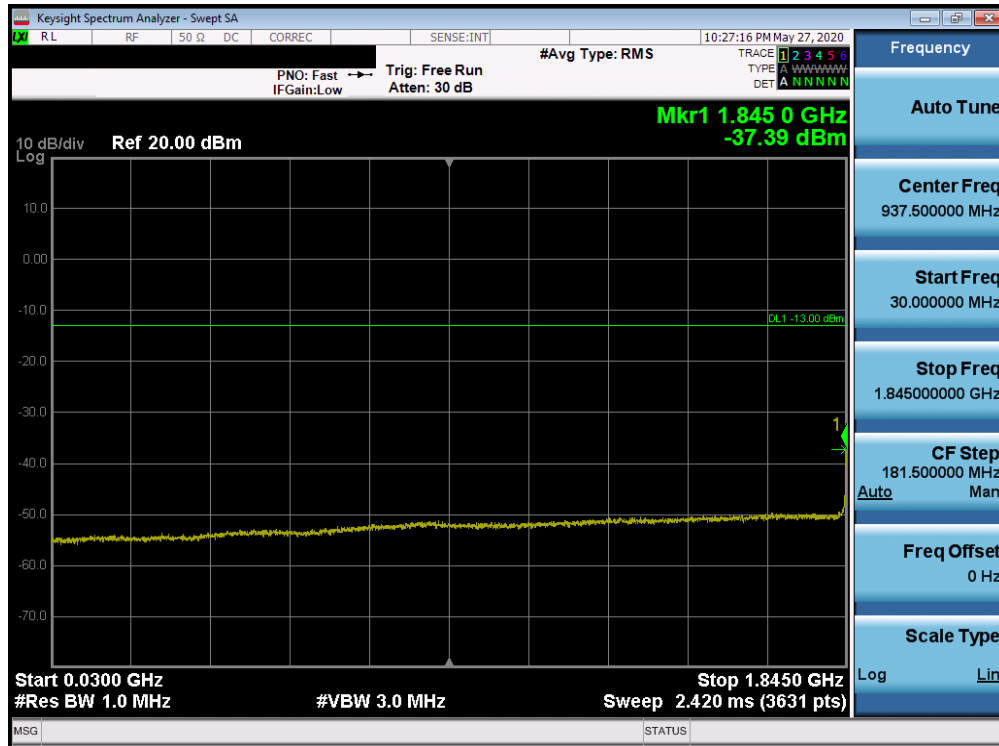
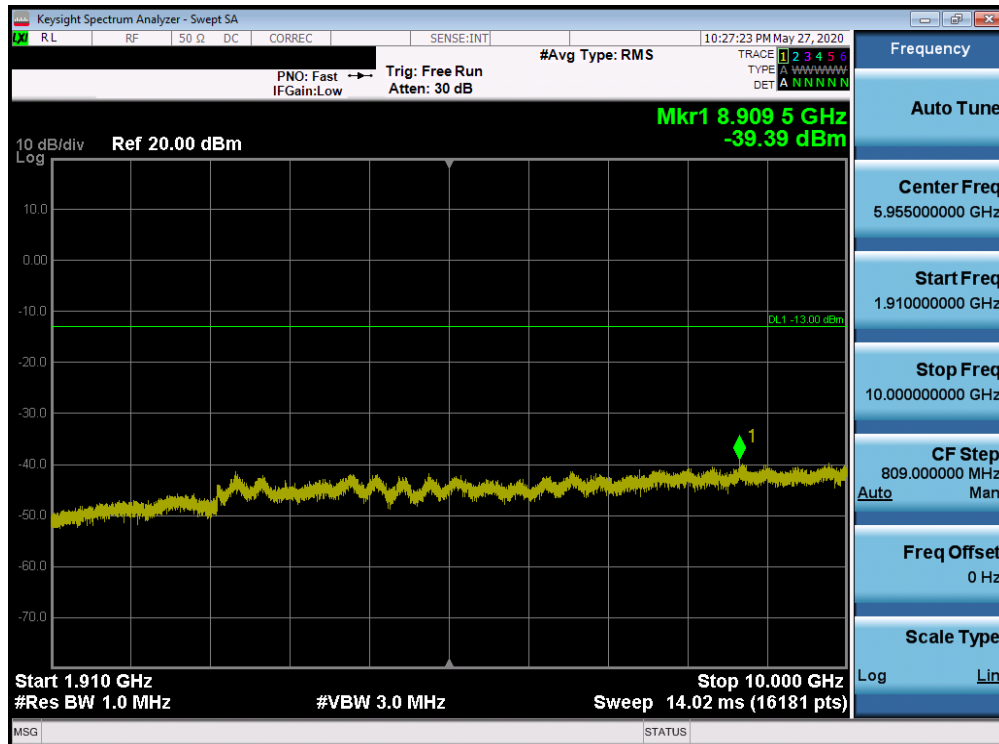


PCS WCDMA Mode

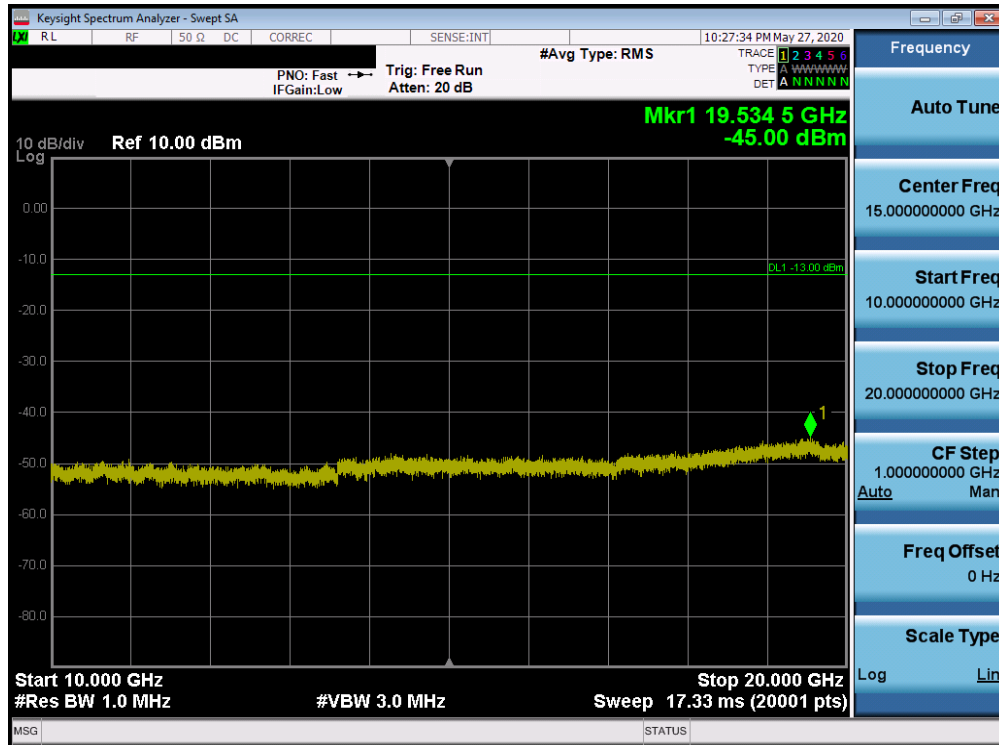


Plot 7-64. Conducted Spurious Plot (PCS WCDMA Mode - Low Channel)

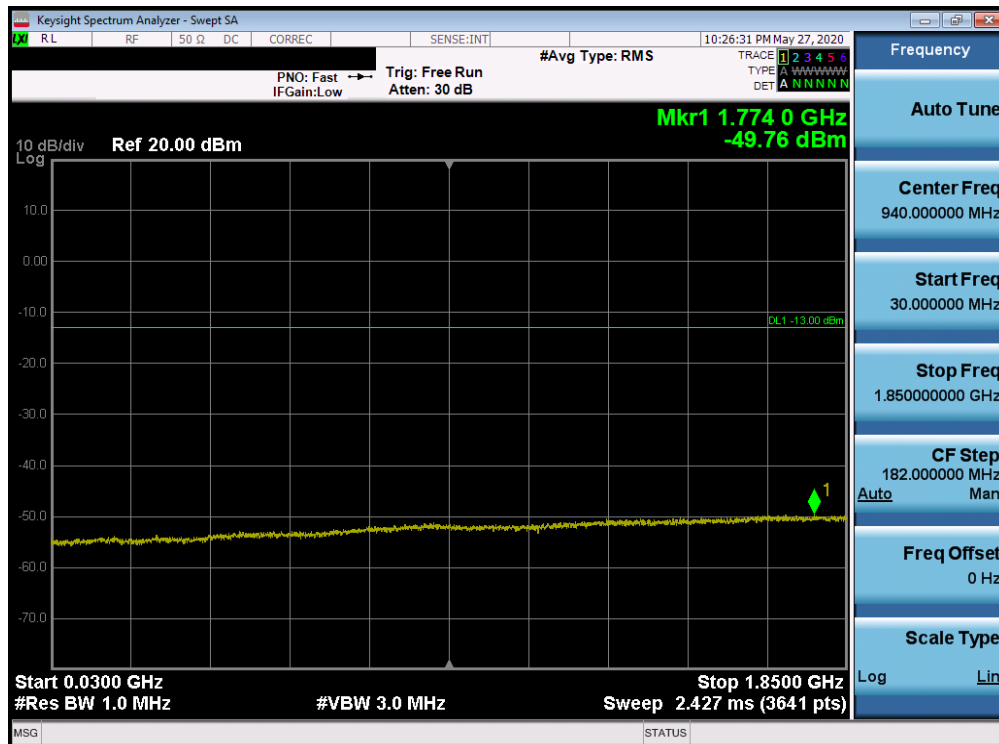


Plot 7-65. Conducted Spurious Plot (PCS WCDMA Mode - Low Channel)

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 48 of 105

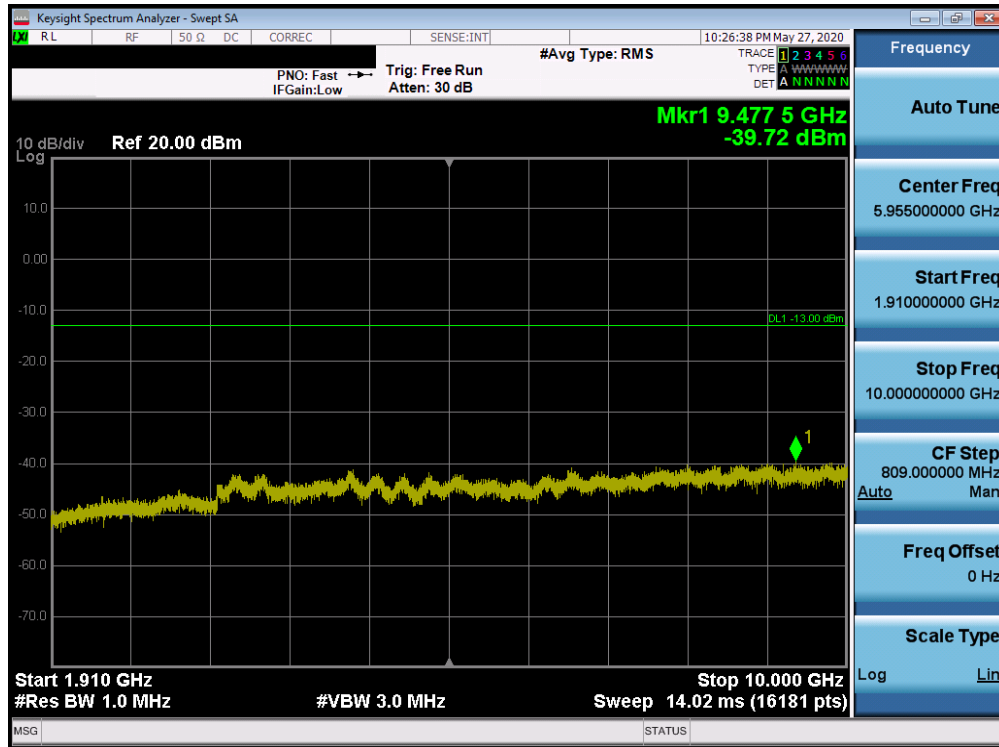


Plot 7-66. Conducted Spurious Plot (PCS WCDMA Mode - Low Channel)

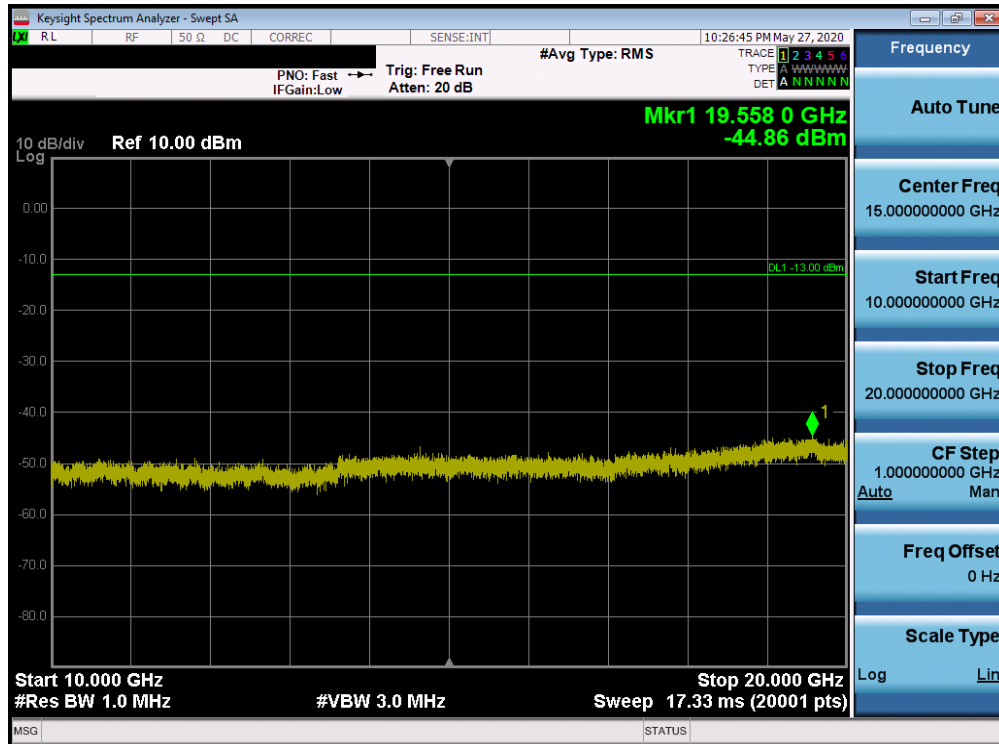


Plot 7-67. Conducted Spurious Plot (PCS WCDMA Mode - Mid Channel)

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 49 of 105

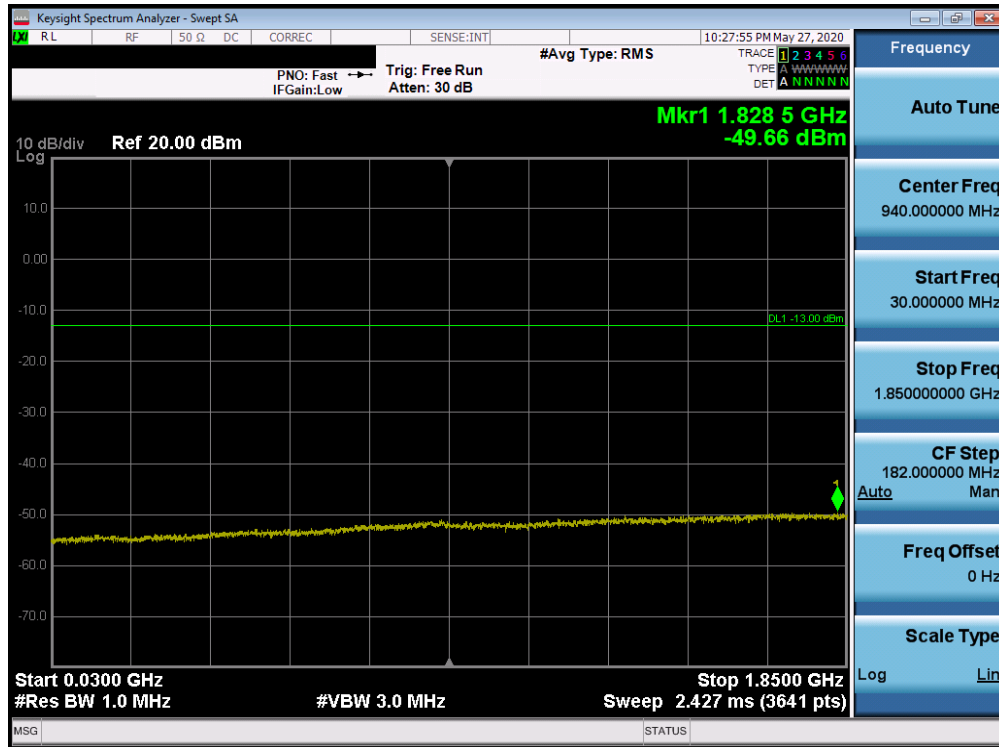


Plot 7-68. Conducted Spurious Plot (PCS WCDMA Mode - Mid Channel)

