TEST REPORT

Applicant Name:	Telepower Communication Co., Ltd.
Address:	5 Bld, Zone A, Hantian Technology Town No.17 ShenHai RD, Nanhai District Foshan China
Report Number:	SZ1240308-11508E-RF-00E
FCC ID:	2AJ2B-T20C

Test Standard (s)

FCC PART 27; FCC PART 22H; FCC PART 24E

Sample Description

Product Type:	Ticket Validator
Model No.:	T20
Multiple Model(s) No.:	T20B, T20C, T20D, T20P
Trade Mark:	Telpo
Date Received:	2024/03/08
Issue Date:	2024/05/28

Test Result:	Pass▲

▲ In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

Gala Liu

RF Engineer

Approved By:

Nancy Wang

RF Supervisor

Note: The information marked # is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report. Customer model name, addresses, names, trademarks etc. are included.

This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk "▼".

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	SZ1240308-11508E-RF-00E	Original Report	2024/05/28

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Ticket Validator			
Tested Model	T20			
Multiple Model(s)	T20B, T20C, T20D, T20P			
Frequency Range	GSM 850: 824-849MHz(TX); 869-894MHz(RX) PCS 1900: 1850-1910MHz(TX); 1930-1990MHz(RX) WCDMA Band 2: 1850-1910MHz(TX); 1930-1990MHz(RX) WCDMA Band 5: 824-849MHz(TX); 869-894MHz(RX) LTE Band 2: 1850-1910MHz(TX); 1930-1990MHz(RX) LTE Band 4: 1710-1755MHz(TX); 2110-2155MHz(RX) LTE Band 7: 2500-2570MHz(TX); 2620-2690MHz(TX) LTE Band 38: 2570-2620MHz(TX/RX)			
Modulation Technique	2G: GMSK,8PSK 3G: BPSK, QPSK, 16QAM 4G: QPSK, 16QAM			
Antenna Specification#	Antenna	Operation Bands	Antenna Gain (G_T) (dBi)	L_C (dB)
	Main ANT	GSM 850/WCDMA B5	-4.91	0.5
		PCS1900/WCDMA/LTE B2	2.30	0.5
		LTE B4	1.88	0.5
		LTE B7	2.95	0.5
		LTE B38	3.34	0.5
	Note: Lc= Signal Attenuation in the connecting cable between the transmitter and antenna, in dB.			
Voltage Range	DC 9V-40V			
Sample serial number	2LGK-4 for Radiated Emissions Test 2LGK-3 for RF Conducted Test (Assigned by BACL, Shenzhen)			
Sample/EUT Status	Good condition			
Normal/Extreme Condition#	L.V.: Low Voltage $9V_{DC}$ N.V.: Normal Voltage $12V_{DC}$ H.V.: High Voltage $40V_{DC}$			
Adapter Information	N/A			
Note: The Multiple models are electrically identical with the test model except for model name. Please refer to the declaration letter# for more detail, which was provided by manufacturer.				

Objective

This test report is in accordance with Part 2-Subpart J, Part 22-Subpart H, Part24-Subpart E, and Part 27 of the Federal Communication Commission's rules.

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

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2-Subpart J as well as the following parts:

Part 22 Subpart H - Public Mobile Services
Part 24 Subpart E - Personal Communication Services
Part 27 - Miscellaneous Wireless Communications Services

ANSI C63.26-2015: American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
KDB 971168 D01: Power Meas License Digital Systems v03r01

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

Each test item follows test standards and with no deviation.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		±5%
RF output power, conducted		0.72 dB(k=2, 95% level of confidence)
Unwanted Emission, conducted		1.75 dB(k=2, 95% level of confidence)
RF Frequency		213.55 Hz(k=2, 95% level of confidence)
Radiated Emissions	30MHz~200MHz (Horizontal)	4.48dB(k=2, 95% level of confidence)
	30MHz~200MHz (Vertical)	4.55dB(k=2, 95% level of confidence)
	200MHz~1000MHz (Horizontal)	4.85dB(k=2, 95% level of confidence)
	200MHz~1000MHz (Vertical)	5.05dB(k=2, 95% level of confidence)
	1GHz - 6GHz	5.35dB(k=2, 95% level of confidence)
	6GHz - 18GHz	5.44dB(k=2, 95% level of confidence)
	18GHz - 40GHz	5.16dB(k=2, 95% level of confidence)
Temperature		±1℃
Humidity		±1%
Supply voltages		±0.4%

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

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 5F(B-West) , 6F, 7F, the 3rd Phase of Wan Li Industrial Building D, Shihua Rd, FuTian Free Trade Zone, Shenzhen, 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. : 715558, the FCC Designation No. : CN5045.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The final qualification test was performed with the EUT operating at normal mode.

Frequency Band	Bandwidth (MHz)	Test Frequency (MHz)		
		Low	Middle	High
GSM850	0.25	824.2	836.6	848.8
PCS1900	0.25	1850.2	1880	1909.8
WCDMA B2	4.2	1852.4	1880	1907.6
WCDMA B5	4.2	826.4	836.6	846.6
LTE B2	1.4	1850.7	1880	1909.3
	3	1851.5	1880	1908.5
	5	1852.5	1880	1907.5
	10	1855	1880	1905
	15	1857.5	1880	1902.5
	20	1860	1880	1900
LTE B4	1.4	1710.7	1732.5	1754.3
	3	1711.5	1732.5	1753.5
	5	1712.5	1732.5	1752.5
	10	1715	1732.5	1750
	15	1717.5	1732.5	1747.5
	20	1720	1732.5	1745
LTE B7	5	2502.5	2535	2567.5
	10	2505	2535	2565
	15	2507.5	2535	2562.5
	20	2510	2535	2560
LTE B38	5	2572.5	2595	2617.5
	10	2575	2595	2615
	15	2577.5	2595	2612.5
	20	2580	2595	2610

Equipment Modifications

No modification was made to the EUT.

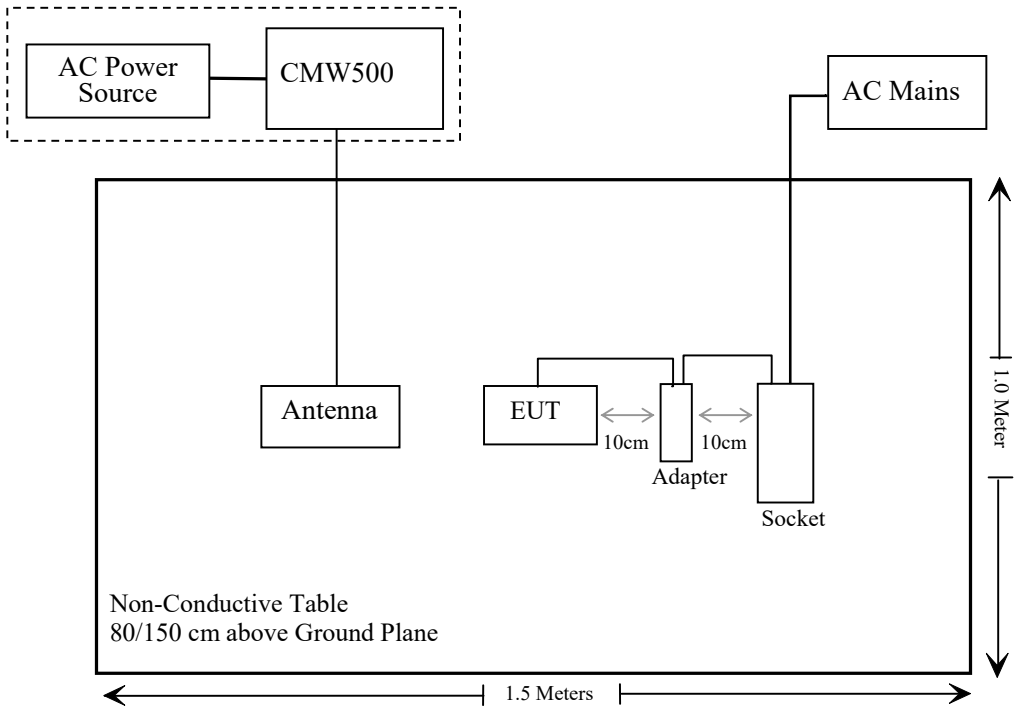
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	146520
Unknown	Adapter	Unknown	Unknown

Support Cable Description

Cable Description	Length (m)	From Port	To
Un-shielding Un-Detachable DC Cable	1.0	EUT	Adapter
Un-shielded Detachable AC Cable	1.5	Adapter	Socket
Un-shielding Un-Detachable AC Cable	1.5	Socket	AC Mains
Un-shielded Detachable AC Cable	1.2	AC Power Source	CMW500

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC §1.1307 ,§2.1091	MPE-Based Exemption	Compliant
§2.1046; § 22.913 (a) (d); § 24.232 (c) (d); §27.50 (d) (h)	RF Output Power	Compliant
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; § 22.905; § 22.917; § 24.238; §27.53	Occupied Bandwidth	Compliant
§ 2.1051; §22.917 (a); § 24.238 (a); §27.53;	Spurious Emissions at Antenna Terminal	Compliant
§ 2.1053; § 22.917 (a); § 24.238 (a); §27.53	Field Strength of Spurious Radiation	Compliant
§ 22.917 (a); § 24.238 (a); §27.53 (h) (m)	Band Edge	Compliant
§ 2.1055; § 22.355; § 24.235; §27.54;	Frequency stability	Compliant

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
R&S	EMI Test Receiver	ESR3	102455	2024/01/16	2025/01/15
Sonoma instrument	Pre-amplifier	310 N	186238	2023/06/08	2024/06/07
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2023/07/20	2026/07/19
Unknown	Cable	Chamber Cable 1	F-03-EM236	2023/08/03	2024/08/02
Unknown	Cable	Chamber Cable 4	EC-007	2023/08/03	2024/08/02
COM-POWER	Dipole Antenna	AD-100	721027	NCR	NCR
Rohde & Schwarz	Spectrum Analyzer	FSV40	101605	2024/03/27	2025/03/26
COM-POWER	Pre-amplifier	PA-122	181919	2023/06/29	2024/06/28
Schwarzbeck	Horn Antenna	BBHA9120D(1201)	1143	2023/07/26	2026/07/25
A.H.System	Horn Antenna	SAS-200/571	135	2021/07/14	2024/07/13
Unknown	RF Cable	KMSE	0735	2023/10/08	2024/10/07
Unknown	RF Cable	UFA147	219661	2023/10/08	2024/10/07
Unknown	RF Cable	XH750A-N	J-10M	2023/10/08	2024/10/07
Agilent	Signal Generator	N5183A	MY50140588	2023/12/18	2024/12/17
JD	Multiplex Switch Test Control Set	DT7220FSU	DQ77926	NCR	NCR
Unknown	1.3G High Pass filter	1.3GHz	101120	2023/08/03	2024/08/02
SNSD	2.4G Band Reject filter	BSF2402-2480MN-0898-001	2.4G filter	2023/08/03	2024/08/02
A.H.System	Pre-amplifier	PAM-1840VH	190	2023/08/02	2024/08/01
Electro-Mechanics Co	Horn Antenna	3116	9510-2270	2023/09/18	2026/09/17
Electro-Mechanics Co	Horn Antenna	3116	2026	2023/09/18	2026/09/17
UTIFLEX	RF Cable	NO. 13	232308-001	2023/08/03	2024/08/02

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
R&S	SPECTRUM ANALYZER	FSV40-N	102259	2024/01/16	2025/01/15
R&S	SPECTRUM ANALYZER	FSU26	200120	2024/01/08	2025/01/07
R&S	Wideband Radio Communication Tester	CMW500	141718	2023/09/06	2024/09/05
instek	DC Power Supply	GPS-3030DD	EM832096	NCR	NCR
Fluke	Digital Multimeter	287	19000011	2023/06/08	2024/06/07
BACL	Temperature & Humidity Chamber	BTH-150-40	30145	2024/01/16	2025/01/15
WEINSCHEL	3dB Attenuator	Unknown	F-03-EM119	2023/07/04	2024/07/03
WEINSCHEL	Power Splitter	1515	RH476	2023/07/04	2024/07/03
Micro-Tronics	RF Cable	8082176	W6102	2023/07/04	2024/07/03

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §1.1307 (B) & §2.1091- MPE-BASED EXEMPTION

Applicable Standard

According to subpart 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

According to KDB 447498 D04 Interim General RF Exposure Guidance

MPE-Based Exemption:

General frequency and separation-distance dependent MPE-based effective radiated power (ERP) thresholds are in Table B.1 [Table 1 of § 1.1307(b)(1)(i)(C)] to support an exemption from further evaluation from 300 kHz through 100 GHz.

Table 1 to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R^2.
1.34-30	3,450 R^2/f^2.
30-300	3.83 R^2.
300-1,500	0.0128 R^2f.
1,500-100,000	19.2R^2.

For multiple RF sources: Multiple RF sources are exempt if:

in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation:

$$\sum_{i=1}^{a} \frac{P_i}{P_{th,i}} + \sum_{j=1}^{b} \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^{c} \frac{Evaluated_k}{Exposure\ Limit_k} \leq 1$$

Result

Mode	Frequency (MHz)	Tune up conducted power#	Antenna Gain#		ERP		Evaluation Distance (m)	ERP Limit (mW)
		(dBm)	(dBi)	(dBd)	(dBm)	(mW)		
BT	2402-2480	10.0	2.16	0.01	10.01	10.02	0.2	768
BLE	2402-2480	-2.5	2.16	0.01	-2.49	0.56	0.2	768
2.4G Wi-Fi	2412-2462	23.5	2.16	0.01	23.51	224.39	0.2	768
5.2G Wi-Fi	5180-5240	15.0	0	-2.15	12.85	19.28	0.2	768
GSM850*	824-849	25.98	-4.91	-7.06	18.92	77.98	0.2	422
PCS1900*	1850-1910	20.48	2.30	0.15	20.63	115.61	0.2	768
WCDMA B2	1850-1910	22.0	2.30	0.15	22.15	164.06	0.2	768
WCDMA B5	824-849	23.0	-4.91	-7.06	15.94	39.26	0.2	422
LTE B2	1850-1910	23.0	2.30	0.15	23.15	206.54	0.2	768
LTE B4	1710-1755	23.0	1.88	-0.27	22.73	187.50	0.2	768
LTE B7	2500-2570	22.0	2.95	0.8	22.8	190.55	0.2	768
LTE B38	2570-2620	22.5	3.34	1.19	23.69	233.88	0.2	768

Note: 1. The tune up conducted power and antenna gain was declared by the applicant.
2. The BT, 2.4G Wi-Fi and 5G Wi-Fi cannot transmit at same time.
3. 0dBd=2.15dBi

Note*: It was the time average power according to the duty cycle.

Mode		Tune-up Peak Output Power (dBm)			Tune-up Average Output Power (dBm)		
		Low	Middle	High	Low	Middle	High
GPRS850	1 slot	33.5	33.5	33.5	24.47	24.47	24.47
	2 slots	32.0	32.0	32.0	**25.98**	**25.98**	**25.98**
	3 slots	30.0	30.0	30.0	25.74	25.74	25.74
	4 slots	28.5	28.5	28.5	25.49	25.49	25.49
GPRS1900	1 slot	27.5	27.5	27.5	18.47	18.47	18.47
	2 slots	26.5	26.5	26.5	**20.48**	**20.48**	**20.48**
	3 slots	24.0	24.0	24.0	19.74	19.74	19.74
	4 slots	23.0	23.0	23.0	19.99	19.99	19.99

Note: the duty cycle for 1 slot is 1/8, 2 slots is 1/4, 3 slots is 3/8, 4 slots is 1/2
The average power=Peak power+ duty cycle factor
Duty cycle factor=10*log (duty cycle)

NFC:

Mode	Frequency (MHz)	Maximum E-Field (dBuV/m@3m)	Maximum EIRP (dBm)	ERP		Evaluation Distance (m)	ERP Limit (mW)
				(dBm)	(mW)		
NFC	13.56	69.98	-25.22	-27.37	0.002	0.2	751

Note: EIRP = E-Field – 95.2 @3m, ERP = EIRP-2.15

Simultaneous transmitting consideration (worst case):

The ratio= $ERP_{2.4G\ Wi\text{-}Fi}$/limit +$ERP_{LTE\ B38}$/limit+ ERP_{NFC}/limit= 224.39/768+ 233.88/768+ 0.002/751 =0.597＜1.0

So simultaneous exposure is compliant.

To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.

Result: Compliant

FCC§2.1047 - MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 22H,24E&27 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

FCC § 2.1046, § 22.913 (a) (d) & § 24.232 (c) (d); §27.50 (d) (h) - RF OUTPUT POWER

Applicable Standard

According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC §2.1046 and §24.232 (c),mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB.

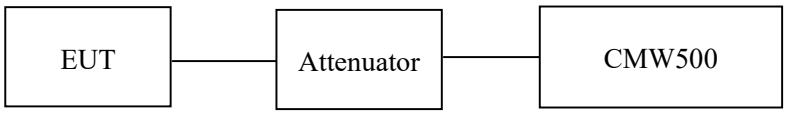
According to §27.50(d), Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

According to §27.50(h), the maximum EIRP must not exceed 2Watts (33dBm) for 2496-2690MHz.

Test Procedure

Conducted method: ANSI C63.26-2015 Section 5.2

The RF output of the transmitter was connected to the CMW500 through sufficient attenuation.



Test Data

Environmental Conditions

Temperature:	26~27 ℃
Relative Humidity:	55~56 %
ATM Pressure:	101kPa

The testing was performed by Jim Cheng from 2024-03-30 to 2024-03-31 and Cheeb Huang on 2024-04-03.

