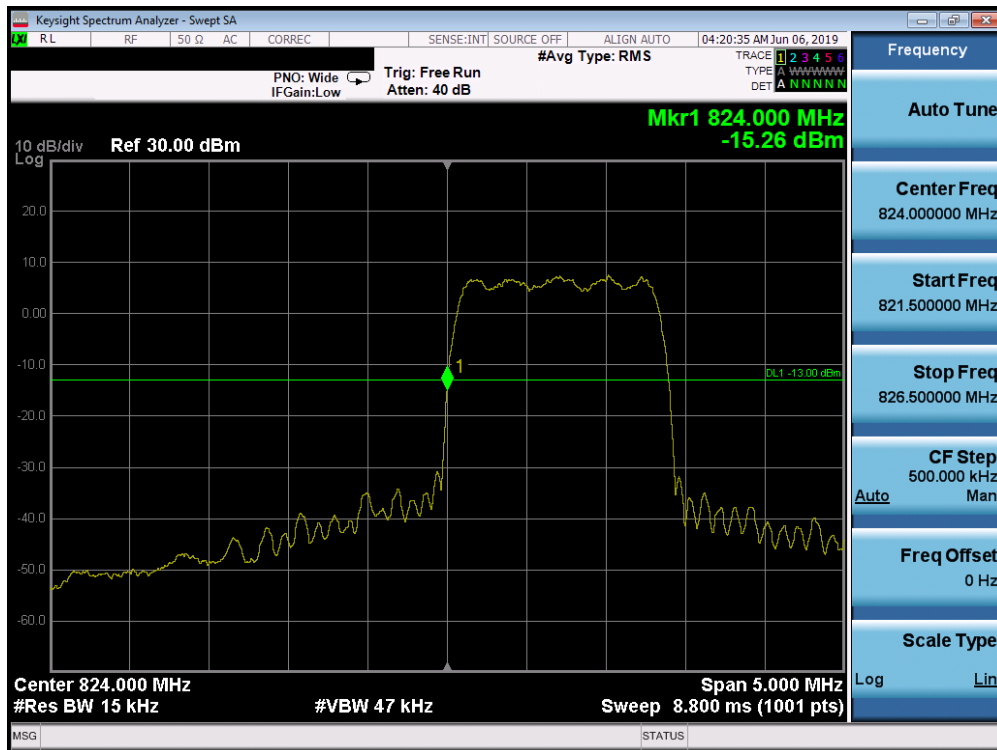
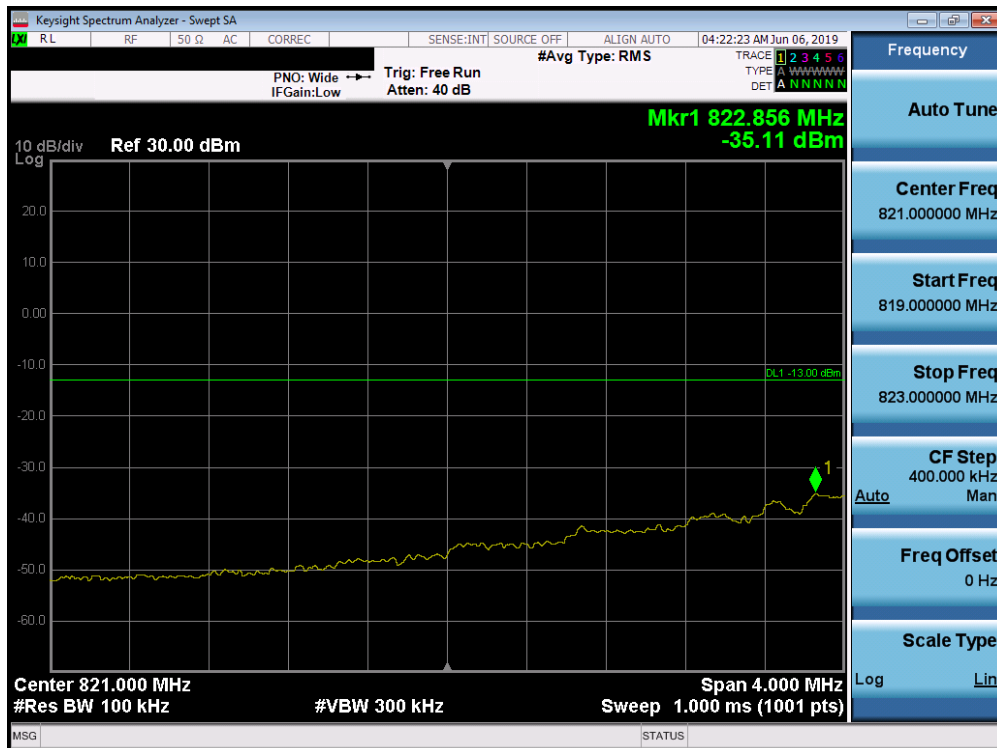


Cellular CDMA Mode

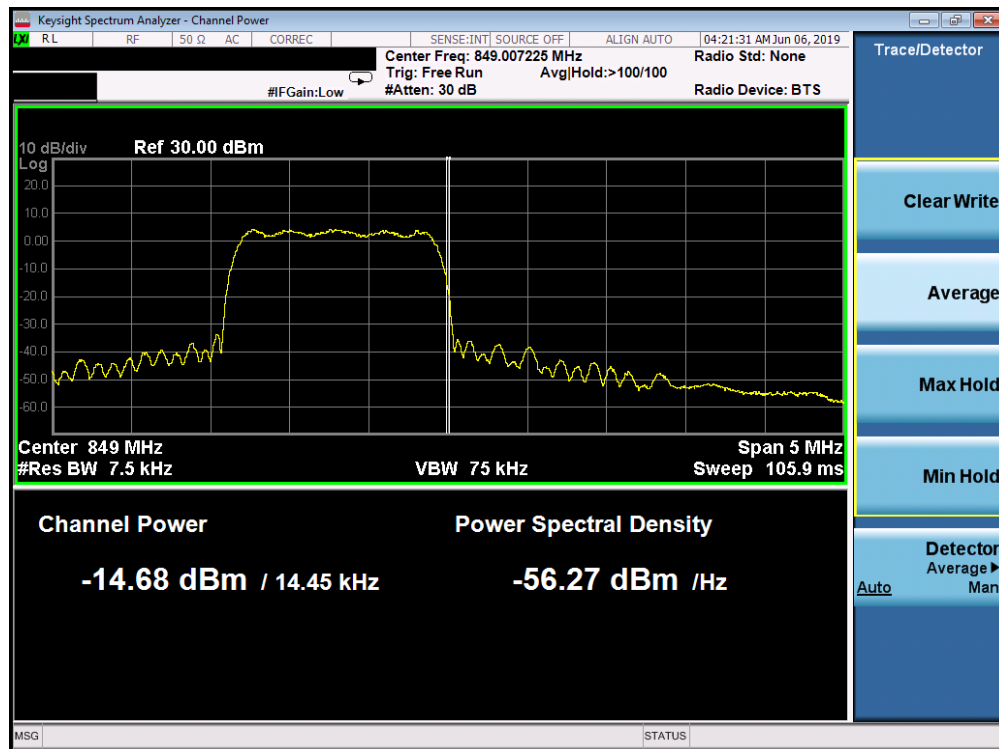


Plot 7-79. Band Edge Plot (Cellular CDMA Mode - Low Channel)



Plot 7-80. 4MHz Span Plot (Cellular CDMA Mode - Low Channel)

FCC ID: A3LSMN970U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1905220084-02.A3L	Test Dates: 05/22 - 07/10/2019	EUT Type: Portable Handset		Page 59 of 112



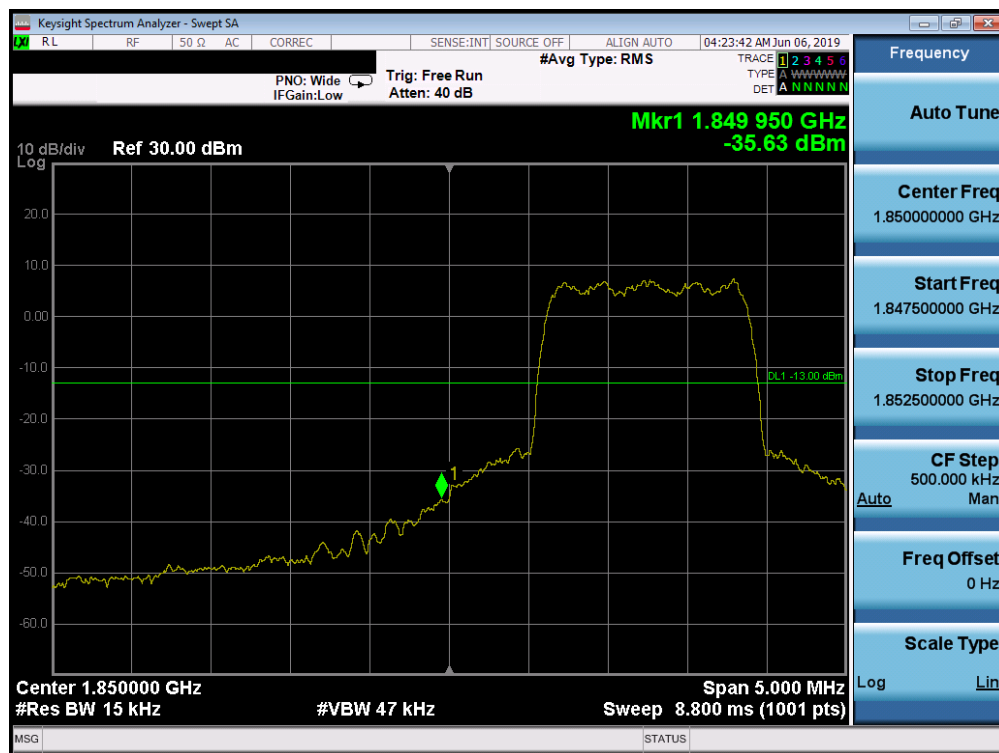
Plot 7-81. Band Edge Plot (Cellular CDMA Mode - High Channel)



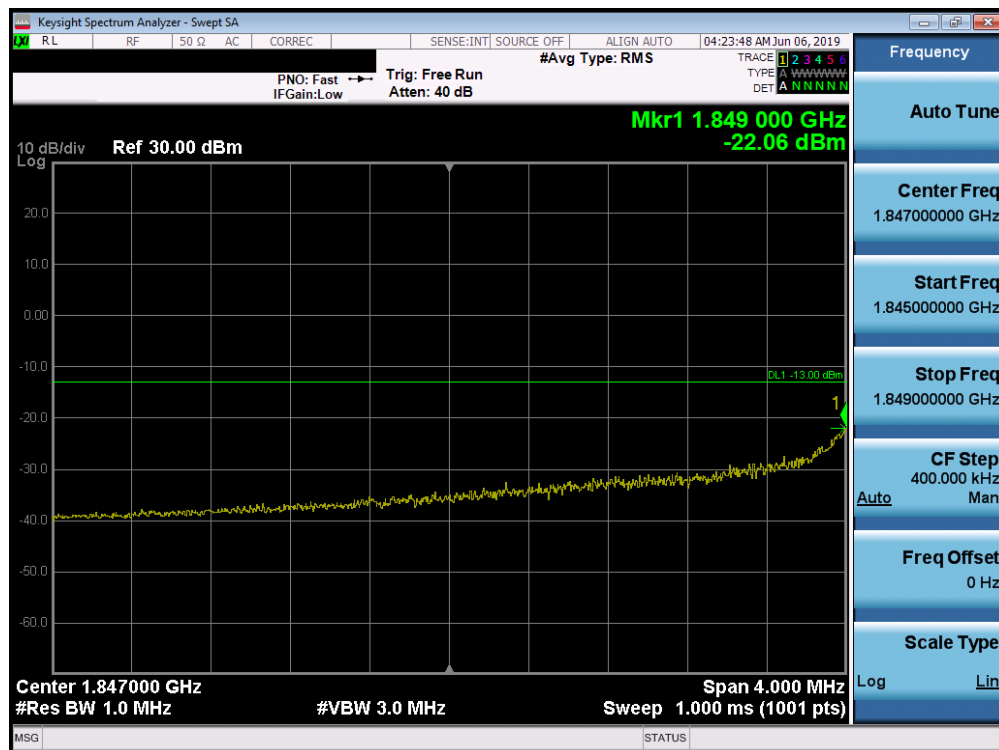
Plot 7-82. 4MHz Span Plot (Cellular CDMA Mode - High Channel)

FCC ID: A3LSMN970U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1905220084-02.A3L	Test Dates: 05/22 - 07/10/2019	EUT Type: Portable Handset		Page 60 of 112

PCS CDMA Mode

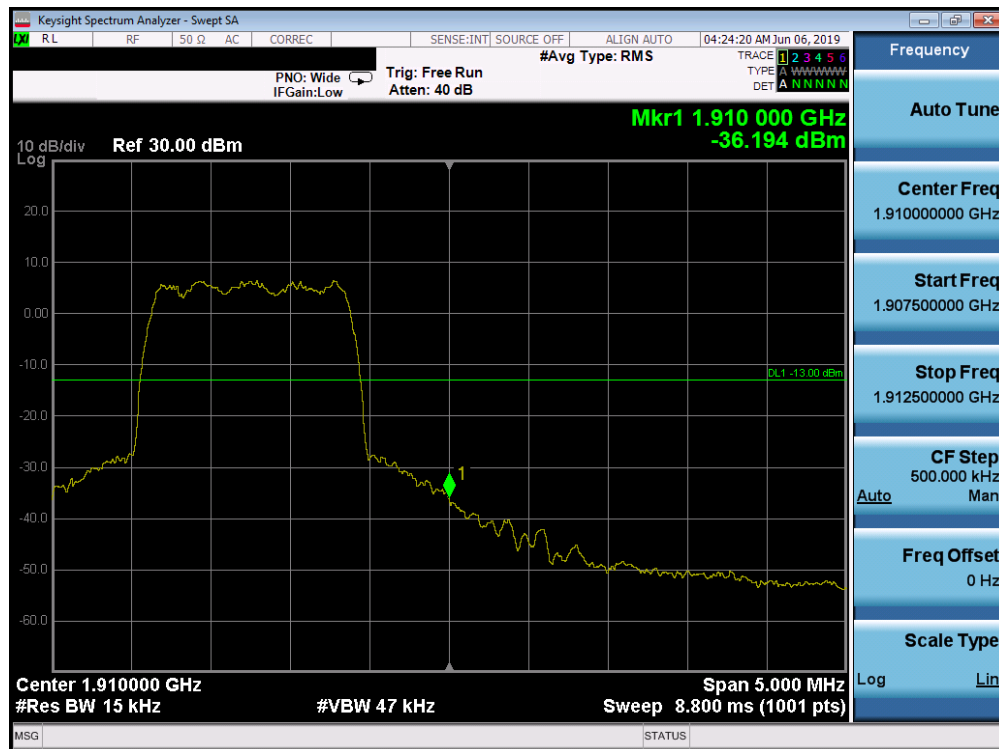


Plot 7-83. Band Edge Plot (PCS CDMA Mode - Low Channel)

