

FCC PART 22H, PART 24E  
FCC PART 27  
MEASUREMENT AND TEST REPORT

For

**MAXWEST INTERNATIONAL LIMITED**

No.1, Longgang Road, Buji, Longgang, Shenzhen City, Guangdong Province, P.R. China

**FCC ID: 2AEN3ASTROX4**

<b>Report Type:</b> Original Report	<b>Product Type:</b> Astro X4
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<b>Report Number:</b> <u>RDG151221001-00C</u>	
<b>Report Date:</b> <u>2015-12-31</u>	
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**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).

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## GENERAL INFORMATION

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

The *MAXWEST INTERNATIONAL LIMITED*'s product, model number: *Astro X4* (FCC ID: 2AEN3ASTROX4) (the "EUT") in this report was a *Astro X4*, which was measured approximately: 12.37 cm (L) x 6.45 cm (W) x 1.05 cm (H), rated input voltage: DC3.7V rechargeable Li-ion battery or DC5.0V charging from adapter.

Adapter information:  
CHARGING ADAPTOR  
Input: AC100-240V, 50/60 Hz 0.2A  
Output: DC 5V, 500mA

*Note: The model Astro X4 have different samples, they are the same electromagnetic emissions and electromagnetic compatibility characteristics, the difference between them is the colour, the details was explained in the attached declaration letter.*

*All measurement and test data in this report was gathered from production sample serial number: 151221001(Assigned byBACL, Dongguan). The EUT was received on 2015-12-21.*

### Objective

This report is prepared on behalf of *MAXWEST INTERNATIONAL LIMITED* in accordance with: Part 2-Subpart J, Part 22-Subpart H, and Part 24-Subpart E of the Federal Communications Commission's rules. Part 2, Part 27 of the Federal Communication Commissions 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: 2AEN3ASTROX4  
FCC Part 15C DSS submissions with FCC ID: 2AEN3ASTROX4  
FCC Part 15C DTS submissions with FCC ID: 2AEN3ASTROX4

### 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  
Part 27 – Miscellaneous wireless communications 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.

F I N A L

## 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.

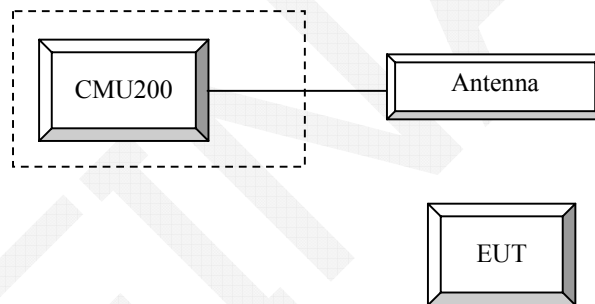
### Equipment Modifications

No modification was made to the EUT.

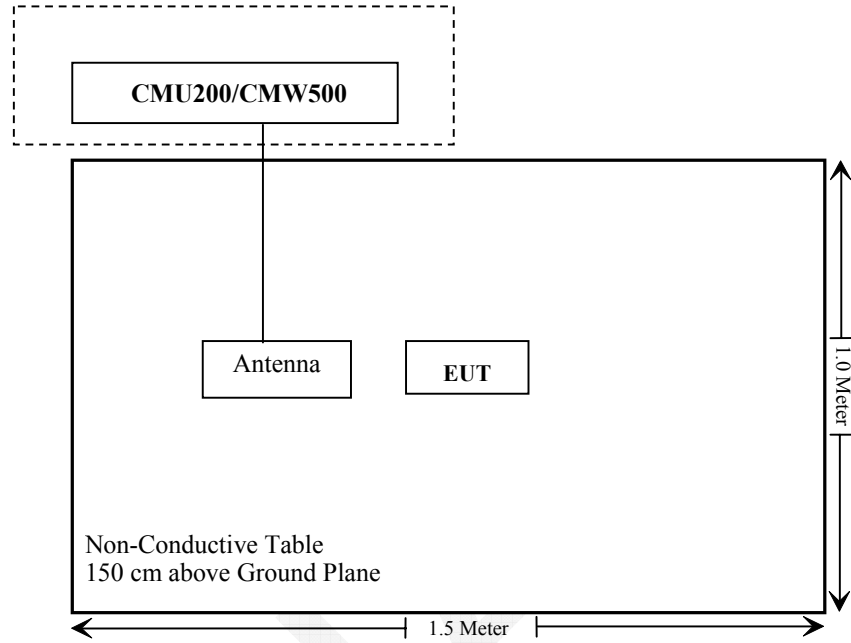
### Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
R&S	Universal Radio Communication Tester	CMU200	109038
R&S	Wideband Radio Communication Tester	CMW500	106891

### Configuration of Test Setup



### Block Diagram of Test Setup



**SUMMARY OF TEST RESULTS**

<b>FCC Rules</b>	<b>Description of Test</b>	<b>Result</b>
§1.1310, §2.1093	RF Exposure	Compliance
§2.1046; § 22.913 (a); § 24.232 (c); §27.50	RF Output Power	Compliance
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; § 22.905 § 22.917; § 24.238; §27.53	Occupied Bandwidth	Compliance
§ 2.1051, § 22.917 (a); § 24.238 (a); §27.53	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053 § 22.917 (a); § 24.238 (a); §27.53	Field Strength of Spurious Radiation	Compliance
§ 22.917 (a); § 24.238 (a); §27.53	Out of band emission, Band Edge	Compliance
§ 2.1055 § 22.355; § 24.235; §27.54	Frequency stability vs. temperature Frequency stability vs. voltage	Compliance

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

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### **Applicable Standard**

FCC§1.1310 and §2.1093.

### **Test Result**

Compliance, please refer to the SAR report: RDG151221001-20.

FINAL



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

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According to FCC § 2.1047(d), Part 22H & 24E, Part 27 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

FINAL

**FCC § 2.1046, § 22.913 (a) & § 24.232 (c) & § 27.50 - 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.

According to FCC §2.1046 and §27.50 (d), (4) Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP. Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

According to FCC §2.1046 and §27.50 (h), (2) Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

**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 Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input  
 Connection 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).

<b>WCDMA General Settings</b>	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	$\beta_c / \beta_d$	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
<b>WCDMA General Settings</b>	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm2			
	$\beta_c$	2/15	12/15	15/15	15/15
	$\beta_d$	15/15	15/15	8/15	4/15
	$\beta_d$ (SF)	64			
	$\beta_c / \beta_d$	2/15	12/15	15/8	15/4
	$\beta_{hs}$	4/15	24/15	30/15	30/15
MPR(dB)	0	0	0.5	0.5	
<b>HSDPA Specific Settings</b>	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.

	<b>Mode</b>	<b>HSUPA</b>	<b>HSUPA</b>	<b>HSUPA</b>	<b>HSUPA</b>	<b>HSUPA</b>
	<b>Subset</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>WCDMA General Settings</b>	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
CM(dB)	1.0	3.0	2.0	3.0	1.0	
MPR(dB)	0	2	1	2	0	
<b>HSDPA Specific Settings</b>	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				
<b>HSUPA Specific Settings</b>	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		

**HSPA+**

The following tests were conducted according to the test requirements in Table C.11.1.4 of 3GPP TS 34.121-1

Sub-test	$\beta_c$ (Note3)	$\beta_d$	$\beta_{HS}$ (Note1)	$\beta_{ec}$	$\beta_{ed}$ (2xSF2) (Note 4)	$\beta_{ed}$ (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	$\beta_{ed1}$ : 30/15 $\beta_{ed2}$ : 30/15	$\beta_{ed3}$ : 24/15 $\beta_{ed4}$ : 24/15	3.5	2.5	14	105	105

- Note 1:  $\Delta_{ACK}, \Delta_{NACK}$  and  $\Delta_{CQI} = 30/15$  with  $\beta_{HS} = 30/15 * \beta_c$ .
- Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).
- Note 3: DPDCH is not configured, therefore the  $\beta_c$  is set to 1 and  $\beta_d = 0$  by default.
- Note 4:  $\beta_{ed}$  can not be set directly; it is set by Absolute Grant Value.
- Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signalled to use the extrapolation algorithm.

**DC-HSDPA**

The following tests were conducted according to the test requirements in Table C.8.1.12 of 3GPP TS 34.121-1

**Table C.8.1.12: Fixed Reference Channel H-Set 12**

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload ( $N_{INF}$ )	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
<p>Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.</p> <p>Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.</p>		

*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	2015-08-03	2016-08-02
Sunol Sciences	Antenna	JB3	A060611-3	2014-11-06	2017-11-05
HP	Amplifier	8447E	2434A02181	2015-09-01	2016-09-01
R&S	Spectrum Analyzer	FSEM	831259/019	2015-07-28	2016-07-27
ETS LINDGREN	Horn Antenna	3115	9808-5557	2015-09-06	2018-09-06
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2015-02-19	2016-02-19
Giga	Signal Generator	1026	320408	2015-11-23	2016-11-22
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

\* **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>	23.5°C
<b>Relative Humidity:</b>	42%
<b>ATM Pressure:</b>	101.2kPa

*The testing was performed by Dean Liu on 2015-12-24.*

**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	33.09	32.23	31.12	29.86	28.80	26.54	24.92	23.36	21.96
	190	32.94	32.11	30.93	29.80	28.62	26.41	24.70	23.10	21.80
	251	33.05	32.17	31.02	29.89	28.68	26.78	25.08	23.66	22.15
PCS	512	29.76	29.21	27.72	26.03	24.45	25.09	23.65	22.15	20.69
	661	29.93	29.33	27.92	26.28	24.69	25.23	23.73	22.41	20.81
	810	29.66	29.10	27.53	25.96	24.41	25.13	23.68	22.17	21.75

**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	22.63	2.36	22.55	2.12	22.50	2.32
HSDPA	1	21.34	2.37	21.11	2.06	21.23	2.36
	2	21.32	2.35	21.25	2.17	21.26	2.41
	3	21.32	2.38	21.09	2.21	21.30	2.42
	4	21.40	2.31	21.19	2.16	21.29	2.33
HSPA	1	21.44	2.28	21.25	2.19	21.22	2.41
	2	21.35	2.32	21.19	2.16	21.19	2.40
	3	21.29	2.37	21.13	2.21	21.10	2.36
	4	21.23	2.45	21.15	2.13	21.17	2.39
	5	21.25	2.30	21.25	2.07	21.21	2.34
DC-HSDPA	1	21.32	2.38	21.12	2.07	21.21	2.28
	2	21.22	2.40	21.04	2.12	21.14	2.32
	3	21.27	2.29	21.10	2.17	21.17	2.27
	4	21.22	2.41	21.12	2.03	21.07	2.23
HSPA+	1	21.21	2.42	21.02	2.18	21.00	2.31

**WCDMA Band IV (PART 27)**

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	22.37	2.32	22.22	2.24	22.16	2.36
HSDPA	1	21.01	2.36	21.14	2.16	21.16	2.22
	2	21.07	2.25	21.30	2.32	21.19	2.38
	3	21.12	2.35	21.14	2.31	21.11	2.29
	4	21.16	2.24	21.17	2.33	21.20	2.40
HSUPA	1	21.03	2.34	21.06	2.29	21.07	2.26
	2	21.08	2.30	21.07	2.33	21.05	2.38
	3	21.07	2.22	21.14	2.28	21.01	2.41
	4	21.07	2.41	21.13	2.22	21.02	2.26
	5	21.09	2.27	21.13	2.15	21.02	2.27
DC-HSDPA	1	20.94	2.27	21.03	2.26	21.08	2.41
	2	21.02	2.29	20.95	2.27	21.04	2.40
	3	20.89	2.34	21.03	2.25	20.92	2.38
	4	20.96	2.38	20.91	2.15	21.01	2.42
HSPA+	1	20.92	2.26	20.97	2.28	20.91	2.27



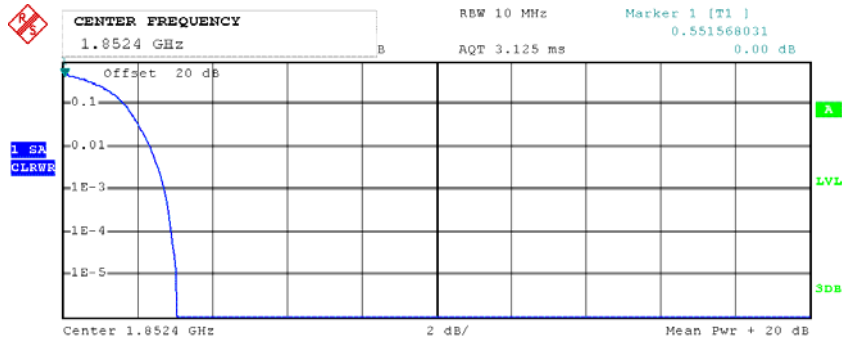
**WCDMA Band V (PART 22H)**

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	22.28	2.28	22.46	2.20	22.68	2.12
HSDPA	1	21.28	2.24	21.42	2.19	21.60	2.21
	2	21.21	2.30	21.37	2.20	21.66	2.18
	3	21.20	2.35	21.43	2.26	21.30	2.05
	4	21.15	2.26	21.44	2.21	21.62	2.07
HSUPA	1	21.25	2.31	21.52	2.23	21.55	2.12
	2	21.19	2.23	21.32	2.25	21.17	2.06
	3	21.34	2.20	21.31	2.12	21.24	2.04
	4	21.15	2.32	21.37	2.30	21.29	2.19
	5	21.24	2.33	21.21	2.23	21.37	2.12
DC-HSDPA	1	21.30	2.31	21.28	2.26	21.51	2.09
	2	21.24	2.19	21.14	2.13	21.26	2.03
	3	21.28	2.21	21.30	2.11	21.31	2.06
	4	21.17	2.28	21.36	2.10	21.50	2.19
HSPA+	1	21.11	2.24	21.21	2.13	21.44	2.15

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      21.34 dBm

Peak      24.41 dBm

Crest      3.07 dB

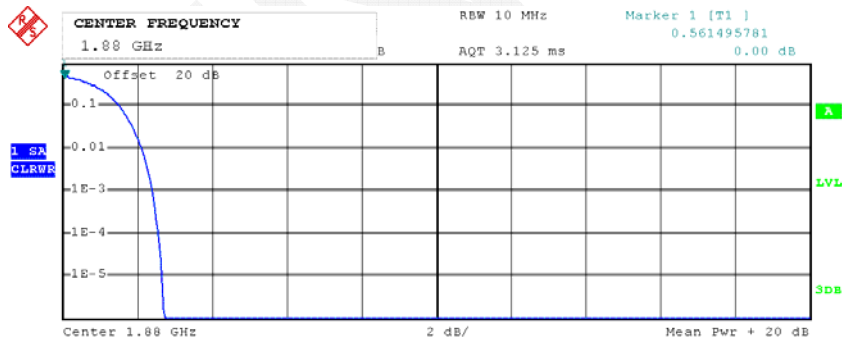
10% @      1.68 dB

1% @      2.36 dB

.1% @      2.76 dB

Date:      24.DEC.2015    23:41:25

**Middle Channel**



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean      20.56 dBm

Peak      23.28 dBm

Crest      2.73 dB

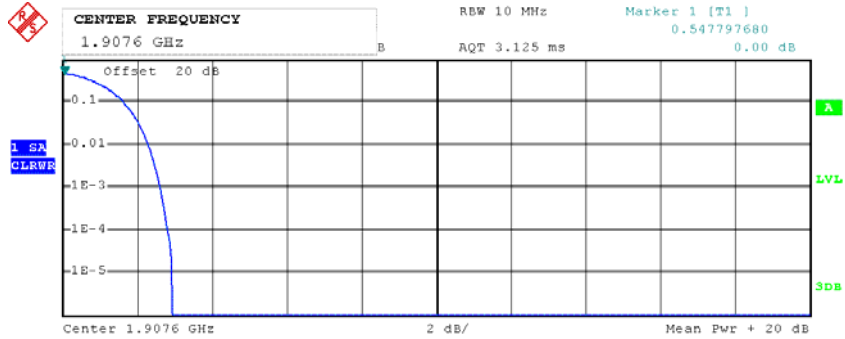
10% @      1.56 dB

1% @      2.12 dB

.1% @      2.44 dB

Date:      24.DEC.2015    23:41:12

### High Channel



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean      20.83 dBm

Peak      23.78 dBm

Crest      2.95 dB

10% @      1.64 dB

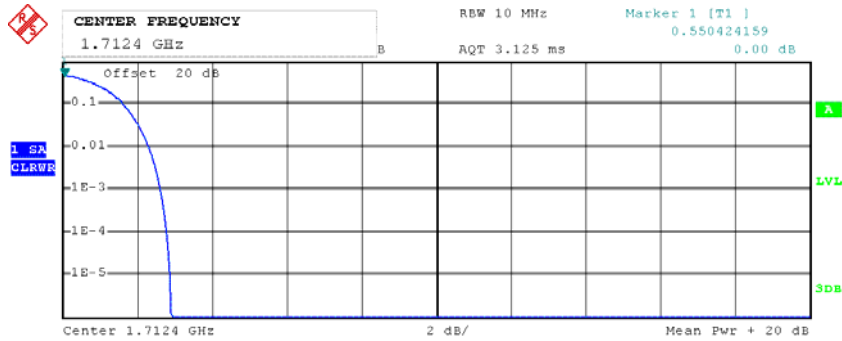
1% @      2.32 dB

.1% @      2.64 dB

Date:      24.DEC.2015      23:40:32

**WCDMA Band IV (PART 27)**

**Low Channel**



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean      20.65 dBm

Peak      23.57 dBm

Crest      2.92 dB

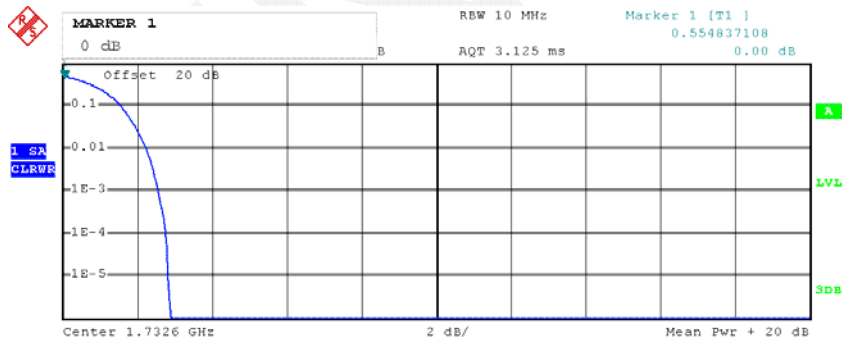
10% @      1.64 dB

1% @      2.32 dB

.1% @      2.64 dB

Date:      24.DEC.2015    23:48:43

**Middle Channel**



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean      20.95 dBm

Peak      23.85 dBm

Crest      2.89 dB

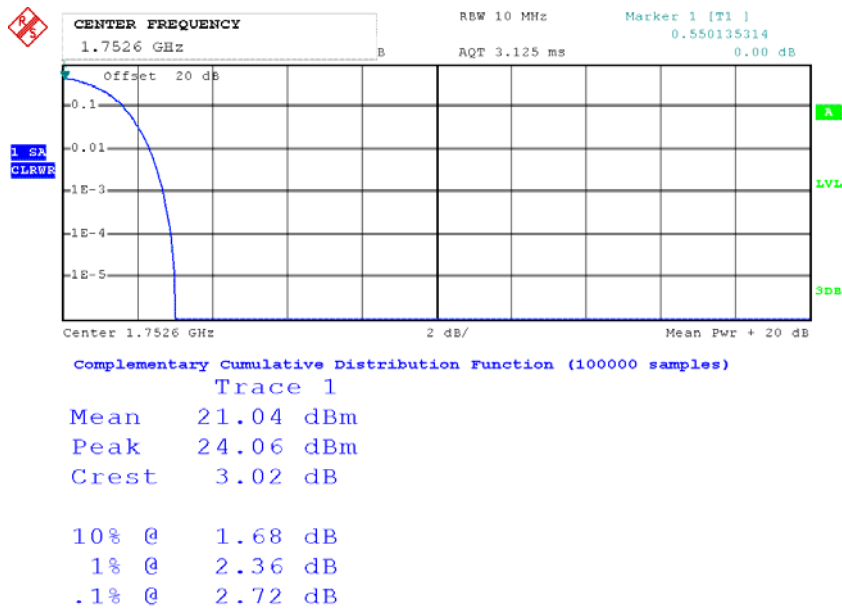
10% @      1.60 dB

1% @      2.24 dB

.1% @      2.56 dB

Date:      24.DEC.2015    23:48:18

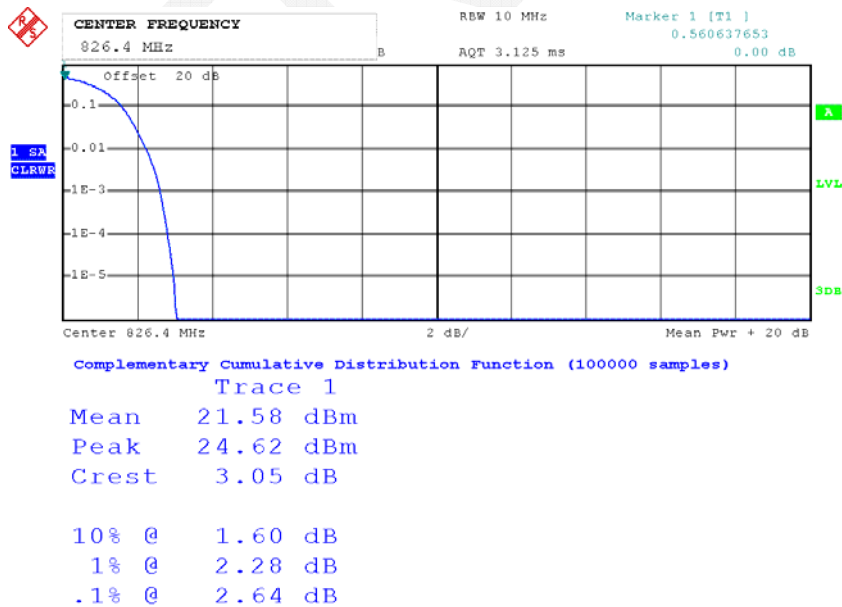
### High Channel



Date: 24.DEC.2015 23:48:31

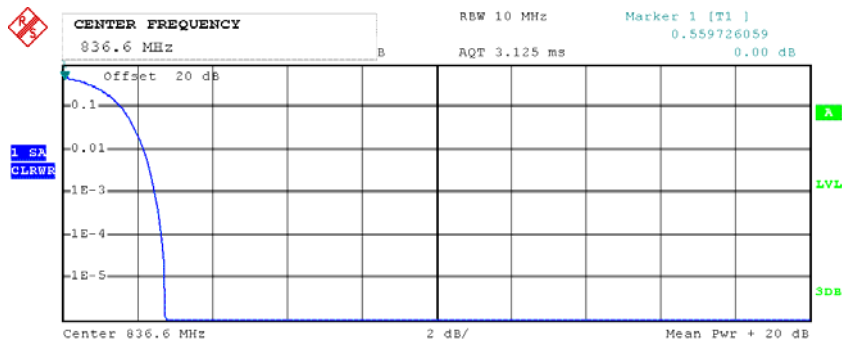
### WCDMA Band V (PART 22H)

