

7.5 Peak-Average Ratio

§24.232(d) RSS-130(4.4) RSS-132(5.4) RSS-133(6.4) RSS-139(6.5)

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 v03 – 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.

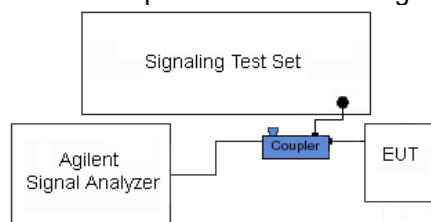


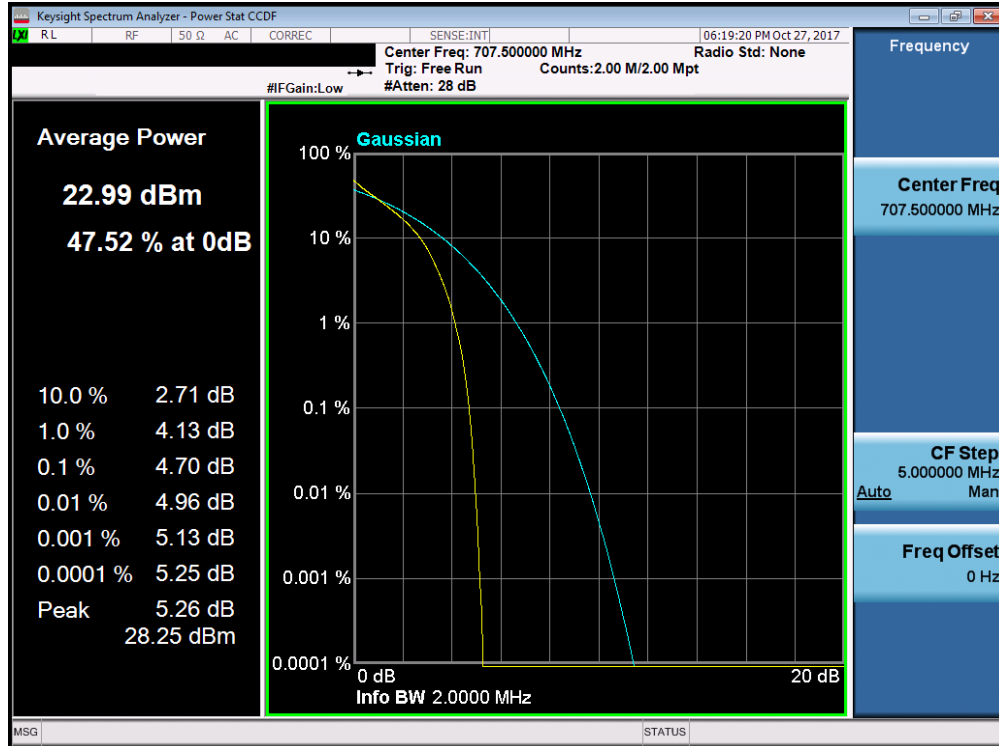
Figure 7-4. Test Instrument & Measurement Setup

Test Notes

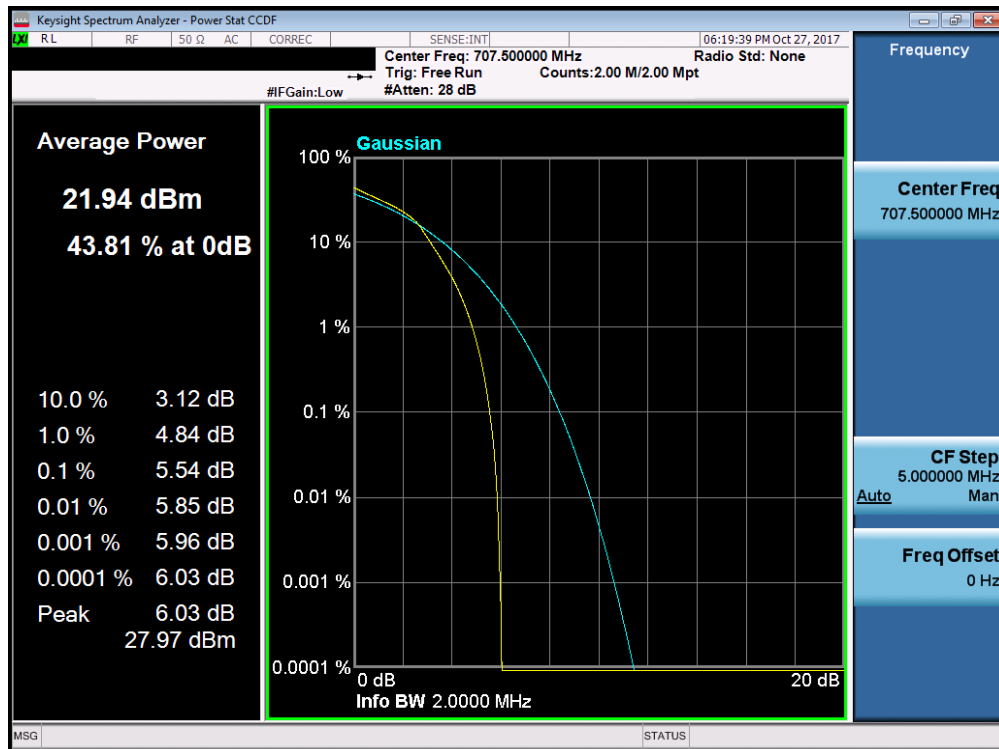
None.

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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Band 12

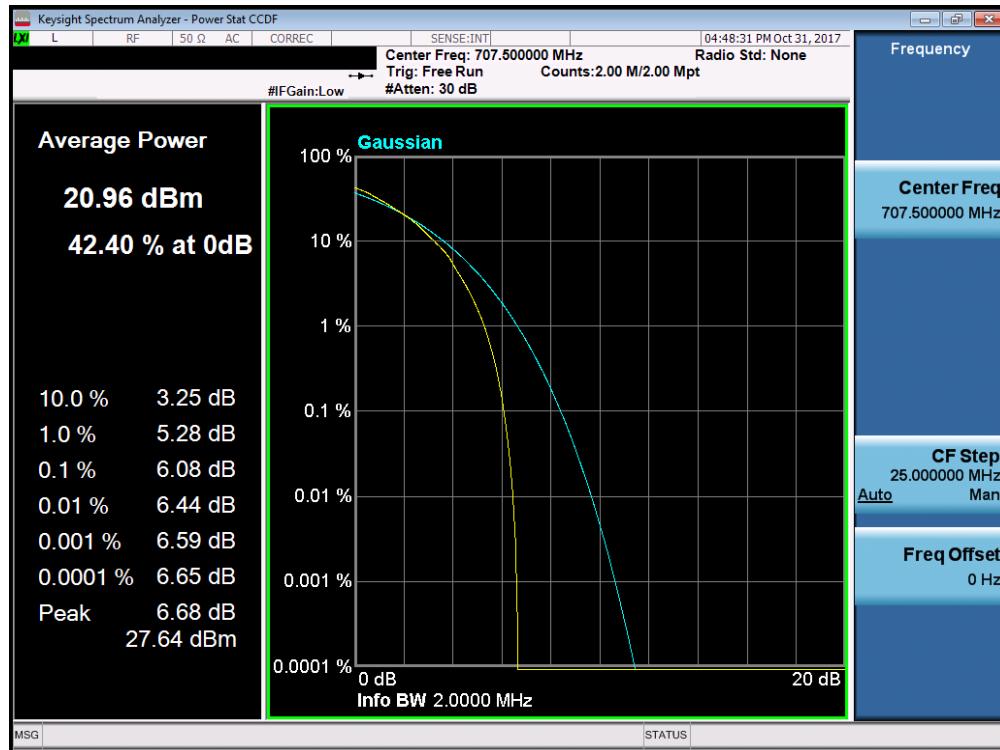


Plot 7-226. PAR Plot (Band 12/17 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-227. PAR Plot (Band 12/17 - 1.4MHz 16-QAM - Full RB Configuration)

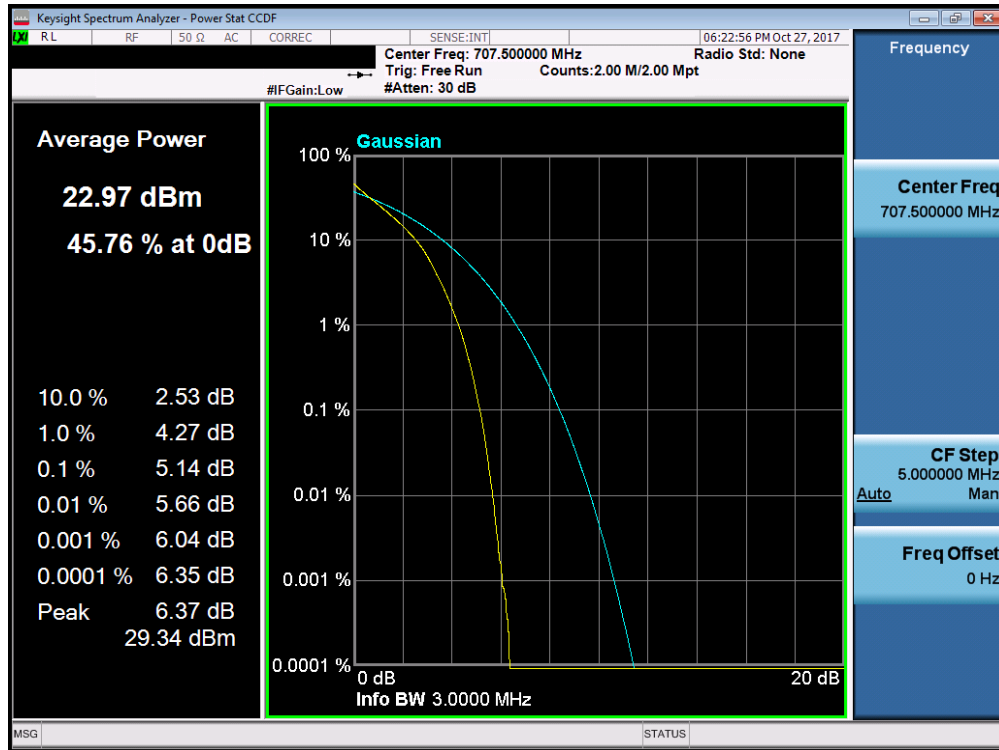
FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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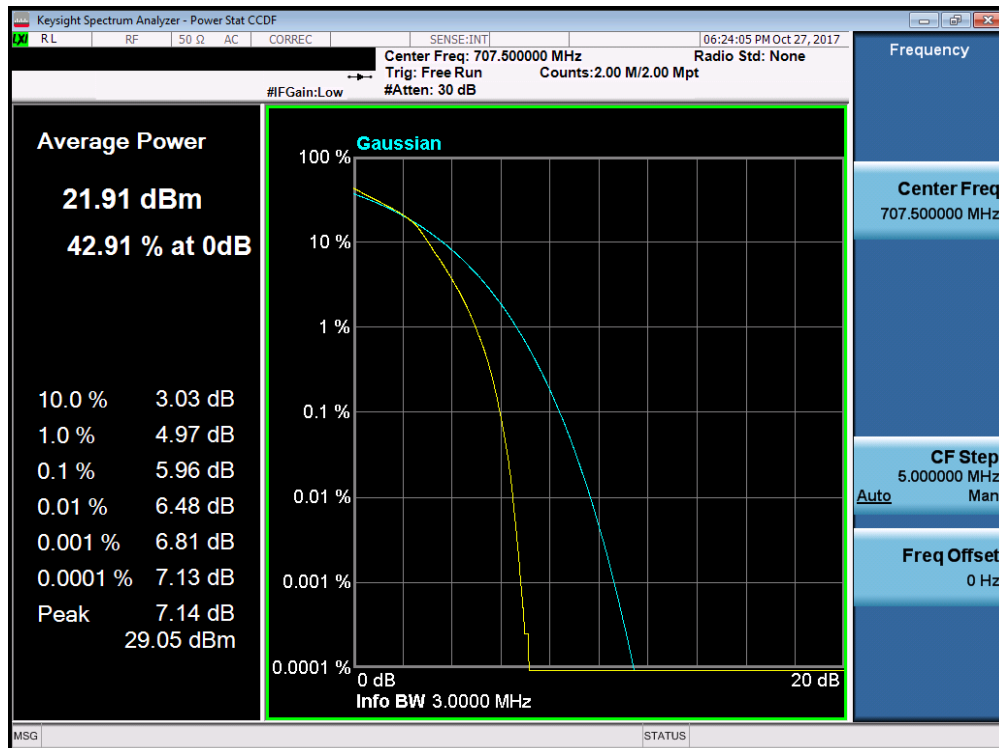
Plot 7-228. PAR Plot (Band 12/17 - 1.4MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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Band 12

