

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

For

**HONG KONG IPRO TECHNOLOGY CO., LIMITED**

12/F 3 LOCKHART ROAD WANCHAI HK

**FCC ID: PQ4IPROSODA6S**

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<b>Report Number:</b>	DG2210831-45238E-00C
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## GENERAL INFORMATION

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

<b>EUT Name:</b>	Soda6S
<b>EUT Model:</b>	Soda6S
<b>Operation modes:</b>	GSM Voice, GPRS Data, WCDMA( R99 (Voice+Data), HSDPA,HSUPA, DC-HSDPA, HSPA+)
<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 5: 824-849 MHz(TX); 869-894 MHz(RX)
<b>Antenna Gain <sup>▲</sup>:</b>	GSM850/WCDMA B5: -0.92dBi(-3.07 dBd) PCS1900/WCDMA B2: -0.41 dBi
<b>Modulation Type:</b>	GMSK, QPSK,16QAM
<b>Adapter Information</b>	<b>Model:</b> NTR-S01
	<b>Input:</b> AC 100-240V 50/60Hz 150mA
	<b>Output:</b> DC 5.0V 1000mA
<b>Rated Input Voltage:</b>	DC 3.8V from Battery or DC 5V from Adapter
<b>Serial Number:</b>	DG2210831-45238E-RF-S1
<b>EUT Received Date:</b>	2021.08.31
<b>EUT Received Status:</b>	Good

### Objective

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

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

### 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.

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	±0.61dB
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.

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## 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 2/5, 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 5	4.2	826.4	836.6	846.6

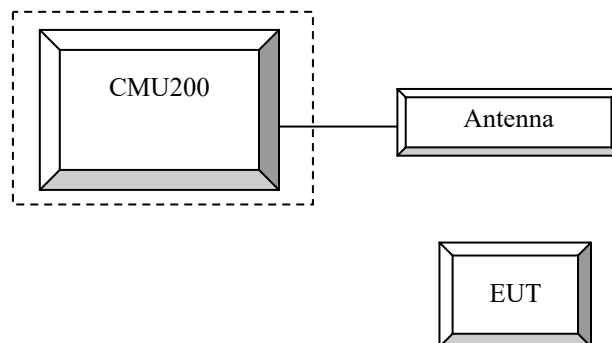
### Equipment Modifications

No modification was made to the EUT.

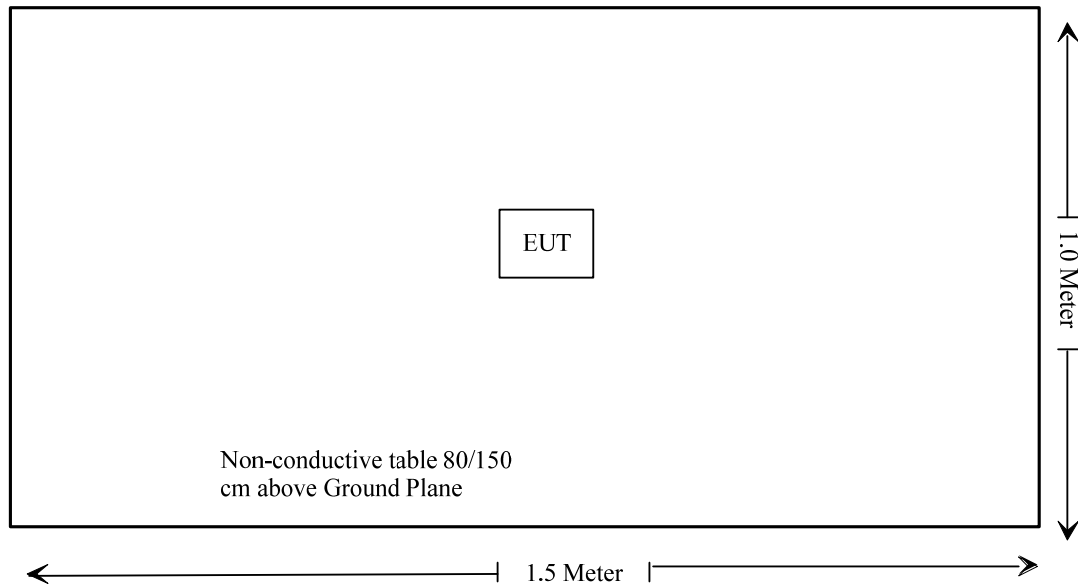
### Support Equipment List and Details

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)	RF Output Power	Compliance
FCC§ 2.1047	Modulation Characteristics	Not Applicable
FCC§ 2.1049; § 22.905 § 22.917; § 24.238	Occupied Bandwidth	Compliance
FCC§ 2.1051, § 22.917 (a); § 24.238 (a)	Spurious Emissions at Antenna Terminal	Compliance
FCC§ 2.1053 § 22.917 (a); § 24.238 (a)	Field Strength of Spurious Radiation	Compliance
FCC§ 22.917 (a); § 24.238 (a)	Out of band emission, Band Edge	Compliance
FCC§ 2.1055 § 22.355; § 24.235	Frequency stability vs. temperature Frequency stability vs. voltage	Compliance



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

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### **Applicable Standard**

FCC§1.1310 and §2.1093.

### **Test Result**

Compliance, please refer to the SAR report: DG2210831-45238E-20.

## **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.

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

### **Test Procedure**

#### **GSM/GPRS/EGPRS**

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

Press Connection control to choose the different menus

Press RESET > choose all the reset all settings

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

Network Support > GSM + GPRS or GSM + EGSM

Main Service > Packet Data

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

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

> Slot configuration > Uplink/Gamma

> 33 dBm for GPRS 850

> 30 dBm for GPRS 1900

> 27 dBm for EGPRS 850

> 26 dBm for EGPRS 1900

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

Frequency Offset > + 0 Hz

Mode > BCCH and TCH

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

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

Channel Type > Off

P0 > 4 dB

Slot Config > Unchanged (if already set under MS signal)

TCH > choose desired test channel

Hopping > Off

Main Timeslot > 3

Network Coding Scheme > CS4 (GPRS) and MCS5 (EGPRS)

Bit Stream > 2E9-1 PSR Bit Stream

AF/RF Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input

Connection Press Signal on to turn on the signal and change settings

**WCDMA-Release 99**

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

<b>WCDMA General Settings</b>	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	$\beta_c / \beta_d$	8/15

**WCDMA HSDPA**

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

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

**WCDMA HSUPA**

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

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

**HSPA+**

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

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

Note 1:  $\Delta_{ACK}, \Delta_{NACK}$  and  $\Delta_{CQI} = 30/15$  with  $\beta_{hs} = 30/15 * \beta_c$ .

Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).

Note 3: DPDCH is not configured, therefore the  $\beta_c$  is set to 1 and  $\beta_d = 0$  by default.

Note 4:  $\beta_{ed}$  can not be set directly; it is set by Absolute Grant Value.

Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signalled to use the extrapolation algorithm.

**DC-HSDPA**

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

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

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload ( $N_{INF}$ )	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK

Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.

Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.

**Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41010012	Each time	N/A
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005011	Each time	N/A
Unknown	Coaxial Cable	C-SJ00-0010	C0010/01	Each time	N/A
E-Microwave	Blocking Control	EMDCB-00036	0E01201047	Each time	N/A
Unknown	Attenuator	UNAT-3+	15529	Each time	N/A
R&S	Universal Radio Communication Tester	CMU200	106 891	2020-09-23	2021-09-22

\* **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>	26.3 °C
<b>Relative Humidity:</b>	71 %
<b>ATM Pressure:</b>	100.4kPa
<b>Tester:</b>	Thehsy Xie
<b>Test Date:</b>	2021-09-02

*Test Result: Compliance*

### Cellular Band & PCS Band

#### Conducted Output Power

Band	Channel No.	Conducted Peak Output Power (dBm)				
		GSM	GPRS 1TX Slot	GPRS 2TX Slots	GPRS 3TX Slots	GPRS 4TX Slots
Cellular	128	31.6	31.68	29.55	27.85	26.41
	190	31.7	31.77	29.54	27.84	26.44
	251	31.8	31.76	29.59	27.86	26.48
PCS	512	28.4	29.22	27.82	26.41	24.69
	661	28.3	29.41	27.84	26.54	24.71
	810	28.3	29.12	27.77	26.48	24.65

#### ERP/EIRP:

Band	Mode	Channel	Conducted Power (dBm)	Antenna Gain (dBi/dBd)	Cable Loss (dB)	Result (dBm)	Limit (dBm)
Cellular	GSM	Low	31.68	-3.07	0.2	28.41	38.45
		Middle	31.77	-3.07	0.2	28.50	38.45
		High	31.80	-3.07	0.2	<b>28.53</b>	38.45
PCS	GSM	Low	29.22	-0.41	0.4	28.41	33
		Middle	29.41	-0.41	0.4	<b>28.60</b>	33
		High	29.12	-0.41	0.4	28.31	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	22.24	3.19	22.87	3.22	22.68	3.25
HSDPA	1	21.65	3.74	21.37	3.30	21.91	3.54
	2	21.34	3.23	21.76	3.27	21.75	3.15
	3	21.35	3.15	21.47	3.48	21.55	3.25
	4	21.24	3.24	21.25	3.24	21.64	3.27
HSUPA	1	21.62	3.30	21.57	3.30	21.81	3.65
	2	21.15	3.64	21.05	3.12	21.45	3.46
	3	21.07	3.15	20.68	3.64	21.18	3.28
	4	20.65	3.75	20.47	3.94	21.75	3.47
	5	20.40	3.24	20.16	2.89	20.84	3.64
DC-HSDPA	1	21.24	3.19	21.23	2.78	21.19	3.25
	2	21.04	3.17	20.15	3.01	21.73	3.78
	3	20.87	3.24	20.86	3.02	21.57	3.61
	4	20.94	3.27	20.45	2.48	20.97	3.21
HSPA+ (16QAM)	1	20.75	3.12	20.59	2.64	21.22	2.99

**EIRP:**

Channel	Conducted Power (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Result (dBm)	Limit (dBm)
Low	22.24	-0.41	0.4	21.43	33
Middle	22.87	-0.41	0.4	22.06	33
High	22.68	-0.41	0.4	21.87	33

**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	24.25	3.16	24.67	2.52	24.58	3.07
HSDPA	1	23.45	3.91	23.57	2.96	23.45	3.42
	2	22.97	3.21	23.18	3.25	22.38	3.45
	3	22.49	3.25	22.64	3.47	21.79	2.89
	4	21.57	3.64	22.11	3.27	21.57	2.68
HSUPA	1	22.87	3.62	22.87	2.96	22.95	3.42
	2	22.80	3.29	22.65	2.08	22.38	2.67
	3	22.46	2.78	22.86	3.15	22.14	2.64
	4	22.29	2.87	22.46	3.24	21.45	3.15
	5	21.86	2.36	22.02	3.27	21.66	3.24
DC-HSDPA	1	21.60	2.67	21.74	3.64	21.46	3.18
	2	21.22	3.64	21.39	3.28	20.97	3.64
	3	20.91	3.27	21.15	3.47	20.94	3.57
	4	20.38	3.18	20.67	3.64	20.55	3.27
HSPA+ (16QAM)	1	21.04	3.05	21.15	3.28	21.37	3.64

**ERP:**

Channel	Conducted Power (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	Result (dBm)	Limit (dBm)
Low	24.25	-3.07	0.2	20.98	38.45
Middle	24.67	-3.07	0.2	21.40	38.45
High	24.58	-3.07	0.2	21.31	38.45

## 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
- 4) The cable loss above is the signal attenuation in connecting cable between the transmitter and antenna.

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

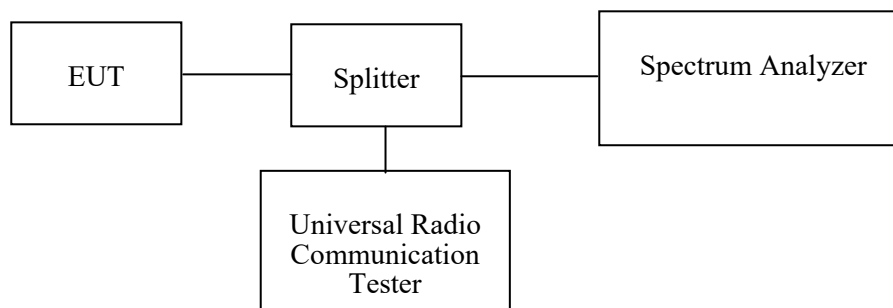
### Applicable Standard

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

### Test Procedure

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

The 26 dB & 99% bandwidth was recorded.



### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101591	2021-07-22	2022-07-21
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41010012	Each time	N/A
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005011	Each time	N/A
Unknown	Coaxial Cable	C-SJ00-0010	C0010/01	Each time	N/A
E-Microwave	Blocking Control	EMDCB-00036	0E01201047	Each time	N/A
Unknown	Attenuator	UNAT-3+	15529	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>	26.3 °C
<b>Relative Humidity:</b>	71 %
<b>ATM Pressure:</b>	100.4kPa
<b>Tester:</b>	Thehsy Xie
<b>Test Date:</b>	2021-09-02

*Test Mode: Transmitting*

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

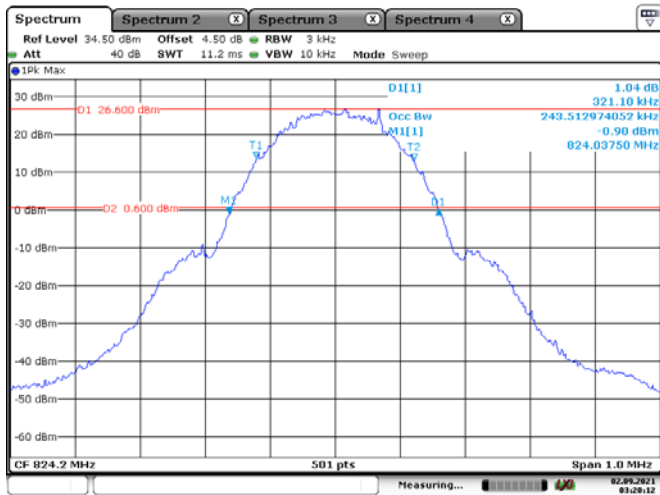
**GSM:**

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	0.244	0.248	0.248	0.321	0.317	0.32
PCS	GSM	0.246	0.248	0.248	0.321	0.324	0.318

**WCDMA:**

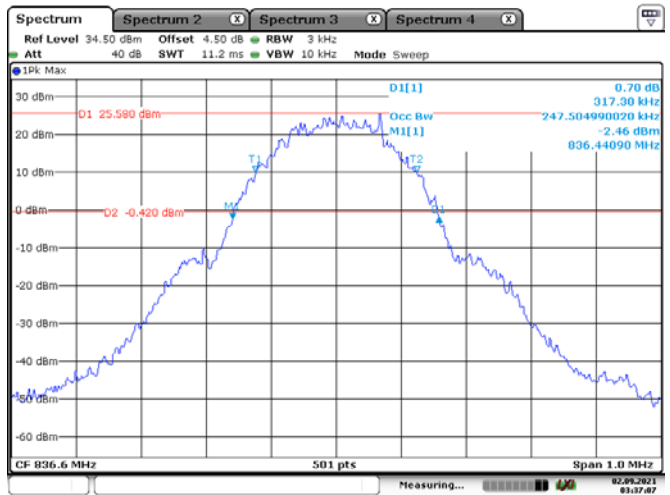
Band	Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
		Low Channel	Middle Channel	High Channel	Low Channel	Middle Channel	High Channel
PCS	Rel 99	4.152	4.152	4.152	4.715	4.724	4.721
	HSDPA	4.172	4.152	4.152	4.724	4.741	4.719
	HSUPA	4.152	4.152	4.152	4.75	4.726	4.739
Cellular	Rel 99	4.172	4.152	4.172	4.735	4.732	4.73
	HSDPA	4.172	4.152	4.152	4.708	4.703	4.706
	HSUPA	4.172	4.152	4.152	4.708	4.71	4.715