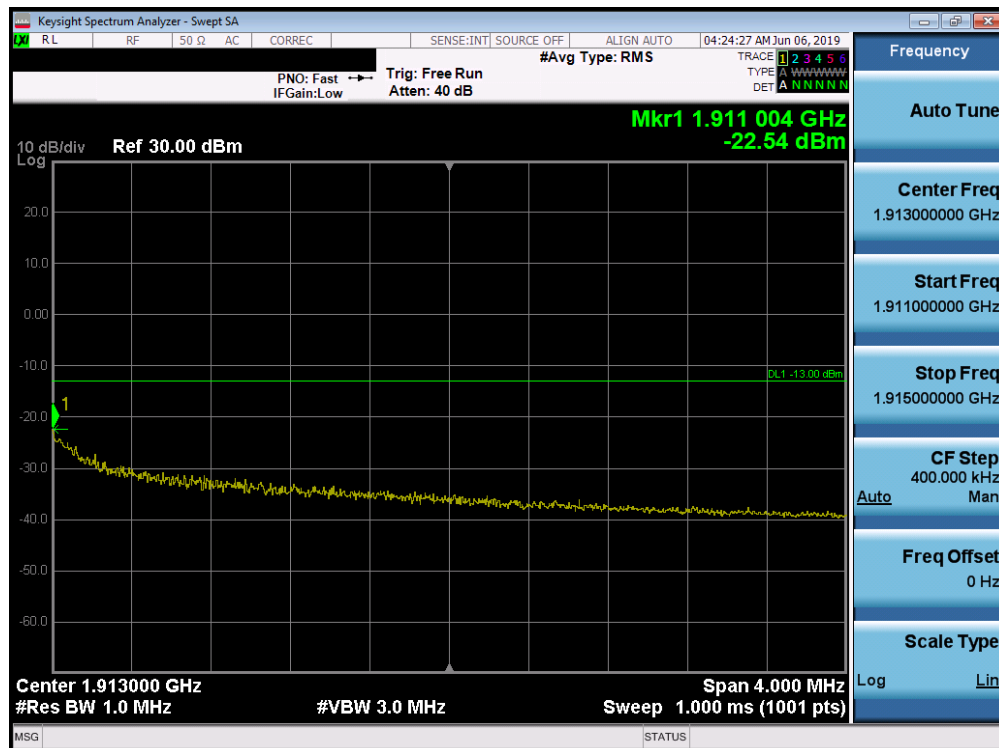


Plot 7-84. 4MHz Span Plot (PCS CDMA Mode - Low Channel)

FCC ID: A3LSMN970U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1905220084-02.A3L	Test Dates: 05/22 - 07/10/2019	EUT Type: Portable Handset		Page 61 of 112



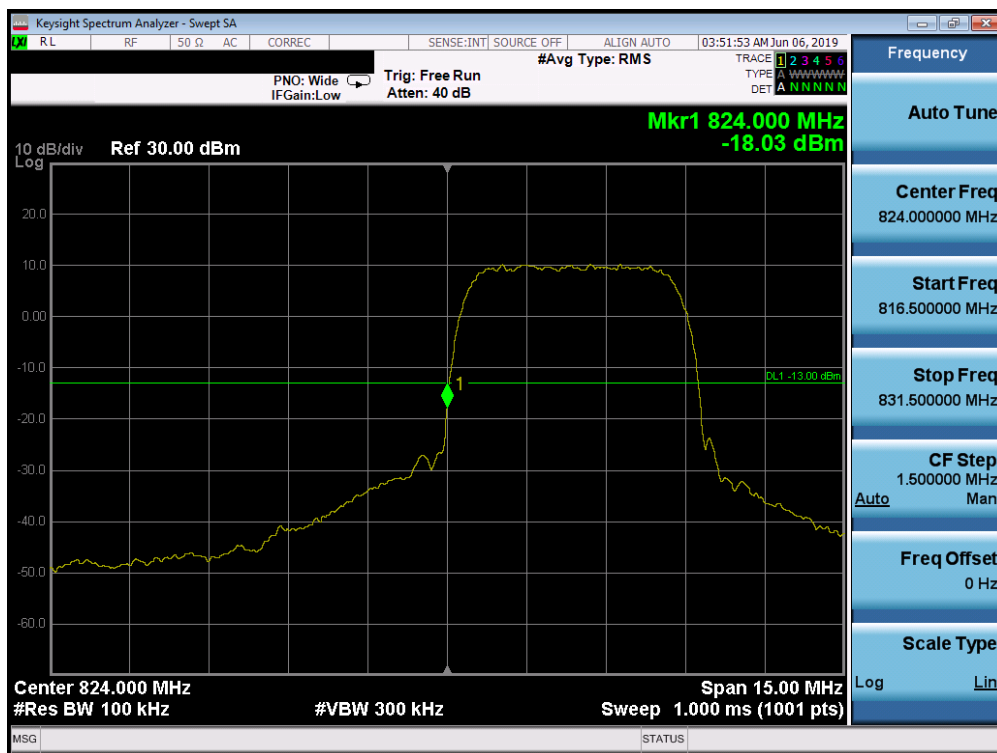
Plot 7-85. Band Edge Plot (PCS CDMA Mode - High Channel)



Plot 7-86. 4MHz Span Plot (PCS CDMA Mode - High Channel)

FCC ID: A3LSMN970U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1905220084-02.A3L	Test Dates: 05/22 - 07/10/2019	EUT Type: Portable Handset		Page 62 of 112

Cellular WCDMA Mode



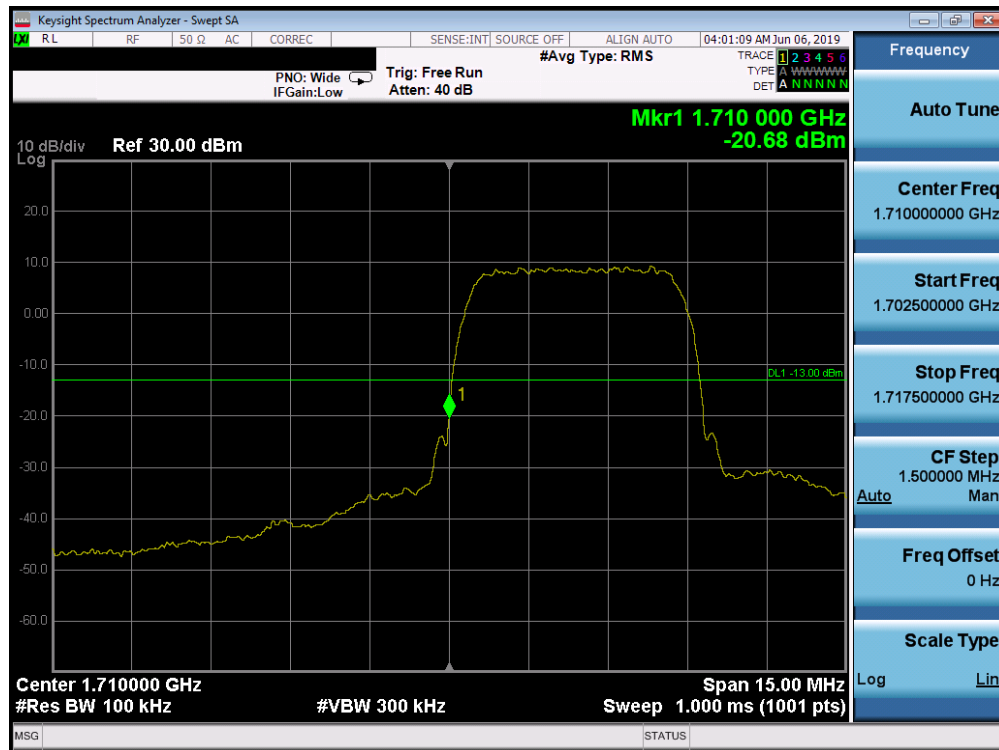
Plot 7-87. Band Edge Plot (Cellular WCDMA Mode - Low Channel)



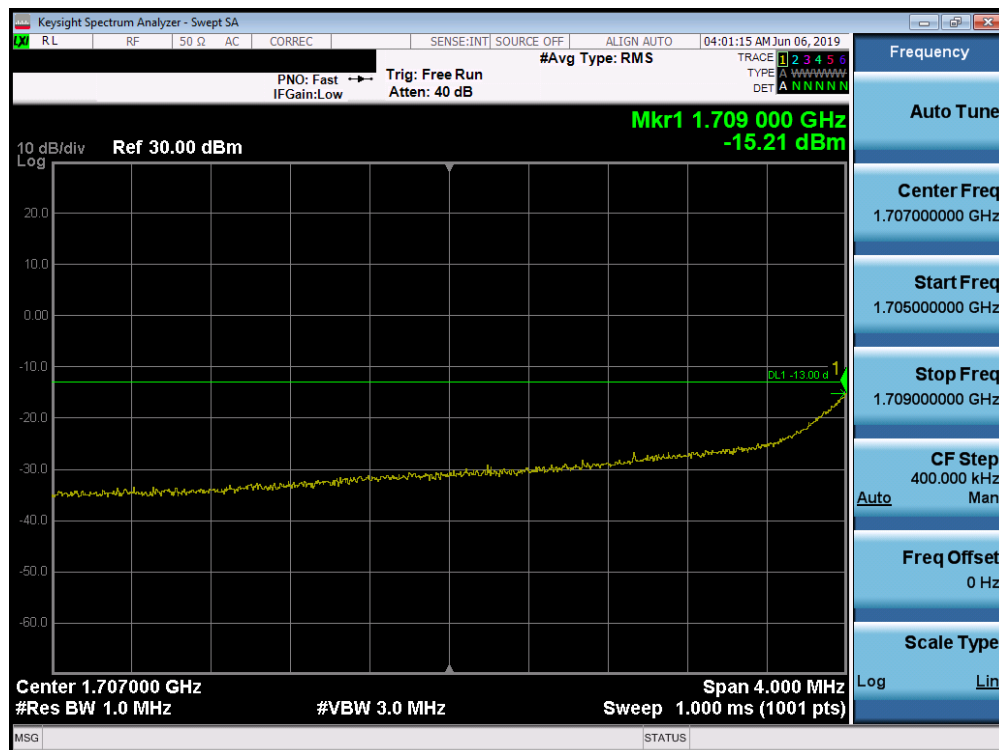
Plot 7-88. Band Edge Plot (Cellular WCDMA Mode - High Channel)

FCC ID: A3LSMN970U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1905220084-02.A3L	Test Dates: 05/22 - 07/10/2019	EUT Type: Portable Handset		Page 63 of 112

AWS WCDMA Mode



Plot 7-89. Band Edge Plot (AWS WCDMA Mode - Low Channel)

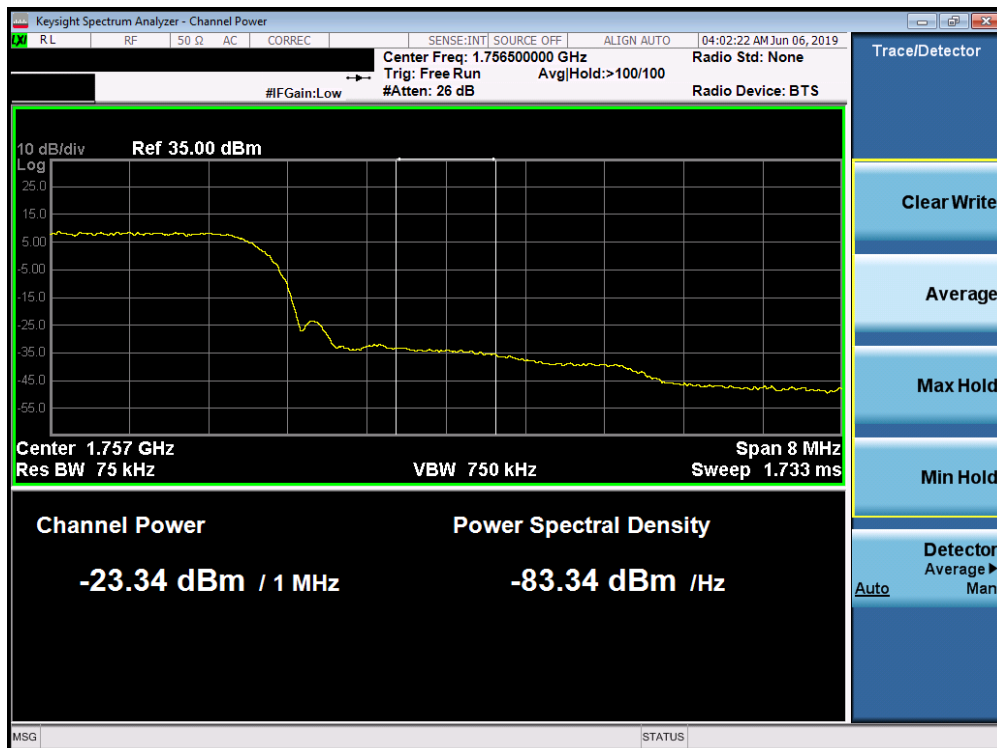


Plot 7-90. 4MHz Span Plot (AWS WCDMA Mode - Low Channel)

FCC ID: A3LSMN970U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1905220084-02.A3L	Test Dates: 05/22 - 07/10/2019	EUT Type: Portable Handset		Page 64 of 112



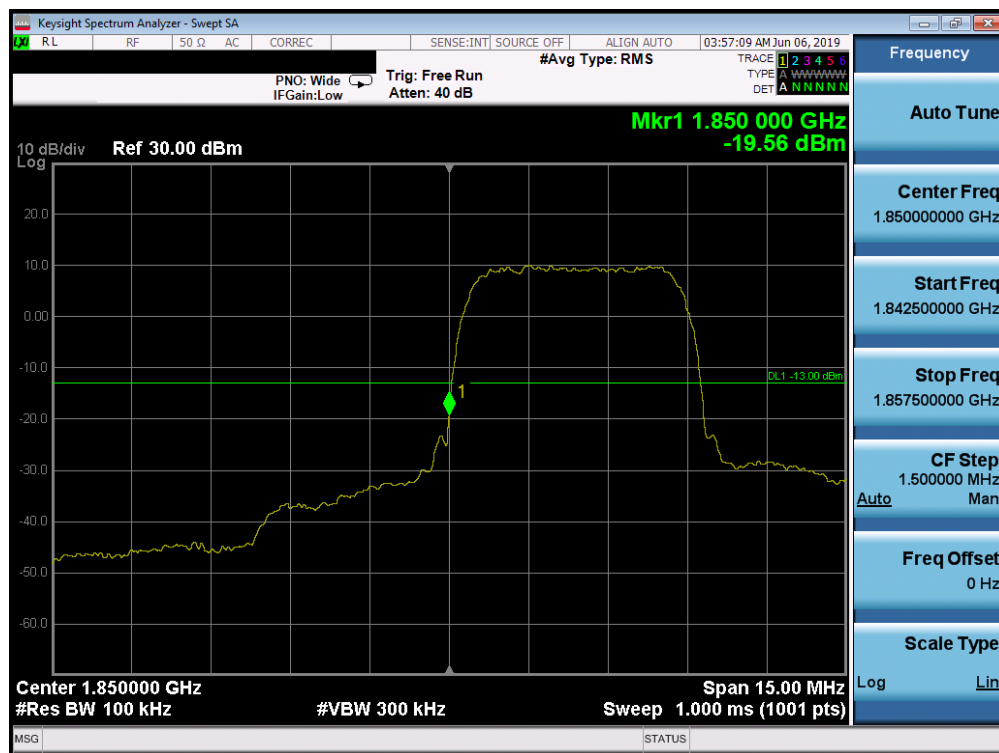
Plot 7-91. Band Edge Plot (AWS WCDMA Mode - High Channel)



