



TESTREPORT

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Report Number: RA221021-48471E-RF-00B
FCC ID: 2ATZ4-CG1MG3M

Test Standard (s)

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

Sample Description

Product Type: Smart phone
Model No.: G1 Max
Multiple Model(s) No.: C1 Max
Trade Mark: UMIDIGI
Date Received: 2022/10/21
Report Date: 2022/11/25

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

Prepared and Checked By:

Approved By:

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EMC Engineer

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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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Version 2: 2021-11-09

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FCC -2G,3G,4G

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Smart phone
Tested Model	G1 Max
Multiple Models	C1 Max (model difference see product declaration letter of similarity)
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 Band5/ LTE Band 5: -1.13dBi PCS1900/WCDMA Band 2/ LTE Band 2: 0.87dBi LTE Band 7: 1.89dBi LTE Band 12: -1.75dBi LTE Band 41: 1.89dBi (provided by the applicant)
Voltage Range	DC 3.85V from battery or DC 5V from adapter
Sample serial number	10A2 for Radiated Emissions 10A1 for RF Conducted Test (Assigned by ATC)
Sample/EUT Status	Good condition
Normal/Extreme Condition	N.V.: Nominal Voltage: 3.85V _{DC} L.V.: Low Voltage 3.45V _{DC} H.V.: High Voltage 4.4V _{DC}
Adapter information	Model: HJ-0502000W2-US Input: AC 100-240V, 50/60Hz, 0.3A Output: DC 5V, 2A

Note: WWAN Main Antenna only transmit with GSM 850, WCDMA 850, and LTE Bands 5/7/12/41

WWAN Aux Antenna only transmit with PCS1900, WCDMA1900, LTE band 2

The models G1 Max and C1 Max have the same size, there are identical device, and we only choose G1 Max to test.

Objective

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

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		0.73dB
Unwanted Emission, conducted		1.6dB
AC Power Lines Conducted Emissions		2.72dB
Emissions, Radiated	9kHz - 30MHz	2.66dB
	30MHz - 1GHz	4.28dB
	1GHz - 18GHz	4.98dB
	18GHz -26.5GHz	5.06dB
	26.5GHz -40GHz	4.72dB
Temperature		1°C
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 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. 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.

Listed by Innovation, Science and Economic Development Canada (ISED), the Registration Number is 5077A.

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
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.

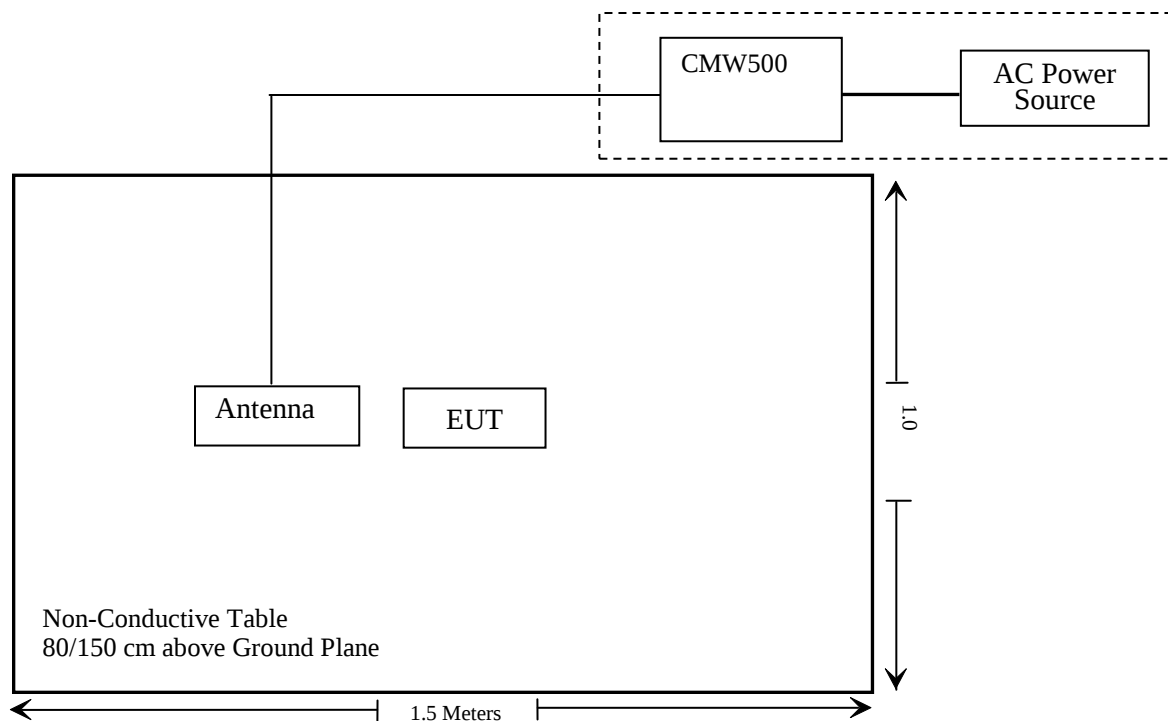
Support Equipment List and Details

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



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 1.1307 , §2.1093	RF Exposure (SAR)	Compliant
§2.1046; § 22.913 (a) (d); § 24.232 (c) (d); §27.50 (c) (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 (g) (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	2021/12/13	2022/12/12
Rohde&Schwarz	Spectrum Analyzer	FSV40	101949	2021/12/13	2022/12/12
SONOMA INSTRUMENT	Amplifier	310 N	186131	2021/11/09	2022/11/08
A.H. Systems, inc.	Preamplifier	PAM-0118P	135	2021/11/09	2022/11/08
Quinstar	Amplifier	QLW-184055 36-J0	15964001002	2021/11/11	2022/11/10
Radiated Emission Test Software: e3 19821b (V9)					
Unknown	RF Coaxial Cable	No.10	N050	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.11	N1000	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.12	N040	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.13	N300	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.14	N800	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.15	N600	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.16	N650	2021/12/14	2022/12/13
Schwarzbeck	Bilog Antenna	VULB9163	9163-194	2020/01/05	2023/01/04
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2021/07/06	2024/07/05
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-655	2020/01/05	2023/01/04
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-1067	2020/01/05	2023/01/04
PASTERNAK	Horn Antenn	PE9852/2F-20	1120 (ATC-BA-024-1)	2020/01/05	2023/01/04
PASTERNAK	Horn Antenn	PE9852/2F-20	1120 (ATC-BA-025-1)	2020/01/05	2023/01/04
Wainwright	High Pass Filter	WHKX3.6/18 G-10SS	5	2021/12/14	2022/12/13
CD	High Pass Filter	HPM-1.2/18G -60	110	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.16	N200	2021/12/14	2022/12/13
Agilent	Signal Generator	N5183A	MY51040755	2021/12/13	2022/12/12

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
SPECTRUM ANALYZER	Rohde & Schwarz	FSU26	200982	2022/07/04	2023/07/03
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	154606	2021/12/13	2022/12/12
Mini-Circuits	Power Splitter	DC-18000MHz	SF10944151S	2021/12/14	2022/12/13
REALE	Temp. & Humid. Chamber	RHP-800BT	R20170318310	2021/12/14	2022/12/13
Fluke	Multi Meter	45	7664009	2021/12/14	2022/12/13
Manson	DC Power Source	KPS-6604	ATCS-205	NCR	NCR
Unknown	RF Coaxial Cable	No.33	RF-03	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: RA221021-48471E-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) (d)& §24.232 (c) (d); §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.

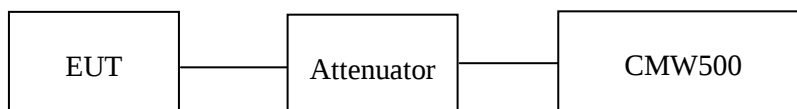
According to §27.50(c), Control and mobile stations in the 698-746 MHz band are limited to 30 watts ERP. And Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

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

Test Procedure

Conducted method:

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



ANSI C63.26-2015 Section 5.5.

Test Data

Environmental Conditions

Temperature:	26 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Cat Kang from 2022-11-12 to 2022-11-16.

Conducted Power**Cellular Band (Part 22H)**

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	ERP(dBm)	Limit (dBm)
GSM	128	824.2	31.40	27.62	38.45
	190	836.6	31.30	27.52	38.45
	251	848.8	31.30	27.52	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	31.35	29.81	27.85	25.81	27.57	26.03	24.07	22.03	38.45
	190	836.6	31.33	29.76	27.84	25.78	27.55	25.98	24.06	22.00	38.45
	251	848.8	31.21	29.66	27.70	25.60	27.43	25.88	23.92	21.82	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		22.60	22.59	22.56	18.82	18.81	18.78
	HSDPA	1	21.55	21.80	21.36	17.77	18.02	17.58
		2	21.45	21.77	21.25	17.67	17.99	17.47
		3	21.46	21.52	21.44	17.68	17.74	17.66
		4	21.38	21.41	21.39	17.60	17.63	17.61
	HSUPA	1	21.66	21.87	21.37	17.88	18.09	17.59
		2	21.48	21.52	21.55	17.70	17.74	17.77
		3	21.52	21.34	21.46	17.74	17.56	17.68
		4	21.37	21.26	21.38	17.59	17.48	17.60
		5	21.55	21.48	21.49	17.77	17.70	17.71
	HSPA+	1	21.41	21.47	21.55	17.63	17.69	17.77

Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBd) - L_C (dB)

For GSM850 / WCDMA Band5: Antenna Gain = -1.13 dBi = -3.28dBd (0dBd=2.15dBi)

L_C = signal attenuation in the connecting cable between the transmitter and antenna in 0.5dB

Limit: ERP ≤ 38.45dBm

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	EIRP(dBm)	Limit (dBm)
GSM	512	1850.2	29.90	30.77	33
	661	1880.0	29.90	30.77	33
	810	1909.8	29.80	30.67	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	29.29	27.49	25.86	23.76	30.16	28.36	26.73	24.63	33
	661	1880.0	29.27	27.36	25.77	23.84	30.14	28.23	26.64	24.71	33
	810	1909.8	29.23	27.30	25.63	23.63	30.10	28.17	26.50	24.50	33

Mode	Test Mode	3GPP Sub Test	Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
WCDMA (Band 2)	RMC12.2k		22.79	22.79	22.73	23.66	23.66	23.60
	HSDPA	1	22.00	21.92	21.32	22.87	22.79	22.19
		2	22.02	21.48	21.31	22.89	22.35	22.18
		3	21.98	21.33	21.28	22.85	22.20	22.15
		4	21.56	21.46	21.56	22.43	22.33	22.43
	HSUPA	1	22.14	21.97	21.82	23.01	22.84	22.69
		2	22.35	21.84	21.77	23.22	22.71	22.64
		3	22.26	21.82	21.52	23.13	22.69	22.39
		4	22.28	21.77	21.64	23.15	22.64	22.51
		5	22.15	21.46	21.76	23.02	22.33	22.63
	HSPA+	1	22.22	21.42	21.64	23.09	22.29	22.51

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi)

For PCS1900 / WCDMA Band2: Antenna Gain = 0.87dBi

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	21.53	21.69	21.24	22.40	22.56	22.11
		RB1#3	21.56	21.68	21.32	22.43	22.55	22.19
		RB1#5	21.55	21.62	21.33	22.42	22.49	22.20
		RB3#0	21.59	21.54	21.48	22.46	22.41	22.35
		RB3#3	21.74	21.58	21.43	22.61	22.45	22.30
		RB6#0	20.74	20.73	20.44	21.61	21.60	21.31
	16QAM	RB1#0	20.38	20.87	20.14	21.25	21.74	21.01
		RB1#3	20.45	20.85	20.15	21.32	21.72	21.02
		RB1#5	20.42	20.81	20.19	21.29	21.68	21.06
		RB3#0	20.83	20.43	20.58	21.70	21.30	21.45
		RB3#3	20.73	20.52	20.58	21.60	21.39	21.45
		RB6#0	19.85	19.61	19.66	20.72	20.48	20.53
3.0	QPSK	RB1#0	21.84	21.67	21.36	22.71	22.54	22.23
		RB1#8	21.82	21.62	21.36	22.69	22.49	22.23
		RB1#14	21.86	21.54	21.34	22.73	22.41	22.21
		RB6#0	20.65	20.73	20.39	21.52	21.60	21.26
		RB6#9	20.76	20.73	20.45	21.63	21.60	21.32
		RB15#0	20.81	20.76	20.51	21.68	21.63	21.38
	16QAM	RB1#0	20.87	20.44	20.72	21.74	21.31	21.59
		RB1#8	20.85	20.31	20.63	21.72	21.18	21.50
		RB1#14	20.85	20.35	20.62	21.72	21.22	21.49
		RB6#0	19.98	19.69	19.72	20.85	20.56	20.59
		RB6#9	19.94	19.65	19.60	20.81	20.52	20.47
		RB15#0	19.87	19.79	19.59	20.74	20.66	20.46

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	21.81	21.64	21.38	22.68	22.51	22.25
		RB1#13	21.78	21.52	21.36	22.65	22.39	22.23
		RB1#24	21.82	21.58	21.34	22.69	22.45	22.21
		RB15#0	20.67	20.79	20.52	21.54	21.66	21.39
		RB15#10	20.68	20.80	20.51	21.55	21.67	21.38
		RB25#0	20.70	20.76	20.57	21.57	21.63	21.44
	16QAM	RB1#0	20.76	20.87	19.71	21.63	21.74	20.58
		RB1#13	20.71	20.74	19.72	21.58	21.61	20.59
		RB1#24	20.72	20.80	19.73	21.59	21.67	20.60
		RB15#0	19.70	19.80	19.68	20.57	20.67	20.55
		RB15#10	19.67	19.71	19.55	20.54	20.58	20.42
		RB25#0	19.77	19.96	19.64	20.64	20.83	20.51
10.0	QPSK	RB1#0	21.71	21.67	21.54	22.58	22.54	22.41
		RB1#25	21.79	21.58	21.50	22.66	22.45	22.37
		RB1#49	21.82	21.57	21.41	22.69	22.44	22.28
		RB25#0	20.78	20.82	20.51	21.65	21.69	21.38
		RB25#25	20.74	20.85	20.55	21.61	21.72	21.42
		RB50#0	20.76	20.74	20.55	21.63	21.61	21.42
	16QAM	RB1#0	21.45	20.59	21.00	22.32	21.46	21.87
		RB1#25	21.45	20.61	20.86	22.32	21.48	21.73
		RB1#49	21.50	20.50	20.94	22.37	21.37	21.81
		RB25#0	19.83	20.03	19.62	20.70	20.90	20.49
		RB25#25	19.86	19.98	19.62	20.73	20.85	20.49
		RB50#0	19.93	19.86	19.61	20.80	20.73	20.48

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	21.83	21.68	21.42	22.70	22.55	22.29
		RB1#38	21.76	21.54	21.38	22.63	22.41	22.25
		RB1#74	21.78	21.50	21.26	22.65	22.37	22.13
		RB36#0	20.82	20.81	20.36	21.69	21.68	21.23
		RB36#39	20.82	20.82	20.46	21.69	21.69	21.33
		RB75#0	20.84	20.82	20.40	21.71	21.69	21.27
	16QAM	RB1#0	21.47	20.97	20.86	22.34	21.84	21.73
		RB1#38	21.46	20.83	20.74	22.33	21.70	21.61
		RB1#74	21.56	20.73	20.71	22.43	21.60	21.58
		RB36#0	19.90	19.88	19.44	20.77	20.75	20.31
		RB36#39	19.95	19.88	19.45	20.82	20.75	20.32
		RB75#0	19.91	19.49	19.51	20.78	20.36	20.38
20.0	QPSK	RB1#0	21.76	21.69	21.61	22.63	22.56	22.48
		RB1#50	21.71	21.56	21.49	22.58	22.43	22.36
		RB1#99	21.77	21.51	21.5	22.64	22.38	22.37
		RB50#0	20.60	20.60	20.54	21.47	21.47	21.41
		RB50#50	20.73	20.53	20.49	21.60	21.40	21.36
		RB100#0	20.65	20.61	20.44	21.52	21.48	21.31
	16QAM	RB1#0	20.62	21.39	20.68	21.49	22.26	21.55
		RB1#50	20.65	21.46	20.62	21.52	22.33	21.49
		RB1#99	20.60	21.39	20.55	21.47	22.26	21.42
		RB50#0	19.57	19.84	19.62	20.44	20.71	20.49
		RB50#50	19.68	19.78	19.62	20.55	20.65	20.49
		RB100#0	19.62	19.80	19.55	20.49	20.67	20.42

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi)

For Band2: Antenna Gain =0.87dBi

Limit: EIRP ≤ 33dBm

LTE Band 5

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	22.64	22.73	22.75	18.86	18.95	18.97
		RB1#3	22.69	22.79	22.62	18.91	19.01	18.84
		RB1#5	22.60	22.86	22.67	18.82	19.08	18.89
		RB3#0	22.77	22.7	22.64	18.99	18.92	18.86
		RB3#3	22.86	22.74	22.62	19.08	18.96	18.84
		RB6#0	21.83	21.57	21.46	18.05	17.79	17.68
	16QAM	RB1#0	21.44	22.32	21.17	17.66	18.54	17.39
		RB1#3	21.43	22.00	21.10	17.65	18.22	17.32
		RB1#5	21.37	21.99	21.08	17.59	18.21	17.30
		RB3#0	21.89	21.53	21.23	18.11	17.75	17.45
		RB3#3	21.84	21.58	21.18	18.06	17.80	17.40
		RB6#0	20.89	20.81	20.39	17.11	17.03	16.61
3.0	QPSK	RB1#0	22.69	22.72	22.67	18.91	18.94	18.89
		RB1#8	22.66	22.77	22.63	18.88	18.99	18.85
		RB1#14	22.69	22.73	22.55	18.91	18.95	18.77
		RB6#0	21.83	21.63	21.55	18.05	17.85	17.77
		RB6#9	21.64	21.59	21.49	17.86	17.81	17.71
		RB15#0	21.74	21.60	21.51	17.96	17.82	17.73
	16QAM	RB1#0	22.45	21.21	21.70	18.67	17.43	17.92
		RB1#8	22.38	20.89	21.70	18.60	17.11	17.92
		RB1#14	22.26	20.95	21.63	18.48	17.17	17.85
		RB6#0	20.77	20.72	20.77	16.99	16.94	16.99
		RB6#9	20.58	20.71	20.47	16.80	16.93	16.69
		RB15#0	20.59	20.68	20.71	16.81	16.90	16.93

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	22.80	22.52	22.53	19.02	18.74	18.75
		RB1#13	22.68	22.56	22.57	18.90	18.78	18.79
		RB1#24	22.71	22.48	22.48	18.93	18.70	18.70
		RB15#0	21.79	21.69	21.60	18.01	17.91	17.82
		RB15#10	21.54	21.53	21.58	17.76	17.75	17.80
		RB25#0	21.59	21.48	21.52	17.81	17.70	17.74
	16QAM	RB1#0	21.69	21.60	20.71	17.91	17.82	16.93
		RB1#13	21.55	21.41	20.68	17.77	17.63	16.90
		RB1#24	21.61	21.61	20.64	17.83	17.83	16.86
		RB15#0	20.51	20.60	20.61	16.73	16.82	16.83
		RB15#10	20.38	20.55	20.71	16.60	16.77	16.93
		RB25#0	20.46	20.70	20.74	16.68	16.92	16.96
10.0	QPSK	RB1#0	22.69	22.51	22.64	18.91	18.73	18.86
		RB1#25	22.61	22.51	22.58	18.83	18.73	18.80
		RB1#49	22.72	22.44	22.58	18.94	18.66	18.80
		RB25#0	21.66	21.69	21.54	17.88	17.91	17.76
		RB25#25	21.67	21.69	21.60	17.89	17.91	17.82
		RB50#0	21.65	21.62	21.65	17.87	17.84	17.87
	16QAM	RB1#0	22.32	21.35	22.15	18.54	17.57	18.37
		RB1#25	22.23	21.16	21.97	18.45	17.38	18.19
		RB1#49	22.31	21.30	21.97	18.53	17.52	18.19
		RB25#0	20.56	21.02	20.43	16.78	17.24	16.65
		RB25#25	20.75	20.71	20.71	16.97	16.93	16.93
		RB50#0	20.65	20.68	20.67	16.87	16.90	16.89

Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBd) - L_C (dB)

For Band5: Antenna Gain = -1.13dBi = -3.28 (0dBd=2.15dBi)

L_C = signal attenuation in the connecting cable between the transmitter and antenna in 0.5dB

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	20.74	20.76	21.15	21.83	21.85	22.24
		RB1#13	20.76	20.71	21.19	21.85	21.80	22.28
		RB1#24	20.77	20.74	21.29	21.86	21.83	22.38
		RB15#0	19.67	19.99	20.13	20.76	21.08	21.22
		RB15#10	19.8	19.94	20.09	20.89	21.03	21.18
		RB25#0	19.79	19.90	20.13	20.88	20.99	21.22
	16QAM	RB1#0	19.29	19.04	19.88	20.38	20.13	20.97
		RB1#13	19.28	18.96	19.96	20.37	20.05	21.05
		RB1#24	19.31	18.99	19.94	20.40	20.08	21.03
		RB15#0	18.85	18.95	19.08	19.94	20.04	20.17
		RB15#10	18.85	18.93	19.00	19.94	20.02	20.09
		RB25#0	18.76	19.06	19.11	19.85	20.15	20.20
10.0	QPSK	RB1#0	20.73	20.81	21.01	21.82	21.90	22.10
		RB1#25	20.72	20.78	20.93	21.81	21.87	22.02
		RB1#49	20.76	20.73	21.08	21.85	21.82	22.17
		RB25#0	19.74	19.78	19.99	20.83	20.87	21.08
		RB25#25	19.83	19.89	20.19	20.92	20.98	21.28
		RB50#0	19.81	19.85	19.98	20.90	20.94	21.07
	16QAM	RB1#0	20.52	19.55	20.40	21.61	20.64	21.49
		RB1#25	20.49	19.68	20.52	21.58	20.77	21.61
		RB1#49	20.51	19.73	20.49	21.60	20.82	21.58
		RB25#0	18.92	19.21	19.15	20.01	20.30	20.24
		RB25#25	18.90	19.14	19.15	19.99	20.23	20.24
		RB50#0	18.84	19.01	19.14	19.93	20.10	20.23

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	20.97	20.65	20.91	22.06	21.74	22.00
		RB1#38	20.70	20.72	21.00	21.79	21.81	22.09
		RB1#74	20.84	20.75	21.08	21.93	21.84	22.17
		RB36#0	19.76	19.83	20.11	20.85	20.92	21.20
		RB36#39	19.73	20.01	20.25	20.82	21.10	21.34
		RB75#0	19.83	19.94	20.00	20.92	21.03	21.09
	16QAM	RB1#0	20.84	20.18	20.33	21.93	21.27	21.42
		RB1#38	20.59	20.18	20.52	21.68	21.27	21.61
		RB1#74	20.72	20.17	20.48	21.81	21.26	21.57
		RB36#0	18.94	18.91	19.14	20.03	20.00	20.23
		RB36#39	18.92	19.00	19.38	20.01	20.09	20.47
		RB75#0	18.90	18.93	19.17	19.99	20.02	20.26
20.0	QPSK	RB1#0	21.12	20.79	20.94	22.21	21.88	22.03
		RB1#50	20.92	20.93	21.06	22.01	22.02	22.15
		RB1#99	21.05	20.98	21.19	22.14	22.07	22.28
		RB50#0	19.85	19.89	19.92	20.94	20.98	21.01
		RB50#50	19.90	19.84	20.18	20.99	20.93	21.27
		RB100#0	19.86	19.97	20.11	20.95	21.06	21.20
	16QAM	RB1#0	20.08	20.70	19.80	21.17	21.79	20.89
		RB1#50	20.07	20.71	19.88	21.16	21.80	20.97
		RB1#99	20.16	20.74	19.97	21.25	21.83	21.06
		RB50#0	18.86	18.86	19.17	19.95	19.95	20.26
		RB50#50	18.93	19.05	19.29	20.02	20.14	20.38
		RB100#0	18.88	19.02	19.06	19.97	20.11	20.15

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi) - L_C (dB)

For Band7: Antenna Gain = 1.89dBi

L_C = signal attenuation in the connecting cable between the transmitter and antenna in 0.8dB

