



Plot 7-105. Peak-Average Ratio Plot (PCS WCDMA Mode)

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7.6 Radiated Power (ERP/EIRP)

Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v03r01 - Section 5.2.1

ANSI/TIA-603-E-2016 - Section 2.2.17

Test Settings

- 1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation. For signals with burst transmission, the signal analyzer's "time domain power" measurement capability is used
- 2. RBW = 1 5% of the expected OBW, not to exceed 1MHz
- 3. VBW \geq 3 x RBW
- 4. Span = 1.5 times the OBW
- 5. No. of sweep points \geq 2 x span / RBW
- 6. Detector = RMS
- 7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto". Trigger is set to enable triggering only on full power bursts with the sweep time set less than or equal to the transmission burst duration
- 8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation. For signals with burst transmission, the "gating" function was enabled to ensure that measurements are performed during times in which the transmitter is operating at its maximum power
- 9. Trace mode = trace averaging (RMS) over 100 sweeps
- 10. The trace was allowed to stabilize

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Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

Figure 7-6. Radiated Test Setup >1GHz

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- 1) This device employs GSM, GPRS, and EDGE capabilities. The EUT was tested under all configurations and the highest power is reported in GPRS mode while transmitting with one slot active.
- 2) This device employs UMTS technology with WCDMA (AMR/RMC), HSDPA, and HSUPA capabilities. For WCDMA and HSUPA transmission, all configurations were investigated and the worst case UMTS emissions were found in RMC WCDMA mode at 12.2kbps with HSDPA inactive and TPC bits all set to "1."
- 3) For CDMA, this device was tested under all RC and SO combinations and the worst case is reported with RC3/SO55 with "All Up" power control bits.
- 4) This unit was tested with its standard battery.
- 5) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.

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Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
824.20	GPRS850	Н	150	353	29.12	1.50	28.46	38.45	-9.99	30.61	40.61	-10.00
836.60	GPRS850	н	150	4	29.48	1.50	28.83	38.45	-9.62	30.98	40.61	-9.63
848.80	GPRS850	н	150	345	28.50	1.50	27.85	38.45	-10.60	30.00	40.61	-10.61
836.60	GPRS850	V	150	120	22.36	1.50	21.71	38.45	-16.75	23.86	40.61	-16.75
836.60	EDGE850	Н	150	4	22.48	1.50	21.83	38.45	-16.62	23.98	40.61	-16.62

Table 7-2. ERP/EIRP (Cellular GPRS)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
824.70	CDMA850	н	150	5	19.79	1.50	19.14	38.45	-19.31	21.29	40.61	-19.32
836.52	CDMA850	н	150	280	20.65	1.50	20.00	38.45	-18.45	22.15	40.61	-18.46
848.31	CDMA850	н	150	7	18.41	1.50	17.76	38.45	-20.69	19.91	40.61	-20.70
836.52	CDMA850	V	150	75	18.11	1.50	17.46	38.45	-20.99	19.61	40.61	-21.00

Table 7-3. ERP/EIRP (Cellular CDMA)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
826.40	WCDMA850	н	150	356	21.67	1.50	21.02	38.45	-17.43	23.17	40.61	-17.44
836.60	WCDMA850	н	150	12	20.94	1.50	20.29	38.45	-18.16	22.44	40.61	-18.17
846.60	WCDMA850	н	150	8	19.82	1.50	19.17	38.45	-19.28	21.32	40.61	-19.29
826.40	WCDMA850	V	150	64	15.13	1.50	14.48	38.45	-23.97	16.63	40.61	-23.98

Table 7-4. ERP/EIRP (Cellular WCDMA)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1712.40	WCDMA1700	V	150	355	16.46	5.55	22.01	30.00	-7.99
1732.60	WCDMA1700	V	150	350	15.66	5.41	21.07	30.00	-8.93
1752.60	WCDMA1700	V	150	146	14.44	5.27	19.71	30.00	-10.29
1712.40	WCDMA1700	н	150	358	15.72	5.41	21.13	30.00	-8.87

Table 7-5. EIRP (AWS WCDMA)