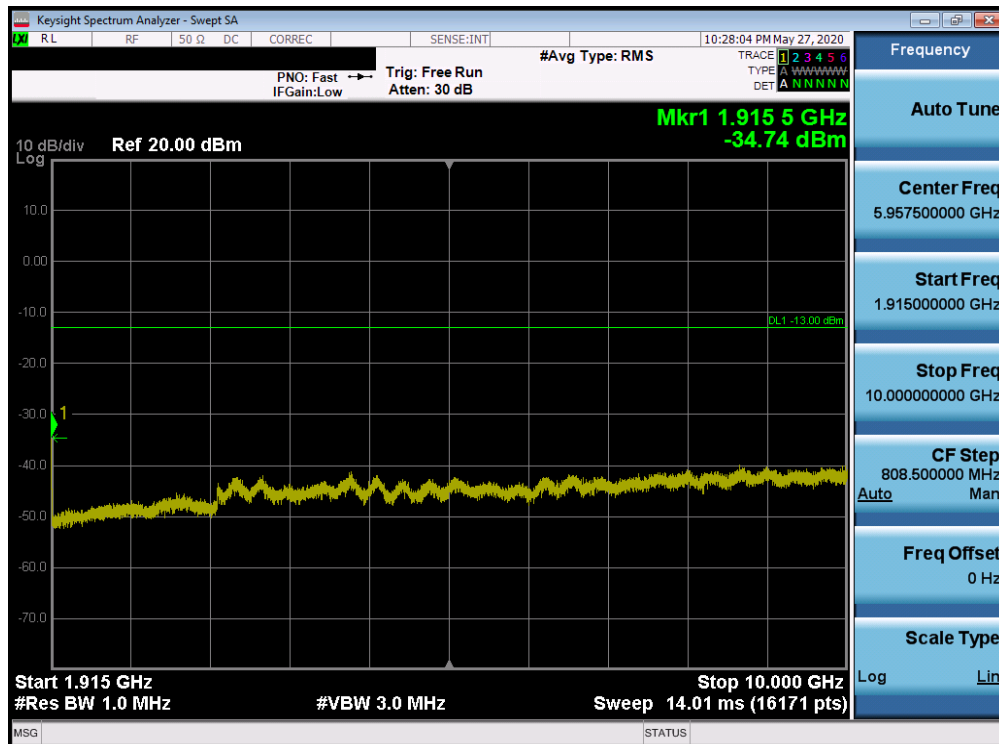


Plot 7-69. Conducted Spurious Plot (PCS WCDMA Mode - Mid Channel)

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 50 of 105

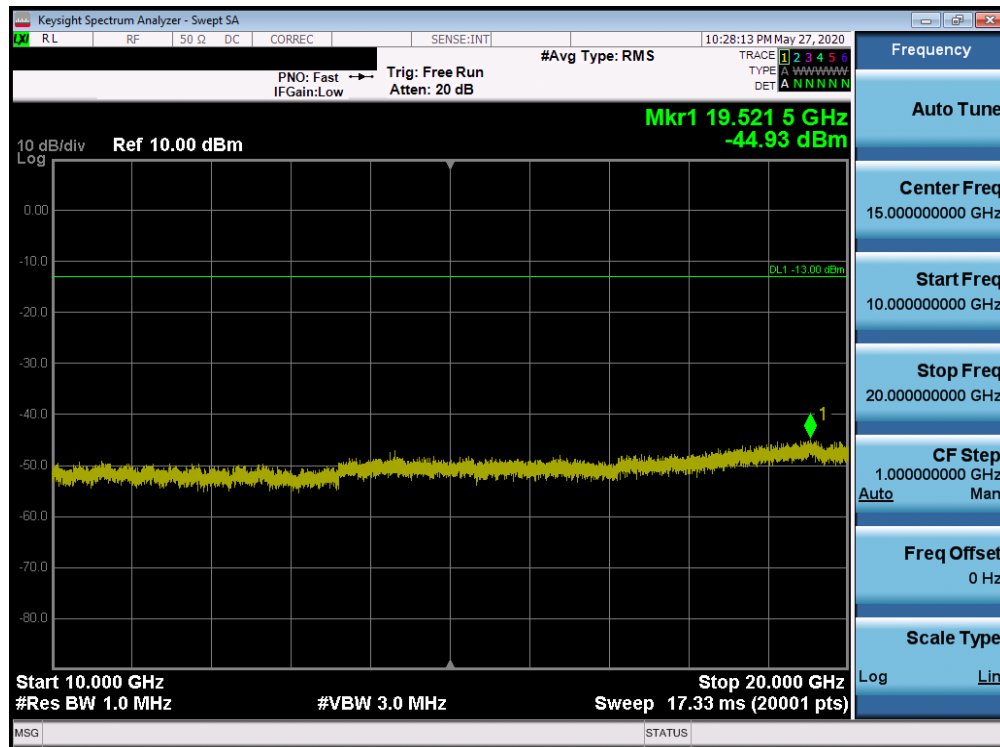


Plot 7-70. Conducted Spurious Plot (PCS WCDMA Mode - High Channel)



Plot 7-71. Conducted Spurious Plot (PCS WCDMA Mode - High Channel)

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 51 of 105



Plot 7-72. Conducted Spurious Plot (PCS WCDMA Mode - High Channel)

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 52 of 105

7.4 Band Edge Emissions at Antenna Terminal

Test Overview

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

The minimum permissible attenuation level of any spurious emission is $43 + 10 \log_{10}(P_{\text{Watts}})$, where P is the transmitter power in Watts.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 6.0

Test Settings

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. $\text{RBW} \geq 1\%$ of the emission bandwidth
4. $\text{VBW} \geq 3 \times \text{RBW}$
5. Detector = RMS
6. Number of sweep points $\geq 2 \times \text{Span}/\text{RBW}$
7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Test Setup

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



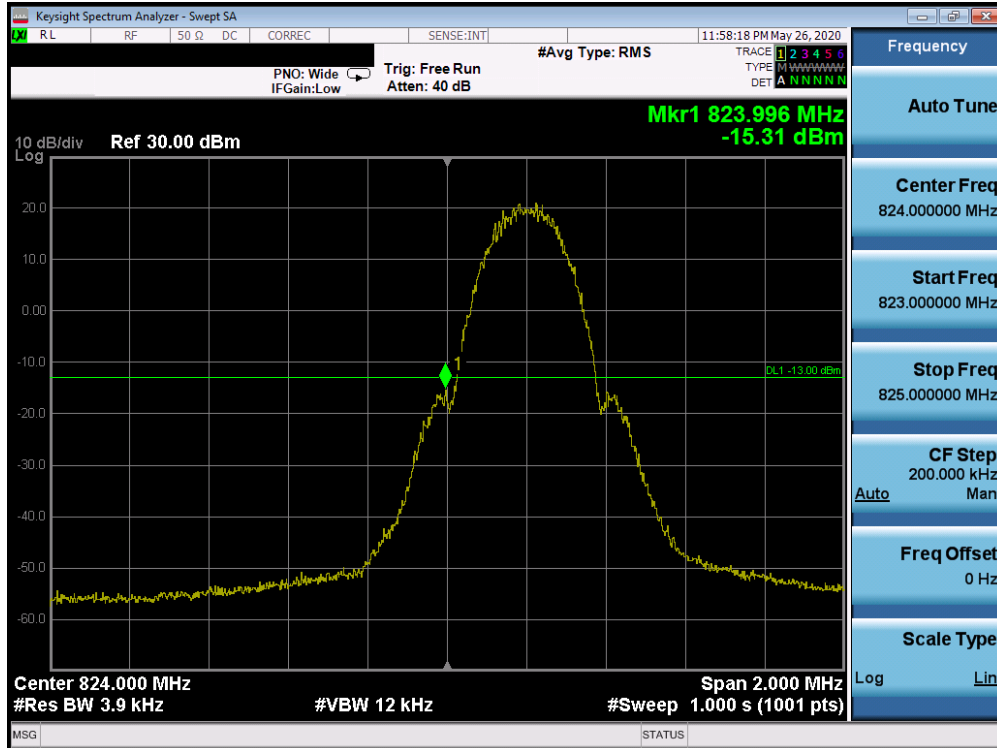
Figure 7-3. Test Instrument & Measurement Setup

Test Notes

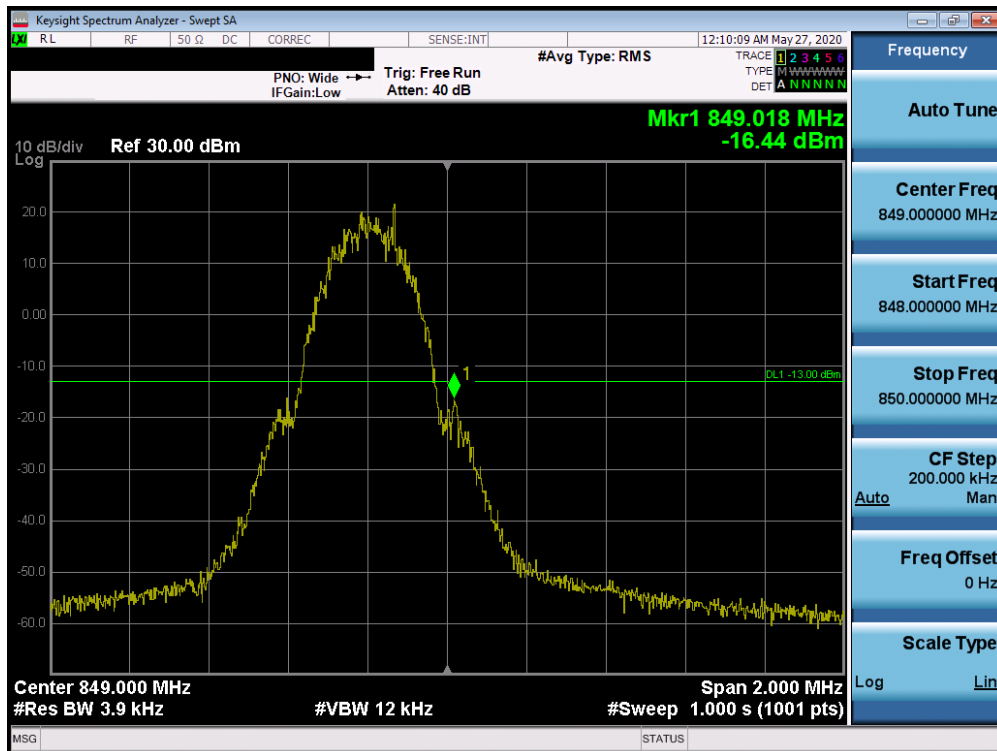
Per 22.917(b), 24.238(b), 27.53(h)(3), and RSS-132(5.5), RSS-133(6.5), RSS-139(6.5), in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to demonstrate compliance with the out-of-band emissions limit. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 53 of 105

Cellular GSM/GPRS Mode



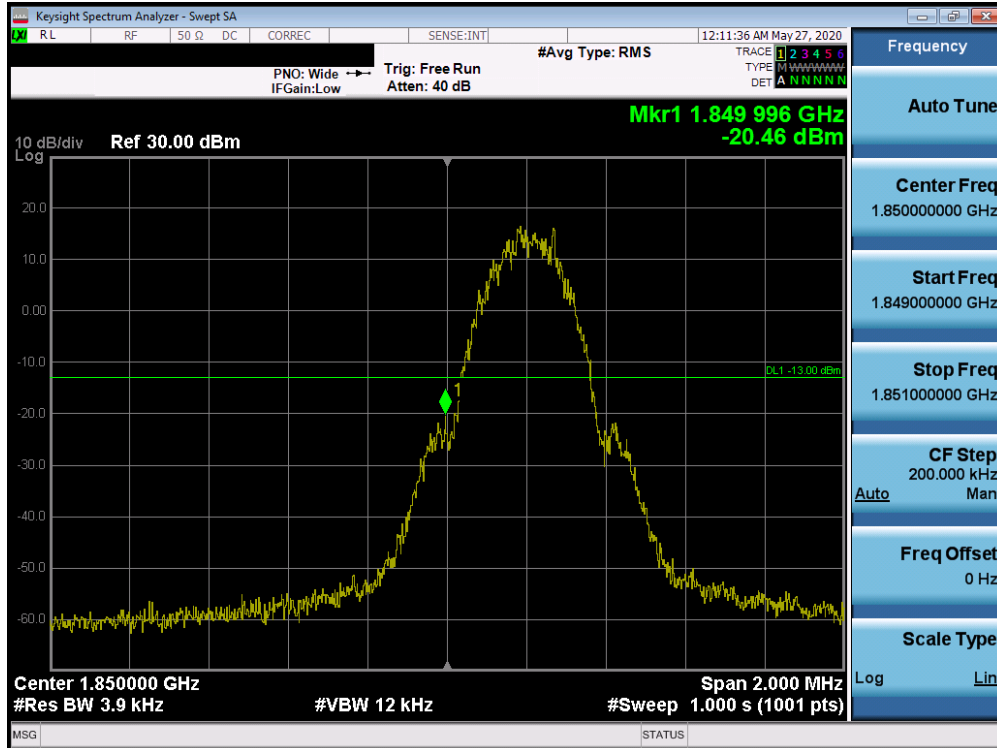
Plot 7-73. Band Edge Plot (Cell GPRS Mode - Low Channel)



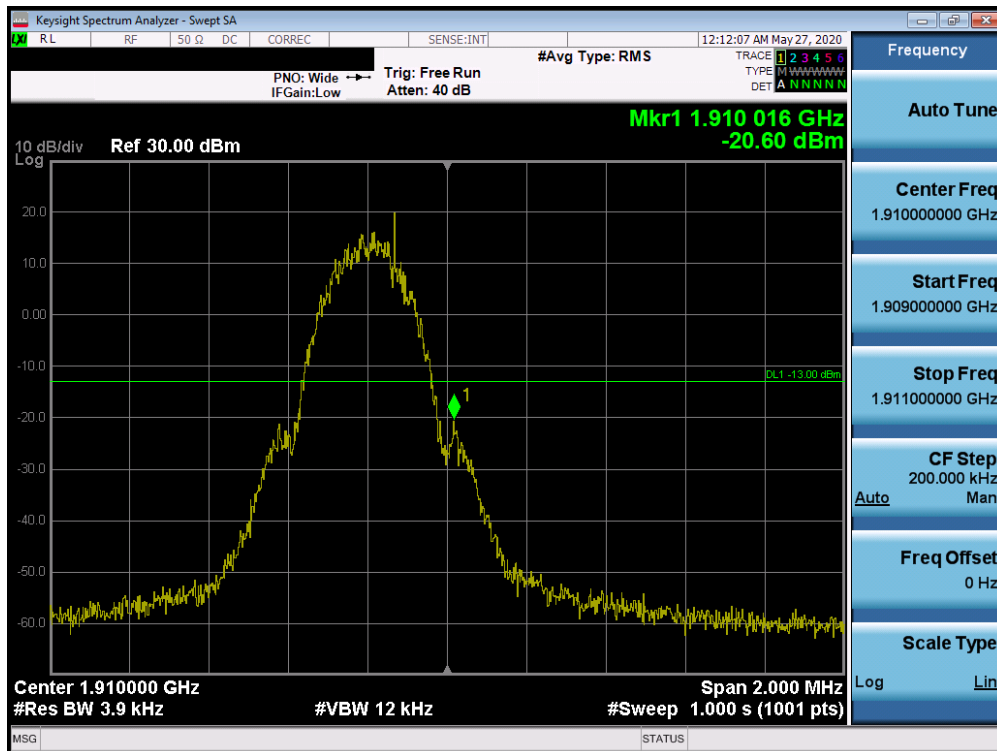
Plot 7-74. Band Edge Plot (Cell GSM Mode - High Channel)