Test Result: Compliant

Cellular Band (Part 22H)

GSM 850

Test Mode	Conducted Peak Output Power(dBm)			Maximum ERP (dBm)	ERP Limit (dBm)
	Lowest Channel	Middle Channel	Highest Channel		
GPRS 1 Slot	33.25	33.36	**33.49**	**25.93**	38.45
GPRS 2 Slots	31.92	31.68	31.89	24.36	38.45
GPRS 3 Slots	29.54	29.38	29.48	21.98	38.45
GPRS 4 Slots	28.27	28.31	28.48	20.92	38.45
EDGE 1 Slot	**26.29**	26.26	26.26	**18.73**	38.45
EDGE 2 Slots	25.35	25.30	25.41	17.85	38.45
EDGE 3 Slots	24.04	23.98	24.01	16.48	38.45
EDGE 4 Slots	23.13	23.14	23.13	15.58	38.45
Note: ERP= Conducted Power(dBm) - L_C(dB) + G_T(dBd) G_T(dBd)=G_T(dBi)-2.15					

WCAMA B5

Test Mode	Conducted Average Output Power(dBm)			Maximum ERP (dBm)	ERP Limit (dBm)
	Lowest Channel	Middle Channel	Highest Channel		
WCDMA R99	**22.55**	22.54	22.32	**14.99**	38.45
HSDPA Subtest 1	19.86	19.61	19.82	12.30	38.45
HSDPA Subtest 2	20.00	19.39	19.72	12.44	38.45
HSDPA Subtest 3	19.34	19.50	19.76	12.20	38.45
HSDPA Subtest 4	19.64	19.40	19.66	12.10	38.45
HSUPA Subtest 1	20.42	20.56	20.25	13.00	38.45
HSUPA Subtest 2	19.99	20.26	20.33	12.77	38.45
HSUPA Subtest 3	20.54	20.26	20.22	12.98	38.45
HSUPA Subtest 4	20.43	20.48	20.08	12.92	38.45
HSUPA Subtest 5	20.35	20.36	19.94	12.80	38.45
Note: ERP= Conducted Power(dBm) - L_C(dB) + G_T(dBd) G_T(dBd)=G_T(dBi)-2.15					

PCS Band (Part 24E)

PCS 1900

Test Mode	Conducted Peak Output Power(dBm)			Maximum EIRP (dBm)	EIRP Limit (dBm)
	Lowest Channel	Middle Channel	Highest Channel		
GPRS 1 Slot	26.40	26.99	**27.30**	**29.10**	33
GPRS 2 Slots	25.33	25.83	26.21	28.01	33
GPRS 3 Slots	23.15	23.66	23.93	25.73	33
GPRS 4 Slots	22.04	22.54	22.87	24.67	33
EDGE 1 Slot	22.90	23.37	**23.58**	**25.38**	33
EDGE 2 Slots	22.35	22.82	23.01	24.81	33
EDGE 3 Slots	20.63	21.09	21.25	23.05	33
EDGE 4 Slots	19.57	19.96	20.14	21.94	33
Note: EIRP=Conducted Power(dBm) - L_C(dB) + G_T(dBi)					

WCDMA B2

Test Mode	Conducted Average Output Power(dBm)			Maximum EIRP (dBm)	EIRP Limit (dBm)
	Lowest Channel	Middle Channel	Highest Channel		
WCDMA R99	21.79	**21.98**	21.91	**23.78**	33
HSDPA Subtest 1	19.28	19.07	19.48	21.28	33
HSDPA Subtest 2	18.88	18.69	19.24	21.04	33
HSDPA Subtest 3	18.70	18.96	19.15	20.95	33
HSDPA Subtest 4	19.17	18.69	19.47	21.27	33
HSUPA Subtest 1	19.51	20.04	19.32	21.84	33
HSUPA Subtest 2	19.53	19.73	19.22	21.53	33
HSUPA Subtest 3	19.50	19.97	19.21	21.77	33
HSUPA Subtest 4	19.25	19.94	18.93	21.74	33
HSUPA Subtest 5	19.13	19.81	19.01	21.61	33
Note: EIRP=Conducted Power(dBm) - L_C(dB) + G_T(dBi)					

LTE Band

Band 2

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum EIRP (dBm)	EIRP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
1.4MHz QPSK	RB1#0	22.35	22.23	22.27	24.26	33
	RB1#3	22.30	22.34	**22.46**		
	RB1#5	22.29	22.26	22.43		
	RB3#0	22.20	22.27	22.24		
	RB3#3	22.18	22.31	22.30		
	RB6#0	21.14	21.25	21.32		
1.4MHz 16QAM	RB1#0	21.23	21.97	21.63	23.83	33
	RB1#3	21.39	**22.03**	21.79		
	RB1#5	21.49	21.94	21.92		
	RB3#0	21.24	21.25	21.42		
	RB3#3	21.27	21.31	21.46		
	RB6#0	19.95	20.38	20.25		
3MHz QPSK	RB1#0	21.97	22.35	22.33	**24.60**	33
	RB1#8	21.96	22.25	22.66		
	RB1#14	21.99	22.40	**22.80**		
	RB6#0	21.09	21.17	21.38		
	RB6#9	21.02	21.30	21.41		
	RB15#0	21.07	21.21	21.40		
3MHz 16QAM	RB1#0	21.51	21.32	21.20	23.46	33
	RB1#8	21.32	**21.66**	21.49		
	RB1#14	20.93	21.58	21.51		
	RB6#0	19.94	20.29	20.08		
	RB6#9	19.99	20.54	20.16		
	RB15#0	20.11	20.19	20.25		
5MHz QPSK	RB1#0	21.97	21.98	22.25	24.09	33
	RB1#13	**22.29**	22.08	22.27		
	RB1#24	22.08	22.04	**22.29**		
	RB15#0	21.09	21.22	21.40		
	RB15#10	21.04	21.18	21.37		
	RB25#0	21.10	21.21	21.28		
5MHz 16QAM	RB1#0	20.74	20.80	21.74	**23.88**	33
	RB1#13	20.74	21.37	**22.08**		
	RB1#24	19.78	20.78	21.98		
	RB15#0	20.02	20.18	20.08		
	RB15#10	19.99	20.39	20.48		
	RB25#0	19.95	20.07	20.29		

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum EIRP (dBm)	EIRP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
10MHz QPSK	RB1#0	22.09	22.29	22.23	24.49	33
	RB1#25	22.19	22.23	**22.69**		
	RB1#49	22.11	22.11	22.37		
	RB25#0	21.11	21.17	21.38		
	RB25#25	21.17	21.18	21.32		
	RB50#0	21.10	21.13	21.26		
10MHz 16QAM	RB1#0	21.51	**21.80**	21.19	23.60	33
	RB1#25	21.79	21.55	21.51		
	RB1#49	21.45	21.57	21.45		
	RB25#0	20.24	19.95	20.41		
	RB25#25	20.06	20.30	20.33		
	RB50#0	20.16	19.92	20.11		
15MHz QPSK	RB1#0	21.89	22.16	22.15	23.98	33
	RB1#38	22.00	22.07	**22.18**		
	RB1#74	21.94	22.09	22.15		
	RB36#0	21.05	21.08	21.32		
	RB36#39	21.05	21.22	21.30		
	RB75#0	21.09	21.15	21.35		
15MHz 16QAM	RB1#0	21.58	21.79	21.66	23.67	33
	RB1#38	21.57	21.79	21.35		
	RB1#74	20.61	**21.87**	21.34		
	RB36#0	20.01	20.22	20.08		
	RB36#39	19.90	20.12	20.32		
	RB75#0	20.02	20.13	20.26		
20MHz QPSK	RB1#0	21.85	22.09	22.15	24.34	33
	RB1#50	21.90	**22.54**	22.06		
	RB1#99	21.98	22.24	22.00		
	RB50#0	21.05	21.15	21.21		
	RB50#50	21.11	21.19	21.14		
	RB100#0	21.03	21.17	21.24		
20MHz 16QAM	RB1#0	21.27	21.15	21.98	23.82	33
	RB1#50	21.46	21.13	**22.02**		
	RB1#99	20.71	21.10	21.99		
	RB50#0	20.05	20.09	20.04		
	RB50#50	20.09	20.18	19.98		
	RB100#0	20.15	20.12	20.20		
Note: EIRP=Conducted Power(dBm) - L_C(dB) + G_T(dBi)						

Band 4

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum EIRP (dBm)	EIRP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
1.4MHz QPSK	RB1#0	22.04	21.93	**22.18**	23.56	30
	RB1#3	22.17	21.95	21.91		
	RB1#5	22.08	21.95	22.10		
	RB3#0	22.05	21.92	22.00		
	RB3#3	22.15	21.91	21.99		
	RB6#0	21.23	20.96	21.06		
1.4MHz 16QAM	RB1#0	21.87	20.78	21.19	23.35	30
	RB1#3	**21.97**	21.00	21.40		
	RB1#5	21.87	20.94	21.30		
	RB3#0	21.24	21.06	21.01		
	RB3#3	20.96	21.03	21.06		
	RB6#0	20.17	19.77	19.98		
3MHz QPSK	RB1#0	22.19	22.12	21.97	23.58	30
	RB1#8	**22.20**	22.08	21.76		
	RB1#14	22.17	21.82	21.99		
	RB6#0	21.13	21.19	20.79		
	RB6#9	21.17	20.97	21.01		
	RB15#0	21.33	21.05	20.91		
3MHz 16QAM	RB1#0	**21.68**	21.31	20.98	23.06	30
	RB1#8	21.48	21.24	21.03		
	RB1#14	21.46	21.02	20.84		
	RB6#0	20.12	20.25	19.59		
	RB6#9	20.15	20.07	19.76		
	RB15#0	20.30	20.07	20.03		
5MHz QPSK	RB1#0	21.55	21.53	21.34	23.00	30
	RB1#13	21.50	21.50	21.40		
	RB1#24	**21.62**	21.13	21.40		
	RB15#0	20.83	20.70	20.36		
	RB15#10	20.82	20.59	20.48		
	RB25#0	20.76	20.62	20.41		
5MHz 16QAM	RB1#0	20.41	20.93	20.14	22.66	30
	RB1#13	20.02	**21.28**	20.23		
	RB1#24	20.07	20.84	20.44		
	RB15#0	19.58	19.61	19.38		
	RB15#10	19.56	19.51	19.45		
	RB25#0	19.61	19.45	19.31		

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum EIRP (dBm)	EIRP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
10MHz QPSK	RB1#0	21.68	21.68	21.24	23.19	30
	RB1#25	**21.81**	21.61	21.60		
	RB1#49	21.69	21.25	21.41		
	RB25#0	20.86	20.70	20.33		
	RB25#25	20.83	20.49	20.42		
	RB50#0	20.83	20.60	20.29		
10MHz 16QAM	RB1#0	21.26	20.88	20.14	23.45	30
	RB1#25	**22.07**	20.96	20.21		
	RB1#49	21.19	20.97	20.37		
	RB25#0	19.90	19.68	19.36		
	RB25#25	19.88	19.66	19.44		
	RB50#0	19.77	19.64	19.21		
15MHz QPSK	RB1#0	22.11	**22.31**	21.84	23.69	30
	RB1#38	22.27	22.13	21.80		
	RB1#74	22.02	21.82	21.81		
	RB36#0	21.30	21.22	20.96		
	RB36#39	21.15	20.96	20.90		
	RB75#0	21.17	21.06	20.94		
15MHz 16QAM	RB1#0	21.87	21.88	21.32	**23.91**	30
	RB1#38	**22.53**	21.67	21.02		
	RB1#74	21.62	21.60	20.64		
	RB36#0	20.37	20.15	19.96		
	RB36#39	20.14	19.91	19.78		
	RB75#0	20.17	20.00	19.87		
20MHz QPSK	RB1#0	22.16	22.18	22.18	**23.72**	30
	RB1#50	**22.34**	22.20	22.22		
	RB1#99	22.01	21.73	21.95		
	RB50#0	21.29	21.22	20.98		
	RB50#50	21.18	21.00	20.88		
	RB100#0	21.22	21.11	20.96		
20MHz 16QAM	RB1#0	21.35	21.40	21.22	23.50	30
	RB1#50	**22.12**	21.93	20.93		
	RB1#99	21.40	21.02	20.67		
	RB50#0	20.34	20.18	20.00		
	RB50#50	20.19	19.93	19.86		
	RB100#0	20.22	19.95	19.92		
Note: EIRP=Conducted Power(dBm) - L_C(dB) + G_T(dBi)						

Band 7

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	20.39	21.08	21.27	23.80	33
	RB1#13	20.65	21.23	**21.35**		
	RB1#24	20.30	21.00	21.27		
	RB15#0	19.60	20.24	20.36		
	RB15#10	19.69	20.31	20.26		
	RB25#0	19.57	20.24	20.30		
5MHz 16QAM	RB1#0	19.80	19.81	19.98	22.80	33
	RB1#13	20.21	**20.35**	20.02		
	RB1#24	20.09	19.91	19.63		
	RB15#0	18.66	19.13	19.60		
	RB15#10	18.63	19.18	19.31		
	RB25#0	18.80	19.22	19.41		
10MHz QPSK	RB1#0	20.76	21.24	21.59	**24.24**	33
	RB1#25	20.78	21.31	**21.79**		
	RB1#49	20.85	21.21	21.21		
	RB25#0	19.66	20.12	20.36		
	RB25#25	19.92	20.24	20.42		
	RB50#0	19.72	20.17	20.39		
10MHz 16QAM	RB1#0	20.22	20.72	20.50	23.43	33
	RB1#25	20.14	20.60	20.32		
	RB1#49	20.23	**20.98**	20.35		
	RB25#0	18.56	19.20	19.68		
	RB25#25	19.01	19.41	19.37		
	RB50#0	18.69	19.17	19.40		
15MHz QPSK	RB1#0	20.76	21.16	**21.36**	23.81	33
	RB1#38	20.69	21.30	21.30		
	RB1#74	20.64	21.32	20.97		
	RB36#0	19.49	20.11	20.14		
	RB36#39	19.79	20.31	20.24		
	RB75#0	19.63	20.25	20.26		
15MHz 16QAM	RB1#0	19.55	20.69	20.82	**23.87**	33
	RB1#38	19.63	**21.42**	20.94		
	RB1#74	19.40	21.36	20.35		
	RB36#0	18.48	19.19	19.27		
	RB36#39	19.03	19.29	19.19		
	RB75#0	18.73	19.10	19.42		

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum EIRP (dBm)	EIRP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
20MHz QPSK	RB1#0	20.50	20.82	21.27	23.97	33
	RB1#50	21.05	21.44	**21.52**		
	RB1#99	20.79	21.19	20.62		
	RB50#0	19.63	20.15	20.20		
	RB50#50	19.93	20.22	20.37		
	RB100#0	19.84	20.15	20.28		
20MHz 16QAM	RB1#0	19.81	20.73	20.20	23.62	33
	RB1#50	**21.17**	21.14	20.45		
	RB1#99	20.66	20.85	19.93		
	RB50#0	18.79	19.15	19.18		
	RB50#50	18.80	19.31	19.43		
	RB100#0	18.78	19.32	19.41		
Note: EIRP=Conducted Power(dBm) - L_C(dB) + G_T(dBi)						

Band 38

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	21.58	21.51	21.52	24.50	33
	RB1#13	21.53	21.58	21.63		
	RB1#24	21.62	**21.66**	21.58		
	RB15#0	20.78	20.85	21.00		
	RB15#10	20.81	20.85	21.07		
	RB25#0	20.78	20.90	21.00		
5MHz 16QAM	RB1#0	20.84	20.57	21.16	24.26	33
	RB1#13	20.98	20.66	**21.42**		
	RB1#24	21.03	20.25	21.15		
	RB15#0	19.77	19.75	20.03		
	RB15#10	19.70	19.78	20.01		
	RB25#0	19.60	19.86	19.96		
10MHz QPSK	RB1#0	21.94	21.89	21.65	24.82	33
	RB1#25	21.65	**21.98**	21.74		
	RB1#49	21.87	21.76	21.82		
	RB25#0	20.79	20.86	21.03		
	RB25#25	20.84	20.85	20.99		
	RB50#0	20.81	20.95	20.93		
10MHz 16QAM	RB1#0	20.59	21.39	20.77	**24.52**	33
	RB1#25	20.65	21.54	**21.68**		
	RB1#49	20.53	21.27	21.39		
	RB25#0	19.68	20.01	20.03		
	RB25#25	19.73	19.74	20.03		
	RB50#0	19.92	19.89	20.04		
15MHz QPSK	RB1#0	21.95	**22.10**	21.78	24.94	33
	RB1#38	21.86	22.09	21.85		
	RB1#74	**22.10**	21.95	21.85		
	RB36#0	20.99	21.07	20.86		
	RB36#39	20.93	20.93	21.09		
	RB75#0	21.01	20.93	20.96		
15MHz 16QAM	RB1#0	20.74	**21.54**	20.43	24.38	33
	RB1#38	20.60	21.44	20.71		
	RB1#74	20.67	20.92	20.74		
	RB36#0	19.81	20.26	19.74		
	RB36#39	19.76	20.03	19.97		
	RB75#0	19.87	19.95	20.01		

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum EIRP (dBm)	EIRP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
20MHz QPSK	RB1#0	21.86	21.75	21.86	**25.06**	33
	RB1#50	21.96	**22.22**	21.96		
	RB1#99	21.74	21.72	22.11		
	RB50#0	20.94	21.04	20.82		
	RB50#50	21.02	21.01	21.06		
	RB100#0	20.90	20.84	20.94		
20MHz 16QAM	RB1#0	21.24	20.69	**21.63**	24.47	33
	RB1#50	21.58	21.11	21.59		
	RB1#99	21.35	20.52	21.52		
	RB50#0	20.02	20.14	19.73		
	RB50#50	19.94	19.93	20.16		
	RB100#0	19.90	19.79	19.92		
Note: EIRP=Conducted Power(dBm) - L_C(dB) + G_T(dBi)						

Peak-to-average ratio (PAR)

Cellular Band

GSM 850

Test Mode	Peak-to-average Ratio(dB)			Limit (dB)
	Lowest Channel	Middle Channel	Highest Channel	
GPRS	2.71	2.52	2.84	13
EDGE	2.88	2.56	2.66	13

WCAMA B5

Test Mode	Peak-to-average Ratio(dB)			Limit (dB)
	Lowest Channel	Middle Channel	Highest Channel	
WCDMA R99	3.27	3.30	3.17	13
HSDPA	4.49	4.84	5.03	13
HSUPA	6.09	6.09	5.93	13

PCS Band

PCS 1900

Test Mode	Peak-to-average Ratio(dB)			Limit (dB)
	Lowest Channel	Middle Channel	Highest Channel	
GPRS	2.65	2.78	2.62	13
EDGE	2.69	2.75	2.37	13

WCDMA B2

Test Mode	Peak-to-average Ratio(dB)			Limit (dB)
	Lowest Channel	Middle Channel	Highest Channel	
WCDMA R99	3.24	3.24	3.27	13
HSDPA	4.74	4.71	4.29	13
HSUPA	6.03	6.06	6.12	13

LTE Band: *(pre-scan all bandwidth, the worst case as below)*

LTE Band 2 20MHz Bandwidth

Test Bandwidth & Modulation	Resource Block & RB offset	Peak-to-average Ratio(dB)			Limit (dB)
		Lowest Channel	Middle Channel	Highest Channel	
20MHz QPSK	RB1#0	4.67	6.29	4.58	13
	RB100#0	5.36	5.28	5.57	13
20MHz 16QAM	RB1#0	5.45	6.99	5.57	13
	RB100#0	6.35	6.32	6.49	13

LTE Band 4 30MHz Bandwidth

Test Bandwidth & Modulation	Resource Block & RB offset	Peak-to-average Ratio(dB)			Limit (dB)
		Lowest Channel	Middle Channel	Highest Channel	
20MHz QPSK	RB1#0	5.19	5.88	5.94	13
	RB100#0	5.19	5.42	5.16	13
20MHz 16QAM	RB1#0	5.62	6.64	7.01	13
	RB100#0	6.26	6.35	6.2	13

LTE Band 7 20MHz Bandwidth

Test Bandwidth & Modulation	Resource Block & RB offset	Peak-to-average Ratio(dB)			Limit (dB)
		Lowest Channel	Middle Channel	Highest Channel	
20MHz QPSK	RB1#0	5.16	4.9	3.86	13
	RB100#0	4.64	5.22	4.61	13
20MHz 16QAM	RB1#0	5.65	5.51	4.67	13
	RB100#0	5.8	6.2	5.59	13

LTE Band 38 20MHz Bandwidth

Test Bandwidth & Modulation	Resource Block & RB offset	Peak-to-average Ratio(dB)			Limit (dB)
		Lowest Channel	Middle Channel	Highest Channel	
20MHz QPSK	RB1#0	9.01	8.84	8.93	13
	RB100#0	8.84	8.84	8.78	13
20MHz 16QAM	RB1#0	9.51	9.42	9.74	13
	RB100#0	9.74	9.74	9.68	13

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

Applicable Standard

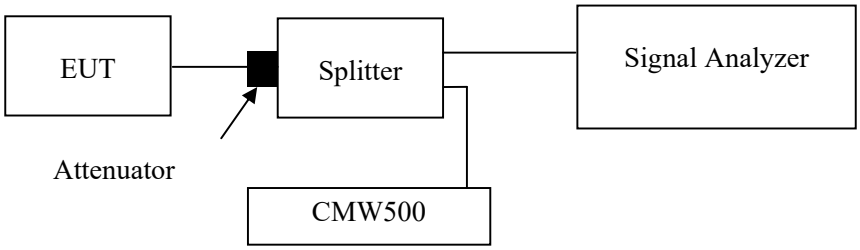
FCC 47 §2.1049, §22.917, §22.905, §24.238 and §27.53.

Test Procedure

ANSI C63.26-2015 Section 5.4.4

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

The resolution bandwidth of the spectrum analyzer was set at 1% to 5% of the anticipated emission bandwidth and the 26 dB & 99% bandwidth was recorded.



