FCC PART 27

FCC PART 22H, PART 24E

TEST REPORT

For

Shenzhen Digidragon Technology Co., Ltd

F02-3, Block 36, Dayun Software Town, Longgang District, Shenzhen, China

FCC ID: 2AW7SDS6018

Report Type:	**Product Type:**
Original Report	4G Mobile Phone

Report Number:	SZ2210527-19874E-00C
Report Date:	2021-07-02
Reviewed By:	Jimmy Xiao RF Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 5F(B-West) ,6F,7F,the 3rd Phase of Wan Li Industrial Building D,Shihua Rd, FuTian Free Trade Zone, Shenzhen, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

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

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	4G Mobile Phone
Tested Model	DS6018
Frequency Range	EGSM 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(RX) LTE Band 17: 704-716MHz(TX); 734-746MHz(RX)
Modulation Technique	2G: GMSK, 8PSK 3G: BPSK, QPSK, 16QAM 4G: QPSK, 16QAM
Antenna Specification*	EGSM850/WCDMA Band 5: -3.0dBi PCS1900/WCDMA Band 2/LTE Band 2: -2.5dBi LTE Band 4/LTE Band 7: -1.5dBi LTE Band 17: -3.5dBi (provided by the applicant)
Voltage Range	DC 3.85V from battery or DC 5V from adapter
Date of Test	2021-05-31 to 2021-07-02
Sample number	SZ2210527-19874E-RF-S1(Assigned by BACL, Shenzhen)
Received date	2021-05-27
Sample/EUT Status	Good condition
Adapter information	Model: J002-1 Input: AC 100-240V, 50/60Hz, 0.2A Output: DC 5.0V, 1000mA

Objective

This test report is in accordance with Part 2-Subpart J, Part 22-Subpart H and Part 24-Subpart E and Subpart 27 of the Federal Communication Commissions 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

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		±0.73dB
Unwanted Emission, conducted		±1.6dB
Emissions, Radiated	Below 1GHz	±4.75dB
	Above 1GHz	±4.88dB
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 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 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.: 342867, the FCC Designation No.: CN1221.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062B.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

Test was performed as below table:

Frequency band	Bandwidth (MHz)	Test Frequency(MHz)		
		Low	Middle	High
EGSM850	0.25	824.2	836.6	848.8
DCS1900	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 B17	5	706.5	710	713.5
	10	709	710	711

Equipment Modifications

No modification was made to the EUT.

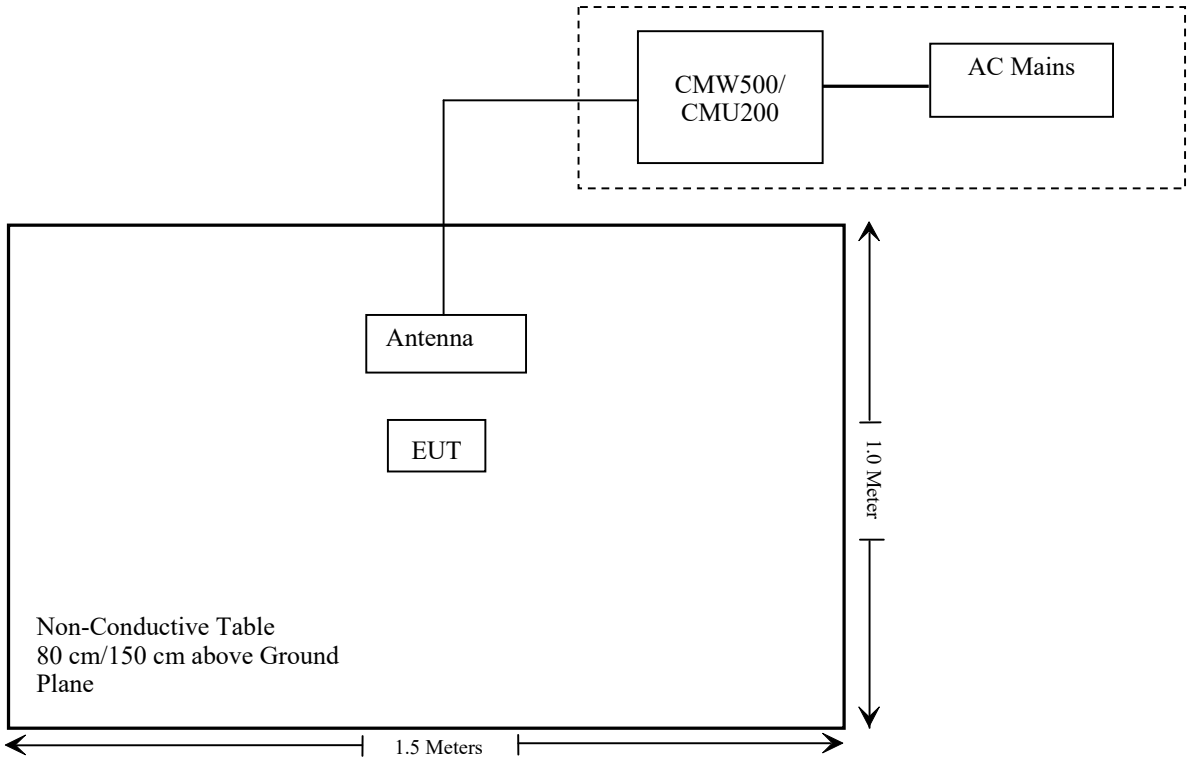
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	115500

Support Cable Description

Cable Description	Length (m)	From / Port	To
Unshielded Detachable AC Cable	1.2	AC Mains	CMW500/CMU200

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 1.1307 , §2.1093	RF Exposure (SAR)	Compliant*
§2.1046; § 22.913 (a); § 24.232 (c); §27.50 (c) (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(c)(h) (m)	Band Edge	Compliant
§ 2.1055; § 22.355; § 24.235; §27.54;	Frequency stability	Compliant

Note: * Please refer to SAR report released by BACL, report number: SZ2210527-19874E-SA.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
R&S	EMI Test Receiver	ESR3	102455	2020/08/04	2021/08/03
Sonoma instrument	Pre-amplifier	310 N	186238	2020/08/04	2021/08/03
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2020/12/22	2023/12/21
COM-POWER	Dipole Antenna	AD-100	721027	NCR	NCR
Unknown	Cable 2	RF Cable 2	F-03-EM197	2020/11/29	2021/11/28
Unknown	Cable	Chamber Cable 1	F-03-EM236	2020/11/29	2021/11/28
Rohde & Schwarz	Spectrum Analyzer	FSV40-N	102259	2020/08/04	2021/08/03
COM-POWER	Pre-amplifier	PA-122	181919	2020/11/29	2021/11/28
Quinstar	Amplifier	QLW-18405536-J0	15964001002	2020/11/28	2021/11/27
Sunol Sciences	Horn Antenna	3115	9107-3694	2021/01/15	2024/01/14
A.H.System	Horn Antenna	SAS-200/571	135	2018/09/01	2021/08/31
Insulted Wire Inc.	RF Cable	SPS-2503-3150	02222010	2020/11/29	2021/11/28
Unknown	RF Cable	W1101-EQ1 OUT	F-19-EM005	2020/11/29	2021/11/28
MICRO-TRONICS	Passband filter	HPM50111	F-19-EM006	2021/04/20	2022/04/20
Unknown	High Pass filter	1.3GHz	101120	2021/04/20	2022/04/20
Ducommun Technolagies	Horn antenna	ARH-4223-02	1007726-01 1304	2020/12/06	2023/12/05
Ducommun Technolagies	Horn antenna	ARH-4223-02	1007726-02 1304	2020/12/06	2023/12/05
Agilent	Signal Generator	N5183A	MY51040755	2020/12/29	2021/12/28
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh	2020/08/04	2021/08/03
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	115500	2020/07/31	2021/07/30

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	Signal and Spectrum Analyzer	FSV40	101473	2020/08/04	2021/08/03
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh	2020/08/04	2021/08/03
Unknown	RF Cable	Unknown	2301 276	2020/11/29	2021/11/28
Unknown	RF Cable	Unknown	DLO J5/W6102	2020/11/29	2021/11/28
Weinschel	Power divider	1515	MY628	2020/11/29	2021/11/28
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	115500	2020/07/31	2021/07/30
instek	DC Power Supply	GPS-3030DD	EM832096	NCR	NCR
ESPEC	Temperature & Humidity Chamber	EL-10KA	9107726	2021/02/23	2022/02/22
Fluke	Digital Multimeter	287	19000011	2020/07/23	2021/07/22

* 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: SZ2210527-19874E-SA.

FCC §2.1047 - MODULATION CHARACTERISTIC

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

FCC § 2.1046, § 22.913 (a) & § 24.232 (c); §27.50 (c) (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(c), Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

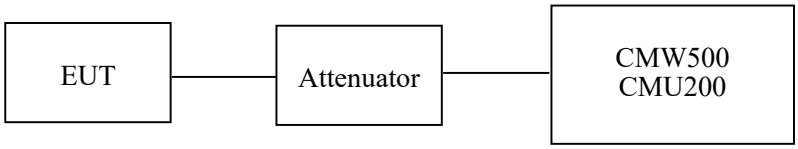
According to §27.50(d), the maximum EIRP must not exceed 1Watts (30dBm) for 1710-1780MHz.

According to §27.50(h), the maximum EIRP must not exceed 2Watts (33dBm) for 2500-2570MHz & 2496-2690MHz.

Test Procedure

Conducted method:

The RF output of the transmitter was connected to the CMW500/CMU200 through sufficient attenuation.



Test Data

Environmental Conditions

Temperature:	28~28.9 ℃
Relative Humidity:	49~58 %
ATM Pressure:	101.0 kPa

The testing was performed by Pedro Yun from 2021-05-31 to 2021-06-04.

Conducted Power

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	ERP (dBm)	Limit (dBm)
GSM	128	824.2	32.04	26.59	38.45
	190	836.6	32.23	26.78	38.45
	251	848.8	32.28	26.83	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	32.07	29.95	28.04	26.13	26.62	24.5	22.59	20.68	38.45
	190	836.6	32.13	29.97	28.02	26.27	26.68	24.52	22.57	20.82	38.45
	251	848.8	32.12	29.96	28.14	26.21	26.67	24.51	22.69	20.76	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	
EGPRS	128	824.2	27.34	27.15	25.95	23.46	21.89	21.70	20.50	18.01	38.45
	190	836.6	27.70	27.49	26.27	23.55	22.25	22.04	20.82	18.10	38.45
	251	848.8	27.62	27.53	26.18	23.74	22.17	22.08	20.73	18.29	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		22.85	22.83	22.85	17.40	17.38	17.40
	HSDPA	1	22.82	22.65	22.52	17.37	17.20	17.07
		2	22.95	22.74	22.61	17.50	17.29	17.16
		3	22.70	22.58	22.47	17.25	17.13	17.02
		4	22.92	22.76	22.61	17.47	17.31	17.16
	HSUPA	1	22.98	22.84	22.60	17.53	17.39	17.15
		2	22.58	22.81	22.56	17.13	17.36	17.11
		3	22.03	22.90	22.70	16.58	17.45	17.25
		4	22.94	22.73	22.52	17.49	17.28	17.07
		5	23.07	22.94	22.72	17.62	17.49	17.27
	HSPA+	1	22.84	22.67	22.46	17.39	17.22	17.01

Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBd)-Cable loss(dB)
For GSM850/WCDMA Band 5: Antenna Gain = -3.0dBi = -5.15dBd (0dBd=2.15dBi)
Cable loss = 0.3dB
The limit: ERP≤38.45dBm

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	EIRP (dBm)	Limit (dBm)
GSM	512	1850.2	28.53	25.73	33
	661	1880.0	28.70	25.90	33
	810	1909.8	29.38	26.58	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	28.56	26.55	24.72	22.81	25.76	23.75	21.92	20.01	33
	661	1880.0	28.80	26.48	24.75	22.83	26.00	23.68	21.95	20.03	33
	810	1909.8	29.45	26.51	24.77	22.72	26.65	23.71	21.97	19.92	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	
EGPRS	512	1850.2	27.00	27.38	25.78	23.40	24.20	24.58	22.98	20.60	33
	661	1880.0	27.01	26.74	24.92	22.34	24.21	23.94	22.12	19.54	33
	810	1909.8	27.50	26.98	25.31	22.50	24.70	24.18	22.51	19.70	33

Mode	Test Mode	3GPP Sub Test	Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
WCDMA (Band 2)	RMC12.2k		22.10	22.61	23.35	19.30	19.81	20.55
	HSDPA	1	21.83	22.25	22.06	19.03	19.45	19.26
		2	21.89	22.35	22.14	19.09	19.55	19.34
		3	21.71	22.19	22.01	18.91	19.39	19.21
		4	21.95	22.34	22.17	19.15	19.54	19.37
	HSUPA	1	21.94	22.23	22.11	19.14	19.43	19.31
		2	22.06	22.16	22.01	19.26	19.36	19.21
		3	22.05	22.27	22.15	19.25	19.47	19.35
		4	21.88	22.15	22.08	19.08	19.35	19.28
		5	21.99	22.36	22.18	19.19	19.56	19.38
	HSPA+	1	21.68	22.15	22.14	18.88	19.35	19.34

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi) - Cable loss(dB)
For PCS1900/WCDMA Band 2: Antenna Gain = -2.5dBi
Cable loss = 0.3dB
The limit: EIRP≤33dBm

Peak-to-average ratio (PAR)

Cellular Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	3.25	13
	Middle	3.31	13
	High	3.47	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	3.21	13
	Middle	3.18	13
	High	3.34	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.21	13
	Middle	3.29	13
	High	3.45	13
HSDPA (16QAM)	Low	3.26	13
	Middle	3.45	13
	High	3.61	13
HSUPA (BPSK)	Low	3.25	13
	Middle	3.21	13
	High	3.47	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	3.38	13
	Middle	3.18	13
	High	3.35	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	3.16	13
	Middle	3.21	13
	High	3.51	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.66	13
	Middle	3.27	13
	High	3.54	13
HSDPA (16QAM)	Low	3.45	13
	Middle	3.31	13
	High	3.66	13
HSUPA (BPSK)	Low	3.05	13
	Middle	3.34	13
	High	3.75	13

LTE Band 2:

Maximum Output Power

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	22.02	22.74	23.24	19.22	19.94	20.44
		RB1#3	22.14	22.72	23.28	19.34	19.92	20.48
		RB1#5	22.22	22.75	23.30	19.42	19.95	20.50
		RB3#0	22.29	22.72	23.46	19.49	19.92	20.66
		RB3#3	22.30	22.71	23.44	19.50	19.91	20.64
		RB6#0	21.25	21.64	22.43	18.45	18.84	19.63
	16QAM	RB1#0	20.97	22.01	23.06	18.17	19.21	20.26
		RB1#3	20.97	22.02	23.06	18.17	19.22	20.26
		RB1#5	20.98	22.09	23.09	18.18	19.29	20.29
		RB3#0	21.29	21.69	22.32	18.49	18.89	19.52
		RB3#3	21.28	21.68	22.28	18.48	18.88	19.48
		RB6#0	20.45	20.83	21.51	17.65	18.03	18.71
3.0	QPSK	RB1#0	22.15	22.63	23.29	19.35	19.83	20.49
		RB1#8	22.18	22.62	23.39	19.38	19.82	20.59
		RB1#14	22.10	22.72	23.43	19.30	19.92	20.63
		RB6#0	21.15	21.70	22.33	18.35	18.90	19.53
		RB6#9	21.13	21.74	22.42	18.33	18.94	19.62
		RB15#0	21.14	21.69	22.48	18.34	18.89	19.68
	16QAM	RB1#0	21.75	22.17	22.19	18.95	19.37	19.39
		RB1#8	21.75	22.18	22.24	18.95	19.38	19.44
		RB1#14	21.67	22.24	22.26	18.87	19.44	19.46
		RB6#0	20.43	20.89	21.57	17.63	18.09	18.77
		RB6#9	20.35	21.34	21.67	17.55	18.54	18.87
		RB15#0	20.35	20.74	21.47	17.55	17.94	18.67

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	22.06	22.58	23.16	19.26	19.78	20.36
		RB1#13	21.92	22.57	23.22	19.12	19.77	20.42
		RB1#24	21.93	22.72	23.30	19.13	19.92	20.50
		RB15#0	21.15	21.55	22.30	18.35	18.75	19.50
		RB15#10	21.19	21.60	22.33	18.39	18.80	19.53
		RB25#0	21.13	21.63	22.31	18.33	18.83	19.51
	16QAM	RB1#0	20.40	21.66	21.92	17.60	18.86	19.12
		RB1#13	20.36	21.75	22.07	17.56	18.95	19.27
		RB1#24	20.28	21.87	22.14	17.48	19.07	19.34
		RB15#0	20.21	20.55	21.44	17.41	17.75	18.64
		RB15#10	20.23	20.93	21.47	17.43	18.13	18.67
		RB25#0	20.20	20.61	21.31	17.40	17.81	18.51
10.0	QPSK	RB1#0	22.19	22.50	23.12	19.39	19.70	20.32
		RB1#25	22.08	22.63	23.18	19.28	19.83	20.38
		RB1#49	22.22	22.76	23.36	19.42	19.96	20.56
		RB25#0	21.12	21.58	22.12	18.32	18.78	19.32
		RB25#25	21.14	21.76	22.37	18.34	18.96	19.57
		RB50#0	21.14	21.66	22.25	18.34	18.86	19.45
	16QAM	RB1#0	21.40	21.67	21.71	18.60	18.87	18.91
		RB1#25	21.37	21.71	21.78	18.57	18.91	18.98
		RB1#49	21.40	21.85	21.86	18.60	19.05	19.06
		RB25#0	20.15	21.10	21.36	17.35	18.30	18.56
		RB25#25	20.13	20.87	21.48	17.33	18.07	18.68
		RB50#0	20.28	20.68	21.35	17.48	17.88	18.55

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	22.10	22.36	22.97	19.30	19.56	20.17
		RB1#38	22.03	22.53	23.18	19.23	19.73	20.38
		RB1#74	22.14	22.77	23.28	19.34	19.97	20.48
		RB36#0	21.24	21.55	22.04	18.44	18.75	19.24
		RB36#39	21.21	21.69	22.27	18.41	18.89	19.47
		RB75#0	21.07	21.61	22.20	18.27	18.81	19.40
	16QAM	RB1#0	21.53	21.66	22.46	18.73	18.86	19.66
		RB1#38	21.50	21.91	22.59	18.70	19.11	19.79
		RB1#74	21.63	22.00	22.78	18.83	19.20	19.98
		RB36#0	20.32	21.02	21.60	17.52	18.22	18.80
		RB36#39	20.31	21.01	21.43	17.51	18.21	18.63
		RB75#0	20.25	20.72	21.30	17.45	17.92	18.50
20.0	QPSK	RB1#0	22.32	22.51	23.01	19.52	19.71	20.21
		RB1#50	22.30	22.68	23.30	19.50	19.88	20.50
		RB1#99	22.53	22.93	23.57	19.73	20.13	20.77
		RB50#0	21.28	21.67	22.13	18.48	18.87	19.33
		RB50#50	21.28	21.88	22.45	18.48	19.08	19.65
		RB100#0	21.21	21.76	22.10	18.41	18.96	19.30
	16QAM	RB1#0	21.38	21.56	22.66	18.58	18.76	19.86
		RB1#50	21.32	21.71	22.73	18.52	18.91	19.93
		RB1#99	21.49	21.97	23.00	18.69	19.17	20.20
		RB50#0	20.41	20.72	21.12	17.61	17.92	18.32
		RB50#50	20.41	20.95	21.28	17.61	18.15	18.48
		RB100#0	20.30	20.76	21.55	17.50	17.96	18.75

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi) – Cable loss (dB)
For LTE Band2: Antenna Gain = -2.5dBi
Cable loss = 0.3dB
The Limit: EIRP≤33dBm

Peak-to-average ratio (PAR)

20MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	3.88	4.17	4.04	13	Pass
QPSK (100RB Size)	5.32	5.29	5.29	13	Pass
16QAM (1RB Size)	4.74	5.38	5.29	13	Pass
16QAM (100RB Size)	6.19	6.15	6.09	13	Pass

LTE Band 4

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	23.59	23.78	23.93	21.79	21.98	22.13
		RB1#3	23.59	23.84	23.85	21.79	22.04	22.05
		RB1#5	23.62	23.77	23.84	21.82	21.97	22.04
		RB3#0	23.67	23.90	23.77	21.87	22.10	21.97
		RB3#3	23.72	23.90	23.78	21.92	22.10	21.98
		RB6#0	22.60	22.96	22.68	20.80	21.16	20.88
	16QAM	RB1#0	23.20	23.55	22.81	21.40	21.75	21.01
		RB1#3	23.20	23.62	22.77	21.40	21.82	20.97
		RB1#5	23.18	23.63	22.83	21.38	21.83	21.03
		RB3#0	22.70	22.82	22.73	20.90	21.02	20.93
		RB3#3	22.72	22.83	22.77	20.92	21.03	20.97
		RB6#0	21.82	21.96	22.05	20.02	20.16	20.25
3.0	QPSK	RB1#0	23.49	23.69	23.90	21.69	21.89	22.10
		RB1#8	23.51	23.81	23.89	21.71	22.01	22.09
		RB1#14	23.58	23.76	23.83	21.78	21.96	22.03
		RB6#0	22.51	22.82	22.79	20.71	21.02	20.99
		RB6#9	22.69	22.90	22.74	20.89	21.10	20.94
		RB15#0	22.55	22.88	22.80	20.75	21.08	21.00
	16QAM	RB1#0	23.03	23.56	22.82	21.23	21.76	21.02
		RB1#8	22.98	23.60	22.80	21.18	21.80	21.00
		RB1#14	23.05	23.60	22.76	21.25	21.80	20.96
		RB6#0	21.65	22.06	22.12	19.85	20.26	20.32
		RB6#9	21.62	22.09	22.05	19.82	20.29	20.25
		RB15#0	21.79	21.95	21.92	19.99	20.15	20.12

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	23.58	23.80	23.61	21.78	22.00	21.81
		RB1#13	23.63	23.89	23.56	21.83	22.09	21.76
		RB1#24	23.63	23.99	23.49	21.83	22.19	21.69
		RB15#0	22.65	22.82	22.72	20.85	21.02	20.92
		RB15#10	22.78	22.83	22.75	20.98	21.03	20.95
		RB25#0	22.66	22.78	22.68	20.86	20.98	20.88
	16QAM	RB1#0	21.93	23.00	22.29	20.13	21.20	20.49
		RB1#13	21.99	22.98	22.24	20.19	21.18	20.44
		RB1#24	22.04	23.04	22.25	20.24	21.24	20.45
		RB15#0	21.79	21.83	21.86	19.99	20.03	20.06
		RB15#10	21.74	21.87	21.78	19.94	20.07	19.98
		RB25#0	21.80	21.93	21.67	20.00	20.13	19.87
10.0	QPSK	RB1#0	23.50	23.80	24.00	21.70	22.00	22.20
		RB1#25	23.65	23.87	23.97	21.85	22.07	22.17
		RB1#49	23.77	23.88	23.89	21.97	22.08	22.09
		RB25#0	22.73	22.85	22.89	20.93	21.05	21.09
		RB25#25	22.75	22.82	22.71	20.95	21.02	20.91
		RB50#0	22.82	22.91	22.98	21.02	21.11	21.18
	16QAM	RB1#0	22.80	22.99	22.43	21.00	21.19	20.63
		RB1#25	22.89	23.01	22.54	21.09	21.21	20.74
		RB1#49	23.00	23.09	22.32	21.20	21.29	20.52
		RB25#0	21.72	22.05	22.02	19.92	20.25	20.22
		RB25#25	21.85	22.08	21.97	20.05	20.28	20.17
		RB50#0	21.89	22.00	22.06	20.09	20.20	20.26

