

RF MEASUREMENT REPORT

FCC ID: HD5-EDA521

Application: Honeywell International Inc
Honeywell Safety and Productivity Solutions

Product: Mobile Computer

Model No.: EDA52-1

Brand Name: Honeywell

FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)

FCC Rule Part(s): Part 2, 22, 24, 27

Test Procedure(s): ANSI C63.26: 2015

Test Date: December 14, 2021 ~ February 28, 2022

Reviewed By:

Jame Yuan

Approved By:

Robin Wu



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.26-2015. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
2112RSU039-U7	Rev. 01	Initial Report	02-28-2022	Valid

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1.1. Applicant

1.2. Manufacturer

1.3. Testing Facility

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1.4. Product Information

Product Name	Mobile Computer
Model No.	EDA52-1
IMEI	Conducted Measurement: 990017701062131 Radiated Measurement: 990017701732584
Wi-Fi Specification	802.11a/b/g/n/ac
Bluetooth Specification	v5.0 dual mode
NFC Specification	Active, 13.56MHz
GNSS Specification	GPS/Galileo/BDS/GLONASS
3GPP Specification	GSM 850/1900 WCDMA Band 2/4/5 LTE Band 2/4/5/7/12/13/17/25/26/30/38/40/41/66
Working Voltage	3.8Vdc
Remark: The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.	

1.5. Radio Specification

T _x Frequency Range:	GSM 850: 824 ~ 849MHz PCS 1900: 1850 ~ 1910MHz WCDMA Band II: 1850 ~ 1910MHz WCDMA Band IV: 1710 ~ 1755MHz WCDMA Band V: 824 ~ 849MHz
R _x Frequency Range:	GSM 850: 869 ~ 894MHz PCS 1900: 1930 ~ 1990MHz WCDMA Band II: 1930 ~ 1990MHz WCDMA Band IV: 2110 ~ 2155MHz WCDMA Band V: 869 ~ 894MHz
Modulation	GSM: GMSK, 8PSK WCDMA: Uplink & Downlink up to 64QAM

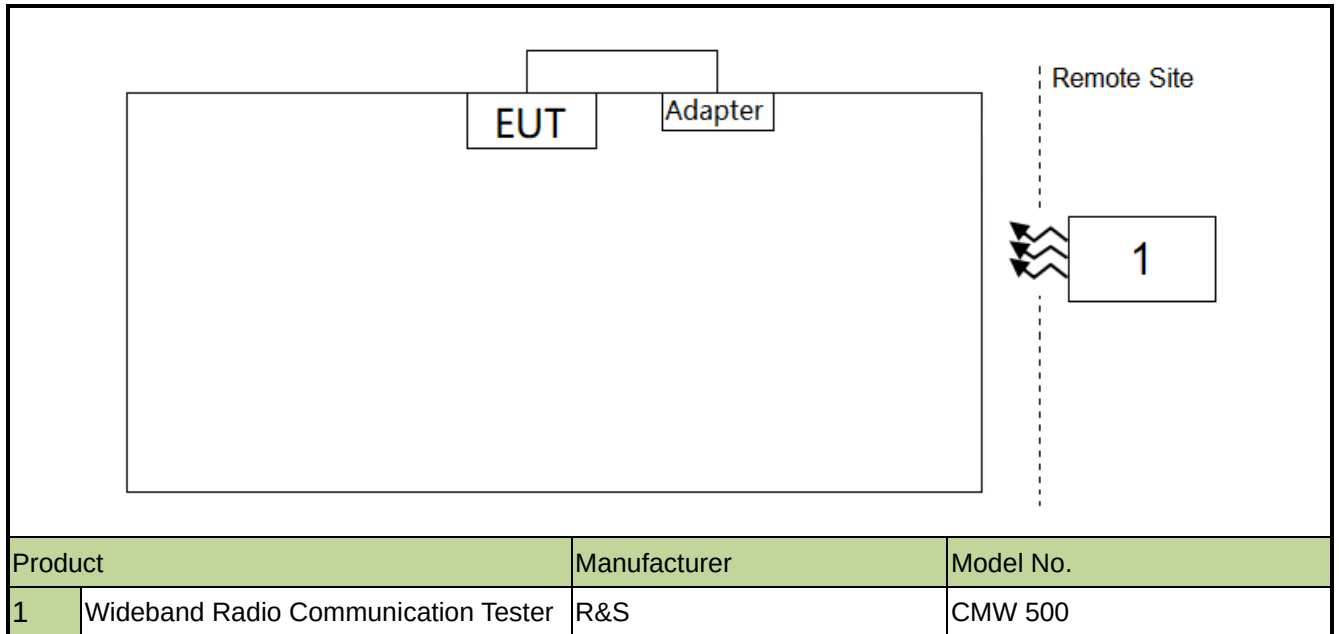
Note: For other features of this EUT, test report will be issued separately.

1.6. Antenna Details

Technology	Frequency Range (MHz)	Antenna Type	Max Peak Gain (dBi)
GSM 850	824 ~ 849	PIFA	-0.12
PCS 1900	1850 ~ 1910		2.66
WCDMA Band II	1850 ~ 1910		2.66
WCDMA Band IV	1710 ~ 1755		0.94
WCDMA Band V	824 ~ 849		-0.12

2. Test Configuration

2.1. Configuration of Tested System



2.2. Test Methodology

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ANSI C63.26:2015
- FCC CFR 47 Part 22, Part 24, Part 27
- FCC KDB 971168 D01 v03r01: Power Meas License Digital Systems
- FCC KDB 971168 D02 v02r01: Misc Rev Approv License Devices
- FCC KDB 412172 D01 v01r01: Determining ERP and EIRP

2.3. Test Environment Condition

Ambient Temperature	15 ~ 35°C
Relative Humidity	20 ~ 75%RH

3. Test Equipment Calibration Date

Instrument Name	Manufacturer	Model No.	Asset No.	Cali. Interval	Cal. Due Date	Test Site
Communication Tester	R&S	CMU 200	MRTSUE06009	1 year	2022/9/7	SIP-SR1
Communication Tester	R&S	CMW500	MRTSUE06243	1 year	2022/10/10	SIP-SR1
Signal Generator	Keysight	E8257D	MRTSUE06453	1 year	2022/6/24	SIP-SR1
Thermohygrometer	testo	622	MRTSUE06629	1 year	2022/11/2	SIP-SR1
Signal Generator	Keysight	E8257D	MRTSUE06904	1 year	2022/11/23	SIP-SR1
DC POWER MODULE	Keysight	N6743B	MRTSUE06905	/	/	SIP-SR1
DC POWER MODULE	Keysight	N6743B	MRTSUE06906	/	/	SIP-SR1
Low-Profile Modular Power System Mainframe	Keysight	N6700C	MRTSUE06907	/	/	SIP-SR1
Signal Analyzer	Keysight	N9021B	MRTSUE06915	1 year	2022/12/19	SIP-SR1
Temperature Chamber	BAOYT	BYG-80CL	MRTSUE06932	1 year	2022/3/16	SIP-SR1
Shielding Room	MIX-BEP	SIP-SR1	MRTSUE06948	/	/	SIP-SR1
Anechoic Chamber	RIKEN	SIP-AC1	MRTSUE06554	1 year	2022/12/23	SIP-AC1
Preamplifier	EMCI	EMC051845SE	MRTSUE06600	1 year	2022/11/8	SIP-AC1
Horn Antenna	R&S	HF907	MRTSUE06610	1 year	2022/8/5	SIP-AC1
Thermohygrometer	testo	608-H1	MRTSUE06616	1 year	2022/11/2	SIP-AC1
Thermohygrometer	testo	608-H1	MRTSUE06620	1 year	2022/11/28	SIP-AC1
TRILOG Antenna	Schwarzbeck	VULB 9168	MRTSUE06645	1 year	2022/8/26	SIP-AC1
EMI Test Receiver	R&S	ESR3	MRTSUE06185	1 year	2022/12/29	SIP-AC2
Signal Analyzer	Keysight	N9010B	MRTSUE06559	1 year	2022/6/24	SIP-AC2
Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06599	1 year	2022/10/20	SIP-AC2
Preamplifier	EMCI	EMC184045SE	MRTSUE06602	1 year	2022/10/11	SIP-AC2
Signal Analyzer	Keysight	N9010B	MRTSUE06603	1 year	2022/10/31	SIP-AC2
Signal Analyzer	Keysight	N9020B	MRTSUE06604	1 year	2022/9/7	SIP-AC2
EMI Test Receiver	R&S	ESR3	MRTSUE06613	1 year	2022/6/24	SIP-AC2
Thermohygrometer	testo	608-H1	MRTSUE06623	1 year	2022/11/28	SIP-AC2
Thermohygrometer	testo	608-H1	MRTSUE06624	1 year	2022/11/28	SIP-AC2
Preamplifier	EMCI	EMC001330	MRTSUE06643	1 year	2022/1/12	SIP-AC2
				1 year	2023/1/13	SIP-AC2
TRILOG Antenna	Schwarzbeck	VULB 9168	MRTSUE06647	1 year	2022/8/5	SIP-AC2
Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06648	1 year	2022/11/9	SIP-AC2
Anechoic Chamber	RIKEN	SIP-AC2	MRTSUE06781	1 year	2022/12/23	SIP-AC2
Loop Antenna	Schwarzbeck	FMZB 1519 B	MRTSUE06937	1 year	2022/3/9	SIP-AC2

