TEST REPORT

For

Mobile Phone

Model Number: V2352

FCC ID: 2AUCY-V2352

Report Number : WT248000637

Test Laboratory	:	Shenzhen Academy of Metrology and Quality Inspection
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Revision History

No	Date	Remark
V1.0	2024.05.07	Initial issue

Test report declaration

Applicant	:	vivo Mobile Communication Co., Ltd.
Address	:	No.1, vivo Road, Chang'an, Dongguan, Guangdong,China
Manufacturer	:	vivo Mobile Communication Co., Ltd.
Address	:	No.1, vivo Road, Chang'an, Dongguan, Guangdong,China
EUT Description	:	Mobile Phone
Model No.	:	V2352
Trade mark	:	vivo
FCC ID	:	2AUCY-V2352

Test Standards:
FCC PART 2, 22H , 24E , 27 & 90S

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the maximum emissions from the EUT. Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory is assumed full responsibility for the accuracy of the test results. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.26 (2015) & KDB971168 and the energy emitted by the sample EUT tested as described in this report is in compliance with FCC Rules Part 2, 22H, 24E, 27 & 90S.

The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Project Engineer:	(Zeng Wei 曾伟)	Date:	May 07, 2024
Checked by:	(Wan Xiaojing 万晓婧)	Date:	May 07, 2024
Approved by:	(Lin Bin 林斌)	Date:	May 07, 2024

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1. TEST RESULTS SUMMARY

No.	Test Description	FCC Part No.	Test Result	Test Verdict
1	Conducted Power & Effective Radiated Power	2.1046 22.913 24.232 27.50 90.635(b)	APPENDIX A	Pass
2	Peak to Average Radio	2.1046 24.232 27.50	APPENDIX A	Pass
3	Occupied Bandwidth & Emission Bandwidth	2.1049 22.917 24.238 27.53 90.209	APPENDIX A	Pass
4	Conducted Band Edge	2.1051 22.917 24.238 27.53 90.691 90.543	APPENDIX A	Pass
5	Conducted Spurious Emissions	2.1051 22.917 24.238 27.53 90.691 90.543	APPENDIX A	Pass
6	Frequency Stability	2.1055 22.355 24.235 27.54 90.213	APPENDIX A	Pass
7	Radiated Spurious Emissions	2.1053 22.917 24.238 27.53 90.691 90.543	APPENDIX B	Pass

2. GENERAL INFORMATION

2.1. Report information

This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that SMQ approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that SMQ in any way guarantees the later performance of the product/equipment.

The samples mentioned in this report is/are supplied by Applicant, SMQ therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through SMQ, unless the applicant has authorized SMQ in writing to do so.

The lab will not be liable for any loss or damage resulting from false, inaccurate, inappropriate or incomplete product information provided by the applicant/manufacturer.

2.2. Laboratory Accreditation and Relationship to Customer

The testing report were performed by the Shenzhen Academy of Metrology and quality Inspection EMC Laboratory (Guangdong EMC compliance testing center), in their facilities located at NETC Building, No.4 Tongfa Rd., Xili, Nanshan, Shenzhen, China.
At the time of testing, Laboratory is accredited by the following organizations:
China National Accreditation Service for Conformity Assessment (CNAS) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is CNAS L0579.
The Laboratory is Accredited Testing Laboratory of FCC with Designation number CN1165 and Site registration number 582918.
The Laboratory is registered to perform emission tests with Innovation, Science and Economic Development (ISED), and the registration number is 11177A.
The Laboratory is registered to perform emission tests with VCCI, and the registration number are C-20048, G20076, R-20077, R-20078, and T-20047.
The Laboratory is Accredited Testing Laboratory of American Association for Laboratory Accreditation (A2LA) and certificate number is 3292.01.

3. PRODUCT DESCRIPTION

3.1. EUT Description

Hardware Revision:	MP_0.1	
Software Revision:	PD2365F_EX_A_14.0.5.3.W30	
Tx Frequency:	GSM850:	824 ~ 849 MHz
	PCS1900:	1850 ~ 1910 MHz
	WCDMA Band V:	824 ~ 849 MHz
	WCDMA Band IV:	1710 ~ 1755 MHz
	WCDMA Band II:	1850 ~ 1910 MHz
	LTE Band 2:	1850 ~ 1910 MHz
	LTE Band 4:	1710 ~ 1755 MHz
	LTE Band 5:	824 ~ 849 MHz
	LTE Band 7:	2500 ~ 2570 MHz
	LTE Band 13:	777 ~ 787 MHz
	LTE Band 26:	814 ~ 849 MHz
	LTE Band 38:	2570 ~ 2620 MHz
	LTE Band 41:	2496 ~ 2690 MHz
	LTE Band 66:	1710 ~ 1780 MHz
Rx Frequency:	GSM850:	869 ~ 894 MHz
	PCS1900:	1930 ~ 1990 MHz
	WCDMA Band V:	869 ~ 894 MHz
	WCDMA Band IV:	2110 ~ 2155 MHz
	WCDMA Band II:	1930 ~ 1990 MHz
	LTE Band 2:	1930 ~ 1990 MHz
	LTE Band 4:	2110 ~ 2155 MHz
	LTE Band 5:	869 ~ 894 MHz
	LTE Band 7:	2620 ~ 2690 MHz
	LTE Band 13:	746 ~ 756 MHz
	LTE Band 26:	859 ~ 894 MHz
	LTE Band 38:	2570 ~ 2620 MHz
	LTE Band 41:	2496 ~ 2690 MHz
	LTE Band 66:	2110 ~ 2180 MHz
Type(s) of Modulation:	GSM: GMSK, 8PSK WCDMA: QPSK LTE: QPSK, 16QAM, 64QAM	
Power Supply Voltage:	DC: 3.7 V (Low) / 3.91 V (Nominal) / 4.4 V (Max)	

Antenna Gain (dBi)		Ant 13 Top antenna	Ant 31 Bottom antenna
GSM 850	824 - 849 MHz	**-5.10**	-6.93
PCS 1900	1850 - 1910 MHz	-1.57	**-1.44**
WCDMA band 2	1850 -1910 MHz	-1.57	**-1.44**
WCDMA band 4	1710 -1755MHz	**-1.23**	-3.92
WCDMA band 5	824 - 849MHz	**-4.20**	-4.20
LTE band 2	1850 - 1910 MHz	-1.57	**-1.44**
LTE band 4	1710 - 1755 MHz	**-1.23**	-3.92
LTE band 5	824 - 849 MHz	**-4.20**	-4.20
LTE band 7	2500 - 2570 MHz	0.04	**0.41**
LTE band 13	777 - 787 MHz	**-5.76**	-9.65
LTE band 26	814 - 849 MHz	**-4.32**	-7.07
LTE band 38	2570 - 2620 MHz	**0.04**	-0.13
LTE band 41	2496 - 2690 MHz	-0.40	**-0.13**
LTE band 66	1710 - 1780 MHz	**-1.18**	-3.87

NOTE:

1. The extreme test conditions for temperature and antenna gain were declared by the manufacturer.
2. The port of Top antenna was chosen as representative port to perform the worst case of conducted test.
3. Both bottom and top antennas support transmission (1TX2RX). The EUT doesn't support UL-MIMO mode of GSM, WCDMA and LTE.
4. There are two types of shielding covers for the EUT mainboard, see the internal photos for details.

3.2. Identification of Accessory equipment

AE #	Type	Manufacturer	Model	Serial Number
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3.3. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: 2AUCY-V2352 filing to comply with FCC PART 2, 22H, 24E, 27 and 90S.

3.4. Operating Condition of EUT

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission (Y plane).
Radiated spurious emissions were investigated below 30MHz, 30MHz-1GHz and above 1GHz.There were no emissions found on below 30MHz and 30MHz-1GHz.

TM1: GSM Mode with GMSK Modulation
TM2: EDGE Mode with 8PSK Modulation
TM3: WCDMA Mode with QPSK Modulation
TM4: LTE Mode with QPSK Modulation
TM5: LTE Mode with 16QAM Modulation
TM6: LTE Mode with 64QAM Modulation

3.5. Frequency List

Test Mode	UL Channel	UL Channel No.	UL Frequency (MHz)
GSM/GPRS/EGPRS 850	Low Channel	128	824.2
	Middle Channel	190	836.6
	High Channel	251	848.8
GSM/GPRS/EGPRS 1900	Low Channel	512	1850.2
	Middle Channel	661	1880.0
	High Channel	810	1909.8
WCDMA Band II	Low Channel	9262	1852.4
	Middle Channel	9400	1880.0
	High Channel	9538	1907.6
WCDMA Band Ⅳ	Low Channel	1312	1712.4
	Middle Channel	1412	1732.4
	High Channel	1513	1752.6
WCDMA Band Ⅴ	Low Channel	4132	826.4
	Middle Channel	4182	836.4
	High Channel	4233	846.6

Test Mode	UL Channel	Channel Bandwidth (MHz)	UL Channel No.	UL Frequency (MHz)
LTE Band 2	Low Range	1.4	18607	1850.7
		3	18615	1851.5
		5	18625	1852.5
		10	18650	1855
		15	18675	1857.5
		20	18700	1860
	Middle Range	1.4/3/5/10/15/20	18900	1880
	High Range	1.4	19193	1909.3
		3	19185	1908.5
		5	19175	1907.5
		10	19150	1905
		15	19125	1902.5
		20	19100	1900
LTE Band 4	Low Range	1.4	19957	1710.7
		3	19965	1711.5
		5	19975	1712.5
		10	20000	1715
		15	20025	1717.5
		20	20050	1720
	Middle Range	1.4/3/5/10/15/20	20175	1732.5
	High Range	1.4	20393	1754.3
		3	20385	1753.5
		5	20375	1752.5
		10	20350	1750
		15	20325	1747.5
		20	20300	1745

Test Mode	UL Channel	Channel Bandwidth (MHz)	UL Channel No.	UL Frequency (MHz)
LTE Band 7	Low Range	5	20775	2502.5
		10	20800	2505
		15	20825	2507.5
		20	20850	2510
	Middle Range	5/10/15/20	21100	2535
	High Range	5	21425	2567.5
		10	21400	2565
		15	21375	2562.5
		20	21350	2560
LTE Band 38	Low Range	5	37775	2572.5
		10	37800	2575
		15	37825	2577.5
		20	37850	2580
	Middle Range	5/10/15/20	38000	2595
	High Range	5	38225	2617.5
		10	38200	2615
		15	38175	2612.5
		20	38150	2610
LTE Band 41	Low Range	5	39675	2498.5
		10	39700	2501
		15	39725	2503.5
		20	39750	2506
	Middle Range	5/10/15/20	40620	2593
	High Range	5	41565	2687.5
		10	41540	2685
		15	41515	2682.5
		20	41490	2680

Test Mode	UL Channel	Channel Bandwidth (MHz)	UL Channel No.	UL Frequency (MHz)
LTE Band 13	Low Range	5	23205	779.5
	Middle Range	5/10	23230	782
	High Range	5	23255	784.5
LTE Band 26 (824 - 849 MHz)	Low Range	1.4	26797	824.7
		3	26805	825.5
		5	26815	826.5
		10	26840	829
		15	26865	831.5
	Middle Range	1.4/3/5/10/15	26915	836.5
	High Range	1.4	27033	848.3
		3	27025	847.5
		5	27015	846.5
		10	26990	844
		15	26965	841.5
LTE Band 26 (814 - 824 MHz)	Low Range	1.4	26697	814.7
		3	26705	815.5
		5	26715	816.5
	Middle Range	1.4/3/5/10	26740	819
	High Range	1.4	26783	823.3
		3	26775	822.5
		5	26765	821.5

Note: FCC rule Part 22.905 of LTE Band 26 (824-849MHz) is covered by LTE band 5 of same rule, since they have the same output power and supported bandwidths. In this report, only test FCC rule Part 90S of LTE Band 26 (814-824MHz) and Part 22.905 of LTE Band 26 (824-849MHz) bandwidth 15MHz.

