



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

For

## CLC HONG KONG LIMITED

802, 8/F., Harbour Centre Tower 1, No.1 Hok Cheung St., Hung Hom, Kowloon, Hong Kong

**FCC ID: 2AG4WGATOR6**

<b>Report Type:</b> Original Report	<b>Product Type:</b> Gator 6
<b>Report Number:</b>	RDG201119002-00D
<b>Report Date:</b>	2020-12-22
<b>Reviewed By:</b>	Ivan Cao Assistant Manager 
<b>Test Laboratory:</b>	Bay Area Compliance Laboratories Corp. (Dongguan) No.12, Pulong East 1 <sup>st</sup> Road, Tangxia Town, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 <a href="http://www.baclcorp.com.cn">www.baclcorp.com.cn</a>

## TABLE OF CONTENTS

<b>GENERAL INFORMATION.....</b>	<b>4</b>
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) .....	4
OBJECTIVE .....	4
RELATED SUBMITTAL(S)/GRANT(S).....	4
TEST METHODOLOGY .....	5
MEASUREMENT UNCERTAINTY .....	5
TEST FACILITY .....	5
DECLARATIONS.....	6
<b>SYSTEM TEST CONFIGURATION.....</b>	<b>7</b>
JUSTIFICATION .....	7
EQUIPMENT MODIFICATIONS .....	7
SUPPORT EQUIPMENT LIST AND DETAILS .....	7
CONFIGURATION OF TEST SETUP .....	7
BLOCK DIAGRAM OF TEST SETUP .....	8
<b>SUMMARY OF TEST RESULTS.....</b>	<b>9</b>
<b>FCC §1.1310 &amp; §2.1093- RF EXPOSURE .....</b>	<b>10</b>
APPLICABLE STANDARD .....	10
TEST RESULT .....	10
<b>FCC §2.1047 - MODULATION CHARACTERISTIC .....</b>	<b>11</b>
<b>FCC § 2.1046, § 22.913 (A) &amp; § 24.232 (C) &amp; § 27.50- RF OUTPUT POWER.....</b>	<b>12</b>
APPLICABLE STANDARD .....	12
TEST PROCEDURE .....	13
TEST EQUIPMENT LIST AND DETAILS.....	16
TEST DATA .....	16
<b>FCC §2.1049, §22.917, §22.905 &amp; §24.238 &amp; §27.53- OCCUPIED BANDWIDTH.....</b>	<b>20</b>
APPLICABLE STANDARD .....	20
TEST PROCEDURE .....	20
TEST EQUIPMENT LIST AND DETAILS.....	20
TEST DATA .....	20
<b>FCC §2.1051, §22.917(A) &amp; §24.238(A) &amp; §27.53- SPURIOUS EMISSIONS AT ANTENNA TERMINALS...30</b>	<b>30</b>
APPLICABLE STANDARD .....	30
TEST PROCEDURE .....	30
TEST EQUIPMENT LIST AND DETAILS.....	30
TEST DATA .....	30
<b>FCC §2.1053, §22.917 &amp; §24.238 &amp; §27.53- SPURIOUS RADIATED EMISSIONS.....</b>	<b>36</b>
APPLICABLE STANDARD .....	36
TEST PROCEDURE .....	36
TEST EQUIPMENT LIST AND DETAILS.....	37
TEST DATA .....	37
<b>FCC §22.917(A) &amp; §24.238(A) &amp; §27.53 - BAND EDGES.....</b>	<b>43</b>
APPLICABLE STANDARD .....	43
TEST PROCEDURE .....	43
TEST EQUIPMENT LIST AND DETAILS.....	43
TEST DATA .....	43

---

---

<b>FCC §2.1055, §22.355 &amp; §24.235 &amp; §27.54 - FREQUENCY STABILITY.....</b>	<b>48</b>
APPLICABLE STANDARD .....	48
TEST PROCEDURE .....	48
TEST EQUIPMENT LIST AND DETAILS.....	49
TEST DATA .....	49

## GENERAL INFORMATION

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

	<b>EUT Name:</b>	Gator 6
	<b>EUT Model:</b>	Z555
	<b>Operation modes:</b>	GSM Voice, GPRS Data, WCDMA( R99 (Voice+Data), HSDPA,HSUPA)
	<b>Operation Frequency:</b>	GSM 850: 824-849 MHz(TX); 869-894 MHz(RX) PCS 1900: 1850-1910 MHz(TX); 1930-1990 MHz(RX) WCDMA Band 2: 1850-1910 MHz(TX); 1930-1990 MHz(RX) WCDMA Band 4: 1710-1755 MHz(TX), 2110-2155 MHz(RX) WCDMA Band 5: 824-849 MHz(TX); 869-894 MHz(RX)
	<b>Antenna Gain:</b>	GSM850 B5: -1.5 dBi; WCDMA B5: -1.5 dBi; PCS1900 B2: 0.73 dBi; WCDMA B2: 0.73 dBi WCDMA B4: 0.58 dBi
	<b>Modulation Type:</b>	GMSK, BPSK, QPSK, 16QAM
<b>Adapter Information</b>	<b>Model:</b>	HJ-0501000E1-US
	<b>Input:</b>	100-240Vac 50/60Hz 0.2A
	<b>Output:</b>	5.0Vdc 1000mA
	<b>Rated Input Voltage:</b>	DC 3.85V from battery or DC 5V from Adapter
	<b>Serial Number:</b>	RDG201119002-RF-S1
	<b>EUT Received Date:</b>	2020.11.19
	<b>EUT Received Status:</b>	Good

### Objective

This report is prepared on behalf of **CLC HONG KONG LIMITED** in accordance with: Part 2-Subpart J, Part 22-Subpart H, Part 24-Subpart E, Part 27 of the Federal Communications Commission's rules.

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

### Related Submittal(s)/Grant(s)

FCC Part 15C DSS submissions with FCC ID:2AG4WGATOR6.  
FCC Part 15C DTS submissions with FCC ID:2AG4WGATOR6  
FCC Part 15B JBP submissions with FCC ID:2AG4WGATOR6

## Test Methodology

All tests and measurements indicated in this document were performed in accordance with:

the Code of federal Regulations Title 47, Part 2, Part 22H, Part 24E, Part 27.

ANSI C63.26-2015, American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Dongguan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

## Measurement Uncertainty

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.61 dB
Unwanted Emissions, radiated	30MHz ~ 1GHz: 5.85 dB 1G~26.5GHz: 5.23 dB
Unwanted Emissions, conducted	±1.5 dB
Temperature	±1 °C
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%

*Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.*

## Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.12, Pulong East 1<sup>st</sup> Road, Tangxia Town, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218, the FCC Designation No. : CN1220.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0022.

## **Declarations**

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol “▲”. Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

This report cannot be reproduced except in full, without prior written approval of the Company.

This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

This report may contain data that are not covered by the accreditation scope and shall be marked with an asterisk “★”.

## SYSTEM TEST CONFIGURATION

### Justification

The EUT was configured for testing according to ANSI C63.26-2015.

The test items were performed with the EUT operating at testing mode. The device operates on GSM Band 850/1900MHz, WCDMA Band 2/4/5 , test was performed with channels as below table:

Frequency Bands	Bandwidth (MHz)	Test Frequency(MHz)		
		Low	Middle	High
GSM/GPRS 850	0.25	824.2	836.6	848.8
GSM/GPRS 1900	0.25	1850.2	1880	1909.8
WCDMA Band 2	4.2	1852.4	1880	1907.6
WCDMA Band 4	4.2	1712.4	1732.6	1752.6
WCDMA Band 5	4.2	826.4	836.6	846.6

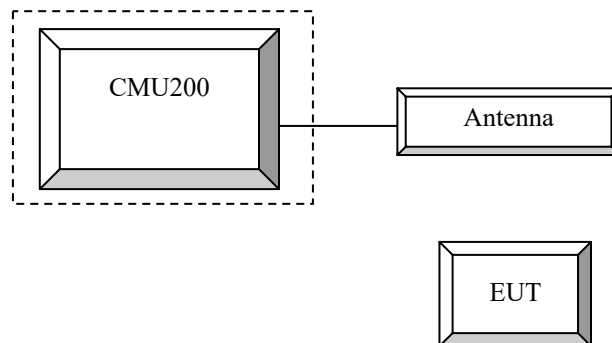
### Equipment Modifications

No modification was made to the EUT.

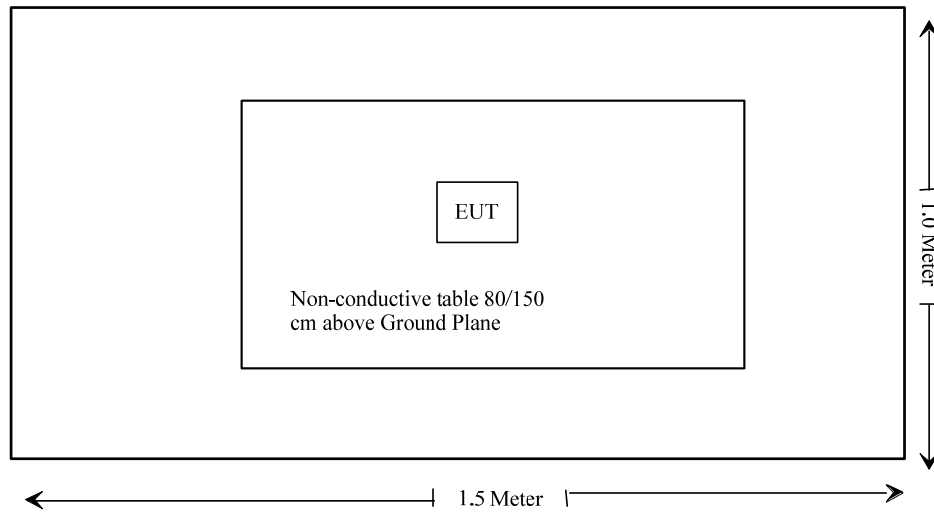
### Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
R&S	Universal Radio Communication Tester	CMU200	106 891
Un-Known	ANTENNA	Un-Known	Un-Known

### Configuration of Test Setup



### Block Diagram of Test Setup





**SUMMARY OF TEST RESULTS**

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

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

---

### **Applicable Standard**

FCC§1.1310 and §2.1093.

### **Test Result**

Compliance, please refer to the SAR report: RDG201119002-20.

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

---

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.

---

**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 §27.50

(a)(3) Mobile and portable stations. (i) For mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth. For mobile and portable stations using time division duplexing (TDD) technology, the duty cycle must not exceed 38 percent in the 2305-2315 MHz and 2350-2360 MHz bands. Mobile and portable stations using FDD technology are restricted to transmitting in the 2305-2315 MHz band. Power averaging shall not include intervals in which the transmitter is off.

(b)(10) Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

(c) (10) Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

(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.

(h),(2) 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
WCDMA General Settings	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
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	$A_{hs} = \beta_{hs} / \beta_c$	30/15			

**WCDMA HSUPA**

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

	<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_FCIs	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		

**Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Unknown	Coaxial Cable	C-SJ00-0010	C0010/04	Each time	N/A
E-Microwave	Blocking Control	EMDCB-00036	0E01201048	Each time	N/A
E-Microwave	Coaxial Attenuators	EMCA10-5RN-6	OE01203239	Each time	N/A
R&S	Universal Radio Communication Tester	CMU200	106 891	2020-09-12	2021-09-12

\* **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>	23.5~23.7 °C
<b>Relative Humidity:</b>	36`41%
<b>ATM Pressure:</b>	102.3~102.4kPa
<b>Tester:</b>	Theshy Xie
<b>Test Date:</b>	2020-12-01~2020-12-02

*Test Result: Compliance*



**Conducted Output Power****Cellular Band & PCS Band**

Band	Channel No.	Conducted Peak Output Power (dBm)				
		GSM	GPRS 1 TX Slot	GPRS 2 TX Slots	GPRS 3 TX Slots	GPRS 4 TX Slots
Cellular	128	32.4	32.47	31.06	28.81	27.86
	190	32.4	32.55	31.19	29.97	28.00
	251	32.4	32.49	31.17	29.00	28.02
PCS	512	30.1	30.11	28.90	26.69	25.74
	661	30.1	30.80	28.92	26.74	25.81
	810	30	29.98	28.90	26.82	25.99

**ERP/EIRP:**

Band	Mode	Channel	Conducted Power (dBm)	Antenna Gain (dBi/dBd)	Cable Loss (dB)	Result (dBm)	Limit (dBm)
Cellular	GSM	Low	32.47	-3.65	0.2	28.62	38.45
		Middle	32.55	-3.65	0.2	28.7	38.45
		High	32.49	-3.65	0.2	28.64	38.45
PCS	GSM	Low	30.11	0.73	0.4	30.44	33
		Middle	30.8	0.73	0.4	31.13	33
		High	30	0.73	0.4	30.33	33

## 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) Result = Conducted Power - Cable loss + Antenna Gain
- 3) Antenna gain(dBd)= Antenna gain(dBi)-2.15

**WCDMA Band 2**

**Conducted Output Power and PAR:**

Mode	3GPP Sub Test	Low Channel		Middle Channel		High Channel	
		Ave. Power (dBm)	PAR (dB)	Ave. Power (dBm)	PAR (dB)	Ave. Power (dBm)	PAR (dB)
Rel 99	1	21.15	1.77	21.79	1.91	21.40	1.86
HSDPA	1	20.98	2.41	20.86	3.16	20.31	2.93
	2	19.56	2.15	19.66	3.14	19.37	3.12
	3	17.23	2.18	18.36	3.25	18.24	3.02
	4	16.55	2.36	17.54	3.26	17.27	2.98
HSUPA	1	21.68	2.58	21.74	3.17	21.42	2.64
	2	20.66	2.58	20.46	3.45	20.46	2.35
	3	19.54	2.56	19.78	3.26	19.34	2.56
	4	18.35	2.14	18.64	3.56	18.64	2.34
	5	17.56	2.34	17.65	3.27	17.23	2.46

**EIRP:**

Channel	Conducted Power (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Result (dBm)	Limit (dBm)
Low	21.68	0.73	0.4	22.01	33
Middle	21.79	0.73	0.4	22.12	33
High	21.42	0.73	0.4	21.75	33

**WCDMA Band 4**

**Conducted Output Power and PAR:**

Mode	3GPP Sub Test	Low Channel		Middle Channel		High Channel	
		Ave. Power (dBm)	PAR (dB)	Ave. Power (dBm)	PAR (dB)	Ave. Power (dBm)	PAR (dB)
Rel 99	1	22.09	2.14	21.11	2.26	20.42	2.09
HSDPA	1	22.08	3.28	21.72	2.99	22.02	2.61
	2	21.12	3.23	20.45	2.78	21.56	2.56
	3	20.00	3.25	19.56	2.89	20.78	2.89
	4	19.45	3.15	18.45	2.88	19.88	2.78
HSUPA	1	21.70	3.39	21.67	3.62	21.85	2.75
	2	20.45	3.03	20.54	3.56	20.78	2.45
	3	19.55	3.01	19.47	3.45	19.54	2.65
	4	18.56	3.15	18.65	3.65	18.45	2.88
	5	17.23	3.05	17.85	3.85	17.66	2.78

**EIRP:**

Channel	Conducted Power (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Result (dBm)	Limit (dBm)
Low	22.09	0.58	0.4	22.27	30
Middle	21.72	0.58	0.4	21.90	30
High	22.02	0.58	0.4	22.20	30

**WCDMA Band 5****Conducted Output Power and PAR:**

Mode	3GPP Sub Test	Low Channel		Middle Channel		High Channel	
		Ave. Power (dBm)	PAR (dB)	Ave. Power (dBm)	PAR (dB)	Ave. Power (dBm)	PAR (dB)
Rel 99	1	21.78	3.22	21.57	2.72	21.82	2.99
HSDPA	1	21.60	4.12	21.83	3.07	21.62	3.94
	2	20.53	4.56	20.36	4.28	20.78	3.98
	3	19.12	4.25	19.56	4.65	19.56	3.89
	4	18.56	4.45	18.56	4.18	18.45	3.89
HSUPA	1	21.52	4.58	21.51	3.10	21.40	3.78
	2	20.75	4.26	20.45	3.18	20.89	3.56
	3	19.62	4.89	19.18	3.16	19.46	3.78
	4	18.35	4.32	18.78	3.78	18.42	3.46
	5	17.46	4.12	17.65	3.98	17.55	3.02

**ERP:**

Channel	Conducted Power (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	Result (dBm)	Limit (dBm)
Low	21.78	-3.65	0.2	17.93	33
Middle	21.83	-3.65	0.2	15.84	33
High	21.82	-3.65	0.2	15.83	33

**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) Result = Conducted Power - Cable loss + Antenna Gain
- 3) Antenna gain(dBd)= Antenna gain(dBi)-2.15