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	23.53	23.79	24.00	21.73	21.99	22.20
		RB1#38	23.77	23.91	24.01	21.97	22.11	22.21
		RB1#74	23.72	23.97	23.90	21.92	22.17	22.10
		RB36#0	22.75	22.87	22.86	20.95	21.07	21.06
		RB36#39	22.88	23.01	22.86	21.08	21.21	21.06
		RB75#0	22.83	22.93	22.96	21.03	21.13	21.16
	16QAM	RB1#0	22.89	22.92	23.23	21.09	21.12	21.43
		RB1#38	22.97	23.06	23.21	21.17	21.26	21.41
		RB1#74	22.96	23.08	23.09	21.16	21.28	21.29
		RB36#0	21.99	22.45	22.02	20.19	20.65	20.22
		RB36#39	21.95	22.16	21.94	20.15	20.36	20.14
		RB75#0	21.89	21.98	21.95	20.09	20.18	20.15
20.0	QPSK	RB1#0	23.82	23.78	23.96	22.02	21.98	22.16
		RB1#50	24.02	23.88	24.04	22.22	22.08	22.24
		RB1#99	23.97	23.92	23.99	22.17	22.12	22.19
		RB50#0	22.82	22.85	22.97	21.02	21.05	21.17
		RB50#50	22.75	22.98	23.03	20.95	21.18	21.23
		RB100#0	22.77	22.96	22.93	20.97	21.16	21.13
	16QAM	RB1#0	22.66	23.25	23.50	20.86	21.45	21.70
		RB1#50	22.78	23.34	23.52	20.98	21.54	21.72
		RB1#99	22.81	23.38	23.46	21.01	21.58	21.66
		RB50#0	21.92	22.06	22.04	20.12	20.26	20.24
		RB50#50	22.03	22.18	22.01	20.23	20.38	20.21
		RB100#0	21.94	22.00	22.05	20.14	20.20	20.25

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi) – Cable loss (dB)
For LTE Band 4: Antenna Gain = -1.5dBi
Cable loss = 0.3dB
The Limit: EIRP≤30dBm

Peak-to-average ratio (PAR)

20MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	3.17	4.68	3.94	13	Pass
QPSK (100RB Size)	4.97	5.48	5.38	13	Pass
16QAM (1RB Size)	4.13	5.54	5.16	13	Pass
16QAM (100RB Size)	5.74	6.35	6.28	13	Pass

LTE Band 7:

Maximum Output Power

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	21.85	21.34	21.43	20.05	19.54	19.63
		RB1#13	21.81	21.29	21.40	20.01	19.49	19.60
		RB1#24	21.81	21.36	21.47	20.01	19.56	19.67
		RB15#0	20.94	20.31	20.59	19.14	18.51	18.79
		RB15#10	20.79	20.32	20.53	18.99	18.52	18.73
		RB25#0	20.74	20.34	20.53	18.94	18.54	18.73
	16QAM	RB1#0	20.14	20.40	20.20	18.34	18.60	18.40
		RB1#13	19.98	20.33	20.19	18.18	18.53	18.39
		RB1#24	19.91	20.37	20.27	18.11	18.57	18.47
		RB15#0	19.89	19.32	19.67	18.09	17.52	17.87
		RB15#10	19.82	19.24	19.69	18.02	17.44	17.89
		RB25#0	19.86	19.42	19.48	18.06	17.62	17.68
10.0	QPSK	RB1#0	21.94	21.85	21.92	20.14	20.05	20.12
		RB1#25	21.97	21.85	21.92	20.17	20.05	20.12
		RB1#49	21.97	21.87	21.91	20.17	20.07	20.11
		RB25#0	21.94	22.09	22.06	20.14	20.29	20.26
		RB25#25	21.93	22.09	22.14	20.13	20.29	20.34
		RB50#0	20.80	21.03	21.05	19.00	19.23	19.25
	16QAM	RB1#0	21.08	21.68	20.76	19.28	19.88	18.96
		RB1#25	21.14	21.70	20.78	19.34	19.90	18.98
		RB1#49	21.08	21.67	20.78	19.28	19.87	18.98
		RB25#0	20.72	21.00	21.21	18.92	19.20	19.41
		RB25#25	20.76	21.07	21.17	18.96	19.27	19.37
		RB50#0	19.87	19.97	20.28	18.07	18.17	18.48

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	21.87	21.89	21.89	20.07	20.09	20.09
		RB1#38	21.81	21.85	21.94	20.01	20.05	20.14
		RB1#74	21.84	21.92	21.98	20.04	20.12	20.18
		RB36#0	20.84	21.04	21.10	19.04	19.24	19.30
		RB36#39	20.82	21.08	21.03	19.02	19.28	19.23
		RB75#0	20.87	20.98	21.07	19.07	19.18	19.27
	16QAM	RB1#0	21.33	21.73	20.81	19.53	19.93	19.01
		RB1#38	21.26	21.69	20.76	19.46	19.89	18.96
		RB1#74	21.24	21.65	20.83	19.44	19.85	19.03
		RB36#0	19.88	20.03	20.30	18.08	18.23	18.50
		RB36#39	19.90	20.04	20.30	18.10	18.24	18.50
		RB75#0	19.99	20.11	20.12	18.19	18.31	18.32
20.0	QPSK	RB1#0	21.90	22.20	22.40	20.10	20.40	20.60
		RB1#50	22.05	22.27	22.37	20.25	20.47	20.57
		RB1#99	22.17	22.28	22.29	20.37	20.48	20.49
		RB50#0	21.13	21.25	21.29	19.33	19.45	19.49
		RB50#50	21.15	21.22	21.11	19.35	19.42	19.31
		RB100#0	21.22	21.31	21.38	19.42	19.51	19.58
	16QAM	RB1#0	21.20	21.39	20.83	19.40	19.59	19.03
		RB1#50	21.29	21.41	20.94	19.49	19.61	19.14
		RB1#99	21.40	21.49	20.72	19.60	19.69	18.92
		RB50#0	20.12	20.45	20.42	18.32	18.65	18.62
		RB50#50	20.25	20.48	20.37	18.45	18.68	18.57
		RB100#0	20.29	20.40	20.46	18.49	18.60	18.66

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi) – Cable loss (dB)
For LTE Band 7: Antenna Gain = -1.5dBi
Cable loss = 0.3dB
The Limit: EIRP≤33dBm

Peak-to-average ratio (PAR)

20MHz bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	3.53	4.36	4.42	13	Pass
QPSK (100RB Size)	5.26	5.42	5.29	13	Pass
16QAM (1RB Size)	4.81	5.67	5.38	13	Pass
16QAM (100RB Size)	5.99	6.15	6.12	13	Pass

LTE Band 17:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			ERP(dBm)		
			Low	Mid	High	Low	Mid	High
5	QPSK	RB1#0	23.54	23.45	23.52	17.59	17.50	17.57
		RB1#13	23.57	23.45	23.52	17.62	17.50	17.57
		RB1#24	23.57	23.47	23.51	17.62	17.52	17.56
		RB15#0	23.54	23.69	23.66	17.59	17.74	17.71
		RB15#10	23.53	23.69	23.74	17.58	17.74	17.79
		RB25#0	22.40	22.63	22.65	16.45	16.68	16.70
	16QAM	RB1#0	22.68	23.28	22.36	16.73	17.33	16.41
		RB1#13	22.74	23.30	22.38	16.79	17.35	16.43
		RB1#24	22.68	23.27	22.38	16.73	17.32	16.43
		RB15#0	22.32	22.60	22.81	16.37	16.65	16.86
		RB15#10	22.36	22.67	22.77	16.41	16.72	16.82
		RB25#0	21.47	21.57	21.88	15.52	15.62	15.93
10	QPSK	RB1#0	23.47	23.49	23.49	17.52	17.54	17.54
		RB1#25	23.41	23.45	23.54	17.46	17.50	17.59
		RB1#49	23.44	23.52	23.58	17.49	17.57	17.63
		RB25#0	22.44	22.64	22.70	16.49	16.69	16.75
		RB25#25	22.42	22.68	22.63	16.47	16.73	16.68
		RB50#0	22.47	22.58	22.67	16.52	16.63	16.72
	16QAM	RB1#0	22.93	23.33	22.41	16.98	17.38	16.46
		RB1#25	22.86	23.29	22.36	16.91	17.34	16.41
		RB1#49	22.84	23.25	22.43	16.89	17.30	16.48
		RB25#0	21.48	21.63	21.90	15.53	15.68	15.95
		RB25#25	21.50	21.64	21.90	15.55	15.69	15.95
		RB50#0	21.59	21.71	21.72	15.64	15.76	15.77

Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBd) – Cable loss (dB)
For LTE Band17: Antenna Gain = -3.5dBi = -5.65dBd (0dBd=2.15dBi)
Cable loss = 0.3dB
Limit: ERP≤34.77dBm

Peak-to-average ratio (PAR)

10MHz bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.77	5.58	5.67	13	Pass
QPSK (50RB Size)	5.83	5.87	5.77	13	Pass
16QAM (1RB Size)	7.15	6.41	7.44	13	Pass
16QAM (50RB Size)	6.70	6.76	6.70	13	Pass

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

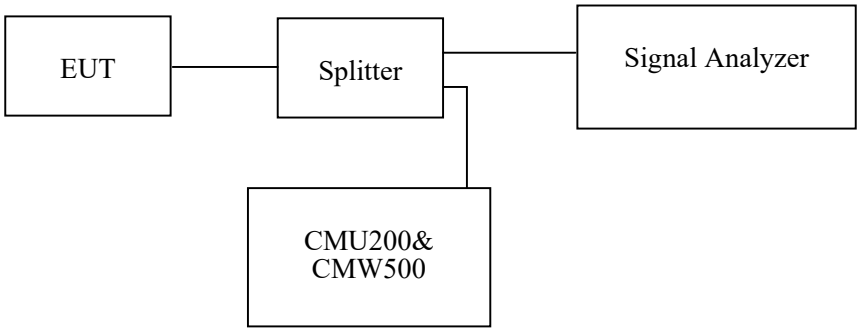
Applicable Standard

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

Test Procedure

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:	28~28.9 ℃
Relative Humidity:	49~58 %
ATM Pressure:	101.0 kPa

The testing was performed by Pedro Yun from 2021-05-31 to 2021-07-02.

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	246.00	319.82
	190	836.6	240.00	312.09
	251	848.8	246.00	315.71
EGPRS(8PSK)	128	824.2	244.00	307.32
	190	836.6	248.00	313.32
	251	848.8	246.00	311.65

Frequency (MHz)		Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)
RMC	826.4	4.14	4.71
	836.6	4.18	4.70
	846.6	4.16	4.71
HSDPA	826.4	4.14	4.69
	836.6	4.18	4.71
	846.6	4.14	4.70
HSUPA	826.4	4.16	4.70
	836.6	4.18	4.69
	846.6	4.16	4.72

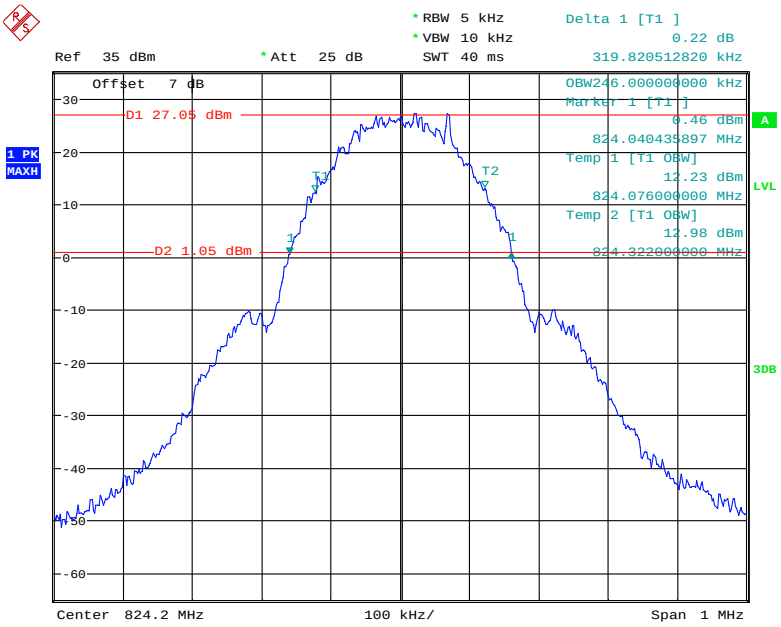
PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	512	1850.2	242.00	319.71
	661	1880.0	244.00	319.27
	810	1909.8	244.00	317.68
EGPRS(8PSK)	512	1850.2	242.00	308.90
	661	1880.0	244.00	310.88
	810	1909.8	248.00	323.32

Frequency (MHz)		Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)
RMC	1852.4	4.16	4.71
	1880.0	4.16	4.68
	1907.6	4.18	4.73
HSDPA	1852.4	4.16	4.68
	1880.0	4.16	4.71
	1907.6	4.18	4.73
HSUPA	1852.4	4.16	4.71
	1880.0	4.16	4.71
	1907.6	4.16	4.73

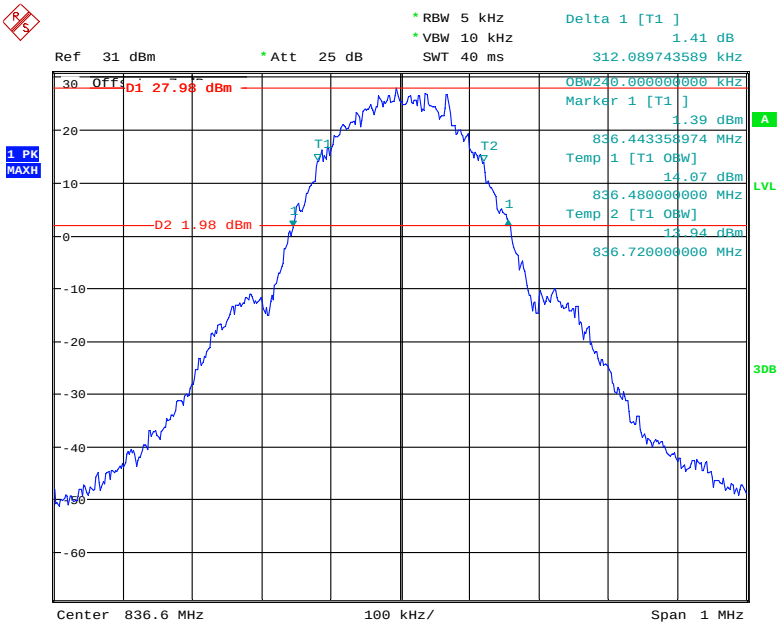
Cellular Band (Part 22H)

