TEST REPORT

Applicant Name :	Shenzhen Youmi Intelligent Technology Co., Ltd.
Address :	406-407 Jinqi Zhigu Building, 4/F, 1 Tangling Road, Nanshan District, Shenzhen City, China
Report Number :	SZNS211213-64419E-RF-00C
FCC ID:	2ATZ4-A13P5

Test Standard (s)

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

Sample Description

Product Type:	Smart Phone
Model No.:	A13 Pro 5G
Multiple Model(s) No.:	A13 Pro Max 5G(Please refer to DOS for Model difference)
Trade Mark:	UMIDIGI
Date Received:	2021/12/13
Report Date:	2022/05/19
Test Result:	Pass*

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

Prepared and Checked By:

Ting Lü
EMC Engineer

Approved By:

Robert Li
EMC Engineer

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

Product Description for Equipment under Test (EUT)

Frequency Range	GSM 850: 824-849MHz(TX); 869-894MHz(RX) PCS 1900: 1850-1910MHz(TX); 1930-1990MHz(RX) WCDMA Band 2: 1850-1910MHz(TX); 1930-1990MHz(RX) WCDMA Band 5: 824-849MHz(TX); 869-894MHz(RX) LTE Band 2: 1850-1910MHz(TX); 1930-1990MHz(RX) LTE Band 5: 824-849MHz(TX); 869-894MHz(RX) LTE Band 12: 699-716MHz(TX); 729-746MHz(RX) LTE Band 41: 2535-2655MHz(TX/RX)
Modulation Technique	2G: GMSK, 8PSK 3G: BPSK, QPSK, 16QAM 4G: QPSK, 16QAM
Antenna Specification*	GSM850/WCDMA 850/LTE B5: -1.15dBi WCDMA 1900/PCS1900/LTE B2: 0.67dBi LTE B12: -1.54dBi,LTE B41: 1.34dBi (provided by the applicant)
Voltage Range	DC 3.85V from battery or DC 5/7/9/12V from adapter
Sample serial number	SZNS211213-64419E-RF-S1 for Radiated Emissions SZNS211213-64419E-RF-S2 for RF Conducted Test (Assigned by ATC)
Sample/EUT Status	Good condition
Normal/Extreme Condition	L.V.: Low Voltage 3.45V_{DC} N.V.: Normal Voltage 3.85V_{DC} H.V.: High Voltage 4.43V_{DC}
Adapter information	Model: HJ-FC017K7-US Input: AC 100-240V, 50/60Hz, 0.6A Output: DC 5.0V, 2.0A or 7.0V,2.0A or 9.0V,2.0A or 12.0V,1.5A,18.0W

Objective

This test report is in accordance with Part 2-Subpart J, Part 22-Subpart H, Part24-Subpart E, and Subpart 27 of the Federal Communication Commission's rules.

The objective is to determine the compliance of the EUT with FCC rules for output power, modulation characteristic, occupied bandwidth, and spurious emission at antenna terminal, spurious radiated emission, frequency stability and band edge.

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2-Subpart J as well as the following parts:

Part 22 Subpart H - Public Mobile Services
Part 24 Subpart E - Personal Communication Services
Part 27 - Miscellaneous Wireless Communications Services

ANSI C63.26-2015: American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

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℃
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 (ISEDC), 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 B12	1.4	699.7	707.5	715.3
	3	700.5	707.5	714.5
	5	701.5	707.5	713.5
	10	704.0	707.5	711.0
LTE B41	5	2537.5	2595	2652.5
	10	2540	2595	2650
	15	2542.5	2595	2647.5
	20	2545	2595	2645

Equipment Modifications

No modification was made to the EUT.

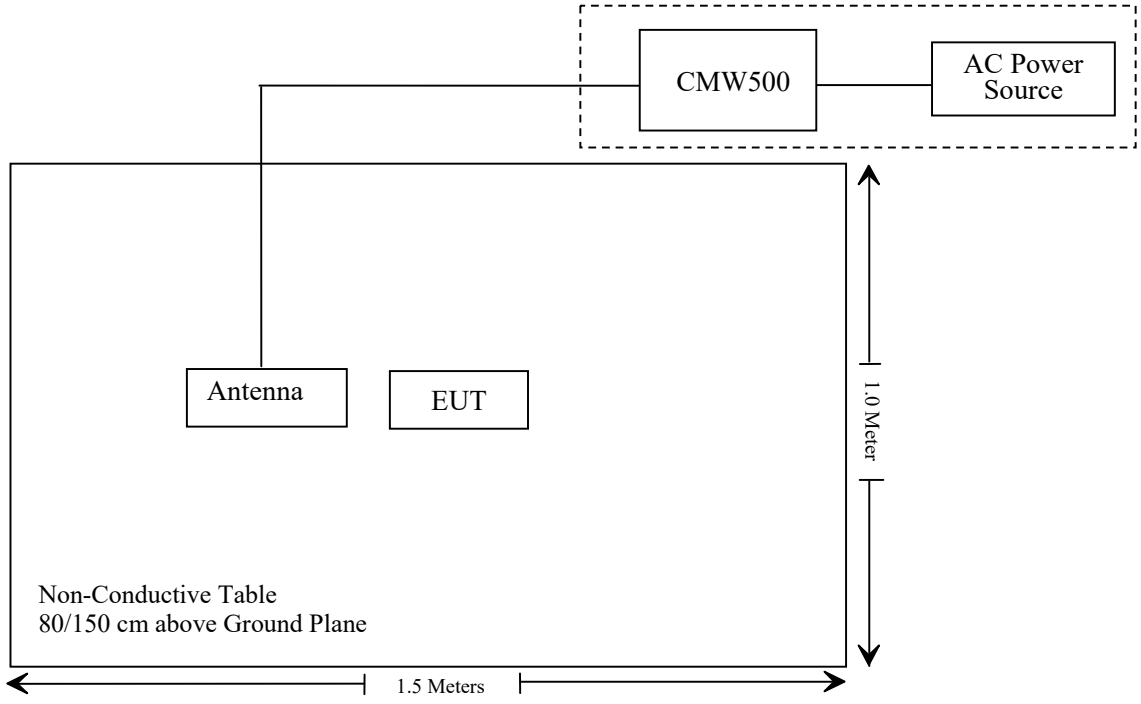
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-116218-UY

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); § 24.232 (c); §27.50 (b) (c) (h);	RF Output Power	Compliant
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; § 22.905; § 22.917; § 24.238; §27.53	Occupied Bandwidth	Compliant
§ 2.1051; §22.917 (a); § 24.238 (a); §27.53;	Spurious Emissions at Antenna Terminal	Compliant
§ 2.1053; § 22.917 (a); § 24.238 (a); §27.53	Field Strength of Spurious Radiation	Compliant
§ 22.917 (a); § 24.238 (a); §27.53 (c) (h) (m)	Band Edge	Compliant
§ 2.1055; § 22.355; § 24.235; §27.54;	Frequency stability	Compliant

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Rohde& Schwarz	Test Receiver	ESR	102725	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-18405536-J0	15964001002	2021/11/11	2022/11/10
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
PASTERNACK	Horn Antenn	PE9852/2F-20	1120	2020/01/05	2023/01/04
PASTERNACK	Horn Antenn	PE9852/2F-20	1120	2020/01/05	2023/01/04
Agilent	Signal Generator	N5183A	MY51040755	2021/12/13	2022/12/12
Wainwright	High Pass Filter	WHKX3.6/18G-10SS	5	2021/12/14	2022/12/13
CD	High Pass Filter	HPM-1.2/18G-60	110	2021/12/14	2022/12/13
RF Conducted Test					
SPECTRUM ANALYZER	Rohde & Schwarz	FSU26	200982	2021/07/06	2022/07/05
Rohde&Schwarz	Spectrum Analyzer	FSV-40	101948	2021/12/13	2022/12/12
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
Gongwen	Temp. & Humid. Chamber	HSD-500	109	2021/10/14	2022/10/13
Fluke	Multi Meter	45	7664009	2021/12/14	2022/12/13
Manson	DC Power Source	KPS-6604	ATCS-205	NCR	NCR
Unknown	RF Cable	Unknown	Unknown	Each time	/
HP	6dB Attenuator	8493B	06151	2021/12/14	2022/12/13

* 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: SZNS211213-64419E-SAA.

FCC§2.1047 - MODULATION CHARACTERISTIC

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

FCC § 2.1046,§ 22.913 (a)&§ 24.232 (c); §27.50 (c)(h)- RF OUTPUT POWER

Applicable Standard

According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

Accordingto 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 successfulcommunications.

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB.

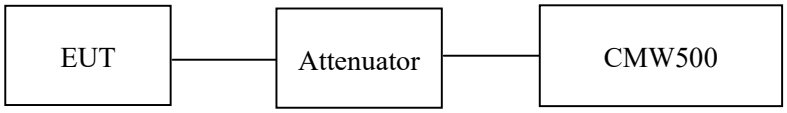
According to §27.50(c), Control and mobile stations in the 698-746 MHz band are limited to 30 watts ERP. And Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

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 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Nick Fan from 2022-04-04 to 2022-05-17.

Conducted Power

Cellular Band

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	ERP(dBm)	Limit (dBm)
GSM	128	824.2	32.70	28.90	38.45
	190	836.6	32.70	28.90	38.45
	251	848.8	32.60	28.80	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	32.73	31.99	30.46	29.26	28.93	28.19	26.66	25.46	38.45
	190	836.6	32.81	32.09	30.48	29.38	29.01	28.29	26.68	25.58	38.45
	251	848.8	32.64	31.92	30.33	29.21	28.84	28.12	26.53	25.41	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	26.84	25.47	23.21	21.64	23.04	21.67	19.41	17.84	38.45
	190	836.6	26.85	25.49	23.28	21.64	23.05	21.69	19.48	17.84	38.45
	251	848.8	26.79	25.45	23.25	21.62	22.99	21.65	19.45	17.82	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		22.59	22.54	22.56	18.79	18.74	18.76
	HSDPA	1	21.60	21.48	21.58	17.80	17.68	17.78
		2	21.52	21.33	21.55	17.72	17.53	17.75
		3	21.44	21.45	21.43	17.64	17.65	17.63
		4	21.38	21.42	21.36	17.58	17.62	17.56
	HSUPA	1	21.11	21.07	21.17	17.31	17.27	17.37
		2	21.12	21.02	21.23	17.32	17.22	17.43
		3	21.32	21.33	21.12	17.52	17.53	17.32
		4	21.22	21.32	21.18	17.42	17.52	17.38
		5	21.41	21.28	21.19	17.61	17.48	17.39
	HSPA+	1	21.33	21.44	21.17	17.53	17.64	17.37

Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBd) - Cable loss(dB)
For GSM850 / WCDMA Band5: Antenna Gain = -1.15dBi = -3.30dBd (0dBd=2.15dBi)
Cable Loss=0.5dB* (provided by the applicant)
Limit: ERP≤38.45dBm

PCS Band

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	EIRP(dBm)	Limit (dBm)
GSM	512	1850.2	29.60	30.27	33
	661	1880.0	29.60	30.27	33
	810	1909.8	29.30	29.97	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	29.46	28.63	26.97	25.77	30.13	29.30	27.64	26.44	33
	661	1880.0	29.52	28.76	27.11	25.92	30.19	29.43	27.78	26.59	33
	810	1909.8	29.23	28.47	26.94	25.74	29.9	29.14	27.61	26.41	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				EIRP(dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	1 slot	2 slots	3 slots	4 slots	
EGPRS	512	1850.2	25.18	23.54	21.31	19.90	25.85	24.21	21.98	20.57	33
	661	1880.0	25.05	23.48	21.22	19.80	25.72	24.15	21.89	20.47	33
	810	1909.8	25.05	23.52	21.22	19.82	25.72	24.19	21.89	20.49	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	22.74	23.46	23.46	23.41
	HSDPA	1	21.77	21.73	21.67	22.44	22.40	22.34
		2	21.52	21.55	21.56	22.19	22.22	22.23
		3	21.44	21.54	21.38	22.11	22.21	22.05
		4	21.39	21.49	21.42	22.06	22.16	22.09
	HSUPA	1	21.42	21.42	21.36	22.09	22.09	22.03
		2	21.33	21.43	21.38	22.00	22.10	22.05
		3	21.41	21.47	21.46	22.08	22.14	22.13
		4	21.43	21.49	21.42	22.10	22.16	22.09
		5	21.33	21.47	21.56	22.00	22.14	22.23
	HSPA+	1	21.38	21.55	21.41	22.05	22.22	22.08

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi)
For PCS1900 / WCDMA Band2: Antenna Gain = 0.67dBi
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	21.31	21.36	21.35	21.98	22.03	22.02
		RB1#3	21.29	21.36	21.39	21.96	22.03	22.06
		RB1#5	21.35	21.39	21.39	22.02	22.06	22.06
		RB3#0	21.39	21.38	21.41	22.06	22.05	22.08
		RB3#3	21.33	21.40	21.42	22.00	22.07	22.09
		RB6#0	20.32	20.37	20.38	20.99	21.04	21.05
	16QAM	RB1#0	20.42	20.38	20.39	21.09	21.05	21.06
		RB1#3	20.43	20.41	20.41	21.10	21.08	21.08
		RB1#5	20.43	20.43	20.40	21.10	21.10	21.07
		RB3#0	20.27	20.43	20.53	20.94	21.10	21.20
		RB3#3	20.28	20.43	20.58	20.95	21.10	21.25
		RB6#0	19.30	19.26	19.34	19.97	19.93	20.01
3.0	QPSK	RB1#0	21.32	21.36	21.40	21.99	22.03	22.07
		RB1#8	21.28	21.37	21.38	21.95	22.04	22.05
		RB1#14	21.27	21.40	21.40	21.94	22.07	22.07
		RB6#0	20.34	20.35	20.43	21.01	21.02	21.10
		RB6#9	20.36	20.37	20.38	21.03	21.04	21.05
		RB15#0	20.32	20.31	20.37	20.99	20.98	21.04
	16QAM	RB1#0	20.91	20.49	20.41	21.58	21.16	21.08
		RB1#8	20.88	20.47	20.38	21.55	21.14	21.05
		RB1#14	20.87	20.48	20.39	21.54	21.15	21.06
		RB6#0	19.35	19.33	19.29	20.02	20.00	19.96
		RB6#9	19.33	19.31	19.29	20.00	19.98	19.96
		RB15#0	19.37	19.23	19.40	20.04	19.90	20.07

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	21.47	21.46	21.50	22.14	22.13	22.17
		RB1#13	21.44	21.46	21.46	22.11	22.13	22.13
		RB1#24	21.46	21.50	21.47	22.13	22.17	22.14
		RB15#0	20.35	20.38	20.46	21.02	21.05	21.13
		RB15#10	20.29	20.37	20.42	20.96	21.04	21.09
		RB25#0	20.34	20.39	20.42	21.01	21.06	21.09
	16QAM	RB1#0	20.26	20.72	20.51	20.93	21.39	21.18
		RB1#13	20.24	20.67	20.48	20.91	21.34	21.15
		RB1#24	20.28	20.72	20.49	20.95	21.39	21.16
		RB15#0	19.37	19.33	19.40	20.04	20.00	20.07
		RB15#10	19.30	19.32	19.39	19.97	19.99	20.06
		RB25#0	19.36	19.39	19.37	20.03	20.06	20.04
10.0	QPSK	RB1#0	21.36	21.37	21.36	22.03	22.04	22.03
		RB1#25	21.41	21.45	21.49	22.08	22.12	22.16
		RB1#49	21.33	21.43	21.45	22.00	22.10	22.12
		RB25#0	20.36	20.39	20.48	21.03	21.06	21.15
		RB25#25	20.35	20.40	20.50	21.02	21.07	21.17
		RB50#0	20.38	20.39	20.52	21.05	21.06	21.19
	16QAM	RB1#0	20.91	20.49	20.37	21.58	21.16	21.04
		RB1#25	20.97	20.54	20.47	21.64	21.21	21.14
		RB1#49	20.89	20.51	20.44	21.56	21.18	21.11
		RB25#0	19.39	19.39	19.56	20.06	20.06	20.23
		RB25#25	19.38	19.42	19.56	20.05	20.09	20.23
		RB50#0	19.31	19.37	19.48	19.98	20.04	20.15

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	21.28	21.29	21.24	21.95	21.96	21.91
		RB1#38	21.34	21.47	21.38	22.01	22.14	22.05
		RB1#74	21.26	21.32	21.30	21.93	21.99	21.97
		RB36#0	20.27	20.36	20.39	20.94	21.03	21.06
		RB36#39	20.31	20.42	20.34	20.98	21.09	21.01
		RB75#0	20.37	20.38	20.41	21.04	21.05	21.08
	16QAM	RB1#0	20.88	20.40	20.69	21.55	21.07	21.36
		RB1#38	20.94	20.55	20.82	21.61	21.22	21.49
		RB1#74	20.83	20.38	20.70	21.50	21.05	21.37
		RB36#0	19.34	19.35	19.37	20.01	20.02	20.04
		RB36#39	19.33	19.34	19.34	20.00	20.01	20.01
		RB75#0	19.32	19.33	19.34	19.99	20.00	20.01
20.0	QPSK	RB1#0	21.32	21.36	21.24	21.99	22.03	21.91
		RB1#50	21.41	21.54	21.44	22.08	22.21	22.11
		RB1#99	21.29	21.36	21.35	21.96	22.03	22.02
		RB50#0	20.30	20.40	20.36	20.97	21.07	21.03
		RB50#50	20.32	20.40	20.35	20.99	21.07	21.02
		RB100#0	20.27	20.41	20.35	20.94	21.08	21.02
	16QAM	RB1#0	20.57	20.54	20.78	21.24	21.21	21.45
		RB1#50	20.67	20.71	20.97	21.34	21.38	21.64
		RB1#99	20.52	20.53	20.91	21.19	21.20	21.58
		RB50#0	19.24	19.36	19.32	19.91	20.03	19.99
		RB50#50	19.26	19.34	19.06	19.93	20.01	19.73
		RB100#0	19.24	19.35	19.28	19.91	20.02	19.95

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi)
For Band2: Antenna Gain = 0.67dBi
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	21.86	21.85	21.73	18.06	18.05	17.93
		RB1#3	21.86	21.83	21.68	18.06	18.03	17.88
		RB1#5	21.83	21.83	21.74	18.03	18.03	17.94
		RB3#0	21.92	21.92	21.77	18.12	18.12	17.97
		RB3#3	21.94	21.87	21.75	18.14	18.07	17.95
		RB6#0	20.91	20.89	20.75	17.11	17.09	16.95
	16QAM	RB1#0	20.88	20.90	20.83	17.08	17.10	17.03
		RB1#3	20.90	20.93	20.91	17.10	17.13	17.11
		RB1#5	20.89	20.92	20.90	17.09	17.12	17.10
		RB3#0	20.94	21.04	20.70	17.14	17.24	16.90
		RB3#3	20.97	21.05	20.75	17.17	17.25	16.95
		RB6#0	19.83	19.88	19.79	16.03	16.08	15.99
3.0	QPSK	RB1#0	21.86	21.78	21.75	18.06	17.98	17.95
		RB1#8	21.79	21.81	21.73	17.99	18.01	17.93
		RB1#14	21.75	21.82	21.75	17.95	18.02	17.95
		RB6#0	20.92	20.89	20.77	17.12	17.09	16.97
		RB6#9	20.85	20.91	20.77	17.05	17.11	16.97
		RB15#0	20.88	20.88	20.74	17.08	17.08	16.94
	16QAM	RB1#0	21.42	21.00	20.80	17.62	17.20	17.00
		RB1#8	21.37	20.98	20.75	17.57	17.18	16.95
		RB1#14	21.32	21.00	20.78	17.52	17.20	16.98
		RB6#0	19.94	19.92	19.70	16.14	16.12	15.90
		RB6#9	19.90	19.93	19.67	16.10	16.13	15.87
		RB15#0	19.91	19.86	19.82	16.11	16.06	16.02

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	21.97	21.88	21.80	18.17	18.08	18.00
		RB1#13	21.93	21.86	21.78	18.13	18.06	17.98
		RB1#24	21.90	21.91	21.79	18.10	18.11	17.99
		RB15#0	20.97	20.83	20.90	17.17	17.03	17.10
		RB15#10	20.80	20.91	20.71	17.00	17.11	16.91
		RB25#0	20.86	20.87	20.81	17.06	17.07	17.01
	16QAM	RB1#0	20.79	21.16	20.84	16.99	17.36	17.04
		RB1#13	20.77	21.17	20.82	16.97	17.37	17.02
		RB1#24	20.73	21.20	20.82	16.93	17.40	17.02
		RB15#0	20.00	19.80	19.90	16.20	16.00	16.10
		RB15#10	19.85	19.89	19.72	16.05	16.09	15.92
		RB25#0	19.92	19.88	19.81	16.12	16.08	16.01
10.0	QPSK	RB1#0	21.89	21.88	21.90	18.09	18.08	18.10
		RB1#25	21.90	21.90	21.83	18.10	18.10	18.03
		RB1#49	21.87	21.87	21.75	18.07	18.07	17.95
		RB25#0	20.98	20.85	20.87	17.18	17.05	17.07
		RB25#25	20.90	20.94	20.73	17.10	17.14	16.93
		RB50#0	20.96	20.95	20.84	17.16	17.15	17.04
	16QAM	RB1#0	21.44	21.01	20.88	17.64	17.21	17.08
		RB1#25	21.45	21.04	20.84	17.65	17.24	17.04
		RB1#49	21.43	21.01	20.79	17.63	17.21	16.99
		RB25#0	20.03	19.89	19.99	16.23	16.09	16.19
		RB25#25	19.96	20.00	19.85	16.16	16.20	16.05
		RB50#0	19.96	19.95	19.86	16.16	16.15	16.06

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

LTE Band 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	22.16	22.11	22.22	17.97	17.92	18.03
		RB1#3	22.14	22.08	22.18	17.95	17.89	17.99
		RB1#5	22.15	22.09	22.22	17.96	17.90	18.03
		RB3#0	22.21	22.15	22.31	18.02	17.96	18.12
		RB3#3	22.20	22.12	22.34	18.01	17.93	18.15
		RB6#0	21.17	21.15	21.26	16.98	16.96	17.07
	16QAM	RB1#0	21.20	21.31	21.33	17.01	17.12	17.14
		RB1#3	21.21	21.31	21.31	17.02	17.12	17.12
		RB1#5	21.23	21.26	21.35	17.04	17.07	17.16
		RB3#0	21.32	21.10	21.34	17.13	16.91	17.15
		RB3#3	21.37	21.12	21.33	17.18	16.93	17.14
		RB6#0	20.17	20.18	20.19	15.98	15.99	16.00
3.0	QPSK	RB1#0	22.26	22.08	22.18	18.07	17.89	17.99
		RB1#8	22.15	22.07	22.23	17.96	17.88	18.04
		RB1#14	22.14	22.07	22.24	17.95	17.88	18.05
		RB6#0	21.18	21.14	21.24	16.99	16.95	17.05
		RB6#9	21.15	21.13	21.25	16.96	16.94	17.06
		RB15#0	21.19	21.11	21.24	17.00	16.92	17.05
	16QAM	RB1#0	21.81	21.29	21.26	17.62	17.10	17.07
		RB1#8	21.68	21.23	21.30	17.49	17.04	17.11
		RB1#14	21.67	21.23	21.37	17.48	17.04	17.18
		RB6#0	20.27	20.13	20.19	16.08	15.94	16.00
		RB6#9	20.24	20.20	20.17	16.05	16.01	15.98
		RB15#0	20.26	20.08	20.31	16.07	15.89	16.12

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	22.36	22.15	22.20	18.17	17.96	18.01
		RB1#13	22.33	22.14	22.26	18.14	17.95	18.07
		RB1#24	22.31	22.17	22.35	18.12	17.98	18.16
		RB15#0	21.22	21.10	21.31	17.03	16.91	17.12
		RB15#10	21.18	21.16	21.26	16.99	16.97	17.07
		RB25#0	21.22	21.12	21.26	17.03	16.93	17.07
	16QAM	RB1#0	21.13	21.43	21.25	16.94	17.24	17.06
		RB1#13	21.09	21.42	21.29	16.90	17.23	17.10
		RB1#24	21.08	21.45	21.36	16.89	17.26	17.17
		RB15#0	20.25	20.10	20.30	16.06	15.91	16.11
		RB15#10	20.25	20.14	20.24	16.06	15.95	16.05
		RB25#0	20.29	20.13	20.27	16.10	15.94	16.08
10.0	QPSK	RB1#0	22.25	22.16	22.11	18.06	17.97	17.92
		RB1#25	22.16	22.17	22.21	17.97	17.98	18.02
		RB1#49	22.17	22.21	22.25	17.98	18.02	18.06
		RB25#0	21.13	21.00	21.20	16.94	16.81	17.01
		RB25#25	21.23	21.14	21.19	17.04	16.95	17.00
		RB50#0	21.19	21.09	21.19	17.00	16.90	17.00
	16QAM	RB1#0	21.80	21.32	21.12	17.61	17.13	16.93
		RB1#25	21.68	21.31	21.20	17.49	17.12	17.01
		RB1#49	21.66	21.37	21.28	17.47	17.18	17.09
		RB25#0	20.18	20.05	20.26	15.99	15.86	16.07
		RB25#25	20.31	20.15	20.27	16.12	15.96	16.08
		RB50#0	20.20	20.11	20.19	16.01	15.92	16.00

Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBd) - Cable Loss(dB)
For Band12: Antenna Gain = -1.54dBi = -3.69dBd (0dBd=2.15dBi)
Cable Loss=0.5dB* (provided by the applicant)
Limit: ERP≤34.77dBm

LTE Band 41:

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
5.0	QPSK	RB1#0	21.46	21.64	21.79	22.80	22.98	23.13
		RB1#13	21.43	21.60	21.79	22.77	22.94	23.13
		RB1#24	21.42	21.64	21.82	22.76	22.98	23.16
		RB15#0	21.43	21.60	21.83	22.77	22.94	23.17
		RB15#10	21.37	21.55	21.80	22.71	22.89	23.14
		RB25#0	21.39	21.56	21.81	22.73	22.90	23.15
	16QAM	RB1#0	21.60	21.60	21.85	22.94	22.94	23.19
		RB1#13	21.60	21.58	21.85	22.94	22.92	23.19
		RB1#24	21.64	21.57	21.87	22.98	22.91	23.21
		RB15#0	21.45	21.52	21.84	22.79	22.86	23.18
		RB15#10	21.39	21.48	21.82	22.73	22.82	23.16
		RB25#0	21.37	21.59	21.85	22.71	22.93	23.19
10.0	QPSK	RB1#0	21.40	21.55	21.82	22.74	22.89	23.16
		RB1#25	21.46	21.63	21.81	22.80	22.97	23.15
		RB1#49	21.43	21.57	21.84	22.77	22.91	23.18
		RB25#0	21.42	21.51	21.81	22.76	22.85	23.15
		RB25#25	21.36	21.58	21.79	22.70	22.92	23.13
		RB50#0	21.43	21.57	21.83	22.77	22.91	23.17
	16QAM	RB1#0	21.58	21.46	21.96	22.92	22.80	23.30
		RB1#25	21.59	21.52	21.97	22.93	22.86	23.31
		RB1#49	21.63	21.49	21.96	22.97	22.83	23.30
		RB25#0	21.42	21.58	21.84	22.76	22.92	23.18
		RB25#25	21.40	21.64	21.84	22.74	22.98	23.18
		RB50#0	21.38	21.57	21.82	22.72	22.91	23.16

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	21.28	21.47	21.73	22.62	22.81	23.07
		RB1#38	21.44	21.60	21.89	22.78	22.94	23.23
		RB1#74	21.33	21.52	21.78	22.67	22.86	23.12
		RB36#0	21.35	21.48	21.79	22.69	22.82	23.13
		RB36#39	21.33	21.56	21.78	22.67	22.90	23.12
		RB75#0	21.38	21.52	21.78	22.72	22.86	23.12
	16QAM	RB1#0	21.47	21.40	21.94	22.81	22.74	23.28
		RB1#38	21.61	21.55	22.05	22.95	22.89	23.39
		RB1#74	21.53	21.47	21.96	22.87	22.81	23.30
		RB36#0	21.33	21.48	21.87	22.67	22.82	23.21
		RB36#39	21.31	21.53	21.87	22.65	22.87	23.21
		RB75#0	21.33	21.51	21.78	22.67	22.85	23.12
20.0	QPSK	RB1#0	21.23	21.36	21.75	22.57	22.70	23.09
		RB1#50	21.43	21.59	21.98	22.77	22.93	23.32
		RB1#99	21.34	21.48	21.84	22.68	22.82	23.18
		RB50#0	21.43	21.54	21.82	22.77	22.88	23.16
		RB50#50	21.36	21.56	21.82	22.70	22.90	23.16
		RB100#0	21.41	21.52	21.79	22.75	22.86	23.13
	16QAM	RB1#0	21.33	21.36	21.98	22.67	22.70	23.32
		RB1#50	21.49	21.59	22.18	22.83	22.93	23.52
		RB1#99	21.42	21.46	22.08	22.76	22.80	23.42
		RB50#0	21.42	21.57	21.85	22.76	22.91	23.19
		RB50#50	21.34	21.60	21.84	22.68	22.94	23.18
		RB100#0	21.38	21.54	21.77	22.72	22.88	23.11

Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi)
For Band 41: Antenna Gain = 1.34dBi
Limit: EIRP≤33dBm

Peak-to-average ratio (PAR)

Cellular Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	3.25	13
	Middle	3.37	13
	High	3.41	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	3.27	13
	Middle	3.51	13
	High	3.44	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC	Low	3.18	13
	Middle	3.35	13
	High	3.27	13
HSDPA	Low	4.26	13
	Middle	3.54	13
	High	3.42	13
HSUPA	Low	3.47	13
	Middle	3.52	13
	High	3.59	13
HSPA+	Low	3.35	13
	Middle	3.38	13
	High	3.46	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	3.35	13
	Middle	3.25	13
	High	3.46	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	3.28	13
	Middle	3.27	13
	High	3.49	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC	Low	3.26	13
	Middle	3.25	13
	High	3.52	13
HSDPA	Low	4.43	13
	Middle	4.22	13
	High	4.45	13
HSUPA	Low	3.48	13
	Middle	3.53	13
	High	3.61	13
HSPA+	Low	3.39	13
	Middle	3.27	13
	High	3.52	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	5.38	5.22	13	Pass
QPSK (100RB Size)	5.77	5.87	5.74	13	Pass
16QAM (1RB Size)	6.09	6.79	6.47	13	Pass
16QAM (100RB Size)	6.57	6.60	6.57	13	Pass

LTE Band 5 10MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.22	5.10	4.42	13	Pass
QPSK (50RB Size)	5.51	5.48	5.45	13	Pass
16QAM (1RB Size)	6.28	5.87	5.58	13	Pass
16QAM (50RB Size)	6.41	6.25	6.28	13	Pass

LTE Band 12 10MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.81	5.19	4.87	13	Pass
QPSK (50RB Size)	5.51	5.58	5.51	13	Pass
16QAM (1RB Size)	5.80	6.22	5.80	13	Pass
16QAM (50RB Size)	6.25	6.44	6.41	13	Pass

LTE Band 41 20MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	8.01	7.40	7.28	13	Pass
QPSK (100RB Size)	8.04	8.04	7.40	13	Pass
16QAM (1RB Size)	7.44	8.33	8.49	13	Pass
16QAM (100RB Size)	4.87	2.18	8.08	13	Pass

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

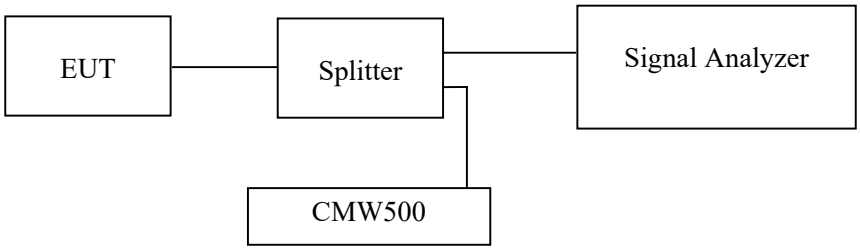
Applicable Standard

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 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Nick Fan from 2022-04-04 to 2022-05-17.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the following tables and plots.