Instrument Name	Manufacturer	Model No.	Asset No.	Cali. Interval	Cal. Due Date	Test Site
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2022/6/9	SIP-AC3
Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06598	1 year	2022/11/9	SIP-AC3
Horn Antenna	R&S	HF907	MRTSUE06611	1 year	2022/9/12	SIP-AC3
Thermohygrometer	testo	608-H1	MRTSUE06619	1 year	2022/11/2	SIP-AC3
Thermohygrometer	testo	608-H1	MRTSUE06622	1 year	2022/11/28	SIP-AC3
Preamplifier	EMCI	EMC012645SE	MRTSUE06642	1 year	2022/1/12	SIP-AC3
				1 year	2023/1/13	SIP-AC3
TRILOG Antenna	Schwarzbeck	VULB 9168	MRTSUE06646	1 year	2022/8/26	SIP-AC3
Anechoic Chamber	RIKEN	SIP-AC3	MRTSUE06782	1 year	2022/12/23	SIP-AC3

Software	Version	Function
EMI Software	V3	EMI Test Software

4. Measurement Uncertainty

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

Radiated Spurious Emissions
Measurement Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): Horizontal: 9kHz ~ 300MHz: 5.04dB 300MHz ~ 1GHz: 4.95dB 1GHz ~ 40GHz: 6.40dB Vertical: 9kHz ~ 300MHz: 5.24dB 300MHz ~ 1GHz: 6.03dB 1GHz ~ 40GHz: 6.40dB
Conducted Spurious Emissions
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 0.78dB
Output Power
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 1.13dB
Occupied Bandwidth
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 0.28%
Frequency Stability
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 76.2Hz

5. Test Result

5.1. Summary

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1049	Occupied Bandwidth	N/A	Conducted	Pass	Section 5.2
2.1055, 22.355 24.235, 27.54	Frequency Stability	< 2.5 ppm		Pass	Section 5.3
22.913(a)(5)	Equivalent Radiated Power (B5)	< 7 Watts Max ERP		Pass	Section 5.4
27.50(d)(4)	Equivalent Isotropic Radiated Power (B4)	< 1 Watts Max EIRP		Pass	Section 5.4
24.232(c)	Equivalent Isotropic Radiated Power (B2)	< 2 Watts Max EIRP		Pass	Section 5.4
2.1051, 22.917(a) 24.238(a), 27.53(h)	Band Edge	< 43 + 10log10 (P _[Watts])		Pass	Section 5.5
2.1051, 22.917(a) 24.238(a), 27.53(h)	Peak to Average Ratio	< 13dB		Pass	Section 5.6
24.232(d), 27.50(d)(5)	Spurious Emission	< 43 + 10log10 (P _[Watts])		Pass	Section 5.7
2.1053, 22.917(a) 24.238(a), 27.53(h)	Spurious Emission	< 43 + 10log10 (P _[Watts])	Radiated	Pass	Section 5.8

Notes:

- 1) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
- 2) All modes of operation and data rates were investigated. For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst-case emissions.
- 3) All supported modulation types were evaluated. The worst-case emission of modulation was selected. Therefore, the Frequency Stability, Channel Band Edge, Radiated & Conducted Spurious Emission were presented worst-case in the test report.

5.2. Occupied Bandwidth Measurement

5.2.1. 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.

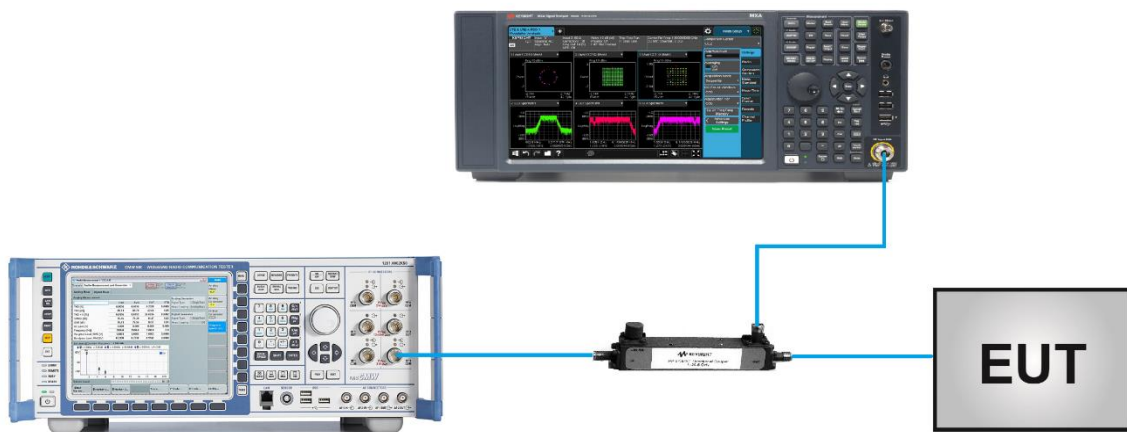
5.2.2. Test Procedure

ANSI C63.26-2015 - Section 5.4

5.2.3. Test Setting

1. Set center frequency to the nominal EUT channel center frequency
2. RBW = The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW
3. VBW $\geq 3 \times$ RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. Allow the trace to stabilize
8. Use the 99% power bandwidth function of the instrument and report the measured bandwidth.

5.2.4. Test Setup



5.2.5. Test Result

Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/07
Test Band	GSM 850_GPRS		

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	824.2	0.246
Middle	836.4	0.244
High	848.8	0.243



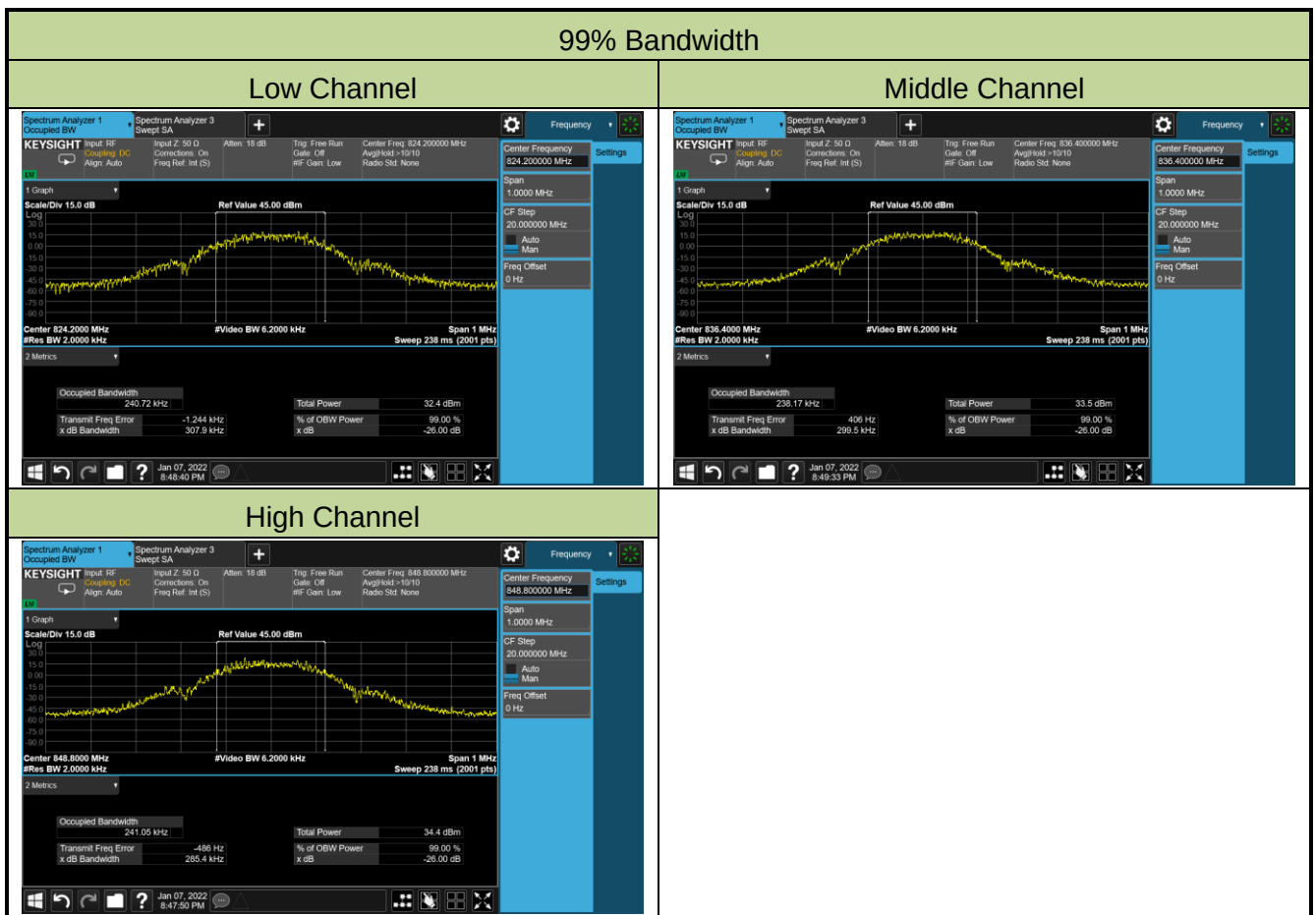
Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/07
Test Band	PCS 1900_GPRS		

