

TEST REPORT

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Report Number: SZ1240124-05544E-RF-00B
FCC ID: 2BHDCMF67MIFI

Test Standard (s)

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

Sample Description

Product Type: 4G LTE Pocket WiFi
Model No.: MF67
Multiple Model(s) No.: N/A
Trade Mark: N/A
Date Received: 2024/01/24
Issue Date: 2024/07/12

Test Result:

Pass▲

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

Prepared and Checked By:

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Approved By:

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Nancy Wang
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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.

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EUT PHOTOGRAPHS61

TEST SETUP PHOTOGRAPHS62

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	SZ1240124-05544E-RF-00B	Original Report	2024/07/12

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	4G LTE Pocket WiFi			
Tested Model	MF67			
Multiple Model(s)	N/A			
Frequency Range	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 12: 699-716MHz(TX); 729-746MHz(RX) LTE Band 17: 704-716MHz(TX); 734-746MHz(RX)			
Modulation Technique	3G: BPSK, QPSK, 16QAM, 64QAM 4G: QPSK, 16QAM			
Antenna Specification [#]	Antenna	Operation Bands	Antenna Gain (G _T) (dBi)	L _c (dB)
	Main ANT	WCDMA B2/LTE B2	2.56	0
		WCDMA B5	-1.27	0
		LTE B4	1.62	0
		LTE B12	-1.29	0
		LTE B17	-1.29	0
Note: L _c = Signal Attenuation in the connecting cable between the transmitter and antenna, in dB.				
Voltage Range	DC 3.7V from battery or DC 5V from Micro USB port			
Sample serial number	2H2U-3 for Radiated Emissions Test 2H2U-1 for RF Conducted Test (Assigned by BACL, Shenzhen)			
Sample/EUT Status	Good condition			
Normal/Extreme Condition [#]	L.V.: Low Voltage 3.45V _{DC} N.V.: Normal Voltage 3.7V _{DC} H.V.: High Voltage 4.4V _{DC}			
Adapter Information	N/A			

Objective

This test report is in accordance with Part 2-Subpart J, Part 22-Subpart H, Part24-Subpart E, and Subpart 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°C
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
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 B12	1.4	699.7	707.5	715.3
	3	700.5	707.5	714.5
	5	701.5	707.5	713.5
	10	704.0	707.5	711.0
LTE B17	5	706.5	710	713.5
	10	709	710	711

Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

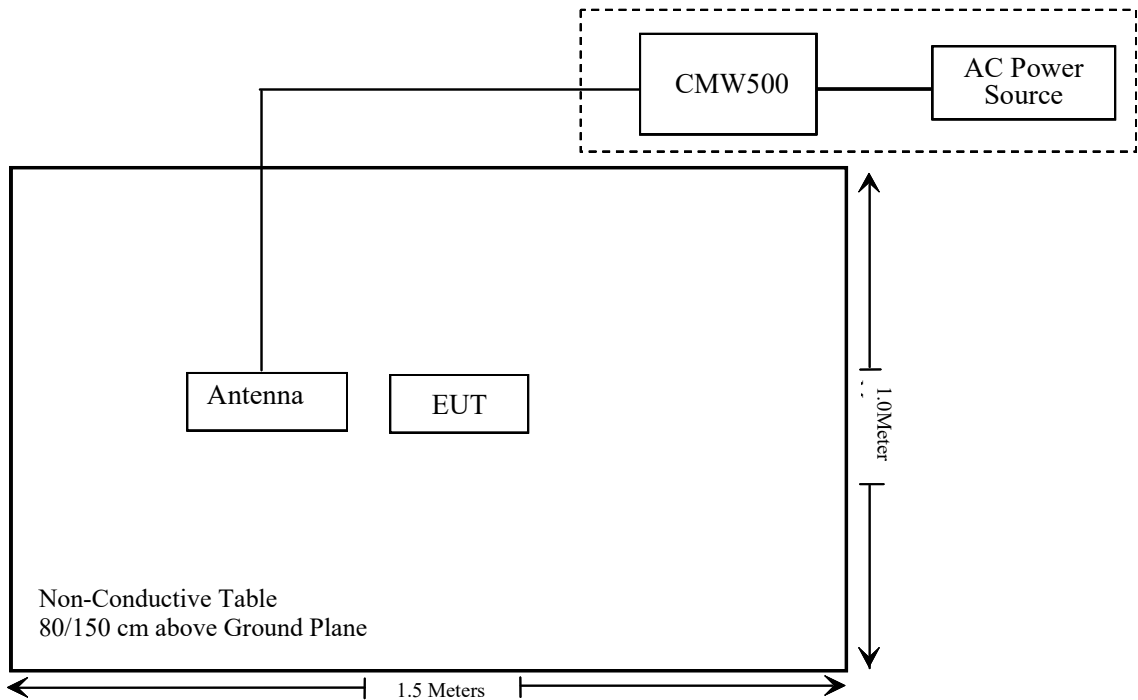
Manufacturer	Description	Model	Serial Number
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	141718

Support Cable Description

Cable Description	Length (m)	From / Port	To
Unshielded Un-detachable AC cable	1.2	AC Power	CMW500

Block Diagram of Test Setup

For radiated spurious emission



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307 ,§2.1093	RF Exposure (SAR)	Compliant
§2.1046; § 22.913 (a) (d); § 24.232 (c) (d); §27.50 (c)(d)	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 (g) (h)	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	2024/07/19
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	2023/04/18	2024/04/17
COM-POWER	Pre-amplifier	PA-122	181919	2023/06/29	2024/06/28
Schwarzbeck	Horn Antenna	BBHA9120D(1201)	1143	2023/07/26	2024/07/25
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
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	2023/08/03	2024/08/02
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	FSU26	200120	2024/01/08	2025/01/07
BACL	Temperature & Humidity Chamber	BTH-150-40	30144	2024/01/16	2025/01/15
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
Unknown	3dB Attenuator	Unknown	F-03-EM121	2023/07/04	2024/07/03
WEINSCHEL	Power Splitter	1515	RH386	2023/07/04	2024/07/03
WEINSCHEL	Power Splitter	1515	RH476	2023/07/04	2024/07/03
Unknown	RF Cable	65475	01670515	2023/07/04	2024/07/03
Micro-Tronics	RF Cable	8082135	W1113	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) & §2.1093 - RF EXPOSURE INFORMATION

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliant, please refer to the SAR report: SZ1240124-05544E-SA.

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 (c) (d) - 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.

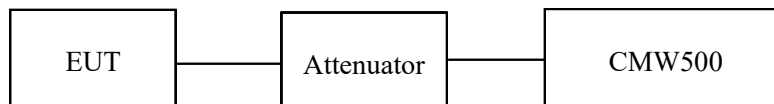
According to §27.50(c), Control and mobile stations in the 698-746 MHz band are limited to 30 watts ERP. And Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

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.

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:	24.1~26.3 °C
Relative Humidity:	38~49 %
ATM Pressure:	101 kPa

The testing was performed by Cheeb Huang from 2024-02-27 to 2024-03-01.

Test Result: Compliant

Cellular Band (Part 22H)**WCAMA B5**

Test Mode	Conducted Average Output Power(dBm)			Maximum ERP (dBm)	ERP Limit (dBm)
	Lowest Channel	Middle Channel	Highest Channel		
WCDMA R99	19.57	20.54	20.90	17.48	38.45
HSDPA Subtest 1	18.97	20.42	20.68	17.26	38.45
HSDPA Subtest 2	18.89	20.31	20.64	17.22	38.45
HSDPA Subtest 3	19.35	20.67	20.68	17.26	38.45
HSDPA Subtest 4	19.07	20.46	21.01	17.59	38.45
HSUPA Subtest 1	18.25	19.85	19.25	16.43	38.45
HSUPA Subtest 2	18.28	20.02	19.37	16.60	38.45
HSUPA Subtest 3	18.18	20.08	19.47	16.66	38.45
HSUPA Subtest 4	18.01	19.79	18.87	16.37	38.45
HSUPA Subtest 5	17.95	19.48	19.35	16.06	38.45
HSPA+ Subtest 1	18.44	20.01	19.38	16.59	38.45

Note:

ERP= Conducted Power(dBm) - Lc(dB) + G_T(dBd)G_T(dBd)=G_T(dBi)-2.15**PCS Band (Part 24E)****WCDMA B2**

Test Mode	Conducted Average Output Power(dBm)			Maximum EIRP (dBm)	EIRP Limit (dBm)
	Lowest Channel	Middle Channel	Highest Channel		
WCDMA R99	21.69	22.49	22.56	25.12	33
HSDPA Subtest 1	21.20	21.89	22.07	24.63	33
HSDPA Subtest 2	21.25	22.23	22.07	24.79	33
HSDPA Subtest 3	20.99	21.85	22.15	24.71	33
HSDPA Subtest 4	21.67	22.01	22.00	24.57	33
HSUPA Subtest 1	20.32	20.97	21.00	23.56	33
HSUPA Subtest 2	20.10	21.00	20.85	23.56	33
HSUPA Subtest 3	20.56	20.97	21.23	23.79	33
HSUPA Subtest 4	20.30	20.92	20.77	23.48	33
HSUPA Subtest 5	20.41	20.86	20.97	23.53	33
HSPA+ Subtest 1	20.57	21.04	21.11	23.67	33

Note: EIRP=Conducted Power(dBm) - Lc(dB) + G_T(dBi)

LTE 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	21.20	22.61	22.57	25.17	33
	RB1#3	21.02	22.49	22.43		
	RB1#5	21.36	22.61	22.54		
	RB3#0	21.24	22.48	22.44		
	RB3#3	21.23	22.51	22.45		
	RB6#0	20.62	21.67	21.87		
1.4MHz 16QAM	RB1#0	20.92	22.06	21.87	24.62	33
	RB1#3	20.72	21.95	21.77		
	RB1#5	21.00	21.99	21.99		
	RB3#0	20.69	21.87	21.77		
	RB3#3	20.79	21.83	21.83		
	RB6#0	19.92	20.99	21.10		
3MHz QPSK	RB1#0	20.99	22.28	22.00	25.01	33
	RB1#8	20.34	21.78	21.76		
	RB1#14	20.96	22.45	22.17		
	RB6#0	20.12	21.22	21.36		
	RB6#9	20.13	21.38	21.56		
	RB15#0	20.06	21.21	21.40		
3MHz 16QAM	RB1#0	20.50	21.78	21.67	24.58	33
	RB1#8	19.76	21.05	21.22		
	RB1#14	20.49	22.02	21.89		
	RB6#0	19.42	20.62	20.61		
	RB6#9	19.43	20.78	20.82		
	RB15#0	19.36	20.55	20.77		
5MHz QPSK	RB1#0	20.92	22.59	22.01	25.15	33
	RB1#13	20.52	21.92	21.82		
	RB1#24	20.94	21.58	22.34		
	RB15#0	20.08	21.18	21.19		
	RB15#10	20.10	21.37	21.43		
	RB25#0	20.17	21.32	21.36		
5MHz 16QAM	RB1#0	20.34	21.95	21.37	24.51	33
	RB1#13	20.07	21.26	21.28		
	RB1#24	20.50	20.94	21.83		
	RB15#0	19.38	20.45	20.46		
	RB15#10	19.39	20.63	20.71		
	RB25#0	19.42	20.67	20.65		
10MHz QPSK	RB1#0	21.47	22.74	22.30	25.30	33
	RB1#25	20.28	21.65	21.31		
	RB1#49	21.90	22.59	22.60		

