

Report No.: 1907WSU008-U4



7.4. Peak-Average Ratio

7.4.1.Test Limit

The transmitter's peak-to-average power ratio (PAPR) shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

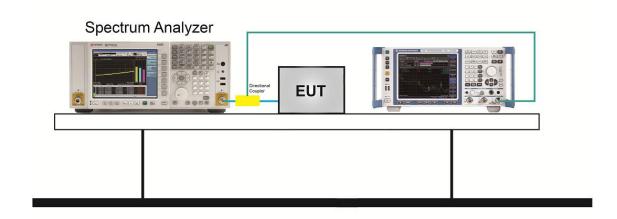
7.4.2.Test Procedure

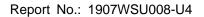
ANSI C63.26-2015 - Section 5.2.3.4

7.4.3.Test Setting

- 1. Configure the EUT according to the following setup photo
- 2. Set the CCDF option in spectrum analyzer.
- 3. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1%.
- 4. Record the deviation as PAPR.

7.4.4.Test Setup







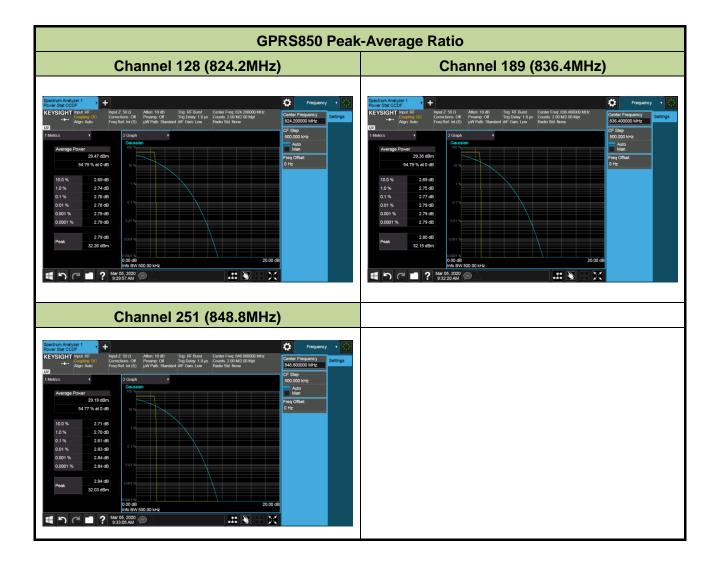
7.4.5.Test Result

Product	Color Radio	Temperature	25°C
Test Engineer	Dandy Li	Relative Humidity	52%
Test Site	TR3	Test Date	2019/08/26
	IKS		~2020/03/05

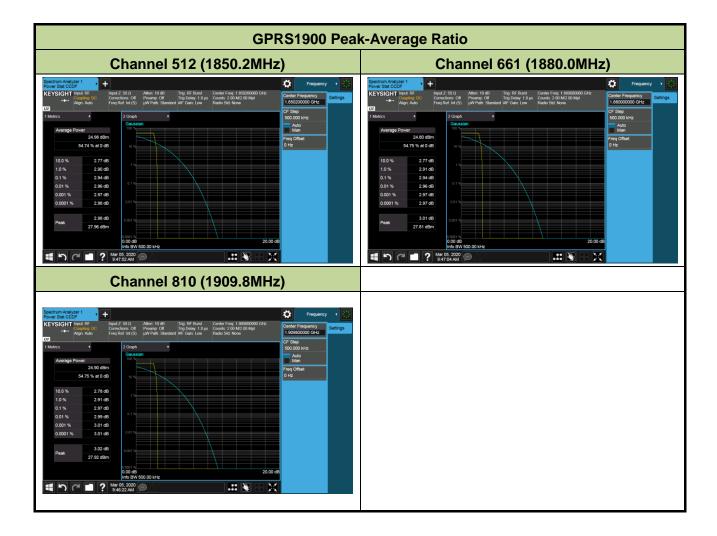
Mode	Channel No.	Frequency (MHz)	Peak-Average Power Ratio (dB)	Limit (dB)	Result
GPRS850	128	824.20	2.76	< 13	Pass
GPRS850	189	836.40	2.77	< 13	Pass
GPRS850	251	848.80	2.81	< 13	Pass
GPRS1900	512	1850.20	2.94	< 13	Pass
GPRS1900	661	1880.00	2.94	< 13	Pass
GPRS1900	810	1909.80	2.97	< 13	Pass
EDGE850	128	824.20	2.76	< 13	Pass
EDGE850	189	836.40	2.77	< 13	Pass
EDGE850	251	848.80	3.21	< 13	Pass
EDGE1900	512	1850.20	2.92	< 13	Pass
EDGE1900	661	1880.00	2.92	< 13	Pass
EDGE1900	810	1909.80	2.98	< 13	Pass
WCDMA Band II	9262	1852.4	3.81	< 13	Pass
WCDMA Band II	9400	1880.0	3.80	< 13	Pass
WCDMA Band II	9538	1907.6	3.84	< 13	Pass
WCDMA Band IV	1312	1712.4	3.85	< 13	Pass
WCDMA Band IV	1413	1732.6	3.92	< 13	Pass
WCDMA Band IV	1513	1752.6	3.88	< 13	Pass
WCDMA Band V	4132	826.40	3.73	< 13	Pass
WCDMA Band V	4182	836.40	3.72	< 13	Pass
WCDMA Band V	4233	846.60	3.84	< 13	Pass