Test Mode	UL Channel	Channel Bandwidth (MHz)	UL Channel No.	UL Frequency (MHz)
LTE Band 5	Low Range	1.4	20407	824.7
		3	20415	825.5
		5	20425	826.5
		10	20450	829
	Middle Range	1.4/3/5/10	20525	836.5
	High Range	1.4	20643	848.3
		3	20635	847.5
		5	20625	846.5
		10	20600	844

Test Mode	UL Channel	Channel Bandwidth (MHz)	UL Channel No.	UL Frequency (MHz)
LTE Band 66	Low Range	1.4	131979	1710.7
		3	131987	1711.5
		5	131997	1712.5
		10	132022	1715
		15	132047	1717.5
		20	132072	1720
	Middle Range	1.4/3/5/10/15/20	132322	1745
	High Range	1.4	132665	1779.3
		3	132657	1778.5
		5	132647	1777.5
		10	132622	1775
		15	132597	1772.5
		20	132572	1770

3.6. Max EIRP / ERP

Mode	Maximum EIRP/ERP (dBm)
GSM850	25.78
PCS1900	28.34
WCDMA Band V	18.28
WCDMA Band IV	22.13
WCDMA Band II	22.34
LTE Band 2	22.10
LTE Band 4	22.11
LTE Band 5	18.03
LTE Band 7	23.75
LTE Band 13	16.19
LTE Band 26 (814 - 824 MHz)	17.90
LTE Band 26 (824 - 849 MHz)	17.84
LTE band 38	23.64
LTE band 41	23.58
LTE band 66	22.11

Note: FCC rule Part 22.905 of LTE Band 26 (824-849MHz) is covered by LTE band 5 of same rule, since they have the same output power and supported bandwidths. In this report, only test FCC rule Part 90S of LTE Band 26 (814-824MHz) and Part 22.905 of LTE Band 26 (824-849MHz) bandwidth 15MHz.

3.7. Environmental Conditions

Date of test：2024.04.03 – 2024.04.19, 2024.05.07

Date of EUT Receive：2024.04.02

Temperature: (22-26) °C
Relative Humidity: (44-51) %
Air Pressure: (100.7-101.9) kPa

3.8. Special Accessories

Not available for this EUT intended for grant.

3.9. Equipment Modifications

Not available for this EUT intended for grant.

4. TEST EQUIPMENT USED

Conducted test equipment

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
SB18827	Wideband Radio communication Tester	Rohde & Schwarz	CMW500	2023.04.24	1 Year
SB18827	Wideband Radio communication Tester	Rohde & Schwarz	CMW500	2024.04.22	1 Year
SB9721/02	Signal Analyzer	Agilent	N9020A	2023.04.24	1 Year
SB9721/02	Signal Analyzer	Agilent	N9020A	2024.04.22	1 Year
SB20321/01	Signal Analyzer	Rohde & Schwarz	FSV3044	2023.04.24	1 Year
SB20321/01	Signal Analyzer	Rohde & Schwarz	FSV3044	2024.04.22	1 Year
SB9721/07	DC Power Supply	Agilent	66319D	--	--
SB11818	Temperature & Humidity Test chamber	Espec	EH-010U	2023.11.28	1 Year
--	Test Software	Tonscend	JS1120 Ver.3.1.46	--	--

Radiated spurious test equipment

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
SB8501/09	EMI Test Receiver	Rohde & Schwarz	ESU40	2024.01.17	1 Year
SB9054/08	Bilog Antenna	Schwarzbeck	VULB9163	2023.05.30	1 Year
SB3435	Horn Antenna	Rohde & Schwarz	HF906	2023.11.21	1 Year
SB8501/11	Horn Antenna	ETS-Lindgren	3160-09	2023.02.22	3 Year
SB8501/12	Horn Antenna	ETS-Lindgren	3160-10	2023.02.22	3 Year
SB8501/14	Preamplifier	Rohde & Schwarz	SCU-03	2024.01.29	1 Year
SB8501/17	Preamplifier	Rohde & Schwarz	SCU-18	2024.01.09	1 Year
SB8501/16	Preamplifier	Rohde & Schwarz	SCU-26	2024.01.16	1 Year
SB9059	Preamplifier	Rohde & Schwarz	SCU-40	2023.08.21	1 Year
SB12724/06	Wideband Radio communication Tester	Rohde & Schwarz	CMW500	2023.04.24	1 Year
SB12724/06	Wideband Radio communication Tester	Rohde & Schwarz	CMW500	2024.04.22	1 Year
--	Radiated Test Software	Rohde & Schwarz	EMC 32 Ver.9.26.01	--	--
SB9555/02	Fully Anechoic Chamber	Albatross	10.0*5.2*5.4(m)	2023.08.15	1 Year
SB15044/01	Test Receiver	Rohde & Schwarz	ESW8	2023.09.12	1 Year
SB12944	Broadband Antenna	Rohde & Schwarz	VULB9163	2023.09.12	1 Year
SB18844	Semi Anechoic Chamber	Albatross	9×6×6(m)	2023.03.19	1 Year

5. MEASUREMENT UNCERTAINTY

For a 95% confidence level (k = 2), the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:

26dB & Occupied Bandwidth: ±0.39%

Frequency Stability: ±0.42%

Peak to Average Ratio: ±0.45 dB

Conducted power: ±0.3 dB

Conducted Spurious Emissions: ±2.0 dB

Conducted Band Edge: ±2.0 dB

Temperature: ±0.698 °C

Supply voltages: ±0.15%

Radiated Emission:
30MHz~1000MHz 4.5dB
1GHz~6GHz 4.6dB
6GHz~18GHz 5.1dB
18GHz~26.5GHz 5.1dB

6. TEST ITEMS

6.1. Conducted Power & Effective Radiated Power

6.1.1. Test Standard

FCC: CFR Part 2.1046, CFR Part 22.913, CFR Part 24.232 CFR Part 27.50, CFR Part 90.635

6.1.2. Test Limit

22.913 (a) Effective radiated power limits.
The effective radiated power (ERP) of mobile transmitters must not exceed 7 Watts.

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.

27.50(a) (3), for mobile and portable stations transmitting in the 2305-2315MHz band or the 2350-2360MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP LTE standards.

27.50(b) (10), portable stations (hand-held devices) transmitting in the 746-757MHz, 776-788MHz, and 805-806MHz bands are limited to 3 watts ERP.
FCC section 27.50(c) (10), portable stations (hand-held devices) in the 600MHz uplink band and the 698-746MHz band, and fixed and mobile stations in the 600MHz uplink band are limited to 3 watts ERP.

27.50(d) (4), 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. Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications. (7) Fixed, mobile, and portable (hand-held) stations operating in the 2000-2020 MHz band are limited to 2 watts EIRP.

27.50(h) (2), for mobile and other user stations, mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

90.635(b), the maximum output power of the transmitter for mobile stations is 100 watts (20dBW).

6.1.3.Test Procedure

KDB 971168 Section 5.6
EIRP (dBm) = ERP (dBm) + 2.15 (dB)
ERP/EIRP = PMeas + GT − LC
where: ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm);

PMeas = measured transmitter output power or PSD, in dBm or dBW;
GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);
LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

For devices utilizing multiple antennas, KDB 662911 provides guidance for determining the effective array transmit antenna gain term to be used in the above equation.
EUT includes different power levels for head use configuration and body use configuration and the below tables contain the highest of all configurations average conducted and ERP/EIRP output powers.

6.1.4.Test Data

Please refer to Appendix A

6.2. Peak to Average Radio

6.2.1. Test Standard

FCC: CFR 47 (FCC) Part 22.913, 24.232(d) & 27.50(d)

6.2.2. Test Limit

The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

6.2.3. Test Procedure

According to KDB 971168 D01, there is CCDF procedure for PAPR:
Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;

Set resolution/measurement bandwidth ≥ signal `s occupied bandwidth;

Set the number of counts to a value that stabilizes the measured CCDF curve;

Set the measurement interval as follows:

for continuous transmissions, set to 1 ms,

for burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.
Record the maximum PAPR level associated with a probability of 0.1%.

Alternate procedure for PAPR:

Use one of the procedures presented in 4.1 to measure the total peak power and record as PPk. Use one of the applicable procedures presented 4.2 to measure the total average power and record as PAvg. Both the peak and average power levels must be expressed in the same logarithmic units (e.g., dBm). Determine the PAPR from:
PAPR (dB) = PPk (dBm) - PAvg (dBm).

6.2.4. Test Data

Please refer to Appendix A

6.3. Occupied Bandwidth & Emission Bandwidth

6.3.1. Test Standard

FCC: CFR Part 2.1049, Part 22.913, Part 24.238, Part 27.53

6.3.2. Test Limit

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the following conditions as applicable.
Transmitters employing digital modulation techniques-when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated.

6.3.3. Test Procedure

1. Connect the equipment as shown in the above diagram.
2. Adjust the settings of the Universal Radio Communication Tester (CMU/CMW) to set the EUT to its maximum power at the required channel.
3. Set the spectrum analyzer to measure the 99% occupied bandwidth. Record the value.
4. Set the spectrum analyzer to measure the -26 dB emission bandwidth. Record the value.
5. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.