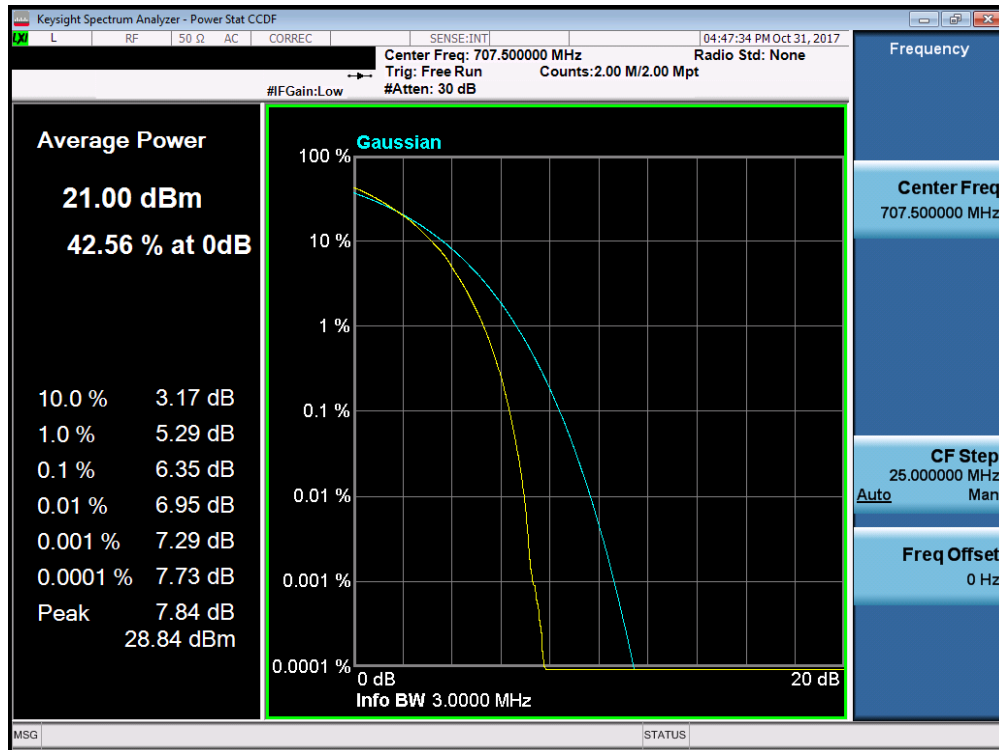


Plot 7-229. PAR Plot (Band 12/17 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-230. PAR Plot (Band 12/17 - 3.0MHz 16-QAM - Full RB Configuration)

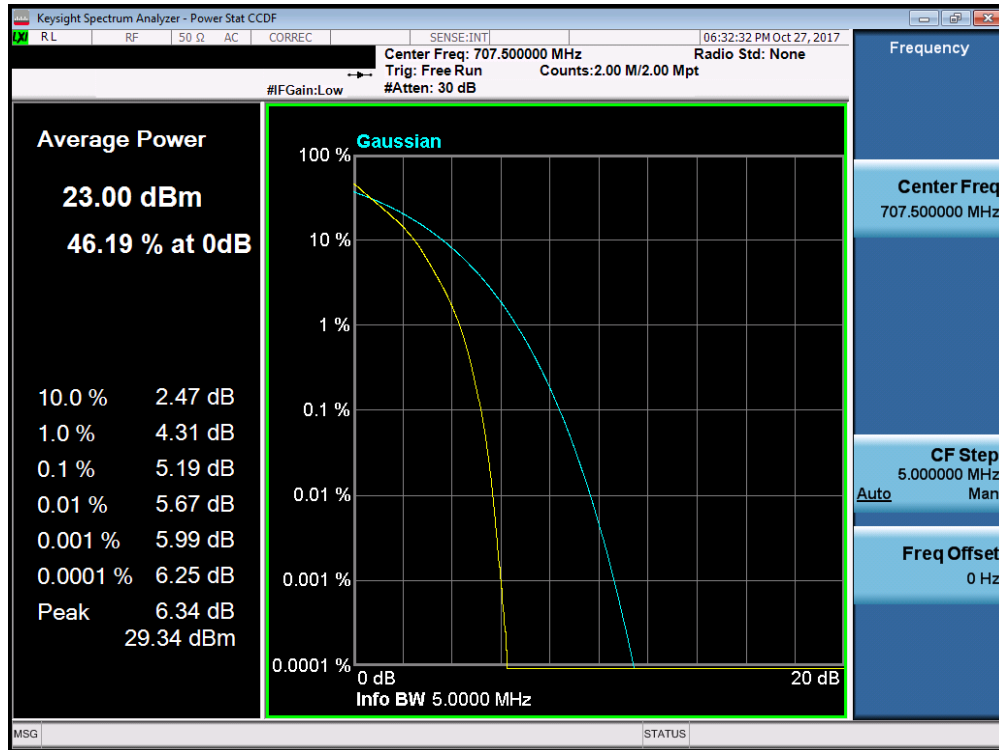
FCC ID: A3LSMA530F	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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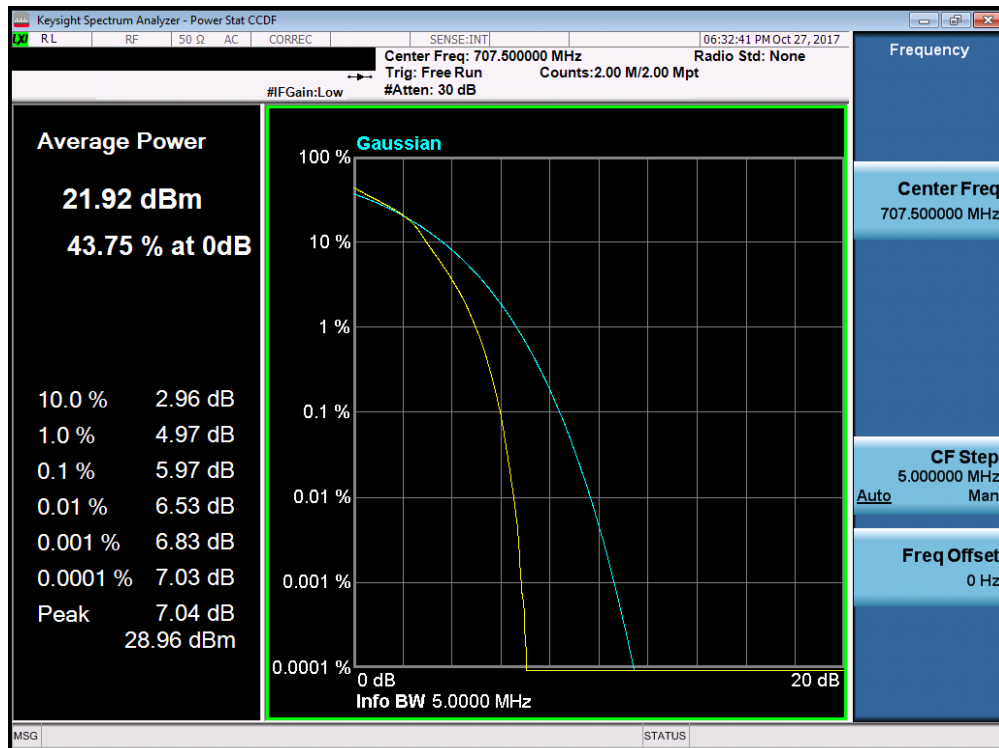
Plot 7-231. PAR Plot (Band 12/17 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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Band 12/17

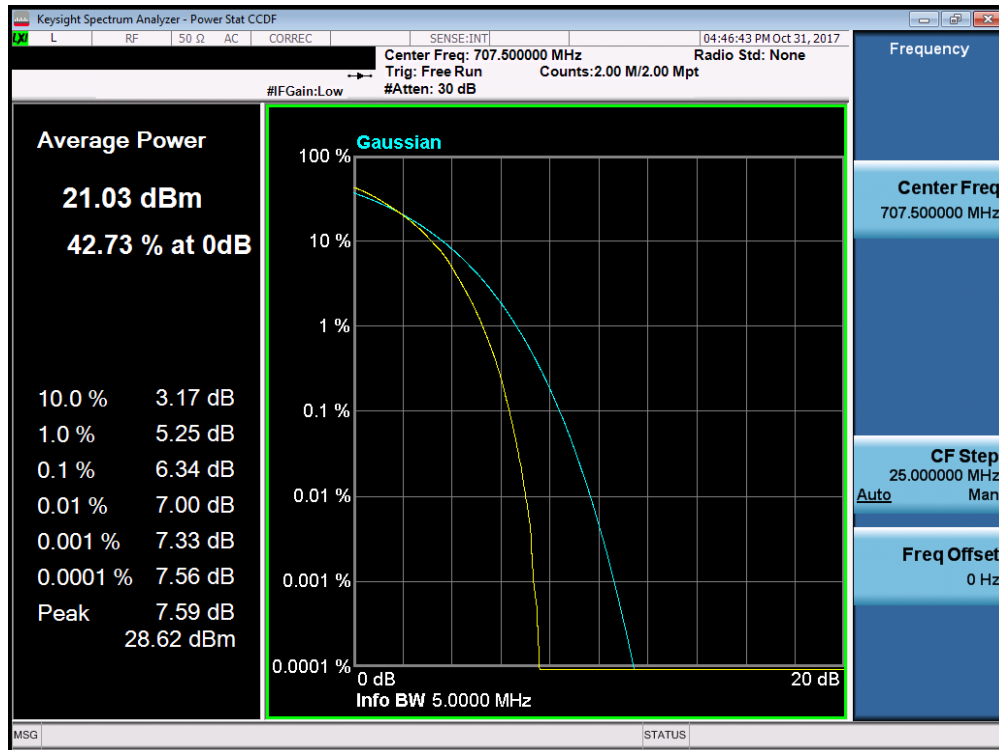


Plot 7-232. PAR Plot (Band 12/17 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-233. PAR Plot (Band 12/17 - 5.0MHz 16-QAM - Full RB Configuration)

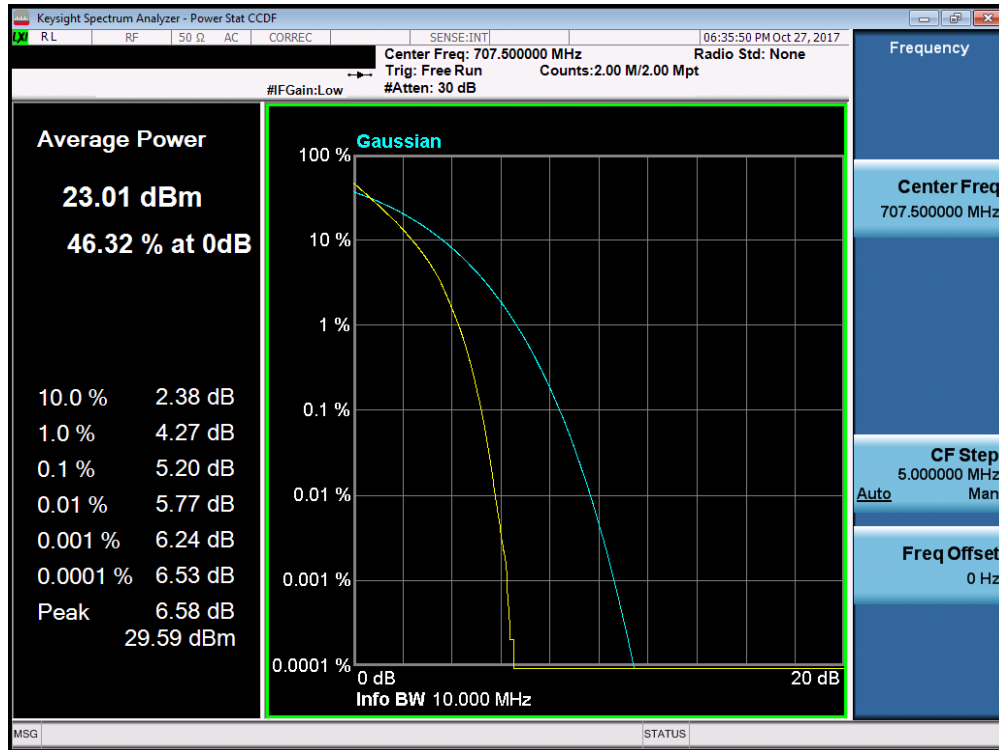
FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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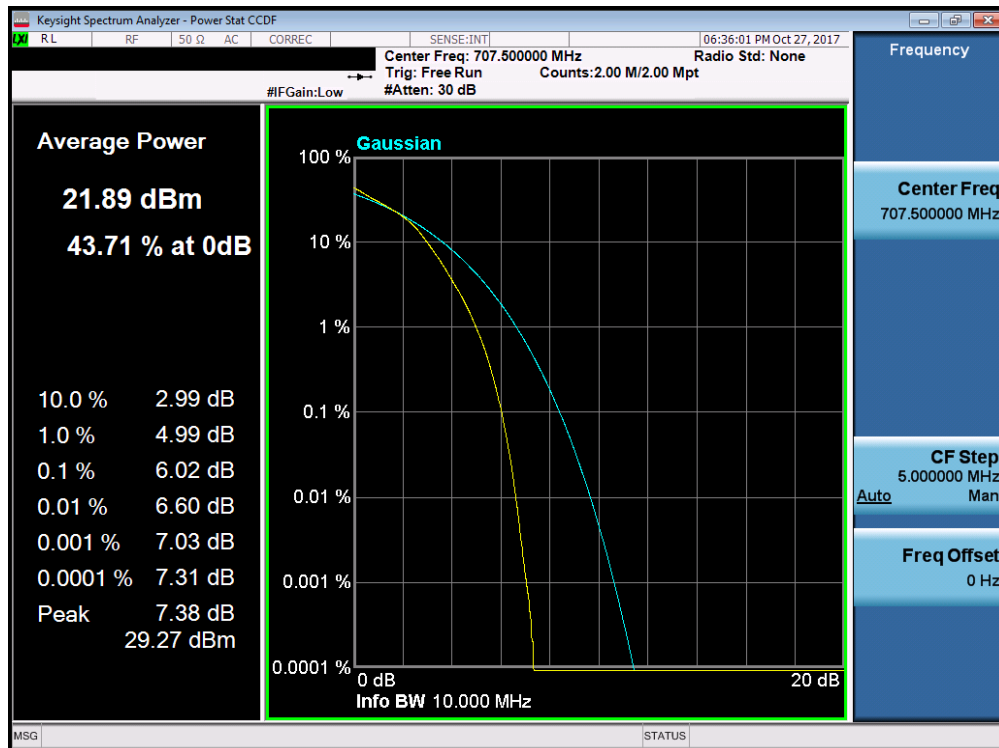
Plot 7-234. PAR Plot (Band 12/17 - 5.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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Band 12/17

