



TESTREPORT

Applicant Name : Bolt Modus Corp
Address : Oficina N.33 Edificio Ofidepositos Central, Calidonia - Distrito
Federal, Panama
ReportNumber: SZNS211213-64444E-RF-00C
FCC ID: 2APW4MAX2

Test Standard (s)

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

Sample Description

Product Type: MAX2
Model No.: MAX2
Multiple Model(s) No.: N/A
Trade Mark: YEZZ
Date Received: 2021/12/13
Date of Test: 2021/12/23~2022/01/11
Report Date: 2022/01/17

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

Prepared and Checked By:

Ting Lv
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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Version 2: 2021-11-09

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FCC -2G,3G,4G

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

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 4: 1710-1755MHz(TX); 2110-2155MHz(RX) LTE Band 7: 2500-2570MHz(TX); 2620-2690MHz(RX) LTE Band 12: 699-716MHz(TX); 729-746MHz(RX) LTE Band 17: 704-716MHz(TX); 734-746MHz(RX)
Modulation Technique	2G: GMSK 3G: BPSK, QPSK, 16QAM 4G: QPSK, 16QAM
Antenna Specification*	GSM850/WCDMA Band5: -1dBi PCS1900/WCDMA Band 2/ LTE Band 2: -0.5dBi LTE Band 4: -0.5dBi LTE Band 7: 1dBi LTE Band 12/LTE Band 17: -1dBi (provided by the applicant)
Voltage Range	DC3.7V from battery or DC 5V from adapter
Sample serial number	SZNS211213-64444E-RF-S1 (RF Conducted Test) SZNS211213-64444E-RF-S2 (for CE&RE) (Assigned by ATC)
Sample/EUT Status	Good condition
Extreme condition*	LV: Low Voltage 3.7V NV: Normal Voltage 3.45V HV: High Voltage 4.4V(provided by the applicant)
Adapter information	Model: CMAX2 Input: AC 110-240V, 50/60Hz, Output: DC 5.0V, 1.0A

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.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		±5%
RF output power, conducted		±0.73dB
Unwanted Emission, conducted		±1.6dB
RF Frequency		±0.082*10 ⁻⁷
Emissions, Radiated	30MHz - 1GHz	±4.28dB
	1GHz - 18GHz	±4.98dB
	18GHz - 26.5GHz	±5.06dB
Temperature		±1 °C
Humidity		±6%
Supply voltages		±0.4%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The Test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China.

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

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

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

Test was performed as below table:

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 B4	1.4	1710.7	1732.5	1754.3
	3	1711.5	1732.5	1753.5
	5	1712.5	1732.5	1752.5
	10	1715	1732.5	1750
	15	1717.5	1732.5	1747.5
	20	1720	1732.5	1745
LTE B7	5	2502.5	2535	2567.5
	10	2505	2535	2565
	15	2507.5	2535	2562.5
	20	2510	2535	2560
LTE B12	1.4	699.7	707.5	715.3
	3	700.5	707.5	714.5
	5	701.5	707.5	713.5
	10	704.0	707.5	711
LTE B17	5	706.5	710	713.5
	10	709	710	711

Equipment Modifications

No modification was made to the EUT.

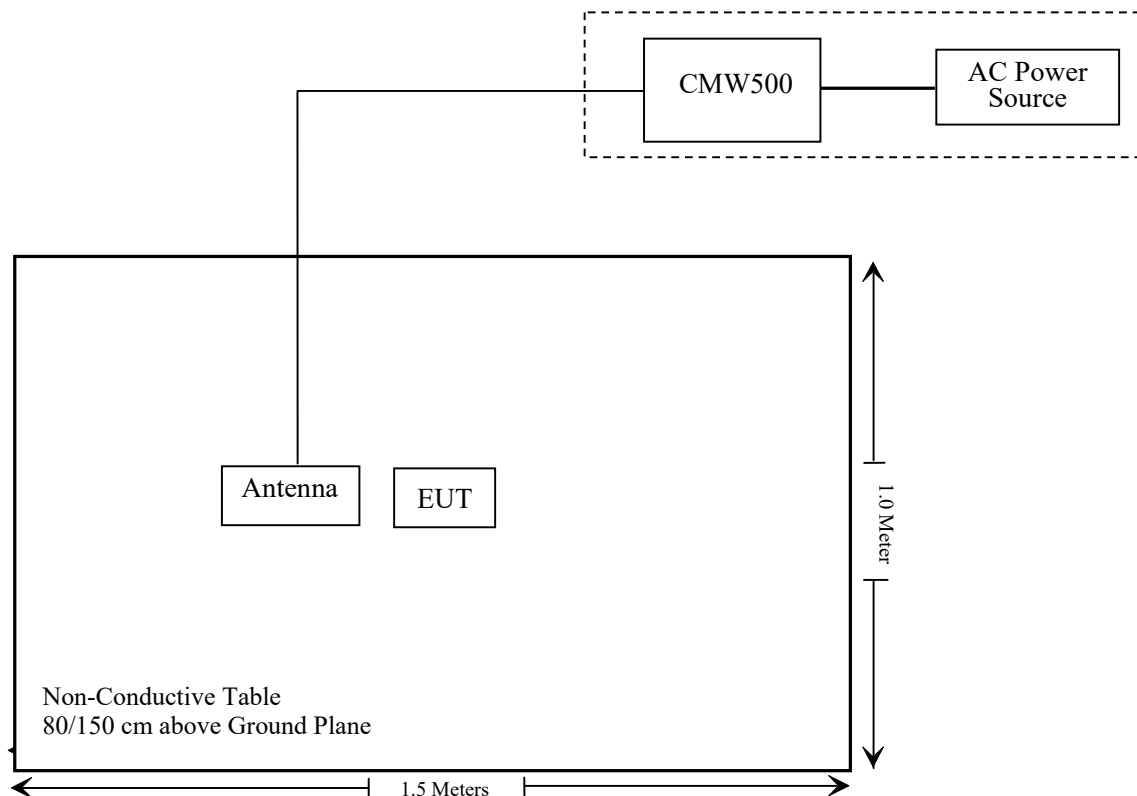
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Rohde&Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-11621 8-U

Support Cable Description

Cable Description	Length (m)	From / Port	To
Un-shielding Detachable AC Cable	1.0	AC Power Source	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 (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 (h) (m)	Band Edge	Compliant
§ 2.1055; § 22.355; § 24.235; §27.54;	Frequency stability	Compliant

Note: * Please refer to SAR report number: SZNS211213-64444E-SA.

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-1840553 6-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	MSF824-862 MS-1147	201706003	2021/12/14	2022/12/13
Unknown	Band Reject Filter	MSF1850-191 0MS-1148	201706003	2021/12/14	2022/12/13
Unknown	Band Reject Filter	MSF1710-178 5MS-1150	201706003	2021/12/14	2022/12/13
Unknown	Band Reject Filter	MSF2495-257 0MS-1152	201706003	2021/12/14	2022/12/13
Unknown	Band Reject Filter	MSF700-800 MS-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
PASTERNAK	Horn Antenna	PE9852/2F-20	1120	2020/01/05	2023/01/04
PASTERNAK	Horn Antenna	PE9852/2F-20	1120	2020/01/05	2023/01/04
Unknown	RF Coaxial Cable	No.16	N200	2021/12/14	2022/12/13
Agilent	Signal Generator	N5183A	MY51040755	2021/12/13	2022/12/12

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde&Schwarz	Spectrum Analyzer	FSV40	101949	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-18000MH z	SF10944151S	2021/12/14	2022/12/13
Gongwen	Temp. & Humid. Chamber	HSD-500	109	2021/10/14	2022/10/13
Unknown	RF Cable	Unknown	Unknown	Each time	/
Fluke	Multi Meter	45	7664009	2021/12/14	2022/12/13
Manson	DC Power Source	KPS-6604	ATCS-205	NCR	NCR
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: SZNS211213-64444E-SA.

FCC§2.1047 - MODULATION CHARACTERISTIC

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

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

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

According to FCC §2.1046 and §24.232 (c), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

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

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

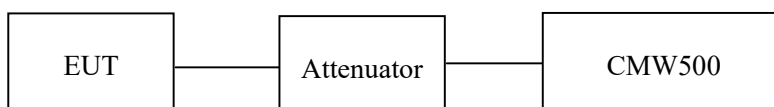
According to §27.50(d), Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

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

Test Procedure

Conducted method:

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

**Test Data****Environmental Conditions**

Temperature:	25°C
Relative Humidity:	60 %
ATM Pressure:	101.0 kPa

The testing was performed by Paul liu from 2021-12-24 to 2022-01-10.

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

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	ERP(dBm)	Limit (dBm)
GSM	128	824.2	32.39	28.74	38.45
	190	836.6	32.63	31.93	38.45
	251	848.8	32.65	31.95	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	33.42	32.56	30.78	29.40	29.77	28.91	27.13	25.75	38.45
	190	836.6	33.54	32.88	31.16	29.78	29.89	29.23	27.51	26.13	38.45
	251	848.8	33.61	32.76	30.95	29.63	29.96	29.11	27.3	25.98	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		22.61	22.71	22.82	18.96	19.06	19.17
	HSDPA	1	21.43	21.59	21.83	17.78	17.94	18.18
		2	21.31	21.30	21.82	17.66	17.65	18.17
		3	21.24	21.52	21.62	17.59	17.87	17.97
		4	21.21	21.23	21.75	17.56	17.58	18.10
	HSUPA	1	20.99	21.61	21.71	17.34	17.96	18.06
		2	20.80	21.60	21.57	17.15	17.95	17.92
		3	20.77	21.44	21.70	17.12	17.79	18.05
		4	20.74	21.43	21.55	17.09	17.78	17.90
		5	20.92	21.58	21.71	17.27	17.93	18.06
	HSPA+	1	20.63	20.52	20.68	16.98	16.87	17.03

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

For GSM850 / WCDMA Band5: Antenna Gain = -1dBi = -3.15dBd (0dBd=2.15dBi)

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	29.39	27.89	33
	661	1880.0	29.08	27.58	33
	810	1909.8	28.81	27.31	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	29.37	28.65	26.79	25.58	27.87	27.15	25.29	24.08	33
	661	1880.0	29.05	28.30	26.39	25.11	27.55	26.80	24.89	23.61	33
	810	1909.8	28.80	27.97	26.02	24.77	27.30	26.47	24.52	23.27	33

Mode	Test Mode	3GPP Sub Test	Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
WCDMA (Band 2)	RMC12.2k		20.62	20.38	20.27	19.12	18.88	18.77
	HSDPA	1	19.57	19.37	19.21	18.07	17.87	17.71
		2	19.29	19.07	19.10	17.79	17.57	17.60
		3	19.31	19.31	19.02	17.81	17.81	17.52
		4	19.10	18.83	18.93	17.60	17.33	17.43
	HSUPA	1	19.07	19.49	18.93	17.57	17.99	17.43
		2	19.03	19.31	18.89	17.53	17.81	17.39
		3	19.02	19.42	18.89	17.52	17.92	17.39
		4	18.93	19.32	18.75	17.43	17.82	17.25
		5	18.90	19.44	18.83	17.40	17.94	17.33
	HSPA+	1	19.44	19.51	19.28	17.94	18.01	17.78

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

For PCS1900 / WCDMA Band2: Antenna Gain = -0.5dBi

Cable Loss=1dB*(provided by the applicant)

Limit: EIRP ≤ 33dBm

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

Mode	Channel	PAR (dB)	Limit(dB)
GSM	Low	3.64	13
	Middle	3.80	13
	High	3.92	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	4.68	13
	Middle	4.87	13
	High	4.78	13
HSDPA (16QAM)	Low	5.71	13
	Middle	4.49	13
	High	4.28	13
HSUPA (BPSK)	Low	5.98	13
	Middle	4.17	13
	High	4.11	13
HSPA+	Low	5.87	13
	Middle	5.69	13
	High	4.05	13

PCS Band

Mode	Channel	PAR (dB)	Limit(dB)
GSM	Low	3.84	13
	Middle	3.71	13
	High	4.23	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	4.74	13
	Middle	5.78	13
	High	5.42	13
HSDPA (16QAM)	Low	4.17	13
	Middle	4.52	13
	High	4.97	13
HSUPA (BPSK)	Low	4.14	13
	Middle	4.24	13
	High	4.39	13
HSPA+	Low	5.83	13
	Middle	5.77	13
	High	4.19	13

LTE Band 2:**Maximum Output Power**

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
1.4	QPSK	RB1#0	24.12	23.00	22.82	22.62	21.50	21.32
		RB1#3	23.93	22.76	22.56	22.43	21.26	21.06
		RB1#5	24.05	22.89	22.47	22.55	21.39	20.97
		RB3#0	24.02	22.95	22.77	22.52	21.45	21.27
		RB3#3	24.01	22.90	22.58	22.51	21.40	21.08
		RB6#0	23.14	21.94	22.00	21.64	20.44	20.50
	16QAM	RB1#0	22.91	22.06	21.89	21.41	20.56	20.39
		RB1#3	22.84	21.89	21.71	21.34	20.39	20.21
		RB1#5	23.02	22.05	21.67	21.52	20.55	20.17
		RB3#0	23.11	21.86	21.93	21.61	20.36	20.43
		RB3#3	23.17	21.85	21.78	21.67	20.35	20.28
		RB6#0	22.03	21.07	21.05	20.53	19.57	19.55
3.0	QPSK	RB1#0	23.90	22.96	22.96	22.40	21.46	21.46
		RB1#8	23.82	22.69	22.59	22.32	21.19	21.09
		RB1#14	23.92	22.86	22.35	22.42	21.36	20.85
		RB6#0	23.13	21.97	22.20	21.63	20.47	20.70
		RB6#9	23.15	21.95	21.96	21.65	20.45	20.46
		RB15#0	23.13	21.92	22.12	21.63	20.42	20.62
	16QAM	RB1#0	23.27	22.05	21.99	21.77	20.55	20.49
		RB1#8	23.29	21.81	21.71	21.79	20.31	20.21
		RB1#14	23.33	22.04	21.56	21.83	20.54	20.06
		RB6#0	22.11	20.99	21.22	20.61	19.49	19.72
		RB6#9	22.07	20.99	21.02	20.57	19.49	19.52
		RB15#0	22.11	20.90	21.26	20.61	19.40	19.76

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
5.0	QPSK	RB1#0	23.65	22.76	22.61	22.15	21.26	21.11
		RB1#13	23.46	22.26	22.27	21.96	20.76	20.77
		RB1#24	23.55	22.75	22.19	22.05	21.25	20.69
		RB15#0	22.76	21.39	21.70	21.26	19.89	20.20
		RB15#10	22.81	21.47	21.72	21.31	19.97	20.22
		RB25#0	22.78	21.47	21.71	21.28	19.97	20.21
	16QAM	RB1#0	22.53	21.96	21.68	21.03	20.46	20.18
		RB1#13	22.45	21.55	21.44	20.95	20.05	19.94
		RB1#24	22.63	22.09	21.46	21.13	20.59	19.96
		RB15#0	21.82	20.46	20.73	20.32	18.96	19.23
		RB15#10	21.92	20.54	20.78	20.42	19.04	19.28
		RB25#0	21.89	20.56	20.78	20.39	19.06	19.28
10.0	QPSK	RB1#0	23.18	21.96	21.60	21.68	20.46	20.10
		RB1#25	23.28	22.16	22.07	21.78	20.66	20.57
		RB1#49	22.60	22.30	21.88	21.10	20.80	20.38
		RB25#0	22.73	21.28	20.87	21.23	19.78	19.37
		RB25#25	22.29	21.48	21.48	20.79	19.98	19.98
		RB50#0	22.54	21.37	21.22	21.04	19.87	19.72
	16QAM	RB1#0	22.66	21.01	20.46	21.16	19.51	18.96
		RB1#25	22.81	21.31	21.07	21.31	19.81	19.57
		RB1#49	22.18	21.50	21.00	20.68	20.00	19.50
		RB25#0	21.84	20.32	19.97	20.34	18.82	18.47
		RB25#25	21.43	20.61	20.61	19.93	19.11	19.11
		RB50#0	21.61	20.50	20.28	20.11	19.00	18.78

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
15.0	QPSK	RB1#0	23.40	22.13	22.35	21.90	20.63	20.85
		RB1#38	22.94	22.08	21.63	21.44	20.58	20.13
		RB1#74	22.36	22.71	22.05	20.86	21.21	20.55
		RB36#0	22.63	21.21	20.84	21.13	19.71	19.34
		RB36#39	21.83	21.61	21.27	20.33	20.11	19.77
		RB75#0	22.26	21.38	21.02	20.76	19.88	19.52
	16QAM	RB1#0	22.84	21.24	21.57	21.34	19.74	20.07
		RB1#38	22.46	21.25	20.99	20.96	19.75	19.49
		RB1#74	21.92	21.96	21.38	20.42	20.46	19.88
		RB36#0	21.69	20.24	19.87	20.19	18.74	18.37
		RB36#39	20.90	20.74	20.31	19.40	19.24	18.81
		RB75#0	21.33	20.53	20.07	19.83	19.03	18.57
20.0	QPSK	RB1#0	23.43	22.24	22.74	21.93	20.74	21.24
		RB1#50	22.67	22.05	21.43	21.17	20.55	19.93
		RB1#99	21.94	22.55	21.88	20.44	21.05	20.38
		RB50#0	22.45	21.12	21.35	20.95	19.62	19.85
		RB50#50	21.45	21.63	21.01	19.95	20.13	19.51
		RB100#0	21.98	21.39	21.14	20.48	19.89	19.64
	16QAM	RB1#0	22.67	21.36	22.29	21.17	19.86	20.79
		RB1#50	22.01	21.24	21.01	20.51	19.74	19.51
		RB1#99	21.26	21.82	21.50	19.76	20.32	20.00
		RB50#0	21.48	20.17	20.42	19.98	18.67	18.92
		RB50#50	20.48	20.68	20.05	18.98	19.18	18.55
		RB100#0	21.07	20.44	20.23	19.57	18.94	18.73

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

For Band2: Antenna Gain = -0.5dBi

Cable Loss=1.0dB*(provided by the applicant)

Limit: EIRP ≤ 33dBm

Peak-to-average ratio (PAR)**20MHz Bandwidth**

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	3.13	4.26	4.38	13	Pass
QPSK (100RB Size)	4.43	5.04	4.93	13	Pass
16QAM (1RB Size)	4.17	5.13	5.74	13	Pass
16QAM (100RB Size)	5.45	6.00	5.94	13	Pass

LTE Band 4**Maximum Output Power**

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
1.4	QPSK	RB1#0	24.48	24.06	23.97	22.98	22.56	22.47
		RB1#3	24.39	23.80	23.49	22.89	22.30	21.99
		RB1#5	24.47	23.91	23.37	22.97	22.41	21.87
		RB3#0	24.48	24.00	23.74	22.98	22.50	22.24
		RB3#3	24.45	23.93	23.44	22.95	22.43	21.94
		RB6#0	23.43	22.96	22.77	21.93	21.46	21.27
	16QAM	RB1#0	23.37	23.15	22.94	21.87	21.65	21.44
		RB1#3	23.38	23.01	22.66	21.88	21.51	21.16
		RB1#5	23.38	23.13	22.60	21.88	21.63	21.10
		RB3#0	23.59	23.00	22.97	22.09	21.50	21.47
		RB3#3	23.63	22.97	22.72	22.13	21.47	21.22
		RB6#0	22.41	22.18	21.92	20.91	20.68	20.42
3.0	QPSK	RB1#0	24.47	24.12	24.52	22.97	22.62	23.02
		RB1#8	24.31	23.82	23.77	22.81	22.32	22.27
		RB1#14	24.41	23.77	23.35	22.91	22.27	21.85
		RB6#0	23.44	23.11	23.53	21.94	21.61	22.03
		RB6#9	23.41	22.96	22.84	21.91	21.46	21.34
		RB15#0	23.44	22.99	23.18	21.94	21.49	21.68
	16QAM	RB1#0	23.81	23.25	23.50	22.31	21.75	22.00
		RB1#8	23.82	23.04	22.91	22.32	21.54	21.41
		RB1#14	23.76	23.03	22.57	22.26	21.53	21.07
		RB6#0	22.48	22.20	22.55	20.98	20.70	21.05
		RB6#9	22.45	22.11	21.97	20.95	20.61	20.47
		RB15#0	22.50	22.06	22.41	21.00	20.56	20.91

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	24.47	24.10	24.71	22.97	22.60	23.21
		RB1#13	24.02	23.50	23.80	22.52	22.00	22.30
		RB1#24	24.35	23.65	23.30	22.85	22.15	21.80
		RB15#0	23.31	22.70	23.42	21.81	21.20	21.92
		RB15#10	23.24	22.51	22.86	21.74	21.01	21.36
		RB25#0	23.29	22.63	23.12	21.79	21.13	21.62
	16QAM	RB1#0	23.29	23.33	23.75	21.79	21.83	22.25
		RB1#13	22.94	22.79	22.95	21.44	21.29	21.45
		RB1#24	23.19	22.96	22.57	21.69	21.46	21.07
		RB15#0	22.35	21.73	22.48	20.85	20.23	20.98
		RB15#10	22.32	21.58	22.02	20.82	20.08	20.52
		RB25#0	22.38	21.71	22.28	20.88	20.21	20.78
10.0	QPSK	RB1#0	24.08	23.99	24.30	22.58	22.49	22.80
		RB1#25	24.10	23.53	24.24	22.60	22.03	22.74
		RB1#49	23.83	23.03	22.90	22.33	21.53	21.40
		RB25#0	23.37	22.88	23.64	21.87	21.38	22.14
		RB25#25	23.19	22.41	23.00	21.69	20.91	21.50
		RB50#0	23.34	22.64	23.31	21.84	21.14	21.81
	16QAM	RB1#0	23.51	23.10	23.25	22.01	21.60	21.75
		RB1#25	23.65	22.70	23.28	22.15	21.20	21.78
		RB1#49	23.38	22.22	22.04	21.88	20.72	20.54
		RB25#0	22.42	22.04	22.69	20.92	20.54	21.19
		RB25#25	22.38	21.50	22.16	20.88	20.00	20.66
		RB50#0	22.35	21.74	22.41	20.85	20.24	20.91

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
15.0	QPSK	RB1#0	24.27	24.21	23.90	22.77	22.71	22.40
		RB1#38	23.96	23.48	24.29	22.46	21.98	22.79
		RB1#74	24.04	23.41	23.15	22.54	21.91	21.65
		RB36#0	23.42	22.97	23.28	21.92	21.47	21.78
		RB36#39	23.22	22.39	23.14	21.72	20.89	21.64
		RB75#0	23.30	22.69	23.21	21.80	21.19	21.71
	16QAM	RB1#0	23.70	23.33	23.18	22.20	21.83	21.68
		RB1#38	23.48	22.65	23.57	21.98	21.15	22.07
		RB1#74	23.61	22.62	22.58	22.11	21.12	21.08
		RB36#0	22.43	22.13	22.25	20.93	20.63	20.75
		RB36#39	22.41	21.48	22.18	20.91	19.98	20.68
		RB75#0	22.47	21.77	22.24	20.97	20.27	20.74
20.0	QPSK	RB1#0	24.17	24.32	23.77	22.67	22.82	22.27
		RB1#50	24.03	24.44	24.26	22.53	22.94	22.76
		RB1#99	23.65	24.59	23.47	22.15	23.09	21.97
		RB50#0	23.34	23.42	22.91	21.84	21.92	21.41
		RB50#50	23.06	23.47	23.39	21.56	21.97	21.89
		RB100#0	23.22	23.45	23.17	21.72	21.95	21.67
	16QAM	RB1#0	23.44	23.67	22.83	21.94	22.17	21.33
		RB1#50	23.41	23.33	23.38	21.91	21.83	21.88
		RB1#99	23.03	23.41	22.72	21.53	21.91	21.22
		RB50#0	22.35	22.43	21.94	20.85	20.93	20.44
		RB50#50	22.23	21.83	22.39	20.73	20.33	20.89
		RB100#0	22.33	22.15	22.19	20.83	20.65	20.69

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

For Band4: Antenna Gain = -0.5dBi

Cable Loss=1dB*(provided by the applicant)

Limit: EIRP≤30dBm

Peak-to-average ratio (PAR)**20MHz Bandwidth**

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.06	3.94	4.29	13	Pass
QPSK (100RB Size)	5.19	5.33	5.01	13	Pass
16QAM (1RB Size)	4.96	5.04	5.19	13	Pass
16QAM (100RB Size)	6.17	6.23	5.94	13	Pass