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 54 of 105

PCS GSM Mode



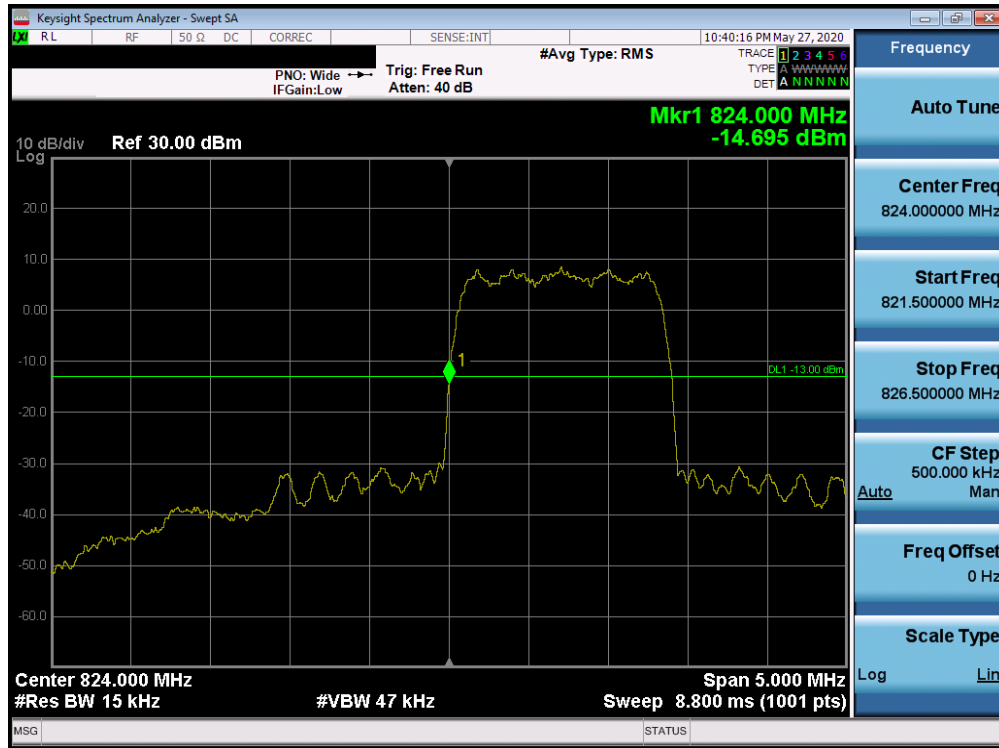
Plot 7-75. Band Edge Plot (PCS GSM Mode - Low Channel)



Plot 7-76. Band Edge Plot (PCS GSM Mode - High Channel)

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 55 of 105

Cellular CDMA Mode

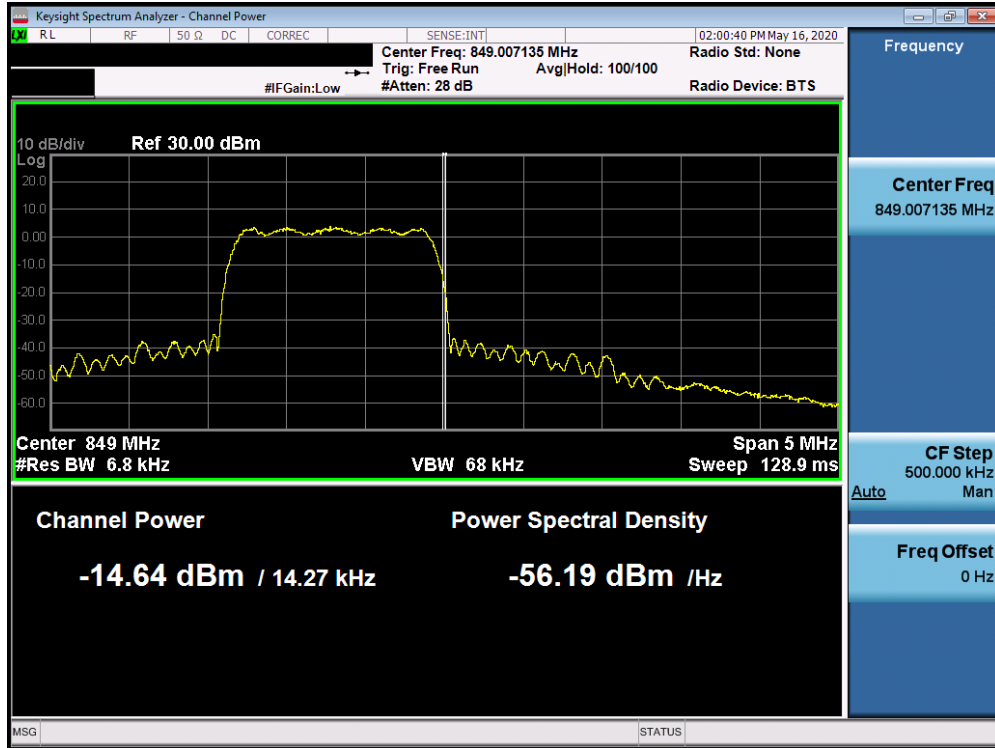


Plot 7-77. Band Edge Plot (Cellular CDMA Mode - Low Channel)



Plot 7-78. 4MHz Span Plot (Cellular CDMA Mode - Low Channel)

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 56 of 105



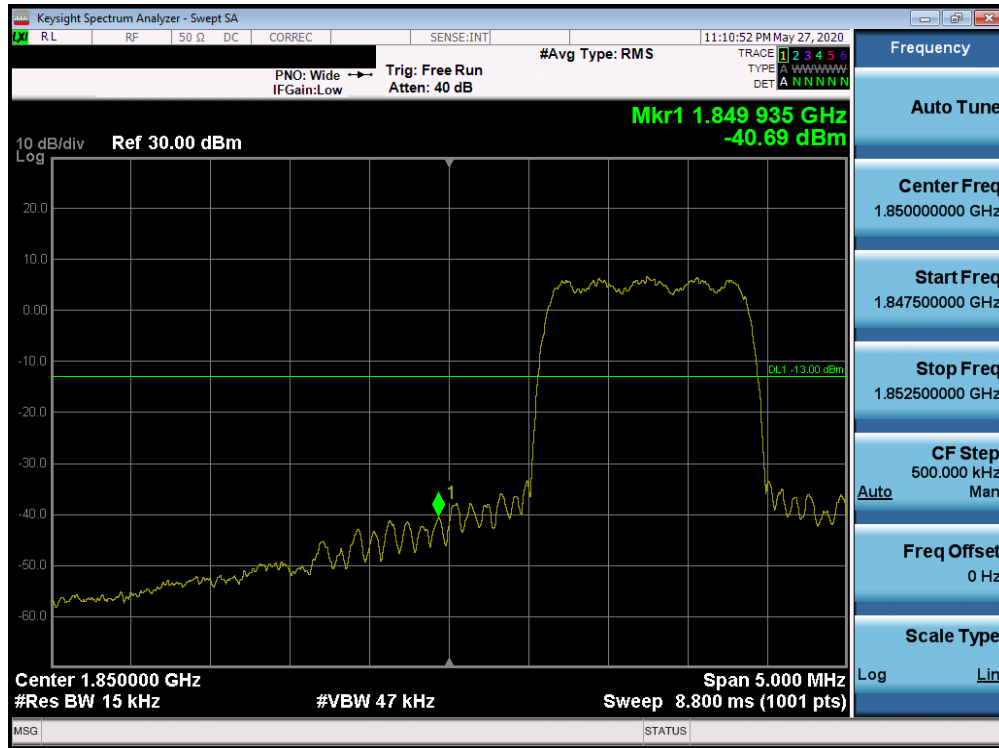
Plot 7-79. Band Edge Plot (Cellular CDMA Mode - High Channel)



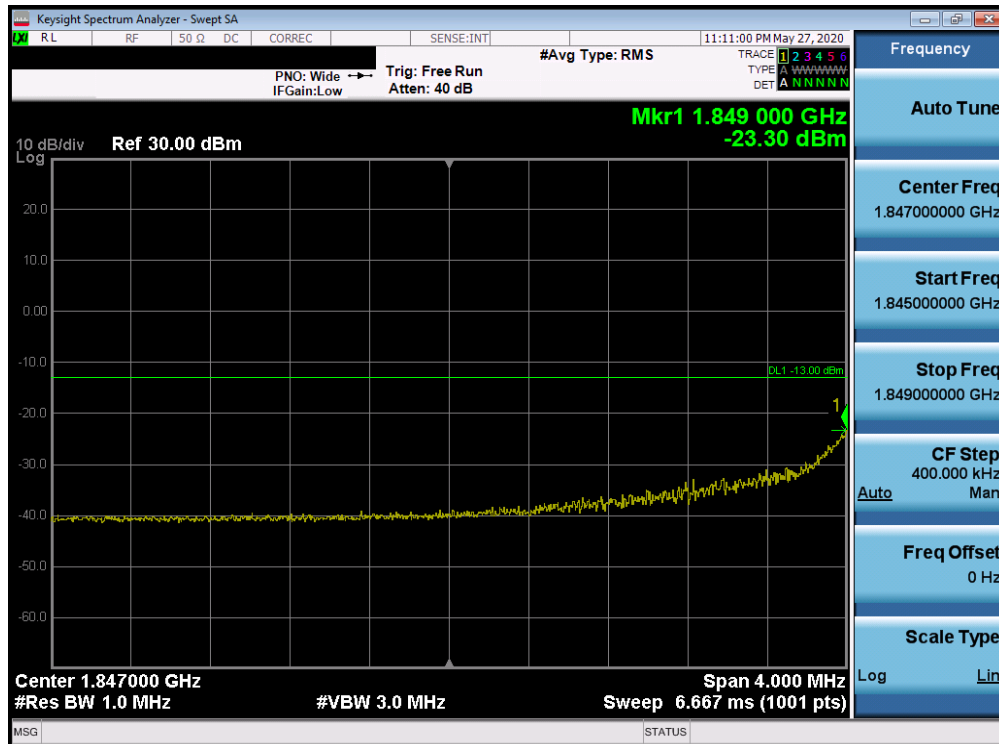
Plot 7-80. 4MHz Span Plot (Cellular CDMA Mode - High Channel)

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 57 of 105

PCS CDMA Mode



Plot 7-81. Band Edge Plot (PCS CDMA Mode - Low Channel)

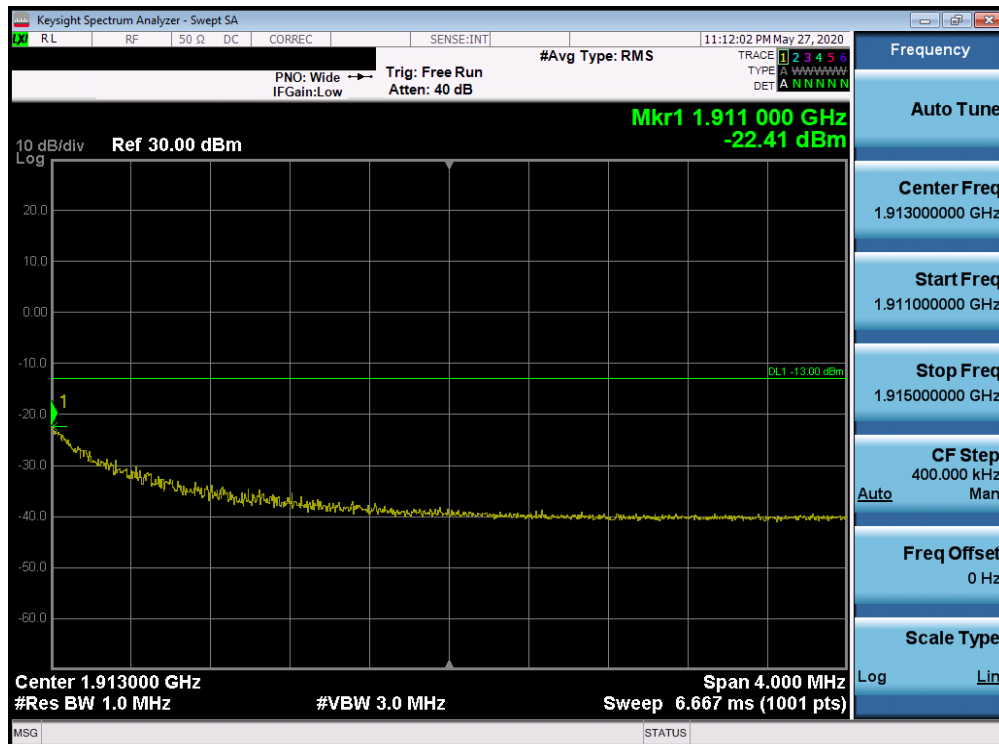


Plot 7-82. 4MHz Span Plot (PCS CDMA Mode - Low Channel)

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 58 of 105



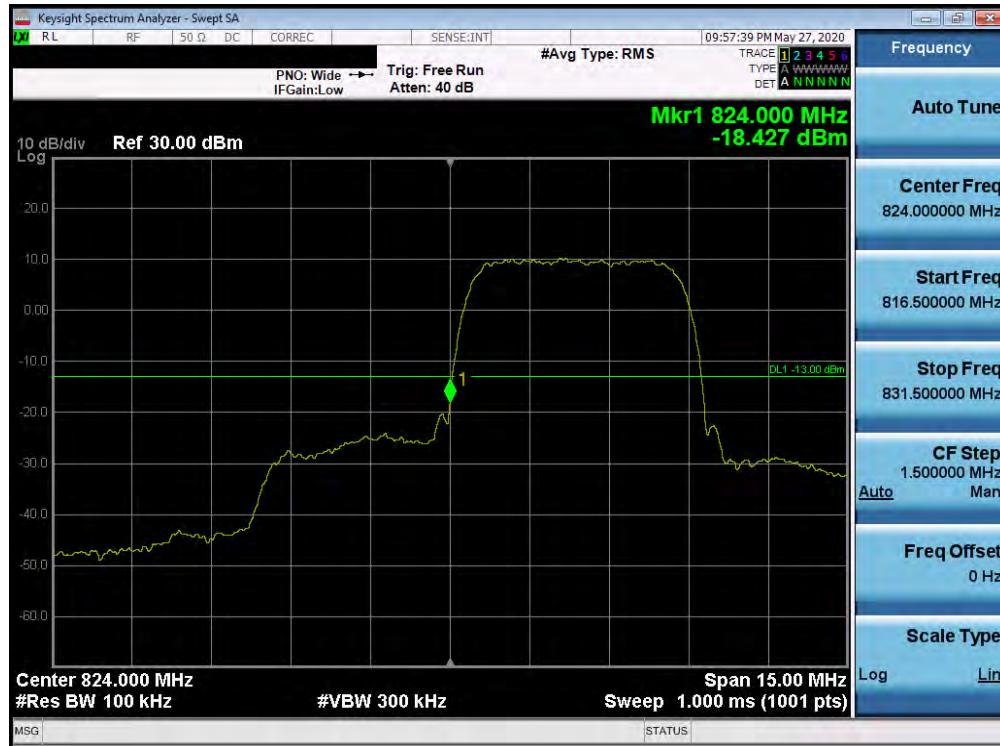
Plot 7-83. Band Edge Plot (PCS CDMA Mode - High Channel)



