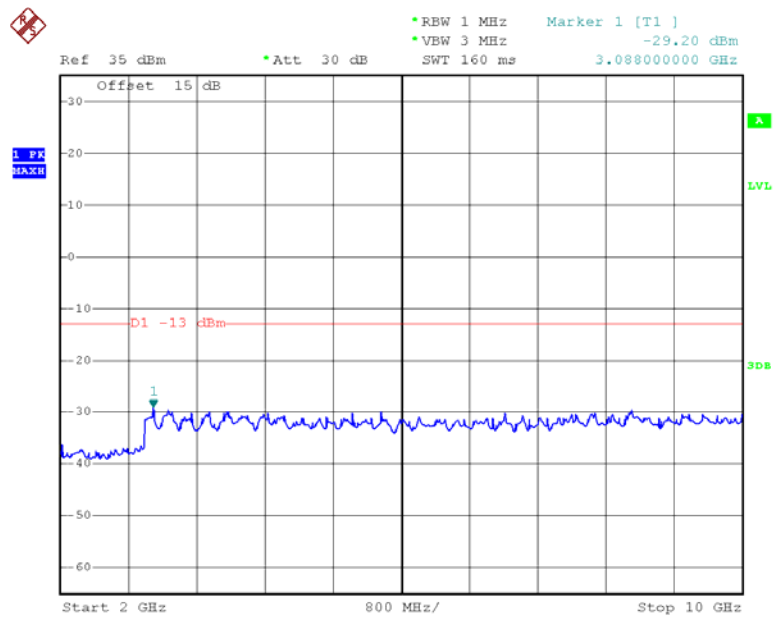
Date: 4.APR.2015 09:53:35

### HSUPA Band V



Fundamental

Date: 4.APR.2015 09:54:26



Date: 4.APR.2015 09:55:42

## 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 =  $10 \lg(\text{TXpwr in Watts}/0.001)$  – the absolute level

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

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2014-05-09	2015-05-09
Sunol Sciences	Antenna	JB3	A060611-3	2014-07-28	2017-07-27
HP	Amplifier	8447E	2434A02181	2014-09-01	2015-09-01
R&S	Spectrum Analyzer	FSEM	DE31388	2014-05-09	2015-05-09
ETS LINDGREN	Horn Antenna	3115	000 527 35	2012-09-06	2015-09-06
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2015-02-19	2016-02-19
Giga	Signal Generator	1026	320408	2014-05-09	2015-05-09
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
TDK RF	Horn Antenna	HRN-0118	130 084	2012-09-06	2015-09-06

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

**Test Data****Environmental Conditions**

<b>Temperature:</b>	25.1 °C
<b>Relative Humidity:</b>	74 %
<b>ATM Pressure:</b>	100.8 kPa

The testing was performed by Allen Qiao on 2015-03-19.

EUT Operation Mode: Transmitting

**Cellular Band**

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:824.200 MHz								
1648.400	H	53.01	-48.1	10.5	1.5	-39.1	-13.0	26.1
1648.400	V	57.86	-43.7	10.5	1.5	-34.7	-13.0	21.7
2472.600	H	41.23	-56.8	12.9	2.6	-46.5	-13.0	33.5
2472.600	V	41.86	-54.9	12.9	2.6	-44.6	-13.0	31.6
Frequency:836.600 MHz								
1673.200	H	54.21	-46.9	10.6	1.5	-37.8	-13.0	24.8
1673.200	V	57.67	-43.7	10.6	1.5	-34.6	-13.0	21.6
2509.800	H	41.35	-56.7	13.1	2.8	-46.4	-13.0	33.4
2509.800	V	42.03	-55.1	13.1	2.8	-44.8	-13.0	31.8
Frequency:848.800 MHz								
1697.600	H	52.34	-48.7	10.8	1.5	-39.4	-13.0	26.4
1697.600	V	55.88	-45.3	10.8	1.5	-36.0	-13.0	23.0
2546.400	H	40.12	-56.5	13.1	2.8	-46.2	-13.0	33.2
2546.400	V	41.38	-55.7	13.1	2.8	-45.4	-13.0	32.4

For below 1GHz, all spurious emissions are 20dB below the limit or are on the system noise floor level.

**WCDMA Band V**

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:826.400 MHz								
1652.800	H	39.25	-61.9	10.5	1.5	-52.9	-13.0	39.9
1652.800	V	36.99	-64.6	10.5	1.5	-55.6	-13.0	42.6
Frequency:836.600 MHz								
1673.200	H	38.74	-62.3	10.6	1.5	-53.2	-13.0	40.2
1673.200	V	37.05	-64.3	10.6	1.5	-55.2	-13.0	42.2
Frequency:846.600 MHz								
1693.200	H	38.31	-62.7	10.7	1.5	-53.5	-13.0	40.5
1693.200	V	37.66	-63.6	10.7	1.5	-54.4	-13.0	41.4

For below 1GHz, all spurious emissions are 20dB below the limit or are on the system noise floor level.

