



TEST REPORT

APPLICANT : Realme Chongqing Mobile
Telecommunications Corp., Ltd.

PRODUCT NAME : Mobile Phone

MODEL NAME : RMX2103

BRAND NAME : realme

FCC ID : 2AUYFRMX2103

STANDARD(S) : 47 CFR Part 22 Subpart H
47 CFR Part 24 Subpart E
47 CFR Part 27 Subpart L

RECEIPT DATE : 2020-08-03

TEST DATE : 2020-08-04 to 2020-08-25

ISSUE DATE : 2020-08-31

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Peng Huarui (Supervisor)

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Change History		
Version	Date	Reason for change
1.0	2020-08-31	First edition



1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Realme Chongqing Mobile Telecommunications Corp., Ltd.
Applicant Address:	No.178 Yulong Avenue, Yufengshan, Yubei District, Chongqing, China
Manufacturer:	Realme Chongqing Mobile Telecommunications Corp., Ltd.
Manufacturer Address:	No.178 Yulong Avenue, Yufengshan, Yubei District, Chongqing, China

1.2. Equipment Under Test (EUT) Description

Product Name:	Mobile Phone	
Hardware Version:	11	
Software Version:	realme UI V1.0	
Modulation Type:	GSM/GPRS Mode with GMSK Modulation EDGE Mode with 8PSK Modulation WCDMA Mode with QPSK Modulation HSDPA Mode with QPSK Modulation HSUPA Mode with QPSK Modulation HSPA+ Mode with QPSK Modulation	
Operating Frequency Range:	GSM 850MHz: Tx: 824MHz - 849MHz Rx: 869MHz - 894MHz GSM 1900MHz: Tx: 1850MHz - 1910MHz Rx: 1930MHz - 1990MHz	WCDMA Band V Tx: 824MHz - 849MHz Rx: 869MHz - 894MHz WCDMA Band II Tx: 1850MHz - 1910MHz Rx: 1930MHz - 1990MHz WCDMA Band IV Tx: 1710MHz - 1755MHz Rx: 2110MHz - 2155MHz



Antenna Type:	PIFA Antenna	
Accessory Information:	Battery 1	
	Brand Name:	realme
	Model No.:	BLP803
	Capacity:	4890.00mAh
	Rated Voltage:	3.87V
	Charge Limit:	4.45V
	Manufacturer	SUNWODA Electronic Co., Ltd.
	Battery 2	
	Brand Name:	realme
	Model No.:	BLP803
	Capacity:	4890.00mAh
	Rated Voltage:	3.87V
	Charge Limit:	4.45V
	Manufacturer	Huizhou Desay Battery Co., Ltd.
	Battery 3	
	Brand Name:	realme
	Model No.:	BLP803
	Capacity:	4890.00mAh
	Rated Voltage:	3.87V
	Charge Limit:	4.45V
	Manufacturer	TWS TECHNOLOGY (GUANGZHOU) LIMITED
	AC Adapter1	
	Brand Name:	realme
	Model No.:	OP92KAUH
	Rated Input:	100-240V ~ 50/60Hz 0.5A
	Rated Output:	9V=2.0A or 5V=2.0A
	Manufacturer	ShenZhen KunXing Technology Co., Ltd
AC Adapter2		
Brand Name:	realme	
Model No.:	OP92KAUH	
Rated Input:	100-240V ~ 50/60Hz 0.5A	
Rated Output:	9V=2.0A or 5V=2.0A	
Manufacturer	Huizhou Golden Lake Industrial Co.,Ltd	



- Note 1:** The transmitter (Tx) frequency arrangement of the Cellular 850MHz band used by the EUT can be represented with the formula $F(n)=824.2+0.2*(n-128)$, $128 \leq n \leq 251$; the lowest, middle, highest channel numbers (ARFCHs) used and tested in this report are separately 128 (824.2MHz), 190 (836.6MHz) and 251 (848.8MHz).
- Note 2:** The transmitter (Tx) frequency arrangement of the PCS 1900MHz band used by the EUT can be represented with the formula $F(n)=1850.2+0.2*(n-512)$, $512 \leq n \leq 810$; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 512 (1850.2MHz), 661 (1880.0MHz) and 810 (1909.8MHz).
- Note 3:** The transmitter (Tx) frequency arrangement of the WCDMA Band V used by the EUT can be represented with the formula $F(n)=826.4+0.2*(n-4132)$, $4132 \leq n \leq 4233$; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 4132 (826.4MHz), 4182(836.4MHz) and 4233 (846.6MHz).
- Note 4:** The transmitter (Tx) frequency arrangement of the WCDMA Band II used by the EUT can be represented with the formula $F(n)=1852.4+0.2*(n-9262)$, $9262 \leq n \leq 9538$; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 9262 (1852.4MHz), 9400 (1880MHz) and 9538 (1907.6MHz).
- Note 5:** The transmitter (Tx) frequency arrangement of the WCDMA 1700MHz band used by the EUT can be represented with the formula $F(n)=1712.4+0.2*(n-1312)$, $1312 \leq n \leq 1513$; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 1312 (1712.4MHz), 1413 (1732.6MHz) and 1513 (1752.6MHz).
- Note 6:** All modes and data rates were considered and evaluated respectively by performing full test. Test modes are chosen to be reported as the worst case below:
GPRS mode and EDGE mode for GSM 850;
GPRS mode and EDGE mode for GSM 1900;
WCDMA mode for WCDMA band V;
WCDMA mode for WCDMA band II;
WCDMA mode for WCDMA band IV;
- Note 7:** For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.