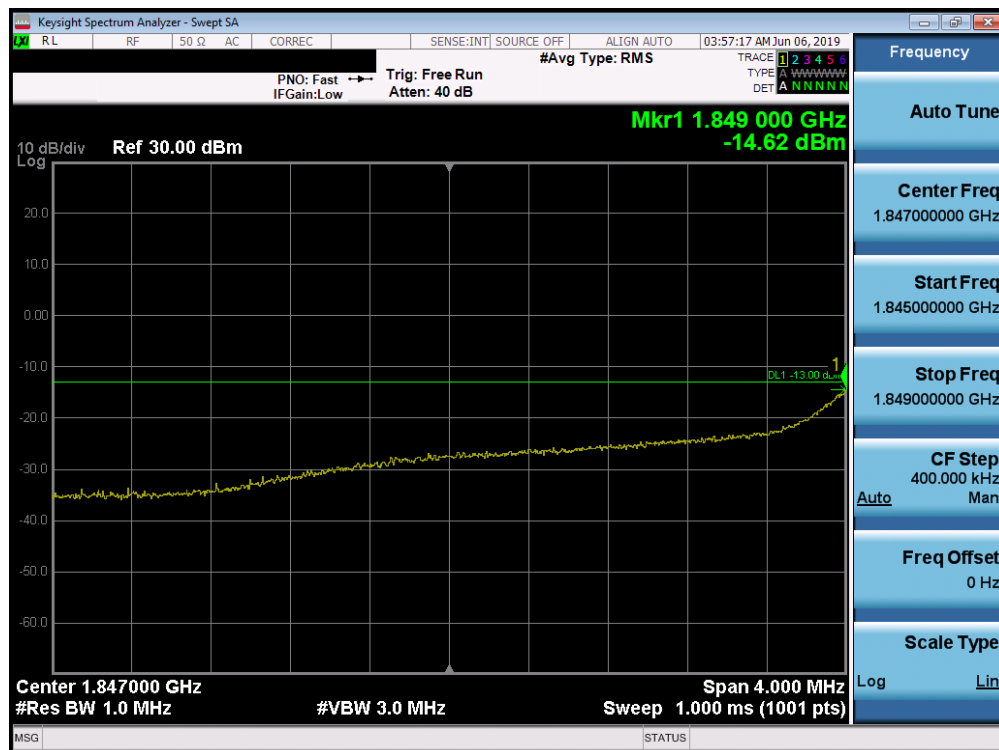
Plot 7-92. 4MHz Span Plot (AWS WCDMA Mode - High Channel)

FCC ID: A3LSMN970U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1905220084-02.A3L	Test Dates: 05/22 - 07/10/2019	EUT Type: Portable Handset		Page 65 of 112

PCS WCDMA Mode



Plot 7-93. Band Edge Plot (PCS WCDMA Mode - Low Channel)

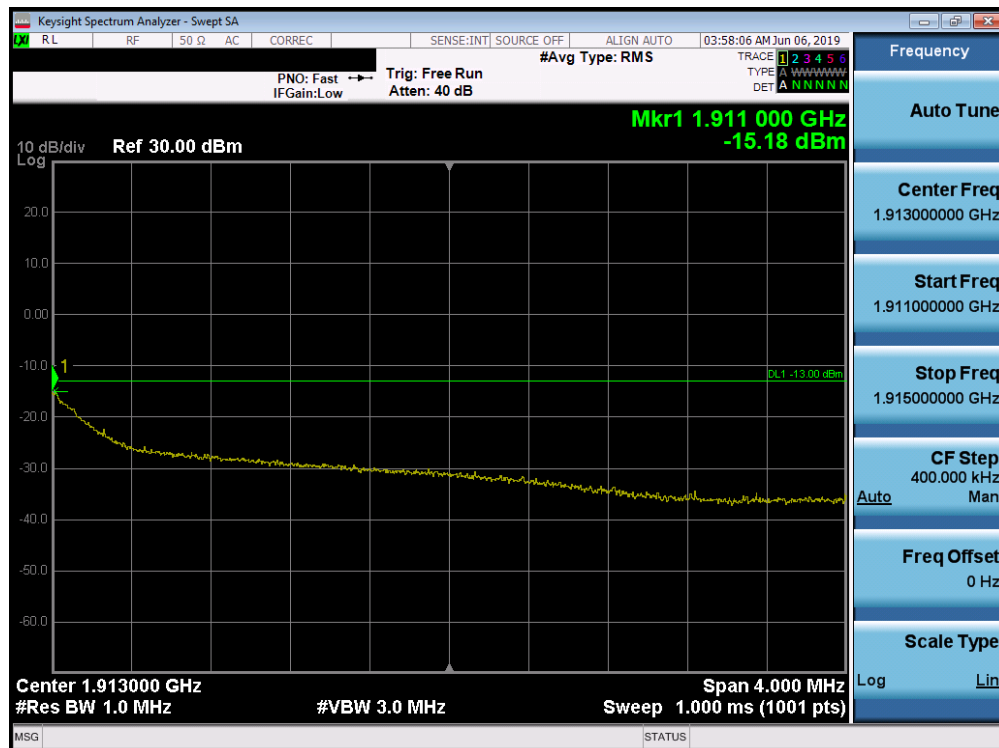


Plot 7-94. 4MHz Span Plot (PCS WCDMA Mode - Low Channel)

FCC ID: A3LSMN970U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1905220084-02.A3L	Test Dates: 05/22 - 07/10/2019	EUT Type: Portable Handset		Page 66 of 112



Plot 7-95. Band Edge Plot (PCS WCDMA Mode - High Channel)



Plot 7-96. 4MHz Span Plot (PCS WCDMA Mode - High Channel)

FCC ID: A3LSMN970U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1905220084-02.A3L	Test Dates: 05/22 - 07/10/2019	EUT Type: Portable Handset		Page 67 of 112

7.5 Peak-Average Ratio

Test Overview

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.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 5.7.1

Test Settings

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW > Emission bandwidth of signal
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

Test Setup

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

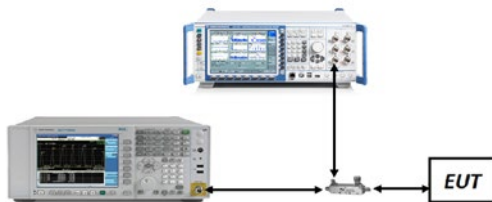
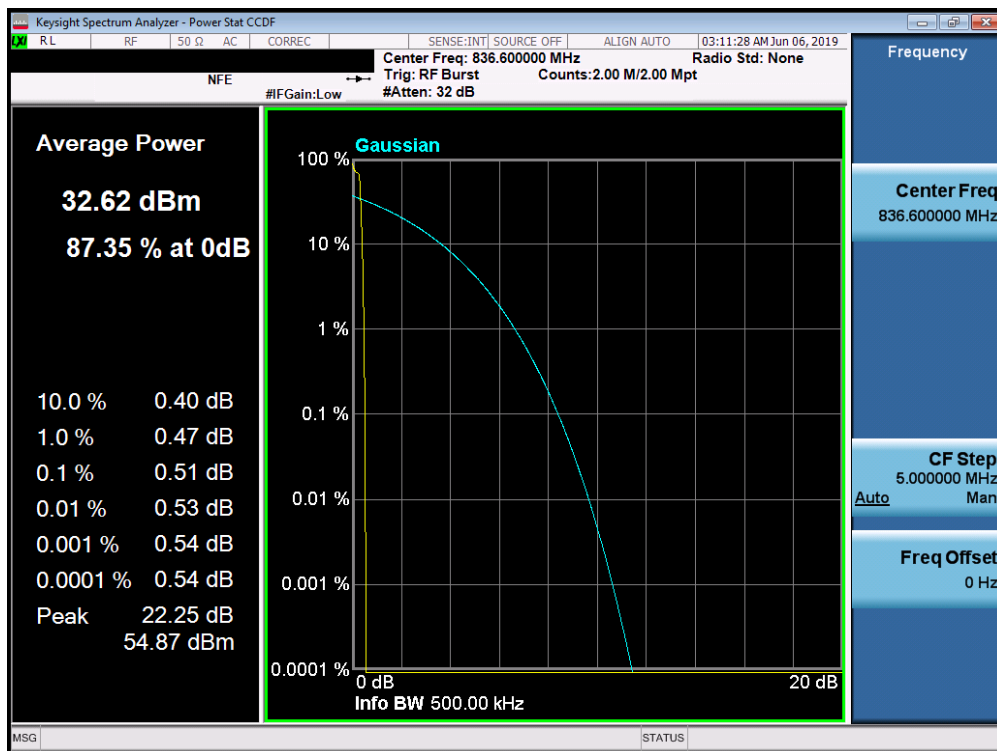


Figure 7-4. Test Instrument & Measurement Setup

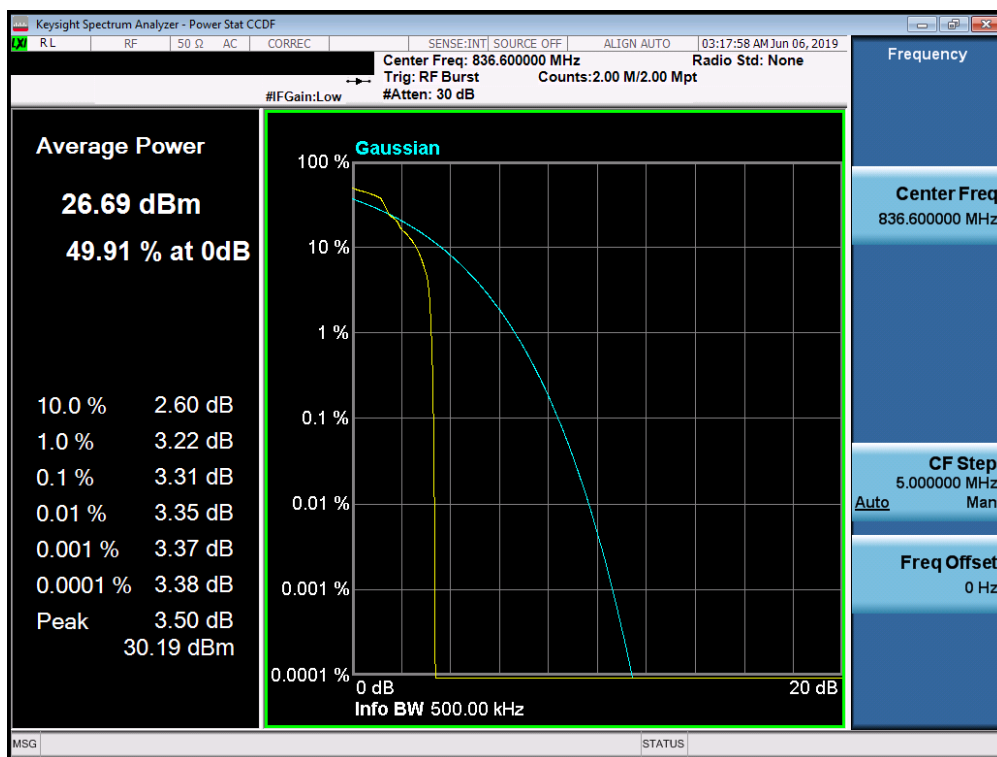
Test Notes

None

FCC ID: A3LSMN970U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1905220084-02.A3L	Test Dates: 05/22 - 07/10/2019	EUT Type: Portable Handset		Page 68 of 112

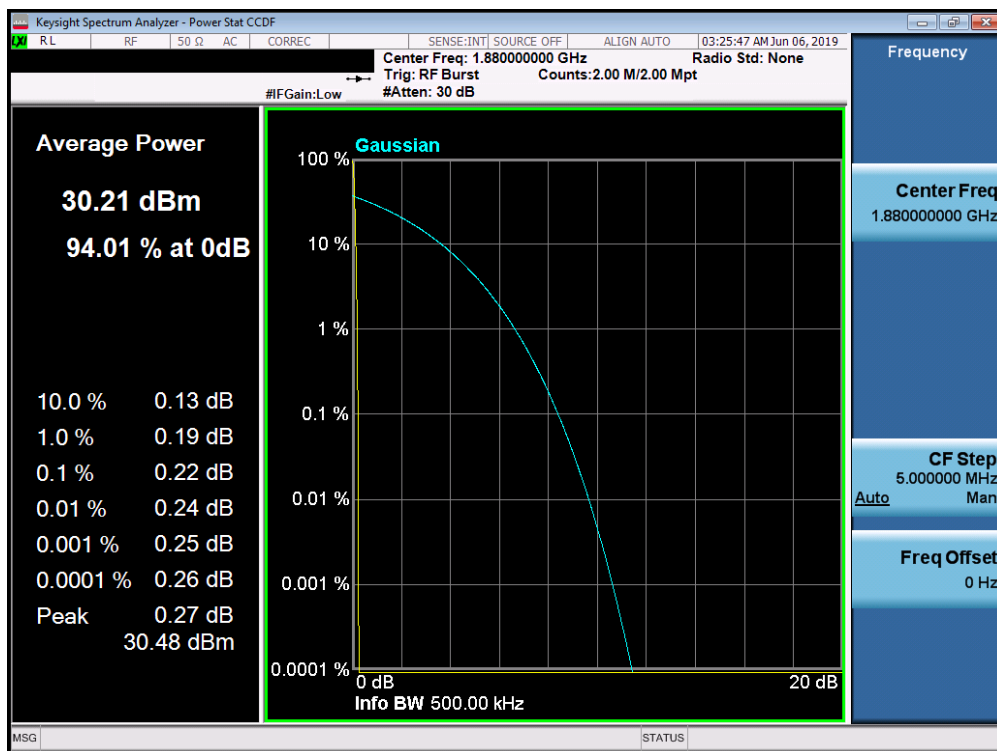


Plot 7-97. Peak-Average Ratio Plot (Cellular GPRS Mode)

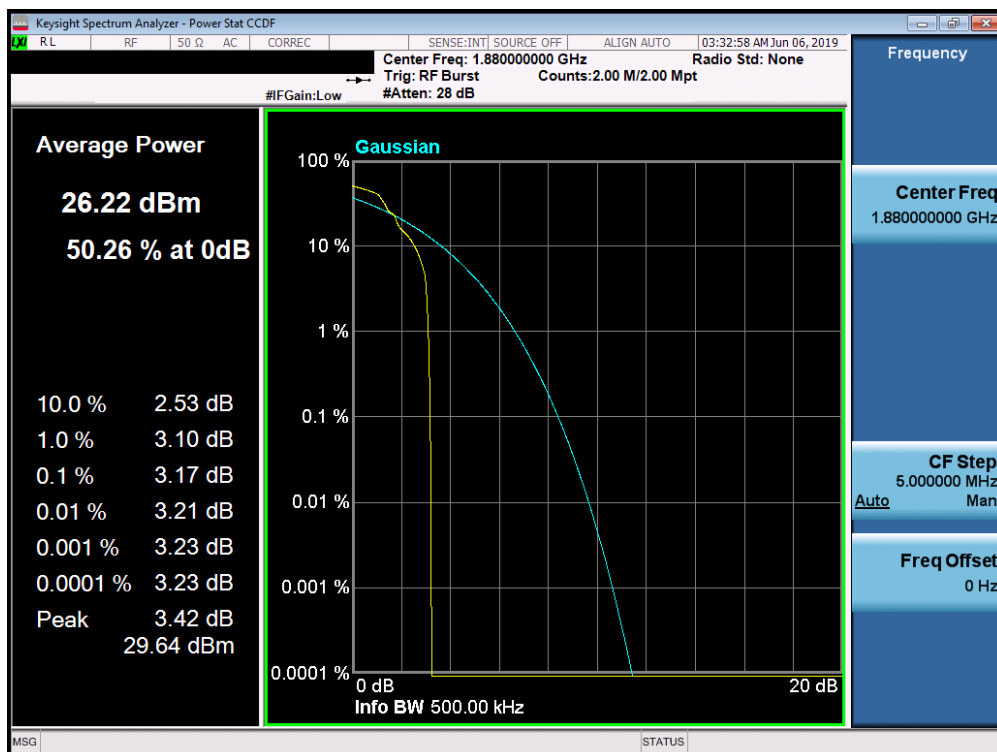


Plot 7-98. Peak-Average Ratio Plot (Cellular EDGE Mode)

FCC ID: A3LSMN970U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1905220084-02.A3L	Test Dates: 05/22 - 07/10/2019	EUT Type: Portable Handset		Page 69 of 112