	RB25#0	20.12	21.59	20.93		
	RB25#25	20.19	20.64	21.32		
	RB50#0	20.15	21.41	21.26		
10MHz 16QAM	RB1#0	20.91	22.31	22.07	24.92	33
	RB1#25	19.77	21.11	20.93		
	RB1#49	21.25	22.00	22.36		
	RB25#0	19.38	20.89	20.25		
	RB25#25	19.61	20.06	20.62		
	RB50#0	19.38	20.75	20.57		
15MHz QPSK	RB1#0	21.39	22.47	21.63	25.07	33
	RB1#38	20.49	21.72	21.33		
	RB1#74	21.85	21.97	22.51		
	RB36#0	20.20	21.60	20.69		
	RB36#39	20.33	20.95	21.31		
	RB75#0	20.20	21.55	21.34		
15MHz 16QAM	RB1#0	20.93	22.16	21.05	24.79	33
	RB1#38	20.09	21.19	20.71		
	RB1#74	21.35	21.54	22.23		
	RB36#0	19.48	20.90	20.04		
	RB36#39	19.86	20.36	20.62		
	RB75#0	19.64	20.88	20.67		
20MHz QPSK	RB1#0	21.25	22.55	21.78	25.13	33
	RB1#50	21.05	22.01	21.87		
	RB1#99	22.44	21.91	22.57		
	RB50#0	20.20	21.60	20.44		
	RB50#50	20.56	21.12	21.38		
	RB100#0	20.48	21.66	21.74		
20MHz 16QAM	RB1#0	20.73	21.97	21.22	24.80	33
	RB1#50	20.39	21.44	21.36		
	RB1#99	22.11	21.36	22.24		
	RB50#0	19.44	20.90	19.84		
	RB50#50	19.91	20.52	20.69		
	RB100#0	19.97	21.01	21.07		
Note: EIRP=Conducted Power(dBm) - Lc(dB) + Gt(dBi)						

LTE 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	21.45	22.92	21.60	24.54	30
	RB1#3	21.23	22.76	21.38		
	RB1#5	21.37	22.86	21.54		
	RB3#0	21.24	22.75	21.40		
	RB3#3	21.24	22.71	21.39		
	RB6#0	20.53	21.97	20.64		
1.4MHz 16QAM	RB1#0	20.51	21.98	20.80	24.11	30
	RB1#3	20.29	21.96	20.53		
	RB1#5	20.57	22.49	20.72		
	RB3#0	20.61	22.39	20.67		
	RB3#3	20.61	22.33	20.64		
	RB6#0	19.85	21.73	19.77		
3MHz QPSK	RB1#0	21.39	23.10	21.30	24.72	30
	RB1#8	20.90	22.41	20.62		
	RB1#14	21.60	22.93	21.30		
	RB6#0	20.49	21.89	20.19		
	RB6#9	20.52	21.82	20.24		
	RB15#0	20.41	21.80	20.13		
3MHz 16QAM	RB1#0	20.96	22.46	20.70	24.08	30
	RB1#8	20.27	21.67	20.09		
	RB1#14	21.00	22.17	20.93		
	RB6#0	19.75	21.13	19.70		
	RB6#9	19.81	21.09	19.55		
	RB15#0	19.68	21.09	19.43		
5MHz QPSK	RB1#0	21.23	22.83	21.02	24.45	30
	RB1#13	20.85	22.33	20.60		
	RB1#24	21.24	22.54	21.03		
	RB15#0	20.26	21.77	20.04		
	RB15#10	20.30	21.66	20.07		
	RB25#0	20.34	21.77	20.12		
5MHz 16QAM	RB1#0	20.57	22.04	20.41	23.66	30
	RB1#13	20.22	21.61	20.04		
	RB1#24	20.64	21.76	20.56		
	RB15#0	19.59	21.07	19.40		
	RB15#10	19.63	20.98	19.43		
	RB25#0	19.66	21.09	19.44		
10MHz QPSK	RB1#0	21.97	23.14	21.62	24.76	30
	RB1#25	20.68	22.19	20.25		
	RB1#49	22.11	22.72	21.60		

	RB25#0	20.29	21.79	20.04		
	RB25#25	20.40	21.56	20.01		
	RB50#0	20.39	21.71	20.08		
10MHz 16QAM	RB1#0	21.08	22.28	20.86	23.90	30
	RB1#25	20.00	21.38	19.70		
	RB1#49	21.27	21.93	20.88		
	RB25#0	19.61	21.08	19.37		
	RB25#25	19.74	20.88	19.36		
	RB50#0	19.68	21.05	19.40		
15MHz QPSK	RB1#0	21.70	22.89	22.27	24.51	30
	RB1#38	20.75	22.14	20.39		
	RB1#74	22.78	22.29	21.45		
	RB36#0	20.34	21.57	20.61		
	RB36#39	20.71	21.25	20.08		
	RB75#0	20.56	21.66	20.21		
15MHz 16QAM	RB1#0	21.10	22.04	21.51	23.66	30
	RB1#38	20.15	21.43	19.82		
	RB1#74	21.97	21.61	20.95		
	RB36#0	19.65	20.91	19.84		
	RB36#39	20.05	20.61	19.42		
	RB75#0	19.88	21.01	19.56		
20MHz QPSK	RB1#0	21.48	22.08	22.68	24.84	30
	RB1#50	21.21	22.38	20.67		
	RB1#99	23.22	22.02	21.45		
	RB50#0	20.45	21.61	21.00		
	RB50#50	21.44	21.23	20.10		
	RB100#0	20.78	21.68	20.39		
20MHz 16QAM	RB1#0	20.84	21.78	22.17	23.97	30
	RB1#50	20.59	21.87	20.29		
	RB1#99	22.35	21.49	20.96		
	RB50#0	19.78	20.95	20.36		
	RB50#50	20.79	20.58	19.46		
	RB100#0	20.12	21.03	19.73		
Note: EIRP=Conducted Power(dBm) - Lc(dB) + Gr(dBi)						

LTE Band 12:

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	22.15	22.02	21.35	19.06	34.77
	RB1#3	22.30	22.03	21.00		
	RB1#5	22.50	22.27	21.08		
	RB3#0	22.20	21.98	21.24		
	RB3#3	22.44	22.09	21.10		
	RB6#0	21.52	21.18	20.42		
1.4MHz 16QAM	RB1#0	21.21	21.17	20.47	18.17	34.77
	RB1#3	21.36	21.10	20.18		
	RB1#5	21.61	21.30	20.28		
	RB3#0	21.20	21.10	20.54		
	RB3#3	21.47	21.18	20.41		
	RB6#0	20.76	20.46	19.75		
3MHz QPSK	RB1#0	22.16	21.86	22.20	19.02	34.77
	RB1#8	22.12	21.54	20.80		
	RB1#14	22.46	22.08	21.13		
	RB6#0	21.33	20.73	20.91		
	RB6#9	21.43	20.98	20.22		
	RB15#0	21.37	20.92	20.52		
3MHz 16QAM	RB1#0	21.34	21.22	21.47	18.27	34.77
	RB1#8	21.27	20.70	20.27		
	RB1#14	21.71	21.35	20.51		
	RB6#0	20.56	20.02	20.29		
	RB6#9	20.71	20.24	19.60		
	RB15#0	20.64	20.21	19.86		
5MHz QPSK	RB1#0	22.08	21.60	22.41	18.97	34.77
	RB1#13	22.05	21.72	21.53		
	RB1#24	21.64	22.13	21.06		
	RB15#0	21.42	20.72	21.35		
	RB15#10	21.09	21.01	20.58		
	RB25#0	21.31	21.05	21.01		
5MHz 16QAM	RB1#0	21.42	20.74	21.70	18.26	34.77
	RB1#13	21.31	20.90	20.83		
	RB1#24	20.94	21.45	20.31		
	RB15#0	20.69	20.04	20.48		
	RB15#10	20.37	20.32	19.74		
	RB25#0	20.56	20.36	20.18		
10MHz QPSK	RB1#0	22.51	22.62	22.36	19.47	34.77
	RB1#25	20.75	21.52	21.91		
	RB1#49	22.49	22.91	21.65		
	RB25#0	21.41	20.68	21.19		

	RB25#25	20.86	21.41	21.13		
	RB50#0	21.04	21.25	21.23		
10MHz 16QAM	RB1#0	22.10	21.85	21.66	18.70	34.77
	RB1#25	20.29	20.62	21.26		
	RB1#49	21.76	22.14	20.87		
	RB25#0	20.65	19.96	20.46		
	RB25#25	20.16	20.67	20.44		
	RB50#0	20.32	20.55	20.50		

Note:

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

LTE Band 17:

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum ERP (dBm)	ERP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
5MHz QPSK	RB1#0	21.68	22.13	22.40	18.96	34.77
	RB1#13	21.47	21.94	21.85		
	RB1#24	21.94	22.34	22.10		
	RB15#0	20.56	21.20	21.32		
	RB15#10	20.98	21.51	21.13		
	RB25#0	20.84	21.41	21.23		
5MHz 16QAM	RB1#0	20.79	21.16	21.71	18.27	34.77
	RB1#13	20.59	21.10	20.99		
	RB1#24	21.30	21.59	21.25		
	RB15#0	19.73	20.39	20.52		
	RB15#10	20.14	20.70	20.32		
	RB25#0	20.02	20.57	20.43		
10MHz QPSK	RB1#0	22.19	22.22	22.40	19.60	34.77
	RB1#25	21.55	21.77	21.85		
	RB1#49	23.04	22.62	22.67		
	RB25#0	20.84	21.07	21.10		
	RB25#25	21.44	21.32	21.24		
	RB50#0	21.14	21.18	21.16		
10MHz 16QAM	RB1#0	21.42	21.37	21.47	18.77	34.77
	RB1#25	20.84	21.02	21.15		
	RB1#49	22.21	21.83	22.04		
	RB25#0	20.02	20.26	20.29		
	RB25#25	20.62	20.52	20.47		
	RB50#0	20.29	20.36	20.34		
Note: ERP= Conducted Power(dBm) - Lc(dB) + G _T (dBd) G _T (dBd)=G _T (dBi)-2.15						

Peak-to-average ratio (PAR)**Cellular Band****WCDMA B5**

Test Mode	Peak-to-average Ratio(dB)			Limit (dB)
	Lowest Channel	Middle Channel	Highest Channel	
WCDMA R99	3.37	3.33	3.37	13
HSDPA	5.26	5.13	5.22	13
HSUPA	6.12	6.28	6.12	13

PCS Band**WCDMA B2**

Test Mode	Peak-to-average Ratio(dB)			Limit (dB)
	Lowest Channel	Middle Channel	Highest Channel	
WCDMA R99	3.24	3.33	3.21	13
HSDPA	4.94	5.13	4.97	13
HSUPA	5.74	6.22	5.77	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	5.36	5.16	4.72	13
	RB100#0	4.99	5.65	5.07	13
20MHz 16QAM	RB1#0	5.45	5.71	5.01	13
	RB100#0	5.51	6.43	5.77	13

LTE Band 4 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	3.42	3.54	13
	RB100#0	4.49	4.55	4.84	13
20MHz 16QAM	RB1#0	4.58	3.68	4.26	13
	RB100#0	5.33	5.25	5.68	13

LTE Band 12 10MHz Bandwidth

Test Bandwidth & Modulation	Resource Block & RB offset	Peak-to-average Ratio(dB)			Limit (dB)
		Lowest Channel	Middle Channel	Highest Channel	
10MHz QPSK	RB1#0	3.08	5.13	3.91	13
	RB50#0	5.35	5.22	5.13	13
10MHz 16QAM	RB1#0	3.04	5.42	4.71	13
	RB50#0	6.06	5.93	5.90	13

LTE Band 17 10MHz Bandwidth

Test Bandwidth & Modulation	Resource Block & RB offset	Peak-to-average Ratio(dB)			Limit (dB)
		Lowest Channel	Middle Channel	Highest Channel	
10MHz QPSK	RB1#0	5.45	4.58	4.01	13
	RB50#0	5.16	5.16	5.13	13
10MHz 16QAM	RB1#0	8.62	5.58	4.78	13
	RB50#0	8.53	5.87	5.80	13

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

Applicable Standard

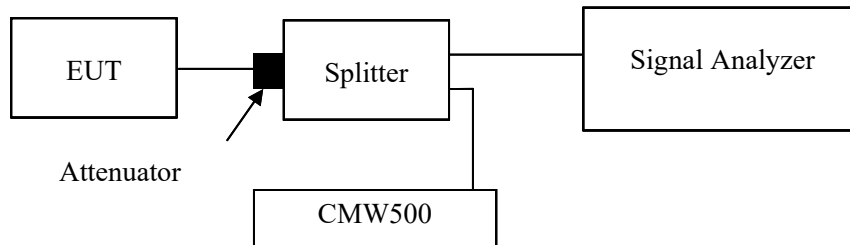
FCC 47 §2.1049, §22.917, §22.905, §24.238 and §27.53.