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



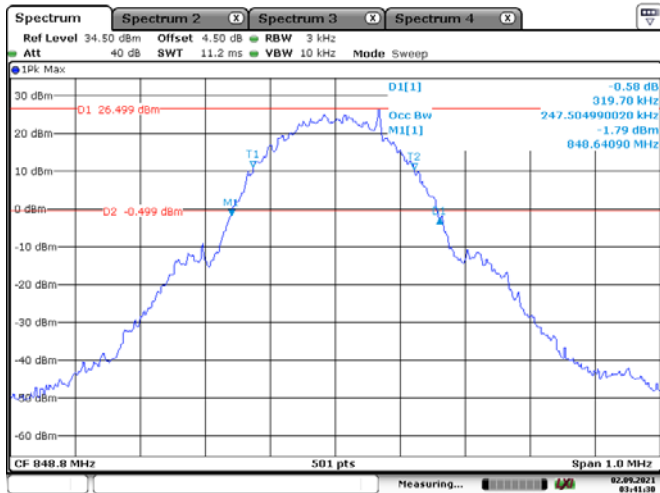
Date: 2.SEP.2021 03:20:12

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



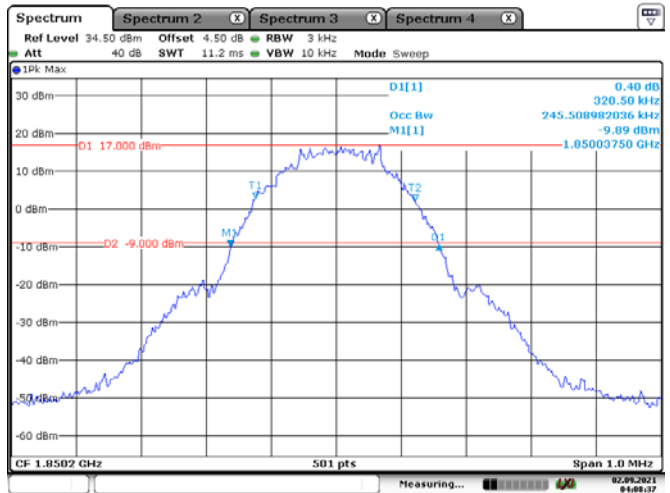
Date: 2.SEP.2021 03:37:07

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



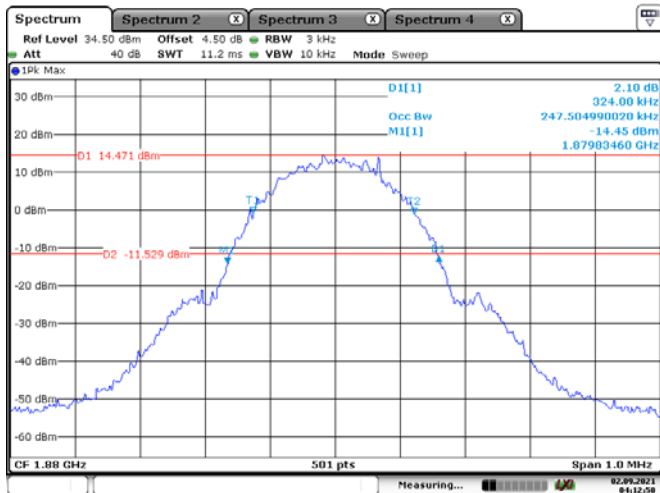
Date: 2.SEP.2021 03:41:30

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



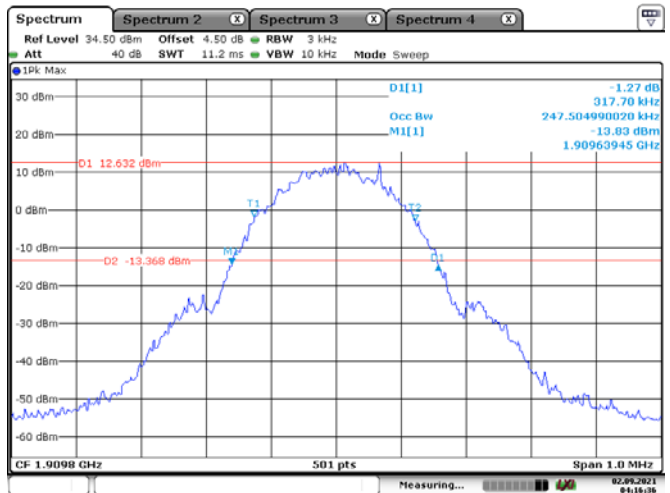
Date: 2.SEP.2021 04:08:37

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



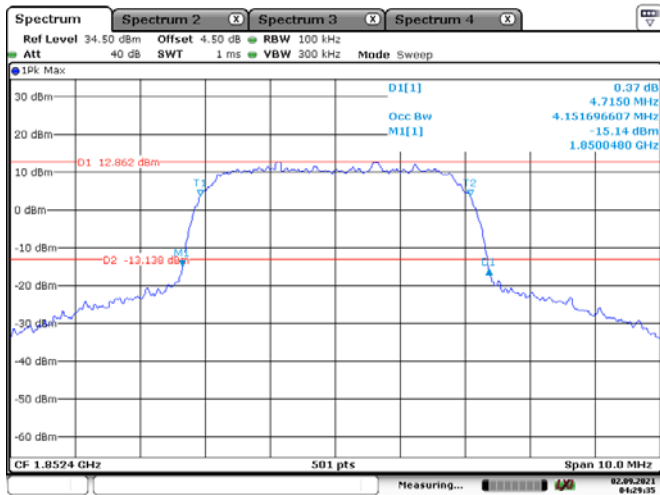
Date: 2.SEP.2021 04:12:50

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



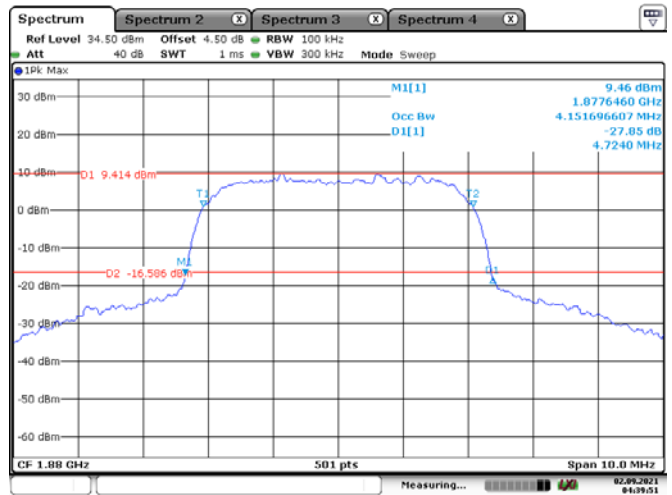
Date: 2.SEP.2021 04:16:36

WCDMA Band II, Rel99, Low Channel



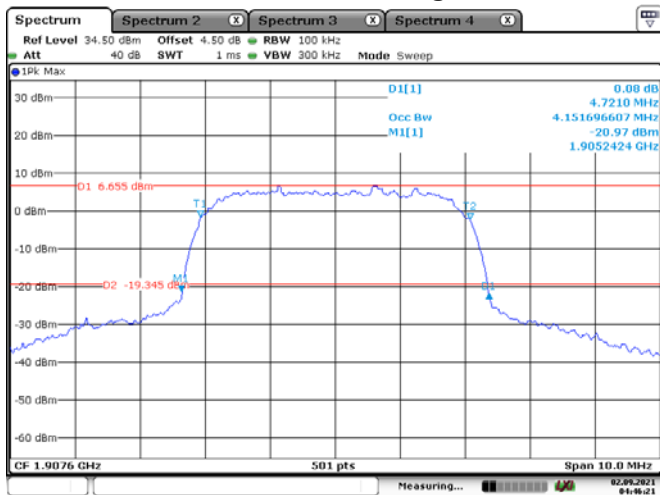
Date: 2.SEP.2021 04:29:35

WCDMA Band II, Rel99, Middle Channel



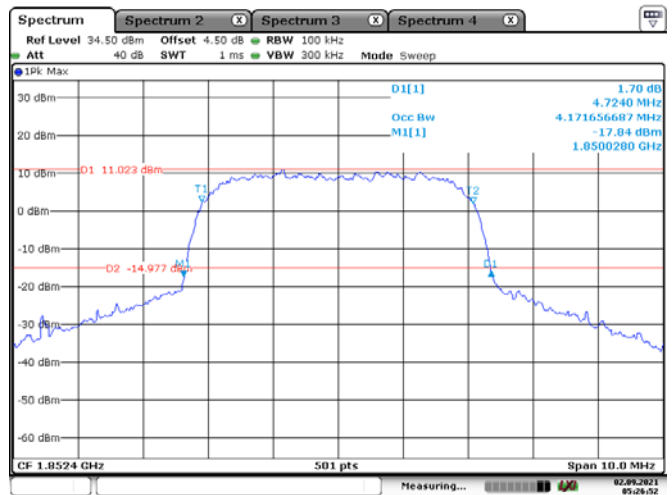
Date: 2.SEP.2021 04:39:51

WCDMA Band II, Rel99, High Channel



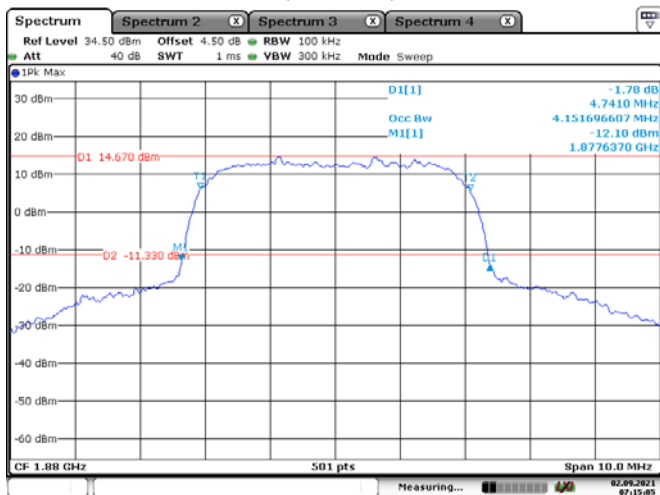
Date: 2.SEP.2021 04:46:22

WCDMA Band II, HSDPA, Low Channel



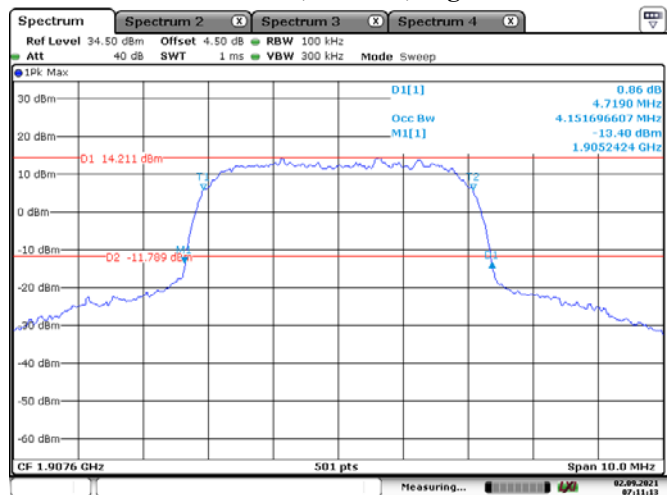
Date: 2.SEP.2021 05:26:53

WCDMA Band II, HSDPA, Middle Channel



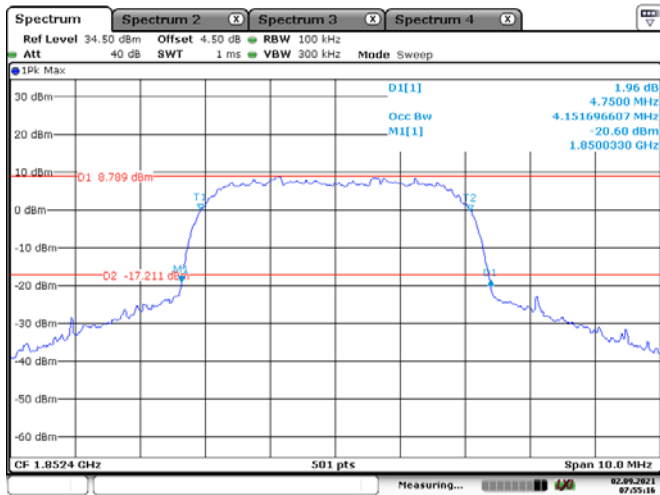
Date: 2.SEP.2021 07:15:06

WCDMA Band II, HSDPA, High Channel



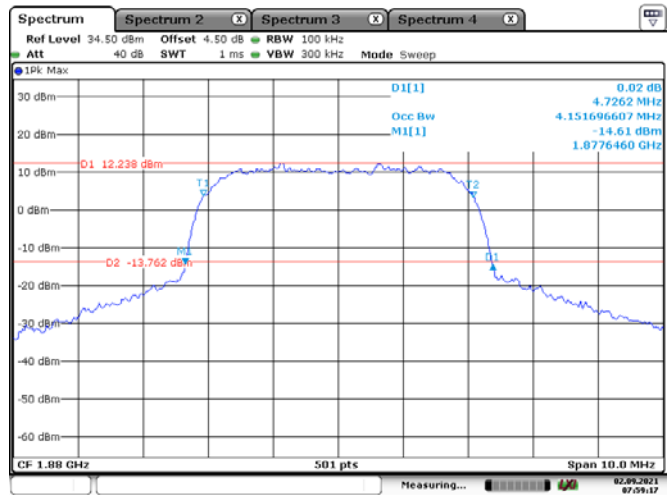
Date: 2.SEP.2021 07:11:13

WCDMA Band II, HSUPA, Low Channel



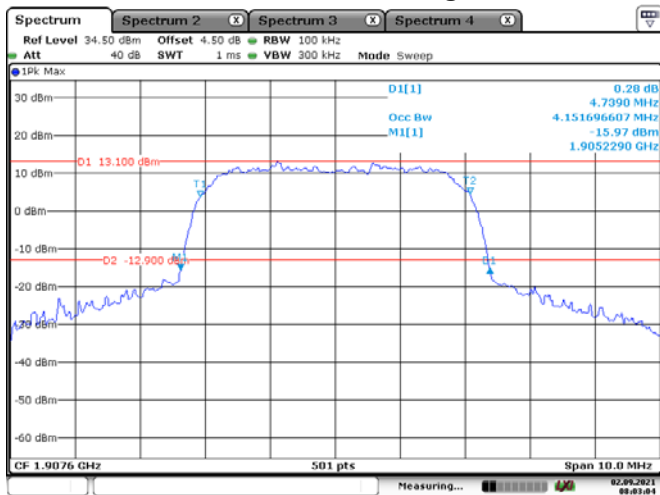
Date: 2.SEP.2021 07:55:17

WCDMA Band II, HSUPA, Middle Channel



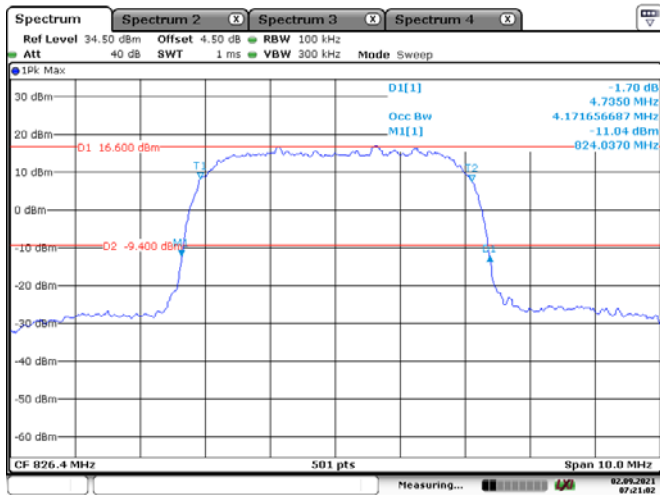
Date: 2.SEP.2021 07:59:17

WCDMA Band II, HSUPA, High Channel



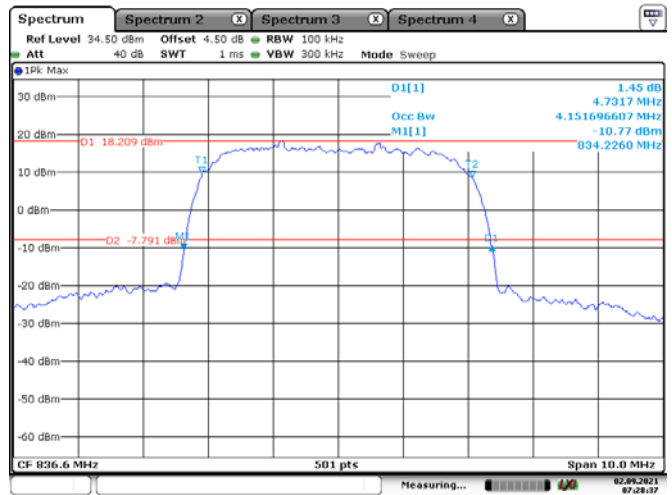
Date: 2.SEP.2021 08:03:04

WCDMA Band V, Rel99, Low Channel



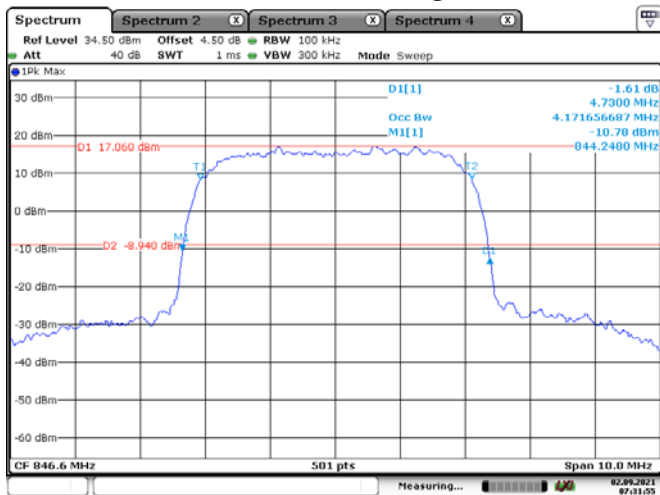
Date: 2.SEP.2021 07:21:02

WCDMA Band V, Rel99, Middle Channel



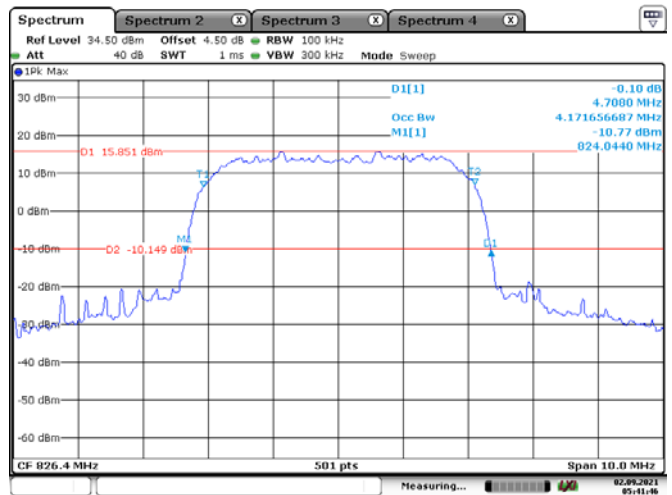
