

MEASUREMENT REPORT

FCC PART 22 & 24 & 27

FCC ID: HD5-EDA61K1

Application: Honeywell International Inc.
Honeywell Safety and Productivity Solutions

Application Type: Certification

Product: Mobile Computer

Model No.: EDA61K-1

Brand Name: Honeywell

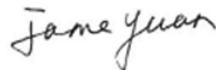
FCC Classification: PCS Licensed Transmitter (PCB)

FCC Rule Part(s): Part 22 Subpart H, Part 24 Subpart E,
Part 27 Subpart L

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

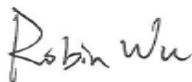
Test Date: November 11 ~ 30, 2020

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
2010RSU078-U6	Rev. 01	Initial Report	11-30-2020	Valid

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1. General Information

1.1. Applicant

Honeywell International Inc
Honeywell Safety and Productivity Solutions
9680 Old Baires Road, Fort Mill, SC 29707 United States

1.2. Manufacturer

Honeywell International Inc
Honeywell Safety and Productivity Solutions
9680 Old Bailes Road, Fort Mill, SC 29707 United States

1.3. Testing Facility

☒	Test Site - MRT Suzhou Laboratory	
	Laboratory Location (Suzhou - Wuzhong)	
	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China	
	Laboratory Location (Suzhou - SIP)	
	4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China	
	Laboratory Accreditations	
A2LA: 3628.01		CNAS: L10551
FCC: CN1166		ISED: CN0001
VCCI: R-20025, G-20034, C-20020, T-20020		
☐	Test Site - MRT Shenzhen Laboratory	
	Laboratory Location (Shenzhen)	
	1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China	
	Laboratory Accreditations	
	A2LA: 3628.02	
FCC: CN1284		ISED: CN0105
☐	Test Site - MRT Taiwan Laboratory	
	Laboratory Location (Taiwan)	
	No. 38, Fuxing 2 nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)	
	Laboratory Accreditations	
TAF: L3261-190725		
FCC: 291082, TW3261		ISED: TW3261

2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name	Mobile Computer
Model No.	EDA61K-1
Serial No.	19252B1389 (Conducted Sample), 20094B219D (Radiated Sample)
Wi-Fi Specification	802.11a/b/g/n/ac
Bluetooth Version	v4.1 dual mode
Satellite	GPS/GLONASS
GSM Operation Band (s)	GPRS/EDGE 850/1900
WCDMA Operation Band (s)	Band II/IV/V
CDMA2000 Operation Band (s)	BC0 / BC1
LTE Operation Band (s)	FDD Band 2/4/5/7/12/13/17/25, TDD Band 38/41
Accessories	
USB Adapter	Model No.: ADS-12B-06 05010E Input Power: 100 - 240V ~ 50/60Hz, Max. 0.3A Output Power: 5VDC 2.0A
Rechargeable Li-ion Battery	Model No.: CK65-BTSC Capacitance: 7000mAh/25.2Wh Rated Voltage: 3.6V

2.2. Product Specification Subjective to this Report

T _x Frequency Range	GPRS/EDGE850: 824.2 ~ 848.8MHz GPRS/EDGE1900: 1850.2 ~ 1909.8MHz WCDMA Band II: 1852.4 ~ 1907.6MHz WCDMA Band IV: 1712.4 ~ 1752.6MHz WCDMA Band V: 826.4 ~ 846.6MHz CDMA2000 BC0: 824.70 ~ 848.31 MHz CDMA2000 BC1: 1851.25 ~ 1908.75 MHz
R _x Frequency Range	GPRS/EDGE850: 869.2 ~ 893.8MHz GPRS/EDGE1900: 1930.2 ~ 1989.8MHz WCDMA Band II: 1932.4 ~ 1987.6MHz WCDMA Band IV: 2112.4 ~ 2152.6MHz WCDMA Band V: 871.4 ~ 891.6MHz CDMA2000 BC0: 869.70 ~ 893.31 MHz CDMA2000 BC1: 1931.25 ~ 1988.75 MHz
Modulation	GPRS: GMSK; EDGE: 8PSK WCDMA: BPSK QPSK CDMA2000: QPSK CDMA2000 1xEV-DO: QPSK/8PSK

Note 1: For other features of this EUT, test report will be issued separately.

Note 2: All product information is provided by the manufacturer.

2.3. Description of Available Antennas

Technology	Frequency Range (MHz)	Antenna Type	Max Peak Gain (dBi)
GPRS 850	824.2 ~ 848.8	FPC	0.56
GPRS 1900	1850.2 ~ 1909.8		-0.59
WCDMA Band II	1850 ~ 1910		-0.59
WCDMA Band IV	1710 ~ 1755		-1.03
WCDMA Band V	824 ~ 849		0.56
CDMA2000 BC0	824.70 ~ 848.31		0.56
CDMA2000 BC1	1850.25 ~ 1909.75		-0.59

Note: All antenna information (Antenna type and Peak Gain) is provided by the manufacturer.

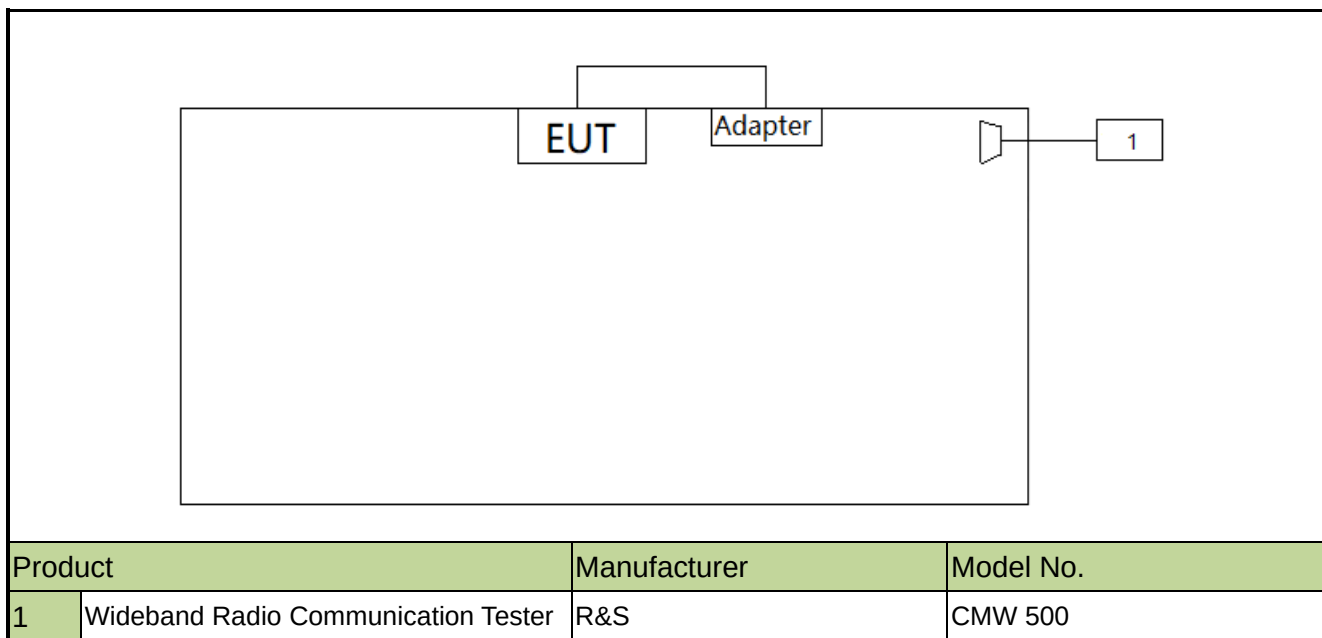
2.4. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