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Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1850.20	GPRS1900	Н	353	302	21.17	4.82	25.99	33.01	-7.02
1880.00	GPRS1900	н	305	280	20.31	4.74	25.05	33.01	-7.96
1909.80	GPRS1900	н	13	304	22.06	4.68	26.74	33.01	-6.27
1909.80	GPRS1900	V	150	176	18.90	4.68	23.58	33.01	-9.43
1909.80	EDGE1900	н	13	304	18.78	4.68	23.46	33.01	-9.55

Table 7-6. EIRP (PCS GPRS)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1851.25	CDMA1900	V	150	35	13.01	4.82	17.83	33.01	-15.18
1880.00	CDMA1900	V	150	308	16.26	4.74	21.00	33.01	-12.01
1908.75	CDMA1900	V	150	317	15.04	4.68	19.72	33.01	-13.29
1880.00	CDMA1900	н	150	231	14.58	4.74	19.32	33.01	-13.69

Table 7-7. EIRP (PCS CDMA)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1852.40	WCDMA1900	Н	150	299	15.77	4.81	20.58	33.01	-12.43
1880.00	WCDMA1900	Н	150	307	15.76	4.74	20.50	33.01	-12.51
1907.60	WCDMA1900	н	150	309	15.58	4.68	20.26	33.01	-12.75
1852.40	WCDMA1900	V	150	38	14.48	4.81	19.29	33.01	-13.72

Table 7-8. EIRP (PCS WCDMA)

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7.7 Radiated Spurious Emissions Measurements

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using horizontally and vertically polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as peak measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v03r01 - Section 5.8

ANSI/TIA-603-E-2016 - Section 2.2.12

Test Settings

- 1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
- 2. VBW \geq 3 x RBW
- 3. Span = 1.5 times the OBW
- 4. No. of sweep points > 2 x span / RBW
- 5. Detector = RMS
- 6. Trace mode = Average (Max Hold for pulsed emissions)
- 7. The trace was allowed to stabilize

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EUT turntable 8. styrofoam block

The EUT and measurement equipment were set up as shown in the diagram below.

Figure 7-7. Test Instrument & Measurement Setup

Test Notes

- 1) This device employs GSM, GPRS, and EDGE capabilities. The EUT was tested under all configurations and the highest power is reported in GPRS mode while transmitting with one slot active.
- 2) This device employs UMTS technology with WCDMA (AMR/RMC), HSDPA, and HSUPA capabilities. For WCDMA and HSUPA transmission, all configurations were investigated and the worst case UMTS emissions were found in RMC WCDMA mode at 12.2kbps with HSDPA inactive and TPC bits all set to "1."
- 3) For CDMA, this device was tested under all RC and SO combinations and the worst case is reported with RC3/SO55 with "All Up" power control bits.
- 4) This unit was tested with its standard battery.
- 5) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.
- 6) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 7) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 8) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

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Cellular GPRS Mode

Plot 7-106. Radiated Spurious Plot Above 1GHz (Cellular GPRS Mode)

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1648.40	Н	390	42	-59.67	8.94	-50.73	-37.7
2472.60	Н	138	143	-41.90	9.64	-32.26	-19.3
3296.80	Н	-	-	-69.29	9.57	-59.71	-46.7
4121.00	Н	-	-	-71.80	10.17	-61.63	-48.6

Table 7-9. Radiated Spurious Data (Cellular GPRS Mode – Ch. 128)

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MHz	6.60	83	OPERATING FREQUENCY:
	90	1	CHANNEL:
	_	GPRS (GMSK)	MODULATION SIGNAL:
	meters	3	DISTANCE:
	dBm	-13	LIMIT:

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.20	Н	143	231	-62.77	8.95	-53.82	-40.8
2509.80	Н	127	130	-45.97	9.75	-36.22	-23.2
3346.40	Н	-	-	-68.64	9.60	-59.04	-46.0
4183.00	н	-	-	-72.21	10.35	-61.86	-48.9

Table 7-10. Radiated Spurious Data (Cellular GPRS Mode – Ch. 190)

