

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

For

**Binatone Electronics International Ltd.**

Floor 23A, 9 Des Voeux Road West, Sheung Wan, Hong Kong, China

**FCC ID: VLJ-SM320**

<b>Report Type:</b> Original Report	<b>Product Type:</b> GSM Mobile Phone
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<b>Report Number:</b> R2DG130917002-00C	
<b>Report Date:</b> 2013-10-22	
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\* This report may contain data that are not covered by the NVLAP accreditation and shall be marked with an asterisk "★" (Rev.2).  
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## GENERAL INFORMATION

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

The *Binatone Electronics International Ltd.*'s product, model number: *SM320 (FCC ID: VLJ-SM320)* (the "EUT") in this report was a *GSM Mobile Phone*, which was measured approximately: 13.0 cm (L) x 5.5 cm (W) x 1.5 cm (H), input voltage: DC 3.7V from lithium battery or DC 5.0V from adapter.

#### Adapter Information:

Model: A31-501000

Input: 100-240VAC, 50/60Hz, 0.2A

Output: DC 5.0V, 1000mA

Manufacturer: Shenzhen Aohai Technology Co.,Ltd

*Note: The series product, model Voxtel-SM320, SM320 are electrically identical, the difference between them is just the model name, we selected The SM320 for fully testing, the details was explained in the attached declaration letter.*

*All measurement and test data in this report was gathered from production sample serial number: 130917002 (Assigned by BACL, Dongguan). The EUT was received on 2013-10-11.*

### Objective

This report is prepared on behalf of *Binatone Electronics International Ltd.* in accordance with Part 2-Subpart J, Part 22-Subpart H, and Part 24-Subpart E 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 15C DSS submissions with FCC ID: *VLJ-SM320* for Bluetooth.

### 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 C63.4-2003.

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

## 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 02, 2012. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

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.

Additionally, Bay Area Compliance Laboratories Corp. (Dongguan) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 500069-0).



The current scope of accreditations can be found at <http://ts.nist.gov/standards/scopes/5000690.htm>

## 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.

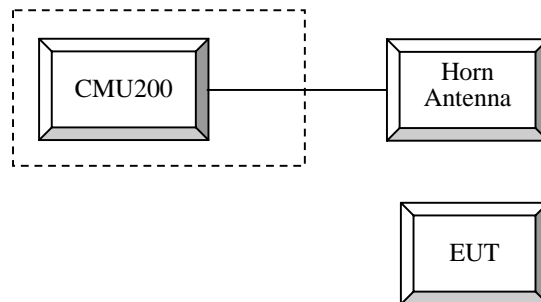
### Equipment Modifications

No modification was made to the EUT.

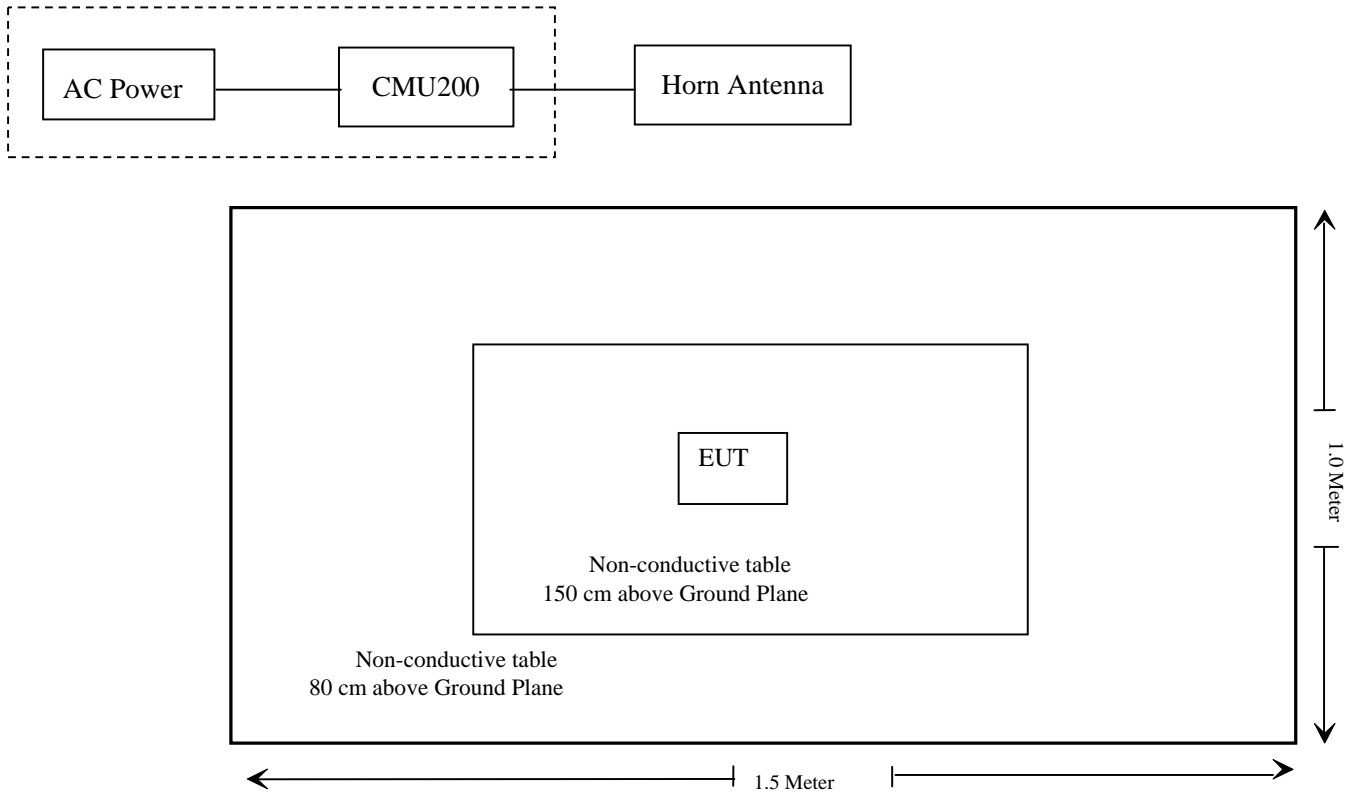
### Support Equipment List and Details

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

### 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)	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



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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: R1DG130917002-20A.

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## **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.