Spectrum analyzer settings: Measurement bandwidth of at least 1% of the occupied bandwidth.

6.3.4. Test Data

Please refer to Appendix A

6.4. Conducted Band Edge

6.4.1. Test Standard

FCC § 2.1051 & 22.917(a) & 24.238(a) & 27.53(a) & 27.53(c) & 27.53(g) & 27.53(h) & 27.53(m) & 90.691& 90.543

6.4.2. Test Limit

In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.
The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

FCC § 22.917(a) & 24.238(a)
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. This is calculated to be -13 dBm.

FCC § 27.53(a) (4)
For mobile and portable stations operating in the 2305-2315MHz and 2350-2360MHz bands:
By a factor of not less than: 43 + 10 log (P) dB on all frequencies between 2305 and 2320MHz and on all frequencies between 2345 and 2360MHz that are outside the licensed band(s) of operation, not less than 55 + 10 log (P) dB on all frequencies between 2320 and 2324MHz and on all frequencies between 2341 and 2345MHz, not less than 61 + 10 log (P) dB on all frequencies between 2324 and 2328MHz and on all frequencies between 2337 and 2341MHz, and not less than 67 + 10 log (P) dB on all frequencies between 2328 and 2337MHz.
By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305MHz, 55 + 10 log (P) dB on all frequencies between 2296 and 2300MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292MHz, and 70 + 10 log (P) dB below 2288MHz.
By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365MHz, and not less than 70 + 10 log (P) dB above 2365MHz.

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:
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;
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;
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;
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;
Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater.
However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;
Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

FCC § 27.53(g)
For operations in the 600MHz band and the 698-746MHz band, the power of any emission outside a 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, by at least 43+10*log(P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz bands immediately outside and adjacent to a licensee’s frequency block, a resolution bandwidth of at least 30 kHz may be employed.

FCC § 27.53(h) (1)
Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.

FCC § 27.53(m) (4)
For mobile digital stations (BRS and EBS stations), the attenuation factor shall be not less than:
40+10logP dB (−10 dBm, 100 nW) on all frequencies between the channel edge and 5 MHz from the channel edge.
43+10logP dB (−13 dBm, 50 nW) on all frequencies between 5 MHz and X MHz from the channel edge,
55+10logP dB (−25 dBm, 3 nW) on all frequencies more than X MHz from the channel edge, where X is the greater of 6 MHz or the actual emission bandwidth (26 dB).
In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

FCC § 90.691

Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50 + 10 Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

FCC § 90.543

(e) For operations in the 758–768 MHz and the 788–798 MHz bands, 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:

On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations.

On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

On any frequency between 775–788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.

Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

6.4.3.Test Procedure

1. Connect the equipment as shown in the above diagram with the EUT's antenna in a horizontal orientation.
2. Adjust the settings of the Wideband Radio Communication Tester to set the EUT to its maximum power at the required channel.
3. Set the spectrum analyzer to measure peak hold with the required settings.
4. Place the measurement antenna in a horizontal orientation. Rotate the EUT 360 . Raise the measurement antenna up to 4 meters in 0.5 meters increments and rotate the EUT 360 at each height to maximize all emissions. Measure and record all spurious emissions (LVL) up to the tenth harmonic of the carrier frequency.
5. Replace the EUT with a horizontally polarized half wave dipole or known gain antenna. The center of the antenna should be at the same location as the center of the EUT's antenna.
6. Connect the antenna to a signal generator with known output power and record the path loss in dB (LOSS). LOSS = Generator Output Power (dBm) – Analyzer reading (dBm).
7. Determine the level of spurious emissions using the following equation:
Spurious (dBm) = LVL (dBm) + LOSS (dB):
8. Repeat steps 4, 5 and 6 with all antennas vertically polarized.
9. Determine the level of spurious emissions using the following equation:
Spurious (dBm) = LVL (dBm) + LOSS (dB):
10. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.

(Note: Steps 5 and 6 above are performed prior to testing and LOSS is recorded by test software. Steps 3, 4 and 7 above are performed with test software.)
Spectrum analyzer settings: RBW=1MHz, VBW=3*RBW

6.4.4.Test Data

Please refer to Appendix A

6.5. Conducted Spurious Emissions

6.5.1. Test Standard

FCC § 2.1051 & 22.917(a) & 24.238(a) & 27.53(a) & 27.53(c) & 27.53(f) & 27.53(g) & 27.53(h) & 27.53(m) & 90.691 & 90.543.

6.5.2. Test Limit

In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.
The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

FCC § 22.917(a) & 24.238(a)
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. This is calculated to be -13 dBm.

FCC § 27.53(a) (4)
For mobile and portable stations operating in the 2305-2315MHz and 2350-2360MHz bands:
By a factor of not less than: 43 + 10 log (P) dB on all frequencies between 2305 and 2320MHz and on all frequencies between 2345 and 2360MHz that are outside the licensed band(s) of operation, not less than 55 + 10 log (P) dB on all frequencies between 2320 and 2324MHz and on all frequencies between 2341 and 2345MHz, not less than 61 + 10 log (P) dB on all frequencies between 2324 and 2328MHz and on all frequencies between 2337 and 2341MHz, and not less than 67 + 10 log (P) dB on all frequencies between 2328 and 2337MHz.
By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305MHz, 55 + 10 log (P) dB on all frequencies between 2296 and 2300MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292MHz, and 70 + 10 log (P) dB below 2288MHz.
By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365MHz, and not less than 70 + 10 log (P) dB above 2365MHz.

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:
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;
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;
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;
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;
Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater.
However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;
Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

FCC § 27.53(g)
For operations in the 600MHz band and the 698-746MHz band, the power of any emission outside a 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, by at least 43+10*log(P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz bands immediately outside and adjacent to a licensee’s frequency block, a resolution bandwidth of at least 30 kHz may be employed.

FCC § 27.53(h) (1)
Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the
power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.

FCC § 27.53(m) (4)
For mobile digital stations (BRS and EBS stations), the attenuation factor shall be not less than:
40+10logP dB (−10 dBm, 100 nW) on all frequencies between the channel edge and 5 MHz from the channel edge.
43+10logP dB (−13 dBm, 50 nW) on all frequencies between 5 MHz and X MHz from the channel edge,
55+10logP dB (−25 dBm, 3 nW) on all frequencies more than X MHz from the channel edge, where X is the greater of 6 MHz or the actual emission bandwidth (26 dB).
In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

FCC § 90.691

Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50 + 10 Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

FCC § 90.543

(e) For operations in the 758–768 MHz and the 788–798 MHz bands, 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:

On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations.

On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

On any frequency between 775–788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.

Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

6.5.3.Test Procedure

1. Connect the equipment as shown in the above diagram.
2. Set the spectrum analyzer to measure peak hold with the required settings.
3. Set the signal generator to a known output power and record the path loss in dB (LOSS) for frequencies up to the tenth harmonic of the EUT's carrier frequency. LOSS = Generator Output Power (dBm) – Analyzer reading (dBm).
4. Replace the signal generator with the EUT.
5. Adjust the settings of the Universal Radio Communication Tester to set the EUT to its maximum power at the required channel.
6. Set the spectrum analyzer to measure peak hold with the required settings. Offset the spectrum analyzer reference level by the path loss measured above.
7. Measure and record all spurious emissions up to the tenth harmonic of the carrier frequency.
8. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.
9. If necessary steps 6 and 7 may be performed with the spectrum analyzer set to average detector.

(Note: Step 3 above is performed prior to testing and LOSS is recorded by test software. Steps 2, 6, and 7 above are performed with test software.)

6.5.4.Test Data

Please refer to Appendix A

6.6. Frequency Stability

6.6.1. Test Standard

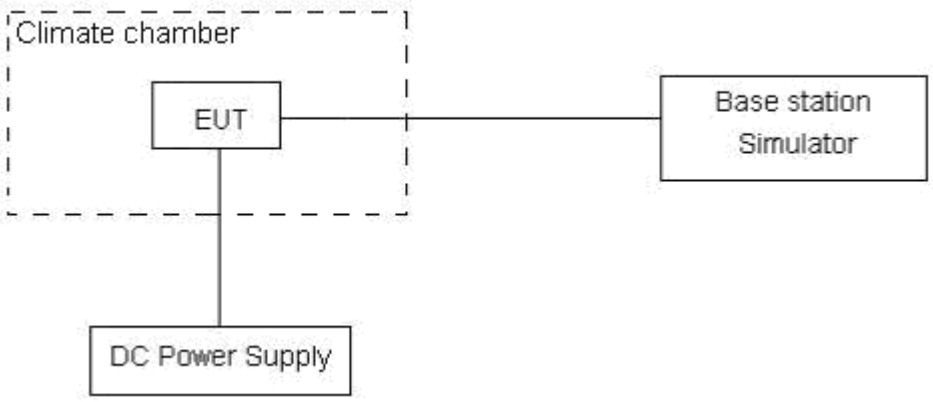
FCC § 2.1055 & 22.355 & 24.235 & 27.54 & 90.213.

6.6.2. Test Limit

According to part 22.355, from 821MHz to 896MHz, for mobile device, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances 2.5ppm.
FCC: §24.235 & §27.54
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. Test Setup

Frequency Stability (Temperature Variation)
The temperature inside the climate chamber is varied from -30°C to +50°C in 10°C step size,
(1) With all power removed, the temperature was decreased to 0°C and permitted to stabilize for three hours.
(2) Measure the carrier frequency with the test equipment in a “call mode”. These measurements should be made within 1 minute of powering up the mobile station, to prevent significant self warming.
(3) Repeat the above measurements at 10°C increments from -30°C to +50°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

Frequency Stability (Voltage Variation)
The frequency stability shall be measured with variation of primary supply voltage as follows:
(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.
(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery-operating end point which shall be specified by the manufacturer.



6.6.3.Test Data

Please refer to Appendix A

6.7. Radiated Spurious Emissions

6.7.1. Test Standard

FCC § 2.1053 & 22.917(a) & 24.238(a) & 27.53(a) & 27.53(c) & 27.53(f) & 27.53(g) & 27.53(h) & 27.53(m) & 90.691& 90.543.

6.7.2. Test Limit

The radio frequency voltage or power generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in FCC 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.
(a) Out of band emissions. 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. For all power levels +30dBm to 0dBm, this becomes a constant specification of -13dBm.

