中认信通
CHINA CERTIFICATION ICT CO., LTD (DONGGUAN)

ACCREDITED
TESTING LABORATORY
CERTIFICATE # 6356.01

TEST REPORT

Applicant: **Beijing Wiseasy Technology Co.,Ltd.**

Address: Room 01 , 27th Floor, No. 1 Building , No. 36 Xiaoyun Road, Chaoyang District, Beijing, China.

FCC ID: **2AXOJ-T2**
IC: **28320-T2**
HVIN: **P2_1xx_30_xx, P2_1xx_11_xx**
Product Name: **Smart Payment Tablet**

Standard(s): **47 CFR Part 2, 47 CFR Part 22, Subpart H**
47 CFR Part 24, Subpart E
47 CFR Part 27
47 CFR Part 90
RSS-130 Issue 2, February 2019
RSS-132 Issue 4, January 31, 2023
RSS-133 Issue 6, January 2018, Amendment
RSS-139 Issue 4, September 29, 2022
RSS-140 Issue 1, April 2018
RSS-199 Issue 3, December 2016
RSS-Gen, Issue 5, February 2021 Amendment 2
ANSI C63.26-2015

The above equipment has been tested and found compliant with the requirement of the relative standards by China Certification ICT Co., Ltd (Dongguan)

Report Number: **CR230524715-00F**
Date Of Issue: **2023/8/17**
Reviewed By: **Sun Zhong**

Sun Zhong

Title: Manager

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Test Facility

The Test site used by China Certification ICT Co., Ltd (Dongguan) to collect test data is located on the No. 113, Pingkang Road, Dalang 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. : 442868, the FCC Designation No. : CN1314.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0123.

Declarations

China Certification ICT Co., Ltd (Dongguan) 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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CONTENTS

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	CR230524715-00F	Original Report	2023/8/17

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Name:	Smart Payment Tablet
EUT Model:	T2
Operation Bands and modes:	GPRS/EGPRS: 850/1900 WCDMA: Band 2/4/5 LTE: band2/4/5/7/12/13/14/17/25/26/66/71/38/41(2535-2655MHz)
Modulation Type:	GMSK, BPSK, QPSK, 16QAM
Rated Input Voltage:	5/9/12Vdc from adapter or 3.87Vdc from Battery
Serial Number:	25K9-3
EUT Received Date:	2023/5/9
EUT Received Status:	Good

Operation Voltage(V_{DC}) ▲:

Lowest:	3.47	Normal:	3.87	Highest:	4.45

Transmission Antenna Information▲:

Antenna	Antenna Manufacturer	Antenna Type	Operation Bands	Antenna Frequency Range (MHz)	Antenna Gain (G_T) (dBi)	L_C (dB)
WWAN Main Antenna	Tenda	PCB	GSM850	824-849	-1.46	0
			PCS1900	1850-1910	0.66	0
			WCDMA B2	1850-1910	0.66	0
			WCDMA B4	1710-1755	1.8	0
			WCDMA B5	824-849	-1.46	0
			LTE B2	1850-1910	0.66	0
			LTE B4	1710-1755	1.8	0
			LTE B5	824-849	-1.46	0
			LTE B7	2500-2570	1.51	0
			LTE B12	699-716	-4.63	0
			LTE B13	777-787	-3.06	0
			LTE B14	788-798	-2.47	0
			LTE B17	704-716	-4.63	0
			LTE B25	1850-1915	0.66	0
			LTE B26	814-849	-1.46	0
			LTE B38	2570-2620	1.2	0
			LTE B41	2535-2655	1.51	0
			LTE B66	1710-1780	1.8	0
			LTE B71	663-698	-5.33	0

Note:
Lc= Signal Attenuation in the connecting cable between the transmitter and antenna, in dB.
LTE B26(814-824) is only used for FCC

1.2 Description of Test Configuration

1.2.1 EUT Operation Condition:

EUT Operation Mode:	The system was configured for testing in each operation mode.
Equipment Modifications:	No
EUT Exercise Software:	No

The maximum power was configured per 3GPP Standard for each operation modes as below setting:

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 + EGPRS
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)

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

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		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				
	βc	11/15	6/15	15/15	2/15	15/15
	βd	15/15	15/15	9/15	15/ 5	0
	βec	209/225	12/15	30 15	2/15	5/ 5
	βc/ βd	11/15	6/15	15/9	2/15	-
	βhs	22/15	12/15	30/15	4/15	5/15
	CM(dB)	1.0	3.0	2.0	3.0	1.0
	PR(dB)	0	2	1	2	0
HSDPA Specific Settings	DA K	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback	4ms				
	CQI Repetition Factor	2				
	Ahs=βhs/ βc	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 k ps	242.1	174.9	482.8	205.8	308.9
	Reference E_FCl	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	

LTE (FDD):

The following tests were conducted according to the test requirements in 3GPP TS36.101

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS_01".

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4,10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	Table 6.2.4-2
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23[1]	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

LTE(TDD):

Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS).

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	-
9	$13168 \cdot T_s$			-	-	-

Table 4.2-2: Uplink-downlink configurations.

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

Calculated Duty Cycle

Uplink-Downlink Configuration	Downlink-to-Uplink Switch-point Periodicity	Subframe Number										Calculated Duty Cycle (%)
		0	1	2	3	4	5	6	7	8	9	
0	5 ms	D	S	U	U	U	D	S	U	U	U	63.33
1	5 ms	D	S	U	U	D	D	S	U	U	D	43.33
2	5 ms	D	S	U	D	D	D	S	U	D	D	23.33
3	10 ms	D	S	U	U	U	D	D	D	D	D	31.67
4	10 ms	D	S	U	U	D	D	D	D	D	D	21.67
5	10 ms	D	S	U	D	D	D	D	D	D	D	11.67
6	5 ms	D	S	U	U	U	D	S	U	U	D	53.33

Calculated Duty Cycle = Extended cyclic prefix in uplink x (T_s) x # of S + # of U

Example for Calculated Duty Cycle for Uplink-Downlink Configuration 0:
Calculated Duty Cycle = 5120 x [1/(15000 x 2048)] x 2 + 6 ms = 63.33%
where
T_s = 1/(15000 x 2048) seconds

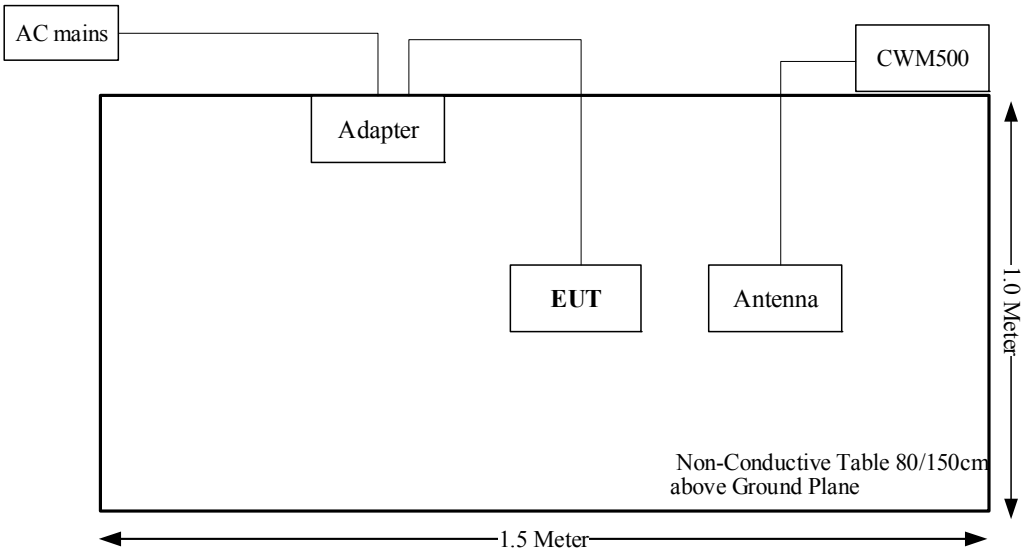
1.2.2 Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
TEJIATE	Antenna	SMA	CR21000011
R&S	Wideband Radio Communication Tester	CMW500	149218

1.2.3 Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
Antenna Cable	No	No	3	CWM500	Antenna
Power Cable	No	No	1.2	Adapter	EUT

1.2.4 Block Diagram of Test Setup



1.3 Measurement Uncertainty

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.

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.61dB
Power Spectral Density, conducted	±0.61 dB
Unwanted Emissions, radiated	30M~200MHz: 4.15 dB,200M~1GHz: 5.61 dB,1G~6GHz: 5.14 dB, 6G~18GHz: 5.93 dB,18G~26.5G:5.47 dB,26.5G~40G:5.63 dB
Unwanted Emissions, conducted	±1.26 dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%
RF Frequency	$\pm 0.082\times10^{-6}$

2. SUMMARY OF TEST RESULTS

Cellular Band: GSM 850/WCDMA Band 5/LTE Band 5/26(824-849):

FCC Standard Rule(s)	ISEDC Standard Rule(s)	Description of Test	Result	Section
/	RSS-132 Clause 5.1	Frequency Sub-bands	Compliant	3.6.1.2
/	RSS-132 Clause 5.2	Types of Modulation	Compliant	3.6.2.2
§ 2.1055, § 22.355	RSS-132 Clause 5.3	Frequency stability	Compliant	4.1, 4.5, 4.8
§2.1046;§ 22.913	RSS-132 Clause 5.4	Transmitter output power and effective radiated power (e.r.p.)	Compliant	4.1, 4.5, 4.8
§ 2.1051,§ 22.917 (a)	RSS-132 Clause 5.5	Transmitter unwanted emissions- at Antenna Terminal	Compliant	4.1, 4.5, 4.8
§ 22.917 (a)	RSS-132 Clause 5.5	Transmitter unwanted emissions- Out of band emission	Compliant	4.1, 4.5, 4.8
§ 2.1053, § 22.917 (a)	RSS-132 Clause 5.5	Transmitter unwanted emissions- Radiated Spurious emissions	Compliant	4.20
§ 2.1049; § 22.905	RSS-Gen Clause 6.7	Occupied Bandwidth	Compliant	4.1, 4.5, 4.8

PCS Band: GSM 1900/WCDMA Band 2/LTE Band 2/25:

FCC Standard Rule(s)	ISEDC Standard Rule(s)	Description of Test	Result	Section
/	RSS-133 Clause 6.1	Frequency Plan	Compliant	3.7.1.2
/	RSS-133 Clause 6.2	Types of Modulation	Compliant	3.7.2.2
§ 2.1055, § 24.235	RSS-133 Clause 6.3	Frequency stability	Compliant	4.2, 4.3, 4.6, 4.14
§2.1046,§ 24.232	RSS-133 Clause 6.4	Transmitter Output Power and Equivalent Isotropically Radiated Power	Compliant	4.2, 4.3, 4.6, 4.14
§ 2.1051,§ 24.238 (a)	RSS-133 Clause 6.5	Transmitter unwanted emissions- at Antenna Terminal	Compliant	4.2, 4.3, 4.6, 4.14
§ 24.238 (a)	RSS-133 Clause 6.5	Transmitter unwanted emissions- Out of band emission	Compliant	4.2, 4.3, 4.6, 4.14
§ 2.1053,§ 24.238 (a)	RSS-133 Clause 6.5	Transmitter unwanted emissions- Radiated Spurious emissions	Compliant	4.20
§ 2.1049, § 24.238	RSS-Gen Clause 6.7	Occupied Bandwidth	Compliant	4.2, 4.3, 4.6, 4.14

Lower 700: LTE Band 12/13/17/71:

FCC Standard Rule(s)	ISEDC Standard Rule(s)	Description of Test	Result	Section
/	RSS-130 Clause 4.2	Types of modulation	Compliant	3.5.1.2
/	RSS-130 Clause 4.3	Frequency block	Compliant	3.5.2.2
/	RSS-130 Clause 4.4	Interoperability requirement	Compliant	3.5.3.2
§ 2.1055, §27.54	RSS-130 Clause 4.5	Transmitter frequency stability	Compliant	4.10, 4.11, 4.13, 4.19
§2.1046, §27.50	RSS-130 Clause 4.6	Transmitter output power and effective radiated power (e.r.p.)	Compliant	4.10, 4.11, 4.13, 4.19
§ 2.1051,§27.53	RSS-130 Clause 4.7	Transmitter unwanted emissions- at Antenna Terminal	Compliant	4.10, 4.11, 4.13, 4.19
§27.53	RSS-130 Clause 4.7	Transmitter unwanted emissions- Out of band emission	Compliant	4.10, 4.11, 4.13, 4.19
§ 2.1053, §27.53	RSS-130 Clause 4.7	Transmitter unwanted emissions- Radiated Spurious emissions	Compliant	4.10, 4.11, 4.13, 4.19
§ 2.1049, §27.53	RSS-Gen Clause 6.7	Occupied Bandwidth	Compliant	4.10, 4.11, 4.13, 4.19

BRS/EBS Band: LTE Band 7/38/41:

FCC Standard Rule(s)	ISEDC Standard Rule(s)	Description of Test	Result	Section
/	RSS-199 Clause 4.1	Frequency Plan	Compliant	3.10.1.2
§ 2.1055, §27.54	RSS-199 Clause 4.3	Frequency stability	Compliant	4.9, 4.16, 4.19
§2.1046, §27.50	RSS-199 Clause 4.4	Transmitter Output Power and Equivalent Isotropically Radiated Power	Compliant	4.9, 4.16, 4.19
§ 2.1051,§27.53	RSS-199 Clause 4.4	Transmitter unwanted emissions- at Antenna Terminal	Compliant	4.9, 4.16, 4.19
§27.53	RSS-199 Clause 4.5	Transmitter unwanted emissions- Out of band emission	Compliant	4.9, 4.16, 4.19
§ 2.1053, §27.53	RSS-199 Clause 4.5	Transmitter unwanted emissions- Radiated Spurious emissions	Compliant	4.20
§ 2.1049, §27.53	RSS-Gen Clause 6.7 RSS-199 Clause 4.2	Occupied Bandwidth	Compliant	4.9, 4.16, 4.19

AWS Band: WCDMA Band 4/LTE Band 4/66:

FCC Standard Rule(s)	ISEDC Standard Rule(s)	Description of Test	Result	Section
/	RSS-139 Clause 5.2	Frequency Plan	Compliant	3.8.1.2
/	RSS-139 Clause 5.3	Types of Modulation	Compliant	3.8.2.2
/	RSS-139 Clause 5.7	Additional Requirements For Subscriber Equipment	Compliant	3.8.6.2
	RSS-139 Clause 5.4	Frequency stability	Compliant	4.4, 4.7, 4.18
§2.1046; §27.50	RSS-139 Clause 5.5	Transmitter Output Power	Compliant	4.4, 4.7, 4.18
§ 2.1051, §27.53	RSS-139 Clause 5.6	Transmitter unwanted emissions- at Antenna Terminal	Compliant	4.4, 4.7, 4.18
§27.53	RSS-139 Clause 5.6	Transmitter unwanted emissions- Bandedge	Compliant	4.4, 4.7, 4.18
§ 2.1053, §27.53	RSS-139 Clause 5.6	Transmitter unwanted emissions- Radiated Spurious emissions	Compliant	4.20
§ 2.1049, §27.53	RSS-Gen Clause 6.7	Occupied Bandwidth	Compliant	4.4, 4.7, 4.18

PSB Band: LTE Band 14/26(814-824) only for FCC:

FCC Standard Rule(s)	ISEDC Standard Rule(s)	Description of Test	Result	Section
/	RSS-140 Clause 4.1	Types of Modulation	Compliant	3.9.1.2
§ 2.1055, § 90.213	RSS-140 Clause 4.2	Transmitter frequency stability	Compliant	3.9.2.2
§ 2.1055, § 90.542(a), § 90.635	RSS-140 Clause 4.3	Transmitter Output Power	Compliant	4.12, 4.15
§2.1046,§ 90.543, § 90.691	RSS-140 Clause 4.4	Transmitter unwanted emissions- at Antenna Terminal	Compliant	4.12, 4.15
§ 2.1051, § 90.543, § 90.691	RSS-140 Clause 4.4	Transmitter unwanted emissions- Bandedge	Compliant	4.12, 4.15
§ 90.543, § 90.691	RSS-140 Clause 4.4	Transmitter unwanted emissions- Radiated Spurious emissions	Compliant	4.12, 4.15
§ 2.1053,§ 90.209	RSS-Gen Clause 6.7	Occupied Bandwidth	Compliant	4.20

3. REQUIREMENTS AND TEST PROCEDURES

3.1 Applicable Standard For Part 22 Subpart H:

3.1.1 RF Output Power

FCC §22.913

(a)(5) The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7watts.

(d) *Power measurement.* Measurement of the ERP of Cellular base transmitters and repeaters must be made using an average power measurement technique. The peak-toaverage ratio (PAR) of the transmission must not exceed 13 dB. Power measurements for base transmitters and repeaters must be made in accordance with either of the following:
(1) A Commission-approved average power technique (*see* FCC Laboratory's Knowledge Database); or
(2) For purposes of this section, peak transmit power must be measured over an interval of continuous transmission using instrumentation calibrated in terms of an rmsequivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, *etc.,* so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.

3.1.2 Spurious Emissions

FCC §22.917

(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

(b) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a reference bandwidth as follows:
(1) In the spectrum below 1 GHz, instrumentation should employ a reference bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy, provided that the measured power is integrated over the full required reference bandwidth (i.e., 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.
(2) In the spectrum above 1 GHz, instrumentation should employ a reference bandwidth of 1 MHz

3.1.3 Frequency stability

FCC §22.355

Except as otherwise provided in this part, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table C-1 of this section.

Table C-1 - 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	20	50
50 to 450	5	5	50
450 to 512	2.5	5	5
821 to 896	1.5	**2.5**	**2.5**
928 to 929	5	n/a	n/a
929 to 960	1.5	n/a	n/a
2110 to 2220	10	n/a	n/a

3.2 Applicable Standard For Part 24 Subpart E:

3.2.1 RF Output Power

FCC §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.

(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.

3.2.2 Spurious Emissions

FCC §24.238

The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service.

(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

(b) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

(c) Alternative out of band emission limit. Licensees in this service may establish an alternative out of band emission limit to be used at specified band edge(s) in specified geographical areas, in lieu of that set forth in this section, pursuant to a private contractual arrangement of all affected licensees and applicants. In this event, each party to such contract shall maintain a copy of the contract in their station files and disclose it to prospective assignees or transferees and, upon request, to the FCC.

(d) Interference caused by out of band emissions. If any emission from a transmitter operating in this service results in interference to users of another radio service, the FCC may require a greater attenuation of that emission than specified in this section.

3.2.3 Frequency stability

FCC §24.235

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

3.3 Applicable Standard For Part 27:

3.3.1 RF Output Power

FCC §27.50

(a)(3) *Mobile and portable stations.*
(i) For mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, *except that* for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth. For mobile and portable stations using time division duplexing (TDD) technology, the duty cycle must not exceed 38 percent in the 2305-2315 MHz and 2350-2360 MHz bands. Mobile and portable stations using FDD technology are restricted to transmitting in the 2305-2315 MHz band. Power averaging shall not include intervals in which the transmitter is off.
(ii) Mobile and portable stations are not permitted to transmit in the 2315-2320 MHz and 2345-2350 MHz bands.
(iii) *Automatic transmit power control.* Mobile and portable stations transmitting in the 2305-2315 MHz band or in the 2350-2360 MHz band must employ automatic transmit power control when operating so the stations operate with the minimum power necessary for successful communications.
(iv) *Prohibition on external vehicle-mounted antennas.* The use of external vehicle-mounted antennas for mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band is prohibited.

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

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

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

(h) The following power limits shall apply in the BRS and EBS:
(2)Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

3.3.2 Spurious Emissions

FCC §27.53

(a) For operations in the 2305-2320 MHz band and the 2345-2360 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power P (with averaging performed only during periods of transmission) within the licensed band(s) of operation, in watts, by the following amounts:
(4)For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:

(i) By a factor of not less than: 43 + 10 log (P) dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than 55 + 10 log (P) dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than 61 + 10 log (P) dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than 67 + 10 log (P) dB on all frequencies between 2328 and 2337 MHz;

(ii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305 MHz, 55 + 10 log (P) dB on all frequencies between 2296 and 2300 MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296 MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292 MHz, and 70 + 10 log (P) dB below 2288 MHz;

(iii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365 MHz, and not less than 70 + 10 log (P) dB above 2365 MHz.

(c)For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;

(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;

(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations;

(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations;

(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to – 70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and – 80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

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

(h) AWS emission limits

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

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

3.3.3 Frequency stability

FCC §27.54

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

3.4 Applicable Standard For Part 90:

3.4.1 RF Output Power

FCC §90.542(a)

(7) Portable stations (hand-held devices) transmitting in the 758-768 MHz band and the 788-798 MHz band are limited to 3 watts ERP.

FCC §90.635

(b) The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw).

3.4.2 Spurious Emissions

FCC §90.543

(c) Out-of-band emission limit. On any frequency outside of the frequency ranges covered by the ACP tables in this section, the power of any emission must be reduced below the mean output power (P) by at least 43 + 10log (P) dB measured in a 100 kHz bandwidth for frequencies less than 1 GHz, and in a 1 MHz bandwidth for frequencies greater than 1 GHz.

FCC §90.691

(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:
(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50 + 10 Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.
(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.
(b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

3.4.3 Frequency stability

FCC §90.213

809-824 MHz band, 2.5ppm for 2W or less output power.

3.5 Applicable Standard For RSS-130 Issue 2, February 2019:

3.5.1 Types of modulation

3.5.1.1 Applicable Standard

RSS-130 clause 4.2

Equipment certified under this standard shall employ digital modulation

3.5.1.2 Judgment

Compliant, the device employs digital modulation.

3.5.2 Frequency block

3.5.2.1 Applicable Standard

RSS-130 clause 4.3

The frequency bands 617-652 MHz, 663-698 MHz, 698-756 MHz and 777-787 MHz are divided into small frequency blocks as per SRSP-518. Equipment shall operate according to the frequency plan given in the SRSP.

3.5.2.2 Judgment

Compliant, the device operates in the frequency bands 663-698 MHz, 698-756 MHz and 777-787 MHz are divided into small frequency blocks as per SRSP-518. Equipment shall operate according to the frequency plan given in the SRSP.

3.5.3 Interoperability requirement

3.5.3.1 Applicable Standard

RSS-130 clause 4.4

Mobile and portable stations in the bands 617-652 MHz and 663-698 MHz must be capable of operating on all frequencies in these bands.

3.5.3.2 Judgment

Compliant, the device employs all the range of 663-698MHz for this band.

3.5.4 Transmitter frequency stability

3.5.4.1 Applicable Standard

RSS-130 clause 4.5

For equipment that is capable of transmitting numerous channels simultaneously for different applications (e.g. LTE and narrowband – internet of things (IoT)), the occupied bandwidth shall be the bandwidth representing the sum of the occupied bandwidths of these channels.

The frequency stability shall be sufficient to ensure that the occupied bandwidth remains within each frequency block range when tested at the temperature and supply voltage variations specified in RSS-Gen.

