TESTREPORT

Applicant Name :	Shenzhen Youmi Intelligent Technology Co., Ltd.
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ReportNumber:	SZNS220316-09131E-RF-00C
FCC ID:	2ATZ4-A13SF

Test Standard (s)

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

Sample Description

Product Type:	Smart phone
Model No.:	A13S
Multiple Model(s) No.:	N/A
Trade Mark:	UMIDIGI
Date Received:	2022/03/16
Report Date:	2022/04/25

Test Result:	Pass*

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

Prepared andChecked 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 13: 777-787MHz(TX); 746-756MHz(RX) LTE Band 41: 2535-2655MHz(TX/RX)
Modulation Technique	2G: GMSK 3G: BPSK, QPSK, 16QAM 4G: QPSK, 16QAM
Antenna Specification*	GSM850/WCDMA 850/LTE B5: -2.28dBi WCDMA 1900/PCS1900/LTE B2: 0.83dBi LTE B12/B13: -1.01dBi LTE B41: -1.33dBi (provided by the applicant)
Voltage Range	DC 3.85V from battery or DC 5Vfrom adapter
Sample serial number	SZNS220316-09131E-RF-S1 for Radiated Emissions SZNS220316-09131E-RF-S2 for RF Conducted Test (Assigned by ATC)
Sample/EUT Status	Good condition
Adapter information	Model: HJ-0502000W2-US Input: AC 100-240V, 50/60Hz, 0.3A Output: DC 5.0V, 2.0A
Normal/Extreme Condition	L.V.: Low Voltage 3.45V_{DC} N.V.: Normal Voltage 3.85V_{DC} H.V.: High Voltage 4.4V_{DC}

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 B13	5	779.5	782.0	784.5
	10	/	782.0	/
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.

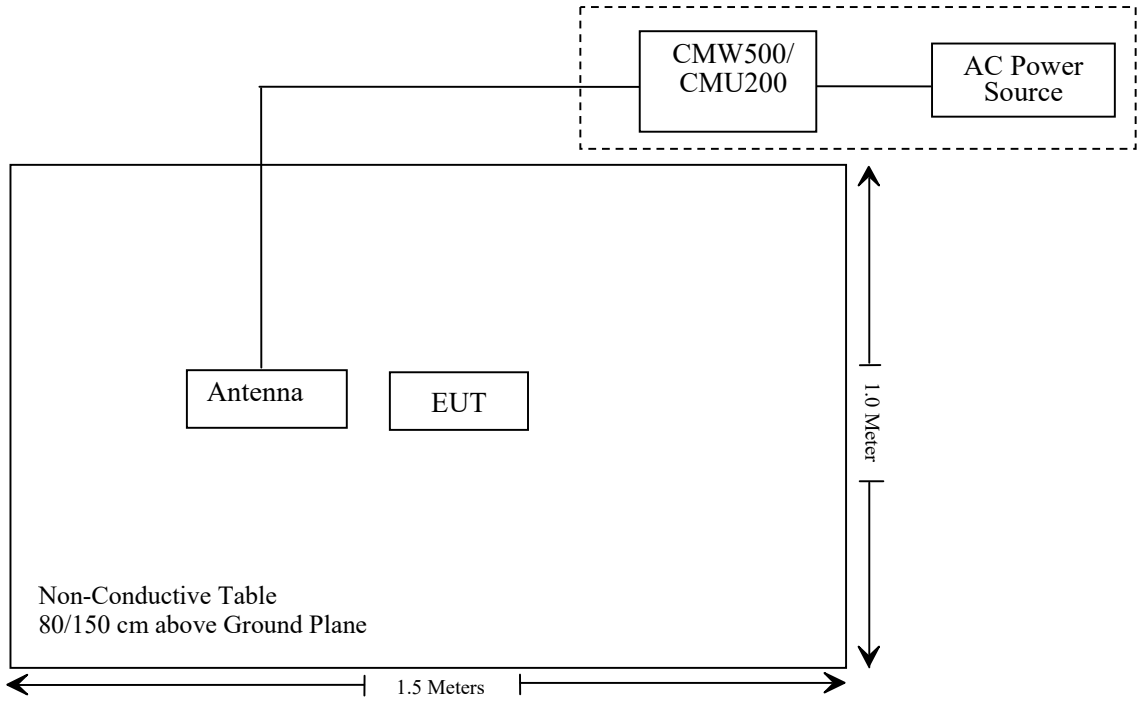
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-116218-UY
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	110605

Support Cable Description

Cable Description	Length (m)	From / Port	To
Unshielded Un-detachable AC Cable	1.2	AC Power	CMW500/ CMU200

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 1.1307 ,§2.1093	RF Exposure (SAR)	Compliant
§2.1046; § 22.913 (a); § 24.232 (c); §27.50 (b) (c) (d) (h);	RF Output Power	Compliant
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; § 22.905; § 22.917; § 24.238; §27.53	Occupied Bandwidth	Compliant
§ 2.1051; §22.917 (a); § 24.238 (a); §27.53;	Spurious Emissions at Antenna Terminal	Compliant
§ 2.1053; § 22.917 (a); § 24.238 (a); §27.53	Field Strength of Spurious Radiation	Compliant
§ 22.917 (a); § 24.238 (a); §27.53 (c) (h) (m)	Band Edge	Compliant
§ 2.1055; § 22.355; § 24.235; §27.54;	Frequency stability	Compliant

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.15	N600	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.16	N650	2021/12/14	2022/12/13
Unknown	Band Reject Filter	MSF824-862MS-1147	201706003	2021/12/14	2022/12/13
Unknown	Band Reject Filter	MSF1850-1910MS-1148	201706003	2021/12/14	2022/12/13
Unknown	Band Reject Filter	MSF700-800MS-1153	201706003	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 Antenna	PE9852/2F-20	1120	2020/01/05	2023/01/04
PASTERNACK	Horn Antenna	PE9852/2F-20	1120	2020/01/05	2023/01/04
Agilent	Signal Generator	N5183A	MY51040755	2021/12/13	2022/12/12
Radiated Emission Test Software: e3 19821b (V9)					
RF Conducted Test					
Rohde&Schwarz	Spectrum Analyzer	FSV-40	101495	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 6dB Attenuator	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: CR22030069-20A.

FCC§2.1047 - MODULATION CHARACTERISTIC

Accordingto 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.

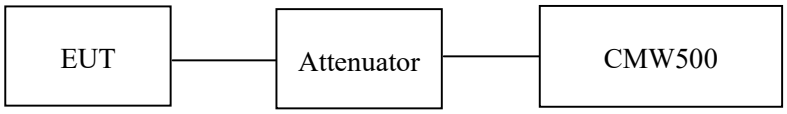
According to §27.50(b), Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

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 Gala Liu from 2022-04-02 to 2022-04-04.

Conducted Power

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	ERP(dBm)	Limit (dBm)
GSM	128	824.2	33.50	28.57	38.45
	190	836.6	33.60	28.67	38.45
	251	848.8	33.60	28.67	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				ERP(dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	33.57	31.03	29.11	26.94	28.64	26.10	24.18	22.01	38.45
	190	836.6	33.69	31.01	29.04	26.86	28.76	26.08	24.11	21.93	38.45
	251	848.8	33.64	30.98	28.97	26.92	28.71	26.05	24.04	21.99	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		23.45	23.38	23.31	18.52	18.45	18.38
	HSDPA	1	22.58	22.66	22.50	17.65	17.73	17.57
		2	22.83	22.52	22.58	17.90	17.59	17.65
		3	22.77	22.33	22.44	17.84	17.40	17.51
		4	22.59	22.45	22.53	17.66	17.52	17.60
	HSUPA	1	22.67	22.69	22.61	17.74	17.76	17.68
		2	22.73	22.42	22.55	17.80	17.49	17.62
		3	22.55	22.56	22.46	17.62	17.63	17.53
		4	22.46	22.43	22.72	17.53	17.50	17.79
		5	22.59	22.46	22.55	17.66	17.53	17.62
	HSPA+	1	22.47	22.80	22.46	17.54	17.87	17.53

Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBd) - Cable loss(dB)
For GSM850/WCDMA Band5: Antenna Gain =-2.28dBi = -4.43dBd (0dBd=2.15dBi)
For 700-960MHz, Cable Loss=0.5dB* (provided by the applicant)
Limit: ERP≤38.45dBm

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	EIRP(dBm)	Limit (dBm)
GSM	512	1850.2	30.90	30.73	33
	661	1880.0	30.50	30.33	33
	810	1909.8	30.20	30.03	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	30.97	28.27	26.74	24.62	30.80	28.10	26.57	24.45	33
	661	1880.0	30.63	28.04	26.48	24.50	30.46	27.87	26.31	24.33	33
	810	1909.8	30.19	27.77	26.22	24.12	30.02	27.60	26.05	23.95	33

Mode	Test Mode	3GPP Sub Test	Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
WCDMA (Band 2)	RMC12.2k		23.88	23.69	23.45	23.71	23.52	23.28
	HSDPA	1	23.16	22.64	22.33	22.99	22.47	22.16
		2	23.01	22.58	22.17	22.84	22.41	22.00
		3	23.05	22.33	22.42	22.88	22.16	22.25
		4	23.07	22.44	22.36	22.9	22.27	22.19
	HSUPA	1	23.19	22.52	22.31	23.02	22.35	22.14
		2	23.28	22.44	22.14	23.11	22.27	21.97
		3	23.11	22.49	22.16	22.94	22.32	21.99
		4	23.01	22.57	22.49	22.84	22.40	22.32
		5	23.06	22.48	22.47	22.89	22.31	22.30
	HSPA+	1	23.02	22.47	22.28	22.85	22.30	22.11

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi) - Cable loss(dB)
For PCS1900 / WCDMA Band2: Antenna Gain =0.83dBi
For 1700-2000MHz, Cable Loss=1.0dB*(provided by the applicant)
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	22.61	21.97	21.36	22.44	21.8	21.19
		RB1#3	22.63	21.97	21.39	22.46	21.8	21.22
		RB1#5	22.69	22.01	21.33	22.52	21.84	21.16
		RB3#0	22.69	22.12	21.36	22.52	21.95	21.19
		RB3#3	22.73	22.09	21.37	22.56	21.92	21.2
		RB6#0	21.71	21.10	20.30	21.54	20.93	20.13
	16QAM	RB1#0	22.37	21.34	19.80	22.2	21.17	19.63
		RB1#3	22.38	21.39	19.89	22.21	21.22	19.72
		RB1#5	22.34	21.41	19.86	22.17	21.24	19.69
		RB3#0	21.72	21.23	20.18	21.55	21.06	20.01
		RB3#3	21.79	21.11	20.14	21.62	20.94	19.97
		RB6#0	20.89	20.12	19.28	20.72	19.95	19.11
3.0	QPSK	RB1#0	22.58	21.92	21.40	22.41	21.75	21.23
		RB1#8	22.61	21.91	21.32	22.44	21.74	21.15
		RB1#14	22.58	21.92	21.30	22.41	21.75	21.13
		RB6#0	21.67	20.99	20.29	21.5	20.82	20.12
		RB6#9	21.57	20.97	20.22	21.4	20.8	20.05
		RB15#0	21.63	21.01	20.27	21.46	20.84	20.1
	16QAM	RB1#0	22.11	21.21	19.87	21.94	21.04	19.7
		RB1#8	22.06	21.18	19.70	21.89	21.01	19.53
		RB1#14	21.97	21.19	19.76	21.8	21.02	19.59
		RB6#0	20.64	20.14	19.37	20.47	19.97	19.2
		RB6#9	20.58	20.00	19.34	20.41	19.83	19.17
		RB15#0	20.82	20.08	19.36	20.65	19.91	19.19

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
5.0	QPSK	RB1#0	22.59	22.15	21.25	22.42	21.98	21.08
		RB1#13	22.64	22.05	21.21	22.47	21.88	21.04
		RB1#24	22.56	22.09	21.05	22.39	21.92	20.88
		RB15#0	21.70	21.02	20.34	21.53	20.85	20.17
		RB15#10	21.63	20.87	20.27	21.46	20.7	20.1
		RB25#0	21.61	20.98	20.32	21.44	20.81	20.15
	16QAM	RB1#0	20.81	20.99	20.46	20.64	20.82	20.29
		RB1#13	20.80	20.97	20.32	20.63	20.8	20.15
		RB1#24	20.71	20.92	20.28	20.54	20.75	20.11
		RB15#0	20.72	19.88	19.32	20.55	19.71	19.15
		RB15#10	20.75	19.83	19.17	20.58	19.66	19.00
		RB25#0	20.78	19.99	19.49	20.61	19.82	19.32
10.0	QPSK	RB1#0	22.57	22.02	21.55	22.4	21.85	21.38
		RB1#25	22.50	21.90	21.35	22.33	21.73	21.18
		RB1#49	22.40	21.91	21.23	22.23	21.74	21.06
		RB25#0	21.53	20.95	20.58	21.36	20.78	20.41
		RB25#25	21.50	20.80	20.23	21.33	20.63	20.06
		RB50#0	21.55	20.85	20.40	21.38	20.68	20.23
	16QAM	RB1#0	22.05	21.77	20.49	21.88	21.6	20.32
		RB1#25	21.98	21.70	20.14	21.81	21.53	19.97
		RB1#49	21.91	21.58	20.04	21.74	21.41	19.87
		RB25#0	20.68	20.10	19.70	20.51	19.93	19.53
		RB25#25	20.65	19.96	19.53	20.48	19.79	19.36
		RB50#0	20.63	20.05	19.47	20.46	19.88	19.30

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
15.0	QPSK	RB1#0	22.46	21.92	21.47	22.29	21.75	21.30
		RB1#38	22.48	21.86	21.27	22.31	21.69	21.10
		RB1#74	22.25	21.76	21.02	22.08	21.59	20.85
		RB36#0	21.57	20.95	20.61	21.4	20.78	20.44
		RB36#39	21.45	20.82	20.36	21.28	20.65	20.19
		RB75#0	21.48	20.84	20.47	21.31	20.67	20.30
	16QAM	RB1#0	21.82	21.73	21.00	21.65	21.56	20.83
		RB1#38	21.76	21.60	20.78	21.59	21.43	20.61
		RB1#74	21.71	21.54	20.55	21.54	21.37	20.38
		RB36#0	20.57	20.04	19.69	20.4	19.87	19.52
		RB36#39	20.42	19.95	19.40	20.25	19.78	19.23
		RB75#0	20.53	19.99	19.58	20.36	19.82	19.41
20.0	QPSK	RB1#0	22.72	22.31	21.75	22.55	22.14	21.58
		RB1#50	22.59	22.14	21.59	22.42	21.97	21.42
		RB1#99	22.33	22.05	21.29	22.16	21.88	21.12
		RB50#0	21.52	21.13	20.76	21.35	20.96	20.59
		RB50#50	21.31	20.82	20.39	21.14	20.65	20.22
		RB100#0	21.47	20.87	20.64	21.30	20.70	20.47
	16QAM	RB1#0	21.65	21.05	21.46	21.48	20.88	21.29
		RB1#50	21.52	20.80	21.22	21.35	20.63	21.05
		RB1#99	21.29	20.89	21.01	21.12	20.72	20.84
		RB50#0	20.62	20.11	19.74	20.45	19.94	19.57
		RB50#50	20.42	19.89	19.42	20.25	19.72	19.25
		RB100#0	20.60	19.94	19.74	20.43	19.77	19.57

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi) - Cable Loss(dB)
For Band2: Antenna Gain =0.83 dBi
Cable Loss=1.0dB*(provided by the applicant)
Limit: EIRP≤33dBm

LTE Band 5

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
1.4	QPSK	RB1#0	24.14	23.98	24.13	19.21	19.05	19.20
		RB1#3	24.16	24.04	24.11	19.23	19.11	19.18
		RB1#5	24.14	24.05	24.07	19.21	19.12	19.14
		RB3#0	24.26	24.04	24.00	19.33	19.11	19.07
		RB3#3	24.26	24.08	24.03	19.33	19.15	19.10
		RB6#0	23.20	23.07	22.99	18.27	18.14	18.06
	16QAM	RB1#0	23.52	23.76	22.56	18.59	18.83	17.63
		RB1#3	23.49	23.75	22.55	18.56	18.82	17.62
		RB1#5	23.47	23.78	22.66	18.54	18.85	17.73
		RB3#0	23.08	23.13	22.71	18.15	18.20	17.78
		RB3#3	23.13	23.15	22.77	18.20	18.22	17.84
		RB6#0	22.22	22.25	22.15	17.29	17.32	17.22
3.0	QPSK	RB1#0	24.05	24.01	24.12	19.12	19.08	19.19
		RB1#8	24.06	24.03	24.09	19.13	19.10	19.16
		RB1#14	24.13	24.03	24.06	19.20	19.10	19.13
		RB6#0	23.07	23.08	22.95	18.14	18.15	18.02
		RB6#9	23.16	23.05	22.97	18.23	18.12	18.04
		RB15#0	23.13	23.00	23.01	18.20	18.07	18.08
	16QAM	RB1#0	23.34	23.28	22.57	18.41	18.35	17.64
		RB1#8	23.23	23.23	22.55	18.30	18.30	17.62
		RB1#14	23.29	23.19	22.55	18.36	18.26	17.62
		RB6#0	22.36	22.26	22.22	17.43	17.33	17.29
		RB6#9	22.29	22.24	22.20	17.36	17.31	17.27
		RB15#0	22.19	22.08	22.06	17.26	17.15	17.13

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
5.0	QPSK	RB1#0	24.05	24.18	23.90	19.12	19.25	18.97
		RB1#13	23.99	24.12	23.88	19.06	19.19	18.95
		RB1#24	23.99	24.18	23.84	19.06	19.25	18.91
		RB15#0	23.21	23.06	22.96	18.28	18.13	18.03
		RB15#10	23.23	23.03	23.02	18.30	18.10	18.09
		RB25#0	23.03	23.01	22.97	18.10	18.08	18.04
	16QAM	RB1#0	22.36	23.10	23.04	17.43	18.17	18.11
		RB1#13	22.36	23.09	22.99	17.43	18.16	18.06
		RB1#24	22.34	23.10	22.99	17.41	18.17	18.06
		RB15#0	22.25	22.02	21.98	17.32	17.09	17.05
		RB15#10	22.24	21.88	21.98	17.31	16.95	17.05
		RB25#0	22.36	22.01	22.17	17.43	17.08	17.24
10.0	QPSK	RB1#0	24.17	24.04	24.02	19.24	19.11	19.09
		RB1#25	24.08	24.08	23.98	19.15	19.15	19.05
		RB1#49	24.07	23.97	23.91	19.14	19.04	18.98
		RB25#0	23.09	23.11	23.09	18.16	18.18	18.16
		RB25#25	23.18	23.05	23.03	18.25	18.12	18.10
		RB50#0	23.06	23.06	23.04	18.13	18.13	18.11
	16QAM	RB1#0	23.56	23.78	22.88	18.63	18.85	17.95
		RB1#25	23.51	23.79	22.87	18.58	18.86	17.94
		RB1#49	23.47	23.70	22.80	18.54	18.77	17.87
		RB25#0	22.24	22.25	22.27	17.31	17.32	17.34
		RB25#25	22.14	22.22	22.26	17.21	17.29	17.33
		RB50#0	22.51	22.15	22.20	17.58	17.22	17.27

Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBd) - Cable Loss(dB)
For Band5: Antenna Gain =-2.28dBi = -4.43dBd (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	25.00	24.92	25.08	21.34	21.26	21.42
		RB1#3	25.00	25.05	25.08	21.34	21.39	21.42
		RB1#5	25.03	24.99	25.08	21.37	21.33	21.42
		RB3#0	25.11	25.09	24.91	21.45	21.43	21.25
		RB3#3	25.09	25.08	24.97	21.43	21.42	21.31
		RB6#0	23.88	24.23	24.06	20.22	20.57	20.40
	16QAM	RB1#0	24.28	24.50	23.61	20.62	20.84	19.95
		RB1#3	24.31	24.85	23.65	20.65	21.19	19.99
		RB1#5	24.22	24.84	23.63	20.56	21.18	19.97
		RB3#0	24.05	24.18	23.72	20.39	20.52	20.06
		RB3#3	23.90	24.21	23.73	20.24	20.55	20.07
		RB6#0	23.10	23.36	23.08	19.44	19.70	19.42
3.0	QPSK	RB1#0	24.97	24.98	25.12	21.31	21.32	21.46
		RB1#8	24.95	24.98	25.07	21.29	21.32	21.41
		RB1#14	24.81	24.97	25.09	21.15	21.31	21.43
		RB6#0	23.91	23.97	23.89	20.25	20.31	20.23
		RB6#9	24.00	24.08	24.05	20.34	20.42	20.39
		RB15#0	24.12	24.11	23.94	20.46	20.45	20.28
	16QAM	RB1#0	24.12	24.06	23.57	20.46	20.40	19.91
		RB1#8	24.08	24.26	23.53	20.42	20.60	19.87
		RB1#14	24.16	24.28	23.53	20.50	20.62	19.87
		RB6#0	23.19	23.34	23.28	19.53	19.68	19.62
		RB6#9	23.12	23.37	23.07	19.46	19.71	19.41
		RB15#0	23.08	23.29	23.02	19.42	19.63	19.36

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			ERP(dBm)		
			Low	Mid	High	Low	Mid	High
5.0	QPSK	RB1#0	24.96	24.95	24.77	21.30	21.29	21.11
		RB1#13	24.84	25.06	24.77	21.18	21.40	21.11
		RB1#24	24.83	25.02	24.75	21.17	21.36	21.09
		RB15#0	23.99	23.96	23.97	20.33	20.30	20.31
		RB15#10	24.12	24.23	23.89	20.46	20.57	20.23
		RB25#0	24.06	24.17	24.05	20.40	20.51	20.39
	16QAM	RB1#0	23.19	23.71	24.08	19.53	20.05	20.42
		RB1#13	23.18	23.90	23.94	19.52	20.24	20.28
		RB1#24	23.13	23.66	23.92	19.47	20.00	20.26
		RB15#0	23.04	23.04	22.92	19.38	19.38	19.26
		RB15#10	23.11	23.08	23.00	19.45	19.42	19.34
		RB25#0	23.09	23.18	23.21	19.43	19.52	19.55
10.0	QPSK	RB1#0	24.85	24.79	24.88	21.19	21.13	21.22
		RB1#25	24.88	24.98	25.00	21.22	21.32	21.34
		RB1#49	24.89	24.94	24.98	21.23	21.28	21.32
		RB25#0	24.10	23.88	24.09	20.44	20.22	20.43
		RB25#25	24.10	24.04	24.01	20.44	20.38	20.35
		RB50#0	23.92	24.22	24.07	20.26	20.56	20.41
	16QAM	RB1#0	24.33	24.65	23.69	20.67	20.99	20.03
		RB1#25	24.21	24.83	23.57	20.55	21.17	19.91
		RB1#49	24.52	24.68	23.75	20.86	21.02	20.09
		RB25#0	22.99	23.24	23.33	19.33	19.58	19.67
		RB25#25	23.14	23.10	23.21	19.48	19.44	19.55
		RB50#0	22.95	23.27	23.16	19.29	19.61	19.50

Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBd) - Cable Loss(dB)
For Band12: Antenna Gain =-1.01 dBi = -3.16dBd (0dBd=2.15dBi)
Cable Loss=0.5dB* (provided by the applicant)
Limit: ERP≤34.77dBm

LTE Band 13

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			ERP(dBm)		
			Low	Mid	High	Low	Mid	High
5.0	QPSK	RB1#0	24.64	24.74	24.45	20.98	21.08	20.79
		RB1#13	24.61	24.74	24.49	20.95	21.08	20.83
		RB1#24	24.60	24.80	24.41	20.94	21.14	20.75
		RB15#0	23.80	23.70	23.73	20.14	20.04	20.07
		RB15#10	23.71	23.57	23.71	20.05	19.91	20.05
		RB25#0	23.56	23.65	23.68	19.90	19.99	20.02
	16QAM	RB1#0	23.06	23.65	23.68	19.40	19.99	20.02
		RB1#13	22.93	23.64	23.66	19.27	19.98	20.00
		RB1#24	22.91	23.67	23.62	19.25	20.01	19.96
		RB15#0	22.84	22.63	22.66	19.18	18.97	19.00
		RB15#10	22.81	22.61	22.65	19.15	18.95	18.99
		RB25#0	22.81	22.66	22.86	19.15	19.00	19.20
10.0	QPSK	RB1#0	/	24.67	/	/	21.01	/
		RB1#25	/	24.65	/	/	20.99	/
		RB1#49	/	24.55	/	/	20.89	/
		RB25#0	/	23.62	/	/	19.96	/
		RB25#25	/	23.70	/	/	20.04	/
		RB50#0	/	23.58	/	/	19.92	/
	16QAM	RB1#0	/	24.16	/	/	20.50	/
		RB1#25	/	24.07	/	/	20.41	/
		RB1#49	/	23.98	/	/	20.32	/
		RB25#0	/	22.68	/	/	19.02	/
		RB25#25	/	22.84	/	/	19.18	/
		RB50#0	/	22.64	/	/	18.98	/

Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBd) - Cable Loss(dB)
For Band13: Antenna Gain = -1.01dBi =-3.16 dBd (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	20.22	20.23	19.21	17.89	17.90	16.88
		RB1#13	20.37	20.33	19.17	18.04	18.00	16.84
		RB1#24	20.25	20.18	19.16	17.92	17.85	16.83
		RB15#0	19.21	19.31	18.28	16.88	16.98	15.95
		RB15#10	19.19	19.32	18.24	16.86	16.99	15.91
		RB25#0	19.35	19.30	18.22	17.02	16.97	15.89
	16QAM	RB1#0	19.60	19.62	17.94	17.27	17.29	15.61
		RB1#13	19.61	19.59	17.87	17.28	17.26	15.54
		RB1#24	19.70	19.59	17.87	17.37	17.26	15.54
		RB15#0	18.46	18.24	17.15	16.13	15.91	14.82
		RB15#10	18.53	18.23	17.11	16.20	15.90	14.78
		RB25#0	18.52	18.32	17.37	16.19	15.99	15.04
10.0	QPSK	RB1#0	19.64	20.21	19.21	17.31	17.88	16.88
		RB1#25	19.80	20.12	19.17	17.47	17.79	16.84
		RB1#49	19.83	20.05	19.11	17.50	17.72	16.78
		RB25#0	18.68	18.98	18.21	16.35	16.65	15.88
		RB25#25	18.76	19.06	18.22	16.43	16.73	15.89
		RB50#0	18.76	18.96	18.14	16.43	16.63	15.81
	16QAM	RB1#0	18.69	19.42	18.15	16.36	17.09	15.82
		RB1#25	18.66	19.16	18.16	16.33	16.83	15.83
		RB1#49	18.73	19.27	18.08	16.40	16.94	15.75
		RB25#0	17.88	18.28	17.69	15.55	15.95	15.36
		RB25#25	17.88	18.21	17.51	15.55	15.88	15.18
		RB50#0	17.90	18.23	17.23	15.57	15.90	14.90

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	19.89	20.04	19.49	17.56	17.71	17.16
		RB1#38	20.01	20.08	19.30	17.68	17.75	16.97
		RB1#74	20.10	20.11	19.27	17.77	17.78	16.94
		RB36#0	18.94	19.05	18.40	16.61	16.72	16.07
		RB36#39	18.95	19.03	18.32	16.62	16.70	15.99
		RB75#0	18.95	19.04	18.36	16.62	16.71	16.03
	16QAM	RB1#0	18.90	19.22	18.14	16.57	16.89	15.81
		RB1#38	19.02	19.26	18.03	16.69	16.93	15.70
		RB1#74	19.07	19.13	17.59	16.74	16.80	15.26
		RB36#0	18.05	17.94	17.77	15.72	15.61	15.44
		RB36#39	18.06	17.96	17.53	15.73	15.63	15.20
		RB75#0	18.11	18.14	17.52	15.78	15.81	15.19
20.0	QPSK	RB1#0	20.42	20.15	19.71	18.09	17.82	17.38
		RB1#50	20.41	20.11	19.61	18.08	17.78	17.28
		RB1#99	20.63	19.98	19.50	18.30	17.65	17.17
		RB50#0	19.47	19.32	18.61	17.14	16.99	16.28
		RB50#50	19.61	19.29	18.44	17.28	16.96	16.11
		RB100#0	19.43	19.31	18.51	17.10	16.98	16.18
	16QAM	RB1#0	19.64	19.06	19.43	17.31	16.73	17.10
		RB1#50	19.82	18.98	19.29	17.49	16.65	16.96
		RB1#99	19.94	18.94	19.23	17.61	16.61	16.90
		RB50#0	18.65	18.42	17.69	16.32	16.09	15.36
		RB50#50	18.73	18.40	17.53	16.40	16.07	15.20
		RB100#0	18.54	18.37	17.58	16.21	16.04	15.25

Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBd) - Cable Loss(dB)
For Band 41: Antenna Gain =-1.33 dBi
Cable Loss=1.0dB* (provided by the applicant)
Limit: ERP≤33dBm

Peak-to-average ratio (PAR)

Cellular Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	3.29	13
	Middle	3.37	13
	High	3.45	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.17	13
	Middle	3.36	13
	High	3.22	13
HSDPA (16QAM)	Low	4.25	13
	Middle	3.53	13
	High	3.42	13
HSUPA (BPSK)	Low	3.43	13
	Middle	3.55	13
	High	3.57	13
HSPA+	Low	3.32	13
	Middle	3.23	13
	High	3.57	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	3.36	13
	Middle	3.22	13
	High	3.41	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.22	13
	Middle	3.25	13
	High	3.33	13
HSDPA (16QAM)	Low	4.42	13
	Middle	4.22	13
	High	4.45	13
HSUPA (BPSK)	Low	3.52	13
	Middle	3.47	13
	High	3.66	13
HSPA+	Low	3.35	13
	Middle	3.26	13
	High	3.38	13

LTE Band 2 20MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.14	4.35	3.39	13	Pass
QPSK (100RB Size)	4.43	5.10	4.96	13	Pass
16QAM (1RB Size)	5.16	4.81	4.26	13	Pass
16QAM (100RB Size)	5.39	6.20	6.03	13	Pass

LTE Band 5 10MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.29	4.17	4.03	13	Pass
QPSK (50RB Size)	4.81	4.75	4.58	13	Pass
16QAM (1RB Size)	5.19	5.10	4.49	13	Pass
16QAM (50RB Size)	5.62	5.65	5.59	13	Pass

LTE Band 12 10MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	3.71	4.43	4.46	13	Pass
QPSK (50RB Size)	5.01	4.87	4.90	13	Pass
16QAM (1RB Size)	4.41	5.42	5.42	13	Pass
16QAM (50RB Size)	6.06	5.83	5.83	13	Pass

LTE Band 13 10MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	/	3.77	/	13	Pass
QPSK (50RB Size)	/	4.64	/	13	Pass
16QAM (1RB Size)	/	4.96	/	13	Pass
16QAM (50RB Size)	/	5.54	/	13	Pass

LTE Band 41 20MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.02	4.15	4.21	13	Pass
QPSK (100RB Size)	4.76	4.66	4.84	13	Pass
16QAM (1RB Size)	5.09	4.60	5.18	13	Pass
16QAM (100RB Size)	3.25	6.85	6.41	13	Pass

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

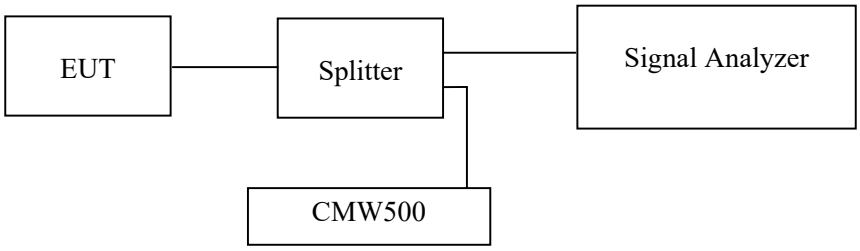
Applicable Standard

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 Gala Liu from 2022-04-02 to 2022-04-04.

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	241.5	301.4
	190	836.6	243.5	307.4
	251	848.8	243.5	301.4

Frequency (MHz)		Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)
RMC	826.4	4.15	4.69
	836.6	4.15	4.69
	846.6	4.17	4.69
HSDPA	826.4	4.15	4.67
	836.6	4.15	4.69
	846.6	4.21	4.69
HSUPA	826.4	4.15	4.67
	836.6	4.15	4.69
	846.6	4.17	4.69

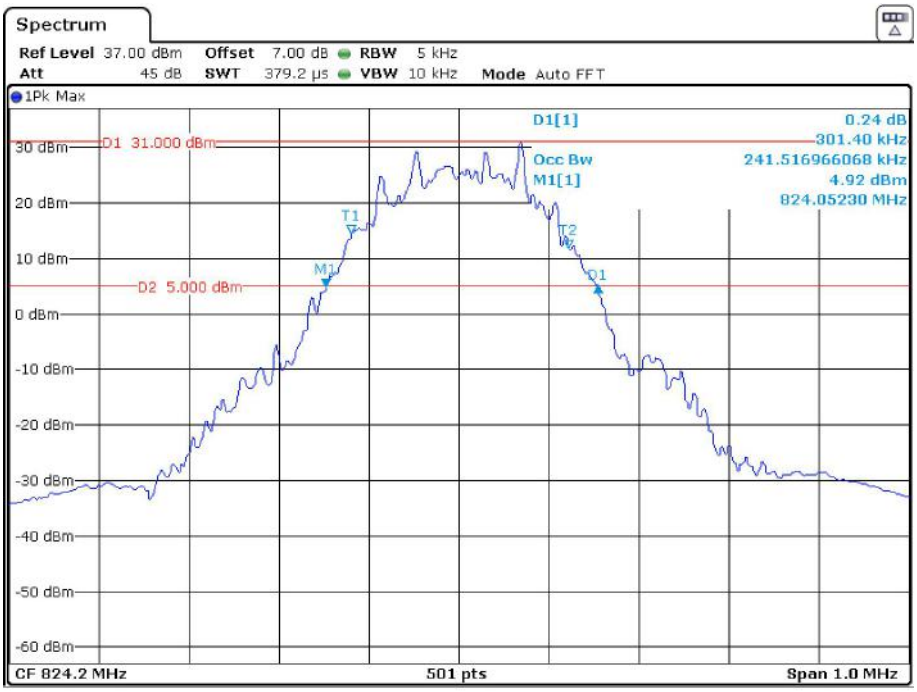
PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	512	1850.2	241.5	305.4
	661	1880.0	243.5	307.4
	810	1909.8	243.5	307.4

Frequency (MHz)		Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)
RMC	1852.4	4.13	4.67
	1880.0	4.15	4.67
	1907.6	4.15	4.67
HSDPA	1852.4	4.17	4.67
	1880.0	4.15	4.67
	1907.6	4.15	4.67
HSUPA	1852.4	4.15	4.67
	1880.0	4.15	4.67
	1907.6	4.15	4.67

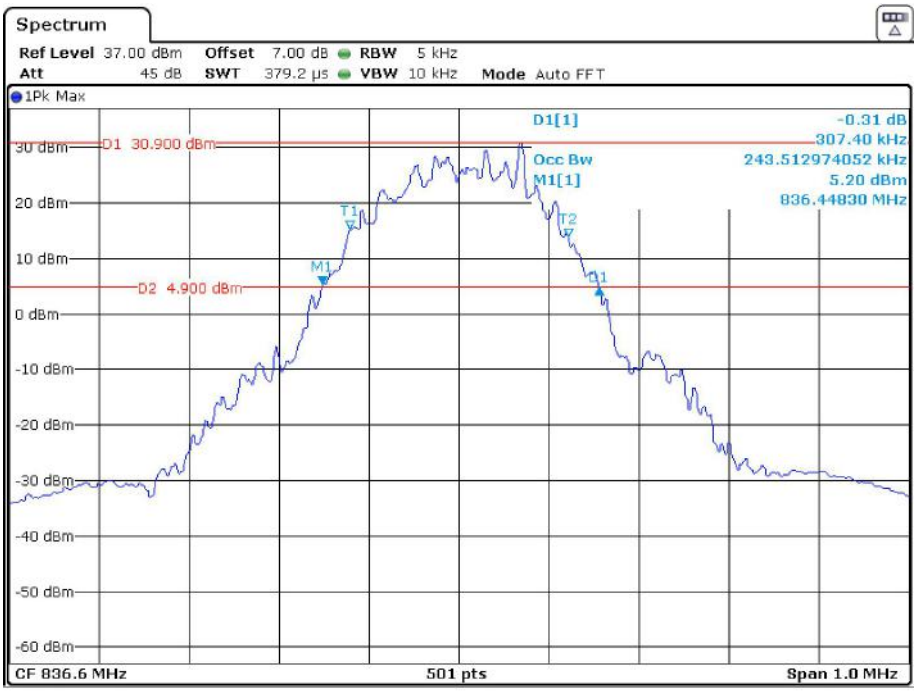
Cellular Band (Part 22H)