**PCS Band**

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:1850.200 MHz								
3700.400	H	37.43	-57.3	14.0	2.5	-45.8	-13.0	32.8
3700.400	V	39.11	-55.3	14.0	2.5	-43.8	-13.0	30.8
Frequency:1880.000 MHz								
3760.000	H	35.17	-59.1	13.8	2.9	-48.2	-13.0	35.2
3760.000	V	37.27	-55.8	13.8	2.9	-44.9	-13.0	31.9
Frequency:1909.800 MHz								
3819.600	H	36.79	-57.0	13.6	3.3	-46.7	-13.0	33.7
3819.600	V	38.53	-53.6	13.6	3.3	-43.3	-13.0	30.3

For below 1GHz, all spurious emissions are 20dB below the limit or are on the system noise floor level.

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

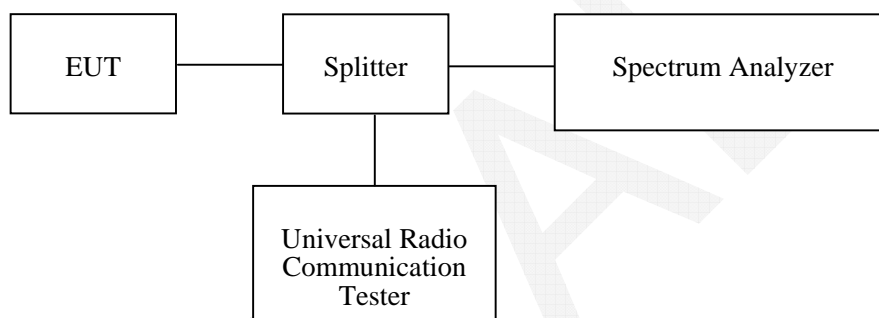
According to § 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

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	2014-05-09	2015-05-09

\* **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:	24.2 °C
Relative Humidity:	71 %
ATM Pressure:	100.9 kPa