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:	24.1~26.3 °C
Relative Humidity:	38~49 %
ATM Pressure:	101 kPa

The testing was performed by Cheeb Huang from 2024-02-28 to 2024-03-01.

EUT operation mode: Transmitting

Test Result: Compliant

Please refer to the following tables and plots.

Cellular Band (Part 22H)**WCDMA B5**

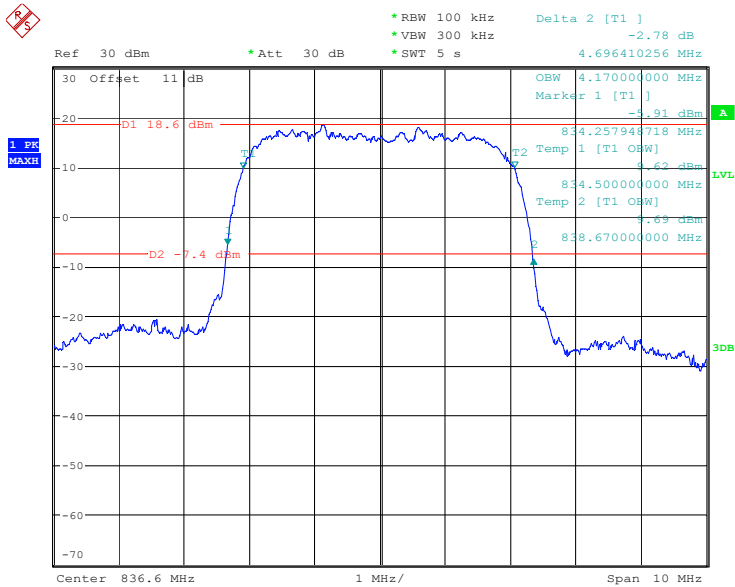
Operation Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
	Middle channel	Middle Channel
WCDMA R99	4.17	4.70
HSDPA	4.19	4.72
HSUPA	4.18	4.74

PCS Band (Part 24E)**WCDMA B2**

Operation Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
	Middle channel	Middle Channel
WCDMA R99	4.17	4.70
HSDPA	4.17	4.70
HSUPA	4.17	4.71

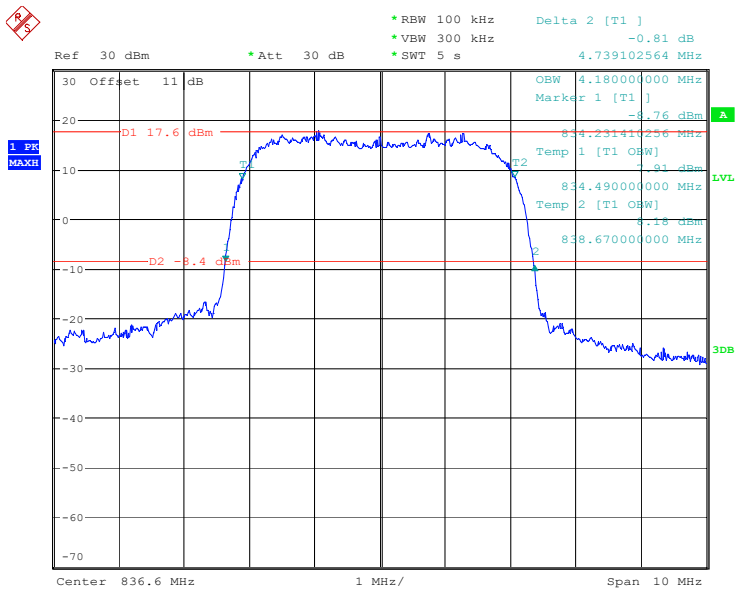
Cellular Band

RMC (BPSK) Mode



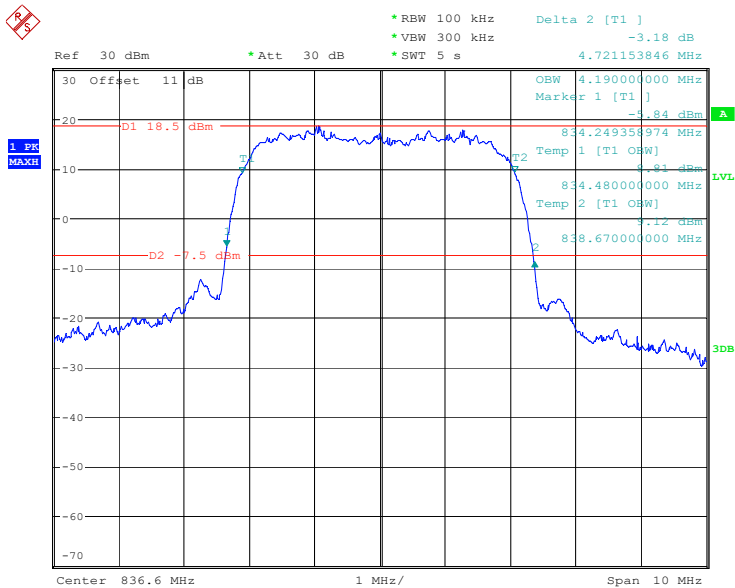
ProjectNo.:SZ1240124-05544E-RF Tester:Cheeb Huang
Date: 28.FEB.2024 02:36:49

HSUPA (QPSK) Mode



ProjectNo.:SZ1240124-05544E-RF Tester:Cheeb Huang
Date: 28.FEB.2024 02:24:19

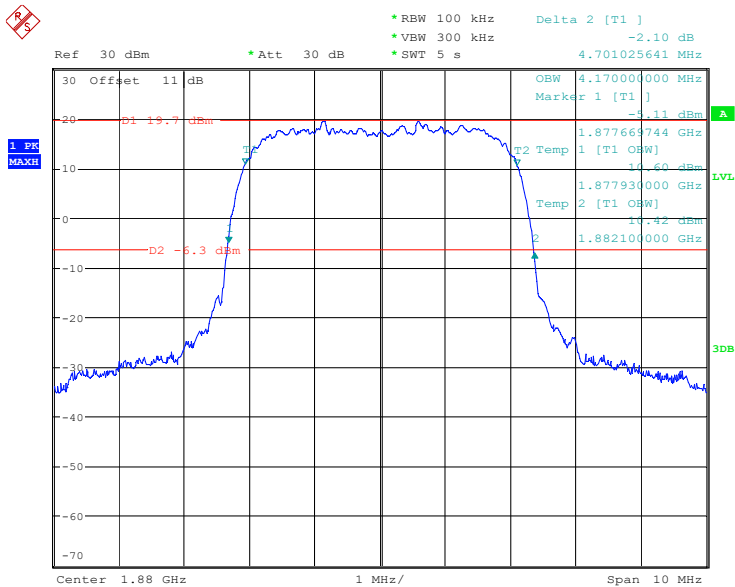
HSDPA (16QAM) Mode



ProjectNo.:SZ1240124-05544E-RF Tester:Cheeb Huang
Date: 28.FEB.2024 02:31:06

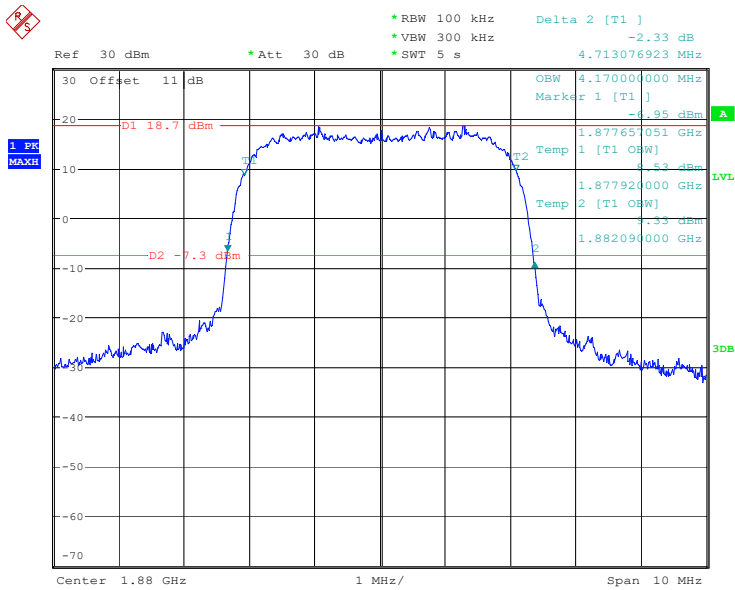
PCS Band

RMC (BPSK) Mode



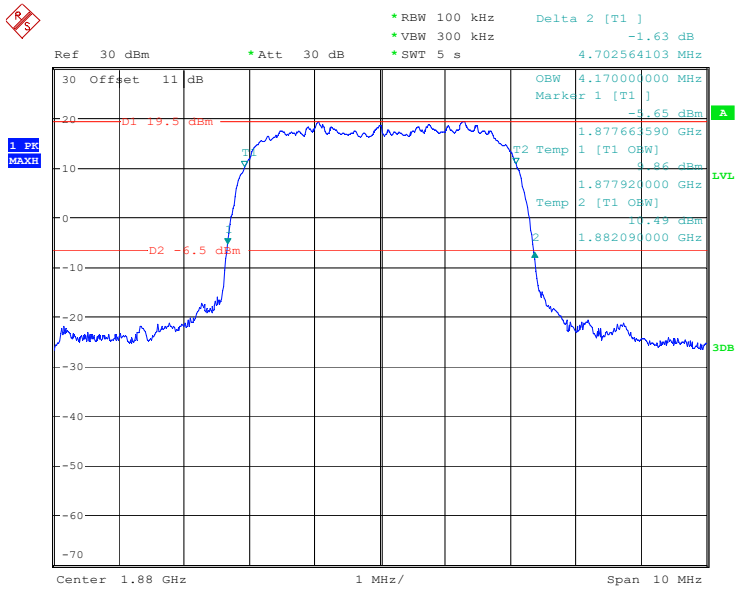
ProjectNo.:SZ1240124-05544E-RF Tester:Cheeb Huang
Date: 28.FEB.2024 02:01:38

HSUPA (QPSK) Mode



ProjectNo.:SZ1240124-05544E-RF Tester:Cheeb Huang
Date: 28.FEB.2024 02:15:05

HSDPA (16QAM) Mode



ProjectNo.:SZ1240124-05544E-RF Tester:Cheeb Huang
Date: 28.FEB.2024 02:09:19

LTE Band 2

Operation Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
	Middle channel	Middle Channel
1.4MHz QPSK	1.128	1.464
1.4MHz 16QAM	1.128	1.458
3MHz QPSK	2.700	3.012
3MHz 16QAM	2.700	3.012
5MHz QPSK	4.560	5.160
5MHz 16QAM	4.560	5.200
10MHz QPSK	9.000	10.240
10MHz 16QAM	9.000	10.280
15MHz QPSK	13.680	15.900
15MHz 16QAM	13.680	15.900
20MHz QPSK	18.160	19.680
20MHz 16QAM	18.080	19.680

LTE Band 4

Operation Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
	Middle channel	Middle Channel
1.4MHz QPSK	1.140	1.548
1.4MHz 16QAM	1.140	1.764
3MHz QPSK	2.700	3.012
3MHz 16QAM	2.700	3.048
5MHz QPSK	4.560	5.180
5MHz 16QAM	4.580	6.120
10MHz QPSK	9.040	10.320
10MHz 16QAM	9.040	10.360
15MHz QPSK	13.680	16.260
15MHz 16QAM	13.740	16.740
20MHz QPSK	18.080	20.000
20MHz 16QAM	18.080	22.720

LTE Band 12:

Operation Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
	Middle channel	Middle Channel
1.4MHz QPSK	1.140	1.518
1.4MHz 16QAM	1.134	1.476
3MHz QPSK	2.700	3.024
3MHz 16QAM	2.700	3.000
5MHz QPSK	4.580	5.180
5MHz 16QAM	4.560	5.140
10MHz QPSK	9.000	10.240
10MHz 16QAM	9.000	10.240

LTE Band 17

Operation Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
	Middle channel	Middle Channel
5MHz QPSK	4.560	5.200
5MHz 16QAM	4.580	5.180
10MHz QPSK	8.960	10.160
10MHz 16QAM	9.000	10.240

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

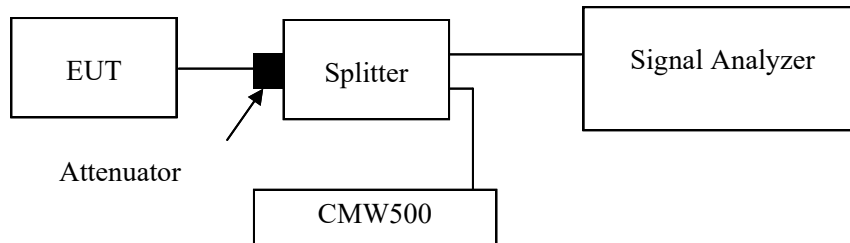
FCC §2.1051, §22.917(a) & §24.238(a) & §27.53.