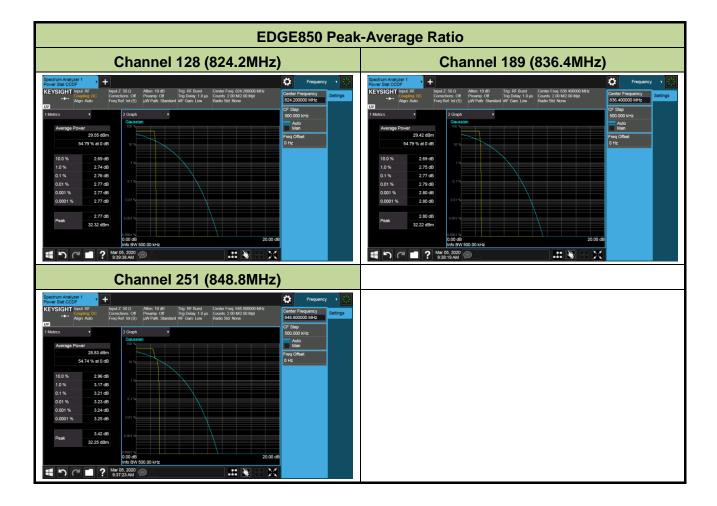




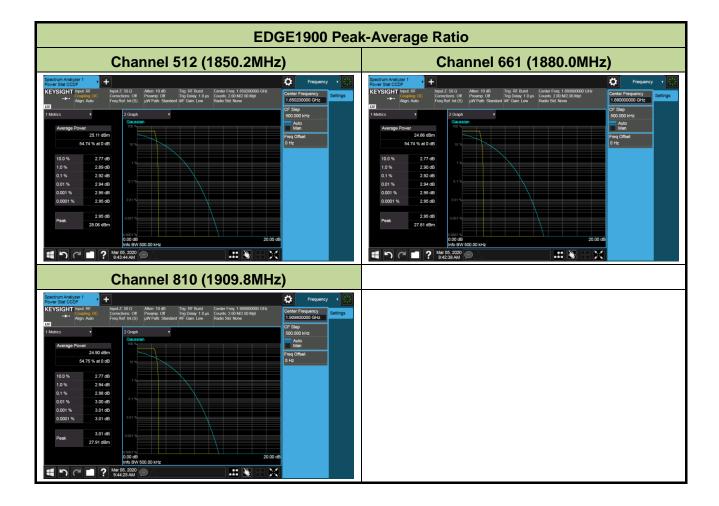




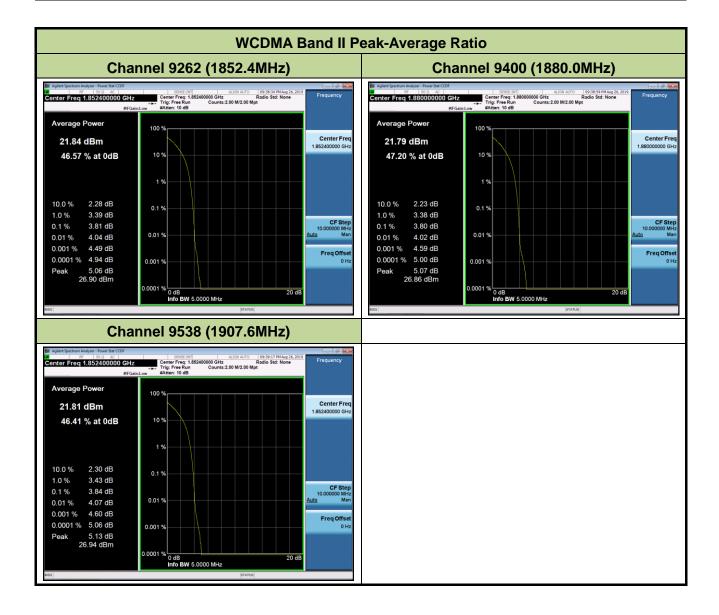




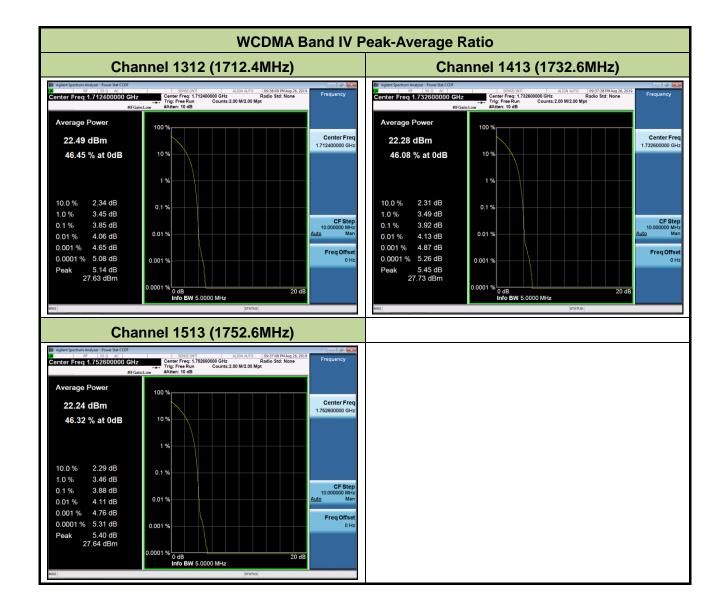




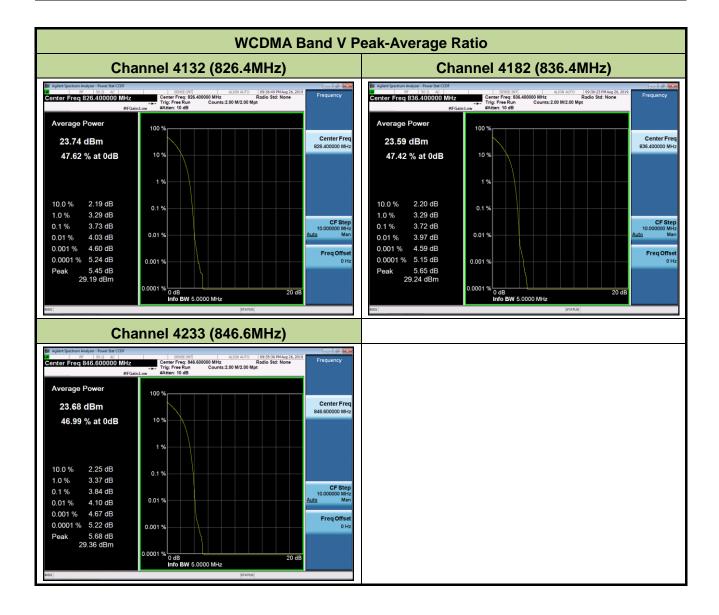












Report No.: 1907WSU008-U4



7.5. Conducted & Radiated Power (ERP & EIRP)

7.5.1.Test Limit

For FCC Part 22.913(a)(2):

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

For FCC Part 24.232(b):

The EIRP of mobile transmitters and auxiliary test transmitters must not exceed 2 Watts.

