

FCC PART 22H, PART 24E
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: 2AG4WE900


Report Type: Original Report	Product Type: Ram 9
Report Number:	<u>RDG201217021-00D</u>
Report Date:	<u>2021-01-22</u>
Reviewed By:	Ivan Cao Assistant Manager 
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.12, Pulong East 1 st Road, Tangxia Town, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

TABLE OF CONTENTS

GENERAL INFORMATION.....	4
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	4
OBJECTIVE	4
RELATED SUBMITTAL(S)/GRANT(S).....	4
TEST METHODOLOGY	4
MEASUREMENT UNCERTAINTY	5
TEST FACILITY	5
DECLARATIONS.....	5
SYSTEM TEST CONFIGURATION.....	6
JUSTIFICATION	6
EQUIPMENT MODIFICATIONS	6
SUPPORT EQUIPMENT LIST AND DETAILS	6
CONFIGURATION OF TEST SETUP	6
BLOCK DIAGRAM OF TEST SETUP	7
SUMMARY OF TEST RESULTS	8
FCC §1.1310 & §2.1093- RF EXPOSURE	9
APPLICABLE STANDARD	9
TEST RESULT	9
FCC §2.1047 - MODULATION CHARACTERISTIC	10
FCC § 2.1046, § 22.913 (A) & § 24.232 (C) - RF OUTPUT POWER.....	11
APPLICABLE STANDARD	11
TEST PROCEDURE	11
TEST EQUIPMENT LIST AND DETAILS.....	15
TEST DATA	15
FCC §2.1049, §22.917, §22.905 & §24.238 - OCCUPIED BANDWIDTH.....	19
APPLICABLE STANDARD	19
TEST PROCEDURE	19
TEST EQUIPMENT LIST AND DETAILS.....	19
TEST DATA	19
FCC §2.1051, §22.917(A) & §24.238(A) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS	26
APPLICABLE STANDARD	26
TEST PROCEDURE	26
TEST EQUIPMENT LIST AND DETAILS.....	26
TEST DATA	26
FCC §2.1053, §22.917 & §24.238 - SPURIOUS RADIATED EMISSIONS	31
APPLICABLE STANDARD	31
TEST PROCEDURE	31
TEST EQUIPMENT LIST AND DETAILS.....	32
TEST DATA	32
FCC §22.917(A) & §24.238(A)- BAND EDGES.....	38
APPLICABLE STANDARD	38
TEST PROCEDURE	38
TEST EQUIPMENT LIST AND DETAILS.....	38
TEST DATA	38

FCC §2.1055, §22.355 & §24.235 - FREQUENCY STABILITY42
APPLICABLE STANDARD42
TEST PROCEDURE42
TEST EQUIPMENT LIST AND DETAILS.....43
TEST DATA43

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:	Ram 9
EUT Model:	E900
Operation modes:	GSM Voice, GPRS Data WCDMA(R99 (Voice/Data), HSDPA/HSUPA/DC-HSPA)
Operation Frequency:	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)
Modulation Type:	GMSK,BPSK,QPSK,16QAM
Antenna Gain▲:	GSM850/WCDMA B5: -0.51 dBi(-2.66 dBd) PCS1900/WCDMA B2: -0.45 dBi
Rated Input Voltage:	DC 3.7 V from Battery or DC 5V from Adapter
Adapter Information	Model: PMC43
	Input: 100-240Vac 50/60Hz
	Output: 5.0Vdc 1000mA
Serial Number:	RDG201217021-RF-S1
EUT Received Date:	2020.12.17
EUT Received Status:	Good

Objective

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

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

Related Submittal(s)/Grant(s)

FCC Part 15C DTS submissions with FCC ID: 2AG4WE900

FCC Part 15C DSS submissions with FCC ID: 2AG4WE900

FCC Part 15B JBP submissions with FCC ID: 2AG4WE900

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 22, Part 24

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	±3.62 dB
Unwanted Emissions, conducted	±2.47 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 1st 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/WCDMA Bands, 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

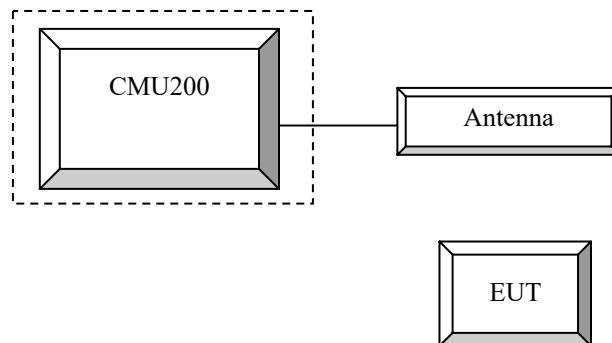
Equipment Modifications

No modification was made to the EUT.

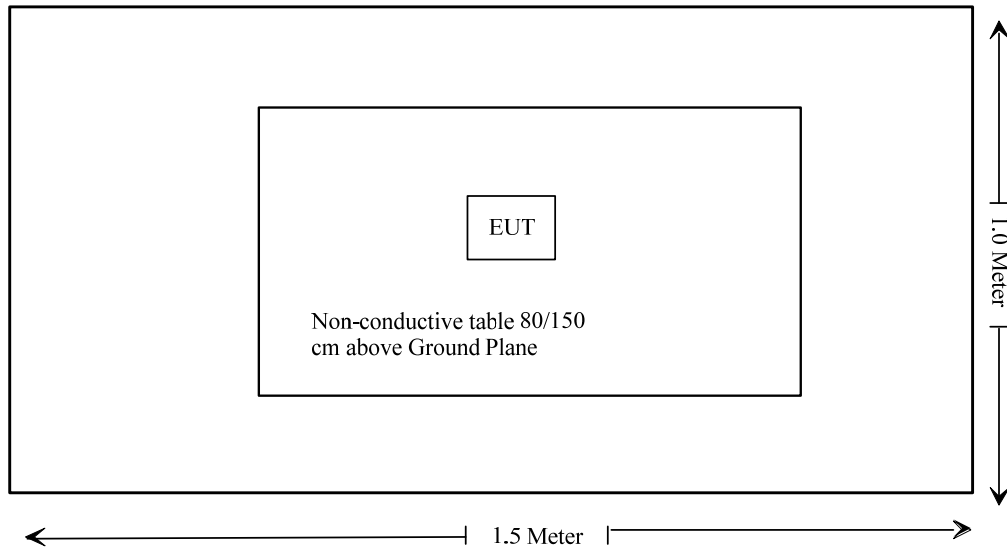
Support Equipment List and Details

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

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

FCC §1.1310 & §2.1093- RF EXPOSURE

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliance, please refer to the SAR report: RDG201217021-20.

FCC §2.1047 - MODULATION CHARACTERISTIC

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).

WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	β_c / β_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			
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	β_d (SF)	64			
	β_c / β_d	2/15	12/15	15/8	15/4
	β_{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.

	Mode	HSUPA	HSUPA	HSUPA	HSUPA	HSUPA
	Subset	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2kbps RMC				
	HSDPA FRC	H-Set1				
	HSUPA Test	HSUPA Loopback				
	Power Control Algorithm	Algorithm2				
	β_c	11/15	6/15	15/15	2/15	15/15
	β_d	15/15	15/15	9/15	15/15	0
	β_{ec}	209/225	12/15	30/15	2/15	5/15
	β_c / β_d	11/15	6/15	15/9	2/15	-
	β_{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	
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				
HSUPA Specific Settings	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	β_c (Note3)	β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{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	β_{ed1} : 30/15 β_{ed2} : 30/15	β_{ed3} : 24/15 β_{ed4} : 24/15	3.5	2.5	14	105	105
<p>Note 1: $\Delta_{ACK}, \Delta_{NACK}$ and $\Delta_{CQI} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$.</p> <p>Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).</p> <p>Note 3: DPDCH is not configured, therefore the β_c is set to 1 and $\beta_d = 0$ by default.</p> <p>Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.</p> <p>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.</p>											

DC-HSDPA

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

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
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	2020-09-12	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**

Temperature:	22.1°C
Relative Humidity:	37%
ATM Pressure:	101.2kPa
Tester:	Rita Huang
Test Date:	2021-01-07

Test Result: Compliance

GSM/GPRS**Conducted Output Power:**

Band	Channel No.	Conducted Peak Output Power (dBm)				
		GSM	GPRS 1 uplink slot	GPRS 2 uplink slot	GPRS 3 uplink slot	GPRS 4 uplink slot
Cellular	128	32.1	32.02	31.38	29.59	28.41
	190	32.1	32.09	31.44	29.61	28.38
	251	32.2	32.16	31.53	29.67	28.43
PCS	512	29.3	29.33	28.88	28.22	26.52
	661	29.2	29.22	28.69	27.83	25.88
	810	29.2	29.25	28.65	27.49	25.43

ERP/EIRP

Band	Mode	Channel	Conducted Power	Antenna Gain	Cable Loss	Result	Limit
			(dBm)	(dBi/dBd)	(dB)	(dBm)	(dBm)
Cellular	GSM	Low	32.10	-2.66	0.2	29.24	38.45
		Middle	32.10	-2.66	0.2	29.24	38.45
		High	32.20	-2.66	0.2	29.34	38.45
PCS	GSM	Low	29.33	-0.45	0.4	28.48	33.00
		Middle	29.22	-0.45	0.4	28.37	33.00
		High	29.25	-0.45	0.4	28.40	33.00

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	21.86	2.61	21.45	2.58	21.73	2.52
HSDPA	1	20.72	2.96	20.41	2.81	20.77	2.96
	2	20.27	2.94	20.20	2.83	20.41	3.01
	3	19.88	3.06	19.81	2.72	20.17	2.71
	4	19.55	2.79	19.63	2.78	19.75	2.88
HSUPA	1	20.79	3.01	20.48	2.70	20.81	3.33
	2	20.55	2.93	20.24	2.95	20.66	3.60
	3	20.25	3.19	19.88	3.36	20.48	3.59
	4	19.86	2.60	19.70	3.17	20.18	2.64
	5	19.38	3.02	19.52	2.80	19.97	2.86
DC-HSDPA	1	20.72	3.53	20.42	3.42	20.76	3.02
	2	20.42	3.14	20.18	2.63	20.55	2.83
	3	20.27	3.43	20.00	3.21	20.28	3.02
	4	20.06	3.31	19.52	3.28	19.92	3.09
HSPA+ (16QAM)	1	19.67	2.74	19.85	3.40	19.77	3.49

EIRP:

Channel	Conducted Power (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Result (dBm)	Limit (dBm)
Low	21.86	-0.45	0.4	21.01	33
Middle	21.45	-0.45	0.4	20.60	33
High	21.73	-0.45	0.4	20.88	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	22.67	3.01	22.59	2.96	22.51	3.01
HSDPA	1	21.73	3.28	21.52	3.59	21.61	3.16
	2	21.52	2.87	21.10	3.16	21.16	3.04
	3	21.16	2.93	20.95	3.19	20.95	2.97
	4	20.95	3.34	20.83	3.16	20.56	3.31
HSUPA	1	21.75	3.07	21.56	2.96	21.63	3.19
	2	21.48	3.52	21.35	2.92	21.24	2.88
	3	21.27	2.97	21.05	2.89	21.12	2.92
	4	21.06	3.57	20.69	2.72	20.70	3.25
	5	20.76	3.02	20.48	3.18	20.43	2.72
DC-HSDPA	1	21.68	3.05	21.51	2.84	21.56	2.85
	2	21.23	3.02	21.15	2.64	21.44	3.50
	3	21.08	3.56	21.00	2.62	21.17	3.55
	4	20.93	3.14	20.58	3.31	20.96	3.11
HSPA+ (16QAM)	1	20.95	3.27	20.68	3.34	20.72	2.86

ERP:

Channel	Conducted Power	Antenna Gain	Cable Loss	Result	Limit
	(dBm)	(dBd)	(dB)	(dBm)	(dBm)
Low	22.67	-2.66	0.2	19.81	38.45
Middle	22.59	-2.66	0.2	19.73	38.45
High	22.51	-2.66	0.2	19.65	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

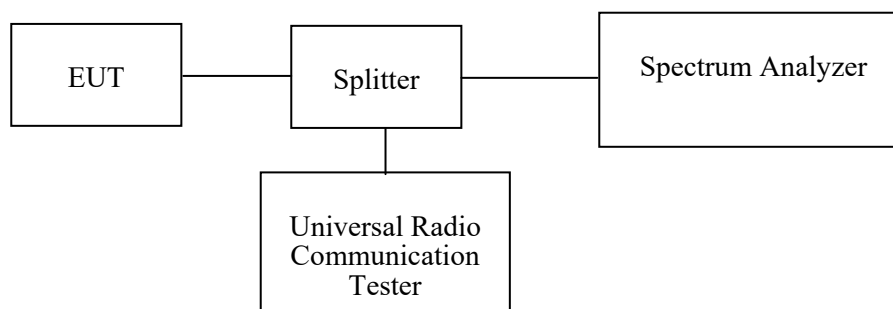
FCC §2.1049, §22.917, §22.905 & §24.238 - OCCUPIED BANDWIDTH**Applicable Standard**