Date: 2.SEP.2021 07:28:38

WCDMA Band V, Rel99, High Channel



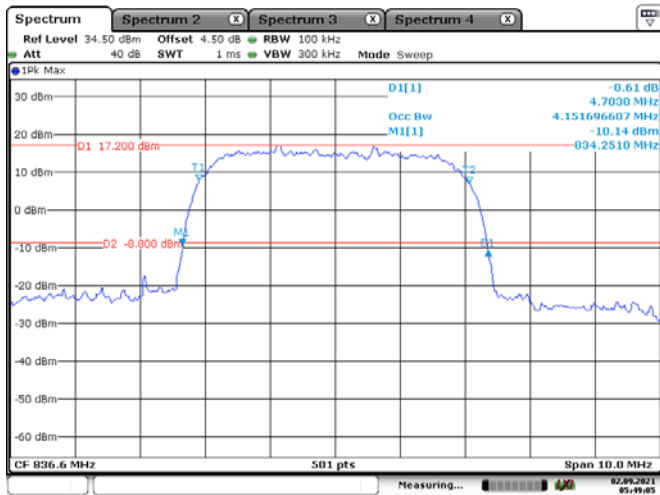
Date: 2.SEP.2021 07:31:55

WCDMA Band V, HSDPA, Low Channel



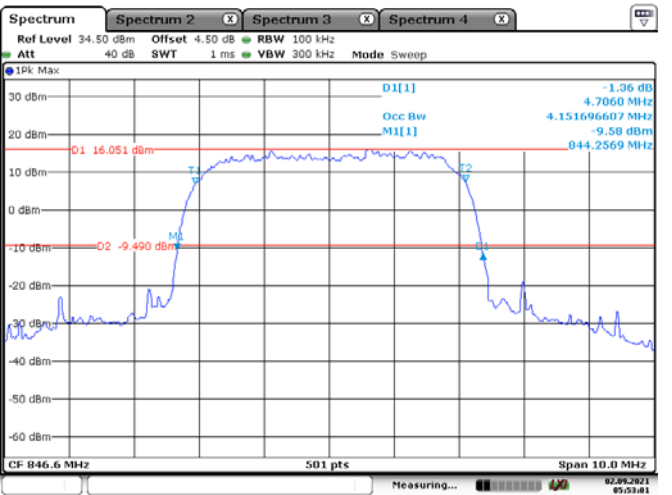
Date: 2.SEP.2021 05:41:46

WCDMA Band V, HSDPA, Middle Channel



Date: 2.SEP.2021 05:49:06

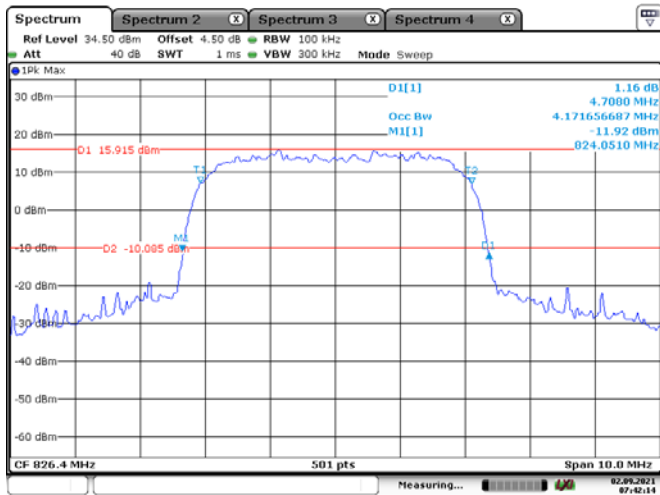
WCDMA Band V, HSDPA, High Channel



Date: 2.SEP.2021 05:53:01

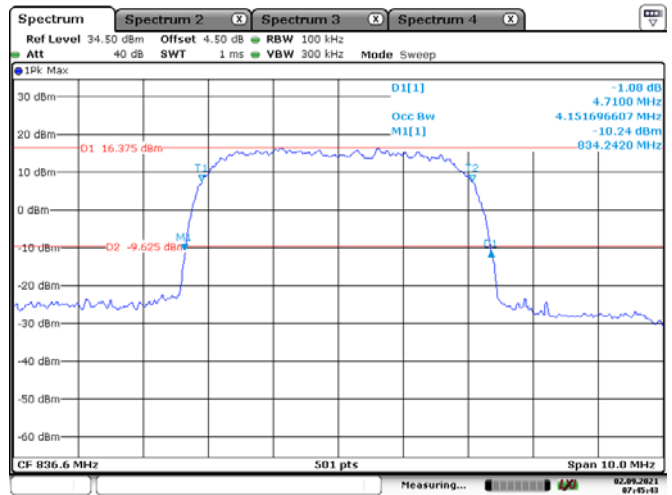


WCDMA Band V, HSUPA, Low Channel



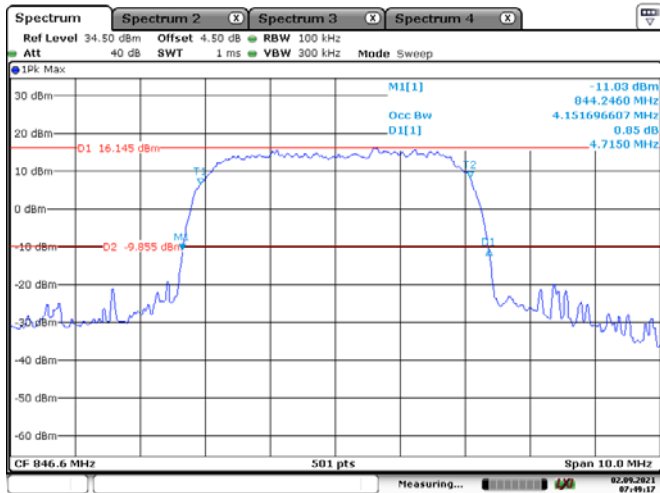
Date: 2.SEP.2021 07:42:15

WCDMA Band V, HSUPA, Middle Channel



Date: 2.SEP.2021 07:45:44

WCDMA Band V, HSUPA, High Channel



Date: 2.SEP.2021 07:49:17

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

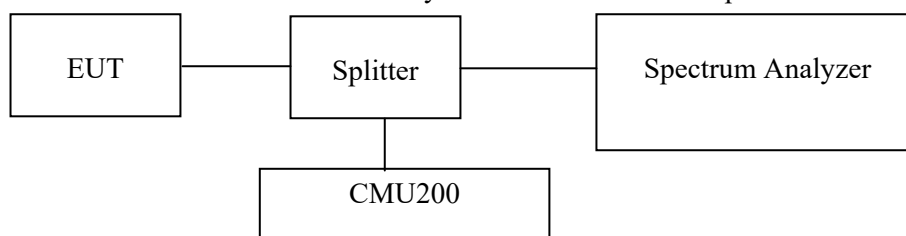
### Applicable Standard

FCC §2.1051, §22.917(a), §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	FSV40	101591	2021-07-22	2022-07-21
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41010012	Each time	N/A
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005011	Each time	N/A
Unknown	Coaxial Cable	C-SJ00-0010	C0010/01	Each time	N/A
E-Microwave	Blocking Control	EMDCB-00036	0E01201047	Each time	N/A
Unknown	Attenuator	UNAT-3+	15529	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).

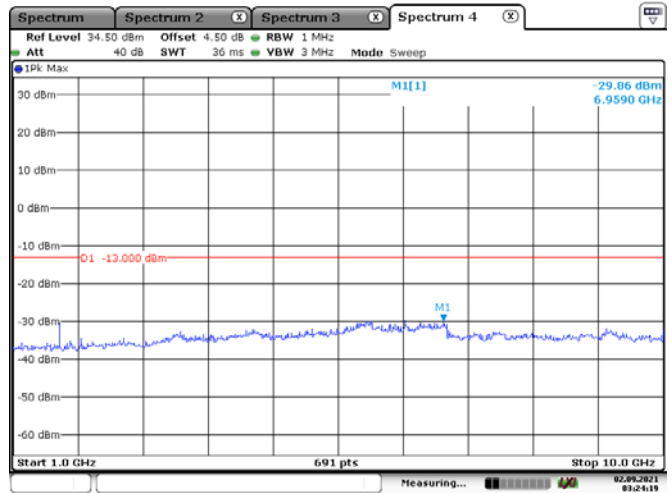
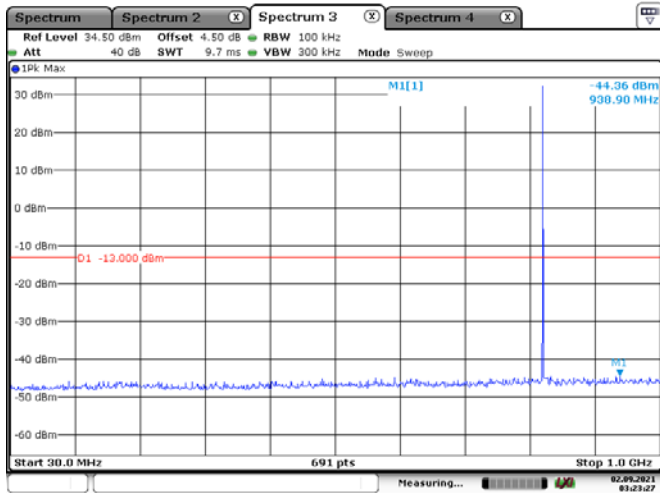
### Test Data

#### Environmental Conditions

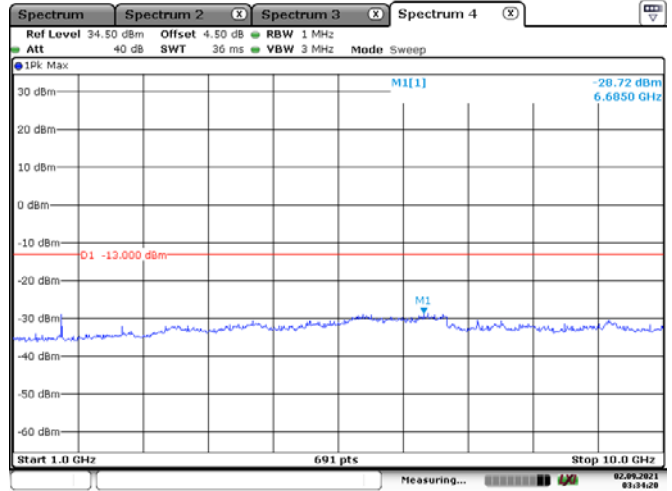
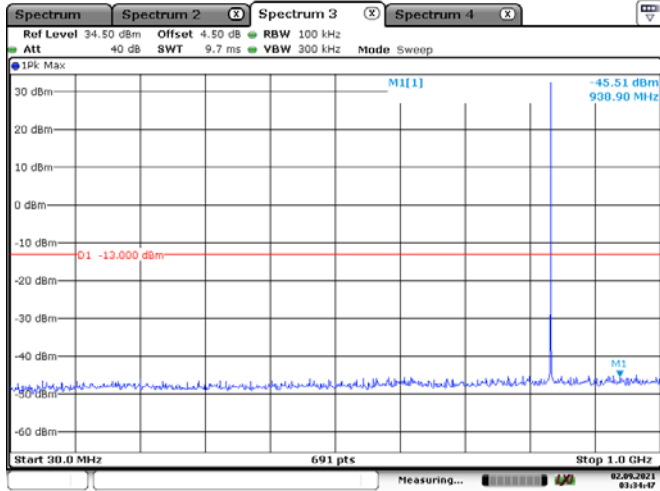
<b>Temperature:</b>	26.3 °C
<b>Relative Humidity:</b>	71 %
<b>ATM Pressure:</b>	100.4kPa
<b>Tester:</b>	Thehsy Xie
<b>Test Date:</b>	2021-09-02

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

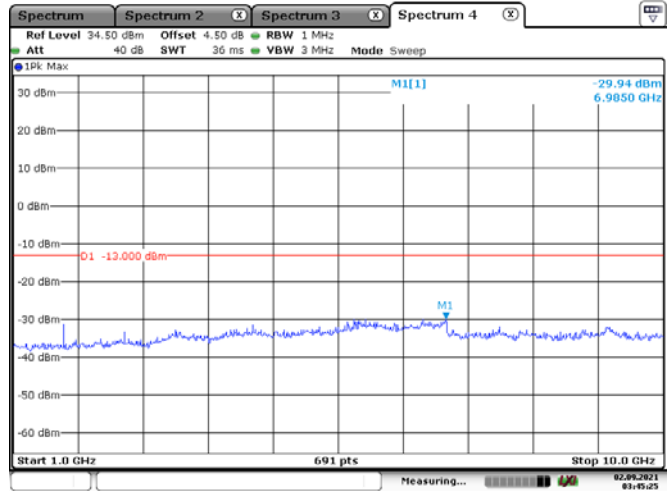
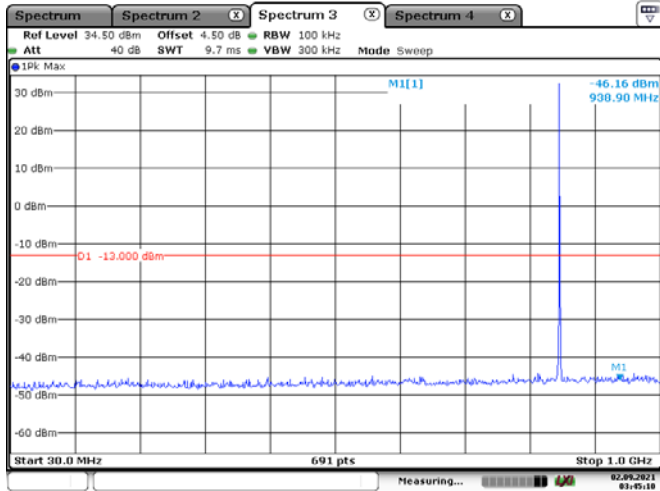
### GSM 850, Low Channel



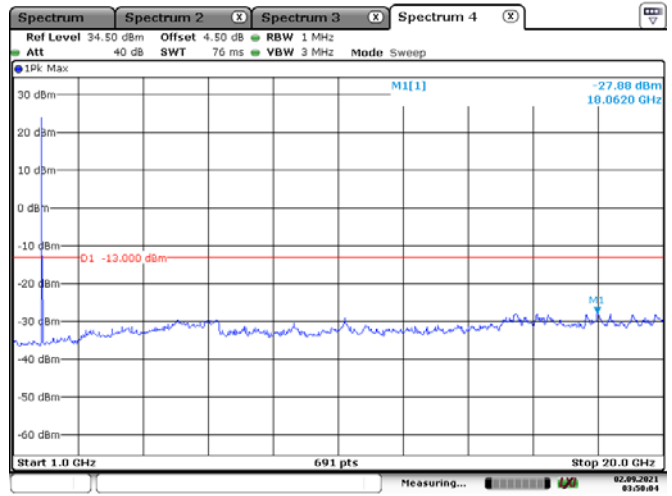
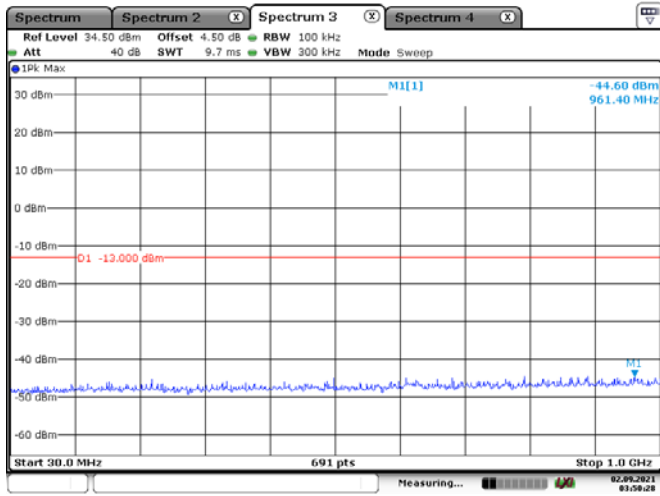
### GSM 850, Middle Channel



