



中认信通

CHINA CERTIFICATION ICT CO., LTD (DONGGUAN)



TEST REPORT

Applicant: TECNO MOBILE LIMITED

Address: FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25
SHAN MEI STREET FOTAN NT HONGKONG

FCC ID: 2ADYY-BG7

Product Name: Mobile Phone

Standard(s): 47 CFR Part 2, 47 CFR Part 22, Subpart H
47 CFR Part 24, Subpart E
47 CFR Part 27
ANSI C63.26-2015
KDB 971168 D01 Power Meas License Digital Systems
v03r01

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: CR230851297-00E

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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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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	CR230851297-00E	Original Report	2023/9/28

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Name:	Mobile Phone
Trade Name:	TECNO
EUT Model:	BG7
Operation Bands and modes:	GSM/GPRS/EDGE: 850/1900 WCDMA: Band 2/4/5 LTE: Band 2/4/5/7/12/17/38/40/41/66
Modulation Type:	GMSK, 8PSK, BPSK, QPSK, 16QAM, 64QAM
Rated Input Voltage:	DC 3.85V from battery or 5V/7.5V from adapter
Serial Number:	RF Conducted Test: 2AS5-5 Radiated emissions: 2AS5-1
EUT Received Date:	2023/9/1
EUT Received Status:	Good

Operation Voltage (V_{DC}) ▲:

Lowest:	3.45	Normal:	3.85	Highest:	4.4
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Transmission Antenna Information ▲:

Antenna Type	Operation Bands	Antenna Frequency Range(MHz)	Antenna Gain (Gr)(dBi)	Lc(dB)
FPC	GSM850	824-849	-5	0
	PCS1900	1850-1910	-1.5	0.8
	WCDMA B2	1850-1910	-1.5	0.8
	WCDMA B4	1710-1755	-1.5	0.8
	WCDMA B5	824-849	-5	0
	LTE B2	1850-1910	-1.5	0.8
	LTE B4	1710-1755	-1.5	0.8
	LTE B5	824-849	-5	0
	LTE B7	2500-2570	-1.5	1.2
	LTE B12	699-716	-6	0
	LTE B17	704-716	-6	0
	LTE B38	2570-2620	-1.5	1.2
	LTE B40 Lower	2305-2315	-1.5	1.2
	LTE B40 Upper	2350-2360	-1.5	1.2
	LTE B41	2535-2655	-1.5	1.2
	LTE B66	1710-1780	-1.5	0.8

Note: Lc= Signal Attenuation in the connecting cable between the transmitter and antenna, in dB.

Accessory Information:

Accessory Description	Manufacturer	Model	Parameters	S/N
Adapter 1	TECNO	U180TSA	Input: AC 100-240V~50/60Hz, 0.6A Output: DC 5.0V, 2.4A or 7.5V, 2.4A 18.0W Max	CY07018473623
Adapter 2	TECNO	U180TSA	Input: AC 100-240V~50/60Hz, 0.6A Output: DC 5.0V, 2.4A or 7.5V, 2.4A 18.0W Max	BJD07018143609

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:	
GSM/GPRS/EGPRS	
Function: Menu select > GSM Mobile Station > GSM 850/1900	
Press Connection control to choose the different menus	
Press RESET > choose all the reset all settings	
Connection Press Signal Off to turn off the signal and change settings	
Network Support > GSM + GPRS or GSM + EGSM	
Main Service > Packet Data	
Service selection > Test Mode A – Auto Slot Config. off	
MS Signal Press Slot Config Bottom on the right twice to select and change the number of time slots and power setting	
> Slot configuration > Uplink/Gamma > 33 dBm for GPRS 850 > 30 dBm for GPRS 1900 > 27 dBm for EGPRS 850 > 26 dBm for EGPRS 1900	
BS Signal Enter the same channel number for TCH channel (test channel) and BCCH channel	
Frequency Offset > + 0 Hz	
Mode > BCCH and TCH	
BCCH Level > -85 dBm (May need to adjust if link is not stable)	
BCCH Channel > choose desire test channel [Enter the same channel number for TCH channel (test channel) and BCCH channel]	
Channel Type > Off	
P0 > 4 dB	
Slot Config > Unchanged (if already set under MS signal)	
TCH > choose desired test channel	
Hopping > Off	
Main Timeslot > 3	
Network Coding Scheme > CS4 (GPRS) and MCS5 (EGPRS)	
Bit Stream > 2E9-1 PSR Bit Stream	
AF/RF Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input	
Connection Press Signal on to turn on the signal and change settings	

WCDMA

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				
	β_c	11/15	6/15	15/15	2/15	15/15
	β_d	15/15	15/15	9/15	15/ 5	0
	β_{ec}	209/225	12/15	30 15	2/15	5/15
	β_c/β_d	11/15	6/15	15/9	2/15	-
	β_{hs}	22/15	12/15	30/15	4/15	5/15
HSDPA Specific Settings	CM(dB)	1.0	3.0	2.0	3.0	1.0
	PR(dB)	0	2	1	2	0
	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback	4ms				
	CQI Repetition Factor	2				
HSUPA Specific Settings	$A_{hs}=\beta_{hs}/\beta_c$	30/15				
	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_FCI	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
64 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 Signalling 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	13	10	Table 6.2.4-2	Table 6.2.4-2
	6.6.3.3.2				
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	$26336 \cdot T_s$			$7680 \cdot T_s$		
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
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 $\times (T_s) \times \#$ of S + $\#$ of U

Example for Calculated Duty Cycle for Uplink-Downlink Configuration 0:

Calculated Duty Cycle = $5120 \times [1/(15000 \times 2048)] \times 2 + 6 \text{ ms} = 63.33\%$

where

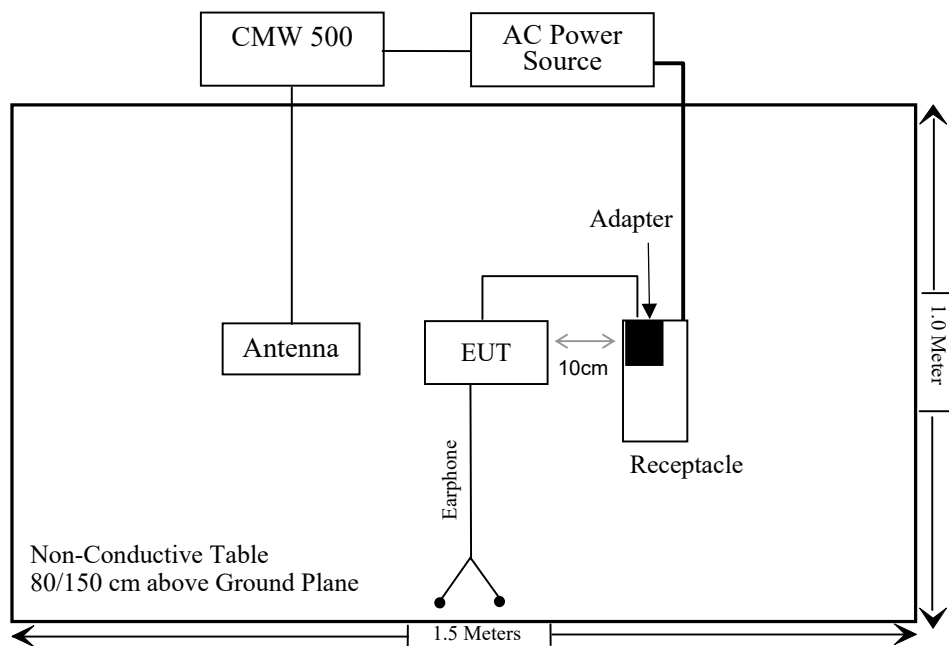
$T_s = 1/(15000 \times 2048)$ seconds

1.2.2 Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
R&S	Wideband Radio Communication Tester	CMW500	143458
Unknown	Antenna	Unknown	Unknown

1.2.3 Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
Power Cable	No	No	1.0	Adapter	EUT
Earphone Cable	No	No	1.5	Earphone	EUT
Antenna Cable	NO	NO	2	Antenna	CMW500

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	±0.082×10 ⁻⁶

2. SUMMARY OF TEST RESULTS

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

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-to-average 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 rms equivalent 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 than $43 + 10 \log (P)$ 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.

3.5 Test Method:

3.5.1 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 and KDB 971168 D01 Power Meas License Digital Systems v03r01:

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

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

where:

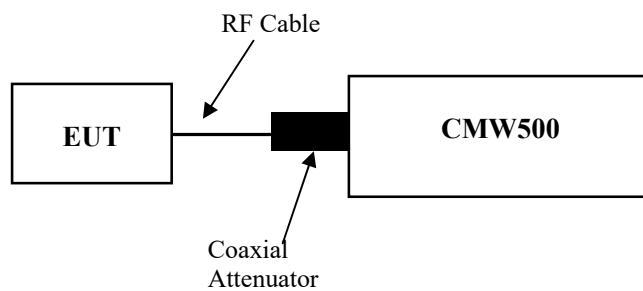
ERP or EIRP = effective radiated power or equivalent isotropically radiated power, respectively
(expressed in the same units as P_{Meas} , typically dBW or dBm);

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.

3.5.2 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 $1.5 \times \text{OBW}$ 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 $\geq 3 \times \text{RBW}$.

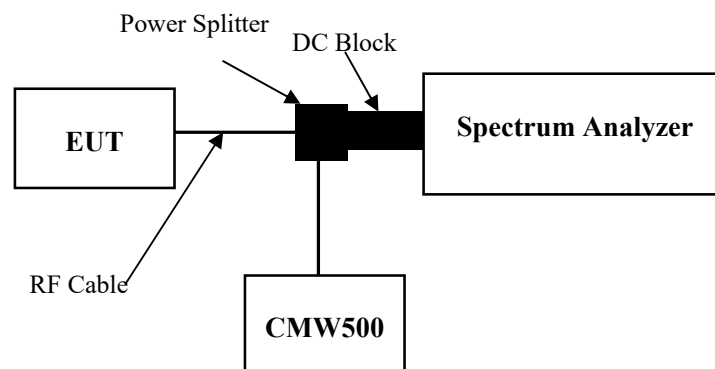
c) Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation. See guidance provided in 4.2.3.
NOTE—Step a), step b), and step c) may require iteration to adjust within the specified tolerances.

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:

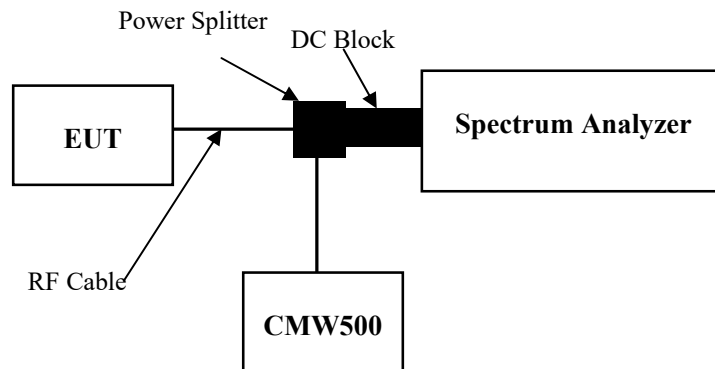


3.5.3 Transmitter unwanted emissions-at antenna terminals

According to ANSI C63.26-2015 Section 5.7.4, KDB 971168 D01 Power Meas License Digital Systems v03r01:

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:

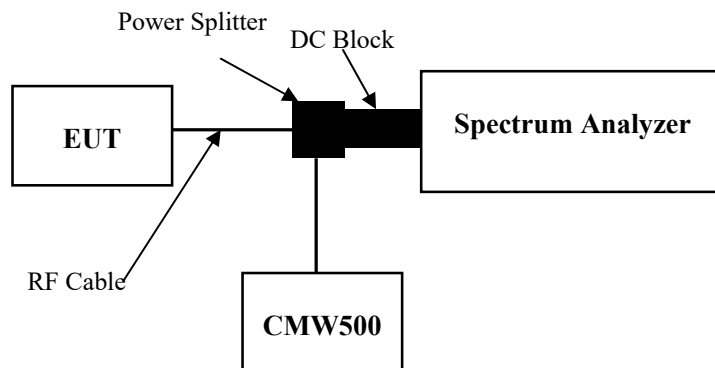


3.5.4 Transmitter unwanted emissions-Out of band emission

According to ANSI C63.26-2015 Section 5.7.3, KDB 971168 D01 Power Meas License Digital Systems v03r01:

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:



3.5.5 Frequency stability

According to ANSI C63.26-2015 Section 5.6, KDB 971168 D01 Power Meas License Digital Systems v03r01:

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.

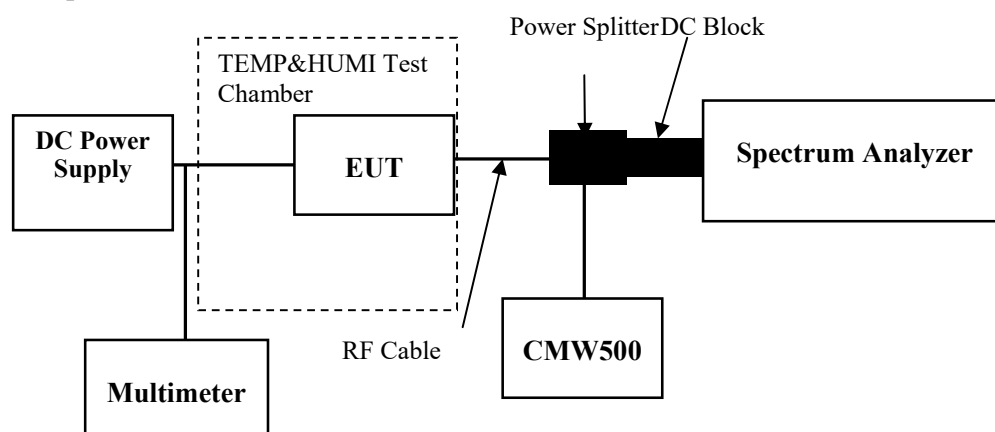
The operating carrier frequency shall be set up in accordance with the manufacturer's published operation and instruction manual prior to the commencement of these tests. No adjustment of any frequency determining circuit element shall be made subsequent to this initial set-up. Frequency stability is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



3.5.6 Transmitter unwanted emissions- Radiated Spurious emissions

According to ANSI C63.26-2015 Section 5.5.3:

Test setup:

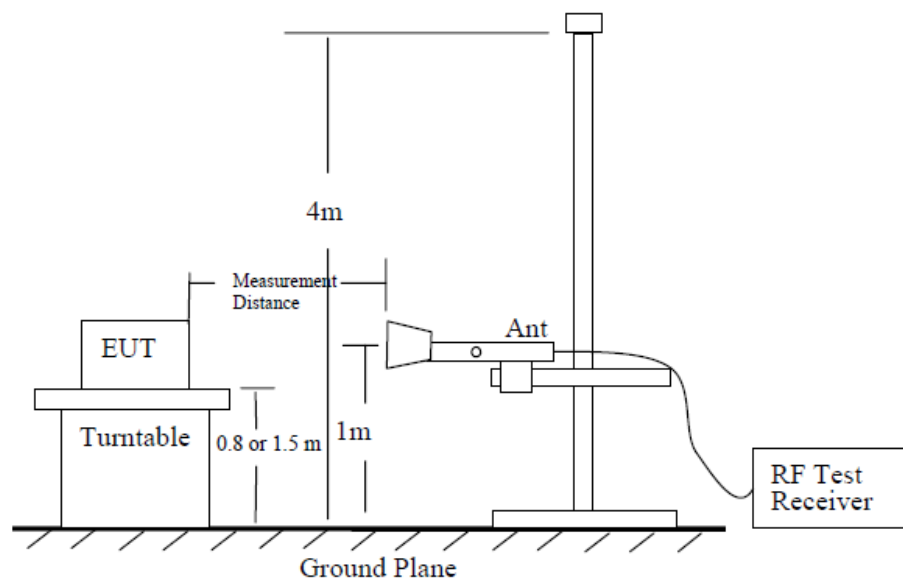


Figure 6—Test site-up for radiated ERP and/or EIRP measurements

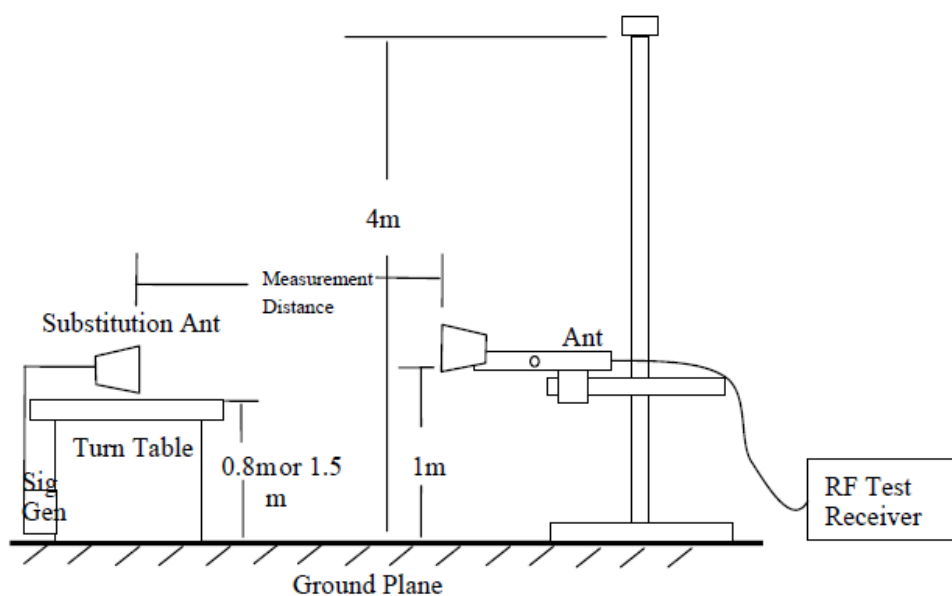


Figure 7—Substitution method set-up for radiated emission

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:

$$P_e = P_s(\text{dBm}) - \text{cable loss (dB)} + \text{antenna gain (dBd)}$$
 where

P_e = equivalent emission power in dBm
 P_s = 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: $\text{gain (dBd)} = \text{gain (dBi)} - 2.15 \text{ dB}$. 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:	2AS5-5	Test Date:	2023/9/14
Test Site:	RF	Test Mode:	Transmitting
Tester:	Rod Luo	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	27	Relative Humidity: (%)	57	ATM Pressure: (kPa)	101
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU26	200256	2023/3/31	2024/3/30
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211002	Each time	N/A
Minl-Circuits	Power Splitter	ZFRSC-183-S+	S F448201619	Each time	N/A
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)
GSM	824.2	836.6	848.8
GPRS	824.2	836.6	848.8
EDGE	824.2	836.6	848.8

Test Data:

FCC§2.1046;§ 22.913 (a):RF Output Power					
Test Mode	Conducted Peak Output Power(dBm)			Maximum ERP (dBm)	ERP Limit (dBm)
	Lowest Channel	Middle Channel	Highest Channel		
GSM	33.77	33.89	33.83	26.74	38.45
GPRS 1 Slot	33.75	33.87	33.78	26.72	38.45
GPRS 2 Slots	32.54	32.7	32.54	25.55	38.45
GPRS 3 Slots	29.8	29.93	29.71	22.78	38.45
GPRS 4 Slots	28.6	28.69	28.48	21.54	38.45
EDGE 1 Slot	27.73	27.83	27.73	20.68	38.45
EDGE 2 Slots	26.38	26.51	26.5	19.36	38.45
EDGE 3 Slots	24.24	24.34	24.34	17.19	38.45
EDGE 4 Slots	23.21	23.18	23.26	16.11	38.45
Note: ERP= Conducted Power(dBm) - Lc(dB) + Gr(dBd) Gr(dBd)=Gr(dBi)-2.15					
				Result:	Pass

FCC §2.1049, §22.917, §22.905: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
GSM	0.246	0.244	0.246	0.319	0.317	0.317
EDGE	0.245	0.243	0.246	0.306	0.302	0.302
Note: The test plots please refer to the Plots of Occupied Bandwidth						

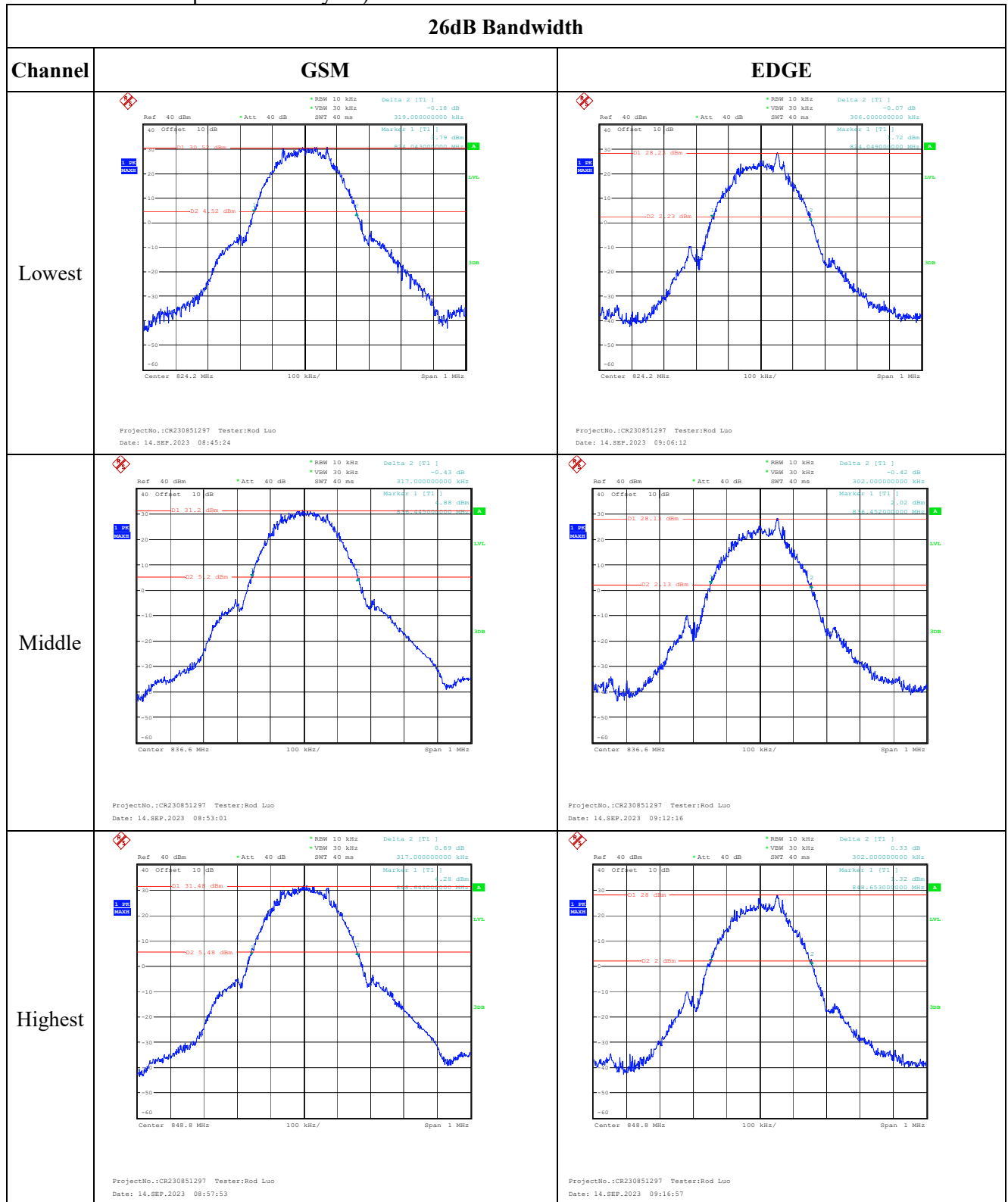
FCC §2.1051, §22.917(a):Spurious Emissions at Antenna Terminal	
Result:	Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.

FCC §2.1051, §22.917(a):Out of band emission, Band Edge	
Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.

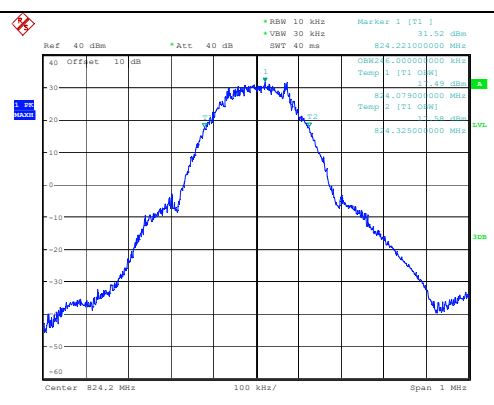
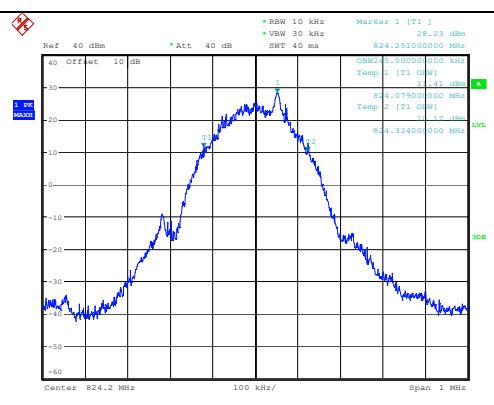
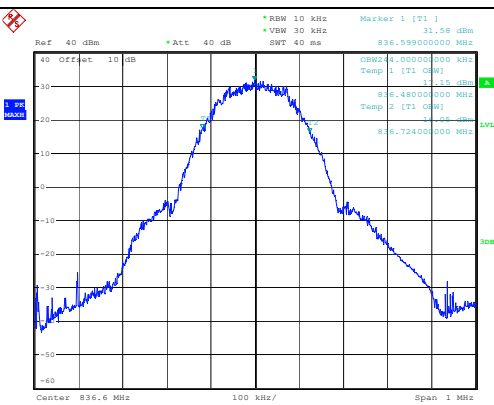
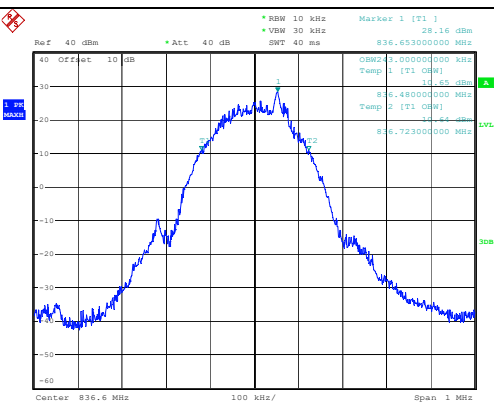
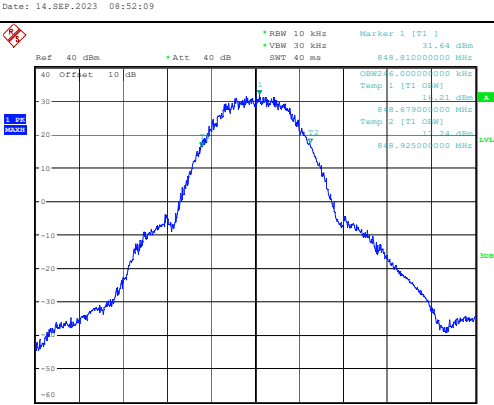
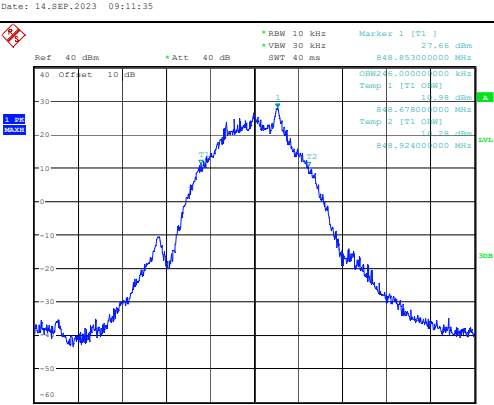
FCC §2.1055, §22.355: Frequency Stability					
Test Modulation:	GMSK		Test Channel:	836.6	MHz
Test Item	Temperature (°C)	Voltage (V _{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.85	8.31	0.010	2.5
	-20	3.85	9.34	0.011	2.5
	-10	3.85	10.54	0.013	2.5
	0	3.85	12.65	0.015	2.5
	10	3.85	13.46	0.016	2.5
	20	3.85	10.43	0.012	2.5
	30	3.85	10.39	0.012	2.5
	40	3.85	12.54	0.015	2.5
	50	3.85	14.05	0.017	2.5
Frequency Stability vs. Voltage	20	3.45	18.67	0.022	2.5
	20	4.4	17.26	0.021	2.5
				Result:	Pass

Test Modulation:	8PSK		Test Channel:	836.6	MHz
Test Item	Temperature (°C)	Voltage (V _{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.85	7.14	0.009	2.5
	-20	3.85	9.24	0.011	2.5
	-10	3.85	11.58	0.014	2.5
	0	3.85	13.54	0.016	2.5
	10	3.85	11.08	0.013	2.5
	20	3.85	9.23	0.011	2.5
	30	3.85	9.32	0.011	2.5
	40	3.85	8.45	0.010	2.5
	50	3.85	7.21	0.009	2.5
Frequency Stability vs. Voltage	20	3.45	13.69	0.016	2.5
	20	4.4	18.96	0.023	2.5
				Result:	Pass

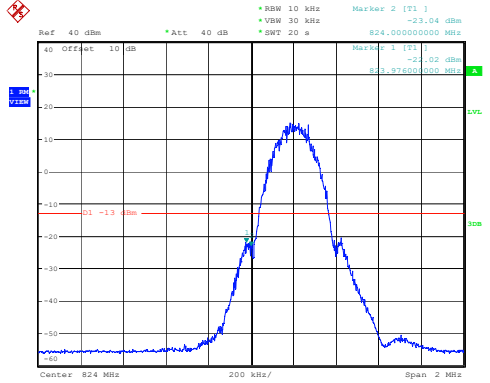
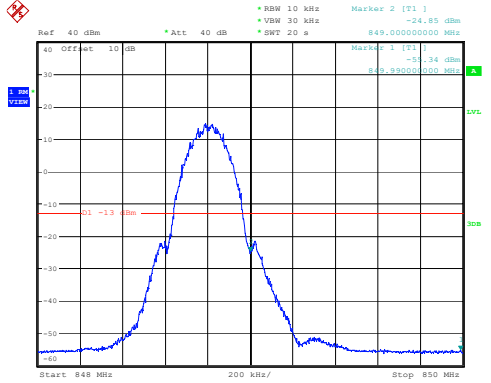
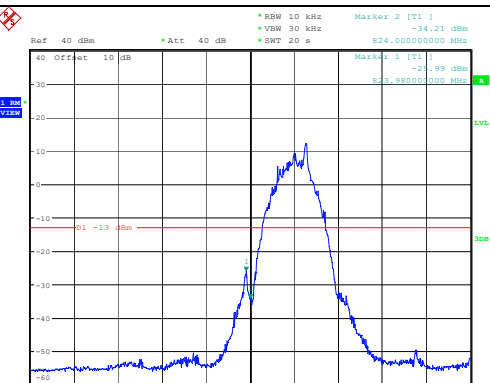
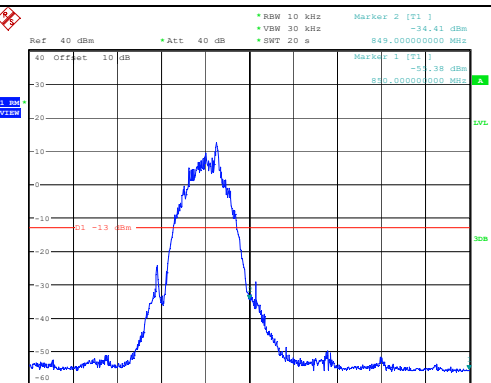
Test Plots (Note: The 10 dB is the Insertion loss of the RF cable and Power Splitter, which was offset into the Spectrum Analyzer):



Occupied Bandwidth

Channel	GSM	EDGE
Lowest	 Ref 40 dBm *Att 40 dB *RBW 10 kHz Marker 1 [T1] 31.52 dBm *VSW 30 kHz SWT 40 ms 824.221000000 MHz OSW2 4.000000000 kHz Temp 1 [T1 OSW] 31.48 dBm 824.079000000 MHz Temp 2 [T1 OSW] 31.58 dBm 824.329000000 MHz Center 824.2 MHz 100 kHz/ Span 1 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 08:44:42	 Ref 40 dBm *Att 40 dB *RBW 10 kHz Marker 1 [T1] 28.23 dBm *VSW 30 kHz SWT 40 ms 824.251000000 MHz OSW2 4.000000000 kHz Temp 1 [T1 OSW] 28.21 dBm 824.079000000 MHz Temp 2 [T1 OSW] 28.25 dBm 824.324000000 MHz Center 824.2 MHz 100 kHz/ Span 1 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 09:05:20
Middle	 Ref 40 dBm *Att 40 dB *RBW 10 kHz Marker 1 [T1] 31.58 dBm *VSW 30 kHz SWT 40 ms 836.599000000 MHz OSW2 4.000000000 kHz Temp 1 [T1 OSW] 31.55 dBm 836.480000000 MHz Temp 2 [T1 OSW] 31.65 dBm 836.724000000 MHz Center 836.6 MHz 100 kHz/ Span 1 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 08:52:09	 Ref 40 dBm *Att 40 dB *RBW 10 kHz Marker 1 [T1] 28.16 dBm *VSW 30 kHz SWT 40 ms 836.633000000 MHz OSW2 4.000000000 kHz Temp 1 [T1 OSW] 28.15 dBm 836.480000000 MHz Temp 2 [T1 OSW] 28.17 dBm 836.723000000 MHz Center 836.6 MHz 100 kHz/ Span 1 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 09:11:35
Highest	 Ref 40 dBm *Att 40 dB *RBW 10 kHz Marker 1 [T1] 31.64 dBm *VSW 30 kHz SWT 40 ms 848.810000000 MHz OSW2 4.000000000 kHz Temp 1 [T1 OSW] 31.61 dBm 848.678000000 MHz Temp 2 [T1 OSW] 31.67 dBm 848.925000000 MHz Center 848.8 MHz 100 kHz/ Span 1 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 08:57:01	 Ref 40 dBm *Att 40 dB *RBW 10 kHz Marker 1 [T1] 27.66 dBm *VSW 30 kHz SWT 40 ms 848.833000000 MHz OSW2 4.000000000 kHz Temp 1 [T1 OSW] 27.65 dBm 848.678000000 MHz Temp 2 [T1 OSW] 27.67 dBm 848.924000000 MHz Center 848.8 MHz 100 kHz/ Span 1 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 09:15:55

Out of band emission, Band Edge

Mode	Lowest	Highest
GSM	 Ref 40 dBm *Att 40 dB *RBW 10 kHz *VBW 10 kHz *SWT 20 s Marker 2 [T1] -23.04 dBm 824.00000000 MHz Marker 1 [T1] -23.02 dBm 823.976000000 MHz Center 824 MHz 200 kHz/ Span 2 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 08:46:40	 Ref 40 dBm *Att 40 dB *RBW 10 kHz *VBW 10 kHz *SWT 20 s Marker 2 [T1] -24.85 dBm 849.00000000 MHz Marker 1 [T1] -24.84 dBm 848.980000000 MHz Start 848 MHz 200 kHz/ Stop 850 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 08:59:26
EDGE	 Ref 40 dBm *Att 40 dB *RBW 10 kHz *VBW 10 kHz *SWT 20 s Marker 2 [T1] -34.21 dBm 824.00000000 MHz Marker 1 [T1] -23.99 dBm 823.980000000 MHz Start 823 MHz 200 kHz/ Stop 825 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 09:07:45	 Ref 40 dBm *Att 40 dB *RBW 10 kHz *VBW 10 kHz *SWT 20 s Marker 2 [T1] -34.41 dBm 849.00000000 MHz Marker 1 [T1] -34.38 dBm 848.980000000 MHz Start 848 MHz 200 kHz/ Stop 850 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 09:17:55

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

Serial Number:	2AS5-5	Test Date:	2023/9/14
Test Site:	RF	Test Mode:	Transmitting
Tester:	Rod Luo	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	27	Relative Humidity: (%)	57	ATM Pressure: (kPa)	101
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU26	200256	2023/3/31	2024/3/30
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211002	Each time	N/A
Minl-Circuits	Power Splitter	ZFRSC-183-S+	S F448201619	Each time	N/A
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)
GSM	1850.2	1880	1909.8
GPRS	1850.2	1880	1909.8
EDGE	1850.2	1880	1909.8

Test Data:

FCC§2.1046;§ 24.232 (c):RF Output Power					
Test Mode	Conducted Peak Output Power(dBm)			Maximum EIRP (dBm)	EIRP Limit (dBm)
	Lowest Channel	Middle Channel	Highest Channel		
GSM	30.11	29.84	29.49	27.81	33
GPRS 1 Slot	30.07	29.78	29.39	27.77	33
GPRS 2 Slots	28.91	28.66	28.34	26.61	33
GPRS 3 Slots	26.80	26.46	26.14	24.50	33
GPRS 4 Slots	25.52	25.19	24.81	23.22	33
EDGE 1 Slot	27.07	26.81	26.30	24.77	33
EDGE 2 Slots	25.71	25.51	25.09	23.41	33
EDGE 3 Slots	23.72	23.47	23.06	21.42	33
EDGE 4 Slots	22.67	22.38	22.00	20.37	33
Note: EIRP=Conducted Power(dBm) - Lc(dB) + Gr(dBi)					
				Result:	Pass

FCC §2.1049, §24.238: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
GSM	0.247	0.245	0.245	0.317	0.315	0.317
EDGE	0.243	0.242	0.242	0.303	0.308	0.305
Note: The test plots please refer to the Plots of Occupied Bandwidth						

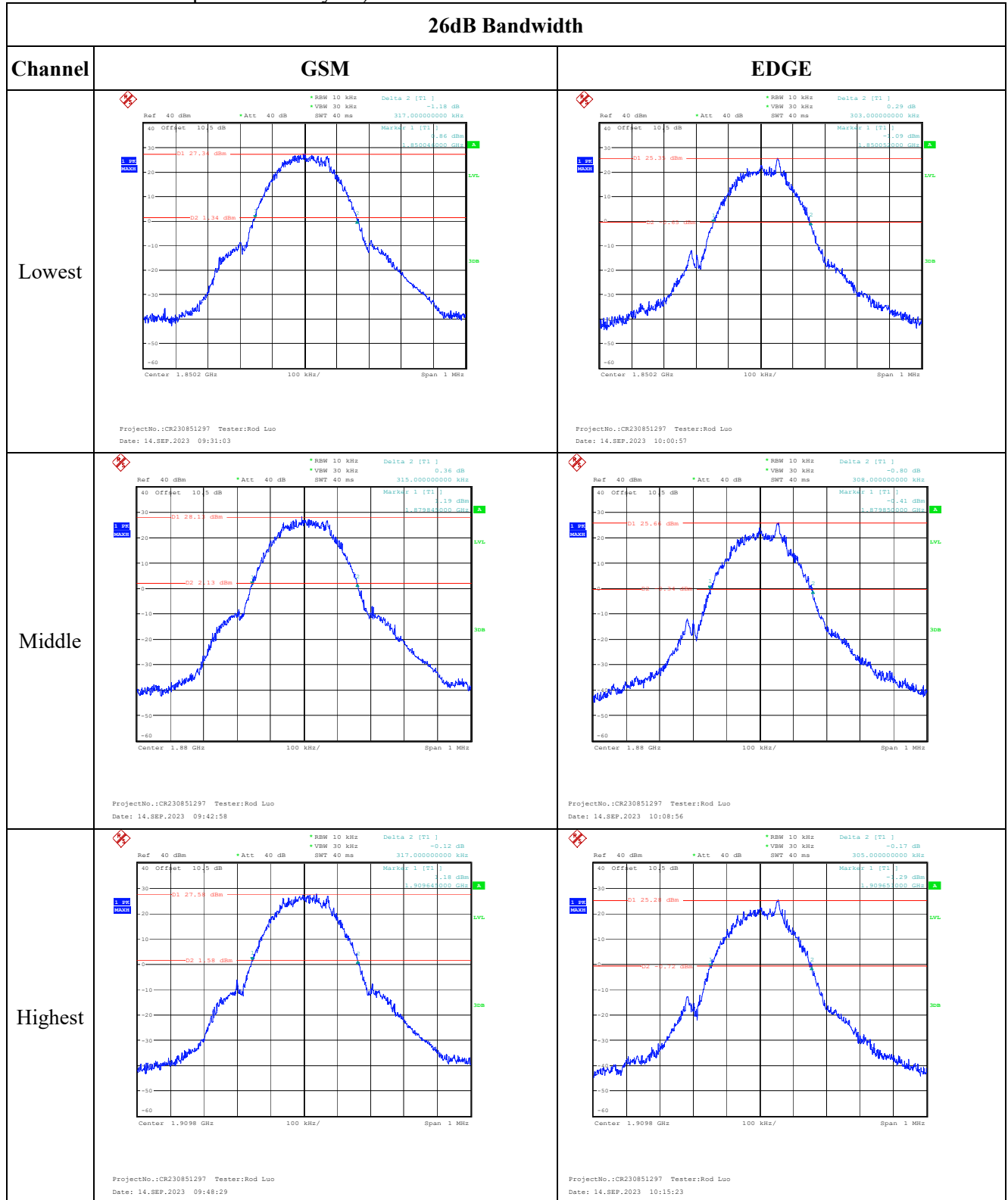
FCC §2.1051, § 24.238 (a):Spurious Emissions at Antenna Terminal	
Result:	Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.

FCC §2.1051, § 24.238 (a):Out of band emission, Band Edge	
Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.