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	101474	2020-07-07	2021-07-07
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	Two-way Splitter	ODP-1-6-2S	OE0120142	Each time	N/A
Unknown	Attenuator	UNAT-3+	15529	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**

Temperature:	22.1°C
Relative Humidity:	37%
ATM Pressure:	101.2kPa
Tester:	Rita Huang
Test Date:	2021-01-07

Test Mode: Transmitting

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

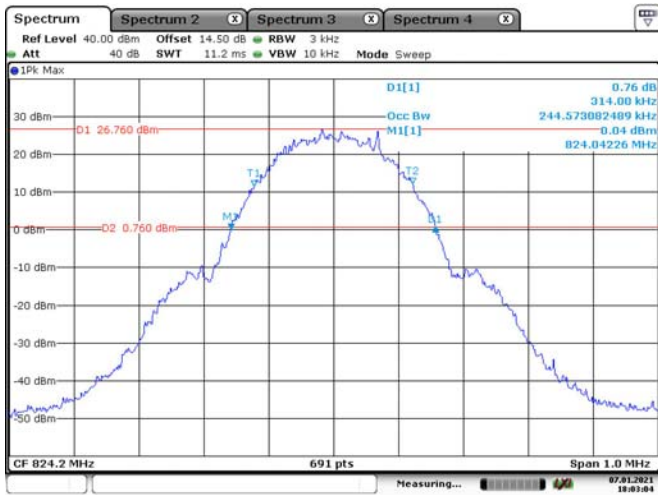
GSM:

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	0.245	0.246	0.314	0.313	0.321
PCS	GSM	0.246	0.245	0.242	0.318	0.316	0.314

WCDMA:

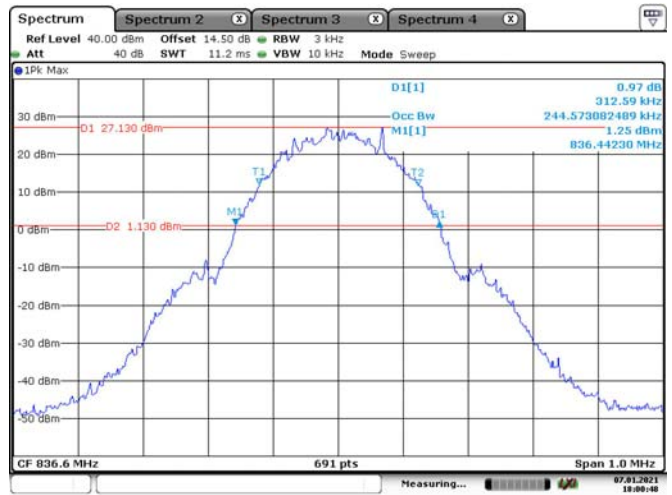
Band	Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
		Low Channel	Middle Channel	High Channel	Low Channel	Middle Channel	High Channel
WCDMA Band 2	Rel 99	4.168	4.182	4.197	4.703	4.718	4.732
	HSDPA	4.168	4.182	4.182	4.703	4.718	4.732
	HSUPA	4.168	4.197	4.182	4.703	4.718	4.718
WCDMA Band 5	Rel 99	4.168	4.168	4.168	4.689	4.689	4.703
	HSDPA	4.168	4.168	4.168	4.689	4.689	4.703
	HSUPA	4.168	4.168	4.153	4.689	4.689	4.703