## **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/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 MCS9 (EGPRS)  
 Bit Stream > 2E9-1 PSR Bit Stream  
 AF/RF Connection Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input  
 Press Signal on to turn on the signal and change settings

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
$\beta ed$	Not Applicable				
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			
	Ahs = $\beta hs/\beta c$	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
HP	Signal Generator	8648A	3426A00831	2012-11-29	2013-11-28
Sunol Sciences	Antenna	JB3	A060611-1	2011-9-6	2014-9-5
EMCO	Adjustable dipole antenna	3121C	9109-753	N/A	N/A
HP	AMPLIFIER	8447E	2434A02181	N/A	N/A
R&S	EMI TEST RECEIVER	ESCI	100224	2013-5-6	2014-5-5
Giga	Signal Generator	1026	320408	2013-5-9	2014-5-8
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	N/A	N/A
TDK RF	horn antenna	HRN-0118	130 084	2012-9-6	2015-9-5
ETS LINDGREN	horn antenna	3115	000 527 35	2012-9-6	2015-9-5
R&S	Spectrum analyzer	FSEM	DE31388	2013-5-7	2014-5-6

\* **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>	28.3 °C
<b>Relative Humidity:</b>	57 %
<b>ATM Pressure:</b>	100.8kPa

*The testing was performed by Ares Liu on 2013-10-15.*

**Conducted Power****Cellular Band (Part 22H) & PCS Band (Part 24E)**

Band	Channel No.	Conducted Output Power (dBm)				
		GSM	GPRS 1 TX Slot	GPRS 2 TX Slot	GPRS 3 TX Slot	GPRS 4 TX Slot
Cellular	128	31.98	31.97	31.2	29.65	29.08
	190	31.79	31.76	30.97	29.38	28.83
	251	31.97	31.92	31.17	29.56	29.09
PCS	512	28.24	28.11	27.57	26.28	25.36
	661	28.49	28.30	27.79	26.18	25.22
	810	28.42	28.22	27.74	26.16	25.16

## ERP &amp; EIRP

Channel No.	Polar (H/V)	Receiver Reading (dB $\mu$ V)	Substituted Method			Absolute Level (dBm)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	
<b>GSM 850</b>						
128 (824.2 MHz)	H	95.37	20.3	0.0	1	19.3
	V	102.44	30.5	0.0	1	29.5
190 (836.6 MHz)	H	95.61	20.7	0.0	1	19.7
	V	102.33	30.5	0.0	1	29.5
251 (848.8 MHz)	H	95.28	20.5	0.0	1	19.5
	V	102.49	30.8	0.0	1	29.8
<b>PCS 1900</b>						
512 (1850.2 MHz)	H	80.26	8.4	11.5	1.4	18.5
	V	89.40	17.5	11.5	1.4	27.6
661 (1880.0 MHz)	H	80.11	8.5	11.7	1.4	18.8
	V	89.14	17.7	11.7	1.4	28.0
810 (1909.8 MHz)	H	80.04	8.7	11.8	1.4	19.1
	V	88.89	17.8	11.8	1.4	28.2

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

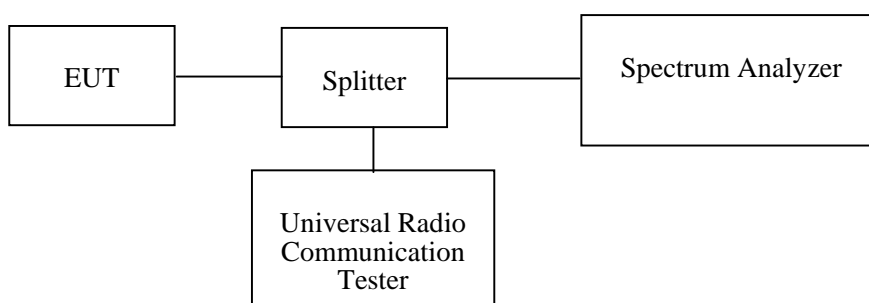
**Applicable Standard**

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 resolution bandwidth of the spectrum analyzer was set at 3 kHz (Cellular /PCS) and 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	2013-6-16	2014-6-15

\* **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>	28.3 °C
<b>Relative Humidity:</b>	57 %
<b>ATM Pressure:</b>	100.8kPa

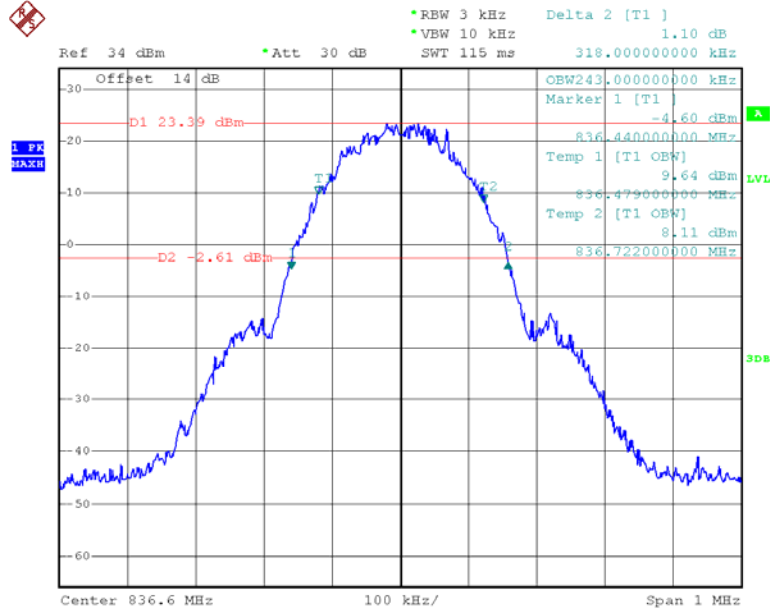
*The testing was performed by Ares Liu on 2013-10-15.*

Band	Channel No.	Mode	99% Occupied Bandwidth	26 dB Occupied Bandwidth
			kHz	kHz
Cellular	190	GMSK	243	318
PCS	661	GMSK	242	314