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 10th 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:	24.1~26.3 °C
Relative Humidity:	38~49 %
ATM Pressure:	101 kPa

The testing was performed by Cheeb Huang from 2024-02-27 to 2024-02-28.

EUT operation mode: Transmitting

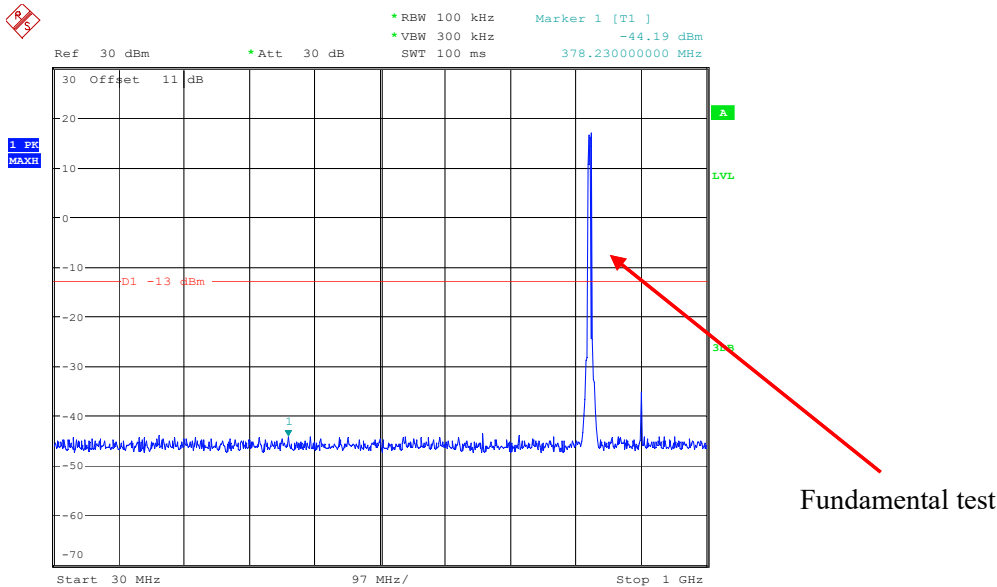
Test result: Compliant

Please refer to the following plots.

Cellular Band

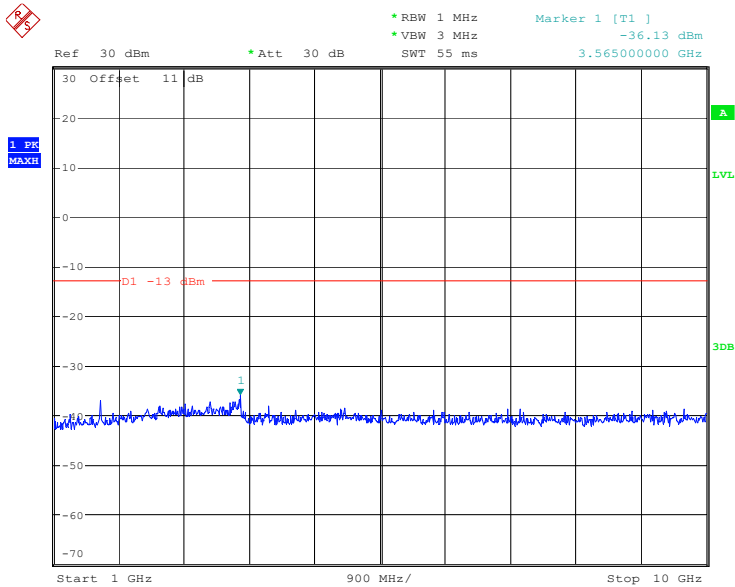
Low Channel:

30 MHz – 1GHz (WCDMA Mode)



ProjectNo.:SZ1240124-05544E-RF Tester:Cheeb Huang
Date: 28.FEB.2024 02:34:47

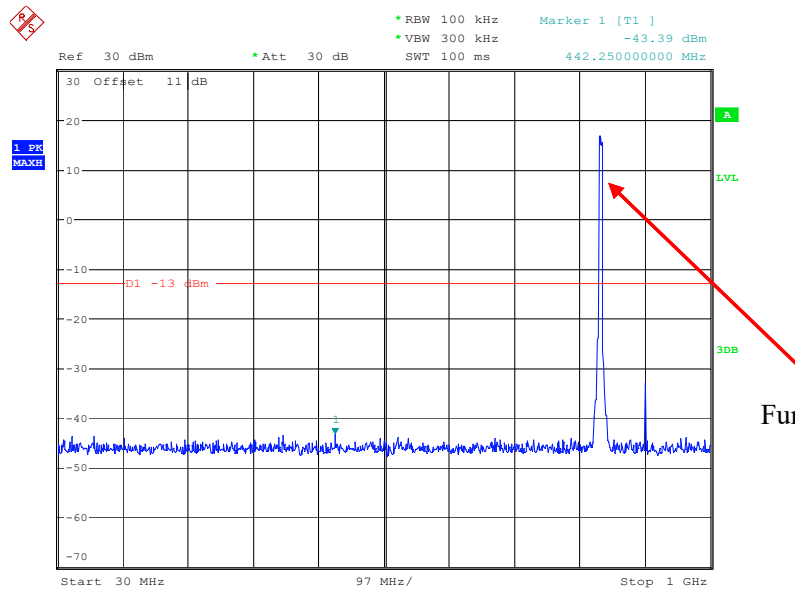
1GHz – 10GHz (WCDMA Mode)



ProjectNo.:SZ1240124-05544E-RF Tester:Cheeb Huang
Date: 28.FEB.2024 02:35:00

Middle Channel:

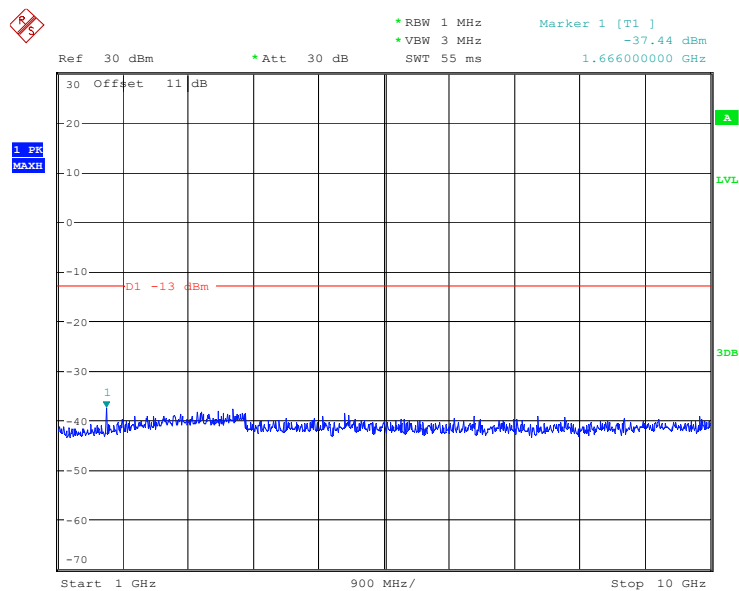
30 MHz – 1GHz (WCDMA Mode)



ProjectNo.:SZ1240124-05544E-RF Tester:Cheeb Huang

Date: 28.FEB.2024 02:37:17

1GHz – 10GHz (WCDMA Mode)

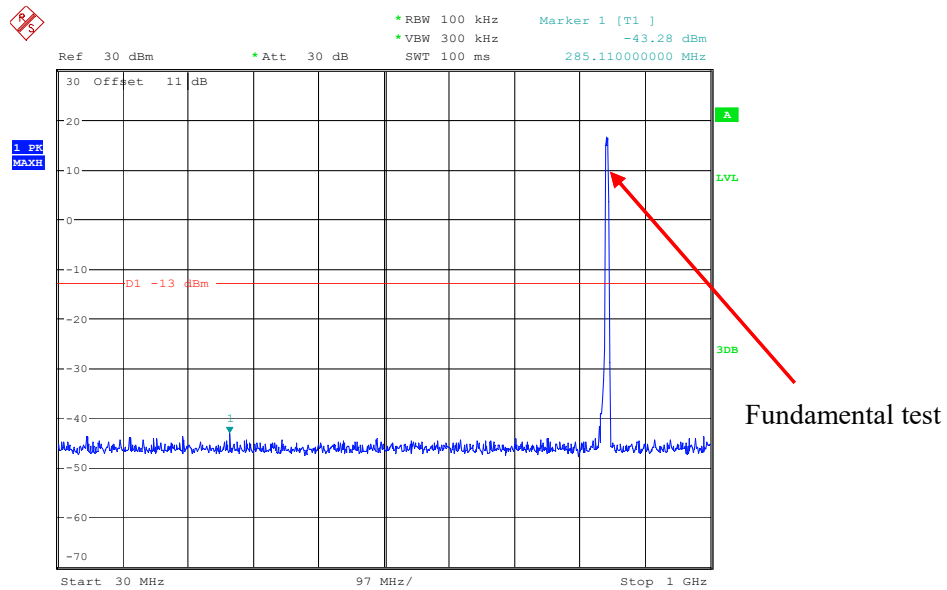


ProjectNo.:SZ1240124-05544E-RF Tester:Cheeb Huang

Date: 28.FEB.2024 02:37:28

High Channel:

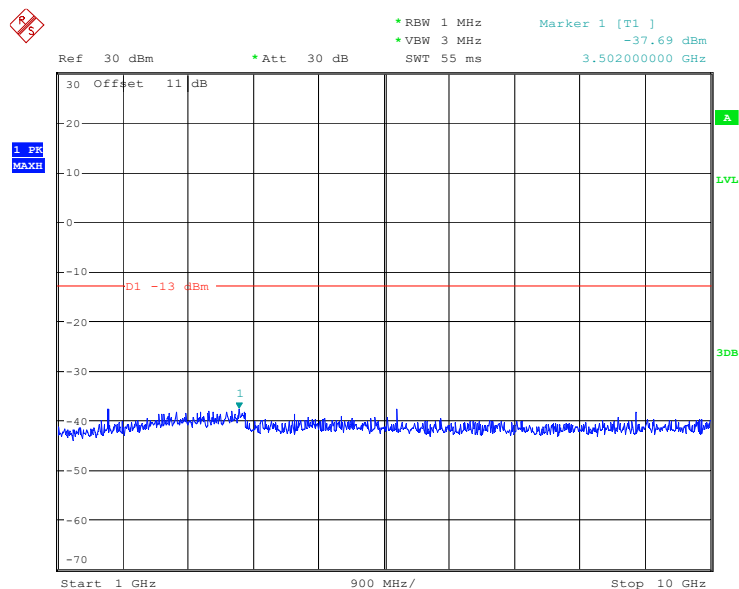
30 MHz – 1GHz (WCDMA Mode)