3.5.5 Transmitter output power and effective radiated power (e.r.p.)

3.5.5.1 Applicable Standard

RSS-130 clause 4.6.1 General

The transmitter output power shall be measured in terms of average power. In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

RSS-130 clause 4.6.2 Frequency bands 617-652 MHz and 663-698 MHz

The e.r.p. shall not exceed 3 watts for mobile equipment, fixed subscriber equipment and portable equipment.

For base and fixed equipment other than fixed subscriber equipment, refer to SRSP-518 for the equivalent isotropically radiated power (e.i.r.p.) limits.

RSS-130 clause 4.6.3 Frequency bands 698-756 MHz and 777-787 MHz

The e.r.p. shall not exceed 30 watts for mobile equipment and outdoor fixed subscriber equipment.
The e.r.p. shall not exceed 3 watts for portable equipment and indoor fixed subscriber equipment.

For base and fixed equipment other than fixed subscriber equipment, refer to SRSP-518 for the e.i.r.p. limits.

3.5.6 Transmitter unwanted emissions

3.5.5.1 Applicable Standard

RSS-130 clause 4.7.1 General unwanted emissions limits

The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least $43 + 10 \log_{10} p$ (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

RSS-130 clause 4.7.2 Additional unwanted emissions limits

In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

a) The power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:
(i) $76 + 10 \log_{10} p$ (watts), dB, for base and fixed equipment, and
(ii) $65 + 10 \log_{10} p$ (watts), dB, for mobile and portable equipment.

b) The e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW/MHz for wideband signal and -80 dBW for discrete emission with bandwidth less than 700 Hz.

3.6 Applicable Standard For RSS-132 Issue 4, January 31, 2023:

3.6.1 Frequency Sub-bands

3.6.1.1 Applicable Standard

RSS-132 clause 5.1

The frequency bands 824-849 MHz and 869-894 MHz are divided into sub-bands as described in SRSP-503. These sub-bands are:

824-835 MHz, 835-845 MHz, 845-846.5 MHz, and 846.5-849 MHz for mobile transmit; and

869-880 MHz, 880-890 MHz, 890-891.5 MHz, and 891.5-894 MHz for base transmit.

3.6.1.2 Judgment

Compliant, the device operates in this band is divided into sub-bands as described in SRSP-503.

3.6.2 Types of Modulation

3.6.2.1 Applicable Standard

RSS-132 clause 5.2

Digital modulation shall be used.

3.6.2.2 Judgment

Compliant, the device operates under this standard use digital modulation.

3.6.3 Frequency stability

3.6.3.1 Applicable Standard

RSS-132 clause 5.3

The frequency stability shall be sufficient to ensure that the occupied bandwidth stays within each of the sub-bands when tested at the temperature and supply voltage variations specified in RSS-Gen.

3.6.4 Transmitter output power and effective radiated power (e.r.p.)

3.6.4.1 Applicable Standard

RSS-132 clause 5.4

The transmitter output power shall be measured in terms of average power. The equivalent radiated power (e.r.p.) shall not exceed 7 watts for mobile equipment and 3 watts for portable equipment.
The effective isotropic radiated power (e.i.r.p.) shall not exceed the limits specified in SRSP-503 for base station equipment.
In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

3.6.5 Transmitter unwanted emissions

3.6.5.1 Applicable Standard

RSS-132 clause 5.5

Mobile and base station equipment shall comply with the limits in (i) and (ii) below.

(i) In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts).

(ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

3.7 Applicable Standard For RSS-133 Issue 6, January 2018 Amendment:

3.7.1 Frequency Plan

3.7.1.1 Applicable Standard

RSS-133 clause 6.1

The frequency plan is described in SRSP-510.

3.7.1.2 Judgment

Compliant, the device operates in this band is Compliant with SRSP-510.

3.7.2 Types of Modulation

3.7.2.1 Applicable Standard

RSS-133 clause 6.2

The devices shall employ digital modulation techniques.

3.7.2.2 Judgment

Compliant, the device operates under this standard use digital modulation.

3.7.3 Frequency stability

3.7.3.1 Applicable Standard

RSS-133 clause 6.3

The carrier frequency shall not depart from the reference frequency, in excess of ±2.5 ppm for mobile stations and ±1.0 ppm for base stations.

In lieu of meeting the above stability values, the test report may show that the frequency stability is sufficient to ensure that the emission bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

3.7.4 Transmitter Output Power and Equivalent Isotropically Radiated Power

3.7.4.1 Applicable Standard

RSS-133 clause 6.4

The equivalent isotropically radiated power (e.i.r.p.) for transmitters shall not exceed the limits given in SRSP-510.

In addition, the transmitter's peak-to-average power ratio (PAPR) shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

3.7.5 Transmitter unwanted emissions

3.7.5.1 Applicable Standard

RSS-132 clause 6.5.1 Out-of-Block Emissions

Equipment shall comply with the limits in (i) and (ii) below.

(i) In the 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1% of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$(watts).

(ii) After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10 p(watts). If the measurement is performed using 1% of the emission bandwidth, power integration over 1.0 MHz is required.

3.8 Applicable Standard For RSS-139 issue 4 September 29, 2022:

3.8.1 Band plan

3.8.1.1 Applicable Standard

RSS-139 clause 5.2

The bands 1710-1780 MHz and 2110-2180 MHz are divided into 11 paired blocks as shown in table 1. Standard Radio System Plan SRSP-513, Technical Requirements for Advanced Wireless Services in the Bands 1710-1780 MHz and 2110-2180 MHz, contains the detailed band plan.

Table 1: Frequency blocks in the bands 1710-1780 MHz and 2110-2180 MHz

Block	Lower sub-band (MHz)	Upper sub-band (MHz)	Total block size (MHz)
Block A	1710-1720	2110-2120	20
Block B	1720-1730	2120-2130	20
Block C	1730-1735	2130-2135	10
Block D	1735-1740	2135-2140	10
Block E	1740-1745	2140-2145	10
Block F	1745-1755	2145-2155	20
Block G	1755-1760	2155-2160	10
Block H	1760-1765	2160-2165	10
Block I	1765-1770	2165-2170	10
Block J1	1770-1775	2170-2175	10
Block J2	1775-1780	2175-2180	10

The band 2180-2200 MHz is divided into two downlink-only blocks, as shown in table 2. SRSP-519, Technical Requirements for the Ancillary Terrestrial Component of Mobile-Satellite Service Systems Operating in the Bands 2000-2020 MHz and 2180-2200 MHz, contains the detailed band plan. In this RSS, AWS-4 is referred to as ATC band 2180-2200 MHz.

Table 2: Frequency blocks in the bands 2180-2200 MHz

Block	Frequency range (MHz)	Block size (MHz)
Block C	2180-2190	10
Block D	2190-2200	10

The blocks listed in tables 1 and 2 can be aggregated to form a larger channel.

3.8.1.2 Judgment

Compliant, the device operates in this band is Compliant with SRSP-513.

3.8.2 Types of Modulation

3.8.2.1 Applicable Standard

RSS-139 clause 5.3

Devices may use any type of modulation technique. The type of modulation shall be documented in the test report.

3.8.2.2 Judgment

Compliant, the device operates under this standard use digital modulation.

3.8.3 Frequency stability

3.8.3.1 Applicable Standard

RSS-139 clause 5.4

The frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the operating frequency block or frequency block group when tested to the temperature and supply voltage variations specified in RSS-Gen.

3.8.4 Transmitter Output Power

3.8.4.1 Applicable Standard

RSS-139 clause 5.5

The maximum output power of the equipment shall comply with the limits specified below. In the tables, maximum power refers to the equivalent isotropically radiated power (e.i.r.p.) or total radiated power (TRP), measured in terms of average values.

The limits in this RSS are specified for the purpose of certification and may not apply to all deployment scenarios. Consult SRSP-513 and SRSP-519 for more details on the bands 2110-2180 MHz and 2180-2200 MHz respectively.

Table 3: Maximum power of equipment in the band 1710-1780 MHz	
Equipment type	**Maximum power**
Fixed station and base station	30 dBm e.i.r.p./channel bandwidth
Subscriber equipment	30 dBm e.i.r.p./channel bandwidth

Table 4: Maximum power of equipment in the band 2110-2180 MHz	
Equipment type	**Maximum power**
Non-AAS fixed station and base station	65 dBm e.i.r.p./MHz
AAS fixed station and base station	46 dBm TRP/MHz
Subscriber equipment	30 dBm e.i.r.p./channel bandwidth

Table 5: Maximum power of equipment in the band 2180-2200 MHz	
Equipment type	**Maximum power**
Non-AAS base station	65 dBm e.i.r.p./MHz
AAS base station	46 dBm TRP/MHz

In addition, the peak to average power ratio (PAPR) of the equipment shall not exceed 13 dB for more than 0.1% of the time, using a signal that corresponds to the highest PAPR during periods of continuous transmission.

3.8.5 Transmitter unwanted emissions

3.8.5.1 Applicable Standard

RSS-139 clause 5.6

Unwanted emissions shall be measured in terms of average values.
For all equipment, the TRP or total conducted power (sum of conducted power across all antenna connectors) of the unwanted emissions outside the frequency block or frequency block group shall not exceed the limits shown in table 4.

Table 6: Unwanted emission limits

Offset from the edge of the frequency block or frequency block group	Unwanted emission limits
≤1 MHz	-13 dBm/(1% of B*)
>1 MHz	-13 dBm/MHz

*B is the frequency block or frequency block group.

In addition to complying with the above limits, equipment operating in the band 2180-2200 MHz may require additional filtering (see SRSP-519).

3.8.6 Additional requirements for subscriber equipment

3.8.6.1 Applicable Standard

RSS-139 clause 5.7

Subscriber equipment other than fixed subscriber equipment shall use transmitter power control to limit power. The applicant shall include, with the application for certification, a declaration of compliance that confirms the control requirement was met and that includes a description of how the requirement was met. The declaration of compliance may be included as a separate document or attached (e.g. as an annex) to the test report.

Subscriber equipment operating in the band 1755-1780 MHz shall operate only when under the control of a base station. The applicant shall include, with the application for certification, a declaration of compliance that confirms the control requirement was met and that includes a description of how the requirement was met. The declaration of compliance may be included as a separate document or attached (e.g. as an annex) to the test report.

3.8.6.2 Judgment

Compliant, the devices use transmitter power control to limit power and operate under the control of a base station.

3.9 Applicable Standard For RSS-140 Issue 1, April 2018:

3.9.1 Types of modulation

3.9.1.1 Applicable Standard

RSS-140 clause 4.1

Equipment shall employ digital modulation techniques.

3.9.1.2 Judgment

Compliant, the device employs digital modulation.

3.9.2 Transmitter frequency stability

3.9.2.1 Applicable Standard

RSS-140 clause 4.2

The frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the operating frequency block when tested at the temperature and supply voltage variations specified in RSS-Gen.

3.9.3 Transmitter output power

3.9.3.1 Applicable Standard

RSS-140 clause 4.3

The equivalent radiated power (e.r.p.) for control and mobile equipment shall not exceed 30 W. The e.r.p. for portable equipment including handheld devices shall not exceed 3 W.

Fixed and base station equipment shall comply with the e.r.p. limits in SRSP-540.

In addition, the peak to average power ratio (PAPR) of the equipment shall not exceed 13 dB for more than 0.1% of the time, using a signal that corresponds to the highest PAPR during periods of continuous transmission.

3.9.4 Transmitter unwanted emission limits

3.9.4.1 Applicable Standard

RSS-140 clause 4.4

The power of any unwanted emission outside the bands 758-768 MHz and 788-798 MHz shall be attenuated below the transmitter output power P in dBW as follows, where p is the transmitter output power in watts:

a) For any frequency between 769-775 MHz and 799-806 MHz:
i) 76 + 10 log (p), dB in a 6.25 kHz band for fixed and base station equipment

ii) 65 + 10 log (p), dB in a 6.25 kHz band for mobile and portable/hand-held equipment

b) For any frequency between 775-788 MHz, above 806 MHz, and below 758 MHz: 43 + 10 log (p), dB in a bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency bands 758-768 MHz and 788-798 MHz, a resolution bandwidth of 30 kHz may be employed.

In addition, the equivalent isotropically radiated power (e.i.r.p.) of all emissions, including harmonics in the band 1559-1610 MHz, shall not exceed −70 dBW/MHz for wideband emissions, and −80 dBW/kHz for discrete emissions of less than 700 Hz bandwidth.

3.10 Applicable Standard For RSS-199 Issue 3 December 2016:

3.10.1 Types of Modulation

3.10.1.1 Applicable Standard

RSS-199 clause 4.1

Equipment certified under this standard shall employ digital modulation.

3.10.1.2 Judgment

Compliant, the device operates under this standard use digital modulation.

3.10.2 Channel bandwidth

3.10.2.1 Applicable Standard

RSS-199 clause 4.2

The channel bandwidth shall be equal to or greater than 1 MHz and shall be reported by the certification applicant

3.10.3 Frequency stability

3.10.3.1 Applicable Standard

RSS-199 clause 4.3

The transmitter frequency stability limit shall be determined as follows:

(a) the frequency offset shall be measured according to the procedure described in RSS-Gen and recorded.

(b) using a resolution bandwidth equal to that permitted within the 1 MHz band immediately outside the channel edge, as found in section 4.5, reference points will be selected at the unwanted emission limits, which comply with the attenuation specified in section 4.5 for the type of device under test, on the emission mask of the lowest and highest channels. The frequency at these points shall be recorded as f_L and f_H respectively.
The applicant shall ensure compliance with frequency stability requirements by showing that f_L minus the frequency offset and f_H plus the frequency offset is within the frequency range in which the equipment is designed to operate.

3.10.4 Transmitter output power and equivalent isotropically radiated power (e.i.r.p.)

3.10.4.1 Applicable Standard

RSS-199 clause 4.4

The transmitter output power shall be measured in terms of average value.

For base station equipment, refer to SRSP-517 for the maximum permissible e.i.r.p.

For mobile subscriber equipment, the e.i.r.p. shall not exceed 2 W. For fixed subscriber equipment, the transmitter output power shall not exceed 2 W and the e.i.r.p. shall be limited to 40 W.

In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

For equipment with multiple antennas, the transmitter output power and e.i.r.p. shall be measured according to ANSI C63.26-2015.

3.10.5 Transmitter unwanted emissions

3.10.5.1 Applicable Standard

RSS-199 clause 4.5

In the 1 MHz band immediately outside and adjacent to the channel edge, the unwanted emission power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth for base station and fixed subscriber equipment, and 2% for mobile subscriber equipment. Beyond the 1 MHz band, a resolution bandwidth of 1 MHz shall be used. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz, or 1% or 2% of the occupied bandwidth, as applicable.

Equipment shall comply with the following unwanted emission limits:

(a) for base station and fixed subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least $43 + 10 \log_{10} p$.

(b) for mobile subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least:

(i) $40 + 10 \log_{10} p$ from the channel edges to 5 MHz away
(ii) $43 + 10 \log_{10} p$ between 5 MHz and X MHz from the channel edges, and
(iii) $55 + 10 \log_{10} p$ at X MHz and beyond from the channel edges

In addition, the attenuation shall not be less than $43 + 10 \log_{10} p$ on all frequencies between 2490.5 MHz and 2496 MHz, and $55 + 10 \log_{10} p$ at or below 2490.5 MHz.

In (a) and (b), **p** is the transmitter power measured in watts and **X** is 6 MHz or the equipment occupied bandwidth, whichever is greater.

3.11 Test Method:

3.11.1 Transmitter output power, e.r.p. and e.i.r.p

According to CFR Part 2.1046, ANSI C63.26-2015 Section 5.2.5.5:

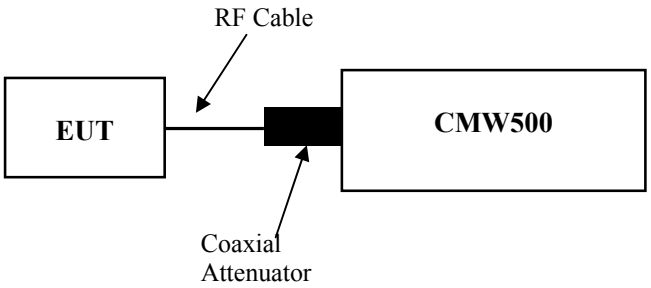
The relevant equation for determining the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

$$ERP \text{ or } EIRP = P_{Meas} + G_T - L_C$$

where:

ERP or EIRP = effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas}, typically dBW or dBm);
P_{Meas} = measured transmitter output power or PSD, in dBm or dBW;
G_T = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);
L_C = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

Test Setup Block:



Note: The Insertion loss of the RF cable and coaxial Attenuator was offset into the Reading of CMW500.

3.11.2 Occupied Bandwidth

According to ANSI C63.26-2015 Section 5.4.4

The OBW is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission.

The following procedure shall be used for measuring (99%) power bandwidth:

a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (typically a span of 1.5 × OBW is sufficient).

b) The nominal IF filter 3 dB bandwidth (RBW) shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set ≥ 3 × RBW.

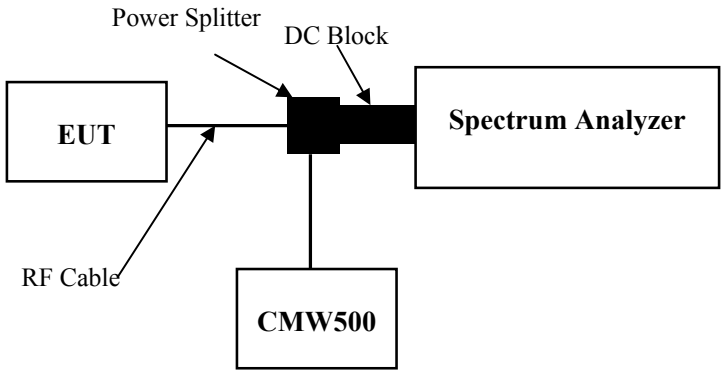
c) Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation. See guidance provided in 4.2.3. NOTE—Step a), step b), and step c) may require iteration to adjust within the specified tolerances.

d) Set the detection mode to peak, and the trace mode to max-hold.

e) If the instrument does not have a 99% OBW function, recover the trace data points and sum directly in linear power terms. Place the recovered amplitude data points, beginning at the lowest frequency, in a running sum until 0.5% of the total is reached. Record that frequency as the lower OBW frequency. Repeat the process until 99.5% of the total is reached and record that frequency as the upper OBW frequency. The 99% power OBW can be determined by computing the difference these two frequencies.

f) The OBW shall be reported and plot(s) of the measuring instrument display shall be provided with the test report. The frequency and amplitude axis and scale shall be clearly labeled. Tabular data can be reported in addition to the plot(s).

Test Setup Block:

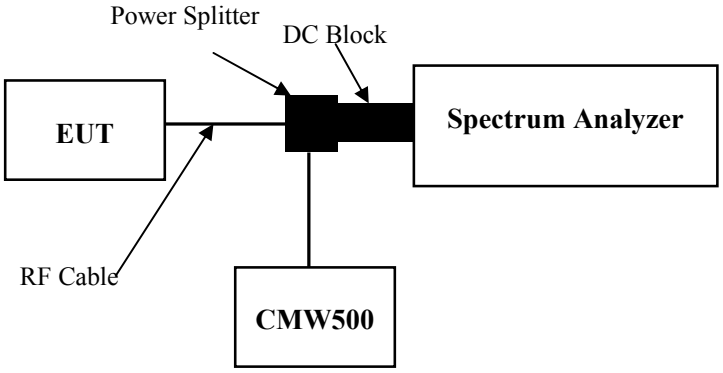


3.11.3 Transmitter unwanted emissions-at antenna terminals

According to ANSI C63.26-2015 Section 5.7.4:

the applicable rule part specifies the reference bandwidth for measuring unwanted emission levels (typically, 100 kHz if the authorized frequency band/block is at or below 1 GHz and 1 MHz if the authorized frequency band/block is above 1 GHz),8 effectively depicting the unwanted emission limit in terms of a power spectral density. In those cases where no reference bandwidth is explicitly specified, the values in the preceding sentence should be used.

Test Setup Block:

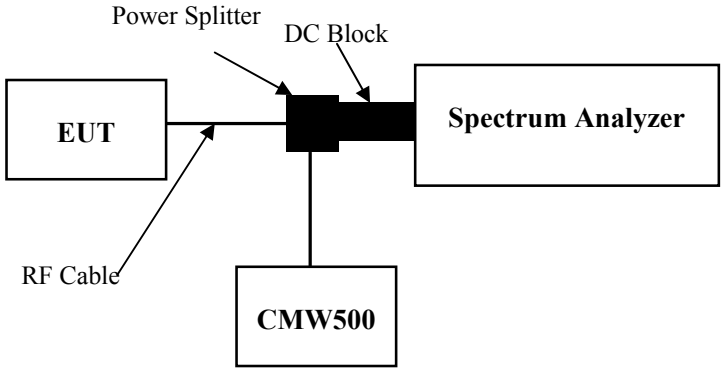


3.11.4 Transmitter unwanted emissions-Out of band emission

According to ANSI C63.26-2015 Section 5.7.3:

Typically, a measurement (resolution) bandwidth smaller than the reference bandwidth is allowed for measurements within a specified frequency range at the edge of the authorized frequency block/band (e.g., within the first Y MHz outside of the authorized frequency band/block, where the value of Y is specified in the relevant rule part). Some FCC out-of-band emission rules permit the use of a narrower RBW (typically limited to a minimum RBW of 1 % of the OBW) for measuring the out-of-band emissions without a requirement to integrate the result over the full reference bandwidth. Beyond the specified frequency range in which this relaxation of the uniform reference bandwidth is permitted, it typically is also acceptable to use a narrower RBW (again limited to a minimum of 1 % of OBW) to increase accuracy, but the measurement result must subsequently be integrated over the full reference bandwidth.

Test Setup Block:



3.11.5 Frequency stability

According to ANSI C63.26-2015 Section 5.6:

Frequency stability is a measure of the frequency drift due to temperature and supply voltage variations, with reference to the frequency measured at +20 °C and rated supply voltage.

The operating carrier frequency shall be set up in accordance with the manufacturer's published operation and instruction manual prior to the commencement of these tests. No adjustment of any frequency determining circuit element shall be made subsequent to this initial set-up. Frequency stability is tested:

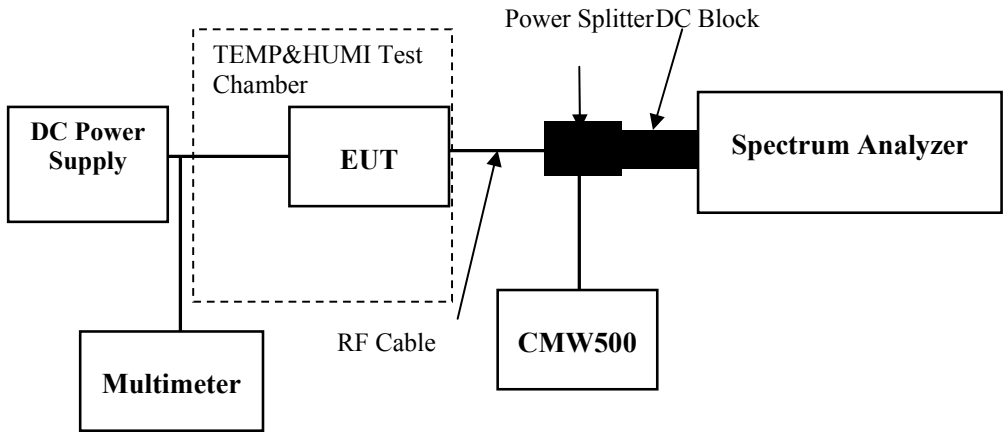
a) At 10 °C intervals of temperatures between −30 °C and +50 °C at the manufacturer's rated supply voltage, and

b) At +20 °C temperature and ±15% supply voltage variations. If a product is specified to operate over a range of input voltage then the −15% variation is applied to the lowermost voltage and the +15% is applied to the uppermost voltage.