MHz	3.80	84	OPERATING FREQUENCY:		
	51	2	CHANNEL:		
	_	GPRS (GMSK)	MODULATION SIGNAL:		
	meters	3	DISTANCE:		
	dBm	-13	LIMIT:		
	_				

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1697.60	Н	282	157	-60.08	8.95	-51.13	-38.1
2546.40	Н	155	355	-50.71	9.74	-40.97	-28.0
3395.20	Н	-	-	-69.32	9.78	-59.54	-46.5
4244.00	Н	-	-	-72.71	10.58	-62.13	-49.1

Table 7-11. Radiated Spurious Data (Cellular GPRS Mode – Ch. 251)

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Plot 7-107. Radiated Spurious Plot Above 1GHz (Cellular CDMA Mode)

OPERATING FREQUENCY:	82	4.70 M	Hz
CHANNEL:	10	013	
MODULATION SIGNAL:	CDMA	_	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1649.40	Н	-	-	-71.78	4.81	-66.97	-54.0
2474.10	Н	-	-	-68.70	4.99	-63.71	-50.7

Table 7-12. Radiated Spurious Data (Cellular CDMA Mode – Ch. 1013)

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Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.04	Н	-	-	-71.71	4.86	-66.85	-53.8
2509.56	Н	-	-	-68.40	5.10	-63.30	-50.3

Table 7-13. Radiated Spurious Data (Cellular CDMA Mode – Ch. 384)

MHz	3.31	8	OPERATING FREQUENCY:
	77		CHANNEL:
	_	CDMA	MODULATION SIGNAL:
	meters	3	DISTANCE:
	dBm	-13	LIMIT:

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1696.62	Н	-	-	-71.61	4.91	-66.70	-53.7
2544.93	Н	-	-	-68.55	5.27	-63.28	-50.3

Table 7-14. Radiated Spurious Data (Cellular CDMA Mode – Ch. 777)

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Cellular WCDMA Mode

Plot 7-108. Radiated Spurious Plot Above 1GHz (Cellular WCDMA Mode)

OPERATING FREQUENCY:	82	6.40	MHz
CHANNEL:	4	132	
MODULATION SIGNAL:	WCDMA	_	
DISTANCE:	3	meters	
LIMIT:	-13	_dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1652.80	Н	-	-	-79.83	8.95	-70.88	-57.9
2479.20	Н	156	148	-70.77	9.67	-61.10	-48.1
3305.60	Н	-	-	-74.17	9.58	-64.59	-51.6
4132.00	Н	-	-	-73.98	10.19	-63.79	-50.8

Table 7-15. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4132)

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Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.20	Н	-	-	-79.47	8.95	-70.52	-57.5
2509.80	Н	151	136	-72.99	9.75	-63.24	-50.2
3346.40	Н	-	-	-74.09	9.60	-64.49	-51.5
4183.00	Н	-	-	-73.96	10.35	-63.61	-50.6

Table 7-16. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4183)

MHz	6.60	84	OPERATING FREQUENCY:
	233	42	CHANNEL:
	_	WCDMA	MODULATION SIGNAL:
	meters	3	DISTANCE:
	dBm	-13	LIMIT:
	-		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1693.20	Н	372	154	-78.15	8.95	-69.19	-56.2
2539.80	Н	146	134	-75.58	9.74	-65.83	-52.8
3386.40	Н	-	-	-74.66	9.75	-64.92	-51.9
4233.00	Н	-	-	-74.25	10.53	-63.71	-50.7

Table 7-17. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4233)

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Plot 7-109. Radiated Spurious Plot Above 1GHz (AWS WCDMA Mode)

MHz	2.40	17	OPERATING FREQUENCY:
	312		CHANNEL:
	_	WCDMA	MODULATION SIGNAL:
	meters	3	DISTANCE:
	dBm	-13	LIMIT:

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3424.80	V	137	16	-71.03	9.83	-61.20	-48.2
5137.20	V	-	-	-72.01	10.69	-61.32	-48.3
6849.60	V	-	-	-70.39	11.64	-58.75	-45.8