1.3. Maximum ERP/EIRP and Emission Designator

System	Maximum ERP/EIRP (W)	Emission Designator
GSM850	1.026	253KG3W
EDGE850	0.256	249KG7W
GSM1900	1.086	251KG2W
EDGE1900	0.423	249KG8W
WCDMA Band V	0.142	4M14F9W
WCDMA Band II	0.251	4M15F9W
WCDMA Band IV	0.231	4M14F9W



1.4. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2, Part 22, Part 24 and Part 27 for the EUT FCC ID Certification:

No	Identity	Document Title
1	47 CFR Part 2 (10-1-12 Edition)	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 22 (10-1-12 Edition)	Public Mobile Services
3	47 CFR Part 24 (10-1-12 Edition)	Personal Communications Services
4	47 CFR Part 27 (10-1-12 Edition)	Miscellaneous Wireless Communications Services



Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Test Date	Test Engineer	Result	Method determination/ Remark
1	2.1046	Conducted RF Output Power	Aug 4 to 6, 2020	Zhou Xiaolong	PASS	No deviation
2	24.232(d)	Peak -Average Ratio	Aug 6 to 8, 2020	Zhou Xiaolong	PASS	No deviation
3	2.1049	99% Occupied Bandwidth	Aug 8 to 10, 2020	Zhou Xiaolong	PASS	No deviation
4	2.1055, 22.355, 24.235, 27.54	Frequency Stability	Aug 13 to 15, 2020	Zhou Xiaolong	PASS	No deviation
5	2.1051, 22.917(a), 24.238(a)	Conducted Out of Band Emissions	Aug 16 to 21, 2020	Zhou Xiaolong	PASS	No deviation
6	2.1051, 22.917(a), 24.238(a)	Band Edge	Aug 22 to 25 2020	Zhou Xiaolong	PASS	No deviation
7	22.913(a), 24.232(a)	Transmitter Radiated Power (EIPR/ERP)	Aug 4, to 8, 2020	Peng Xuwei	PASS	No deviation
8	2.1051, 22.917(a), 24.238(a)	Radiated Out of Band Emissions	Aug 7	Peng Xuwei	PASS	No deviation

Note 1: The tests were performed according to the method of measurements prescribed in KDB971168 D01 v03 and ANSI/TIA-603-E-2016.

Note 2: The path loss during the RF test is calibrated to correct the results by the offset setting in the test equipments. The ref offset 26.5dB contains two parts that cable loss 16.5dB and Attenuator 10dB.



1.5. Environmental Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 - 35
Relative Humidity (%):	30 -60
Atmospheric Pressure (kPa):	86-106

2.47 CFR Part 2, Part 22H , 24E&27L Requirements

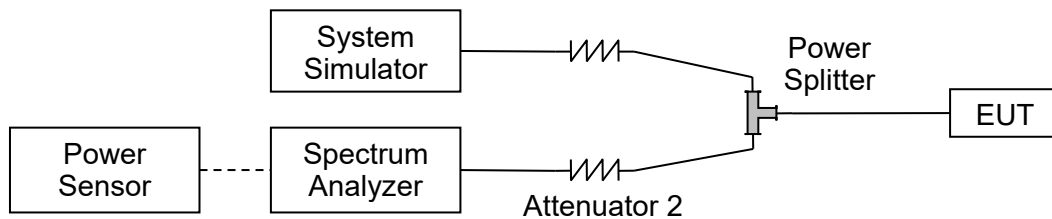
2.1. Conducted RF Output Power

2.1.1. Requirement

According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

2.1.2. Test Description

Test Setup:



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS.



2.1.3. Test Results

Top Antenna

GSM850	Average Power (dBm)		
TX Channel	128	190	251
Frequency (MHz)	824.2	836.6	848.8
GSM 1 Tx slot	31.49	31.65	31.76
GPRS 1 Tx slot	31.52	31.69	31.82
GPRS 2 Tx slots	31.01	31.15	31.51
GPRS 3 Tx slots	30.70	30.82	31.12
GPRS 4 Tx slots	30.40	30.54	30.80
EDGE 1 Tx slot	25.74	25.67	25.57
EDGE 2 Tx slots	23.71	23.75	23.72
EDGE 3 Tx slots	22.54	22.43	22.60
EDGE 4 Tx slots	21.95	21.89	22.02

GSM1900	Average Power (dBm)		
TX Channel	512	661	810
Frequency (MHz)	1850.2	1880	1909.8
GSM 1 Tx slot	29.26	29.14	29.19
GPRS 1 Tx slot	29.30	29.05	29.14
GPRS 2 Tx slots	29.14	28.84	29.03
GPRS 3 Tx slots	29.01	28.70	28.93
GPRS 4 Tx slots	28.78	28.61	28.71
EDGE 1 Tx slot	25.16	24.94	24.99
EDGE 2 Tx slots	25.06	24.75	24.90
EDGE 3 Tx slots	24.90	24.63	24.75
EDGE 4 Tx slots	24.78	24.53	24.60



WCDMA Band V	Average Power (dBm)		
	TX Channel	4132	4182
Frequency (MHz)	826.4	836.4	846.6
RMC 12.2Kbps	23.17	22.98	23.09
HSDPA Subtest-1	22.12	21.99	22.25
HSDPA Subtest-2	21.15	21.02	21.24
HSDPA Subtest-3	20.32	20.23	20.51
HSDPA Subtest-4	20.19	20.12	20.37
HSUPA Subtest-1	21.14	21.01	21.27
HSUPA Subtest-2	21.12	21.00	21.23
HSUPA Subtest-3	20.80	20.74	20.95
HSUPA Subtest-4	22.15	21.99	22.21
HSUPA Subtest-5	21.03	20.89	21.14
HSPA+ (16QAM) Subtest-1	20.19	20.04	20.27
DC-HSDPA Subtest-1	21.88	21.8	21.78
DC-HSDPA Subtest-2	21.9	21.73	21.76
DC-HSDPA Subtest-3	21.38	21.24	21.25
DC-HSDPA Subtest-4	21.42	21.27	21.26