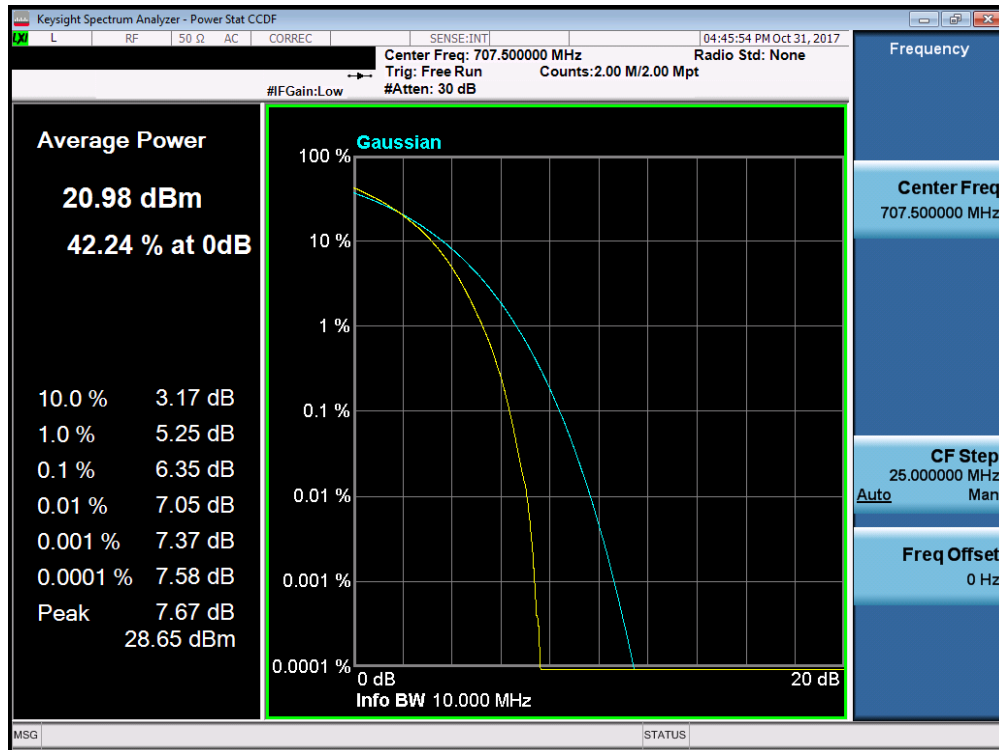


Plot 7-235. PAR Plot (Band 12/17 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-236. PAR Plot (Band 12/17 - 10.0MHz 16-QAM - Full RB Configuration)

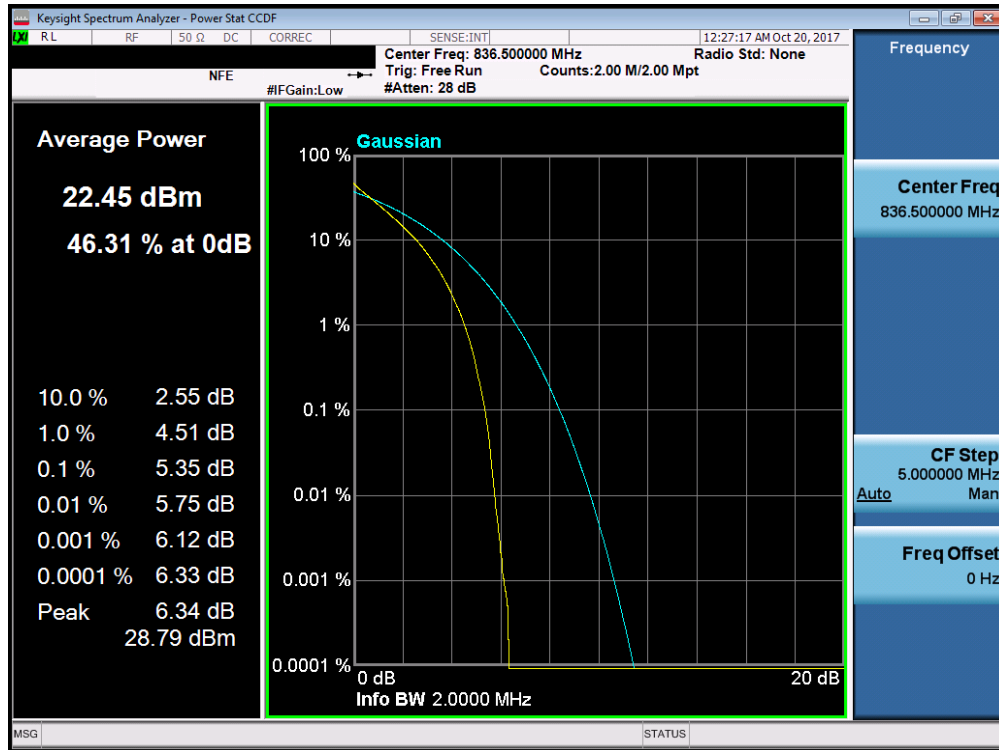
FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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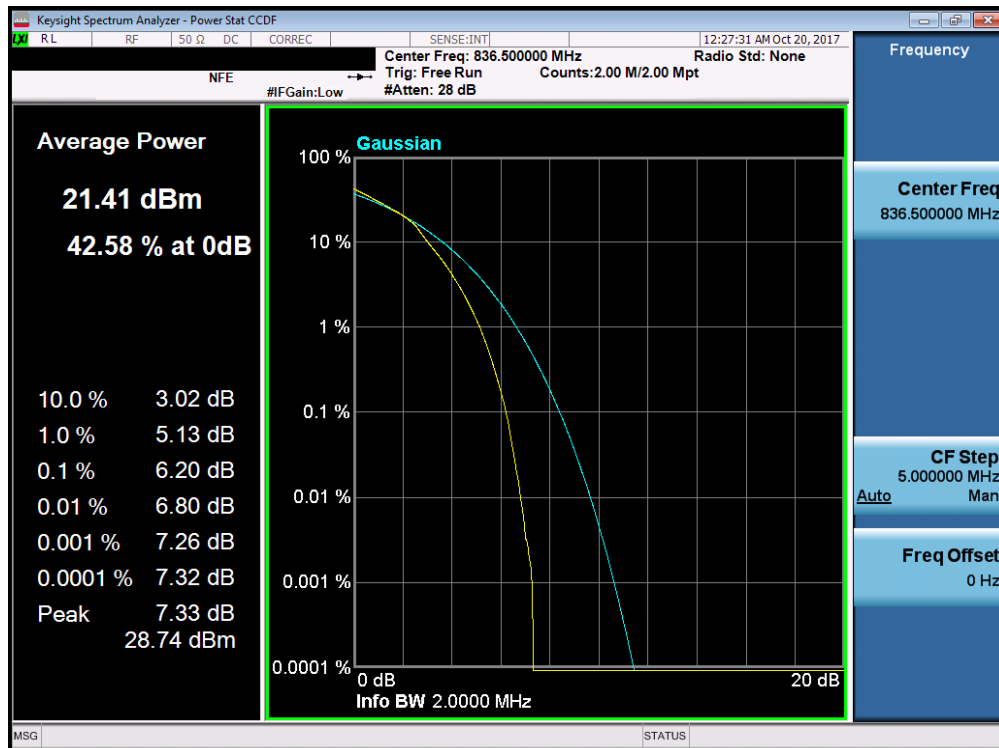
Plot 7-237. PAR Plot (Band 12/17 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 26/5

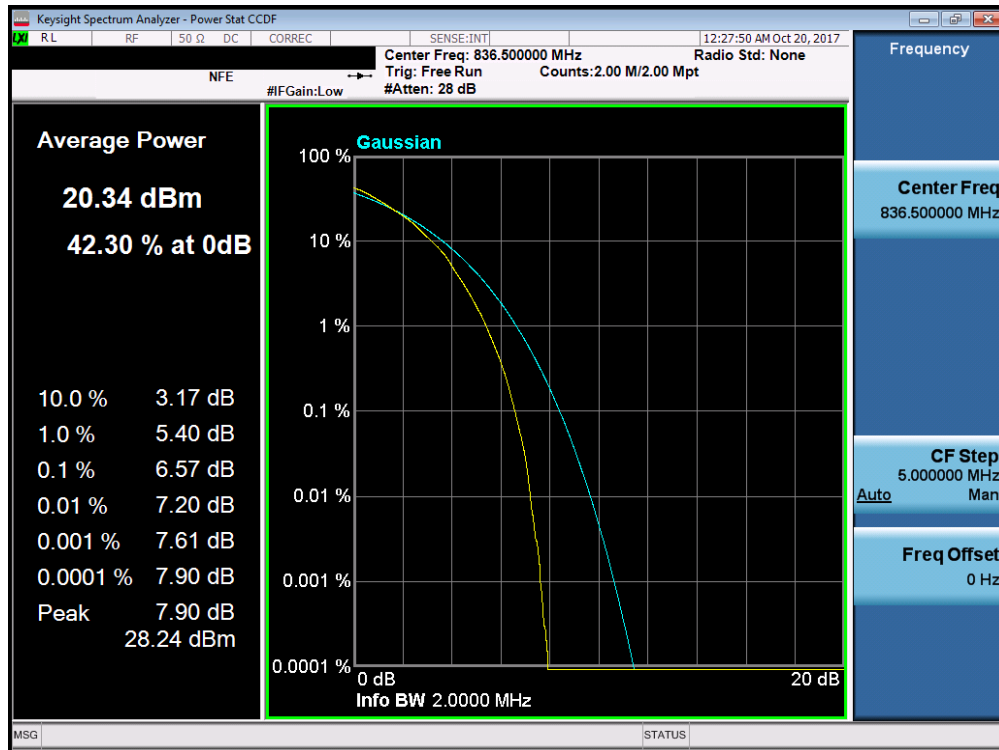


Plot 7-238. PAR Plot (Band 26/5 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-239. PAR Plot (Band 26/5 - 1.4MHz 16-QAM - Full RB Configuration)