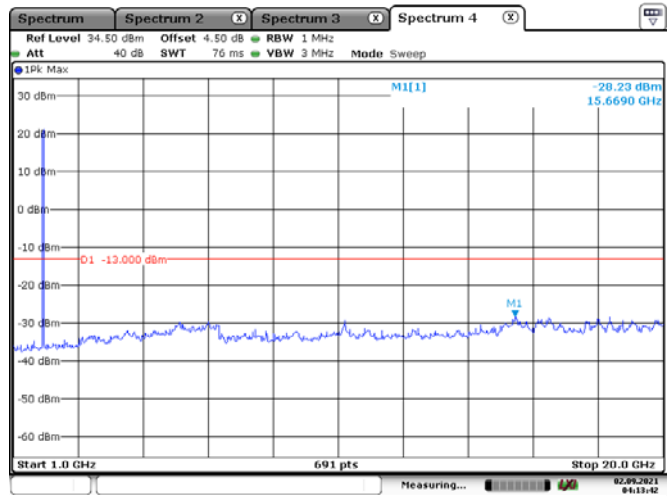
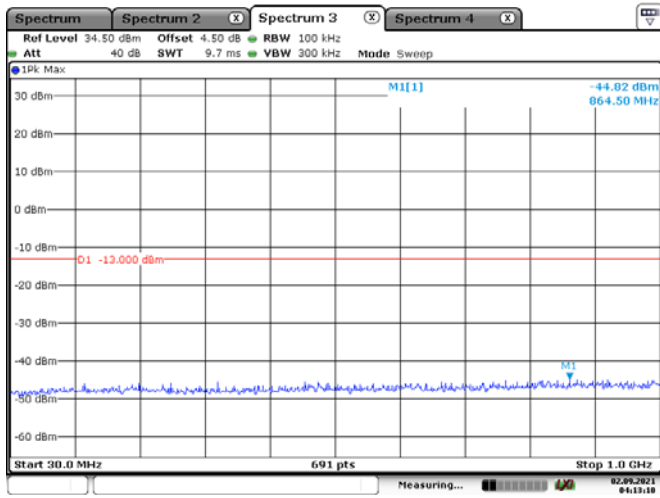
### GSM 850, High Channel



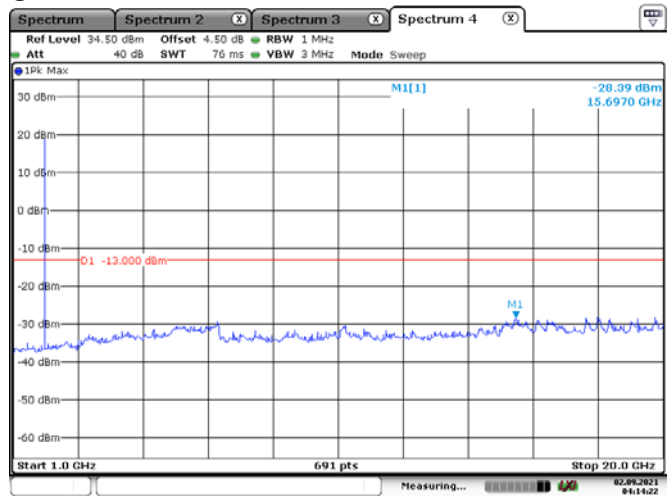
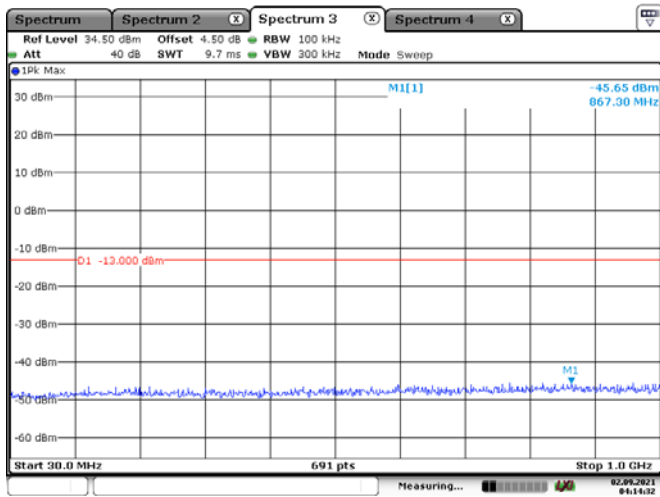
PCS 1900, Low Channel



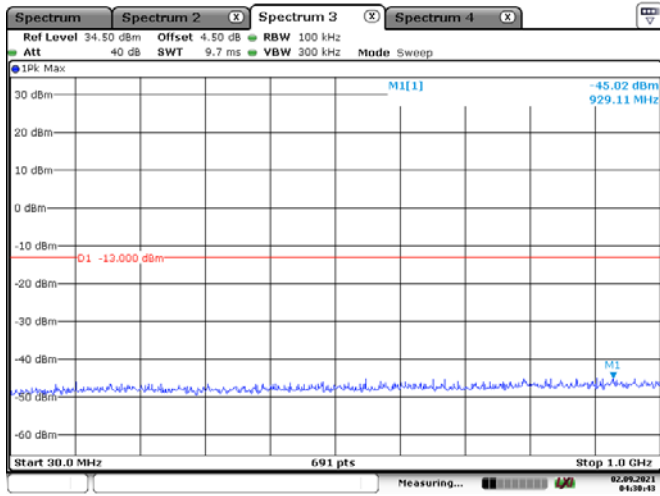
PCS 1900, Middle Channel



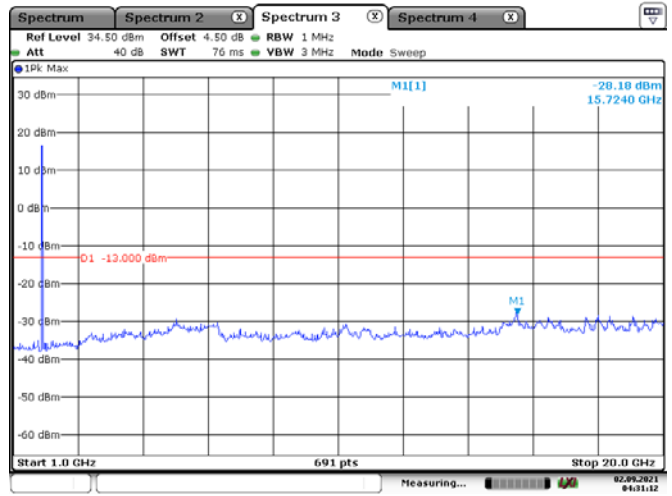
PCS 1900, High Channel



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

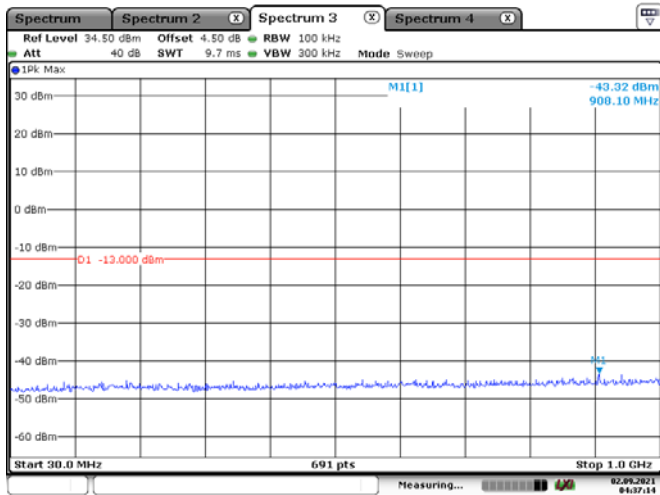


Date: 2.SEP.2021 04:30:43

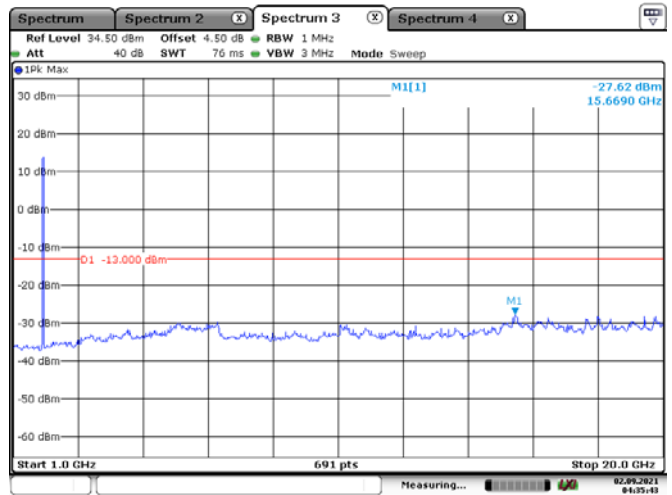


Date: 2.SEP.2021 04:31:13

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

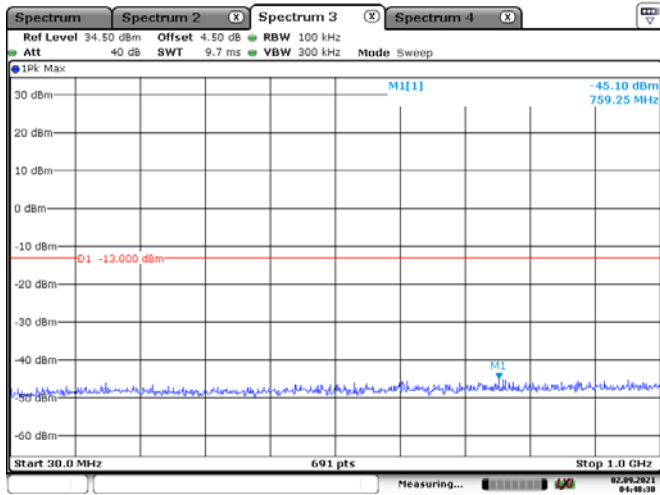


Date: 2.SEP.2021 04:37:14

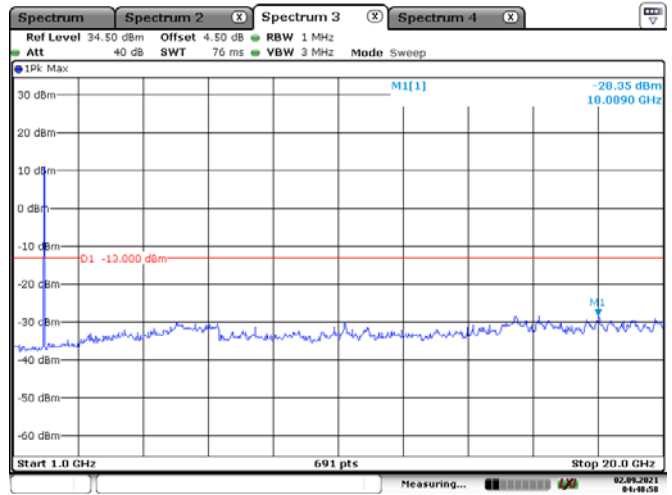


Date: 2.SEP.2021 04:35:43

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

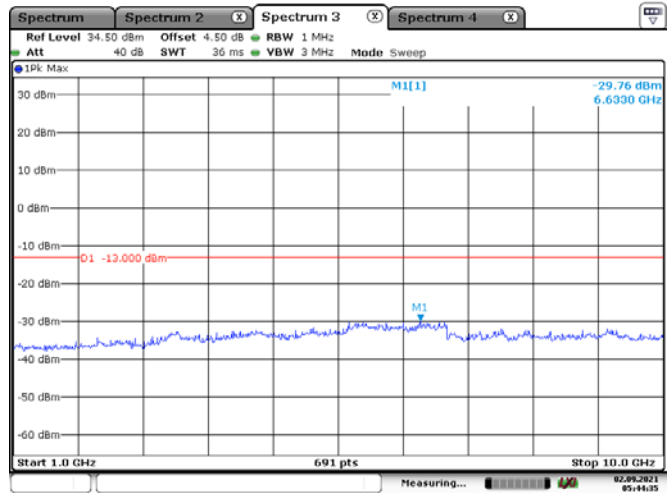
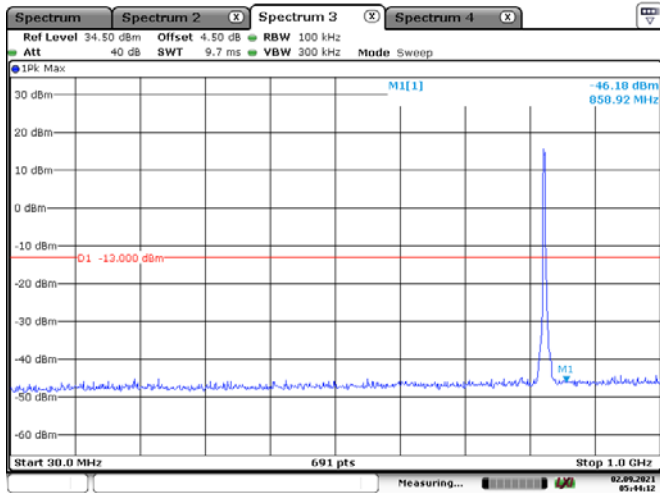