WCDMA Band II	Average Power (dBm)		
	TX Channel	9262	9400
Frequency (MHz)	1852.4	1880.0	1907.6
RMC 12.2Kbps	22.85	22.88	22.89
HSDPA Subtest-1	21.35	21.39	21.34
HSDPA Subtest-2	20.43	20.38	20.44
HSDPA Subtest-3	19.70	19.56	19.71
HSDPA Subtest-4	19.59	19.50	19.53
HSUPA Subtest-1	20.59	20.41	20.40
HSUPA Subtest-2	20.54	20.37	20.31
HSUPA Subtest-3	20.28	20.08	20.03
HSUPA Subtest-4	21.51	21.36	21.29
HSUPA Subtest-5	20.45	20.28	20.30
HSPA+ (16QAM) Subtest-1	19.61	19.47	19.44
DC-HSDPA Subtest-1	21.71	21.66	21.62
DC-HSDPA Subtest-2	21.74	21.72	21.61
DC-HSDPA Subtest-3	21.21	21.13	21.15
DC-HSDPA Subtest-4	21.22	21.18	21.13



WCDMA Band IV	Average Power (dBm)		
	1312	1413	1513
TX Channel	1312	1413	1513
Frequency (MHz)	1712.4	1732.6	1752.6
RMC 12.2Kbps	22.48	22.47	22.52
HSDPA Subtest-1	21.47	21.43	21.38
HSDPA Subtest-2	20.50	20.43	20.41
HSDPA Subtest-3	19.66	19.71	19.65
HSDPA Subtest-4	19.57	19.62	19.58
HSUPA Subtest-1	20.51	20.43	20.41
HSUPA Subtest-2	20.49	20.40	20.37
HSUPA Subtest-3	20.18	20.09	20.11
HSUPA Subtest-4	21.45	21.38	21.39
HSUPA Subtest-5	20.39	20.33	20.30
HSPA+ (16QAM) Subtest-1	19.25	19.17	19.24
DC-HSDPA Subtest-1	21.58	21.52	21.59
DC-HSDPA Subtest-2	21.49	21.47	21.54
DC-HSDPA Subtest-3	20.96	20.98	21.04
DC-HSDPA Subtest-4	21.02	21.00	21.05

**Bottom Antenna**

GSM850	Average Power (dBm)		
TX Channel	128	190	251
Frequency (MHz)	824.2	836.6	848.8
GSM 1 Tx slot	31.34	31.5	31.61
GPRS 1 Tx slot	31.37	31.54	31.67
GPRS 2 Tx slots	30.86	31	31.36
GPRS 3 Tx slots	30.55	30.67	30.97
GPRS 4 Tx slots	30.25	30.39	30.65
EDGE 1 Tx slot	25.59	25.52	25.42
EDGE 2 Tx slots	23.56	23.6	23.57
EDGE 3 Tx slots	22.39	22.28	22.45
EDGE 4 Tx slots	21.8	21.74	21.87

GSM1900	Average Power (dBm)		
TX Channel	512	661	810
Frequency (MHz)	1850.2	1880	1909.8
GSM 1 Tx slot	29.11	28.99	29.04
GPRS 1 Tx slot	29.15	28.9	28.99
GPRS 2 Tx slots	28.99	28.69	28.88
GPRS 3 Tx slots	28.86	28.55	28.78
GPRS 4 Tx slots	28.63	28.46	28.56
EDGE 1 Tx slot	25.01	24.79	24.84
EDGE 2 Tx slots	24.91	24.6	24.75
EDGE 3 Tx slots	24.75	24.48	24.6
EDGE 4 Tx slots	24.63	24.38	24.45



WCDMA Band V	Average Power (dBm)		
TX Channel	4132	4182	4233
Frequency (MHz)	826.4	836.4	846.6
RMC 12.2Kbps	23.01	22.83	22.95
HSDPA Subtest-1	21.97	21.84	22.11
HSDPA Subtest-2	21.03	20.87	21.09
HSDPA Subtest-3	20.17	20.08	20.33
HSDPA Subtest-4	20.04	19.97	20.23
HSUPA Subtest-1	20.99	20.86	21.12
HSUPA Subtest-2	20.97	20.85	21.04
HSUPA Subtest-3	20.65	20.58	20.81
HSUPA Subtest-4	22.02	21.84	22.06
HSUPA Subtest-5	20.88	20.74	20.99
HSPA+ (16QAM) Subtest-1	20.04	19.89	20.12
DC-HSDPA Subtest-1	21.73	21.65	21.63
DC-HSDPA Subtest-2	21.75	21.57	21.61
DC-HSDPA Subtest-3	21.23	21.09	21.12
DC-HSDPA Subtest-4	21.27	21.12	21.11

WCDMA Band II	Average Power (dBm)		
TX Channel	9262	9400	9538
Frequency (MHz)	1852.4	1880.0	1907.6
RMC 12.2Kbps	22.71	22.72	22.73
HSDPA Subtest-1	21.24	21.24	21.18
HSDPA Subtest-2	20.28	20.23	20.25
HSDPA Subtest-3	19.55	19.41	19.56
HSDPA Subtest-4	19.44	19.35	19.36
HSUPA Subtest-1	20.44	20.26	20.24
HSUPA Subtest-2	20.39	20.22	20.16
HSUPA Subtest-3	20.13	19.92	19.88
HSUPA Subtest-4	21.36	21.21	21.13
HSUPA Subtest-5	20.32	20.13	20.15
HSPA+ (16QAM) Subtest-1	19.46	19.35	19.29
DC-HSDPA Subtest-1	21.53	21.51	21.46
DC-HSDPA Subtest-2	21.59	21.57	21.46
DC-HSDPA Subtest-3	21.03	20.98	21.02
DC-HSDPA Subtest-4	21.07	21.03	20.98