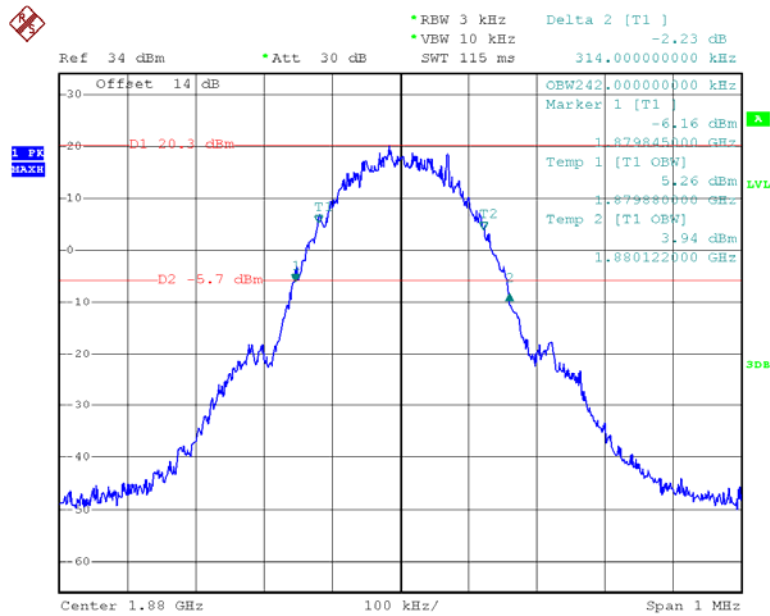
Please refer to the following plots.

### GSM850



Date: 15.OCT.2013 10:51:57

### GSM1900



Date: 15.OCT.2013 11:22:34

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

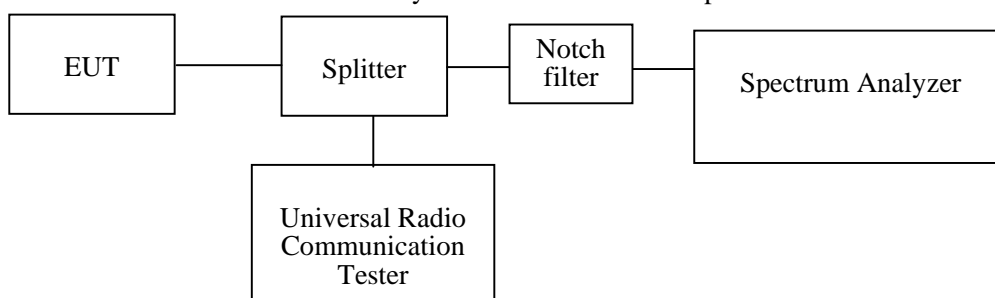
### Applicable Standard

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	2013-6-16	2014-6-15

\* **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

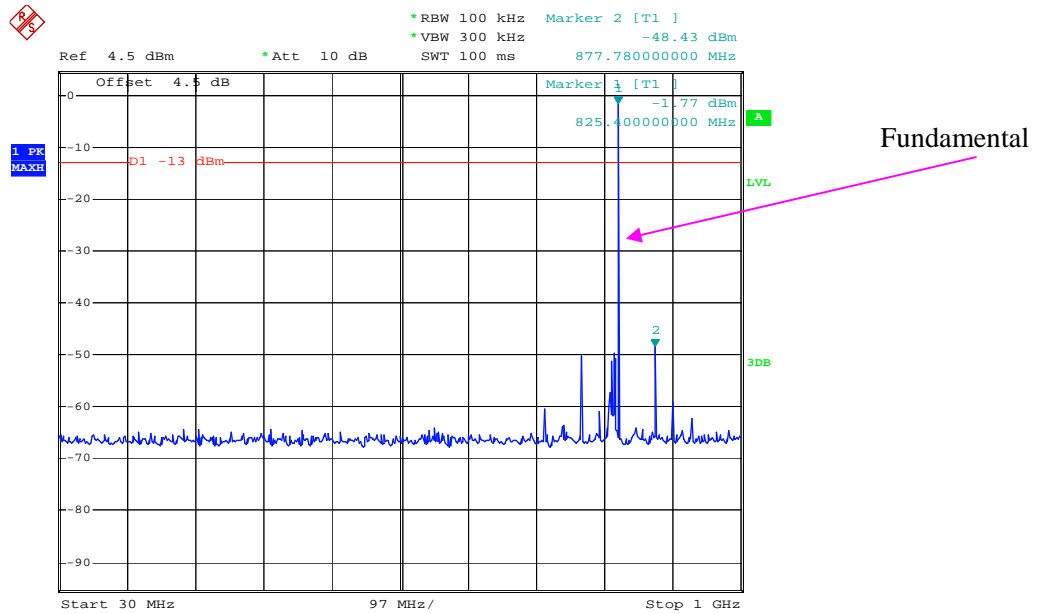
#### Environmental Conditions

<b>Temperature:</b>	26.1 °C
<b>Relative Humidity:</b>	64 %
<b>ATM Pressure:</b>	100.1kPa

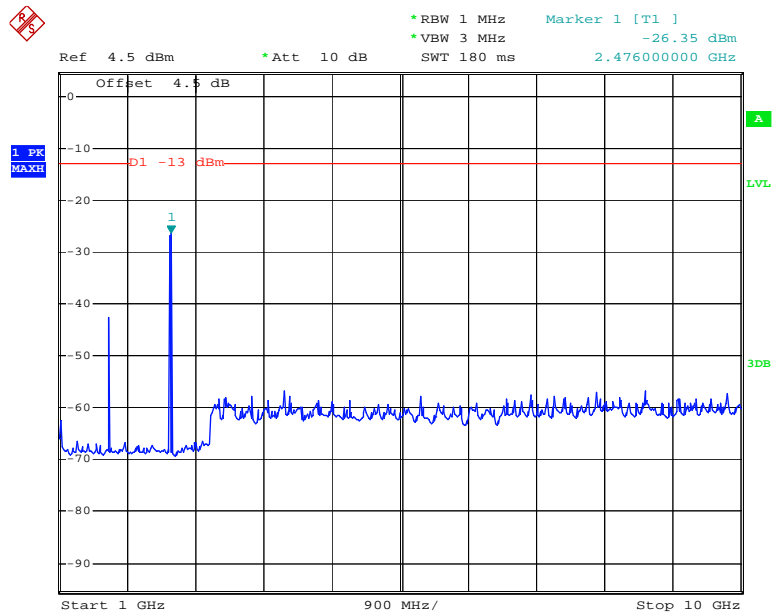
*The testing was performed by Ares Liu on 2013-11-23.*

Please refer to the following plots.

