

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: 2401S54552E-RF-00E
FCC ID: 2AJ2B-M8

Test Standard (s)

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

Sample Description

Product Type: POS Terminal
Model No.: M8
Multiple Model(s) No.: N/A
Trade Mark: Telpo
Date Received: 2024/04/25
Issue Date: 2024/07/12

Test Result:	Pass▲
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▲ In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

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RF Engineer

Approved By:

Nancy Wang

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.

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	2401S54552E-RF-00E	Original Report	2024/07/12

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	POS Terminal			
Tested Model	M8			
Multiple Model(s)	N/A			
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	-3.59	0
		PCS1900/WCDMA/LTE B2	-0.34	0
		LTE B4	-0.31	0
		LTE B7	-0.13	0
		LTE B38	-0.09	0
Note: Lc= Signal Attenuation in the connecting cable between the transmitter and antenna, in dB.				
Voltage Range	DC 7.60V from Li-ion battery or DC 12V from Adapter			
Sample serial number	2KLY-2 for Radiated Emissions Test 2KLY-1 for RF Conducted Test (Assigned by BACL, Shenzhen)			
Sample/EUT Status	Good condition			
Normal/Extreme Condition [#]	L.V.: Low Voltage 6.46 V _{DC} N.V.: Normal Voltage 7.60V _{DC} H.V.: High Voltage 8.70V _{DC}			
Adapter Information	Model: GMB36-120300-F Input: AC 100-240V, 50/60Hz, 1.5A Output: DC 12.0V, 3.0A, 36.0W			

Objective

This test report is in accordance with Part 2-Subpart J, Part 22-Subpart H, Part 24-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°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
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

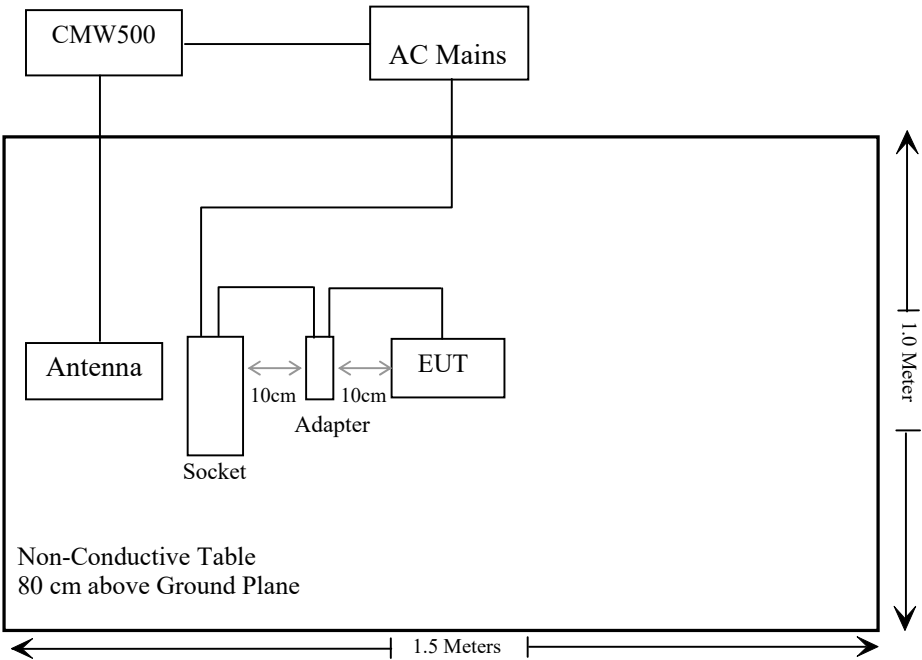
Manufacturer	Description	Model	Serial Number
Rohde & Schwarz	Universal Radio Communication Tester	CMW500	141718
Unknown	Socket	Unknown	Unknown

Support Cable Description

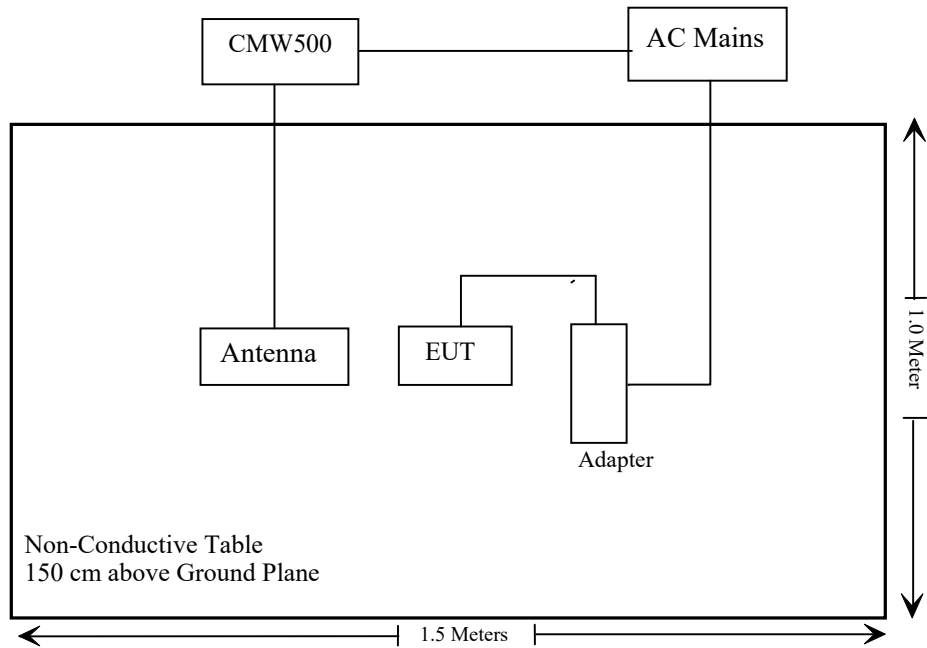
Cable Description	Length (m)	From / Port	To
Un-shielding Un-Detachable DC Cable	1.5	EUT	Adapter
Un-shielded Detachable AC Cable	1.5	Adapter	AC Mains/Socket
Un-shielded Detachable AC Cable	1.2	Socket	AC Mains
Un-shielded Detachable AC Cable	1.2	CMW500	AC Mains

Block Diagram of Test Setup

Below 1GHz



Above 1GHz



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307 ,§2.1093	RF Exposure Information	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	1.3G High Pass filter	1.3GHz	101120	2023/08/03	2024/08/02
JD	Filter Switch Unit	DT7210FSU	DQ77930	NCR	NCR
JD	Multiplex Switch Test Control Set	DT7220FSU	DQ77926	NCR	NCR
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
Agilent	Signal Generator	N5183A	MY50140588	2023/12/18	2024/12/17

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	SPECTRUM ANALYZER	FSU26	200982	2023/12/18	2024/12/17
BACL	Temperature & Humidity Chamber	BTH-150-40	30145	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
BACL	Temperature & Humidity Chamber	BTH-150-40	30145	2024/01/16	2025/01/15
narda	Power divider	SN5	100005	2023/12/07	2024/12/06
WEINSCHEL	3dB Attenuator	Unknown	F-03-EM220	2023/07/04	2024/07/03
Unknown	RF Cable	65475	01670515	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: 2402S54552E-20.

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.

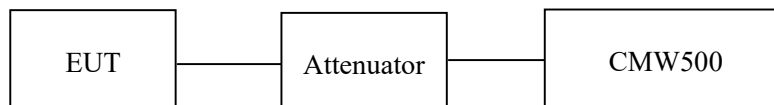
According to §27.50(d), Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

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:	23~24 °C
Relative Humidity:	42~43 %
ATM Pressure:	100 kPa

The testing was performed by Allen Bai from 2024-05-26 to 2024-05-30.

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		
GSM	32.49	32.55	32.71	26.97	38.45
GPRS 1 Slot	32.37	32.38	32.56	26.82	38.45
GPRS 2 Slots	30.91	30.99	31.25	25.51	38.45
GPRS 3 Slots	28.43	28.49	28.75	23.01	38.45
GPRS 4 Slots	27.21	27.18	27.37	21.63	38.45
EDGE 1 Slot	26.53	26.44	26.55	20.81	38.45
EDGE 2 Slots	25.34	25.38	25.36	19.64	38.45
EDGE 3 Slots	24.25	24.20	24.28	18.54	38.45
EDGE 4 Slots	23.15	23.10	23.15	17.41	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	16.29	16.29	16.29	16.29	38.45
HSDPA Subtest 1	13.31	13.31	13.31	13.31	38.45
HSDPA Subtest 2	13.45	13.45	13.45	13.45	38.45
HSDPA Subtest 3	13.36	13.36	13.36	13.36	38.45
HSDPA Subtest 4	13.37	13.37	13.37	13.37	38.45
HSUPA Subtest 1	14.03	14.03	14.03	14.03	38.45
HSUPA Subtest 2	13.69	13.69	13.69	13.69	38.45
HSUPA Subtest 3	13.53	13.53	13.53	13.53	38.45
HSUPA Subtest 4	13.71	13.71	13.71	13.71	38.45
HSUPA Subtest 5	13.65	13.65	13.65	13.65	38.45
DC-HSDPA Subtest 1	13.69	13.69	13.69	13.69	38.45
DC-HSDPA Subtest 2	13.70	13.70	13.70	13.70	38.45
DC-HSDPA Subtest 3	13.64	13.64	13.64	13.64	38.45
DC-HSDPA Subtest 4	13.61	13.61	13.61	13.61	38.45
HSPA+ Subtest 1	13.66	13.66	13.66	13.66	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		
GSM	28.32	28.87	28.83	28.53	33
GPRS 1 Slot	28.36	28.90	28.85	28.56	33
GPRS 2 Slots	27.29	27.76	27.80	27.46	33
GPRS 3 Slots	25.07	25.52	25.65	25.31	33
GPRS 4 Slots	23.98	24.38	24.37	24.04	33
EDGE 1 Slot	25.48	25.89	25.96	25.62	33
EDGE 2 Slots	24.90	24.97	25.14	24.80	33
EDGE 3 Slots	22.86	23.19	24.37	24.03	33
EDGE 4 Slots	22.07	22.30	22.38	22.04	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	21.95	22.13	22.02	21.79	33
HSDPA Subtest 1	19.12	19.23	19.16	18.89	33
HSDPA Subtest 2	19.30	19.12	18.95	18.96	33
HSDPA Subtest 3	19.57	19.46	19.18	19.23	33
HSDPA Subtest 4	19.52	19.13	19.29	19.18	33
HSUPA Subtest 1	19.78	19.89	19.72	19.55	33
HSUPA Subtest 2	20.11	19.92	19.62	19.77	33
HSUPA Subtest 3	19.67	20.22	19.95	19.88	33
HSUPA Subtest 4	19.96	19.93	19.93	19.62	33
HSUPA Subtest 5	20.02	19.24	19.91	19.68	33
DC-HSDPA Subtest 1	19.43	19.62	19.51	19.28	33
DC-HSDPA Subtest 2	19.68	19.56	19.29	19.34	33
DC-HSDPA Subtest 3	19.41	19.74	19.50	19.40	33
DC-HSDPA Subtest 4	19.68	19.53	19.84	19.50	33
HSPA+ Subtest 1	19.61	19.80	19.41	19.46	33
Note: EIRP=Conducted Power(dBm) - L _C (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	22.19	21.87	21.74	21.97	33
	RB1#3	22.31	22.05	21.61		
	RB1#5	22.22	21.91	21.60		
	RB3#0	22.17	21.87	21.87		
	RB3#3	22.12	21.99	21.88		
	RB6#0	20.92	21.10	20.79		
1.4MHz 16QAM	RB1#0	21.20	21.06	20.94	21.23	33
	RB1#3	21.05	21.57	20.82		
	RB1#5	20.99	21.49	20.70		
	RB3#0	20.99	21.06	20.83		
	RB3#3	21.02	21.01	20.74		
	RB6#0	19.80	20.34	19.56		
3MHz QPSK	RB1#0	22.15	21.87	21.83	21.81	33
	RB1#8	22.14	21.91	21.74		
	RB1#14	21.91	22.09	21.73		
	RB6#0	20.94	21.13	20.74		
	RB6#9	20.91	21.11	20.78		
	RB15#0	20.99	21.00	20.78		
3MHz 16QAM	RB1#0	21.39	21.34	20.97	21.09	33
	RB1#8	21.43	21.34	20.89		
	RB1#14	21.30	21.35	20.54		
	RB6#0	19.98	20.25	19.93		
	RB6#9	20.00	20.37	19.95		
	RB15#0	20.09	20.37	19.76		
5MHz QPSK	RB1#0	21.98	21.94	21.63	21.64	33
	RB1#13	21.87	21.71	21.79		
	RB1#24	21.57	21.73	21.51		
	RB15#0	21.09	21.08	20.90		
	RB15#10	20.94	21.08	20.86		
	RB25#0	21.08	20.99	20.82		
5MHz 16QAM	RB1#0	20.91	21.48	20.58	21.55	33
	RB1#13	20.72	21.89	20.97		
	RB1#24	20.13	21.44	20.60		
	RB15#0	19.92	19.95	19.93		
	RB15#10	19.86	20.01	19.90		
	RB25#0	20.01	19.89	19.96		

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	22.24	21.99	21.93	21.90	33
	RB1#25	21.92	21.98	22.18		
	RB1#49	22.10	21.83	21.84		
	RB25#0	21.07	20.93	20.90		
	RB25#25	20.95	20.93	20.87		
	RB50#0	20.95	20.93	20.84		
10MHz 16QAM	RB1#0	21.49	21.63	20.89	21.70	33
	RB1#25	22.04	21.40	21.76		
	RB1#49	21.31	21.64	20.74		
	RB25#0	20.12	20.26	20.02		
	RB25#25	19.91	20.12	20.25		
	RB50#0	19.81	19.93	19.90		
15MHz QPSK	RB1#0	21.96	22.11	21.78	21.77	33
	RB1#38	21.87	22.08	21.80		
	RB1#74	21.85	21.78	21.66		
	RB36#0	20.91	20.99	20.92		
	RB36#39	20.94	20.94	20.86		
	RB75#0	20.88	20.95	20.90		
15MHz 16QAM	RB1#0	21.58	21.69	21.28	21.80	33
	RB1#38	22.14	22.06	21.22		
	RB1#74	21.34	21.67	20.47		
	RB36#0	19.92	20.09	19.81		
	RB36#39	19.83	20.08	19.95		
	RB75#0	19.90	20.02	19.92		
20MHz QPSK	RB1#0	21.86	21.77	22.08	22.01	33
	RB1#50	22.15	22.17	22.35		
	RB1#99	21.73	21.64	22.11		
	RB50#0	20.92	20.93	20.94		
	RB50#50	20.91	20.99	20.89		
	RB100#0	20.80	20.99	20.91		
20MHz 16QAM	RB1#0	21.78	21.18	21.19	21.83	33
	RB1#50	22.17	21.82	21.05		
	RB1#99	21.74	21.12	21.00		
	RB50#0	20.00	20.11	19.97		
	RB50#50	20.02	19.98	19.90		
	RB100#0	19.92	19.89	19.94		
Note: EIRP=Conducted Power(dBm) - L _C (dB) + G _T (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	21.36	21.17	21.36	21.08	30
	RB1#3	21.18	21.25	21.17		
	RB1#5	21.04	21.18	21.22		
	RB3#0	21.32	21.18	21.13		
	RB3#3	21.39	21.22	21.18		
	RB6#0	20.19	20.25	20.27		
1.4MHz 16QAM	RB1#0	20.92	20.48	20.55	20.61	30
	RB1#3	20.89	20.38	20.60		
	RB1#5	20.81	20.15	20.41		
	RB3#0	20.44	20.41	20.14		
	RB3#3	20.33	20.32	20.26		
	RB6#0	19.35	19.15	19.13		
3MHz QPSK	RB1#0	21.16	21.23	20.99	21.12	30
	RB1#8	21.43	21.28	21.04		
	RB1#14	21.13	21.17	21.17		
	RB6#0	20.25	20.42	20.13		
	RB6#9	20.22	20.34	20.18		
	RB15#0	20.20	20.34	20.26		
3MHz 16QAM	RB1#0	20.65	20.98	20.38	20.72	30
	RB1#8	20.69	20.92	19.92		
	RB1#14	20.65	21.03	19.80		
	RB6#0	19.24	19.45	18.91		
	RB6#9	19.29	19.40	19.14		
	RB15#0	19.17	19.52	19.31		
5MHz QPSK	RB1#0	20.97	21.19	20.86	21.04	30
	RB1#13	21.13	21.35	20.99		
	RB1#24	20.92	20.97	21.10		
	RB15#0	20.21	20.32	20.28		
	RB15#10	20.28	20.26	20.30		
	RB25#0	20.19	20.32	20.24		
5MHz 16QAM	RB1#0	19.88	20.83	20.28	20.85	30
	RB1#13	20.41	21.16	20.29		
	RB1#24	19.75	20.56	20.17		
	RB15#0	19.24	19.26	19.31		
	RB15#10	19.21	19.27	19.22		
	RB25#0	19.35	19.22	19.27		

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	21.23	21.26	21.08	21.23	30
	RB1#25	21.20	21.54	21.41		
	RB1#49	21.12	21.04	21.25		
	RB25#0	20.26	20.35	20.17		
	RB25#25	20.08	20.23	20.26		
	RB50#0	20.30	20.38	20.25		
10MHz 16QAM	RB1#0	20.77	20.96	20.06	21.21	30
	RB1#25	21.35	21.52	20.26		
	RB1#49	20.54	20.74	20.23		
	RB25#0	19.37	19.48	19.23		
	RB25#25	19.03	19.39	19.33		
	RB50#0	19.41	19.26	19.34		
15MHz QPSK	RB1#0	21.26	21.52	21.21	21.21	30
	RB1#38	21.36	21.23	21.02		
	RB1#74	21.37	21.04	21.10		
	RB36#0	20.25	20.34	20.21		
	RB36#39	20.20	20.23	20.26		
	RB75#0	20.24	20.20	20.23		
15MHz 16QAM	RB1#0	20.90	21.02	20.68	21.14	30
	RB1#38	21.45	20.94	20.45		
	RB1#74	20.77	20.84	19.96		
	RB36#0	19.35	19.35	19.29		
	RB36#39	19.12	19.14	19.10		
	RB75#0	19.25	19.21	19.17		
20MHz QPSK	RB1#0	21.19	21.26	21.39	21.22	30
	RB1#50	21.19	21.53	21.44		
	RB1#99	21.07	21.02	21.27		
	RB50#0	20.25	20.36	20.42		
	RB50#50	20.33	20.28	20.14		
	RB100#0	20.36	20.20	20.29		
20MHz 16QAM	RB1#0	20.47	20.55	20.52	20.92	30
	RB1#50	21.02	21.23	20.27		
	RB1#99	21.11	20.52	20.31		
	RB50#0	19.31	19.36	19.32		
	RB50#50	19.21	19.21	19.19		
	RB100#0	19.32	19.23	19.33		
Note: EIRP=Conducted Power(dBm) - L _C (dB) + G _T (dBi)						