Cellular 850 Band, GSM, Low Channel



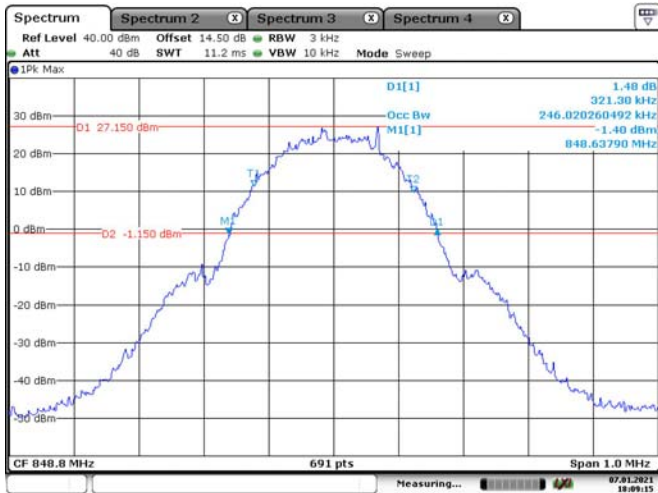
Date: 7, JAN, 2021 18:03:04

Cellular 850 Band, GSM, Middle Channel



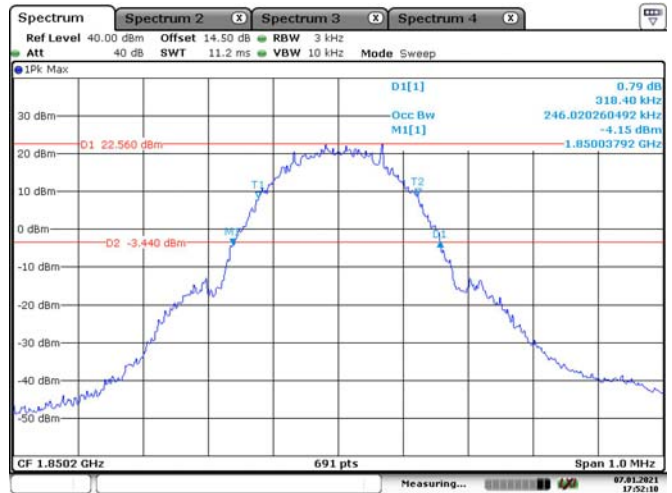
Date: 7, JAN, 2021 18:00:49

Cellular 850 Band, GSM, High Channel



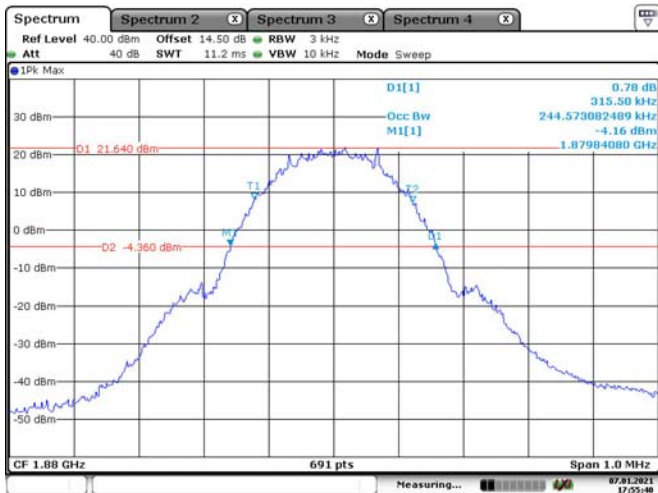
Date: 7, JAN, 2021 18:09:16

PCS 1900 Band, GSM, Low Channel



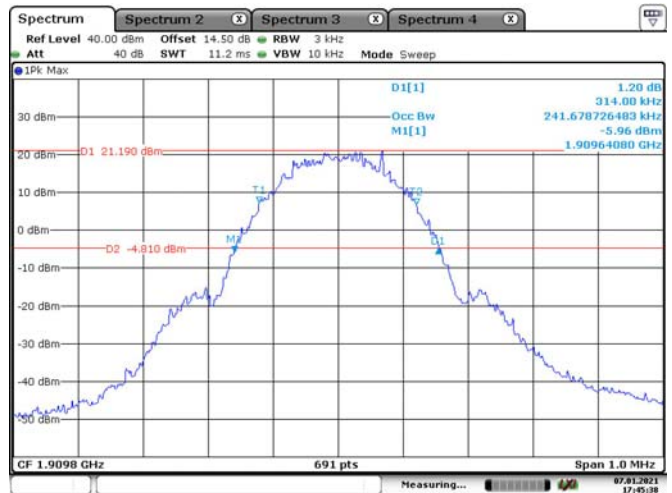
Date: 7, JAN, 2021 17:52:10

PCS 1900 Band, GSM, Middle Channel



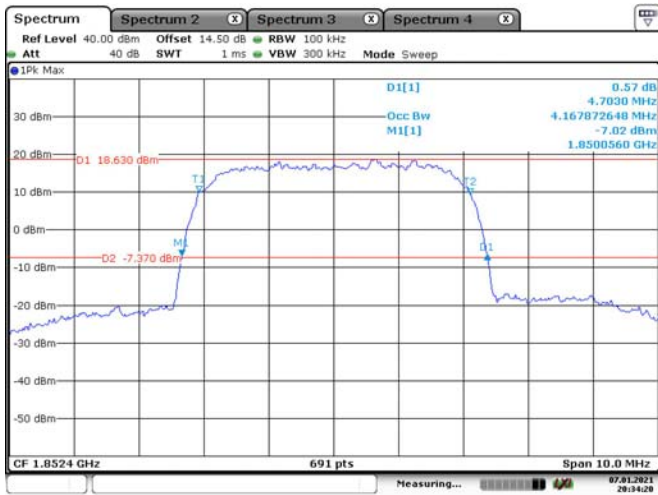
Date: 7, JAN, 2021 17:55:41

PCS 1900 Band, GSM, High Channel

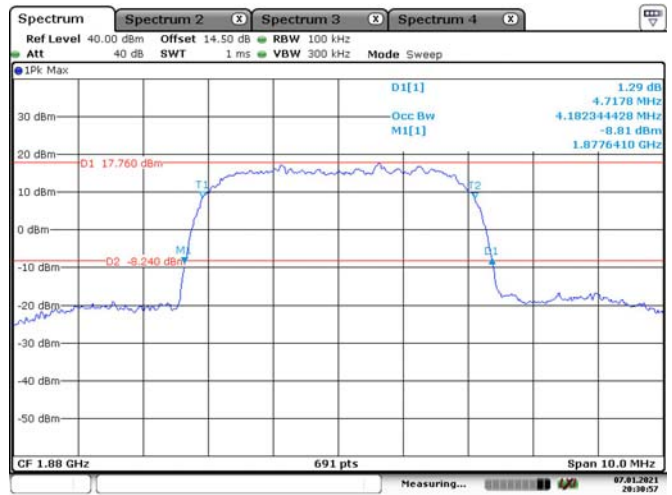


Date: 7, JAN, 2021 17:45:38

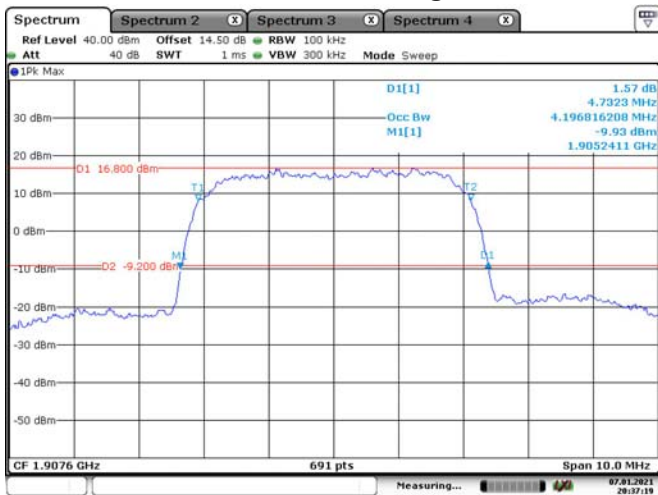
WCDMA Band II, Rel99, Low Channel



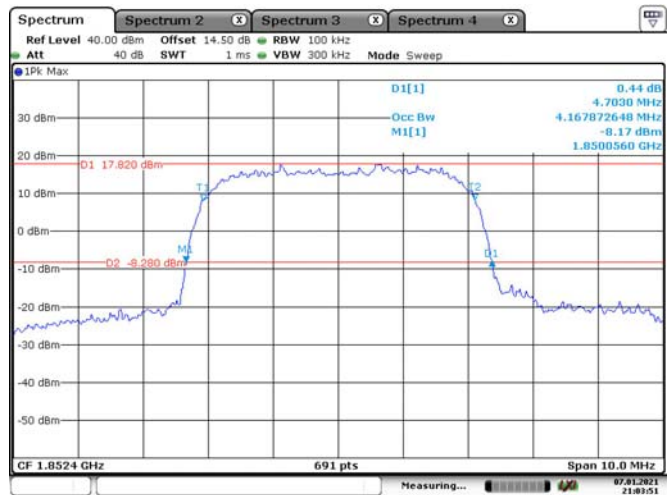
WCDMA Band II, Rel99, Middle Channel



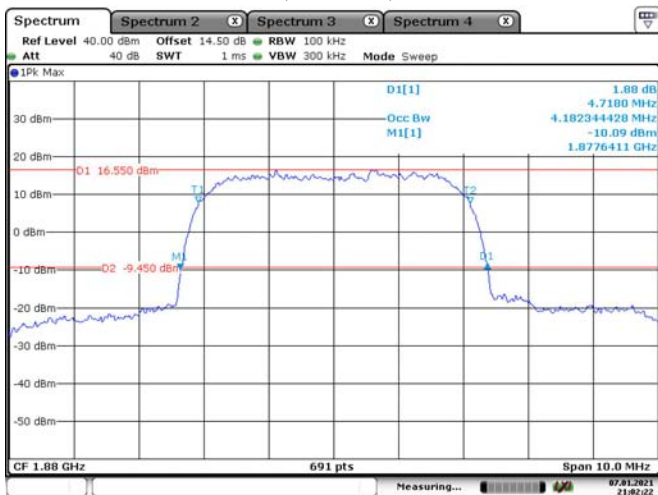
WCDMA Band II, Rel99, High Channel



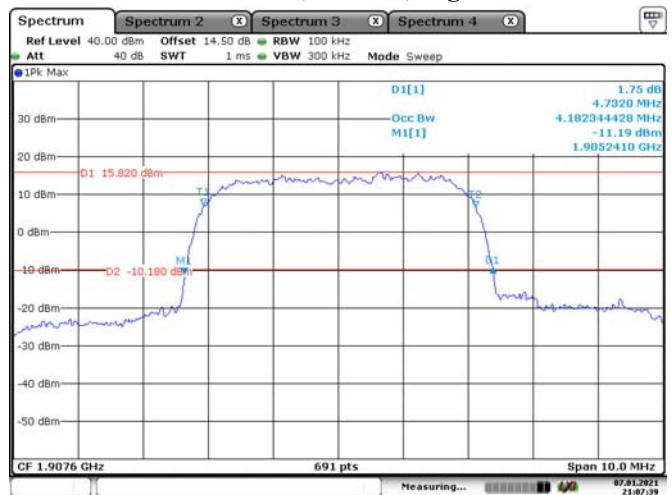
WCDMA Band II, HSDPA, Low Channel



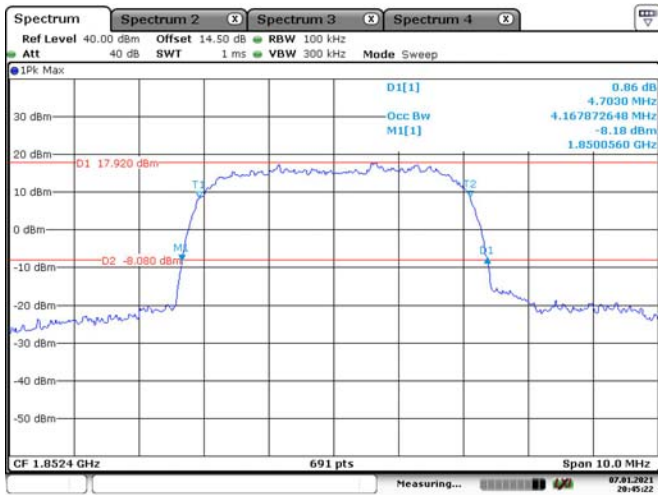
WCDMA Band II, HSDPA, Middle Channel



WCDMA Band II, HSDPA, High Channel

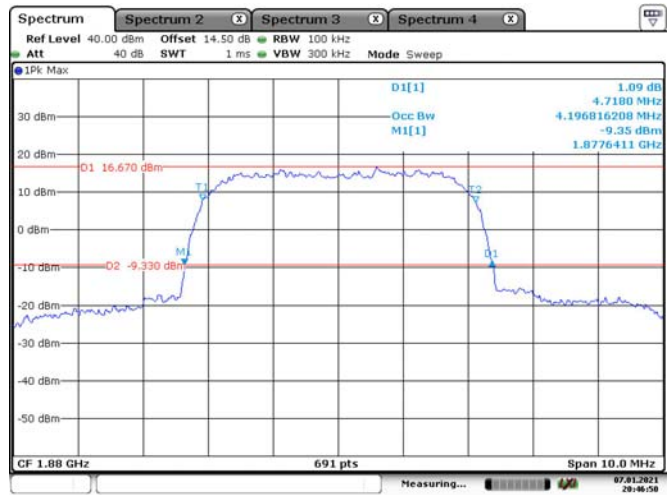


WCDMA Band II, HSUPA, Low Channel



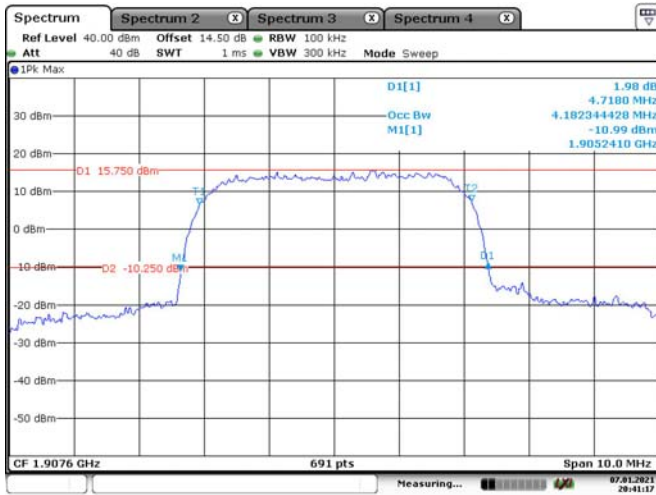
Date: 7.JAN.2021 20:45:23

WCDMA Band II, HSUPA, Middle Channel



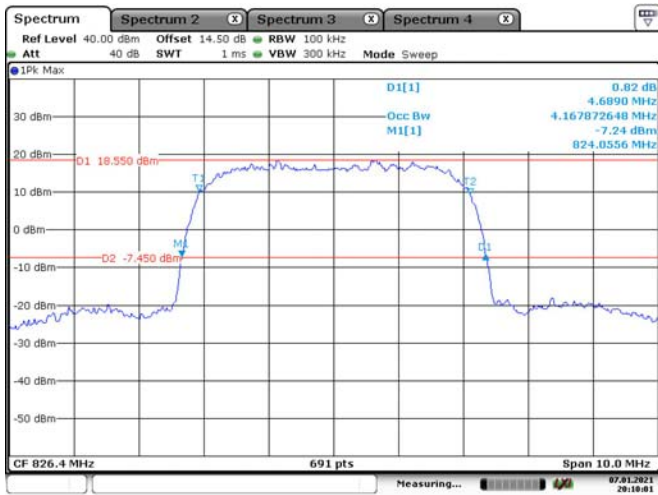
Date: 7.JAN.2021 20:46:51

WCDMA Band II, HSUPA, High Channel

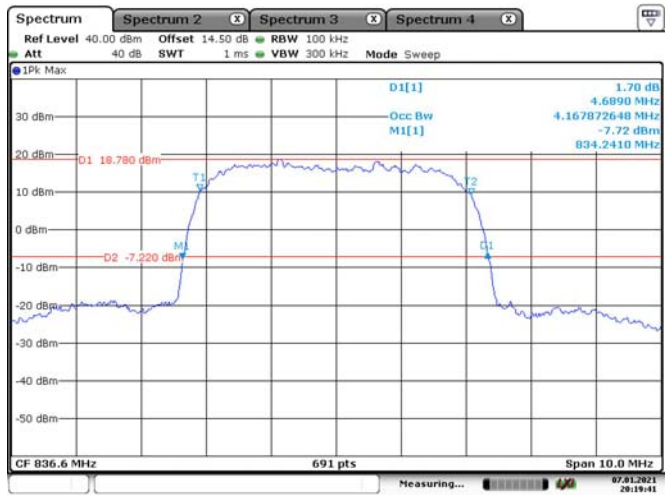


Date: 7.JAN.2021 20:41:18

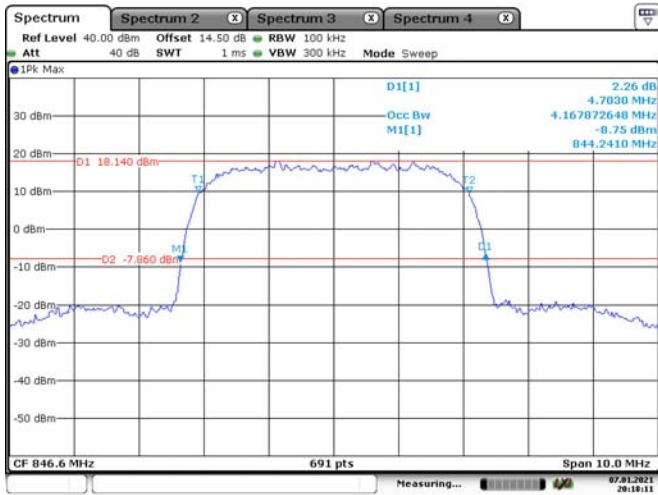
WCDMA Band V, Rel99, Low Channel



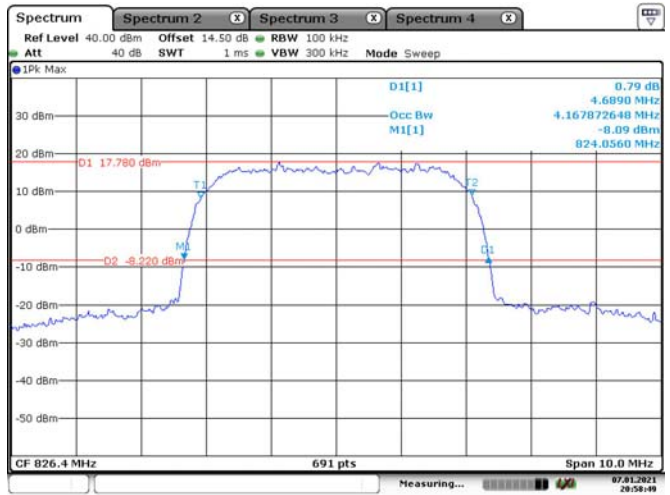
WCDMA Band V, Rel99, Middle Channel



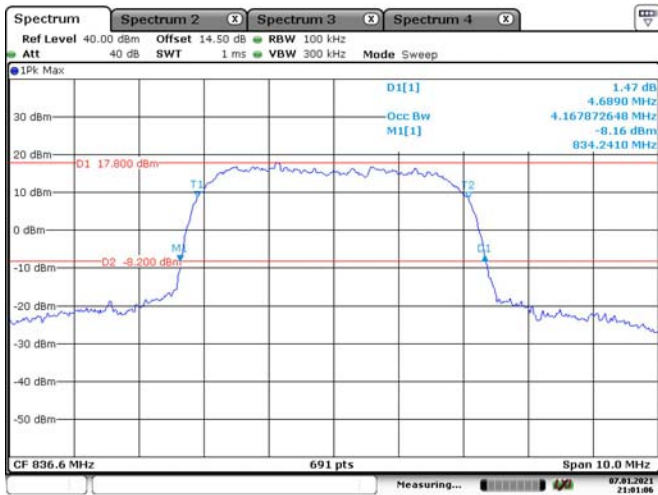