ProjectNo.:SZ1240124-05544E-RF Tester:Cheeb Huang

Date: 28.FEB.2024 02:39:45

1GHz – 10GHz (WCDMA Mode)



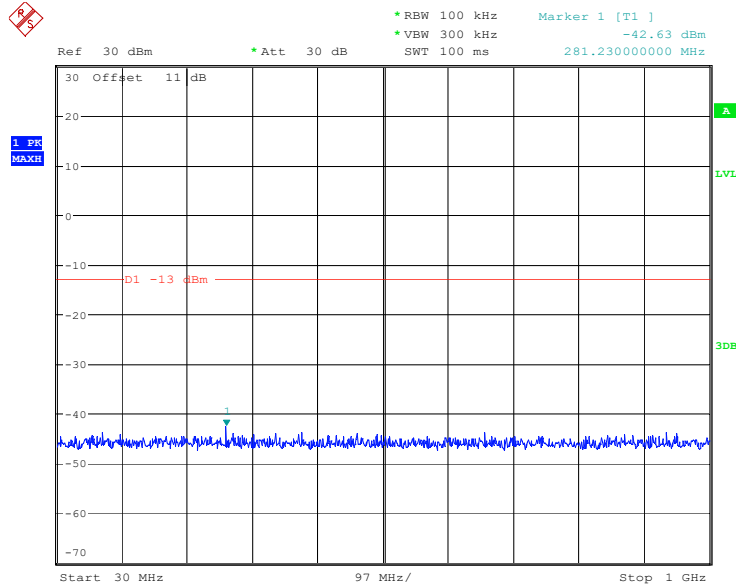
ProjectNo.:SZ1240124-05544E-RF Tester:Cheeb Huang

Date: 28.FEB.2024 02:39:56

PCS Band

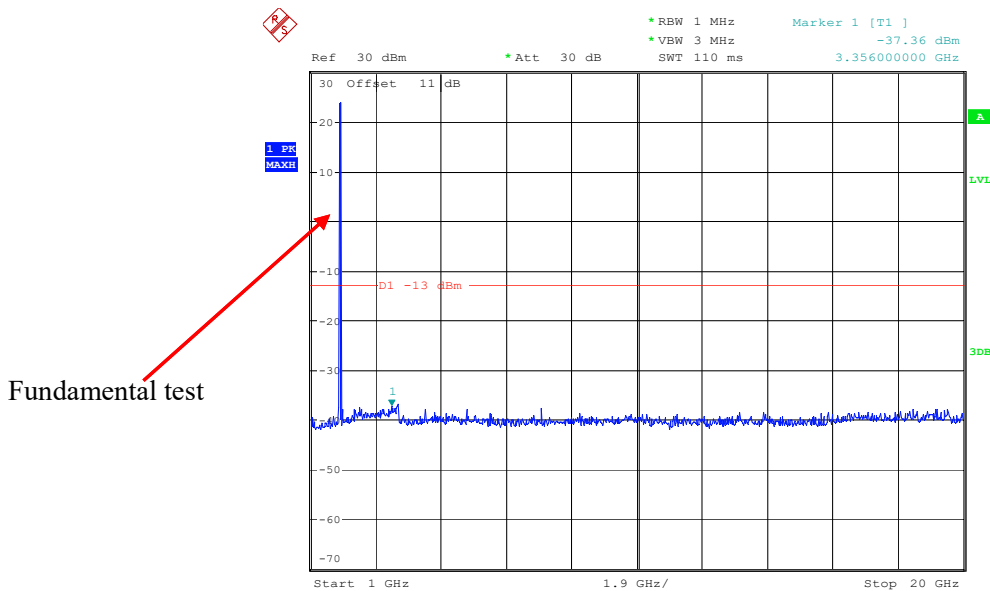
Low Channel:

30 MHz – 1GHz (WCDMA Mode)



ProjectNo.:SZ1240124-05544E-RF Tester:Cheeb Huang
Date: 28.FEB.2024 01:55:28

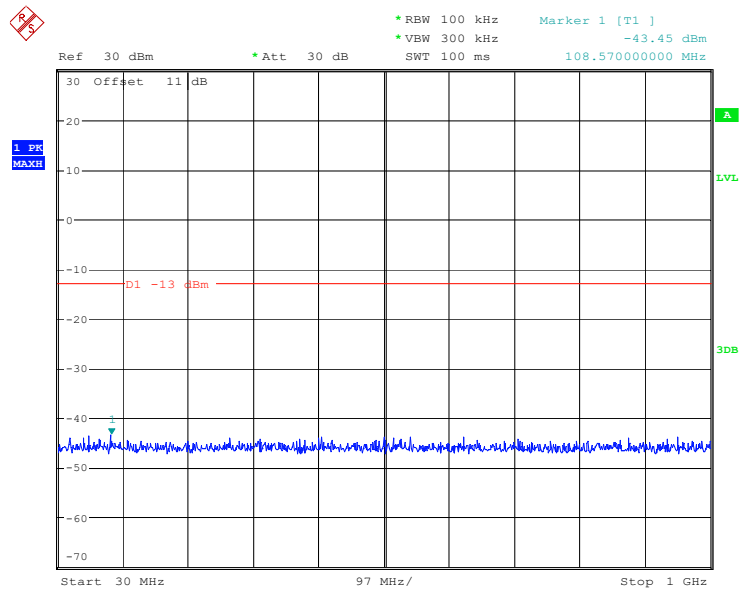
1GHz – 20GHz (WCDMA Mode)



ProjectNo.:SZ1240124-05544E-RF Tester:Cheeb Huang
Date: 28.FEB.2024 01:55:58

Middle Channel:

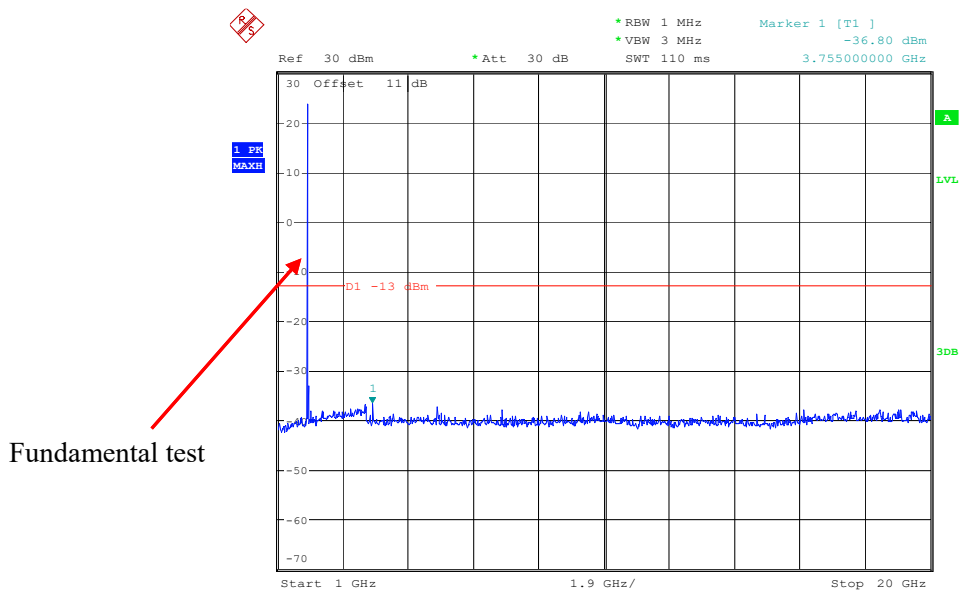
30 MHz – 1GHz (WCDMA Mode)



ProjectNo.:SZ1240124-05544E-RF Tester:Cheeb Huang

Date: 28.FEB.2024 02:01:59

1GHz – 20GHz (WCDMA Mode)

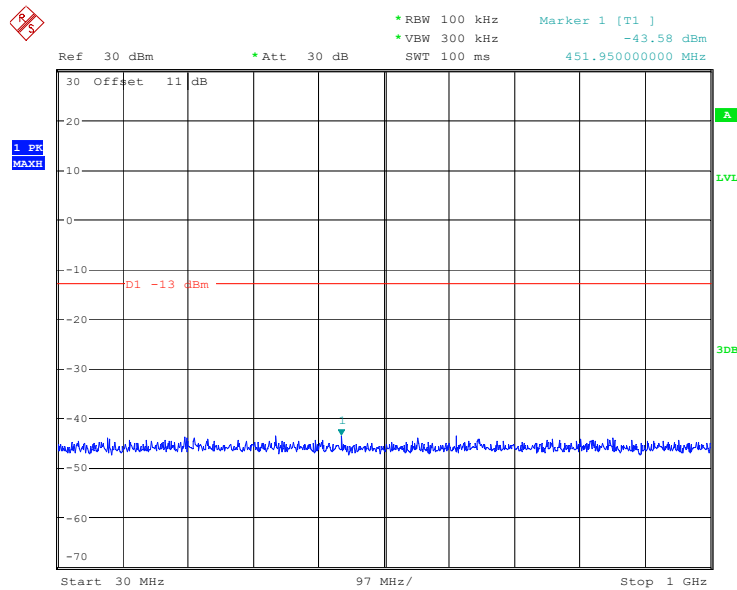


ProjectNo.:SZ1240124-05544E-RF Tester:Cheeb Huang

Date: 28.FEB.2024 02:02:24

High Channel:

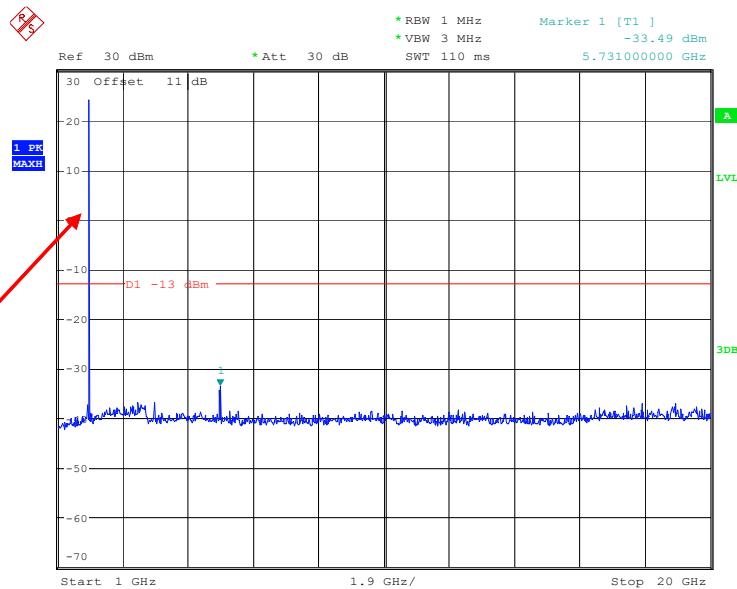
30 MHz – 1GHz (WCDMA Mode)



ProjectNo.:SZ1240124-05544E-RF Tester:Cheeb Huang

Date: 28.FEB.2024 02:03:44

1GHz – 20GHz (WCDMA Mode)



Fundamental test

ProjectNo.:SZ1240124-05544E-RF Tester:Cheeb Huang

Date: 28.FEB.2024 02:04:06

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:	24 °C
Relative Humidity:	56 %
ATM Pressure:	101 kPa

The testing was performed by Warren Huang on 2024-02-20 for below 1GHz and Tyler Wu on 2024-03-28.