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	1850.2	0.243
Middle	1880.0	0.246
High	1909.8	0.243



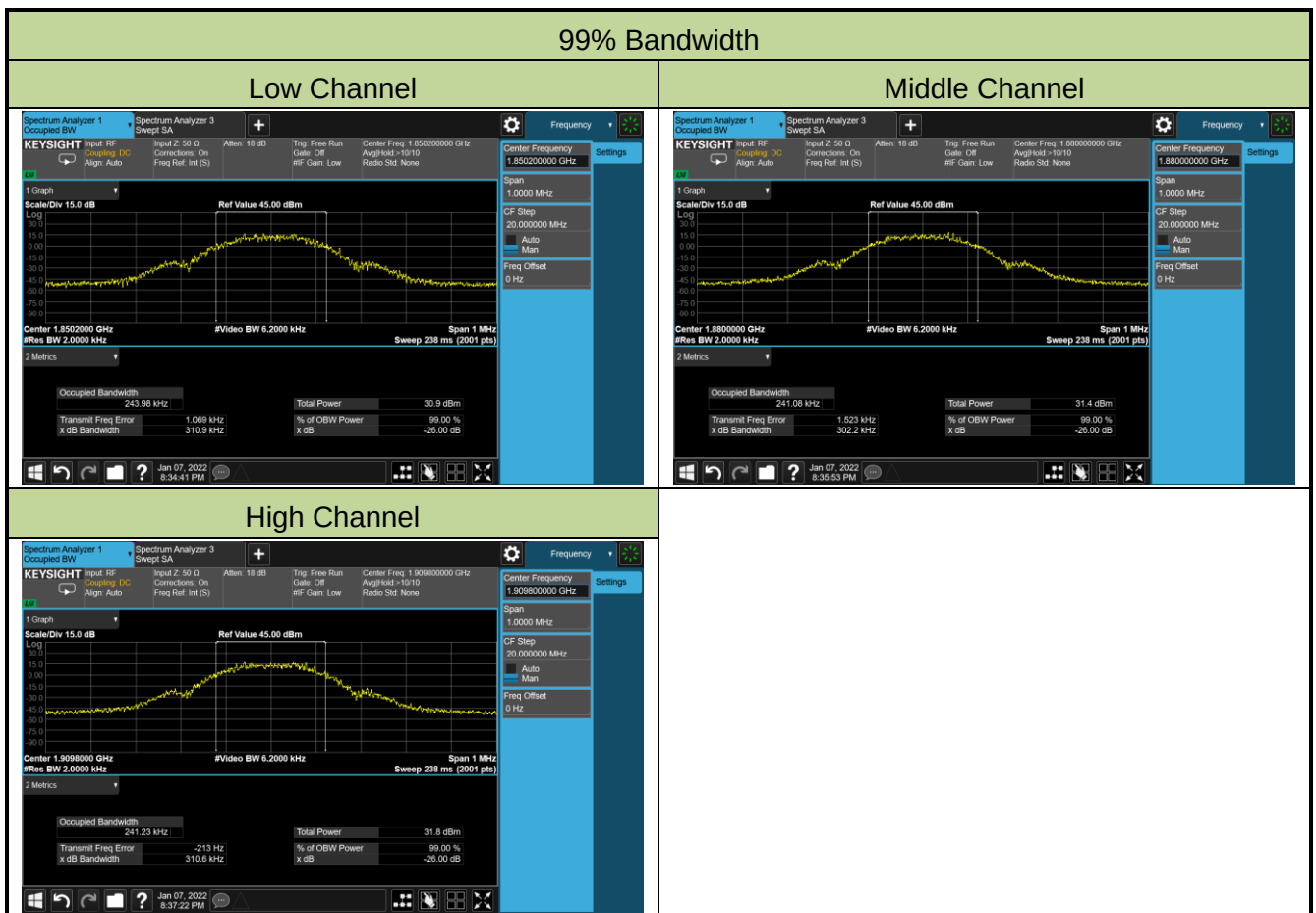
Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/07
Test Band	GSM 850_EGPRS		

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	824.2	0.241
Middle	836.4	0.238
High	848.8	0.241



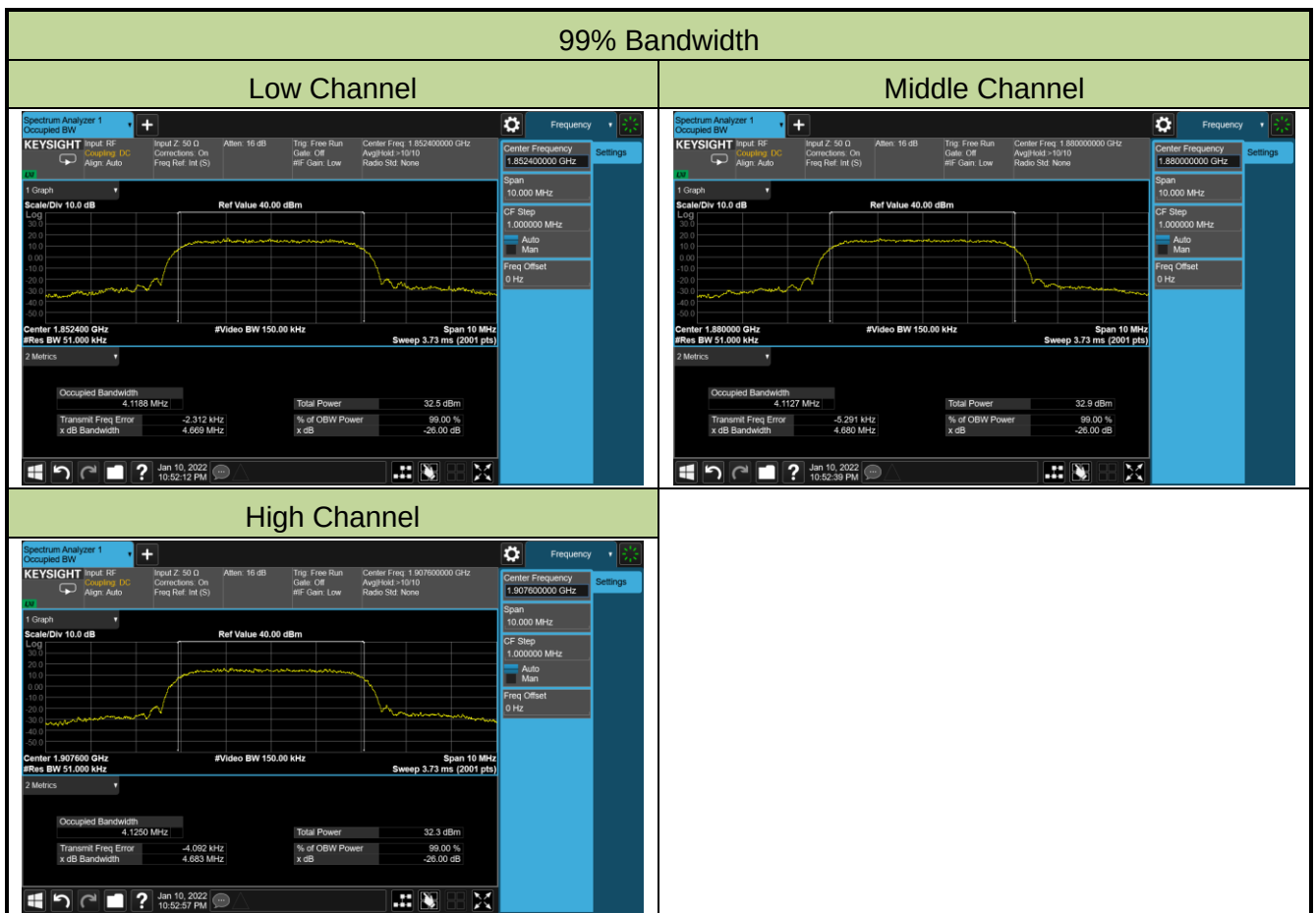
Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/07
Test Band	PCS 1900_EGPRS		