### Low Channel



Date: 24.DEC.2015 23:51:12

### Middle Channel



Complementary Cumulative Distribution Function (100000 samples)

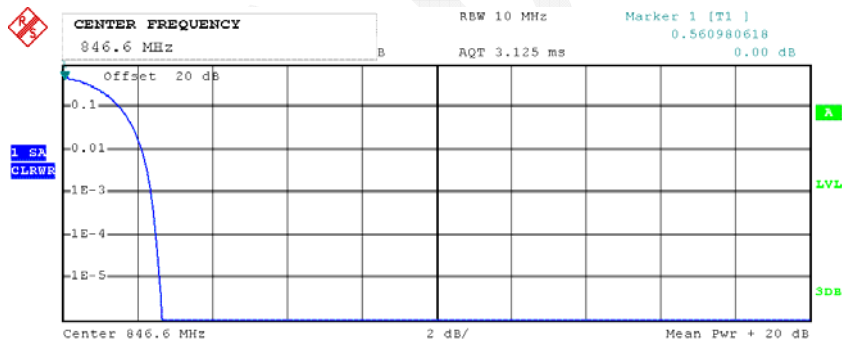
Trace 1

Mean    21.87 dBm  
 Peak    24.62 dBm  
 Crest    2.76 dB

10% @    1.60 dB  
   1% @    2.20 dB  
 .1% @    2.48 dB

Date: 24.DEC.2015 23:50:35

### High Channel



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean    21.46 dBm  
 Peak    24.13 dBm  
 Crest    2.67 dB

10% @    1.56 dB  
   1% @    2.12 dB  
 .1% @    2.40 dB

Date: 24.DEC.2015 23:50:53

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)			
<b>GSM 850 Middle Channel</b>								
836.600	H	93.01	18.1	0.0	1	17.1	38.45	21.4
836.600	V	104.63	32.8	0.0	1	31.8	38.45	6.7
<b>EGPRS 850 Middle Channel</b>								
836.600	H	89.37	14.4	0.0	1	13.4	38.45	25.1
836.600	V	97.25	25.5	0.0	1	24.5	38.45	14.0
<b>WCDMA Band V Middle Channel</b>								
836.600	H	85.30	10.4	0.0	1	9.4	38.45	29.1
836.600	V	91.66	19.9	0.0	1	18.9	38.45	19.6

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)			
<b>PCS 1900 Middle Channel</b>								
1880.000	H	90.06	18.5	11.1	1.4	28.2	33.0	4.8
1880.000	V	92.31	20.9	11.1	1.4	30.6	33.0	2.4
<b>EGPRS 1900 Middle Channel</b>								
1880.000	H	87.10	15.5	11.1	1.4	25.2	33.0	7.8
1880.000	V	88.44	17	11.1	1.4	26.7	33.0	6.3
<b>WCDMA Band II Middle Channel</b>								
1880.000	H	85.33	13.7	11.1	1.4	23.4	33.0	9.6
1880.000	V	87.12	15.7	11.1	1.4	25.4	33.0	7.6

Part 27

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)			
<b>WCDMA Band IV Middle Channel</b>								
1732.600	H	83.93	10.9	10.7	1.4	20.2	30.0	9.8
1732.600	V	84.16	10.8	10.7	1.4	20.1	30.0	9.9

**FCC §2.1049, §22.917, §22.905 & §24.238 & §27.53- OCCUPIED BANDWIDTH**

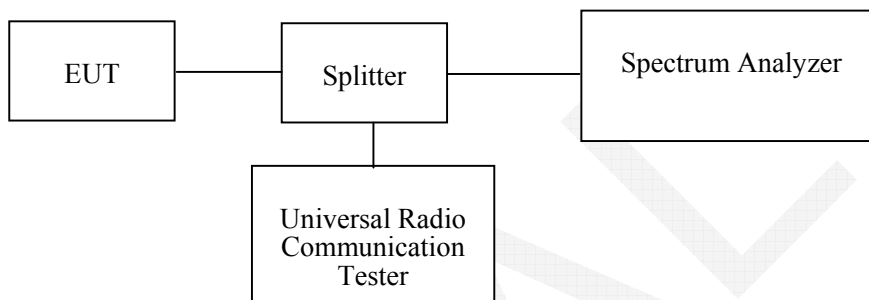
**Applicable Standard**

FCC §2.1049, §22.917, §22.905, §24.238 and §27.53.

**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	109038	2015-07-28	2016-07-27
R&S	Wideband Radio Communication Tester	CMW500	106891	2015-12-19	2016-12-19

\* **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>	23.7~23.9 °C
<b>Relative Humidity:</b>	40~41%
<b>ATM Pressure:</b>	101~101.7 kPa

*The testing was performed by Dean Liu from 2015-12-24 to 2015-12-25.*

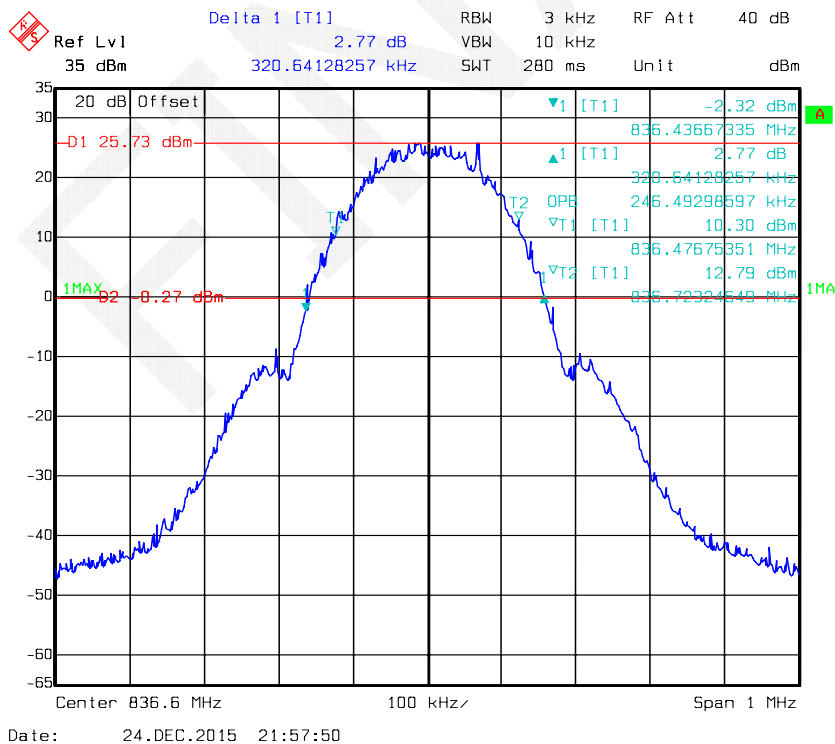
*Test Mode: Transmitting*

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

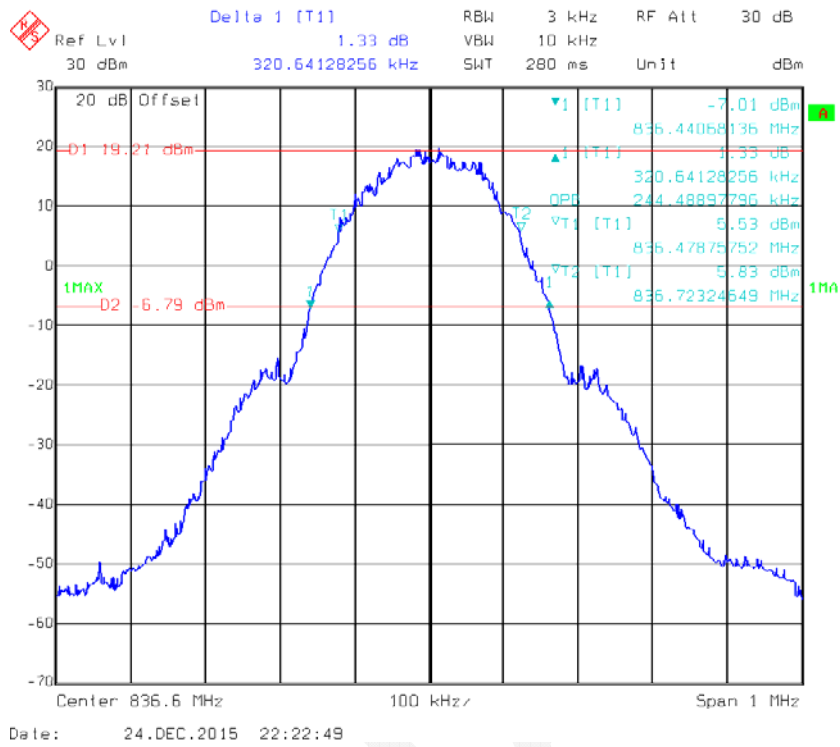


Band	Channel No.	Mode	99% Occupied Bandwidth (kHz)	26 dB Occupied Bandwidth (kHz)
Cellular	190	GSM	246.49	320.64
		EDGE	244.49	320.64
PCS	661	PCS	246.49	312.63
		EDGE	254.51	324.65
WCDMA Band II	9400	Rel 99	4188.38	4729.46
		HSDPA	4188.38	4729.46
		HSUPA	4188.38	4689.38
WCDMA Band IV	1413	Rel 99	4228.46	4909.82
		HSDPA	4228.46	4909.82
		HSUPA	4228.46	4949.9
WCDMA Band V	4175	Rel 99	4248.5	4909.82
		HSDPA	4228.46	4909.82
		HSUPA	4248.5	4929.86