LTE 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	20.12	20.67	21.09	21.03	33
	RB1#13	20.25	20.90	21.16		
	RB1#24	20.11	20.59	21.06		
	RB15#0	19.37	19.93	20.17		
	RB15#10	19.34	20.10	20.07		
	RB25#0	19.42	19.95	20.08		
5MHz 16QAM	RB1#0	19.85	19.63	19.67	20.09	33
	RB1#13	20.22	20.08	19.76		
	RB1#24	19.69	19.67	19.15		
	RB15#0	18.23	18.85	19.07		
	RB15#10	18.32	18.82	19.06		
	RB25#0	18.19	18.70	19.20		
10MHz QPSK	RB1#0	20.43	21.11	21.13	21.11	33
	RB1#25	20.73	21.24	21.19		
	RB1#49	20.46	21.08	21.04		
	RB25#0	19.42	20.07	20.16		
	RB25#25	19.52	20.00	20.21		
	RB50#0	19.51	20.03	20.17		
10MHz 16QAM	RB1#0	19.92	19.97	20.60	21.26	33
	RB1#25	20.10	20.90	21.39		
	RB1#49	20.10	19.98	20.46		
	RB25#0	18.40	19.25	19.24		
	RB25#25	18.29	19.29	19.32		
	RB50#0	18.48	19.05	19.23		
15MHz QPSK	RB1#0	20.42	21.25	20.86	21.12	33
	RB1#38	20.43	21.17	20.98		
	RB1#74	20.61	20.95	20.97		
	RB36#0	19.55	20.18	20.10		
	RB36#39	19.56	20.09	20.17		
	RB75#0	19.51	20.15	20.15		
15MHz 16QAM	RB1#0	20.11	20.86	20.32	20.73	33
	RB1#38	20.11	20.76	20.39		
	RB1#74	19.24	20.70	19.76		
	RB36#0	18.35	19.33	19.12		
	RB36#39	18.46	19.09	19.23		
	RB75#0	18.50	19.05	19.08		

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	20.88	21.19	21.24	33
	RB1#50	20.86	21.34	21.37		
	RB1#99	20.50	21.05	20.92		
	RB50#0	19.51	20.11	20.10		
	RB50#50	19.61	20.10	20.20		
	RB100#0	19.55	20.06	20.16		
20MHz 16QAM	RB1#0	19.82	20.04	20.74	21.45	33
	RB1#50	20.17	20.15	21.58		
	RB1#99	19.86	19.55	20.91		
	RB50#0	18.47	19.11	19.01		
	RB50#50	18.68	19.09	19.07		
	RB100#0	18.66	19.06	19.11		
Note: EIRP=Conducted Power(dBm) - L _C (dB) + G _T (dBi)						

LTE 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	20.43	20.45	21.13	21.40	33
	RB1#13	20.10	20.46	21.37		
	RB1#24	19.90	20.35	21.49		
	RB15#0	19.42	19.88	20.56		
	RB15#10	19.12	19.86	20.65		
	RB25#0	19.25	19.85	20.52		
5MHz 16QAM	RB1#0	20.11	20.15	20.84	20.86	33
	RB1#13	19.19	20.19	20.95		
	RB1#24	18.73	20.04	20.76		
	RB15#0	18.59	18.75	19.37		
	RB15#10	18.29	19.33	19.43		
	RB25#0	18.64	19.30	19.21		
10MHz QPSK	RB1#0	21.14	21.21	21.29	21.44	33
	RB1#25	20.71	21.20	21.48		
	RB1#49	20.94	21.15	21.53		
	RB25#0	20.01	20.27	20.39		
	RB25#25	19.97	20.32	20.51		
	RB50#0	19.93	20.26	20.43		
10MHz 16QAM	RB1#0	20.78	19.95	20.70	21.04	33
	RB1#25	20.58	20.11	21.13		
	RB1#49	20.48	20.00	21.12		
	RB25#0	19.01	19.18	19.53		
	RB25#25	19.05	19.26	19.58		
	RB50#0	19.01	19.21	19.47		
15MHz QPSK	RB1#0	21.32	21.30	21.25	21.39	33
	RB1#38	20.90	21.25	21.11		
	RB1#74	21.20	21.29	21.48		
	RB36#0	19.91	20.25	20.26		
	RB36#39	20.11	20.25	20.43		
	RB75#0	19.95	20.18	20.31		
15MHz 16QAM	RB1#0	20.00	20.70	20.27	20.61	33
	RB1#38	19.33	20.62	20.17		
	RB1#74	19.96	20.69	20.53		
	RB36#0	18.95	19.44	19.36		
	RB36#39	19.16	19.25	19.49		
	RB75#0	19.02	19.27	19.27		

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	20.97	21.14	21.35	21.36	33
	RB1#50	21.02	21.25	21.26		
	RB1#99	20.81	21.01	21.45		
	RB50#0	19.78	20.14	20.21		
	RB50#50	20.14	20.18	20.35		
	RB100#0	20.06	20.21	20.29		
20MHz 16QAM	RB1#0	20.59	20.05	20.72	21.17	33
	RB1#50	20.64	20.03	20.92		
	RB1#99	20.53	19.85	21.26		
	RB50#0	19.02	19.36	19.16		
	RB50#50	19.29	19.27	19.30		
	RB100#0	19.19	19.19	19.22		
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	
GSM	3.17	3.24	3.56	13
EDGE	3.28	2.07	3.43	13

WCAMA B5

Test Mode	Peak-to-average Ratio(dB)			Limit (dB)
	Lowest Channel	Middle Channel	Highest Channel	
WCDMA R99	3.11	3.62	3.11	13
HSDPA	4.94	4.74	4.58	13
HSUPA	5.51	6.03	5.96	13

PCS Band**PCS1900**

Test Mode	Peak-to-average Ratio(dB)			Limit (dB)
	Lowest Channel	Middle Channel	Highest Channel	
GSM	3.04	3.44	3.16	13
EDGE	3.37	3.58	3.47	13

WCDMA B2

Test Mode	Peak-to-average Ratio(dB)			Limit (dB)
	Lowest Channel	Middle Channel	Highest Channel	
WCDMA R99	3.17	3.17	3.14	13
HSDPA	4.97	4.78	4.81	13
HSUPA	5.90	5.96	5.93	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	2.24	1.79	2.12	13
	RB100#0	6.41	6.44	6.57	13
20MHz 16QAM	RB1#0	2.15	1.73	2.08	13
	RB100#0	7.21	7.15	7.34	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	2.21	2.21	2.31	13
	RB100#0	6.44	6.44	6.38	13
20MHz 16QAM	RB1#0	2.21	2.18	2.24	13
	RB100#0	7.18	7.24	7.24	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	2.50	2.47	2.66	13
	RB100#0	6.41	6.44	6.41	13
20MHz 16QAM	RB1#0	2.50	2.44	2.60	13
	RB100#0	7.18	7.18	7.28	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	6.03	5.19	8.49	13
	RB100#0	10.71	10.93	10.37	13
20MHz 16QAM	RB1#0	8.49	9.68	11.76	13
	RB100#0	9.38	12.02	11.47	13

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

Applicable Standard

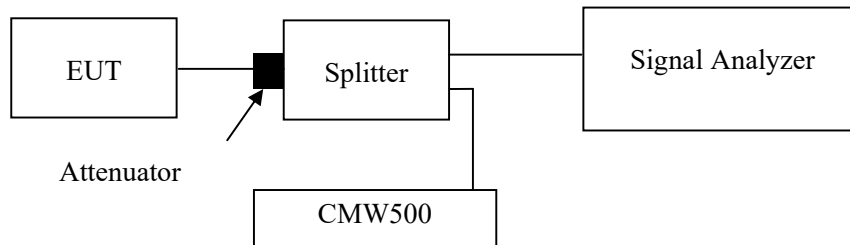
FCC 47 §2.1049, §22.917, §22.905, §24.238 and §27.53.

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:	23~24 °C
Relative Humidity:	42~43 %
ATM Pressure:	100 kPa

The testing was performed by Allen Bai from 2024-05-26 to 2024-05-29.

EUT operation mode: Transmitting

Test Result: Compliant

Please refer to the following tables and plots.

Cellular Band (Part 22H)**GSM 850**

Operation Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
	Middle channel	Middle Channel
GSM	0.245	0.318
EDGE	0.243	0.311

WCAMA B5

Operation Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
	Middle channel	Middle Channel
WCDMA R99	4.14	4.98
HSDPA	4.11	4.71
HSUPA	4.11	4.74

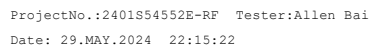
PCS Band (Part 24E)**PCS 1900**

Operation Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
	Middle channel	Middle Channel
GSM	0.244	0.319
EDGE	0.243	0.315

WCDMA B2

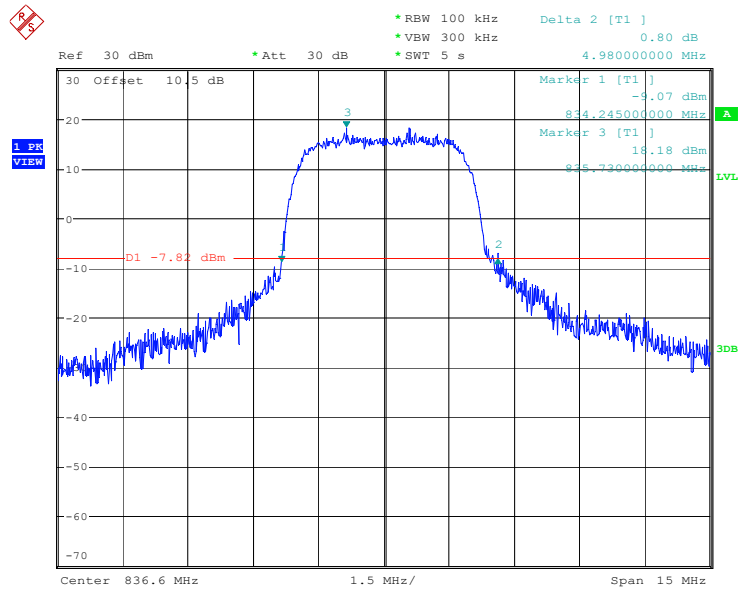
Operation Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
	Middle channel	Middle Channel
WCDMA R99	4.10	4.71
HSDPA	4.13	4.73
HSUPA	4.11	4.76

GSM(GMSK) Mode, Middle channel



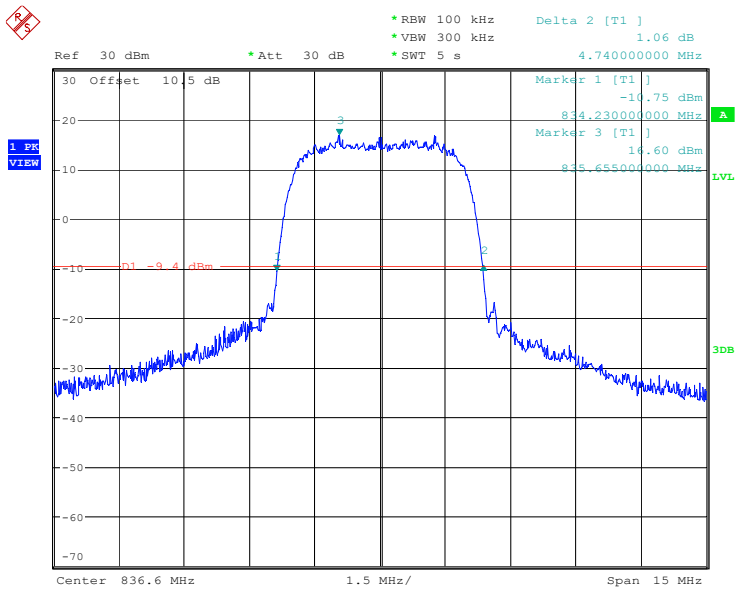
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Date: 29.MAY.2024 20:47:42

RMC (BPSK) Mode, Middle channel



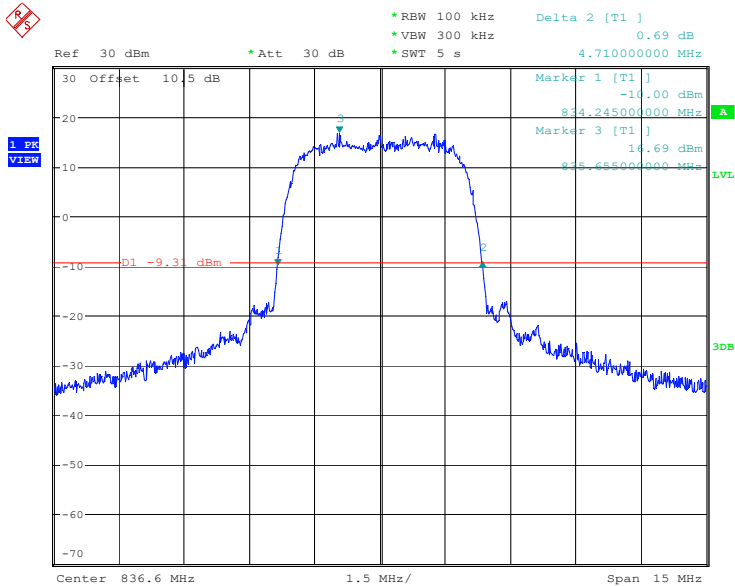
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 Date: 29.MAY.2024 01:59:22

HSUPA (QPSK) Mode, Middle channel



ProjectNo.:2401S54552E-RF Tester:Allen Bai
 Date: 29.MAY.2024 02:02:43

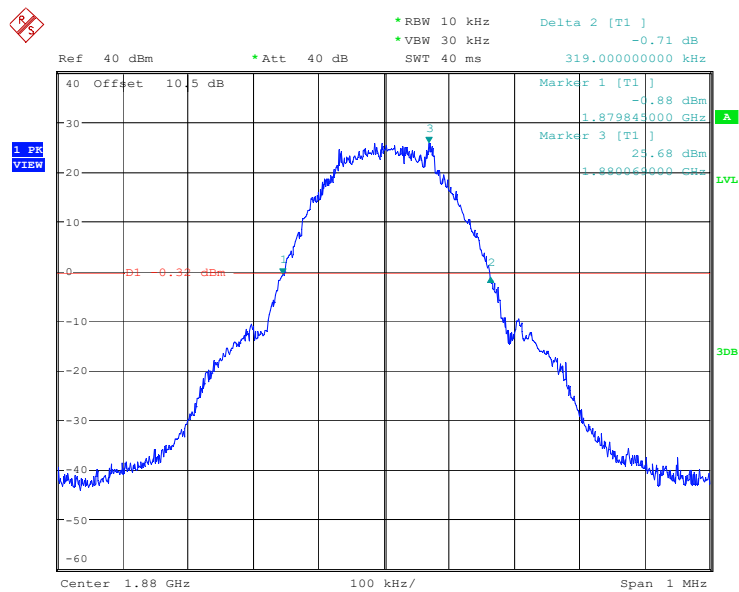
HSDPA (16QAM) Mode, Middle channel



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Date: 29.MAY.2024 01:48:48

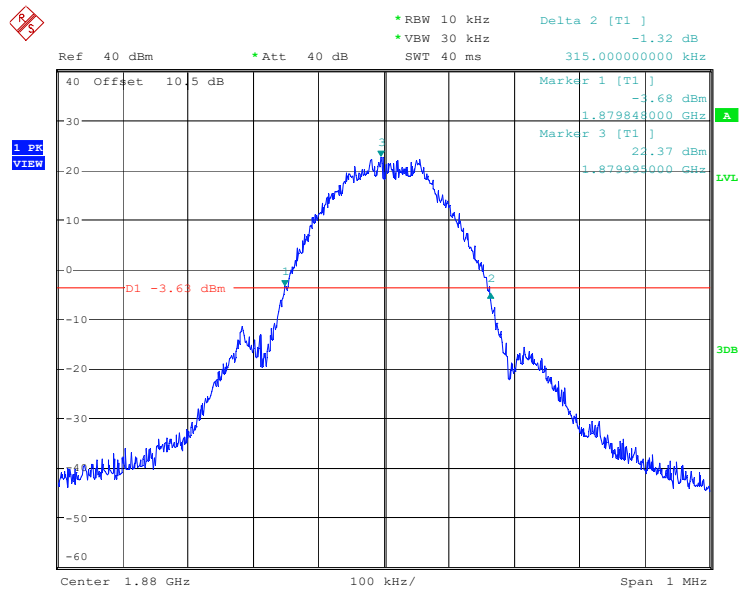
PCS Band

GSM(GMSK) Mode, Middle channel



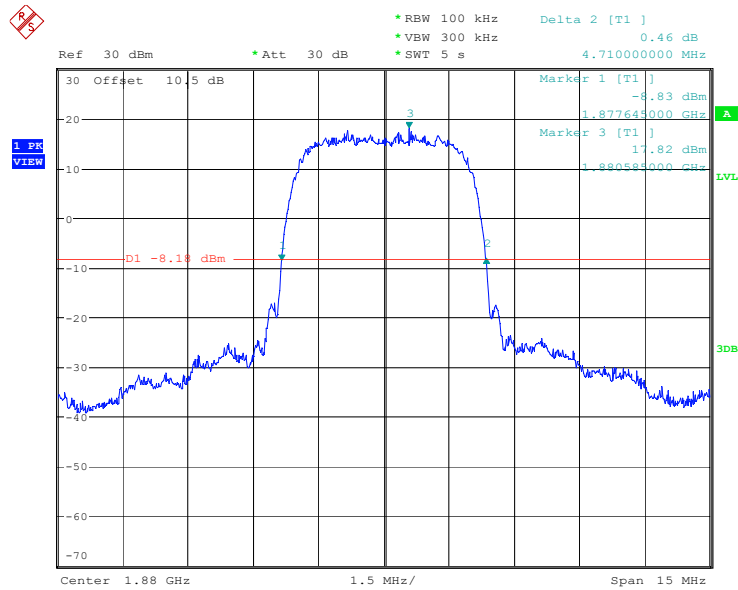
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EDGE(8PSK) Mode, Middle channel



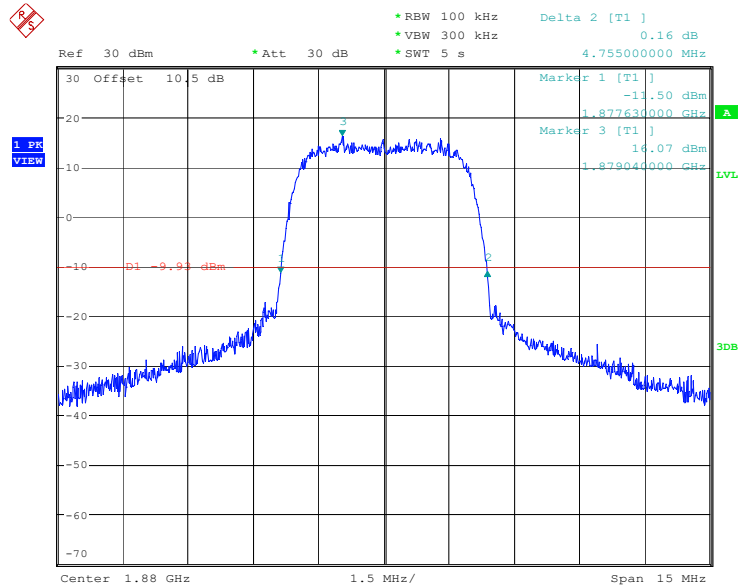
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Date: 29.MAY.2024 20:27:26