2.5. Maximum Power, Frequency Tolerance, and Emission Designator

FCC Rule	System	Maximum ERP/EIRP (W)	Frequency Tolerance (ppm)	Emission Designator
Part 22	GPRS850	1.8239	0.0059	247KGXW
Part 24	GPRS1900	0.7980	-0.0039	249KGXW
Part 22	EDGE850	0.3581	0.0032	248KG7W
Part 24	EDGE1900	0.3112	-0.0048	250KG7W
Part 24	WCDMA Band II	0.1991	-0.0026	4M11F9W
Part 27	WCDMA Band IV	0.1803	0.0010	4M12F9W
Part 22	WCDMA Band V	0.1648	-0.0009	4M12F9W
Part 22	CDMA2000 BC0	0.1556	0.0020	1M27F9W
Part 24	CDMA2000 BC1	0.1888	-0.0016	1M27F9W

2.6. Configuration of Tested System



2.7. Test Environment Condition

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

3. TEST EQUIPMENT CALIBRATION DATE

Conducted Emission (WZ-SR2)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06185	1 year	2021/01/18
Two-Line V-Network	R&S	ENV216	MRTSUE06002	1 year	2021/09/09
Thermal Hygrometer	testo	608-H1	MRTSUE06404	1 year	2021/07/26
Wideband Radio Communication Tester	R&S	CMW 500	MRTSUE06243	1 year	2021/10/20
Shielding Room	MIX-BEP	Chamber-SR2	MRTSUE06215	N/A	N/A

Conducted Emission (SIP-SR2)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06613	1 year	2021/07/02
Two-Line V-Network	R&S	ENV216	MRTSUE06003	1 year	2021/09/09
Wideband Radio Communication Tester	R&S	CMW 500	MRTSUE06243	1 year	2021/10/20
Thermal Hygrometer	testo	608-H1	MRTSUE06621	1 year	2020/12/29

Radiated Emission (WZ-AC1)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2021/01/18
PXA Signal Analyzer	Keysight	N9030B	MRTSUE06395	1 year	2021/08/30
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2021/11/08
Bilog Period Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2021/08/08
Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06023	1 year	2021/09/27
Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06597	1 year	2020/12/17
Microwave System Amplifier	Agilent	83017A	MRTSUE06076	1 year	2021/11/14
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2021/06/11
Wideband Radio Communication Tester	R&S	CMW 500	MRTSUE06243	1 year	2021/10/20
Thermal Hygrometer	testo	608-H1	MRTSUE06403	1 year	2021/07/26
Anechoic Chamber	TDK	Chamber-AC1	MRTSUE06212	1 year	2021/04/30

Radiated Emission (WZ-AC2)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
MXE EMI Receiver	Keysight	N9038A	MRTSUE06125	1 year	2021/07/02
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2021/11/08
Bilog Period Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2021/05/26
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06171	1 year	2021/10/25
Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06597	1 year	2020/12/17
Broadband Coaxial Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06176	1 year	2021/11/14
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2021/06/11
Wideband Radio Communication Tester	R&S	CMW 500	MRTSUE06243	1 year	2021/10/20
Thermal Hygrometer	Minggao	ETH529	MRTSUE06170	1 year	2020/12/15
Anechoic Chamber	RIKEN	Chamber-AC2	MRTSUE06213	1 year	2021/04/30

Radiated Emission (SIP-AC1)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06612	1 year	2021/07/02
EXA Signal Analyzer	Keysight	N9010B	MRTSUE06559	1 year	2021/07/23
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2021/11/08
Bilog Period Antenna	Schwarzbeck	VULB9168	MRTSUE06645	1 year	2021/08/30
Double Ridged Horn Antenna	R&S	HF907	MRTSUE06610	1 year	2021/08/30
Preamplifier	EMCI	EMC051845SE	MRTSUE06600	1 year	2021/11/09
Wideband Radio Communication Tester	R&S	CMW 500	MRTSUE06243	1 year	2021/10/20
Thermal Hygrometer	testo	608-H1	MRTSUE06620	1 year	2020/12/29
Anechoic Chamber	RIKEN	SIP-AC1	MRTSUE06554	1 year	2020/12/25

Radiated Emission (SIP-AC2)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06613	1 year	2021/07/02
MXA Signal Analyzer	Keysight	N9020B	MRTSUE06604	1 year	2021/09/26
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2021/11/08
Bilog Period Antenna	Schwarzbeck	VULB9168	MRTSUE06646	1 year	2021/08/30
Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06648	1 year	2020/12/17
Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06599	1 year	2020/12/17
Preamplifier	EMCI	EMC051845SE	MRTSUE06644	1 year	2021/11/09
Preamplifier	EMCI	EMC184045SE	MRTSUE06602	1 year	2021/10/21
Wideband Radio Communication Tester	R&S	CMW 500	MRTSUE06243	1 year	2021/10/20
Thermal Hygrometer	testo	608-H1	MRTSUE06624	1 year	2020/12/29
Anechoic Chamber	RIKEN	WZ-AC2	MRTSUE06781	1 year	2020/12/25

Radiated Emission (SIP-AC3)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06612	1 year	2021/07/02
EXA Signal Analyzer	Keysight	N9010B	MRTSUE06559	1 year	2021/07/23
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2021/11/08
Bilog Period Antenna	Schwarzbeck	VULB9168	MRTSUE06647	1 year	2021/08/08
Double Ridged Horn Antenna	R&S	HF907	MRTSUE06611	1 year	2021/09/13
Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06598	1 year	2020/12/17
Preamplifier	EMCI	EMC012645SE	MRTSUE06642	1 year	2021/01/16
Preamplifier	EMCI	EMC184045SE	MRTSUE06641	1 year	2021/01/16
Wideband Radio Communication Tester	R&S	CMW 500	MRTSUE06243	1 year	2021/10/20
Thermal Hygrometer	testo	608-H1	MRTSUE06622	1 year	2020/12/29
Anechoic Chamber	RIKEN	SIP-AC3	MRTSUE06782	1 year	2020/12/25

Conducted Test Equipment (WZ-TR3)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EXA Signal Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2021/04/14
EXA Signal Analyzer	Keysight	N9010B	MRTSUE06607	1 year	2021/01/08
Signal Analyzer	R&S	FSV40	MRTSUE06218	1 year	2021/04/14
Power Meter	Agilent	U2021XA	MRTSUE06030	1 year	2021/10/22
USB wideband power sensor	Keysight	U2021XA	MRTSUE06446	1 year	2021/08/30
USB wideband power sensor	Keysight	U2021XA	MRTSUE06447	1 year	2021/08/08
Bluetooth Test Set	Anritsu	MT8852B-042	MRTSUE06389	1 year	2021/06/11
Audio Analyzer	Agilent	U8903B	MRTSUE06143	1 year	2021/06/11
Modulation Analyzer	HP	HP8901A	MRTSUE06098	1 year	2021/09/26
Wideband Radio Communication Tester	R&S	CMW 500	MRTSUE06243	1 year	2021/10/20
DC Power Supply	GWINSTEK	DPS-3303C	MRTSUE06064	N/A	N/A
Temperature & Humidity Chamber	BAOYT	BYH-150CL	MRTSUE06051	1 year	2021/10/21
Thermal Hygrometer	testo	608-H1	MRTSUE06401	1 year	2021/07/26