Table 7-18. Radiated Spurious Data (AWS WCDMA Mode - Ch. 1312)

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Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3465.20	V	395	29	-71.85	9.88	-61.98	-49.0
5197.80	V	-	-	-72.18	10.76	-61.42	-48.4
6930.40	V	-	-	-70.89	11.74	-59.15	-46.1

Table 7-19. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1413)

OPERATING FREQUENCY:	1752.60		
CHANNEL:	1513		
MODULATION SIGNAL:	WCDMA	_	_
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3505.20	V	211	359	-72.58	9.92	-62.66	-49.7
5257.80	V	-	-	-72.18	10.72	-61.46	-48.5
7010.40	V	-	-	-71.24	11.86	-59.38	-46.4

Table 7-20. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1513)

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MHz	0.20	185	OPERATING FREQUENCY:		
	12	5	CHANNEL:		
	_	GPRS (GMSK)	MODULATION SIGNAL:		
	meters	3	DISTANCE:		
	dBm	-13	LIMIT:		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3700.40	Н	-	-	-70.85	9.58	-61.27	-48.3
5550.60	Н	-	-	-70.68	10.94	-59.74	-46.7

Table 7-21. Radiated Spurious Data (PCS GPRS Mode – Ch. 512)

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OPERATING FREQUENCY:	188	30.00	MHz
CHANNEL:	6	_	
MODULATION SIGNAL:	GPRS (GMSK)		
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3760.00	Н	-	-	-70.26	9.37	-60.90	-47.9
5640.00	Н	-	-	-70.38	11.17	-59.21	-46.2

Table 7-22. Radiated Spurious Data (PCS GPRS Mode - Ch. 661)

MHz	9.80	190	OPERATING FREQUENCY:		
	10	8	CHANNEL:		
		GPRS (GMSK)	MODULATION SIGNAL:		
	meters	3	DISTANCE:		
	dBm	-13	LIMIT:		

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3819.60	Н	-	-	-70.94	9.30	-61.64	-48.6
5729.40	Н	-	-	-70.75	11.39	-59.36	-46.4

Table 7-23. Radiated Spurious Data (PCS GPRS Mode – Ch. 810)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	فا 🕕	Approved by: Quality Manager
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Plot 7-111. Radiated Spurious Plot Above 1GHz (PCS CDMA Mode)

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3702.50	V	-	-	-67.86	6.76	-61.09	-48.1
5553.75	V	-	-	-67.32	8.44	-58.89	-45.9

Table 7-24. Radiated Spurious Data (PCS CDMA Mode – Ch. 25)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3760.00	V	-	-	-68.17	6.84	-61.33	-48.3
5640.00	V	-	-	-66.71	8.52	-58.19	-45.2

Table 7-25. Radiated Spurious Data (PCS CDMA Mode - Ch. 600)

MHz	8.75	190	OPERATING FREQUENCY:
_	75	1 1	CHANNEL:
_	_	CDMA	MODULATION SIGNAL:
	meters	3	DISTANCE:
	dBm	-13	LIMIT:

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3817.50	V	-	-	-68.11	6.99	-61.12	-48.1
5726.25	V	-	-	-66.60	8.58	-58.02	-45.0

Table 7-26. Radiated Spurious Data (PCS CDMA Mode – Ch. 1175)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Plot 7-112. Radiated Spurious Plot Above 1GHz (PCS WCDMA Mode)

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3704.80	Н	-	-	-72.75	9.57	-63.18	-50.2
5557.20	Н	-	-	-72.36	10.95	-61.41	-48.4

Table 7-27. Radiated Spurious Data (PCS WCDMA Mode - Ch. 9262)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3760.00	Н	-	-	-72.23	9.37	-62.87	-49.9
5640.00	Н	-	-	-72.12	11.17	-60.95	-47.9

Table 7-28. Radiated Spurious Data (PCS WCDMA Mode - Ch. 9400)

MHz	7.60	190	OPERATING FREQUENCY:
	538	95	CHANNEL:
	_	WCDMA	MODULATION SIGNAL:
	meters	3	DISTANCE:
	dBm	-13	LIMIT:

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3815.20	Н	-	-	-72.74	9.30	-63.44	-50.4
5722.80	Н	-	-	-72.27	11.37	-60.90	-47.9

Table 7-29. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9538)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-E-2016. The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

For Part 22, RSS-132, and RSS-133, the frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency. For Part 24, Part 27, and RSS-139, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Procedure Used

ANSI/TIA-603-E-2016

Test Settings

- 1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
- 2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
- 3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Test Setup

The EUT was connected via an RF cable to a spectrum analyzer with the EUT placed inside an environmental chamber.

