TEST REPORT

Applicant Name :	Shenzhen Youmi Intelligent Technology Co., Ltd.
Address :	406-407 Jinqi Zhigu Building, 4/F, 1 Tangling Road, Nanshan District, Shenzhen City, China
Report Number :	RA230505-23860E-RF-00A
FCC ID:	2ATZ4-G5MECHA

Test Standard (s)

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

Sample Description

Product Type:	Smart phone
Test Model No.:	G5 Mecha
Multiple Model(s) No.:	N/A
Trade Mark:	UMIDIGI
Date Received:	2023/05/05
Report Date:	2023/06/01

Test Result:	Pass*

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

Prepared and Checked By:

Roger Ling
EMC Engineer

Approved By:

Candy Li
EMC Engineer

Note: This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "★ ".
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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	RA230505-23860E-RF-00A	Original Report	2023/06/01

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

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 5: 824-849MHz(TX); 869-894MHz(RX) LTE Band 7: 2500-2570MHz(TX), 2620-2690MHz(RX) LTE Band 12: 699-716MHz(TX); 729-746MHz(RX) LTE Band 41: 2535-2655MHz(TX/RX)
Modulation Technique	2G: GMSK 3G: BPSK, QPSK, 16QAM 4G: QPSK, 16QAM
Antenna Specification*	GSM850/WCDMA 850/LTE B5: -1.15dBi WCDMA 1900/PCS1900/LTE B2: 0.91dBi LTE B12: -1.85dBi, B7: 1.78dBi, B41: 1.79dBi (provided by the applicant)
Voltage Range	DC 3.87V from battery or DC 5V from adapter
Sample serial number	RE: 25E7-1 RF: 25E7-2 (Assigned by ATC)
Sample/EUT Status	Good condition
Normal/Extreme Condition	L.V.: Low Voltage 3.5VDC N.V.: Normal Voltage 3.87VDC H.V.: High Voltage 4.35VDC
Adapter 1 information	Model: HJ-0502000W2-US Input: AC 100-240V, 50/60Hz, 0.3A Output: DC 5V, 2A
Adapter 2 information	Model: HF-0502000U Input: AC 100-240V, 50/60Hz, 0.3A Output: DC 5.0V, 2A

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
ANSI/TIA-603-E-2016: Land Mobile FM or PM Communications Equipment Measurement and Performance Standards

All emissions measurement was performed at Shenzhen Accurate Technology Co., Ltd. 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 Frequency		$0.082*10^{-7}$
RF output power, conducted		0.71dB
Unwanted Emission, conducted		1.6dB
AC Power Lines Conducted Emissions		2.72dB
Audio Frequency Response		0.1dB
Low Pass Filter Response		1.2dB
Modulation Limiting		1%
Emissions, Radiated	9kHz - 30MHz	2.06dB
	30MHz - 1GHz	5.08dB
	1GHz - 18GHz	4.96dB
	18GHz - 26.5GHz	5.16dB
	26.5GHz - 40GHz	4.64dB
Temperature		1℃
Humidity		6%
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 Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the Floor 1, KuMaKe Building, Dongzhou Community, Guangming Street, Guangming District, Shenzhen, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 708358,the FCC Designation No.: CN1189. Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 429 7.01.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0016. The Registration Number is 30241.

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 B5	1.4	824.7	836.5	848.3
	3	825.5	836.5	847.5
	5	826.5	836.5	846.5
	10	829	836.5	844
LTE B7	5	2502.5	2535	2567.5
	10	2505	2535	2565
	15	2507.5	2535	2562.5
	20	2510	2535	2560
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 B41	5	2537.5	2595	2652.5
	10	2540	2595	2650
	15	2542.5	2595	2647.5
	20	2545	2595	2645

Equipment Modifications

No modification was made to the EUT.

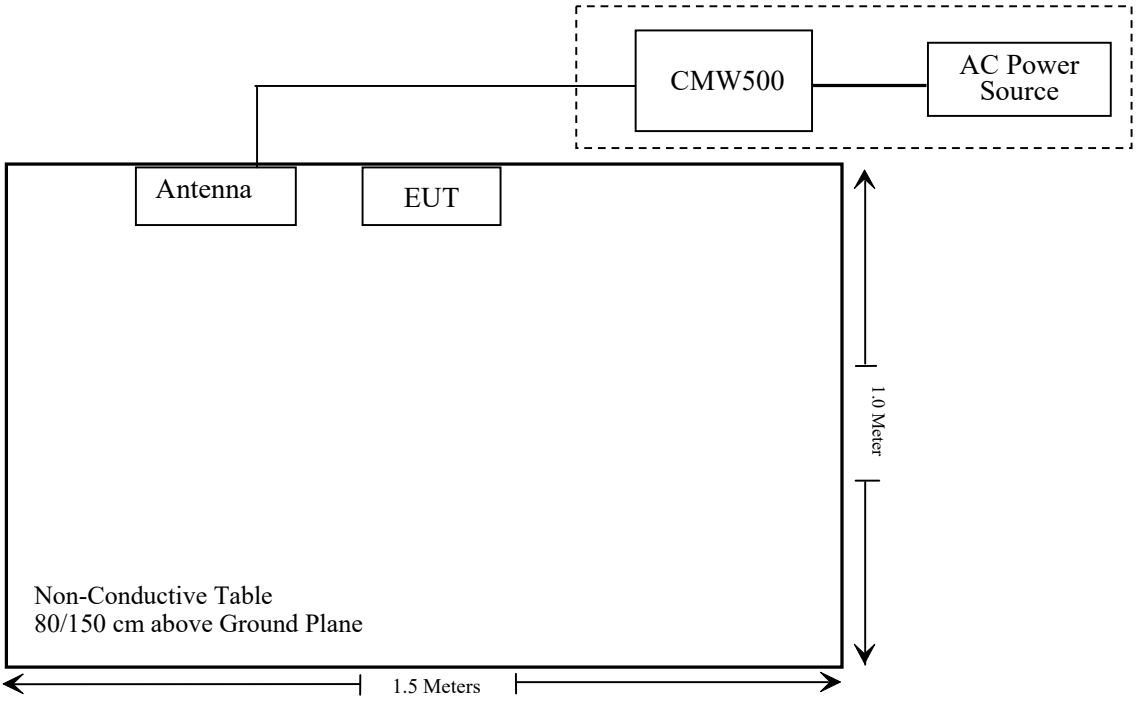
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	154606

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



Note: the support table edge is flush with center of turntable

SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 1.1307 ,§2.1093	RF Exposure (SAR)	Compliant
§2.1046; § 22.913; § 24.232; §27.50 (b) (c) (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 (c) (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					
Rohde& Schwarz	Test Receiver	ESR	102725	2022/11/25	2023/11/24
Rohde&Schwarz	Spectrum Analyzer	FSV40	101949	2022/11/25	2023/11/24
SONOMA INSTRUMENT	Amplifier	310 N	186131	2022/11/08	2023/11/07
A.H. Systems, inc.	Preamplifier	PAM-0118P	135	2022/11/08	2023/11/07
Quinstar	Amplifier	QLW-18405536-J0	15964001002	2022/11/08	2023/11/07
Schwarzbeck	Bilog Antenna	VULB9163	9163-194	2022/11/30	2025/11/29
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2021/07/06	2024/07/05
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-655	2022/12/26	2025/12/25
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-1067	2022/11/30	2025/11/29
PASTERNACK	Horn Antenna	PE9852/2F-20	1120 (ATC-BA-024-1)	2023/01/04	2026/01/03
PASTERNACK	Horn Antenna	PE9852/2F-20	1120 (ATC-BA-025-1)	2023/01/04	2026/01/03
PASTERNACK	Horn Antenna	PE9850/2F-20	720 (ATC-BA-024)	2023/01/04	2026/01/03
PASTERNACK	Horn Antenna	PE9850/2F-20	720 (ATC-BA-025)	2023/01/04	2026/01/03
Unknown	RF Coaxial Cable	No.16	N200	2022/11/25	2023/11/24
Agilent	Signal Generator	N5183A	MY51040755	2022/11/25	2023/11/24
Radiated Emission Test Software: e3 19821b (V9)					
Unknown	RF Coaxial Cable	No.10	N050	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.11	N1000	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.12	N040	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.13	N300	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.14	N800	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.15	N600	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.16	N650	2022/11/25	2023/11/24
Unknown	Band Reject Filter	MSF824-862MS-1147	ATCE-141	2022/11/25	2023/11/24
Unknown	Band Reject Filter	MSF1850-1910MS-1148	ATCE-142	2022/11/25	2023/11/24
Unknown	Band Reject Filter	MSF2495-2570MS-1152	ATCE-146	2022/11/25	2023/11/24
Unknown	Band Reject Filter	MSF700-800MS-1153	ATCE-147	2022/11/25	2023/11/24

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	SPECTRUM ANALYZER	FSU26	200982	2022/07/04	2023/07/03
Rohde&Schwarz	Spectrum Analyzer	FSV-40	101948	2022/11/25	2023/11/24
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	154606	2022/11/25	2023/11/24
Mini-Circuits	Power Splitter	DC-18000MHz	SF10944151S	2022/11/25	2023/11/24
WEINSCHEL	10dB Attenuator	5324	AU 3842	2022/11/25	2023/11/24
HP	6dB Attenuator	3dB Attenuator	06151	2022/11/25	2023/11/24
Fluke	Multi Meter	45	7664009	2022/11/23	2023/11/22
Manson	DC Power Source	KPS-6604	ATCS-205	NCR	NCR
REALE	Temp. & Humid. Chamber	RHP-800BT	R20170318310	2022/11/23	2023/11/22
Unknown	RF Coaxial Cable	No.31	RF-01	Each time	

* Statement of Traceability: Shenzhen Accurate Technology Co., Ltd. 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: RA230505-23860E-20A.

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)&§ 24.232 (c); §27.50 (c)(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.

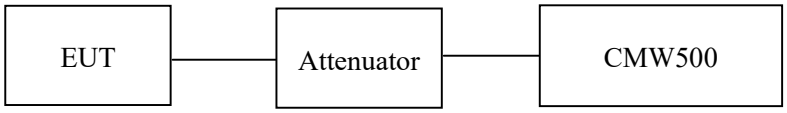
According to §27.50(c), Control and mobile stations in the 698-746 MHz band are limited to 30 watts ERP. And Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

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

Test Procedure

Conducted method: ANSI C63.26-2015 Section 5.2

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



Test Data

Environmental Conditions

Temperature:	26~28.8℃
Relative Humidity:	46.8~56%
ATM Pressure:	101.0 kPa

The testing was performed by Jacob Huang from 2023-05-19 to 2023-05-22.

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	ERP(dBm)	Limit (dBm)
GSM	128	824.2	33.6	29.8	38.45
	190	836.6	33.5	29.7	38.45
	251	848.8	33.4	29.6	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				ERP(dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	33.80	31.23	29.23	28.08	30.00	27.43	25.43	24.28	38.45
	190	836.6	33.63	31.36	29.35	28.02	29.83	27.56	25.55	24.22	38.45
	251	848.8	33.83	31.51	29.51	28.01	30.03	27.71	25.71	24.21	38.45

Mode	Test Mode	3GPP Sub Test	Average Output Power (dBm)			ERP(dBm)		
			Low	Mid	High	Low	Mid	High
WCDMA (Band 5)	RMC12.2k		24.17	24.28	23.71	20.37	20.48	19.91
	HSDPA	1	22.58	22.77	22.39	18.78	18.97	18.59
		2	22.72	22.82	22.45	18.92	19.02	18.65
		3	22.88	22.94	22.60	19.08	19.14	18.80
		4	22.98	22.97	22.73	19.18	19.17	18.93
	HSUPA	1	22.77	22.77	22.74	18.97	18.97	18.94
		2	22.86	22.78	22.87	19.06	18.98	19.07
		3	22.87	22.90	22.94	19.07	19.10	19.14
		4	23.06	22.97	23.04	19.26	19.17	19.24
		5	23.21	23.05	23.13	19.41	19.25	19.33
	HSPA+	1	22.59	22.65	22.78	18.79	18.85	18.98

Note: ERP (dBm) = Conducted Power (dBm) + Antenna Gain (dBd) - Cable Loss
For band5: Antenna Gain = -1.15dBi = -3.30dBd (0dBd=2.15(dBi)
Cable Loss=0.5dB*(provided by the applicant)
Limit: ERP≤38.45dBm

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	EIRP(dBm)	Limit (dBm)
GSM	512	1850.2	31.6	32.51	33
	661	1880.0	31.5	32.41	33
	810	1909.8	31.5	32.41	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				EIRP(dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	31.68	28.67	26.74	24.73	32.59	29.58	27.65	25.64	33
	661	1880.0	31.53	28.58	26.55	24.70	32.44	29.49	27.46	25.61	33
	810	1909.8	31.50	28.53	26.52	24.74	32.41	29.44	27.43	25.65	33

Mode	Test Mode	3GPP Sub Test	Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
WCDMA (Band 2)	RMC12.2k		23.52	23.44	23.62	24.43	24.35	24.53
	HSDPA	1	22.34	21.96	21.85	23.25	22.87	22.76
		2	22.46	22.07	21.96	23.37	22.98	22.87
		3	22.50	22.24	22.02	23.41	23.15	22.93
		4	22.52	22.26	22.16	23.43	23.17	23.07
	HSUPA	1	22.33	21.87	21.64	23.24	22.78	22.55
		2	22.34	21.91	21.82	23.25	22.82	22.73
		3	22.47	22.09	21.86	23.38	23.00	22.77
		4	22.65	22.15	21.98	23.56	23.06	22.89
		5	22.75	22.23	22.08	23.66	23.14	22.99
	HSPA+	1	21.89	21.89	21.90	22.80	22.80	22.81

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi)
For Band2: Antenna Gain = 0.91dBi
Limit: EIRP≤33dBm

LTE Band 2

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
1.4	QPSK	RB1#0	24.32	24.11	24.15	25.23	25.02	25.06
		RB1#3	24.33	24.15	24.12	25.24	25.06	25.03
		RB1#5	24.32	24.16	24.1	25.23	25.07	25.01
		RB3#0	24.37	24.16	24.16	25.28	25.07	25.07
		RB3#3	24.39	24.13	24.09	25.30	25.04	25.00
		RB6#0	23.37	23.18	23.08	24.28	24.09	23.99
	16QAM	RB1#0	23.89	23.13	23.59	24.80	24.04	24.50
		RB1#3	23.95	23.1	23.57	24.86	24.01	24.48
		RB1#5	23.87	23.21	23.54	24.78	24.12	24.45
		RB3#0	23.22	23.05	23.01	24.13	23.96	23.92
		RB3#3	23.27	23.05	23.05	24.18	23.96	23.96
		RB6#0	22.48	22.19	22.12	23.39	23.10	23.03
3.0	QPSK	RB1#0	24.35	24.15	24.06	25.26	25.06	24.97
		RB1#8	24.41	24.08	24.06	25.32	24.99	24.97
		RB1#14	24.31	24.06	24.07	25.22	24.97	24.98
		RB6#0	23.37	23.22	23.11	24.28	24.13	24.02
		RB6#9	23.39	23.11	23.03	24.30	24.02	23.94
		RB15#0	23.4	23.21	23.06	24.31	24.12	23.97
	16QAM	RB1#0	23.11	22.87	23.54	24.02	23.78	24.45
		RB1#8	23.08	22.84	23.57	23.99	23.75	24.48
		RB1#14	23.09	22.85	23.55	24.00	23.76	24.46
		RB6#0	22.55	22.13	22.12	23.46	23.04	23.03
		RB6#9	22.54	22.18	22.06	23.45	23.09	22.97
		RB15#0	22.45	22.32	22.34	23.36	23.23	23.25

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
5.0	QPSK	RB1#0	24.51	24.03	24	25.42	24.94	24.91
		RB1#13	24.55	24.03	23.98	25.46	24.94	24.89
		RB1#24	24.47	24.06	23.99	25.38	24.97	24.90
		RB15#0	23.41	23.22	23.21	24.32	24.13	24.12
		RB15#10	23.4	23.09	23.14	24.31	24.00	24.05
		RB25#0	23.34	23.13	23.07	24.25	24.04	23.98
	16QAM	RB1#0	23.4	23.27	22.47	24.31	24.18	23.38
		RB1#13	23.38	23.21	22.42	24.29	24.12	23.33
		RB1#24	23.41	23.29	22.36	24.32	24.20	23.27
		RB15#0	22.34	22.26	22.22	23.25	23.17	23.13
		RB15#10	22.32	22.23	22.26	23.23	23.14	23.17
		RB25#0	22.38	22.39	22.38	23.29	23.30	23.29
10.0	QPSK	RB1#0	24.39	24.16	24.04	25.30	25.07	24.95
		RB1#25	24.39	24.19	24.03	25.30	25.10	24.94
		RB1#49	24.31	24.16	24.09	25.22	25.07	25.00
		RB25#0	23.44	23.16	23.18	24.35	24.07	24.09
		RB25#25	23.24	23.29	23.05	24.15	24.20	23.96
		RB50#0	23.41	23.3	23.1	24.32	24.21	24.01
	16QAM	RB1#0	23.88	23.12	23.35	24.79	24.03	24.26
		RB1#25	23.92	23.06	23.42	24.83	23.97	24.33
		RB1#49	23.91	23.03	23.42	24.82	23.94	24.33
		RB25#0	22.52	22.47	22.17	23.43	23.38	23.08
		RB25#25	22.41	22.41	22.21	23.32	23.32	23.12
		RB50#0	22.51	22.35	22.23	23.42	23.26	23.14

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
15.0	QPSK	RB1#0	24.36	24.03	24.14	25.27	24.94	25.05
		RB1#38	24.31	23.99	24.02	25.22	24.90	24.93
		RB1#74	24.25	23.95	24.08	25.16	24.86	24.99
		RB36#0	23.44	23.28	23.06	24.35	24.19	23.97
		RB36#39	23.31	23.14	23.19	24.22	24.05	24.10
		RB75#0	23.35	23.22	23.1	24.26	24.13	24.01
	16QAM	RB1#0	24.16	23.41	23.68	25.07	24.32	24.59
		RB1#38	24.06	23.3	23.56	24.97	24.21	24.47
		RB1#74	24.03	23.27	23.56	24.94	24.18	24.47
		RB36#0	22.51	22.34	22.18	23.42	23.25	23.09
		RB36#39	22.36	22.29	22.25	23.27	23.20	23.16
		RB75#0	22.42	22.22	22.25	23.33	23.13	23.16
20.0	QPSK	RB1#0	24.54	24.34	24.18	25.45	25.25	25.09
		RB1#50	24.44	24.14	24.19	25.35	25.05	25.10
		RB1#99	24.41	24.27	24.16	25.32	25.18	25.07
		RB50#0	23.4	23.24	23.2	24.31	24.15	24.11
		RB50#50	23.38	23.22	23.12	24.29	24.13	24.03
		RB100#0	23.39	23.22	23.11	24.30	24.13	24.02
	16QAM	RB1#0	23.46	24.02	23.31	24.37	24.93	24.22
		RB1#50	23.36	23.86	23.27	24.27	24.77	24.18
		RB1#99	23.26	23.99	23.3	24.17	24.90	24.21
		RB50#0	22.54	22.35	22.28	23.45	23.26	23.19
		RB50#50	22.32	22.27	22.28	23.23	23.18	23.19
		RB100#0	22.33	22.29	22.23	23.24	23.20	23.14

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi)
For Band2: Antenna Gain = 0.91dBi
Limit: EIRP≤33dBm

LTE Band5

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			ERP(dBm)		
			Low	Mid	High	Low	Mid	High
1.4	QPSK	RB1#0	25.44	24.48	24.27	21.64	20.68	20.47
		RB1#3	24.49	24.55	24.28	20.69	20.75	20.48
		RB1#5	24.43	24.51	24.27	20.63	20.71	20.47
		RB3#0	24.63	24.49	24.35	20.83	20.69	20.55
		RB3#3	24.59	24.45	24.42	20.79	20.65	20.62
		RB6#0	23.51	23.49	23.33	19.71	19.69	19.53
	16QAM	RB1#0	24.18	23.13	23.79	20.38	19.33	19.99
		RB1#3	24.17	23.2	23.76	20.37	19.40	19.96
		RB1#5	24.1	23.21	23.76	20.30	19.41	19.96
		RB3#0	23.39	23.35	23.44	19.59	19.55	19.64
		RB3#3	23.44	23.33	23.46	19.64	19.53	19.66
		RB6#0	22.57	22.51	22.48	18.77	18.71	18.68
3.0	QPSK	RB1#0	24.52	24.53	24.32	20.72	20.73	20.52
		RB1#8	24.51	24.5	24.23	20.71	20.70	20.43
		RB1#14	24.46	24.45	24.29	20.66	20.65	20.49
		RB6#0	23.47	23.53	23.29	19.67	19.73	19.49
		RB6#9	23.55	23.45	23.28	19.75	19.65	19.48
		RB15#0	23.58	23.54	23.36	19.78	19.74	19.56
	16QAM	RB1#0	23.72	23.29	23.66	19.92	19.49	19.86
		RB1#8	23.64	23.33	23.51	19.84	19.53	19.71
		RB1#14	23.6	23.33	23.48	19.80	19.53	19.68
		RB6#0	22.69	22.74	22.39	18.89	18.94	18.59
		RB6#9	22.77	22.7	22.33	18.97	18.90	18.53
		RB15#0	22.56	22.57	22.46	18.76	18.77	18.66

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			ERP(dBm)		
			Low	Mid	High	Low	Mid	High
5.0	QPSK	RB1#0	24.7	24.29	24.27	20.90	20.49	20.47
		RB1#13	24.57	24.32	24.27	20.77	20.52	20.47
		RB1#24	24.62	24.31	24.24	20.82	20.51	20.44
		RB15#0	23.52	23.52	23.5	19.72	19.72	19.70
		RB15#10	23.43	23.46	23.38	19.63	19.66	19.58
		RB25#0	23.54	23.46	23.28	19.74	19.66	19.48
	16QAM	RB1#0	23.53	23.62	22.72	19.73	19.82	18.92
		RB1#13	23.53	23.54	22.7	19.73	19.74	18.90
		RB1#24	23.49	23.48	22.63	19.69	19.68	18.83
		RB15#0	22.37	22.51	22.5	18.57	18.71	18.70
		RB15#10	22.46	22.47	22.42	18.66	18.67	18.62
		RB25#0	22.51	22.63	22.49	18.71	18.83	18.69
10.0	QPSK	RB1#0	24.56	24.43	24.34	20.76	20.63	20.54
		RB1#25	24.45	24.48	24.35	20.65	20.68	20.55
		RB1#49	24.5	24.35	24.27	20.70	20.55	20.47
		RB25#0	23.61	23.54	23.46	19.81	19.74	19.66
		RB25#25	23.52	23.45	23.35	19.72	19.65	19.55
		RB50#0	23.38	23.42	23.56	19.58	19.62	19.76
	16QAM	RB1#0	23.65	23.46	23.63	19.85	19.66	19.83
		RB1#25	23.56	23.33	23.67	19.76	19.53	19.87
		RB1#49	23.67	22.95	23.58	19.87	19.15	19.78
		RB25#0	22.64	22.73	22.54	18.84	18.93	18.74
		RB25#25	22.69	22.65	22.42	18.89	18.85	18.62
		RB50#0	22.53	22.57	22.58	18.73	18.77	18.78

Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBd)- Cable Loss
For Band5: Antenna Gain = -1.15dBi = -3.30dBd (0dBd=2.15dBi)
Cable Loss=0.5dB*(provided by the applicant)
Limit: ERP≤38.45dBm

LTE Band 7

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
5.0	QPSK	RB1#0	23.69	23.57	23.39	24.67	24.55	24.37
		RB1#13	23.75	23.54	23.34	24.73	24.52	24.32
		RB1#24	23.8	23.57	23.06	24.78	24.55	24.04
		RB15#0	22.75	22.67	22.26	23.73	23.65	23.24
		RB15#10	22.76	22.66	22.35	23.74	23.64	23.33
		RB25#0	22.7	22.64	22.4	23.68	23.62	23.38
	16QAM	RB1#0	22.47	21.92	22.41	23.45	22.90	23.39
		RB1#13	22.47	22.02	22.43	23.45	23.00	23.41
		RB1#24	22.43	21.96	22.35	23.41	22.94	23.33
		RB15#0	21.9	21.73	21.43	22.88	22.71	22.41
		RB15#10	21.93	21.73	21.3	22.91	22.71	22.28
		RB25#0	21.88	21.75	21.4	22.86	22.73	22.38
10.0	QPSK	RB1#0	23.75	23.7	23.32	24.73	24.68	24.30
		RB1#25	23.75	23.64	23.26	24.73	24.62	24.24
		RB1#49	23.84	23.64	23.27	24.82	24.62	24.25
		RB25#0	22.77	22.74	22.41	23.75	23.72	23.39
		RB25#25	22.73	22.68	22.28	23.71	23.66	23.26
		RB50#0	22.88	22.67	22.37	23.86	23.65	23.35
	16QAM	RB1#0	23	22.21	22.62	23.98	23.19	23.60
		RB1#25	22.92	22.11	22.64	23.90	23.09	23.62
		RB1#49	22.92	22.11	22.62	23.90	23.09	23.60
		RB25#0	22.03	21.85	21.55	23.01	22.83	22.53
		RB25#25	21.99	21.85	21.42	22.97	22.83	22.40
		RB50#0	22.01	21.77	21.58	22.99	22.75	22.56