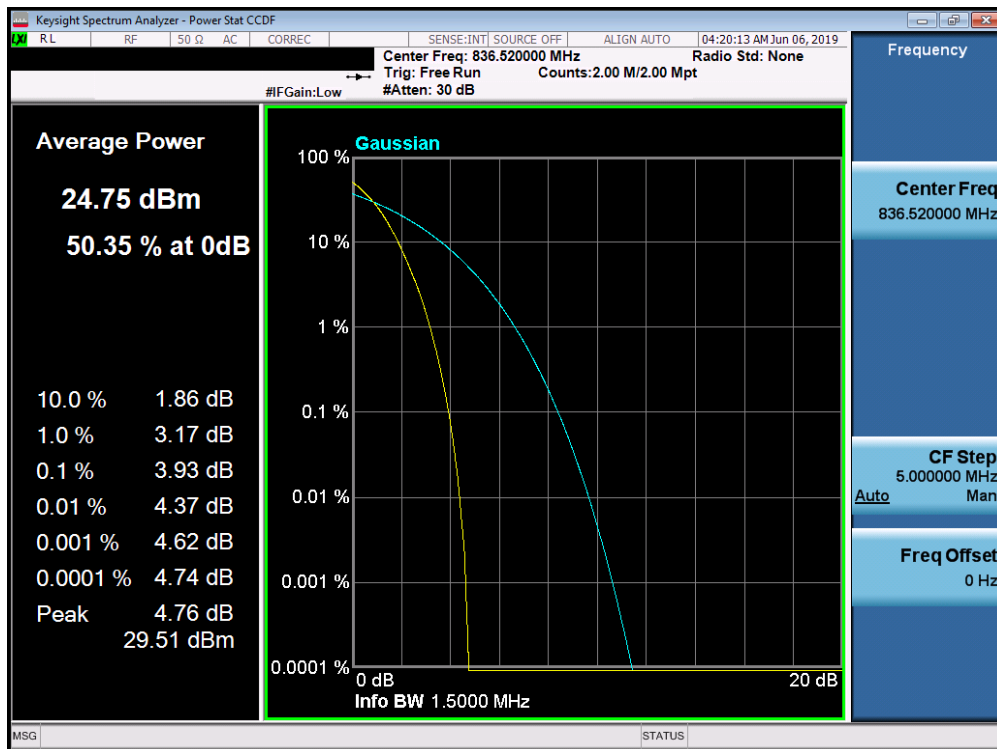


Plot 7-99. Peak-Average Ratio Plot (PCS GPRS Mode)

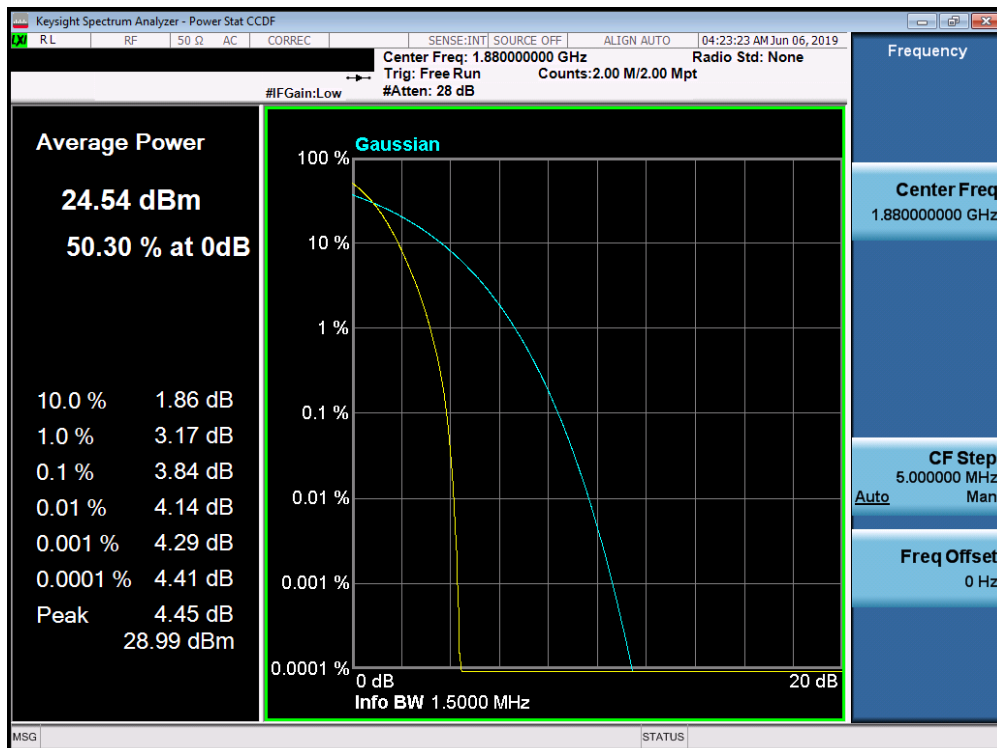


Plot 7-100. Peak-Average Ratio Plot (PCS EDGE Mode)

FCC ID: A3LSMN970U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1905220084-02.A3L	Test Dates: 05/22 - 07/10/2019	EUT Type: Portable Handset		Page 70 of 112

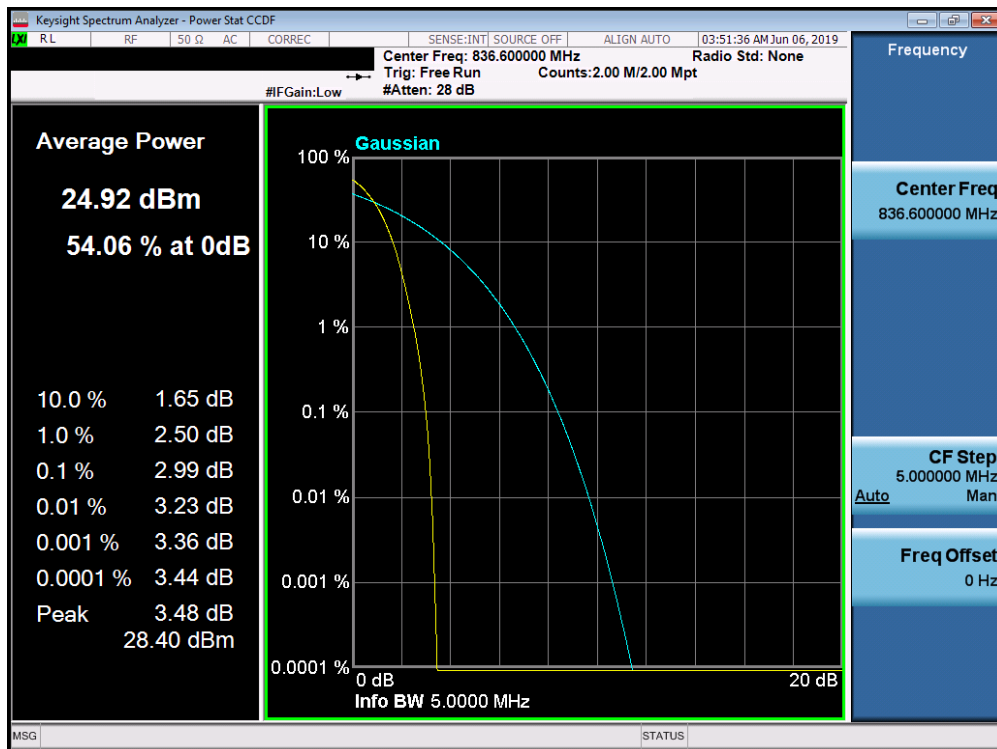


Plot 7-101. Peak-Average Ratio Plot (Cellular CDMA Mode)

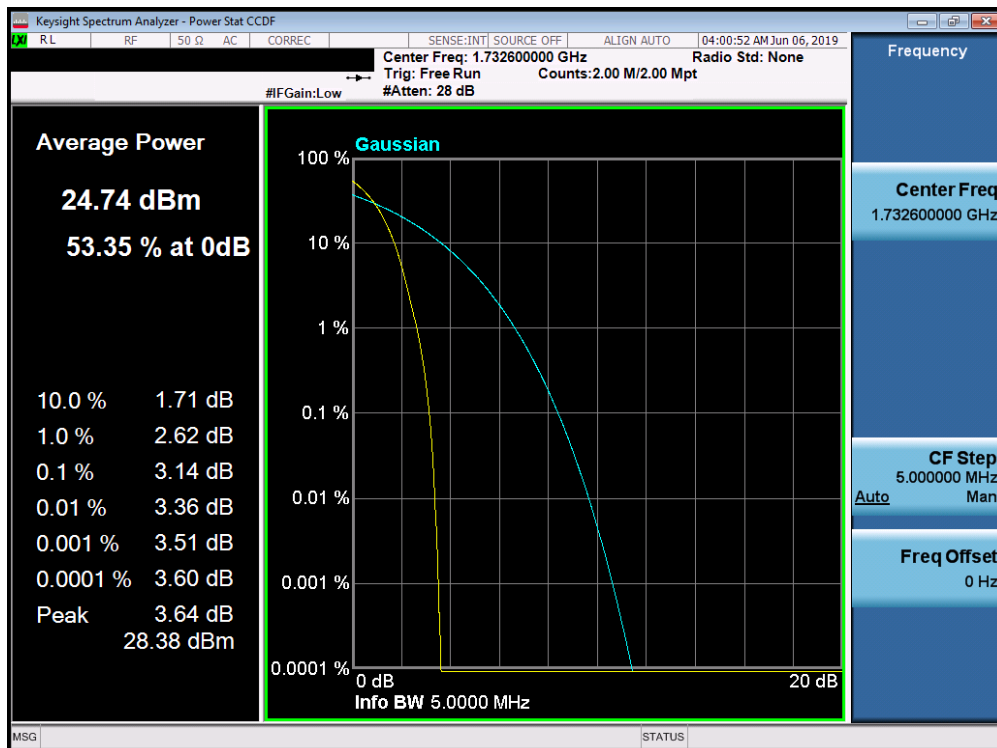


Plot 7-102. Peak-Average Ratio Plot (PCS CDMA Mode)

FCC ID: A3LSMN970U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1905220084-02.A3L	Test Dates: 05/22 - 07/10/2019	EUT Type: Portable Handset		Page 71 of 112

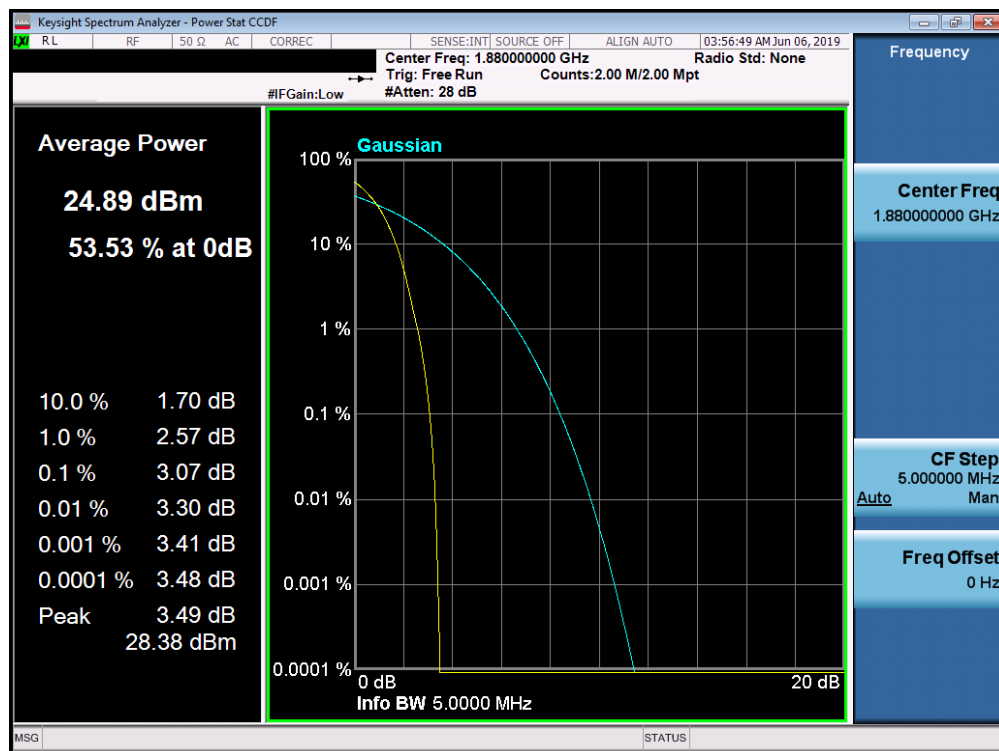


Plot 7-103. Peak-Average Ratio Plot (Cellular WCDMA Mode)



Plot 7-104. Peak-Average Ratio Plot (AWS WCDMA Mode)

FCC ID: A3LSMN970U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1905220084-02.A3L	Test Dates: 05/22 - 07/10/2019	EUT Type: Portable Handset		Page 72 of 112



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

FCC ID: A3LSMN970U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1905220084-02.A3L	Test Dates: 05/22 - 07/10/2019	EUT Type: Portable Handset		Page 73 of 112

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 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 $\geq 3 \times$ RBW
4. Span = 1.5 times the OBW
5. No. of sweep points $\geq 2 \times$ 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

FCC ID: A3LSMN970U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Test Setup

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

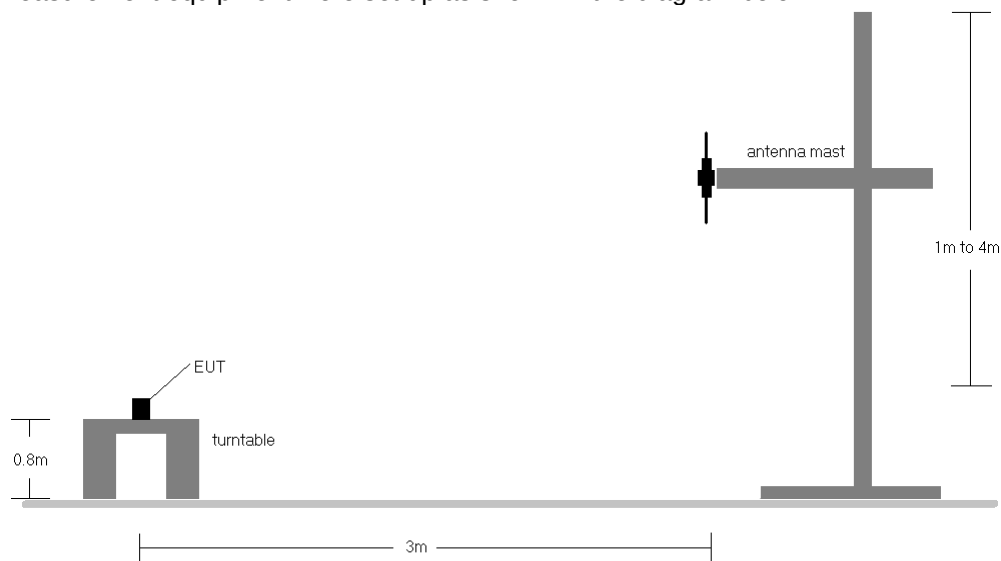


Figure 7-5. Radiated Test Setup <1GHz

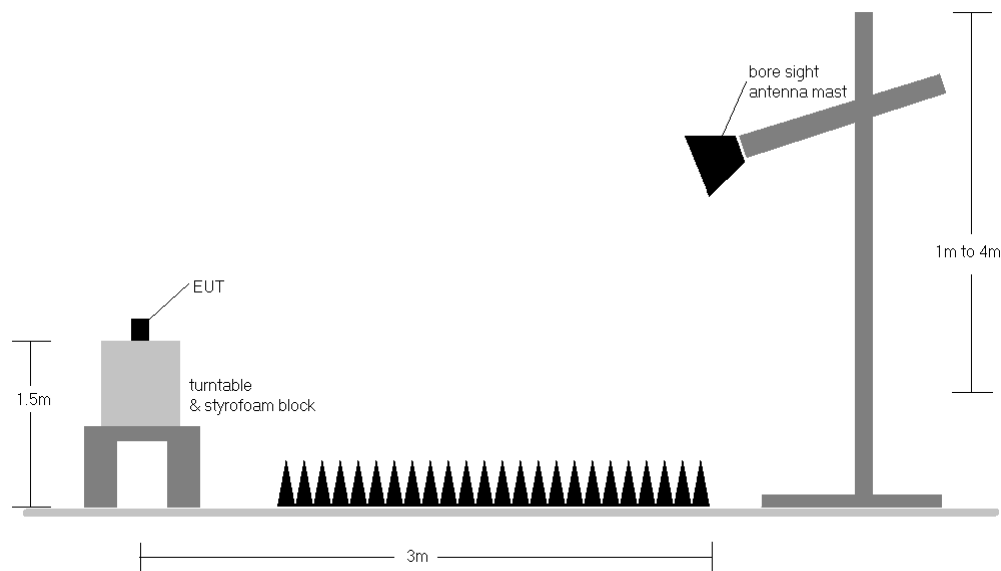


Figure 7-6. Radiated Test Setup >1GHz

FCC ID: A3LSMN970U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1905220084-02.A3L	Test Dates: 05/22 - 07/10/2019	EUT Type: Portable Handset		Page 75 of 112

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.