Date: 2.SEP.2021 04:48:31

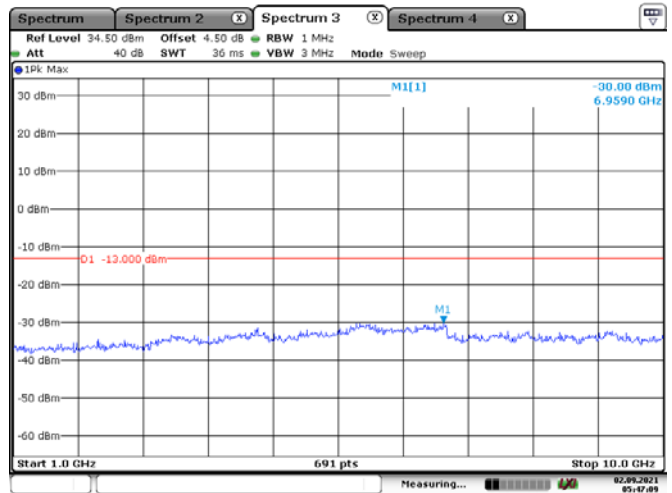
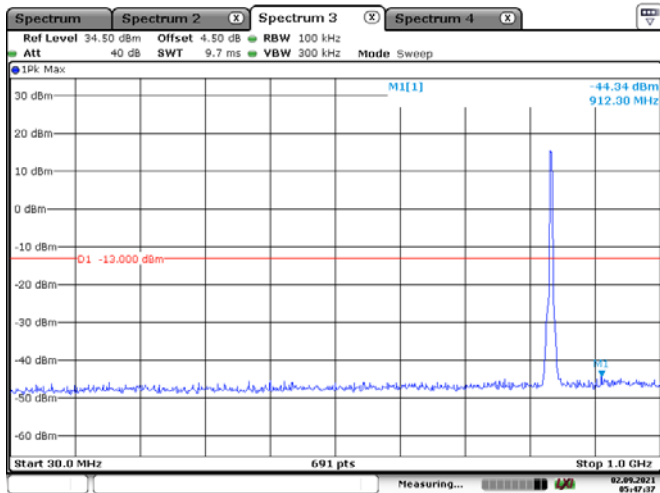


Date: 2.SEP.2021 04:48:58

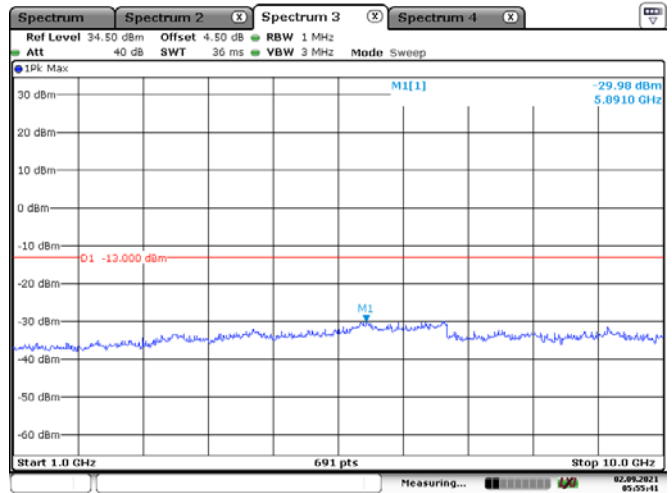
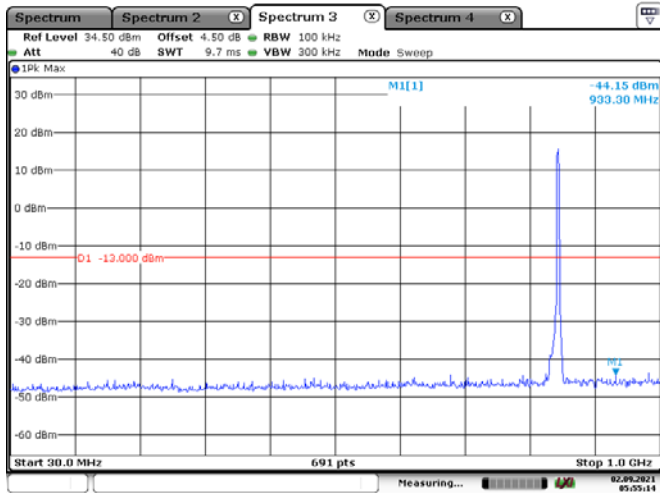
WCDMA Band V, R99, Low Channel



WCDMA Band V, R99, Middle Channel



WCDMA Band V, R99, High Channel



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

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**Applicable Standard**

FCC § 2.1053, §22.917, § 24.238

**Test Procedure**

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

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

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

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

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

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

**Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Antenna	JB3	A060611-1	2020-11-10	2023-11-10
R&S	EMI Test Receiver	ESR3	102453	2020-09-23	2021-09-22
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2021-07-19	2022-07-18
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2021-07-19	2022-07-18
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2021-07-19	2022-07-18
Sonoma	Amplifier	310N	372193	2021-07-18	2022-07-17
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Agilent	Spectrum Analyzer	E4440A	SG43360054	2021-07-22	2022-07-21
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2021-09-04	2022-09-03
Mini-Circuit	Amplifier	ZVA-213-S+	54201245	2021-09-04	2022-09-03
TDK RF	Horn Antenna	HRN-0118	130 084	2018-10-12	2021-10-12
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2021-09-04	2022-09-03
Agilent	Signal Generator	E8247C	MY43321350	2021-04-25	2022-04-24
Sinoscite	Band-stop filter	BSF1850-1910MS-0935V2	0935V2	2021-06-16	2022-06-16
Sinoscite	Band-stop filter	BSF824-862MS-1438-001	1438001	2021-06-16	2022-06-16
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-02 1304	2020-12-05	2023-12-04
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-01 1304	2020-12-05	2023-12-04

\* **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>	27°C	23.7°C
<b>Relative Humidity:</b>	57%	66%
<b>ATM Pressure:</b>	100.4kPa	100.3kPa
<b>Tester:</b>	Joyce Qiao	Joker Chen
<b>Test Date:</b>	2021-09-13	2021-09-08

*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	59.96	-44.32	8.68	0.80	-36.44	-13.00	23.44
1648.40	V	60.52	-43.84	8.68	0.80	-35.96	-13.00	22.96
2472.60	H	46.44	-54.28	9.38	1.00	-45.90	-13.00	32.90
2472.60	V	48.08	-52.59	9.38	1.00	-44.21	-13.00	31.21
3296.80	H	46.32	-49.78	10.32	1.15	-40.61	-13.00	27.61
3296.80	V	47.02	-48.84	10.32	1.15	-39.67	-13.00	26.67
158.49	H	48.10	-65.19	0.00	0.39	-65.58	-13.00	52.58
161.40	V	47.02	-71.60	0.00	0.40	-72.00	-13.00	59.00
GSM850 Frequency:836.6MHz								
1673.20	H	59.81	-44.47	8.71	0.85	-36.61	-13.00	23.61
1673.20	V	59.52	-44.87	8.71	0.85	-37.01	-13.00	24.01
2509.80	H	46.32	-54.26	9.42	1.01	-45.85	-13.00	32.85
2509.80	V	47.99	-52.60	9.42	1.01	-44.19	-13.00	31.19
3346.40	H	42.01	-54.41	10.34	1.16	-45.23	-13.00	32.23
3346.40	V	41.75	-54.54	10.34	1.16	-45.36	-13.00	32.36
147.83	H	48.44	-64.18	0.00	0.37	-64.55	-13.00	51.55
159.46	V	46.60	-72.03	0.00	0.40	-72.43	-13.00	59.43
GSM850 Frequency:848.8MHz								
1697.60	H	59.22	-45.07	8.74	0.90	-37.23	-13.00	24.23
1697.60	V	57.47	-46.95	8.74	0.90	-39.11	-13.00	26.11
2546.40	H	57.22	-43.05	9.47	1.01	-34.59	-13.00	21.59
2546.40	V	52.07	-48.16	9.47	1.01	-39.70	-13.00	26.70
3395.20	H	42.54	-54.24	10.36	1.19	-45.07	-13.00	32.07
3395.20	V	43.07	-53.68	10.36	1.19	-44.51	-13.00	31.51
147.83	H	49.27	-63.35	0.00	0.37	-63.72	-13.00	50.72
160.43	V	47.04	-71.58	0.00	0.40	-71.98	-13.00	58.98

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	43.80	-60.48	8.68	0.81	-52.61	-13.00	39.61
1652.80	V	44.73	-59.63	8.68	0.81	-51.76	-13.00	38.76
2479.20	H	60.66	-40.05	9.39	1.01	-31.67	-13.00	18.67
2479.20	V	62.75	-37.93	9.39	1.01	-29.55	-13.00	16.55
3305.60	H	35.46	-60.66	10.32	1.15	-51.49	-13.00	38.49
3305.60	V	35.63	-60.26	10.32	1.15	-51.09	-13.00	38.09
209.85	H	47.83	-67.45	0.00	0.49	-67.94	-13.00	54.94
153.65	V	52.04	-66.69	0.00	0.38	-67.07	-13.00	54.07
WCDMA Band 5 Frequency:836.6MHz								
1673.20	H	46.53	-57.75	8.71	0.85	-49.89	-13.00	36.89
1673.20	V	46.18	-58.21	8.71	0.85	-50.35	-13.00	37.35
2509.80	H	59.41	-41.17	9.42	1.01	-32.76	-13.00	19.76
2509.80	V	60.37	-40.22	9.42	1.01	-31.81	-13.00	18.81
3346.40	H	35.36	-61.06	10.34	1.16	-51.88	-13.00	38.88
3346.40	V	35.42	-60.87	10.34	1.16	-51.69	-13.00	38.69
210.82	H	46.67	-68.63	0.00	0.49	-69.12	-13.00	56.12
157.60	V	55.03	-63.63	0.00	0.39	-64.02	-13.00	51.02
WCDMA Band 5 Frequency:846.6MHz								
1693.20	H	46.01	-58.28	8.73	0.89	-50.44	-13.00	37.44
1693.20	V	45.77	-58.64	8.73	0.89	-50.80	-13.00	37.80
2539.80	H	60.33	-40.00	9.46	1.01	-31.55	-13.00	18.55
2539.80	V	61.41	-38.88	9.46	1.01	-30.43	-13.00	17.43
3386.40	H	37.17	-59.55	10.35	1.18	-50.38	-13.00	37.38
3386.40	V	35.92	-60.75	10.35	1.18	-51.58	-13.00	38.58
160.43	H	46.72	-66.72	0.00	0.40	-67.12	-13.00	54.12
152.68	V	59.56	-59.19	0.00	0.38	-59.57	-13.00	46.57

**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	62.72	-33.77	10.60	1.25	-24.42	-13.00	11.42
3700.40	V	65.18	-31.29	10.60	1.25	-21.94	-13.00	8.94
5550.60	H	49.14	-43.90	11.44	1.49	-33.95	-13.00	20.95
5550.60	V	47.82	-45.05	11.44	1.49	-35.10	-13.00	22.10
158.34	H	44.64	-68.64	0.00	0.39	-69.03	-13.00	56.03
153.65	V	51.33	-67.40	0.00	0.38	-67.78	-13.00	54.78
GSM 1900 Frequency:1880MHz								
3760.00	H	65.47	-30.19	10.66	1.24	-20.77	-13.00	7.77
3760.00	V	63.39	-32.15	10.66	1.24	-22.73	-13.00	9.73
5640.00	H	51.27	-42.00	11.33	1.54	-32.21	-13.00	19.21
5640.00	V	51.47	-41.68	11.33	1.54	-31.89	-13.00	18.89
297.06	H	45.28	-70.17	0.00	0.52	-70.69	-13.00	57.69
152.68	V	49.62	-69.13	0.00	0.38	-69.51	-13.00	56.51
GSM 1900 Frequency:1909.8MHz								
3819.60	H	60.43	-34.77	10.72	1.29	-25.34	-13.00	12.34
3819.60	V	61.08	-33.97	10.72	1.29	-24.54	-13.00	11.54
5729.40	H	50.61	-42.89	11.22	1.59	-33.26	-13.00	20.26
5729.40	V	51.29	-42.08	11.22	1.59	-32.45	-13.00	19.45
300.94	H	45.61	-69.77	0.00	0.52	-70.29	-13.00	57.29
153.65	V	51.05	-67.68	0.00	0.38	-68.06	-13.00	55.06