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
15.0	QPSK	RB1#0	23.79	23.69	23.31	24.77	24.67	24.29
		RB1#38	23.77	23.67	23.29	24.75	24.65	24.27
		RB1#74	23.79	23.6	23.22	24.77	24.58	24.20
		RB36#0	22.77	22.72	22.47	23.75	23.70	23.45
		RB36#39	22.85	22.67	22.21	23.83	23.65	23.19
		RB75#0	22.81	22.66	22.42	23.79	23.64	23.40
	16QAM	RB1#0	23.14	23.12	22.71	24.12	24.10	23.69
		RB1#38	23.10	23.02	22.63	24.08	24.00	23.61
		RB1#74	23.05	23.08	22.57	24.03	24.06	23.55
		RB36#0	22.00	21.82	21.64	22.98	22.80	22.62
		RB36#39	21.96	21.75	21.52	22.94	22.73	22.50
		RB75#0	21.92	21.76	21.50	22.90	22.74	22.48
20.0	QPSK	RB1#0	23.94	23.54	23.57	24.92	24.52	24.55
		RB1#50	23.93	23.55	23.52	24.91	24.53	24.50
		RB1#99	23.85	23.46	23.34	24.83	24.44	24.32
		RB50#0	22.78	22.78	22.51	23.76	23.76	23.49
		RB50#50	22.81	22.67	22.4	23.79	23.65	23.38
		RB100#0	22.85	22.65	22.48	23.83	23.63	23.46
	16QAM	RB1#0	22.95	23.5	22.51	23.93	24.48	23.49
		RB1#50	22.94	23.41	22.41	23.92	24.39	23.39
		RB1#99	22.91	23.44	22.29	23.89	24.42	23.27
		RB50#0	22.02	21.9	21.66	23.00	22.88	22.64
		RB50#50	21.88	21.71	21.56	22.86	22.69	22.54
		RB100#0	21.93	21.9	21.53	22.91	22.88	22.51

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi)- Cable Loss
For Band7: Antenna Gain = 1.78dBi
Cable Loss=0.8dB*(provided by the applicant)
Limit: EIRP≤33dBm

LTE Band 12

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			ERP(dBm)		
			Low	Mid	High	Low	Mid	High
1.4	QPSK	RB1#0	24.4	24.44	24.45	19.90	19.94	19.95
		RB1#3	24.41	24.34	24.4	19.91	19.84	19.90
		RB1#5	24.44	24.34	24.39	19.94	19.84	19.89
		RB3#0	24.47	24.33	24.58	19.97	19.83	20.08
		RB3#3	24.6	24.34	24.5	20.10	19.84	20.00
		RB6#0	23.51	23.35	23.4	19.01	18.85	18.90
	16QAM	RB1#0	24.36	23.55	23.79	19.86	19.05	19.29
		RB1#3	24.34	23.48	23.88	19.84	18.98	19.38
		RB1#5	24.31	23.09	23.81	19.81	18.59	19.31
		RB3#0	23.47	23.22	23.33	18.97	18.72	18.83
		RB3#3	23.51	23.17	23.43	19.01	18.67	18.93
		RB6#0	22.59	22.92	22.53	18.09	18.42	18.03
3.0	QPSK	RB1#0	24.49	24.31	24.43	19.99	19.81	19.93
		RB1#8	24.42	24.35	24.5	19.92	19.85	20.00
		RB1#14	24.49	24.23	24.41	19.99	19.73	19.91
		RB6#0	23.5	23.36	23.45	19.00	18.86	18.95
		RB6#9	23.45	23.32	23.37	18.95	18.82	18.87
		RB15#0	23.43	23.32	23.41	18.93	18.82	18.91
	16QAM	RB1#0	23.67	23.1	23.75	19.17	18.60	19.25
		RB1#8	23.68	23.05	23.74	19.18	18.55	19.24
		RB1#14	23.68	23.12	23.75	19.18	18.62	19.25
		RB6#0	22.6	22.62	22.56	18.10	18.12	18.06
		RB6#9	22.66	23.07	22.64	18.16	18.57	18.14
		RB15#0	22.37	22.92	22.5	17.87	18.42	18.00

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			ERP(dBm)		
			Low	Mid	High	Low	Mid	High
5.0	QPSK	RB1#0	24.53	24.3	24.39	20.03	19.80	19.89
		RB1#13	24.47	24.21	24.48	19.97	19.71	19.98
		RB1#24	24.47	24.29	24.34	19.97	19.79	19.84
		RB15#0	23.48	23.47	23.53	18.98	18.97	19.03
		RB15#10	23.43	23.46	23.46	18.93	18.96	18.96
		RB25#0	23.46	23.33	23.37	18.96	18.83	18.87
	16QAM	RB1#0	23.49	23.38	22.62	18.99	18.88	18.12
		RB1#13	23.56	23.35	22.65	19.06	18.85	18.15
		RB1#24	23.54	23.39	22.75	19.04	18.89	18.25
		RB15#0	22.29	22.32	22.54	17.79	17.82	18.04
		RB15#10	22.38	22.76	22.46	17.88	18.26	17.96
		RB25#0	22.42	22.88	22.52	17.92	18.38	18.02
10.0	QPSK	RB1#0	24.53	24.46	24.38	20.03	19.96	19.88
		RB1#25	24.51	24.32	24.25	20.01	19.82	19.75
		RB1#49	24.49	24.44	24.42	19.99	19.94	19.92
		RB25#0	23.49	23.48	23.45	18.99	18.98	18.95
		RB25#25	23.45	23.46	23.49	18.95	18.96	18.99
		RB50#0	23.44	23.32	23.46	18.94	18.82	18.96
	16QAM	RB1#0	23.57	23.33	23.78	19.07	18.83	19.28
		RB1#25	23.49	23.1	23.64	18.99	18.60	19.14
		RB1#49	23.41	23.24	23.83	18.91	18.74	19.33
		RB25#0	22.53	22.64	22.85	18.03	18.14	18.35
		RB25#25	22.58	22.56	22.51	18.08	18.06	18.01
		RB50#0	22.47	22.94	22.40	17.97	18.44	17.90

Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBd) - Cable Loss
For Band12: Antenna Gain = -1.85dBi = -4.00dBd (0dBd=2.15dBi)
Cable Loss=0.5dB*(provided by the applicant)
Limit: ERP≤34.77dBm

LTE Band 41

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
5.0	QPSK	RB1#0	23.82	23.18	22.88	24.81	24.17	23.87
		RB1#13	23.75	23.2	22.9	24.74	24.19	23.89
		RB1#24	23.66	23.06	22.93	24.65	24.05	23.92
		RB15#0	22.55	22.23	21.9	23.54	23.22	22.89
		RB15#10	22.71	22.23	21.81	23.70	23.22	22.80
		RB25#0	22.6	22.19	21.85	23.59	23.18	22.84
	16QAM	RB1#0	23.07	22.05	22.06	24.06	23.04	23.05
		RB1#13	22.96	22.21	22	23.95	23.20	22.99
		RB1#24	22.99	22.09	21.75	23.98	23.08	22.74
		RB15#0	21.95	21.47	20.92	22.94	22.46	21.91
		RB15#10	21.84	21.46	20.99	22.83	22.45	21.98
		RB25#0	21.93	21.22	20.98	22.92	22.21	21.97
10.0	QPSK	RB1#0	23.73	23.24	22.79	24.72	24.23	23.78
		RB1#25	23.72	23.14	22.79	24.71	24.13	23.78
		RB1#49	23.69	23.17	22.93	24.68	24.16	23.92
		RB25#0	22.66	22.24	21.89	23.65	23.23	22.88
		RB25#25	22.57	22.19	21.75	23.56	23.18	22.74
		RB50#0	22.57	22.19	21.78	23.56	23.18	22.77
	16QAM	RB1#0	22.88	22.28	21.94	23.87	23.27	22.93
		RB1#25	22.87	22.14	21.95	23.86	23.13	22.94
		RB1#49	22.93	22.11	21.9	23.92	23.10	22.89
		RB25#0	21.96	21.63	20.91	22.95	22.62	21.90
		RB25#25	21.96	21.58	20.82	22.95	22.57	21.81
		RB50#0	21.99	21.27	20.85	22.98	22.26	21.84

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
15.0	QPSK	RB1#0	23.85	23.24	22.91	24.84	24.23	23.90
		RB1#38	23.71	23.14	22.88	24.70	24.13	23.87
		RB1#74	23.62	23.14	22.93	24.61	24.13	23.92
		RB36#0	22.63	22.29	21.92	23.62	23.28	22.91
		RB36#39	22.64	22.16	21.78	23.63	23.15	22.77
		RB75#0	22.6	22.14	21.81	23.59	23.13	22.80
	16QAM	RB1#0	22.93	21.77	22.12	23.92	22.76	23.11
		RB1#38	22.85	21.67	22.05	23.84	22.66	23.04
		RB1#74	22.92	21.7	22.1	23.91	22.69	23.09
		RB36#0	21.72	21.59	20.93	22.71	22.58	21.92
		RB36#39	21.6	21.47	20.84	22.59	22.46	21.83
		RB75#0	21.76	21.39	20.89	22.75	22.38	21.88
20.0	QPSK	RB1#0	23.58	23.43	22.85	24.57	24.42	23.84
		RB1#50	23.53	23.42	22.89	24.52	24.41	23.88
		RB1#99	23.56	23.32	22.83	24.55	24.31	23.82
		RB50#0	22.52	22.22	21.94	23.51	23.21	22.93
		RB50#50	22.59	22.21	21.85	23.58	23.20	22.84
		RB100#0	22.56	22.19	21.86	23.55	23.18	22.85
	16QAM	RB1#0	22.57	22.99	22.21	23.56	23.98	23.20
		RB1#50	22.48	22.97	22.22	23.47	23.96	23.21
		RB1#99	22.45	22.77	22.27	23.44	23.76	23.26
		RB50#0	21.74	21.36	21.19	22.73	22.35	22.18
		RB50#50	21.79	21.38	21.14	22.78	22.37	22.13
		RB100#0	21.57	21.34	21.01	22.56	22.33	22.00

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi) - Cable Loss
For Band41: Antenna Gain =1.79dBi
Cable Loss=0.8dB*(provided by the applicant)
Limit: EIRP≤33dBm

Peak-to-average ratio (PAR)

Cellular Band 850

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	3.10	13
	Middle	3.93	13
	High	3.29	13

Cellular Band 5

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	2.93	13
	Middle	3.11	13
	High	2.98	13
HSDPA (16QAM)	Low	4.68	13
	Middle	4.71	13
	High	4.70	13
HSUPA (QPSK)	Low	4.99	13
	Middle	5.31	13
	High	5.09	13
HSPA+	Low	4.58	13
	Middle	4.51	13
	High	4.59	13

PCS Band 1900

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	3.38	13
	Middle	3.68	13
	High	3.17	13

PCS Band 2

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.10	13
	Middle	2.94	13
	High	3.01	13
HSDPA (16QAM)	Low	4.81	13
	Middle	4.53	13
	High	4.88	13
HSUPA (QPSK)	Low	5.47	13
	Middle	4.82	13
	High	5.25	13
HSPA+	Low	4.45	13
	Middle	4.49	13
	High	4.79	13

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

LTE Band 2 20MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.41	3.94	5.33	13	Pass
QPSK (100RB Size)	5.13	4.81	4.93	13	Pass
16QAM (1RB Size)	5.59	4.84	6.41	13	Pass
16QAM (100RB Size)	6.03	5.74	5.91	13	Pass

LTE Band 5 10MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	3.43	3.3	4.01	13	Pass
QPSK (50RB Size)	5.19	5.26	5.22	13	Pass
16QAM (1RB Size)	4.65	3.62	5.06	13	Pass
16QAM (50RB Size)	6.03	6.19	6.15	13	Pass

LTE Band 7 20MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	2.78	2.67	2.75	13	Pass
QPSK (100RB Size)	4.41	4.17	3.97	13	Pass
16QAM (1RB Size)	3.80	3.83	3.88	13	Pass
16QAM (100RB Size)	5.39	5.07	4.90	13	Pass

LTE Band 12 10MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	3.46	3.69	4.46	13	Pass
QPSK (50RB Size)	5.38	5.45	5.29	13	Pass
16QAM (1RB Size)	4.39	4.87	5.29	13	Pass
16QAM (50RB Size)	6.19	6.25	6.15	13	Pass

LTE Band 41 20MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	7.45	7.71	6.96	13	Pass
QPSK (100RB Size)	8.14	8.70	7.97	13	Pass
16QAM (1RB Size)	8.35	8.38	7.86	13	Pass
16QAM (100RB Size)	8.99	9.51	8.81	13	Pass

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

Applicable Standard

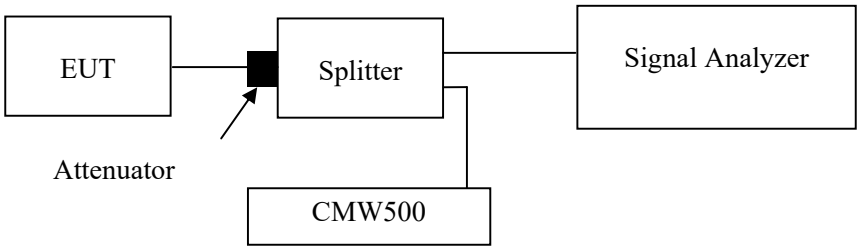
FCC 47 §2.1049, §22.917, §22.905, §24.238 and §27.53.

Test Procedure

ANSI C63.26-2015 Section 5.4.4

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

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



Test Data

Environmental Conditions

Temperature:	26~28.8℃
Relative Humidity:	46.8~56%
ATM Pressure:	101.0 kPa

The testing was performed by Jacob Huang from 2023-05-19 to 2023-05-30.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the following tables and plots.

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	128	824.2	239.0	308.0
	190	836.6	239.0	307.0
	251	848.8	237.0	312.0

Frequency (MHz)		Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)
RMC	826.4	4.140	4.695
	836.6	4.155	4.680
	846.6	4.155	4.680
HSDPA	826.4	4.140	4.695
	836.6	4.155	4.695
	846.6	4.155	4.680
HSUPA	826.4	4.155	4.695
	836.6	4.155	4.710
	846.6	4.140	4.680

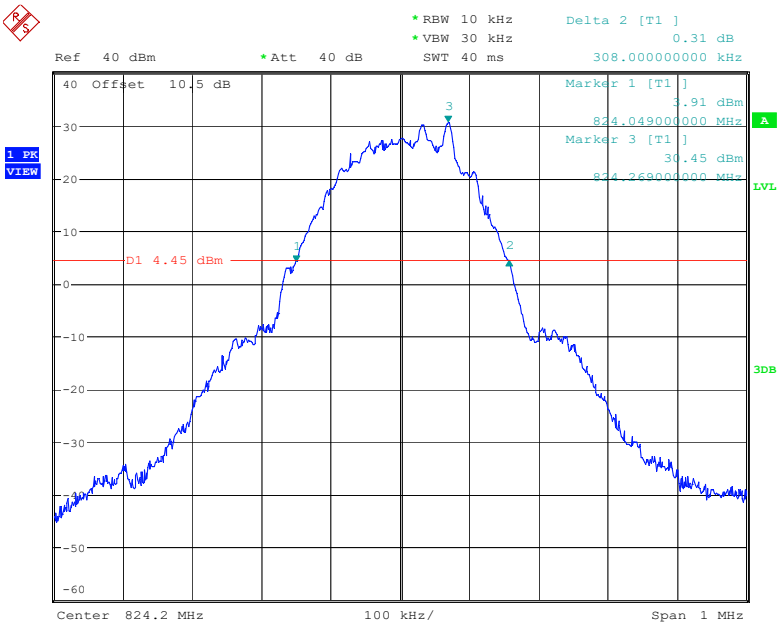
PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	512	1850.2	241.0	311.0
	661	1880.0	241.0	315.0
	810	1909.8	240.0	310.0

Frequency (MHz)		Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)
RMC	1852.4	4.140	4.695
	1880.0	4.155	4.710
	1907.6	4.155	4.710
HSDPA	1852.4	4.155	4.695
	1880.0	4.140	4.680
	1907.6	4.155	4.680
HSUPA	1852.4	4.155	4.695
	1880.0	4.155	4.695
	1907.6	4.155	4.680