During the test all necessary settings, adjustments and control of the EUT have to be performed without disturbing the test environment, i.e., without opening the environmental chamber. The frequency stabilities can be maintained to a lesser temperature range provided that the transmitter is automatically inhibited from operating outside the lesser temperature range. For handheld equipment that is only capable of operating from internal batteries and the supply voltage cannot be varied, the frequency stability tests shall be performed at the nominal battery voltage and the battery end point voltage specified by the manufacturer. An external supply voltage can be used and set at the internal battery nominal voltage, and again at the battery operating end point voltage which shall be specified by the equipment manufacturer.

If an unmodulated carrier is not available, the mean frequency of a modulated carrier can be obtained by using a frequency counter with gating time set to an appropriately large multiple of bit periods (gating time depending on the required accuracy). Full details on the choice of values shall be included in the test report.

Test Setup Block:



3.11.6 Transmitter unwanted emissions- Radiated Spurious emissions

According to ANSI C63.26-2015 Section 5.5.3:

Test setup:

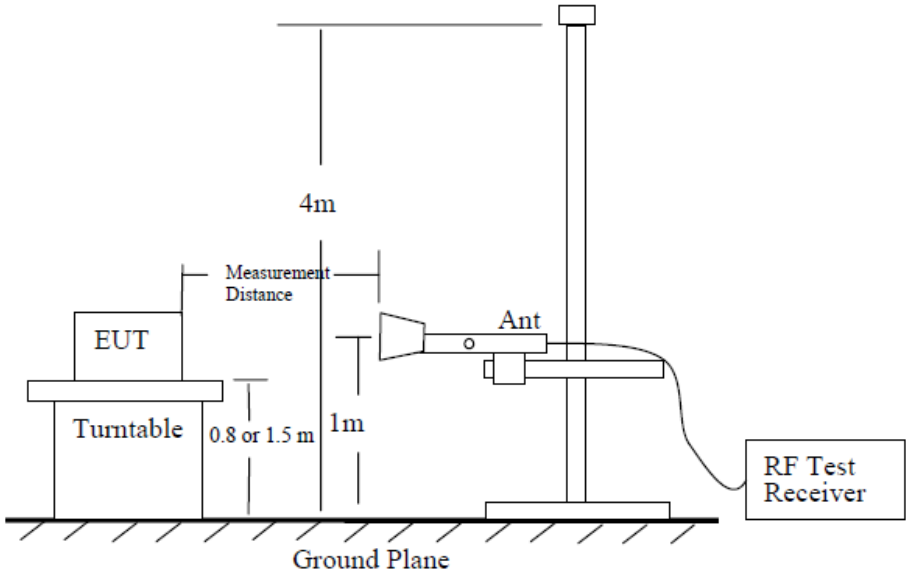


Figure 6—Test site-up for radiated ERP and/or EIRP measurements

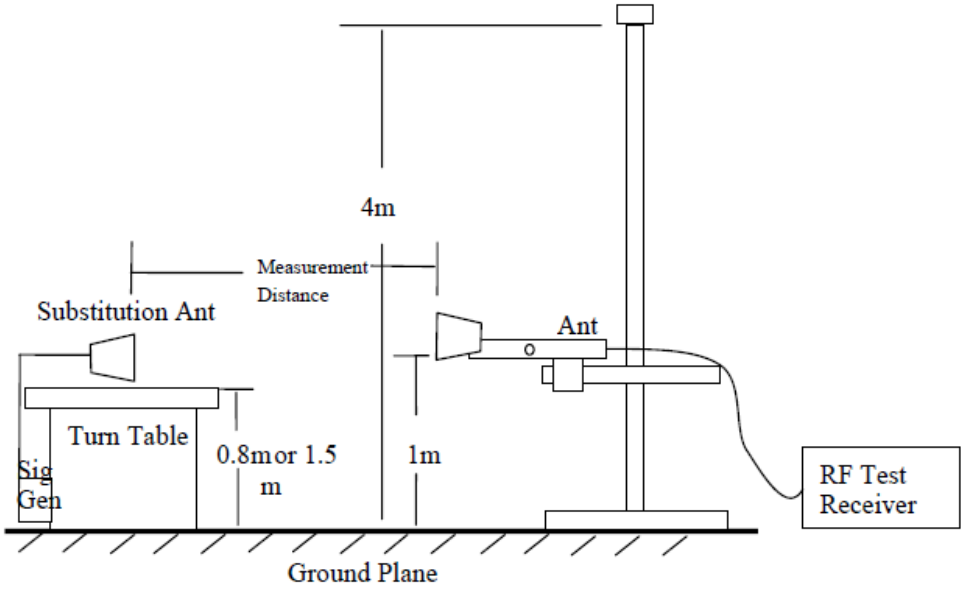


Figure 7—Substitution method set-up for radiated emission

Test Procedure:

a) Place the EUT in the center of the turntable. The EUT shall be configured to transmit into the standard non-radiating load (for measuring radiated spurious emissions), connected with cables of minimal length unless specified otherwise. If the EUT uses an adjustable antenna, the antenna shall be positioned to the length that produces the worst case emission at the fundamental operating frequency.

b) Each emission under consideration shall be evaluated:

1) Raise and lower the measurement antenna in accordance 5.5.2, as necessary to enable detection of the maximum emission amplitude relative to measurement antenna height.

2) Rotate the EUT through 360° to determine the maximum emission level relative to the axial position.

3) Return the turntable to the azimuth where the highest emission amplitude level was observed.

4) Vary the measurement antenna height again through 1 m to 4 m again to find the height associated with the maximum emission amplitude.

5) Record the measured emission amplitude level and frequency using the appropriate RBW.

c) Repeat step b) for each emission frequency with the measurement antenna oriented in both the horizontal and vertical polarizations to determine the orientation that gives the maximum emissions amplitude.

d) Set-up the substitution measurement with the reference point of the substitution antenna located as near as possible to where the center of the EUT radiating element was located during the initial EUT measurement.

e) Maintain the previous measurement instrument settings and test set-up, with the exception that the EUT is removed and replaced by the substitution antenna.

f) Connect a signal generator to the substitution antenna; locate the signal generator so as to minimize any potential influences on the measurement results. Set the signal generator to the frequency where emissions are detected, and set an output power level such that the radiated signal can be detected by the measurement instrument, with sufficient dynamic range relative to the noise floor.

g) For each emission that was detected and measured in the initial test [i.e., in step b) and step c)]:

1) Vary the measurement antenna height between 1 m to 4 m to maximize the received (measured) signal amplitude.

2) Adjust the signal generator output power level until the amplitude detected by the measurement instrument equals the amplitude level of the emission previously measured directly in step b) and step c).

3) Record the output power level of the signal generator when equivalence is achieved in step 2).

h) Repeat step e) through step g) with the measurement antenna oriented in the opposite polarization.

i) Calculate the emission power in dBm referenced to a half-wave dipole using the following equation:

Pe = Ps(dBm) − cable loss (dB) + antenna gain (dBd)

where

Pe = equivalent emission power in dBm
Ps = source (signal generator) power in dBm

NOTE—dBd refers to the measured antenna gain in decibels relative to a half-wave dipole.

j) Correct the antenna gain of the substitution antenna if necessary to reference the emission power to a half-wave dipole. When using measurement antennas with the gain specified in dBi, the equivalent dipole-referenced gain can be determined from: gain (dBd) = gain (dBi) − 2.15 dB. If necessary, the antenna gain can be calculated from calibrated antenna factor information

k) Provide the complete measurement results as a part of the test report.

4. Test DATA AND RESULTS

4.1 Antenna Port Test Data and Results for GSM 850 band:

Serial Number:	25K9-3	Test Date:	2023/6/6~2023/07/17
Test Site:	RF	Test Mode:	Transmitting
Tester:	George Chen	Test Result:	**Pass**

Environmental Conditions:					
Temperature: (℃)	24.2~27.5	Relative Humidity: (%)	38~62	ATM Pressure: (kPa)	100.1~102.2

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101474	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
YINSAIGE	Coaxial Cable	SS402	SJ0100001	Each time	N/A
Mini-Circuits	DC Block	BLK-18-S+	1554403	Each time	N/A
Weinschel	Power Splitter	1515	RA914	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	149218	2023/3/31	2024/3/30
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2022/9/29	2023/9/28
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	N/A

** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Frequency For Each Mode:

Operation Modes	Lowest Frequency (MHz)	Middle Frequency (MHz)	Highest Frequency (MHz)
GPRS	824.2	836.6	848.8
EDGE	824.2	836.6	848.8

Test Data:

RF Output Power						
Test Mode	Conducted Peak Output Power(dBm)			Maximum ERP (dBm)	ERP Limit (dBm)	
	Lowest Channel	Middle Channel	Highest Channel		FCC	IC
GPRS 1 Slot	31.72	31.63	31.41	28.11	38.45	34.77
GPRS 2 Slots	29.66	29.66	29.34	26.05	38.45	34.77
GPRS 3 Slots	27.72	27.74	27.29	24.13	38.45	34.77
GPRS 4 Slots	25.68	25.5	25.19	22.07	38.45	34.77
EDGE 1 Slot	27.22	26.53	26.42	23.61	38.45	34.77
EDGE 2 Slots	25.22	24.58	24.34	21.61	38.45	34.77
EDGE 3 Slots	23.25	22.57	22.32	19.64	38.45	34.77
EDGE 4 Slots	21.28	20.54	20.41	17.67	38.45	34.77
Note: ERP= Conducted Power(dBm) - L_C(dB) + G_T(dBd) G_T(dBd)=G_T(dBi)-2.15						
					Result:	**Pass**

Occupied Bandwidth						
Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Low Channel	Middle channel	High Channel	Low Channel	Middle Channel	High Channel
GPRS	0.244	0.246	0.244	0.3253	0.319	0.319
EDGE	0.239	0.24	0.243	0.3054	0.313	0.316
Note: The test plots please refer to the Plots of Occupied Bandwidth						

Spurious Emissions at Antenna Terminal	
Result:	**Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.**

Out of band emission, Band Edge	
Result:	**Pass, Please refer to the test plots of Out of band emission, Band Edge.**

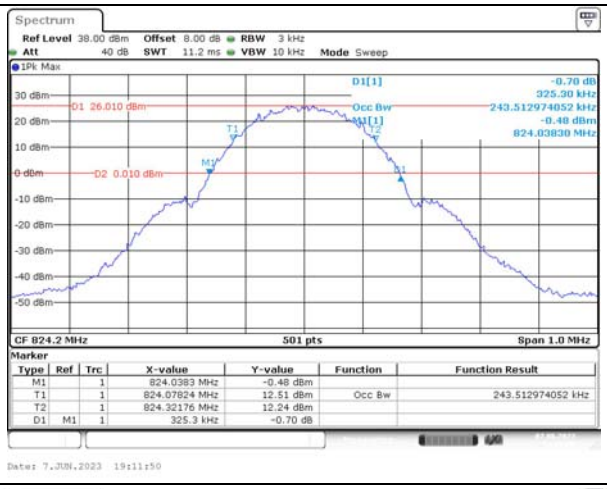
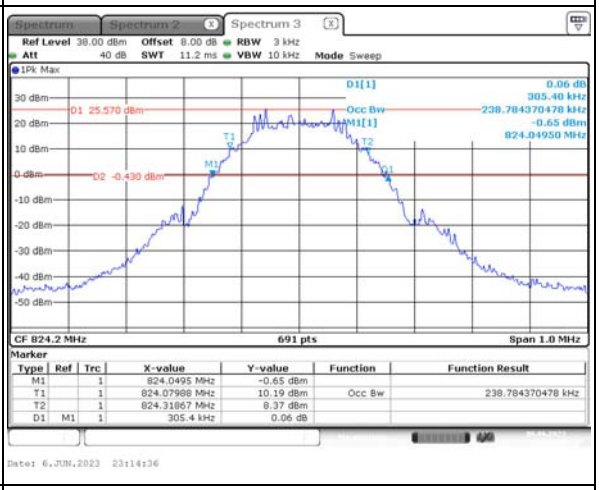
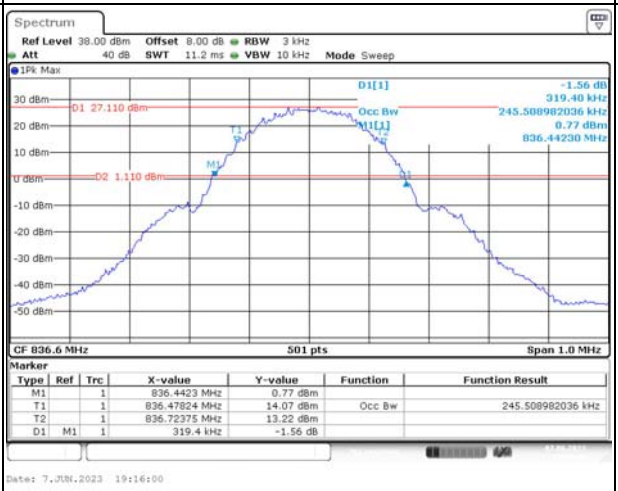
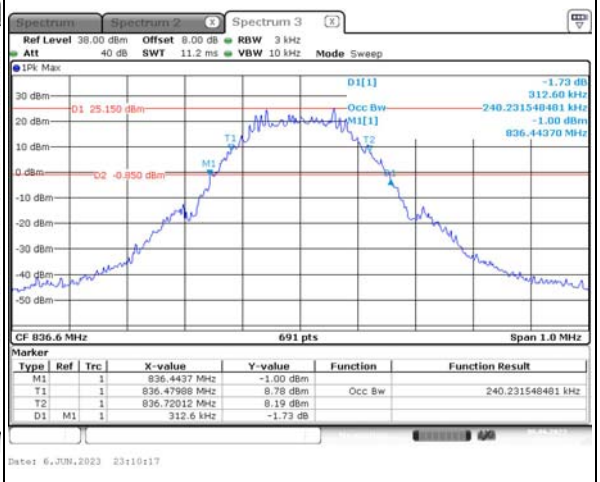
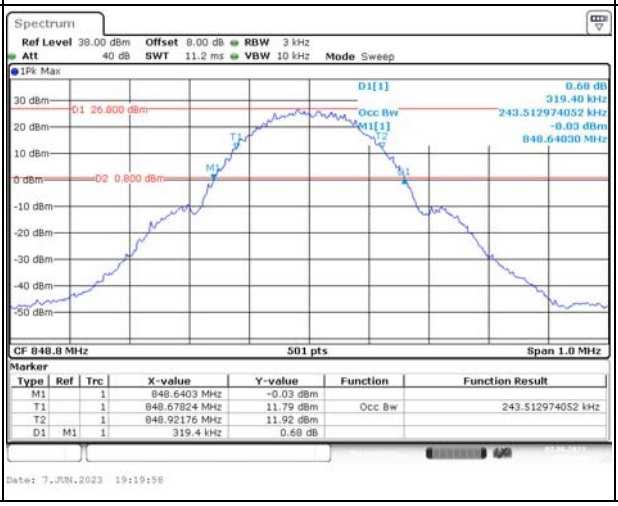
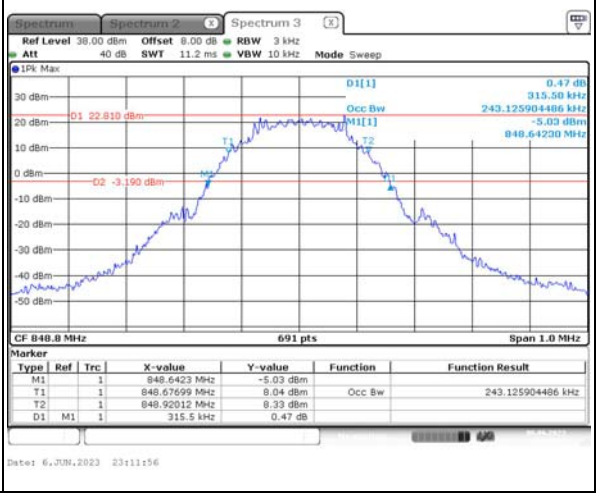
Frequency Stability(For FCC)					
Test Modulation:	GMSK		Test Channel:	836.6	MHz
Test Item	Temperature (℃)	Voltage (V_{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.87	-8.65	-0.010	2.5
	-20	3.87	-6.68	-0.008	2.5
	-10	3.87	9.77	0.012	2.5
	0	3.87	-7.62	-0.009	2.5
	10	3.87	-9.91	-0.012	2.5
	20	3.87	-9.82	-0.012	2.5
	30	3.87	-6.68	-0.008	2.5
	40	3.87	-8.86	-0.011	2.5
	50	3.87	5.67	0.007	2.5
Frequency Stability vs. Voltage	20	3.47	6.05	0.007	2.5
	20	4.45	7.52	0.009	2.5
				Result:	**Pass**

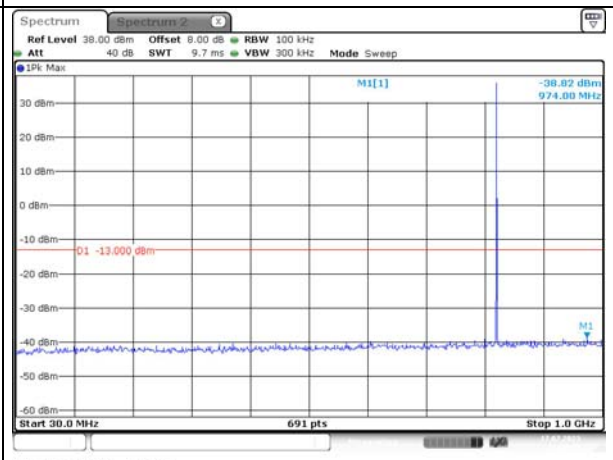
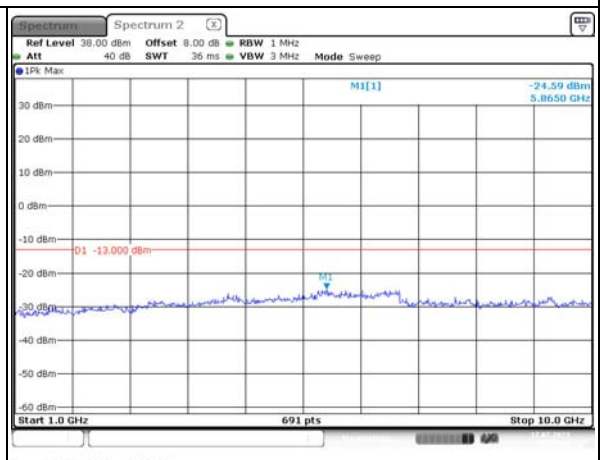
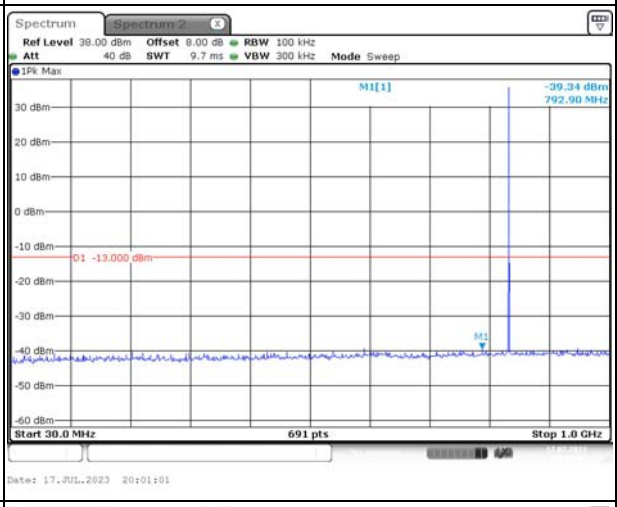
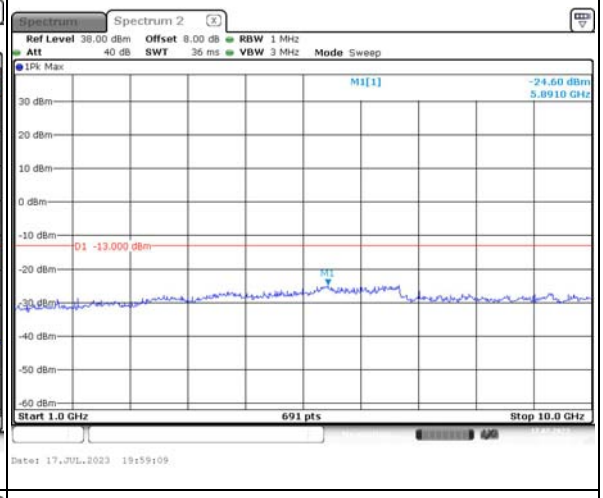
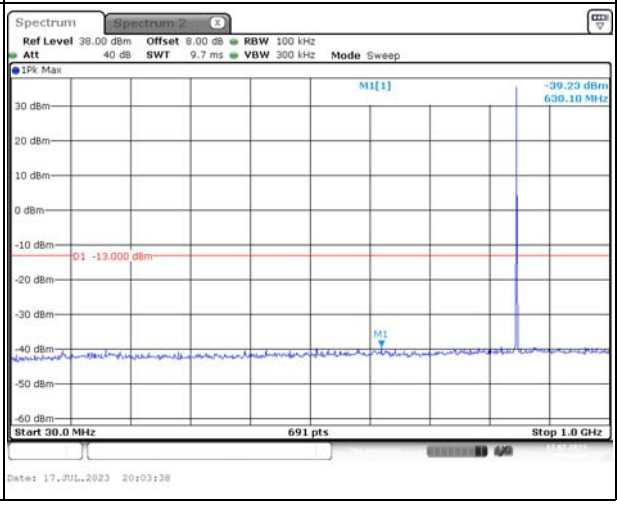
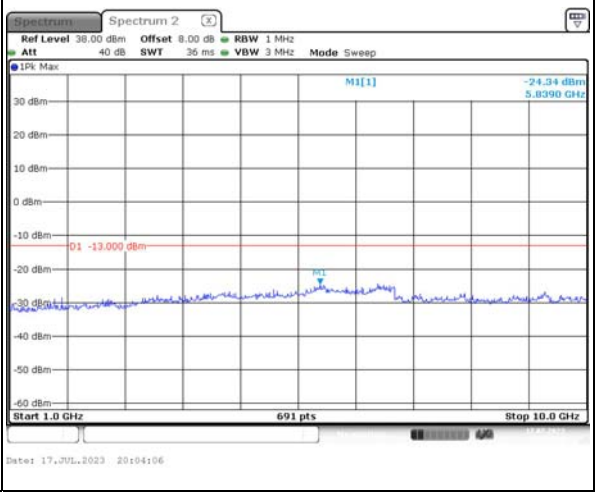
Test Modulation:	8PSK		Test Channel:	836.6	MHz
Test Item	Temperature (℃)	Voltage (V_{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.87	-7.8	-0.009	2.5
	-20	3.87	-9.97	-0.012	2.5
	-10	3.87	-6.13	-0.007	2.5
	0	3.87	6.17	0.007	2.5
	10	3.87	7.92	0.009	2.5
	20	3.87	6.46	0.008	2.5
	30	3.87	-6.52	-0.008	2.5
	40	3.87	7.18	0.009	2.5
	50	3.87	-9.7	-0.012	2.5
Frequency Stability vs. Voltage	20	3.47	-8.17	-0.010	2.5
	20	4.45	-7.05	-0.008	2.5
				Result:	**Pass**