### GSM850 Low Channel

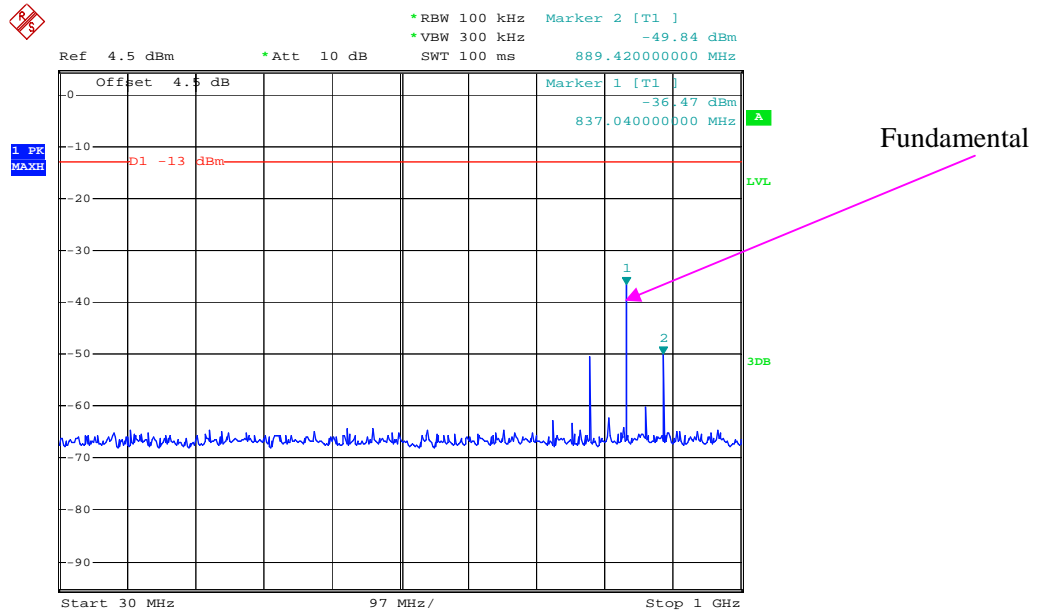


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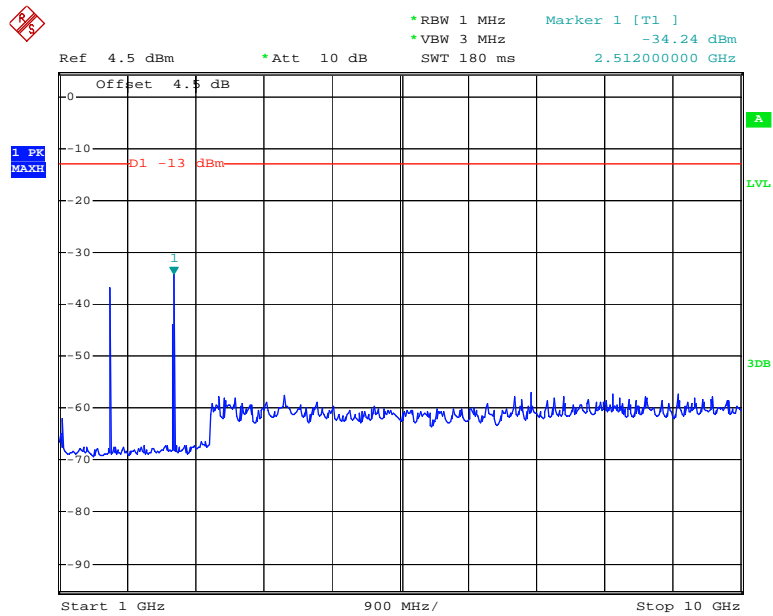


Date: 23.NOV.2013 11:50:11

### GSM850 Middle Channel

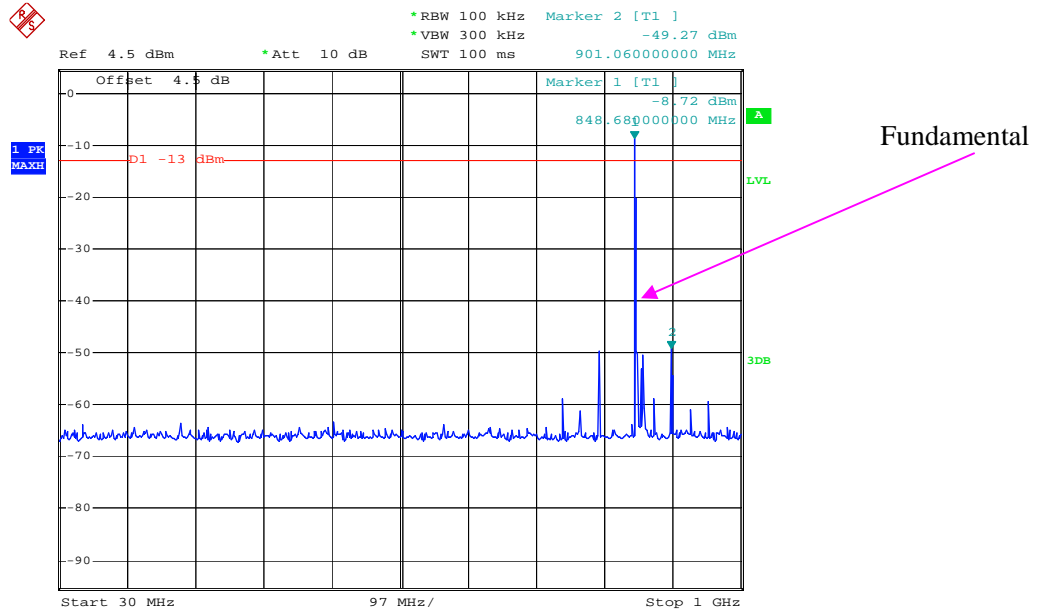


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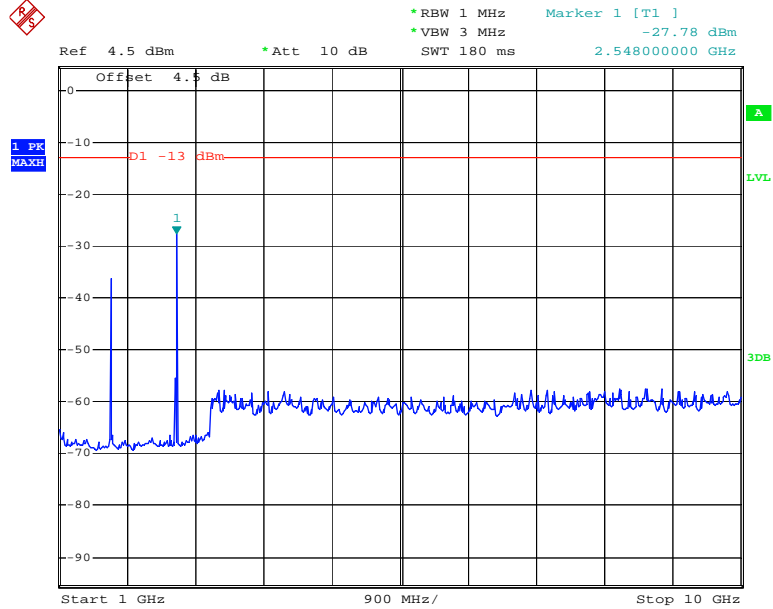