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

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 59 of 105

Cellular WCDMA Mode



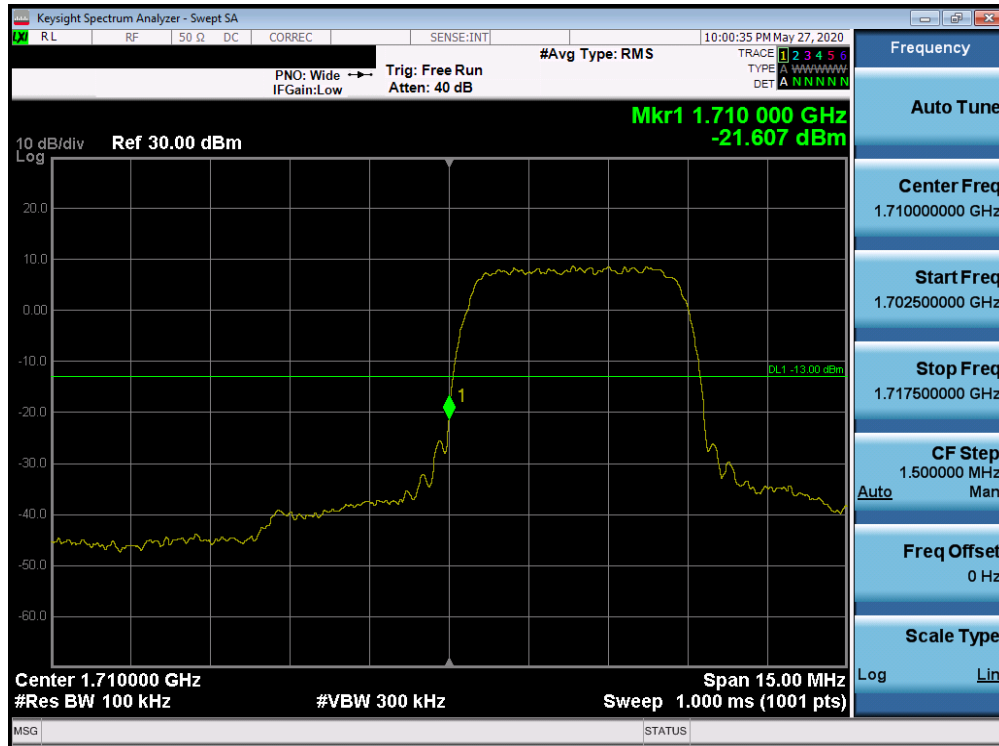
Plot 7-85. Band Edge Plot (Cellular WCDMA Mode - Low Channel)



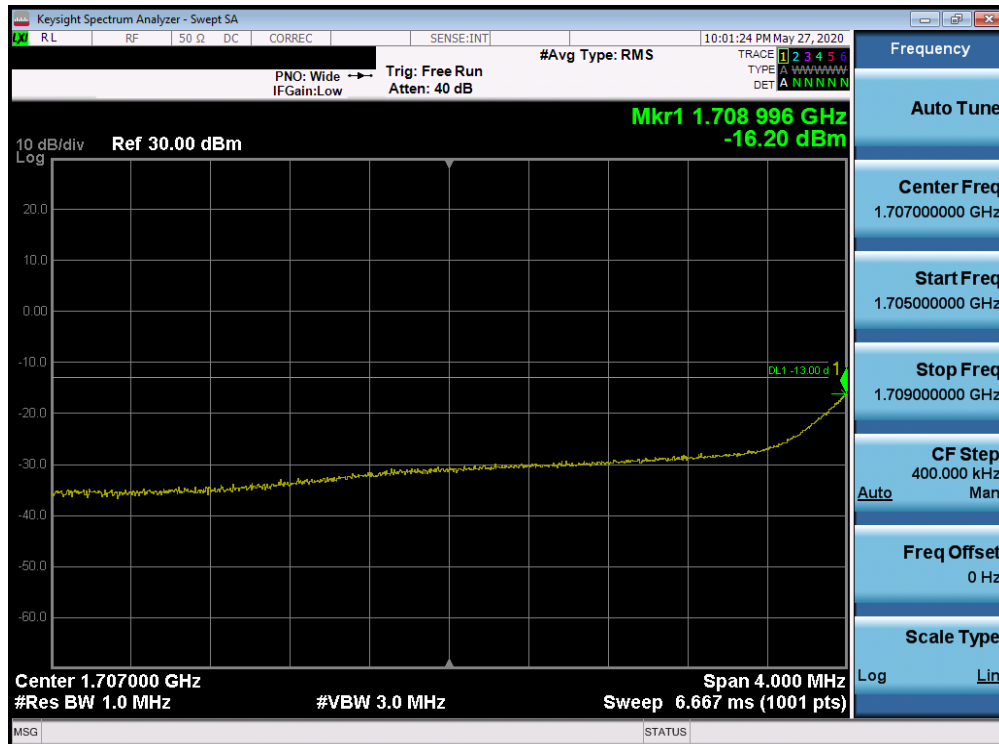
Plot 7-86. Band Edge Plot (Cellular WCDMA Mode - High Channel)

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 60 of 105

AWS WCDMA Mode



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

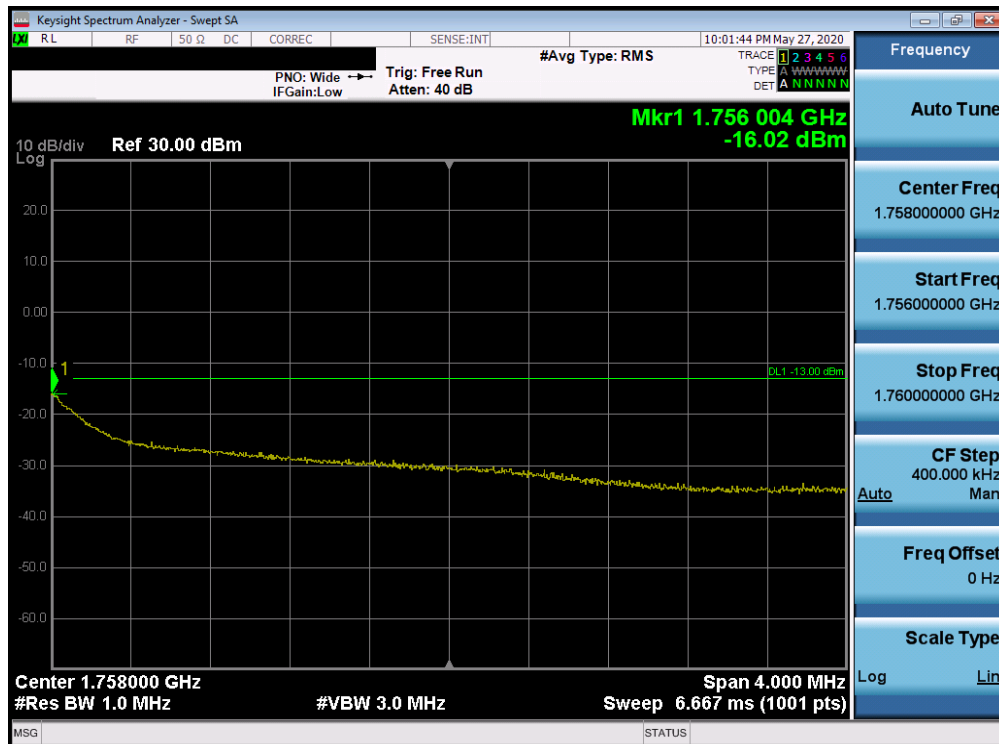


Plot 7-88. 4MHz Span Plot (AWS WCDMA Mode - Low Channel)

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 61 of 105



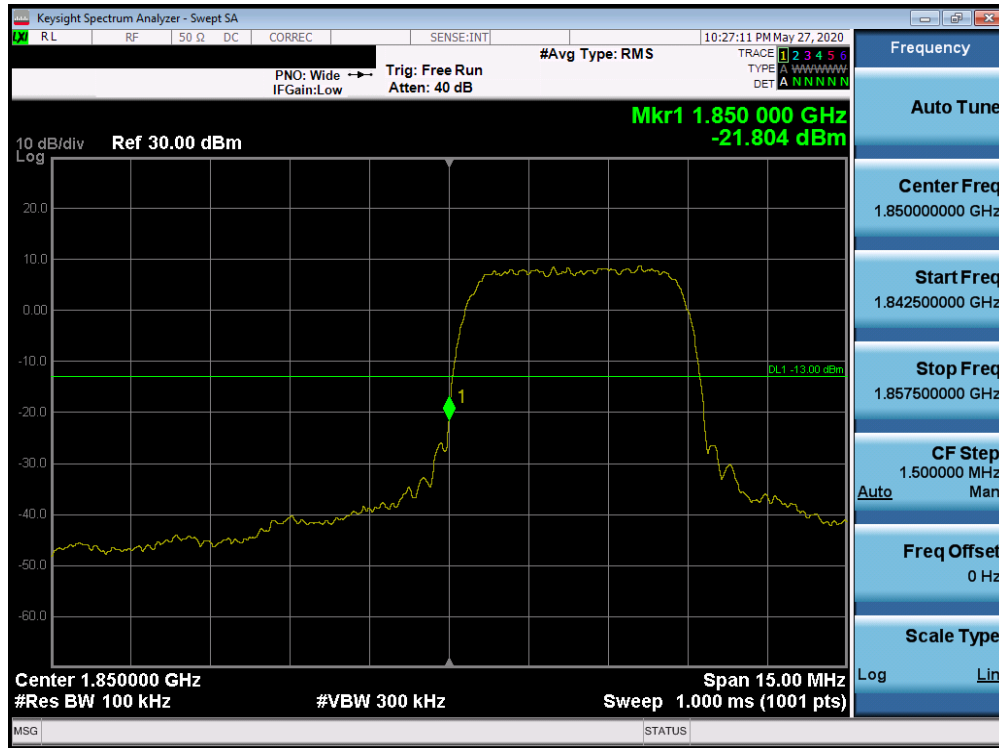
Plot 7-89. Band Edge Plot (AWS WCDMA Mode - High Channel)



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

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 62 of 105

PCS WCDMA Mode



Plot 7-91. Band Edge Plot (PCS WCDMA Mode - Low Channel)



Plot 7-92. Band Edge Plot (PCS WCDMA Mode - High Channel)

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 63 of 105

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.

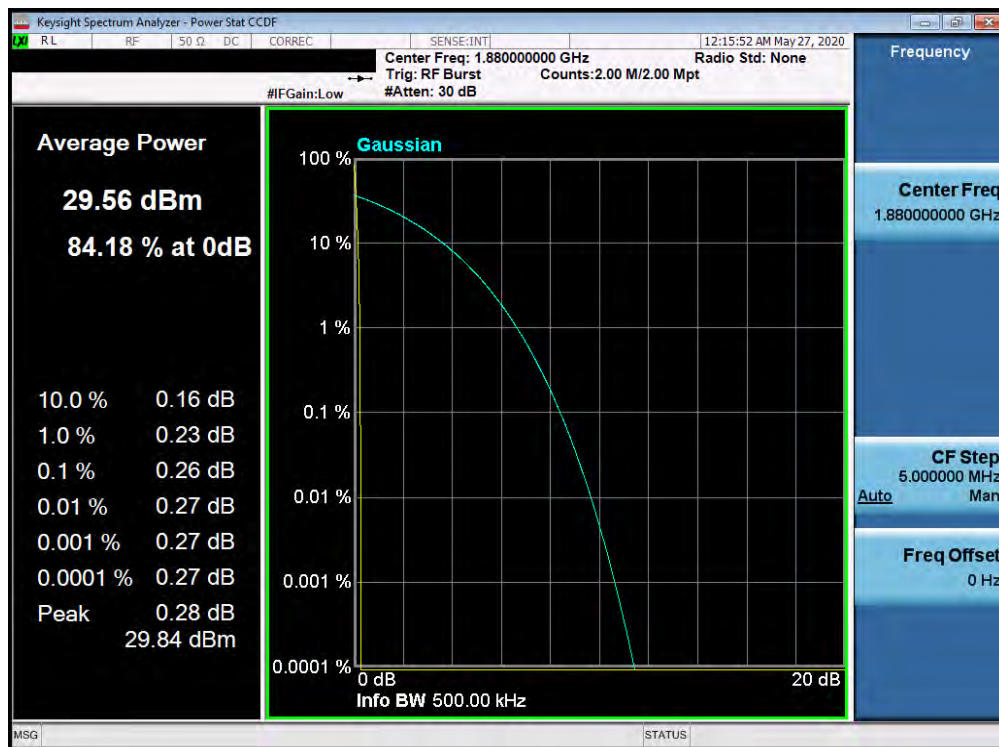


Figure 7-4. Test Instrument & Measurement Setup

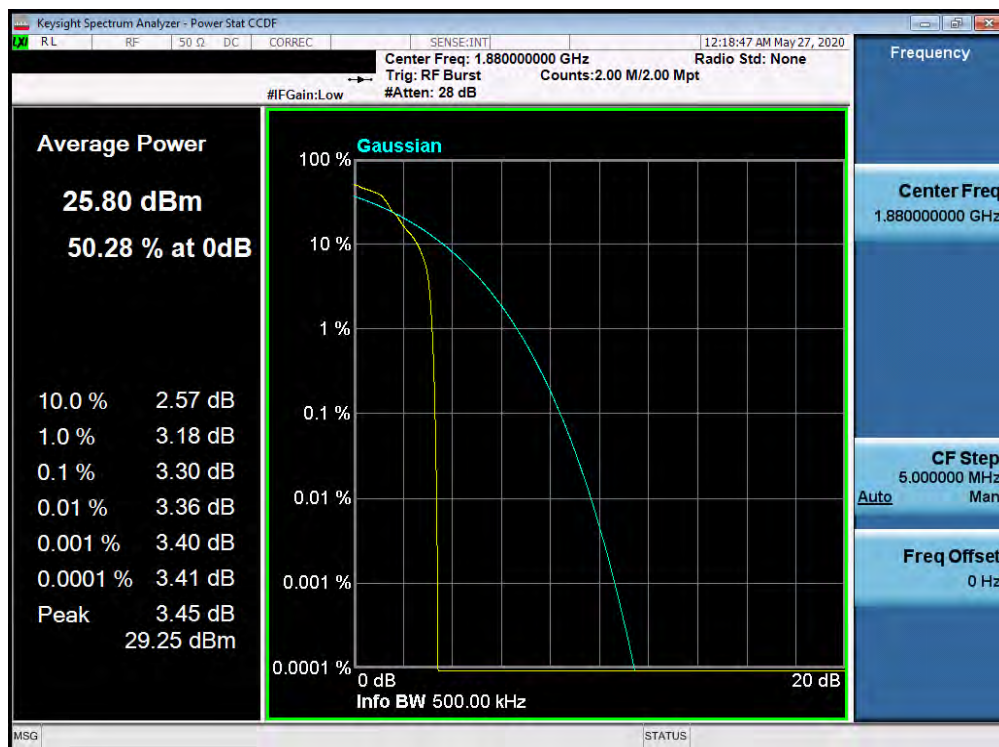
Test Notes

None

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 64 of 105

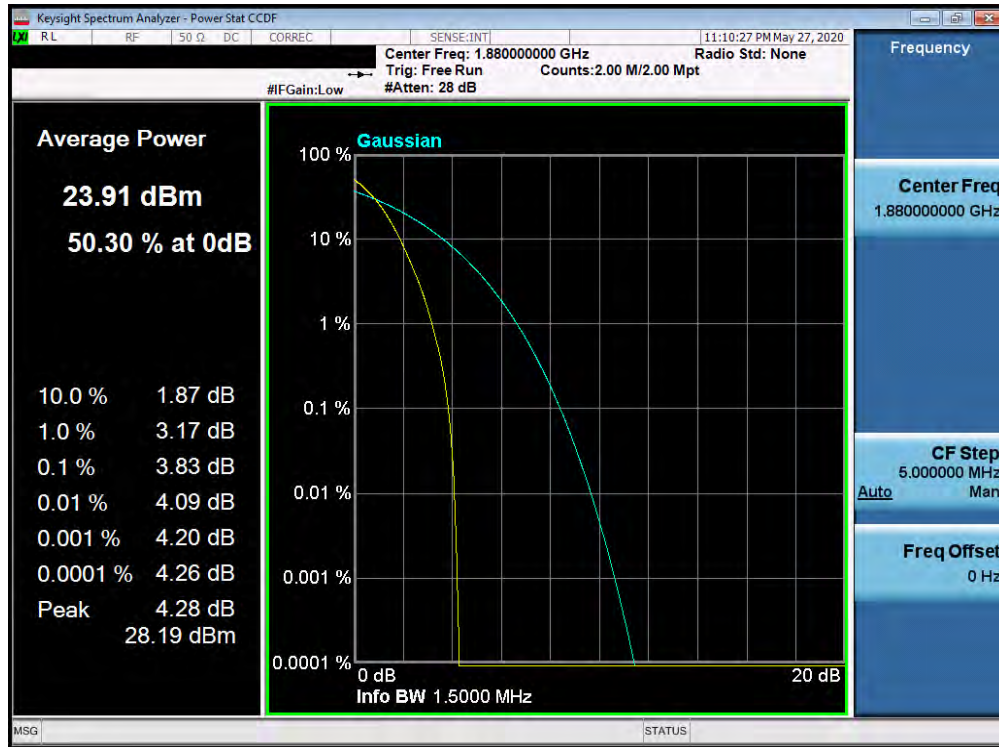


Plot 7-93. Peak-Average Ratio Plot (PCS GPRS Mode)