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



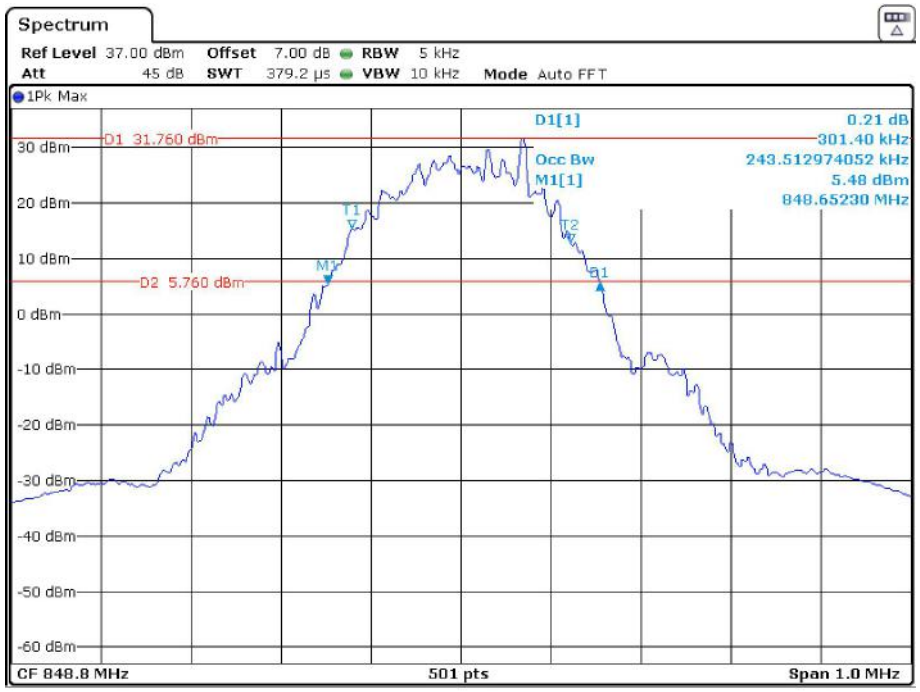
Date: 2.APR.2022 19:32:01

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



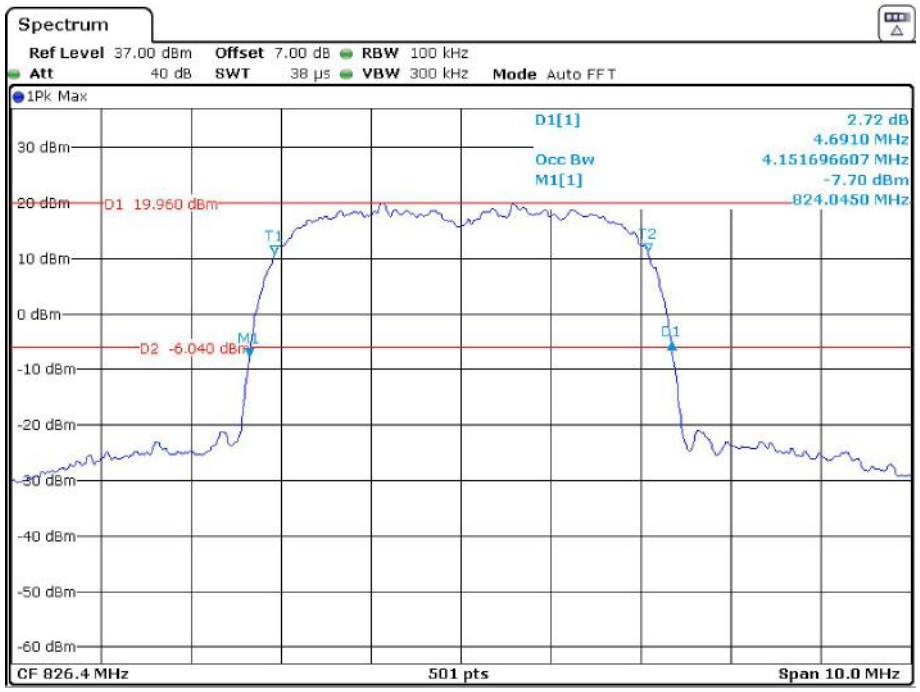
Date: 2.APR.2022 19:33:42

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



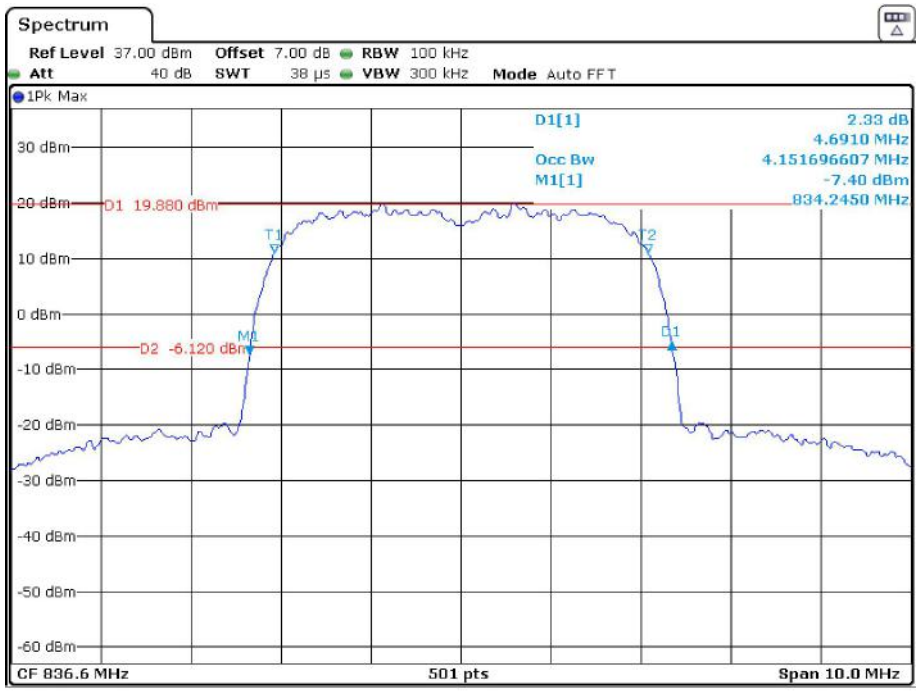
Date: 2.APR.2022 19:34:42

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



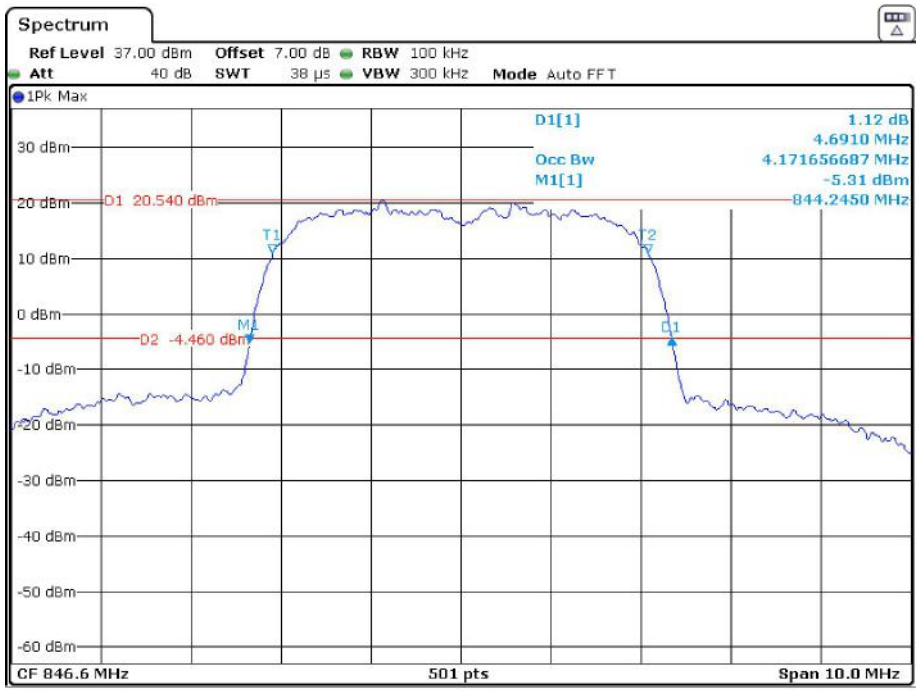
Date: 2.APR.2022 20:05:23

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



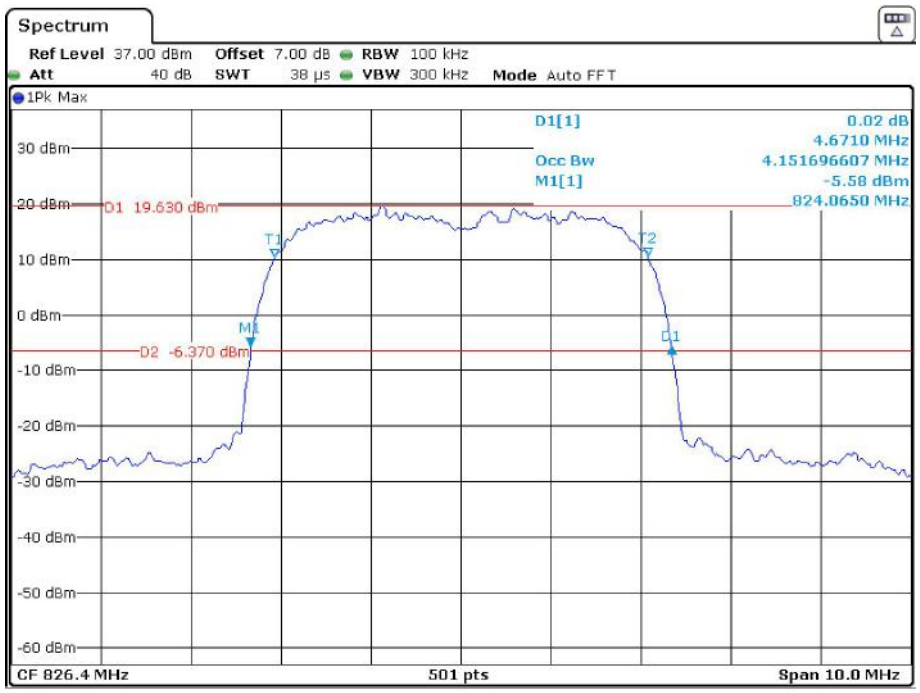
Date: 2.APR.2022 20:06:19

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



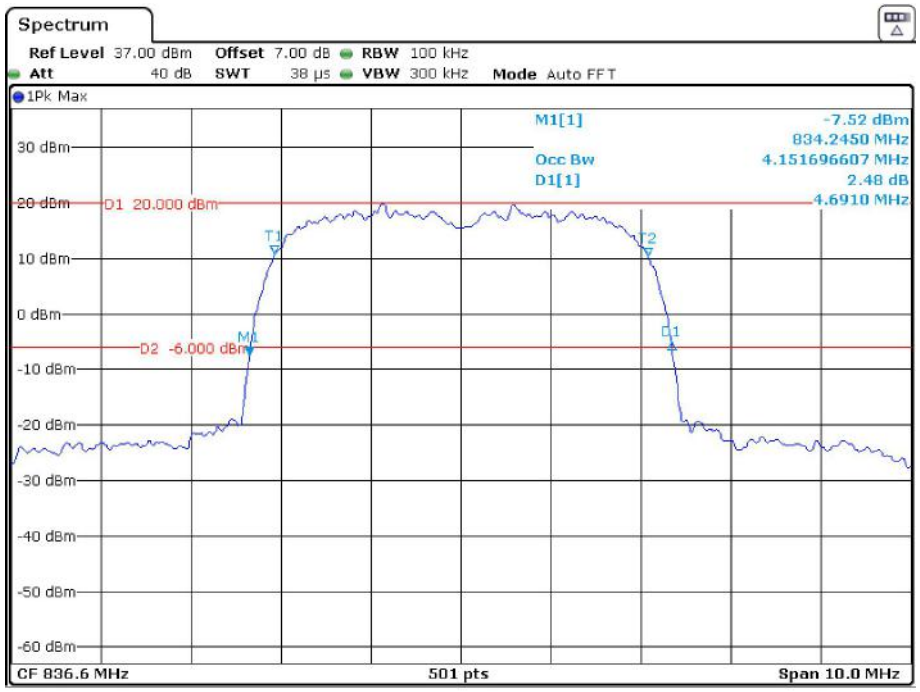
Date: 2.APR.2022 20:07:30

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



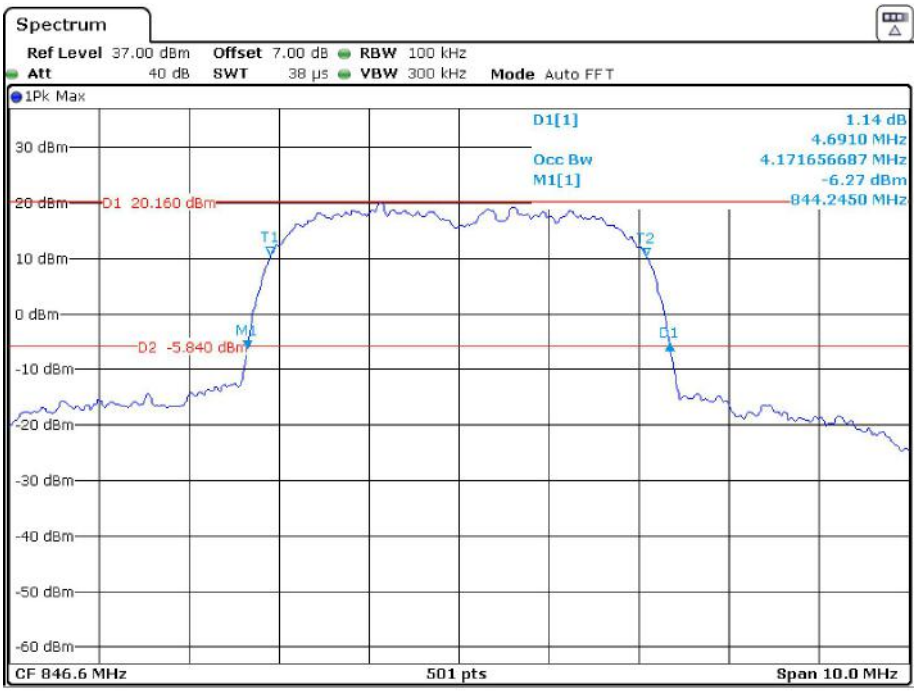
Date: 2.APR.2022 20:41:31

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



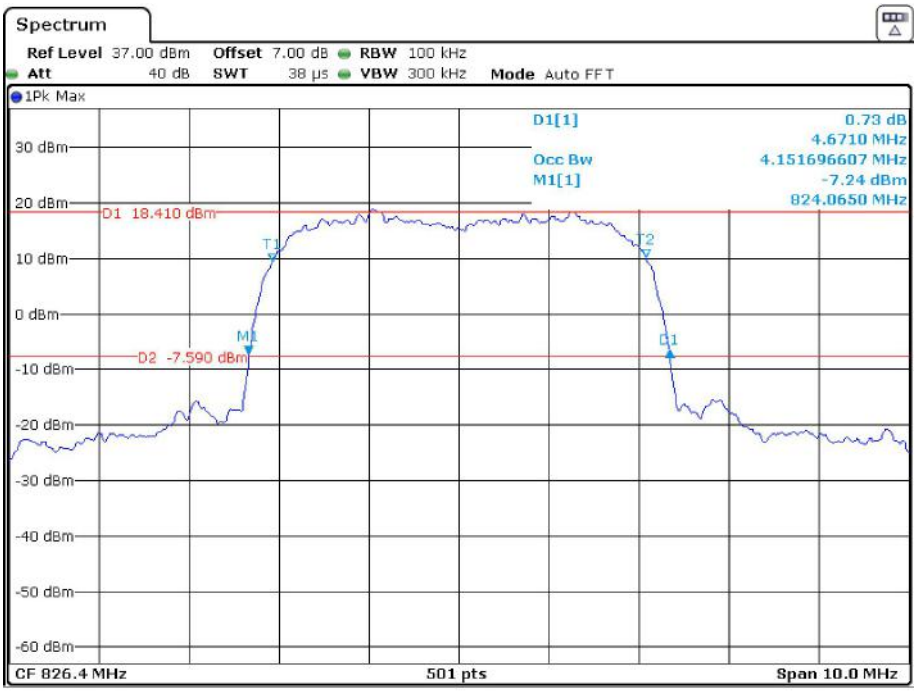
Date: 2.APR.2022 20:40:33

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



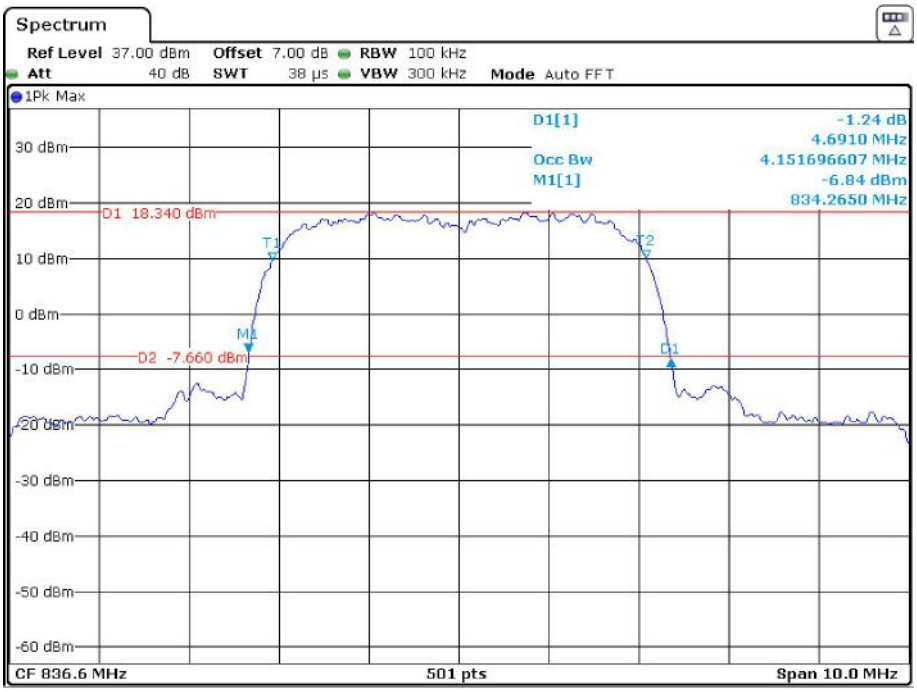
Date: 2.APR.2022 20:39:45

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



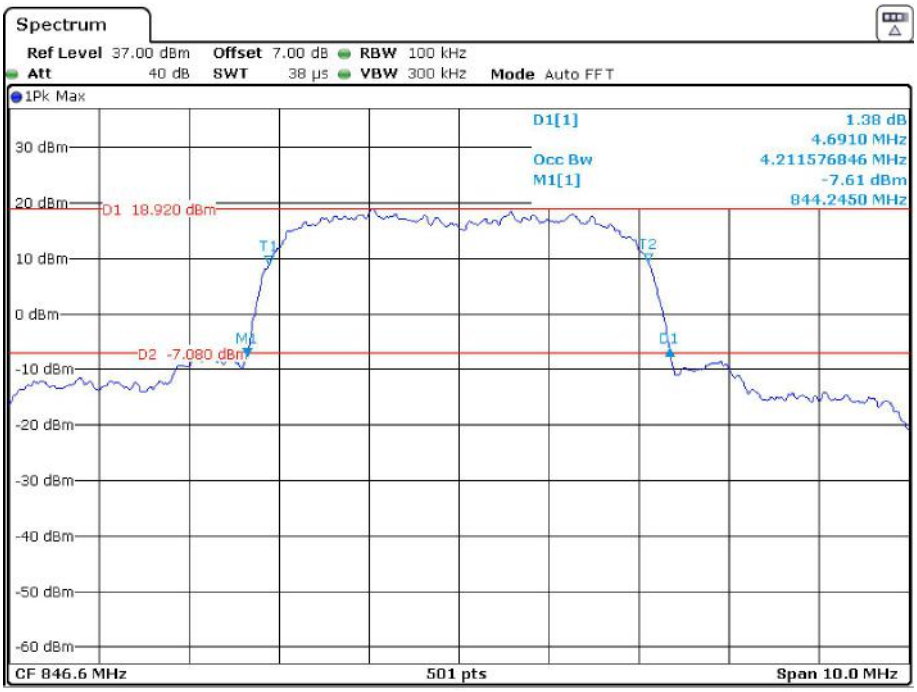
Date: 2.APR.2022 20:29:43

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



Date: 2.APR.2022 20:30:29

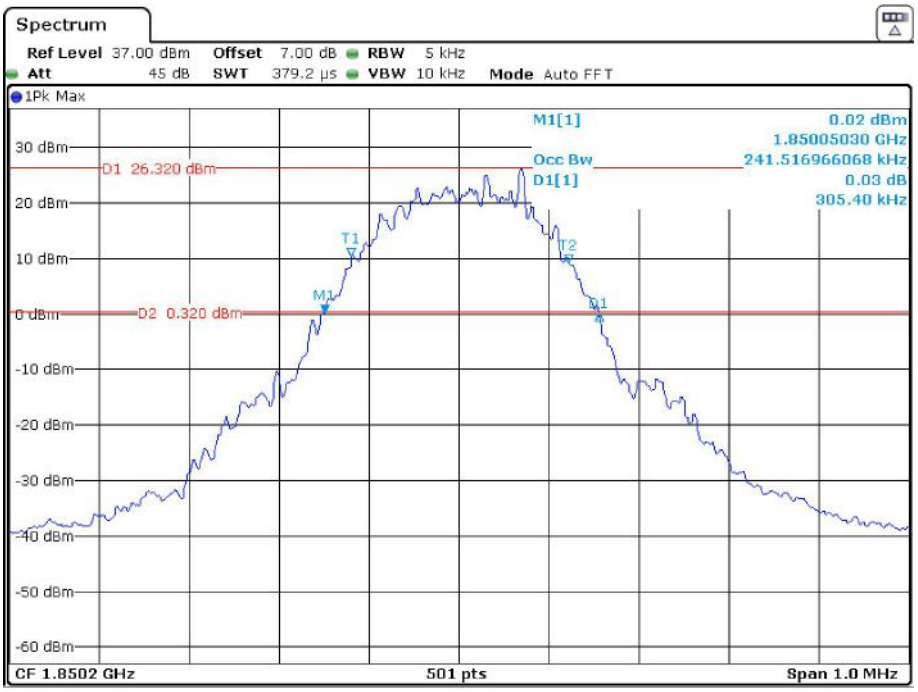
26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode, High channel



Date: 2.APR.2022 20:31:09

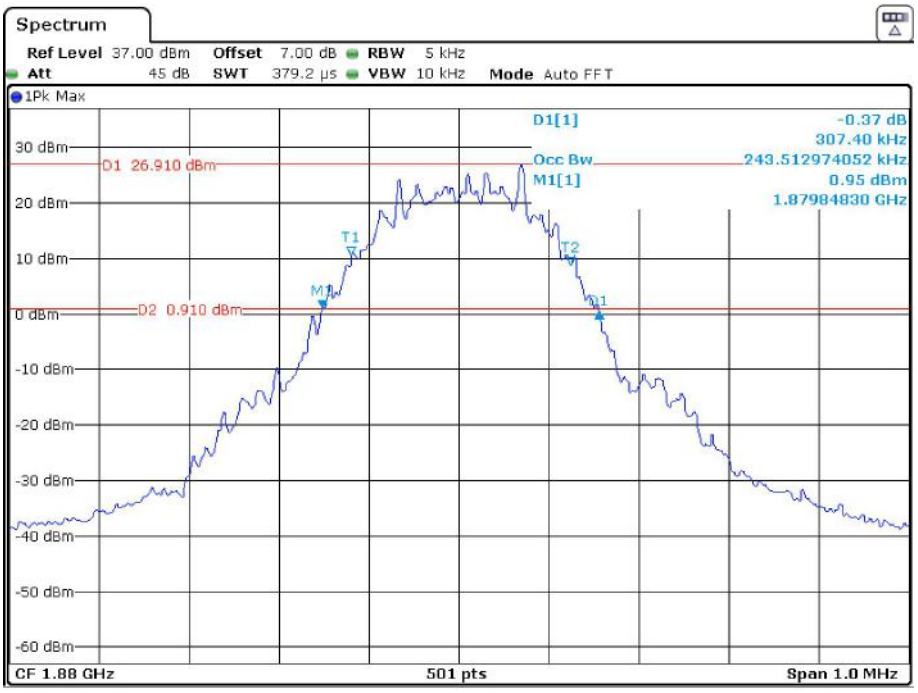
PCS Band (Part 24E)