LTE Band 7:**Maximum Output Power**

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
5.0	QPSK	RB1#0	19.59	19.02	18.96	19.59	19.02	18.96
		RB1#13	19.47	18.99	18.97	19.47	18.99	18.97
		RB1#24	19.25	18.89	18.88	19.25	18.89	18.88
		RB15#0	18.58	18.04	18.03	18.58	18.04	18.03
		RB15#10	18.45	18.02	17.99	18.45	18.02	17.99
		RB25#0	18.51	18.02	17.96	18.51	18.02	17.96
	16QAM	RB1#0	18.57	18.40	18.13	18.57	18.40	18.13
		RB1#13	18.42	18.40	18.07	18.42	18.40	18.07
		RB1#24	18.24	18.30	17.97	18.24	18.30	17.97
		RB15#0	17.66	17.03	17.09	17.66	17.03	17.09
		RB15#10	17.53	16.99	17.03	17.53	16.99	17.03
		RB25#0	17.59	17.05	17.01	17.59	17.05	17.01
10.0	QPSK	RB1#0	19.46	18.98	18.92	19.46	18.98	18.92
		RB1#25	19.20	18.96	18.90	19.20	18.96	18.90
		RB1#49	18.99	18.84	18.89	18.99	18.84	18.89
		RB25#0	18.45	18.02	18.04	18.45	18.02	18.04
		RB25#25	18.18	17.95	17.96	18.18	17.95	17.96
		RB50#0	18.32	18.00	18.02	18.32	18.00	18.02
	16QAM	RB1#0	19.22	18.24	18.09	19.22	18.24	18.09
		RB1#25	18.96	18.19	18.04	18.96	18.19	18.04
		RB1#49	18.78	18.12	17.93	18.78	18.12	17.93
		RB25#0	17.57	17.11	17.16	17.57	17.11	17.16
		RB25#25	17.29	16.99	17.08	17.29	16.99	17.08
		RB50#0	17.38	17.02	17.08	17.38	17.02	17.08

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	19.43	18.83	18.87	19.43	18.83	18.87
		RB1#38	19.02	18.81	18.97	19.02	18.81	18.97
		RB1#74	18.90	18.74	18.95	18.90	18.74	18.95
		RB36#0	18.35	17.99	18.02	18.35	17.99	18.02
		RB36#39	18.06	17.90	17.99	18.06	17.90	17.99
		RB75#0	18.20	17.96	18.04	18.20	17.96	18.04
	16QAM	RB1#0	19.20	18.68	18.15	19.20	18.68	18.15
		RB1#38	18.81	18.62	18.24	18.81	18.62	18.24
		RB1#74	18.71	18.58	18.15	18.71	18.58	18.15
		RB36#0	17.40	17.08	17.07	17.40	17.08	17.07
		RB36#39	17.13	16.98	17.03	17.13	16.98	17.03
		RB75#0	17.25	17.02	17.07	17.25	17.02	17.07
20.0	QPSK	RB1#0	19.36	19.01	18.90	19.36	19.01	18.90
		RB1#50	18.93	18.98	19.04	18.93	18.98	19.04
		RB1#99	18.86	18.85	19.04	18.86	18.85	19.04
		RB50#0	18.30	18.10	18.01	18.30	18.10	18.01
		RB50#50	18.06	17.94	18.05	18.06	17.94	18.05
		RB100#0	18.15	18.02	18.01	18.15	18.02	18.01
	16QAM	RB1#0	19.19	18.48	18.28	19.19	18.48	18.28
		RB1#50	18.75	18.38	18.34	18.75	18.38	18.34
		RB1#99	18.72	18.27	18.29	18.72	18.27	18.29
		RB50#0	17.38	17.13	17.05	17.38	17.13	17.05
		RB50#50	17.14	16.97	17.09	17.14	16.97	17.09
		RB100#0	17.25	17.06	17.06	17.25	17.06	17.06

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

For Band7: Antenna Gain = 1dBi

Cable Loss=1dB* (provided by the applicant)

Limit: ERP≤33dBm

Peak-to-average ratio (PAR)**20MHz bandwidth**

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.25	5.59	5.54	13	Pass
QPSK (100RB Size)	5.62	5.68	5.74	13	Pass
16QAM (1RB Size)	6.09	6.35	6.43	13	Pass
16QAM (100RB Size)	6.75	6.72	6.61	13	Pass

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	23.47	23.26	22.40	19.82	19.61	18.75
		RB1#3	23.19	23.15	22.40	19.54	19.5	18.75
		RB1#5	23.35	23.21	22.36	19.7	19.56	18.71
		RB3#0	23.05	23.24	22.60	19.4	19.59	18.95
		RB3#3	23.04	23.19	22.51	19.39	19.54	18.86
		RB6#0	22.44	22.42	21.76	18.79	18.77	18.11
	16QAM	RB1#0	22.14	22.45	21.34	18.49	18.8	17.69
		RB1#3	22.22	22.44	21.51	18.57	18.79	17.86
		RB1#5	22.05	22.41	21.53	18.4	18.76	17.88
		RB3#0	22.03	22.11	21.55	18.38	18.46	17.9
		RB3#3	22.06	22.05	21.61	18.41	18.4	17.96
		RB6#0	21.13	21.27	20.65	17.48	17.62	17.00
3.0	QPSK	RB1#0	22.86	22.95	23.06	19.21	19.3	19.41
		RB1#8	22.52	22.85	22.49	18.87	19.2	18.84
		RB1#14	22.37	23.48	22.49	18.72	19.83	18.84
		RB6#0	22.33	22.40	22.27	18.68	18.75	18.62
		RB6#9	22.07	22.36	21.92	18.42	18.71	18.27
		RB15#0	22.21	22.33	22.04	18.56	18.68	18.39
	16QAM	RB1#0	22.19	22.55	22.10	18.54	18.9	18.45
		RB1#8	21.90	22.55	21.65	18.25	18.9	18.00
		RB1#14	21.81	22.44	21.66	18.16	18.79	18.01
		RB6#0	21.20	21.34	21.24	17.55	17.69	17.59
		RB6#9	21.23	21.24	20.87	17.58	17.59	17.22
		RB15#0	21.18	21.29	20.95	17.53	17.64	17.3

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	22.88	22.71	23.13	19.23	19.06	19.48
		RB1#13	22.47	22.54	22.19	18.82	18.89	18.54
		RB1#24	22.60	23.30	22.19	18.95	19.65	18.54
		RB15#0	22.31	22.38	22.02	18.66	18.73	18.37
		RB15#10	22.00	22.28	21.44	18.35	18.63	17.79
		RB25#0	22.03	22.26	21.66	18.38	18.61	18.01
	16QAM	RB1#0	21.58	22.16	22.04	17.93	18.51	18.39
		RB1#13	21.06	22.15	21.04	17.41	18.5	17.39
		RB1#24	21.28	22.05	21.15	17.63	18.4	17.5
		RB15#0	20.94	21.33	21.02	17.29	17.68	17.37
		RB15#10	20.63	21.20	20.44	16.98	17.55	16.79
		RB25#0	20.79	21.26	20.75	17.14	17.61	17.1
10.0	QPSK	RB1#0	23.04	22.66	23.63	19.39	19.01	19.98
		RB1#25	22.77	22.59	22.69	19.12	18.94	19.04
		RB1#49	22.73	21.80	21.92	19.08	18.15	18.27
		RB25#0	22.17	22.16	22.81	18.52	18.51	19.16
		RB25#25	22.15	22.03	21.51	18.5	18.38	17.86
		RB50#0	22.07	22.10	22.27	18.42	18.45	18.62
	16QAM	RB1#0	22.10	21.92	22.63	18.45	18.27	18.98
		RB1#25	21.81	21.96	21.81	18.16	18.31	18.16
		RB1#49	22.06	21.15	21.06	18.41	17.5	17.41
		RB25#0	21.15	21.25	21.77	17.5	17.6	18.12
		RB25#25	21.09	21.10	20.72	17.44	17.45	17.07
		RB50#0	21.07	21.22	21.43	17.42	17.57	17.78

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

For Band12: Antenna Gain = -1dBi = -3.15dBd (0dBd=2.15dBi)

Cable Loss=0.5dB* (provided by the applicant)

Limit: ERP≤34.77dBm

Peak-to-average ratio (PAR)**10MHz bandwidth**

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	2.41	2.61	2.99	13	Pass
QPSK (50RB Size)	4.26	4.41	4.52	13	Pass
16QAM (1RB Size)	3.77	3.59	3.94	13	Pass
16QAM (50RB Size)	5.28	5.36	5.42	13	Pass

LTE Band 17:**Maximum Output Power**

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power(dBm)			ERP(dBm)		
			Low	Mid	High	Low	Mid	High
5.0	QPSK	RB1#0	23.37	24.07	23.65	19.72	20.42	20.00
		RB1#13	23.10	23.52	22.02	19.45	19.87	18.37
		RB1#24	23.73	22.87	21.81	20.08	19.22	18.16
		RB15#0	22.15	22.80	21.69	18.50	19.15	18.04
		RB15#10	22.41	22.40	20.87	18.76	18.75	17.22
		RB25#0	22.33	22.60	21.29	18.68	18.95	17.64
	16QAM	RB1#0	22.35	23.41	22.73	18.70	19.76	19.08
		RB1#13	22.13	22.90	21.13	18.48	19.25	17.48
		RB1#24	22.85	22.32	20.94	19.20	18.67	17.29
		RB15#0	21.32	21.86	20.77	17.67	18.21	17.12
		RB15#10	21.59	21.51	19.98	17.94	17.86	16.33
		RB25#0	21.50	21.71	20.44	17.85	18.06	16.79
10.0	QPSK	RB1#0	23.56	23.67	23.70	19.91	20.02	20.05
		RB1#25	23.76	23.54	23.26	20.11	19.89	19.61
		RB1#49	21.94	21.72	21.47	18.29	18.07	17.82
		RB25#0	22.64	22.79	22.85	18.99	19.14	19.20
		RB25#25	22.23	21.85	21.37	18.58	18.20	17.72
		RB50#0	22.47	22.36	23.11	18.82	18.71	19.46
	16QAM	RB1#0	23.08	22.83	23.86	19.43	19.18	20.21
		RB1#25	23.36	22.81	23.38	19.71	19.16	19.73
		RB1#49	21.63	20.97	21.51	17.98	17.32	17.86
		RB25#0	21.74	21.87	22.36	18.09	18.22	18.71
		RB25#25	21.41	20.97	21.26	17.76	17.32	17.61
		RB50#0	21.59	21.46	21.12	17.94	17.81	17.47

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

For Band13: Antenna Gain = -1dBi = -3.15dBd (0dBd=2.15dBi)

Cable Loss=-0.5dB* (provided by the applicant)

Limit: ERP≤34.77dBm

Peak-to-average ratio (PAR)**10MHz bandwidth**

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.14	4.17	4.32	13	Pass
QPSK (50RB Size)	5.30	5.39	5.42	13	Pass
16QAM (1RB Size)	5.25	5.51	5.3	13	Pass
16QAM (50RB Size)	6.29	6.29	6.35	13	Pass

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

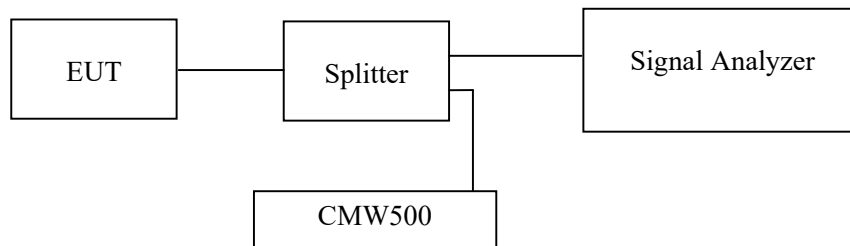
Applicable Standard

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:	25°C
Relative Humidity:	60 %
ATM Pressure:	101.0 kPa

The testing was performed by Paul liu from 2021-12-23 to 2022-01-10.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the following tables and plots.

Cellular Band (Part 22H)

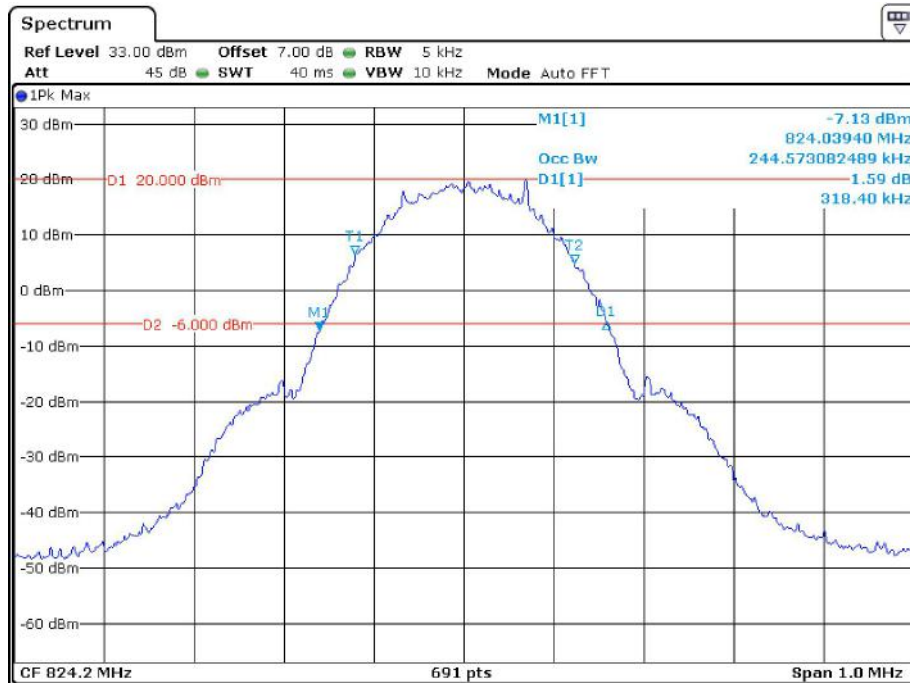
Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	128	824.2	244.57	318.40
	190	836.6	244.57	321.30
	251	848.8	244.57	318.40

	Frequency (MHz)	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)
RMC	826.4	4.21	4.88
	836.6	4.20	4.86
	846.6	4.21	4.88
HSDPA	826.4	4.21	4.86
	836.6	4.20	4.86
	846.6	4.20	4.88
HSUPA	826.4	4.23	4.85
	836.6	4.20	4.86
	846.6	4.21	4.86

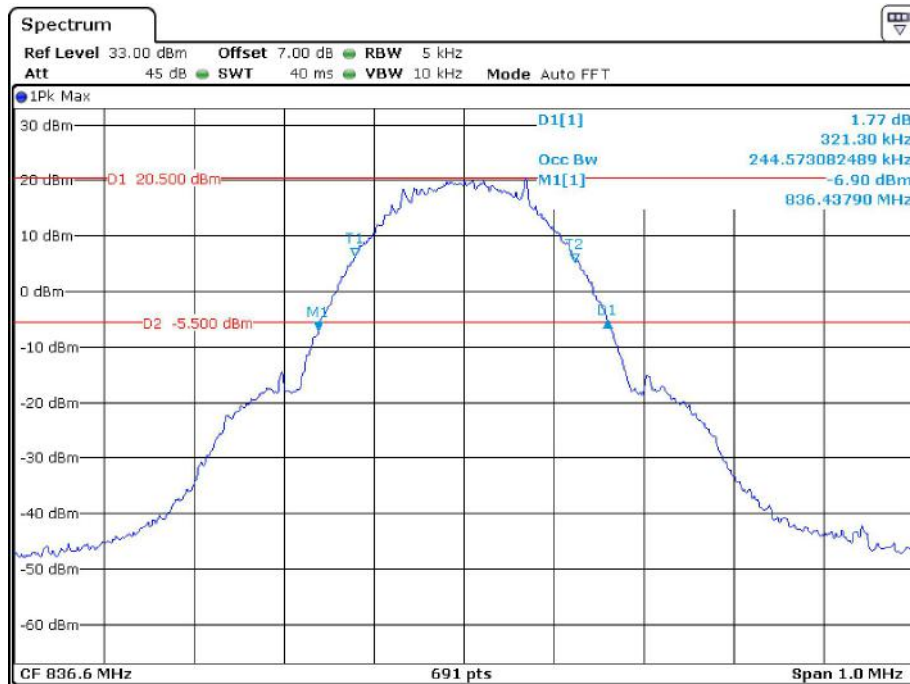
PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	512	1850.2	240.23	315.50
	661	1880.0	246.02	315.50
	810	1909.8	244.57	301.00

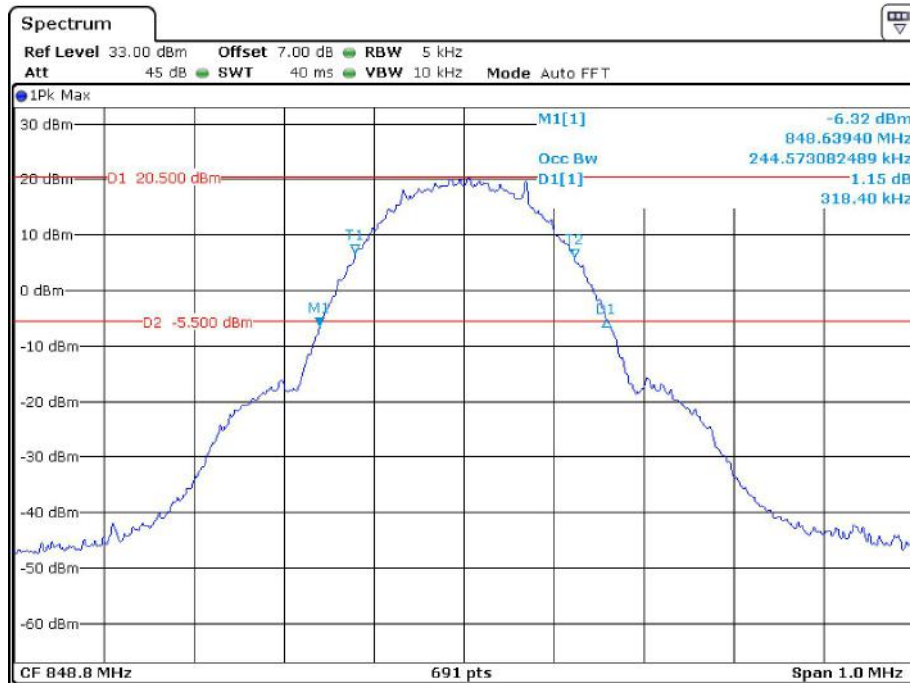
	Frequency (MHz)	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)
RMC	1852.4	4.20	4.89
	1880.0	4.21	4.86
	1907.6	4.20	4.88
HSDPA	1852.4	4.20	4.88
	1880.0	4.20	4.88
	1907.6	4.20	4.86
HSUPA	1852.4	4.21	4.85
	1880.0	4.21	4.88
	1907.6	4.20	4.86

Cellular Band (Part 22H)**26 dB Emissions & 99% Occupied Bandwidth for GSM (GMSK) Mode, Low channel**