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	V	142	310	21.08	6.30	25.23	38.45	-13.22	27.38	40.61	-13.23
836.60	GPRS850	V	153	249	21.76	6.40	26.01	38.45	-12.44	28.16	40.61	-12.45
848.80	GPRS850	V	150	255	22.40	6.50	26.75	38.45	-11.70	28.90	40.61	-11.71
848.80	GPRS850	H	115	176	20.58	6.70	25.13	38.45	-13.32	27.28	40.61	-13.33
848.80	EDGE850	V	150	255	18.73	6.40	22.98	38.45	-15.47	25.13	40.61	-15.48
848.80	GPRS850 (WCP)	V	141	261	16.93	6.40	21.18	38.45	-17.27	23.33	40.61	-17.28

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

FCC ID: A3LSMN970U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1905220084-02.A3L	Test Dates: 05/22 - 07/10/2019	EUT Type: Portable Handset		Page 76 of 112

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	V	138	257	12.77	6.30	16.92	38.45	-21.53	19.07	40.61	-21.54
836.52	CDMA850	V	142	255	13.25	6.40	17.50	38.45	-20.95	19.65	40.61	-20.96
848.31	CDMA850	V	136	260	13.52	6.50	17.87	38.45	-20.58	20.02	40.61	-20.59
848.31	CDMA850	H	182	177	10.70	6.70	15.25	38.45	-23.20	17.40	40.61	-23.21
848.31	CDMA850 (WCP)	V	168	168	8.10	6.40	12.35	38.45	-26.10	14.50	40.61	-26.11

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	V	177	293	13.21	6.30	17.36	38.45	-21.09	19.51	40.61	-21.10
836.60	WCDMA850	V	163	243	12.79	6.40	17.04	38.45	-21.41	19.19	40.61	-21.42
846.60	WCDMA850	V	256	244	13.57	6.50	17.92	38.45	-20.53	20.07	40.61	-20.54
846.60	WCDMA850	H	205	277	11.19	6.70	15.74	38.45	-22.71	17.89	40.61	-22.72
846.60	WCDMA850 (WCP)	V	164	197	7.13	6.50	11.48	38.45	-26.97	13.63	40.61	-26.98

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	154	326	13.09	9.34	22.43	30.00	-7.57
1732.60	WCDMA1700	V	100	330	14.45	9.19	23.64	30.00	-6.36
1752.60	WCDMA1700	V	100	328	14.27	9.08	23.35	30.00	-6.65
1732.60	WCDMA1700	H	100	227	13.52	9.31	22.83	30.00	-7.17
1732.60	WCDMA1700 (WCP)	V	104	53	6.86	9.19	16.05	30.00	-13.95

Table 7-5. EIRP (AWS WCDMA)

FCC ID: A3LSMN970U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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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	V	105	205	19.59	9.87	29.46	33.01	-3.55
1880.00	GPRS1900	V	105	317	20.96	10.10	31.06	33.01	-1.95
1909.80	GPRS1900	V	280	338	20.09	10.31	30.40	33.01	-2.61
1880.00	GPRS1900	H	230	187	18.14	9.90	28.04	33.01	-4.97
1880.00	EDGE1900	V	105	317	17.15	10.10	27.25	33.01	-5.76
1880.00	GPRS1900 (WCP)	V	160	61	15.62	10.10	25.72	33.01	-7.29

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	100	319	14.48	9.88	24.36	33.01	-8.65
1880.00	CDMA1900	V	100	354	14.55	10.10	24.65	33.01	-8.36
1908.75	CDMA1900	V	100	33	12.36	10.31	22.67	33.01	-10.35
1880.00	CDMA1900	H	356	326	13.60	9.90	23.50	33.01	-9.51
1880.00	CDMA1900 (WCP)	V	169	57	8.23	10.10	18.33	33.01	-14.68

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	V	100	220	14.07	9.89	23.96	33.01	-9.05
1880.00	WCDMA1900	V	100	340	14.92	10.10	25.02	33.01	-7.99
1907.60	WCDMA1900	V	102	356	13.69	10.30	23.99	33.01	-9.02
1880.00	WCDMA1900	H	299	10	13.94	10.24	24.18	33.01	-8.83
1880.00	WCDMA1900 (WCP)	V	115	45	8.91	10.10	19.01	33.01	-14.00

Table 7-8. EIRP (PCS WCDMA)

FCC ID: A3LSMN970U	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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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 $\geq 3 \times$ RBW
3. Span = 1.5 times the OBW
4. No. of sweep points $\geq 2 \times$ 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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Test Setup

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

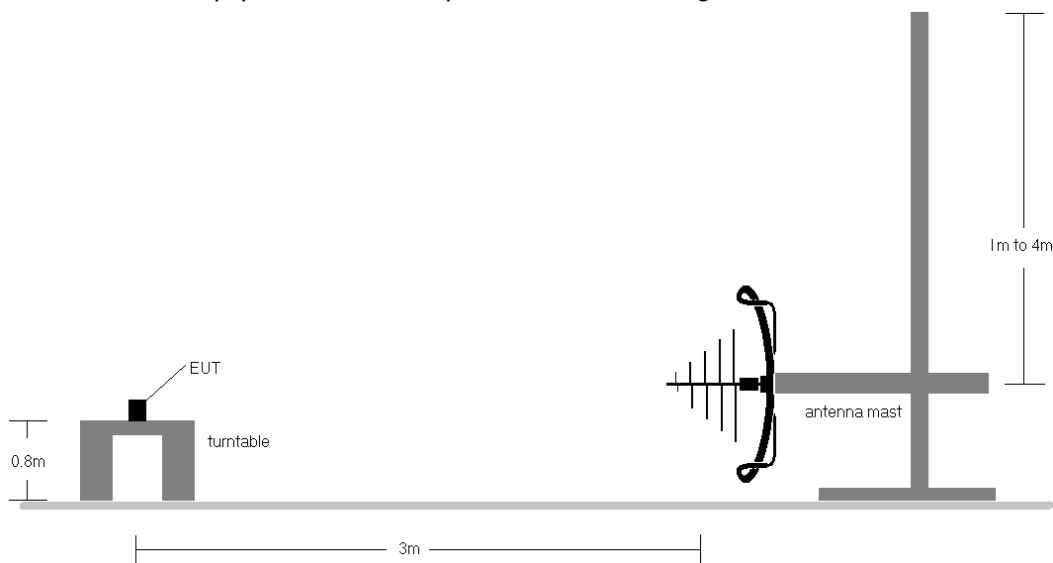


Figure 7-7. Test Instrument & Measurement Setup < 1GHz

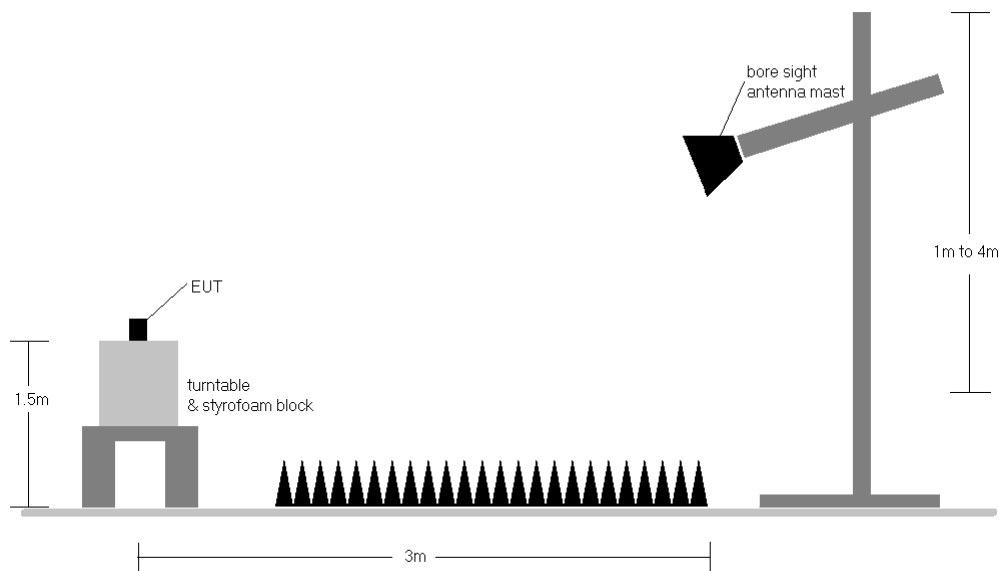


Figure 7-8. Test Instrument & Measurement Setup >1 GHz

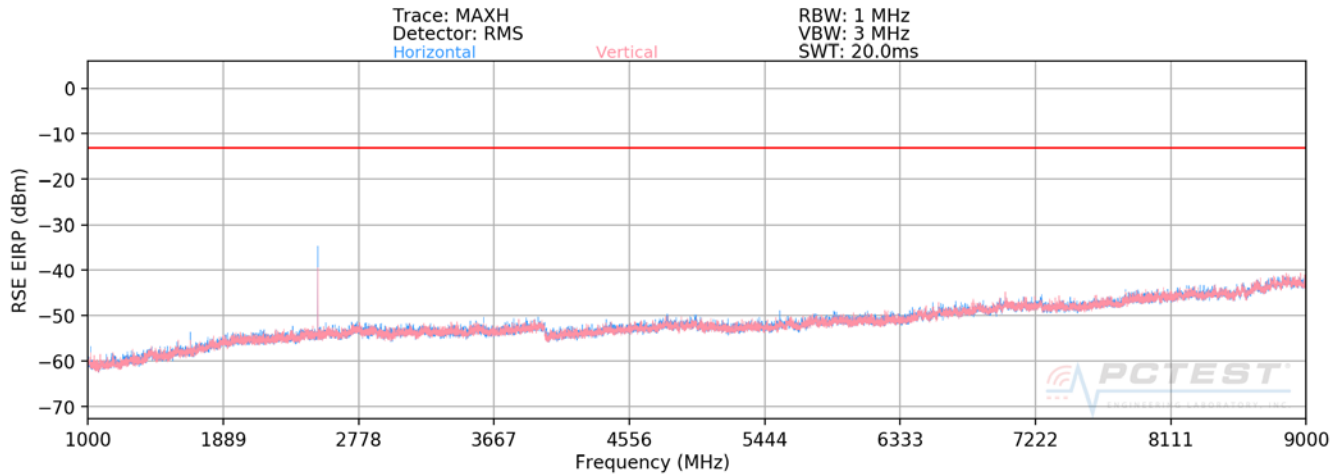
FCC ID: A3LSMN970U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Test Notes

- 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)

OPERATING FREQUENCY: 824.20 MHz
 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]
1648.40	V	114	221	-56.01	3.07	-52.94	-39.9
2472.60	V	111	356	-44.61	3.82	-40.79	-27.8
3296.80	V	-	-	-65.26	6.00	-59.26	-46.3
4121.00	V	-	-	-70.04	7.67	-62.37	-49.4
4945.20	V	-	-	-69.59	8.72	-60.87	-47.9

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

FCC ID: A3LSMN970U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 836.60 MHz
 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]
1673.20	V	132	31	-56.01	3.10	-52.91	-39.9
2509.80	V	146	358	-47.23	4.02	-43.21	-30.2
3346.40	V	-	-	-65.57	6.03	-59.54	-46.5
4183.00	V	-	-	-70.89	7.79	-63.09	-50.1
5019.60	V	-	-	-72.01	8.78	-63.23	-50.2

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

OPERATING FREQUENCY: 848.80 MHz
 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]
1697.60	V	134	207	-57.11	3.15	-53.96	-41.0
2546.40	V	115	13	-50.77	4.15	-46.62	-33.6
3395.20	V	-	-	-67.06	6.24	-60.82	-47.8
4244.00	V	-	-	-71.47	7.97	-63.50	-50.5
5092.80	V	-	-	-70.42	8.88	-61.54	-48.5

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

FCC ID: A3LSMN970U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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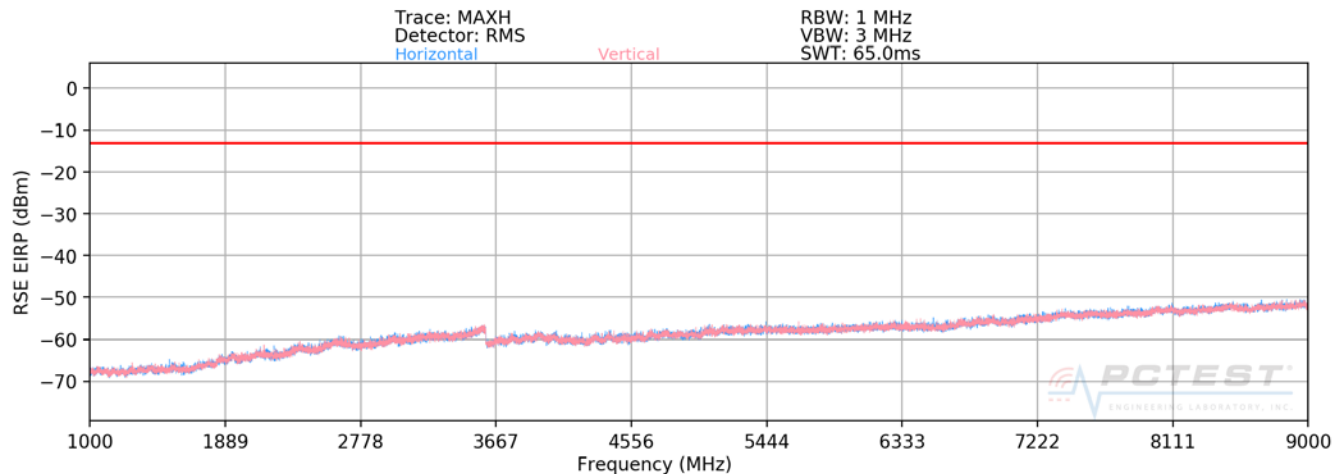
OPERATING FREQUENCY: 848.80 MHz
 MODULATION SIGNAL: GPRS (GMSK)
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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]
1697.60	V	163	118	-57.54	3.15	-54.39	-41.4
2546.40	V	117	190	-56.15	4.15	-52.00	-39.0
3395.20	V	-	-	-58.94	6.24	-52.71	-39.7
4244.00	V	-	-	-60.67	7.97	-52.70	-39.7
5092.80	V	-	-	-59.77	8.88	-50.89	-37.9

Table 7-12. Radiated Spurious Data with WCP (Cellular GPRS Mode – Ch. 251)

FCC ID: A3LSMN970U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Cellular CDMA Mode