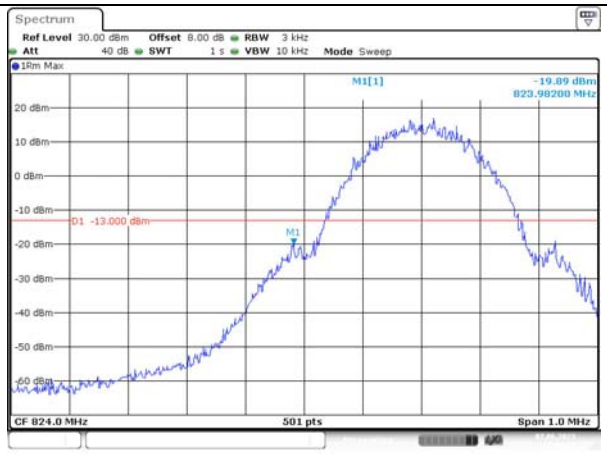
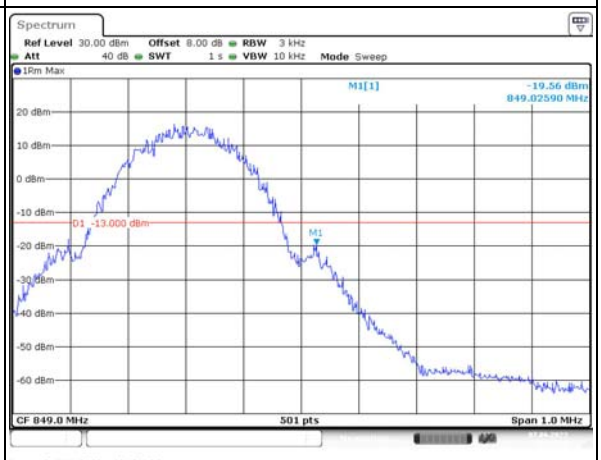
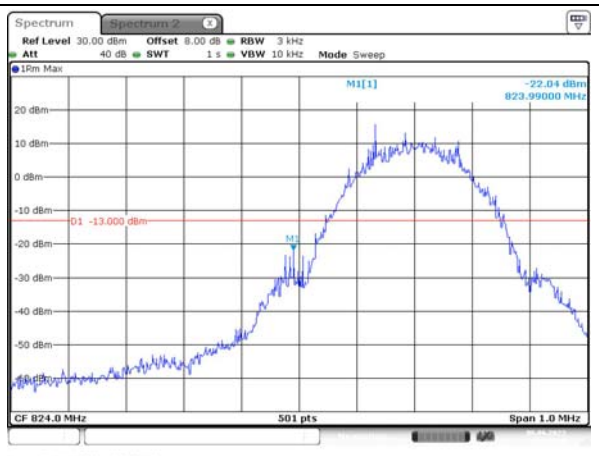
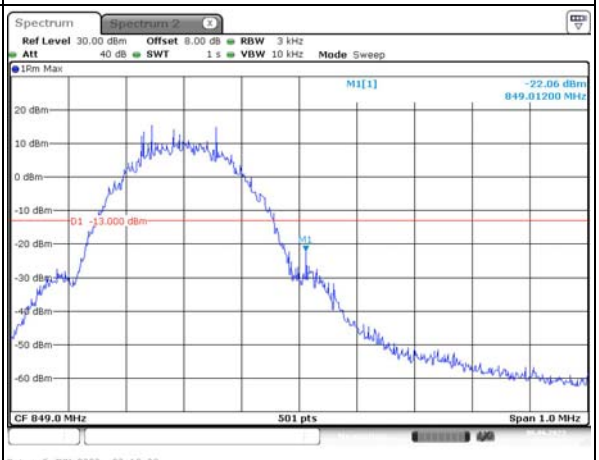
Frequency Stability (For IC)						
Test Mode:	GMSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.87	824.084	824.000	848.919	849.000
	-20	3.87	824.089	824.000	848.928	849.000
	-10	3.87	824.077	824.000	848.926	849.000
	0	3.87	824.074	824.000	848.923	849.000
	10	3.87	824.09	824.000	848.922	849.000
	20	3.87	824.078	824.000	848.922	849.000
	30	3.87	824.084	824.000	848.921	849.000
	40	3.87	824.075	824.000	848.927	849.000
	50	3.87	824.079	824.000	848.913	849.000
Frequency Stability vs. Voltage	20	3.47	824.089	824.000	848.927	849.000
	20	4.45	824.075	824.000	848.931	849.000
					Result:	**Pass**

Test Mode:	8PSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.87	824.084	824.000	848.928	849.000
	-20	3.87	824.075	824.000	848.915	849.000
	-10	3.87	824.085	824.000	848.924	849.000
	0	3.87	824.079	824.000	848.934	849.000
	10	3.87	824.088	824.000	848.926	849.000
	20	3.87	824.080	824.000	848.920	849.000
	30	3.87	824.088	824.000	848.920	849.000
	40	3.87	824.084	824.000	848.920	849.000
	50	3.87	824.090	824.000	848.915	849.000
Frequency Stability vs. Voltage	20	3.47	824.074	824.000	848.91	849.000
	20	4.45	824.081	824.000	848.926	849.000
					Result:	**Pass**

Test Plots(Note: The 8dB is the Insertion loss of the RF cable, Coaxial tee connector and DC Block, which was offset into the Spectrum Analyzer)**:**

Occupied Bandwidth		
Channel	**GPRS**	**EDGE**
Lowest		
Middle		
Highest		

Spurious Emissions at Antenna Terminal		
Channel	**GPRS**	
Lowest		
Middle		
Highest		

Out of band emission, Band Edge		
Mode	Lowest	Highest
GPRS		
EDGE		

4.2 Antenna Port Test Data and Results for GSM 1900 band:

Serial Number:	25K9-3	Test Date:	2023/6/6~2023/07/17
Test Site:	RF	Test Mode:	Transmitting
Tester:	George Chen	Test Result:	**Pass**

Environmental Conditions:					
Temperature: (℃)	24.2~27.5	Relative Humidity: (%)	38~62	ATM Pressure: (kPa)	100.1~102.2

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101474	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
YINSAIGE	Coaxial Cable	SS402	SJ0100001	Each time	N/A
Mini-Circuits	DC Block	BLK-18-S+	1554403	Each time	N/A
Weinschel	Power Splitter	1515	RA914	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	149218	2023/3/31	2024/3/30
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2022/9/29	2023/9/28
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	N/A

** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Frequency For Each Mode:

Operation Modes	Lowest Frequency (MHz)	Middle Frequency (MHz)	Highest Frequency (MHz)
GPRS	1850.2	1880	1909.8
EDGE	1850.2	1880	1909.8

Test Data:

RF Output Power					
Test Mode	Conducted Peak Output Power(dBm)			Maximum EIRP (dBm)	EIRP Limit (dBm)
	Lowest Channel	Middle Channel	Highest Channel		
GPRS 1 Slot	29.75	29.45	29.31	30.41	33
GPRS 2 Slots	27.69	27.51	27.23	28.35	33
GPRS 3 Slots	25.69	25.53	25.17	26.35	33
GPRS 4 Slots	23.78	23.63	23.11	24.44	33
EDGE 1 Slot	27	26.53	26.5	27.66	33
EDGE 2 Slots	24.95	24.57	24.59	25.61	33
EDGE 3 Slots	22.95	22.58	22.6	23.61	33
EDGE 4 Slots	20.92	20.6	20.59	21.58	33
Note: EIRP=Conducted Power(dBm) - L_C(dB) + G_T(dBi)					
				Result:	**Pass**

Occupied Bandwidth						
Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Low Channel	Middle channel	High Channel	Low Channel	Middle Channel	High Channel
GPRS	0.246	0.244	0.246	0.319	0.317	0.323
EDGE	0.242	0.245	0.243	0.305	0.317	0.313
Note: The test plots please refer to the Plots of Occupied Bandwidth						

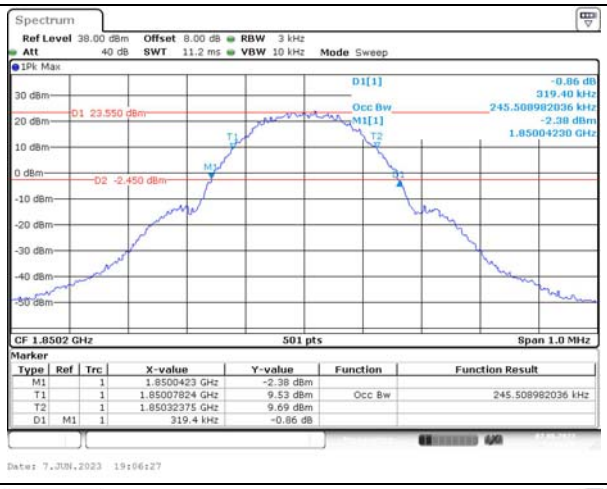
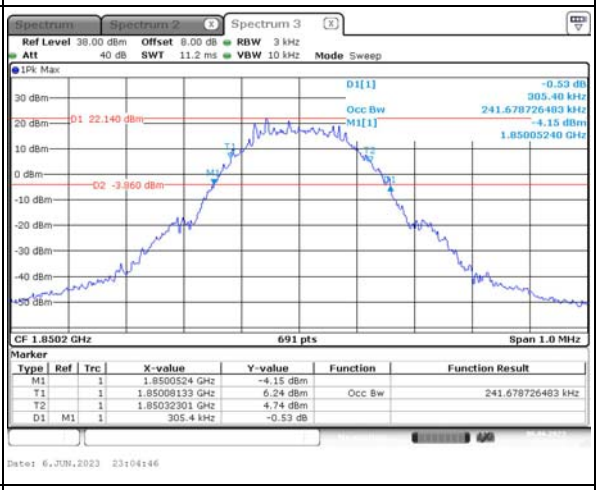
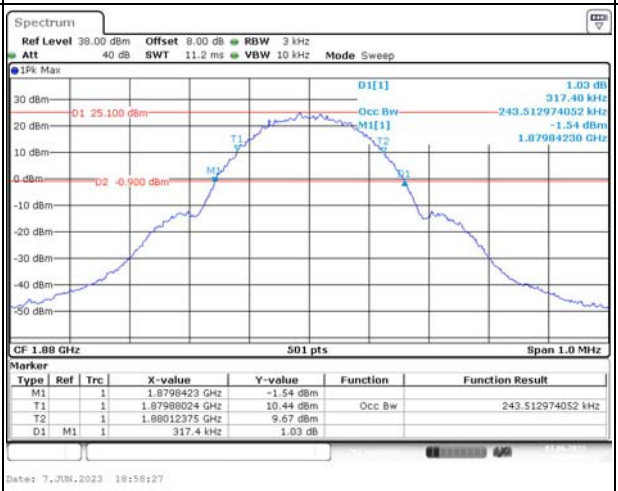
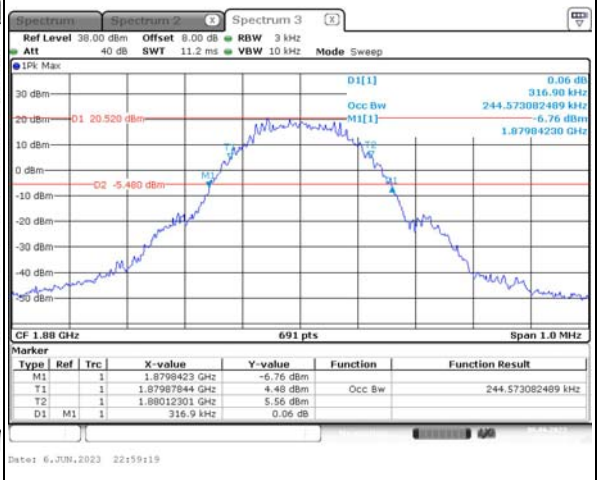
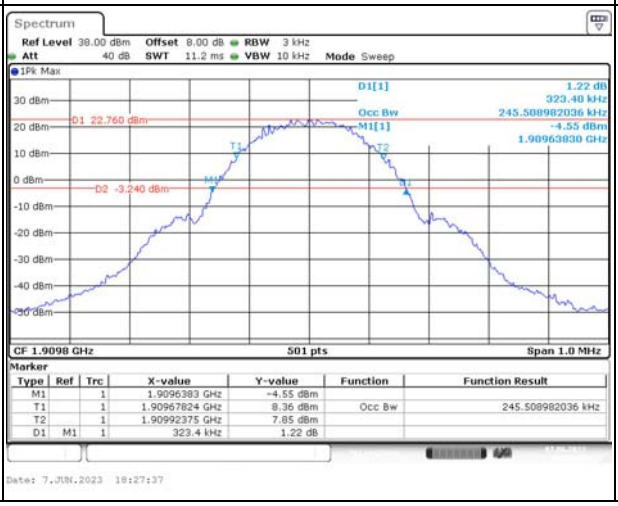
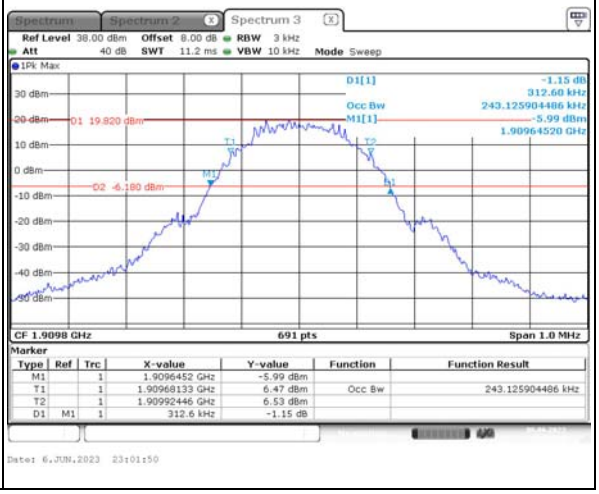
Spurious Emissions at Antenna Terminal	
Result:	**Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.**

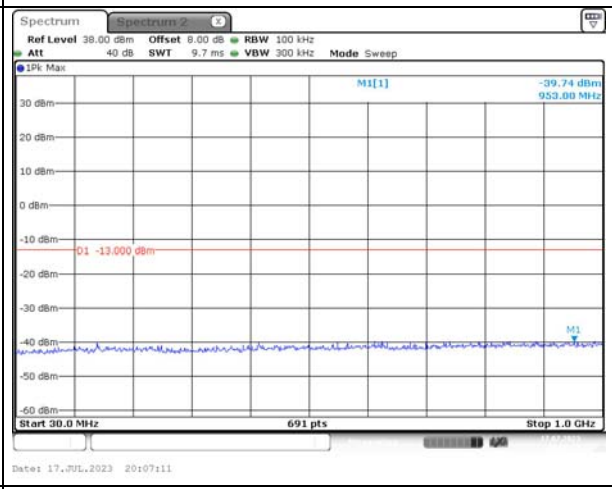
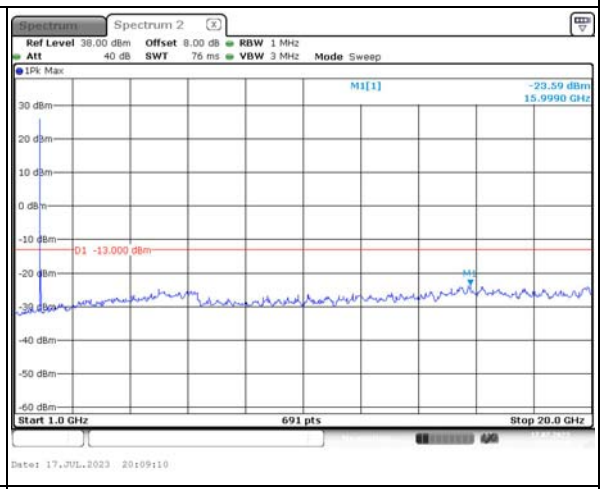
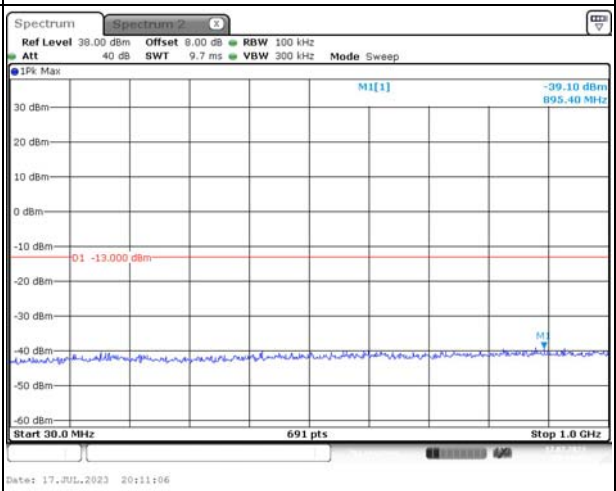
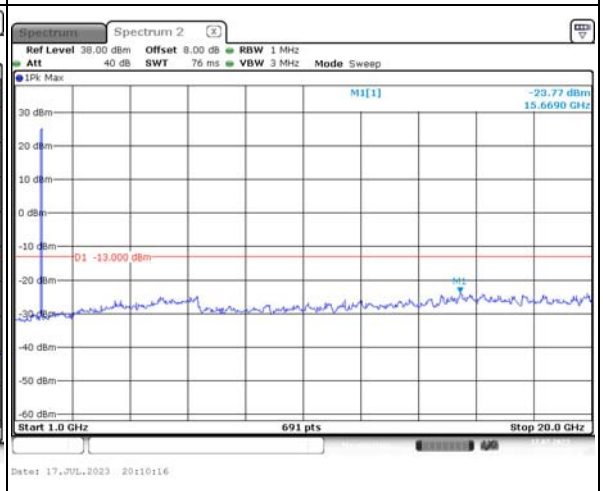
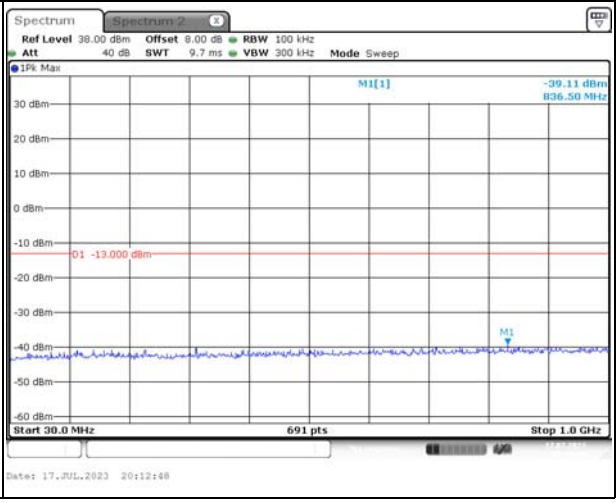
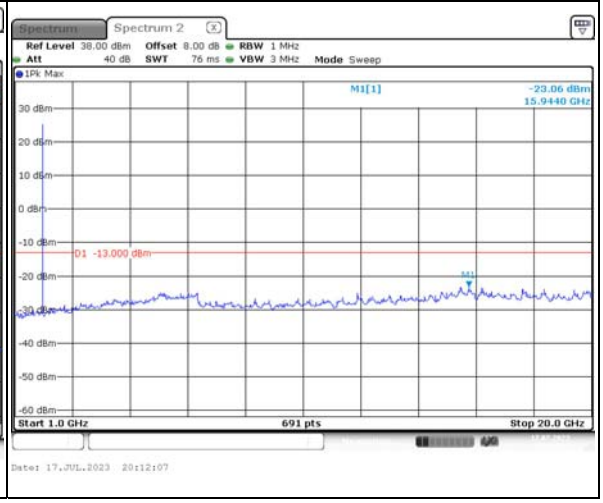
Out of band emission, Band Edge	
Result:	**Pass, Please refer to the test plots of Out of band emission, Band Edge.**

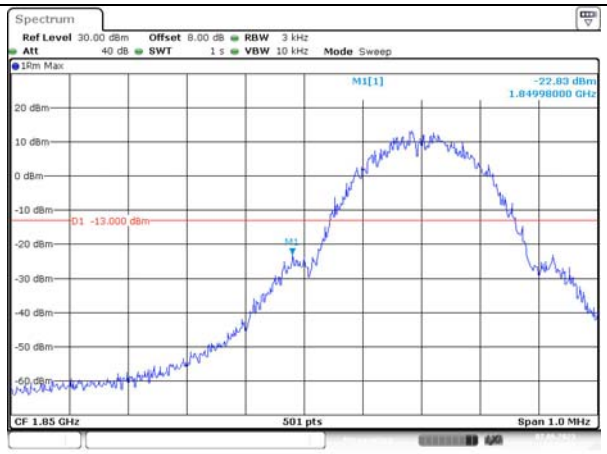
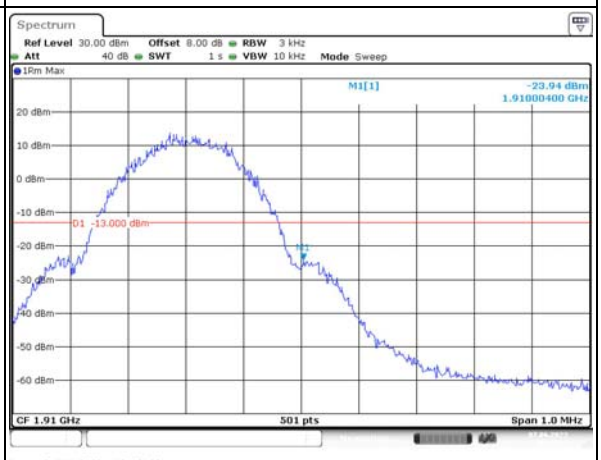
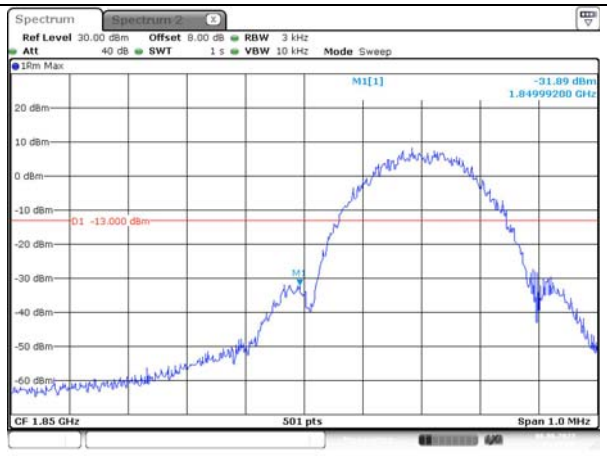
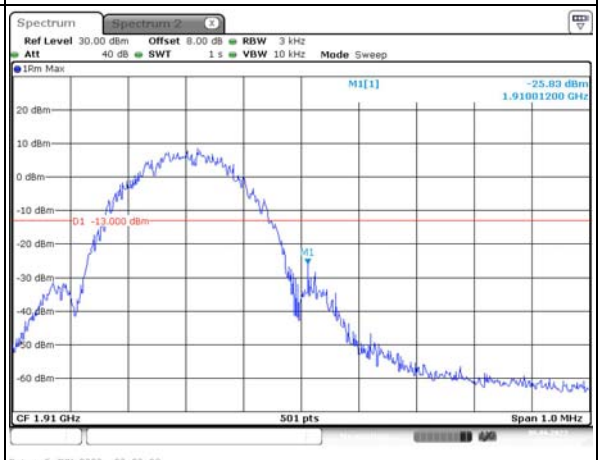
Frequency Stability						
Test Mode:	GMSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.87	1850.002	1850.000	1909.991	1910.000
	-20	3.87	1850.068	1850.000	1909.914	1910.000
	-10	3.87	1850.006	1850.000	1909.993	1910.000
	0	3.87	1850.065	1850.000	1909.963	1910.000
	10	3.87	1850.024	1850.000	1909.945	1910.000
	20	3.87	1850.080	1850.000	1909.923	1910.000
	30	3.87	1850.023	1850.000	1909.911	1910.000
	40	3.87	1850.040	1850.000	1909.972	1910.000
	50	3.87	1850.048	1850.000	1909.921	1910.000
Frequency Stability vs. Voltage	20	3.47	1850.053	1850.000	1909.968	1910.000
	20	4.45	1850.027	1850.000	1909.991	1910.000
					Result:	**Pass**