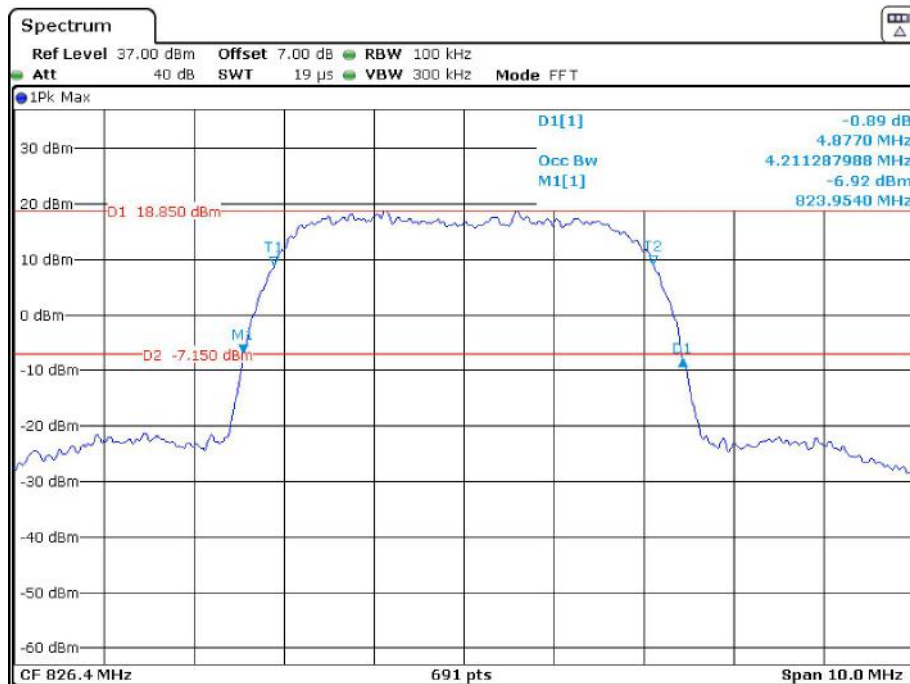
Date: 24.DEC.2021 14:07:20

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

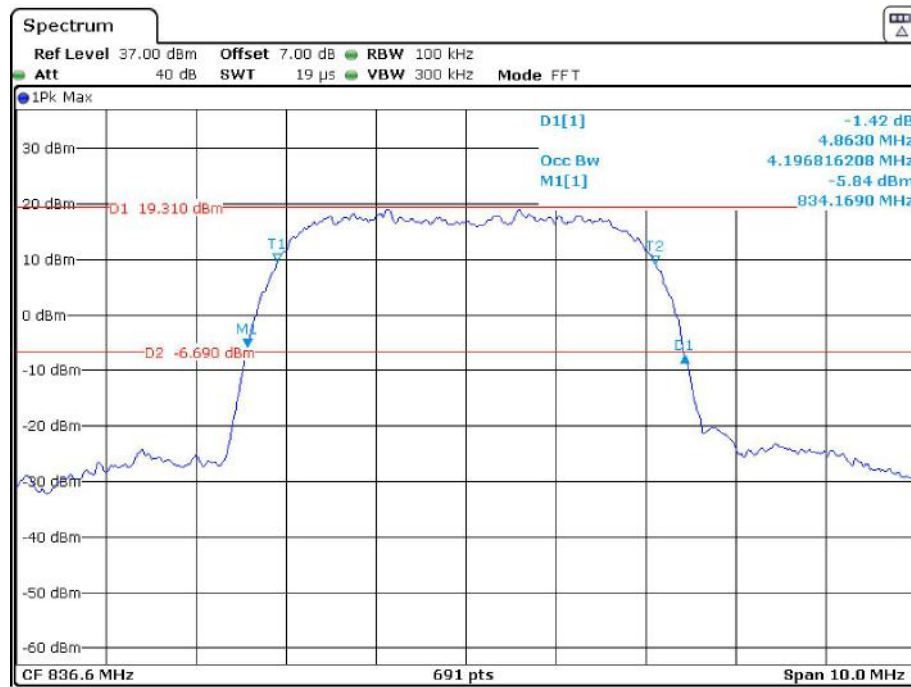
Date: 24.DEC.2021 14:10:19

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

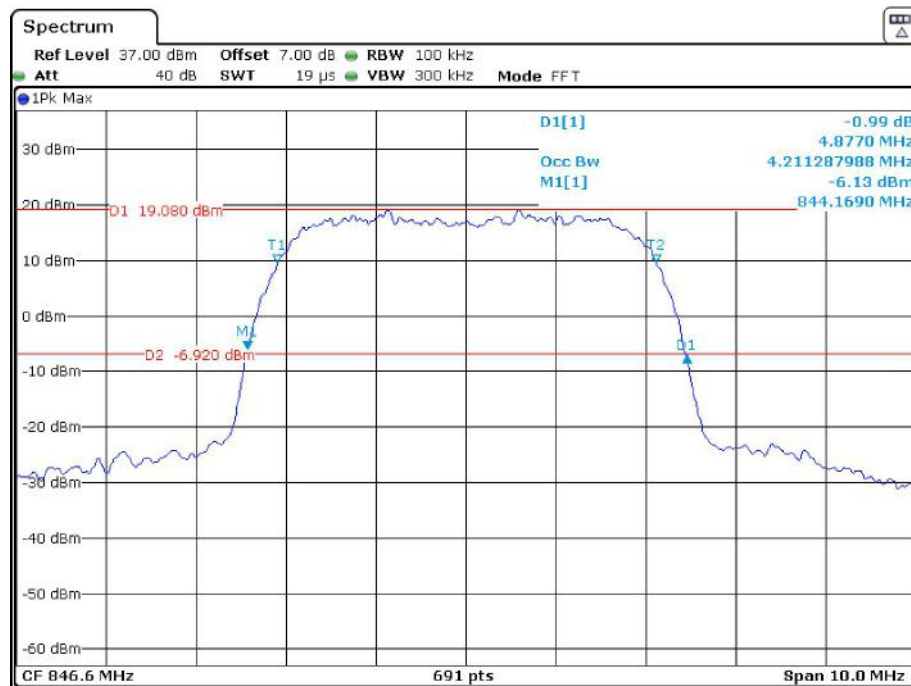
Date: 24.DEC.2021 14:12:50

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

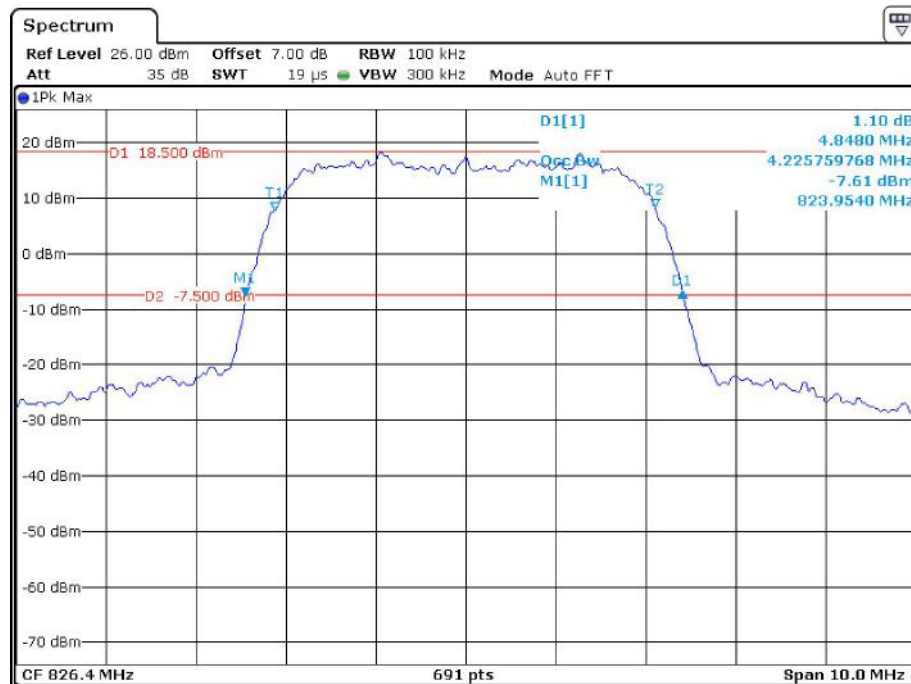
Date: 10.JAN.2022 20:31:21

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

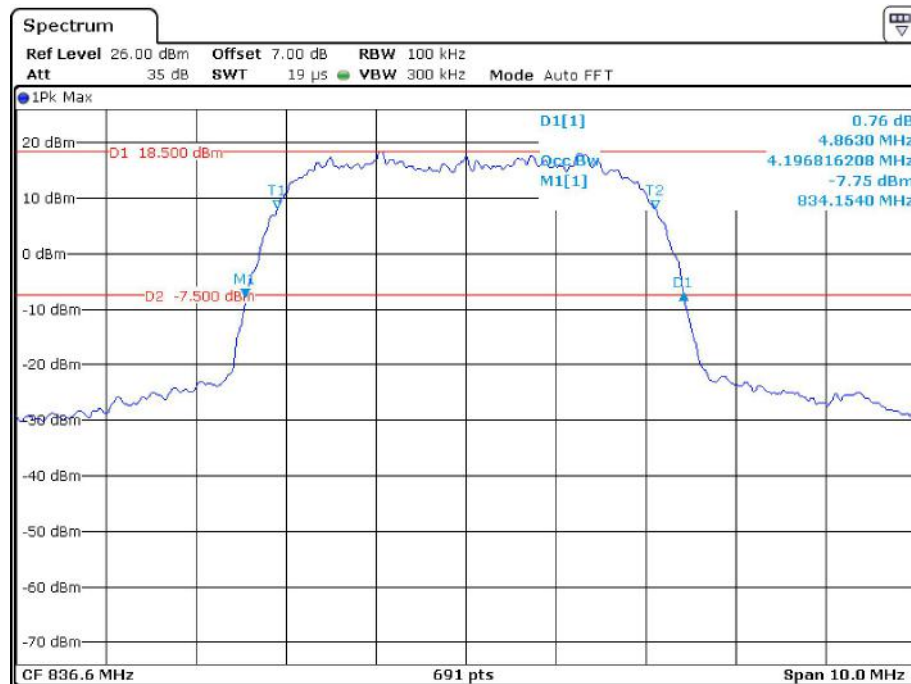
Date: 10.JAN.2022 20:30:09

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

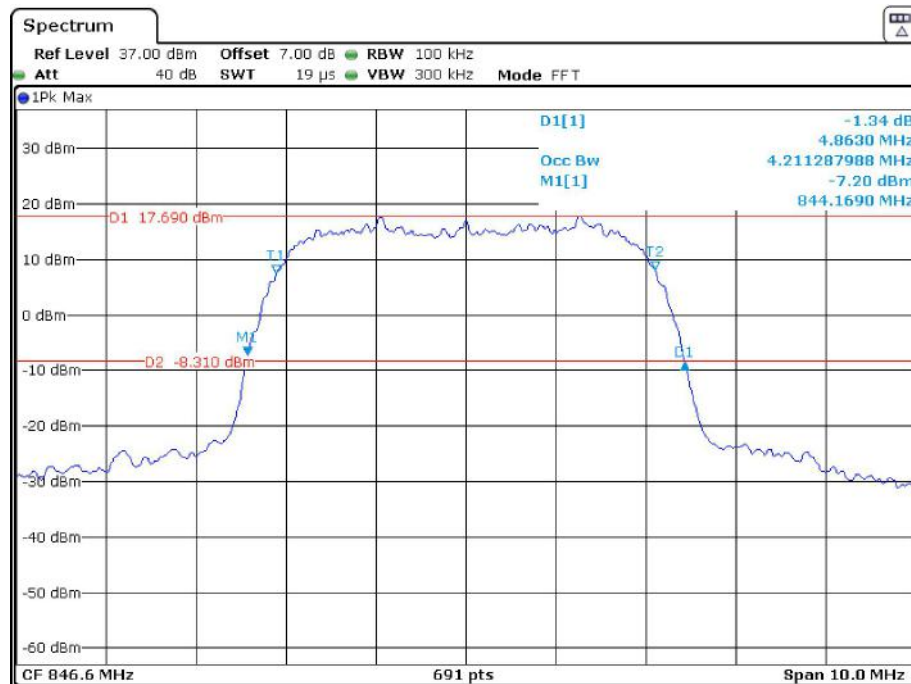
Date: 10.JAN.2022 20:28:08

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

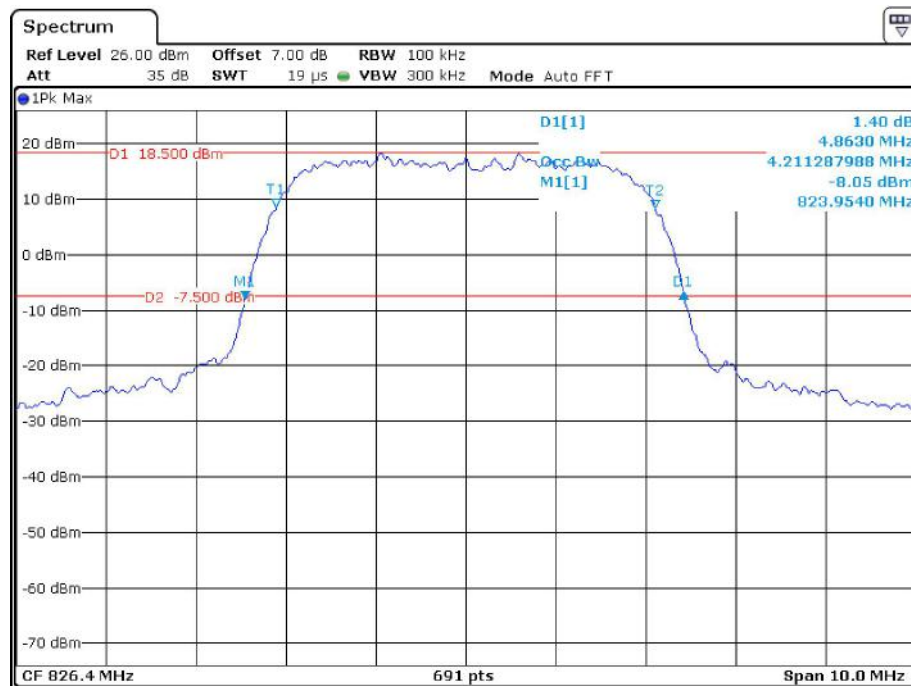
Date: 23.DEC.2021 19:32:29

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

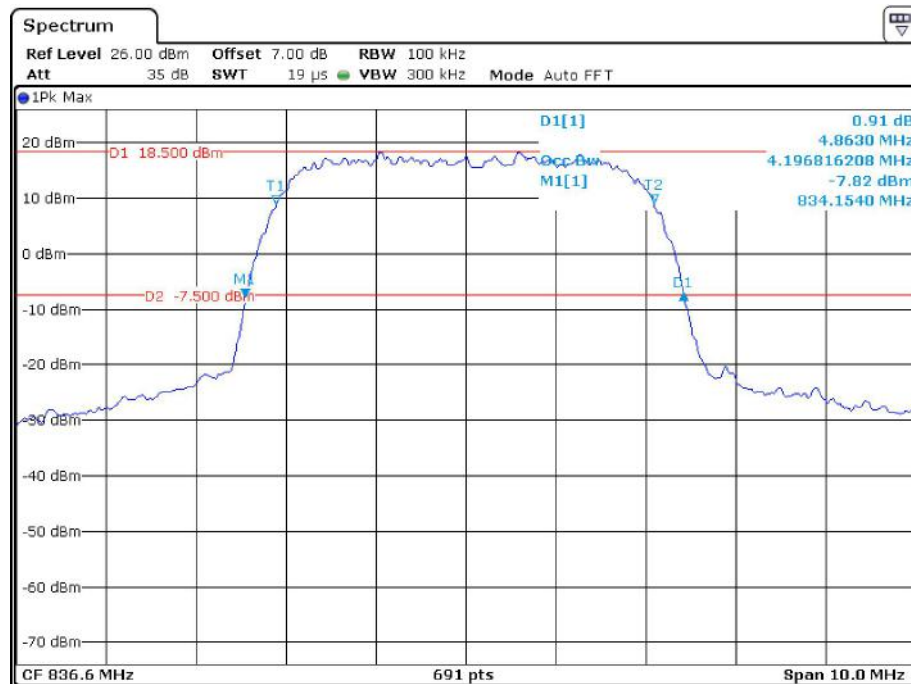
Date: 23.DEC.2021 19:36:08

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

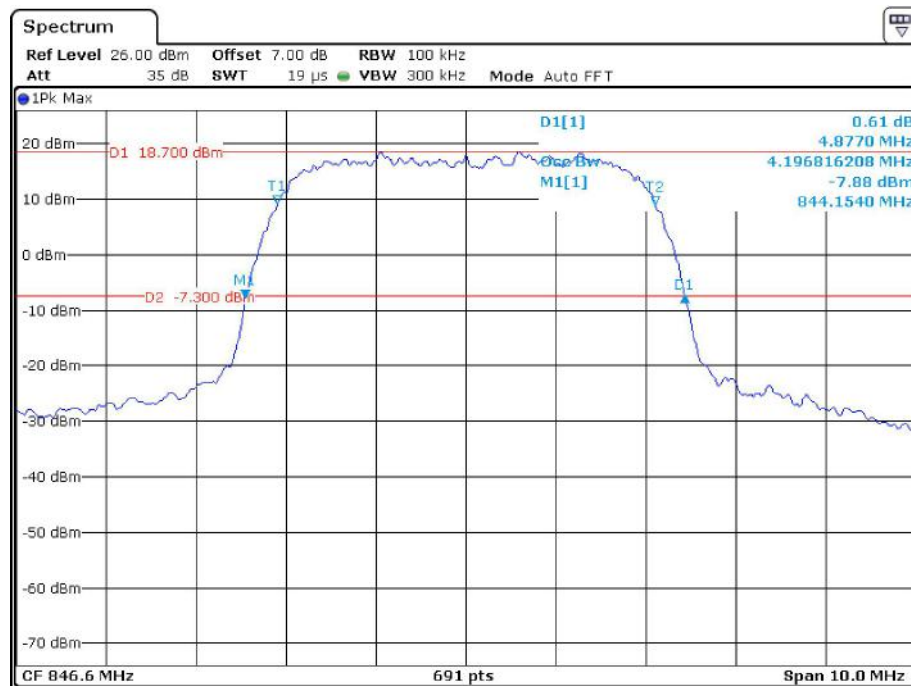
Date: 10.JAN.2022 20:26:48

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

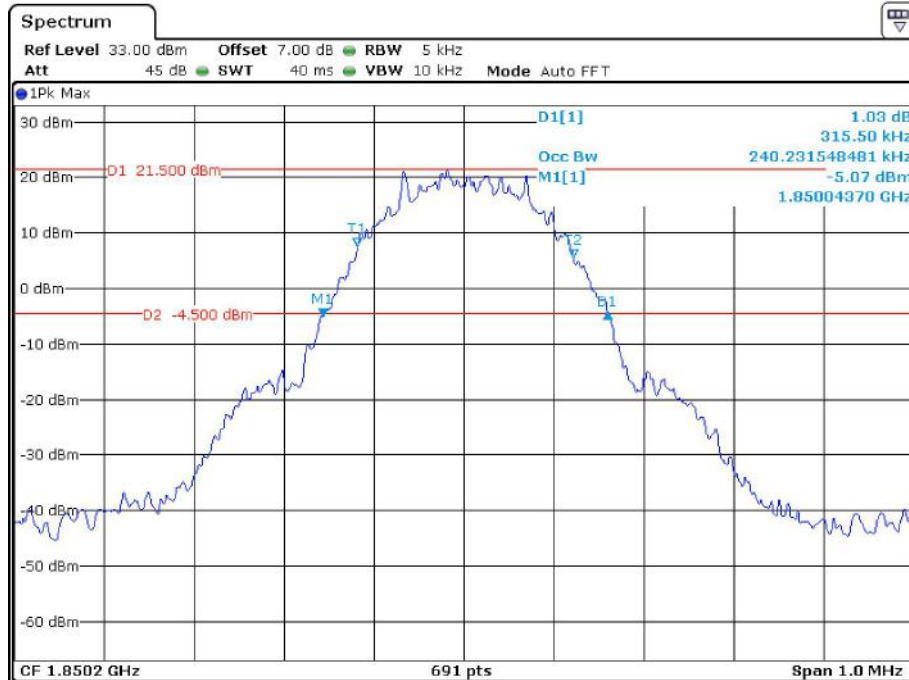
Date: 23.DEC.2021 19:24:01

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

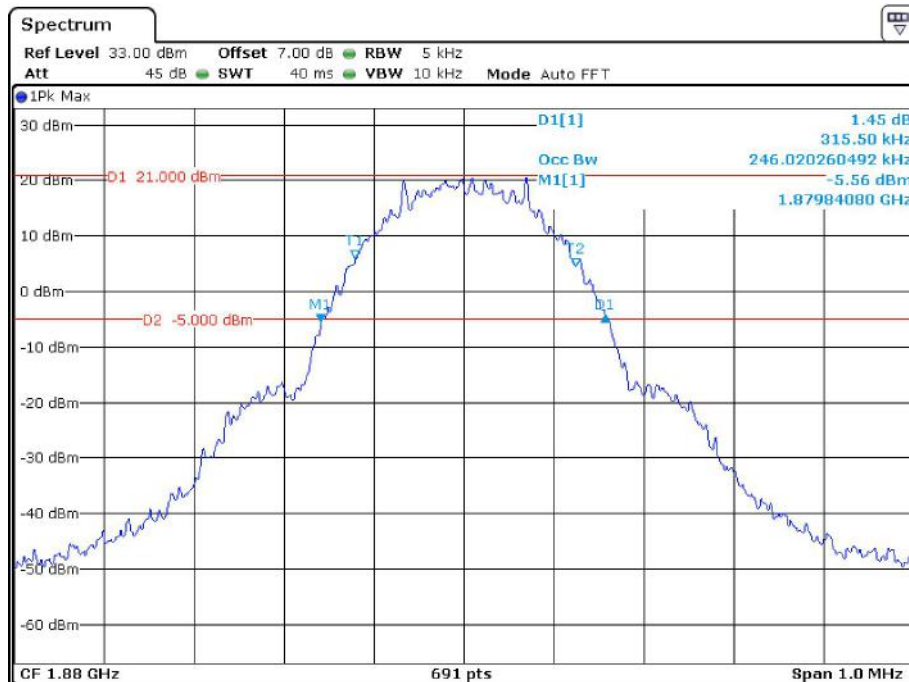
Date: 23.DEC.2021 19:26:41

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

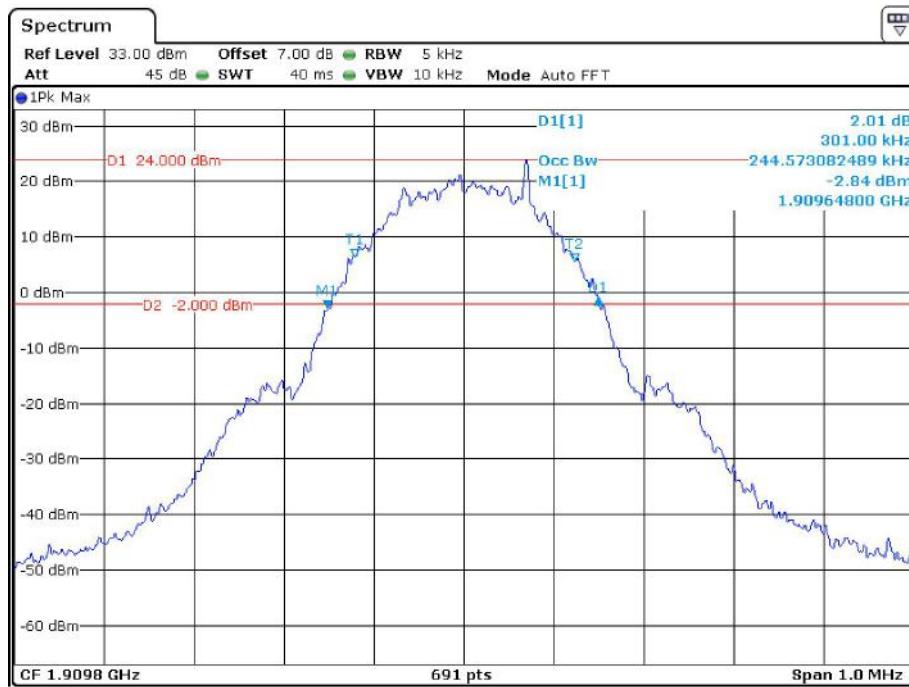
Date: 23.DEC.2021 19:29:19

PCS Band (Part 24E)**26 dB Emissions & 99% Occupied Bandwidth for GSM (GMSK) Mode, Low channel**