FCC §2.1055, §24.235: Frequency Stability						
Test Mode:	GMSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.85	1850.287	1850.000	1909.724	1910.000
	-20	3.85	1850.227	1850.000	1909.783	1910.000
	-10	3.85	1850.132	1850.000	1909.831	1910.000
	0	3.85	1850.292	1850.000	1909.799	1910.000
	10	3.85	1850.297	1850.000	1909.734	1910.000
	20	3.85	1850.232	1850.000	1909.707	1910.000
	30	3.85	1850.168	1850.000	1909.855	1910.000
	40	3.85	1850.185	1850.000	1909.738	1910.000
	50	3.85	1850.292	1850.000	1909.724	1910.000
Frequency Stability vs. Voltage	20	3.45	1850.182	1850.000	1909.703	1910.000
	20	4.4	1850.207	1850.000	1909.736	1910.000
					Result:	Pass

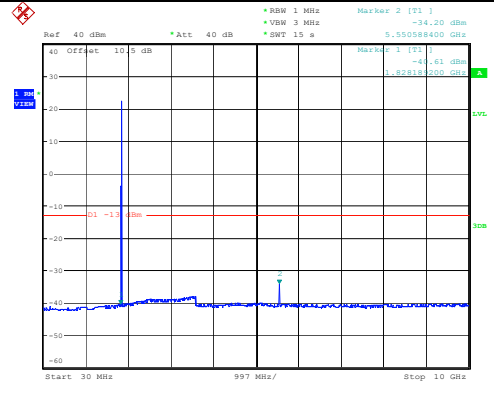
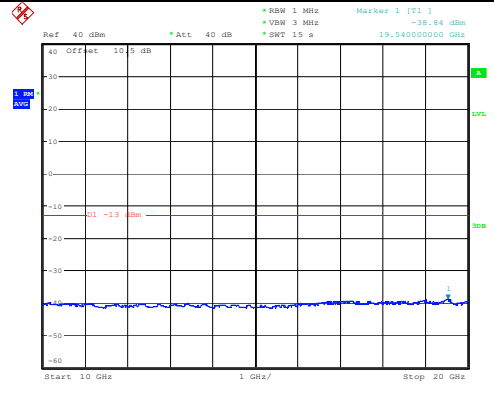
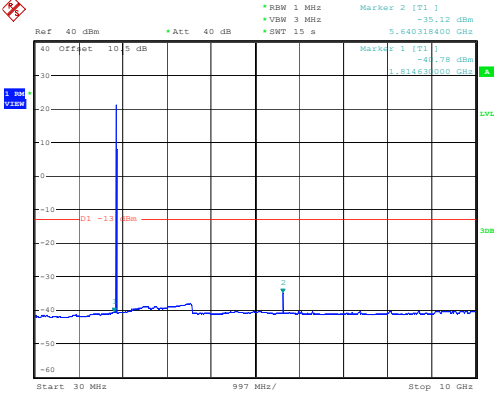
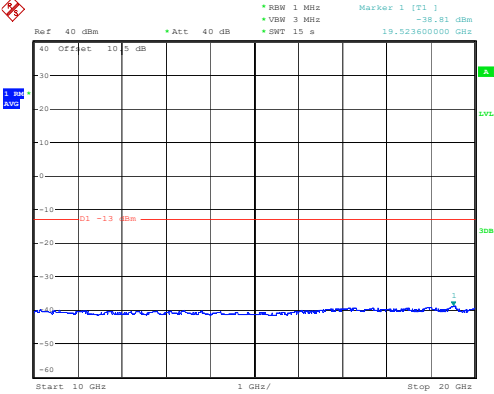
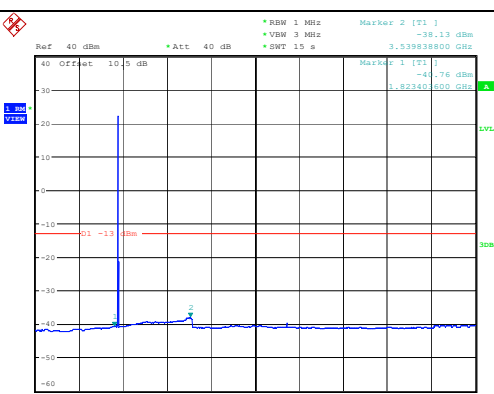
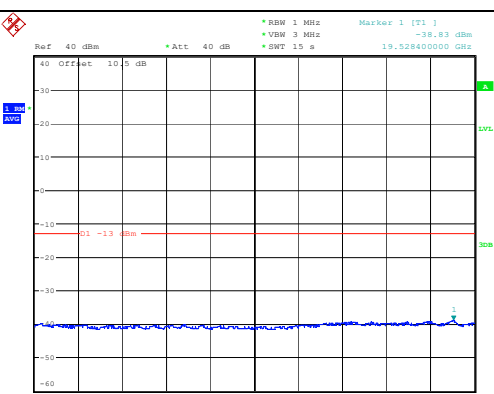
Test Mode:	8PSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.85	1850.136	1850.000	1909.813	1910.000
	-20	3.85	1850.113	1850.000	1909.730	1910.000
	-10	3.85	1850.198	1850.000	1909.772	1910.000
	0	3.85	1850.245	1850.000	1909.808	1910.000
	10	3.85	1850.225	1850.000	1909.714	1910.000
	20	3.85	1850.158	1850.000	1909.892	1910.000
	30	3.85	1850.291	1850.000	1909.834	1910.000
	40	3.85	1850.218	1850.000	1909.899	1910.000
	50	3.85	1850.174	1850.000	1909.865	1910.000
Frequency Stability vs. Voltage	20	3.45	1850.114	1850.000	1909.873	1910.000
	20	4.4	1850.279	1850.000	1909.804	1910.000
					Result:	Pass

Test Plots (Note: The 10.5 dB is the Insertion loss of the RF cable and Power Splitter, which was offset into the Spectrum Analyzer):

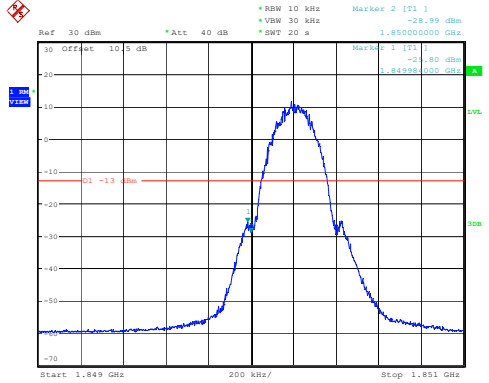
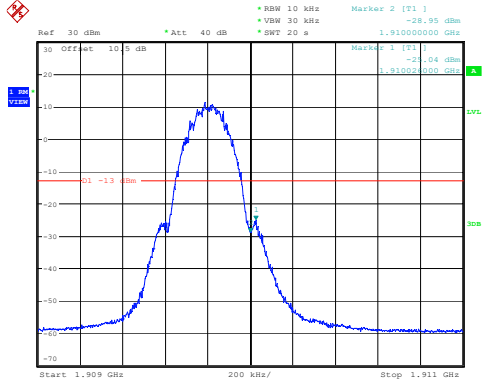
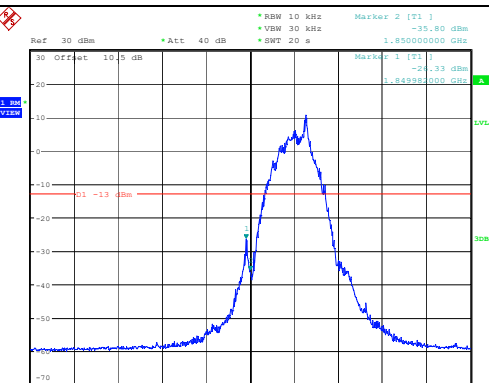
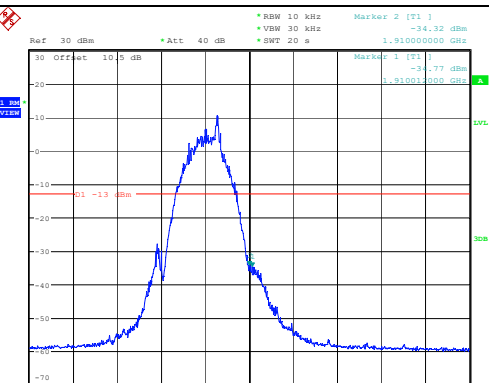


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Spurious Emissions at Antenna Terminal

Channel	GSM	
Lowest	 Ref 40 dBm *Att 40 dB *SWT 15 s 5.550588400 GHz Marker 1 [T1] -40.61 dBm 5.550588400 GHz Start 30 MHz 997 MHz/ Stop 10 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 09:55:00	 Ref 40 dBm *Att 40 dB *SWT 15 s 19.540000000 GHz Marker 1 [T1] -38.84 dBm 19.540000000 GHz Start 10 GHz 1 GHz/ Stop 20 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 09:35:24
	 Ref 40 dBm *Att 40 dB *SWT 15 s 5.640318400 GHz Marker 1 [T1] -40.78 dBm 5.640318400 GHz Start 30 MHz 997 MHz/ Stop 10 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 09:44:47	 Ref 40 dBm *Att 40 dB *SWT 15 s 19.523600000 GHz Marker 1 [T1] -38.81 dBm 19.523600000 GHz Start 10 GHz 1 GHz/ Stop 20 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 09:45:36
Highest	 Ref 40 dBm *Att 40 dB *SWT 15 s 5.539838800 GHz Marker 1 [T1] -40.76 dBm 5.539838800 GHz Start 30 MHz 997 MHz/ Stop 10 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 09:51:51	 Ref 40 dBm *Att 40 dB *SWT 15 s 19.528400000 GHz Marker 1 [T1] -38.83 dBm 19.528400000 GHz Start 10 GHz 1 GHz/ Stop 20 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 09:52:32

Out of band emission, Band Edge

Channel	Lowest	Highest
GSM	 Ref 30 dBm *Att 40 dB *RBW 10 kHz Marker 2 [T1] -28.59 dBm *VBW 30 kHz *SWT 20 s 1.850000000 GHz Start 1.849 GHz 200 kHz/ Stop 1.851 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 09:32:37	 Ref 30 dBm *Att 40 dB *RBW 10 kHz Marker 2 [T1] -28.95 dBm *VBW 30 kHz *SWT 20 s 1.910000000 GHz Start 1.909 GHz 200 kHz/ Stop 1.911 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 09:50:01
EDGE	 Ref 30 dBm *Att 40 dB *RBW 10 kHz Marker 2 [T1] -24.33 dBm *VBW 30 kHz *SWT 20 s 1.850000000 GHz Start 1.849 GHz 200 kHz/ Stop 1.851 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 10:02:28	 Ref 30 dBm *Att 40 dB *RBW 10 kHz Marker 2 [T1] -34.32 dBm *VBW 30 kHz *SWT 20 s 1.910000000 GHz Start 1.909 GHz 200 kHz/ Stop 1.911 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 10:16:55

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

Serial Number:	2AS5-5	Test Date:	2023/9/14
Test Site:	RF	Test Mode:	Transmitting
Tester:	Rod Luo	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	27	Relative Humidity: (%)	57	ATM Pressure: (kPa)	101
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU26	200256	2023/3/31	2024/3/30
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211002	Each time	N/A
Minl-Circuits	Power Splitter	ZFRSC-183-S+	S F448201619	Each time	N/A
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 Band 2	1852.4	1880	1907.6

Test Data:**FCC§2.1046;§ 24.232****RF Output Power:**

Test Mode	Conducted Average Output Power(dBm)			Maximum EIRP (dBm)	EIRP Limit (dBm)
	Lowest Channel	Middle Channel	Highest Channel		
WCDMA R99	23.18	22.84	22.67	20.88	33
HSDPA Subtest 1	20.48	20.22	20.03	18.18	33
HSDPA Subtest 2	20.67	20.38	20.08	18.37	33
HSDPA Subtest 3	20.62	20.41	20.12	18.32	33
HSDPA Subtest 4	20.53	20.31	20.09	18.23	33
HSUPA Subtest 1	20.34	19.86	19.69	18.04	33
HSUPA Subtest 2	20.40	19.92	19.80	18.10	33
HSUPA Subtest 3	20.45	19.91	19.80	18.15	33
HSUPA Subtest 4	20.54	20.05	19.85	18.24	33
HSUPA Subtest 5	20.51	20.00	19.84	18.21	33
HSPA+ Subtest 1	20.46	20.02	19.81	18.16	33

Note: EIRP=Conducted Power(dBm) - Lc(dB) + Gr(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	2.88	2.98	3.04	13
HSDPA	4.65	4.62	4.74	13
HSUPA	5.64	5.48	5.9	13

Result:**Pass****FCC §2.1049, §24.238: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	4.170	4.170	4.170	4.740	4.740	4.725
HSDPA	4.200	4.200	4.230	4.800	4.950	5.130
HSUPA	4.200	4.215	4.260	4.785	4.830	5.370

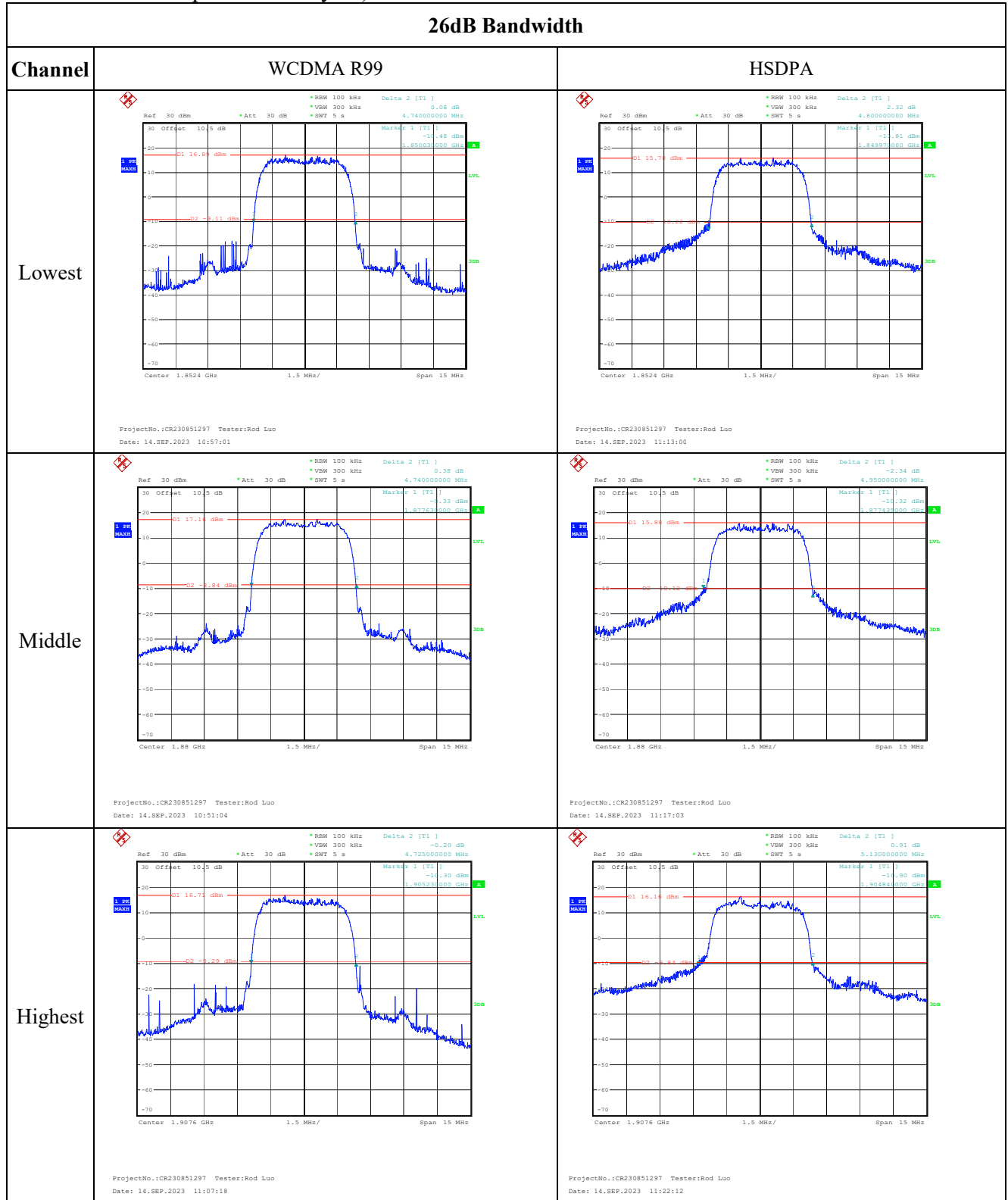
Note: The test plots please refer to the Plots of Occupied Bandwidth

FCC §2.1051, § 24.238 (a):Spurious Emissions at Antenna Terminal**Result:****Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.**

FCC §2.1051, § 24.238 (a):Out of band emission, Band Edge	
Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.

FCC §2.1055, §24.235: Frequency Stability						
Test Mode:	WCDMA R99	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.85	1850.172	1850.000	1909.802	1910.000
	-20	3.85	1850.150	1850.000	1909.892	1910.000
	-10	3.85	1850.106	1850.000	1909.756	1910.000
	0	3.85	1850.271	1850.000	1909.798	1910.000
	10	3.85	1850.150	1850.000	1909.896	1910.000
	20	3.85	1850.144	1850.000	1909.792	1910.000
	30	3.85	1850.161	1850.000	1909.854	1910.000
	40	3.85	1850.292	1850.000	1909.840	1910.000
	50	3.85	1850.150	1850.000	1909.792	1910.000
Frequency Stability vs. Voltage	20	3.45	1850.117	1850.000	1909.886	1910.000
	20	4.4	1850.117	1850.000	1909.765	1910.000
Result:					Pass	

Test Plots (Note: The 10.5 dB is the Insertion loss of the RF cable and Power Splitter, which was offset into the Spectrum Analyzer):

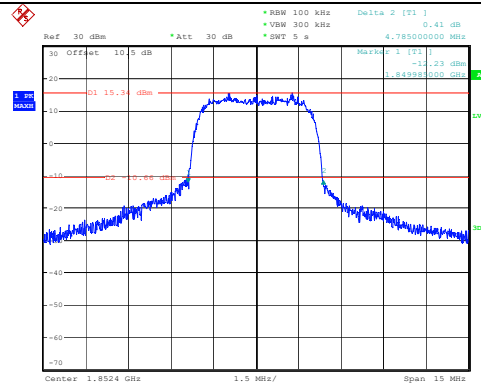


26dB Bandwidth

Channel

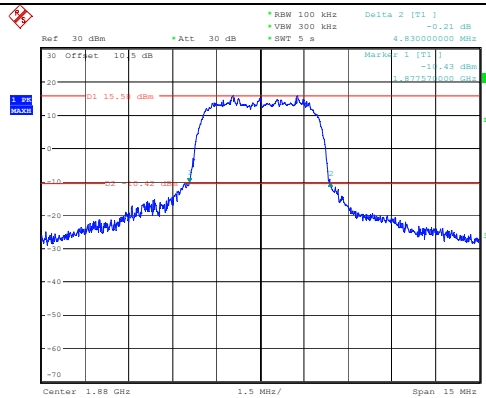
HSUPA

Lowest



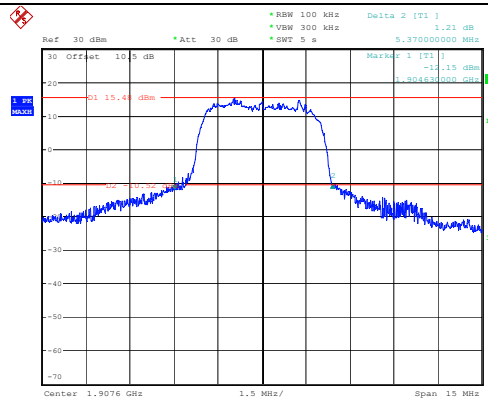
ProjectNo.:CR230851297 Tester:Rod Luo
Date: 14.SEP.2023 11:31:39

Middle



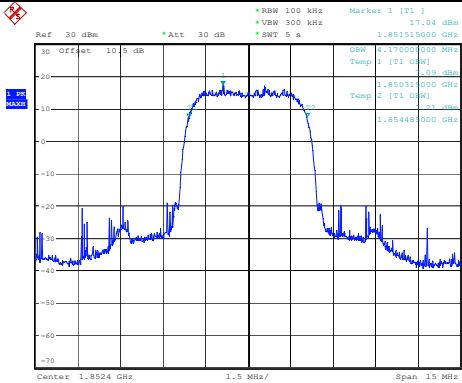
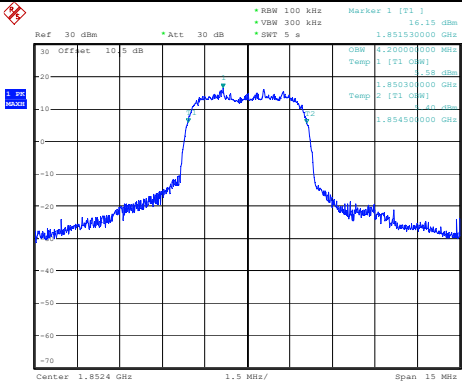
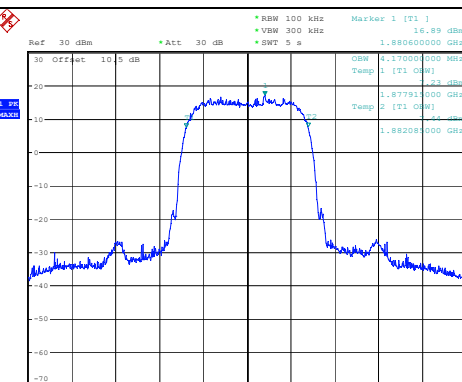
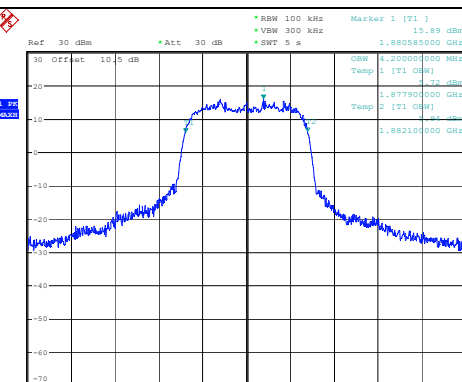
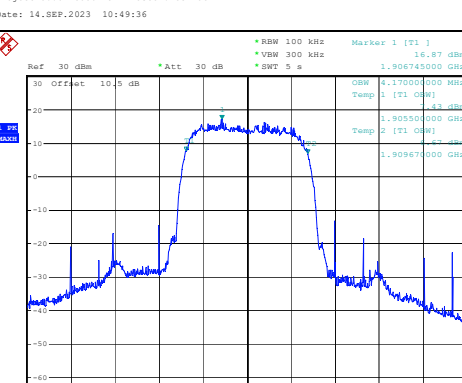
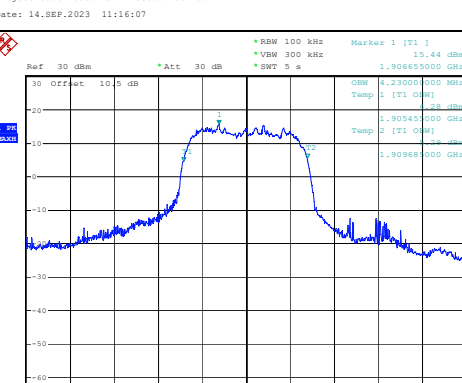
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Date: 14.SEP.2023 11:36:45

Highest



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 14.SEP.2023 11:44:44

Occupied Bandwidth

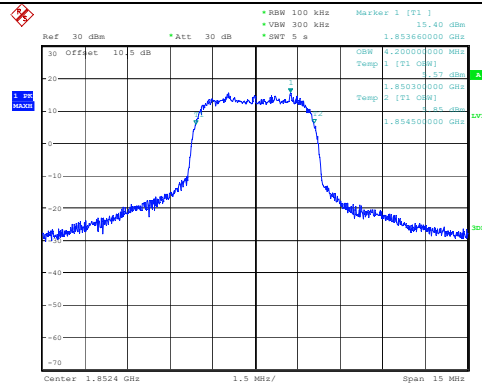
Channel	WCDMA R99	HSDPA
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Middle	 ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 10:49:36	 ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 11:16:07
Highest	 ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 11:06:29	 ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 11:20:45

Occupied Bandwidth

Channel

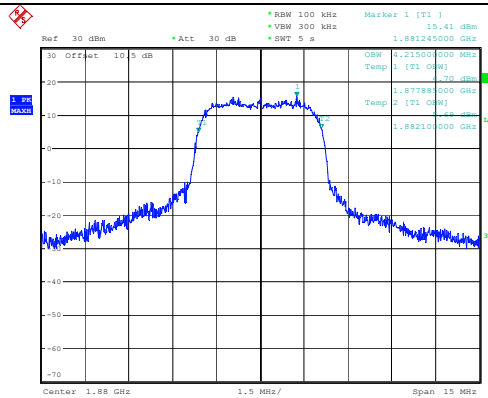
HSUPA

Lowest



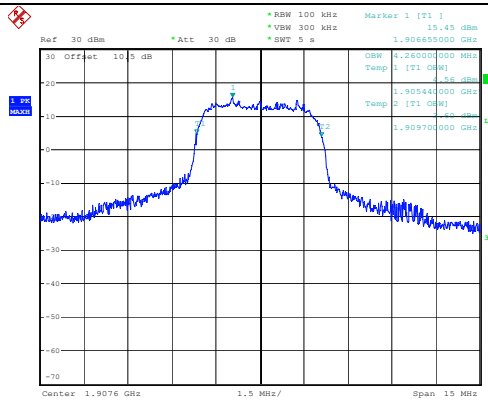
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Date: 14.SEP.2023 11:30:57

Middle



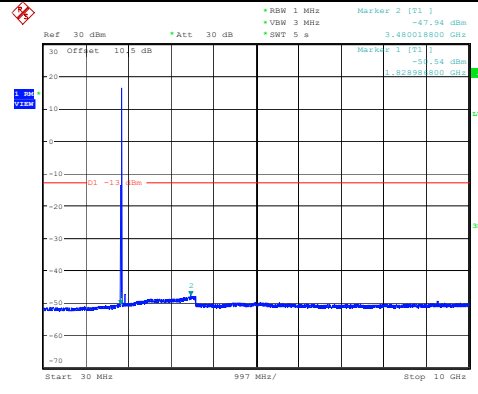
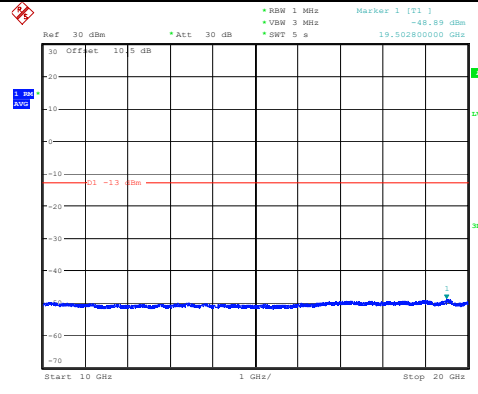
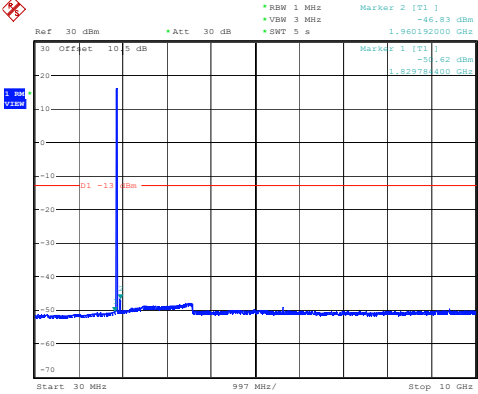
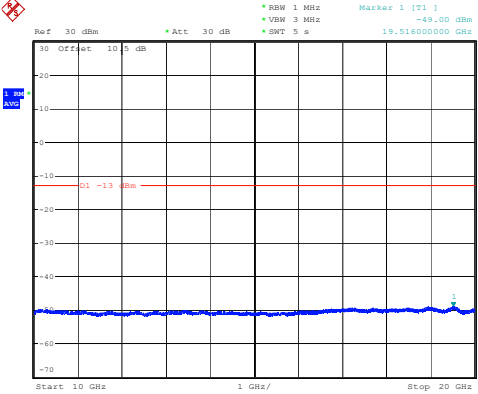
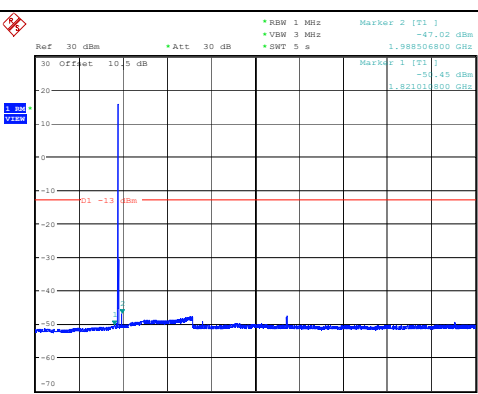
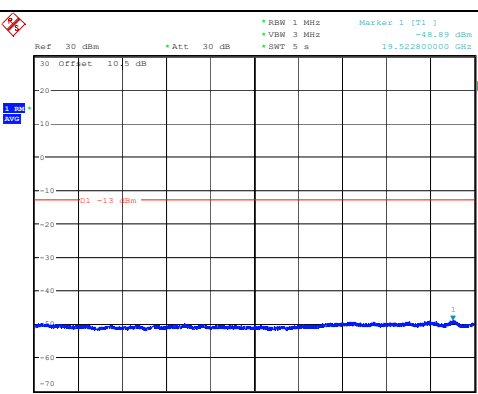
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Date: 14.SEP.2023 11:35:18

Highest

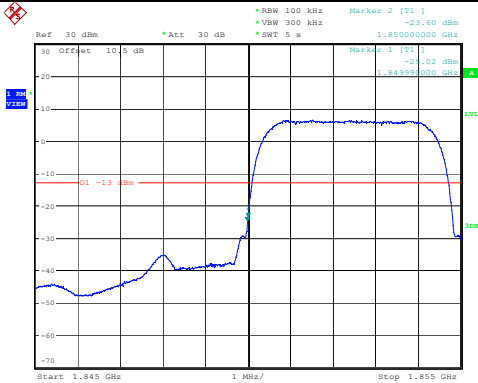
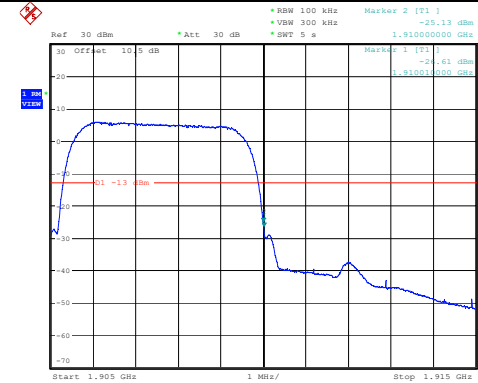
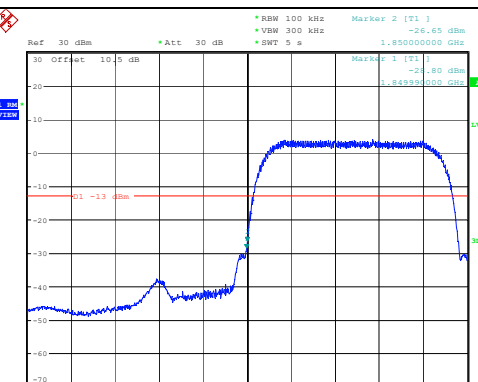
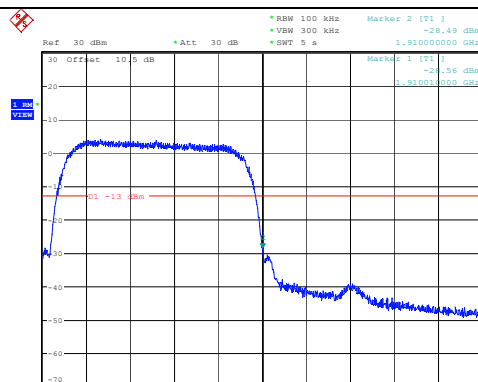
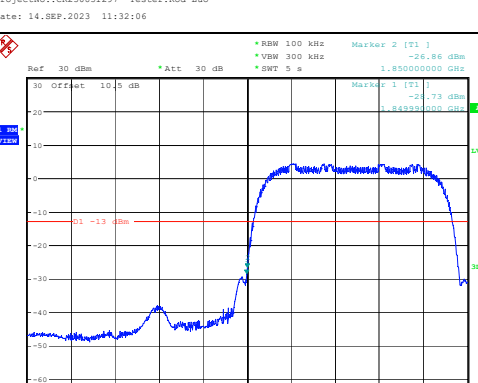
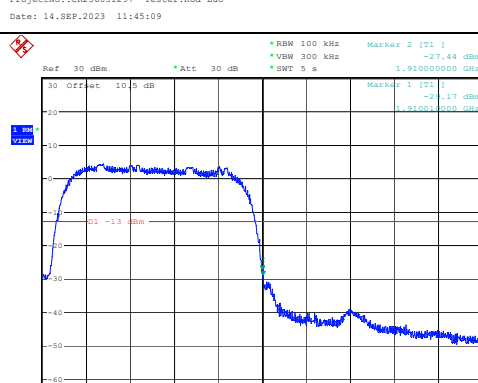


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 14.SEP.2023 11:43:52

Spurious Emissions at Antenna Terminal

Channel	WCDMA R99	
Lowest	 Ref 30 dBm *Att 30 dB *RBW 1 MHz *VBW 3 MHz *SWT 5 s Marker 1 [T1] -47.94 dBm Marker 2 [T1] -47.94 dBm 3.480018800 GHz Start 30 MHz 997 MHz/ Stop 10 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 10:38:08	 Ref 30 dBm *Att 30 dB *RBW 1 MHz *VBW 3 MHz *SWT 5 s Marker 1 [T1] -48.89 dBm 19.502800000 GHz Start 10 GHz 1 GHz/ Stop 20 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 10:38:36
	 Ref 30 dBm *Att 30 dB *RBW 1 MHz *VBW 3 MHz *SWT 5 s Marker 1 [T1] -46.83 dBm Marker 2 [T1] -46.83 dBm 1.960192000 GHz Start 30 MHz 997 MHz/ Stop 10 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 10:51:35	 Ref 30 dBm *Att 30 dB *RBW 1 MHz *VBW 3 MHz *SWT 5 s Marker 1 [T1] -49.00 dBm 19.516000000 GHz Start 10 GHz 1 GHz/ Stop 20 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 10:52:03
Highest	 Ref 30 dBm *Att 30 dB *RBW 1 MHz *VBW 3 MHz *SWT 5 s Marker 1 [T1] -47.02 dBm Marker 2 [T1] -47.02 dBm 1.988506800 GHz Start 30 MHz 997 MHz/ Stop 10 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 11:02:01	 Ref 30 dBm *Att 30 dB *RBW 1 MHz *VBW 3 MHz *SWT 5 s Marker 1 [T1] -48.89 dBm 19.522800000 GHz Start 10 GHz 1 GHz/ Stop 20 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 11:02:29

Out of band emission, Band Edge

Mode	Lowest	Highest
R99	 Ref 30 dBm *Att 30 dB *RBW 100 kHz *VBW 300 kHz *SWT 5 s Marker 2 [T1] 1.850000000 GHz -23.60 dBm -23.60 dBm 1.849999999 GHz Start 1.845 GHz 1 MHz/ Stop 1.855 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 10:37:42	 Ref 30 dBm *Att 30 dB *RBW 100 kHz *VBW 300 kHz *SWT 5 s Marker 2 [T1] 1.910000000 GHz -25.13 dBm -25.13 dBm 1.910000000 GHz Start 1.905 GHz 1 MHz/ Stop 1.915 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 11:07:44
HSUPA	 Ref 30 dBm *Att 30 dB *RBW 100 kHz *VBW 300 kHz *SWT 5 s Marker 2 [T1] 1.850000000 GHz -26.65 dBm -26.65 dBm 1.849999999 GHz Start 1.845 GHz 1 MHz/ Stop 1.855 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 11:32:06	 Ref 30 dBm *Att 30 dB *RBW 100 kHz *VBW 300 kHz *SWT 5 s Marker 2 [T1] 1.910000000 GHz -28.49 dBm -28.49 dBm 1.910000000 GHz Start 1.905 GHz 1 MHz/ Stop 1.915 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 11:45:09
HSDPA	 Ref 30 dBm *Att 30 dB *RBW 100 kHz *VBW 300 kHz *SWT 5 s Marker 2 [T1] 1.850000000 GHz -26.86 dBm -26.86 dBm 1.849999999 GHz Start 1.845 GHz 1 MHz/ Stop 1.855 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 11:13:28	 Ref 30 dBm *Att 30 dB *RBW 100 kHz *VBW 300 kHz *SWT 5 s Marker 2 [T1] 1.910000000 GHz -27.44 dBm -27.44 dBm 1.910000000 GHz Start 1.905 GHz 1 MHz/ Stop 1.915 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 11:22:39

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

Serial Number:	2AS5-5	Test Date:	2023/9/14~2023/9/18
Test Site:	RF	Test Mode:	Transmitting
Tester:	Rod Luo	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	25.9~27	Relative Humidity: (%)	57~60	ATM Pressure: (kPa)	100.2~101
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU26	200256	2023/3/31	2024/3/30
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211002	Each time	N/A
Minl-Circuits	Power Splitter	ZFRSC-183-S+	S F448201619	Each time	N/A
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 Band 4	1712.4	1732.6	1752.6

Test Data:**FCC§2.1046;§27.50(d)(4)****RF Output Power:**

Test Mode	Conducted Average Output Power(dBm)			Maximum EIRP (dBm)	EIRP Limit (dBm)
	Lowest Channel	Middle Channel	Highest Channel		
WCDMA R99	23.58	23.84	23.83	21.54	30
HSDPA Subtest 1	21.24	21.34	21.24	19.04	30
HSDPA Subtest 2	21.44	21.53	21.39	19.23	30
HSDPA Subtest 3	21.36	21.54	21.38	19.24	30
HSDPA Subtest 4	21.44	21.53	21.35	19.23	30
HSUPA Subtest 1	20.57	21.06	20.88	18.76	30
HSUPA Subtest 2	20.73	21.11	21.08	18.81	30
HSUPA Subtest 3	20.73	21.16	20.95	18.86	30
HSUPA Subtest 4	20.74	21.17	20.96	18.87	30
HSUPA Subtest 5	20.65	21.21	20.97	18.91	30
HSPA+ Subtest 1	20.7	21.16	21.08	18.86	30

Note: EIRP=Conducted Power(dBm) - Lc(dB) + Gr(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	2.95	3.01	2.82	13
HSDPA	4.94	5.1	4.74	13
HSUPA	5.51	5.42	5.54	13

Result:**Pass****FCC §2.1049, §27.53: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	4.170	4.170	4.170	4.740	4.725	4.740
HSDPA	4.260	4.260	4.320	5.805	6.705	6.795
HSUPA	4.320	4.320	4.290	7.245	7.245	6.855

Note: The test plots please refer to the Plots of Occupied Bandwidth

FCC §2.1051, § 27.53:Spurious Emissions at Antenna Terminal

Result:	Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.
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FCC §2.1051, § 27.53: Out of band emission, Band Edge

Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.
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FCC §2.1055, §27.54: Frequency Stability

Test Mode:	WCDMA R99	Test Channel: Lowest for Lower Edge, Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{bc})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.85	1710.224	1710.000	1754.828	1755.000
	-20	3.85	1710.178	1710.000	1754.840	1755.000
	-10	3.85	1710.119	1710.000	1754.894	1755.000
	0	3.85	1710.202	1710.000	1754.777	1755.000
	10	3.85	1710.296	1710.000	1754.709	1755.000
	20	3.85	1710.298	1710.000	1754.880	1755.000
	30	3.85	1710.197	1710.000	1754.890	1755.000
	40	3.85	1710.256	1710.000	1754.824	1755.000
	50	3.85	1710.193	1710.000	1754.893	1755.000
Frequency Stability vs. Voltage	20	3.45	1710.108	1710.000	1754.788	1755.000
	20	4.4	1710.194	1710.000	1754.736	1755.000
Result:					Pass	

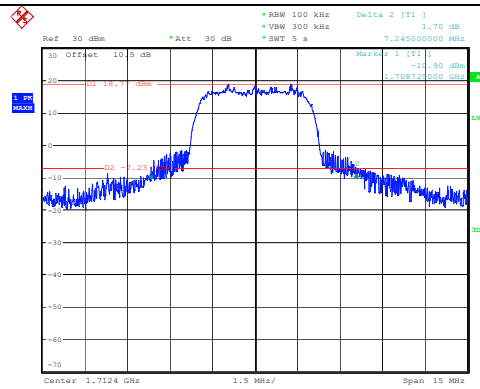
26dB Bandwidth	
Channel	WCDMA R99 HSDPA
Lowest	Ref 30 dBm Att 30 dB RBW 100 kHz Delta 2 [T1] 0.53 dB VSW 300 kHz Center 1.7124 GHz Span 15 MHz Marker 1 [T1] -11.18 dBm 1.712031000 GHz Q1 16.5 dBm Q2 -5.16 dBm 1.5 MHz/ 15 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 11:59:14 Ref 30 dBm Att 30 dB RBW 100 kHz Delta 2 [T1] 0.46 dB VSW 300 kHz Center 1.7124 GHz Span 15 MHz Marker 1 [T1] -11.32 dBm 1.712031000 GHz Q1 16.8 dBm Q2 -7.2 dBm 1.5 MHz/ 15 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 08:44:06
Middle	Ref 30 dBm Att 30 dB RBW 100 kHz Delta 2 [T1] -2.22 dB VSW 300 kHz Center 1.7326 GHz Span 15 MHz Marker 1 [T1] -12.27 dBm 1.732241000 GHz Q1 17.38 dBm Q2 -6.62 dBm 1.5 MHz/ 15 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 12:02:59 Ref 30 dBm Att 30 dB RBW 100 kHz Delta 2 [T1] -1.33 dB VSW 300 kHz Center 1.7326 GHz Span 15 MHz Marker 1 [T1] -12.38 dBm 1.732311000 GHz Q1 17.54 dBm Q2 -6.46 dBm 1.5 MHz/ 15 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 08:49:42
Highest	Ref 30 dBm Att 30 dB RBW 100 kHz Delta 2 [T1] -1.08 dB VSW 300 kHz Center 1.7526 GHz Span 15 MHz Marker 1 [T2] -11.31 dBm 1.750231000 GHz Q1 17.07 dBm Q2 -6.91 dBm 1.5 MHz/ 15 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 12:11:20 Ref 30 dBm Att 30 dB RBW 100 kHz Delta 2 [T1] -0.63 dB VSW 300 kHz Center 1.7526 GHz Span 15 MHz Marker 1 [T2] -11.87 dBm 1.748931000 GHz Q1 19.11 dBm Q2 -1.88 dBm 1.5 MHz/ 15 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 09:05:13

26dB Bandwidth

Channel

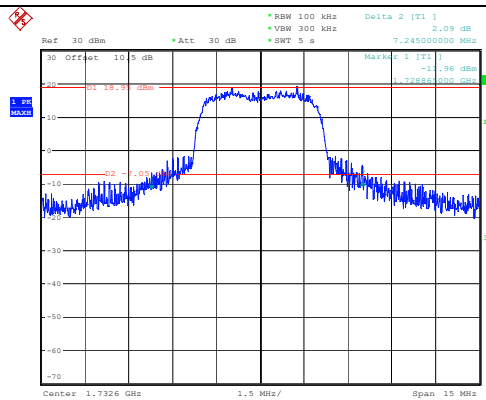
HSUPA

Lowest



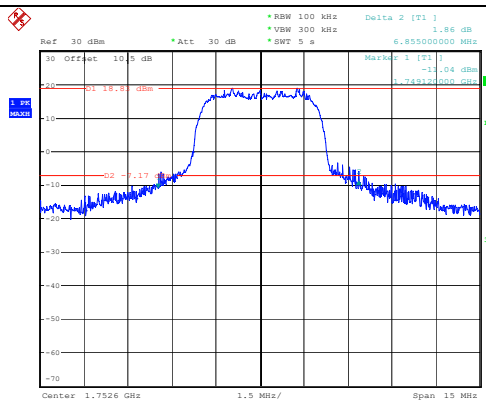
ProjectNo.:CR230851297 Tester:Rod Luo
Date: 18.SEP.2023 09:12:18

Middle



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 18.SEP.2023 09:18:41

Highest



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 18.SEP.2023 09:24:22

Occupied Bandwidth

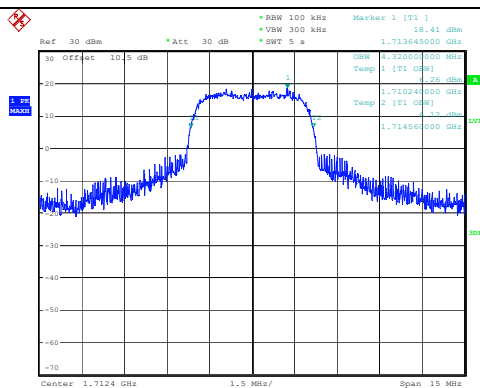
Channel	WCDMA R99	HSDPA
Lowest	Ref 30 dBm *Att 30 dB *RSW 100 kHz *VSW 300 kHz *SWT 5 s Marker 1 [T1] 1.7124 GHz 16.19 dBm Temp 1 [T1] 1.7124 GHz 16.19 dBm Temp 2 [T1] 1.7124 GHz 16.19 dBm Center 1.7124 GHz 1.5 MHz/ Span 15 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 11:58:12	Ref 30 dBm *Att 30 dB *RSW 100 kHz *VSW 300 kHz *SWT 5 s Marker 1 [T1] 1.7124 GHz 18.79 dBm Temp 1 [T1] 1.7124 GHz 18.79 dBm Temp 2 [T1] 1.7124 GHz 18.79 dBm Center 1.7124 GHz 1.5 MHz/ Span 15 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 08:42:53
Middle	Ref 30 dBm *Att 30 dB *RSW 100 kHz *VSW 300 kHz *SWT 5 s Marker 1 [T1] 1.7326 GHz 17.25 dBm Temp 1 [T1] 1.7326 GHz 17.25 dBm Temp 2 [T1] 1.7326 GHz 17.25 dBm Center 1.7326 GHz 1.5 MHz/ Span 15 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 11:02:13	Ref 30 dBm *Att 30 dB *RSW 100 kHz *VSW 300 kHz *SWT 5 s Marker 1 [T1] 1.7326 GHz 19.18 dBm Temp 1 [T1] 1.7326 GHz 19.18 dBm Temp 2 [T1] 1.7326 GHz 19.18 dBm Center 1.7326 GHz 1.5 MHz/ Span 15 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 08:49:00
Highest	Ref 30 dBm *Att 30 dB *RSW 100 kHz *VSW 300 kHz *SWT 5 s Marker 1 [T1] 1.7526 GHz 17.12 dBm Temp 1 [T1] 1.7526 GHz 17.12 dBm Temp 2 [T1] 1.7526 GHz 17.12 dBm Center 1.7526 GHz 1.5 MHz/ Span 15 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 12:10:53	Ref 30 dBm *Att 30 dB *RSW 100 kHz *VSW 300 kHz *SWT 5 s Marker 1 [T1] 1.7526 GHz 19.68 dBm Temp 1 [T1] 1.7526 GHz 19.68 dBm Temp 2 [T1] 1.7526 GHz 19.68 dBm Center 1.7526 GHz 1.5 MHz/ Span 15 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 09:04:24

Occupied Bandwidth

Channel

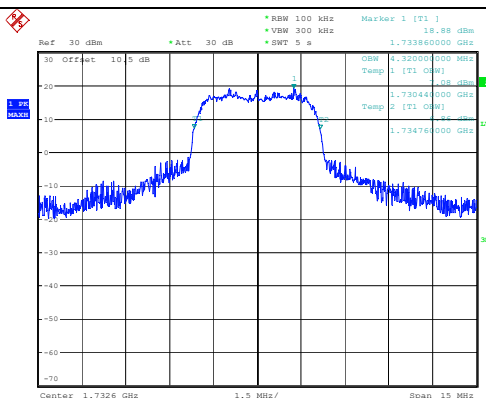
HSUPA

Lowest



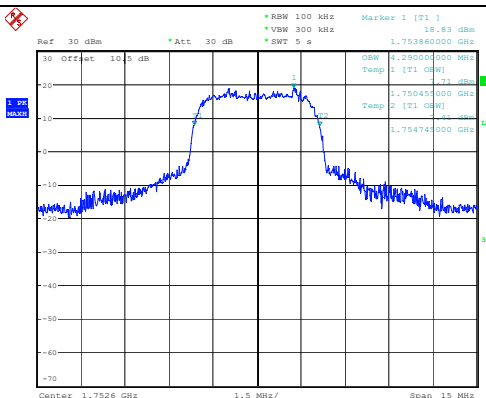
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Date: 18.SEP.2023 09:11:22

Middle



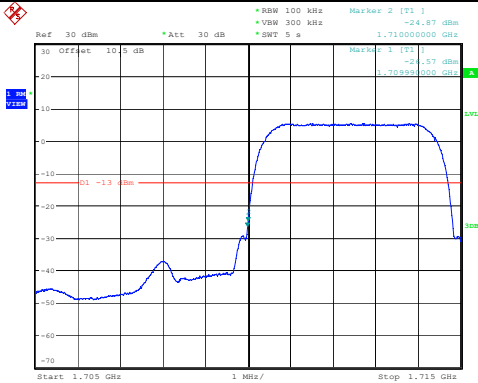
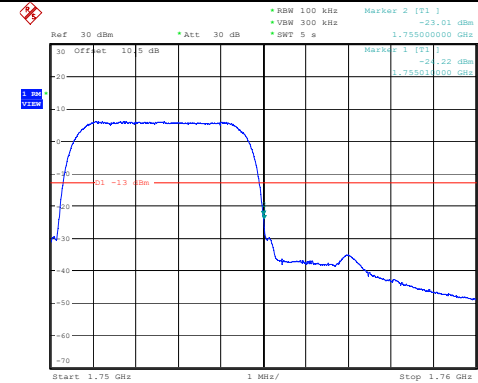
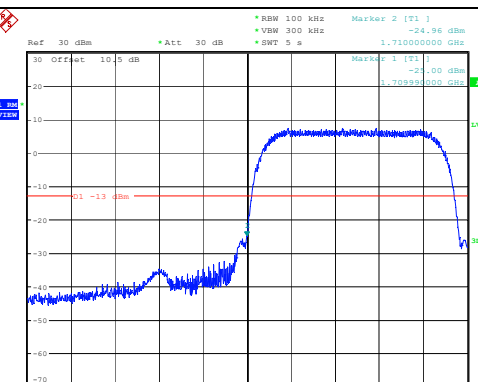
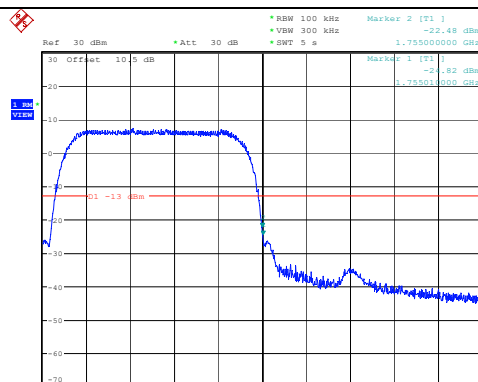
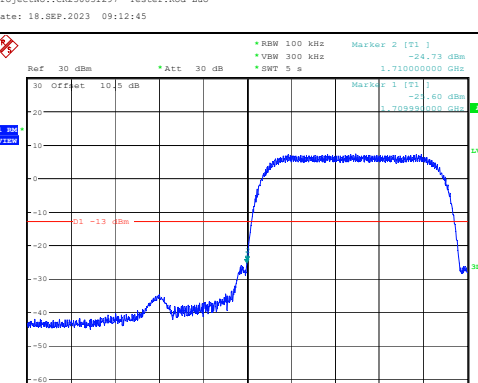
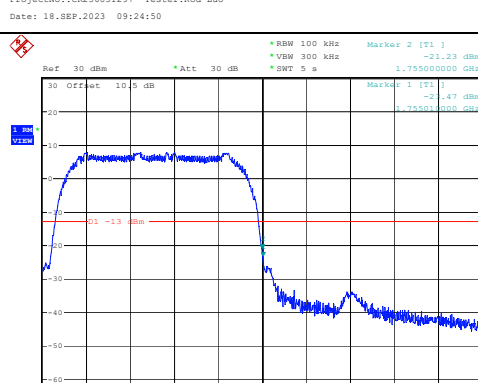
ProjectNo.:CR230851297 Tester:Rod Luo
Date: 18.SEP.2023 09:17:24