§22.917:
The rules in this section govern the spectral characteristics of emissions in the Cellular Radio telephone Service.
(b) Measurement procedure. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz of 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

§24.238:
The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service.
(b) Measurement procedure. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz of 1 percent of emission bandwidth, as

specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

§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;
(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a 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, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.
(h) AWS emission limits—(1) General protection levels. Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.
(m)(4) For mobile digital stations, the attenuation factor shall be not less than 43 + 10 log (P)dB at the channel edge and 55 + 10 log (P) dB at 5.5 megahertz from the channel edges.(Channel edges are defined under §27.5 (i) Frequency assignment for the BRS/EBS band)
(m)(6) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz of 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center

frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

FCC § 90.691
Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:
For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50 + 10 Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.
For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.
When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

FCC § 90.543
(e) For operations in the 758–768 MHz and the 788–798 MHz bands, 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:
On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations.
On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.
On any frequency between 775–788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.
Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

6.7.3.Test Procedure

1. Connect the equipment as shown in the above diagram with the EUT's antenna in a horizontal orientation.
2. Adjust the settings of the Wideband Radio Communication Tester (CMW500) to set the EUT to its maximum power at the required channel.
3. Set the spectrum analyzer to measure peak hold with the required settings.
4. Place the measurement antenna in a horizontal orientation. Rotate the EUT 360.

Raise the measurement antenna up to 4 meters in 0.5 meters increments and rotate the EUT 360 at each height to maximize all emissions. Measure and record all spurious emissions (LVL) up to the tenth harmonic of the carrier frequency.

5. Replace the EUT with a horizontally polarized half wave dipole or known gain antenna. The center of the antenna should be at the same location as the center of the EUT's antenna.
6. Connect the antenna to a signal generator with known output power and record the path loss in dB (LOSS). LOSS = Generator Output Power (dBm) – Analyzer reading (dBm).
7. Determine the level of spurious emissions using the following equation:

Spurious (dBm) = LVL (dBm) + LOSS (dB):

8. Repeat steps 4, 5 and 6 with all antennas vertically polarized.
9. Determine the level of spurious emissions using the following equation:

Spurious (dBm) = LVL (dBm) + LOSS (dB):

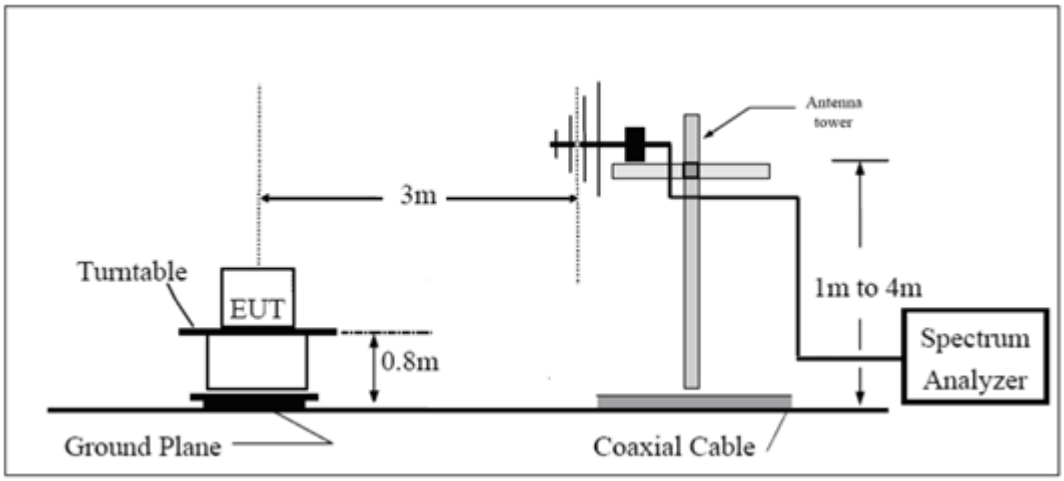
10. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.

(Note: Steps 5 and 6 above are performed prior to testing and LOSS is recorded by test software. Steps 3, 4 and 7 above are performed with test software.)

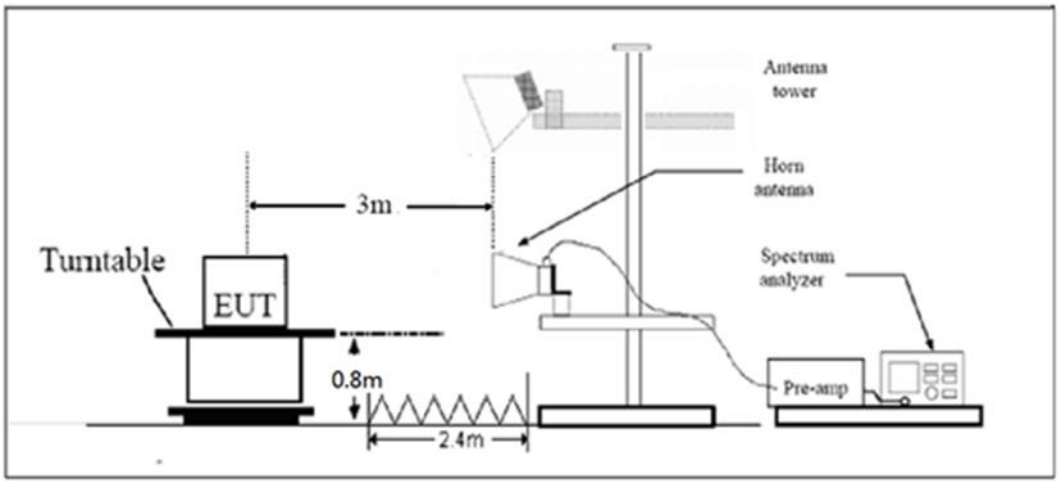
Spectrum analyzer settings: RBW=VBW=1MHz

6.7.4.Test Setup

For Radiated test from 30MHz to 1GHz



For Radiated test above 1GHz



6.7.5.Test Data

Please refer to Appendix B

APPENDIX A-1. TEST RESULTS OF CONDUCTED TEST – GSM / WCDMA

CONDUCTED POWER & EFFECTIVE RADIATED POWER

Test Result

GSM:

Band	Channel	Frequency (MHz)	Conducted Power(dBm)	ERP/EIRP (dBm)	Limit(dBm)	Verdict
GSM850	128	824.2	32.99	25.74	38.5	PASS
GSM850	190	836.6	32.94	25.69	38.5	PASS
GSM850	251	848.8	32.91	25.66	38.5	PASS
GSM1900	512	1850.2	29.75	28.31	33	PASS
GSM1900	661	1880	29.72	28.28	33	PASS
GSM1900	810	1909.8	29.64	28.2	33	PASS
GPRS850	128	824.2	33.03	25.78	38.5	PASS
GPRS850	190	836.6	32.87	25.62	38.5	PASS
GPRS850	251	848.8	32.79	25.54	38.5	PASS
GPRS1900	512	1850.2	29.78	28.34	33	PASS
GPRS1900	661	1880	29.74	28.3	33	PASS
GPRS1900	810	1909.8	29.7	28.26	33	PASS
EGPRS850	128	824.2	26.26	19.01	38.5	PASS
EGPRS850	190	836.6	26.01	18.76	38.5	PASS
EGPRS850	251	848.8	26.12	18.87	38.5	PASS
EGPRS1900	512	1850.2	25.52	24.08	33	PASS
EGPRS1900	661	1880	25.49	24.05	33	PASS
EGPRS1900	810	1909.8	25.56	24.12	33	PASS

Band: GSM850	Measured (dBm)		
Test Condition	TNVN		
Channel	128	190	251
Frequency (MHz)	824.2	836.6	848.8
GSM (GMSK, 1 Tx slot)	32.99	32.94	32.91
GPRS (GMSK, 1 Tx slot)	33.03	32.87	32.79
GPRS (GMSK, 2 Tx slots)	31.46	31.39	31.30
GPRS (GMSK, 3 Tx slots)	29.35	29.34	29.23
GPRS (GMSK, 4 Tx slots)	28.34	28.35	28.26
EDGE (8PSK, 1 Tx slot)	26.26	26.01	26.12
EDGE (8PSK, 2 Tx slots)	23.80	23.71	23.77
EDGE (8PSK, 3 Tx slots)	21.31	21.26	21.34
EDGE (8PSK, 4 Tx slots)	19.88	19.80	19.86

Band: PCS1900	Measured (dBm)		
Test Condition	TNVN		
Channel	512	661	810
Frequency (MHz)	1850.2	1880	1909.8
GSM (GMSK, 1 Tx slot)	29.75	29.72	29.64
GPRS (GMSK, 1 Tx slot)	29.78	29.74	29.70
GPRS (GMSK, 2 Tx slots)	28.21	28.20	28.12
GPRS (GMSK, 3 Tx slots)	26.19	26.17	26.10
GPRS (GMSK, 4 Tx slots)	25.23	25.22	25.14
EDGE (8PSK, 1 Tx slot)	25.52	25.49	25.56
EDGE (8PSK, 2 Tx slots)	23.43	23.51	23.65
EDGE (8PSK, 3 Tx slots)	21.29	21.38	21.45
EDGE (8PSK, 4 Tx slots)	20.10	20.20	20.29

WCDMA:

Band	Channel	Frequency (MHz)	Conducted Power(dBm)	ERP/EIRP (dBm)	Limit(dBm)	Verdict
Band II	9262	1852.4	23.67	22.23	33	PASS
Band II	9400	1880.0	23.7	22.26	33	PASS
Band II	9538	1907.6	23.78	22.34	33	PASS
Band IV	1312	1712.4	23.36	22.13	30	PASS
Band IV	1413	1732.6	23.34	22.11	30	PASS
Band IV	1513	1752.6	23.33	22.1	30	PASS
Band V	4132	826.4	24.63	18.28	38.5	PASS
Band V	4182	836.4	24.51	18.16	38.5	PASS
Band V	4233	846.6	24.42	18.07	38.5	PASS

Band: WCDMA Band II	Average Power [dBm]		
Channel	9262	9400	9538
Frequency (MHz)	1852.4	1880.0	1907.6
RMC 12.2K	23.67	23.70	23.78
HSDPA Subtest-1	22.74	22.76	22.79
HSDPA Subtest-2	22.05	22.05	22.07
HSDPA Subtest-3	22.01	22.05	21.97
HSDPA Subtest-4	21.98	22.02	22.01
HSUPA Subtest-1	21.95	21.45	21.44
HSUPA Subtest-2	21.46	21.44	21.47
HSUPA Subtest-3	22.42	22.51	22.50
HSUPA Subtest-4	20.94	21.04	21.01
HSUPA Subtest-5	22.40	22.39	22.43