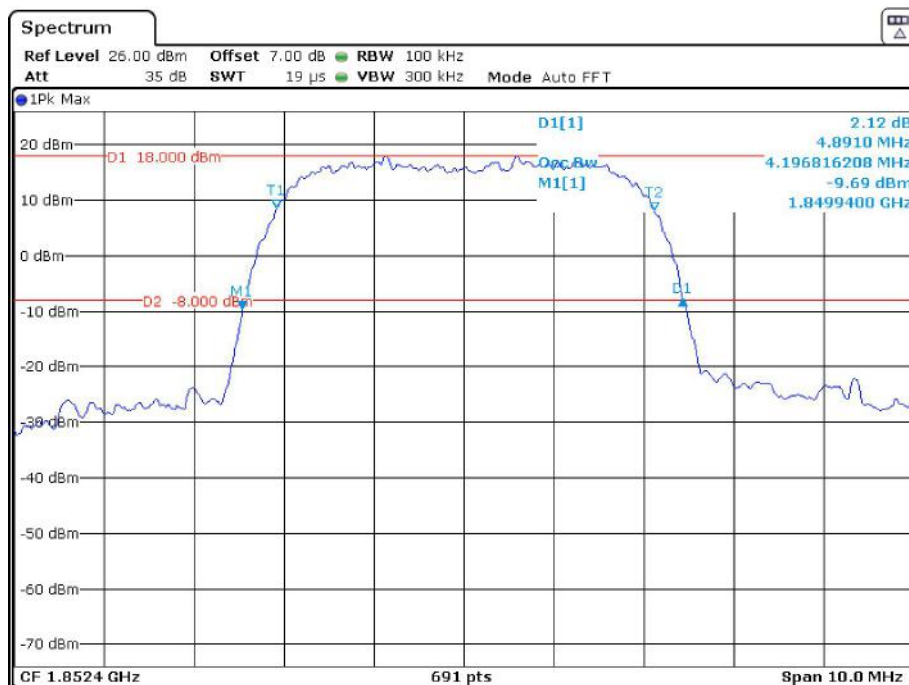
Date: 24.DEC.2021 14:21:50

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

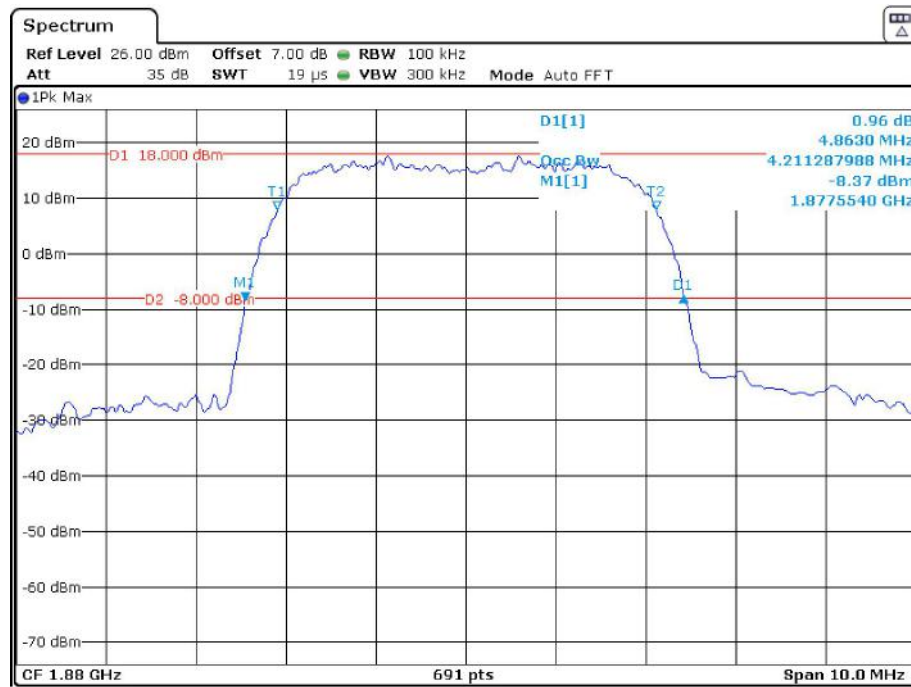
Date: 24.DEC.2021 14:26:01

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

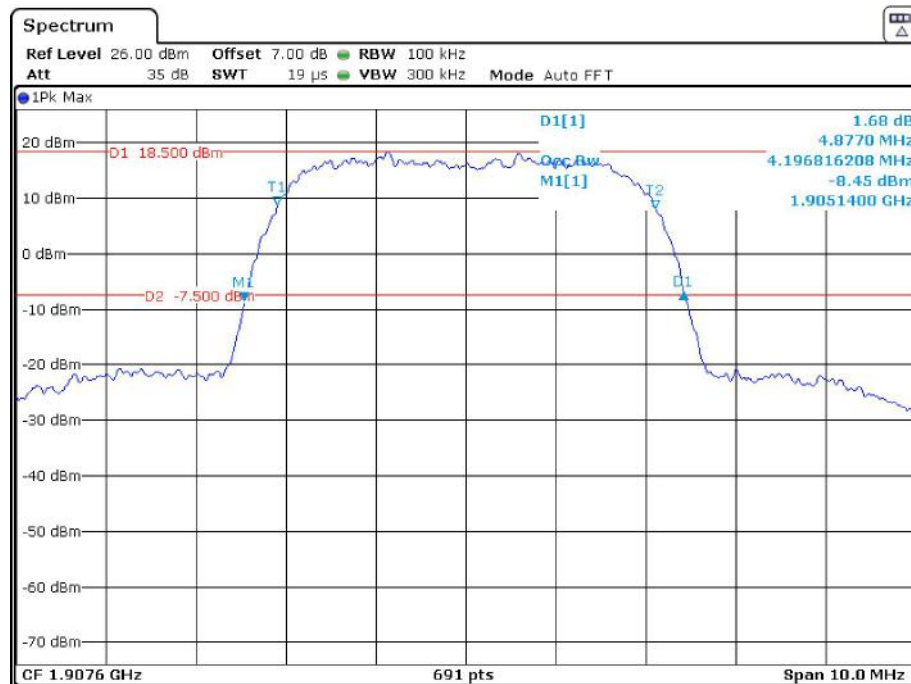
Date: 24.DEC.2021 14:29:16

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

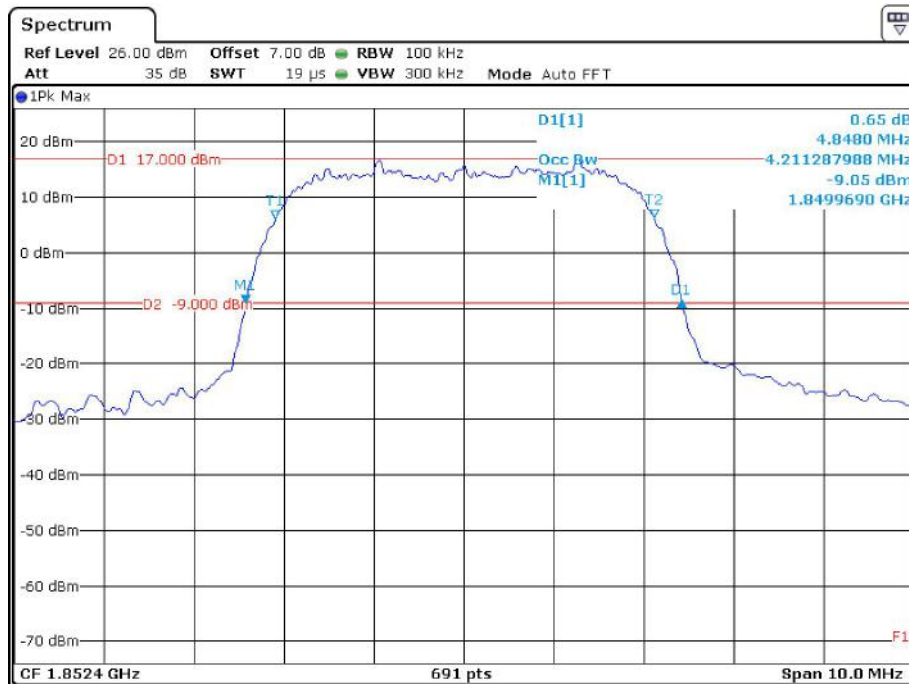
Date: 23.DEC.2021 18:17:39

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

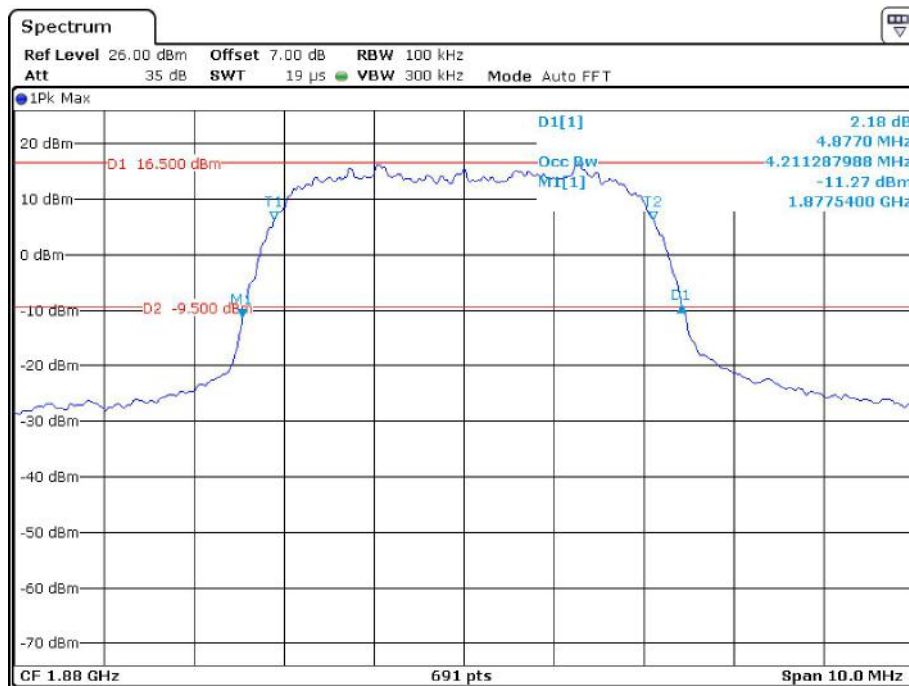
Date: 23.DEC.2021 18:22:20

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

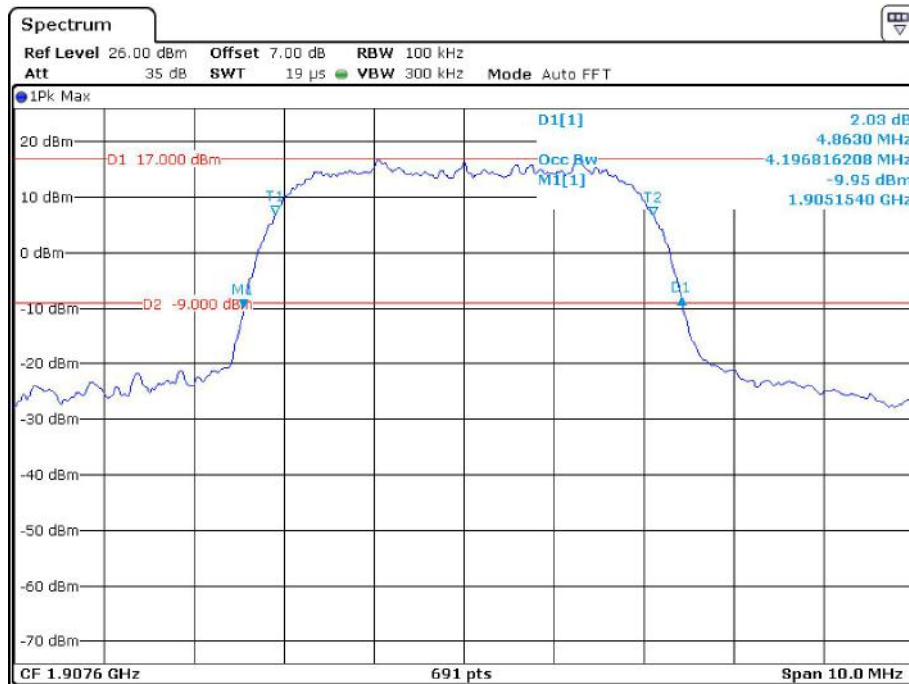
Date: 23.DEC.2021 18:24:51

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

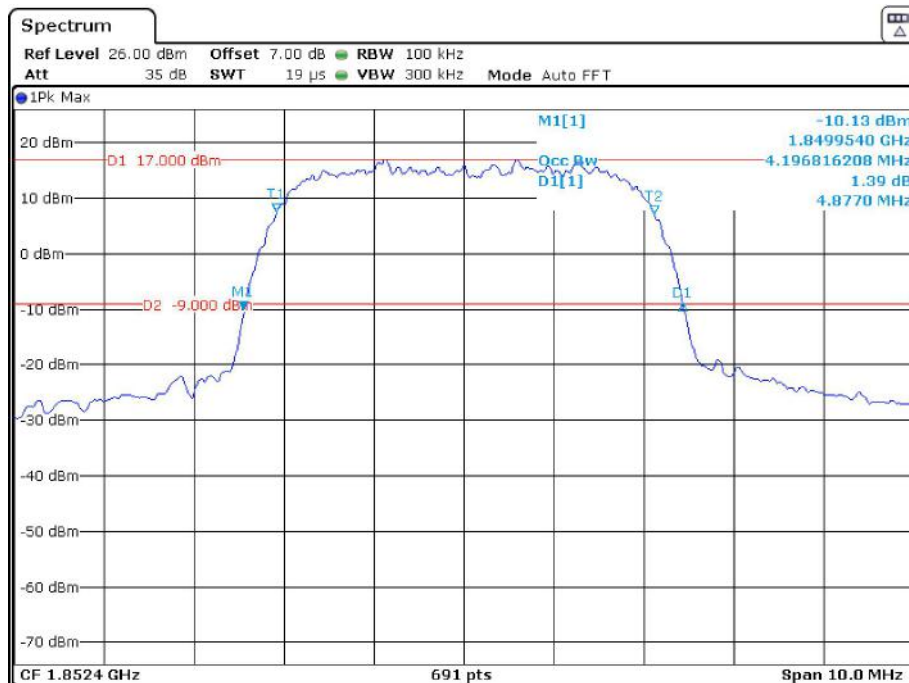
Date: 23.DEC.2021 18:55:45

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

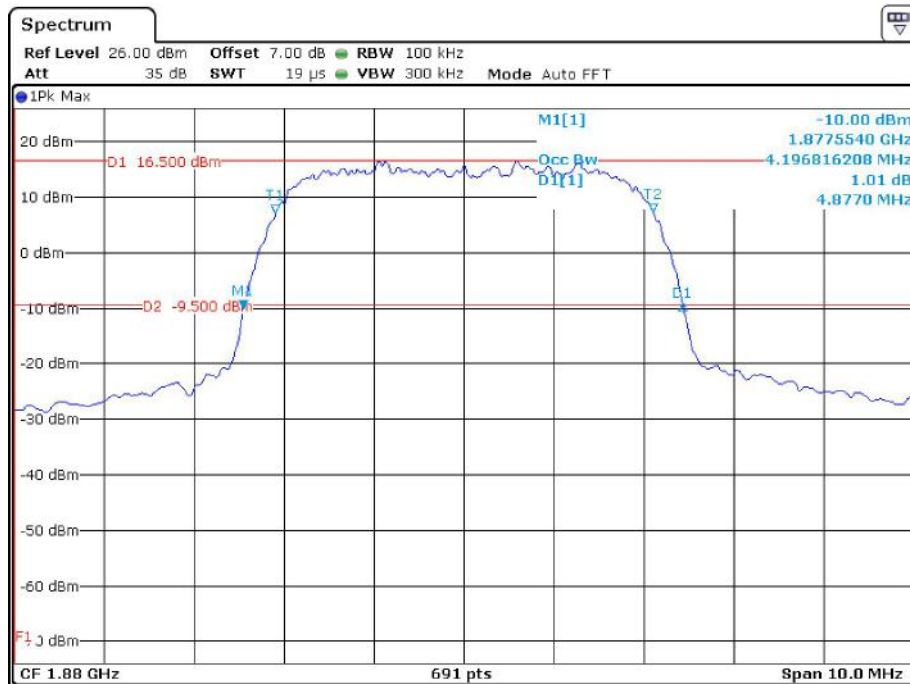
Date: 23.DEC.2021 19:05:15

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

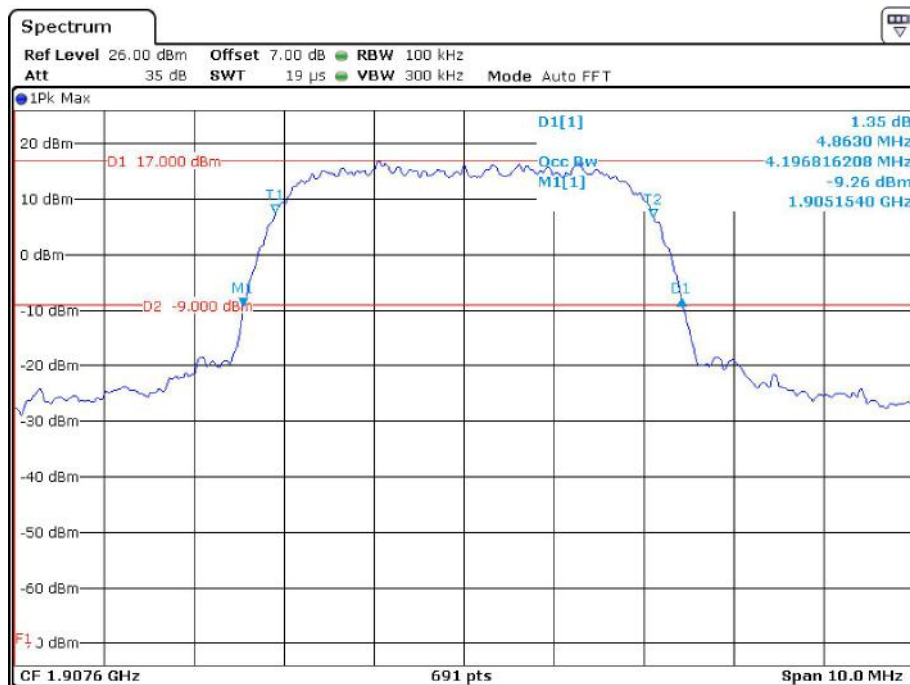
Date: 23.DEC.2021 19:08:27

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

Date: 23.DEC.2021 18:29:54

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

Date: 23.DEC.2021 18:33:33

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

Date: 23.DEC.2021 18:36:00

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	1.278	1.096	1.284	1.114	1.410
	16QAM	1.102	1.296	1.096	1.260	1.102	1.302
3 MHz	QPSK	2.695	2.928	2.695	2.904	2.683	2.940
	16QAM	2.695	2.952	2.683	2.928	2.683	2.952
5 MHz	QPSK	4.531	4.940	4.511	5.120	4.511	5.100
	16QAM	4.511	5.080	4.551	5.100	4.551	5.120
10 MHz	QPSK	8.942	9.840	8.942	9.680	8.942	9.800
	16QAM	8.942	9.720	8.942	9.800	8.942	9.800
15 MHz	QPSK	13.533	14.460	13.473	14.940	13.533	15.000
	16QAM	13.533	14.880	13.533	14.880	13.533	15.000
20 MHz	QPSK	17.945	19.566	17.964	19.520	18.044	19.760
	16QAM	18.044	19.440	18.044	19.760	17.964	19.440

LTE Band 4:

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	1.278	1.102	1.284	1.102	1.266
	16QAM	1.102	1.290	1.090	1.260	1.102	1.272
3 MHz	QPSK	2.695	2.928	2.695	2.916	2.683	2.928
	16QAM	2.695	2.952	2.683	2.940	2.683	2.916
5 MHz	QPSK	4.531	5.120	4.531	5.120	4.511	5.080
	16QAM	4.511	5.060	4.531	5.080	4.551	5.100
10 MHz	QPSK	8.942	9.840	8.942	9.680	8.942	9.800
	16QAM	8.942	9.680	8.942	9.720	8.942	9.760
15 MHz	QPSK	13.533	15.000	13.473	14.880	13.533	15.000
	16QAM	13.473	14.880	13.533	14.820	13.533	14.820
20 MHz	QPSK	17.964	19.360	17.884	19.440	17.964	19.520
	16QAM	17.964	19.360	17.964	19.520	17.964	19.440

LTE Band 7

Bandwidth	Modulation	Low channel		Middle channel		High channel	
		OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)
5 MHz	QPSK	4.551	5.120	4.511	5.100	4.511	5.060
	16QAM	4.511	5.040	4.551	5.100	4.551	5.120
10 MHz	QPSK	8.942	9.840	8.942	9.760	8.942	9.800
	16QAM	8.942	9.720	8.942	9.800	8.982	9.800
15 MHz	QPSK	13.533	15.000	13.413	14.880	13.533	15.000
	16QAM	13.533	14.820	13.533	14.940	13.473	14.940
20 MHz	QPSK	18.044	19.520	17.884	19.440	17.964	19.600
	16QAM	17.964	19.520	17.964	19.600	17.884	19.440

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	1.272	1.102	1.296	1.102	1.272
	16QAM	1.096	1.290	1.090	1.266	1.102	1.278
3 MHz	QPSK	2.683	2.916	2.695	2.904	2.683	2.940
	16QAM	2.683	2.940	2.683	2.928	2.683	2.928
5 MHz	QPSK	4.551	5.060	4.511	5.080	4.511	5.060
	16QAM	4.531	5.040	4.551	5.080	4.551	5.080
10 MHz	QPSK	8.982	9.840	8.942	9.760	8.982	9.760
	16QAM	8.942	9.680	8.942	9.760	8.982	9.760

LTE Band 17

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	4.551	5.080	4.531	5.100	4.531	5.060
	16QAM	4.511	5.060	4.531	5.060	4.531	5.100
10 MHz	QPSK	8.982	9.800	8.942	9.680	8.942	9.760
	16QAM	8.942	9.720	8.942	9.680	8.942	9.760

The test plots of LTE band please refer to the Appendix A.

FCC §2.1051, §22.917(a) & §24.238(a)& §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

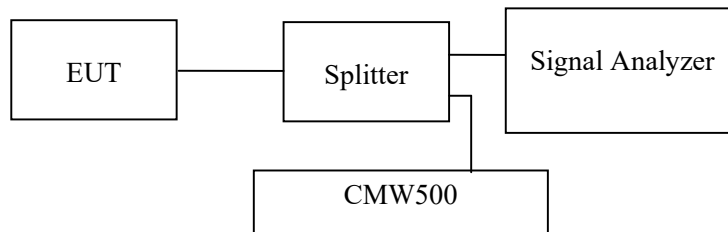
Applicable Standard

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

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

Test Procedure

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



Test Data

Environmental Conditions

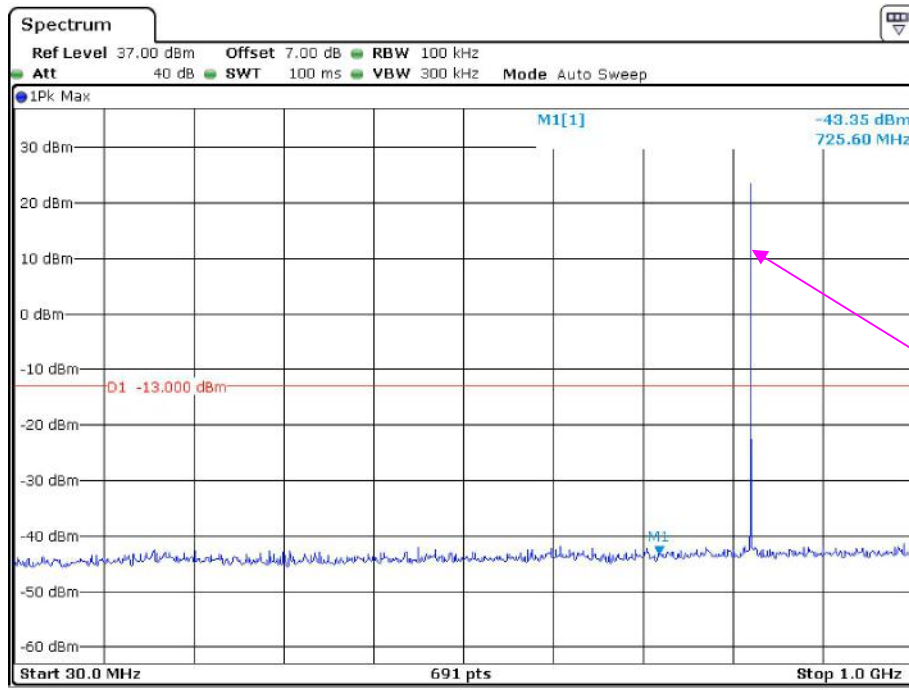
Temperature:	25°C
Relative Humidity:	60 %
ATM Pressure:	101.0 kPa

The testing was performed by Paul liu on 2021-12-24.

EUT operation mode: Transmitting

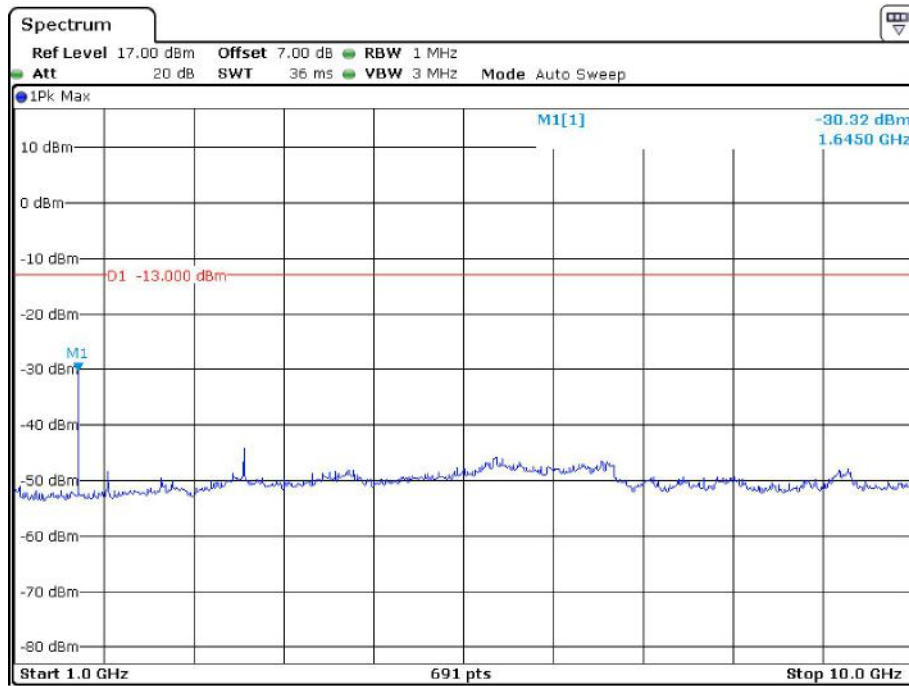
Test result: Pass

Please refer to the following plots.

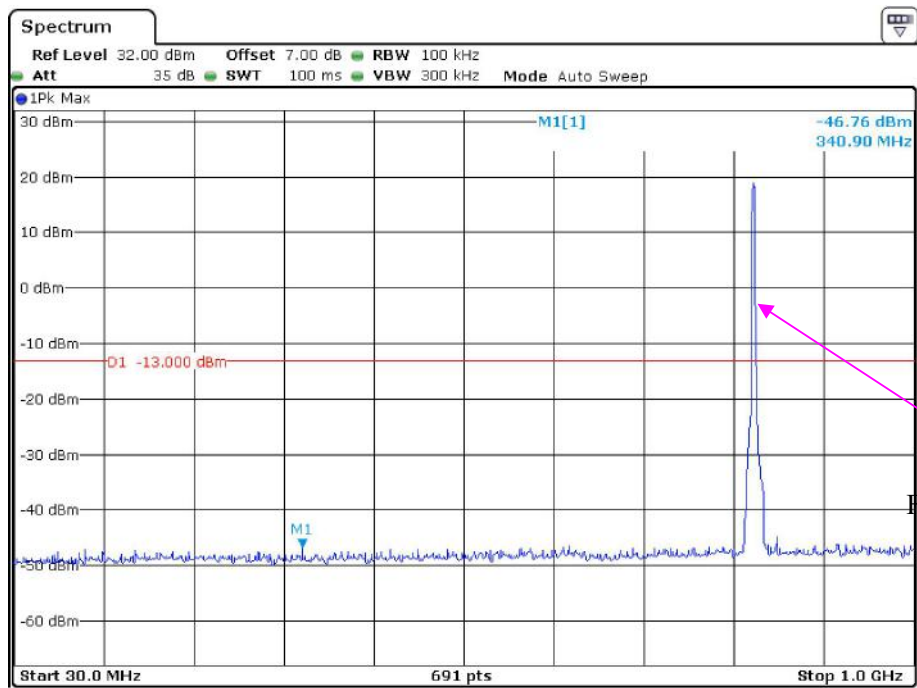
Cellular Band (Part 22H)**Low Channel:****30 MHz – 1 GHz (GSM Mode)**

Date: 24.DEC.2021 15:00:08

Fundamental test

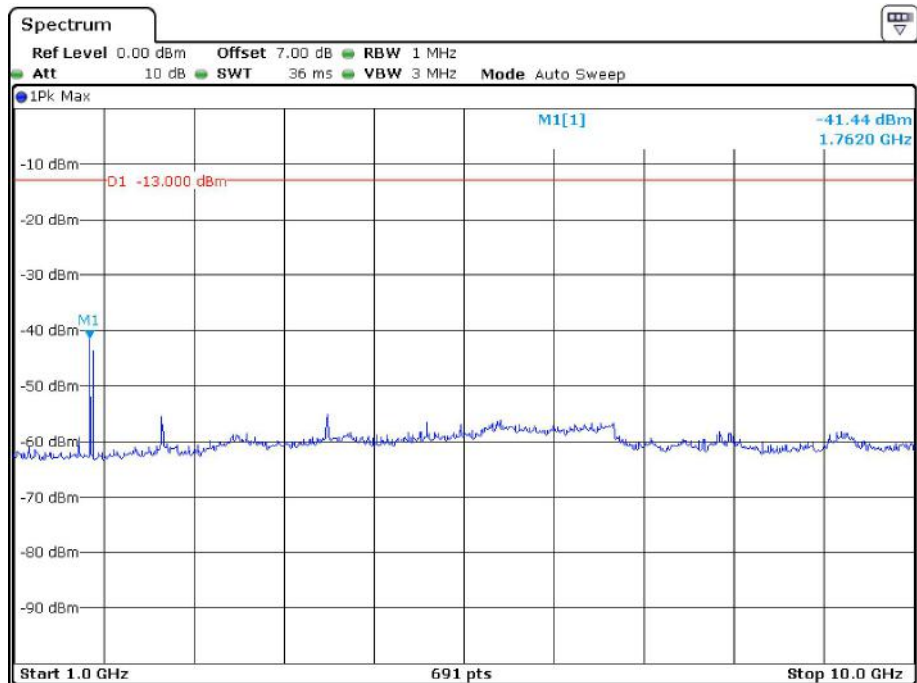
1 GHz – 10 GHz (GSM Mode)

Date: 24.DEC.2021 15:01:29

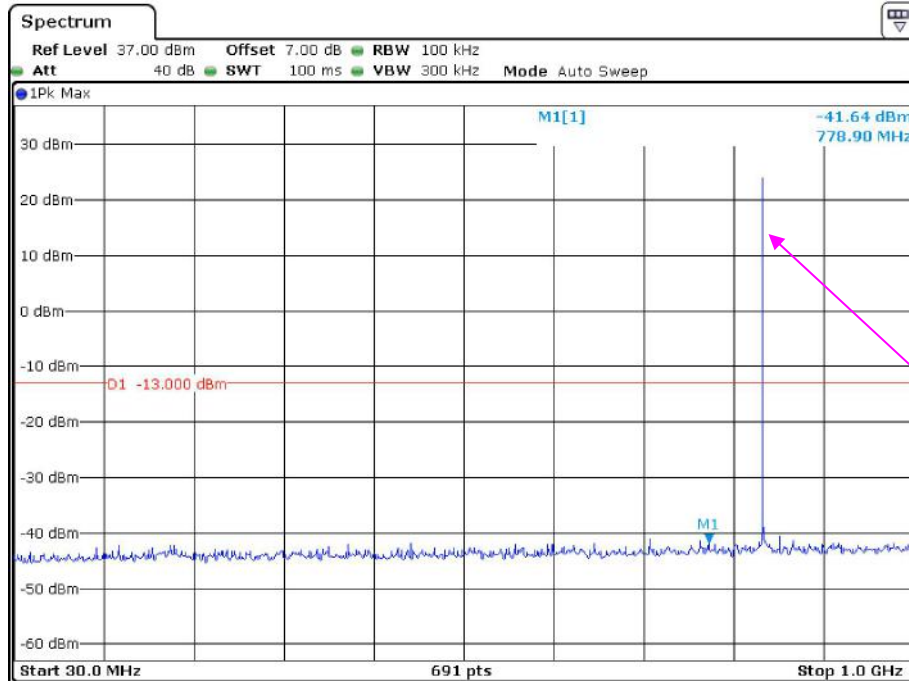
30 MHz – 1 GHz (WCDMA Mode)