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	22.46	22.54	22.42	18.06	18.14	18.02
		RB1#3	22.52	22.60	22.48	18.12	18.20	18.08
		RB1#5	22.46	22.65	22.49	18.06	18.25	18.09
		RB3#0	22.60	22.57	22.41	18.20	18.17	18.01
		RB3#3	22.55	22.50	22.56	18.15	18.10	18.16
		RB6#0	21.36	21.43	21.34	16.96	17.03	16.94
	16QAM	RB1#0	21.04	22.11	21.27	16.64	17.71	16.87
		RB1#3	21.07	22.21	21.23	16.67	17.81	16.83
		RB1#5	21.01	22.15	21.06	16.61	17.75	16.66
		RB3#0	21.53	21.23	21.17	17.13	16.83	16.77
		RB3#3	21.54	21.36	20.96	17.14	16.96	16.56
		RB6#0	20.60	20.35	20.23	16.20	15.95	15.83
3.0	QPSK	RB1#0	22.58	22.47	22.46	18.18	18.07	18.06
		RB1#8	22.59	22.58	22.36	18.19	18.18	17.96
		RB1#14	22.55	22.44	22.43	18.15	18.04	18.03
		RB6#0	21.46	21.57	21.43	17.06	17.17	17.03
		RB6#9	21.34	21.47	21.30	16.94	17.07	16.90
		RB15#0	21.42	21.43	21.56	17.02	17.03	17.16
	16QAM	RB1#0	21.63	21.16	21.57	17.23	16.76	17.17
		RB1#8	21.48	20.94	21.48	17.08	16.54	17.08
		RB1#14	21.66	20.95	21.50	17.26	16.55	17.10
		RB6#0	20.53	20.37	20.42	16.13	15.97	16.02
		RB6#9	20.49	20.45	20.16	16.09	16.05	15.76
		RB15#0	20.41	20.32	20.46	16.01	15.92	16.06

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	22.55	22.38	22.48	18.15	17.98	18.08
		RB1#13	22.52	22.45	22.34	18.12	18.05	17.94
		RB1#24	22.57	22.51	22.35	18.17	18.11	17.95
		RB15#0	21.48	21.48	21.62	17.08	17.08	17.22
		RB15#10	21.53	21.47	21.47	17.13	17.07	17.07
		RB25#0	21.49	21.57	21.71	17.09	17.17	17.31
	16QAM	RB1#0	21.46	21.58	20.69	17.06	17.18	16.29
		RB1#13	21.33	21.27	20.56	16.93	16.87	16.16
		RB1#24	21.49	21.31	20.56	17.09	16.91	16.16
		RB15#0	20.34	20.37	20.50	15.94	15.97	16.10
		RB15#10	20.33	20.25	20.51	15.93	15.85	16.11
		RB25#0	20.37	20.41	20.61	15.97	16.01	16.21
10.0	QPSK	RB1#0	22.64	22.35	22.47	18.24	17.95	18.07
		RB1#25	22.55	22.38	22.56	18.15	17.98	18.16
		RB1#49	22.52	22.46	22.49	18.12	18.06	18.09
		RB25#0	21.43	21.60	21.52	17.03	17.20	17.12
		RB25#25	21.54	21.43	21.59	17.14	17.03	17.19
		RB50#0	21.54	21.44	21.42	17.14	17.04	17.02
	16QAM	RB1#0	22.02	21.04	21.86	17.62	16.64	17.46
		RB1#25	22.04	21.04	21.66	17.64	16.64	17.26
		RB1#49	22.18	21.11	21.81	17.78	16.71	17.41
		RB25#0	20.46	20.68	20.38	16.06	16.28	15.98
		RB25#25	20.47	20.90	20.56	16.07	16.50	16.16
		RB50#0	20.56	20.32	20.74	16.16	15.92	16.34

Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBd) - L_C (dB)

For Band12: Antenna Gain = -1.75dBi = -3.90dBd (0dBd=2.15dBi)

L_C = signal attenuation in the connecting cable between the transmitter and antenna in 0.5dB

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	20.55	20.75	21.08	21.64	21.84	22.17
		RB1#13	20.47	20.88	21.05	21.56	21.97	22.14
		RB1#24	20.58	20.84	21.19	21.67	21.93	22.28
		RB15#0	19.52	19.77	20.24	20.61	20.86	21.33
		RB15#10	19.53	19.87	20.16	20.62	20.96	21.25
		RB25#0	19.48	19.86	20.16	20.57	20.95	21.25
	16QAM	RB1#0	19.13	20.08	20.04	20.22	21.17	21.13
		RB1#13	19.39	20.17	20.02	20.48	21.26	21.11
		RB1#24	19.37	20.13	20.03	20.46	21.22	21.12
		RB15#0	18.57	18.98	19.45	19.66	20.07	20.54
		RB15#10	18.48	19.07	19.48	19.57	20.16	20.57
		RB25#0	18.52	18.92	19.12	19.61	20.01	20.21
10.0	QPSK	RB1#0	20.53	20.77	21.39	21.62	21.86	22.48
		RB1#25	20.57	20.73	21.30	21.66	21.82	22.39
		RB1#49	20.76	20.94	21.37	21.85	22.03	22.46
		RB25#0	19.50	19.82	20.14	20.59	20.91	21.23
		RB25#25	19.45	19.81	20.22	20.54	20.90	21.31
		RB50#0	19.15	19.45	19.86	20.24	20.54	20.95
	16QAM	RB1#0	19.92	19.70	20.27	21.01	20.79	21.36
		RB1#25	19.79	19.75	20.34	20.88	20.84	21.43
		RB1#49	20.05	19.76	20.43	21.14	20.85	21.52
		RB25#0	18.68	19.07	19.15	19.77	20.16	20.24
		RB25#25	18.70	19.17	19.22	19.79	20.26	20.31
		RB50#0	18.41	18.39	18.98	19.50	19.48	20.07

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	20.67	20.78	21.41	21.76	21.87	22.50
		RB1#38	20.59	20.80	21.38	21.68	21.89	22.47
		RB1#74	20.79	20.90	21.47	21.88	21.99	22.56
		RB36#0	19.57	19.81	20.17	20.66	20.90	21.26
		RB36#39	19.46	19.88	20.21	20.55	20.97	21.30
		RB75#0	19.10	19.40	19.88	20.19	20.49	20.97
	16QAM	RB1#0	19.88	18.83	20.35	20.97	19.92	21.44
		RB1#38	19.94	19.05	20.26	21.03	20.14	21.35
		RB1#74	19.87	19.04	20.18	20.96	20.13	21.27
		RB36#0	18.41	19.03	19.29	19.50	20.12	20.38
		RB36#39	18.45	19.15	19.33	19.54	20.24	20.42
		RB75#0	18.34	18.48	18.95	19.43	19.57	20.04
20.0	QPSK	RB1#0	20.23	20.92	21.14	21.32	22.01	22.23
		RB1#50	20.27	21.03	21.12	21.36	22.12	22.21
		RB1#99	20.38	21.18	21.28	21.47	22.27	22.37
		RB50#0	19.44	19.76	20.26	20.53	20.85	21.35
		RB50#50	19.39	19.96	20.29	20.48	21.05	21.38
		RB100#0	19.04	19.36	19.76	20.13	20.45	20.85
	16QAM	RB1#0	19.12	20.59	20.68	20.21	21.68	21.77
		RB1#50	19.23	20.53	20.77	20.32	21.62	21.86
		RB1#99	19.33	20.79	20.83	20.42	21.88	21.92
		RB50#0	18.60	18.84	19.47	19.69	19.93	20.56
		RB50#50	18.56	19.00	19.44	19.65	20.09	20.53
		RB100#0	18.10	18.46	18.92	19.19	19.55	20.01

Note: $EIRP(dBm) = \text{Conducted Power}(dBm) + \text{Antenna Gain}(dBi) - L_C (dB)$

For Band 41: Antenna Gain = 1.89dBi

L_C = signal attenuation in the connecting cable between the transmitter and antenna in 0.8dB

Limit: $EIRP \leq 33dBm$

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

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	4.10	13
	Middle	4.13	13
	High	4.75	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.14	13
	Middle	3.17	13
	High	3.11	13
HSDPA (16QAM)	Low	3.97	13
	Middle	4.20	13
	High	4.10	13
HSUPA (BPSK)	Low	3.97	13
	Middle	4.04	13
	High	4.04	13
HSPA+	Low	3.52	13
	Middle	3.44	13
	High	3.26	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	4.69	13
	Middle	4.23	13
	High	4.42	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.01	13
	Middle	2.92	13
	High	2.92	13
HSDPA (16QAM)	Low	3.75	13
	Middle	3.81	13
	High	3.81	13
HSUPA (BPSK)	Low	3.85	13
	Middle	3.72	13
	High	3.78	13
HSPA+	Low	3.55	13
	Middle	3.42	13
	High	3.26	13

LTE Band 2 20MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.19	4.58	5.32	13	Pass
QPSK (100RB Size)	5.64	5.42	5.54	13	Pass
16QAM (1RB Size)	6.06	5.35	6.22	13	Pass
16QAM (100RB Size)	6.44	6.22	6.31	13	Pass

LTE Band 5 10MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.32	5.19	5.67	13	Pass
QPSK (50RB Size)	5.64	5.67	5.74	13	Pass
16QAM (1RB Size)	6.28	5.9	6.54	13	Pass
16QAM (50RB Size)	6.47	6.51	6.54	13	Pass

LTE Band 7 20MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.51	4.58	4.58	13	Pass
QPSK (100RB Size)	5.51	5.39	5.19	13	Pass
16QAM (1RB Size)	5.97	5.10	6.46	13	Pass
16QAM (100RB Size)	6.38	6.29	6.03	13	Pass

LTE Band 12 10MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.42	5.51	5.74	13	Pass
QPSK (50RB Size)	5.67	5.71	5.58	13	Pass
16QAM (1RB Size)	6.41	6.6	6.63	13	Pass
16QAM (50RB Size)	6.51	7.95	6.44	13	Pass

LTE Band 41 20MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	7.74	7.30	6.41	13	Pass
QPSK (100RB Size)	6.55	7.07	5.77	13	Pass
16QAM (1RB Size)	7.48	9.45	7.51	13	Pass
16QAM (100RB Size)	7.86	9.39	6.64	13	Pass

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

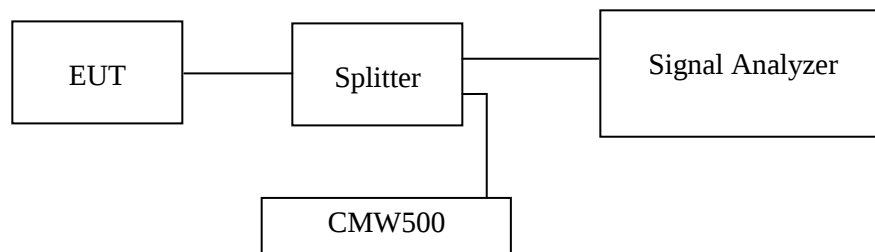
Applicable Standard

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:	26 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Cat Kang from 2022-11-11 to 2022-11-12.

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	242.00	313.00
	190	836.6	243.00	319.00
	251	848.8	243.00	318.00

	Frequency (MHz)	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)
RMC	826.4	4.16	4.70
	836.6	4.16	4.68
	846.6	4.14	4.70
HSDPA	826.4	4.16	4.70
	836.6	4.16	4.71
	846.6	4.16	4.68
HSUPA	826.4	4.16	4.70
	836.6	4.16	4.71
	846.6	4.16	4.71

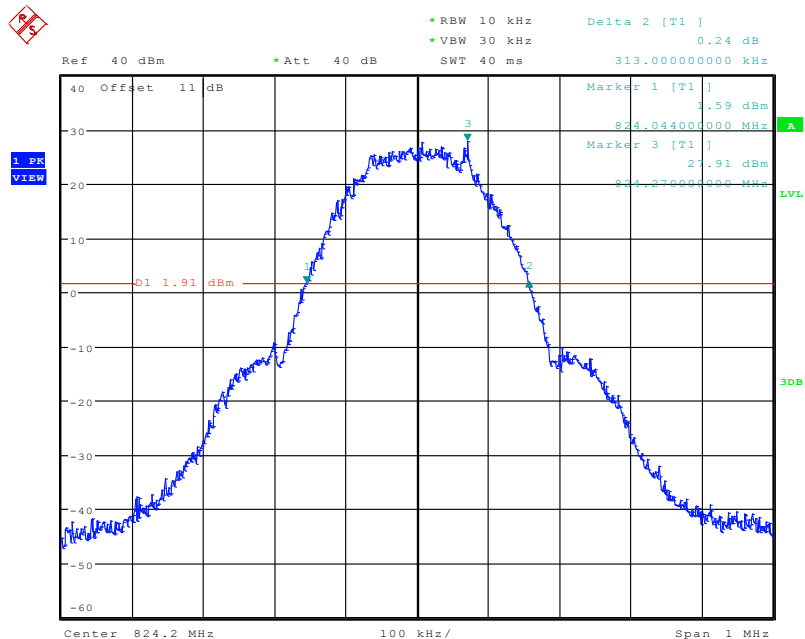
PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	512	1850.2	242.00	312.00
	661	1880.0	241.00	314.00
	810	1909.8	242.00	313.00

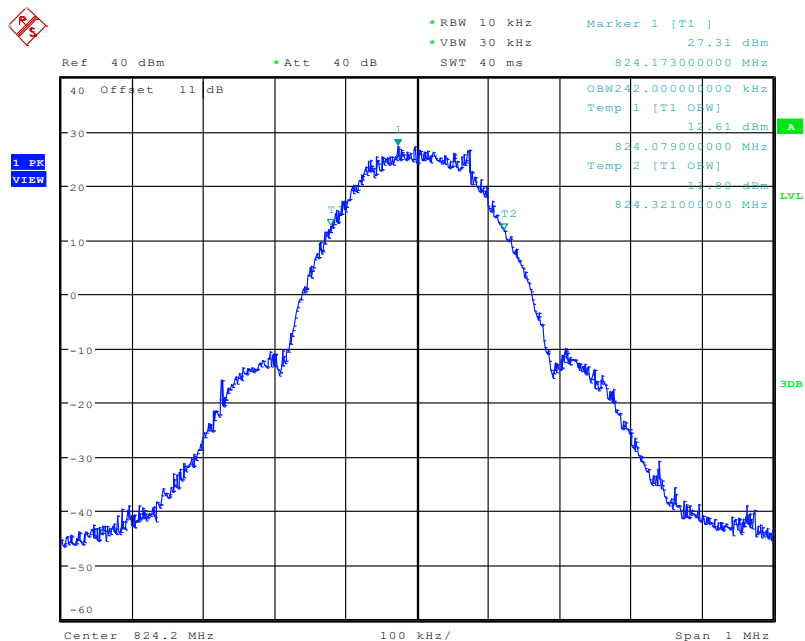
	Frequency (MHz)	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)
RMC	1852.4	4.16	4.70
	1880.0	4.14	4.71
	1907.6	4.16	4.68
HSDPA	1852.4	4.16	4.68
	1880.0	4.16	4.71
	1907.6	4.16	4.70
HSUPA	1852.4	4.14	4.70
	1880.0	4.14	4.68
	1907.6	4.16	4.68

Cellular Band (Part 22H)

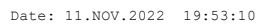
26 dB Emissions & 99% Occupied Bandwidth for GSM(GMSK) Mode, Low channel



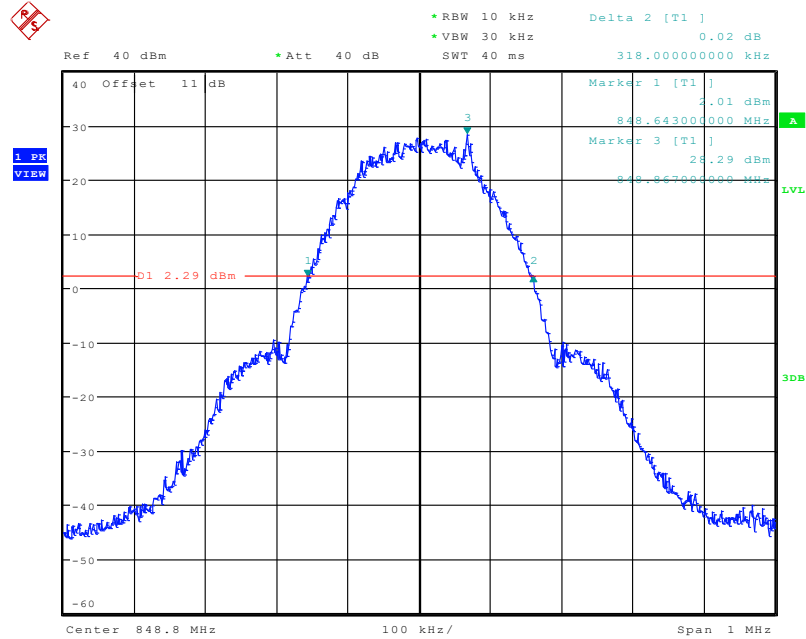
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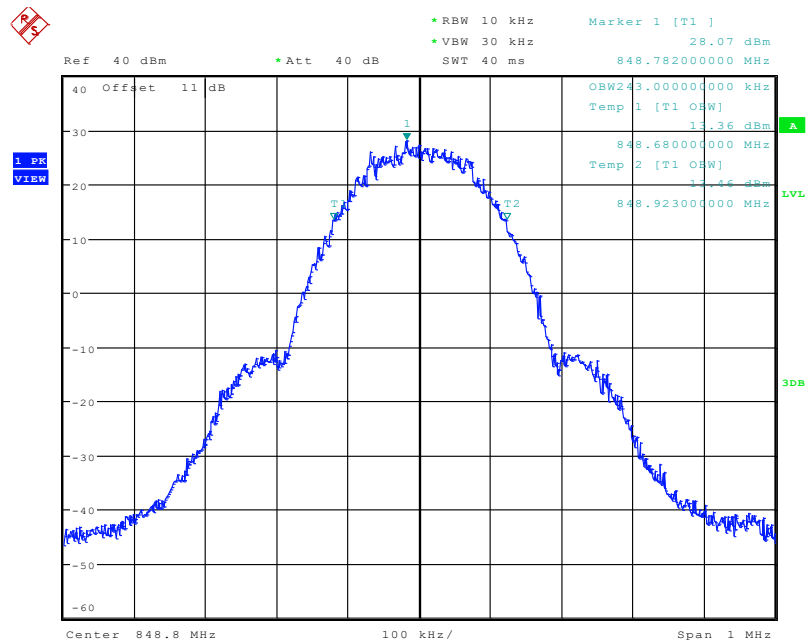
Date: 11.NOV.2022 19:37:34



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

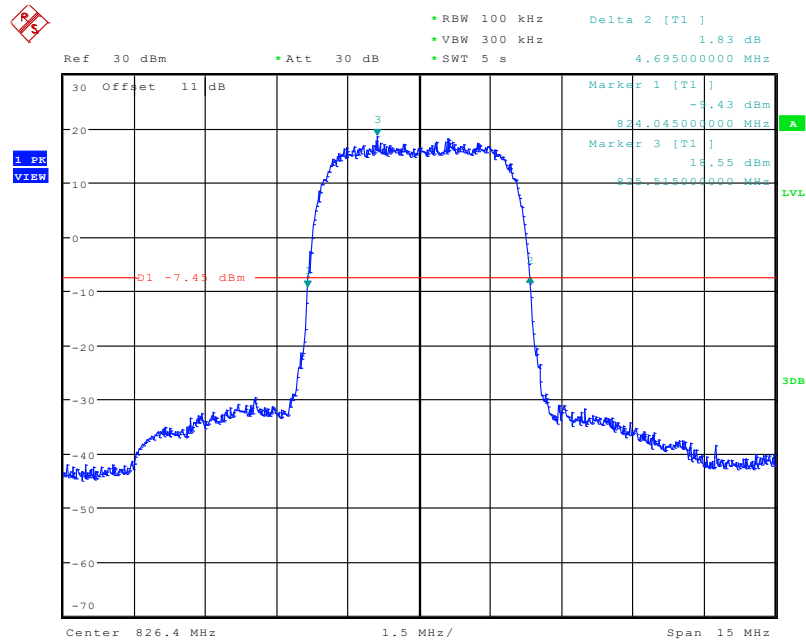


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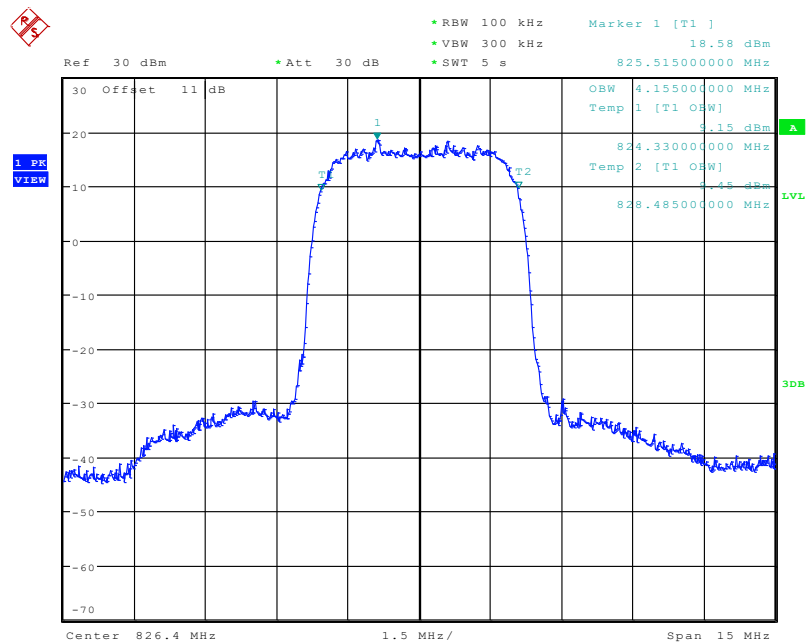


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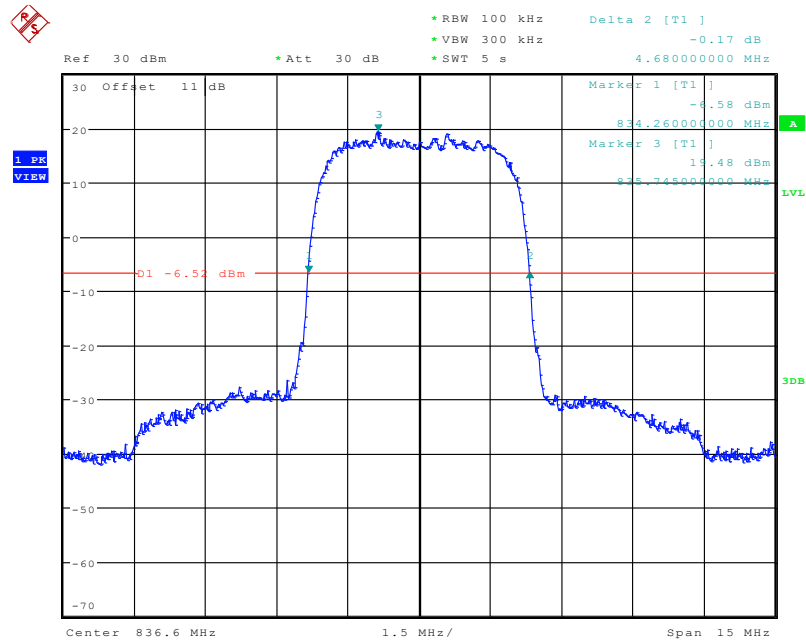
26 dB Emissions & 99% Occupied Bandwidth for RMC (BPSK) Mode, Low channel