Highest



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 18.SEP.2023 09:23:10

Out of band emission, Band Edge

Mode	Lowest	Highest
R99	 Ref 30 dBm *Att 30 dB *RBW 100 kHz *VBW 300 kHz *SWT 5 s Marker 2 [T1] 1.710000000 GHz -24.87 dBm Marker 1 [T1] 1.709999999 GHz -24.87 dBm Start 1.705 GHz 1 MHz/ Stop 1.715 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 11:59:41	 Ref 30 dBm *Att 30 dB *RBW 100 kHz *VBW 300 kHz *SWT 5 s Marker 2 [T1] 1.750000000 GHz -23.01 dBm Marker 1 [T1] 1.750000000 GHz -23.01 dBm Start 1.75 GHz 1 MHz/ Stop 1.76 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 14.SEP.2023 12:11:45
HSUPA	 Ref 30 dBm *Att 30 dB *RBW 100 kHz *VBW 300 kHz *SWT 5 s Marker 2 [T1] 1.710000000 GHz -24.96 dBm Marker 1 [T1] 1.709999999 GHz -24.96 dBm Start 1.705 GHz 1 MHz/ Stop 1.715 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 09:12:45	 Ref 30 dBm *Att 30 dB *RBW 100 kHz *VBW 300 kHz *SWT 5 s Marker 2 [T1] 1.750000000 GHz -22.48 dBm Marker 1 [T1] 1.750000000 GHz -22.48 dBm Start 1.75 GHz 1 MHz/ Stop 1.76 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 09:24:50
HSDPA	 Ref 30 dBm *Att 30 dB *RBW 100 kHz *VBW 300 kHz *SWT 5 s Marker 2 [T1] 1.710000000 GHz -24.73 dBm Marker 1 [T1] 1.709999999 GHz -24.73 dBm Start 1.705 GHz 1 MHz/ Stop 1.715 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 08:44:33	 Ref 30 dBm *Att 30 dB *RBW 100 kHz *VBW 300 kHz *SWT 5 s Marker 2 [T1] 1.750000000 GHz -21.23 dBm Marker 1 [T1] 1.750000000 GHz -21.23 dBm Start 1.75 GHz 1 MHz/ Stop 1.76 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 09:05:40

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

Serial Number:	2AS5-5	Test Date:	2023/9/18
Test Site:	RF	Test Mode:	Transmitting
Tester:	Rod Luo	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	25.9	Relative Humidity: (%)	60	ATM Pressure: (kPa)	100.2
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU26	200256	2023/3/31	2024/3/30
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211002	Each time	N/A
Minl-Circuits	Power Splitter	ZFRSC-183-S+	S F448201619	Each time	N/A
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 Band 5	826.4	836.6	846.6

Test Data:**FCC§2.1046;§ 22.913 (a)****RF Output Power:**

Test Mode	Conducted Average Output Power(dBm)			Maximum ERP (dBm)	ERP Limit (dBm)
	Lowest Channel	Middle Channel	Highest Channel		
WCDMA R99	23.69	23.63	23.71	16.56	38.45
HSDPA Subtest 1	21.27	21.29	21.31	14.16	38.45
HSDPA Subtest 2	21.44	21.39	21.44	14.29	38.45
HSDPA Subtest 3	21.35	21.36	21.48	14.33	38.45
HSDPA Subtest 4	21.47	21.38	21.38	14.32	38.45
HSUPA Subtest 1	20.72	20.54	20.38	13.57	38.45
HSUPA Subtest 2	20.84	20.63	20.58	13.69	38.45
HSUPA Subtest 3	20.80	20.70	20.43	13.65	38.45
HSUPA Subtest 4	20.81	20.73	20.43	13.66	38.45
HSUPA Subtest 5	20.85	20.70	20.46	13.70	38.45
HSPA+ Subtest 1	20.90	20.60	20.50	13.75	38.45

Note:

ERP= Conducted Power(dBm) - Lc(dB) + Gr(dBd)

Gr(dBd)=Gr(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	3.01	2.82	3.14	13
HSDPA	4.62	4.33	5.03	13
HSUPA	5.48	5.13	5.51	13

Result:**Pass****FCC §2.1049, §22.917, §22.905: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	4.155	4.170	4.155	4.725	4.725	4.710
HSDPA	4.200	4.200	4.215	5.040	4.845	5.070
HSUPA	4.215	4.215	4.215	5.040	4.800	4.710

Note: The test plots please refer to the Plots of Occupied Bandwidth

FCC §2.1051, §22.917(a):Spurious Emissions at Antenna Terminal

Result:	Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.
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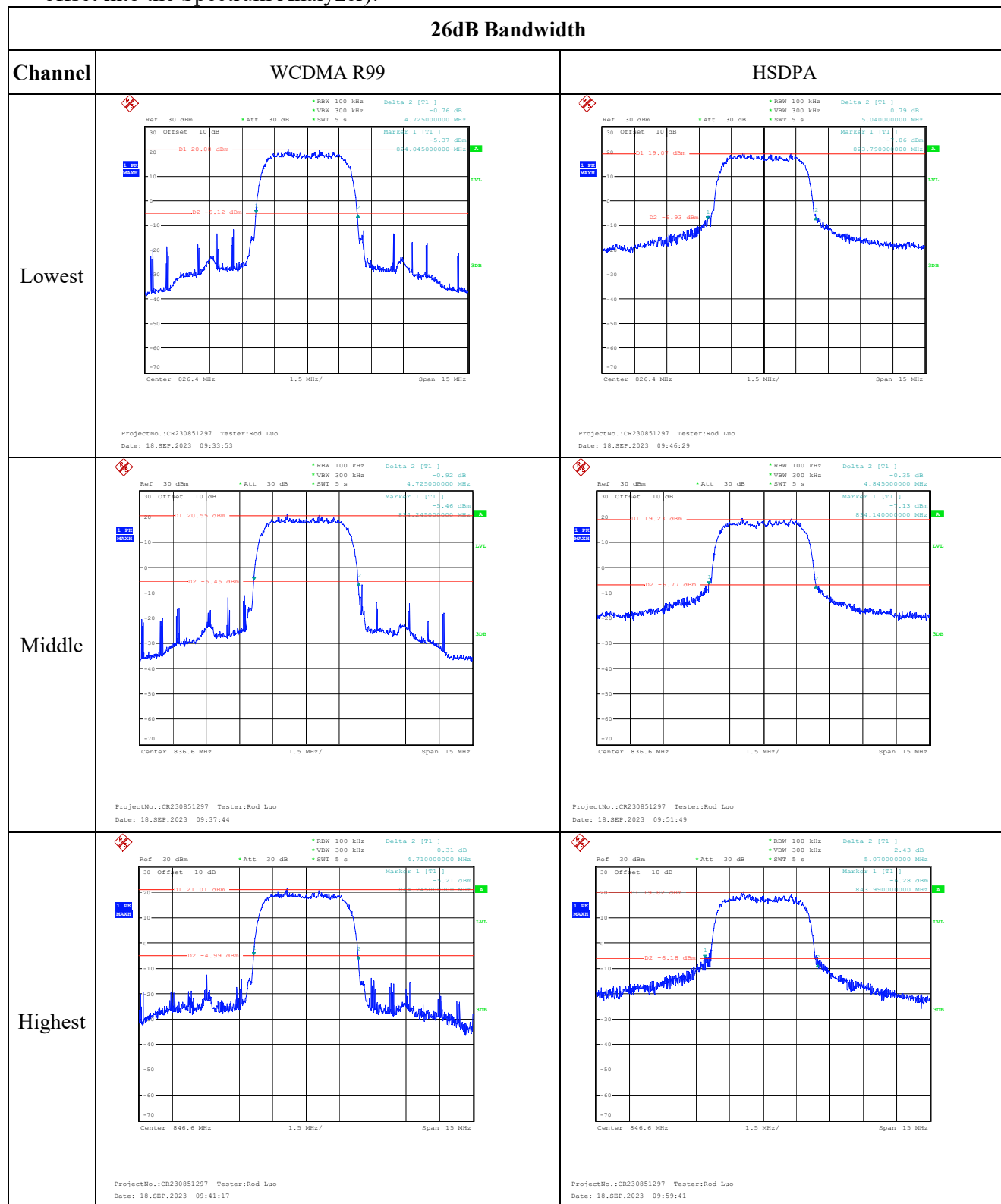
FCC §2.1051, §22.917(a): Out of band emission, Band Edge

Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.
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FCC §2.1055, §22.355: Frequency Stability

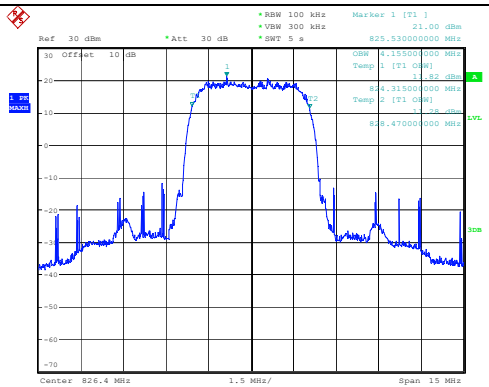
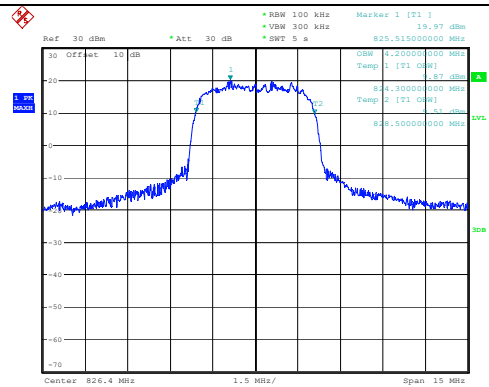
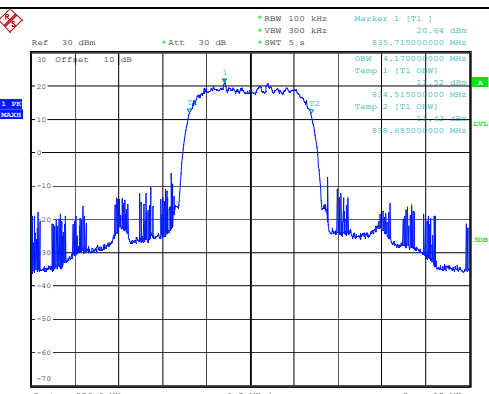
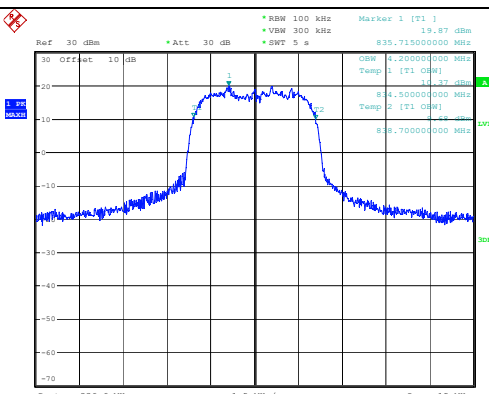
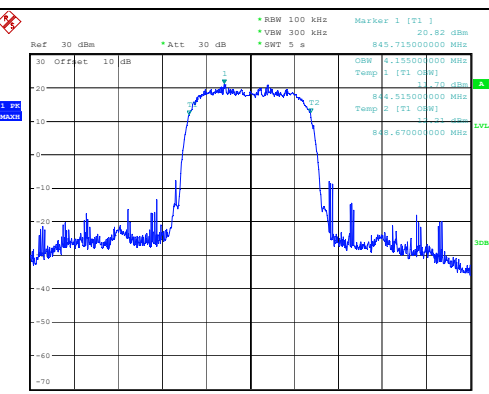
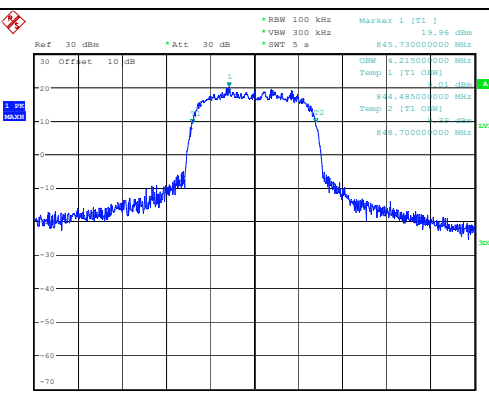
Test Modulation:	WCDMA R99		Test Channel:	836.6	MHz
Test Item	Temperature (°C)	Voltage (V _{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.85	15.3	0.018	2.5
	-20	3.85	18.96	0.023	2.5
	-10	3.85	25.43	0.030	2.5
	0	3.85	21.08	0.025	2.5
	10	3.85	15.36	0.018	2.5
	20	3.85	17.24	0.021	2.5
	30	3.85	11.39	0.014	2.5
	40	3.85	19.54	0.023	2.5
	50	3.85	16.57	0.020	2.5
Frequency Stability vs. Voltage	20	3.45	15.64	0.019	2.5
	20	4.4	13.82	0.017	2.5
Result:				Pass	

Test Plots(Note: The 10 dB is the Insertion loss of the RF cable and Power Splitter, which was offset into the Spectrum Analyzer):



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Occupied Bandwidth

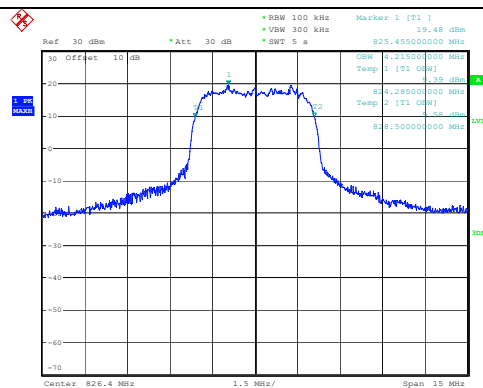
Channel	WCDMA R99	HSDPA
Lowest	 Ref 30 dBm *Att 30 dB *RSW 100 kHz Marker 1 [T1] 21.00 dBm *VSW 300 kHz 825.53000000 MHz *SWT 5 s OSW 1.15000000 MHz Temp 1 [T1 OSW] 21.00 dBm Temp 2 [T1 OSW] 21.00 dBm 824.31000000 MHz 825.70000000 MHz Center 826.4 MHz 1.5 MHz/ Span 15 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 09:32:55	 Ref 30 dBm *Att 30 dB *RSW 100 kHz Marker 1 [T1] 19.97 dBm *VSW 300 kHz 825.51500000 MHz *SWT 5 s OSW 1.20000000 MHz Temp 1 [T1 OSW] 19.97 dBm Temp 2 [T1 OSW] 19.97 dBm 824.30000000 MHz 826.30000000 MHz Center 826.4 MHz 1.5 MHz/ Span 15 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 09:45:17
Middle	 Ref 30 dBm *Att 30 dB *RSW 100 kHz Marker 1 [T1] 20.64 dBm *VSW 300 kHz 835.71500000 MHz *SWT 5 s OSW 1.17000000 MHz Temp 1 [T1 OSW] 20.64 dBm Temp 2 [T1 OSW] 20.64 dBm 834.51500000 MHz 836.98500000 MHz Center 836.6 MHz 1.5 MHz/ Span 15 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 09:37:21	 Ref 30 dBm *Att 30 dB *RSW 100 kHz Marker 1 [T1] 19.87 dBm *VSW 300 kHz 835.71500000 MHz *SWT 5 s OSW 1.20000000 MHz Temp 1 [T1 OSW] 19.87 dBm Temp 2 [T1 OSW] 19.87 dBm 834.50000000 MHz 836.70000000 MHz Center 836.6 MHz 1.5 MHz/ Span 15 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 09:50:37
Highest	 Ref 30 dBm *Att 30 dB *RSW 100 kHz Marker 1 [T1] 20.82 dBm *VSW 300 kHz 845.71500000 MHz *SWT 5 s OSW 1.15000000 MHz Temp 1 [T1 OSW] 20.82 dBm Temp 2 [T1 OSW] 20.82 dBm 844.51500000 MHz 846.97000000 MHz Center 846.6 MHz 1.5 MHz/ Span 15 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 09:40:44	 Ref 30 dBm *Att 30 dB *RSW 100 kHz Marker 1 [T1] 19.96 dBm *VSW 300 kHz 845.73000000 MHz *SWT 5 s OSW 1.21000000 MHz Temp 1 [T1 OSW] 19.96 dBm Temp 2 [T1 OSW] 19.96 dBm 844.48500000 MHz 846.70000000 MHz Center 846.6 MHz 1.5 MHz/ Span 15 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 09:58:45

Occupied Bandwidth

Channel

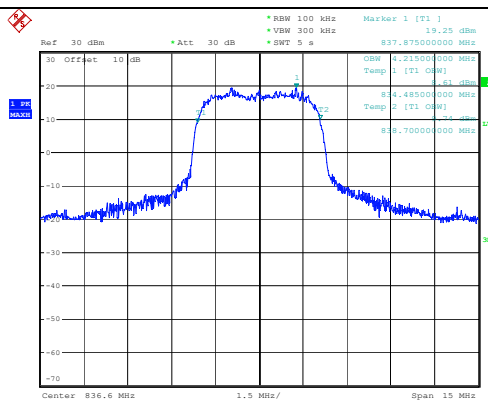
HSUPA

Lowest



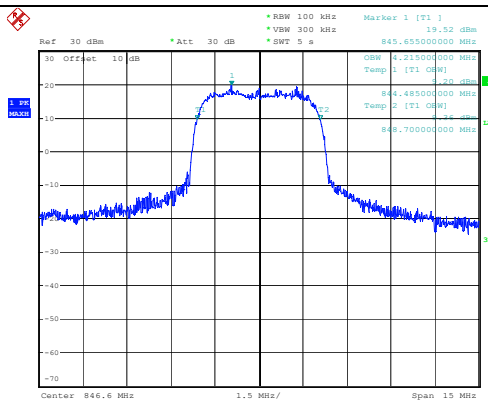
ProjectNo.:CR230851297 Tester:Rod Luo
Date: 18.SEP.2023 10:03:58

Middle



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 18.SEP.2023 10:09:25

Highest



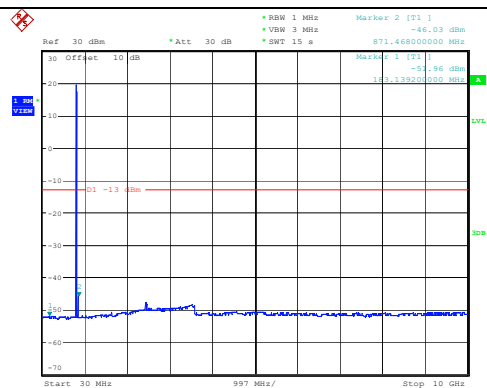
ProjectNo.:CR230851297 Tester:Rod Luo
Date: 18.SEP.2023 10:14:05

Spurious Emissions at Antenna Terminal

Channel

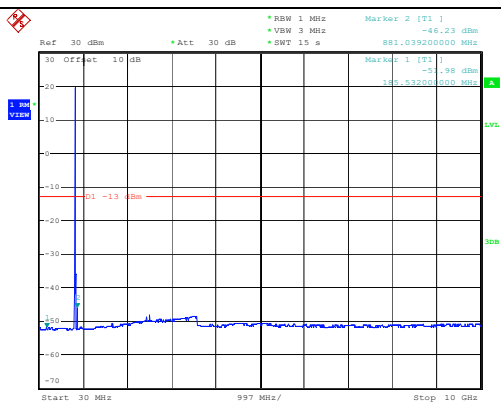
WCDMA R99

Lowest



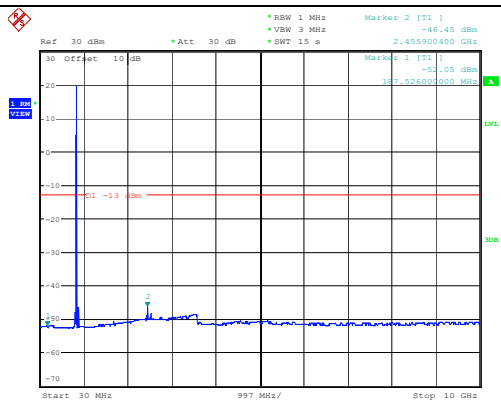
ProjectNo.:CR230851297 Tester:Rod Luo
Date: 18.SEP.2023 09:34:55

Middle



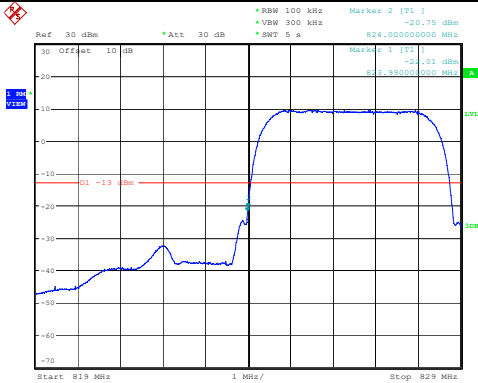
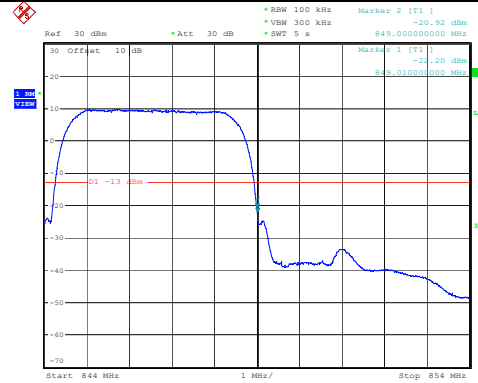
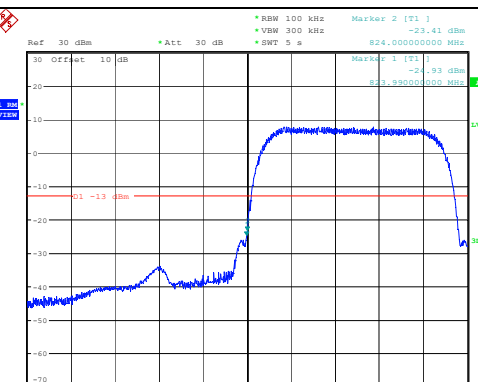
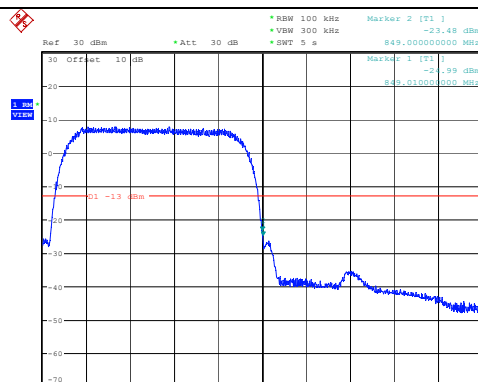
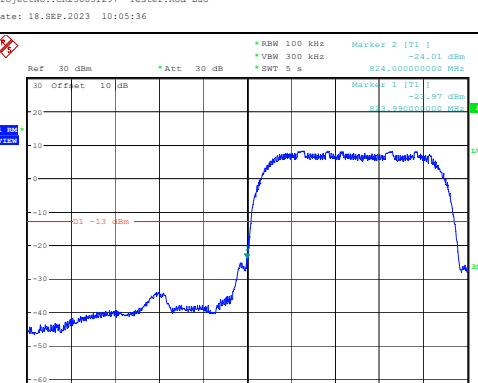
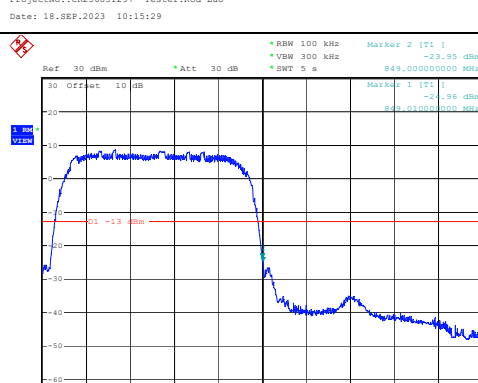
ProjectNo.:CR230851297 Tester:Rod Luo
Date: 18.SEP.2023 09:38:32

Highest



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 18.SEP.2023 09:42:31

Out of band emission, Band Edge

Mode	Lowest	Highest
R99	 Ref 30 dBm *Att 30 dB *RBW 100 kHz *VBW 300 kHz *SWT 5 s Marker 2 [T1] -20.75 dBm 824.000000000 MHz Marker 1 [T1] -24.01 dBm 824.950000000 MHz Start 819 MHz 1 MHz/ Stop 829 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 09:34:20	 Ref 30 dBm *Att 30 dB *RBW 100 kHz *VBW 300 kHz *SWT 5 s Marker 2 [T1] -20.92 dBm 849.000000000 MHz Marker 1 [T1] -24.20 dBm 849.910000000 MHz Start 844 MHz 1 MHz/ Stop 854 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 09:41:42
HSUPA	 Ref 30 dBm *Att 30 dB *RBW 100 kHz *VBW 300 kHz *SWT 5 s Marker 2 [T1] -23.41 dBm 824.000000000 MHz Marker 1 [T1] -24.93 dBm 824.950000000 MHz Start 819 MHz 1 MHz/ Stop 829 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 09:05:36	 Ref 30 dBm *Att 30 dB *RBW 100 kHz *VBW 300 kHz *SWT 5 s Marker 2 [T1] -23.48 dBm 849.000000000 MHz Marker 1 [T1] -24.99 dBm 849.910000000 MHz Start 844 MHz 1 MHz/ Stop 854 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 10:15:29
HSDPA	 Ref 30 dBm *Att 30 dB *RBW 100 kHz *VBW 300 kHz *SWT 5 s Marker 2 [T1] -24.01 dBm 824.000000000 MHz Marker 1 [T1] -23.97 dBm 824.950000000 MHz Start 819 MHz 1 MHz/ Stop 829 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 09:46:55	 Ref 30 dBm *Att 30 dB *RBW 100 kHz *VBW 300 kHz *SWT 5 s Marker 2 [T1] -23.95 dBm 849.000000000 MHz Marker 1 [T1] -24.96 dBm 849.910000000 MHz Start 844 MHz 1 MHz/ Stop 854 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 10:00:07

4.6 Antenna Port Test Data and Results for LTE Band 2

Serial Number:	2AS5-5	Test Date:	2023/9/16
Test Site:	RF	Test Mode:	Transmitting
Tester:	Rod Luo	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	28	Relative Humidity: (%)	55	ATM Pressure: (kPa)	100.1
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU26	200256	2023/3/31	2024/3/30
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211002	Each time	N/A
Minl-Circuits	Power Splitter	ZFRSC-183-S+	S F448201619	Each time	N/A
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:**FCC§2.1046;§ 24.232****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	23.11	22.67	22.41	20.88	33
	RB1#3	23.18	22.83	22.64		
	RB1#5	23.04	22.61	22.35		
	RB3#0	23.02	22.71	22.52		
	RB3#3	23.07	22.71	22.46		
	RB6#0	22.12	21.73	21.49		
1.4MHz 16QAM	RB1#0	21.94	21.71	21.46	19.84	33
	RB1#3	22.14	21.76	21.71		
	RB1#5	21.98	21.64	21.47		
	RB3#0	22.02	21.9	21.4		
	RB3#3	22.06	21.91	21.44		
	RB6#0	20.99	20.79	20.5		
3MHz QPSK	RB1#0	23.53	22.77	22.49	21.30	33
	RB1#8	23.6	22.74	22.5		
	RB1#14	23.5	22.64	22.39		
	RB6#0	22.57	21.73	21.47		
	RB6#9	22.53	21.71	21.39		
	RB15#0	22.33	21.73	21.49		
3MHz 16QAM	RB1#0	22.05	22.2	21.59	19.90	33
	RB1#8	21.99	22.18	21.61		
	RB1#14	21.94	22.1	21.53		
	RB6#0	21.11	20.84	20.46		
	RB6#9	21.09	20.8	20.46		
	RB15#0	21.23	21.05	20.46		
5MHz QPSK	RB1#0	23.43	22.57	22.43	21.26	33
	RB1#13	23.56	22.71	22.52		
	RB1#24	23.37	22.57	22.28		
	RB15#0	22.54	21.7	21.67		
	RB15#10	22.54	21.71	21.4		
	RB25#0	22.49	21.8	21.47		
5MHz 16QAM	RB1#0	22.49	21.64	21.29	20.39	33
	RB1#13	22.69	21.77	21.4		
	RB1#24	22.16	21.6	21.19		
	RB15#0	21.06	20.69	20.68		
	RB15#10	20.99	20.98	20.43		
	RB25#0	20.98	21.02	20.52		

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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	3.88	4.7	4.75	13
	RB100#0	4.9	4.93	4.93	13
20MHz 16QAM	RB1#0	4.52	5.51	5.74	13
	RB100#0	5.86	5.86	5.88	13
Result:					Pass

FCC §2.1049, §24.238: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	1.110	1.098	1.104	1.302	1.302	1.308
1.4MHz 16QAM	1.098	1.104	1.098	1.296	1.320	1.290
3MHz QPSK	2.688	2.676	2.676	2.880	2.892	2.892
3MHz 16QAM	2.688	2.676	2.688	2.880	2.868	2.868
5MHz QPSK	4.520	4.500	4.520	4.960	4.940	4.940
5MHz 16QAM	4.520	4.500	4.520	4.940	4.980	4.940
10MHz QPSK	8.960	8.960	8.960	9.600	9.680	9.560
10MHz 16QAM	8.960	8.960	8.960	9.600	9.600	9.560
15MHz QPSK	13.500	13.500	13.500	14.820	14.880	14.940
15MHz 16QAM	13.560	13.500	13.500	14.760	14.760	14.760
20MHz QPSK	18.000	18.000	17.920	19.360	20.640	19.280
20MHz 16QAM	18.000	18.000	18.000	19.360	19.520	19.360

Note: The test plots please refer to the Plots of Occupied Bandwidth

FCC §2.1051, § 24.238 (a):Spurious Emissions at Antenna Terminal

Result:	Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.
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FCC §2.1051, § 24.238 (a):Out of band emission, Band Edge

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

FCC §2.1055, §24.235: Frequency Stability						
Test Mode:	20M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.85	1850.162	1850.000	1909.825	1910.000
	-20	3.85	1850.156	1850.000	1909.825	1910.000
	-10	3.85	1850.170	1850.000	1909.809	1910.000
	0	3.85	1850.262	1850.000	1909.822	1910.000
	10	3.85	1850.207	1850.000	1909.733	1910.000
	20	3.85	1850.293	1850.000	1909.766	1910.000
	30	3.85	1850.174	1850.000	1909.788	1910.000
	40	3.85	1850.267	1850.000	1909.703	1910.000
	50	3.85	1850.257	1850.000	1909.709	1910.000
Frequency Stability vs. Voltage	20	3.45	1850.163	1850.000	1909.891	1910.000
	20	4.4	1850.144	1850.000	1909.840	1910.000
					Result:	Pass
Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.85	1850.121	1850.000	1909.735	1910.000
	-20	3.85	1850.169	1850.000	1909.807	1910.000
	-10	3.85	1850.122	1850.000	1909.826	1910.000
	0	3.85	1850.241	1850.000	1909.774	1910.000
	10	3.85	1850.143	1850.000	1909.762	1910.000
	20	3.85	1850.184	1850.000	1909.792	1910.000
	30	3.85	1850.112	1850.000	1909.752	1910.000
	40	3.85	1850.252	1850.000	1909.826	1910.000
	50	3.85	1850.281	1850.000	1909.761	1910.000
Frequency Stability vs. Voltage	20	3.45	1850.116	1850.000	1909.723	1910.000
	20	4.4	1850.121	1850.000	1909.800	1910.000
					Result:	Pass

Occupied Bandwidth

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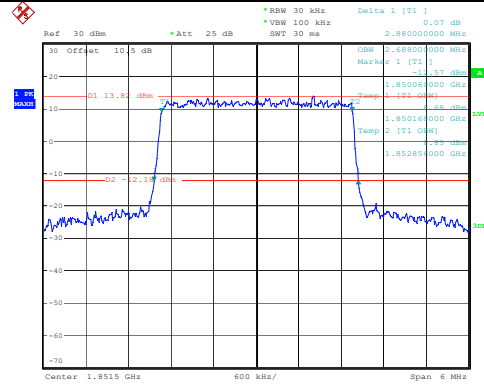
Occupied Bandwidth

Channel

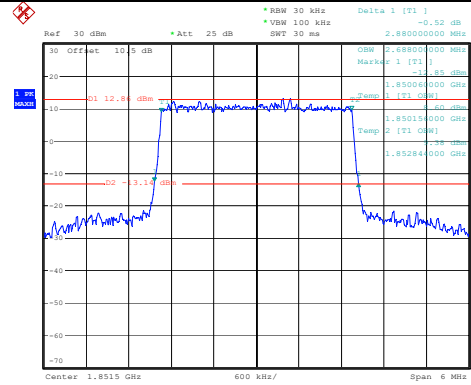
3MHz Bandwidth QPSK

3MHz Bandwidth 16QAM

Lowest

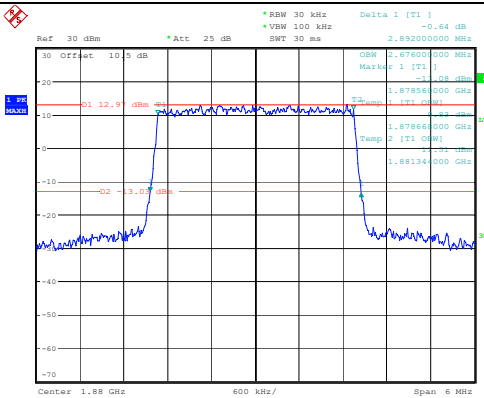


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 13:37:12

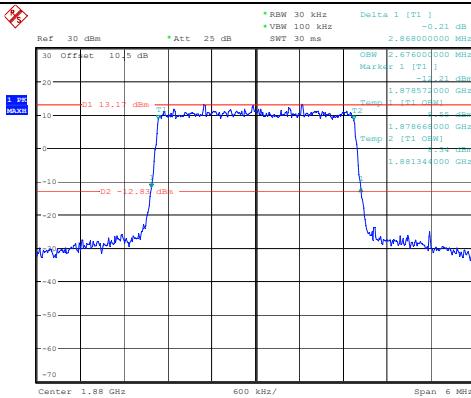


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 13:37:26

Middle

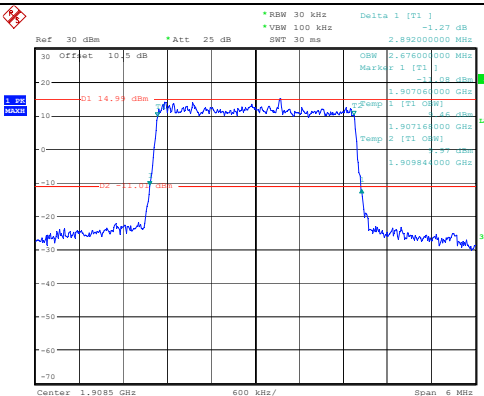


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Date: 16.SEP.2023 13:37:42

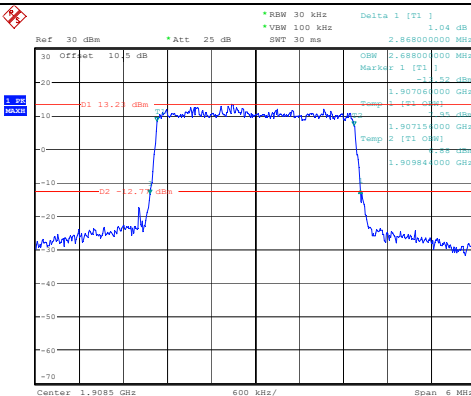


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 13:37:56

Highest



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 13:38:15



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 13:38:32

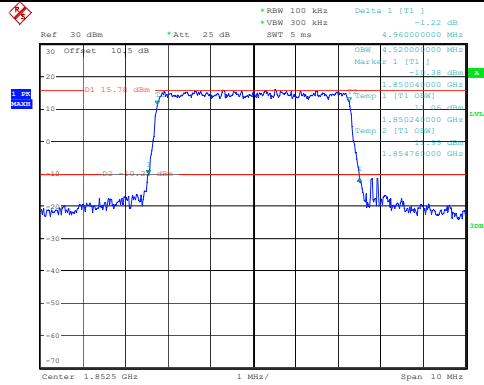
Occupied Bandwidth

Channel

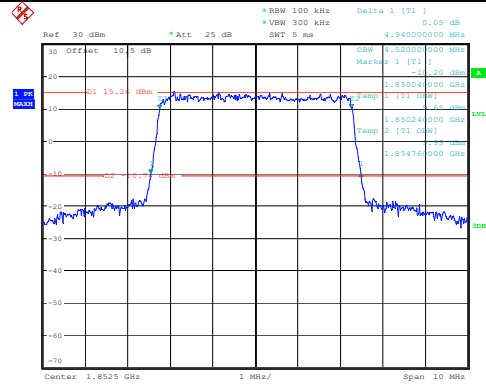
5MHz Bandwidth QPSK

5MHz Bandwidth 16QAM

Lowest

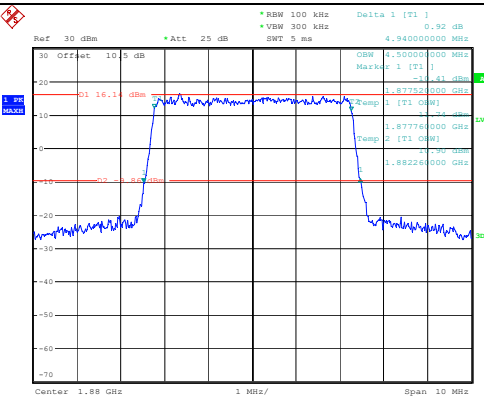


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Date: 16.SEP.2023 13:39:54

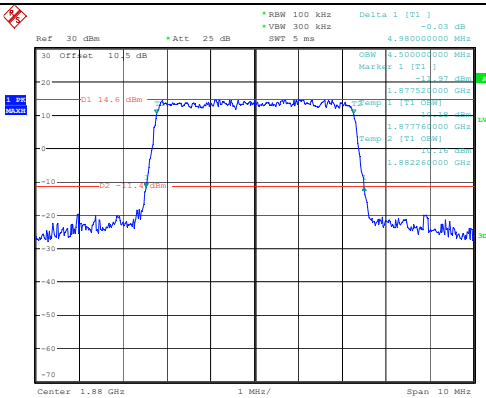


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 13:40:12

Middle

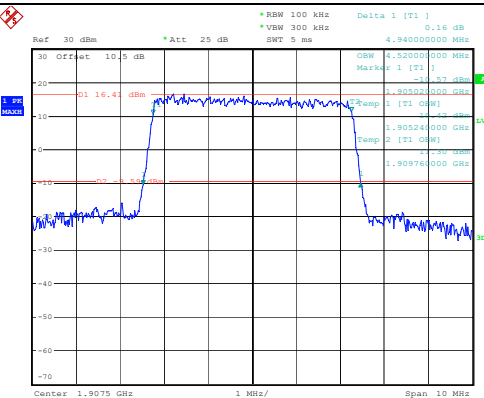


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Date: 16.SEP.2023 13:40:28

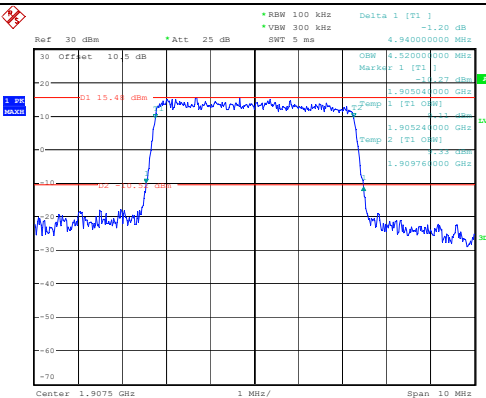


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 13:40:46

Highest

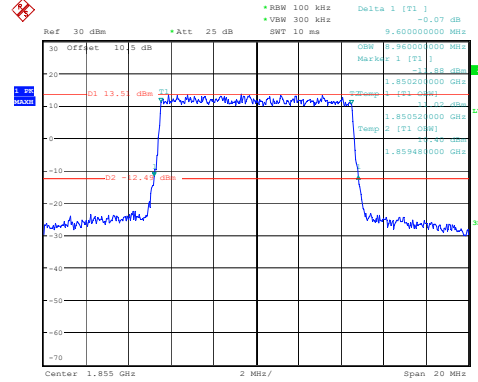
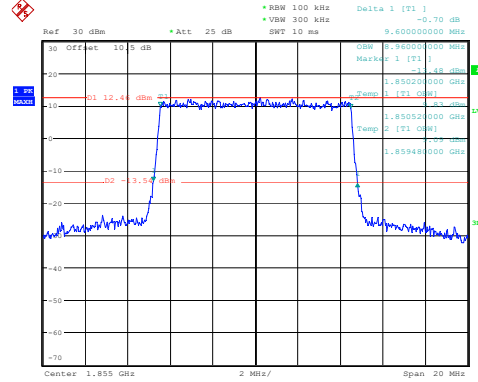
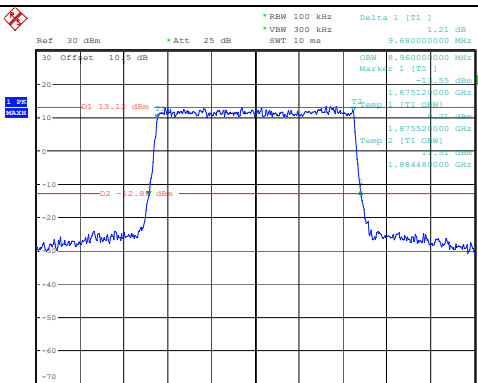
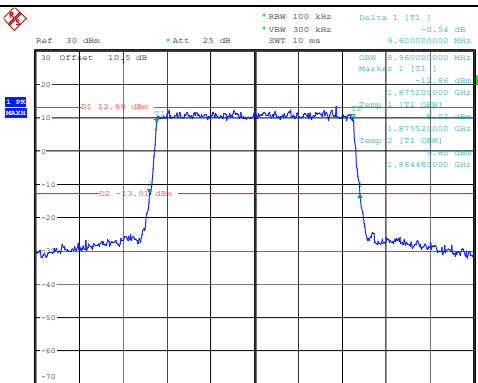
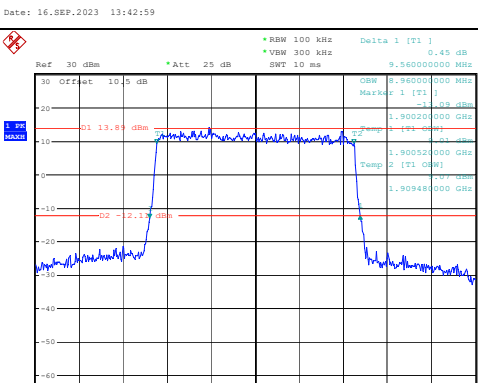
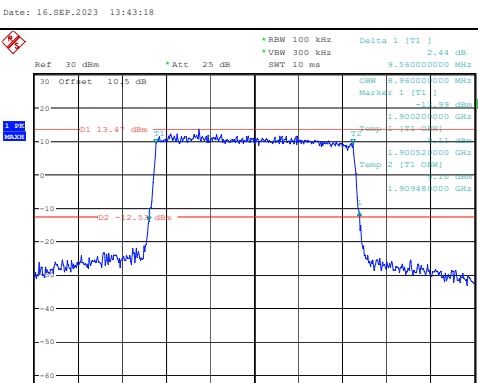


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 13:41:09



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 13:41:27

Occupied Bandwidth

Channel	10MHz Bandwidth QPSK	10MHz Bandwidth 16QAM
Lowest	 Ref 30 dBm *Att 25 dB *RBW 100 kHz Delta 1 [T1] -0.07 dB *VSW 300 kHz SWT 10 ms 9.60000000 MHz OSW 9.96000000 MHz Marker 1 [T1] -0.07 dB D1 13.5 dBm D2 -12.4 dBm Temp 1 [T1] 0.00 dB Temp 2 [T1] 0.00 dB 1.85020000 GHz 1.85052000 GHz 1.85948000 GHz Center 1.855 GHz 2 MHz/ Span 20 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 13:42:20	 Ref 30 dBm *Att 25 dB *RBW 100 kHz Delta 1 [T1] -0.70 dB *VSW 300 kHz SWT 10 ms 9.60000000 MHz OSW 9.96000000 MHz Marker 1 [T1] -0.70 dB D1 12.4 dBm D2 -12.4 dBm Temp 1 [T1] 0.00 dB Temp 2 [T1] 0.00 dB 1.85020000 GHz 1.85052000 GHz 1.85948000 GHz Center 1.855 GHz 2 MHz/ Span 20 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 13:42:39
Middle	 Ref 30 dBm *Att 25 dB *RBW 100 kHz Delta 1 [T1] 1.21 dB *VSW 300 kHz SWT 10 ms 9.60000000 MHz OSW 9.96000000 MHz Marker 1 [T1] 1.21 dB D1 13.1 dBm D2 -12.8 dBm Temp 1 [T1] 0.00 dB Temp 2 [T1] 0.00 dB 1.87512000 GHz 1.87552000 GHz 1.88448000 GHz Center 1.88 GHz 2 MHz/ Span 20 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 13:42:59	 Ref 30 dBm *Att 25 dB *RBW 100 kHz Delta 1 [T1] -0.54 dB *VSW 300 kHz SWT 10 ms 9.60000000 MHz OSW 9.96000000 MHz Marker 1 [T1] -0.54 dB D1 12.9 dBm D2 -12.8 dBm Temp 1 [T1] 0.00 dB Temp 2 [T1] 0.00 dB 1.87512000 GHz 1.87552000 GHz 1.88448000 GHz Center 1.88 GHz 2 MHz/ Span 20 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 13:43:18
Highest	 Ref 30 dBm *Att 25 dB *RBW 100 kHz Delta 1 [T1] 0.45 dB *VSW 300 kHz SWT 10 ms 9.56000000 MHz OSW 9.96000000 MHz Marker 1 [T1] 0.45 dB D1 13.8 dBm D2 -12.1 dBm Temp 1 [T1] 0.00 dB Temp 2 [T1] 0.00 dB 1.90020000 GHz 1.90052000 GHz 1.90948000 GHz Center 1.905 GHz 2 MHz/ Span 20 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 13:43:34	 Ref 30 dBm *Att 25 dB *RBW 100 kHz Delta 1 [T1] 2.44 dB *VSW 300 kHz SWT 10 ms 9.56000000 MHz OSW 9.96000000 MHz Marker 1 [T1] 2.44 dB D1 13.4 dBm D2 -12.5 dBm Temp 1 [T1] 0.00 dB Temp 2 [T1] 0.00 dB 1.90020000 GHz 1.90052000 GHz 1.90948000 GHz Center 1.905 GHz 2 MHz/ Span 20 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 13:43:53

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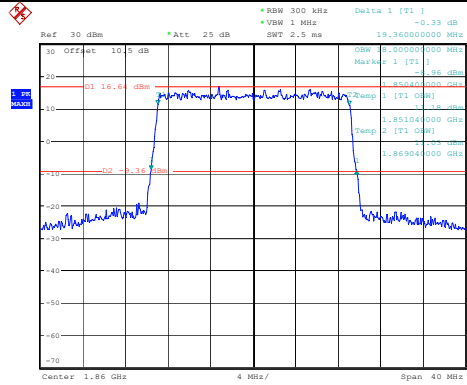
Occupied Bandwidth