Test Mode:	8PSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.87	1850.079	1850.000	1909.935	1910.000
	-20	3.87	1850.078	1850.000	1909.944	1910.000
	-10	3.87	1850.026	1850.000	1909.980	1910.000
	0	3.87	1850.042	1850.000	1909.950	1910.000
	10	3.87	1850.025	1850.000	1909.911	1910.000
	20	3.87	1850.032	1850.000	1909.968	1910.000
	30	3.87	1850.029	1850.000	1909.954	1910.000
	40	3.87	1850.056	1850.000	1909.936	1910.000
	50	3.87	1850.025	1850.000	1909.948	1910.000
Frequency Stability vs. Voltage	20	3.47	1850.016	1850.000	1909.999	1910.000
	20	4.45	1850.024	1850.000	1909.916	1910.000
					Result:	**Pass**

Test Plots(Note: The 8dB is the Insertion loss of the RF cable, Coaxial tee connector and DC Block, which was offset into the Spectrum Analyzer)**:**

Occupied Bandwidth		
Channel	**GPRS**	**EDGE**
Lowest		
Middle		
Highest		

Spurious Emissions at Antenna Terminal		
Channel	**GPRS**	
Lowest		
Middle		
Highest		

Out of band emission, Band Edge		
Channel	Lowest	Highest
GPRS		
EDGE		

4.3 Antenna Port Test Data and Results for WCDMA Band 2:

Serial Number:	25K9-3	Test Date:	2023/06/06
Test Site:	RF	Test Mode:	Transmitting
Tester:	George Chen	Test Result:	**Pass**

Environmental Conditions:					
Temperature: (℃)	27.5	Relative Humidity: (%)	62	ATM Pressure: (kPa)	102.2

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101474	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
YINSAIGE	Coaxial Cable	SS402	SJ0100001	Each time	N/A
Mini-Circuits	DC Block	BLK-18-S+	1554403	Each time	N/A
Weinschel	Power Splitter	1515	RA914	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	149218	2023/3/31	2024/3/30
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2022/9/29	2023/9/28
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	N/A

** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Frequency For Each Mode:

Operation Modes	Lowest Frequency (MHz)	Middle Frequency (MHz)	Highest Frequency (MHz)
WCDMA	1852.4	1880	1907.6

Test Data:

RF Output Power:

Test Mode	Conducted Average Output Power(dBm)			Maximum EIRP (dBm)	EIRP Limit (dBm)
	Lowest Channel	Middle Channel	Highest Channel		
WCDMA R99	22.3	22.86	22.54	23.52	33
HSDPA Subtest 1	22.27	22.8	22.74	23.46	33
HSDPA Subtest 2	22.03	21.96	22.79	23.45	33
HSDPA Subtest 3	21.82	22.22	22.12	22.88	33
HSDPA Subtest 4	21.74	21.6	22.11	22.77	33
HSUPA Subtest 1	22.13	22.45	22.96	23.62	33
HSUPA Subtest 2	22.15	22.64	22.15	23.3	33
HSUPA Subtest 3	21.95	21.96	22.22	22.88	33
HSUPA Subtest 4	21.86	22.46	21.99	23.12	33
HSUPA Subtest 5	21.82	21.88	22.61	23.27	33
DC-HSDPA Subtest 1	22.05	21.96	22.54	23.2	33
DC-HSDPA Subtest 2	21.9	22.24	21.94	22.9	33
DC-HSDPA Subtest 3	21.7	21.67	22.04	22.7	33
DC-HSDPA Subtest 4	21.69	22.17	21.79	22.83	33
HSPA+ Subtest 1	21.57	21.87	21.82	22.53	33
Note: EIRP=Conducted Power(dBm) - L_C(dB) + G_T(dBi)					
				Result:	**Pass**

Peak-to-average Ratio(PAR)

Test Mode	Peak-to-average Ratio(dB)			Limit (dB)
	Lowest Channel	Middle Channel	Highest Channel	
WCDMA R99	2.93	2.75	2.84	13
HSDPA	4.75	3.04	3.16	13
HSUPA	4.75	5.71	5.77	13
				Result: **Pass**

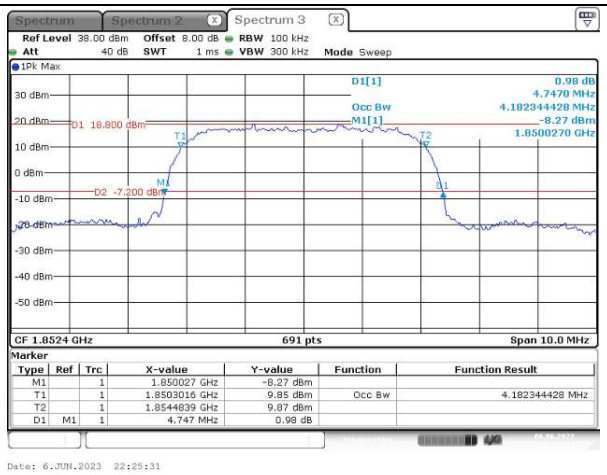
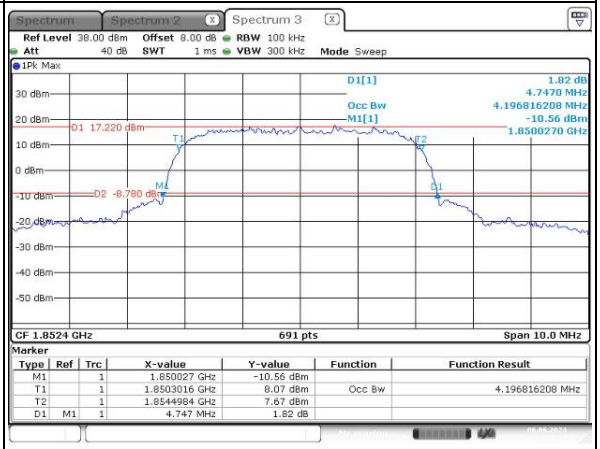
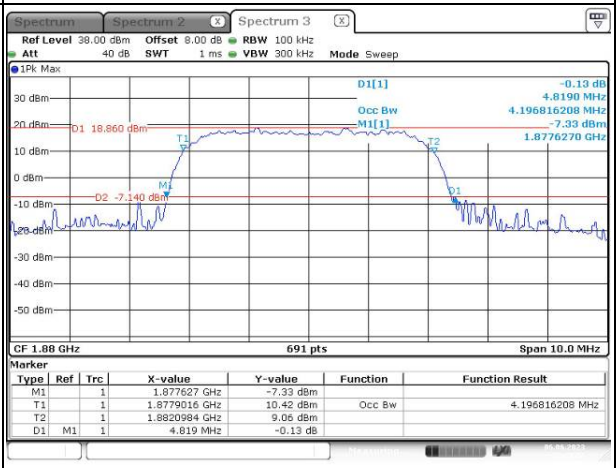
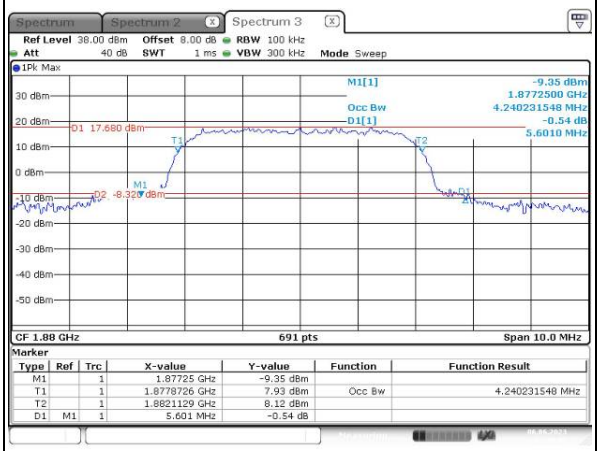
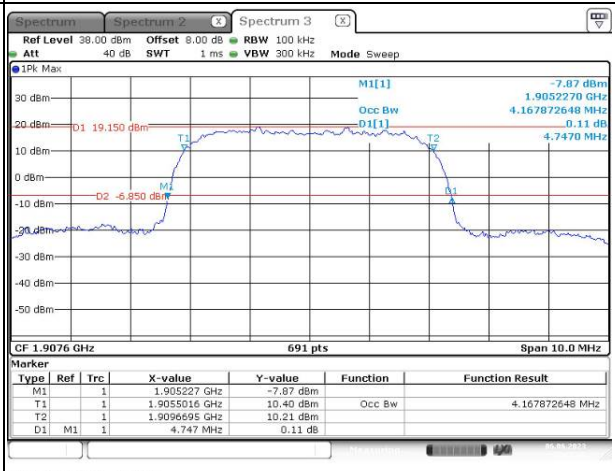
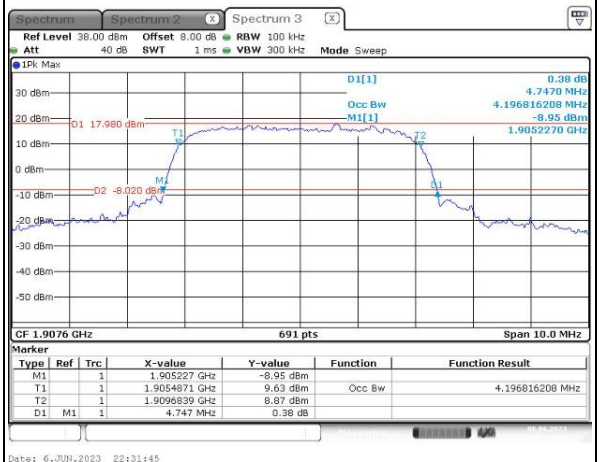
Occupied Bandwidth						
Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Low Channel	Middle channel	High Channel	Low Channel	Middle Channel	High Channel
WCDMA R99	4.18	4.197	4.168	4.747	4.819	4.747
HSDPA	4.199	4.240	4.197	4.747	5.601	4.747
HSUPA	4.199	4.255	4.182	4.761	5.702	4.732
Note: The test plots please refer to the Plots of Occupied Bandwidth						

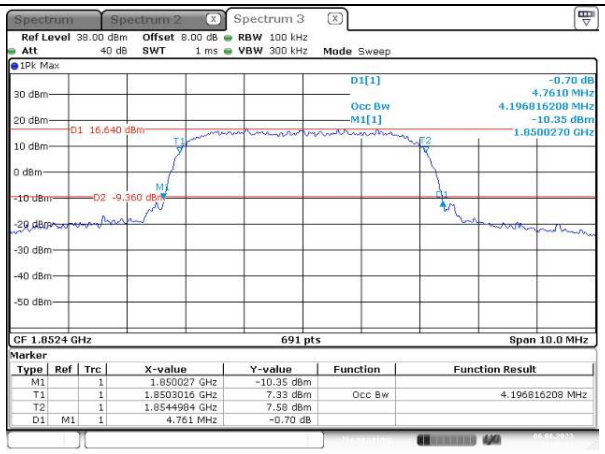
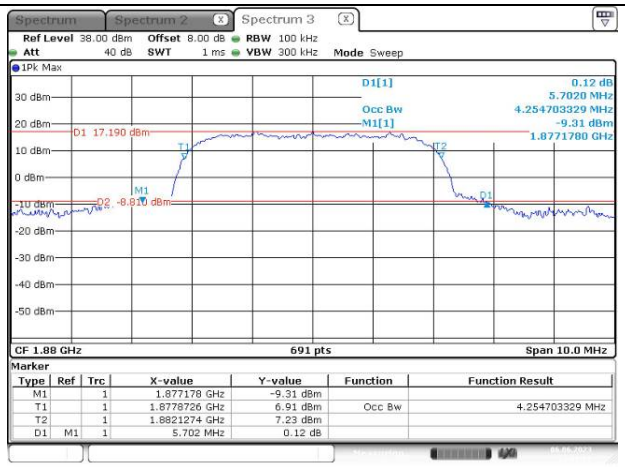
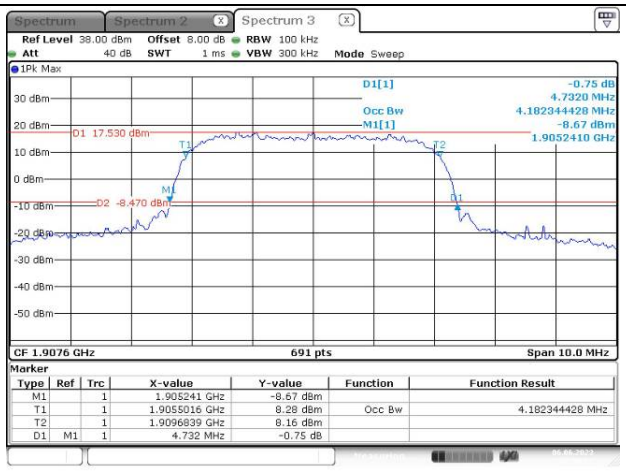
Spurious Emissions at Antenna Terminal	
Result:	**Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.**

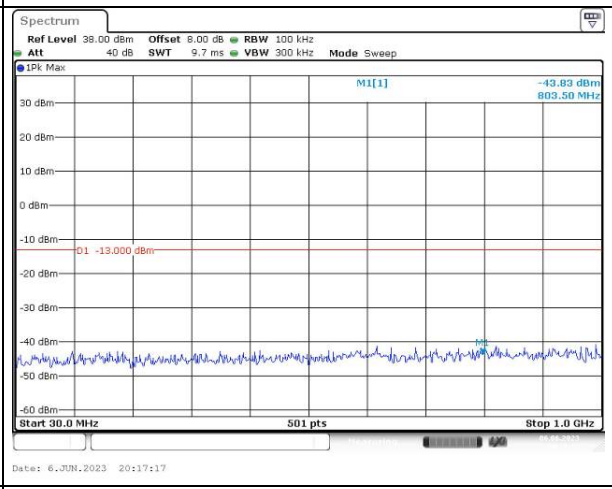
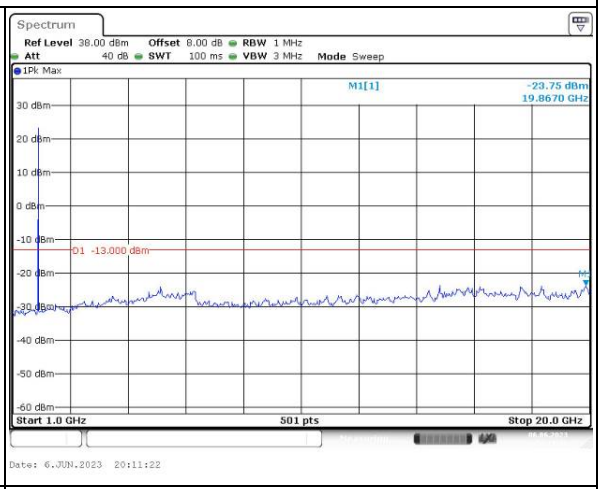
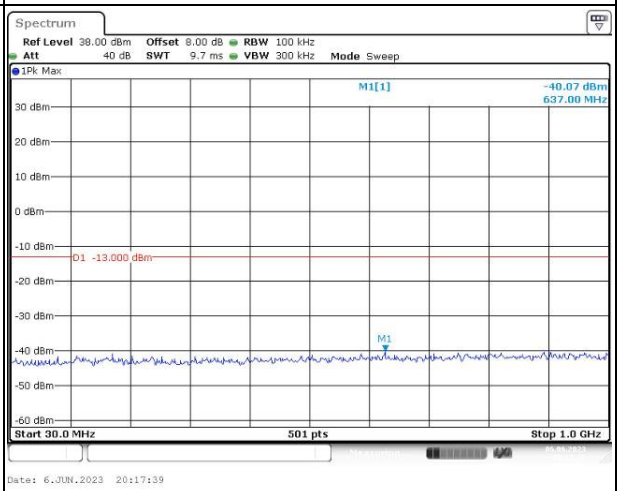
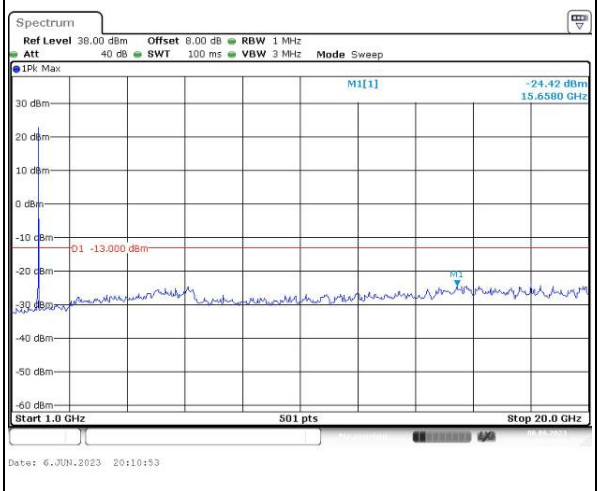
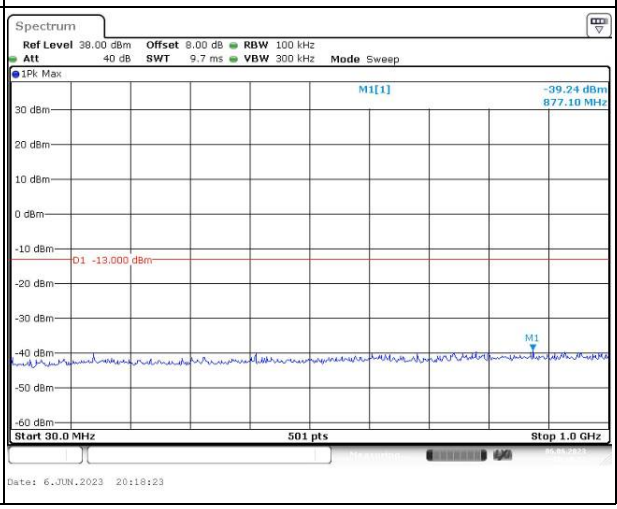
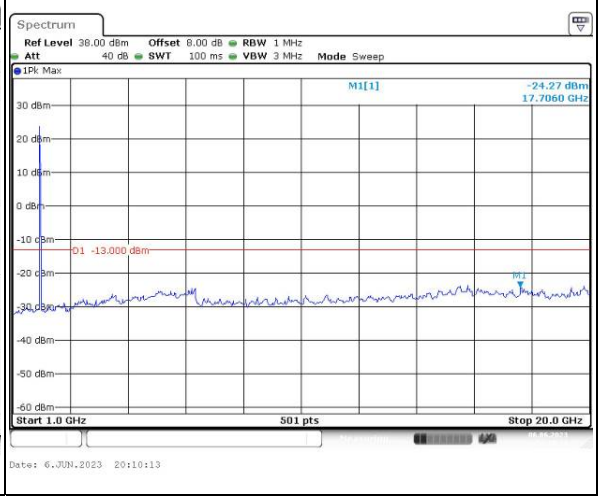
Out of band emission, Band Edge	
Result:	**Pass, Please refer to the test plots of Out of band emission, Band Edge.**