Date: 24.DEC.2021 11:11:55

Fundamental test

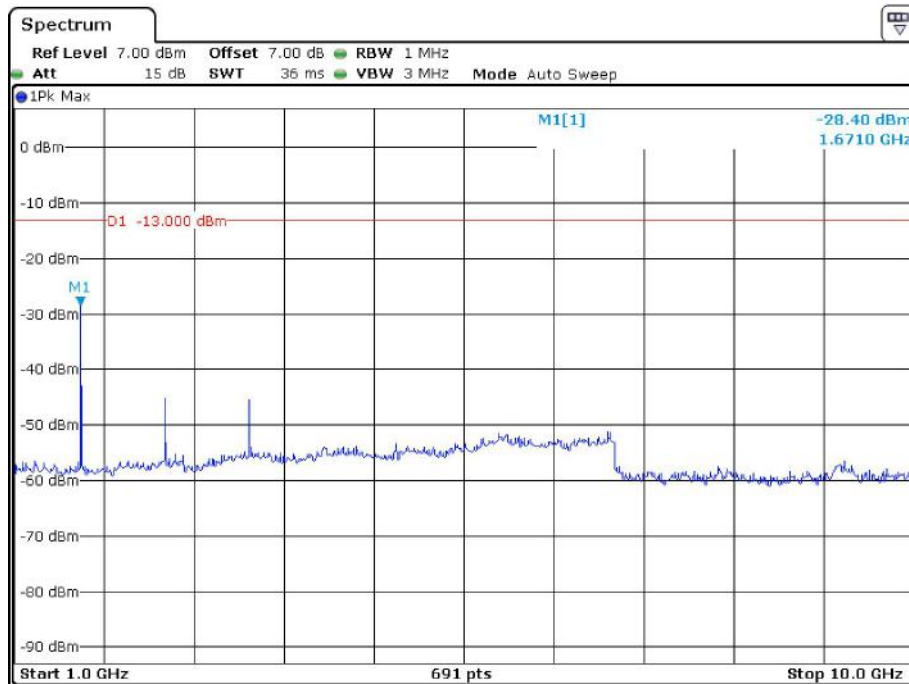
1 GHz – 10 GHz (WCDMA Mode)

Date: 24.DEC.2021 10:39:34

Middle Channel:**30 MHz – 1 GHz (GSM Mode)**

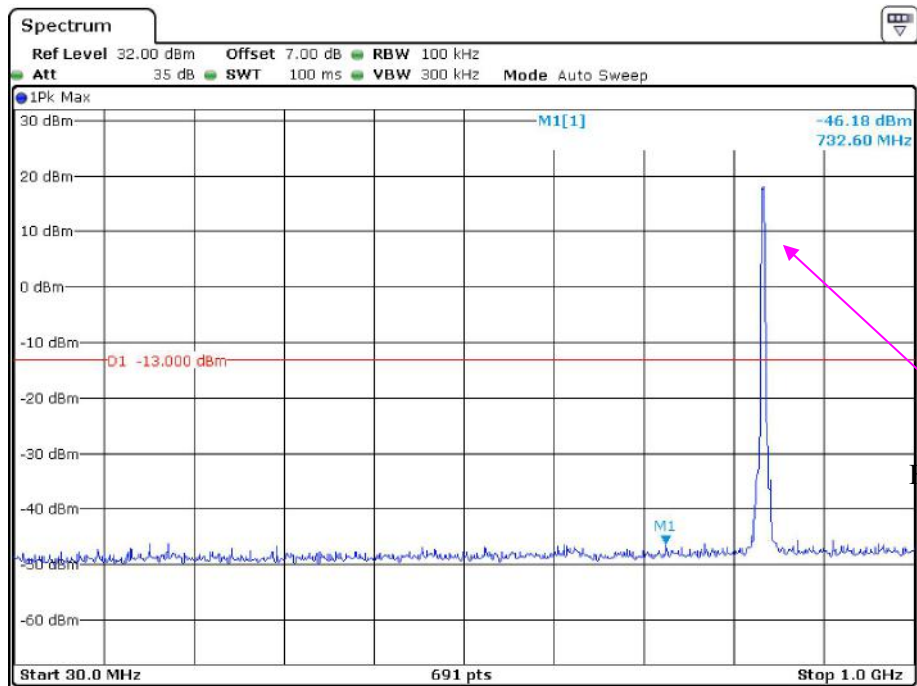
Date: 24.DEC.2021 15:03:19

Fundamental test

1 GHz – 10 GHz (GSM Mode)

Date: 24.DEC.2021 15:03:57

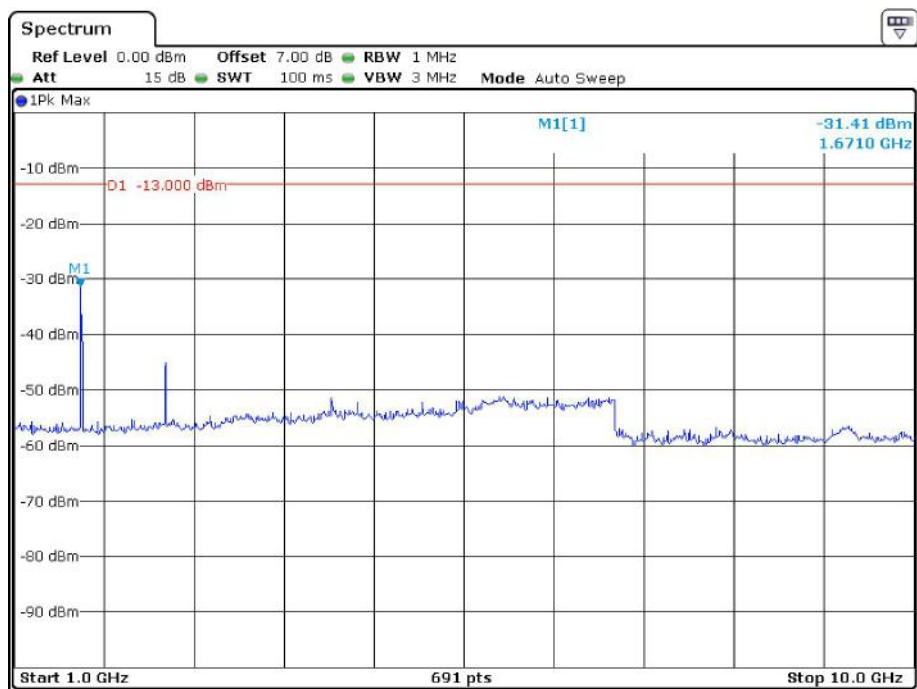
30 MHz – 1 GHz (WCDMA Mode)



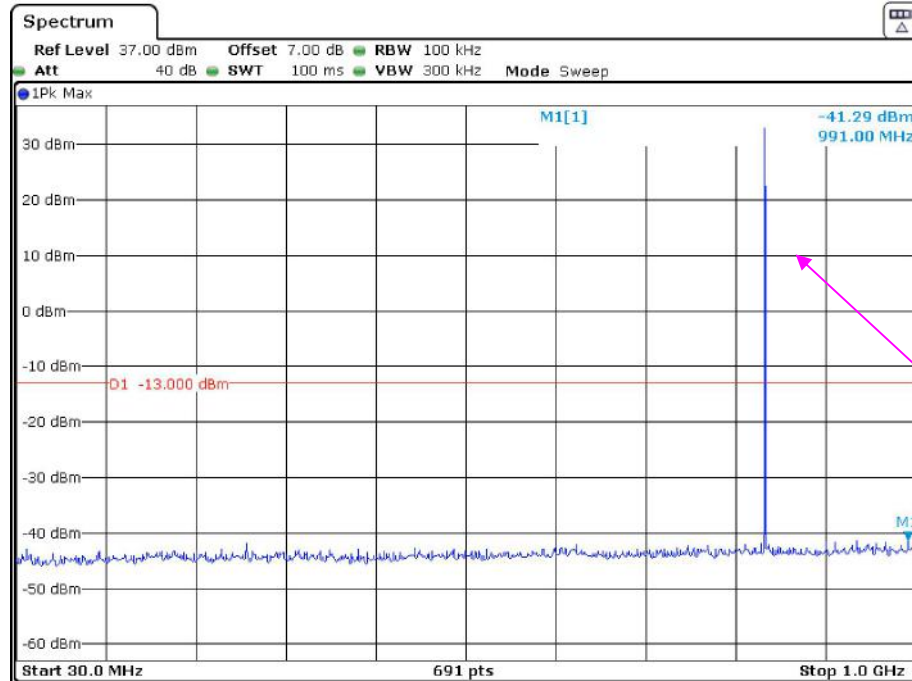
Date: 24.DEC.2021 11:13:23

Fundamental test

1 GHz – 10 GHz (WCDMA Mode)

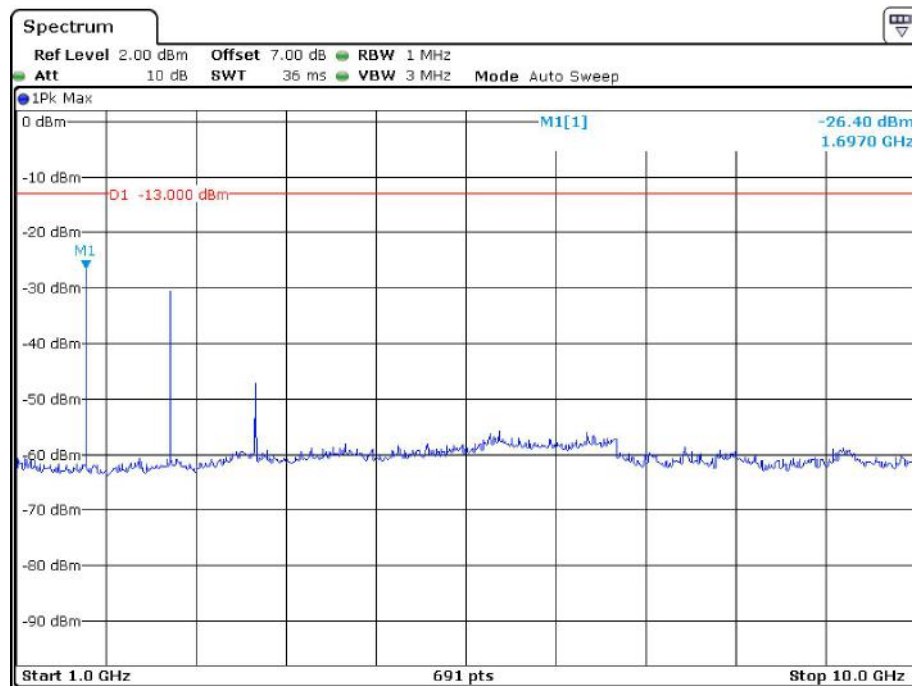


Date: 24.DEC.2021 11:02:56

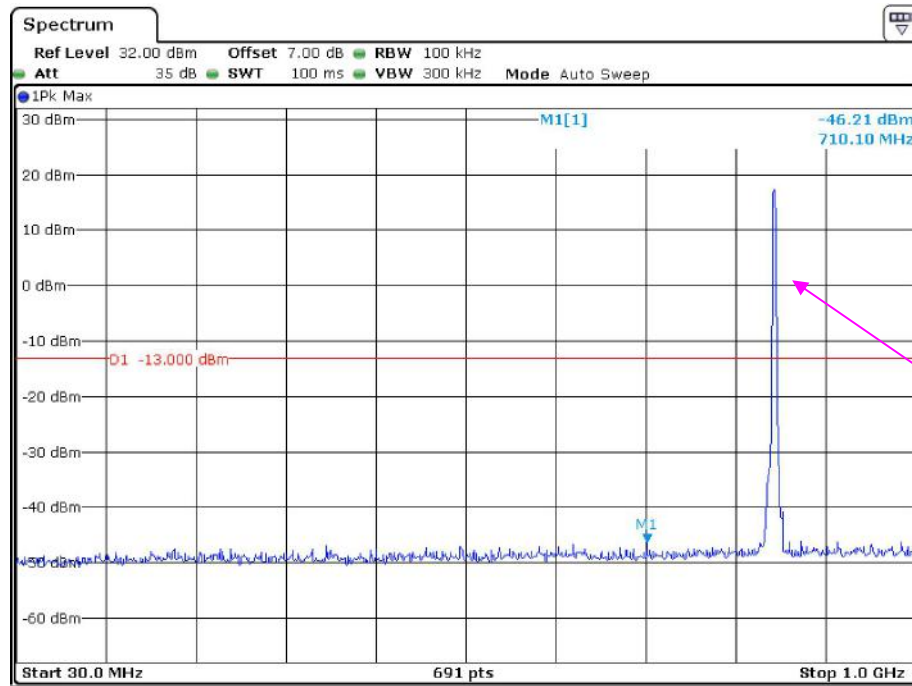
High Channel:**30 MHz – 1 GHz (GSM Mode)**

Date: 10.JAN.2022 20:04:48

Fundamental test

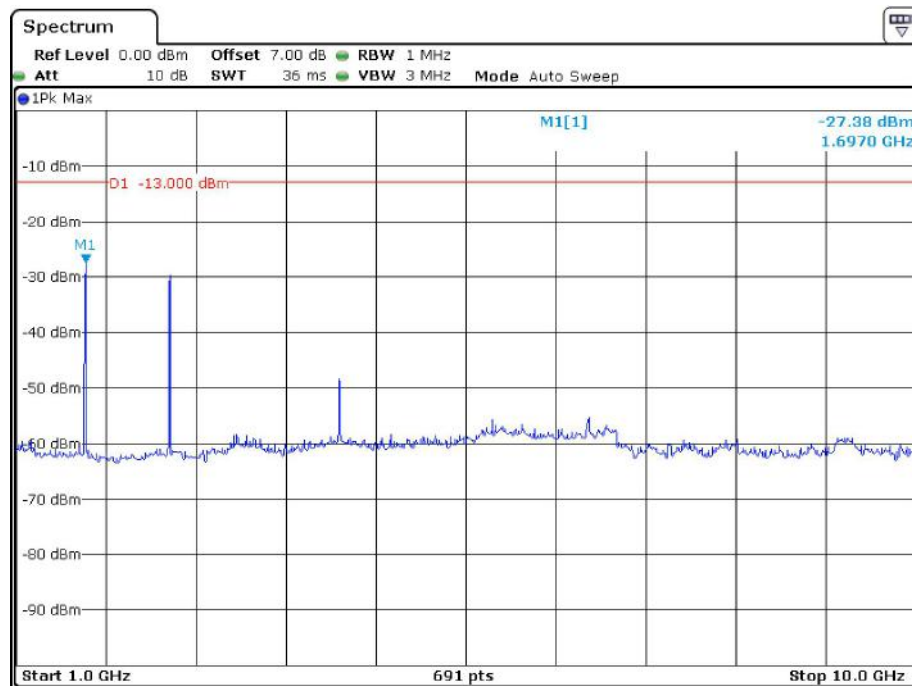
1 GHz – 10 GHz (GSM Mode)

Date: 24.DEC.2021 15:06:11

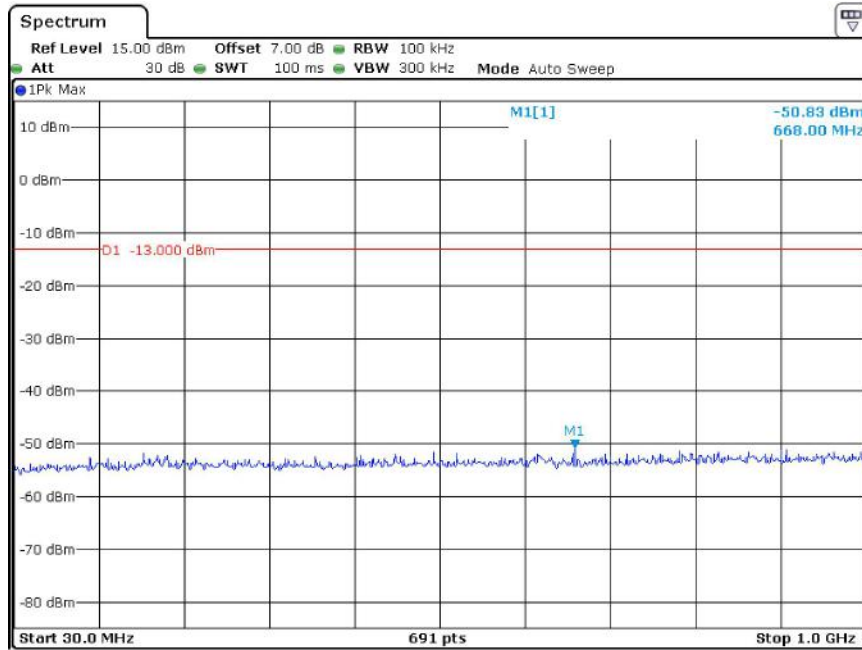
30 MHz – 1 GHz (WCDMA Mode)