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

OPERATING FREQUENCY: 824.70 MHz
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	H	358	206	-70.92	3.08	-67.85	-54.8
2474.10	H	341	164	-68.87	3.84	-65.04	-52.0
3298.80	H	-	-	-70.84	6.00	-64.84	-51.8
4123.50	H	-	-	-72.05	7.68	-64.37	-51.4

Table 7-13. Radiated Spurious Data (Cellular CDMA Mode – Ch. 1013)

FCC ID: A3LSMN970U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 836.52 MHz
 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]
1673.04	H	150	190	-70.11	3.10	-67.02	-54.0
2509.56	H	360	165	-67.77	4.02	-63.75	-50.8
3346.08	H	-	-	-71.19	6.03	-65.16	-52.2
4182.60	H	-	-	-72.86	7.79	-65.06	-52.1
5019.12	H	-	-	-71.80	8.78	-63.02	-50.0

Table 7-14. Radiated Spurious Data (Cellular CDMA Mode – Ch. 384)

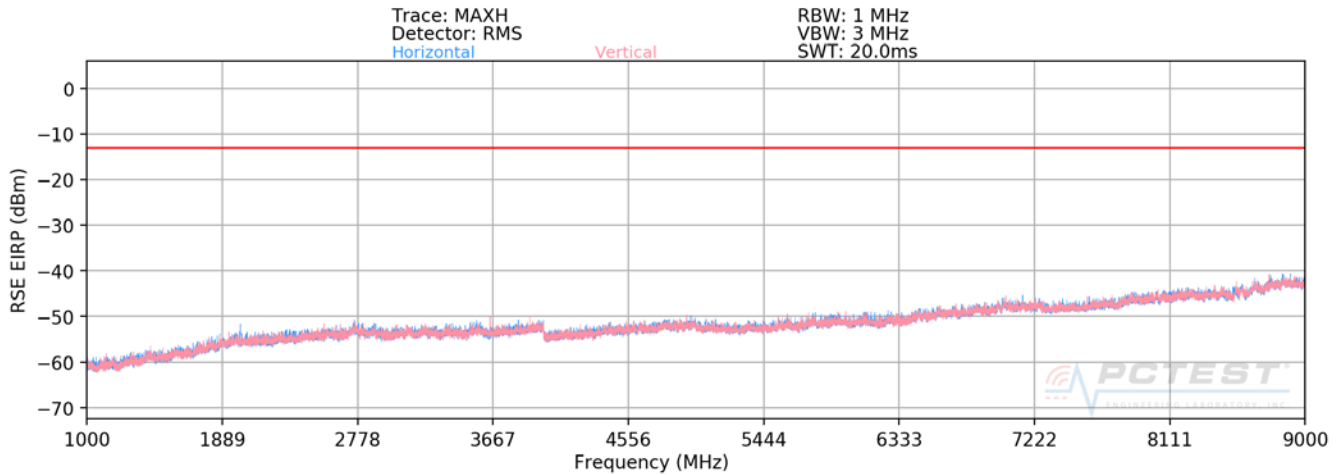
OPERATING FREQUENCY: 848.31 MHz
 MODULATION SIGNAL: CDMA
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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]
1696.62	H	351	319	-70.11	3.15	-66.96	-54.0
2544.93	H	395	144	-67.97	4.14	-63.82	-50.8
3393.24	H	-	-	-72.18	6.23	-65.95	-53.0
4241.55	H	-	-	-73.57	7.96	-65.60	-52.6
5089.86	H	-	-	-72.25	8.88	-63.36	-50.4

Table 7-15. Radiated Spurious Data (Cellular CDMA Mode – Ch. 777)

FCC ID: A3LSMN970U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Cellular WCDMA Mode



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

OPERATING FREQUENCY: 826.40 MHz
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	V	306	294	-69.30	3.09	-66.21	-53.2
2479.20	V	325	300	-68.28	3.91	-64.38	-51.4
3305.60	V	-	-	-72.00	6.00	-66.00	-53.0

Table 7-16. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4132)

FCC ID: A3LSMN970U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 836.60 MHz
 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]
1673.20	V	144	218	-69.97	3.10	-66.87	-53.9
2509.80	V	-	-	-70.34	4.02	-66.32	-53.3
3346.40	V	-	-	-72.58	6.03	-66.55	-53.5

Table 7-17. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4183)

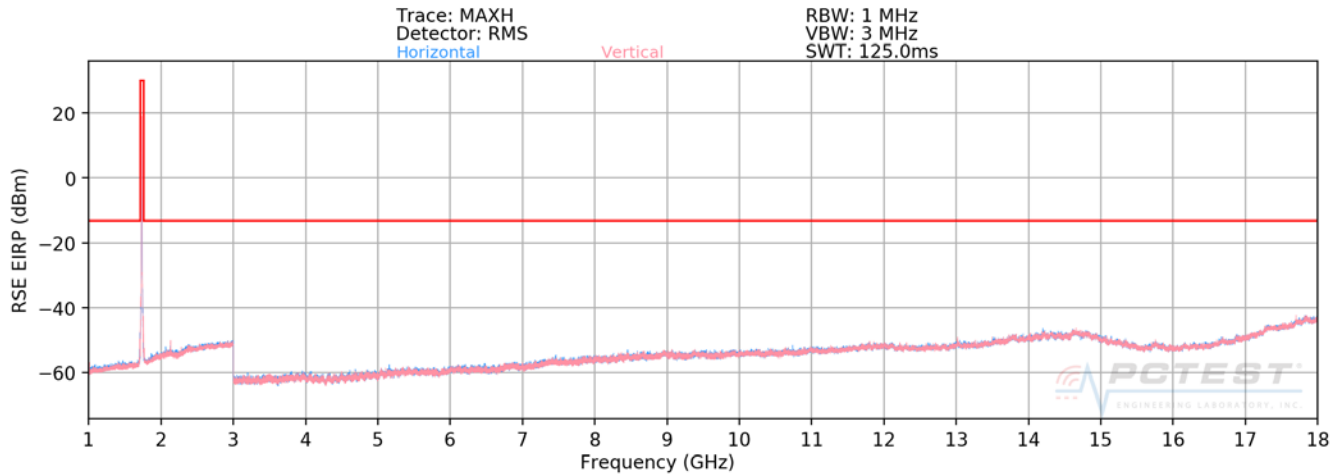
OPERATING FREQUENCY: 846.60 MHz
 MODULATION SIGNAL: WCDMA
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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]
1693.20	V	127	334	-67.74	3.17	-64.56	-51.6
2539.80	V	-	-	-70.73	4.13	-66.60	-53.6
3386.40	V	-	-	-72.80	6.20	-66.61	-53.6

Table 7-18. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4233)

FCC ID: A3LSMN970U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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AWS WCDMA Mode



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

OPERATING FREQUENCY: 1712.40 MHz
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]
3424.80	H	-	-	-69.30	6.27	-63.03	-50.0
5137.20	H	-	-	-70.15	8.94	-61.21	-48.2

Table 7-19. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1312)

OPERATING FREQUENCY: 1732.60 MHz
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]
3465.20	H	-	-	-69.65	6.35	-63.30	-50.3
5197.80	H	-	-	-70.18	9.05	-61.14	-48.1

Table 7-20. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1413)

FCC ID: A3LSMN970U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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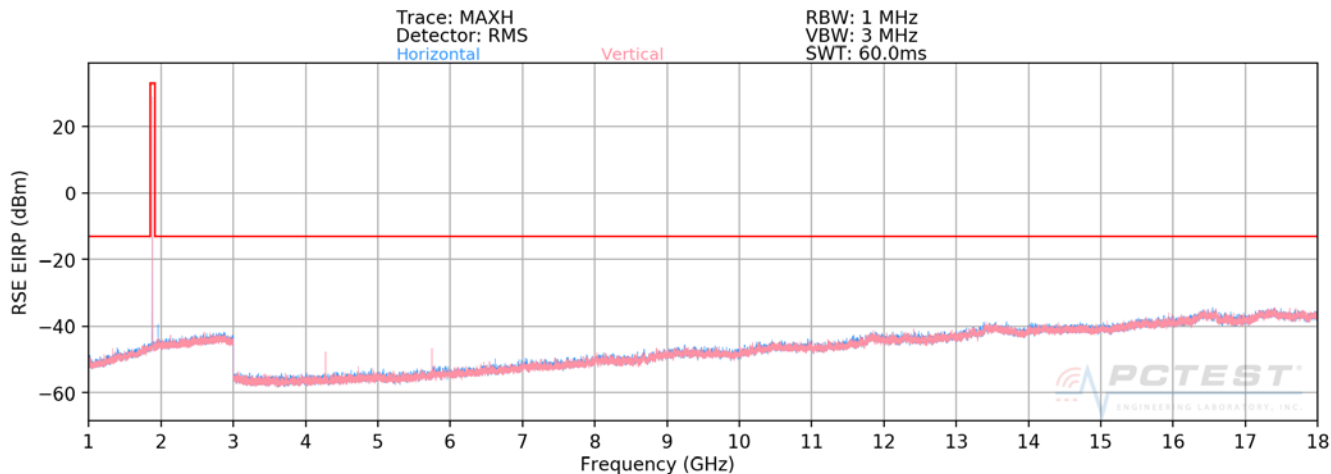
OPERATING FREQUENCY: 1752.60 MHz
 MODULATION SIGNAL: WCDMA
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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	H	-	-	-69.71	6.50	-63.21	-50.2
5257.80	H	-	-	-69.95	8.96	-60.99	-48.0

Table 7-21. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1513)

FCC ID: A3LSMN970U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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PCS GPRS Mode



Plot 7-110. Radiated Spurious Plot above 1GHz (PCS GPRS Mode)

OPERATING FREQUENCY: 1850.20 MHz
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]
3700.40	V	364	186	-68.05	6.89	-61.16	-48.2
5550.60	V	345	323	-67.48	9.02	-58.47	-45.5
7400.80	V	-	-	-66.68	9.21	-57.47	-44.5
9251.00	V	-	-	-64.42	9.45	-54.97	-42.0
11101.20	V	-	-	-63.80	9.44	-54.37	-41.4

Table 7-22. Radiated Spurious Data (PCS GPRS Mode – Ch. 512)

FCC ID: A3LSMN970U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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OPERATING FREQUENCY: 1880.00 MHz
 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	V	365	30	-67.84	6.93	-60.91	-47.9
5640.00	V	345	327	-67.24	9.15	-58.08	-45.1
7520.00	V	-	-	-67.04	9.31	-57.72	-44.7
9400.00	V	-	-	-64.17	9.49	-54.68	-41.7
11280.00	V	-	-	-63.18	9.48	-53.70	-40.7

Table 7-23. Radiated Spurious Data (PCS GPRS Mode – Ch. 661)

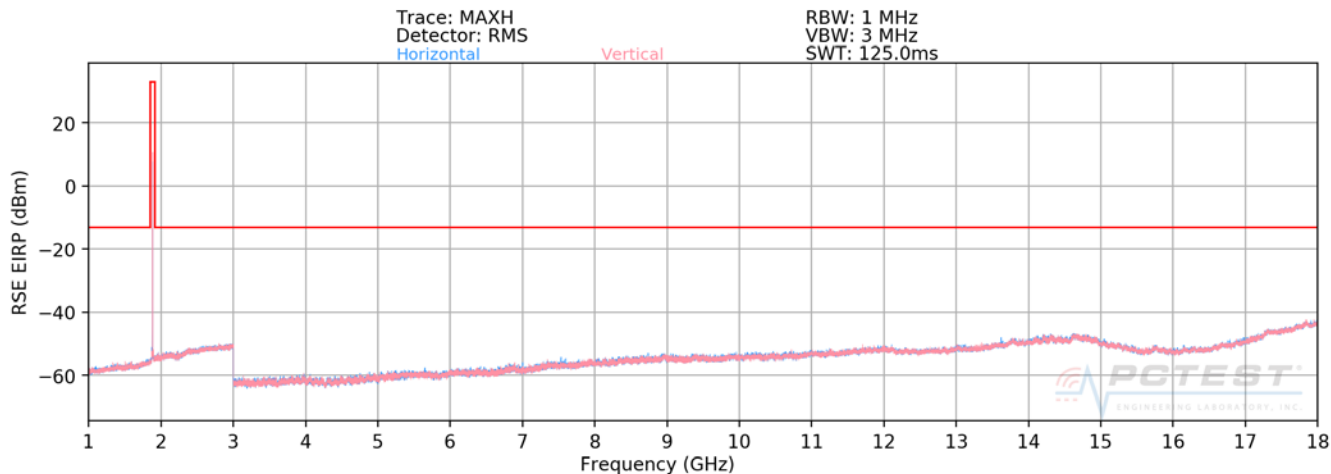
OPERATING FREQUENCY: 1909.80 MHz
 MODULATION SIGNAL: GPRS (GMSK)
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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]
3819.60	V	387	205	-68.10	7.11	-60.99	-48.0
5729.40	V	121	30	-67.40	9.03	-58.36	-45.4
7639.20	V	-	-	-67.02	9.29	-57.73	-44.7
9549.00	V	-	-	-64.61	9.43	-55.18	-42.2
11458.80	V	-	-	-63.40	9.49	-53.90	-40.9

Table 7-24. Radiated Spurious Data (PCS GPRS Mode – Ch. 810)

FCC ID: A3LSMN970U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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PCS CDMA Mode



Plot 7-111. Radiated Spurious Plot above 1GHz (PCS CDMA Mode)

OPERATING FREQUENCY: 1851.25 MHz
 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]
3702.50	V	-	-	-71.07	6.89	-64.17	-51.2
5553.75	V	112	221	-68.73	9.02	-59.70	-46.7
7405.00	V	115	292	-67.55	9.22	-58.33	-45.3
9256.25	V	112	271	-65.86	9.45	-56.41	-43.4
11107.50	V	-	-	-64.99	9.44	-55.55	-42.5
12958.75	V	-	-	-62.48	8.76	-53.71	-40.7
14810.00	V	-	-	-59.91	8.64	-51.27	-38.3

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

FCC ID: A3LSMN970U	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)		SAMSUNG	Approved by: Quality Manager
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OPERATING FREQUENCY: 1880.00 MHz
 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]
3760.00	V	-	-	-70.76	6.93	-63.83	-50.8
5640.00	V	112	222	-69.15	9.15	-59.99	-47.0
7520.00	V	113	121	-66.05	9.31	-56.73	-43.7
9400.00	V	398	282	-65.48	9.49	-55.99	-43.0
11280.00	V	-	-	-64.97	9.48	-55.49	-42.5
13160.00	V	-	-	-63.60	8.71	-54.88	-41.9
15040.00	V	-	-	-61.01	8.85	-52.16	-39.2

Table 7-26. Radiated Spurious Data (PCS CDMA Mode – Ch. 600)