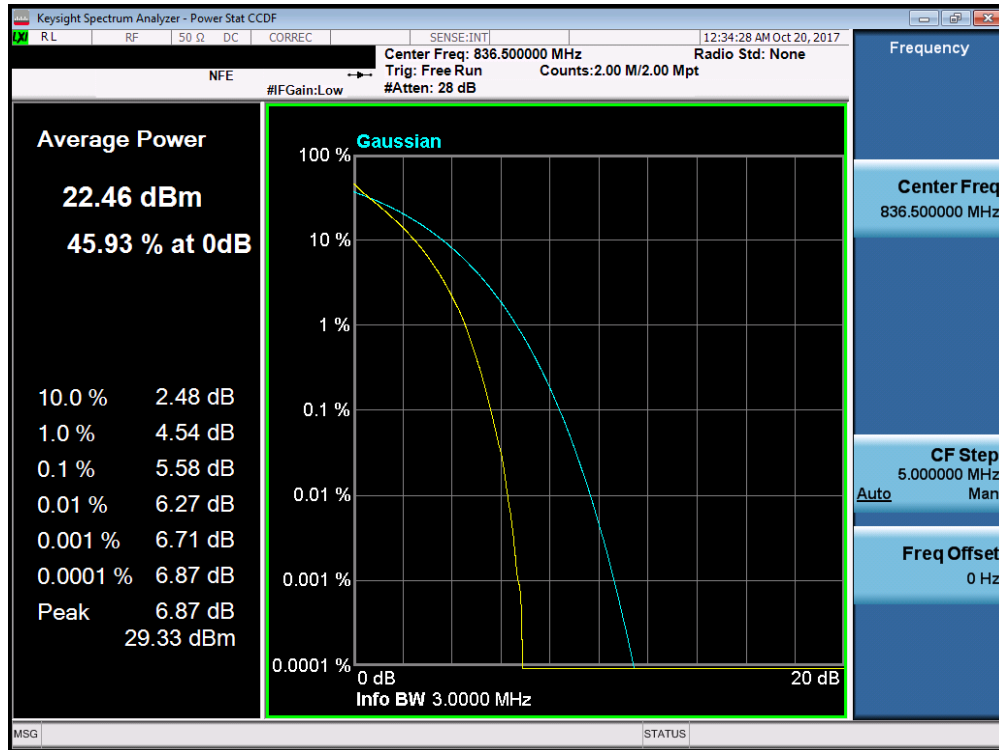
FCC ID: A3LSMA530F	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset		Page 159 of 236



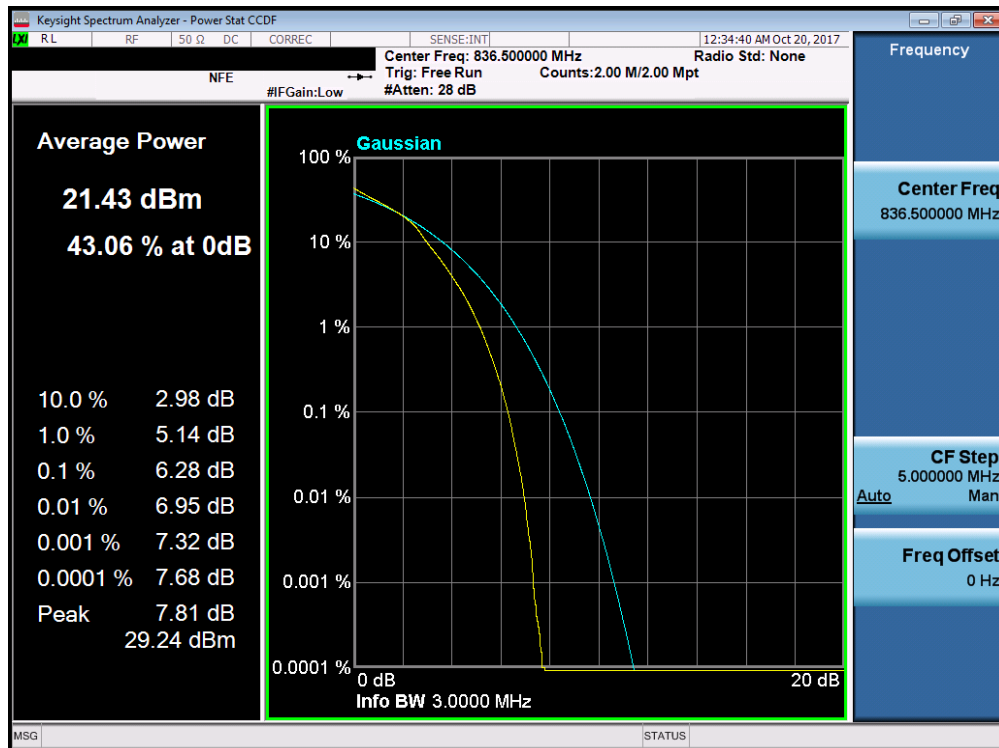
Plot 7-240. PAR Plot (Band 26/5 - 1.4MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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Band 26/5

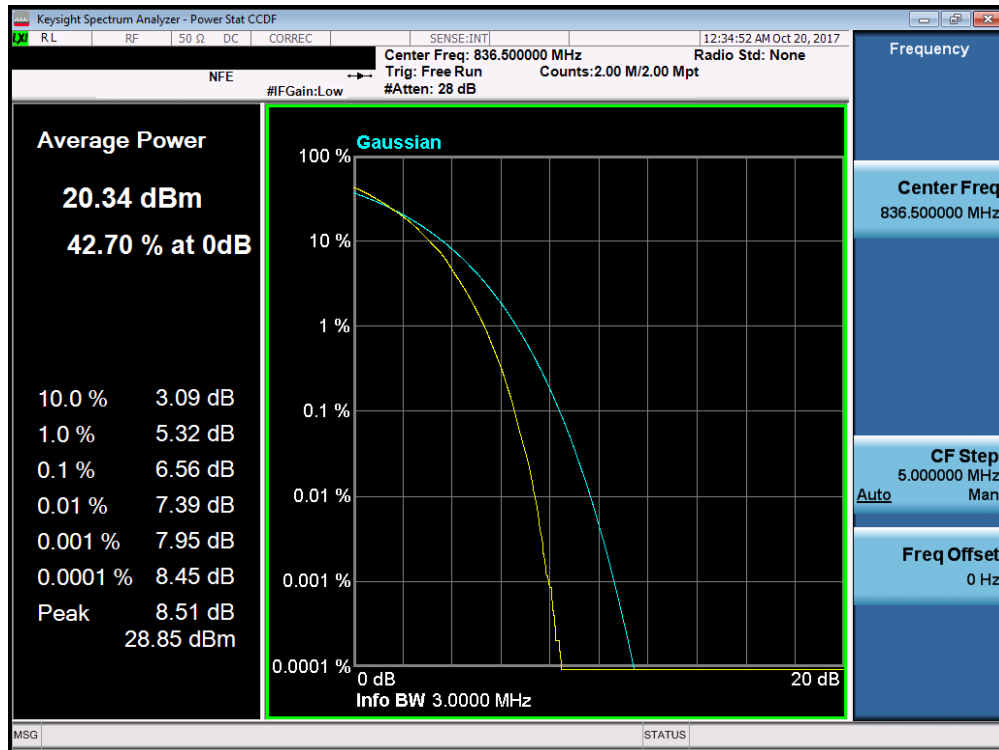


Plot 7-241. PAR Plot (Band 26/5 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-242. PAR Plot (Band 26/5 - 3.0MHz 16-QAM - Full RB Configuration)

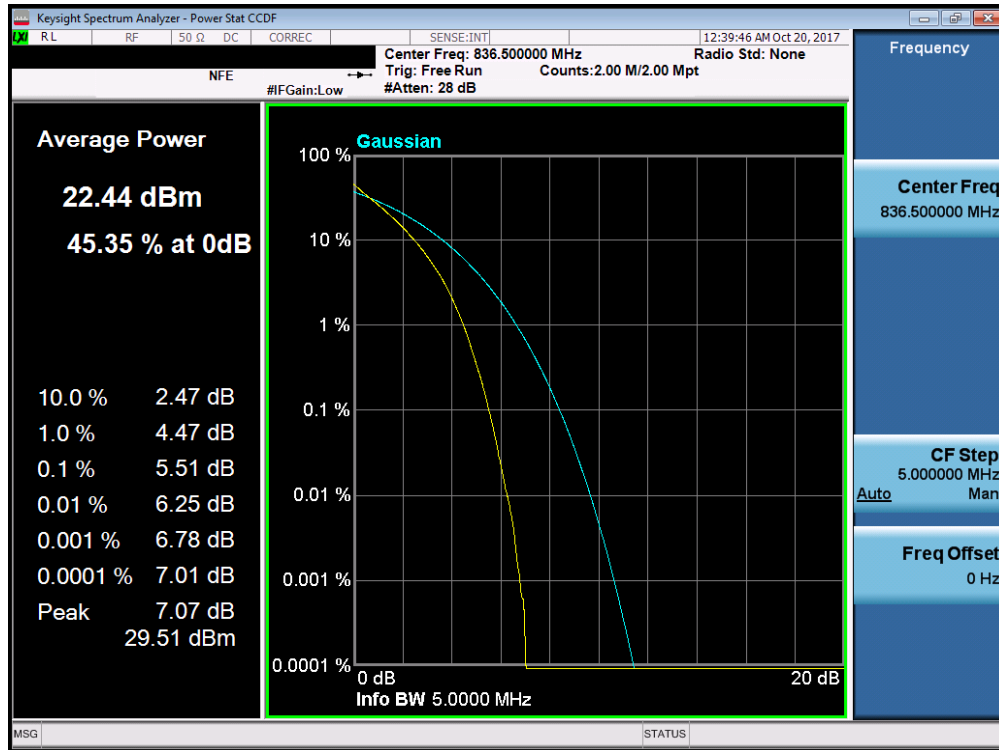
FCC ID: A3LSMA530F	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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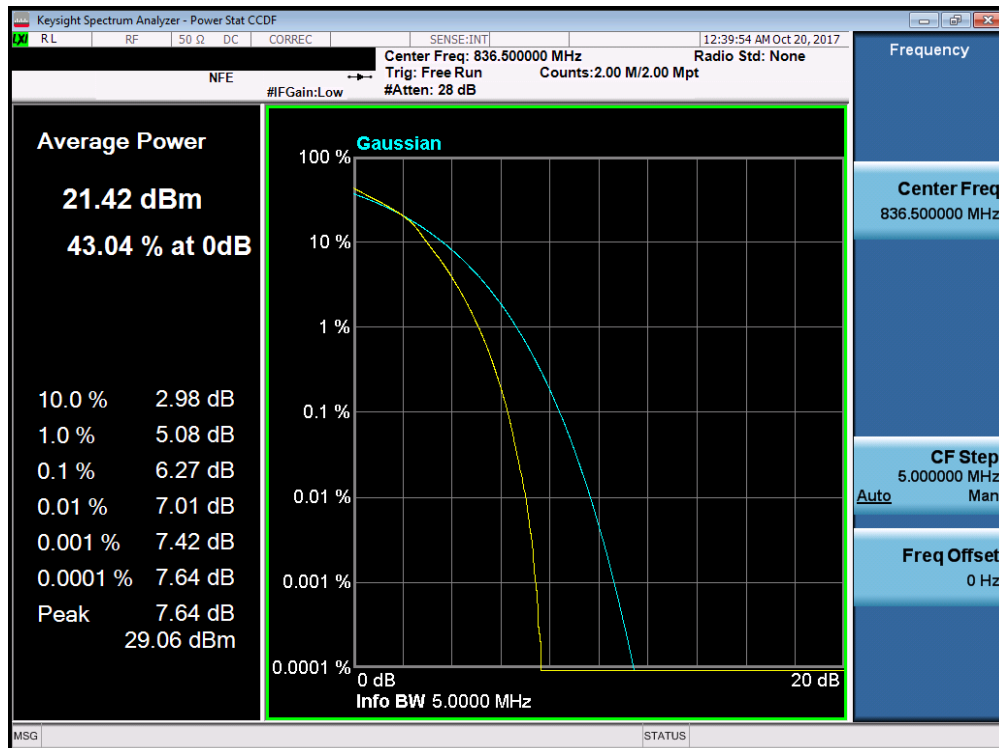
Plot 7-243. PAR Plot (Band 26/5 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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Band 26/5