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

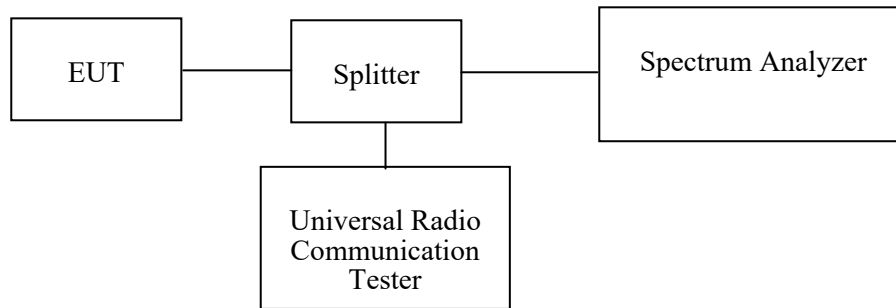
**Applicable Standard**

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	FSV40	101474	2020-01-09	2021-01-09
Unknown	Coaxial Cable	C-SJ00-0010	C0010/04	Each time	N/A
E-Microwave	Blocking Control	EMDCB-00036	0E01201048	Each time	N/A
E-Microwave	Coaxial Attenuators	EMCA10-5RN-6	OE01203239	Each time	N/A
E-Microwave	Two-way Splitter	ODP-1-6-2S	OE0120142	Each time	N/A

\* **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>	23.5~23.7 °C
<b>Relative Humidity:</b>	36~41%
<b>ATM Pressure:</b>	102.3~102.4kPa
<b>Tester:</b>	Theshy Xie
<b>Test Date:</b>	2020-12-01~2020-12-02

*Test Mode: Transmitting*

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

**GSM:**

Band	Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
		Low Channel	Middle Channel	High Channel	Low Channel	Middle Channel	High Channel
Cellular	GSM	0.245	0.246	0.245	0.313	0.317	0.313
PCS	GSM	0.245	0.247	0.243	0.313	0.318	0.316

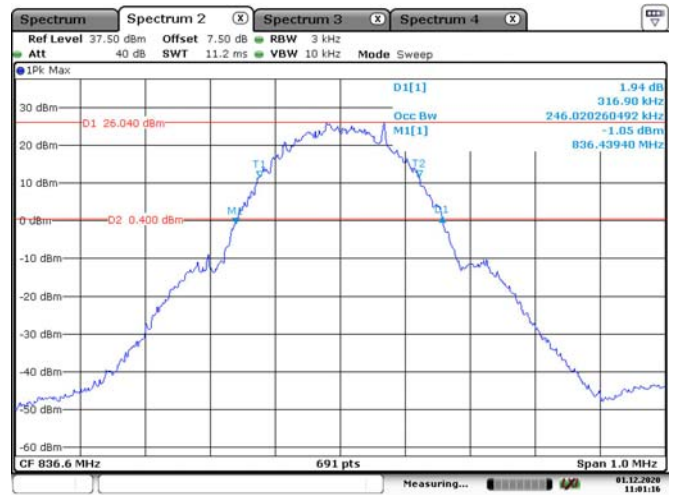
**WCDMA:**

Band	Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
		Low Channel	Middle Channel	High Channel	Low Channel	Middle Channel	High Channel
WCDMA Band 2	Rel 99	4.211	4.197	4.197	4.834	4.819	4.819
	HSDPA	4.176	4.176	4.716	4.762	4.759	4.759
	HSUPA	4.193	4.176	4.193	4.759	4.742	4.742
WCDMA Band 4	Rel 99	4.182	4.182	4.168	4.747	7.747	4.790
	HSDPA	4.160	4.176	4.176	4.725	4.742	4.742
	HSUPA	4.160	4.160	4.160	4.725	4.709	4.742
WCDMA Band 5	Rel 99	4.143	4.160	4.160	4.709	4.709	4.709
	HSDPA	4.160	4.176	4.160	4.709	4.725	4.725
	HSUPA	4.160	4.160	4.176	4.709	4.742	4.725

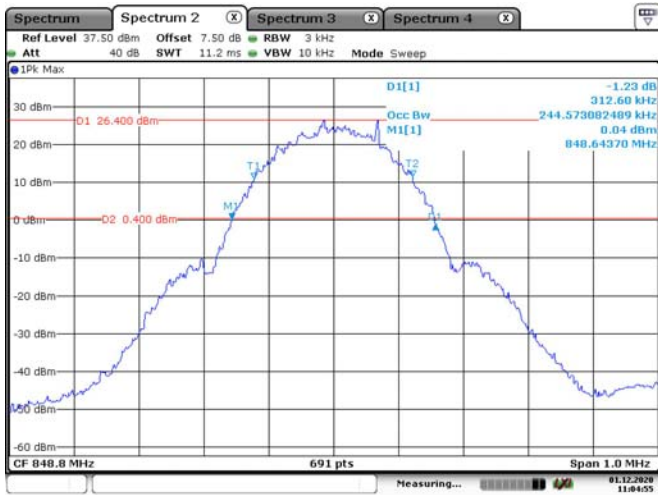
**Cellular 850 Band, GSM, Low Channel**



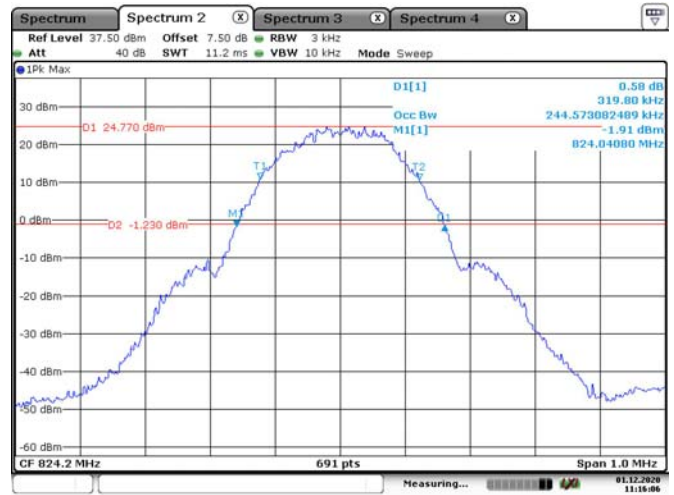
**Cellular 850 Band, GSM, Middle Channel**



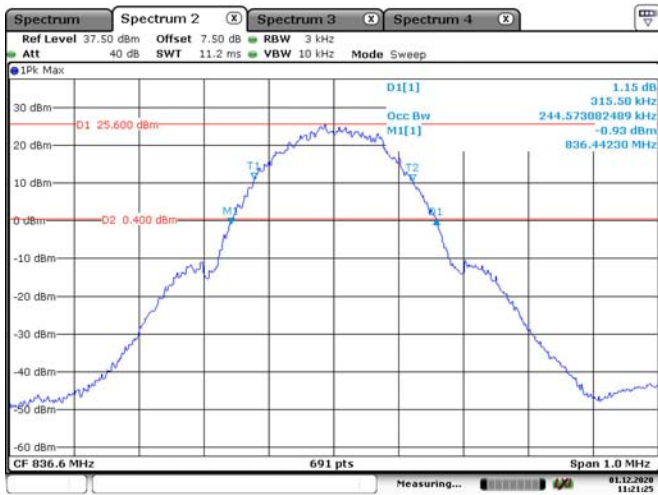
**Cellular 850 Band, GSM, High Channel**



**Cellular 850 Band, GPRS, Low Channel**



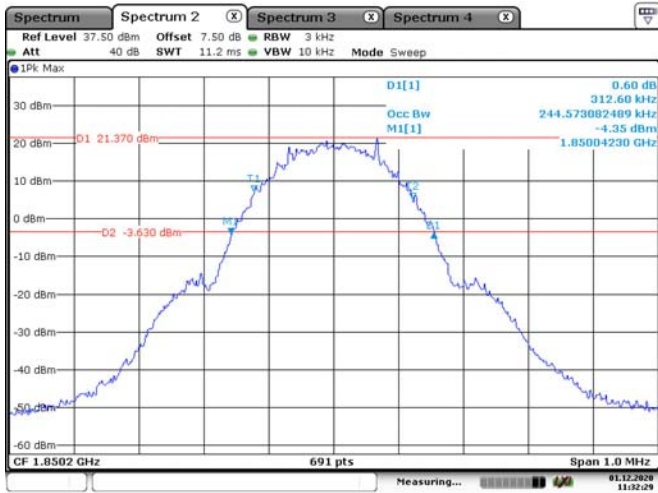
**Cellular 850 Band, GPRS, Middle Channel**



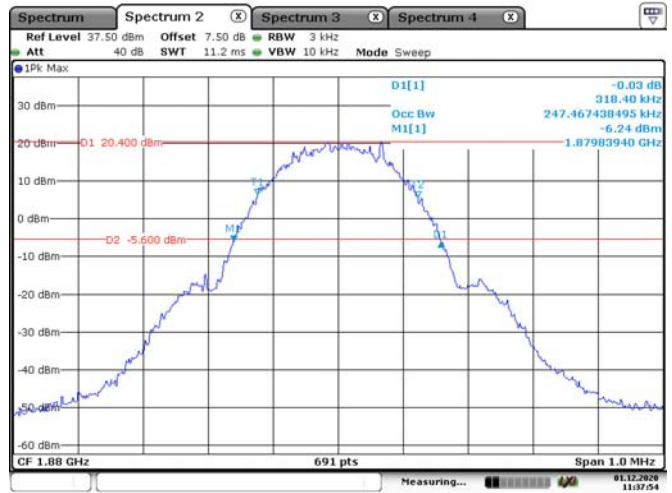
**Cellular 850 Band, GPRS, High Channel**