Channel

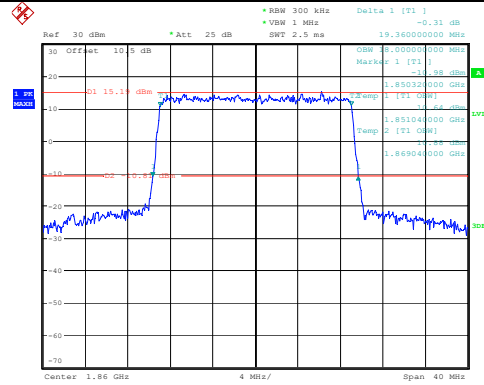
20MHz Bandwidth QPSK

20MHz Bandwidth 16QAM

Lowest

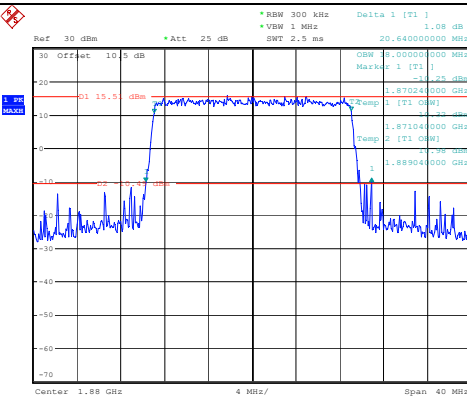


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 13:48:11

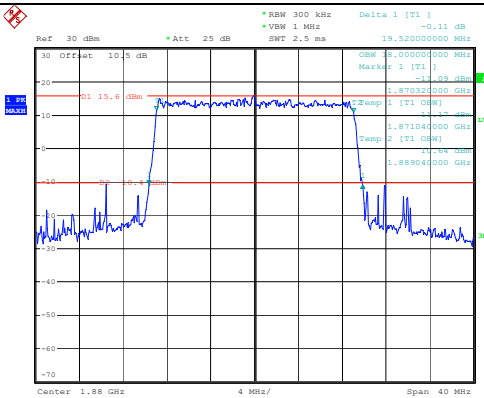


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 13:48:30

Middle

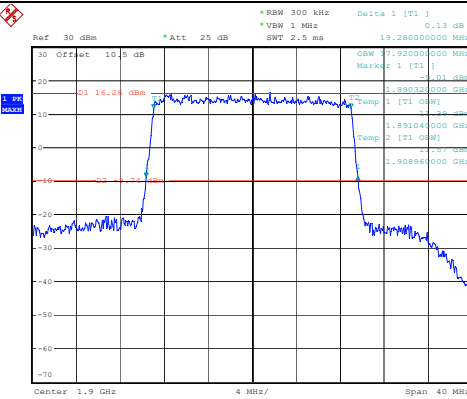


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 13:48:50

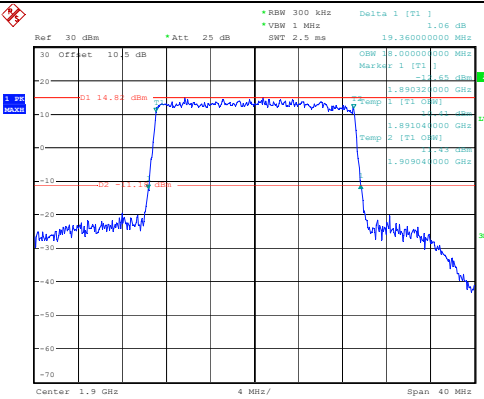


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 13:49:18

Highest



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 13:49:41



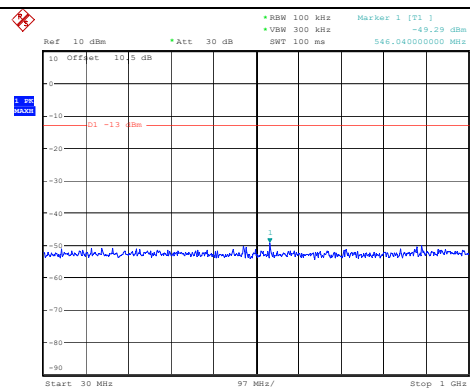
ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 13:50:03

Spurious Emissions at Antenna Terminal

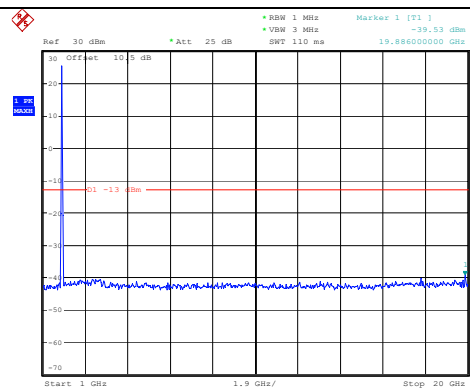
Channel

1.4MHz Bandwidth QPSK

Lowest

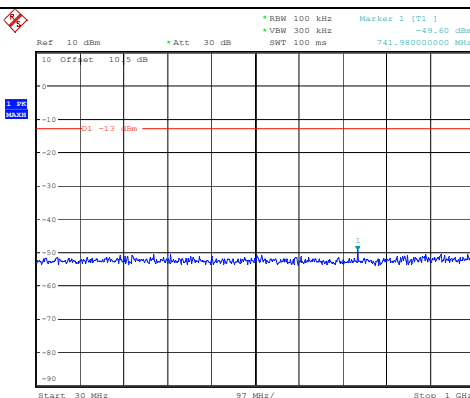


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:47:28

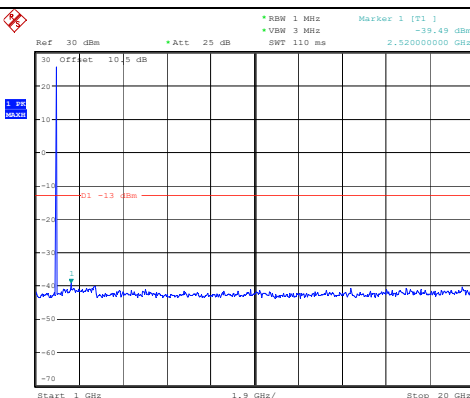


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:47:38

Middle

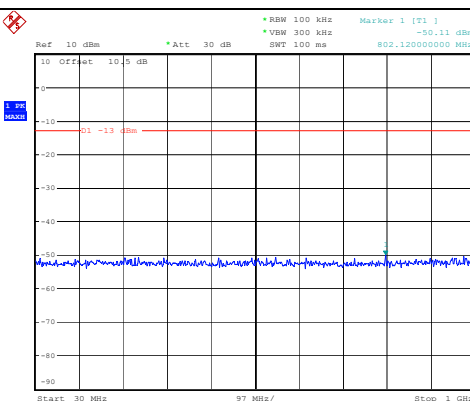


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:47:55

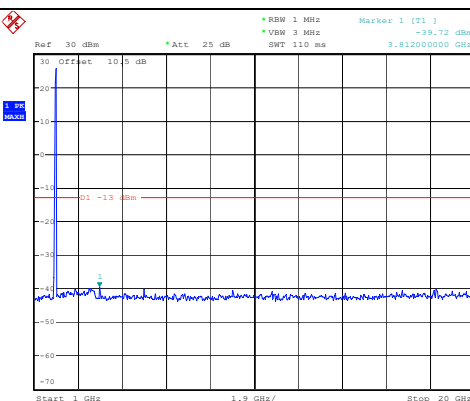


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:48:05

Highest



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:48:22



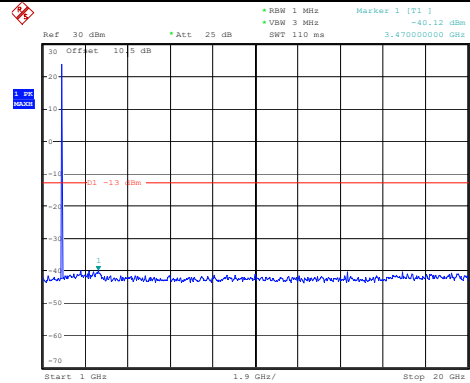
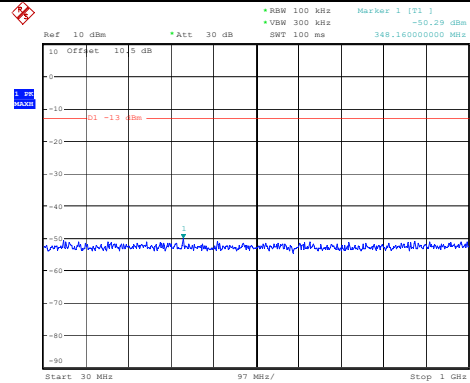
ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:48:32

Spurious Emissions at Antenna Terminal

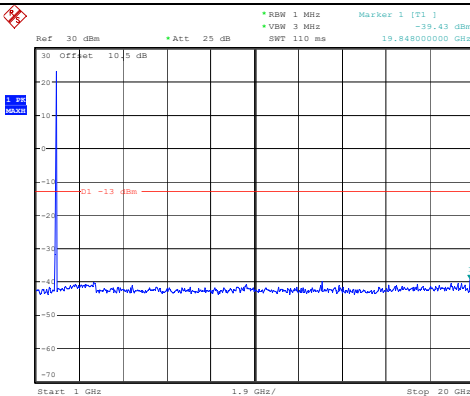
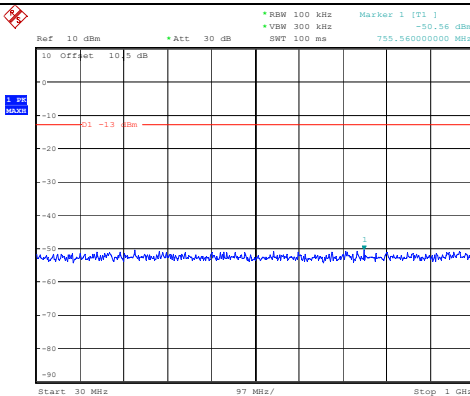
Channel

3MHz Bandwidth QPSK

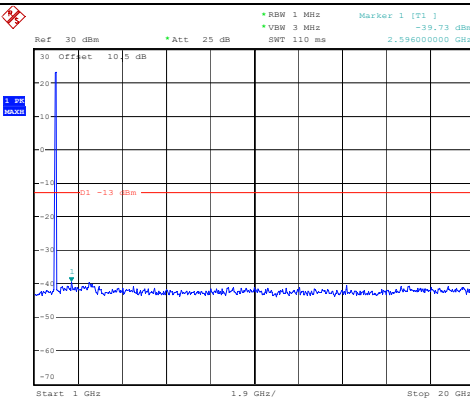
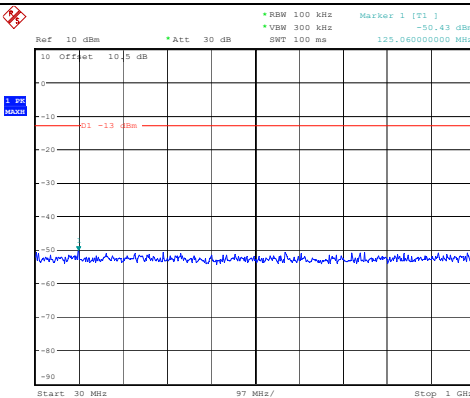
Lowest



Middle



Highest

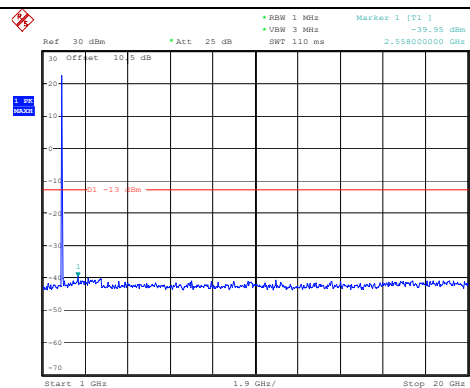
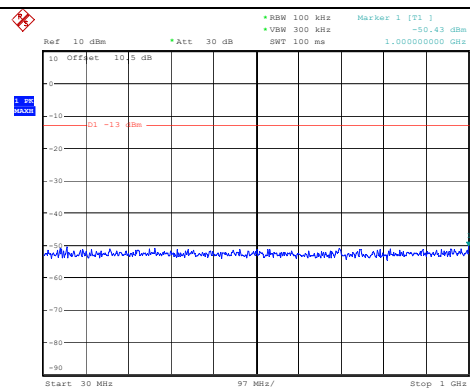


Spurious Emissions at Antenna Terminal

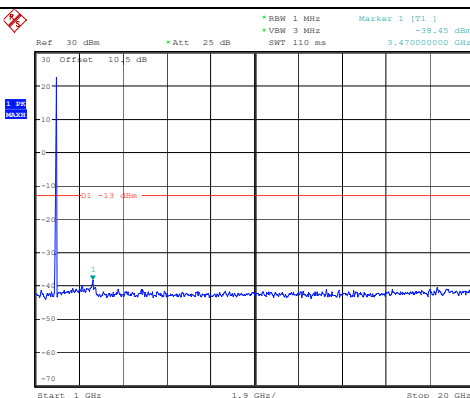
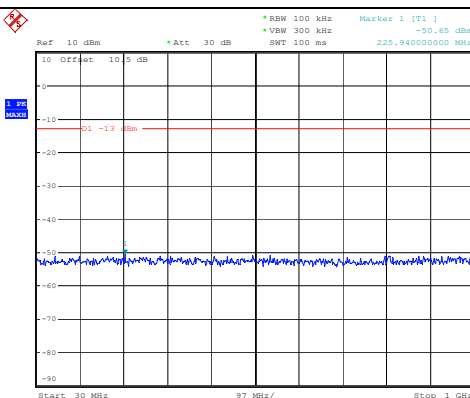
Channel

5MHz Bandwidth QPSK

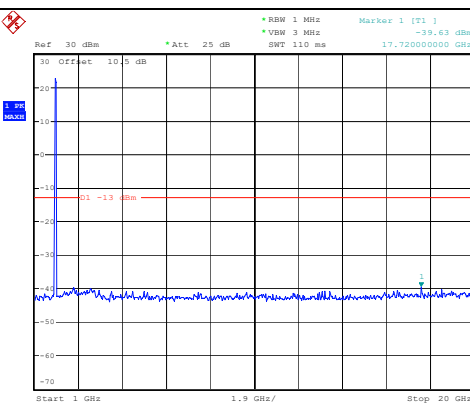
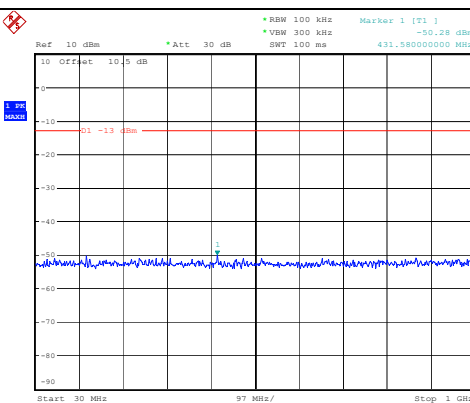
Lowest



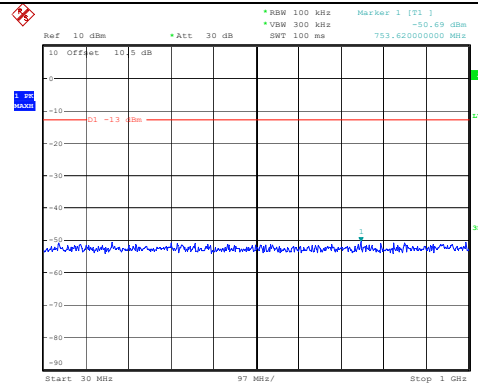
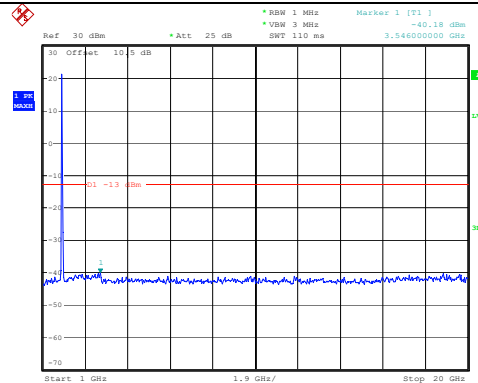
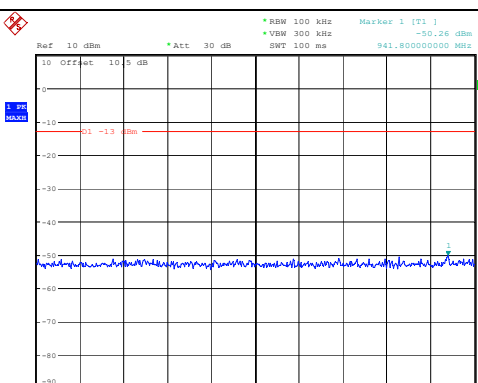
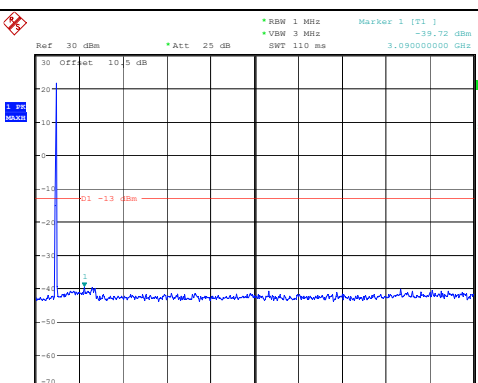
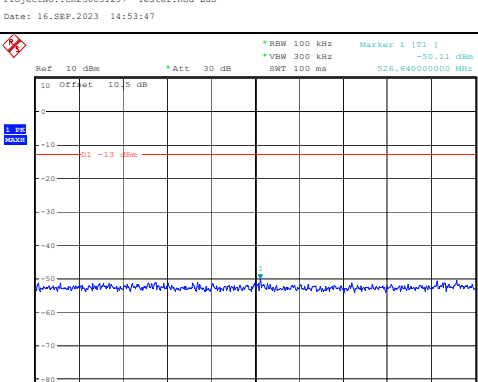
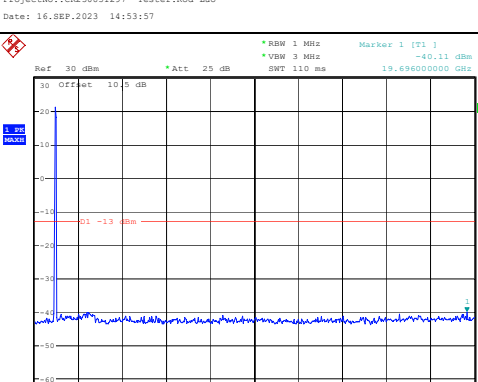
Middle



Highest



Spurious Emissions at Antenna Terminal

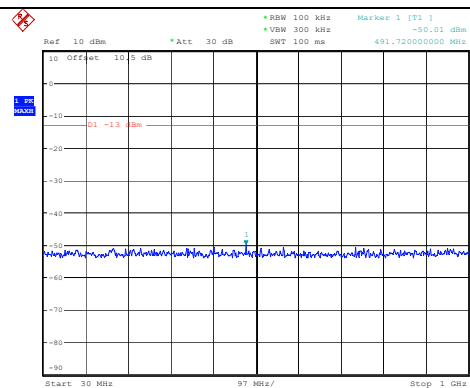
Channel	10MHz Bandwidth QPSK	
Lowest	 Ref 10 dBm *Att 30 dB *RBW 100 kHz Marker 1 [T1] -50.69 dBm *VSW 300 kHz SWT 100 ms 753.62000000 MHz Start 30 MHz 97 MHz/ Stop 1 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 14:53:22	 Ref 30 dBm *Att 25 dB *RBW 1 MHz Marker 1 [T1] -40.18 dBm *VSW 3 MHz SWT 110 ms 3.546000000 GHz Start 1 GHz 1.9 GHz/ Stop 20 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 14:53:32
	 Ref 10 dBm *Att 30 dB *RBW 100 kHz Marker 1 [T1] -50.26 dBm *VSW 300 kHz SWT 100 ms 941.800000000 MHz Start 30 MHz 97 MHz/ Stop 1 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 14:53:47	 Ref 30 dBm *Att 25 dB *RBW 1 MHz Marker 1 [T1] -39.72 dBm *VSW 3 MHz SWT 110 ms 3.990000000 GHz Start 1 GHz 1.9 GHz/ Stop 20 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 14:53:57
Highest	 Ref 10 dBm *Att 30 dB *RBW 100 kHz Marker 1 [T1] -50.11 dBm *VSW 300 kHz SWT 100 ms 526.640000000 MHz Start 30 MHz 97 MHz/ Stop 1 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 14:54:13	 Ref 30 dBm *Att 25 dB *RBW 1 MHz Marker 1 [T1] -40.11 dBm *VSW 3 MHz SWT 110 ms 19.696000000 GHz Start 1 GHz 1.9 GHz/ Stop 20 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 14:54:23

Spurious Emissions at Antenna Terminal

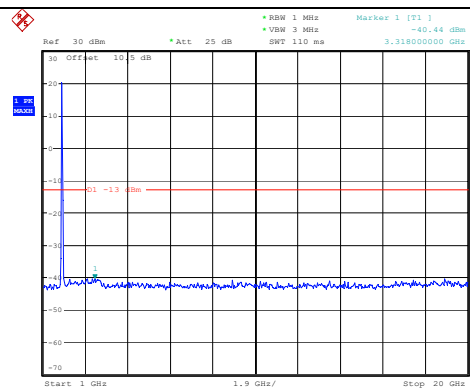
Channel

15MHz Bandwidth QPSK

Lowest

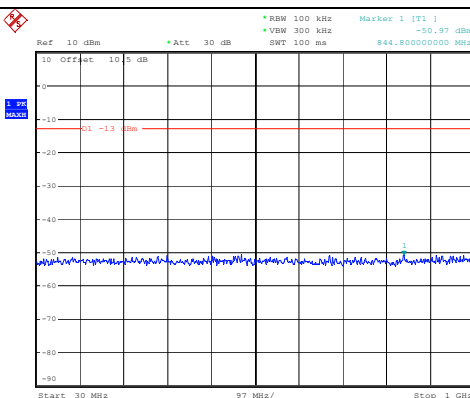


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:55:06

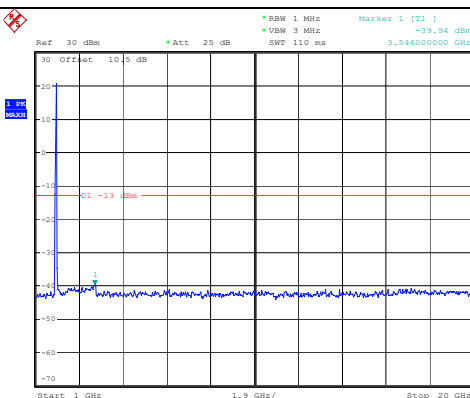


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:55:16

Middle

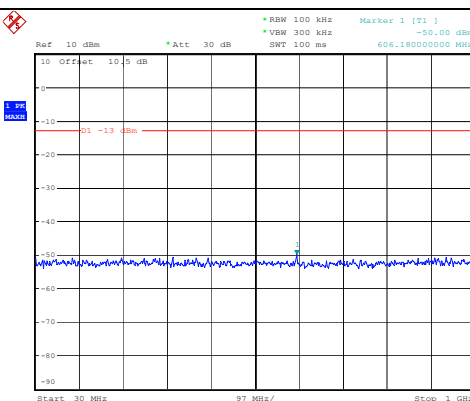


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:55:34

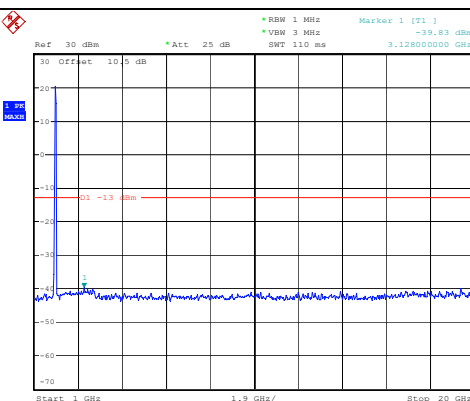


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:55:44

Highest



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:56:05



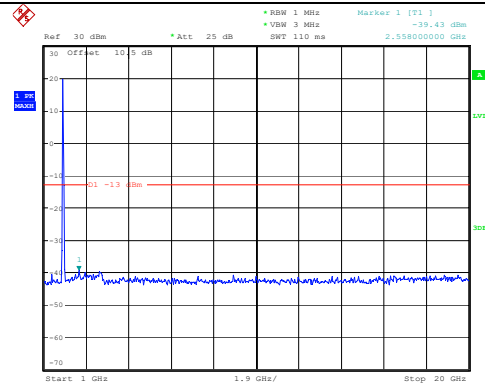
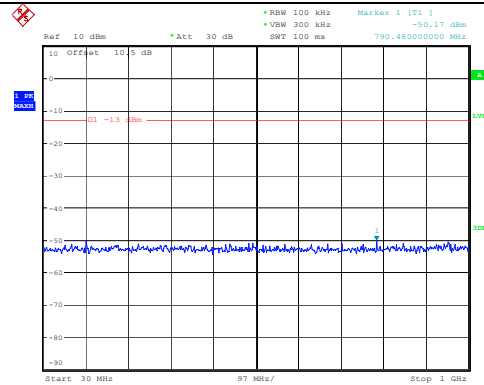
ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:56:15

Spurious Emissions at Antenna Terminal

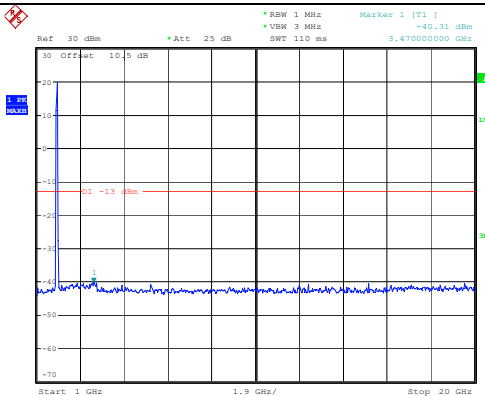
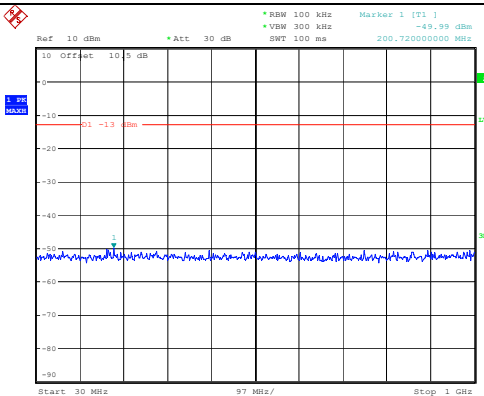
Channel

20MHz Bandwidth QPSK

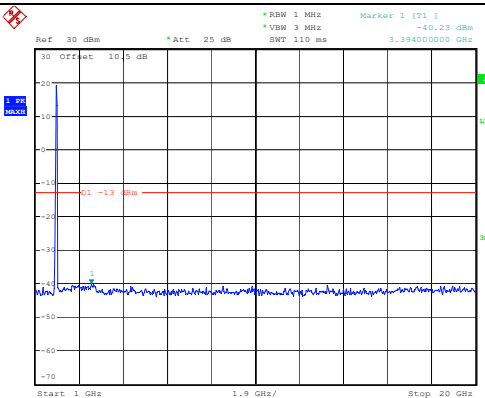
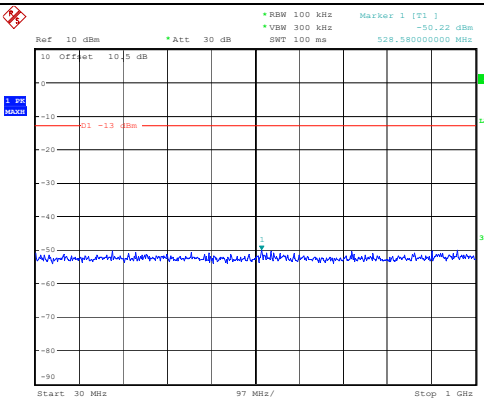
Lowest



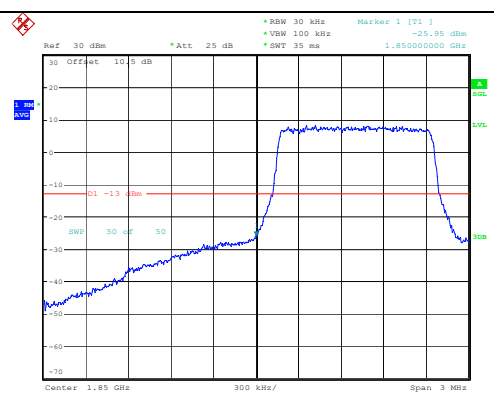
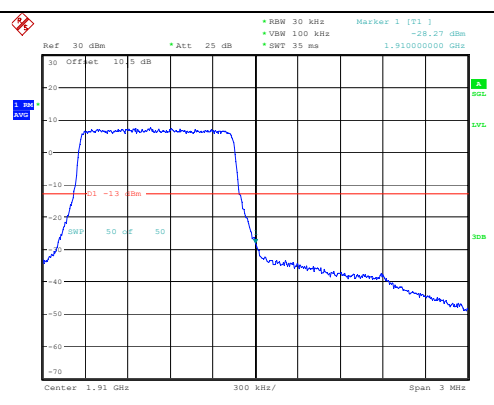
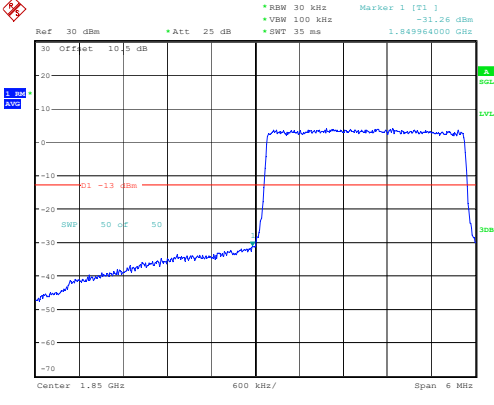
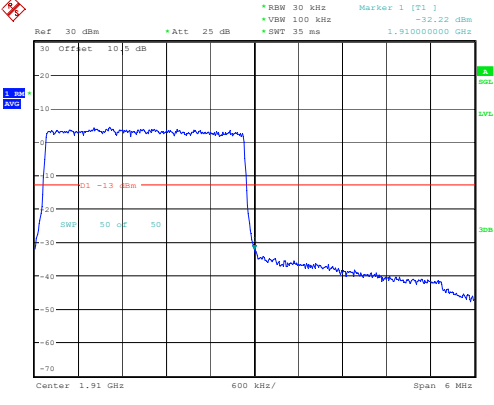
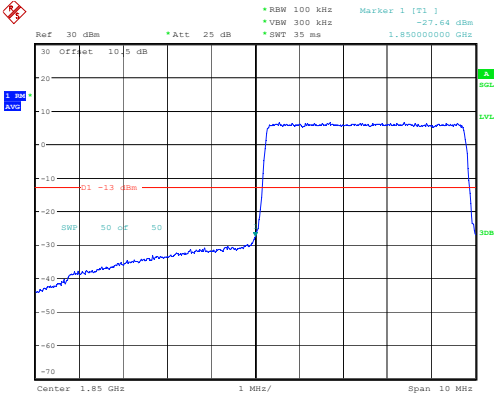
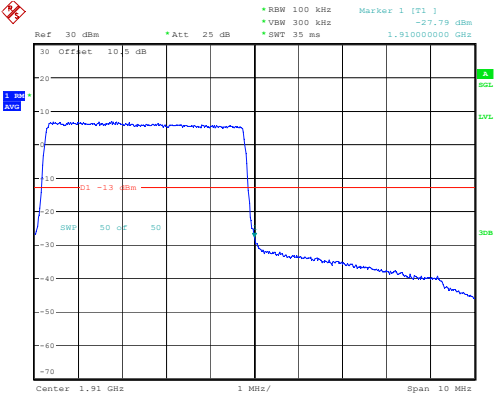
Middle



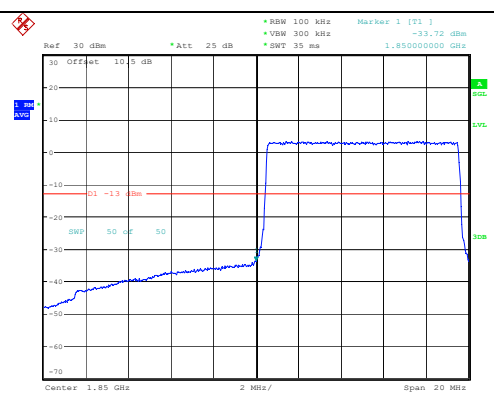
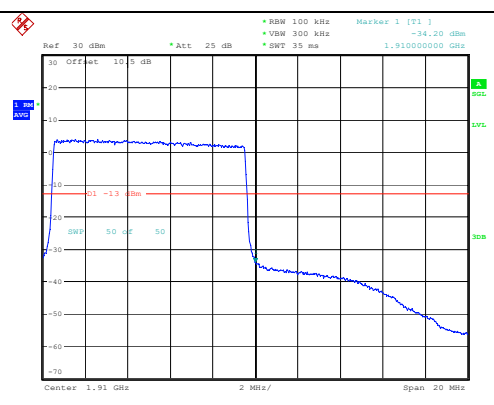
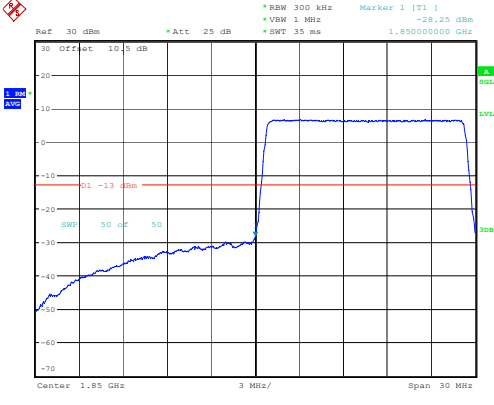
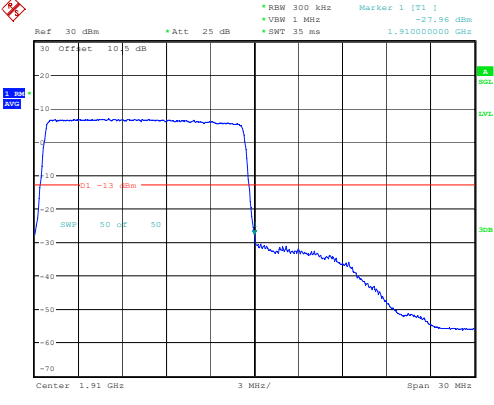
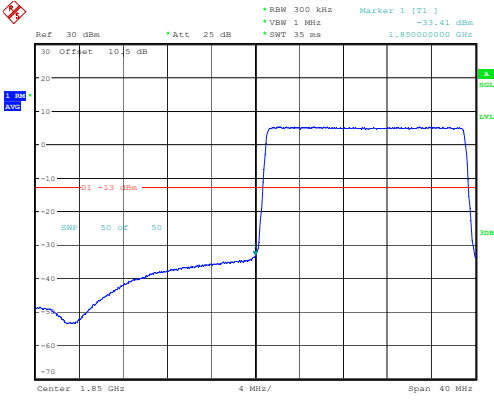
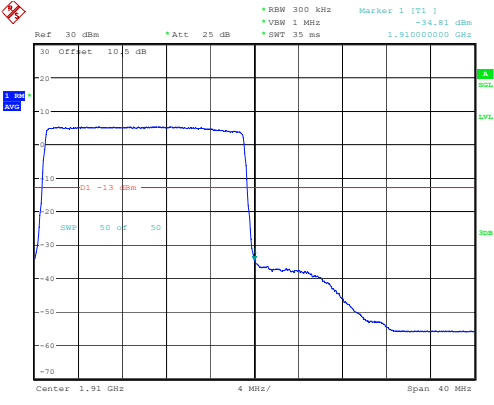
Highest



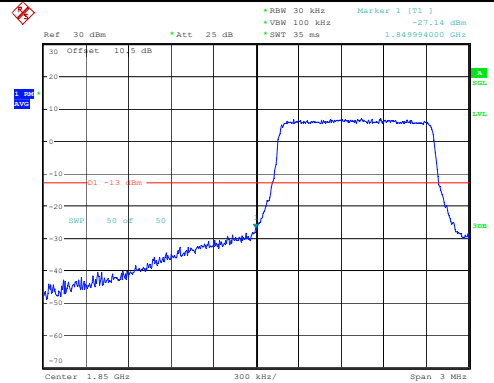
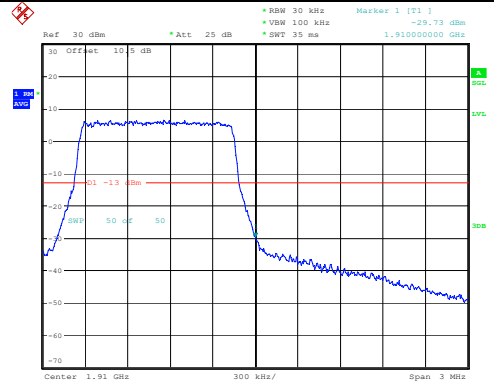
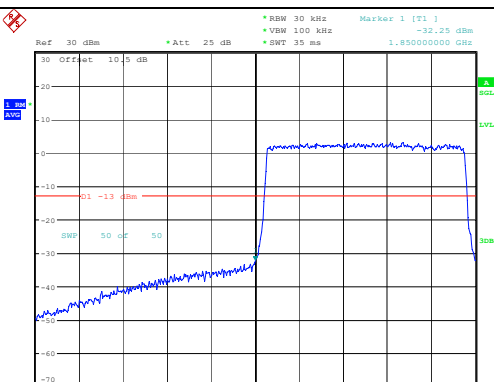
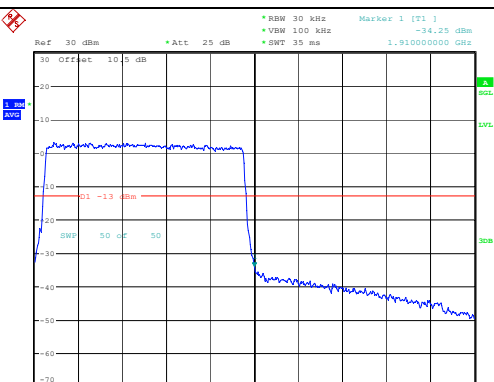
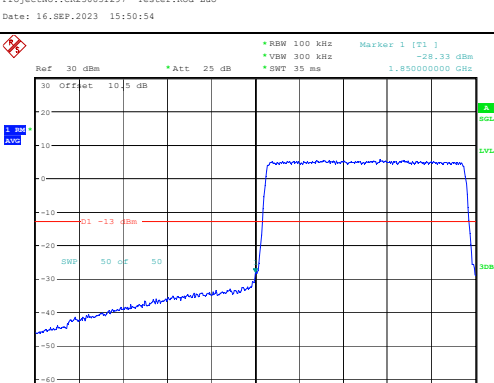
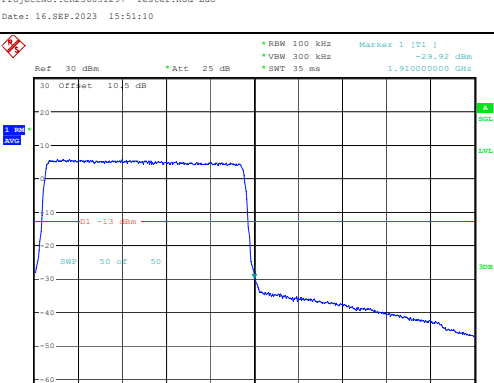
Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 1.4MHz	 Ref 30 dBm *Att 25 dB *RBW 30 kHz Marker 1 [T1] -25.55 dBm *VBW 100 kHz *SWT 35 ms 1.85000000 GHz Center 1.85 GHz 300 kHz/ Span 3 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:49:44	 Ref 30 dBm *Att 25 dB *RBW 30 kHz Marker 1 [T1] -28.27 dBm *VBW 100 kHz *SWT 35 ms 1.91000000 GHz Center 1.91 GHz 300 kHz/ Span 3 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:49:58
QPSK 3MHz	 Ref 30 dBm *Att 25 dB *RBW 30 kHz Marker 1 [T1] -31.26 dBm *VBW 100 kHz *SWT 35 ms 1.849964000 GHz Center 1.85 GHz 600 kHz/ Span 6 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:50:47	 Ref 30 dBm *Att 25 dB *RBW 30 kHz Marker 1 [T1] -32.22 dBm *VBW 100 kHz *SWT 35 ms 1.910000000 GHz Center 1.91 GHz 600 kHz/ Span 6 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:51:02
QPSK 5MHz	 Ref 30 dBm *Att 25 dB *RBW 100 kHz Marker 1 [T1] -27.64 dBm *VBW 300 kHz *SWT 35 ms 1.850000000 GHz Center 1.85 GHz 1 MHz/ Span 10 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:51:53	 Ref 30 dBm *Att 25 dB *RBW 100 kHz Marker 1 [T1] -27.79 dBm *VBW 300 kHz *SWT 35 ms 1.910000000 GHz Center 1.91 GHz 1 MHz/ Span 10 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:52:08

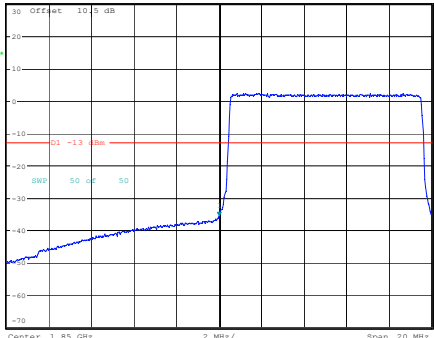
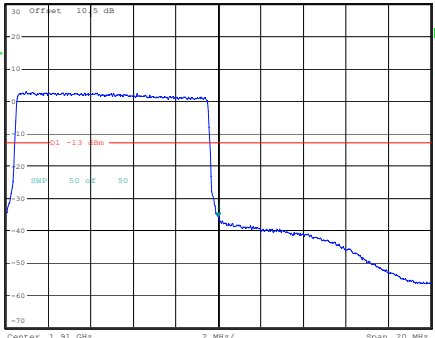
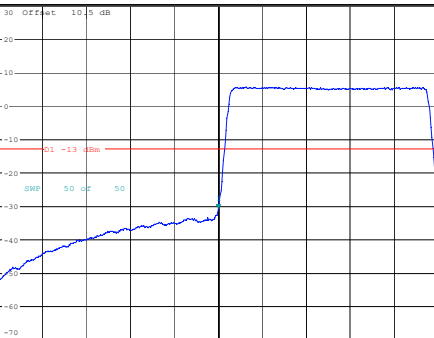
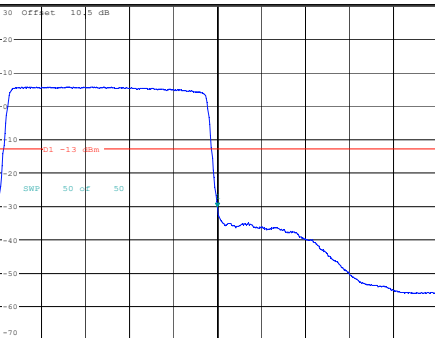
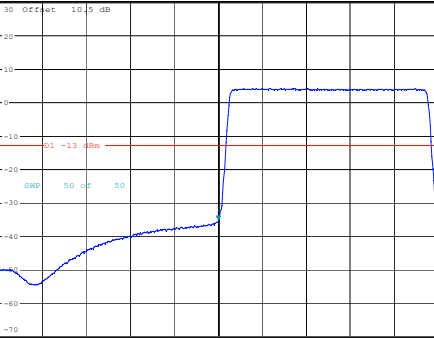
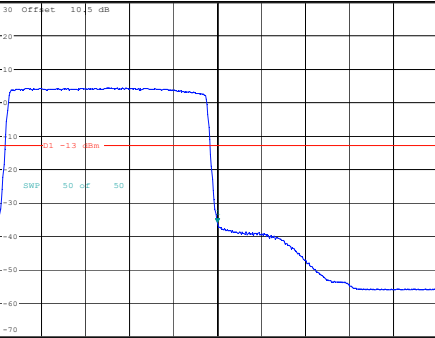
Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 10MHz	 Ref 30 dBm *Att 25 dB *RBW 100 kHz Marker 1 [T1] -13.72 dBm *VSW 300 kHz *SWT 35 ms 1.85000000 GHz Center 1.85 GHz 2 MHz/ Span 20 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:53:25	 Ref 30 dBm *Att 25 dB *RBW 100 kHz Marker 1 [T1] -14.20 dBm *VSW 300 kHz *SWT 35 ms 1.91000000 GHz Center 1.91 GHz 2 MHz/ Span 20 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:53:42
QPSK 15MHz	 Ref 30 dBm *Att 25 dB *RBW 300 kHz Marker 1 [T1] -13.25 dBm *VSW 1 MHz *SWT 35 ms 1.85000000 GHz Center 1.85 GHz 3 MHz/ Span 30 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:54:59	 Ref 30 dBm *Att 25 dB *RBW 300 kHz Marker 1 [T1] -13.96 dBm *VSW 1 MHz *SWT 35 ms 1.91000000 GHz Center 1.91 GHz 3 MHz/ Span 30 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:55:16
QPSK 20MHz	 Ref 30 dBm *Att 25 dB *RBW 300 kHz Marker 1 [T1] -13.41 dBm *VSW 1 MHz *SWT 35 ms 1.85000000 GHz Center 1.85 GHz 4 MHz/ Span 40 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:56:42	 Ref 30 dBm *Att 25 dB *RBW 300 kHz Marker 1 [T1] -14.81 dBm *VSW 1 MHz *SWT 35 ms 1.91000000 GHz Center 1.91 GHz 4 MHz/ Span 40 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:56:59

Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 1.4MHz	 Ref 30 dBm *Att 25 dB *RBW 30 kHz Marker 1 [T1] -27.14 dBm *VBW 100 kHz *SWT 35 ms 1.84994000 GHz Center 1.85 GHz 300 kHz/ Span 3 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:49:50	 Ref 30 dBm *Att 25 dB *RBW 30 kHz Marker 1 [T1] -29.73 dBm *VBW 100 kHz *SWT 35 ms 1.910000000 GHz Center 1.91 GHz 300 kHz/ Span 3 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:50:05
16QAM 3MHz	 Ref 30 dBm *Att 25 dB *RBW 30 kHz Marker 1 [T1] -32.25 dBm *VBW 100 kHz *SWT 35 ms 1.850000000 GHz Center 1.85 GHz 600 kHz/ Span 6 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:50:54	 Ref 30 dBm *Att 25 dB *RBW 30 kHz Marker 1 [T1] -34.25 dBm *VBW 100 kHz *SWT 35 ms 1.910000000 GHz Center 1.91 GHz 600 kHz/ Span 6 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:51:10
16QAM 5MHz	 Ref 30 dBm *Att 25 dB *RBW 100 kHz Marker 1 [T1] -28.33 dBm *VBW 300 kHz *SWT 35 ms 1.850000000 GHz Center 1.85 GHz 1 MHz/ Span 10 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:52:00	 Ref 30 dBm *Att 25 dB *RBW 100 kHz Marker 1 [T2] -29.92 dBm *VBW 300 kHz *SWT 35 ms 1.910000000 GHz Center 1.91 GHz 1 MHz/ Span 10 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:52:16

Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 10MHz	 Ref 30 dBm *Att 25 dB *RBW 100 kHz Marker 1 [T1] -29.73 dBm *VSW 300 kHz *SWT 35 ms 1.85000000 GHz Center 1.85 GHz 2 MHz/ Span 20 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:53:33	 Ref 30 dBm *Att 25 dB *RBW 100 kHz Marker 1 [T1] -29.81 dBm *VSW 300 kHz *SWT 35 ms 1.91000000 GHz Center 1.91 GHz 2 MHz/ Span 20 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:53:50
16QAM 15MHz	 Ref 30 dBm *Att 25 dB *RBW 300 kHz Marker 1 [T1] -30.80 dBm *VSW 1 MHz *SWT 35 ms 1.85000000 GHz Center 1.85 GHz 3 MHz/ Span 30 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:55:07	 Ref 30 dBm *Att 25 dB *RBW 300 kHz Marker 1 [T1] -30.43 dBm *VSW 1 MHz *SWT 35 ms 1.91000000 GHz Center 1.91 GHz 3 MHz/ Span 30 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:55:25
16QAM 20MHz	 Ref 30 dBm *Att 25 dB *RBW 300 kHz Marker 1 [T1] -35.25 dBm *VSW 1 MHz *SWT 35 ms 1.85000000 GHz Center 1.85 GHz 4 MHz/ Span 40 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:56:50	 Ref 30 dBm *Att 25 dB *RBW 300 kHz Marker 1 [T1] -36.17 dBm *VSW 1 MHz *SWT 35 ms 1.91000000 GHz Center 1.91 GHz 4 MHz/ Span 40 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:57:08