For FCC Part 27.50(d)(4)

The EIRP of mobile transmitters and auxiliary test transmitters must not exceed 1 Watts.

7.5.2.Test Procedure Used

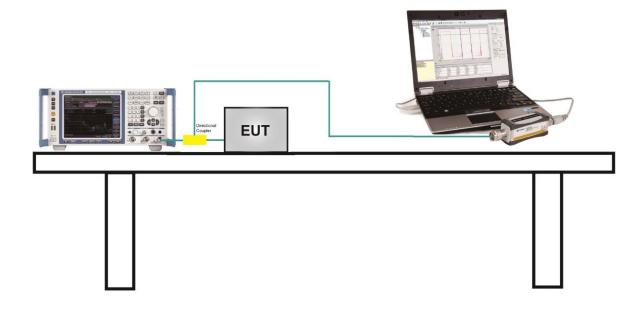
ANSI C63.26-2015 - Section 5.2.4.2 & 5.2.7

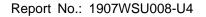
7.5.3.Test Setting

Average Power Measurement

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.

7.5.4.Test Setup







7.5.5.Test Result

Product	Color Radio	Temperature	25°C
Test Engineer	Dandy Li	Relative Humidity	52%
Test Site	TR3	Test Date	2019/08/26

For GPRS/EDGE 850 & WCDMA Band V

Mode	C	onducted Pow	er	F	Radiated Powe	er	
		(dBm)		(dBm)			
	128	189	251	128	189	251	
	824.2	836.4	848.8	824.2	836.4	848.8	
GPRS 850	29.33	29.25	29.38	23.81	23.73	23.86	
EDGE 850	29.39	29.50	29.55	23.87	23.98	24.03	
Mode	C	onducted Pow	er	F	Radiated Powe	er	
Mode	Co	onducted Pow (dBm)	er	F	Radiated Powe (dBm)	er	
Mode	4132		er 4233	4132		er 4233	
Mode		(dBm)			(dBm)		

Note:

 $EIRP = P_T + G_T - L_C$ (Refer to ANSI C63.26 Annex C)

 P_T = Conducted Power, G_T - L_C = -3.37dBi

ERP = EIRP - 2.15 dB

So Radiated Power (dBm) = Conducted Power (dBm) - 3.37 dBi - 2.15 dB





For GPRS/EDGE 1900 & WCDMA Band II

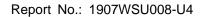
Mode	C	onducted Pow	er	F	Radiated Powe	er	
		(dBm)		(dBm)			
	512	661	810	512	661	810	
	1850.2	1880.0	1909.8	1850.2	1880.0	1909.8	
GPRS 1900	25.29	25.36	25.27	21.92	21.99	21.90	
EDGE 1900	25.28	25.35	25.24	21.91	21.98	21.87	
Mode	C	onducted Pow	er	Radiated Power			
		(dBm)		(dBm)			
	9262	9400	9538	9262	9400	9538	
	1852.4	1852.4 1880.0 1907.6			1880.0	1907.6	
WCDMA Band II	21.45	21.69	21.45	18.08	18.32	18.08	

Note:

 $EIRP = P_T + G_T - L_C$ (Refer to ANSI C63.26 Annex C)

 P_T = Conducted Power, G_T - L_C = -3.37dBi

So Radiated Power (dBm) = Conducted Power (dBm) - 3.37 dBi





For WCDMA Band IV

Mode	C	onducted Pow	er	Radiated Power			
		(dBm)		(dBm)			
	1312 1413 1513			1312	1413	1513	
	1712.4	1732.6	1752.6	1712.4 1732.6 1752.6			
WCDMA Band IV	21.88	22.11	21.87	18.51	18.74	18.50	

Note:

 $EIRP = P_T + G_T - L_C$ (Refer to ANSI C63.26 Annex C)

 P_T = Conducted Power, G_T - L_C = -3.37dBi

So Radiated Power (dBm) = Conducted Power (dBm) - 3.37 dBi



7.6. Radiated Spurious Emissions

7.6.1.Test Limit

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 + 10log(P) dB.