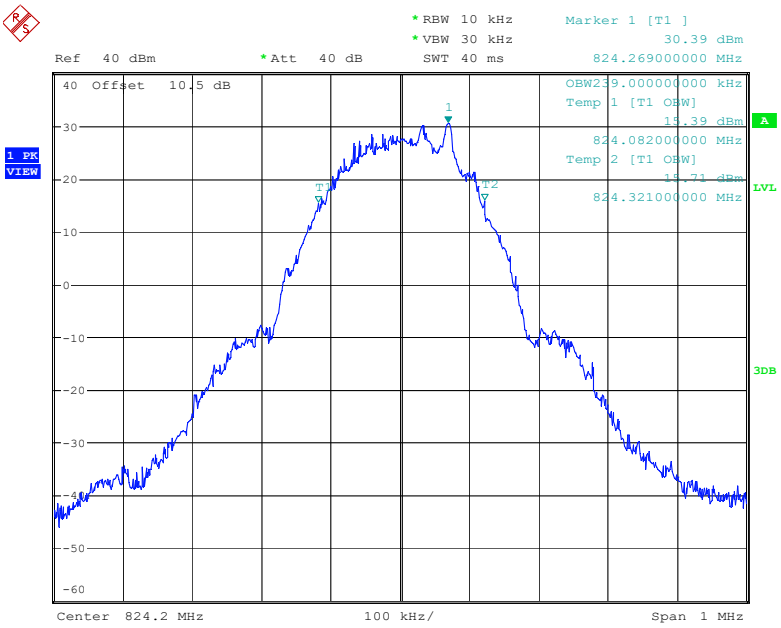
Cellular Band

26 dB Emission Bandwidth for GSM(GMSK) Mode, Low channel



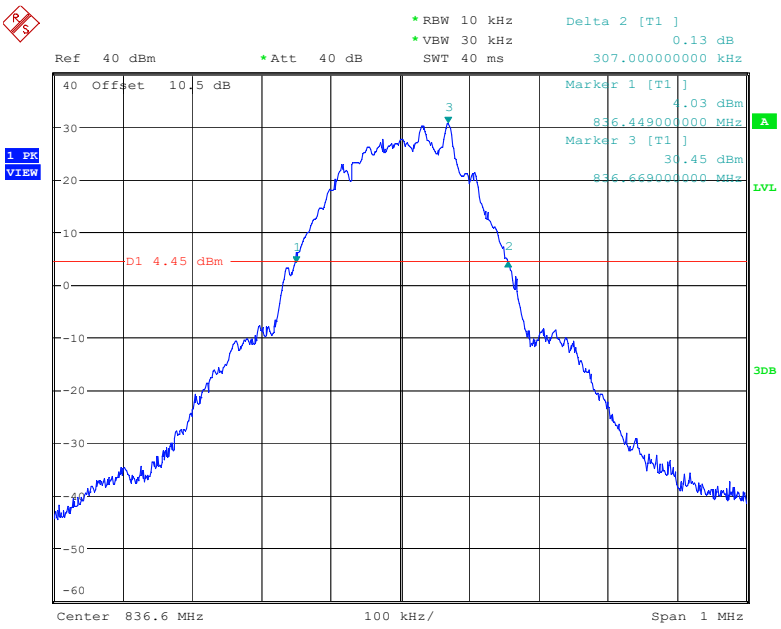
Date: 30.MAY.2023 22:02:13

99% Occupied Bandwidth for GSM(GMSK) Mode, Low channel



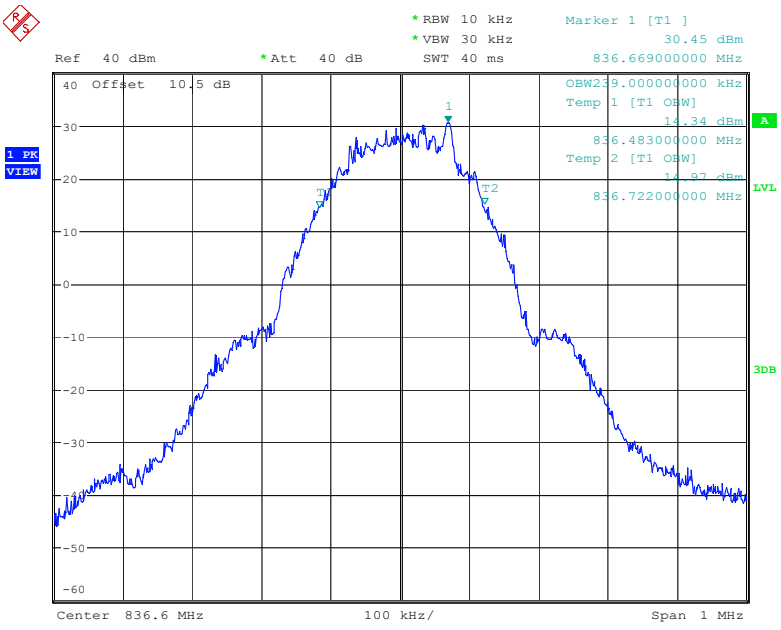
Date: 30.MAY.2023 22:01:11

26 dB Emission Bandwidth for GSM(GMSK) Mode, Middle channel



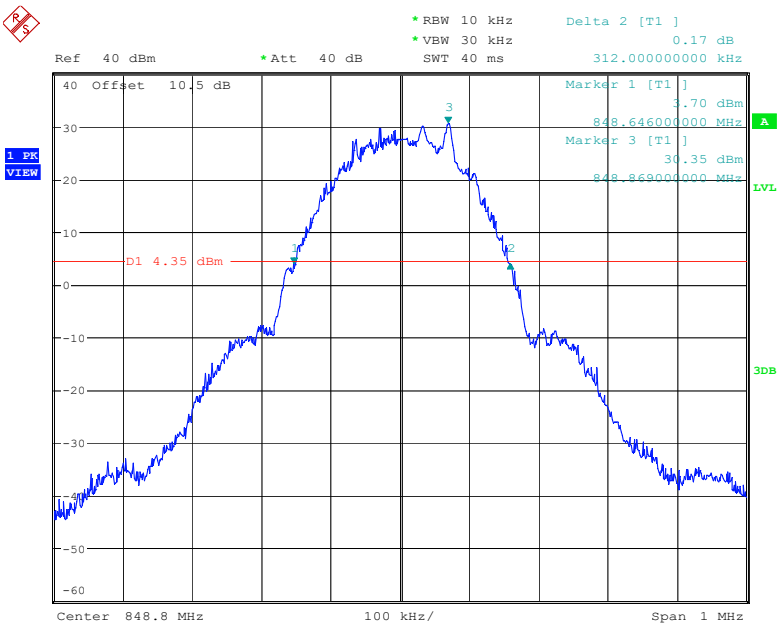
Date: 30.MAY.2023 21:55:53

99% Occupied Bandwidth for GSM(GMSK) Mode, Middle channel



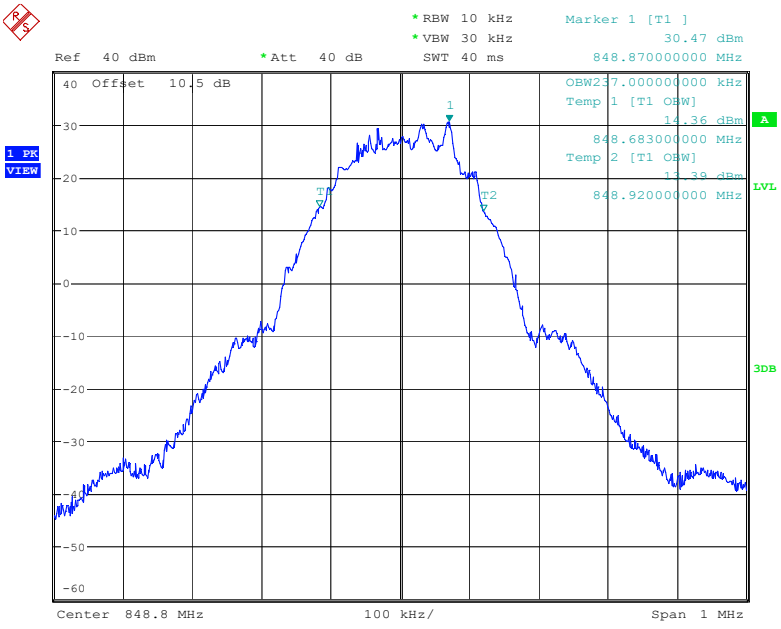
Date: 30.MAY.2023 21:55:02

26 dB Emission Bandwidth for GSM(GMSK) Mode, High channel



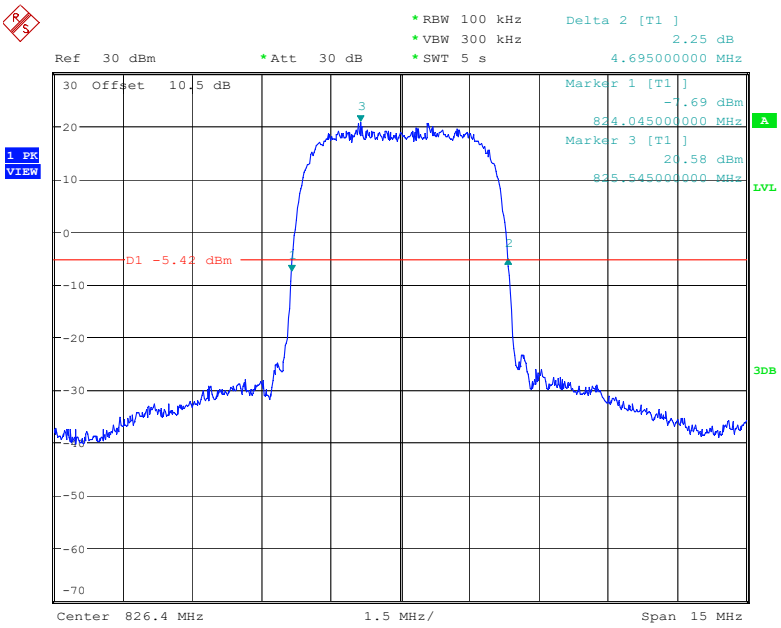
Date: 30.MAY.2023 22:15:39

99% Occupied Bandwidth for GSM(GMSK) Mode, High channel



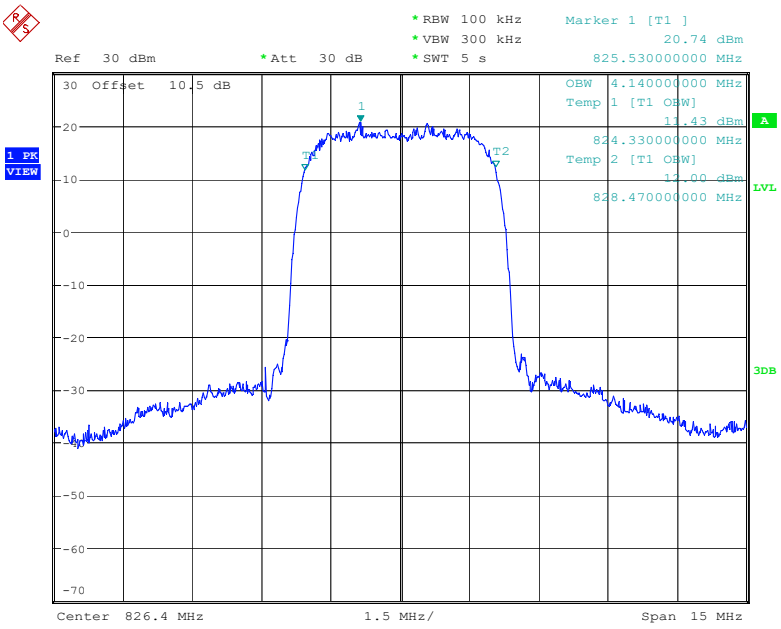
Date: 30.MAY.2023 22:14:48

26 dB Emission Bandwidth for RMC (BPSK) Mode, Low channel



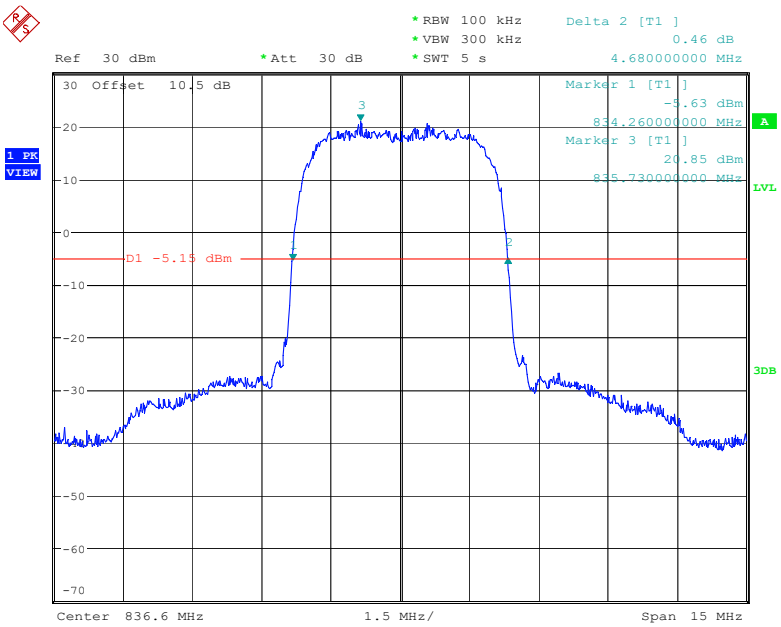
Date: 19.MAY.2023 21:37:07

99% Occupied Bandwidth for RMC (BPSK) Mode, Low channel



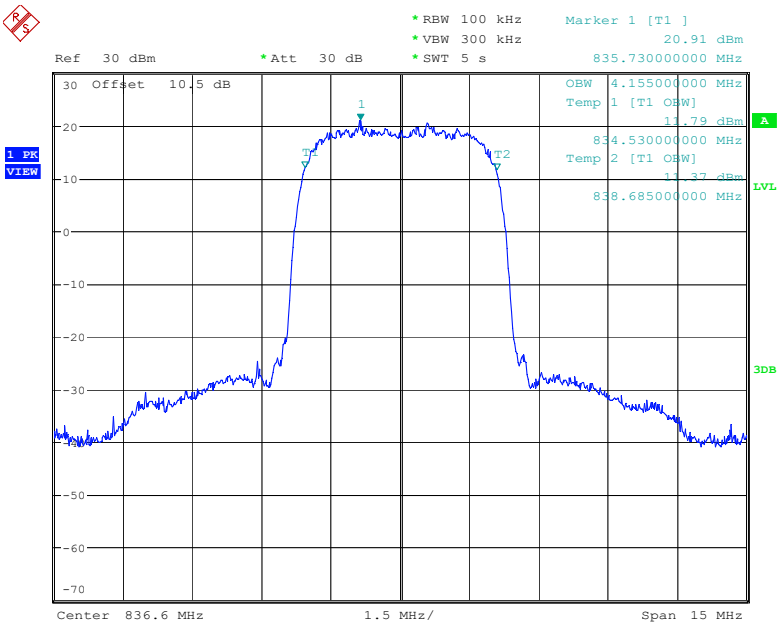
Date: 19.MAY.2023 21:36:40

26 dB Emission Bandwidth for RMC (BPSK) Mode, Middle channel



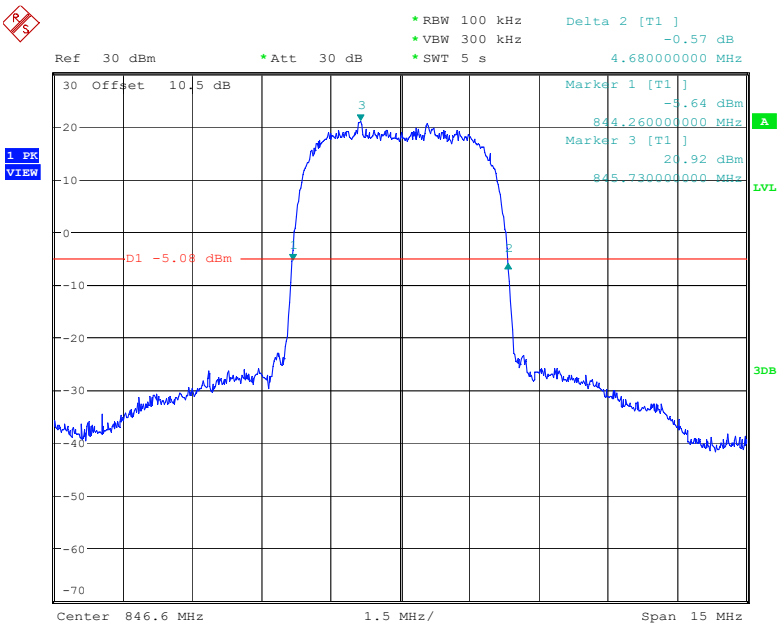
Date: 19.MAY.2023 21:50:16

99% Occupied Bandwidth for RMC (BPSK) Mode, Middle channel



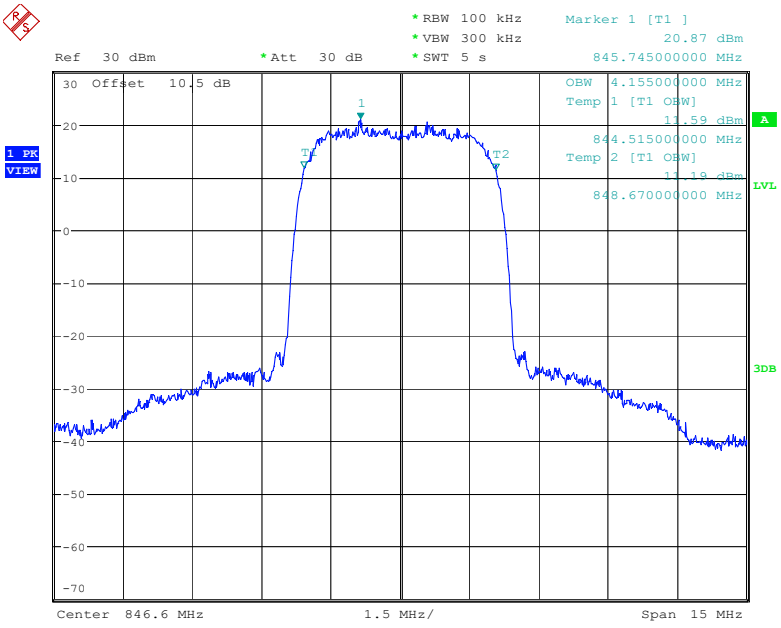
Date: 19.MAY.2023 21:49:49

26 dB Emission Bandwidth for RMC (BPSK) Mode, High channel



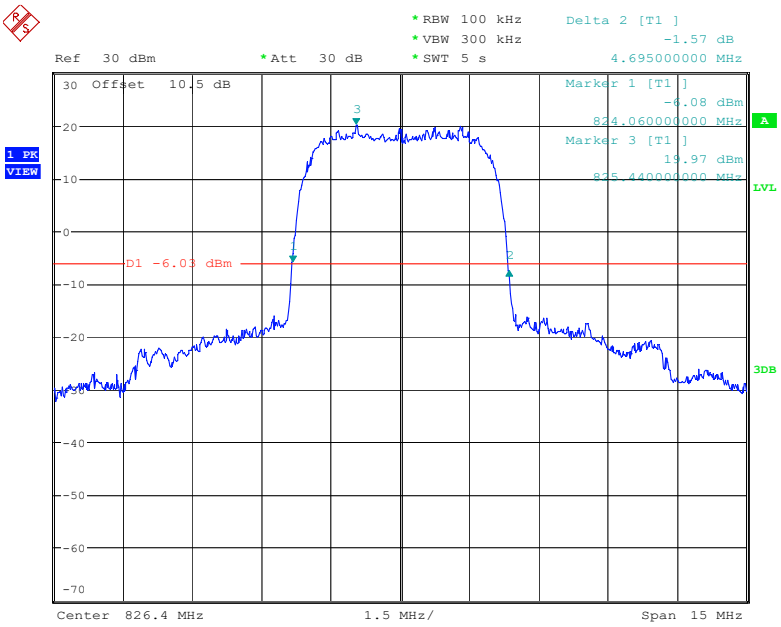
Date: 19.MAY.2023 21:53:36

99% Occupied Bandwidth for RMC (BPSK) Mode, High channel



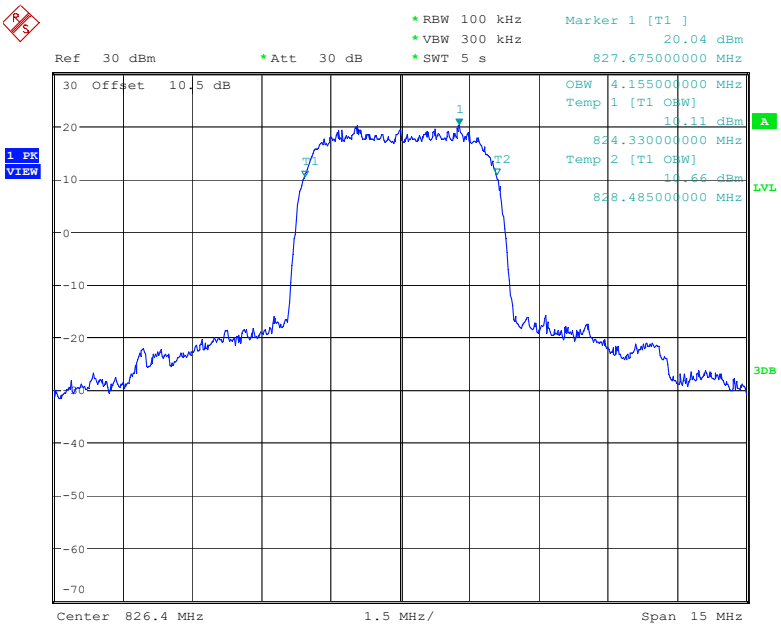
Date: 19.MAY.2023 21:53:09

26 dB Emission Bandwidth for HSUPA (QPSK) Mode, Low channel



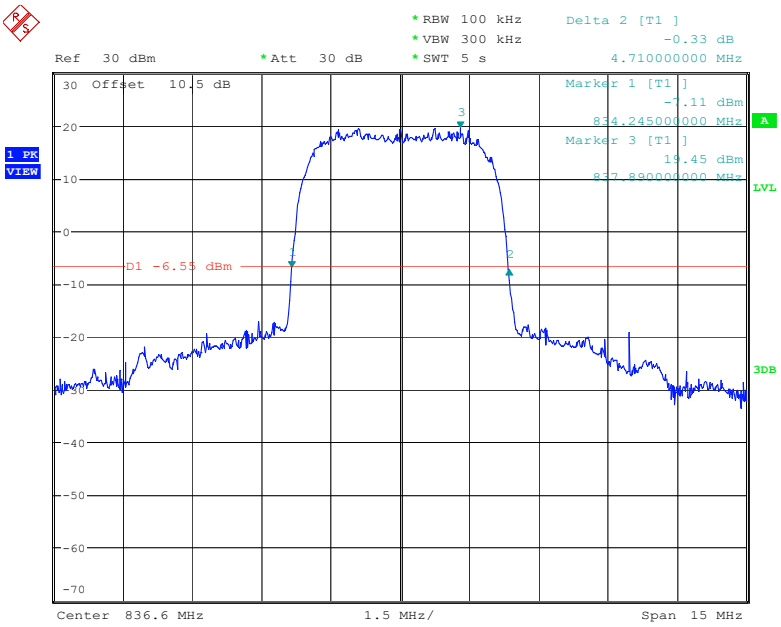
Date: 19.MAY.2023 22:17:13

99% Occupied Bandwidth for HSUPA (QPSK) Mode, Low channel



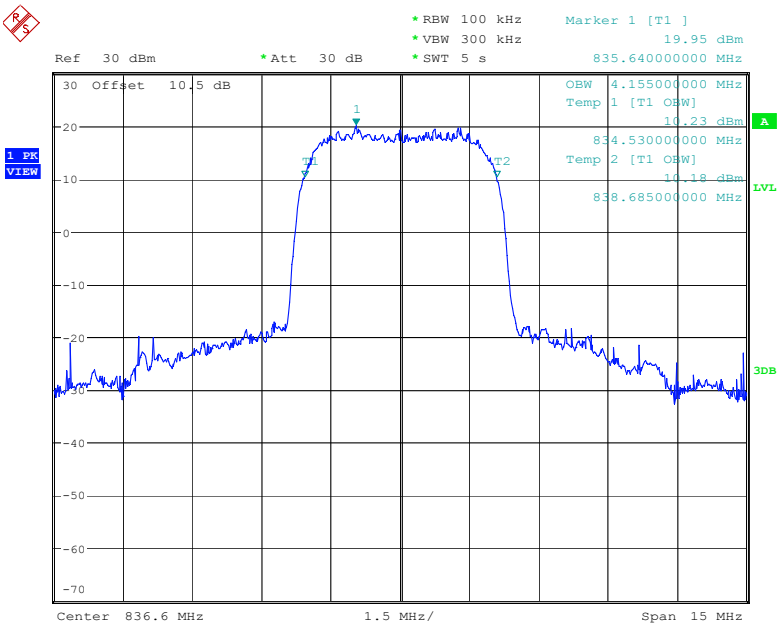
Date: 19.MAY.2023 22:16:32

26 dB Emission Bandwidth for HSUPA (QPSK) Mode, Middle channel



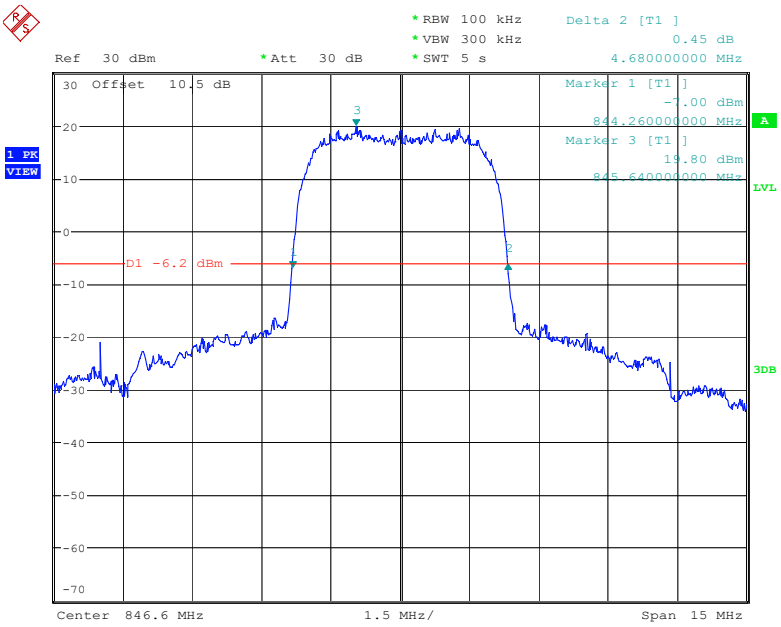
Date: 19.MAY.2023 22:21:59

99% Occupied Bandwidth for HSUPA (QPSK) Mode, Middle channel



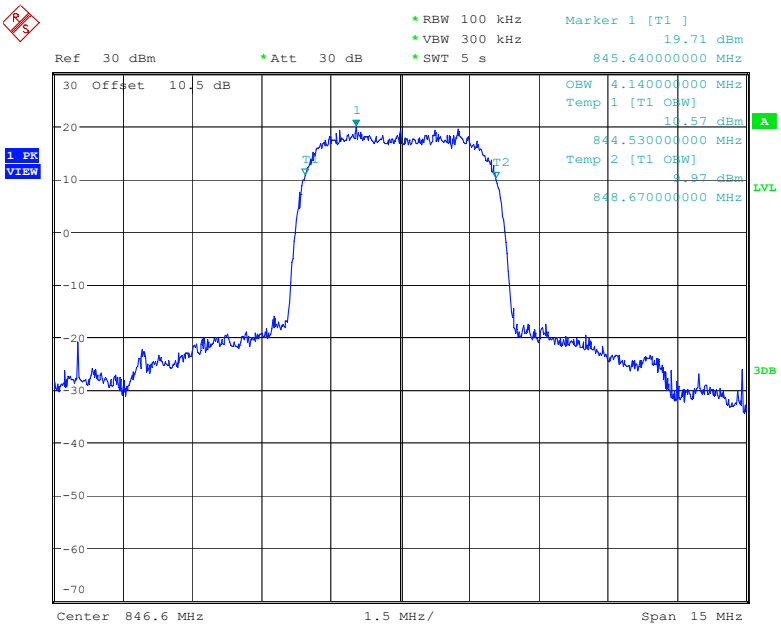
Date: 19.MAY.2023 22:21:14

26 dB Emission Bandwidth for HSUPA (QPSK) Mode, High channel



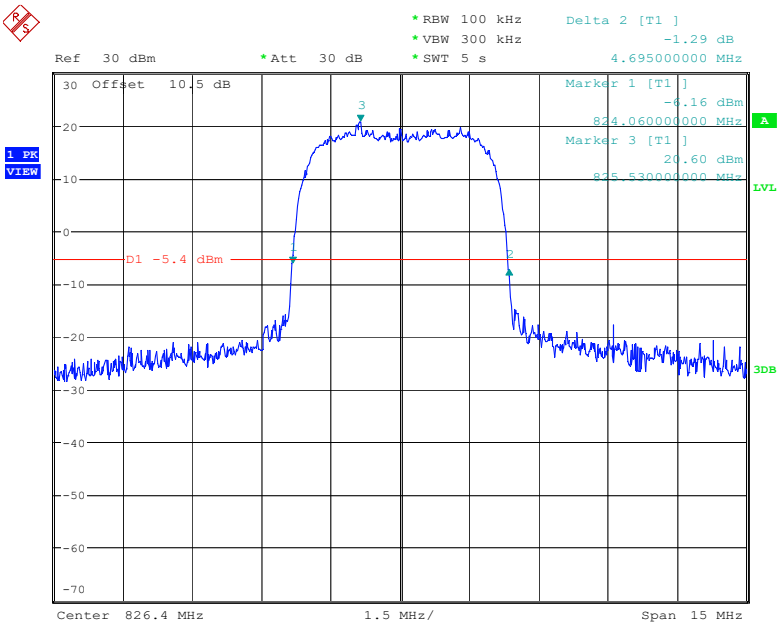
Date: 19.MAY.2023 22:25:12

99% Occupied Bandwidth for HSUPA (QPSK) Mode, High channel



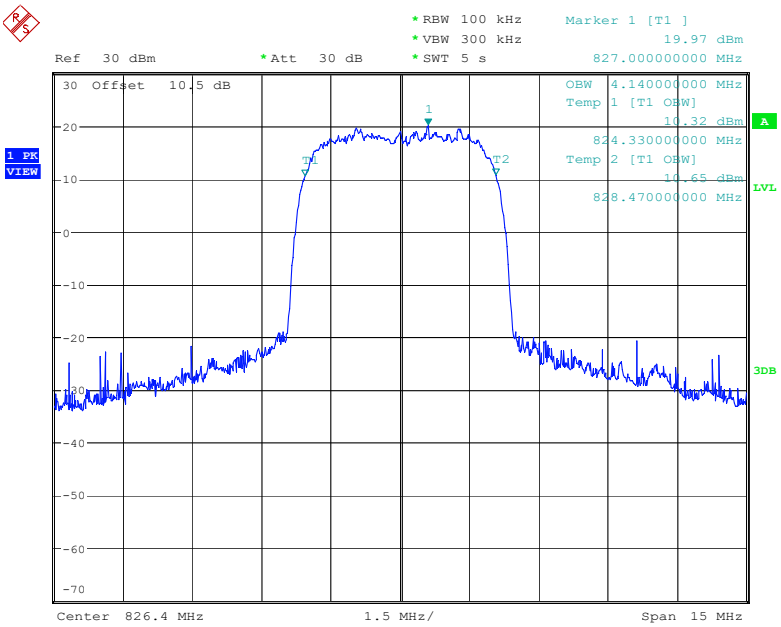
Date: 19.MAY.2023 22:24:30

26 dB Emission Bandwidth for HSDPA (16QAM) Mode, Low channel



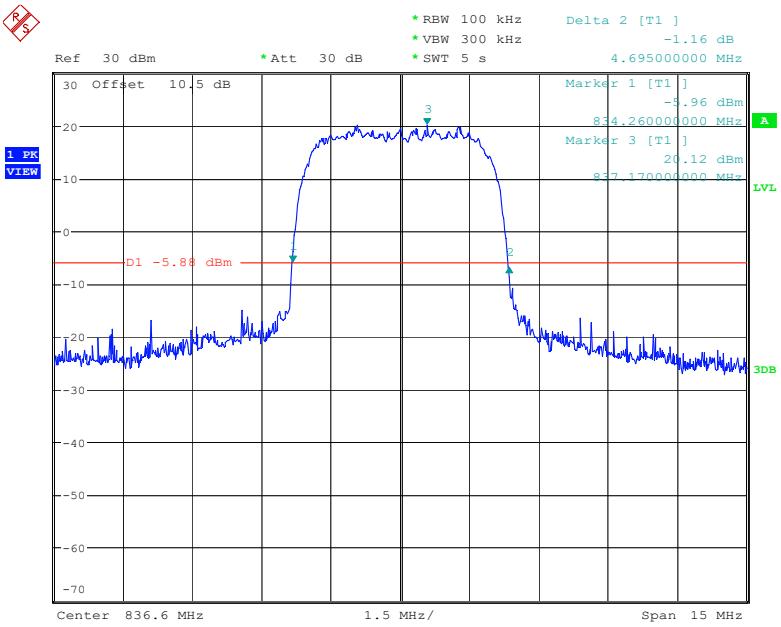
Date: 19.MAY.2023 22:12:17

99% Occupied Bandwidth for HSDPA (16QAM) Mode, Low channel



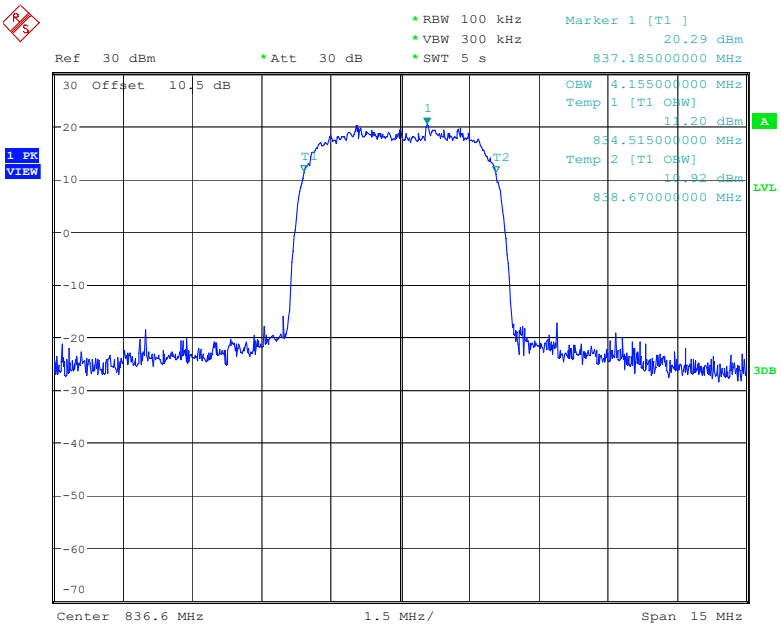
Date: 19.MAY.2023 22:11:05

26 dB Emission Bandwidth for HSDPA (16QAM) Mode, Middle channel



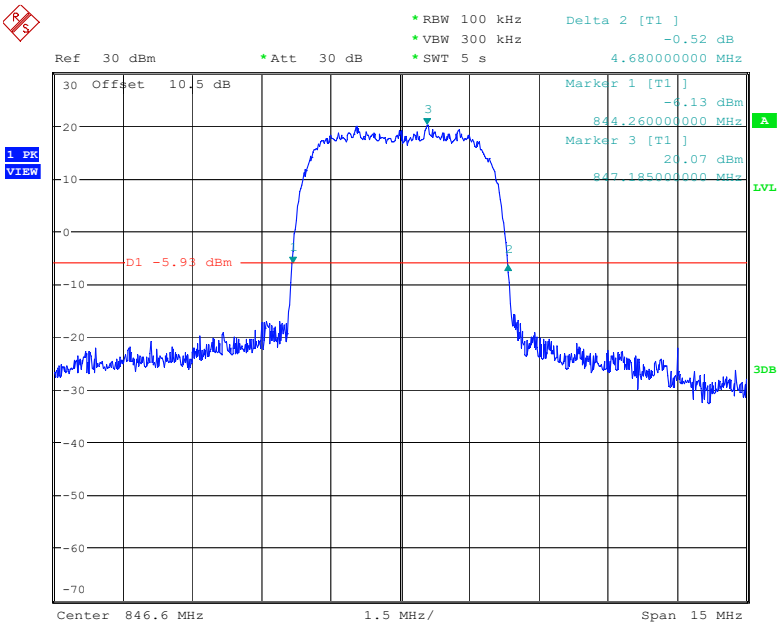
Date: 19.MAY.2023 22:04:36

99% Occupied Bandwidth for HSDPA (16QAM) Mode, Middle channel



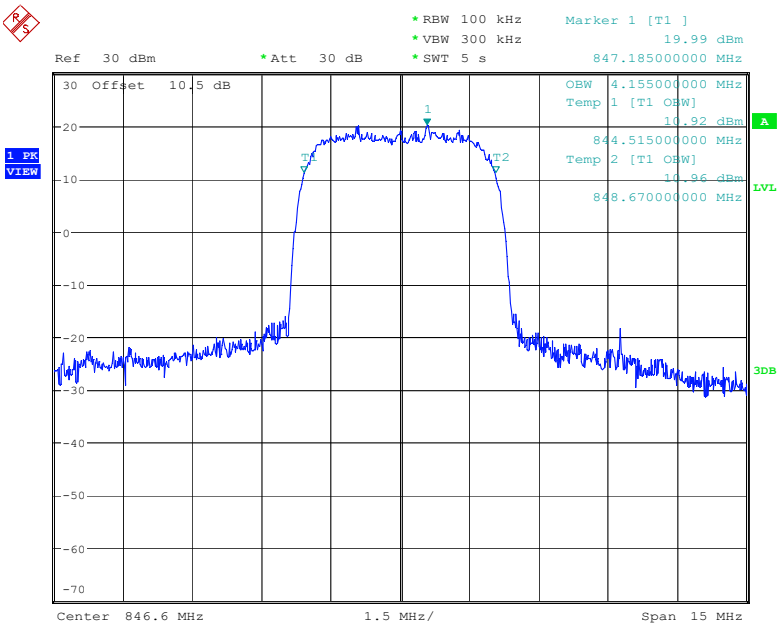
Date: 19.MAY.2023 22:03:08

26 dB Emission Bandwidth for HSDPA (16QAM) Mode, High channel



Date: 19.MAY.2023 21:59:44

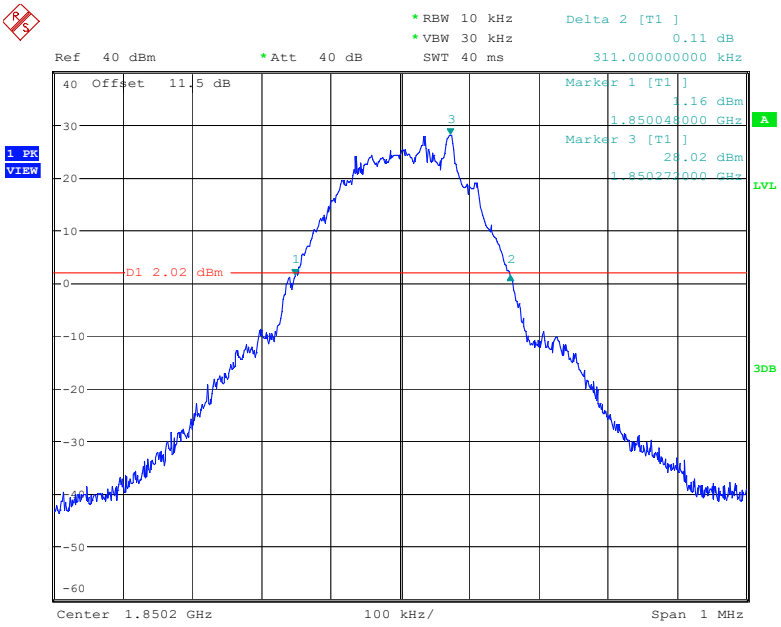
99% Occupied Bandwidth for HSDPA (16QAM) Mode, High channel