4.7 Antenna Port Test Data and Results for LTE Band 4

Serial Number:	2AS5-5	Test Date:	2023/9/16
Test Site:	RF	Test Mode:	Transmitting
Tester:	Rod Luo	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	28	Relative Humidity: (%)	55	ATM Pressure: (kPa)	100.1
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU26	200256	2023/3/31	2024/3/30
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211002	Each time	N/A
Minl-Circuits	Power Splitter	ZFRSC-183-S+	S F448201619	Each time	N/A
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	1710.7	1732.5	1754.3
3MHz	1711.5	1732.5	1753.5
5MHz	1712.5	1732.5	1752.5
10MHz	1715	1732.5	1750
15MHz	1717.5	1732.5	1747.5
20MHz	1720	1732.5	1745

Test Data:**FCC§2.1046;§ 27.50(d)(4)****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	24.00	23.83	23.76	21.88	30
	RB1#3	23.86	24.00	23.91		
	RB1#5	23.61	23.82	23.76		
	RB3#0	23.67	23.89	23.77		
	RB3#3	23.61	23.84	24.18		
	RB6#0	22.64	22.83	23.31		
1.4MHz 16QAM	RB1#0	22.56	22.76	23.13	21.04	30
	RB1#3	22.71	23.01	23.34		
	RB1#5	22.56	22.77	23.2		
	RB3#0	22.68	23.01	23.25		
	RB3#3	22.66	23.03	23		
	RB6#0	21.6	21.9	21.88		
3MHz QPSK	RB1#0	24.23	23.82	23.79	21.93	30
	RB1#8	24.09	23.8	23.77		
	RB1#14	24.15	23.79	23.75		
	RB6#0	23.11	22.77	22.77		
	RB6#9	23.09	22.83	22.75		
	RB15#0	23.09	22.79	22.73		
3MHz 16QAM	RB1#0	23.11	23.32	22.86	21.03	30
	RB1#8	22.87	23.33	22.82		
	RB1#14	22.74	23.27	22.83		
	RB6#0	21.55	21.82	21.72		
	RB6#9	21.51	21.83	21.72		
	RB15#0	21.62	21.85	21.67		
5MHz QPSK	RB1#0	24.15	23.75	23.72	21.85	30
	RB1#13	23.82	23.83	23.8		
	RB1#24	23.52	23.75	23.68		
	RB15#0	22.56	22.81	22.81		
	RB15#10	22.58	22.83	22.78		
	RB25#0	22.55	22.77	22.73		
5MHz 16QAM	RB1#0	22.81	22.77	22.57	20.59	30
	RB1#13	22.88	22.89	22.62		
	RB1#24	22.75	22.8	22.52		
	RB15#0	21.53	21.83	21.79		
	RB15#10	21.56	21.85	21.75		
	RB25#0	21.53	21.82	21.79		

10MHz QPSK	RB1#0	24.19	23.8	23.89	21.98	30
	RB1#25	24.28	24.04	23.95		
	RB1#49	23.62	23.88	23.77		
	RB25#0	22.62	22.84	22.84		
	RB25#25	22.63	22.88	22.77		
	RB50#0	22.63	22.85	22.78		
10MHz 16QAM	RB1#0	22.79	22.78	23.36	21.10	30
	RB1#25	22.88	23	23.4		
	RB1#49	22.74	22.84	23.16		
	RB25#0	21.63	21.93	21.89		
	RB25#25	21.64	21.97	21.82		
	RB50#0	21.62	21.9	21.82		
15MHz QPSK	RB1#0	24.14	23.69	23.8	21.85	30
	RB1#38	24.15	23.88	23.82		
	RB1#74	23.63	23.79	23.7		
	RB36#0	22.75	22.91	22.99		
	RB36#39	22.76	22.93	22.89		
	RB75#0	22.74	22.94	22.94		
15MHz 16QAM	RB1#0	22.7	23.01	23.29	20.99	30
	RB1#38	22.75	23.22	23.27		
	RB1#74	22.72	23.08	23.1		
	RB36#0	21.65	21.82	21.9		
	RB36#39	21.7	21.85	21.78		
	RB75#0	21.68	21.85	21.88		
20MHz QPSK	RB1#0	23.98	23.49	23.69	21.99	30
	RB1#50	24.29	23.98	24.04		
	RB1#99	23.75	23.55	23.53		
	RB50#0	22.57	22.77	22.86		
	RB50#50	22.66	22.83	22.76		
	RB100#0	22.63	22.84	22.81		
20MHz 16QAM	RB1#0	22.6	23.02	22.98	21.22	30
	RB1#50	22.98	23.52	23.26		
	RB1#99	22.72	23.05	22.73		
	RB50#0	21.6	21.81	21.85		
	RB50#50	21.63	21.81	21.72		
	RB100#0	21.64	21.85	21.83		
Note: EIRP=Conducted Power(dBm) - Lc(dB) + Gr(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	3.91	4.41	4.26	13
	RB100#0	4.81	4.84	4.64	13
20MHz 16QAM	RB1#0	4.64	5.3	5.39	13
	RB100#0	5.74	5.77	5.57	13
Result:					Pass

FCC §2.1049, §27.53: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	1.098	1.104	1.110	1.308	1.308	1.308
1.4MHz 16QAM	1.104	1.098	1.104	1.320	1.290	1.338
3MHz QPSK	2.688	2.676	2.688	2.868	2.892	2.880
3MHz 16QAM	2.688	2.676	2.688	2.880	2.880	2.892
5MHz QPSK	4.520	4.500	4.520	4.920	4.940	4.940
5MHz 16QAM	4.520	4.520	4.500	4.960	4.980	4.920
10MHz QPSK	8.960	8.960	9.000	9.600	9.600	9.720
10MHz 16QAM	9.000	8.960	8.960	9.600	9.600	9.680
15MHz QPSK	13.500	13.500	13.500	14.820	14.880	14.760
15MHz 16QAM	13.560	13.500	13.620	14.820	14.820	14.820
20MHz QPSK	17.920	18.080	18.000	19.440	19.600	19.280
20MHz 16QAM	18.000	18.000	18.000	19.520	19.520	19.440

Note: The test plots please refer to the Plots of Occupied Bandwidth

FCC §2.1051, § 27.53:Spurious Emissions at Antenna Terminal

Result:	Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.
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FCC §2.1051, § 27.53:Out of band emission, Band Edge

Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.
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FCC §2.1055, §27.54: Frequency Stability

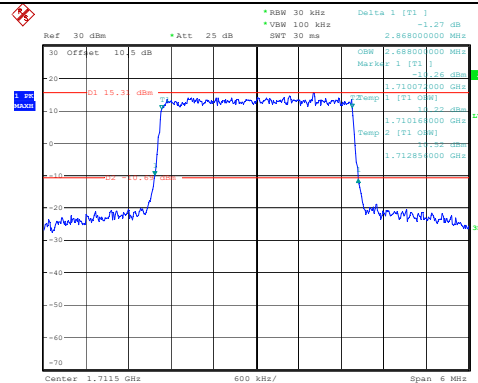
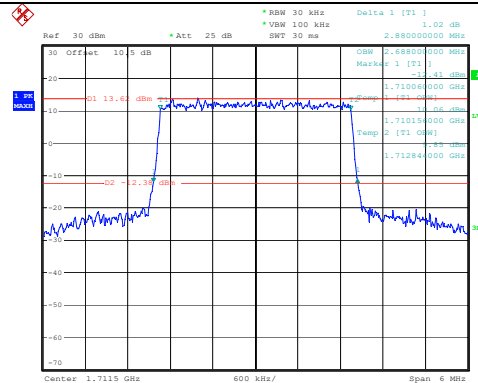
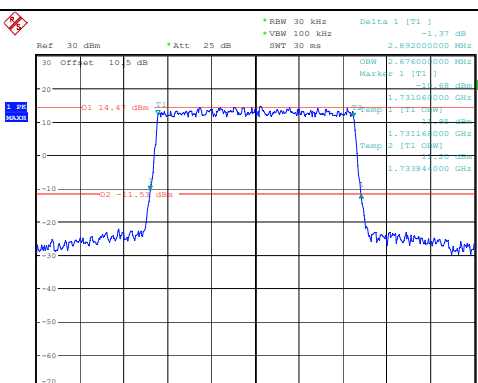
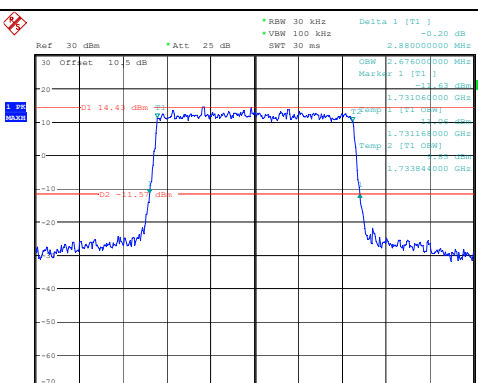
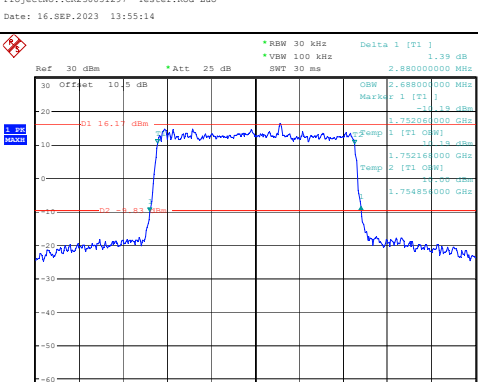
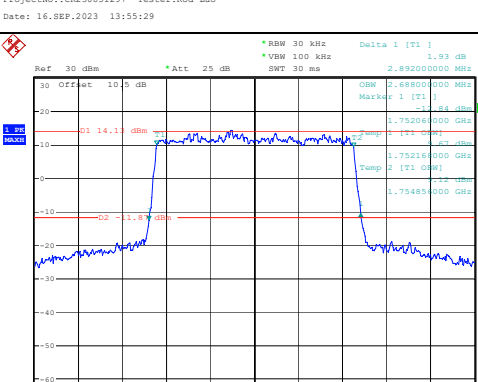
Test Mode:	20M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.85	1710.238	1710.00	1754.714	1755
	-20	3.85	1710.259	1710.00	1754.811	1755
	-10	3.85	1710.231	1710.00	1754.743	1755
	0	3.85	1710.286	1710.00	1754.859	1755
	10	3.85	1710.102	1710.00	1754.884	1755
	20	3.85	1710.133	1710.00	1754.758	1755
	30	3.85	1710.282	1710.00	1754.715	1755
	40	3.85	1710.100	1710.00	1754.838	1755
	50	3.85	1710.292	1710.00	1754.801	1755
Frequency Stability vs. Voltage	20	3.45	1710.240	1710.00	1754.754	1755
	20	4.4	1710.138	1710.00	1754.830	1755
					Result:	Pass

Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.85	1710.148	1710.00	1754.763	1755
	-20	3.85	1710.265	1710.00	1754.757	1755
	-10	3.85	1710.211	1710.00	1754.796	1755
	0	3.85	1710.239	1710.00	1754.760	1755
	10	3.85	1710.153	1710.00	1754.734	1755
	20	3.85	1710.292	1710.00	1754.816	1755
	30	3.85	1710.156	1710.00	1754.701	1755
	40	3.85	1710.180	1710.00	1754.716	1755
	50	3.85	1710.184	1710.00	1754.897	1755
Frequency Stability vs. Voltage	20	3.45	1710.270	1710.00	1754.722	1755
	20	4.4	1710.173	1710.00	1754.844	1755
					Result:	Pass

Occupied Bandwidth

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Occupied Bandwidth

Channel	3MHz Bandwidth QPSK	3MHz Bandwidth 16QAM
Lowest	 Ref 30 dBm *Att 25 dB *RBW 30 kHz Delta 1 [T1] -1.27 dB *VSW 100 kHz SWT 30 ms 2.892000000 MHz OSW 2.892000000 MHz Marker 1 [T1] -1.27 dB 1.710970000 GHz 1.710970000 GHz 1.710160000 GHz 1.710160000 GHz 1.712850000 GHz 1.712850000 GHz Center 1.7115 GHz 600 kHz/ Span 6 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 13:54:41	 Ref 30 dBm *Att 25 dB *RBW 30 kHz Delta 1 [T1] -1.02 dB *VSW 100 kHz SWT 30 ms 2.892000000 MHz OSW 2.892000000 MHz Marker 1 [T1] -1.02 dB 1.710940000 GHz 1.710940000 GHz 1.710190000 GHz 1.710190000 GHz 1.712840000 GHz 1.712840000 GHz Center 1.7115 GHz 600 kHz/ Span 6 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 13:54:59
Middle	 Ref 30 dBm *Att 25 dB *RBW 30 kHz Delta 1 [T1] -1.37 dB *VSW 100 kHz SWT 30 ms 2.892000000 MHz OSW 2.892000000 MHz Marker 1 [T1] -1.37 dB 1.731040000 GHz 1.731040000 GHz 1.731160000 GHz 1.731160000 GHz 1.733840000 GHz 1.733840000 GHz Center 1.7325 GHz 600 kHz/ Span 6 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 13:55:14	 Ref 30 dBm *Att 25 dB *RBW 30 kHz Delta 1 [T1] -1.37 dB *VSW 100 kHz SWT 30 ms 2.892000000 MHz OSW 2.892000000 MHz Marker 1 [T1] -1.37 dB 1.731040000 GHz 1.731040000 GHz 1.731160000 GHz 1.731160000 GHz 1.733840000 GHz 1.733840000 GHz Center 1.7325 GHz 600 kHz/ Span 6 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 13:55:29
Highest	 Ref 30 dBm *Att 25 dB *RBW 30 kHz Delta 1 [T1] -1.39 dB *VSW 100 kHz SWT 30 ms 2.892000000 MHz OSW 2.892000000 MHz Marker 1 [T1] -1.39 dB 1.752060000 GHz 1.752060000 GHz 1.752160000 GHz 1.752160000 GHz 1.754850000 GHz 1.754850000 GHz Center 1.7535 GHz 600 kHz/ Span 6 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 13:55:47	 Ref 30 dBm *Att 25 dB *RBW 30 kHz Delta 1 [T1] -1.39 dB *VSW 100 kHz SWT 30 ms 2.892000000 MHz OSW 2.892000000 MHz Marker 1 [T1] -1.39 dB 1.752060000 GHz 1.752060000 GHz 1.752160000 GHz 1.752160000 GHz 1.754850000 GHz 1.754850000 GHz Center 1.7535 GHz 600 kHz/ Span 6 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 13:56:05

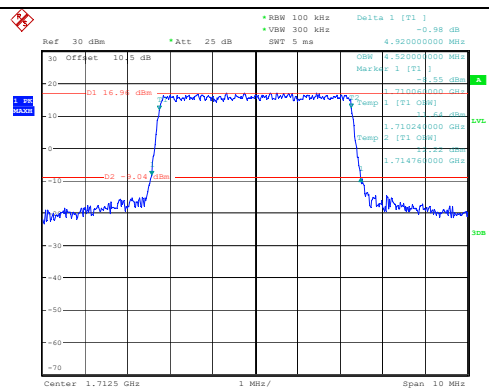
Occupied Bandwidth

Channel

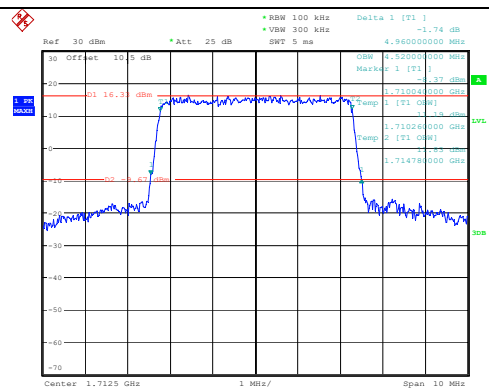
5MHz Bandwidth QPSK

5MHz Bandwidth 16QAM

Lowest

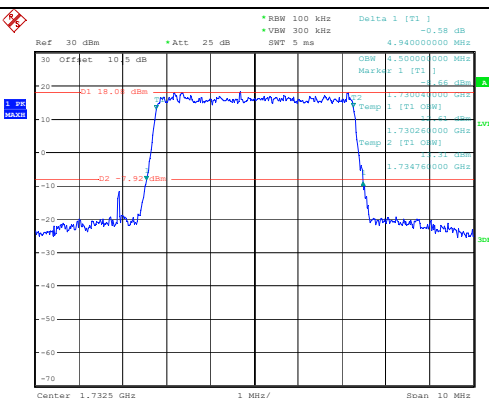


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Date: 16.SEP.2023 13:57:21

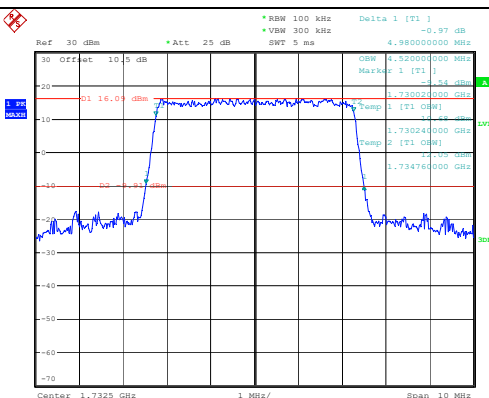


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 13:57:42

Middle

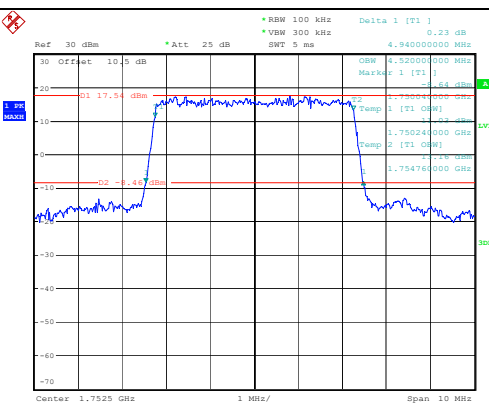


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 13:58:01

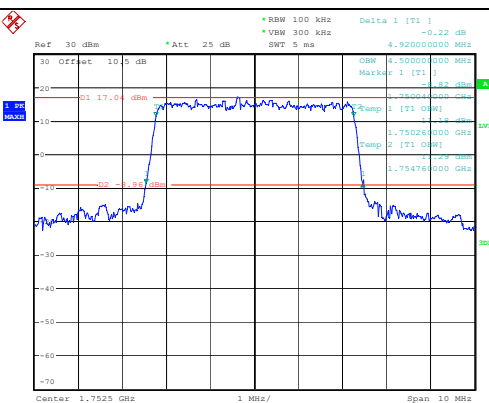


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 13:58:19

Highest



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 13:58:41



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 13:59:03

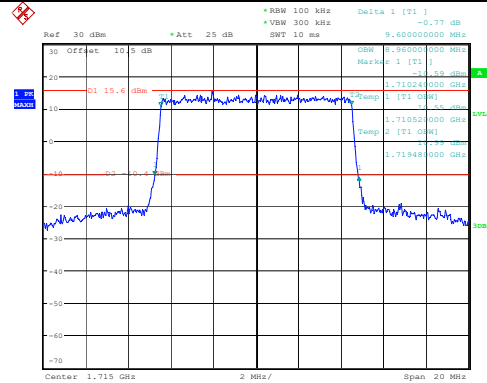
Occupied Bandwidth

Channel

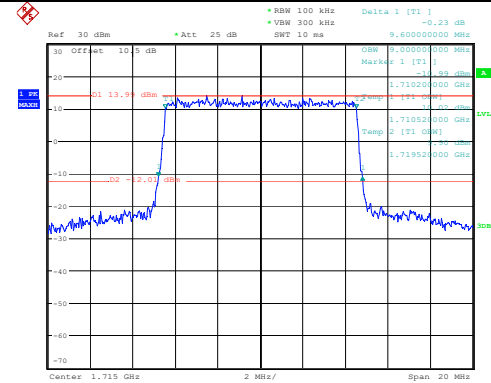
10MHz Bandwidth QPSK

10MHz Bandwidth 16QAM

Lowest

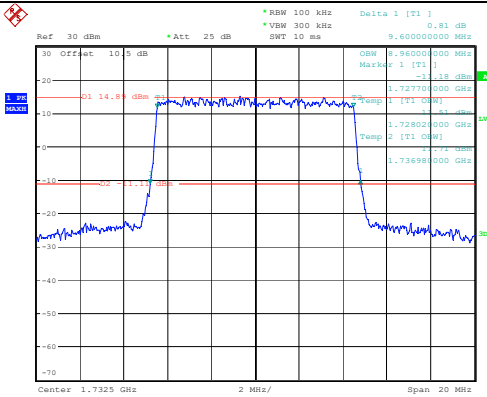


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 13:59:57

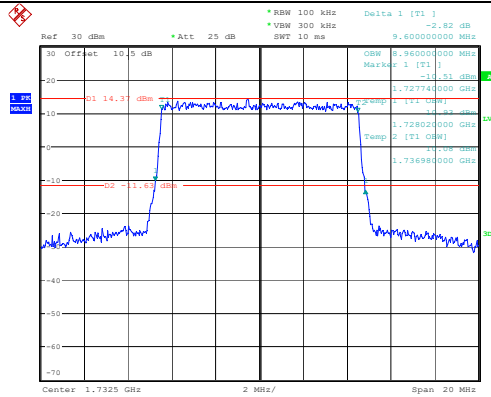


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:00:15

Middle

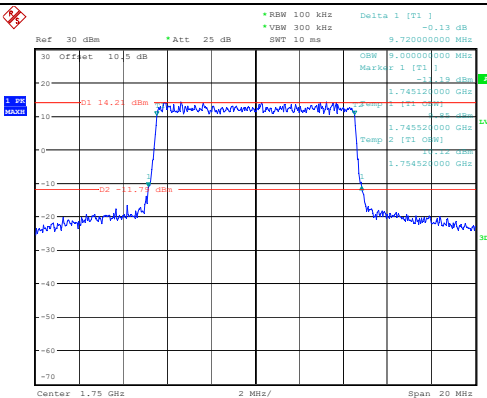


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:00:35

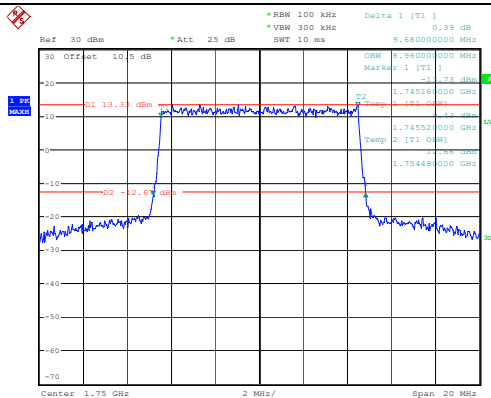


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:00:51

Highest



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:01:08



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:01:26

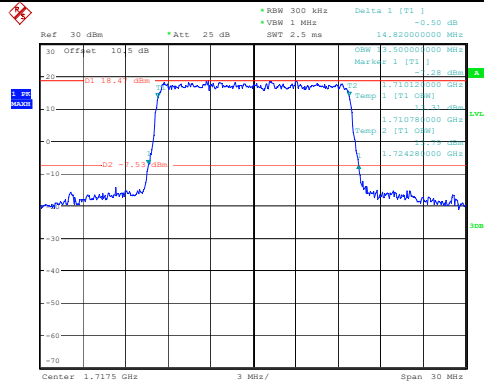
Occupied Bandwidth

Channel

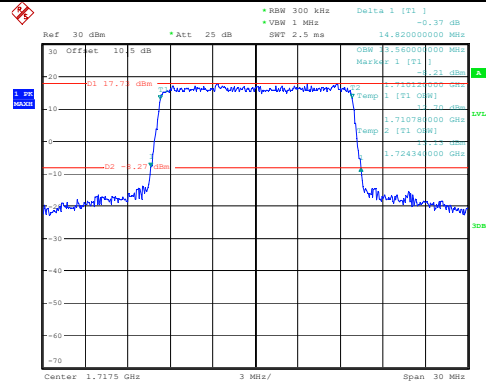
15MHz Bandwidth QPSK

15MHz Bandwidth 16QAM

Lowest

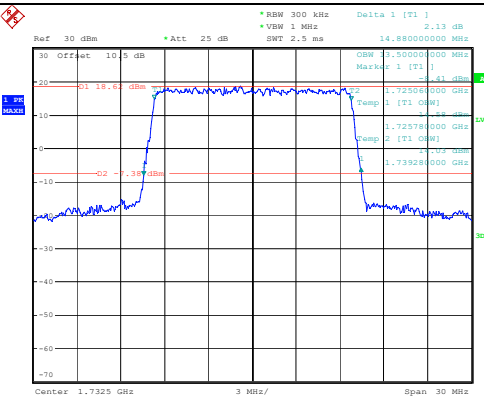


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:02:43

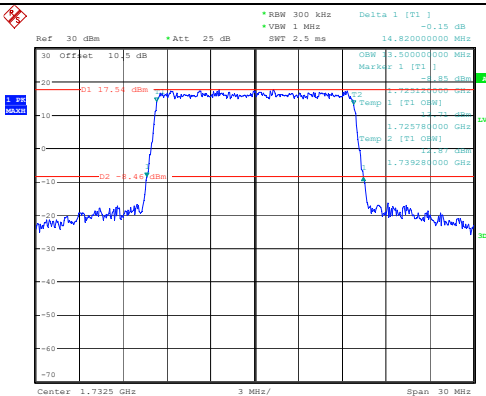


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:03:10

Middle

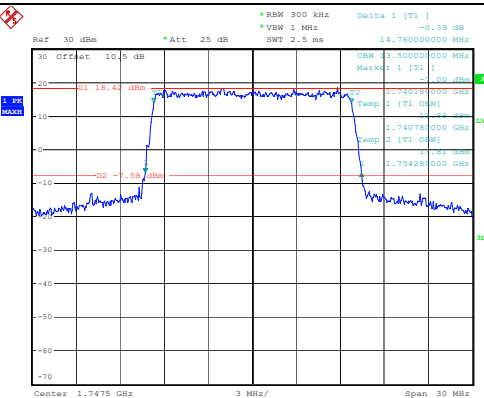


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:03:39

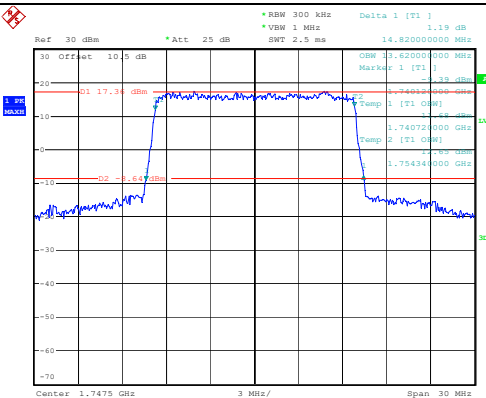


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:04:03

Highest



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:04:26



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:04:53

Occupied Bandwidth

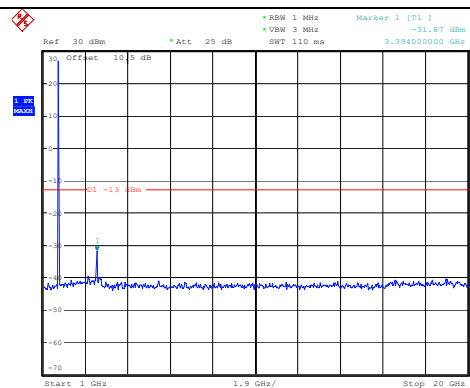
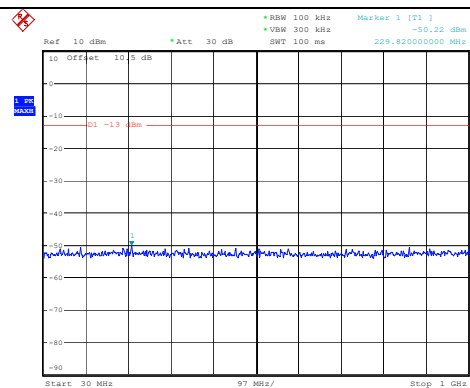
Channel	20MHz Bandwidth QPSK	20MHz Bandwidth 16QAM
Lowest	ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 14:06:07	ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 14:06:29
Middle	ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 14:06:55	ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 14:07:17
Highest	ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 14:07:40	ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 14:08:02

Spurious Emissions at Antenna Terminal

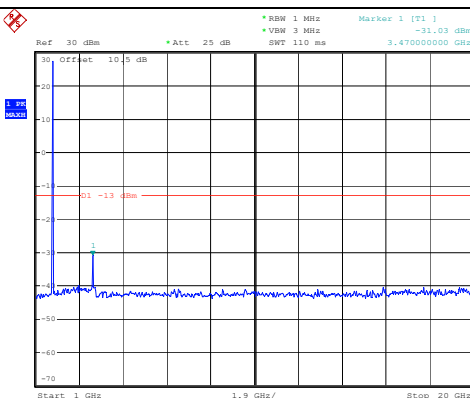
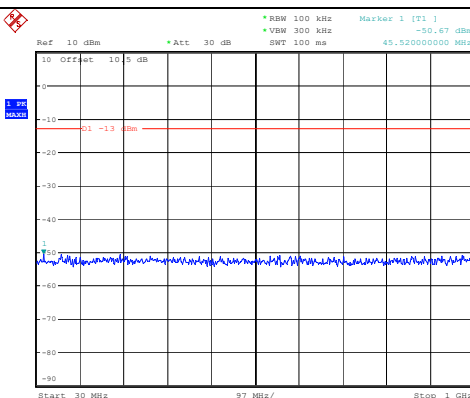
Channel

1.4MHz Bandwidth QPSK

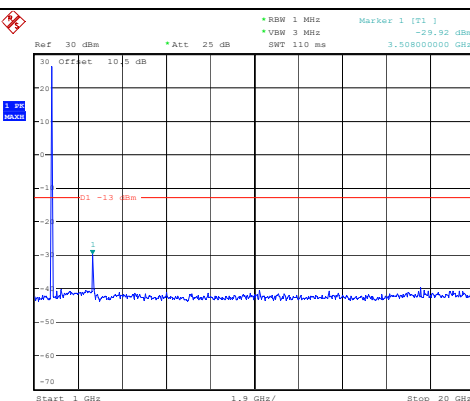
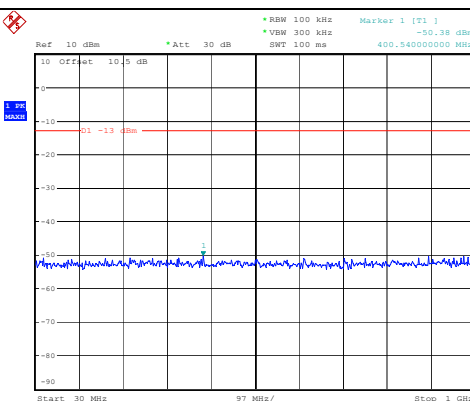
Lowest



Middle



Highest

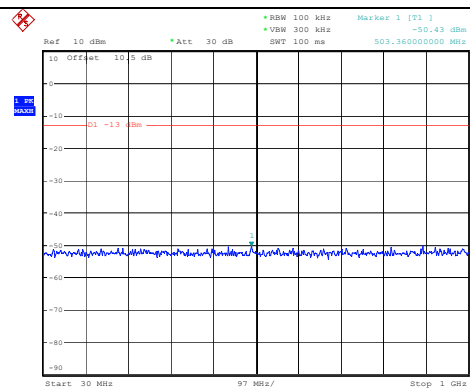


Spurious Emissions at Antenna Terminal

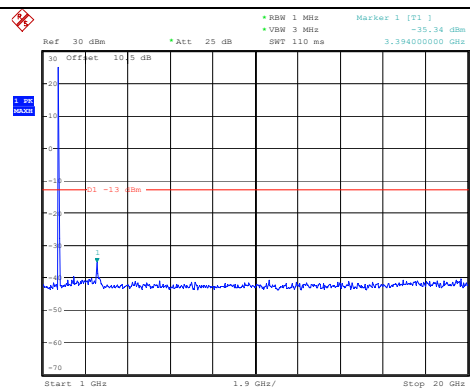
Channel

3MHz Bandwidth QPSK

Lowest

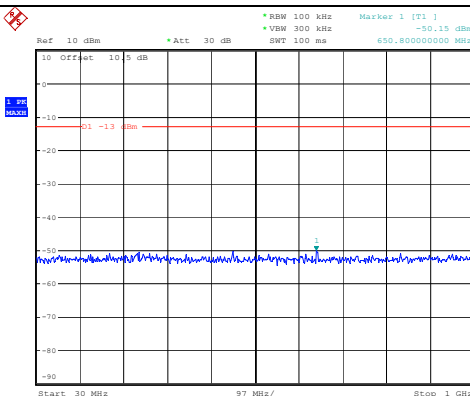


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 15:01:33

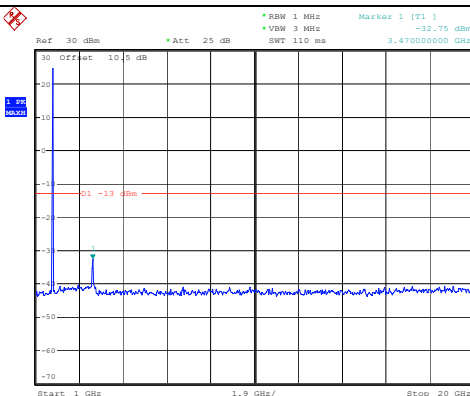


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 15:01:43

Middle

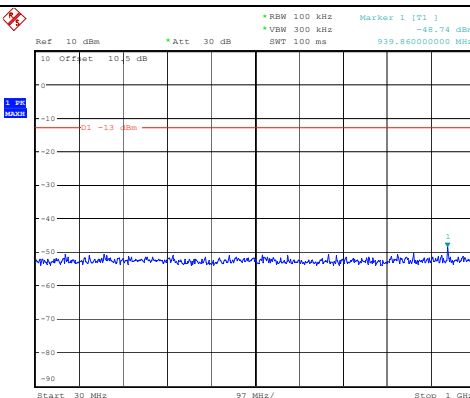


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 15:01:57

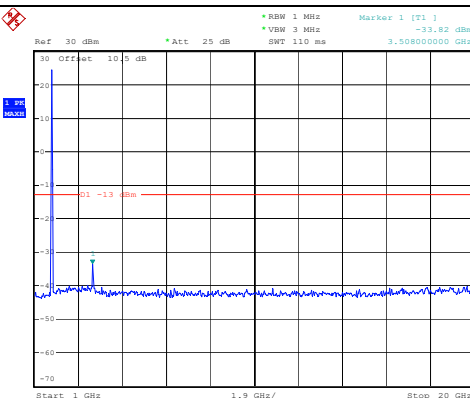


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 15:02:07

Highest



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 15:02:21



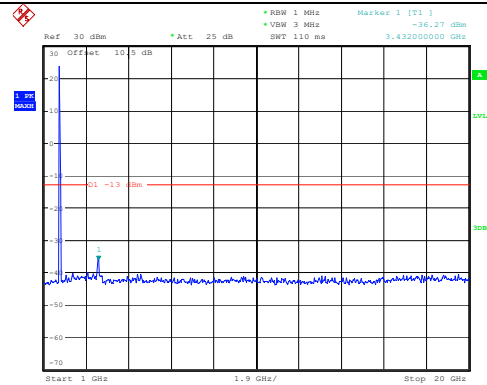
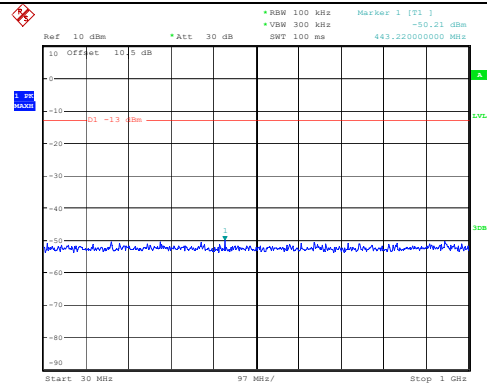
ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 15:02:34

Spurious Emissions at Antenna Terminal

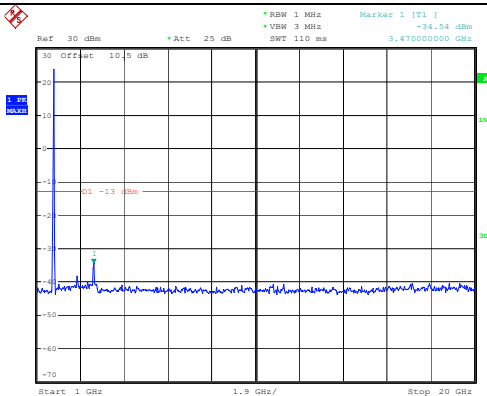
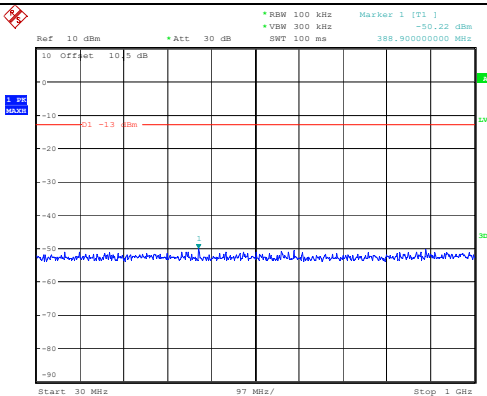
Channel

5MHz Bandwidth QPSK

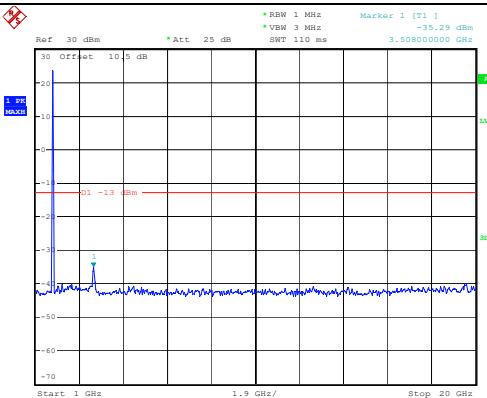
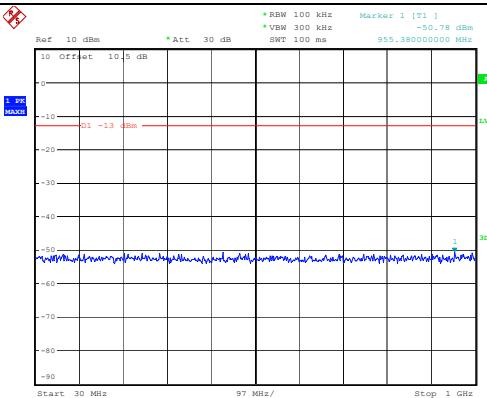
Lowest



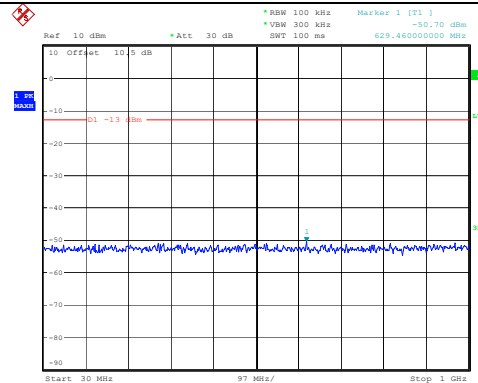
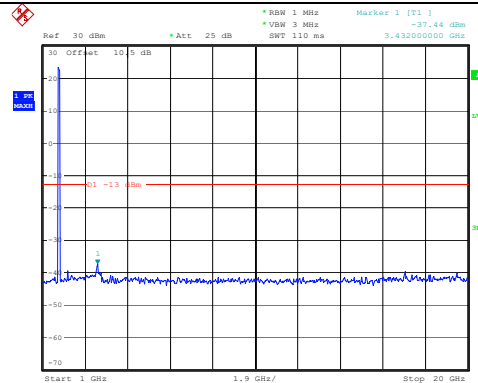
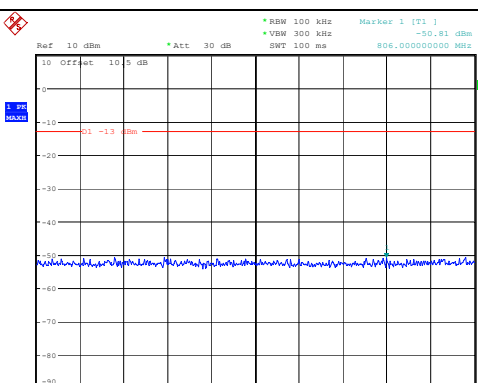
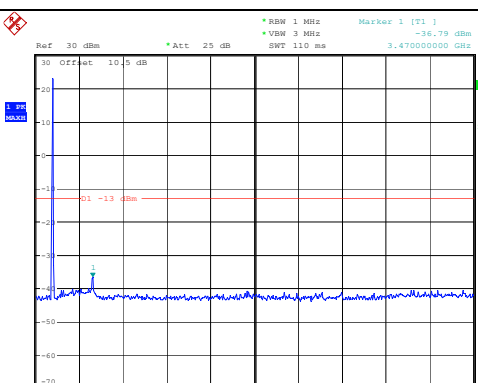
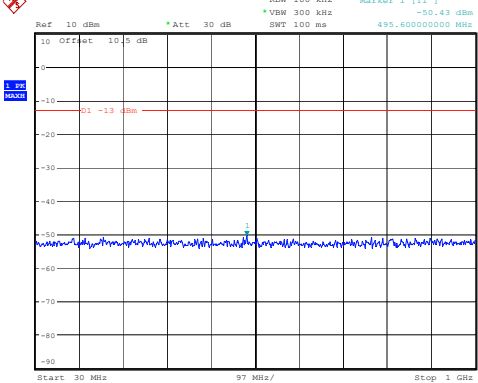
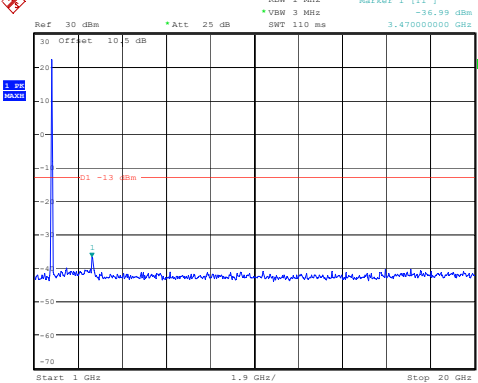
Middle



Highest



Spurious Emissions at Antenna Terminal

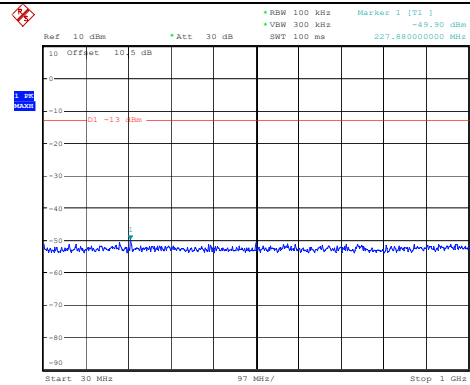
Channel	10MHz Bandwidth QPSK	
Lowest	 Ref 10 dBm *Att 30 dB *RBW 100 kHz *VSW 300 kHz *SWT 100 ms Marker 1 [T1] -50.70 dBm 629.460000000 MHz Start 30 MHz 97 MHz/ Stop 1 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:05:23	 Ref 30 dBm *Att 25 dB *RBW 1 MHz *VSW 3 MHz *SWT 110 ms Marker 1 [T1] -37.44 dBm 3.432000000 GHz Start 1 GHz 1.9 GHz/ Stop 20 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:05:34
	 Ref 10 dBm *Att 30 dB *RBW 100 kHz *VSW 300 kHz *SWT 100 ms Marker 1 [T1] -50.81 dBm 806.000000000 MHz Start 30 MHz 97 MHz/ Stop 1 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:05:52	 Ref 30 dBm *Att 25 dB *RBW 1 MHz *VSW 3 MHz *SWT 110 ms Marker 1 [T1] -36.79 dBm 3.470000000 GHz Start 1 GHz 1.9 GHz/ Stop 20 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:06:02
Highest	 Ref 10 dBm *Att 30 dB *RBW 100 kHz *VSW 300 kHz *SWT 100 ms Marker 1 [T1] -50.43 dBm 495.600000000 MHz Start 30 MHz 97 MHz/ Stop 1 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:06:17	 Ref 30 dBm *Att 25 dB *RBW 1 MHz *VSW 3 MHz *SWT 110 ms Marker 1 [T1] -36.99 dBm 3.470000000 GHz Start 1 GHz 1.9 GHz/ Stop 20 GHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:06:27

Spurious Emissions at Antenna Terminal

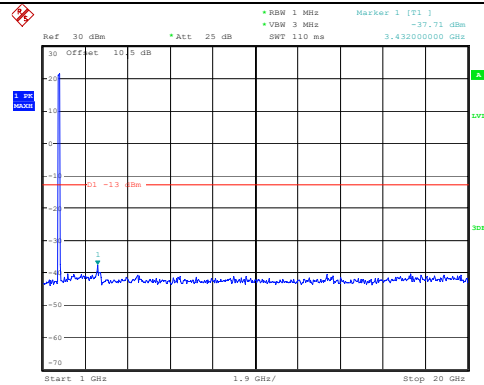
Channel

15MHz Bandwidth QPSK

Lowest

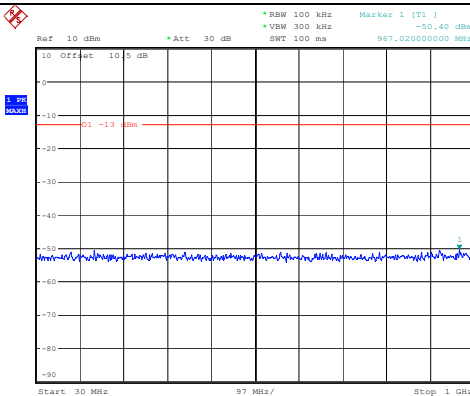


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 15:07:19

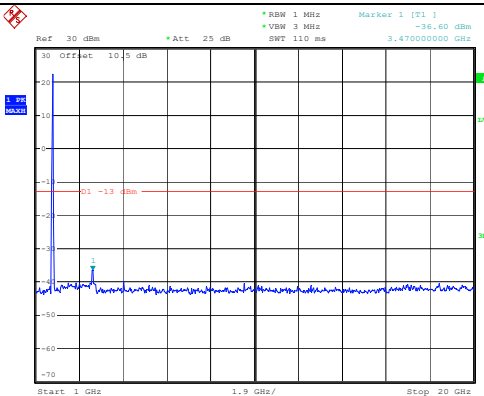


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 15:07:30

Middle

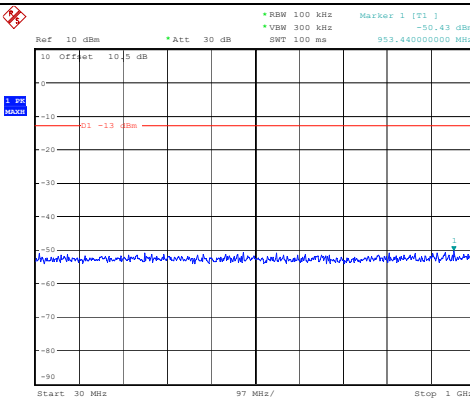


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 15:07:47

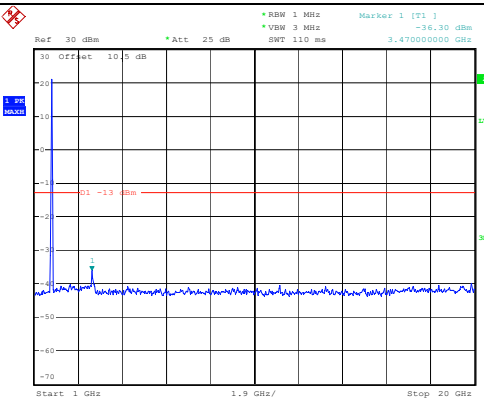


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 15:07:57

Highest



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 15:08:15



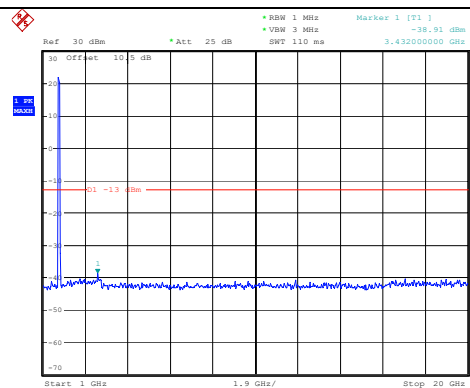
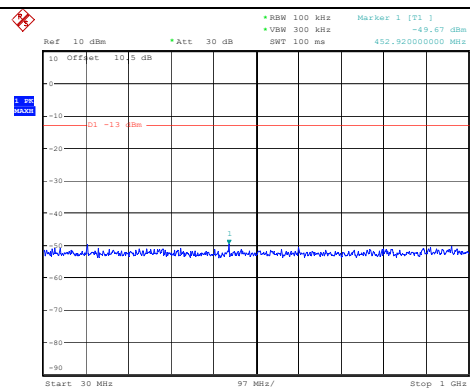
ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 15:08:26