7.6.2.Test Procedure Used

ANSI C63.26-2015 - Section 5.2.7 & 5.5

7.6.3.Test Setting

- The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
- The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
- 3. The output of the test antenna shall be connected to the measuring receiver.
- The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.
- The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
- 6. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- 7. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
- 8. The maximum signal level detected by the measuring receiver shall be noted.
- 9. The transmitter shall be replaced by a substitution antenna.
- 10. The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
- 11. The substitution antenna shall be connected to a calibrated signal generator.

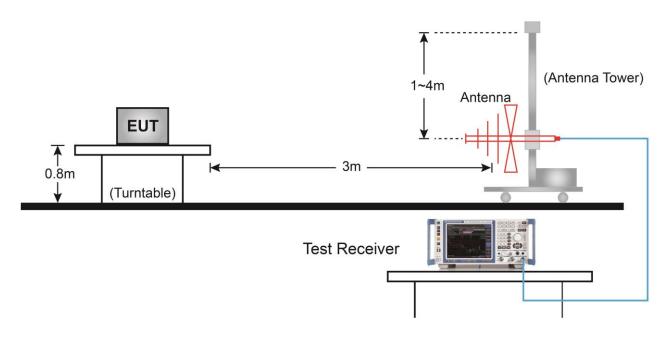


- 12. If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- 13. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
- 14. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
- 15. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
- 16. The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.
- 17. Test site anechoic chamber refer to ANSI C63.4: 2014.

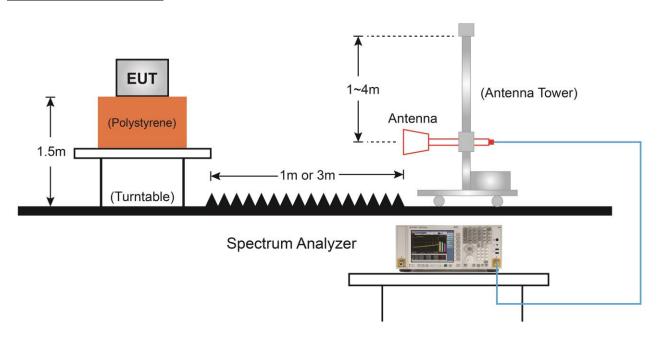


7.6.4.Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:





7.6.5.Test Result

Product	Color Radio	Temperature	25°C
Test Engineer	Snake Ni	Relative Humidity	54%
Test Site	AC1	Test Date	2019/09/17

GPRS 850

Frequency	Ant. Pol.	SG Reading	Cable Loss	Substitute	ERP	Limit	Margin
(MHz)	(H/V)	(dBm)	(dB)	Antenna	(dBm)	(dBm)	(dB)
				Gain (dBi)			
High Channel	251 (848.8	BOMHz)					
1697.00	V	-63.98	1.29	10.11	-57.31	-13.00	-44.31
2547.00	V	-49.82	1.46	10.68	-42.75	-13.00	-29.75
2547.00	Н	-48.40	1.00	10.68	-40.87	-13.00	-27.87
4247.00	Н	-59.76	1.29	12.71	-50.49	-13.00	-37.49

Note:

- 1. Spurious emissions within 30-1000MHz were found more than 20dB below limit line.
- 2. ERP (dBm) = SG Reading (dBm) Cable Loss (dB) + Substitute Antenna Gain (dBi) 2.15

GPRS 1900

Frequency	Ant. Pol.	SG Reading	Cable Loss	Substitute	EIRP	Limit	Margin
(MHz)	(H/V)	(dBm)	(dB)	Antenna	(dBm)	(dBm)	(dB)
				Gain (dBi)			
Middle Chann	el 661 (188	30.00MHz)					
5641.00	V	-56.83	0.99	13.14	-44.68	-13.00	-31.68
7502.50	V	-57.14	1.27	11.24	-47.17	-13.00	-34.17
3762.50	Н	-63.12	1.27	12.73	-51.66	-13.00	-38.66
5641.00	Н	-58.19	1.40	13.14	-46.45	-13.00	-33.45

- 1. Spurious emissions within 30-1000MHz were found more than 20dB below limit line.
- 2. EIRP (dBm) = SG Reading (dBm) Cable Loss (dB) + Substitute Antenna Gain (dBi)