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	1850.2	0.244
Middle	1880.0	0.241
High	1909.8	0.241



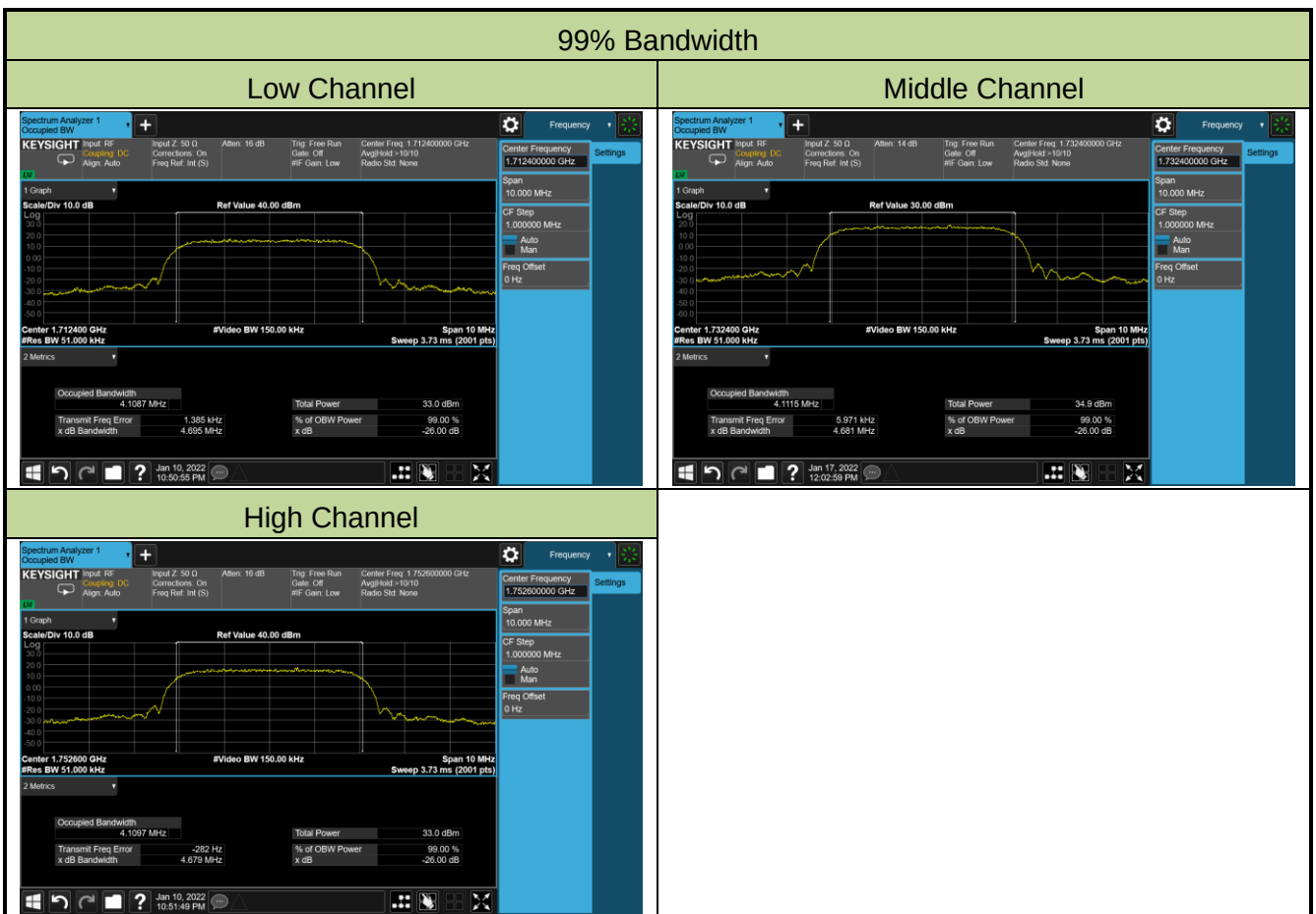
Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/10
Test Band	WCDMA Band II		

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	1852.4	4.12
Middle	1880.0	4.11
High	1907.6	4.13



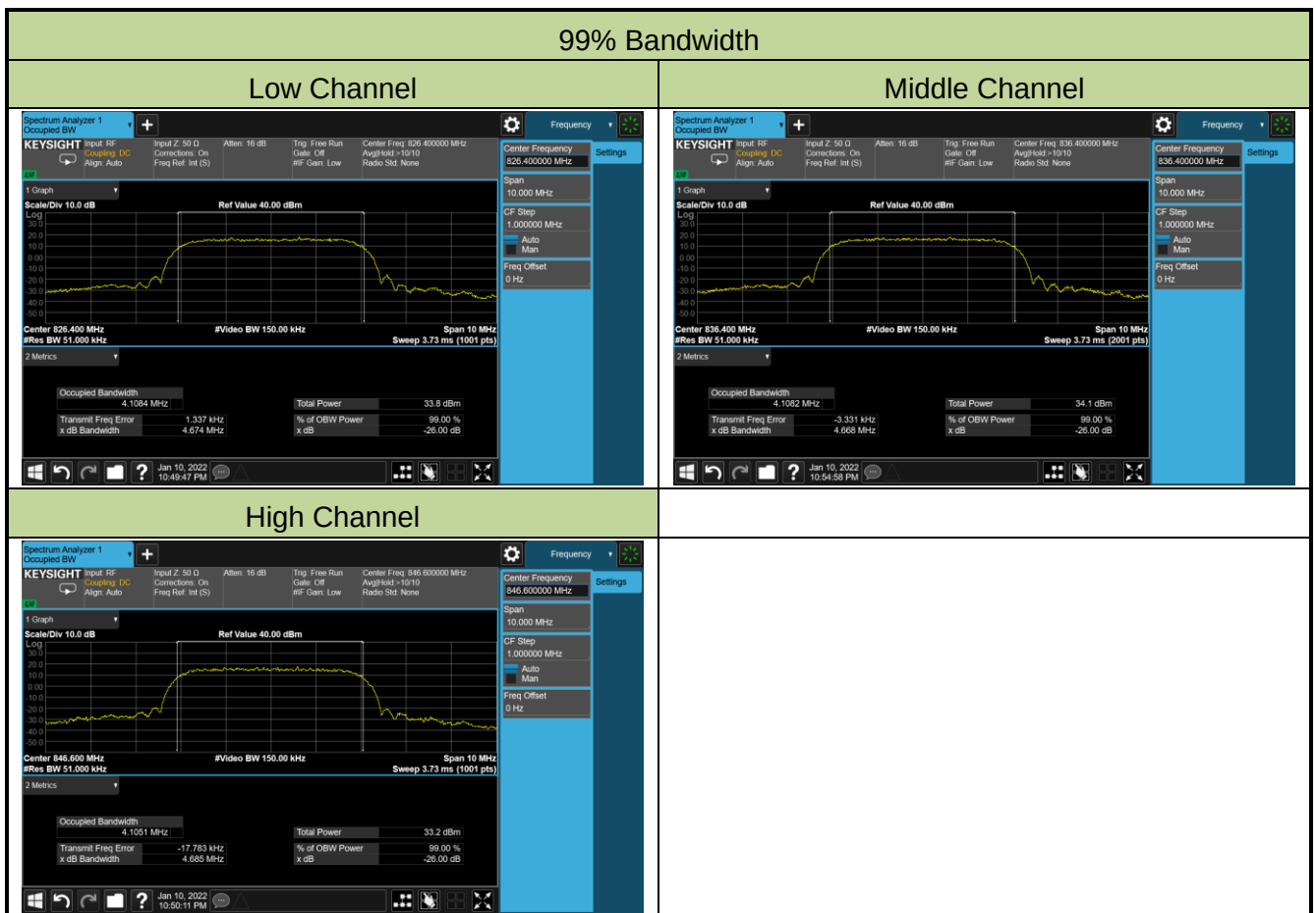
Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/10 ~ 2022/01/17
Test Band	WCDMA Band IV		

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	1712.4	4.11
Middle	1732.4	4.11
High	1752.6	4.11



Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/10
Test Band	WCDMA Band V		

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	826.4	4.11
Middle	836.4	4.11
High	846.6	4.11



5.3. Frequency Stability Measurement

5.3.1. Test Limit

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency.