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	56.66	-39.77	10.60	1.25	-30.42	-13.00	17.42
3704.80	V	46.67	-49.74	10.60	1.25	-40.39	-13.00	27.39
5557.20	H	46.71	-46.34	11.43	1.49	-36.40	-13.00	23.40
5557.20	V	40.08	-52.81	11.43	1.49	-42.87	-13.00	29.87
7409.60	H	44.99	-44.68	10.95	2.05	-35.78	-13.00	22.78
7409.60	V	41.80	-48.61	10.95	2.05	-39.71	-13.00	26.71
9262.00	H	47.36	-40.96	11.30	2.36	-32.02	-13.00	19.02
9262.00	V	38.08	-50.76	11.30	2.36	-41.82	-13.00	28.82
195.13	H	46.99	-68.41	0.00	0.48	-68.89	-13.00	55.89
152.68	V	52.23	-66.52	0.00	0.38	-66.90	-13.00	53.90
WCDMA Band II, Frequency:1880 MHz								
3760.00	H	57.60	-38.06	10.66	1.24	-28.64	-13.00	15.64
3760.00	V	47.40	-48.14	10.66	1.24	-38.72	-13.00	25.72
5640.00	H	47.13	-46.14	11.33	1.54	-36.35	-13.00	23.35
5640.00	V	40.43	-52.72	11.33	1.54	-42.93	-13.00	29.93
7520.00	H	44.64	-45.70	10.90	1.96	-36.76	-13.00	23.76
7520.00	V	40.56	-50.31	10.90	1.96	-41.37	-13.00	28.37
9400.00	H	47.12	-40.63	11.30	2.39	-31.72	-13.00	18.72
9400.00	V	38.23	-49.97	11.30	2.39	-41.06	-13.00	28.06
157.52	H	48.02	-65.21	0.00	0.39	-65.60	-13.00	52.60
153.65	V	52.24	-66.49	0.00	0.38	-66.87	-13.00	53.87
WCDMA Band II, Frequency:1907.6MHz								
3815.20	H	54.63	-40.54	10.72	1.29	-31.11	-13.00	18.11
3815.20	V	47.74	-47.28	10.72	1.29	-37.85	-13.00	24.85
5722.80	H	45.53	-47.96	11.23	1.58	-38.31	-13.00	25.31
5722.80	V	39.56	-53.80	11.23	1.58	-44.15	-13.00	31.15
7630.40	H	46.03	-44.03	10.87	2.04	-35.20	-13.00	22.20
7630.40	V	39.54	-51.22	10.87	2.04	-42.39	-13.00	29.39
9538.00	H	47.32	-40.47	11.33	2.41	-31.55	-13.00	18.55
9538.00	V	38.19	-49.92	11.33	2.41	-41.00	-13.00	28.00
158.49	H	47.46	-65.83	0.00	0.39	-66.22	-13.00	53.22
153.65	V	53.03	-65.70	0.00	0.38	-66.08	-13.00	53.08

## 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) - BAND EDGES

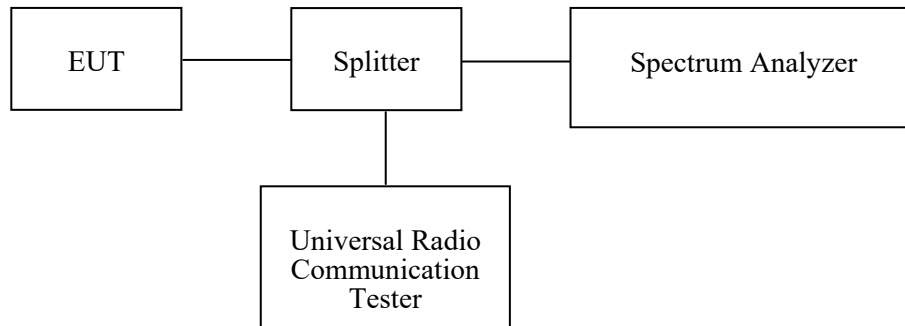
### Applicable Standard

FCC § 2.1053, §22.917, § 24.238

### 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	101591	2021-07-22	2022-07-21
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41010012	Each time	N/A
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005011	Each time	N/A
Unknown	Coaxial Cable	C-SJ00-0010	C0010/01	Each time	N/A
E-Microwave	Blocking Control	EMDCB-00036	0E01201047	Each time	N/A
Unknown	Attenuator	UNAT-3+	15529	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).*

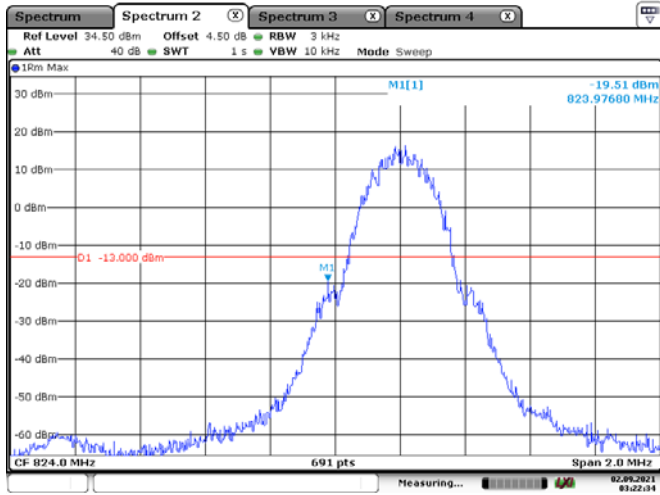
### Test Data

#### Environmental Conditions

<b>Temperature:</b>	26.3 °C
<b>Relative Humidity:</b>	71 %
<b>ATM Pressure:</b>	100.4kPa
<b>Tester:</b>	Thehsy Xie
<b>Test Date:</b>	2021-09-02

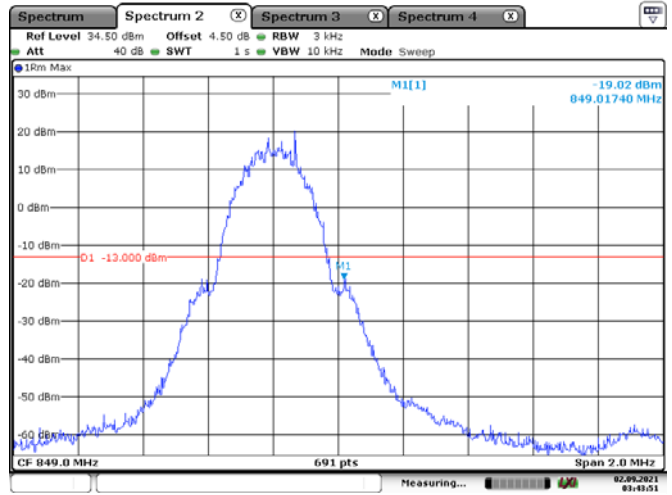
Test Mode: Transmitting  
 Test Result: Compliance. Please refer to the following plots.

GSM 850, Left Band Edge



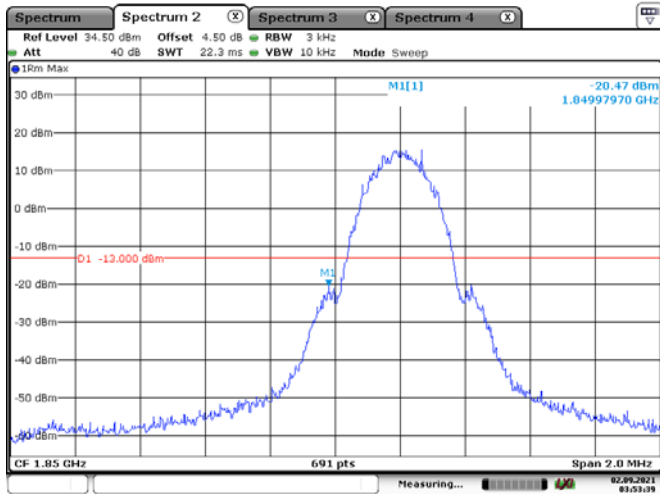
Date: 2.SEP.2021 03:22:34

GSM 850, Right Band Edge



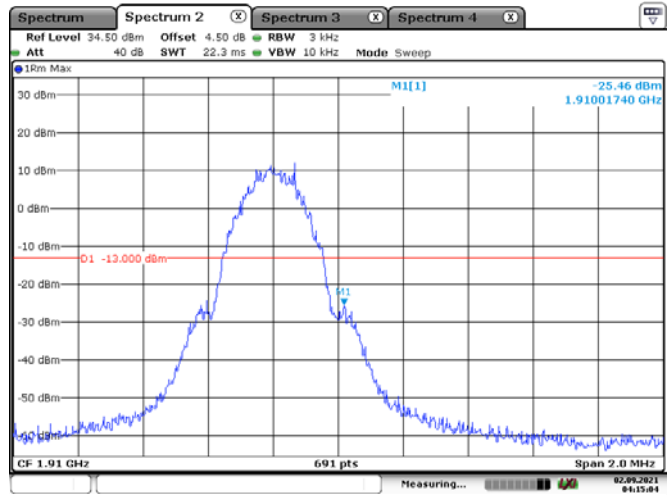
Date: 2.SEP.2021 03:43:52

PCS 1900, Left Band Edge



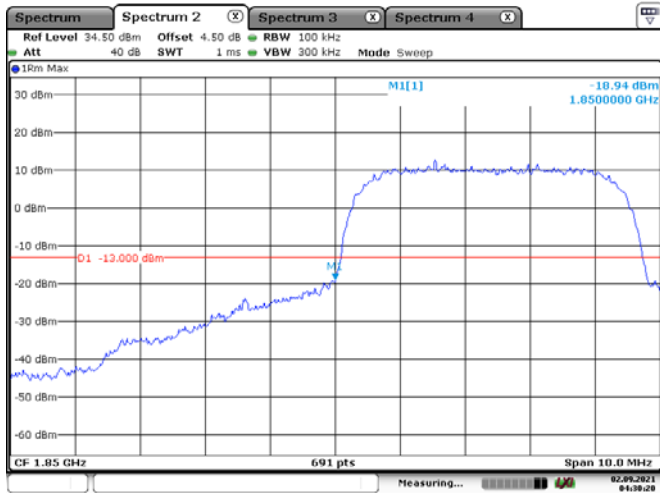
Date: 2.SEP.2021 03:53:39

PCS 1900, Right Band Edge

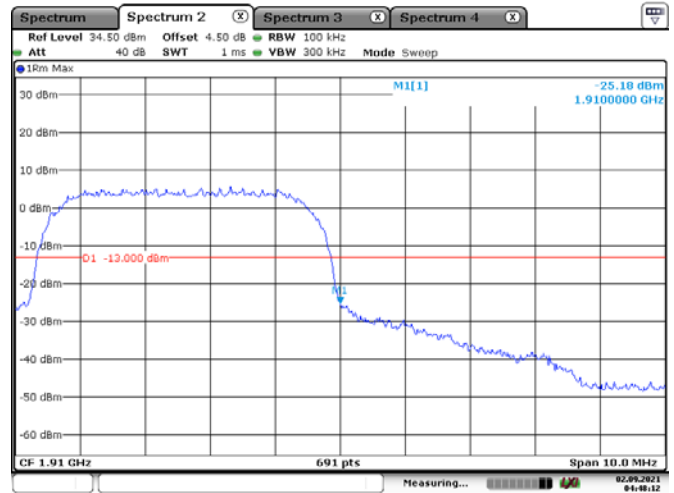


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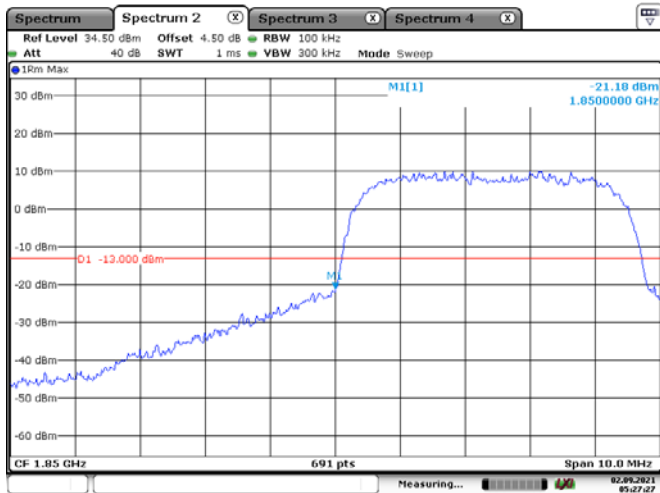
WCDMA Band II,Rel99, Left Band Edge