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 Factor			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
WCDMA Band 2								
Test frequency range: 30MHz-20GHz								
Low Channel								
499.6	40.97	H	-62.3	1.07	0.0	-63.37	-13	50.37
500.1	40.22	V	-59.8	1.07	0.0	-60.87	-13	47.87
3704.80	53.33	H	-52.1	1.30	11.00	-42.40	-13	29.40
3704.80	51.91	V	-53.3	1.30	11.00	-43.60	-13	30.60
5557.20	51.97	H	-50.4	1.70	10.90	-41.20	-13	28.20
5557.20	44.17	V	-58.4	1.70	10.90	-49.20	-13	36.20
Middle Channel								
499.6	41.26	H	-62.0	1.07	0.0	-63.07	-13	50.07
500.1	40.54	V	-59.5	1.07	0.0	-60.57	-13	47.57
3760.00	55.65	H	-49.5	1.30	10.70	-40.10	-13	27.10
3760.00	53.24	V	-51.8	1.30	10.70	-42.40	-13	29.40
5640.00	50.75	H	-51.7	1.70	10.90	-42.50	-13	29.50
5640.00	47.07	V	-55.5	1.70	10.90	-46.30	-13	33.30
High Channel								
499.6	41.48	H	-61.8	1.07	0.0	-62.87	-13	49.87
500.1	40.76	V	-59.2	1.07	0.0	-60.27	-13	47.27
3815.20	55.53	H	-49.6	1.30	10.70	-40.20	-13	27.20
3815.20	54.81	V	-50.3	1.30	10.70	-40.90	-13	27.90
5722.80	51.41	H	-50.8	1.70	11.10	-41.40	-13	28.40
5722.80	53.98	V	-48.4	1.70	11.10	-39.00	-13	26.00

Frequency (MHz)	Receiver Reading (dBμV)	Polar (H / V)	Substituted Factor			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
WCDMA Band 5								
Test frequency range: 30MHz-10GHz								
Low Channel								
499.6	41.84	H	-61.5	1.07	0.0	-62.57	-13	49.57
500.1	41.32	V	-58.7	1.07	0.0	-59.77	-13	46.77
1652.80	51.28	H	-56.3	0.90	8.60	-48.60	-13	35.60
1652.80	50.70	V	-57.4	0.90	8.60	-49.70	-13	36.70
2479.20	51.99	H	-55.4	1.10	8.80	-47.70	-13	34.70
2479.20	51.46	V	-55.7	1.10	8.80	-48.00	-13	35.00
3305.60	58.03	H	-48.0	1.30	8.80	-40.50	-13	27.50
3305.60	56.89	V	-48.8	1.30	8.80	-41.30	-13	28.30
Middle Channel								
499.6	42.34	H	-61.0	1.07	0.0	-62.07	-13	49.07
500.1	41.60	V	-58.4	1.07	0.0	-59.47	-13	46.47
1673.20	51.09	H	-56.5	0.90	8.60	-48.80	-13	35.80
1673.20	50.58	V	-57.6	0.90	8.60	-49.90	-13	36.90
2509.80	43.16	H	-64.2	1.10	8.80	-56.50	-13	43.50
2509.80	51.98	V	-55.1	1.10	8.80	-47.40	-13	34.40
3346.40	56.03	H	-50.0	1.30	8.80	-42.50	-13	29.50
3346.40	55.51	V	-50.2	1.30	8.80	-42.70	-13	29.70
High Channel								
499.6	43.41	H	-59.9	1.07	0.0	-60.97	-13	47.97
500.1	41.85	V	-58.2	1.07	0.0	-59.27	-13	46.27
1693.20	50.77	H	-56.8	0.90	8.60	-49.10	-13	36.10
1693.20	50.27	V	-57.9	0.90	8.60	-50.20	-13	37.20
2539.80	52.75	H	-54.6	1.10	8.80	-46.90	-13	33.90
2539.80	54.38	V	-52.7	1.10	8.80	-45.00	-13	32.00
3386.40	54.35	H	-51.6	1.30	9.90	-43.00	-13	30.00
3386.40	55.58	V	-50.1	1.30	9.90	-41.50	-13	28.50

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

Frequency (MHz)	Receiver Reading (dBμV)	Polar (H / V)	Substituted Factor			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
LTE Band 2								
Test frequency range: 30MHz-20GHz								
QPSK 1.4MHz Bandwidth, Low channel								
499.6	41.26	H	-62.0	1.07	0.0	-63.07	-13	50.07
500.1	41.72	V	-58.3	1.07	0.0	-59.37	-13	46.37
3701.40	68.47	H	-36.9	1.30	11.00	-27.20	-13	14.20
3701.40	69.31	V	-35.9	1.30	11.00	-26.20	-13	13.20
5552.10	60.53	H	-41.9	1.70	10.90	-32.70	-13	19.70
5552.10	61.15	V	-41.4	1.70	10.90	-32.20	-13	19.20
QPSK 1.4MHz Bandwidth, Middle channel								
499.6	41.56	H	-61.7	1.07	0.0	-62.77	-13	49.77
500.1	41.90	V	-58.1	1.07	0.0	-59.17	-13	46.17
3760.00	70.61	H	-34.5	1.30	10.70	-25.10	-13	12.10
3760.00	71.39	V	-33.7	1.30	10.70	-24.30	-13	11.30
5640.00	61.02	H	-41.4	1.70	10.90	-32.20	-13	19.20
5640.00	61.78	V	-40.8	1.70	10.90	-31.60	-13	18.60
QPSK 1.4MHz Bandwidth, High channel								
499.6	41.87	H	-61.4	1.07	0.0	-62.47	-13	49.47
500.1	42.35	V	-57.7	1.07	0.0	-58.77	-13	45.77
3818.60	66.15	H	-39.0	1.30	10.70	-29.60	-13	16.60
3818.60	67.94	V	-37.1	1.30	10.70	-27.70	-13	14.70
5727.90	59.29	H	-42.9	1.70	11.10	-33.50	-13	20.50
5727.90	60.02	V	-42.3	1.70	11.10	-32.90	-13	19.90

Frequency (MHz)	Receiver Reading (dBμV)	Polar (H / V)	Substituted Factor			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
LTE Band 4								
Test frequency range: 30MHz-20GHz								
QPSK 1.4MHz Bandwidth, Low channel								
499.6	42.81	H	-60.5	1.07	0.0	-61.57	-13	48.57
500.1	42.58	V	-57.4	1.07	0.0	-58.47	-13	45.47
3421.40	70.85	H	-35.1	1.30	9.90	-26.50	-13	13.50
3421.40	71.63	V	-34.0	1.30	9.90	-25.40	-13	12.40
5132.10	55.02	H	-48.2	1.50	9.60	-40.10	-13	27.10
5132.10	56.17	V	-46.4	1.50	9.60	-38.30	-13	25.30
QPSK 1.4MHz Bandwidth, Middle channel								
499.6	43.11	H	-60.2	1.07	0.0	-61.27	-13	48.27
500.1	42.94	V	-57.1	1.07	0.0	-58.17	-13	45.17
3465.00	70.72	H	-35.2	1.30	10.50	-26.00	-13	13.00
3465.00	71.23	V	-34.4	1.30	10.50	-25.20	-13	12.20
5197.50	54.85	H	-48.2	1.60	9.70	-40.10	-13	27.10
5197.50	55.61	V	-47.0	1.60	9.70	-38.90	-13	25.90
QPSK 1.4MHz Bandwidth, High channel								
499.6	43.23	H	-60.1	1.07	0.0	-61.17	-13	48.17
500.1	43.15	V	-56.9	1.07	0.0	-57.97	-13	44.97
3508.60	71.03	H	-34.9	1.30	10.50	-25.70	-13	12.70
3508.60	71.98	V	-33.6	1.30	10.50	-24.40	-13	11.40
5262.90	55.26	H	-47.7	1.60	10.00	-39.30	-13	26.30
5262.90	56.37	V	-46.3	1.60	10.00	-37.90	-13	24.90

Frequency (MHz)	Receiver Reading (dBμV)	Polar (H / V)	Substituted Factor			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
LTE Band 12								
Test frequency range: 30MHz-10GHz								
QPSK 1.4MHz Bandwidth, Low channel								
499.6	42.94	H	-60.4	1.07	0.0	-61.47	-13	48.47
500.1	43.51	V	-56.5	1.07	0.0	-57.57	-13	44.57
1399.40	52.17	H	-55.5	0.80	7.90	-48.40	-13	35.40
1399.40	52.64	V	-55.8	0.80	7.90	-48.70	-13	35.70
2099.10	73.09	H	-34.2	1.00	8.30	-26.90	-13	13.90
2099.10	72.16	V	-35.7	1.00	8.30	-28.40	-13	15.40
2798.80	49.38	H	-57.2	1.20	9.20	-49.20	-13	36.20
2798.80	50.94	V	-55.4	1.20	9.20	-47.40	-13	34.40
QPSK 1.4MHz Bandwidth, Middle channel								
499.6	43.20	H	-60.1	1.07	0.0	-61.17	-13	48.17
500.1	43.77	V	-56.2	1.07	0.0	-57.27	-13	44.27
1415.00	51.82	H	-55.9	0.80	7.90	-48.80	-13	35.80
1415.00	52.43	V	-56.0	0.80	7.90	-48.90	-13	35.90
2122.50	72.97	H	-34.3	1.00	8.30	-27.00	-13	14.00
2122.50	71.62	V	-36.2	1.00	8.30	-28.90	-13	15.90
2830.00	49.07	H	-57.5	1.20	9.20	-49.50	-13	36.50
2830.00	50.62	V	-55.7	1.20	9.20	-47.70	-13	34.70
QPSK 1.4MHz Bandwidth, High channel								
499.6	43.68	H	-59.6	1.07	0.0	-60.67	-13	47.67
500.1	43.89	V	-56.1	1.07	0.0	-57.17	-13	44.17
1430.60	52.47	H	-55.2	0.80	7.90	-48.10	-13	35.10
1430.60	52.81	V	-55.6	0.80	7.90	-48.50	-13	35.50
2145.90	73.28	H	-34.0	1.00	8.30	-26.70	-13	13.70
2145.90	72.59	V	-35.2	1.00	8.30	-27.90	-13	14.90
2861.20	50.16	H	-56.1	1.20	9.00	-48.30	-13	35.30
2861.20	51.24	V	-54.8	1.20	9.00	-47.00	-13	34.00

Frequency (MHz)	Receiver Reading (dBμV)	Polar (H / V)	Substituted Factor			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
LTE Band 17								
Test frequency range: 30MHz-10GHz								
QPSK 5MHz Bandwidth, Low channel								
499.6	42.66	H	-60.6	1.07	0.0	-61.67	-13	48.67
500.1	41.40	V	-58.6	1.07	0.0	-59.67	-13	46.67
1413.00	59.25	H	-48.5	0.80	7.90	-41.40	-13	28.40
1413.00	60.01	V	-48.4	0.80	7.90	-41.30	-13	28.30
2119.50	75.34	H	-32.0	1.00	8.30	-24.70	-13	11.70
2119.50	74.63	V	-33.2	1.00	8.30	-25.90	-13	12.90
2826.00	49.07	H	-57.5	1.20	9.20	-49.50	-13	36.50
2826.00	48.15	V	-58.2	1.20	9.20	-50.20	-13	37.20
QPSK 5MHz Bandwidth, Middle channel								
499.6	42.96	H	-60.3	1.07	0.0	-61.37	-13	48.37
500.1	41.71	V	-58.3	1.07	0.0	-59.37	-13	46.37
1420.00	58.61	H	-49.1	0.80	7.90	-42.00	-13	29.00
1420.00	59.63	V	-48.8	0.80	7.90	-41.70	-13	28.70
2130.00	75.28	H	-32.0	1.00	8.30	-24.70	-13	11.70
2130.00	74.25	V	-33.6	1.00	8.30	-26.30	-13	13.30
2840.00	48.72	H	-57.8	1.20	9.20	-49.80	-13	36.80
2840.00	47.54	V	-58.8	1.20	9.20	-50.80	-13	37.80
QPSK 5MHz Bandwidth, High channel								
499.6	43.22	H	-60.1	1.07	0.0	-61.17	-13	48.17
500.1	42.16	V	-57.8	1.07	0.0	-58.87	-13	45.87
1427.00	59.76	H	-47.9	0.80	7.90	-40.80	-13	27.80
1427.00	60.23	V	-48.2	0.80	7.90	-41.10	-13	28.10
2140.50	75.92	H	-31.4	1.00	8.30	-24.10	-13	11.10
2140.50	75.01	V	-32.8	1.00	8.30	-25.50	-13	12.50
2854.00	49.52	H	-56.8	1.20	9.00	-49.00	-13	36.00
2854.00	48.36	V	-57.7	1.20	9.00	-49.90	-13	36.90

Note:

Absolute Level = Reading Level + Substituted Factor

Substituted Factor contains: Substituted Level - Cable loss+ Antenna Gain

Margin = Limit -Absolute Level

FCC§ 22.917 (a); § 24.238 (a); §27.53 (g) (h) - 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 (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.