Cellular Band

Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	128	824.2	245.51	317.40
	190	836.6	243.51	315.40
	251	848.8	243.51	313.40
EGPRS(8PSK)	128	824.2	257.49	331.30
	190	836.6	255.49	333.30
	251	848.8	251.50	327.30

Frequency (MHz)		Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)
RMC	826.4	4.13	4.70
	836.6	4.15	4.71
	846.6	4.15	4.69
HSDPA	826.4	4.15	4.69
	836.6	4.15	4.71
	846.6	4.15	4.71
HSUPA	826.4	4.13	4.71
	836.6	4.15	4.69
	846.6	4.17	4.69

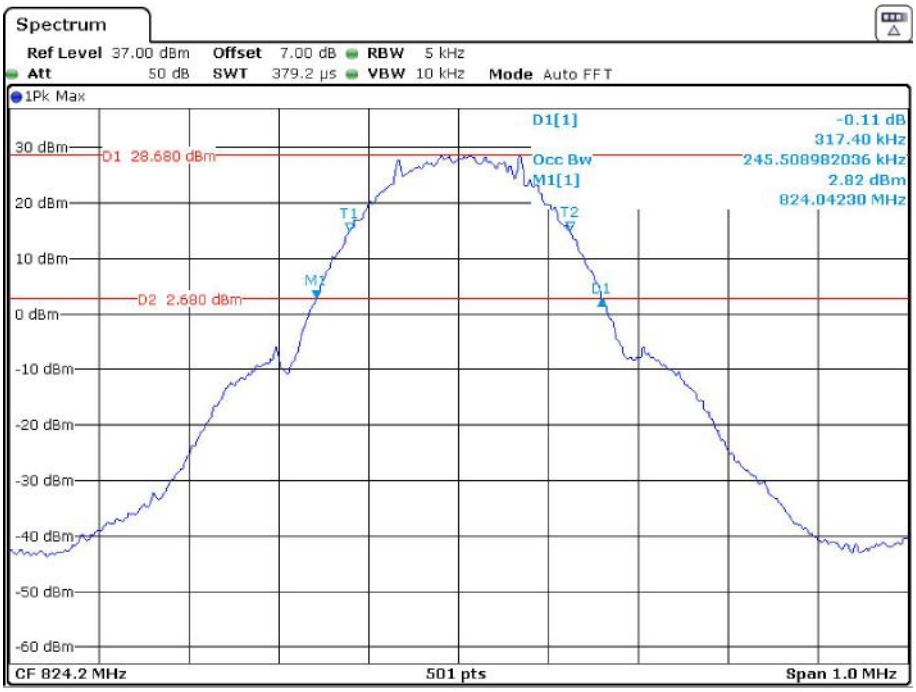
PCS Band

Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	512	1850.2	245.51	317.40
	661	1880.0	243.51	317.40
	810	1909.8	245.51	319.40
EGPRS(8PSK)	512	1850.2	265.47	343.30
	661	1880.0	267.47	347.30
	810	1909.8	265.47	349.30

Frequency (MHz)		Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)
RMC	1852.4	4.15	4.71
	1880.0	4.13	4.69
	1907.6	4.15	4.71
HSDPA	1852.4	4.15	4.73
	1880.0	4.15	4.69
	1907.6	4.15	4.71
HSUPA	1852.4	4.15	4.73
	1880.0	4.17	4.69
	1907.6	4.15	4.73