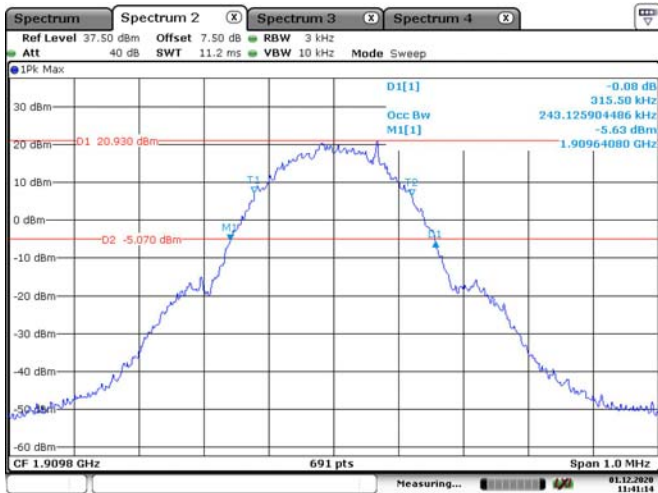
**PCS 1900 Band, GSM, Low Channel**



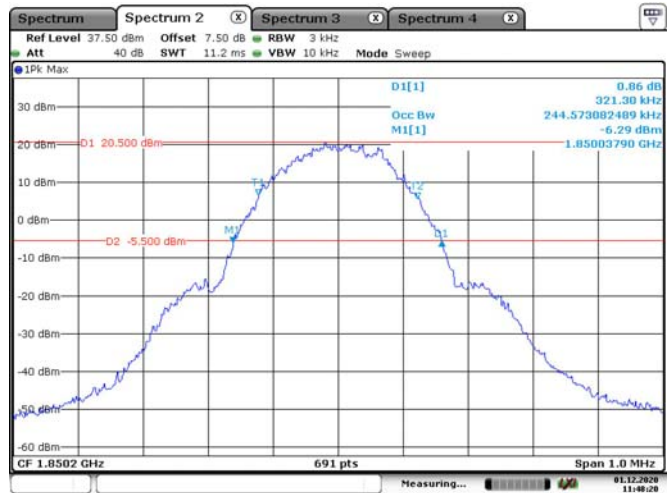
**PCS 1900 Band, GSM, Middle Channel**



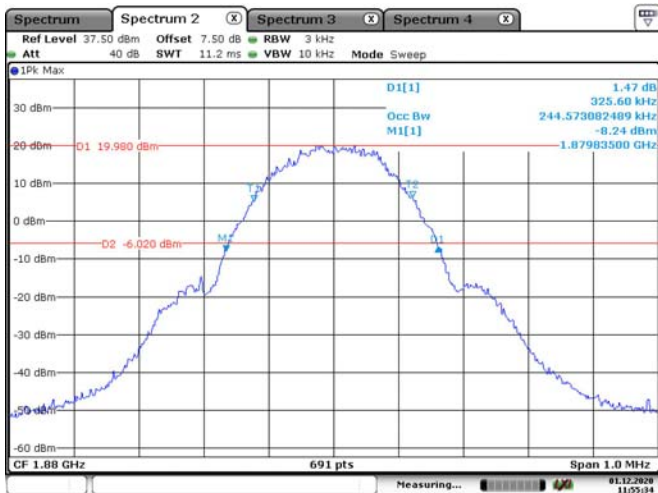
**PCS 1900 Band, GSM, High Channel**



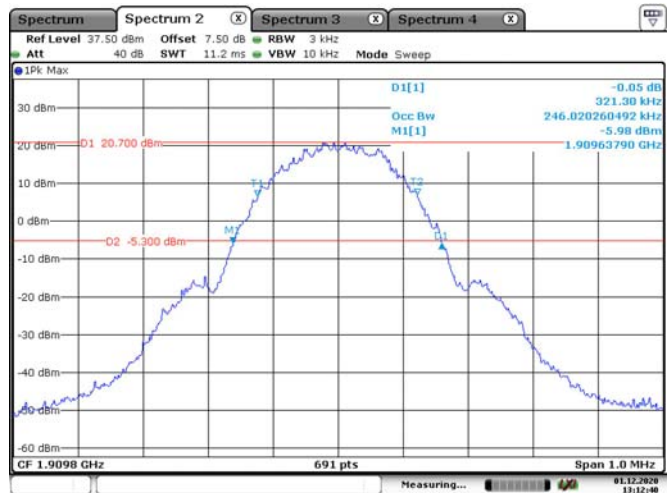
**PCS 1900 Band, GPRS, Low Channel**



**PCS 1900 Band, GPRS, Middle Channel**

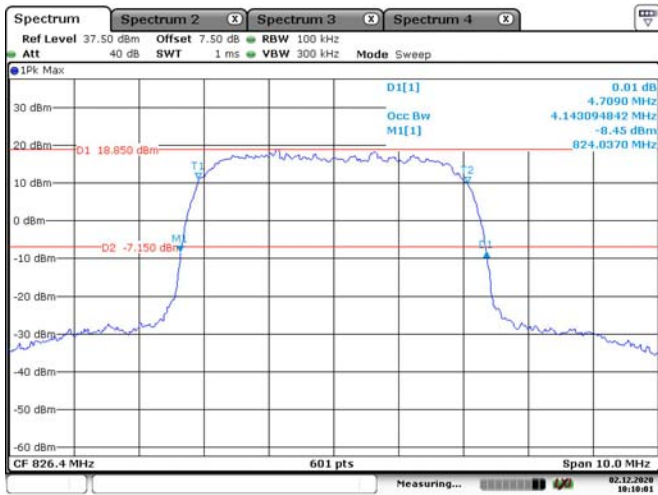


**PCS 1900 Band, GPRS, High Channel**

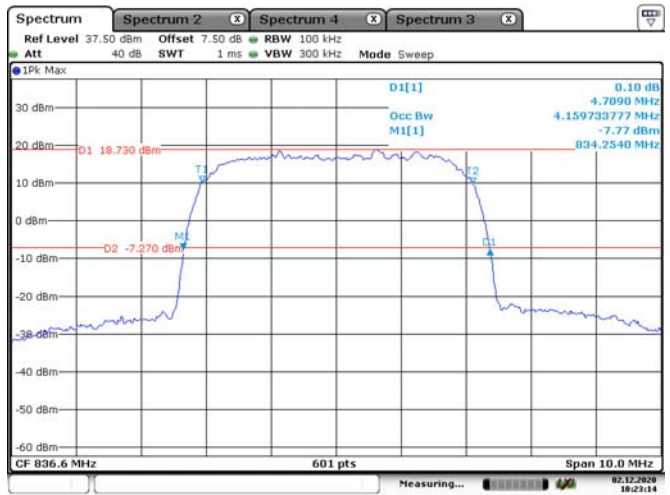




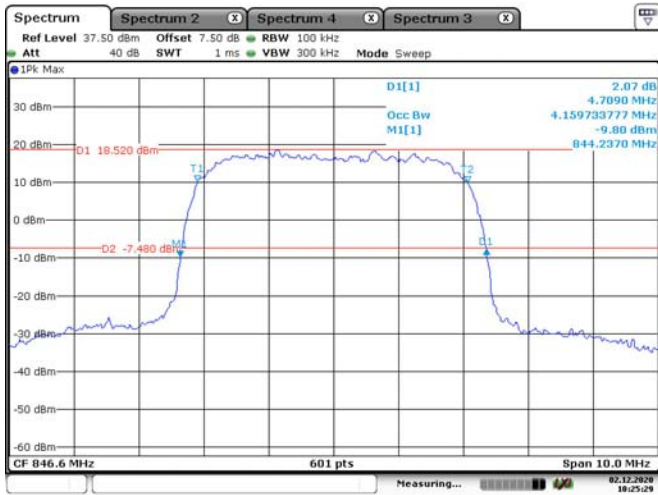
WCDMA Band V, Rel99, Low Channel



WCDMA Band V, Rel99, Middle Channel

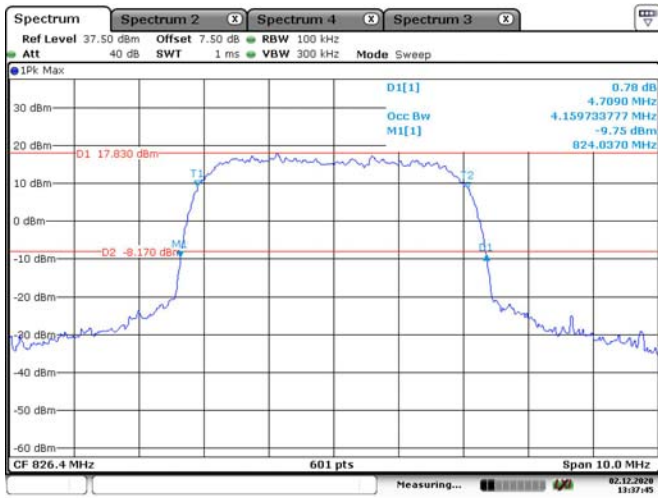


WCDMA Band V, Rel99, High Channel



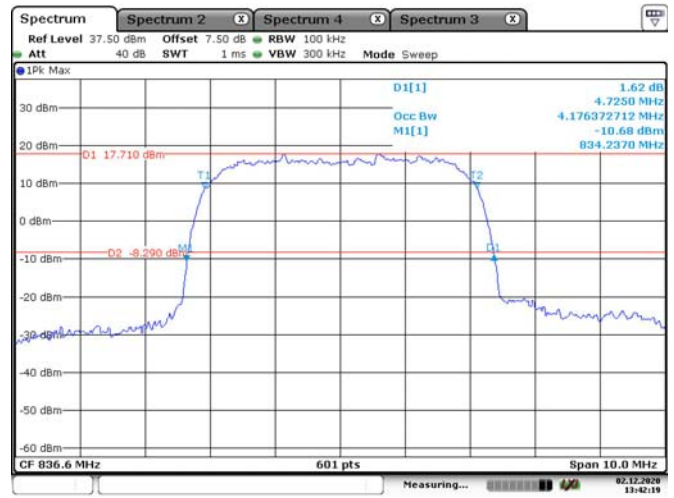


**WCDMA Band V, HSDPA, Low Channel**



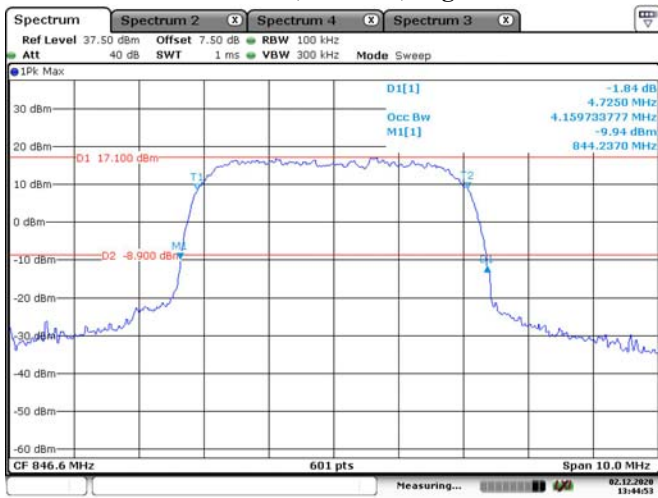
Date: 2, DEC, 2020 13:37:45

**WCDMA Band V, HSDPA, Middle Channel**



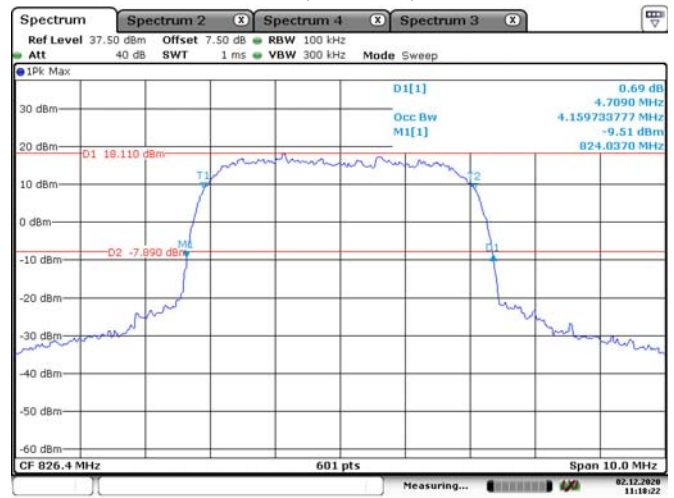
Date: 2, DEC, 2020 13:42:19

**WCDMA Band V, HSDPA, High Channel**



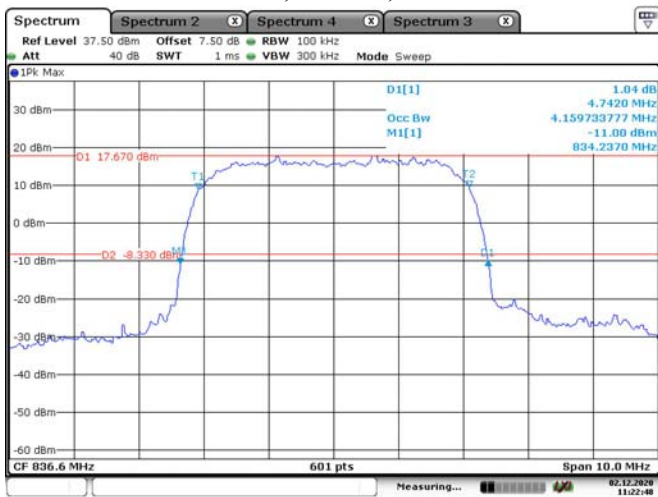
Date: 2, DEC, 2020 13:44:53

**WCDMA Band V, HSUPA, Low Channel**



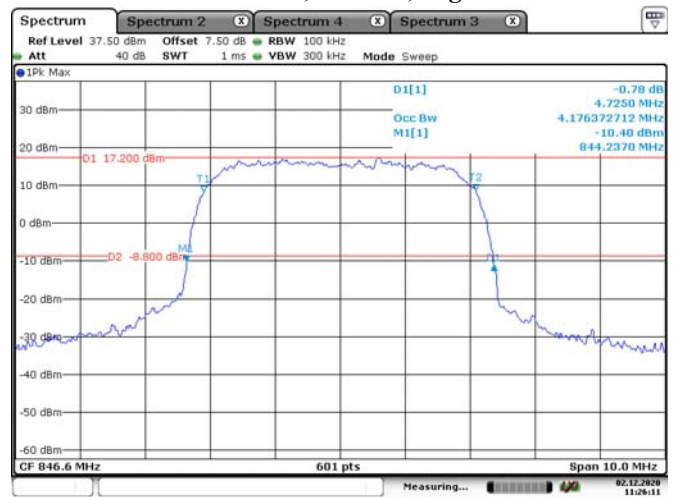
Date: 2, DEC, 2020 11:18:23

**WCDMA Band V, HSUPA, Middle Channel**



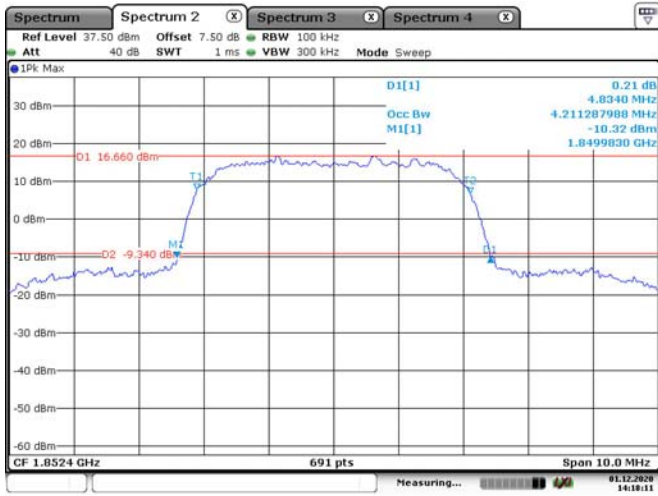
Date: 2, DEC, 2020 11:22:49

**WCDMA Band V, HSUPA, High Channel**



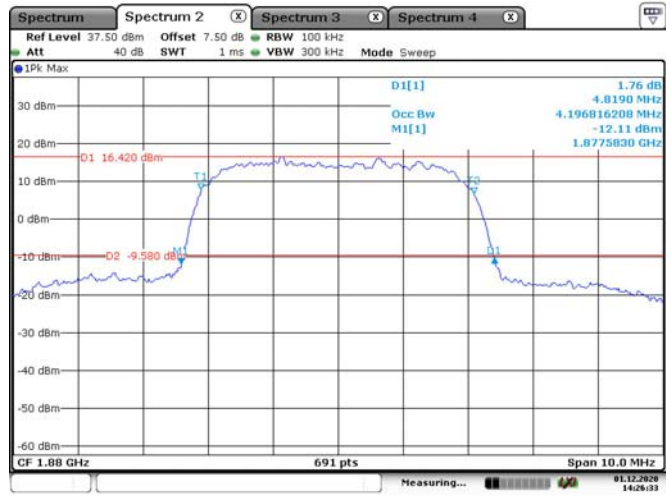
Date: 2, DEC, 2020 11:26:11

WCDMA Band II, Rel99, Low Channel



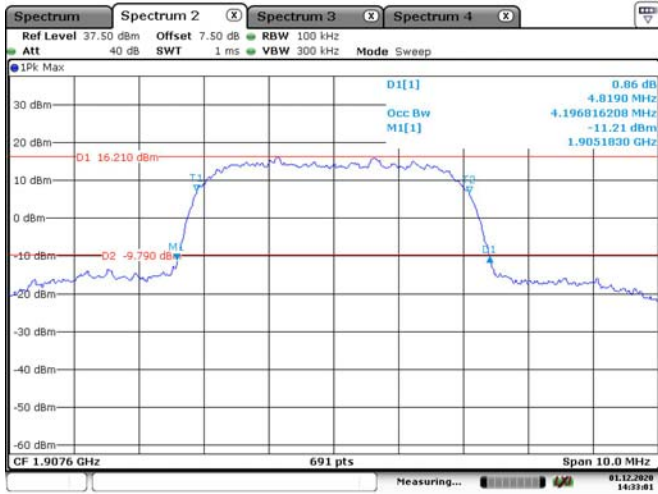
Date: 1.DEC.2020 14:18:10

WCDMA Band II, Rel99, Middle Channel



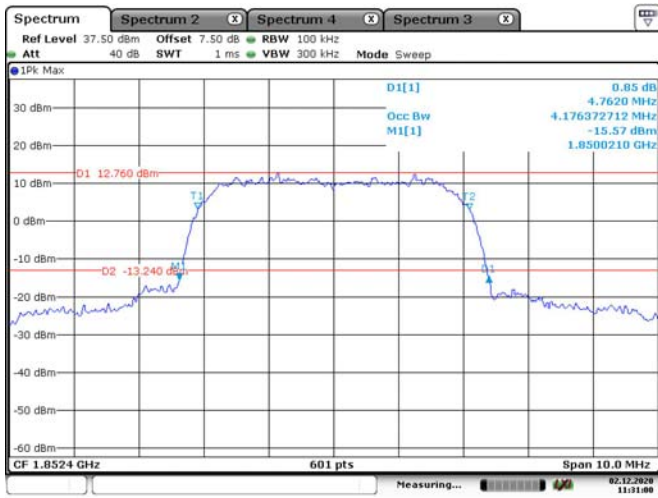
Date: 1.DEC.2020 14:26:33

WCDMA Band II, Rel99, High Channel



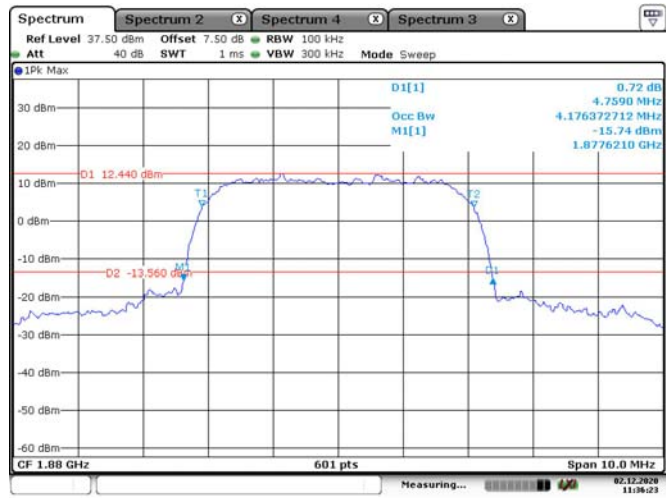
Date: 1.DEC.2020 14:33:01

**WCDMA Band II, HSDPA, Low Channel**



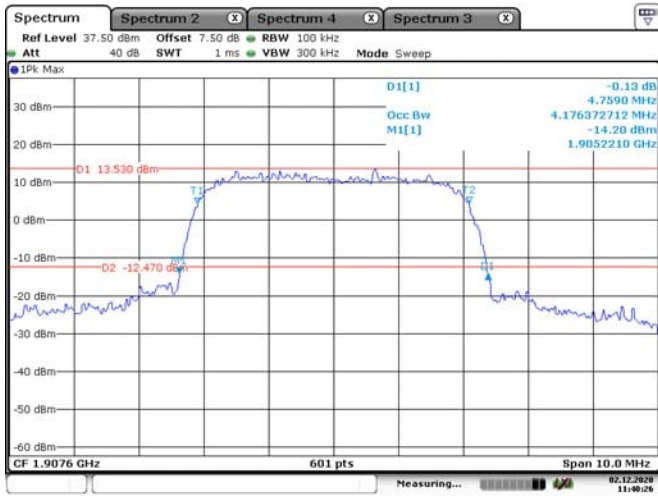
Date: 2, DEC, 2020 11:31:01

**WCDMA Band II, HSDPA, Middle Channel**



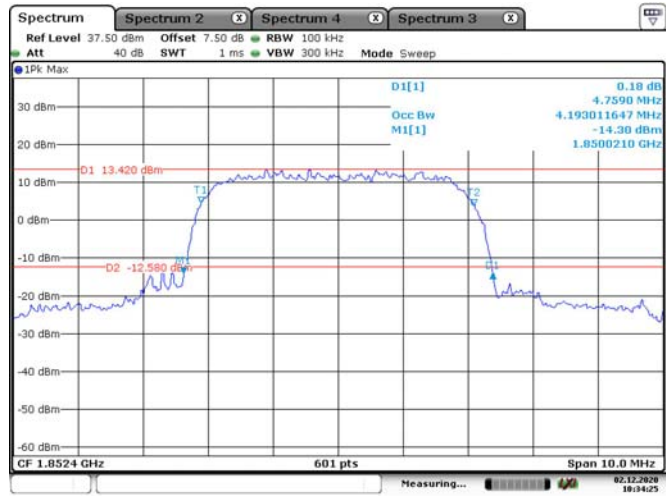
Date: 2, DEC, 2020 11:36:23

**WCDMA Band II, HSDPA, High Channel**



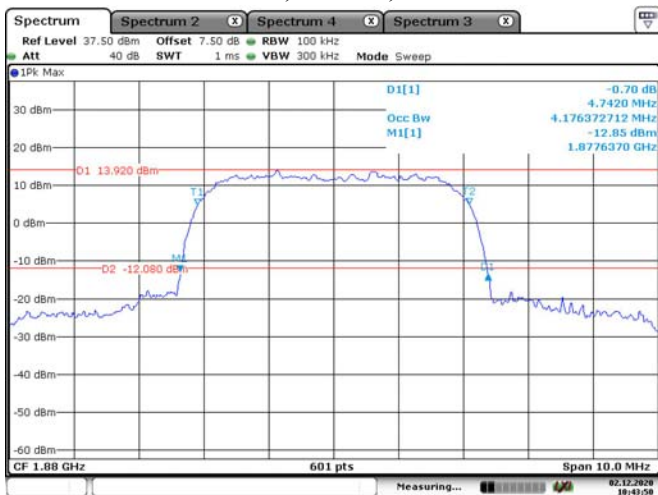