Test Data

Environmental Conditions

Temperature:	26~27 ℃
Relative Humidity:	55~56 %
ATM Pressure:	101kPa

The testing was performed by Jim Cheng from 2024-03-30 to 2024-03-31 and Cheeb Huang on 2024-04-03.

EUT operation mode: Transmitting

Test Result: Compliant

Please refer to the following tables and plots.

Cellular Band (Part 22H)

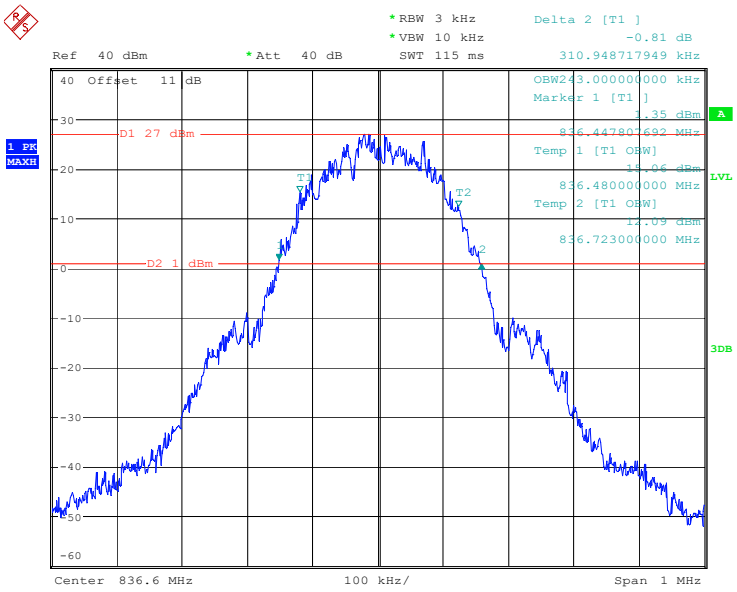
Operation Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
	Middle channel	Middle Channel
GSM 850		
GPRS	0.243	0.311
EDGE	0.245	0.300
WCDMA Band5		
WCDMA R99	4.11	4.705
HSDPA	4.11	4.700
HSUPA	4.11	4.729

PCS Band (Part 24E)

Operation Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
	Middle channel	Middle Channel
PCS1900		
GPRS	0.243	0.314
EDGE	0.244	0.305
WCDMA Band2		
WCDMA R99	4.12	4.715
HSDPA	4.10	4.688
HSUPA	4.11	4.731

Cellular Band

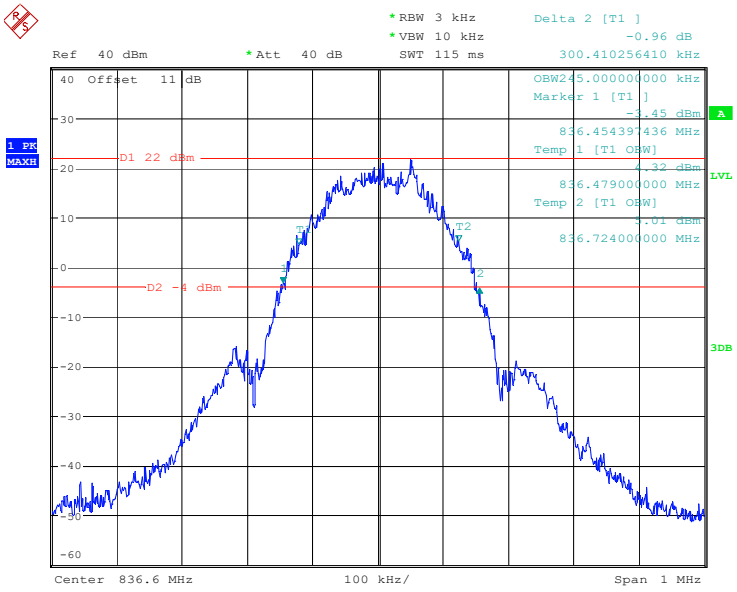
GPRS(GMSK) Mode, Middle channel



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang

Date: 3.APR.2024 13:36:45

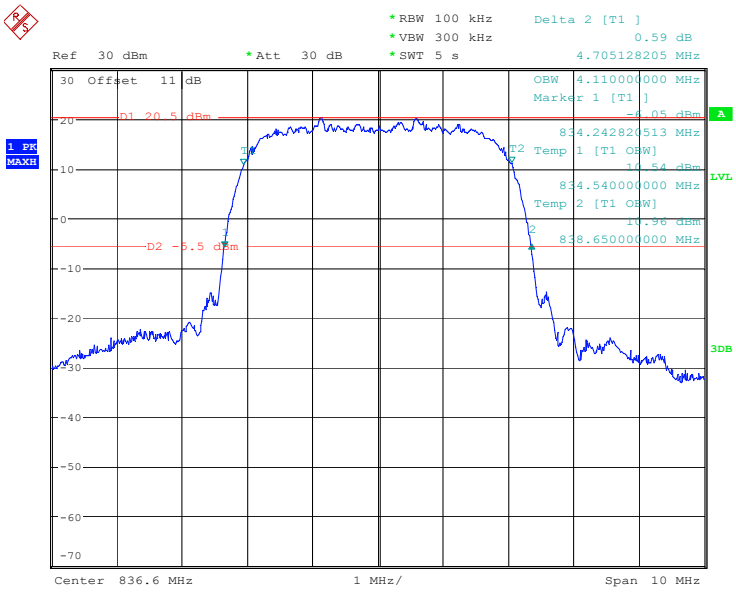
EDGE(8PSK) Mode, Middle channel



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang

Date: 3.APR.2024 13:50:32

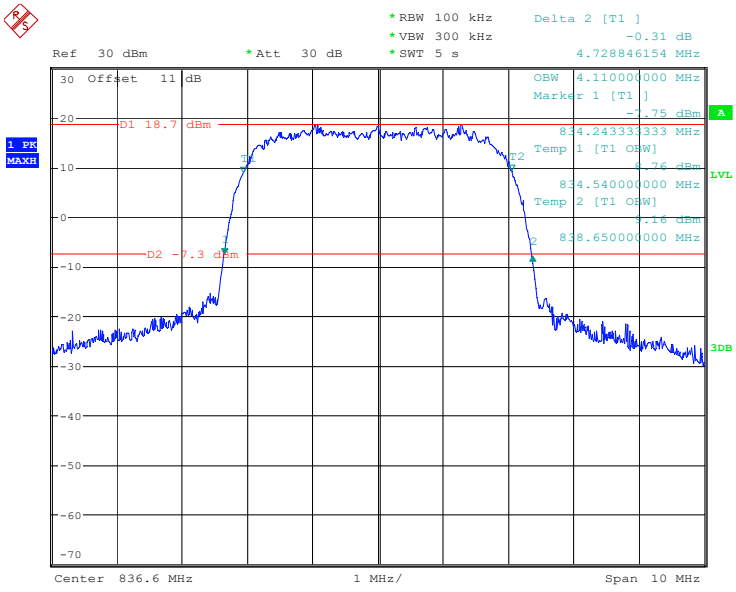
RMC (BPSK) Mode, Middle channel



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang

Date: 3.APR.2024 15:11:03

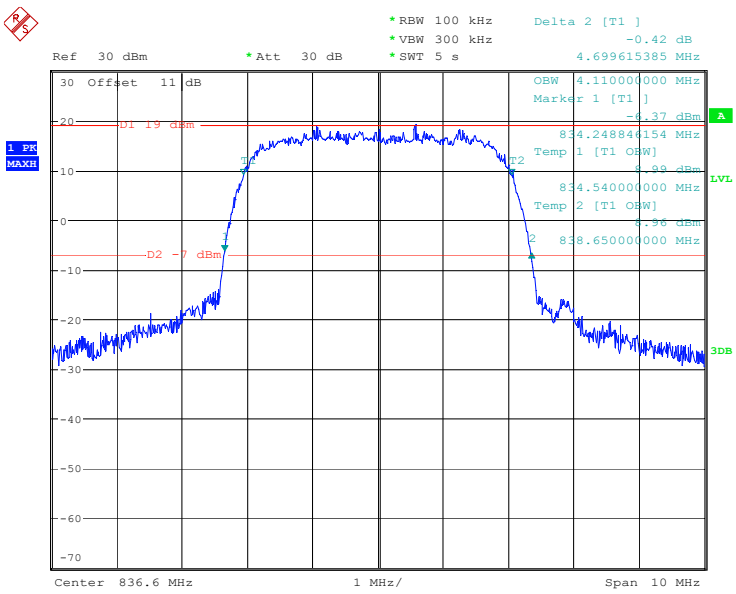
HSUPA (QPSK) Mode, Middle channel



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang

Date: 3.APR.2024 14:59:11

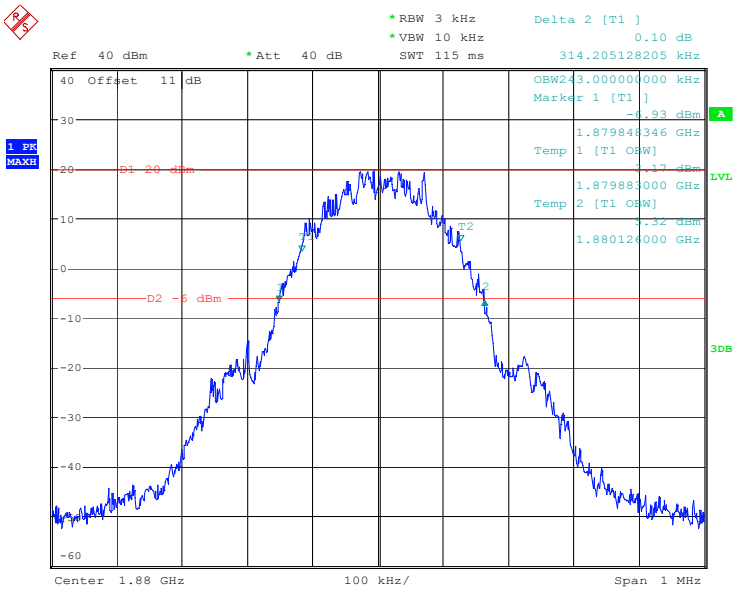
HSDPA (16QAM) Mode, Middle channel



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 15:05:18

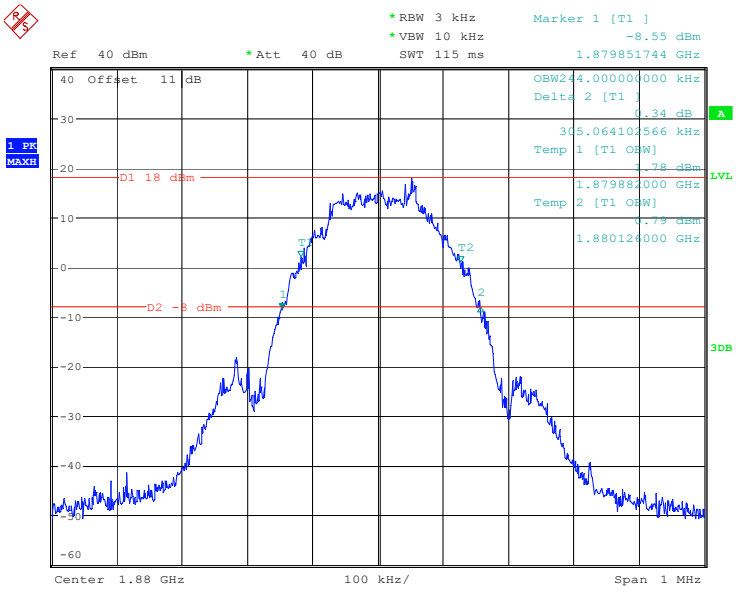
PCS Band

GPRS(GMSK) Mode, Middle channel



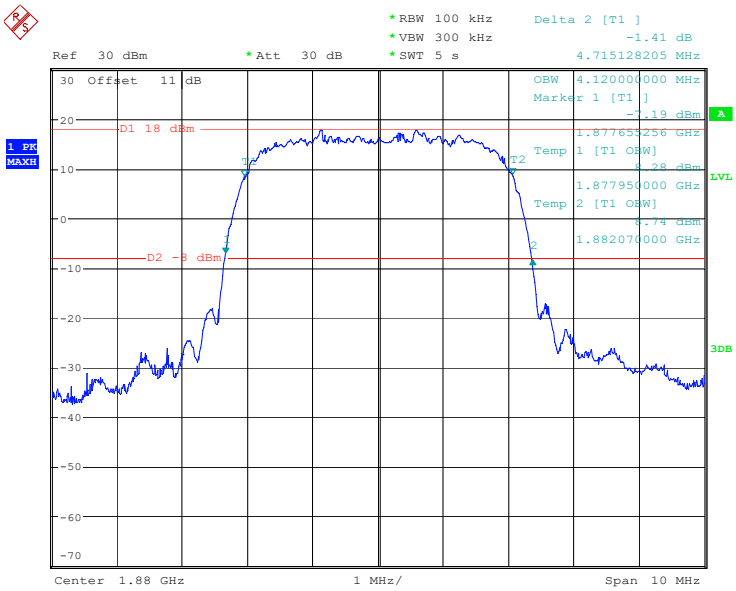
ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 14:15:45

EDGE(8PSK) Mode, Middle channel



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 14:04:07

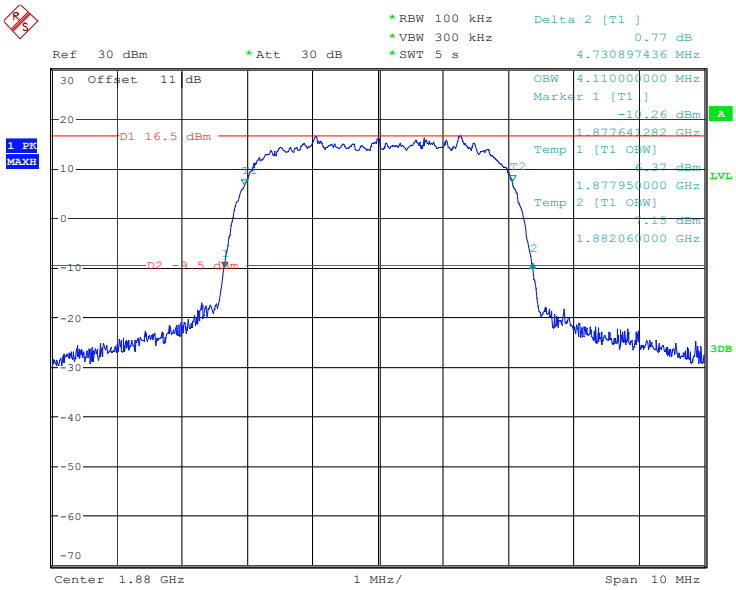
RMC (BPSK) Mode, Middle channel



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang

Date: 3.APR.2024 14:26:48

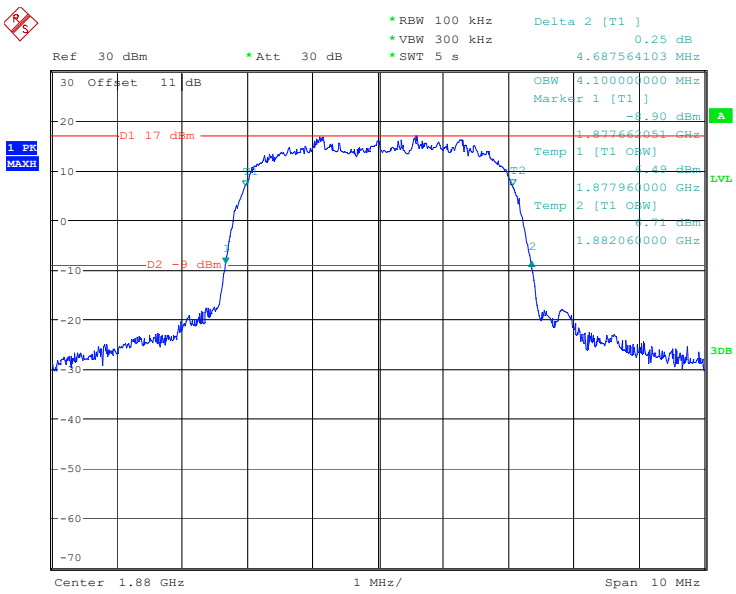
HSUPA (QPSK) Mode, Middle channel



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang

Date: 3.APR.2024 14:40:44

HSDPA (16QAM) Mode, Middle channel



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 14:34:36

LTE Band 2

Operation Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
	Middle channel	Middle Channel
1.4MHz QPSK	1.096	1.296
1.4MHz 16QAM	1.102	1.320
3MHz QPSK	2.695	2.940
3MHz 16QAM	2.683	2.940
5MHz QPSK	4.491	5.020
5MHz 16QAM	4.531	5.060
10MHz QPSK	8.902	9.680
10MHz 16QAM	8.942	9.720
15MHz QPSK	13.473	14.760
15MHz 16QAM	13.473	14.760
20MHz QPSK	17.884	19.200
20MHz 16QAM	17.804	19.360

LTE Band 4

Operation Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
	Middle channel	Middle Channel
1.4MHz QPSK	1.108	1.290
1.4MHz 16QAM	1.102	1.308
3MHz QPSK	2.695	2.928
3MHz 16QAM	2.683	2.940
5MHz QPSK	4.511	5.040
5MHz 16QAM	4.511	5.020
10MHz QPSK	8.942	9.720
10MHz 16QAM	8.942	9.760
15MHz QPSK	13.413	14.700
15MHz 16QAM	13.473	14.760
20MHz QPSK	17.884	19.600
20MHz 16QAM	17.884	19.440

LTE Band 7:

Operation Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
	Middle channel	Middle Channel
5MHz QPSK	4.511	5.020
5MHz 16QAM	4.531	5.040
10MHz QPSK	8.942	9.760
10MHz 16QAM	8.942	9.720
15MHz QPSK	13.473	14.880
15MHz 16QAM	13.473	14.760
20MHz QPSK	17.884	19.360
20MHz 16QAM	17.964	19.440

LTE Band 38

Operation Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
	Middle channel	Middle Channel
5MHz QPSK	4.511	5.000
5MHz 16QAM	4.511	4.980
10MHz QPSK	8.942	9.800
10MHz 16QAM	8.942	9.560
15MHz QPSK	13.473	14.760
15MHz 16QAM	13.533	15.060
20MHz QPSK	17.884	19.280
20MHz 16QAM	17.884	19.200

The test plots of LTE band please refer to the Appendix A.

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

Applicable Standard

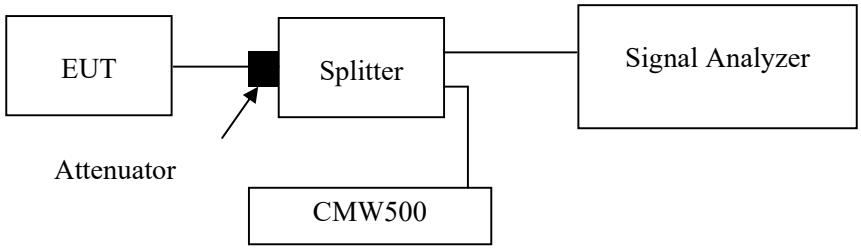
FCC §2.1051, §22.917(a) & §24.238(a) & §27.53.

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1051.

Test Procedure

ANSI C63.26-2015 Section 5.7

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz. Sufficient scans were taken to show any out of band emissions up to 10^{th} harmonic.



Note: the worst path loss (cable loss and splitter inset loss) among the test frequency range was added into plots.

Test Data

Environmental Conditions

Temperature:	26~27 ℃
Relative Humidity:	55~56 %
ATM Pressure:	101kPa

The testing was performed by Jim Cheng on 2024-03-31 and Cheeb Huang on 2024-04-03.