WCDMA Band IV	Average Power (dBm)		
	1312	1413	1513
TX Channel	1312	1413	1513
Frequency (MHz)	1712.4	1732.6	1752.6
RMC 12.2Kbps	22.34	22.31	22.35
HSDPA Subtest-1	21.33	21.28	21.22
HSDPA Subtest-2	20.35	20.21	20.26
HSDPA Subtest-3	19.51	19.56	19.52
HSDPA Subtest-4	19.41	19.43	19.42
HSUPA Subtest-1	20.35	20.28	20.22
HSUPA Subtest-2	20.34	20.24	20.21
HSUPA Subtest-3	20.03	19.94	19.96
HSUPA Subtest-4	21.32	21.24	21.24
HSUPA Subtest-5	20.23	20.18	20.15
HSPA+ (16QAM) Subtest-1	19.12	19.01	19.08
DC-HSDPA Subtest-1	21.43	21.37	21.44
DC-HSDPA Subtest-2	21.32	21.32	21.39
DC-HSDPA Subtest-3	20.82	20.86	20.82
DC-HSDPA Subtest-4	20.89	20.84	20.92

Note: The measured power value of the upper antenna is larger than that of the lower antenna, and the test results are all from the upper antenna.

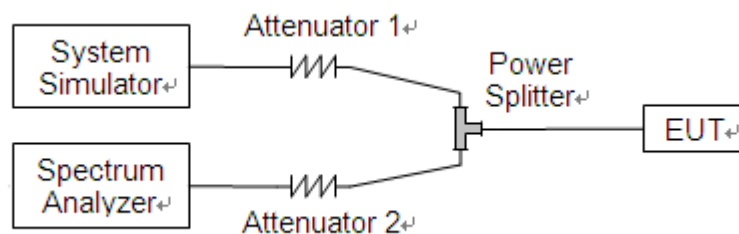
2.2. Peak to Average Ratio

2.2.1. Requirement

According to FCC 24.232(d) and 27.50(d), the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

2.2.2. Test Description

Test Setup:



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS.

2.2.3. Test procedure

1. For GSM/EDGE operating mode:
 - a. Set RBW=1MHz, VBW=3MHz, peak detector in spectrum analyzer.
 - b. Set EUT in maximum output power, and triggered the bust signal.
 - c. Measured respectively the peak level and mean level, and the deviation was recorded as Peak to Average ratio.
2. For UMTS operating mode:
 - a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
 - b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1%.



2.2.4. Test Result

The lowest, middle and highest channels are selected to perform testing to verify the conducted RF output peak power of the Module.

A. Test Verdict:

Band	Channel	Frequency (MHz)	Peak to Average ratio	Limit	Verdict
			dB	dB	
GSM 1900MHz	512	1850.2	0.038	13	PASS
	661	1880.0	0.024		PASS
	810	1909.8	0.028		PASS
EDGE 1900MHz	512	1850.2	0.022		PASS
	661	1880.0	0.025		PASS
	810	1909.8	0.019		PASS

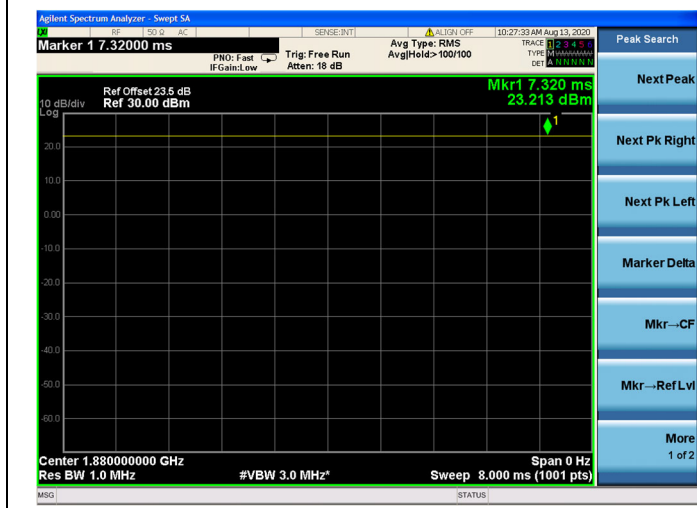
Band	Channel	Frequency (MHz)	Peak to Average ratio	Limit	Verdict
			dB	dB	
WCDMA Band II	9262	1852.4	2.930	13	PASS
	9400	1880.0	3.020		PASS
	9538	1907.6	3.040		PASS
WCDMA Band IV	1312	1712.4	3.030		PASS
	1413	1732.6	3.000		PASS
	1513	1752.6	2.970		PASS



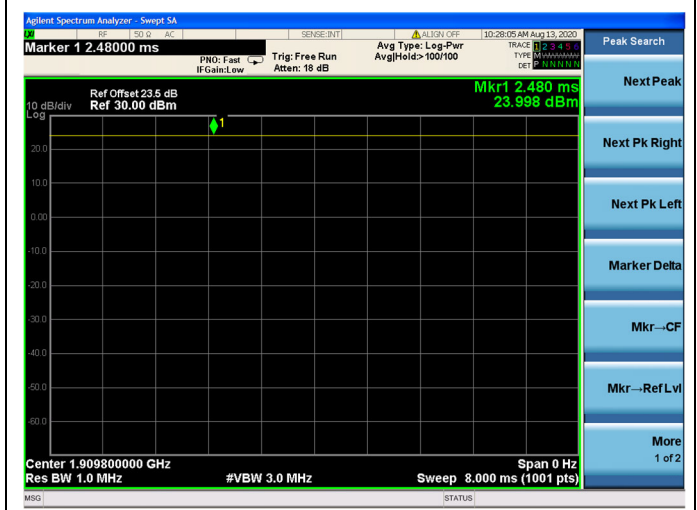
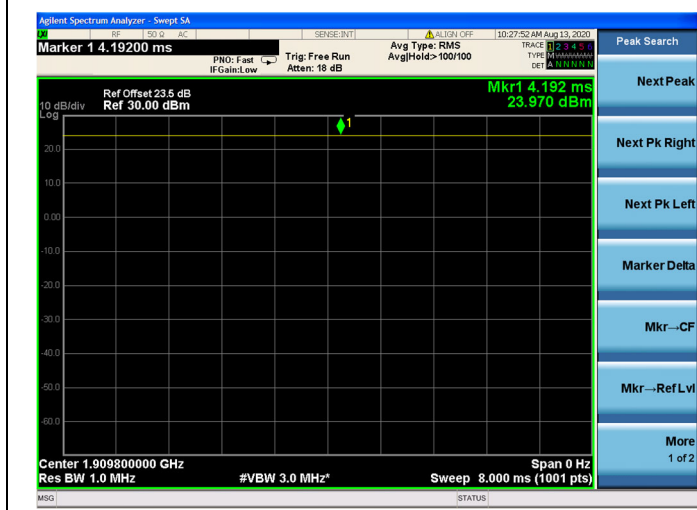
GSM 1900MHz CH512 1850.2MHz