Date: 19.MAY.2023 21:58:48

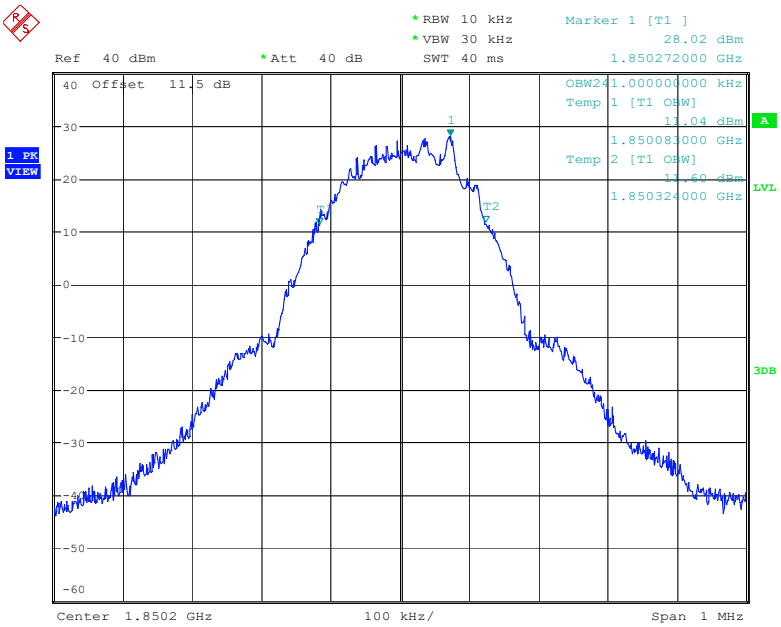
PCS Band

26 dB Emission Bandwidth for GSM(GMSK) Mode, Low channel



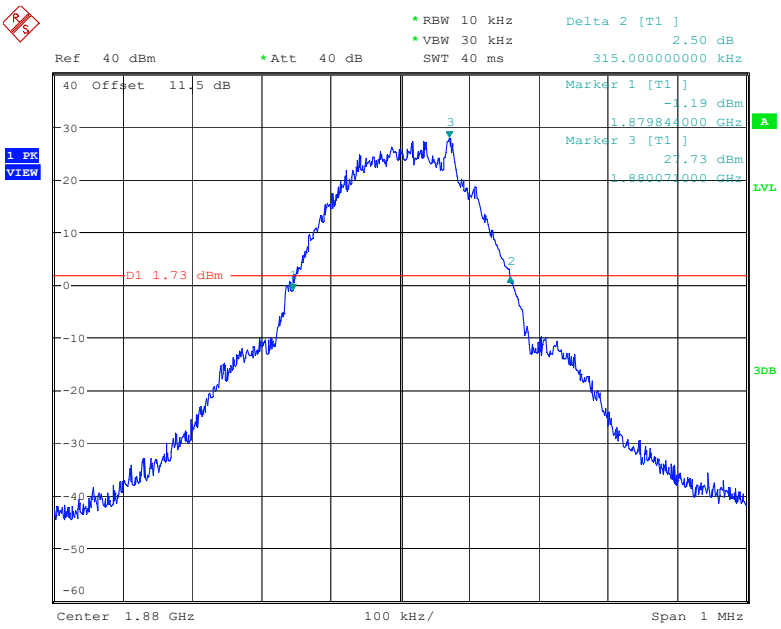
Date: 30.MAY.2023 22:34:16

99% Occupied Bandwidth for GSM(GMSK) Mode, Low channel



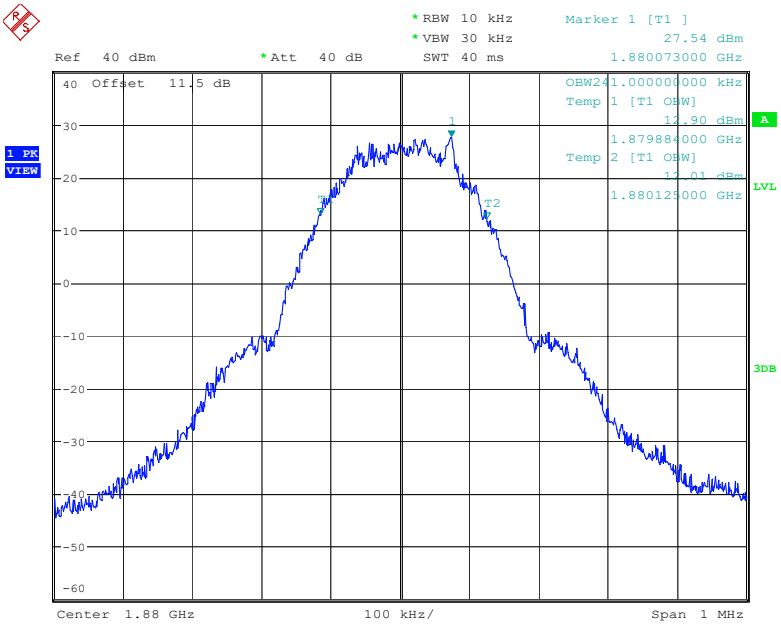
Date: 30.MAY.2023 22:33:34

26 dB Emission Bandwidth for GSM(GMSK) Mode, Middle channel



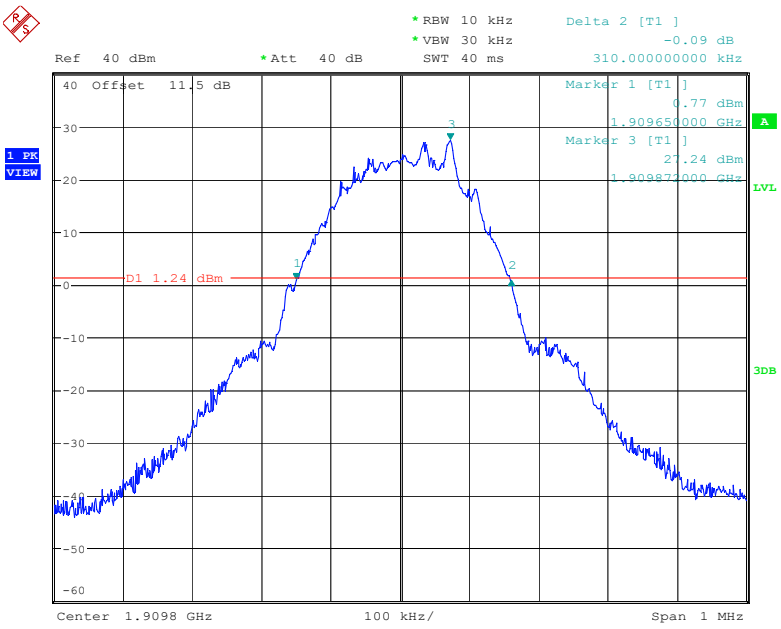
Date: 30.MAY.2023 22:27:56

99% Occupied Bandwidth for GSM(GMSK) Mode, Middle channel



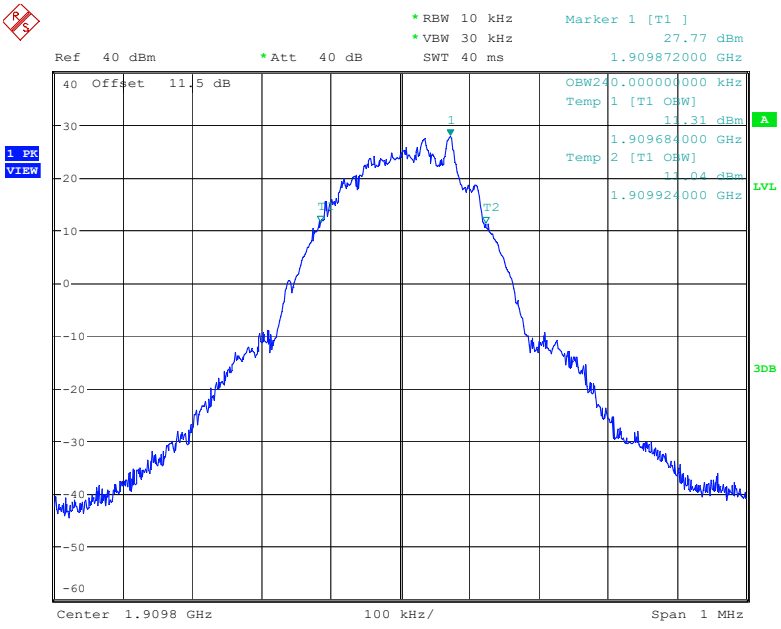
Date: 30.MAY.2023 22:27:24

26 dB Emission Bandwidth for GSM(GMSK) Mode, High channel



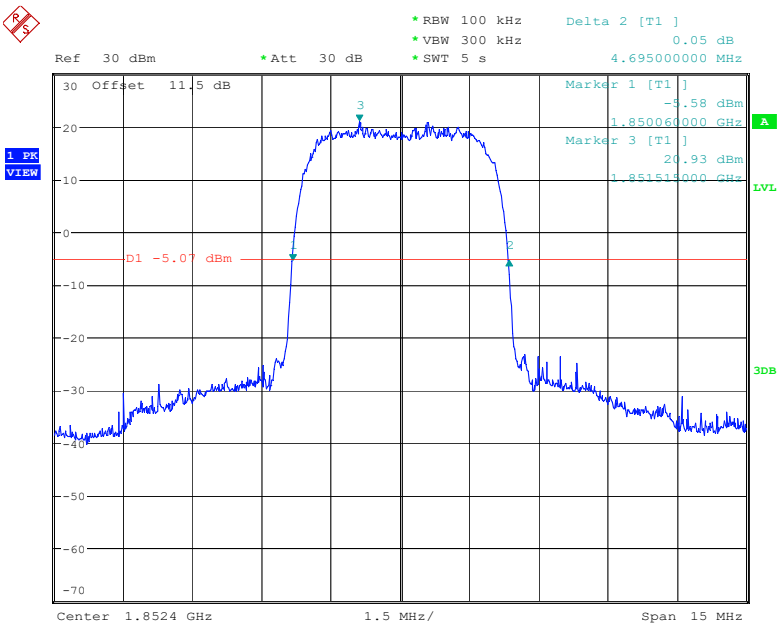
Date: 30.MAY.2023 22:41:55

99% Occupied Bandwidth for GSM(GMSK) Mode, High channel



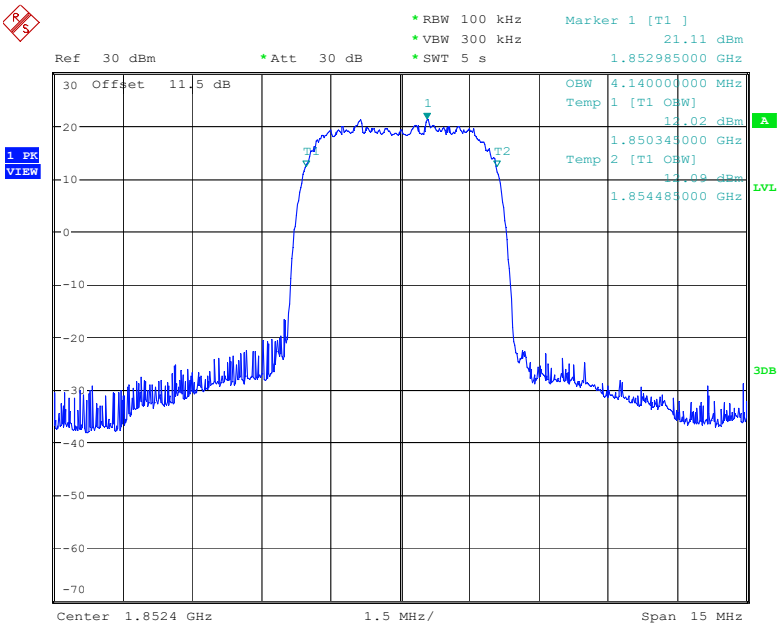
Date: 30.MAY.2023 22:41:14

26 dB Emission Bandwidth for RMC (BPSK) Mode, Low channel



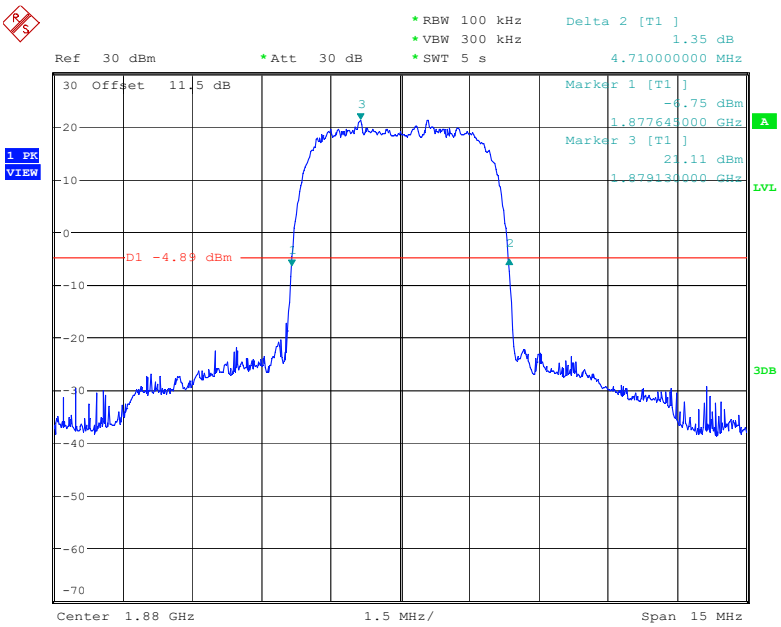
Date: 19.MAY.2023 23:11:25

99% Occupied Bandwidth for RMC (BPSK) Mode, Low channel



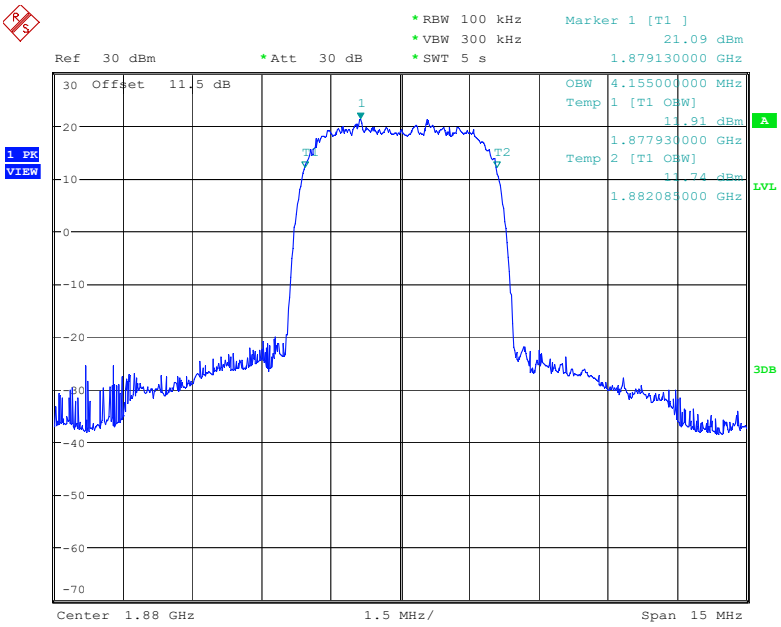
Date: 19.MAY.2023 23:10:58

26 dB Emission Bandwidth for RMC (BPSK) Mode, Middle channel



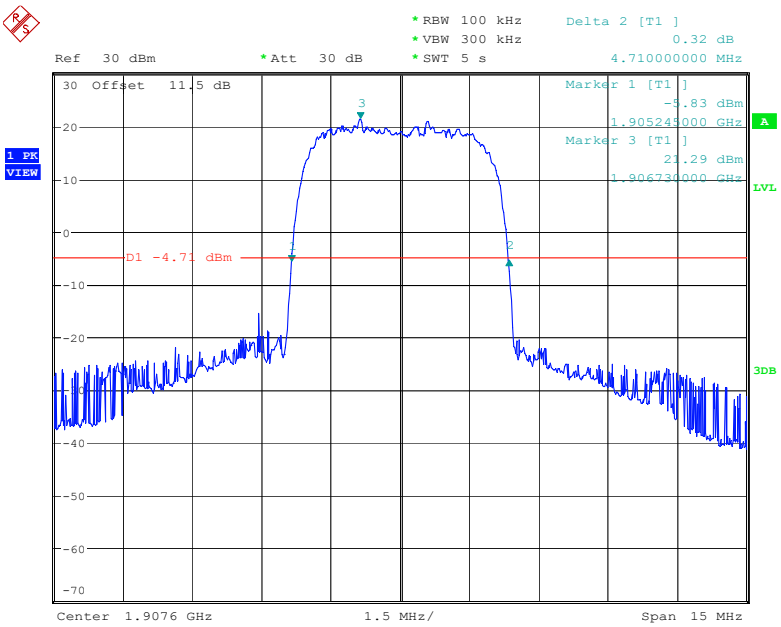
Date: 19.MAY.2023 23:03:58

99% Occupied Bandwidth for RMC (BPSK) Mode, Middle channel



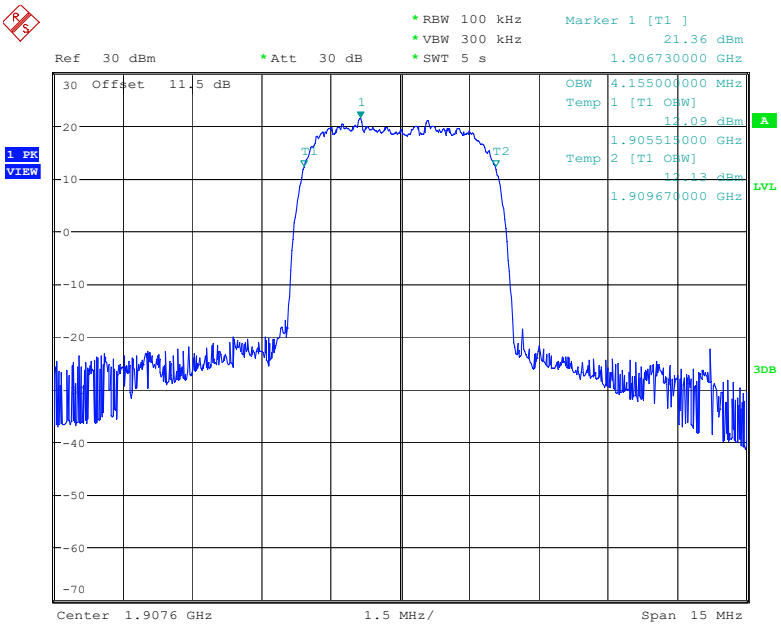
Date: 19.MAY.2023 23:02:47

26 dB Emission Bandwidth for RMC (BPSK) Mode, High channel



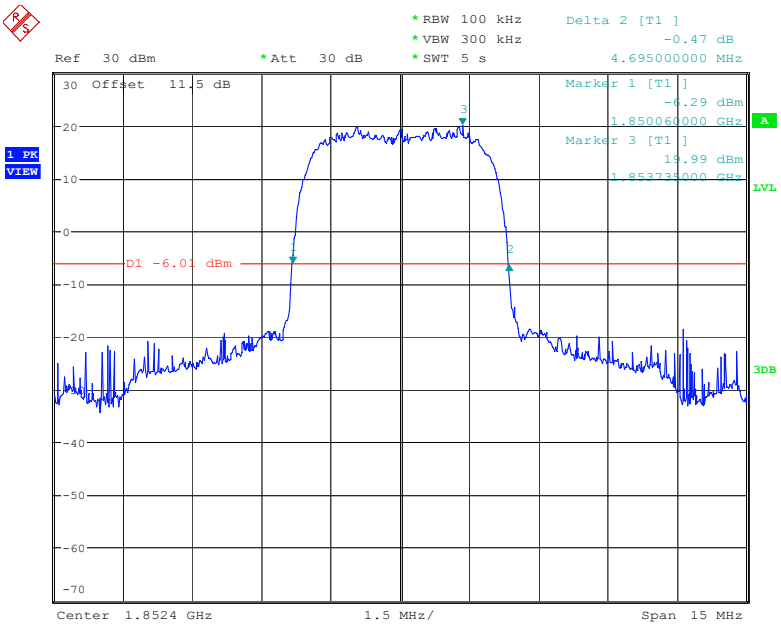
Date: 19.MAY.2023 23:24:13

99% Occupied Bandwidth for RMC (BPSK) Mode, High channel



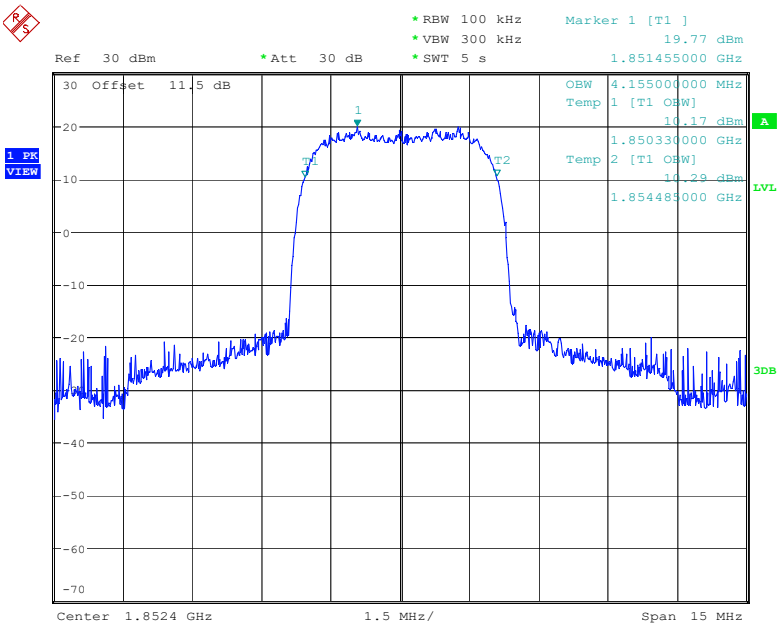
Date: 19.MAY.2023 23:19:58

26 dB Emission Bandwidth for HSUPA (QPSK) Mode, Low channel



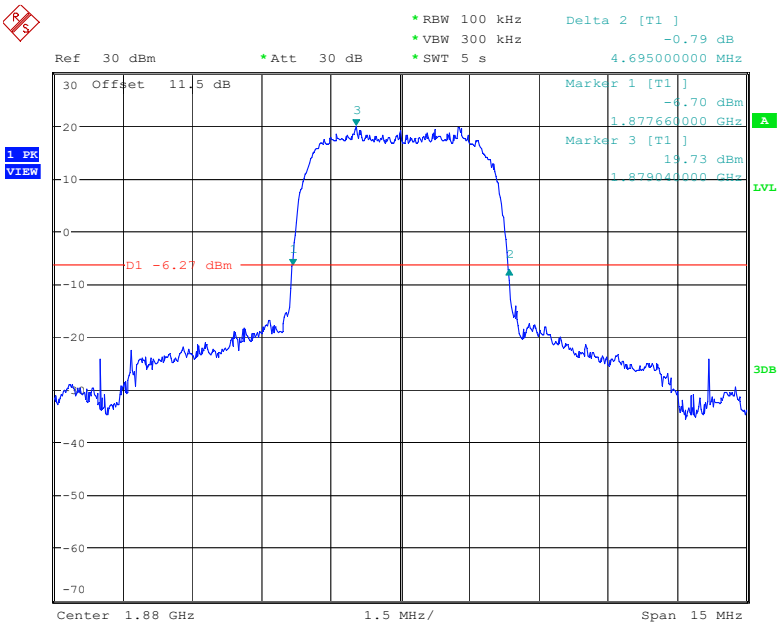
Date: 19.MAY.2023 23:52:06

99% Occupied Bandwidth for HSUPA (QPSK) Mode, Low channel



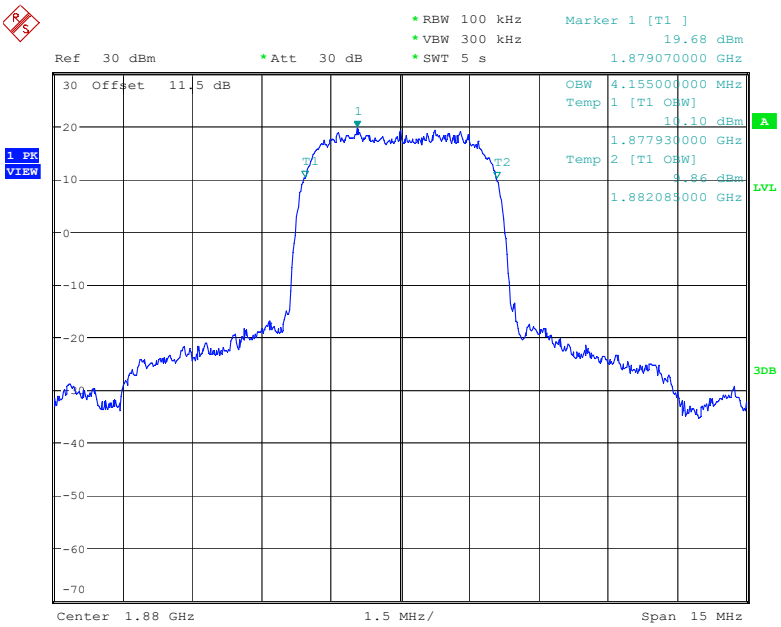
Date: 19.MAY.2023 23:50:43

26 dB Emission Bandwidth for HSUPA (QPSK) Mode, Middle channel



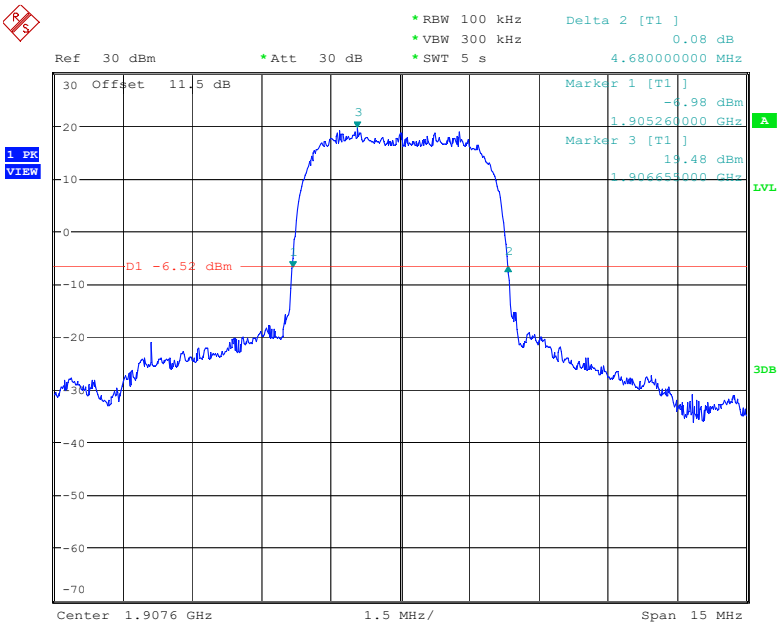
Date: 19.MAY.2023 23:55:40

99% Occupied Bandwidth for HSUPA (QPSK) Mode, Middle channel



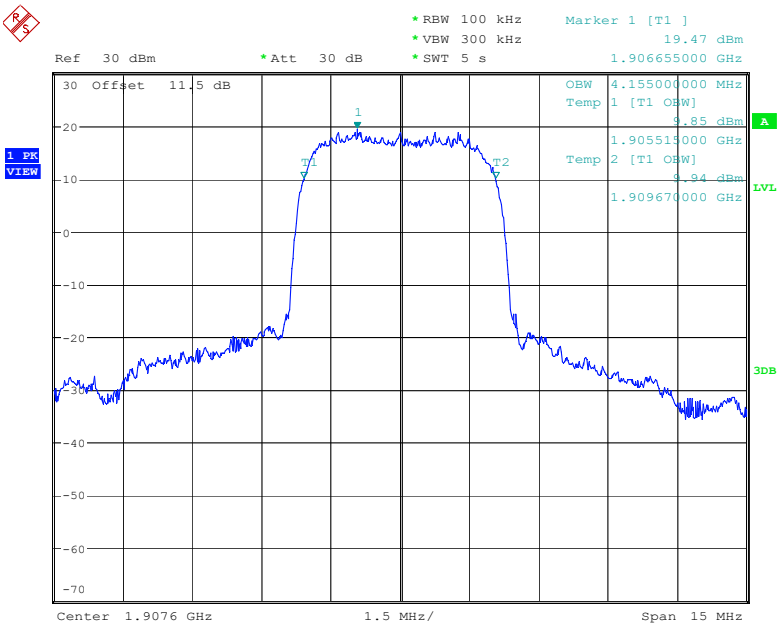
Date: 19.MAY.2023 23:54:59

26 dB Emission Bandwidth for HSUPA (QPSK) Mode, High channel



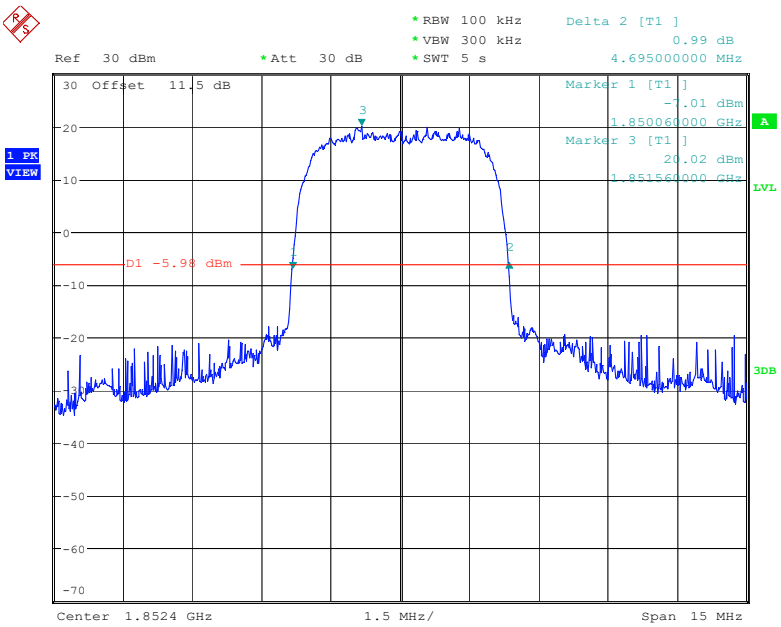
Date: 19.MAY.2023 23:59:01

99% Occupied Bandwidth for HSUPA (QPSK) Mode, High channel



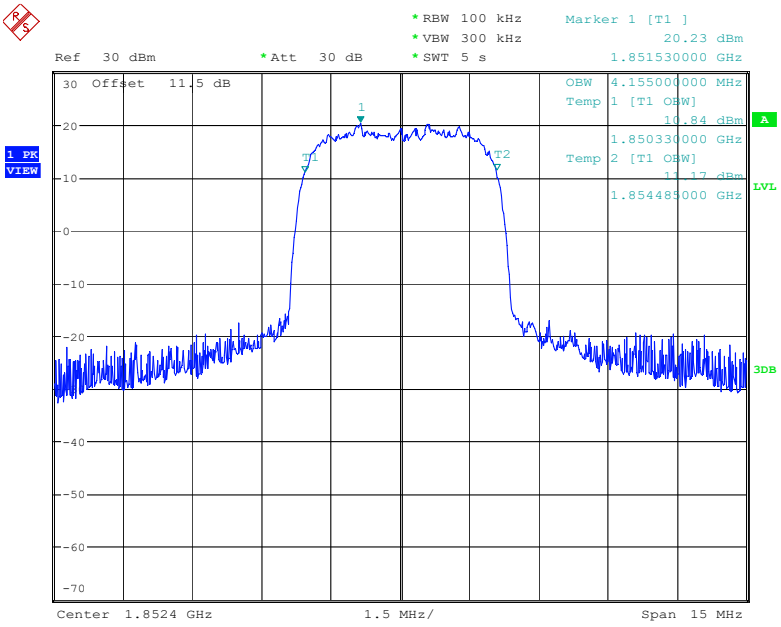
Date: 19.MAY.2023 23:58:20

26 dB Emission Bandwidth for HSDPA (16QAM) Mode, Low channel



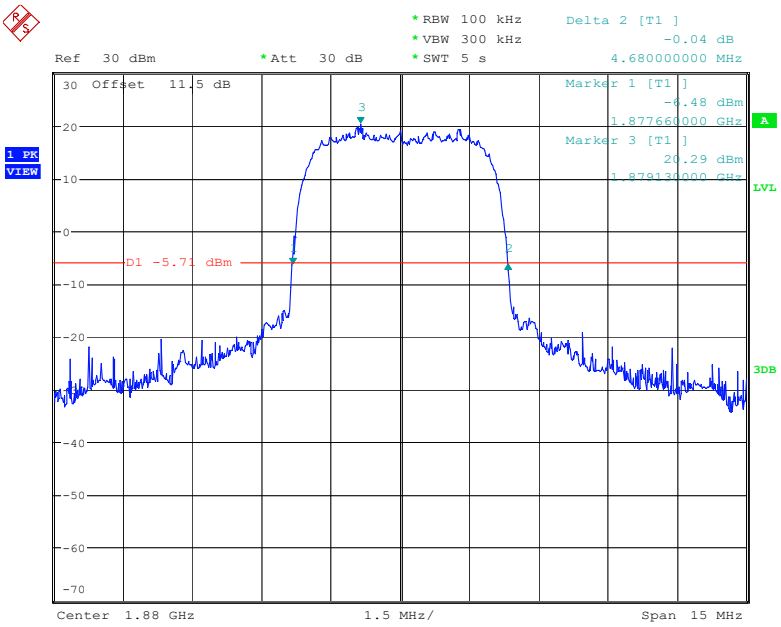
Date: 19.MAY.2023 23:45:28

99% Occupied Bandwidth for HSDPA (16QAM) Mode, Low channel



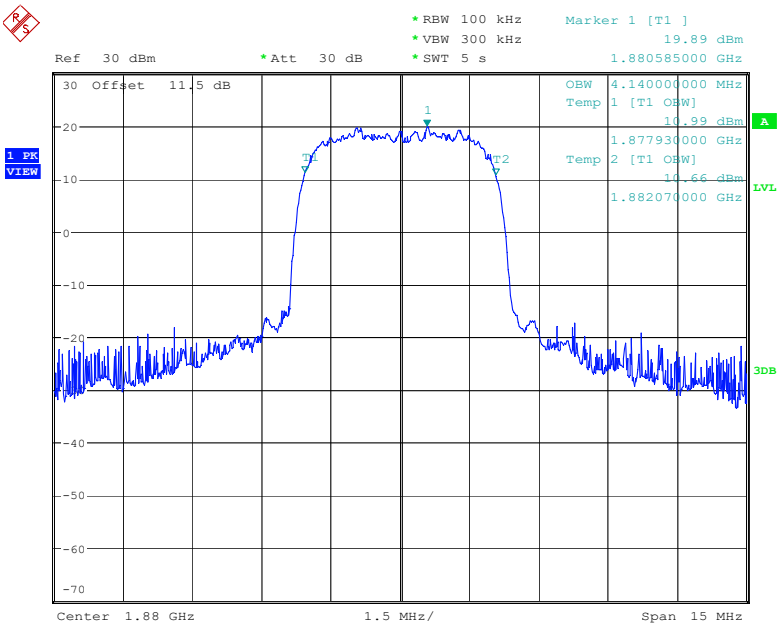
Date: 19.MAY.2023 23:44:24

26 dB Emission Bandwidth for HSDPA (16QAM) Mode, Middle channel



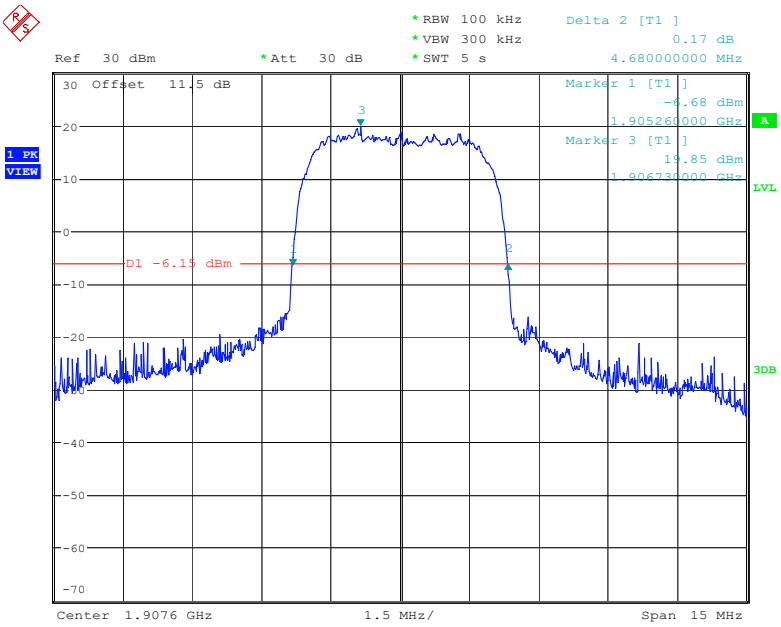
Date: 19.MAY.2023 23:38:40

99% Occupied Bandwidth for HSDPA (16QAM) Mode, Middle channel



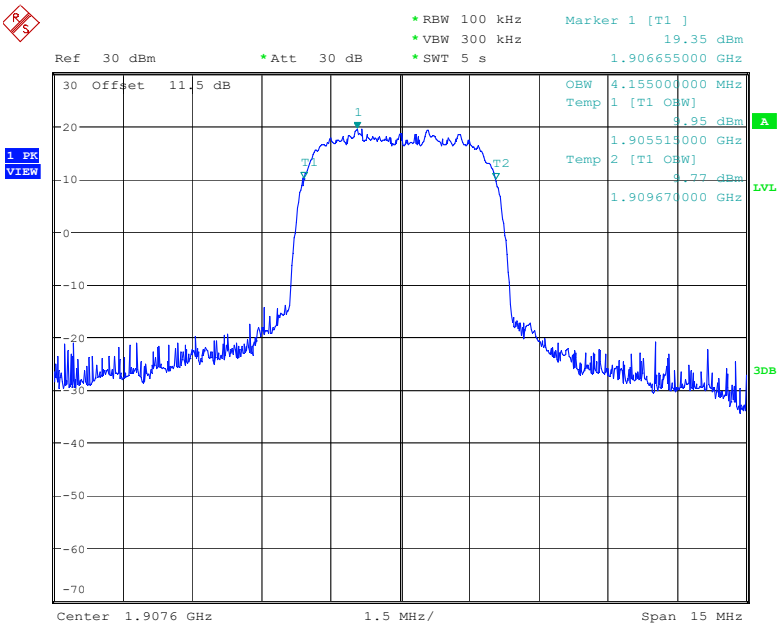
Date: 19.MAY.2023 23:37:41

26 dB Emission Bandwidth for HSDPA (16QAM) Mode, High channel



Date: 19.MAY.2023 23:31:53

99% Occupied Bandwidth for HSDPA (16QAM) Mode, High channel



Date: 19.MAY.2023 23:30:19

LTE Band 2:

Bandwidth	Modulation	Low channel		Middle channel		High channel	
		OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)
1.4 MHz	QPSK	1.104	1.266	1.11	1.26	1.098	1.260
	16QAM	1.098	1.254	1.104	1.260	1.110	1.26
3 MHz	QPSK	2.700	2.988	2.700	3.012	2.700	2.988
	16QAM	2.700	3.012	2.700	3.024	2.700	3.024
5 MHz	QPSK	4.520	5.020	4.520	4.980	4.520	5.000
	16QAM	4.540	5.020	4.540	5.000	4.520	5.020
10 MHz	QPSK	9.000	9.760	8.960	9.800	8.960	9.720
	16QAM	9.000	9.800	8.960	9.800	8.960	9.720
15 MHz	QPSK	13.560	14.940	13.500	15.200	13.500	15.000
	16QAM	13.560	15.120	13.560	15.120	13.500	15.060
20 MHz	QPSK	18.000	19.600	18.080	19.840	18.000	19.600
	16QAM	18.000	19.680	18.080	19.680	17.920	19.600

LTE Band 5:

Bandwidth	Modulation	Low channel		Middle channel		High channel	
		OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)
1.4 MHz	QPSK	1.110	1.254	1.104	1.254	1.104	1.278
	16QAM	1.110	1.254	1.116	1.260	1.104	1.254
3 MHz	QPSK	2.700	3.000	2.700	3.024	2.700	3.012
	16QAM	2.688	3.000	2.700	3.036	2.700	3.024
5 MHz	QPSK	4.540	5.000	4.520	4.960	4.520	5.000
	16QAM	4.540	5.020	4.520	5.020	4.520	5.020
10 MHz	QPSK	8.960	9.760	8.960	9.760	8.960	9.760
	16QAM	9.000	9.760	8.960	9.920	8.960	9.720

LTE Band 7:

Bandwidth	Modulation	Low channel		Middle channel		High channel	
		OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)
5 MHz	QPSK	4.520	5.000	4.520	5.060	4.540	5.020
	16QAM	4.540	5.040	4.540	5.060	4.540	5.000
10 MHz	QPSK	9.000	9.800	9.000	9.840	9.000	9.840
	16QAM	9.000	9.840	9.000	9.840	8.960	9.840
15 MHz	QPSK	13.560	15.060	13.560	15.120	13.560	15.060
	16QAM	13.620	15.120	13.560	15.120	13.620	15.180
20 MHz	QPSK	18.000	19.600	18.000	19.840	18.000	19.520
	16QAM	18.000	19.920	18.000	19.760	18.000	19.760

LTE Band 12:

Bandwidth	Modulation	Low channel		Middle channel		High channel	
		OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)
1.4 MHz	QPSK	1.098	1.236	1.104	1.254	1.110	1.260
	16QAM	1.104	1.248	1.104	1.254	1.116	1.272
3 MHz	QPSK	2.700	3.000	2.700	3.012	2.712	3.000
	16QAM	2.700	3.000	2.700	3.024	2.700	3.024
5 MHz	QPSK	4.520	4.980	4.500	4.960	4.520	5.000
	16QAM	4.520	4.980	4.560	5.020	4.520	4.980
10 MHz	QPSK	8.960	9.640	9.000	9.800	9.000	9.760
	16QAM	8.960	9.800	9.000	9.840	8.960	9.760

LTE Band 41:

Bandwidth	Modulation	Low channel		Middle channel		High channel	
		OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)
5 MHz	QPSK	4.540	4.980	4.520	5.020	4.500	5.000
	16QAM	4.520	5.040	4.500	5.060	4.520	4.980
10 MHz	QPSK	9.000	9.800	9.000	9.720	9.000	9.800
	16QAM	8.960	9.720	9.000	9.880	9.000	9.760
15 MHz	QPSK	13.560	14.880	13.560	15.240	13.560	15.000
	16QAM	13.620	15.720	13.560	14.880	13.500	14.120
20 MHz	QPSK	18.000	19.440	18.000	19.760	18.000	19.680
	16QAM	17.920	19.600	18.000	19.600	18.000	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

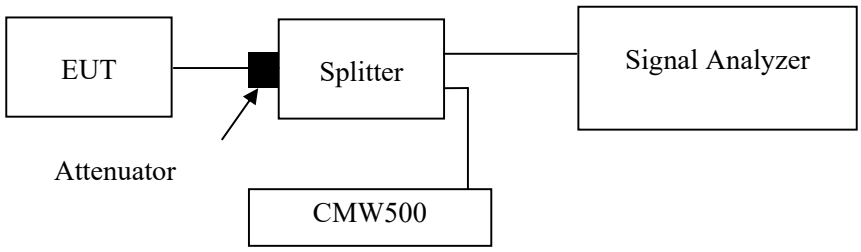
FCC §2.1051, §22.917(a) & §24.238(a)&§27.53.

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 10^{th} harmonic.



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

Test Data

Environmental Conditions

Temperature:	26~28.8℃
Relative Humidity:	46.8~56%
ATM Pressure:	101.0 kPa

The testing was performed by Jacob Huang from 2023-05-19 to 2023-05-31.

EUT operation mode: Transmitting

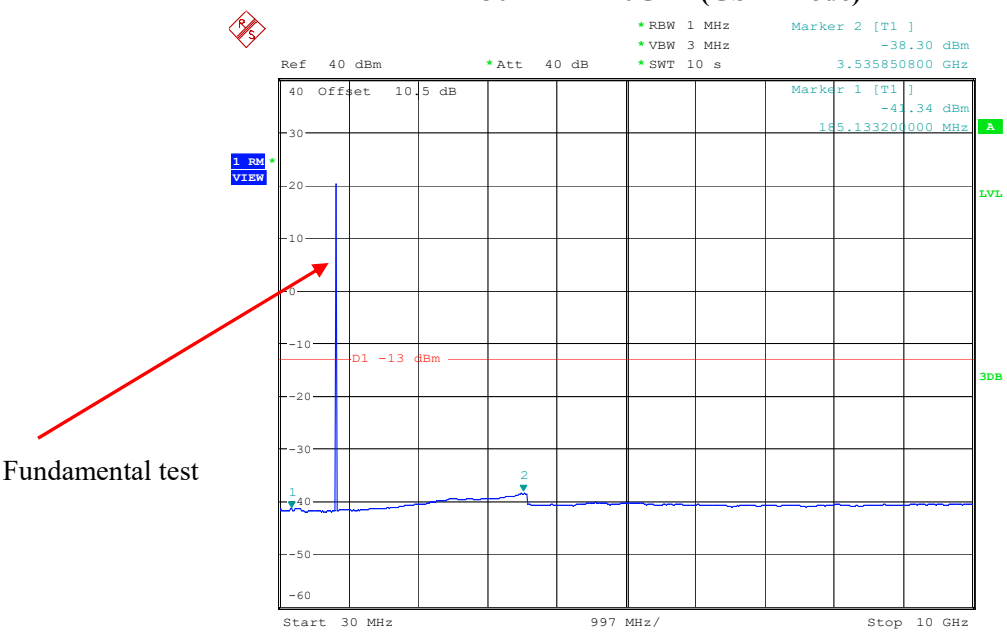
Test result: Pass

Please refer to the following plots.