Conducted Test Equipment (SIP-SR6)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Signal Analyzer	R&S	FSV40	MRTSUE06218	1 year	2021/04/14
PXA Signal Analyzer	Keysight	N9030B	MRTSUE06395	1 year	2021/08/30
USB wideband power sensor	Agilent	U2021XA	MRTSUE06595	1 year	2021/09/26
USB wideband power sensor	Agilent	U2021XA	MRTSUE06596	1 year	2021/09/26
Wideband Radio Communication Tester	R&S	CMW 500	MRTSUE06243	1 year	2021/10/20
Bluetooth Test Set	Anritsu	MT8852B-042	MRTSUE06389	1 year	2021/06/11
Temperature Chamber	BAOYT	BYG-408CS	MRTSUE06847	1 year	2021/03/31
Thermal Hygrometer	testo	622	MRTSUE06629	1 year	2020/12/30

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 Emission Measurement
Measurement Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 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
Spurious Emissions, Conducted
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 0.78dB
Output Power
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 1.13dB
Power Spectrum Density
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 1.15dB
Occupied Bandwidth
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 0.28%
Frequency Stability
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 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	< 7 Watts Max ERP		Pass	Section 5.4
27.50(d)(4)	Equivalent Isotropic Radiated Power	< 1 Watts Max EIRP			
24.232(c)	Equivalent Isotropic Radiated Power	< 2 Watts Max EIRP			
2.1051, 22.917(a) 24.238(a), 27.53(h)	Band Edge	< 43 + 10log10 (P _[Watts])		Pass	Section 5.5, 5.7
2.1051, 22.917(a) 24.238(a), 27.53(h)	Spurious Emission	< 43 + 10log10 (P _[Watts])			
24.232(d) 27.50(d)(5)	Peak to Average Ratio	< 13dB	Radiated	Pass	Section 5.6
2.1053, 22.917(a) 24.238(a), 27.53(h)	Spurious Emissions	< 43 + 10log10 (P _[Watts])		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 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 in the test report.

5.2. Occupied Bandwidth

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.

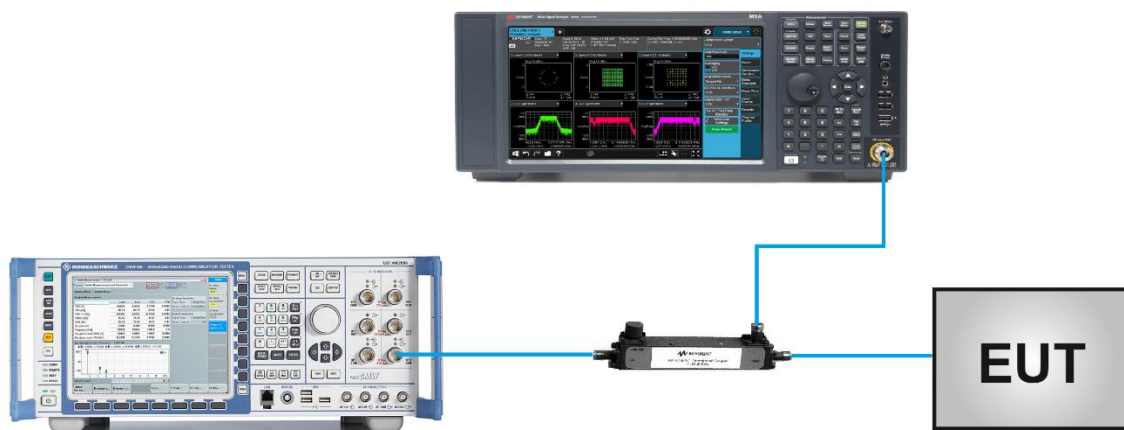
5.2.2. Test Procedure

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-SR6
Test Engineer	Candy Luo	Test Date	2020/11/11 ~ 2020/11/27

Test Mode	Channel No.	Frequency (MHz)	99% Occupied Bandwidth (kHz)
GPRS850	128	824.2	246.7
	189	836.4	245.0
	251	848.8	246.4
GPRS1900	512	1850.2	247.8
	661	1880.0	249.2
	810	1909.8	240.6
EDGE850	128	824.2	240.3
	189	836.4	248.1
	251	848.8	245.6
EDGE1900	512	1850.2	246.0
	661	1880.0	247.0
	810	1909.8	250.2
WCDMA Band II	9262	1852.4	4105.3
	9400	1880.0	4112.7
	9538	1907.6	4108.0
WCDMA Band IV	1312	1712.4	4117.1
	1413	1732.6	4107.1
	1513	1752.6	4108.6
WCDMA Band V	4132	826.4	4121.7
	4182	836.4	4107.2
	4233	846.6	4114.9
CDMA2000 BC0	1013	824.7	1273.0
	384	836.52	1268.5
	777	848.31	1267.7
CDMA2000 BC1	25	1851.25	1272.3
	600	1880.0	1273.1
	1175	1908.75	1272.8

GPRS850 99% Occupied Bandwidth

Channel 128 (824.2MHz)



Channel 189 (836.4MHz)



Channel 251 (848.8MHz)



GPRS1900 99% Occupied Bandwidth

Channel 512 (1850.2MHz)



Channel 661 (1880.0MHz)



Channel 810 (1909.8MHz)



EDGE850 99% Occupied Bandwidth

Channel 128 (824.2MHz)



Channel 189 (836.4MHz)



Channel 251 (848.8MHz)



EDGE1900 99% Occupied Bandwidth

Channel 512 (1850.2MHz)



Channel 661 (1880.0MHz)

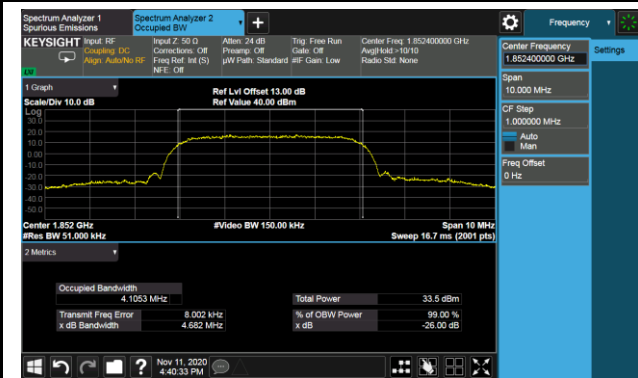


Channel 810 (1909.8MHz)

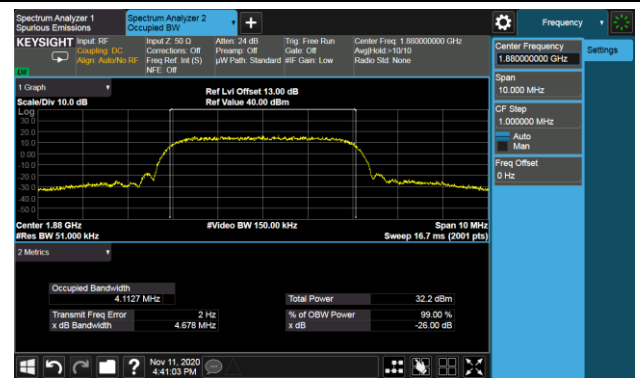


WCDMA Band II 99% Occupied Bandwidth

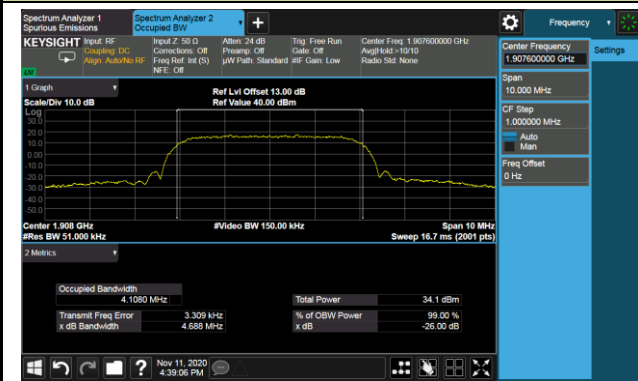
Channel 9262 (1852.4MHz)