Test Notes

None

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OPERATING FREQUENCY:	836,600,000	Hz
CHANNEL:	190	
REFERENCE VOLTAGE:	4.34	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.34	+ 20 (Ref)	836,600,345	345	0.0000412
100 %		- 30	836,599,994	-6	-0.0000007
100 %		- 20	836,600,252	252	0.0000301
100 %		- 10	836,600,212	212	0.0000253
100 %		0	836,600,176	176	0.0000210
100 %		+ 10	836,600,042	42	0.0000050
100 %		+ 20	836,600,163	163	0.0000195
100 %		+ 30	836,599,533	-467	-0.0000558
100 %		+ 40	836,600,012	12	0.0000014
100 %		+ 50	836,600,032	32	0.0000038
BATT. ENDPOINT	3.43	+ 20	836,600,085	85	0.0000102

Table 7-30. Frequency Stability Data (Cellular GPRS Mode – Ch. 190)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Figure 7-8. Frequency Stability Graph (Cellular GPRS Mode – Ch. 190)

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OPERATING FREQUENCY:	836,520,000	Hz
CHANNEL:	384	
REFERENCE VOLTAGE:	4.34	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.34	+ 20 (Ref)	836,519,806	-194	-0.0000232
100 %		- 30	836,520,015	15	0.0000018
100 %		- 20	836,520,109	109	0.0000130
100 %		- 10	836,520,172	172	0.0000206
100 %		0	836,519,873	-127	-0.0000152
100 %		+ 10	836,519,870	-130	-0.0000155
100 %		+ 20	836,519,708	-292	-0.0000349
100 %		+ 30	836,519,815	-185	-0.0000221
100 %		+ 40	836,520,163	163	0.0000195
100 %		+ 50	836,519,728	-272	-0.0000325
BATT. ENDPOINT	3.43	+ 20	836,520,316	316	0.0000378

Table 7-31. Frequency Stability Data (Cellular CDMA Mode – Ch. 384)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Figure 7-9. Frequency Stability Graph (Cellular CDMA Mode – Ch. 384)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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OPERATING FREQUENCY:	836,600,000	Hz
CHANNEL:	4183	
REFERENCE VOLTAGE:	4.34	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.34	+ 20 (Ref)	836,600,085	85	0.0000102
100 %		- 30	836,599,856	-144	-0.0000172
100 %		- 20	836,600,041	41	0.0000049
100 %		- 10	836,600,306	306	0.0000366
100 %		0	836,599,739	-261	-0.0000312
100 %		+ 10	836,600,014	14	0.0000017
100 %		+ 20	836,599,948	-52	-0.0000062
100 %		+ 30	836,599,858	-142	-0.0000170
100 %		+ 40	836,600,160	160	0.0000191
100 %		+ 50	836,600,188	188	0.0000225
BATT. ENDPOINT	3.43	+ 20	836,599,914	-86	-0.0000103

Table 7-32. Frequency Stability Data (Cellular WCDMA Mode – Ch. 4183)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Figure 7-10. Frequency Stability Graph (Cellular WCDMA Mode – Ch. 4183)