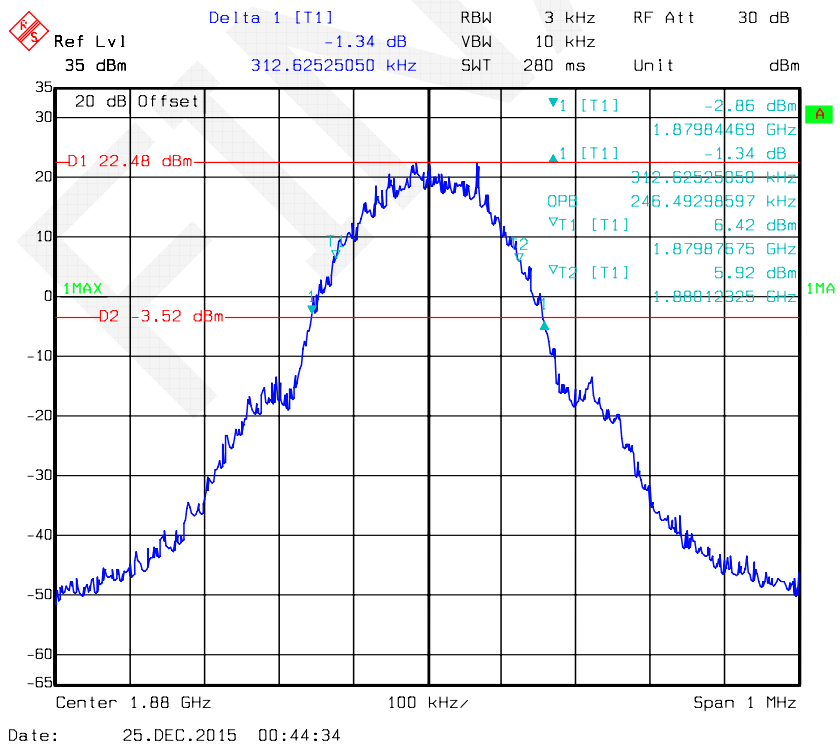
**GMSK 850 Cellular Band**



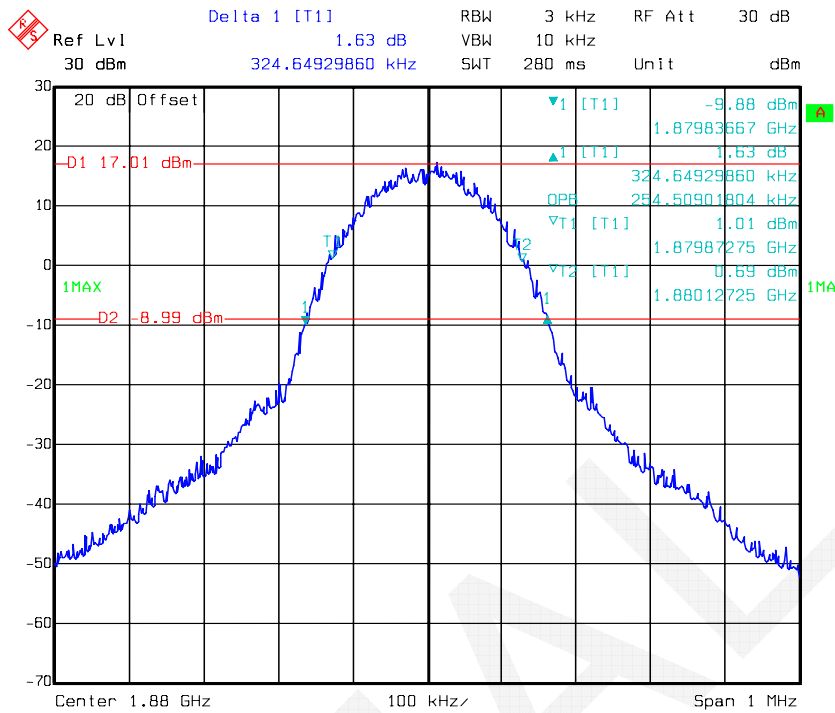
### EDGE 850 Cellular Band



### GMSK PCS Band

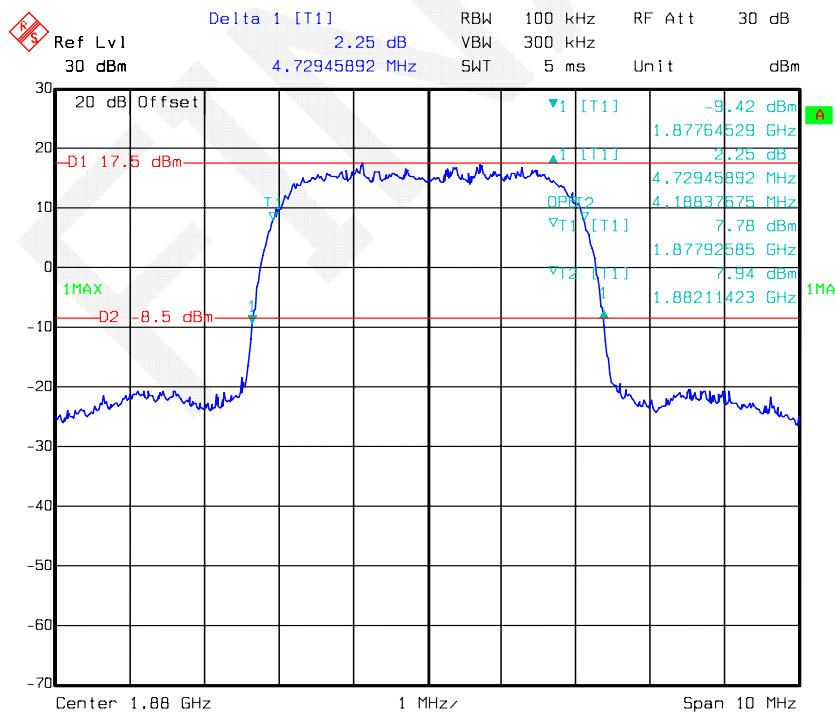


**EDGE PCS Band**



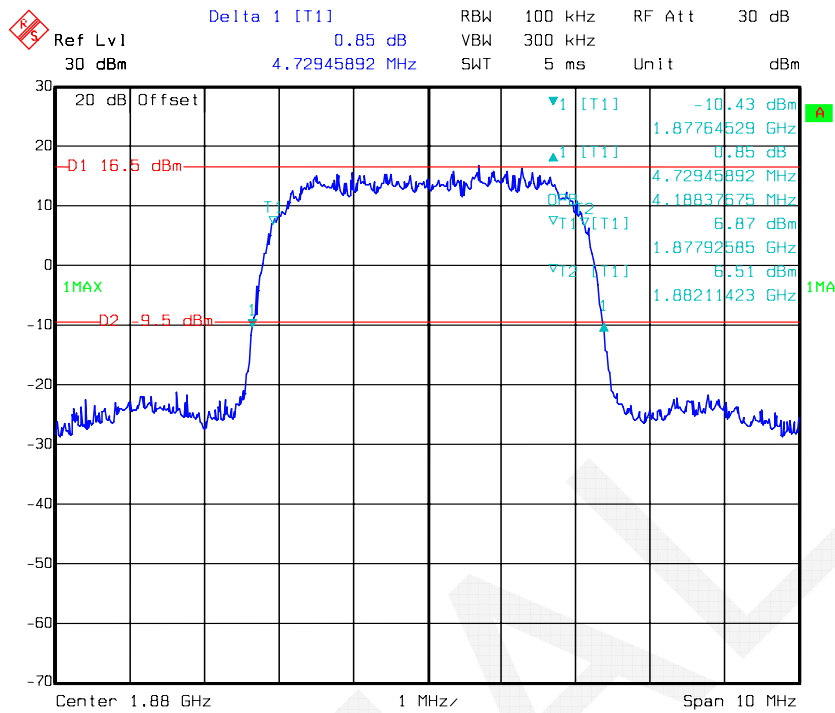
Date: 25.DEC.2015 00:56:42

**REL99 Band II**



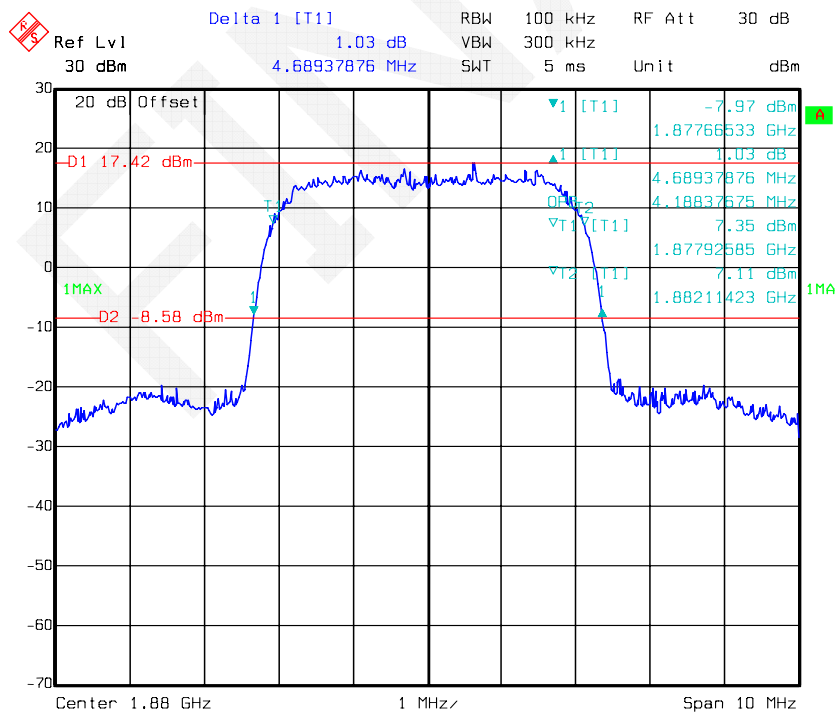
Date: 24.DEC.2015 22:55:16

### HSDPA Band II



Date: 24.DEC.2015 22:57:38

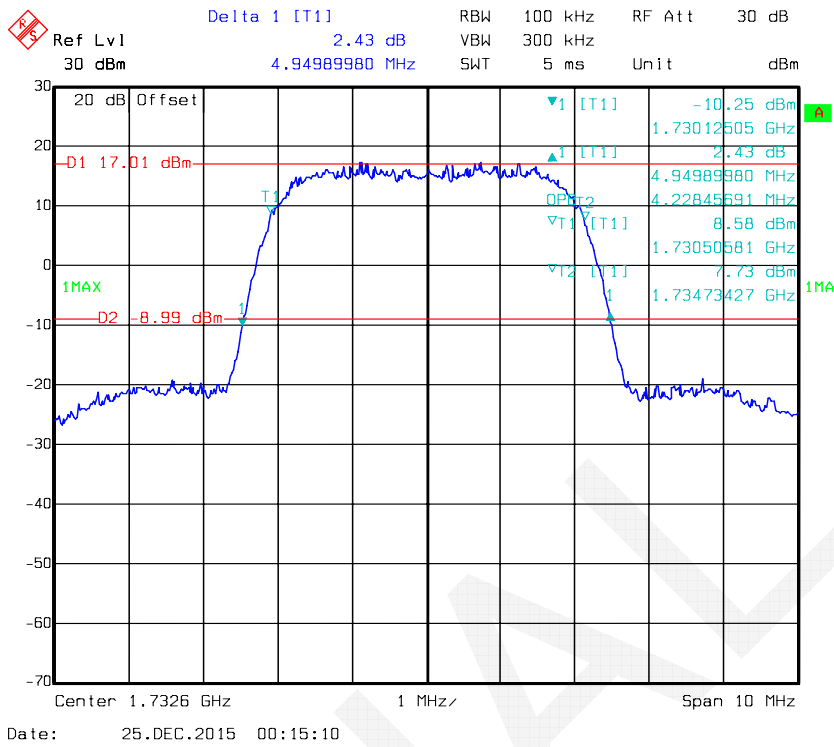
### HSUPA Band II



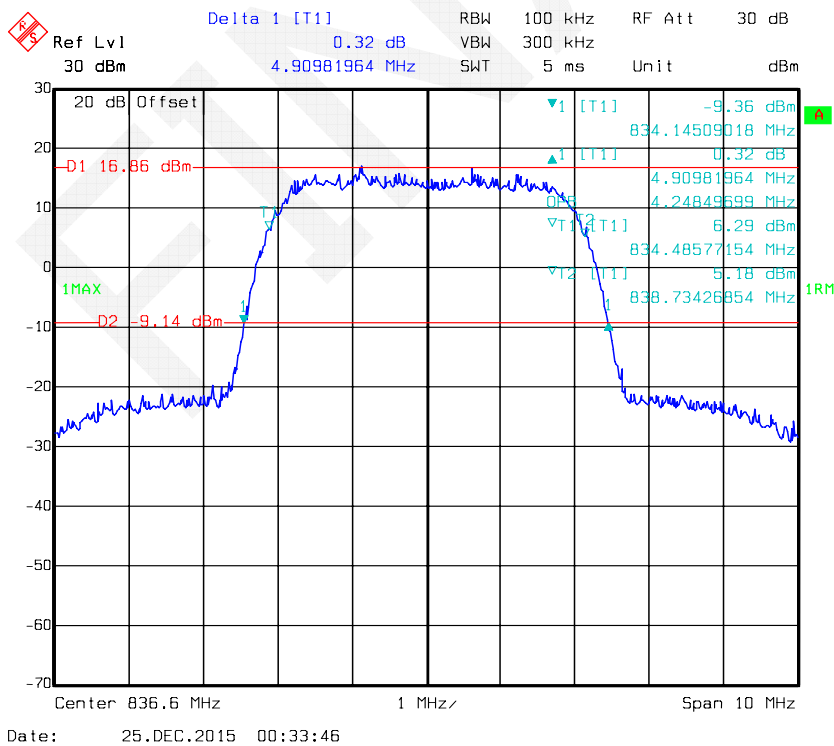
Date: 24.DEC.2015 22:53:00



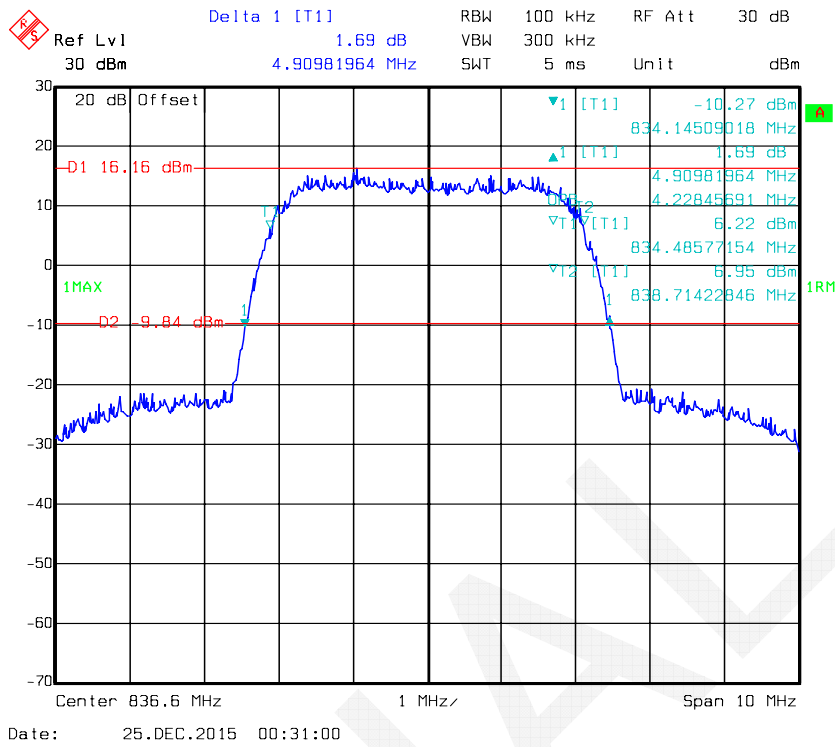
### HSUPA Band IV



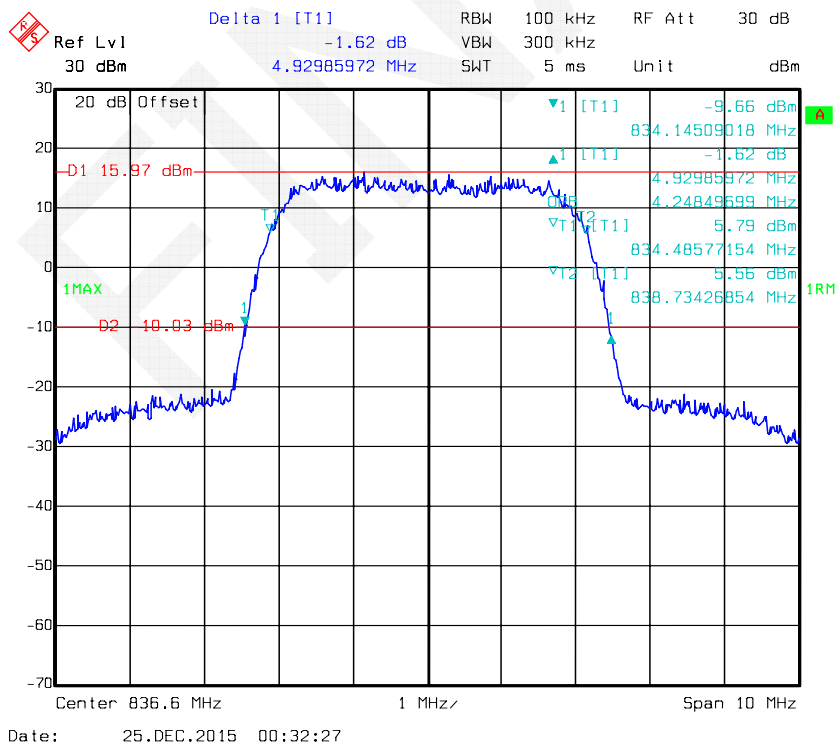
### REL99 Band V



### HSDPA Band V



### HSUPA Band V



## FCC §2.1051, §22.917(a) & §24.238(a) & §27.53- SPURIOUS EMISSIONS AT ANTENNA TERMINALS

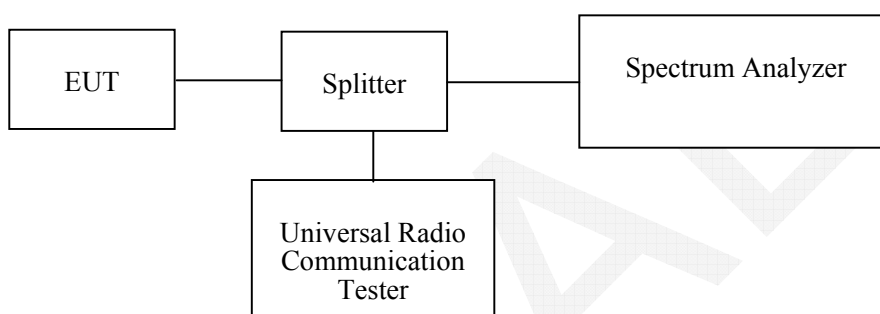
### Applicable Standard

FCC §2.1051, §22.917(a), §24.238(a) and §27.53.

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	2015-05-09	2016-05-09
R&S	Universal Radio Communication Tester	CMU200	109038	2015-05-09	2016-05-09
R&S	Wideband Radio Communication Tester	CMW500	106891	2015-12-19	2016-12-19

\* **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

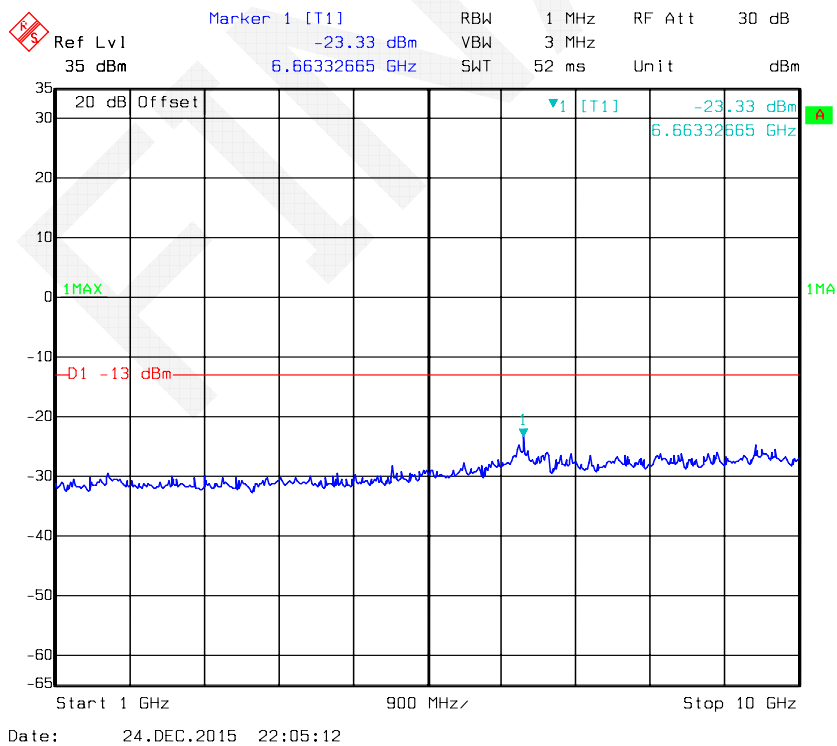
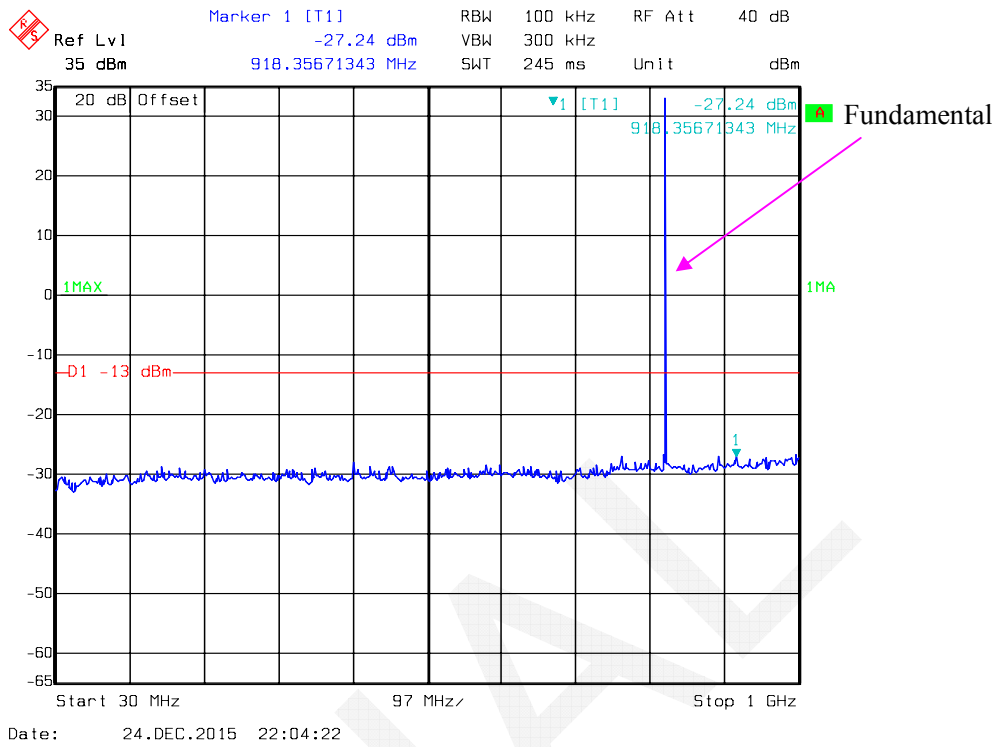
<b>Temperature:</b>	23.7~23.9 °C
<b>Relative Humidity:</b>	40~41 %
<b>ATM Pressure:</b>	101~101.7kPa

*The testing was performed by Dean Liu from 2015-12-24 to 2015-12-25.*

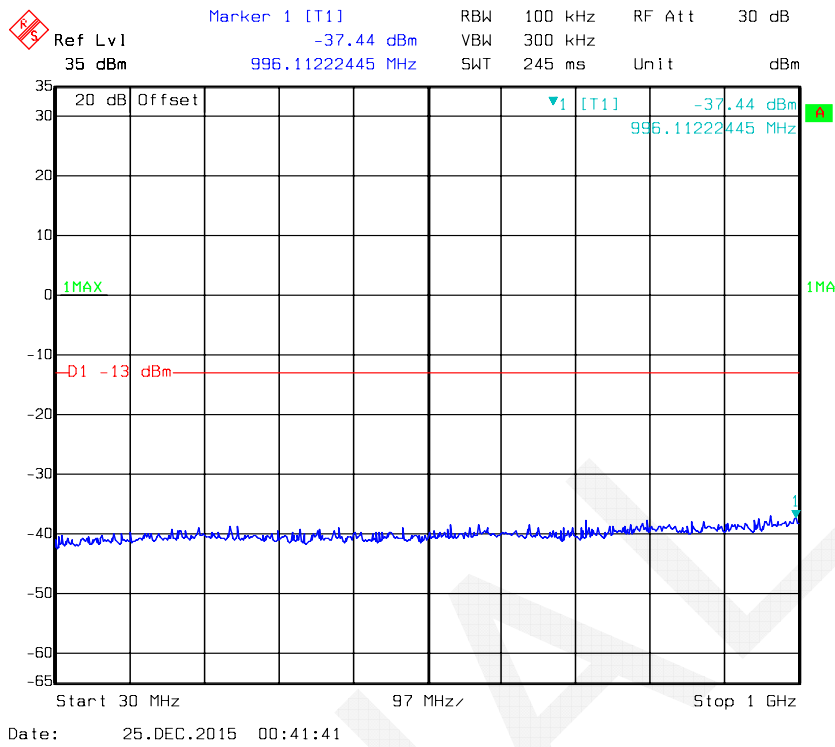
Please refer to the following plots.



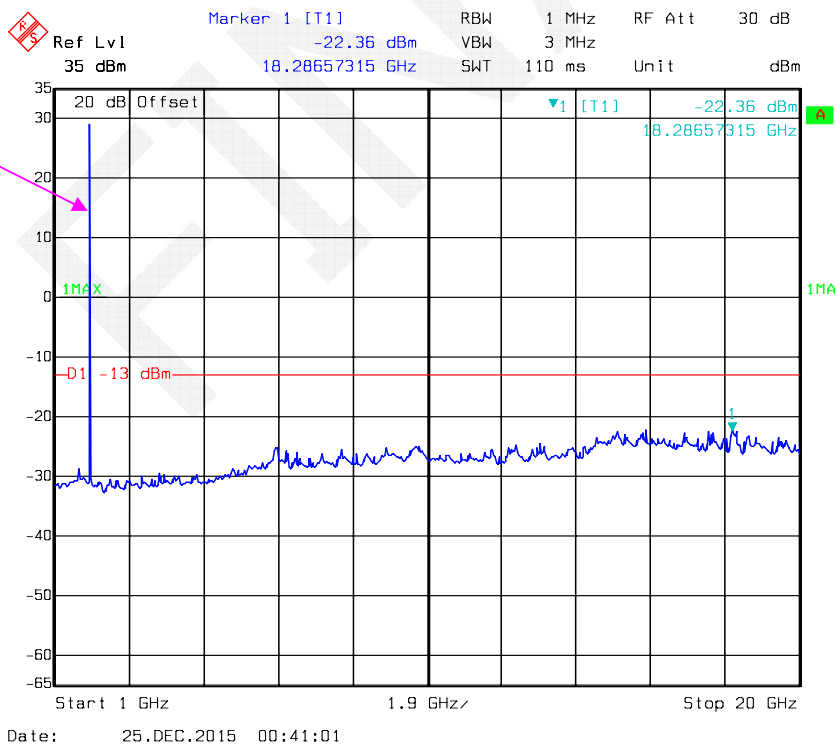
**GSM850\_Middle Channel**



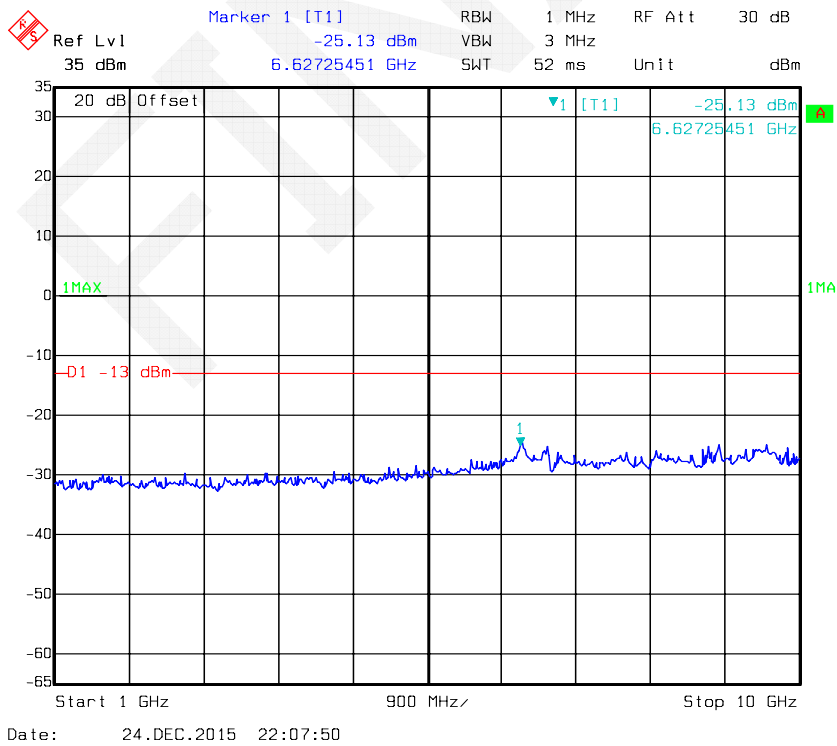
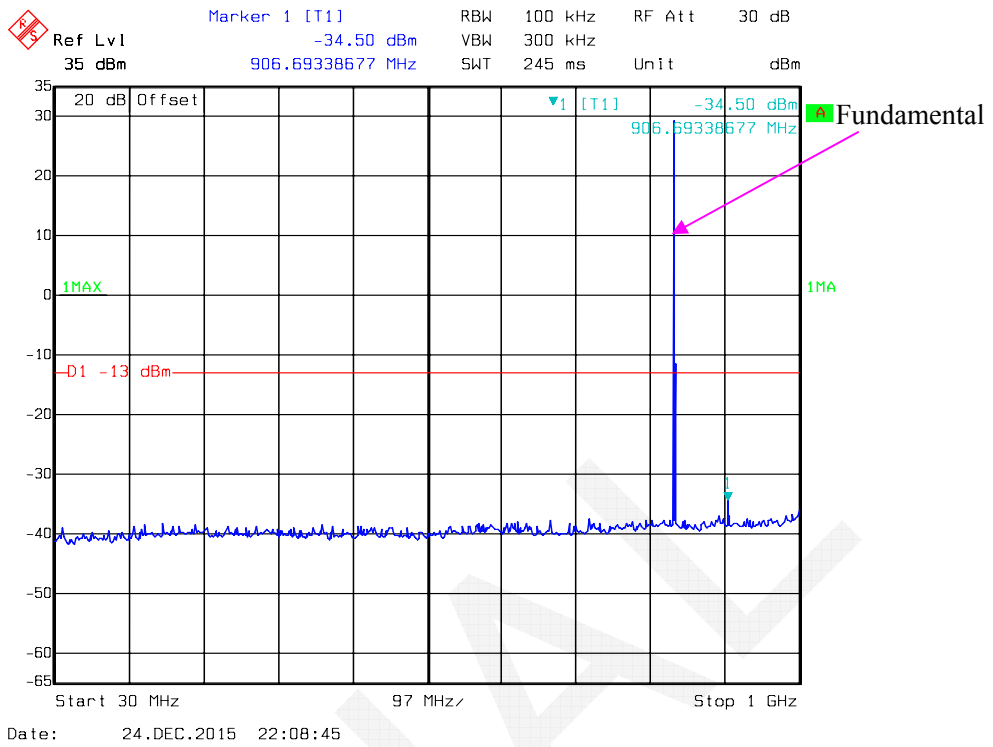
### PCS 1900\_ Middle Channel