Date: 24.DEC.2021 11:14:52

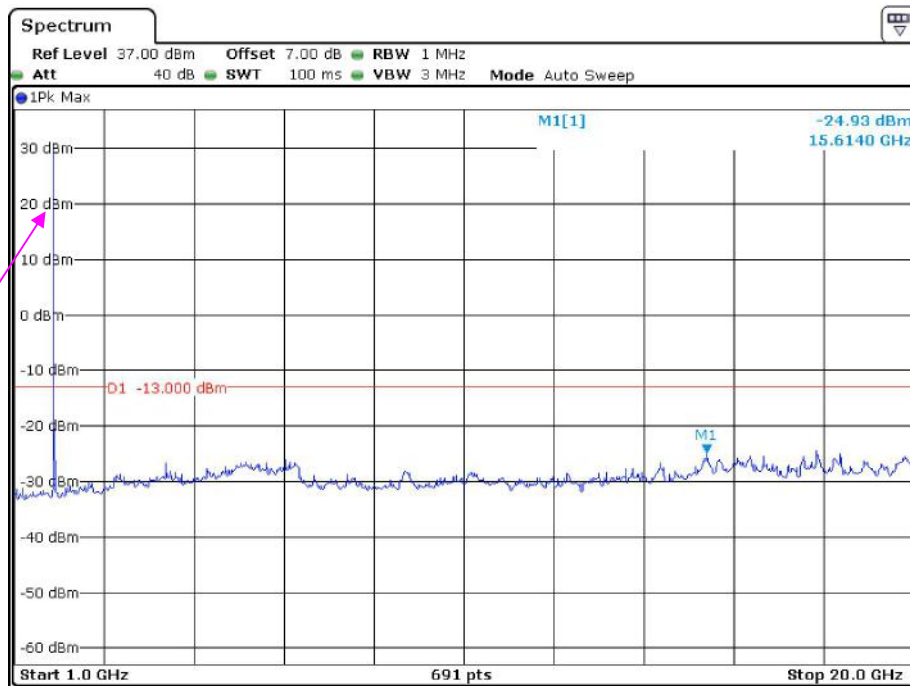
Fundamental test

1 GHz – 10 GHz (WCDMA Mode)

Date: 24.DEC.2021 11:15:51

**PCS Band (Part 24E)
Low Channel:****30 MHz – 1 GHz (GSM Mode)**

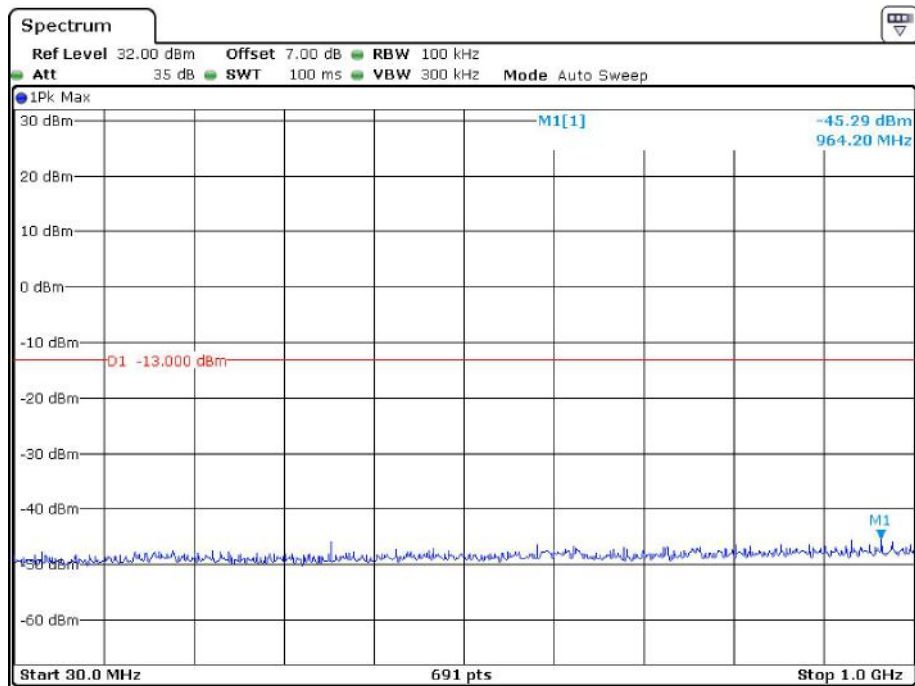
Date: 24.DEC.2021 15:10:30

2 GHz – 20 GHz (GSM Mode)

Date: 24.DEC.2021 15:13:37

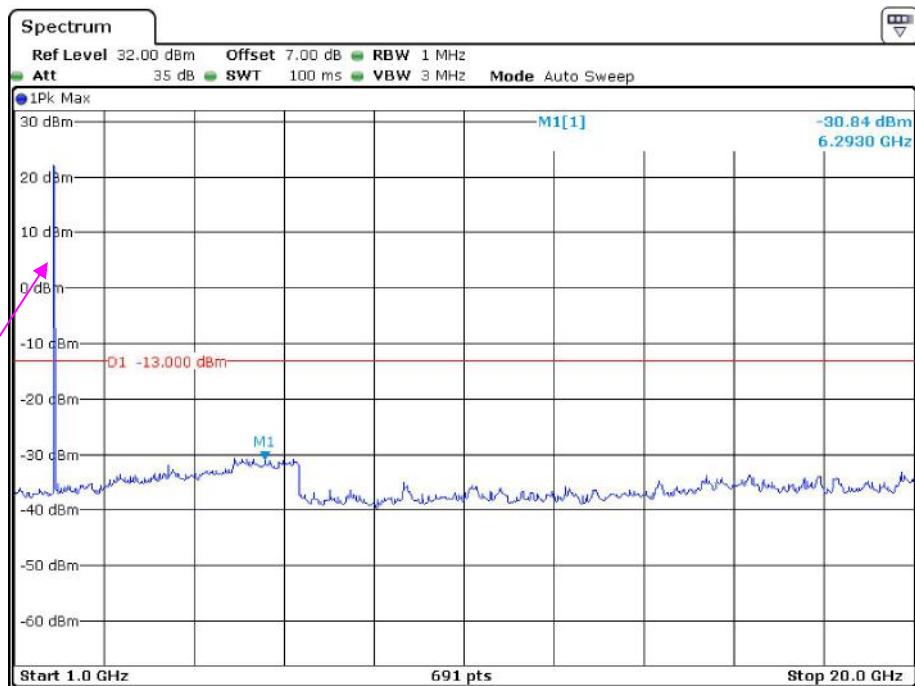
Fundamental test

30 MHz – 1 GHz (WCDMA Mode)



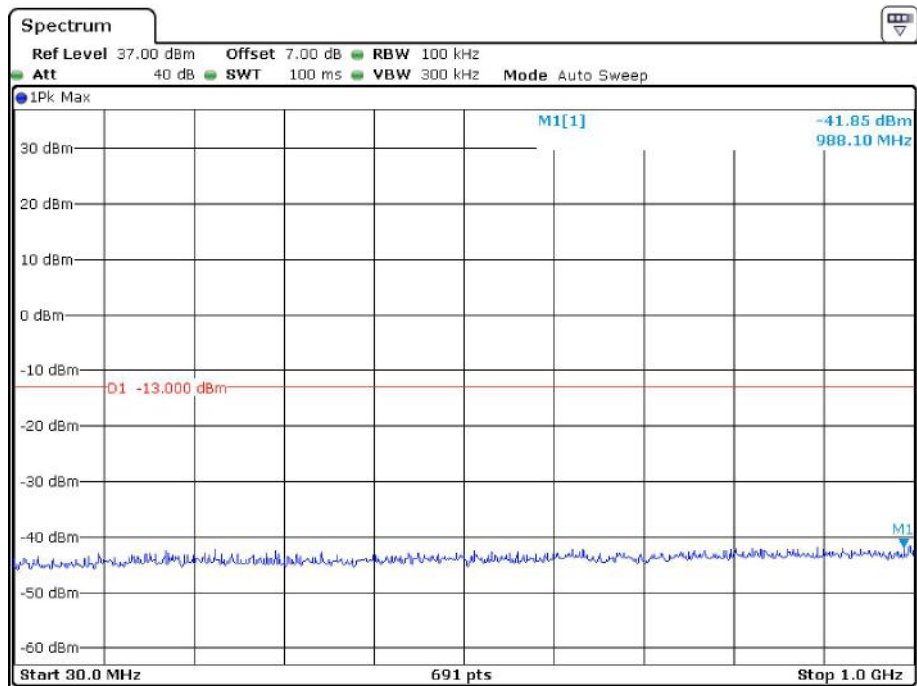
Date: 24.DEC.2021 11:19:52

2 GHz – 20 GHz (WCDMA Mode)

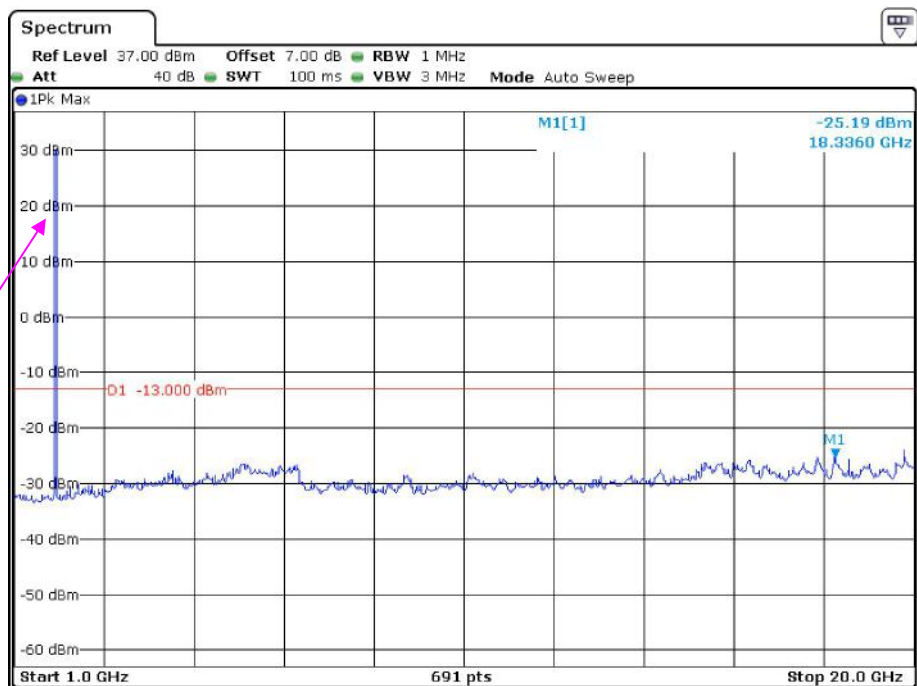


Date: 24.DEC.2021 11:22:32

Fundamental test

Middle Channel:**30 MHz – 1 GHz (GSM Mode)**

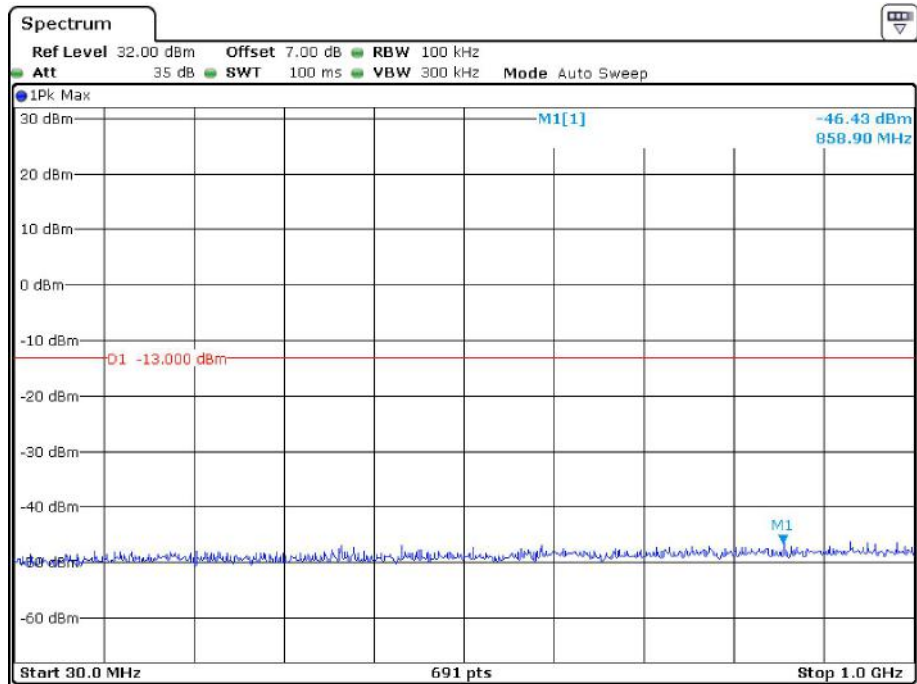
Date: 24.DEC.2021 15:14:41

2 GHz – 20 GHz (GSM Mode)

Date: 24.DEC.2021 15:15:46

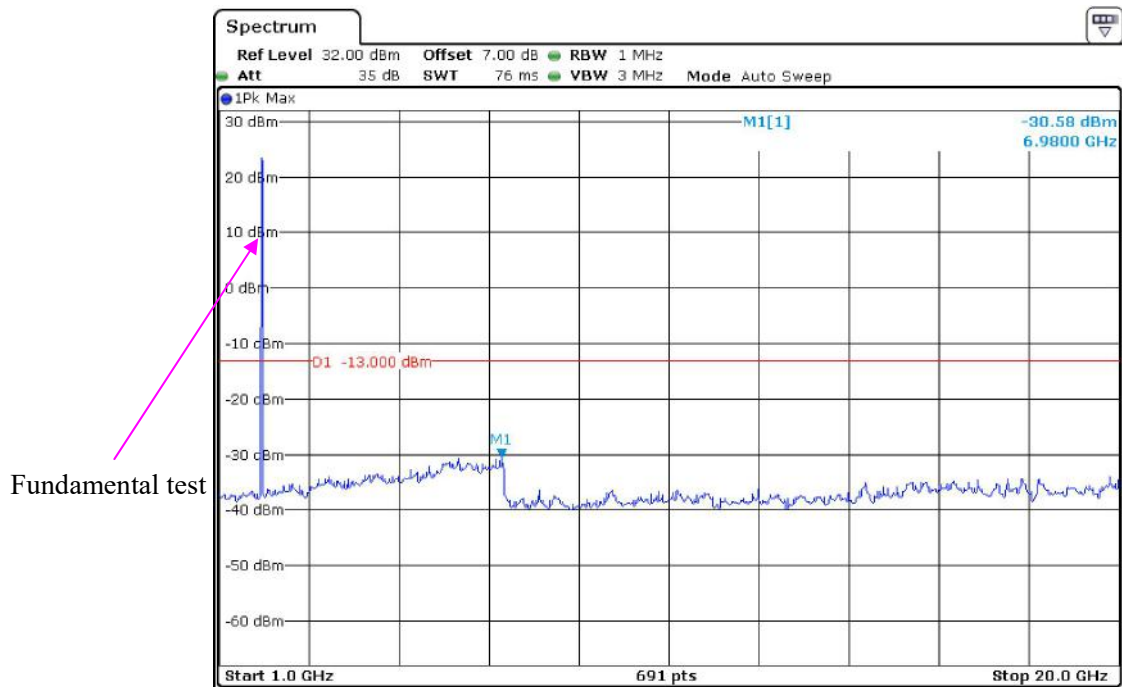
Fundamental test

30 MHz – 1 GHz (WCDMA Mode)

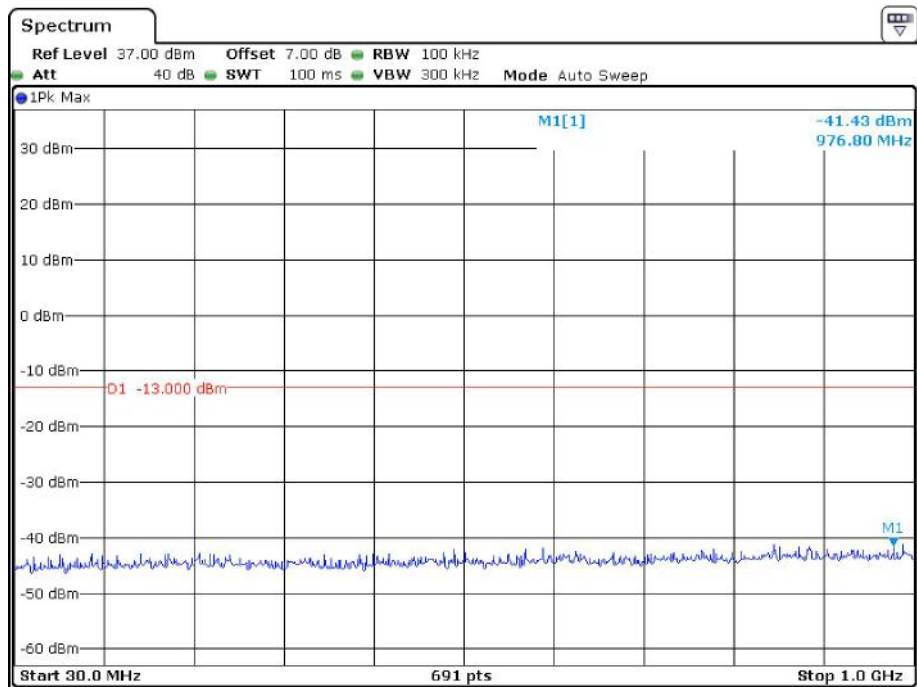


Date: 24.DEC.2021 11:23:53

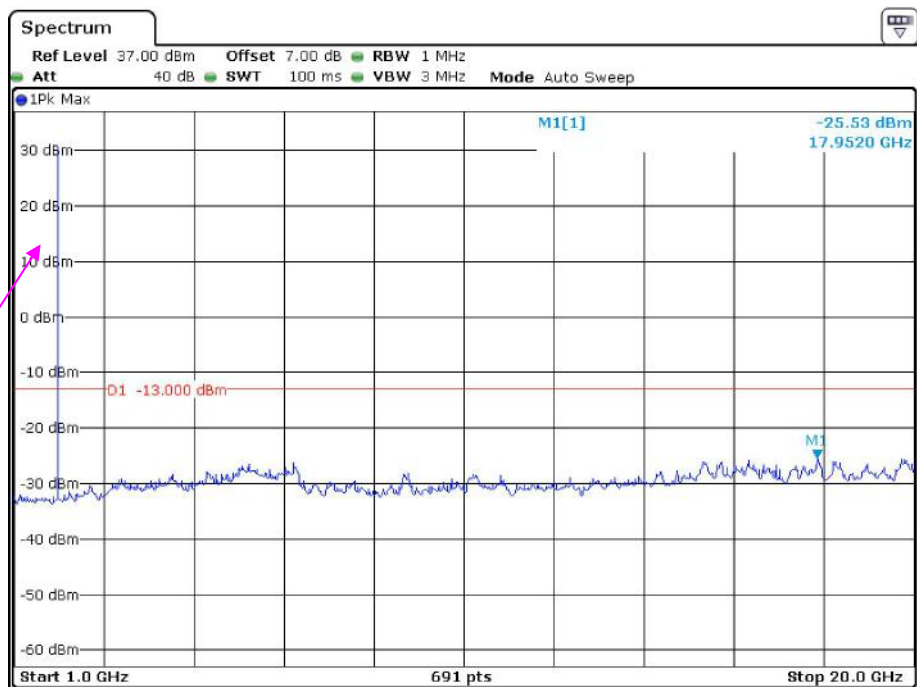
2 GHz – 20 GHz (WCDMA Mode)



Date: 24.DEC.2021 11:25:57

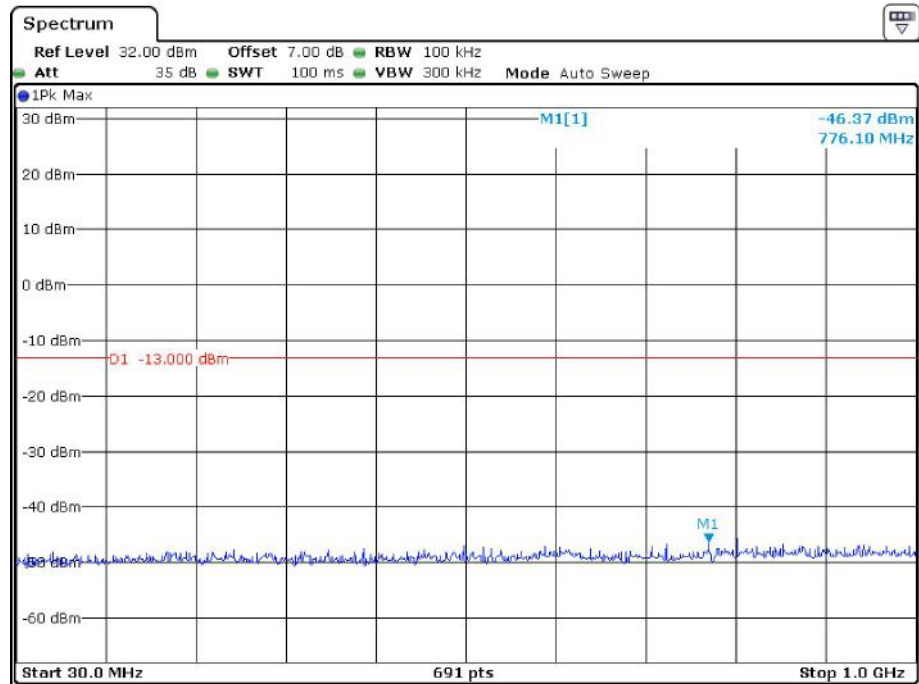
High Channel:**30 MHz – 1 GHz (GSM Mode)**

Date: 24.DEC.2021 15:16:38

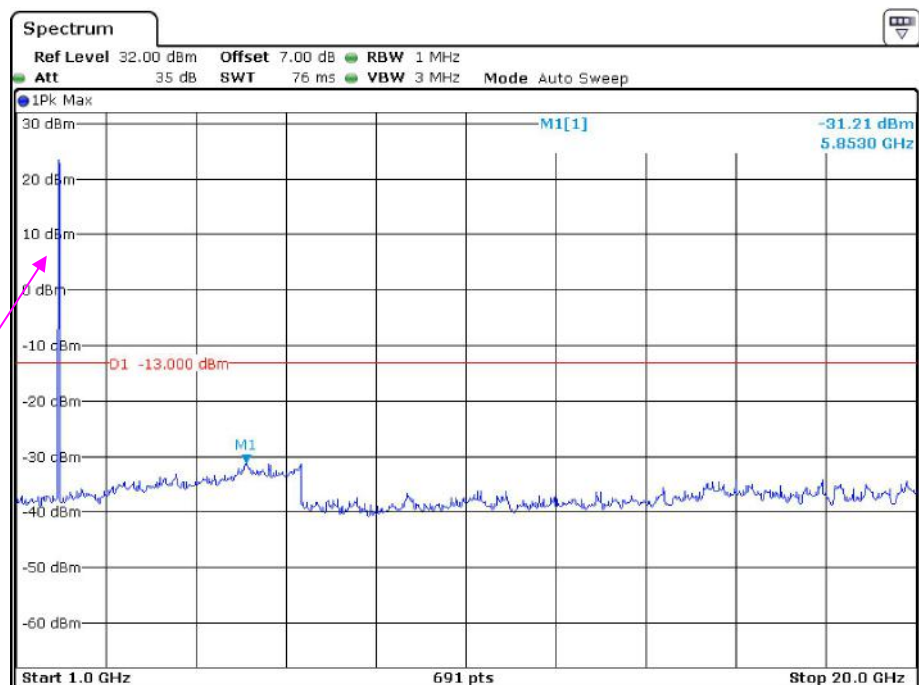
2 GHz – 20 GHz (GSM Mode)

Date: 24.DEC.2021 15:24:42

Fundamental test

30 MHz – 1 GHz (WCDMA Mode)

Date: 24.DEC.2021 11:27:37

2 GHz – 20 GHz (WCDMA Mode)

Date: 24.DEC.2021 11:26:34

Fundamental test

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:	25.5~26.5 °C
Relative Humidity:	50~52 %
ATM Pressure:	101.0kPa

The testing was performed by Caro hu on 2022-01-11 for below 1GHz and by Bin Deng on 2021-12-23 for above 1GHz..

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

The worst case is as below:

30MHz-10GHz:**Cellular Band (Part 22H)**

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								
Low Channel								
965.7	-77.16	224	1.4	H	10.7	-66.46	-13	-53.46
965.7	-74.76	264	2.4	V	11.7	-63.06	-13	-50.06
1648.4	-28.6	193	2.2	H	3.5	-25.1	-13	-12.1
1648.4	-26.4	45	2.1	V	3.1	-23.3	-13	-10.3
2472.6	-27.7	221	1.8	H	6.6	-21.1	-13	-8.1
2472.6	-21.8	16	2	V	5.8	-16	-13	-3
3296.8	-35.6	282	2	H	6.4	-29.2	-13	-16.2
3296.8	-31.2	242	1.8	V	5.7	-25.5	-13	-12.5
Middle Channel								
961.4	-76.36	162	1.1	H	10.7	-65.66	-13	-52.66
961.4	-73.86	117	1	V	11.7	-62.16	-13	-49.16
1673.2	-26.6	150	1	H	3.8	-22.8	-13	-9.8
1673.2	-24.5	42	2	V	3.1	-21.4	-13	-8.4
2509.8	-29.4	141	1.3	H	6.2	-23.2	-13	-10.2
2509.8	-21.8	150	1.2	V	5.6	-16.2	-13	-3.2
3346.4	-34.6	94	2.1	H	6.6	-28	-13	-15
3346.4	-31.5	106	1.4	V	5.4	-26.1	-13	-13.1
High Channel								
965.1	-76.26	185	1.1	H	10.7	-65.56	-13	-52.56
965.1	-73.66	79	1.2	V	11.7	-61.96	-13	-48.96
1697.6	-29.1	29	1.4	H	4.1	-25	-13	-12
1697.6	-24.8	336	1.8	V	3.1	-21.7	-13	-8.7
2546.4	-30.6	113	1.2	H	6.1	-24.5	-13	-11.5
2546.4	-23.6	75	1.4	V	5.8	-17.8	-13	-4.8
3395.2	-33.6	356	1.3	H	6.2	-27.4	-13	-14.4
3395.2	-31.6	124	1.1	V	5.4	-26.2	-13	-13.2

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 Band 5								
Low Channel ((826.4MHz)								
952.6	-75.36	144	2.5	H	9.8	-65.56	-13	-52.56
952.6	-73.66	101	2.5	V	11.7	-61.96	-13	-48.96
1652.8	-45.1	64	1.3	H	3.5	-41.6	-13	-28.6
1652.8	-41.6	317	2.4	V	3.1	-38.5	-13	-25.5
2479.2	-43.5	49	1.6	H	6.5	-37	-13	-24
2479.2	-38.4	151	1.4	V	5.7	-32.7	-13	-19.7
3305.6	-40.4	49	1.6	H	6.4	-34	-13	-21
3305.6	-37	151	1.4	V	5.7	-31.3	-13	-18.3
Middle Channel (836.6MHz)								
951.2	-75.26	302	2.4	H	9.8	-65.46	-13	-52.46
951.2	-73.96	139	2.4	V	11.7	-62.26	-13	-49.26
1673.2	-45.9	232	2	H	3.8	-42.1	-13	-29.1
1673.2	-43.6	289	2.1	V	3.1	-40.5	-13	-27.5
2509.8	-44.7	122	1.3	H	6.2	-38.5	-13	-25.5
2509.8	-39.3	16	1.1	V	5.7	-33.6	-13	-20.6
3346.4	-40.1	122	1.3	H	6.6	-33.5	-13	-20.5
3346.4	-36.5	16	1.1	V	5.4	-31.1	-13	-18.1
High Channel (846.6MHz)								
966.3	-76.36	116	1	H	10.7	-65.66	-13	-52.66
966.3	-73.76	184	2.5	V	11.7	-62.06	-13	-49.06
1673.2	-44.1	135	2.1	H	4	-40.1	-13	-27.1
1673.2	-44.3	71	2.2	V	3.1	-41.2	-13	-28.2
2509.8	-46.7	293	2.4	H	6.1	-40.6	-13	-27.6
2509.8	-39.8	139	2	V	5.7	-34.1	-13	-21.1
3386.4	-41.2	293	2.4	H	6.3	-34.9	-13	-21.9
3386.4	-37.4	139	2	V	5.4	-32	-13	-19

30MHz-20GHz:**PCS Band (Part 24E)**

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
GSM 1900								
Low Channel								
962.1	-75.96	255	2.1	H	10.7	-65.26	-13	-52.26
962.1	-73.46	208	1.4	V	11.7	-61.76	-13	-48.76
3700.4	-42.6	6	2.2	H	8.1	-34.5	-13	-21.5
3700.4	-41.3	316	1.9	V	7.6	-33.7	-13	-20.7
5550.6	-46.8	128	1.1	H	9.6	-37.2	-13	-24.2
5550.6	-46.4	309	1.5	V	9.1	-37.3	-13	-24.3
Middle Channel								
962.9	-75.86	330	2	H	10.7	-65.16	-13	-52.16
962.9	-73.76	41	2.2	V	11.7	-62.06	-13	-49.06
3760	-47.2	45	1.8	H	8.8	-38.4	-13	-25.4
3760	-44.6	86	1.1	V	8	-36.6	-13	-23.6
5640	-46.4	133	1.8	H	10.2	-36.2	-13	-23.2
5640	-46	337	1.3	V	9.4	-36.6	-13	-23.6
High Channel								
962.6	-76.16	155	1.2	H	10.7	-65.46	-13	-52.46
962.6	-73.66	239	1.8	V	11.7	-61.96	-13	-48.96
3819.6	-47.7	96	1.9	H	8.7	-39	-13	-26
3819.6	-45.5	94	1.9	V	8	-37.5	-13	-24.5
5729.4	-47.5	209	1.9	H	10.6	-36.9	-13	-23.9
5729.4	-47.2	237	1.1	V	10.2	-37	-13	-24

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 Band 2								
Low Channel (1852.4MHz)								
954.5	-75.26	269	1.1	H	9.8	-65.46	-13	-52.46
954.5	-73.46	77	1.7	V	11.7	-61.76	-13	-48.76
3704.8	-39.7	221	1.7	H	8.8	-30.9	-13	-17.9
3704.8	-36.6	342	2	V	7.9	-28.7	-13	-15.7
5557.2	-44.1	221	1.7	H	9.7	-34.4	-13	-21.4
5557.2	-41.2	342	2	V	9.1	-32.1	-13	-19.1
Middle Channel (1880MHz)								
954.2	-75.46	294	1.6	H	9.8	-65.66	-13	-52.66
954.2	-73.76	241	2.5	V	11.7	-62.06	-13	-49.06
3760	-36.4	119	1.9	H	8.8	-27.6	-13	-14.6
3760	-32.6	204	1.2	V	8	-24.6	-13	-11.6
5557.2	-45.2	119	1.9	H	10.2	-35	-13	-22
5557.2	-42	204	1.2	V	9.4	-32.6	-13	-19.6
High Channel (1907.6MHz)								
961.6	-75.96	282	1.6	H	10.7	-65.26	-13	-52.26
961.6	-73.46	14	1.7	V	11.7	-61.76	-13	-48.76
3815.2	-37.8	337	2.3	H	8.7	-29.1	-13	-16.1
3815.2	-33.1	197	1.7	V	7.9	-25.2	-13	-12.2
5722.8	-40.1	337	2.3	H	10.6	-29.5	-13	-16.5
5722.8	-36.6	197	1.7	V	10.1	-26.5	-13	-13.5

LTE Band: (Pre-scan with all the bandwidth, and 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)				
Band 2								
Test frequency range: 30MHz-20GHz								
1.4MHz bandwidth, Low Channel								
961.6	-75.66	251	1.6	H	10.7	-64.96	-13	-51.96
961.6	-73.66	95	2.3	V	11.7	-61.96	-13	-48.96
3701.4	-32.3	105	1.2	H	8.1	-24.2	-13	-11.2
3701.4	-29	358	1	V	7.6	-21.4	-13	-8.4
5550.6	-31.9	294	1.6	H	9.6	-22.3	-13	-9.3
5550.6	-29.6	300	1.2	V	9.1	-20.5	-13	-7.5
1.4MHz bandwidth, Middle Channel								
961.2	-75.86	109	1.4	H	10.7	-65.16	-13	-52.16
961.2	-73.76	299	1.3	V	11.7	-62.06	-13	-49.06
3760	-31.6	343	1.5	H	8.8	-22.8	-13	-9.8
3760	-27.6	337	2.1	V	8	-19.6	-13	-6.6
5640	-34.9	107	2.1	H	10.2	-24.7	-13	-11.7
5640	-31.4	202	1.9	V	9.4	-22	-13	-9
1.4MHz bandwidth, High Channel								
960.2	-76.46	340	2.4	H	10.7	-65.76	-13	-52.76
960.2	-73.46	126	2.3	V	11.7	-61.76	-13	-48.76
3818.6	-33.7	335	1.4	H	8.7	-25	-13	-12
3818.6	-29.4	350	1.1	V	8	-21.4	-13	-8.4
5727.90	-35.9	71	1.9	H	10.6	-25.3	-13	-12.3
5727.90	-32	0	1.6	V	10.2	-21.8	-13	-8.8