WCDMA Band V, Rel99, High Channel



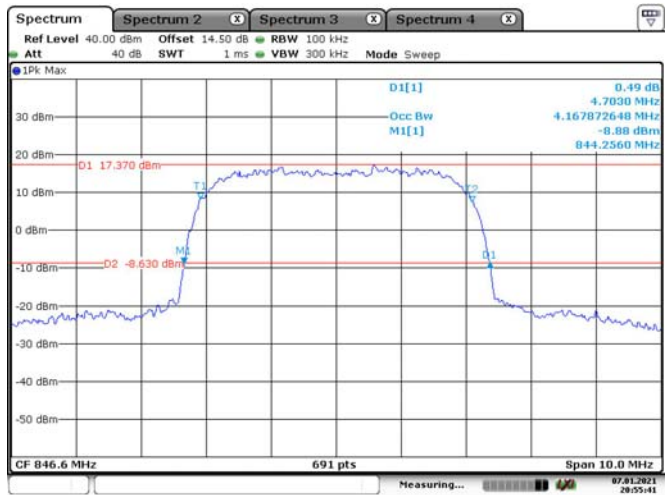
WCDMA Band V, HSDPA, Low Channel



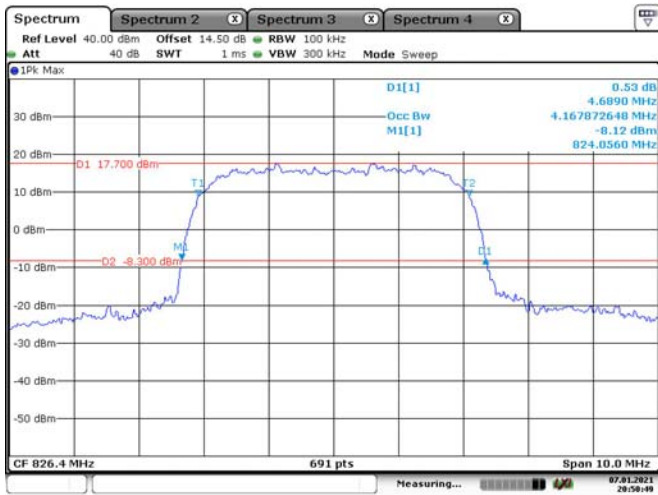
WCDMA Band V, HSDPA, Middle Channel



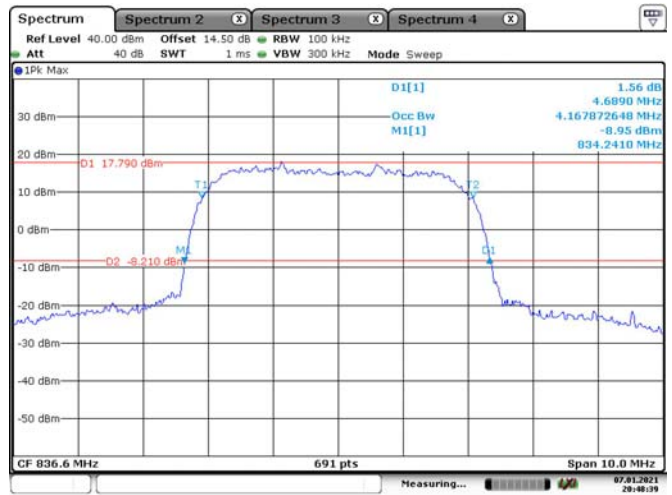
WCDMA Band V, HSDPA, High Channel



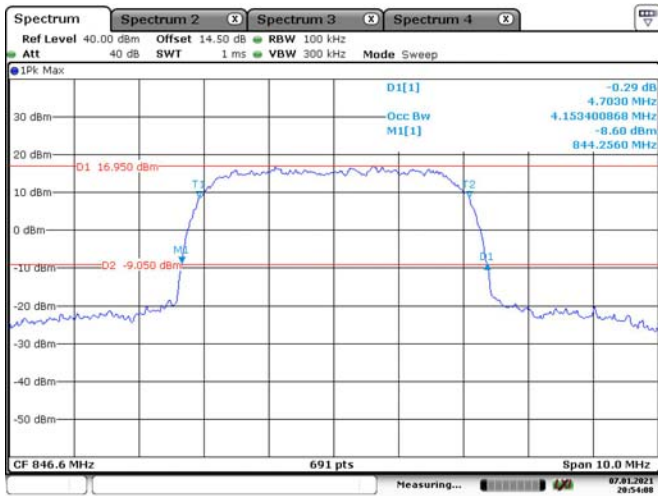
WCDMA Band V, HSUPA, Low Channel



WCDMA Band V, HSUPA, Middle Channel



WCDMA Band V, HSUPA, High Channel



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

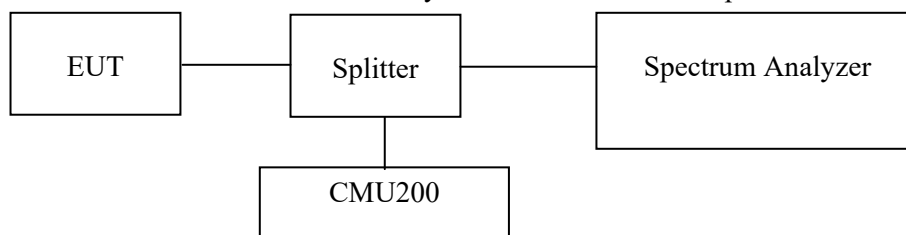
Applicable Standard

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 10th harmonic.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101474	2020-07-07	2021-07-07
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	Two-way Splitter	ODP-1-6-2S	OE0120142	Each time	N/A
Unknown	Attenuator	UNAT-3+	15529	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

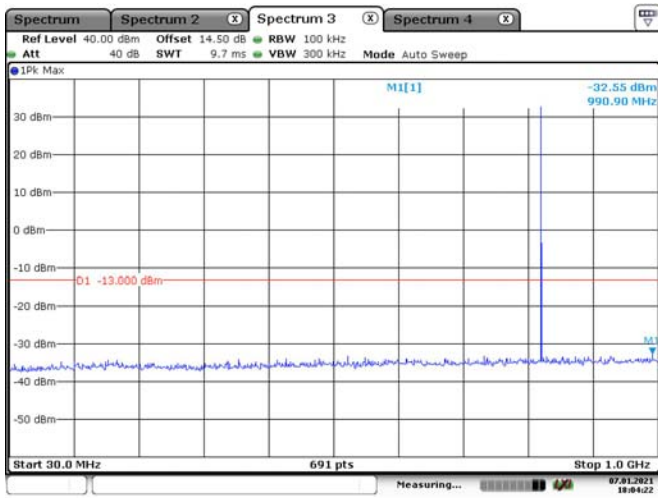
Environmental Conditions

Temperature:	22.1°C
Relative Humidity:	37%
ATM Pressure:	101.2kPa
Tester:	Rita Huang
Test Date:	2021-01-07

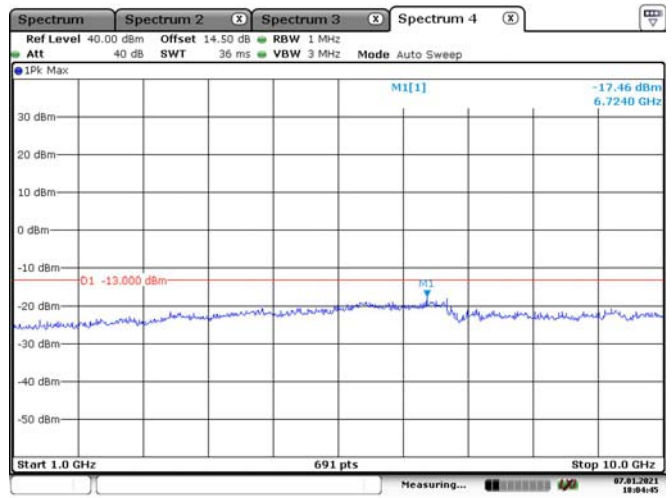
Test mode: Transmitting

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

Cellular 850 Band, GSM, Low Channel

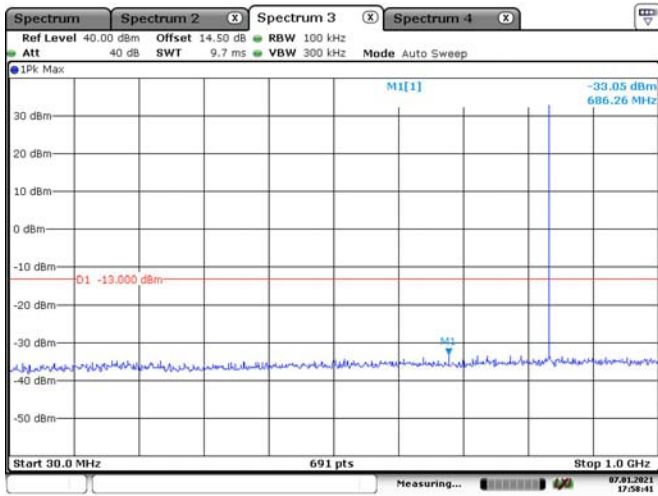


Date: 7, JAN, 2021 18:04:22

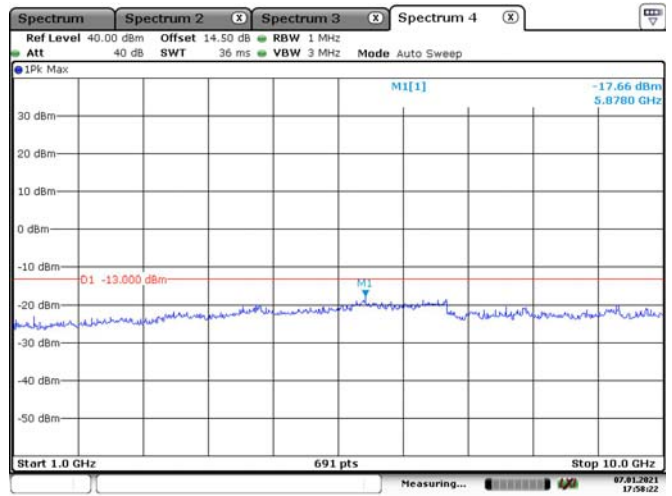


Date: 7, JAN, 2021 18:04:46

Cellular 850 Band, GSM, Middle Channel

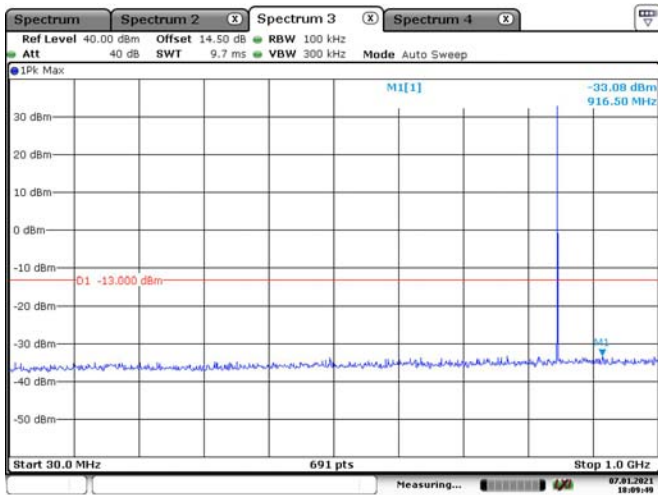


Date: 7, JAN, 2021 17:58:42

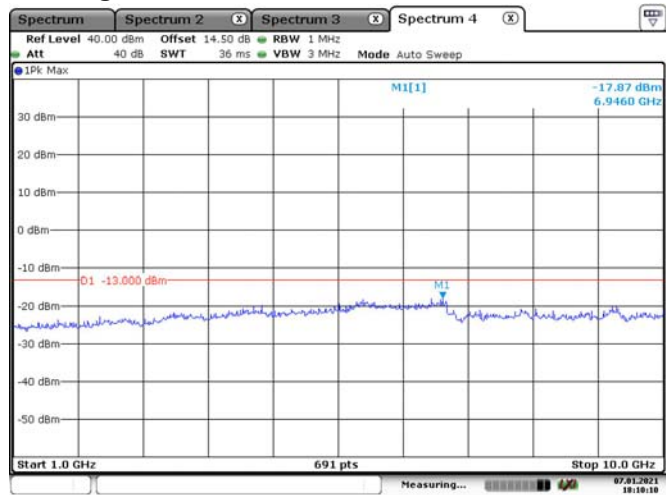


Date: 7, JAN, 2021 17:58:22

Cellular 850 Band, GSM, High Channel

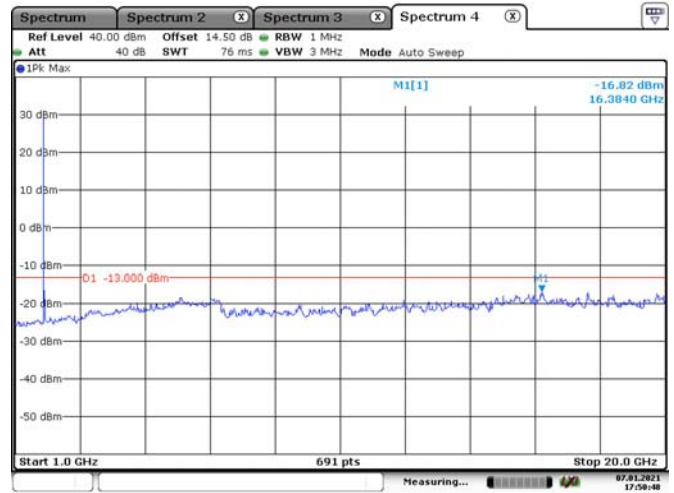
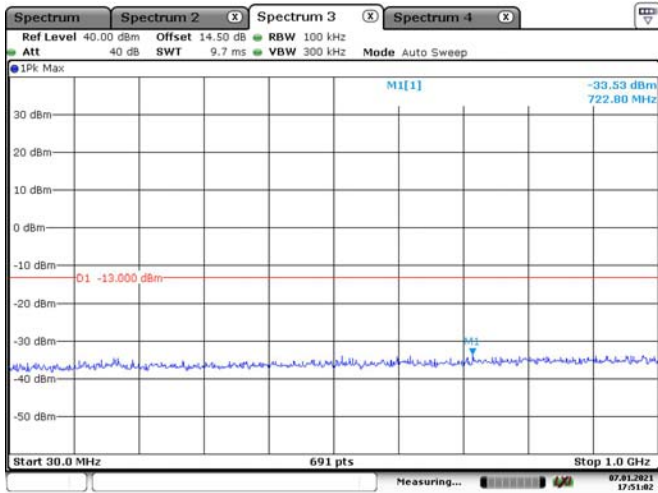