Date: 23.NOV.2013 11:49:27

### GSM850 High Channel

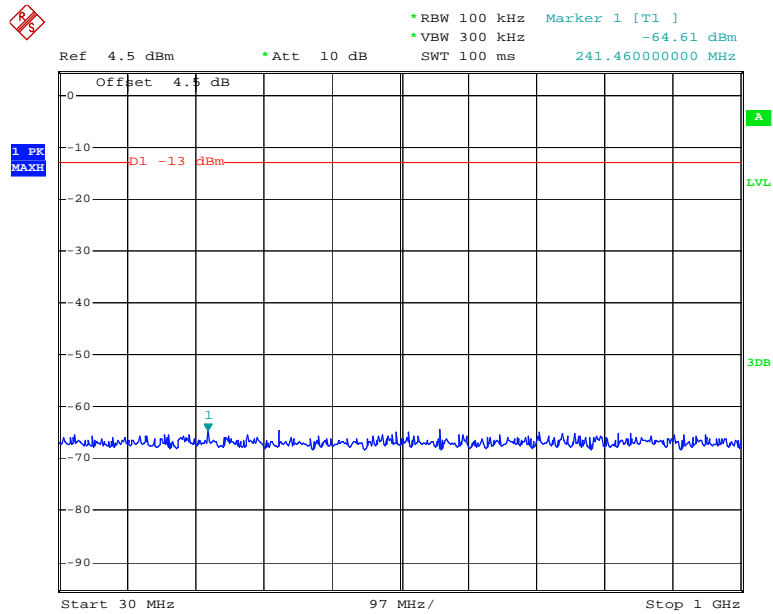


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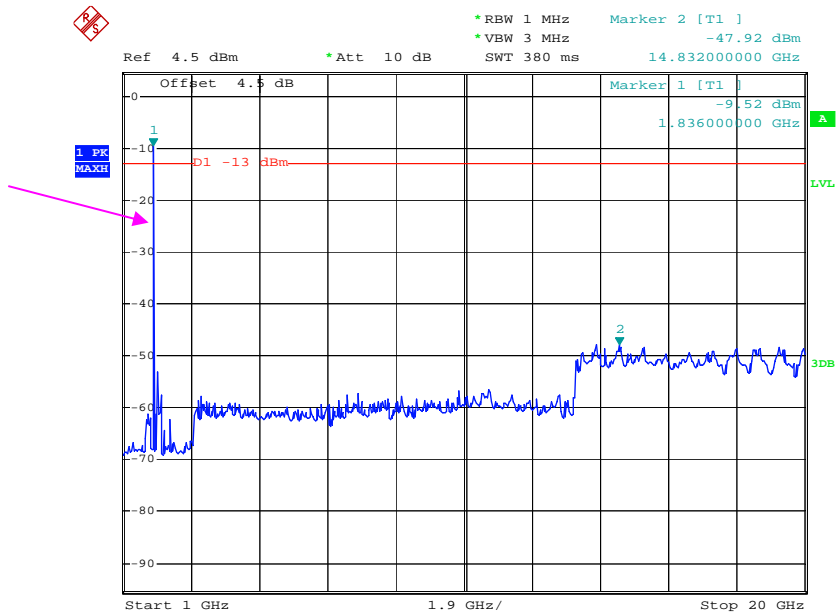
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### GSM1900 Low Channel