Date: 2, DEC, 2020 11:40:27

**WCDMA Band II, HSUPA, Low Channel**



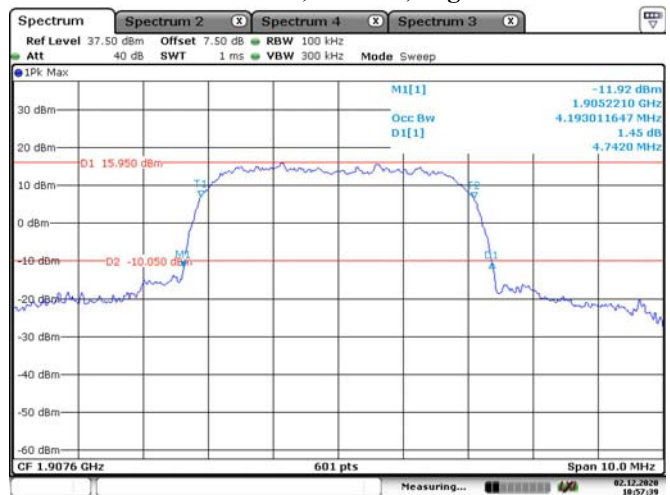
Date: 2, DEC, 2020 10:34:25

**WCDMA Band II, HSUPA, Middle Channel**



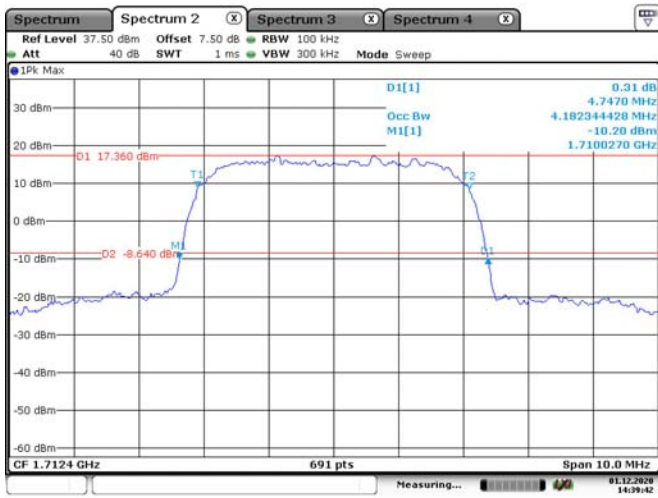
Date: 2, DEC, 2020 10:43:50

**WCDMA Band II, HSUPA, High Channel**

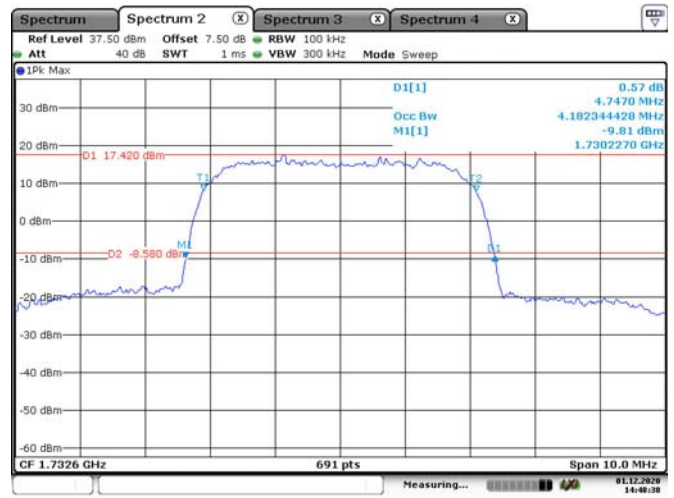


Date: 2, DEC, 2020 10:57:39

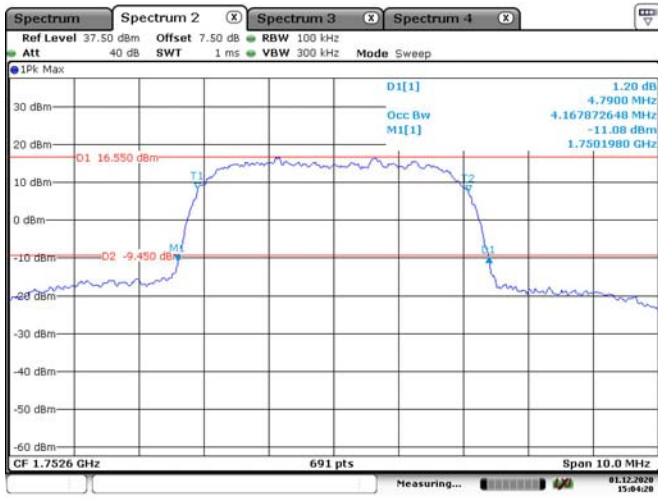
WCDMA Band IV, Rel99, Low Channel



WCDMA Band IV, Rel99, Middle Channel



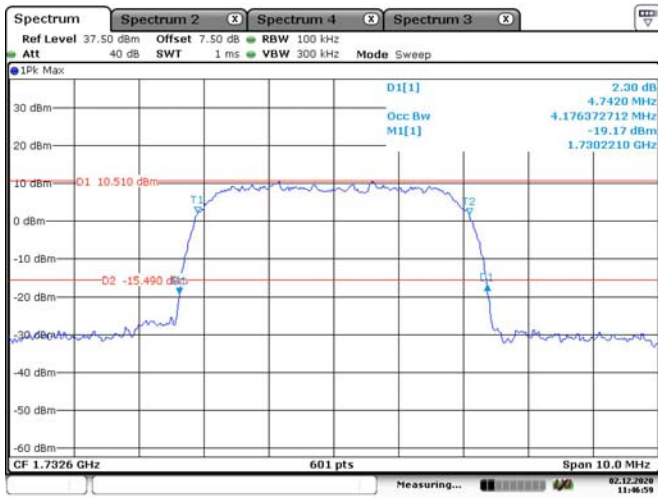
WCDMA Band IV, Rel99, High Channel



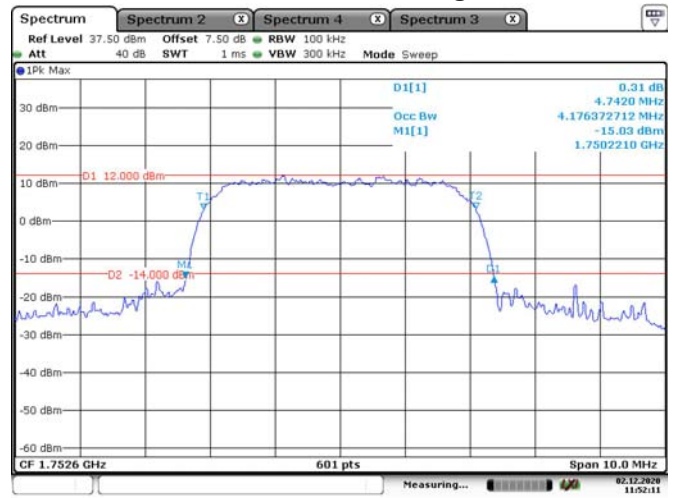
WCDMA Band IV, HSDPA, Low Channel



WCDMA Band IV, HSDPA, Middle Channel

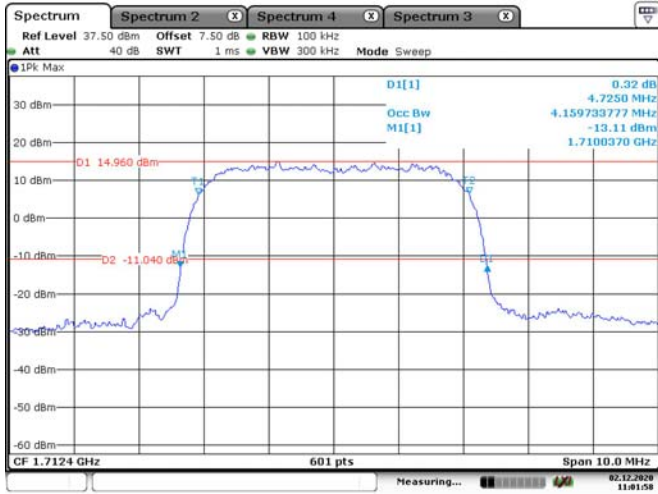


WCDMA Band IV, HSDPA, High Channel



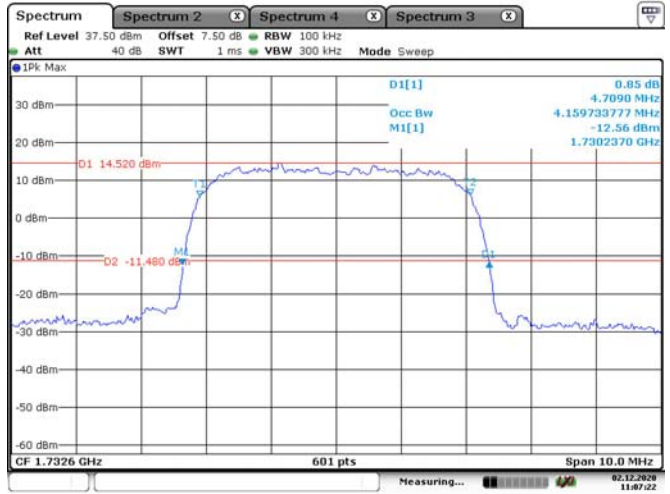


**WCDMA Band IV, HSUPA, Low Channel**



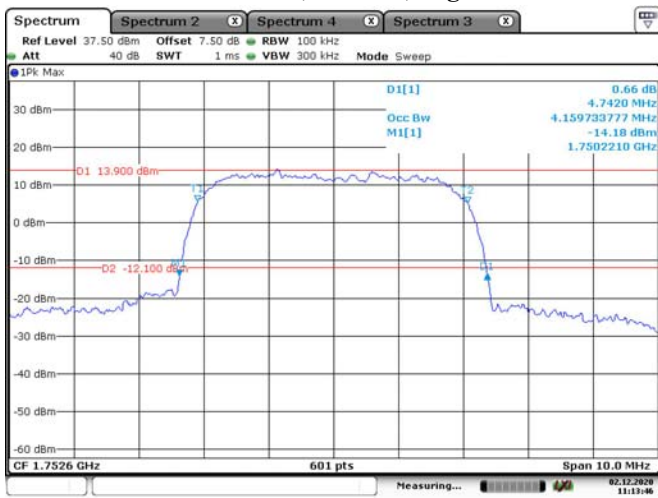
Date: 2.DEC.2020 11:01:59

**WCDMA Band IV, HSUPA, Middle Channel**



Date: 2.DEC.2020 11:07:23

**WCDMA Band IV, HSUPA, High Channel**



Date: 2.DEC.2020 11:13:46

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

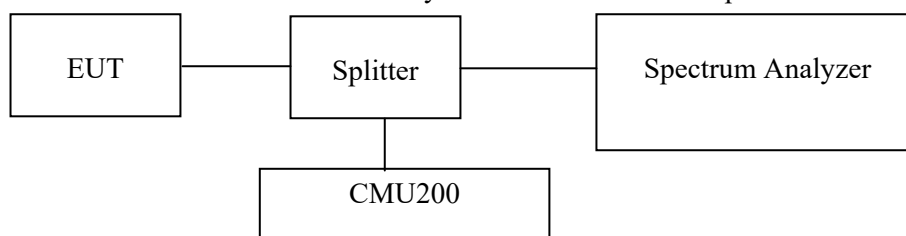
### Applicable Standard

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	FSV40	101474	2020-01-09	2021-01-09
Unknown	Coaxial Cable	C-SJ00-0010	C0010/04	Each time	N/A
E-Microwave	Blocking Control	EMDCB-00036	0E01201048	Each time	N/A
E-Microwave	Coaxial Attenuators	EMCA10-5RN-6	OE01203239	Each time	N/A
E-Microwave	Two-way Splitter	ODP-1-6-2S	OE0120142	Each time	N/A

\* **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).

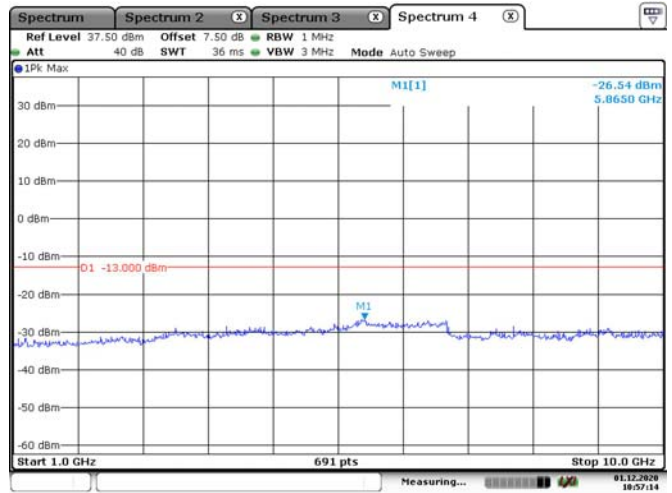
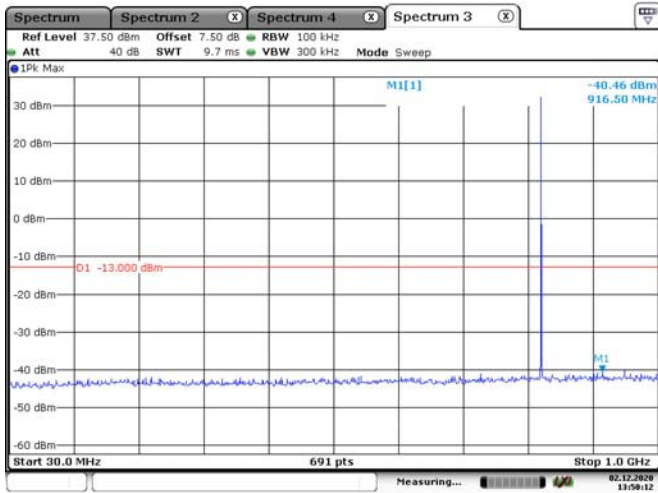
### Test Data

#### Environmental Conditions

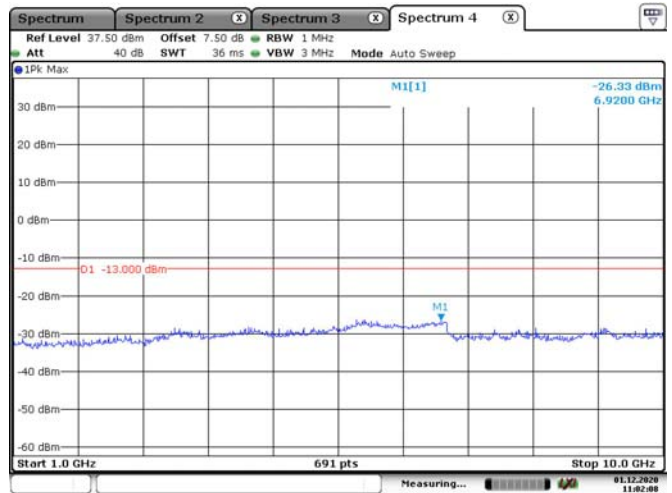
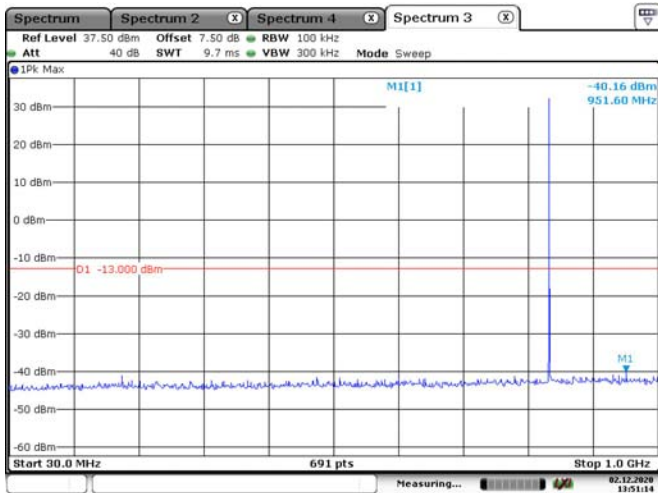
<b>Temperature:</b>	23.5~23.7 °C
<b>Relative Humidity:</b>	36~41%
<b>ATM Pressure:</b>	102.3~102.4kPa
<b>Tester:</b>	Theshy Xie
<b>Test Date:</b>	2020-12-01~2020-12-02