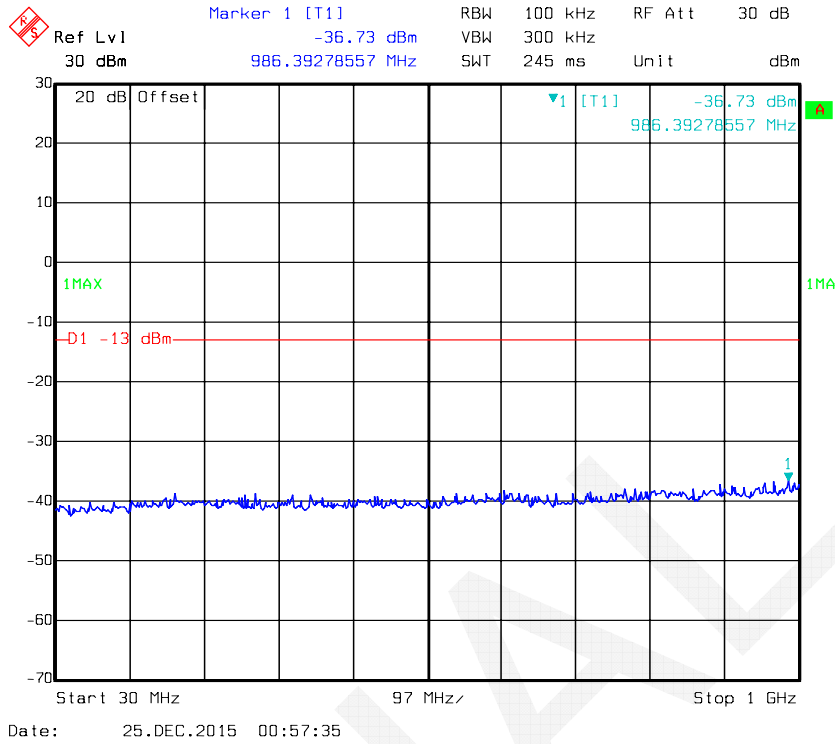
Fundamental



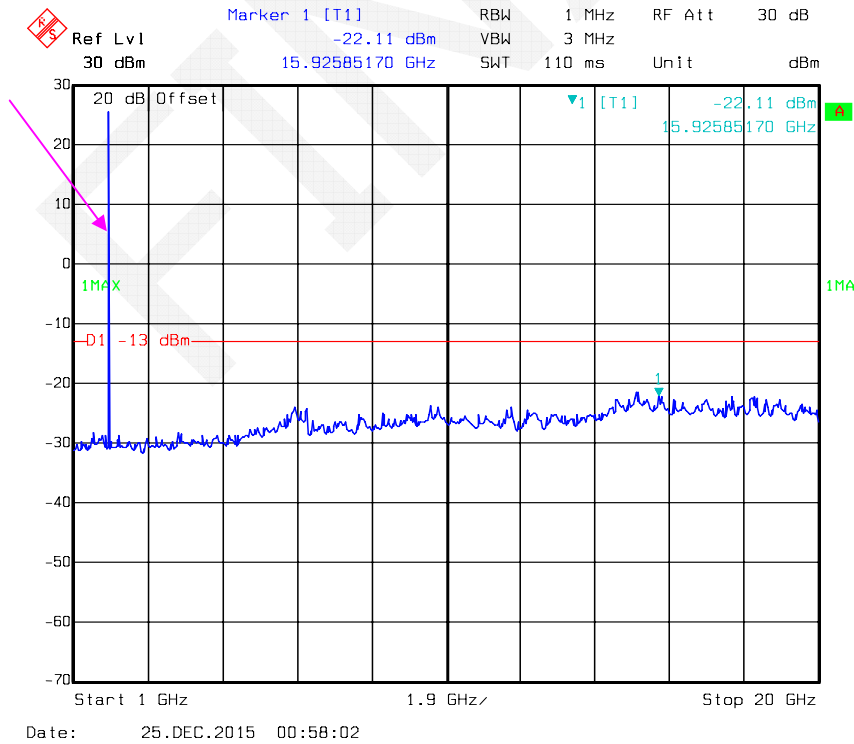
**EDGE850\_Middle Channel**



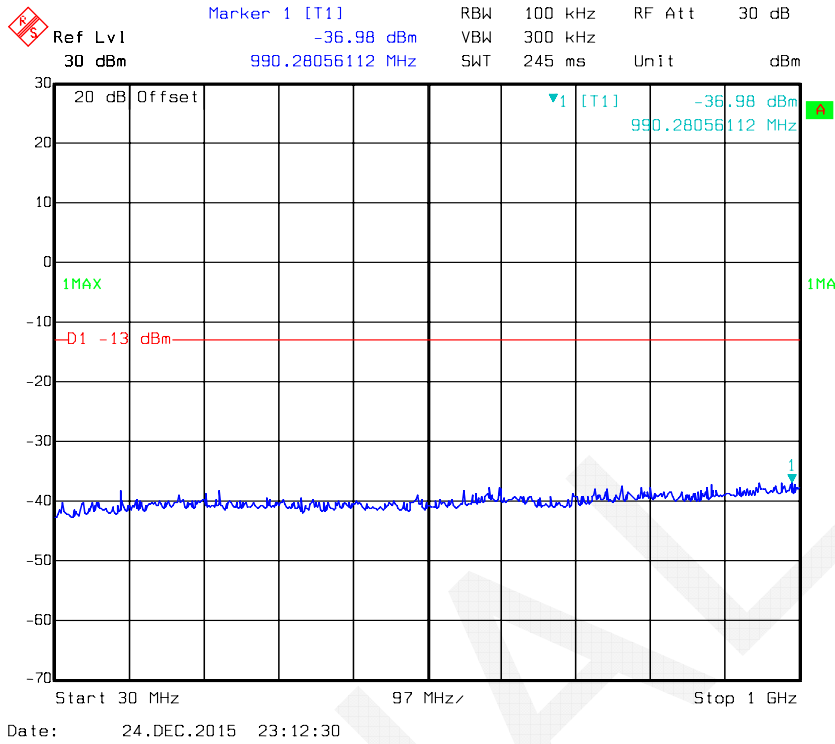
**EDGE1900\_ Middle Channel**



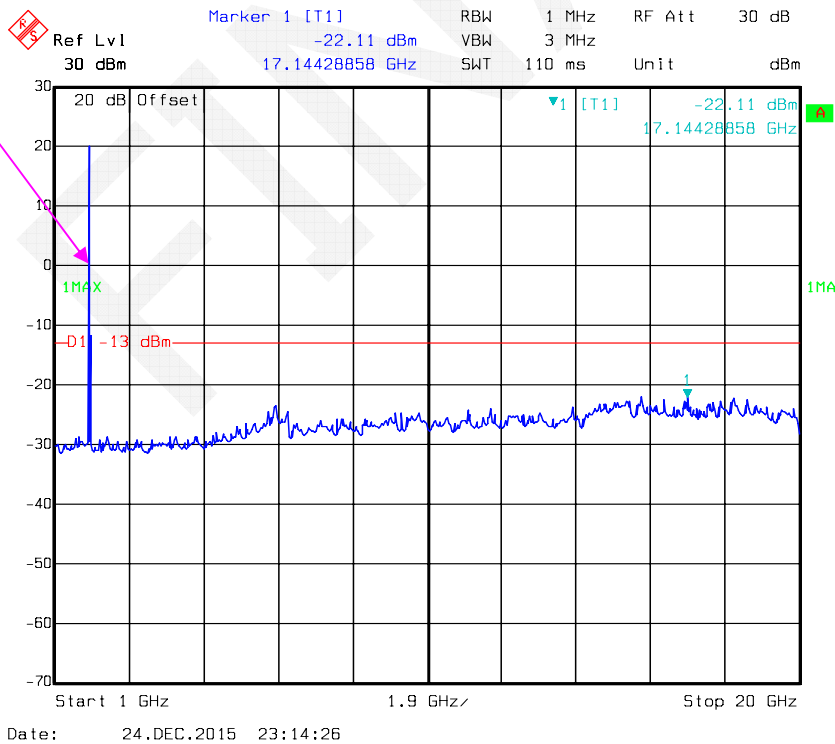
Fundamental



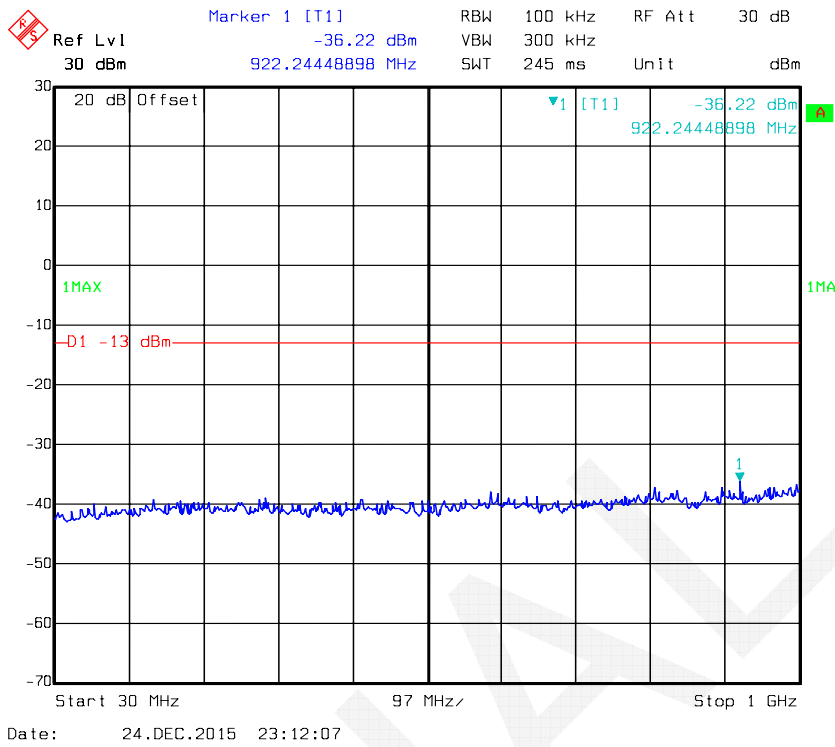
**REL99 Band II\_ Middle Channel**



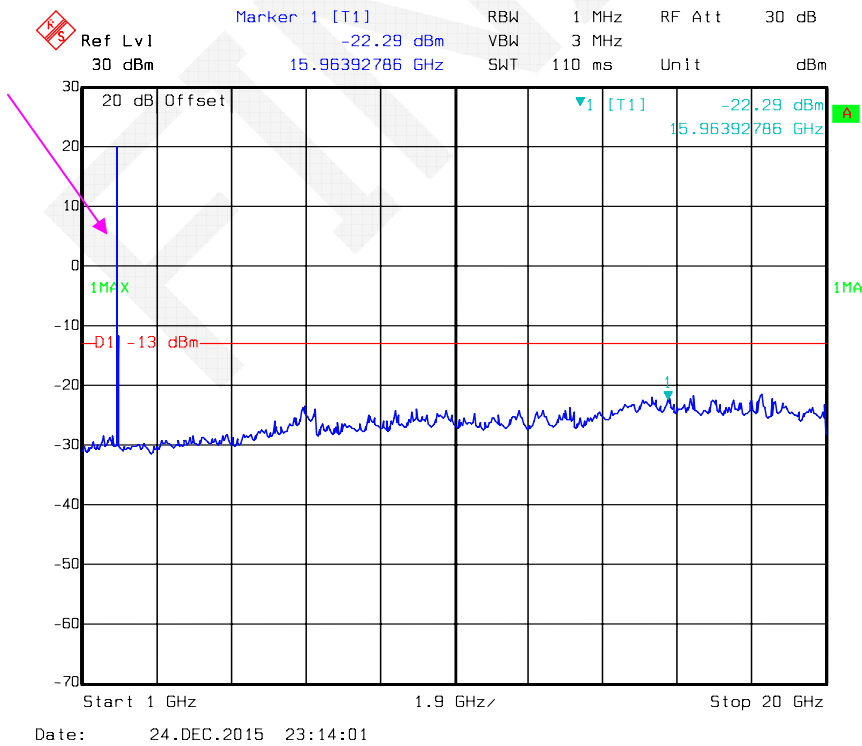
Fundamental



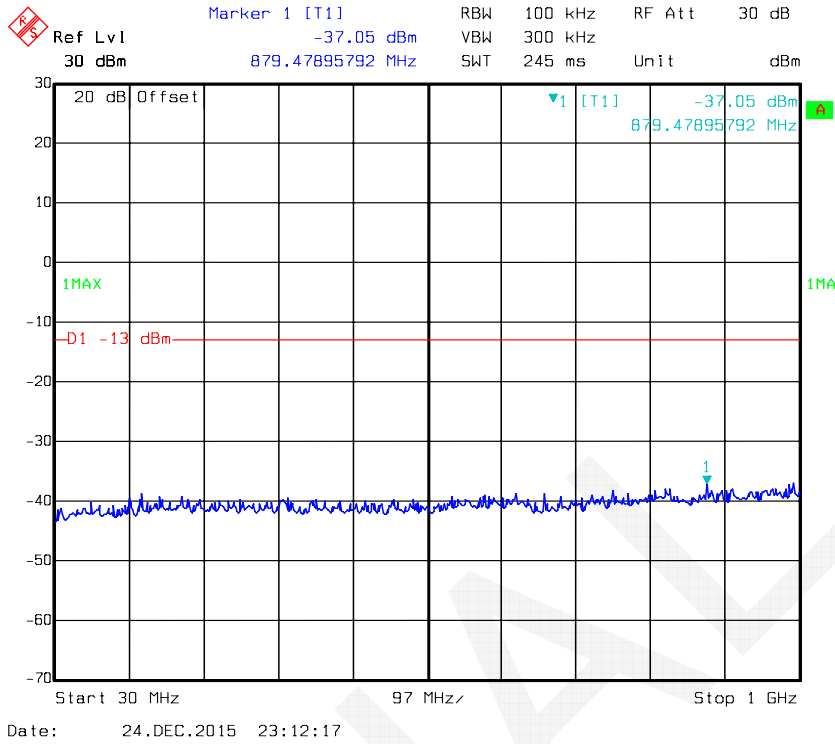
**HSDPA Band II \_Middle Channel**



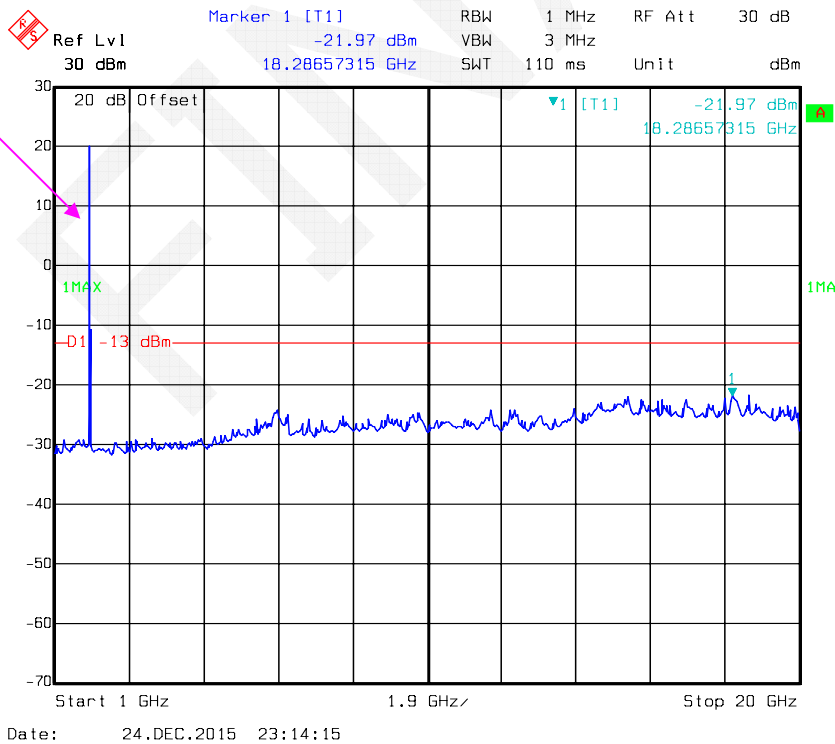
Fundamental



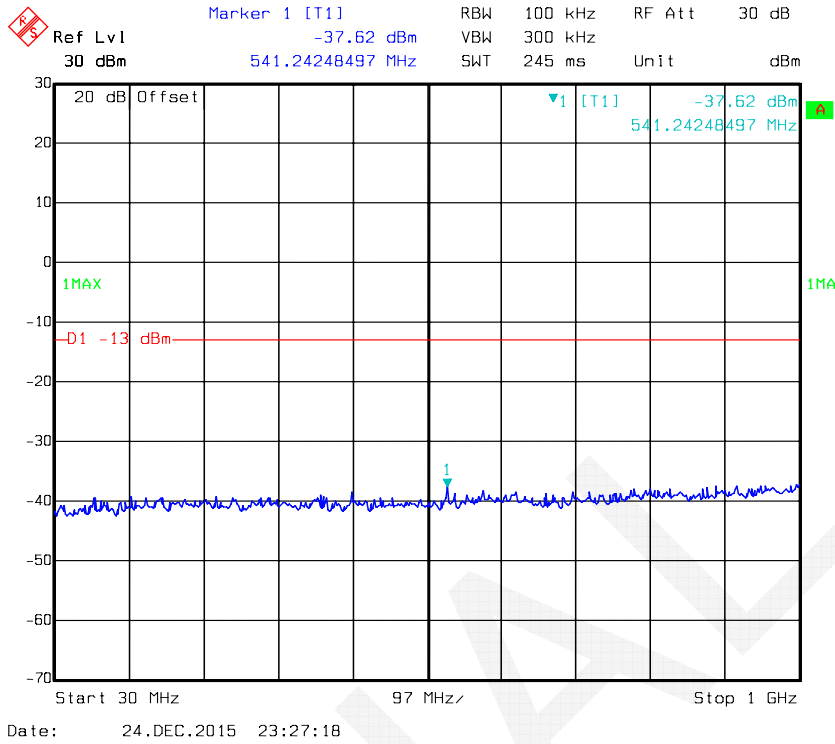
### HSUPA Band II \_ Middle Channel



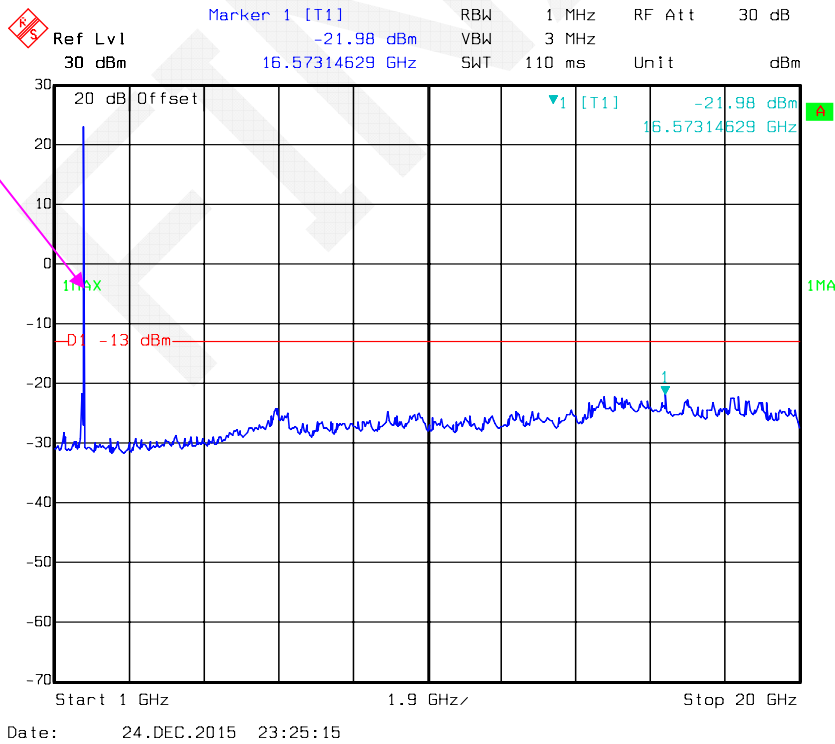
Fundamental



### REL99 Band IV\_ Middle Channel

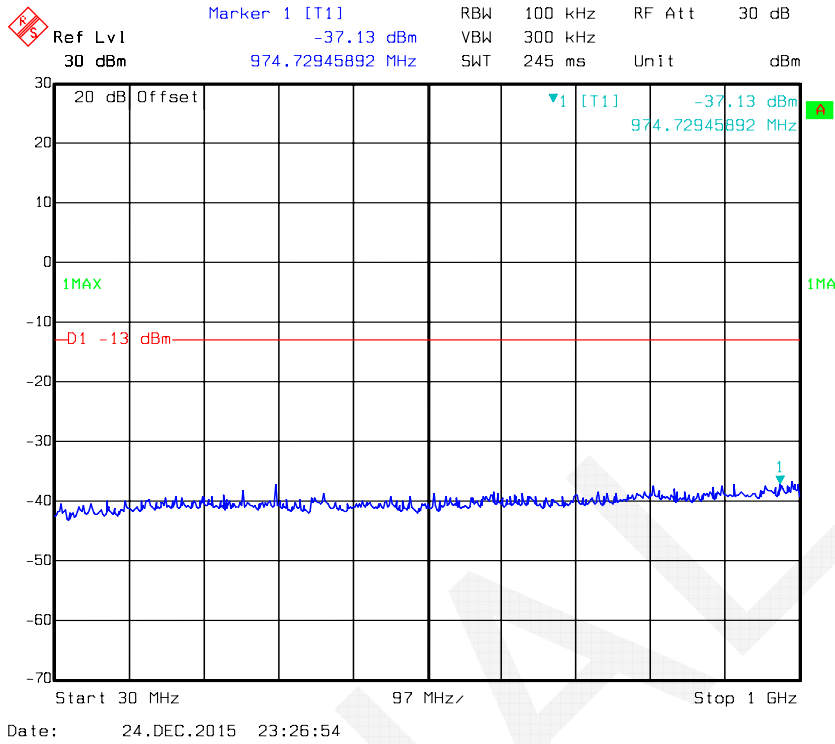


Fundamental

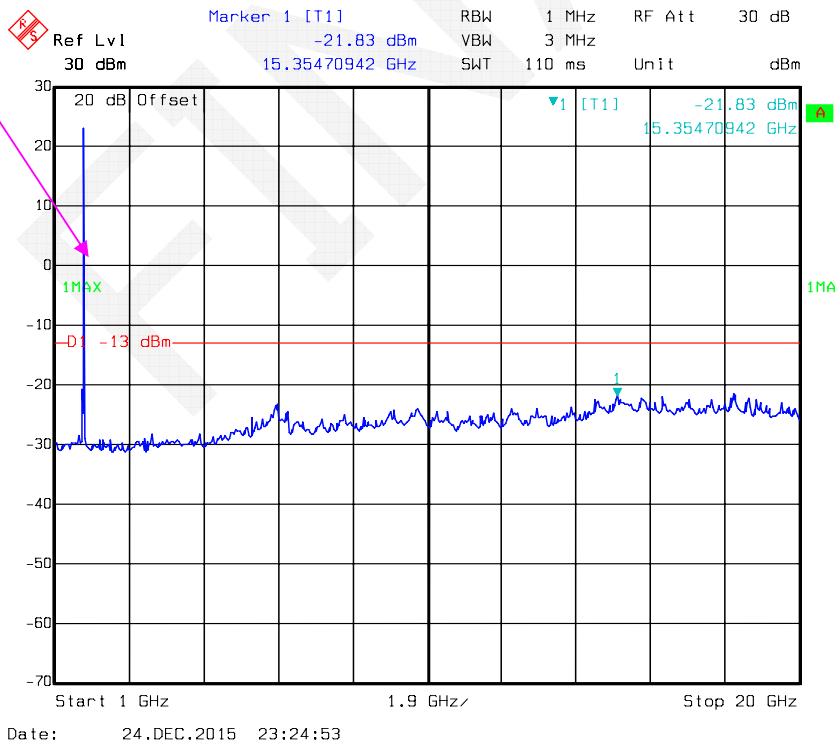




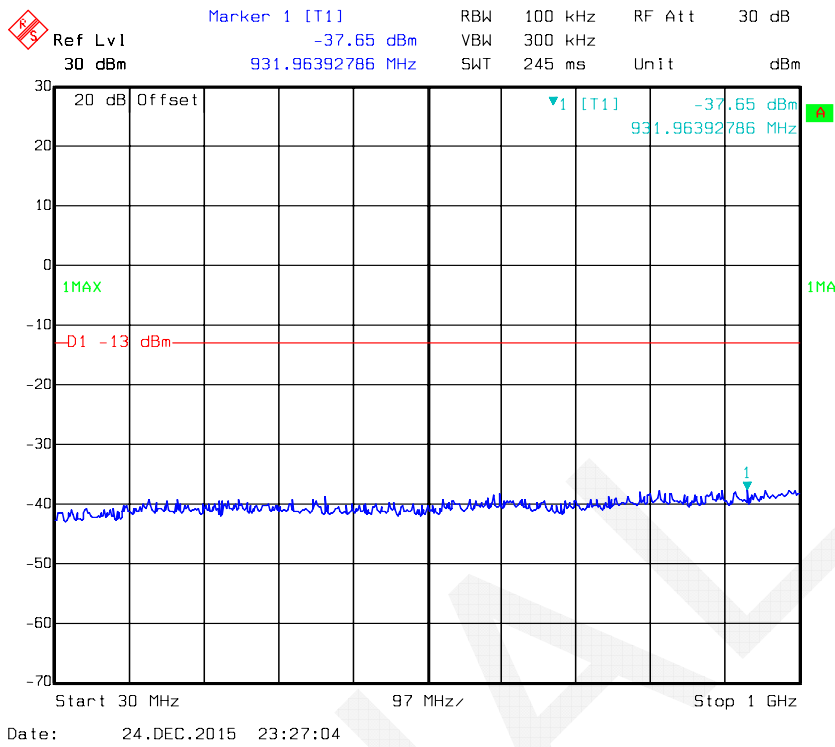
**HSDPA Band IV \_Middle Channel**



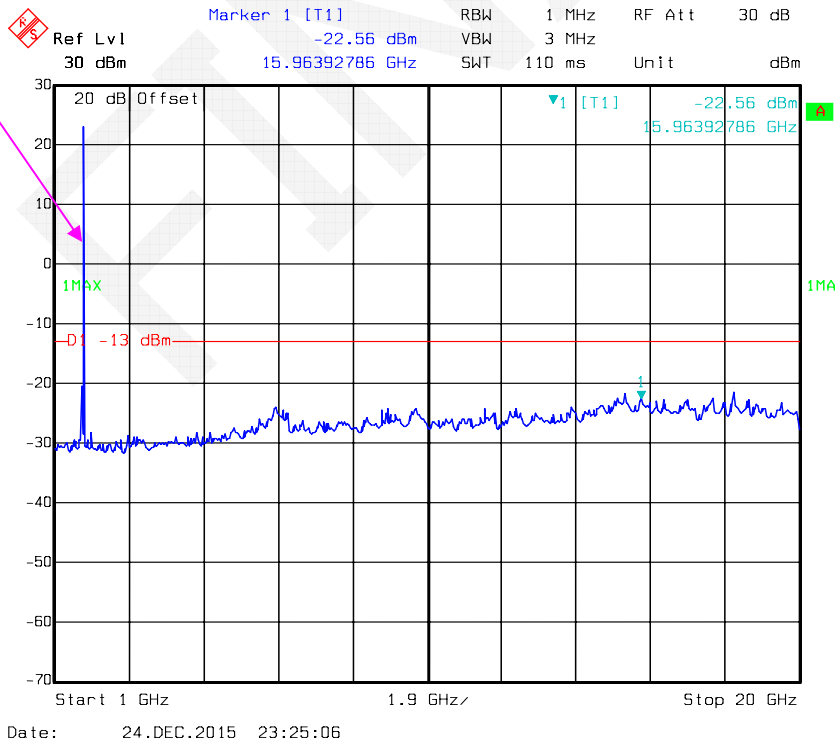
Fundamental



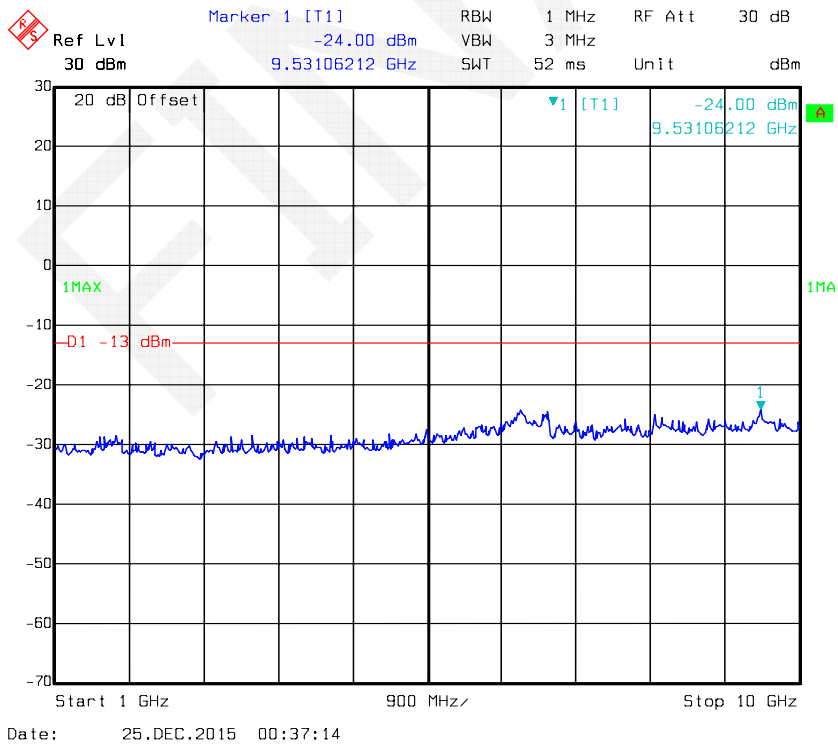
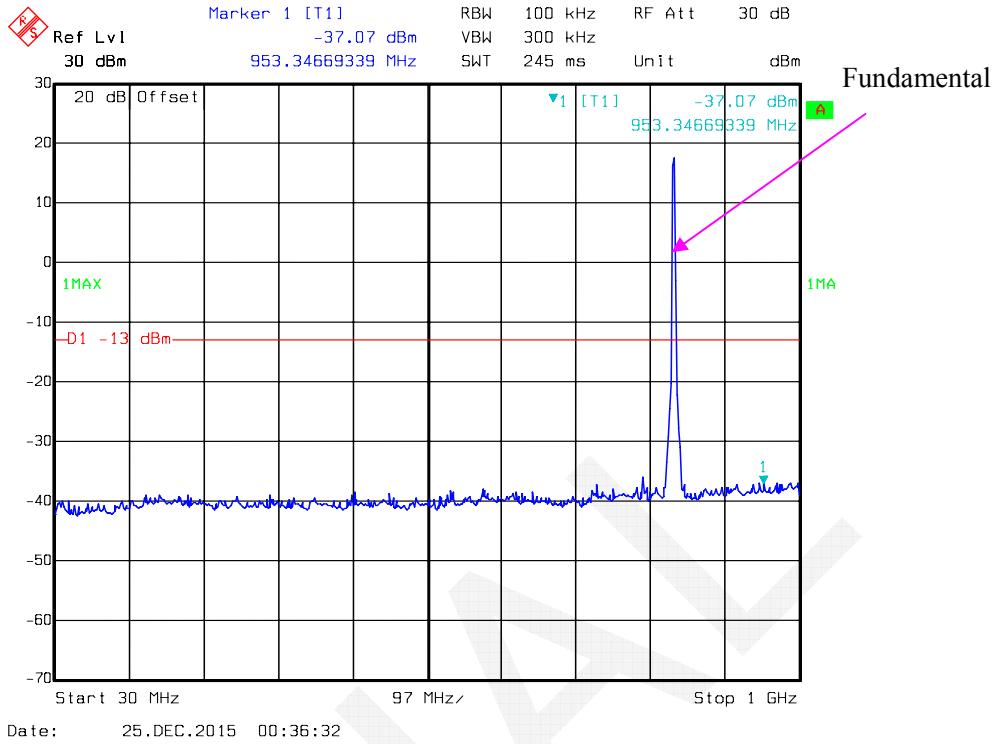
### HSUPA Band IV \_ Middle Channel



Fundamental

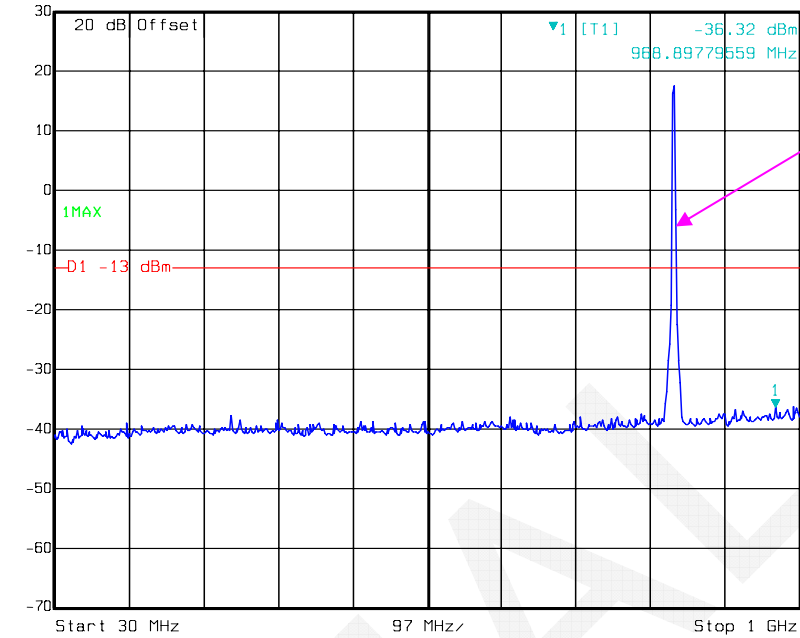


**REL99 Band V\_ Middle Channel**



### HSDPA Band V\_ Middle Channel

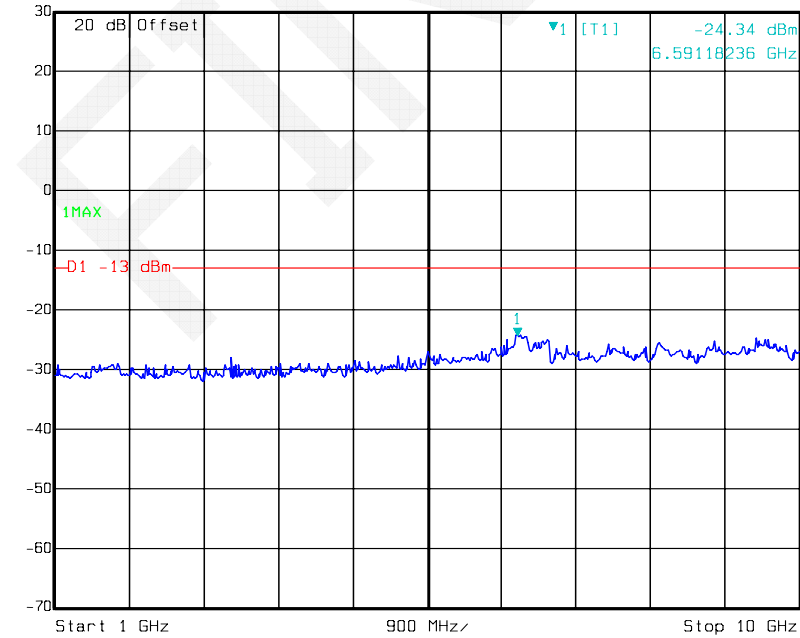
Marker 1 [T1] RBW 100 kHz RF Att 30 dB  
Ref Lvl -36.32 dBm VBW 300 kHz  
30 dBm 968.89779559 MHz SWT 245 ms Unit dBm



Fundamental

Date: 25.DEC.2015 00:35:48

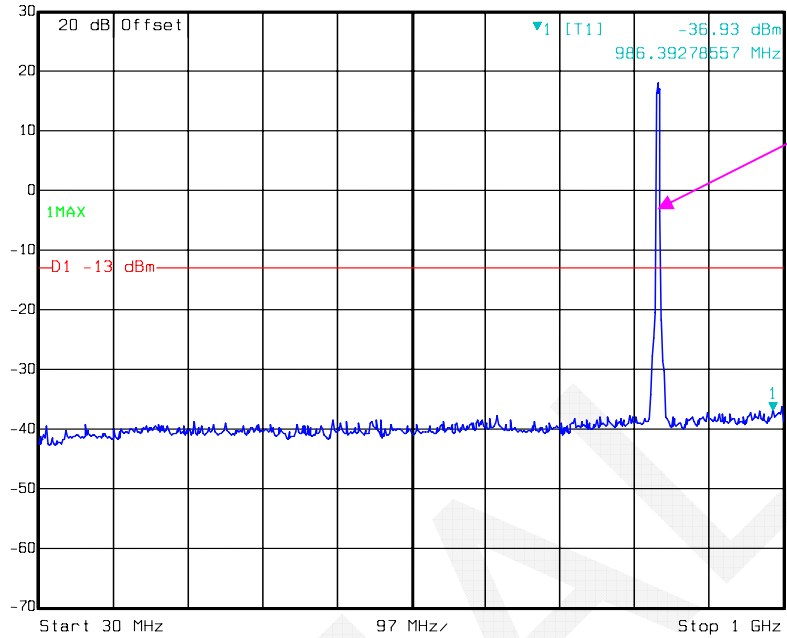
Marker 1 [T1] RBW 1 MHz RF Att 30 dB  
Ref Lvl -24.34 dBm VBW 3 MHz  
30 dBm 6.59118236 GHz SWT 52 ms Unit dBm



Date: 25.DEC.2015 00:36:55

**HSUPA Band V\_ Middle Channel**

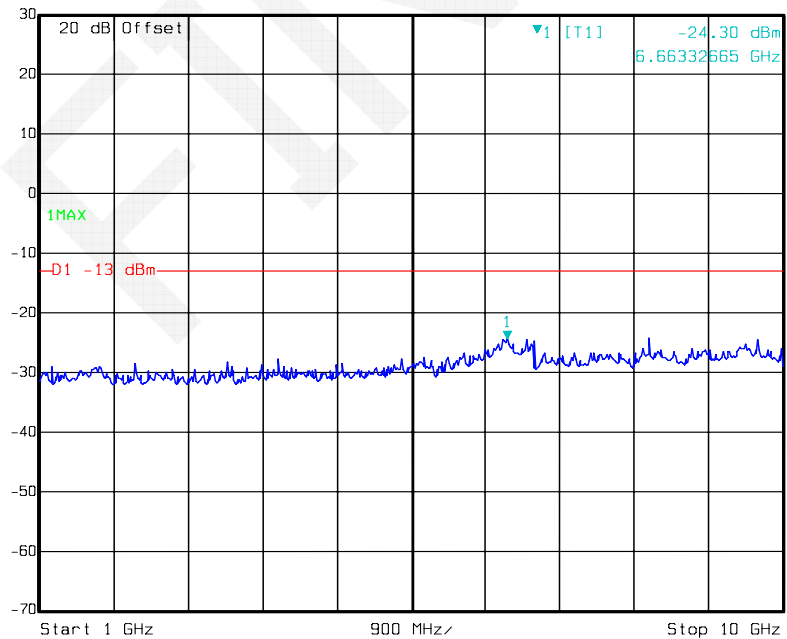
⚠ Ref Lvl 30 dBm      Marker 1 [T1] 986.39278557 MHz      RBW 100 kHz      RF Att 30 dB  
 -36.93 dBm      VBW 300 kHz  
 -13 dBm      SWT 245 ms      Unit dBm



Date: 25.DEC.2015 00:36:11

Fundamental

⚠ Ref Lvl 30 dBm      Marker 1 [T1] 6.66332665 GHz      RBW 1 MHz      RF Att 30 dB  
 -24.30 dBm      VBW 3 MHz  
 -13 dBm      SWT 52 ms      Unit dBm



Date: 25.DEC.2015 00:37:04

## FCC §2.1053, §22.917 & §24.238 & §27.53- SPURIOUS RADIATED EMISSIONS

### Applicable Standard

FCC § 2.1053, §22.917, § 24.238 and § 27.53.

### 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 Log<sub>10</sub> (power out in Watts)

Spurious attenuation limit in dB = 55 + 10 Log<sub>10</sub> (power out in Watts) for band 7

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2015-08-03	2016-08-02