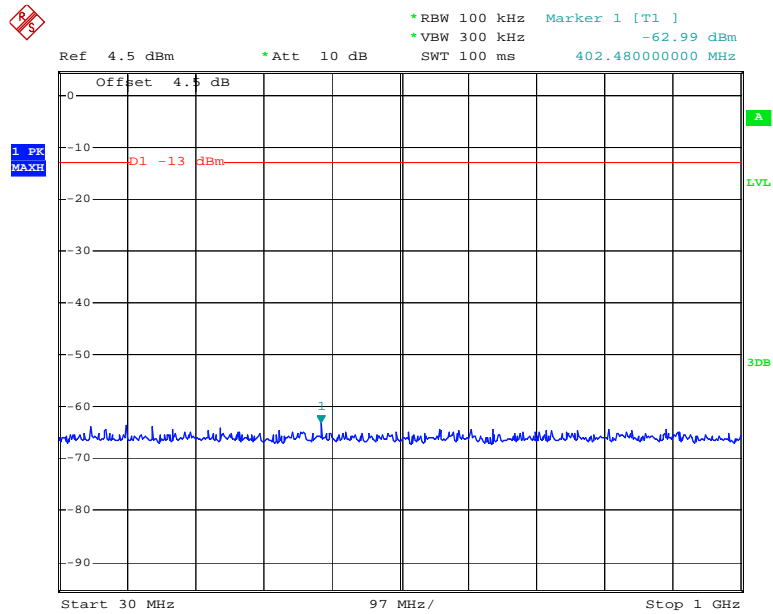
Date: 23.NOV.2013 12:00:01

Fundamental



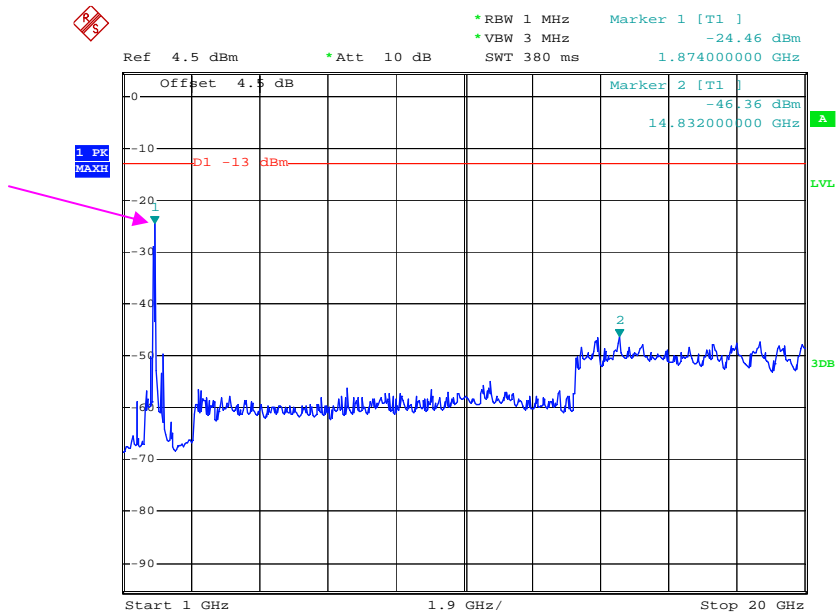
Date: 23.NOV.2013 12:04:04

### GSM1900 Middle Channel



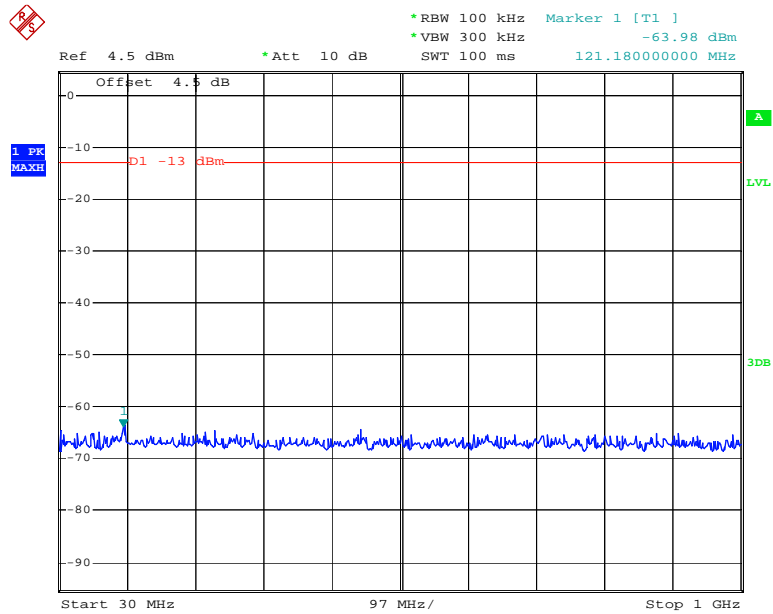
Date: 23.NOV.2013 12:00:19

Fundamental



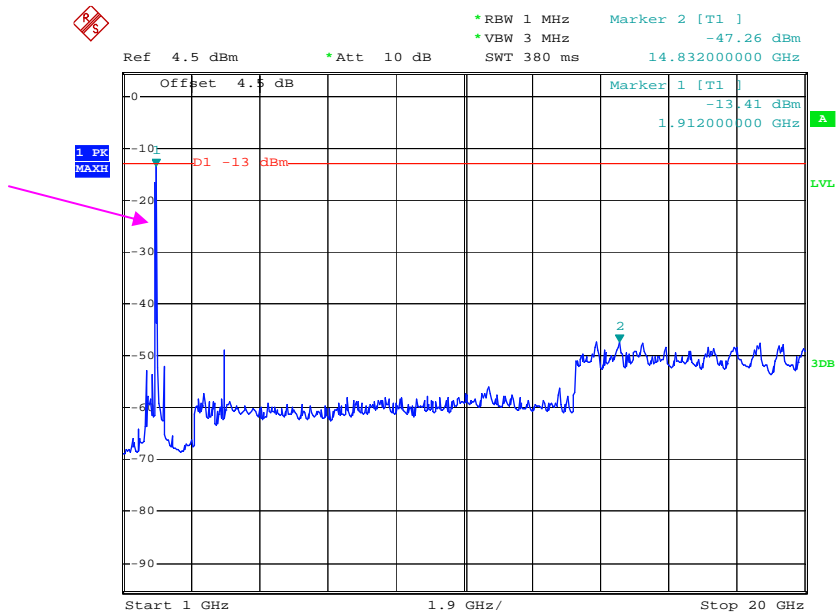
Date: 23.NOV.2013 11:59:14

### GSM1900 High Channel



Date: 23.NOV.2013 12:04:52

Fundamental



Date: 23.NOV.2013 12:04:37



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

### **Applicable Standard**

FCC § 2.1053, §22.917 and § 24.238.

### **Test Procedure**

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

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

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

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

Spurious emissions in dB = 10 lg (TXpwr in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 Log<sub>10</sub> (power out in Watts)

### **Test Equipment List and Details**

<b>Manufacturer</b>	<b>Description</b>	<b>Model</b>	<b>Serial Number</b>	<b>Calibration Date</b>	<b>Calibration Due Date</b>
HP	Signal Generator	8648A	3426A00831	2012-11-29	2013-11-28
Sunol Sciences	Antenna	JB3	A060611-1	2011-9-6	2014-9-5
EMCO	Adjustable dipole antenna	3121C	9109-753	N/A	N/A
HP	AMPLIFIER	8447E	2434A02181	N/A	N/A
R&S	EMI TEST RECEIVER	ESCI	100224	2013-5-6	2014-5-5
Giga	Signal Generator	1026	320408	2013-5-9	2014-5-8
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	N/A	N/A
TDK RF	horn antenna	HRN-0118	130 084	2012-9-6	2015-9-5
ETS LINDGREN	horn antenna	3115	000 527 35	2012-9-6	2015-9-5
R&S	Spectrum analyzer	FSEM	DE31388	2013-5-7	2014-5-6

\* **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>	25.2 °C
<b>Relative Humidity:</b>	61 %
<b>ATM Pressure:</b>	100.8kPa

The testing was performed by Ares Liu on 2013-10-15.