Channel 9400 (1880.0MHz)

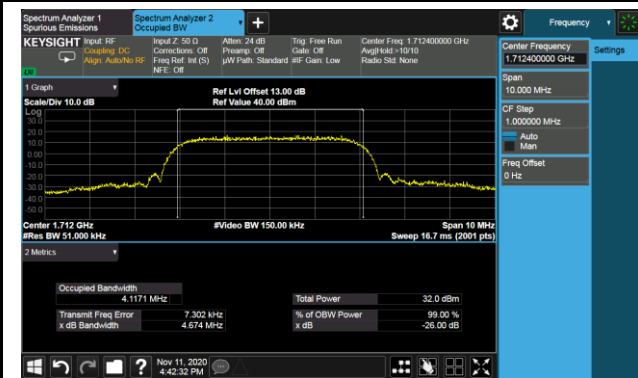


Channel 9538 (1907.6MHz)

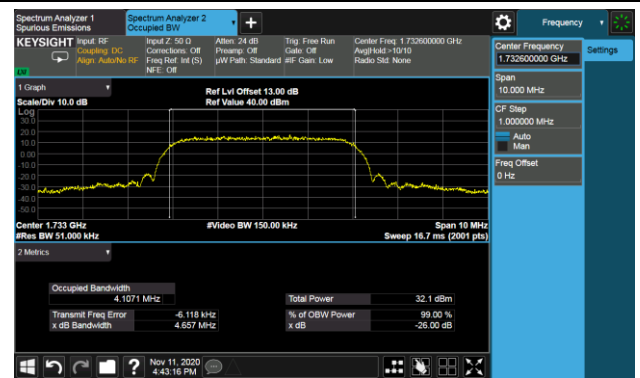


WCDMA Band IV 99% Occupied Bandwidth

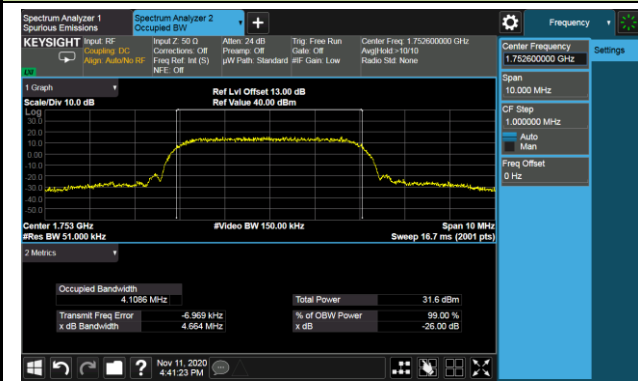
Channel 1312 (1712.4MHz)



Channel 1413 (1732.6MHz)

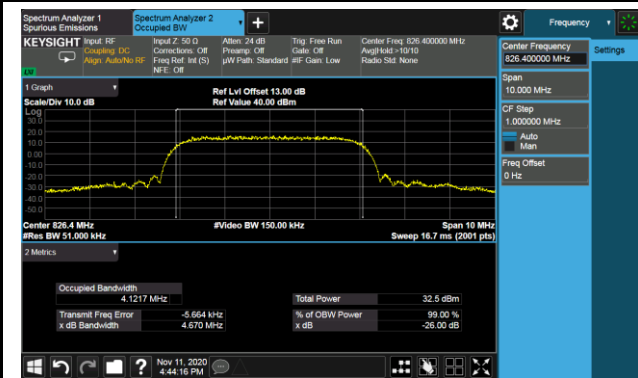


Channel 1513 (1752.6MHz)

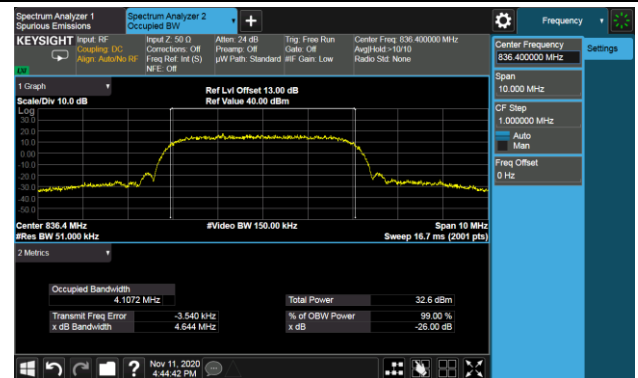


WCDMA Band V 99% Occupied Bandwidth

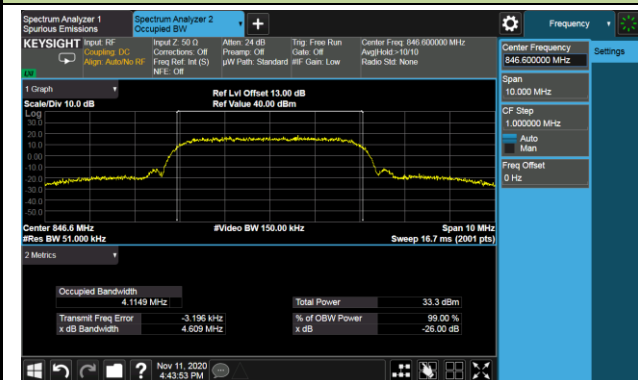
Channel 4132 (826.4MHz)



Channel 4182 (836.4MHz)

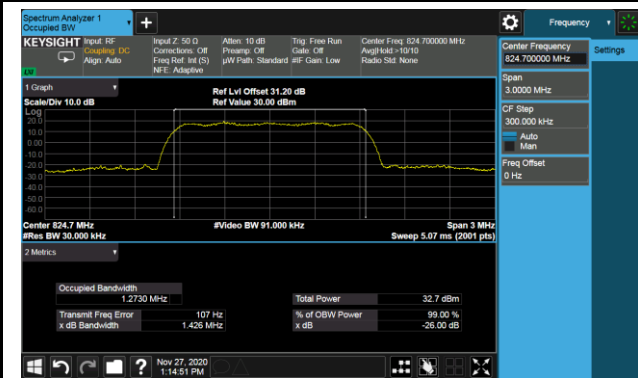


Channel 4233 (846.6MHz)

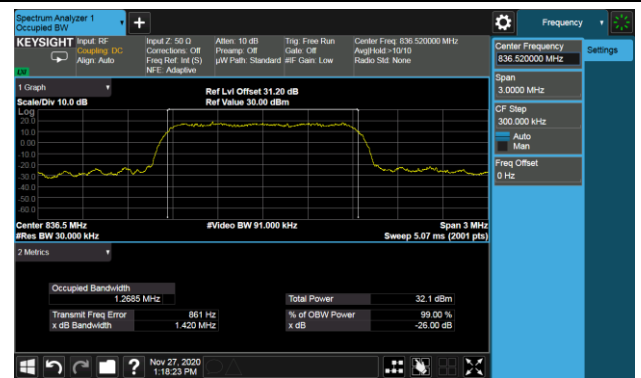


CDMA2000 BC0 Occupied Bandwidth

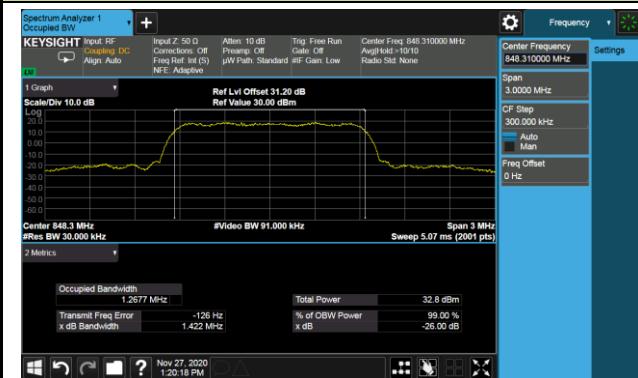
Channel 1013 (824.7MHz)