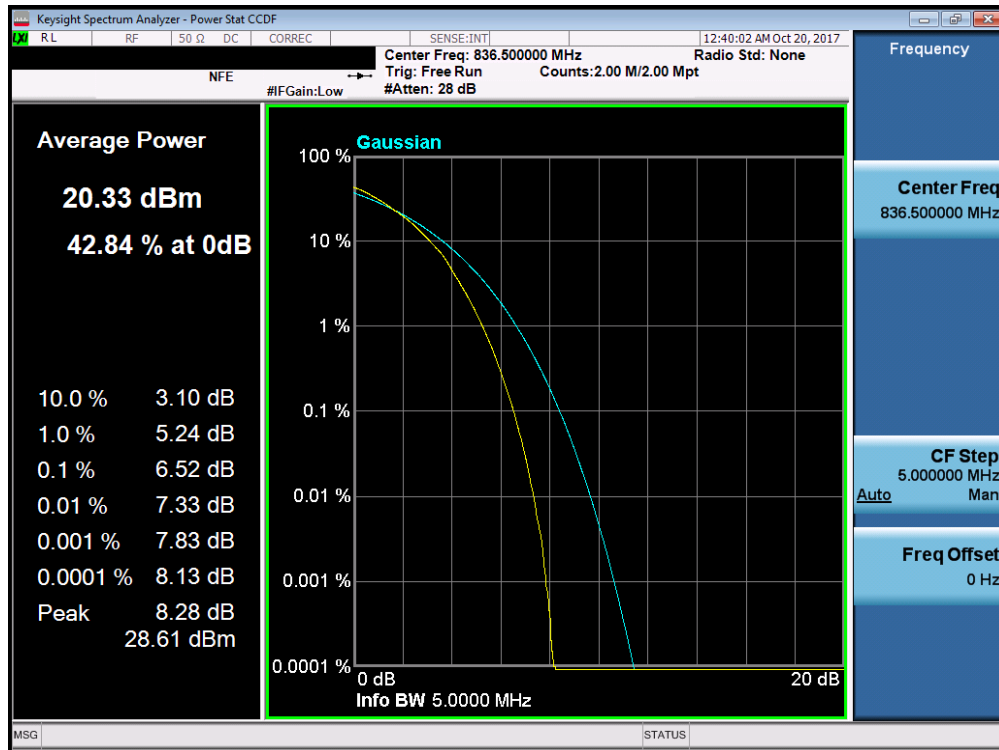


Plot 7-244. PAR Plot (Band 26/5 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-245. PAR Plot (Band 26/5 - 5.0MHz 16-QAM - Full RB Configuration)

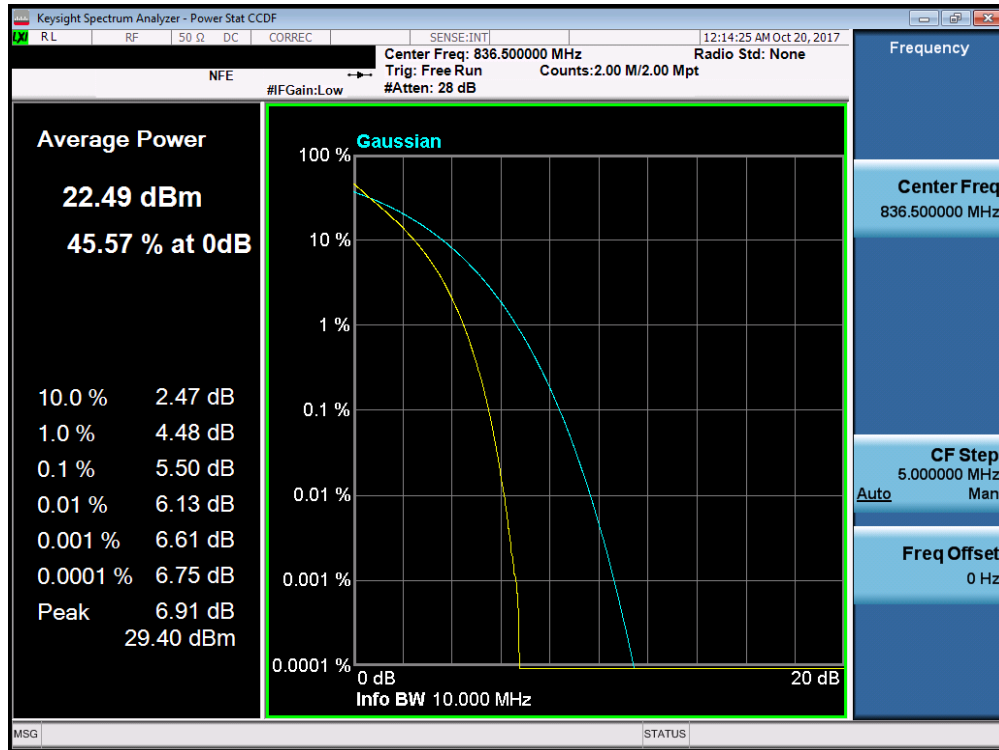
FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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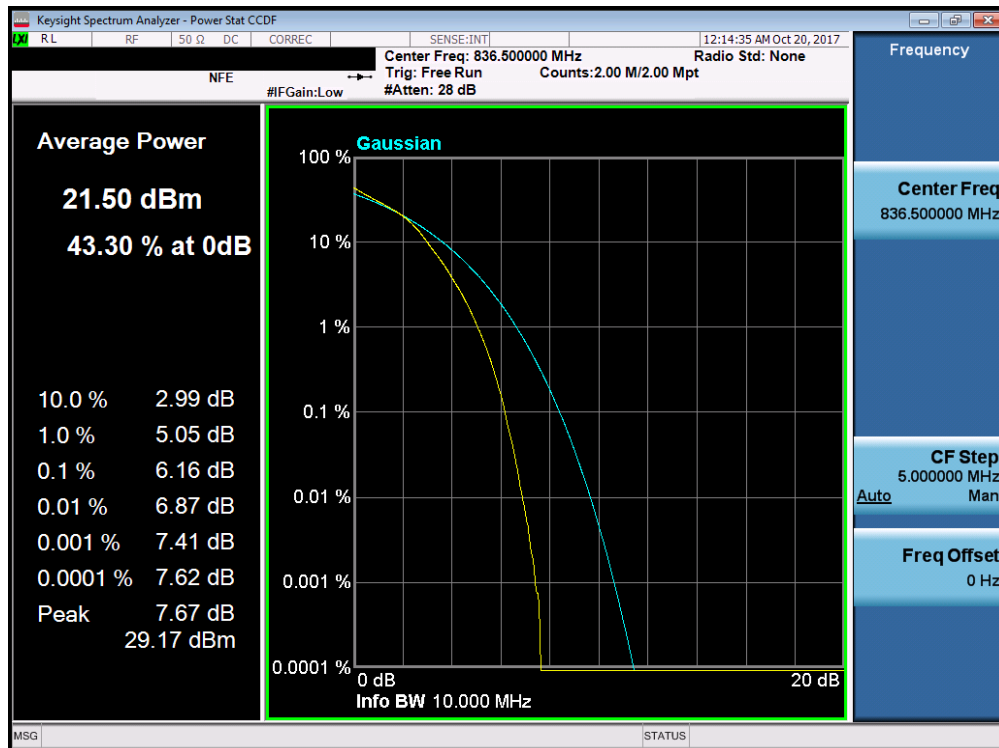
Plot 7-246. PAR Plot (Band 26/5 - 5.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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Band 26/5

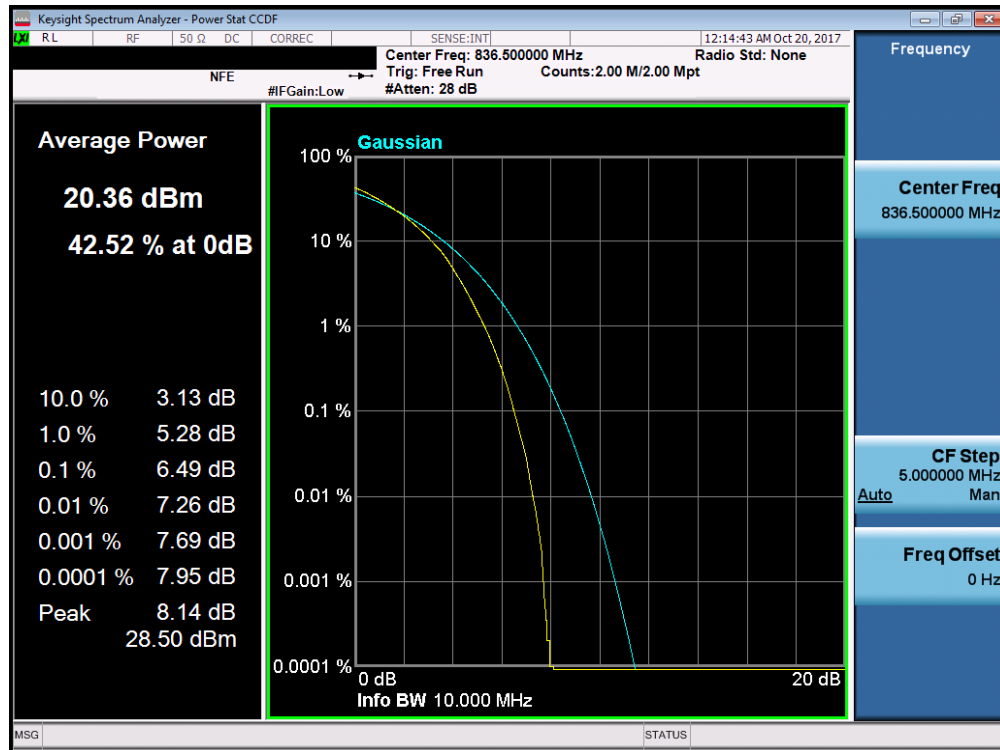


Plot 7-247. PAR Plot (Band 26/5 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-248. PAR Plot (Band 26/5 - 10.0MHz 16-QAM - Full RB Configuration)

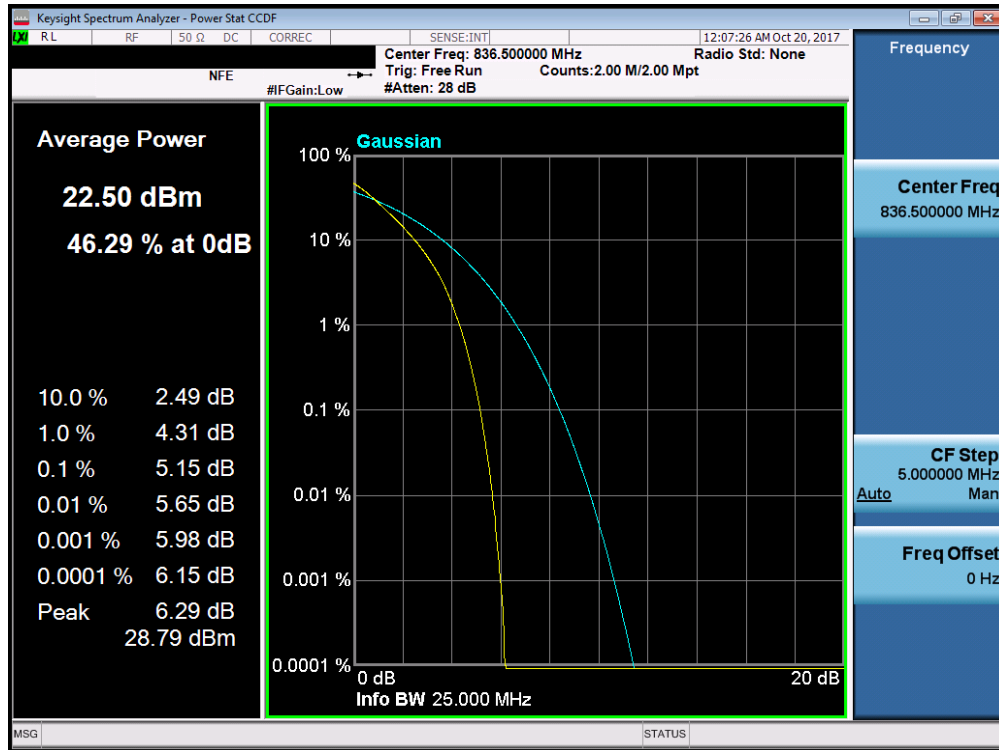
FCC ID: A3LSMA530F	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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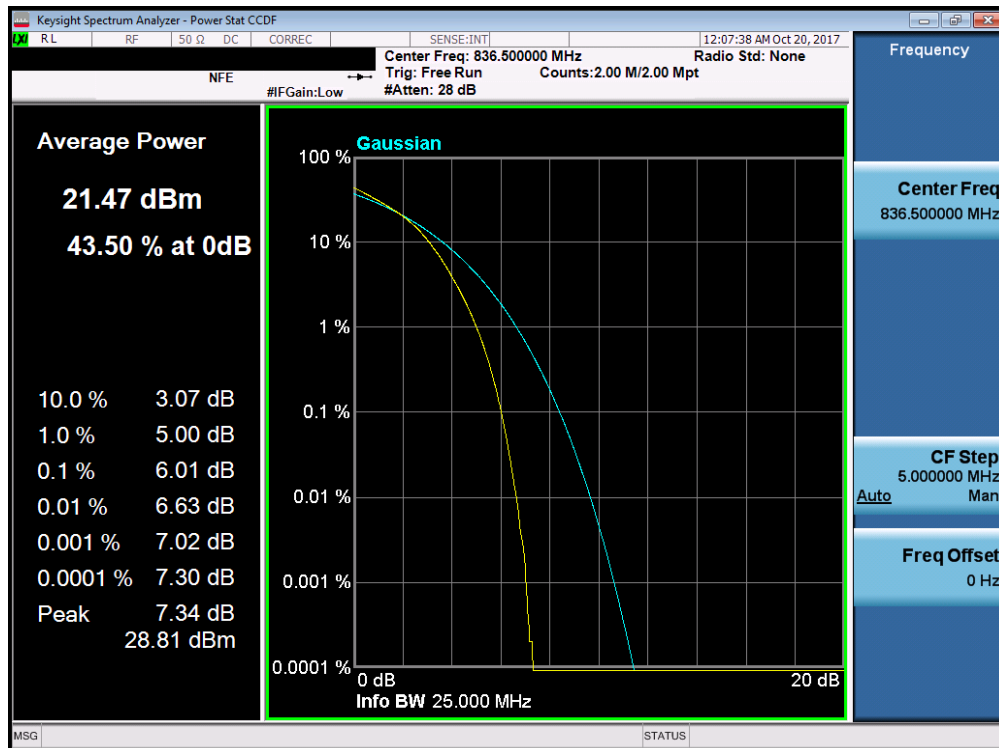
Plot 7-249. PAR Plot (Band 26/5 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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Band 26