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OPERATING FREQUENCY:	1,732,600,000	Hz
CHANNEL:	1413	_
REFERENCE VOLTAGE:	4.34	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.34	+ 20 (Ref)	1,732,599,893	-107	-0.0000062
100 %		- 30	1,732,600,013	13	0.000008
100 %		- 20	1,732,599,849	-151	-0.0000087
100 %		- 10	1,732,599,900	-100	-0.0000058
100 %		0	1,732,599,815	-185	-0.0000107
100 %		+ 10	1,732,599,916	-84	-0.0000048
100 %		+ 20	1,732,600,185	185	0.0000107
100 %		+ 30	1,732,599,944	-56	-0.0000032
100 %		+ 40	1,732,599,785	-215	-0.0000124
100 %		+ 50	1,732,600,091	91	0.0000053
BATT. ENDPOINT	3.43	+ 20	1,732,600,017	17	0.0000010

 Table 7-33. Frequency Stability Data (AWS WCDMA Mode – Ch. 1413)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

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Figure 7-11. Frequency Stability Graph (AWS WCDMA Mode – Ch. 1413)

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OPERATING FREQUENCY:	1,880,000,000	Hz
CHANNEL:	661	
REFERENCE VOLTAGE:	4.34	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.34	+ 20 (Ref)	1,879,999,629	-371	-0.0000197
100 %		- 30	1,879,999,999	-1	-0.0000001
100 %		- 20	1,879,999,848	-152	-0.0000081
100 %		- 10	1,879,999,971	-29	-0.0000015
100 %		0	1,880,000,060	60	0.0000032
100 %		+ 10	1,879,999,853	-147	-0.0000078
100 %		+ 20	1,879,999,835	-165	-0.0000088
100 %		+ 30	1,879,999,869	-131	-0.0000070
100 %		+ 40	1,879,999,899	-101	-0.0000054
100 %		+ 50	1,880,000,031	31	0.0000016
BATT. ENDPOINT	3.43	+ 20	1,880,000,006	6	0.0000003

Table 7-34. Frequency Stability Data (PCS GPRS Mode – Ch. 661)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

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Figure 7-12. Frequency Stability Graph (PCS GPRS Mode – Ch. 661)

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OPERATING FREQUENCY:	1,880,000,000	Hz
CHANNEL:	600	_
REFERENCE VOLTAGE:	4.34	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.34	+ 20 (Ref)	1,879,999,715	-285	-0.0000152
100 %		- 30	1,879,999,971	-29	-0.0000015
100 %		- 20	1,880,000,003	3	0.0000002
100 %		- 10	1,880,000,149	149	0.0000079
100 %		0	1,880,000,181	181	0.0000096
100 %		+ 10	1,880,000,160	160	0.0000085
100 %		+ 20	1,880,000,041	41	0.0000022
100 %		+ 30	1,880,000,076	76	0.0000040
100 %		+ 40	1,879,999,910	-90	-0.0000048
100 %		+ 50	1,879,999,890	-110	-0.0000059
BATT. ENDPOINT	3.43	+ 20	1,879,999,908	-92	-0.0000049

Table 7-35. Frequency Stability Data (PCS CDMA Mode - Ch. 600)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

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Figure 7-13. Frequency Stability Graph (PCS CDMA Mode – Ch. 600)

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OPERATING FREQUENCY:	1,880,000,000	Hz
CHANNEL:	9400	
REFERENCE VOLTAGE:	4.34	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.34	+ 20 (Ref)	1,879,999,802	-198	-0.0000105
100 %		- 30	1,880,000,041	41	0.0000022
100 %		- 20	1,880,000,051	51	0.0000027
100 %		- 10	1,880,000,245	245	0.0000130
100 %		0	1,880,000,102	102	0.0000054
100 %		+ 10	1,879,999,524	-476	-0.0000253
100 %		+ 20	1,879,999,893	-107	-0.0000057
100 %		+ 30	1,879,999,724	-276	-0.0000147
100 %		+ 40	1,880,000,048	48	0.0000026
100 %		+ 50	1,880,000,273	273	0.0000145
BATT. ENDPOINT	3.43	+ 20	1,880,000,115	115	0.0000061

Table 7-36. Frequency Stability Data (PCS WCDMA Mode – Ch. 9400)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

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Figure 7-14. Frequency Stability Graph (PCS WCDMA Mode – Ch. 9400)

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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFQ910QM** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules and RSS-132, RSS-133, RSS-139 of the Innovation, Science and Economic Development Canada Rules.

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