5.3.2. Test Procedure

ANSI C63.26-2015 - Section 5.6

5.3.3. Test Setting

Frequency Stability Under Temperature Variations:

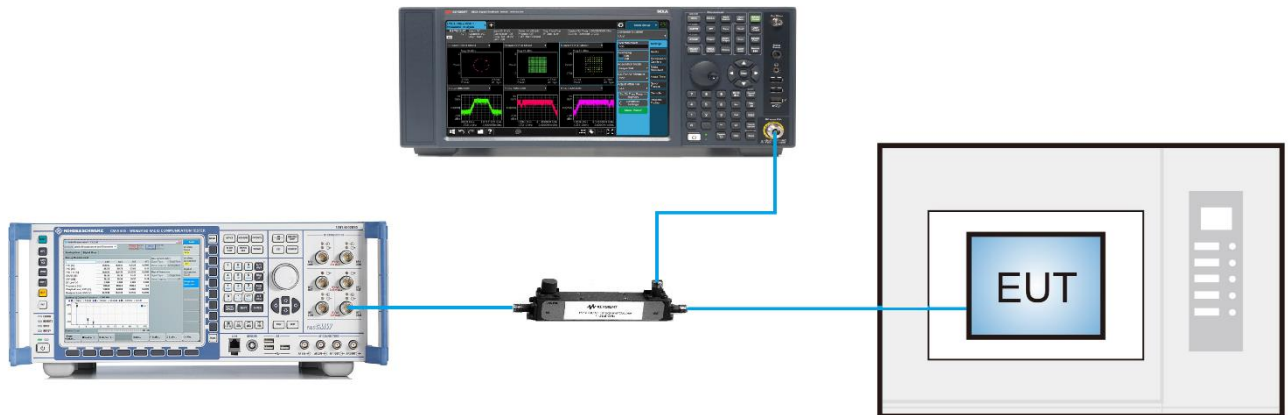
The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to High. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C decreased per stage until the Low temperature reached.

Frequency Stability Under Voltage Variations:

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation ($\pm 15\%$) and endpoint, record the maximum frequency change.

5.3.4. Test Setup



5.3.5.Test Result

Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/18
Test Band	GSM 850_GPRS		

Power (Vdc)	Temp. (°C)	Frequency Tolerance (ppm)
3.80	- 30	0.0192
	- 20	0.0154
	- 10	0.0157
	0	0.0132
	+ 10	0.0171
	+ 20	0.0178
	+ 30	0.0176
	+ 40	0.0136
	+ 50	0.0162
4.37	+ 20	0.0148
3.23	+ 20	0.0176

Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/18
Test Band	PCS 1900_GPRS		

Power (Vdc)	Temp. (°C)	Frequency Tolerance (ppm)
3.80	- 30	0.0046
	- 20	0.0030
	- 10	0.0049
	0	0.0031
	+ 10	0.0019
	+ 20	0.0079
	+ 30	0.0033
	+ 40	0.0048
	+ 50	0.0067
4.37	+ 20	0.0062
3.23	+ 20	0.0080

Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/18
Test Band	GSM 850_EGPRS		

Power (Vdc)	Temp. (°C)	Frequency Tolerance (ppm)
3.80	- 30	0.0167
	- 20	0.0243
	- 10	0.0249
	0	0.0224
	+ 10	0.0195
	+ 20	0.0176
	+ 30	0.0113
	+ 40	0.0159
	+ 50	0.0115
4.37	+ 20	0.0152
3.23	+ 20	0.0235

Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/18
Test Band	PCS 1900_EGPRS		

Power (Vdc)	Temp. (°C)	Frequency Tolerance (ppm)
3.80	- 30	0.0048
	- 20	0.0054
	- 10	0.0041
	0	0.0057
	+ 10	0.0056
	+ 20	0.0027
	+ 30	0.0026
	+ 40	0.0071
	+ 50	0.0027
4.37	+ 20	0.0073
3.23	+ 20	0.0068

Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/18
Test Band	WCDMA Band II		

Power (Vdc)	Temp. (°C)	Frequency Tolerance (ppm)
3.80	- 30	0.0015
	- 20	0.0001
	- 10	-0.0006
	0	0.0008
	+ 10	-0.0012
	+ 20	-0.0005
	+ 30	-0.0020
	+ 40	-0.0010
	+ 50	-0.0005
4.37	+ 20	-0.0010
3.23	+ 20	-0.0010

Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/18
Test Band	WCDMA Band IV		

Power (Vdc)	Temp. (°C)	Frequency Tolerance (ppm)
3.80	- 30	0.0023
	- 20	-0.0005
	- 10	-0.0001
	0	-0.0006
	+ 10	-0.0011
	+ 20	-0.0011
	+ 30	0.0001
	+ 40	-0.0015
	+ 50	-0.0012
4.37	+ 20	-0.0013
3.23	+ 20	-0.0012

Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/18
Test Band	WCDMA Band V		

Power (Vdc)	Temp. (°C)	Frequency Tolerance (ppm)
3.80	- 30	0.0015
	- 20	-0.0001
	- 10	0.0000
	0	-0.0008
	+ 10	-0.0001
	+ 20	-0.0006
	+ 30	-0.0004
	+ 40	-0.0008
	+ 50	-0.0006
4.37	+ 20	-0.0006
3.23	+ 20	-0.0002

5.4. Equivalent Isotropically Radiated Power Measurement

5.4.1. Test Limit

Band 2:

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.

Band 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.

Band 5:

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

5.4.2. Test Procedure

ANSI C63.26-2015 - Section 5.2

5.4.3. Test Setting

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.

The relevant equation for determining the maximum ERP or EIRP from the measured RF output power is given in Equation (1) as follows:

$$\text{ERP or EIRP} = P_{\text{Meas}} + G_T$$

where

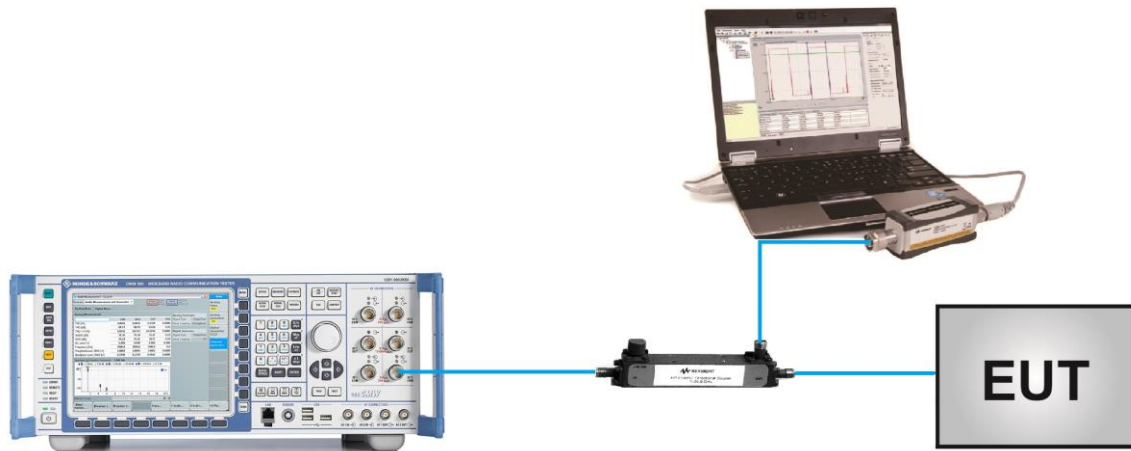
ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas} , e.g., dBm or dBW)