Spurious Emissions at Antenna Terminal

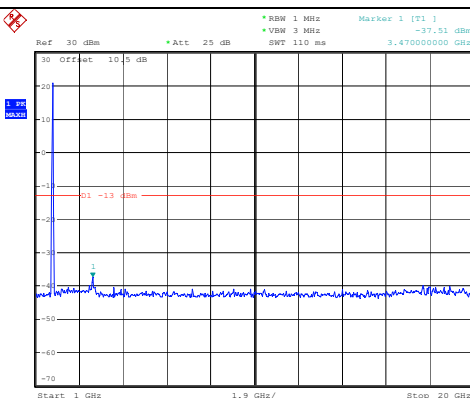
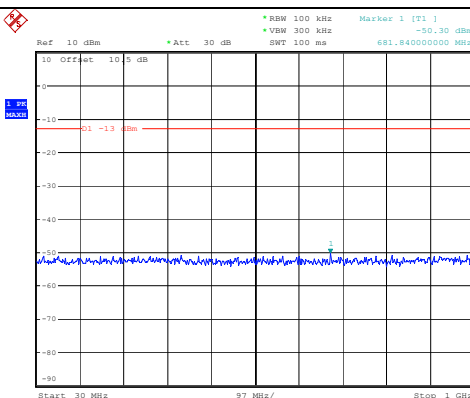
Channel

20MHz Bandwidth QPSK

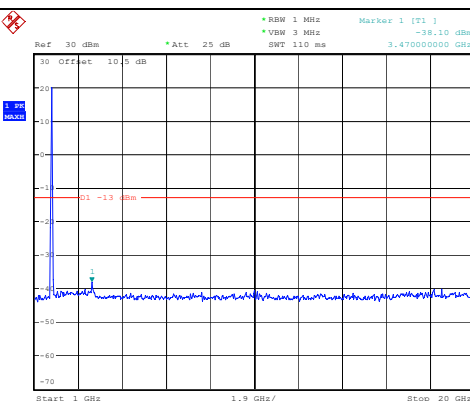
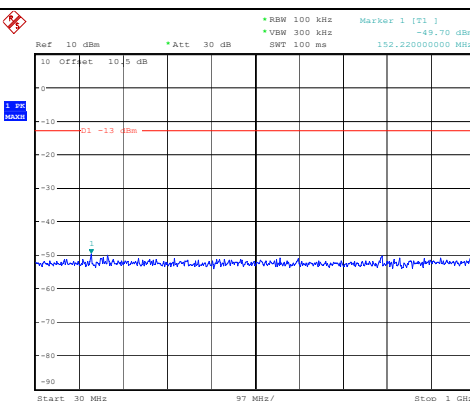
Lowest



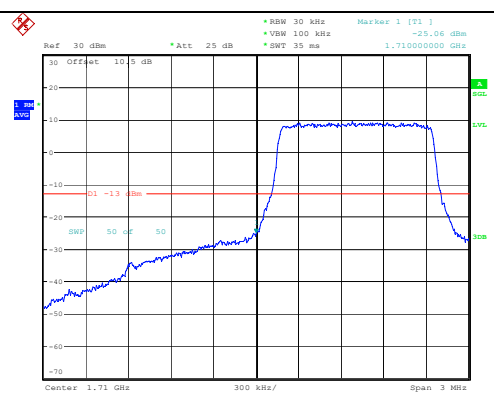
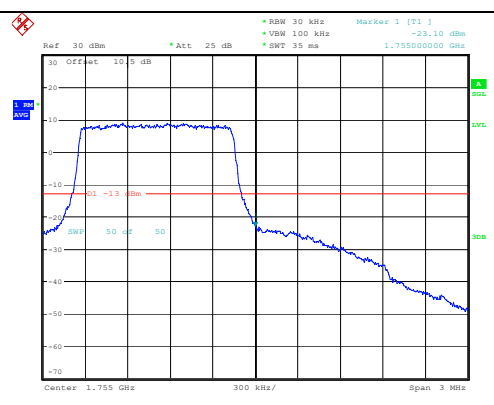
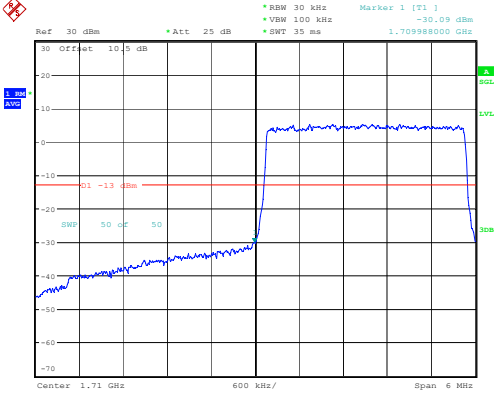
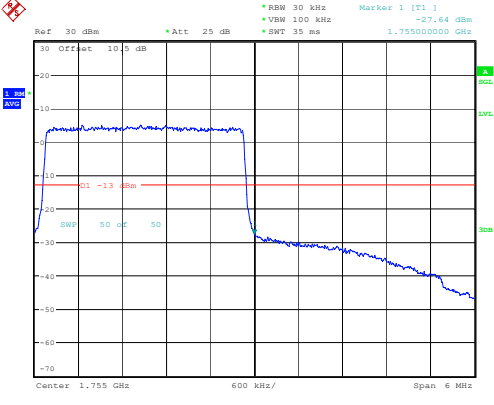
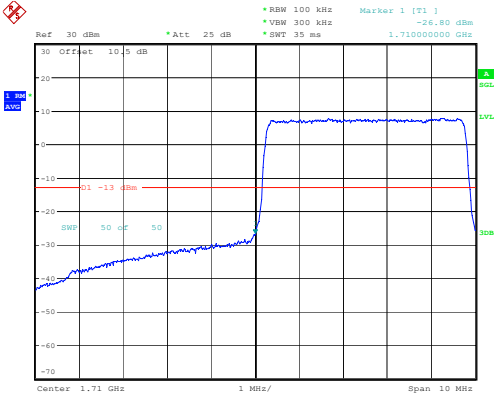
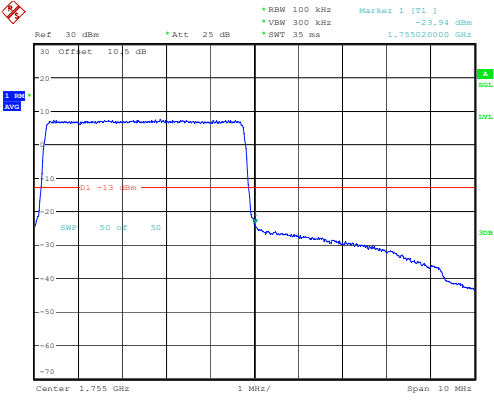
Middle



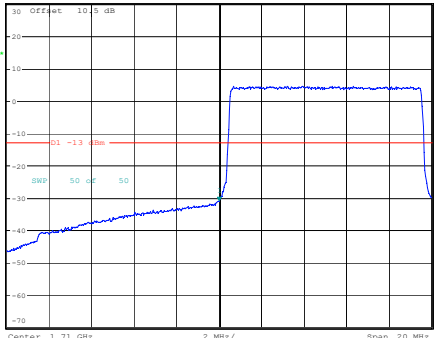
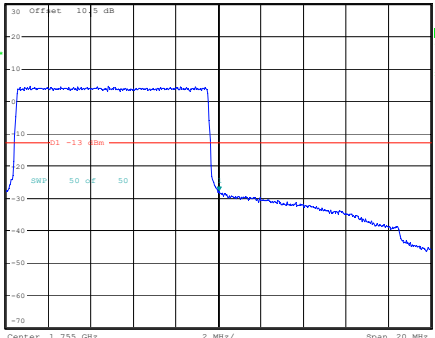
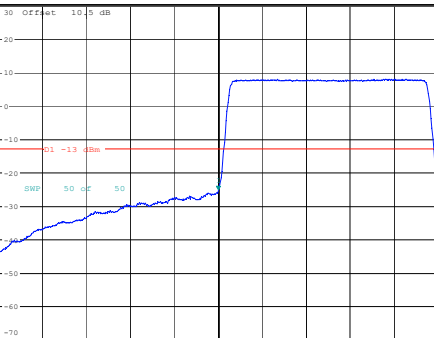
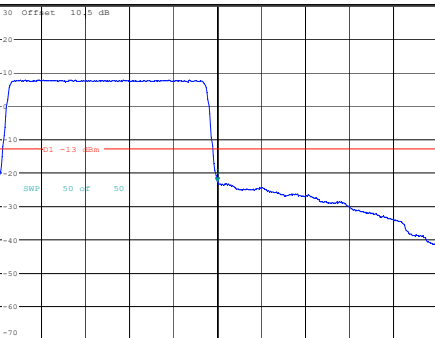
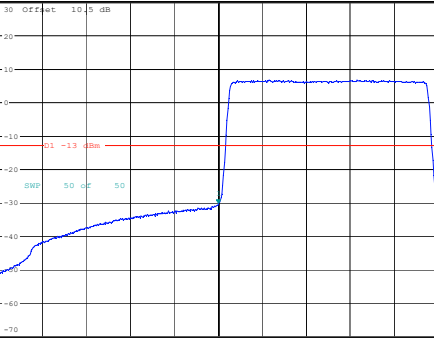
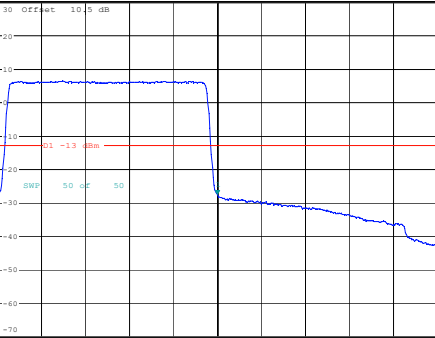
Highest



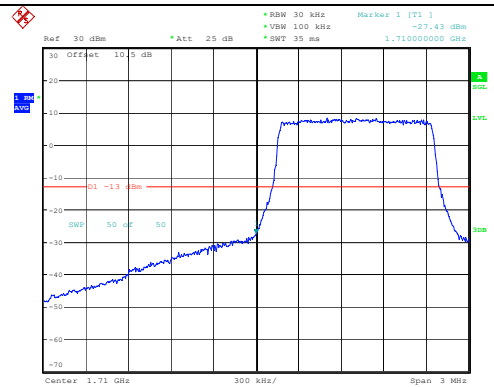
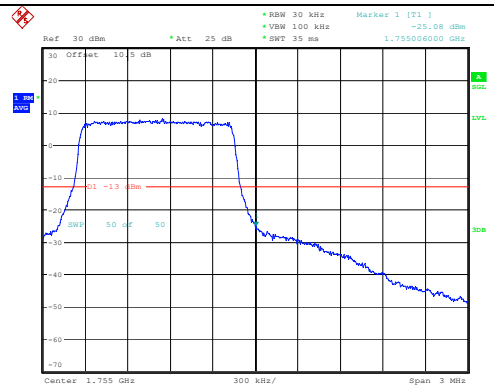
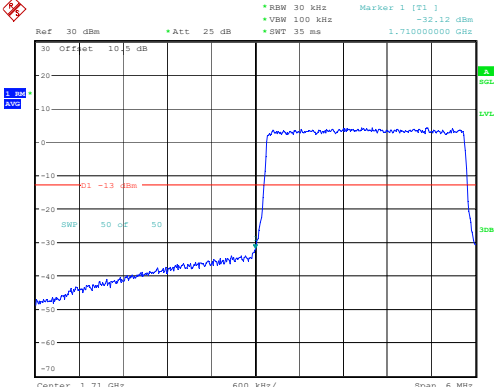
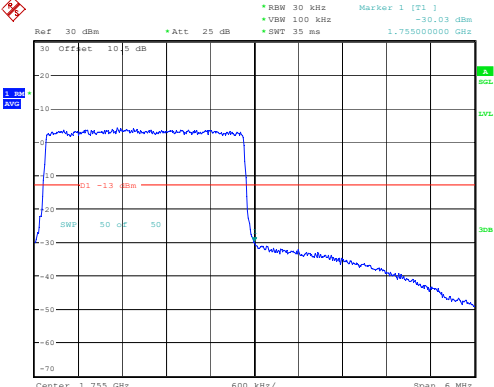
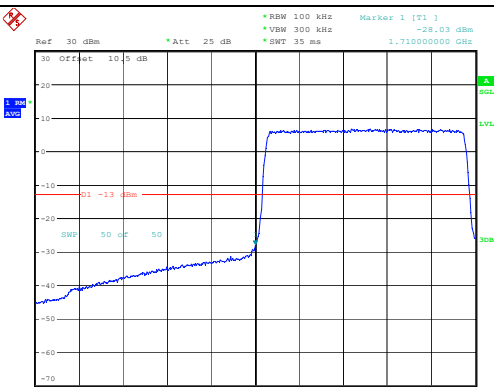
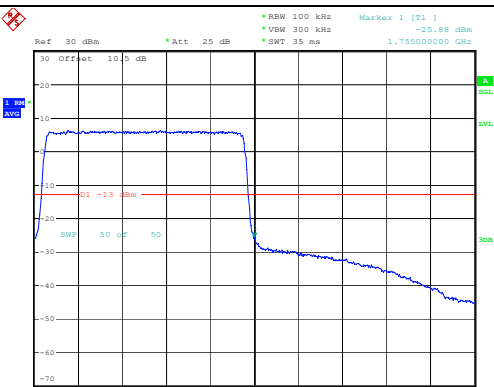
Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 1.4MHz	 Ref 30 dBm *Att 25 dB *RBW 30 kHz Marker 1 [T1] -25.06 dBm *VBW 100 kHz *SWT 35 ms 1.710000000 GHz Center 1.71 GHz 300 kHz/ Span 3 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:57:52	 Ref 30 dBm *Att 25 dB *RBW 30 kHz Marker 1 [T1] -23.10 dBm *VBW 100 kHz *SWT 35 ms 1.755000000 GHz Center 1.755 GHz 300 kHz/ Span 3 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:58:07
QPSK 3MHz	 Ref 30 dBm *Att 25 dB *RBW 30 kHz Marker 1 [T1] -26.09 dBm *VBW 100 kHz *SWT 35 ms 1.709988000 GHz Center 1.71 GHz 600 kHz/ Span 6 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:58:56	 Ref 30 dBm *Att 25 dB *RBW 30 kHz Marker 1 [T1] -27.64 dBm *VBW 100 kHz *SWT 35 ms 1.755000000 GHz Center 1.755 GHz 600 kHz/ Span 6 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:59:11
QPSK 5MHz	 Ref 30 dBm *Att 25 dB *RBW 100 kHz Marker 1 [T1] -26.80 dBm *VBW 300 kHz *SWT 35 ms 1.710000000 GHz Center 1.71 GHz 1 MHz/ Span 10 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:59:52	 Ref 30 dBm *Att 25 dB *RBW 100 kHz Marker 1 [T1] -23.94 dBm *VBW 300 kHz *SWT 35 ms 1.755000000 GHz Center 1.755 GHz 1 MHz/ Span 10 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 16:00:08

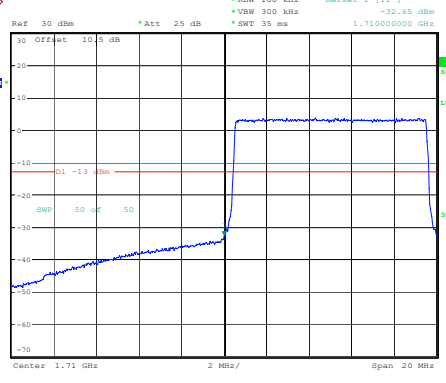
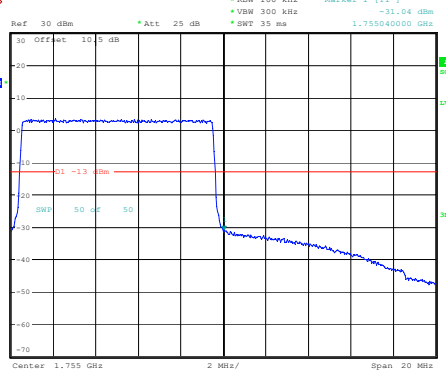
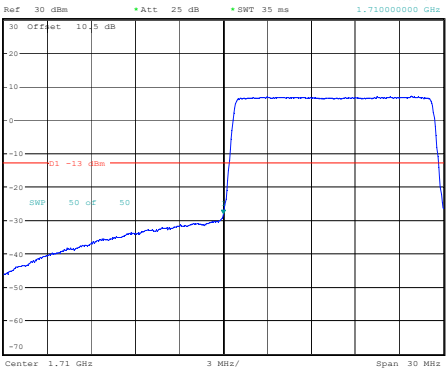
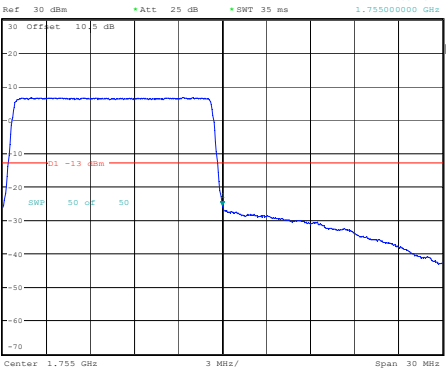
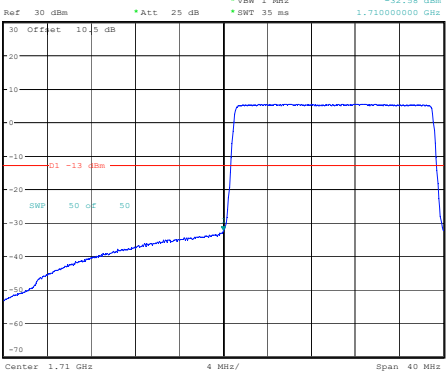
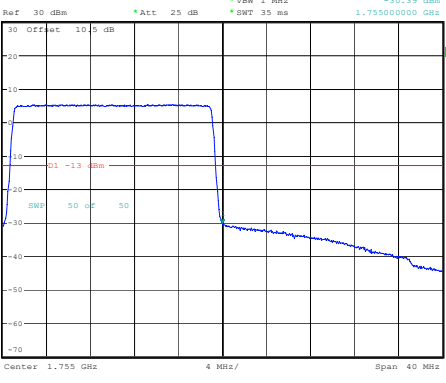
Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 10MHz	 Ref 30 dBm *Att 25 dB *RBW 100 kHz Marker 1 [T1] -20.57 dBm *VSW 300 kHz *SWT 35 ms 1.710000000 GHz Center 1.71 GHz 2 MHz/ Span 20 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 16:00:51	 Ref 30 dBm *Att 25 dB *RBW 100 kHz Marker 1 [T1] -27.93 dBm *VSW 300 kHz *SWT 35 ms 1.755000000 GHz Center 1.755 GHz 2 MHz/ Span 20 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 16:01:08
QPSK 15MHz	 Ref 30 dBm *Att 25 dB *RBW 300 kHz Marker 1 [T1] -25.26 dBm *VSW 1 MHz *SWT 35 ms 1.710000000 GHz Center 1.71 GHz 3 MHz/ Span 30 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 16:02:00	 Ref 30 dBm *Att 25 dB *RBW 300 kHz Marker 1 [T1] -22.74 dBm *VSW 1 MHz *SWT 35 ms 1.755000000 GHz Center 1.755 GHz 3 MHz/ Span 30 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 16:02:17
QPSK 20MHz	 Ref 30 dBm *Att 25 dB *RBW 300 kHz Marker 1 [T1] -30.46 dBm *VSW 1 MHz *SWT 35 ms 1.710000000 GHz Center 1.71 GHz 4 MHz/ Span 40 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 16:03:09	 Ref 30 dBm *Att 25 dB *RBW 300 kHz Marker 1 [T1] -27.76 dBm *VSW 1 MHz *SWT 35 ms 1.755000000 GHz Center 1.755 GHz 4 MHz/ Span 40 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 16:03:27

Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 1.4MHz	 Ref 30 dBm *Att 25 dB *RBW 30 kHz Marker 1 [T1] -27.43 dBm *VBW 100 kHz *SWT 35 ms 1.71000000 GHz Center 1.71 GHz 300 kHz/ Span 3 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:58:00	 Ref 30 dBm *Att 25 dB *RBW 30 kHz Marker 1 [T1] -25.08 dBm *VBW 100 kHz *SWT 35 ms 1.75500000 GHz Center 1.755 GHz 300 kHz/ Span 3 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:58:13
16QAM 3MHz	 Ref 30 dBm *Att 25 dB *RBW 30 kHz Marker 1 [T1] -32.12 dBm *VBW 100 kHz *SWT 35 ms 1.71000000 GHz Center 1.71 GHz 600 kHz/ Span 6 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:59:03	 Ref 30 dBm *Att 25 dB *RBW 30 kHz Marker 1 [T1] -30.03 dBm *VBW 100 kHz *SWT 35 ms 1.75500000 GHz Center 1.755 GHz 600 kHz/ Span 6 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:59:17
16QAM 5MHz	 Ref 30 dBm *Att 25 dB *RBW 100 kHz Marker 1 [T1] -28.03 dBm *VBW 300 kHz *SWT 35 ms 1.71000000 GHz Center 1.71 GHz 1 MHz/ Span 10 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 15:59:59	 Ref 30 dBm *Att 25 dB *RBW 100 kHz Marker 1 [T1] -25.88 dBm *VBW 300 kHz *SWT 35 ms 1.75500000 GHz Center 1.755 GHz 1 MHz/ Span 10 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 16:00:15

Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 10MHz	 Ref 30 dBm *Att 25 dB *RBW 100 kHz Marker 1 [T1] -22.65 dBm *VBW 300 kHz *SWT 35 ms 1.710000000 GHz Center 1.71 GHz 2 MHz/ Span 20 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 16:00:59	 Ref 30 dBm *Att 25 dB *RBW 100 kHz Marker 1 [T1] -21.04 dBm *VBW 300 kHz *SWT 35 ms 1.755000000 GHz Center 1.755 GHz 2 MHz/ Span 20 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 16:01:16
16QAM 15MHz	 Ref 30 dBm *Att 25 dB *RBW 300 kHz Marker 1 [T1] -28.30 dBm *VBW 1 MHz *SWT 35 ms 1.710000000 GHz Center 1.71 GHz 3 MHz/ Span 30 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 16:02:08	 Ref 30 dBm *Att 25 dB *RBW 300 kHz Marker 1 [T1] -25.82 dBm *VBW 1 MHz *SWT 35 ms 1.755000000 GHz Center 1.755 GHz 3 MHz/ Span 30 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 16:02:25
16QAM 20MHz	 Ref 30 dBm *Att 25 dB *RBW 300 kHz Marker 1 [T1] -32.58 dBm *VBW 1 MHz *SWT 35 ms 1.710000000 GHz Center 1.71 GHz 4 MHz/ Span 40 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 16:03:17	 Ref 30 dBm *Att 25 dB *RBW 300 kHz Marker 1 [T1] -30.39 dBm *VBW 1 MHz *SWT 35 ms 1.755000000 GHz Center 1.755 GHz 4 MHz/ Span 40 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 16:03:35

4.8 Antenna Port Test Data and Results for LTE Band 5

Serial Number:	2AS5-5	Test Date:	2023/9/16
Test Site:	RF	Test Mode:	Transmitting
Tester:	Rod Luo	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	28	Relative Humidity: (%)	55	ATM Pressure: (kPa)	100.1
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU26	200256	2023/3/31	2024/3/30
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211002	Each time	N/A
Minl-Circuits	Power Splitter	ZFRSC-183-S+	S F448201619	Each time	N/A
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	824.7	836.5	848.3
3MHz	825.5	836.5	847.5
5MHz	826.5	836.5	846.5
10MHz	829	836.5	844

Test Data:**FCC§2.1046;§ 22.913 (a)****RF Output Power:**

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum ERP (dBm)	ERP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
1.4MHz QPSK	RB1#0	23.55	23.01	23.17	16.48	38.45
	RB1#3	23.63	23.24	23.32		
	RB1#5	23.54	22.98	23.14		
	RB3#0	23.41	23.06	23.12		
	RB3#3	23.5	23.04	23.14		
	RB6#0	22.47	22.27	22.2		
1.4MHz 16QAM	RB1#0	22.19	22.06	22.16	15.23	38.45
	RB1#3	22.38	22.18	22.37		
	RB1#5	22.11	21.99	22.18		
	RB3#0	22.22	22.22	22.04		
	RB3#3	22.22	22.21	22.11		
	RB6#0	21.15	21.31	21.28		
3MHz QPSK	RB1#0	23.61	23.06	23.22	16.46	38.45
	RB1#8	23.59	22.98	23.1		
	RB1#14	23.59	22.98	23.11		
	RB6#0	22.5	22.06	22.05		
	RB6#9	22.52	22.06	22.09		
	RB15#0	22.55	22.11	22.1		
3MHz 16QAM	RB1#0	22.59	22.55	22.21	15.44	38.45
	RB1#8	22.53	22.51	22.18		
	RB1#14	22.35	22.5	22.23		
	RB6#0	21.47	21.1	21.12		
	RB6#9	21.29	21.07	21.14		
	RB15#0	21.35	21.1	21.12		
5MHz QPSK	RB1#0	23.58	23.36	22.97	16.47	38.45
	RB1#13	23.62	23.31	23.2		
	RB1#24	23.54	23	23.05		
	RB15#0	22.6	22.13	22.17		
	RB15#10	22.58	22.2	22.13		
	RB25#0	22.56	22.09	22.11		
5MHz 16QAM	RB1#0	22.76	22.13	21.95	15.72	38.45
	RB1#13	22.87	22.21	22		
	RB1#24	22.73	22	21.95		
	RB15#0	21.58	21.04	21.23		
	RB15#10	21.56	21.16	21.16		
	RB25#0	21.57	21.18	21.17		

10MHz QPSK	RB1#0	23.53	23.43	23.04	16.49	38.45
	RB1#25	23.64	23.24	23.27		
	RB1#49	23.51	23.11	23.15		
	RB25#0	22.57	22.04	22.12		
	RB25#25	22.5	22.06	22.08		
	RB50#0	22.56	22.14	22.12		
10MHz 16QAM	RB1#0	23.06	22.2	22.01	16.06	38.45
	RB1#25	23.21	22.27	22.21		
	RB1#49	22.93	22.21	22.12		
	RB25#0	21.68	21.05	21.18		
	RB25#25	21.59	21.07	21.22		
	RB50#0	21.47	21.09	21.12		

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

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	
10MHz QPSK	RB1#0	4.71	4.65	4.07	13
	RB50#0	5.45	5.32	5.35	13
10MHz 16QAM	RB1#0	5.74	5.71	4.62	13
	RB50#0	6.25	6.15	6.15	13
				Result:	Pass

FCC §2.1049, §22.905: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	1.098	1.104	1.104	1.308	1.314	1.314
1.4MHz 16QAM	1.098	1.110	1.092	1.302	1.308	1.296
3MHz QPSK	2.688	2.688	2.688	2.880	2.892	2.868
3MHz 16QAM	2.688	2.676	2.688	2.880	2.880	2.880
5MHz QPSK	4.500	4.520	4.520	4.960	4.940	5.000
5MHz 16QAM	4.500	4.500	4.520	4.960	4.960	4.960
10MHz QPSK	8.960	9.000	8.960	9.600	9.640	9.480
10MHz 16QAM	8.960	8.960	8.960	9.600	9.560	9.640

Note: The test plots please refer to the Plots of Occupied Bandwidth

FCC §2.1051, §22.917(a):Spurious Emissions at Antenna Terminal

Result:	Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.
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FCC §2.1051, §22.917(a):Out of band emission, Band Edge

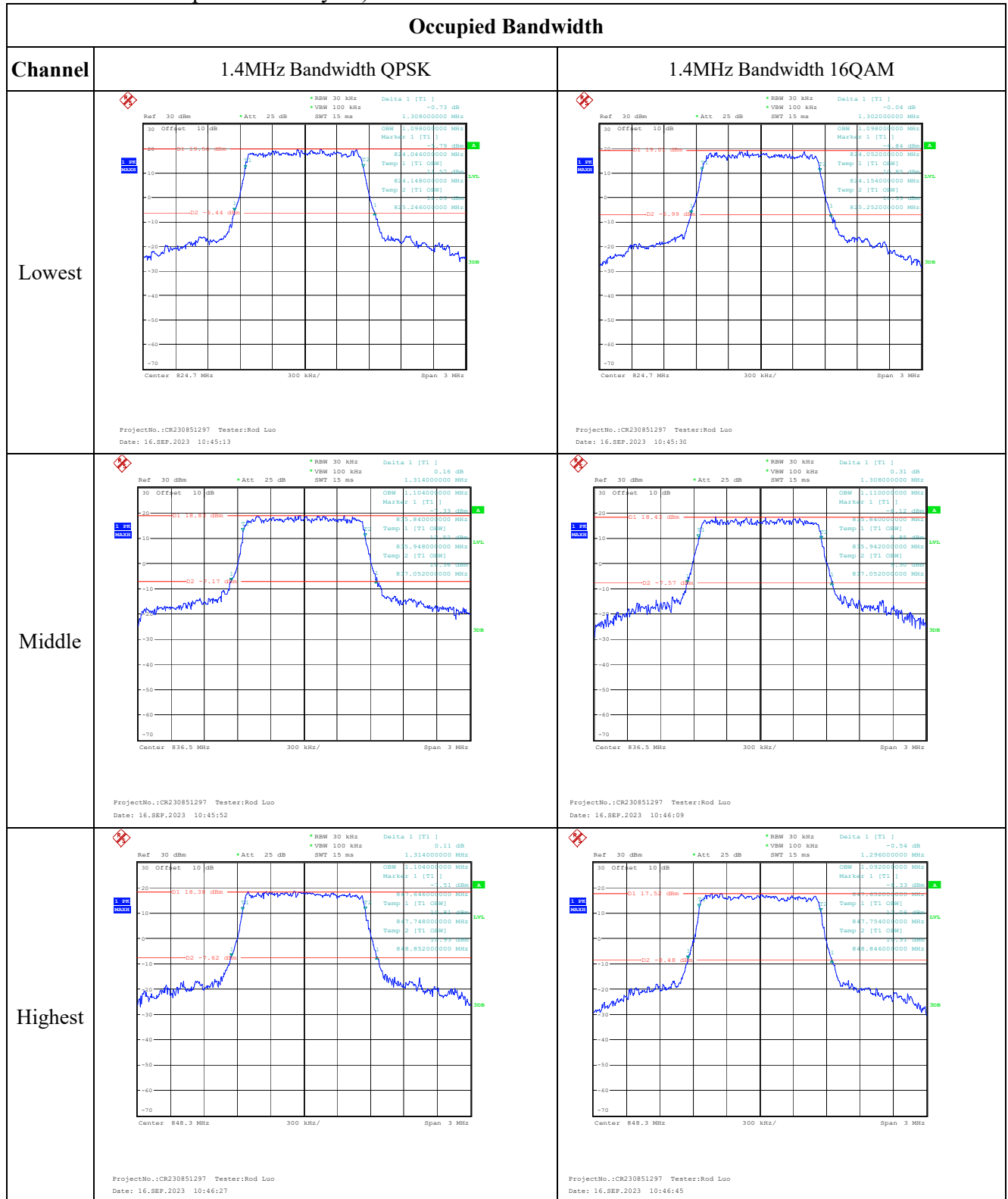
Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.
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FCC §2.1055, §22.355: Frequency Stability

Test Modulation:	10 MHz QPSK		Test Channel:	836.5	MHz
Test Item	Temperature (°C)	Voltage (V _{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.85	22.36	0.027	2.5
	-20	3.85	21.15	0.025	2.5
	-10	3.85	20.09	0.024	2.5
	0	3.85	22.32	0.027	2.5
	10	3.85	16.55	0.020	2.5
	20	3.85	20.87	0.025	2.5
	30	3.85	22.51	0.027	2.5
	40	3.85	17.33	0.021	2.5
	50	3.85	21.72	0.026	2.5
Frequency Stability vs. Voltage	20	3.45	16.89	0.020	2.5
	20	4.4	21.8	0.026	2.5
Result:				Pass	

Test Modulation:	10 MHz 16QAM		Test Channel:	836.5	MHz
Test Item	Temperature (°C)	Voltage (V _{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.85	17.21	0.021	2.5
	-20	3.85	18.92	0.023	2.5
	-10	3.85	16.91	0.020	2.5
	0	3.85	21.62	0.026	2.5
	10	3.85	19.28	0.023	2.5
	20	3.85	19.15	0.023	2.5
	30	3.85	19.34	0.023	2.5
	40	3.85	20.67	0.025	2.5
	50	3.85	19.79	0.024	2.5
Frequency Stability vs. Voltage	20	3.45	21.24	0.025	2.5
	20	4.4	20.95	0.025	2.5
Result:				Pass	

Test Plots(Note: The 10 dB is the Insertion loss of the RF cable and Power Splitter, which was offset into the Spectrum Analyzer):



Occupied Bandwidth

Channel	3MHz Bandwidth QPSK	3MHz Bandwidth 16QAM
Lowest	Ref 30 dBm *Att 25 dB *RBW 30 kHz Delta 1 [T1] -0.61 dB *VSW 100 kHz SWT 30 ms 2.880000000 MHz OSW 2.880000000 MHz Marker 1 [T1] -16.14 dBm Temp 1 [T1] OSW 825.500000000 MHz Temp 2 [T1] OSW 826.844000000 MHz Center 825.5 MHz 600 kHz/ Span 6 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 10:47:38	Ref 30 dBm *Att 25 dB *RBW 30 kHz Delta 1 [T1] -0.10 dB *VSW 100 kHz SWT 30 ms 2.880000000 MHz OSW 2.880000000 MHz Marker 1 [T1] -15.19 dBm Temp 1 [T1] OSW 825.500000000 MHz Temp 2 [T1] OSW 826.844000000 MHz Center 825.5 MHz 600 kHz/ Span 6 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 10:47:52
Middle	Ref 30 dBm *Att 25 dB *RBW 30 kHz Delta 1 [T1] 0.03 dB *VSW 100 kHz SWT 30 ms 2.880000000 MHz OSW 2.880000000 MHz Marker 1 [T1] -15.4 dBm Temp 1 [T1] OSW 836.500000000 MHz Temp 2 [T1] OSW 837.844000000 MHz Center 836.5 MHz 600 kHz/ Span 6 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 10:48:07	Ref 30 dBm *Att 25 dB *RBW 30 kHz Delta 1 [T1] 0.22 dB *VSW 100 kHz SWT 30 ms 2.880000000 MHz OSW 2.880000000 MHz Marker 1 [T1] -15.4 dBm Temp 1 [T1] OSW 836.500000000 MHz Temp 2 [T1] OSW 837.844000000 MHz Center 836.5 MHz 600 kHz/ Span 6 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 10:48:25
Highest	Ref 30 dBm *Att 25 dB *RBW 30 kHz Delta 1 [T1] 0.43 dB *VSW 100 kHz SWT 30 ms 2.880000000 MHz OSW 2.880000000 MHz Marker 1 [T1] -16.6 dBm Temp 1 [T1] OSW 847.500000000 MHz Temp 2 [T1] OSW 848.844000000 MHz Center 847.5 MHz 600 kHz/ Span 6 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 10:48:40	Ref 30 dBm *Att 25 dB *RBW 30 kHz Delta 1 [T1] 3.25 dB *VSW 100 kHz SWT 30 ms 2.880000000 MHz OSW 2.880000000 MHz Marker 1 [T1] -14.6 dBm Temp 1 [T1] OSW 847.500000000 MHz Temp 2 [T1] OSW 848.844000000 MHz Center 847.5 MHz 600 kHz/ Span 6 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 10:48:54

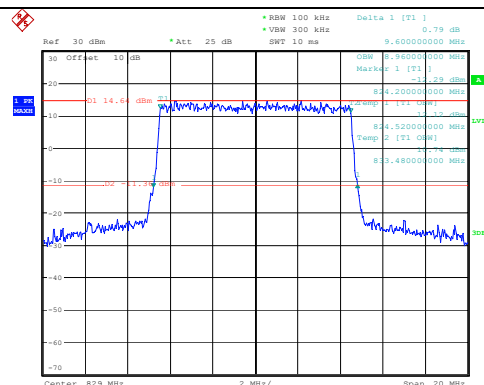
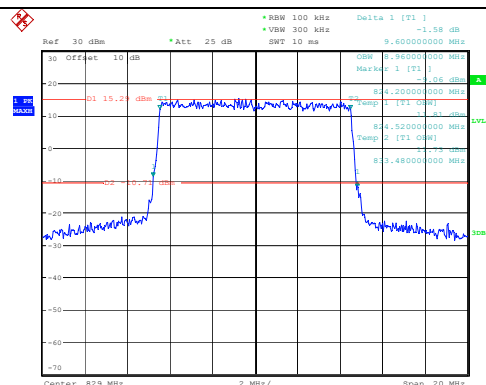
Occupied Bandwidth

Channel

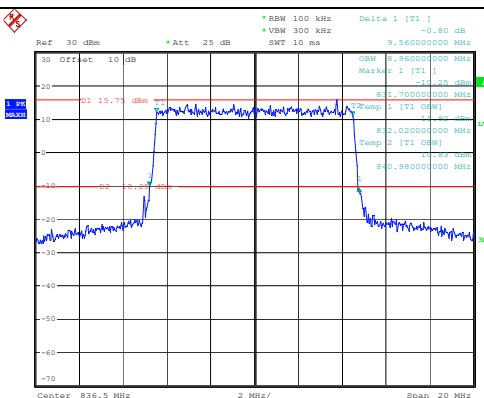
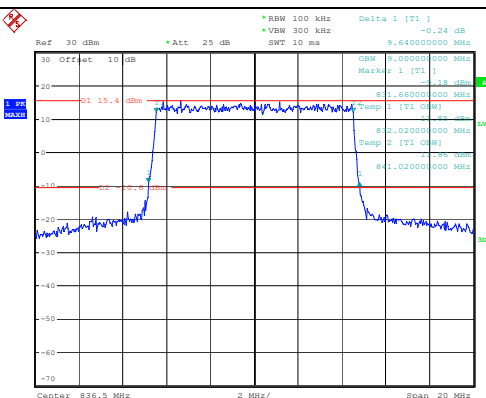
10MHz Bandwidth QPSK

10MHz Bandwidth 16QAM

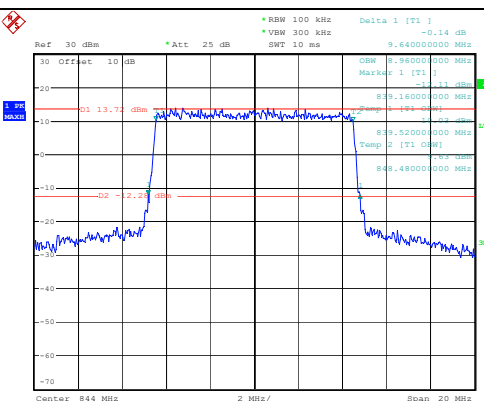
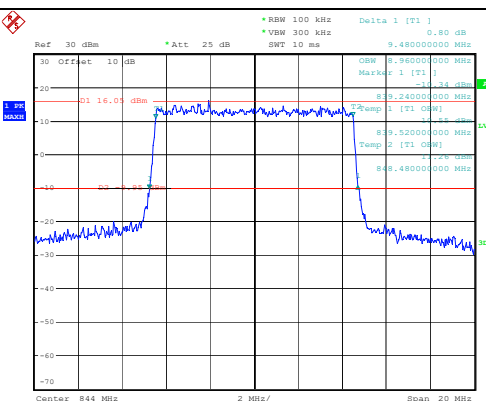
Lowest



Middle



Highest

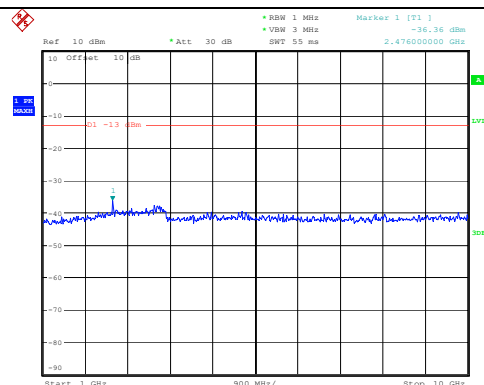
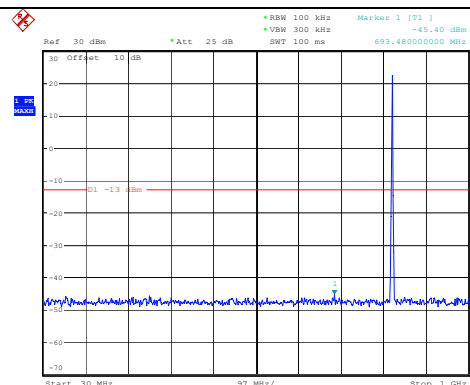


Spurious Emissions at Antenna Terminal

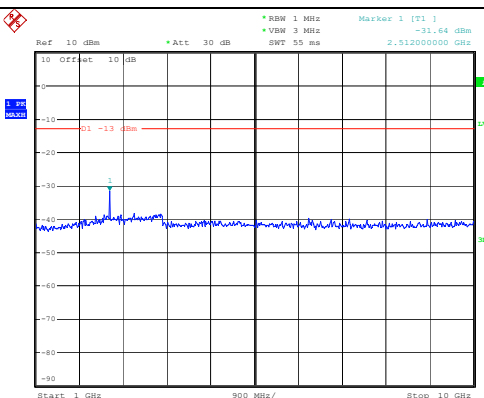
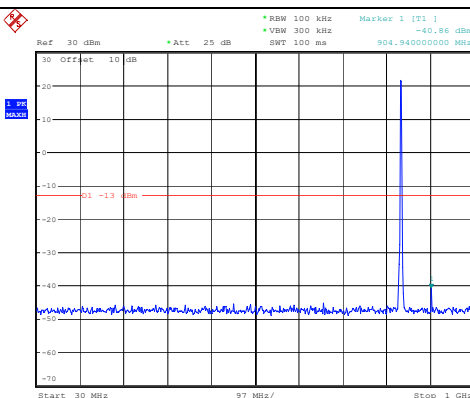
Channel

1.4MHz Bandwidth QPSK

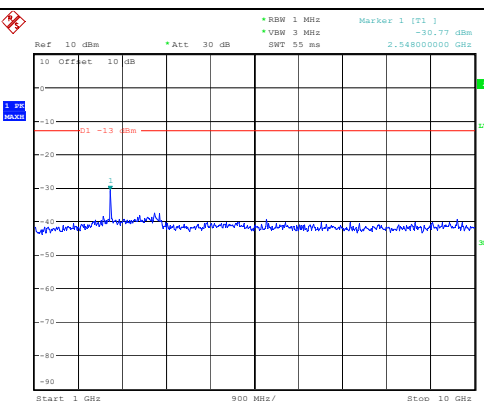
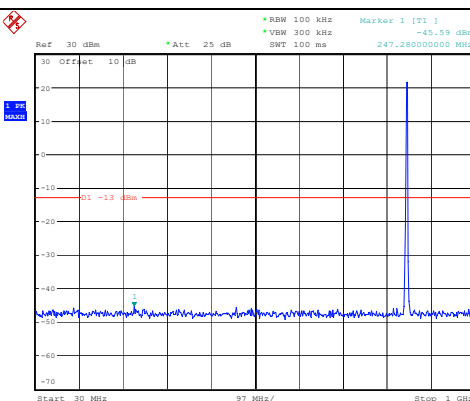
Lowest