Cellular Band

Low Channel:

30 MHz – 10GHz (GSM Mode)

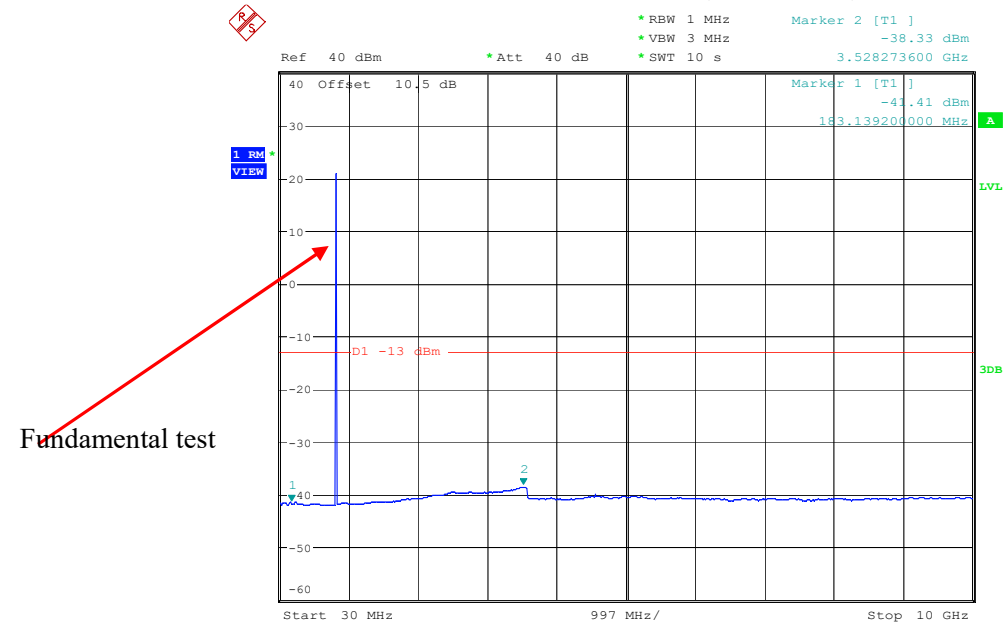


Fundamental test

Date: 31.MAY.2023 23:22:32

Middle Channel:

30 MHz – 10GHz (GSM Mode)

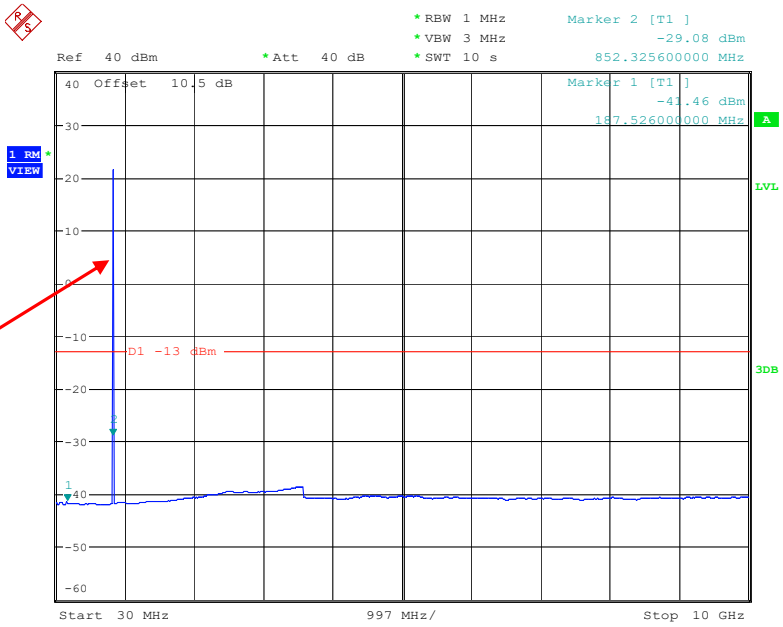


Fundamental test

Date: 30.MAY.2023 21:57:47

High Channel:

30 MHz – 10GHz (GSM Mode)

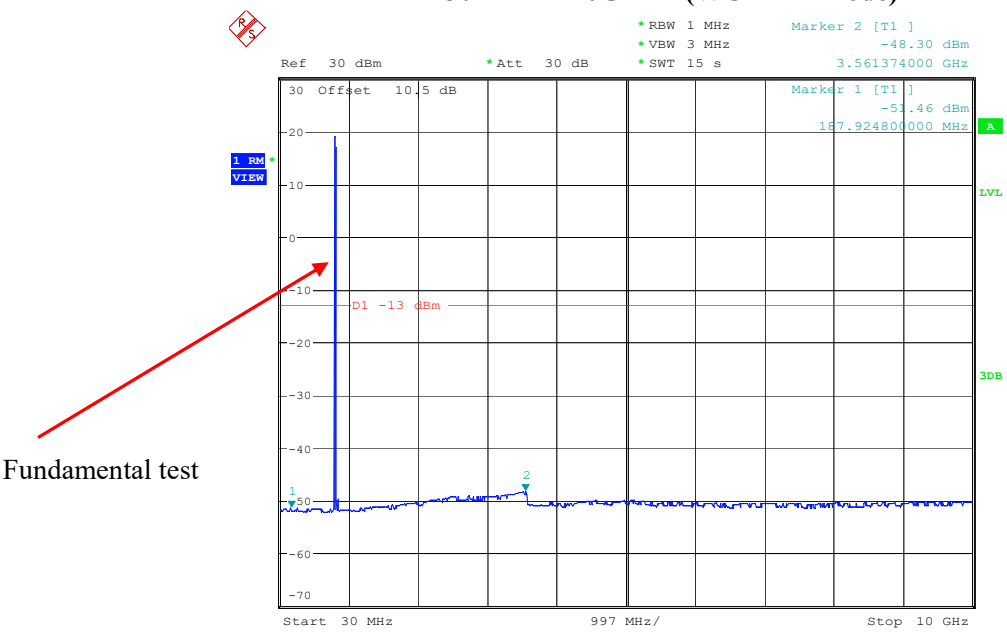


Fundamental test

Date: 30.MAY.2023 22:19:31

Low Channel:

30 MHz – 10GHz (WCDMA Mode)

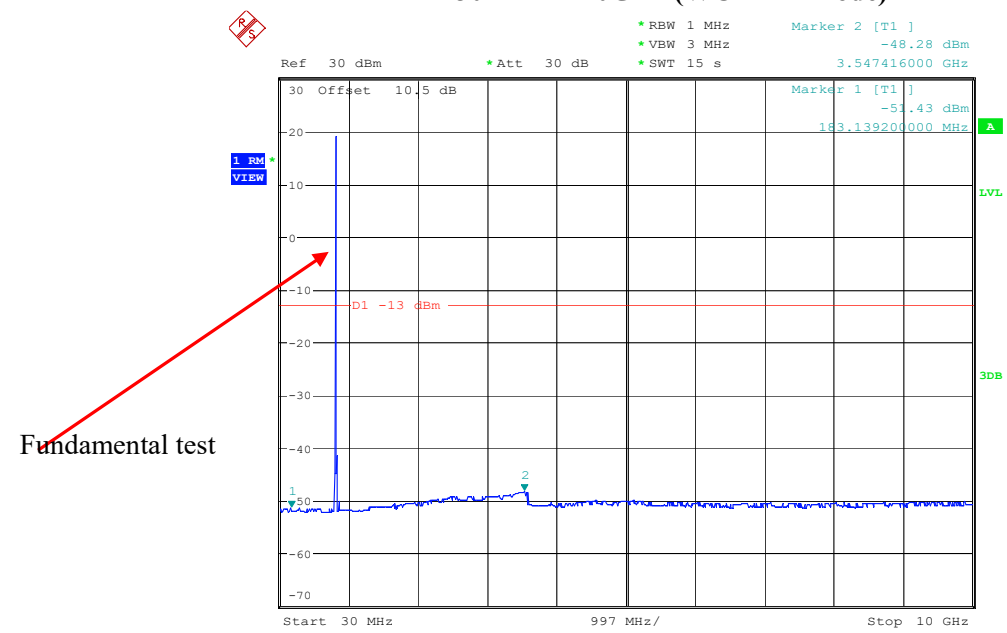


Fundamental test

Date: 19.MAY.2023 21:38:19

Middle Channel:

30 MHz – 10GHz (WCDMA Mode)

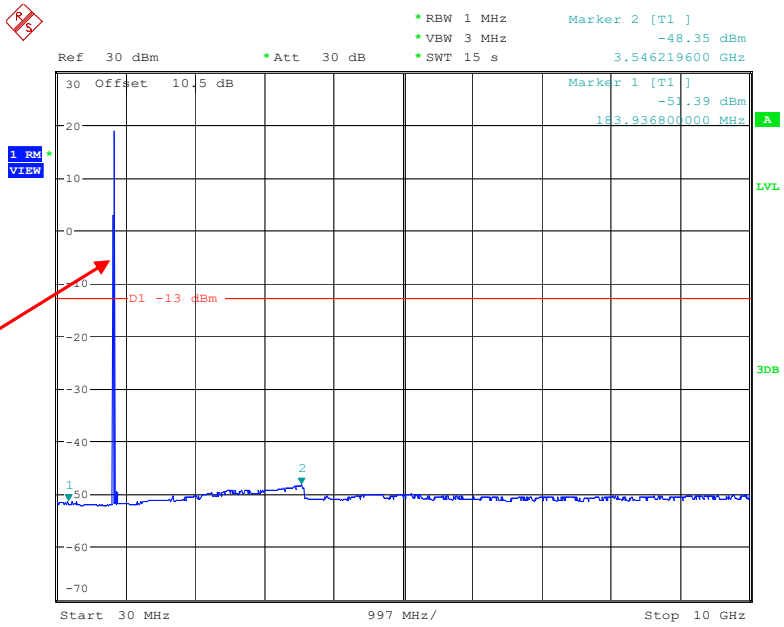


Fundamental test

Date: 19.MAY.2023 21:51:01

High Channel:

30 MHz – 10GHz RMC (WCDMA Mode)



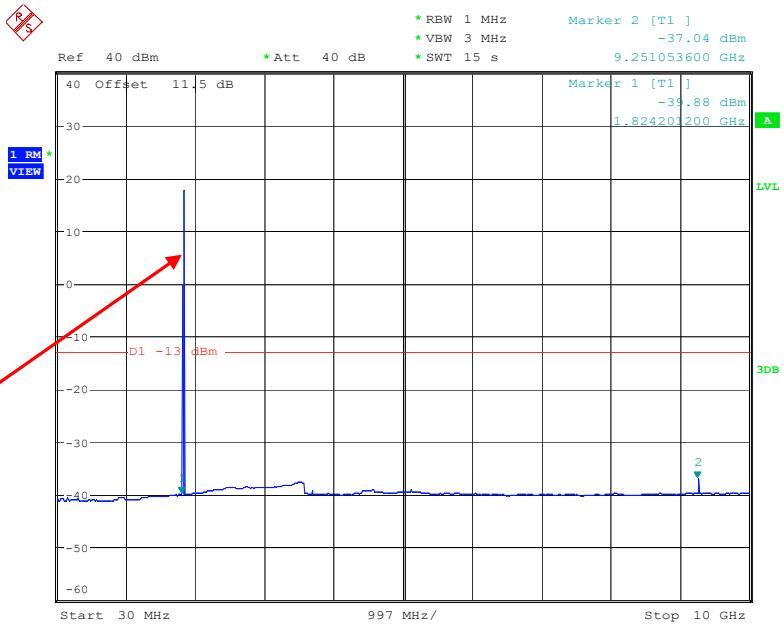
Fundamental test

Date: 19.MAY.2023 21:54:49

PCS Band

Low Channel:

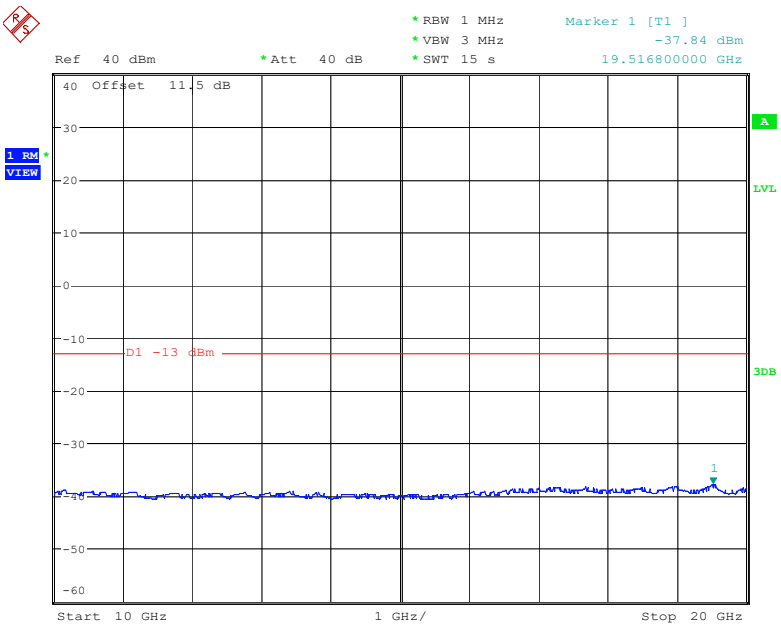
30 MHz – 10GHz (GSM Mode)



Fundamental test

Date: 31.MAY.2023 23:16:06

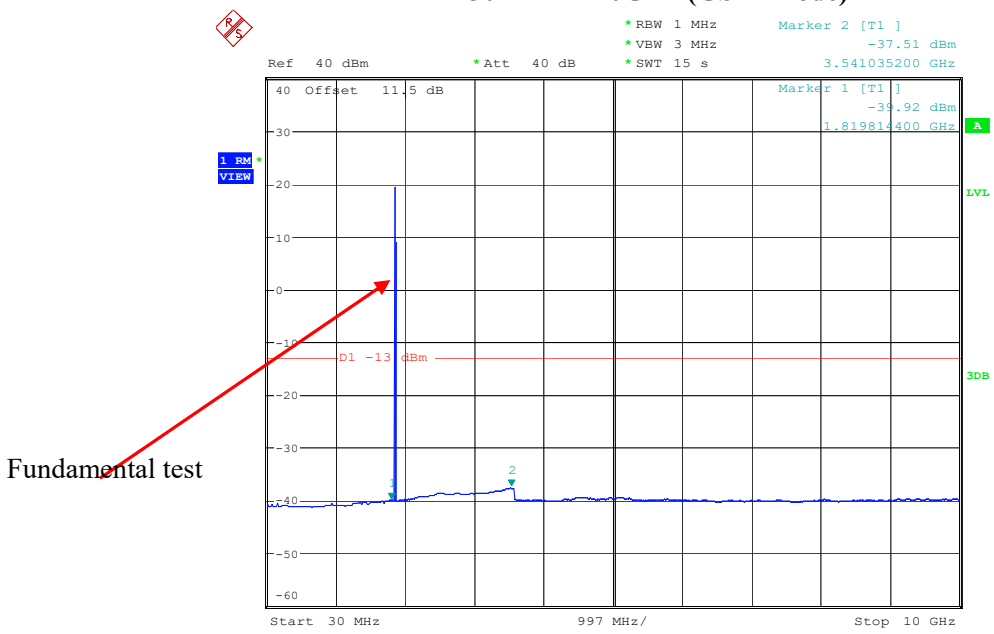
10 GHz – 20GHz (GSM Mode)



Date: 30.MAY.2023 22:39:11

Middle Channel:

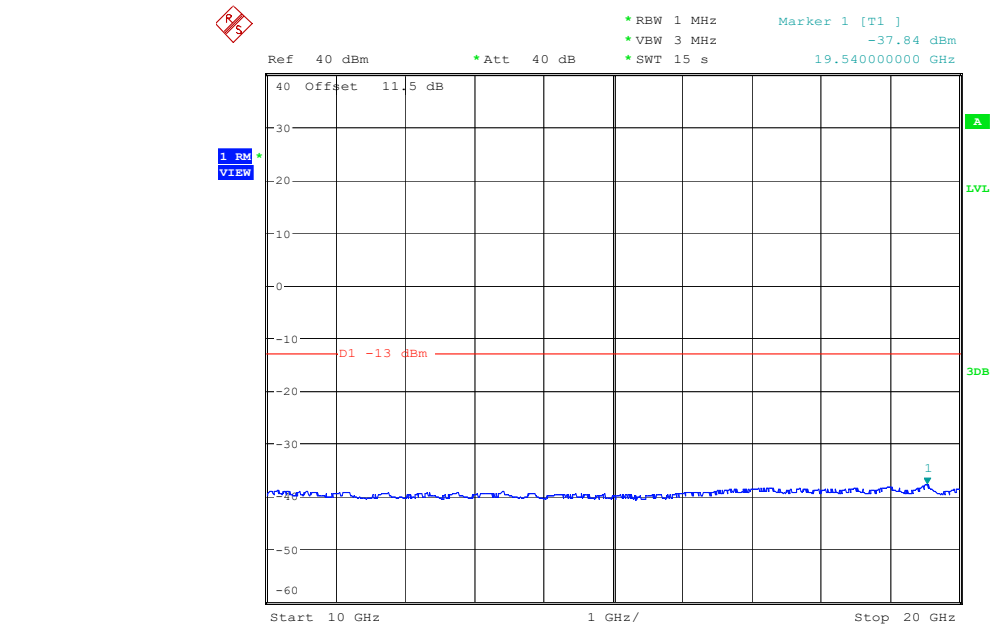
30 MHz – 10GHz (GSM Mode)



Fundamental test

Date: 30.MAY.2023 22:30:30

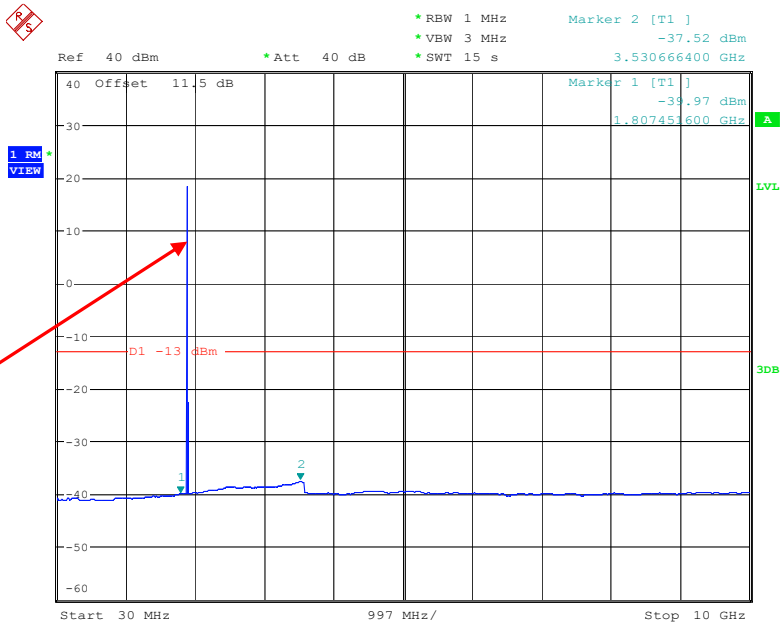
10 GHz – 20GHz (GSM Mode)



Date: 30.MAY.2023 22:31:18

High Channel:

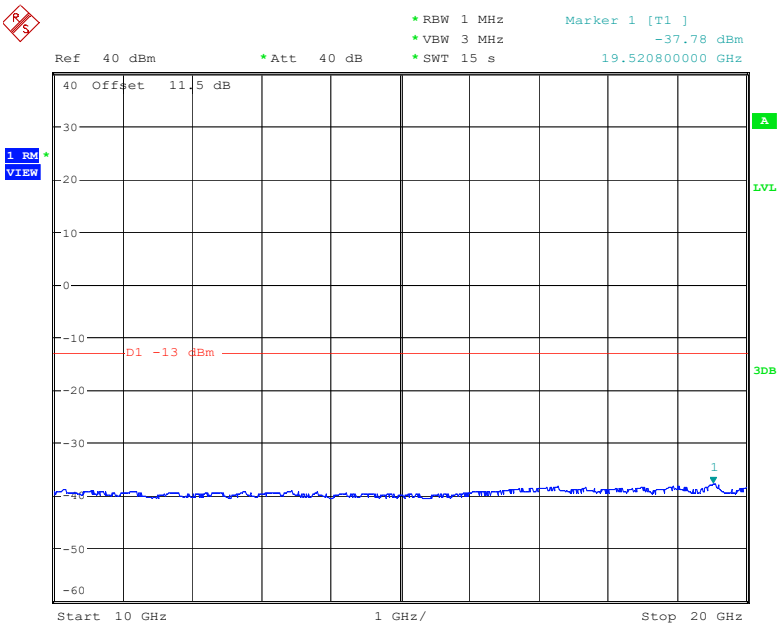
30 MHz – 10GHz (GSM Mode)



Fundamental test

Date: 30.MAY.2023 22:47:50

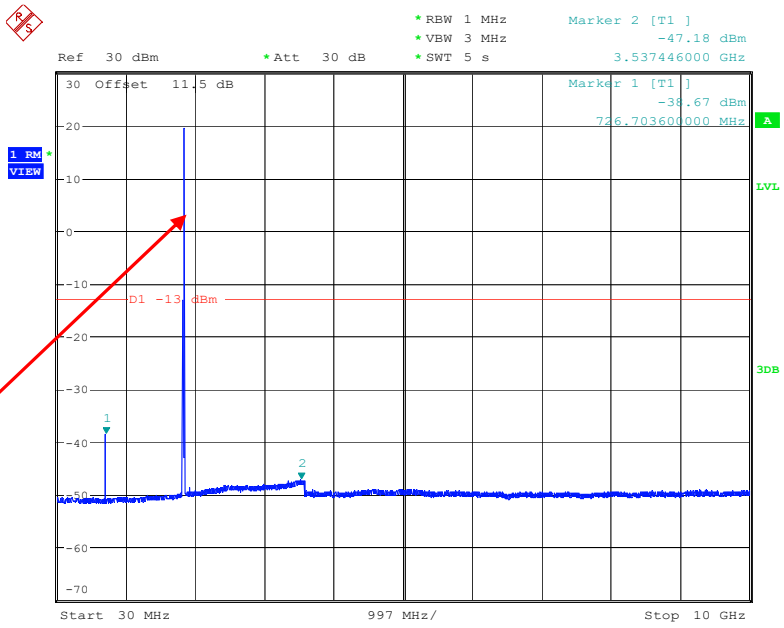
10 GHz – 20GHz (GSM Mode)



Date: 30.MAY.2023 22:48:38

Low Channel:

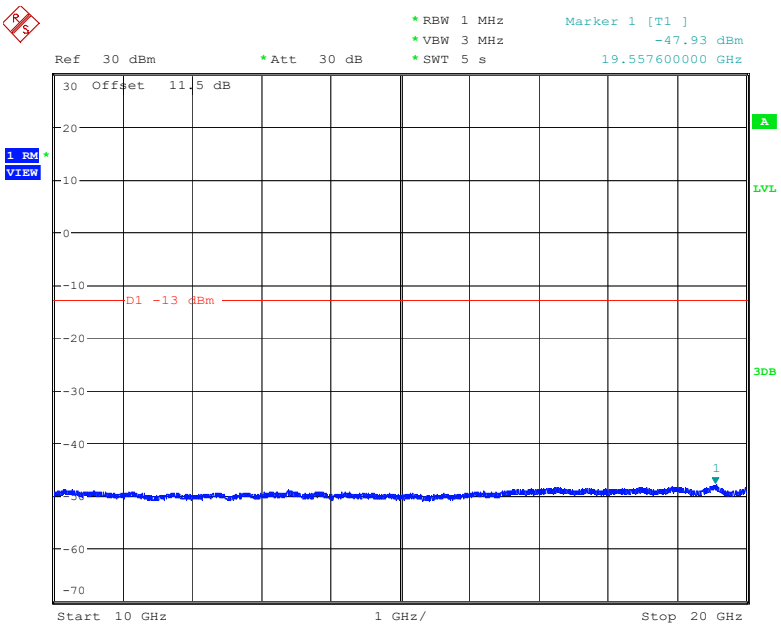
30 MHz – 10GHz (WCDMA Mode)



Fundamental test

Date: 19.MAY.2023 23:12:19

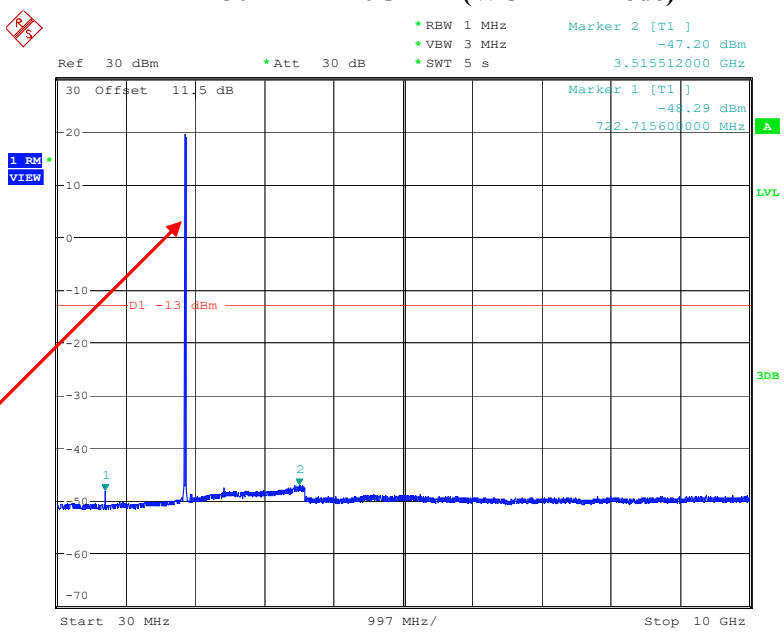
10 GHz – 20GHz (WCDMA Mode)



Date: 19.MAY.2023 23:12:47

Middle Channel:

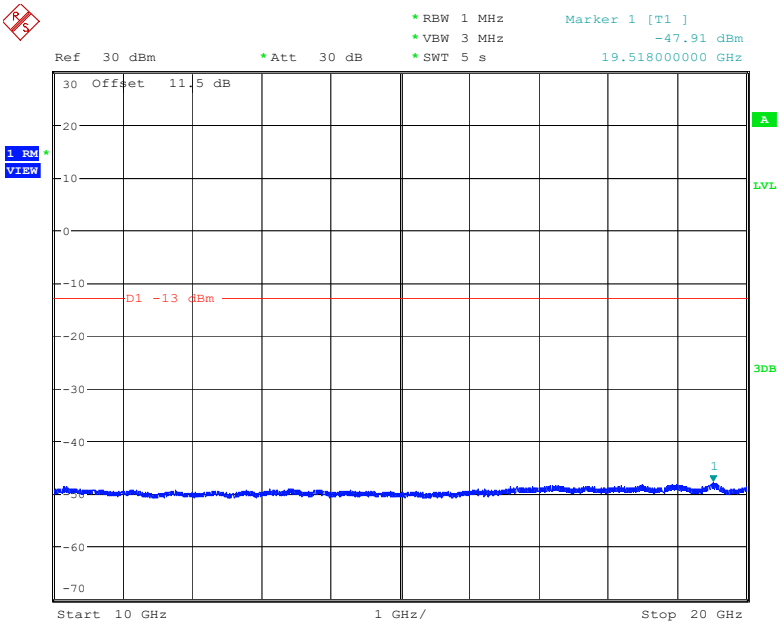
30 MHz – 10GHz (WCDMA Mode)