EUT operation mode: Transmitting

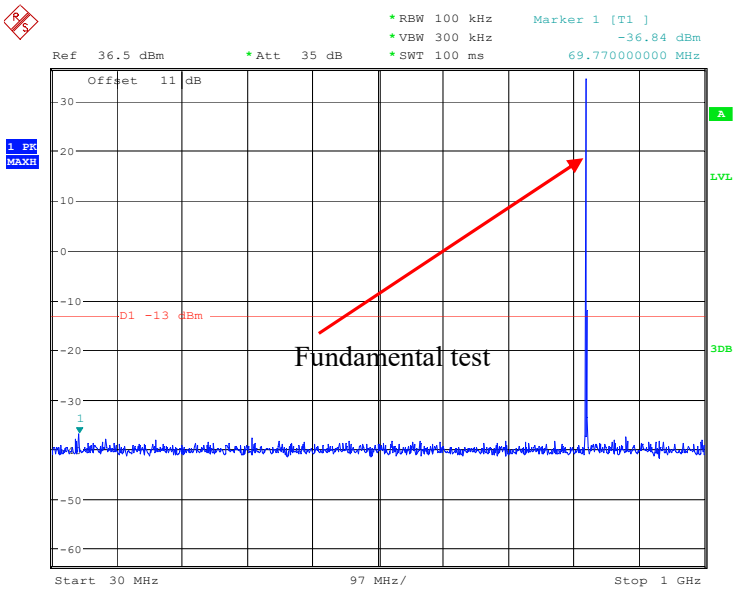
Test result: Compliant

Please refer to the following plots.

Cellular Band

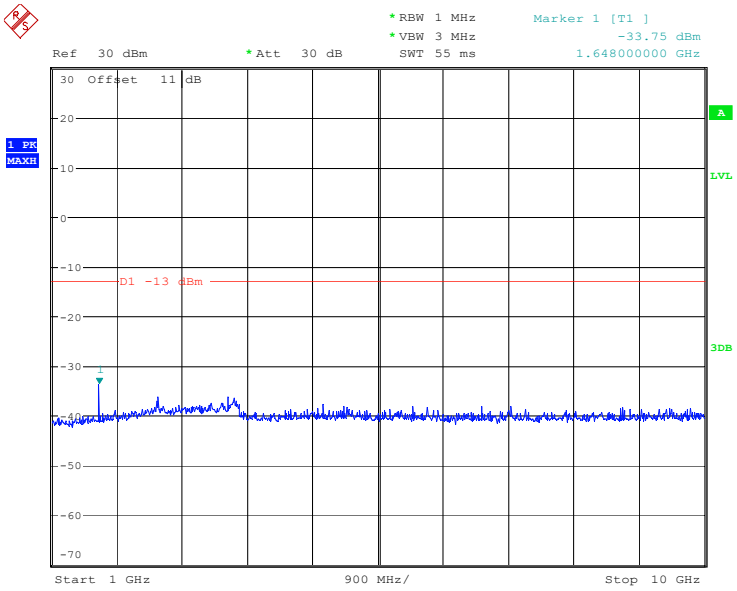
Low Channel:

30 MHz – 1GHz (GPRS Mode)



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 13:34:23

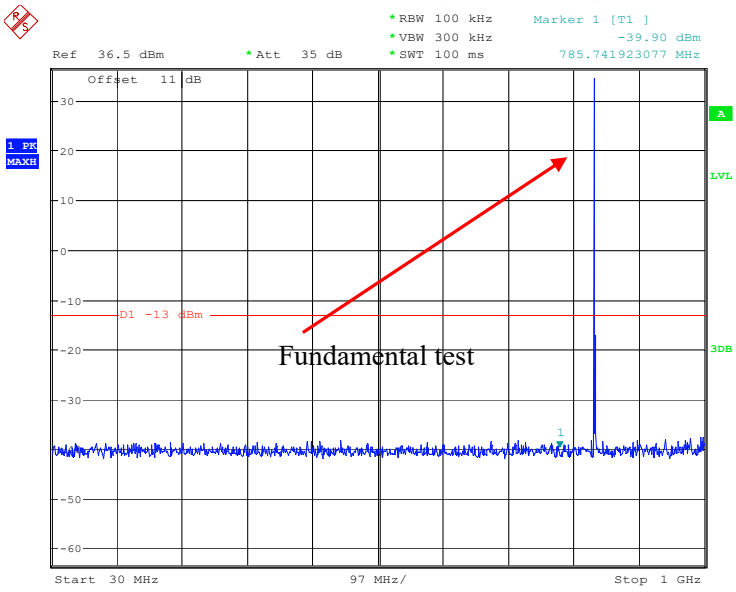
1 – 10GHz (GPRS Mode)



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 13:34:45

Middle Channel:

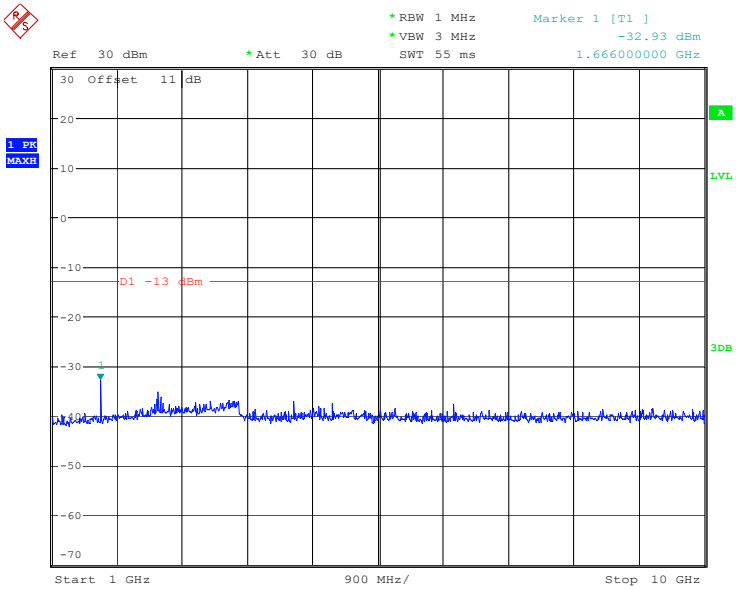
30 MHz – 1GHz (GPRS Mode)



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang

Date: 3.APR.2024 13:37:05

1 – 10GHz (GPRS Mode)

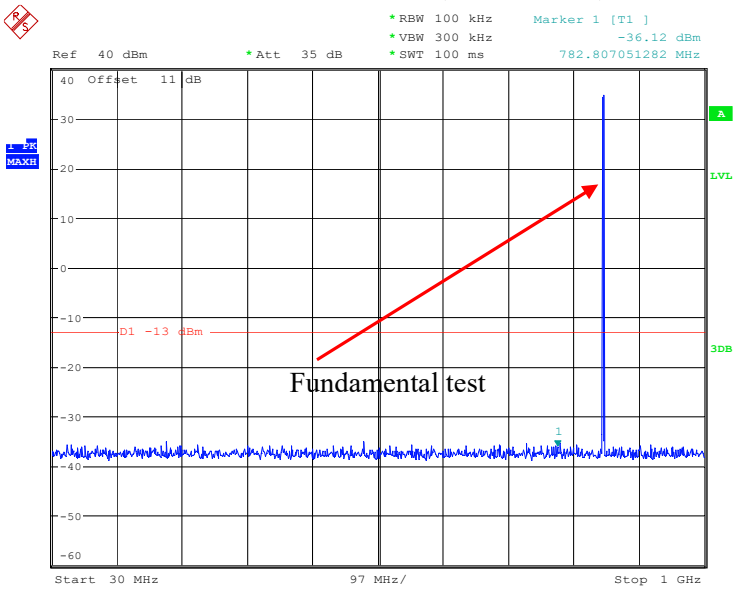


ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang

Date: 3.APR.2024 13:37:26

High Channel:

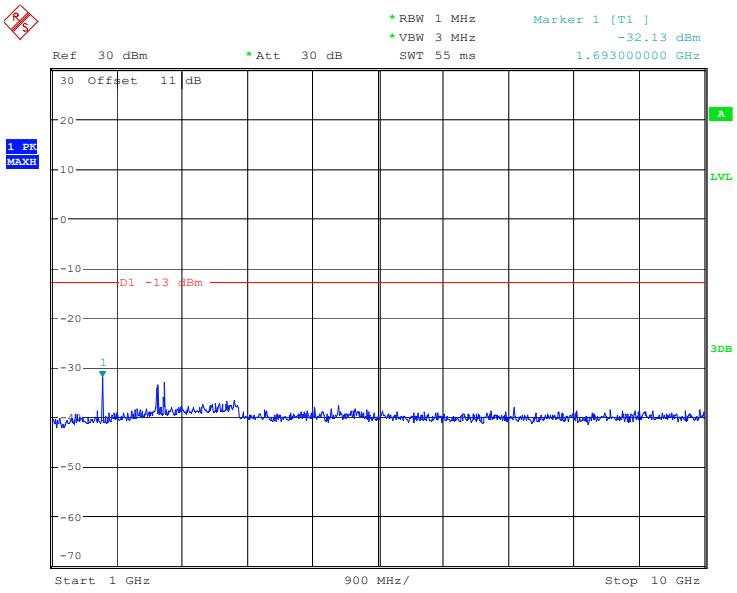
30 MHz – 1GHz (GPRS Mode)



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang

Date: 3.APR.2024 13:40:25

1 – 10GHz (GPRS Mode)

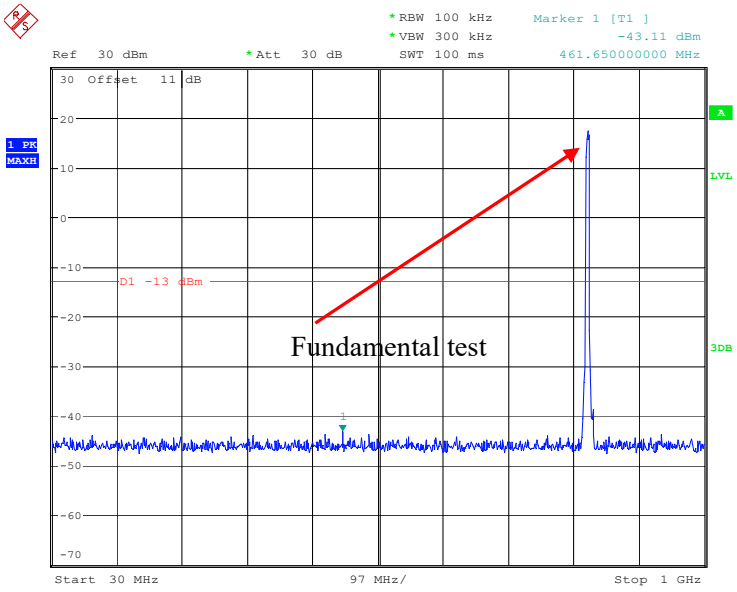


ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang

Date: 3.APR.2024 13:40:56

Low Channel:

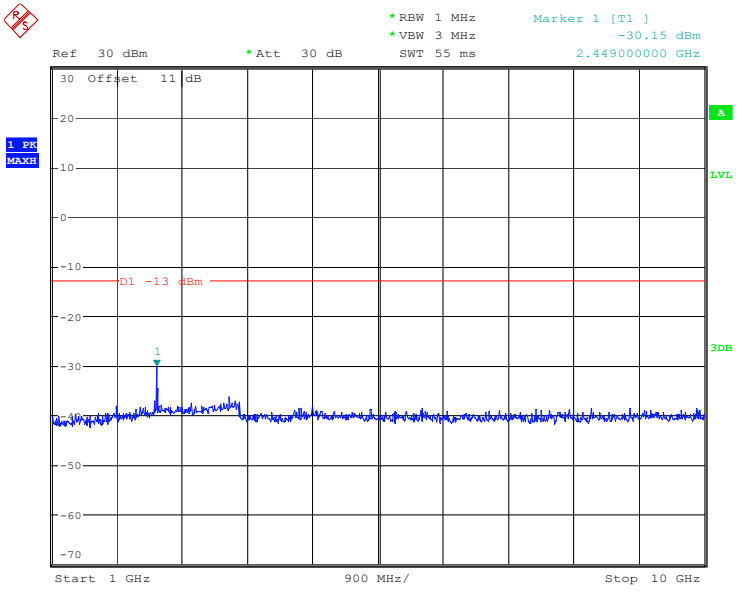
30 MHz – 1GHz RMC (WCDMA Mode)



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang

Date: 3.APR.2024 15:09:10

1 – 10GHz RMC (WCDMA Mode)

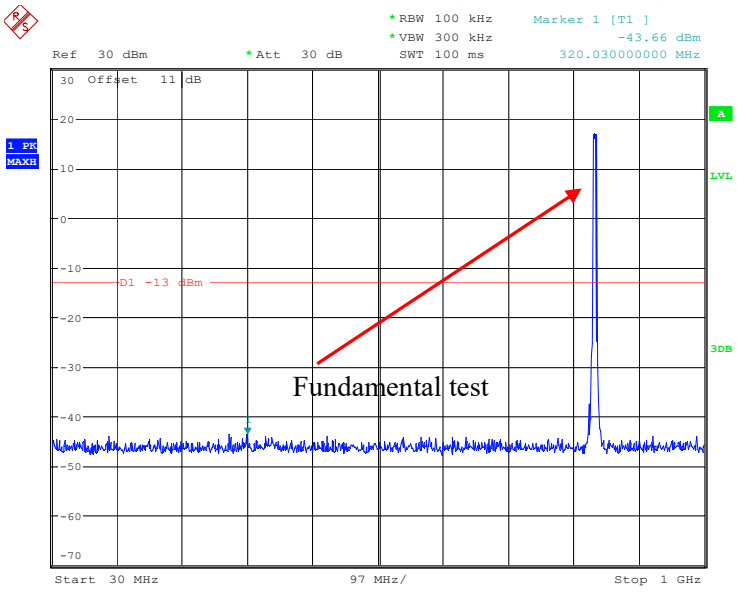


ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang

Date: 3.APR.2024 15:09:30

Middle Channel:

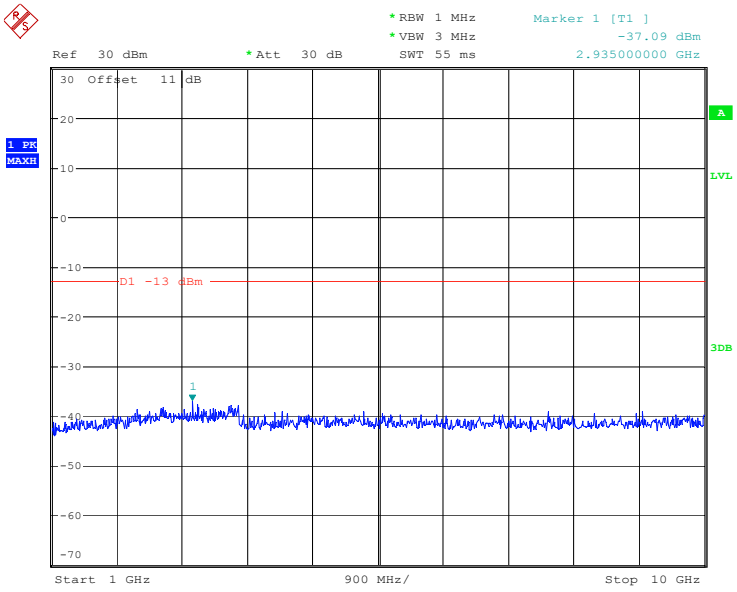
30 MHz – 1GHz RMC (WCDMA Mode)



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang

Date: 3.APR.2024 15:11:32

1 – 10GHz RMC (WCDMA Mode)

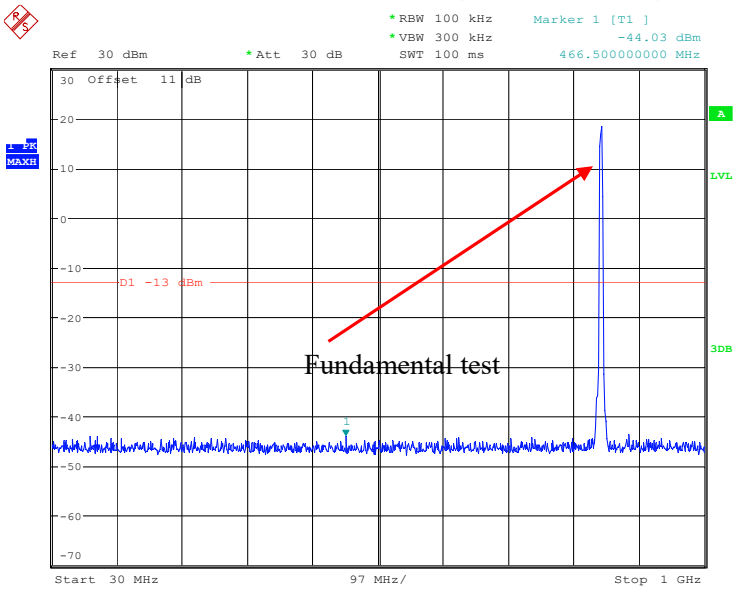


ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang

Date: 3.APR.2024 15:11:42

High Channel:

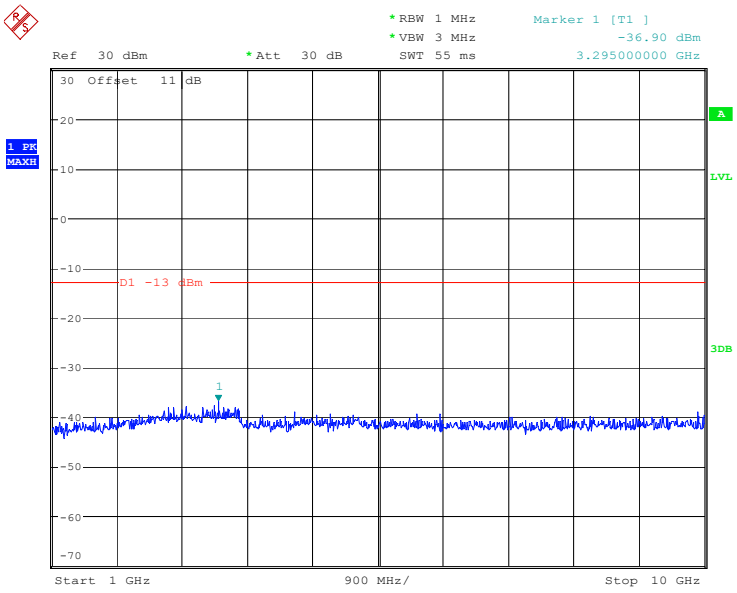
30 MHz – 1GHz RMC (WCDMA Mode)



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang

Date: 3.APR.2024 15:12:55

1 – 10GHz RMC (WCDMA Mode)



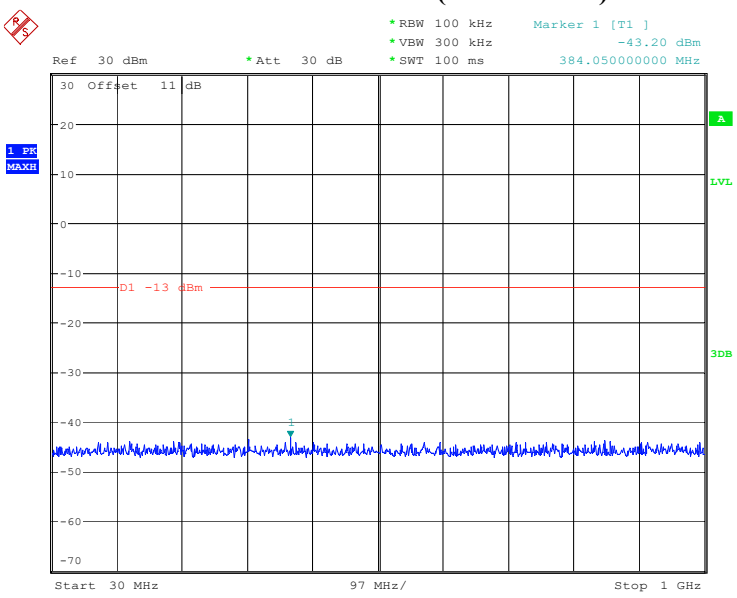
ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang