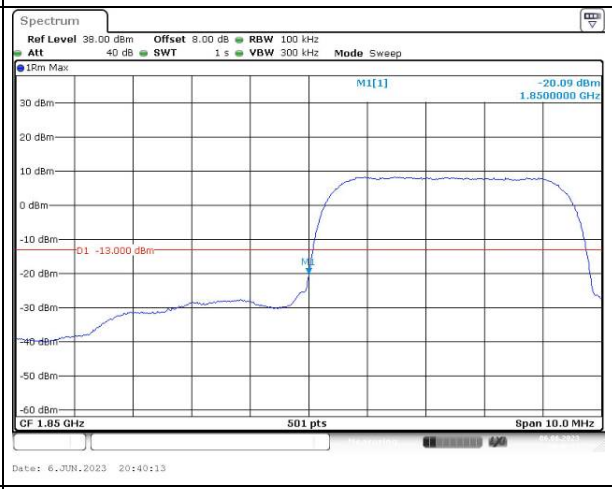
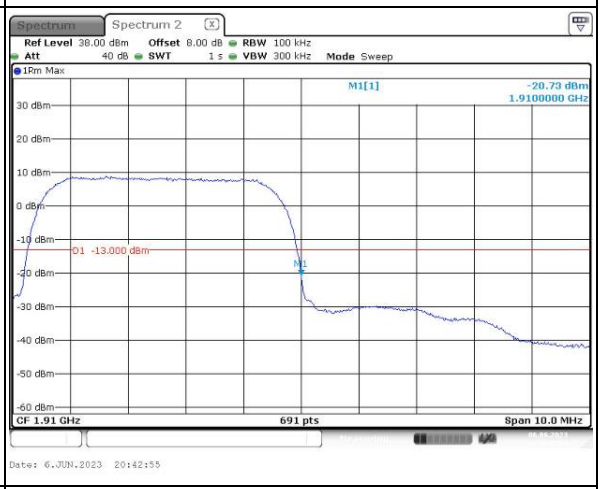
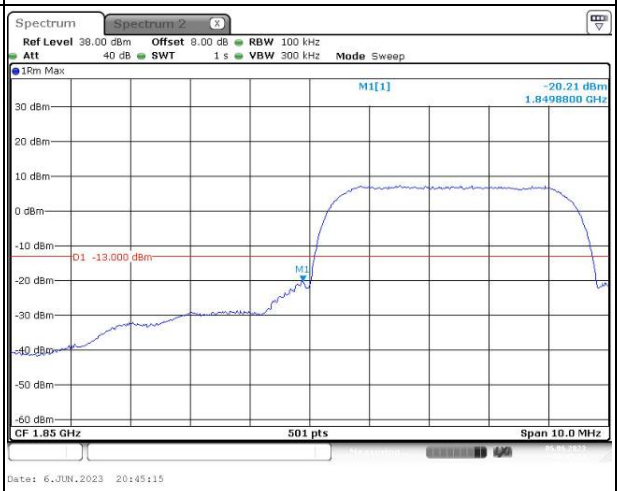
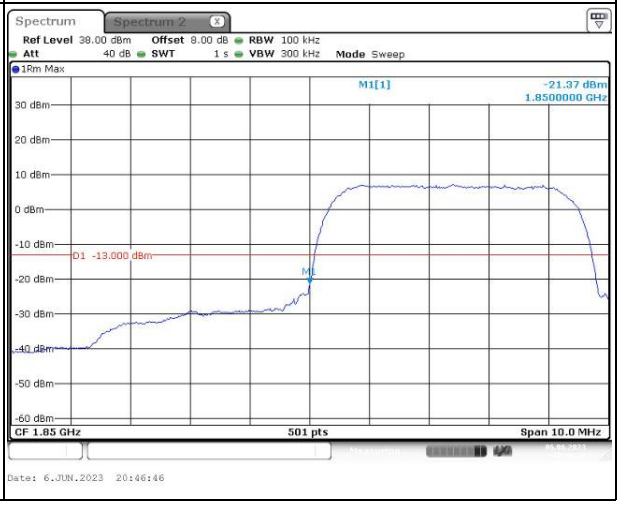
Frequency Stability						
Test Mode:	WCDMA R99	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.87	1850.392	1850.000	1909.614	1910.000
	-20	3.87	1850.314	1850.000	1909.675	1910.000
	-10	3.87	1850.373	1850.000	1909.624	1910.000
	0	3.87	1850.350	1850.000	1909.638	1910.000
	10	3.87	1850.390	1850.000	1909.683	1910.000
	20	3.87	1850.302	1850.000	1909.669	1910.000
	30	3.87	1850.302	1850.000	1909.676	1910.000
	40	3.87	1850.391	1850.000	1909.685	1910.000
	50	3.87	1850.310	1850.000	1909.612	1910.000
Frequency Stability vs. Voltage	20	3.47	1850.335	1850.000	1909.695	1910.000
	20	4.45	1850.316	1850.000	1909.653	1910.000
					Result:	**Pass**

Test Plots(Note: The 8dB is the Insertion loss of the RF cable, Coaxial tee connector and DC Block, which was offset into the Spectrum Analyzer)**:**

Occupied Bandwidth		
Channel	WCDMA R99	HSDPA
Lowest		
Middle		
Highest		

Occupied Bandwidth	
Channel	HSUPA
Lowest	
Middle	
Highest	

Spurious Emissions at Antenna Terminal		
Channel	WCDMA R99	
Lowest		
Middle		
Highest		

Out of band emission, Band Edge		
Mode	**Lowest**	**Highest**
R99		
HSUPA		
HSDPA		

4.4 Antenna Port Test Data and Results for WCDMA Band 4:

Serial Number:	25K9-3	Test Date:	2023/06/06~2023/08/16
Test Site:	RF	Test Mode:	Transmitting
Tester:	George Chen	Test Result:	**Pass**

Environmental Conditions:					
Temperature: (℃)	27.5	Relative Humidity: (%)	62	ATM Pressure: (kPa)	102.2

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101474	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
YINSAIGE	Coaxial Cable	SS402	SJ0100001	Each time	N/A
Mini-Circuits	DC Block	BLK-18-S+	1554403	Each time	N/A
Weinschel	Power Splitter	1515	RA914	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	149218	2023/3/31	2024/3/30
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2022/9/29	2023/9/28
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	N/A

** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Frequency For Each Mode:

Operation Modes	Lowest Frequency (MHz)	Middle Frequency (MHz)	Highest Frequency (MHz)
WCDMA	1712.4	1732.6	1752.6

Test Data:

RF Output Power:

Test Mode	Conducted Average Output Power(dBm)			Maximum EIRP (dBm)	EIRP Limit (dBm)
	Lowest Channel	Middle Channel	Highest Channel		
WCDMA R99	22.16	22.73	22.38	24.53	30
HSDPA Subtest 1	21.88	22.19	21.97	23.99	30
HSDPA Subtest 2	21.75	21.94	22.39	24.19	30
HSDPA Subtest 3	21.56	21.7	22.17	23.97	30
HSDPA Subtest 4	21.4	21.81	22.1	23.9	30
HSUPA Subtest 1	22.03	22.28	22.28	24.08	30
HSUPA Subtest 2	22.09	22.66	22.69	24.49	30
HSUPA Subtest 3	21.86	22.12	22.21	24.01	30
HSUPA Subtest 4	21.77	22.04	22.29	24.09	30
HSUPA Subtest 5	21.55	21.36	21.9	23.7	30
DC-HSDPA Subtest 1	21.85	21.93	22.64	24.44	30
DC-HSDPA Subtest 2	21.76	22.19	21.83	23.99	30
DC-HSDPA Subtest 3	21.6	21.43	22	23.8	30
DC-HSDPA Subtest 4	21.47	21.98	21.95	23.78	30
HSPA+ Subtest 1	21.46	21.46	22.15	23.95	30
Note: EIRP=Conducted Power(dBm) - L_C(dB) + G_T(dBi)					
				Result:	**Pass**

Peak-to-average Ratio(PAR)

Test Mode	Peak-to-average Ratio(dB)			Limit (dB)	
	Lowest Channel	Middle Channel	Highest Channel		
WCDMA R99	2.78	3.01	2.81	13	
HSDPA	3.07	5.04	4.46	13	
HSUPA	5.22	5.62	5.28	13	
				Result:	**Pass**

Occupied Bandwidth						
Opration Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Low Channel	Middle channel	High Channel	Low Channel	Middle Channel	High Channel
WCDMA R99	4.182	4.168	4.182	4.747	4.732	4.747
HSDPA	4.182	4.182	4.168	4.747	4.747	4.718
HSUPA	4.199	4.168	4.182	4.747	4.732	4.474
Note: The test plots please refer to the Plots of Occupied Bandwidth						

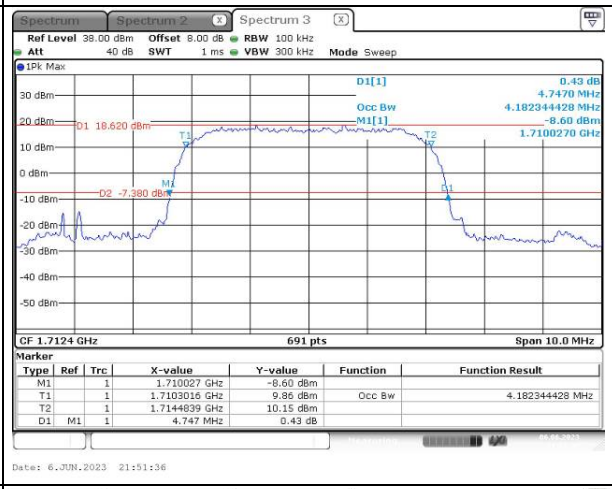
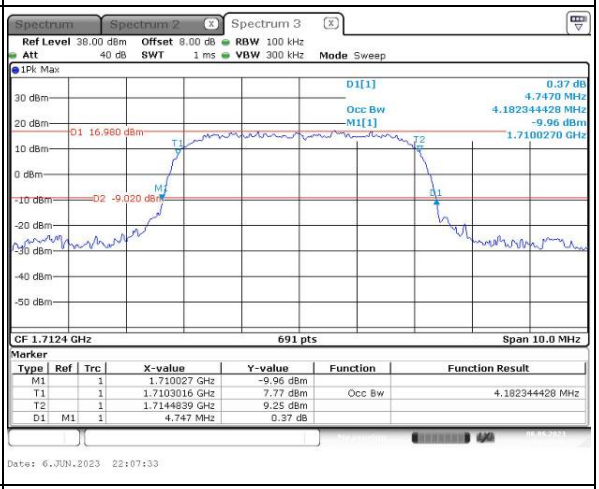
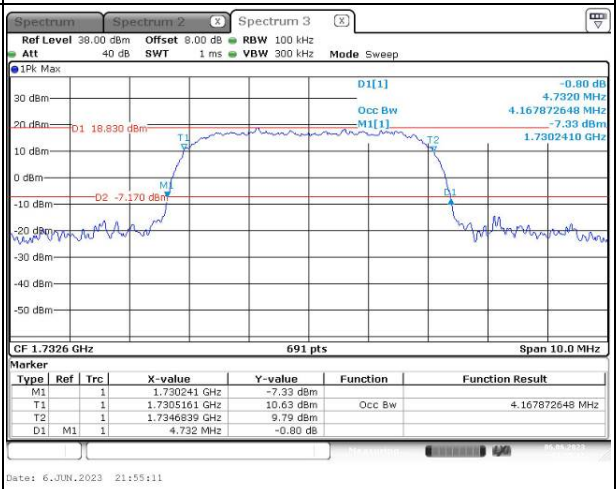
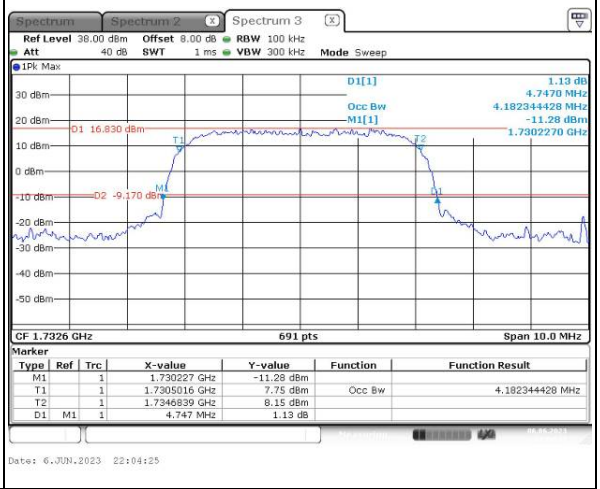
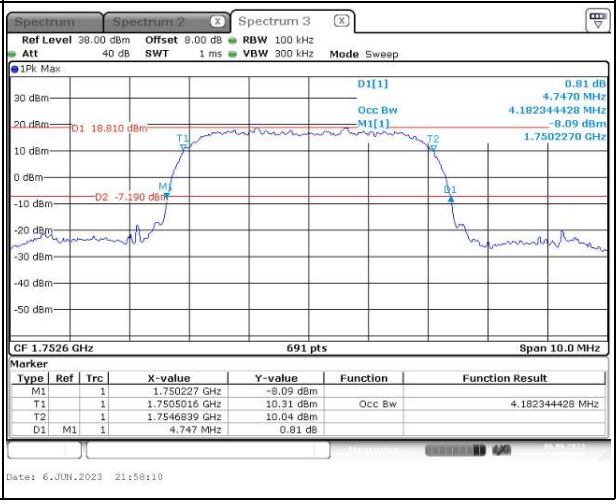
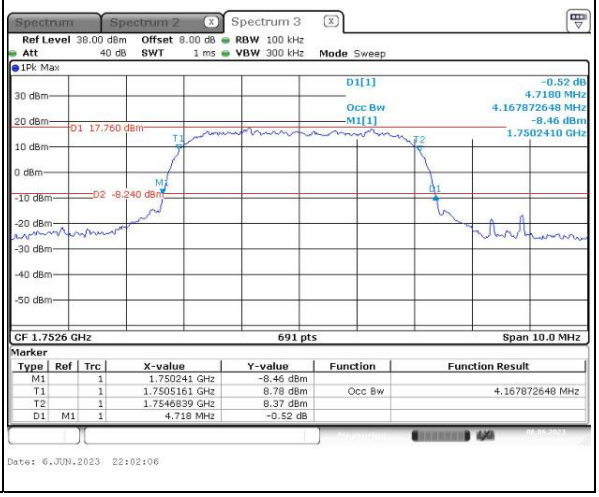
Spurious Emissions at Antenna Terminal	
Result:	**Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.**

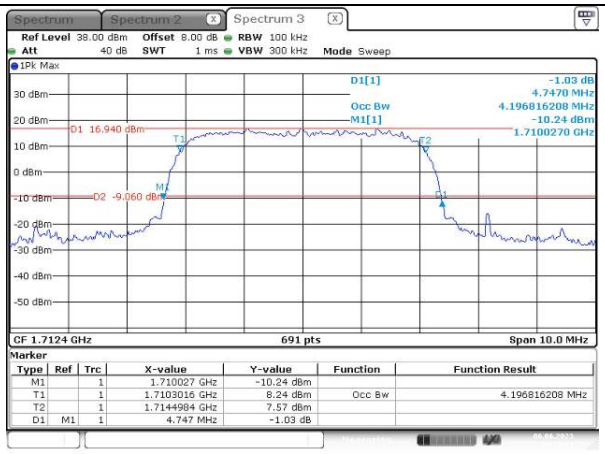
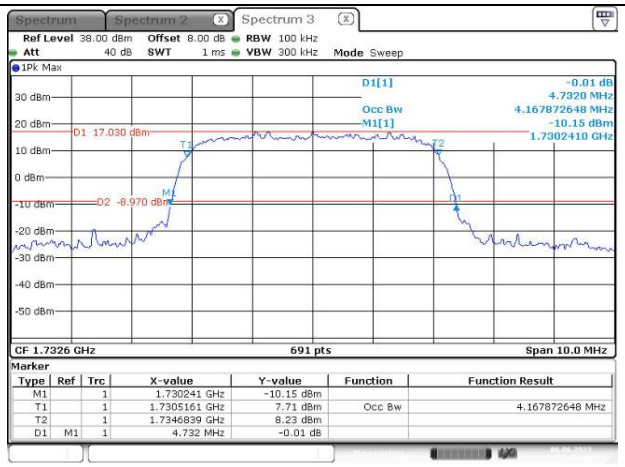
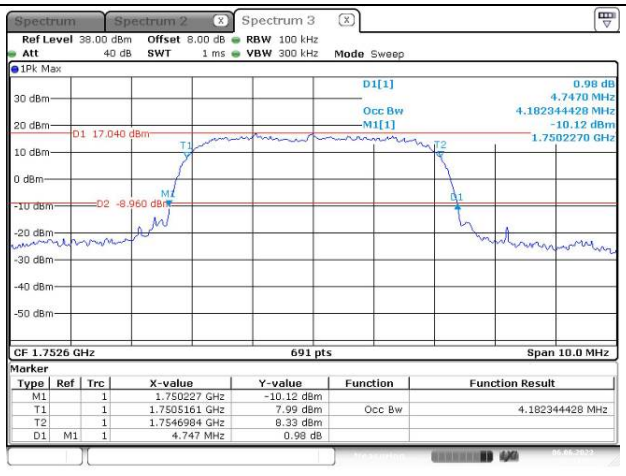
Out of band emission, Band Edge	
Result:	**Pass, Please refer to the test plots of Out of band emission, Band Edge.**

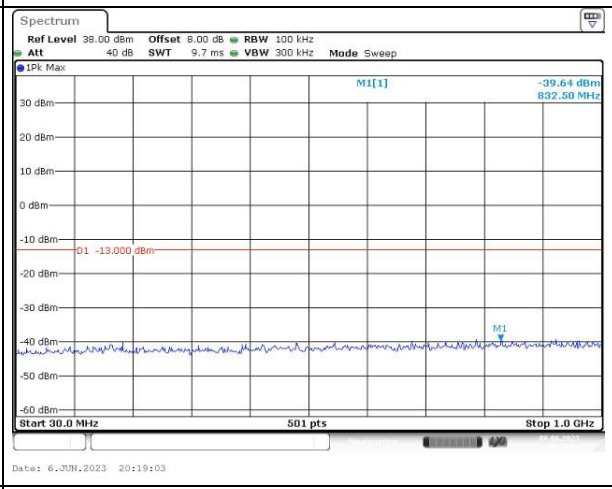
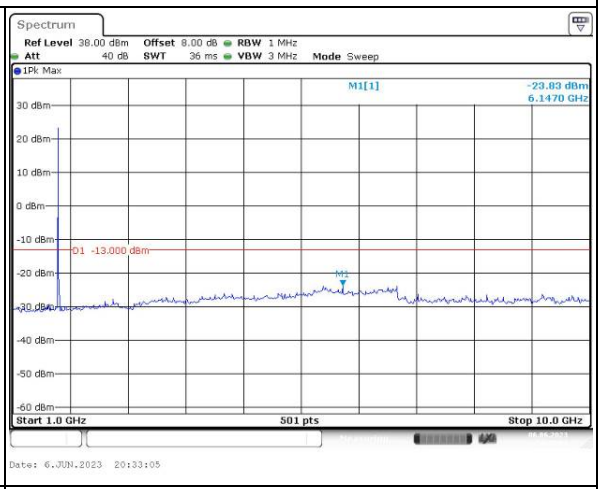
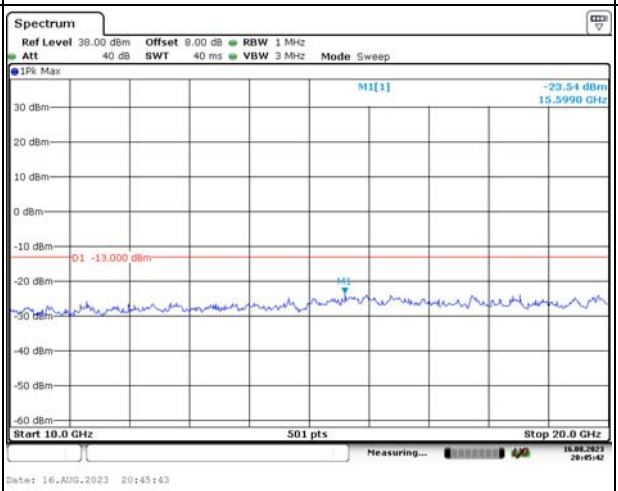
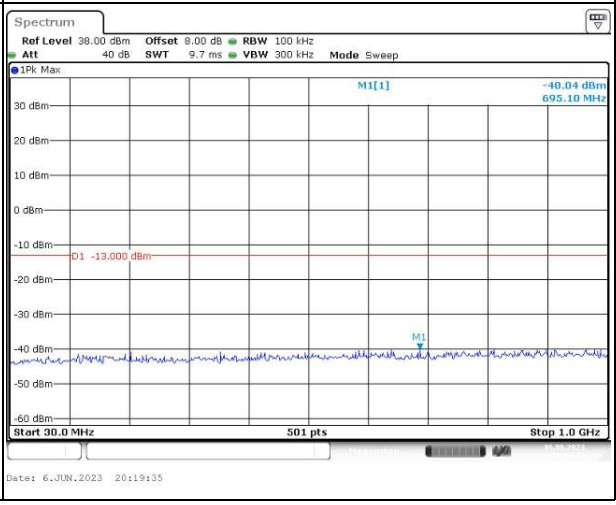
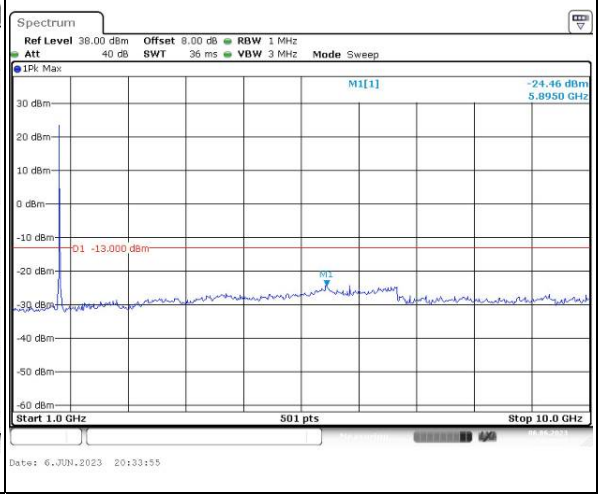
Frequency Stability

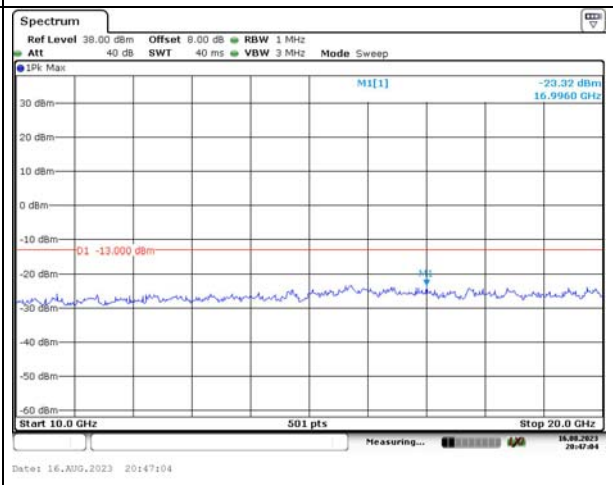
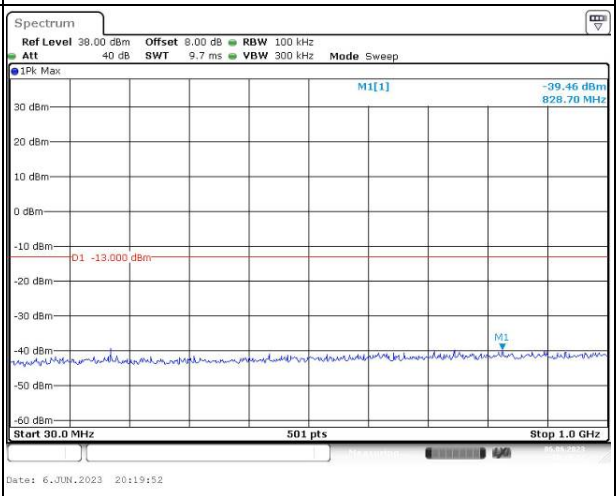
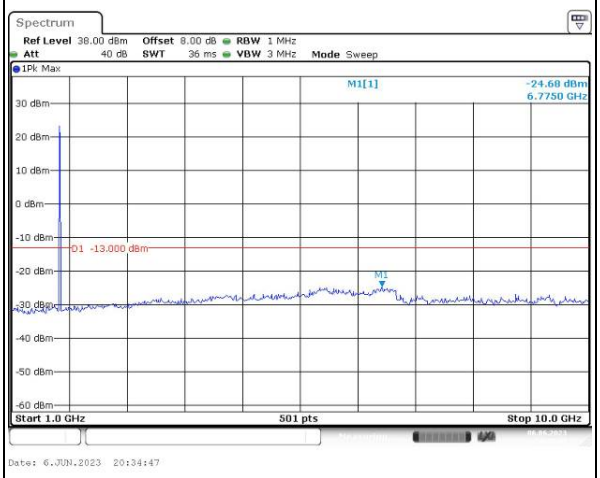
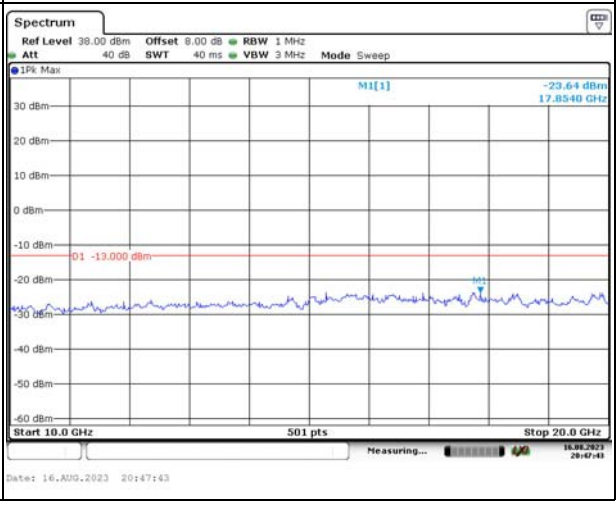
Test Mode:	WCDMA R99	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.87	1710.354	1710.000	1754.604	1755.000
	-20	3.87	1710.355	1710.000	1754.640	1755.000
	-10	3.87	1710.334	1710.000	1754.630	1755.000
	0	3.87	1710.382	1710.000	1754.643	1755.000
	10	3.87	1710.337	1710.000	1754.625	1755.000
	20	3.87	1710.316	1710.000	1754.684	1755.000
	30	3.87	1710.341	1710.000	1754.643	1755.000
	40	3.87	1710.387	1710.000	1754.690	1755.000
	50	3.87	1710.338	1710.000	1754.677	1755.000
Frequency Stability vs. Voltage	20	3.47	1710.303	1710.000	1754.631	1755.000
	20	4.45	1710.381	1710.000	1754.671	1755.000
					Result:	**Pass**