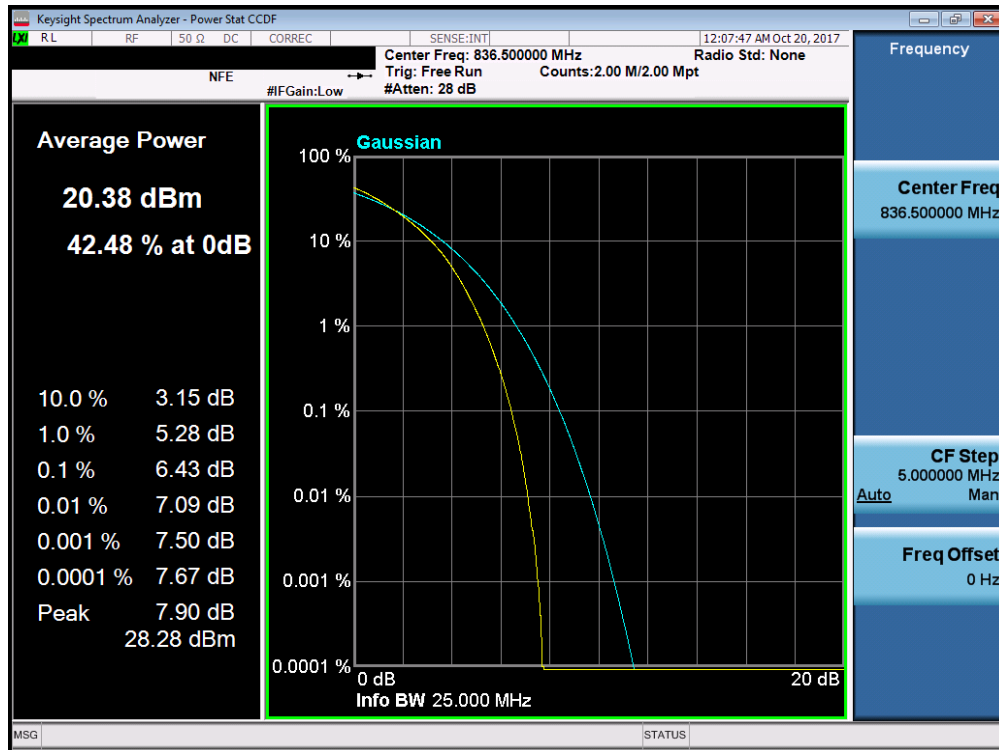


Plot 7-250. PAR Plot (Band 26 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-251. PAR Plot (Band 26 - 15.0MHz 16-QAM - Full RB Configuration)

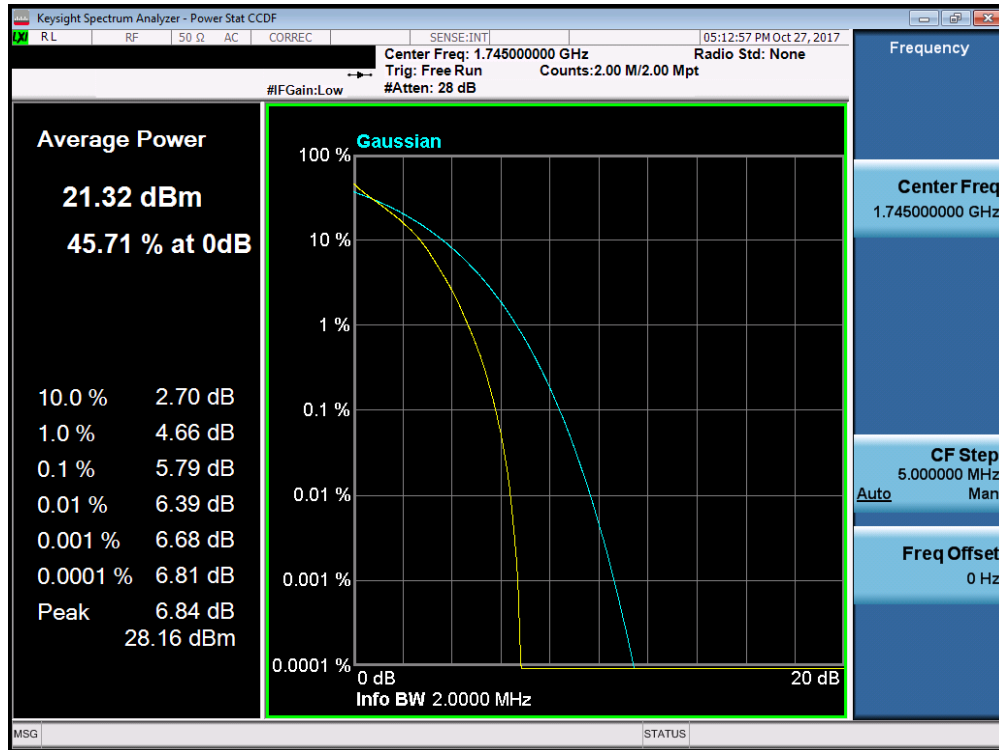
FCC ID: A3LSMA530F	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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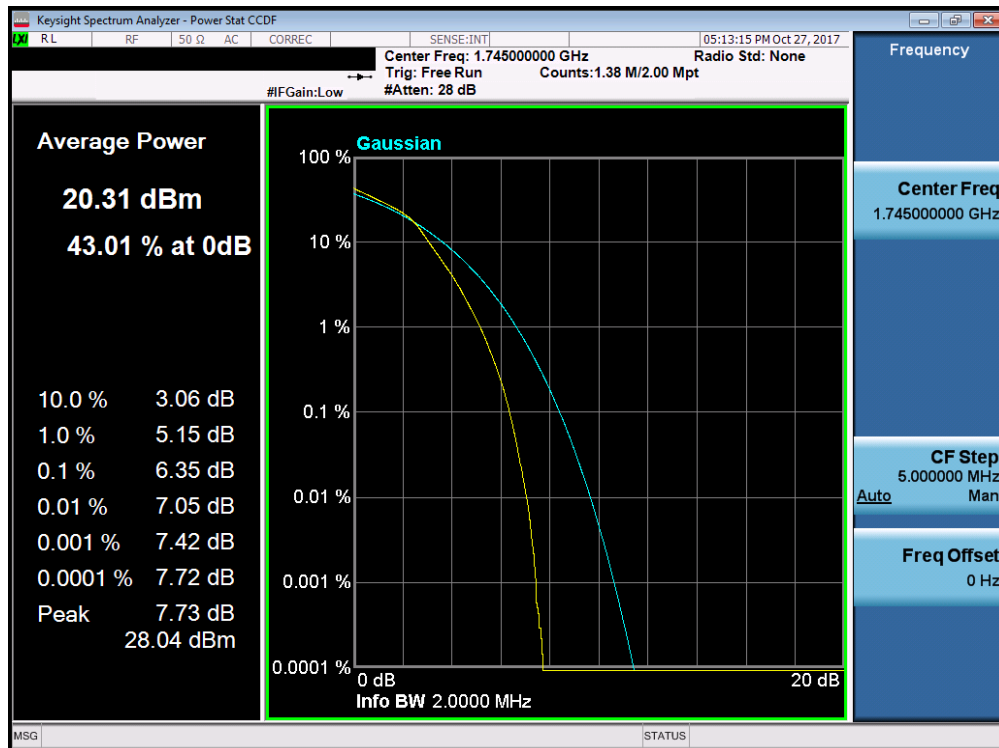
Plot 7-252. PAR Plot (Band 26 - 15.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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Band 66/4

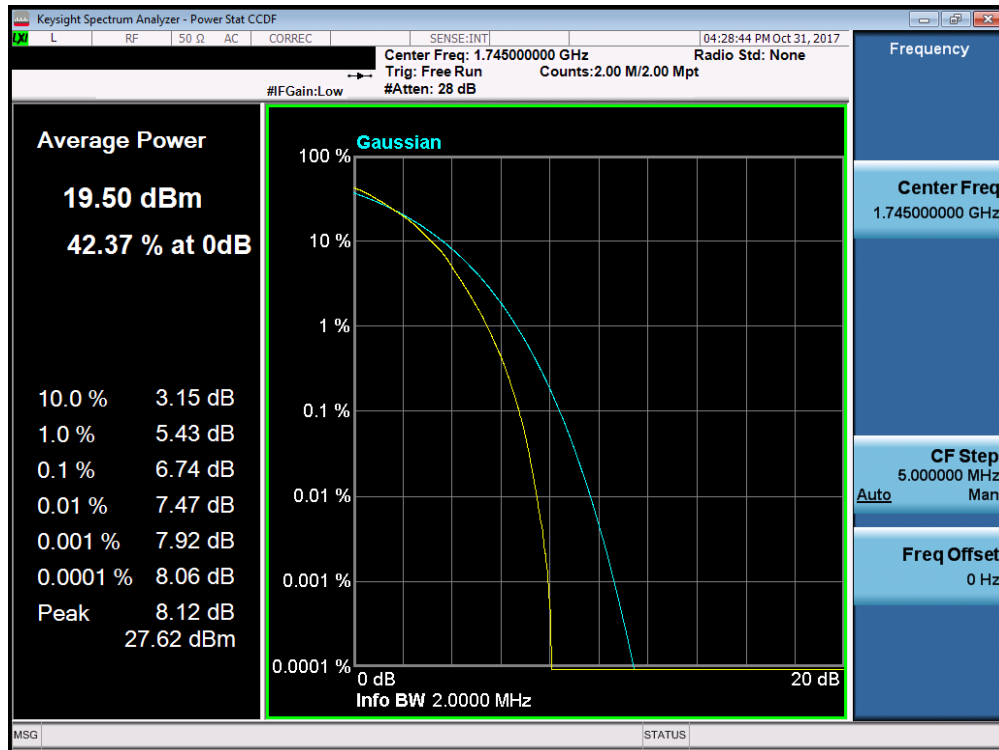


Plot 7-253. PAR Plot (Band 66/4 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-254. PAR Plot (Band 66/4 - 1.4MHz 16-QAM - Full RB Configuration)