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



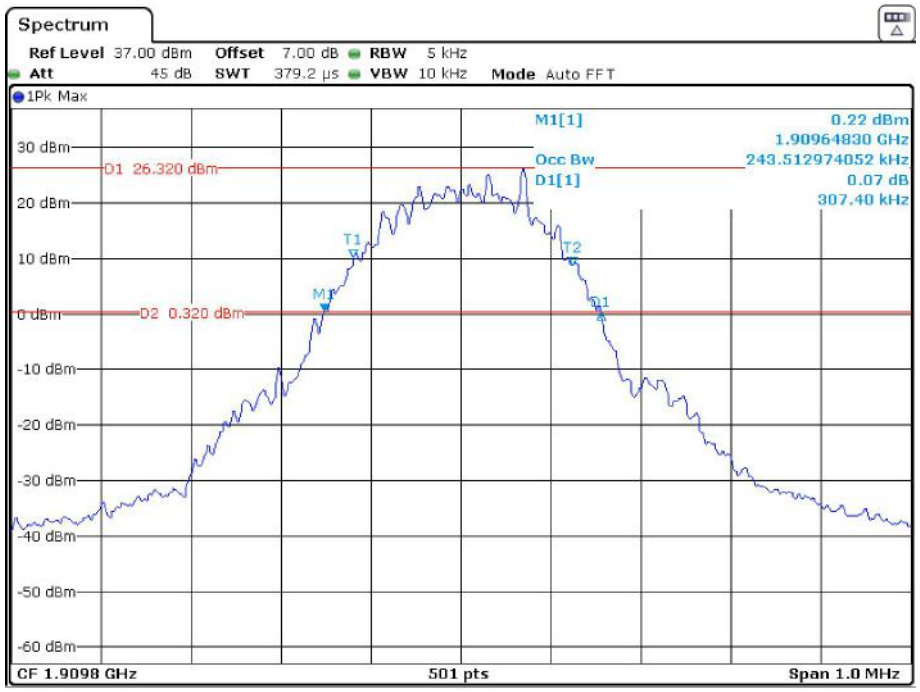
Date: 2.APR.2022 19:52:13

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



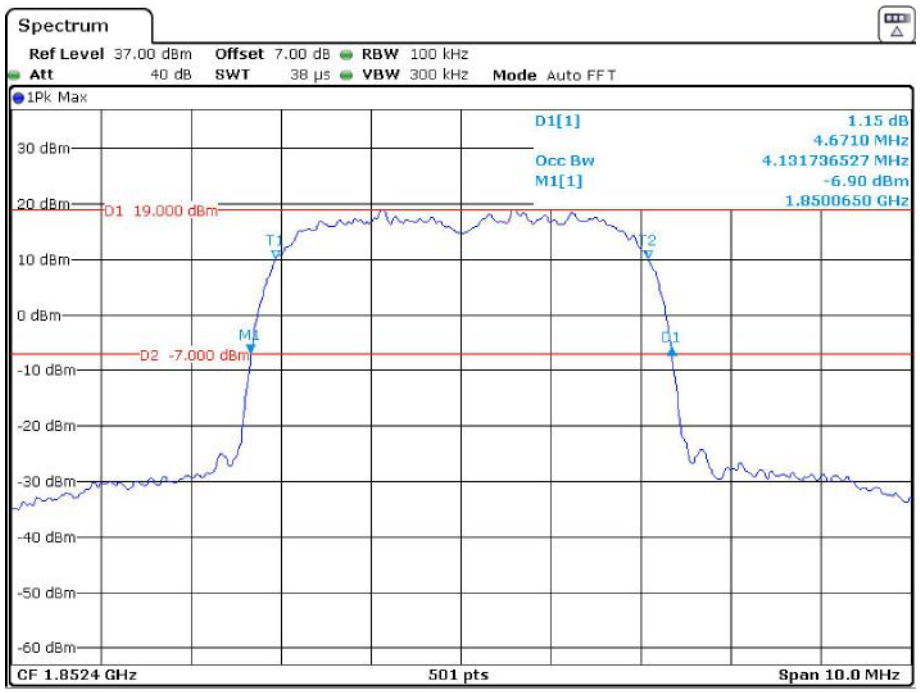
Date: 2.APR.2022 19:51:06

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



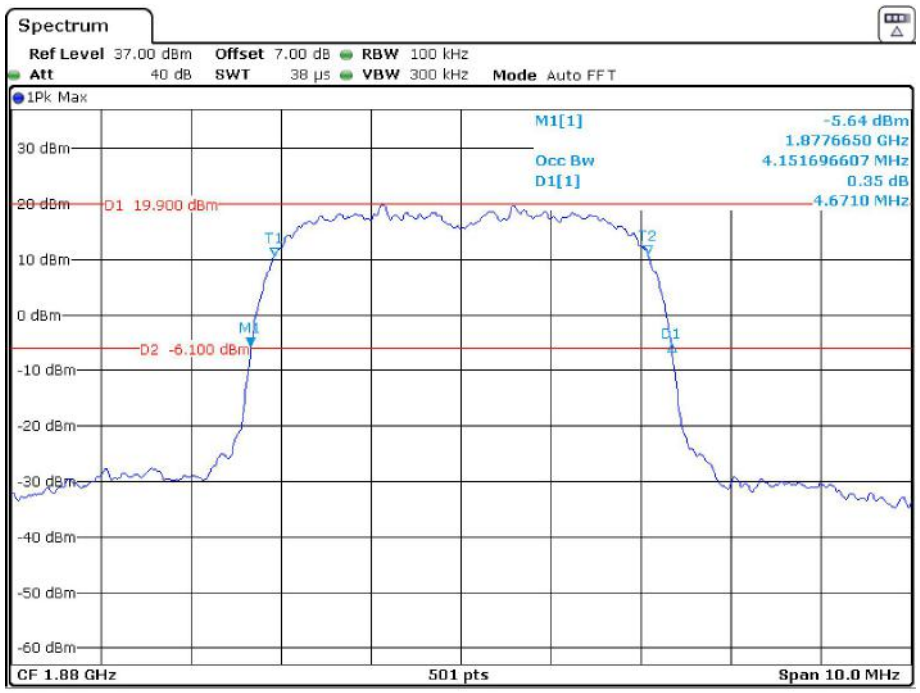
Date: 2.APR.2022 19:50:28

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



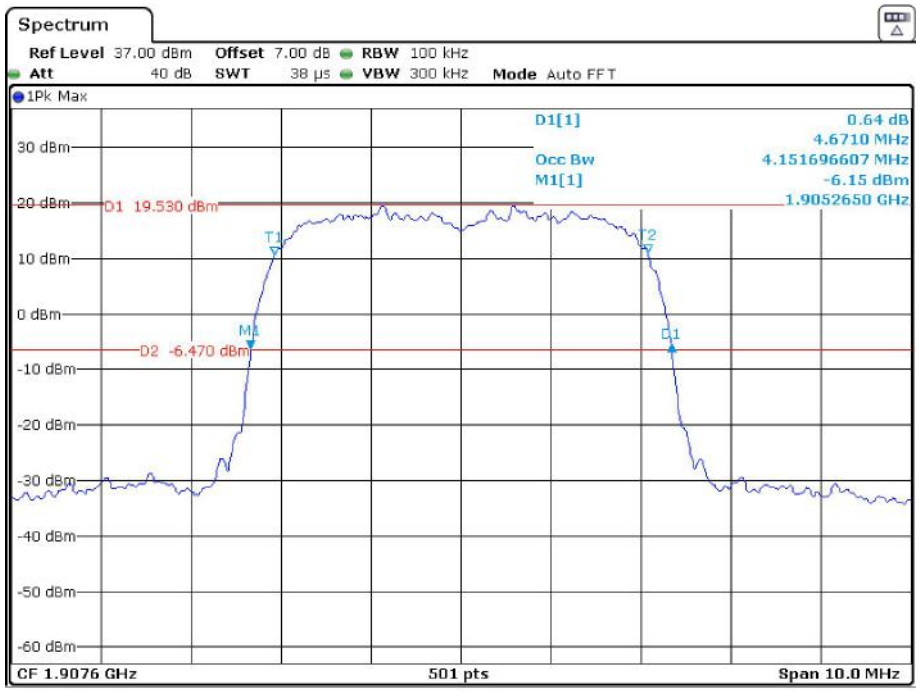
Date: 2.APR.2022 20:02:39

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



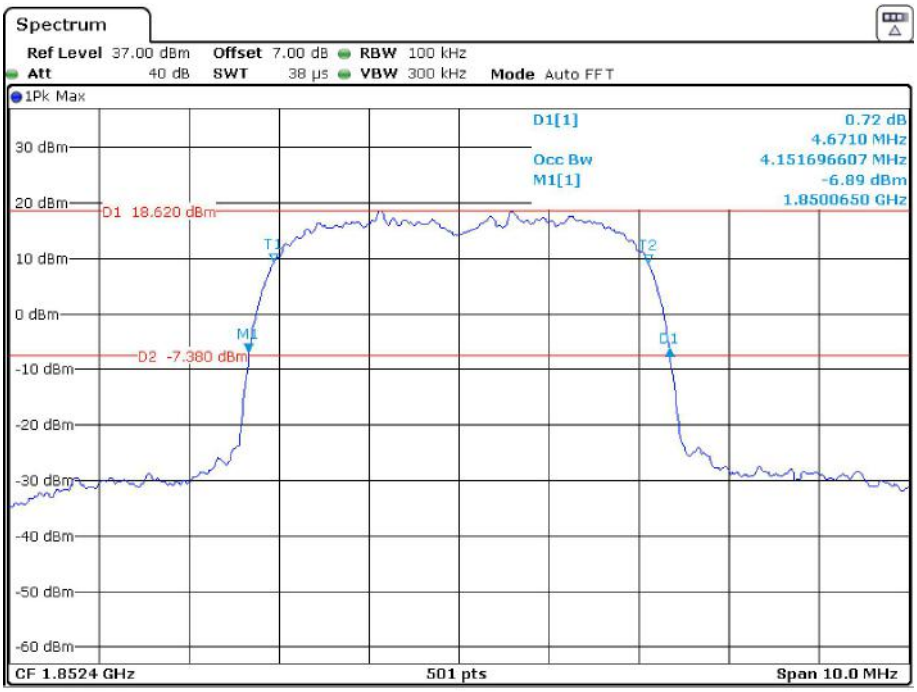
Date: 2.APR.2022 20:03:41

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



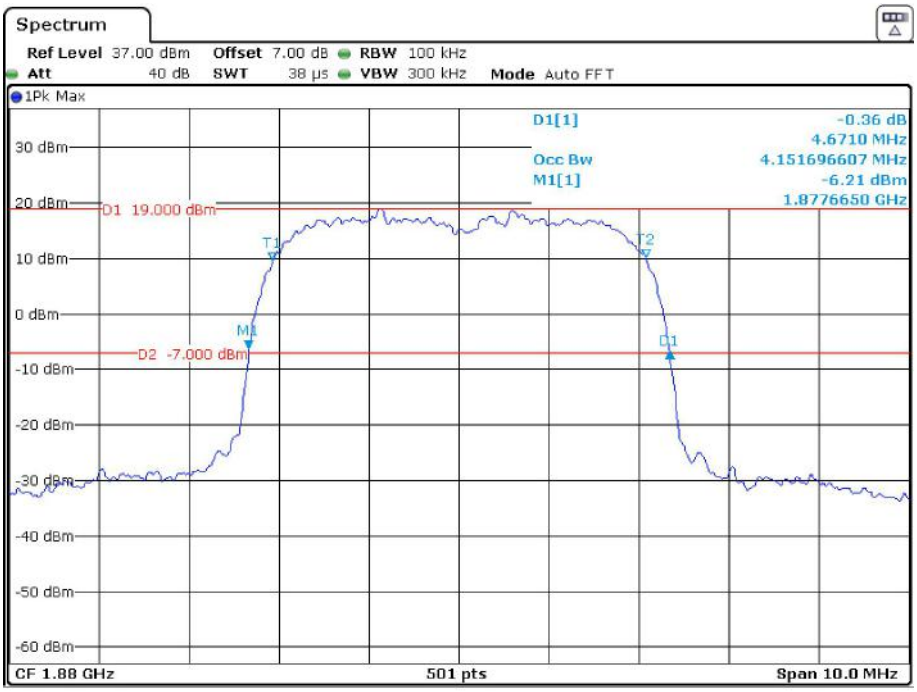
Date: 2.APR.2022 20:04:28

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



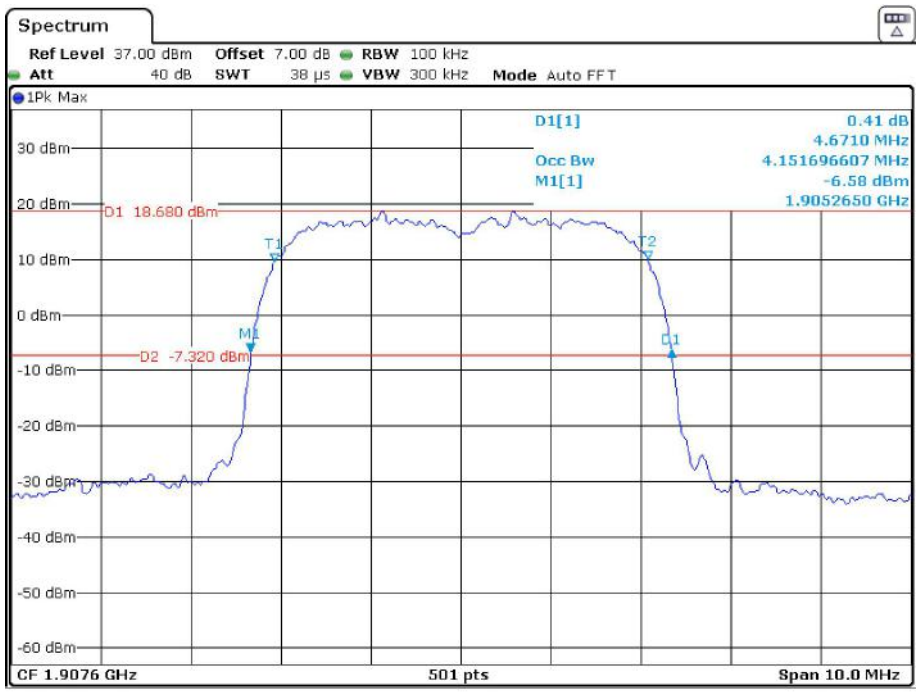
Date: 2.APR.2022 20:43:20

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



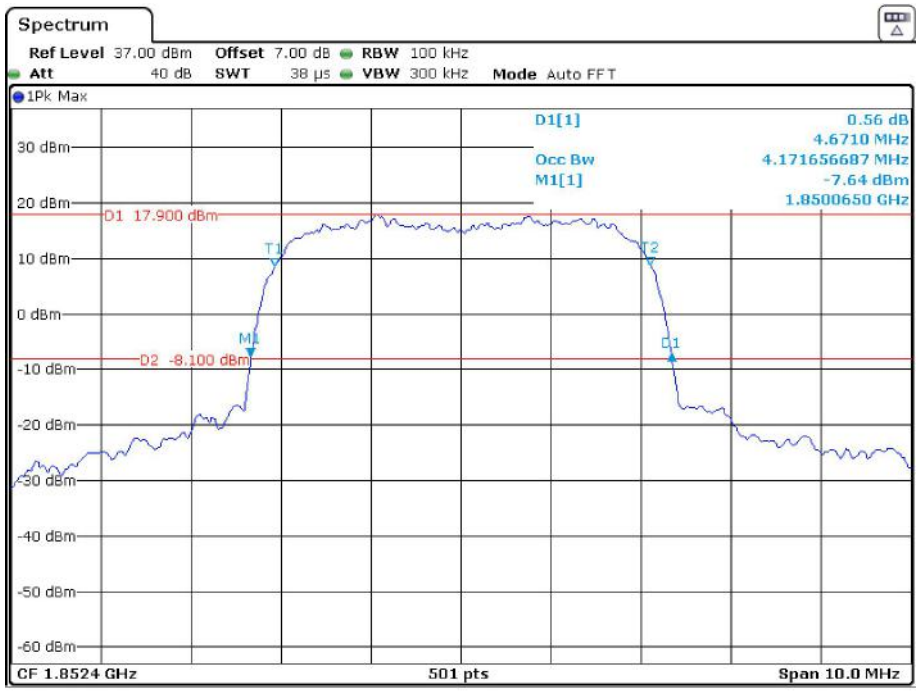
Date: 2.APR.2022 20:44:21

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



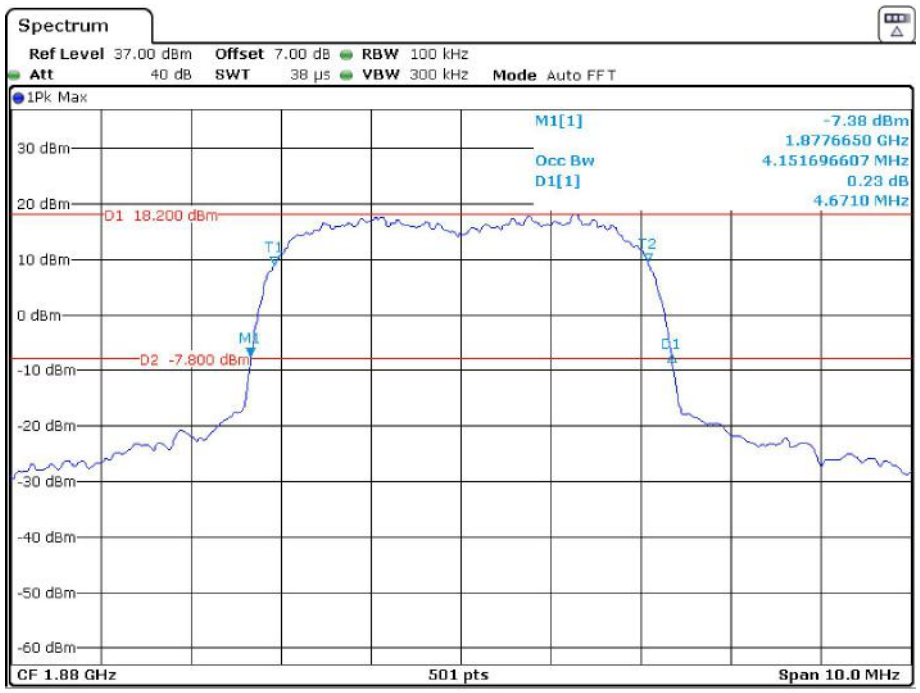
Date: 2.APR.2022 20:45:37

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



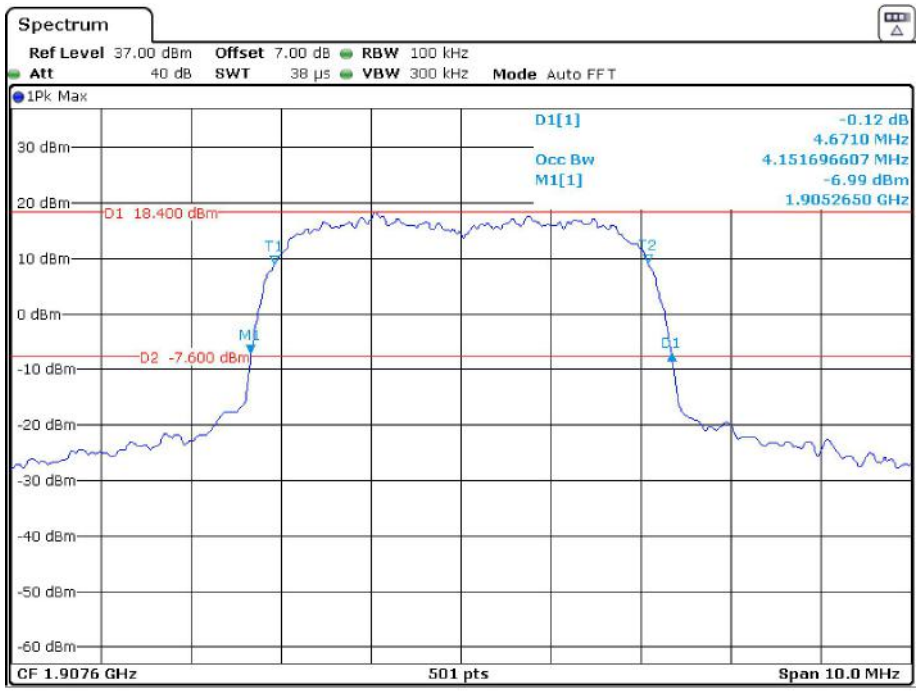
Date: 2.APR.2022 20:23:27

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



Date: 2.APR.2022 20:24:28

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



Date: 2.APR.2022 20:28:44

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	1.102	1.254	1.096	1.260	1.102	1.260
	16QAM	1.102	1.260	1.102	1.254	1.096	1.254
3 MHz	QPSK	2.695	3.000	2.695	3.012	2.695	3.012
	16QAM	2.695	3.012	2.683	3.000	2.695	3.024
5 MHz	QPSK	4.531	5.000	4.511	5.000	4.511	5.000
	16QAM	4.511	5.000	4.531	5.000	4.531	5.020
10 MHz	QPSK	8.981	9.760	8.942	9.760	8.942	9.800
	16QAM	8.942	9.680	8.981	9.800	8.981	9.880
15 MHz	QPSK	13.473	14.820	13.413	14.700	13.533	14.880
	16QAM	13.473	14.820	13.533	14.820	13.533	14.880
20 MHz	QPSK	17.964	19.600	17.964	19.760	17.964	19.680
	16QAM	17.964	19.760	18.044	19.840	17.964	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	1.096	1.254	1.102	1.260	1.102	1.260
	16QAM	1.102	1.260	1.090	1.248	1.102	1.266
3 MHz	QPSK	2.695	3.000	2.695	3.000	2.707	3.036
	16QAM	2.695	3.012	2.683	3.000	2.695	3.036
5 MHz	QPSK	4.531	5.000	4.511	5.020	4.511	5.000
	16QAM	4.511	5.020	4.531	5.020	4.551	5.040
10 MHz	QPSK	8.942	9.760	8.942	9.760	8.981	9.720
	16QAM	8.942	9.760	8.942	9.800	8.981	9.880

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	1.096	1.254	1.102	1.248	1.102	1.254
	16QAM	1.108	1.266	1.090	1.248	1.102	1.254
3 MHz	QPSK	2.695	2.988	2.695	3.000	2.683	3.024
	16QAM	2.695	3.012	2.683	3.000	2.695	3.024
5 MHz	QPSK	4.511	5.000	4.511	5.000	4.511	4.980
	16QAM	4.511	4.980	4.531	5.020	4.531	5.020
10 MHz	QPSK	8.942	9.800	8.942	9.760	8.942	9.800
	16QAM	8.942	9.840	8.942	9.800	8.942	9.800

LTE Band 13:

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	4.531	5.000	4.511	5.000	4.511	5.000
	16QAM	4.511	5.000	4.551	5.020	4.551	5.040
10 MHz	QPSK	/	/	8.942	9.760	/	/
	16QAM	/	/	8.942	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	4.511	5.040	4.511	5.080	4.511	5.020
	16QAM	4.531	5.120	4.511	5.120	4.511	4.980
10 MHz	QPSK	8.981	9.720	8.981	10.000	8.942	9.840
	16QAM	8.942	9.720	8.942	9.720	8.942	9.800
15 MHz	QPSK	13.533	14.760	13.473	14.760	13.473	14.820
	16QAM	13.533	14.760	13.533	14.760	13.533	14.640
20 MHz	QPSK	17.884	19.440	17.964	19.520	17.884	19.760
	16QAM	17.884	19.520	17.884	19.600	17.884	19.680

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

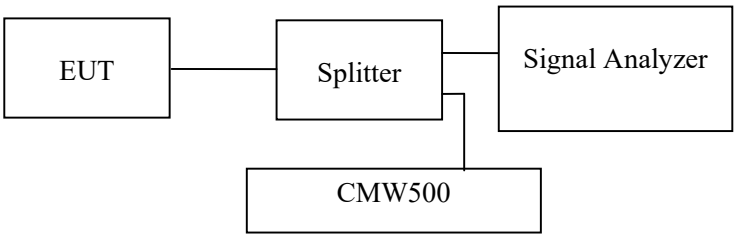
Applicable Standard

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 Gala Liu from 2022-04-02 to 2022-04-04.

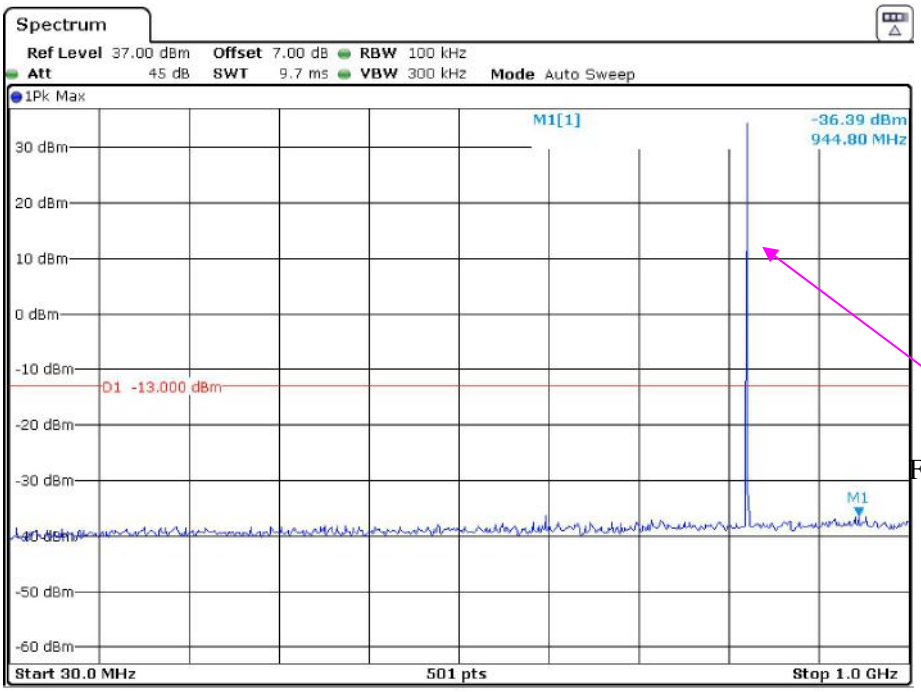
EUT operation mode: Transmitting

Test result: Pass

Please refer to the following plots.

Cellular Band (Part 22H)
Low Channel:

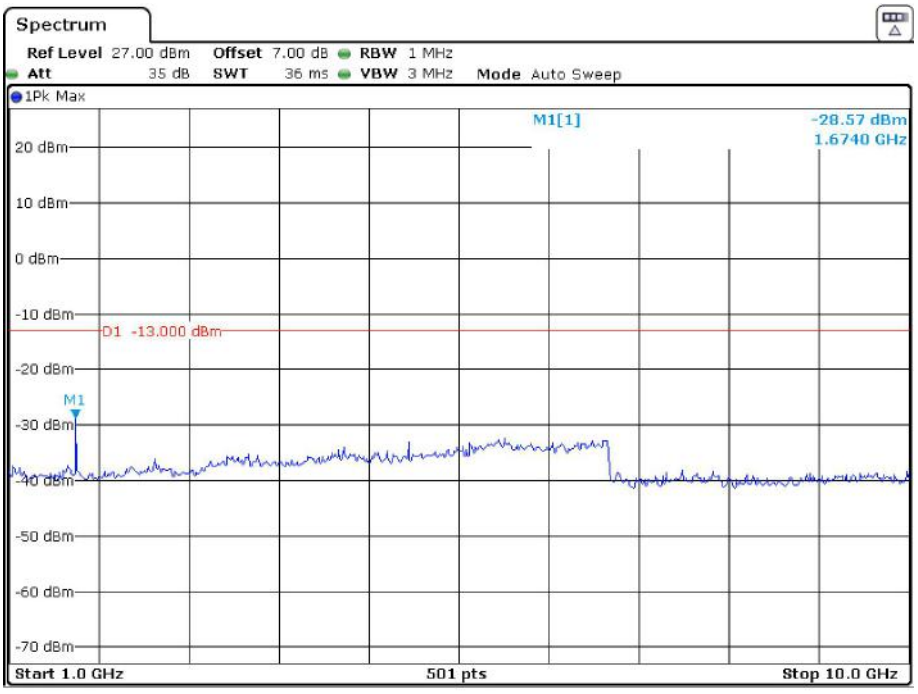
30 MHz – 1 GHz (GSM Mode)



Fundamental test

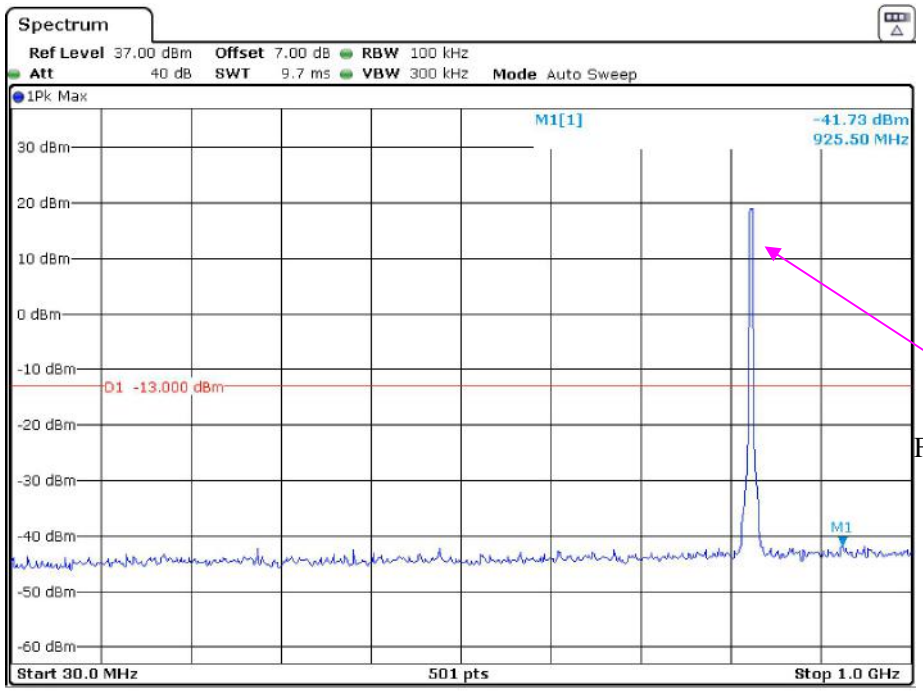
Date: 2.APR.2022 19:56:10

1 GHz – 10 GHz (GSM Mode)



Date: 2.APR.2022 19:58:00

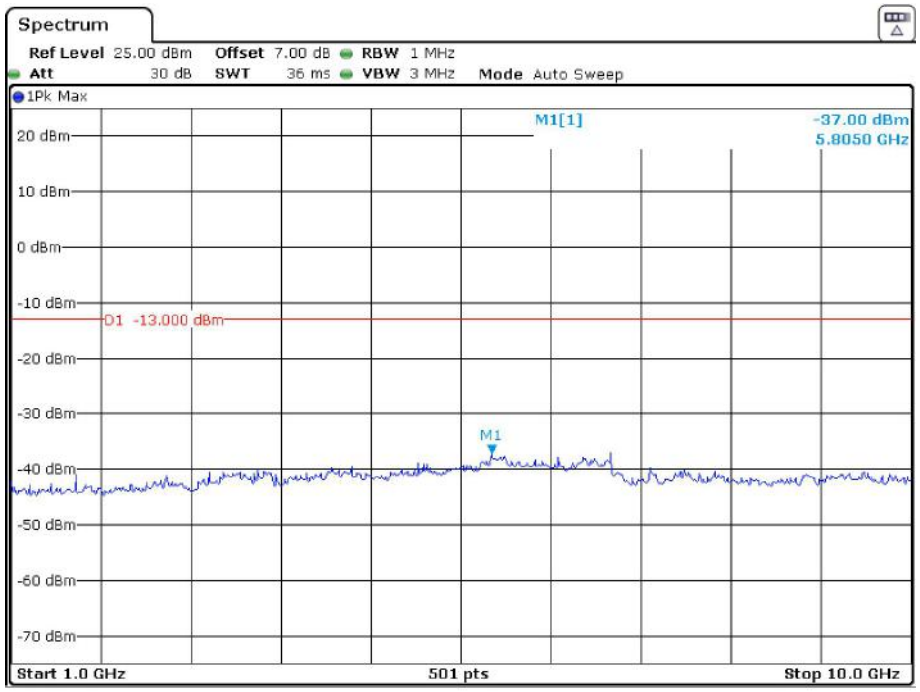
30 MHz – 1 GHz (WCDMA Mode)



Fundamental test

Date: 2.APR.2022 20:12:29

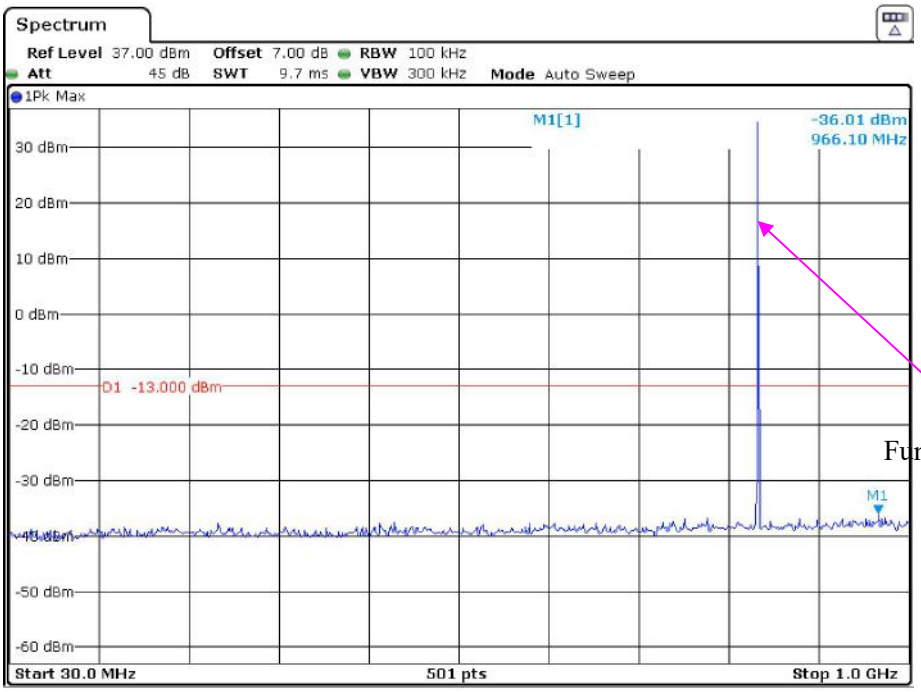
1 GHz – 10 GHz (WCDMA Mode)



Date: 2.APR.2022 20:14:58

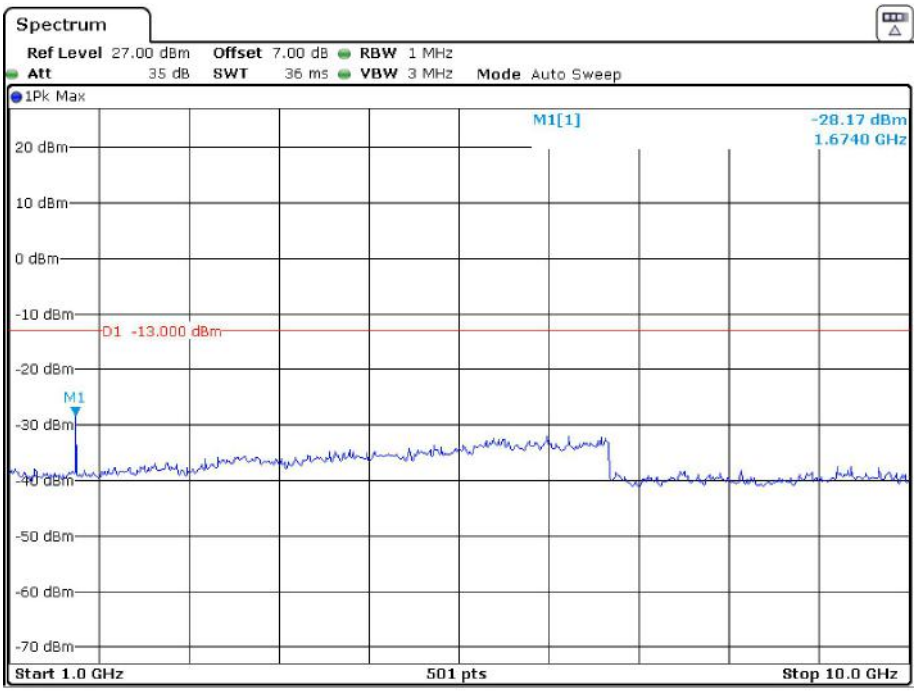
Middle Channel:

30 MHz – 1 GHz (GSM Mode)



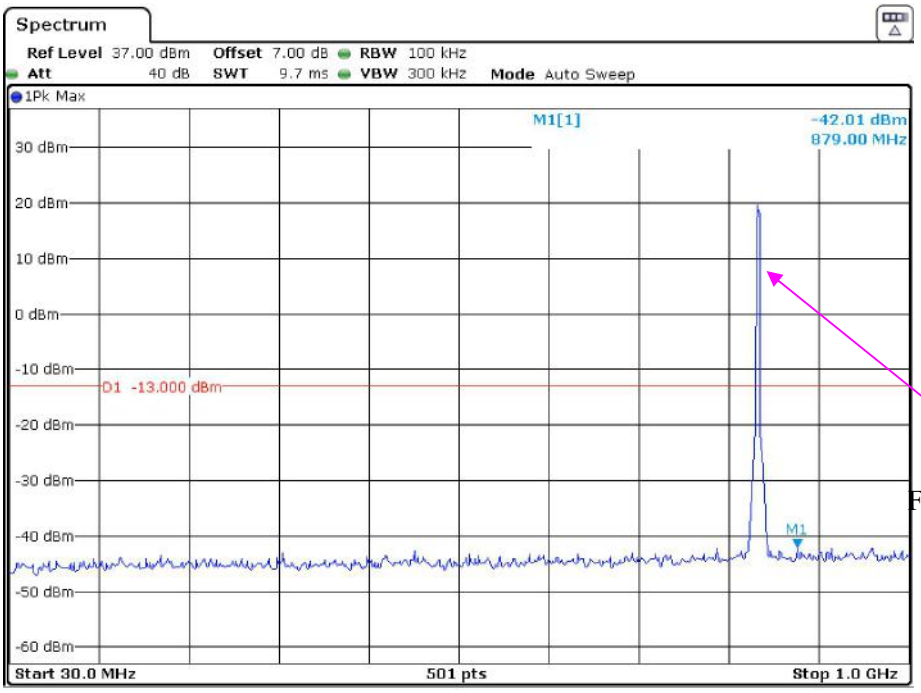
Date: 2.APR.2022 19:56:39

1 GHz – 10 GHz (GSM Mode)



Date: 2.APR.2022 19:57:42

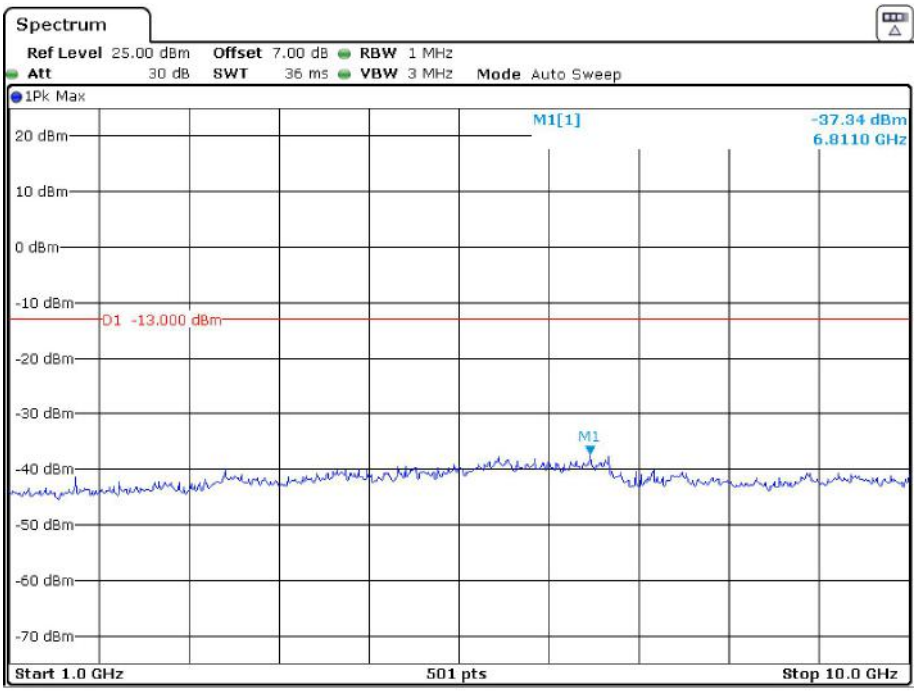
30 MHz – 1 GHz (WCDMA Mode)