EDGE850

Frequency	Ant. Pol.	SG Reading	Cable Loss	Substitute	ERP	Limit	Margin
(MHz)	(H/V)	(dBm)	(dB)	Antenna	(dBm)	(dBm)	(dB)
				Gain (dBi)			
High Channel	251 (848.8	BOMHz)					
1697.00	V	-64.16	1.29	10.11	-57.49	-13.00	-44.49
2547.00	V	-50.50	1.46	10.68	-43.43	-13.00	-30.43
2547.00	Н	-49.53	1.00	10.68	-42.00	-13.00	-29.00
4247.00	Н	-60.11	1.29	12.71	-50.84	-13.00	-37.84

Note:

- 1. Spurious emissions within 30-1000MHz were found more than 20dB below limit line.
- 2. ERP (dBm) = SG Reading (dBm) Cable Loss (dB) + Substitute Antenna Gain (dBi) 2.15

EDGE1900

Frequency	Ant. Pol.	SG Reading	Cable Loss	Substitute	EIRP	Limit	Margin
(MHz)	(H/V)	(dBm)	(dB)	Antenna	(dBm)	(dBm)	(dB)
				Gain (dBi)			
Middle Chann	el 661 (188	30.00MHz)					
5641.00	V	-56.99	0.99	13.14	-44.84	-13.00	-31.84
7502.50	V	-58.12	1.27	11.24	-48.15	-13.00	-35.15
3762.50	Н	-63.21	1.27	12.73	-51.75	-13.00	-38.75
5641.00	Н	-58.52	1.40	13.14	-46.78	-13.00	-33.78

- 1. Spurious emissions within 30-1000MHz were found more than 20dB below limit line.
- 2. EIRP (dBm) = SG Reading (dBm) Cable Loss (dB) + Substitute Antenna Gain (dBi)



WCDMA Band II

Frequency	Ant. Pol.	SG Reading	Cable Loss	Substitute	EIRP	Limit	Margin
(MHz)	(H/V)	(dBm)	(dB)	Antenna	(dBm)	(dBm)	(dB)
				Gain (dBi)			
Middle Chann	el 9400 (18	380.0MHz)					
5632.50	V	-55.94	0.99	13.14	-43.79	-13.00	-30.79
7519.50	V	-55.24	1.27	11.28	-45.23	-13.00	-32.23
5632.50	Н	-54.92	1.27	13.14	-43.05	-13.00	-30.05
7511.00	Н	-51.61	1.40	11.26	-41.75	-13.00	-28.75

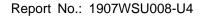
Note:

- 1. Spurious emissions within 30-1000MHz were found more than 20dB below limit line.
- 2. EIRP (dBm) = SG Reading (dBm) Cable Loss (dB) + Substitute Antenna Gain (dBi)

WCDMA Band IV

Frequency	Ant. Pol.	SG Reading	Cable Loss	Substitute	EIRP	Limit	Margin
(MHz)	(H/V)	(dBm)	(dB)	Antenna	(dBm)	(dBm)	(dB)
				Gain (dBi)			
Middle Chann	el 1413 (17	732.6MHz)					
5258.50	V	-49.19	0.99	12.94	-37.24	-13.00	-24.24
10520.00	V	-50.55	1.27	11.65	-40.17	-13.00	-27.17
5258.50	Н	-53.25	1.27	12.94	-41.58	-13.00	-28.58
7009.50	Н	-50.60	1.40	11.61	-40.39	-13.00	-27.39

- 1. Spurious emissions within 30-1000MHz were found more than 20dB below limit line.
- 2. EIRP (dBm) = SG Reading (dBm) Cable Loss (dB) + Substitute Antenna Gain (dBi)





WCDMA Band V

Frequency	Ant. Pol.	SG Reading	Cable Loss	Substitute	ERP	Limit	Margin
(MHz)	(H/V)	(dBm)	(dB)	Antenna	(dBm)	(dBm)	(dB)
				Gain (dBi)			
Middle Chann	el 4182 (83	36.40MHz)					
4179.00	V	-43.11	0.99	12.69	-33.56	-13.00	-20.56
5012.00	V	-46.22	1.27	12.66	-36.98	-13.00	-23.98
4187.50	Н	-46.13	1.27	12.69	-36.86	-13.00	-23.86
5012.00	Н	-51.96	1.40	12.66	-42.85	-13.00	-29.85

- 1. Spurious emissions within 30-1000MHz were found more than 20dB below limit line.
- 2. ERP (dBm) = SG Reading (dBm) Cable Loss (dB) + Substitute Antenna Gain (dBi) 2.15



7.7. Frequency Stability Under Temperature & Voltage Variations

7.7.1.Test Limit

The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5 ppm) of the center frequency.