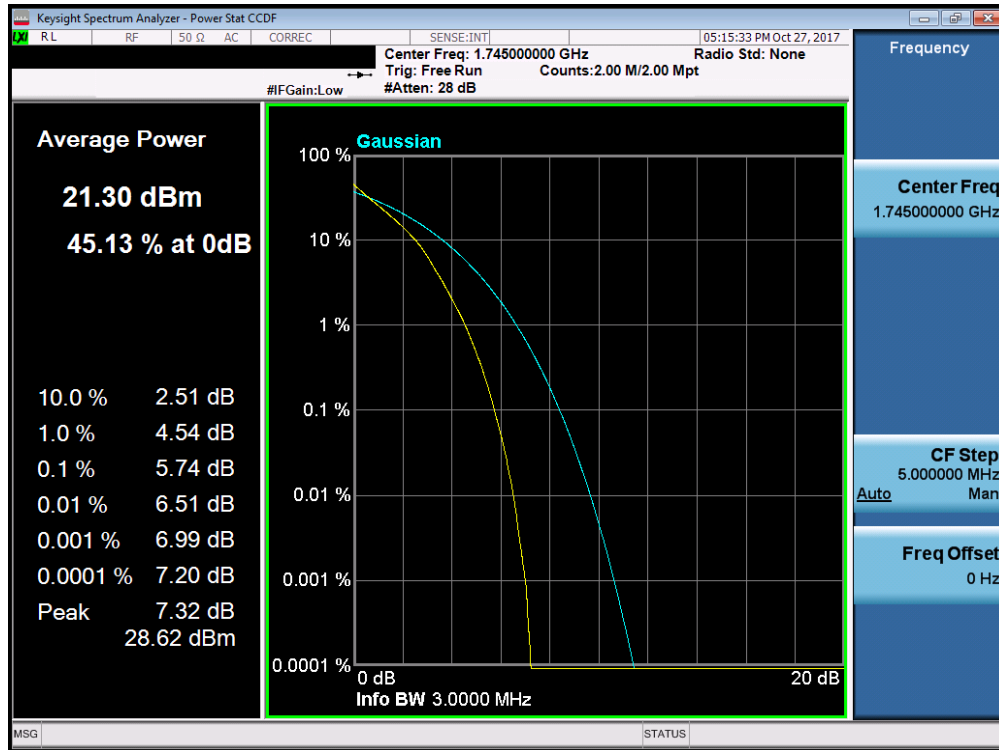
FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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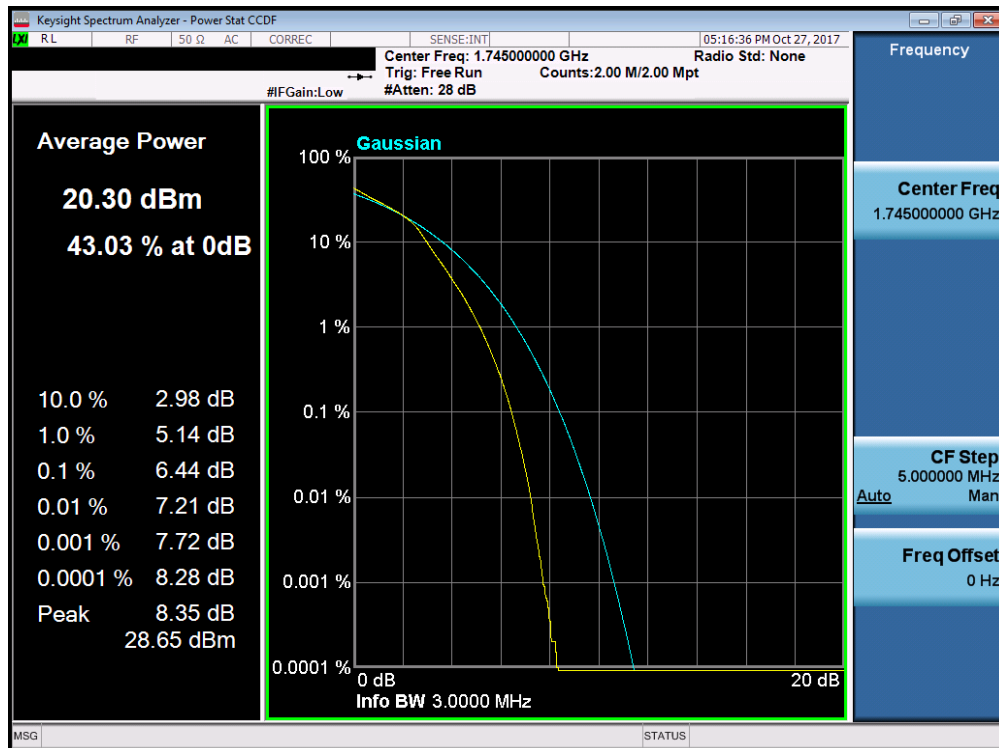
Plot 7-255. PAR Plot (Band 66/4 - 1.4MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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Band 66/4

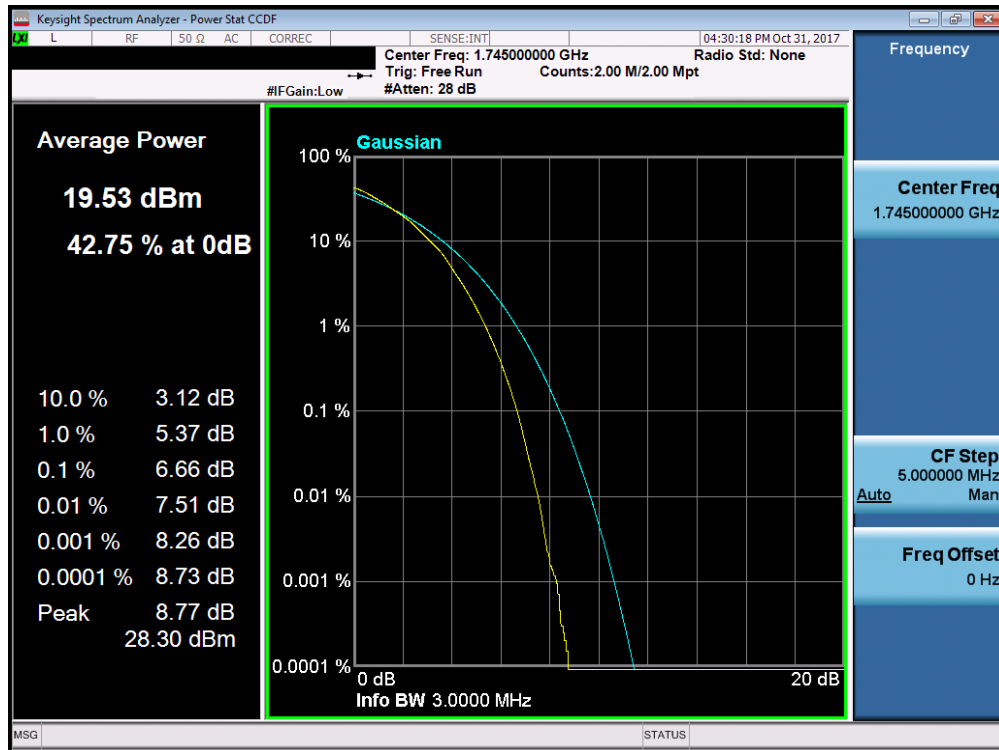


Plot 7-256. PAR Plot (Band 66/4 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-257. PAR Plot (Band 66/4 - 3.0MHz 16-QAM - Full RB Configuration)

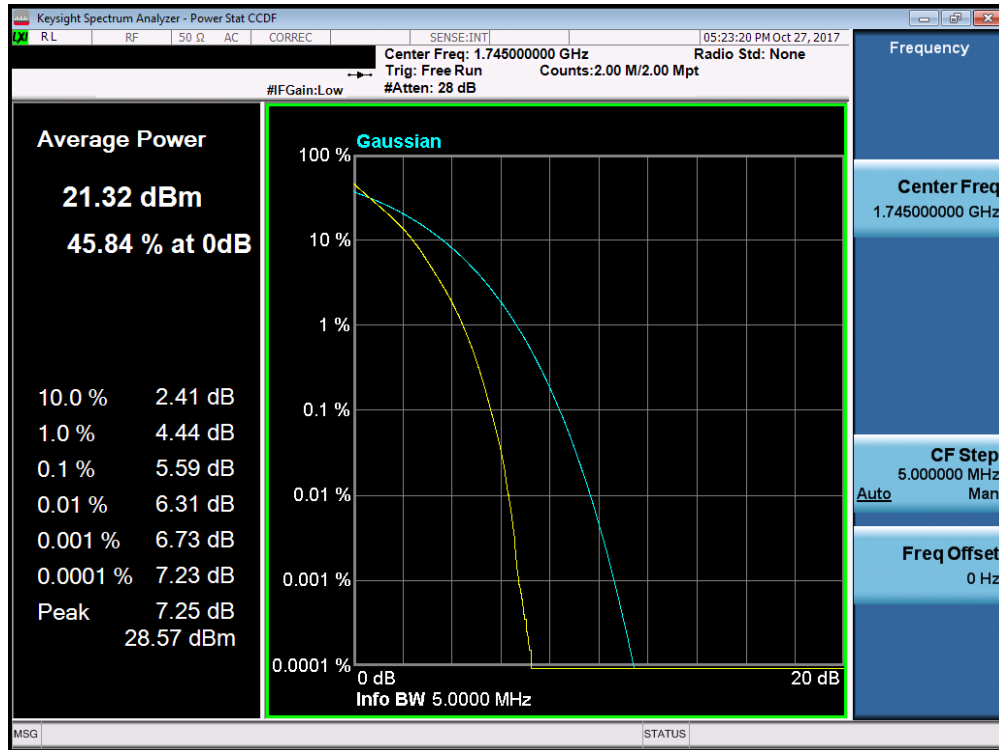
FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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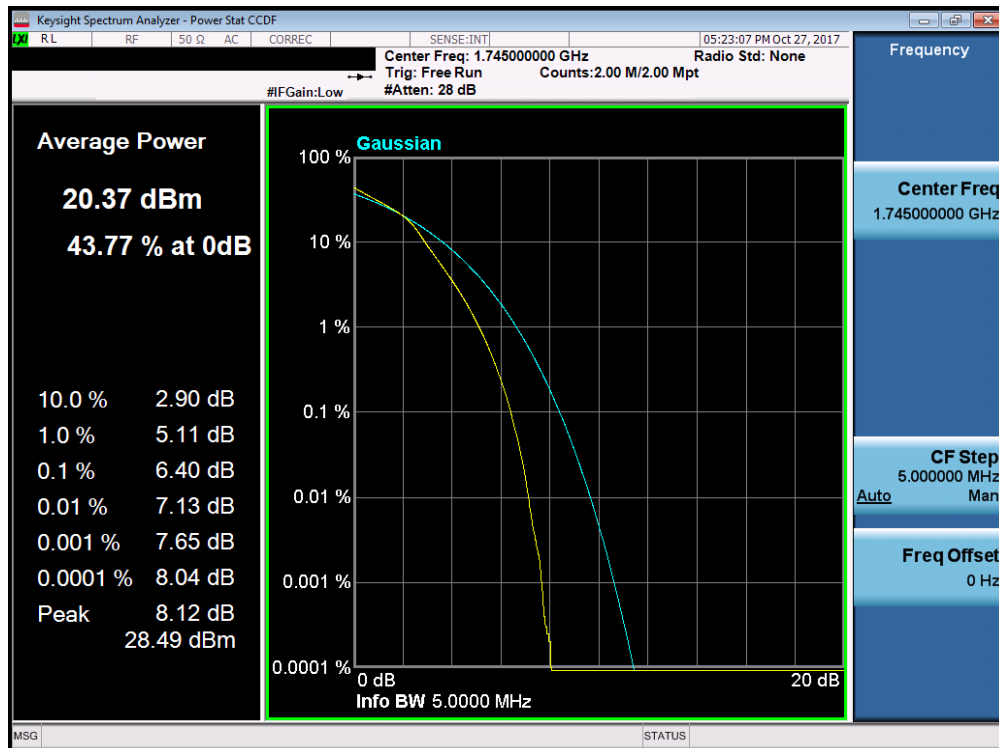
Plot 7-258. PAR Plot (Band 66/4 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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Band 66/4

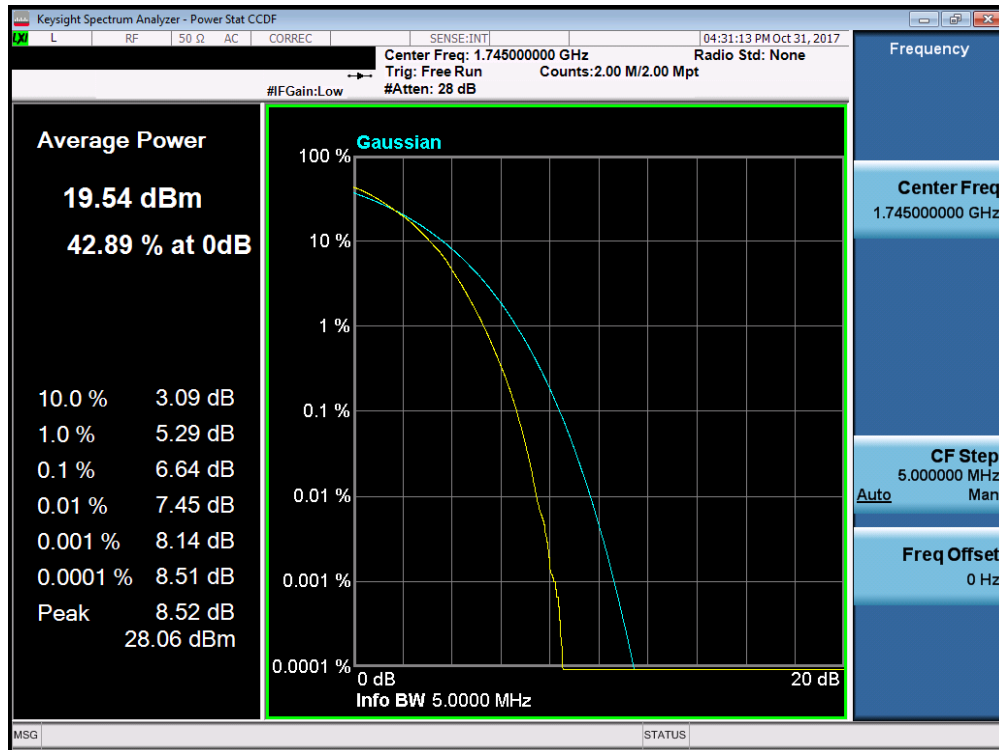


Plot 7-259. PAR Plot (Band 66/4 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-260. PAR Plot (Band 66/4 - 5.0MHz 16-QAM - Full RB Configuration)