26 dB Emissions &99% Occupied Bandwidth for GSM (GMSK) Mode, Low channel



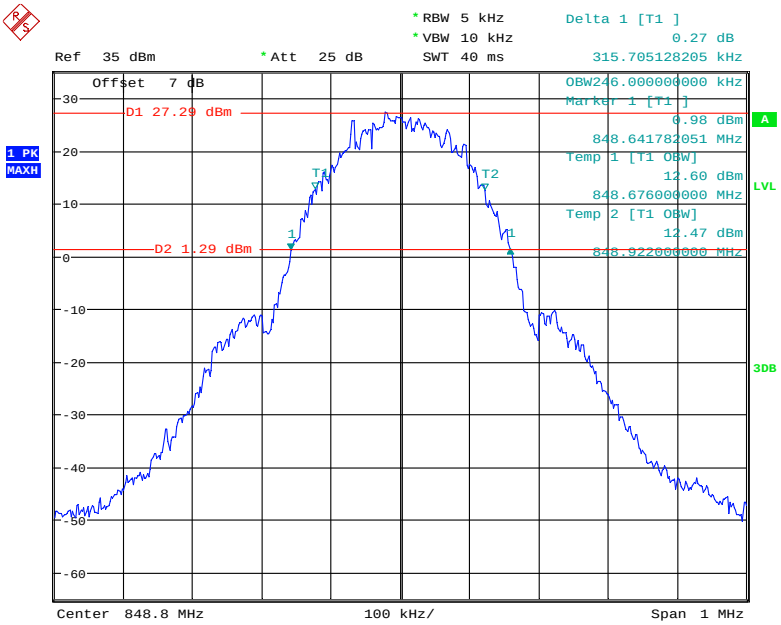
Date: 31.MAY.2021 15:06:49

26 dB Emissions &99% Occupied Bandwidth for GSM (GMSK) Mode, Middle channel



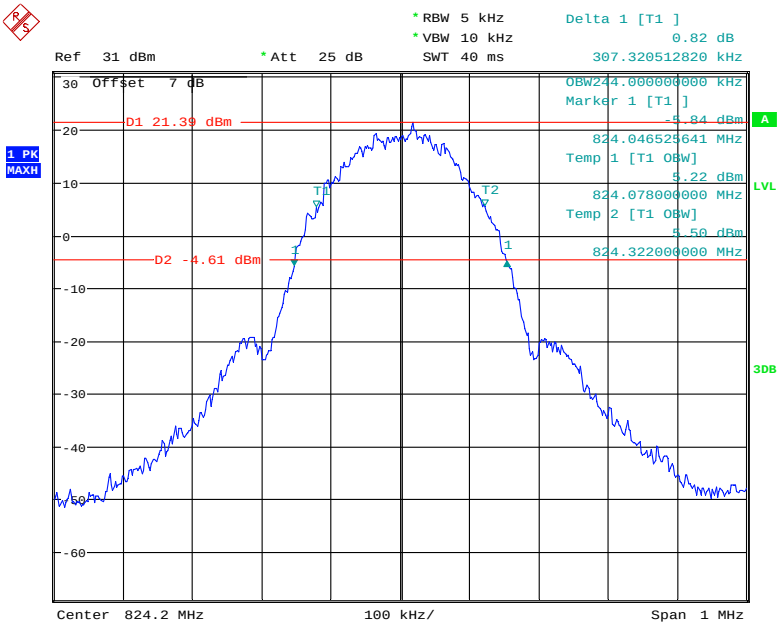
Date: 31.MAY.2021 11:20:36

26 dB Emissions &99% Occupied Bandwidth for GSM (GMSK) Mode, High channel



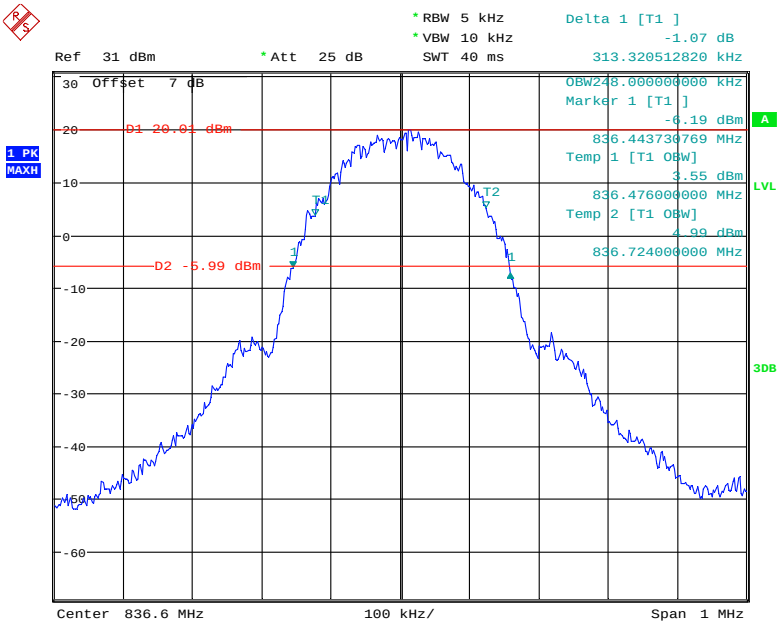
Date: 31.MAY.2021 11:28:53

26 dB Emissions &99% Occupied Bandwidth for EGPRS (8PSK) Mode, Low channel



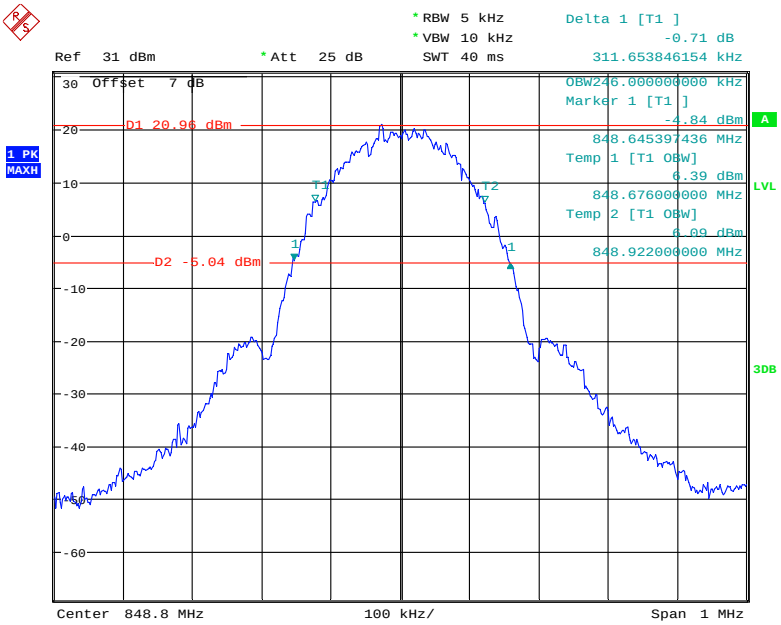
Date: 31.MAY.2021 11:09:41

26 dB Emissions &99% Occupied Bandwidth for EGPRS (8PSK) Mode, Middle channel



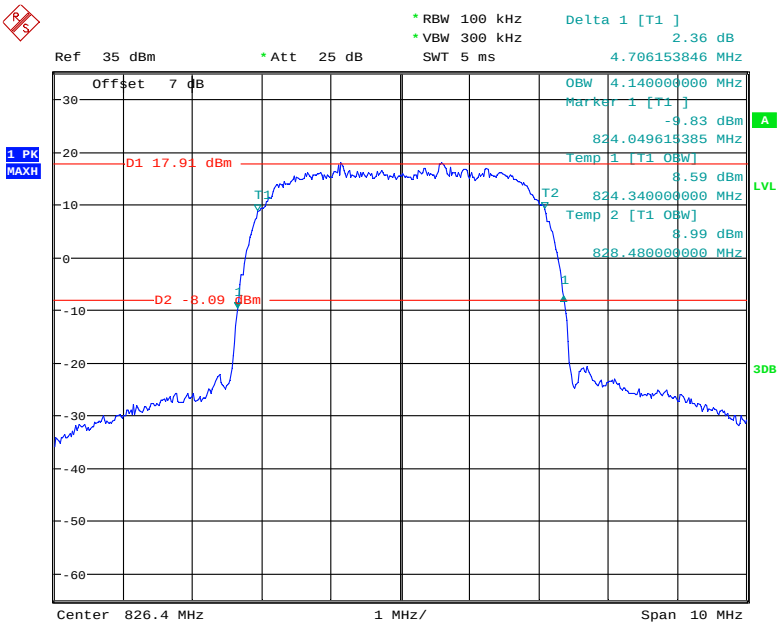
Date: 31.MAY.2021 11:10:48

26 dB Emissions &99% Occupied Bandwidth for EGPRS (8PSK) Mode, High channel



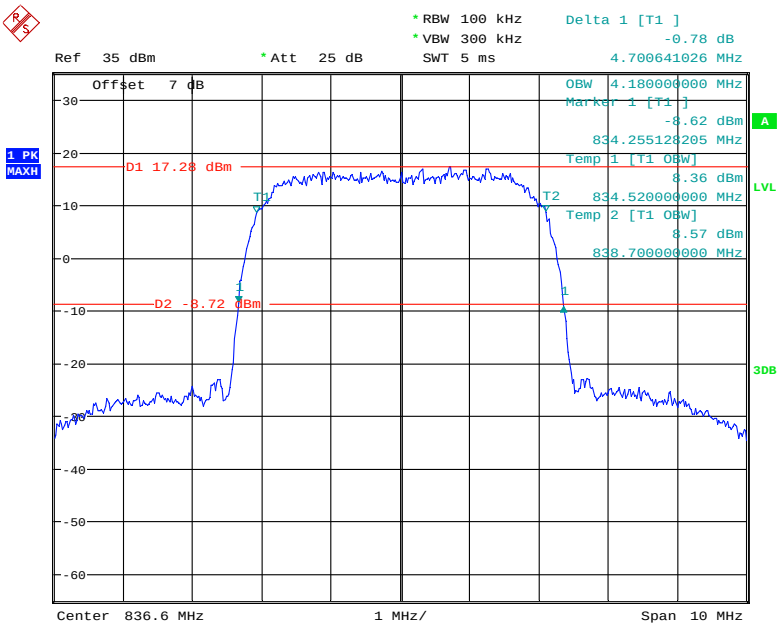
Date: 31.MAY.2021 11:06:55

26 dB Emissions &99% Occupied Bandwidth for RMC (BPSK) Mode, Low channel



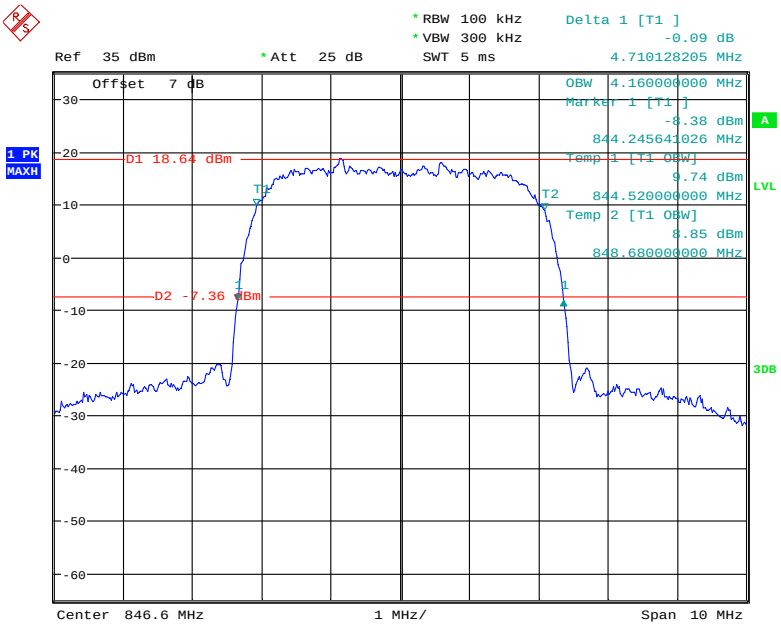
Date: 31.MAY.2021 14:12:55

26 dB Emissions &99% Occupied Bandwidth for RMC (BPSK) Mode, Middle channel



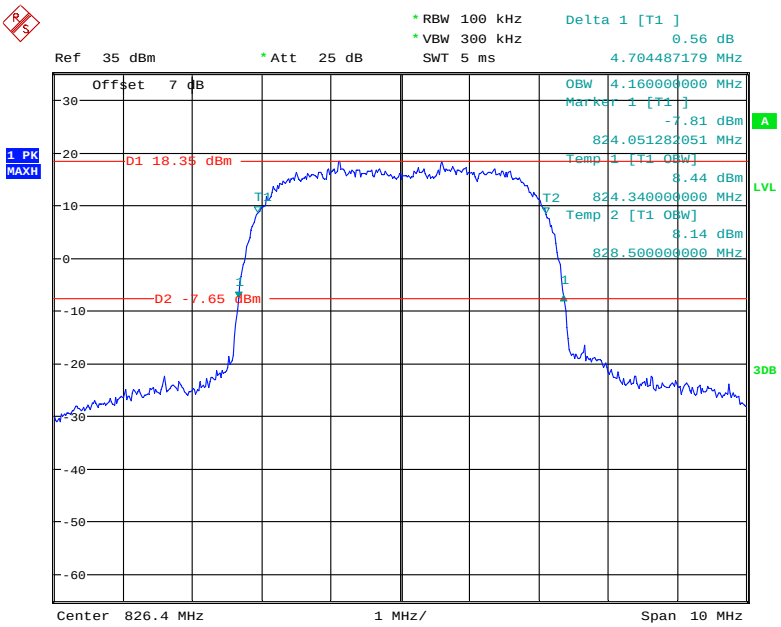
Date: 31.MAY.2021 14:11:20

26 dB Emissions &99% Occupied Bandwidth for RMC (BPSK) Mode, High channel



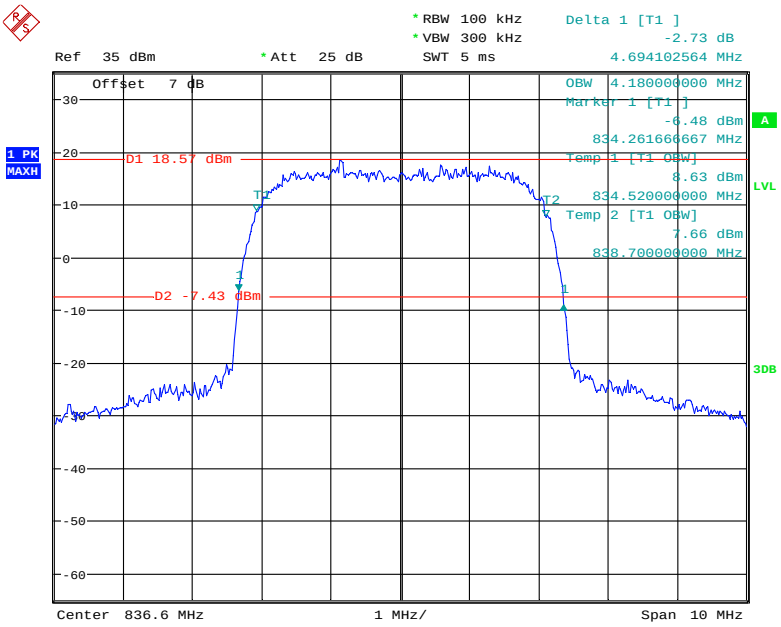
Date: 31.MAY.2021 16:10:51

26 dB Emissions &99% Occupied Bandwidth for HSUPA (BPSK) Mode, Low channel



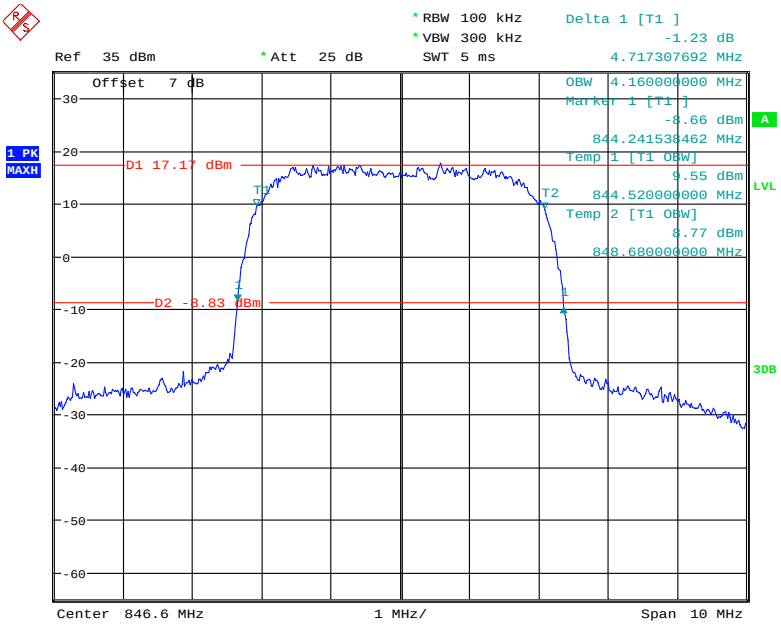
Date: 31.MAY.2021 14:00:58

26 dB Emissions &99% Occupied Bandwidth for HSUPA (BPSK) Mode, Middle channel



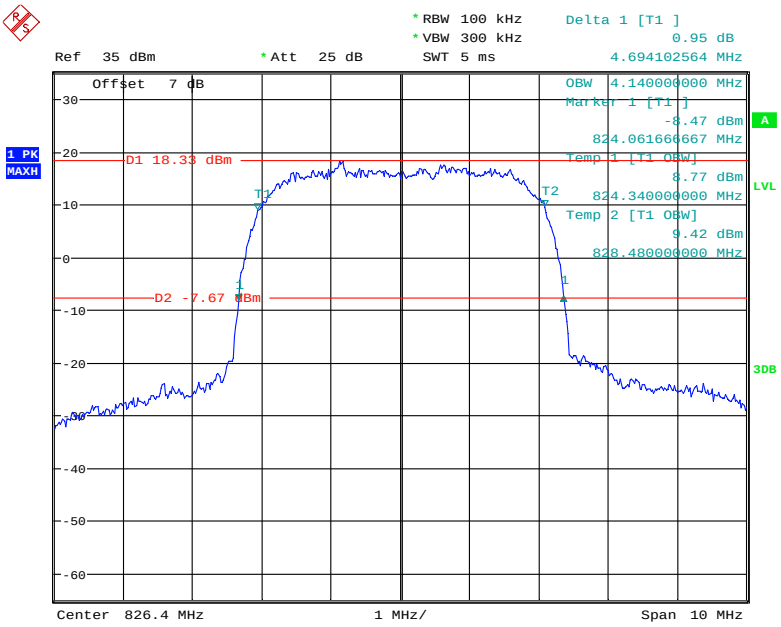
Date: 31.MAY.2021 13:59:22

26 dB Emissions &99% Occupied Bandwidth for HSUPA (BPSK) Mode, High channel



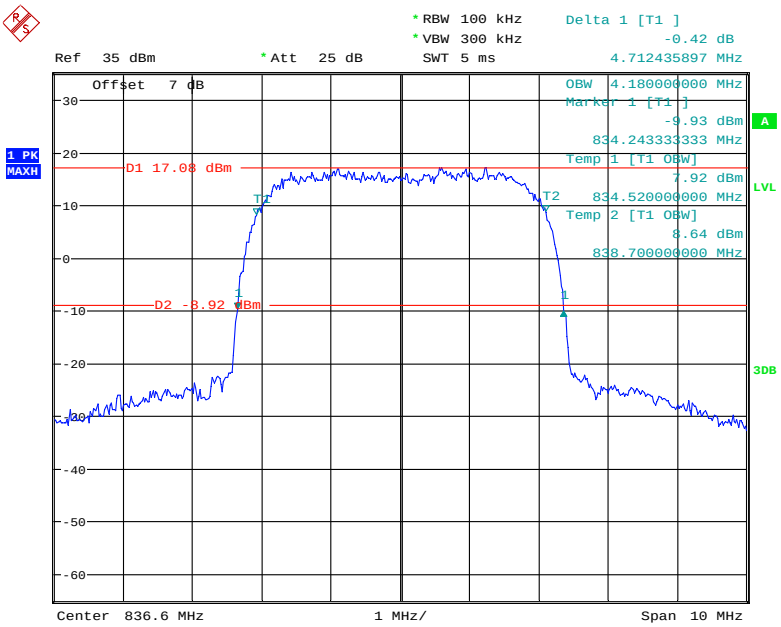
Date: 31.MAY.2021 13:57:50

26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode, Low channel



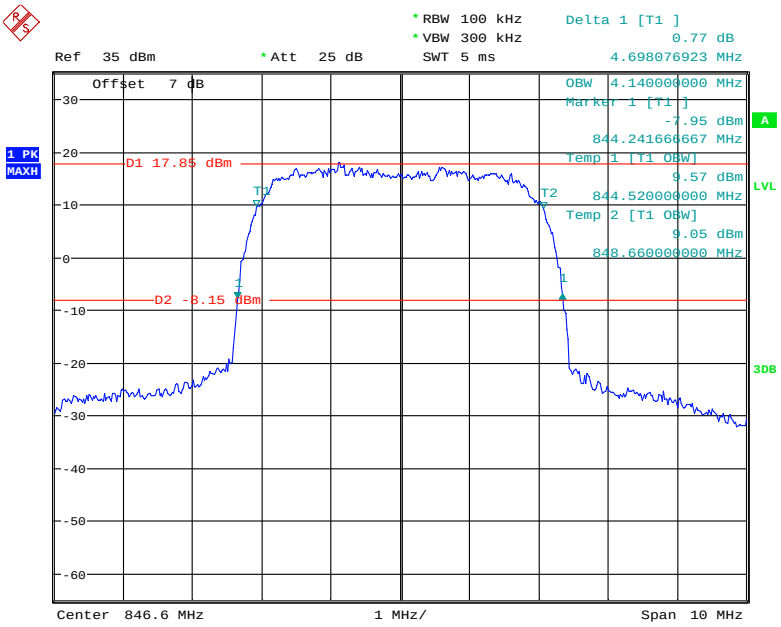
Date: 31.MAY.2021 14:05:11

26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode, Middle channel



Date: 31.MAY.2021 14:06:58

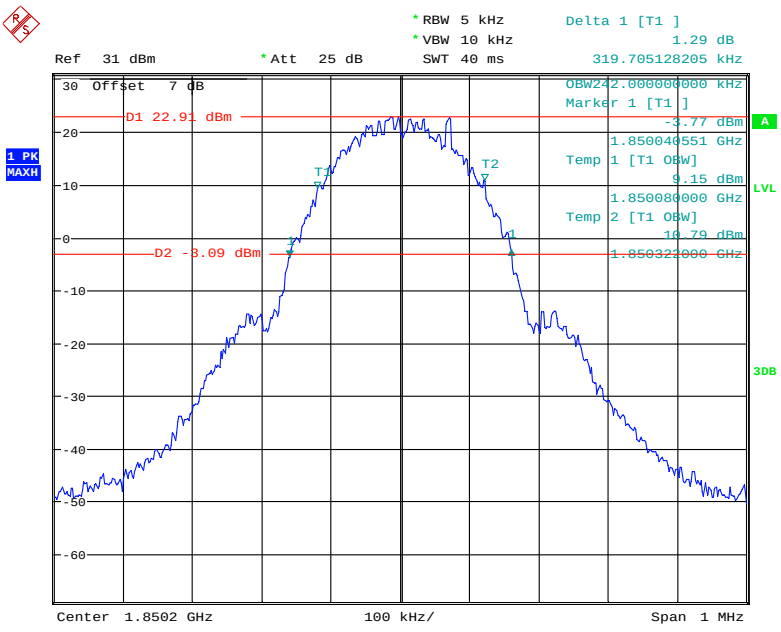
26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode, High channel



Date: 31.MAY.2021 14:08:46

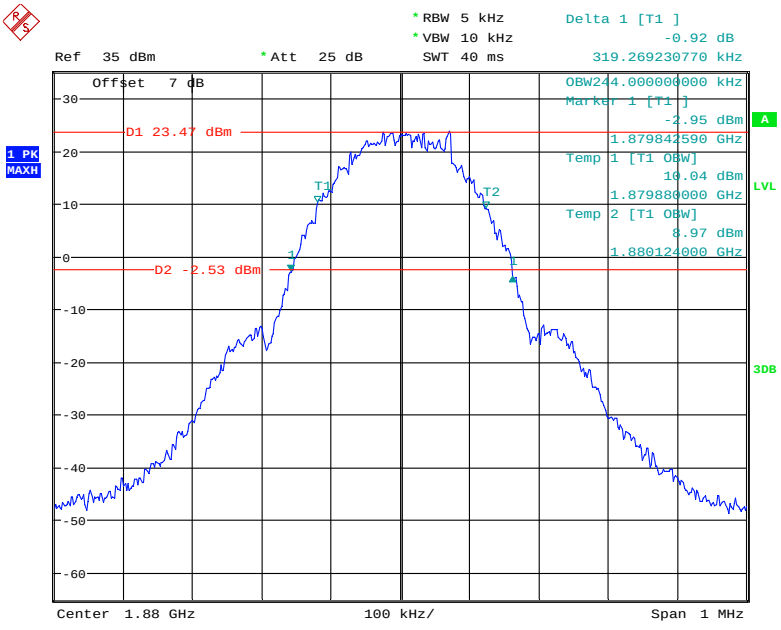
PCS Band (Part 24E)