Middle



Highest

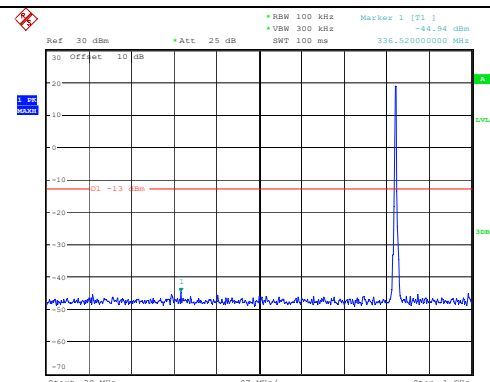


Spurious Emissions at Antenna Terminal

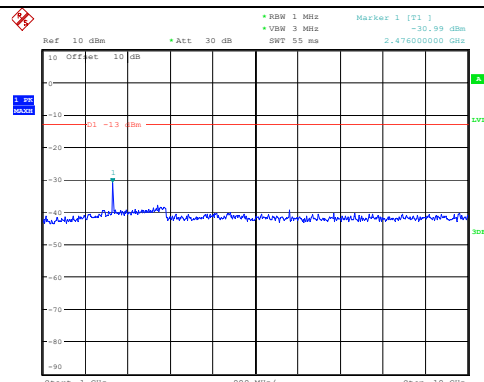
Channel

3MHz Bandwidth QPSK

Lowest

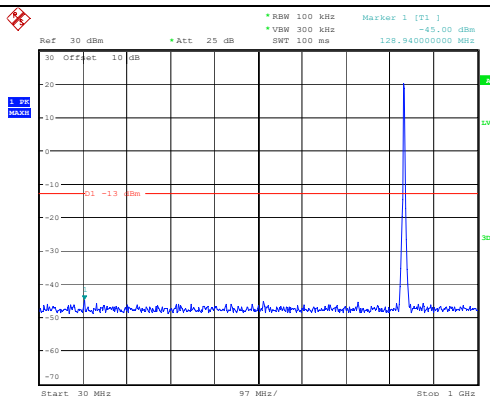


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 11:38:43

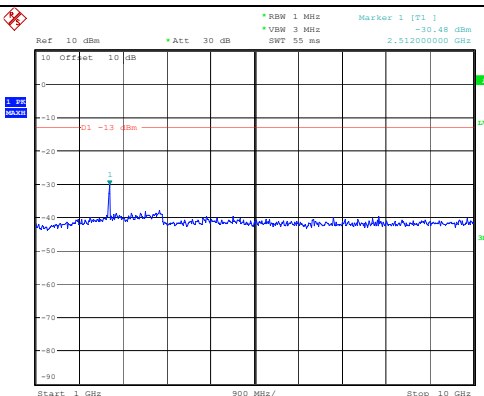


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Date: 16.SEP.2023 11:38:54

Middle

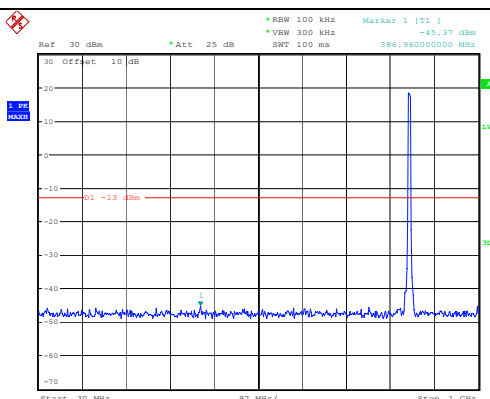


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 11:39:07

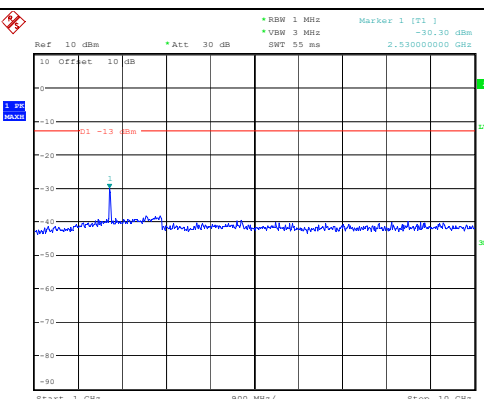


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 11:39:18

Highest



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 11:39:31



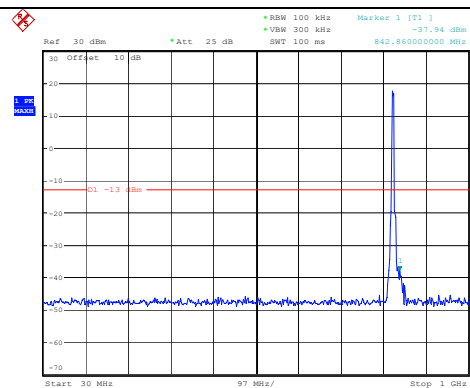
ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 11:39:42

Spurious Emissions at Antenna Terminal

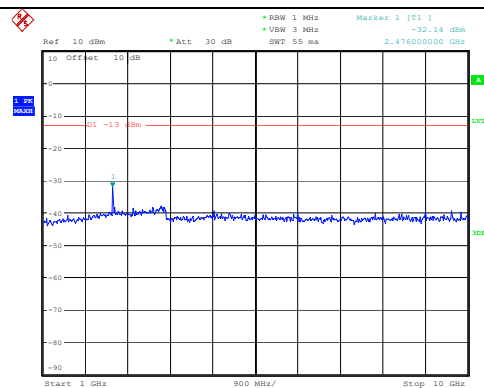
Channel

5MHz Bandwidth QPSK

Lowest

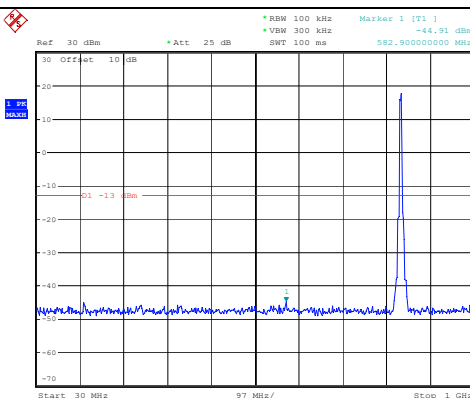


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 11:40:23

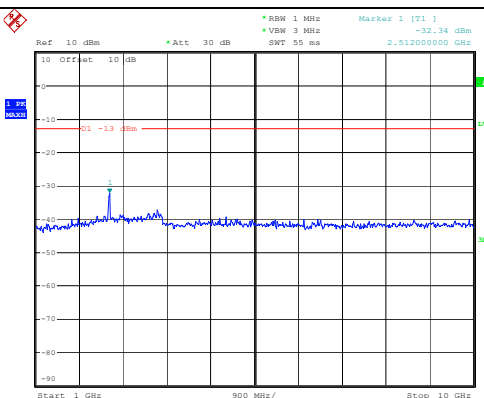


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 11:40:33

Middle

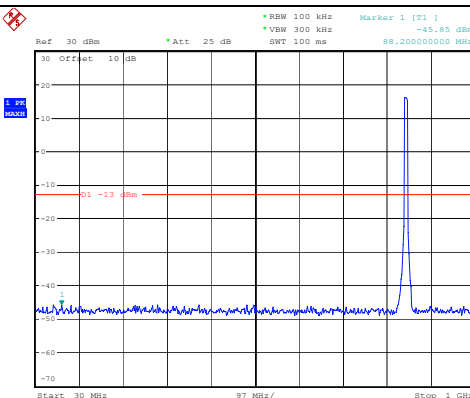


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Date: 16.SEP.2023 11:40:48

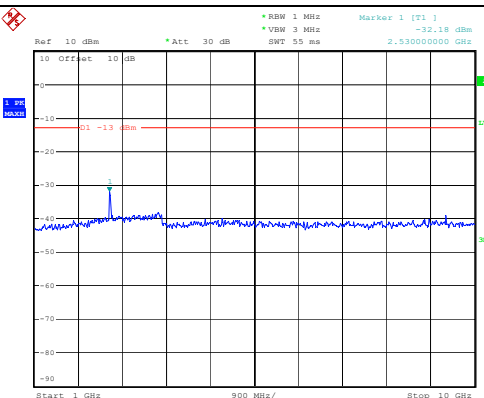


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 11:40:58

Highest

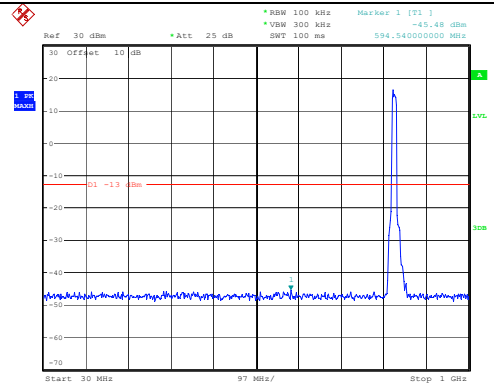
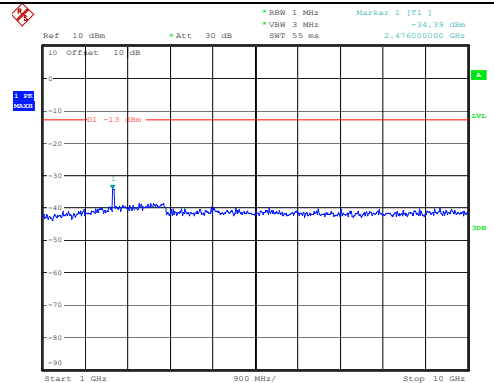
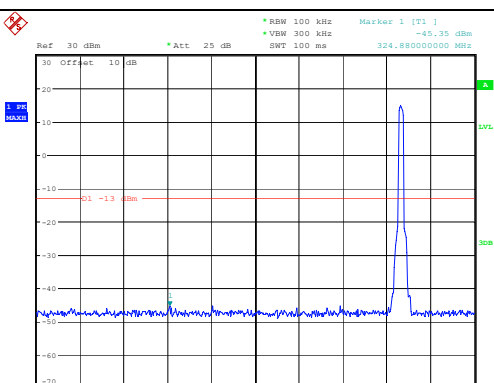
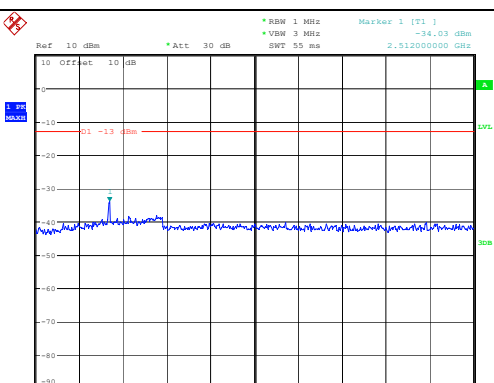
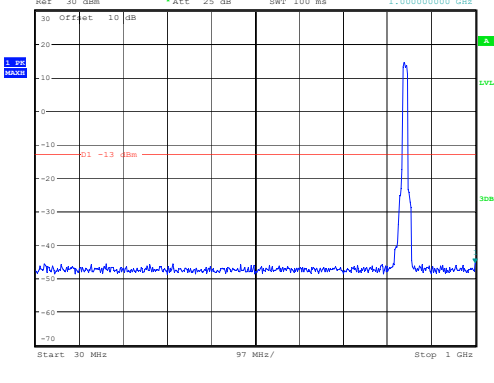
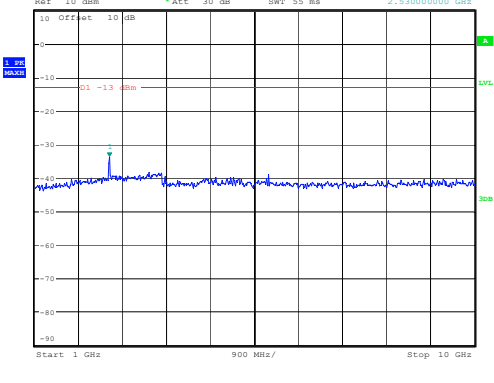


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 11:41:12

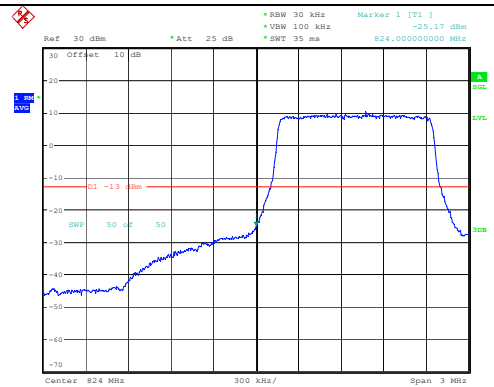
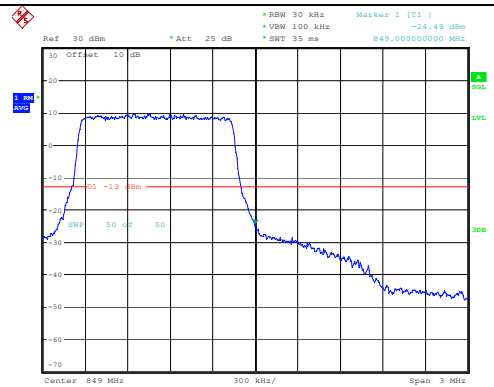
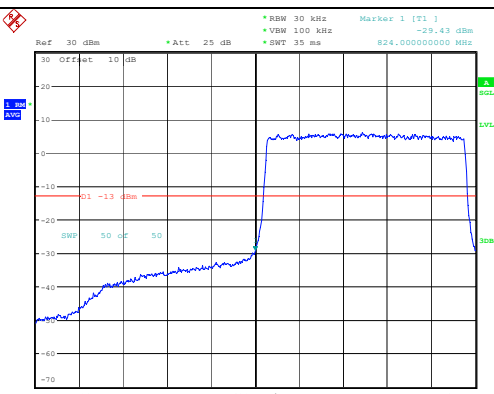
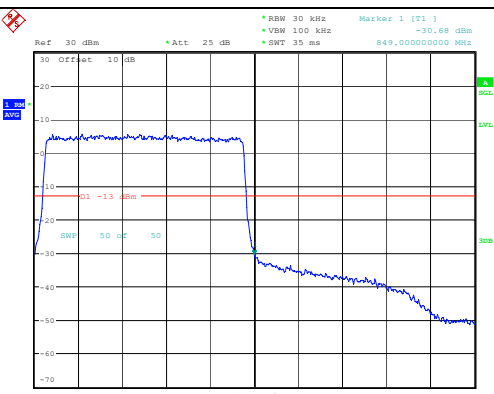
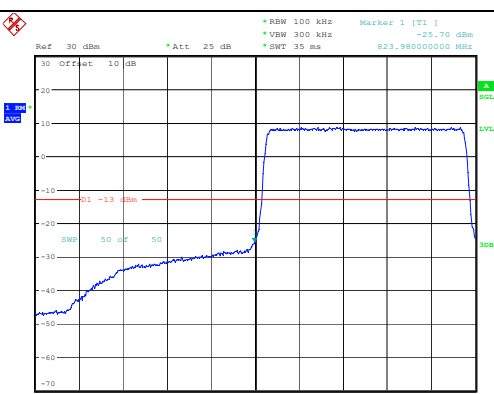
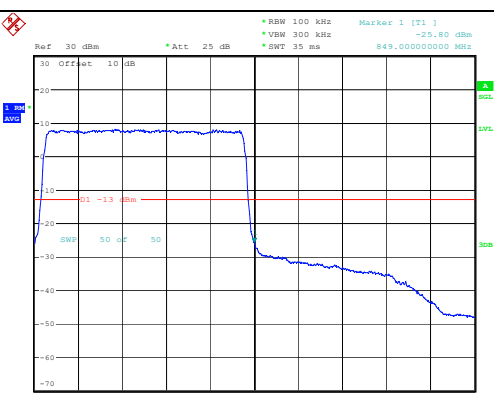


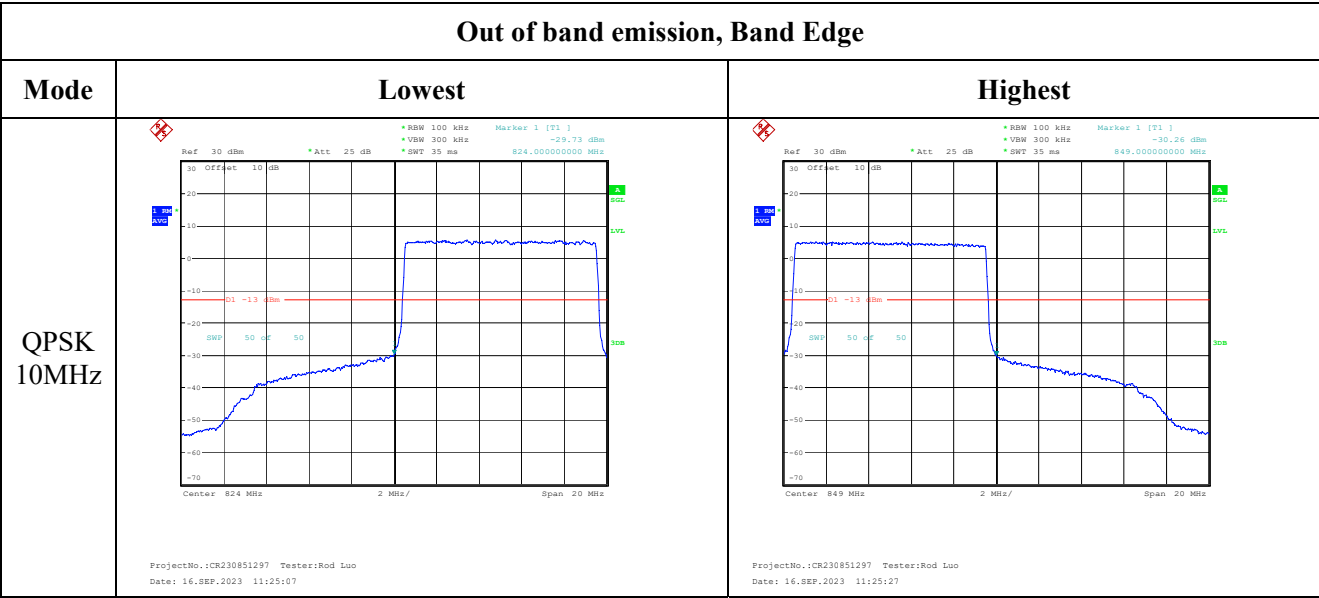
ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 11:41:22

Spurious Emissions at Antenna Terminal

Channel	10MHz Bandwidth QPSK	
Lowest	 ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 11:42:08	 ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 11:42:18
	 ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 11:42:36	 ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 11:42:46
Highest	 ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 11:43:05	 ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 11:43:15

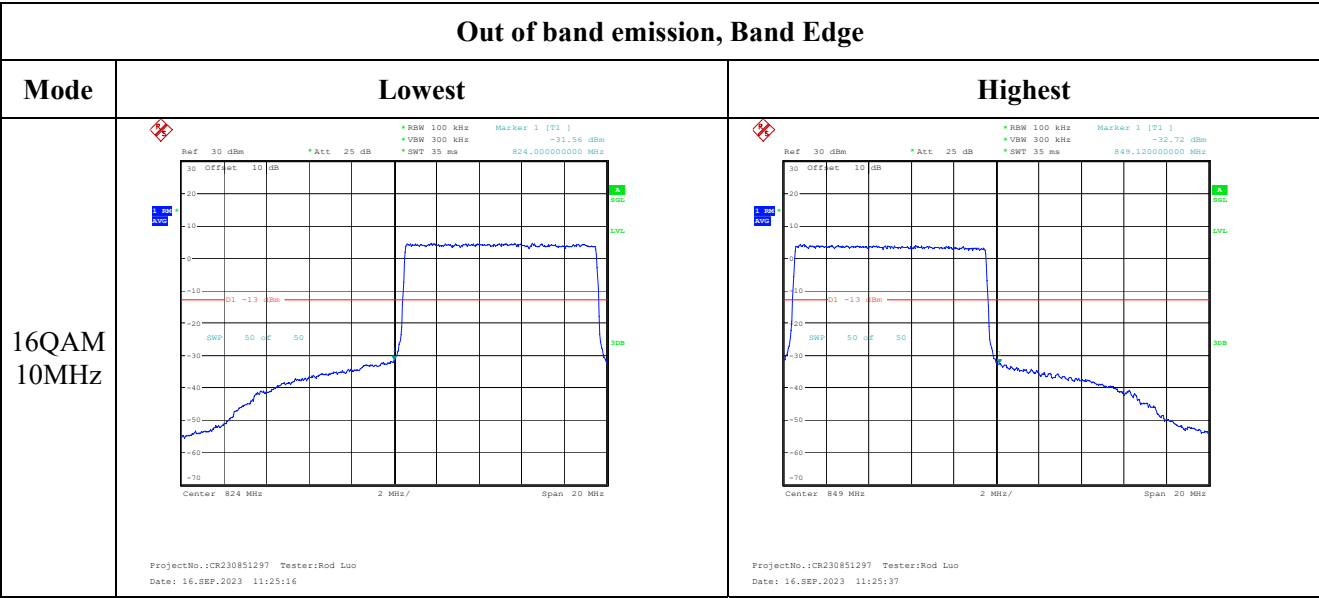
Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 1.4MHz	 ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 11:22:09	 ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 11:22:24
QPSK 3MHz	 ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 11:23:06	 ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 11:23:21
QPSK 5MHz	 ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 11:24:05	 ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 11:24:22



Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 1.4MHz	Ref: 30 dBm *Att: 25 dB *RBW 30 kHz *VSW 100 kHz *SWT 35 ns Marker 1 [T1] -26.23 dBm 823.994000000 MHz Center: 824 MHz 300 kHz/ Span: 3 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 11:22:16	Ref: 30 dBm *Att: 25 dB *RBW 30 kHz *VSW 100 kHz *SWT 35 ns Marker 1 [T1] -27.40 dBm 849.006000000 MHz Center: 849 MHz 300 kHz/ Span: 3 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 11:22:31
16QAM 3MHz	Ref: 30 dBm *Att: 25 dB *RBW 30 kHz *VSW 100 kHz *SWT 35 ns Marker 1 [T1] -31.42 dBm 823.988000000 MHz Center: 824 MHz 600 kHz/ Span: 6 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 11:23:13	Ref: 30 dBm *Att: 25 dB *RBW 30 kHz *VSW 100 kHz *SWT 35 ns Marker 1 [T1] -31.85 dBm 849.000000000 MHz Center: 849 MHz 600 kHz/ Span: 6 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 11:23:29
16QAM 5MHz	Ref: 30 dBm *Att: 25 dB *RBW 100 kHz *VSW 300 kHz *SWT 35 ns Marker 1 [T1] -26.42 dBm 824.000000000 MHz Center: 824 MHz 1 MHz/ Span: 10 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 11:24:13	Ref: 30 dBm *Att: 25 dB *RBW 100 kHz *VSW 300 kHz *SWT 35 ns Marker 1 [T1] -30.01 dBm 849.000000000 MHz Center: 849 MHz 1 MHz/ Span: 10 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 11:24:30



4.9 Antenna Port Test Data and Results for LTE Band 7

Serial Number:	2AS5-5	Test Date:	2023/9/16~2023/9/18
Test Site:	RF	Test Mode:	Transmitting
Tester:	Rod Luo	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	25.9-28	Relative Humidity: (%)	55-60	ATM Pressure: (kPa)	100.1~100.2
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU26	200256	2023/3/31	2024/3/30
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211002	Each time	N/A
Mini-Circuits	Power Splitter	ZFRSC-183-S+	S F448201619	Each time	N/A
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)
5MHz	2502.5	2535	2567.5
10MHz	2505	2535	2565
15MHz	2507.5	2535	2562.5
20MHz	2510	2535	2560

Test Data:**FCC§2.1046;§ 27.50(h)(2)****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		
5MHz QPSK	RB1#0	22.6	22.09	22.38	19.90	33
	RB1#13	22.22	22.25	22.54		
	RB1#24	21.92	22.13	22.55		
	RB15#0	21.15	21.18	21.47		
	RB15#10	21.09	21.22	21.49		
	RB25#0	21.05	21.19	21.47		
5MHz 16QAM	RB1#0	21.1	20.92	21.6	19.08	33
	RB1#13	21.2	21.07	21.78		
	RB1#24	21.01	20.96	21.74		
	RB15#0	20.21	20.24	20.44		
	RB15#10	20.16	20.28	20.48		
	RB25#0	20.16	20.23	20.42		
10MHz QPSK	RB1#0	22.71	22.19	22.38	20.01	33
	RB1#25	22.71	22.39	22.62		
	RB1#49	22.47	22.24	22.61		
	RB25#0	21.12	21.15	21.42		
	RB25#25	21.04	21.22	21.52		
	RB50#0	21.06	21.19	21.46		
10MHz 16QAM	RB1#0	21.16	21.64	21.45	19.14	33
	RB1#25	21.14	21.84	21.7		
	RB1#49	20.97	21.67	21.72		
	RB25#0	20.26	20.27	20.47		
	RB25#25	20.19	20.33	20.53		
	RB50#0	20.16	20.24	20.46		
15MHz QPSK	RB1#0	22.63	22.13	22.2	19.93	33
	RB1#38	22.53	22.27	22.43		
	RB1#74	22.04	22.15	22.52		
	RB36#0	21.14	21.29	21.42		
	RB36#39	21.01	21.33	21.58		
	RB75#0	21.06	21.33	21.49		
15MHz 16QAM	RB1#0	21.24	21.41	21.75	19.32	33
	RB1#38	21.17	21.54	21.95		
	RB1#74	20.96	21.46	22.02		
	RB36#0	20.17	20.25	20.41		
	RB36#39	20.06	20.29	20.51		
	RB75#0	20.07	20.24	20.45		

20MHz QPSK	RB1#0	22.48	21.86	22	19.95	33
	RB1#50	22.65	22.34	22.51		
	RB1#99	22.3	21.94	22.34		
	RB50#0	21	21.07	21.28		
	RB50#50	20.93	21.21	21.4		
	RB100#0	20.98	21.16	21.37		
20MHz 16QAM	RB1#0	21.13	21.41	21.31	19.14	33
	RB1#50	21.36	21.84	21.77		
	RB1#99	20.92	21.5	21.58		
	RB50#0	20.03	20.08	20.3		
	RB50#50	19.99	20.23	20.38		
	RB100#0	20.06	20.18	20.34		

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	4.58	4.09	4.78	13
	RB100#0	5.16	4.67	4.99	13
20MHz 16QAM	RB1#0	5.62	4.87	5.8	13
	RB100#0	6.09	5.62	5.97	13
				Result:	Pass

FCC §2.1049, §27.53: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
5MHz QPSK	4.500	4.520	4.520	4.960	4.940	4.960
5MHz 16QAM	4.520	4.500	4.500	4.980	4.920	4.980
10MHz QPSK	9.000	9.000	8.960	9.560	9.720	9.560
10MHz 16QAM	8.960	8.920	8.960	9.520	9.560	9.600
15MHz QPSK	13.500	13.500	13.500	14.820	14.880	14.820
15MHz 16QAM	13.560	13.500	13.560	14.820	14.700	14.760
20MHz QPSK	18.000	17.920	18.000	19.520	19.360	19.360
20MHz 16QAM	18.000	18.000	18.000	19.360	19.440	19.440

Note: The test plots please refer to the Plots of Occupied Bandwidth

FCC §2.1051, § 27.53:Spurious Emissions at Antenna Terminal

Result:	Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.
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FCC §2.1051, § 27.53: Out of band emission, Band Edge

Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.
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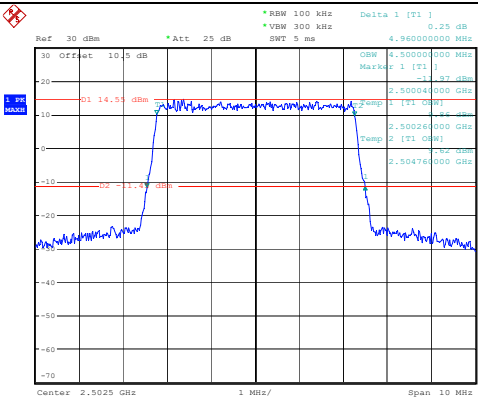
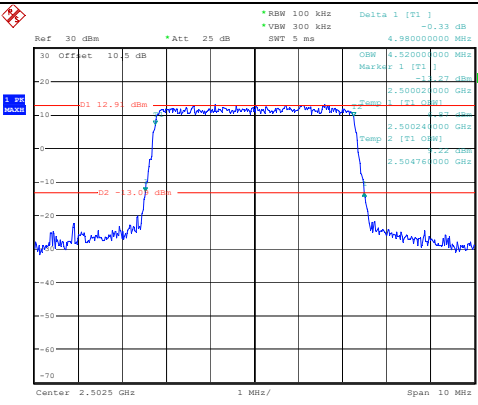
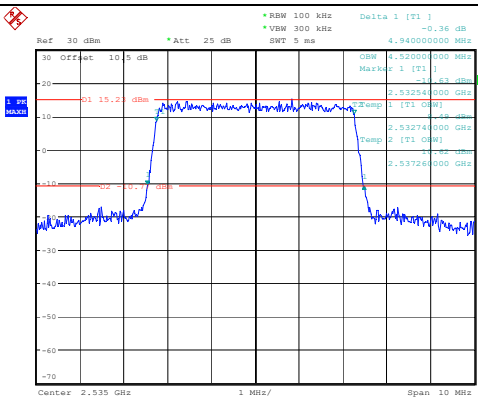
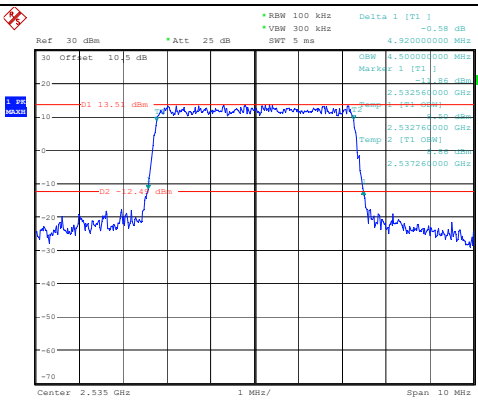
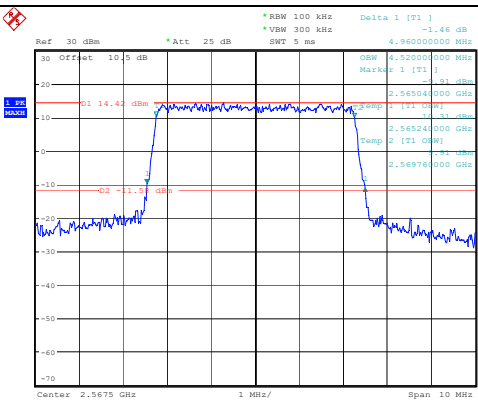
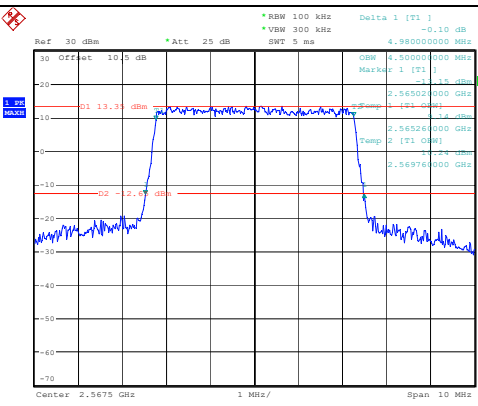
FCC §2.1055, §27.54: Frequency Stability

Test Mode:	20M QPSK	Test Channel: Lowest for Lower Edge, Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.85	2500.279	2500.00	2569.773	2570
	-20	3.85	2500.258	2500.00	2569.872	2570
	-10	3.85	2500.102	2500.00	2569.840	2570
	0	3.85	2500.208	2500.00	2569.789	2570
	10	3.85	2500.238	2500.00	2569.819	2570
	20	3.85	2500.108	2500.00	2569.892	2570
	30	3.85	2500.160	2500.00	2569.742	2570
	40	3.85	2500.288	2500.00	2569.758	2570
Frequency Stability vs. Voltage	50	3.85	2500.286	2500.00	2569.806	2570
	20	3.45	2500.220	2500.00	2569.714	2570
	20	4.4	2500.181	2500.00	2569.855	2570
Result:					Pass	

Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge, Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.85	2500.153	2500.00	2569.745	2570
	-20	3.85	2500.247	2500.00	2569.773	2570
	-10	3.85	2500.143	2500.00	2569.876	2570
	0	3.85	2500.257	2500.00	2569.722	2570
	10	3.85	2500.181	2500.00	2569.807	2570
	20	3.85	2500.269	2500.00	2569.772	2570
	30	3.85	2500.216	2500.00	2569.834	2570
	40	3.85	2500.254	2500.00	2569.781	2570
Frequency Stability vs. Voltage	50	3.85	2500.162	2500.00	2569.826	2570
	20	3.45	2500.151	2500.00	2569.747	2570
Frequency Stability vs. Voltage	20	4.4	2500.129	2500.00	2569.890	2570
Result:					Pass	

Test Plots(Note: The 10.5dB is the Insertion loss of the RF cable, Power Splitter and DC Block, which was offset into the Spectrum Analyzer):

Occupied Bandwidth

Channel	5MHz Bandwidth QPSK	5MHz Bandwidth 16QAM
Lowest	 Ref 30 dBm *Att 25 dB *RBW 100 kHz *VSW 300 kHz SWF 5 ms Delta 1 [T1] 0.25 dB OSW 4.960000000 MHz Marker 1 [T1] -14.55 dBm Temp 1 [T1] OSW Temp 2 [T1] OSW Center 2.5025 GHz 1 MHz/ Span 10 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 14:09:06	 Ref 30 dBm *Att 25 dB *RBW 100 kHz *VSW 300 kHz SWF 5 ms Delta 1 [T1] -0.33 dB OSW 4.960000000 MHz Marker 1 [T1] -12.9 dBm Temp 1 [T1] OSW Temp 2 [T1] OSW Center 2.5025 GHz 1 MHz/ Span 10 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 14:09:24
Middle	 Ref 30 dBm *Att 25 dB *RBW 100 kHz *VSW 300 kHz SWF 5 ms Delta 1 [T1] -0.36 dB OSW 4.960000000 MHz Marker 1 [T1] -15.2 dBm Temp 1 [T1] OSW Temp 2 [T1] OSW Center 2.535 GHz 1 MHz/ Span 10 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 14:09:43	 Ref 30 dBm *Att 25 dB *RBW 100 kHz *VSW 300 kHz SWF 5 ms Delta 1 [T1] -0.58 dB OSW 4.960000000 MHz Marker 1 [T1] -13.5 dBm Temp 1 [T1] OSW Temp 2 [T1] OSW Center 2.535 GHz 1 MHz/ Span 10 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 14:10:04
Highest	 Ref 30 dBm *Att 25 dB *RBW 100 kHz *VSW 300 kHz SWF 5 ms Delta 1 [T1] -1.46 dB OSW 4.960000000 MHz Marker 1 [T1] -14.42 dBm Temp 1 [T1] OSW Temp 2 [T1] OSW Center 2.5675 GHz 1 MHz/ Span 10 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 14:10:23	 Ref 30 dBm *Att 25 dB *RBW 100 kHz *VSW 300 kHz SWF 5 ms Delta 1 [T1] -0.10 dB OSW 4.960000000 MHz Marker 1 [T1] -13.3 dBm Temp 1 [T1] OSW Temp 2 [T1] OSW Center 2.5675 GHz 1 MHz/ Span 10 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 16.SEP.2023 14:10:42

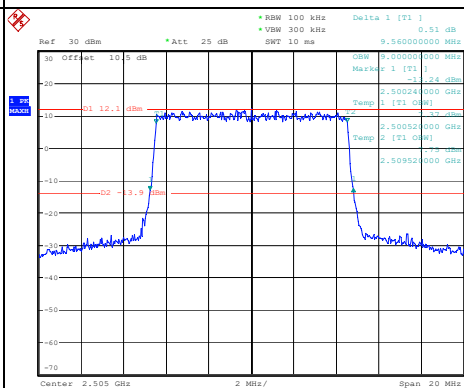
Occupied Bandwidth

Channel

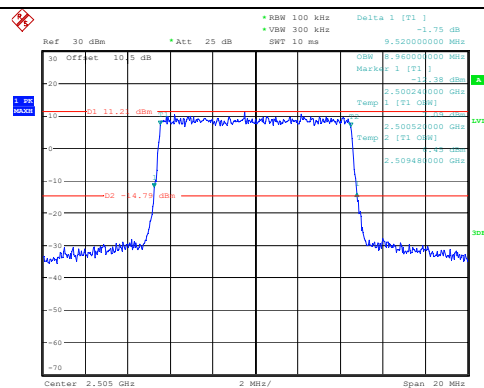
10MHz Bandwidth QPSK

10MHz Bandwidth 16QAM

Lowest

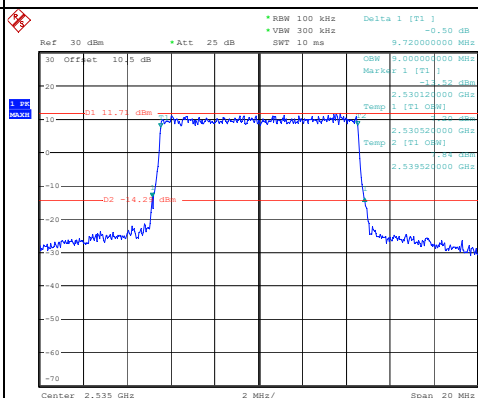


ProjectNo.:CR230851297 Tester:Rod Luo
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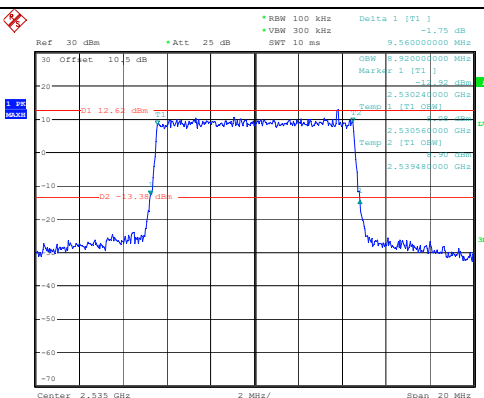


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:12:00

Middle

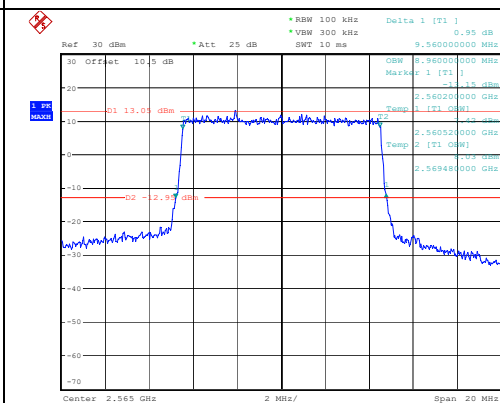


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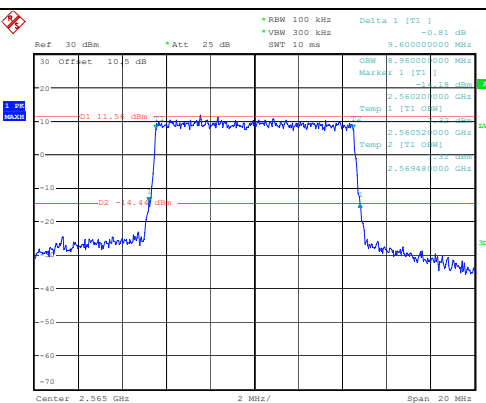


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:12:32

Highest



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:12:51



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:13:07

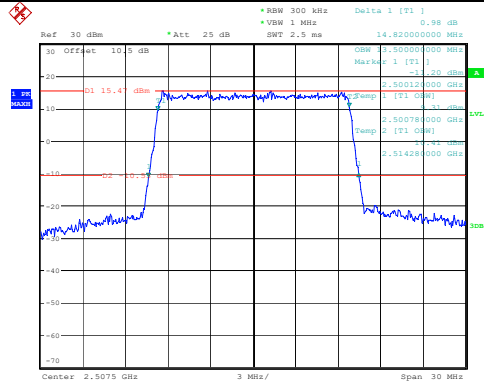
Occupied Bandwidth

Channel

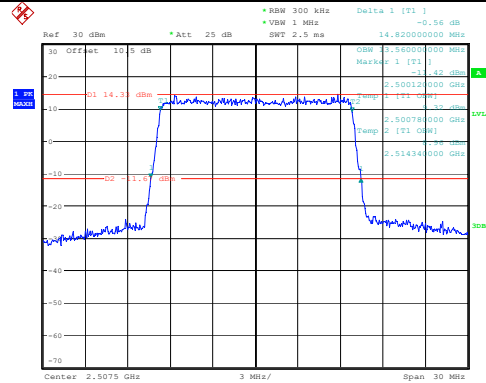
15MHz Bandwidth QPSK

15MHz Bandwidth 16QAM

Lowest

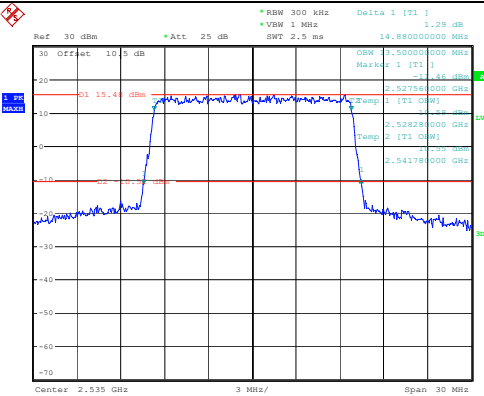


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:14:21

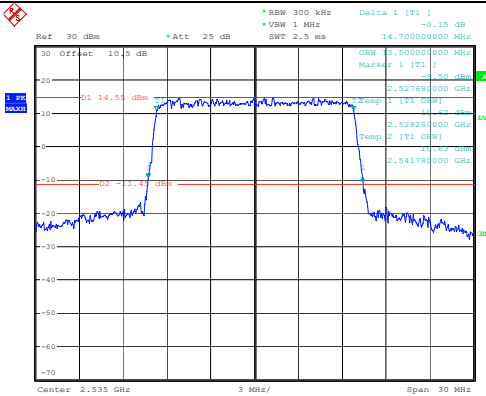


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:14:39

Middle

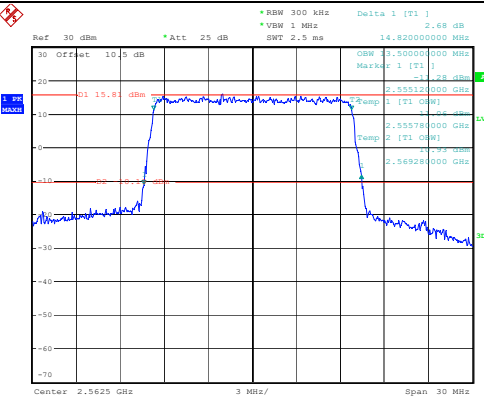


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:15:01

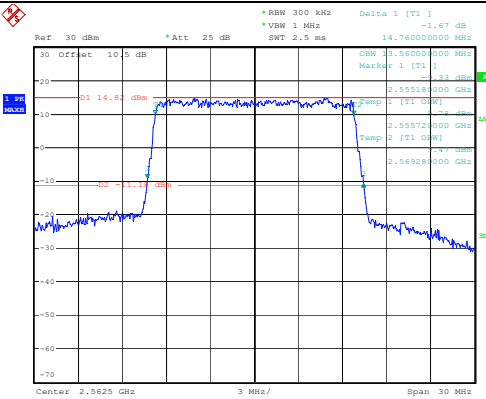


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:15:23

Highest



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:15:45



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:16:06

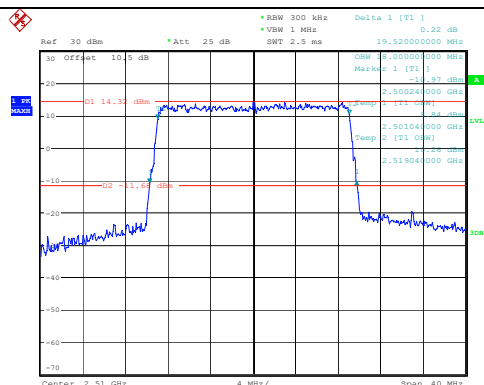
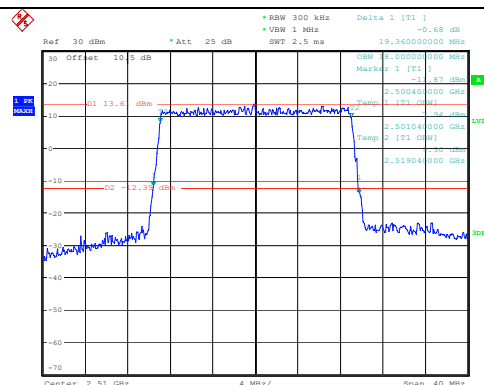
Occupied Bandwidth

Channel

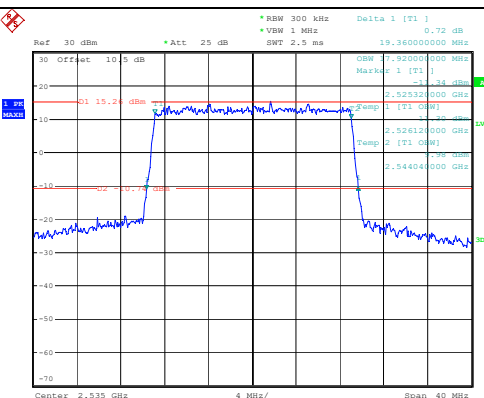
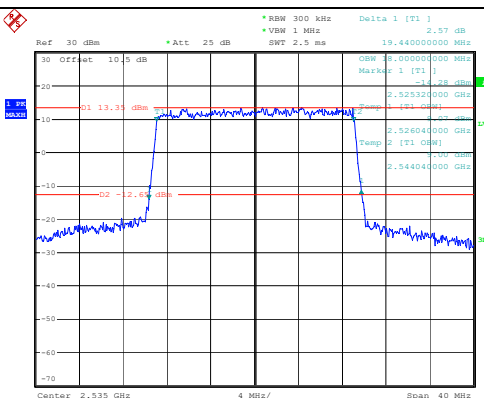
20MHz Bandwidth QPSK

20MHz Bandwidth 16QAM

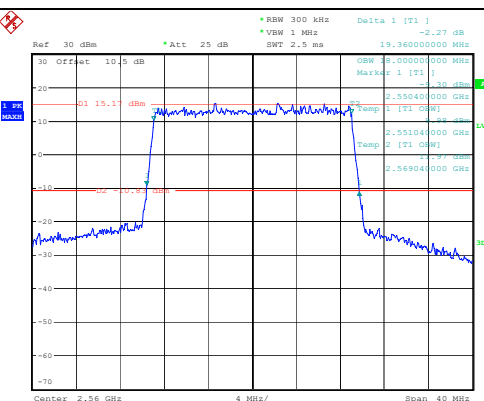
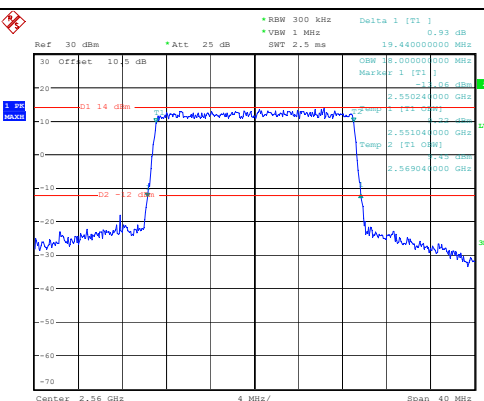
Lowest

ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:17:12ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:17:34

Middle

ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:17:56ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:18:18

Highest

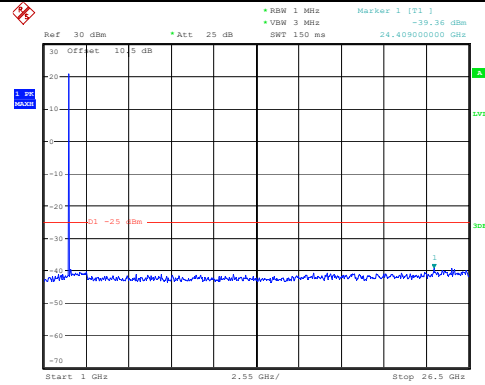
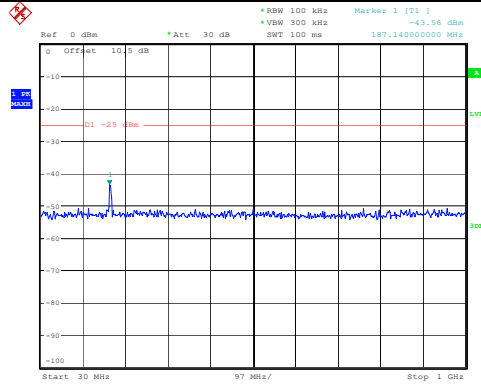
ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:18:38ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 14:19:00