Fundamental test

Date: 2.APR.2022 20:12:43

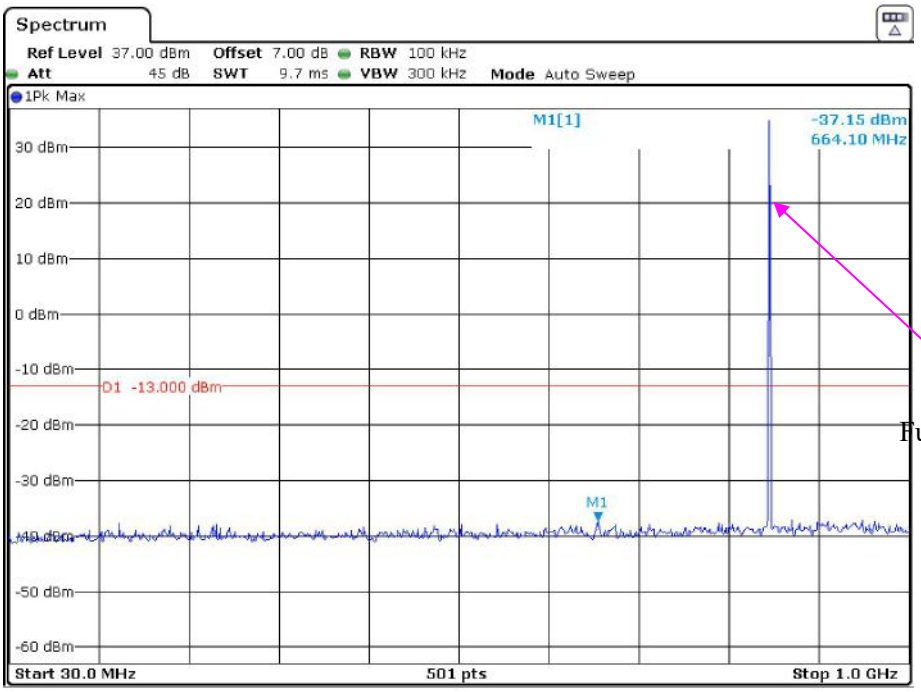
1 GHz – 10 GHz (WCDMA Mode)



Date: 2.APR.2022 20:14:30

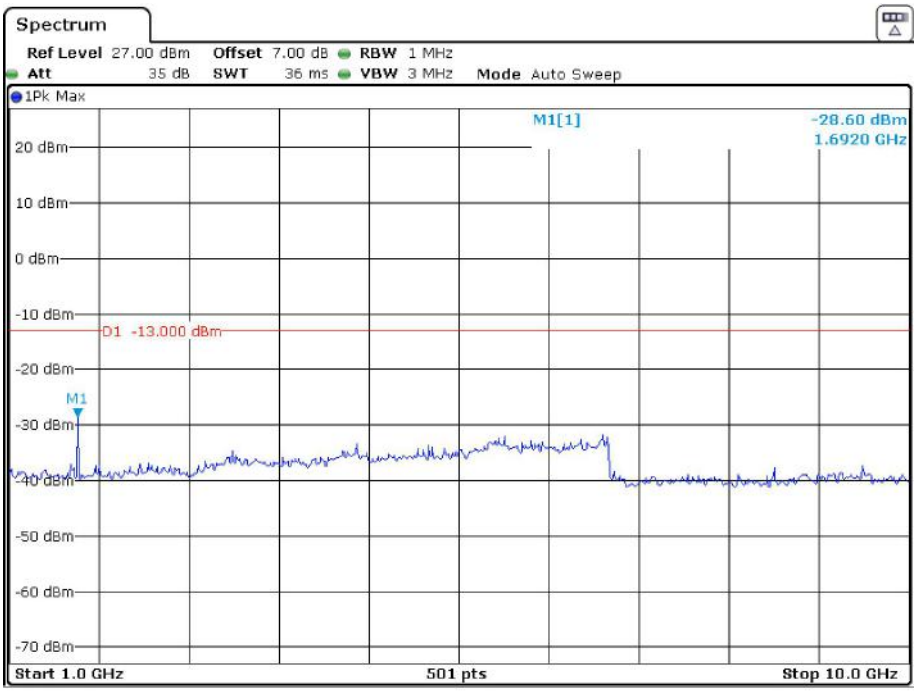
High Channel:

30 MHz – 1 GHz (GSM Mode)

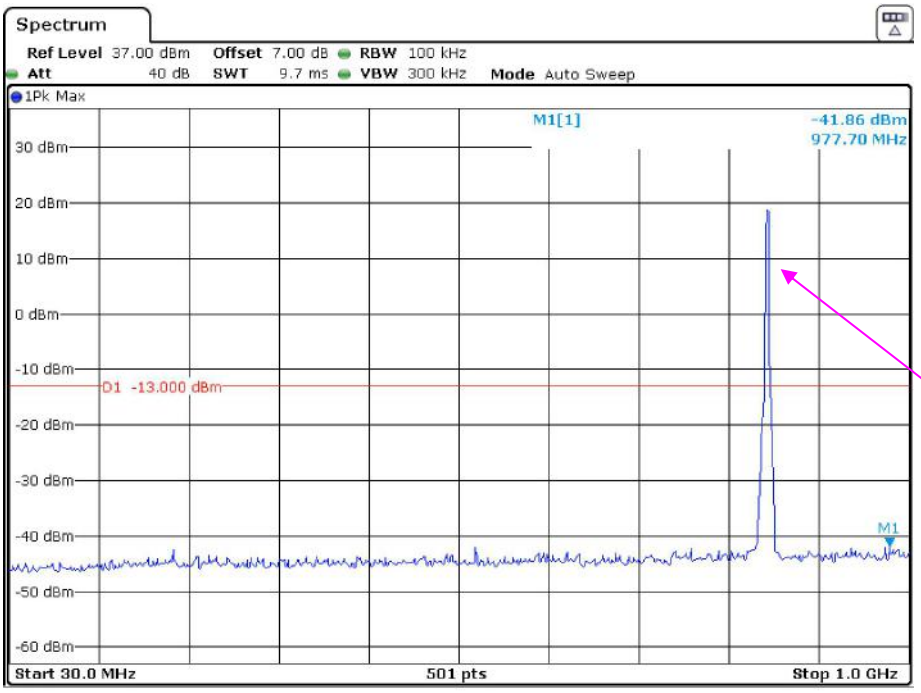


Fundamental test

1 GHz – 10 GHz (GSM Mode)



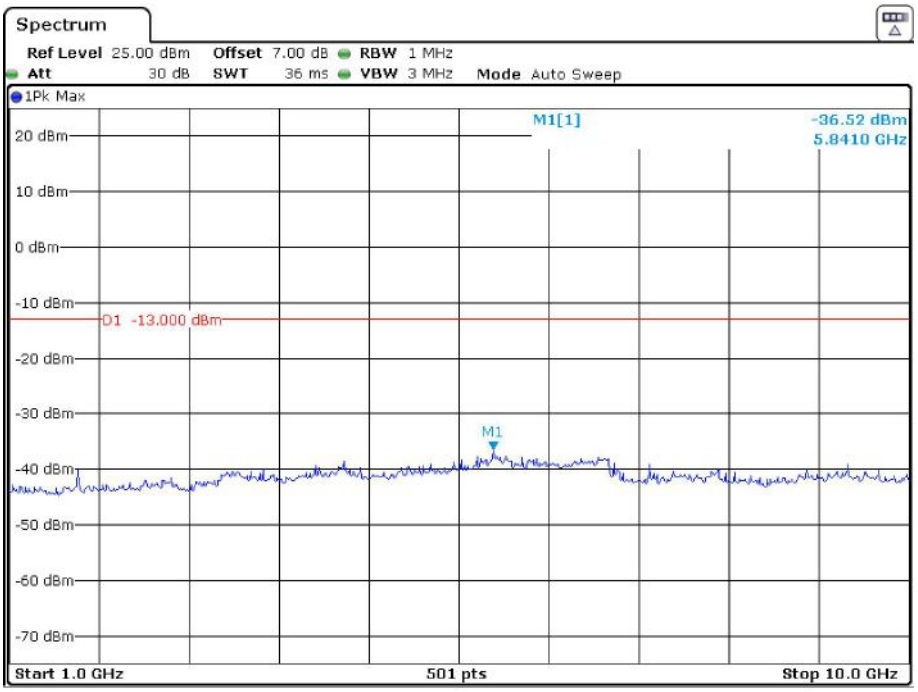
30 MHz – 1 GHz (WCDMA Mode)



Fundamental test

Date: 2.APR.2022 20:13:03

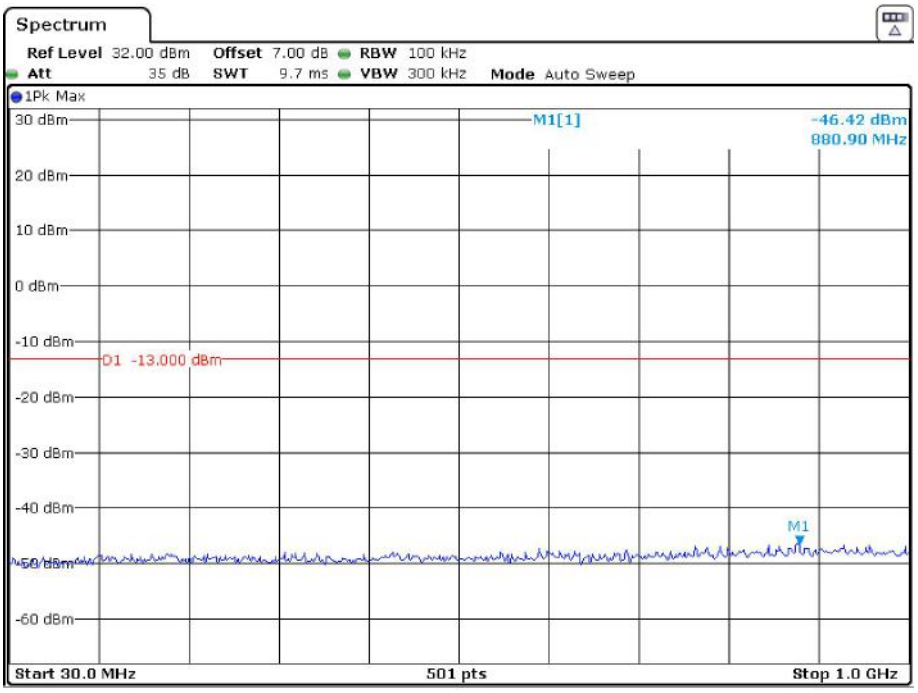
1 GHz – 10 GHz (WCDMA Mode)



Date: 2.APR.2022 20:14:18

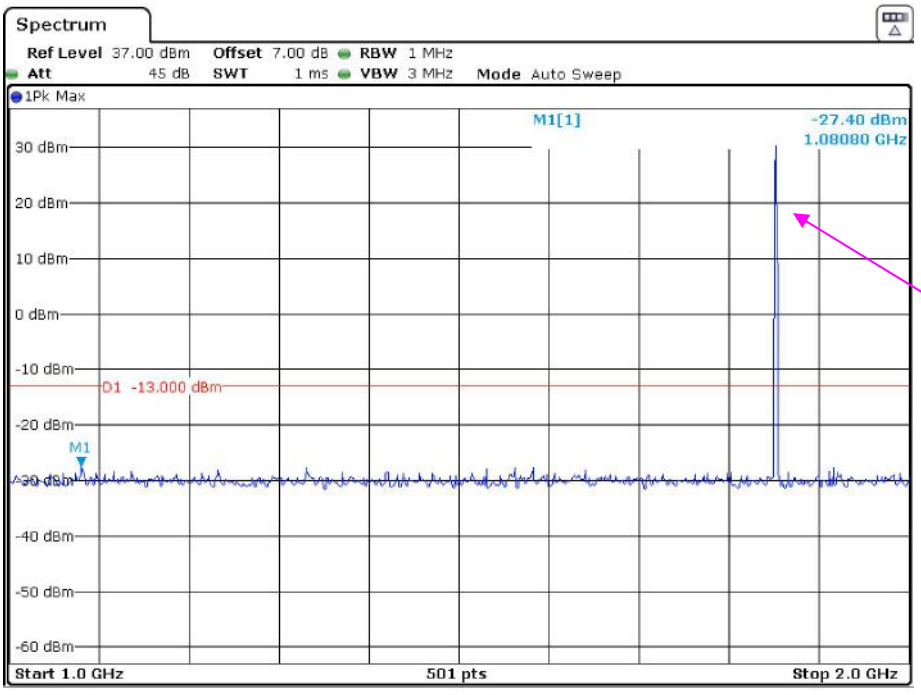
PCS Band (Part24E)
Low Channel:

30 MHz – 1 GHz (GSM Mode)



Date: 2.APR.2022 19:45:23

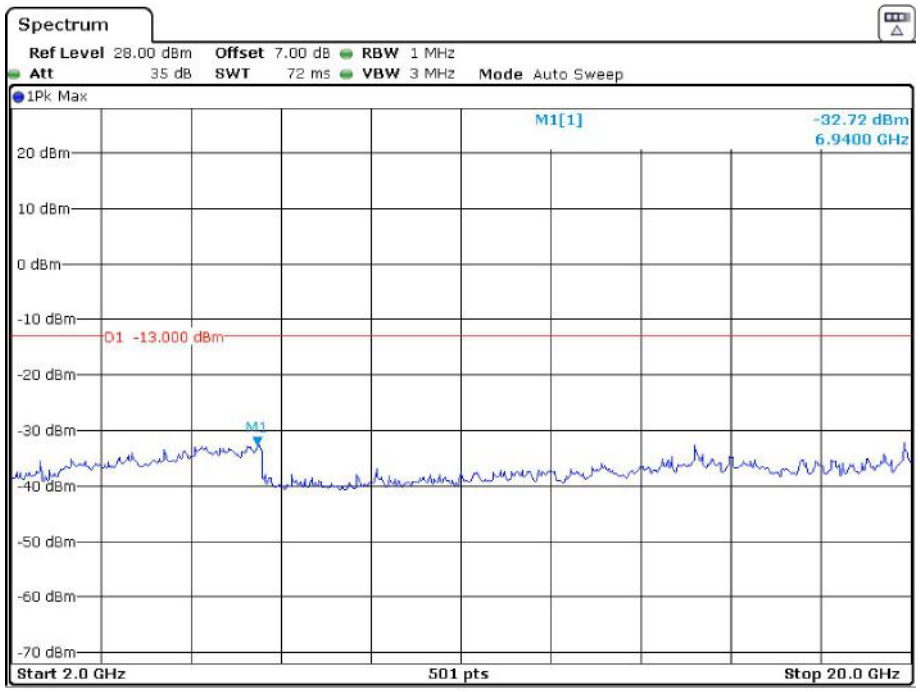
1 GHz – 2 GHz (GSM Mode)



Fundamental test

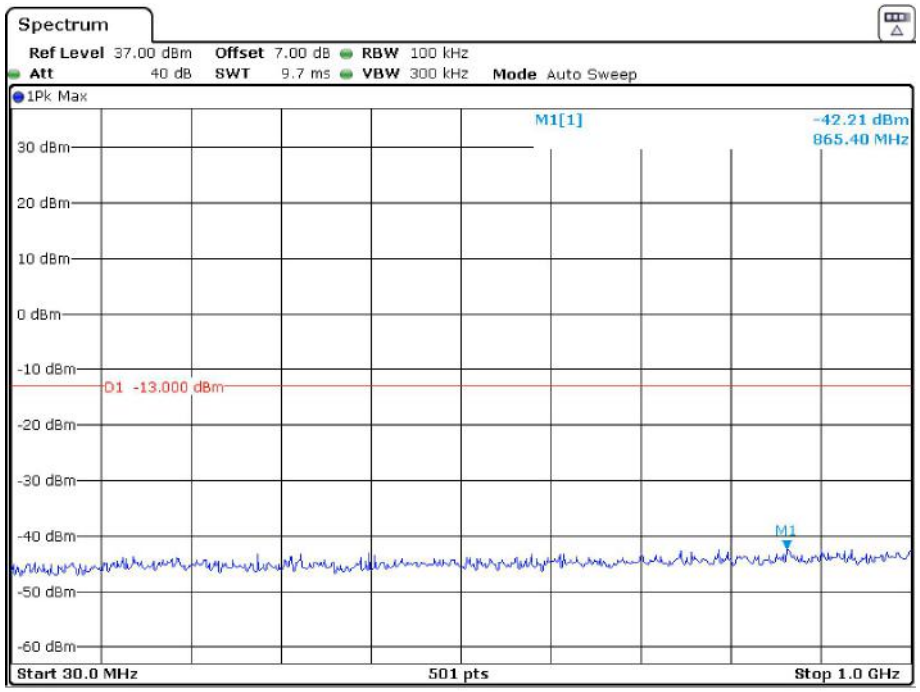
Date: 2.APR.2022 19:47:34

2 GHz – 20 GHz (GSM Mode)



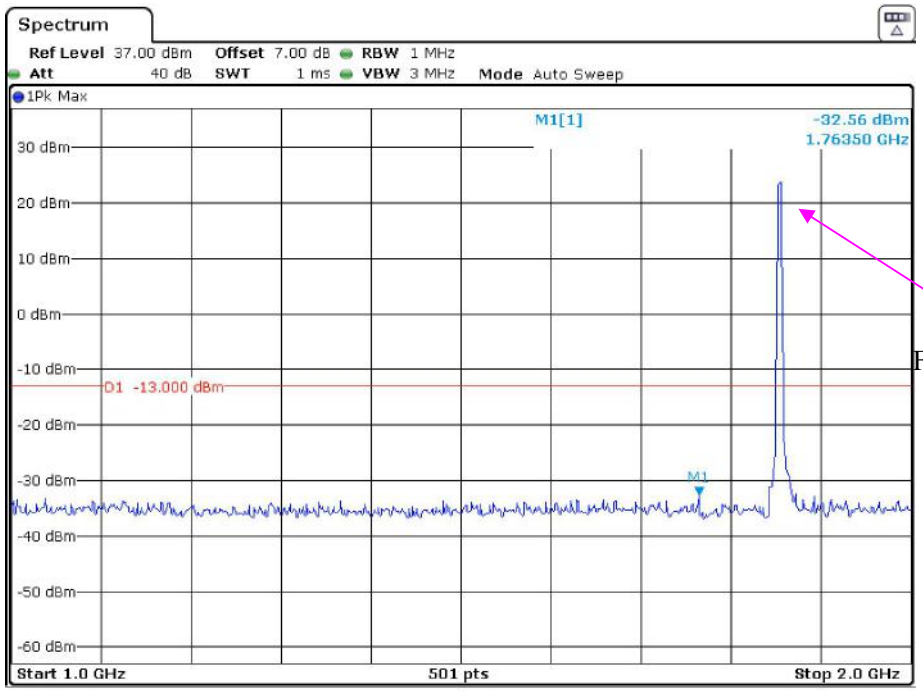
Date: 2.APR.2022 19:48:09

30 MHz – 1 GHz (WCDMA Mode)



Date: 2.APR.2022 20:11:58

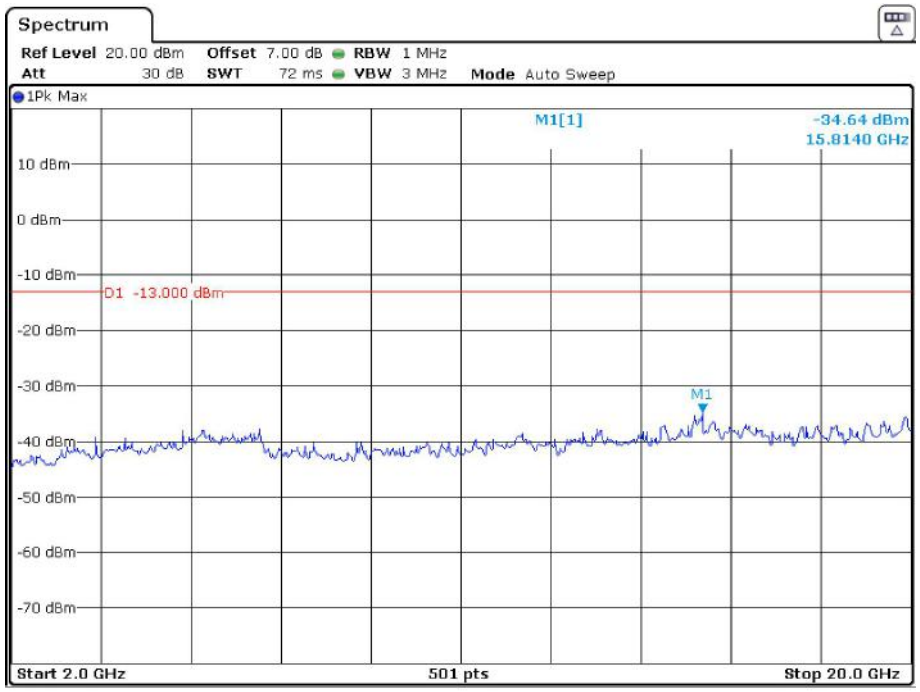
1 GHz – 2 GHz (WCDMA Mode)



Fundamental test

Date: 2.APR.2022 20:19:08

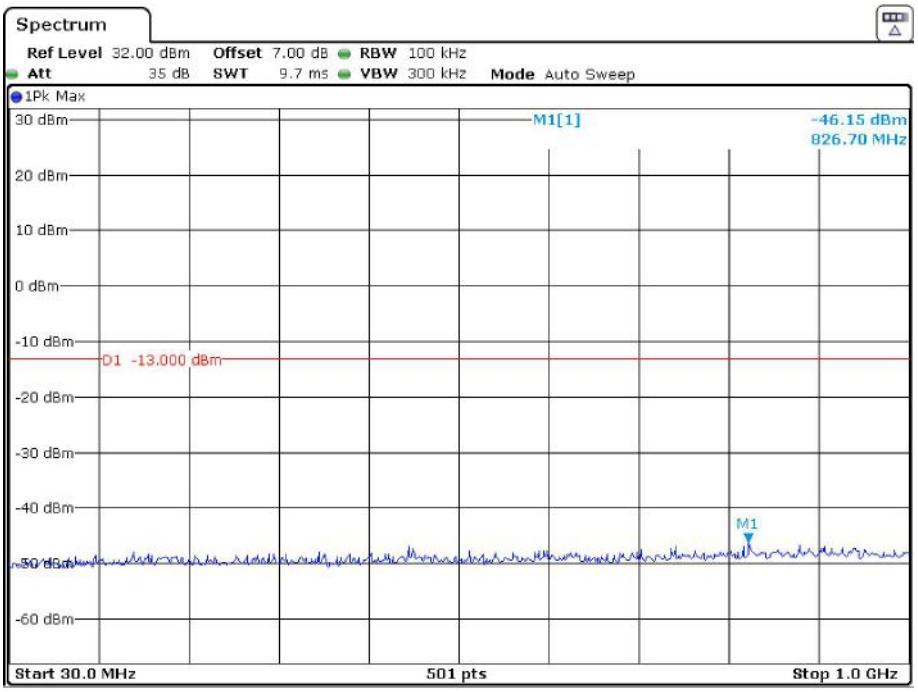
2 GHz – 20 GHz (WCDMA Mode)



Date: 2.APR.2022 20:19:47

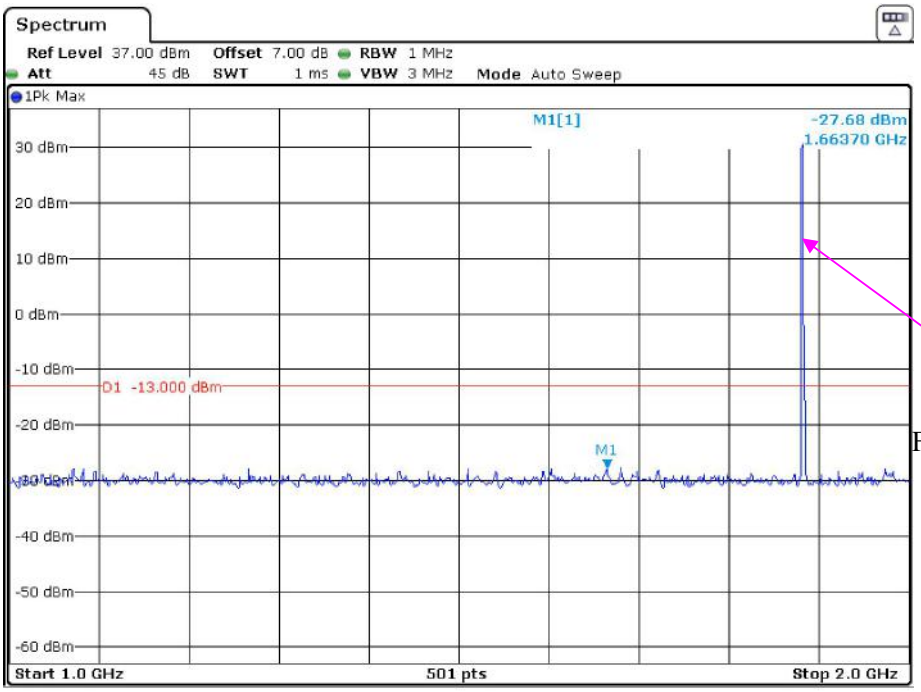
Middle Channel:

30 MHz – 1 GHz (GSM Mode)



Date: 2.APR.2022 19:45:45

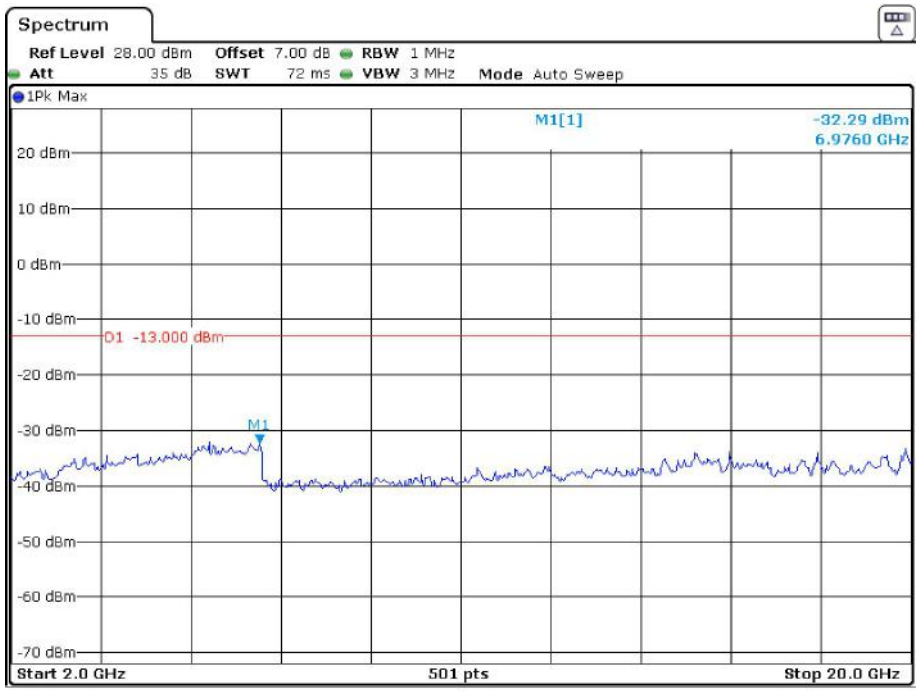
1 GHz – 2 GHz (GSM Mode)



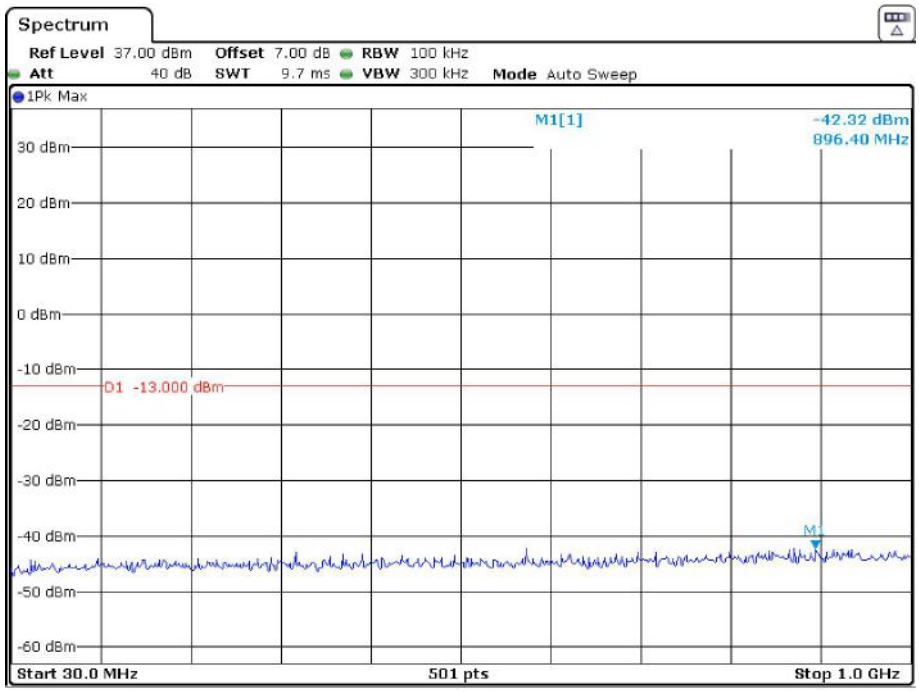
Fundamental test

Date: 2.APR.2022 19:47:01

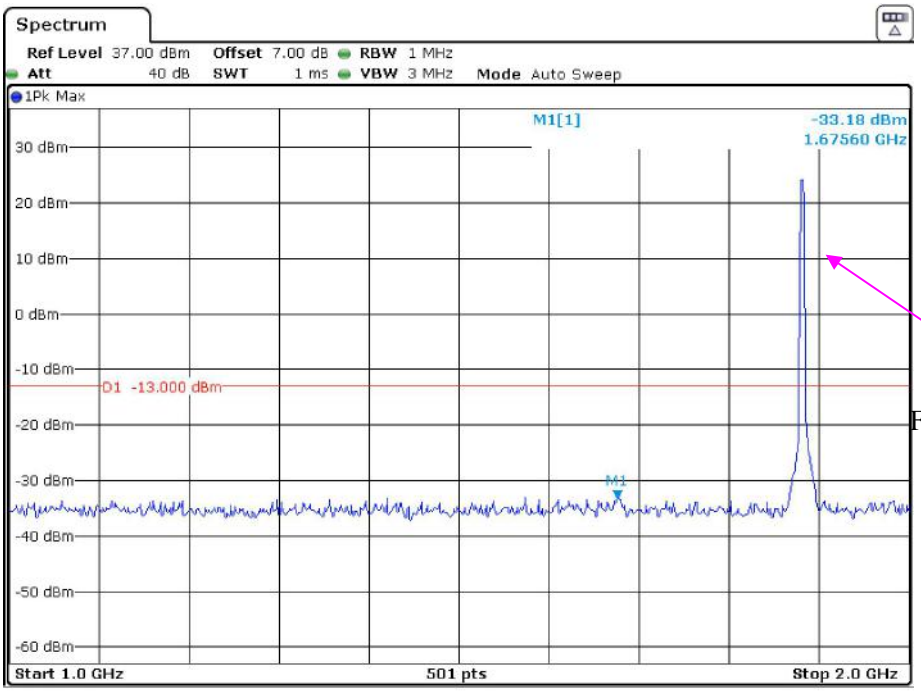
2 GHz– 20 GHz (GSM Mode)



30 MHz – 1 GHz (WCDMA Mode)



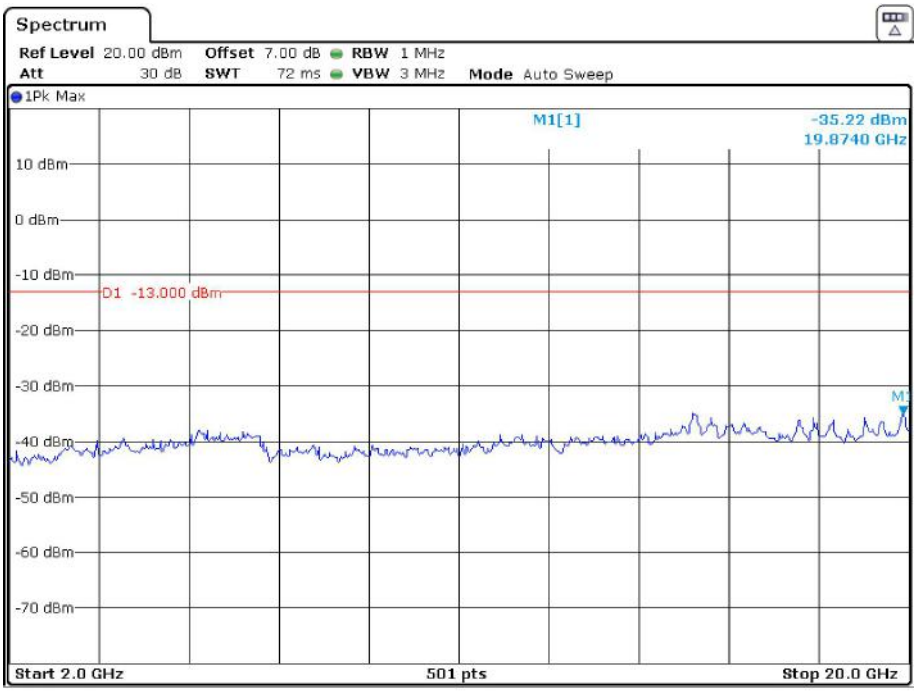
1 GHz – 2 GHz (WCDMA Mode)



Fundamental test

Date: 2.APR.2022 20:18:29

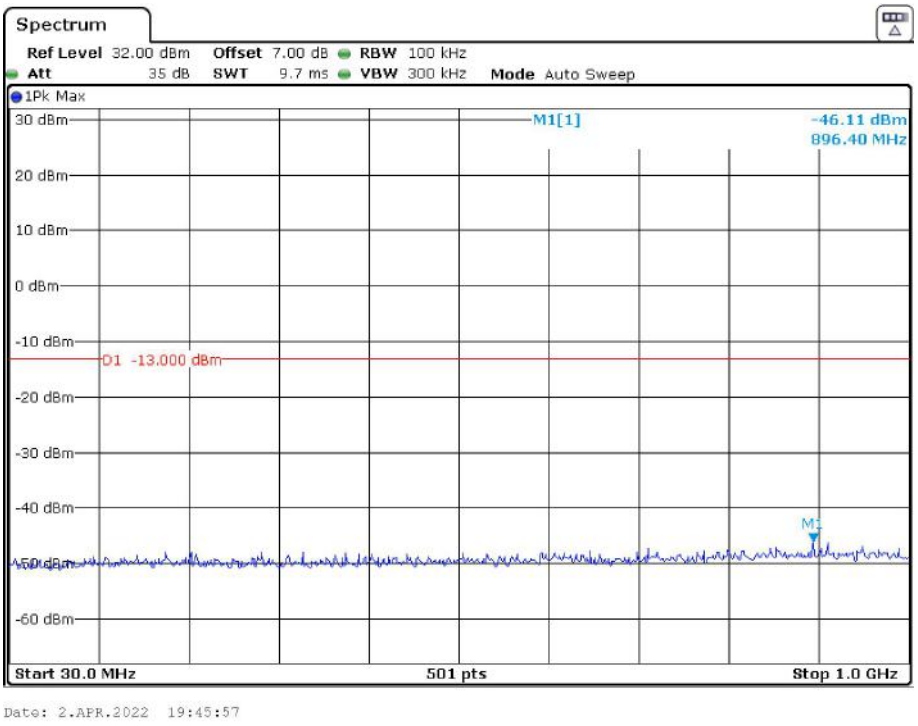
2 GHz – 20 GHz (WCDMA Mode)



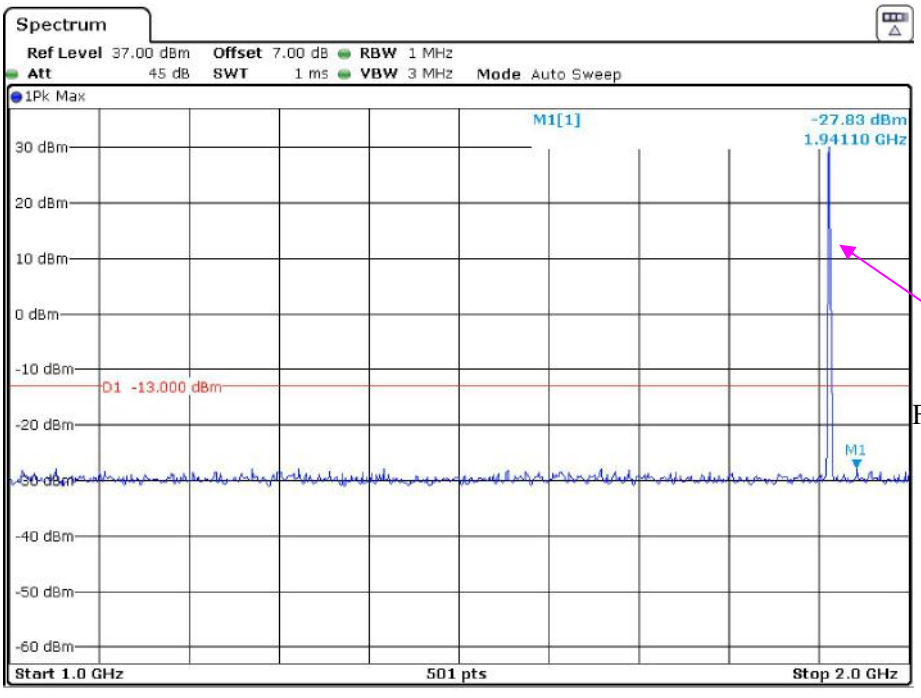
Date: 2.APR.2022 20:20:00

High Channel:

30 MHz – 1 GHz (GSM Mode)

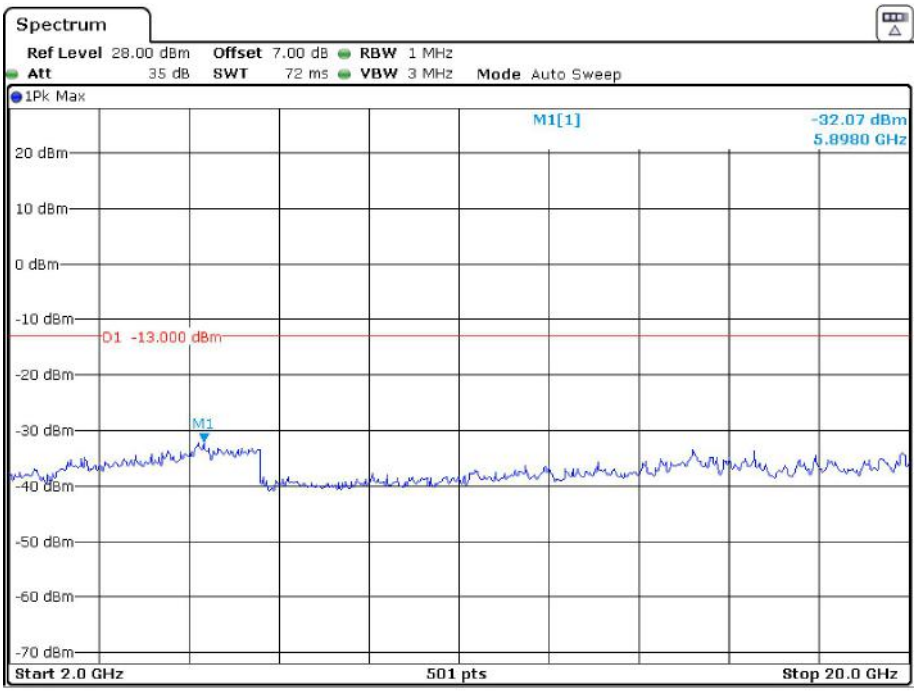


1 GHz– 2 GHz (GSM Mode)



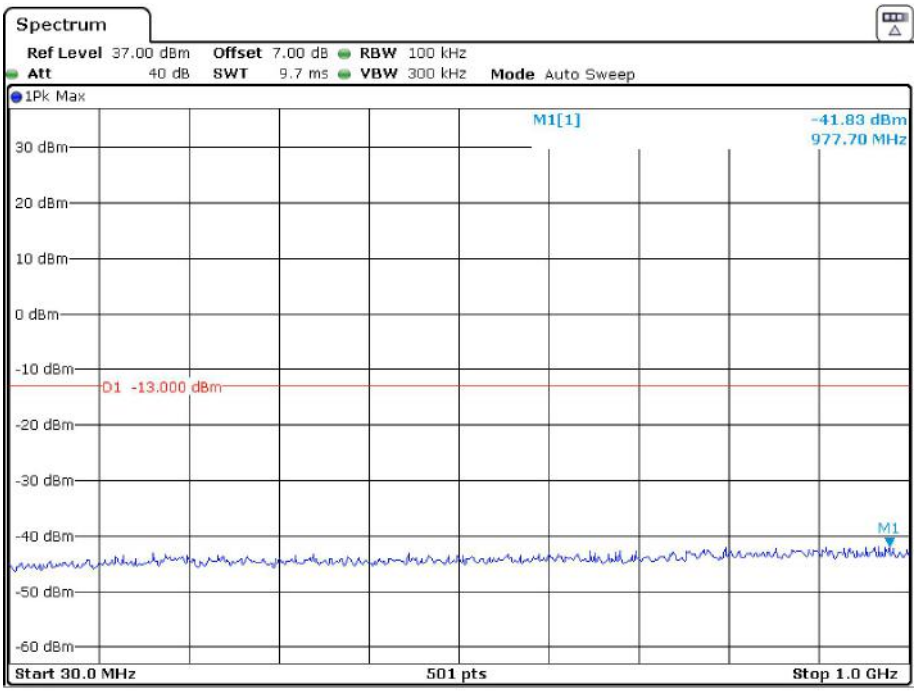
Fundamental test

2 GHz– 20 GHz (GSM Mode)



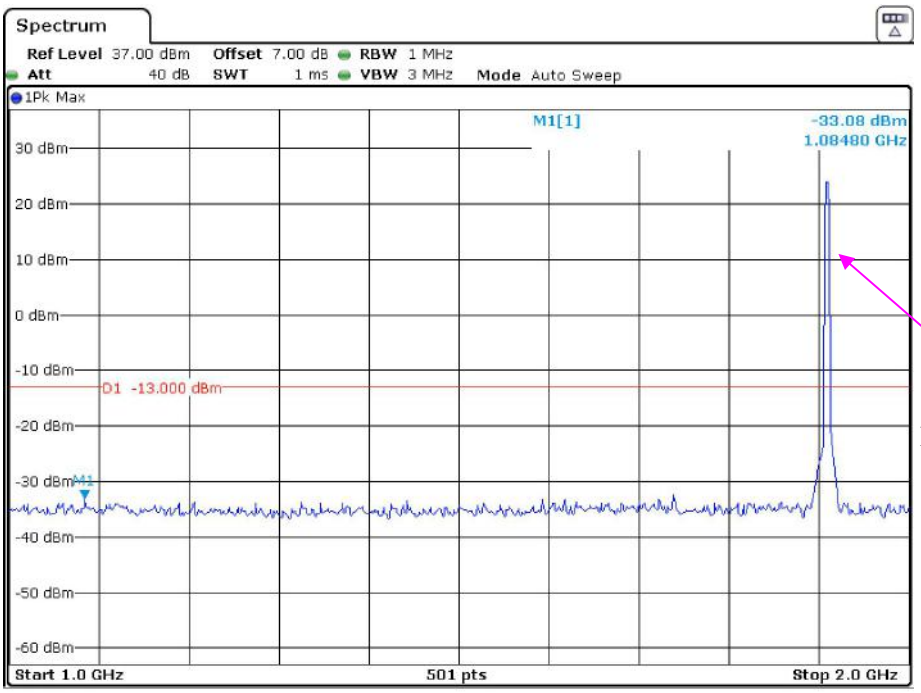
Date: 2.APR.2022 19:48:43

30 MHz – 1 GHz (WCDMA Mode)



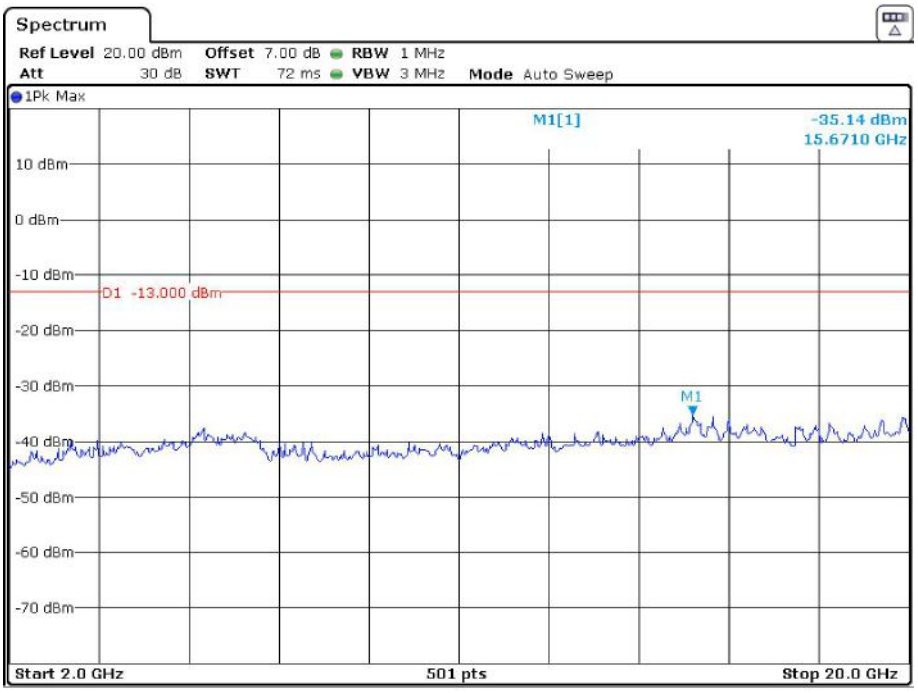
Date: 2.APR.2022 20:11:30

1 GHz – 2 GHz (WCDMA Mode)



Date: 2.APR.2022 20:18:15

2GHz – 20 GHz (WCDMA Mode)



Date: 2.APR.2022 20:20:14

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:	101.0~101.2 kPa

The testing was performed by Icey Huang from 2022-04-07 to 2022-04-09.

EUT operation mode: Transmitting (Pre-scan in the X,Y and Z axes of orientation, the worst case Y-axes of orientation 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)				
GSM850								
Test frequency range: 30MHz-10GHz								
Low channel								
101.21	-64.40	117	1.7	H	-2.2	-66.6	-13	-53.6
300.13	-66.31	195	2.1	V	1.5	-64.8	-13	-51.8
1648.4	-39.1	258	2.1	H	3.5	-35.60	-13	-22.60
1648.4	-39.5	248	2.0	V	3.1	-36.40	-13	-23.40
2472.6	-31.4	139	1.5	H	6.6	-24.80	-13	-11.80
2472.6	-31.7	128	1.8	V	5.8	-25.90	-13	-12.90
3296.8	-52.0	333	1.8	H	6.4	-45.60	-13	-32.60
3296.8	-51.2	272	2.1	V	5.7	-45.50	-13	-32.50
Middle channel								
101.21	-64.86	144	1.8	H	-2.2	-67.1	-13	-54.1
300.13	-67.38	168	2.0	V	1.5	-65.9	-13	-52.9
1673.2	-36.3	162	1.6	H	3.8	-32.50	-13	-19.50
1673.2	-37.2	13	1.6	V	3.1	-34.10	-13	-21.10
2509.8	-33.3	166	1.7	H	6.2	-27.10	-13	-14.10
2509.8	-34.0	355	2.0	V	5.6	-28.40	-13	-15.40
3346.4	-51.5	132	1.8	H	6.6	-44.90	-13	-31.90
3346.4	-50.5	266	1.9	V	5.4	-45.10	-13	-32.10
High channel								
101.21	-64.49	166	1.6	H	-2.2	-66.7	-13	-53.7
300.13	-67.50	291	1.9	V	1.5	-66.0	-13	-53.0
1697.6	-37.1	220	1.6	H	4.1	-33.00	-13	-20.00
1697.6	-35.7	15	2.1	V	3.1	-32.60	-13	-19.60
2546.4	-33.0	236	1.8	H	6.1	-26.90	-13	-13.90
2546.4	-33.1	103	1.6	V	5.8	-27.30	-13	-14.30
3395.2	-50.1	272	1.7	H	6.2	-43.90	-13	-30.90
3395.2	-49.7	75	1.6	V	5.4	-44.30	-13	-31.30

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
GSM1900								
Test frequency range: 30MHz-20GHz								
Low channel								
101.21	-65.75	100	1.9	H	-2.2	-68.0	-13	-55.0
300.13	-65.76	235	1.9	V	1.5	-64.3	-13	-51.3
3700.4	-51.0	61	2.1	H	8.1	-42.90	-13	-29.90
3700.4	-53.7	218	2.0	V	7.6	-46.10	-13	-33.10
5550.6	-48.0	299	1.9	H	9.6	-38.40	-13	-25.40
5550.6	-49.3	309	2.0	V	9.1	-40.20	-13	-27.20
Middle channel								
101.21	-65.67	267	2.1	H	-2.2	-67.9	-13	-54.9
300.13	-66.77	127	1.5	V	1.5	-65.3	-13	-52.3
3760	-53.3	1	2.0	H	8.8	-44.50	-13	-31.50
3760	-54.6	134	1.9	V	8	-46.60	-13	-33.60
5640	-49.6	354	2.0	H	10.2	-39.40	-13	-26.40
5640	-50.1	105	1.8	V	9.4	-40.70	-13	-27.70
High channel								
101.21	-64.27	155	1.6	H	-2.2	-66.5	-13	-53.5
300.13	-67.15	48	1.6	V	1.5	-65.7	-13	-52.7
3819.6	-53.5	293	1.9	H	8.7	-44.80	-13	-31.80
3819.6	-54.4	266	1.8	V	8	-46.40	-13	-33.40
5729.4	-50.7	30	1.6	H	10.6	-40.10	-13	-27.10
5729.4	-50.3	185	1.6	V	10.2	-40.10	-13	-27.10