26 dB Emissions &99% Occupied Bandwidth for GSM (GMSK) Mode, Low channel



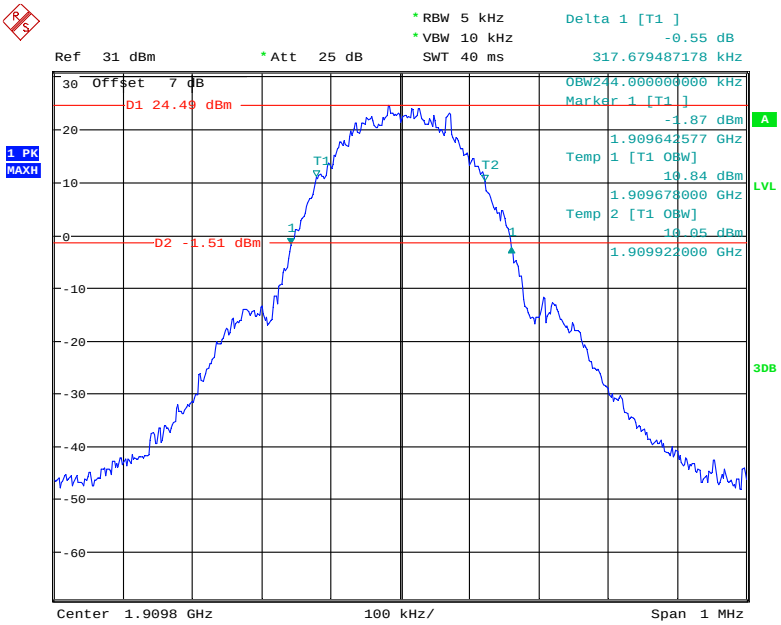
Date: 31.MAY.2021 11:17:15

26 dB Emissions &99% Occupied Bandwidth for GSM (GMSK) Mode, Middle channel



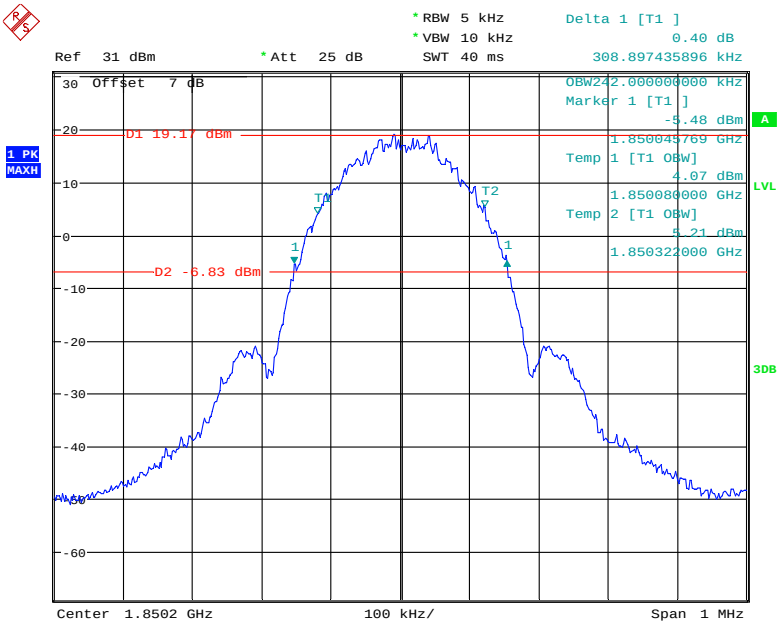
Date: 31.MAY.2021 16:04:25

26 dB Emissions &99% Occupied Bandwidth for GSM (GMSK) Mode, High channel



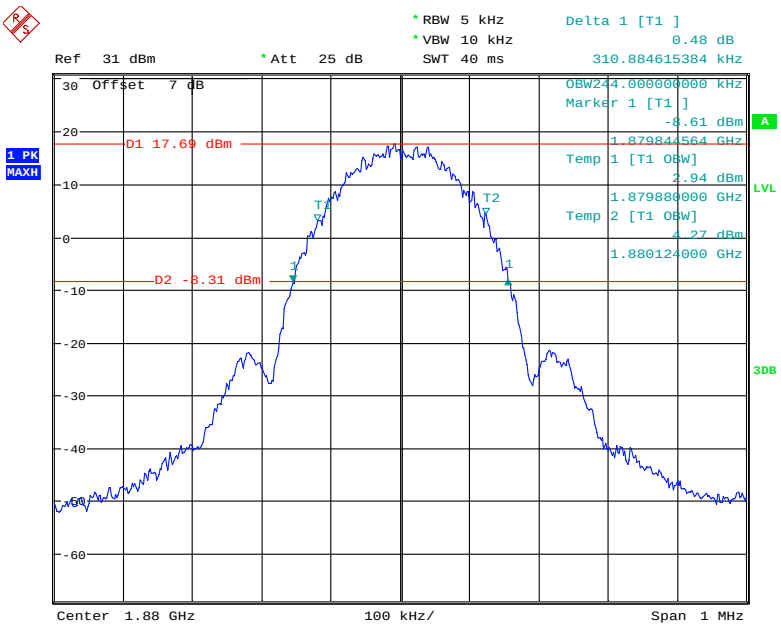
Date: 31.MAY.2021 11:14:47

26 dB Emissions &99% Occupied Bandwidth for EGPRS (8PSK) Mode, Low channel



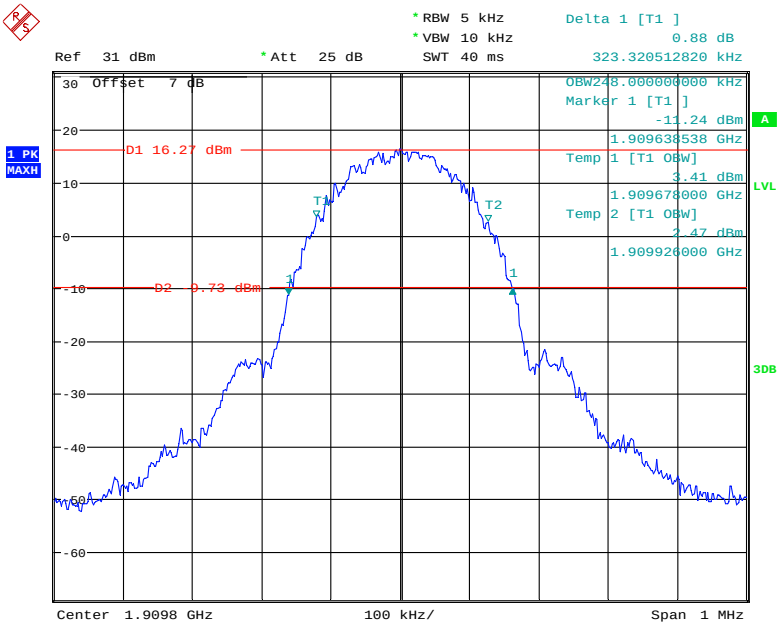
Date: 31.MAY.2021 10:59:22

26 dB Emissions &99% Occupied Bandwidth for EGPRS (8PSK) Mode, Middle channel



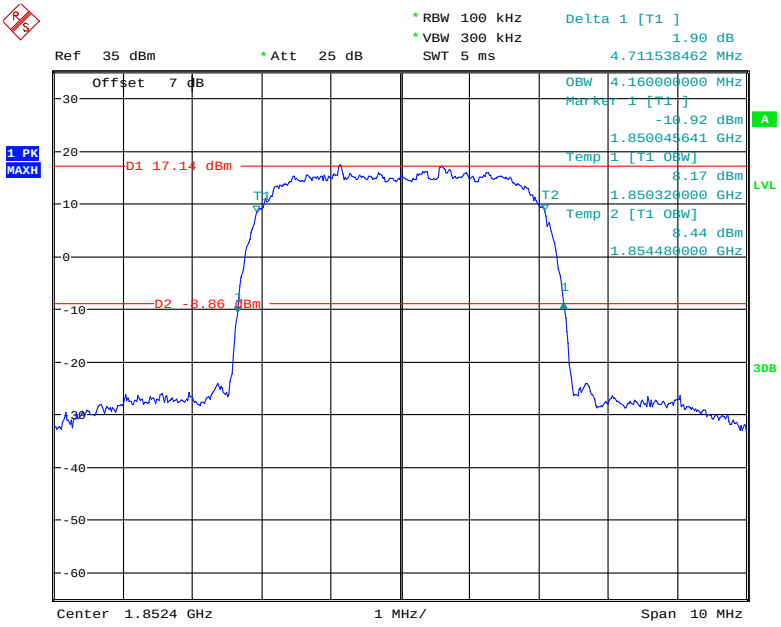
Date: 31.MAY.2021 11:02:53

26 dB Emissions &99% Occupied Bandwidth for EGPRS (8PSK) Mode, High channel



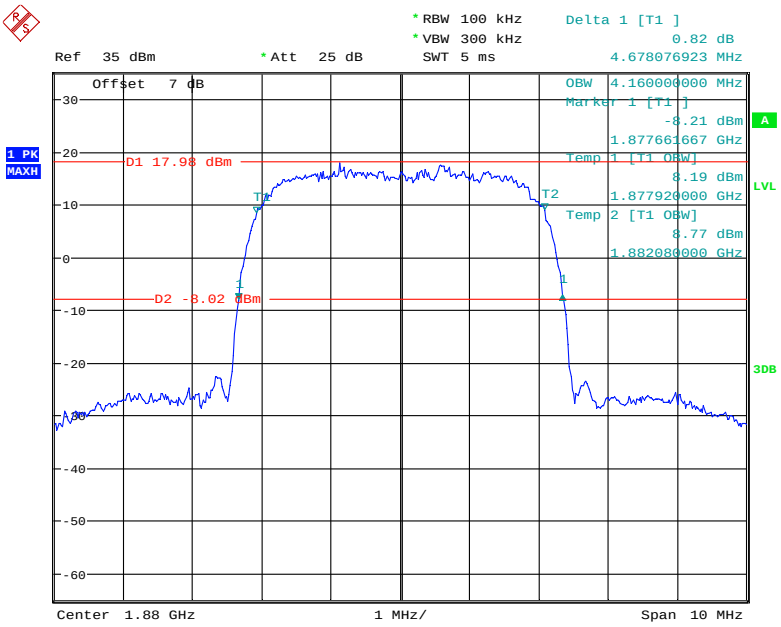
Date: 31.MAY.2021 11:04:21

26 dB Emissions &99% Occupied Bandwidth for RMC (BPSK) Mode, Low channel



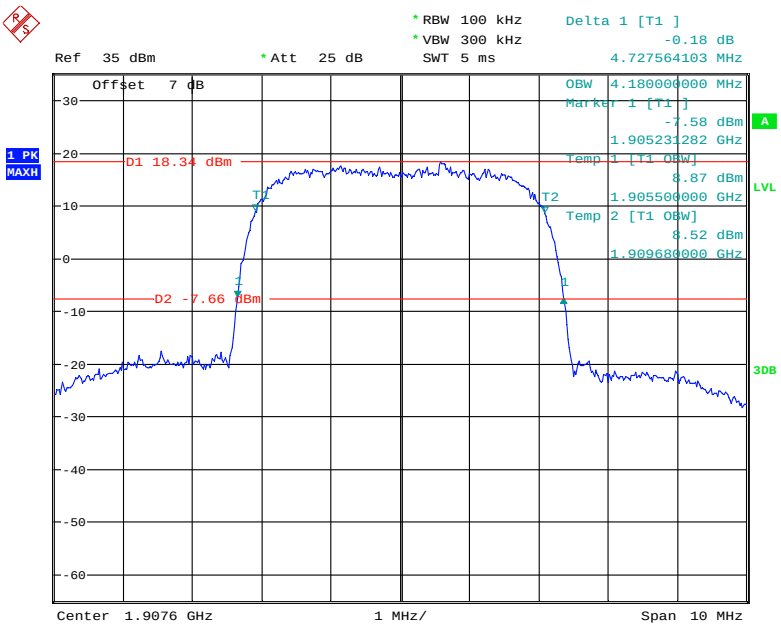
Date: 31.MAY.2021 13:36:27

26 dB Emissions &99% Occupied Bandwidth for RMC (BPSK) Mode, Middle channel



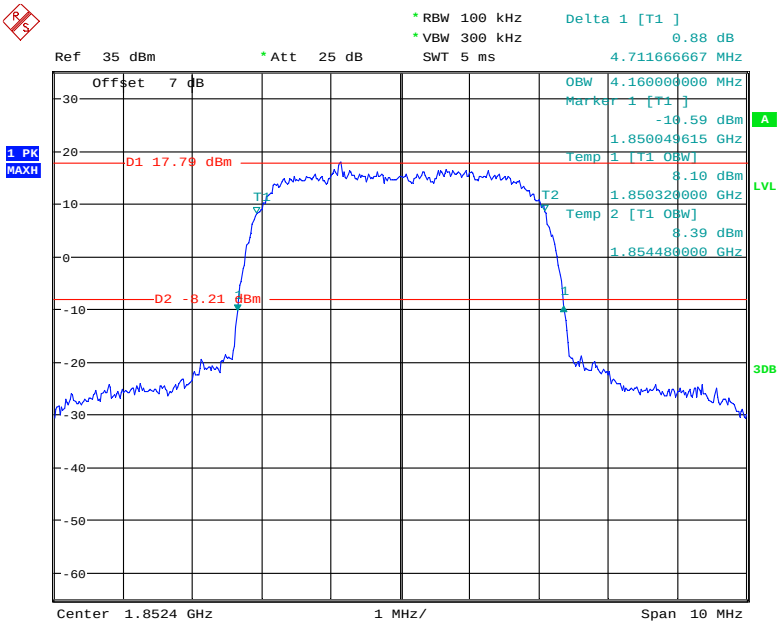
Date: 31.MAY.2021 13:41:43

26 dB Emissions &99% Occupied Bandwidth for RMC (BPSK) Mode, High channel



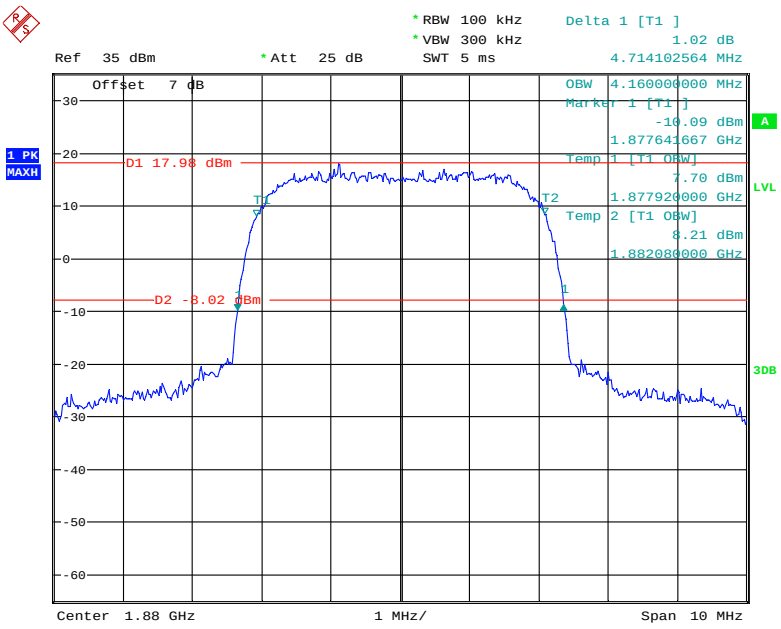
Date: 31.MAY.2021 13:43:38

26 dB Emissions &99% Occupied Bandwidth for HSUPA (BPSK) Mode, Low channel



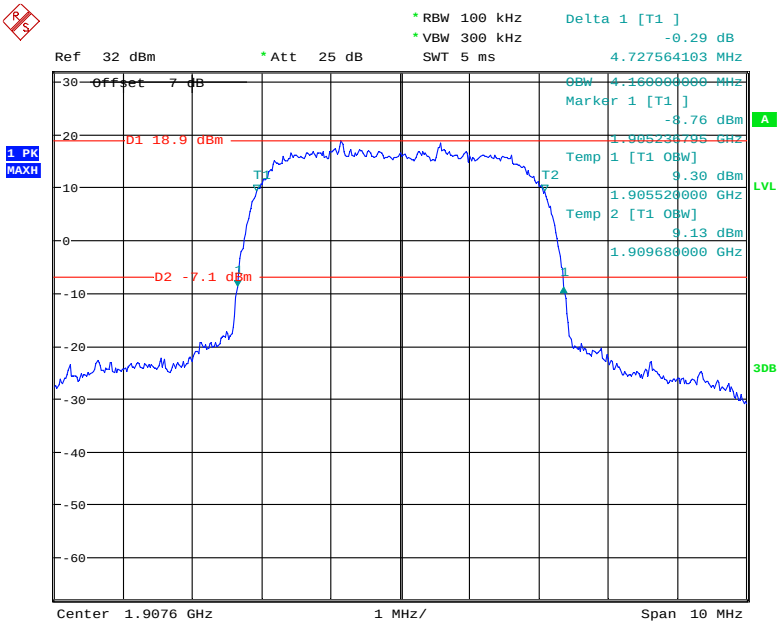
Date: 31.MAY.2021 13:52:27

26 dB Emissions &99% Occupied Bandwidth for HSUPA (BPSK) Mode, Middle channel



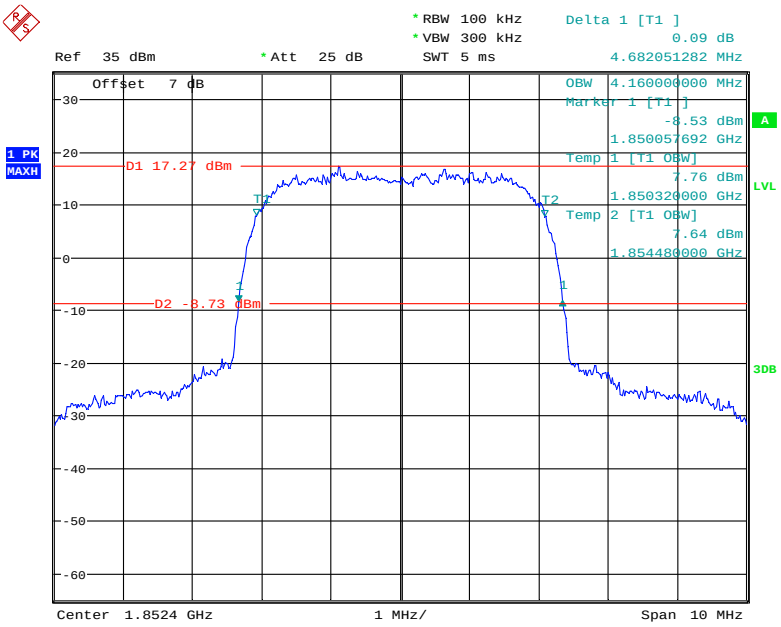
Date: 31.MAY.2021 13:53:50

26 dB Emissions &99% Occupied Bandwidth for HSUPA (BPSK) Mode, High channel



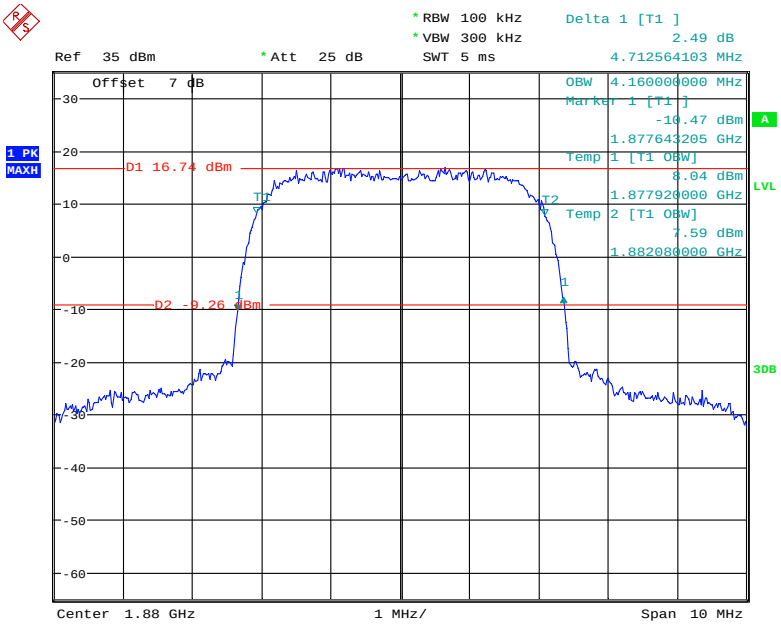
Date: 2.JUL.2021 13:54:10

26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode, Low channel



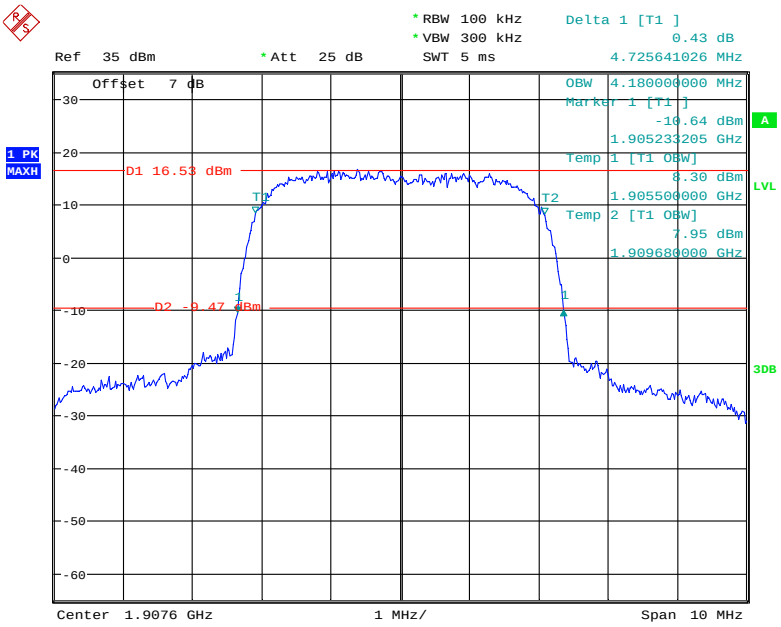
Date: 31.MAY.2021 13:47:48

26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode, Middle channel



Date: 31.MAY.2021 13:46:34

26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode, High channel



Date: 31.MAY.2021 13:45:08

LTE Band 2:

Bandwidth (MHz)	Modulation	Channel	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	Low	1.110	1.260
		Middle	1.104	1.260
		High	1.104	1.266
	16QAM	Low	1.104	1.260
		Middle	1.116	1.266
		High	1.098	1.266
3	QPSK	Low	2.688	2.988
		Middle	2.700	3.000
		High	2.700	3.012
	16QAM	Low	2.700	3.024
		Middle	2.700	2.988
		High	2.700	3.036
5	QPSK	Low	4.520	5.000
		Middle	4.520	5.020
		High	4.520	5.020
	16QAM	Low	4.520	4.980
		Middle	4.520	5.020
		High	4.520	5.020
10	QPSK	Low	8.960	9.720
		Middle	8.960	9.720
		High	8.960	9.760
	16QAM	Low	8.960	9.760
		Middle	8.960	9.760
		High	8.960	9.800
15	QPSK	Low	13.560	14.940
		Middle	13.500	15.120
		High	13.500	15.120
	16QAM	Low	13.560	15.000
		Middle	13.500	15.060
		High	13.500	15.060
20	QPSK	Low	18.000	19.520
		Middle	18.000	19.600
		High	18.000	19.680
	16QAM	Low	18.080	19.680
		Middle	18.000	19.600
		High	17.920	19.600

Band 4:

Bandwidth (MHz)	Modulation	Channel	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	Low	1.098	1.254
		Middle	1.098	1.254
		High	1.104	1.254
	16QAM	Low	1.116	1.272
		Middle	1.098	1.254
		High	1.104	1.254
3	QPSK	Low	2.700	2.988
		Middle	2.700	3.000
		High	2.700	3.024
	16QAM	Low	2.700	3.012
		Middle	2.688	3.012
		High	2.700	3.012
5	QPSK	Low	4.520	4.980
		Middle	4.520	5.020
		High	4.520	5.000
	16QAM	Low	4.520	4.980
		Middle	4.540	5.020
		High	4.520	5.000
10	QPSK	Low	9.000	9.840
		Middle	8.960	9.760
		High	8.960	9.800
	16QAM	Low	8.960	9.720
		Middle	9.000	9.800
		High	8.960	9.880
15	QPSK	Low	13.560	15.120
		Middle	13.560	15.060
		High	13.560	15.180
	16QAM	Low	13.560	15.000
		Middle	13.560	15.120
		High	13.560	15.120
20	QPSK	Low	17.920	19.520
		Middle	17.920	19.680
		High	18.000	19.760
	16QAM	Low	18.080	19.680
		Middle	18.000	19.680
		High	18.000	19.840

Band 7

Bandwidth (MHz)	Modulation	Channel	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5	QPSK	Low	4.520	4.980
		Middle	4.520	5.020
		High	4.500	4.940
	16QAM	Low	4.520	4.980
		Middle	4.520	4.980
		High	4.520	4.980
10	QPSK	Low	8.960	9.760
		Middle	8.960	9.800
		High	8.960	9.720
	16QAM	Low	8.960	9.800
		Middle	8.960	9.840
		High	8.960	9.800
15	QPSK	Low	13.560	15.060
		Middle	13.500	15.000
		High	13.560	15.060
	16QAM	Low	13.500	15.060
		Middle	13.560	15.000
		High	13.500	15.060
20	QPSK	Low	18.000	19.680
		Middle	17.920	19.680
		High	18.000	19.760
	16QAM	Low	18.080	19.600
		Middle	18.000	19.760
		High	18.000	19.840

Band 17

Bandwidth (MHz)	Modulation	Channel	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5	QPSK	Low	4.520	5.000
		Middle	4.520	5.000
		High	4.520	5.000
	16QAM	Low	4.520	4.980
		Middle	4.520	5.000
		High	4.520	4.960
10	QPSK	Low	8.960	9.760
		Middle	8.960	9.720
		High	8.960	9.800
	16QAM	Low	8.960	9.800
		Middle	9.000	9.800
		High	8.960	9.800

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

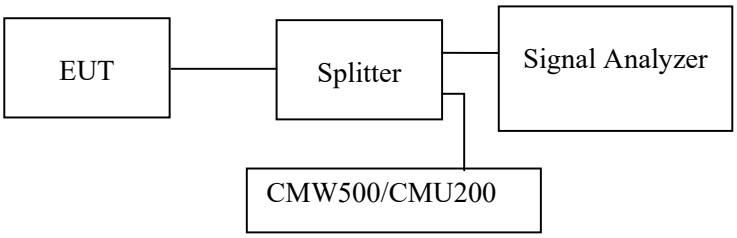
Applicable Standard

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

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

Test Procedure

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.



Test Data

Environmental Conditions

Temperature:	28~28.9 ℃
Relative Humidity:	49~58 %
ATM Pressure:	101.0 kPa

The testing was performed by Pedro Yun from 2021-05-31 to 2021-06-04.

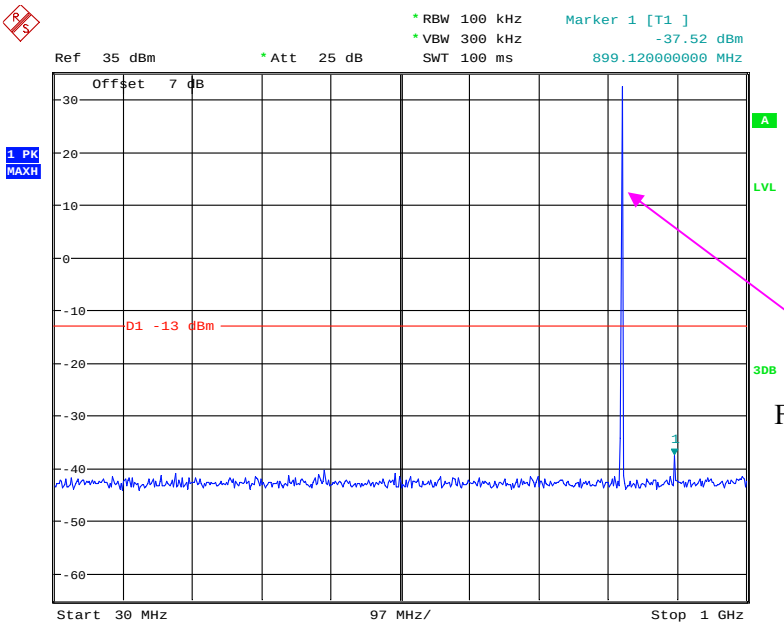
EUT operation mode: Transmitting

Test result: Pass

Please refer to the following plots.

Cellular Band (Part 22H)
Low Channel:

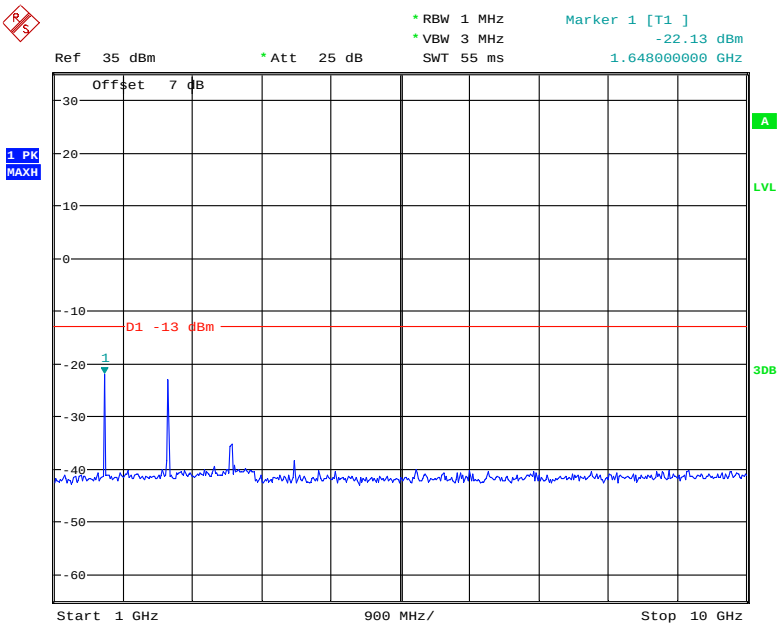
30 MHz – 1 GHz (GSM Mode)



Fundamental test

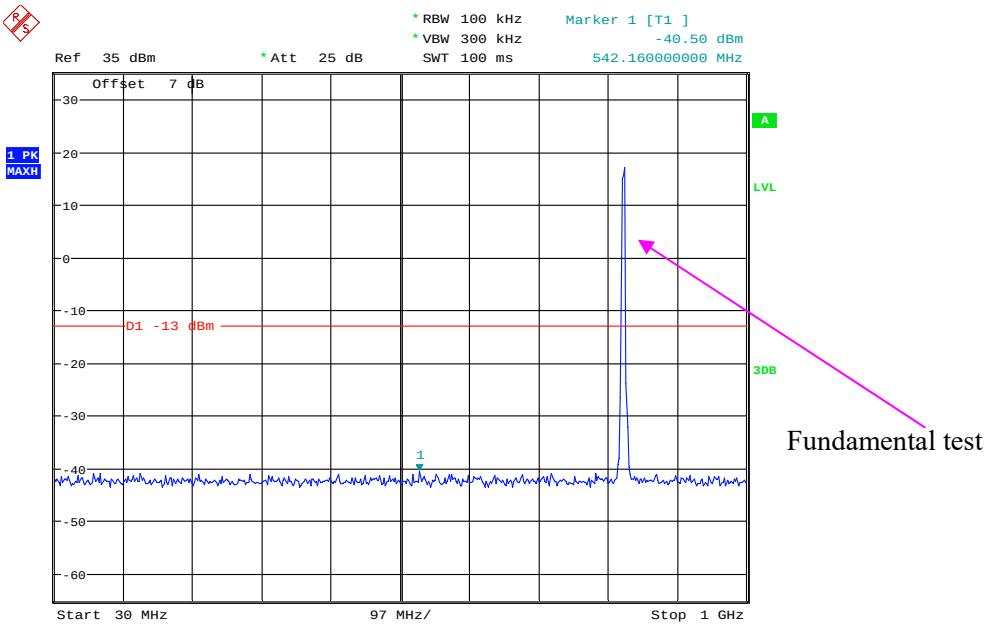
Date: 31.MAY.2021 11:34:40

1 GHz – 10 GHz (GSM Mode)



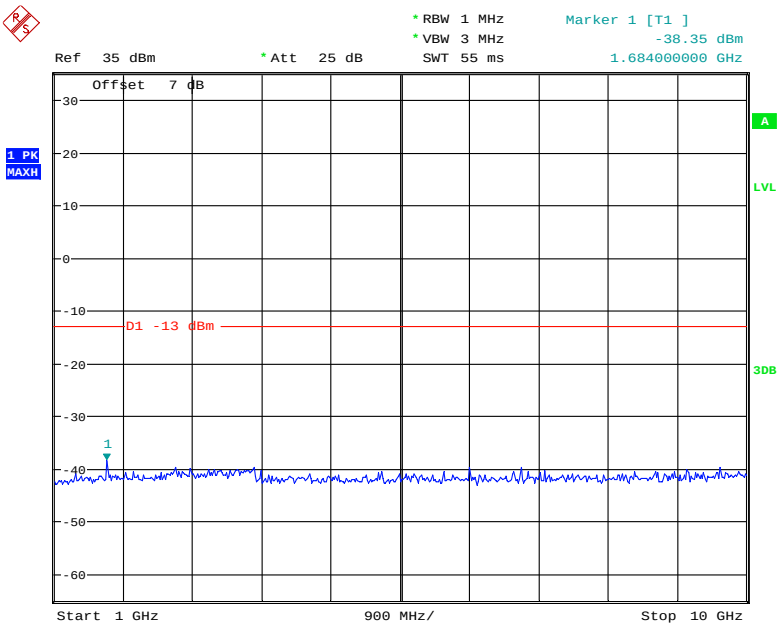
Date: 31.MAY.2021 11:35:22

30 MHz – 1 GHz (WCDMA Mode)



Date: 31.MAY.2021 14:38:29

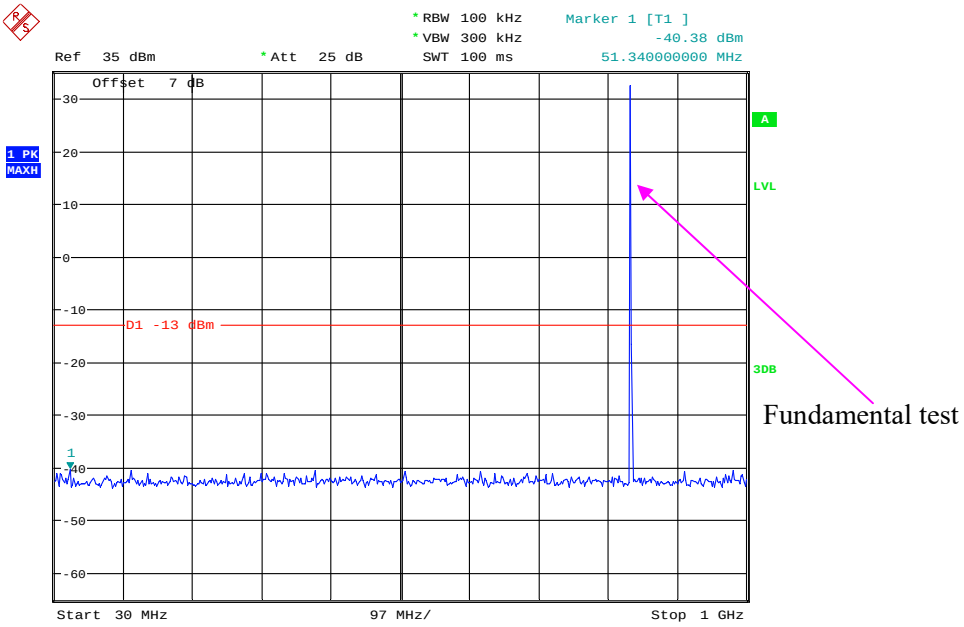
1 GHz – 10 GHz (WCDMA Mode)