Band: WCDMA Band IV	Average Power [dBm]		
Channel	1312	1413	1513
Frequency (MHz)	1712.4	1732.6	1752.6
RMC 12.2K	23.36	23.34	23.33
HSDPA Subtest-1	22.42	22.36	22.38
HSDPA Subtest-2	21.67	21.66	21.58
HSDPA Subtest-3	21.63	21.69	21.55
HSDPA Subtest-4	21.62	21.56	21.60
HSUPA Subtest-1	21.10	21.03	21.05
HSUPA Subtest-2	21.25	21.20	21.17
HSUPA Subtest-3	22.05	22.01	22.04
HSUPA Subtest-4	20.66	20.52	20.68
HSUPA Subtest-5	22.04	22.05	22.03

Band: WCDMA Band V	Average Power [dBm]		
Channel	4,132	4,182	4,233
Frequency (MHz)	826.4	836.4	846.6
RMC 12.2K	24.63	24.51	24.42
HSDPA Subtest-1	23.65	23.55	23.45
HSDPA Subtest-2	22.76	22.83	22.56
HSDPA Subtest-3	22.84	22.80	22.57
HSDPA Subtest-4	22.85	22.71	22.58
HSUPA Subtest-1	22.24	22.17	22.13
HSUPA Subtest-2	22.38	22.27	22.20
HSUPA Subtest-3	23.26	23.21	23.10
HSUPA Subtest-4	21.92	21.75	21.70
HSUPA Subtest-5	23.28	23.17	23.17

Peak-to-Average Ratio

Test Result

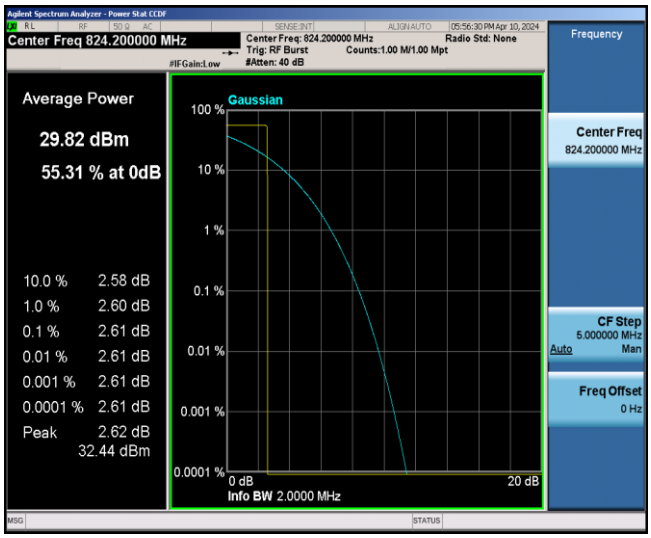
GSM:

Band	Channel	Result(dB)	Limit(dB)	Verdict
GSM850	128	2.61	13	PASS
GSM850	190	2.6	13	PASS
GSM850	251	2.6	13	PASS
GPRS850	128	2.6	13	PASS
GPRS850	190	2.6	13	PASS
GPRS850	251	2.6	13	PASS
EGPRS850	128	5.44	13	PASS
EGPRS850	190	5.45	13	PASS
EGPRS850	251	5.48	13	PASS
GSM1900	512	2.6	13	PASS
GSM1900	661	2.6	13	PASS
GSM1900	810	2.6	13	PASS
GPRS1900	512	2.6	13	PASS
GPRS1900	661	2.6	13	PASS
GPRS1900	810	2.6	13	PASS
EGPRS1900	512	5.53	13	PASS
EGPRS1900	661	5.56	13	PASS
EGPRS1900	810	5.53	13	PASS

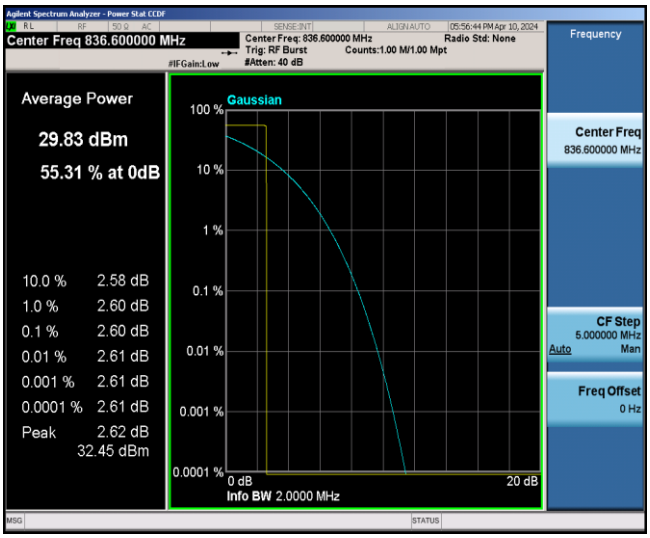
WCDMA:

Band	Channel	Peak-to-Average Ratio(dB)	Limit(dB)	Verdict
Band2	9262	2.66	13	PASS
Band2	9400	2.85	13	PASS
Band2	9538	2.75	13	PASS
Band4	1312	2.46	13	PASS
Band4	1413	2.93	13	PASS
Band4	1513	2.48	13	PASS
Band5	4132	3.04	13	PASS
Band5	4182	2.9	13	PASS
Band5	4233	2.7	13	PASS

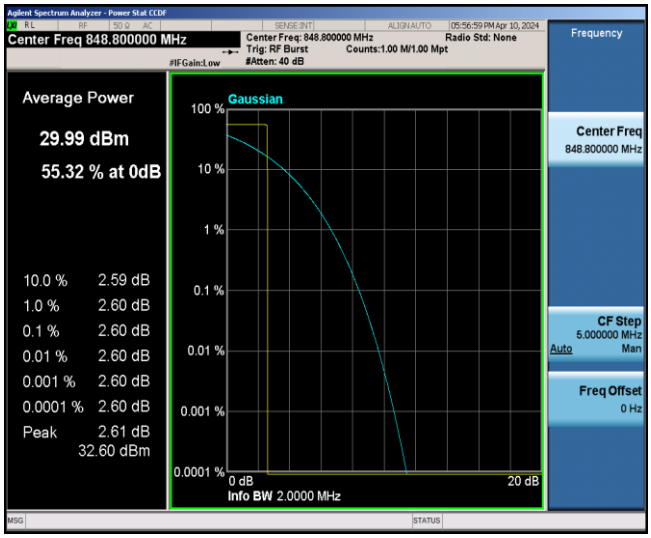
Test Graphs



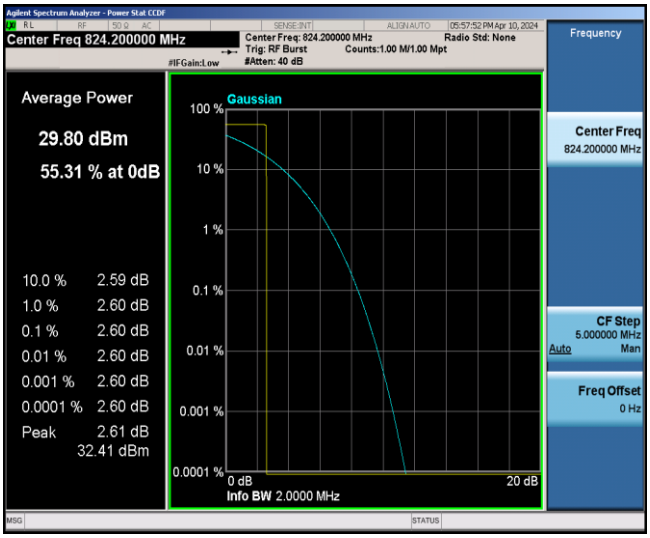
GSM850-128-3



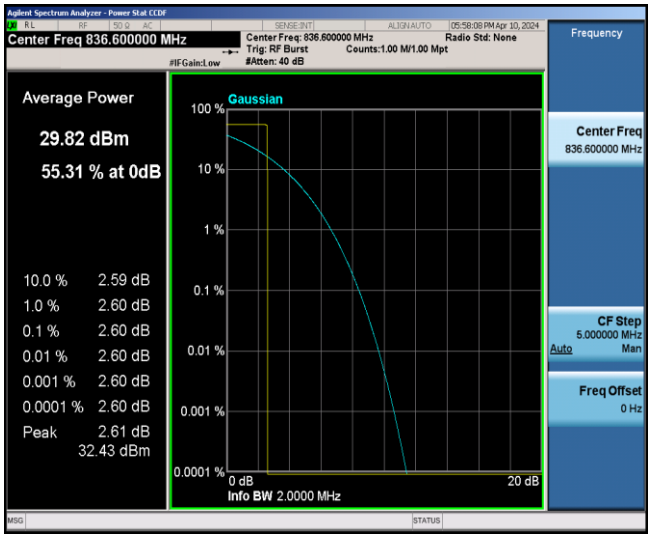
GSM850-190-3



GSM850-251-3



GPRS850-128-3



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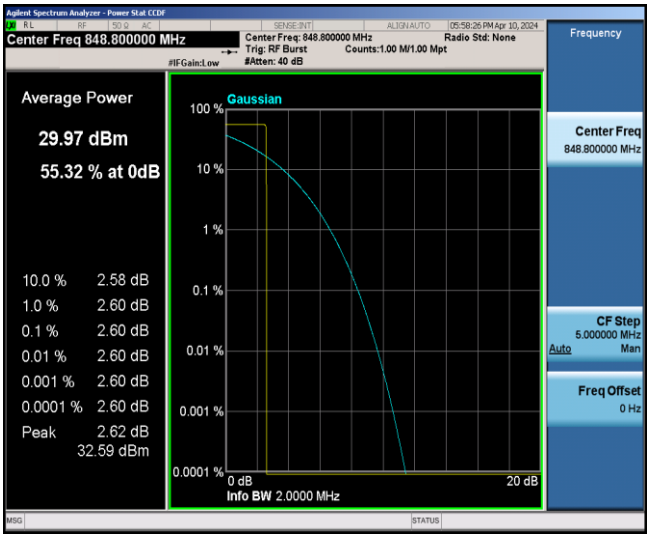