*The testing was performed by Allen Qiao on 2015-03-30.*

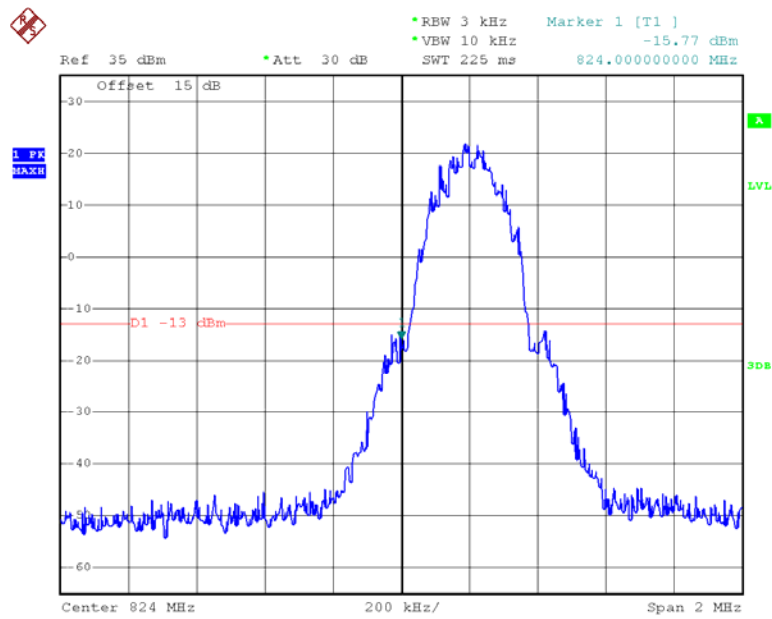


*Test Mode: Transmitting*

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

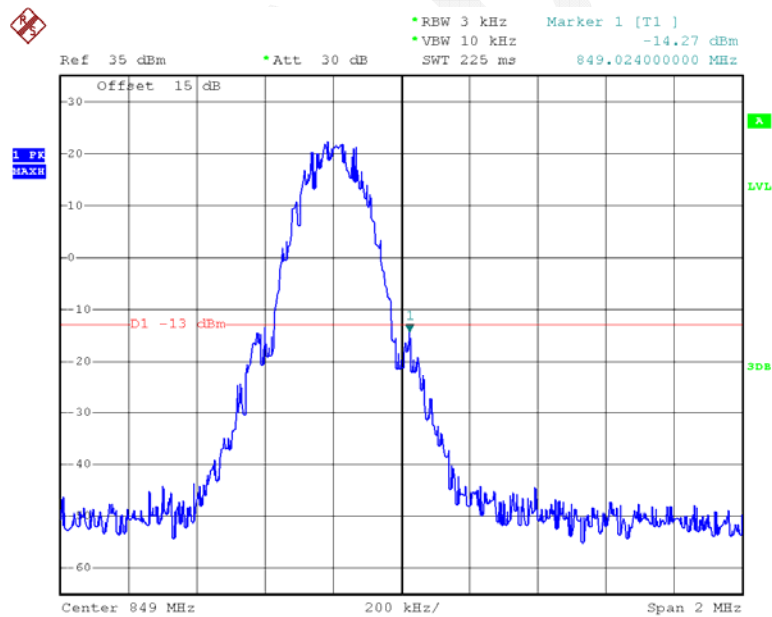
Band	Mode	Band Edge	Reading	Limit
			dBm	dBm
Cellular	GSM	Left	-15.77	≤-13
		Right	-14.27	≤-13
	EGPRS	Left	-25.10	≤-13
		Right	-24.05	≤-13
PCS	PCS	Left	-17.01	≤-13
		Right	-19.70	≤-13
	EGPRS	Left	-20.70	≤-13
		Right	-23.37	≤-13
WCDMA Band V	Rel 99	Left	-15.29	≤-13
		Right	-15.77	≤-13
	HSDPA	Left	-16.82	≤-13
		Right	-19.02	≤-13
	HSUPA	Left	-17.88	≤-13
		Right	-18.52	≤-13