Date: 31.MAY.2021 14:39:19

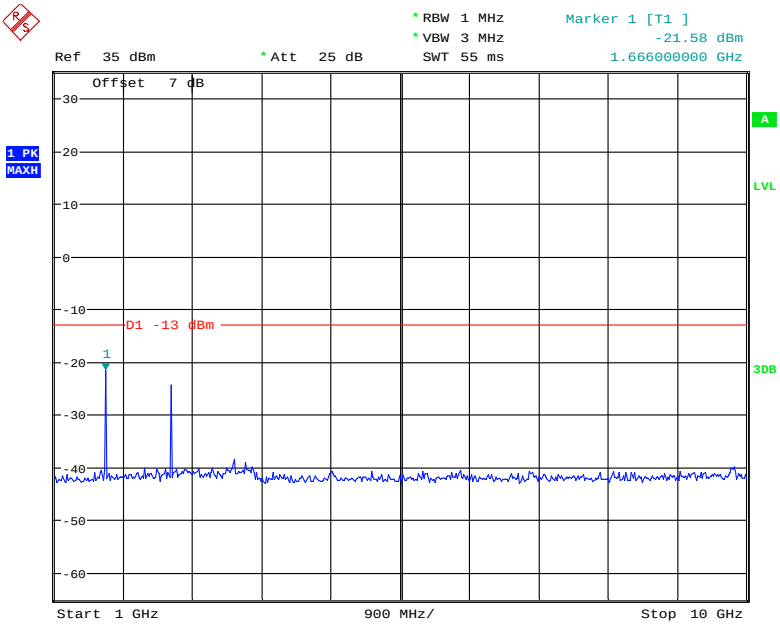
Middle Channel:

30 MHz – 1 GHz (GSM Mode)



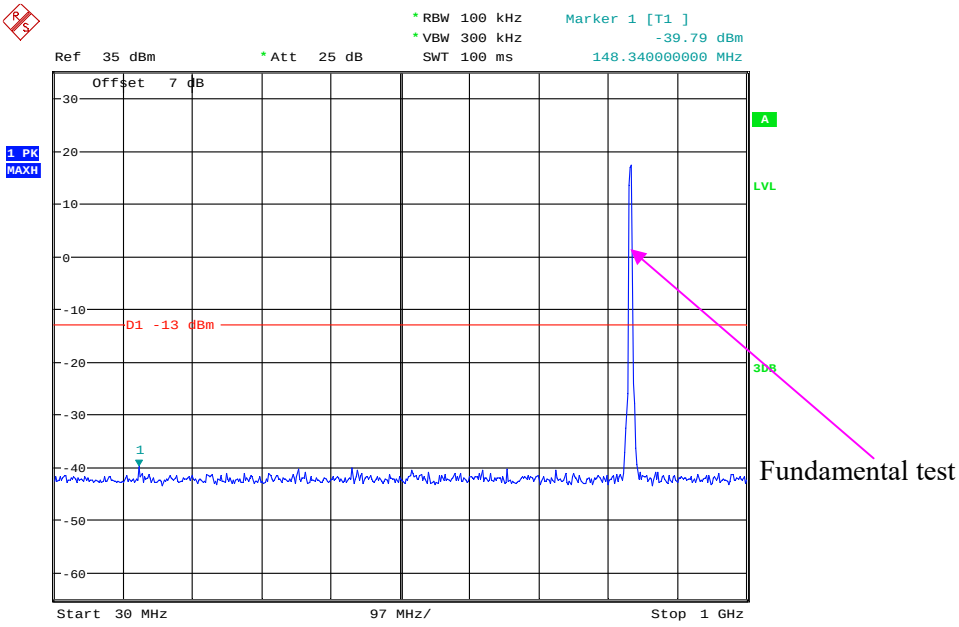
Date: 31.MAY.2021 11:34:09

1 GHz – 10 GHz (GSM Mode)



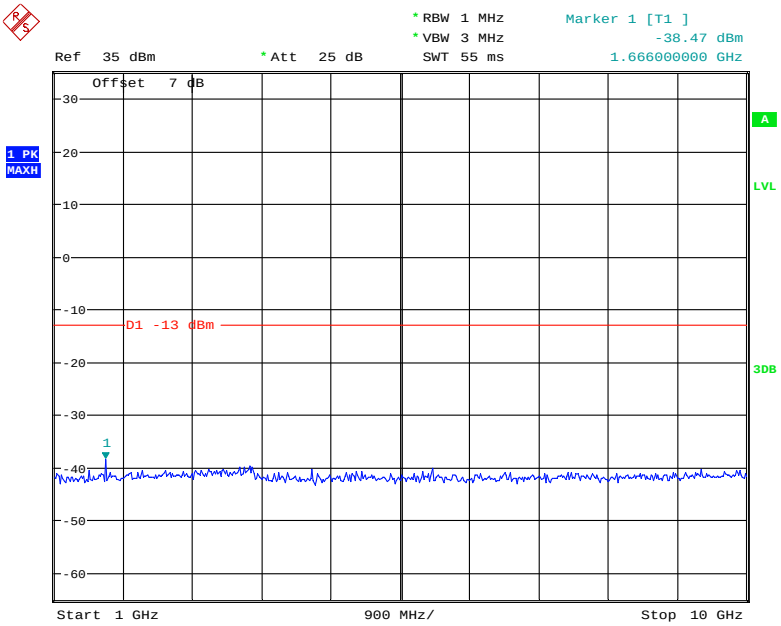
Date: 31.MAY.2021 11:33:05

30 MHz – 1 GHz (WCDMA Mode)



Date: 31.MAY.2021 16:14:18

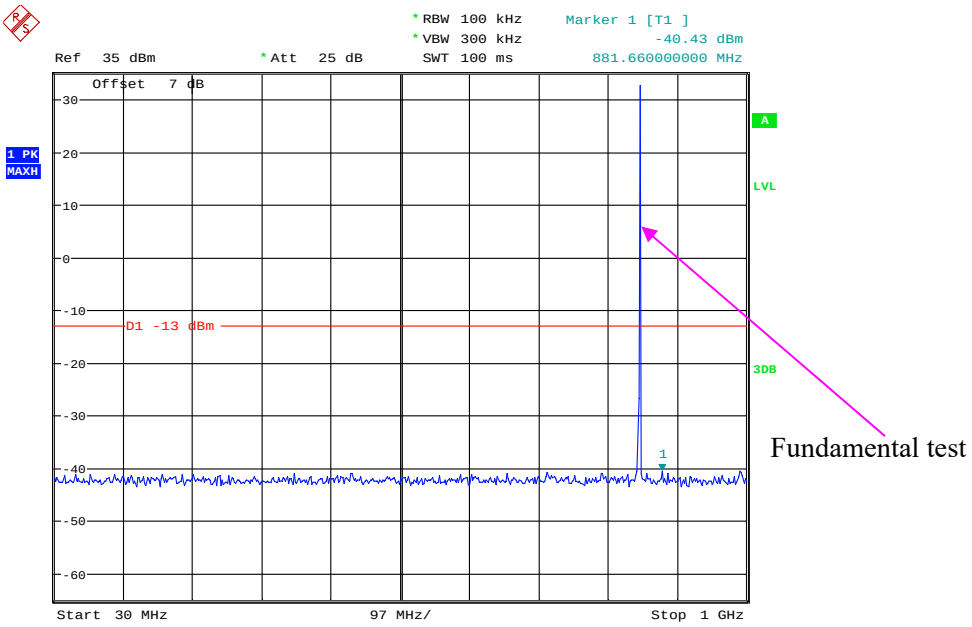
1 GHz – 10 GHz (WCDMA Mode)



Date: 31.MAY.2021 16:16:32

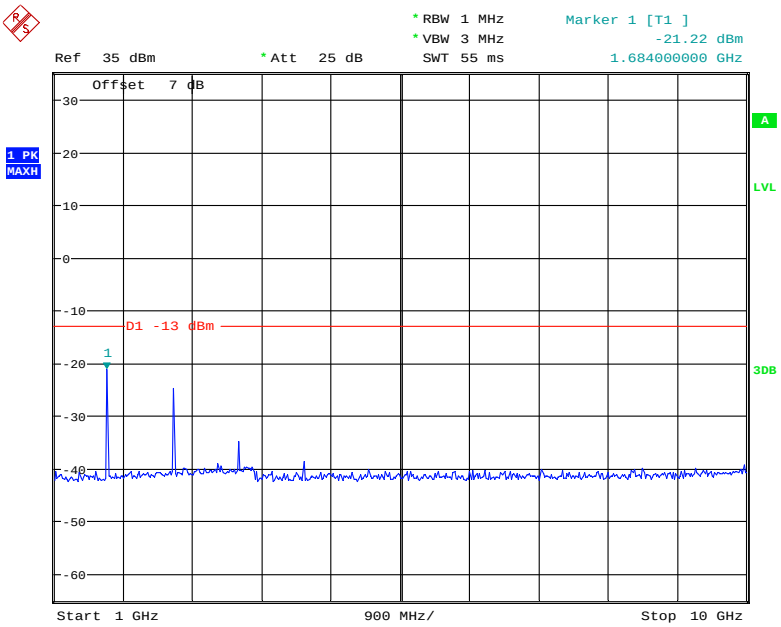
High Channel:

30 MHz – 1 GHz (WCDMA Mode)



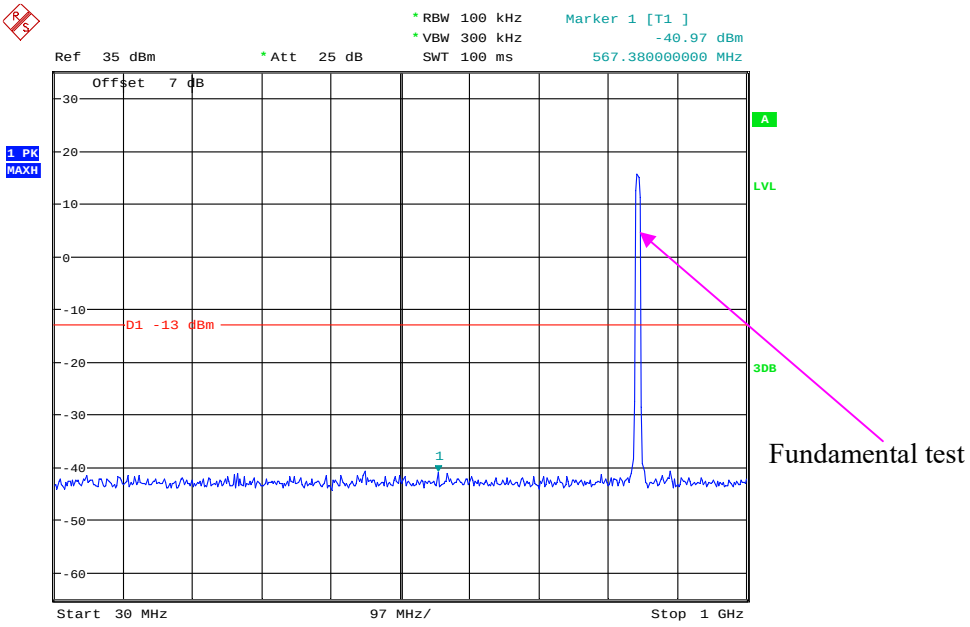
Date: 31.MAY.2021 11:31:10

1 GHz – 10 GHz (WCDMA Mode)



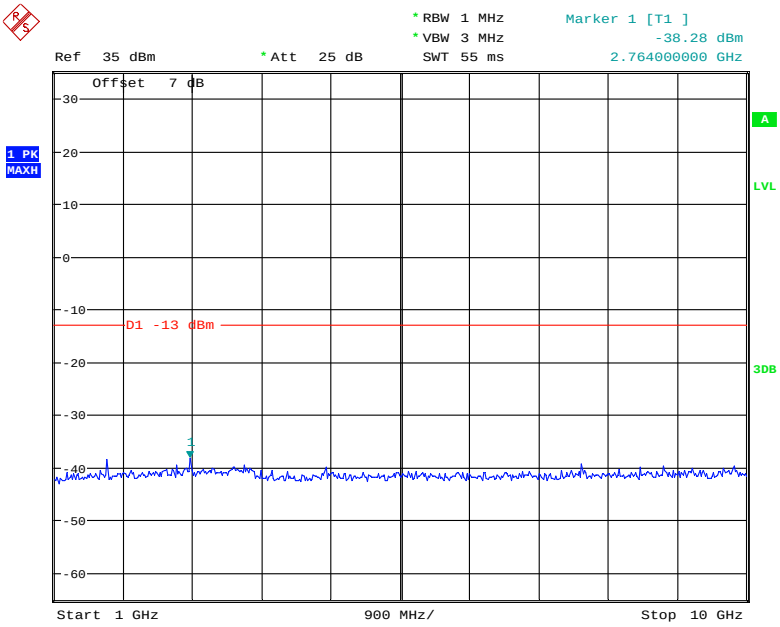
Date: 31.MAY.2021 11:32:17

30 MHz – 1 GHz (WCDMA Mode)



Date: 31.MAY.2021 16:15:14

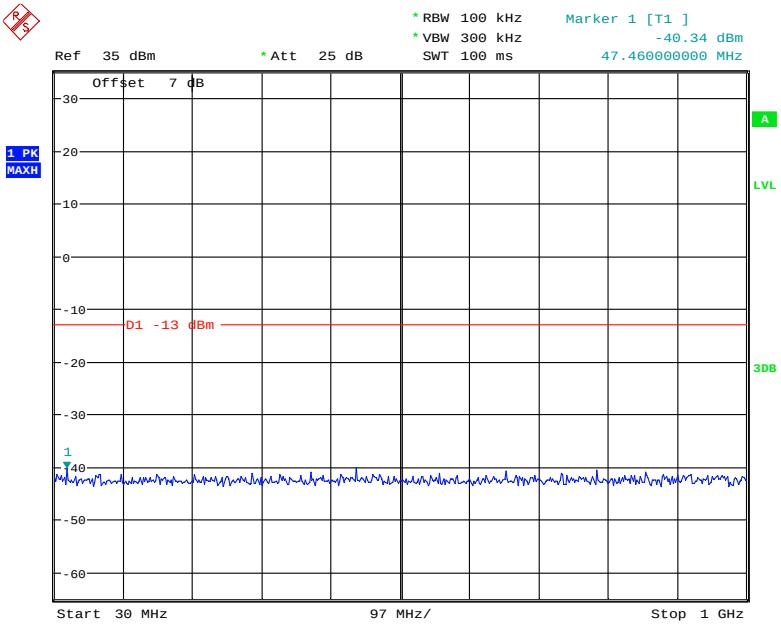
1 GHz – 10 GHz (WCDMA Mode)



Date: 31.MAY.2021 16:15:56

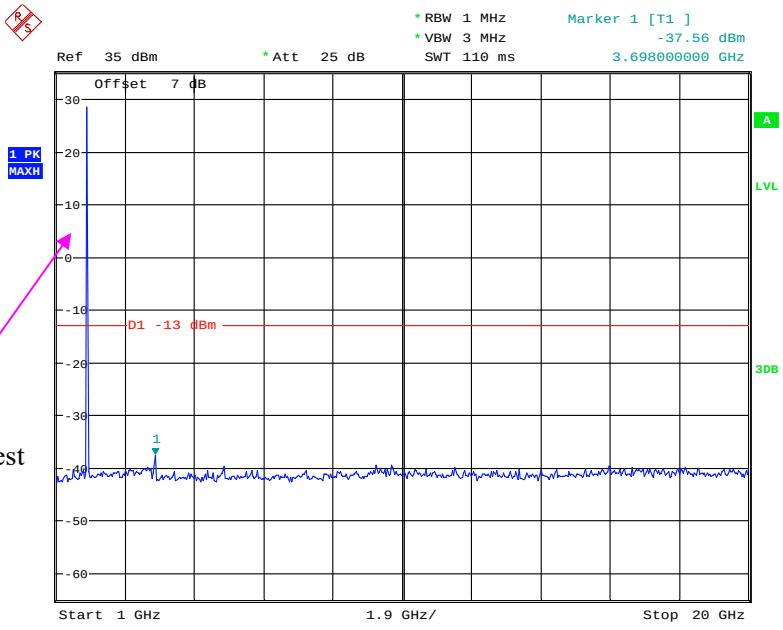
PCS Band (Part 24E) Low Channel:

30 MHz – 1 GHz (GSM Mode)



Date: 31.MAY.2021 11:36:55

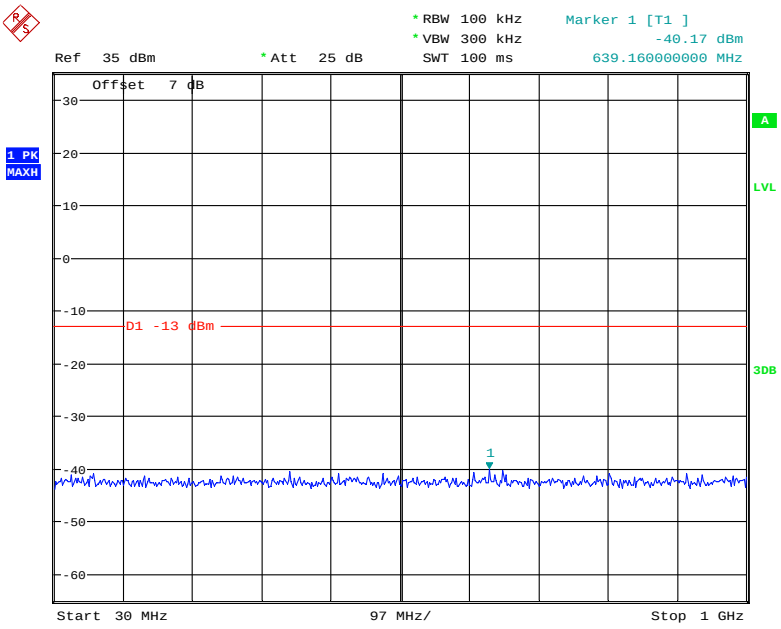
1 GHz – 20GHz (GSM Mode)



Fundamental test

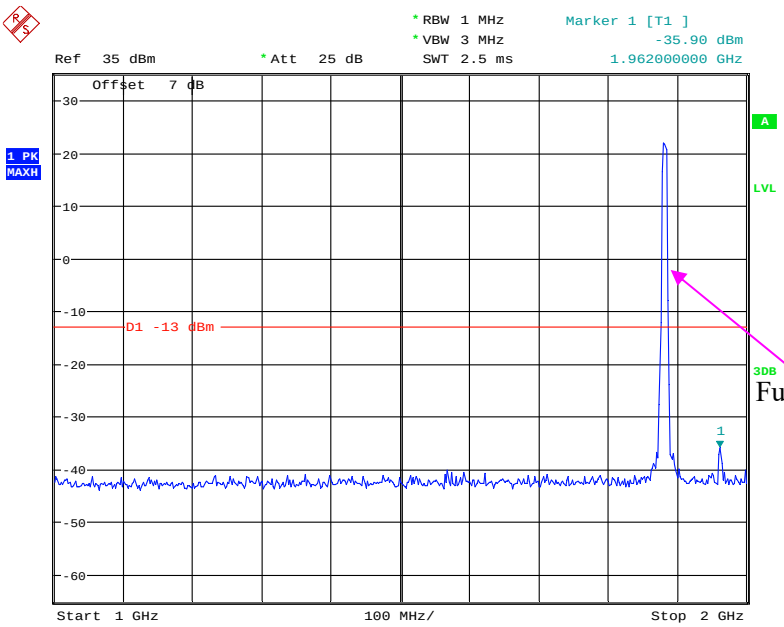
Date: 31.MAY.2021 11:41:29

30 MHz – 1 GHz (WCDMA Mode)



Date: 31.MAY.2021 14:34:17

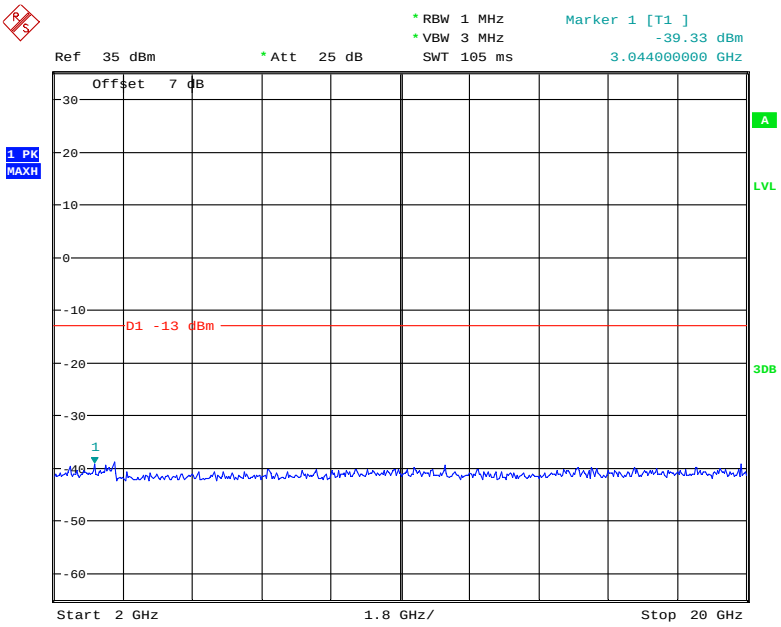
1 GHz – 2 GHz (WCDMA Mode)



Fundamental test

Date: 31.MAY.2021 14:35:56

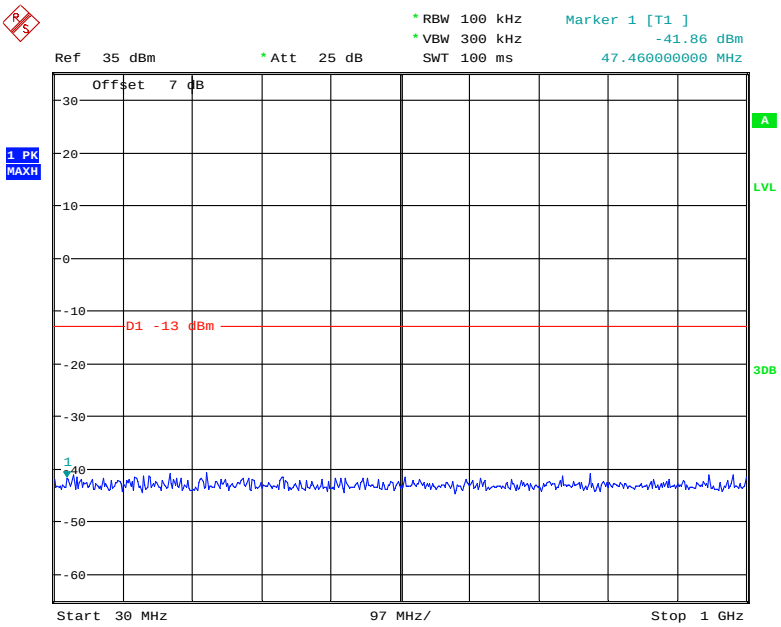
2 GHz – 20 GHz (WCDMA Mode)