Date: 7, JAN, 2021 18:09:50

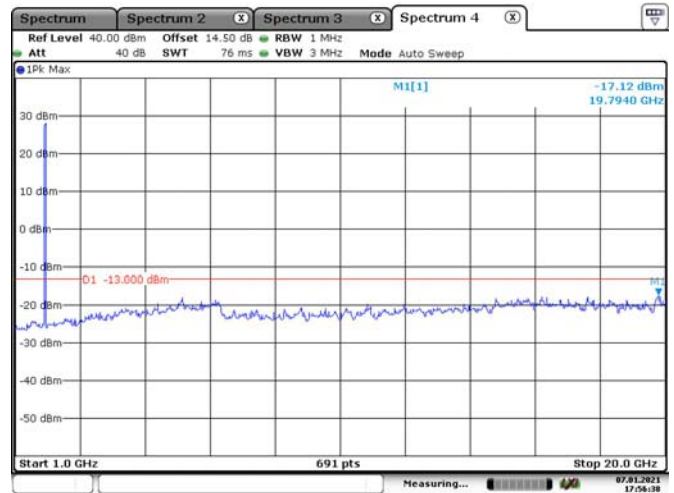
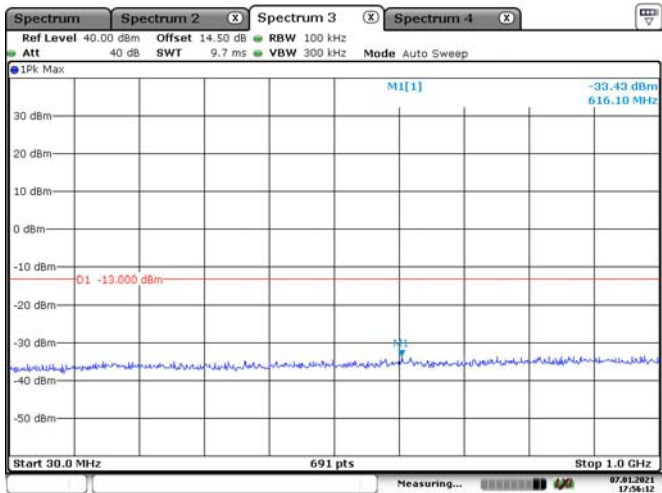


Date: 7, JAN, 2021 18:10:11

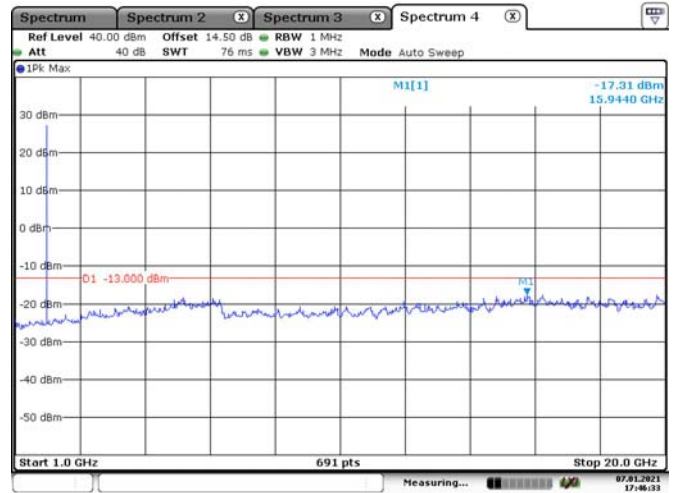
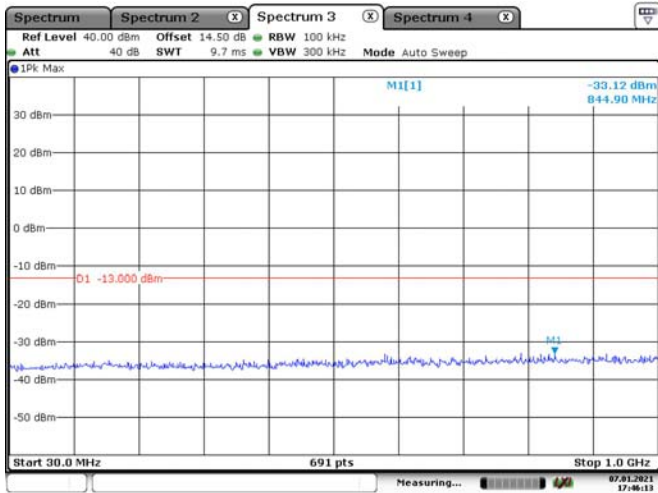
PCS 1900 Band, GSM, Low Channel



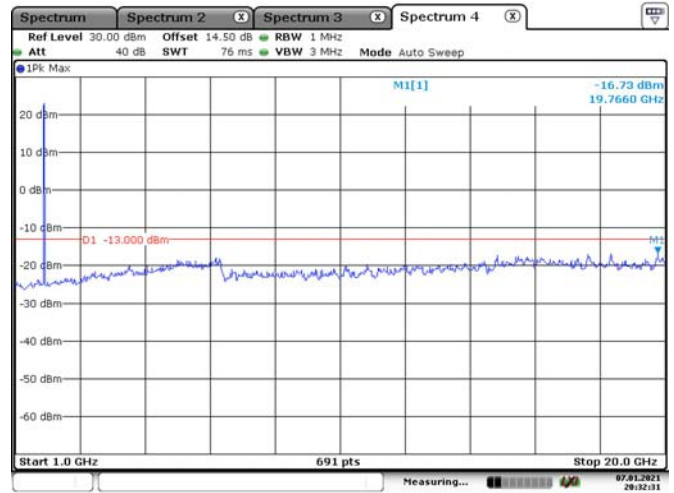
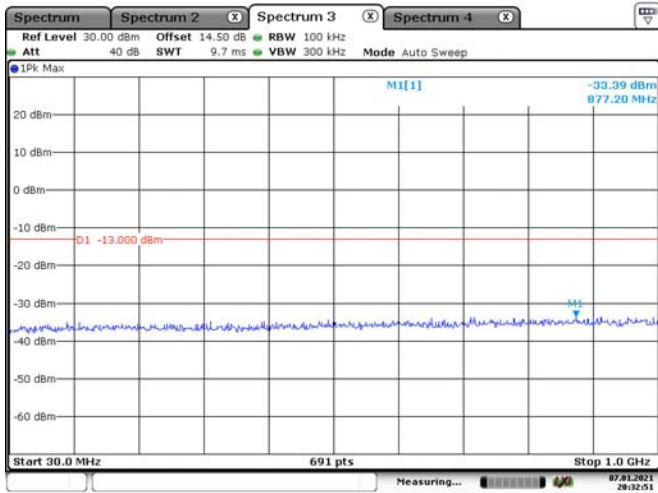
PCS 1900 Band, GSM, Middle Channel



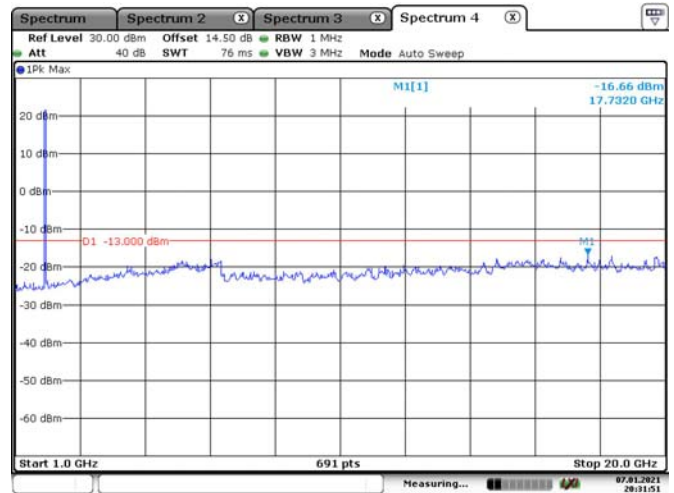
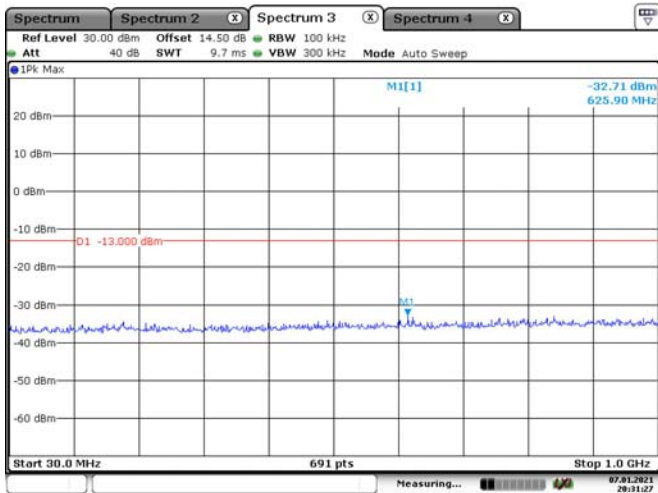
PCS 1900 Band, GSM, High Channel



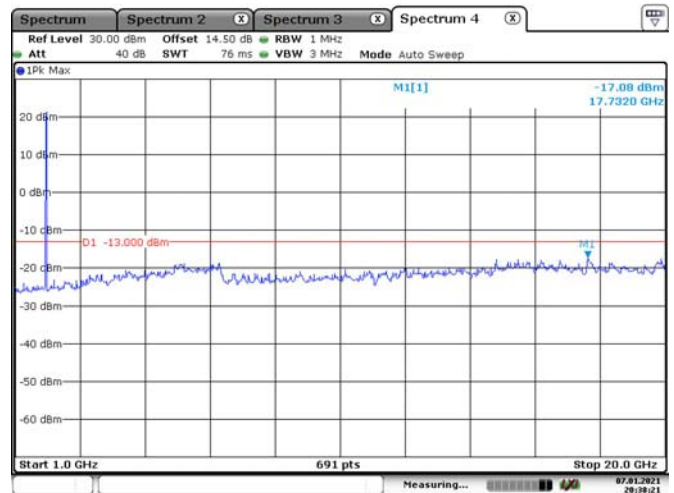
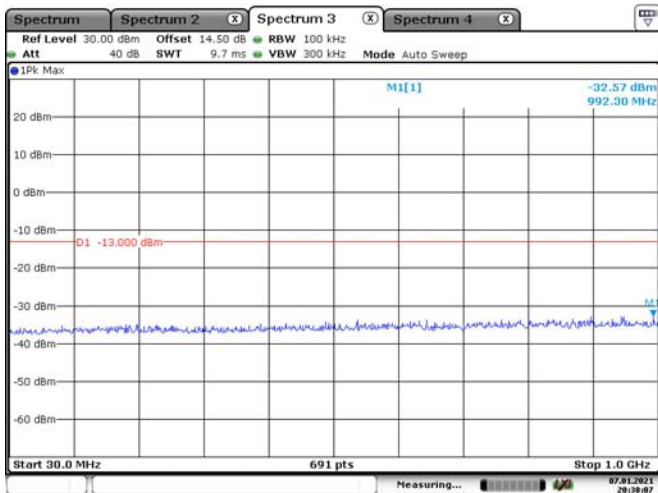
WCDMA Band II, R99, Low Channel



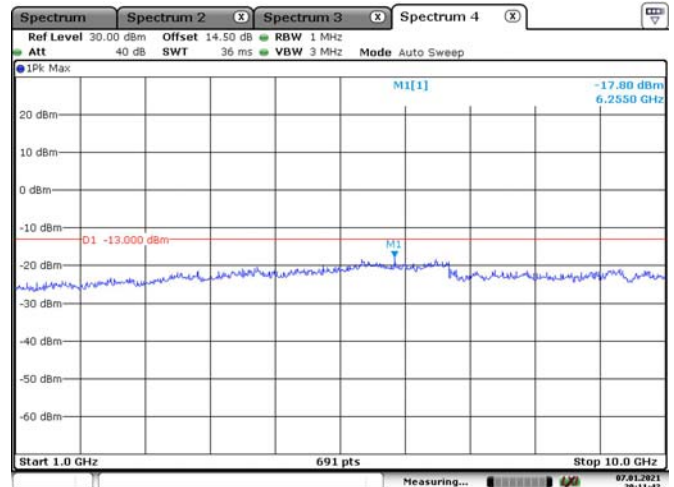
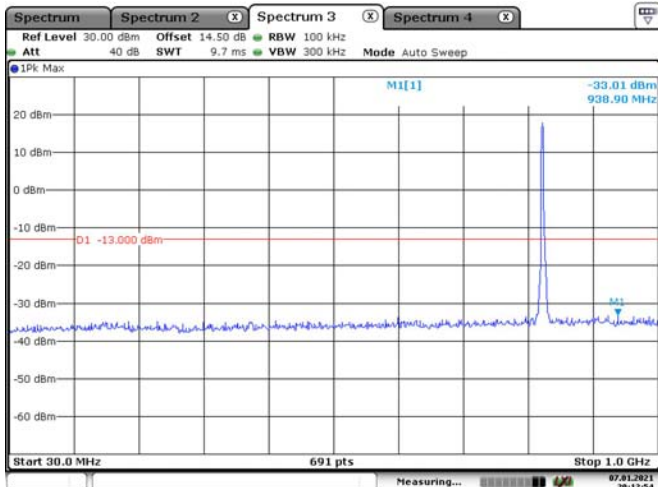
WCDMA Band II, R99, Middle Channel