GSM 1900MHz CH661 1880.0MHz



GSM 1900MHz CH810 1909.8MHz

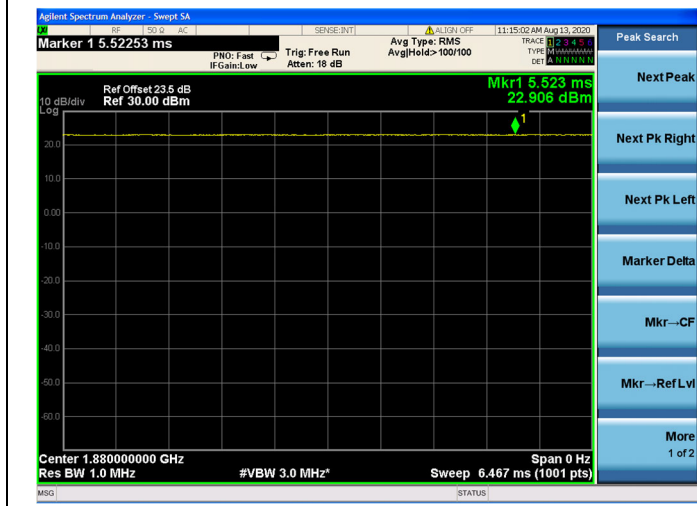




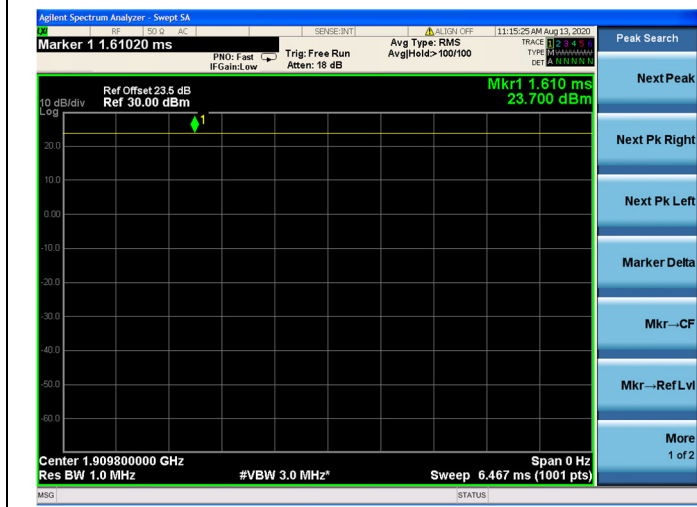
EDGE 1900MHz CH512 1850.2MHz

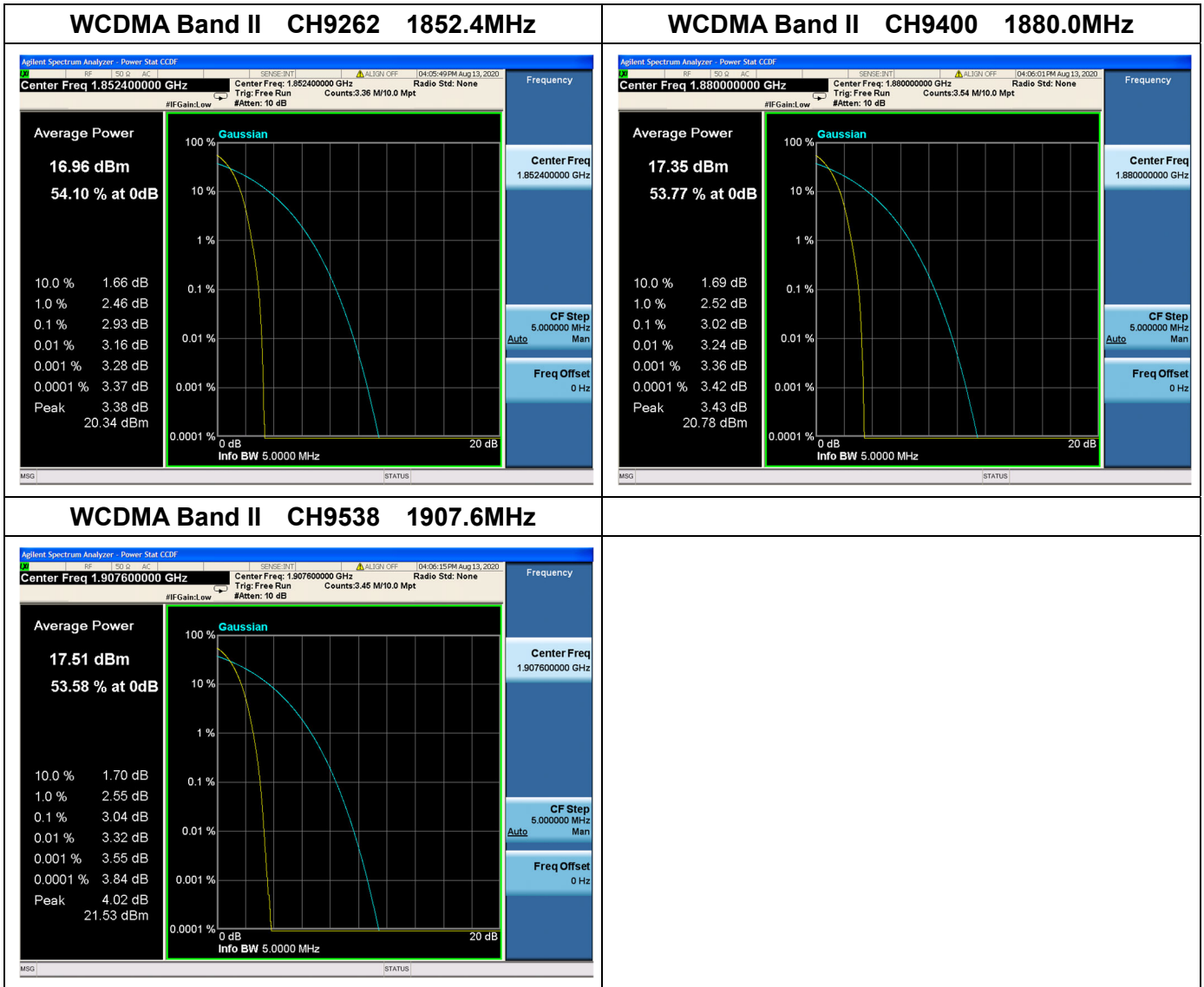


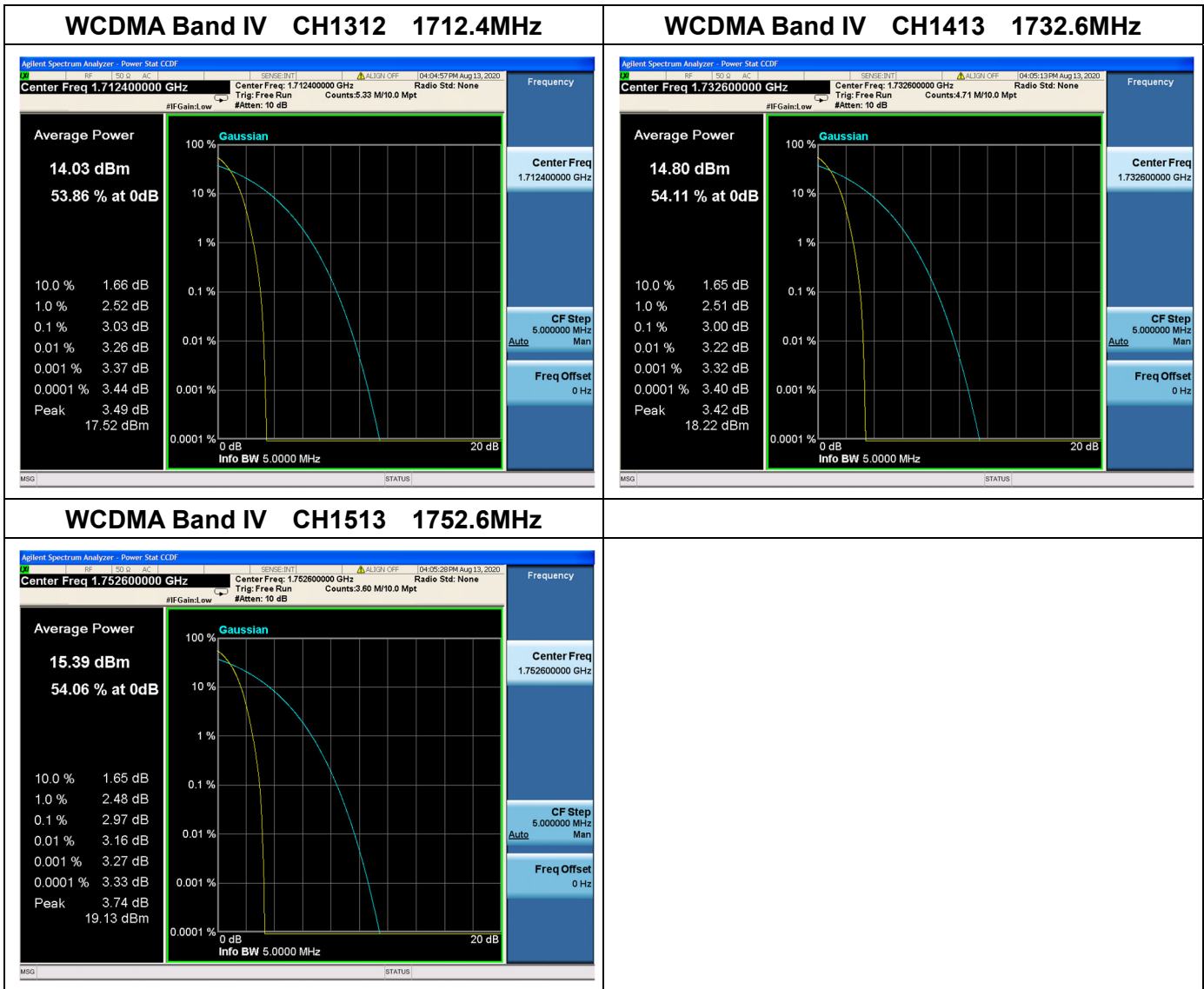
EDGE 1900MHz CH661 1880.0MHz



EDGE 1900MHz CH810 1909.8MHz







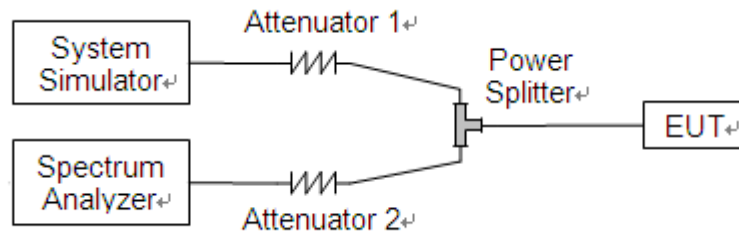
2.3.99% Occupied Bandwidth

2.3.1. Requirement

According to FCC section 2.1049, the occupied bandwidth 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. Occupied bandwidth is also known as the 99% emission bandwidth.