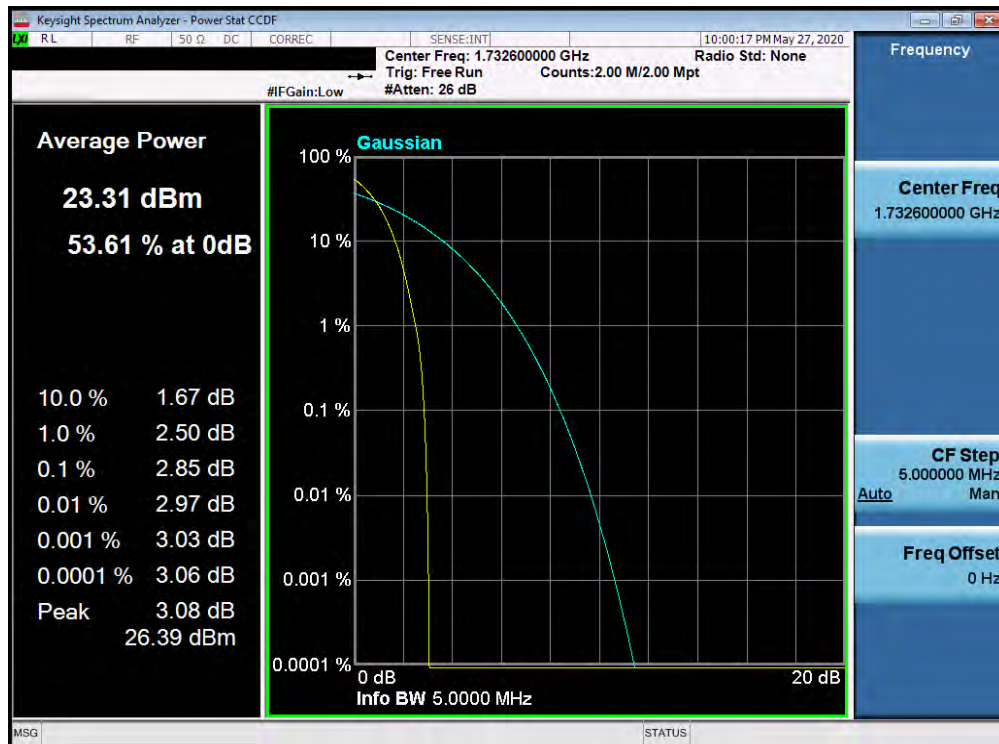


Plot 7-94. Peak-Average Ratio Plot (EDGE1900 Mode)

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 65 of 105

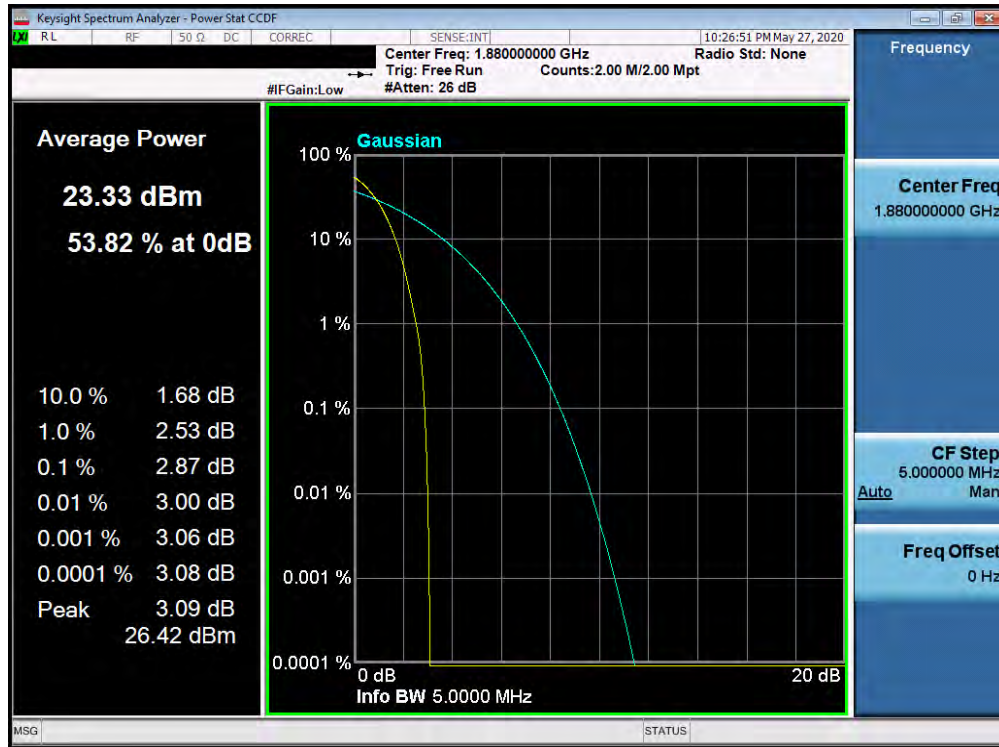


Plot 7-95. Peak-Average Ratio Plot (PCS CDMA Mode)



Plot 7-96. Peak-Average Ratio Plot (AWS WCDMA Mode)

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 66 of 105



Plot 7-97. Peak-Average Ratio Plot (PCS WCDMA Mode)

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 67 of 105

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: A3LSMN981U	 PCTEST® Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 68 of 105

Test Setup

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

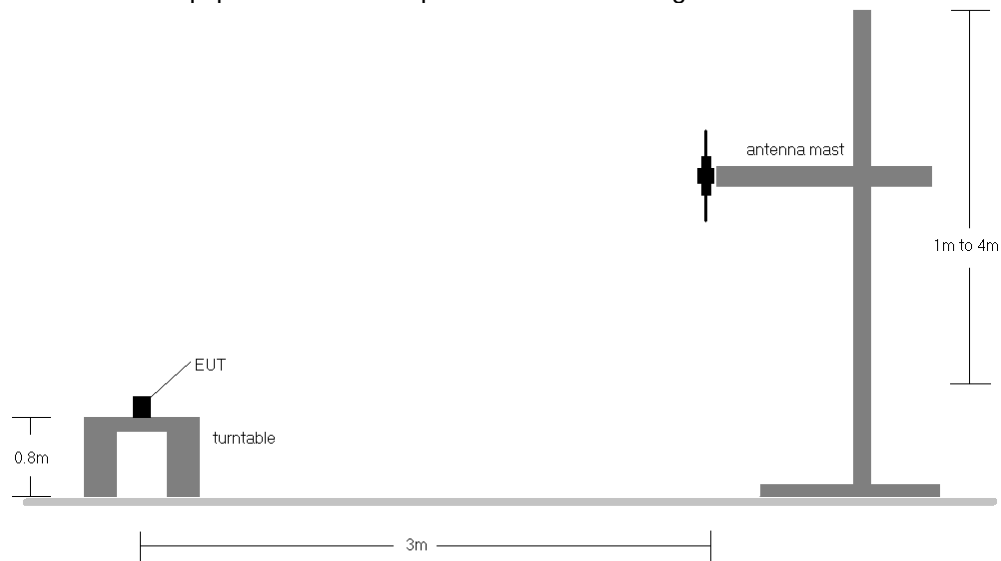


Figure 7-5. Radiated Test Setup <1GHz

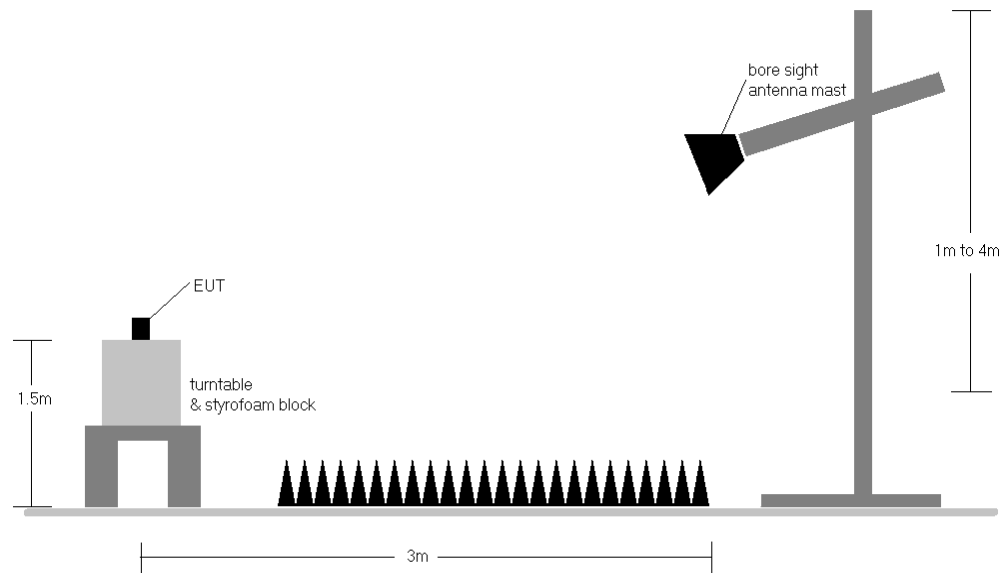


Figure 7-6. Radiated Test Setup >1GHz

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 69 of 105

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	269	90	18.54	6.35	22.74	38.45	-15.71	24.89	40.61	-15.72
836.60	GPRS850	V	158	66	20.69	6.38	24.92	38.45	-13.53	27.07	40.61	-13.54
848.80	GPRS850	V	152	91	22.08	6.51	26.44	38.45	-12.02	28.59	40.61	-12.02
848.80	GPRS850	H	213	190	16.04	6.51	20.40	38.45	-18.06	22.55	40.61	-18.06
848.80	EDGE850	V	152	91	15.62	6.51	19.98	38.45	-18.48	22.13	40.61	-18.48
848.80	GPRS850 (WCP)	V	169	201	20.91	6.51	25.27	38.45	-13.19	27.42	40.61	-13.19

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

FCC ID: A3LSMN981U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 70 of 105

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	154	82	14.40	6.70	18.95	38.45	-19.50	21.10	40.61	-19.51
836.52	CDMA850	V	154	82	14.24	6.70	18.79	38.45	-19.66	20.94	40.61	-19.67
848.31	CDMA850	V	250	75	13.62	6.70	18.17	38.45	-20.28	20.32	40.61	-20.29
824.70	CDMA850	H	132	120	12.20	6.70	16.75	38.45	-21.70	18.90	40.61	-21.71
824.70	CDMA850 (WCP)	V	142	110	13.14	6.70	17.69	38.45	-20.76	19.84	40.61	-20.77

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	137	105	15.43	6.37	19.65	38.45	-18.80	21.80	40.61	-18.80
836.60	WCDMA850	V	137	104	15.06	6.38	19.29	38.45	-19.16	21.44	40.61	-19.17
846.60	WCDMA850	V	142	98	15.27	6.48	19.60	38.45	-18.85	21.75	40.61	-18.85
826.40	WCDMA850	H	221	81	12.65	6.37	16.87	38.45	-21.58	19.02	40.61	-21.58
826.40	WCDMA850 (WCP)	V	156	159	14.58	6.37	18.80	38.45	-19.65	20.95	40.61	-19.65

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	153	338	13.79	9.37	23.16	30.00	-6.84
1732.60	WCDMA1700	V	139	349	14.08	9.22	23.30	30.00	-6.70
1752.60	WCDMA1700	V	153	327	12.84	9.11	21.95	30.00	-8.05
1732.60	WCDMA1700	H	236	99	13.25	9.22	22.47	30.00	-7.53
1732.60	WCDMA1700 (WCP)	V	154	201	12.75	9.22	21.97	30.00	-8.03

Table 7-5. EIRP (AWS WCDMA)

FCC ID: A3LSMN981U		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	122	206	17.86	9.90	27.76	33.01	-5.25
1880.00	GPRS1900	V	137	206	19.01	10.13	29.14	33.01	-3.87
1909.80	GPRS1900	V	109	215	19.19	10.34	29.53	33.01	-3.48
1909.80	GPRS1900	H	182	183	17.76	10.34	28.10	33.01	-4.91
1909.80	EDGE1900	V	109	215	15.99	10.34	26.33	33.01	-6.68
1909.80	GPRS1900 (WCP)	V	157	222	18.31	10.34	28.65	33.01	-4.36

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	138	315	13.97	10.10	24.07	33.01	-8.94
1880.00	CDMA1900	V	383	311	13.80	10.10	23.90	33.01	-9.11
1908.75	CDMA1900	V	322	321	12.59	10.10	22.69	33.01	-10.32
1851.25	CDMA1900	H	160	170	13.38	10.10	23.48	33.01	-9.53
1851.25	CDMA1900 (WCP)	V	160	153	13.96	10.10	24.06	33.01	-8.95

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	161	361	13.69	9.92	23.61	33.01	-9.40
1880.00	WCDMA1900	V	158	370	15.02	10.13	25.15	33.01	-7.86
1907.60	WCDMA1900	V	101	286	14.47	10.33	24.80	33.01	-8.21
1880.00	WCDMA1900	H	191	202	13.76	10.13	23.89	33.01	-9.12
1880.00	WCDMA1900 (WCP)	V	169	222	14.69	10.13	24.82	33.01	-8.19

Table 7-8. EIRP (PCS WCDMA)

FCC ID: A3LSMN981U		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.