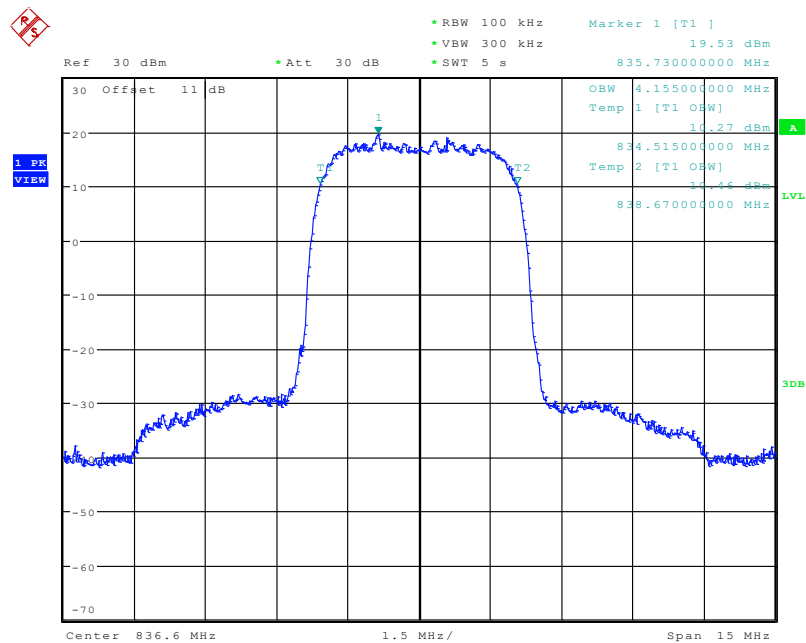
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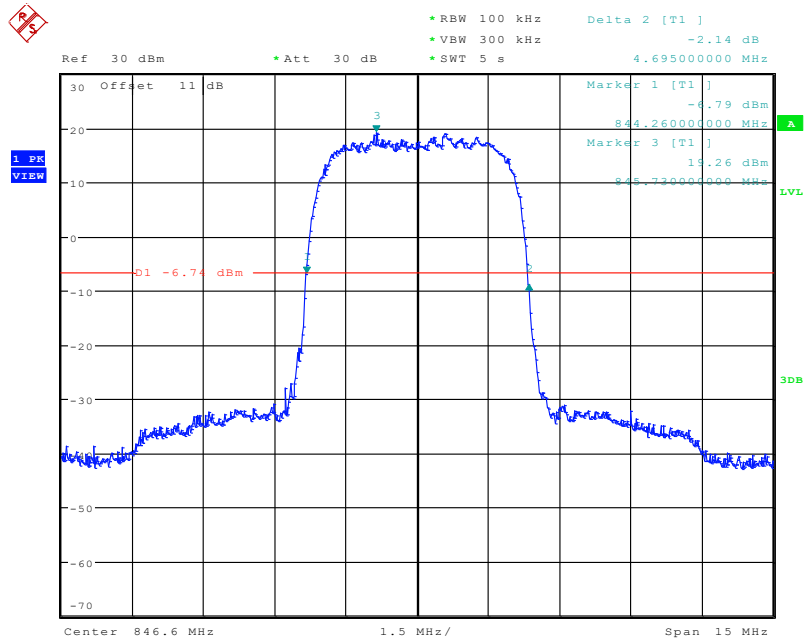
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26 dB Emissions & 99% Occupied Bandwidth for RMC (BPSK) Mode, Middle channel

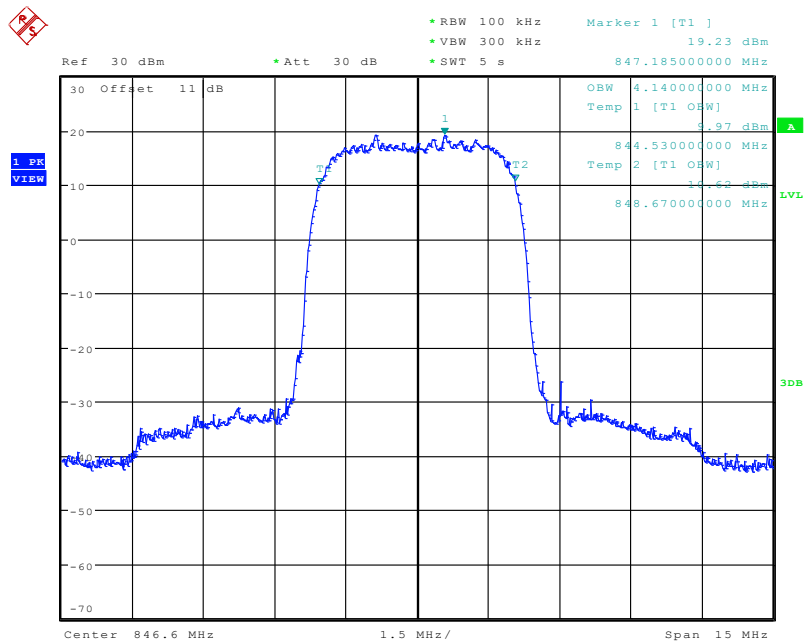
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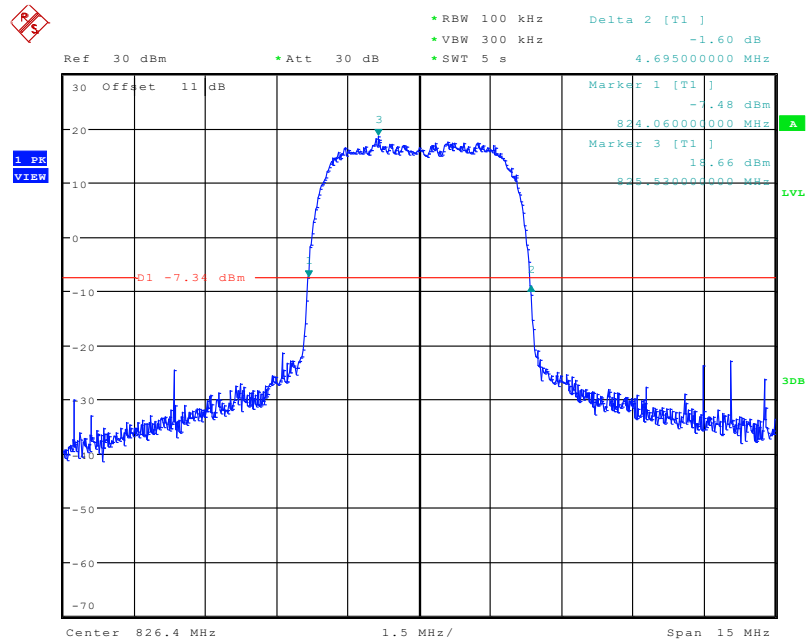
Date: 14.NOV.2022 14:41:21

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

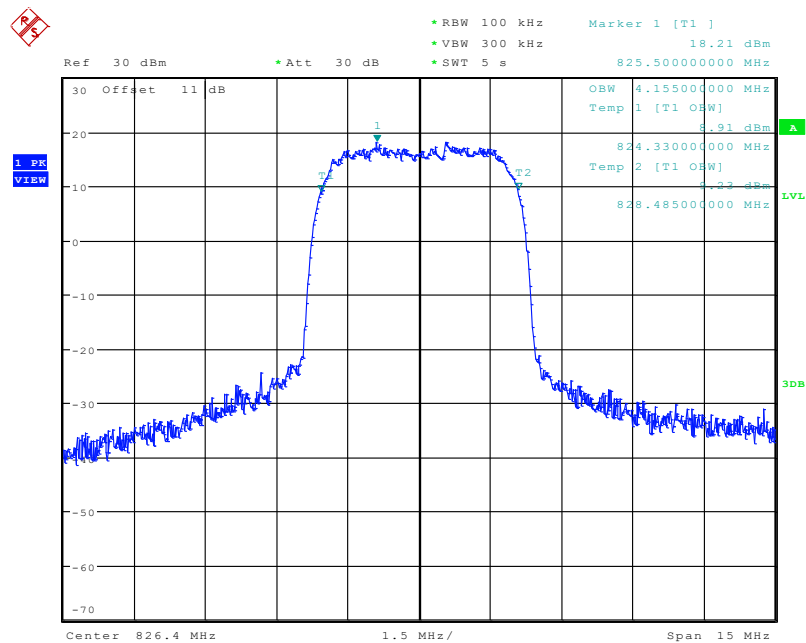
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Date: 14.NOV.2022 14:43:19

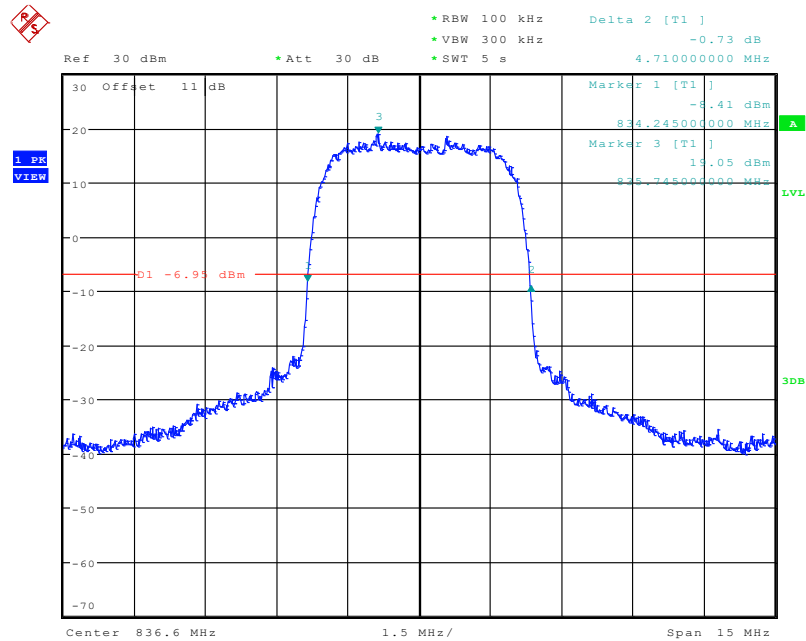
26 dB Emissions & 99% Occupied Bandwidth for HSUPA (QPSK) Mode, Low channel

Date: 12.NOV.2022 08:42:20

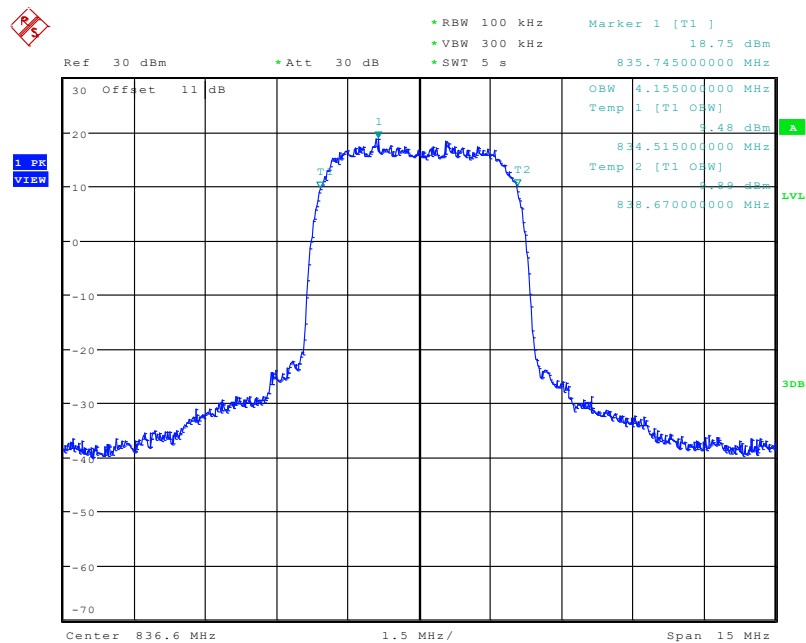


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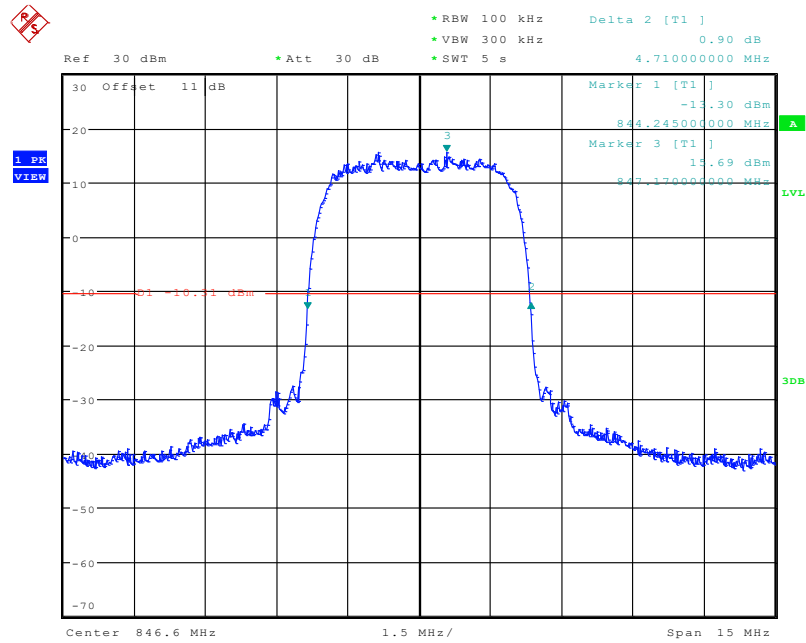
26 dB Emissions & 99% Occupied Bandwidth for HSUPA (QPSK) Mode, Middle channel



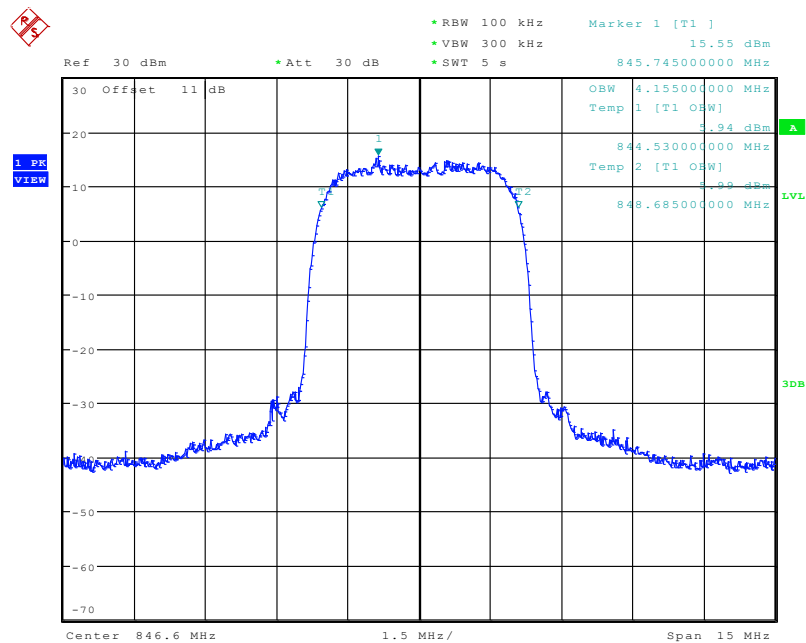
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Date: 12.NOV.2022 08:47:08

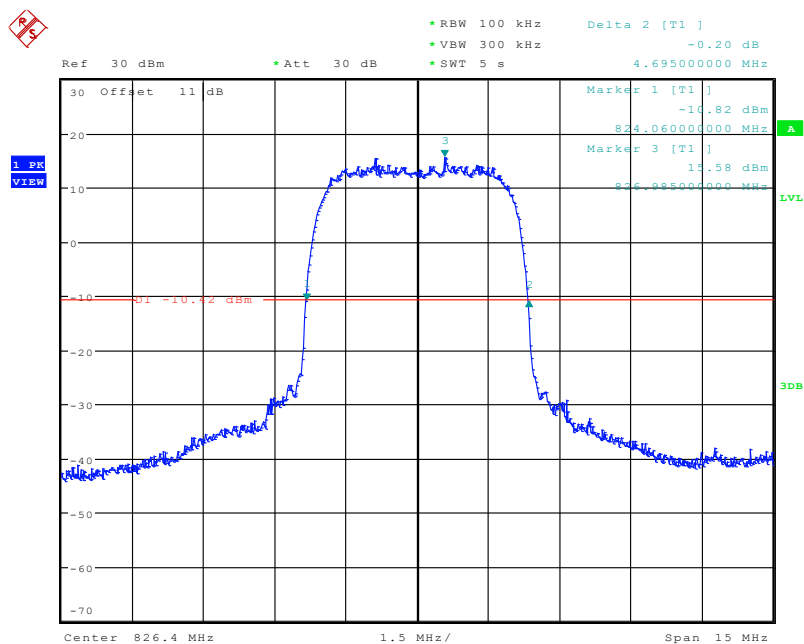
26 dB Emissions & 99% Occupied Bandwidth for HSUPA (QPSK) Mode, High channel

Date: 12.NOV.2022 08:53:40

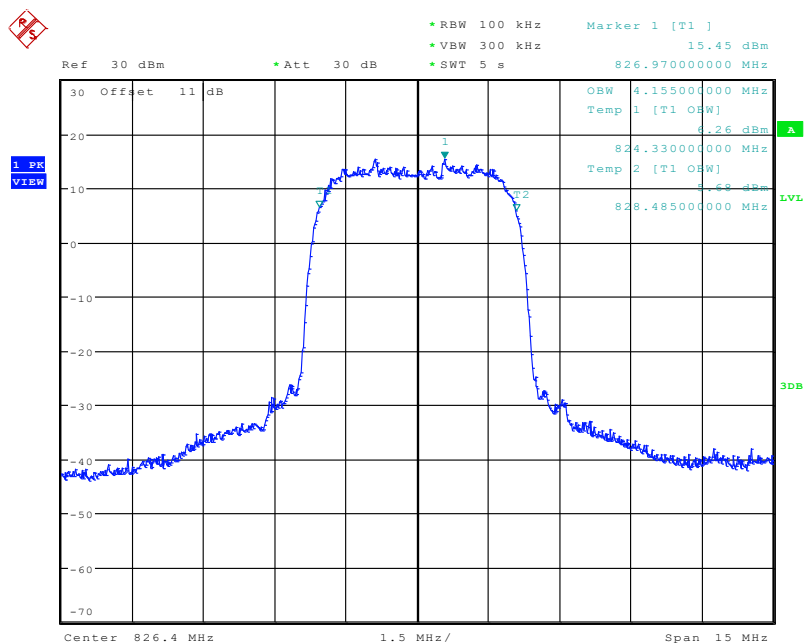


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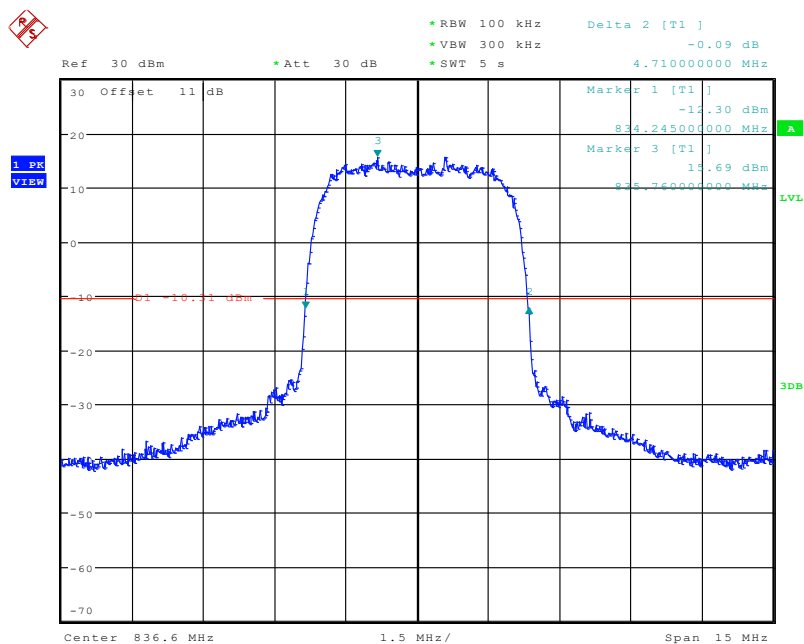
26 dB Emissions & 99% Occupied Bandwidth for HSDPA (16QAM) Mode, Low channel



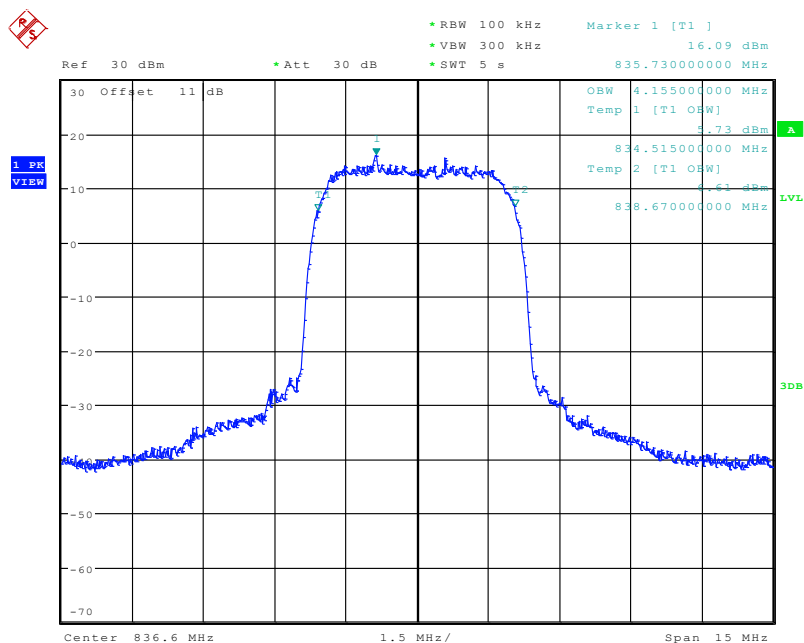
Date: 12.NOV.2022 09:05:27



Date: 12.NOV.2022 09:04:47

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

Date: 12.NOV.2022 09:09:05



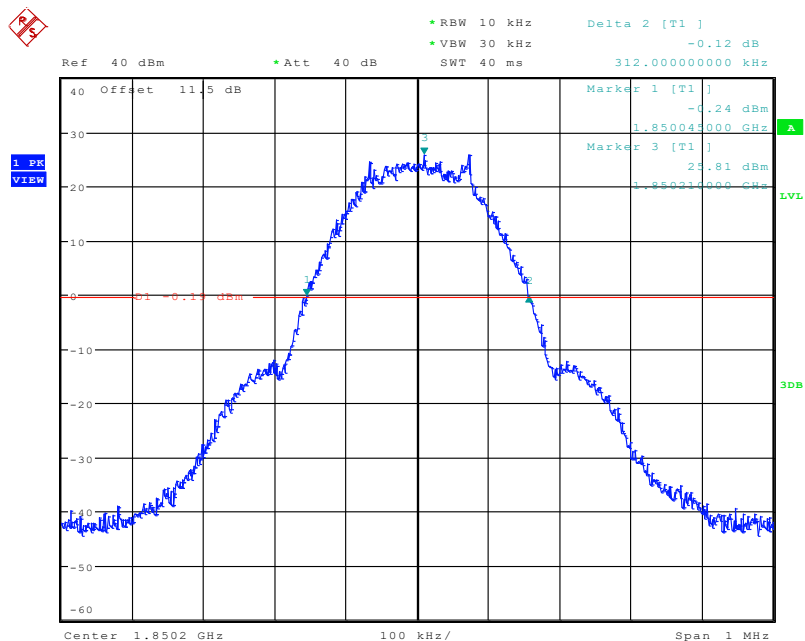
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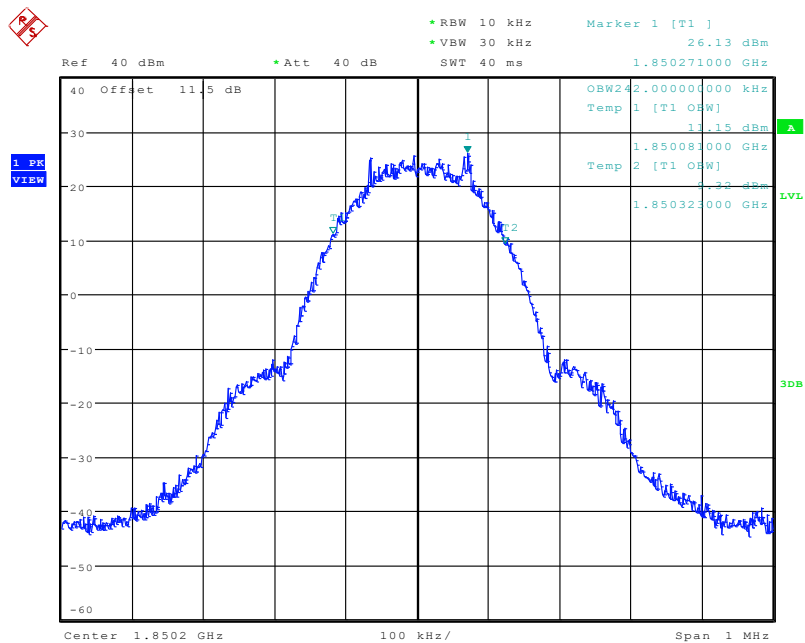
FCC -2G,3G,4G

PCS Band (Part 24E)