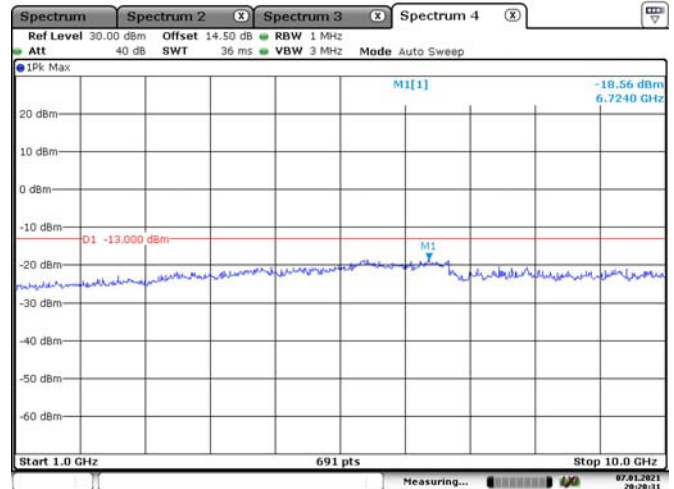
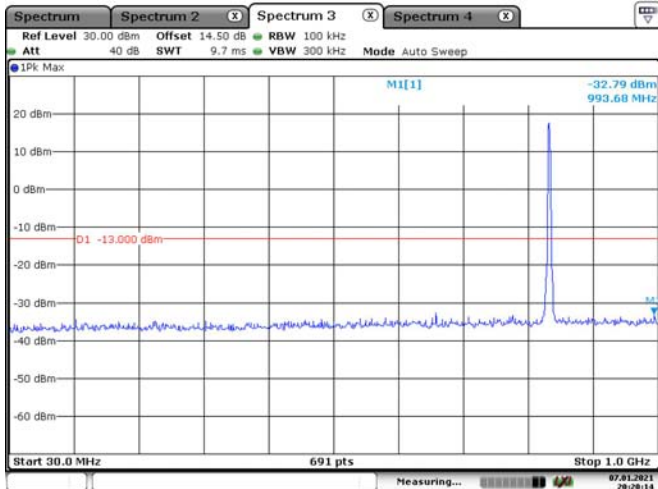
WCDMA Band II, R99, High Channel



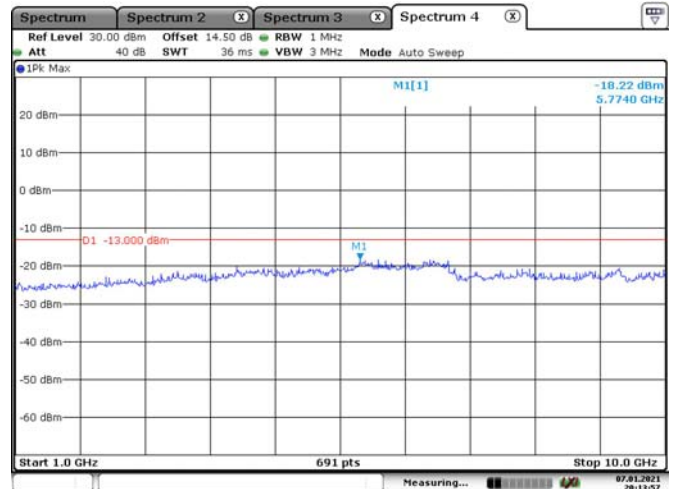
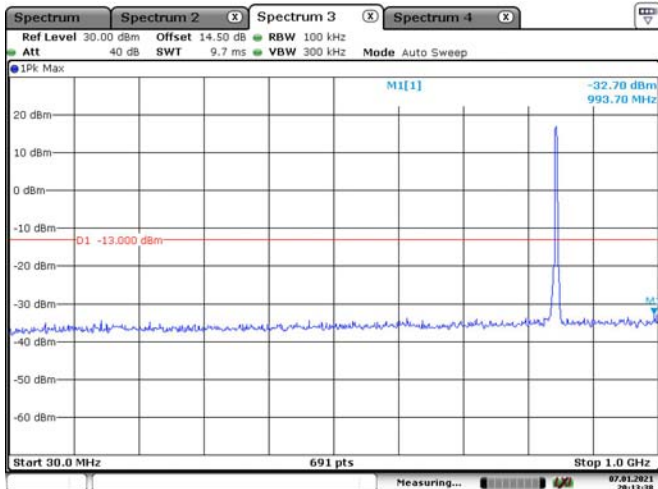
WCDMA Band V, R99, Low Channel



WCDMA Band V, R99, Middle Channel



WCDMA Band V, R99, High Channel



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

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	2020-09-12	2021-09-12
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2020-05-06	2021-05-06
HP	Amplifier	8447D	2727A05902	2020-09-05	2021-09-05
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2020-09-05	2021-09-05
Agilent	Signal Generator	E8247C	MY43321350	2020-12-09	2021-12-08
TDK RF	Horn Antenna	HRN-0118	130 084	2018-10-12	2021-10-12
R&S	Spectrum Analyzer	FSP 38	100478	2020-07-07	2021-07-07
HUBER+SUHNER	Coaxial Cable	SUCOFLEX 126EA	MY369/26/26EA	2020-09-25	2021-09-25
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2020-09-05	2021-09-05
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2020-09-05	2021-09-05
Agilent	Signal Generator	E8247C	MY43321350	2020-12-09	2021-12-08
Sinoscite	Band-stop filter	BSF1850-1910MS-0935V2	0935V2	2020-06-16	2021-06-16
Sinoscite	Band-stop filter	BSF824-862MS-1438-001	1438001	2020-06-16	2021-06-16
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-021304	2020-12-06	2021-12-05
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-011304	2020-12-06	2021-12-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2020-09-05	2021-09-05
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2020-06-27	2021-06-27

* **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
Temperature:	22.5°C	18.5°C
Relative Humidity:	51%	30%
ATM Pressure:	101.3kPa	101.5kPa
Tester:	Jalon Liu	Jalon Liu
Test Date:	2020-12-30	2021-01-02

Test Mode: Transmitting

Test Result: Compliance. Please refer to the following tables:

Cellular Band (PART 22H)

30 MHz-10 GHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB μ V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
Cellular 850 Band, GSM, Low Channel								
1648.40	H	71.05	-33.99	10.45	1.28	-24.82	-13.00	11.82
1648.40	V	72.14	-32.83	10.45	1.28	-23.66	-13.00	10.66
2472.60	H	67.04	-36.67	12.16	1.23	-25.74	-13.00	12.74
2472.60	V	66.33	-38.72	12.16	1.23	-27.79	-13.00	14.79
3296.80	H	54.45	-47.81	12.28	1.57	-37.10	-13.00	24.10
3296.80	V	61.01	-40.32	12.28	1.57	-29.61	-13.00	16.61
4121.00	H	50.80	-49.27	12.57	1.47	-38.17	-13.00	25.17
4121.00	V	55.65	-45.12	12.57	1.47	-34.02	-13.00	21.02
4945.20	H	42.51	-55.10	13.04	1.45	-43.51	-13.00	30.51
4945.20	V	46.60	-50.75	13.04	1.45	-39.16	-13.00	26.16
5769.40	H	44.92	-51.02	13.18	1.32	-39.16	-13.00	26.16
5769.40	V	40.61	-55.51	13.18	1.32	-43.65	-13.00	30.65
6593.60	H	45.65	-48.23	13.97	1.72	-35.98	-13.00	22.98
6593.60	V	46.30	-47.62	13.97	1.72	-35.37	-13.00	22.37
846.30	H	35.87	-62.08	0.00	0.99	-63.07	-13.00	50.07
875.80	V	48.57	-51.37	0.00	1.02	-52.39	-13.00	39.39
Cellular 850 Band, GSM, Middle Channel								
1673.20	H	70.91	-34.11	10.52	1.27	-24.86	-13.00	11.86
1673.20	V	72.60	-32.35	10.52	1.27	-23.10	-13.00	10.10
2509.80	H	65.27	-38.36	12.20	1.25	-27.41	-13.00	14.41
2509.80	V	63.37	-41.65	12.20	1.25	-30.70	-13.00	17.70
3346.40	H	54.12	-48.06	12.26	1.58	-37.38	-13.00	24.38
3346.40	V	55.62	-45.48	12.26	1.58	-34.80	-13.00	21.80
4183.00	H	48.59	-51.33	12.70	1.48	-40.11	-13.00	27.11
4183.00	V	52.18	-48.38	12.70	1.48	-37.16	-13.00	24.16
5019.60	H	43.14	-54.25	12.99	1.43	-42.69	-13.00	29.69
5019.60	V	46.57	-50.51	12.99	1.43	-38.95	-13.00	25.95
5856.20	H	46.64	-49.07	13.30	1.35	-37.12	-13.00	24.12
5856.20	V	42.46	-53.34	13.30	1.35	-41.39	-13.00	28.39
6692.80	H	45.00	-48.53	13.83	1.74	-36.44	-13.00	23.44
6692.80	V	41.36	-52.25	13.83	1.74	-40.16	-13.00	27.16
844.90	H	36.76	-61.21	0.00	0.98	-62.19	-13.00	49.19
875.80	V	48.27	-51.67	0.00	1.02	-52.69	-13.00	39.69

Cellular 850 Band, GSM, High Channel								
1697.60	H	66.99	-38.01	10.59	1.26	-28.68	-13.00	15.68
1697.60	V	74.54	-30.39	10.59	1.26	-21.06	-13.00	8.06
2546.40	H	61.42	-42.15	12.22	1.26	-31.19	-13.00	18.19
2546.40	V	61.17	-43.68	12.22	1.26	-32.72	-13.00	19.72
3395.20	H	55.67	-46.42	12.24	1.59	-35.77	-13.00	22.77
3395.20	V	50.19	-50.69	12.24	1.59	-40.04	-13.00	27.04
4244.00	H	49.49	-50.28	12.84	1.49	-38.93	-13.00	25.93
4244.00	V	51.31	-49.05	12.84	1.49	-37.70	-13.00	24.70
5092.80	H	42.50	-54.78	12.96	1.40	-43.22	-13.00	30.22
5092.80	V	46.11	-50.98	12.96	1.40	-39.42	-13.00	26.42
5941.60	H	46.22	-49.27	13.42	1.37	-37.22	-13.00	24.22
5941.60	V	42.65	-52.83	13.42	1.37	-40.78	-13.00	27.78
6790.40	H	47.07	-46.12	13.69	1.77	-34.20	-13.00	21.20
6790.40	V	43.43	-49.87	13.69	1.77	-37.95	-13.00	24.95
844.90	H	36.85	-61.12	0.00	0.98	-62.10	-13.00	49.10
875.80	V	48.20	-51.74	0.00	1.02	-52.76	-13.00	39.76

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

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB μ V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
PCS 1900 Band, GSM, Low Channel								
3700.40	H	56.88	-44.41	12.24	1.55	-33.72	-13.00	20.72
3700.40	V	56.10	-44.61	12.24	1.55	-33.92	-13.00	20.92
5550.60	H	50.24	-46.29	12.87	1.26	-34.68	-13.00	21.68
5550.60	V	44.84	-52.08	12.87	1.26	-40.47	-13.00	27.47
948.80	H	35.81	-59.30	0.00	0.90	-60.20	-13.00	47.20
960.00	V	39.53	-56.70	0.00	0.86	-57.56	-13.00	44.56
PCS 1900 Band, GSM, Middle Channel								
3760.00	H	58.81	-42.29	12.25	1.53	-31.57	-13.00	18.57
3760.00	V	57.40	-43.41	12.25	1.53	-32.69	-13.00	19.69
5640.00	H	48.60	-47.69	13.00	1.28	-35.97	-13.00	22.97
5640.00	V	41.95	-54.64	13.00	1.28	-42.92	-13.00	29.92
844.90	H	37.13	-60.84	0.00	0.98	-61.82	-13.00	48.82
910.90	V	39.97	-58.65	0.00	1.02	-59.67	-13.00	46.67
PCS 1900 Band, GSM, High Channel								
3819.60	H	58.93	-41.99	12.26	1.51	-31.24	-13.00	18.24
3819.60	V	57.67	-43.23	12.26	1.51	-32.48	-13.00	19.48
5640.00	H	47.98	-48.31	13.00	1.28	-36.59	-13.00	23.59
5640.00	V	41.68	-54.91	13.00	1.28	-43.19	-13.00	30.19
846.30	H	36.85	-61.10	0.00	0.99	-62.09	-13.00	49.09
871.60	V	39.80	-60.28	0.00	1.02	-61.30	-13.00	48.30

Cellular Band (PART 22H)

30 MHz-10 GHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB μ 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	54.76	-50.27	10.46	1.28	-41.09	-13.00	28.09
1652.80	V	59.51	-45.46	10.46	1.28	-36.28	-13.00	23.28
2479.20	H	42.30	-61.40	12.17	1.24	-50.47	-13.00	37.47
2479.20	V	41.62	-63.43	12.17	1.24	-52.50	-13.00	39.50
3305.60	H	52.49	-49.76	12.28	1.57	-39.05	-13.00	26.05
3305.60	V	54.43	-46.86	12.28	1.57	-36.15	-13.00	23.15
962.80	H	35.78	-58.75	0.00	0.86	-59.61	-13.00	46.61
844.90	V	38.41	-62.54	0.00	0.98	-63.52	-13.00	50.52
WCDMA Band 5 Frequency:836.6MHz								
1673.20	H	56.61	-48.41	10.52	1.27	-39.16	-13.00	26.16
1673.20	V	61.92	-43.03	10.52	1.27	-33.78	-13.00	20.78
2509.80	H	44.66	-58.97	12.20	1.25	-48.02	-13.00	35.02
2509.80	V	42.49	-62.53	12.20	1.25	-51.58	-13.00	38.58
3346.40	H	57.16	-45.02	12.26	1.58	-34.34	-13.00	21.34
3346.40	V	55.94	-45.16	12.26	1.58	-34.48	-13.00	21.48
844.90	H	37.26	-60.71	0.00	0.98	-61.69	-13.00	48.69
844.90	V	35.81	-65.14	0.00	0.98	-66.12	-13.00	53.12
WCDMA Band 5 Frequency:846.6MHz								
1693.20	H	58.58	-46.42	10.58	1.26	-37.10	-13.00	24.10
1693.20	V	58.82	-46.12	10.58	1.26	-36.80	-13.00	23.80
2539.80	H	42.11	-61.47	12.22	1.26	-50.51	-13.00	37.51
2539.80	V	44.66	-60.22	12.22	1.26	-49.26	-13.00	36.26
3386.40	H	55.51	-46.60	12.25	1.59	-35.94	-13.00	22.94
3386.40	V	55.78	-45.14	12.25	1.59	-34.48	-13.00	21.48
844.90	H	36.63	-61.34	0.00	0.98	-62.32	-13.00	49.32
844.90	V	36.16	-64.79	0.00	0.98	-65.77	-13.00	52.77