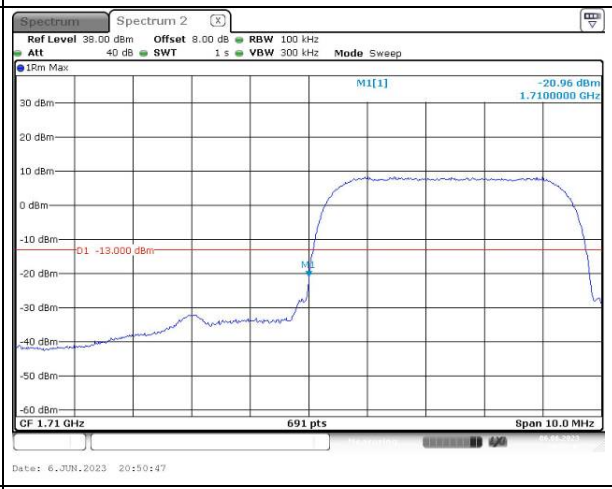
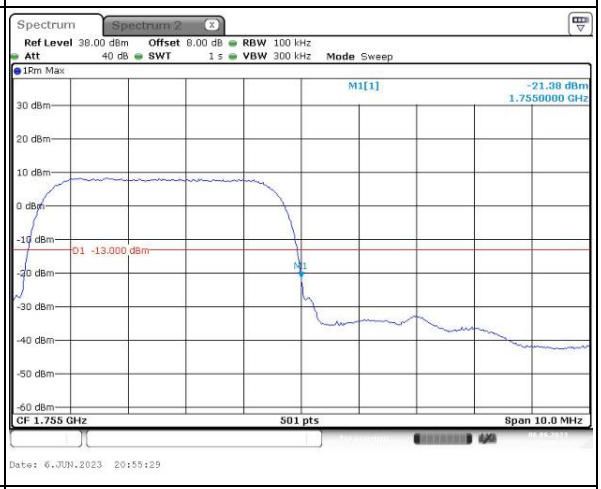
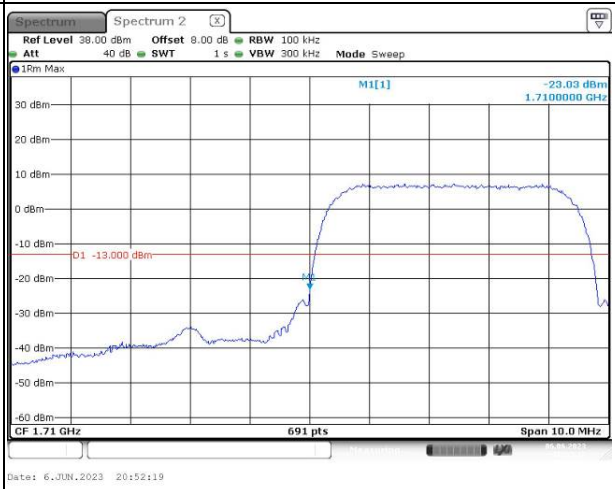
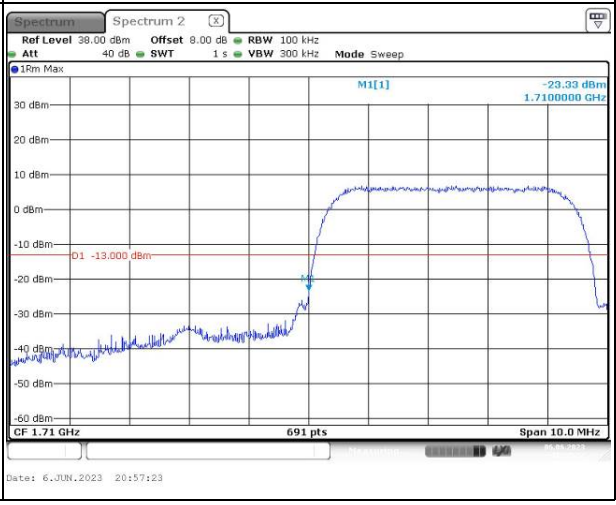
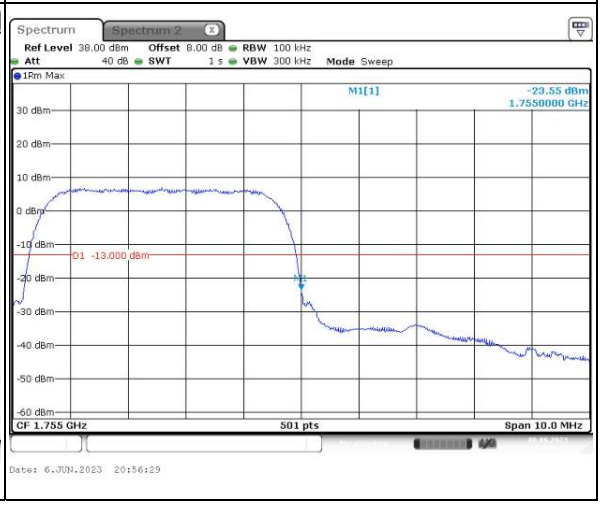
Test Plots(Note: The 8dB is the Insertion loss of the RF cable, Coaxial tee connector and DC Block, which was offset into the Spectrum Analyzer)**:**

Occupied Bandwidth		
Channel	WCDMA R99	HSDPA
Lowest		
Middle		
Highest		

Occupied Bandwidth	
Channel	HSUPA
Lowest	
Middle	
Highest	

Spurious Emissions at Antenna Terminal		
Channel	WCDMA R99	
Lowest		
Lowest		
Middle		

Spurious Emissions at Antenna Terminal		
Channel	WCDMA R99	
Middle		
Highest		
Highest		

Out of band emission, Band Edge		
Mode	**Lowest**	**Highest**
R99		
HSUPA		
HSDPA		

4.5 Antenna Port Test Data and Results for WCDMA Band 5:

Serial Number:	25K9-3	Test Date:	2023/06/06
Test Site:	RF	Test Mode:	Transmitting
Tester:	George Chen	Test Result:	**Pass**

Environmental Conditions:					
Temperature: (℃)	27.5	Relative Humidity: (%)	62	ATM Pressure: (kPa)	102.2

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101474	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
YINSAIGE	Coaxial Cable	SS402	SJ0100001	Each time	N/A
Mini-Circuits	DC Block	BLK-18-S+	1554403	Each time	N/A
Weinschel	Power Splitter	1515	RA914	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	149218	2023/3/31	2024/3/30
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2022/9/29	2023/9/28
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	N/A

** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Frequency:

Operation Modes	Lowest Frequency (MHz)	Middle Frequency (MHz)	Highest Frequency (MHz)
WCDMA	826.4	836.6	846.6

Test Data:

RF Output Power:

Test Mode	Conducted Average Output Power(dBm)			Maximum ERP (dBm)	ERP Limit (dBm)	
	Lowest Channel	Middle Channel	Highest Channel		FCC	IC
WCDMA R99	22.52	22.39	23.04	19.43	38.45	34.77
HSDPA Subtest 1	22.38	22.64	22.82	19.21	38.45	34.77
HSDPA Subtest 2	22.24	22.41	22.83	19.22	38.45	34.77
HSDPA Subtest 3	22.09	22.31	22.53	18.92	38.45	34.77
HSDPA Subtest 4	21.95	21.83	21.99	18.38	38.45	34.77
HSUPA Subtest 1	22.66	22.91	23.25	19.64	38.45	34.77
HSUPA Subtest 2	22.49	22.81	22.86	19.25	38.45	34.77
HSUPA Subtest 3	22.28	22.62	22.61	19.01	38.45	34.77
HSUPA Subtest 4	22.12	22.19	22.49	18.88	38.45	34.77
HSUPA Subtest 5	21.93	22.24	22.17	18.63	38.45	34.77
DC-HSDPA Subtest 1	22.23	22.15	22.23	18.62	38.45	34.77
DC-HSDPA Subtest 2	22.03	22.46	22.29	18.85	38.45	34.77
DC-HSDPA Subtest 3	21.87	21.96	22.15	18.54	38.45	34.77
DC-HSDPA Subtest 4	21.64	21.91	21.75	18.3	38.45	34.77
HSPA+ Subtest 1	21.61	21.49	21.87	18.26	38.45	34.77

Note:
ERP= Conducted Power(dBm) - L_C(dB) + G_T(dBd)
G_T(dBd)=G_T(dBi)-2.15

Result:	**Pass**

Peak-to-average Ratio(PAR)

Test Mode	Peak-to-average Ratio(dB)			Limit (dB)
	Lowest Channel	Middle Channel	Highest Channel	
WCDMA R99	3.07	3.04	3.04	13
HSDPA	3.36	4.52	3.45	13
HSUPA	5.59	5.68	5.45	13

Result:	**Pass**

Occupied Bandwidth						
Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Low Channel	Middle channel	High Channel	Low Channel	Middle Channel	High Channel
WCDMA R99	4.168	4.152	4.182	4.718	4.747	4.79
HSDPA	4.21	4.197	4.197	4.891	4.863	4.834
HSUPA	4.21	4.226	4.211	5.065	4.906	4.877
Note: The test plots please refer to the Plots of Occupied Bandwidth						

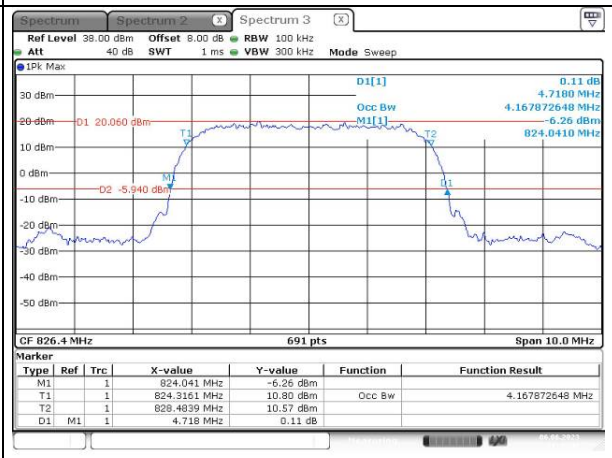
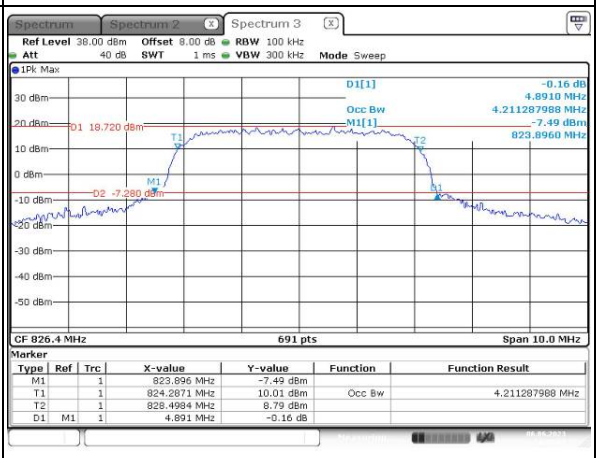
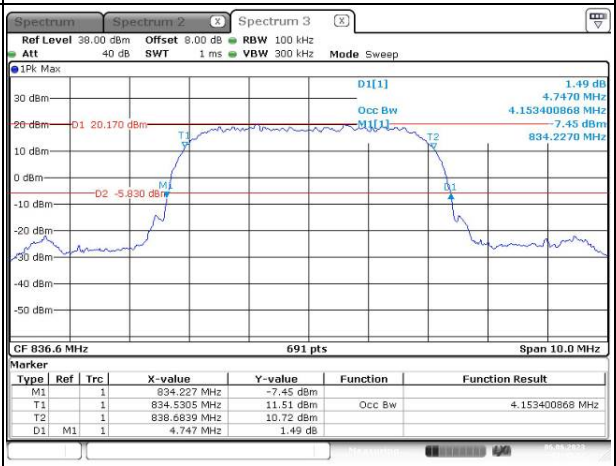
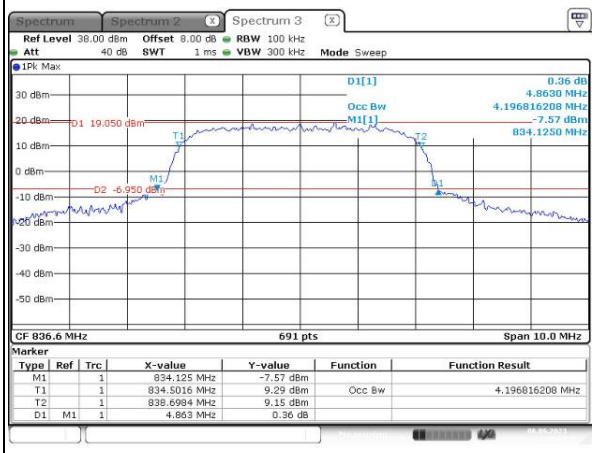
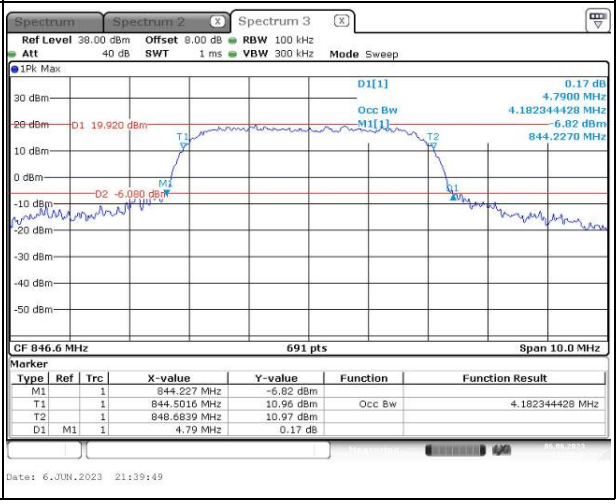
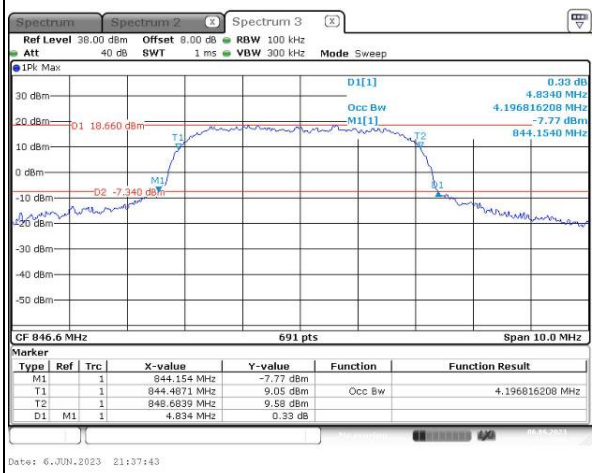
Spurious Emissions at Antenna Terminal	
Result:	**Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.**

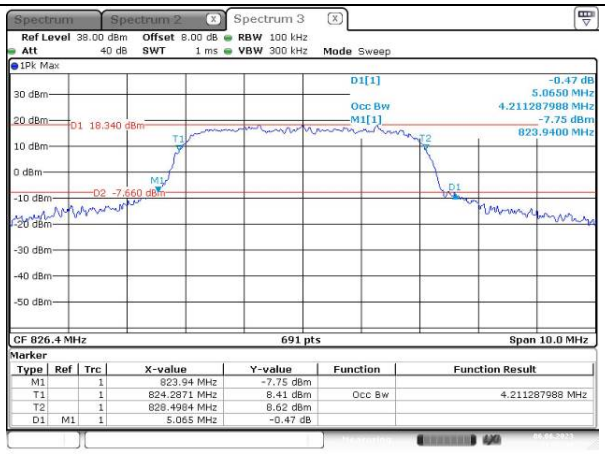
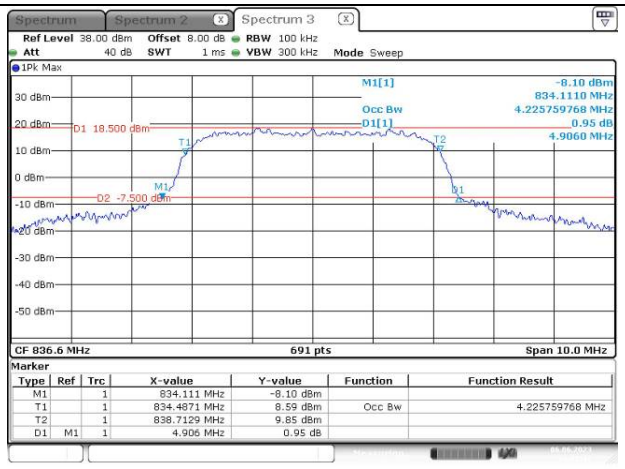
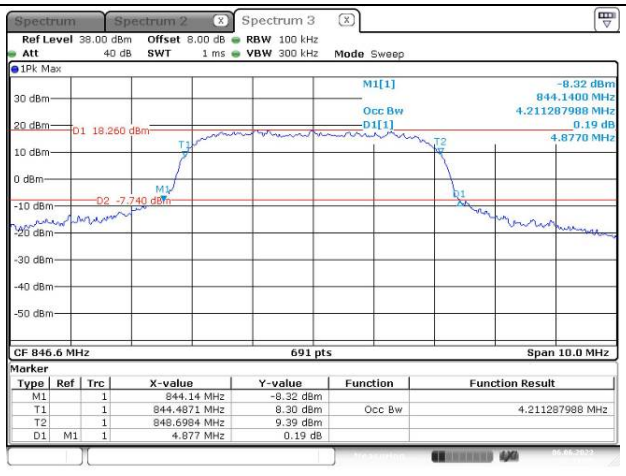
Out of band emission, Band Edge	
Result:	**Pass, Please refer to the test plots of Out of band emission, Band Edge.**

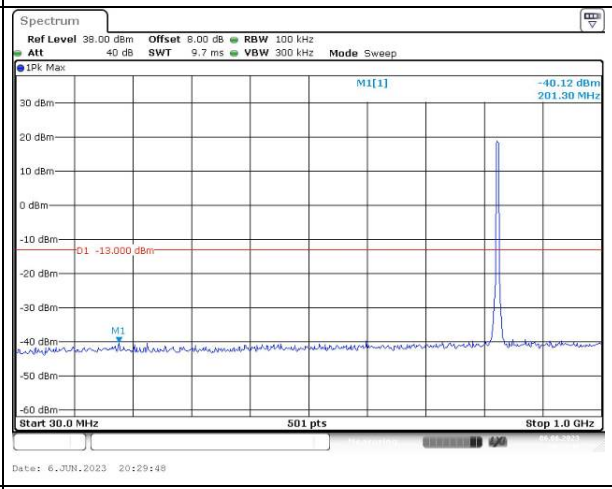
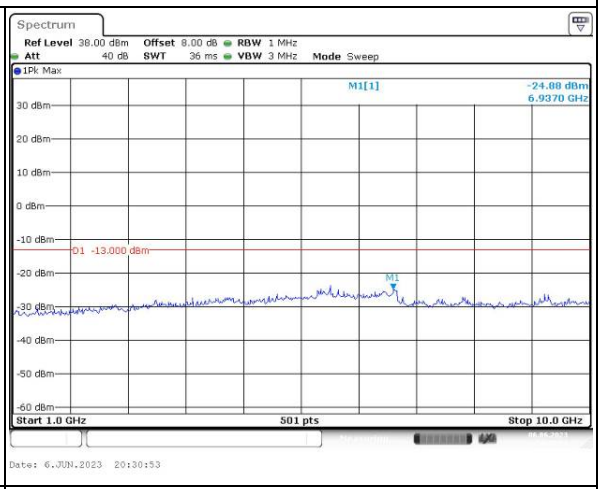
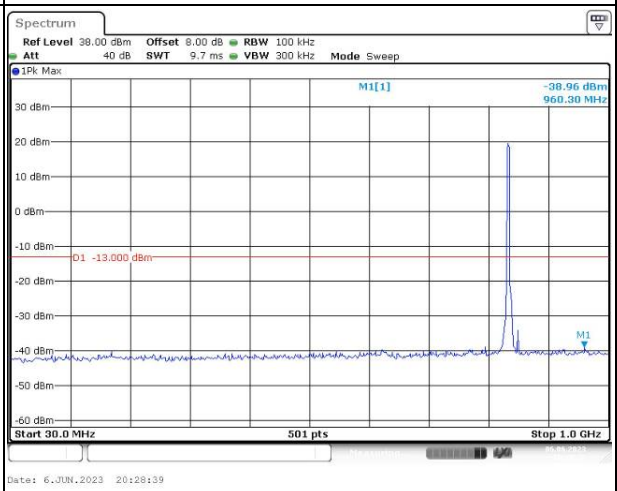
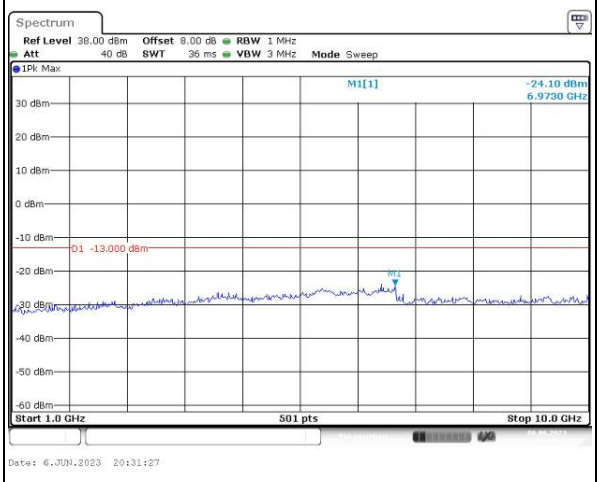
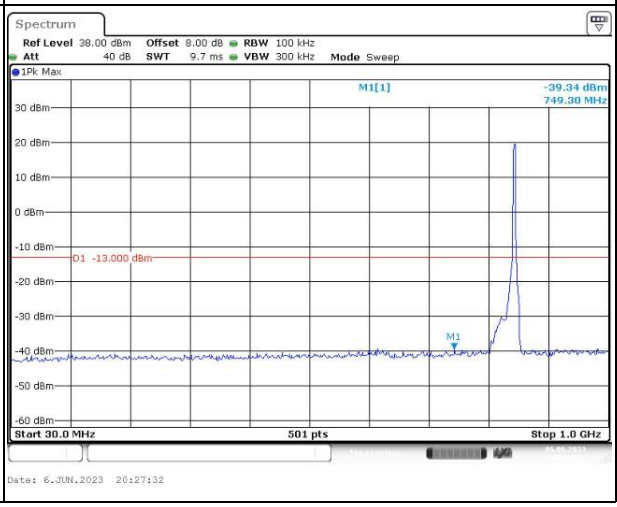
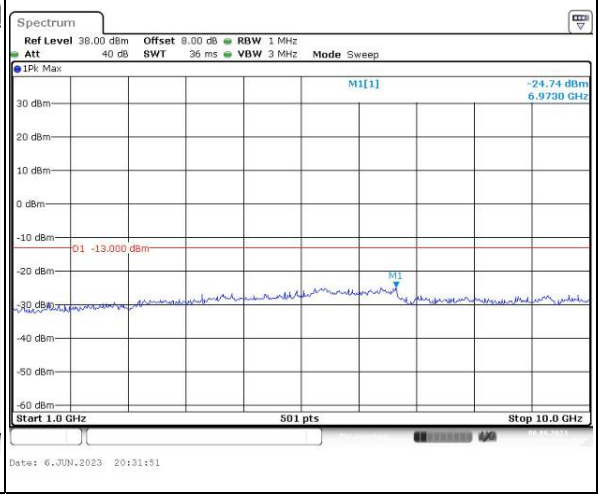
Frequency Stability(For FCC)					
Test Modulation:	WCDMA R99		Test Channel:	836.6	MHz
Test Item	Temperature (℃)	Voltage (V_{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.87	-3.2	-0.004	2.5
	-20	3.87	-6.68	-0.008	2.5
	-10	3.87	9.77	0.012	2.5
	0	3.87	-7.62	-0.009	2.5
	10	3.87	-9.91	-0.012	2.5
	20	3.87	-9.82	-0.012	2.5
	30	3.87	-6.68	-0.008	2.5
	40	3.87	-8.86	-0.011	2.5
	50	3.87	5.67	0.007	2.5
Frequency Stability vs. Voltage	20	3.47	6.05	0.007	2.5
	20	4.45	7.52	0.009	2.5
				Result:	**Pass**