Sunol Sciences	Antenna	JB3	A060611-3	2014-11-06	2017-11-05
HP	Amplifier	8447E	2434A02181	2015-09-01	2016-09-01
R&S	Spectrum Analyzer	FSEM	DE31388	2015-05-09	2016-05-09
ETS LINDGREN	Horn Antenna	3115	000 527 35	2015-09-06	2018-09-06
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2015-02-19	2016-02-19
Giga	Signal Generator	1026	320408	2015-11-23	2016-11-22
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

\* **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>	23.9°C
<b>Relative Humidity:</b>	40 %
<b>ATM Pressure:</b>	101.7 kPa

The testing was performed by Dean Liu on 2015-12-25.

EUT Operation Mode: Transmitting

**Cellular Band (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	35.49	-65.6	10.5	1.5	-56.6	-13.0	43.6
1673.200	V	34.83	-66.5	10.5	1.5	-57.5	-13.0	44.5
2509.800	H	44.40	-53.6	12.2	2.8	-44.2	-13.0	31.2
2509.800	V	43.69	-53.4	12.2	2.8	-44.0	-13.0	31.0
381.700	H	40.82	-56.8	0.0	0.6	-57.4	-13.0	44.4
266.100	V	40.36	-65.2	0.0	0.5	-65.7	-13.0	52.7

**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:836.6 MHz								
1673.200	H	35.38	-65.7	10.5	1.5	-56.7	-13.0	43.7
1673.200	V	34.70	-66.7	10.5	1.5	-57.7	-13.0	44.7
381.700	H	39.64	-57.9	0.0	0.6	-58.5	-13.0	45.5
266.100	V	39.12	-66.4	0.0	0.5	-66.9	-13.0	53.9

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

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB $\mu$ 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	43.86	-50.4	12.3	2.9	-41.0	-13.0	28.0
3760.000	V	42.29	-50.8	12.3	2.9	-41.4	-13.0	28.4
381.700	H	40.23	-57.4	0.0	0.6	-58.0	-13.0	45.0
266.100	V	40.17	-65.3	0.0	0.5	-65.8	-13.0	52.8

**WCDMA Band II**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB $\mu$ 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	38.90	-55.4	12.3	2.9	-46.0	-13.0	33.0
3760.000	V	36.89	-56.2	12.3	2.9	-46.8	-13.0	33.8
381.700	H	39.63	-58	0.0	0.6	-58.6	-13.0	45.6
266.100	V	39.11	-66.4	0.0	0.5	-66.9	-13.0	53.9

**WCDMA Band IV**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB $\mu$ V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
Frequency:1732.6 MHz								
3465.200	H	38.23	-58.7	12.2	1.9	-48.4	-13.0	35.4
3465.200	V	35.88	-60.3	12.2	1.9	-50.0	-13.0	37.0
381.700	H	39.32	-58.3	0.0	0.6	-58.9	-13.0	45.9
266.100	V	39.17	-66.3	0.0	0.5	-66.8	-13.0	53.8

## 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) & §27.53(g)§27.53(h) §27.53(m) - 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.