EUT Operation Mode: Transmitting

**GSM 850**

Frequency	Polar	S.A Reading	S.G. Level	Antenna Gain	Cable Loss	Absolute Level	Limit	Margin
MHz	H/V	dB $\mu$ V	dBm	dBd/dBi	dB	dBm	dBm	dB
<b>Low Channel, fo = 824.2 MHz</b>								
1648.400	H	50.19	-50.9	10.5	1.5	-41.9	-13.0	28.9
1648.400	V	50.33	-51.3	10.5	1.5	-42.3	-13.0	29.3
2472.600	H	52.31	-45.7	12.9	2.6	-35.4	-13.0	22.4
2472.600	V	51.08	-45.7	12.9	2.6	-35.4	-13.0	22.4
374.000	H	35.66	-62.9	0.0	0.6	-63.5	-13.0	50.5
374.000	V	34.97	-60.9	0.0	0.6	-61.5	-13.0	48.5
<b>High Channel, fo = 848.8 MHz</b>								
1697.600	H	51.33	-49.7	10.8	1.5	-40.4	-13.0	27.4
1697.600	V	51.25	-49.9	10.8	1.5	-40.6	-13.0	27.6
2546.400	H	50.96	-45.6	13.1	2.8	-35.3	-13.0	22.3
2546.400	V	50.67	-46.4	13.1	2.8	-36.1	-13.0	23.1
374.000	H	35.69	-62.8	0.0	0.6	-63.4	-13.0	50.4
374.000	V	35.11	-60.8	0.0	0.6	-61.4	-13.0	48.4

**GSM 1900**

Frequency	Polar	S.A. Reading	S.G. Level	Antenna Gain	Cable Loss	Absolute Level	Limit	Margin
MHz	H/V	dB $\mu$ V	dBm	dBd/dBi	dB	dBm	dBm	dB
<b>Low Channel, fo = 1850.2 MHz</b>								
3704.800	H	41.36	-53.4	13.9	2.5	-42.0	-13.0	29.0
3704.800	V	45.27	-49	13.9	2.5	-37.6	-13.0	24.6
407.000	H	34.28	-60.6	0.0	0.6	-61.2	-13.0	48.2
407.000	V	33.98	-58.3	0.0	0.6	-58.9	-13.0	45.9
<b>High Channel, fo = 1909.8 MHz</b>								
3815.200	H	40.09	-53.8	13.6	3.3	-43.5	-13.0	30.5
3815.200	V	44.58	-47.6	13.6	3.3	-37.3	-13.0	24.3
407.000	H	34.41	-60.5	0.0	0.6	-61.1	-13.0	48.1
407.000	V	33.57	-58.7	0.0	0.6	-59.3	-13.0	46.3

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

### Applicable Standard

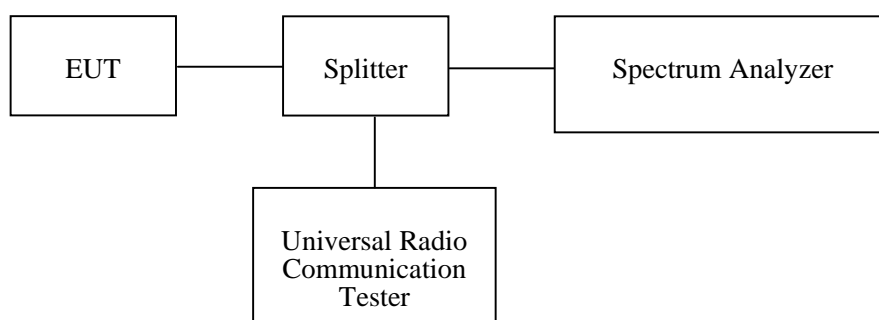
According to § 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

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	2013-6-16	2014-6-15

\* **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

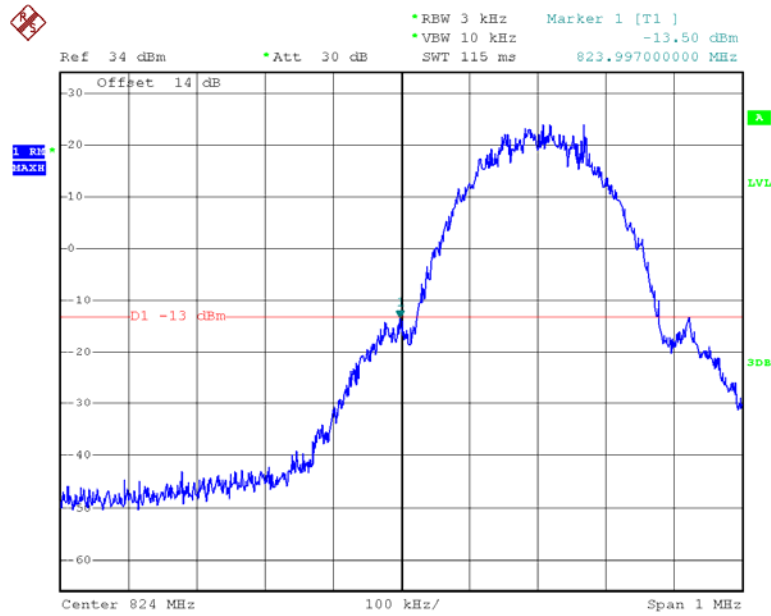
#### Environmental Conditions

Temperature:	27.8 °C
Relative Humidity:	53 %
ATM Pressure:	101.1 kPa

*The testing was performed by Ares Liu on 2013-10-16.*

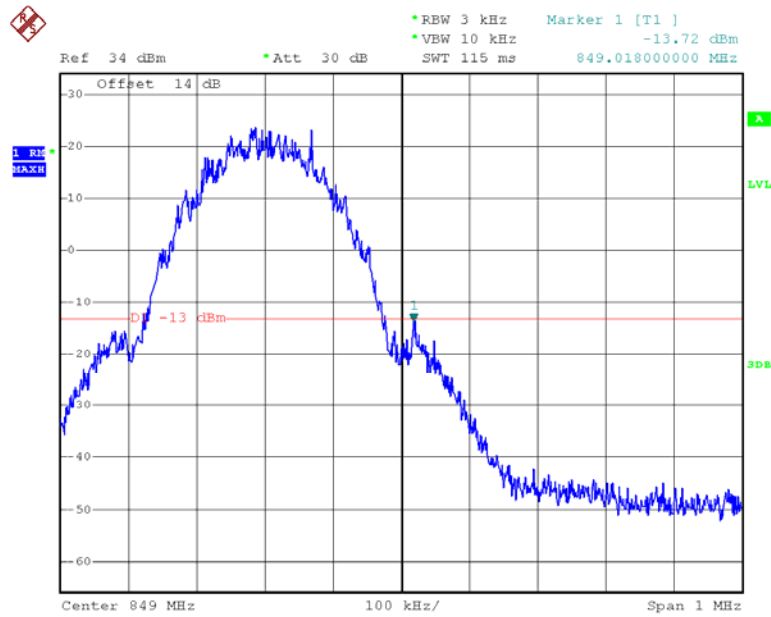
Please refer to the following tables and plots.