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								
101.21	-63.83	186	2.0	H	-2.2	-66.0	-13	-53.0
300.13	-66.94	357	1.7	V	1.5	-65.4	-13	-52.4
3704.8	-56.5	17	2.0	H	8.2	-48.3	-13	-35.3
3704.8	-55.3	230	1.9	V	7.6	-47.7	-13	-34.7
Middle channel								
101.21	-65.28	135	2.1	H	-2.2	-67.5	-13	-54.5
300.13	-65.92	200	2.1	V	1.5	-64.4	-13	-51.4
3760.0	-57.5	337	1.8	H	8.8	-48.7	-13	-35.7
3760.0	-55.6	211	2.0	V	8	-47.6	-13	-34.6
High channel								
101.21	-64.28	202	1.5	H	-2.2	-66.5	-13	-53.5
300.13	-65.77	81	1.7	V	1.5	-64.3	-13	-51.3
3815.2	-56.7	34	1.7	H	8.7	-48	-13	-35
3815.2	-55.7	69	1.7	V	7.9	-47.8	-13	-34.8

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								
101.21	-65.33	49	2.1	H	-2.2	-67.5	-13	-54.5
300.13	-66.58	72	1.6	V	1.5	-65.1	-13	-52.1
1652.8	-58	34	1.8	H	3.5	-54.5	-13	-41.5
1652.8	-56.6	210	2.1	V	3.1	-53.5	-13	-40.5
2479.2	-57.3	170	2.1	H	6.5	-50.8	-13	-37.8
2479.2	-56.5	239	1.7	V	5.7	-50.8	-13	-37.8
3305.6	-53.2	42	1.5	H	6.4	-46.8	-13	-33.8
3305.6	-52.8	64	1.9	V	5.7	-47.1	-13	-34.1
Middle channel								
101.21	-65.68	137	1.8	H	-2.2	-67.9	-13	-54.9
300.13	-66.44	94	1.8	V	1.5	-64.9	-13	-51.9
1673.2	-58	101	1.8	H	3.8	-54.2	-13	-41.2
1673.2	-57.1	42	2.0	V	3.1	-54	-13	-41
2509.8	-57.1	159	2.0	H	6.2	-50.9	-13	-37.9
2509.8	-56.7	242	1.7	V	5.7	-51	-13	-38
3346.4	-53.4	292	1.8	H	6.6	-46.8	-13	-33.8
3346.4	-52.5	302	2.0	V	5.4	-47.1	-13	-34.1
High channel								
101.21	-64.41	240	1.7	H	-2.2	-66.6	-13	-53.6
300.13	-67.27	36	1.8	V	1.5	-65.8	-13	-52.8
1693.2	-57.9	34	1.7	H	4	-53.9	-13	-40.9
1693.2	-57.1	127	1.9	V	3.1	-54	-13	-41
2509.8	-57	315	2.0	H	6.1	-50.9	-13	-37.9
2509.8	-56.3	46	1.7	V	5.7	-50.6	-13	-37.6
3386.4	-53.3	222	1.9	H	6.3	-47	-13	-34
3386.4	-52.8	133	1.8	V	5.4	-47.4	-13	-34.4

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, Low channel								
101.21	-65.13	145	1.8	H	-2.2	-67.3	-13	-54.3
300.13	-66.83	296	1.8	V	1.5	-65.3	-13	-52.3
3701.4	-53.9	184	1.6	H	8.1	-45.8	-13	-32.8
3701.4	-52.7	353	2.0	V	7.6	-45.1	-13	-32.1
1.4MHz, Middle channel								
101.21	-65.22	184	1.8	H	-2.2	-67.4	-13	-54.4
300.13	-67.05	105	2.1	V	1.5	-65.6	-13	-52.6
3760.0	-56.5	126	1.6	H	8.8	-47.7	-13	-34.7
3760.0	-53.7	58	1.8	V	8	-45.7	-13	-32.7
1.4MHz, High channel								
101.21	-65.03	50	1.7	H	-2.2	-67.2	-13	-54.2
300.13	-65.78	326	1.8	V	1.5	-64.3	-13	-51.3
3818.6	-54.8	347	1.7	H	8.7	-46.1	-13	-33.1
3818.6	-53.3	246	1.6	V	8	-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, Low channel								
101.21	-64.62	330	1.8	H	-2.2	-66.8	-13	-53.8
300.13	-66.40	350	1.6	V	1.5	-64.9	-13	-51.9
1649.4	-56.6	167	1.6	H	3.2	-53.4	-13	-40.4
1649.4	-57.4	103	1.7	V	3.1	-54.3	-13	-41.3
2474.1	-45.2	61	1.8	H	6.6	-38.6	-13	-25.6
2474.1	-39.7	41	2.0	V	5.8	-33.9	-13	-20.9
3298.8	-50.7	272	1.7	H	6.4	-44.3	-13	-31.3
3298.8	-50.2	190	1.9	V	5.7	-44.5	-13	-31.5
1.4MHz, Middle channel								
101.21	-64.30	273	1.9	H	-2.2	-66.5	-13	-53.5
300.13	-66.96	179	1.5	V	1.5	-65.5	-13	-52.5
1673.0	-54.9	193	1.5	H	3.8	-51.1	-13	-38.1
1673.0	-54.4	108	1.9	V	3.1	-51.3	-13	-38.3
2509.5	-43.5	355	1.7	H	6.2	-37.3	-13	-24.3
2509.5	-40.6	121	1.6	V	5.6	-35.0	-13	-22.0
3346.0	-52	130	1.7	H	6.6	-45.4	-13	-32.4
3346.0	-49.2	91	1.8	V	5.4	-43.8	-13	-30.8
1.4MHz, High channel								
101.21	-65.24	266	1.6	H	-2.2	-67.4	-13	-54.4
300.13	-66.17	17	1.9	V	1.5	-64.7	-13	-51.7
1696.6	-54.6	141	1.6	H	4.1	-50.5	-13	-37.5
1696.6	-53.3	49	1.8	V	3.1	-50.2	-13	-37.2
2544.9	-43.5	162	1.7	H	6.1	-37.4	-13	-24.4
2544.9	-40.6	30	2.0	V	5.8	-34.8	-13	-21.8
3393.2	-50.5	227	2.0	H	6.3	-44.2	-13	-31.2
3393.2	-48.5	197	2.0	V	5.4	-43.1	-13	-30.1

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
LTE Band12								
Test frequency range: 30MHz-10GHz								
1.4MHz, Low channel								
101.21	-64.52	212	1.7	H	-2.2	-66.7	-13	-53.7
300.13	-67.00	322	2.0	V	1.5	-65.5	-13	-52.5
1399.4	-60	159	1.8	H	5.9	-54.1	-13	-41.1
1399.4	-61	312	1.6	V	5.9	-55.1	-13	-42.1
2099.1	-37.3	190	2.0	H	6.3	-31.0	-13	-18.0
2099.1	-39.1	153	1.8	V	5.1	-34.0	-13	-21.0
1.4MHz, Middle channel								
101.21	-64.85	42	1.7	H	-2.2	-67.1	-13	-54.1
300.13	-65.79	332	2.0	V	1.5	-64.3	-13	-51.3
1415	-59.3	341	2.0	H	5.7	-53.6	-13	-40.6
1415	-60.9	30	1.9	V	5.4	-55.5	-13	-42.5
2122.5	-39.2	78	1.9	H	6.7	-32.5	-13	-19.5
2122.5	-40.6	22	1.9	V	5.8	-34.8	-13	-21.8
1.4MHz, High channel								
101.21	-63.99	65	1.9	H	-2.2	-66.2	-13	-53.2
300.13	-65.71	109	1.8	V	1.5	-64.2	-13	-51.2
1430.6	-59.1	65	1.9	H	5.4	-53.7	-13	-40.7
1430.6	-59	173	1.8	V	4.8	-54.2	-13	-41.2
2145.9	-39.1	82	1.7	H	7	-32.1	-13	-19.1
2145.9	-41.1	338	2.0	V	6.6	-34.5	-13	-21.5

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 Band13								
Test frequency range: 30MHz-10GHz								
1.4MHz, Low channel								
101.21	-65.56	218	1.7	H	-2.2	-67.8	-13	-54.8
300.13	-66.18	224	2.0	V	1.5	-64.7	-13	-51.7
1559	-54.70	34	2.0	H	4.2	-50.5	-40	-10.5
1559	-53.8	294	1.6	V	3.3	-50.5	-40	-10.5
2338.5	-47.8	23	1.9	H	7.3	-40.5	-13	-27.5
2338.5	-43.3	2	1.5	V	6.5	-36.8	-13	-23.8
3118	-54.2	89	1.8	H	7.3	-46.9	-13	-33.9
3118	-52.5	73	1.7	V	6.5	-46.0	-13	-33.0
1.4MHz, Middle channel								
101.21	-65.13	202	1.5	H	-2.2	-67.3	-13	-54.3
300.13	-66.22	161	2.0	V	1.5	-64.7	-13	-51.7
1564	-56.00	135	1.9	H	4.2	-51.8	-40	-11.8
1564	-55.50	2	1.9	V	3.3	-52.2	-40	-12.2
2346	-48.6	12	2.0	H	7.3	-41.3	-13	-28.3
2346	-45.1	224	1.8	V	6.4	-38.7	-13	-25.7
3128	-53.4	145	2.0	H	7.3	-46.1	-13	-33.1
3128	-52.5	35	1.8	V	6.6	-45.9	-13	-32.9
1.4MHz, High channel								
101.21	-64.27	24	1.6	H	-2.2	-66.5	-13	-53.5
300.13	-66.57	297	1.9	V	1.5	-65.1	-13	-52.1
1569	-56.10	74	1.9	H	4.2	-51.9	-40	-11.9
1569	-56.30	10	1.7	V	3.3	-53.0	-40	-13.0
2353.5	-47.9	31	1.6	H	7.3	-40.6	-13	-27.6
2353.5	-46.7	73	1.8	V	6.4	-40.3	-13	-27.3
3138	-53.6	178	1.9	H	7.4	-46.2	-13	-33.2
3138	-53	180	1.8	V	6.6	-46.4	-13	-33.4

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, Low channel								
101.21	-65.29	345	2.0	H	-2.2	-67.5	-25	-42.5
300.13	-66.15	282	1.8	V	1.5	-64.7	-25	-39.7
5075.0	-48.8	98	1.6	H	11.2	-37.6	-25	-12.6
5075.0	-46.9	78	1.9	V	10.8	-36.1	-25	-11.1
5MHz, Middle channel								
101.21	-65.47	97	1.8	H	-2.2	-67.7	-25	-42.7
300.13	-66.35	68	1.7	V	1.5	-64.9	-25	-39.9
5190.0	-48.42	324	1.7	H	10.52	-37.9	-25	-12.9
5190.0	-44.5	200	1.8	V	10	-34.5	-25	-9.5
5MHz, High channel								
101.21	-63.82	26	1.5	H	-2.2	-66.0	-25	-41.0
300.13	-66.19	272	1.9	V	1.5	-64.7	-25	-39.7
5305.0	-47.5	358	1.9	H	9.6	-37.9	-25	-12.9
5305.0	-43.3	55	1.5	V	8.8	-34.5	-25	-9.5

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 (c)(h)(m) - BAND EDGES

Applicable Standard

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

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

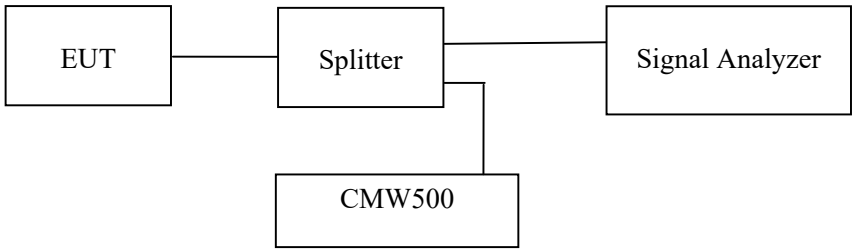
According to FCC §27.53 (c), For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:
(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;
(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;
(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations;
(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations;

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

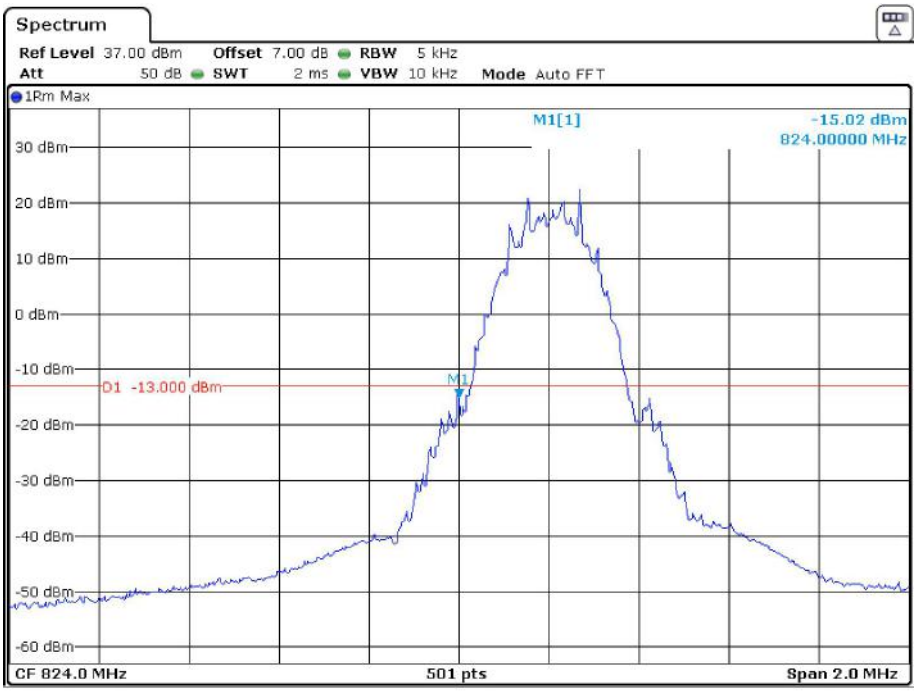
The testing was performed by Gala Liu from 2022-04-02 to 2022-04-04.

EUT operation mode: Transmitting (Worst case)

Test Result: Pass

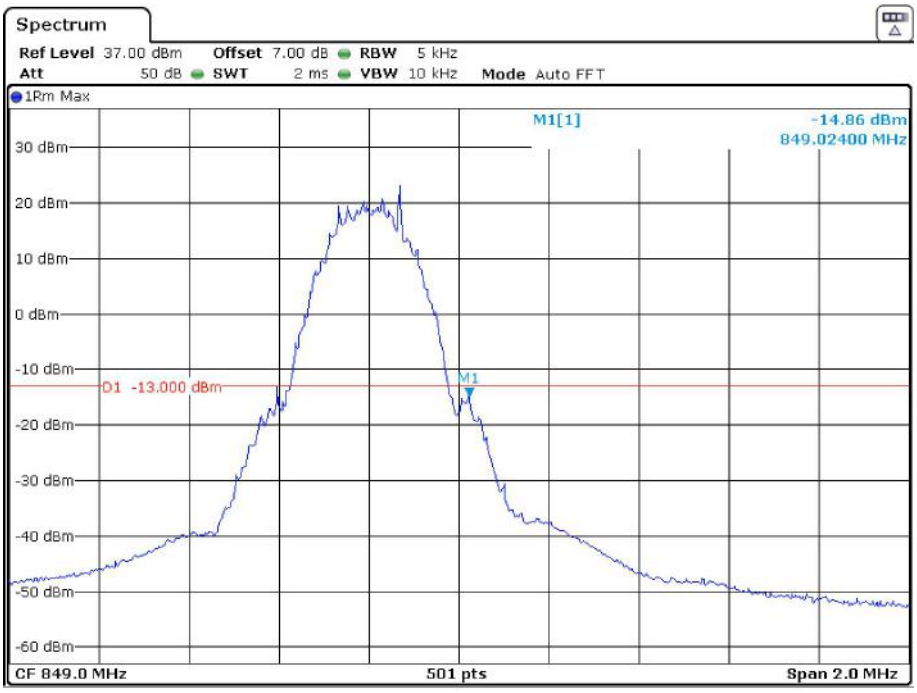
Please refer to the following plots.