Date: 31.MAY.2021 14:36:54

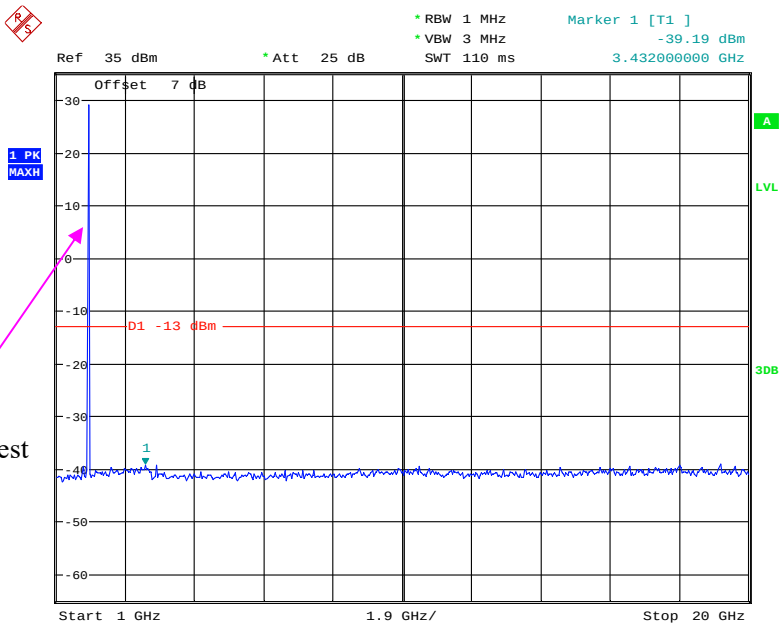
Middle Channel:

30 MHz – 1 GHz (GSM Mode)



Date: 31.MAY.2021 11:37:57

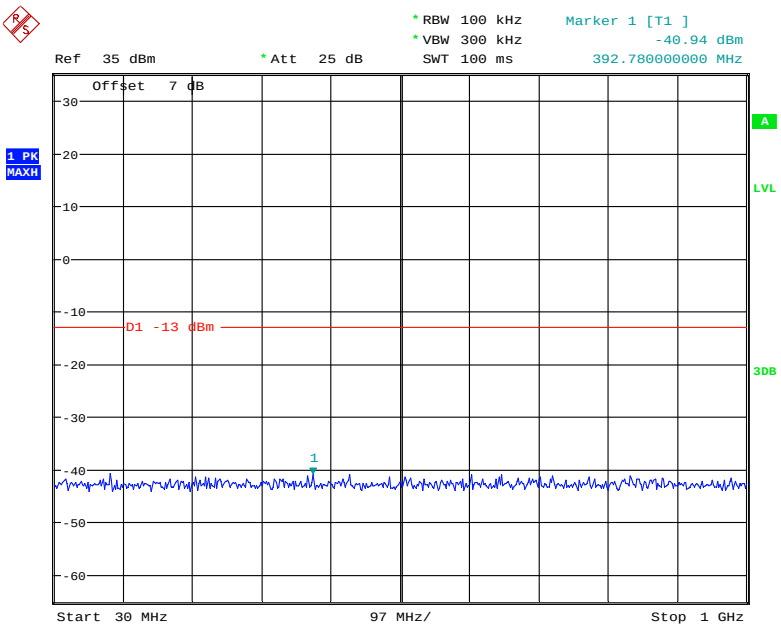
1 GHz – 20 GHz (GSM Mode)



Fundamental test

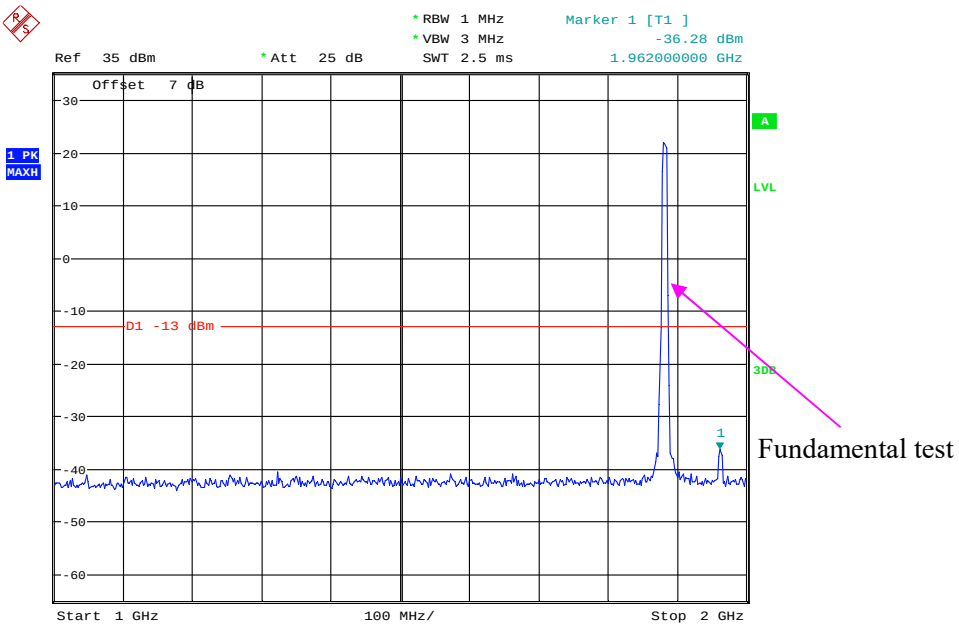
Date: 31.MAY.2021 11:41:01

30 MHz – 1 GHz (WCDMA Mode)



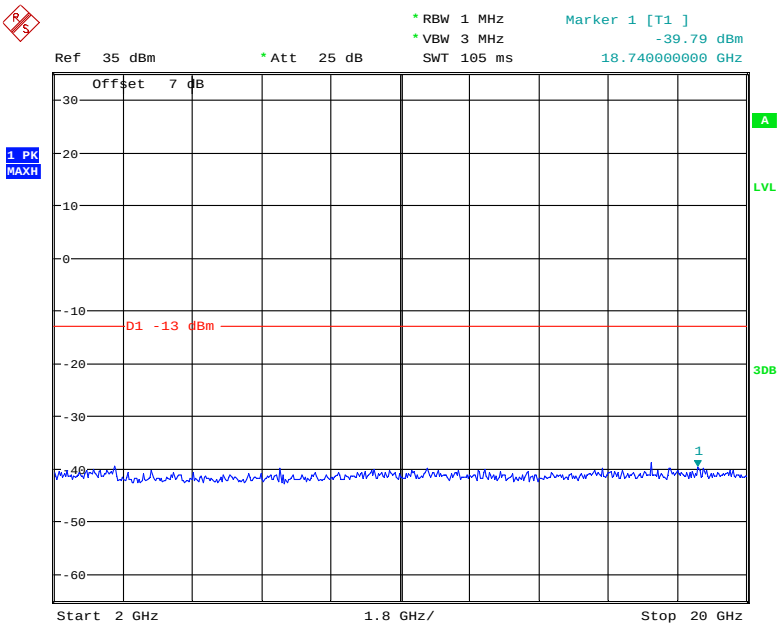
Date: 31.MAY.2021 16:18:40

1 GHz – 2 GHz (WCDMA Mode)



Date: 31.MAY.2021 16:19:25

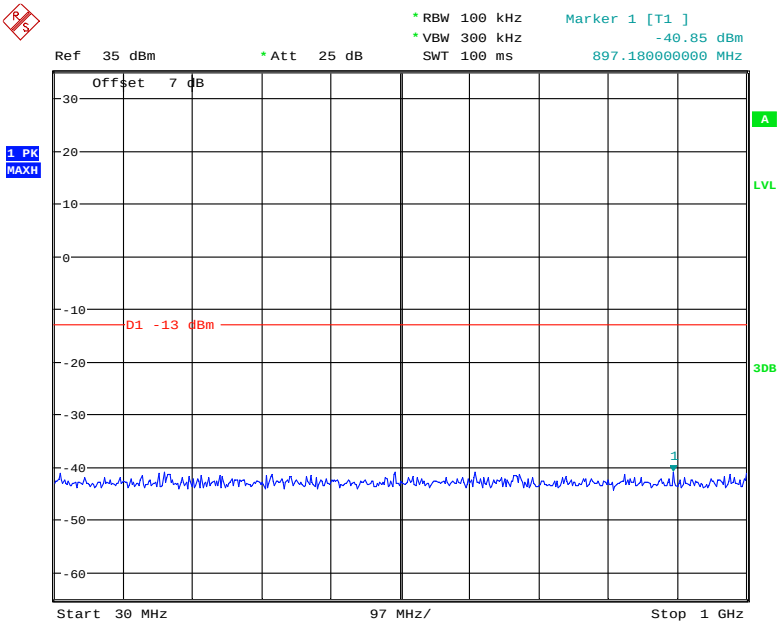
2 GHz – 20 GHz (WCDMA Mode)



Date: 31.MAY.2021 16:21:08

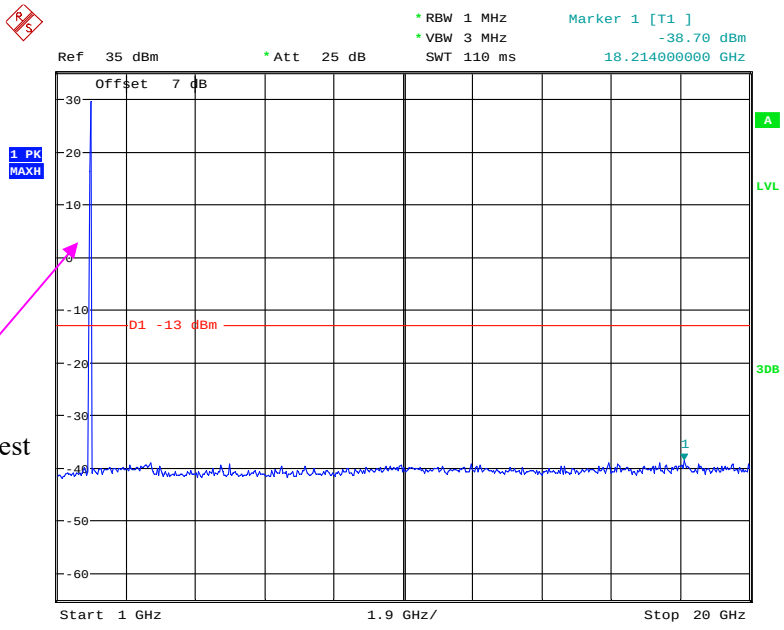
High Channel:

30 MHz – 1 GHz (GSM Mode)



Date: 31.MAY.2021 11:38:24

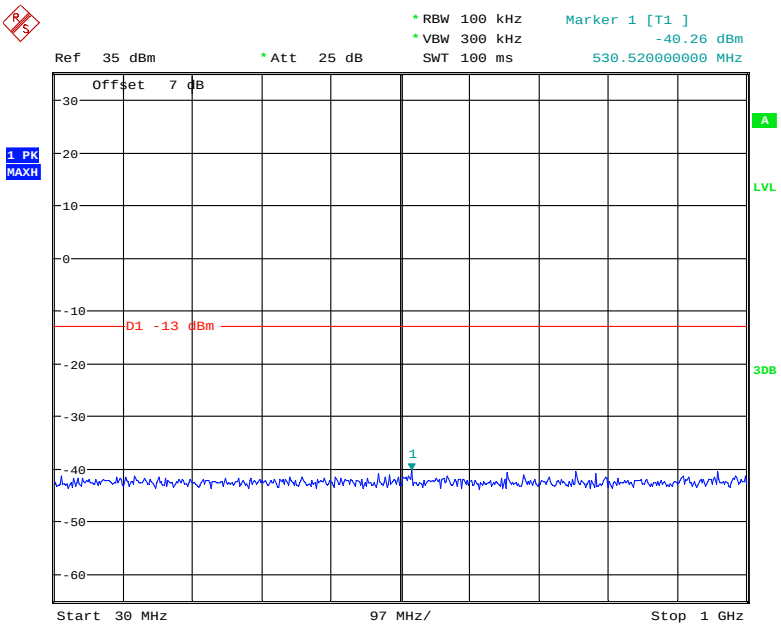
1 GHz – 20 GHz (GSM Mode)



Fundamental test

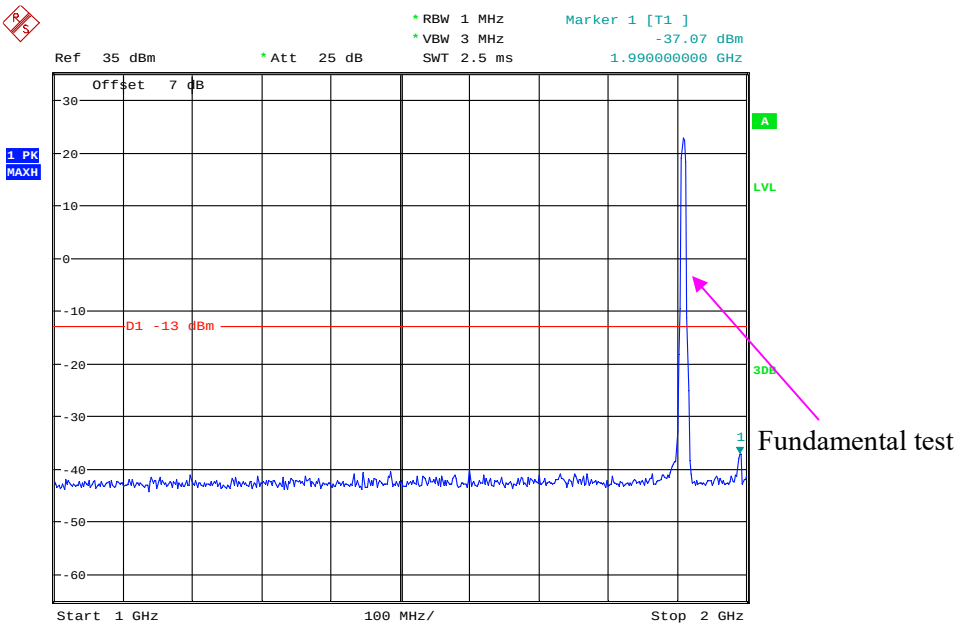
Date: 31.MAY.2021 11:40:15

30 MHz – 1 GHz (WCDMA Mode)



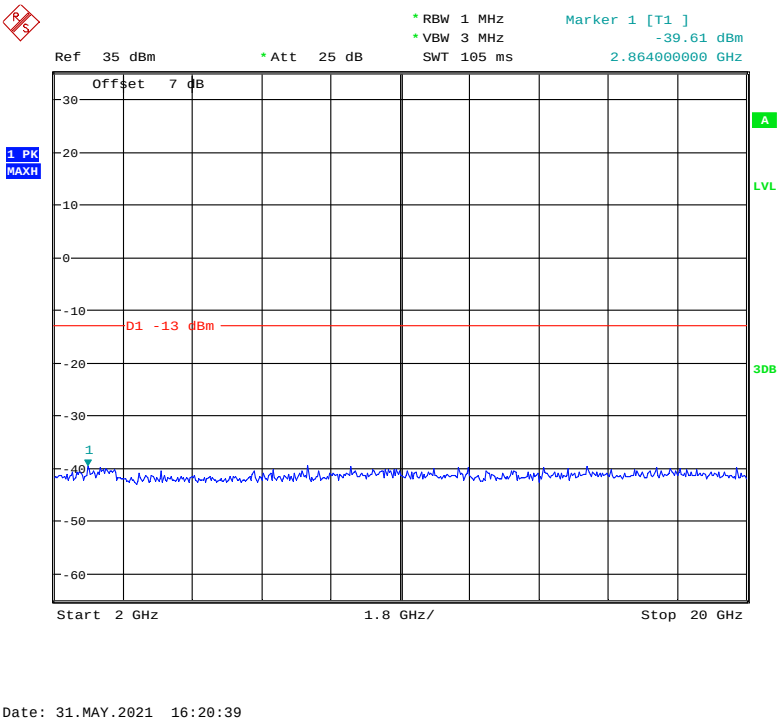
Date: 31.MAY.2021 16:18:02

1 GHz – 2 GHz (WCDMA Mode)



Date: 31.MAY.2021 16:19:56

2 GHz – 20 GHz (WCDMA Mode)



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) and § 24.238(a) and § 27.53

Test Procedure

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:	26~26.3 ℃
Relative Humidity:	46~58 %
ATM Pressure:	101.0~101.1 kPa

The testing was performed by Zero Yan on 2021-06-05 for below 1GHz, Alan He on 2021-06-06 for above 1GHz.

EUT operation mode: Transmitting

30 MHz ~ 10 GHz:

Cellular Band (Part 22H)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		Limit (dBm)	Margin (dB)
GSM Mode										
Low channel										
925.3	30.49	245	1.4	H	-65.9	1.33	0.0	-67.23	-13	54.23
925.3	31.61	207	1.9	V	-64.5	1.33	0.0	-65.83	-13	52.83
1648.40	48.73	213	1.1	H	-59.3	1.40	8.70	-52.00	-13	39.00
1648.40	47.01	212	1.8	V	-60.8	1.40	8.70	-53.50	-13	40.50
2472.60	43.39	148	1.3	H	-60.0	2.60	10.20	-52.40	-13	39.40
2472.60	43.19	310	2.0	V	-59.6	2.60	10.20	-52.00	-13	39.00
3296.80	47.52	304	1.7	H	-53.4	1.50	11.70	-43.20	-13	30.20
3296.80	45.53	1	1.8	V	-55.4	1.50	11.70	-45.20	-13	32.20
Middle channel										
920.6	30.53	244	1.4	H	-65.8	1.33	0.0	-67.13	-13	54.13
920.6	31.64	105	1.1	V	-64.4	1.33	0.0	-65.73	-13	52.73
1673.20	52.10	334	1.9	H	-54.2	1.30	8.90	-46.60	-13	33.60
1673.20	52.35	226	1.9	V	-53.4	1.30	8.90	-45.80	-13	32.80
2509.80	47.63	248	1.7	H	-55.7	2.60	10.20	-48.10	-13	35.10
2509.80	47.07	285	1.2	V	-55.7	2.60	10.20	-48.10	-13	35.10
3346.40	48.66	144	1.6	H	-52.2	1.50	11.70	-42.00	-13	29.00
3346.40	47.96	159	1.1	V	-53.0	1.50	11.70	-42.80	-13	29.80
High channel										
925.8	30.48	312	1.5	H	-65.9	1.33	0.0	-67.23	-13	54.23
925.8	31.51	39	1.3	V	-64.6	1.33	0.0	-65.93	-13	52.93
1697.60	52.10	63	2.3	H	-54.2	1.30	8.90	-46.60	-13	33.60
1697.60	49.32	335	1.4	V	-56.4	1.30	8.90	-48.80	-13	35.80
2546.40	50.14	195	2.3	H	-53.2	2.60	10.20	-45.60	-13	32.60
2546.40	48.15	1	1.1	V	-54.6	2.60	10.20	-47.00	-13	34.00
3395.20	48.01	56	1.8	H	-53.2	1.40	11.80	-42.80	-13	29.80
3395.20	45.40	110	1.5	V	-55.6	1.40	11.80	-45.20	-13	32.20

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		Limit (dBm)	Margin (dB)
WCDMA Mode										
Low channel										
922.3	30.49	184	2.2	H	-65.9	1.33	0.0	-67.23	-13	54.23
922.3	31.57	152	1.0	V	-64.5	1.33	0.0	-65.83	-13	52.83
1652.80	45.34	282	2.2	H	-61.0	1.30	8.90	-53.40	-13	40.40
1652.80	47.24	125	2.2	V	-58.5	1.30	8.90	-50.90	-13	37.90
2479.20	44.16	152	1.2	H	-59.2	2.60	10.20	-51.60	-13	38.60
2479.20	43.19	313	2.1	V	-59.6	2.60	10.20	-52.00	-13	39.00
3305.60	43.77	255	2.5	H	-57.1	1.50	11.70	-46.90	-13	33.90
3305.60	44.21	336	1.7	V	-56.7	1.50	11.70	-46.50	-13	33.50
Middle channel										
921.6	30.47	14	2.2	H	-65.9	1.33	0.0	-67.23	-13	54.23
921.6	31.62	178	1.9	V	-64.5	1.33	0.0	-65.83	-13	52.83
1673.20	46.28	206	2.2	H	-60.1	1.30	8.90	-52.50	-13	39.50
1673.20	47.62	160	1.3	V	-58.1	1.30	8.90	-50.50	-13	37.50
2509.80	44.53	112	1.8	H	-58.8	2.60	10.20	-51.20	-13	38.20
2509.80	44.32	189	1.9	V	-58.4	2.60	10.20	-50.80	-13	37.80
3346.40	43.93	337	1.8	H	-57.0	1.50	11.70	-46.80	-13	33.80
3346.40	43.64	55	1.4	V	-57.3	1.50	11.70	-47.10	-13	34.10
High channel										
926.7	30.43	170	2.0	H	-65.9	1.33	0.0	-67.23	-13	54.23
926.7	31.58	247	2.3	V	-64.5	1.33	0.0	-65.83	-13	52.83
1693.20	45.96	242	1.6	H	-60.4	1.30	8.90	-52.80	-13	39.80
1693.20	47.43	310	1.6	V	-58.3	1.30	8.90	-50.70	-13	37.70
2539.80	43.99	64	1.6	H	-59.4	2.60	10.20	-51.80	-13	38.80
2539.80	43.85	239	1.0	V	-58.9	2.60	10.20	-51.30	-13	38.30
3386.40	43.76	253	2.3	H	-57.5	1.40	11.80	-47.10	-13	34.10
3386.40	43.52	248	1.5	V	-57.5	1.40	11.80	-47.10	-13	34.10

30 MHz ~ 20 GHz:

PCS Band (Part 24E)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 24E	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		Limit (dBm)	Margin (dB)
GSM Mode										
Low channel										
922.1	30.43	66	2.1	H	-65.9	1.33	0.0	-67.23	-13	54.23
922.1	31.57	326	1.6	V	-64.5	1.33	0.0	-65.83	-13	52.83
3700.40	44.03	245	1.9	H	-57.8	1.60	11.90	-47.50	-13	34.50
3700.40	43.92	172	2.1	V	-57.3	1.60	11.90	-47.00	-13	34.00
Middle channel										
923.2	30.52	212	2.4	H	-65.8	1.33	0.0	-67.13	-13	54.13
923.2	31.63	2	2.2	V	-64.4	1.33	0.0	-65.73	-13	52.73
3760.00	43.72	42	1.5	H	-58.3	1.50	11.80	-48.00	-13	35.00
3760.00	43.56	4	1.3	V	-58.0	1.50	11.80	-47.70	-13	34.70
High channel										
922.5	30.44	101	1.0	H	-65.9	1.33	0.0	-67.23	-13	54.23
922.5	31.52	356	2.1	V	-64.6	1.33	0.0	-65.93	-13	52.93
3819.60	43.88	327	2.0	H	-58.2	1.50	11.80	-47.90	-13	34.90
3819.60	43.67	349	2.1	V	-57.9	1.50	11.80	-47.60	-13	34.60
WCDMA Mode										
Low channel										
926.8	30.56	336	1.1	H	-65.8	1.33	0.0	-67.13	-13	54.13
926.8	31.52	192	1.4	V	-64.6	1.33	0.0	-65.93	-13	52.93
3704.80	43.95	315	1.9	H	-57.9	1.60	11.90	-47.60	-13	34.60
3704.80	44.26	100	1.7	V	-57.0	1.60	11.90	-46.70	-13	33.70
Middle channel										
924.7	30.45	265	2.0	H	-65.9	1.33	0.0	-67.23	-13	54.23
924.7	31.64	322	1.0	V	-64.4	1.33	0.0	-65.73	-13	52.73
3760.00	44.12	25	1.3	H	-57.9	1.50	11.80	-47.60	-13	34.60
3760.00	43.92	197	1.8	V	-57.7	1.50	11.80	-47.40	-13	34.40
High channel										
921.2	30.42	226	2.1	H	-65.9	1.33	0.0	-67.23	-13	54.23
921.2	31.61	96	1.3	V	-64.5	1.33	0.0	-65.83	-13	52.83
3815.20	43.86	28	2.3	H	-58.2	1.50	11.80	-47.90	-13	34.90
3815.20	43.52	0	1.5	V	-58.1	1.50	11.80	-47.80	-13	34.80