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

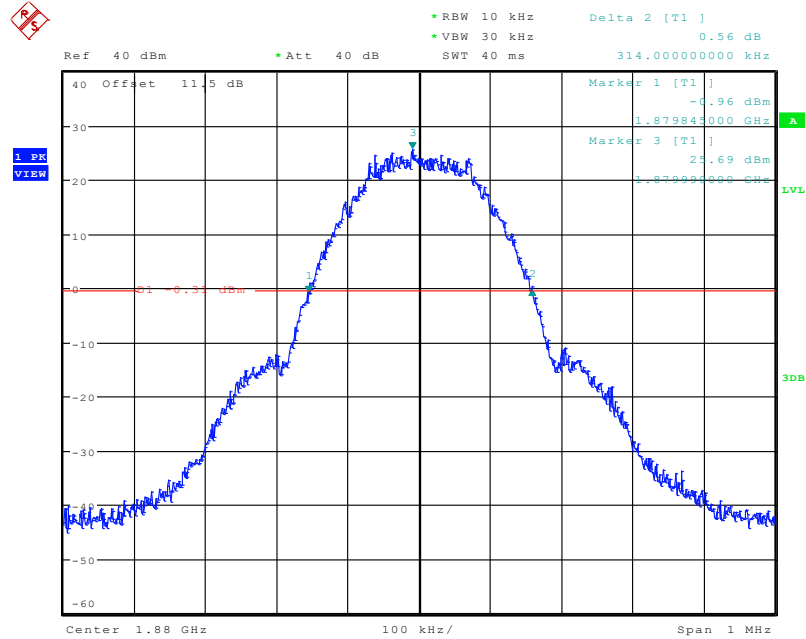


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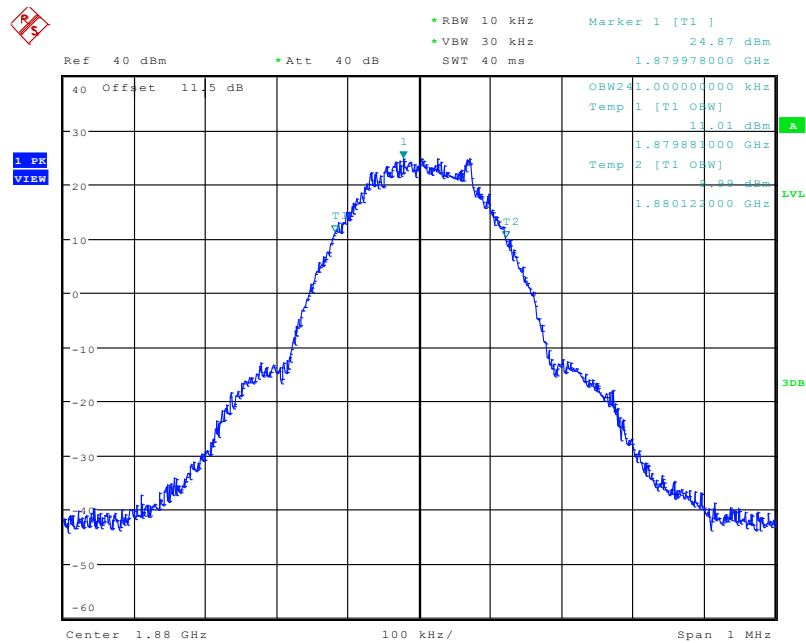


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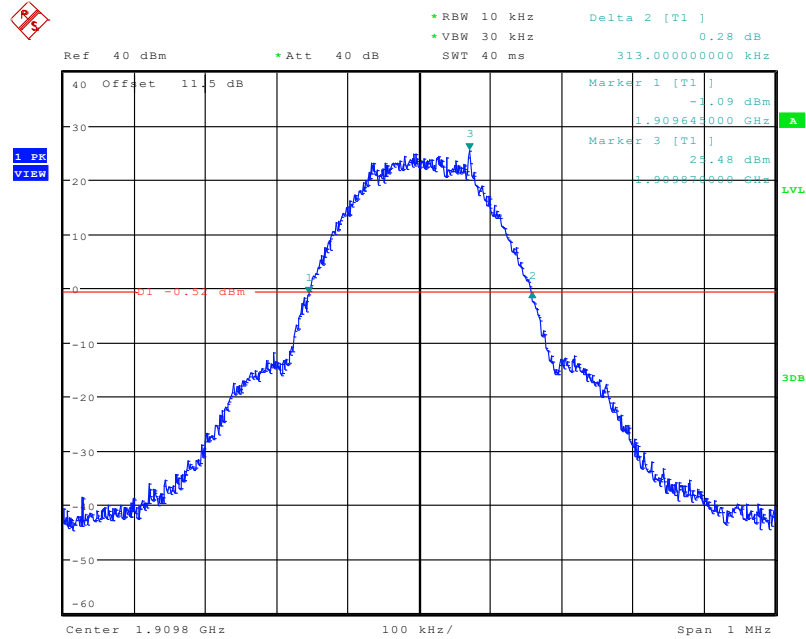
26 dB Emissions & 99% Occupied Bandwidth for GSM(GMSK) Mode, Middle channel



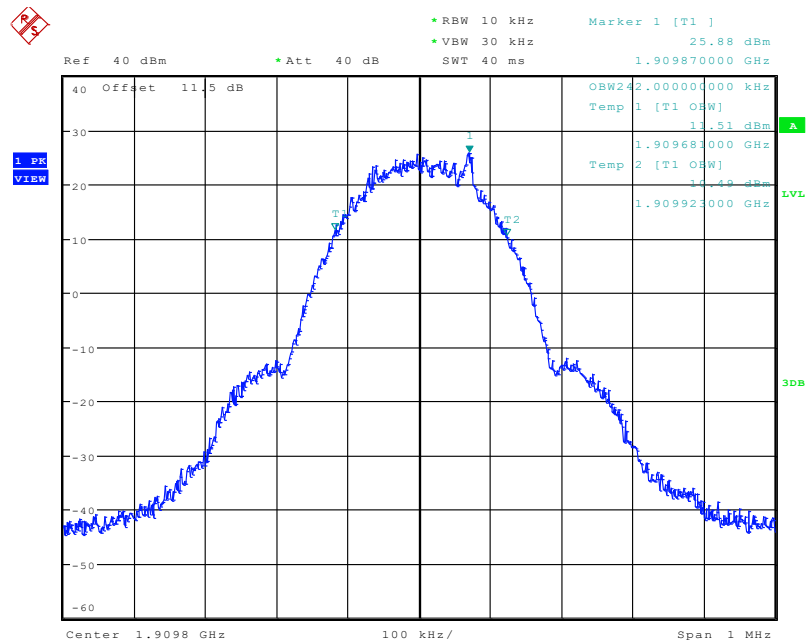
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Date: 11.NOV.2022 19:11:34

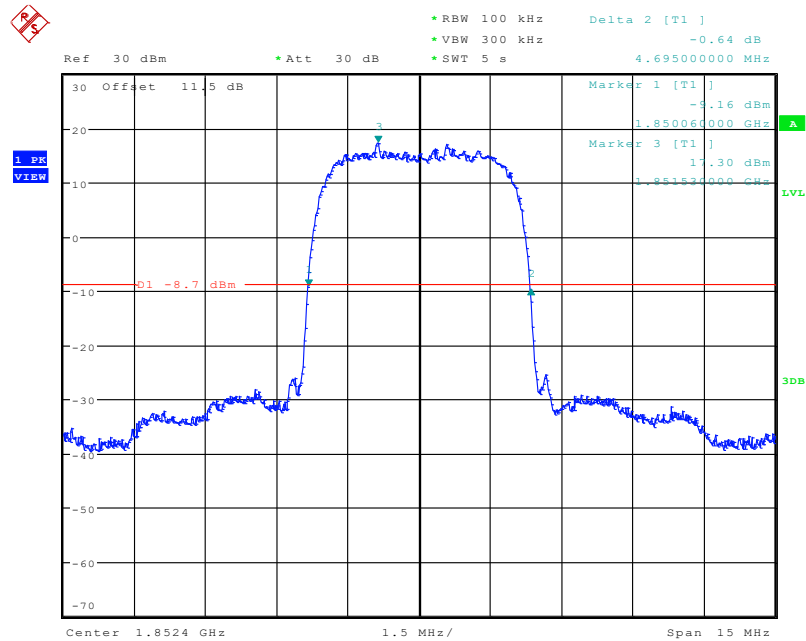
26 dB Emissions & 99% Occupied Bandwidth for GSM(GMSK) Mode, High channel

Date: 11.NOV.2022 19:19:02

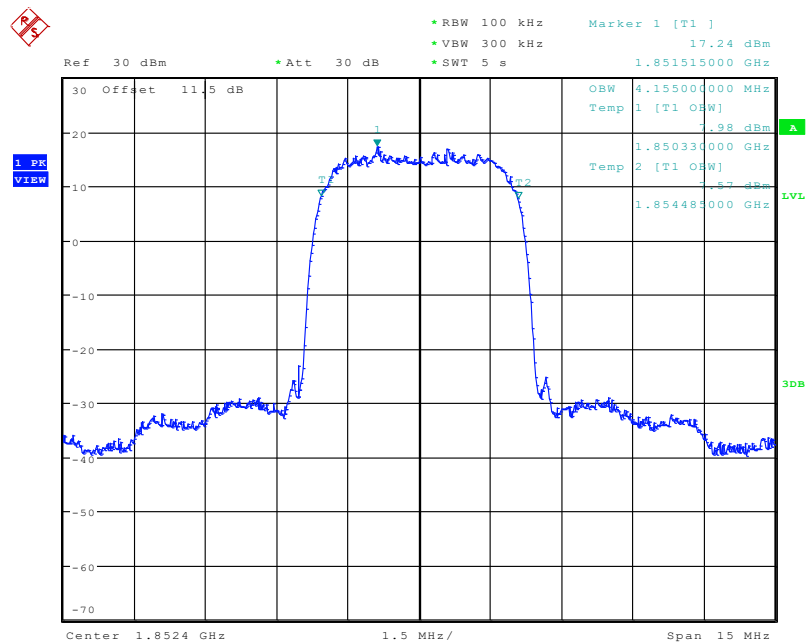


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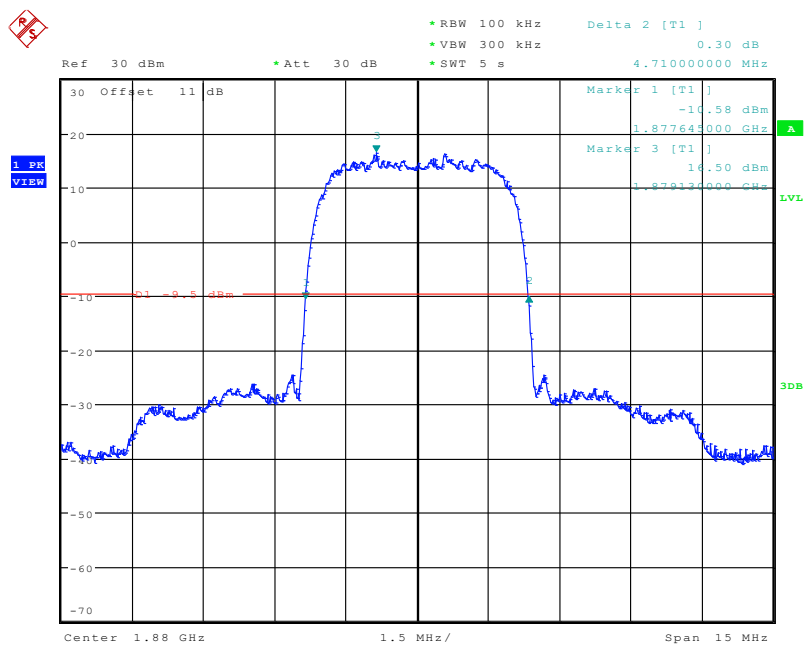
26 dB Emissions & 99% Occupied Bandwidth for RMC (BPSK) Mode, Low channel



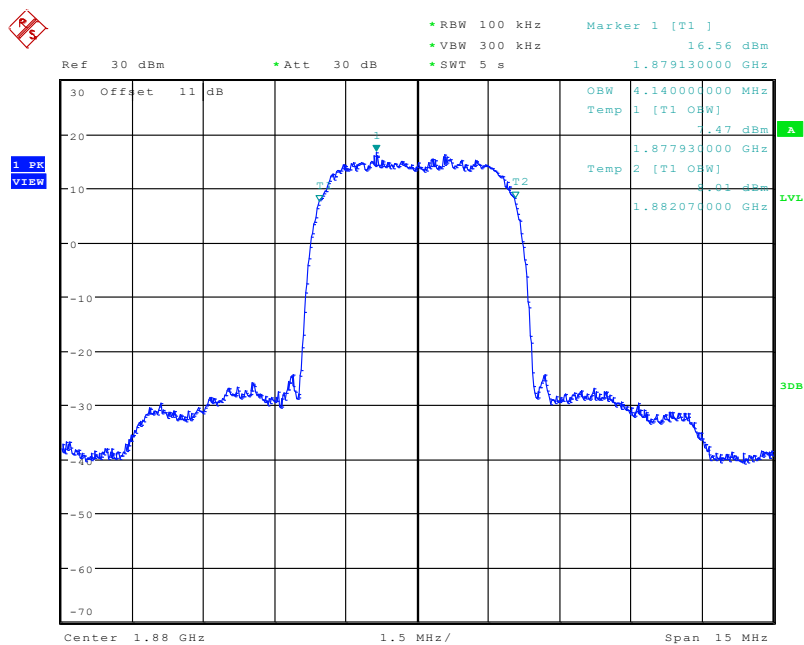
Date: 12.NOV.2022 09:25:23



Date: 12.NOV.2022 09:24:42

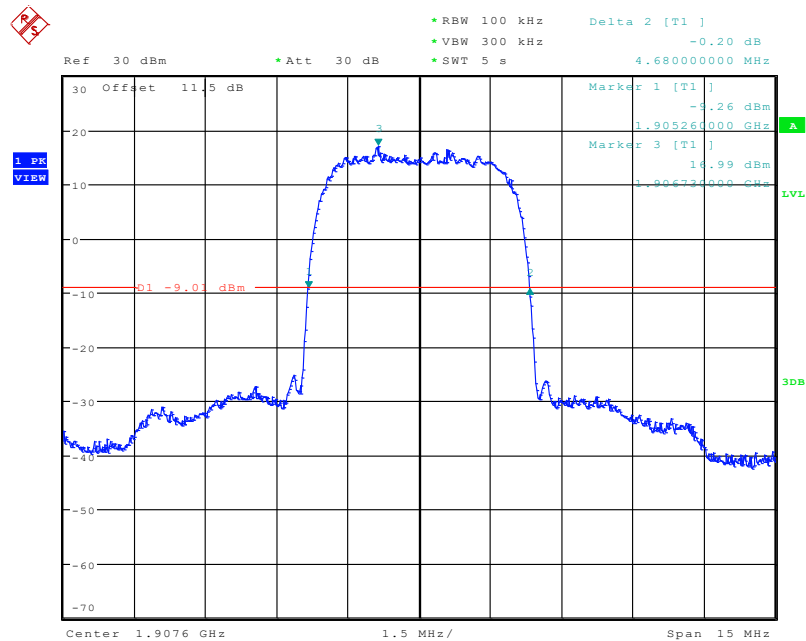
26 dB Emissions & 99% Occupied Bandwidth for RMC (BPSK) Mode, Middle channel

Date: 12.NOV.2022 09:29:23

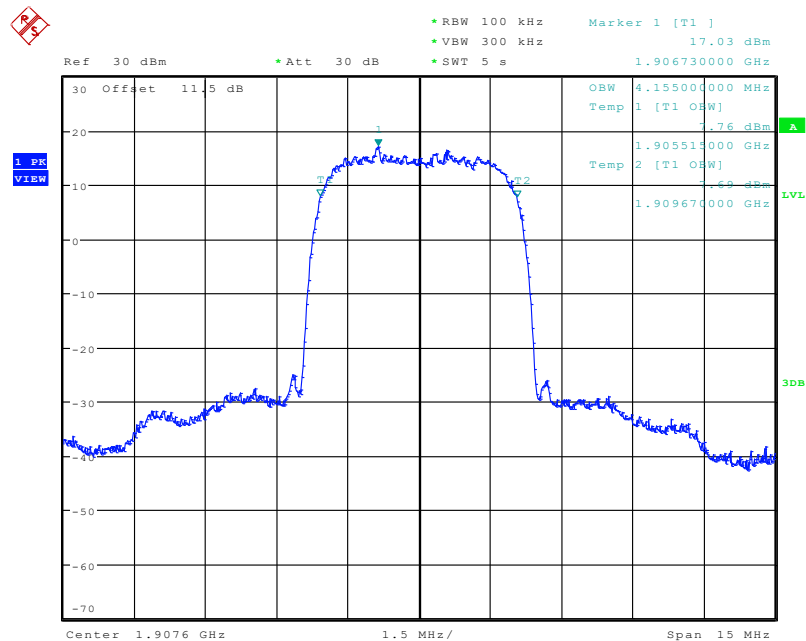


Date: 12.NOV.2022 09:28:43

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

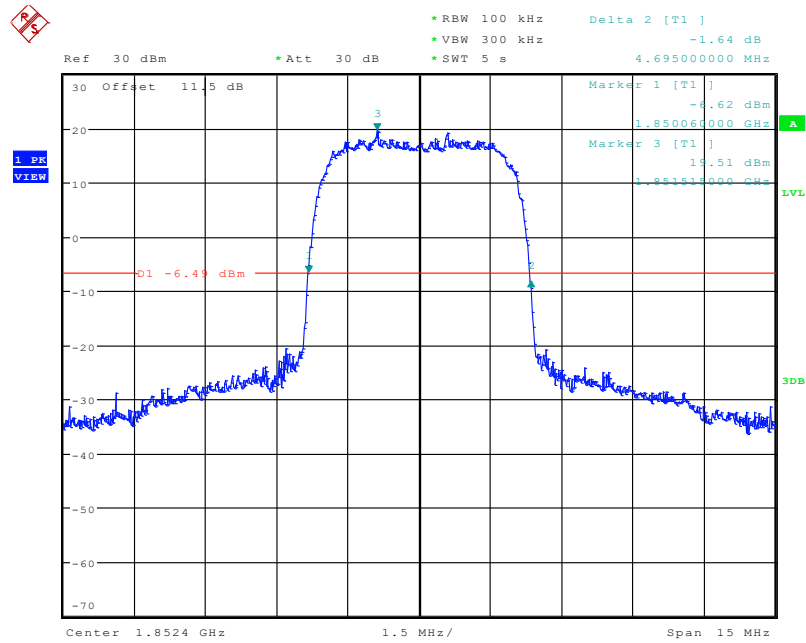


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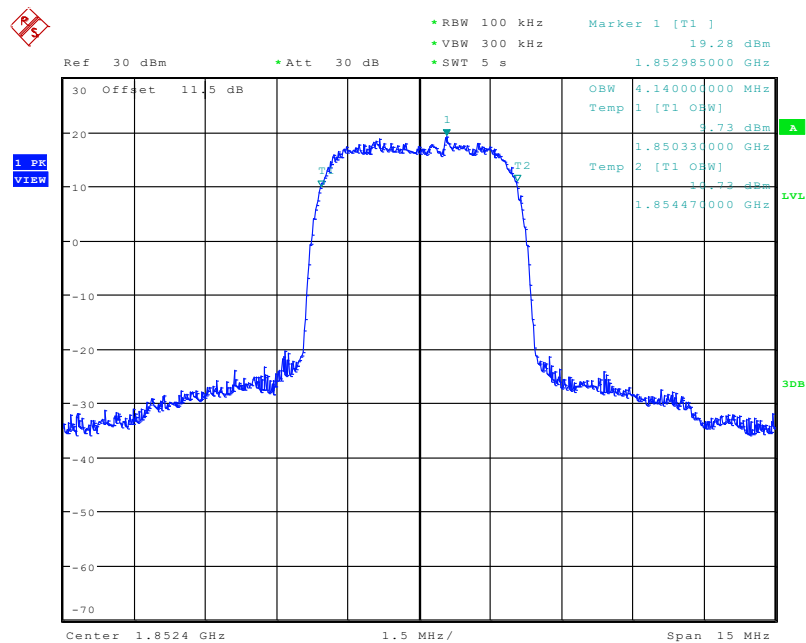


Date: 12.NOV.2022 09:31:43

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

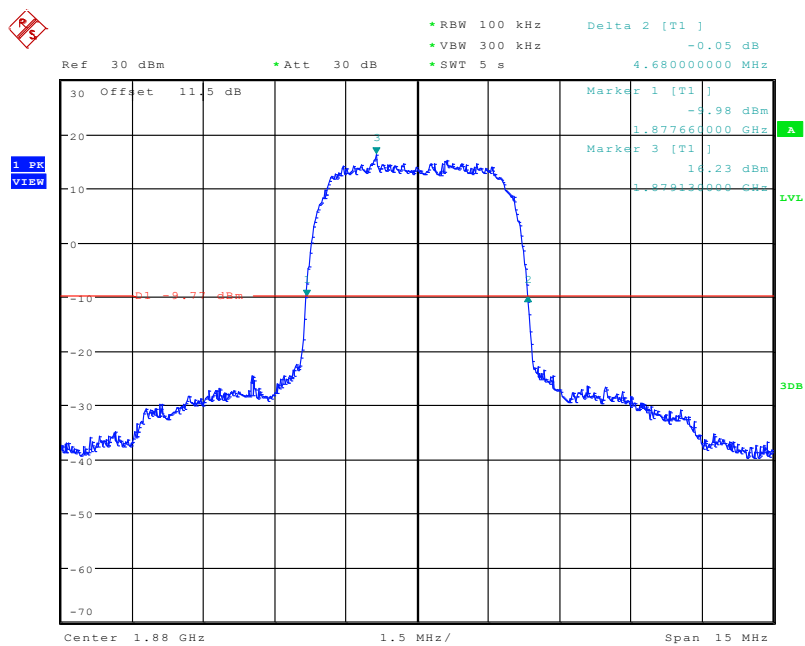


Date: 14.NOV.2022 14:54:44

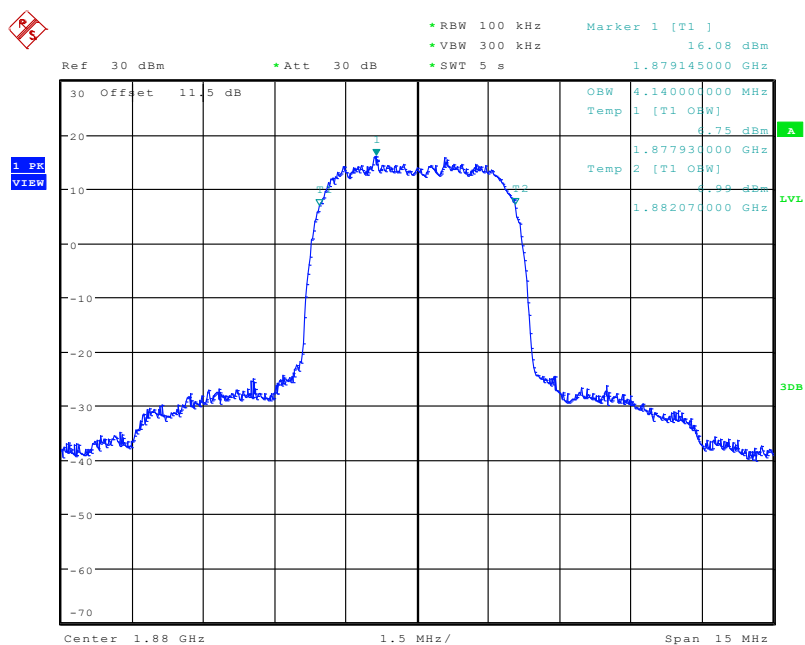


Date: 14.NOV.2022 14:54:03

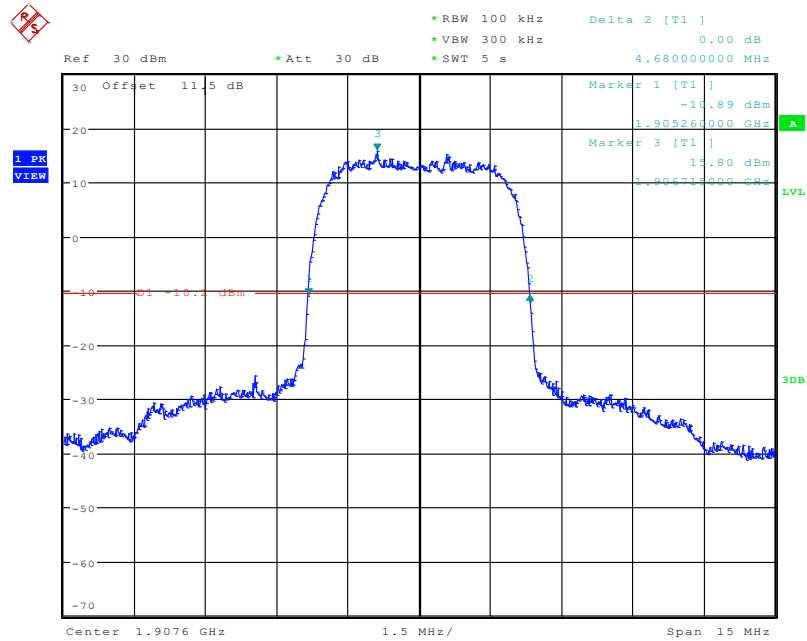
26 dB Emissions & 99% Occupied Bandwidth for HSUPA (QPSK) Mode, Middle channel