Date: 3.APR.2024 15:13:05

PCS Band

Low Channel:

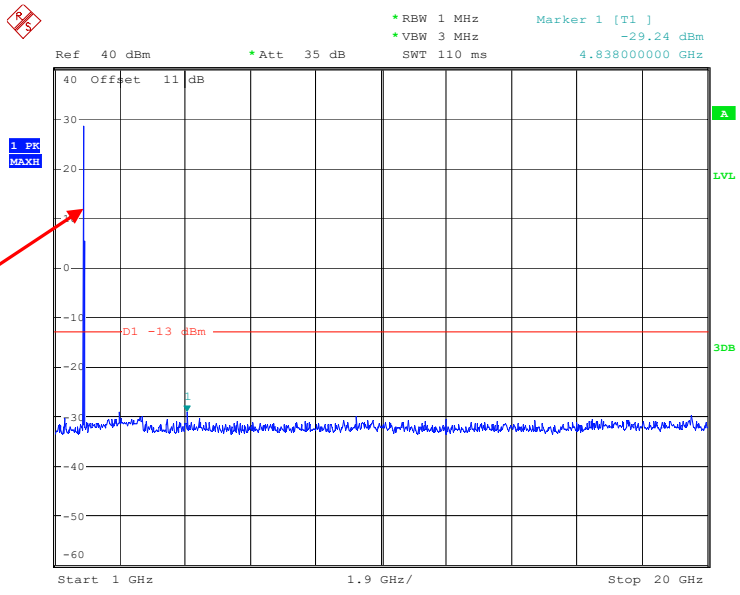
30 MHz – 1GHz (GPRS Mode)



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang

Date: 3.APR.2024 14:13:29

1 GHz – 20GHz (GPRS Mode)



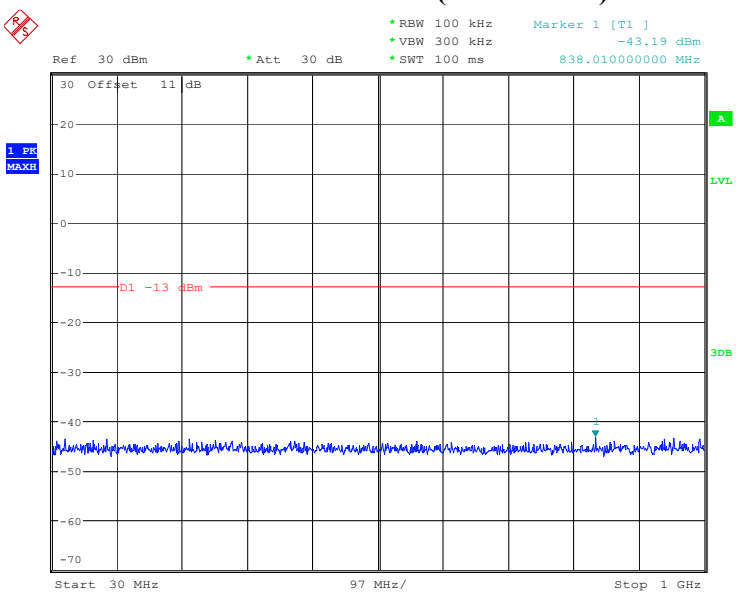
Fundamental test

ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang

Date: 3.APR.2024 14:13:51

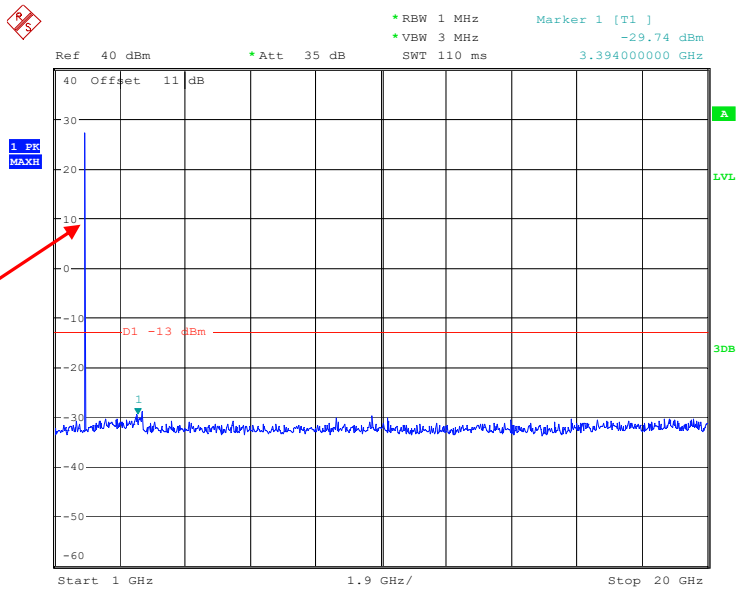
Middle Channel:

30 MHz – 1GHz (GPRS Mode)



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 14:16:17

1 GHz – 20GHz (GPRS Mode)

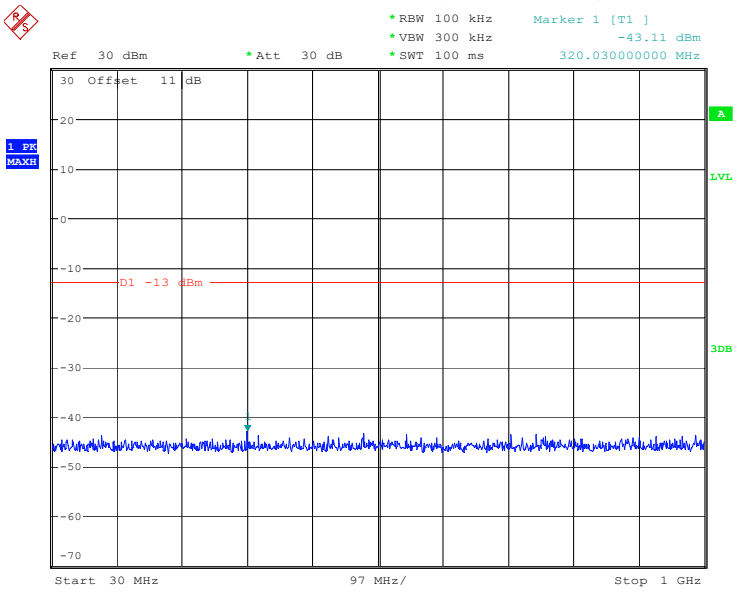


Fundamental test

ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 14:16:38

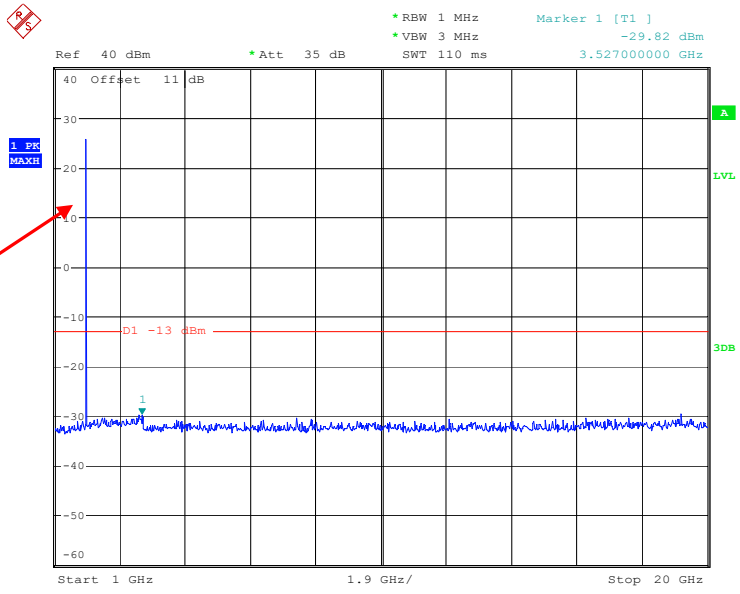
High Channel:

30 MHz – 1GHz (GPRS Mode)



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 14:19:06

1 GHz – 20GHz (GPRS Mode)

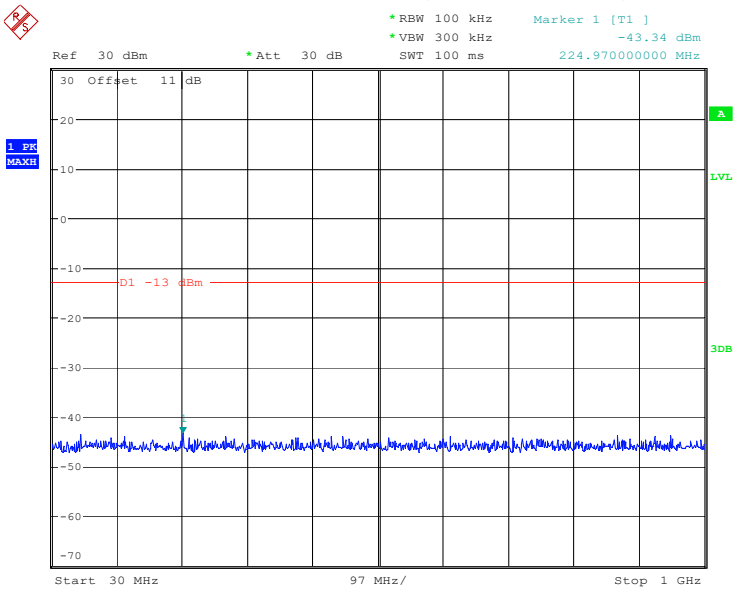


Fundamental test

ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 14:19:56

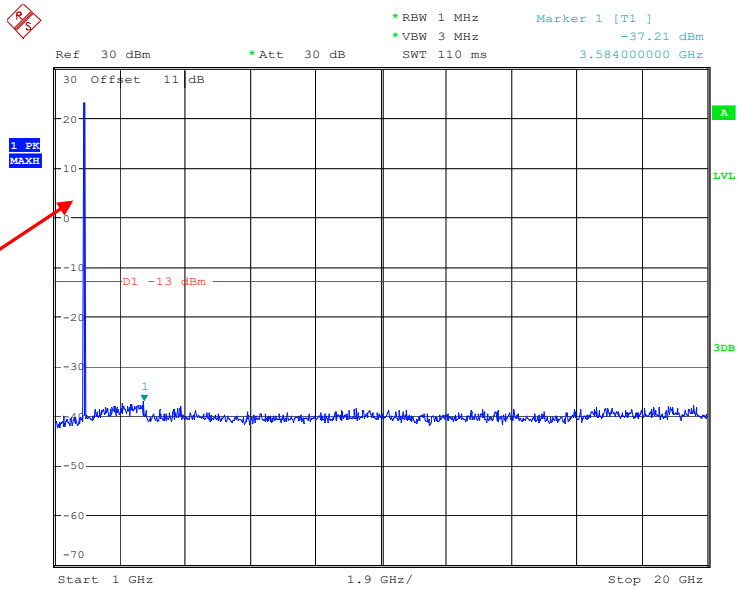
Low Channel:

30 MHz – 1GHz (WCDMA Mode)



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 14:24:41

1 GHz – 20GHz (WCDMA Mode)

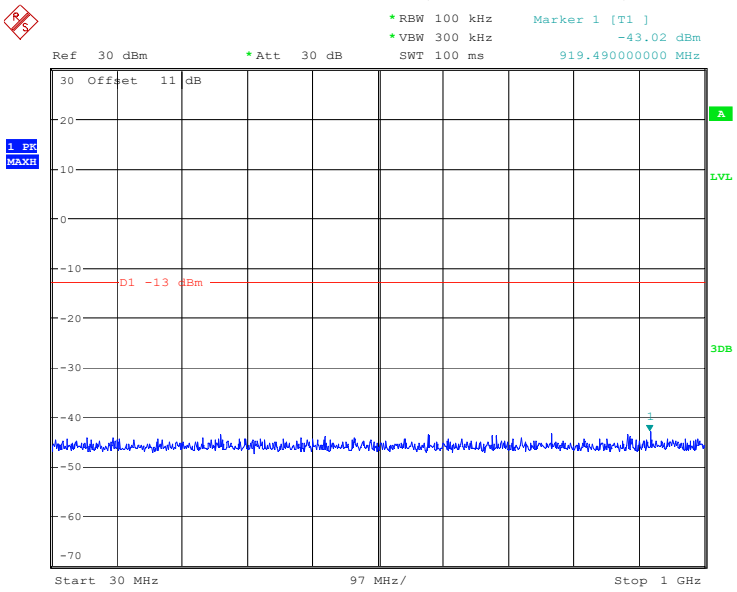


Fundamental test

ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 14:25:01

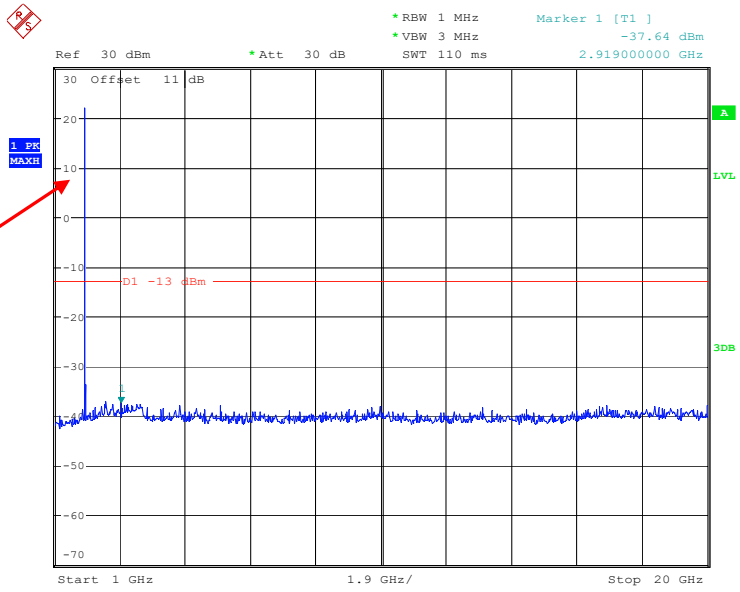
Middle Channel:

30 MHz – 1GHz (WCDMA Mode)



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 14:27:09

1 GHz – 20GHz (WCDMA Mode)

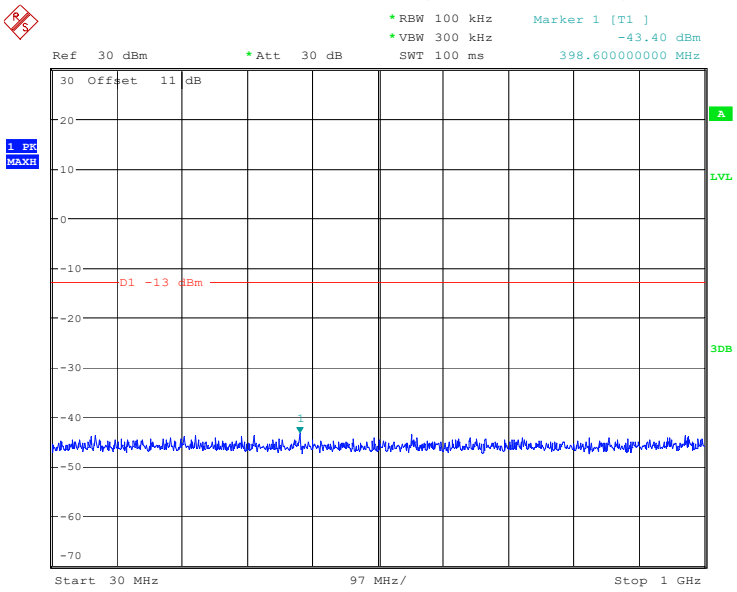


Fundamental test

ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 14:27:29

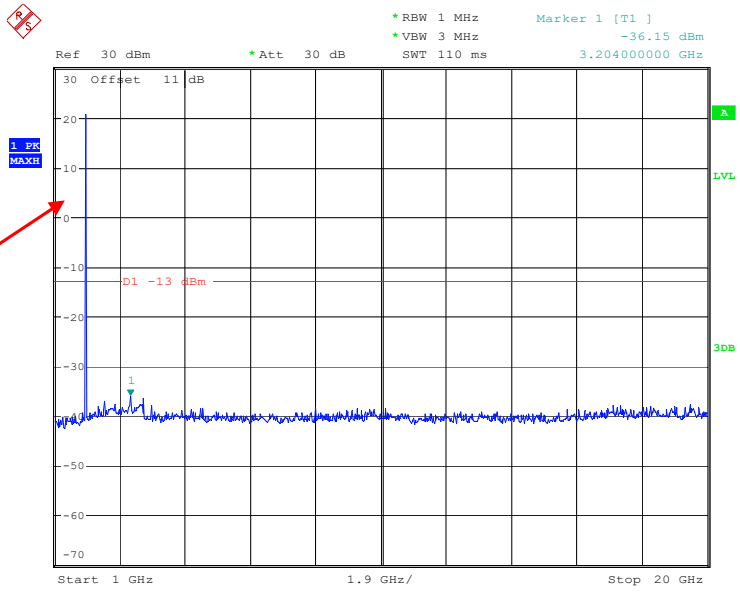
High Channel:

30 MHz – 1GHz (WCDMA Mode)



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 14:28:44

1 GHz – 20GHz (WCDMA Mode)



Fundamental test

ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 14:29:05

The test plots of LTE band please refer to the Appendix B.

FCC § 2.1053; § 22.917 (a); § 24.238 (a); §27.53 - SPURIOUS RADIATED EMISSIONS

Applicable Standard

FCC § 2.1053, §22.917(a)& § 24.238(a) &§ 27.53.

Test Procedure

ANSI/TIA-603-E-2016 Section 2.2.12
KDB 671168 D01 v03r01 Section 6.2

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

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

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

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	101kPa

The testing was performed by Anson Su on 2024-04-01for above 1GHz and Zenos Qiao on 2024-04-20 for above 1GHz.