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
Band 4								
Test frequency range: 30MHz-20GHz								
1.4MHz bandwidth, Low Channel								
963.7	-75.86	118	1.7	H	10.7	-65.16	-13	-52.16
963.7	-73.46	48	1.9	V	11.7	-61.76	-13	-48.76
3421.4	-37.7	71	1.2	H	6.4	-31.3	-13	-18.3
3421.4	-33.2	104	1.1	V	5.7	-27.5	-13	-14.5
5132.1	-33.1	51	1	H	11.3	-21.8	-13	-8.8
5132.1	-29.9	25	1.2	V	10.8	-19.1	-13	-6.1
1.4MHz bandwidth, Middle Channel								
959.1	-75.46	342	2.3	H	9.8	-65.66	-13	-52.66
959.1	-73.66	78	2.5	V	11.7	-61.96	-13	-48.96
3465	-31	250	1.4	H	7	-24	-13	-18.80
3465	-29.5	352	1.8	V	6.2	-23.3	-13	-18.10
5197.5	-36.5	41	1.8	H	10.4	-26.1	-13	-27.60
5197.5	-31.6	140	2.4	V	9.8	-21.8	-13	-25.40
1.4MHz bandwidth, High Channel								
959.9	-74.86	31	2.5	H	9.8	-65.06	-13	-52.06
959.9	-73.66	93	1.7	V	11.7	-61.96	-13	-48.96
3508.6	-30.3	61	1.9	H	7.8	-22.5	-13	-9.5
3508.6	-26.7	8	1.1	V	6.6	-20.1	-13	-7.1
5262.9	-39.3	63	2	H	9.5	-29.8	-13	-16.8
5262.9	-37.6	43	2.5	V	8.9	-28.7	-13	-15.7

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
Band 7								
Test frequency range: 30MHz-26.5GHz								
5MHz bandwidth, Low Channel								
957.6	-87.96	120	2.1	H	10.7	-77.26	-25	-52.26
957.6	-85.36	177	1.6	V	11.7	-73.66	-25	-48.66
5005	-44.4	71	1.2	H	10.8	-33.6	-25	-8.6
5005	-39.6	104	1.1	V	10.2	-29.4	-25	-4.4
7507.5	-51.3	51	1	H	20.3	-31	-25	-6
7507.5	-50.4	25	1.2	V	20.1	-30.3	-25	-5.3
5MHz bandwidth, Middle Channel								
964.2	-88.26	96	1.7	H	10.7	-77.56	-25	-52.56
964.2	-85.46	226	1.7	V	11.7	-73.76	-25	-48.76
5070	-42.3	250	1.4	H	11.1	-31.2	-25	-6.2
5070	-39.8	352	1.8	V	10.8	-29	-25	-4
7605	-58.3	41	1.8	H	21.2	-37.1	-25	-12.1
7605	-58	140	2.4	V	20.1	-37.9	-25	-12.9
5MHz bandwidth, High Channel								
961.9	-87.86	293	1.5	H	10.7	-77.16	-25	-52.16
961.9	-85.76	160	1.7	V	11.7	-74.06	-25	-49.06
5135	-40.3	61	1.9	H	11.3	-29	-25	-4
5135	-38.9	8	1.1	V	10.8	-28.1	-25	-3.1
7702.5	-59.3	63	2	H	21.2	-38.1	-25	-13.1
7702.5	-57.6	43	2.5	V	21	-36.6	-25	-11.6

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 12								
Test frequency range: 30MHz-10GHz								
1.4MHz bandwidth, Low Channel								
957.1	-75.16	269	1.2	H	9.8	-65.36	-13	-52.36
957.1	-73.36	174	2.2	V	11.7	-61.66	-13	-48.66
1399.4	-31.2	71	1.2	H	5.9	-25.3	-13	-12.3
1399.4	-27.3	104	1.1	V	5.9	-21.4	-13	-8.4
2099.1	-22.5	51	1	H	6.3	-16.2	-13	-3.2
2099.1	-23.5	25	1.2	V	5.1	-18.4	-13	-5.4
2798.8	-36.6	51	1	H	6.7	-29.9	-13	-16.9
2798.8	-32.6	25	1.2	V	6.7	-25.9	-13	-12.9
1.4MHz bandwidth, Middle Channel								
957.9	-75.06	220	2.4	H	9.8	-65.26	-13	-52.26
957.9	-73.96	146	1.8	V	11.7	-62.26	-13	-49.26
1415	-31.6	250	1.4	H	5.7	-25.9	-13	-12.9
1415	-27.8	352	1.8	V	5.4	-22.4	-13	-9.4
2122.5	-22.7	41	1.8	H	6.7	-16	-13	-3
2122.5	-22.8	140	2.4	V	5.8	-17	-13	-4
2830	-35.6	41	1.8	H	7.1	-28.5	-13	-15.5
2830	-34.3	140	2.4	V	6.5	-27.8	-13	-14.8
1.4MHz bandwidth, High Channel								
961.6	-76.16	171	1.2	H	10.7	-65.46	-13	-52.46
961.6	-73.56	311	2	V	11.7	-61.86	-13	-48.86
1430.6	-32.3	61	1.9	H	5.4	-26.9	-13	-13.9
1430.6	-25.9	8	1.1	V	4.8	-21.1	-13	-8.1
2145.9	-23.1	63	2	H	7	-16.1	-13	-3.1
2145.9	-23.9	43	2.5	V	6.6	-17.3	-13	-4.3
2861.2	-36.8	63	2	H	7.3	-29.5	-13	-16.5
2861.2	-35.4	43	2.5	V	6.3	-29.1	-13	-16.1

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
BAND 17								
Test frequency range: 1-10GHz								
5MHz bandwidth, Low Channel								
962.4	-76.36	136	2.3	H	10.7	-65.66	-13	-52.66
962.4	-73.66	220	2	V	11.7	-61.96	-13	-48.96
1413	-31	71	1.2	H	5.7	-25.3	-13	-12.3
1413	-27.4	104	1.1	V	5.4	-22	-13	-9
2119.5	-22.7	51	1	H	6.6	-16.1	-13	-3.1
2119.5	-25.2	25	1.2	V	5.7	-19.5	-13	-6.5
2826	-37	51	1	H	7.1	-29.9	-13	-16.9
2826	-35.7	25	1.2	V	6.5	-29.2	-13	-16.2
5MHz bandwidth, Middle Channel								
961.3	-75.76	46	1.7	H	10.7	-65.06	-13	-52.06
961.3	-73.46	141	1.6	V	11.7	-61.76	-13	-48.76
1420	-32.3	71	1.2	H	5.6	-26.7	-13	-13.7
1420	-26.7	104	1.1	V	5.2	-21.5	-13	-8.5
2130	-22.8	51	1	H	6.8	-16	-13	-3
2130	-23.5	25	1.2	V	5.7	-17.8	-13	-4.8
2840	-37.1	51	1	H	7.3	-29.8	-13	-16.8
2840	-34.9	25	1.2	V	6.5	-28.4	-13	-15.4
5MHz bandwidth, High Channel								
963.5	-75.96	107	1.3	H	10.7	-65.26	-13	-52.26
963.5	-73.66	353	1.5	V	11.7	-61.96	-13	-48.96
1427	-31.7	71	1.2	H	5.5	-26.2	-13	-13.2
1427	-26.4	104	1.1	V	4.9	-21.5	-13	-8.5
2140.5	-22.9	51	1	H	6.9	-16	-13	-3
2140.5	-24.5	25	1.2	V	6.4	-18.1	-13	-5.1
2854	-37.9	51	1	H	7.4	-30.5	-13	-17.5
2854	-36.3	25	1.2	V	6.4	-29.9	-13	-16.9

Note:

Absolute Level = Reading Level + Substituted Factor

Substituted Factor contains: SG Level - Cable loss+ Antenna Gain

Margin = Absolute Level - Limit

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

Applicable Standard

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

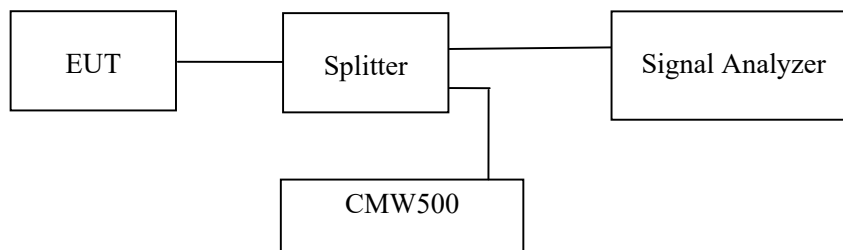
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to FCC §27.53 (g)(h)(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:	25℃
Relative Humidity:	60 %
ATM Pressure:	101.0 kPa

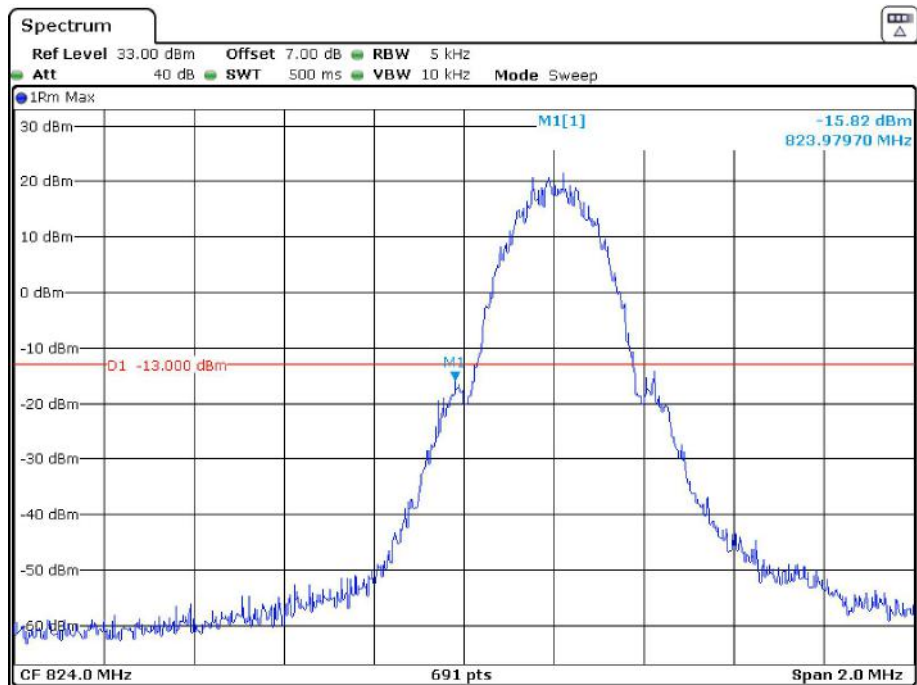
The testing was performed by Paul liu from 2021-12-24 to 2022-01-10.

EUT operation mode: Transmitting (Worst case)

Test Result: Pass

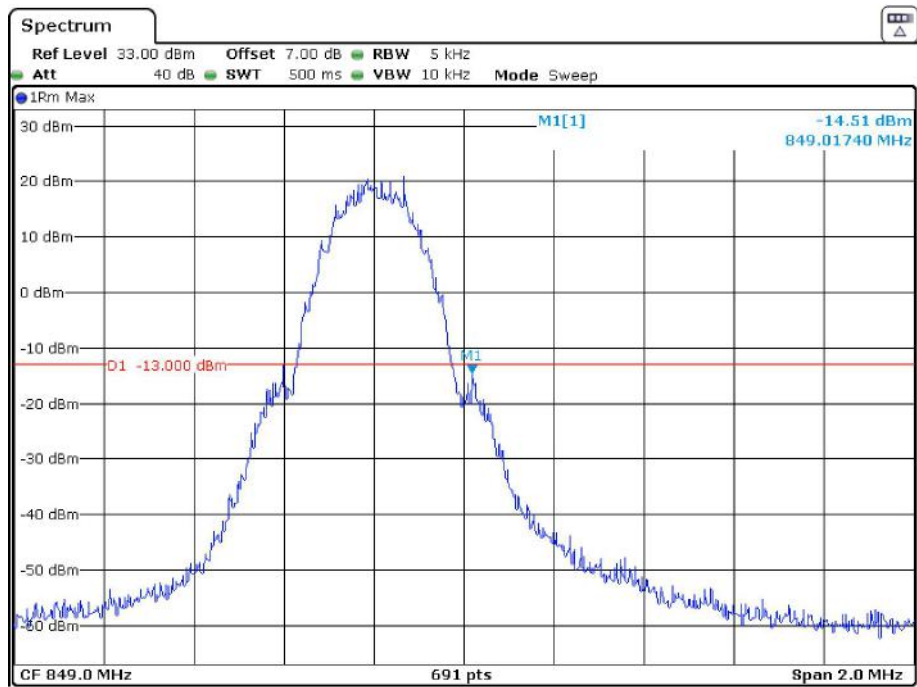
Please refer to the following plots.

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



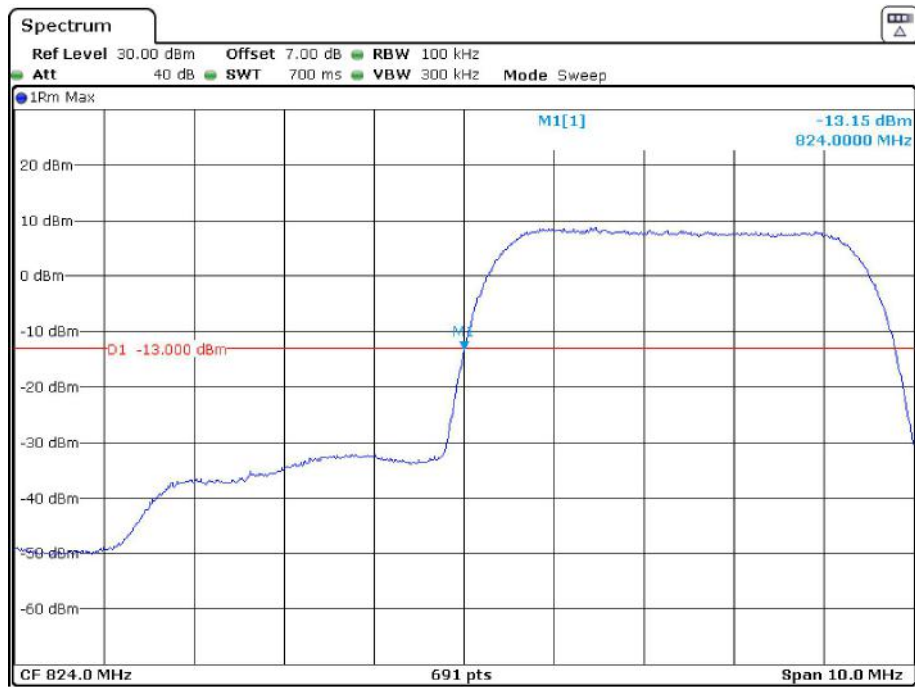
Date: 10.JAN.2022 20:34:50

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



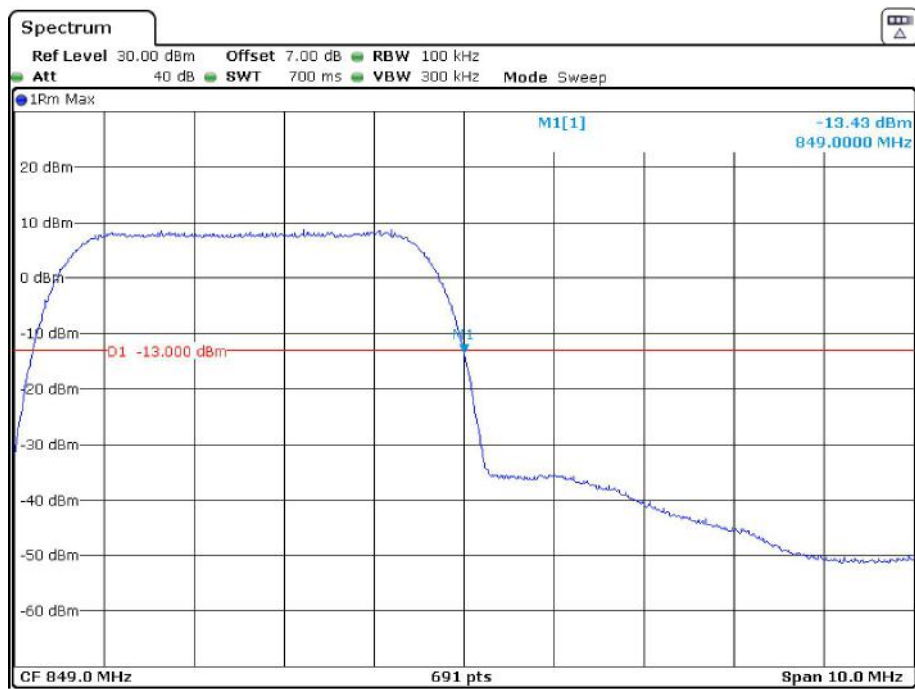
Date: 10.JAN.2022 20:35:49

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

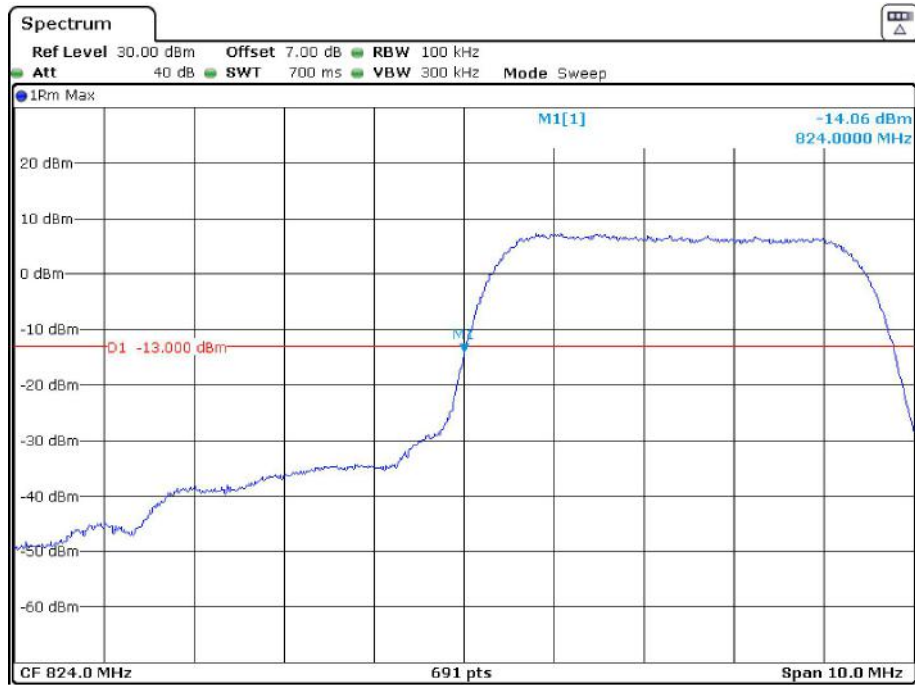


Date: 10.JAN.2022 20:14:35

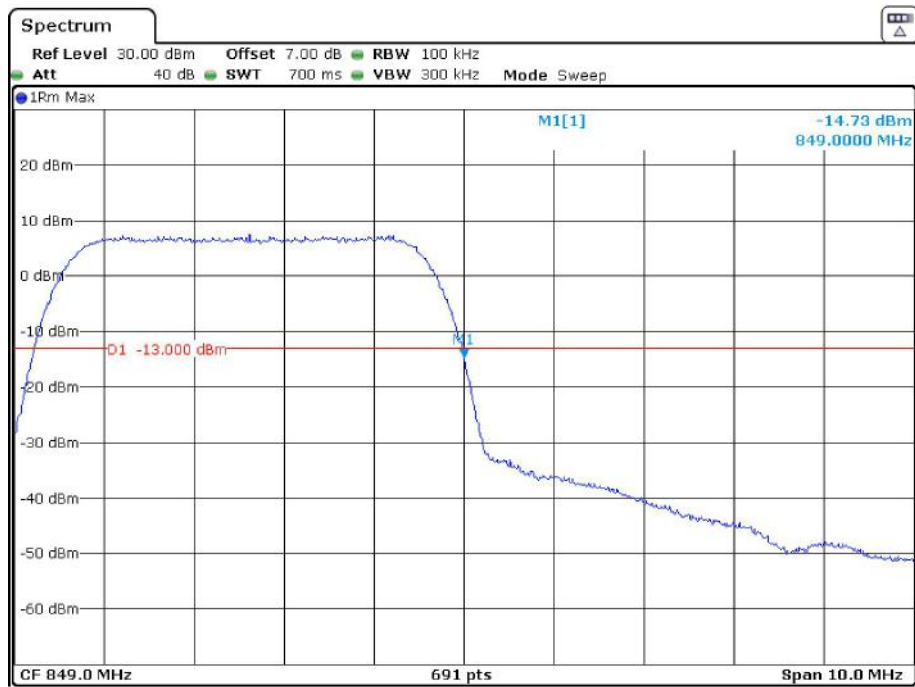
Cellular Band, Right Band Edge for RMC (BPSK) Mode



Date: 10.JAN.2022 20:15:31

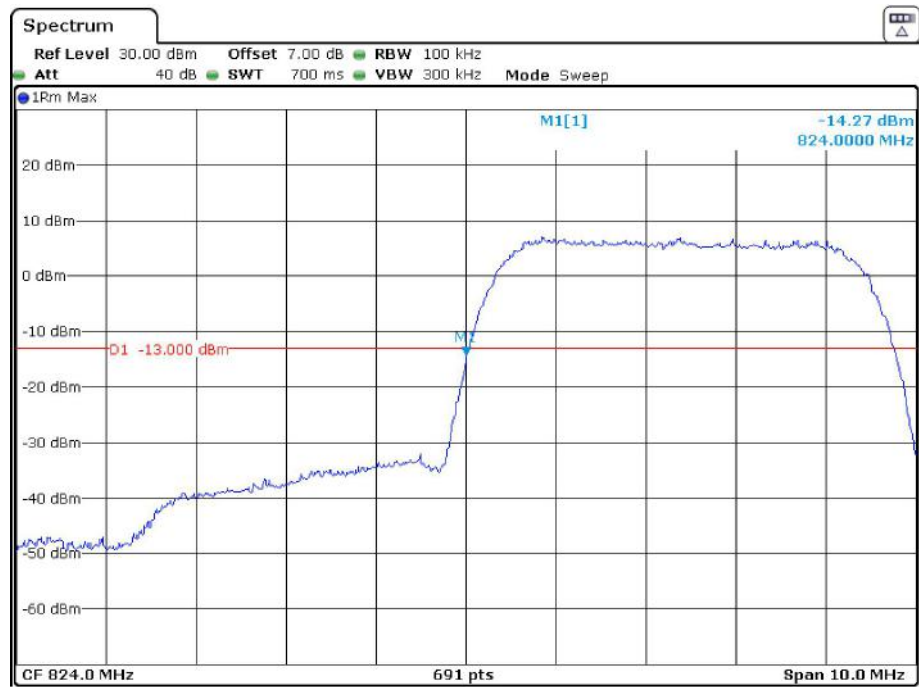
Cellular Band, Left Band Edge for HSDPA(16QAM) Mode