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

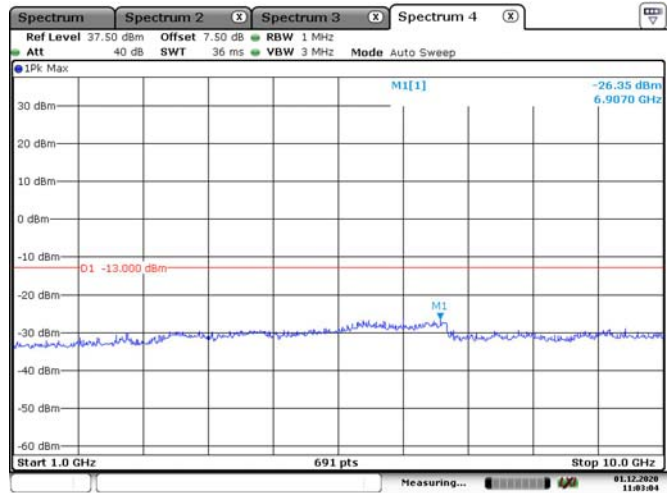
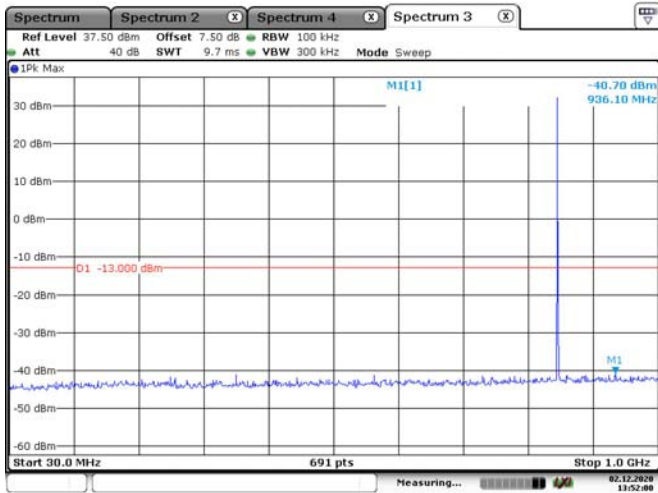
GSM 850, Low Channel



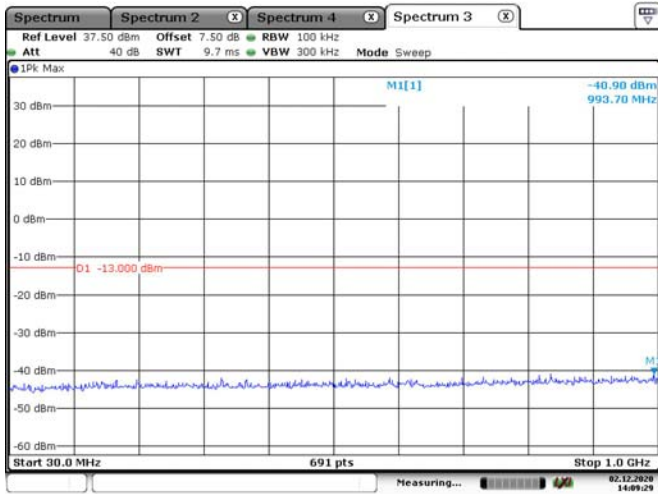
GSM 850, Middle Channel



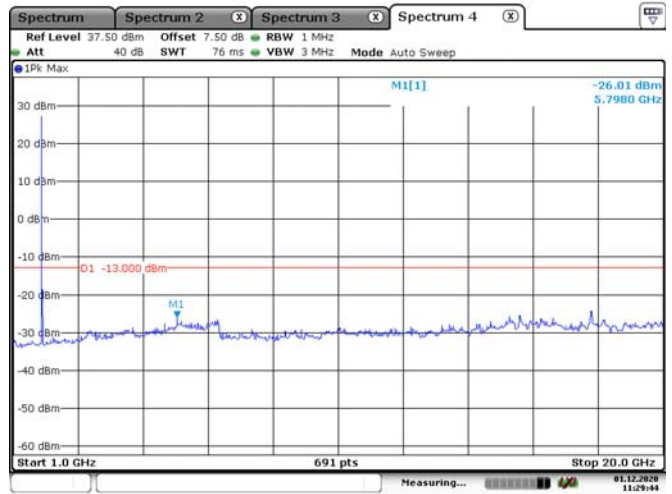
GSM 850, High Channel



PCS 1900, Low Channel

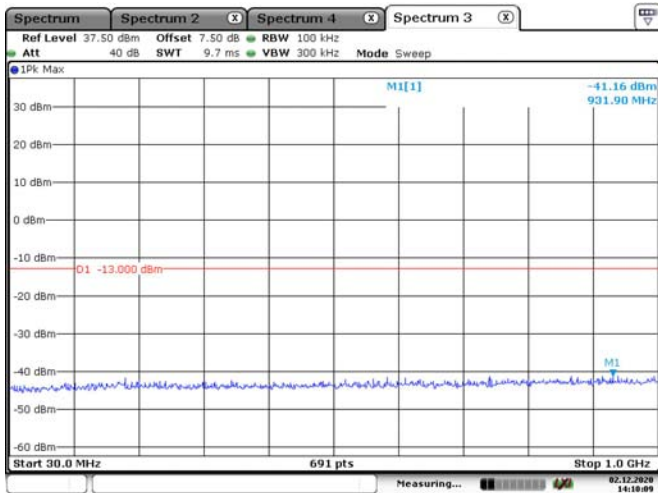


Date: 2.DEC.2020 14:09:29

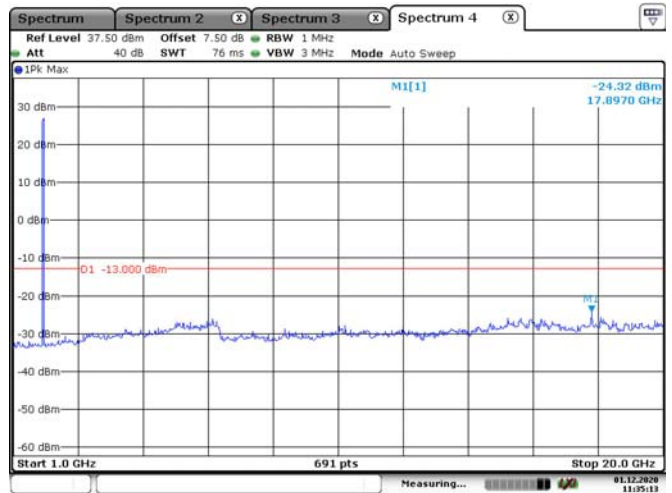


Date: 1.DEC.2020 11:29:44

PCS 1900, Middle Channel

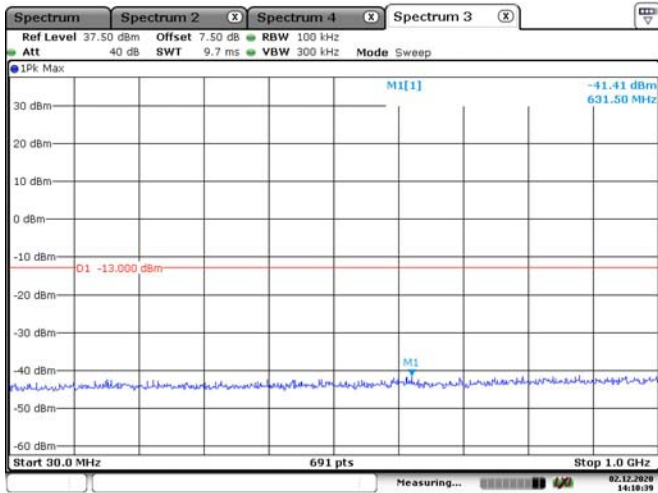


Date: 2.DEC.2020 14:10:09

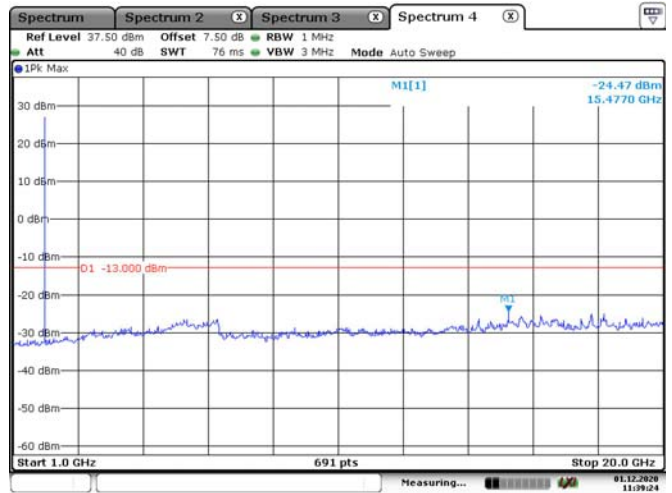


Date: 1.DEC.2020 11:35:13

PCS 1900, High Channel



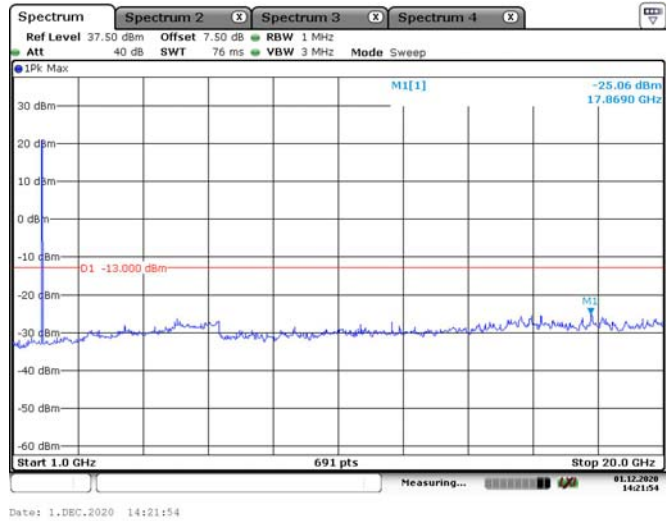
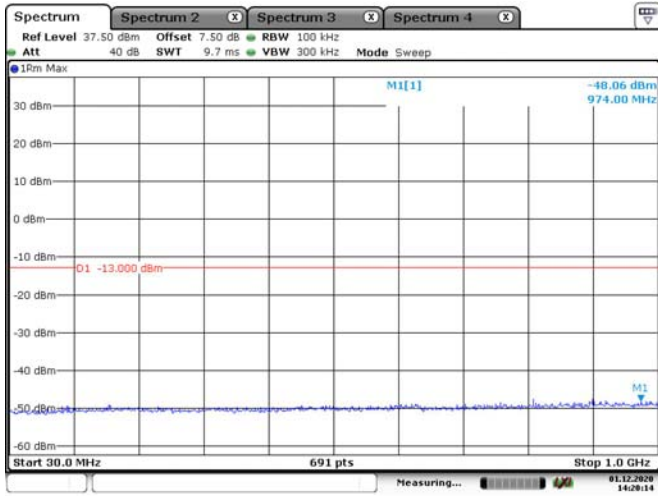
Date: 2.DEC.2020 14:10:39



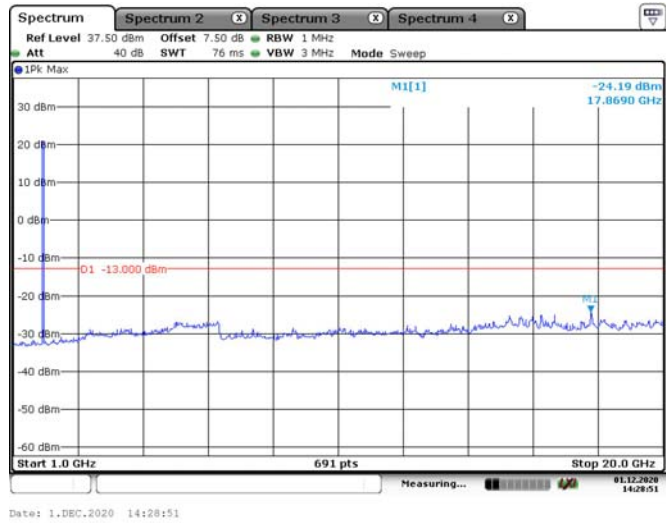
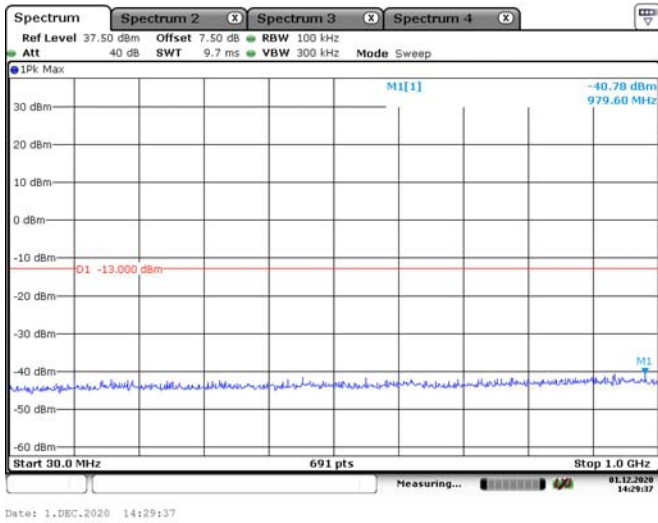
Date: 1.DEC.2020 11:39:24



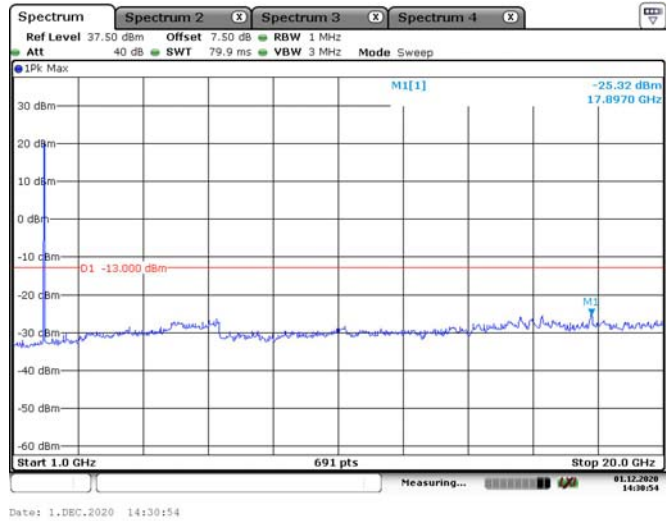
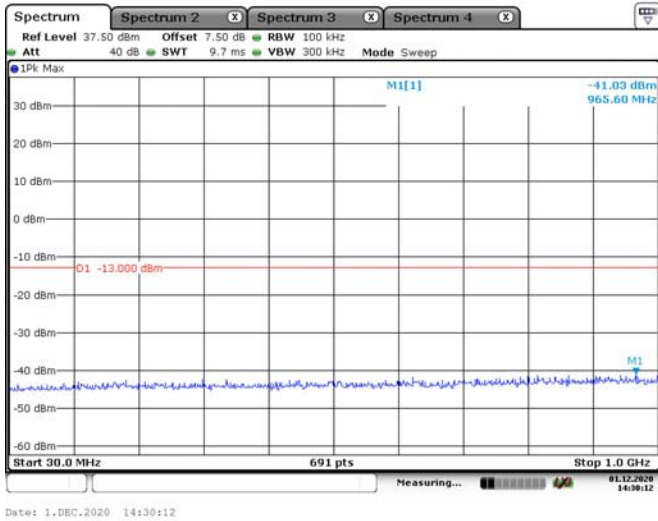
**WCDMA Band II, R99, Low Channel**