### GSM 850, Left Band Edge



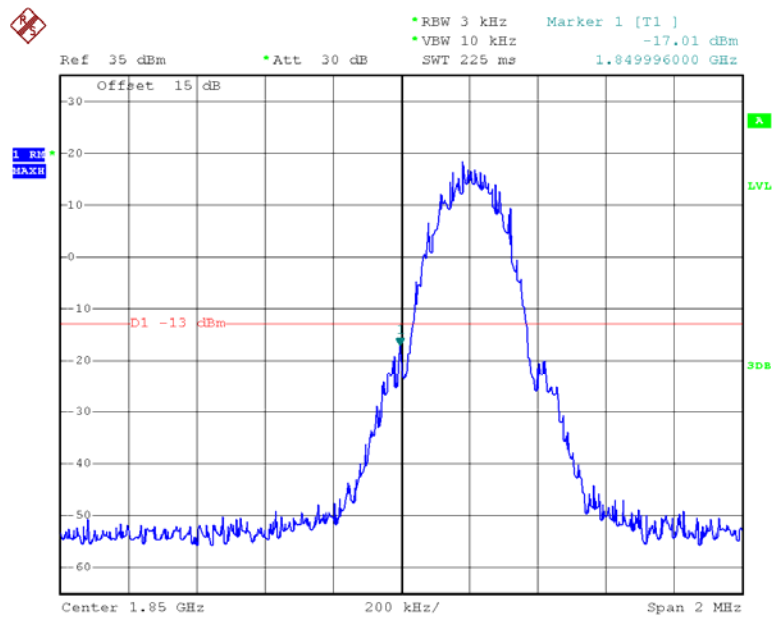
Date: 30.MAR.2015 02:22:42

### GSM 850, Right Band Edge



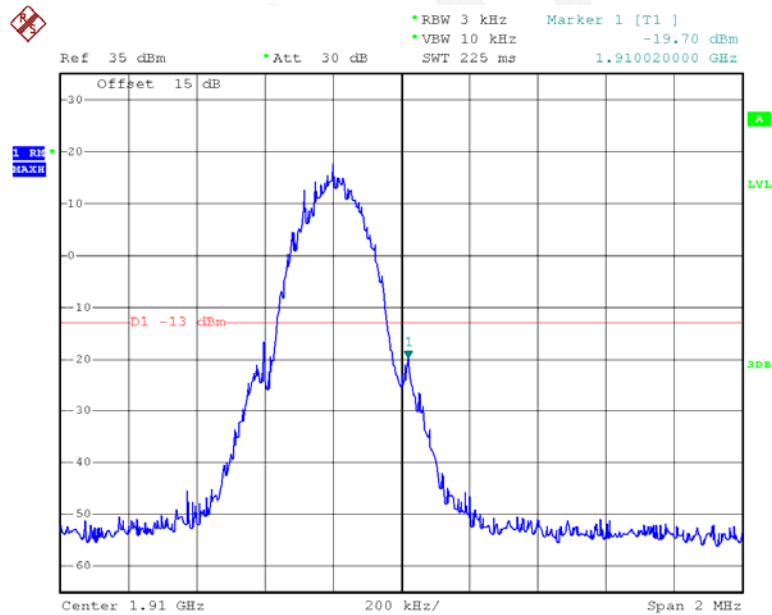
Date: 30.MAR.2015 02:27:33

### GSM 1900, Left Band Edge



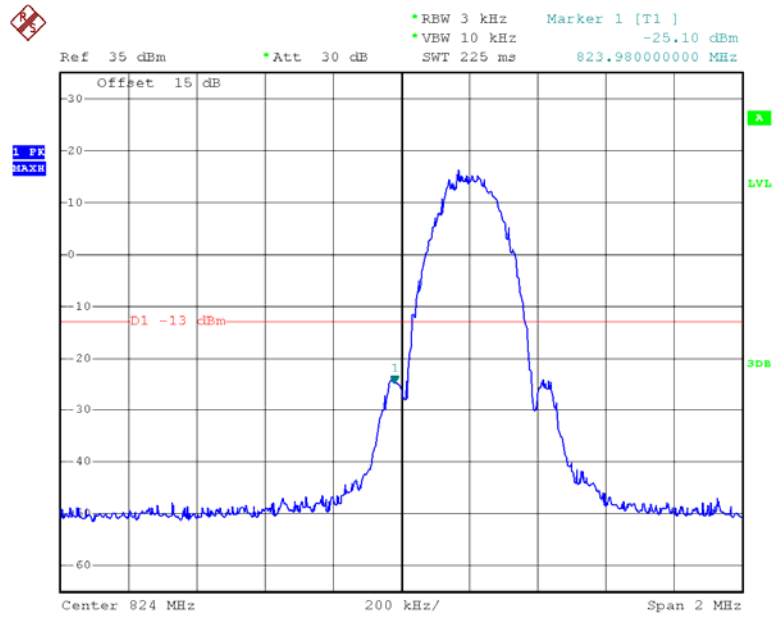
Date: 4.APR.2015 09:09:01

### GSM 1900, Right Band Edge



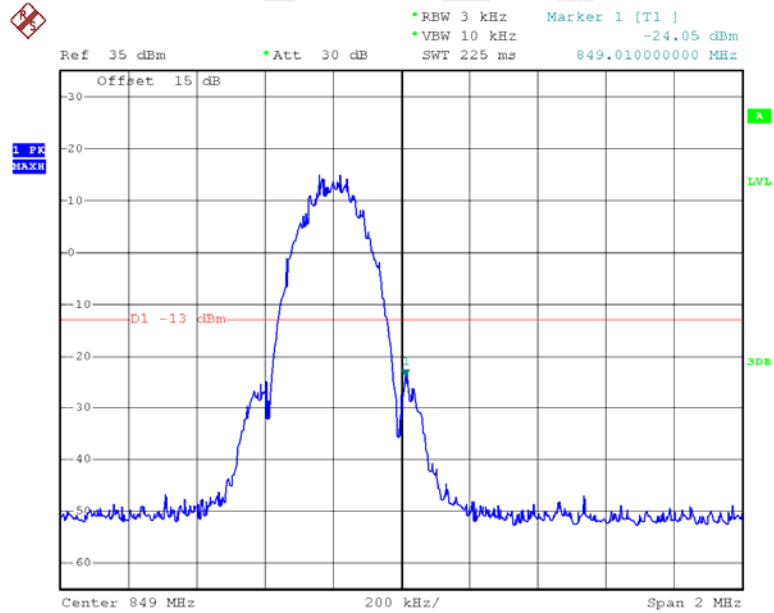
Date: 4.APR.2015 09:08:15