2.3.2. Test Description

Test Setup:



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS.



2.3.3. Test Result

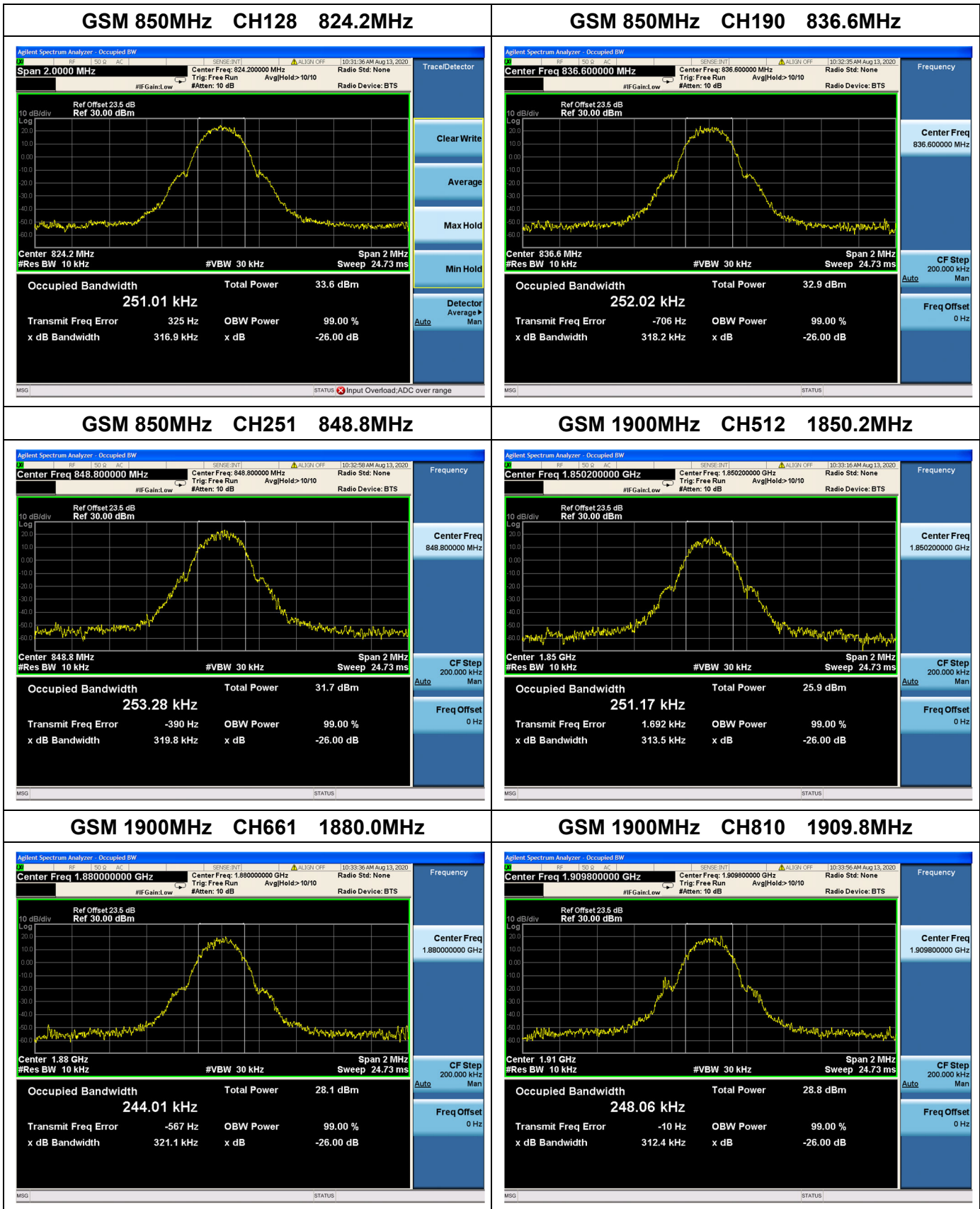
The lowest, middle and highest channels are selected to perform testing to record the 99% occupied bandwidth.

GSM Test Verdict:

Band	Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26dB Bandwidth (kHz)
GSM 850MHz	128	824.2	251.01	316.90
	190	836.6	252.02	318.20
	251	848.8	253.28	319.80
GSM 1900MHz	512	1850.2	251.17	313.50
	661	1880.0	244.01	321.10
	810	1909.8	248.06	312.40
EDGE 850MHz	128	824.2	248.07	318.20
	190	836.6	249.67	320.90
	251	848.8	248.92	319.70
EDGE 1900MHz	512	1850.2	241.64	317.60
	661	1880.0	240.73	309.50
	810	1909.8	249.82	321.30