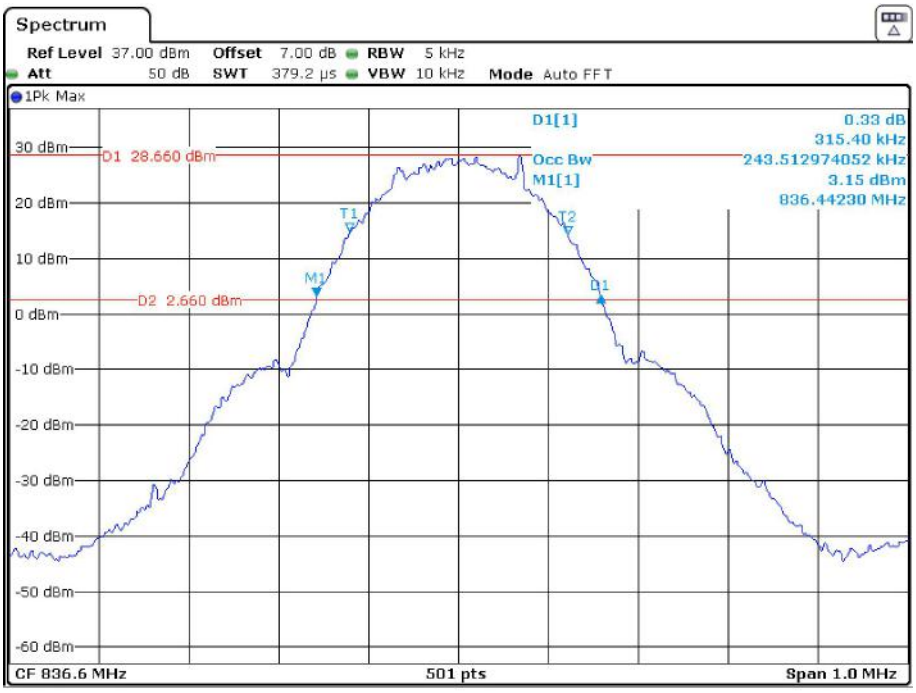
Cellular Band

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



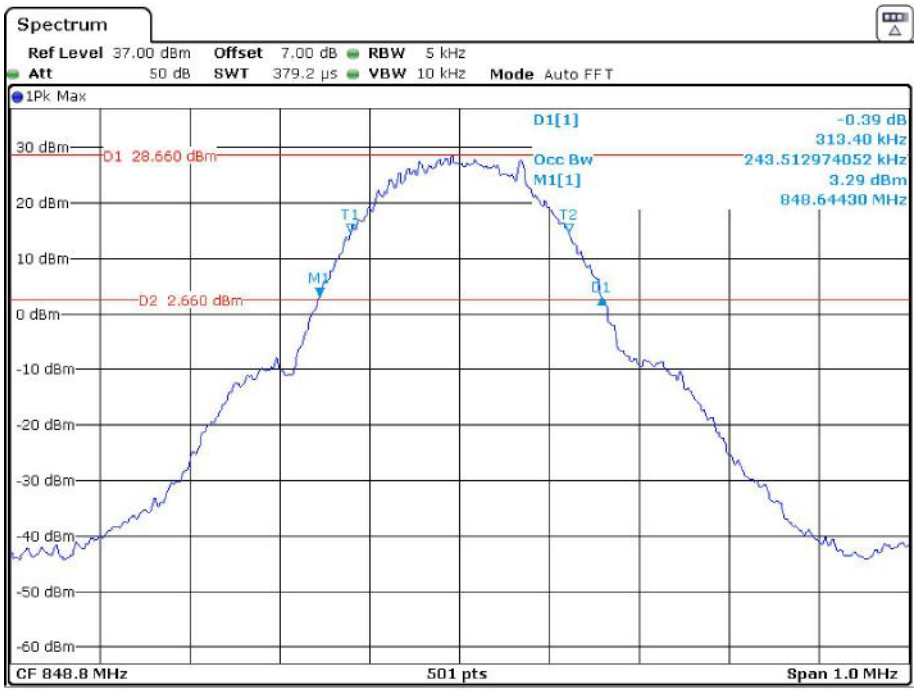
Date: 4.APR.2022 14:10:37

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



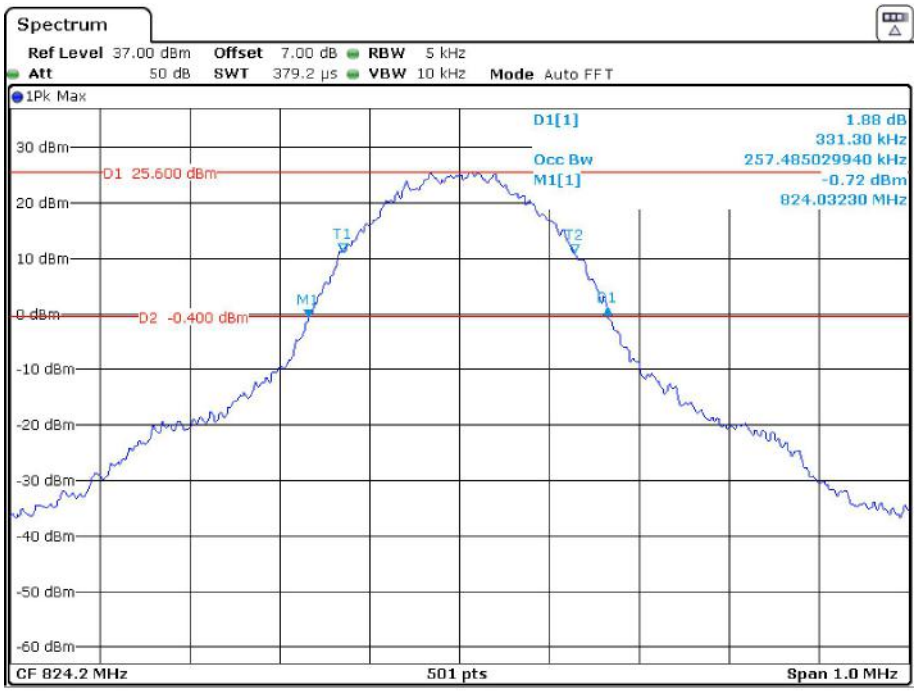
Date: 4.APR.2022 14:11:16

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



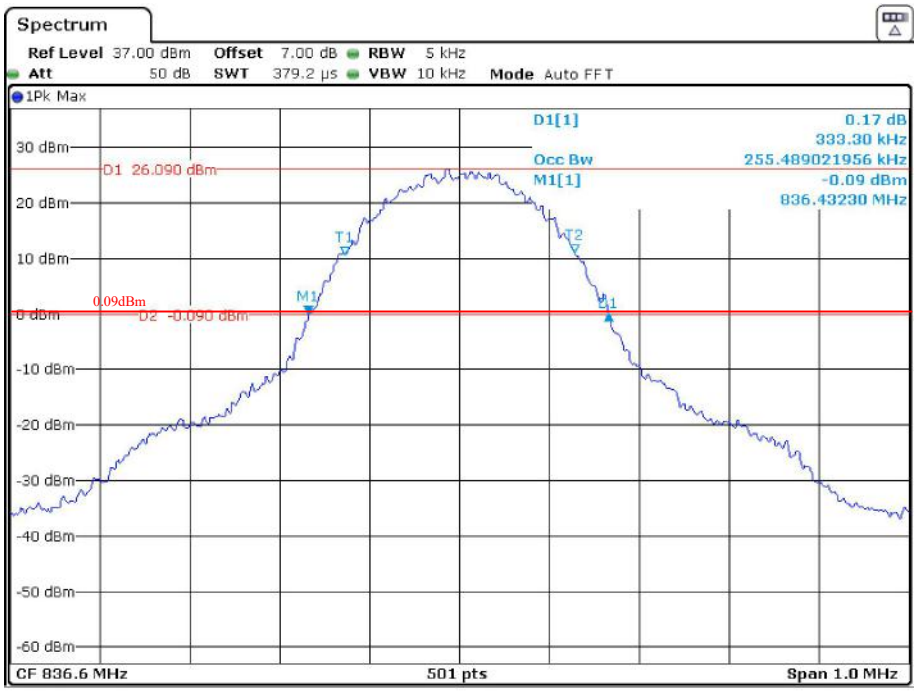
Date: 4.APR.2022 14:11:48

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



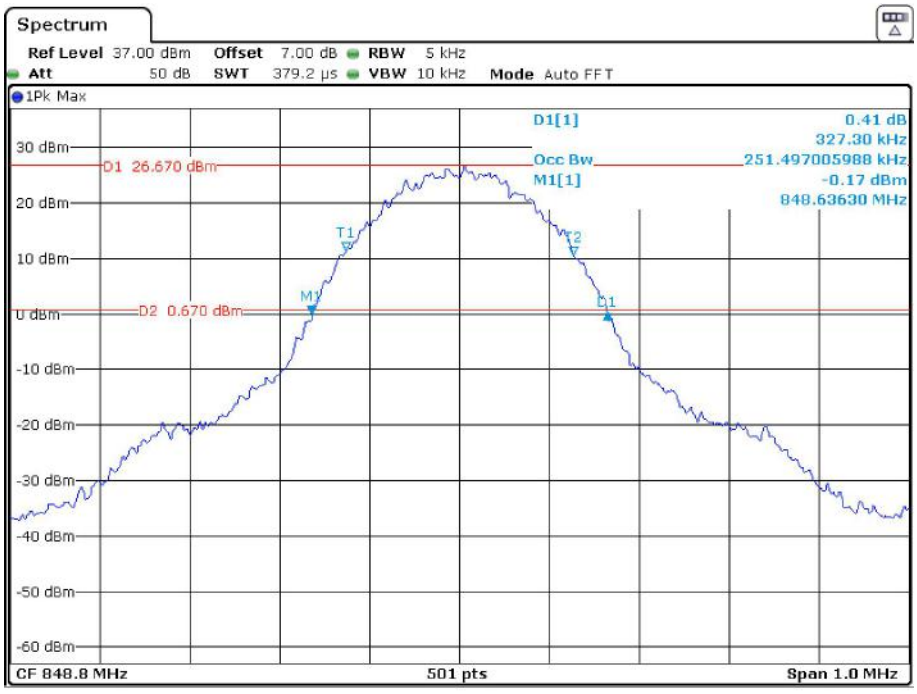
Date: 4.APR.2022 14:19:07

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



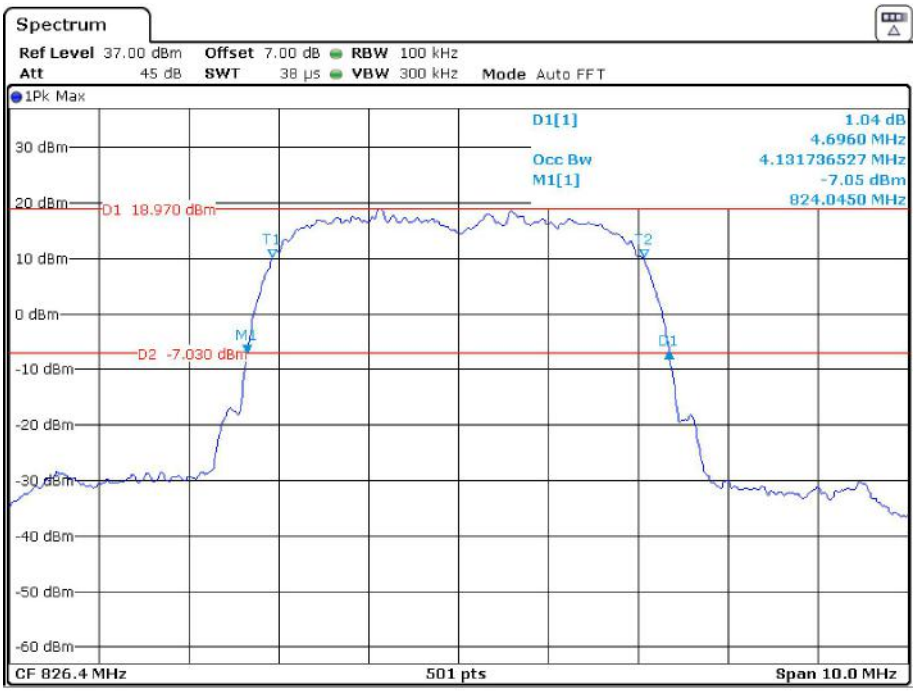
Date: 4.APR.2022 14:19:55

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



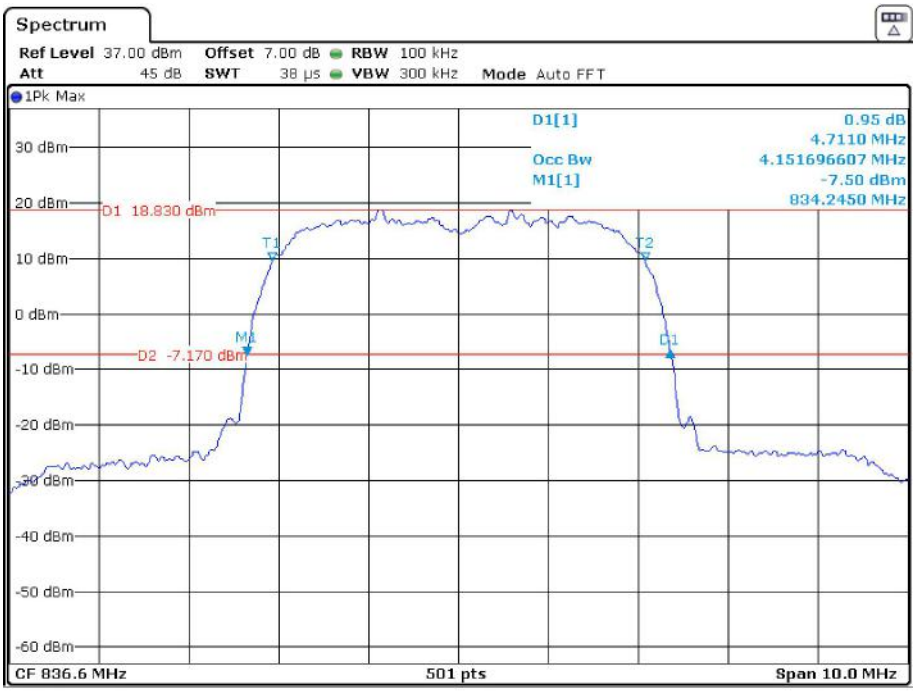
Date: 4.APR.2022 14:20:38

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



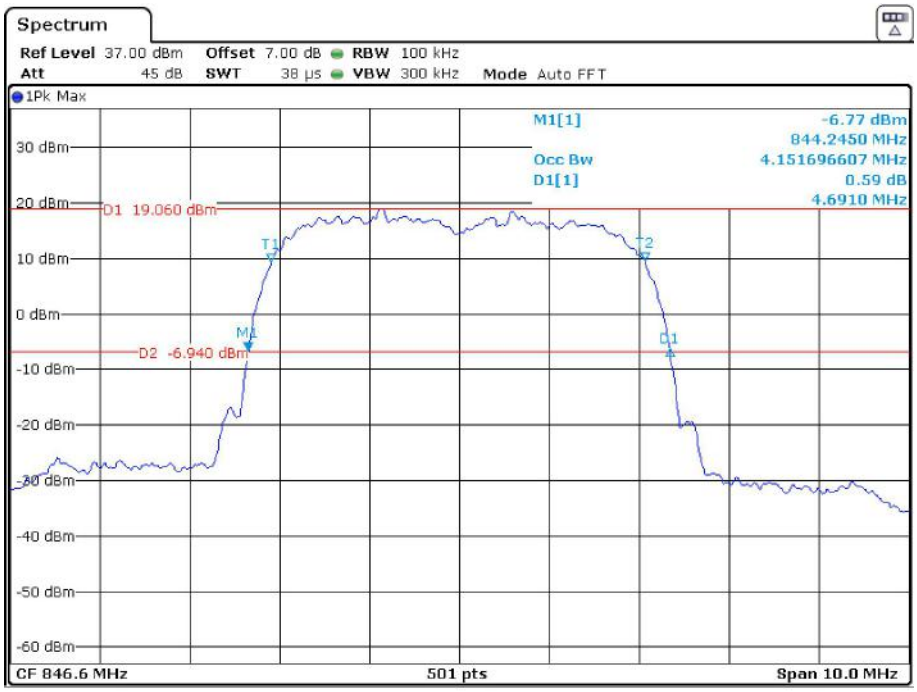
Date: 4.APR.2022 15:06:08

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



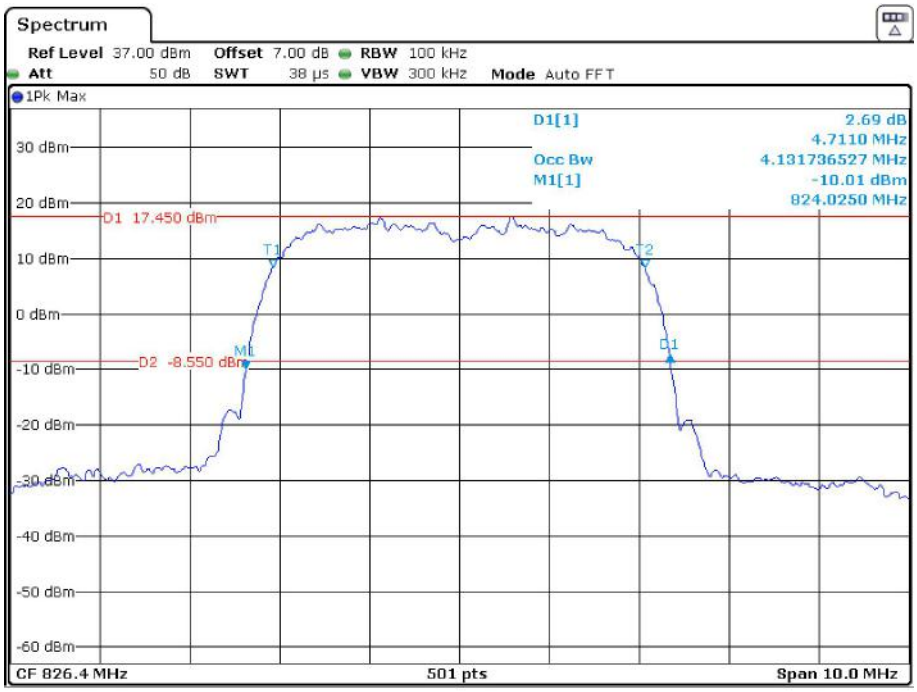
Date: 4.APR.2022 15:06:48

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



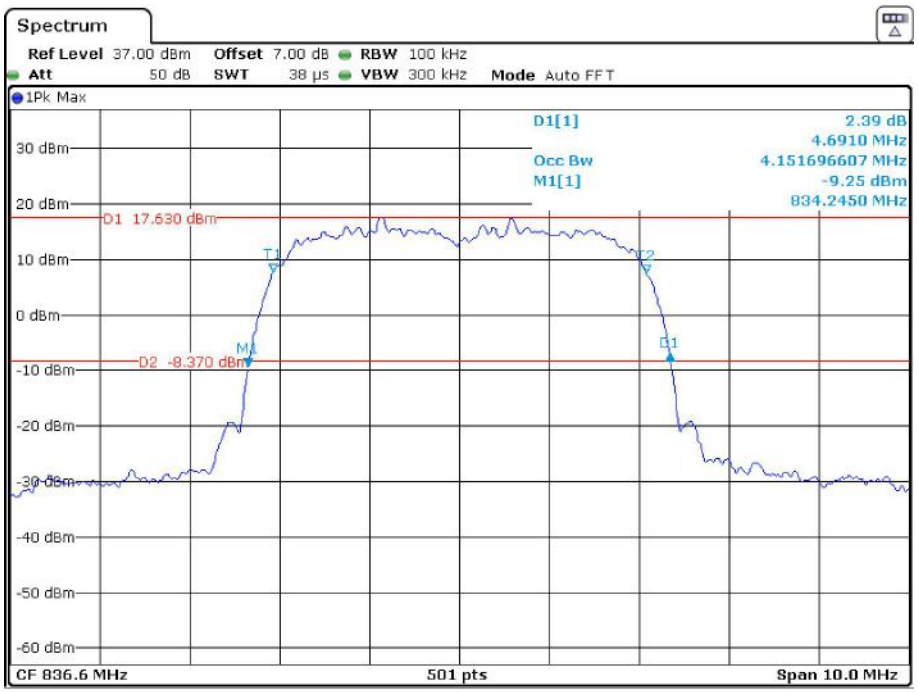
Date: 4.APR.2022 15:07:39

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



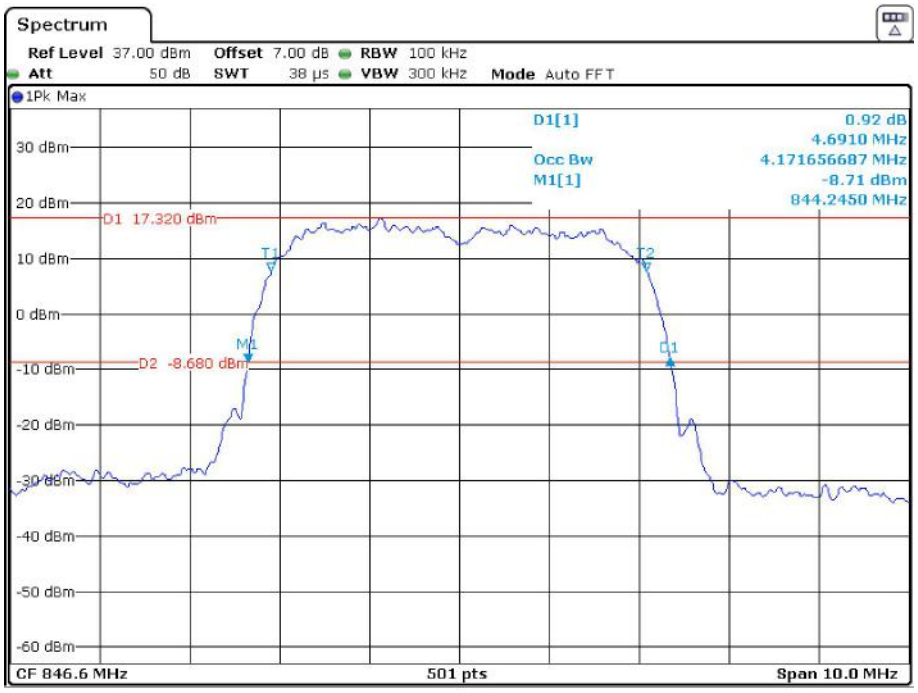
Date: 4.APR.2022 15:21:35

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



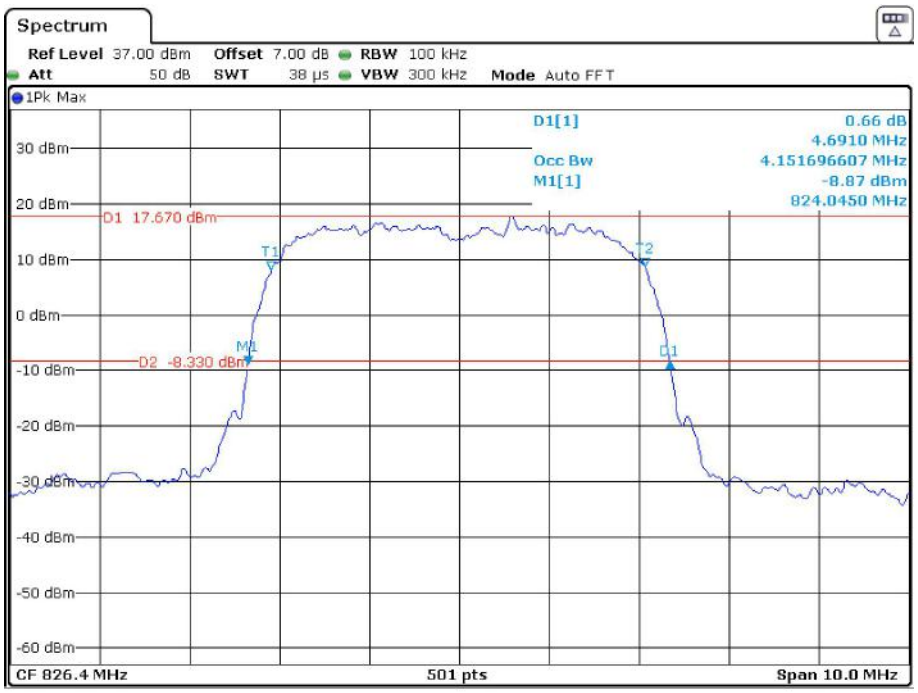
Date: 4.APR.2022 15:20:16

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



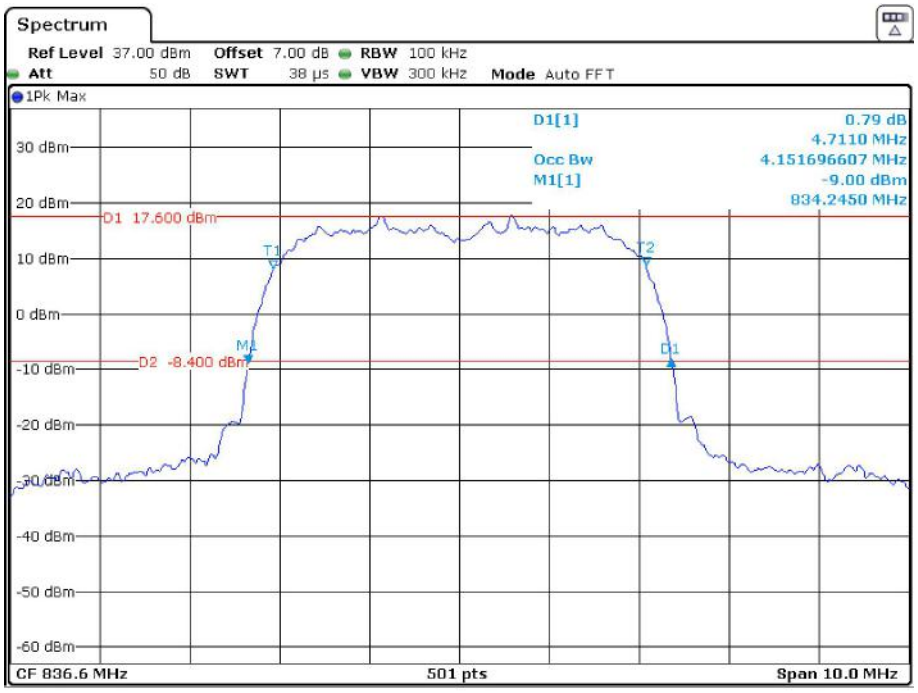
Date: 4.APR.2022 15:19:44

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



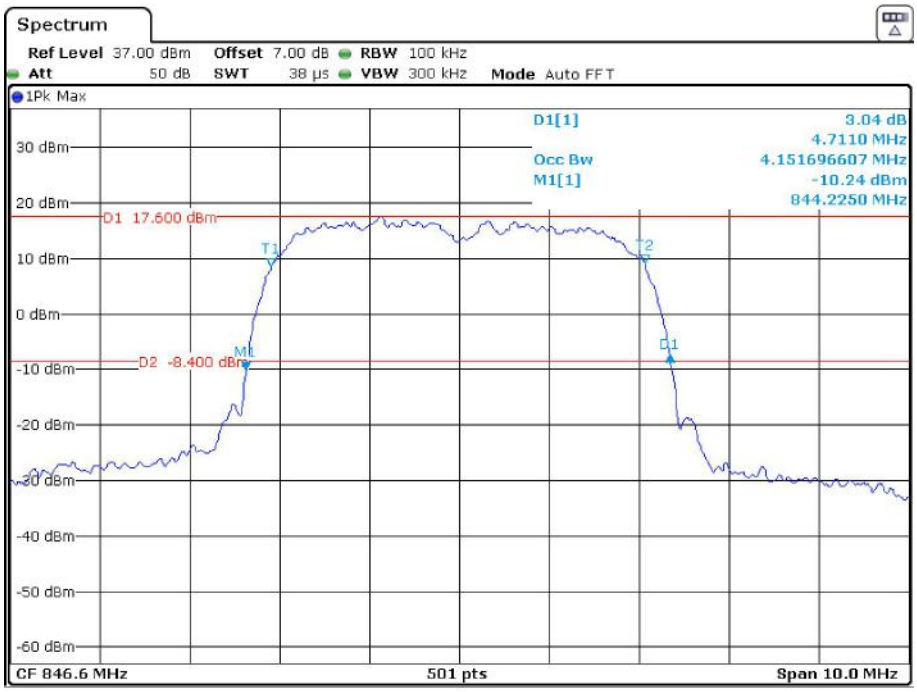
Date: 4.APR.2022 15:14:28

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



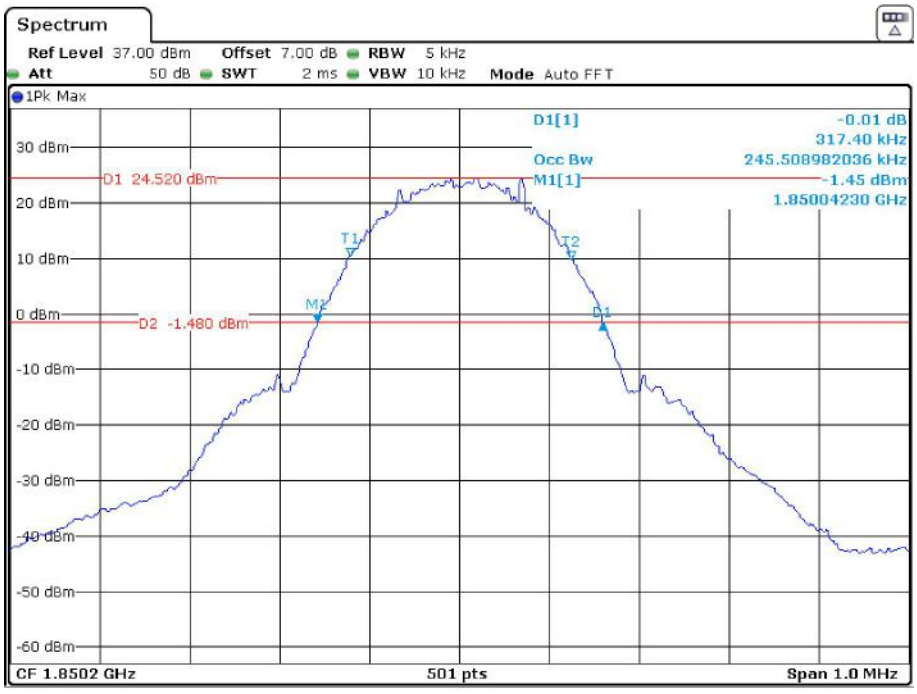
Date: 4.APR.2022 15:15:03

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

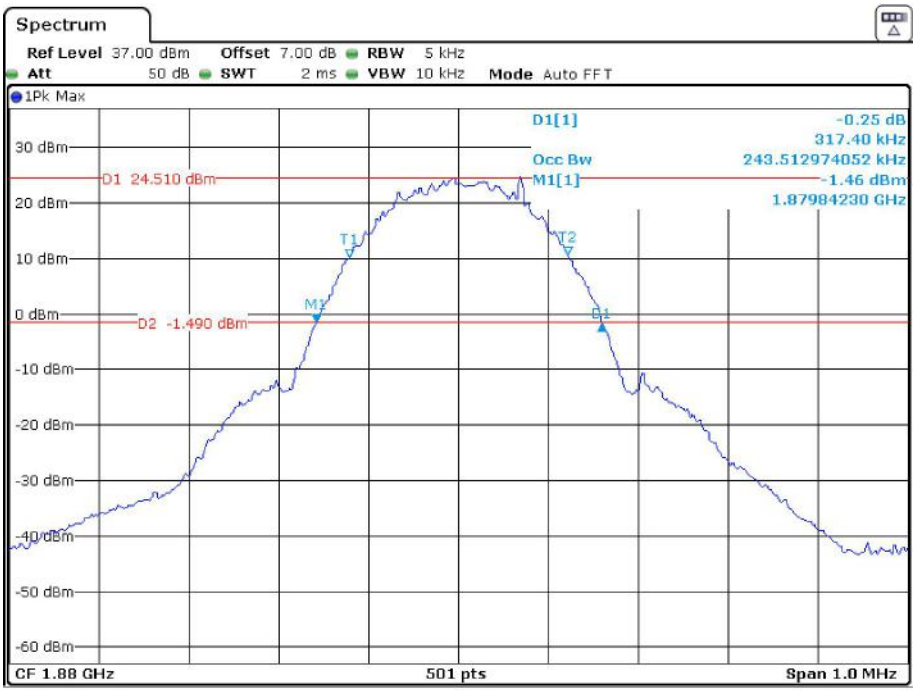


PCS Band

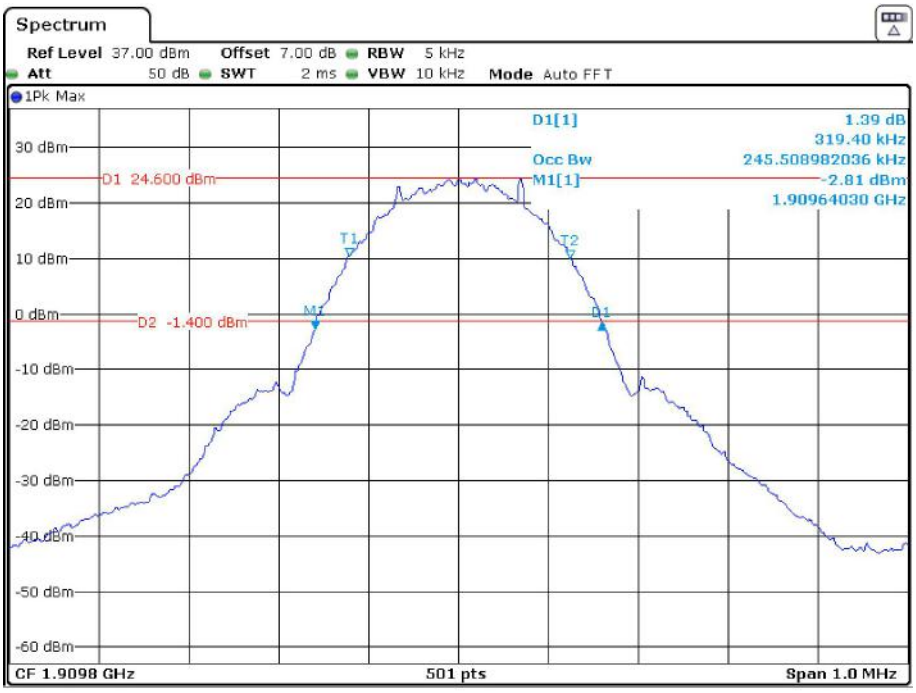
26 dB Emissions &99% Occupied Bandwidth for GSM (GMSK) Mode, Low channel



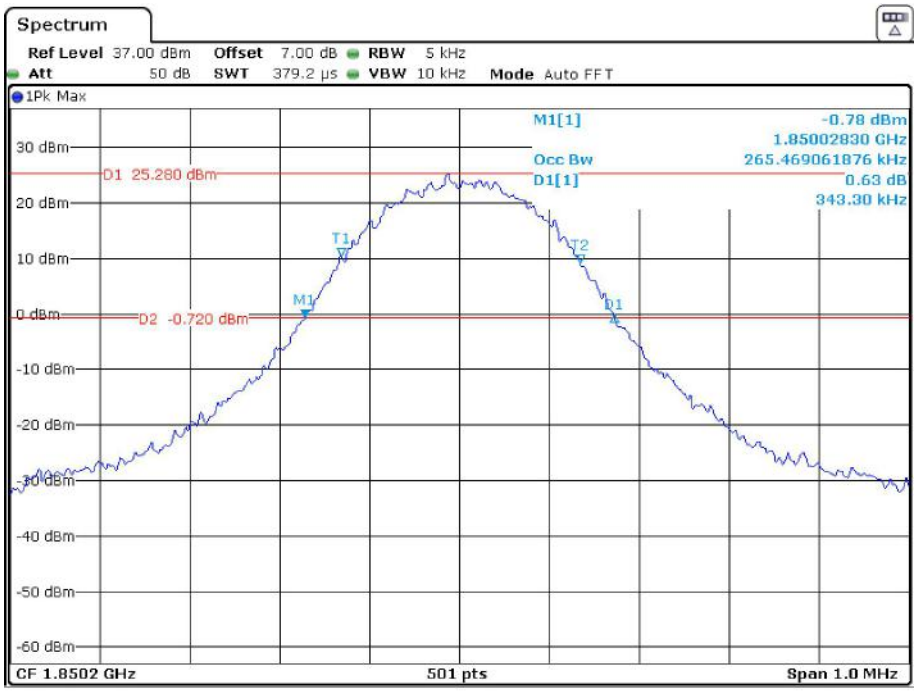
26 dB Emissions &99% Occupied Bandwidth for GSM (GMSK) Mode, Middle channel



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

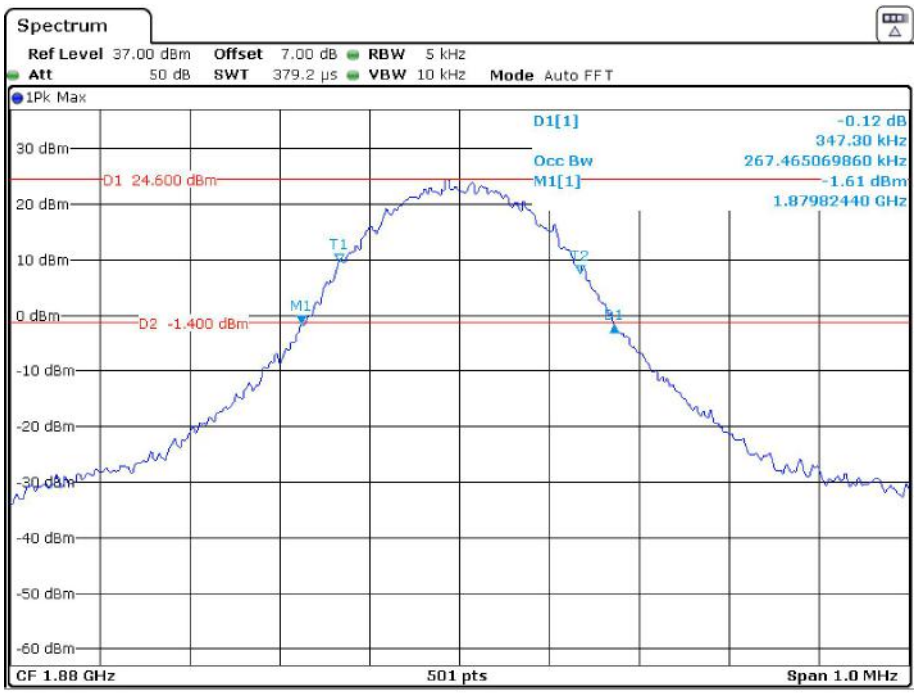


26 dB Emissions &99% Occupied Bandwidth for GSM (8PSK) Mode, Low channel



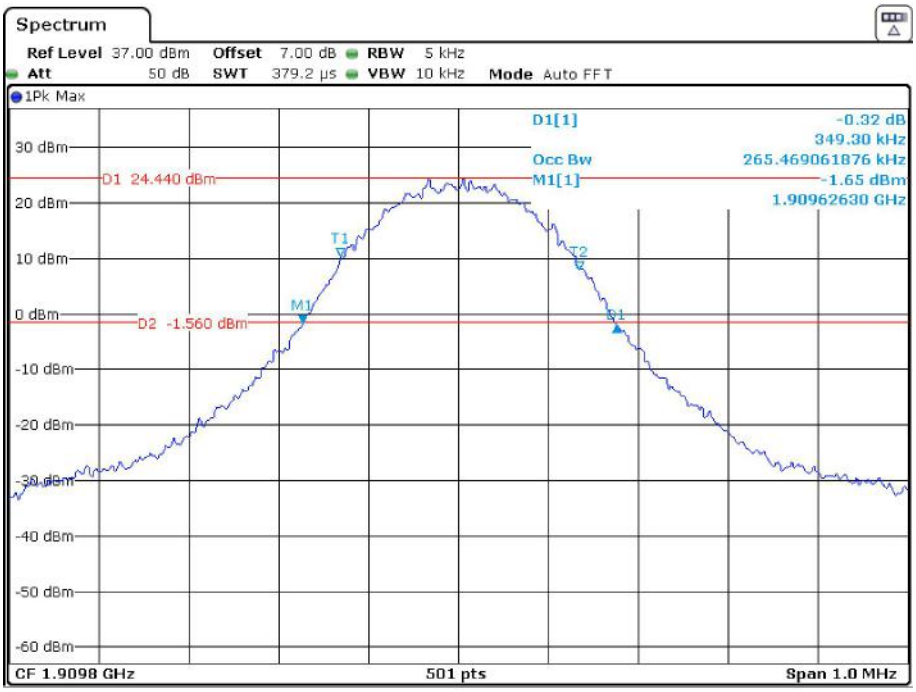
Date: 4.APR.2022 14:35:29

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



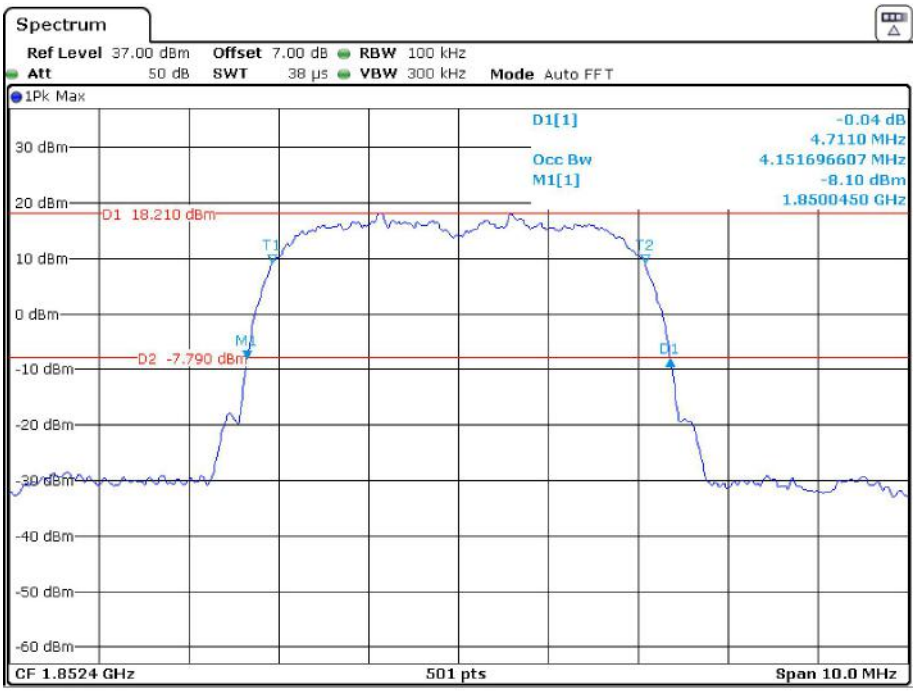
Date: 4.APR.2022 14:36:01

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



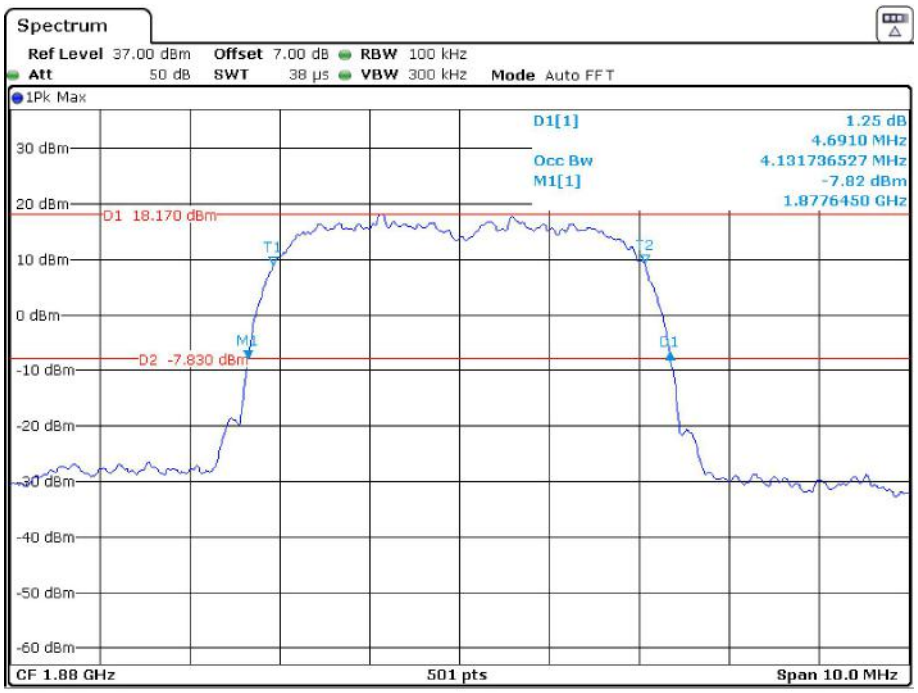
Date: 4.APR.2022 14:37:05

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



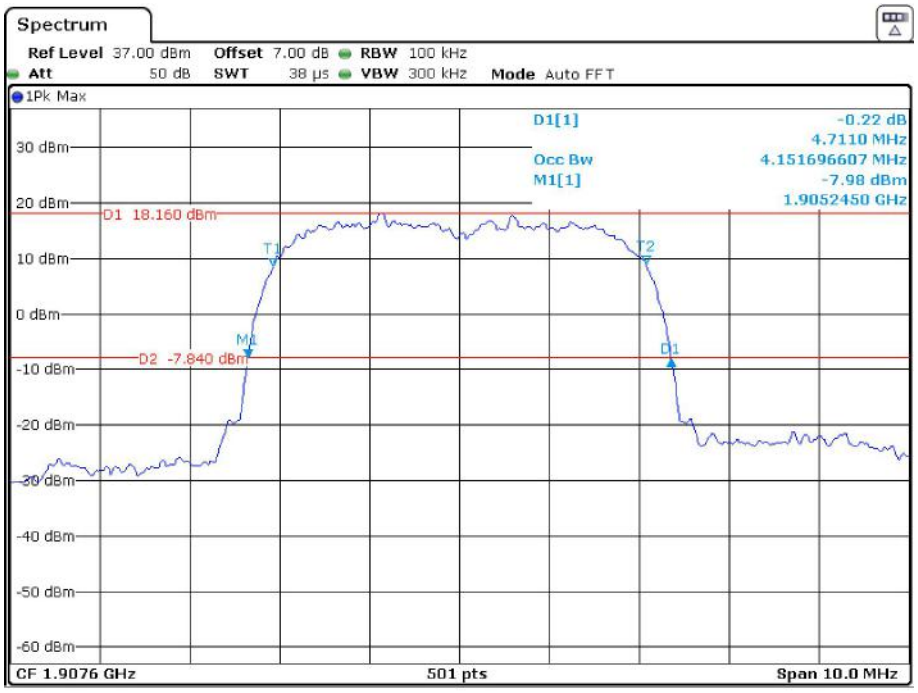
Date: 4.APR.2022 14:47:37

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



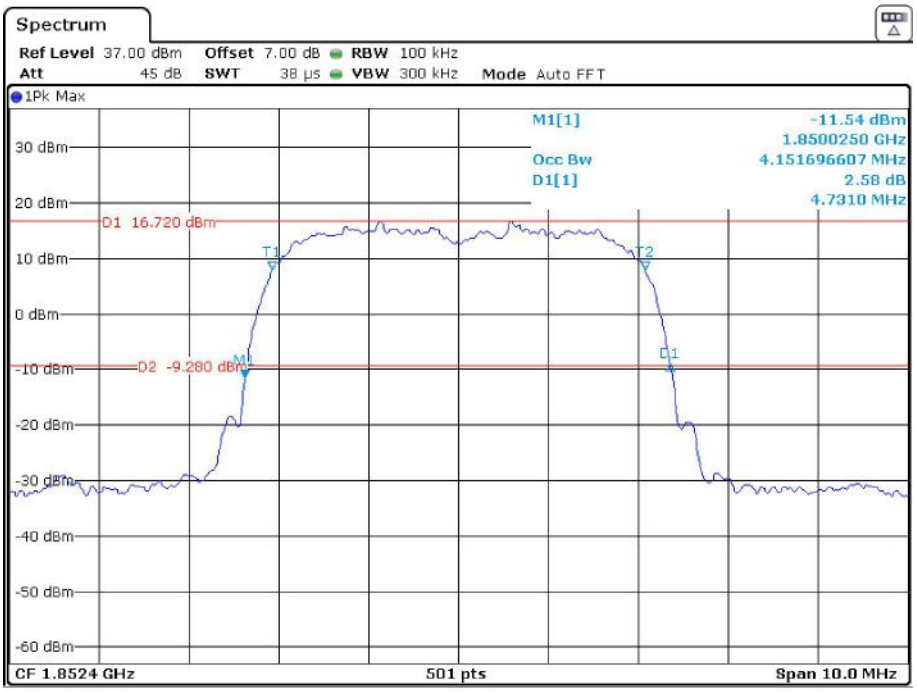
Date: 4.APR.2022 14:47:04

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

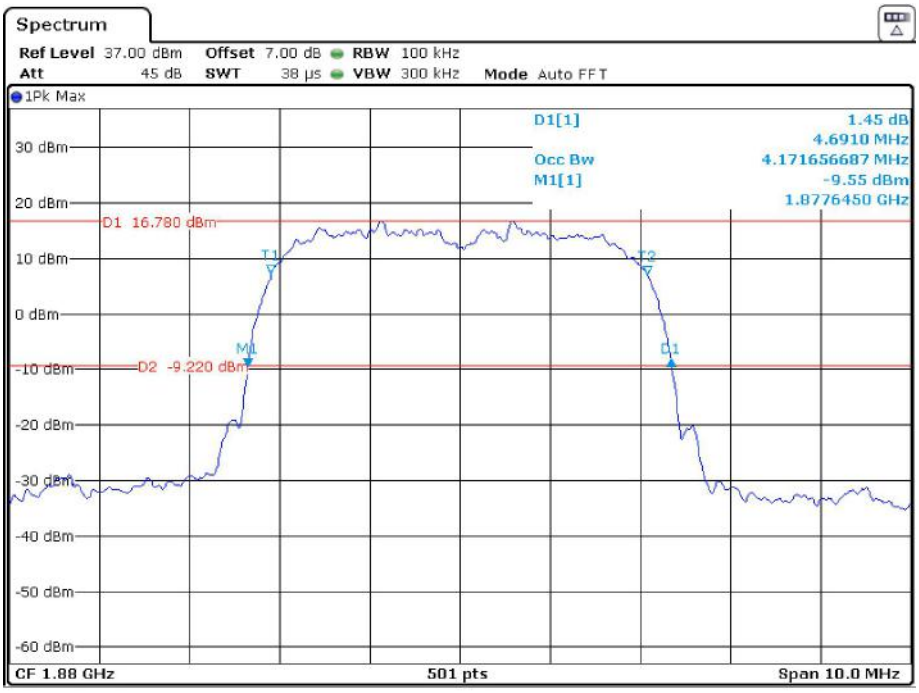


Date: 4.APR.2022 14:46:17

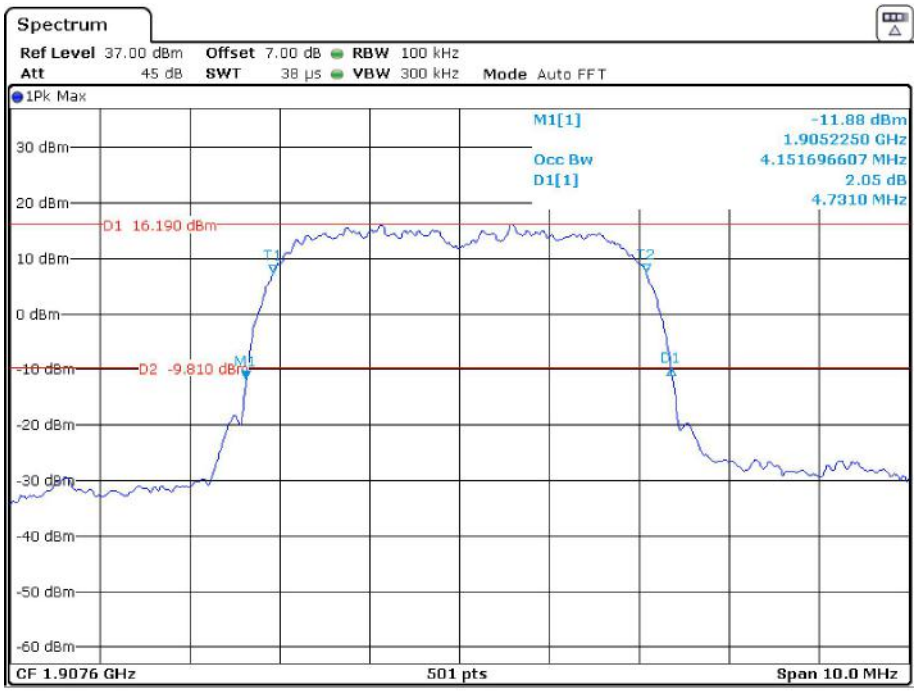
26 dB Emissions &99% Occupied Bandwidth for HSUPA (QPSK) Mode, Low channel