Channel 384 (836.52MHz)

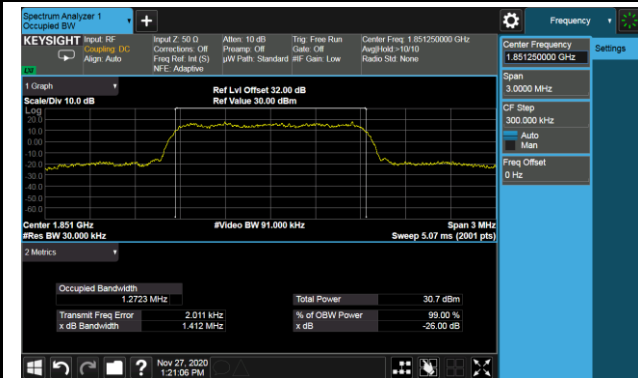


Channel 777 (848.31MHz)

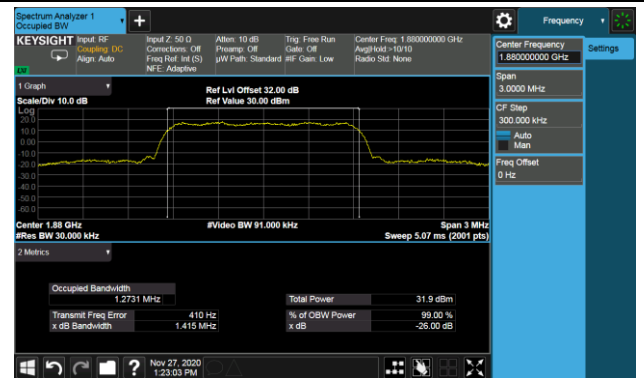


CDMA2000 BC1 Occupied Bandwidth

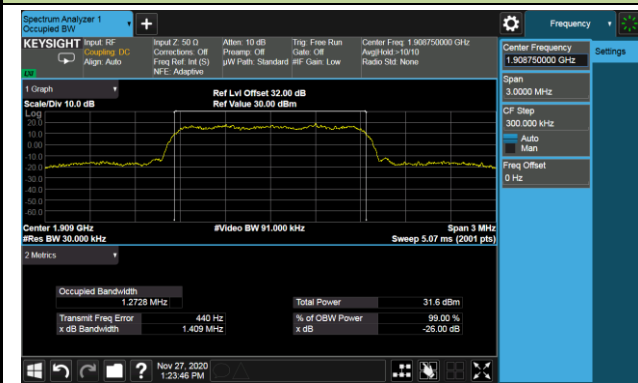
Channel 25 (1851.25MHz)



Channel 600 (1880.0MHz)



Channel 1175 (1908.75MHz)



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 Procedures Used

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 highest. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C decreased per stage until the lowest temperature reached.

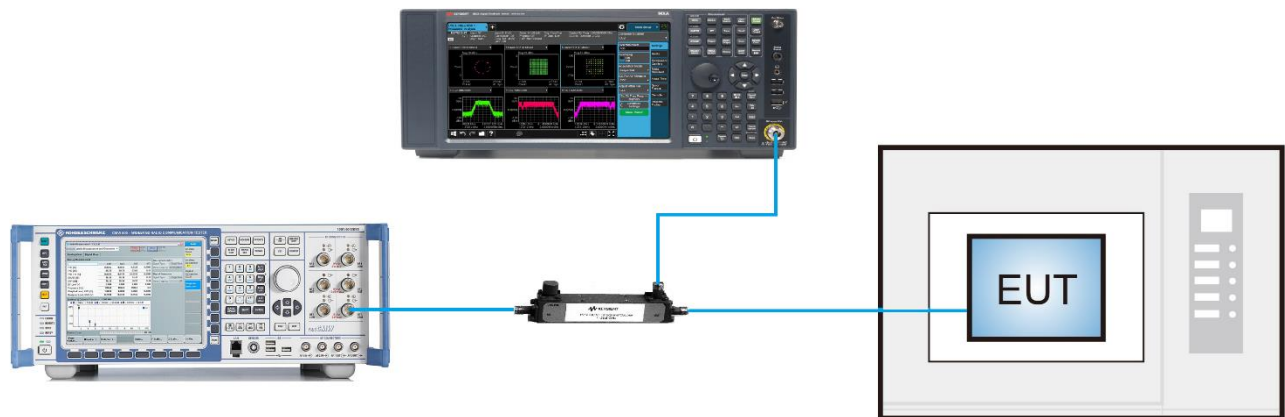
Frequency Stability Under Voltage Variations:

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.

For hand-carried battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

5.3.4. Test Setup



5.3.5.Test Result

Product	Mobile Computer	Test Date	2020/11/12
Test Engineer	Candy Luo	Test Site	SIP-SR6
Test Band	GPRS850		

Voltage (%)	Power (VDC)	Temp (°C)	Frequency Tolerance (ppm)
100%	3.6	- 30	0.0014
		- 20	0.0033
		- 10	0.0059
		0	0.0014
		+ 10	-0.0017
		+ 20 (Ref)	0.0002
		+ 30	0.0031
		+ 40	0.0012
		+ 50	-0.0010
Battery Upper	4.2	+ 20	-0.0007
Battery Endpoint	3.4	+ 20	0.0019

Note: Battery upper voltage is 4.2Vdc, battery endpoint voltage is 3.4Vdc, which are declared by the manufacturer.

Product	Mobile Computer	Test Date	2020/11/12
Test Engineer	Candy Luo	Test Site	SIP-SR6
Test Band	GPRS1900		

Voltage (%)	Power (VDC)	Temp (°C)	Frequency Tolerance (ppm)
100%	3.6	- 30	-0.0008
		- 20	0.0011
		- 10	-0.0006
		0	-0.0002
		+ 10	-0.0039
		+ 20 (Ref)	-0.0027
		+ 30	-0.0021
		+ 40	-0.0029
		+ 50	-0.0026
Battery Upper	4.2	+ 20	-0.0022
Battery Endpoint	3.4	+ 20	-0.0038

Note: Battery upper voltage is 4.2Vdc, battery endpoint voltage is 3.4Vdc, which are declared by the manufacturer.

Product	Mobile Computer	Test Date	2020/11/12
Test Engineer	Candy Luo	Test Site	SIP-SR6
Test Band	EDGE850		

Voltage (%)	Power (VDC)	Temp (°C)	Frequency Tolerance (ppm)
100%	3.6	- 30	0.0000
		- 20	0.0003
		- 10	0.0019
		0	-0.0003
		+ 10	0.0032
		+ 20 (Ref)	0.0005
		+ 30	0.0027
		+ 40	0.0001
		+ 50	-0.0021
Battery Upper	4.2	+ 20	-0.0001
Battery Endpoint	3.4	+ 20	-0.0008

Note: Battery upper voltage is 4.2Vdc, battery endpoint voltage is 3.4Vdc, which are declared by the manufacturer.