P_{Meas} measured transmitter output power or PSD, in dBm or dBW

G_T gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

$$\text{ERP} = \text{EIRP} - 2.15$$

5.4.4. Test Setup



5.4.5. Test Result

Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/07
Test Band	GSM 850		

Mode	Slot	Conducted Power (dBm)			Antenna Gain (dBi)	ERP (dBm)		
		GSM 850 Channel				GSM 850 Channel		
		128	189	251		128	189	251
GSM	-	32.84	33.18	33.26	-0.12	30.57	30.91	30.99
GPRS	1	32.79	33.20	33.27	-0.12	30.52	30.93	31.00
	2	29.92	30.05	30.16	-0.12	27.65	27.78	27.89
	3	27.69	28.09	28.10	-0.12	25.42	25.82	25.83
	4	26.14	26.49	26.57	-0.12	23.87	24.22	24.30
EGPRS (GMSK)	1	32.74	33.16	33.24	-0.12	30.47	30.89	30.97
	2	29.86	29.93	30.07	-0.12	27.59	27.66	27.80
	3	27.68	28.01	27.98	-0.12	25.41	25.74	25.71
	4	26.01	26.42	26.48	-0.12	23.74	24.15	24.21
EGPRS (8PSK)	1	27.67	27.86	27.93	-0.12	25.40	25.59	25.66
	2	24.28	24.57	24.74	-0.12	22.01	22.30	22.47
	3	22.16	22.36	22.45	-0.12	19.89	20.09	20.18
	4	20.46	20.65	20.78	-0.12	18.19	18.38	18.51
Limit	38.45dBm							

Note: The ERP (dBm) = Output Power (dBm) + Antenna Gain (dBi) – 2.15

Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/07
Test Band	PCS 1900		

Mode	Slot	Conducted Power (dBm)			Antenna Gain (dBi)	EIRP (dBm)		
		DCS 1900 Channel				DCS 1900 Channel		
		512	661	810		512	661	810
GSM	-	29.03	28.96	29.04	2.66	31.69	31.62	31.70
GPRS	1	29.06	28.99	29.06	2.66	31.72	31.65	31.72
	2	26.35	26.24	26.46	2.66	29.01	28.90	29.12
	3	24.13	24.11	24.33	2.66	26.79	26.77	26.99
	4	22.80	22.71	22.85	2.66	25.46	25.37	25.51
EGPRS (GMSK)	1	29.12	29.05	29.14	2.66	31.78	31.71	31.80
	2	26.41	26.27	26.50	2.66	29.07	28.93	29.16
	3	24.16	24.17	24.37	2.66	26.82	26.83	27.03
	4	22.77	22.70	22.85	2.66	25.43	25.36	25.51
EGPRS (8PSK)	1	25.22	25.12	25.46	2.66	27.88	27.78	28.12
	2	22.67	22.74	23.10	2.66	25.33	25.40	25.76
	3	20.74	20.78	20.95	2.66	23.40	23.44	23.61
	4	19.13	19.18	19.23	2.66	21.79	21.84	21.89
Limit	33.01dBm							

Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)

Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/11
Test Band	WCDMA Band II		

Mode	3GPP Subtest	Conducted Power (dBm)			Antenna Gain (dBi)	EIRP (dBm)		
		Band II Channel				Band II Channel		
		9262	9400	9538		9262	9400	9538
WCDMA R99	1	24.47	24.38	24.27	2.66	27.13	27.04	26.93
HSDPA	1	23.40	23.36	23.27	2.66	26.06	26.02	25.93
	2	23.45	23.35	23.26	2.66	26.11	26.01	25.92
	3	22.97	22.85	22.76	2.66	25.63	25.51	25.42
	4	22.93	22.87	22.77	2.66	25.59	25.53	25.43
HSUPA	1	23.48	23.39	23.30	2.66	26.14	26.05	25.96
	2	21.49	21.36	21.30	2.66	24.15	24.02	23.96
	3	22.44	22.34	22.29	2.66	25.10	25.00	24.95
	4	21.47	21.37	21.31	2.66	24.13	24.03	23.97
	5	23.62	23.41	23.31	2.66	26.28	26.07	25.97
Limit	33.01dBm							

Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)

Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/11
Test Band	WCDMA Band IV		

Mode	3GPP Subtest	Conducted Power (dBm)			Antenna Gain (dBi)	EIRP (dBm)		
		Band IV Channel				Band IV Channel		
		1312	1412	1513		1312	1412	1513
WCDMA R99	1	24.57	24.72	24.60	0.94	25.51	25.66	25.54
HSDPA	1	23.56	23.63	23.60	0.94	24.50	24.57	24.54
	2	23.53	23.59	23.53	0.94	24.47	24.53	24.47
	3	23.02	23.20	23.06	0.94	23.96	24.14	24.00
	4	23.07	23.20	23.07	0.94	24.01	24.14	24.01
HSUPA	1	23.55	23.70	23.57	0.94	24.49	24.64	24.51
	2	21.61	21.65	21.61	0.94	22.55	22.59	22.55
	3	22.52	22.68	22.53	0.94	23.46	23.62	23.47
	4	21.63	21.66	21.61	0.94	22.57	22.60	22.55
	5	23.64	23.71	23.66	0.94	24.58	24.65	24.60
Limit	30.00dBm							

Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)

Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/11
Test Band	WCDMA Band V		

Mode	3GPP Subtest	Conducted Power (dBm)			Antenna Gain (dBi)	ERP (dBm)		
		Band V Channel				Band V Channel		
		4132	4182	4233		4132	4182	4233
WCDMA R99	1	24.75	24.83	24.66	-0.12	22.48	22.56	22.39
HSDPA	1	23.80	23.90	23.73	-0.12	21.53	21.63	21.46
	2	23.85	23.87	23.79	-0.12	21.58	21.60	21.52
	3	23.40	23.48	23.31	-0.12	21.13	21.21	21.04
	4	23.38	23.46	23.29	-0.12	21.11	21.19	21.02
HSUPA	1	23.80	23.91	23.75	-0.12	21.53	21.64	21.48
	2	21.88	21.88	21.74	-0.12	19.61	19.61	19.47
	3	22.82	22.93	22.79	-0.12	20.55	20.66	20.52
	4	21.89	22.01	21.75	-0.12	19.62	19.74	19.48
	5	23.79	23.89	23.63	-0.12	21.52	21.62	21.36
Limit	38.45dBm							

Note: The ERP (dBm) = Output Power (dBm) + Antenna Gain (dBi) – 2.15

5.5. Band Edge Measurement

5.5.1. Test Limit

For operations in the 824 ~ 849 MHz, 1850 ~ 1910 MHz, 1930 ~ 1990 MHz, 698 ~ 746 MHz and 1710 ~ 1755 MHz, the FCC limit is $43 + 10\log_{10}(P_{\text{[Watts]}})$ dB below the transmitter power P(Watts) in a 1 MHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