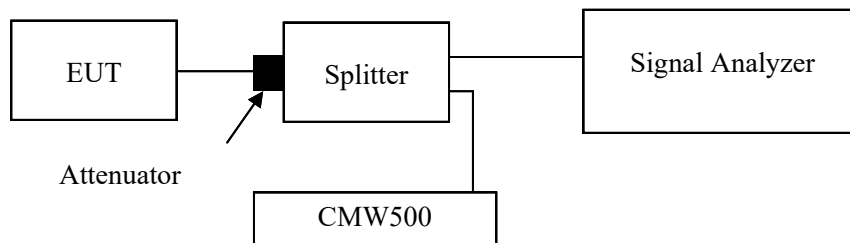
According to FCC §27.53 (h), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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

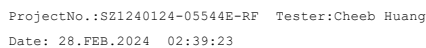
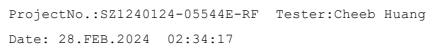
Temperature:	24.1~26.3 °C
Relative Humidity:	38~49 %
ATM Pressure:	101 kPa

The testing was performed by Cheeb Huang from 2024-02-27 to 2024-02-28.

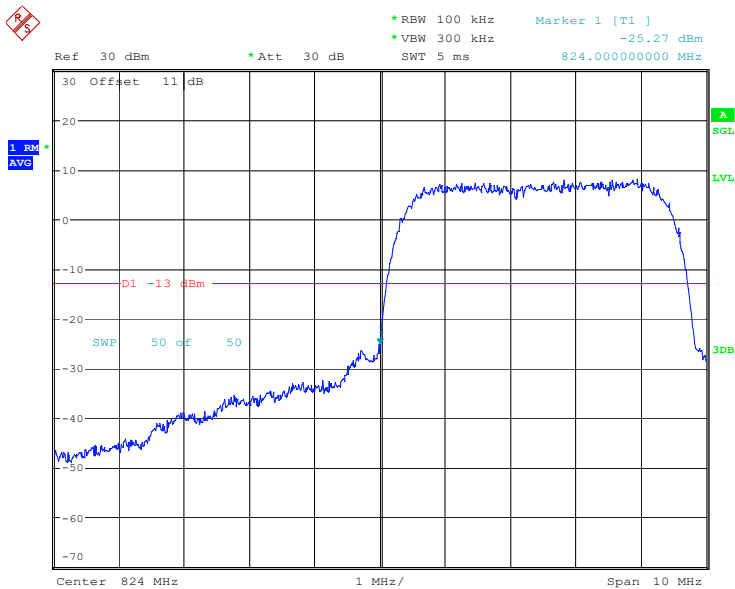
EUT operation mode: Transmitting (Worst case)

Test Result: Compliant

Please refer to the following plots.

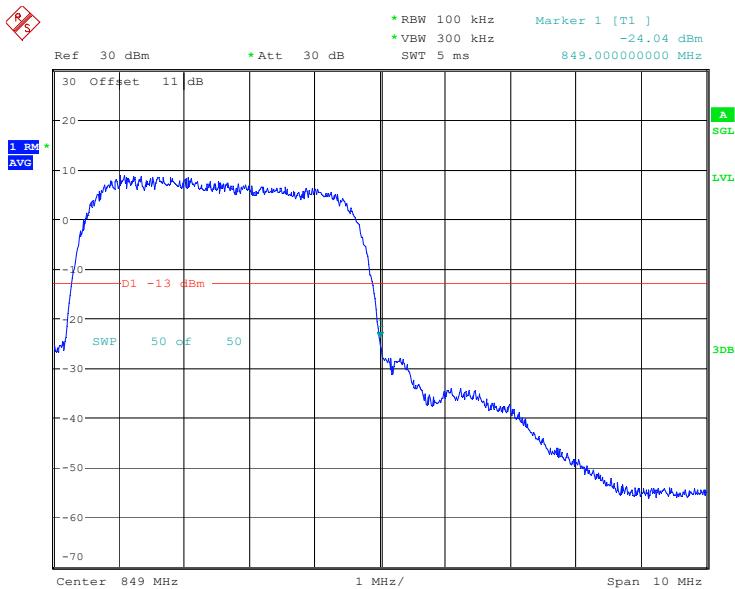


Cellular Band, Left Band Edge for HSDPA(16QAM) Mode



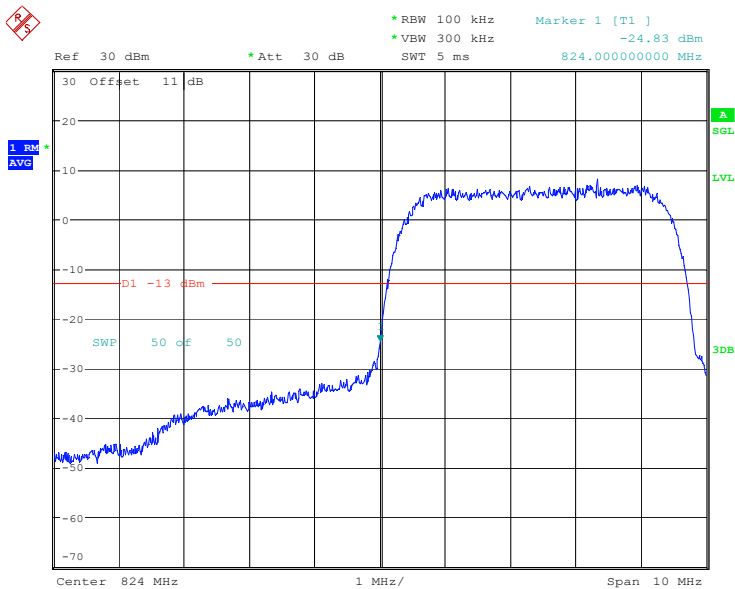
ProjectNo.:SZ1240124-05544E-RF Tester:Cheeb Huang
Date: 28.FEB.2024 02:32:29

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



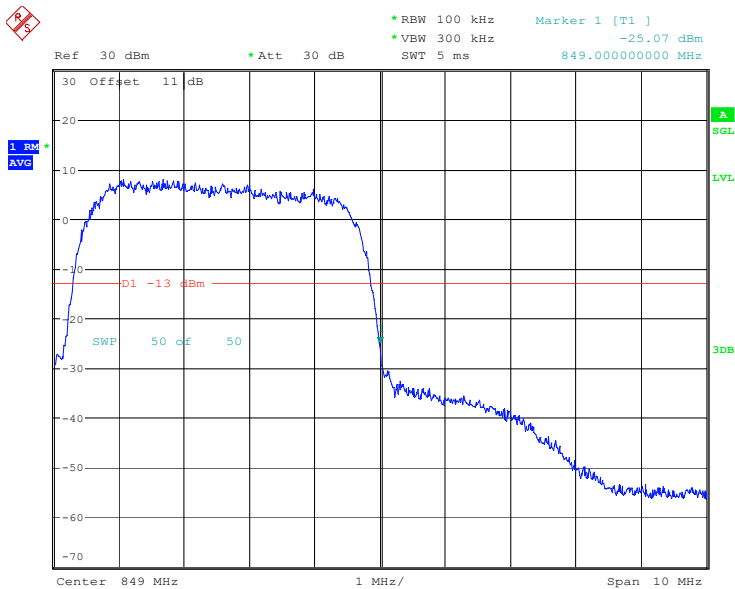
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Date: 28.FEB.2024 02:28:49

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



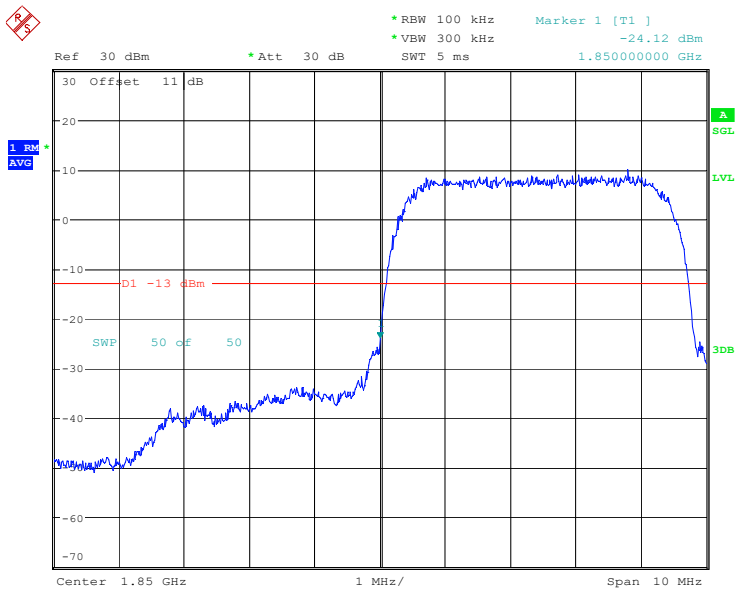
ProjectNo.:SZ1240124-05544E-RF Tester:Cheeb Huang
Date: 28.FEB.2024 02:19:43

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



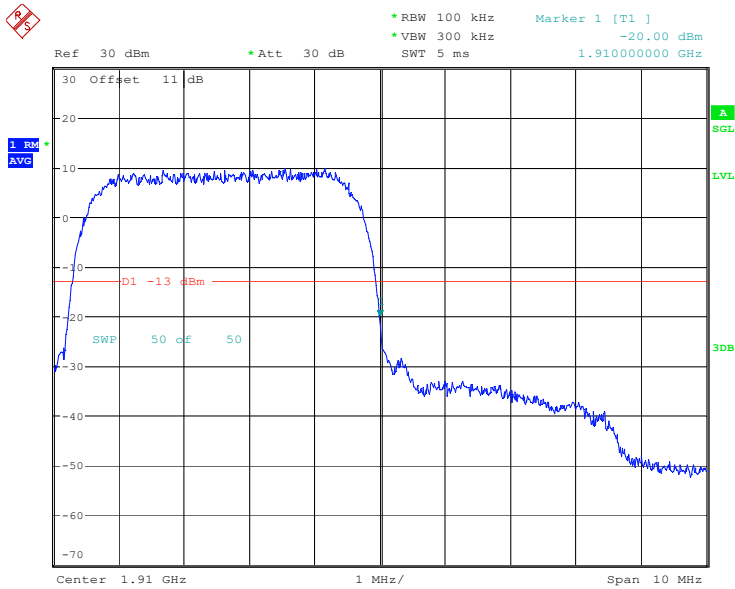
ProjectNo.:SZ1240124-05544E-RF Tester:Cheeb Huang
Date: 28.FEB.2024 02:26:07

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

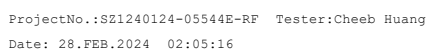
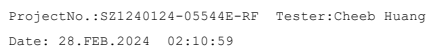