RMC (BPSK) Mode, Middle channel



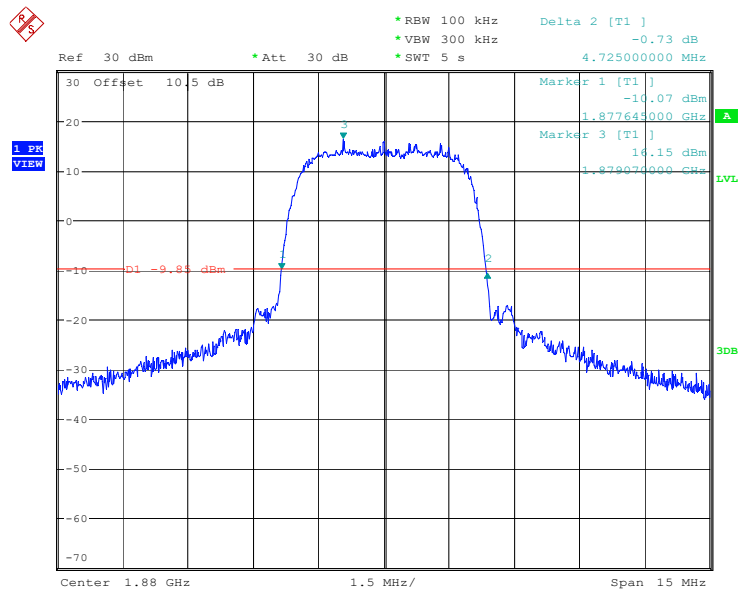
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 Date: 29.MAY.2024 02:26:56

HSUPA (QPSK) Mode, Middle channel

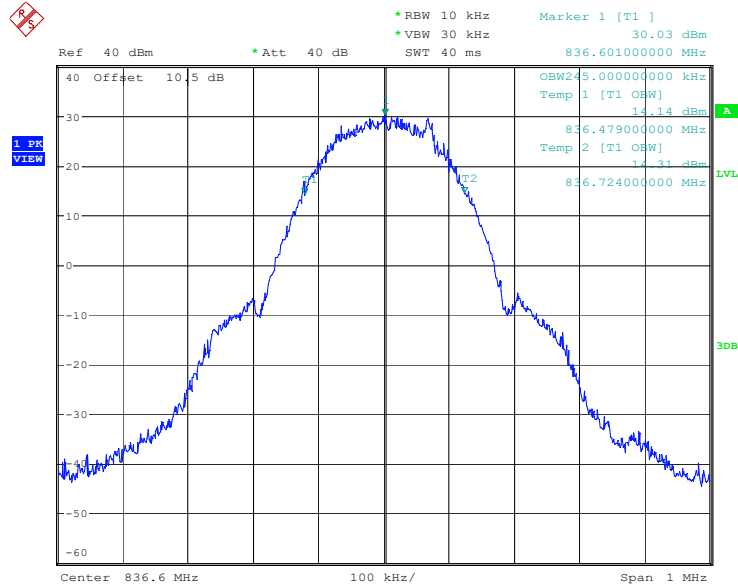


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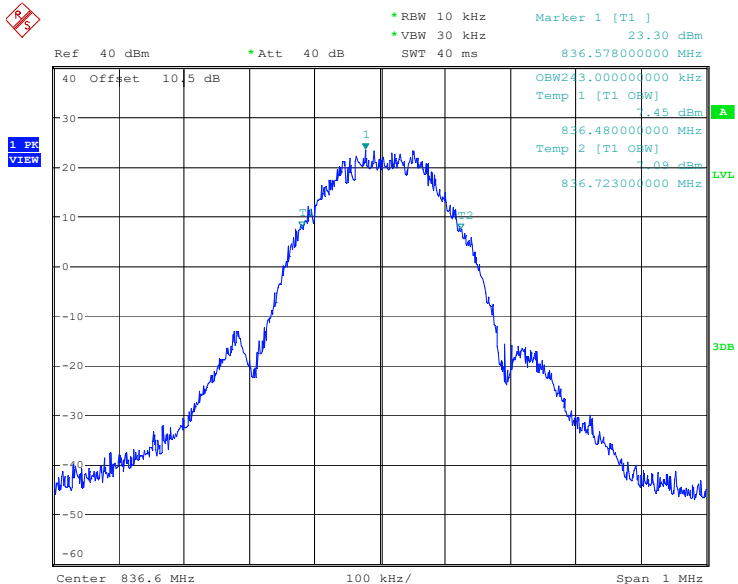
HSDPA (16QAM) Mode, Middle channel



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Date: 29.MAY.2024 02:36:37

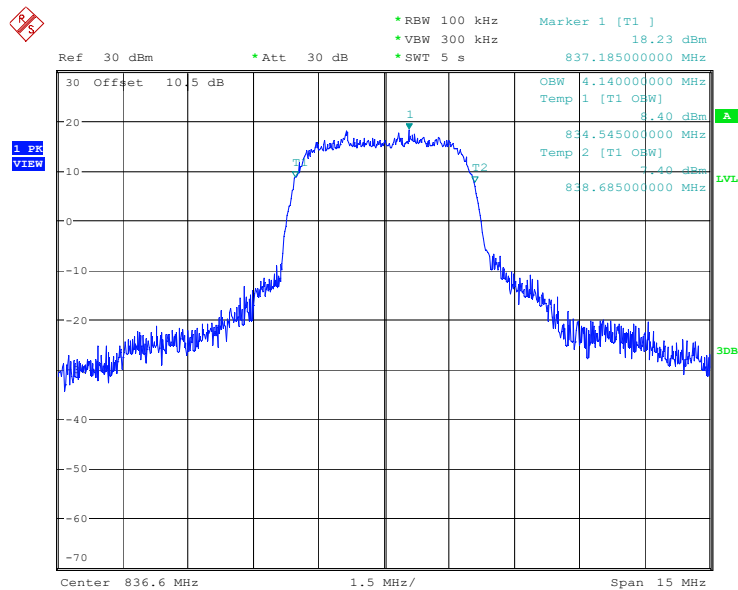
**99% Occupied Bandwidth
Cellular Band****GSM(GMSK) Mode, Middle channel**

ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 22:14:37

EDGE(8PSK) Mode, Middle channel

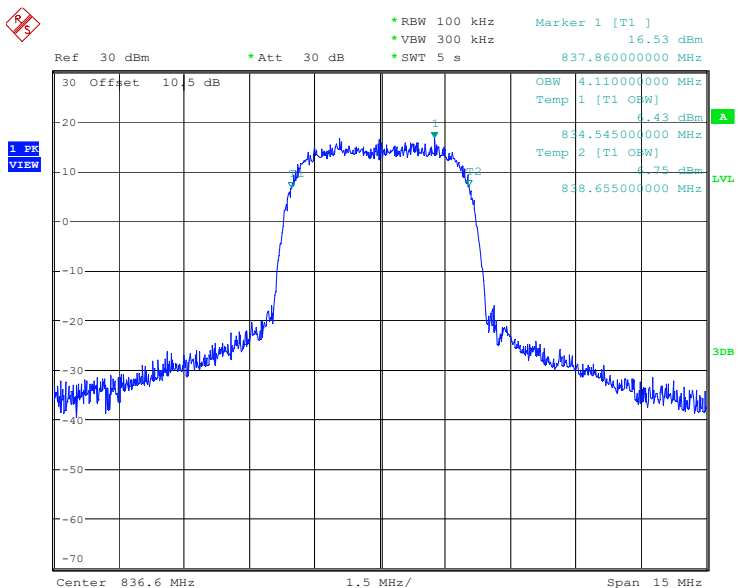
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RMC (BPSK) Mode, Middle channel



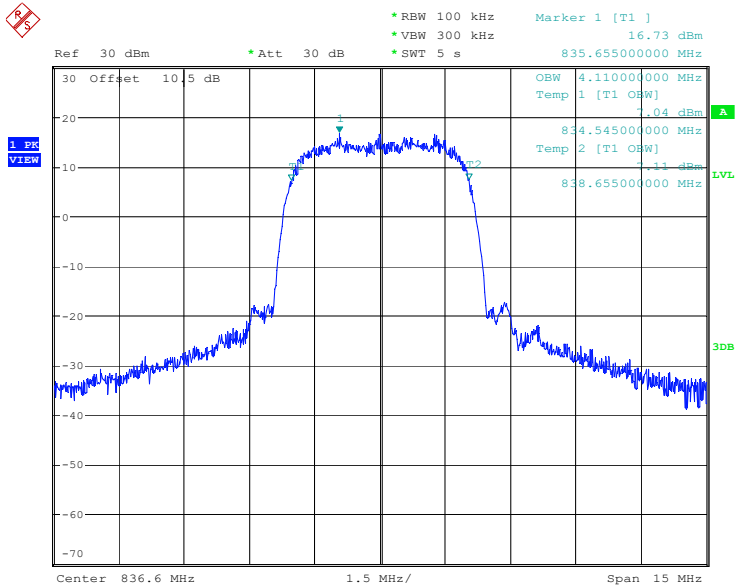
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Date: 29.MAY.2024 01:58:44

HSUPA (QPSK) Mode, Middle channel



ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 02:02:04

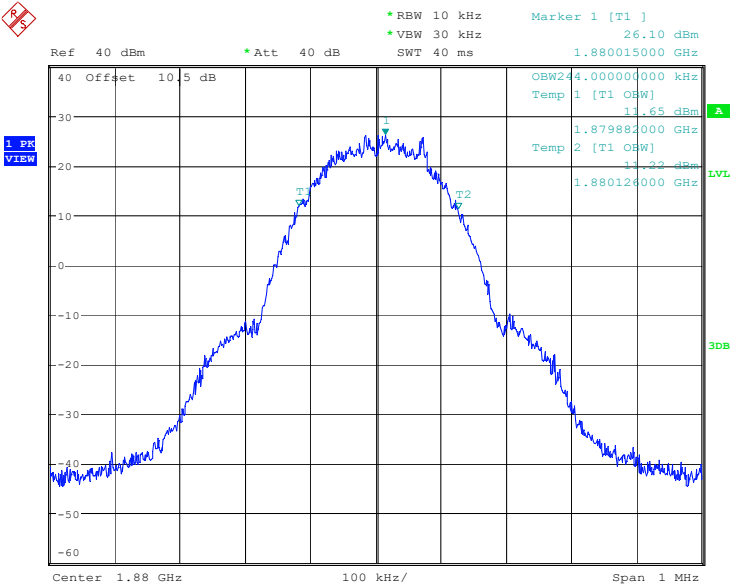
HSDPA (16QAM) Mode, Middle channel



ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 01:48:08

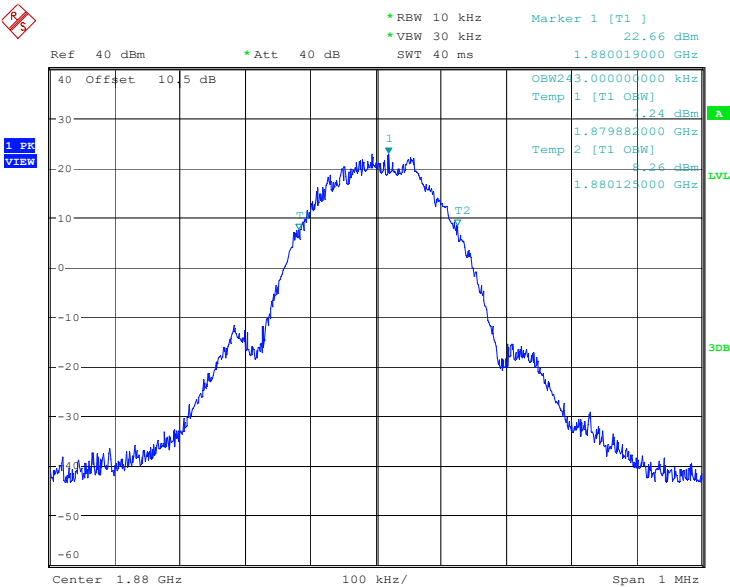
PCS Band

GSM(GMSK) Mode, Middle channel



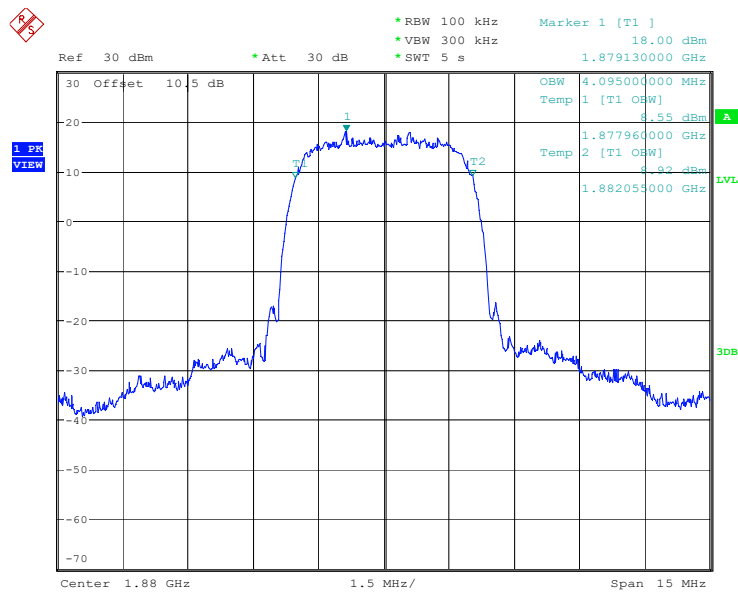
ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 21:58:13

EDGE(8PSK) Mode, Middle channel



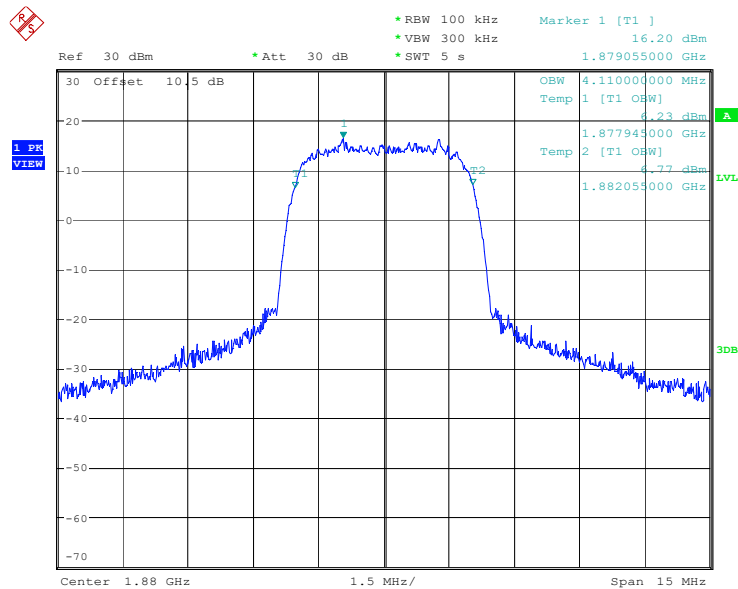
ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 20:26:44

RMC (BPSK) Mode, Middle channel



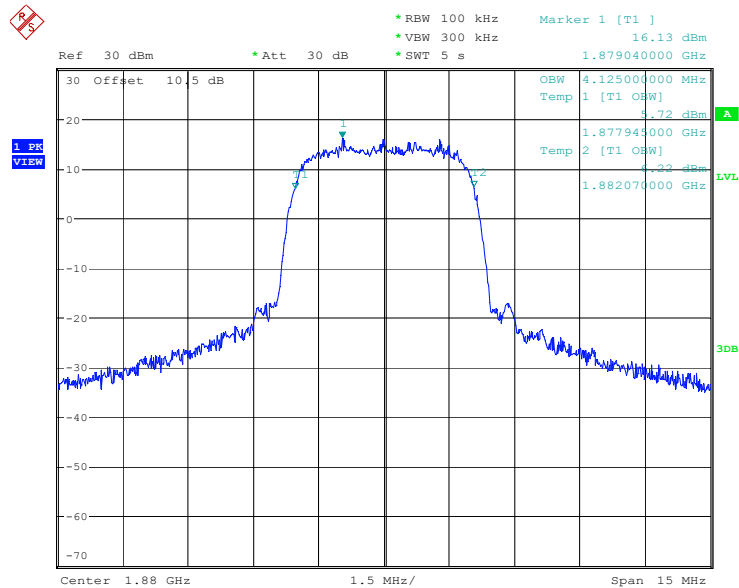
ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 02:26:32

HSUPA (QPSK) Mode, Middle channel



ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 02:45:29

HSDPA (16QAM) Mode, Middle channel



ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 02:36:01

LTE Band 2

Operation Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
	Middle channel	Middle Channel
1.4MHz QPSK	1.014	1.326
1.4MHz 16QAM	1.104	1.302
3MHz QPSK	2.688	2.940
3MHz 16QAM	2.688	2.952
5MHz QPSK	4.500	5.020
5MHz 16QAM	4.540	5.020
10MHz QPSK	8.960	9.720
10MHz 16QAM	8.960	9.720
15MHz QPSK	13.380	14.700
15MHz 16QAM	13.380	14.820
20MHz QPSK	17.920	19.360
20MHz 16QAM	17.840	19.440

LTE Band 4

Operation Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
	Middle channel	Middle Channel
1.4MHz QPSK	1.104	1.326
1.4MHz 16QAM	1.104	1.296
3MHz QPSK	2.700	2.952
3MHz 16QAM	2.700	2.952
5MHz QPSK	4.520	5.000
5MHz 16QAM	4.520	5.020
10MHz QPSK	8.960	9.640
10MHz 16QAM	8.960	9.680
15MHz QPSK	13.500	14.880
15MHz 16QAM	13.500	14.940
20MHz QPSK	17.840	19.360
20MHz 16QAM	17.920	19.520

LTE Band 7

Operation Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
	Middle channel	Middle Channel
5MHz QPSK	4.500	4.980
5MHz 16QAM	4.540	5.000
10MHz QPSK	8.960	9.680
10MHz 16QAM	8.920	9.680
15MHz QPSK	13.500	14.880
15MHz 16QAM	13.500	14.820
20MHz QPSK	17.840	19.360
20MHz 16QAM	17.920	19.520

LTE Band 38

Operation Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
	Middle channel	Middle Channel
5MHz QPSK	4.500	5.020
5MHz 16QAM	4.500	5.040
10MHz QPSK	8.960	10.040
10MHz 16QAM	8.960	9.560
15MHz QPSK	13.440	15.240
15MHz 16QAM	13.500	14.940
20MHz QPSK	17.920	19.360
20MHz 16QAM	17.920	19.600

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

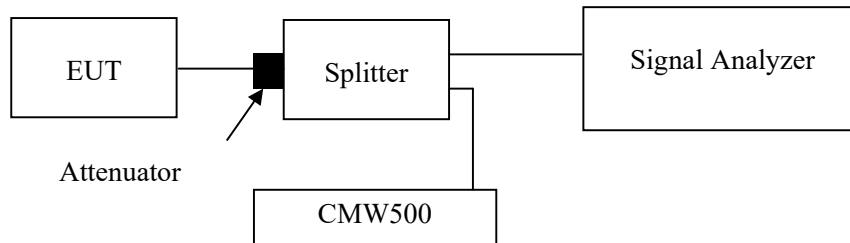
FCC §2.1051, §22.917(a) & §24.238(a) & §27.53.