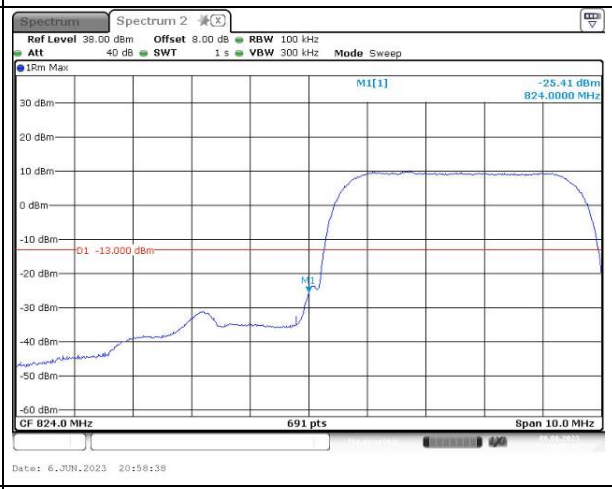
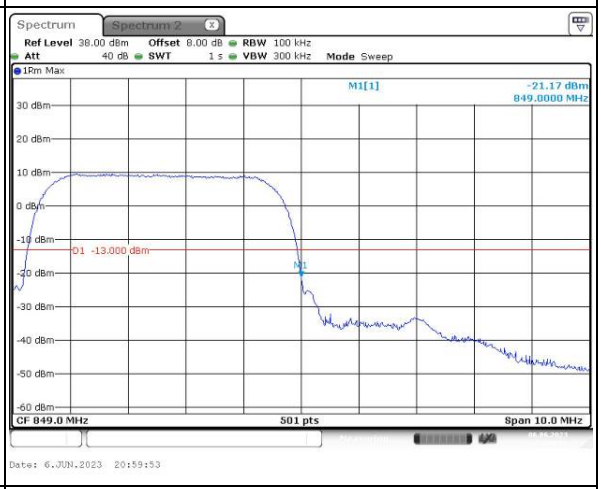
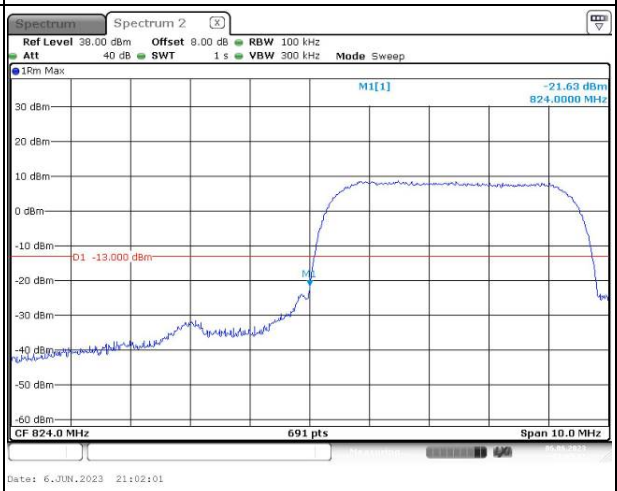
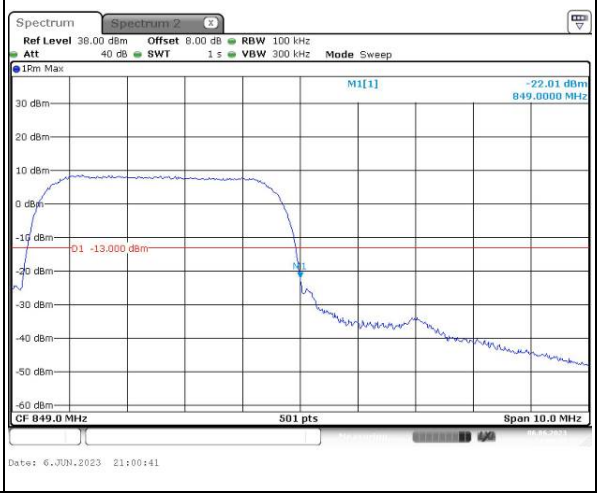
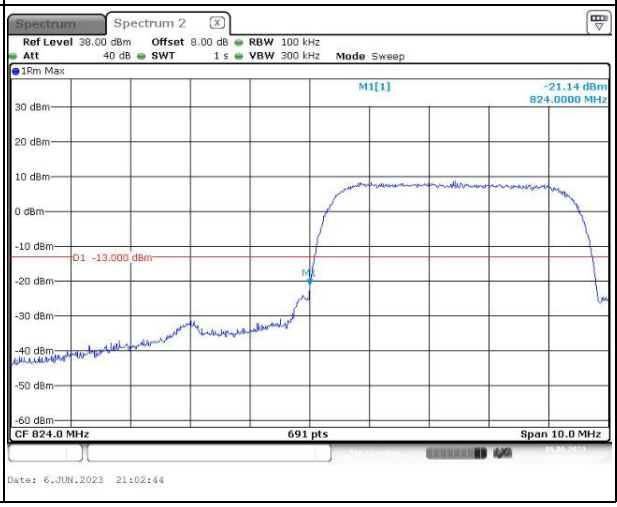
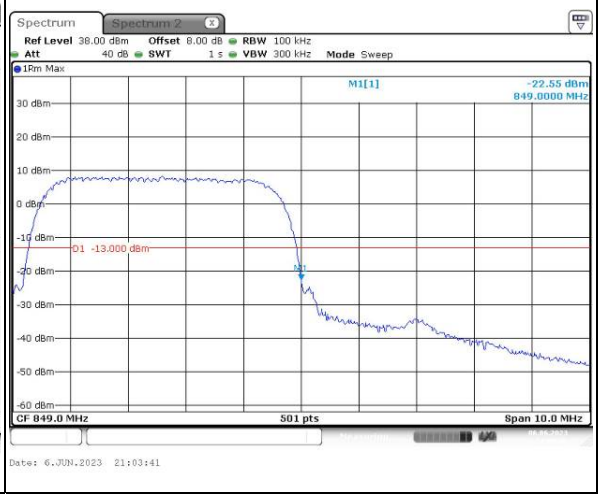
Frequency Stability(For IC)						
Test Mode:	WCDMA R99	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.87	824.327	824.000	848.681	849.000
	-20	3.87	824.317	824.000	848.685	849.000
	-10	3.87	824.325	824.000	848.696	849.000
	0	3.87	824.318	824.000	848.685	849.000
	10	3.87	824.329	824.000	848.697	849.000
	20	3.87	824.316	824.000	848.684	849.000
	30	3.87	824.319	824.000	848.679	849.000
	40	3.87	824.326	824.000	848.684	849.000
	50	3.87	824.320	824.000	848.694	849.000
Frequency Stability vs. Voltage	20	3.47	824.314	824.000	848.688	849.000
	20	4.45	824.312	824.000	848.680	849.000
					Result:	**Pass**

Test Plots(Note: The 8dB is the Insertion loss of the RF cable, Coaxial tee connector and DC Block, which was offset into the Spectrum Analyzer)**:**

Occupied Bandwidth		
Channel	WCDMA R99	HSDPA
Lowest		
Middle		
Highest		

Occupied Bandwidth	
Channel	HSUPA
Lowest	
Middle	
Highest	

Spurious Emissions at Antenna Terminal		
Channel	WCDMA R99	
Lowest		
Middle		
Highest		

Out of band emission, Band Edge		
Mode	**Lowest**	**Highest**
R99		
HSUPA		
HSDPA		

4.6 Antenna Port Test Data and Results for LTE Band 2

Serial Number:	25K9-3	Test Date:	2023/05/30~2023/05/31
Test Site:	RF	Test Mode:	Transmitting
Tester:	George Chen	Test Result:	**Pass**

Environmental Conditions:					
Temperature: (℃)	26.7~27.2	Relative Humidity: (%)	49~55	ATM Pressure: (kPa)	99.6~100.0

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101474	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
YINSAIGE	Coaxial Cable	SS402	SJ0100001	Each time	N/A
Mini-Circuits	DC Block	BLK-18-S+	1554403	Each time	N/A
Unknown	Coaxial tee connector	Unknown	2204004	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	149218	2023/3/31	2024/3/30
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2022/9/29	2023/9/28
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386	N/A	N/A

** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Frequency For Each Mode:

Operation Bandwidth	Lowest Frequency (MHz)	Middle Frequency (MHz)	Highest Frequency (MHz)
1.4MHz	1850.7	1880	1909.3
3MHz	1851.5	1880	1908.5
5MHz	1852.5	1880	1907.5
10MHz	1855	1880	1905
15MHz	1857.5	1880	1902.5
20MHz	1860	1880	1900

Test Data:

RF Output Power:

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum EIRP(dBm)	EIRP Limit(dBm)
		Lowest Channel	Middle Channel	Highest Channel		
1.4MHz QPSK	RB1#0	22.72	22.71	22.82	23.75	33
	RB1#3	22.92	22.83	23.09		
	RB1#5	22.72	22.74	22.82		
	RB3#0	22.84	22.77	22.9		
	RB3#3	22.79	22.8	22.96		
	RB6#0	21.79	21.81	21.92		
1.4MHz 16QAM	RB1#0	21.7	21.83	21.83	22.72	33
	RB1#3	21.89	22.06	22.01		
	RB1#5	21.76	21.87	21.9		
	RB3#0	22.01	21.77	21.95		
	RB3#3	22.01	21.78	21.96		
	RB6#0	20.85	20.88	20.91		
3MHz QPSK	RB1#0	22.67	22.71	22.83	23.51	33
	RB1#8	22.68	22.7	22.83		
	RB1#14	22.63	22.71	22.85		
	RB6#0	21.68	21.68	21.82		
	RB6#9	21.64	21.7	21.8		
	RB15#0	21.72	21.67	21.84		
3MHz 16QAM	RB1#0	22.23	21.83	21.85	22.89	33
	RB1#8	22.17	21.83	21.85		
	RB1#14	22.22	21.85	21.81		
	RB6#0	20.81	20.74	20.81		
	RB6#9	20.71	20.75	20.78		
	RB15#0	20.81	20.69	20.9		
5MHz QPSK	RB1#0	22.6	22.62	22.69	23.5	33
	RB1#13	22.7	22.77	22.84		
	RB1#24	22.57	22.63	22.76		
	RB15#0	21.74	21.75	21.83		
	RB15#10	21.66	21.68	21.74		
	RB25#0	21.64	21.64	21.79		
5MHz 16QAM	RB1#0	21.72	21.5	22	22.82	33
	RB1#13	21.76	21.63	22.16		
	RB1#24	21.67	21.56	22.02		
	RB15#0	20.77	20.78	20.85		
	RB15#10	20.73	20.74	20.79		
	RB25#0	20.69	20.74	20.78		

10MHz QPSK	RB1#0	22.68	22.64	22.82	23.56	33
	RB1#25	22.84	22.83	22.9		
	RB1#49	22.68	22.69	22.83		
	RB25#0	21.71	21.7	21.76		
	RB25#25	21.64	21.65	21.78		
	RB50#0	21.67	21.7	21.76		
10MHz 16QAM	RB1#0	21.66	22.21	21.89	23.02	33
	RB1#25	21.82	22.36	22.09		
	RB1#49	21.67	22.25	21.96		
	RB25#0	20.83	20.75	20.85		
	RB25#25	20.8	20.77	20.84		
	RB50#0	20.73	20.72	20.78		
15MHz QPSK	RB1#0	22.6	22.59	22.67	23.51	33
	RB1#38	22.68	22.76	22.85		
	RB1#74	22.58	22.68	22.71		
	RB36#0	21.73	21.73	21.8		
	RB36#39	21.77	21.75	21.87		
	RB75#0	21.71	21.73	21.85		
15MHz 16QAM	RB1#0	22.12	21.73	22.11	22.9	33
	RB1#38	22.24	21.88	22.24		
	RB1#74	22.23	21.83	22.23		
	RB36#0	20.74	20.74	20.8		
	RB36#39	20.78	20.75	20.87		
	RB75#0	20.76	20.76	20.83		
20MHz QPSK	RB1#0	22.42	22.46	22.51	23.65	33
	RB1#50	22.82	22.89	22.99		
	RB1#99	22.46	22.58	22.6		
	RB50#0	21.7	21.67	21.8		
	RB50#50	21.81	21.68	21.78		
	RB100#0	21.76	21.7	21.83		
20MHz 16QAM	RB1#0	21.95	21.77	21.72	23.05	33
	RB1#50	22.39	22.14	22.2		
	RB1#99	22	21.87	21.79		
	RB50#0	20.72	20.69	20.82		
	RB50#50	20.84	20.69	20.83		
	RB100#0	20.81	20.75	20.89		
Note: EIRP=Conducted Power(dBm) - L_C(dB) + G_T(dBi)						
					Result:	**Pass**

Peak-to-average Ratio(PAR)					
Test Bandwidth & Modulation	Resource Block & RB offset	Peak-to-average Ratio(dB)			Limit (dB)
		Lowest Channel	Middle Channel	Highest Channel	
20MHz QPSK	RB1#0	4.72	4.78	5.01	13
	RB100#0	5.25	5.04	5.04	13
20MHz 16QAM	RB1#0	5.59	5.74	5.62	13
	RB100#0	6.09	5.97	5.97	13
				Result:	**Pass**

Occupied Bandwidth						
Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Low Channel	Middle channel	High Channel	Low Channel	Middle Channel	High Channel
1.4MHz QPSK	1.102	1.102	1.102	1.314	1.332	1.296
1.4MHz 16QAM	1.102	1.096	1.096	1.326	1.302	1.302
3MHz QPSK	2.683	2.695	2.683	2.88	2.88	2.88
3MHz 16QAM	2.683	2.683	2.683	2.892	2.88	2.868
5MHz QPSK	4.511	4.511	4.491	4.94	4.96	4.92
5MHz 16QAM	4.491	4.531	4.511	4.92	5	4.96
10MHz QPSK	8.942	8.942	8.942	9.64	9.6	9.68
10MHz 16QAM	8.942	8.942	8.942	9.64	9.6	9.6
15MHz QPSK	13.473	13.473	13.473	14.7	14.82	14.76
15MHz 16QAM	13.533	13.473	13.473	14.76	14.82	14.7
20MHz QPSK	17.964	17.964	17.964	19.28	19.28	19.52
20MHz 16QAM	17.964	17.884	17.964	19.36	19.44	19.36
Note: The test plots please refer to the Plots of Occupied Bandwidth						

Spurious Emissions at Antenna Terminal	
Result:	**Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.**

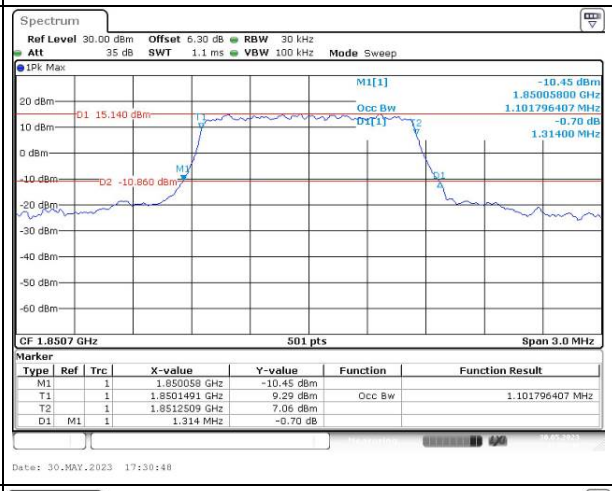
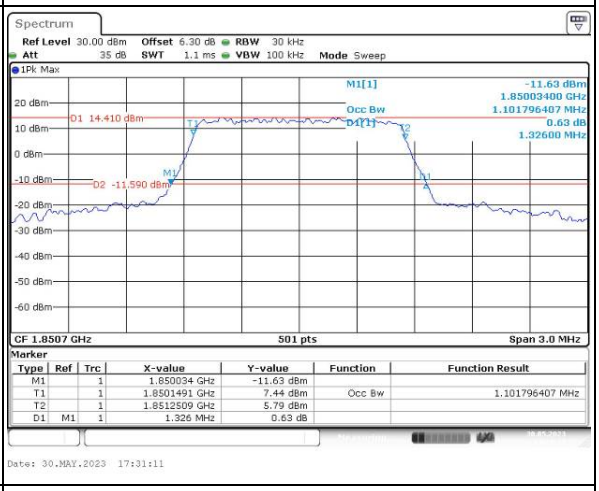
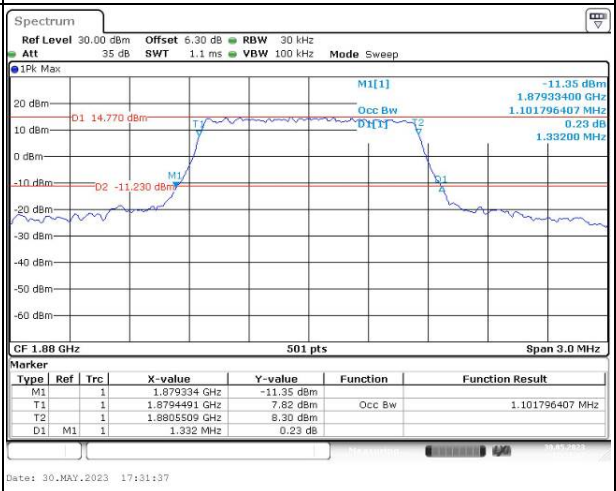
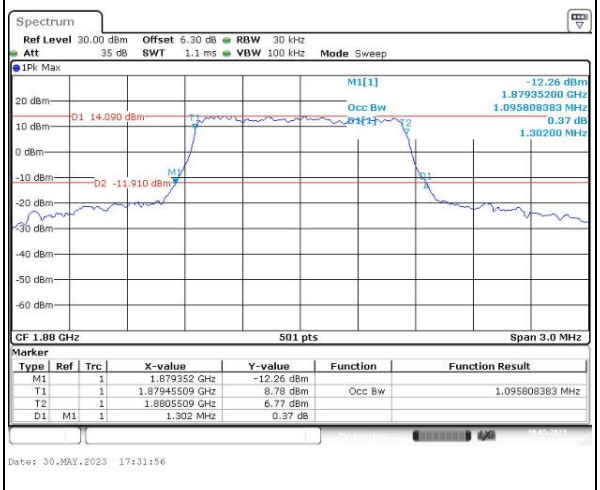
Out of band emission, Band Edge	
Result:	**Pass, Please refer to the test plots of Out of band emission, Band Edge.**

Frequency Stability

Test Mode:	20M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.87	1851.042	1850.000	1909.028	1910.000
	-20	3.87	1851.021	1850.000	1909.070	1910.000
	-10	3.87	1851.074	1850.000	1909.025	1910.000
	0	3.87	1851.056	1850.000	1909.098	1910.000
	10	3.87	1851.026	1850.000	1909.092	1910.000
	20	3.87	1851.058	1850.000	1909.022	1910.000
	30	3.87	1851.005	1850.000	1909.041	1910.000
	40	3.87	1851.054	1850.000	1909.052	1910.000
	50	3.87	1851.087	1850.000	1909.004	1910.000
Frequency Stability vs. Voltage	20	3.47	1851.009	1850.000	1909.080	1910.000
	20	4.45	1851.060	1850.000	1909.032	1910.000
					Result:	**Pass**

Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.87	1851.074	1850.000	1909.036	1910.000
	-20	3.87	1851.060	1850.000	1909.031	1910.000
	-10	3.87	1851.079	1850.000	1909.002	1910.000
	0	3.87	1851.075	1850.000	1909.030	1910.000
	10	3.87	1851.069	1850.000	1909.053	1910.000
	20	3.87	1851.058	1850.000	1909.022	1910.000
	30	3.87	1851.000	1850.000	1909.053	1910.000
	40	3.87	1851.094	1850.000	1909.097	1910.000
	50	3.87	1851.055	1850.000	1909.037	1910.000
Frequency Stability vs. Voltage	20	3.47	1851.027	1850.000	1909.055	1910.000
	20	4.45	1851.005	1850.000	1909.095	1910.000
					Result:	**Pass**

Test Plots(Note: The 6.3dB is the Insertion loss of the RF cable, Coaxial tee connector and DC Block, which was offset into the Spectrum Analyzer)**:**

Occupied Bandwidth		
Channel	1.4MHz Bandwidth QPSK	1.4MHz Bandwidth 16QAM
Lowest		
Middle		
Highest