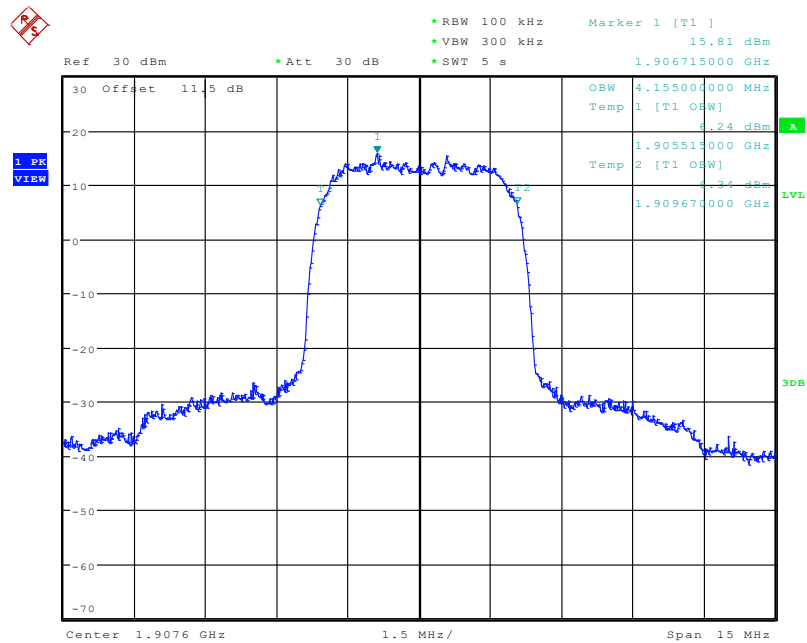
Date: 12.NOV.2022 10:05:14



Date: 12.NOV.2022 10:04:35

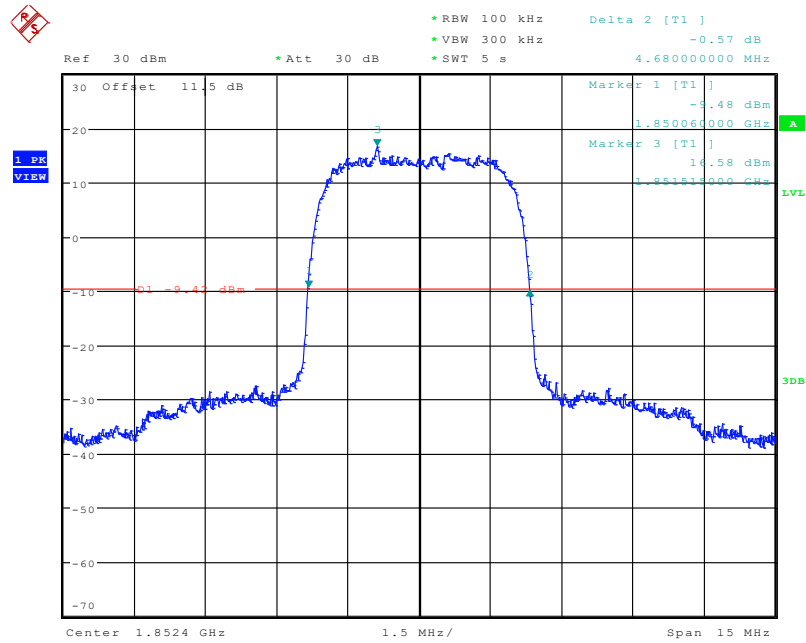
26 dB Emissions & 99% Occupied Bandwidth for HSUPA (QPSK) Mode, High channel

Date: 12.NOV.2022 10:09:51

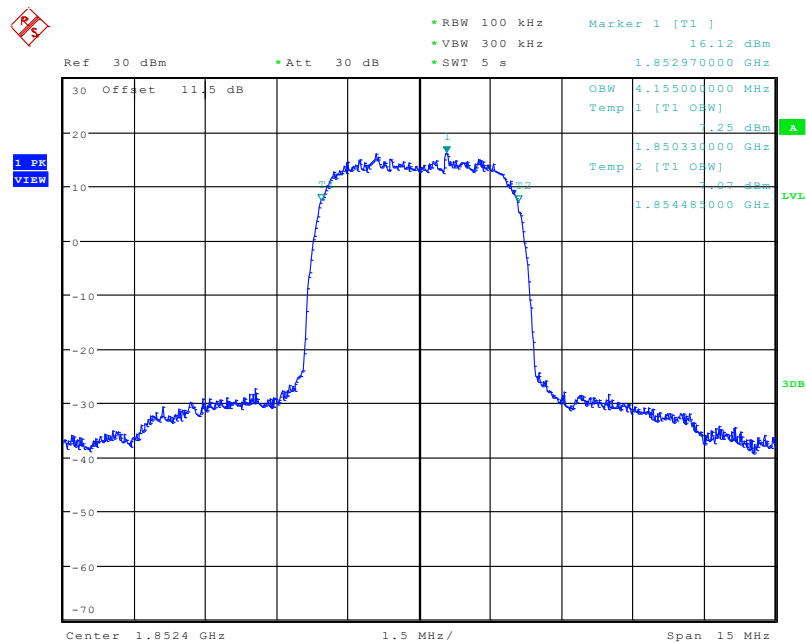


Date: 12.NOV.2022 10:09:11

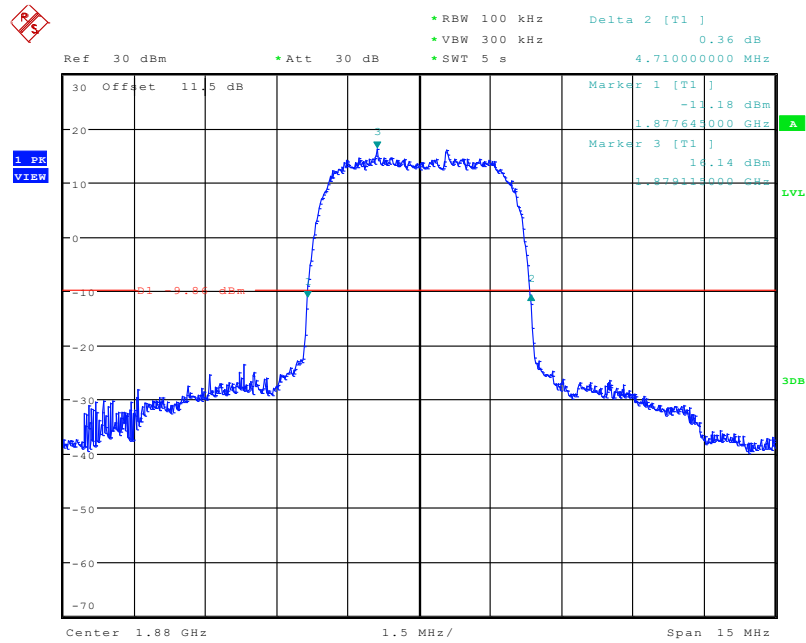
26 dB Emissions & 99% Occupied Bandwidth for HSDPA (16QAM) Mode, Low channel



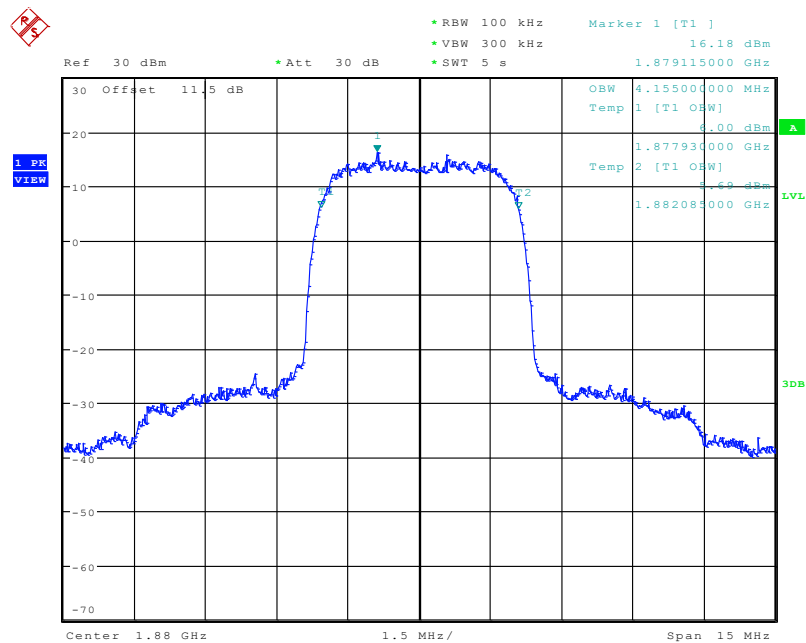
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Date: 12.NOV.2022 09:42:11

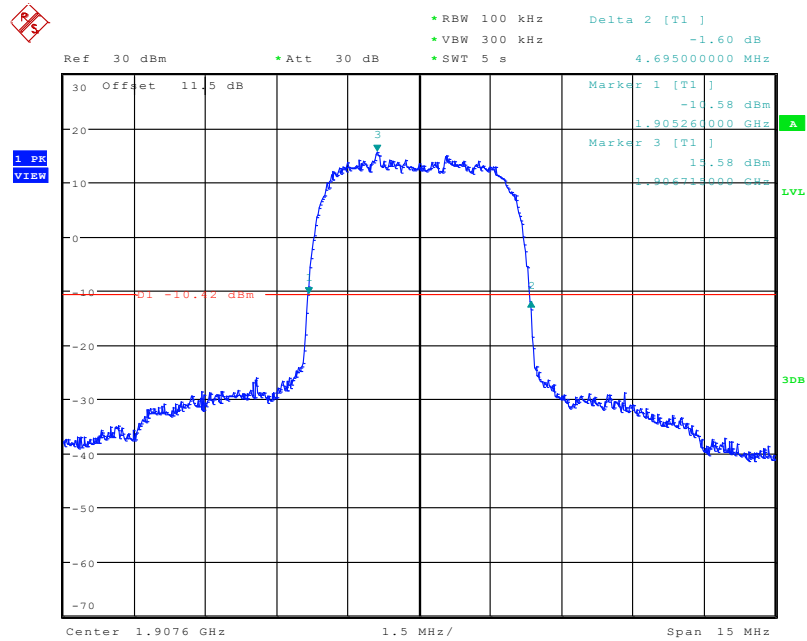
26 dB Emissions & 99% Occupied Bandwidth for HSDPA (16QAM) Mode, Middle channel

Date: 12.NOV.2022 09:46:53

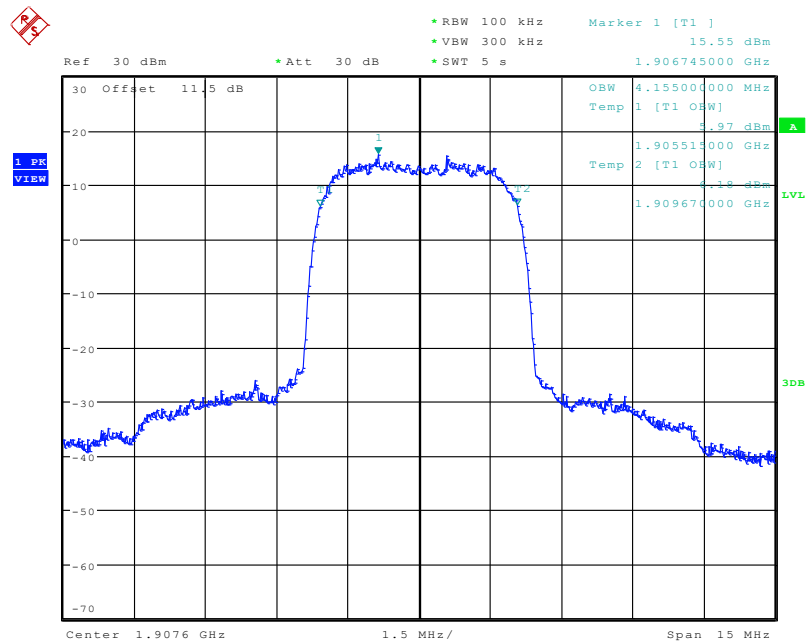


Date: 12.NOV.2022 09:46:13

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



Date: 12.NOV.2022 09:50:54



Date: 12.NOV.2022 09:50:14

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	1.110	1.260	1.104	1.260	1.104	1.260
	16QAM	1.116	1.260	1.098	1.248	1.104	1.254
3 MHz	QPSK	2.700	3.024	2.700	3.000	2.700	3.000
	16QAM	2.688	3.000	2.700	3.024	2.688	3.000
5 MHz	QPSK	4.520	4.960	4.520	5.000	4.520	5.000
	16QAM	4.520	5.000	4.540	5.000	4.520	5.000
10 MHz	QPSK	8.960	9.680	8.960	9.800	8.960	9.760
	16QAM	9.000	9.760	8.960	9.840	8.960	9.800
15 MHz	QPSK	13.500	14.940	13.560	15.120	13.620	14.940
	16QAM	13.560	14.940	13.560	15.060	13.560	15.060
20 MHz	QPSK	18.000	19.600	18.000	19.840	18.000	19.680
	16QAM	18.000	19.760	18.000	19.760	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	1.104	1.260	1.092	1.254	1.098	1.254
	16QAM	1.104	1.260	1.110	1.254	1.098	1.248
3 MHz	QPSK	2.688	3.000	2.700	3.000	2.700	2.988
	16QAM	2.688	3.000	2.700	2.988	2.700	3.000
5 MHz	QPSK	4.520	4.980	4.520	4.980	4.520	4.980
	16QAM	4.540	4.980	4.520	4.980	4.500	4.980
10 MHz	QPSK	9.000	9.800	8.960	9.760	9.000	9.760
	16QAM	8.960	9.760	8.960	9.760	8.960	9.600

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	5.020	4.520	5.000	4.520	4.960
	16QAM	4.520	4.940	4.520	5.000	4.540	4.980
10 MHz	QPSK	8.960	9.720	8.960	9.760	8.960	9.760
	16QAM	8.960	9.800	8.960	9.840	8.960	9.720
15 MHz	QPSK	13.500	14.880	13.560	15.120	13.560	15.000
	16QAM	13.620	15.000	13.500	15.060	13.560	15.000
20 MHz	QPSK	18.000	19.600	18.000	19.760	18.000	19.600
	16QAM	18.080	19.680	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	1.104	1.254	1.104	1.248	1.104	1.260
	16QAM	1.098	1.248	1.104	1.254	1.110	1.260
3 MHz	QPSK	2.700	2.988	2.700	3.000	2.700	2.988
	16QAM	2.688	3.000	2.688	3.012	2.688	3.024
5 MHz	QPSK	4.520	4.980	4.520	4.960	4.520	4.980
	16QAM	4.520	4.980	4.520	5.000	4.500	5.000
10 MHz	QPSK	8.960	9.760	8.960	9.800	8.960	9.760
	16QAM	8.960	9.720	8.960	9.760	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	4.520	5.100	4.520	4.960	4.520	5.200
	16QAM	4.540	5.060	4.520	5.000	4.520	5.000
10 MHz	QPSK	8.960	9.880	9.000	9.800	8.960	9.880
	16QAM	8.960	9.640	8.960	9.800	8.960	9.680
15 MHz	QPSK	13.500	15.000	13.560	15.480	13.560	15.000
	16QAM	13.620	16.080	13.500	15.480	13.560	16.320
20 MHz	QPSK	18.000	19.520	17.920	19.840	17.920	20.000
	16QAM	18.000	20.160	18.000	19.520	18.080	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

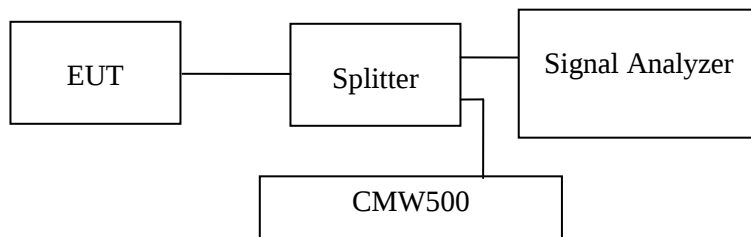
Applicable Standard

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

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



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

Test Data

Environmental Conditions

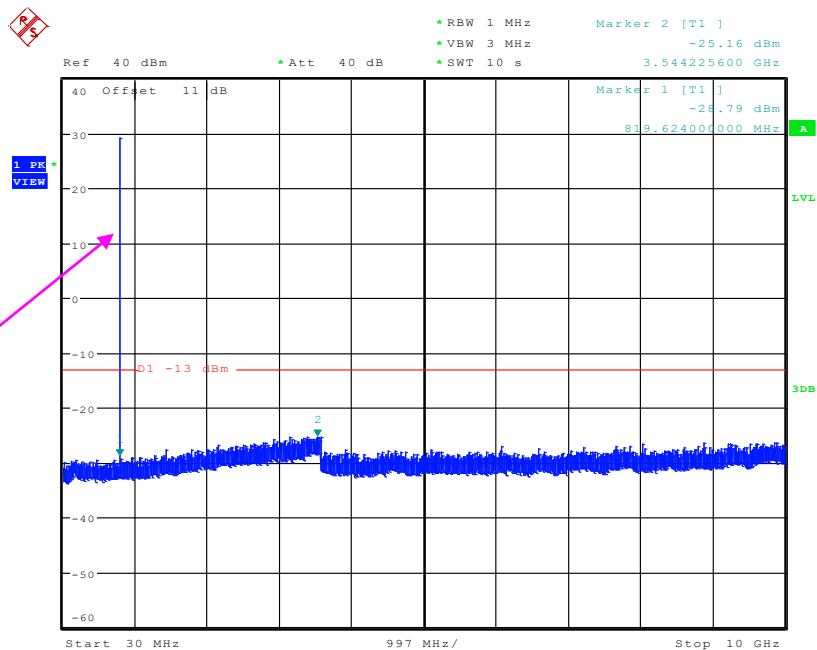
Temperature:	26 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Cat Kang from 2022-11-11 to 2022-11-12.

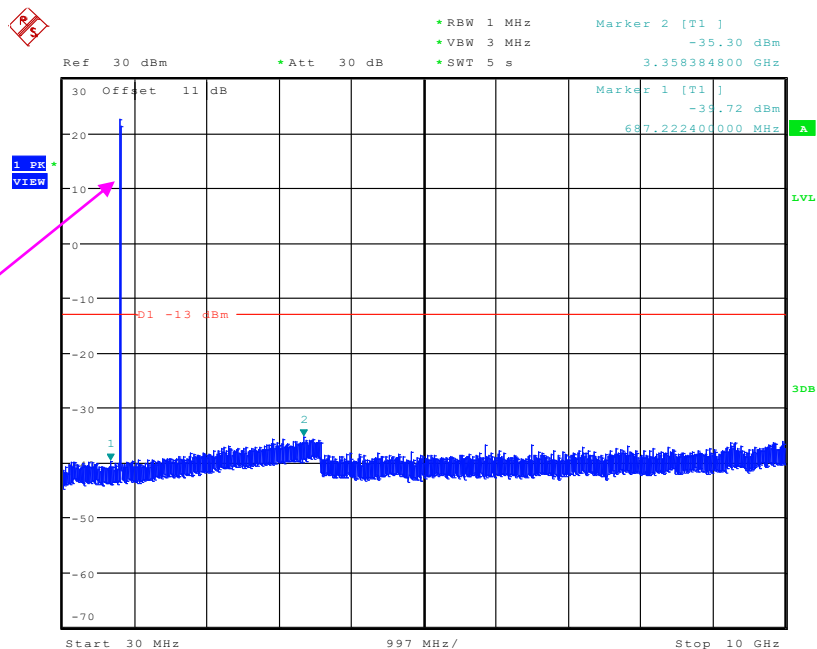
EUT operation mode: Transmitting

Test result: Pass

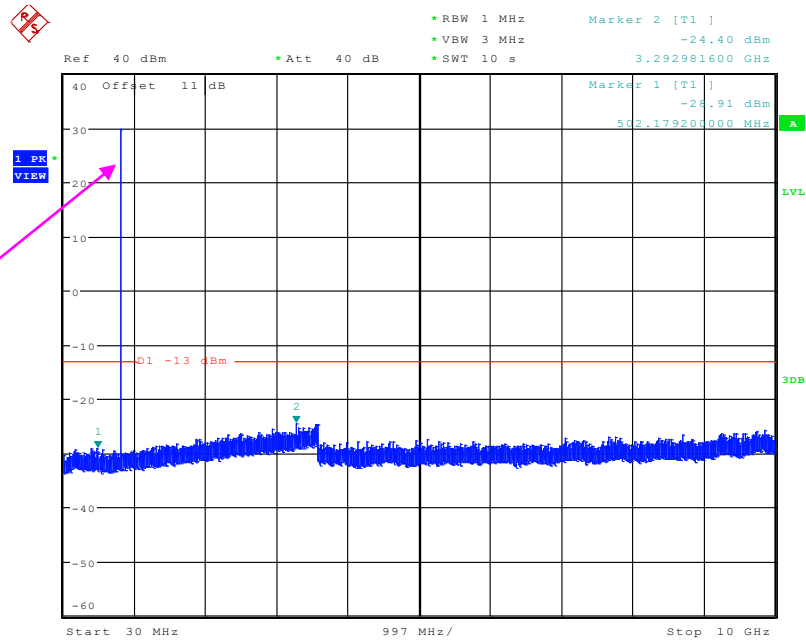
Please refer to the following plots.