### EGPRS 850 , Left Band Edge



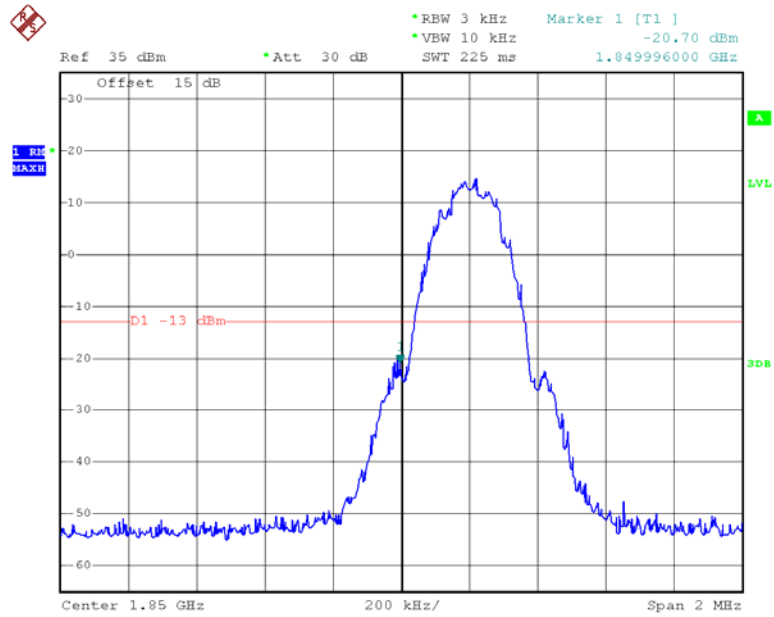
Date: 30.MAR.2015 03:37:10

### EGPRS 850 , Right Band Edge



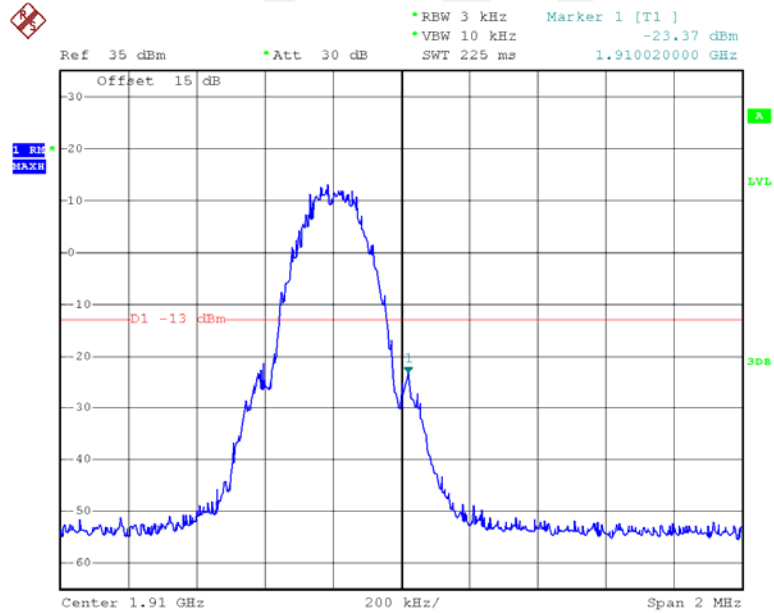
Date: 30.MAR.2015 03:32:23

### EGPRS 1900 , Left Band Edge



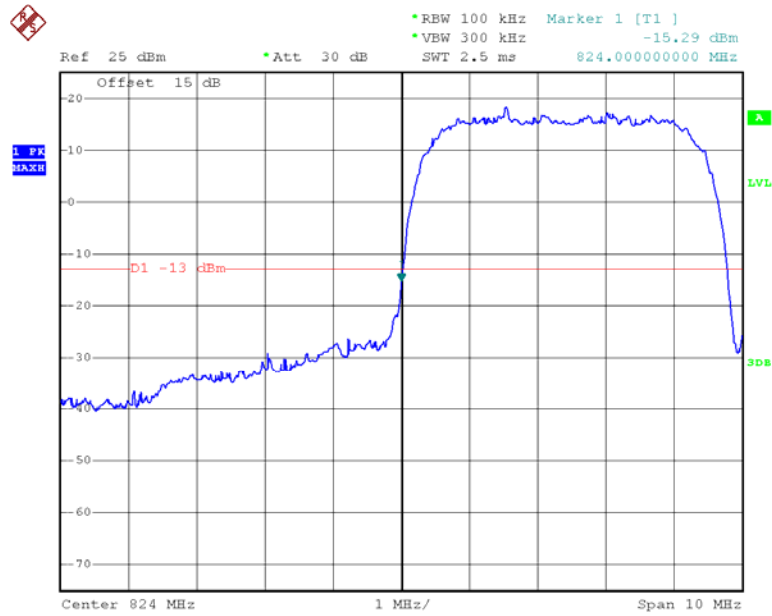
Date: 4.APR.2015 09:13:54

### EGPRS 1900 , Right Band Edge



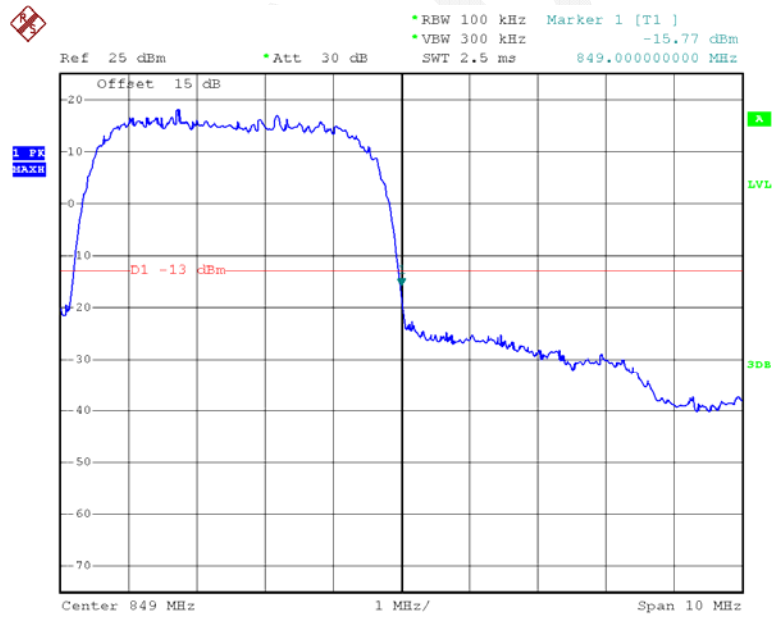
Date: 4.APR.2015 09:15:43