According to §27.53 (g), For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log (P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

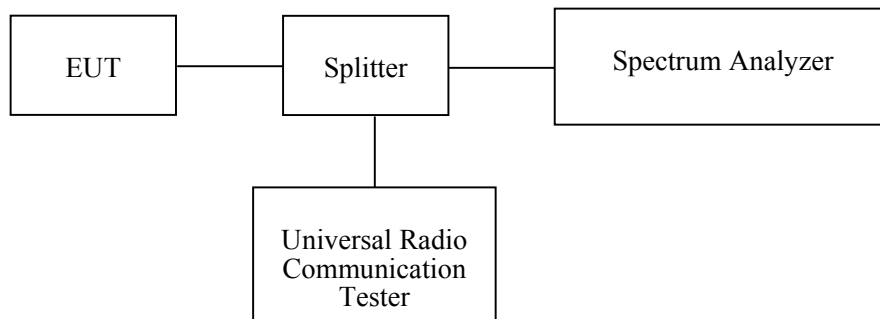
According to §27.53 (h), AWS emission limits—(1) General protection levels. Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10} (P)$  dB.

According to §27.53 (m), (4) For mobile digital stations, the attenuation factor shall be not less than  $40 + 10 \log (P)$  dB on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log (P)$  dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and  $55 + 10 \log (P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that  $43 + 10 \log (P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log (P)$  dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

**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	2015-05-09	2016-05-09
R&S	Universal Radio Communication Tester	CMU200	109038	2015-05-09	2016-05-09
R&S	Wideband Radio Communication Tester	CMW500	106891	2015-12-19	2016-12-19

\* **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**

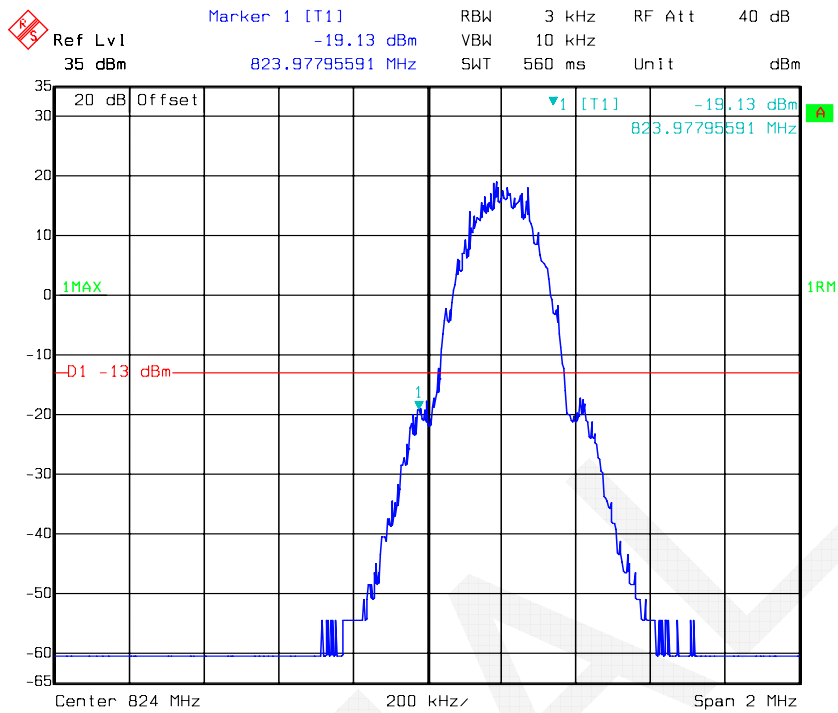
<b>Temperature:</b>	23.7~23.9 °C
<b>Relative Humidity:</b>	40~41 %
<b>ATM Pressure:</b>	101~101.7 kPa