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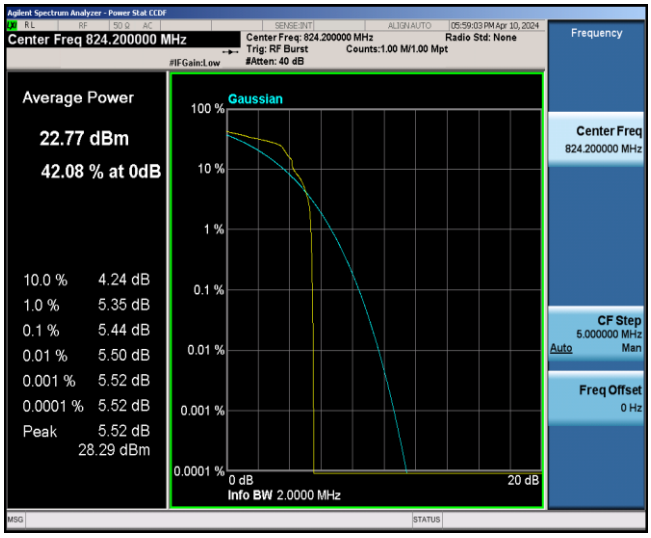

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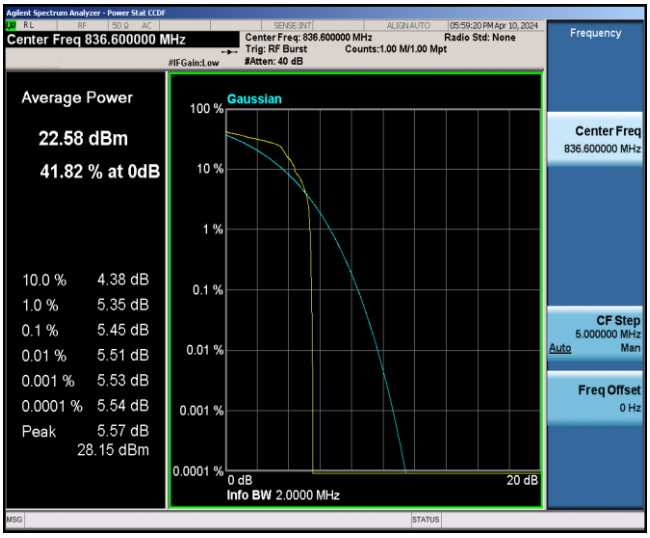
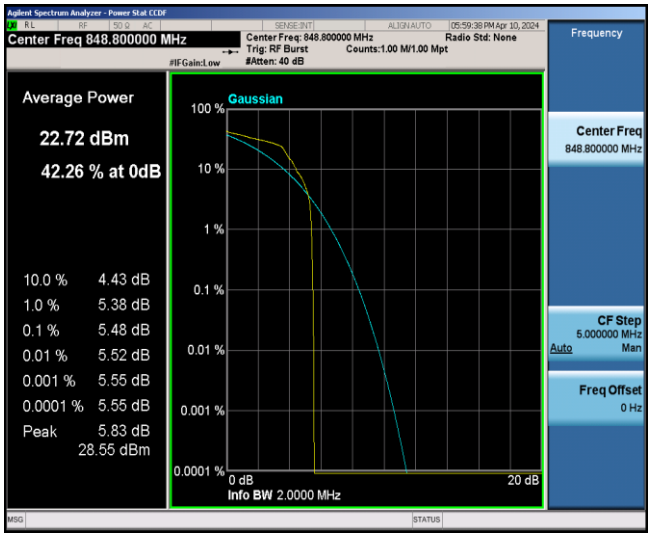
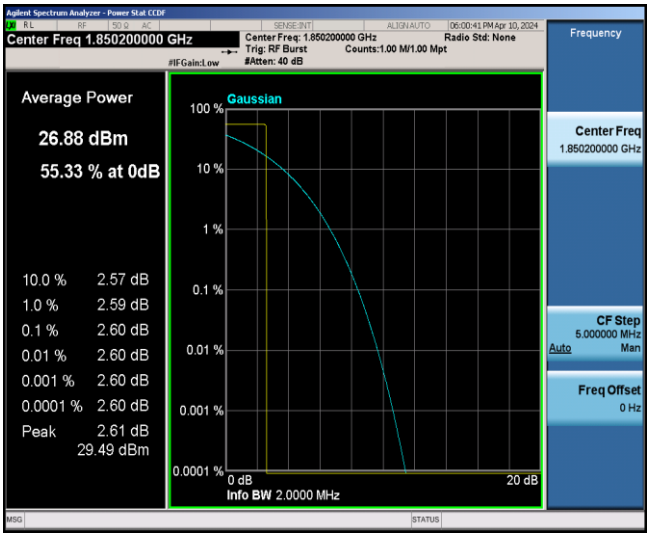


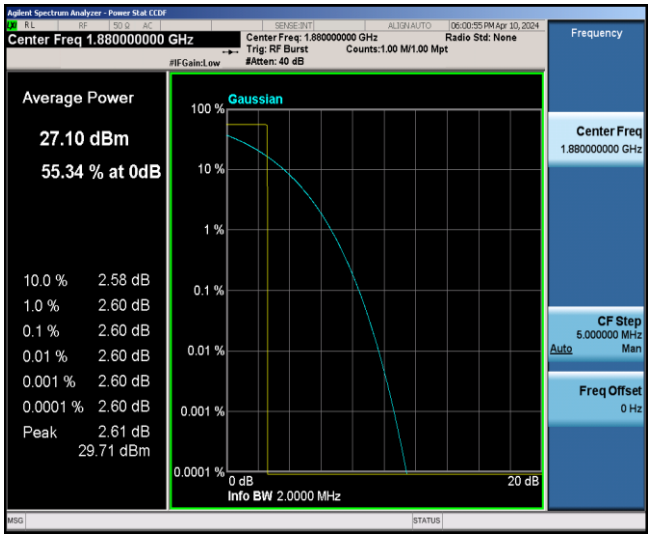
EGPRS850-190-8



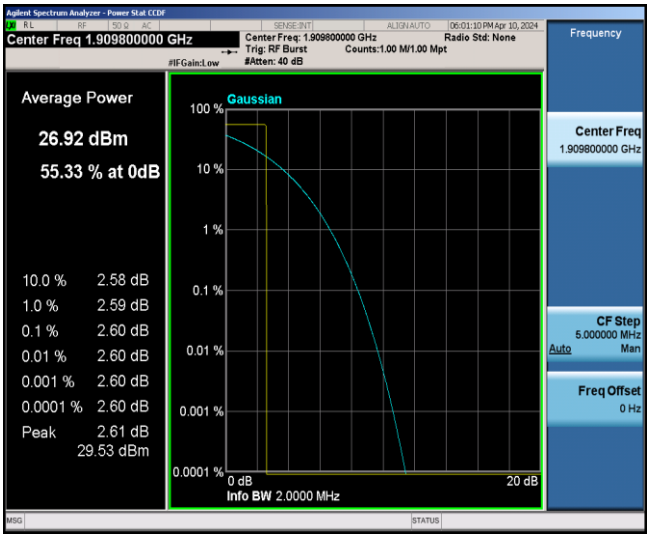
EGPRS850-251-8



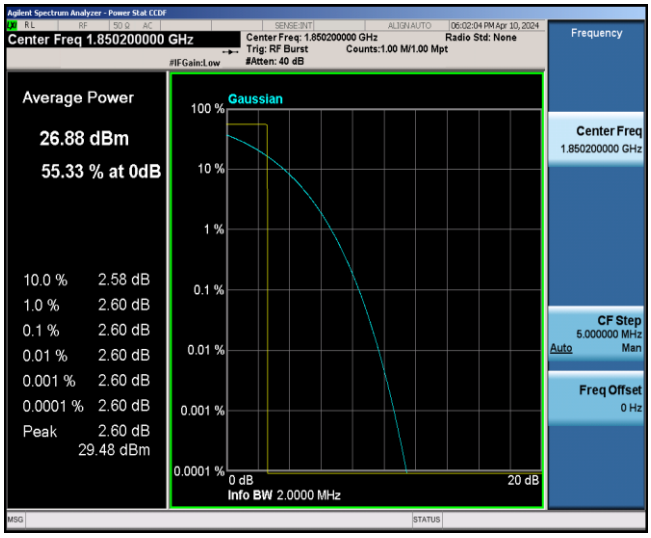
GSM1900-512-0



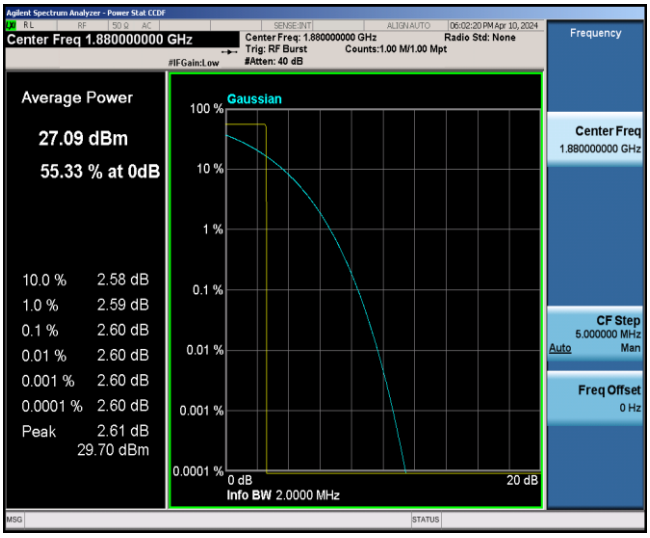
GSM1900-661-0



GSM1900-810-0



GPRS1900-512-0



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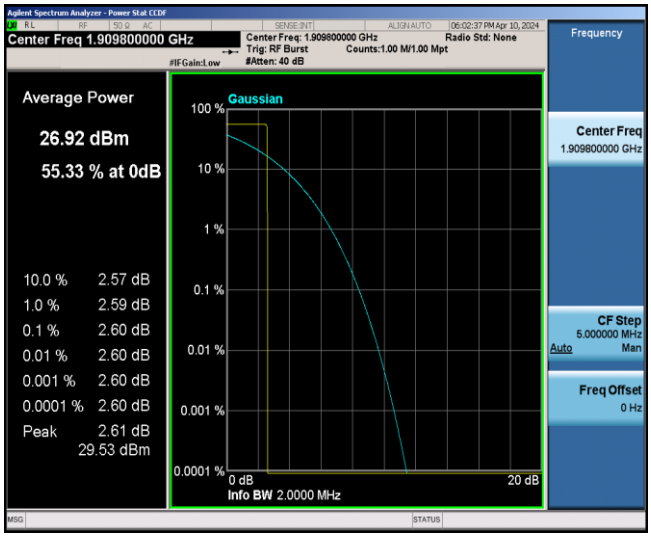