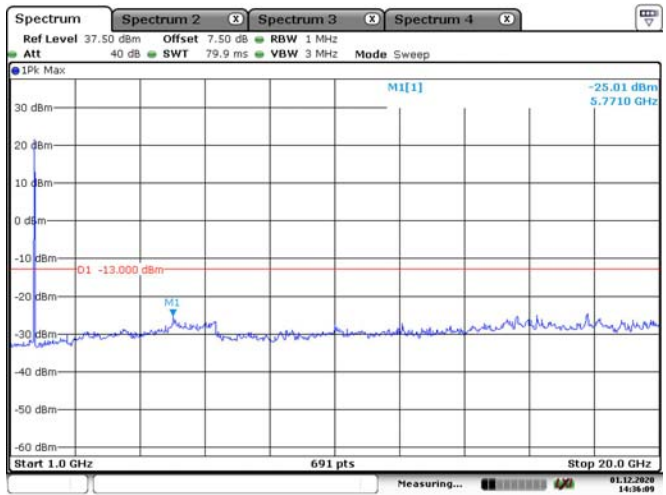
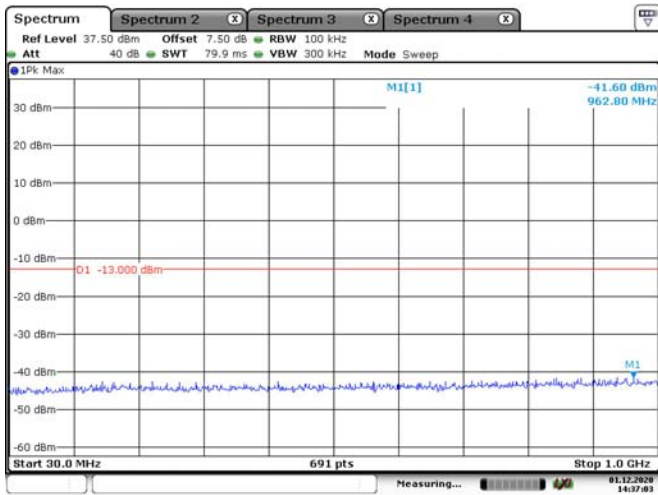
**WCDMA Band II, R99, Middle Channel**



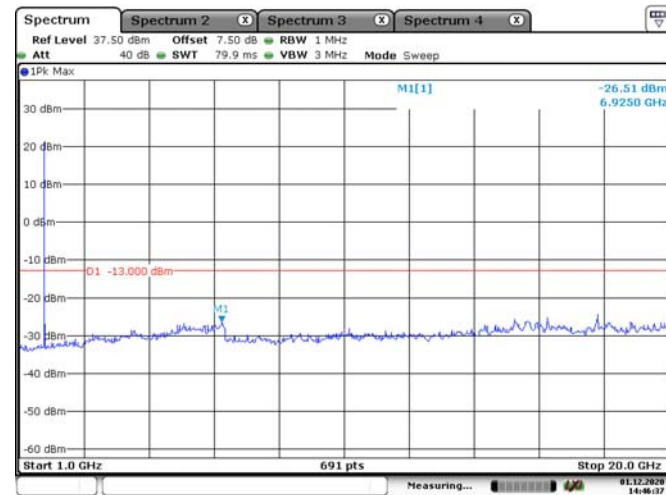
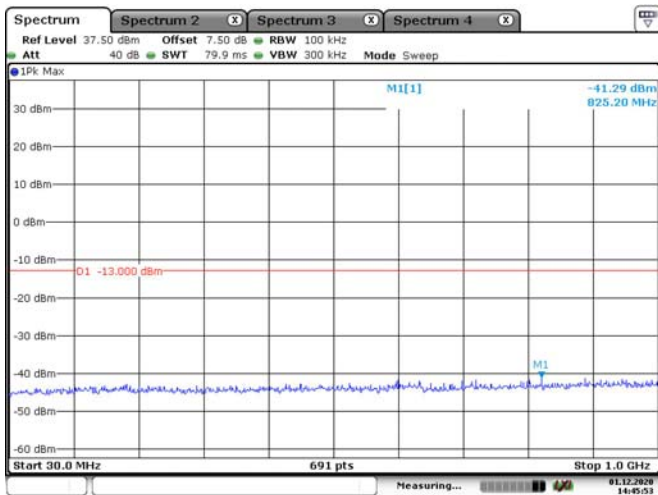
**WCDMA Band II, R99, High Channel**



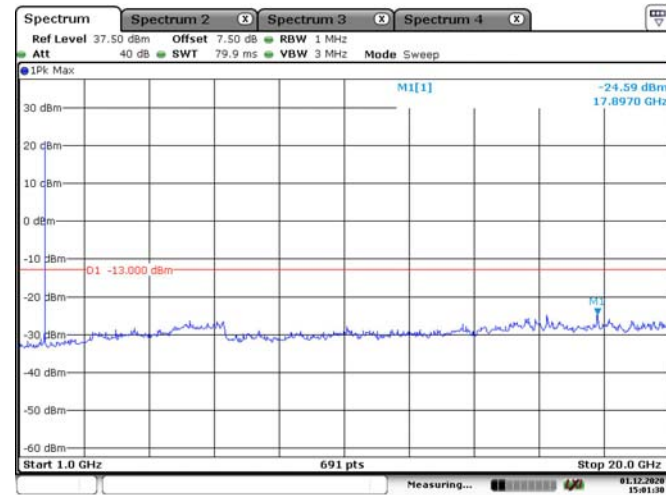
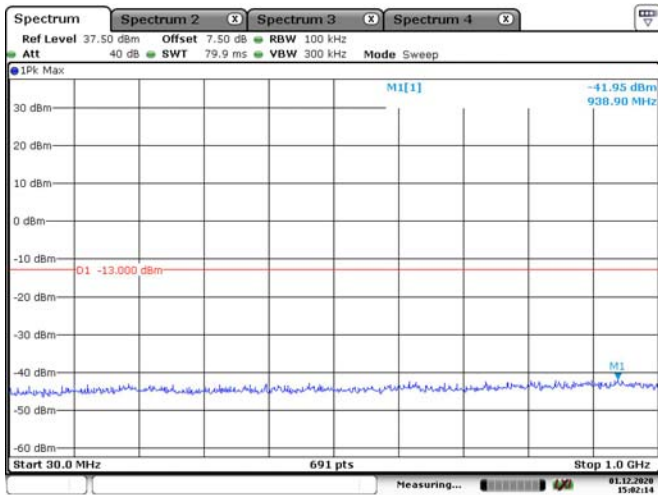
WCDMA Band IV, R99, Low Channel



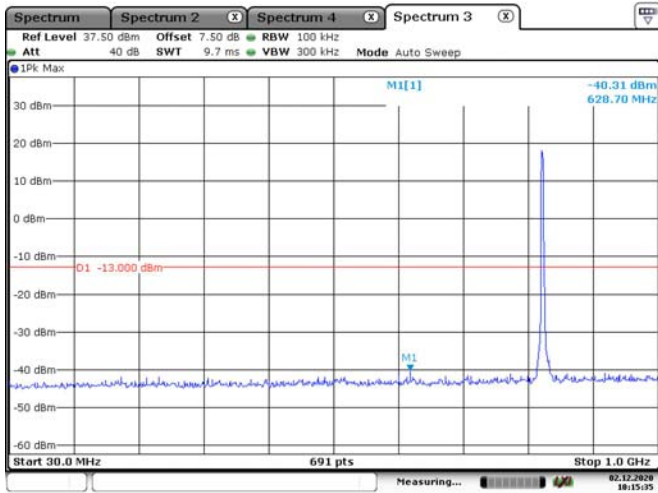
WCDMA Band IV, R99, Middle Channel



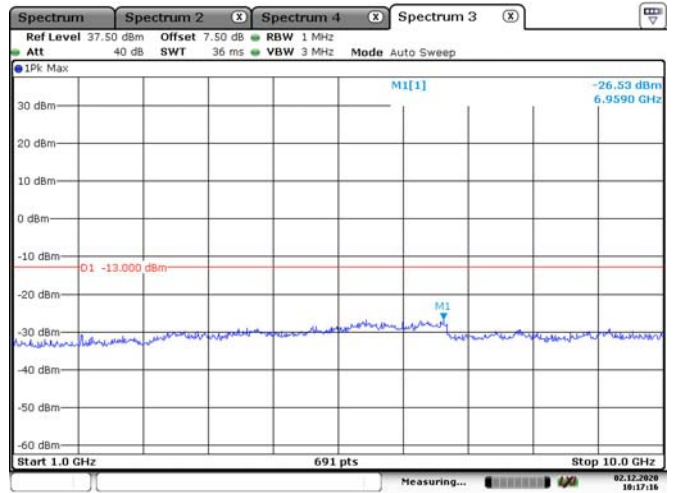
WCDMA Band IV, R99, High Channel



**WCDMA Band V, R99, Low Channel**

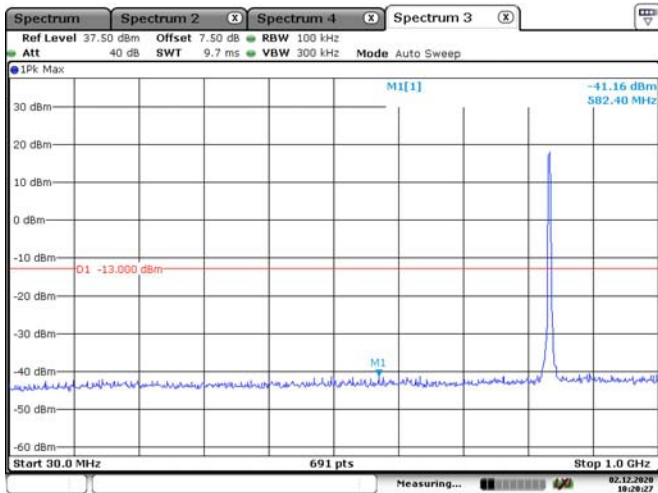


Date: 2, DEC, 2020 10:15:136

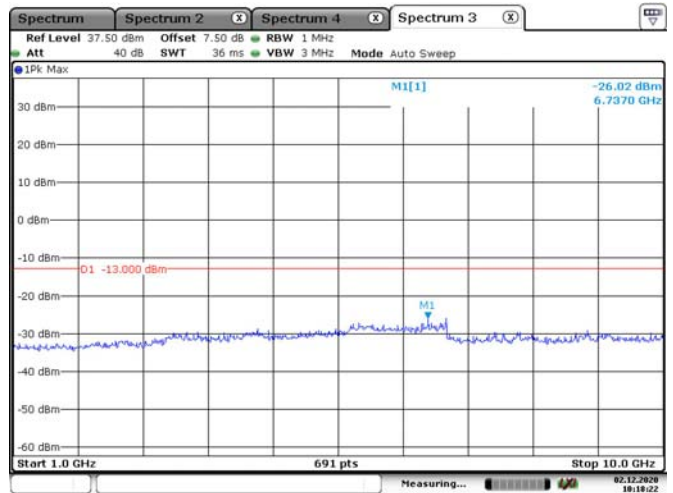


Date: 2, DEC, 2020 10:17:16

**WCDMA Band V, R99, Middle Channel**

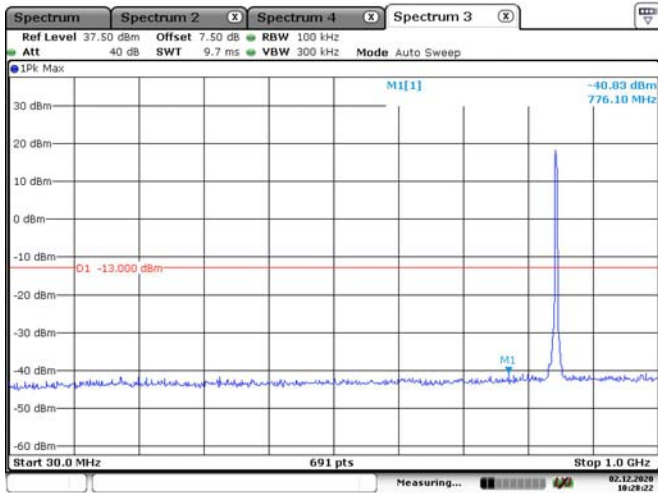


Date: 2, DEC, 2020 10:20:127

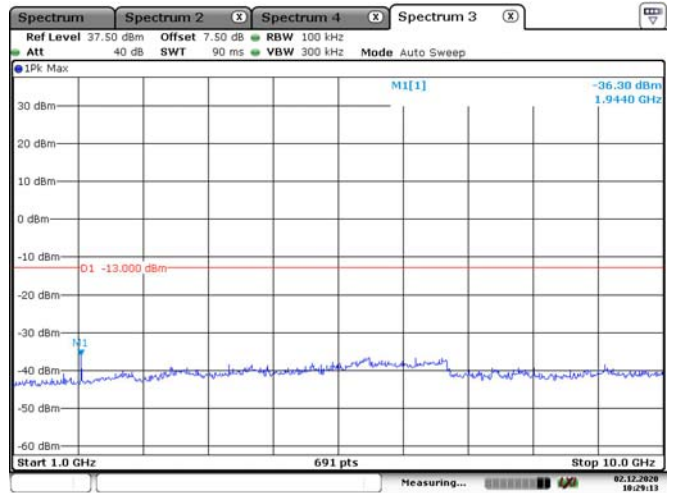


Date: 2, DEC, 2020 10:18:23

**WCDMA Band V, R99, High Channel**



Date: 2, DEC, 2020 10:28:122



Date: 2, DEC, 2020 10:29:14

---

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

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

**Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Antenna	JB3	A060611-2	2020-08-25	2023-08-25
R&S	EMI Test Receiver	ESCI	100224	2020-09-12	2021-09-12
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-02	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2020-09-24	2021-09-24
Sonoma	Amplifier	310N	185914	2020-10-13	2021-10-13
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
TDK RF	Horn Antenna	HRN-0118	130 084	2018-10-12	2021-10-12
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-01 1304	2017-12-06	2020-12-05
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-02 1304	2017-12-06	2020-12-05
Agilent	Spectrum Analyzer	E4440A	SG43360054	2020-07-07	2021-07-07
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-2.4J2.4J-50	C-0700-02	2020-06-27	2021-06-27
Mini-Circuit	Amplifier	ZVA-213-S+	54201245	2020-09-05	2021-09-05
Quinstar	Amplifier	QLW-18405536- JO	15964001001	2020-06-27	2021-06-27
Sinoscite	Band-stop filter	BSF1850- 1910MS-0935V2	0935V2	2020-06-16	2021-06-16
Sinoscite	Band-stop filter	BSF2500- 2750MS-1439-001	1437001	2020-06-16	2021-06-16
Micro-tronics	High Pass Filter	HPM50111	S/N-G217	2020-06-16	2021-06-16
Agilent	Signal Generator	E8247C	MY43321350	2019-12-10	2020-12-10
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2020-09-05	2021-09-05
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A

\* **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**

Test Items	Radiation Below 1GHz	Radiation Above 1GHz
<b>Temperature:</b>	23.5 °C	23°C
<b>Relative Humidity:</b>	35%	35%
<b>ATM Pressure:</b>	102.5kPa	102.5kPa
<b>Tester:</b>	Jalon Liu	Jalon Liu
<b>Test Date:</b>	2020-12-01	2020-11-30

*Test Result: Compliance.*

*EUT Operation Mode: Transmitting*

## Cellular Band (PART 22H)

## 30 MHz-10 GHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB $\mu$ V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
GSM850 Frequency:824.2MHz								
1648.40	H	61.59	-43.45	10.45	1.28	-34.28	-13.00	21.28
1648.40	V	56.51	-48.46	10.45	1.28	-39.29	-13.00	26.29
2472.60	H	54.52	-49.19	12.16	1.23	-38.26	-13.00	25.26
2472.60	V	59.31	-45.74	12.16	1.23	-34.81	-13.00	21.81
3296.80	H	39.41	-62.85	12.28	1.57	-52.14	-13.00	39.14
3296.80	V	37.95	-63.38	12.28	1.57	-52.67	-13.00	39.67
126.20	H	48.41	-55.79	0.00	0.32	-56.11	-13.00	43.11
700.30	V	42.37	-61.53	0.00	0.94	-62.47	-13.00	49.47
GSM850 Frequency:836.6MHz								
1673.20	H	57.85	-47.17	10.52	1.27	-37.92	-13.00	24.92
1673.20	V	53.67	-51.28	10.52	1.27	-42.03	-13.00	29.03
2509.80	H	69.76	-33.87	12.20	1.25	-22.92	-13.00	9.92
2509.80	V	60.26	-44.76	12.20	1.25	-33.81	-13.00	20.81
3346.40	H	37.95	-64.23	12.26	1.58	-53.55	-13.00	40.55
3346.40	V	37.90	-63.20	12.26	1.58	-52.52	-13.00	39.52
126.20	H	47.72	-56.48	0.00	0.32	-56.80	-13.00	43.80
700.30	V	43.77	-60.13	0.00	0.94	-61.07	-13.00	48.07
GSM850 Frequency:848.8MHz								
1697.60	H	56.32	-48.68	10.59	1.26	-39.35	-13.00	26.35
1697.60	V	52.70	-52.23	10.59	1.26	-42.90	-13.00	29.90
2546.40	H	61.41	-42.16	12.22	1.26	-31.20	-13.00	18.20
2546.40	V	60.11	-44.74	12.22	1.26	-33.78	-13.00	20.78
3395.20	H	37.90	-64.19	12.24	1.59	-53.54	-13.00	40.54
3395.20	V	37.60	-63.28	12.24	1.59	-52.63	-13.00	39.63
126.20	H	48.62	-55.58	0.00	0.32	-55.90	-13.00	42.90
700.30	V	42.94	-60.96	0.00	0.94	-61.90	-13.00	48.90