7.7.2.Test Procedure

ANSI C63.26 - Section 5.6

7.7.3.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.

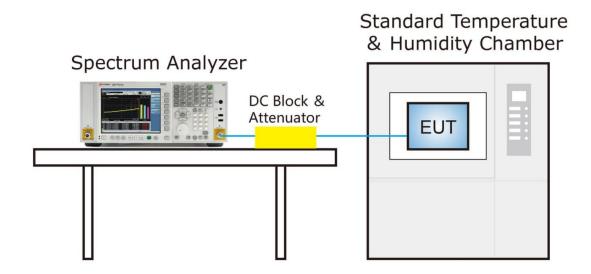
Frequency Stability Under Voltage Variations:

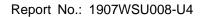
Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation (±15%) and endpoint (If a product is specified to operate over a range of input voltage then the -15% variation is applied to the lowermost voltage and the +15% is applied to the uppermost voltage), record the maximum frequency change.



7.7.4.Test Setup



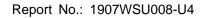




7.7.5.Test Result

Product	Color Radio	Temperature	25°C
Test Engineer	Dandy Li	Relative Humidity	52%
Test Site	TR3	Test Date	2019/08/26
Test Mode	GPRS 850	Operating Frequency	836.4MHz (Channel 189)

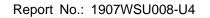
Voltage (%)	Power (V _{DC})	TEMP (%)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)	Limit (%)	Result
100%		+20(Ref)	836,400,000	18	0.000002	±0.00025	Pass
100%		-30	836,400,000	16	0.000002	±0.00025	Pass
100%		-20	836,400,000	16	0.000002	±0.00025	Pass
100%		-10	836,400,000	16	0.000002	±0.00025	Pass
100%	4.0	0	836,400,000	18	0.000002	±0.00025	Pass
100%	12	+10	836,400,000	16	0.000002	±0.00025	Pass
100%		+20	836,400,000	18	0.000002	±0.00025	Pass
100%		+30	836,400,000	18	0.000002	±0.00025	Pass
100%		+40	836,400,000	17	0.000002	±0.00025	Pass
100%		+50	836,400,000	18	0.000002	±0.00025	Pass
115%	13.8	+20	836,400,000	16	0.000002	±0.00025	Pass
85%	10.2	+20	836,400,000	20	0.000002	±0.00025	Pass





Product	Color Radio	Temperature	25°C
Test Engineer	Dandy Li	Relative Humidity	52%
Test Site	TR3	Test Date	2019/08/26
Test Mode	GPRS1900	Operating Frequency	1880.0MHz (Channel 661)

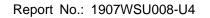
Voltage (%)	Power (V _{DC})	TEMP (%)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)	Limit (%)	Result
100%		+20(Ref)	1880,000,000	10	0.000001	±0.00025	Pass
100%		-30	1880,000,000	10	0.000001	±0.00025	Pass
100%		-20	1880,000,000	10	0.000001	±0.00025	Pass
100%		-10	1880,000,000	10	0.000001	±0.00025	Pass
100%		0	1880,000,000	12	0.000001	±0.00025	Pass
100%	12	+10	1880,000,000	10	0.000001	±0.00025	Pass
100%		+20	1880,000,000	11	0.000001	±0.00025	Pass
100%		+30	1880,000,000	11	0.000001	±0.00025	Pass
100%		+40	1880,000,000	12	0.000001	±0.00025	Pass
100%		+50	1880,000,000	13	0.000001	±0.00025	Pass
115%	13.8	+20	1880,000,000	15	0.000001	±0.00025	Pass
85%	10.2	+20	1880,000,000	11	0.000001	±0.00025	Pass





Product	Color Radio	Temperature	25°C
Test Engineer	Dandy Li	Relative Humidity	52%
Test Site	TR3	Test Date	2019/08/26
Test Mode	WCDMA Band II	Operating Frequency	1880.0MHz (Channel 9400)