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:	23~24 °C
Relative Humidity:	42~43 %
ATM Pressure:	100 kPa

The testing was performed by Allen Bai from 2024-05-26 to 2024-05-29.

EUT operation mode: Transmitting

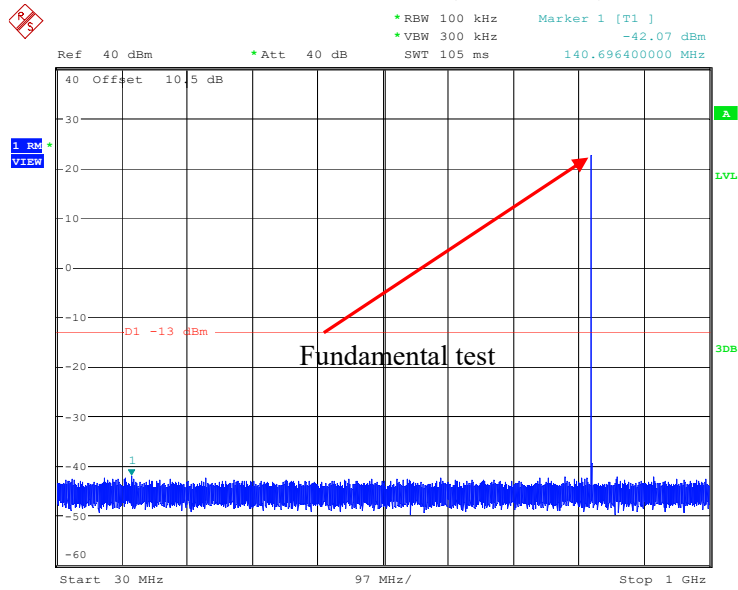
Test result: Compliant

Please refer to the following plots.

Cellular Band

Low Channel:

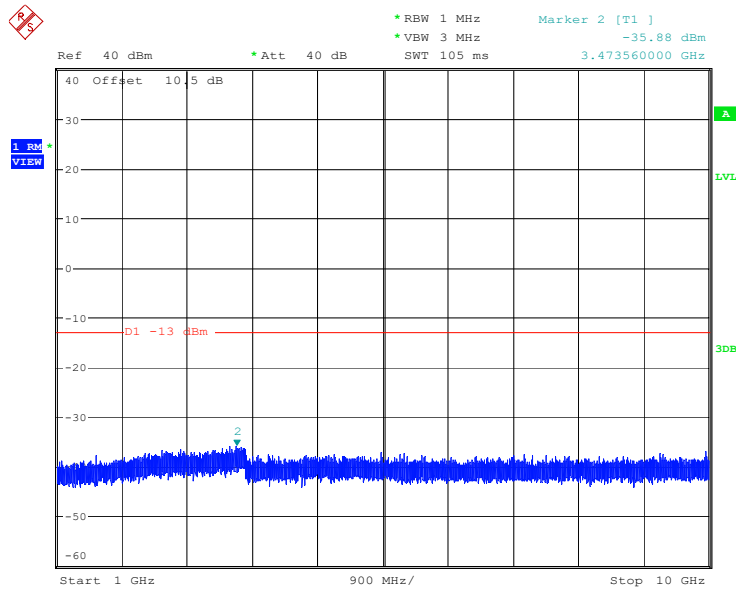
30 MHz – 1GHz (GSM Mode)



ProjectNo.:2401S54552E-RF Tester:Allen Bai

Date: 29.MAY.2024 22:12:20

1 – 10GHz (GSM Mode)

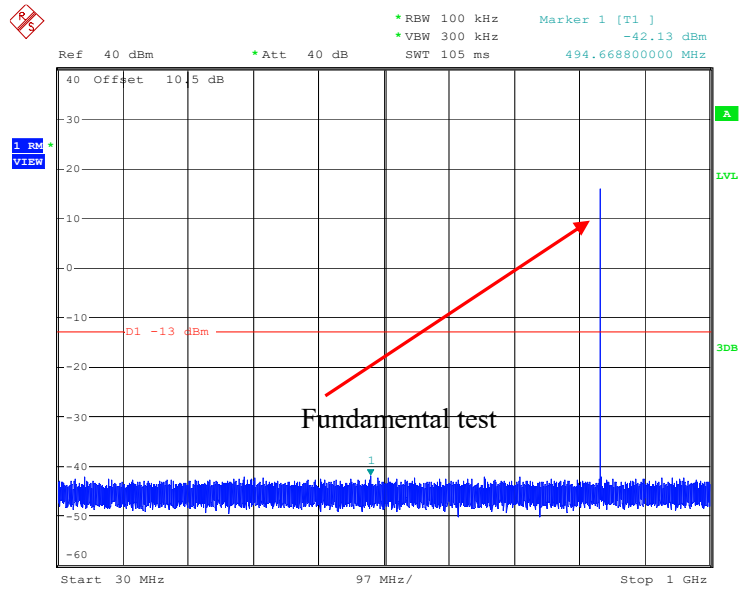


ProjectNo.:2401S54552E-RF Tester:Allen Bai

Date: 29.MAY.2024 22:12:46

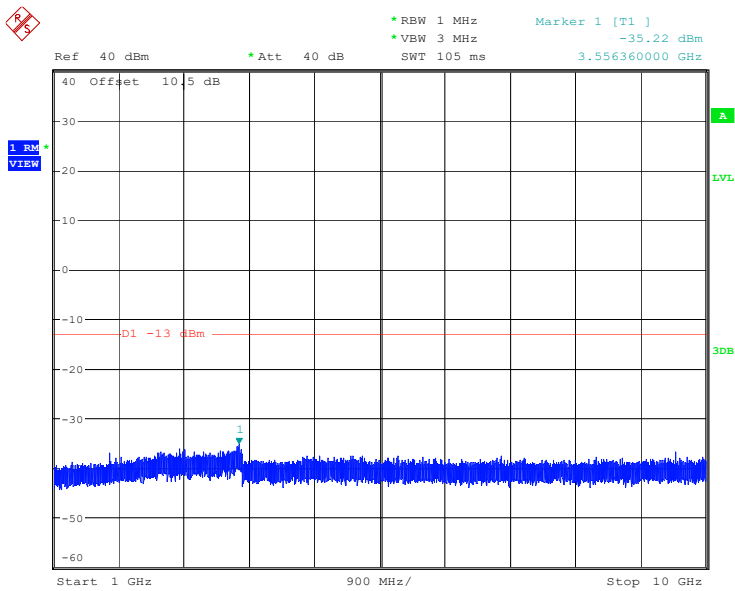
Middle Channel:

30 MHz – 1GHz (GSM Mode)



ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 22:16:55

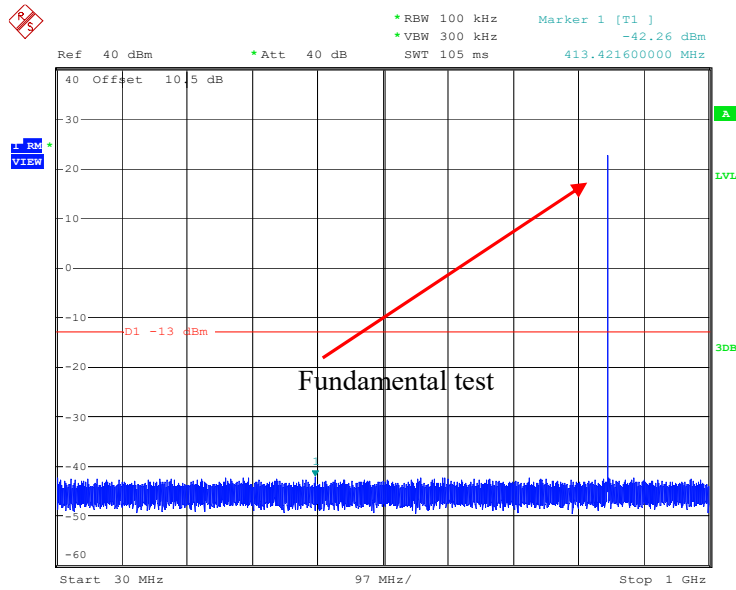
1 – 10GHz (GSM Mode)



ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 22:17:31

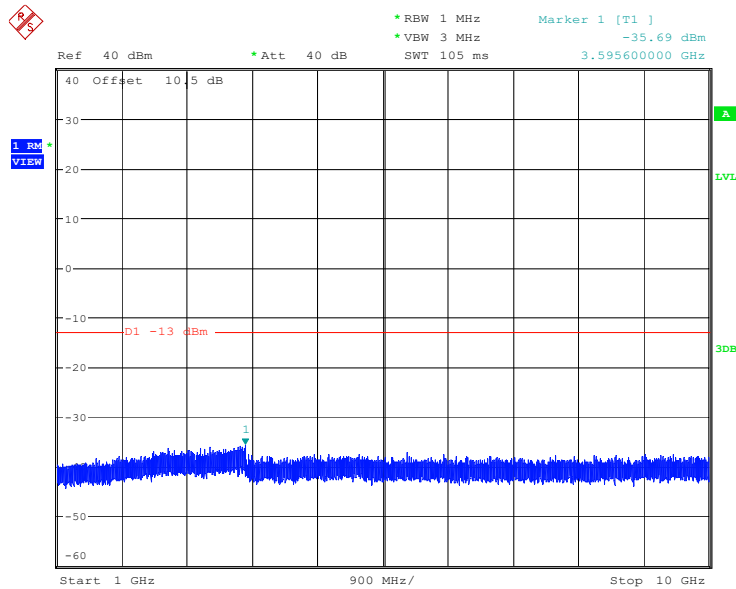
High Channel:

30 MHz – 1GHz (GSM Mode)



ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 22:22:49

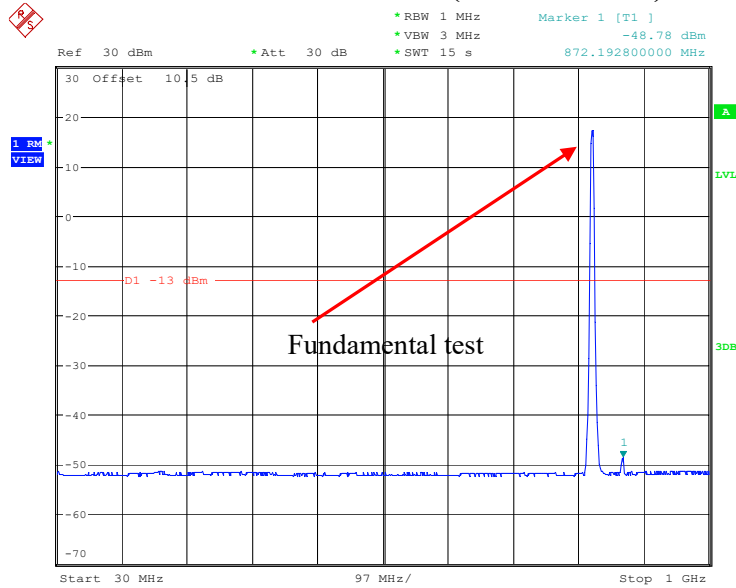
1 – 10GHz (GSM Mode)



ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 22:23:38

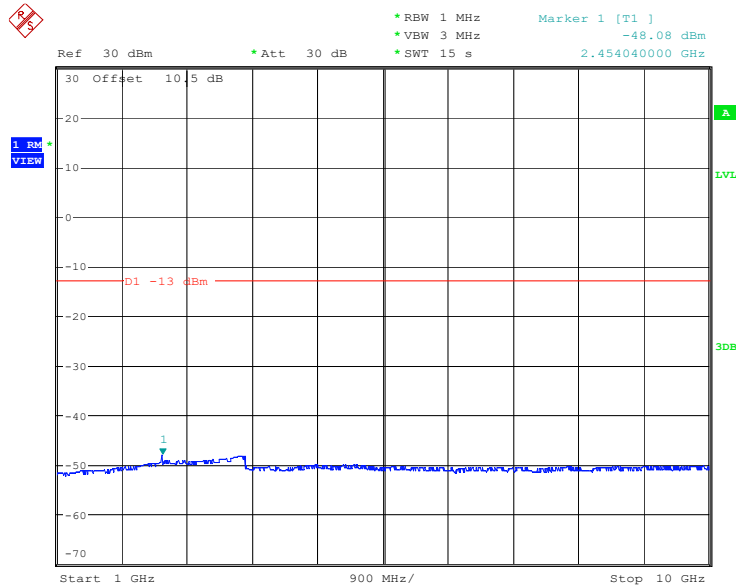
Low Channel:

30 MHz – 1GHz RMC (WCDMA Mode)



ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 01:23:43

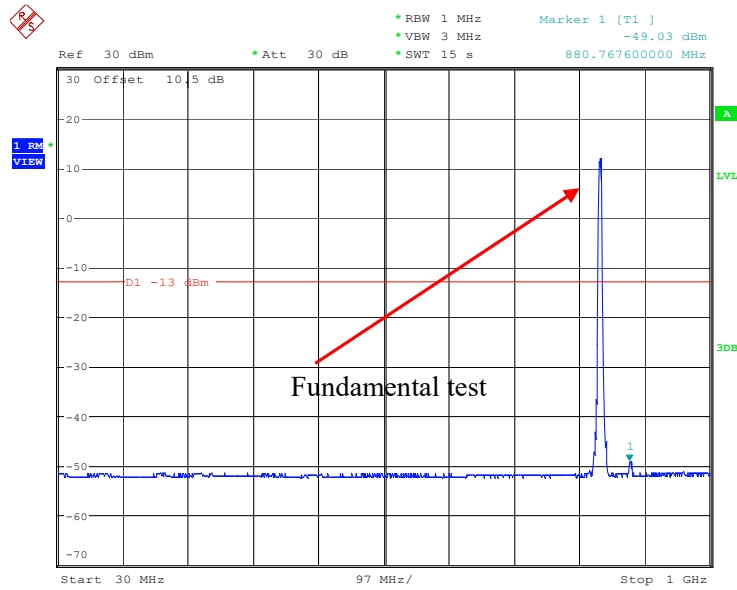
1 – 10GHz RMC (WCDMA Mode)



ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 01:21:48

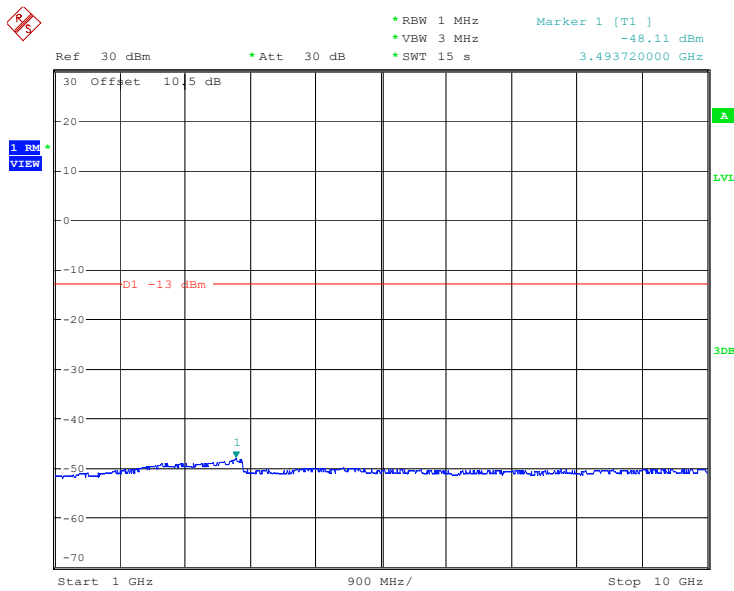
Middle Channel:

30 MHz – 1GHz RMC (WCDMA Mode)



ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 01:59:49

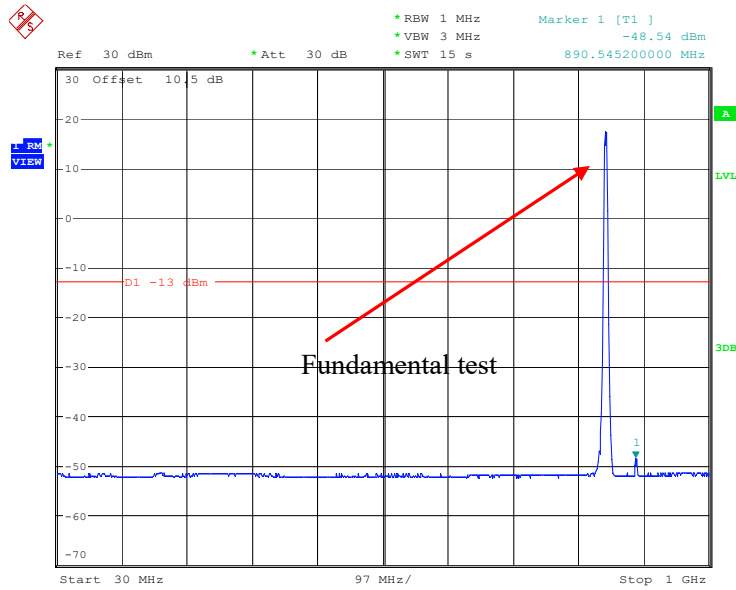
1 – 10GHz RMC (WCDMA Mode)



ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 02:00:31

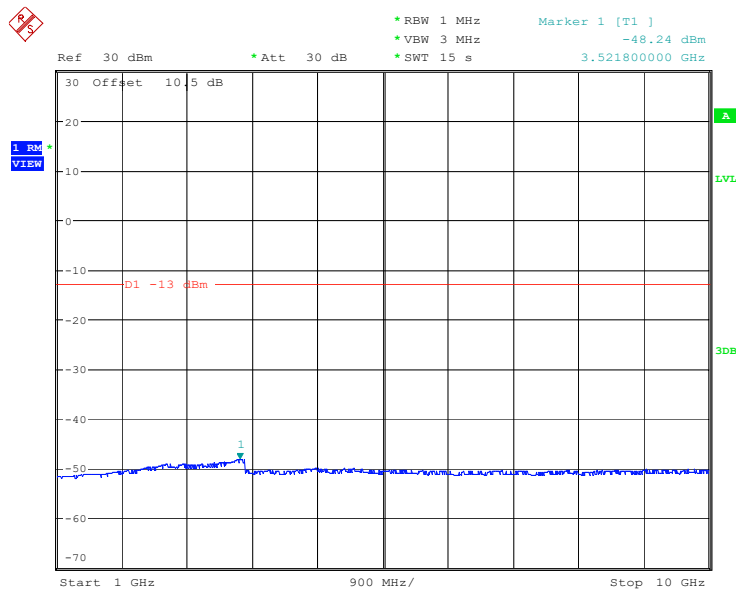
High Channel:

30 MHz – 1GHz RMC (WCDMA Mode)



ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 01:29:18

1 – 10GHz RMC (WCDMA Mode)