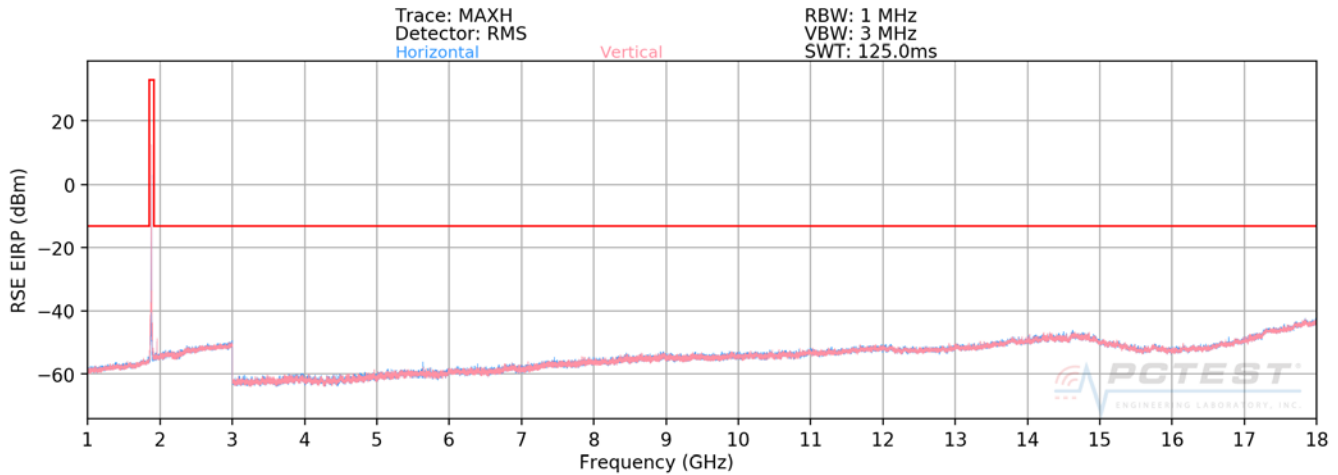
OPERATING FREQUENCY: 1908.75 MHz
 MODULATION SIGNAL: CDMA
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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]
3817.50	V	-	-	-70.75	7.10	-63.65	-50.6
5726.25	V	113	227	-69.84	9.03	-60.81	-47.8
7635.00	V	116	187	-67.12	9.29	-57.83	-44.8
9543.75	V	115	291	-63.44	9.44	-54.00	-41.0
11452.50	V	-	-	-65.72	9.50	-56.22	-43.2
13361.25	V	-	-	-62.70	8.72	-53.98	-41.0
15270.00	V	-	-	-62.19	8.57	-53.62	-40.6

Table 7-27. Radiated Spurious Data (PCS CDMA Mode – Ch. 1175)

FCC ID: A3LSMN970U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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PCS WCDMA Mode



Plot 7-112. Radiated Spurious Plot above 1GHz (PCS WCDMA Mode)

OPERATING FREQUENCY: 1852.40 MHz
 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]
3704.80	H	-	-	-69.71	6.89	-62.81	-49.8
5557.20	H	-	-	-69.82	9.03	-60.80	-47.8

Table 7-28. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9262)

OPERATING FREQUENCY: 1880.00 MHz
 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]
3760.00	H	139	52	-70.23	6.93	-63.30	-50.3
5640.00	H	-	-	-71.62	9.15	-62.46	-49.5

Table 7-29. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9400)

FCC ID: A3LSMN970U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 1907.60 MHz
 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]
3815.20	H	-	-	-69.61	7.09	-62.52	-49.5
5722.80	H	-	-	-69.72	9.04	-60.69	-47.7

Table 7-30. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9538)

FCC ID: A3LSMN970U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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7.8 Frequency Stability / Temperature Variation

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

FCC ID: A3LSMN970U	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Frequency Stability / Temperature Variation

OPERATING FREQUENCY: 836,600,000 Hz

CHANNEL: 190

REFERENCE VOLTAGE: 4.32 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.32	- 30	836,600,135	135	0.0000161
100 %		- 20	836,600,060	60	0.0000072
100 %		- 10	836,599,901	-99	-0.0000118
100 %		0	836,600,048	48	0.0000057
100 %		+ 10	836,599,802	-198	-0.0000237
100 %		+ 20	836,599,979	-21	-0.0000025
100 %		+ 30	836,599,871	-129	-0.0000154
100 %		+ 40	836,600,288	288	0.0000344
100 %		+ 50	836,600,115	115	0.0000137
BATT. ENDPOINT	3.36	+ 20	836,600,185	185	0.0000221

Table 7-31. Frequency Stability Data (Cellular GPRS Mode – Ch. 190)

FCC ID: A3LSMN970U	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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Frequency Stability / Temperature Variation

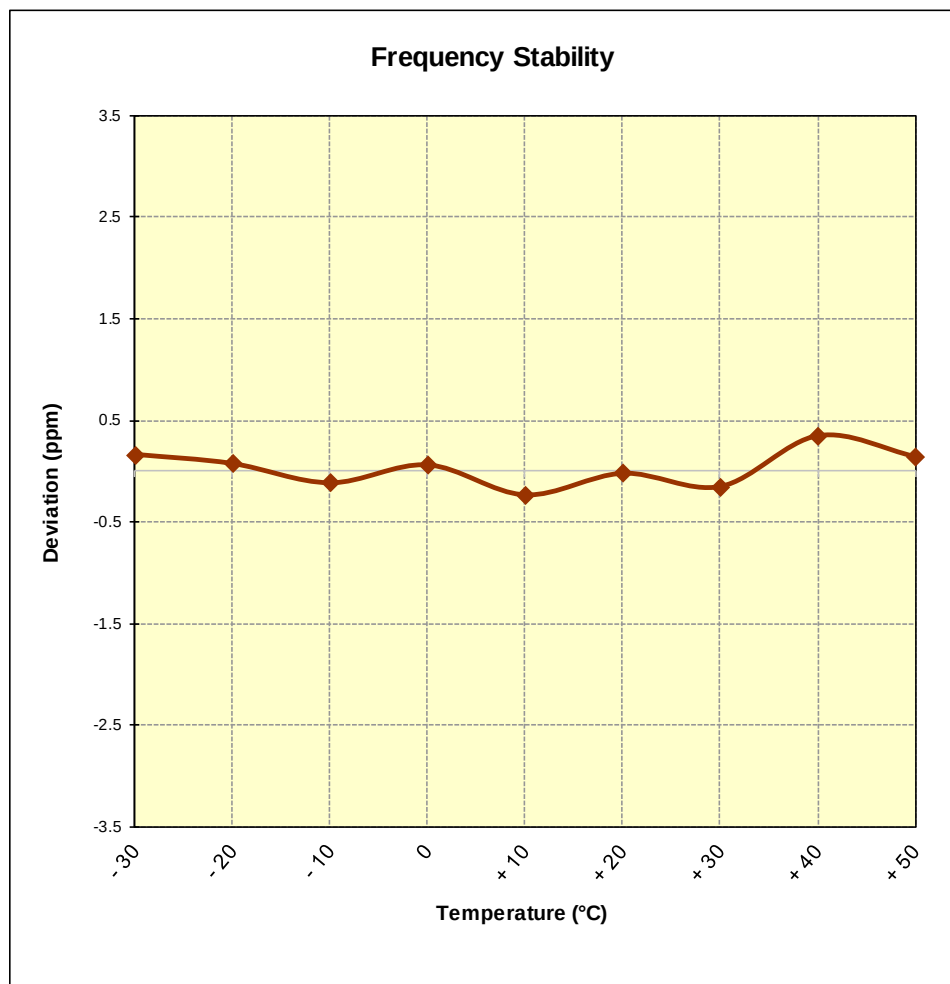


Figure 7-9. Frequency Stability Graph (Cellular GPRS Mode – Ch. 190)

FCC ID: A3LSMN970U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1905220084-02.A3L	Test Dates: 05/22 - 07/10/2019	EUT Type: Portable Handset		Page 99 of 112

Frequency Stability / Temperature Variation

OPERATING FREQUENCY: 836,520,000 Hz

CHANNEL: 384

REFERENCE VOLTAGE: 4.32 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.32	- 30	836,519,740	-260	-0.0000311
100 %		- 20	836,519,946	-54	-0.0000065
100 %		- 10	836,520,259	259	0.0000310
100 %		0	836,520,020	20	0.0000024
100 %		+ 10	836,520,110	110	0.0000131
100 %		+ 20	836,520,163	163	0.0000195
100 %		+ 30	836,520,035	35	0.0000042
100 %		+ 40	836,520,022	22	0.0000026
100 %		+ 50	836,519,941	-59	-0.0000071
BATT. ENDPOINT	3.36	+ 20	836,520,123	123	0.0000147

Table 7-32. Frequency Stability Data (Cellular CDMA Mode – Ch. 384)

FCC ID: A3LSMN970U	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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Frequency Stability / Temperature Variation

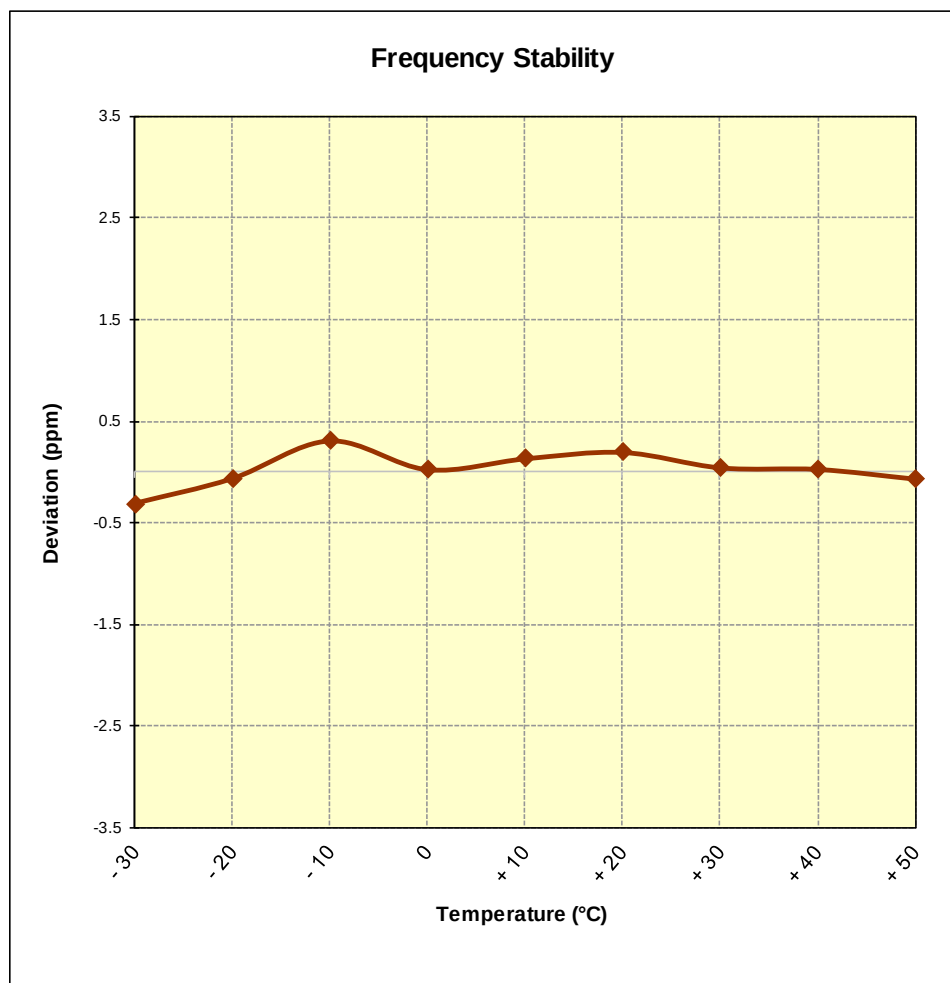


Figure 7-10. Frequency Stability Graph (Cellular CDMA Mode – Ch. 384)

FCC ID: A3LSMN970U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1905220084-02.A3L	Test Dates: 05/22 - 07/10/2019	EUT Type: Portable Handset		Page 101 of 112

Frequency Stability / Temperature Variation

OPERATING FREQUENCY: 836,600,000 Hz

CHANNEL: 4183

REFERENCE VOLTAGE: 4.32 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.32	- 30	836,600,094	94	0.0000112
100 %		- 20	836,600,026	26	0.0000031
100 %		- 10	836,600,219	219	0.0000262
100 %		0	836,600,029	29	0.0000035
100 %		+ 10	836,599,854	-146	-0.0000175
100 %		+ 20	836,600,047	47	0.0000056
100 %		+ 30	836,599,860	-140	-0.0000167
100 %		+ 40	836,599,848	-152	-0.0000182
100 %		+ 50	836,599,976	-24	-0.0000029
BATT. ENDPOINT	3.36	+ 20	836,600,286	286	0.0000342

Table 7-33. Frequency Stability Data (Cellular WCDMA Mode – Ch. 4183)

FCC ID: A3LSMN970U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Frequency Stability / Temperature Variation

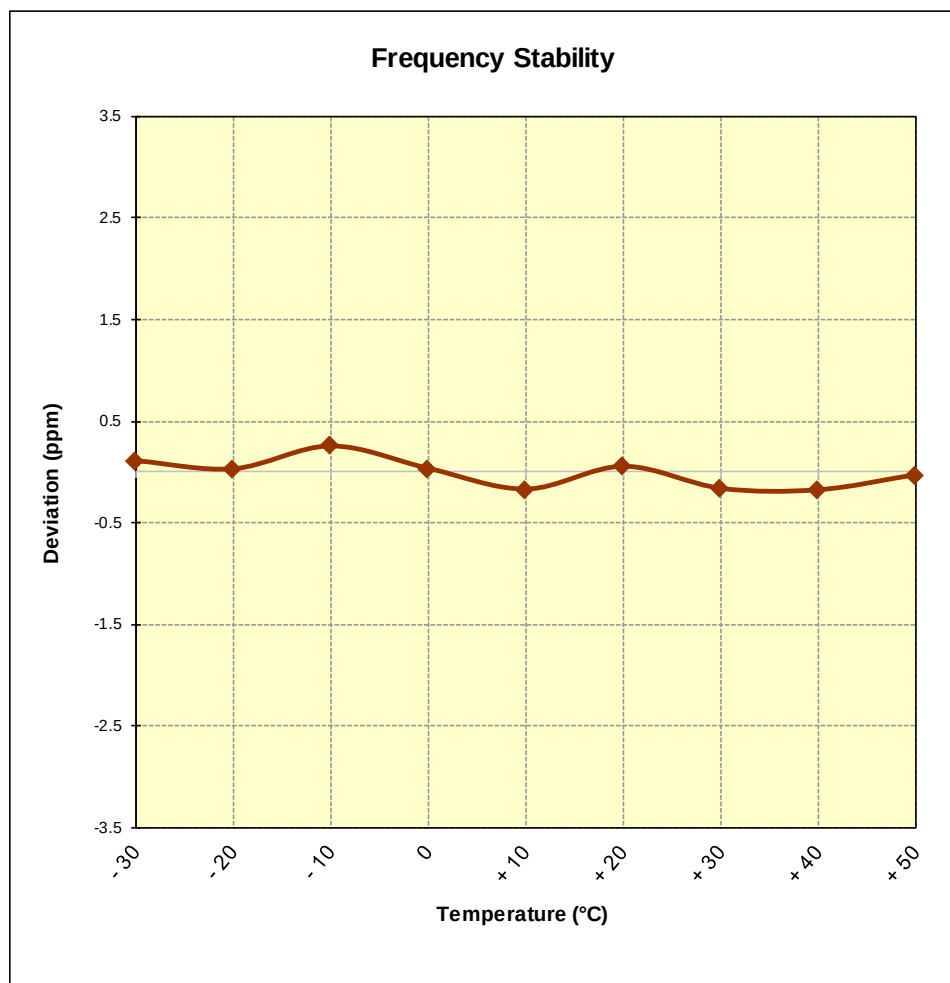


Figure 7-11. Frequency Stability Graph (Cellular WCDMA Mode – Ch. 4183)

FCC ID: A3LSMN970U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Frequency Stability / Temperature Variation

OPERATING FREQUENCY: 1,732,600,000 Hz
 CHANNEL: 1413
 REFERENCE VOLTAGE: 4.32 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.32	- 30	1,732,599,826	-174	-0.0000100
100 %		- 20	1,732,600,318	318	0.0000184
100 %		- 10	1,732,599,738	-262	-0.0000151
100 %		0	1,732,600,014	14	0.0000008
100 %		+ 10	1,732,599,990	-10	-0.0000006
100 %		+ 20	1,732,599,660	-340	-0.0000196
100 %		+ 30	1,732,600,383	383	0.0000221
100 %		+ 40	1,732,600,148	148	0.0000085
100 %		+ 50	1,732,600,039	39	0.0000023
BATT. ENDPOINT	3.36	+ 20	1,732,600,049	49	0.0000028

Table 7-34. 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.