EUT operation mode: Transmitting (Pre-scan in the X, Y and Z axes of orientation, the worst case z-axis of orientation was recorded)

Frequency (MHz)	Receiver Reading (dBµV)	Polar (H / V)	Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi/dBd)			
GSM 850								
Test frequency range: 30MHz-10GHz								
Low Channel								
212.5	46.34	H	-62.9	0.85	0.0	-63.75	-13.00	50.75
47.9	44.49	V	-63.9	0.75	0.0	-64.65	-13.00	51.65
1648.40	47.62	H	-60.08	0.90	8.60	-52.38	-13.00	39.38
1648.40	49.90	V	-58.30	0.90	8.60	-50.60	-13.00	37.60
2472.60	41.17	H	-66.23	1.10	8.80	-58.53	-13.00	45.53
2472.60	41.82	V	-65.28	1.10	8.80	-57.58	-13.00	44.58
3296.80	43.96	H	-62.04	1.30	8.80	-54.54	-13.00	41.54
3296.80	44.55	V	-61.15	1.30	8.80	-53.65	-13.00	40.65
Middle Channel								
212.5	46.68	H	-62.5	0.85	0.0	-63.35	-13.00	50.35
47.9	44.71	V	-63.7	0.75	0.0	-64.45	-13.00	51.45
1673.20	47.69	H	-59.91	0.90	8.60	-52.21	-13.00	39.21
1673.20	45.27	V	-62.83	0.90	8.60	-55.13	-13.00	42.13
2509.80	42.29	H	-65.11	1.10	8.80	-57.41	-13.00	44.41
2509.80	41.49	V	-65.61	1.10	8.80	-57.91	-13.00	44.91
3346.40	43.88	H	-62.12	1.30	8.80	-54.62	-13.00	41.62
3346.40	43.33	V	-62.37	1.30	8.80	-54.87	-13.00	41.87
High Channel								
212.5	46.85	H	-62.4	0.85	0.0	-63.25	-13.00	50.25
47.9	44.96	V	-63.4	0.75	0.0	-64.15	-13.00	51.15
1697.60	53.77	H	-53.83	0.90	8.60	-46.13	-13.00	33.13
1697.60	57.18	V	-50.92	0.90	8.60	-43.22	-13.00	30.22
2546.40	43.34	H	-64.06	1.10	8.80	-56.36	-13.00	43.36
2546.40	46.74	V	-60.36	1.10	8.80	-52.66	-13.00	39.66
3395.20	42.10	H	-63.90	1.30	9.90	-55.30	-13.00	42.30
3395.20	41.38	V	-64.32	1.30	9.90	-55.72	-13.00	42.72

Frequency (MHz)	Receiver Reading (dBμV)	Polar (H / V)	Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi/dBd)			
PCS 1900								
Test frequency range: 30MHz-20GHz								
Low Channel								
212.5	45.73	H	-63.5	0.85	0.0	-64.35	-13.00	51.35
47.9	44.02	V	-64.4	0.75	0.0	-65.15	-13.00	52.15
3700.40	40.48	H	-64.92	1.30	11.00	-55.22	-13.00	42.22
3700.40	41.19	V	-64.11	1.30	11.00	-54.41	-13.00	41.41
5550.600	40.51	H	-61.89	1.70	10.90	-52.69	-13.00	39.69
5550.600	41.14	V	-61.46	1.70	10.90	-52.26	-13.00	39.26
Middle Channel								
212.5	45.94	H	-63.3	0.85	0.0	-64.15	-13.00	51.15
47.9	44.18	V	-64.2	0.75	0.0	-64.95	-13.00	51.95
3760.00	42.29	H	-62.81	1.30	10.70	-53.41	-13.00	40.41
3760.00	42.76	V	-62.34	1.30	10.70	-52.94	-13.00	39.94
5640.000	39.83	H	-62.57	1.70	10.90	-53.37	-13.00	40.37
5640.000	40.52	V	-62.08	1.70	10.90	-52.88	-13.00	39.88
High Channel								
212.5	46.16	H	-63.0	0.85	0.0	-63.85	-13.00	50.85
47.9	44.32	V	-64.1	0.75	0.0	-64.85	-13.00	51.85
3819.60	42.66	H	-62.44	1.30	10.70	-53.04	-13.00	40.04
3819.60	43.40	V	-61.70	1.30	10.70	-52.30	-13.00	39.30
5729.400	38.98	H	-63.22	1.70	11.10	-53.82	-13.00	40.82
5729.400	41.30	V	-61.00	1.70	11.10	-51.60	-13.00	38.60

Frequency (MHz)	Receiver Reading (dBμV)	Polar (H / V)	Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi/dBd)			
WCDMA Band 2								
Test frequency range: 30MHz-20GHz								
Low Channel								
212.5	47.01	H	-62.2	0.85	0.0	-63.05	-13.00	50.05
47.9	45.29	V	-63.1	0.75	0.0	-63.85	-13.00	50.85
3704.80	41.63	H	-63.77	1.30	11.00	-54.07	-13.00	41.07
3704.80	44.96	V	-60.34	1.30	11.00	-50.64	-13.00	37.64
5557.20	40.61	H	-61.79	1.70	10.90	-52.59	-13.00	39.59
5557.20	40.68	V	-61.92	1.70	10.90	-52.72	-13.00	39.72
Middle Channel								
212.5	47.96	H	-61.2	0.85	0.0	-62.05	-13.00	49.05
47.9	46.08	V	-62.3	0.75	0.0	-63.05	-13.00	50.05
3760.00	42.29	H	-62.81	1.30	10.70	-53.41	-13.00	40.41
3760.00	42.76	V	-62.34	1.30	10.70	-52.94	-13.00	39.94
5640.00	39.83	H	-62.57	1.70	10.90	-53.37	-13.00	40.37
5640.00	40.52	V	-62.08	1.70	10.90	-52.88	-13.00	39.88
High Channel								
212.5	48.58	H	-60.6	0.85	0.0	-61.45	-13.00	48.45
47.9	46.81	V	-61.6	0.75	0.0	-62.35	-13.00	49.35
3815.20	43.69	H	-61.41	1.30	10.70	-52.01	-13.00	39.01
3815.20	43.66	V	-61.44	1.30	10.70	-52.04	-13.00	39.04
5722.80	39.06	H	-63.14	1.70	11.10	-53.74	-13.00	40.74
5722.80	39.71	V	-62.59	1.70	11.10	-53.19	-13.00	40.19

Frequency (MHz)	Receiver Reading (dBµV)	Polar (H / V)	Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi/dBd)			
WCDMA Band 5								
Test frequency range: 30MHz-10GHz								
Low Channel								
212.5	47.43	H	-61.8	0.85	0.0	-62.65	-13.00	49.65
47.9	45.88	V	-62.5	0.75	0.0	-63.25	-13.00	50.25
1652.80	45.46	H	-62.14	0.90	8.60	-54.44	-13.00	41.44
1652.80	45.87	V	-62.23	0.90	8.60	-54.53	-13.00	41.53
2479.20	42.74	H	-64.66	1.10	8.80	-56.96	-13.00	43.96
2479.20	41.03	V	-66.07	1.10	8.80	-58.37	-13.00	45.37
3305.60	44.32	H	-61.68	1.30	8.80	-54.18	-13.00	41.18
3305.60	43.61	V	-62.09	1.30	8.80	-54.59	-13.00	41.59
Middle Channel								
212.5	48.21	H	-61.0	0.85	0.0	-61.85	-13.00	48.85
47.9	46.47	V	-61.9	0.75	0.0	-62.65	-13.00	49.65
1673.20	40.45	H	-67.15	0.90	8.60	-59.45	-13.00	46.45
1673.20	41.17	V	-66.93	0.90	8.60	-59.23	-13.00	46.23
2509.80	42.40	H	-65.00	1.10	8.80	-57.30	-13.00	44.30
2509.80	41.60	V	-65.50	1.10	8.80	-57.80	-13.00	44.80
3346.40	42.76	H	-63.24	1.30	8.80	-55.74	-13.00	42.74
3346.40	43.65	V	-62.05	1.30	8.80	-54.55	-13.00	41.55
High Channel								
212.5	48.74	H	-60.5	0.85	0.0	-61.35	-13.00	48.35
47.9	46.95	V	-61.5	0.75	0.0	-62.25	-13.00	49.25
1693.20	43.56	H	-64.04	0.90	8.60	-56.34	-13.00	43.34
1693.20	45.11	V	-62.99	0.90	8.60	-55.29	-13.00	42.29
2539.80	42.97	H	-64.43	1.10	8.80	-56.73	-13.00	43.73
2539.80	41.46	V	-65.64	1.10	8.80	-57.94	-13.00	44.94
3386.40	42.07	H	-63.93	1.30	9.90	-55.33	-13.00	42.33
3386.40	41.37	V	-64.33	1.30	9.90	-55.73	-13.00	42.73

LTE Bands: (pre-scan QPSK & 16QAM with all bandwidths, the worst case as below)

Frequency (MHz)	Receiver Reading (dBμV)	Polar (H / V)	Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi/dBd)			
LTE Band 2								
Test frequency range: 30MHz-20GHz								
QPSK 1.4MHz Bandwidth, Low channel								
212.5	48.27	H	-60.9	0.85	0.0	-61.75	-13.00	48.75
47.9	46.03	V	-62.4	0.75	0.0	-63.15	-13.00	50.15
3701.40	42.97	H	-62.43	1.30	11.00	-52.73	-13.00	39.73
3701.40	41.42	V	-63.88	1.30	11.00	-54.18	-13.00	41.18
5552.10	41.09	H	-61.31	1.70	10.90	-52.11	-13.00	39.11
5552.10	41.34	V	-61.26	1.70	10.90	-52.06	-13.00	39.06
QPSK 1.4MHz Bandwidth, Middle channel								
212.5	48.45	H	-60.8	0.85	0.0	-61.65	-13.00	48.65
47.9	46.14	V	-62.3	0.75	0.0	-63.05	-13.00	50.05
3760.00	41.90	H	-63.20	1.30	10.70	-53.80	-13.00	40.80
3760.00	43.45	V	-61.65	1.30	10.70	-52.25	-13.00	39.25
5640.00	39.65	H	-62.75	1.70	10.90	-53.55	-13.00	40.55
5640.00	41.28	V	-61.32	1.70	10.90	-52.12	-13.00	39.12
QPSK 1.4MHz Bandwidth, High channel								
212.5	48.61	H	-60.6	0.85	0.0	-61.45	-13.00	48.45
47.9	46.38	V	-62.0	0.75	0.0	-62.75	-13.00	49.75
3818.60	43.00	H	-62.10	1.30	10.70	-52.70	-13.00	39.70
3818.60	43.53	V	-61.57	1.30	10.70	-52.17	-13.00	39.17
5727.90	38.96	H	-63.24	1.70	11.10	-53.84	-13.00	40.84
5727.90	39.67	V	-62.63	1.70	11.10	-53.23	-13.00	40.23

Frequency (MHz)	Receiver Reading (dBμV)	Polar (H / V)	Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi/dBd)			
LTE Band 4								
Test frequency range: 30MHz-20GHz								
QPSK 1.4MHz Bandwidth, Low channel								
212.5	47.71	H	-61.5	0.85	0.0	-62.35	-13.00	49.35
47.9	45.62	V	-62.8	0.75	0.0	-63.55	-13.00	50.55
3421.40	41.43	H	-64.57	1.30	9.90	-55.97	-13.00	42.97
3421.40	41.85	V	-63.85	1.30	9.90	-55.25	-13.00	42.25
5132.10	43.99	H	-59.21	1.50	9.60	-51.11	-13.00	38.11
5132.10	43.09	V	-59.51	1.50	9.60	-51.41	-13.00	38.41
QPSK 1.4MHz Bandwidth, Middle Channel								
212.5	47.89	H	-61.3	0.85	0.0	-62.15	-13.00	49.15
47.9	45.78	V	-62.6	0.75	0.0	-63.35	-13.00	50.35
3465.00	41.38	H	-64.52	1.30	10.50	-55.32	-13.00	42.32
3465.00	42.41	V	-63.19	1.30	10.50	-53.99	-13.00	40.99
5197.50	41.08	H	-61.92	1.60	9.70	-53.82	-13.00	40.82
5197.50	41.64	V	-61.06	1.60	9.70	-52.96	-13.00	39.96
QPSK 1.4MHz Bandwidth, High Channel								
212.5	48.05	H	-61.2	0.85	0.0	-62.05	-13.00	49.05
47.9	45.91	V	-62.5	0.75	0.0	-63.25	-13.00	50.25
3508.60	59.10	H	-46.80	1.30	10.50	-37.60	-13	24.60
3508.60	60.50	V	-45.10	1.30	10.50	-35.90	-13	22.90
5262.90	49.70	H	-53.20	1.60	10.00	-44.80	-13	31.80
5262.90	51.70	V	-51.00	1.60	10.00	-42.60	-13	29.60

Frequency (MHz)	Receiver Reading (dBμV)	Polar (H / V)	Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi/dBd)			
LTE Band 7								
Test frequency range: 30MHz-26.5GHz								
QPSK 5MHz Bandwidth, Low channel								
212.5	46.18	H	-63.0	0.85	0.0	-63.85	-25.00	38.85
47.9	45.08	V	-63.3	0.75	0.0	-64.05	-25.00	39.05
5005.00	48.63	H	-54.67	1.50	9.80	-46.37	-25.00	21.37
5005.00	46.23	V	-56.37	1.50	9.80	-48.07	-25.00	23.07
7507.50	35.99	H	-60.01	1.90	10.80	-51.11	-25.00	26.11
7507.50	35.65	V	-60.65	1.90	10.80	-51.75	-25.00	26.75
QPSK 5MHz Bandwidth, Middle Channel								
212.5	46.58	H	-62.6	0.85	0.0	-63.45	-25.00	38.45
47.9	45.39	V	-63.0	0.75	0.0	-63.75	-25.00	38.75
5070.00	56.32	H	-46.88	1.50	9.60	-38.78	-25.00	13.78
5070.00	50.88	V	-51.72	1.50	9.60	-43.62	-25.00	18.62
7605.00	38.29	H	-57.61	1.90	11.00	-48.51	-25.00	23.51
7605.00	36.00	V	-60.20	1.90	11.00	-51.10	-25.00	26.10
QPSK 5MHz Bandwidth, High Channel								
212.5	47.15	H	-62.1	0.85	0.0	-62.95	-25.00	37.95
47.9	45.61	V	-62.8	0.75	0.0	-63.55	-25.00	38.55
5135.00	50.90	H	-52.33	1.50	9.60	-44.23	-25.00	19.23
5135.00	47.80	V	-54.80	1.50	9.60	-46.70	-25.00	21.70
7702.50	38.20	H	-57.59	1.90	10.90	-48.59	-25.00	23.59
7702.50	36.40	V	-59.83	1.90	10.90	-50.83	-25.00	25.83

Frequency (MHz)	Receiver Reading (dBμV)	Polar (H / V)	Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi/dBd)			
LTE Band 38								
Test frequency range: 30MHz-26.5GHz								
QPSK 5MHz Bandwidth, Low channel								
212.5	47.32	H	-61.9	0.85	0.0	-62.75	-25.00	37.75
47.9	45.84	V	-62.6	0.75	0.0	-63.35	-25.00	38.35
5145.00	60.77	H	-42.43	1.50	9.60	-34.33	-25.00	9.33
5145.00	58.27	V	-44.33	1.50	9.60	-36.23	-25.00	11.23
7717.50	45.99	H	-49.81	1.90	10.90	-40.81	-25.00	15.81
7717.50	41.97	V	-54.23	1.90	10.90	-45.23	-25.00	20.23
QPSK 5MHz Bandwidth, Middle Channel								
212.5	47.67	H	-61.5	0.85	0.0	-62.35	-25.00	37.35
47.9	46.06	V	-62.3	0.75	0.0	-63.05	-25.00	38.05
5190.00	62.94	H	-40.06	1.60	9.70	-31.96	-25.00	6.96
5190.00	60.62	V	-42.08	1.60	9.70	-33.98	-25.00	8.98
7785.00	46.11	H	-49.59	1.90	11.10	-40.39	-25.00	15.39
7785.00	40.90	V	-55.20	1.90	11.10	-46.00	-25.00	21.00
QPSK 5MHz Bandwidth, High Channel								
212.5	47.99	H	-61.2	0.85	0.0	-62.05	-25.00	37.05
47.9	46.25	V	-62.2	0.75	0.0	-62.95	-25.00	37.95
5235.00	62.01	H	-40.99	1.60	9.70	-32.89	-25.00	7.89
5235.00	59.54	V	-43.16	1.60	9.70	-35.06	-25.00	10.06
7852.50	45.68	H	-49.92	1.90	11.10	-40.72	-25.00	15.72
7852.50	41.83	V	-54.17	1.90	11.10	-44.97	-25.00	19.97

Note:
Absolute Level = Reading Level + Substituted Factor
Substituted Factor contains: Substituted Level - Cable loss+ Antenna Gain
Margin = Absolute Level - Limit

FCC§ 22.917 (a); § 24.238 (a); §27.53 (h)(m) - BAND EDGES

Applicable Standard

According to § 22.917(a), the power of any emissions 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.

According to §24.238(a), the power of any emissions 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.

According to FCC §27.53 (h), 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.

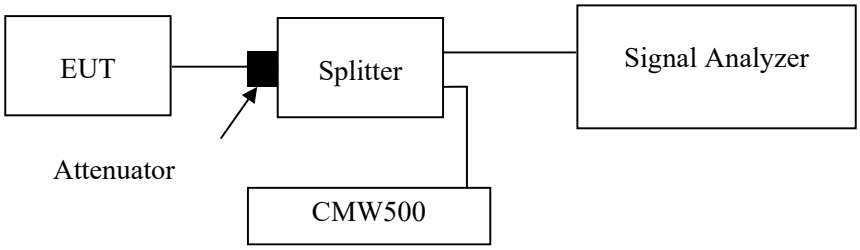
According to FCC §27.53 (m), For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5MHz.

Test Procedure

ANSI C63.26-2015 Section 5.7

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

The center of the spectrum analyzer was set to block edge frequency



Test Data

Environmental Conditions

Temperature:	26~27 ℃
Relative Humidity:	55~56 %
ATM Pressure:	101kPa

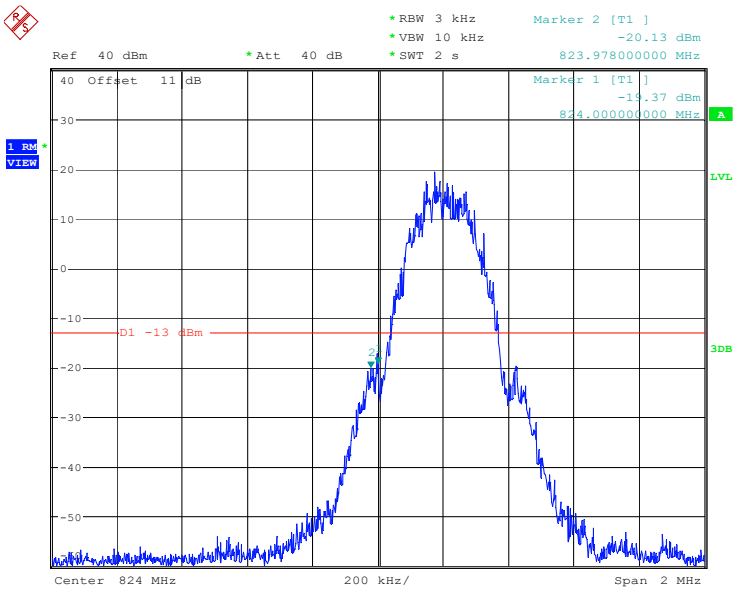
The testing was performed by Jim Cheng from 2024-03-31 to 2024-04-02 and Cheeb Huang on 2024-04-03.

EUT operation mode: Transmitting (Worst case)

Test Result: Compliant

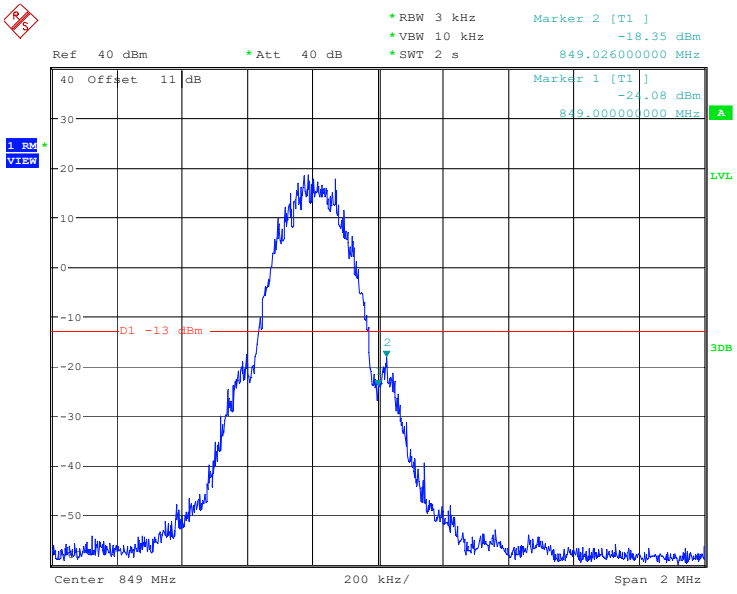
Please refer to the following plots.