Spurious Emissions at Antenna Terminal

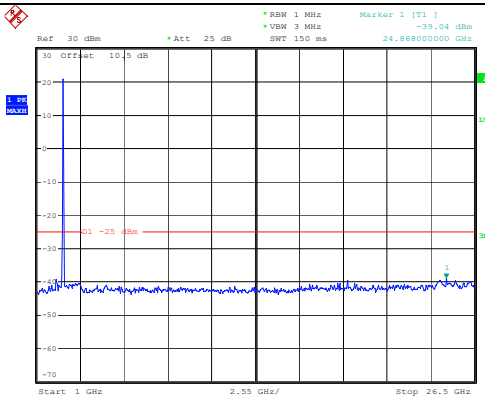
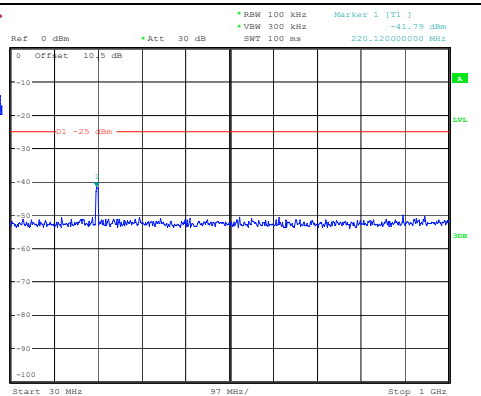
Channel

5MHz Bandwidth QPSK

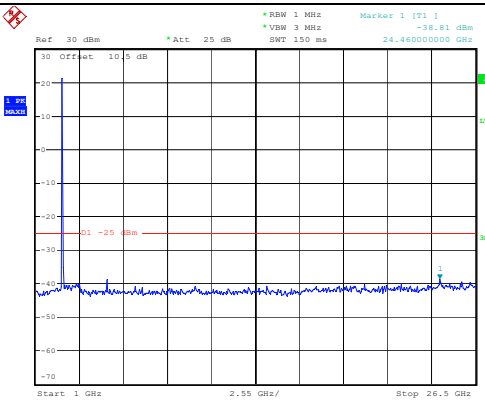
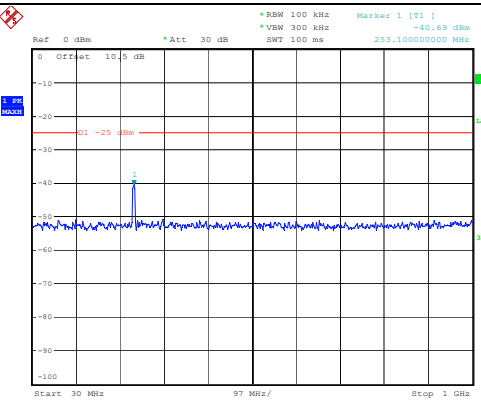
Lowest



Middle



Highest

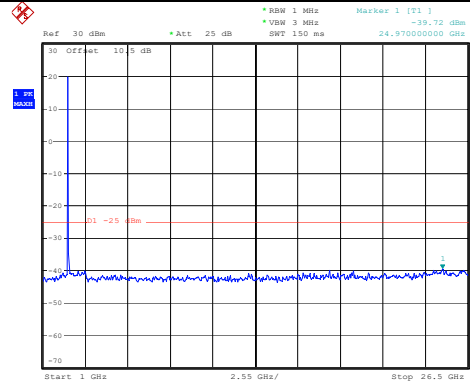
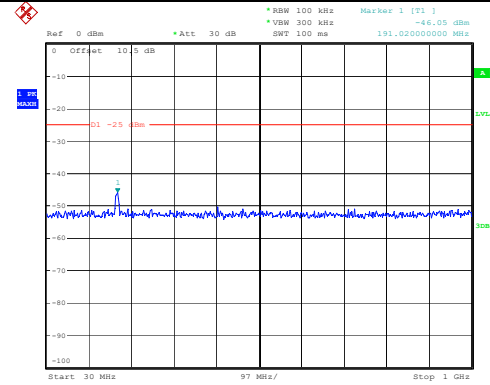


Spurious Emissions at Antenna Terminal

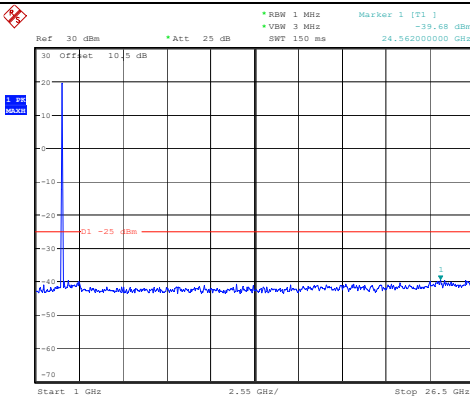
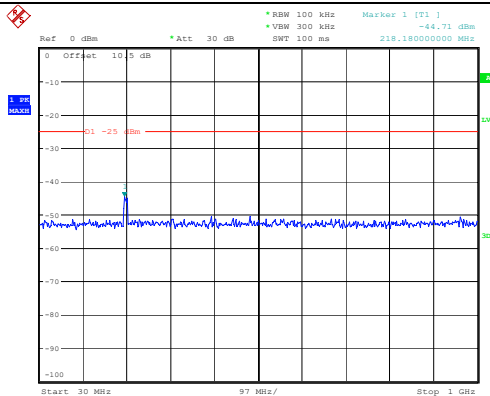
Channel

10MHz Bandwidth QPSK

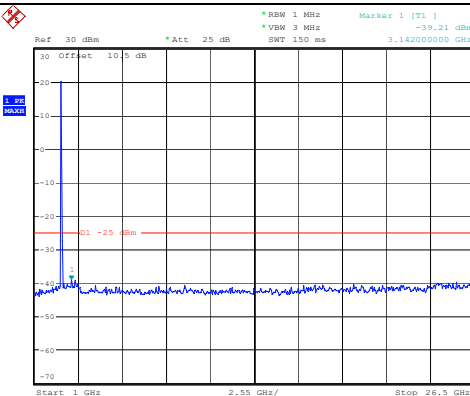
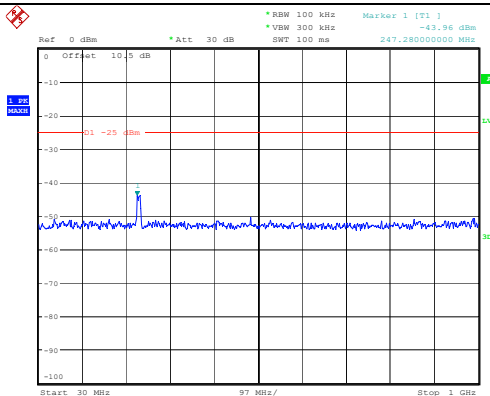
Lowest



Middle



Highest

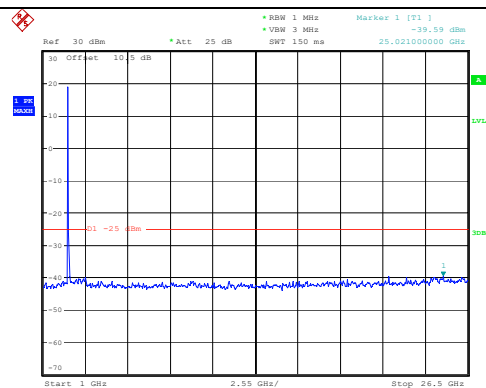
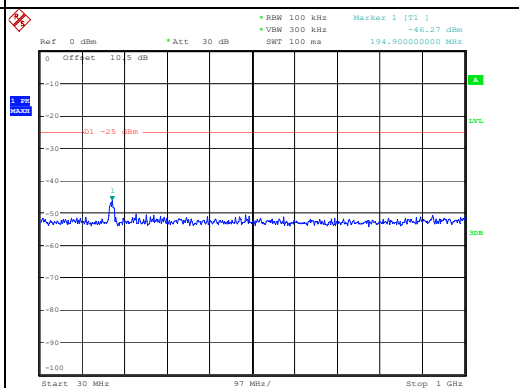


Spurious Emissions at Antenna Terminal

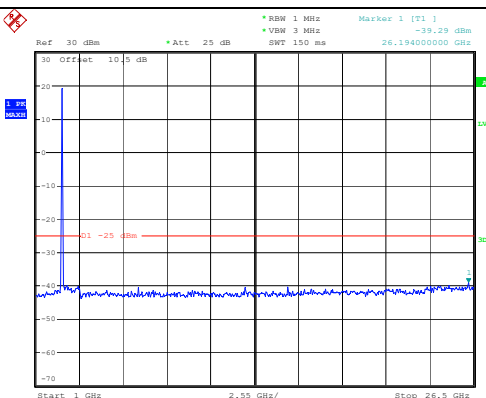
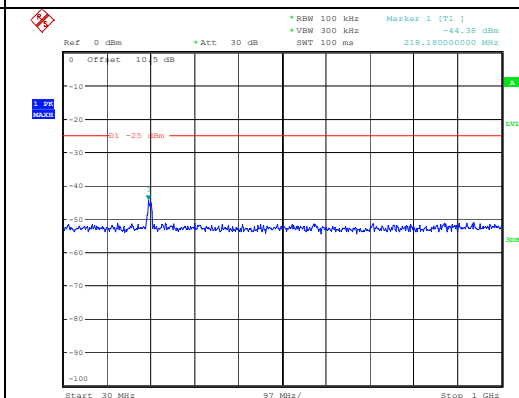
Channel

15MHz Bandwidth QPSK

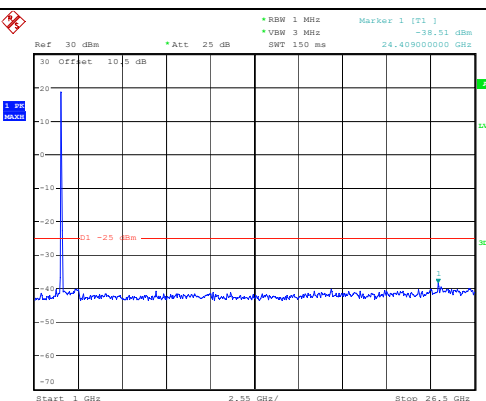
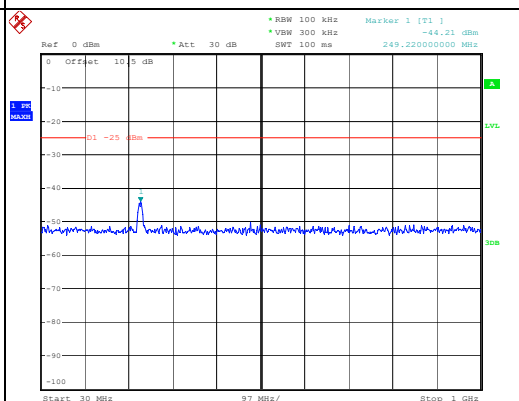
Lowest



Middle



Highest

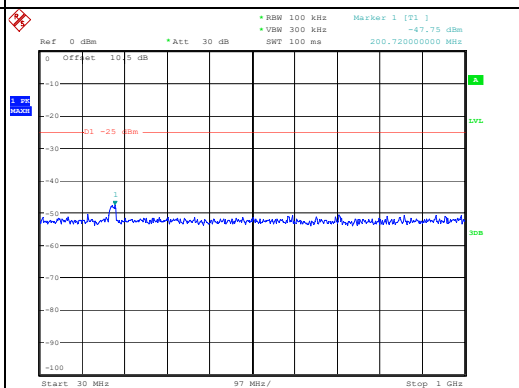
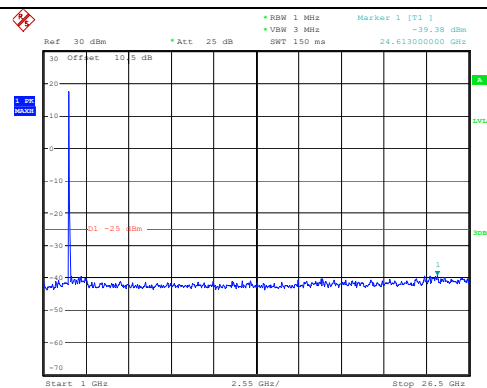


Spurious Emissions at Antenna Terminal

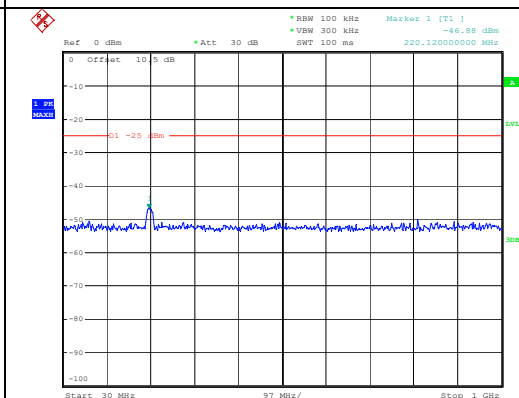
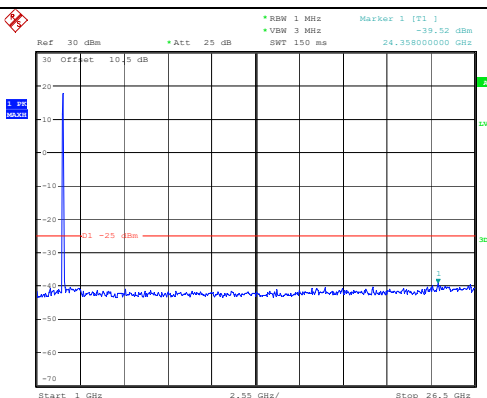
Channel

20MHz Bandwidth QPSK

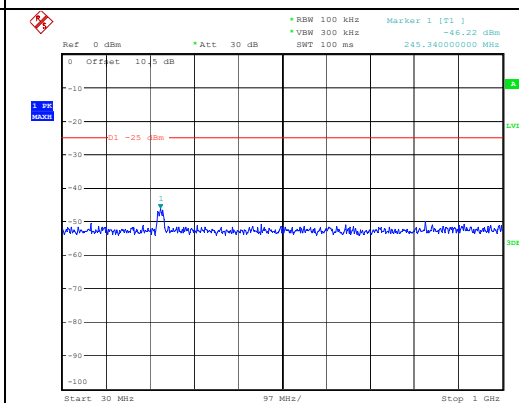
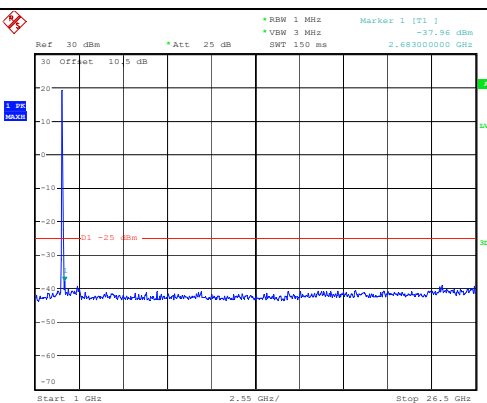
Lowest

ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 15:17:42ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 15:17:52

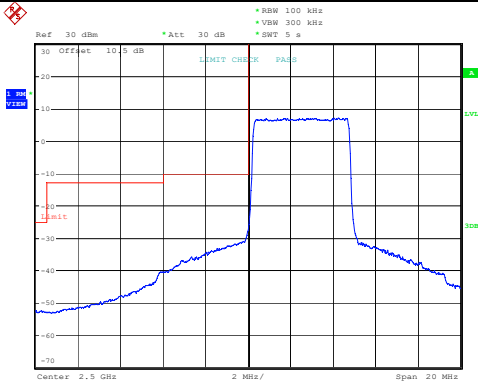
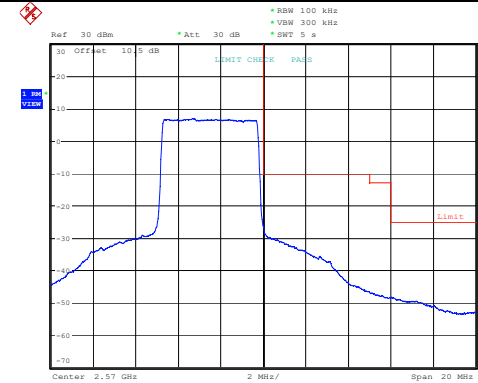
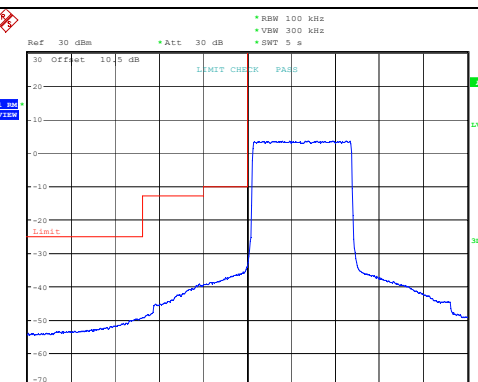
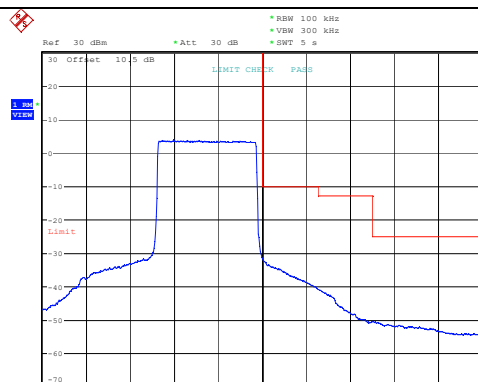
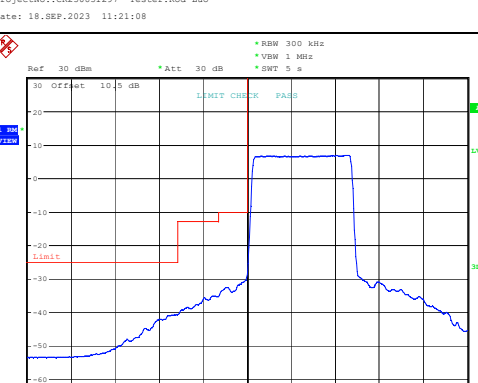
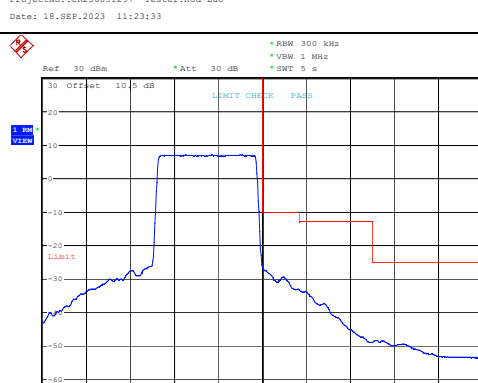
Middle

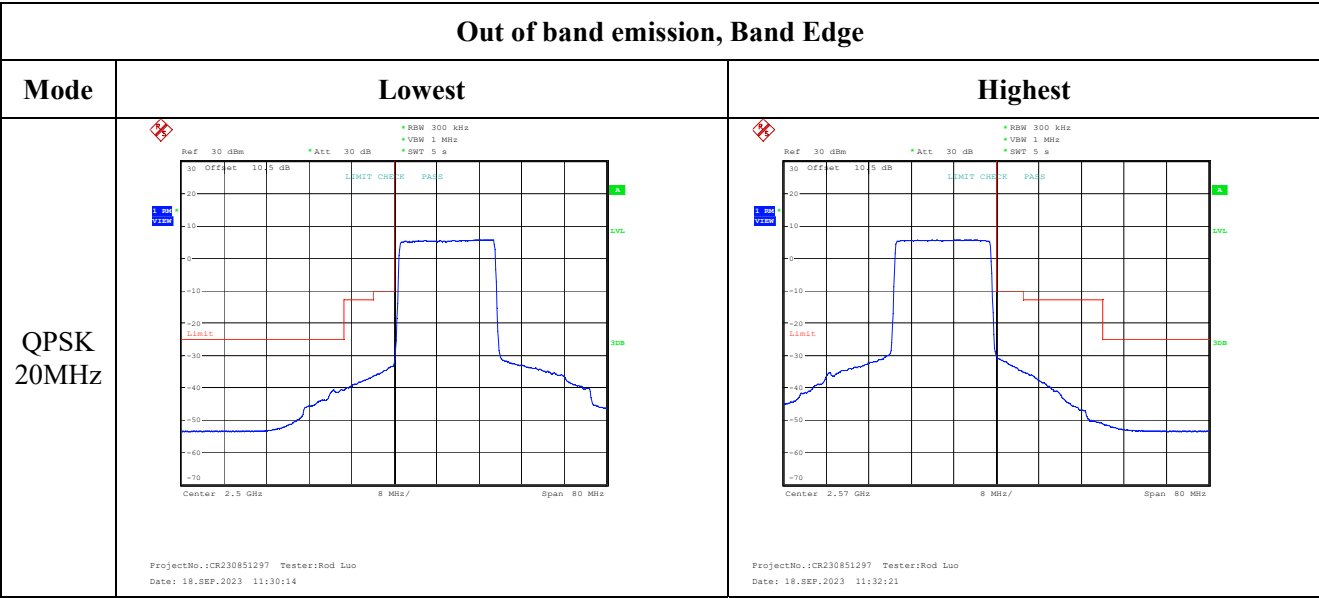
ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 15:18:13ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 15:18:23

Highest

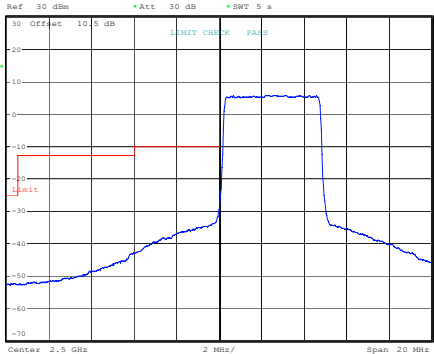
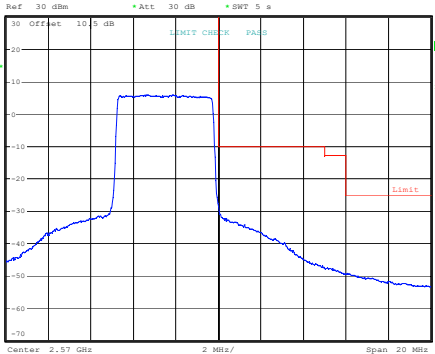
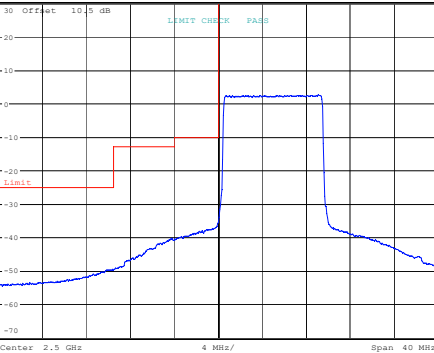
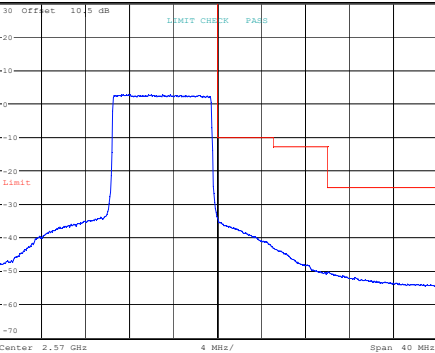
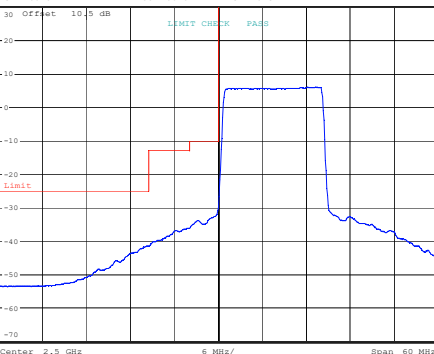
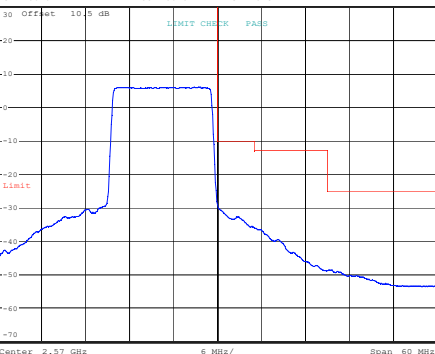
ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 15:18:42ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 15:18:52

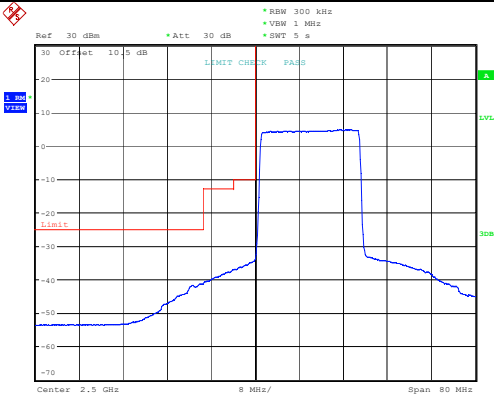
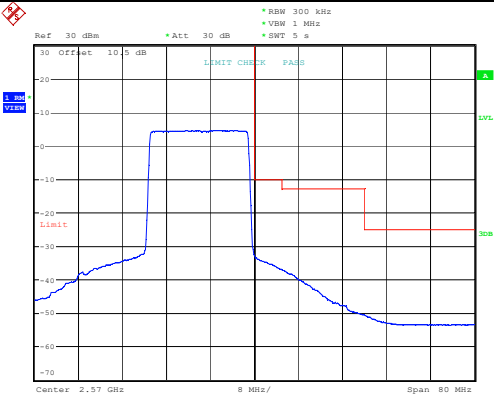
Out of band emission, Band Edge

Mode	Lowest	Highest
QPSK 5MHz	 Ref 30 dBm *Att 30 dB *RBW 100 kHz *VBW 100 kHz *SWT 5 s 30 Offset 10.5 dB LIMIT CHECK PASS Center 2.5 GHz 2 MHz/ Span 20 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 11:16:26	 Ref 30 dBm *Att 30 dB *RBW 100 kHz *VBW 100 kHz *SWT 5 s 30 Offset 10.5 dB LIMIT CHECK PASS Center 2.57 GHz 2 MHz/ Span 20 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 11:18:34
QPSK 10MHz	 Ref 30 dBm *Att 30 dB *RBW 100 kHz *VBW 100 kHz *SWT 5 s 30 Offset 10.5 dB LIMIT CHECK PASS Center 2.5 GHz 4 MHz/ Span 40 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 11:21:08	 Ref 30 dBm *Att 30 dB *RBW 100 kHz *VBW 100 kHz *SWT 5 s 30 Offset 10.5 dB LIMIT CHECK PASS Center 2.57 GHz 4 MHz/ Span 40 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 11:23:33
QPSK 15MHz	 Ref 30 dBm *Att 30 dB *RBW 300 kHz *VBW 1 MHz *SWT 5 s 30 Offset 10.5 dB LIMIT CHECK PASS Center 2.5 GHz 6 MHz/ Span 60 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 11:26:00	 Ref 30 dBm *Att 30 dB *RBW 300 kHz *VBW 1 MHz *SWT 5 s 30 Offset 10.5 dB LIMIT CHECK PASS Center 2.57 GHz 6 MHz/ Span 60 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 11:27:56



Out of band emission, Band Edge

Mode	Lowest	Highest
16QAM 5MHz	 Ref: 30 dBm *RBW 100 kHz *Att: 30 dB *VBW 300 kHz *SWT 5 s Offset 10.5 dB LIMIT CHECK PASS Center: 2.5 GHz 2 MHz/ Span: 20 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 11:17:32	 Ref: 30 dBm *RBW 100 kHz *Att: 30 dB *VBW 300 kHz *SWT 5 s Offset 10.5 dB LIMIT CHECK PASS Center: 2.57 GHz 2 MHz/ Span: 20 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 11:19:42
16QAM 10MHz	 Ref: 30 dBm *RBW 100 kHz *Att: 30 dB *VBW 300 kHz *SWT 5 s Offset 10.5 dB LIMIT CHECK PASS Center: 2.5 GHz 4 MHz/ Span: 40 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 11:22:05	 Ref: 30 dBm *RBW 100 kHz *Att: 30 dB *VBW 300 kHz *SWT 5 s Offset 10.5 dB LIMIT CHECK PASS Center: 2.57 GHz 4 MHz/ Span: 40 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 11:24:21
16QAM 15MHz	 Ref: 30 dBm *RBW 300 kHz *Att: 30 dB *VBW 1 MHz *SWT 5 s Offset 10.5 dB LIMIT CHECK PASS Center: 2.5 GHz 6 MHz/ Span: 60 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 11:26:55	 Ref: 30 dBm *RBW 300 kHz *Att: 30 dB *VBW 1 MHz *SWT 5 s Offset 10.5 dB LIMIT CHECK PASS Center: 2.57 GHz 6 MHz/ Span: 60 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 11:28:54

Out of band emission, Band Edge		
Mode	Lowest	Highest
16QAM 20MHz	 Ref: 30 dBm, Offset: 10.5 dB, Att: 30 dB, RBW: 300 kHz, VBW: 1 MHz, SWT: 5 s Limit: -30 dBm Center: 2.5 GHz, Span: 80 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 11:31:11	 Ref: 30 dBm, Offset: 10.5 dB, Att: 30 dB, RBW: 300 kHz, VBW: 1 MHz, SWT: 5 s Limit: -30 dBm Center: 2.57 GHz, Span: 80 MHz ProjectNo.:CR230851297 Tester:Rod Luo Date: 18.SEP.2023 11:33:20

4.10 Antenna Port Test Data and Results for LTE Band 12

Serial Number:	2AS5-5	Test Date:	2023/9/16
Test Site:	RF	Test Mode:	Transmitting
Tester:	Rod Luo	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	28	Relative Humidity: (%)	55	ATM Pressure: (kPa)	100.1
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU26	200256	2023/3/31	2024/3/30
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30
zhuoxiang	Coaxial Cable	SMA-178	211002	Each time	N/A
Minl-Circuits	Power Splitter	ZFRSC-183-S+	S F448201619	Each time	N/A
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	699.7	707.5	715.3
3MHz	700.5	707.5	714.5
5MHz	701.5	707.5	713.5
10MHz	704	707.5	711

Test Data:**FCC§2.1046;§ 27.50(c) (10)****RF Output Power:**

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum ERP (dBm)	ERP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
1.4MHz QPSK	RB1#0	23.24	22.69	22.57	15.13	34.77
	RB1#3	23.28	22.89	22.72		
	RB1#5	22.97	22.68	22.57		
	RB3#0	22.84	22.78	22.61		
	RB3#3	22.92	22.76	22.63		
	RB6#0	21.89	21.78	21.64		
1.4MHz 16QAM	RB1#0	21.82	21.65	21.57	13.88	34.77
	RB1#3	22.03	21.82	21.71		
	RB1#5	21.99	21.69	21.58		
	RB3#0	21.72	21.8	21.79		
	RB3#3	21.8	21.78	21.78		
	RB6#0	20.86	20.67	20.63		
3MHz QPSK	RB1#0	23.32	23.3	22.66	15.30	34.77
	RB1#8	23.45	22.86	22.59		
	RB1#14	23.42	22.74	22.58		
	RB6#0	22.31	21.72	21.6		
	RB6#9	22.4	21.68	21.62		
	RB15#0	22.37	21.72	21.62		
3MHz 16QAM	RB1#0	22.39	21.84	22.2	14.37	34.77
	RB1#8	22.51	21.71	22.12		
	RB1#14	22.52	21.7	22.13		
	RB6#0	21.3	20.67	20.66		
	RB6#9	21.47	20.64	20.67		
	RB15#0	21.32	20.75	20.64		
5MHz QPSK	RB1#0	23.22	22.75	22.61	15.27	34.77
	RB1#13	23.42	22.82	22.67		
	RB1#24	23.3	22.65	22.57		
	RB15#0	22.36	21.8	21.73		
	RB15#10	22.33	21.76	21.54		
	RB25#0	22.31	21.75	21.61		
5MHz 16QAM	RB1#0	21.92	22.02	21.63	13.89	34.77
	RB1#13	21.86	22.04	21.71		
	RB1#24	21.73	21.91	21.61		
	RB15#0	20.96	20.78	20.75		
	RB15#10	20.94	20.71	20.56		
	RB25#0	20.88	20.75	20.63		

10MHz QPSK	RB1#0	23.37	22.88	22.8	15.42	34.77
	RB1#25	23.57	22.94	22.87		
	RB1#49	23.28	22.72	22.65		
	RB25#0	22.43	21.92	21.68		
	RB25#25	22.35	21.84	21.59		
	RB50#0	22.36	21.92	21.66		
10MHz 16QAM	RB1#0	22.02	21.83	22.32	14.17	34.77
	RB1#25	22.15	21.89	22.31		
	RB1#49	21.86	21.67	22.16		
	RB25#0	20.96	21.03	20.73		
	RB25#25	20.84	20.88	20.62		
	RB50#0	20.91	20.96	20.66		

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

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	
10MHz QPSK	RB1#0	4.1	4.49	4.78	13
	RB50#0	5.38	5.45	5.42	13
10MHz 16QAM	RB1#0	4.9	5.45	5.67	13
	RB50#0	6.15	6.22	6.25	13
				Result:	Pass

FCC §2.1049, §27.53: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	1.104	1.098	1.104	1.326	1.320	1.302
1.4MHz 16QAM	1.110	1.092	1.098	1.314	1.290	1.302
3MHz QPSK	2.688	2.688	2.688	2.868	2.904	2.880
3MHz 16QAM	2.688	2.676	2.688	2.880	2.880	2.892
5MHz QPSK	4.520	4.520	4.540	5.180	5.160	5.200
5MHz 16QAM	4.540	4.540	4.540	5.180	5.260	5.180
10MHz QPSK	8.960	8.960	8.960	9.720	9.880	10.000
10MHz 16QAM	8.960	8.960	8.960	9.880	9.920	9.800

Note: The test plots please refer to the Plots of Occupied Bandwidth

FCC §2.1051, §27.53:Spurious Emissions at Antenna Terminal

Result:	Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.
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FCC §2.1051, §27.53:Out of band emission, Band Edge

Result:	Pass, Please refer to the test plots of Out of band emission, Band Edge.
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FCC §2.1055, §27.54: Frequency Stability

Test Mode:	10M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.85	699.279	699.00	715.828	716.00
	-20	3.85	699.232	699.00	715.805	716.00
	-10	3.85	699.185	699.00	715.799	716.00
	0	3.85	699.122	699.00	715.701	716.00
	10	3.85	699.160	699.00	715.704	716.00
	20	3.85	699.185	699.00	715.760	716.00
	30	3.85	699.126	699.00	715.874	716.00
	40	3.85	699.226	699.00	715.880	716.00
	50	3.85	699.268	699.00	715.874	716.00
Frequency Stability vs. Voltage	20	3.45	699.131	699.00	715.800	716.00
	20	4.4	699.129	699.00	715.838	716.00
					Result:	Pass

Test Mode:	10M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.85	699.228	699.00	715.869	716.00
	-20	3.85	699.233	699.00	715.706	716.00
	-10	3.85	699.260	699.00	715.702	716.00
	0	3.85	699.294	699.00	715.830	716.00
	10	3.85	699.184	699.00	715.764	716.00
	20	3.85	699.249	699.00	715.799	716.00
	30	3.85	699.120	699.00	715.717	716.00
	40	3.85	699.238	699.00	715.731	716.00
	50	3.85	699.179	699.00	715.881	716.00
Frequency Stability vs. Voltage	20	3.45	699.161	699.00	715.792	716.00
	20	4.4	699.189	699.00	715.855	716.00
					Result:	Pass

Occupied Bandwidth

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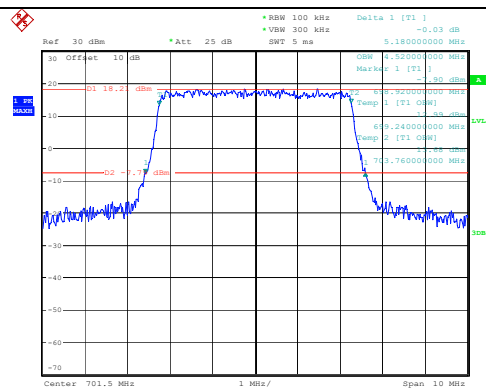
Occupied Bandwidth

Channel

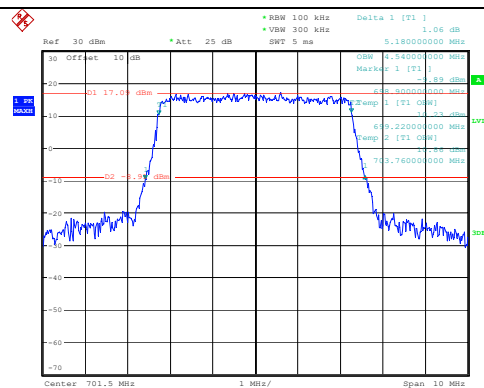
5MHz Bandwidth QPSK

5MHz Bandwidth 16QAM

Lowest

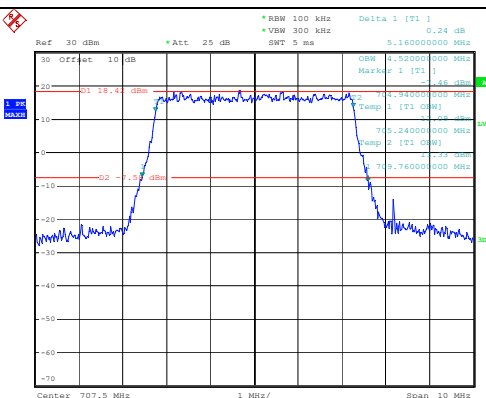


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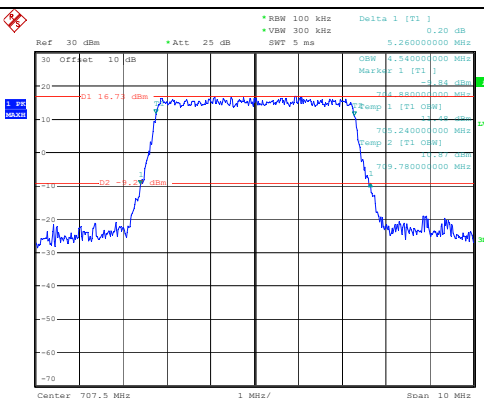


ProjectNo.:CR230851297 Tester:Rod Luo
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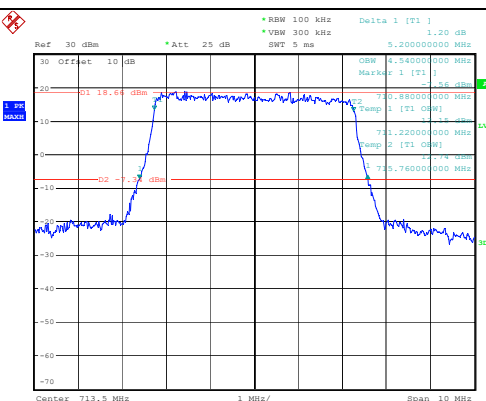


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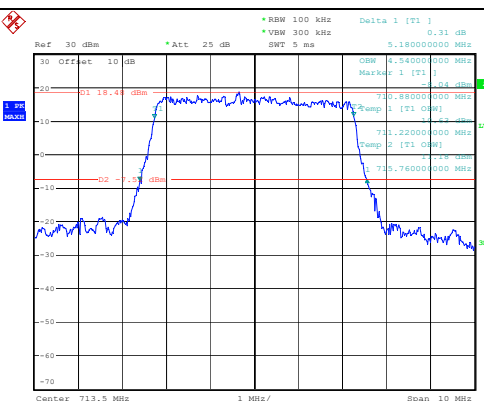


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Date: 16.SEP.2023 11:01:19

Highest



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Date: 16.SEP.2023 11:01:41



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 11:02:03

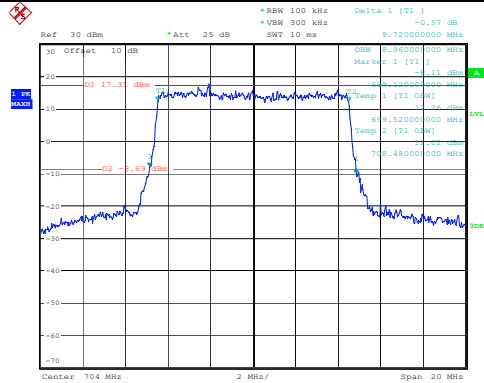
Occupied Bandwidth

Channel

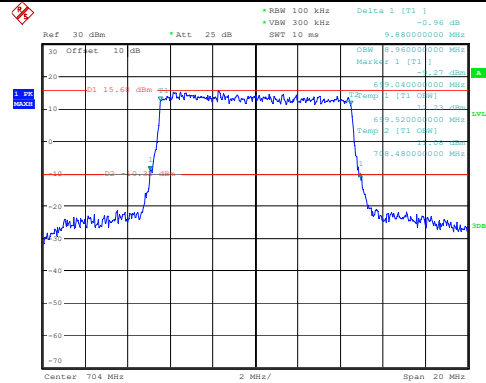
10MHz Bandwidth QPSK

10MHz Bandwidth 16QAM

Lowest

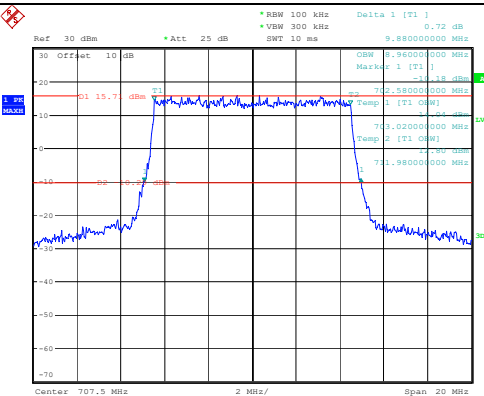


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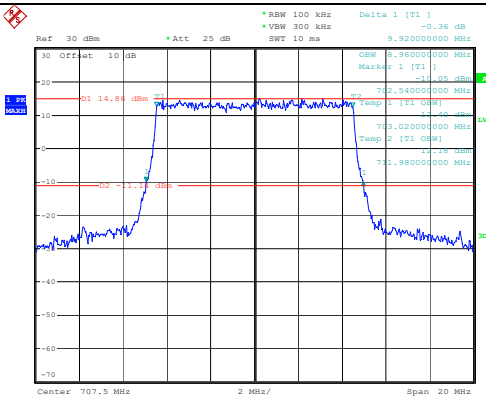


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Date: 16.SEP.2023 11:03:35

Middle

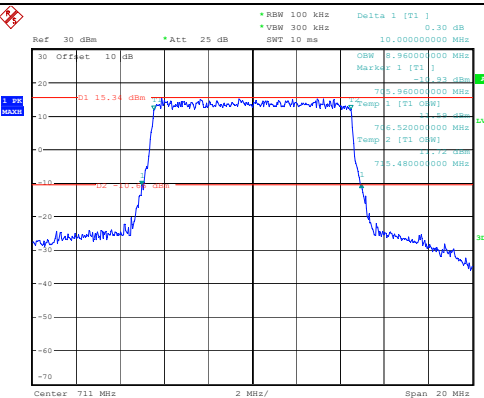


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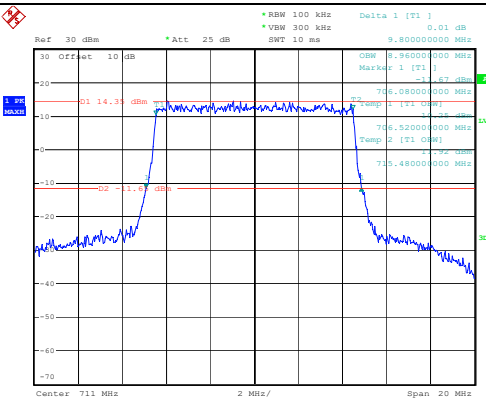


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 11:04:16

Highest



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 11:04:36



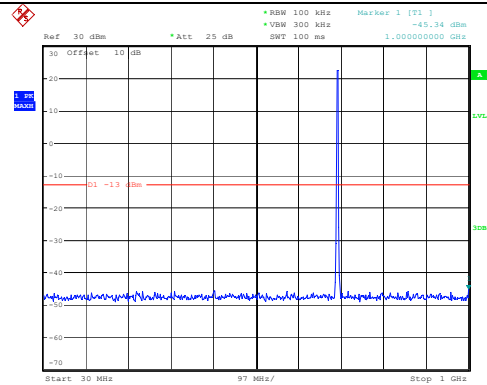
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Date: 16.SEP.2023 11:04:52

Spurious Emissions at Antenna Terminal

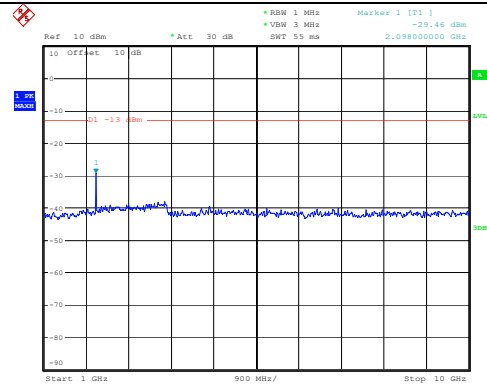
Channel

1.4MHz Bandwidth QPSK

Lowest

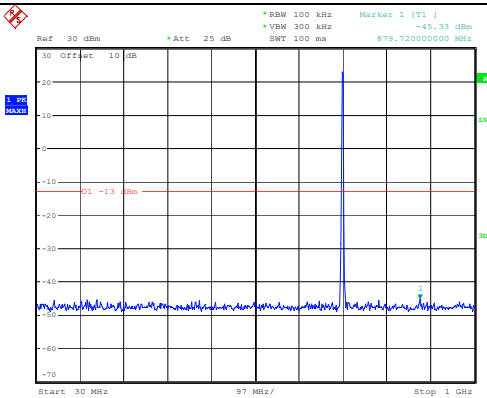


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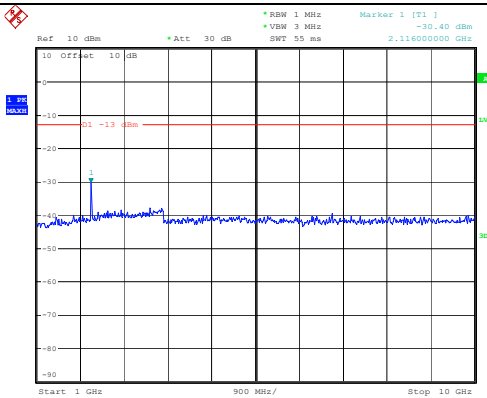


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Date: 16.SEP.2023 11:44:15

Middle

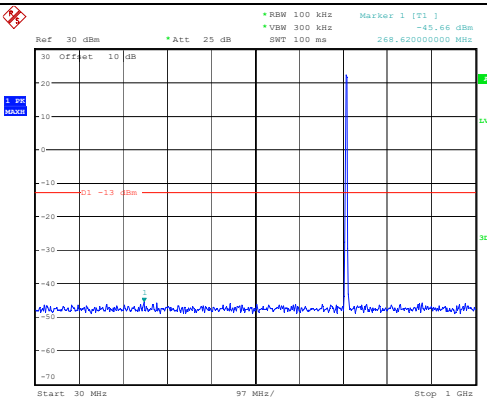


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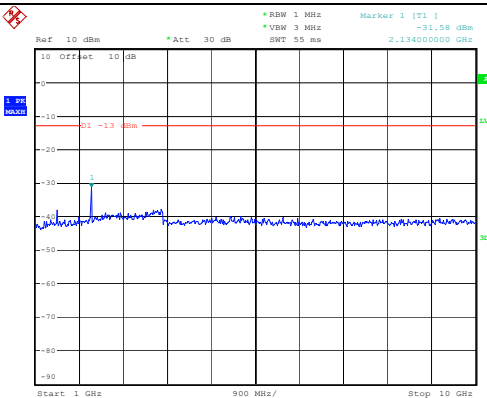


ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 11:44:39

Highest



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 11:44:53



ProjectNo.:CR230851297 Tester:Rod Luo
Date: 16.SEP.2023 11:45:03