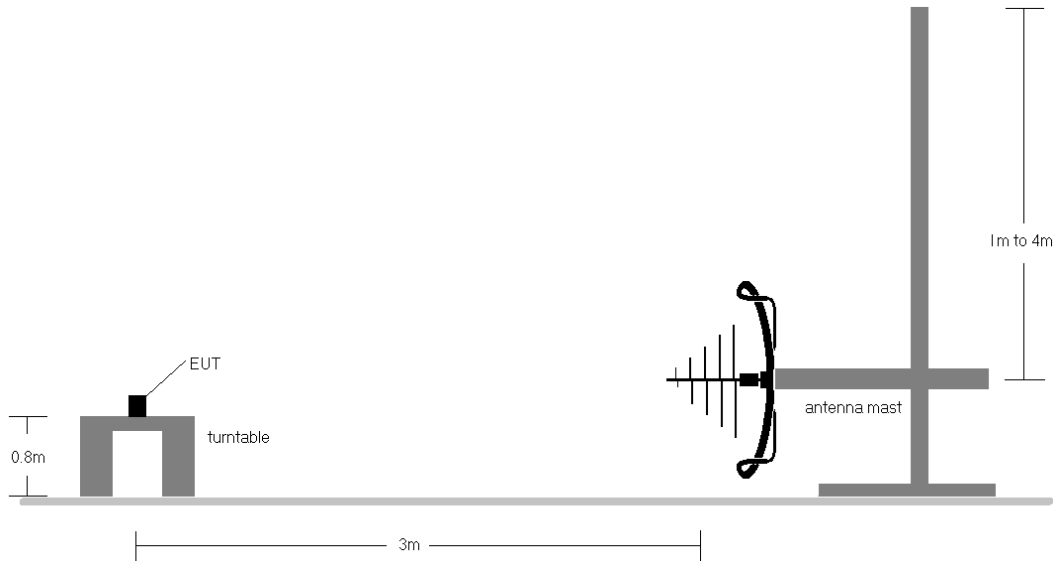


Figure 7-7. Test Instrument & Measurement Setup < 1GHz

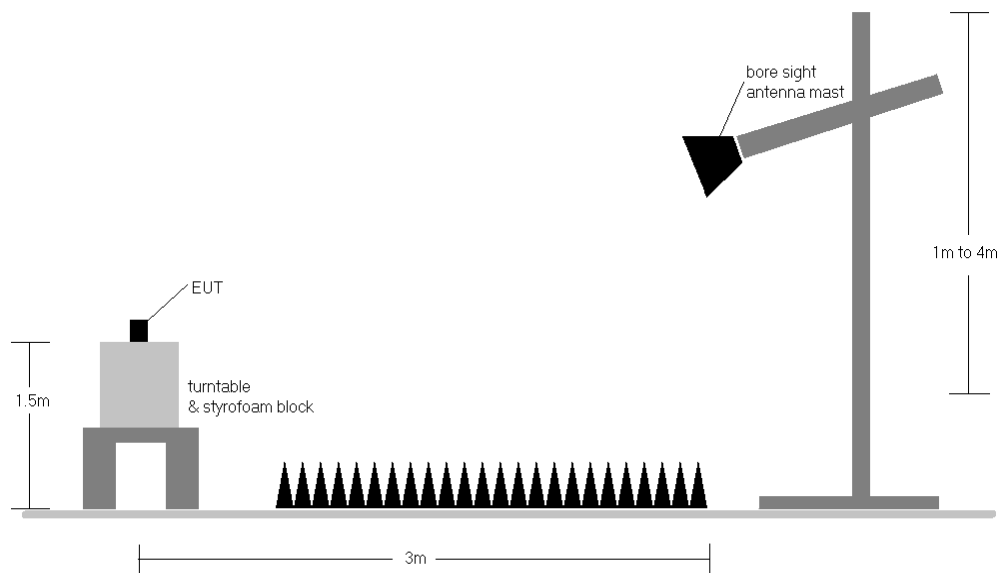


Figure 7-8. Test Instrument & Measurement Setup >1 GHz

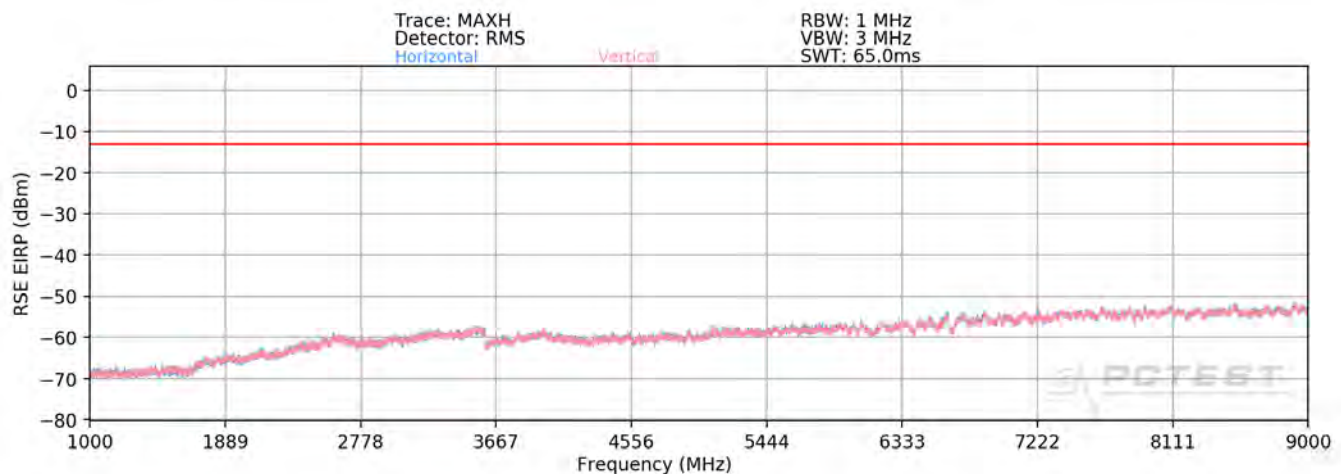
Test Notes

- 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."

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- 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.

Cellular GPRS Mode



Plot 7-98. Radiated Spurious Plot above 1GHz (Cellular GPRS Mode)

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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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	400	302	-75.62	8.93	-66.69	-53.7
2472.60	V	389	323	-61.67	9.18	-52.49	-39.5
3296.80	V	-	-	-69.68	9.43	-60.25	-47.2

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

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	289	204	-73.90	8.78	-65.12	-52.1
2509.80	V	375	332	-61.61	9.27	-52.33	-39.3
3346.40	V	-	-	-70.78	9.44	-61.34	-48.3
4183.00	V	-	-	-74.61	10.35	-64.26	-51.3

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

FCC ID: A3LSMN981U		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	111	205	-74.06	8.61	-65.44	-52.4
2546.40	V	154	327	-65.57	9.28	-56.30	-43.3
3395.20	V	-	-	-71.31	9.55	-61.76	-48.8

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

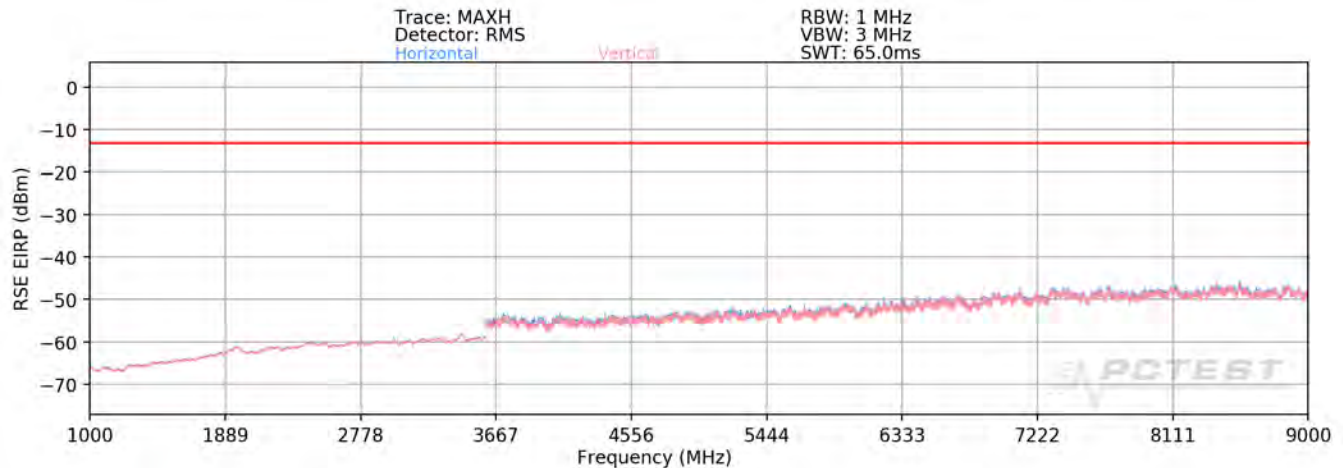
OPERATING FREQUENCY: 848.80 MHz
 MODULATION SIGNAL: GPRS (GMSK)
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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							

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

FCC ID: A3LSMN981U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Cellular CDMA Mode



Plot 7-99. 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	101	5	-64.31	3.61	-60.70	-47.7
2474.10	H	-	-	-59.48	4.22	-55.26	-42.3

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

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	101	5	-64.25	3.62	-60.63	-47.6
2509.56	H	-	-	-61.36	4.33	-57.02	-44.0

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

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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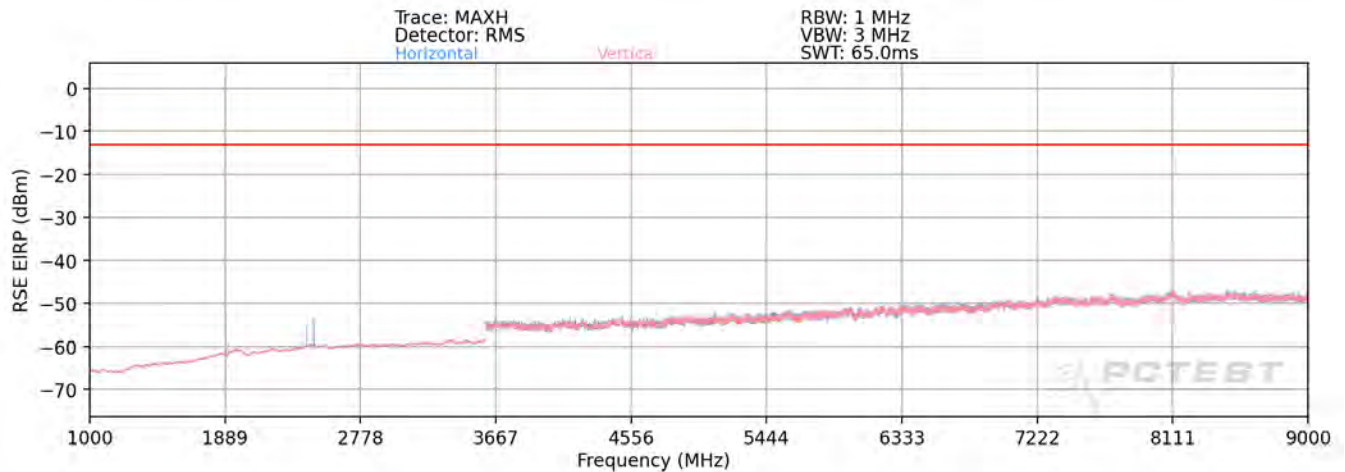
OPERATING FREQUENCY: 848.31 MHz
 MODULATION SIGNAL: CDMA
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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	101	5	-65.06	3.63	-61.43	-48.4
2544.93	H	-	-	-59.71	4.55	-55.16	-42.2

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

FCC ID: A3LSMN981U	 Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Cellular WCDMA Mode



Plot 7-100. 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	H	389	148	-72.93	8.92	-64.01	-51.0
2479.20	H	-	-	-69.13	9.20	-59.93	-46.9

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

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	H	-	-	-72.92	8.78	-64.14	-51.1
2509.80	H	-	-	-69.97	9.27	-60.70	-47.7

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

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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OPERATING FREQUENCY: 846.60 MHz

MODULATION SIGNAL: WCDMA

DISTANCE: 3 meters

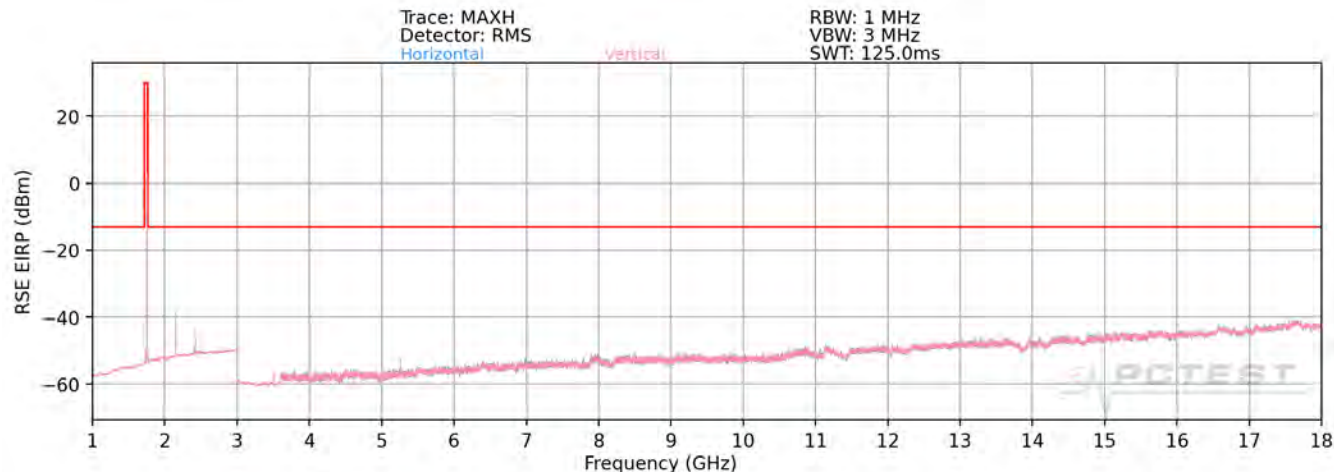
LIMIT: -13 dBm

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	H	-	-	-72.74	8.64	-64.10	-51.1
2539.80	H	-	-	-69.98	9.28	-60.70	-47.7

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

FCC ID: A3LSMN981U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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AWS WCDMA Mode



Plot 7-101. 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	V	303	364	-64.97	9.62	-55.35	-42.3
5137.20	V	273	333	-64.37	11.05	-53.31	-40.3
6849.60	V	-	-	-62.20	10.93	-51.27	-38.3

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

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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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	V	349	4	-65.14	9.68	-55.46	-42.5
5197.80	V	303	343	-65.09	11.02	-54.07	-41.1
6930.40	V	-	-	-63.66	11.02	-52.63	-39.6

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

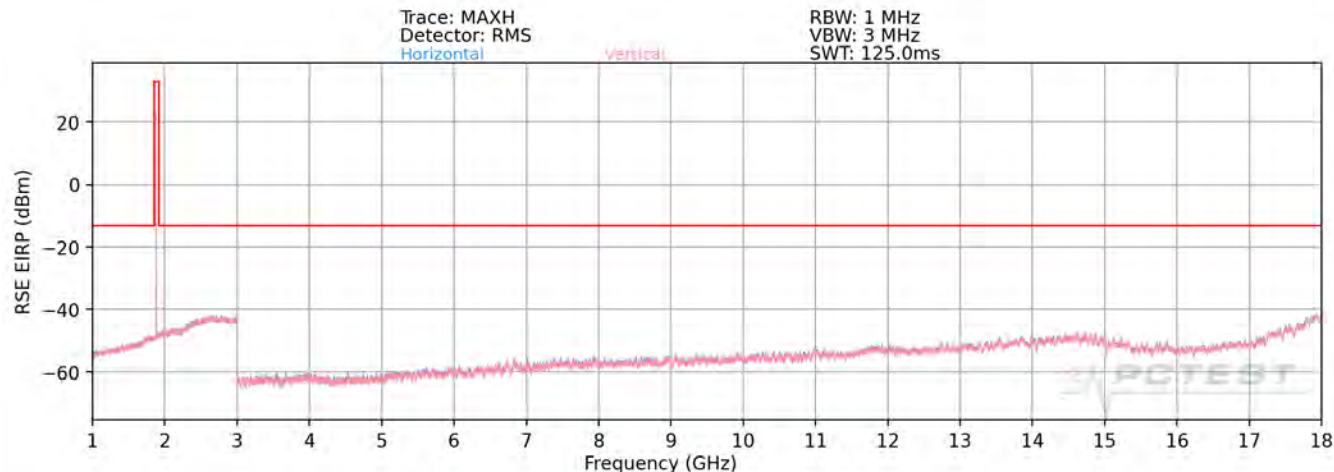
OPERATING FREQUENCY: 1752.60 MHz
 MODULATION SIGNAL: WCDMA
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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	V	180	351	-63.84	9.71	-54.13	-41.1
5257.80	V	117	344	-63.86	11.11	-52.75	-39.8
7010.40	V	-	-	-64.33	11.06	-53.27	-40.3

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

FCC ID: A3LSMN981U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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PCS GPRS Mode



Plot 7-102. 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	-	-	-68.76	9.85	-58.91	-45.9
5550.60	V	-	-	-64.78	11.18	-53.60	-40.6

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

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	-	-	-67.75	9.59	-58.16	-45.2
5640.00	V	-	-	-66.12	11.30	-54.81	-41.8

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

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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OPERATING FREQUENCY: 1909.80 MHz

MODULATION SIGNAL: GPRS (GMSK)

DISTANCE: 3 meters

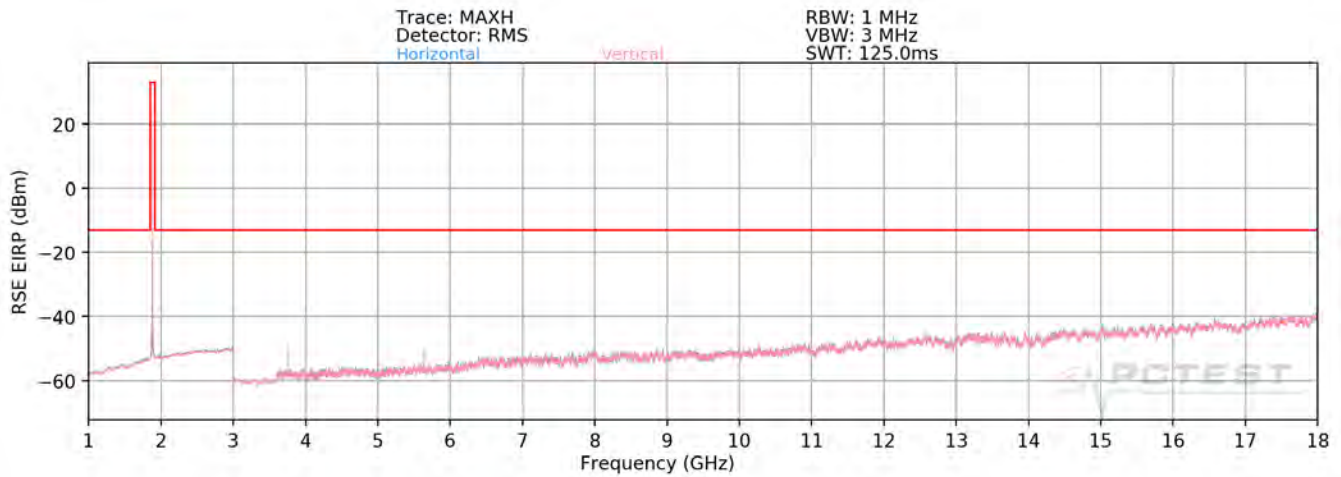
LIMIT: -13 dBm

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	-	-	-65.32	9.28	-56.05	-43.0
5729.40	V	-	-	-64.79	11.40	-53.39	-40.4