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

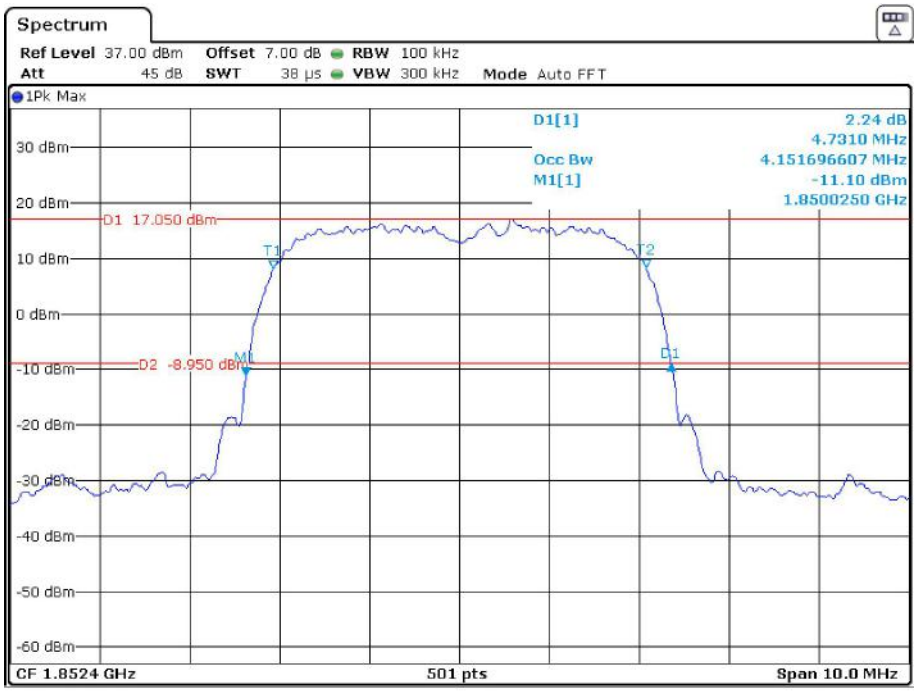


26 dB Emissions &99% Occupied Bandwidth for HSUPA (QPSK) Mode, High channel



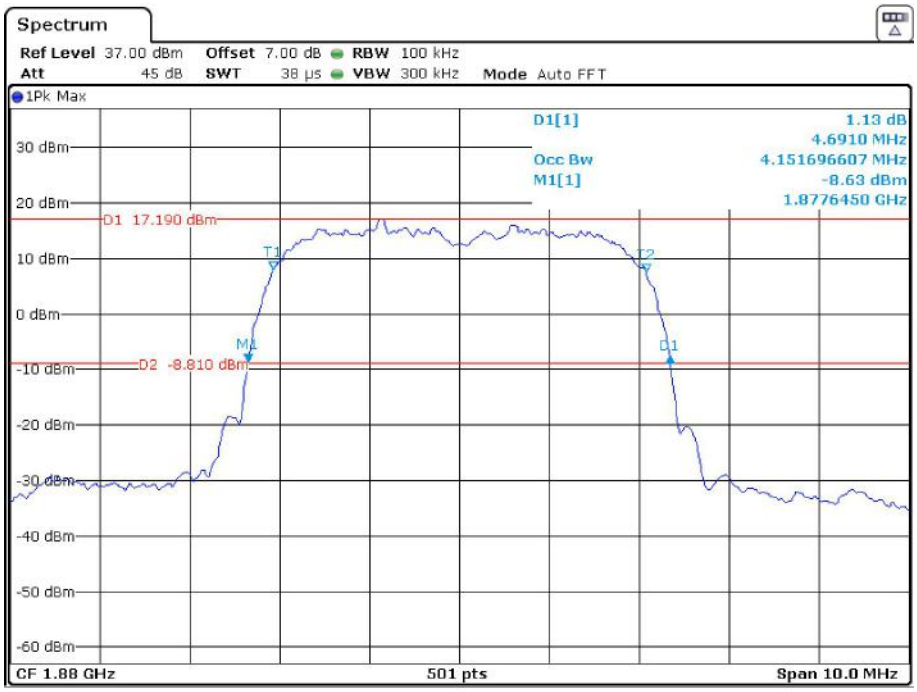
Date: 4.APR.2022 15:02:37

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

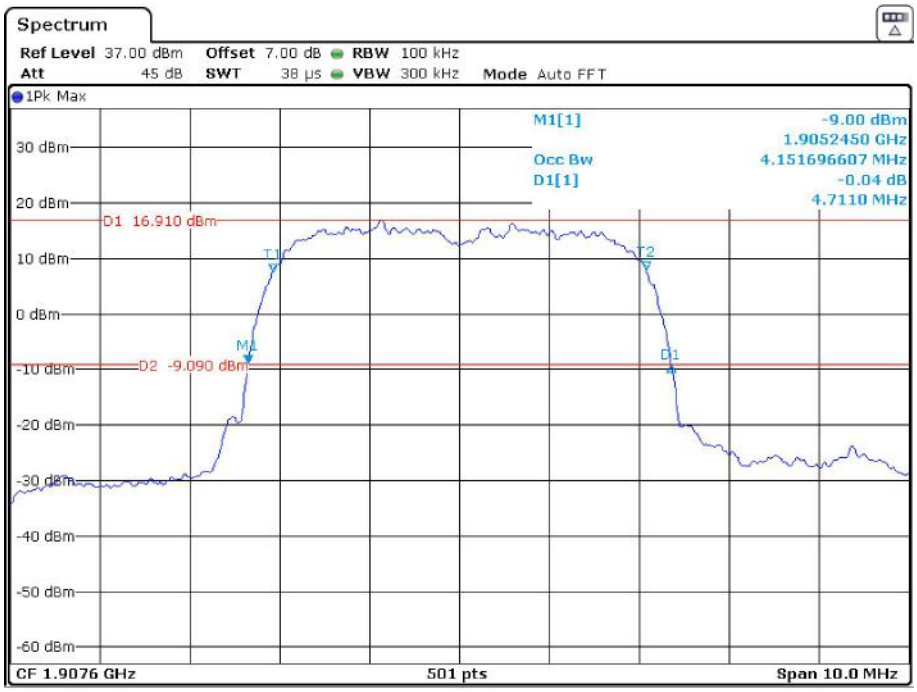


Date: 4.APR.2022 14:54:05

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



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



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	1.092	1.308	1.110	1.320	1.104	1.296
	16QAM	1.110	1.314	1.098	1.284	1.104	1.302
3 MHz	QPSK	2.688	2.892	2.688	2.904	2.688	2.904
	16QAM	2.688	2.916	2.688	2.916	2.688	2.892
5 MHz	QPSK	4.540	5.000	4.520	4.960	4.520	4.960
	16QAM	4.500	4.960	4.520	5.000	4.520	5.000
10 MHz	QPSK	9.000	9.720	9.000	9.600	8.960	9.680
	16QAM	8.960	9.640	8.960	9.600	8.960	9.680
15 MHz	QPSK	13.560	14.820	13.500	14.820	13.500	14.880
	16QAM	13.500	14.820	13.560	14.760	13.560	14.880
20 MHz	QPSK	18.000	19.360	17.920	19.280	18.000	19.440
	16QAM	18.080	19.280	17.920	19.440	18.000	19.360

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	1.308	1.098	1.326	1.104	1.290
	16QAM	1.110	1.314	1.098	1.290	1.104	1.296
3 MHz	QPSK	2.688	2.904	2.688	2.904	2.688	2.916
	16QAM	2.688	2.916	2.688	2.892	2.688	2.916
5 MHz	QPSK	4.520	4.980	4.520	4.980	4.500	4.960
	16QAM	4.520	4.980	4.520	4.940	4.520	4.960
10 MHz	QPSK	8.960	9.680	8.960	9.600	8.920	9.600
	16QAM	8.960	9.600	9.000	9.560	8.920	9.520

LTE Band 12:

Bandwidth	Modulation	Low channel		Middle channel		High channel	
		OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)
1.4 MHz	QPSK	1.098	1.290	1.104	1.320	1.110	1.296
	16QAM	1.110	1.326	1.098	1.290	1.104	1.314
3 MHz	QPSK	2.700	2.880	2.688	2.892	2.688	2.916
	16QAM	2.688	2.892	2.688	2.892	2.688	2.892
5 MHz	QPSK	4.520	4.940	4.520	5.000	4.520	4.940
	16QAM	4.500	4.980	4.520	4.960	4.520	5.000
10 MHz	QPSK	8.960	9.600	8.960	9.680	8.960	9.600
	16QAM	8.920	9.520	8.960	9.680	8.960	9.680

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	5.400	4.520	5.360	4.520	5.060
	16QAM	4.500	5.080	4.520	5.060	4.520	5.000
10 MHz	QPSK	9.000	9.600	9.000	9.600	8.960	9.600
	16QAM	8.960	9.520	8.960	9.480	8.960	9.640
15 MHz	QPSK	13.500	14.880	13.500	15.180	13.500	14.940
	16QAM	13.620	14.940	13.560	14.880	13.500	14.820
20 MHz	QPSK	18.000	19.280	18.000	19.840	18.000	19.600
	16QAM	18.000	19.280	17.920	19.360	18.000	19.520

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

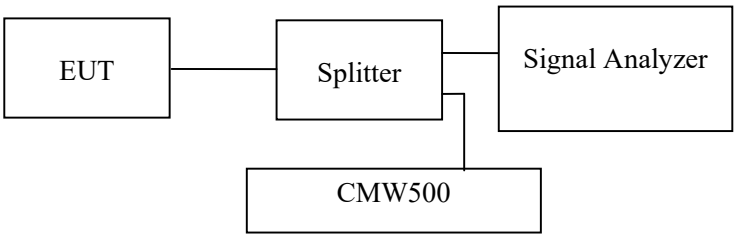
Applicable Standard

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 10^{th} harmonic.



Test Data

Environmental Conditions

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

The testing was performed by Nick Fang from 2022-04-04 to 2022-05-17.

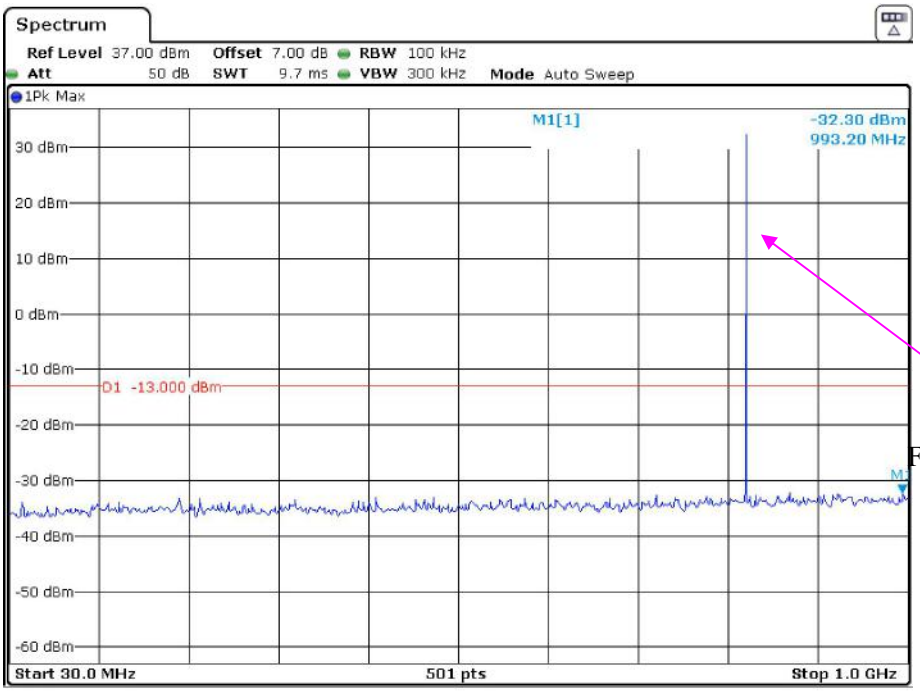
EUT operation mode: Transmitting

Test result: Pass

Please refer to the following plots.

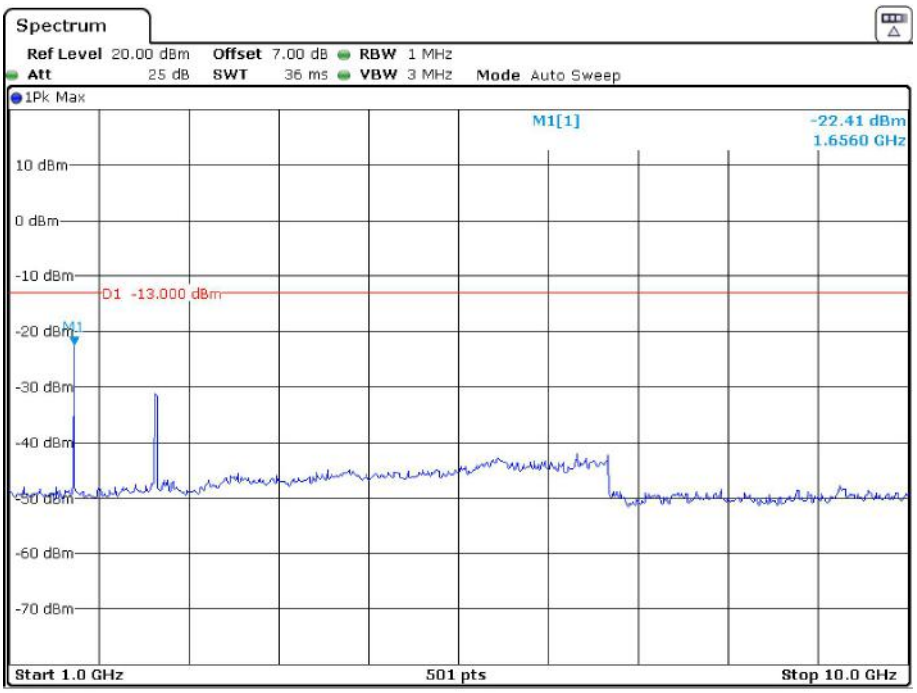
Cellular Band
Low Channel:

30 MHz – 1 GHz (GSM Mode)



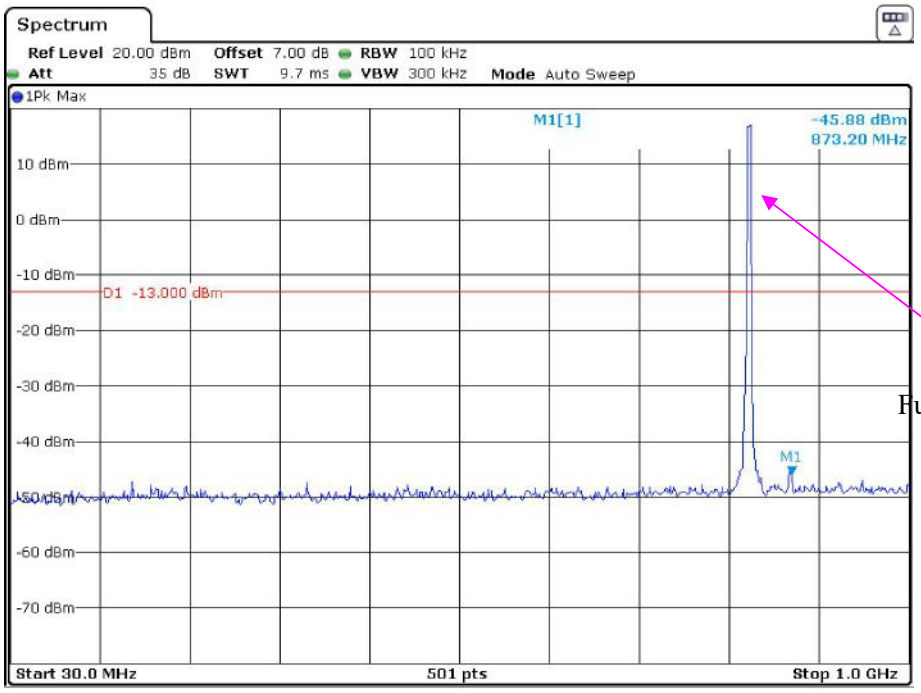
Date: 4.APR.2022 14:15:43

1 GHz – 10 GHz (GSM Mode)



Date: 4.APR.2022 14:17:13

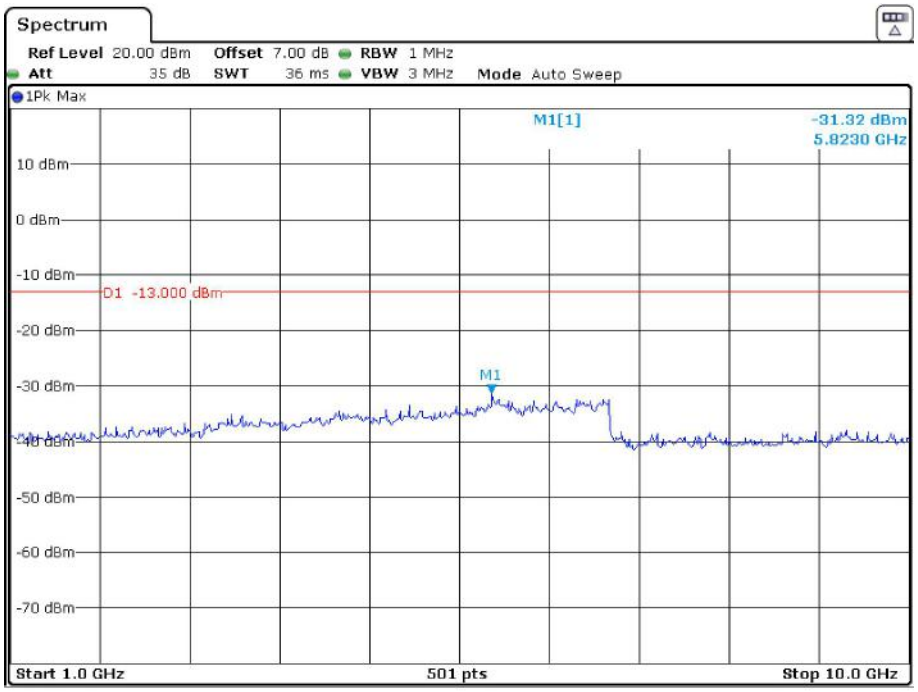
30 MHz – 1 GHz (WCDMA Mode)



Fundamental test

Date: 4.APR.2022 15:11:00

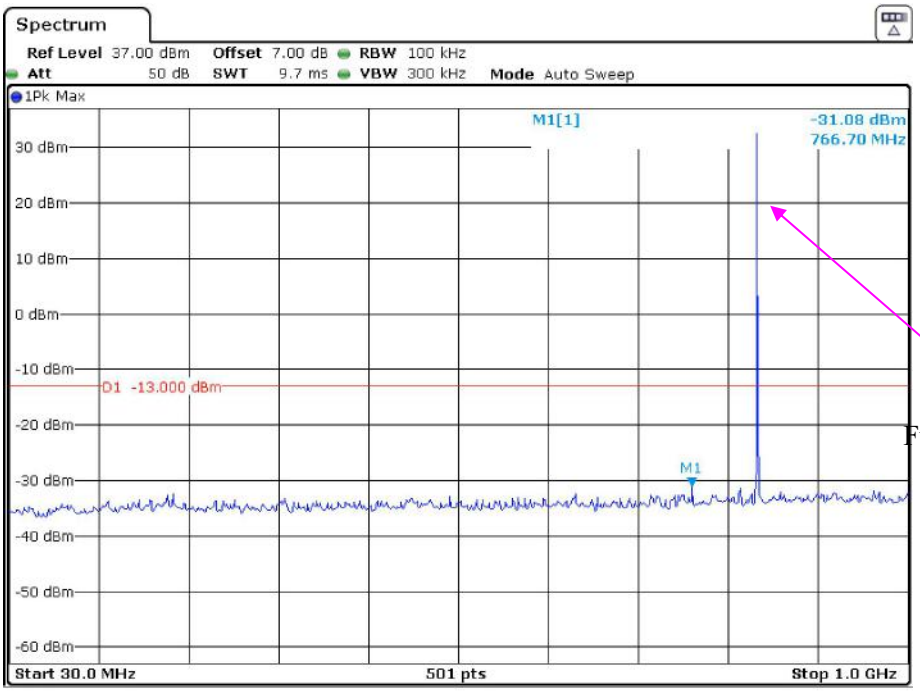
1 GHz – 10 GHz (WCDMA Mode)



Date: 4.APR.2022 15:11:48

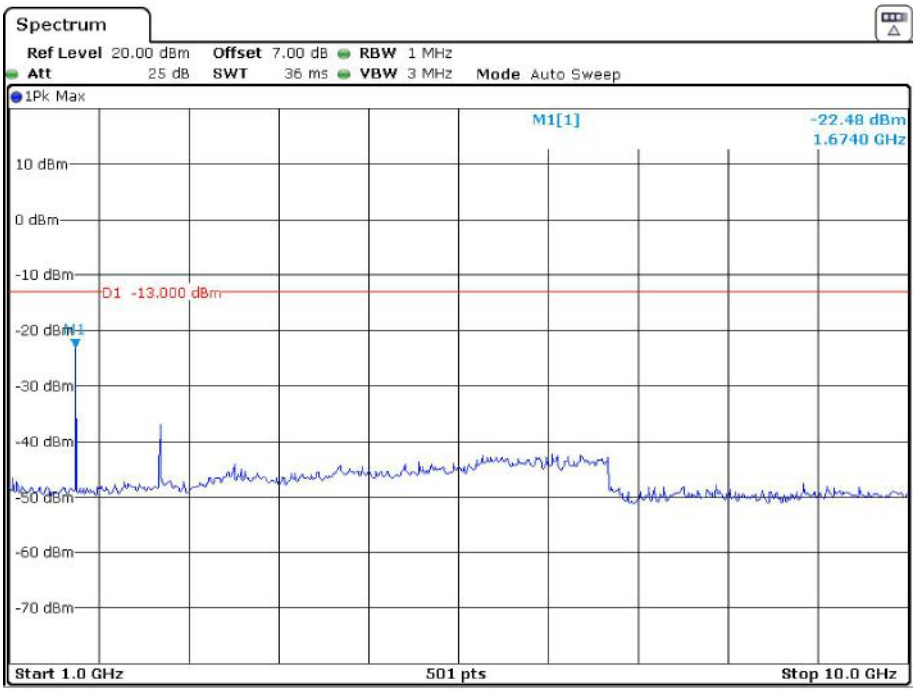
Middle Channel:

30 MHz – 1 GHz (GSM Mode)

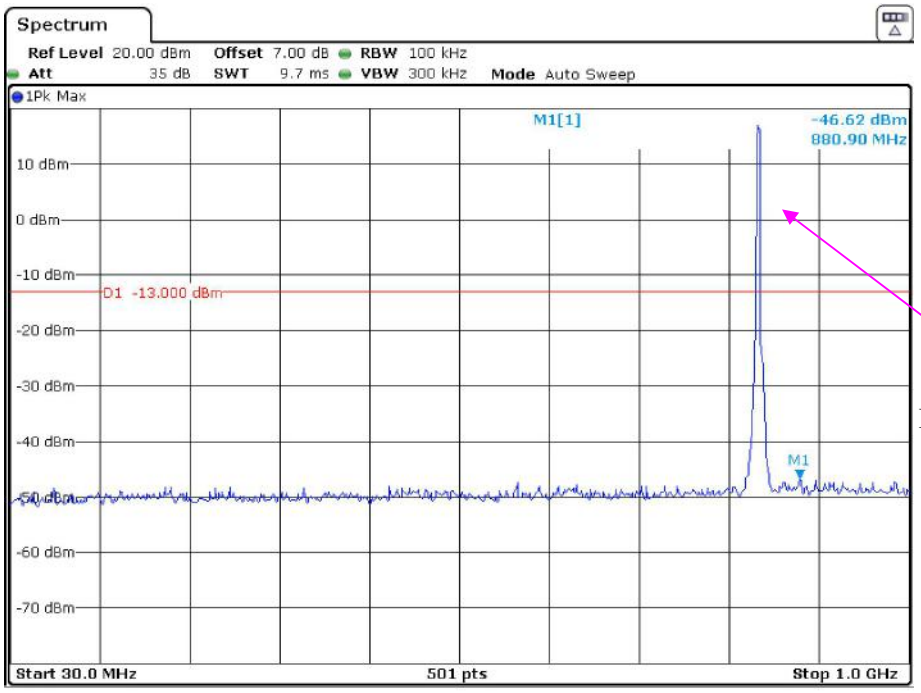


Fundamental test

1 GHz – 10 GHz (GSM Mode)



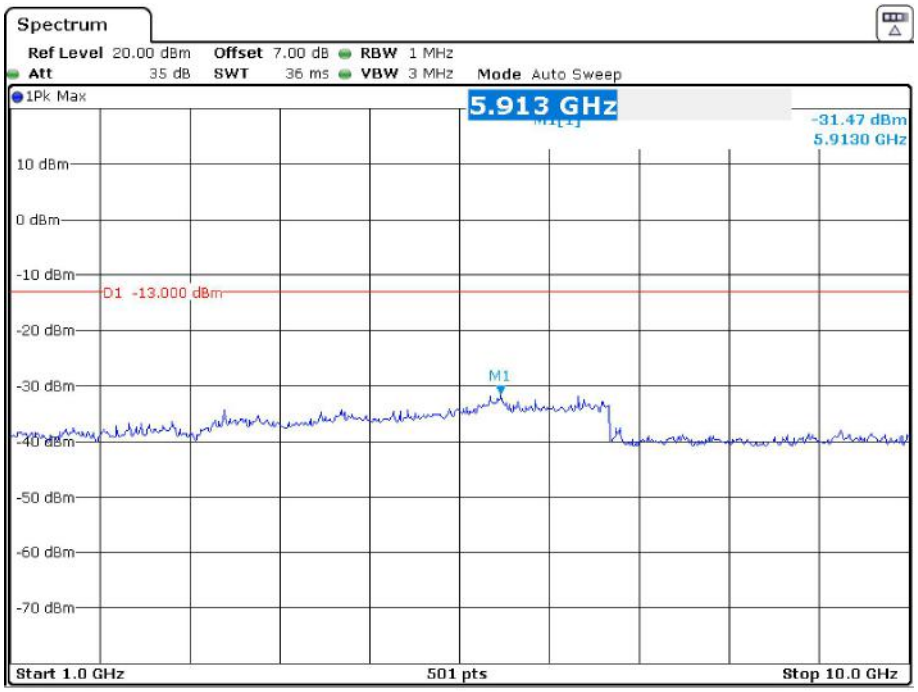
30 MHz – 1 GHz (WCDMA Mode)



Fundamental test

Date: 4.APR.2022 15:10:48

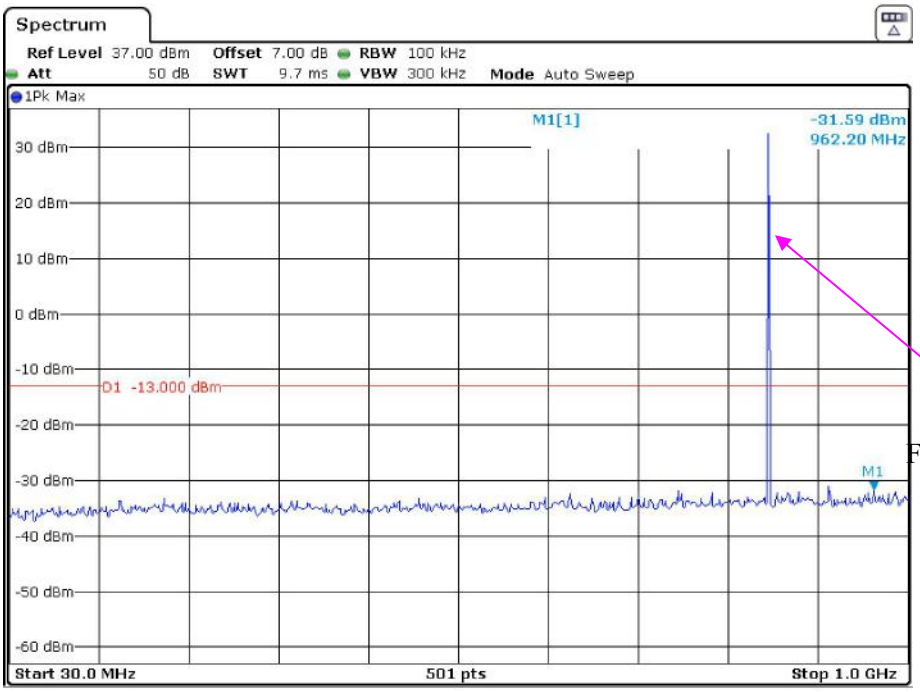
1 GHz – 10 GHz (WCDMA Mode)



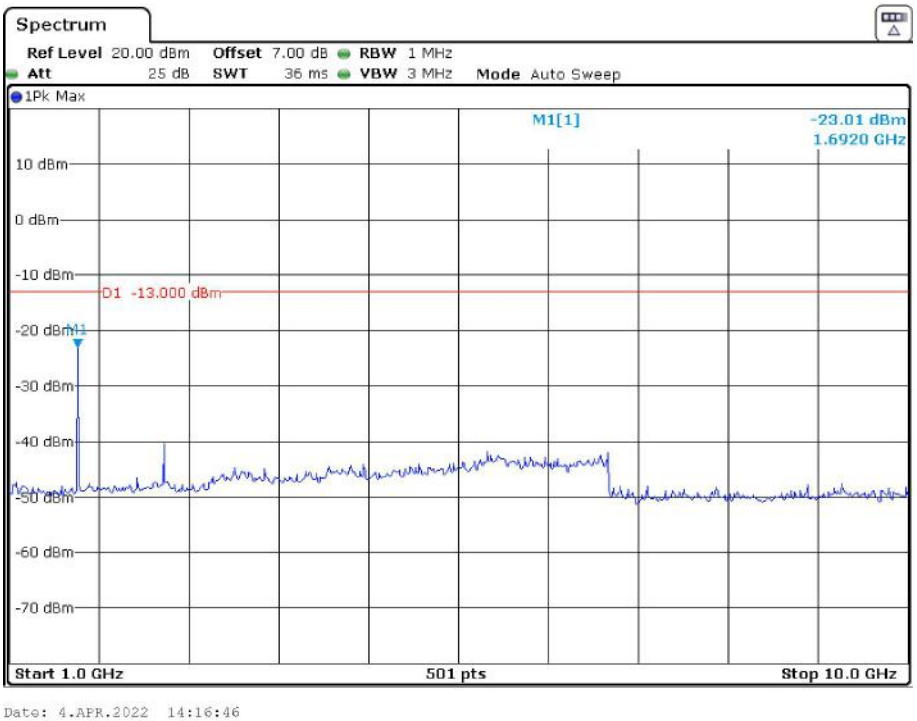
Date: 4.APR.2022 15:12:03

High Channel:

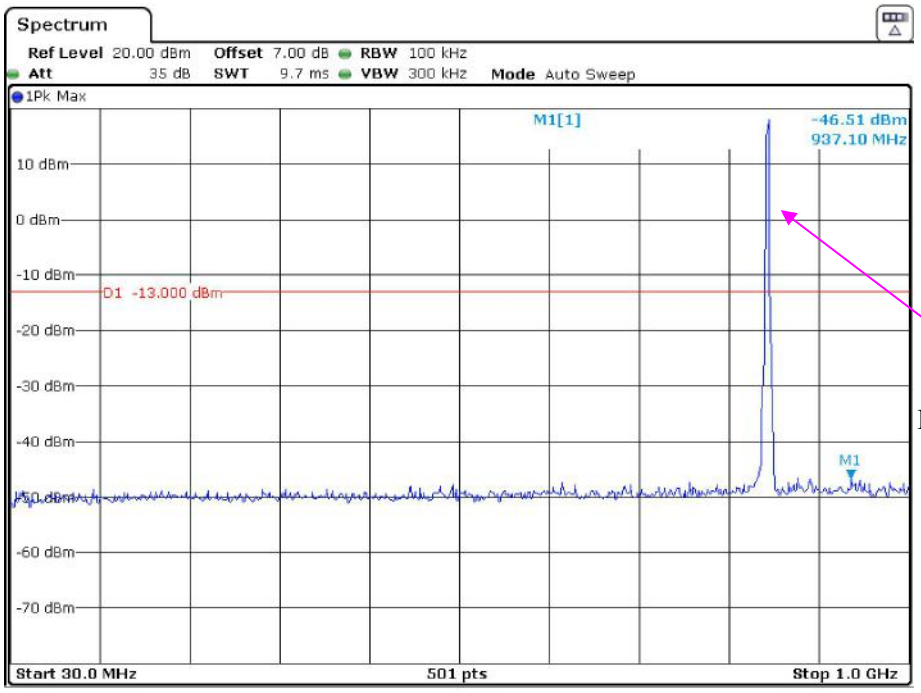
30 MHz – 1 GHz (GSM Mode)



1 GHz – 10 GHz (GSM Mode)



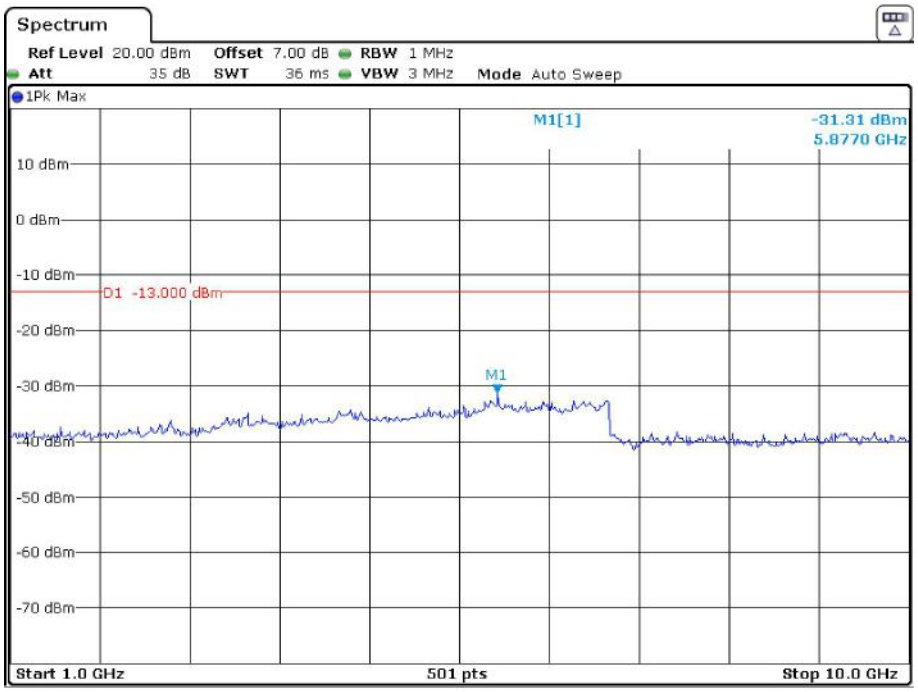
30 MHz – 1 GHz (WCDMA Mode)



Fundamental test

Date: 4.APR.2022 15:10:34

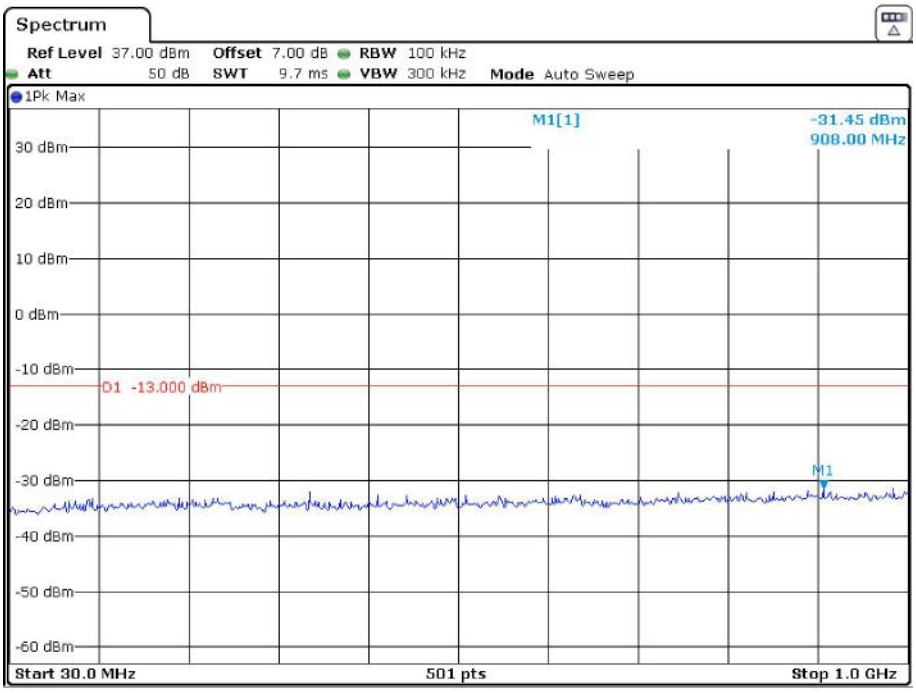
1 GHz – 10 GHz (WCDMA Mode)



Date: 4.APR.2022 15:12:20

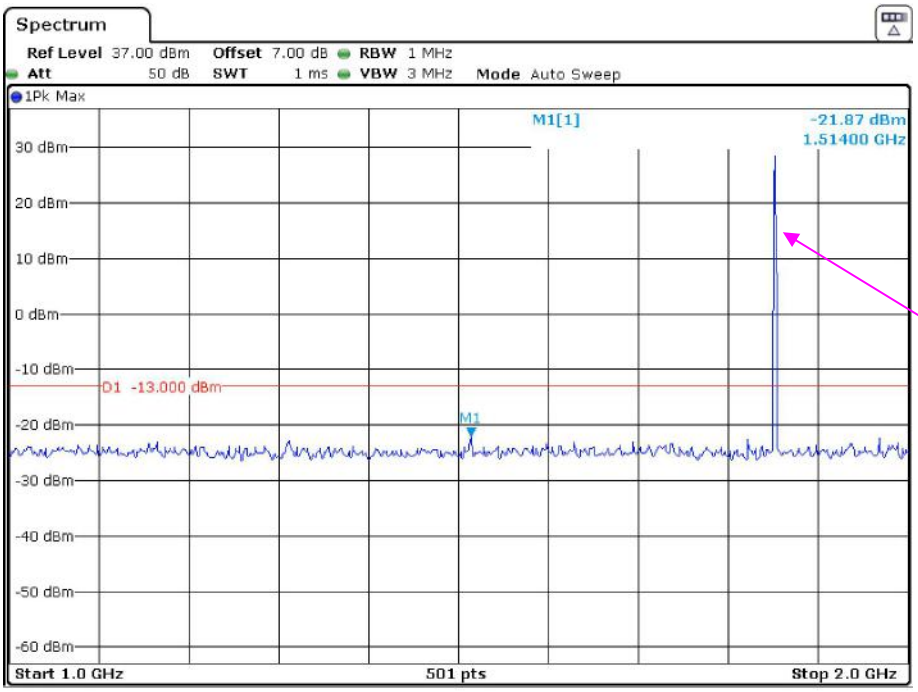
PCS Band
Low Channel:

30 MHz – 1 GHz (GSM Mode)



Date: 4.APR.2022 14:29:40

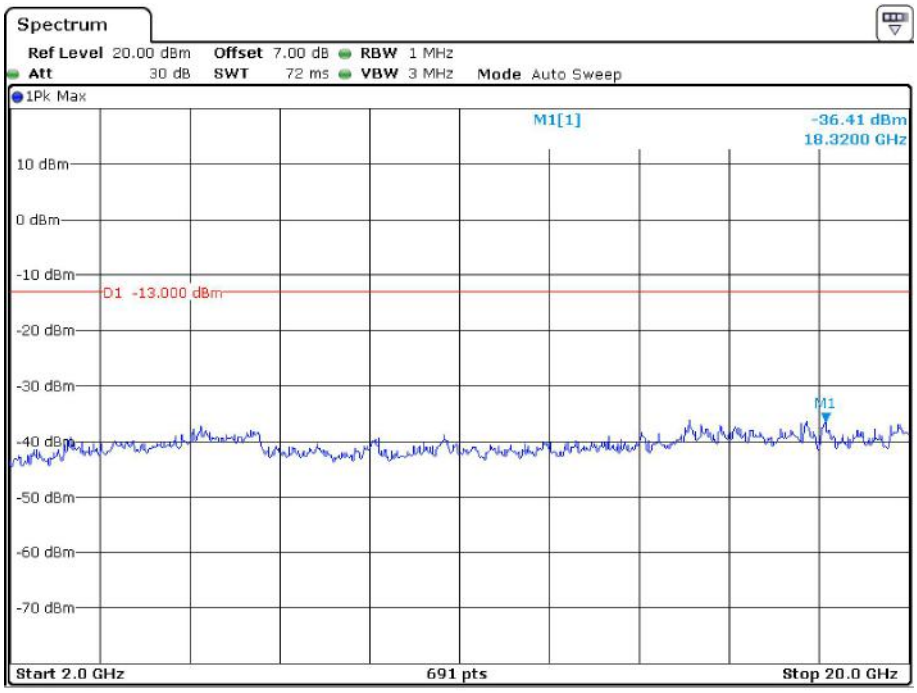
1 GHz – 2 GHz (GSM Mode)



Fundamental test

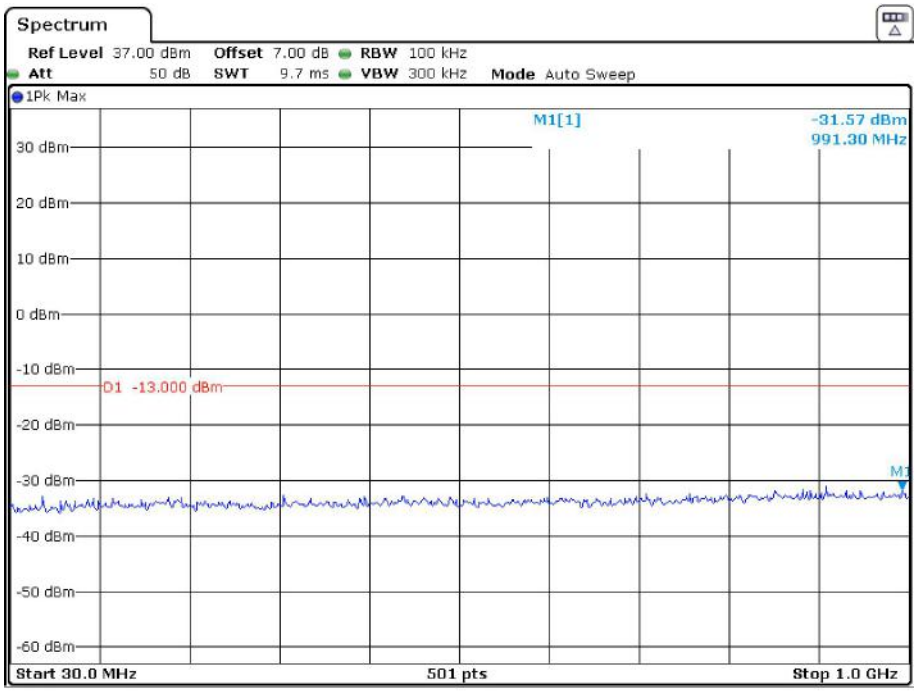
Date: 4.APR.2022 14:31:01

2 GHz – 20 GHz (GSM Mode)



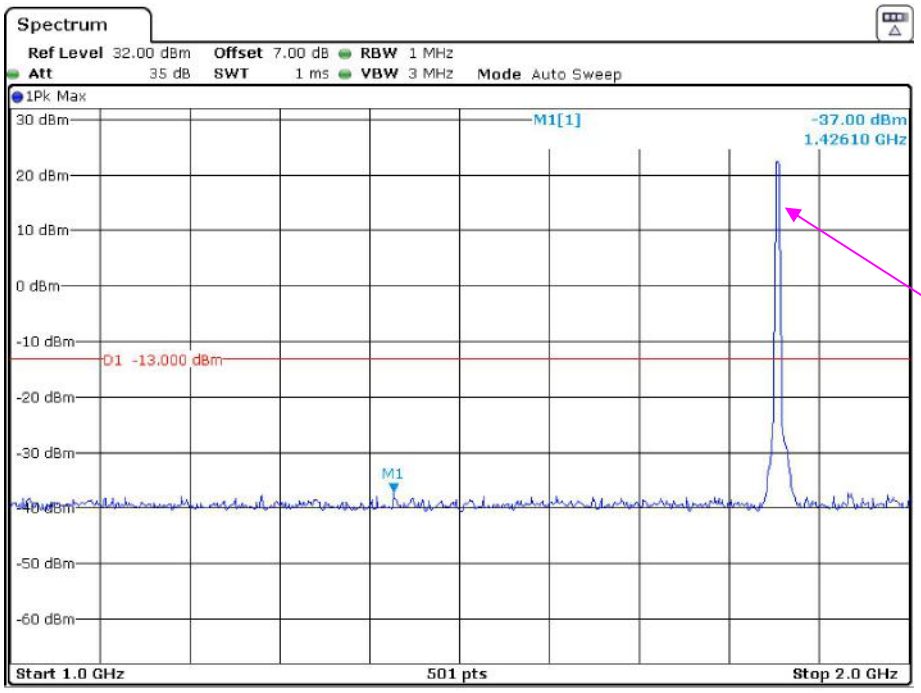
Date: 4.APR.2022 13:32:21

30 MHz – 1 GHz (WCDMA Mode)



Date: 4.APR.2022 14:48:37

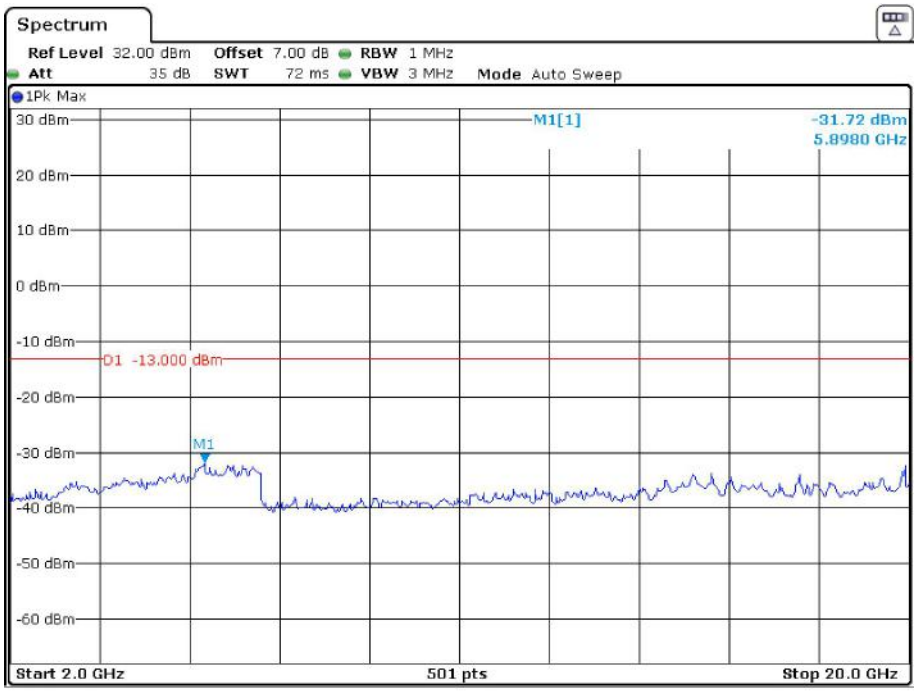
1 GHz – 2 GHz (WCDMA Mode)



Fundamental test

Date: 4.APR.2022 14:50:24

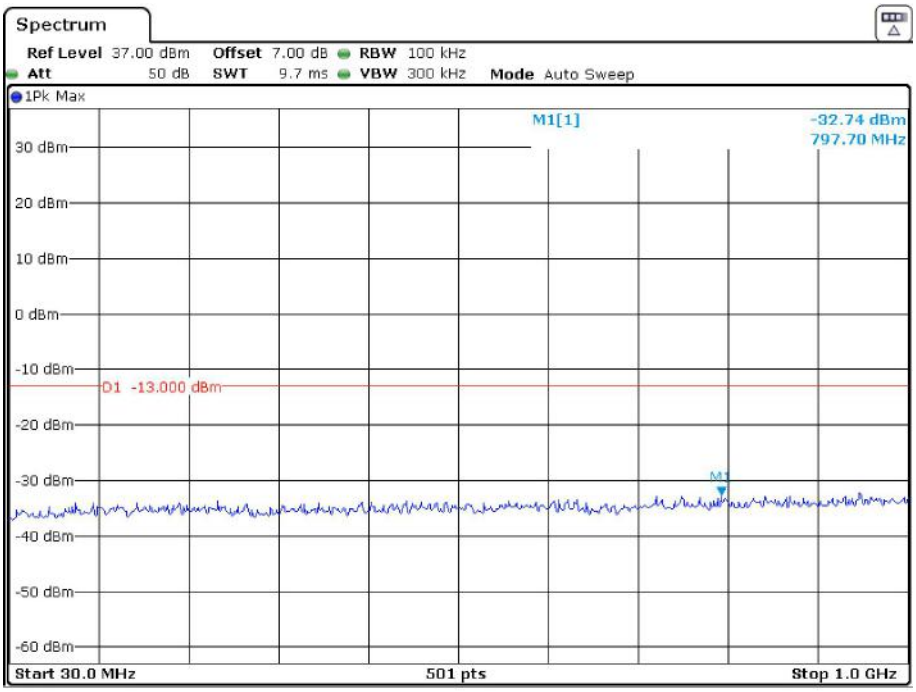
2 GHz – 20 GHz (WCDMA Mode)



Date: 4.APR.2022 14:50:44

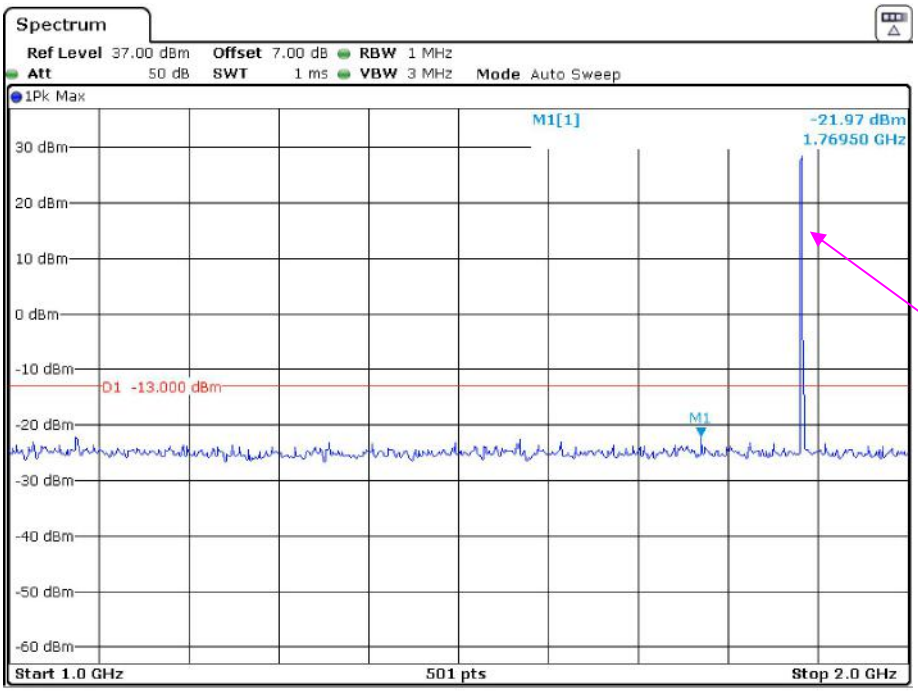
Middle Channel:

30 MHz – 1 GHz (GSM Mode)



Date: 4.APR.2022 14:29:50

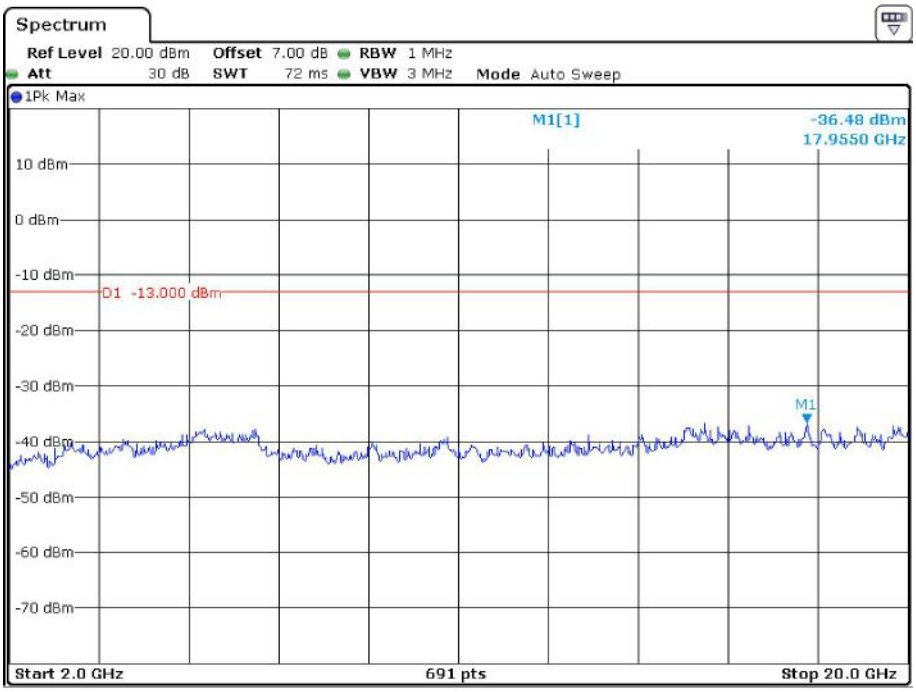
1 GHz – 2 GHz (GSM Mode)



Fundamental test

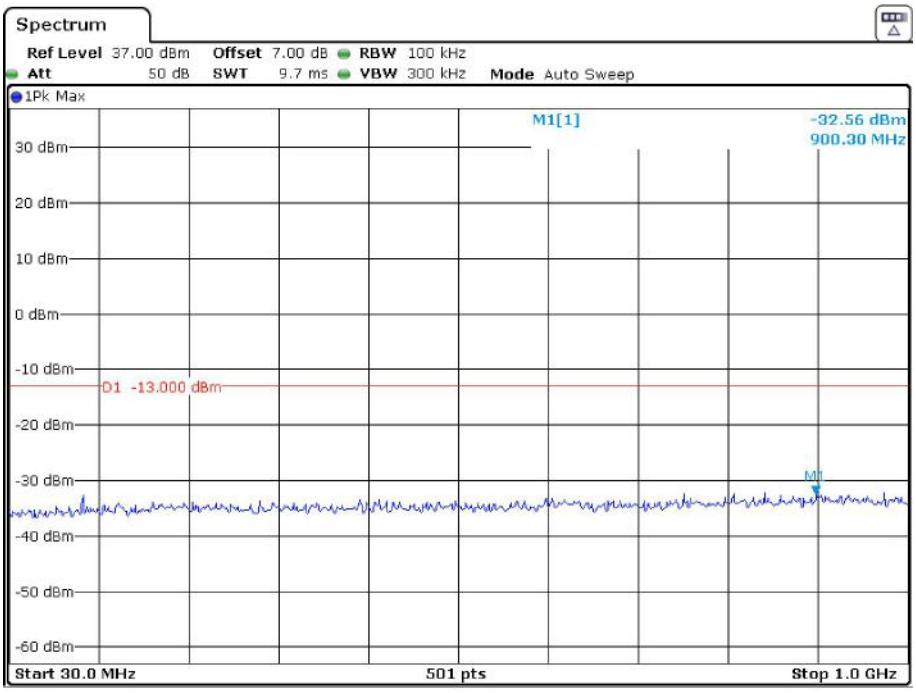
Date: 4.APR.2022 14:30:42

2 GHz– 20 GHz (GSM Mode)



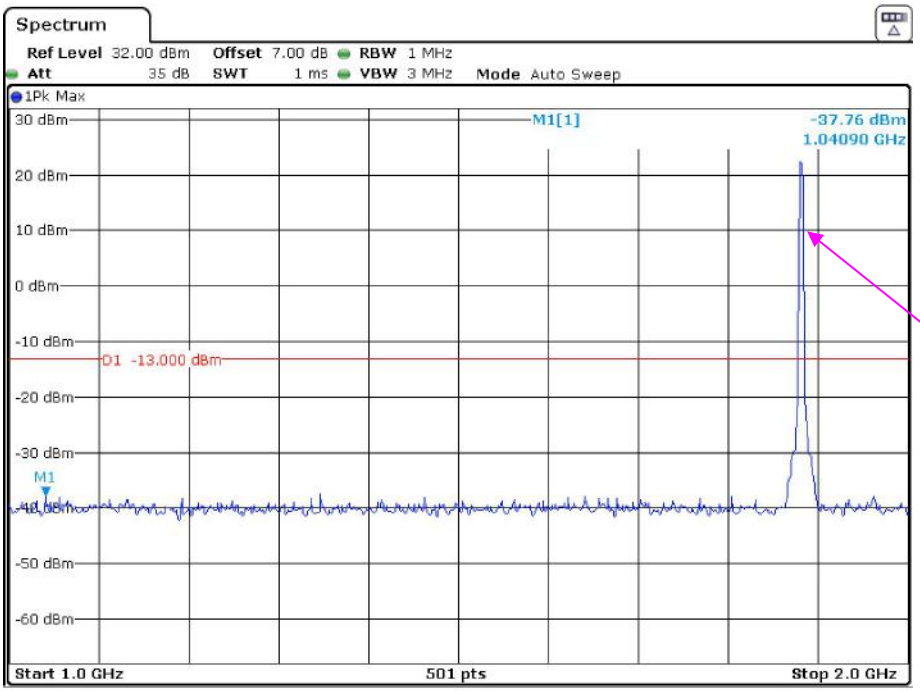
Date: 4.APR.2022 13:32:30

30 MHz – 1 GHz (WCDMA Mode)



Date: 4.APR.2022 14:48:51

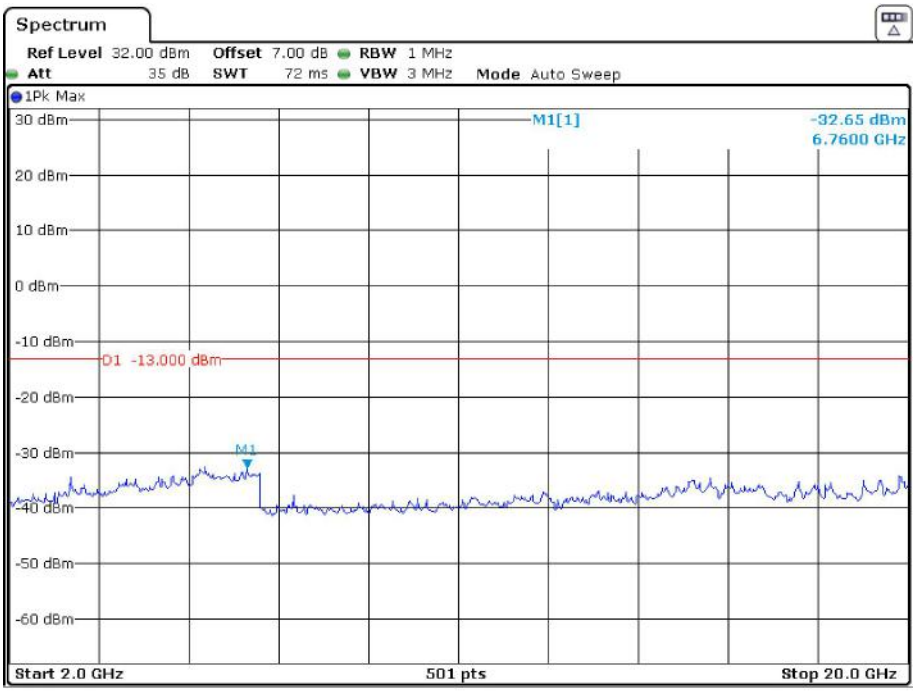
1 GHz – 2 GHz (WCDMA Mode)



Fundamental test

Date: 4.APR.2022 14:49:59

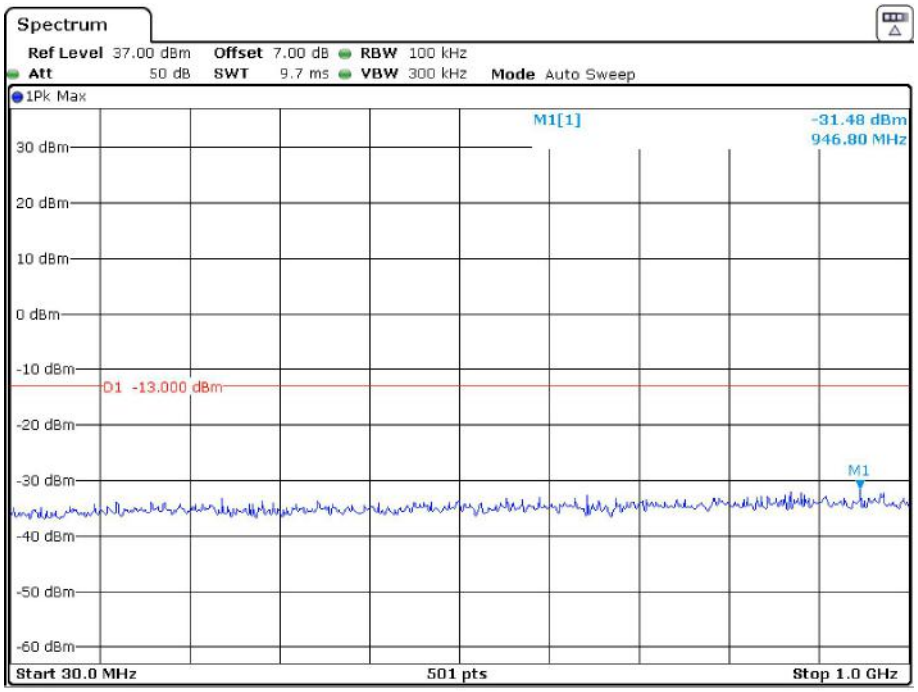
2 GHz – 20 GHz (WCDMA Mode)



Date: 4.APR.2022 14:50:55

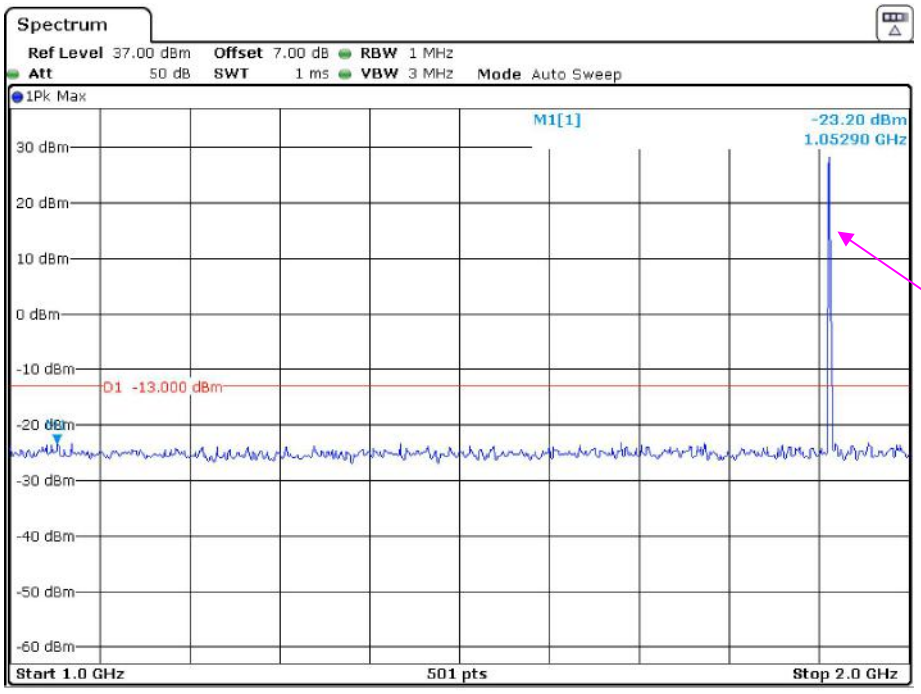
High Channel:

30 MHz – 1 GHz (GSM Mode)



Date: 4.APR.2022 14:30:01

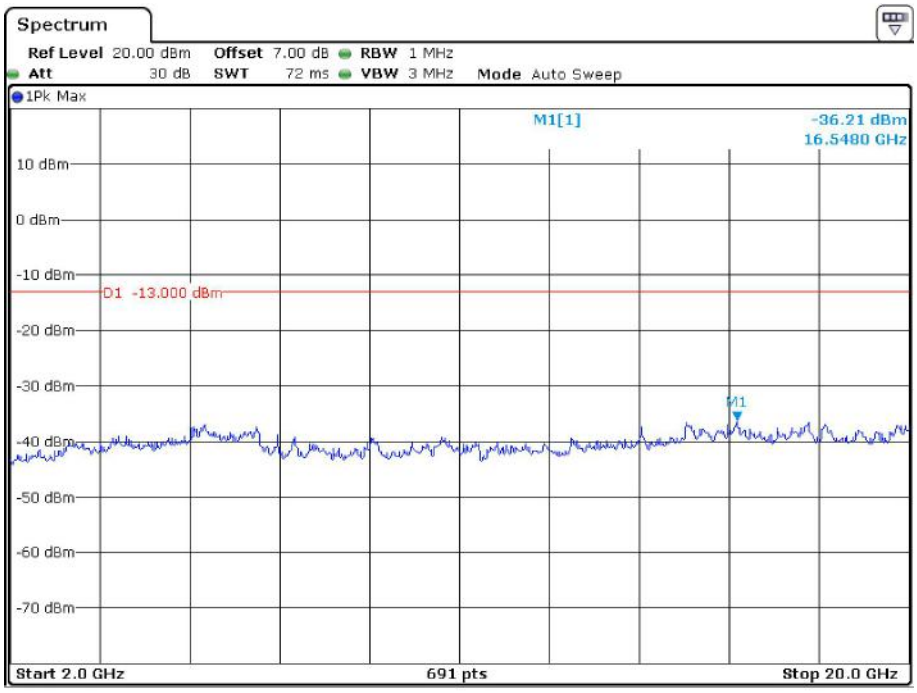
1 GHz– 2 GHz (GSM Mode)



Fundamental test

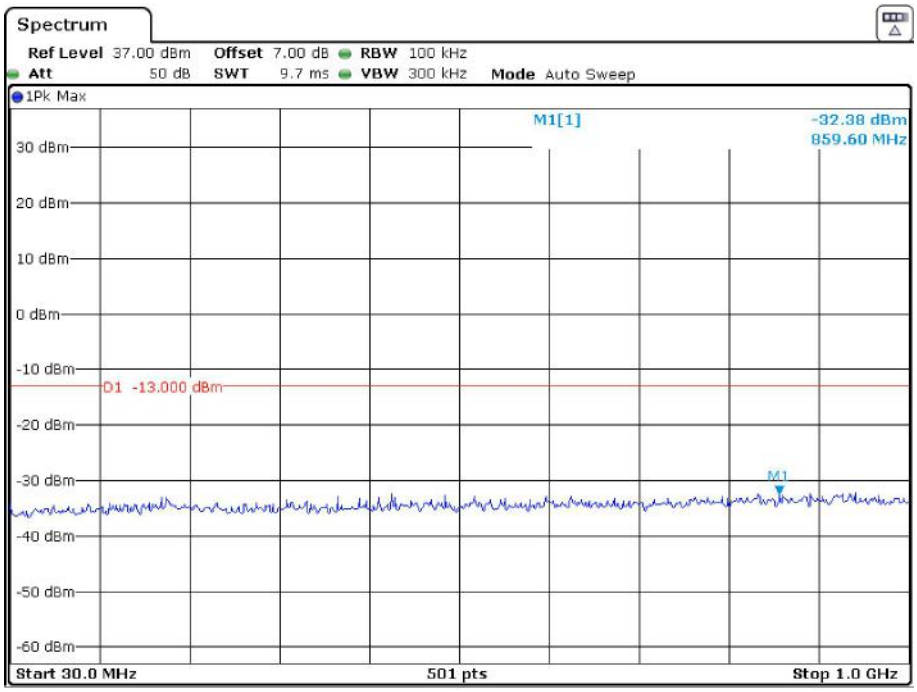
Date: 4.APR.2022 14:30:28

2 GHz– 20 GHz (GSM Mode)



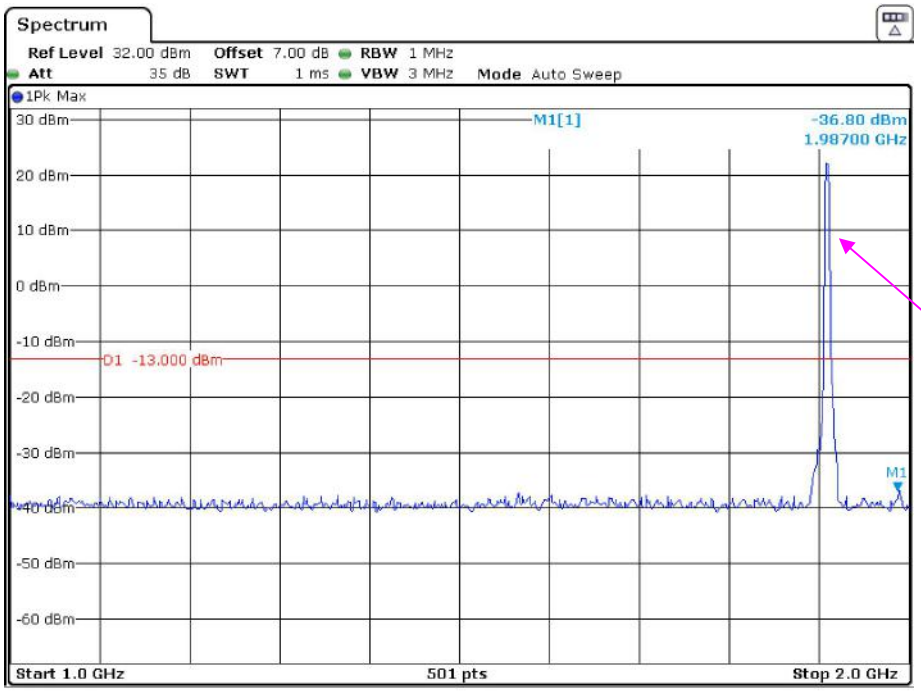
Date: 4.APR.2022 13:32:11

30 MHz – 1 GHz (WCDMA Mode)



Date: 4.APR.2022 14:49:07

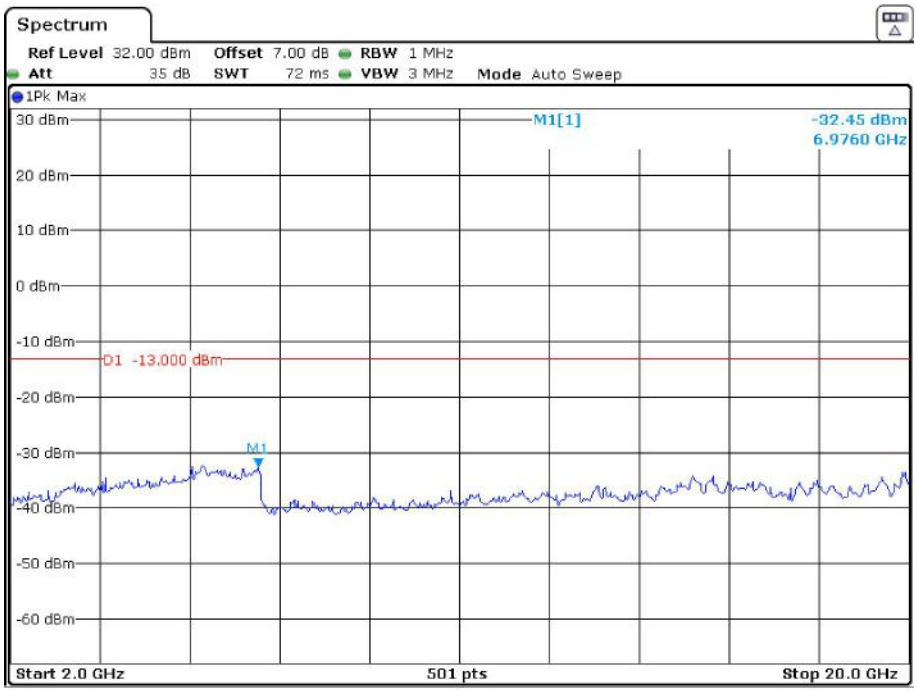
1 GHz – 2 GHz (WCDMA Mode)



Fundamental test

Date: 4.APR.2022 14:49:47

2GHz – 20 GHz (WCDMA Mode)



Date: 4.APR.2022 14:51:07

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 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by I Icey Huang from 2022-04-10 to 2022-04-13

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

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

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
GSM850								
Test frequency range: 30MHz-10GHz								
Low channel								
188.9	-43.8	158	1.7	H	-1.7	-45.5	-13	-32.5
388.84	-48.6	328	1.9	V	5.1	-43.5	-13	-30.5
1648.4	-52.4	358	1.7	H	3.5	-48.9	-13	-35.90
1648.4	-56.5	336	1.7	V	3.1	-53.4	-13	-40.40
2472.6	-49.7	19	1.7	H	6.6	-43. 1	-13	-30.10
2472.6	-48.9	222	1.7	V	5.8	-43.1	-13	-30.10
3296.8	-51.7	174	2.0	H	6.4	-45.3	-13	-32.30
3296.8	-51.6	334	2.0	V	5.7	-45.9	-13	-32.90
Middle channel								
188.9	-44.0	228	1.8	H	-1.7	-45.7	-13	-32.7
388.84	-50.0	12	1.7	V	5.1	-44.9	-13	-31.9
1673.2	-50.1	324	1.6	H	3.8	-46.3	-13	-33.30
1673.2	-52.0	148	2.1	V	3.1	-48.9	-13	-35.90
2509.8	-51.9	72	1.8	H	6.2	-45.7	-13	-32.70
2509.8	-52.8	334	1.6	V	5.6	-47.2	-13	-34.20
3346.4	-51.7	203	2.1	H	6.6	-45.1	-13	-32.10
3346.4	-51.9	246	1.9	V	5.4	-46.5	-13	-33.50
High channel								
188.9	-44.0	228	1.8	H	-1.7	-45.7	-13	-32.7
388.84	-50.0	12	1.7	V	5.1	-44.9	-13	-31.9
1697.6	-51.0	327	1.8	H	4.1	-46.9	-13	-33.9
1697.6	-53.5	253	1.5	V	3.1	-50.4	-13	-37.4
2546.4	-53.4	264	2.0	H	6.1	-47.3	-13	-34.3
2546.4	-55.1	63	2.0	V	5.8	-49.3	-13	-36.3
3395.2	-51.9	334	1.9	H	6.2	-45.7	-13	-32.7
3395.2	-51.5	148	1.9	V	5.4	-46.1	-13	-33.1

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
GSM1900								
Test frequency range: 30MHz-20GHz								
Low channel								
188.9	-43.6	311	1.9	H	-1.7	-45.3	-13	-32.3
388.84	-49.9	349	1.6	V	5.1	-44.8	-13	-31.8
3700.4	-51.4	261	1.6	H	8.1	-43.30	-13	-30.3
3700.4	-52.8	187	1.5	V	7.6	-45.2	-13	-32.2
5550.6	-42.8	174	1.9	H	9.6	-33.2	-13	-20.2
5550.6	-44.9	197	1.5	V	9.1	-35.8	-13	-22.8
Middle channel								
188.9	-43.4	171	1.8	H	-1.7	-45.1	-13	-32.1
388.84	-49.6	100	1.8	V	5.1	-44.5	-13	-31.5
3760	-54.9	155	2.1	H	8.8	-46.1	-13	-33.5
3760	-54.4	49	1.6	V	8	-46.4	-13	-33.4
5640	-46.3	279	1.6	H	10.2	-36.1	-13	-30.9
5640	-49.5	285	2.0	V	9.4	-40.1	-13	-26.7
High channel								
188.9	-42.6	155	1.6	H	-1.7	-44.3	-13	-31.3
388.84	-48.8	185	1.7	V	5.1	-43.7	-13	-30.7
3819.6	-51.5	130	2.1	H	8.7	-42.80	-13	-33.9
3819.6	-51.9	325	1.7	V	8	-43.90	-13	-33.8
5729.4	-45.2	279	1.9	H	10.6	-34.60	-13	-28.8
5729.4	-48.9	41	1.9	V	10.2	-38.70	-13	-26.1

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
WCDMA Band2								
Test frequency range: 30MHz-20GHz								
Low channel								
188.9	-43.7	24	1.8	H	-1.7	-45.4	-13	-32.4
388.84	-48.9	122	1.6	V	5.1	-43.8	-13	-30.8
3704.8	-55.7	234	1.5	H	8.2	-47.5	-13	-34.5
3704.8	-54	337	1.7	V	7.6	-46.4	-13	-33.4
5557.2	-53.4	340	1.8	H	9.7	-43.7	-13	-30.7
5557.2	-52.6	320	1.6	V	9.1	-43.5	-13	-30.5
Middle channel								
188.9	-43.7	59	1.7	H	-1.7	-45.4	-13	-32.4
388.84	-49.7	15	1.6	V	5.1	-44.6	-13	-31.6
3760	-56.3	165	2.1	H	8.8	-47.5	-13	-34.5
3760	-54.6	128	1.6	V	8	-46.6	-13	-33.6
5640	-55.5	197	1.9	H	10.2	-45.3	-13	-32.3
5640	-53.9	176	1.9	V	9.4	-44.5	-13	-31.5
High channel								
188.9	-43.8	194	1.9	H	-1.7	-45.5	-13	-32.5
388.84	-50.0	140	1.8	V	5.1	-44.9	-13	-31.9
3815.2	-56.6	215	1.6	H	8.7	-47.9	-13	-34.9
3815.2	-55.1	259	2.0	V	7.9	-47.2	-13	-34.2
5722.8	-56.7	233	2.0	H	10.6	-46.1	-13	-33.1
5722.8	-55	42	1.7	V	10.1	-44.9	-13	-31.9

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
WCDMA Band5								
Test frequency range: 30MHz-10GHz								
Low channel								
188.9	-44.4	349	1.8	H	-1.7	-46.1	-13	-33.1
388.84	-49.4	120	2.0	V	5.1	-44.3	-13	-31.3
1652.8	-54.3	218	1.9	H	3.5	-50.8	-13	-37.8
1652.8	-55.7	298	1.8	V	3.1	-52.6	-13	-39.6
2479.2	-53	354	1.7	H	6.5	-46.5	-13	-33.5
2479.2	-51.2	302	1.6	V	5.7	-45.5	-13	-32.5
3305.6	-52.5	357	1.5	H	6.4	-46.1	-13	-33.1
3305.6	-51.3	265	1.9	V	5.7	-45.6	-13	-32.6
Middle channel								
188.9	-44.1	266	1.9	H	-1.7	-45.8	-13	-32.8
388.84	-49.2	78	1.7	V	5.1	-44.1	-13	-31.1
1673.2	-49.7	56	1.8	H	3.8	-45.9	-13	-32.9
1673.2	-52.1	354	1.9	V	3.1	-49	-13	-36
2509.8	-51.7	90	2.1	H	6.2	-45.5	-13	-32.5
2509.8	-49.6	129	2.1	V	5.7	-43.9	-13	-30.9
3346.4	-52.9	187	2.0	H	6.6	-46.3	-13	-33.3
3346.4	-51.4	117	1.5	V	5.4	-46	-13	-33
High channel								
188.9	-43.9	308	1.7	H	-1.7	-45.6	-13	-32.6
388.84	-50.0	65	1.7	V	5.1	-44.9	-13	-31.9
1693.2	-56.4	223	2.1	H	4	-52.4	-13	-39.4
1693.2	-55.8	283	2.0	V	3.1	-52.7	-13	-39.7
2509.8	-56.5	148	1.5	H	6.1	-50.4	-13	-37.4
2509.8	-56	49	1.9	V	5.7	-50.3	-13	-37.3
3386.4	-52.5	262	1.5	H	6.3	-46.2	-13	-33.2
3386.4	-51.3	312	2.0	V	5.4	-45.9	-13	-32.9

LTE Bands: (pre-scan all bandwidths, the worst case as below)