Fundamental test

Date: 19.MAY.2023 23:04:25

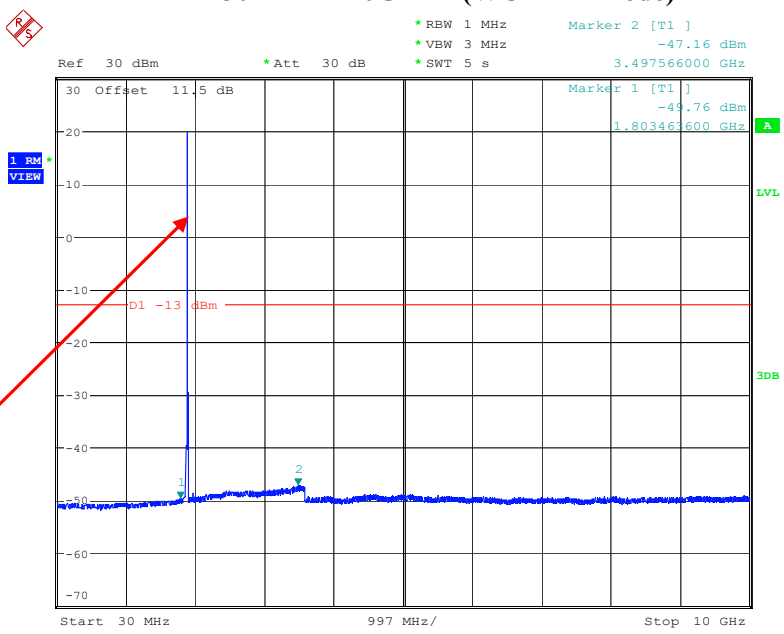
10 GHz – 20GHz (WCDMA Mode)



Date: 19.MAY.2023 23:04:54

High Channel:

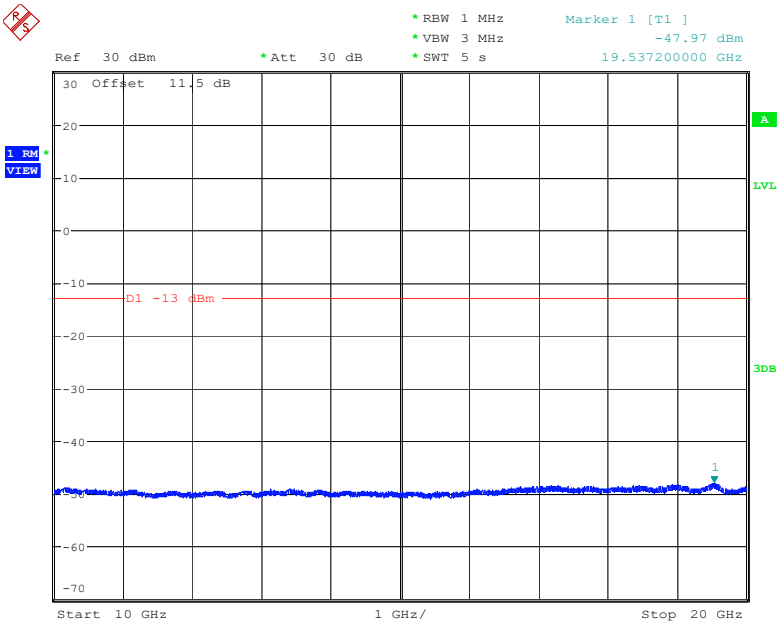
30 MHz – 10GHz (WCDMA Mode)



Fundamental test

Date: 19.MAY.2023 23:25:07

10 GHz – 20GHz (WCDMA Mode)



Date: 19.MAY.2023 23:25:53

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:	21.1~25.5 ℃
Relative Humidity:	42~50 %
ATM Pressure:	100.2~101.0 kPa

The testing was performed by Jimi Zheng from 2023-05-13 to 2023-05-15

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

Radiated Emission *(Scan with X-AXIS, Y-AXIS, Z-AXIS, the worst case was recorded)*

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
GSM850								
Test frequency range: 30MHz-10GHz								
Low channel								
1648.4	-50.70	82	1.5	H	3	-47.70	-13	-34.70
1648.4	-52.20	27	1.7	V	2.6	-49.60	-13	-36.60
2472.6	-49.60	93	2.4	H	7.1	-42.50	-13	-29.50
2472.6	-46.30	121	1.3	V	5.9	-40.40	-13	-27.40
3296.8	-45.60	330	1.4	H	6.7	-38.90	-13	-25.90
3296.8	-45.30	134	2	V	6.2	-39.10	-13	-26.10
Middle channel								
1673.2	-48.40	184	1.9	H	3.1	-45.30	-13	-32.30
1673.2	-50.30	332	1.1	V	2.5	-47.80	-13	-34.80
2509.8	-54.90	80	1.5	H	7.1	-47.80	-13	-34.80
2509.8	-51.60	251	2.3	V	5.4	-46.20	-13	-33.20
3346.4	-45.70	39	1.7	H	7.3	-38.40	-13	-25.40
3346.4	-44.00	111	2.3	V	5.4	-38.60	-13	-25.60
High channel								
1697.6	-47.80	2	1	H	3.2	-44.60	-13	-31.60
1697.6	-48.10	112	1.3	V	2.4	-45.70	-13	-32.70
2546.4	-53.00	212	2.2	H	6.9	-46.10	-13	-33.10
2546.4	-50.30	212	1.6	V	6.2	-44.10	-13	-31.10
3395.2	-43.80	266	1.5	H	5.9	-37.90	-13	-24.90
3395.2	-43.40	4	1.5	V	5.2	-38.20	-13	-25.20

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
GSM1900								
Test frequency range: 30MHz-20GHz								
Low channel								
3700.4	-44.80	320	2	H	8.2	-36.60	-13	-23.60
3700.4	-43.60	172	1.7	V	6.8	-36.80	-13	-23.80
5550.6	-50.70	175	1.8	H	9	-41.70	-13	-28.70
5550.6	-52.00	269	1.7	V	10	-42.00	-13	-29.00
Middle channel								
3760.0	-44.80	163	1.6	H	8.2	-36.60	-13	-23.60
3760.0	-44.70	202	2	V	7.7	-37.00	-13	-24.00
5640.0	-52.20	204	1.6	H	10.7	-41.50	-13	-28.50
5640.0	-51.70	287	2.2	V	9.8	-41.90	-13	-28.90
High channel								
3819.6	-43.70	289	2.2	H	8.1	-35.60	-13	-22.60
3819.6	-43.20	13	1.6	V	7.6	-35.60	-13	-22.60
5729.4	-51.80	105	2.4	H	11.4	-40.40	-13	-27.40
5729.4	-50.50	58	1.7	V	10	-40.50	-13	-27.50

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
WCDMA Band2								
Test frequency range: 30MHz-20GHz								
Low channel								
3704.8	-52.00	64	2.2	H	8.2	-43.80	-13	-30.80
3704.8	-49.70	203	1.5	V	6.9	-42.80	-13	-29.80
5557.2	-51.10	137	1.7	H	9.1	-42.00	-13	-29.00
5557.2	-50.90	243	2.4	V	9.9	-41.00	-13	-28.00
Middle channel								
3760.0	-52.00	81	1.8	H	8.2	-43.80	-13	-30.80
3760.0	-50.70	87	1.8	V	7.7	-43.00	-13	-30.00
5640.0	-52.50	282	1.7	H	10.7	-41.80	-13	-28.80
5640.0	-50.60	280	1.1	V	9.8	-40.80	-13	-27.80
High channel								
3815.2	-51.20	258	1.2	H	8.2	-43.00	-13	-30.00
3815.2	-49.30	298	1.3	V	7.5	-41.80	-13	-28.80
5722.8	-52.60	266	1.6	H	11.3	-41.30	-13	-28.30
5722.8	-49.90	123	2.1	V	10	-39.90	-13	-26.90

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
WCDMA Band5								
Test frequency range: 30MHz-10GHz								
Low channel								
1652.8	-54.60	151	1.9	H	3	-51.60	-13	-38.60
1652.8	-53.30	123	2.4	V	2.6	-50.70	-13	-37.70
2479.2	-54.90	147	2.3	H	7.1	-47.80	-13	-34.80
2479.2	-52.70	329	1.5	V	5.8	-46.90	-13	-33.90
3305.6	-49.10	316	1.7	H	6.7	-42.40	-13	-29.40
3305.6	-48.20	298	1.4	V	6.1	-42.10	-13	-29.10
Middle channel								
1673.2	-54.60	147	2.3	H	3.1	-51.50	-13	-38.50
1673.2	-53.10	199	1.5	V	2.5	-50.60	-13	-37.60
2509.8	-54.80	9	1.8	H	7.1	-47.70	-13	-34.70
2509.8	-52.00	188	1.6	V	5.4	-46.60	-13	-33.60
3346.4	-49.50	311	1.8	H	7.3	-42.20	-13	-29.20
3346.4	-47.40	147	2.1	V	5.4	-42.00	-13	-29.00
High channel								
1693.2	-54.10	236	1.1	H	3.2	-50.90	-13	-37.90
1693.2	-52.30	183	1.8	V	2.4	-49.90	-13	-36.90
2539.8	-53.90	299	1.9	H	7	-46.90	-13	-33.90
2539.8	-51.60	47	1.6	V	6	-45.60	-13	-32.60
3386.4	-48.30	116	2.5	H	6.2	-42.10	-13	-29.10
3386.4	-46.70	2	1.4	V	5.2	-41.50	-13	-28.50

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

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
LTE Band 2								
Test frequency range: 30MHz-20GHz								
QPSK 1.4MHz Bandwidth, Low channel								
3701.4	-52.40	29	2.2	H	8.2	-44.20	-13	-31.20
3701.4	-49.00	231	1.2	V	6.9	-42.10	-13	-29.10
5552.1	-47.30	160	2.3	H	9	-38.30	-13	-25.30
5552.1	-47.40	185	1.1	V	10	-37.40	-13	-24.40
QPSK 1.4MHz Bandwidth, Middle channel								
3760.0	-51.60	253	1.8	H	8.2	-43.40	-13	-30.40
3760.0	-50.10	47	2	V	7.7	-42.40	-13	-29.40
5640.0	-48.70	138	1.5	H	10.7	-38.00	-13	-25.00
5640.0	-46.80	120	1.9	V	9.8	-37.00	-13	-24.00
QPSK 1.4MHz Bandwidth, High channel								
3818.6	-51.00	319	1.8	H	8.1	-42.90	-13	-29.90
3818.6	-49.50	318	2.4	V	7.6	-41.90	-13	-28.90
5727.9	-49.20	16	1.4	H	11.4	-37.80	-13	-24.80
5727.9	-46.30	60	1.5	V	10	-36.30	-13	-23.30

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
LTE Band 5								
Test frequency range: 30MHz-10GHz								
QPSK 1.4MHz Bandwidth, Low channel								
1649.4	-56.70	240	1.8	H	3	-53.70	-13	-40.70
1649.4	-55.20	87	2.3	V	2.6	-52.60	-13	-39.60
2474.1	-55.10	100	1.4	H	7.1	-48.00	-13	-35.00
2474.1	-53.00	129	1.5	V	5.9	-47.10	-13	-34.10
3298.8	-46.60	144	1	H	6.7	-39.90	-13	-26.90
3298.8	-44.50	70	2.1	V	6.2	-38.30	-13	-25.30
QPSK 1.4MHz Bandwidth, Middle channel								
1673.0	-54.80	197	2.2	H	3.1	-51.70	-13	-38.70
1673.0	-52.70	276	1.2	V	2.5	-50.20	-13	-37.20
2509.5	-55.00	224	1.5	H	7.1	-47.90	-13	-34.90
2509.5	-52.40	327	1.2	V	5.4	-47.00	-13	-34.00
3346.0	-46.90	117	1.9	H	7.3	-39.60	-13	-26.60
3346.0	-43.60	354	1.3	V	5.4	-38.20	-13	-25.20
QPSK 1.4MHz Bandwidth, High channel								
1696.6	-54.20	151	2	H	3.3	-50.90	-13	-37.90
1696.6	-52.00	244	1.5	V	2.4	-49.60	-13	-36.60
2544.9	-53.70	351	1.8	H	6.9	-46.80	-13	-33.80
2544.9	-51.80	6	2.4	V	6.1	-45.70	-13	-32.70
3393.2	-44.70	313	1.7	H	5.9	-38.80	-13	-25.80
3393.2	-42.60	301	1.1	V	5.2	-37.40	-13	-24.40

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
LTE Band7								
Test frequency range: 30MHz-26GHz								
QPSK 5MHz Bandwidth, Low channel								
5005.0	-53.90	355	1.9	H	10.8	-43.10	-25	-18.10
5005.0	-51.60	19	2.1	V	10.2	-41.40	-25	-16.40
7507.5	-58.10	6	1.7	H	19.8	-38.30	-25	-13.30
7507.5	-56.10	281	1.9	V	19.5	-36.60	-25	-11.60
QPSK 5MHz Bandwidth, Middle channel								
5070.0	-53.70	282	1.6	H	11.6	-42.10	-25	-17.10
5070.0	-52.00	17	1.6	V	11.2	-40.80	-25	-15.80
7605.0	-61.10	23	1.1	H	21.9	-39.20	-25	-14.20
7605.0	-57.30	107	1.8	V	19.8	-37.50	-25	-12.50
QPSK 5MHz Bandwidth, High channel								
5135.0	-52.00	81	2.2	H	11.3	-40.70	-25	-15.70
5135.0	-50.30	336	1.6	V	10.6	-39.70	-25	-14.70
7702.5	-59.40	333	1.8	H	20.8	-38.60	-25	-13.60
7702.5	-58.30	172	1.5	V	21.8	-36.50	-25	-11.50

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
LTE Band12								
Test frequency range: 30MHz-10GHz								
QPSK 1.4MHz Bandwidth, Low channel								
1399.4	-58.50	268	1.8	H	5.5	-53.00	-13	-40.00
1399.4	-59.00	7	1.3	V	6.3	-52.70	-13	-39.70
2099.1	-50.80	33	1.8	H	5.8	-45.00	-13	-32.00
2099.1	-49.60	68	1.2	V	4.6	-45.00	-13	-32.00
2798.8	-52.20	360	1.4	H	5.8	-46.40	-13	-33.40
2798.8	-51.80	69	1.5	V	6.9	-44.90	-13	-31.90
QPSK 1.4MHz Bandwidth, Middle channel								
1415.0	-57.60	160	2.5	H	5.1	-52.50	-13	-39.50
1415.0	-58.00	349	2.1	V	5.6	-52.40	-13	-39.40
2122.5	-51.50	286	1.6	H	6.7	-44.80	-13	-31.80
2122.5	-50.50	100	2.2	V	5.6	-44.90	-13	-31.90
2830.0	-52.50	109	1.2	H	6.3	-46.20	-13	-33.20
2830.0	-51.30	311	2	V	6.5	-44.80	-13	-31.80
QPSK 1.4MHz Bandwidth, High channel								
1430.6	-56.50	174	1	H	4.7	-51.80	-13	-38.80
1430.6	-56.40	293	2.3	V	4.9	-51.50	-13	-38.50
2145.9	-51.10	293	1.2	H	7.6	-43.50	-13	-30.50
2145.9	-50.50	340	2.1	V	6.7	-43.80	-13	-30.80
2861.2	-52.10	267	1.3	H	6.7	-45.40	-13	-32.40
2861.2	-50.50	288	1.3	V	6.2	-44.30	-13	-31.30

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
LTE Band 41								
Test frequency range: 30MHz-27GHz								
QPSK 5MHz Bandwidth, Low channel								
5075.0	-53.80	276	2	H	11.6	-42.20	-25	-17.20
5075.0	-52.60	352	1	V	11.2	-41.40	-25	-16.40
7612.5	-61.20	295	1.1	H	21.7	-39.50	-25	-14.50
7612.5	-58.10	55	1.5	V	19.9	-38.20	-25	-13.20
QPSK 5MHz Bandwidth, Middle channel								
5190.0	-53.20	77	2.4	H	11.1	-42.10	-25	-17.10
5190.0	-50.60	46	1	V	9.9	-40.70	-25	-15.70
7785.0	-56.50	239	1.6	H	17.8	-38.70	-25	-13.70
7785.0	-54.60	70	2.2	V	17.1	-37.50	-25	-12.50
QPSK 5MHz Bandwidth, High channel								
5305.0	-50.40	216	1.4	H	9.4	-41.00	-25	-16.00
5305.0	-48.10	87	2.4	V	8.6	-39.50	-25	-14.50
7957.5	-58.10	233	1.9	H	19.4	-38.70	-25	-13.70
7957.5	-55.60	37	2.1	V	18.1	-37.50	-25	-12.50

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.

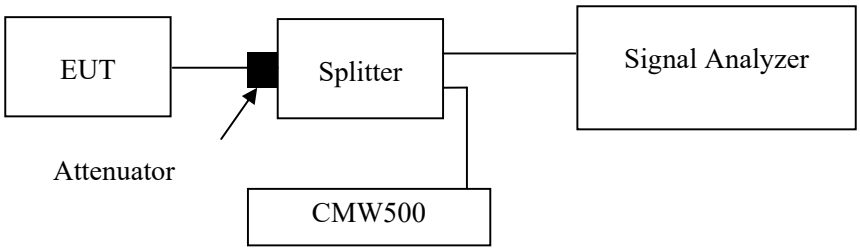
According to FCC §27.53 (m), For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, 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:	26~28.8℃
Relative Humidity:	46.8~56%
ATM Pressure:	101.0 kPa

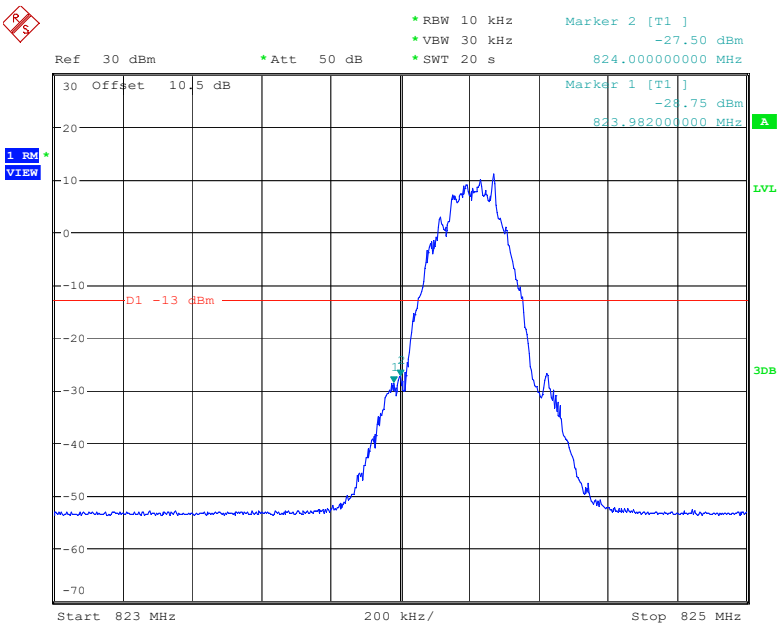
The testing was performed by Jacob Huang from 2023-05-18 to 2023-05-30.

EUT operation mode: Transmitting (Worst case)

Test Result: Pass

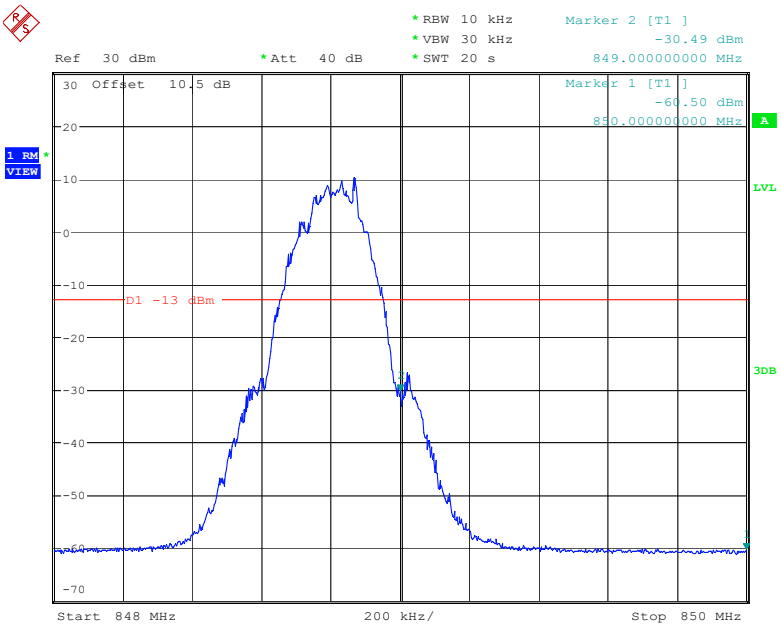
Please refer to the following plots.