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

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB μ 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	60.08	-41.20	12.24	1.54	-30.50	-13.00	17.50
3704.80	V	53.37	-47.35	12.24	1.54	-36.65	-13.00	23.65
5557.20	H	46.50	-50.01	12.88	1.26	-38.39	-13.00	25.39
5557.20	V	53.89	-43.01	12.88	1.26	-31.39	-13.00	18.39
7409.60	H	49.58	-43.16	12.91	1.41	-31.66	-13.00	18.66
7409.60	V	51.72	-41.63	12.91	1.41	-30.13	-13.00	17.13
832.30	H	37.24	-60.92	0.00	0.97	-61.89	-13.00	48.89
943.10	V	39.00	-58.05	0.00	0.92	-58.97	-13.00	45.97
WCDMA Band II, Frequency:1880 MHz								
3760.00	H	61.26	-39.84	12.25	1.53	-29.12	-13.00	16.12
3760.00	V	56.73	-44.08	12.25	1.53	-33.36	-13.00	20.36
5640.00	H	50.36	-45.93	13.00	1.28	-34.21	-13.00	21.21
5640.00	V	58.00	-38.59	13.00	1.28	-26.87	-13.00	13.87
7520.00	H	51.20	-41.56	12.81	1.33	-30.08	-13.00	17.08
7520.00	V	51.80	-41.65	12.81	1.33	-30.17	-13.00	17.17
844.90	H	38.21	-59.76	0.00	0.98	-60.74	-13.00	47.74
940.30	V	39.32	-57.87	0.00	0.93	-58.80	-13.00	45.80
WCDMA Band II, Frequency:1907.6MHz								
3815.20	H	60.16	-40.77	12.26	1.51	-30.02	-13.00	17.02
3815.20	V	56.54	-44.35	12.26	1.51	-33.60	-13.00	20.60
5722.80	H	52.72	-43.35	13.11	1.31	-31.55	-13.00	18.55
5722.80	V	58.73	-37.56	13.11	1.31	-25.76	-13.00	12.76
7630.40	H	46.62	-45.91	12.85	1.42	-34.48	-13.00	21.48
7630.40	V	48.17	-45.03	12.85	1.42	-33.60	-13.00	20.60
920.70	H	35.80	-60.48	0.00	0.99	-61.47	-13.00	48.47
960.00	V	39.63	-56.60	0.00	0.86	-57.46	-13.00	44.46

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

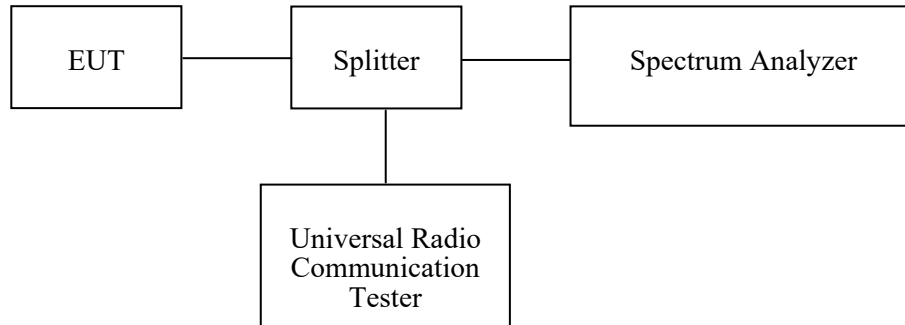
Applicable Standard

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	101474	2020-07-07	2021-07-07
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	Two-way Splitter	ODP-1-6-2S	OE0120142	Each time	N/A
Unknown	Attenuator	UNAT-3+	15529	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

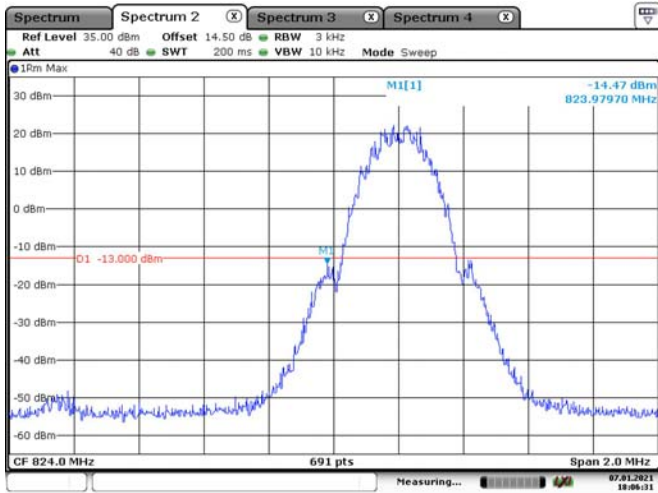
Environmental Conditions

Temperature:	22.1°C
Relative Humidity:	37%
ATM Pressure:	101.2kPa
Tester:	Rita Huang
Test Date:	2021-01-07