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
LTE Band 2								
Test frequency range: 30MHz-20GHz								
1.4MHz Bandwidth, Low channel								
188.9	-42.6	331	1.5	H	-1.7	-44.3	-13	-31.3
388.84	-50.1	200	1.6	V	5.1	-45.0	-13	-32.0
3701.4	-55.2	181	1.6	H	8.1	-47.1	-13	-34.1
3701.4	-53.8	347	1.6	V	7.6	-46.2	-13	-33.2
5552.1	-54.1	204	1.7	H	9.6	-44.5	-13	-31.5
5552.1	-52.9	3	1.8	V	9.1	-43.8	-13	-30.8
1.4MHz Bandwidth, Middle channel								
188.9	-43.7	295	1.7	H	-1.7	-45.4	-13	-32.4
388.84	-48.5	38	1.9	V	5.1	-43.4	-13	-30.4
3760	-56.2	113	1.8	H	8.8	-47.4	-13	-34.4
3760	-55.1	275	1.7	V	8	-47.1	-13	-34.1
5640	-55.2	283	2.1	H	10.2	-45.0	-13	-32.0
5640	-54.2	69	1.5	V	9.4	-44.8	-13	-31.8
1.4MHz Bandwidth, High channel								
188.9	-44.3	89	1.9	H	-1.7	-46.0	-13	-33.0
388.84	-49.5	60	2.1	V	5.1	-44.4	-13	-31.4
3818.6	-55.7	90	1.9	H	8.7	-47.0	-13	-34.0
3818.6	-54.9	119	1.7	V	8	-46.9	-13	-33.9
5727.9	-56.3	127	1.8	H	10.6	-45.7	-13	-32.7
5727.9	-55.5	78	1.6	V	10.2	-45.3	-13	-32.3

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								
1.4MHz Bandwidth, Low channel								
188.9	-44.3	16	2.0	H	-1.7	-46.0	-13	-33.0
388.84	-49.3	128	1.9	V	5.1	-44.2	-13	-31.2
1649.4	-59.9	80	1.9	H	3.2	-56.7	-13	-43.7
1649.4	-58.5	193	1.9	V	3.1	-55.4	-13	-42.4
2474.1	-54.8	267	1.6	H	6.6	-48.2	-13	-35.2
2474.1	-53.1	9	2.0	V	5.8	-47.3	-13	-34.3
3298.8	-52.6	240	1.8	H	6.4	-46.2	-13	-33.2
3298.8	-51.6	303	2.0	V	5.7	-45.9	-13	-32.9
1.4MHz Bandwidth, Middle channel								
188.9	-43.6	118	2.0	H	-1.7	-45.3	-13	-32.3
388.84	-48.5	198	1.8	V	5.1	-43.4	-13	-30.4
1673.0	-52.8	299	1.6	H	3.8	-49.0	-13	-36.0
1673.0	-52.7	244	1.8	V	3.1	-49.6	-13	-36.6
2509.5	-57.3	21	1.7	H	6.2	-51.1	-13	-38.1
2509.5	-55.8	185	1.9	V	5.6	-50.2	-13	-37.2
3346.0	-52.7	90	1.6	H	6.6	-46.1	-13	-33.1
3346.0	-51.3	295	1.7	V	5.4	-45.9	-13	-32.9
1.4MHz Bandwidth, High channel								
188.9	-42.5	227	1.7	H	-1.7	-44.2	-13	-31.2
388.84	-50.0	343	2.0	V	5.1	-44.9	-13	-31.9
1696.6	-52.8	299	1.6	H	3.8	-49.0	-13	-36.0
1696.6	-52.7	244	1.8	V	3.1	-49.6	-13	-36.6
2544.9	-57.3	21	1.7	H	6.2	-51.1	-13	-38.1
2544.9	-55.8	185	1.9	V	5.6	-50.2	-13	-37.2
3393.2	-52.7	90	1.6	H	6.6	-46.1	-13	-33.1
3393.2	-51.3	295	1.7	V	5.4	-45.9	-13	-32.9

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
LTE Band12								
Test frequency range: 30MHz-10GHz								
1.4MHz Bandwidth, Low channel								
188.9	-43.7	249	1.7	H	-1.7	-45.4	-13	-32.4
388.84	-50.3	142	2.0	V	5.1	-45.2	-13	-32.2
1399.4	-63.3	13	1.9	H	5.9	-57.4	-13	-44.4
1399.4	-62.7	146	1.8	V	5.9	-56.8	-13	-43.8
2099.1	-52.2	205	1.8	H	6.3	-45.9	-13	-32.9
2099.1	-51	47	1.6	V	5.1	-45.9	-13	-32.9
1.4MHz Bandwidth, Middle channel								
188.9	-44.2	92	1.9	H	-1.7	-45.9	-13	-32.9
388.84	-49.6	238	1.9	V	5.1	-44.5	-13	-31.5
1415	-63.7	153	1.7	H	5.7	-58.0	-13	-45.0
1415	-62.8	208	2.0	V	5.4	-57.4	-13	-44.4
2122.5	-53.8	210	1.7	H	6.7	-47.1	-13	-34.1
2122.5	-53.8	77	1.8	V	5.8	-48.0	-13	-35.0
1.4MHz Bandwidth, High channel								
188.9	-42.6	8	1.9	H	-1.7	-44.3	-13	-31.3
388.84	-49.7	358	2.0	V	5.1	-44.6	-13	-31.6
1430.6	-62.7	265	1.6	H	5.4	-57.3	-13	-44.3
1430.6	-61.6	271	1.8	V	4.8	-56.8	-13	-43.8
2145.9	-54	64	2.0	H	7	-47.0	-13	-34.0
2145.9	-54	184	1.8	V	6.6	-47.4	-13	-34.4

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 Band41								
Test frequency range: 30MHz-26.5GHz								
5MHz Bandwidth, Low channel								
188.9	-42.5	158	1.6	H	-1.7	-44.2	-25	-19.2
388.84	-49.1	189	1.5	V	5.1	-44.0	-25	-19.0
5075	-54.6	211	2.0	H	11.2	-43.4	-25	-18.4
5075	-53.9	273	1.9	V	10.8	-43.1	-25	-18.1
7612.5	-66.7	60	1.7	H	21.2	-45.5	-25	-20.5
7612.5	-65.3	234	1.6	V	20.2	-45.1	-25	-20.1
5MHz Bandwidth, Middle channel								
188.9	-44.2	18	1.8	H	-1.7	-45.9	-25	-20.9
388.84	-49.5	139	1.7	V	5.1	-44.4	-25	-19.4
5190	-52.82	183	1.9	H	10.52	-42.3	-25	-17.3
5190	-45.2	164	1.8	V	10	-35.2	-25	-10.2
7785	-62.6	210	2.0	H	18.3	-44.3	-25	-19.3
7785	-62	185	1.6	V	18	-44.0	-25	-19.0
5MHz Bandwidth, High channel								
188.9	-44.0	323	1.6	H	-1.7	-45.7	-25	-20.7
388.84	-49.0	318	1.8	V	5.1	-43.9	-25	-18.9
5305	-47	280	1.9	H	9.6	-37.4	-25	-12.4
5305	-44.2	133	1.7	V	8.8	-35.4	-25	-10.4
7957.5	-52.6	243	2.0	H	18.9	-33.7	-25	-8.7
7957.5	-59.1	221	1.7	V	18.5	-40.6	-25	-15.6

Note:
Absolute Level = Reading Level + Substituted Factor
Substituted Factor contains: SG Level - Cable loss+ Antenna Gain
Margin = Absolute Level - Limit

FCC§ 22.917 (a);§ 24.238 (a); §27.53 (h)(m) - BAND EDGES

Applicable Standard

According to § 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

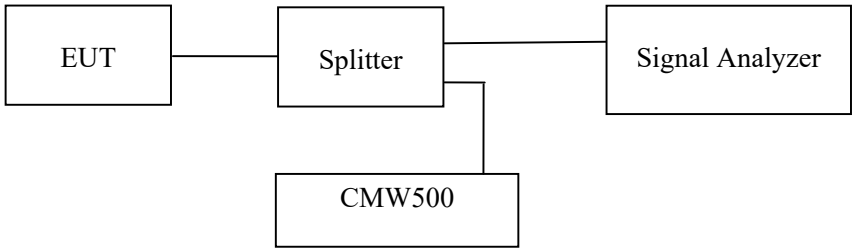
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

According to FCC §27.53 (h)(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:	26 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

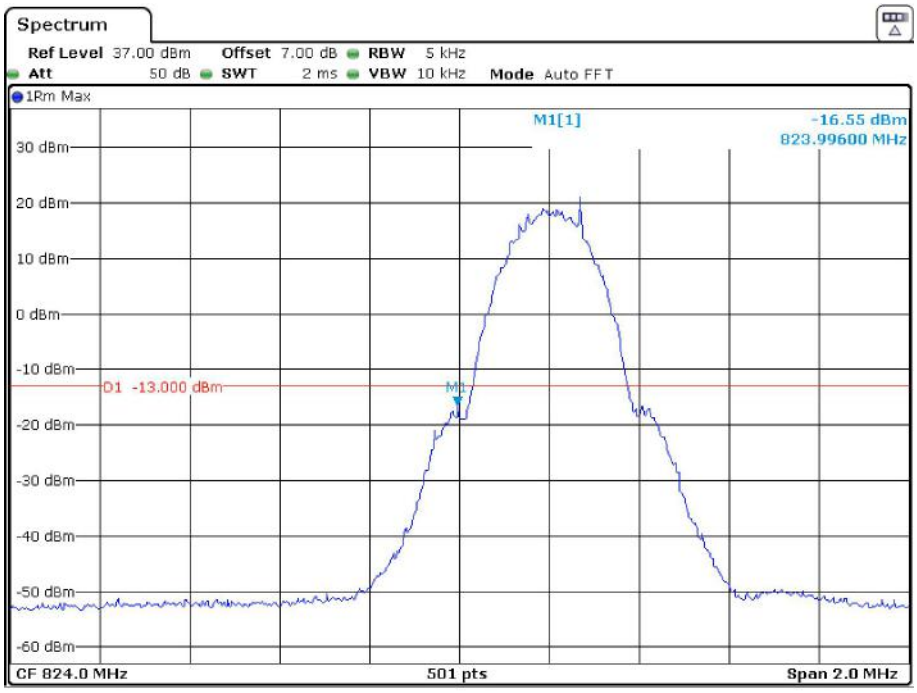
The testing was performed by Nick Fang from 2022-04-04 to 2022-05-17.

EUT operation mode: Transmitting (Worst case)

Test Result: Pass

Please refer to the following plots.

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



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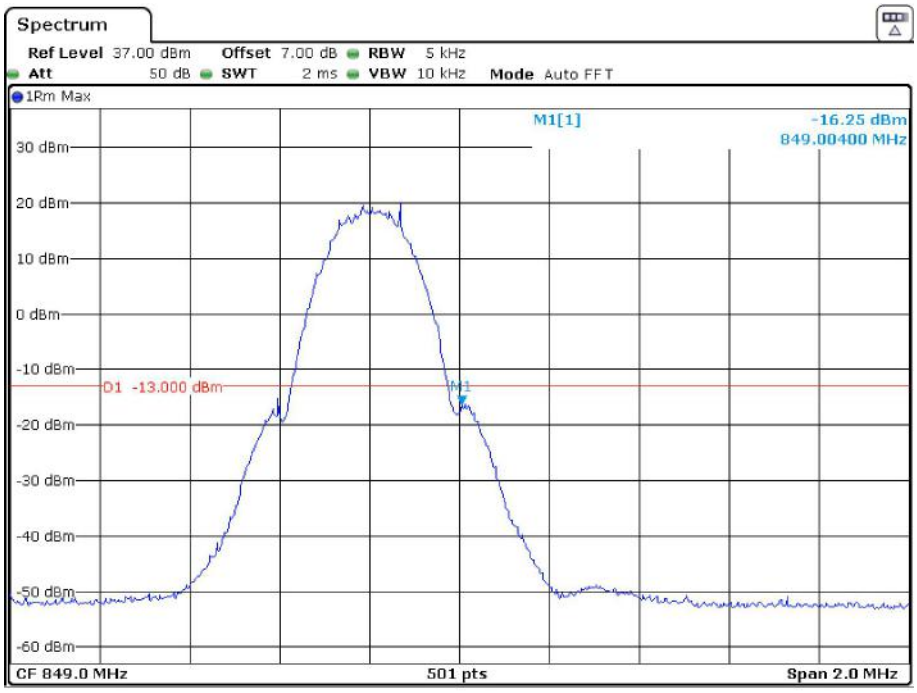
Cellular Band, Right Band Edge for GSM (GMSK) Mode



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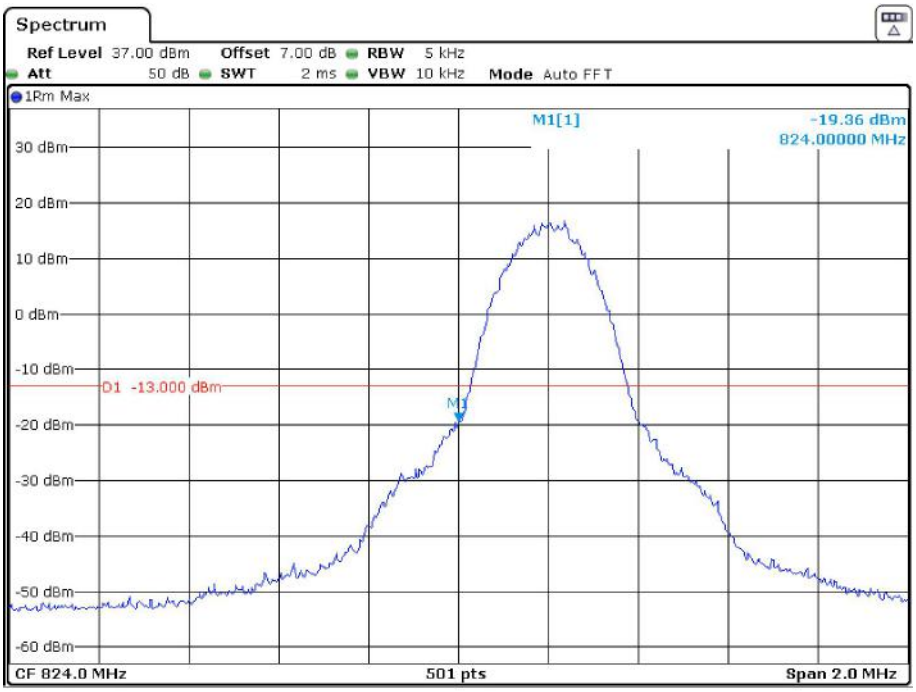
Cellular Band, Left Band Edge for GSM (8PSK) Mode



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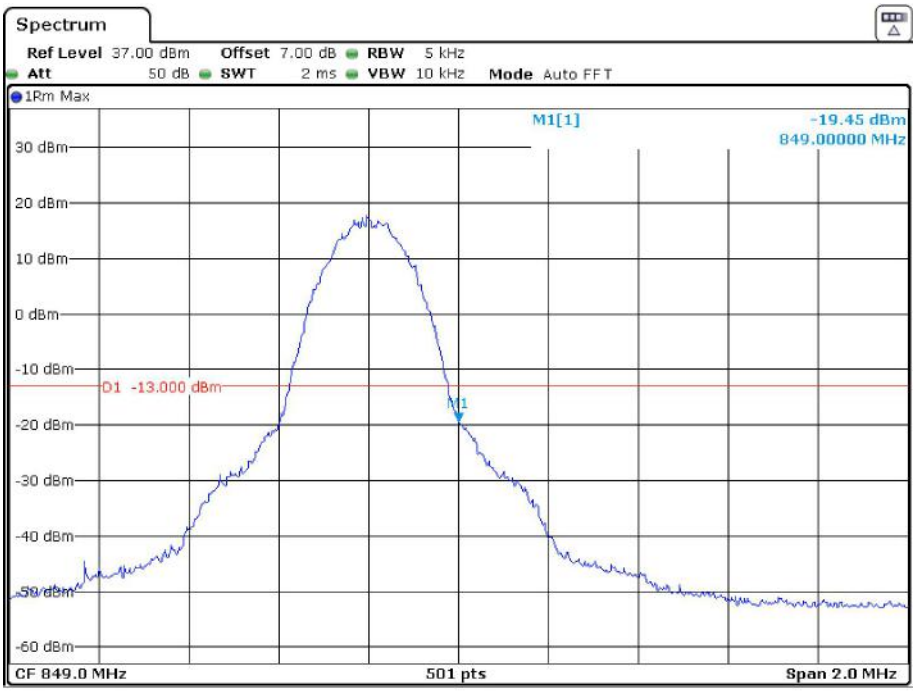
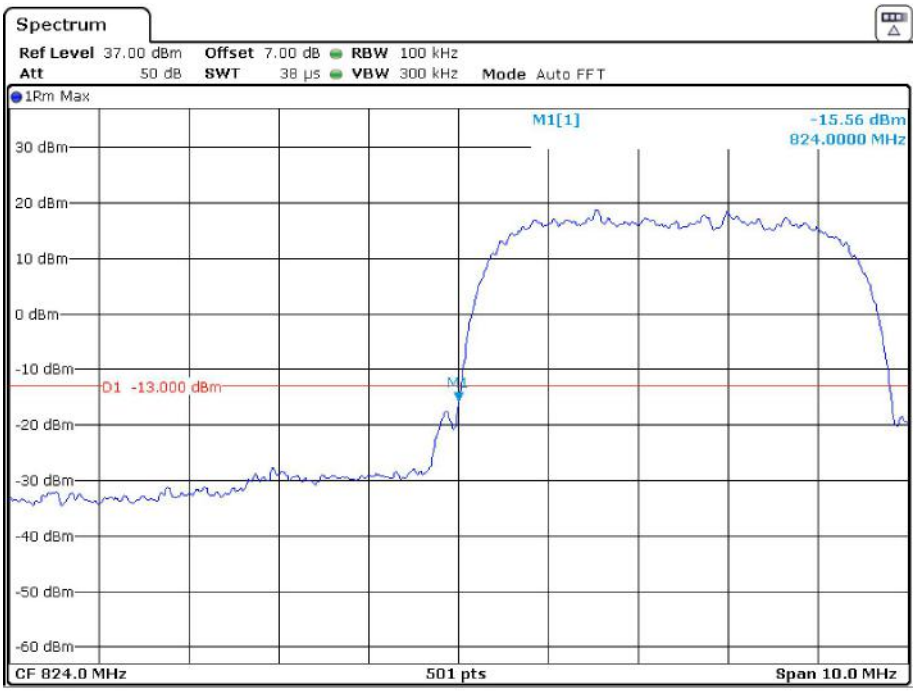
Cellular Band, Right Band Edge for GSM (8PSK) Mode

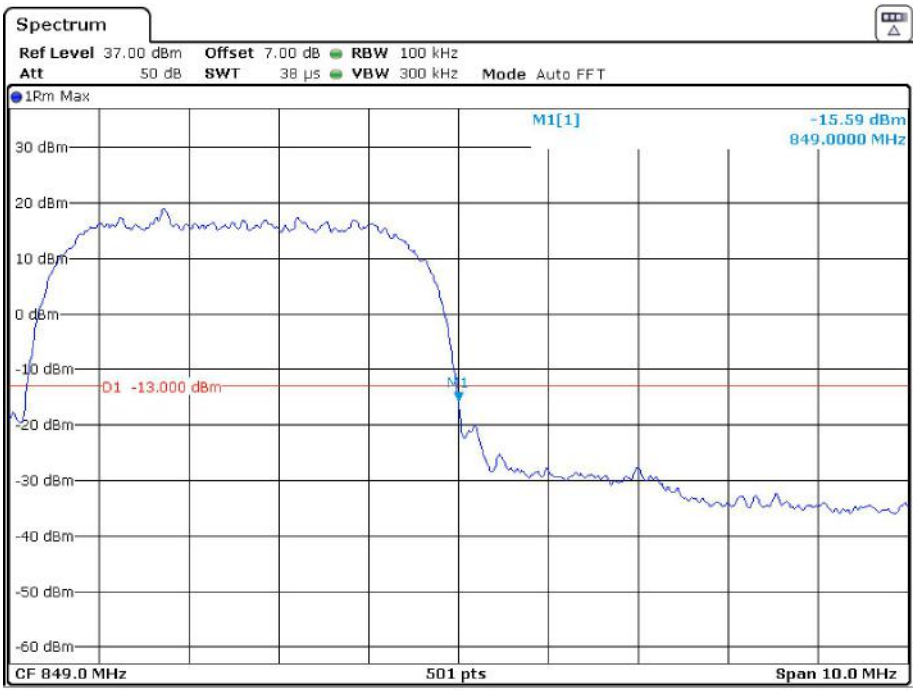


Date: 4.APR.2022 14:21:27

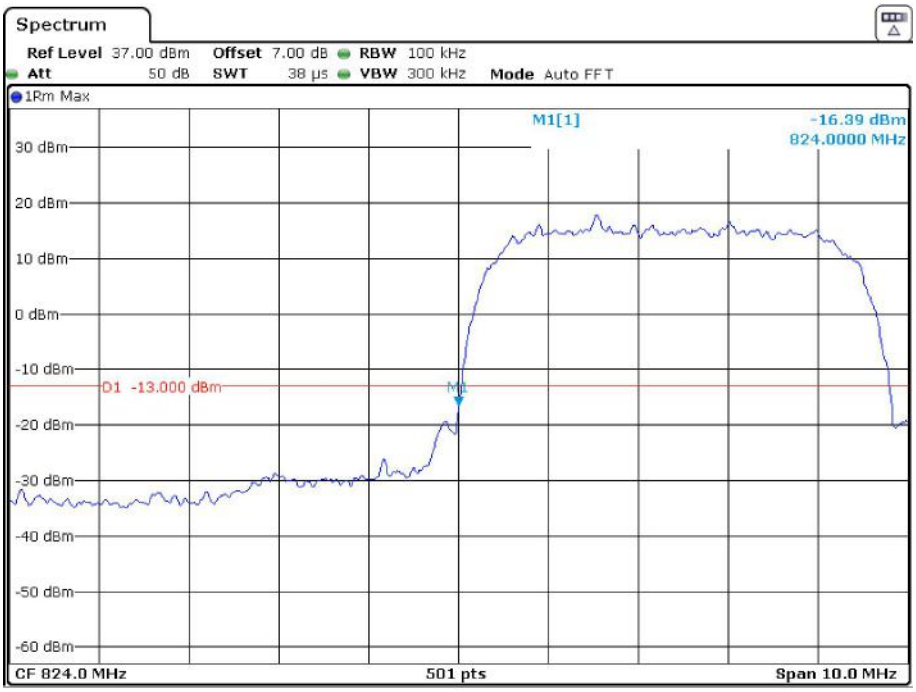
Cellular Band, Left Band Edge for RMC (BPSK) Mode



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

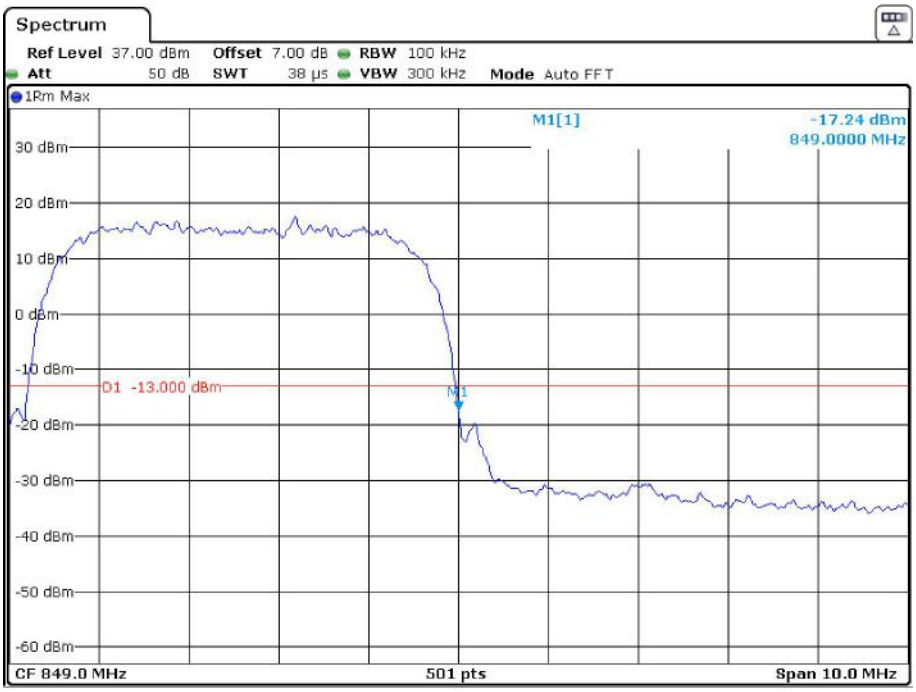


Cellular Band, Left Band Edge for HSDPA(16QAM) Mode



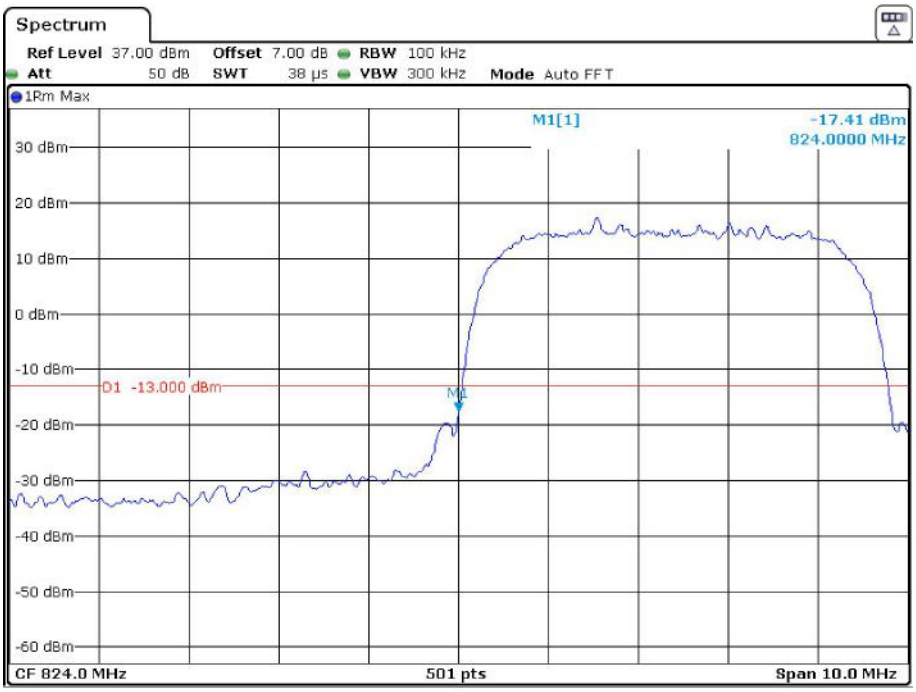
Date: 4.APR.2022 15:16:44

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

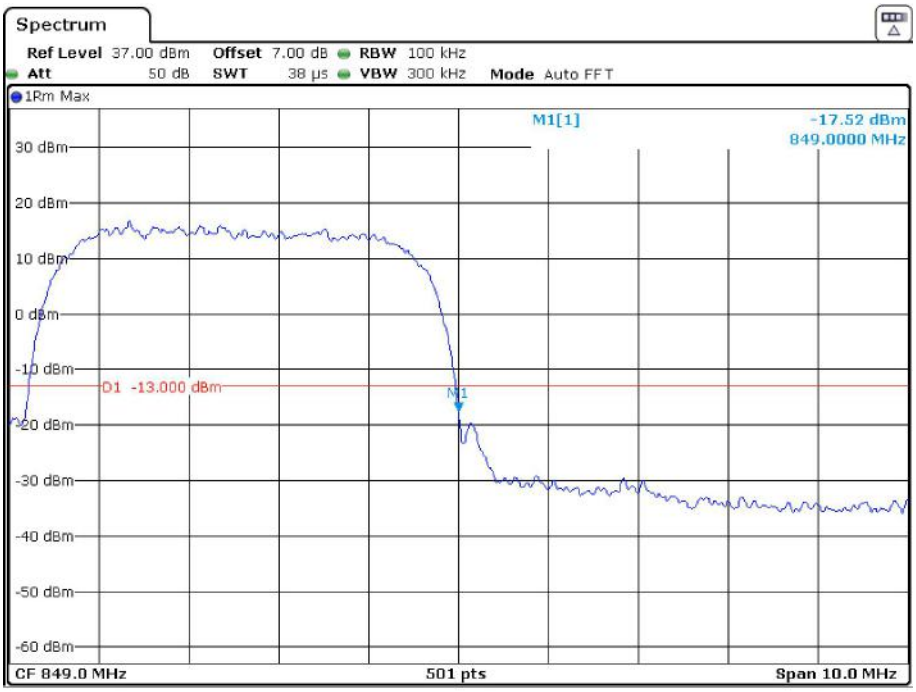


Date: 4.APR.2022 15:16:28

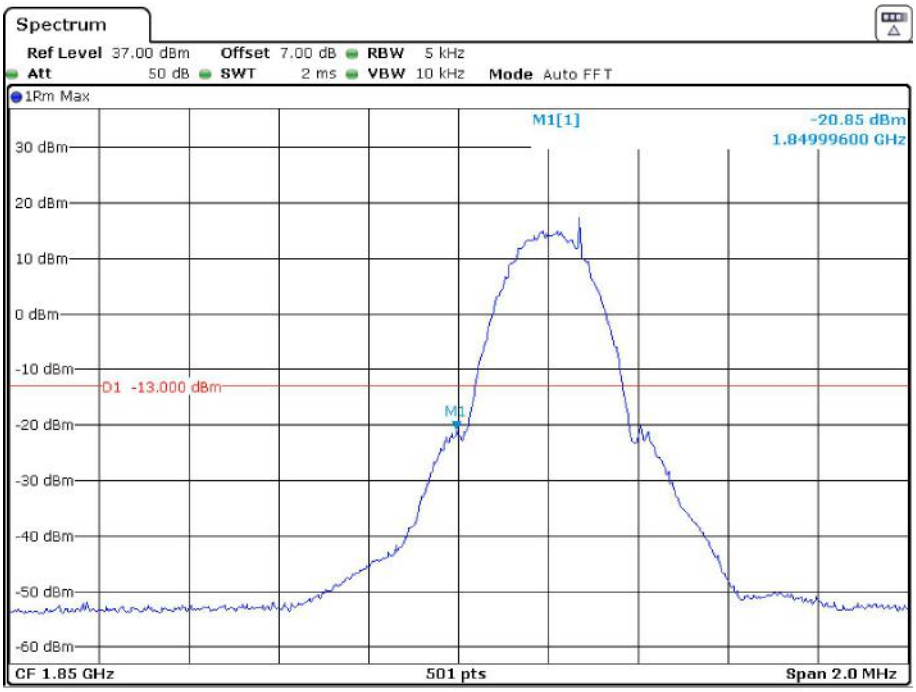
Cellular Band, Left Band Edge for HSUPA (QPSK) Mode