FCC ID: A3LSMN970U	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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Frequency Stability / Temperature Variation

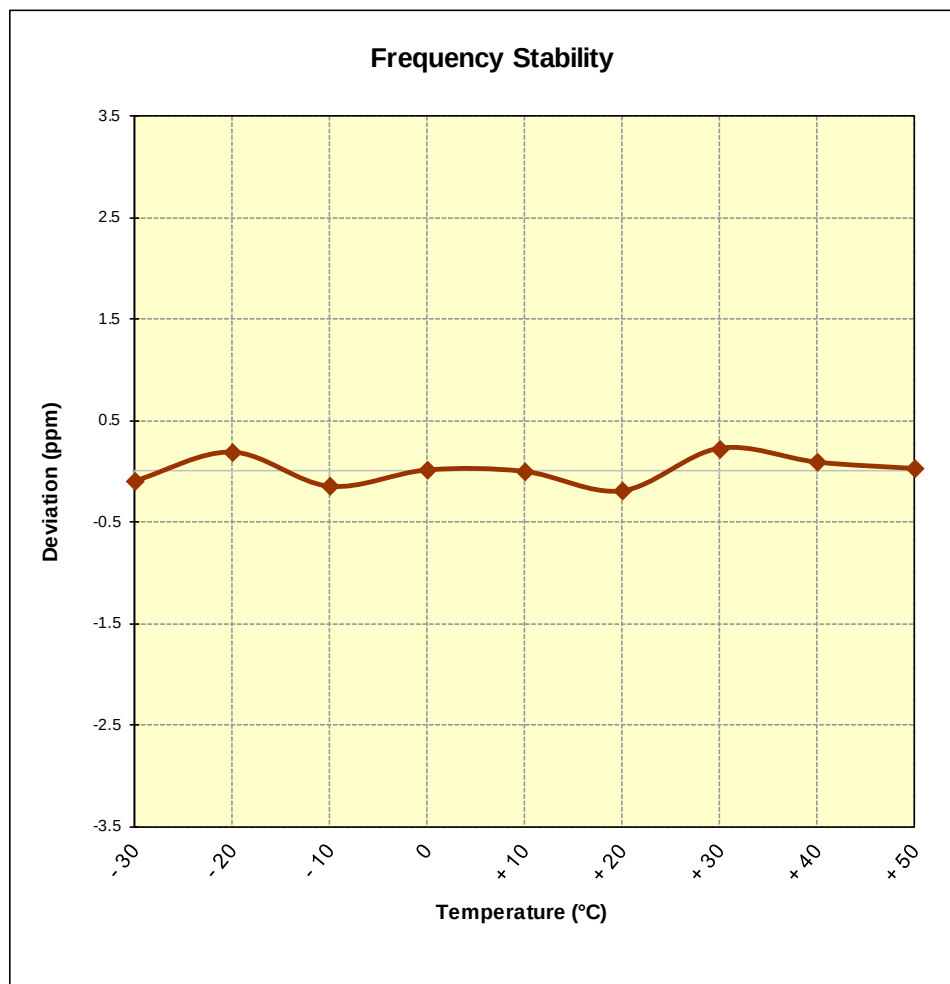


Figure 7-12. Frequency Stability Graph (AWS WCDMA Mode – Ch. 1413)

FCC ID: A3LSMN970U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Frequency Stability / Temperature Variation

OPERATING FREQUENCY: 1,880,000,000 Hz

CHANNEL: 661

REFERENCE VOLTAGE: 4.32 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.32	- 30	1,880,000,250	250	0.0000133
100 %		- 20	1,879,999,980	-20	-0.0000011
100 %		- 10	1,880,000,425	425	0.0000226
100 %		0	1,879,999,927	-73	-0.0000039
100 %		+ 10	1,880,000,012	12	0.0000006
100 %		+ 20	1,880,000,383	383	0.0000204
100 %		+ 30	1,879,999,743	-257	-0.0000137
100 %		+ 40	1,879,999,985	-15	-0.0000008
100 %		+ 50	1,880,000,050	50	0.0000027
BATT. ENDPOINT	3.36	+ 20	1,879,999,887	-113	-0.0000060

Table 7-35. Frequency Stability Data (PCS GPRS Mode – Ch. 661)

FCC ID: A3LSMN970U	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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Frequency Stability / Temperature Variation

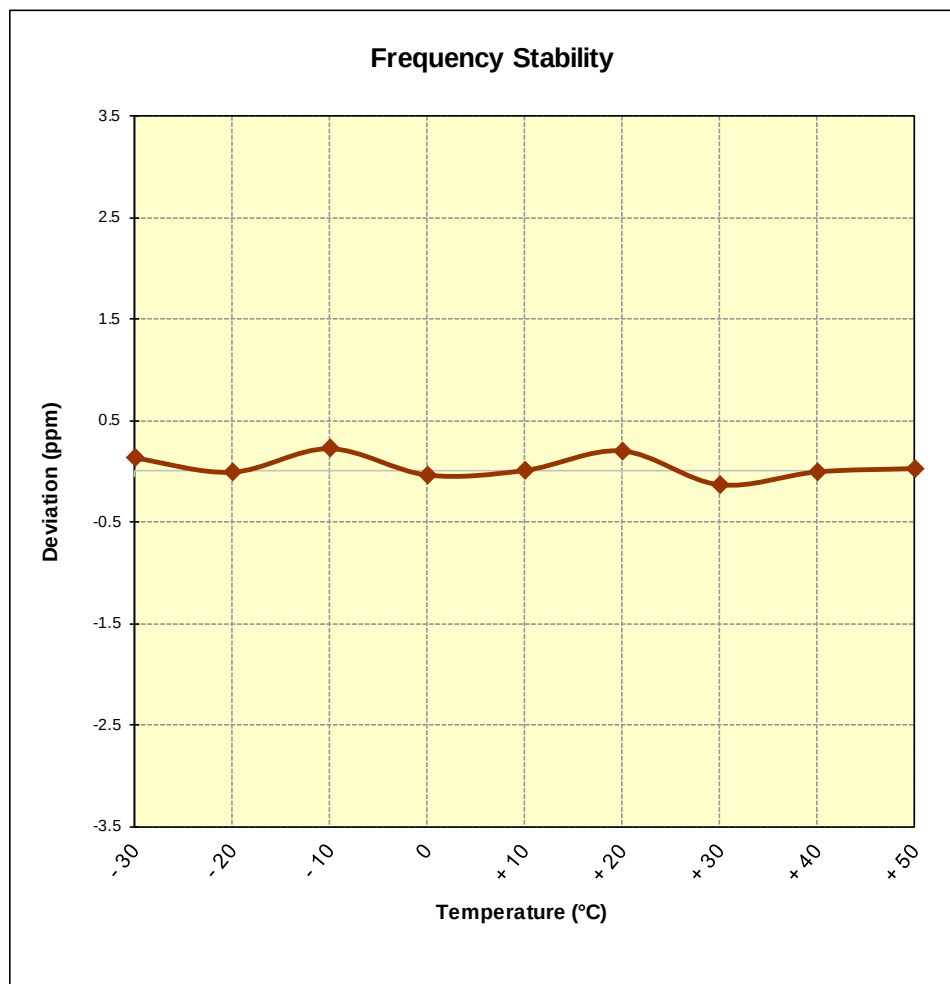


Figure 7-13. Frequency Stability Graph (PCS GPRS Mode – Ch. 661)

FCC ID: A3LSMN970U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Frequency Stability / Temperature Variation

OPERATING FREQUENCY: 1,880,000,000 Hz

CHANNEL: 600

REFERENCE VOLTAGE: 4.32 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.32	- 30	1,879,999,951	-49	-0.0000026
100 %		- 20	1,879,999,814	-186	-0.0000099
100 %		- 10	1,879,999,648	-352	-0.0000187
100 %		0	1,880,000,197	197	0.0000105
100 %		+ 10	1,879,999,962	-38	-0.0000020
100 %		+ 20	1,879,999,632	-368	-0.0000196
100 %		+ 30	1,880,000,161	161	0.0000086
100 %		+ 40	1,880,000,020	20	0.0000011
100 %		+ 50	1,880,000,080	80	0.0000043
BATT. ENDPOINT	3.36	+ 20	1,880,000,016	16	0.0000009

Table 7-36. Frequency Stability Data (PCS CDMA Mode – Ch. 600)

FCC ID: A3LSMN970U	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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Frequency Stability / Temperature Variation

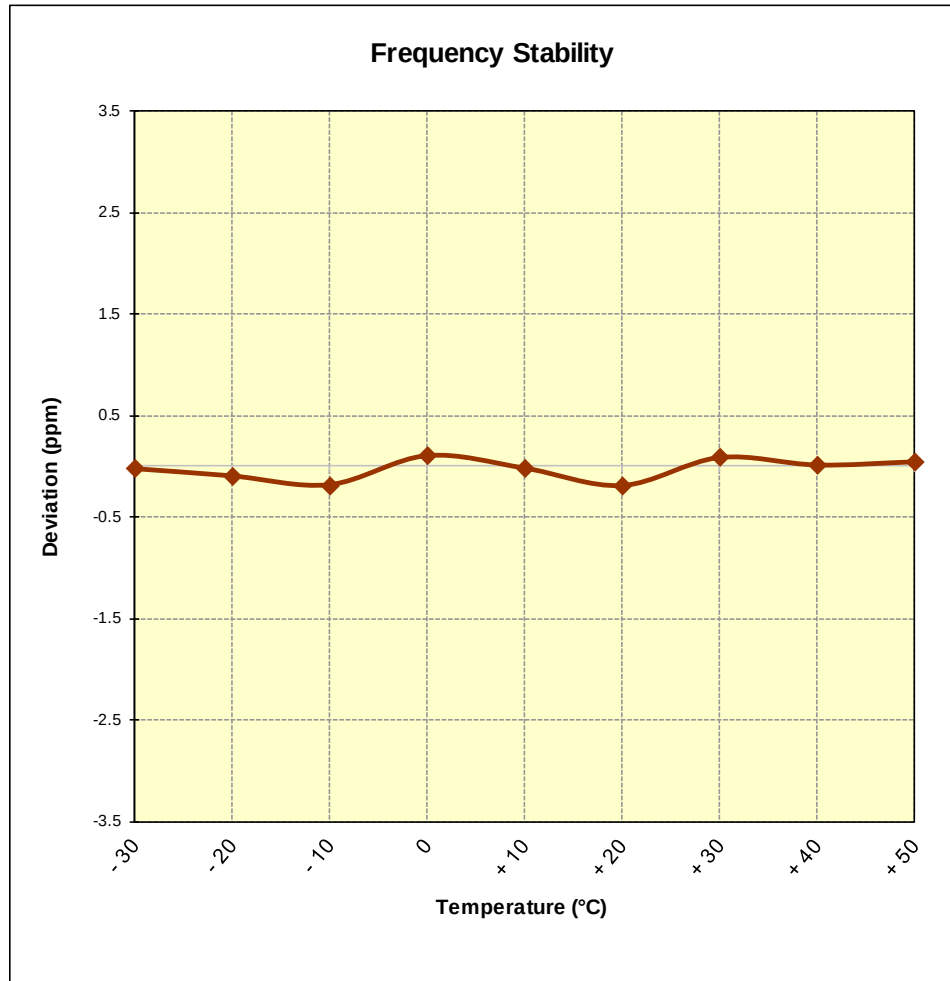


Figure 7-14. Frequency Stability Graph (PCS CDMA Mode – Ch. 600)

FCC ID: A3LSMN970U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Frequency Stability / Temperature Variation

OPERATING FREQUENCY: 1,880,000,000 Hz

CHANNEL: 9400

REFERENCE VOLTAGE: 4.32 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.32	- 30	1,879,999,700	-300	-0.0000160
100 %		- 20	1,879,999,967	-33	-0.0000018
100 %		- 10	1,880,000,132	132	0.0000070
100 %		0	1,880,000,079	79	0.0000042
100 %		+ 10	1,880,000,416	416	0.0000221
100 %		+ 20	1,879,999,941	-59	-0.0000031
100 %		+ 30	1,880,000,175	175	0.0000093
100 %		+ 40	1,879,999,932	-68	-0.0000036
100 %		+ 50	1,879,999,808	-192	-0.0000102
BATT. ENDPOINT	3.36	+ 20	1,879,999,825	-175	-0.0000093

Table 7-37. Frequency Stability Data (PCS WCDMA Mode – Ch. 9400)

FCC ID: A3LSMN970U	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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Frequency Stability / Temperature Variation

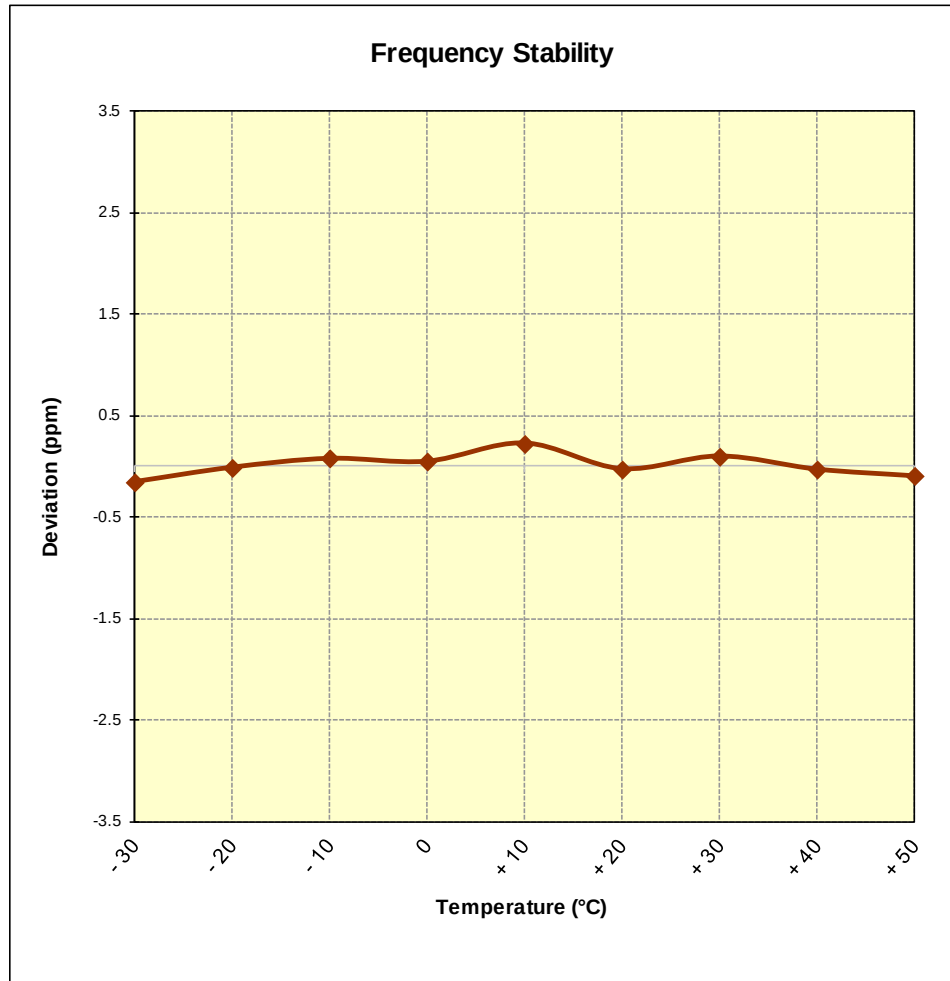


Figure 7-15. Frequency Stability Graph (PCS WCDMA Mode – Ch. 9400)

FCC ID: A3LSMN970U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMN970U** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules.

FCC ID: A3LSMN970U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1905220084-02.A3L	Test Dates: 05/22 - 07/10/2019	EUT Type: Portable Handset		Page 112 of 112