Date: 10.JAN.2022 20:17:07

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

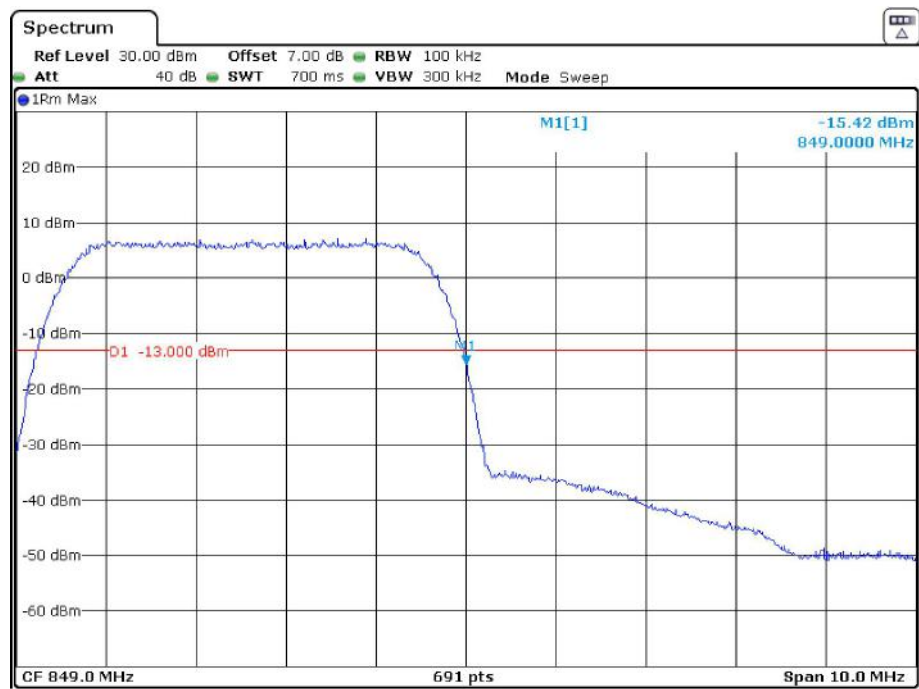
Date: 10.JAN.2022 20:16:35

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



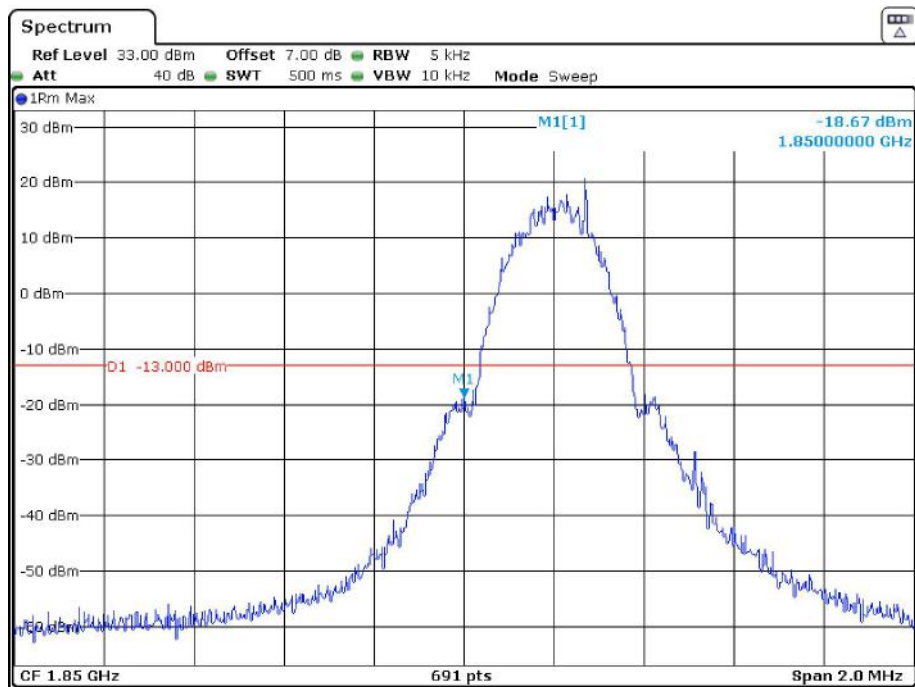
Date: 10.JAN.2022 20:21:07

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



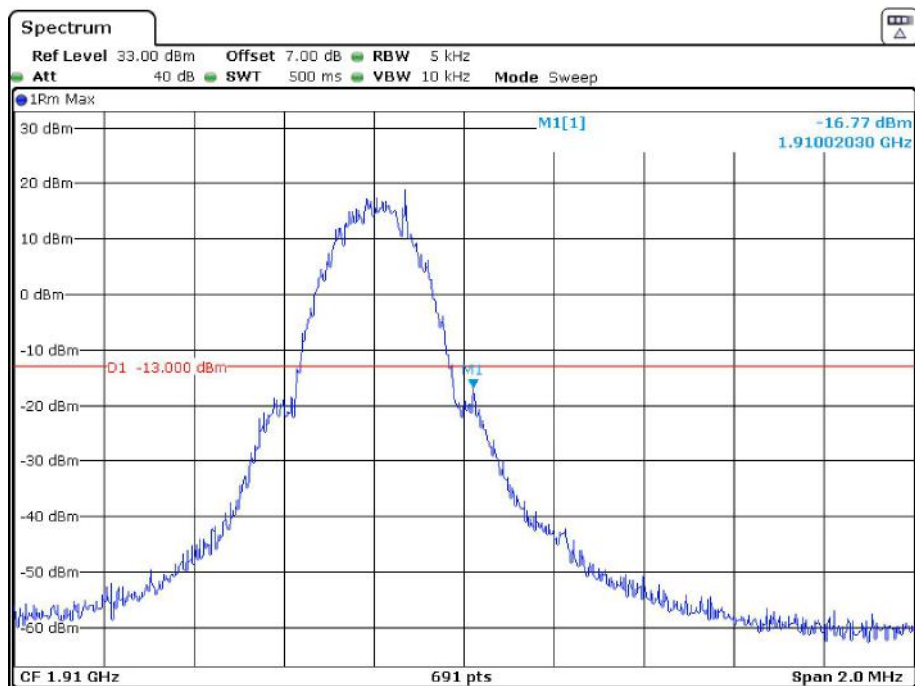
Date: 10.JAN.2022 20:21:47

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

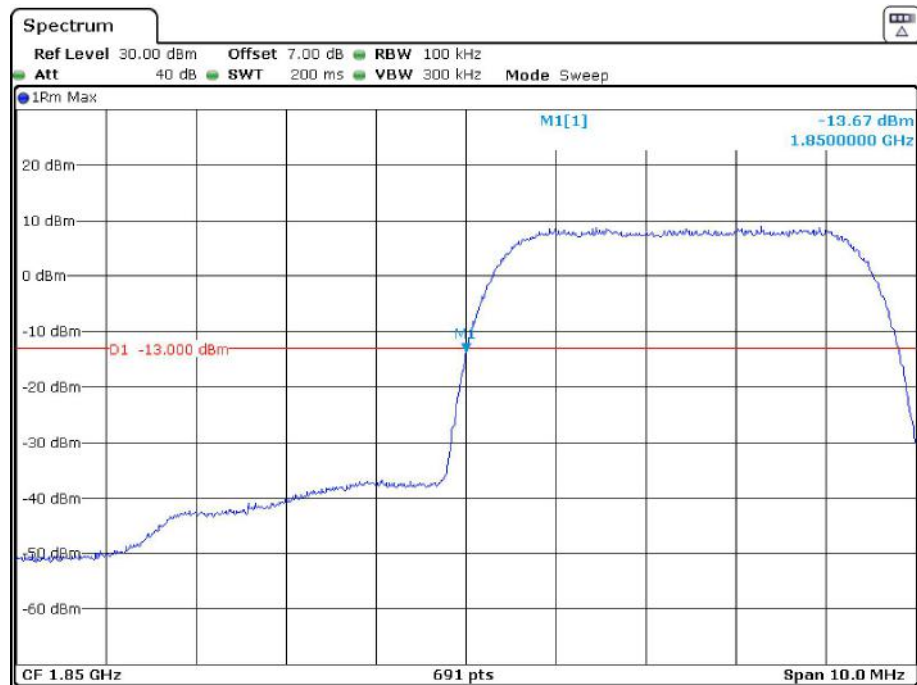
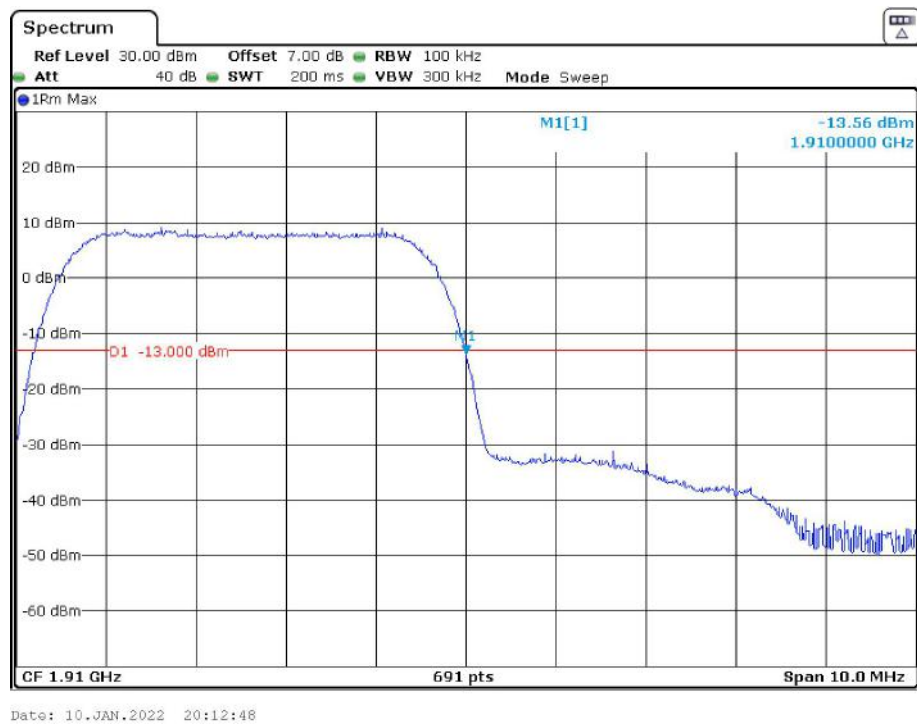


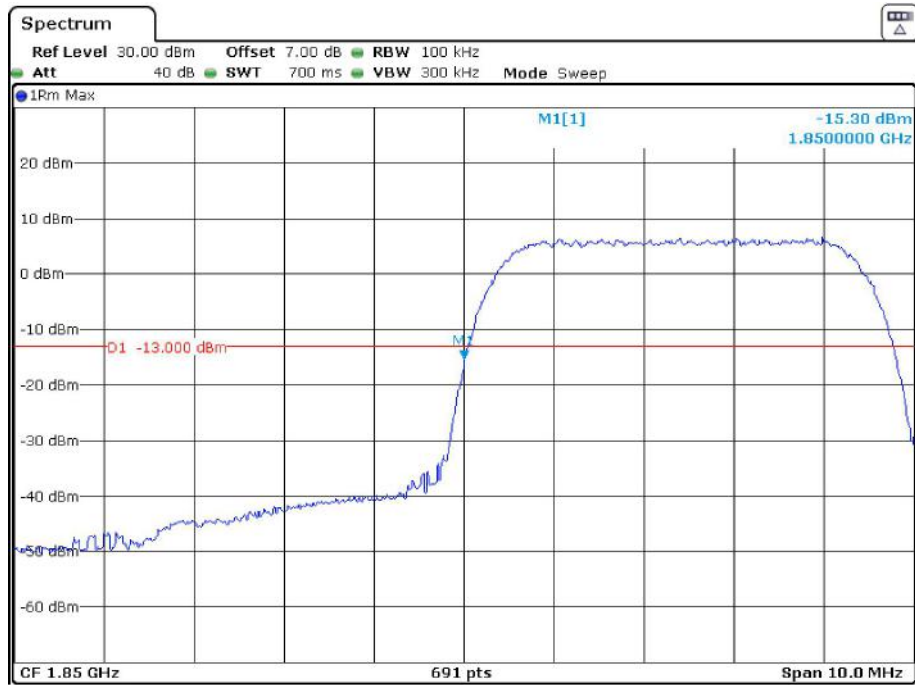
Date: 10.JAN.2022 20:38:01

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

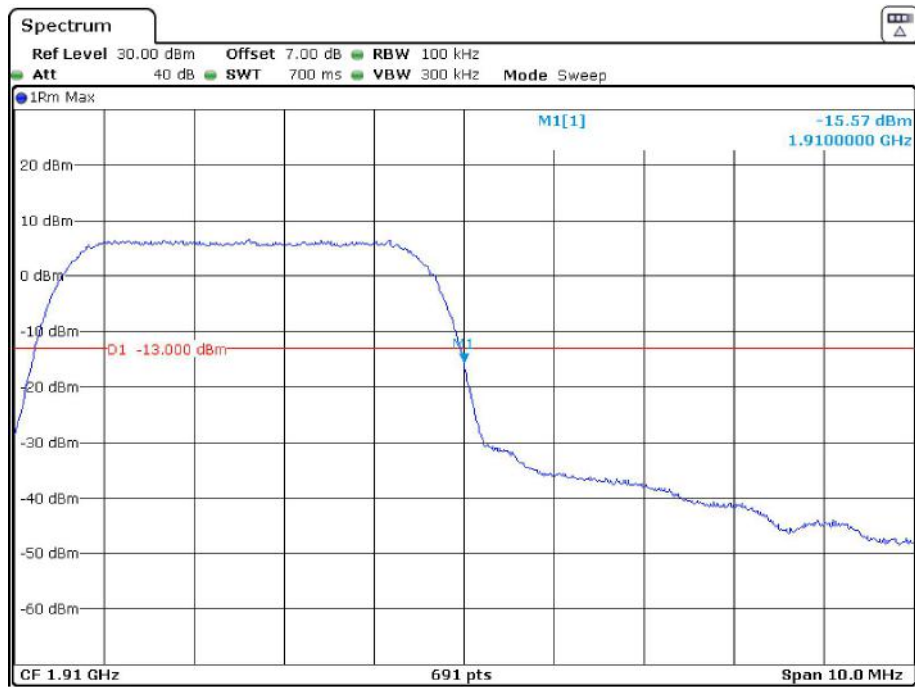


Date: 10.JAN.2022 20:38:51

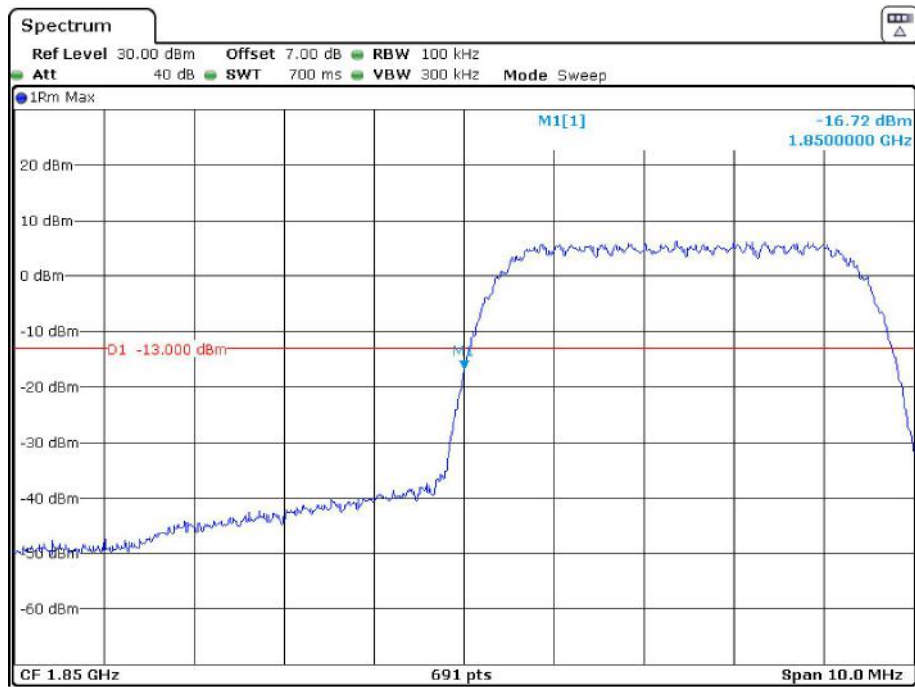
PCS Band, Left Band Edge for RMC (BPSK) Mode**PCS Band, Right Band Edge for RMC (BPSK) Mode**

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

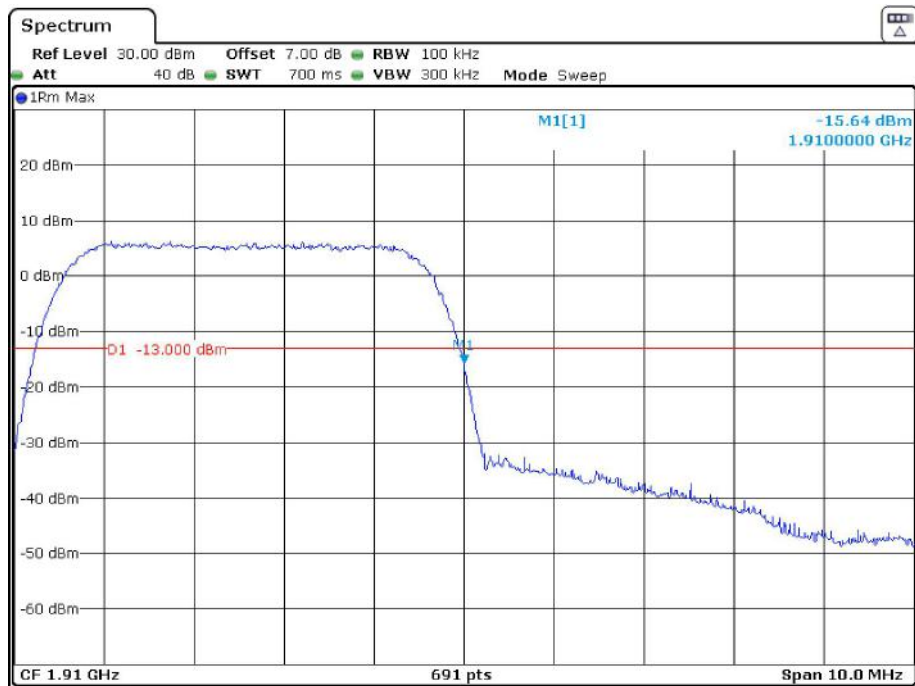
Date: 10.JAN.2022 20:18:46

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

Date: 10.JAN.2022 20:18:00

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

Date: 10.JAN.2022 20:19:39

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

Date: 10.JAN.2022 20:20:24

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

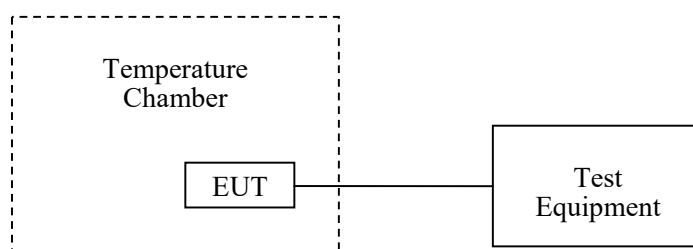
According to §24.235&§27.54, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

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:	25°C
Relative Humidity:	60 %
ATM Pressure:	101.0 kPa

The testing was performed by Paul liu from 2021-12-24 to 2022-01-10.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the following tables.

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

Middle Channel, $f_0 = 836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	N.V.	-1.97	-0.0024	2.5
-20		-2.29	-0.0027	2.5
-10		4.78	0.0057	2.5
0		6.13	0.0073	2.5
10		-3.56	-0.0043	2.5
20		3.67	0.0044	2.5
30		-1.53	-0.0018	2.5
40		-3.79	-0.0045	2.5
50		-3.06	-0.0037	2.5
20	L.V.	-2.26	-0.0027	2.5
	H.V.	-1.97	-0.0024	2.5

WCDMA Mode

Middle Channel, $f_0=836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	N.V.	8.75	0.0105	2.5
-20		3.71	0.0044	2.5
-10		-1.97	-0.0024	2.5
0		-4.86	-0.0058	2.5
10		-1.82	-0.0022	2.5
20		-5.69	-0.0068	2.5
30		-1.75	-0.0021	2.5
40		-4.34	-0.0052	2.5
50		0.47	0.0006	2.5
20	L.V.	1.08	0.0013	2.5
	H.V.	1.39	0.0017	2.5

PCS Band (Part 24E)**GSM Mode**

Middle Channel, $f_0=1880.0\text{ MHz}$				
Temperature (°C)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	N.V.	2.95	0.0016	pass
-20		2.95	0.0016	pass
-10		1.34	0.0007	pass
0		-3.72	-0.0020	pass
10		2.04	0.0011	pass
20		-5.36	-0.0029	pass
30		3.79	0.0020	pass
40		0.21	0.0001	pass
50		0.29	0.0002	pass
20	L.V.	0.67	0.0004	pass
	H.V.	1.38	0.0007	pass

WCDMA Mode

Middle Channel, $f_0=1880.0$ MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	N.V.	5.08	0.0027	pass
-20		5.07	0.0027	pass
-10		-1.42	-0.0008	pass
0		1.77	0.0009	pass
10		1.92	0.0010	pass
20		-4.23	-0.0023	pass
30		-1.62	-0.0009	pass
40		4.39	0.0023	pass
50		-1.15	-0.0006	pass
20	L.V.	-0.68	-0.0004	pass
	H.V.	0.05	0.0000	pass

LTE:
QPSK:
Band 2:

10.0 MHz Middle Channel, $f_0=1880$ MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	NV	-0.79	-0.0004	pass
-20		-0.79	-0.0004	pass
-10		-4.87	-0.0026	pass
0		1.40	0.0007	pass
10		-3.09	-0.0016	pass
20		-5.22	-0.0028	pass
30		0.80	0.0004	pass
40		1.02	0.0005	pass
50		0.10	0.0001	pass
20	LV	0.80	0.0004	pass
	HV	0.86	0.0005	pass

Band 4:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	1710.5141	1754.4817	1710	1755
-20		1710.5159	1754.4826	1710	1755
-10		1710.5196	1754.4823	1710	1755
0		1710.5193	1754.4860	1710	1755
10		1710.5163	1754.4836	1710	1755
20		1710.5189	1754.4844	1710	1755
30		1710.5152	1754.4807	1710	1755
40		1710.5172	1754.4846	1710	1755
50		1710.5154	1754.4856	1710	1755
20	L.V.	1710.5141	1754.4877	1710	1755
	H.V.	1710.5139	1754.4876	1710	1755

Band 7:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	2500.3469	2569.7491	2500	2570
-20		2500.3497	2569.7601	2500	2570
-10		2500.3376	2569.7459	2500	2570
0		2500.3359	2569.7363	2500	2570
10		2500.3461	2569.7508	2500	2570
20		2500.3358	2569.7082	2500	2570
30		2500.3286	2569.7167	2500	2570
40		2500.3087	2569.7457	2500	2570
50		2500.3070	2569.7467	2500	2570
20	L.V.	2500.3969	2569.7369	2500	2570
	H.V.	2500.3091	2569.7288	2500	2570

Band 12:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	699.0375	715.9630	699	716
-20		699.0369	715.9620	699	716
-10		699.0365	715.9679	699	716
0		699.0318	715.9664	699	716
10		699.0347	715.9647	699	716
20		699.0384	715.9675	699	716
30		699.0378	715.9665	699	716
40		699.0379	715.9693	699	716
50		699.0368	715.9654	699	716
20	L.V.	699.0338	715.9676	699	716
	H.V.	699.0374	715.9640	699	716

Band 17:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	704.2498	715.6114	704	716
-20		704.2438	715.6084	704	716
-10		704.2481	715.6088	704	716
0		704.2422	715.6114	704	716
10		704.2452	715.6105	704	716
20		704.2496	715.6133	704	716
30		704.2463	715.6134	704	716
40		704.2496	715.6143	704	716
50		704.2467	715.6101	704	716
20	L.V.	704.2415	715.6106	704	716
	H.V.	704.2471	715.6087	704	716

16QAM:**Band 2:**

10.0 MHz Middle Channel, $f_0=1880\text{MHz}$				
Temperature (°C)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	N.V.	3.67	0.0020	pass
-20		3.67	0.0020	pass
-10		-2.39	-0.0013	pass
0		-0.23	-0.0001	pass
10		6.83	0.0036	pass
20		-2.33	-0.0012	pass
30		4.54	0.0024	pass
40		3.40	0.0018	pass
50		3.36	0.0018	pass
20	L.V.	3.84	0.0020	pass
	H.V.	3.99	0.0021	pass

Band 4:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V_{DC})	F_L (MHz)	F_H (MHz)	F_L Limit (MHz)	F_H Limit (MHz)
-30	N.V.	1710.5366	1754.6211	1710	1755
-20		1710.5395	1754.6227	1710	1755
-10		1710.5341	1754.6251	1710	1755
0		1710.5394	1754.6244	1710	1755
10		1710.5366	1754.6232	1710	1755
20		1710.5410	1754.6273	1710	1755
30		1710.5394	1754.6223	1710	1755
40		1710.5339	1754.6214	1710	1755
50		1710.5377	1754.6261	1710	1755
20	L.V.	1710.5411	1754.6237	1710	1755
	H.V.	1710.5369	1754.6208	1710	1755

Band 7:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	2500.5098	2569.4167	2500	2570
-20		2500.5981	2569.4193	2500	2570
-10		2500.5970	2569.4074	2500	2570
0		2500.5879	2569.4172	2500	2570
10		2500.5998	2569.4885	2500	2570
20		2500.5871	2569.4526	2500	2570
30		2500.5980	2569.4512	2500	2570
40		2500.5968	2569.4084	2500	2570
50		2500.5969	2569.4105	2500	2570
20	L.V.	2500.5876	2569.4992	2500	2570
	H.V.	2500.5070	2569.4915	2500	2570

Band 12:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	699.2389	715.9475	699	716
-20		699.2395	715.9441	699	716
-10		699.2401	715.9444	699	716
0		699.2397	715.9436	699	716
10		699.2380	715.9456	699	716
20		699.2373	715.9437	699	716
30		699.2415	715.9461	699	716
40		699.2361	715.9437	699	716
50		699.2417	715.9429	699	716
20	L.V.	699.2403	715.9441	699	716
	H.V.	699.2416	715.9456	699	716

Band 17:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	704.2431	715.6102	704	716
-20		704.2441	715.6098	704	716
-10		704.2457	715.6079	704	716
0		704.2438	715.6073	704	716
10		704.2447	715.6072	704	716
20		704.2457	715.6091	704	716
30		704.2456	715.6081	704	716
40		704.2441	715.6088	704	716
50		704.2425	715.6098	704	716
20	L.V.	704.2420	715.6108	704	716
	H.V.	704.2447	715.6091	704	716

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