ProjectNo.:SZ1240124-05544E-RF Tester:Cheeb Huang
Date: 28.FEB.2024 01:55:05

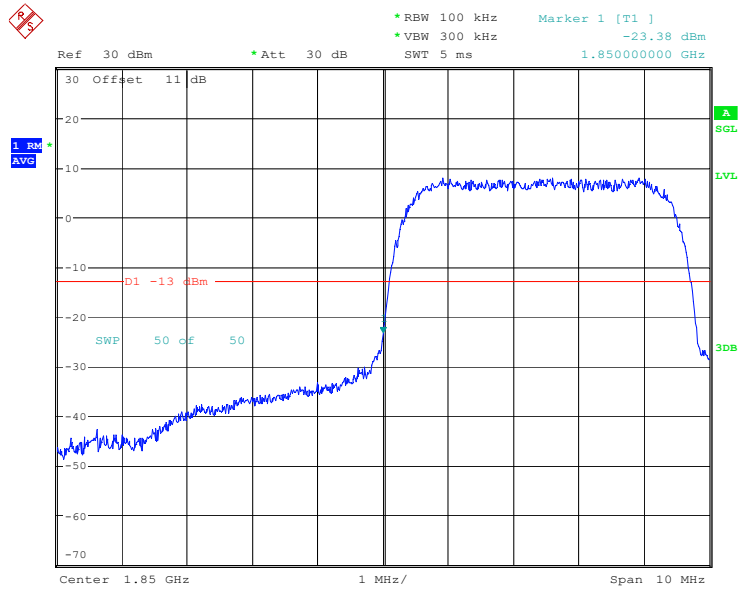
PCS Band, Right Band Edge for RMC (BPSK) Mode



ProjectNo.:SZ1240124-05544E-RF Tester:Cheeb Huang
Date: 28.FEB.2024 02:03:22

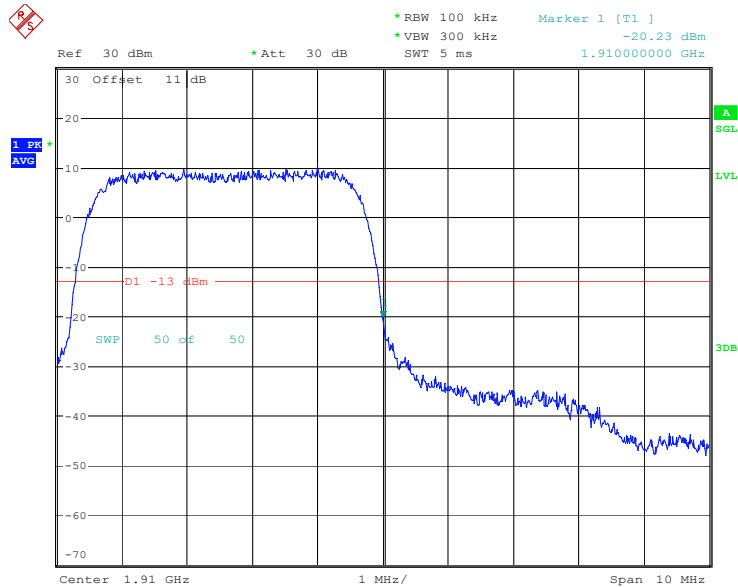


PCS Band, Left Band Edge for HSUPA (QPSK) Mode



ProjectNo.:SZ1240124-05544E-RF Tester:Cheeb Huang
Date: 28.FEB.2024 02:12:48

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



ProjectNo.:SZ1240124-05544E-RF Tester:Cheeb Huang
Date: 28.FEB.2024 02:16:46

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.

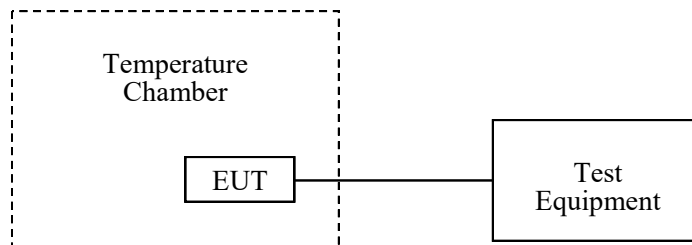
Test Procedure

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:	24.1~26.3 °C
Relative Humidity:	38~49 %
ATM Pressure:	101 kPa

The testing was performed by Cheeb Huang from 2024-02-27 to 2024-03-01.

EUT operation mode: Transmitting

Test Result: Compliant

Please refer to the following tables.

Cellular Band (Part 22H)

WCDMA Mode

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	3.7	-10.02	-0.012	2.5
	-20	3.7	-11.12	-0.013	2.5
	-10	3.7	0.88	0.001	2.5
	0	3.7	0.58	0.001	2.5
	10	3.7	2.78	0.003	2.5
	20	3.7	-9.42	-0.011	2.5
	30	3.7	4.38	0.005	2.5
	40	3.7	-3.12	-0.004	2.5
	50	3.7	5.88	0.007	2.5
Frequency Stability vs. Voltage	20	3.45	2.68	0.003	2.5
	20	4.4	-13.12	-0.016	2.5

PCS Band (Part 24E)**WCDMA Mode**

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	3.7	1850.100	1850.000	1909.740	1910.000
	-20	3.7	1850.520	1850.000	1909.620	1910.000
	-10	3.7	1850.580	1850.000	1909.580	1910.000
	0	3.7	1850.190	1850.000	1909.820	1910.000
	10	3.7	1850.350	1850.000	1909.780	1910.000
	20	3.7	1850.700	1850.000	1909.660	1910.000
	30	3.7	1850.140	1850.000	1909.510	1910.000
	40	3.7	1850.200	1850.000	1909.590	1910.000
	50	3.7	1850.340	1850.000	1909.660	1910.000
Frequency Stability vs. Voltage	20	3.45	1850.300	1850.000	1909.520	1910.000
	20	4.4	1850.360	1850.000	1909.350	1910.000

LTE Band 2:

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	3.7	1851.040	1850.000	1908.990	1910.000
	-20	3.7	1851.030	1850.000	1909.010	1910.000
	-10	3.7	1850.940	1850.000	1908.970	1910.000
	0	3.7	1850.870	1850.000	1909.190	1910.000
	10	3.7	1850.980	1850.000	1909.140	1910.000
	20	3.7	1850.800	1850.000	1909.100	1910.000
	30	3.7	1850.850	1850.000	1909.040	1910.000
	40	3.7	1850.810	1850.000	1909.070	1910.000
	50	3.7	1850.980	1850.000	1909.020	1910.000
Frequency Stability vs. Voltage	20	3.45	1850.910	1850.000	1909.120	1910.000
	20	4.4	1851.050	1850.000	1909.060	1910.000
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	3.7	1851.010	1850.000	1909.170	1910.000
	-20	3.7	1850.910	1850.000	1909.060	1910.000
	-10	3.7	1850.910	1850.000	1909.200	1910.000
	0	3.7	1851.050	1850.000	1909.040	1910.000
	10	3.7	1851.020	1850.000	1909.190	1910.000
	20	3.7	1850.920	1850.000	1909.150	1910.000
	30	3.7	1850.820	1850.000	1909.190	1910.000
	40	3.7	1850.950	1850.000	1909.150	1910.000
	50	3.7	1851.030	1850.000	1909.130	1910.000
Frequency Stability vs. Voltage	20	3.45	1850.920	1850.000	1909.170	1910.000
	20	4.4	1850.940	1850.000	1909.200	1910.000

LTE Band 4:

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	3.7	1710.850	1710.00	1754.120	1755
	-20	3.7	1710.960	1710.00	1754.080	1755
	-10	3.7	1710.990	1710.00	1754.020	1755
	0	3.7	1710.840	1710.00	1754.070	1755
	10	3.7	1711.010	1710.00	1754.010	1755
	20	3.7	1711.010	1710.00	1754.110	1755
	30	3.7	1710.810	1710.00	1753.960	1755
	40	3.7	1710.940	1710.00	1754.070	1755
	50	3.7	1711.000	1710.00	1754.060	1755
Frequency Stability vs. Voltage	20	3.45	1710.860	1710.00	1754.120	1755
	20	4.4	1711.050	1710.00	1754.140	1755
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	3.7	1711.010	1710.00	1754.140	1755
	-20	3.7	1710.870	1710.00	1754.010	1755
	-10	3.7	1710.950	1710.00	1754.000	1755
	0	3.7	1710.980	1710.00	1754.160	1755
	10	3.7	1710.890	1710.00	1754.160	1755
	20	3.7	1710.820	1710.00	1754.070	1755
	30	3.7	1710.900	1710.00	1754.200	1755
	40	3.7	1710.830	1710.00	1753.970	1755
	50	3.7	1710.880	1710.00	1754.000	1755
Frequency Stability vs. Voltage	20	3.45	1710.820	1710.00	1754.040	1755
	20	4.4	1710.960	1710.00	1754.070	1755

LTE Band 12:

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	3.7	699.550	699.00	715.510	716.00
	-20	3.7	699.550	699.00	715.460	716.00
	-10	3.7	699.470	699.00	715.680	716.00
	0	3.7	699.300	699.00	715.660	716.00
	10	3.7	699.340	699.00	715.520	716.00
	20	3.7	699.390	699.00	715.680	716.00
	30	3.7	699.510	699.00	715.670	716.00
	40	3.7	699.540	699.00	715.520	716.00
	50	3.7	699.480	699.00	715.510	716.00
Frequency Stability vs. Voltage	20	3.45	699.390	699.00	715.560	716.00
	20	4.4	699.460	699.00	715.650	716.00
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	3.7	699.420	699.00	715.470	716.00
	-20	3.7	699.490	699.00	715.490	716.00
	-10	3.7	699.370	699.00	715.640	716.00
	0	3.7	699.330	699.00	715.490	716.00
	10	3.7	699.460	699.00	715.550	716.00
	20	3.7	699.370	699.00	715.510	716.00
	30	3.7	699.350	699.00	715.560	716.00
	40	3.7	699.450	699.00	715.620	716.00
	50	3.7	699.500	699.00	715.600	716.00
Frequency Stability vs. Voltage	20	3.45	699.400	699.00	715.530	716.00
	20	4.4	699.340	699.00	715.510	716.00

LTE Band 17:

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	3.7	704.370	704.00	715.520	716.00
	-20	3.7	704.360	704.00	715.480	716.00
	-10	3.7	704.410	704.00	715.490	716.00
	0	3.7	704.430	704.00	715.590	716.00
	10	3.7	704.400	704.00	715.590	716.00
	20	3.7	704.340	704.00	715.570	716.00
	30	3.7	704.310	704.00	715.640	716.00
	40	3.7	704.450	704.00	715.480	716.00
	50	3.7	704.520	704.00	715.470	716.00
Frequency Stability vs. Voltage	20	3.45	704.480	704.00	715.620	716.00
	20	4.4	704.490	704.00	715.680	716.00
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	3.7	704.480	704.00	715.530	716.00
	-20	3.7	704.410	704.00	715.540	716.00
	-10	3.7	704.540	704.00	715.610	716.00
	0	3.7	704.460	704.00	715.480	716.00
	10	3.7	704.510	704.00	715.550	716.00
	20	3.7	704.300	704.00	715.500	716.00
	30	3.7	704.370	704.00	715.450	716.00
	40	3.7	704.320	704.00	715.480	716.00
	50	3.7	704.450	704.00	715.690	716.00
Frequency Stability vs. Voltage	20	3.45	704.510	704.00	715.480	716.00
	20	4.4	704.490	704.00	715.450	716.00

EUT PHOTOGRAPHS

Please refer to the attachment SZ1240124-05544E-RF External photo and SZ1240124-05544E-RF Internal photo.

TEST SETUP PHOTOGRAPHS

Please refer to the attachment SZ1240124-05544E-RFB Test Setup photo.

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