*The testing was performed by Dean Liu from 2015-12-24 to 2015-12-25.*

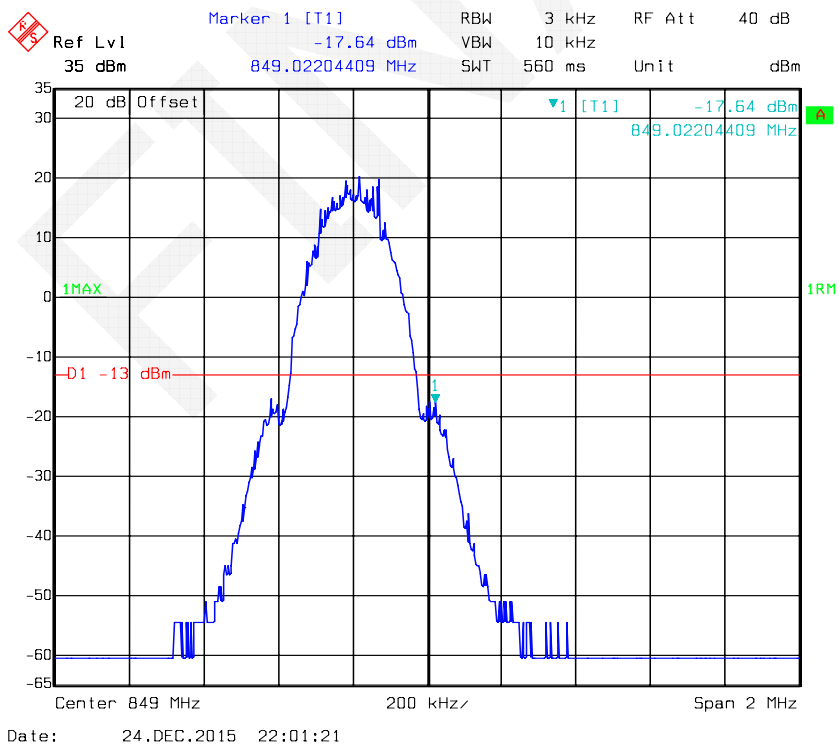
*Test Mode: Transmitting*

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

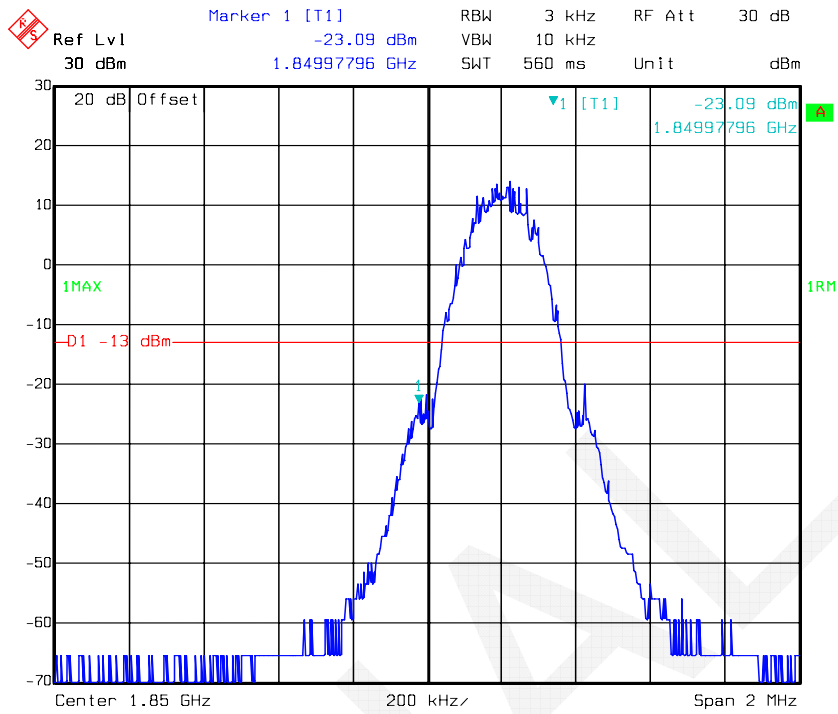
**GSM 850, Left Band Edge**



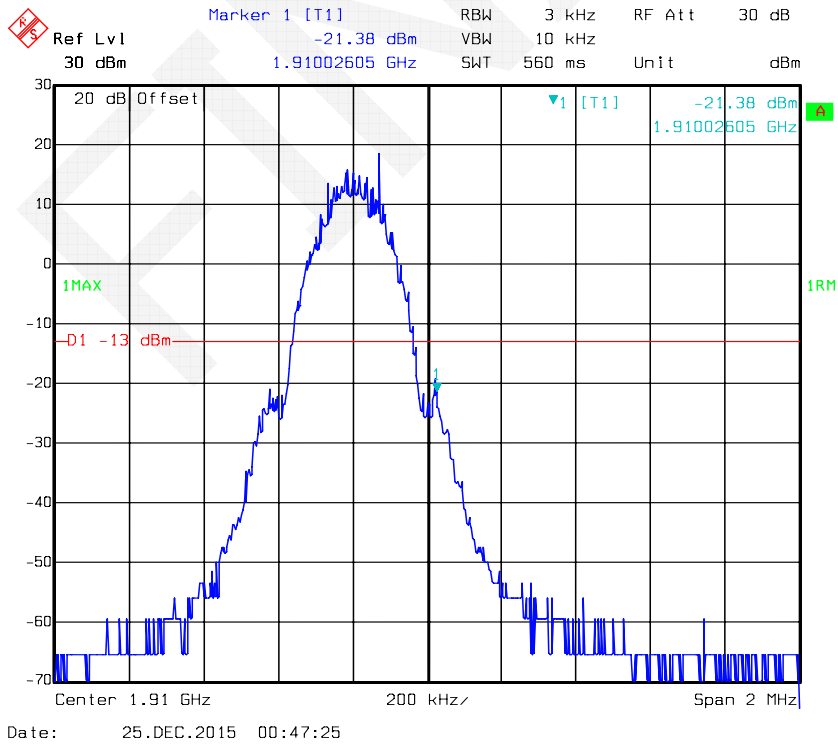
**GSM 850, Right Band Edge**



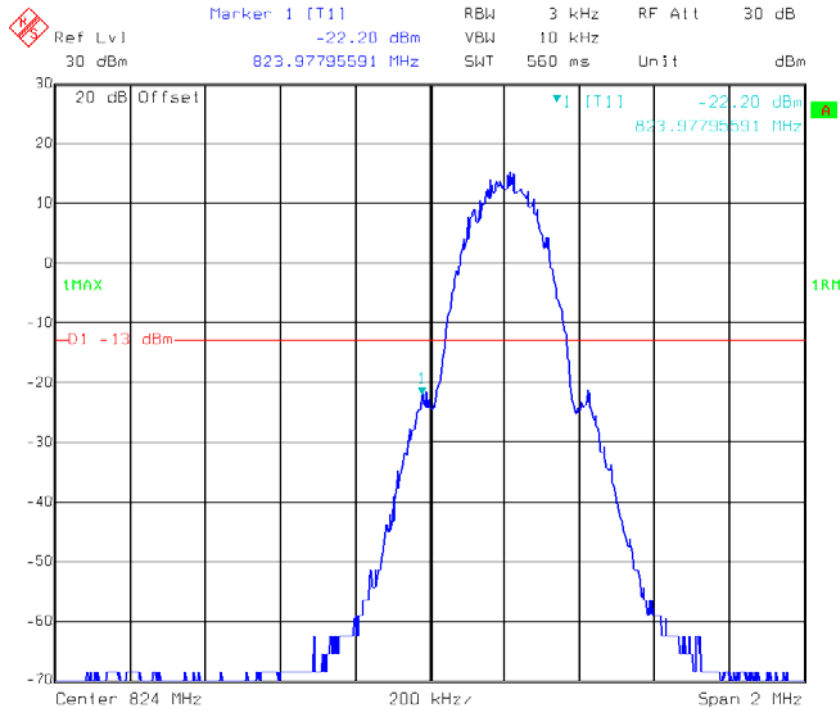
**GSM 1900, Left Band Edge**



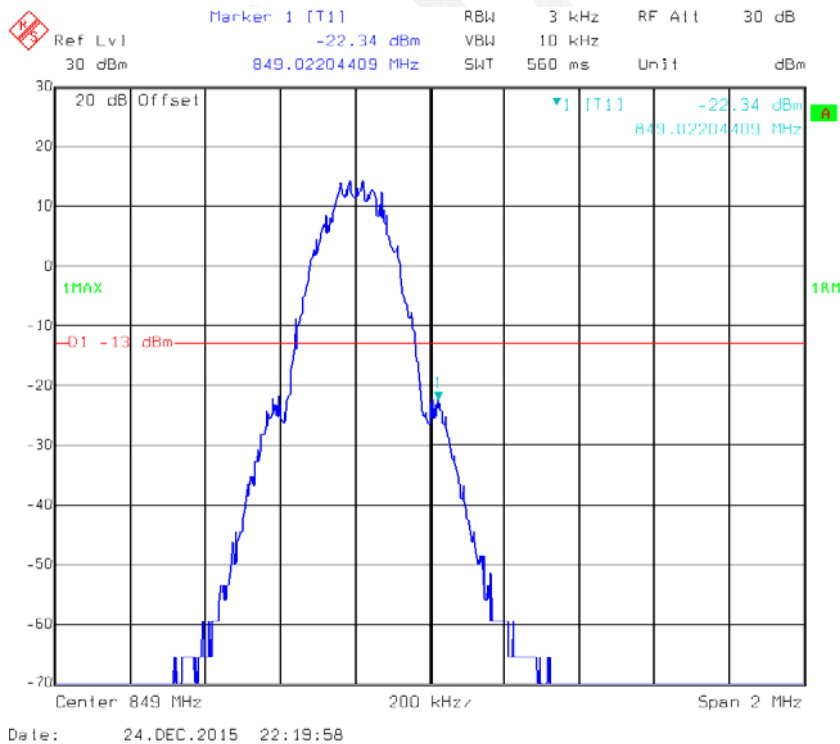
**GSM 1900, Right Band Edge**



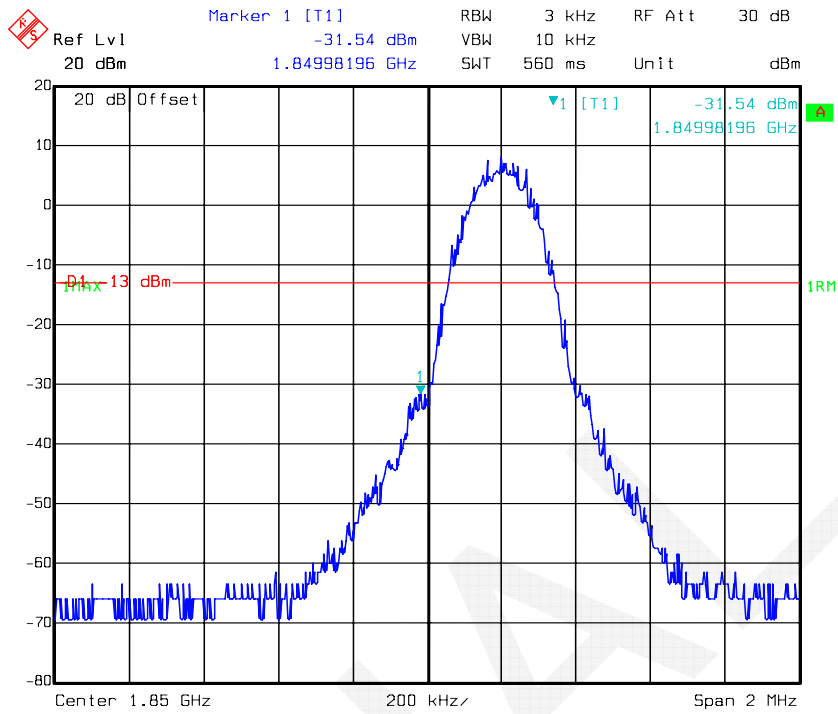
**EDGE 850, Left Band Edge**



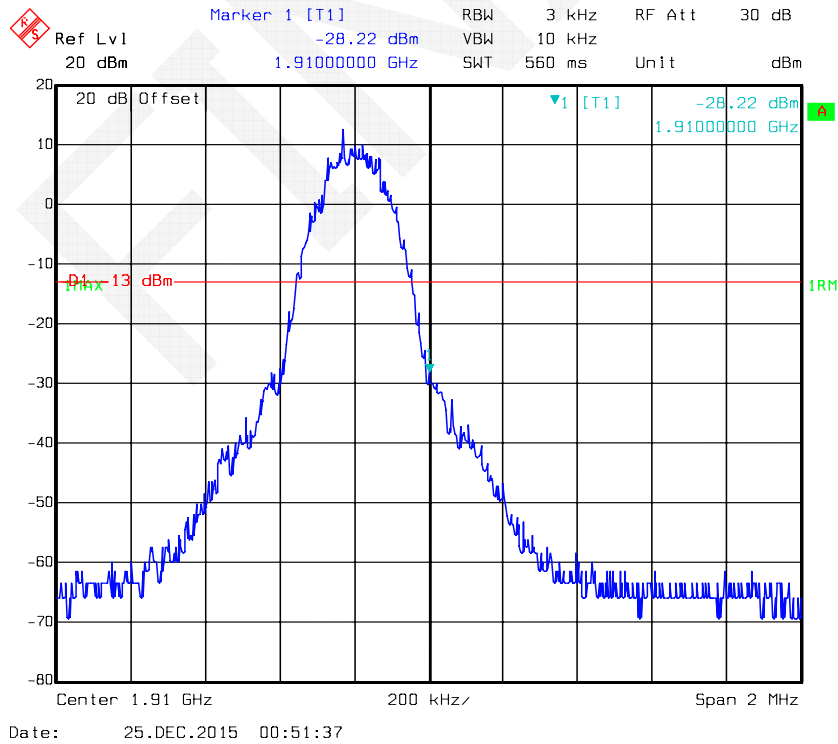
**EDGE 850, Right Band Edge**



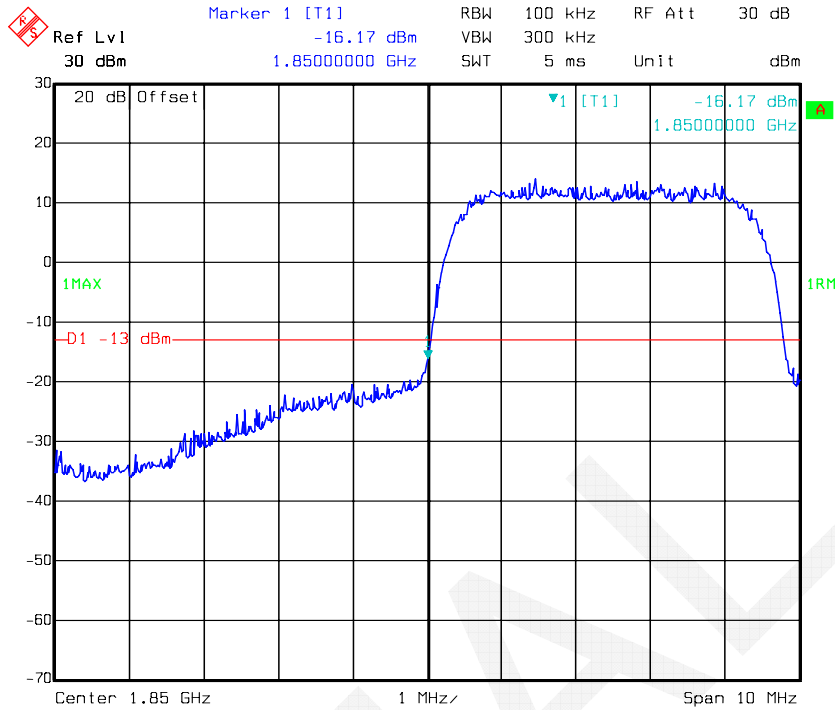
**EDGE 1900, Left Band Edge**



**EDGE 1900, Right Band Edge**

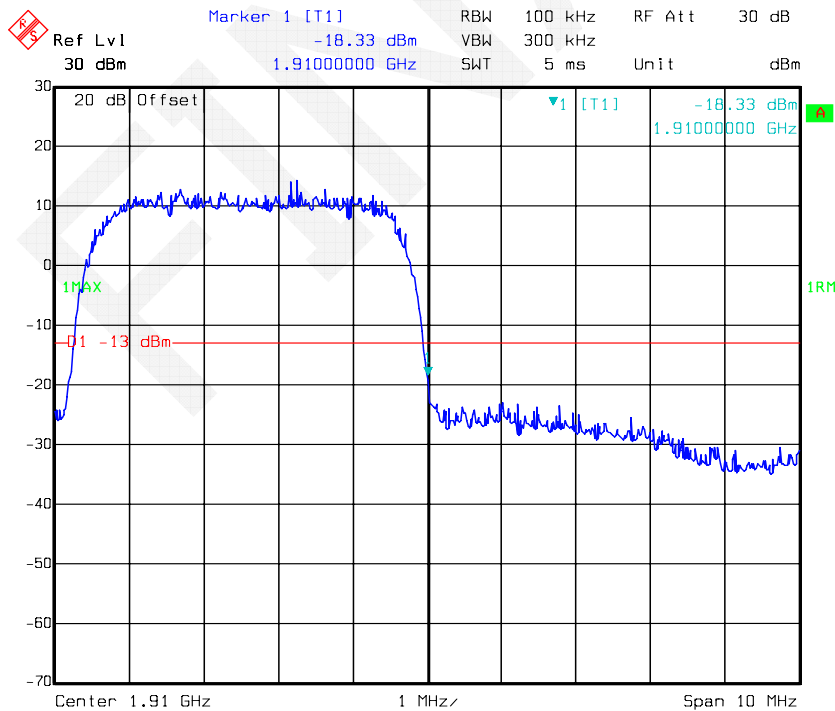


**REL99 Band II, Left Band Edge**



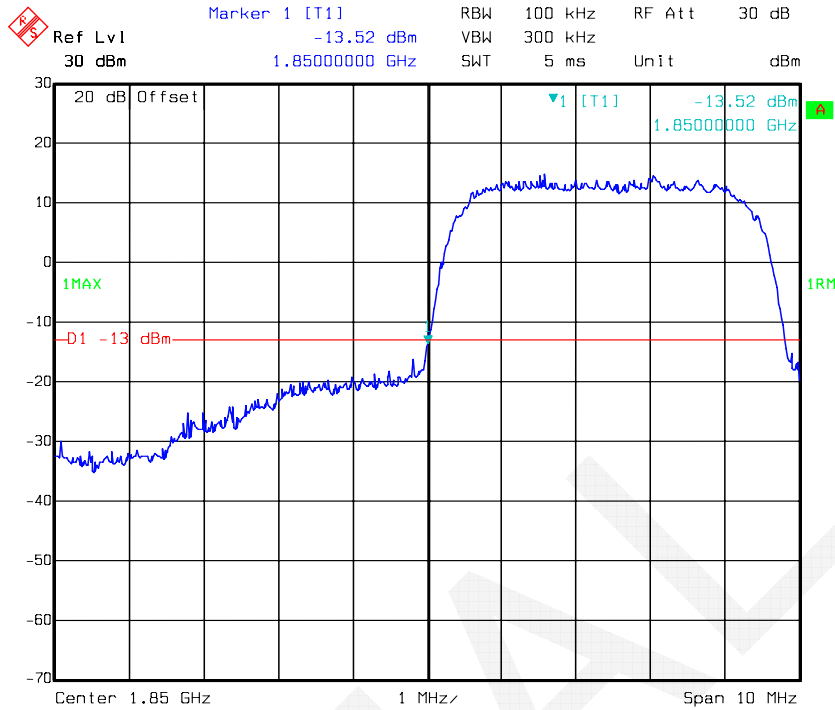
Date: 24.DEC.2015 23:08:10

**REL99 Band II, Right Band Edge**



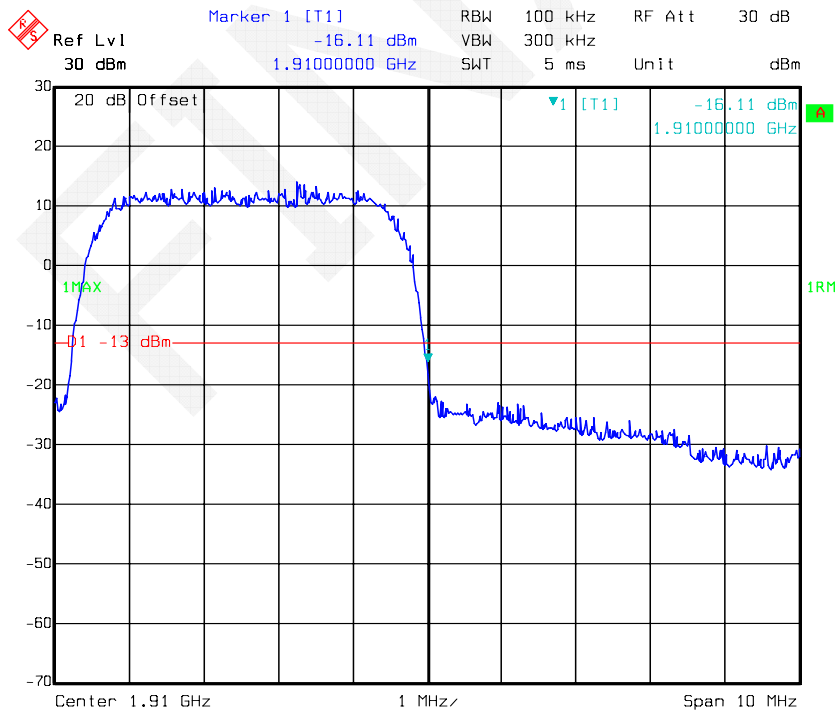
Date: 24.DEC.2015 23:10:44

**HSDPA Band II, Left Band Edge**



Date: 24.DEC.2015 23:07:35

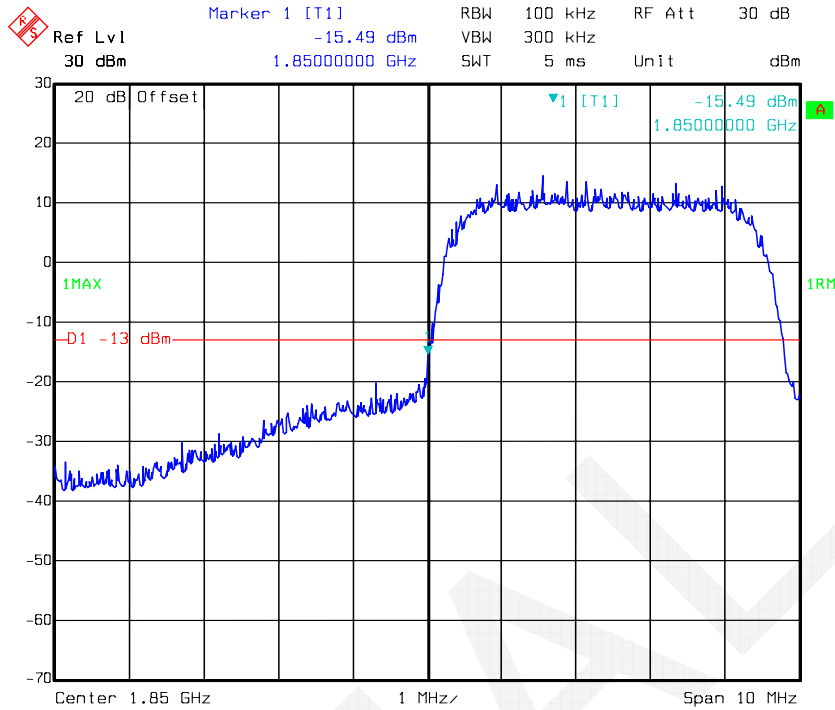
**HSDPA Band II, Right Band Edge**



Date: 24.DEC.2015 23:10:21

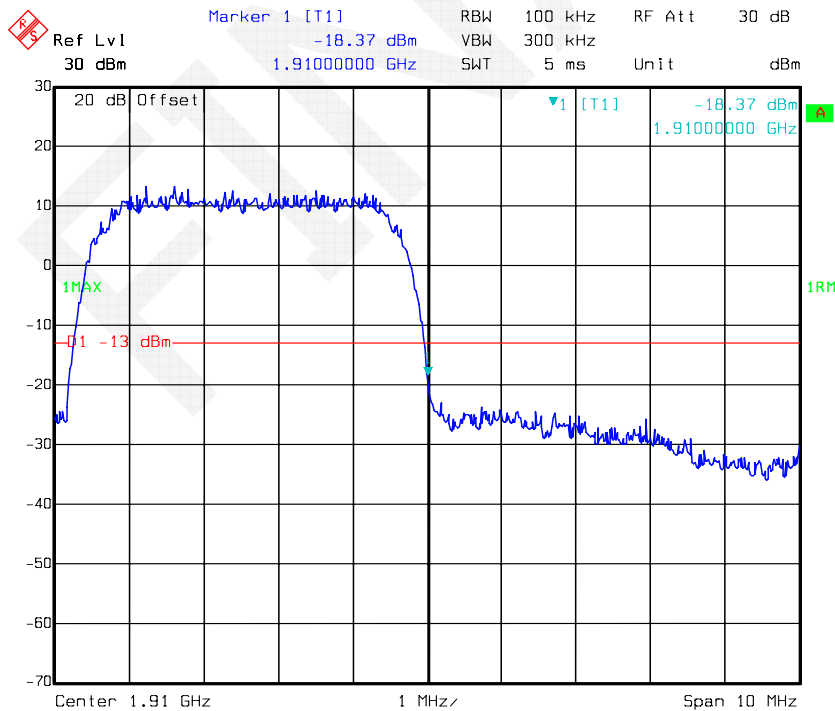


**HSUPA Band II, Left Band Edge**



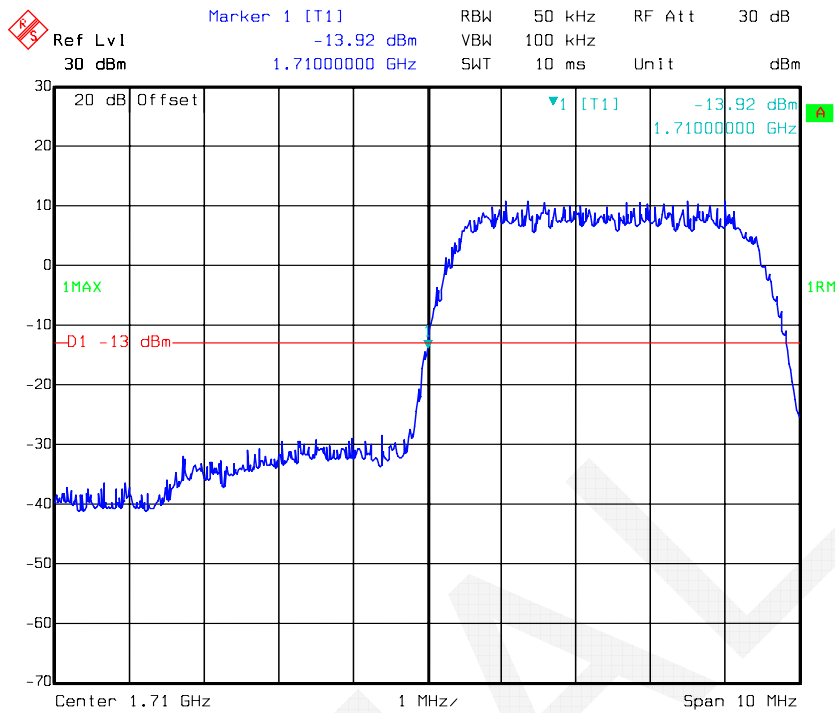
Date: 24.DEC.2015 23:07:45

**HSUPA Band II, Right Band Edge**



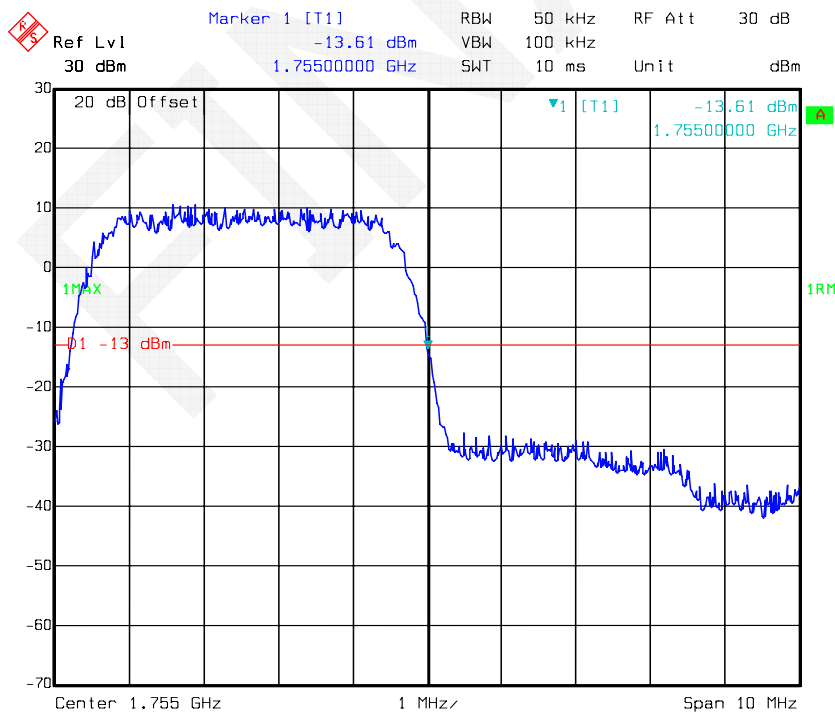
Date: 24.DEC.2015 23:10:33

**REL99 Band IV, Left Band Edge**



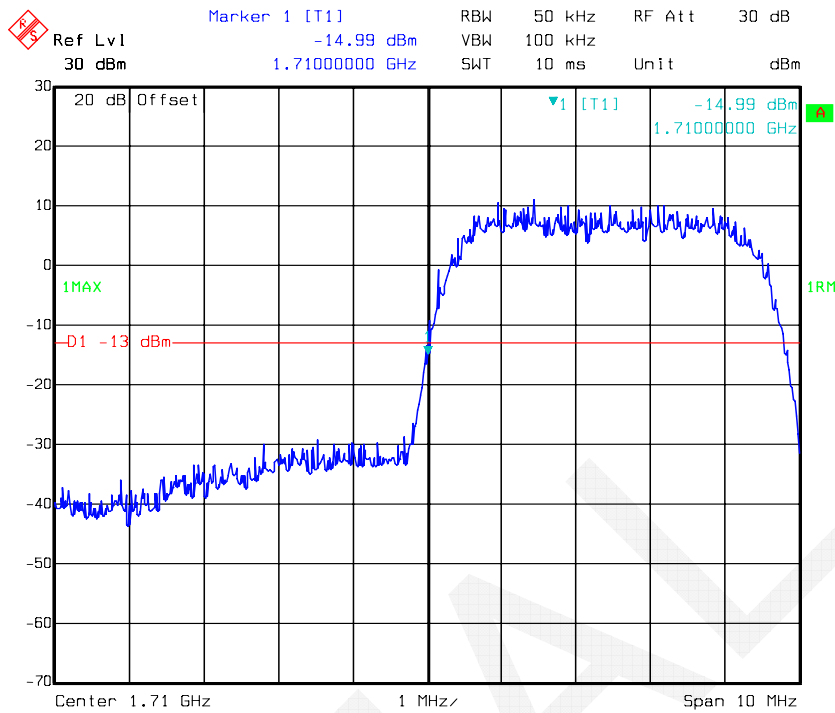
Date: 25.DEC.2015 00:19:07

**REL99 Band IV, Right Band Edge**

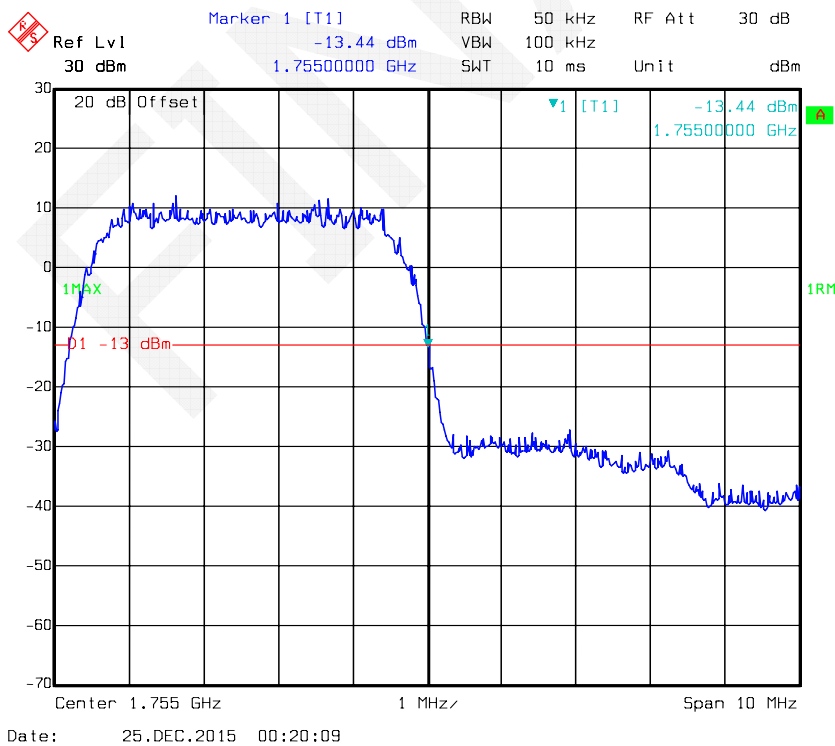


Date: 25.DEC.2015 00:20:30

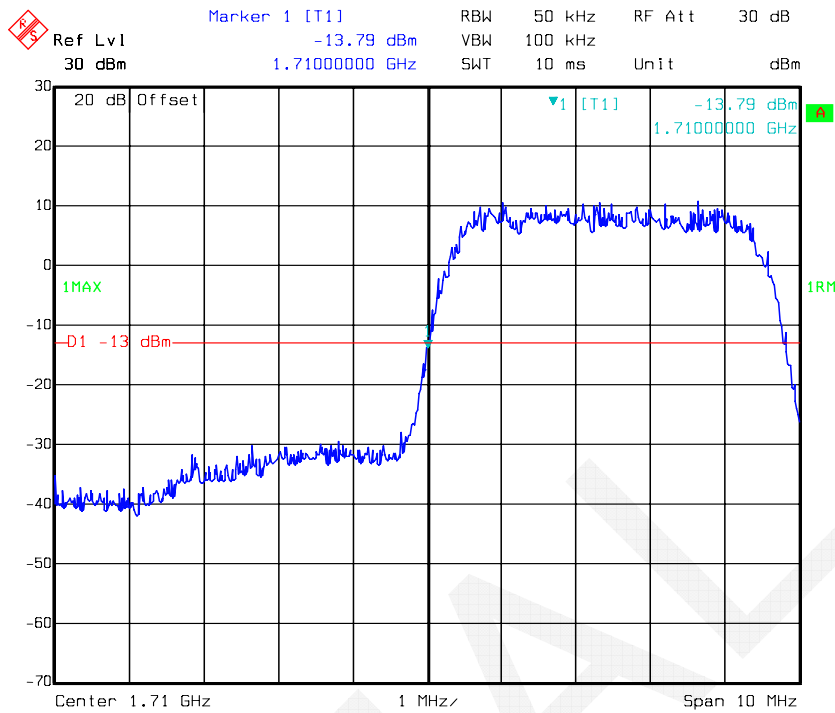
**HSDPA Band IV, Left Band Edge**



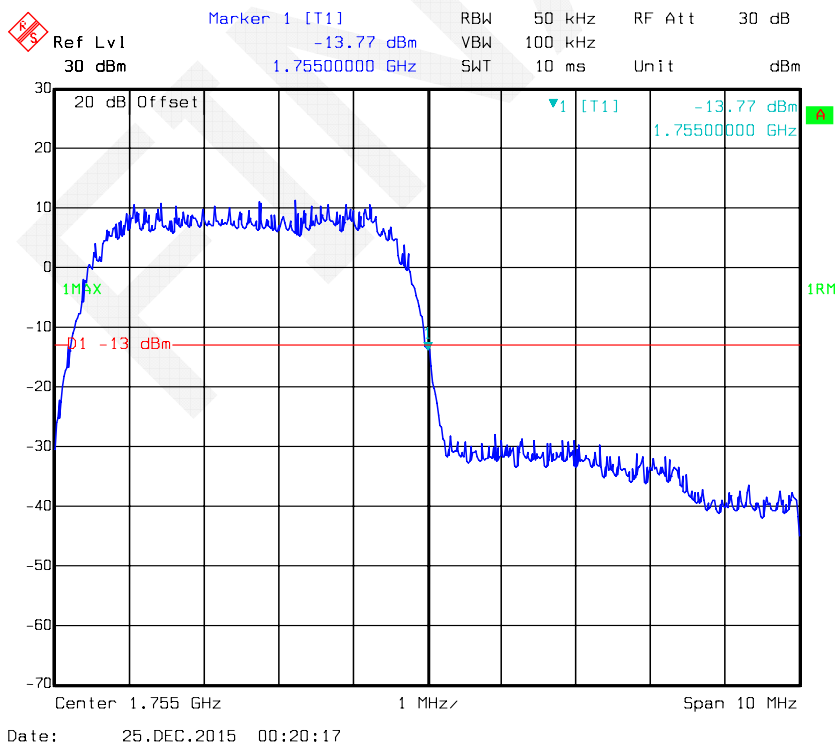
**HSDPA Band IV, Right Band Edge**



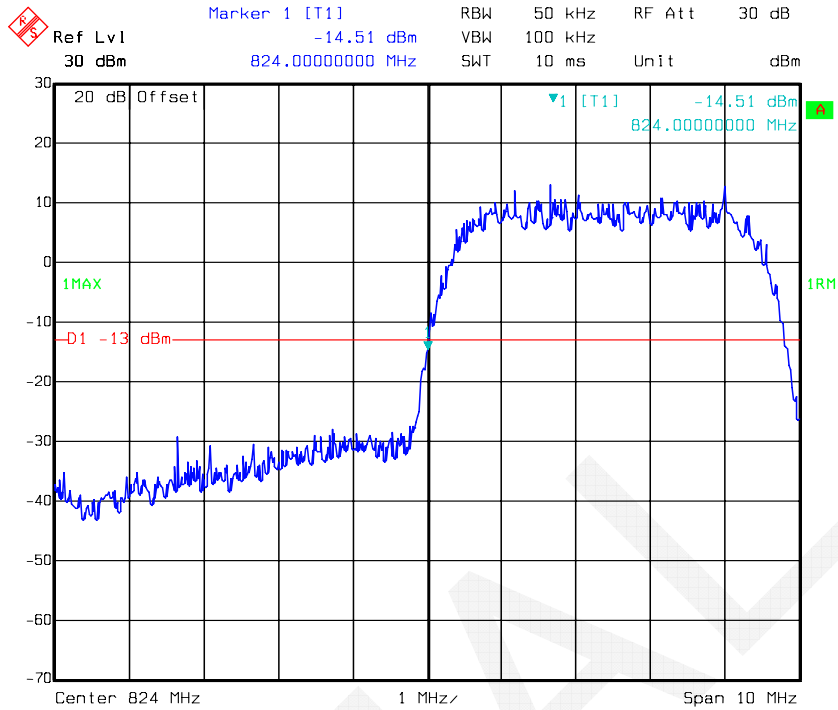
**HSUPA Band IV, Left Band Edge**



**HSUPA Band IV, Right Band Edge**

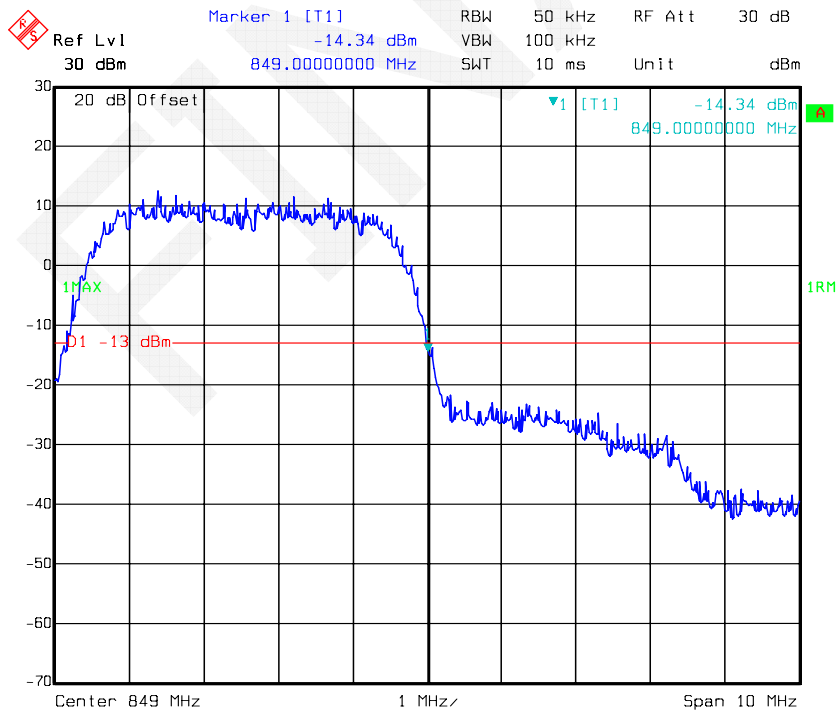


### REL99 Band V, Left Band Edge



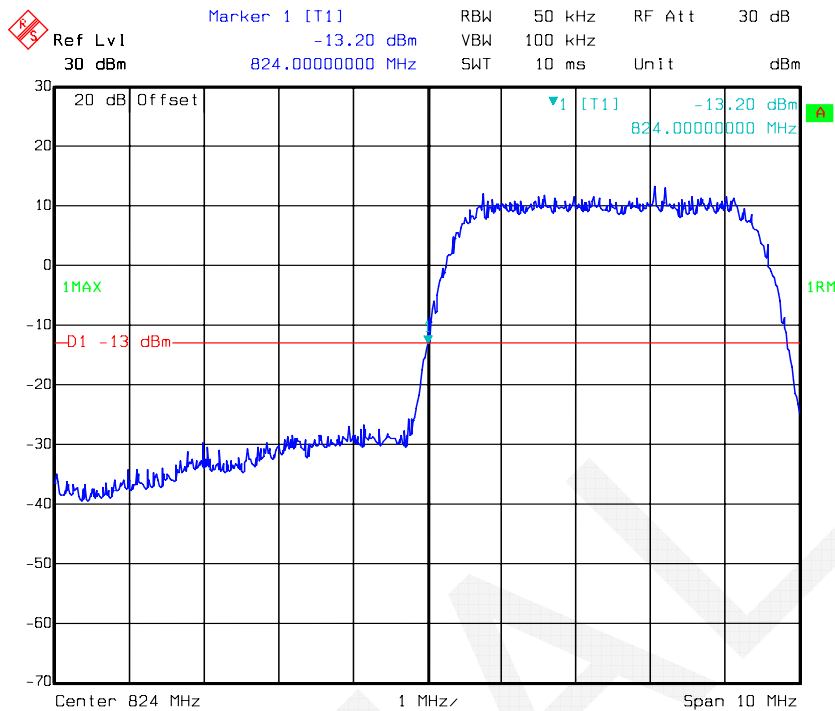
Date: 25.DEC.2015 00:25:16

### REL99 Band V Right Band Edge

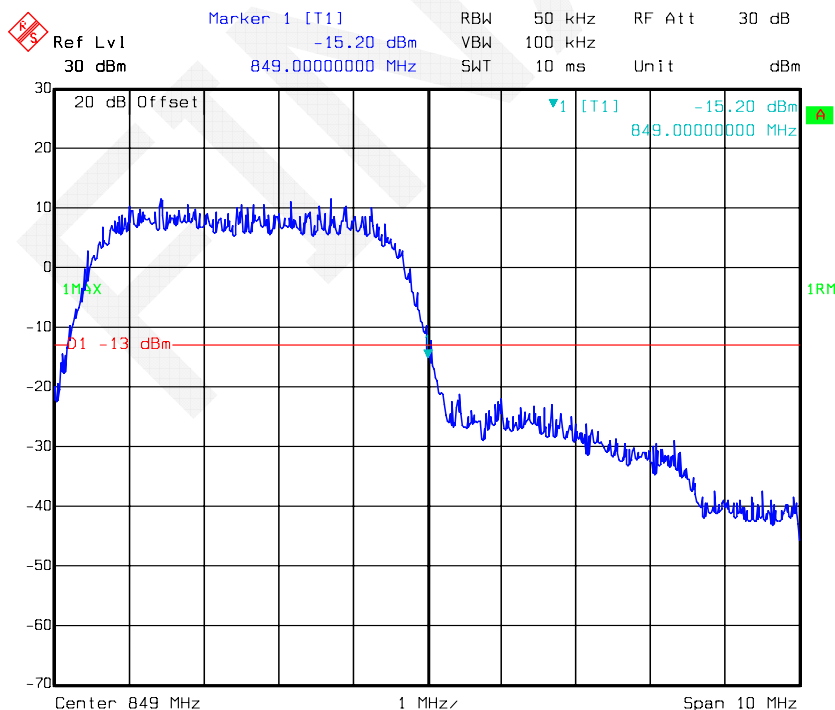


Date: 25.DEC.2015 00:27:35

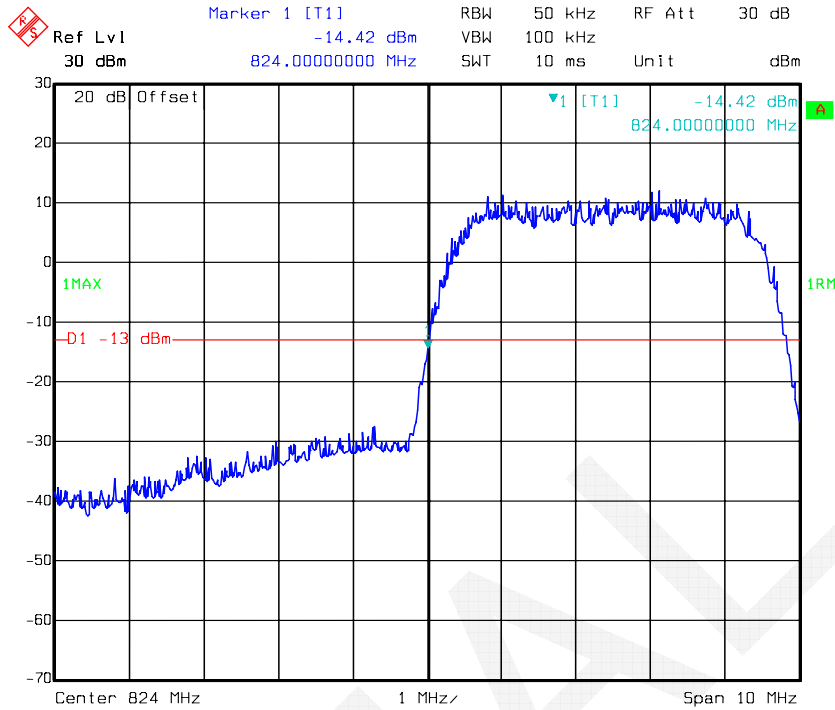
**HSDPA Band V, Left Band Edge**



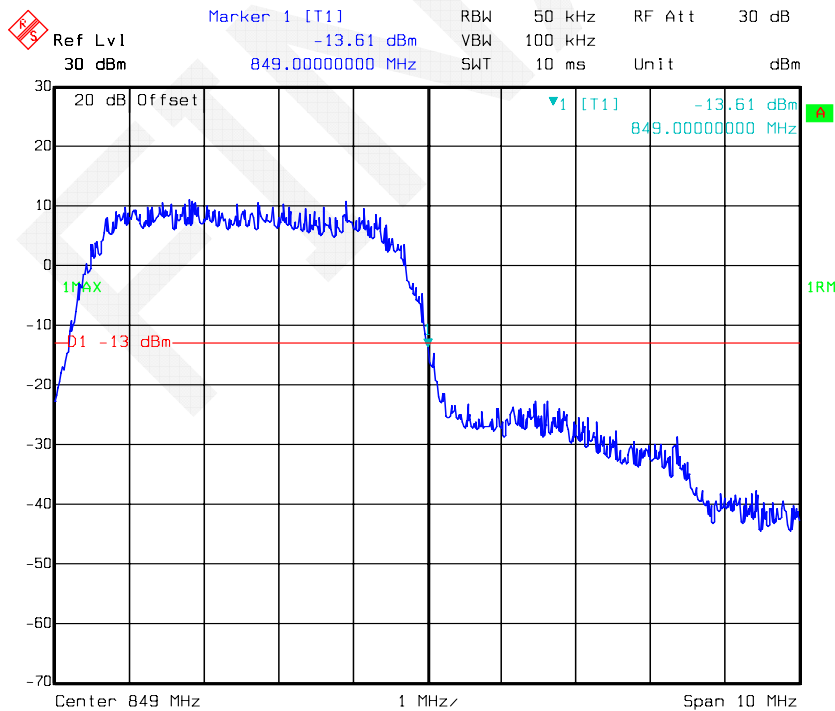
**HSDPA Band V, Right Band Edge**



**HSUPA Band V, Left Band Edge**



**HSUPA Band V, Right Band Edge**



## FCC §2.1055, §22.355 & §24.235 & §27.54 - FREQUENCY STABILITY

### Applicable Standard

FCC § 2.1055 (a), § 2.1055 (d), §22.355, §24.235, §27.54

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

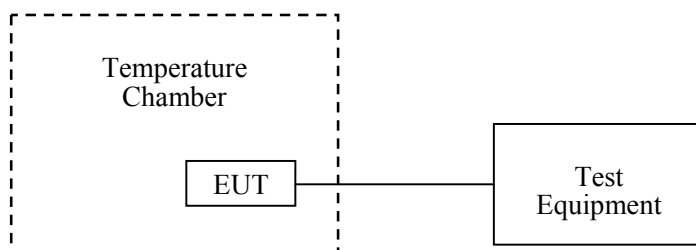
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

### 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	2015-09-10	2016-09-09
R&S	Universal Radio Communication Tester	CMU200	109 038	2015-05-09	2016-05-09
R&S	Wideband Radio Communication Tester	CMW500	106891	2015-12-19	2016-12-19

\* **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>	23.9 °C
<b>Relative Humidity:</b>	40 %
<b>ATM Pressure:</b>	101.7 kPa

The testing was performed by Dean Liu on 2015-12-25.

**(Part 22H):**

**Cellular Band**

GMSK, 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	23	0.027	2.5
-20	3.7	25	0.030	2.5
-10	3.7	20	0.024	2.5
0	3.7	24	0.029	2.5
10	3.7	16	0.019	2.5
20	3.7	18	0.022	2.5
30	3.7	21	0.025	2.5
40	3.7	26	0.031	2.5
50	3.7	21	0.025	2.5
25	3.5	18	0.022	2.5
25	4.2	22	0.026	2.5

EDGE, 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	26	0.039	2.5
-20	3.7	21	0.035	2.5
-10	3.7	16	0.042	2.5
0	3.7	17	0.045	2.5
10	3.7	22	0.035	2.5
20	3.7	14	0.038	2.5
30	3.7	20	0.043	2.5
40	3.7	14	0.039	2.5
50	3.7	22	0.035	2.5
25	3.5	19	0.033	2.5
25	4.2	22	0.039	2.5

**WCDMA Band V: Re199**

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	32	0.038	2.5
-20	3.7	27	0.032	2.5
-10	3.7	32	0.038	2.5
0	3.7	35	0.042	2.5
10	3.7	27	0.032	2.5
20	3.7	29	0.035	2.5
30	3.7	33	0.039	2.5
40	3.7	30	0.036	2.5
50	3.7	27	0.032	2.5
25	3.5	26	0.031	2.5
25	4.2	33	0.039	2.5

**WCDMA Band V: 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	23	0.027	2.5
-20	3.7	20	0.024	2.5
-10	3.7	25	0.030	2.5
0	3.7	29	0.035	2.5
10	3.7	20	0.024	2.5
20	3.7	23	0.027	2.5
30	3.7	24	0.029	2.5
40	3.7	24	0.029	2.5
50	3.7	19	0.023	2.5
25	3.5	18	0.022	2.5
25	4.2	23	0.027	2.5

**WCDMA Band V: 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	23	0.027	2.5
-20	3.7	22	0.026	2.5
-10	3.7	25	0.030	2.5
0	3.7	29	0.035	2.5
10	3.7	22	0.026	2.5
20	3.7	22	0.026	2.5
30	3.7	27	0.032	2.5
40	3.7	26	0.031	2.5
50	3.7	22	0.026	2.5
25	3.5	18	0.022	2.5
25	4.2	25	0.030	2.5

**Part 27:**

**WCDMA Band IV REL99**

Middle Channel, $f_c = 1732.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V <sub>DC</sub>	Hz	ppm	
-30	3.7	33	0.018	Compliance