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



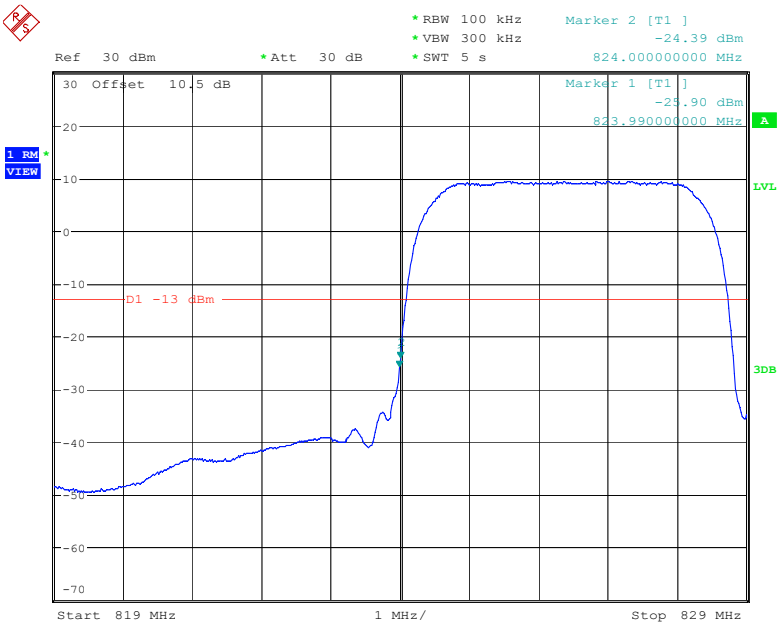
Date: 30.MAY.2023 22:13:11

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



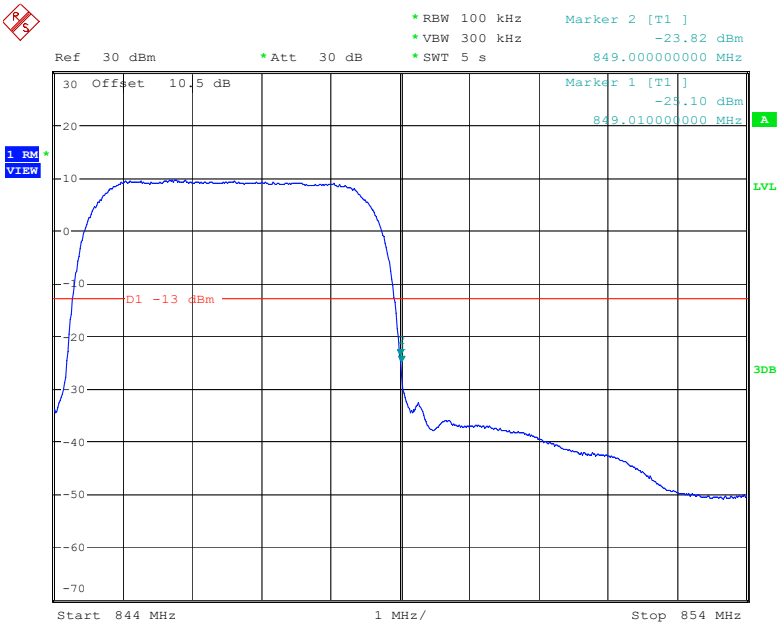
Date: 30.MAY.2023 22:22:36

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



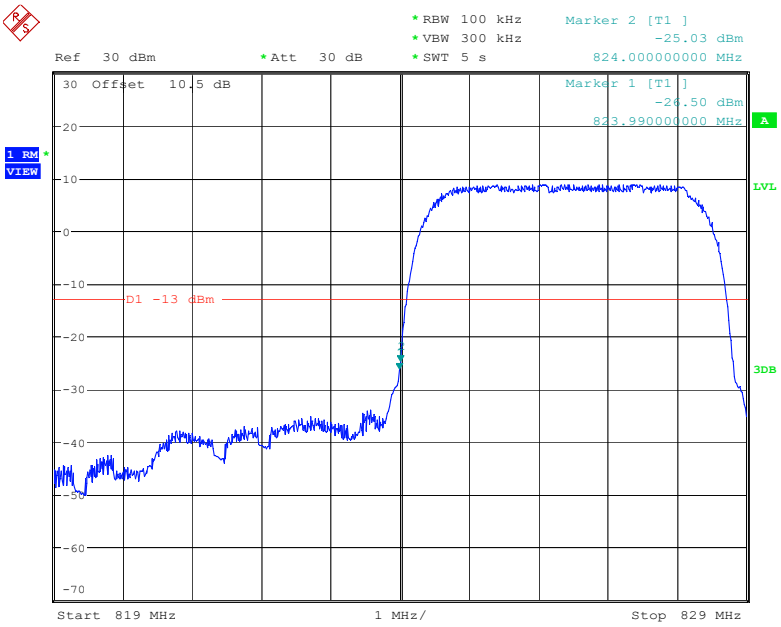
Date: 19.MAY.2023 21:37:33

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



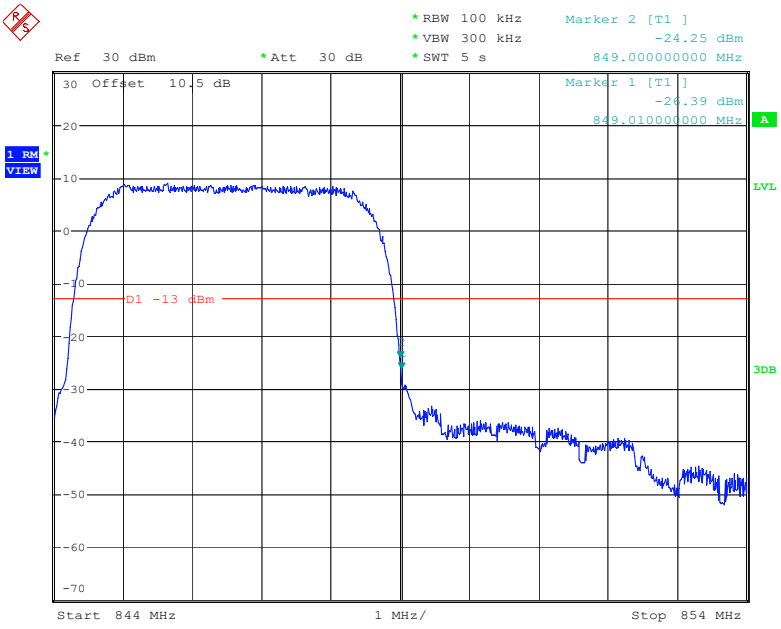
Date: 19.MAY.2023 21:54:03

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



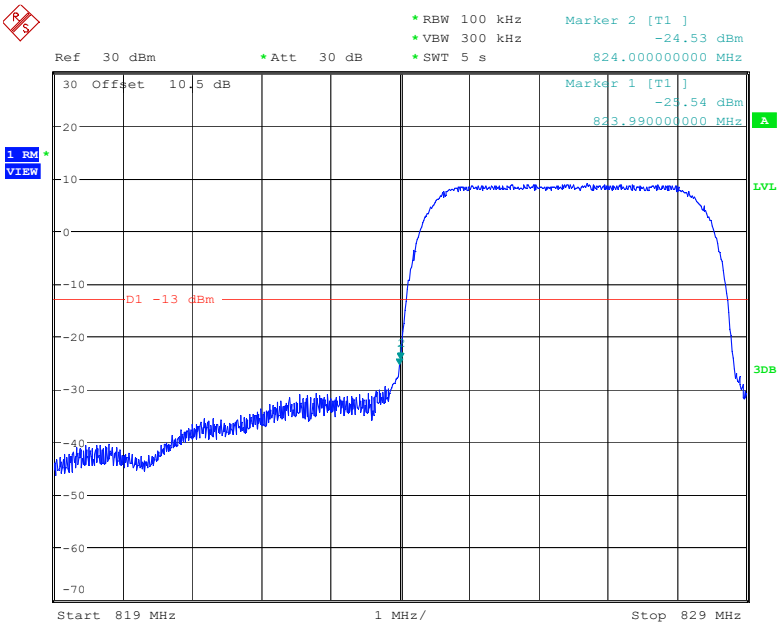
Date: 19.MAY.2023 22:12:44

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



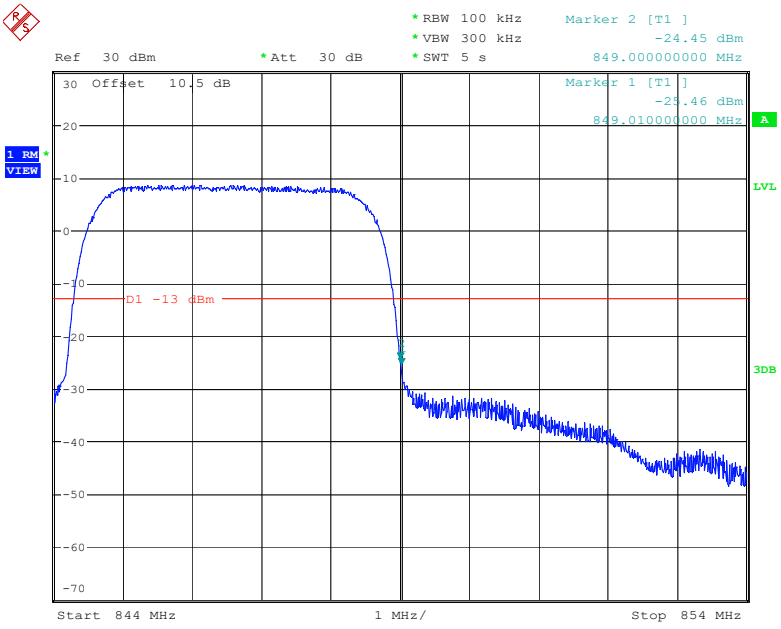
Date: 19.MAY.2023 22:00:09

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



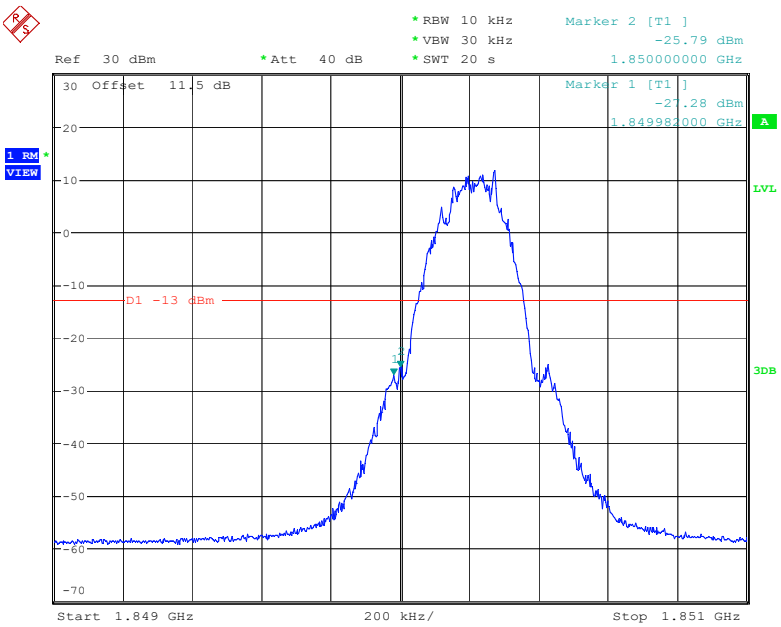
Date: 19.MAY.2023 22:17:50

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



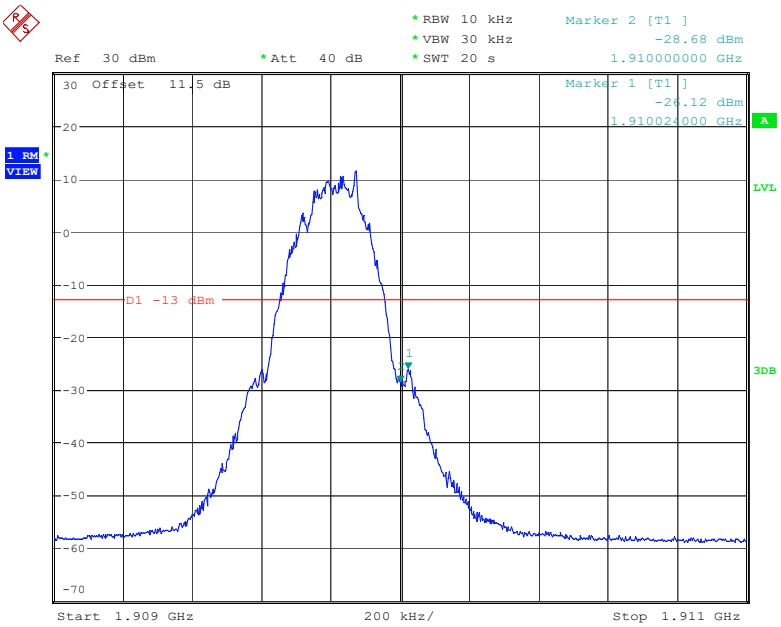
Date: 19.MAY.2023 22:25:38

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



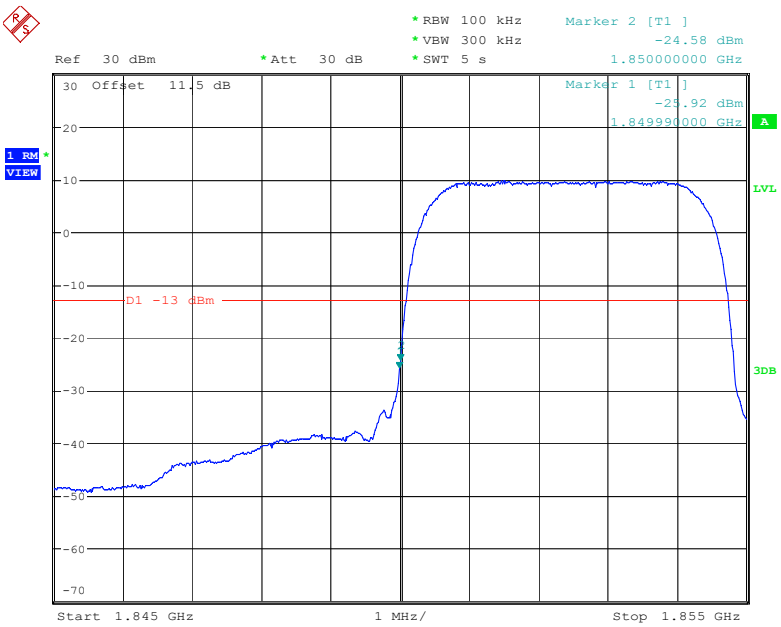
Date: 30.MAY.2023 22:35:48

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



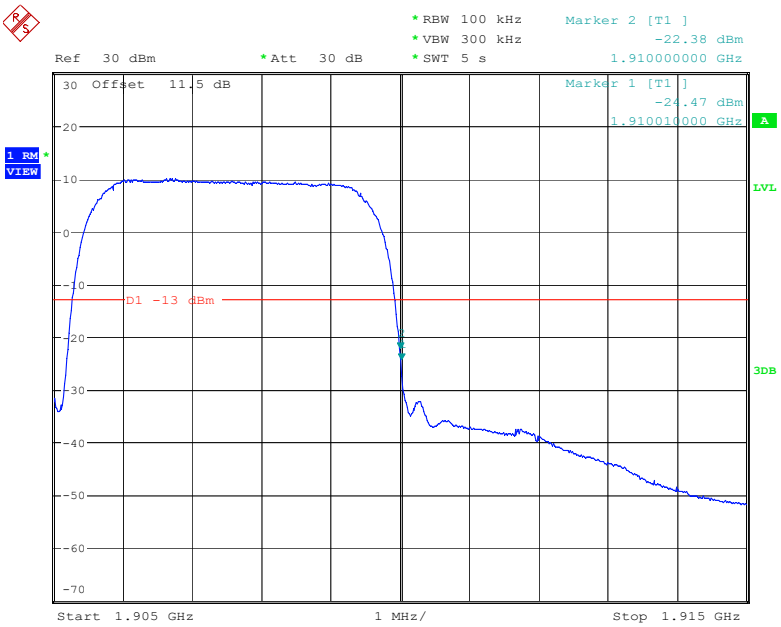
Date: 30.MAY.2023 22:43:28

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



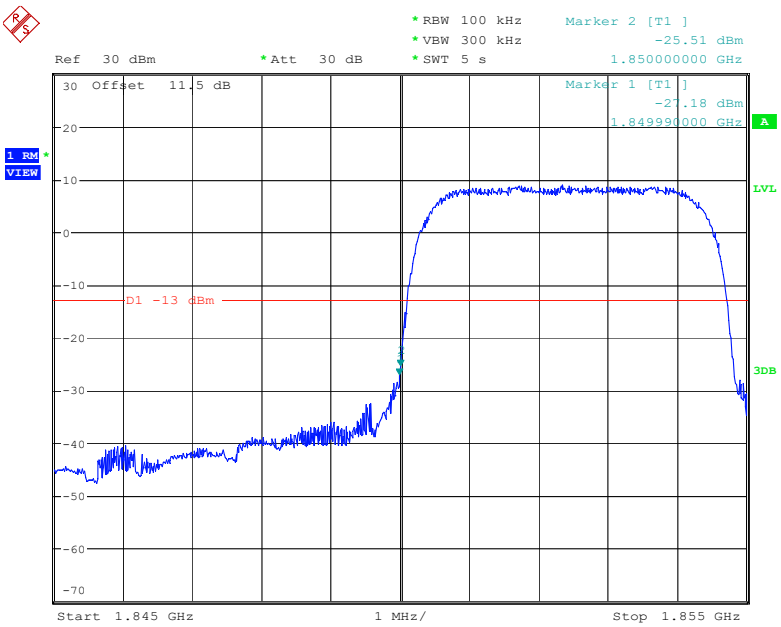
Date: 19.MAY.2023 23:11:52

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



Date: 19.MAY.2023 23:24:40

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



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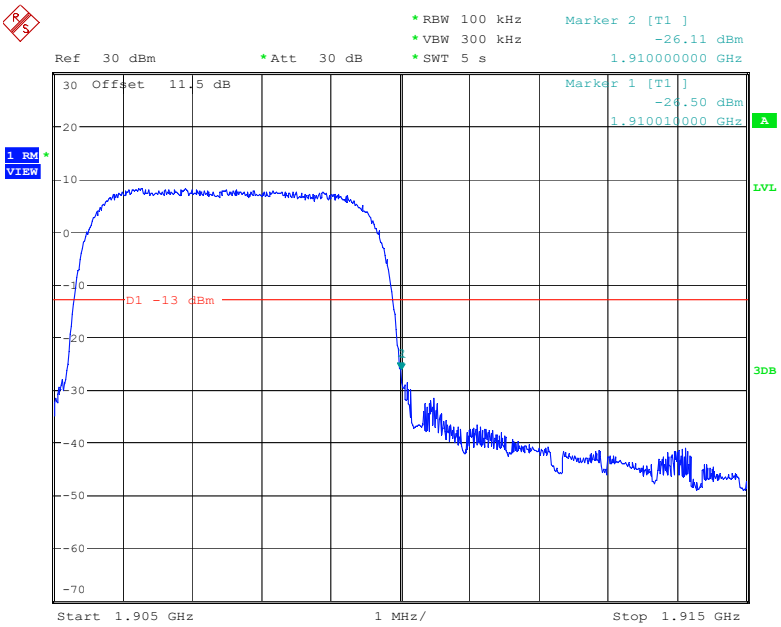
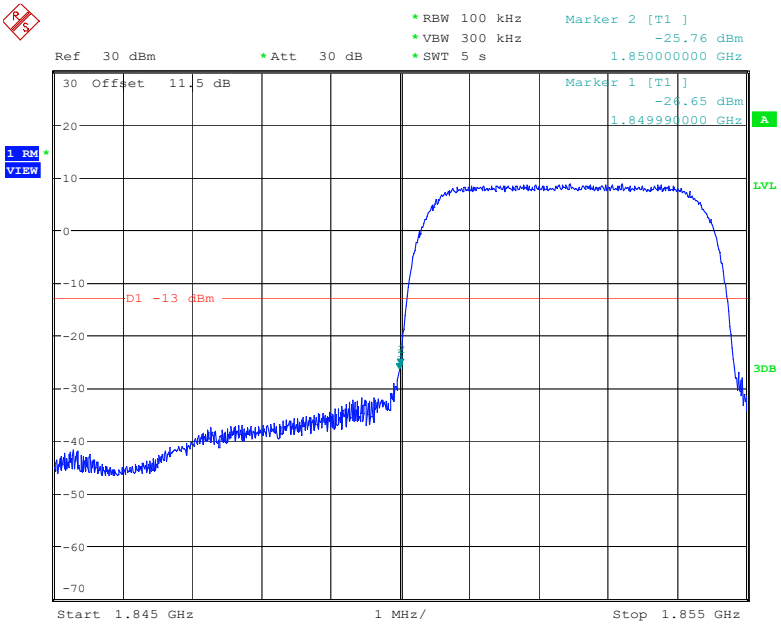
PCS Band, Right Band Edge for HSDPA (16QAM) Mode



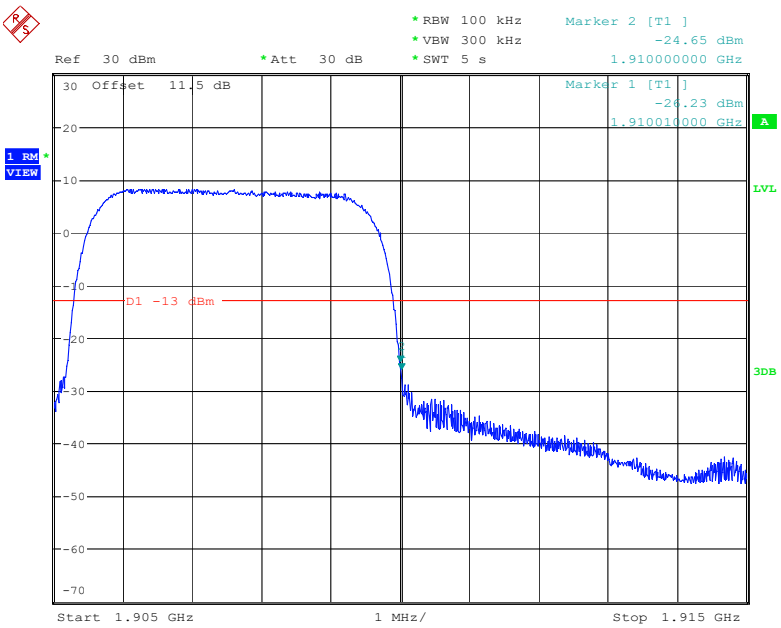
Date: 19.MAY.2023 23:32:19

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



Date: 19.MAY.2023 23:52:32

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



Date: 19.MAY.2023 23:59:28

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

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

Applicable Standard

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

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

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

Frequency Tolerance for Transmitters in the Public Mobile Services

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

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

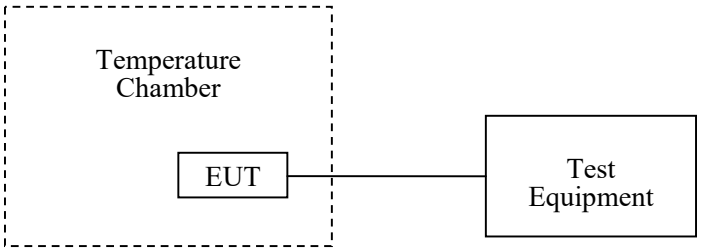
Test Procedure

ANSI C63.26-2015 Section 5.6

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

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

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



Test Data

Environmental Conditions

Temperature:	26~28.8℃
Relative Humidity:	46.8~56%
ATM Pressure:	101.0 kPa

The testing was performed by Jacob Huang from 2023-05-19 to 2023-05-22.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the following tables.

Cellular Band (Part 22H)
GSM Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	N.V.	7	0.0084	2.5
-20		10	0.0120	2.5
-10		12	0.0143	2.5
0		13	0.0155	2.5
10		16	0.0191	2.5
20		11	0.0131	2.5
30		8	0.0096	2.5
40		7	0.0084	2.5
50		24	0.0287	2.5
20	L.V.	7	0.0084	2.5
	H.V.	5	0.0060	2.5

WCDMA Mode band5

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	N.V.	-0.79	-0.0009	2.5
-20		-6.49	-0.0078	2.5
-10		-11.26	-0.0135	2.5
0		-15.30	-0.0183	2.5
10		-10.38	-0.0124	2.5
20		-17.00	-0.0203	2.5
30		-15.70	-0.0188	2.5
40		-13.31	-0.0159	2.5
50		-7.68	-0.0092	2.5
20	L.V.	-7.28	-0.0087	2.5
	H.V.	-7.16	-0.0086	2.5

PCS Band (Part 24E)

GSM Mode

Middle Channel, f_o =1880MHz					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	N.V.	1850.0158	1909.9734	1850	1910
-20		1850.0194	1909.9613	1850	1910
-10		1850.0121	1909.9751	1850	1910
0		1850.0215	1909.9598	1850	1910
10		1850.0275	1909.9581	1850	1910
20		1850.0281	1909.9522	1850	1910
30		1850.0125	1909.9705	1850	1910
40		1850.0111	1909.9744	1850	1910
50		1850.0286	1909.9523	1850	1910
20	L.V.	1850.0196	1909.9612	1850	1910
	H.V.	1850.0274	1909.9547	1850	1910

WCDMA Mode band 2

Middle Channel, f_o =1880MHz					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	N.V.	1850.0148	1909.9710	1850	1910
-20		1850.0127	1909.9728	1850	1910
-10		1850.0122	1909.9699	1850	1910
0		1850.0157	1909.9756	1850	1910
10		1850.0122	1909.9725	1850	1910
20		1850.0121	1909.9724	1850	1910
30		1850.0156	1909.9703	1850	1910
40		1850.0126	1909.9728	1850	1910
50		1850.0122	1909.9708	1850	1910
20	L.V.	1850.0124	1909.9729	1850	1910
	H.V.	1850.0121	1909.9749	1850	1910

LTE:
QPSK:
Band 2:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	N.V.	1850.0545	1909.9560	1850	1910
-20		1850.0550	1909.9554	1850	1910
-10		1850.0482	1909.9556	1850	1910
0		1850.0481	1909.9564	1850	1910
10		1850.0511	1909.9558	1850	1910
20		1850.0490	1909.9573	1850	1910
30		1850.0529	1909.9575	1850	1910
40		1850.0553	1909.9547	1850	1910
50		1850.0539	1909.9554	1850	1910
20	L.V.	1850.0495	1909.9597	1850	1910
	H.V.	1850.0514	1909.9582	1850	1910

Band 5:

10.0 MHz Middle Channel, f_o =836.5MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	N.V.	-2.64	-0.0032	2.5
-20		-7.39	-0.0088	2.5
-10		-14.04	-0.0168	2.5
0		-9.57	-0.0114	2.5
10		-8.26	-0.0099	2.5
20		-14.00	-0.0167	2.5
30		-13.22	-0.0158	2.5
40		-6.14	-0.0073	2.5
50		-7.34	-0.0088	2.5
20	L.V.	-6.85	-0.0082	2.5
	H.V.	-6.77	-0.0081	2.5

Band 7:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	N.V.	2500.0354	2569.9842	2500	2570
-20		2500.0307	2569.9838	2500	2570
-10		2500.0333	2569.9804	2500	2570
0		2500.0345	2569.9848	2500	2570
10		2500.0322	2569.9825	2500	2570
20		2500.0349	2569.9831	2500	2570
30		2500.0293	2569.9800	2500	2570
40		2500.0344	2569.9831	2500	2570
50		2500.0296	2569.9873	2500	2570
20	L.V.	2500.0352	2569.9873	2500	2570
	H.V.	2500.0330	2569.9869	2500	2570

Band 12:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	N.V.	699.0135	715.9947	699	716
-20		699.0164	715.9876	699	716
-10		699.0175	715.9937	699	716
0		699.0184	715.9900	699	716
10		699.0135	715.9898	699	716
20		699.0119	715.9887	699	716
30		699.0134	715.9918	699	716
40		699.0149	715.9918	699	716
50		699.0156	715.9933	699	716
20	L.V.	699.0180	715.9877	699	716
	H.V.	699.0109	715.9919	699	716

Band 41:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	N.V.	2535.0620	2654.9619	2535	2655
-20		2535.0571	2654.9621	2535	2655
-10		2535.0579	2654.9684	2535	2655
0		2535.0634	2654.9678	2535	2655
10		2535.0589	2654.9645	2535	2655
20		2535.0603	2654.9673	2535	2655
30		2535.0579	2654.9684	2535	2655
40		2535.0565	2654.9639	2535	2655
50		2535.0593	2654.9644	2535	2655
20	L.V.	2535.0564	2654.9678	2535	2655
	H.V.	2535.0620	2654.9676	2535	2655

16QAM:

Band 2:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	N.V.	1850.0262	1909.9760	1850	1910
-20		1850.0202	1909.9728	1850	1910
-10		1850.0245	1909.9762	1850	1910
0		1850.0269	1909.9701	1850	1910
10		1850.0322	1909.9825	1850	1910
20		1850.0203	1909.9753	1850	1910
30		1850.0394	1909.9725	1850	1910
40		1850.0315	1909.9768	1850	1910
50		1850.0313	1909.9766	1850	1910
20	L.V.	1850.0343	1909.9762	1850	1910
	H.V.	1850.0301	1909.9729	1850	1910

Band 5:

10.0 MHz Middle Channel, f_o=836.5MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	N.V.	5.33	0.0064	2.5
-20		-4.10	-0.0049	2.5
-10		-13.99	-0.0167	2.5
0		-9.48	-0.0113	2.5
10		-13.16	-0.0157	2.5
20		-15.90	-0.0190	2.5
30		-13.06	-0.0156	2.5
40		-9.00	-0.0108	2.5
50		-6.36	-0.0076	2.5
20	L.V.	-6.35	-0.0076	2.5
	H.V.	-5.83	-0.0070	2.5

Band 7:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	N.V.	2500.1333	2569.8925	2500	2570
-20		2500.1393	2569.8924	2500	2570
-10		2500.1342	2569.8930	2500	2570
0		2500.1327	2569.8932	2500	2570
10		2500.1354	2569.8888	2500	2570
20		2500.1327	2569.8869	2500	2570
30		2500.1388	2569.8887	2500	2570
40		2500.1352	2569.8898	2500	2570
50		2500.1376	2569.8869	2500	2570
20	L.V.	2500.1351	2569.8928	2500	2570
	H.V.	2500.1373	2569.8893	2500	2570

Band 12:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	N.V.	699.1097	715.9206	699	716
-20		699.1066	715.9158	699	716
-10		699.1030	715.9205	699	716
0		699.1081	715.9184	699	716
10		699.1056	715.9158	699	716
20		699.1085	715.9161	699	716
30		699.1042	715.9201	699	716
40		699.1064	715.9178	699	716
50		699.1102	715.9179	699	716
20	L.V.	699.1030	715.9161	699	716
	H.V.	699.1075	715.9156	699	716

Band 41:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	N.V.	2535.0686	2654.9551	2535	2655
-20		2535.0679	2654.9564	2535	2655
-10		2535.0673	2654.9575	2535	2655
0		2535.0619	2654.9547	2535	2655
10		2535.0648	2654.9568	2535	2655
20		2535.0655	2654.9571	2535	2655
30		2535.0674	2654.9584	2535	2655
40		2535.0630	2654.9605	2535	2655
50		2535.0683	2654.9560	2535	2655
20	L.V.	2535.0669	2654.9601	2535	2655
	H.V.	2535.0691	2654.9586	2535	2655

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