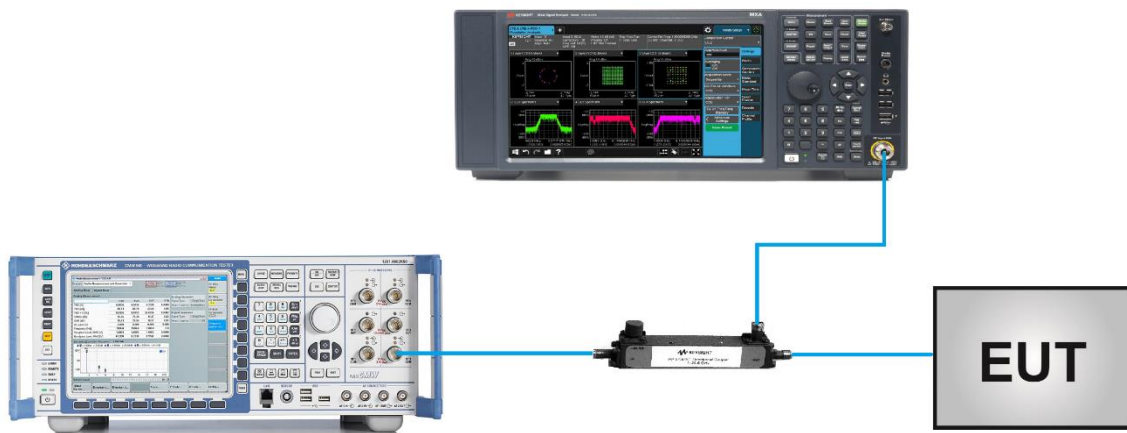
5.5.2. Test Procedure

ANSI C63.26-2015 - Section 5.7

5.5.3. Test Setting

1. Set the analyzer frequency to low or high channel
2. $RBW \geq$ The nominal RBW shall be in the range of 1% of the anticipated OBW (in the 1MHz band immediately outside and adjacent to the band edge). For improvement of the accuracy in the measurement of the average power of a noise-like emission, a RBW narrower than the specified reference bandwidth can be used (generally limited to no less than 1% of the OBW), provided that a subsequent integration is performed over the full required measurement bandwidth. This integration should be performed using the spectrum analyzer's band power functions.
3. $VBW \geq 3 \cdot RBW$
4. Sweep time = auto
5. Detector = power averaging (rms)
6. Set sweep trigger to "free run."
7. User gate triggered such that the analyzer only sweeps when the device is transmitting at full power
8. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple.
To accurately determine the average power over the on and off time of the transmitter, it can be necessary to increase the number of traces to be averaged above 100, or if using a manually configured sweep time, increase the sweep time.

5.5.4. Test Setup



5.5.5. Test Result

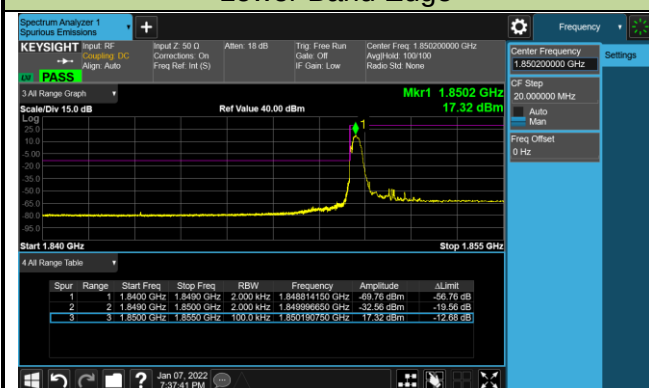
Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/07
Test Band	GSM 850		



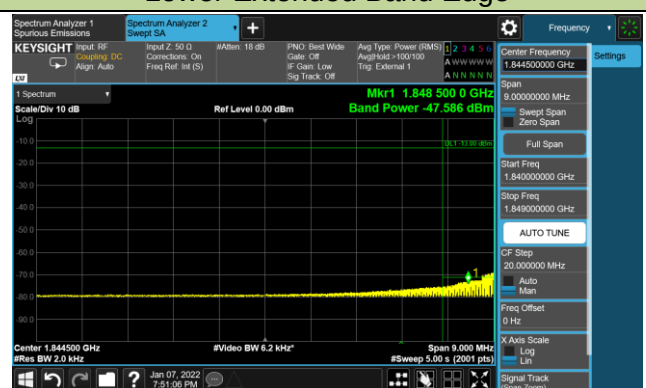
Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/07
Test Band	PCS 1900		