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

Frequency	Receiver	Turntable	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
(MHz)	Reading (dBμV)	Angle Degree	Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
Band 2										
Test frequency range: 30 MHz ~ 20 GHz										
1.4MHz, Low channel										
921.6	30.56	72	2.5	H	-65.8	1.33	0.0	-67.13	-13	54.13
921.6	31.52	167	2.2	V	-64.6	1.33	0.0	-65.93	-13	52.93
3701.40	43.96	346	1.4	H	-57.8	1.60	11.90	-47.50	-13	34.50
3701.40	43.75	96	1.9	V	-57.5	1.60	11.90	-47.20	-13	34.20
1.4MHz, Middle channel										
921.3	30.42	271	2.0	H	-65.9	1.33	0.0	-67.23	-13	54.23
921.3	31.57	35	1.5	V	-64.5	1.33	0.0	-65.83	-13	52.83
3760.00	44.34	195	1.7	H	-57.7	1.50	11.80	-47.40	-13	34.40
3760.00	44.05	108	1.6	V	-57.5	1.50	11.80	-47.20	-13	34.20
1.4MHz, High channel										
929.4	30.51	57	1.4	H	-65.8	1.33	0.0	-67.13	-13	54.13
929.4	31.53	241	1.1	V	-64.5	1.33	0.0	-65.83	-13	52.83
3818.60	44.25	346	1.7	H	-57.8	1.50	11.80	-47.50	-13	34.50
3818.60	44.01	26	1.8	V	-57.6	1.50	11.80	-47.30	-13	34.30
Band 4										
Test frequency range:30 MHz ~ 20 GHz										
1.4MHz, Low channel										
923.9	30.54	229	1.4	H	-65.8	1.33	0.0	-67.13	-13	54.13
923.9	31.59	82	2.3	V	-64.5	1.33	0.0	-65.83	-13	52.83
3421.40	44.28	198	1.8	H	-56.5	1.40	11.80	-46.10	-13	33.10
3421.40	43.99	115	1.3	V	-56.6	1.40	11.80	-46.20	-13	33.20
1.4MHz, Middle channel										
928.6	30.47	252	1.7	H	-65.9	1.33	0.0	-67.23	-13	54.23
928.6	31.67	93	1.8	V	-64.4	1.33	0.0	-65.73	-13	52.73
3465.00	43.96	290	1.3	H	-56.8	1.50	12.00	-46.30	-13	33.30
3465.00	44.24	25	2.1	V	-57.3	1.50	12.00	-46.80	-13	33.80
1.4MHz, High channel										
929.7	30.54	87	1.5	H	-65.8	1.33	0.0	-67.13	-13	54.13
929.7	31.62	358	1.7	V	-64.5	1.33	0.0	-65.83	-13	52.83
3508.60	44.36	311	1.4	H	-56.4	1.50	12.00	-45.90	-13	32.90
3508.60	44.07	91	1.1	V	-57.4	1.50	12.00	-46.90	-13	33.90

Frequency	Receiver	Turntable	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
(MHz)	Reading (dBμV)	Angle Degree	Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
Band 7										
Test frequency range: 30 MHz ~ 26.5 GHz										
5MHz, Low channel										
926.8	30.46	45	2.4	H	-65.9	1.33	0.0	-67.23	-25	42.23
926.8	31.66	262	2.4	V	-64.4	1.33	0.0	-65.73	-25	40.73
5010.00	44.52	287	2.1	H	-56.1	1.70	12.00	-45.80	-25	20.80
5010.00	44.35	225	2.1	V	-55.7	1.70	12.00	-45.40	-25	20.40
5MHz, Middle channel										
924.7	30.57	330	1.0	H	-65.8	1.33	0.0	-67.13	-25	42.13
924.7	31.69	331	1.6	V	-64.4	1.33	0.0	-65.73	-25	40.73
5070.00	44.71	138	2.5	H	-55.3	1.60	12.10	-44.80	-25	19.80
5070.00	44.55	127	1.3	V	-55.5	1.60	12.10	-45.00	-25	20.00
5MHz, High channel										
921.2	30.67	192	1.8	H	-65.7	1.33	0.0	-67.03	-25	42.03
921.2	31.55	214	1.8	V	-64.5	1.33	0.0	-65.83	-25	40.83
5130.00	44.61	315	2.0	H	-55.4	1.60	12.10	-44.90	-25	19.90
5130.00	44.42	210	1.9	V	-55.6	1.60	12.10	-45.10	-25	20.10
Band 17										
Test frequency range: 30 MHz ~ 10 GHz										
5MHz, Low channel										
922.5	30.58	243	1.4	H	-65.8	1.33	0.0	-67.13	-13	54.13
922.5	31.63	275	2.3	V	-64.4	1.33	0.0	-65.73	-13	52.73
1418.00	43.77	164	1.6	H	-64.4	1.60	7.90	-58.10	-13	45.10
1418.00	43.26	148	1.4	V	-65.2	1.60	7.90	-58.90	-13	45.90
2127.00	50.36	251	1.0	H	-50.8	1.30	9.70	-42.40	-13	29.40
2127.00	55.42	242	2.1	V	-46.5	1.30	9.70	-38.10	-13	25.10
2836.00	43.66	20	1.1	H	-60.3	1.80	10.50	-51.60	-13	38.60
2836.00	44.01	8	1.9	V	-59.6	1.80	10.50	-50.90	-13	37.90
5MHz, Middle channel										
921.7	30.44	273	1.5	H	-65.9	1.33	0.0	-67.23	-13	54.23
921.7	31.68	112	1.2	V	-64.4	1.33	0.0	-65.73	-13	52.73
1420.00	43.81	184	1.1	H	-64.4	1.60	7.90	-58.10	-13	45.10
1420.00	43.19	132	1.6	V	-65.2	1.60	7.90	-58.90	-13	45.90
2130.00	50.22	64	2.1	H	-50.9	1.30	9.70	-42.50	-13	29.50
2130.00	55.78	147	1.3	V	-46.2	1.30	9.70	-37.80	-13	24.80
2840.00	43.82	35	1.4	H	-60.1	1.80	10.50	-51.40	-13	38.40
2840.00	44.28	39	2.4	V	-59.3	1.80	10.50	-50.60	-13	37.60
5MHz, High channel										
923.6	30.56	4	2.2	H	-65.8	1.33	0.0	-67.13	-13	54.13
923.6	31.76	189	1.9	V	-64.3	1.33	0.0	-65.63	-13	52.63
1422.00	43.86	34	2.1	H	-64.3	1.60	7.90	-58.00	-13	45.00
1422.00	43.45	51	2.2	V	-65.0	1.60	7.90	-58.70	-13	45.70
2133.00	49.78	30	2.4	H	-51.3	1.30	9.70	-42.90	-13	29.90
2133.00	53.44	165	1.4	V	-48.5	1.30	9.70	-40.10	-13	27.10
2844.00	43.29	286	1.5	H	-60.7	1.80	10.50	-52.00	-13	39.00
2844.00	43.82	256	1.7	V	-59.8	1.80	10.50	-51.10	-13	38.10

Note:
Absolute Level = Substituted Level - Cable loss + Antenna Gain
Margin = Limit- Absolute Level
dBd is for the ERP, dBi is for EIRP.

FCC § 22.917 (a);§ 24.238 (a); §27.53(c) (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.

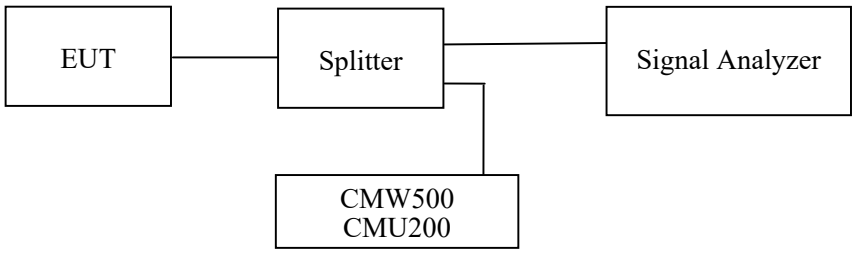
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

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

Test Procedure

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:	28~28.9 ℃
Relative Humidity:	49~58 %
ATM Pressure:	101.0 kPa

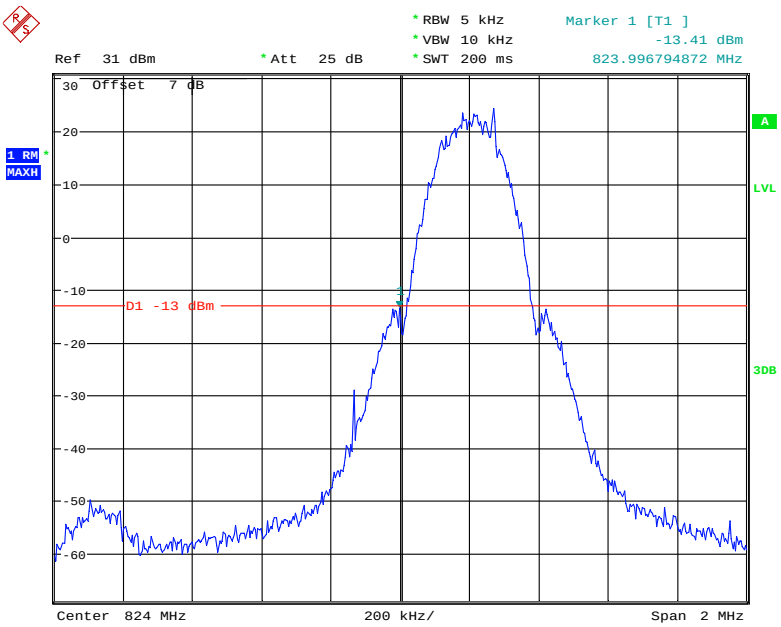
The testing was performed by Pedro Yun from 2021-05-31 to 2021-06-04.

EUT operation mode: Transmitting (Worst case)

Test Result: Pass

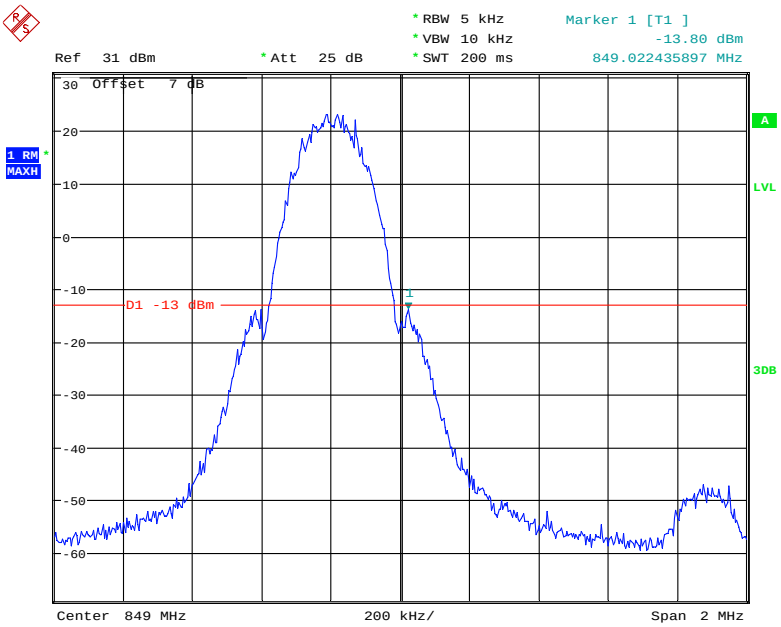
Please refer to the following plots.