-20	3.7	29	0.015	Compliance
-10	3.7	35	0.019	Compliance
0	3.7	38	0.020	Compliance
10	3.7	29	0.015	Compliance
20	3.7	32	0.017	Compliance
30	3.7	36	0.019	Compliance
40	3.7	33	0.018	Compliance
50	3.7	29	0.015	Compliance
25	3.5	28	0.015	Compliance
25	4.2	33	0.018	Compliance

**WCDMA Band IV HSDPA**

Middle Channel, $f_c = 1732.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V <sub>DC</sub>	Hz	ppm	
-30	3.7	31	0.018	Compliance
-20	3.7	27	0.016	Compliance
-10	3.7	32	0.018	Compliance
0	3.7	32	0.018	Compliance
10	3.7	26	0.015	Compliance
20	3.7	27	0.016	Compliance
30	3.7	32	0.018	Compliance
40	3.7	31	0.018	Compliance
50	3.7	26	0.015	Compliance
25	3.5	24	0.014	Compliance
25	4.2	30	0.017	Compliance

**WCDMA Band IV HSUPA**

<b>Middle Channel, <math>f_c = 1732.6</math> MHz</b>				
<b>Temperature</b>	<b>Voltage</b>	<b>Frequency Error</b>	<b>Frequency Error</b>	<b>Result</b>
<b>°C</b>	<b>V<sub>DC</sub></b>	<b>Hz</b>	<b>ppm</b>	
-30	3.7	30	0.017	Compliance
-20	3.7	31	0.018	Compliance
-10	3.7	35	0.020	Compliance
0	3.7	32	0.018	Compliance
10	3.7	31	0.018	Compliance
20	3.7	33	0.019	Compliance
30	3.7	33	0.019	Compliance
40	3.7	36	0.021	Compliance
50	3.7	37	0.021	Compliance
25	3.5	29	0.017	Compliance
25	4.2	35	0.020	Compliance

**Part 24E:**

**PCS Band**

<b>GMSK, Middle Channel, <math>f_c = 1880.0</math> MHz</b>				
<b>Temperature</b>	<b>Voltage</b>	<b>Frequency Error</b>	<b>Frequency Error</b>	<b>Result</b>
<b>°C</b>	<b>V<sub>DC</sub></b>	<b>Hz</b>	<b>ppm</b>	
-30	3.7	-19	-0.010	Compliance
-20	3.7	-23	-0.012	Compliance
-10	3.7	-23	-0.012	Compliance
0	3.7	-18	-0.010	Compliance
10	3.7	-17	-0.009	Compliance
20	3.7	-20	-0.011	Compliance
30	3.7	-21	-0.011	Compliance
40	3.7	-13	-0.007	Compliance
50	3.7	-18	-0.010	Compliance
25	3.5	-16	-0.009	Compliance
25	4.2	-14	-0.007	Compliance

<b>EDGE, Middle Channel, <math>f_c = 1880.0</math> MHz</b>				
<b>Temperature</b>	<b>Voltage</b>	<b>Frequency Error</b>	<b>Frequency Error</b>	<b>Result</b>
<b>°C</b>	<b>V<sub>DC</sub></b>	<b>Hz</b>	<b>ppm</b>	
-30	3.7	-23	0.018	Compliance
-20	3.7	-19	0.015	Compliance
-10	3.7	-17	0.019	Compliance
0	3.7	-22	0.020	Compliance
10	3.7	-14	0.015	Compliance
20	3.7	-19	0.017	Compliance
30	3.7	-11	0.019	Compliance
40	3.7	-17	0.018	Compliance
50	3.7	-15	0.015	Compliance
25	3.5	-21	0.015	Compliance
25	4.2	-18	0.018	Compliance

**WCDMA Band II: Re199**

<b>Middle Channel, <math>f_c = 1880.0</math> MHz</b>				
<b>Temperature</b>	<b>Voltage</b>	<b>Frequency Error</b>	<b>Frequency Error</b>	<b>Result</b>
<b>°C</b>	<b>V<sub>DC</sub></b>	<b>Hz</b>	<b>ppm</b>	
-30	3.7	33	0.018	Compliance
-20	3.7	29	0.015	Compliance
-10	3.7	35	0.019	Compliance
0	3.7	38	0.020	Compliance
10	3.7	29	0.015	Compliance
20	3.7	32	0.017	Compliance
30	3.7	36	0.019	Compliance
40	3.7	33	0.018	Compliance
50	3.7	29	0.015	Compliance
25	3.5	28	0.015	Compliance
25	4.2	33	0.018	Compliance

**WCDMA Band II: HSDPA**

Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V <sub>DC</sub>	Hz	ppm	
-30	3.7	25	0.013	Compliance
-20	3.7	21	0.011	Compliance
-10	3.7	28	0.015	Compliance
0	3.7	31	0.016	Compliance
10	3.7	21	0.011	Compliance
20	3.7	23	0.012	Compliance
30	3.7	28	0.015	Compliance
40	3.7	26	0.014	Compliance
50	3.7	26	0.014	Compliance
25	3.5	23	0.012	Compliance
25	4.2	30	0.016	Compliance

**WCDMA Band II: HSUPA**

Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V <sub>DC</sub>	Hz	ppm	
-30	3.7	35	0.019	Compliance
-20	3.7	31	0.016	Compliance
-10	3.7	37	0.020	Compliance
0	3.7	39	0.021	Compliance
10	3.7	31	0.016	Compliance
20	3.7	33	0.018	Compliance
30	3.7	39	0.021	Compliance
40	3.7	36	0.019	Compliance
50	3.7	33	0.018	Compliance
25	3.5	29	0.015	Compliance
25	4.2	36	0.019	Compliance

Note: The fundamental emissions stay within the authorized bands of operation based on the frequency deviation measured is small.

## DECLARATION LETTER

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MAXWEST INTERNATIONAL LIMITED

Add: No.1,Longgang Road,Buji,Longgang,ShenzhenCity,Guangdong Province, P.R. China

Tel: 9498007607

Fax: 9498007607

### DECLARATION OF SIMILARITY

Date: 2015-12-22

Dear Sir or Madam:

We, MAXWEST INTERNATIONAL LIMITED, hereby declare that product name: Astro X4, model: Astro X4, they are the same electromagnetic emissions and electromagnetic compatibility characteristics. A description of the difference among the 5 samples and those that are declared similar are as follows:

1) They have different colours: golden, white, pink, blue and black.

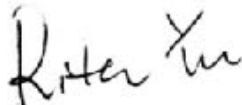
The rest are the same.

Please contact me should there be need for any additional clarification or information.

Best Regards,

Signature:

Rita Yu



Assistant Manager

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