PCS 1900_GPRS

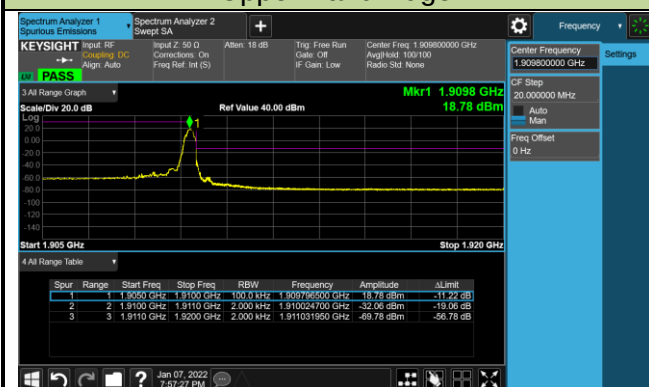
Lower Band Edge



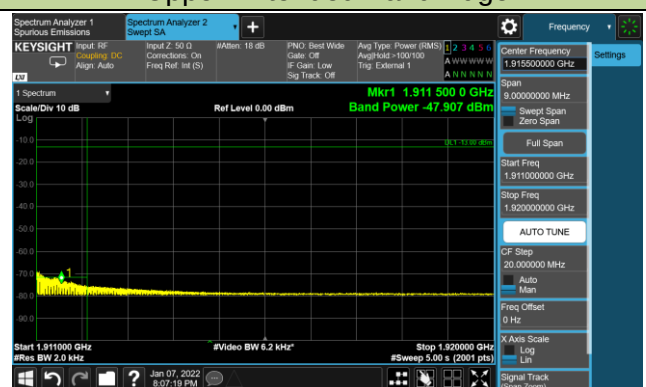
Lower Extended Band Edge



Upper Band Edge

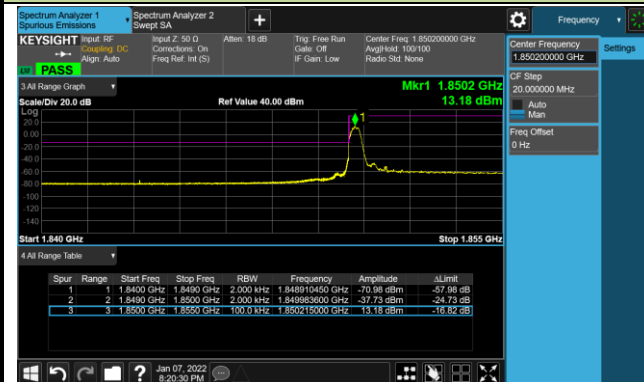


Upper Extended Band Edge

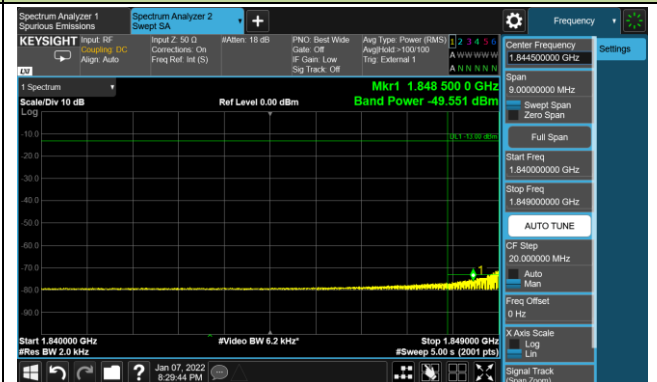


PCS 1900_EGPRS

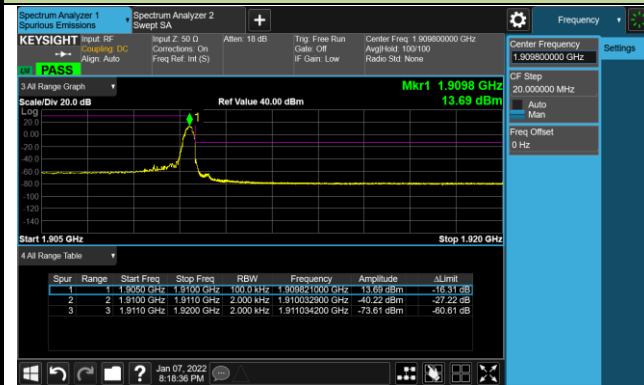
Lower Band Edge



Lower Extended Band Edge



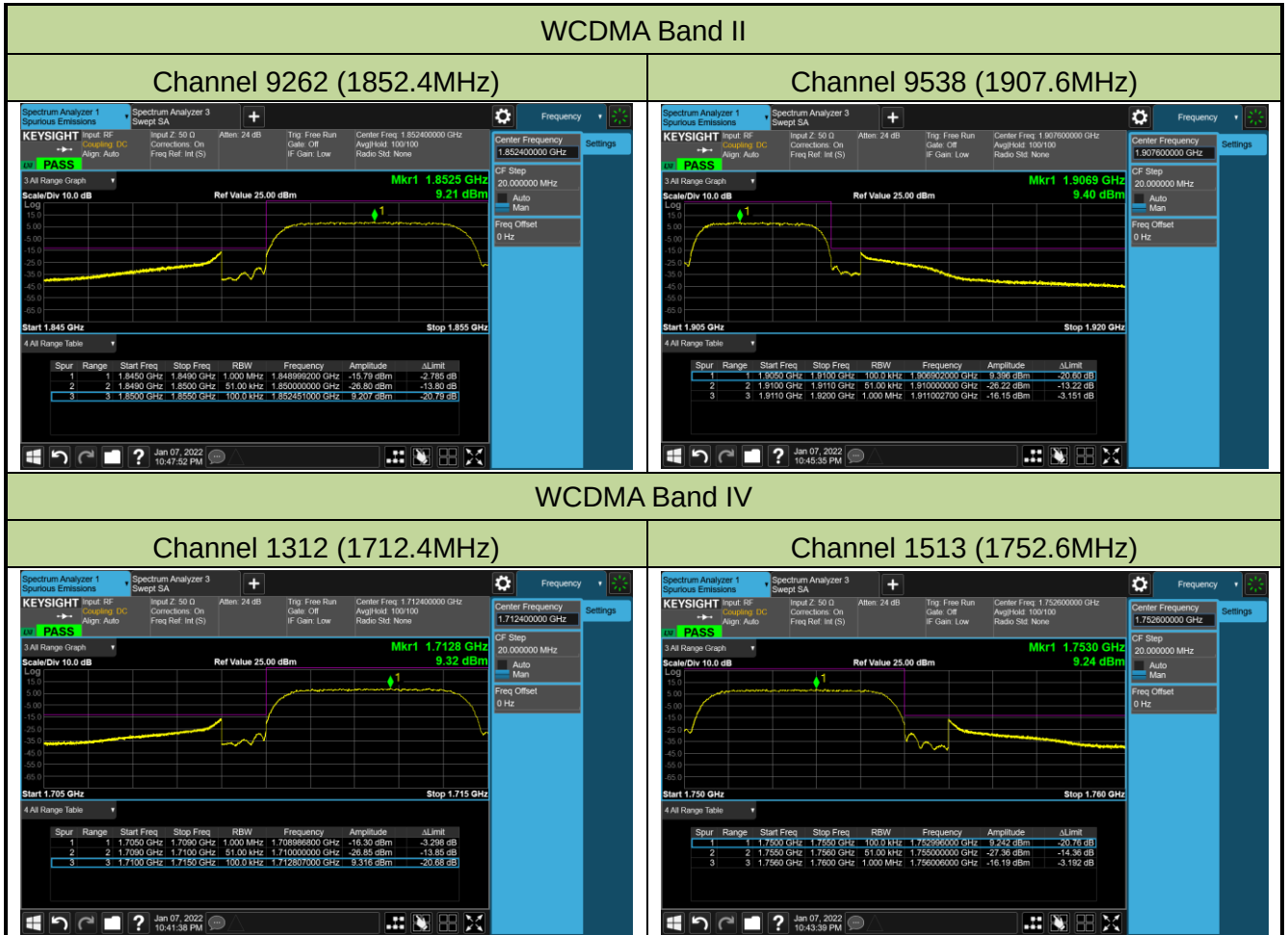
Upper Band Edge

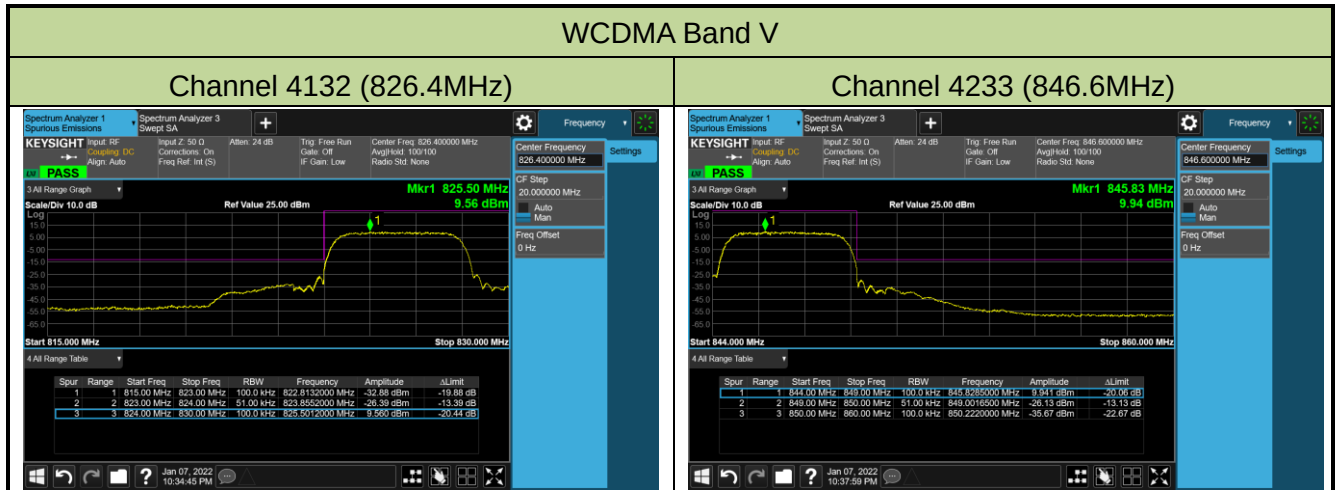


Upper Extended Band Edge



Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/07
Test Band	WCDMA Band II, IV, V		





5.6. Peak to Average Ratio Measurement

5.6.1. Test Limit

A peak to average ratio measurement is performed at the conducted port of the EUT. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

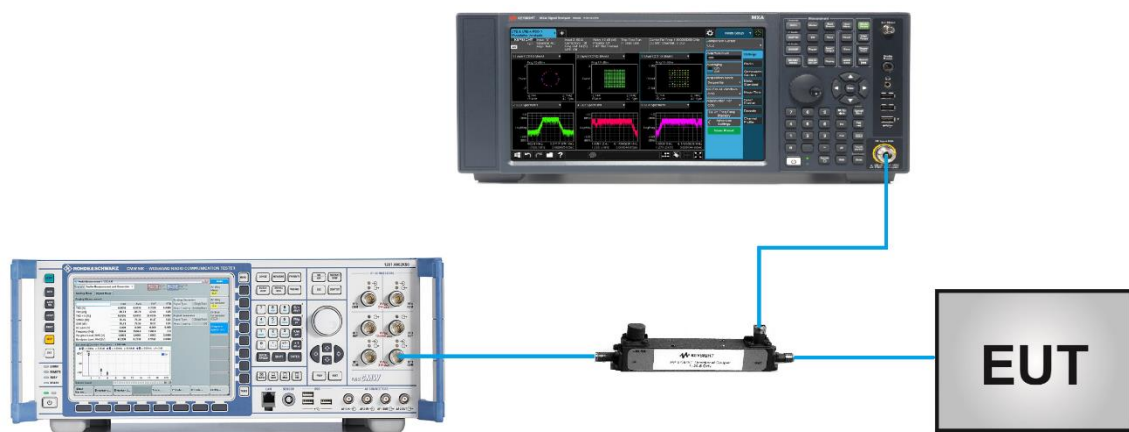
5.6.2. Test Procedure

ANSI C63.26-2015 - Section 5.2.3.4 (CCDF).

5.6.3. Test Setting

1. Set the resolution / measurement bandwidth $\geq$ signal's occupied bandwidth
2. Set the number of counts to a value that stabilizes the measured CCDF curve
3. Record the maximum PARR level associated with a probability of 0.1%

5.6.4. Test Setup



5.6.5. Test Result

Product	Mobile Computer	Test Site	SIP-SR1
Test Engineer	Candy Luo	Test Date	2022/01/07
Test Band	GSM 850, PCS 1900		

Channel No.	Frequency (MHz)	Channel Bandwidth (kHz)	Peak to Average Ratio (dB)	Limit (dB)	Result
GPRS 850					
128	824.2	200	2.62	≤ 13.00	Pass
189	836.4	200	2.62	≤ 13.00	Pass
251	848.8	200	2.62	≤ 13.00	Pass
EGPRS 850					
128	824.2	200	5.73	≤ 13.00	Pass
189	836.4	200	5.64	≤ 13.00	Pass
251	848.8	200	5.61	≤ 13.00	Pass
GPRS 1900					
512	1850.2	200	2.61	≤ 13.00	Pass
661	1880.0	200	2.61	≤ 13.00	Pass
810	1909.8	200	2.61	≤ 13.00	Pass
EGPRS 1900					
512	1850.2	200	6.50	≤ 13.00	Pass
661	1880.0	200	6.44	≤ 13.00	Pass
810	1909.8	200	6.18	≤ 13.00	Pass