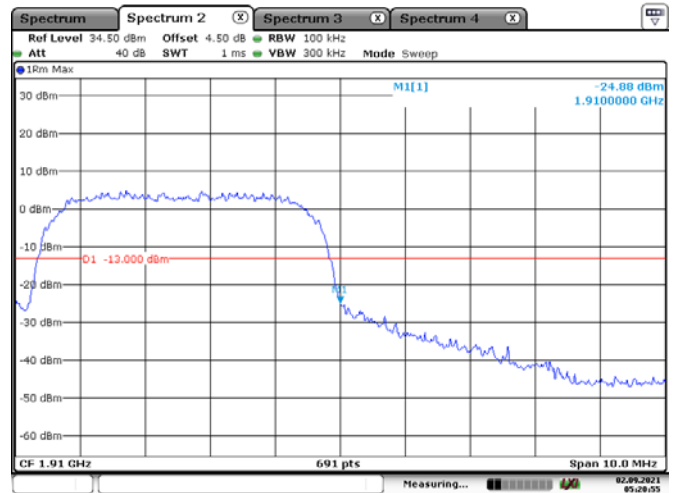
WCDMA Band II,Rel99, Right Band Edge



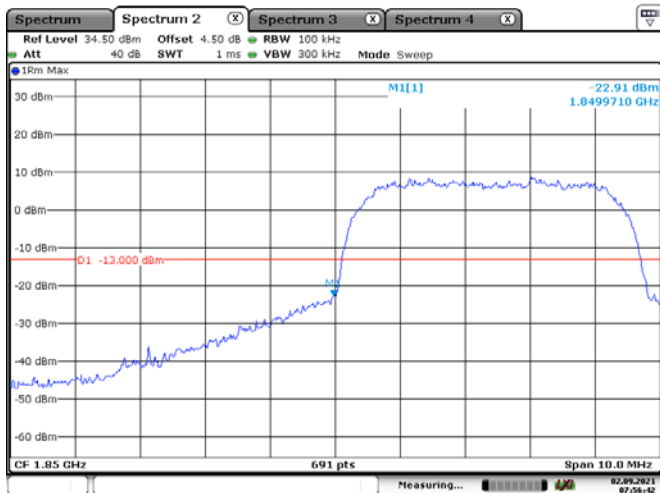
WCDMA Band II,HSDPA, Left Band Edge



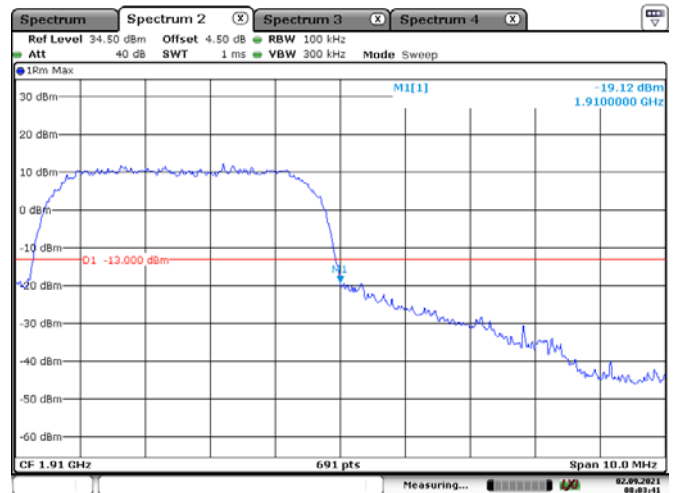
WCDMA Band II,HSDPA,Right Band Edge



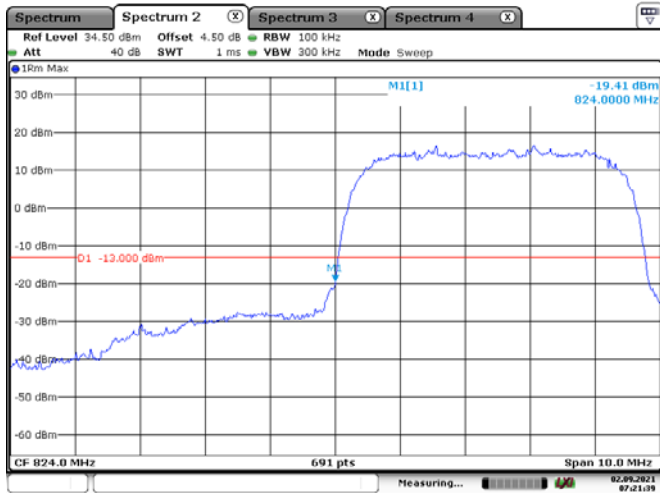
WCDMA Band II,HSUPA, Left Band Edge



WCDMA Band II,HSUPA, Right Band Edge

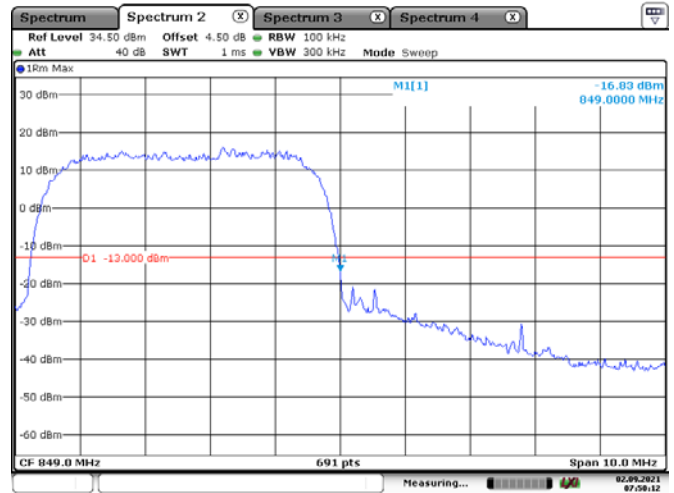


WCDMA Band V,Rel99, Left Band Edge



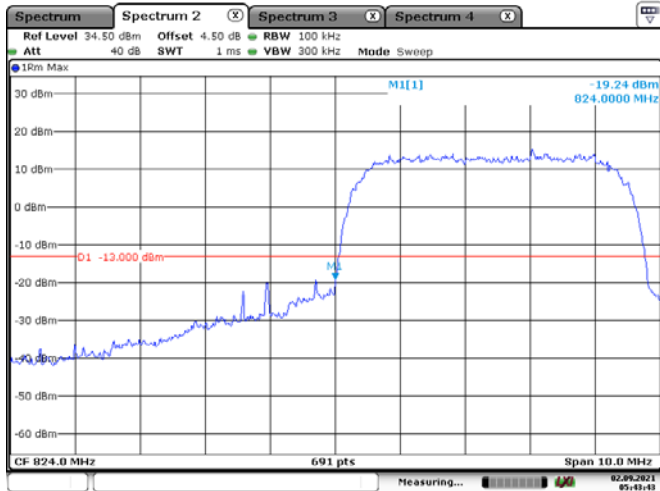
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WCDMA Band V,Rel99, Right Band Edge



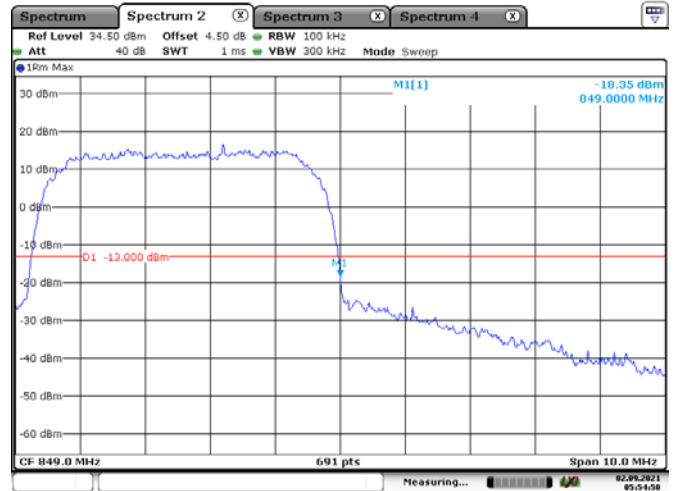
Date: 2.SEP.2021 07:50:13

WCDMA Band V,HSDPA, Left Band Edge



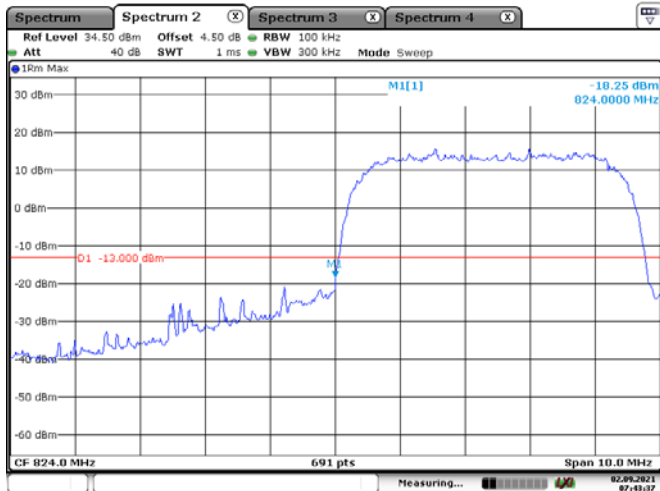
Date: 2.SEP.2021 05:43:43

WCDMA Band V,HSDPA,Right Band Edge



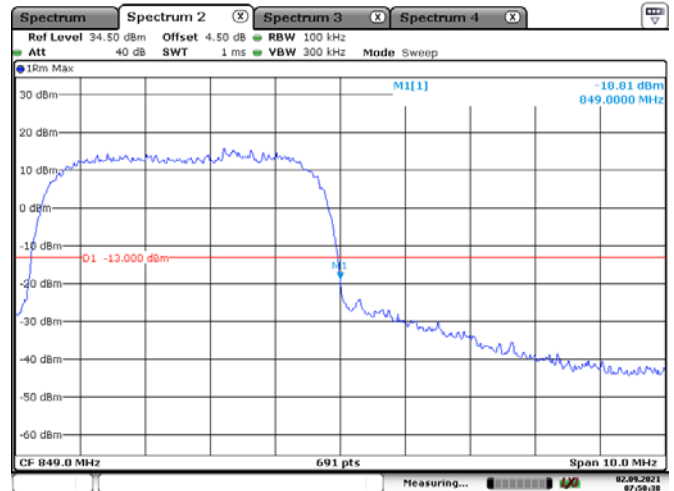
Date: 2.SEP.2021 05:54:50

WCDMA Band V,HSUPA, Left Band Edge



Date: 2.SEP.2021 07:43:37

WCDMA Band V,HSUPA, Right Band Edge



Date: 2.SEP.2021 07:50:38



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

### Applicable Standard

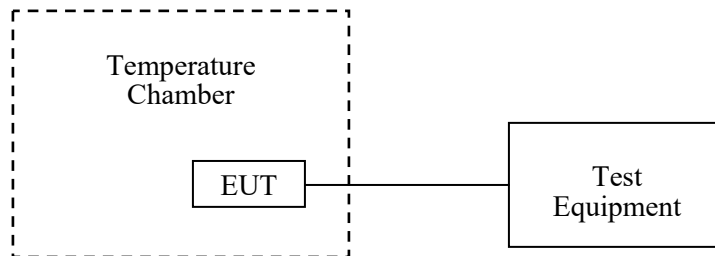
FCC § 2.1055 (a), § 2.1055 (d), §22.355, §24.235

### 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
E-Microwave	Blocking Control	EMDCB-00036	0E01201047	Each time	N/A
Unknown	Attenuator	UNAT-3+	15529	Each time	N/A
R&S	Universal Radio Communication Tester	CMU200	106 891	2020-09-23	2021-09-22
ESPEC	Constant temperature and humidity Tester	ESX-4CA	018 463	2021-03-10	2022-03-09
UNI-T	Multimeter	UT39A	M130199938	2021-06-30	2022-06-29
Pro instrument	DC Power Supply	pps3300	3300012	N/A	N/A
Unknown	Coaxial Cable	C-SJ00-0010	C0010/01	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>	26.3 °C
<b>Relative Humidity:</b>	71 %
<b>ATM Pressure:</b>	100.4kPa
<b>Tester:</b>	Thehsy Xie
<b>Test Date:</b>	2021-09-02

*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	3.8	-2	-0.00239	2.5
-20		-13	-0.01554	
-10		2	0.00239	
0		-6	-0.00717	
10		-2	-0.00239	
20		14	0.01673	
30		5	0.00598	
40		2	0.00239	
50		-1	-0.00120	
20		3.6	25	
20	4.35	21	0.02510	

GMSK, Middle Channel, $f_c = 1880$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V <sub>DC</sub>	Hz	ppm	
-30	3.8	-5	-0.00266	Pass
-20		-1	-0.00053	
-10		4	0.00213	
0		6	0.00319	
10		3	0.00160	
20		2	0.00106	
30		-8	-0.00426	
40		4	0.00213	
50		7	0.00372	
20		3.6	-2	
20	4.35	-12	-0.00638	

**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	3.8	-2	-0.00106	Pass
-20		12	0.00638	
-10		11	0.00585	
0		-5	-0.00266	
10		-7	-0.00372	
20		-8	-0.00426	
30		21	0.01117	
40		22	0.01170	
50		26	0.01383	
20		3.6	-2	
20	4.35	-6	-0.00319	

**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	3.8	-5	-0.00598	2.5
-20		-8	-0.00956	
-10		4	0.00478	
0		5	0.00598	
10		9	0.01076	
20		12	0.01434	
30		-5	-0.00598	
40		-7	-0.00837	
50		12	0.01434	
20		3.6	16	
20	4.35	21	0.02510	

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 \*\*\*\*\***