Product	Mobile Computer	Test Date	2020/11/12
Test Engineer	Candy Luo	Test Site	SIP-SR6
Test Band	EDGE1900		

Voltage (%)	Power (VDC)	Temp (°C)	Frequency Tolerance (ppm)
100%	3.6	- 30	-0.0048
		- 20	-0.0002
		- 10	-0.0012
		0	-0.0013
		+ 10	-0.0004
		+ 20 (Ref)	-0.0023
		+ 30	-0.0021
		+ 40	-0.0017
		+ 50	-0.0036
Battery Upper	4.2	+ 20	0.0009
Battery Endpoint	3.4	+ 20	-0.0040

Note: Battery upper voltage is 4.2Vdc, battery endpoint voltage is 3.4Vdc, which are declared by the manufacturer.

Product	Mobile Computer	Test Date	2020/11/12
Test Engineer	Candy Luo	Test Site	SIP-SR6
Test Band	WCDMA Band II		

Voltage (%)	Power (VDC)	Temp (°C)	Frequency Tolerance (ppm)
100%	3.6	- 30	-0.0019
		- 20	-0.0013
		- 10	-0.0005
		0	-0.0007
		+ 10	0.0001
		+ 20 (Ref)	0.0007
		+ 30	-0.0026
		+ 40	-0.0002
		+ 50	-0.0013
Battery Upper	4.2	+ 20	-0.0012
Battery Endpoint	3.4	+ 20	-0.0007

Note: Battery upper voltage is 4.2Vdc, battery endpoint voltage is 3.4Vdc, which are declared by the manufacturer.

Product	Mobile Computer	Test Date	2020/11/12
Test Engineer	Candy Luo	Test Site	SIP-SR6
Test Band	WCDMA Band IV		

Voltage (%)	Power (VDC)	Temp (°C)	Frequency Tolerance (ppm)
100%	3.6	- 30	-0.0004
		- 20	0.0004
		- 10	-0.0005
		0	-0.0010
		+ 10	-0.0003
		+ 20 (Ref)	0.0000
		+ 30	0.0010
		+ 40	-0.0003
		+ 50	0.0009
Battery Upper	4.2	+ 20	-0.0006
Battery Endpoint	3.4	+ 20	0.0000

Note: Battery upper voltage is 4.2Vdc, battery endpoint voltage is 3.4Vdc, which are declared by the manufacturer.

Product	Mobile Computer	Test Date	2020/11/12
Test Engineer	Candy Luo	Test Site	SIP-SR6
Test Band	WCDMA Band V		

Voltage (%)	Power (VDC)	Temp (°C)	Frequency Tolerance (ppm)
100%	3.6	- 30	-0.0003
		- 20	0.0006
		- 10	-0.0005
		0	-0.0009
		+ 10	-0.0004
		+ 20 (Ref)	0.0005
		+ 30	-0.0001
		+ 40	-0.0004
		+ 50	0.0004
Battery Upper	4.2	+ 20	0.0002
Battery Endpoint	3.4	+ 20	0.0001

Note: Battery upper voltage is 4.2Vdc, battery endpoint voltage is 3.4Vdc, which are declared by the manufacturer.

Product	Mobile Computer	Test Date	2020/11/12
Test Engineer	Candy Luo	Test Site	SIP-SR6
Test Band	CDMA2000 BC0		

Voltage (%)	Power (VDC)	Temp (°C)	Frequency Tolerance (ppm)
100%	3.6	- 30	-0.0014
		- 20	-0.0006
		- 10	0.0004
		0	0.0020
		+ 10	0.0004
		+ 20 (Ref)	0.0003
		+ 30	-0.0011
		+ 40	0.0016
		+ 50	0.0014
Battery Upper	4.2	+ 20	-0.0001
Battery Endpoint	3.4	+ 20	-0.0003

Note: Battery upper voltage is 4.2Vdc, battery endpoint voltage is 3.4Vdc, which are declared by the manufacturer.

Product	Mobile Computer	Test Date	2020/11/12
Test Engineer	Candy Luo	Test Site	SIP-SR6
Test Band	CDMA2000 BC1		

Voltage (%)	Power (VDC)	Temp (°C)	Frequency Tolerance (ppm)
100%	3.6	- 30	-0.0015
		- 20	-0.0013
		- 10	-0.0016
		0	-0.0004
		+ 10	-0.0014
		+ 20 (Ref)	-0.0011
		+ 30	-0.0008
		+ 40	0.0009
		+ 50	0.0004
Battery Upper	4.2	+ 20	-0.0009
Battery Endpoint	3.4	+ 20	0.0009

Note: Battery upper voltage is 4.2Vdc, battery endpoint voltage is 3.4Vdc, which are declared by the manufacturer.

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 Procedures Used

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

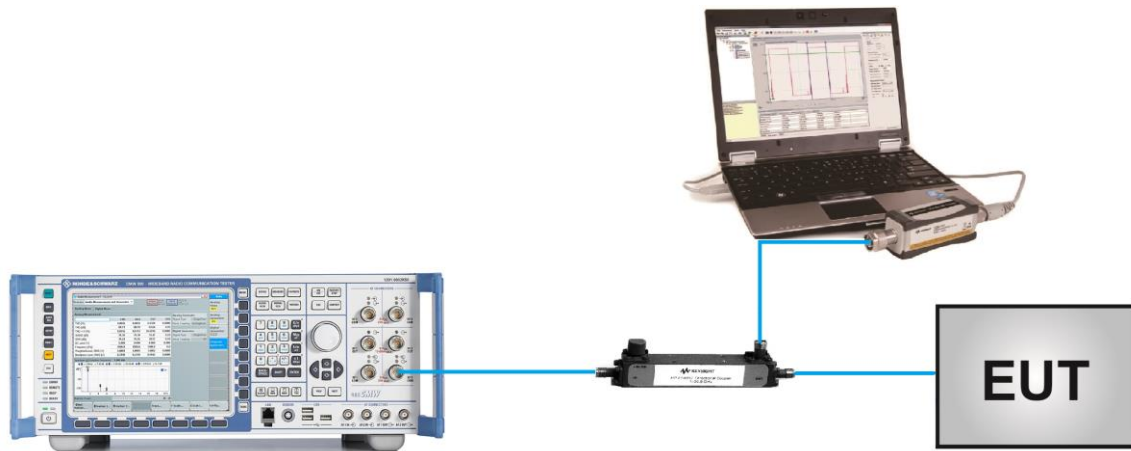
ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas} , e.g., dBm or dBW)

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 Engineer	Candy Luo
Test Date	2020/11/11	Test Site	SIP-SR6
Test Band	GPRS 850 / EDGE 850		