**Cellular Band
Low Channel:****30 MHz – 10 GHz (GSM Mode)**

Date: 11.NOV.2022 19:48:45

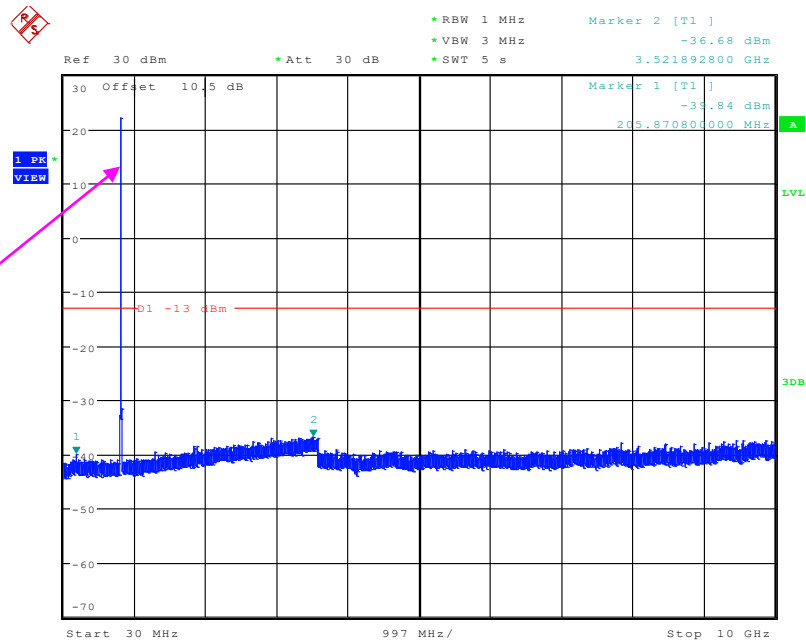
30 MHz – 10 GHz (WCDMA Mode)

Date: 11.NOV.2022 20:12:49

Middle Channel:**30 MHz – 10 GHz (GSM Mode)**

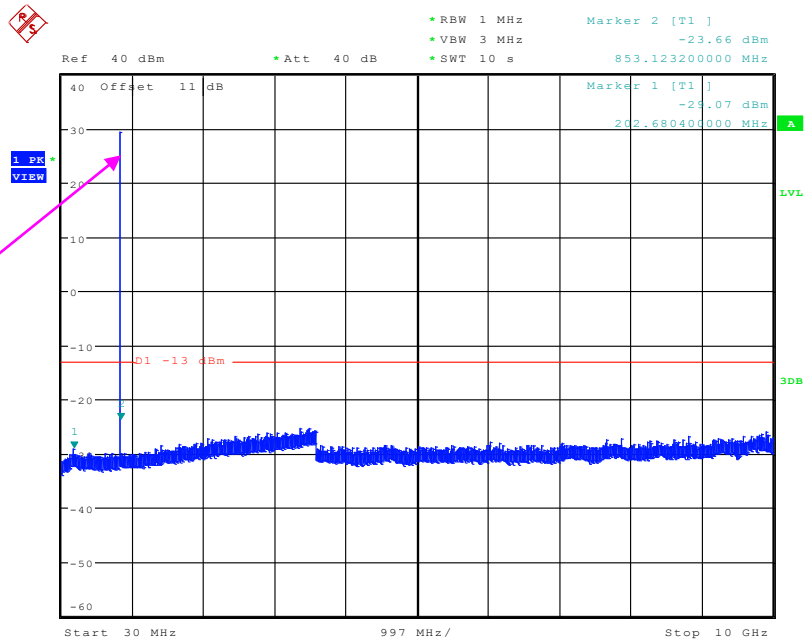
Fundamental test

Date: 11.NOV.2022 19:53:43

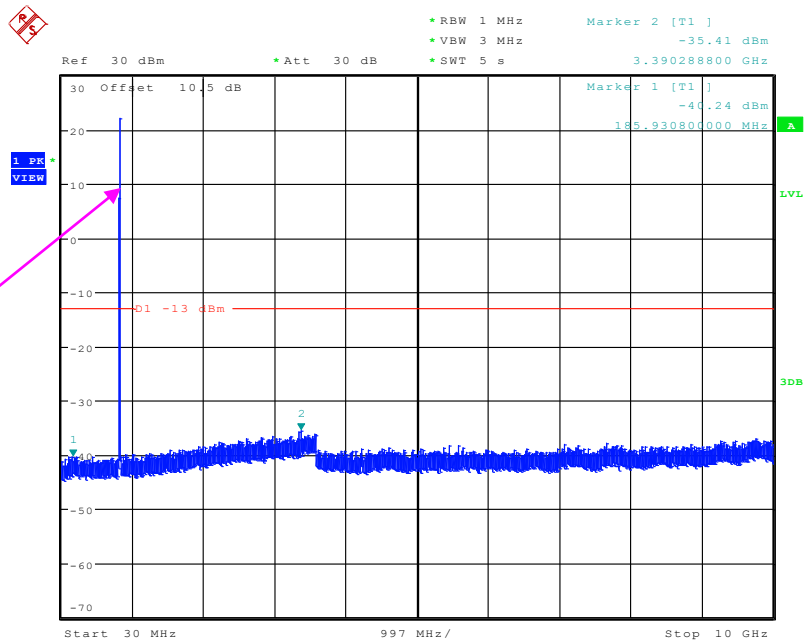
30 MHz – 10 GHz (WCDMA Mode)

Fundamental test

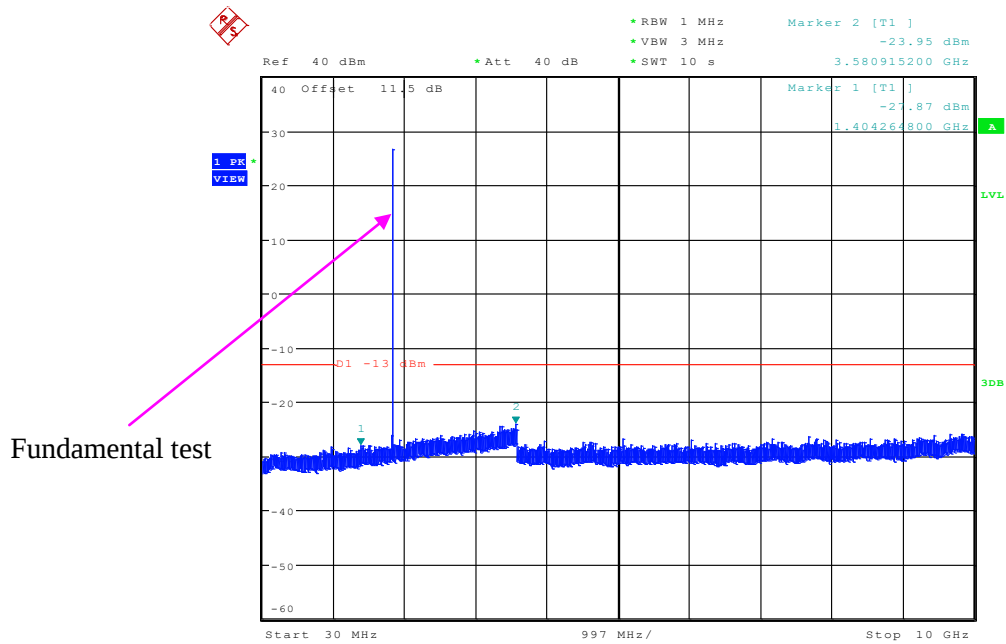
Date: 11.NOV.2022 20:13:57

High Channel:**30 MHz – 10 GHz (GSM Mode)**

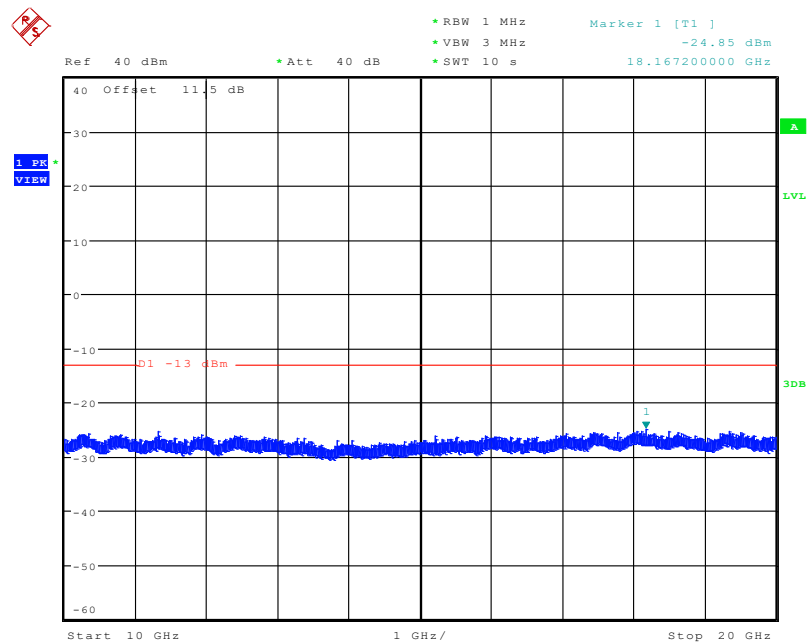
Date: 11.NOV.2022 19:57:44

30 MHz – 10 GHz (WCDMA Mode)

Date: 11.NOV.2022 20:15:00

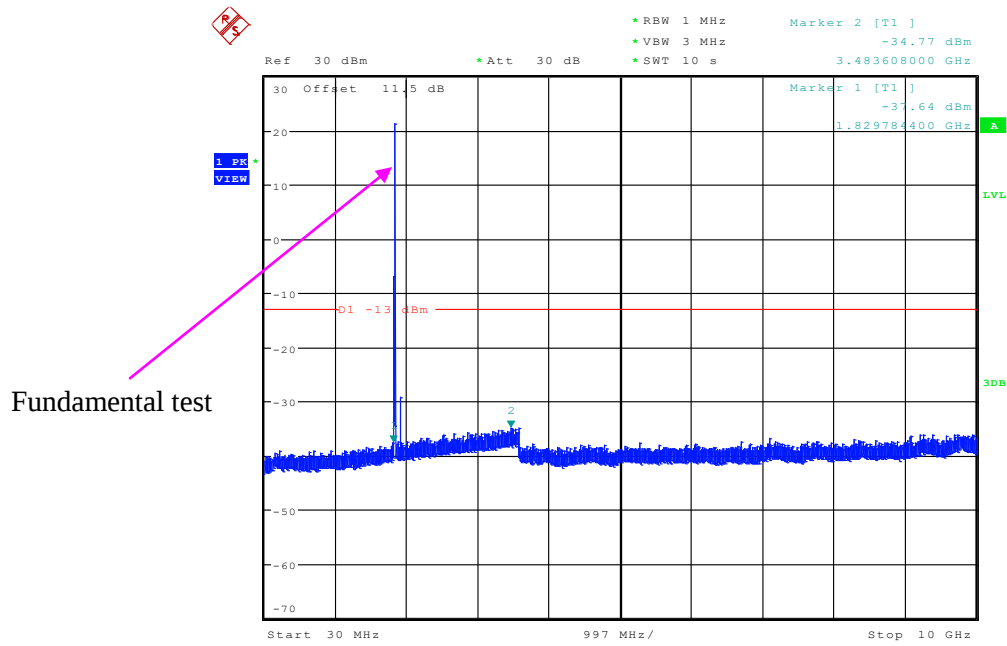
**PCS Band
Low Channel:****30 MHz – 10 GHz (GSM Mode)**

Date: 11.NOV.2022 19:08:45

10 GHz – 20 GHz (GSM Mode)

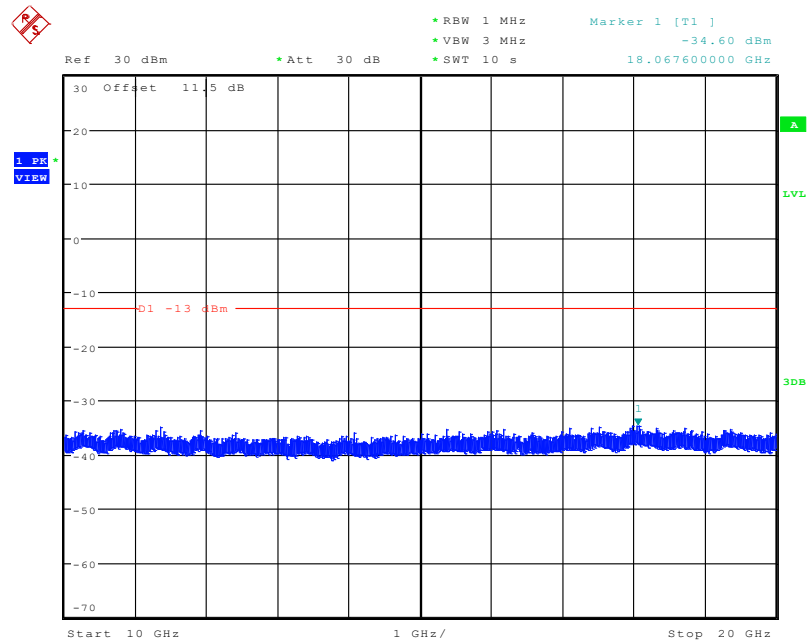
Date: 11.NOV.2022 19:09:58

30MHz – 10 GHz (WCDMA Mode)

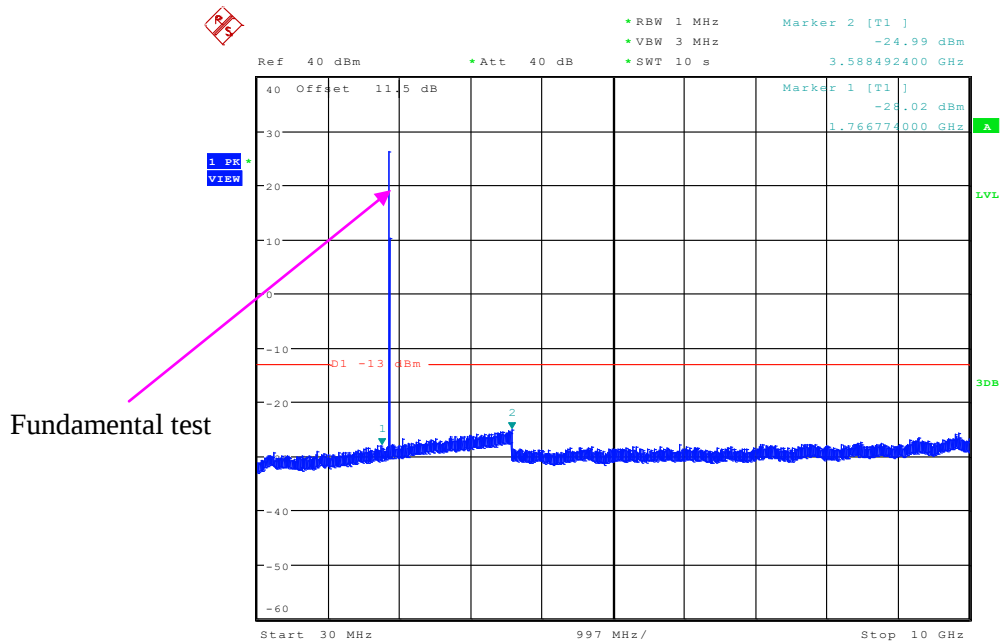


Date: 12.NOV.2022 09:26:44

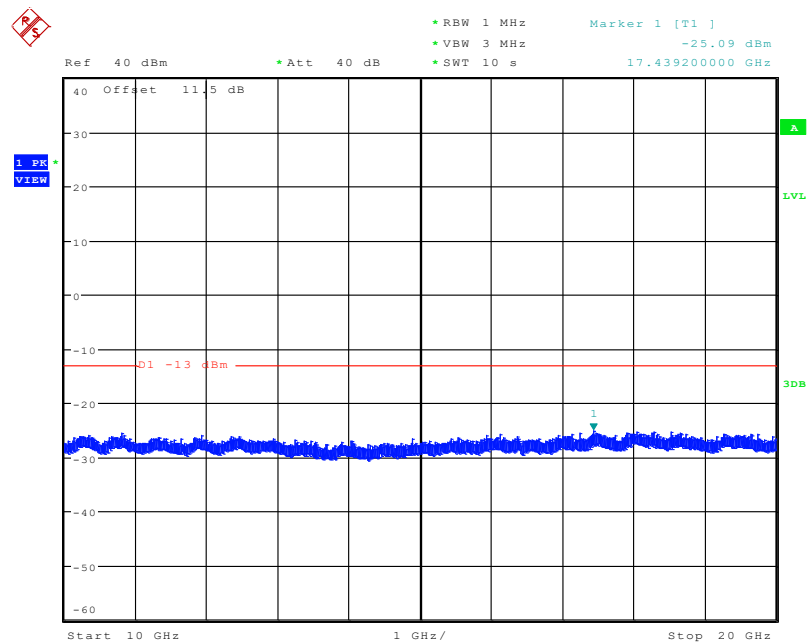
10 GHz – 20 GHz (WCDMA Mode)



Date: 12.NOV.2022 09:27:26

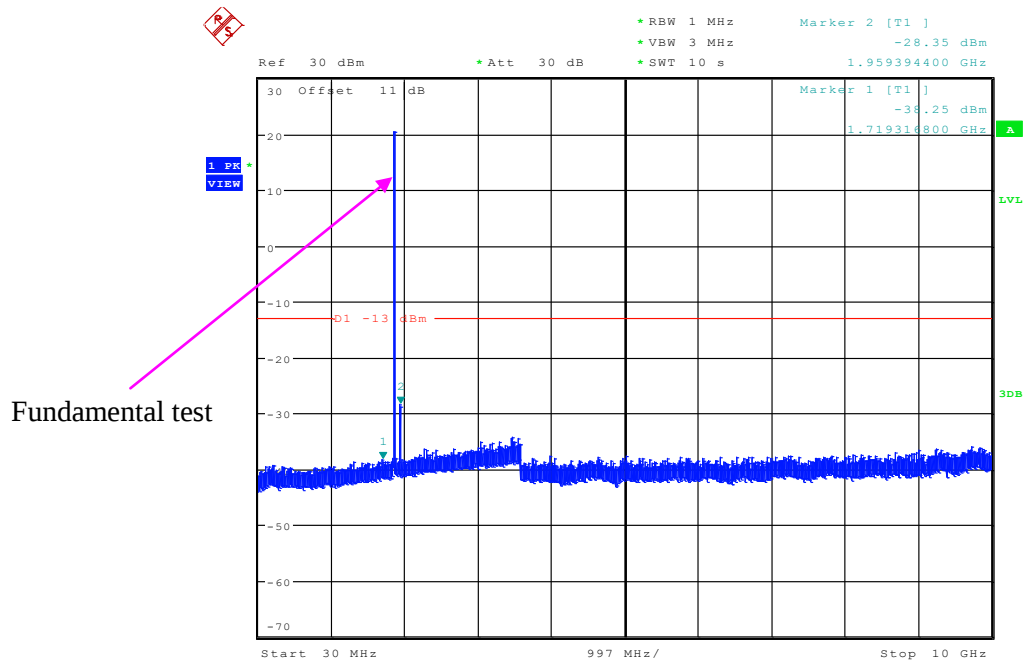
Middle Channel:**30 MHz – 10 GHz (GSM Mode)**

Date: 11.NOV.2022 19:13:26

10 GHz – 20 GHz (GSM Mode)

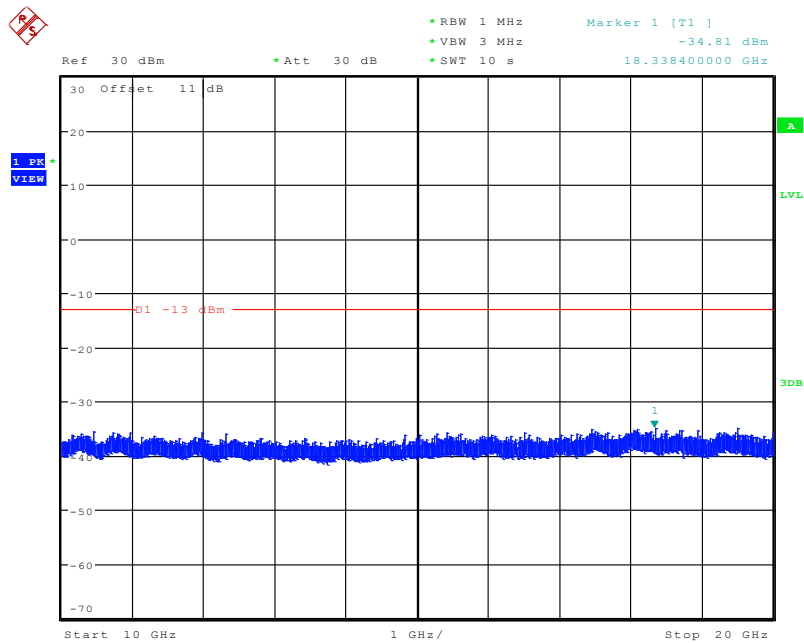
Date: 11.NOV.2022 19:14:40

30 MHz – 10 GHz (WCDMA Mode)

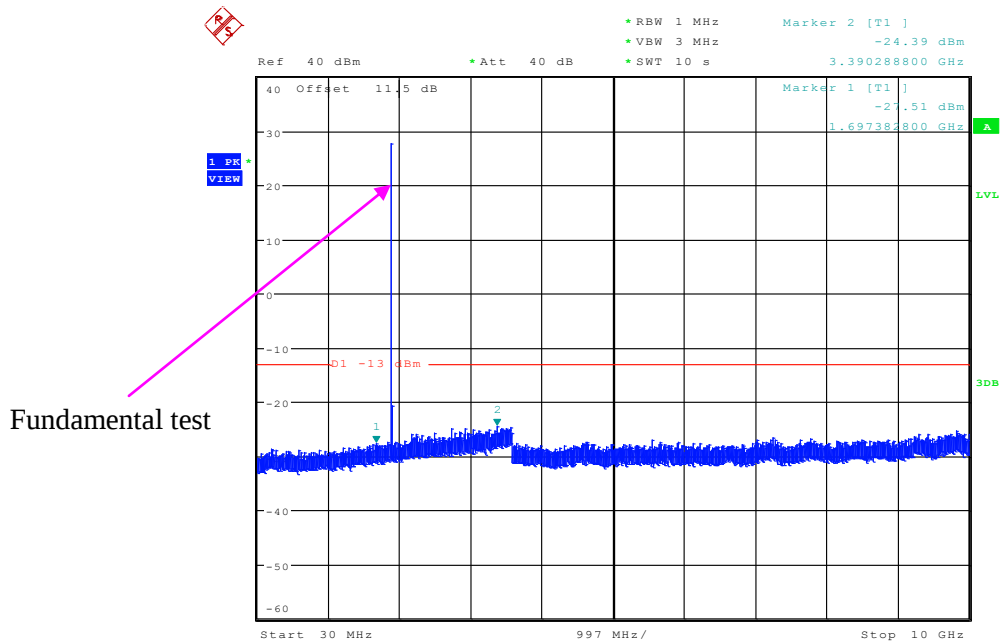


Date: 12.NOV.2022 09:29:46

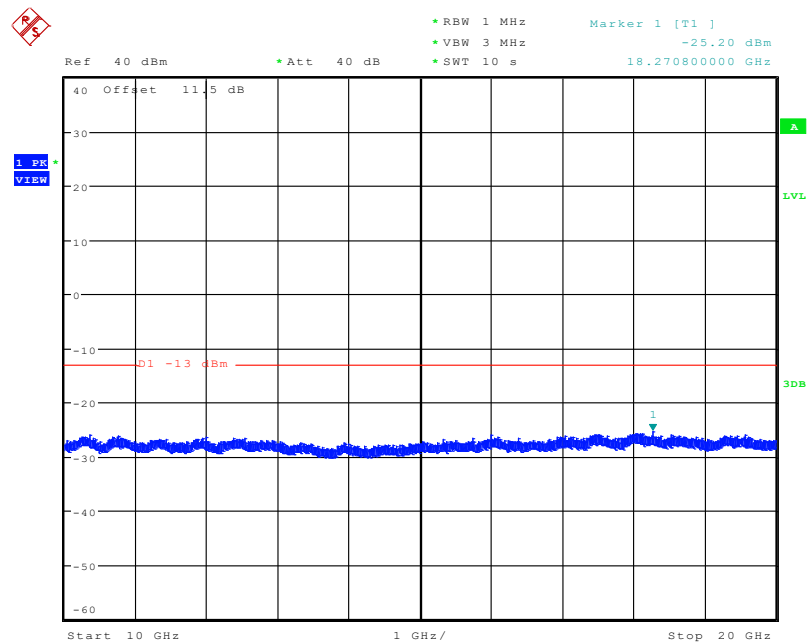
10 GHz – 20 GHz (WCDMA Mode)



Date: 12.NOV.2022 09:30:14

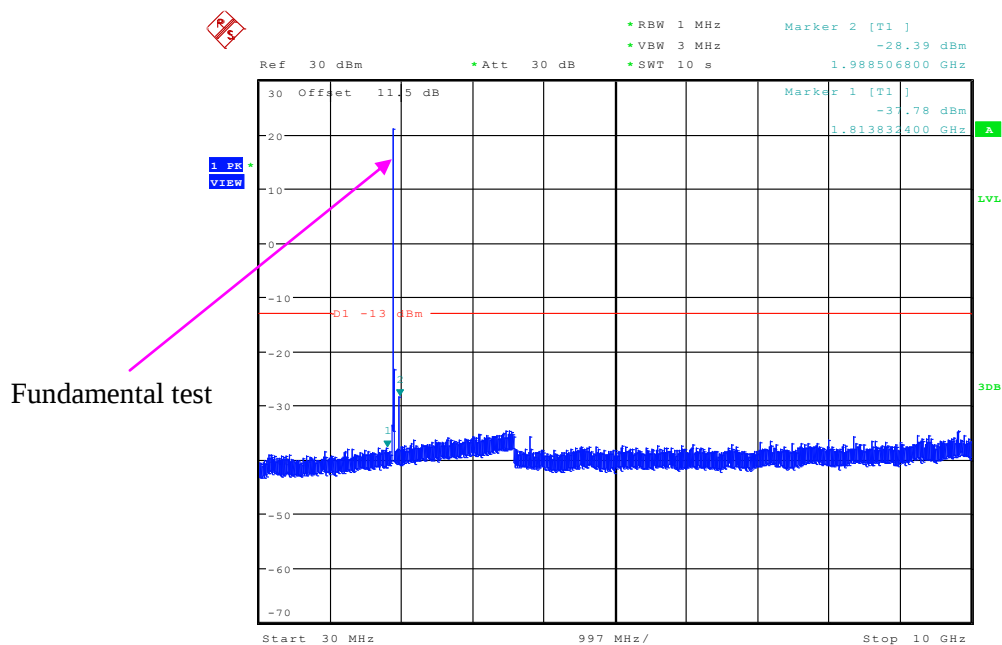
High Channel:**30 MHz – 10 GHz (GSM Mode)**

Date: 11.NOV.2022 19:22:07

10 GHz – 20 GHz (GSM Mode)

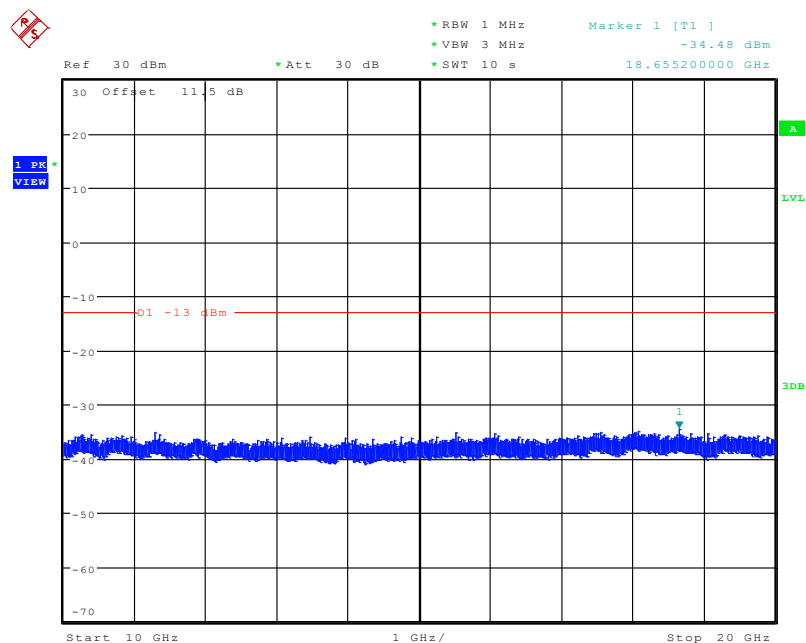
Date: 11.NOV.2022 19:23:56

30 MHz – 1 GHz (WCDMA Mode)



Date: 12.NOV.2022 09:33:30

10 GHz – 20 GHz (WCDMA Mode)



Date: 12.NOV.2022 09:34:04

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

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

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

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

Test Data

Environmental Conditions

Temperature:	25.5 °C
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Level Li on 2022-11-03.