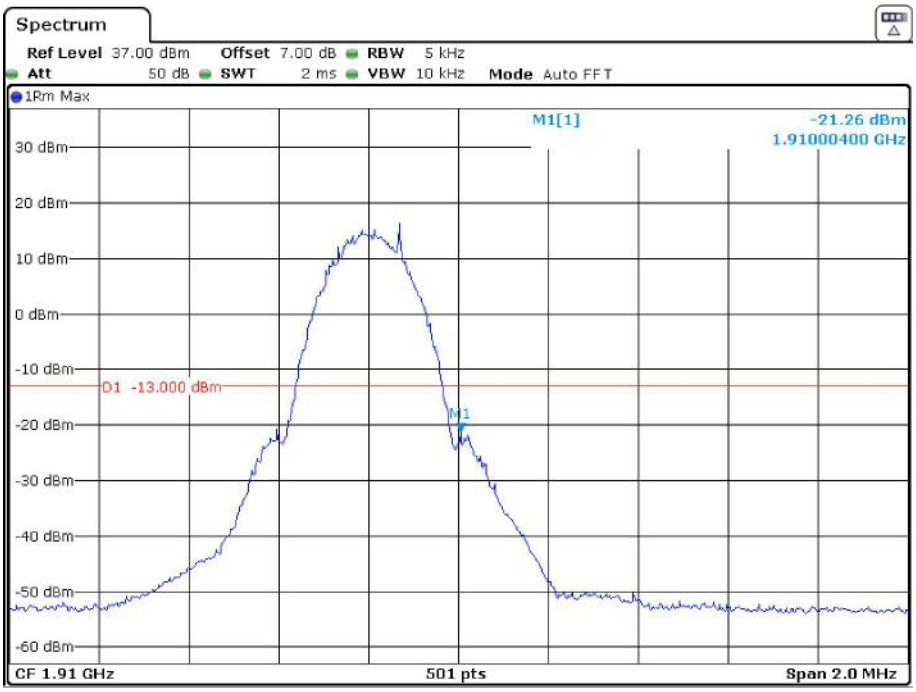
Cellular Band, Right Band Edge for HSUPA (QPSK) Mode



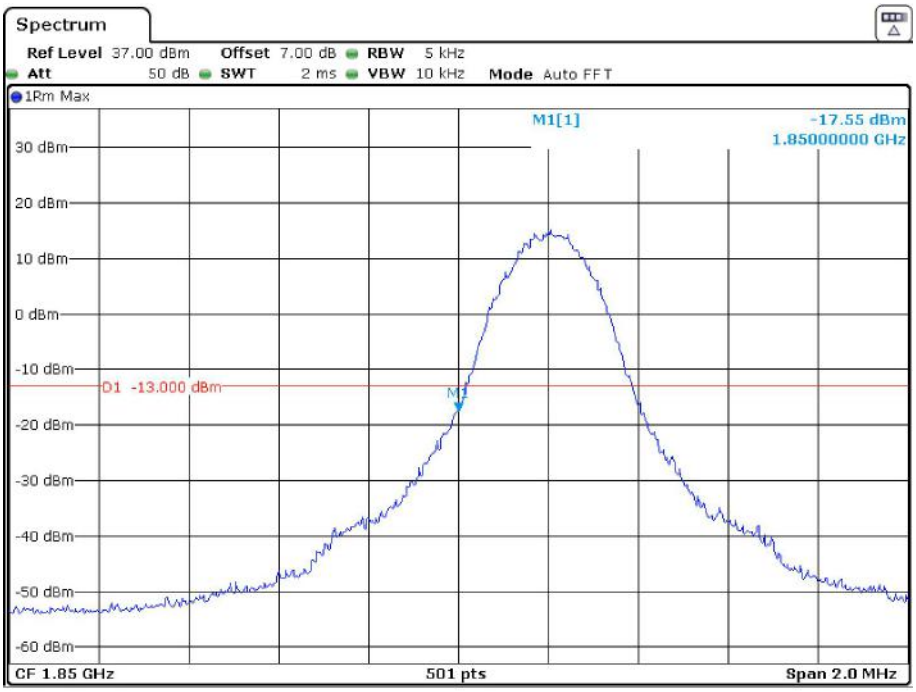
PCS Band, Left Band Edge for GSM (GMSK) Mode



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



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



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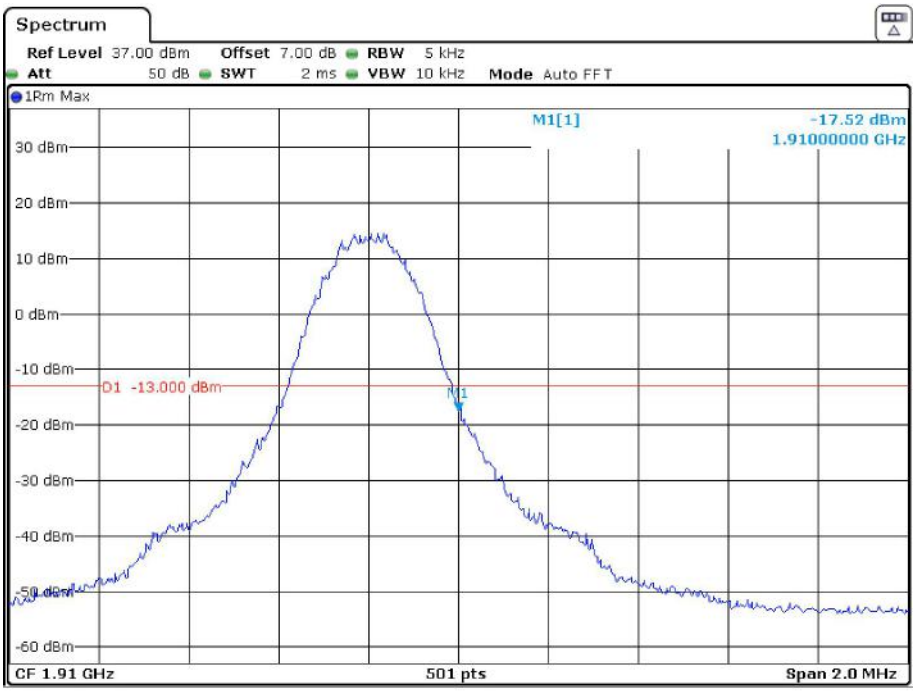
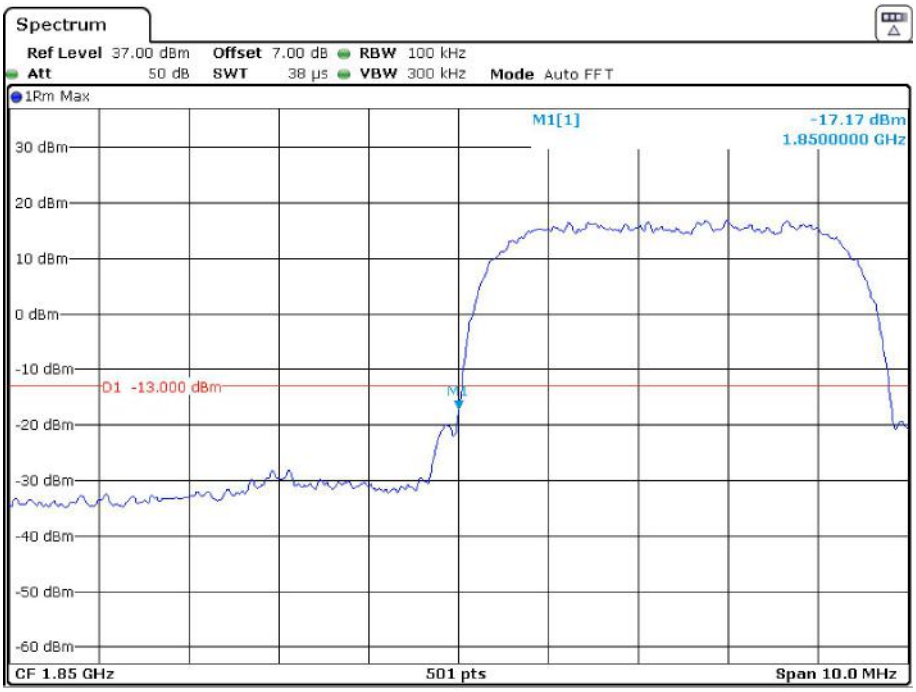
PCS Band, Right Band Edge for GSM (8PSK) Mode

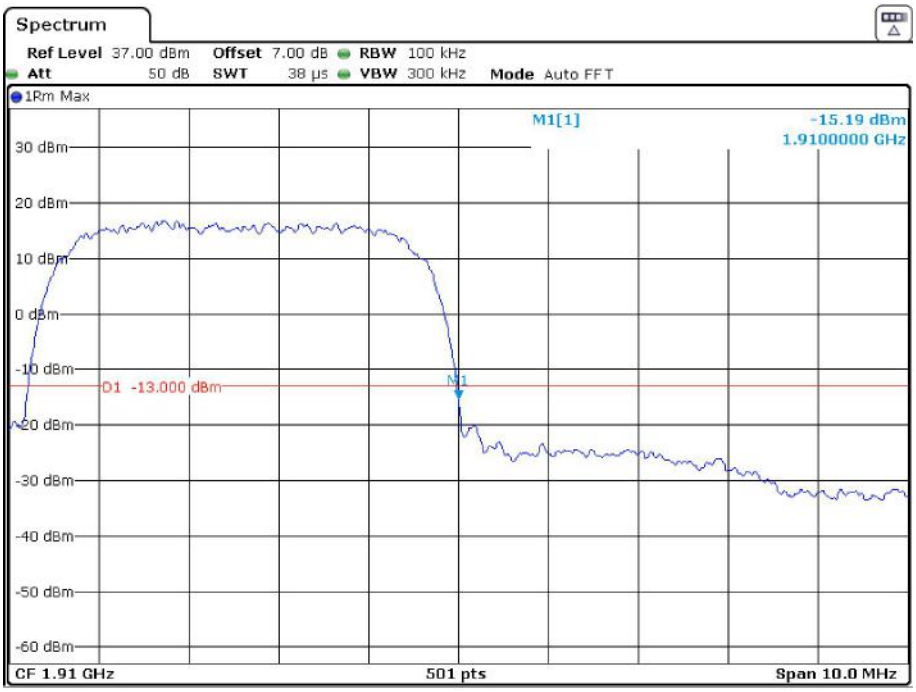


Date: 4.APR.2022 14:38:05

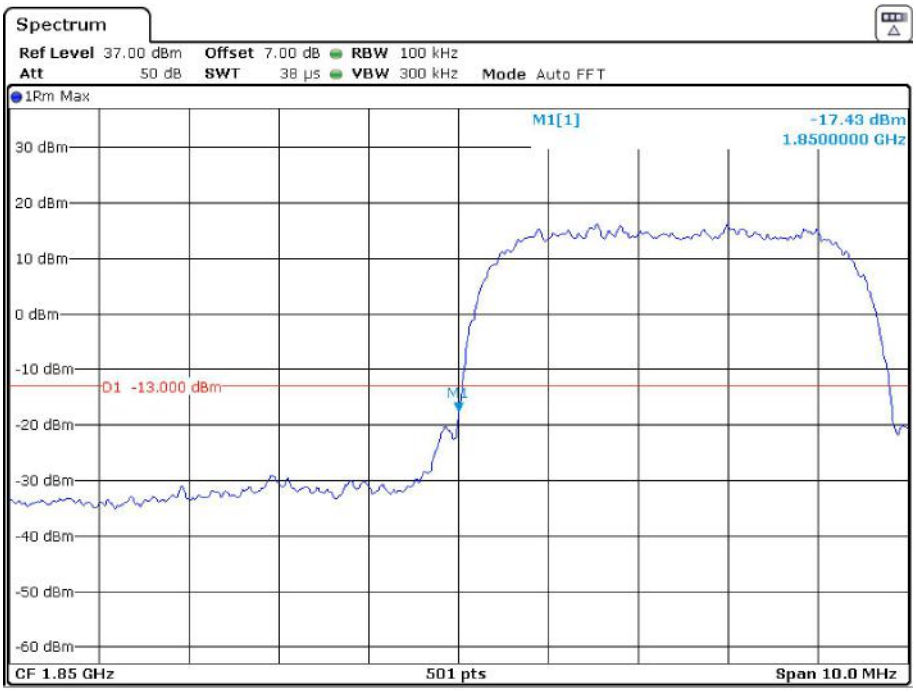
PCS Band, Left Band Edge for RMC (BPSK) Mode



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



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



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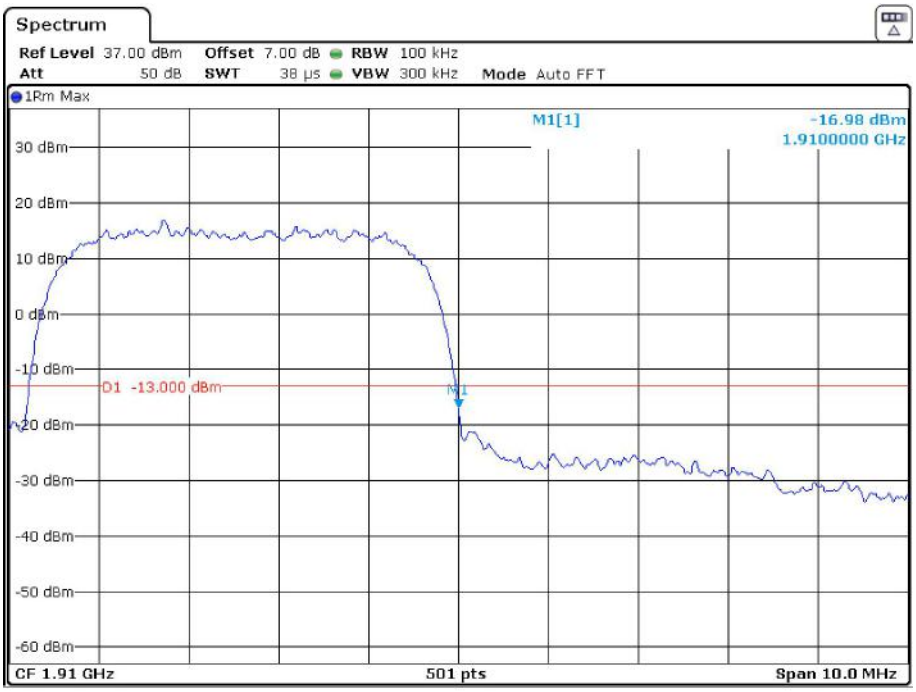
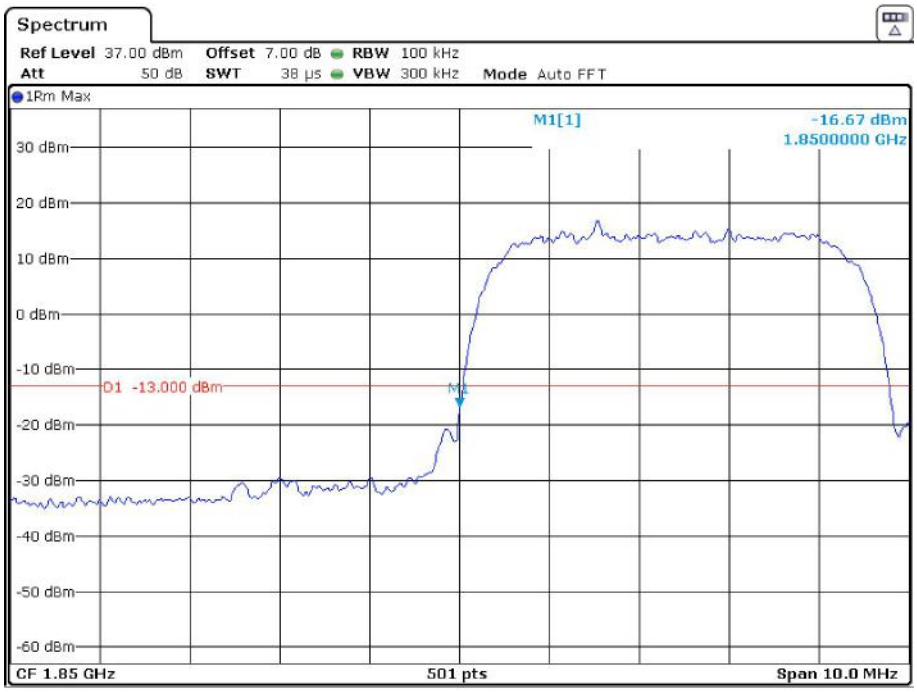
PCS Band, Right Band Edge for HSDPA (16QAM) Mode

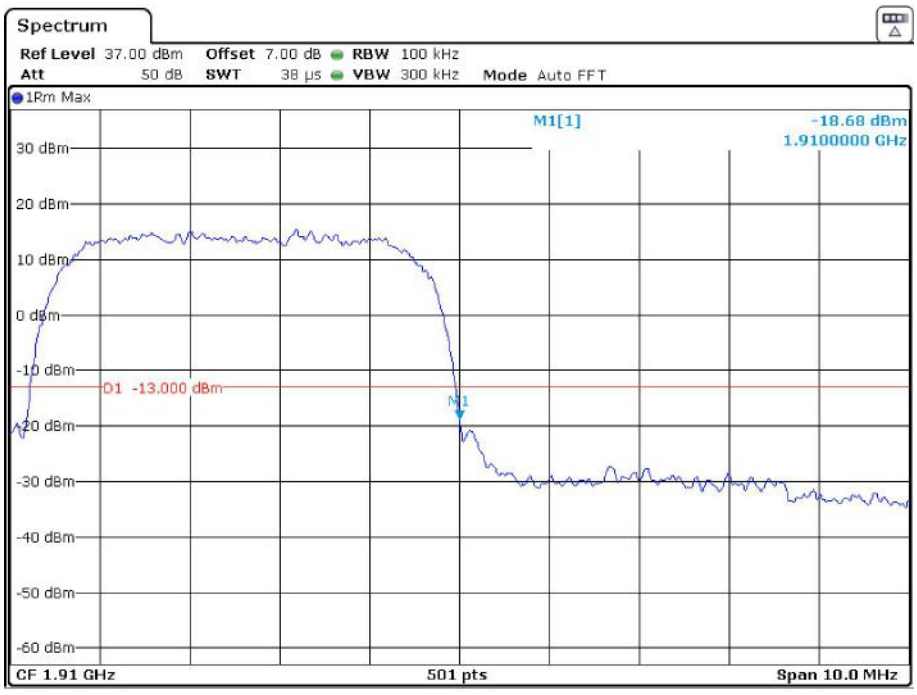


Date: 4.APR.2022 14:56:45

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



PCS Band, Right Band Edge for HSUPA (QPSK) 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&§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

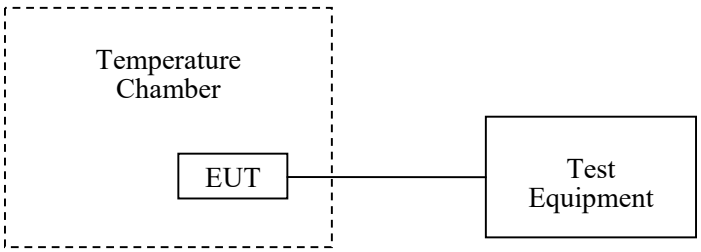
According to §24.235&§27.54, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

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 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Key Pei from 2022-03-24 to 2022-05-09.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the following tables.

Cellular Band (Part 22H)

GSM Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	N.V.	5	0.0060	2.5
-20		7	0.0084	2.5
-10		10	0.0120	2.5
0		5	0.0060	2.5
10		6	0.0072	2.5
20		-3	-0.0036	2.5
30		4	0.0048	2.5
40		3	0.0036	2.5
50		7	0.0084	2.5
20	L.V.	5	0.0060	2.5
	H.V.	6	0.0072	2.5

EDGE Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	N.V.	4	0.0048	2.5
-20		7	0.0084	2.5
-10		2	0.0024	2.5
0		6	0.0072	2.5
10		4	0.0048	2.5
20		-2	-0.0024	2.5
30		6	0.0072	2.5
40		7	0.0084	2.5
50		5	0.0060	2.5
20	L.V.	3	0.0036	2.5
	H.V.	4	0.0048	2.5

WCDMA Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	N.V.	1.54	0.0018	2.5
-20		1.37	0.0016	2.5
-10		1.58	0.0019	2.5
0		1.54	0.0018	2.5
10		1.39	0.0017	2.5
20		0.99	0.0012	2.5
30		1.56	0.0019	2.5
40		1.45	0.0017	2.5
50		1.63	0.0019	2.5
20	L.V.	1.35	0.0016	2.5
	H.V.	1.24	0.0015	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	N.V.	8	0.0043	pass
-20		-6	-0.0032	pass
-10		15	0.0080	pass
0		11	0.0059	pass
10		-12	-0.0064	pass
20		-7	-0.0037	pass
30		-9	-0.0048	pass
40		-14	-0.0074	pass
50		6	0.0032	pass
20	L.V.	8	0.0043	pass
	H.V.	-10	-0.0053	pass

EDGE Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	N.V.	5	0.0027	pass
-20		6	0.0032	pass
-10		7	0.0037	pass
0		2	0.0011	pass
10		10	0.0053	pass
20		0	0.0000	pass
30		9	0.0048	pass
40		6	0.0032	pass
50		8	0.0043	pass
20	L.V.	5	0.0027	pass
	H.V.	7	0.0037	pass

WCDMA Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	N.V.	1.55	0.0008	pass
-20		1.47	0.0008	pass
-10		2.11	0.0011	pass
0		2.35	0.0013	pass
10		2.41	0.0013	pass
20		1.08	0.0006	pass
30		2.15	0.0011	pass
40		2.16	0.0011	pass
50		2.14	0.0011	pass
20	L.V.	2.47	0.0013	pass
	H.V.	2.53	0.0013	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	N.V.	-3.69	-0.0020	pass
-20		-9.97	-0.0053	pass
-10		-6.13	-0.0033	pass
0		6.17	0.0033	pass
10		7.92	0.0042	pass
20		6.46	0.0034	pass
30		-6.52	-0.0035	pass
40		7.18	0.0038	pass
50		-9.69	-0.0052	pass
20	L.V.	-8.17	-0.0043	pass
	H.V.	-7.05	-0.0038	pass

Band 5:

10.0 MHz Middle Channel, f_o =836.5MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	N.V.	-3.03	-0.0036	2.5
-20		-9.97	-0.0119	2.5
-10		-6.13	-0.0073	2.5
0		6.17	0.0074	2.5
10		7.92	0.0095	2.5
20		6.46	0.0077	2.5
30		-6.52	-0.0078	2.5
40		7.18	0.0086	2.5
50		-9.69	-0.0116	2.5
20	L.V.	-8.17	-0.0098	2.5
	H.V.	-7.05	-0.0084	2.5

Band 12:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	N.V.	699.0374	715.9632	699	716
-20		699.0362	715.9627	699	716
-10		699.0362	715.9671	699	716
0		699.0318	715.9665	699	716
10		699.0345	715.9647	699	716
20		699.0384	715.9672	699	716
30		699.0378	715.9665	699	716
40		699.0377	715.9691	699	716
50		699.0362	715.9654	699	716
20	L.V.	699.0338	715.9672	699	716
	H.V.	699.0375	715.9647	699	716

Band 41:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	N.V.	2535.0567	2654.9455	2535	2655
-20		2535.0558	2654.9468	2535	2655
-10		2535.0525	2654.9406	2535	2655
0		2535.0539	2654.9427	2535	2655
10		2535.0528	2654.9425	2535	2655
20		2535.0526	2654.9472	2535	2655
30		2535.0512	2654.9467	2535	2655
40		2535.0565	2654.9452	2535	2655
50		2535.0574	2654.9395	2535	2655
20	L.V.	2535.0497	2654.9414	2535	2655
	H.V.	2535.0512	2654.9422	2535	2655

Note: the frequency range of LTE B41 is 2535-2655MHz which was declared by applicant.

16QAM:

Band 2:

10.0 MHz Middle Channel, f_o =1880MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	N.V.	-3.99	-0.0021	pass
-20		-6.68	-0.0036	pass
-10		9.77	0.0052	pass
0		-7.62	-0.0041	pass
10		-9.91	-0.0053	pass
20		-9.82	-0.0052	pass
30		-6.68	-0.0036	pass
40		-8.85	-0.0047	pass
50		5.67	0.0030	pass
20	L.V.	6.05	0.0032	pass
	H.V.	7.52	0.0040	pass

Band 5:

10.0 MHz Middle Channel, f_o =836.5MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	N.V.	0.30	0.0004	2.5
-20		-6.68	-0.0080	2.5
-10		9.77	0.0117	2.5
0		-7.62	-0.0091	2.5
10		-9.91	-0.0118	2.5
20		-9.82	-0.0117	2.5
30		-6.68	-0.0080	2.5
40		-8.85	-0.0106	2.5
50		5.67	0.0068	2.5
20	L.V.	6.05	0.0072	2.5
	H.V.	7.52	0.0090	2.5

Band 12:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	N.V.	699.0387	715.9688	699	716
-20		699.0355	715.9627	699	716
-10		699.0398	715.9674	699	716
0		699.0345	715.9676	699	716
10		699.0355	715.9657	699	716
20		699.0407	715.9628	699	716
30		699.0355	715.9626	699	716
40		699.0342	715.9644	699	716
50		699.0385	715.9636	699	716
20	L.V.	699.0367	715.9665	699	716
	H.V.	699.0345	715.9676	699	716

Band 41:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	N.V.	2535.0512	2654.8539	2535	2655
-20		2535.0495	2654.8532	2535	2655
-10		2535.0432	2654.8556	2535	2655
0		2535.0458	2654.8582	2535	2655
10		2535.0457	2654.8548	2535	2655
20		2535.0433	2654.8555	2535	2655
30		2535.0472	2654.8562	2535	2655
40		2535.0445	2654.8536	2535	2655
50		2535.0462	2654.8595	2535	2655
20	L.V.	2535.0487	2654.8547	2535	2655
	H.V.	2535.0428	2654.8553	2535	2655

Note: the frequency range of LTE B41 is 2535-2655MHz which was declared by applicant.

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