Mode	Channel	Frequency (MHz)	Output Power (dBm)	ERP (dBm)	Limit (dBm)
GPRS850 (1 Slot)	128	824.2	33.91	32.32	38.45
	189	836.4	34.20	32.61	38.45
	251	848.8	33.85	32.26	38.45
GPRS850 (2 Slot)	128	824.2	31.49	29.90	38.45
	189	836.4	31.68	30.09	38.45
	251	848.8	31.48	29.89	38.45
GPRS850 (3 Slot)	128	824.2	29.28	27.69	38.45
	189	836.4	29.39	27.80	38.45
	251	848.8	29.24	27.65	38.45
GPRS850 (4 Slot)	128	824.2	28.12	26.53	38.45
	189	836.4	28.33	26.74	38.45
	251	848.8	28.07	26.48	38.45
EDGE850 (1 Slot)	128	824.2	27.11	25.52	38.45
	189	836.4	27.13	25.54	38.45
	251	848.8	26.96	25.37	38.45
EDGE850 (2 Slot)	128	824.2	25.04	23.45	38.45
	189	836.4	25.03	23.44	38.45
	251	848.8	24.88	23.29	38.45
EDGE850 (3 Slot)	128	824.2	22.91	21.32	38.45
	189	836.4	22.97	21.38	38.45
	251	848.8	22.82	21.23	38.45
EDGE850 (4 Slot)	128	824.2	21.97	20.38	38.45
	189	836.4	22.16	20.57	38.45
	251	848.8	21.92	20.33	38.45

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

Product	Mobile Computer	Test Engineer	Candy Luo
Test Date	2020/11/11	Test Site	SIP-SR6
Test Band	GPRS 1900 / EDGE 1900		

Mode	Channel	Frequency (MHz)	Output Power (dBm)	EIRP (dBm)	Limit (dBm)
GPRS1900 (1 Slot)	512	1850.2	29.26	28.67	33.00
	661	1880.0	29.28	28.69	33.00
	810	1909.8	29.31	28.72	33.00
GPRS1900 (2 Slot)	512	1850.2	27.46	26.87	33.00
	661	1880.0	27.43	26.84	33.00
	810	1909.8	27.53	26.94	33.00
GPRS1900 (3 Slot)	512	1850.2	25.47	24.88	33.00
	661	1880.0	25.44	24.85	33.00
	810	1909.8	25.41	24.82	33.00
GPRS1900 (4 Slot)	512	1850.2	24.15	23.56	33.00
	661	1880.0	24.21	23.62	33.00
	810	1909.8	24.21	23.62	33.00
EDGE1900 (1 Slot)	512	1850.2	25.42	24.83	33.00
	661	1880.0	25.52	24.93	33.00
	810	1909.8	25.51	24.92	33.00
EDGE1900 (2 Slot)	512	1850.2	23.28	22.69	33.00
	661	1880.0	23.31	22.72	33.00
	810	1909.8	23.38	22.79	33.00
EDGE1900 (3 Slot)	512	1850.2	21.13	20.54	33.00
	661	1880.0	21.09	20.50	33.00
	810	1909.8	21.19	20.60	33.00
EDGE1900 (4 Slot)	512	1850.2	20.12	19.53	33.00
	661	1880.0	20.15	19.56	33.00
	810	1909.8	20.02	19.43	33.00

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

Product	Mobile Computer	Test Engineer	Candy Luo
Test Date	2020/11/11	Test Site	SIP-SR6
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	23.58	23.54	23.57	-0.59	22.99	22.95	22.98
Rel5 HSDPA	1	23.57	22.21	22.20	-0.59	22.98	21.62	21.61
	2	22.13	22.17	22.18	-0.59	21.54	21.58	21.59
	3	22.11	22.07	22.19	-0.59	21.52	21.48	21.60
	4	22.54	22.25	22.29	-0.59	21.95	21.66	21.70
Rel6 HSUPA	1	21.21	21.44	21.86	-0.59	20.62	20.85	21.27
	2	22.60	21.53	21.95	-0.59	22.01	20.94	21.36
	3	22.59	22.65	22.62	-0.59	22.00	22.06	22.03
	4	22.52	21.58	21.51	-0.59	21.93	20.99	20.92
	5	22.62	22.58	21.52	-0.59	22.03	21.99	20.93
Limit	33.01dBm							

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

Product	Mobile Computer	Test Engineer	Candy Luo
Test Date	2020/11/11	Test Site	SIP-SR6
Test Band	WCDMA Band IV		

Mode	3GPP Subtest	Conducted Power (dBm)			Antenna Gain (dBi)	EIRP (dBm)		
		Band IV Channel				Band IV Channel		
		1312	1413	1513		1312	1413	1513
WCDMA R99	1	23.52	23.36	23.59	-1.03	22.49	22.33	22.56
Rel5 HSDPA	1	22.55	22.40	22.54	-1.03	21.52	21.37	21.51
	2	22.37	22.31	22.51	-1.03	21.34	21.28	21.48
	3	21.92	21.88	22.11	-1.03	20.89	20.85	21.08
	4	22.18	22.05	22.27	-1.03	21.15	21.02	21.24
Rel6 HSUPA	1	20.81	21.45	21.53	-1.03	19.78	20.42	20.50
	2	21.45	20.82	20.72	-1.03	20.42	19.79	19.69
	3	20.72	21.46	21.73	-1.03	19.69	20.43	20.70
	4	21.55	21.56	20.87	-1.03	20.52	20.53	19.84
	5	20.67	21.54	21.73	-1.03	19.64	20.51	20.70
Limit	30.00dBm							

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

Product	Mobile Computer	Test Engineer	Candy Luo
Test Date	2020/11/11	Test Site	SIP-SR6
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	23.65	23.71	23.76	0.56	22.06	22.12	22.17
Rel5 HSDPA	1	22.44	22.42	22.46	0.56	20.85	20.83	20.87
	2	22.28	22.29	22.34	0.56	20.69	20.70	20.75
	3	22.25	22.28	22.31	0.56	20.66	20.69	20.72
	4	22.45	22.41	22.46	0.56	20.86	20.82	20.87
Rel6 HSUPA	1	22.02	22.08	22.07	0.56	20.43	20.49	20.48
	2	22.06	22.08	22.07	0.56	20.47	20.49	20.48
	3	21.82	21.86	21.17	0.56	20.23	20.27	19.58
	4	21.12	21.84	21.94	0.56	19.53	20.25	20.35
	5	21.82	21.89	21.22	0.56	20.23	20.30	19.63
Limit	38.45dBm							

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

Product	Mobile Computer	Test Engineer	Candy Luo
Test Date	2020/11/27	Test Site	SIP-SR6
Test Band	CDMA2000 BC0		

Test Mode		Conducted Power (dBm)			Antenna Gain (dBi)	ERP (dBm)		
		BC0 Channel				BC0 Channel		
		1013	384	777		1013	384	777
SO55/RC3		23.12	23.21	23.46	0.56	21.53	21.62	21.87
SO55/RC1		23.16	23.31	23.49	0.56	21.57	21.72	21.90
SO32/RC3(FCH only)		23.12	23.22	23.51	0.56	21.53	21.63	21.92
SO32/RC3(FCH+SCHn)		23.05	23.16	23.42	0.56	21.46	21.57	21.83
Limit		38.45dBm						

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

Product	Mobile Computer	Test Engineer	Candy Luo
Test Date	2020/11/27	Test Site	SIP-SR6
Test Band	CDMA2000 BC1		

Test Mode		Conducted Power (dBm)			Antenna Gain (dBi)	EIRP (dBm)		
		BC1 Channel				BC1 Channel		
		25	600	1175		25	600	1175
SO55/RC3		23.26	23.28	23.35	-0.59	22.67	22.69	22.76
SO55/RC1		23.30	23.28	23.30	-0.59	22.71	22.69	22.71
SO32/RC3(FCH only)		23.29	23.21	23.33	-0.59	22.70	22.62	22.74
SO32/RC3(FCH+SCHn)		23.22	23.16	23.32	-0.59	22.63	22.57	22.73
Limit	33.01dBm							

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

5.5. Band Edge Measurement

5.5.1. Test Limit

22.917(a), 24.238 (a), 27.53 (h)

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.