Frequency (MHz)	Polar (H/V)	Receiver Reading (dB $\mu$ V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
WCDMA Band 5 Frequency:826.4 MHz								
1652.80	H	37.88	-67.15	10.46	1.28	-57.97	-13.00	44.97
1652.80	V	41.33	-63.64	10.46	1.28	-54.46	-13.00	41.46
2479.20	H	41.66	-62.04	12.17	1.24	-51.11	-13.00	38.11
2479.20	V	42.62	-62.43	12.17	1.24	-51.50	-13.00	38.50
3305.60	H	38.01	-64.24	12.28	1.57	-53.53	-13.00	40.53
3305.60	V	38.10	-63.19	12.28	1.57	-52.48	-13.00	39.48
700.30	H	46.73	-54.69	0.00	0.94	-55.63	-13.00	42.63
700.30	V	45.63	-58.27	0.00	0.94	-59.21	-13.00	46.21
WCDMA Band 5 Frequency:836.6MHz								
1673.20	H	39.22	-65.80	10.52	1.27	-56.55	-13.00	43.55
1673.20	V	41.45	-63.50	10.52	1.27	-54.25	-13.00	41.25
2509.80	H	41.04	-62.59	12.20	1.25	-51.64	-13.00	38.64
2509.80	V	42.73	-62.29	12.20	1.25	-51.34	-13.00	38.34
3346.40	H	37.15	-65.03	12.26	1.58	-54.35	-13.00	41.35
3346.40	V	37.87	-63.23	12.26	1.58	-52.55	-13.00	39.55
126.20	H	48.22	-55.98	0.00	0.32	-56.30	-13.00	43.30
700.30	V	44.47	-59.43	0.00	0.94	-60.37	-13.00	47.37
WCDMA Band 5 Frequency:846.6MHz								
1693.20	H	39.31	-65.69	10.58	1.26	-56.37	-13.00	43.37
1693.20	V	40.69	-64.25	10.58	1.26	-54.93	-13.00	41.93
2539.80	H	42.08	-61.50	12.22	1.26	-50.54	-13.00	37.54
2539.80	V	42.67	-62.21	12.22	1.26	-51.25	-13.00	38.25
3386.40	H	38.05	-64.06	12.25	1.59	-53.40	-13.00	40.40
3386.40	V	38.89	-62.03	12.25	1.59	-51.37	-13.00	38.37
700.30	H	46.52	-54.90	0.00	0.94	-55.84	-13.00	42.84
700.30	V	42.33	-61.57	0.00	0.94	-62.51	-13.00	49.51

**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)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
GSM1900 Frequency:1850.2MHz								
3700.40	H	47.25	-54.04	12.24	1.55	-43.35	-13.00	30.35
3700.40	V	45.08	-55.63	12.24	1.55	-44.94	-13.00	31.94
5550.60	H	40.17	-56.36	12.87	1.26	-44.75	-13.00	31.75
5550.60	V	53.10	-43.82	12.87	1.26	-32.21	-13.00	19.21
126.20	H	48.01	-56.19	0.00	0.32	-56.51	-13.00	43.51
700.30	V	42.99	-60.91	0.00	0.94	-61.85	-13.00	48.85
GSM 1900 Frequency:1880MHz								
3760.00	H	45.17	-55.93	12.25	1.53	-45.21	-13.00	32.21
3760.00	V	44.75	-56.06	12.25	1.53	-45.34	-13.00	32.34
5640.00	H	38.81	-57.48	13.00	1.28	-45.76	-13.00	32.76
5640.00	V	56.26	-40.33	13.00	1.28	-28.61	-13.00	15.61
700.30	H	47.10	-54.32	0.00	0.94	-55.26	-13.00	42.26
700.30	V	43.86	-60.04	0.00	0.94	-60.98	-13.00	47.98
GSM 1900 Frequency:1909.8MHz								
3819.60	H	44.49	-56.43	12.26	1.51	-45.68	-13.00	32.68
3819.60	V	45.86	-55.04	12.26	1.51	-44.29	-13.00	31.29
5640.00	H	42.31	-53.98	13.00	1.28	-42.26	-13.00	29.26
5640.00	V	49.24	-47.35	13.00	1.28	-35.63	-13.00	22.63
126.20	H	49.35	-54.85	0.00	0.32	-55.17	-13.00	42.17
700.30	V	44.64	-59.26	0.00	0.94	-60.20	-13.00	47.20



Frequency (MHz)	Polar (H/V)	Receiver Reading (dB $\mu$ V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
WCDMA Band II, Frequency:1852.4 MHz								
3704.80	H	44.02	-57.26	12.24	1.54	-46.56	-13.00	33.56
3704.80	V	40.15	-60.57	12.24	1.54	-49.87	-13.00	36.87
5557.20	H	46.91	-49.60	12.88	1.26	-37.98	-13.00	24.98
5557.20	V	50.26	-46.64	12.88	1.26	-35.02	-13.00	22.02
700.30	H	48.33	-53.09	0.00	0.94	-54.03	-13.00	41.03
700.30	V	45.56	-58.34	0.00	0.94	-59.28	-13.00	46.28
WCDMA Band II, Frequency:1880 MHz								
3760.00	H	38.37	-62.73	12.25	1.53	-52.01	-13.00	39.01
3760.00	V	38.59	-62.22	12.25	1.53	-51.50	-13.00	38.50
5640.00	H	44.81	-51.48	13.00	1.28	-39.76	-13.00	26.76
5640.00	V	53.88	-42.71	13.00	1.28	-30.99	-13.00	17.99
700.30	H	42.70	-58.72	0.00	0.94	-59.66	-13.00	46.66
700.30	V	45.45	-58.45	0.00	0.94	-59.39	-13.00	46.39
WCDMA Band II, Frequency:1907.6MHz								
3815.20	H	38.22	-62.71	12.26	1.51	-51.96	-13.00	38.96
3815.20	V	38.39	-62.50	12.26	1.51	-51.75	-13.00	38.75
5722.80	H	44.01	-52.06	13.11	1.31	-40.26	-13.00	27.26
5722.80	V	51.70	-44.59	13.11	1.31	-32.79	-13.00	19.79
700.30	H	47.06	-54.36	0.00	0.94	-55.30	-13.00	42.30
700.30	V	45.20	-58.70	0.00	0.94	-59.64	-13.00	46.64

## AWS Band, Part 27

## 30 MHz-20 GHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB $\mu$ V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
WCDMA Band IV, Frequency:1712.4 MHz								
3424.80	H	38.07	-63.97	12.23	1.59	-53.33	-13.00	40.33
3424.80	V	38.23	-62.52	12.23	1.59	-51.88	-13.00	38.88
5137.20	H	41.91	-55.30	12.95	1.39	-43.74	-13.00	30.74
5137.20	V	51.06	-46.03	12.95	1.39	-34.47	-13.00	21.47
126.20	H	47.95	-56.25	0.00	0.32	-56.57	-13.00	43.57
700.30	V	42.39	-61.51	0.00	0.94	-62.45	-13.00	49.45
WCDMA Band IV, Frequency:1732.6 MHz								
3465.20	H	38.15	-63.82	12.21	1.60	-53.21	-13.00	40.21
3465.20	V	38.36	-62.21	12.21	1.60	-51.60	-13.00	38.60
5197.80	H	43.55	-53.57	12.92	1.36	-42.01	-13.00	29.01
5197.80	V	52.16	-44.93	12.92	1.36	-33.37	-13.00	20.37
126.20	H	46.85	-57.35	0.00	0.32	-57.67	-13.00	44.67
700.30	V	44.24	-59.66	0.00	0.94	-60.60	-13.00	47.60
WCDMA Band II, Frequency:1952.6MHz								
3505.20	H	38.69	-63.20	12.20	1.61	-52.61	-13.00	39.61
3505.20	V	39.05	-61.37	12.20	1.61	-50.78	-13.00	37.78
5257.80	H	45.13	-51.90	12.90	1.34	-40.34	-13.00	27.34
5257.80	V	55.02	-42.08	12.90	1.34	-30.52	-13.00	17.52
126.20	H	47.19	-57.01	0.00	0.32	-57.33	-13.00	44.33
700.30	V	45.26	-58.64	0.00	0.94	-59.58	-13.00	46.58

## 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 = Substituted Level - Cable loss + Antenna Gain
- 3) Margin = Limit-Absolute Level

**FCC §22.917(a) & §24.238(a) & §27.53 - BAND EDGES**

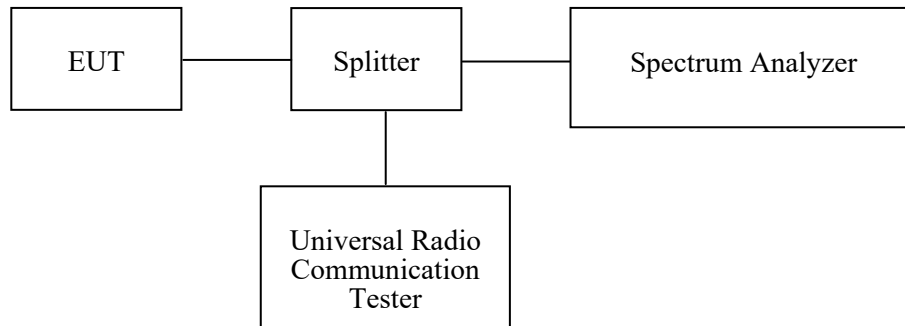
**Applicable Standard**

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

**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	FSV40	101474	2020-01-09	2021-01-09
Unknown	Coaxial Cable	C-SJ00-0010	C0010/04	Each time	N/A
E-Microwave	Blocking Control	EMDCB-00036	0E01201048	Each time	N/A
E-Microwave	Coaxial Attenuators	EMCA10-5RN-6	0E01203239	Each time	N/A
E-Microwave	Two-way Splitter	ODP-1-6-2S	0E0120142	Each time	N/A

\* **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**

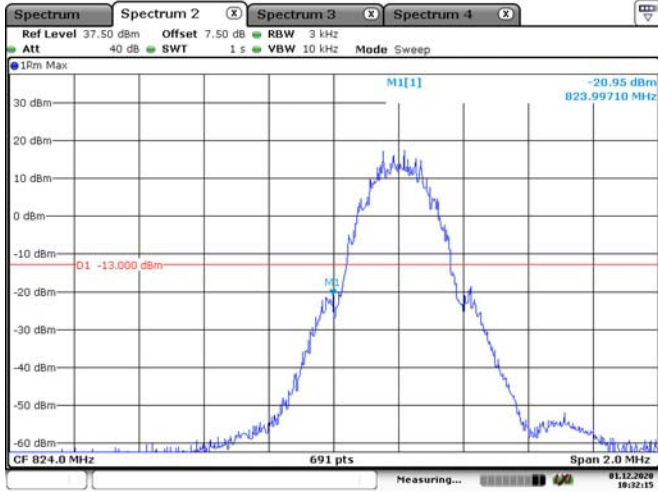
**Environmental Conditions**

<b>Temperature:</b>	23.5~23.7 °C
<b>Relative Humidity:</b>	36~41%
<b>ATM Pressure:</b>	102.3~102.4kPa
<b>Tester:</b>	Theshy Xie
<b>Test Date:</b>	2020-12-01~2020-12-02