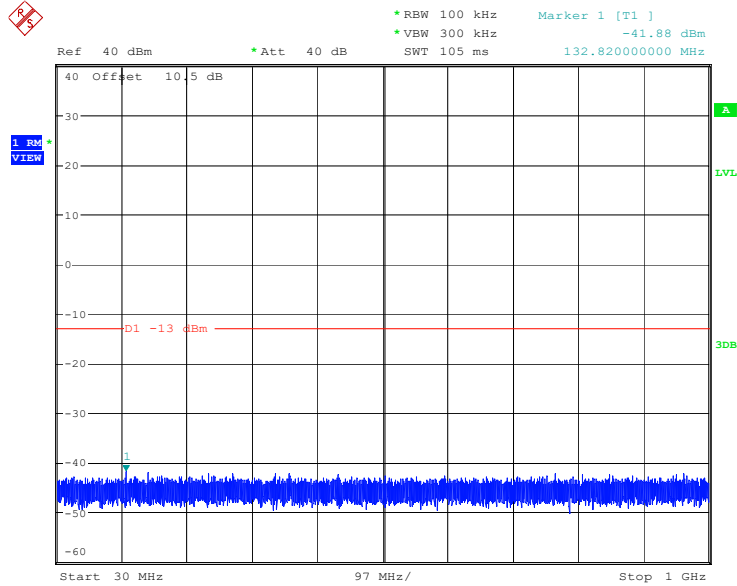


ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 01:29:51

PCS Band

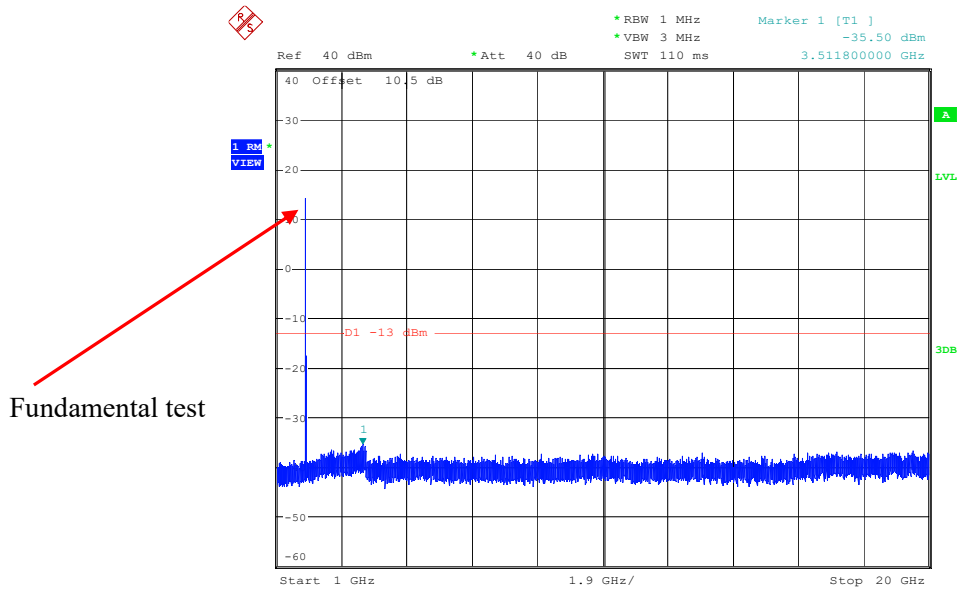
Low Channel:

30 MHz – 1GHz (GSM Mode)



ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 22:04:48

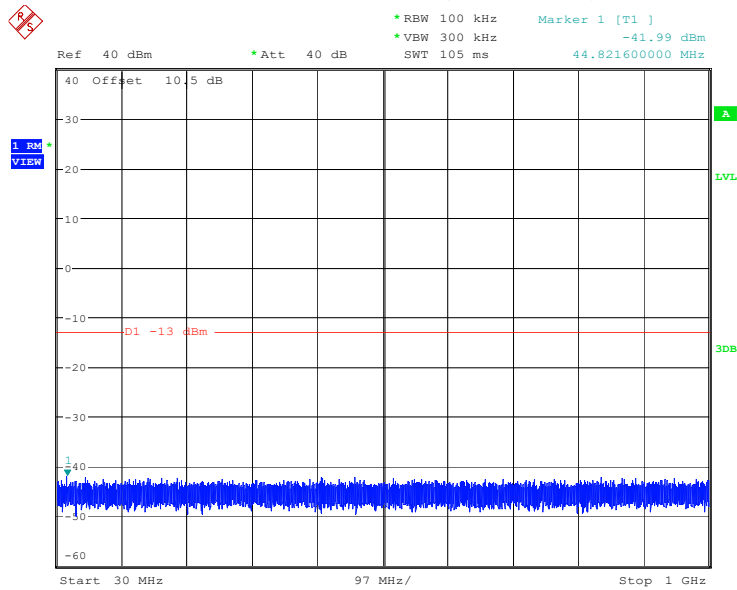
1GHz – 20GHz (GSM Mode)



ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 22:05:20

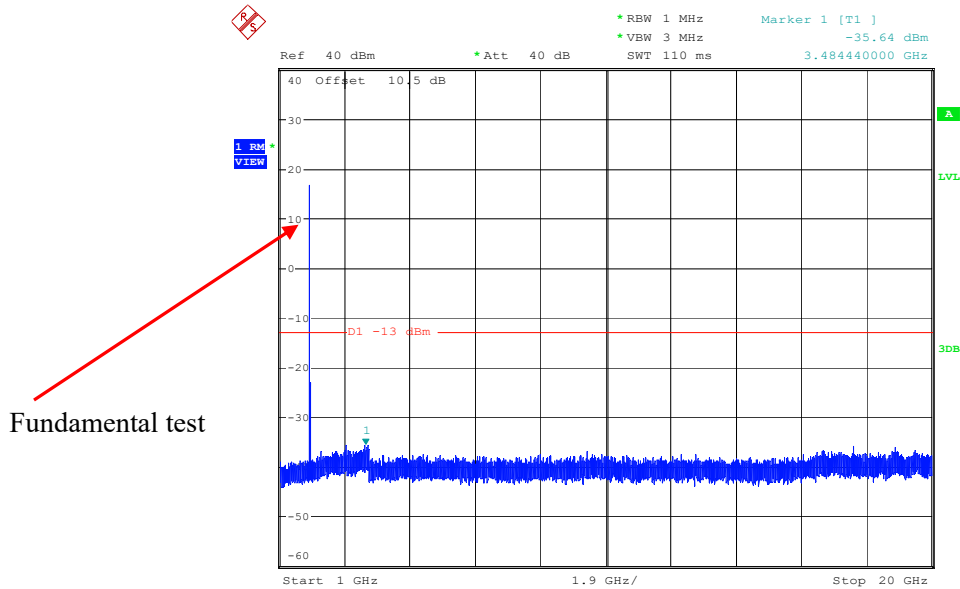
Middle Channel:

30 MHz – 1GHz (GSM Mode)



ProjectNo.:2401S54552E-RF Tester:Allen Bai
 Date: 29.MAY.2024 21:59:31

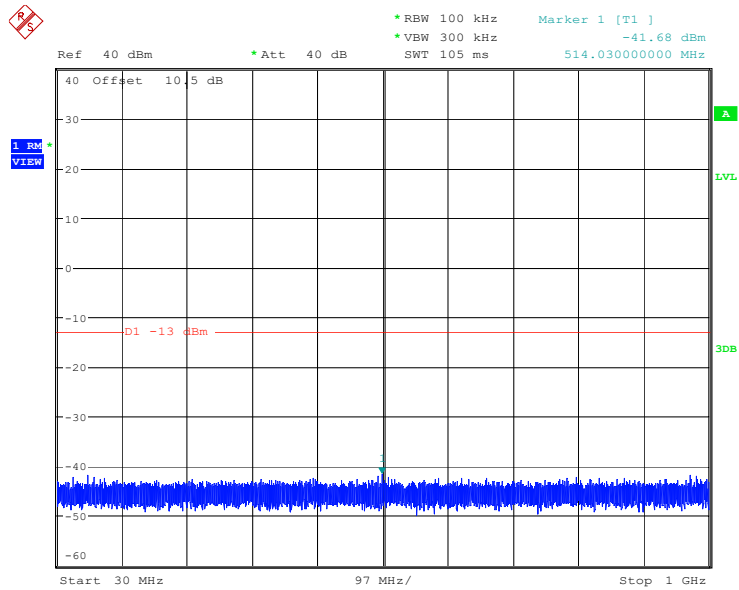
1 GHz – 20GHz (GSM Mode)



ProjectNo.:2401S54552E-RF Tester:Allen Bai
 Date: 29.MAY.2024 22:00:20

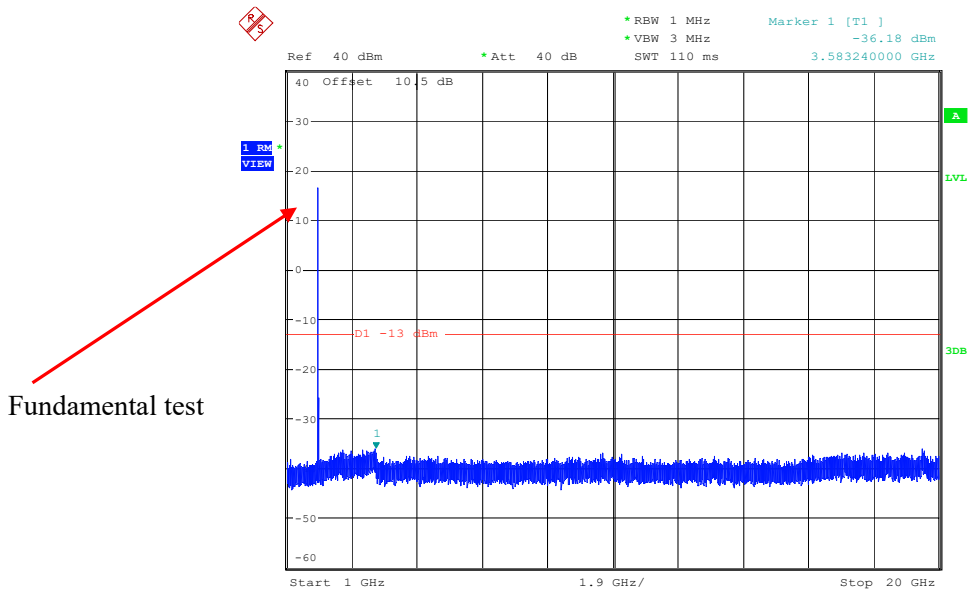
High Channel:

30 MHz – 1GHz (GSM Mode)



ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 21:56:29

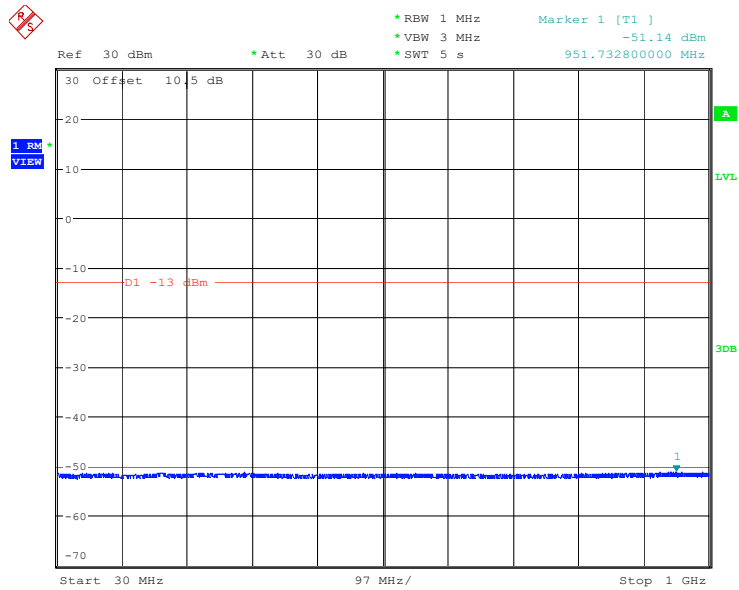
1 GHz – 20GHz (GSM Mode)



ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 21:37:24

Low Channel:

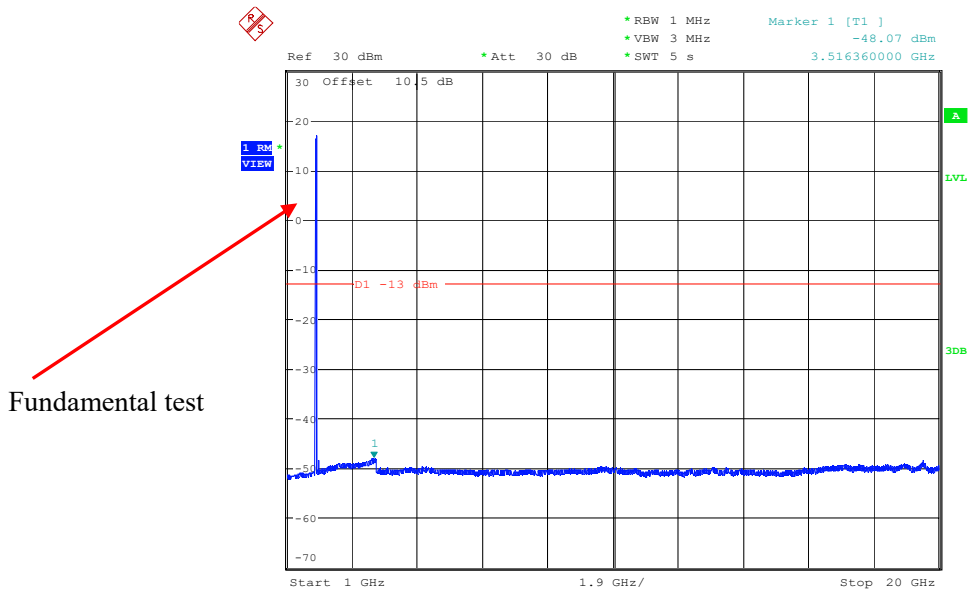
30 MHz – 1GHz (WCDMA Mode)



ProjectNo.:2401S54552E-RF Tester:Allen Bai

Date: 29.MAY.2024 02:24:57

1 GHz – 20GHz (WCDMA Mode)

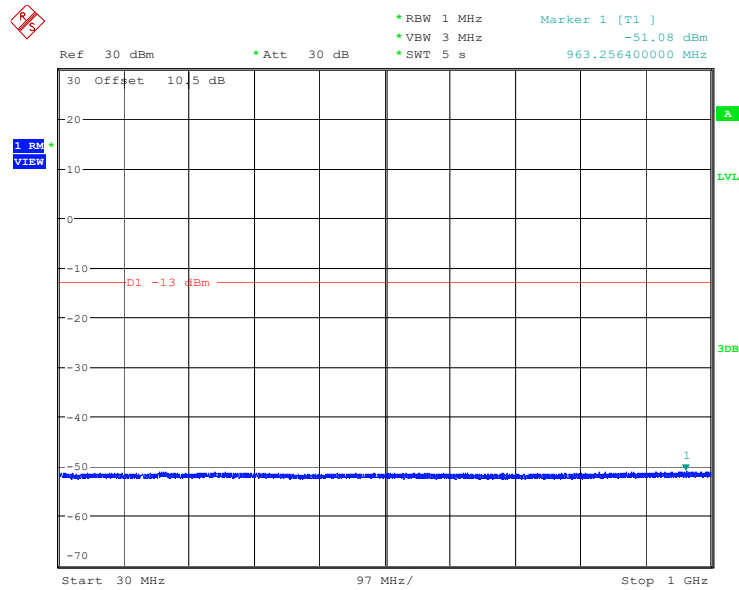


ProjectNo.:2401S54552E-RF Tester:Allen Bai

Date: 29.MAY.2024 02:25:21

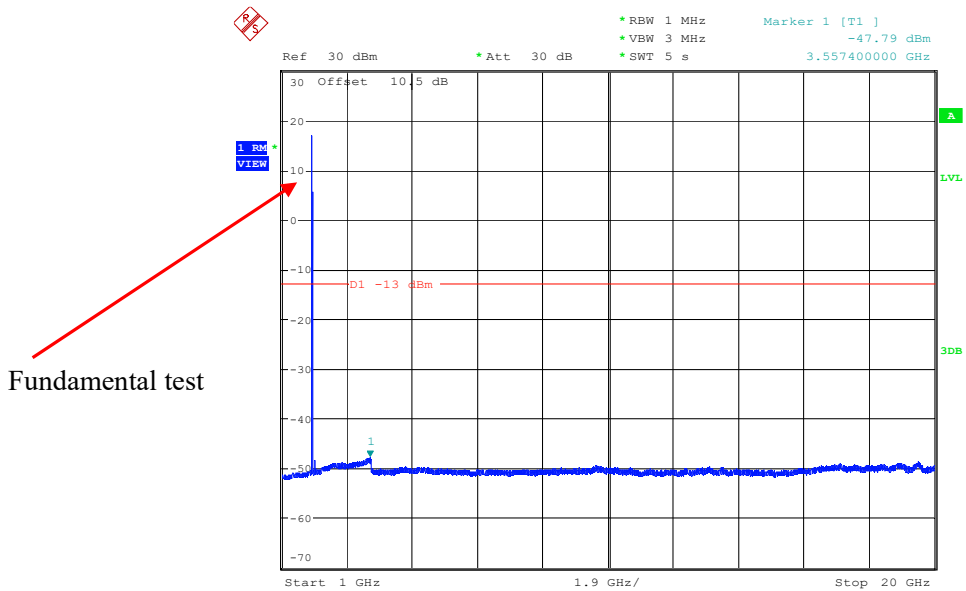
Middle Channel:

30 MHz – 1GHz (WCDMA Mode)



ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 02:27:13

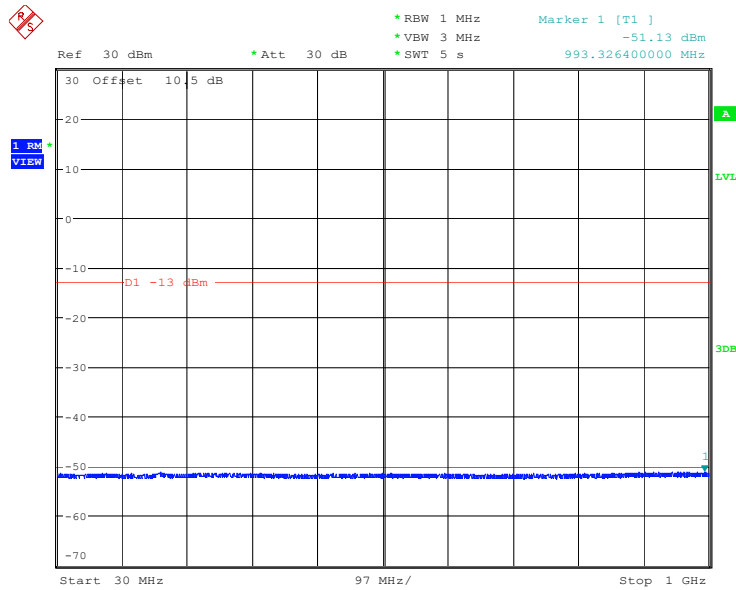
1 GHz – 20GHz (WCDMA Mode)



ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 02:27:32

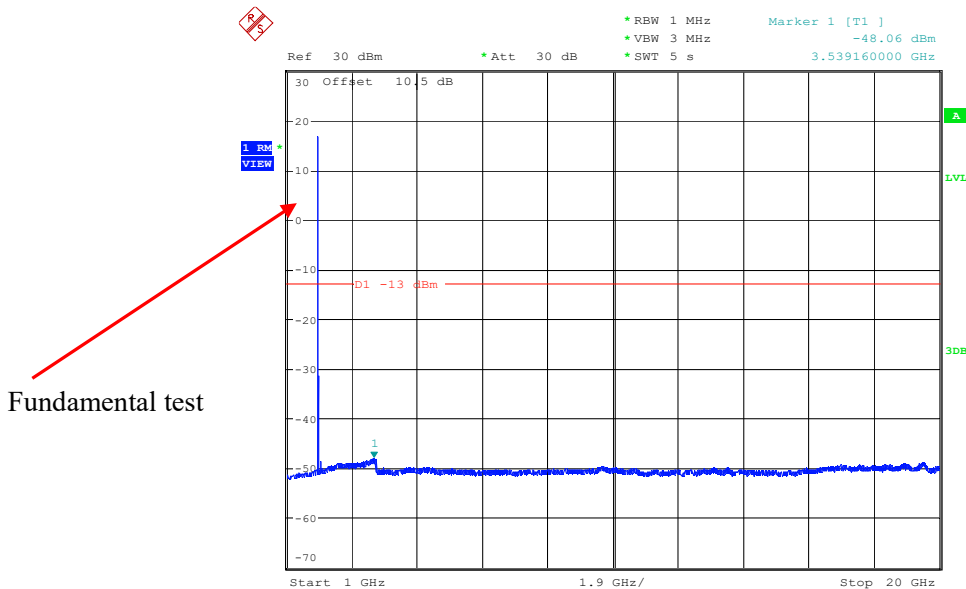
High Channel:

30 MHz – 1GHz (WCDMA Mode)



ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 02:30:06

1GHz – 20GHz (WCDMA Mode)



ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 02:30:32

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:	101 kPa

The testing was performed by Anson Su on 2024-05-29 for below 1GHz and Zenos Qiao from 2024-05-18 to 2024-05-19 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 (30MHz-10GHz)								
Low Channel								
112.1	49.22	H	-65.2	0.75	0.0	-65.95	-13	52.95
84.0	49.17	V	-59.2	0.75	0.0	-59.95	-13	46.95
1648.40	75.57	H	-32.1	0.90	8.60	-24.40	-13	11.40
1648.40	74.14	V	-34.1	0.90	8.60	-26.40	-13	13.40
2472.60	68.98	H	-38.4	1.10	8.80	-30.70	-13	17.70
2472.60	67.45	V	-39.7	1.10	8.80	-32.00	-13	19.00
3296.80	57.61	H	-48.4	1.30	8.80	-40.90	-13	27.90
3296.80	58.32	V	-47.4	1.30	8.80	-39.90	-13	26.90
Middle Channel								
112.1	50.07	H	-64.3	0.75	0.0	-65.05	-13	52.05
84.0	49.86	V	-58.5	0.75	0.0	-59.25	-13	46.25
1673.20	77.36	H	-30.2	0.90	8.60	-22.50	-13	9.50
1673.20	75.85	V	-32.3	0.90	8.60	-24.60	-13	11.60
2509.80	70.43	H	-36.9	1.10	8.80	-29.20	-13	16.20
2509.80	69.12	V	-38.0	1.10	8.80	-30.30	-13	17.30
3346.40	58.54	H	-47.4	1.30	8.80	-39.90	-13	26.90
3346.40	59.27	V	-46.4	1.30	8.80	-38.90	-13	25.90
High Channel								
112.1	50.82	H	-63.6	0.75	0.0	-64.35	-13	51.35
84.0	50.55	V	-57.9	0.75	0.0	-58.65	-13	45.65
1697.60	79.25	H	-28.3	0.90	8.60	-20.60	-13	7.60
1697.60	77.86	V	-30.3	0.90	8.60	-22.60	-13	9.60
2546.40	71.78	H	-35.6	1.10	8.80	-27.90	-13	14.90
2546.40	70.42	V	-36.7	1.10	8.80	-29.00	-13	16.00
3395.20	59.17	H	-46.8	1.30	9.90	-38.20	-13	25.20
3395.20	60.39	V	-45.3	1.30	9.90	-36.70	-13	23.70

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(30MHz-20GHz)								
Low Channel								
112.1	49.73	H	-64.7	0.75	0.0	-65.45	-13	52.45
84.0	49.51	V	-58.9	0.75	0.0	-59.65	-13	46.65
3700.40	49.58	H	-55.8	1.30	11.00	-46.10	-13	33.10
3700.40	50.64	V	-54.6	1.30	11.00	-44.90	-13	31.90
Middle Channel								
112.1	50.34	H	-64.1	0.75	0.0	-64.85	-13	51.85
84.0	50.04	V	-58.4	0.75	0.0	-59.15	-13	46.15
3760.00	50.69	H	-54.4	1.30	10.70	-45.00	-13	32.00
3760.00	51.82	V	-53.2	1.30	10.70	-43.80	-13	30.80
High Channel								
112.1	50.61	H	-63.8	0.75	0.0	-64.55	-13	51.55
84.0	50.39	V	-58.0	0.75	0.0	-58.75	-13	45.75
3819.60	51.75	H	-53.4	1.30	10.70	-44.00	-13	31.00
3819.60	52.94	V	-52.1	1.30	10.70	-42.70	-13	29.70

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 (30MHz-20GHz)								
Low Channel								
112.1	48.66	H	-65.7	0.75	0.0	-66.45	-13	53.45
84.0	48.54	V	-59.9	0.75	0.0	-60.65	-13	47.65
3704.80	48.48	H	-56.9	1.30	11.00	-47.20	-13	34.20
3704.80	49.07	V	-56.2	1.30	11.00	-46.50	-13	33.50
5557.20	46.54	H	-55.9	1.70	10.90	-46.70	-13	33.70
5557.20	46.15	V	-56.4	1.70	10.90	-47.20	-13	34.20
Middle Channel								
112.1	49.39	H	-65.0	0.75	0.0	-65.75	-13	52.75
84.0	49.47	V	-58.9	0.75	0.0	-59.65	-13	46.65
3760.00	49.22	H	-55.9	1.30	10.70	-46.50	-13	33.50
3760.00	49.85	V	-55.2	1.30	10.70	-45.80	-13	32.80
5640.00	47.09	H	-55.3	1.70	10.90	-46.10	-13	33.10
5640.00	46.76	V	-55.8	1.70	10.90	-46.60	-13	33.60
High Channel								
112.1	49.87	H	-64.5	0.75	0.0	-65.25	-13	52.25
84.0	49.98	V	-58.4	0.75	0.0	-59.15	-13	46.15
3815.20	50.45	H	-54.7	1.30	10.70	-45.30	-13	32.30
3815.20	50.96	V	-54.1	1.30	10.70	-44.70	-13	31.70
5722.80	48.24	H	-53.9	1.70	11.10	-44.50	-13	31.50
5722.80	47.67	V	-54.7	1.70	11.10	-45.30	-13	32.30

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 (30MHz-10GHz)								
Low Channel								
112.1	48.95	H	-65.4	0.75	0.0	-66.15	-13	53.15
84.0	48.71	V	-59.7	0.75	0.0	-60.45	-13	47.45
1652.80	53.32	H	-54.2	0.90	8.60	-46.50	-13	33.50
1652.80	52.07	V	-56.1	0.90	8.60	-48.40	-13	35.40
2479.20	47.89	H	-59.5	1.10	8.80	-51.80	-13	38.80
2479.20	47.26	V	-59.9	1.10	8.80	-52.20	-13	39.20
3305.60	46.18	H	-59.8	1.30	8.80	-52.30	-13	39.30
3305.60	45.71	V	-60.0	1.30	8.80	-52.50	-13	39.50
Middle Channel								
112.1	49.61	H	-64.8	0.75	0.0	-65.55	-13	52.55
84.0	49.73	V	-58.7	0.75	0.0	-59.45	-13	46.45
1673.20	54.43	H	-53.1	0.90	8.60	-45.40	-13	32.40
1673.20	53.18	V	-55.0	0.90	8.60	-47.30	-13	34.30
2509.80	48.37	H	-59.0	1.10	8.80	-51.30	-13	38.30
2509.80	47.54	V	-59.6	1.10	8.80	-51.90	-13	38.90
3346.40	46.61	H	-59.4	1.30	8.80	-51.90	-13	38.90
3346.40	46.25	V	-59.4	1.30	8.80	-51.90	-13	38.90
High Channel								
112.1	50.17	H	-64.2	0.75	0.0	-64.95	-13	51.95
84.0	50.21	V	-58.2	0.75	0.0	-58.95	-13	45.95
1693.20	55.57	H	-52.0	0.90	8.60	-44.30	-13	31.30
1693.20	54.36	V	-53.8	0.90	8.60	-46.10	-13	33.10
2539.80	49.45	H	-57.9	1.10	8.80	-50.20	-13	37.20
2539.80	48.68	V	-58.4	1.10	8.80	-50.70	-13	37.70
3386.40	47.24	H	-58.7	1.30	9.90	-50.10	-13	37.10
3386.40	46.73	V	-58.9	1.30	9.90	-50.30	-13	37.30

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)			
Band 2 (30MHz-20GHz)								
Low Channel								
112.1	48.94	H	-65.5	0.75	0.0	-66.25	-13	53.25
84.0	48.67	V	-59.7	0.75	0.0	-60.45	-13	47.45
3701.40	51.79	H	-53.6	1.30	11.00	-43.90	-13	30.90
3701.40	52.56	V	-52.7	1.30	11.00	-43.00	-13	30.00
5552.10	46.64	H	-55.8	1.70	10.90	-46.60	-13	33.60
5552.10	47.21	V	-55.3	1.70	10.90	-46.10	-13	33.10
Middle Channel								
112.1	49.79	H	-64.6	0.75	0.0	-65.35	-13	52.35
84.0	49.71	V	-58.7	0.75	0.0	-59.45	-13	46.45
3760.00	52.65	H	-52.5	1.30	10.70	-43.10	-13	30.10
3760.00	53.12	V	-51.9	1.30	10.70	-42.50	-13	29.50
5640.00	47.08	H	-55.3	1.70	10.90	-46.10	-13	33.10
5640.00	47.87	V	-54.7	1.70	10.90	-45.50	-13	32.50
High Channel								
112.1	50.14	H	-64.3	0.75	0.0	-65.05	-13	52.05
84.0	49.96	V	-58.4	0.75	0.0	-59.15	-13	46.15
3818.60	53.40	H	-51.7	1.30	10.70	-42.30	-13	29.30
3818.60	54.36	V	-50.7	1.30	10.70	-41.30	-13	28.30
5727.90	47.75	H	-54.4	1.70	11.10	-45.00	-13	32.00
5727.90	48.32	V	-54.0	1.70	11.10	-44.60	-13	31.60

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)			
Band 4 (30MHz-20GHz)								
Low Channel								
112.1	49.36	H	-65.0	0.75	0.0	-65.75	-13	52.75
84.0	49.25	V	-59.2	0.75	0.0	-59.95	-13	46.95
3421.40	49.73	H	-56.2	1.30	9.90	-47.60	-13	34.60
3421.40	50.86	V	-54.8	1.30	9.90	-46.20	-13	33.20
5132.10	46.45	H	-56.7	1.50	9.60	-48.60	-13	35.60
5132.10	47.08	V	-55.5	1.50	9.60	-47.40	-13	34.40
Middle Channel								
112.1	49.95	H	-64.4	0.75	0.0	-65.15	-13	52.15
84.0	49.83	V	-58.6	0.75	0.0	-59.35	-13	46.35
3465.00	50.54	H	-55.4	1.30	10.50	-46.20	-13	33.20
3465.00	51.48	V	-54.1	1.30	10.50	-44.90	-13	31.90
5197.50	46.92	H	-56.1	1.60	9.70	-48.00	-13	35.00
5197.50	47.69	V	-55.0	1.60	9.70	-46.90	-13	33.90
High Channel								
112.1	50.26	H	-64.1	0.75	0.0	-64.85	-13	51.85
84.0	50.14	V	-58.3	0.75	0.0	-59.05	-13	46.05
3508.60	51.95	H	-54.0	1.30	10.50	-44.80	-13	31.80
3508.60	52.88	V	-52.7	1.30	10.50	-43.50	-13	30.50
5262.90	47.47	H	-55.4	1.60	10.00	-47.00	-13	34.00
5262.90	48.14	V	-54.6	1.60	10.00	-46.20	-13	33.20

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)			
Band 7 (30MHz-26.5GHz)								
Low Channel								
112.1	48.48	H	-65.9	0.75	0.0	-66.65	-25	41.65
84.0	48.61	V	-59.8	0.75	0.0	-60.55	-25	35.55
5005.00	48.42	H	-54.9	1.50	9.80	-46.60	-25	21.60
5005.00	49.39	V	-53.2	1.50	9.80	-44.90	-25	19.90
7507.50	47.03	H	-48.9	1.90	10.80	-40.00	-25	15.00
7507.50	47.64	V	-48.7	1.90	10.80	-39.80	-25	14.80
Middle Channel								
112.1	49.28	H	-65.1	0.75	0.0	-65.85	-25	40.85
84.0	49.33	V	-59.1	0.75	0.0	-59.85	-25	34.85
5070.00	49.06	H	-54.1	1.50	9.60	-46.00	-25	21.00
5070.00	49.91	V	-52.7	1.50	9.60	-44.60	-25	19.60
7605.00	47.55	H	-48.3	1.90	11.00	-39.20	-25	14.20
7605.00	48.17	V	-48.1	1.90	11.00	-39.00	-25	14.00
High Channel								
112.1	49.91	H	-64.5	0.75	0.0	-65.25	-25	40.25
84.0	50.05	V	-58.4	0.75	0.0	-59.15	-25	34.15
5135.00	50.14	H	-53.0	1.50	9.60	-44.90	-25	19.90
5135.00	50.87	V	-51.7	1.50	9.60	-43.60	-25	18.60
7702.50	48.32	H	-47.5	1.90	10.90	-38.50	-25	13.50
7702.50	48.98	V	-47.2	1.90	10.90	-38.20	-25	13.20

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(30MHz-26.5GHz)								
Low Channel								
112.1	48.62	H	-65.8	0.75	0.0	-66.55	-25	41.55
84.0	48.86	V	-59.5	0.75	0.0	-60.25	-25	35.25
5145.00	49.26	H	-53.9	1.50	9.60	-45.80	-25	20.80
5145.00	49.97	V	-52.6	1.50	9.60	-44.50	-25	19.50
7717.50	47.18	H	-48.6	1.90	10.90	-39.60	-25	14.60
7717.50	47.72	V	-48.4	1.90	10.90	-39.40	-25	14.40
Middle Channel								
112.1	49.74	H	-64.7	0.75	0.0	-65.45	-25	40.45
84.0	49.87	V	-58.5	0.75	0.0	-59.25	-25	34.25
5190.00	49.81	H	-53.2	1.60	9.70	-45.10	-25	20.10
5190.00	50.64	V	-52.0	1.60	9.70	-43.90	-25	18.90
7785.00	47.53	H	-48.2	1.90	11.10	-39.00	-25	14.00
7785.00	48.25	V	-47.8	1.90	11.10	-38.60	-25	13.60
High Channel								
112.1	50.07	H	-64.3	0.75	0.0	-65.05	-25	40.05
84.0	50.31	V	-58.1	0.75	0.0	-58.85	-25	33.85
5235.00	50.59	H	-52.5	1.60	9.70	-44.40	-25	19.40
5235.00	51.37	V	-51.3	1.60	9.70	-43.20	-25	18.20
7852.50	48.21	H	-47.4	1.90	11.10	-38.20	-25	13.20
7852.50	48.78	V	-47.2	1.90	11.10	-38.00	-25	13.00

Note:

Absolute Level = Reading Level + Substituted Factor

Substituted Factor contains: SG 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.

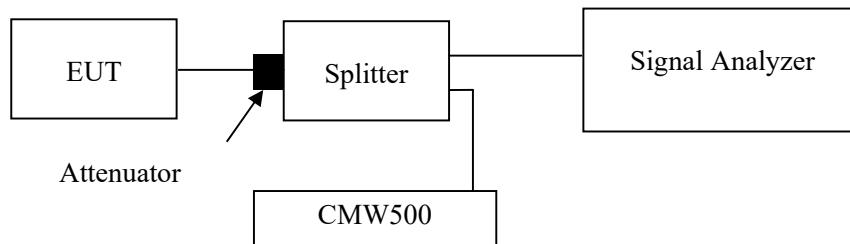
According to FCC §27.53 (m), For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log(P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log(P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel 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:	23~24 °C
Relative Humidity:	42~43 %
ATM Pressure:	100 kPa

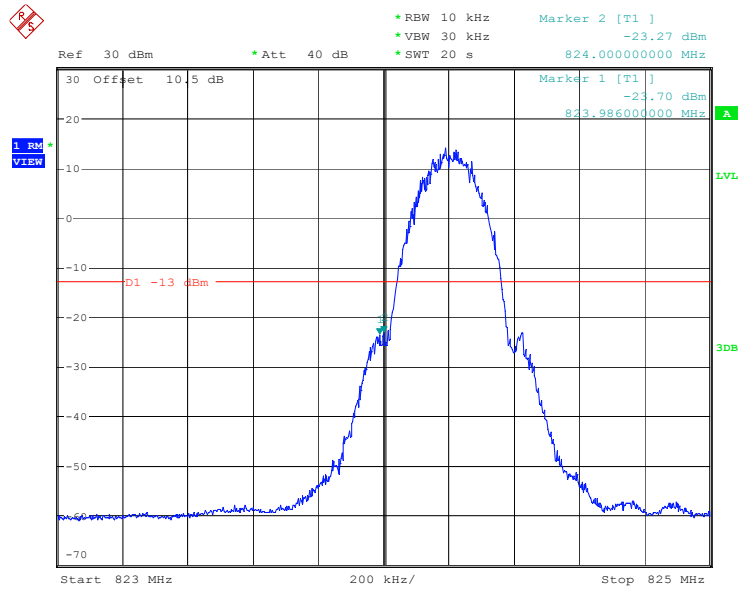
The testing was performed by Allen Bai from 2024-05-28 to 2024-05-30.

EUT operation mode: Transmitting (Worst case)

Test Result: Compliant

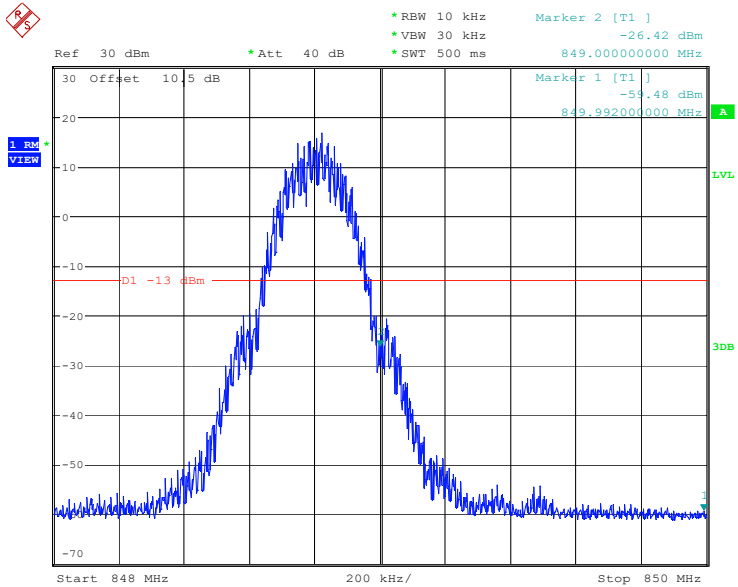
Please refer to the following plots.