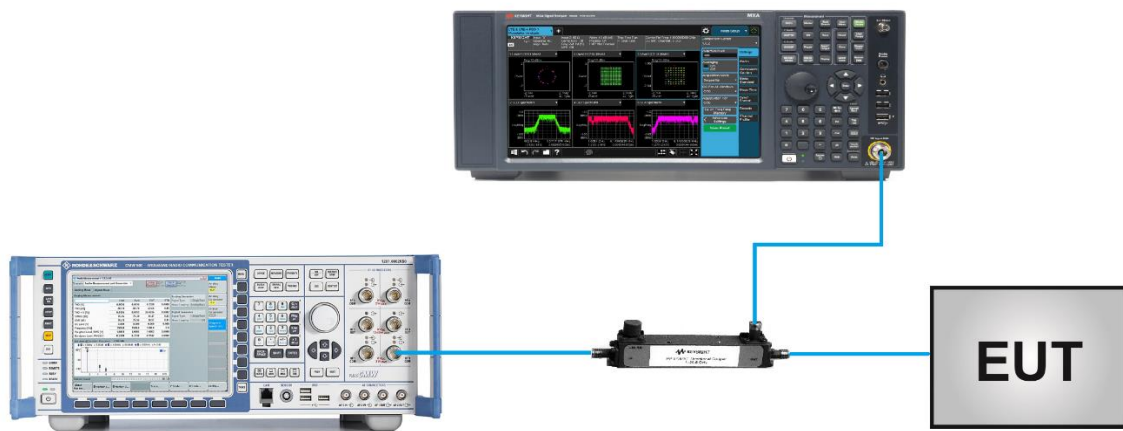
5.5.2. Test Procedure Used

ANSI C63.26-2015 - Section 5.7

5.5.3. Test Setting

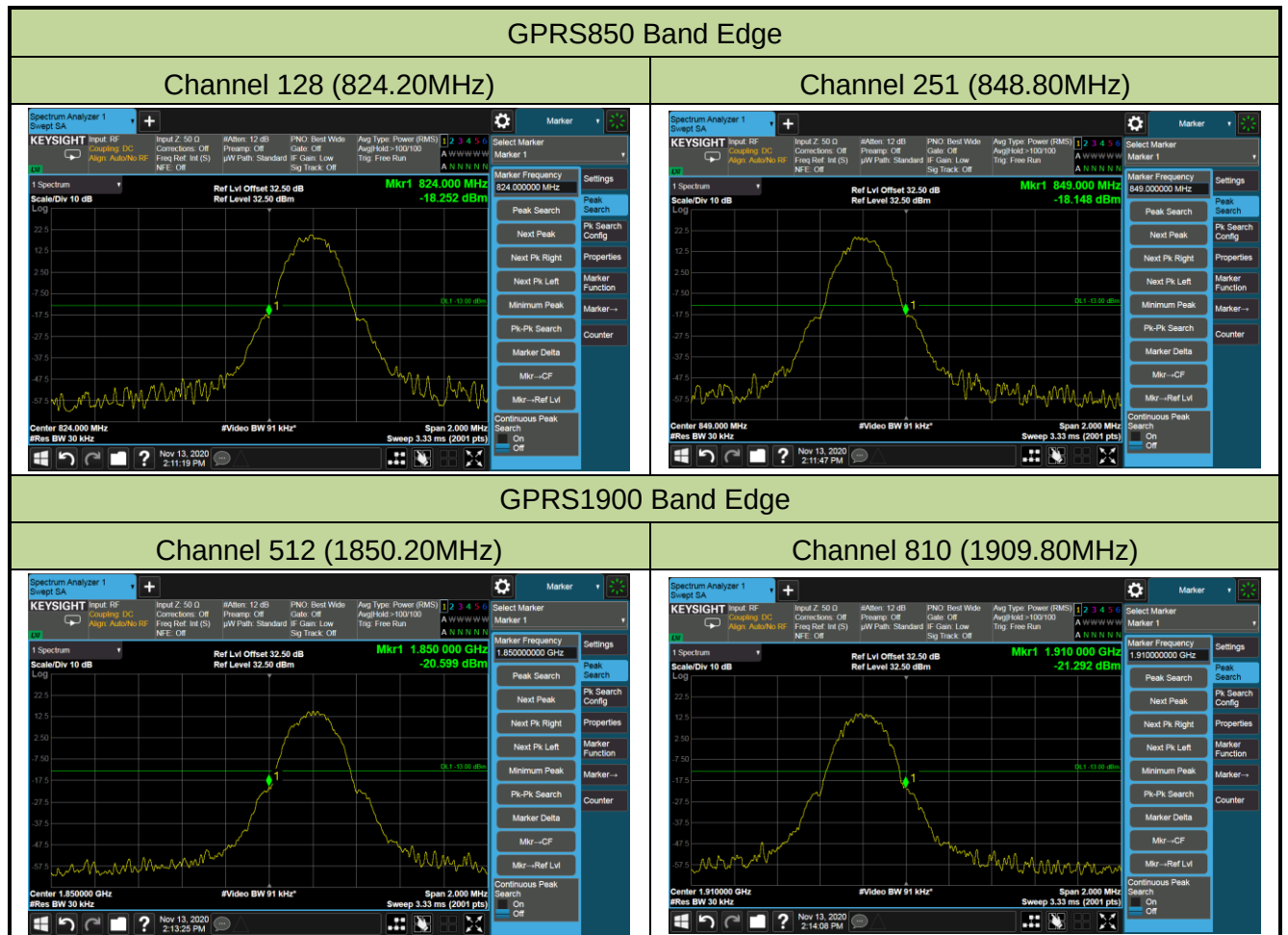
1. Set the analyzer frequency to low or high channel
2. $RBW \geq$ The nominal RBW shall be in the range of 1% of the anticipated OBW (in the 1MHz band immediately outside and adjacent to the band edge). For improvement of the accuracy in the measurement of the average power of a noise-like emission, 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



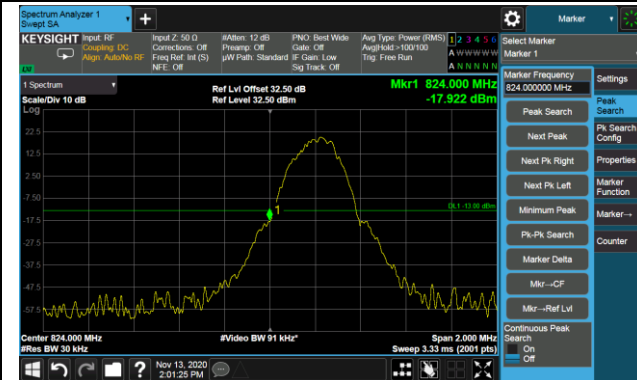
5.5.5. Test Result

Product	Mobile Computer	Test Engineer	Candy Luo
Test Date	2020/11/13	Test Site	SIP-SR6
Test Band	GPRS 850 / 1900	Test Result	Pass



EDGE850 Band Edge

Channel 128 (824.20MHz)



Channel 251 (848.80MHz)



EDGE1900 Band Edge

Channel 512 (1850.20MHz)



Channel 810 (1909.80MHz)



Product	Mobile Computer	Test Engineer	Candy Luo
Test Date	2020/11/11 ~ 2020/11/25	Test Site	SIP-SR6
Test Band	WCDMA Band II, IV, V	Test Result	Pass