### REL99 Band V , Left Band Edge



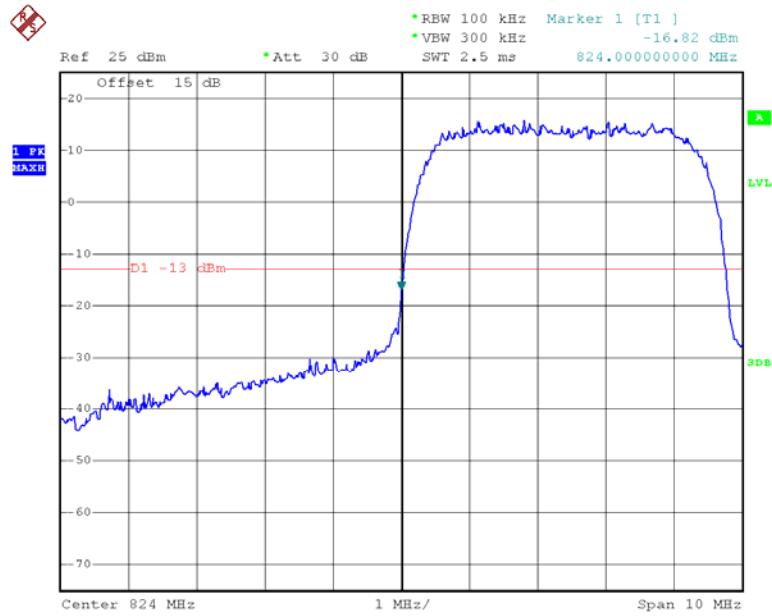
Date: 29.MAR.2015 09:33:22

### REL 99 Band V , Right Band Edge



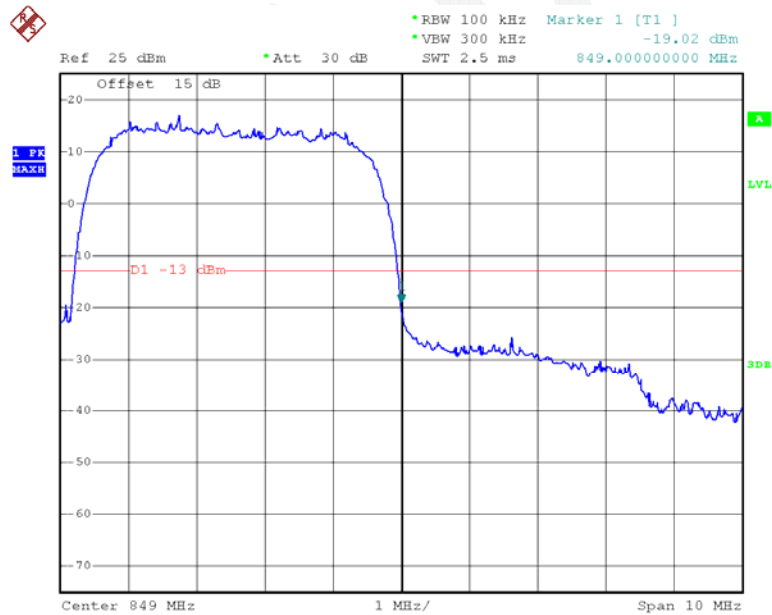
Date: 29.MAR.2015 09:34:39

### HSDPA Band V , Left Band Edge



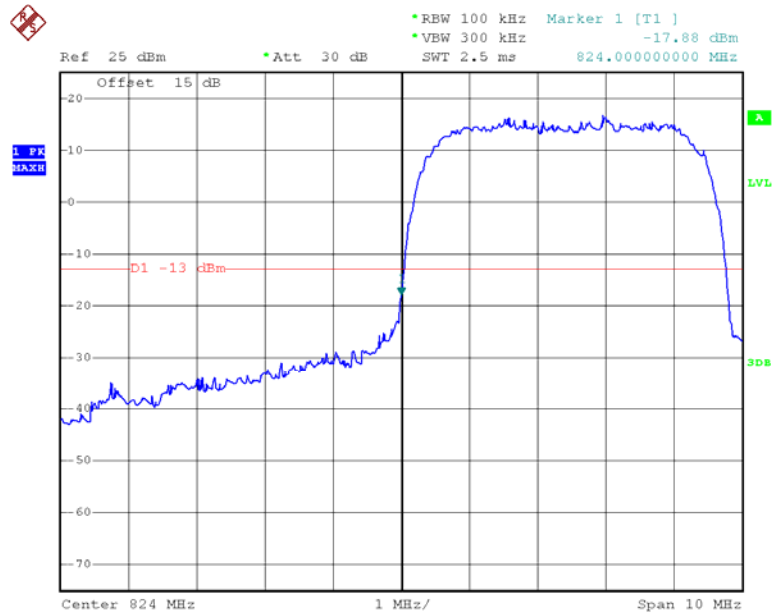
Date: 29.MAR.2015 09:39:53

### HSDPA Band V , Right Band Edge



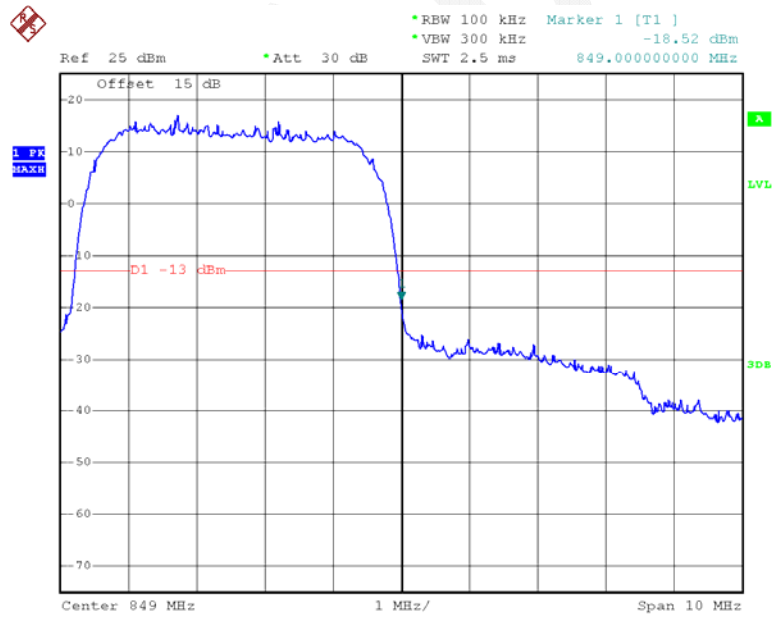
Date: 29.MAR.2015 09:38:39

### HSUPA Band V , Left Band Edge



Date: 29.MAR.2015 10:05:08

### HSUPA Band V , Right Band Edge



Date: 29.MAR.2015 10:06:11



## 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

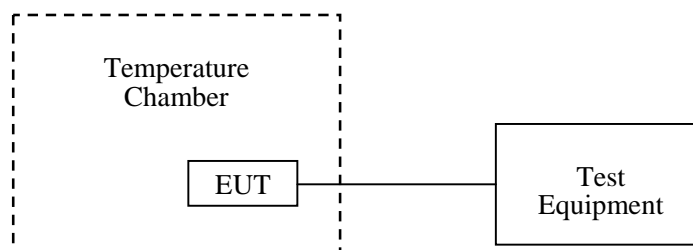
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

### 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	2014-08-01	2015-08-01
R&S	Universal Radio Communication Tester	CMU200	109 038	2014-05-09	2015-05-09