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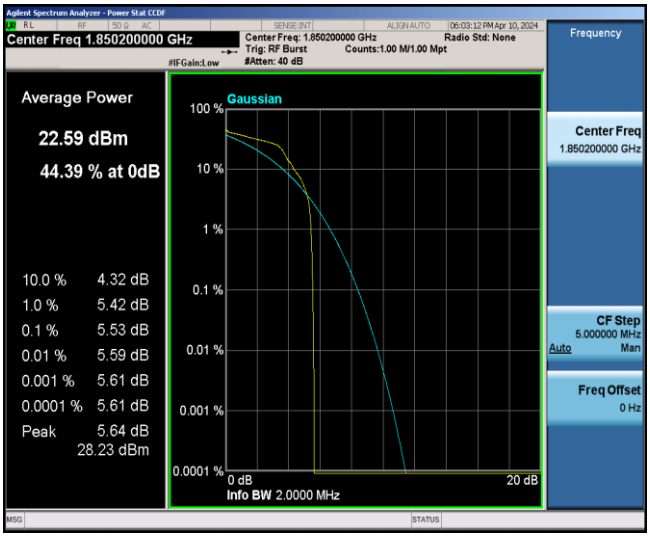

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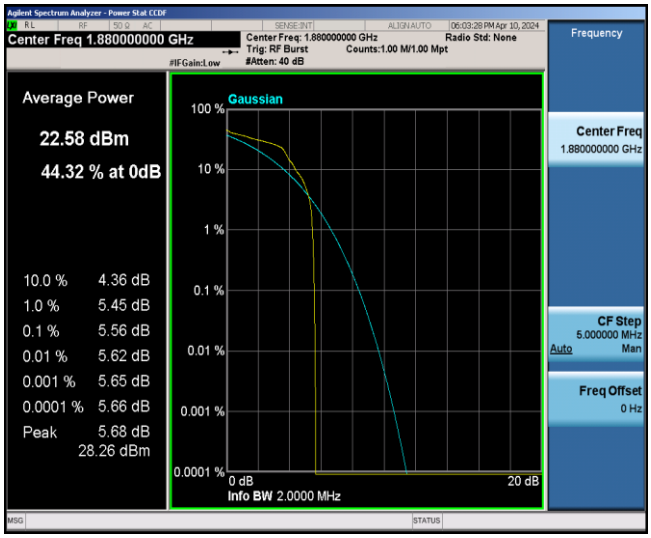

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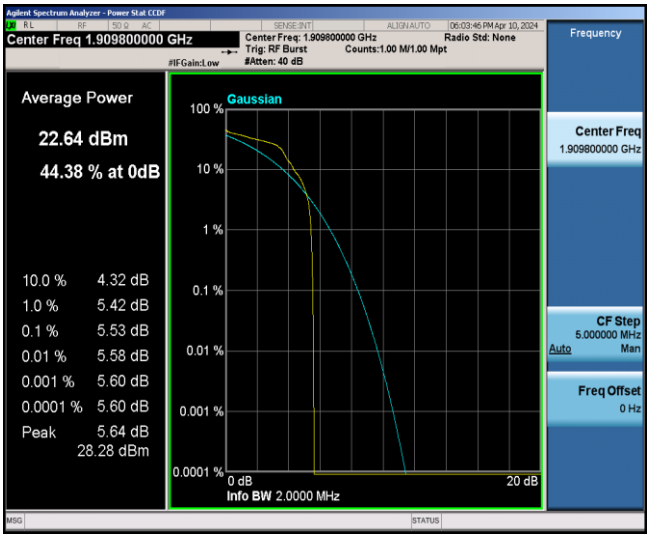

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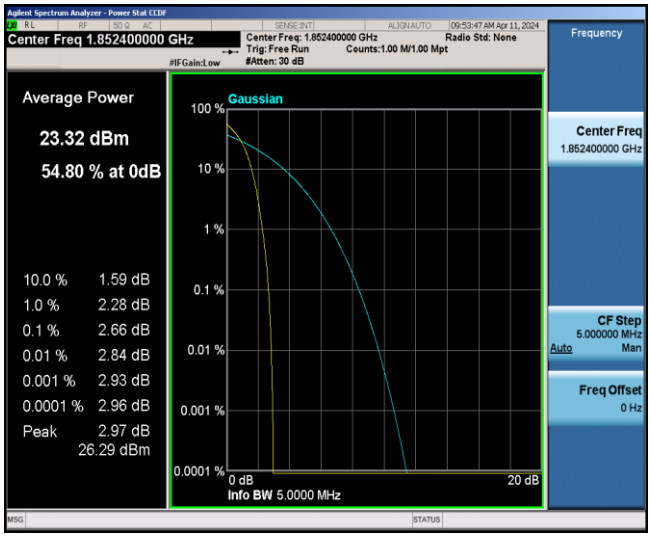
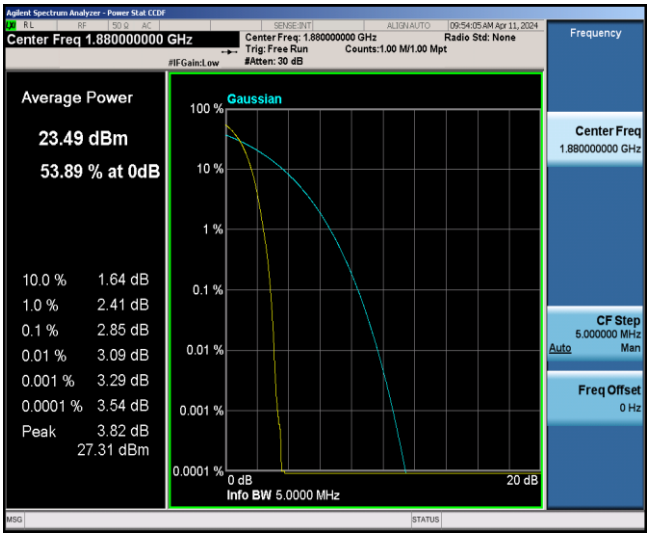
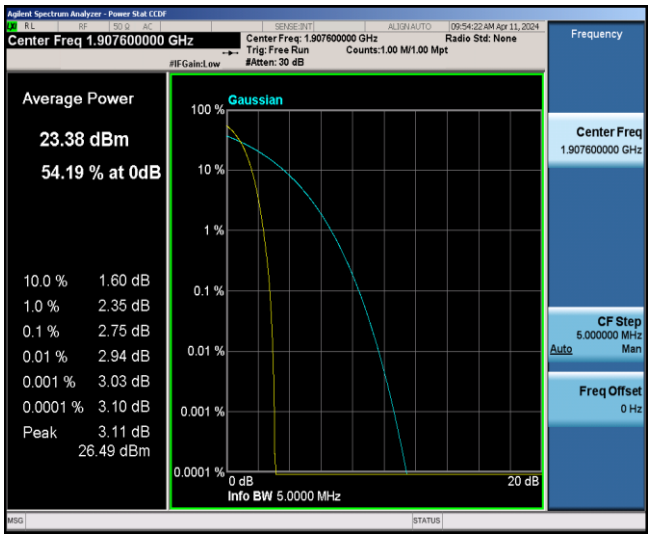