Cellular Band, Left Band Edge for GRRS (GMSK) Mode



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 13:33:58

Cellular Band, Right Band Edge for GRRS (GMSK) Mode



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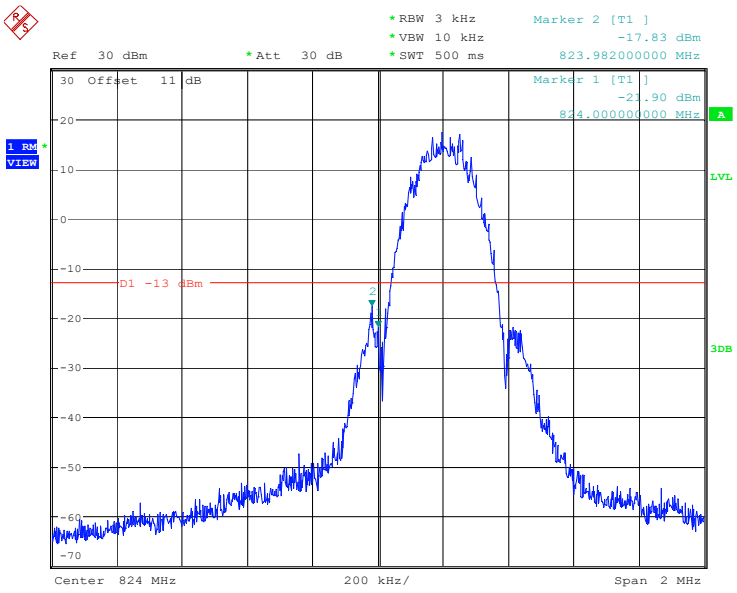
Date: 3.APR.2024 13:39:13

Cellular Band, Left Band Edge for EDGE(8PSK) Mode



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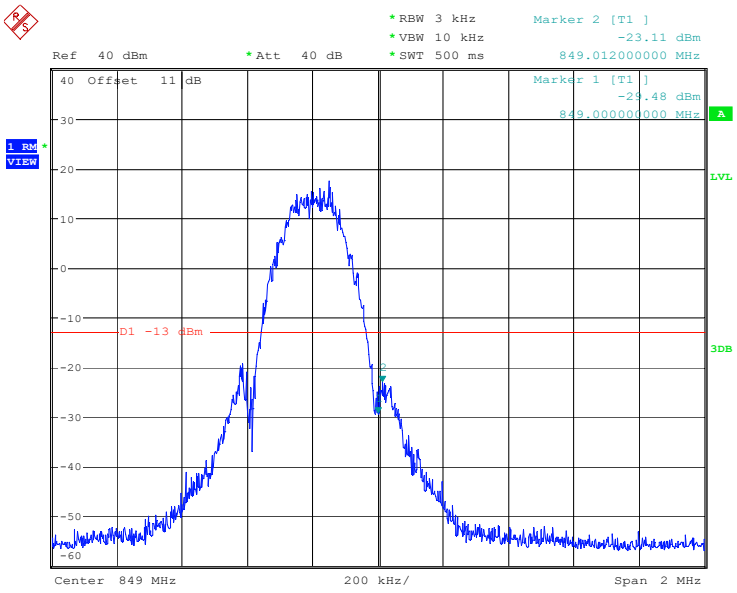
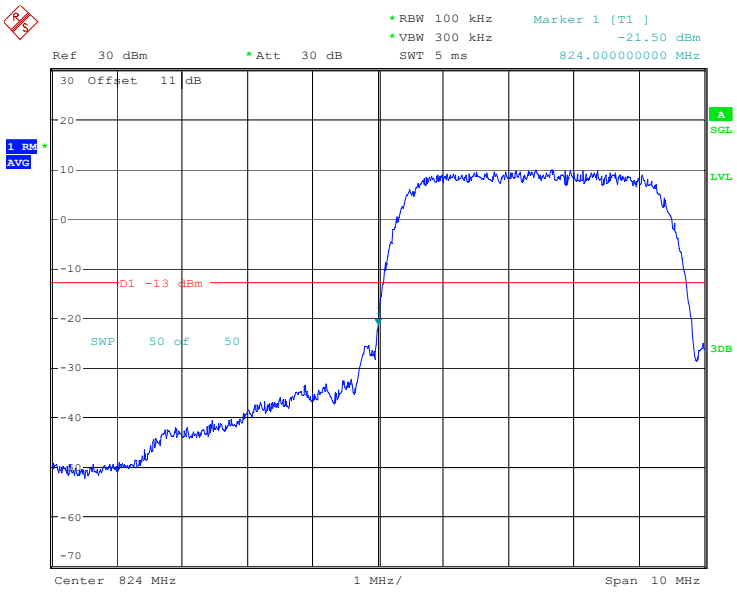
Date: 3.APR.2024 13:54:01

Cellular Band, Right Band Edge for EDGE(8PSK) Mode



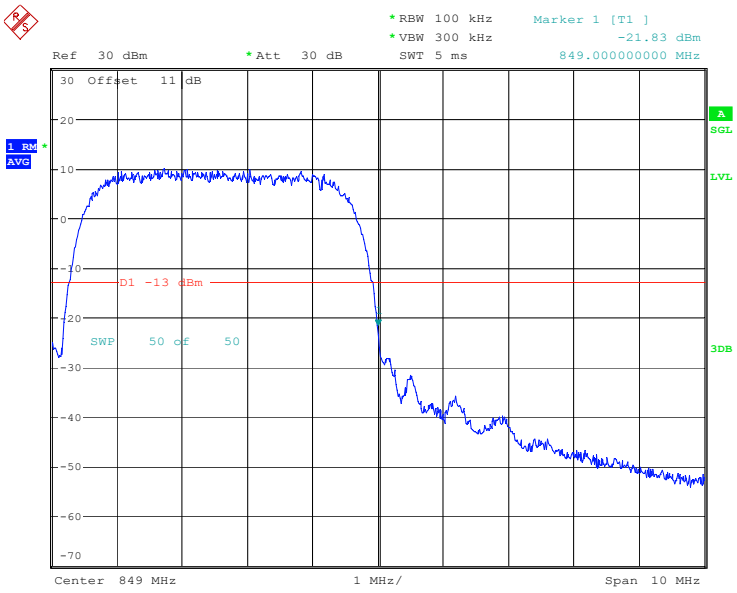
ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 13:45:14

Cellular Band, Left Band Edge for RMC (BPSK) Mode



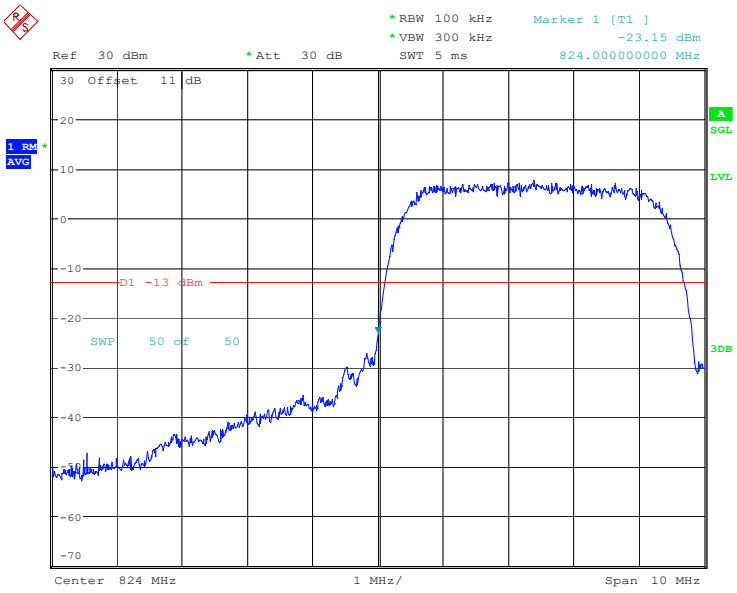
ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 15:08:40

Cellular Band, Right Band Edge for RMC (BPSK) Mode



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 15:12:28

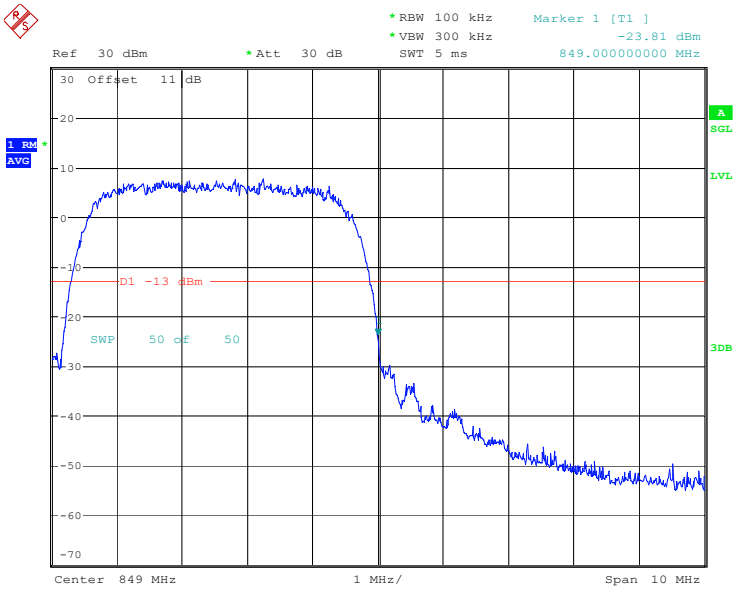
Cellular Band, Left Band Edge for HSDPA(16QAM) Mode



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang

Date: 3.APR.2024 15:06:48

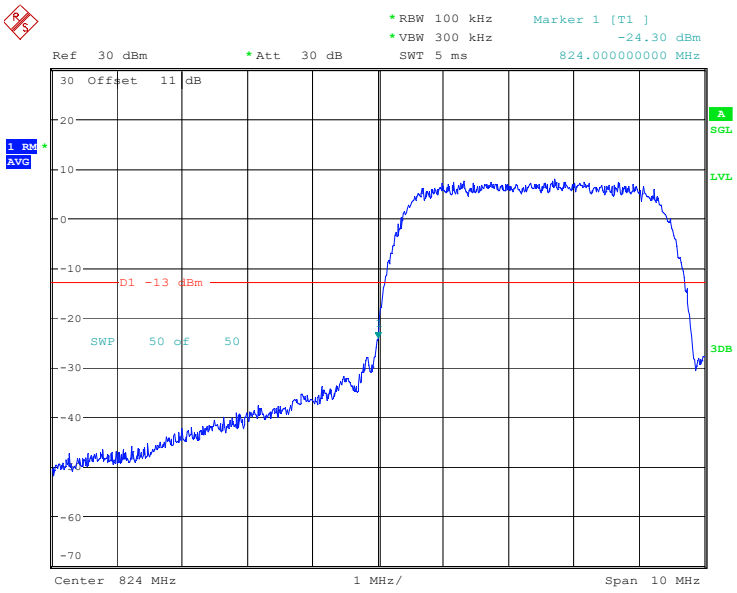
Cellular Band, Right Band Edge for HSDPA (16QAM) Mode



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang

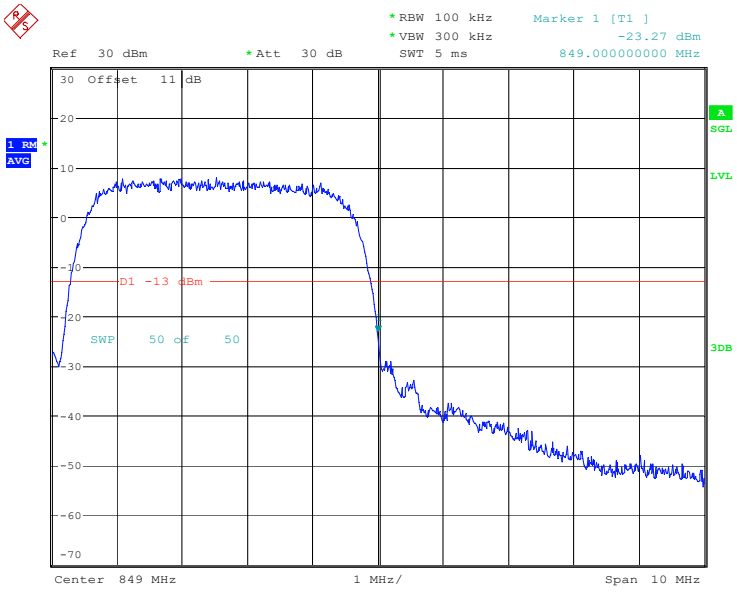
Date: 3.APR.2024 15:03:05

Cellular Band, Left Band Edge for HSUPA (QPSK) Mode



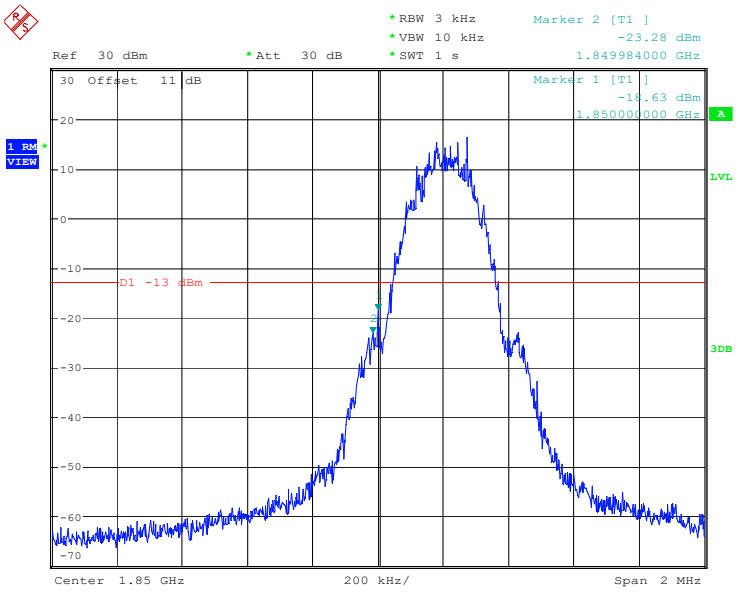
ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 14:55:57

Cellular Band, Right Band Edge for HSUPA (QPSK) Mode



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 15:00:58

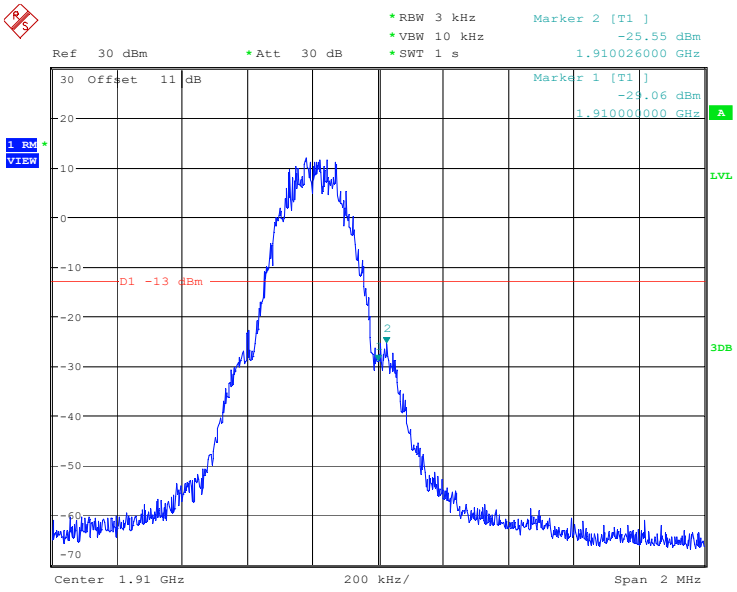
PCS Band, Left Band Edge for GRRS (GMSK) Mode



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang

Date: 3.APR.2024 14:13:08

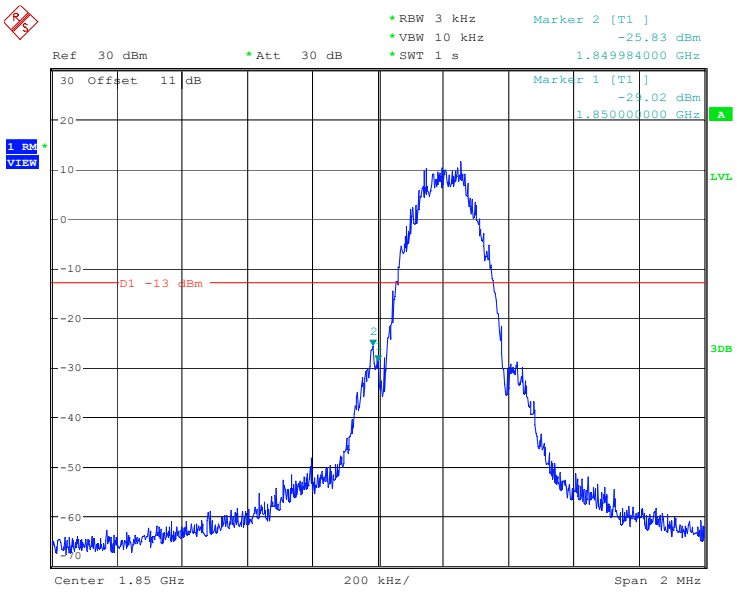
PCS Band, Right Band Edge for GRRS (GMSK) Mode



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang

Date: 3.APR.2024 14:18:44

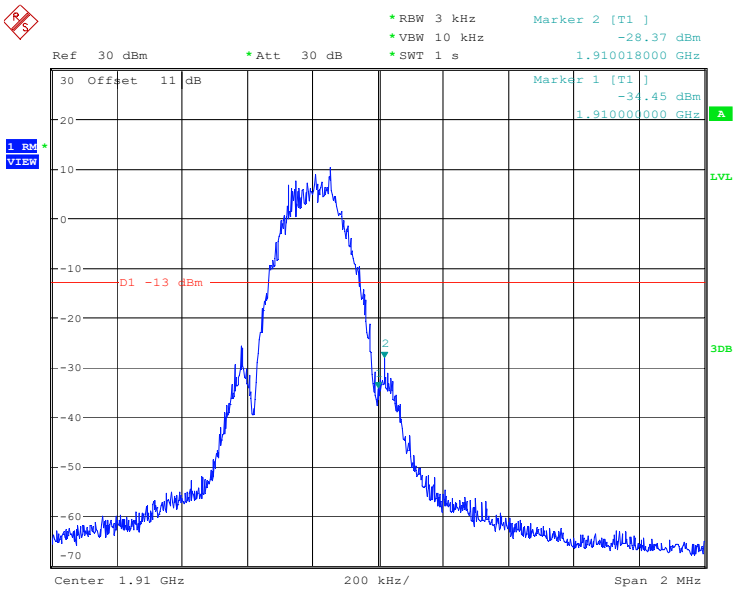
PCS Band, Left Band Edge for EDGE(8PSK) Mode



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang

Date: 3.APR.2024 13:59:55

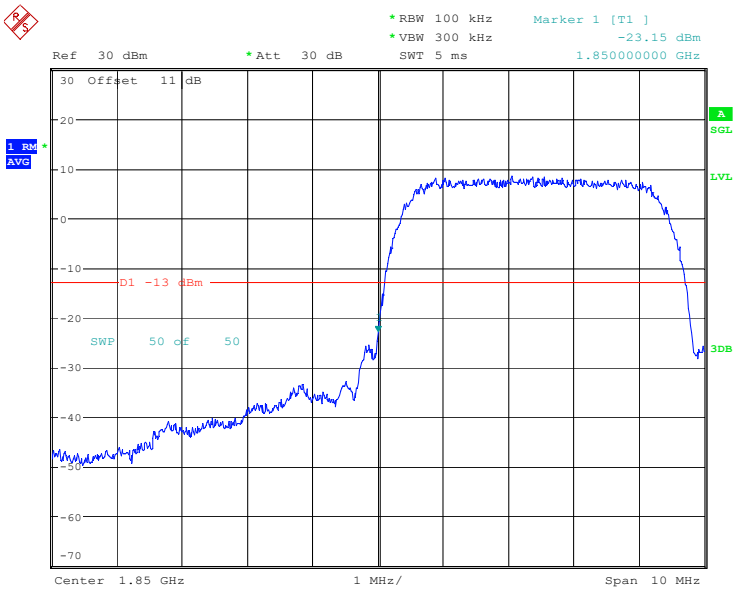
PCS Band, Right Band Edge for EDGE(8PSK) Mode