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



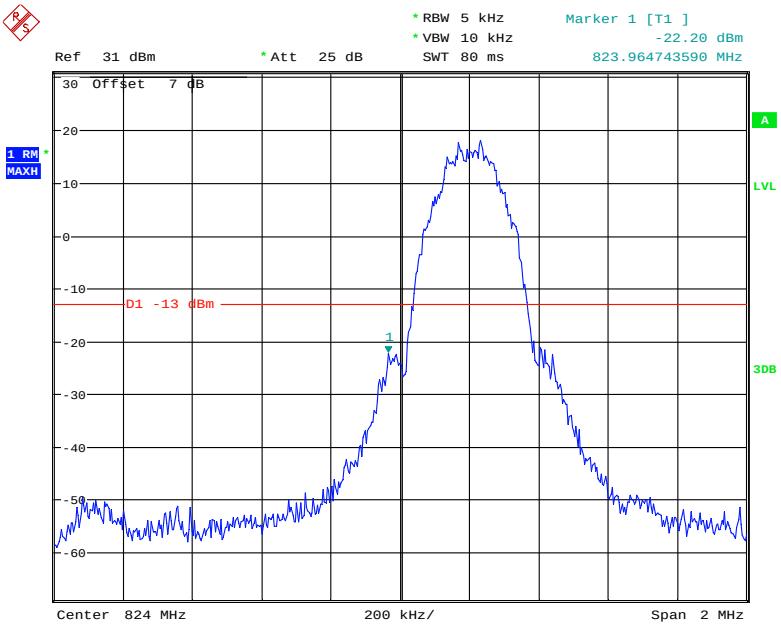
Date: 31.MAY.2021 10:33:15

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



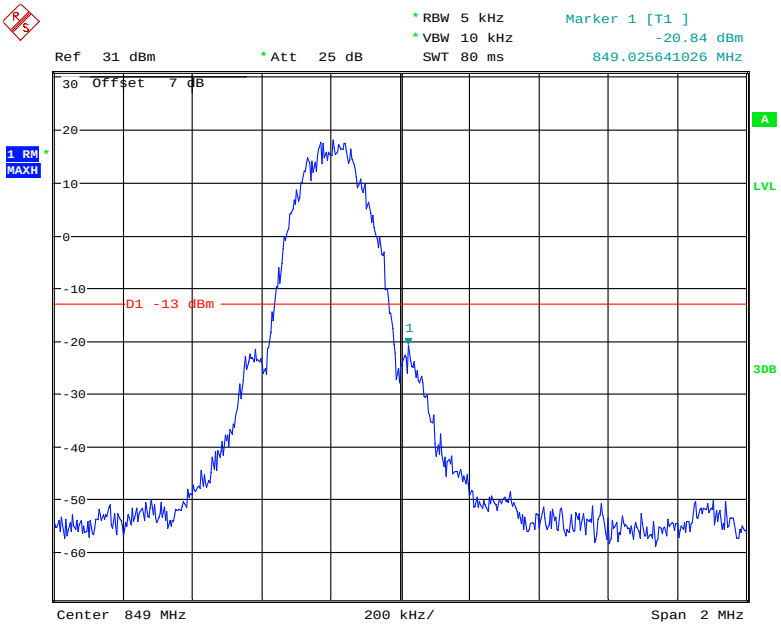
Date: 31.MAY.2021 10:38:18

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



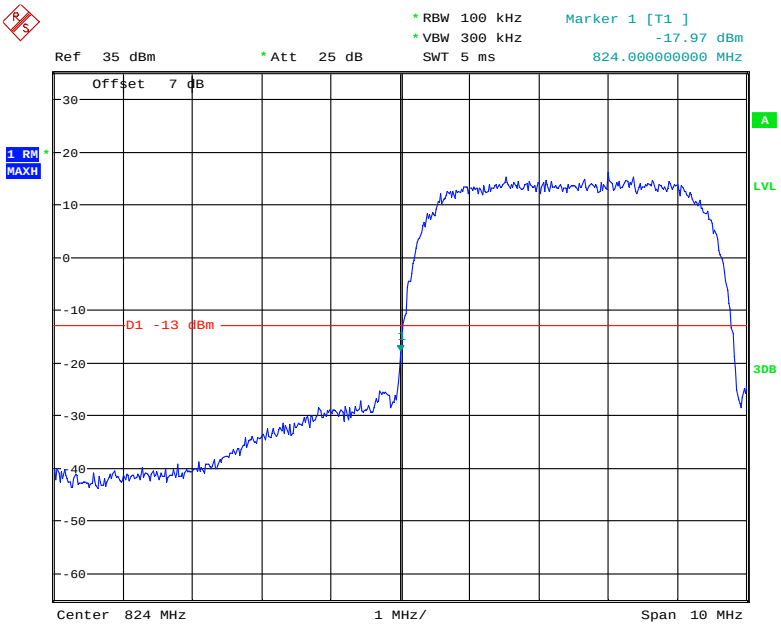
Date: 31.MAY.2021 10:43:50

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



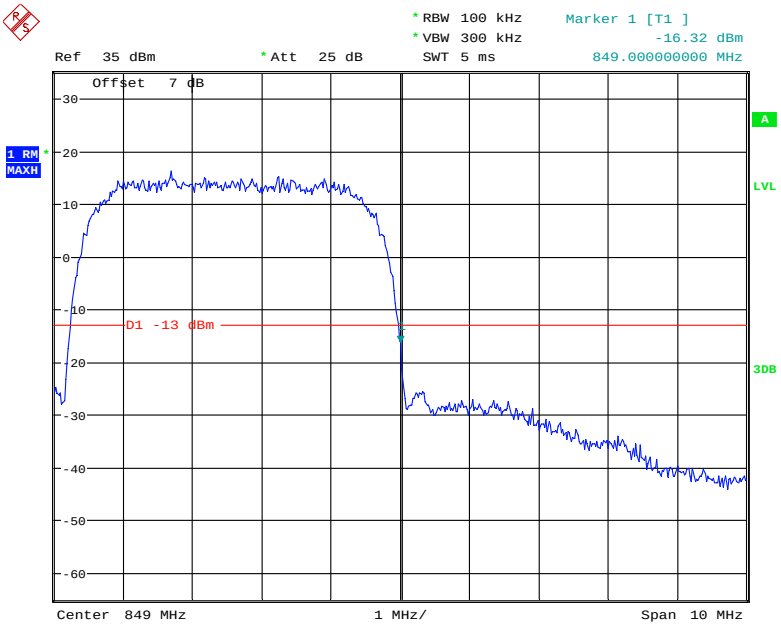
Date: 31.MAY.2021 10:45:02

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



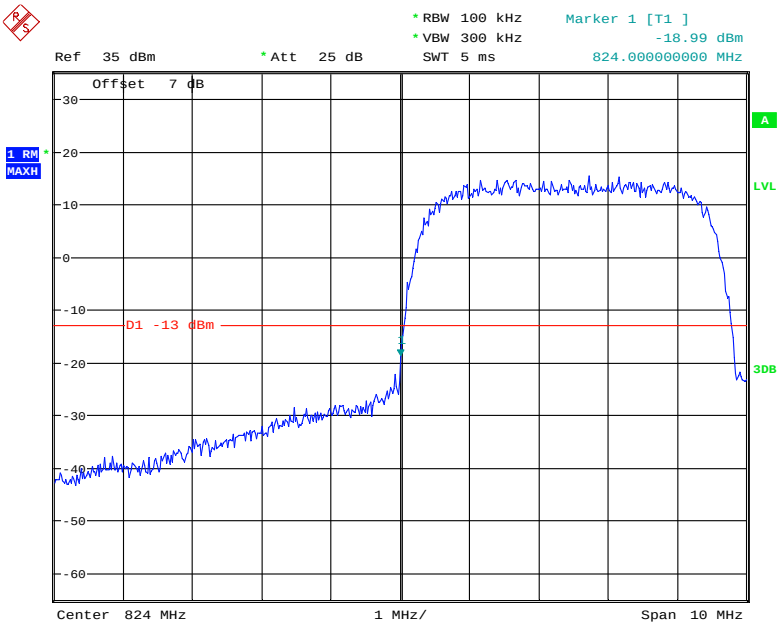
Date: 31.MAY.2021 14:17:27

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



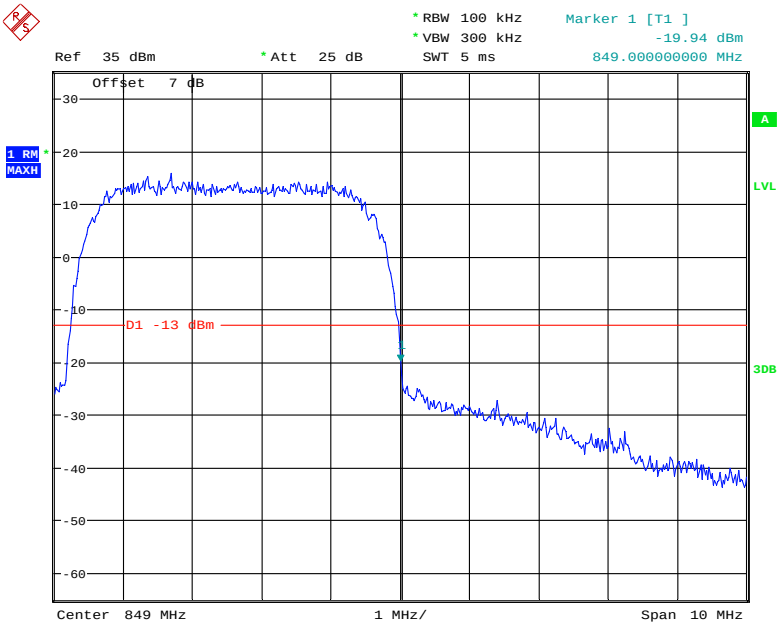
Date: 31.MAY.2021 14:18:48

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



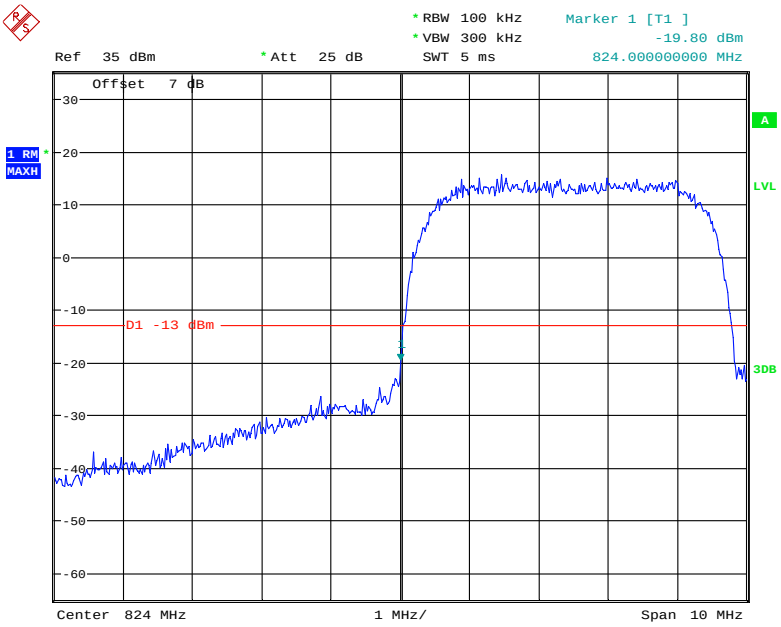
Date: 31.MAY.2021 14:20:47

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



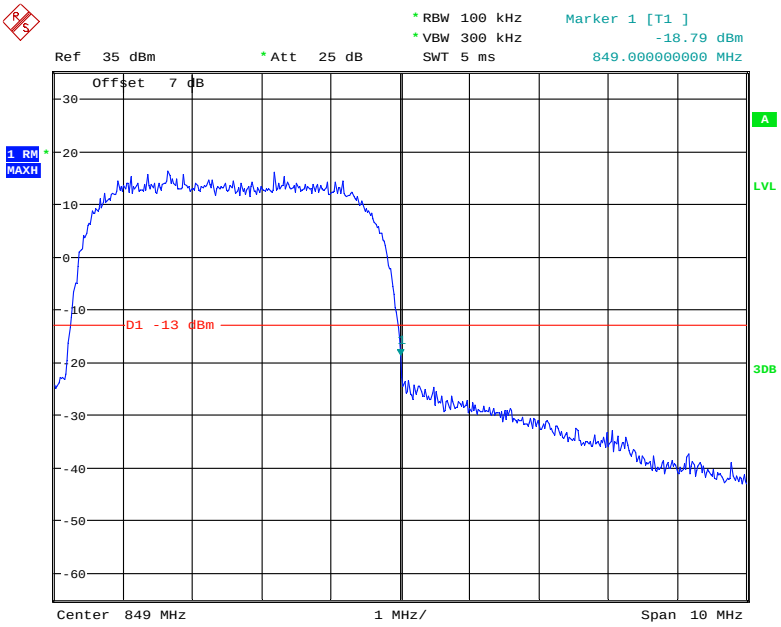
Date: 31.MAY.2021 14:19:55

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



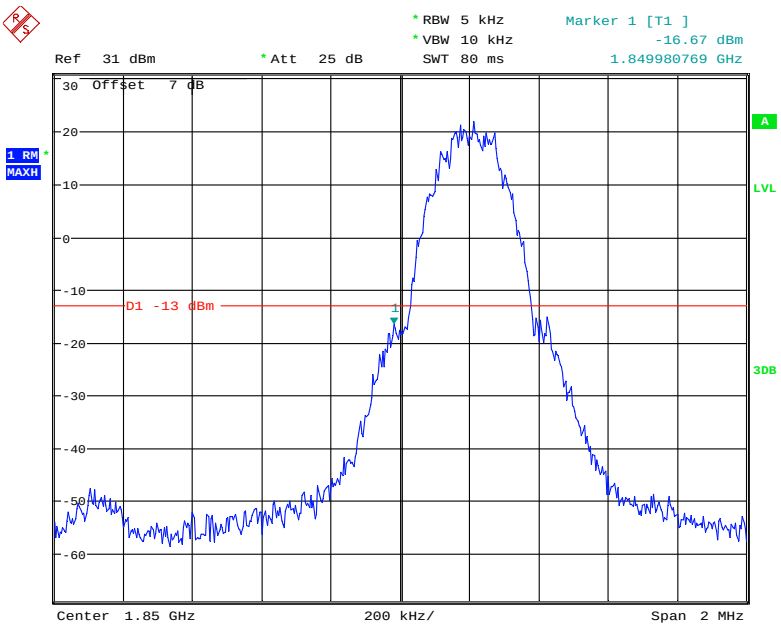
Date: 31.MAY.2021 14:21:46

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



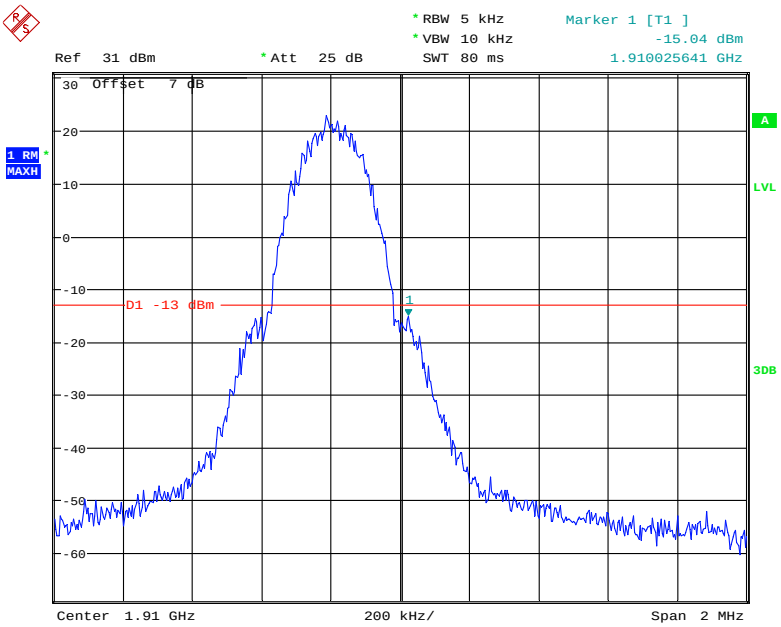
Date: 31.MAY.2021 14:22:40

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



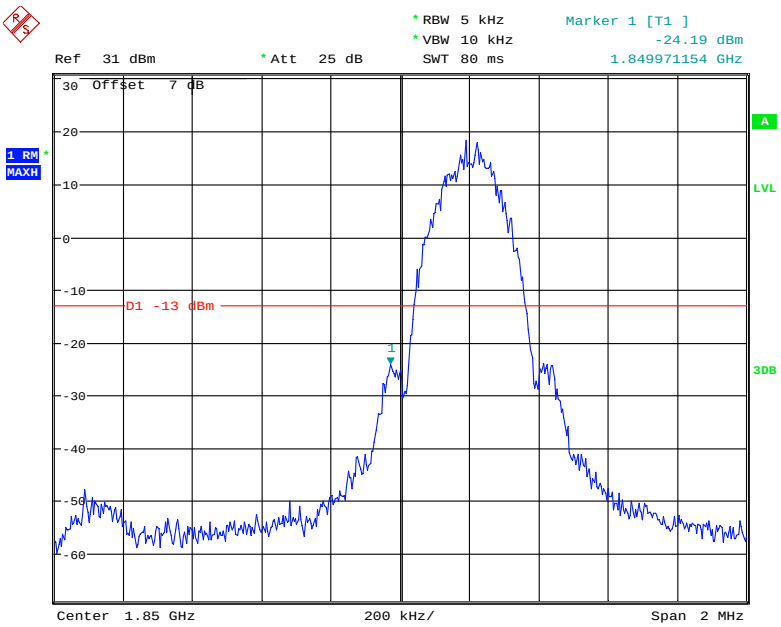
Date: 31.MAY.2021 10:40:28

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



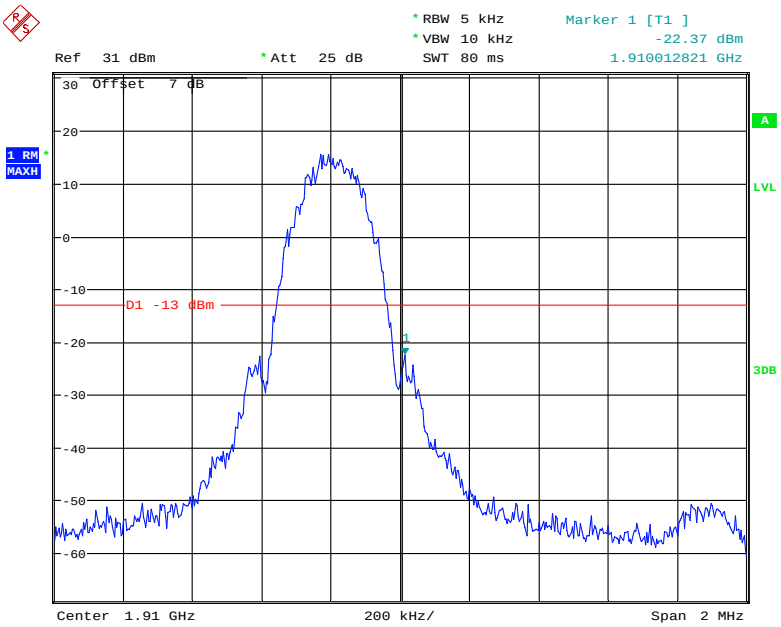
Date: 31.MAY.2021 10:41:34

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



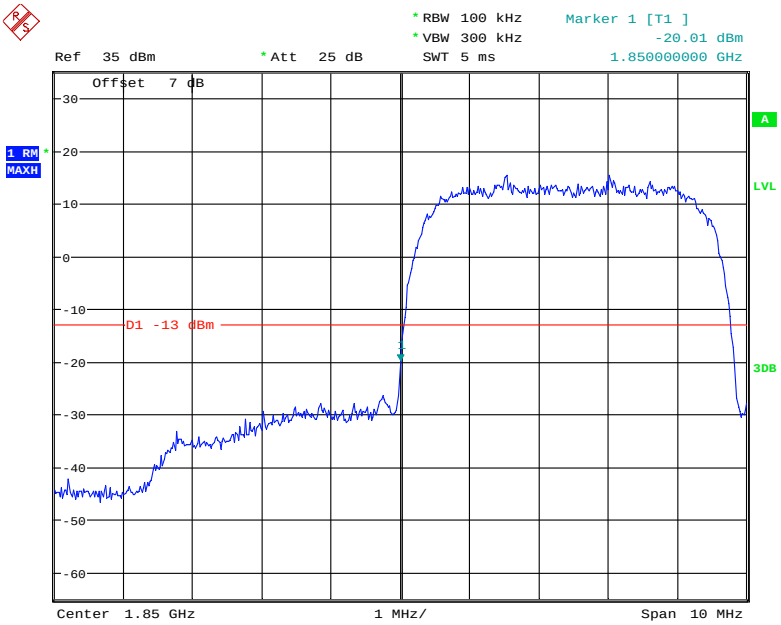
Date: 31.MAY.2021 10:52:24

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



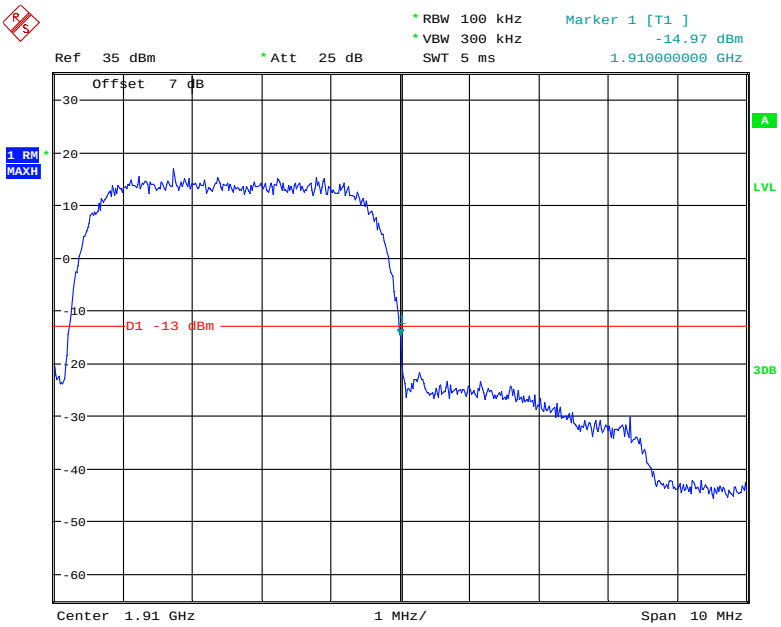
Date: 31.MAY.2021 10:51:05

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



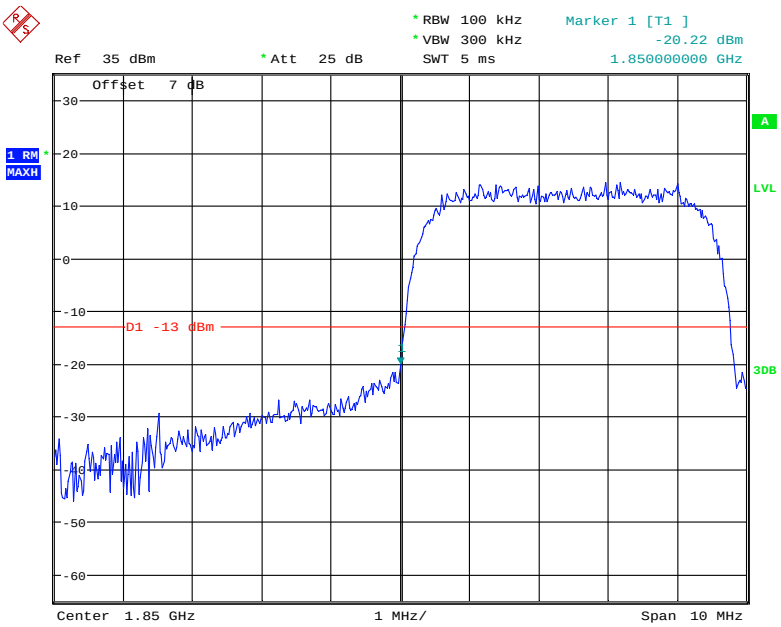
Date: 31.MAY.2021 14:29:07

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



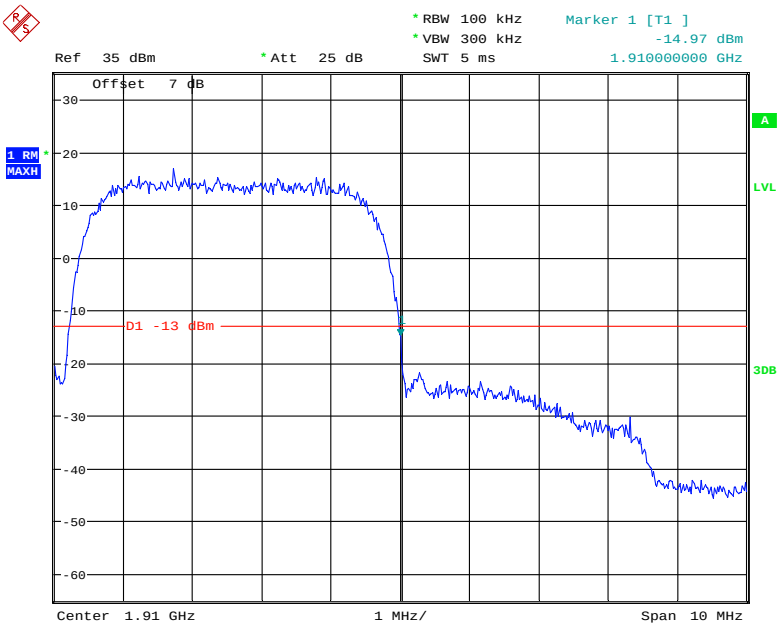
Date: 31.MAY.2021 14:29:55

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



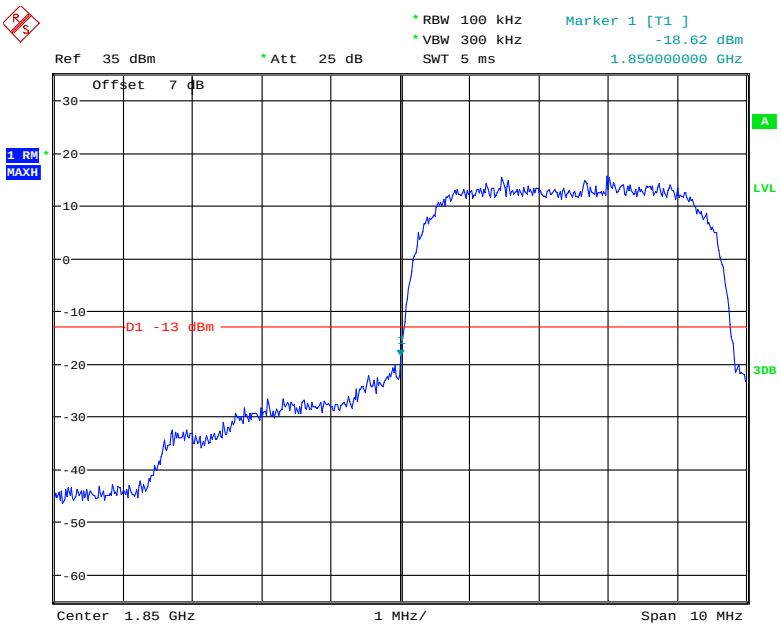
Date: 31.MAY.2021 14:31:38

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

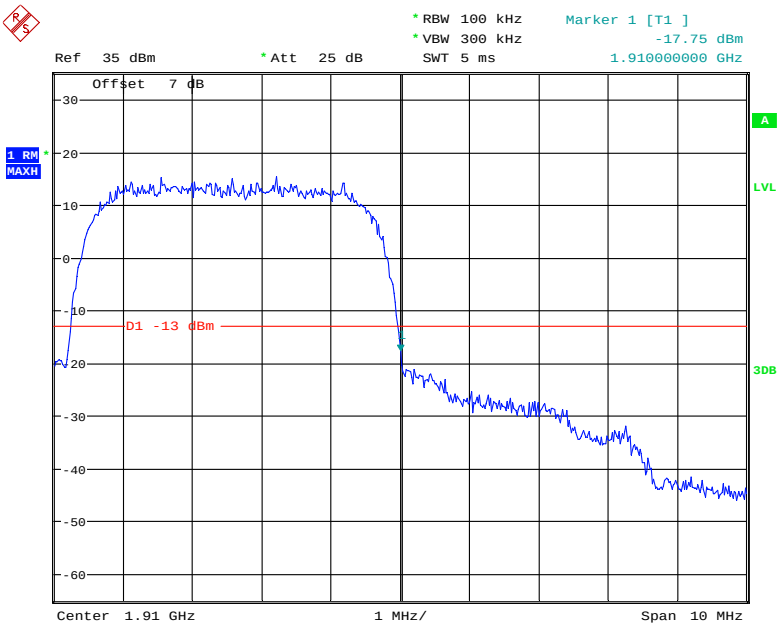


Date: 31.MAY.2021 14:29:55

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



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



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 and & §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

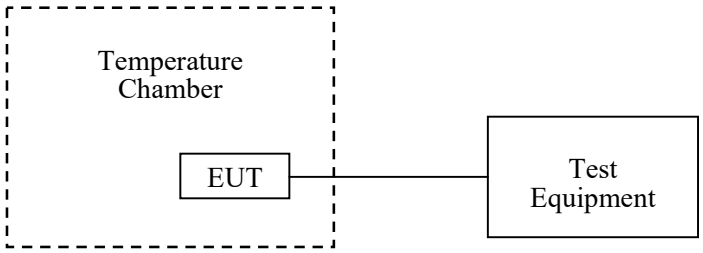
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

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:	28~28.9 ℃
Relative Humidity:	49~58 %
ATM Pressure:	101.0 kPa

The testing was performed by Pedro Yun from 2021-05-31 to 2021-06-04.

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	Vnor.=3.85	5	0.0060	2.5
-20		3	0.0036	2.5
-10		4	0.0048	2.5
0		7	0.0084	2.5
10		4	0.0048	2.5
20		11	0.0131	2.5
30		6	0.0072	2.5
40		8	0.0096	2.5
50		4	0.0048	2.5
20	Vmin.= 3.0	8	0.0096	2.5
	Vmax.= 4.4	9	0.0108	2.5

EDGE Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	Vnor.=3.85	-6	-0.0072	2.5
-20		-5	-0.0060	2.5
-10		-6	-0.0072	2.5
0		-4	-0.0048	2.5
10		-5	-0.0060	2.5
20		-5	-0.0060	2.5
30		-8	-0.0096	2.5
40		-6	-0.0072	2.5
50		-9	-0.0108	2.5
20	Vmin.= 3.0	-5	-0.0060	2.5
	Vmax.= 4.4	-7	-0.0084	2.5

WCDMA Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	Vnor.=3.85	-1	-0.0012	2.5
-20		1	0.0012	2.5
-10		-3	-0.0036	2.5
0		1	0.0012	2.5
10		2	0.0024	2.5
20		-2	-0.0024	2.5
30		6	0.0072	2.5
40		1	0.0012	2.5
50		-1	-0.0012	2.5
20	Vmin.= 3.0	-4	-0.0048	2.5
	Vmax.= 4.4	-2	-0.0024	2.5

PCS Band (Part 24E)

GSM Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	Vnor.=3.85	6	0.0032	Pass
-20		4	0.0021	Pass
-10		2	0.0011	Pass
0		1	0.0005	Pass
10		5	0.0027	Pass
20		7	0.0037	Pass
30		4	0.0021	Pass
40		6	0.0032	Pass
50		6	0.0032	Pass
20	Vmin.= 3.0	4	0.0021	Pass
	Vmax.= 4.4	5	0.0027	Pass

EDGE Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	Vnor.=3.85	-2	-0.0011	Pass
-20		-4	-0.0021	Pass
-10		-5	-0.0027	Pass
0		-6	-0.0032	Pass
10		-4	-0.0021	Pass
20		-2	-0.0011	Pass
30		-2	-0.0011	Pass
40		-5	-0.0027	Pass
50		-3	-0.0016	Pass
20	Vmin.= 3.0	-2	-0.0011	Pass
	Vmax.= 4.4	-5	-0.0027	Pass

WCDMA Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	Vnor.=3.85	2	0.0011	Pass
-20		5	0.0027	Pass
-10		-3	-0.0016	Pass
0		8	0.0043	Pass
10		-6	-0.0032	Pass
20		-3	-0.0016	Pass
30		1	0.0005	Pass
40		4	0.0021	Pass
50		2	0.0011	Pass
20	Vmin.= 3.0	5	0.0027	Pass
	Vmax.= 4.4	3	0.0016	Pass

LTE:
QPSK:

Band 2:

10.0 MHz Middle Channel, f_o =1880MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	Vnor.=3.85	5	0.0027	Pass
-20		2	0.0011	Pass
-10		6	0.0032	Pass
0		-8	-0.0043	Pass
10		-7	-0.0037	Pass
20		6	0.0032	Pass
30		2	0.0011	Pass
40		4	0.0021	Pass
50		-2	-0.0011	Pass
20	Vmin.= 3.0	4	0.0021	Pass
	Vmax.= 4.4	6	0.0032	Pass

Band 4:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	Vnor.=3.85	1710.4397	1754.4797	1710	1755
-20		1710.4258	1754.6346	1710	1755
-10		1710.3975	1754.5281	1710	1755
0		1710.2512	1754.6406	1710	1755
10		1710.6019	1754.7768	1710	1755
20		1710.3995	1754.5411	1710	1755
30		1710.3820	1754.4354	1710	1755
40		1710.4848	1754.4514	1710	1755
50		1710.3881	1754.9676	1710	1755
20	Vmin.= 3.0	1710.5141	1754.3837	1710	1755
	Vmax.= 4.4	1710.2311	1754.8910	1710	1755

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	Vnor.=3.85	2500.3542	2569.3338	2500	2570
-20		2500.3500	2569.2138	2500	2570
-10		2500.4729	2569.5763	2500	2570
0		2500.6637	2569.4877	2500	2570
10		2500.2759	2569.7428	2500	2570
20		2500.4481	2569.6385	2500	2570
30		2500.3973	2569.2542	2500	2570
40		2500.4350	2569.6861	2500	2570
50		2500.6395	2569.4321	2500	2570
20	Vmin.= 3.0	2500.5730	2569.3208	2500	2570
	Vmax.= 4.4	2500.2260	2569.2201	2500	2570

Band 17:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	Vnor.=3.85	704.3025	715.6504	704	716
-20		704.5969	715.3010	704	716
-10		704.4721	715.5749	704	716
0		704.6040	715.3009	704	716
10		704.1757	715.3069	704	716
20		704.4894	715.7589	704	716
30		704.4254	715.3555	704	716
40		704.6444	715.6614	704	716
50		704.7334	715.5012	704	716
20	Vmin.= 3.0	704.3820	715.6890	704	716
	Vmax.= 4.4	704.3320	715.5366	704	716

16QAM:

Band 2:

10.0 MHz Middle Channel, f_o =1880MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	Vnor.=3.85	-6	-0.0032	Pass
-20		-5	-0.0027	Pass
-10		12	0.0064	Pass
0		-3	-0.0016	Pass
10		6	0.0032	Pass
20		-7	-0.0037	Pass
30		-5	-0.0027	Pass
40		-3	-0.0016	Pass
50		12	0.0064	Pass
20	Vmin.= 3.0	11	0.0059	Pass
	Vmax.= 4.4	10	0.0053	Pass

Band 4:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	Vnor.=3.85	1710.1071	1754.4825	1710	1755
-20		1710.1847	1754.3048	1710	1755
-10		1710.5072	1754.5642	1710	1755
0		1710.3077	1754.3116	1710	1755
10		1710.6601	1754.5871	1710	1755
20		1710.2522	1754.6052	1710	1755
30		1710.4892	1754.7015	1710	1755
40		1710.5406	1754.7163	1710	1755
50		1710.5163	1754.4792	1710	1755
20	Vmin.= 3.0	1710.4205	1754.8945	1710	1755
	Vmax.= 4.4	1710.3453	1754.2480	1710	1755

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	Vnor.=3.85	2500.3066	2569.1339	2500	2570
-20		2500.4789	2569.3001	2500	2570
-10		2500.5102	2569.5386	2500	2570
0		2500.5359	2569.7698	2500	2570
10		2500.5311	2569.5758	2500	2570
20		2500.5893	2569.4527	2500	2570
30		2500.5108	2569.8376	2500	2570
40		2500.2994	2569.5125	2500	2570
50		2500.3991	2569.4495	2500	2570
20	Vmin.= 3.0	2500.5917	2569.5056	2500	2570
	Vmax.= 4.4	2500.2774	2569.6653	2500	2570

Band 17:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	Vnor.=3.85	704.7936	715.7435	704	716
-20		704.4236	715.6557	704	716
-10		704.4721	715.5749	704	716
0		704.4090	715.3365	704	716
10		704.1037	715.2602	704	716
20		704.6491	715.5634	704	716
30		704.4763	715.6605	704	716
40		704.5193	715.7523	704	716
50		704.3296	715.3842	704	716
20	Vmin.= 3.0	704.2647	715.3304	704	716
	Vmax.= 4.4	704.5475	715.7264	704	716

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