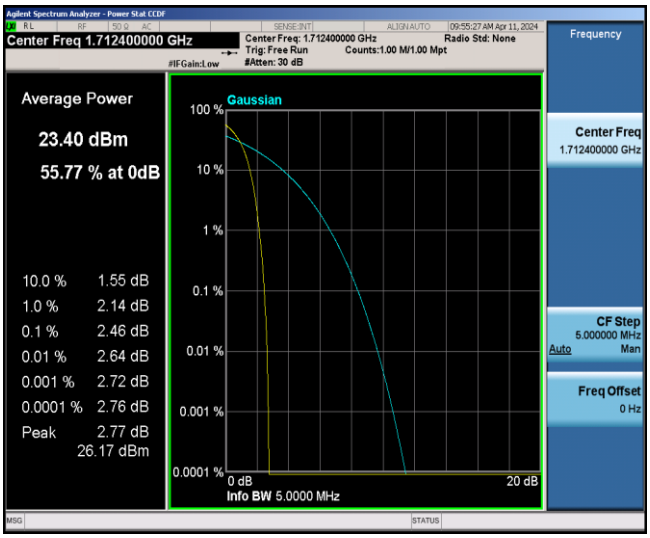
Band2-9262



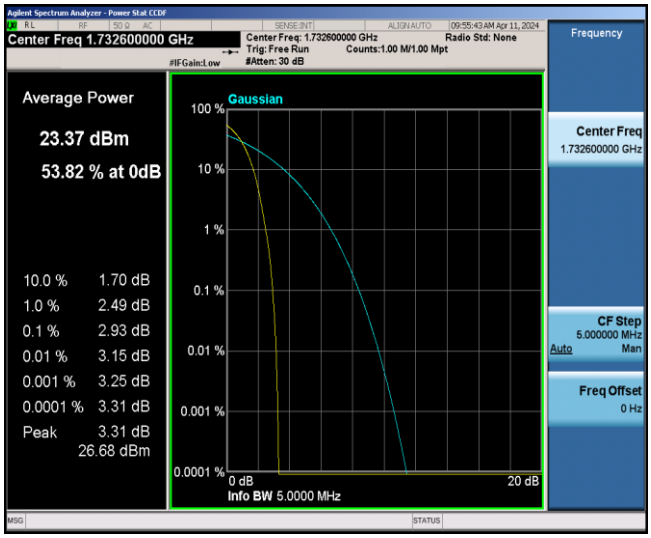
Band2-9400



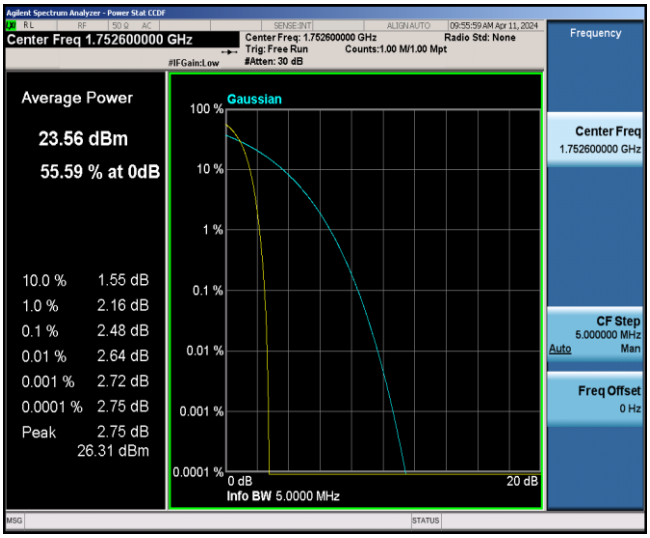
Band2-9538



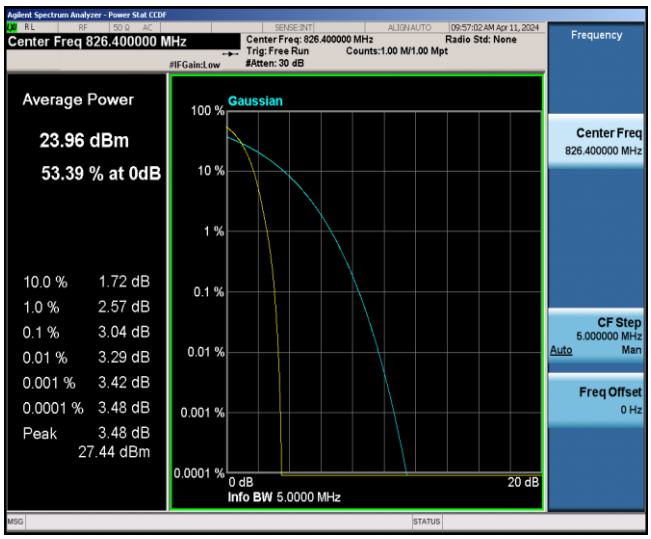
Band4-1312



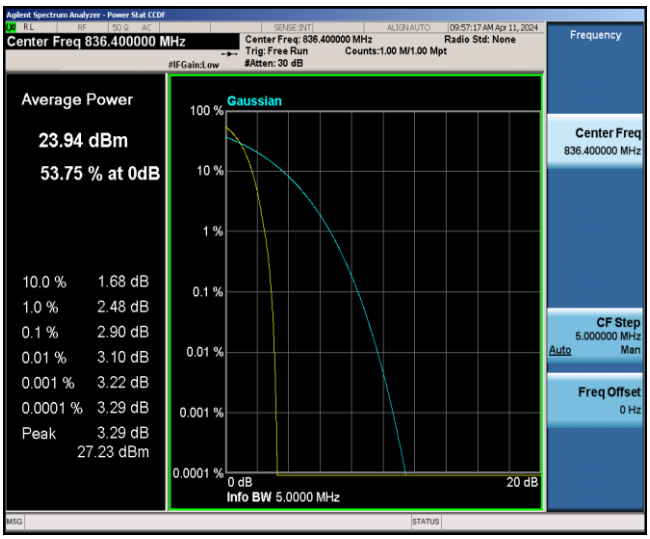
Band4-1413



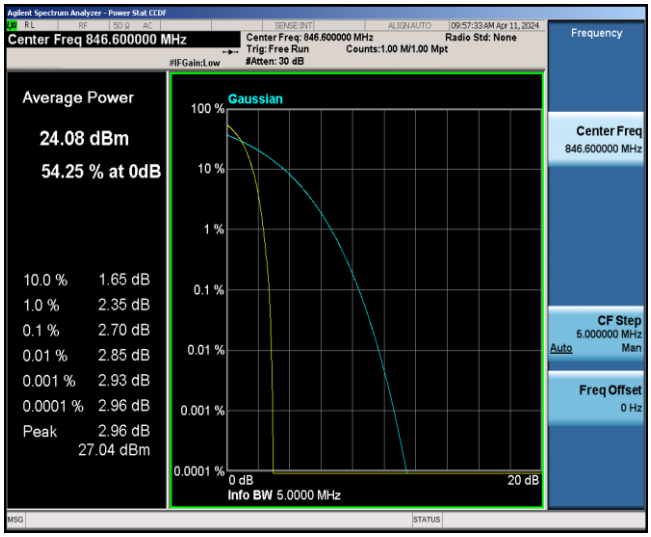
Band4-1513



Band5-4132



Band5-4182



Band5-4233

OCCUPIED BANDWIDTH

Test Result

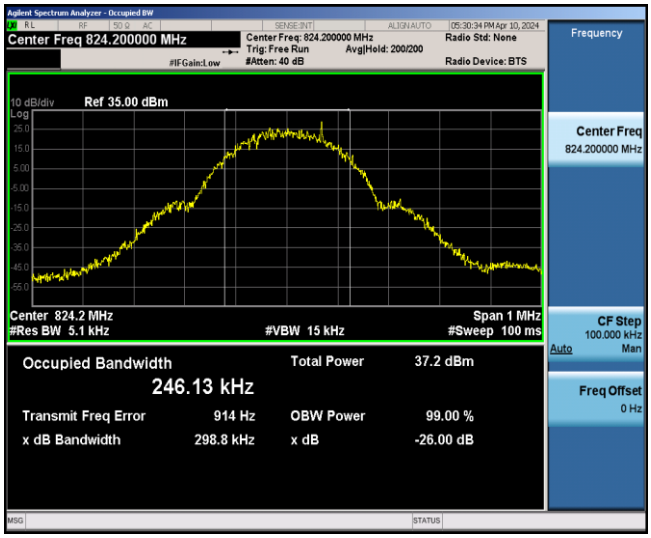
GSM:

Band	Channel	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
GSM850	128	0.24613	0.2988	PASS
GSM850	190	0.24746	0.3125	PASS
GSM850	251	0.24541	0.3110	PASS
GPRS850	128	0.24463	0.3172	PASS
GPRS850	190	0.24672	0.3157	PASS
GPRS850	251	0.24682	0.3129	PASS
EGPRS850	128	0.24820	0.3123	PASS
EGPRS850	190	0.25066	0.3140	PASS
EGPRS850	251	0.24575	0.3101	PASS
GSM1900	512	0.24629	0.3109	PASS
GSM1900	661	0.24608	0.3092	PASS
GSM1900	810	0.24567	0.3073	PASS
GPRS1900	512	0.24365	0.3173	PASS
GPRS1900	661	0.24752	0.3162	PASS
GPRS1900	810	0.24564	0.3159	PASS
EGPRS1900	512	0.24821	0.3094	PASS
EGPRS1900	661	0.24819	0.3252	PASS
EGPRS1900	810	0.25181	0.3119	PASS

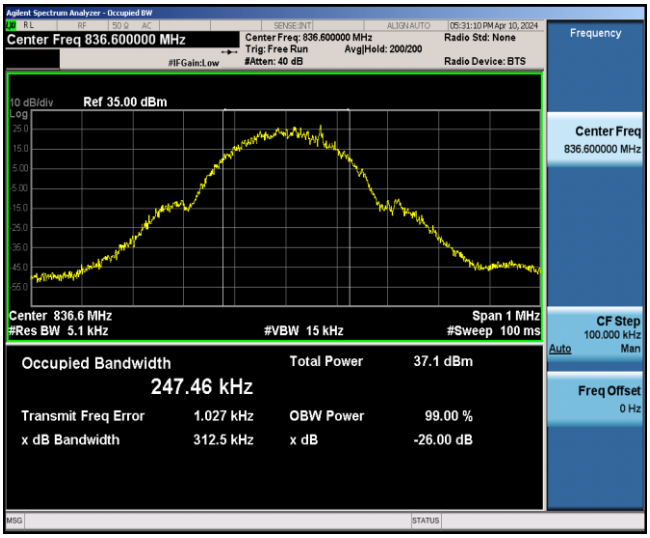
WCDMA:

Band	Channel	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
Band2	9262	4.1937	4.743	PASS
Band2	9400	4.1897	4.730	PASS
Band2	9538	4.1793	4.734	PASS
Band4	1312	4.1927	4.757	PASS
Band4	1413	4.1846	4.718	PASS
Band4	1513	4.1977	4.748	PASS
Band5	4132	4.1851	4.716	PASS
Band5	4182	4.1777	4.720	PASS
Band5	4233	4.1831	4.723	PASS

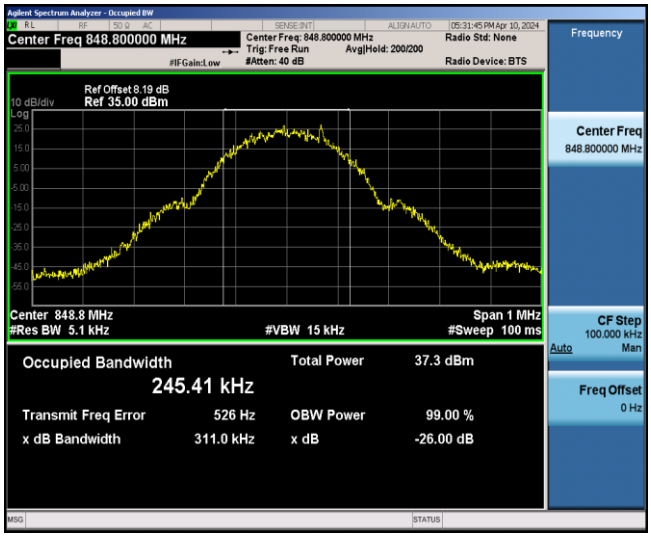
Test Graphs



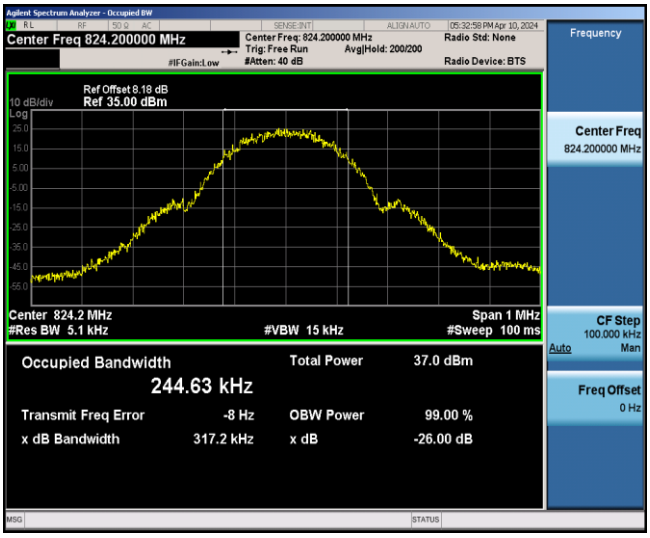
GSM850-128-3-0.2988



GSM850-190-3-0.3125



GSM850-251-3-0.3110



GPRS850-128-3-0.3172