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



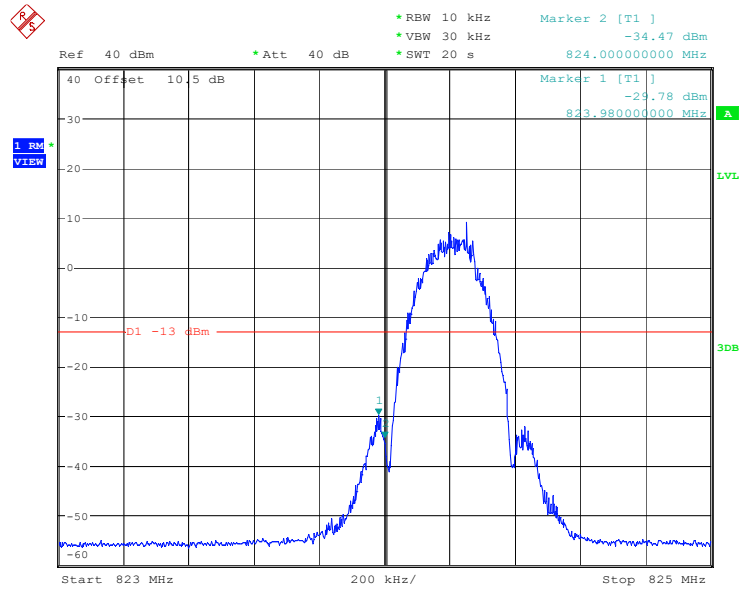
ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 22:11:23

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



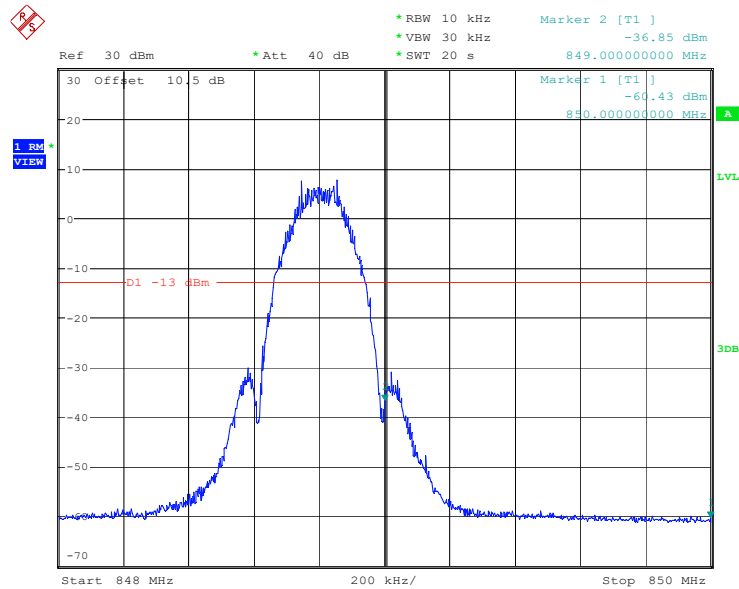
ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 22:30:05

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



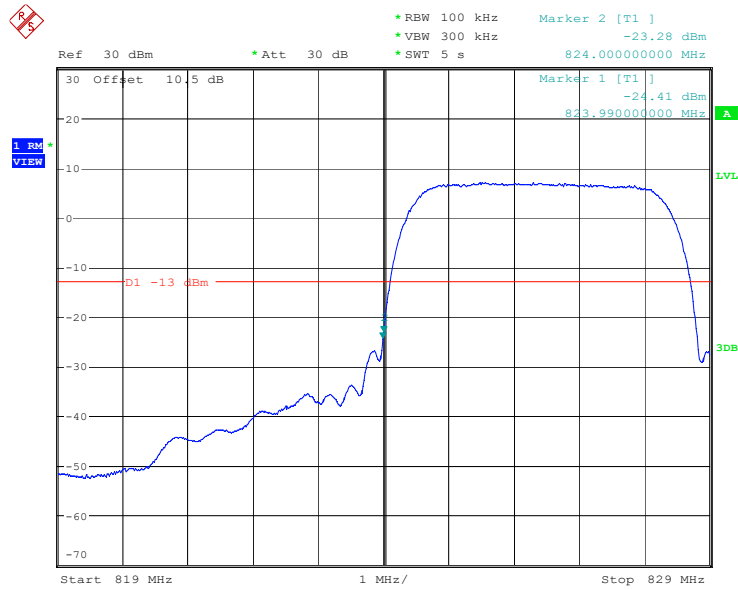
ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 20:54:59

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



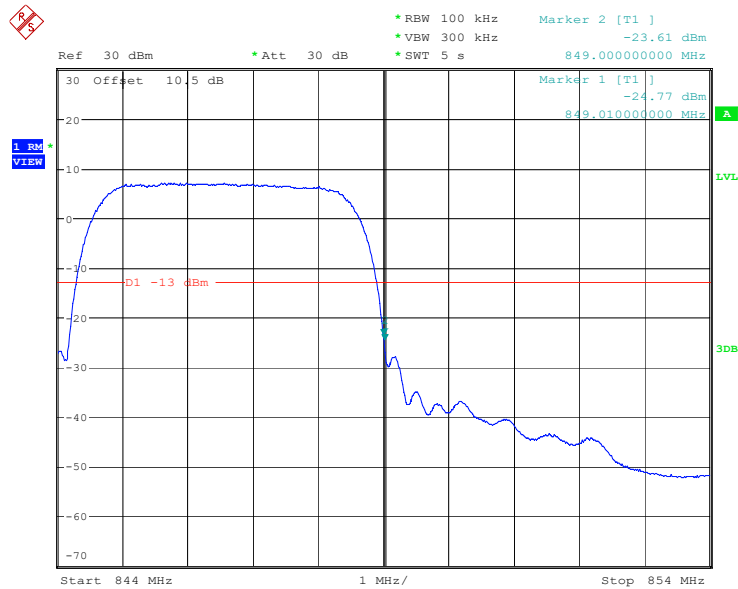
ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 20:52:58

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



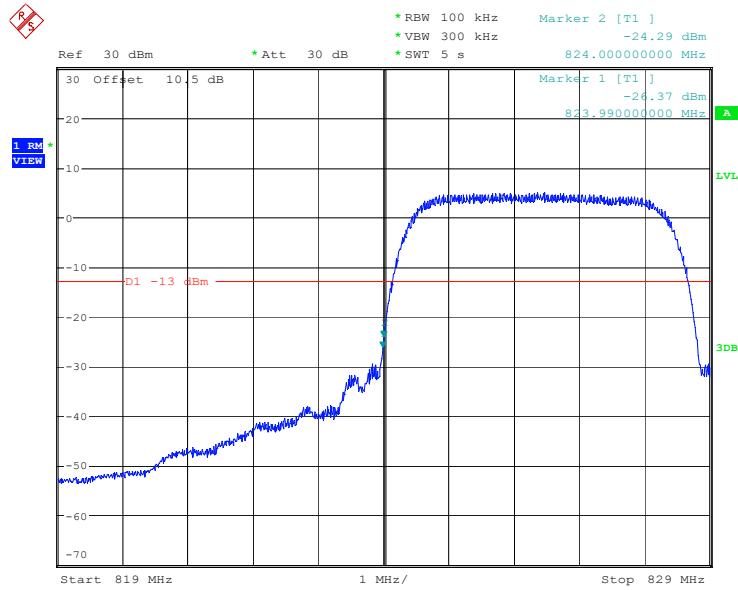
ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 01:20:33

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



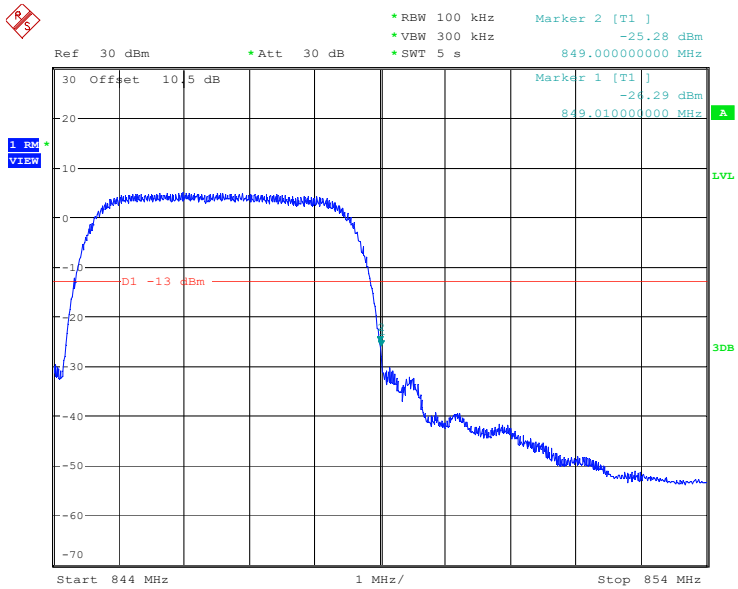
ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 01:28:32

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



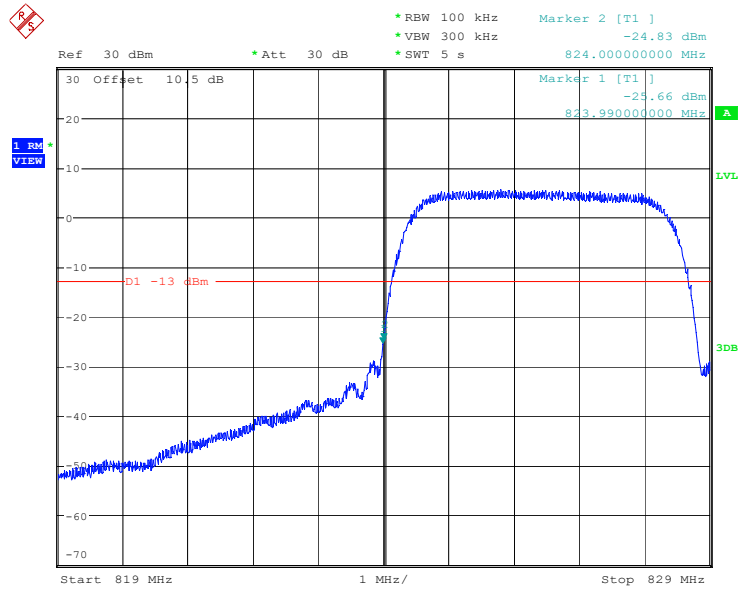
ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 01:34:18

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



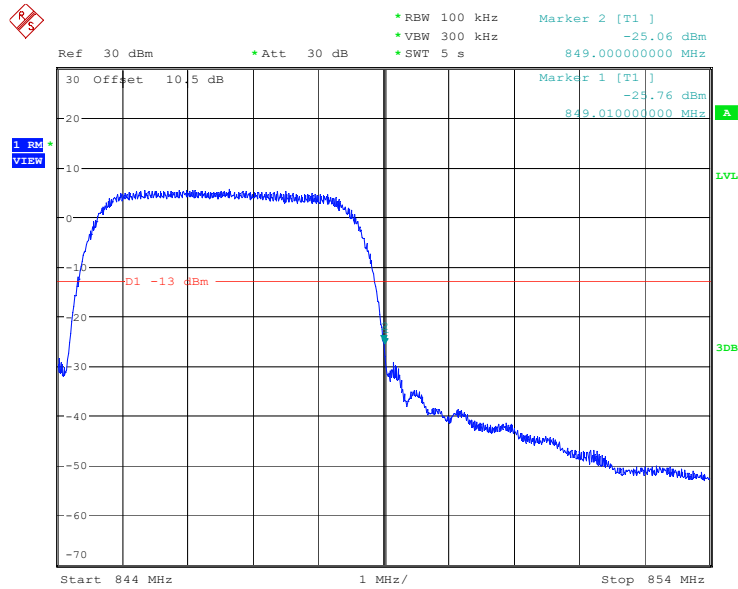
ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 01:54:21

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



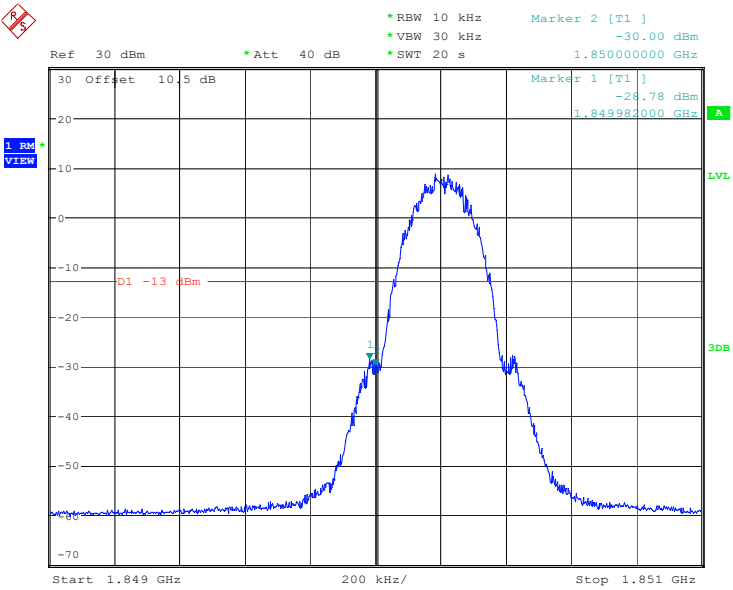
ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 02:19:37

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



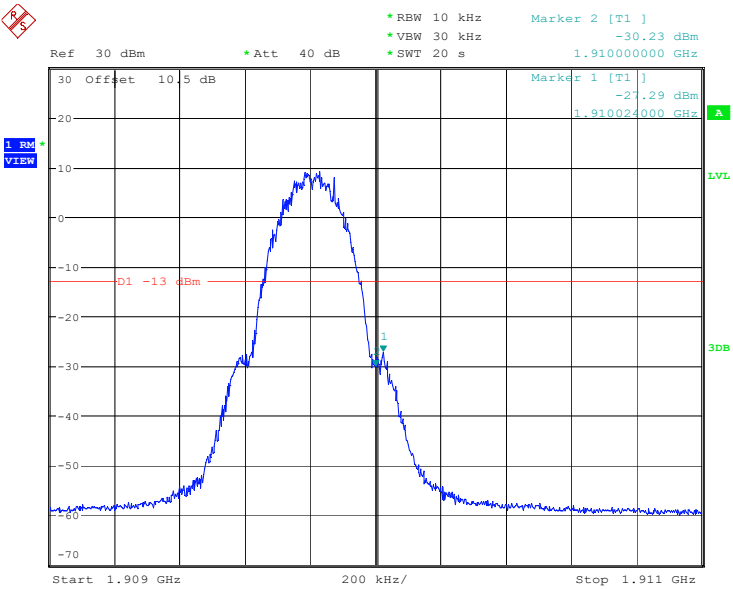
ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 02:09:00

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



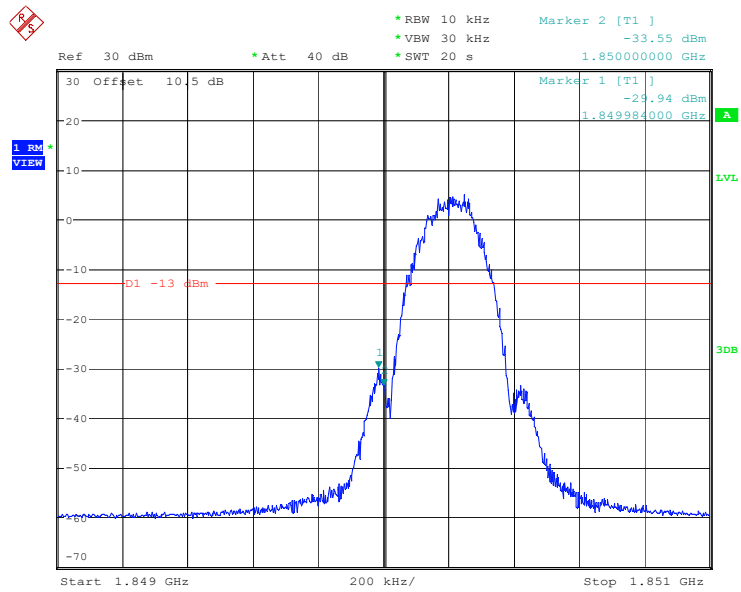
ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 22:03:38

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



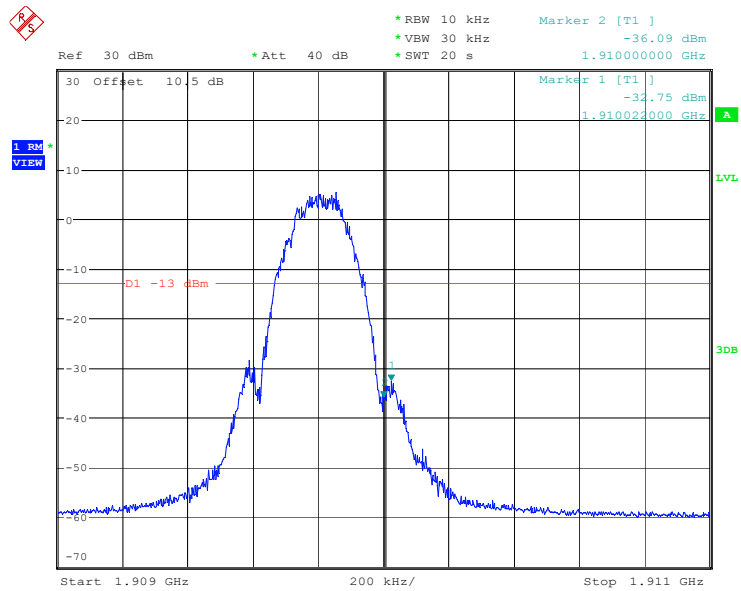
ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 21:36:32

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



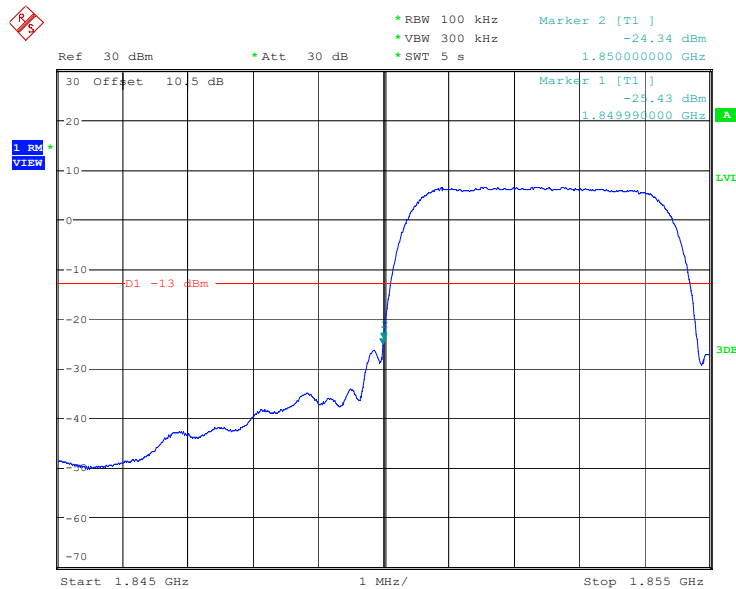
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Date: 29.MAY.2024 20:32:08