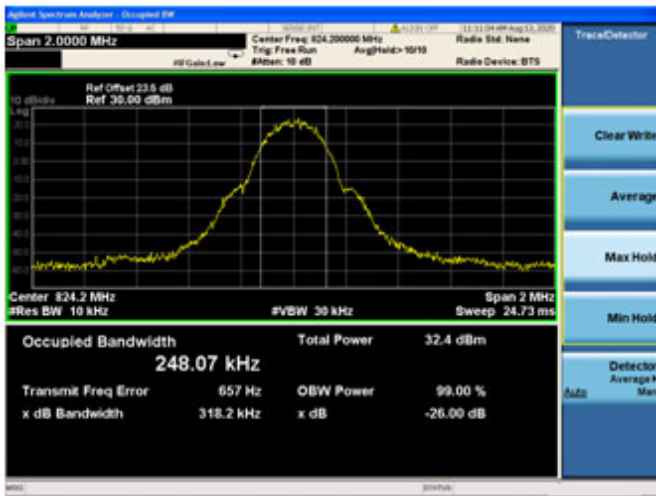
WCDMA Test Verdict:

Band	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)
WCDMA Band V	4132	826.4	4.119	4.700
	4182	836.4	4.128	4.720
	4233	846.6	4.139	4.715
WCDMA Band II	9262	1852.4	4.148	4.714
	9400	1880.0	4.140	4.727
	9538	1907.6	4.144	4.698
WCDMA Band IV	1312	1712.4	4.139	4.716
	1413	1732.6	4.131	4.713
	1513	1752.6	4.129	4.716

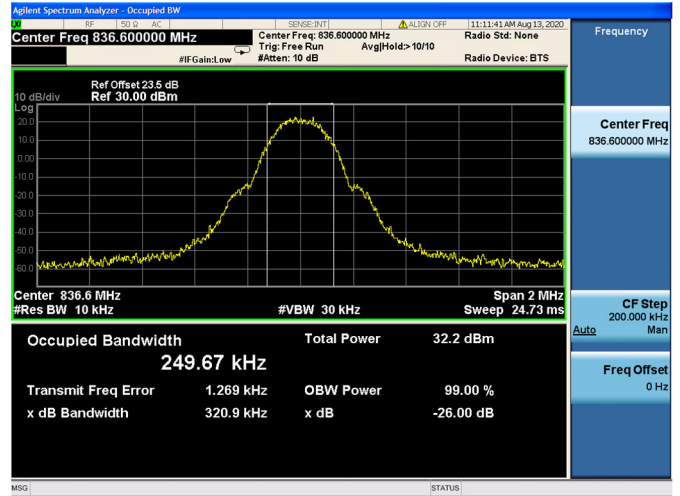




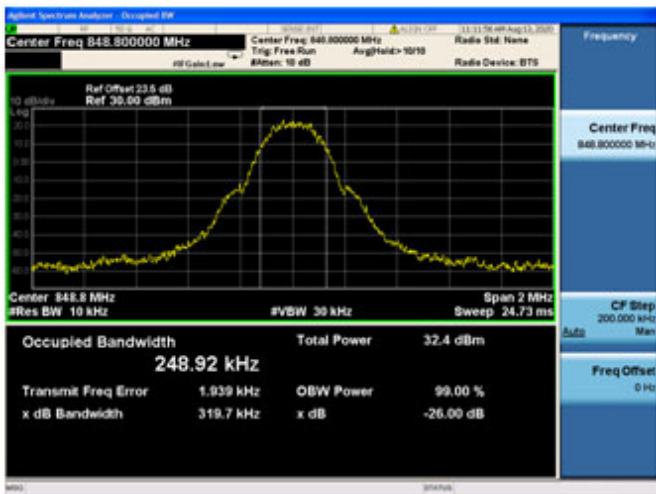
EDGE 850MHz CH128 824.2MHz



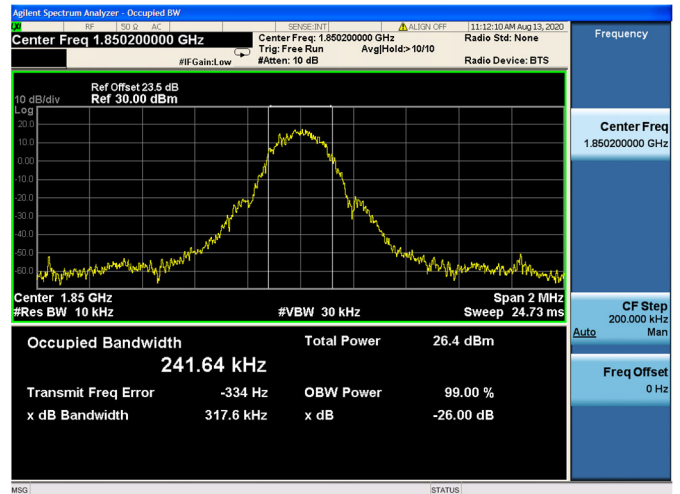
EDGE 850MHz CH190 836.6MHz



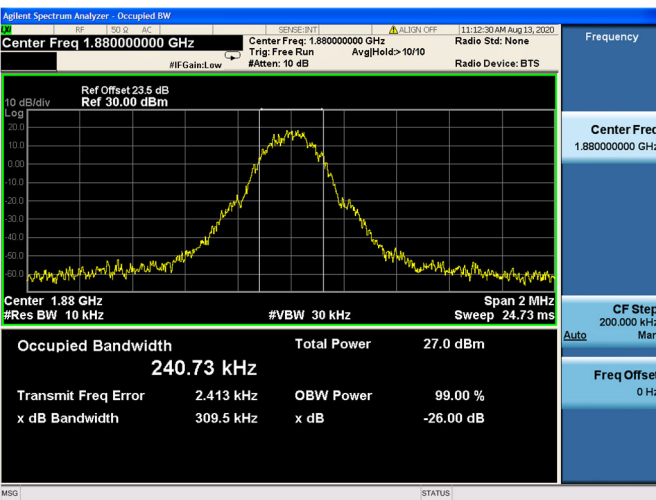
EDGE 850MHz CH251 848.8MHz



EDGE 1900MHz CH512 1850.2MHz



EDGE 1900MHz CH661 1880.0MHz



EDGE 1900MHz CH810 1909.8MHz