EUT operation mode: Transmitting (Scan with X-AXIS, Y-AXIS, Z-AXIS, the worst case Y-AXIS was recorded)

The worst case is 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)				
Test frequency range: 30MHz-10GHz								
GSM850, 824.2MHz								
951.3	-70.2	120	2	H	9.6	-60.6	-13	-47.6
951.3	-72.5	101	1.4	V	11.7	-60.8	-13	-47.8
1648.4	-53.90	271	1.9	H	3.5	-50.40	-13	-37.40
1648.4	-54.60	62	1.7	V	3.1	-51.50	-13	-38.50
2472.6	-47.60	190	1.5	H	6.6	-41.00	-13	-28.00
2472.6	-45.20	175	1.5	V	5.8	-39.40	-13	-26.40
3296.8	-50.70	34	2.2	H	6.4	-44.30	-13	-31.30
3296.8	-49.90	81	1.1	V	5.7	-44.20	-13	-31.20
GSM850, 836.6MHz								
948.8	-72.5	287	2.2	H	9.6	-62.9	-13	-49.9
948.8	-72.7	30	1	V	11.7	-61	-13	-48
1673.2	-50.70	83	2	H	3.8	-46.90	-13	-33.90
1673.2	-49.20	19	1.3	V	3.1	-46.10	-13	-33.10
2509.8	-45.90	304	2.3	H	6.2	-39.70	-13	-26.70
2509.8	-44.90	239	1.7	V	5.6	-39.30	-13	-26.30
3346.4	-50.90	133	2.1	H	6.6	-44.30	-13	-31.30
3346.4	-49.20	200	1.2	V	5.4	-43.80	-13	-30.80
GSM850, 848.8MHz								
943.5	-70	180	1.8	H	9.6	-60.4	-13	-47.4
943.5	-72.3	282	1.9	V	11.7	-60.6	-13	-47.6
1697.6	-51.50	40	1.0	H	4.1	-47.40	-13	-34.40
1697.6	-49.80	47	1.8	V	3.1	-46.70	-13	-33.70
2546.4	-46.90	88	1.6	H	6.1	-40.80	-13	-27.80
2546.4	-45.60	234	1.9	V	5.8	-39.80	-13	-26.80
3395.2	-50.60	342	2.4	H	6.2	-44.40	-13	-31.40
3395.2	-50.00	34	1.7	V	5.4	-44.60	-13	-31.60

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
Test frequency range: 30MHz-20GHz								
PCS1900, 1850.2MHz								
951.3	-70.1	40	1.4	H	9.6	-60.5	-13	-47.50
951.3	-73.3	331	2	V	11.7	-61.6	-13	-48.60
3700.4	-36.30	29	2.4	H	8.1	-28.20	-13	-15.20
3700.4	-34.70	6	1.3	V	7.6	-27.10	-13	-14.10
PCS1900, 1880MHz								
941.1	-70.2	139	1.5	H	9.6	-60.6	-13	-47.60
941.1	-72.7	164	1.5	V	11.7	-61	-13	-48.00
3760	-37.50	101	1.2	H	8.8	-28.70	-13	-15.70
3760	-35.70	130	1.7	V	8	-27.70	-13	-14.70
PCS1900, 1909.8MHz								
951.1	-71.8	287	2.1	H	9.6	-62.2	-13	-49.20
951.1	-72.4	113	1.1	V	11.7	-60.7	-13	-47.70
3819.6	-37.30	159	1.9	H	8.7	-28.60	-13	-15.60
3819.6	-36.20	164	1.7	V	7.9	-28.30	-13	-15.30

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
Test frequency range: 30MHz-20GHz								
WCDMA Band 2,1852.4MHz								
947.7	-71.1	237	1.4	H	9.6	-61.5	-13	-48.50
947.7	-73.4	89	2.2	V	11.7	-61.7	-13	-48.70
3704.8	-52.60	67	2.4	H	8.1	-44.50	-13	-31.50
3704.8	-51.60	140	1.5	V	7.6	-44.00	-13	-31.00
WCDMA Band2,1880MHz								
946.9	-71.8	15	2.1	H	9.6	-62.2	-13	-49.20
946.9	-71.8	28	2	V	11.7	-60.1	-13	-47.10
3760	-53.60	316	1.9	H	8.8	-44.80	-13	-31.80
3760	-52.40	25	1.1	V	8	-44.40	-13	-31.40
WCDMA Band2,1907.6MHz								
948.1	-70.3	284	1.8	H	9.6	-60.7	-13	-47.70
948.1	-73.7	133	1.3	V	11.7	-62	-13	-49.00
3815.2	-54.30	304	2.5	H	8.7	-45.60	-13	-32.60
3815.2	-52.90	271	1.6	V	7.9	-45.00	-13	-32.00

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
Test frequency range: 30MHz-10GHz								
WCDMA Band 5,826.4MHz								
945.7	-72	190	1.5	H	9.6	-62.4	-13	-49.40
945.7	-71.8	258	1.3	V	11.7	-60.1	-13	-47.10
1652.8	-55.50	31	2.2	H	3.5	-52.00	-13	-39.00
1652.8	-54.40	346	2.1	V	3.1	-51.30	-13	-38.30
2479.2	-52.00	27	1.9	H	6.6	-45.40	-13	-32.40
2479.2	-50.50	85	1	V	5.8	-44.70	-13	-31.70
3305.6	-51.00	198	1.4	H	6.4	-44.60	-13	-31.60
3305.6	-50.20	112	2.2	V	5.7	-44.50	-13	-31.50
WCDMA Band5,836.6MHz								
947.8	-71.4	182	1.3	H	9.6	-61.8	-13	-48.80
947.8	-74.6	141	1.2	V	11.7	-62.9	-13	-49.90
1673.2	-55.20	146	1	H	3.8	-51.40	-13	-38.40
1673.2	-53.60	266	1.8	V	3.1	-50.50	-13	-37.50
2509.8	-52.40	199	2.1	H	6.2	-46.20	-13	-33.20
2509.8	-50.00	95	2	V	5.6	-44.40	-13	-31.40
3346.4	-51.00	317	2.2	H	6.6	-44.40	-13	-31.40
3346.4	-49.20	347	2.1	V	5.4	-43.80	-13	-30.80
WCDMA Band5,846.6MHz								
945.2	-70.4	160	2.1	H	9.6	-60.8	-13	-47.80
945.2	-73.1	335	1.6	V	11.7	-61.4	-13	-48.40
1693.2	-55.70	249	1.9	H	4.1	-51.60	-13	-38.60
1693.2	-52.80	152	2.3	V	3.1	-49.70	-13	-36.70
2539.8	-50.60	100	2.4	H	6.1	-44.50	-13	-31.50
2539.8	-49.90	222	1.4	V	5.8	-44.10	-13	-31.10
3386.4	-50.00	219	2.0	H	6.2	-43.80	-13	-30.80
3386.4	-48.60	197	2.1	V	5.4	-43.20	-13	-30.20

LTE Bands: (pre-scan all bandwidth/modulation, 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,1850.7MHz								
942.8	-72.4	28	1	H	9.6	-62.8	-13	-49.80
942.8	-73.2	193	1.9	V	11.7	-61.5	-13	-48.50
3701.4	-51.80	211	2.1	H	8.1	-43.70	-13	-30.70
3701.4	-50.10	17	1.1	V	7.6	-42.50	-13	-29.50
QPSK,1.4MHz,1880MHz								
941	-70	289	1.4	H	9.6	-60.4	-13	-47.40
941	-74.3	177	1.7	V	11.7	-62.6	-13	-49.60
3760.0	-52.80	24	2.3	H	8.8	-44.00	-13	-31.00
3760.0	-51.00	291	2.1	V	8	-43.00	-13	-30.00
QPSK,1.4MHz,1909.3MHz								
942.1	-71.3	103	1.8	H	9.6	-61.7	-13	-48.70
942.1	-72.1	332	1	V	11.7	-60.4	-13	-47.40
3818.6	-51.80	328	2.3	H	8.7	-43.10	-13	-30.10
3818.6	-49.40	143	1.6	V	7.9	-41.50	-13	-28.50

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 Band 5, Test frequency range: 30MHz-10GHz								
QPSK,1.4MHz,824.7MHz								
950.6	-71.9	158	2	H	9.6	-62.3	-13	-49.30
950.6	-73	171	1.9	V	11.7	-61.3	-13	-48.30
1649.4	-57.90	208	1.9	H	3.5	-54.40	-13	-41.40
1649.4	-57.20	34	2.1	V	3.1	-54.10	-13	-41.10
QPSK,1.4MHz,836.5Hz								
950.2	-71.7	189	1.2	H	9.6	-62.1	-13	-49.10
950.2	-72.7	180	1.9	V	11.7	-61	-13	-48.00
1673.0	-56.40	206	2.3	H	3.8	-52.60	-13	-39.60
1673.0	-54.30	7	2.3	V	3.1	-51.20	-13	-38.20
QPSK,1.4MHz,848.3Hz								
951.9	-72.4	245	1	H	9.6	-62.8	-13	-49.80
951.9	-73.9	219	1.9	V	11.7	-62.2	-13	-49.20
1696.6	-57.10	3	1.4	H	4.1	-53.00	-13	-40.00
1696.6	-54.30	163	2.4	V	3.1	-51.20	-13	-38.20

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
LTE Band 7, Test frequency range: 30MHz-26.5GHz								
QPSK, 5MHz, 2502.5MHz								
944.1	-70.4	16	1	H	9.6	-60.8	-25	-35.80
944.1	-72.4	222	1.6	V	11.7	-60.7	-25	-35.70
5005.0	-43.4	267	1.2	H	10.8	-32.6	-25	-7.60
5005.0	-44.1	101	1.3	V	10.2	-33.9	-25	-8.90
7507.5	-53.8	269	1.2	H	20.4	-33.4	-25	-8.40
7507.5	-53.3	291	1.3	V	20.1	-33.2	-25	-8.20
QPSK, 5MHz, 2535MHz								
943.2	-70.7	261	1.3	H	9.6	-61.1	-25	-36.10
943.2	-74.1	358	1.4	V	11.7	-62.4	-25	-37.40
5070.0	-42	314	1.4	H	11.1	-30.9	-25	-5.90
5070.0	-42.7	37	1.3	V	10.8	-31.9	-25	-6.90
7605.0	-54	118	2.1	H	21.2	-32.8	-25	-7.80
7605.0	-53.2	94	1.5	V	20.1	-33.1	-25	-8.10
QPSK, 5MHz, 2567.5MHz								
944.7	-70.1	319	1.1	H	9.6	-60.5	-25	-35.50
944.7	-73.2	162	1.8	V	11.7	-61.5	-25	-36.50
5135.0	-41.9	96	1.9	H	11.3	-30.6	-25	-5.60
5135.0	-42.1	17	1.1	V	10.8	-31.3	-25	-6.30
7702.5	-53.6	6	2.1	H	21.2	-32.4	-25	-7.40
7702.5	-53.8	339	1	V	21	-32.8	-25	-7.80
LTE Band 12, Test frequency range: 30MHz-10GHz								
QPSK, 1.4MHz, 699.7MHz								
948.7	-71.9	206	1.5	H	9.6	-62.3	-13	-49.30
948.7	-72	304	1.5	V	11.7	-60.3	-13	-47.30
1399.4	-60.70	32	2.4	H	5.9	-54.80	-13	-41.80
1399.4	-61.40	309	2.3	V	5.9	-55.50	-13	-42.50
QPSK, 1.4MHz, 707.5MHz								
949.1	-70.3	105	1.6	H	9.6	-60.7	-13	-47.70
949.1	-72.3	260	2.1	V	11.7	-60.6	-13	-47.60
1415.0	-60.10	323	2.4	H	5.9	-54.20	-13	-41.20
1415.0	-60.70	136	2.4	V	5.9	-54.80	-13	-41.80
QPSK, 1.4MHz, 715.3MHz								
944	-69.8	318	2.2	H	9.6	-60.2	-13	-47.2
944	-72.9	5	1	V	11.7	-61.2	-13	-48.2
1430.6	-60.00	279	1.6	H	5.9	-54.10	-13	-41.10
1430.6	-60.70	230	1.9	V	5.9	-54.80	-13	-41.80

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-26.5GHz								
QPSK,5MHz,2537.5MHz								
942.8	-70.1	69	1.5	H	9.6	-60.5	-25	-35.5
942.8	-73	317	1.8	V	11.7	-61.3	-25	-36.3
5075.0	-43.20	246	1.1	H	11.2	-32.00	-25	-7.00
5075.0	-42.50	334	2	V	10.9	-31.60	-25	-6.60
QPSK, 5MHz,2595MHz								
948.9	-70.2	276	1.1	H	9.6	-60.6	-25	-35.6
948.9	-72.4	211	1.9	V	11.7	-60.7	-25	-35.7
5190.0	-41.20	71	1.8	H	10.5	-30.70	-25	-5.70
5190.0	-41.90	325	1.1	V	10	-31.90	-25	-6.90
QPSK, 5MHz,2652.5MHz								
948.1	-70.8	147	1.8	H	9.6	-61.2	-25	-36.2
948.1	-72.5	285	2	V	11.7	-60.8	-25	-35.8
5305.0	-39.90	12	2.2	H	9.6	-30.30	-25	-6.30
5305.0	-39.00	332	1.9	V	8.8	-30.20	-25	-6.20

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 (g) (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.

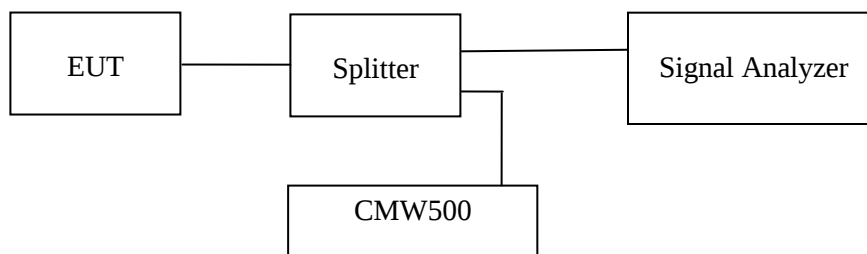
According to FCC §27.53(g)(h), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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 than $43 + 10 \log(P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log(P)$ dB at or below 2490.5MHz.

Test Procedure

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**

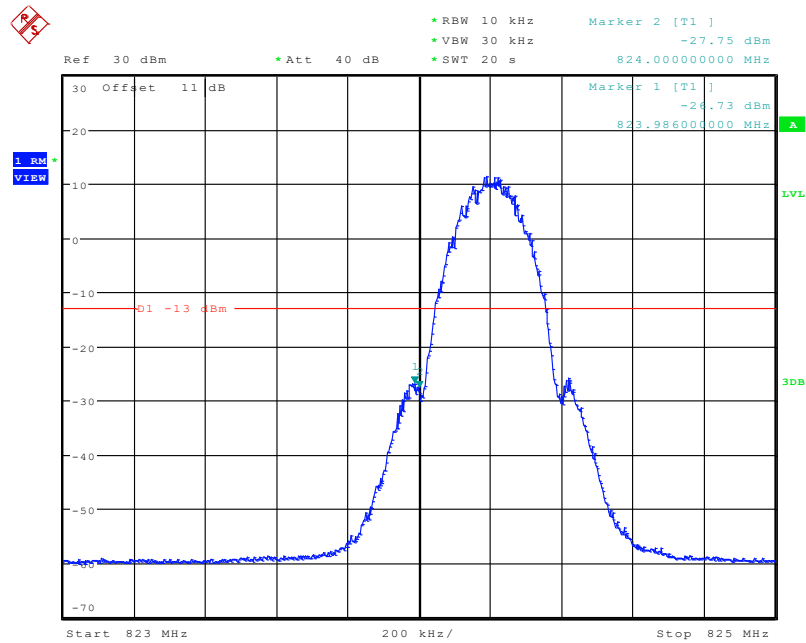
Temperature:	26 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Cat Kang from 2022-11-11 to 2022-11-18.

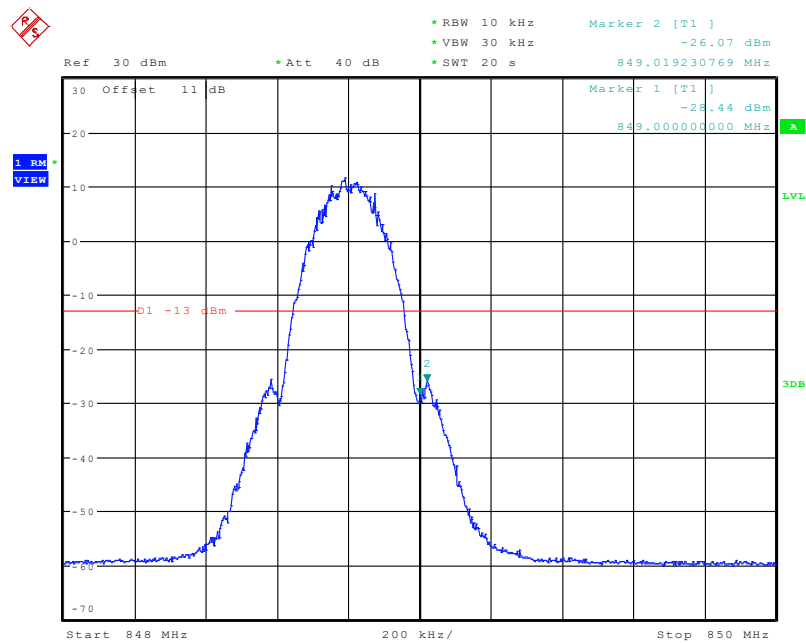
EUT operation mode: Transmitting (Worst case)

Test Result: Pass

Please refer to the following plots.

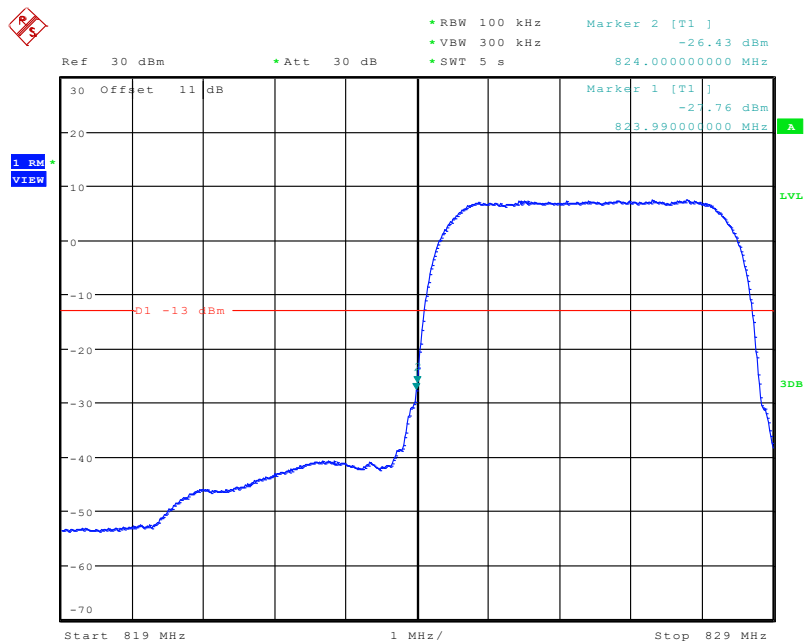
Cellular Band, Left Band Edge for GSM (GMSK) Mode