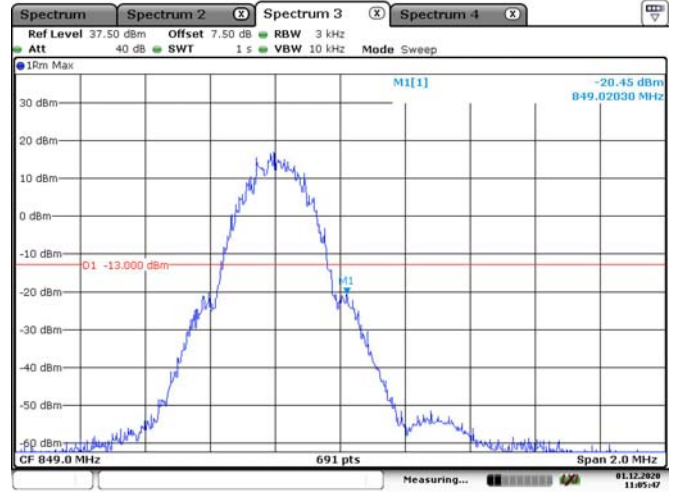
*Test Mode: Transmitting*

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

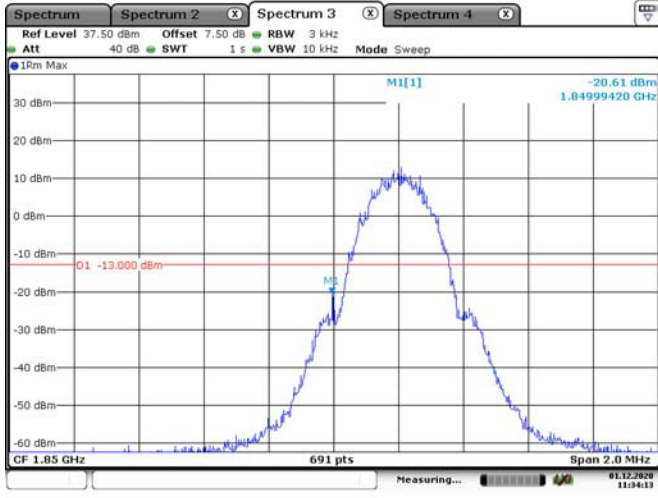
### GSM 850, Left Band Edge



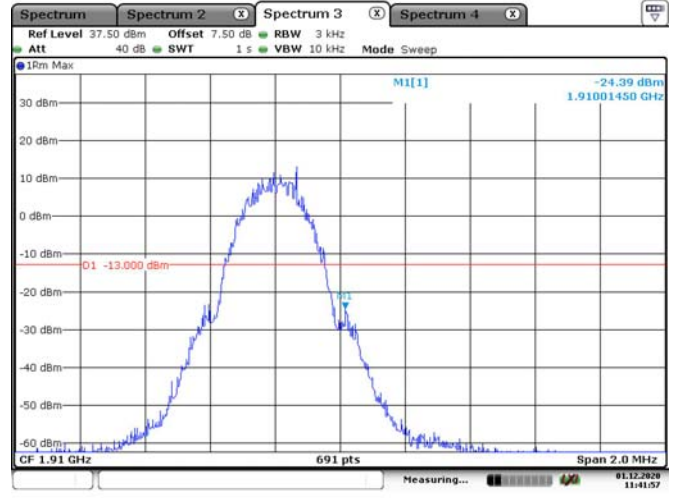
### GSM 850, Right Band Edge



### GSM 1900, Left Band Edge



### GSM 1900, Right Band Edge



WCDMA Band II,Rel99, Left Band Edge



Date: 1. DEC. 2020 14:19:41

WCDMA Band II,Rel99, Right Band Edge



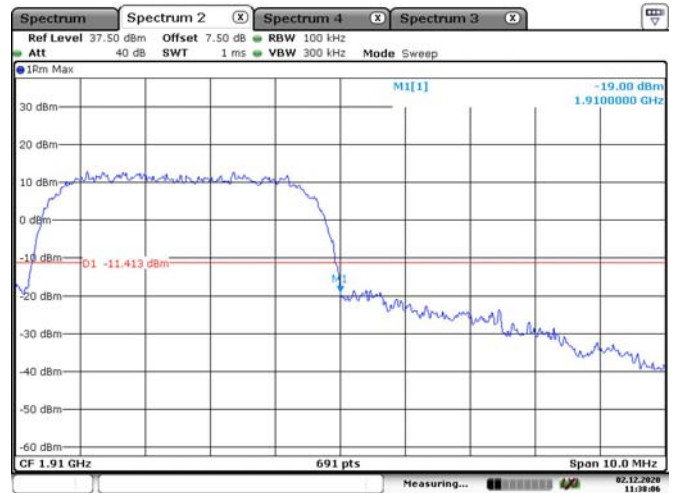
Date: 1. DEC. 2020 14:33:53

WCDMA Band II,HSDPA, Left Band Edge



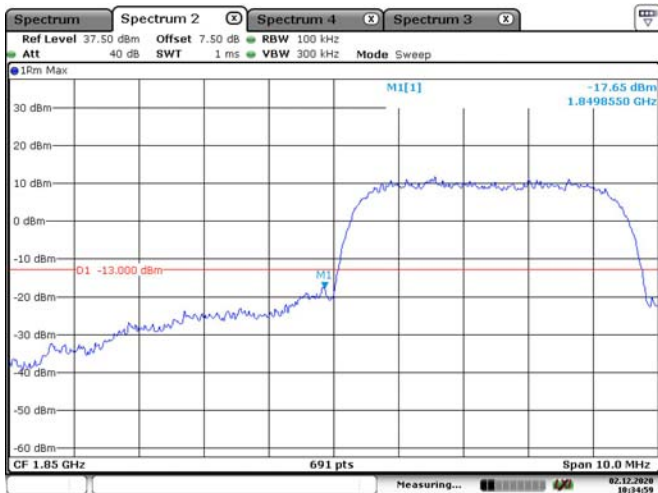
Date: 2. DEC. 2020 11:32:08

WCDMA Band II,HSDPA,Right Band Edge



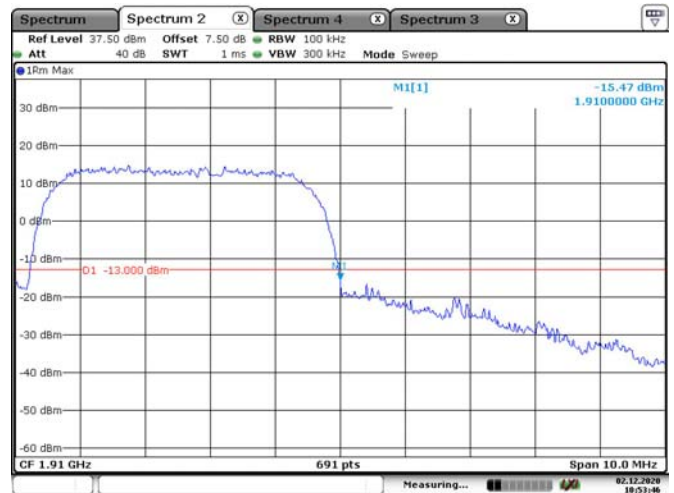
Date: 2. DEC. 2020 11:38:06

WCDMA Band II,HSUPA, Left Band Edge



Date: 2. DEC. 2020 10:35:00

WCDMA Band II,HSUPA, Right Band Edge



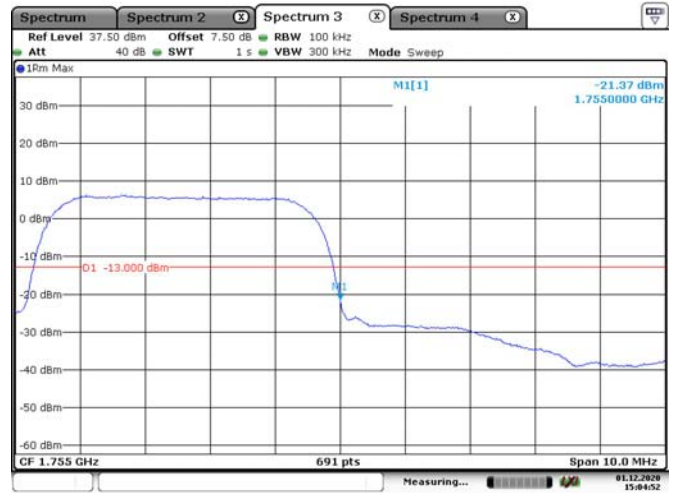
Date: 2. DEC. 2020 10:53:47

**WCDMA Band IV,Rel99, Left Band Edge**



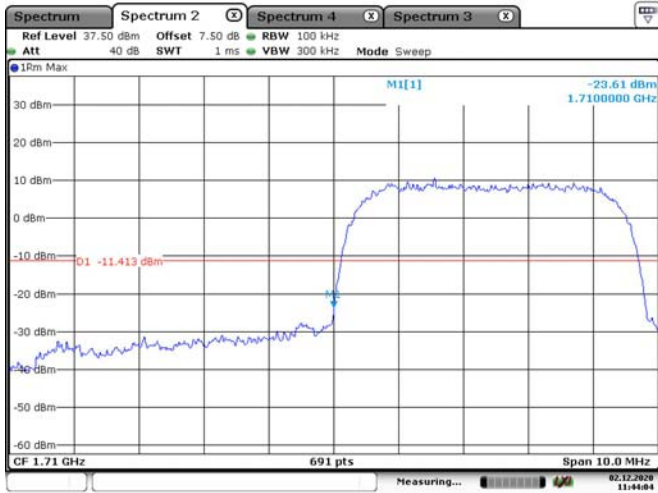
Date: 1. DEC. 2020 14:41:02

**WCDMA Band IV,Rel99, Right Band Edge**



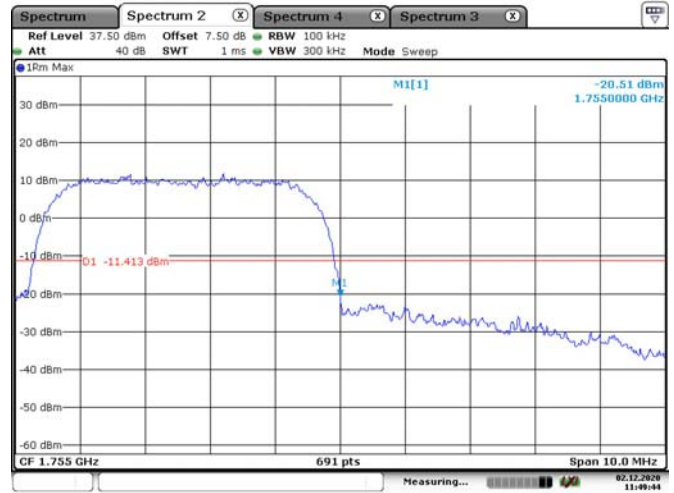
Date: 1. DEC. 2020 15:04:52

**WCDMA Band IV,HSDPA, Left Band Edge**



Date: 2. DEC. 2020 11:44:04

**WCDMA Band IV,HSDPA,Right Band Edge**



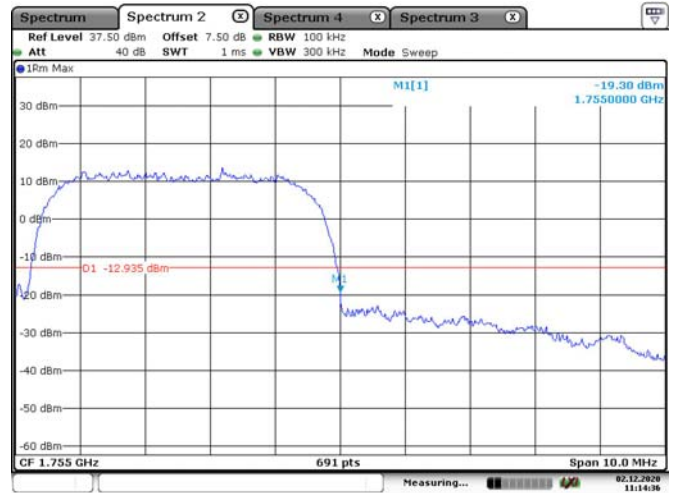
Date: 2. DEC. 2020 11:49:45

**WCDMA Band IV,HSUPA, Left Band Edge**



Date: 2. DEC. 2020 11:02:13

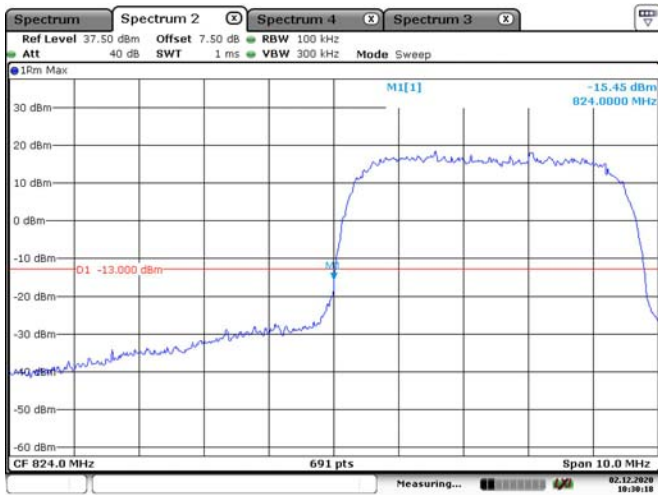
**WCDMA Band IV,HSUPA, Right Band Edge**



Date: 2. DEC. 2020 11:14:37



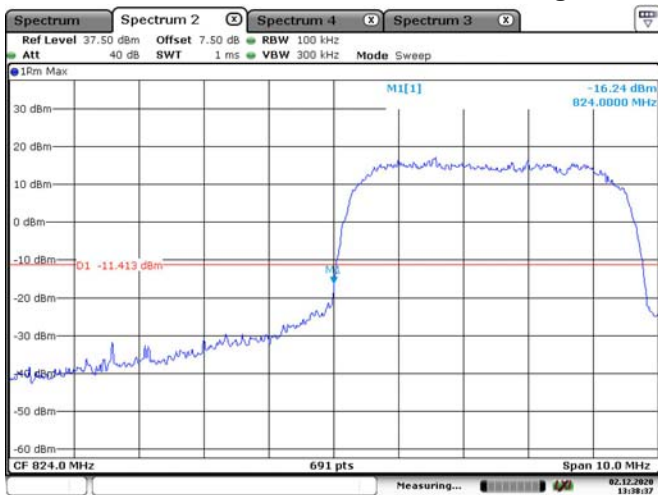
WCDMA Band V,Rel99, Left Band Edge



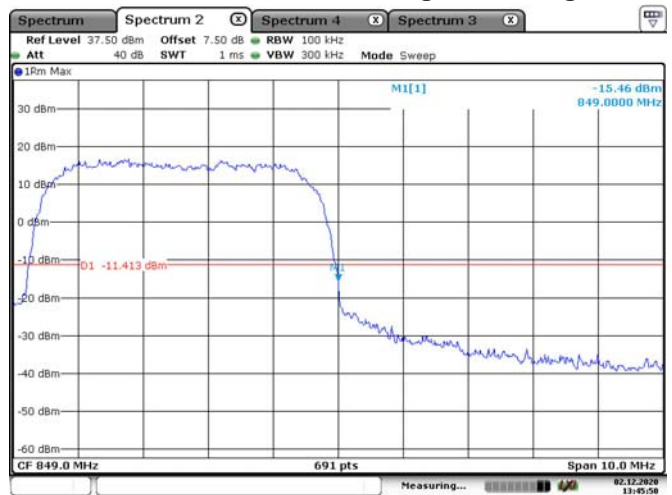
WCDMA Band V,Rel99, Right Band Edge



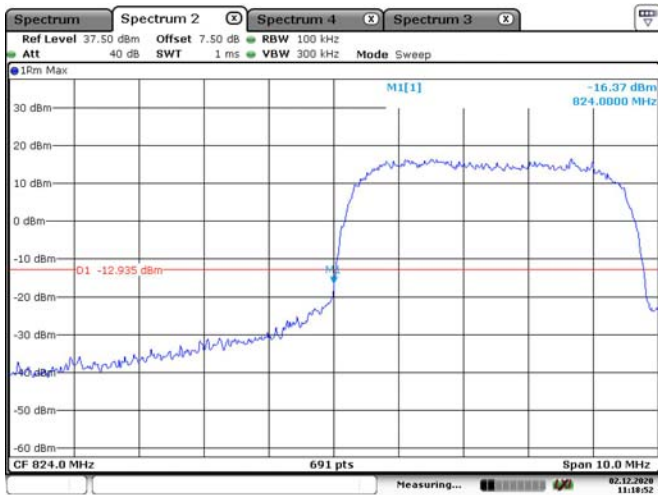
WCDMA Band V,HSDPA, Left Band Edge



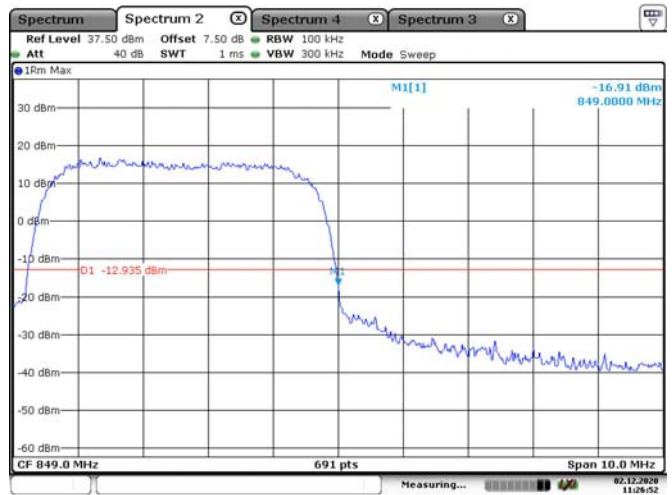
WCDMA Band V,HSDPA,Right Band Edge



WCDMA Band V,HSUPA, Left Band Edge



WCDMA Band V,HSUPA, Right Band Edge



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

### **Applicable Standard**

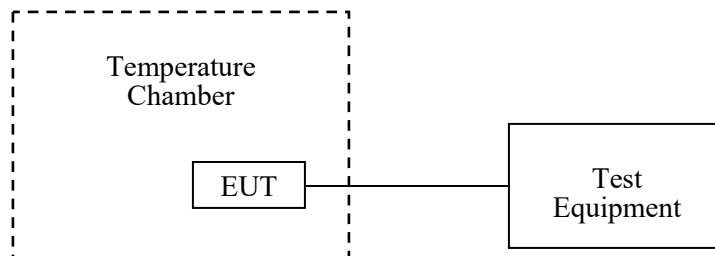
FCC § 2.1055 (a), § 2.1055 (d), §22.355, §24.235, §27.54

### **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 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
R&S	Spectrum Analyzer	FSV40	101474	2020-01-09	2021-01-09
Unknown	Coaxial Cable	C-SJ00-0010	C0010/04	Each time	N/A
E-Microwave	Blocking Control	EMDCB-00036	0E01201048	Each time	N/A
E-Microwave	Coaxial Attenuators	EMCA10-5RN-6	OE01203239	Each time	N/A
R&S	Universal Radio Communication Tester	CMU200	106 891	2020-09-12	2021-09-12
ESPEC	Constant temperature and humidity Tester	ESX-4CA	018 463	2020-03-10	2021-03-09
UNI-T	Multimeter	UT39A	M130199938	2020-07-24	2021-07-24
Pro instrument	DC Power Supply	pps3300	3300012	N/A	N/A

\* **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>	23.5~23.7 °C
<b>Relative Humidity:</b>	36`41%
<b>ATM Pressure:</b>	102.3~102.4kPa
<b>Tester:</b>	Theshy Xie
<b>Test Date:</b>	2020-12-01~2020-12-02

*Test Result: Compliance.*

GMSK, Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V <sub>DC</sub>	Hz	ppm	ppm
-30	3.85	4	0.00478	2.5
-20		-8	-0.00956	
-10		-11	-0.01315	
0		-6	-0.00717	
10		-3	-0.00359	
20		10	0.01195	
30		9	0.01076	
40		-5	-0.00598	
50		-11	-0.01315	
20		3.5	11	
20	4.2	8	0.00956	

GMSK, Middle Channel, $f_c = 1880$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V <sub>DC</sub>	Hz	ppm	
-30	3.85	6	0.00319	Pass
-20		-4	-0.00213	
-10		-5	-0.00266	
0		-10	-0.00532	
10		-6	-0.00319	
20		5	0.00266	
30		12	0.00638	
40		-9	-0.00479	
50		-6	-0.00319	
20		3.5	6	
20	4.2	7	0.00372	

**WCDMA Band II: R99**

Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V <sub>DC</sub>	Hz	ppm	
-30	3.85	9	0.00479	Pass
-20		-3	-0.00160	
-10		4	0.00213	
0		6	0.00319	
10		12	0.00638	
20		6	0.00319	
30		8	0.00426	
40		-10	-0.00532	
50		-11	-0.00585	
20		3.5	11	
20	4.2	-5	-0.00266	

**WCDMA Band IV: R99**

Power Supplied	Temperature	F <sub>L</sub>	Limit	F <sub>H</sub>	Limit
Vdc	°C	GHz	GHz	GHz	GHz
3.85	-30	1.710310	1.710	1.754168	1.755
	-20	1.710312		1.754193	
	-10	1.710333		1.754197	
	0	1.710315		1.754190	
	10	1.710285		1.754193	
	20	1.710312		1.754171	
	30	1.710310		1.754201	
	40	1.710322		1.754179	
	50	1.710301		1.754155	
3.5	25	1.710318	1.754163		
4.2	25	1.710315	1.754150		

**WCDMA Band V: R99**

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	-6	-0.00717	2.5
-20		7	0.00837	
-10		8	0.00956	
0		11	0.01315	
10		10	0.01195	
20		9	0.01076	
30		-7	-0.00837	
40		-5	-0.00598	
50		-2	-0.00239	
20		3.5	4	
20	4.2	2	0.00239	

Note: The fundamental emissions stay within the authorized bands of operation based on the frequency deviation measured is small, the extreme voltage was declared by applicant.

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