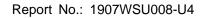
Voltage (%)	Power (V _{DC})	TEMP (%)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)	Limit (%)	Result
100%		+20(Ref)	1880,000,000	-17	-0.000001	±0.00025	Pass
100%		-30	1880,000,000	-30	-0.000002	±0.00025	Pass
100%		-20	1880,000,000	-19	-0.000001	±0.00025	Pass
100%		-10	1880,000,000	-23	-0.000001	±0.00025	Pass
100%		0	1880,000,000	-31	-0.000002	±0.00025	Pass
100%	12	+10	1880,000,000	-29	-0.000002	±0.00025	Pass
100%		+20	1880,000,000	-13	-0.000001	±0.00025	Pass
100%		+30	1880,000,000	13	0.000001	±0.00025	Pass
100%		+40	1880,000,000	14	0.000001	±0.00025	Pass
100%		+50	1880,000,000	19	0.000001	±0.00025	Pass
115%	13.8	+20	1880,000,000	24	0.000001	±0.00025	Pass
85%	10.2	+20	1880,000,000	30	0.000002	±0.00025	Pass





Product	Color Radio	Temperature	25°C
Test Engineer	Dandy Li	Relative Humidity	52%
Test Site	TR3	Test Date	2019/08/26
Test Mode	WCDMA Band IV	Operating Frequency	1732.6MHz (Channel 1413)

Voltage (%)	Power (V _{DC})	TEMP (%)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)	Limit (%)	Result
100%		+20(Ref)	1,732,600,000	-13	-0.000001	±0.00025	Pass
100%		-30	1,732,600,000	75	0.000004	±0.00025	Pass
100%		-20	1,732,600,000	22	0.000001	±0.00025	Pass
100%		-10	1,732,600,000	82	0.000005	±0.00025	Pass
100%		0	1,732,600,000	68	0.000004	±0.00025	Pass
100%	12	+10	1,732,600,000	77	0.000004	±0.00025	Pass
100%		+20	1,732,600,000	-25	-0.000001	±0.00025	Pass
100%		+30	1,732,600,000	-10	-0.000001	±0.00025	Pass
100%		+40	1,732,600,000	18	0.000001	±0.00025	Pass
100%		+50	1,732,600,000	-10	-0.000001	±0.00025	Pass
115%	13.8	+20	1,732,600,000	20	0.000001	±0.00025	Pass
85%	10.2	+20	1,732,600,000	14	0.000001	±0.00025	Pass





Product	Color Radio	Temperature	25°C
Test Engineer	Dandy Li	Relative Humidity	52%
Test Site	TR3	Test Date	2019/08/26
Test Mode	WCDMA Band V	Operating Frequency	836.4MHz (Channel 4182)

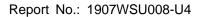
Voltage (%)	Power (V _{DC})	TEMP (%)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)	Limit (%)	Result
100%		+20(Ref)	836,400,000	-23	-0.000003	±0.00025	Pass
100%		-30	836,400,000	37	0.000005	±0.00025	Pass
100%		-20	836,400,000	41	0.000006	±0.00025	Pass
100%		-10	836,400,000	32	0.000005	±0.00025	Pass
100%		0	836,400,000	15	0.000002	±0.00025	Pass
100%	12	+10	836,400,000	-25	-0.000004	±0.00025	Pass
100%		+20	836,400,000	31	0.000004	±0.00025	Pass
100%		+30	836,400,000	33	0.000005	±0.00025	Pass
100%		+40	836,400,000	27	0.000004	±0.00025	Pass
100%		+50	836,400,000	11	0.000002	±0.00025	Pass
115%	13.8	+20	836,400,000	28	0.000004	±0.00025	Pass
85%	10.2	+20	836,400,000	23	0.000003	±0.00025	Pass



8. CONCLUSION

The data collected relate only the item(s) tested and show that the device compliance with all the requirements of Parts 2, 22, 24, 27 of the FCC Rules.

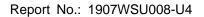
— The End





Appendix A – Test Setup Photograph

Refer to "1907WSU008-UT" file.





Appendix B – EUT Photograph

Refer to "1907WSU008-UE" file.