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang

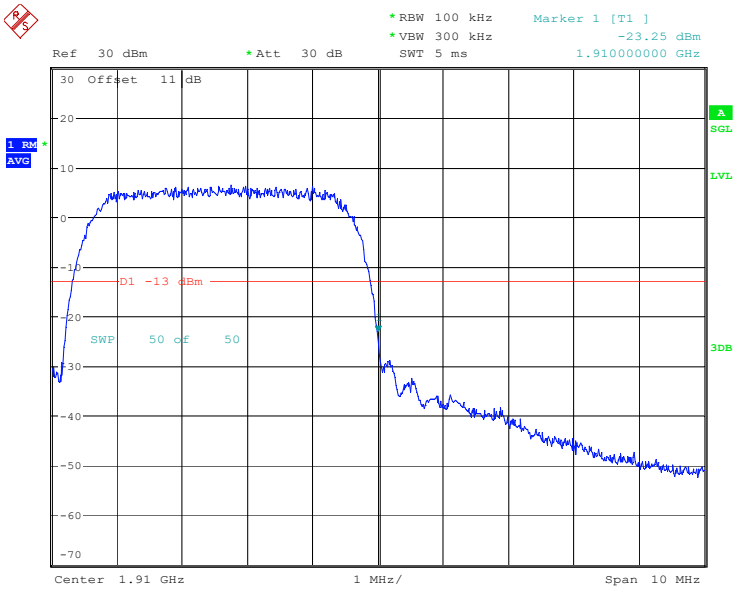
Date: 3.APR.2024 14:08:04

PCS Band, Left Band Edge for RMC (BPSK) Mode



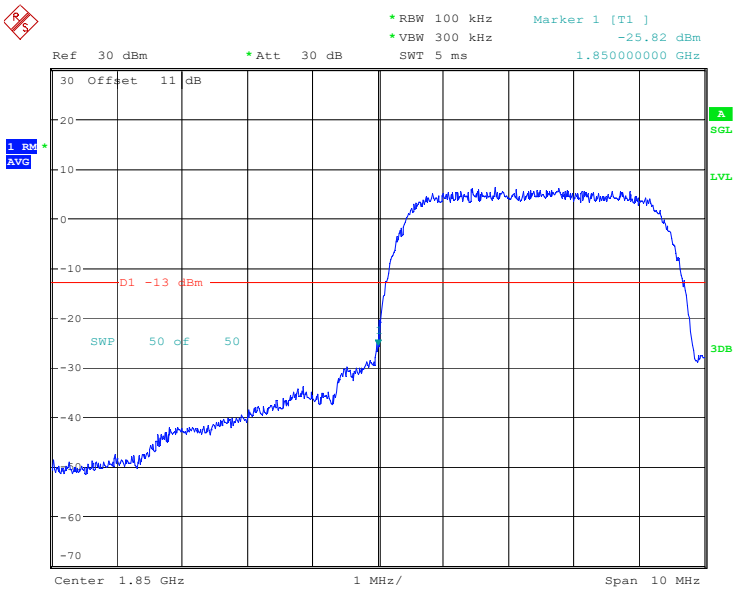
ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 14:24:20

PCS Band, Right Band Edge for RMC (BPSK) Mode



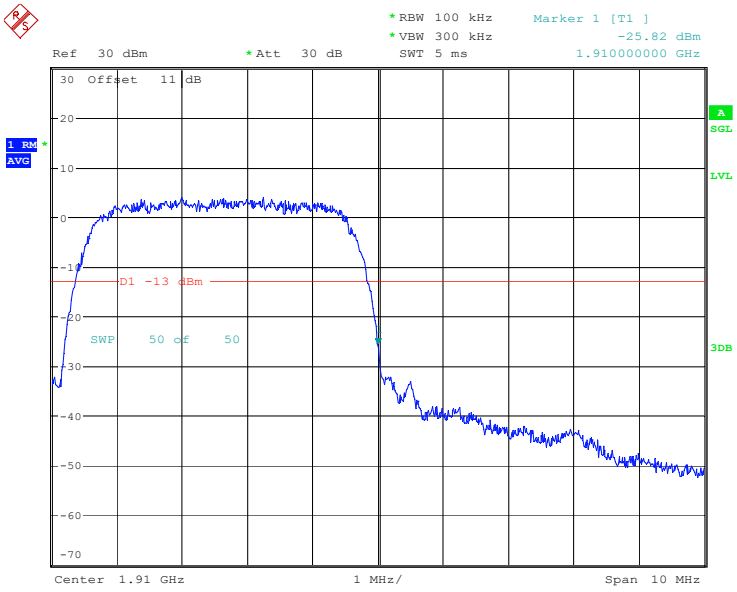
ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 14:28:23

PCS Band, Left Band Edge for HSDPA(16QAM) Mode



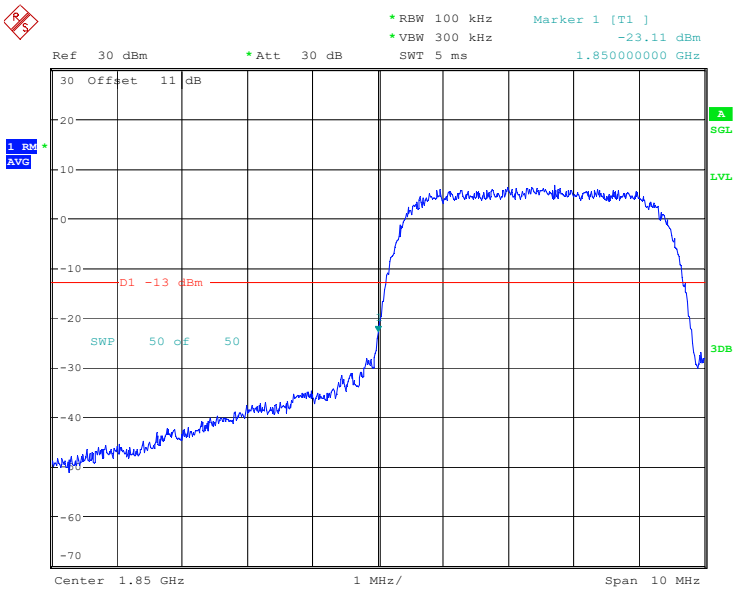
ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 14:36:09

PCS Band, Right Band Edge for HSDPA (16QAM) Mode



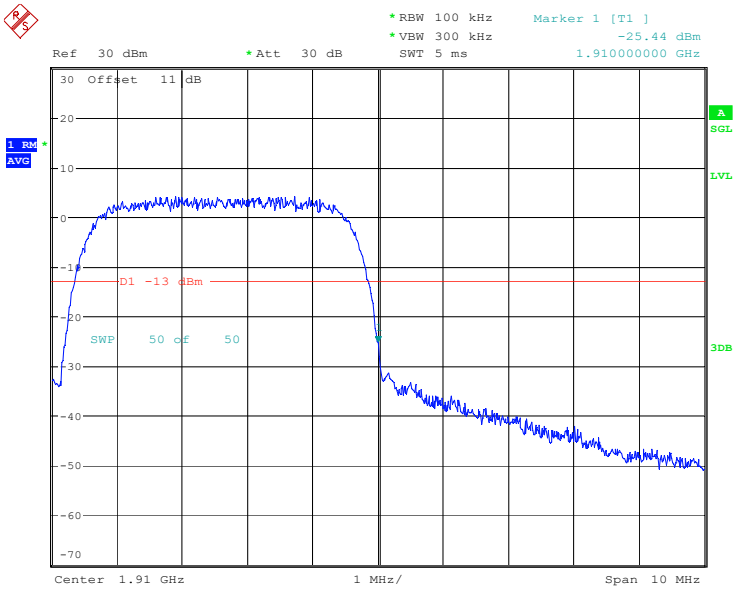
ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 14:30:15

PCS Band, Left Band Edge for HSUPA (QPSK) Mode



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 14:37:54

PCS Band, Right Band Edge for HSUPA (QPSK) Mode



ProjectNo.:SZ1240308-11508E-RF Tester:Cheeb Huang
Date: 3.APR.2024 14:42:29

The test plots of LTE bands please refer to the Appendix C.

FCC § 2.1055; § 22.355; § 24.235; §27.54 - FREQUENCY STABILITY

Applicable Standard

FCC § 2.1055, §22.355, §24.235&§27.54.

According to FCC §2.1055, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

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

Frequency Tolerance for Transmitters in the Public Mobile Services

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

According to §24.235&§27.54, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

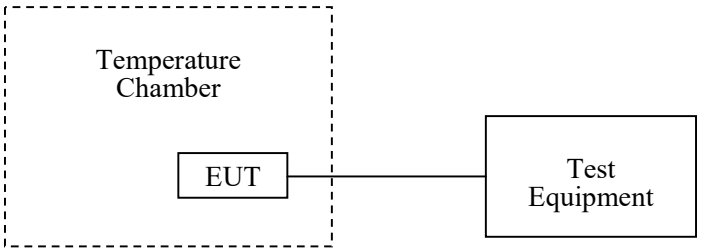
Test Procedure

ANSI C63.26-2015 Section 5.6

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: For hand carried, battery powered equipment; reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.



Test Data

Environmental Conditions

Temperature:	26~27 ℃
Relative Humidity:	55~56 %
ATM Pressure:	101kPa

The testing was performed by Jim Cheng from 2024-03-30 to 2024-03-31 and Cheeb Huang on 2024-04-03.

EUT operation mode: Transmitting

Test Result: Compliant

Please refer to the following tables.

Cellular Band (Part 22H)

GSM Mode

Test Modulation:	GMSK		Test Channel:	836.6	MHz
Test Item	Temperature (℃)	Voltage (V_{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	12	11.05	0.013	2.5
	-20	12	23.98	0.029	2.5
	-10	12	15.09	0.018	2.5
	0	12	20.45	0.024	2.5
	10	12	19.79	0.024	2.5
	20	12	22.17	0.027	2.5
	30	12	20.81	0.025	2.5
	40	12	20.53	0.025	2.5
	50	12	21.05	0.025	2.5
Frequency Stability vs. Voltage	20	9	16.55	0.020	2.5
	20	40	18.12	0.022	2.5

Test Modulation:	8PSK		Test Channel:	836.6	MHz
Test Item	Temperature (℃)	Voltage (V_{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	12	13.36	0.016	2.5
	-20	12	20.63	0.025	2.5
	-10	12	12.88	0.015	2.5
	0	12	5.26	0.006	2.5
	10	12	10.9	0.013	2.5
	20	12	12.36	0.015	2.5
	30	12	17.25	0.021	2.5
	40	12	10.94	0.013	2.5
	50	12	22.51	0.027	2.5
Frequency Stability vs. Voltage	20	9	9.08	0.011	2.5
	20	40	16.21	0.019	2.5

WCDMA Mode

Test Modulation:	WCDMA R99		Test Channel:	836.6	MHz
Test Item	Temperature (℃)	Voltage (V_{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	12	7.01	0.008	2.5
	-20	12	3.79	0.005	2.5
	-10	12	2.97	0.004	2.5
	0	12	1.85	0.002	2.5
	10	12	9.14	0.011	2.5
	20	12	9.54	0.011	2.5
	30	12	6.63	0.008	2.5
	40	12	8.39	0.010	2.5
	50	12	1	0.001	2.5
Frequency Stability vs. Voltage	20	9	4.14	0.005	2.5
	20	40	4.82	0.006	2.5

PCS Band (Part 24E)

GSM Mode

Test Mode:	GMSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	12	1850.710	1850.000	1908.480	1910.000
	-20	12	1851.870	1850.000	1909.300	1910.000
	-10	12	1850.960	1850.000	1908.970	1910.000
	0	12	1851.290	1850.000	1908.570	1910.000
	10	12	1850.470	1850.000	1908.900	1910.000
	20	12	1850.370	1850.000	1909.030	1910.000
	30	12	1851.250	1850.000	1908.430	1910.000
	40	12	1850.990	1850.000	1908.970	1910.000
	50	12	1851.170	1850.000	1909.130	1910.000
Frequency Stability vs. Voltage	20	9	1850.880	1850.000	1908.800	1910.000
	20	40	1850.400	1850.000	1909.230	1910.000

Test Mode:	8PSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	12	1850.450	1850.000	1908.500	1910.000
	-20	12	1850.420	1850.000	1909.040	1910.000
	-10	12	1850.630	1850.000	1908.690	1910.000
	0	12	1850.820	1850.000	1909.100	1910.000
	10	12	1850.780	1850.000	1908.660	1910.000
	20	12	1850.520	1850.000	1909.540	1910.000
	30	12	1851.080	1850.000	1908.460	1910.000
	40	12	1850.790	1850.000	1909.200	1910.000
	50	12	1851.370	1850.000	1908.630	1910.000
Frequency Stability vs. Voltage	20	9	1851.210	1850.000	1908.930	1910.000
	20	40	1851.860	1850.000	1909.100	1910.000

WCDMA Mode

Test Mode:	WCDMA R99	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	12	1850.490	1850.000	1908.620	1910.000
	-20	12	1851.710	1850.000	1909.020	1910.000
	-10	12	1850.510	1850.000	1909.350	1910.000
	0	12	1850.800	1850.000	1908.590	1910.000
	10	12	1850.940	1850.000	1908.860	1910.000
	20	12	1851.090	1850.000	1908.600	1910.000
	30	12	1851.270	1850.000	1908.800	1910.000
	40	12	1851.660	1850.000	1908.610	1910.000
	50	12	1851.270	1850.000	1909.340	1910.000
Frequency Stability vs. Voltage	20	9	1851.570	1850.000	1909.180	1910.000
	20	40	1851.010	1850.000	1908.200	1910.000

LTE

QPSK:

Band 2

Test Mode:	20M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	12	1850.127	1850.000	1909.964	1910.000
	-20	12	1850.146	1850.000	1909.873	1910.000
	-10	12	1850.072	1850.000	1909.969	1910.000
	0	12	1850.032	1850.000	1909.840	1910.000
	10	12	1850.145	1850.000	1909.956	1910.000
	20	12	1850.092	1850.000	1909.961	1910.000
	30	12	1850.197	1850.000	1909.826	1910.000
	40	12	1850.118	1850.000	1909.871	1910.000
	50	12	1850.114	1850.000	1909.886	1910.000
Frequency Stability vs. Voltage	20	9	1850.143	1850.000	1909.831	1910.000
	20	40	1850.187	1850.000	1909.998	1910.000

Band 4

Test Mode:	20M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	12	1710.110	1710.00	1754.898	1755
	-20	12	1710.053	1710.00	1754.816	1755
	-10	12	1710.189	1710.00	1754.883	1755
	0	12	1710.006	1710.00	1754.980	1755
	10	12	1710.037	1710.00	1754.849	1755
	20	12	1710.005	1710.00	1754.952	1755
	30	12	1710.154	1710.00	1754.933	1755
	40	12	1710.033	1710.00	1754.921	1755
	50	12	1710.192	1710.00	1754.913	1755
Frequency Stability vs. Voltage	20	9	1710.010	1710.00	1754.986	1755
	20	40	1710.020	1710.00	1754.865	1755

Band 7

Test Mode:	20M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	12	2500.046	2500.00	2569.807	2570
	-20	12	2500.054	2500.00	2569.826	2570
	-10	12	2500.074	2500.00	2569.912	2570
	0	12	2500.112	2500.00	2569.957	2570
	10	12	2500.143	2500.00	2569.908	2570
	20	12	2500.003	2500.00	2569.810	2570
	30	12	2500.047	2500.00	2569.927	2570
	40	12	2500.118	2500.00	2569.801	2570
	50	12	2500.152	2500.00	2569.937	2570
Frequency Stability vs. Voltage	20	9	2500.123	2500.00	2569.923	2570
	20	40	2500.029	2500.00	2569.865	2570

Band 38

Test Mode:	20M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	12	2570.146	2570.00	2619.915	2620
	-20	12	2570.028	2570.00	2619.818	2620
	-10	12	2570.107	2570.00	2619.896	2620
	0	12	2570.048	2570.00	2619.840	2620
	10	12	2570.108	2570.00	2619.988	2620
	20	12	2570.052	2570.00	2619.804	2620
	30	12	2570.108	2570.00	2619.902	2620
	40	12	2570.122	2570.00	2619.868	2620
	50	12	2570.039	2570.00	2619.879	2620
Frequency Stability vs. Voltage	20	9	2570.122	2570.00	2619.958	2620
	20	40	2570.169	2570.00	2619.808	2620

16QAM:

Band 2

Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	12	1850.153	1850.000	1909.938	1910.000
	-20	12	1850.195	1850.000	1909.844	1910.000
	-10	12	1850.090	1850.000	1909.920	1910.000
	0	12	1850.167	1850.000	1909.947	1910.000
	10	12	1850.124	1850.000	1909.985	1910.000
	20	12	1850.196	1850.000	1909.850	1910.000
	30	12	1850.123	1850.000	1909.852	1910.000
	40	12	1850.027	1850.000	1909.835	1910.000
	50	12	1850.177	1850.000	1909.905	1910.000
Frequency Stability vs. Voltage	20	9	1850.118	1850.000	1909.946	1910.000
	20	40	1850.065	1850.000	1909.916	1910.000

Band 4

Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	12	1710.093	1710.00	1754.820	1755
	-20	12	1710.043	1710.00	1754.998	1755
	-10	12	1710.055	1710.00	1754.878	1755
	0	12	1710.075	1710.00	1754.893	1755
	10	12	1710.018	1710.00	1754.888	1755
	20	12	1710.050	1710.00	1754.896	1755
	30	12	1710.160	1710.00	1754.875	1755
	40	12	1710.005	1710.00	1754.935	1755
	50	12	1710.172	1710.00	1754.866	1755
Frequency Stability vs. Voltage	20	9	1710.012	1710.00	1754.968	1755
	20	40	1710.110	1710.00	1754.865	1755

Band 7

Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	12	2500.010	2500.00	2569.974	2570
	-20	12	2500.096	2500.00	2569.841	2570
	-10	12	2500.181	2500.00	2569.852	2570
	0	12	2500.154	2500.00	2569.917	2570
	10	12	2500.056	2500.00	2569.919	2570
	20	12	2500.128	2500.00	2569.938	2570
	30	12	2500.139	2500.00	2569.851	2570
	40	12	2500.166	2500.00	2569.978	2570
	50	12	2500.146	2500.00	2569.810	2570
Frequency Stability vs. Voltage	20	9	2500.011	2500.00	2569.801	2570
	20	40	2500.095	2500.00	2569.980	2570

Band 38

Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	12	2570.123	2570.00	2619.984	2620
	-20	12	2570.019	2570.00	2619.849	2620
	-10	12	2570.174	2570.00	2619.857	2620
	0	12	2570.136	2570.00	2619.851	2620
	10	12	2570.068	2570.00	2619.872	2620
	20	12	2570.027	2570.00	2619.895	2620
	30	12	2570.161	2570.00	2619.925	2620
	40	12	2570.032	2570.00	2619.919	2620
	50	12	2570.185	2570.00	2619.868	2620
Frequency Stability vs. Voltage	20	9	2570.130	2570.00	2619.859	2620
	20	40	2570.122	2570.00	2619.946	2620

EUT PHOTOGRAPHS

Please refer to the attachment SZ1240308-11508E-RF External photo and SZ1240308-11508E-RF Internal photo.

TEST SETUP PHOTOGRAPHS

Please refer to the attachment SZ1240308-11508E-RFD Test Setup photo.

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