### Cellular Band, Left Band Edge



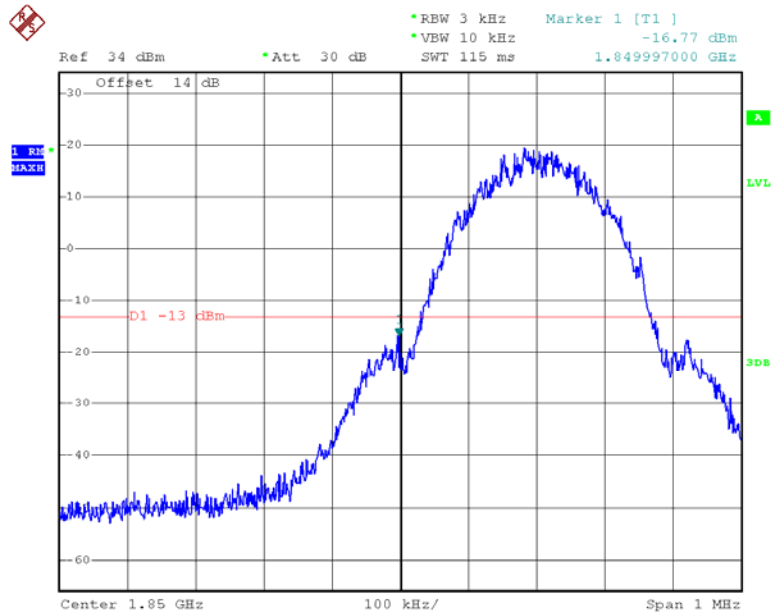
Date: 16.OCT.2013 10:48:27

### Cellular Band, Right Band Edge



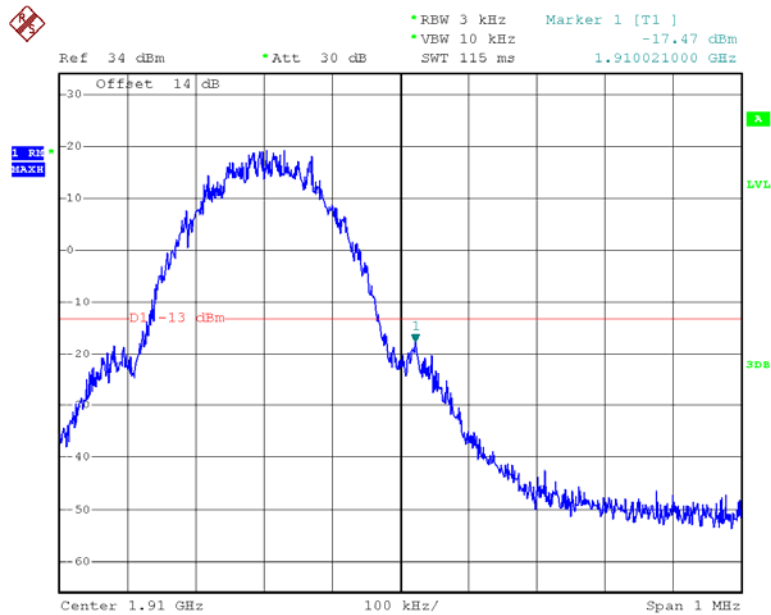
Date: 16.OCT.2013 10:50:49

### PCS Band, Left Band Edge



Date: 16.OCT.2013 10:52:28

### PCS Band, Right Band Edge



Date: 16.OCT.2013 10:53:29

## 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

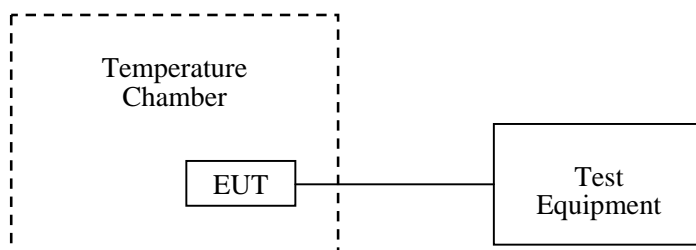
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

### 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 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	Humidity tester	DP1000	201105083-3	2013-7-3	2014-7-2
R&S	Universal Radio Communication Tester	CMU200	109038	2013-5-2	2014-5-1

\* **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>	26.1 °C
<b>Relative Humidity:</b>	64 %
<b>ATM Pressure:</b>	100.1kPa

*The testing was performed by Ares Liu on 2013-08-30.*

**Cellular Band (Part 22H)**

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	8	0.010	2.5
-20	3.7	5	0.006	2.5
-10	3.7	7	0.008	2.5
0	3.7	6	0.007	2.5
10	3.7	5	0.006	2.5
20	3.7	3	0.004	2.5
30	3.7	5	0.006	2.5
40	3.7	4	0.005	2.5
50	3.7	6	0.007	2.5
25	V <sub>end point</sub> =3.5	5	0.006	2.5

**PCS Band (Part 24E)**

<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	10	0.005	Pass
-20	3.7	9	0.005	Pass
-10	3.7	9	0.005	Pass
0	3.7	9	0.005	Pass
10	3.7	7	0.004	Pass
20	3.7	6	0.003	Pass
30	3.7	5	0.003	Pass
40	3.7	8	0.004	Pass
50	3.7	8	0.004	Pass
25	V <sub>end point</sub> =3.5	7	0.004	Pass



## **DECLARATION OF SIMILARITY**

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**Binatone Electronics International Ltd.**

Add: Floor 23A, 9 Des Voeux Road West, Sheung Wan, Hong Kong, China

Tel: 00852-28027388

Fax: 00852-28028138

### **DECLARATION OF SIMILARITY**

October 14, 2013

Dear Sir or Madam:

We, Binatone Electronics International Ltd., hereby declare that our product: GSM Mobile Phone, models: Voxel-SM320 is electrically identical with the same electromagnetic emissions and electromagnetic compatibility characteristics as SM320. And they are tested by BACL, the results of which are featured in BACL project: R2DG130917002, R2DG130917003, R2DG130917003-03, R1DG130917002-20, R1DG130917003-20

A description of the differences between the tested model and those that are declared similar areas follows:

Models: Voxel-SM320, SM320 the only difference is the model name.

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

Best Regards,

  
  
(Legally valid signature)

Patrick Cheung, Senior Product Manager

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