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

**Test Data****Environmental Conditions**

Temperature:	24.1 °C
Relative Humidity:	57 %
ATM Pressure:	101.9 kPa

*The testing was performed by Allen Qiao on 2015-03-26.*

**Cellular Band (Part 22H)**

<b>GMSK, Middle Channel, <math>f_c = 836.6</math> MHz</b>				
<b>Temperature</b>	<b>Voltage</b>	<b>Frequency Error</b>	<b>Frequency Error</b>	<b>Limit</b>
<b>°C</b>	<b>V<sub>DC</sub></b>	<b>Hz</b>	<b>ppm</b>	<b>ppm</b>
-30	3.7	-16	-0.019	2.5
-20	3.7	-20	-0.024	2.5
-10	3.7	-24	-0.029	2.5
0	3.7	-26	-0.031	2.5
10	3.7	-21	-0.025	2.5
20	3.7	-17	-0.020	2.5
30	3.7	-19	-0.023	2.5
40	3.7	-20	-0.024	2.5
50	3.7	-24	-0.029	2.5
25	3.5	-19	-0.023	2.5
25	4.2	-18	-0.022	2.5

<b>EDGE, Middle Channel, <math>f_c = 836.6</math> MHz</b>				
<b>Temperature</b>	<b>Voltage</b>	<b>Frequency Error</b>	<b>Frequency Error</b>	<b>Limit</b>
<b>°C</b>	<b>V<sub>DC</sub></b>	<b>Hz</b>	<b>ppm</b>	<b>ppm</b>
-30	3.7	-15	-0.018	2.5
-20	3.7	-19	-0.023	2.5
-10	3.7	-18	-0.022	2.5
0	3.7	-14	-0.017	2.5
10	3.7	-17	-0.020	2.5
20	3.7	-20	-0.024	2.5
30	3.7	-16	-0.019	2.5
40	3.7	-20	-0.024	2.5
50	3.7	-21	-0.025	2.5
25	3.5	-19	-0.023	2.5
25	4.2	-16	-0.019	2.5

**Band V:**

Rel 99, Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V <sub>DC</sub>	Hz	ppm	ppm
-30	3.7	-19	-0.023	2.5
-20	3.7	-17	-0.020	2.5
-10	3.7	-21	-0.025	2.5
0	3.7	-16	-0.019	2.5
10	3.7	-15	-0.018	2.5
20	3.7	-18	-0.022	2.5
30	3.7	-23	-0.027	2.5
40	3.7	-26	-0.031	2.5
50	3.7	-21	-0.025	2.5
25	3.5	-24	-0.029	2.5
25	4.2	-27	-0.032	2.5

HSDPA, Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V <sub>DC</sub>	Hz	ppm	ppm
-30	3.7	-17	-0.020	2.5
-20	3.7	-15	-0.018	2.5
-10	3.7	-18	-0.022	2.5
0	3.7	-15	-0.018	2.5
10	3.7	-19	-0.023	2.5
20	3.7	-17	-0.020	2.5
30	3.7	-19	-0.023	2.5
40	3.7	-20	-0.024	2.5
50	3.7	-16	-0.019	2.5
25	3.5	-15	-0.018	2.5
25	4.2	-18	-0.022	2.5

HSUPA, Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V <sub>DC</sub>	Hz	ppm	ppm
-30	3.7	-15	-0.018	2.5
-20	3.7	-16	-0.009	2.5
-10	3.7	-19	-0.010	2.5
0	3.7	-14	-0.007	2.5
10	3.7	-17	-0.009	2.5
20	3.7	-14	-0.007	2.5
30	3.7	-16	-0.009	2.5
40	3.7	-19	-0.010	2.5
50	3.7	-21	-0.011	2.5
25	3.5	-17	-0.009	2.5
25	4.2	-20	-0.011	2.5

**PCS Band (Part 24E)**

GMSK, Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V <sub>DC</sub>	Hz	ppm	
-30	3.7	-12	-0.006	Pass
-20	3.7	-11	-0.006	Pass
-10	3.7	-19	-0.010	Pass
0	3.7	-20	-0.011	Pass
10	3.7	-17	-0.009	Pass
20	3.7	-11	-0.006	Pass
30	3.7	-17	-0.009	Pass
40	3.7	-15	-0.008	Pass
50	3.7	-18	-0.010	Pass
25	3.5	-14	-0.007	Pass
25	4.2	-16	-0.009	Pass

EDGE, Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V <sub>DC</sub>	Hz	ppm	
-30	3.7	-18	-0.010	Pass
-20	3.7	-23	-0.012	Pass
-10	3.7	-14	-0.007	Pass
0	3.7	-22	-0.012	Pass
10	3.7	-18	-0.010	Pass
20	3.7	-22	-0.012	Pass
30	3.7	-17	-0.009	Pass
40	3.7	-21	-0.011	Pass
50	3.7	-12	-0.006	Pass
25	3.5	-19	-0.010	Pass
25	4.2	-15	-0.008	Pass

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