Date: 11.NOV.2022 19:39:47

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

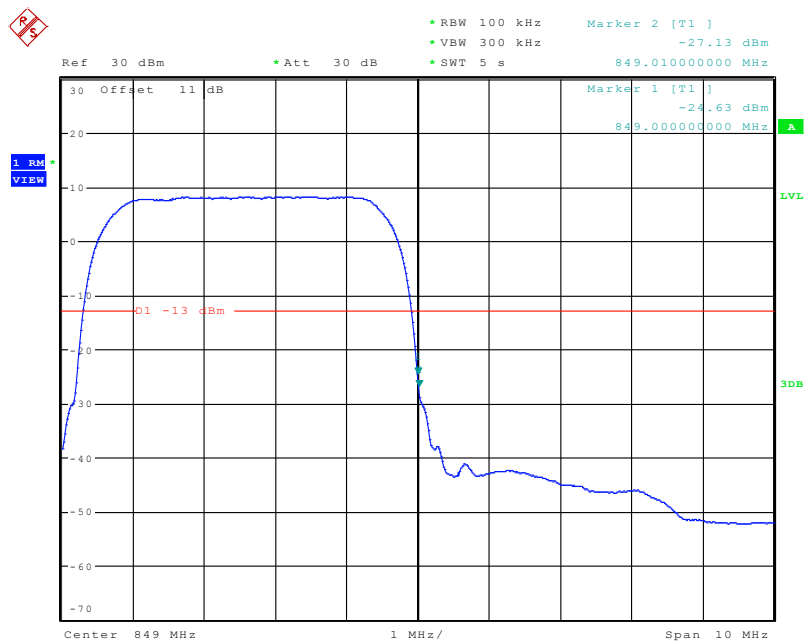
Date: 11.NOV.2022 20:01:23

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

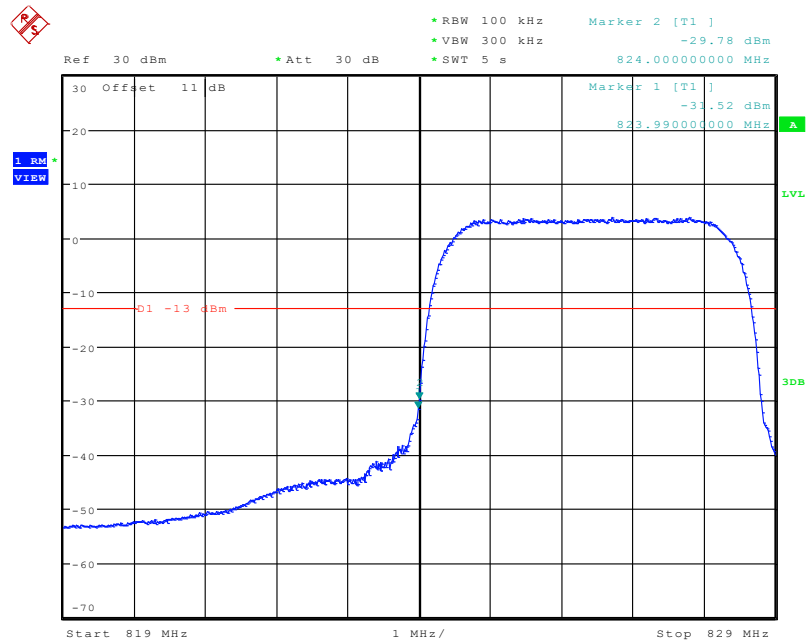


Date: 11.NOV.2022 20:12:32

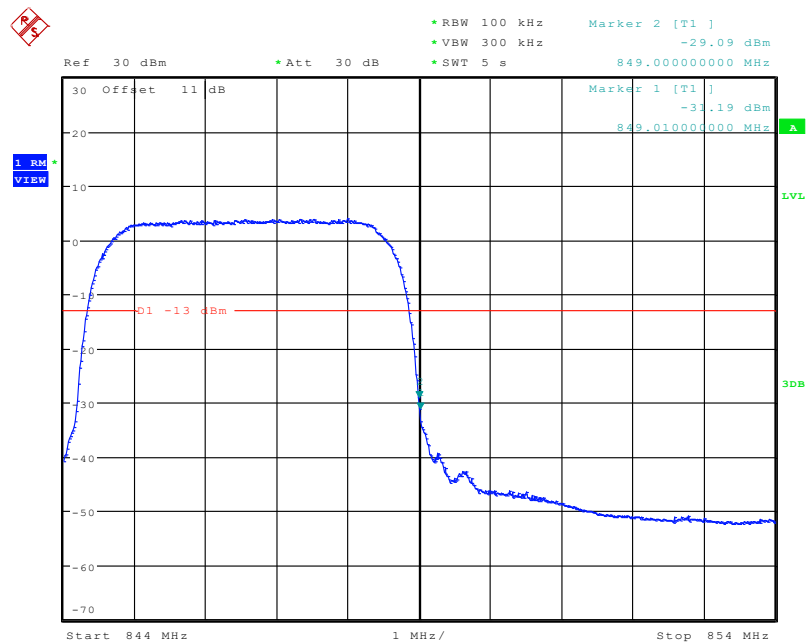
Cellular Band, Right Band Edge for RMC (BPSK) Mode



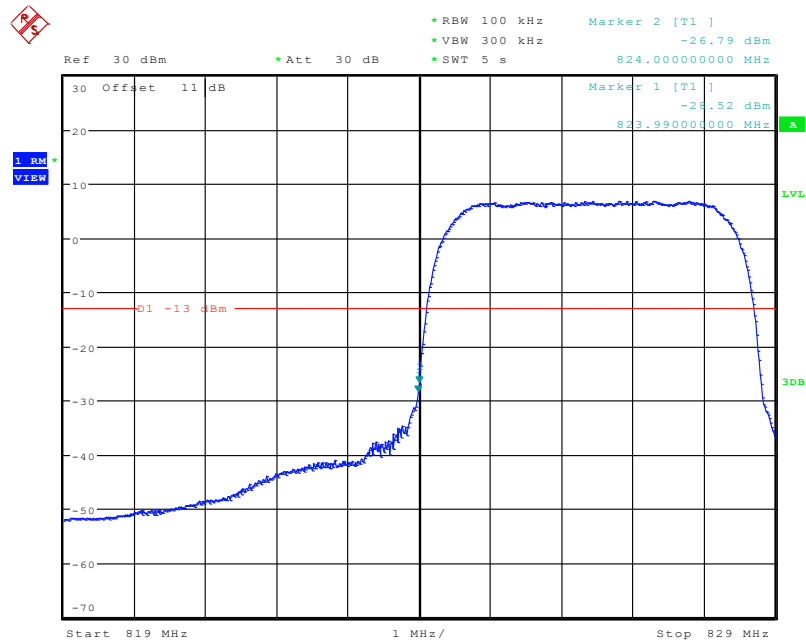
Date: 18.NOV.2022 19:17:24

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

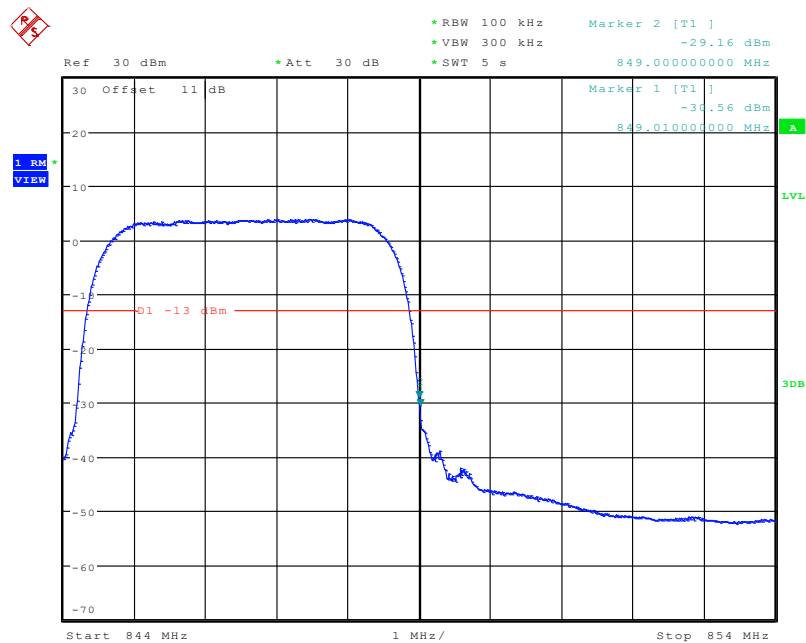
Date: 12.NOV.2022 09:06:08

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

Date: 12.NOV.2022 09:12:26

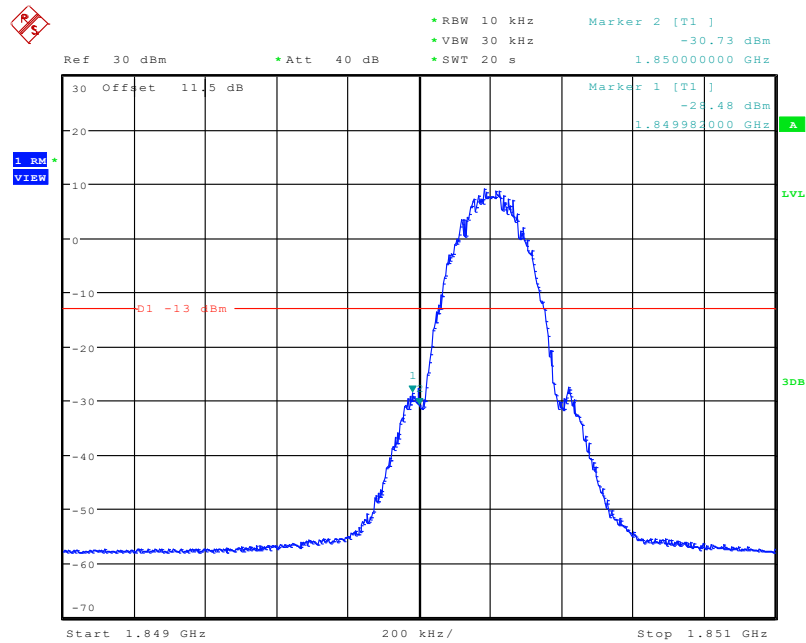
Cellular Band, Left Band Edge for HSUPA (QPSK) Mode

Date: 12.NOV.2022 08:43:00

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

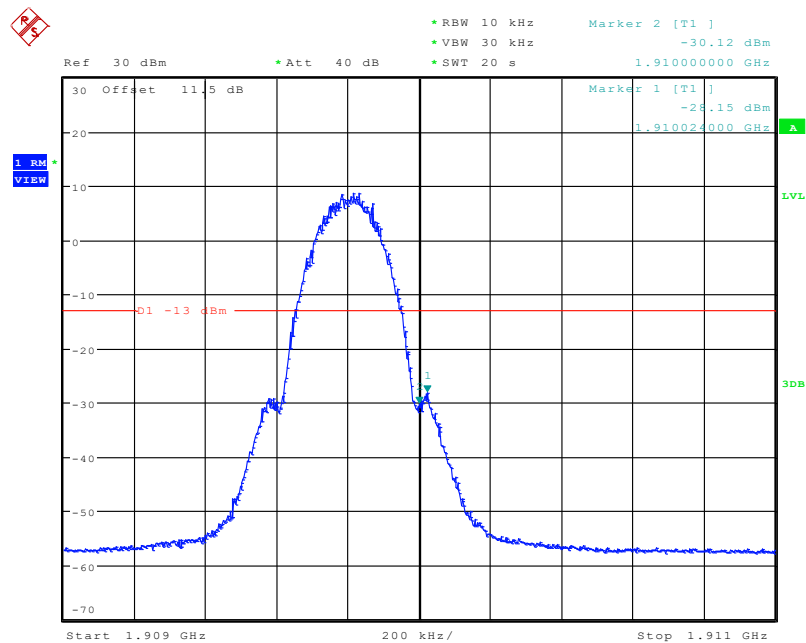
Date: 12.NOV.2022 08:54:21

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

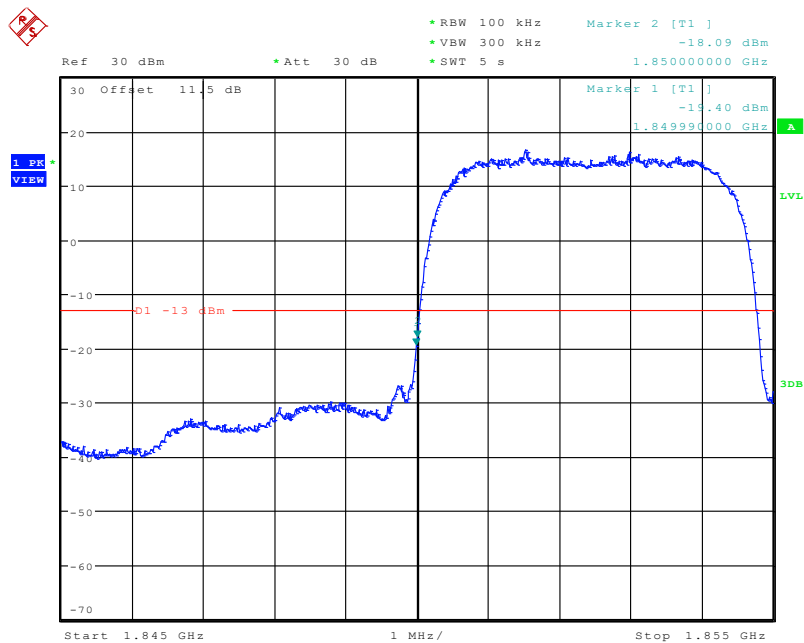


Date: 11.NOV.2022 19:06:31

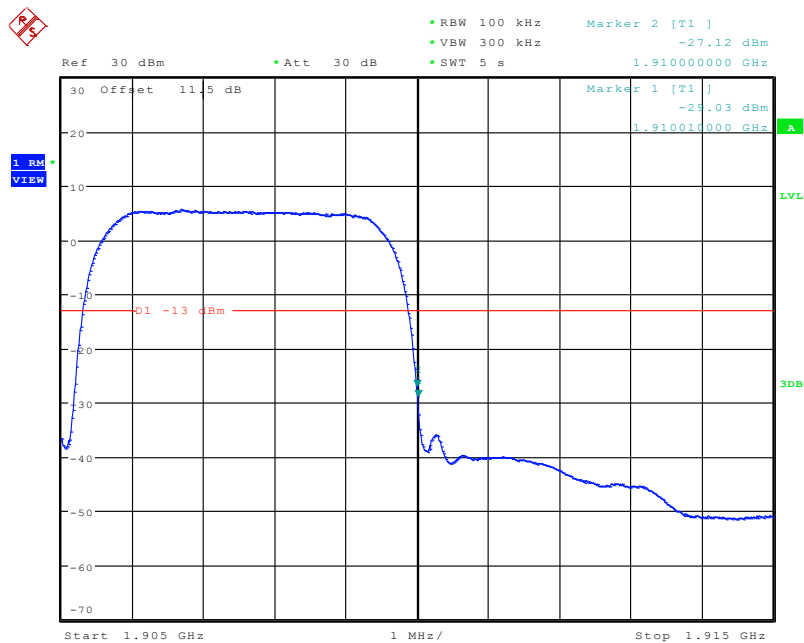
PCS Band, Right Band Edge for GSM (GMSK) Mode



Date: 11.NOV.2022 19:20:34

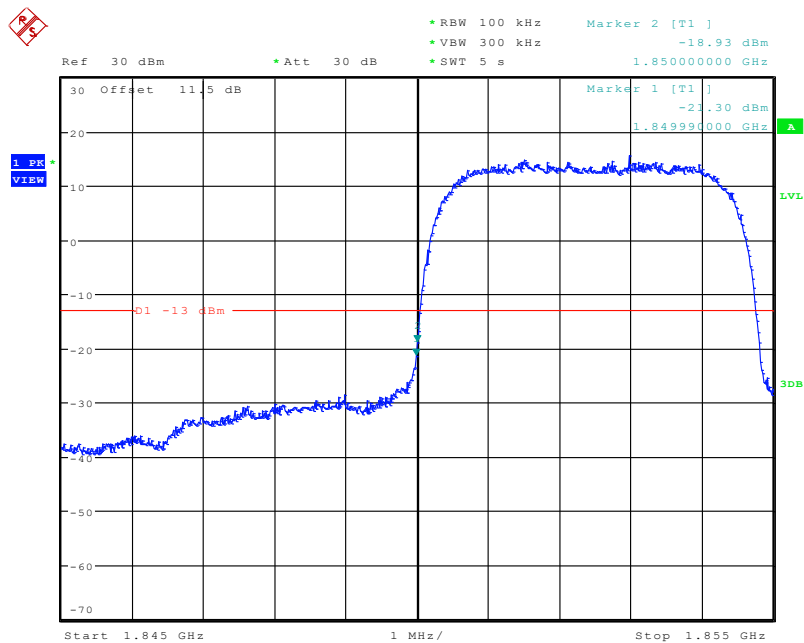
PCS Band, Left Band Edge for RMC (BPSK) Mode

Date: 12.NOV.2022 09:26:03

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

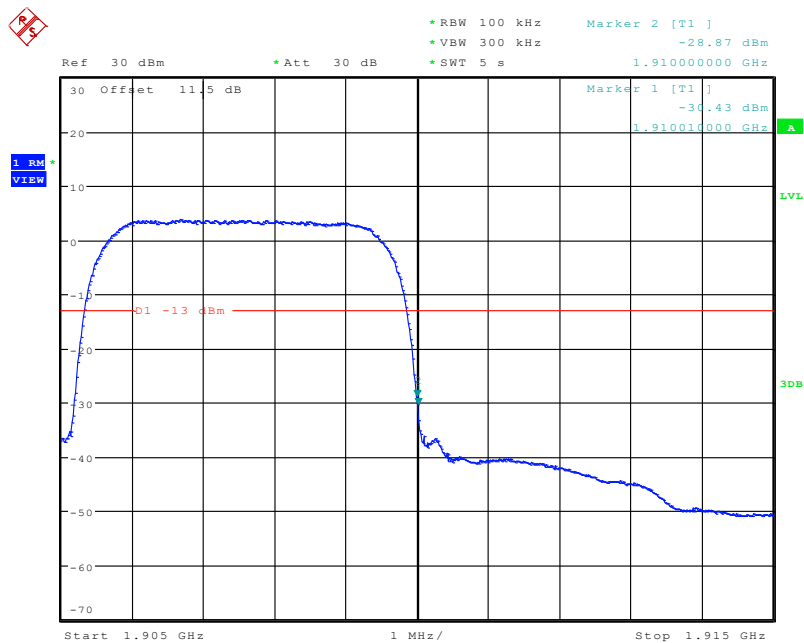
Date: 12.NOV.2022 09:33:05

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



Date: 12.NOV.2022 09:43:32

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



Date: 12.NOV.2022 09:51:35

[illegible]

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



FCC -2G,3G,4G

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

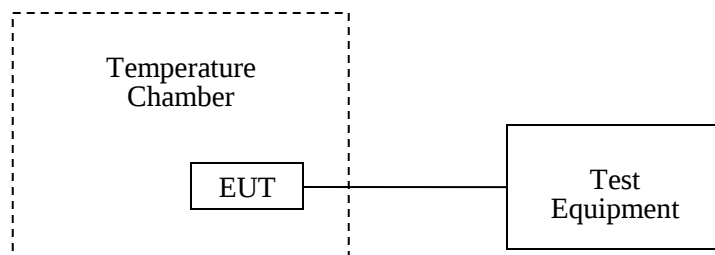
According to §24.235& §27.54, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external AC 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 AC 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 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Cat Kang from 2022-11-12 to 2022-11-16.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the following tables.

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

Middle Channel, $f_0 = 836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	N.V.	5	0.0060	2.5
-20		4	0.0048	2.5
-10		5	0.0060	2.5
0		6	0.0072	2.5
10		3	0.0036	2.5
20		1	0.0012	2.5
30		2	0.0024	2.5
40		4	0.0048	2.5
50		3	0.0036	2.5
20	L.V.	2	0.0024	2.5
	H.V.	6	0.0072	2.5

WCDMA Mode

Middle Channel, $f_0 = 836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	N.V.	1.22	0.0015	2.5
-20		1.35	0.0016	2.5
-10		1.42	0.0017	2.5
0		1.36	0.0016	2.5
10		1.24	0.0015	2.5
20		0.95	0.0011	2.5
30		1.28	0.0015	2.5
40		1.36	0.0016	2.5
50		1.45	0.0017	2.5
20	L.V.	1.26	0.0015	2.5
	H.V.	1.39	0.0017	2.5

PCS Band (Part 24E)
GSM Mode

Middle Channel, $f_o = 1880.0$ MHz				
Temperature (°C)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	N.V.	7	0.0037	pass
-20		5	0.0027	pass
-10		6	0.0032	pass
0		7	0.0037	pass
10		8	0.0043	pass
20		11	0.0059	pass
30		6	0.0032	pass
40		5	0.0027	pass
50		4	0.0021	pass
20	L.V.	7	0.0037	pass
	H.V.	8	0.0043	pass

WCDMA Mode

Middle Channel, $f_o = 1880.0$ MHz				
Temperature (°C)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	N.V.	1.62	0.0009	pass
-20		1.48	0.0008	pass
-10		1.35	0.0007	pass
0		2.41	0.0013	pass
10		2.35	0.0013	pass
20		1.17	0.0006	pass
30		1.25	0.0007	pass
40		1.34	0.0007	pass
50		1.64	0.0009	pass
20	L.V.	1.26	0.0007	pass
	H.V.	1.38	0.0007	pass

LTE:
QPSK:
Band 2:

10.0 MHz Middle Channel, $f_o = 1880\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	7.6	8.59	0.0046	pass
-20		8.09	0.0043	pass
-10		7.59	0.0040	pass
0		8.98	0.0048	pass
10		-8.18	-0.0044	pass
20		-7.74	-0.0041	pass
30		-8.65	-0.0046	pass
40		8.55	0.0045	pass
50		-6.50	-0.0035	pass
20	L.V.	7.74	0.0041	pass
	H.V.	-8.39	-0.0045	pass

Band 5:

10.0 MHz Middle Channel, $f_o = 836.5\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	N.V.	-19.4	-0.0232	2.5
-20		-8.6	-0.0103	2.5
-10		7.5	0.0090	2.5
0		5.5	0.0066	2.5
10		-7.9	-0.0094	2.5
20		8.5	0.0102	2.5
30		-7.9	-0.0094	2.5
40		8.4	0.0100	2.5
50		-5.4	-0.0065	2.5
20	L.V.	-9.0	-0.0107	2.5
	H.V.	6.7	0.0080	2.5

Band 7:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	2500.1967	2569.8760	2500	2570
-20		2500.1956	2569.8867	2500	2570
-10		2500.1939	2569.8855	2500	2570
0		2500.1962	2569.8887	2500	2570
10		2500.1929	2569.8862	2500	2570
20		2500.1944	2569.8876	2500	2570
30		2500.1966	2569.8882	2500	2570
40		2500.1958	2569.8835	2500	2570
50		2500.1962	2569.8827	2500	2570
20	L.V.	2500.1945	2569.8829	2500	2570
	H.V.	2500.1968	2569.8863	2500	2570

Band 12:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	699.0346	715.9634	699	716
-20		699.0327	715.9626	699	716
-10		699.0345	715.9642	699	716
0		699.0326	715.9663	699	716
10		699.0325	715.9635	699	716
20		699.0364	715.9672	699	716
30		699.0337	715.9636	699	716
40		699.0355	715.9654	699	716
50		699.0346	715.9656	699	716
20	L.V.	699.0335	715.9642	699	716
	H.V.	699.0352	715.9636	699	716

Band 41:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	2535.0534	2654.9453	2535	2655
-20		2535.0526	2654.9462	2535	2655
-10		2535.0527	2654.9442	2535	2655
0		2535.0535	2654.9425	2535	2655
10		2535.0521	2654.9417	2535	2655
20		2535.0536	2654.9466	2535	2655
30		2535.0528	2654.9454	2535	2655
40		2535.0534	2654.9437	2535	2655
50		2535.0528	2654.9728	2535	2655
20	L.V.	2535.0553	2654.9412	2535	2655
	H.V.	2535.0517	2654.9421	2535	2655

16QAM:**Band 2:**

10.0 MHz Middle Channel, f ₀ = 1880MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	N.V.	4.5	0.0024	pass
-20		5.3	0.0028	pass
-10		-8.1	-0.0043	pass
0		7.9	0.0042	pass
10		9.8	0.0052	pass
20		-9.7	-0.0052	pass
30		9.5	0.0051	pass
40		-6.2	-0.0033	pass
50		-9.9	-0.0053	pass
20	L.V.	-7.4	-0.0039	pass
	H.V.	-8.1	-0.0043	pass

Band 5:

10.0 MHz Middle Channel, $f_0=836.5\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	N.V.	-24.18	-0.0289	2.5
-20		9.50	0.0114	2.5
-10		7.34	0.0088	2.5
0		-6.61	-0.0079	2.5
10		5.87	0.0070	2.5
20		8.68	0.0104	2.5
30		-9.43	-0.0113	2.5
40		7.96	0.0095	2.5
50		-5.42	-0.0065	2.5
20	L.V.	7.10	0.0085	2.5
	H.V.	-5.36	-0.0064	2.5

Band 7:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	2500.1488	2569.8563	2500	2570
-20		2500.1374	2569.8545	2500	2570
-10		2500.1365	2569.8436	2500	2570
0		2500.1243	2569.8542	2500	2570
10		2500.1388	2569.8238	2500	2570
20		2500.1244	2569.8874	2500	2570
30		2500.1335	2569.8855	2500	2570
40		2500.1328	2569.8442	2500	2570
50		2500.1327	2569.8456	2500	2570
20	L.V.	2500.1251	2569.8355	2500	2570
	H.V.	2500.1432	2569.8282	2500	2570

Band 12:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	699.0343	715.9684	699	716
-20		699.0352	715.9655	699	716
-10		699.0352	715.9672	699	716
0		699.0341	715.9643	699	716
10		699.0356	715.9662	699	716
20		699.0452	715.9648	699	716
30		699.0346	715.9629	699	716
40		699.0346	715.9642	699	716
50		699.0388	715.9636	699	716
20	L.V.	699.0365	715.9667	699	716
	H.V.	699.0346	715.9647	699	716

Band 41:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	2535.1428	2654.8532	2535	2655
-20		2535.1433	2654.8527	2535	2655
-10		2535.1425	2654.8544	2535	2655
0		2535.1452	2654.8551	2535	2655
10		2535.1447	2654.8546	2535	2655
20		2535.1431	2654.8533	2535	2655
30		2535.1423	2654.8551	2535	2655
40		2535.1442	2654.8546	2535	2655
50		2535.1436	2654.8562	2535	2655
20	L.V.	2535.1417	2654.8548	2535	2655
	H.V.	2535.1421	2654.8557	2535	2655

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