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



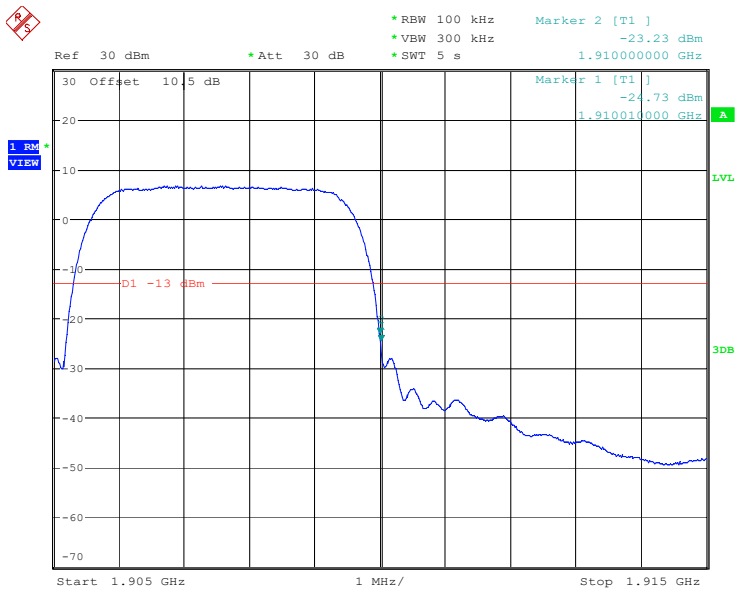
ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 20:23:15

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



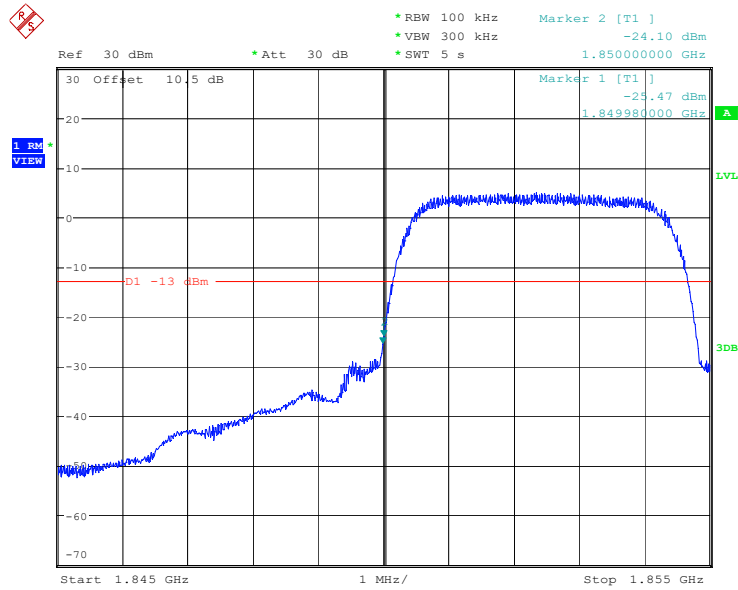
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Date: 29.MAY.2024 02:24:31

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



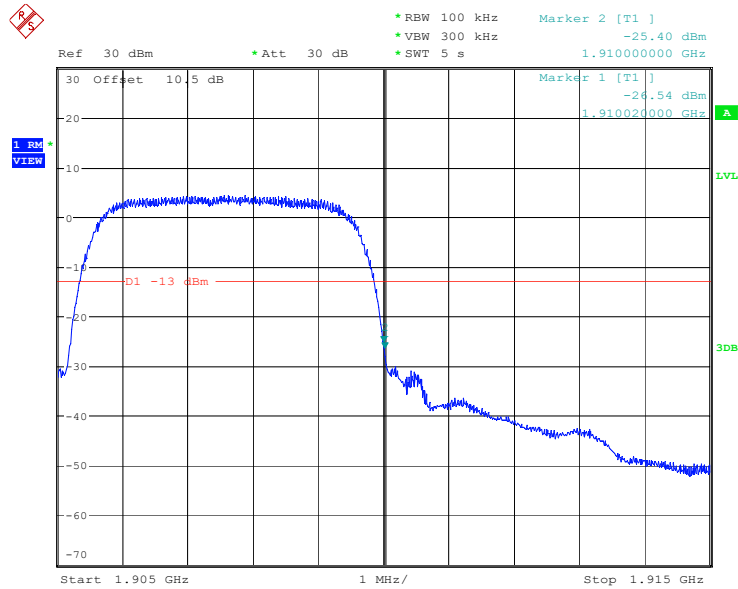
ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 02:29:38

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



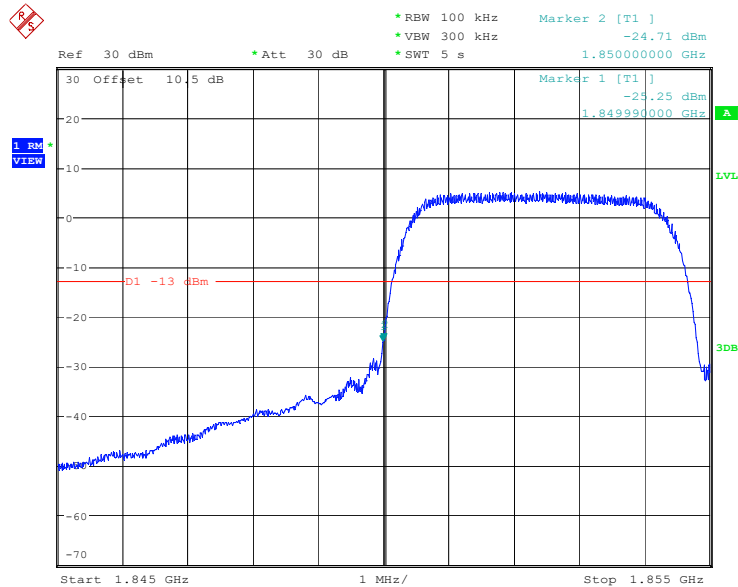
ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 02:39:45

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



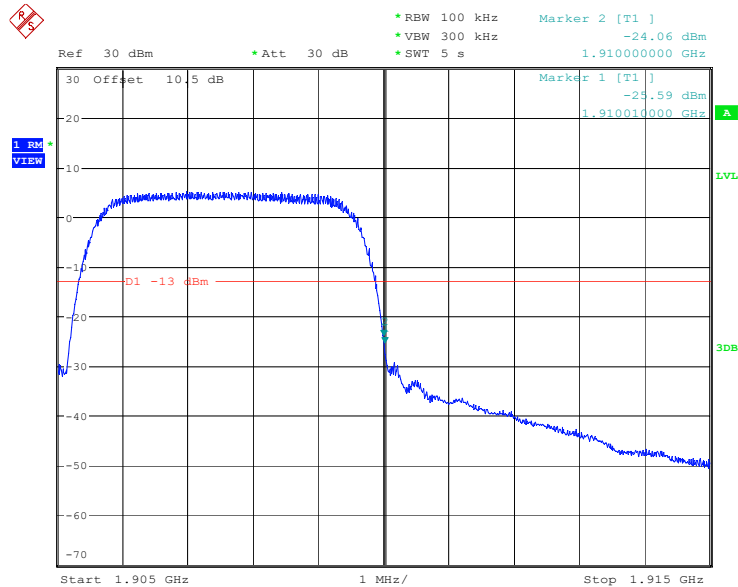
ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 02:33:46

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



ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 02:43:02

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



ProjectNo.:2401S54552E-RF Tester:Allen Bai
Date: 29.MAY.2024 02:49:03

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.

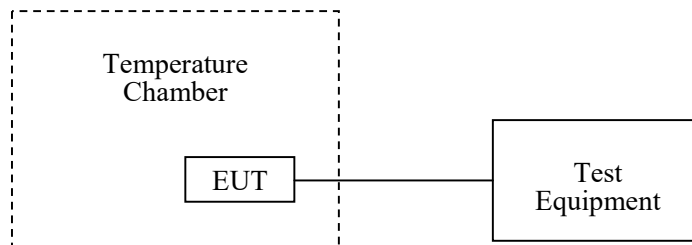
Test Procedure

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:	23~24 °C
Relative Humidity:	42~43 %
ATM Pressure:	100 kPa

The testing was performed by Allen Bai from 2024-05-26 to 2024-05-30.

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 (°C)	Voltage (V _{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	7.6	6.26	0.007	2.5
	-20	7.6	7.09	0.008	2.5
	-10	7.6	12.83	0.015	2.5
	0	7.6	10.64	0.013	2.5
	10	7.6	3.78	0.005	2.5
	20	7.6	9.98	0.012	2.5
	30	7.6	7.26	0.009	2.5
	40	7.6	11.49	0.014	2.5
	50	7.6	3.74	0.004	2.5
Frequency Stability vs. Voltage	20	6.46	1.24	0.001	2.5
	20	8.7	11.62	0.014	2.5

Test Modulation:	8PSK		Test Channel:	836.6	MHz
Test Item	Temperature (°C)	Voltage (V _{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	7.6	8.72	0.010	2.5
	-20	7.6	11.33	0.014	2.5
	-10	7.6	6.01	0.007	2.5
	0	7.6	10.42	0.012	2.5
	10	7.6	5.66	0.007	2.5
	20	7.6	17.27	0.021	2.5
	30	7.6	1.73	0.002	2.5
	40	7.6	12.37	0.015	2.5
	50	7.6	9.52	0.011	2.5
Frequency Stability vs. Voltage	20	6.46	6.41	0.008	2.5
	20	8.7	8.03	0.010	2.5

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	7.6	9.34	0.011	2.5
	-20	7.6	11.36	0.014	2.5
	-10	7.6	7.37	0.009	2.5
	0	7.6	5.47	0.007	2.5
	10	7.6	4.51	0.005	2.5
	20	7.6	6.25	0.007	2.5
	30	7.6	7.17	0.009	2.5
	40	7.6	6.15	0.007	2.5
	50	7.6	5.13	0.006	2.5
Frequency Stability vs. Voltage	20	6.46	7.72	0.009	2.5
	20	8.7	3.66	0.004	2.5

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

Test Mode:	GMSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DE})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	7.6	1850.641	1850.000	1909.461	1910.000
	-20	7.6	1850.457	1850.000	1909.135	1910.000
	-10	7.6	1850.136	1850.000	1909.741	1910.000
	0	7.6	1850.843	1850.000	1909.194	1910.000
	10	7.6	1850.105	1850.000	1909.343	1910.000
	20	7.6	1850.842	1850.000	1909.648	1910.000
	30	7.6	1850.015	1850.000	1909.219	1910.000
	40	7.6	1850.437	1850.000	1909.248	1910.000
	50	7.6	1850.864	1850.000	1909.463	1910.000
Frequency Stability vs. Voltage	20	6.46	1850.423	1850.000	1909.487	1910.000
	20	8.7	1850.743	1850.000	1909.149	1910.000

Test Mode:	8PSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DE})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	7.6	1850.264	1850.000	1909.351	1910.000
	-20	7.6	1850.456	1850.000	1909.564	1910.000
	-10	7.6	1850.466	1850.000	1909.741	1910.000
	0	7.6	1850.753	1850.000	1909.317	1910.000
	10	7.6	1850.698	1850.000	1909.452	1910.000
	20	7.6	1850.458	1850.000	1909.674	1910.000
	30	7.6	1850.134	1850.000	1909.466	1910.000
	40	7.6	1850.684	1850.000	1909.854	1910.000
	50	7.6	1850.626	1850.000	1909.364	1910.000
Frequency Stability vs. Voltage	20	6.46	1850.578	1850.000	1909.219	1910.000
	20	8.7	1850.254	1850.000	1909.087	1910.000

WCDMA Mode

Test Mode:	WCDMA R99	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DE})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	7.6	1850.357	1850.000	1909.136	1910.000
	-20	7.6	1850.643	1850.000	1909.456	1910.000
	-10	7.6	1850.316	1850.000	1909.478	1910.000
	0	7.6	1850.946	1850.000	1909.634	1910.000
	10	7.6	1850.745	1850.000	1909.482	1910.000
	20	7.6	1850.452	1850.000	1909.422	1910.000
	30	7.6	1850.154	1850.000	1909.451	1910.000
	40	7.6	1850.523	1850.000	1909.216	1910.000
	50	7.6	1850.155	1850.000	1909.842	1910.000
Frequency Stability vs. Voltage	20	6.46	1850.466	1850.000	1909.155	1910.000
	20	8.7	1850.649	1850.000	1909.684	1910.000

LTE Band 2**QPSK:**

Test Mode:	20M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DE})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	7.6	1850.655	1850.000	1909.827	1910.000
	-20	7.6	1850.748	1850.000	1909.546	1910.000
	-10	7.6	1850.590	1850.000	1909.714	1910.000
	0	7.6	1850.377	1850.000	1909.052	1910.000
	10	7.6	1850.203	1850.000	1909.291	1910.000
	20	7.6	1850.048	1850.000	1909.609	1910.000
	30	7.6	1850.550	1850.000	1909.421	1910.000
	40	7.6	1850.695	1850.000	1909.915	1910.000
	50	7.6	1850.005	1850.000	1909.532	1910.000
Frequency Stability vs. Voltage	20	6.46	1850.084	1850.000	1909.149	1910.000
	20	8.7	1850.820	1850.000	1909.382	1910.000

16QAM:

Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DE})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	7.6	1850.738	1850.000	1909.822	1910.000
	-20	7.6	1850.846	1850.000	1909.113	1910.000
	-10	7.6	1850.981	1850.000	1909.069	1910.000
	0	7.6	1850.749	1850.000	1909.980	1910.000
	10	7.6	1850.201	1850.000	1909.764	1910.000
	20	7.6	1850.905	1850.000	1909.342	1910.000
	30	7.6	1850.159	1850.000	1909.390	1910.000
	40	7.6	1850.711	1850.000	1909.467	1910.000
	50	7.6	1850.319	1850.000	1909.093	1910.000
Frequency Stability vs. Voltage	20	6.46	1850.442	1850.000	1909.148	1910.000
	20	8.7	1850.896	1850.000	1909.723	1910.000

LTE Band 4**QPSK:**

Test Mode:	20M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DE})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	7.6	1710.257	1710.00	1754.452	1755
	-20	7.6	1710.385	1710.00	1754.124	1755
	-10	7.6	1710.611	1710.00	1754.587	1755
	0	7.6	1710.348	1710.00	1754.634	1755
	10	7.6	1710.405	1710.00	1754.452	1755
	20	7.6	1710.760	1710.00	1754.147	1755
	30	7.6	1710.425	1710.00	1754.428	1755
	40	7.6	1710.157	1710.00	1754.451	1755
	50	7.6	1710.485	1710.00	1754.425	1755
Frequency Stability vs. Voltage	20	6.46	1710.165	1710.00	1754.423	1755
	20	8.7	1710.145	1710.00	1754.455	1755

16QAM:

Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DE})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	7.6	1710.257	1710.00	1754.842	1755
	-20	7.6	1710.145	1710.00	1754.756	1755
	-10	7.6	1710.485	1710.00	1754.485	1755
	0	7.6	1710.624	1710.00	1754.458	1755
	10	7.6	1710.456	1710.00	1754.465	1755
	20	7.6	1710.374	1710.00	1754.846	1755
	30	7.6	1710.964	1710.00	1754.768	1755
	40	7.6	1710.871	1710.00	1754.843	1755
	50	7.6	1710.124	1710.00	1754.698	1755
Frequency Stability vs. Voltage	20	6.46	1710.487	1710.00	1754.345	1755
	20	8.7	1710.642	1710.00	1754.674	1755

LTE Band 7**QPSK:**

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	7.6	2500.642	2500.00	2569.451	2570
	-20	7.6	2500.346	2500.00	2569.758	2570
	-10	7.6	2500.672	2500.00	2569.682	2570
	0	7.6	2500.124	2500.00	2569.367	2570
	10	7.6	2500.587	2500.00	2569.250	2570
	20	7.6	2500.164	2500.00	2569.168	2570
	30	7.6	2500.753	2500.00	2569.234	2570
	40	7.6	2500.124	2500.00	2569.142	2570
	50	7.6	2500.345	2500.00	2569.346	2570
Frequency Stability vs. Voltage	20	6.46	2500.842	2500.00	2569.668	2570
	20	8.7	2500.124	2500.00	2569.742	2570

16QAM:

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	7.6	2500.245	2500.00	2569.627	2570
	-20	7.6	2500.864	2500.00	2569.212	2570
	-10	7.6	2500.157	2500.00	2569.247	2570
	0	7.6	2500.246	2500.00	2569.146	2570
	10	7.6	2500.986	2500.00	2569.842	2570
	20	7.6	2500.766	2500.00	2569.769	2570
	30	7.6	2500.059	2500.00	2569.415	2570
	40	7.6	2500.840	2500.00	2569.455	2570
	50	7.6	2500.557	2500.00	2569.843	2570
Frequency Stability vs. Voltage	20	6.46	2500.608	2500.00	2569.846	2570
	20	8.7	2500.524	2500.00	2569.486	2570

LTE Band 38**QPSK:**

Test Mode:	20M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DE})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	7.6	2570.265	2570.00	2619.452	2620
	-20	7.6	2570.806	2570.00	2619.433	2620
	-10	7.6	2570.405	2570.00	2619.452	2620
	0	7.6	2570.231	2570.00	2619.134	2620
	10	7.6	2570.674	2570.00	2619.809	2620
	20	7.6	2570.840	2570.00	2619.238	2620
	30	7.6	2570.054	2570.00	2619.387	2620
	40	7.6	2570.642	2570.00	2619.472	2620
	50	7.6	2570.130	2570.00	2619.549	2620
Frequency Stability vs. Voltage	20	6.46	2570.854	2570.00	2619.175	2620
	20	8.7	2570.840	2570.00	2619.846	2620

16QAM:

Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DE})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	7.6	2570.469	2570.00	2619.214	2620
	-20	7.6	2570.432	2570.00	2619.988	2620
	-10	7.6	2570.151	2570.00	2619.452	2620
	0	7.6	2570.376	2570.00	2619.326	2620
	10	7.6	2570.845	2570.00	2619.520	2620
	20	7.6	2570.433	2570.00	2619.562	2620
	30	7.6	2570.685	2570.00	2619.701	2620
	40	7.6	2570.345	2570.00	2619.433	2620
	50	7.6	2570.752	2570.00	2619.142	2620
Frequency Stability vs. Voltage	20	6.46	2570.540	2570.00	2619.727	2620
	20	8.7	2570.841	2570.00	2619.452	2620

EUT PHOTOGRAPHS

Please refer to the attachment 2401S54552E-RF External photo and 2401S54552E-RF Internal photo.

TEST SETUP PHOTOGRAPHS

Please refer to the attachment 2401S54552E-RFC Test Setup photo.

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