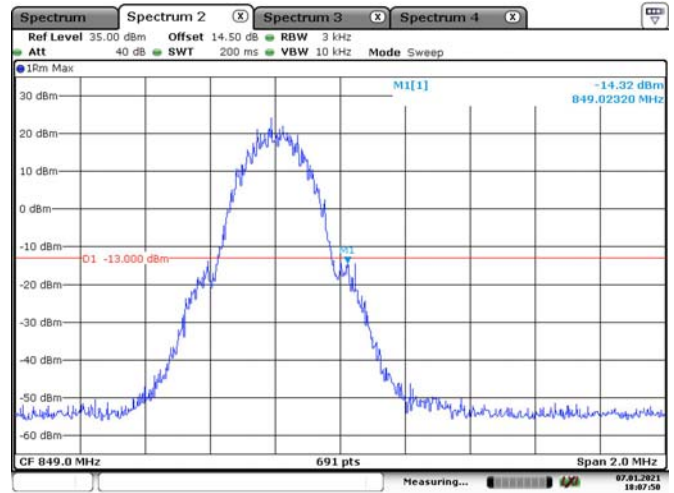
Test Mode: Transmitting

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

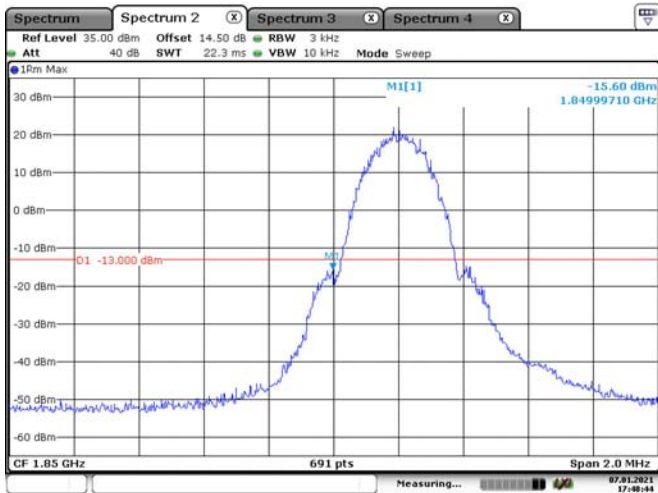
Cellular 850 Band, GSM, Left Band Edge



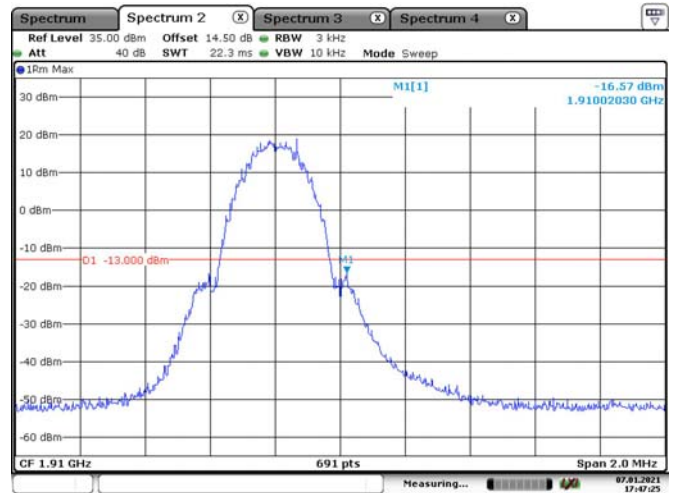
Cellular 850 Band, GSM, Right Band Edge



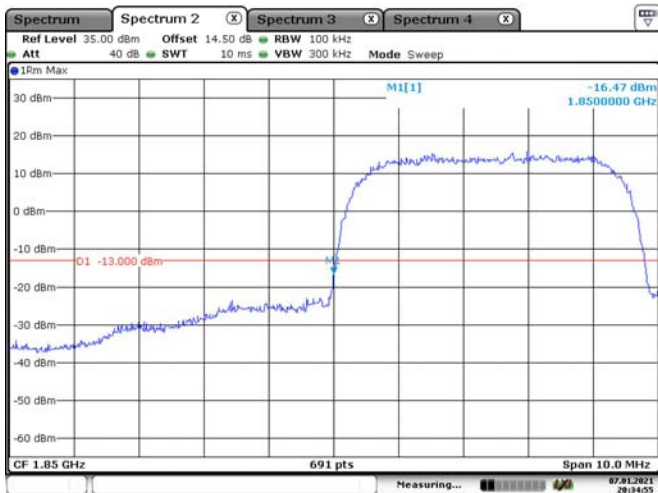
PCS 1900 Band, GSM, Left Band Edge



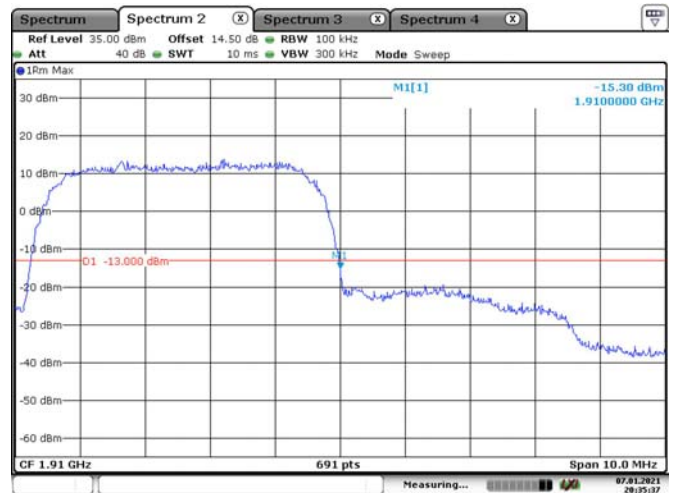
PCS 1900 Band, GSM, Right Band Edge



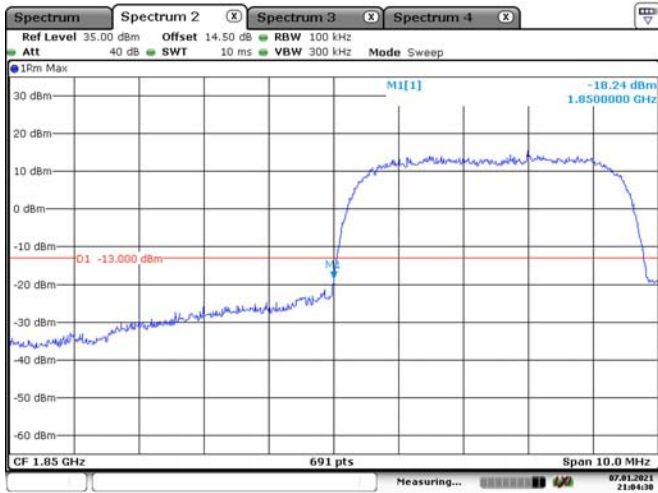
WCDMA Band II, Rel99, Left Band Edge



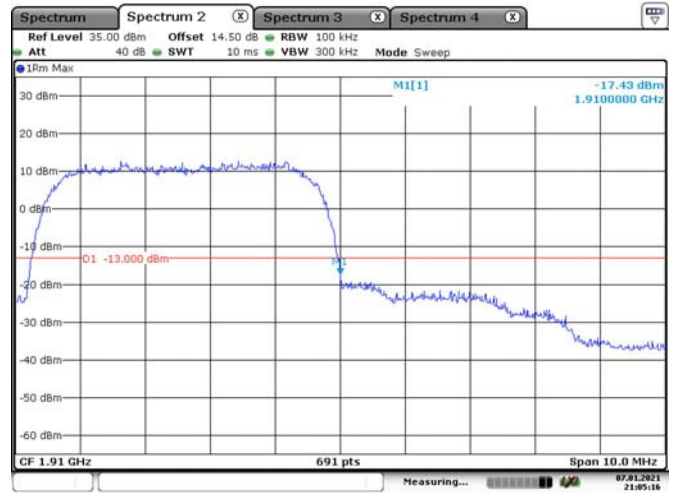
WCDMA Band II, Rel99, Right Band Edge



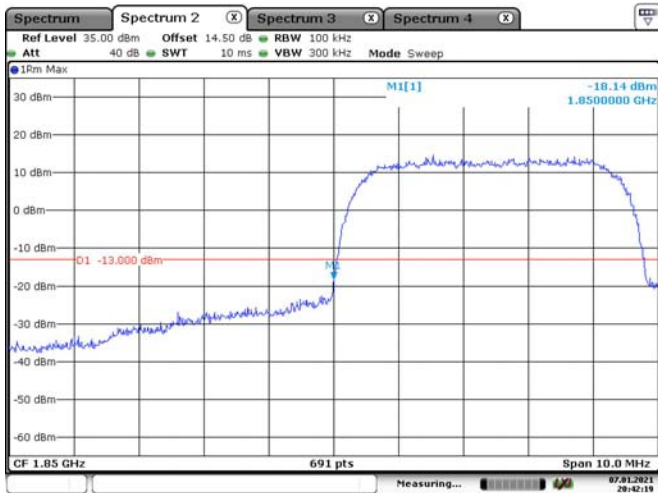
WCDMA Band II,HSDPA, Left Band Edge



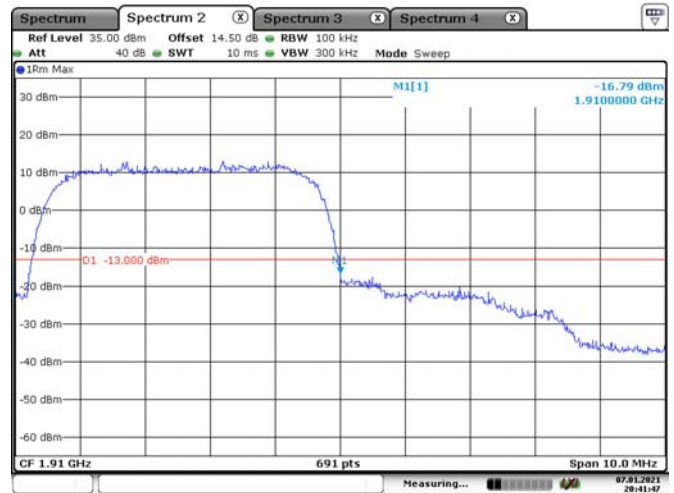
WCDMA Band II,HSDPA,Right Band Edge



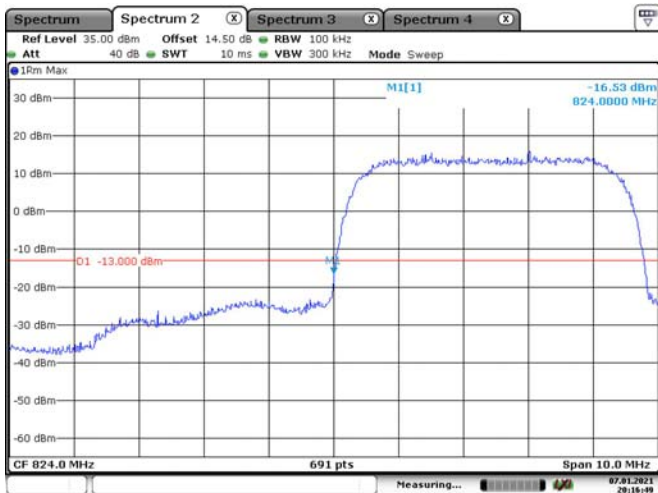
WCDMA Band II,HSUPA, Left Band Edge



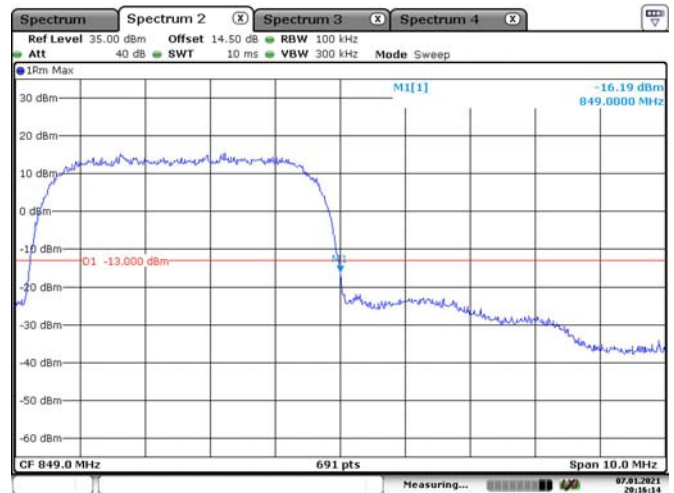
WCDMA Band II,HSUPA, Right Band Edge



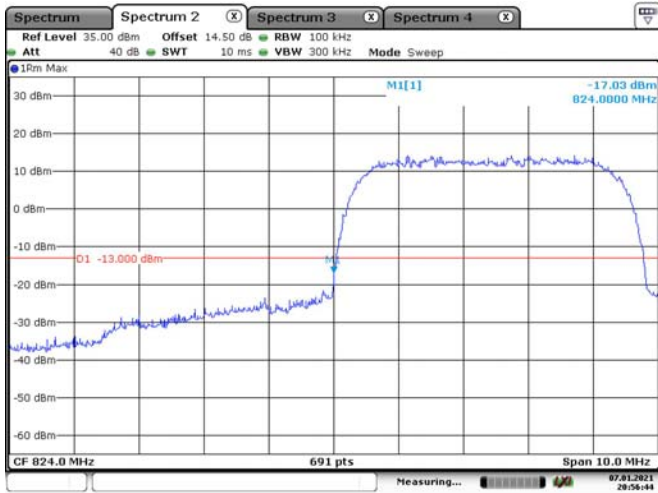
WCDMA Band V,Rel99, Left Band Edge



WCDMA Band V,Rel99, Right Band Edge

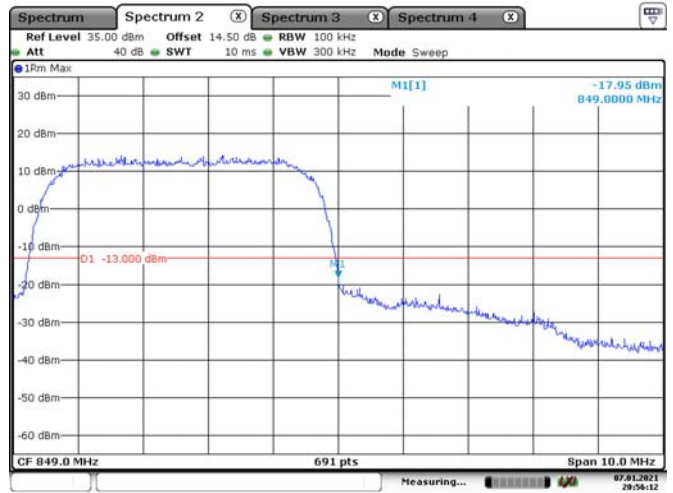


WCDMA Band V,HSDPA, Left Band Edge



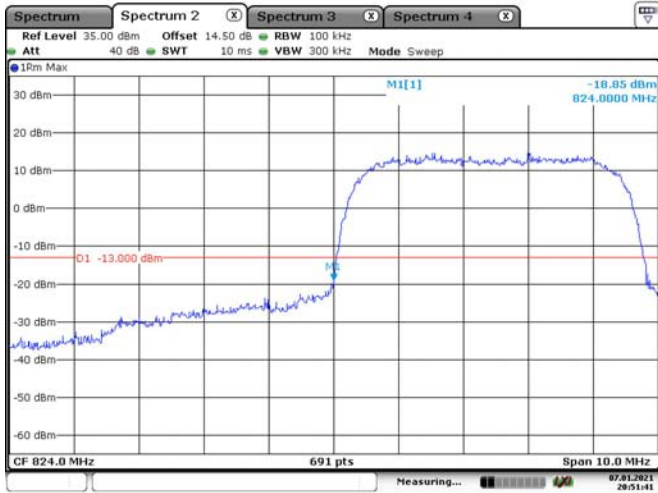
Date: 7, JAN, 2021 20:56:44

WCDMA Band V,HSDPA,Right Band Edge



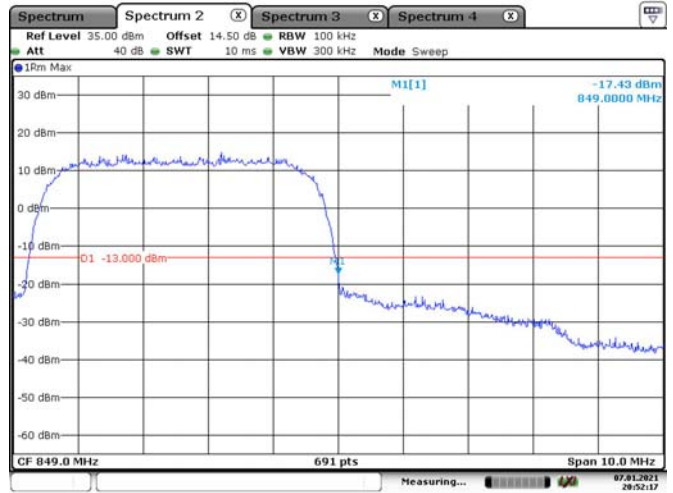
Date: 7, JAN, 2021 20:56:13

WCDMA Band V,HSUPA, Left Band Edge



Date: 7, JAN, 2021 20:51:42

WCDMA Band V,HSUPA, Right Band Edge



Date: 7, JAN, 2021 20:52:18

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

Applicable Standard

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

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:

Frequency Tolerance for Transmitters in the Public Mobile Services

Frequency Range (MHz)	Base, fixed (ppm)	Mobile > 3 watts (ppm)	Mobile ≤ 3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929.	5.0	N/A	N/A
929 to 960.	1.5	N/A	N/A
2110 to 2220	10.0	N/A	N/A

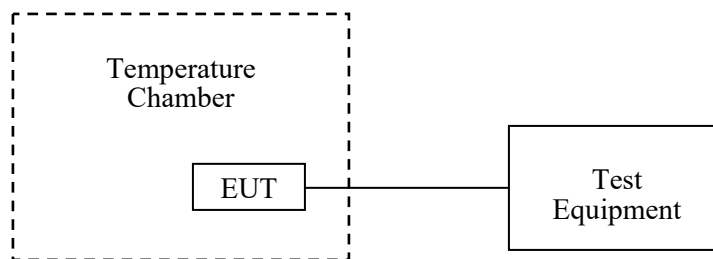
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The 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
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	2020-09-12	2021-09-12
ESPEC	Constant temperature and humidity Tester	ESX-4CA	018 463	2020-03-10	2021-03-09
UNI-T	Multimeter	UT39A	M130199938	2020-07-01	2021-07-01
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**

Temperature:	22.1°C
Relative Humidity:	37%
ATM Pressure:	101.2kPa
Tester:	Rita Huang
Test Date:	2021-01-07

Test Mode: Transmitting

Test Result: Compliance. Please refer to the following tables.

Cellular Band

GMSK, Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V _{DC}	Hz	ppm	ppm
-30	3.7	8	0.00956	2.5
-20		13	0.01554	
-10		15	0.01793	
0		16	0.01913	
10		5	0.00598	
20		17	0.02032	
30		14	0.01673	
40		19	0.02271	
50		18	0.02152	
20		4.2	12	
20	3.5	7	0.00837	

PCS Band

GMSK, Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Results
°C	V _{DC}	Hz	ppm	
-30	3.7	15	0.00798	Pass
-20		13	0.00691	
-10		17	0.00904	
0		25	0.01330	
10		19	0.01011	
20		35	0.01862	
30		19	0.01011	
40		14	0.00745	
50		11	0.00585	
20		4.2	20	
20	3.5	17	0.00904	

WCDMA Band II: R99

Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{DC}	Hz	ppm	
-30	3.7	5	0.00266	Pass
-20		10	0.00532	
-10		7	0.00372	
0		-1	-0.00053	
10		13	0.00691	
20		3	0.00160	
30		15	0.00798	
40		5	0.00266	
50		-1	-0.00053	
20		4.2	10	
20	3.5	14	0.00745	

WCDMA Band V: R99

Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limits (ppm)
°C	V _{DC}	Hz	ppm	
-30	3.7	14	0.01673	2.5
-20		-1	-0.00120	
-10		1	0.00120	
0		13	0.01554	
10		8	0.00956	
20		7	0.00837	
30		8	0.00956	
40		2	0.00239	
50		5	0.00598	
20		4.2	10	
20	3.5	4	0.00478	

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