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

FCC ID: A3LSMN981U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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PCS CDMA Mode



Plot 7-103. 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	357	57	-62.20	9.84	-52.36	-39.4
5553.75	V	115	152	-60.00	11.19	-48.81	-35.8

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

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	-	-	-59.98	6.67	-53.31	-40.3
5640.00	V	-	-	-60.49	8.81	-51.67	-38.7

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

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 86 of 105

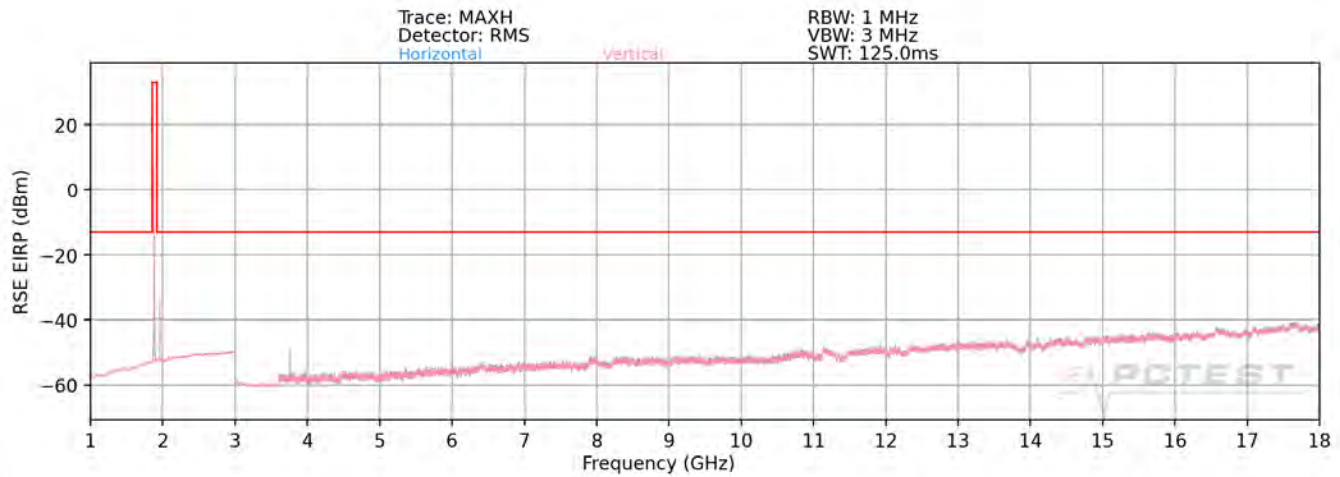
OPERATING FREQUENCY: 1908.75 MHz
 MODULATION SIGNAL: CDMA
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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	389	116	-56.55	6.98	-49.57	-36.6
5726.25	V	102	172	-54.79	8.77	-46.02	-33.0
7635.00	V	318	185	-54.65	8.53	-46.12	-33.1

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

FCC ID: A3LSMN981U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 87 of 105

PCS WCDMA Mode



Plot 7-104. 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	V	202	5	-60.01	9.83	-50.18	-37.2
5557.20	V	127	346	-63.06	11.19	-51.87	-38.9
7409.60	V	-	-	-59.89	10.88	-49.02	-36.0

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

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 88 of 105

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	V	303	3	-58.54	9.59	-48.96	-36.0
5640.00	V	115	342	-63.04	11.30	-51.73	-38.7
7520.00	V	-	-	-60.03	11.08	-48.95	-36.0
9400.00	V	-	-	-59.77	12.32	-47.46	-34.5

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

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	V	393	7	-57.96	9.28	-48.68	-35.7
5722.80	V	102	331	-62.77	11.40	-51.38	-38.4

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

FCC ID: A3LSMN981U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 89 of 105

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: A3LSMN981U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 90 of 105

Frequency Stability / Temperature Variation

OPERATING FREQUENCY: 836,600,000 Hz
 CHANNEL: 190
 REFERENCE VOLTAGE: 4.21 VDC
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.21	- 30	836,600,037	37	0.0000044
100 %		- 20	836,599,948	-52	-0.0000062
100 %		- 10	836,599,922	-78	-0.0000093
100 %		0	836,600,020	20	0.0000024
100 %		+ 10	836,599,975	-25	-0.0000030
100 %		+ 20	836,599,881	-119	-0.0000142
100 %		+ 30	836,600,014	14	0.0000017
100 %		+ 40	836,600,145	145	0.0000173
100 %		+ 50	836,599,976	-24	-0.0000029
BATT. ENDPOINT	2.84	+ 20	836,599,930	-70	-0.0000084

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

FCC ID: A3LSMN981U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 91 of 105

Frequency Stability / Temperature Variation

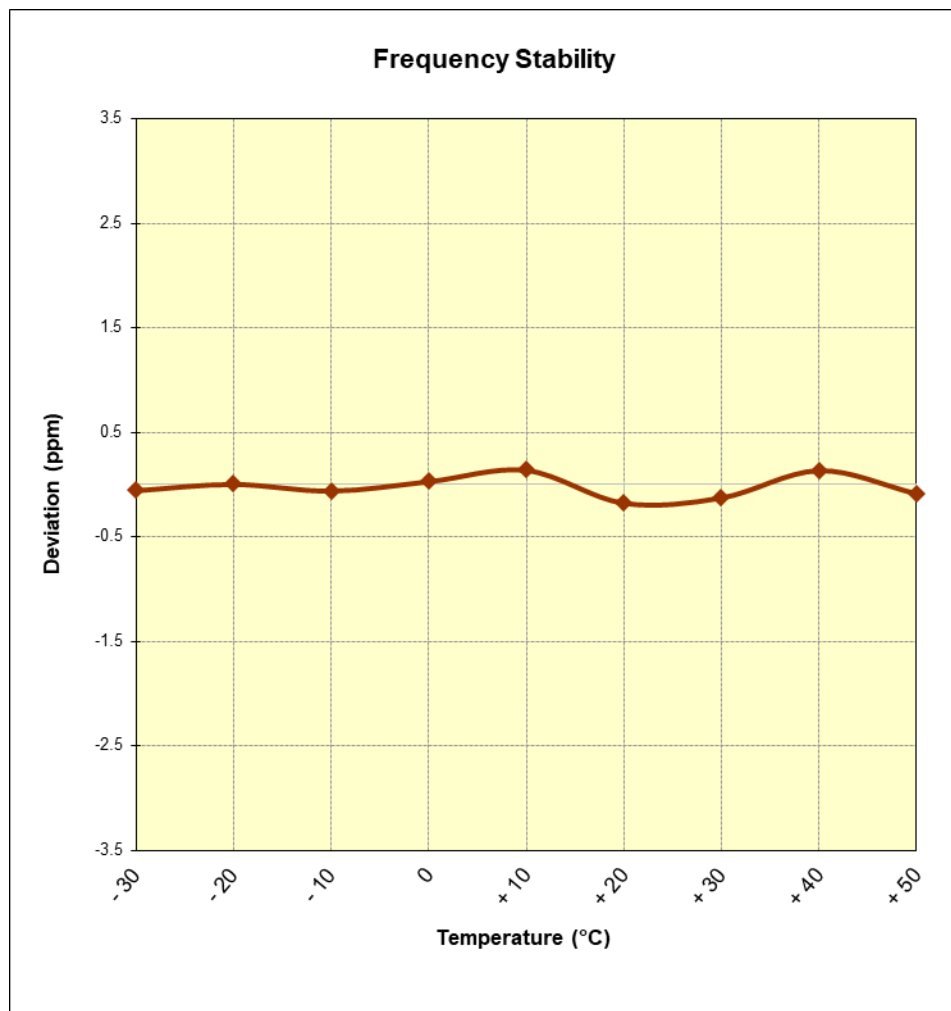


Figure 7-9. Frequency Stability Graph (Cellular GPRS Mode – Ch. 190)

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 92 of 105

Frequency Stability / Temperature Variation

OPERATING FREQUENCY: 836,520,000 Hz
CHANNEL: 384
REFERENCE VOLTAGE: 4.21 VDC
DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.21	- 30	836,520,009	9	0.0000011
100 %		- 20	836,519,930	-70	-0.0000084
100 %		- 10	836,520,011	11	0.0000013
100 %		0	836,519,979	-21	-0.0000025
100 %		+ 10	836,519,878	-122	-0.0000146
100 %		+ 20	836,519,977	-23	-0.0000027
100 %		+ 30	836,519,897	-103	-0.0000123
100 %		+ 40	836,519,860	-140	-0.0000167
100 %		+ 50	836,519,867	-133	-0.0000159
BATT. ENDPOINT	2.84	+ 20	836,519,973	-27	-0.0000032

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

FCC ID: A3LSMN981U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 93 of 105

Frequency Stability / Temperature Variation

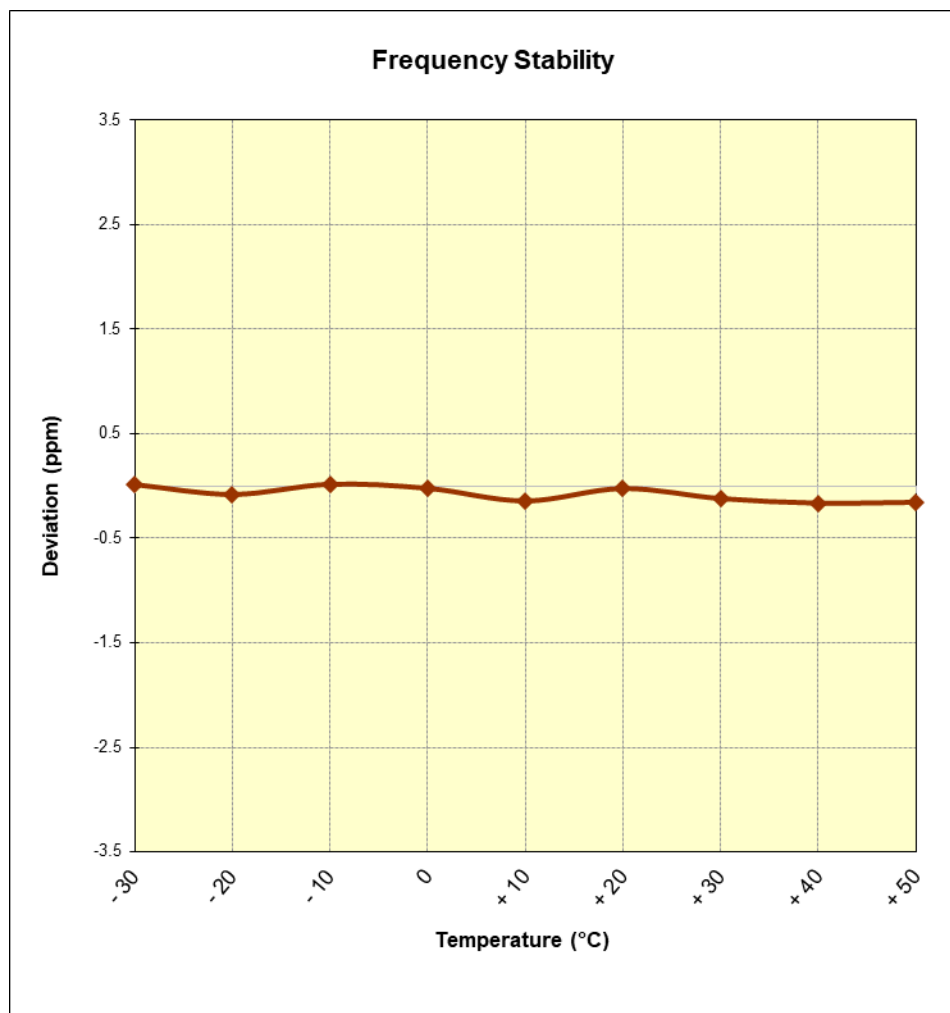


Figure 7-10. Frequency Stability Graph (Cellular CDMA Mode – Ch. 384)

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 94 of 105

Frequency Stability / Temperature Variation

OPERATING FREQUENCY: 836,600,000 Hz
 CHANNEL: 4183
 REFERENCE VOLTAGE: 4.21 VDC
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.21	- 30	836,599,924	-76	-0.0000091
100 %		- 20	836,600,058	58	0.0000069
100 %		- 10	836,600,118	118	0.0000141
100 %		0	836,600,049	49	0.0000059
100 %		+ 10	836,599,937	-63	-0.0000075
100 %		+ 20	836,600,140	140	0.0000167
100 %		+ 30	836,599,923	-77	-0.0000092
100 %		+ 40	836,599,986	-14	-0.0000017
100 %		+ 50	836,600,110	110	0.0000131
BATT. ENDPOINT	2.84	+ 20	836,599,895	-105	-0.0000126

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

FCC ID: A3LSMN981U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 95 of 105

Frequency Stability / Temperature Variation

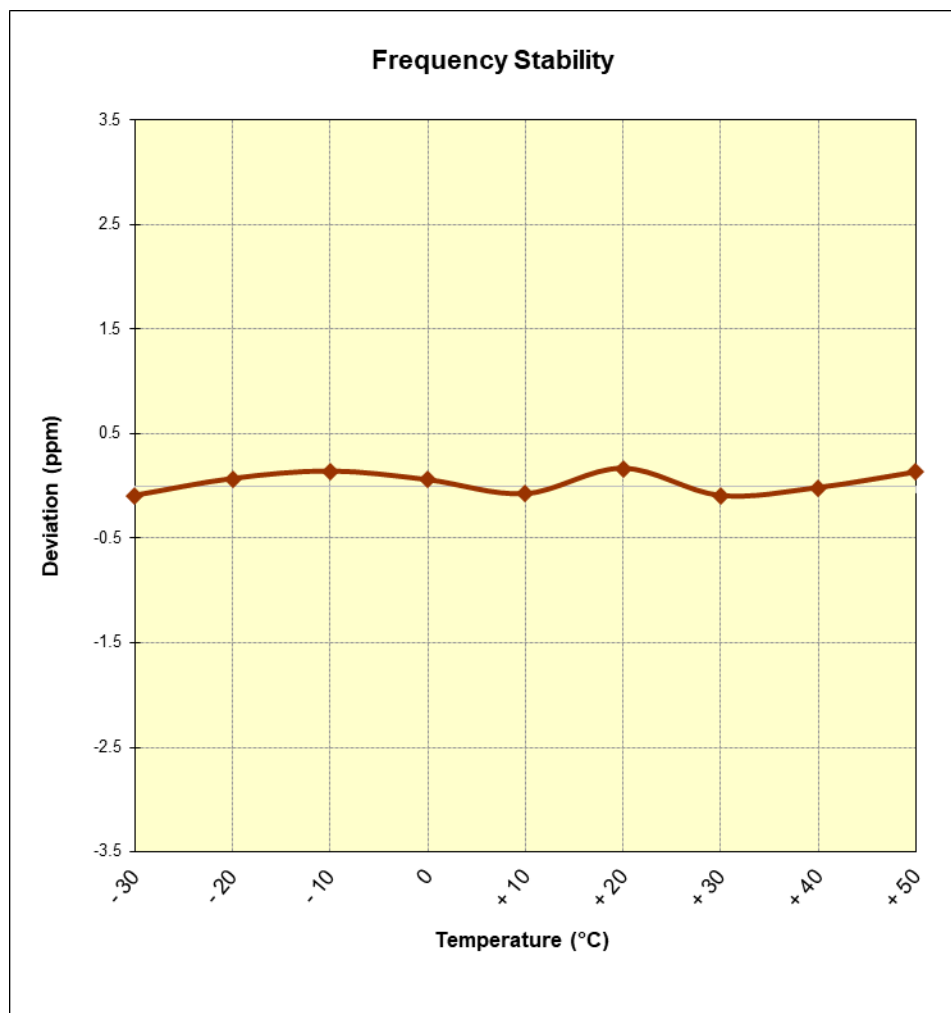


Figure 7-11. Frequency Stability Graph (Cellular WCDMA Mode – Ch. 4183)