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



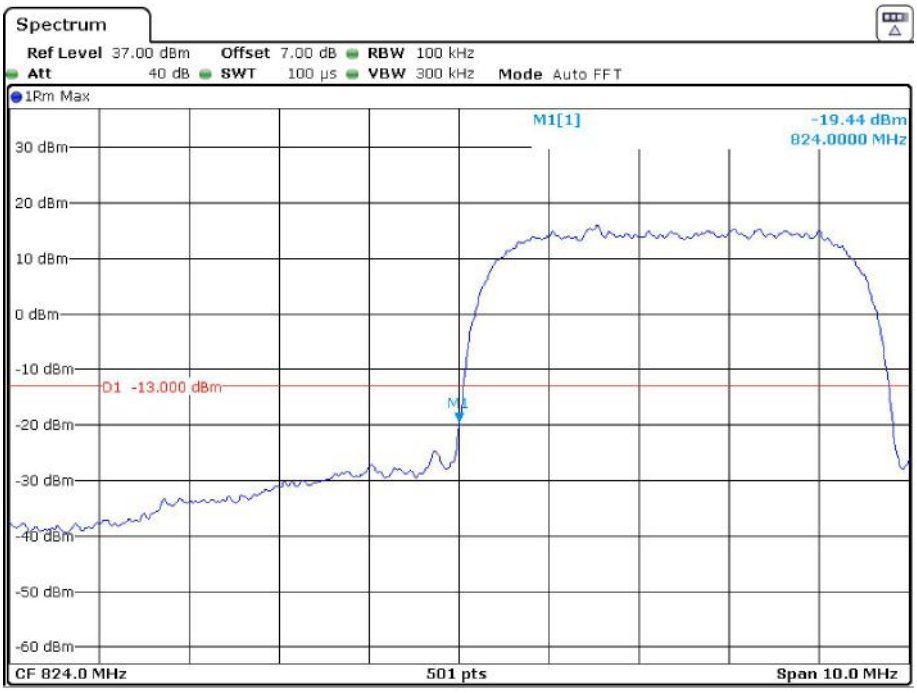
Date: 2.APR.2022 19:36:43

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



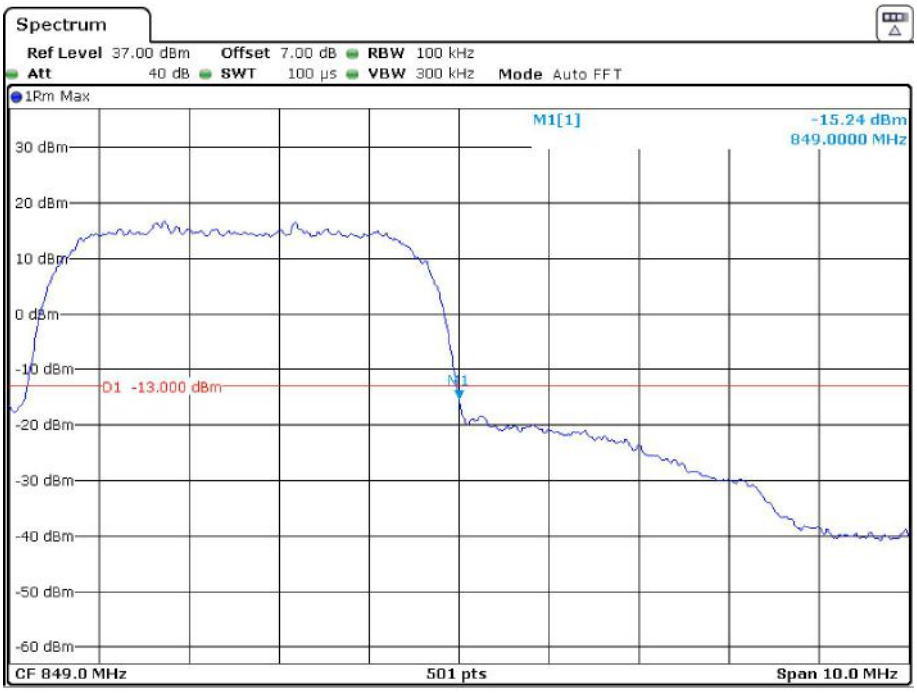
Date: 2.APR.2022 19:36:29

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



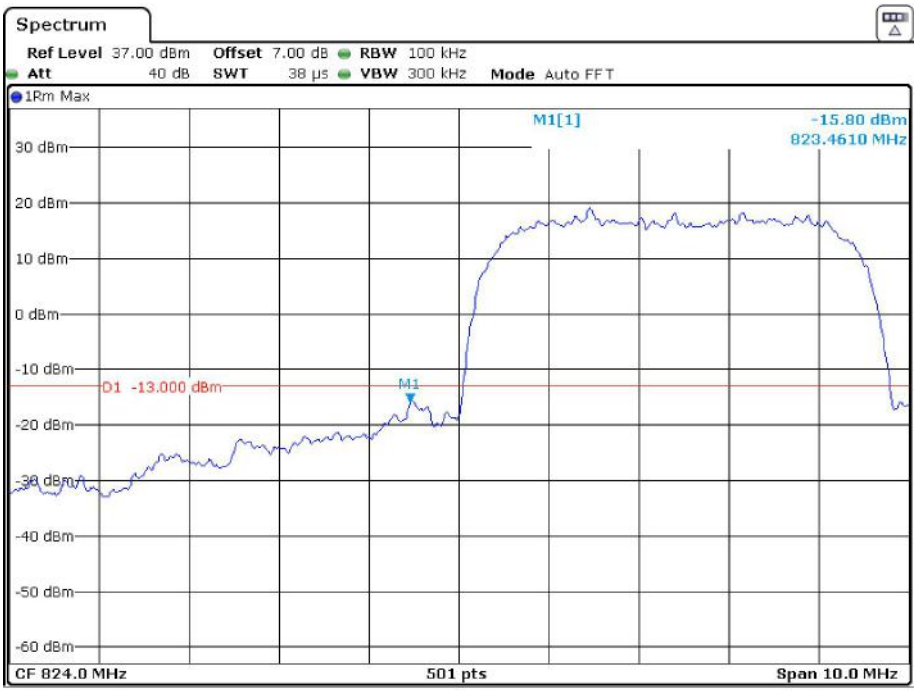
Date: 2.APR.2022 20:10:03

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



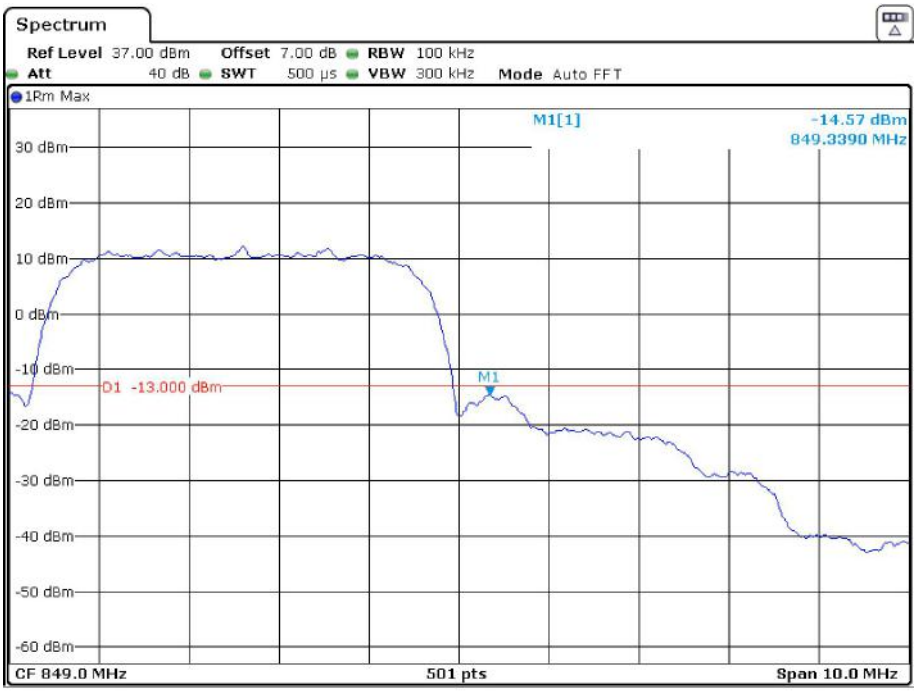
Date: 2.APR.2022 20:09:40

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



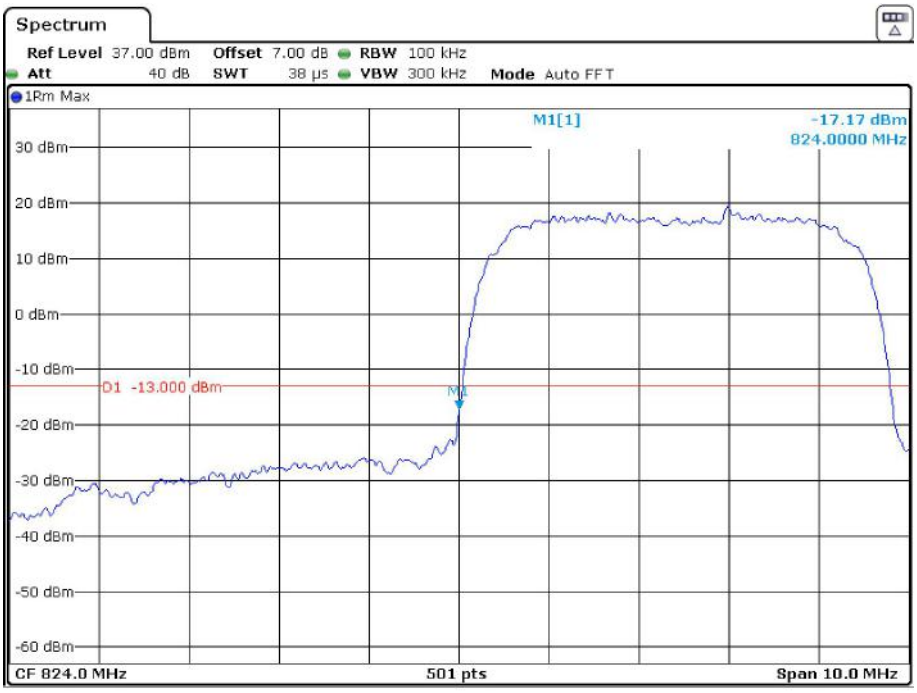
Date: 2.APR.2022 20:33:16

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



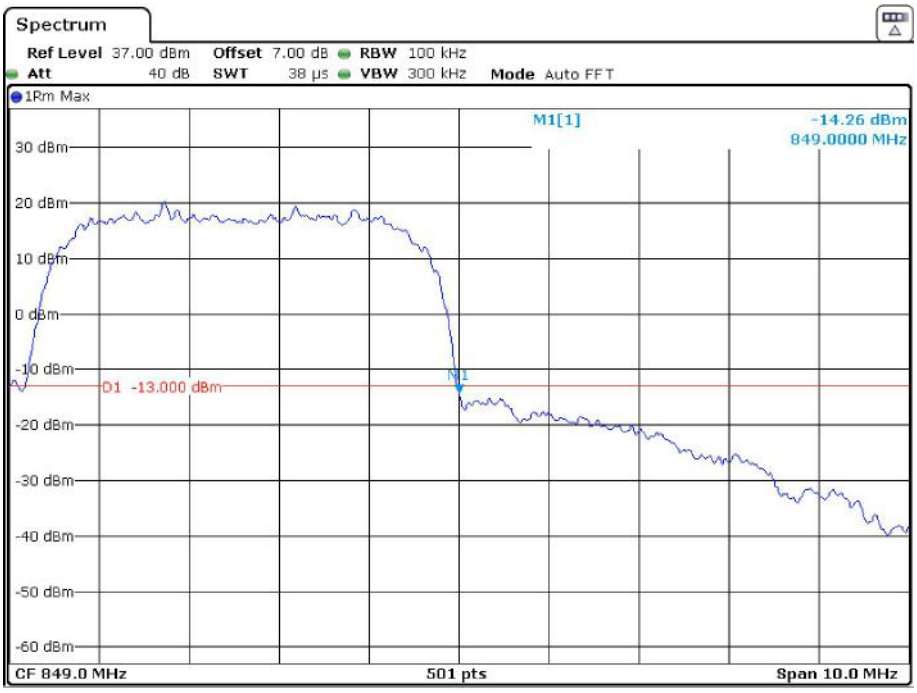
Date: 2.APR.2022 20:32:47

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



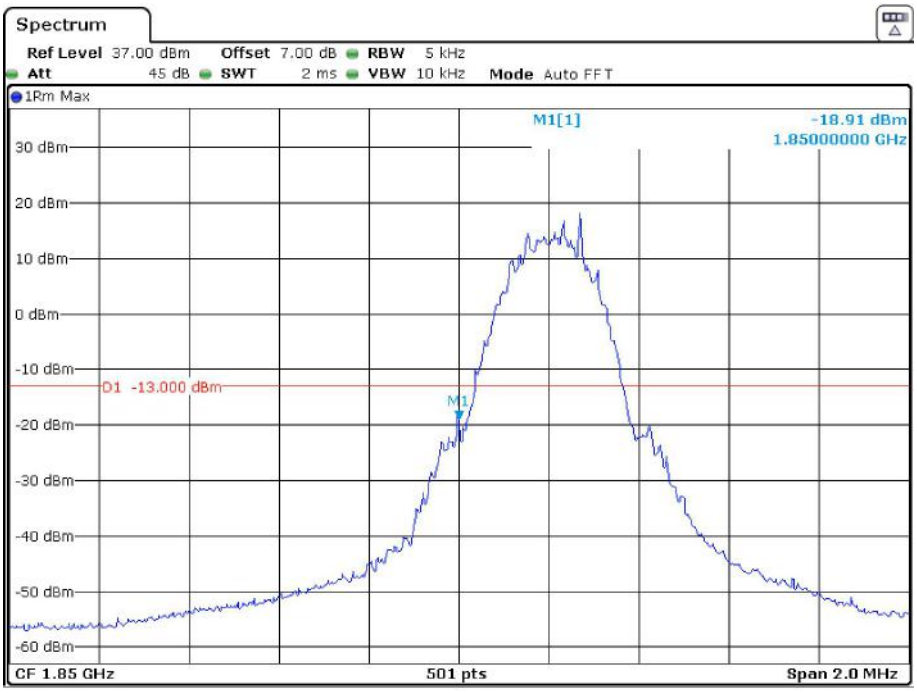
Date: 2.APR.2022 20:37:54

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



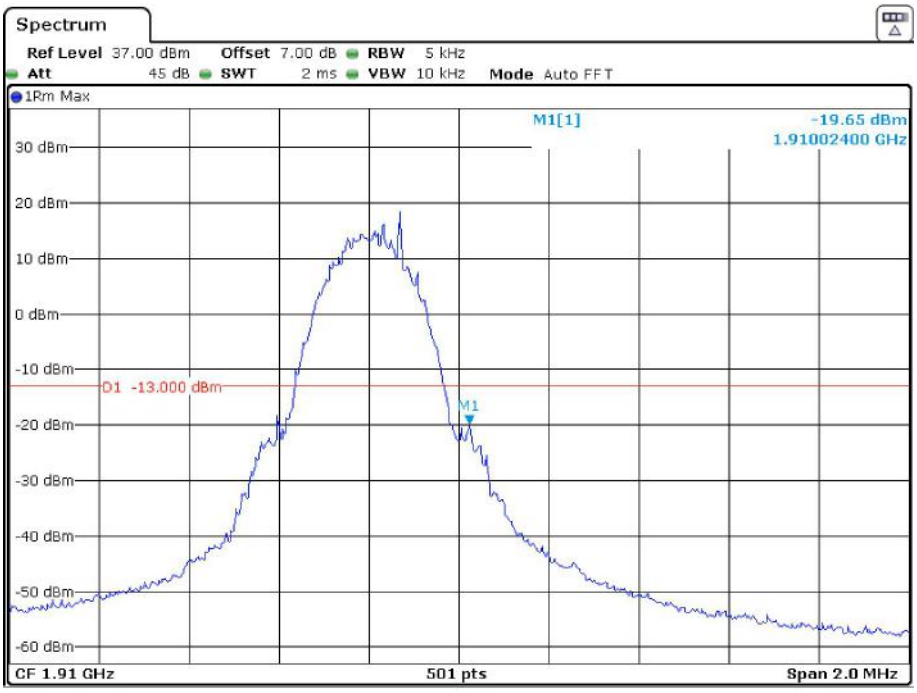
Date: 2.APR.2022 20:38:15

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



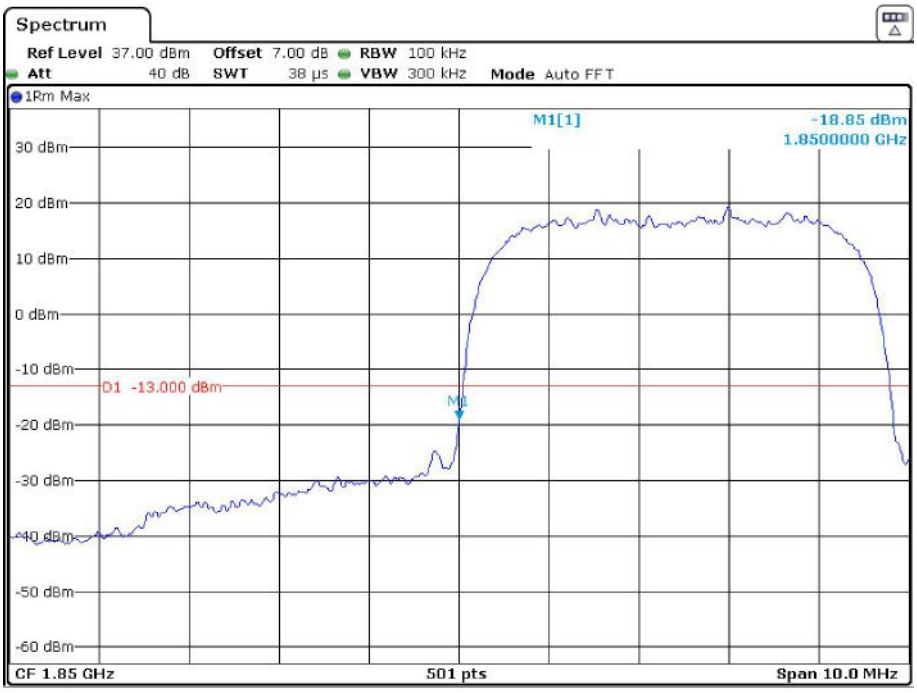
Date: 2.APR.2022 19:54:00

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



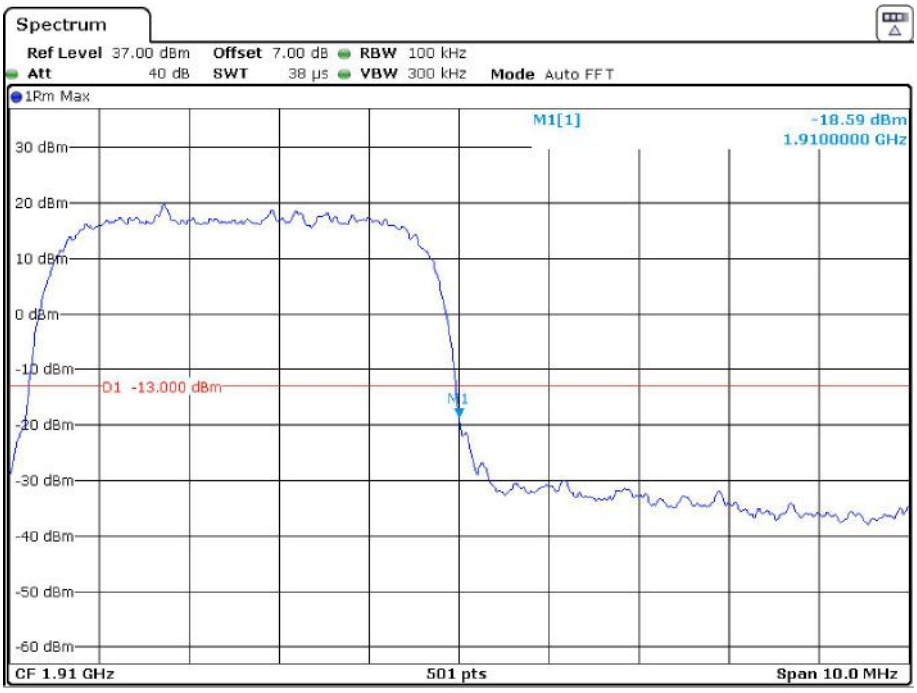
Date: 2.APR.2022 19:54:16

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



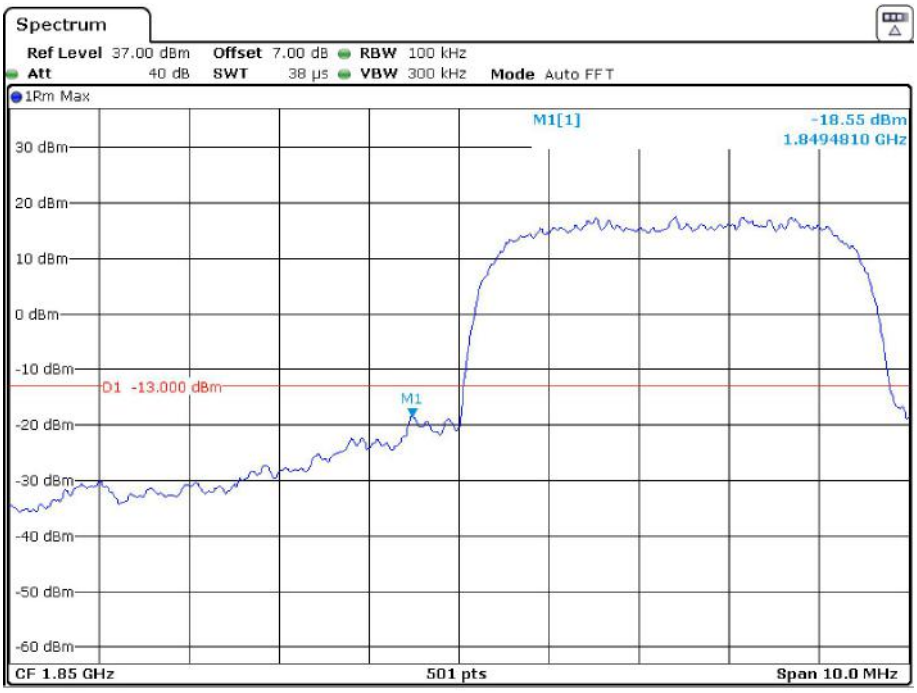
Date: 2.APR.2022 20:10:29

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



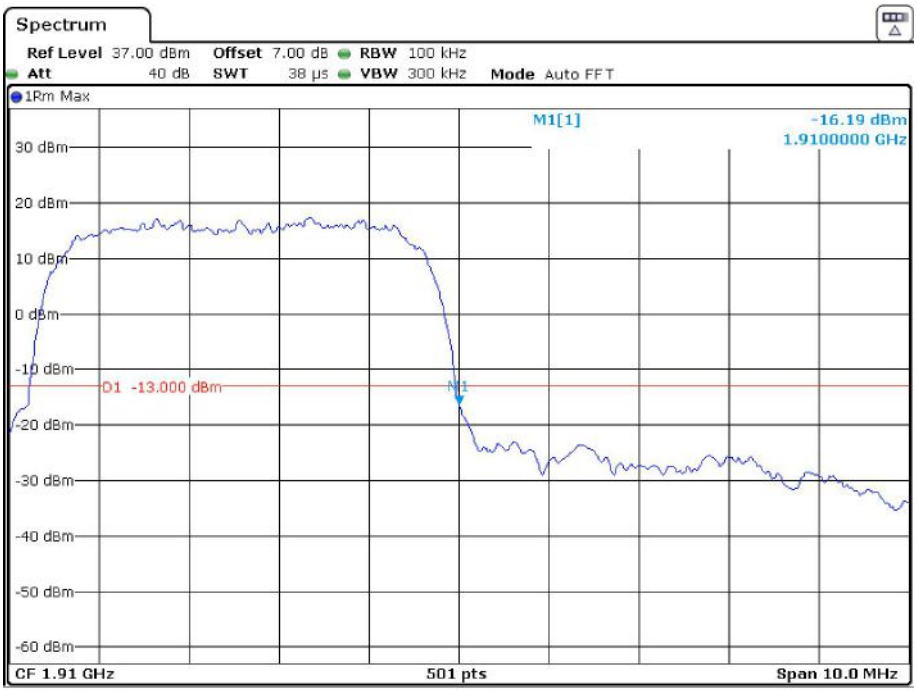
Date: 2.APR.2022 20:10:48

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



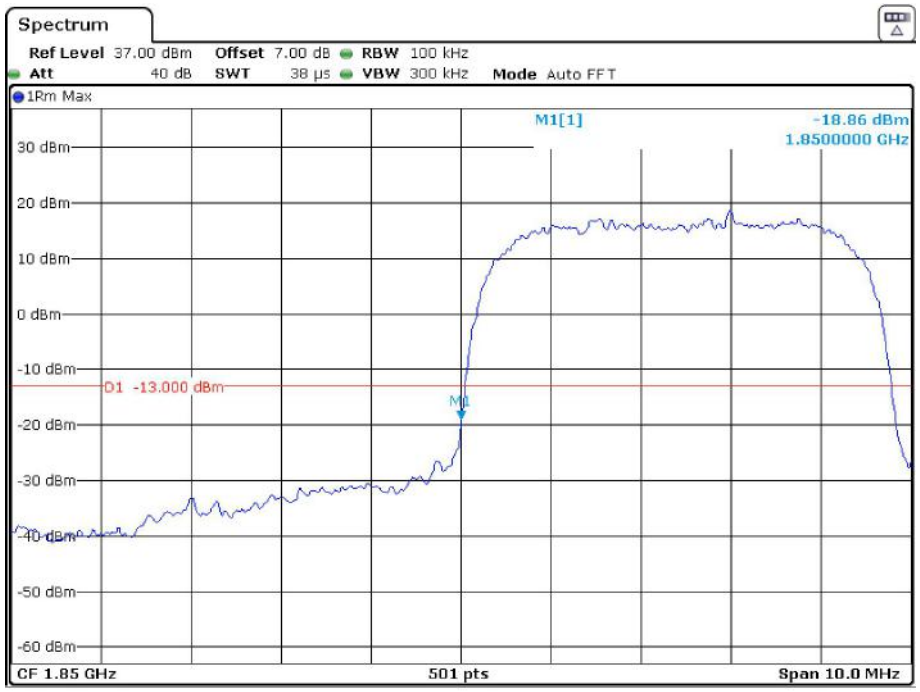
Date: 2.APR.2022 20:33:46

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



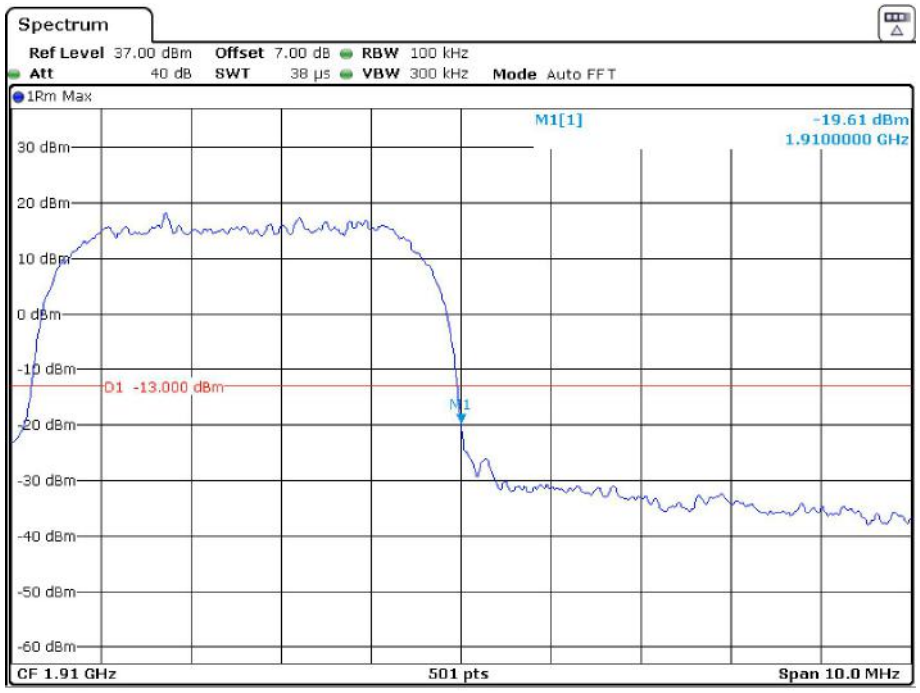
Date: 2.APR.2022 20:34:01

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



Date: 2.APR.2022 20:37:33

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



Date: 2.APR.2022 20:36:38

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

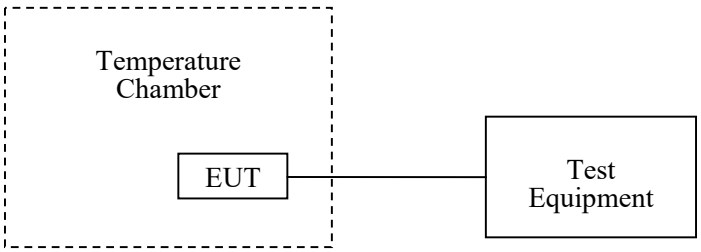
According to §24.235&§27.54, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

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 Gala Liu from 2022-04-02 to 2022-04-04.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the following tables.

Cellular Band (Part 22H)

GSM Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-30	N.V.	5	0.0060	2.5
-20		4	0.0048	2.5
-10		7	0.0084	2.5
0		7	0.0084	2.5
10		4	0.0048	2.5
20		-1	-0.0012	2.5
30		6	0.0072	2.5
40		2	0.0024	2.5
50		8	0.0096	2.5
20	L.V.	6	0.0072	2.5
	H.V.	3	0.0036	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.	1.26	0.0015	2.5
-20		2.35	0.0028	2.5
-10		3.22	0.0038	2.5
0		1.53	0.0018	2.5
10		-1.34	-0.0016	2.5
20		0.87	0.0010	2.5
30		1.96	0.0023	2.5
40		1.47	0.0018	2.5
50		1.62	0.0019	2.5
20	L.V.	1.87	0.0022	2.5
	H.V.	1.73	0.0021	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.	7	0.0037	Pass
-20		-6	-0.0032	Pass
-10		12	0.0064	Pass
0		10	0.0053	Pass
10		-12	-0.0064	Pass
20		-3	-0.0016	Pass
30		-9	-0.0048	Pass
40		-11	-0.0059	Pass
50		6	0.0032	Pass
20	L.V.	3	0.0016	Pass
	H.V.	5	0.0027	Pass

WCDMA Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	N.V.	1.42	0.0008	Pass
-20		1.34	0.0007	Pass
-10		1.26	0.0007	Pass
0		1.29	0.0007	Pass
10		2.17	0.0012	Pass
20		1.09	0.0006	Pass
30		2.31	0.0012	Pass
40		1.23	0.0007	Pass
50		1.42	0.0008	Pass
20	L.V.	1.37	0.0007	Pass
	H.V.	1.45	0.0008	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.	-30.84	-0.0164	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.	8.81	0.0105	2.5
-20		9.11	0.0109	2.5
-10		8.51	0.0102	2.5
0		-7.15	-0.0085	2.5
10		-5.29	-0.0063	2.5
20		7.24	0.0087	2.5
30		-5.81	-0.0069	2.5
40		5.59	0.0067	2.5
50		6.87	0.0082	2.5
20	L.V.	9.94	0.0119	2.5
	H.V.	9.99	0.0119	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.	699.0377	715.9634	699	716
-20		699.0344	715.9626	699	716
-10		699.0368	715.9672	699	716
0		699.0312	715.9666	699	716
10		699.0342	715.9643	699	716
20		699.0339	715.9672	699	716
30		699.0375	715.9664	699	716
40		699.0372	715.9691	699	716
50		699.0362	715.9653	699	716
20	L.V.	699.0333	715.9675	699	716
	H.V.	699.0372	715.9642	699	716

Band 13:

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.	777.1288	786.8452	777	787
-20		777.1237	786.8434	777	787
-10		777.1276	786.8422	777	787
0		777.1213	786.8432	777	787
10		777.1246	786.8441	777	787
20		777.1297	786.8472	777	787
30		777.1253	786.8456	777	787
40		777.1294	786.8495	777	787
50		777.1265	786.8432	777	787
20	L.V.	777.1233	786.8454	777	787
	H.V.	777.1265	786.8444	777	787

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.	2535.0562	2654.9433	2535	2655
-20		2535.0554	2654.9462	2535	2655
-10		2535.0522	2654.9412	2535	2655
0		2535.0537	2654.9425	2535	2655
10		2535.0525	2654.9423	2535	2655
20		2535.0524	2654.9472	2535	2655
30		2535.0513	2654.9467	2535	2655
40		2535.0562	2654.9451	2535	2655
50		2535.0575	2654.9355	2535	2655
20	L.V.	2535.0494	2654.9411	2535	2655
	H.V.	2535.0513	2654.9423	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.	-33.27	-0.0177	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.	24.43	0.0292	2.5
-20		6.80	0.0081	2.5
-10		-9.52	-0.0114	2.5
0		-8.15	-0.0097	2.5
10		-8.88	-0.0106	2.5
20		-9.82	-0.0117	2.5
30		8.38	0.0100	2.5
40		6.75	0.0081	2.5
50		-5.89	-0.0070	2.5
20	L.V.	8.98	0.0107	2.5
	H.V.	-7.83	-0.0094	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.	699.0389	715.9649	699	716
-20		699.0352	715.9625	699	716
-10		699.0374	715.9673	699	716
0		699.0343	715.9658	699	716
10		699.0350	715.9641	699	716
20		699.0402	715.9628	699	716
30		699.0351	715.9633	699	716
40		699.0342	715.9642	699	716
50		699.0332	715.9637	699	716
20	L.V.	699.0363	715.9652	699	716
	H.V.	699.0347	715.9671	699	716

Band 13:

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.	777.0317	786.9212	777	787
-20		777.0362	786.9233	777	787
-10		777.0352	786.9247	777	787
0		777.0362	786.9272	777	787
10		777.0315	786.9235	777	787
20		777.0328	786.9242	777	787
30		777.0337	786.9236	777	787
40		777.0314	786.9245	777	787
50		777.0295	786.9244	777	787
20	L.V.	777.0322	786.9252	777	787
	H.V.	777.0343	786.9217	777	787

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.	2535.0517	2654.8532	2535	2655
-20		2535.0492	2654.8521	2535	2655
-10		2535.0438	2654.8545	2535	2655
0		2535.0452	2654.8526	2535	2655
10		2535.0446	2654.8542	2535	2655
20		2535.0437	2654.8557	2535	2655
30		2535.0438	2654.8563	2535	2655
40		2535.0442	2654.8532	2535	2655
50		2535.0451	2654.8597	2535	2655
20	L.V.	2535.0466	2654.8552	2535	2655
	H.V.	2535.0427	2654.8524	2535	2655

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

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