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 96 of 105

Frequency Stability / Temperature Variation

OPERATING FREQUENCY: 1,732,600,000 Hz
CHANNEL: 1413
REFERENCE VOLTAGE: 4.21 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.21	- 30	1,732,599,992	-8	-0.0000005
100 %		- 20	1,732,599,890	-110	-0.0000063
100 %		- 10	1,732,600,147	147	0.0000085
100 %		0	1,732,599,860	-140	-0.0000081
100 %		+ 10	1,732,600,059	59	0.0000034
100 %		+ 20	1,732,600,109	109	0.0000063
100 %		+ 30	1,732,600,034	34	0.0000020
100 %		+ 40	1,732,599,914	-86	-0.0000050
100 %		+ 50	1,732,599,952	-48	-0.0000028
BATT. ENDPOINT	2.84	+ 20	1,732,599,980	-20	-0.0000012

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: A3LSMN981U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 97 of 105

Frequency Stability / Temperature Variation

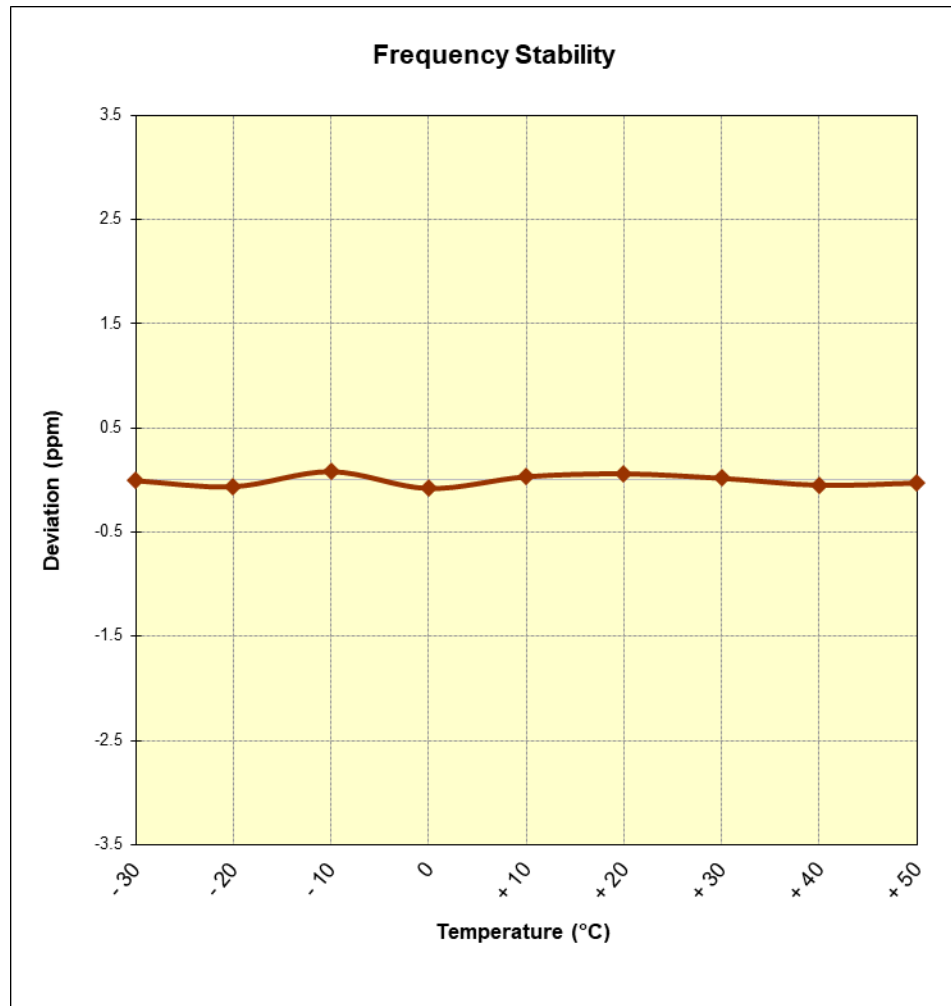


Figure 7-12. Frequency Stability Graph (AWS WCDMA Mode – Ch. 1413)

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 98 of 105

Frequency Stability / Temperature Variation

OPERATING FREQUENCY: 1,880,000,000 Hz
 CHANNEL: 661
 REFERENCE VOLTAGE: 4.21 VDC
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.21	- 30	1,879,999,856	-144	-0.0000077
100 %		- 20	1,879,999,981	-19	-0.0000010
100 %		- 10	1,879,999,913	-87	-0.0000046
100 %		0	1,879,999,990	-10	-0.0000005
100 %		+ 10	1,879,999,985	-15	-0.0000008
100 %		+ 20	1,880,000,059	59	0.0000031
100 %		+ 30	1,880,000,059	59	0.0000031
100 %		+ 40	1,880,000,116	116	0.0000062
100 %		+ 50	1,879,999,927	-73	-0.0000039
BATT. ENDPOINT	2.84	+ 20	1,880,000,087	87	0.0000046

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

FCC ID: A3LSMN981U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 99 of 105

Frequency Stability / Temperature Variation

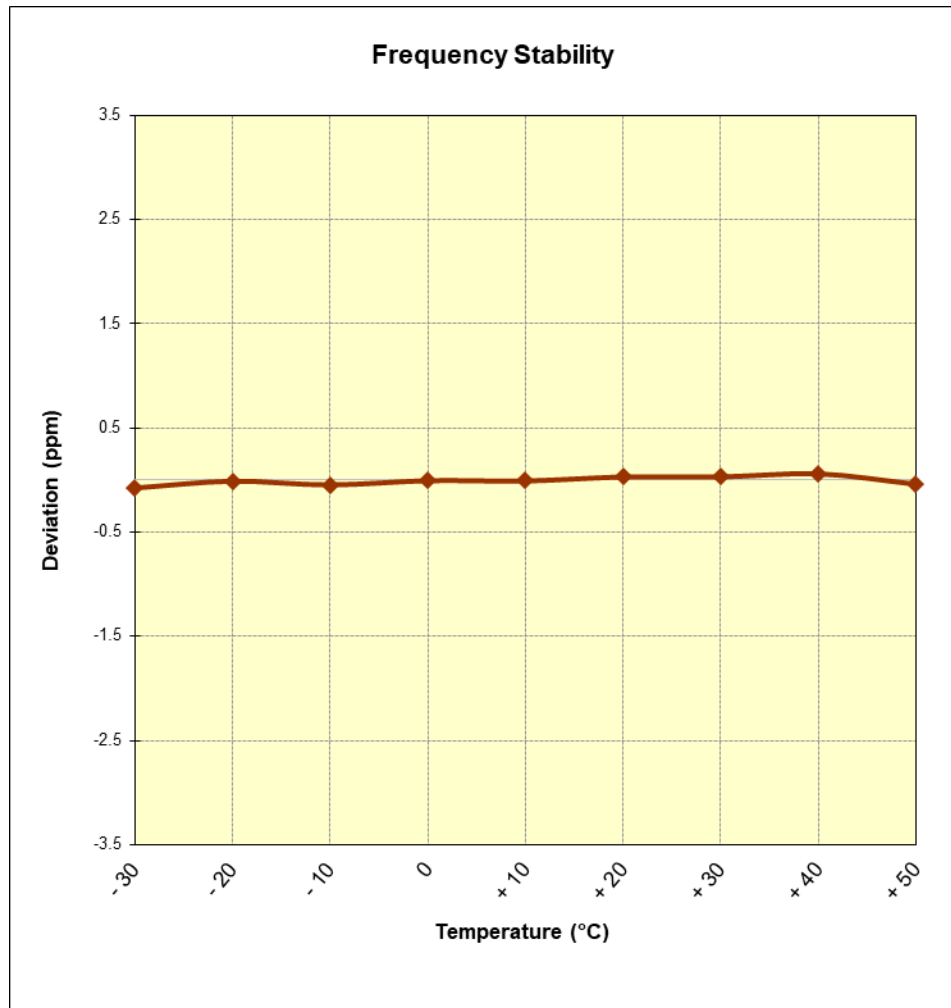


Figure 7-13. Frequency Stability Graph (PCS GPRS Mode – Ch. 661)

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 100 of 105

Frequency Stability / Temperature Variation

OPERATING FREQUENCY: 1,880,000,000 Hz
 CHANNEL: 600
 REFERENCE VOLTAGE: 4.21 VDC
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.21	- 30	1,880,000,110	110	0.0000059
100 %		- 20	1,879,999,897	-103	-0.0000055
100 %		- 10	1,880,000,005	5	0.0000003
100 %		0	1,879,999,866	-134	-0.0000071
100 %		+ 10	1,880,000,014	14	0.0000007
100 %		+ 20	1,879,999,867	-133	-0.0000071
100 %		+ 30	1,880,000,149	149	0.0000079
100 %		+ 40	1,879,999,864	-136	-0.0000072
100 %		+ 50	1,879,999,907	-93	-0.0000049
BATT. ENDPOINT	2.84	+ 20	1,879,999,903	-97	-0.0000052

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

FCC ID: A3LSMN981U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 101 of 105

Frequency Stability / Temperature Variation

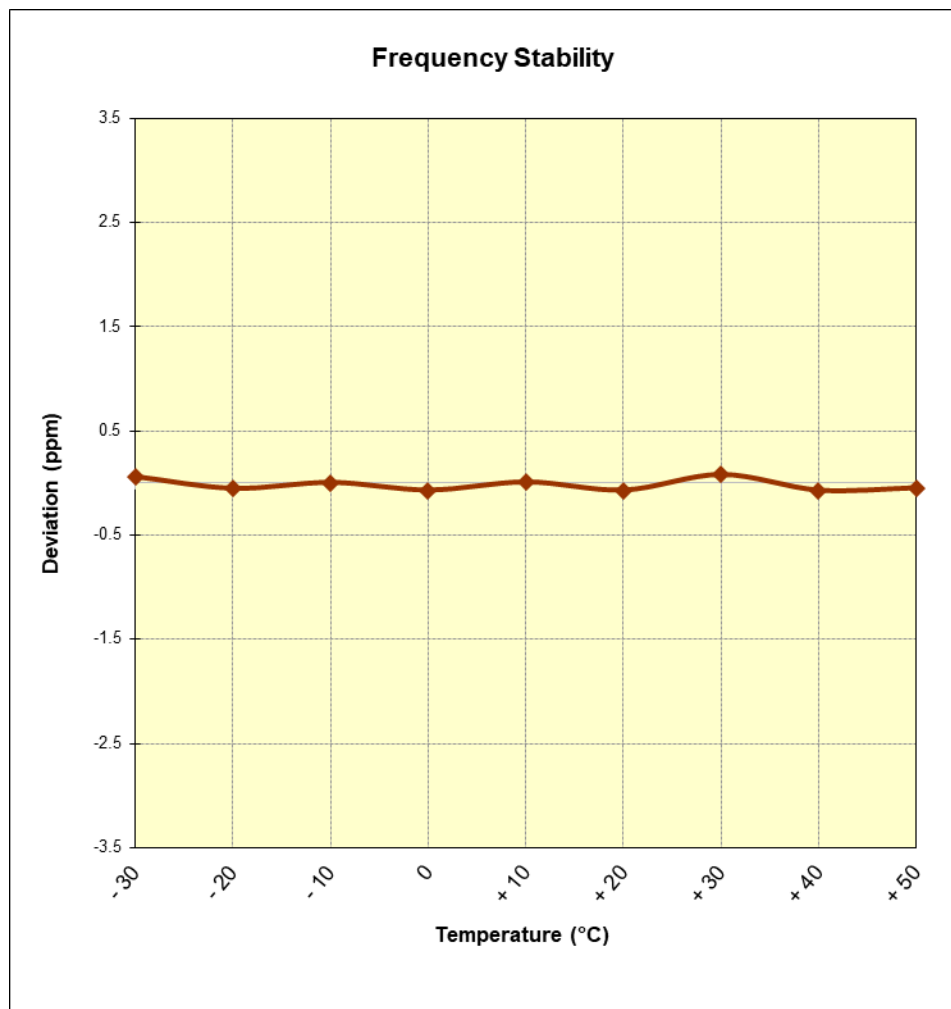


Figure 7-14. Frequency Stability Graph (PCS CDMA Mode – Ch. 600)

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 102 of 105

Frequency Stability / Temperature Variation

OPERATING FREQUENCY: 1,880,000,000 Hz
 CHANNEL: 9400
 REFERENCE VOLTAGE: 4.21 VDC
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.21	- 30	1,880,000,094	94	0.0000050
100 %		- 20	1,880,000,145	145	0.0000077
100 %		- 10	1,880,000,038	38	0.0000020
100 %		0	1,880,000,049	49	0.0000026
100 %		+ 10	1,880,000,137	137	0.0000073
100 %		+ 20	1,879,999,943	-57	-0.0000030
100 %		+ 30	1,880,000,119	119	0.0000063
100 %		+ 40	1,880,000,008	8	0.0000004
100 %		+ 50	1,880,000,042	42	0.0000022
BATT. ENDPOINT	2.84	+ 20	1,880,000,094	94	0.0000050

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

FCC ID: A3LSMN981U		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 103 of 105

Frequency Stability / Temperature Variation

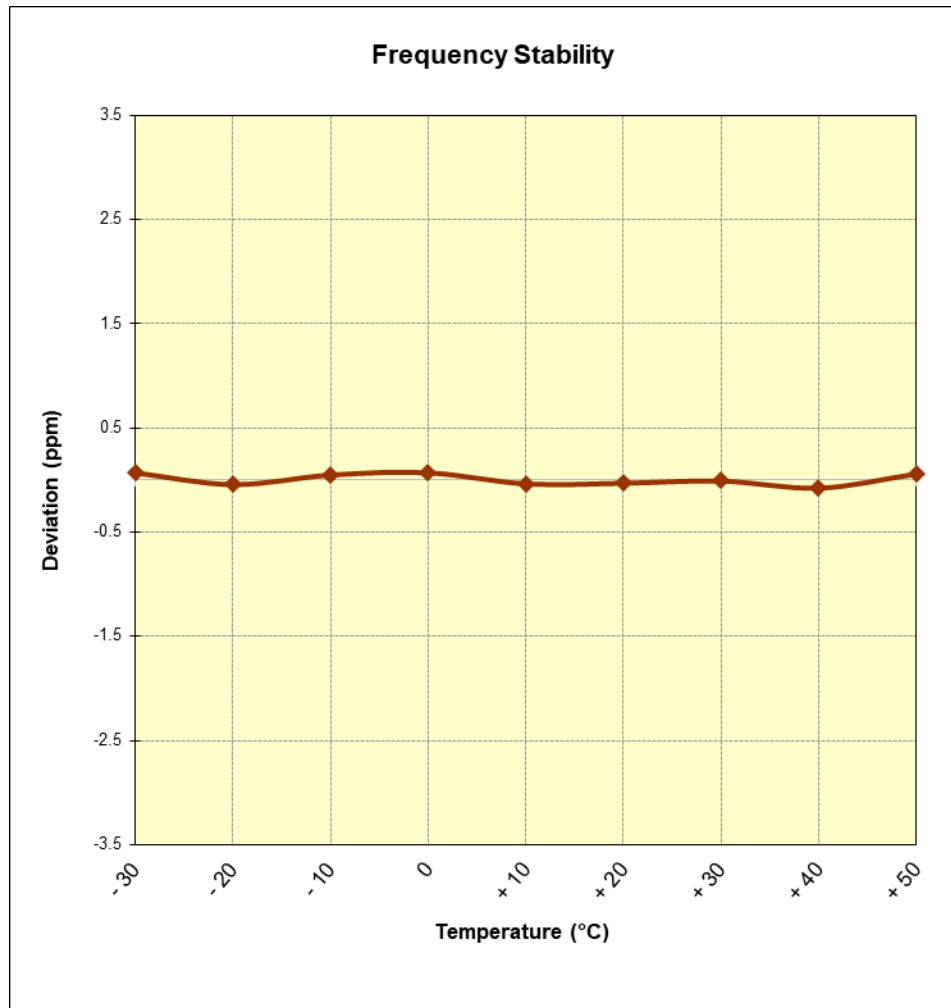


Figure 7-15. Frequency Stability Graph (PCS WCDMA Mode – Ch. 9400)

FCC ID: A3LSMN981U	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 104 of 105

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMN981U** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules.

FCC ID: A3LSMN981U	 Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2005050081-02.A3L	Test Dates: 5/5 - 7/7/2020	EUT Type: Portable Handset		Page 105 of 105