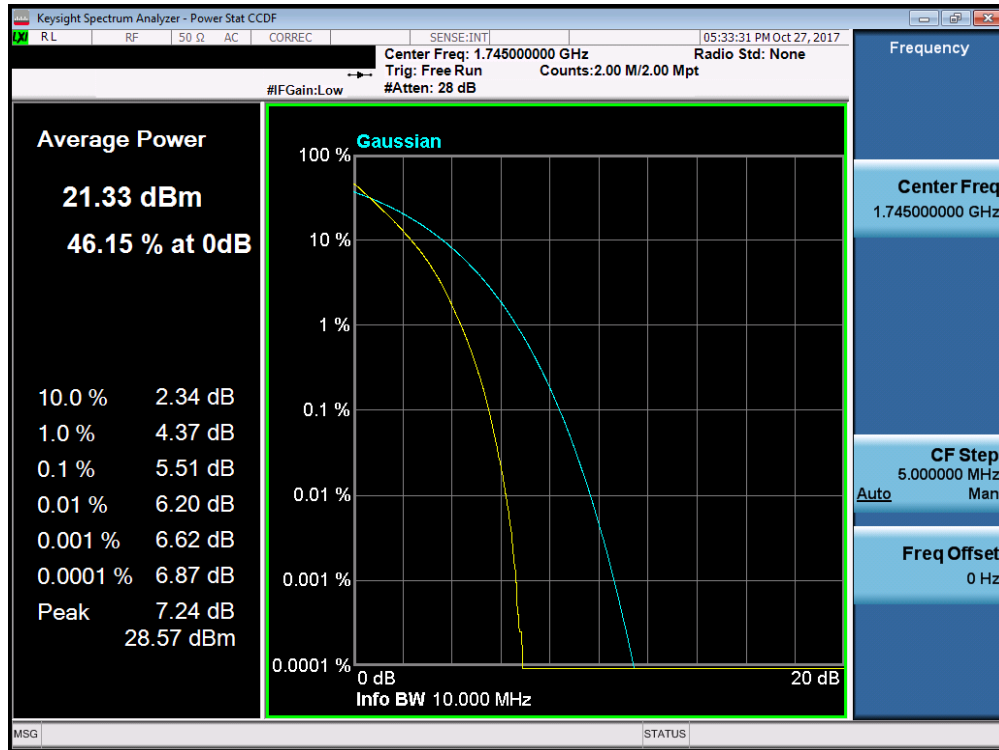
FCC ID: A3LSMA530F	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset		Page 173 of 236



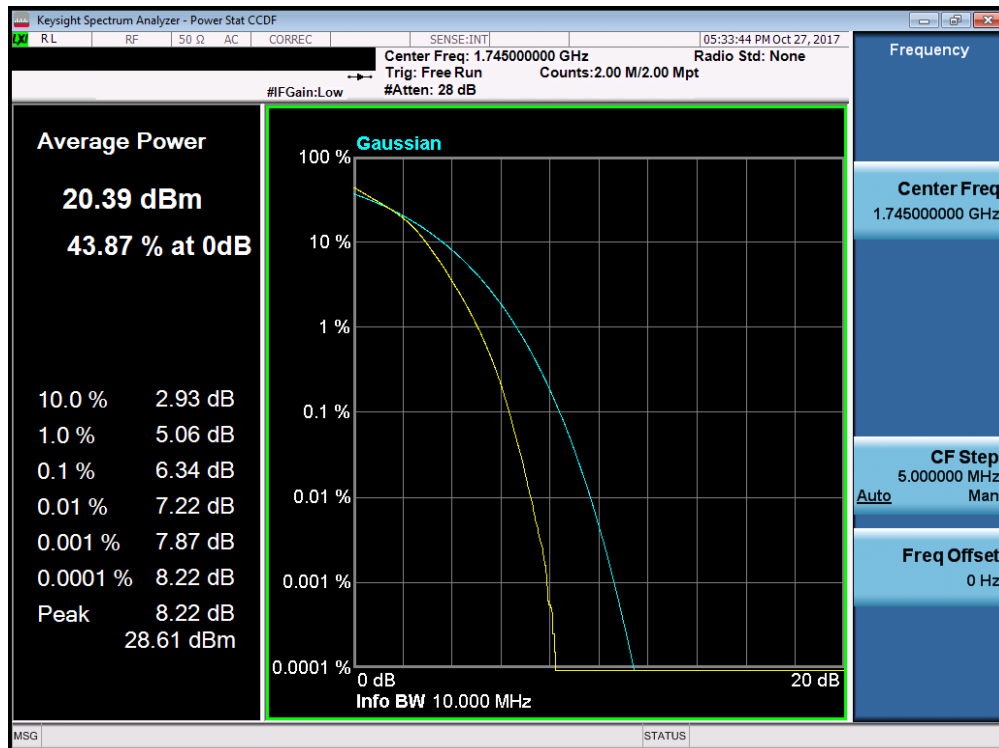
Plot 7-261. PAR Plot (Band 66/4 - 5.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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Band 66/4

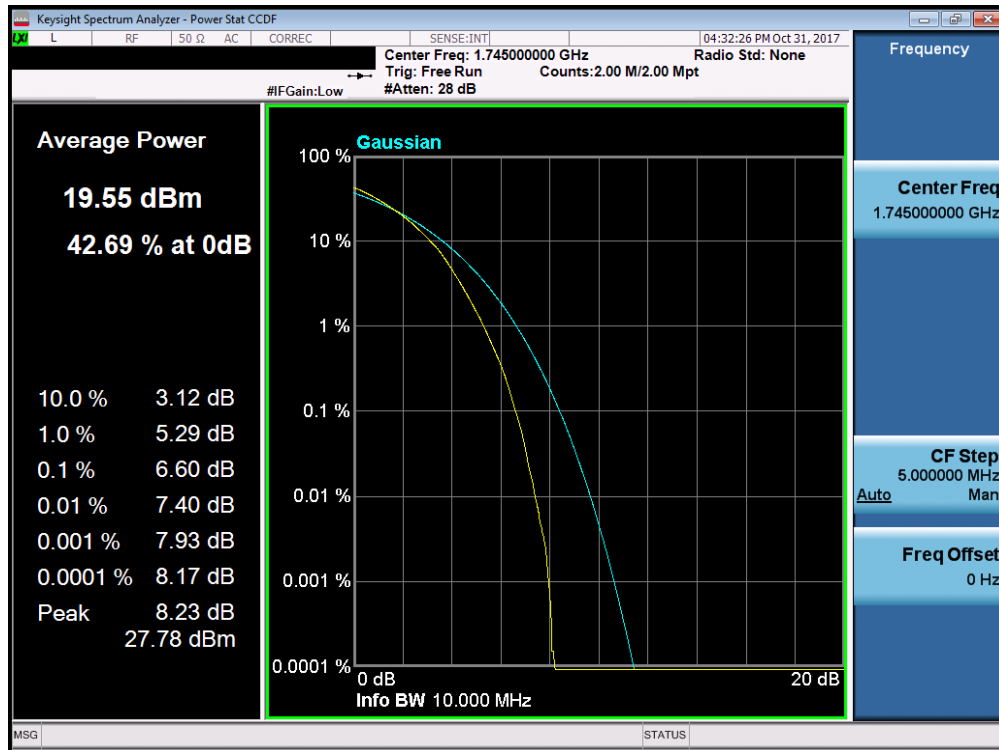


Plot 7-262. PAR Plot (Band 66/4 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-263. PAR Plot (Band 66/4 - 10.0MHz 16-QAM - Full RB Configuration)

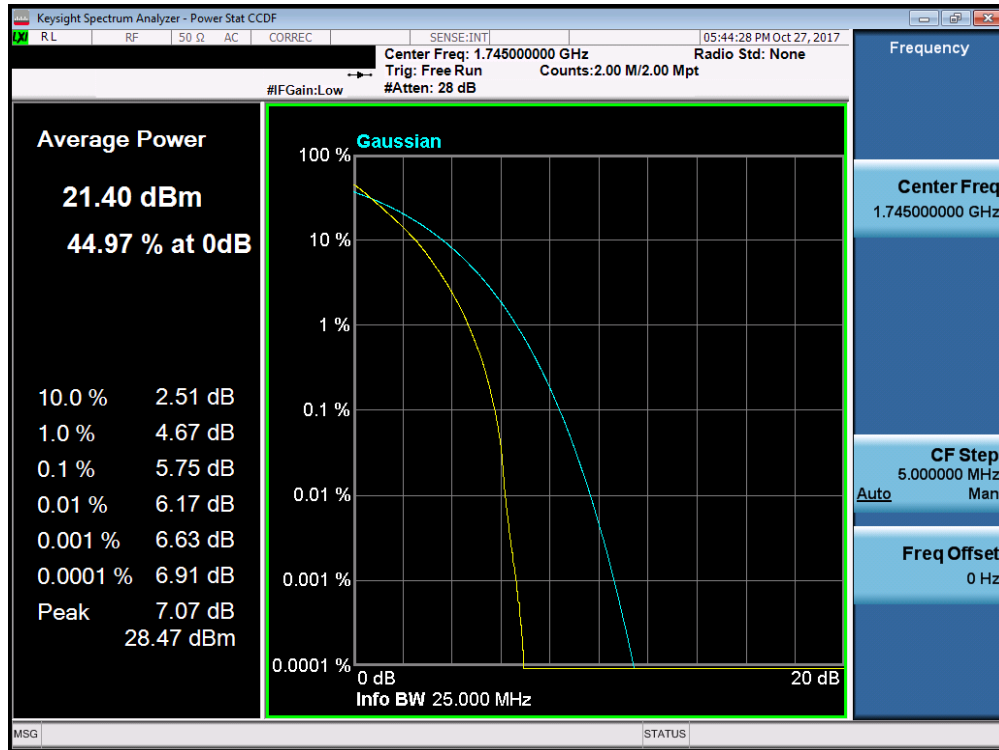
FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset	Page 175 of 236	



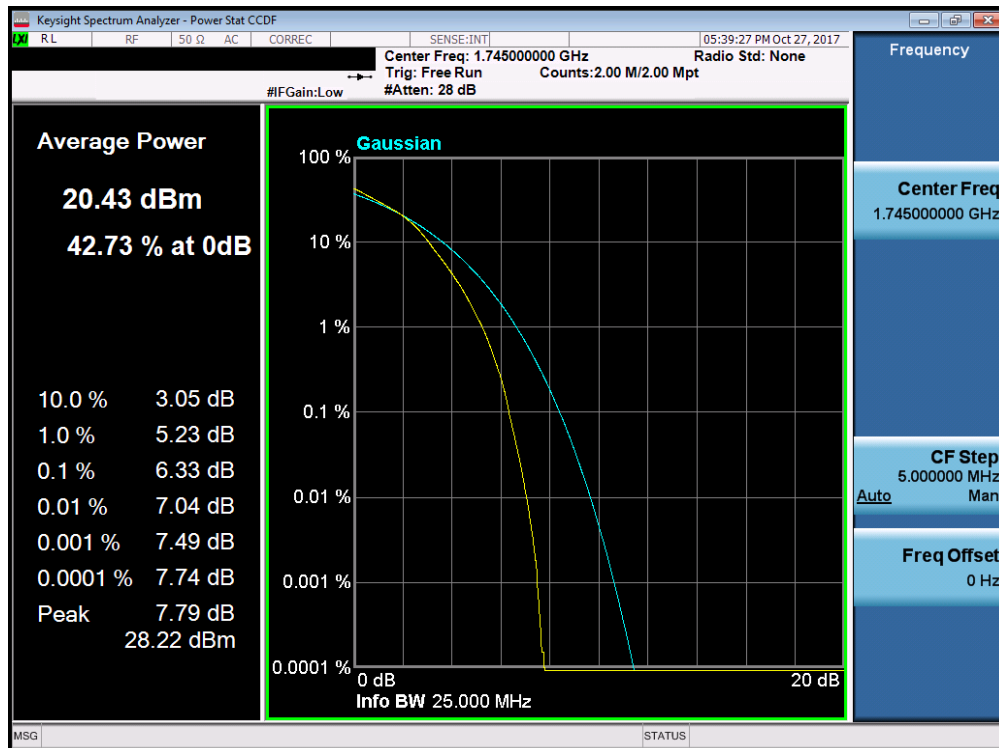
Plot 7-264. PAR Plot (Band 66/4 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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Band 66/4

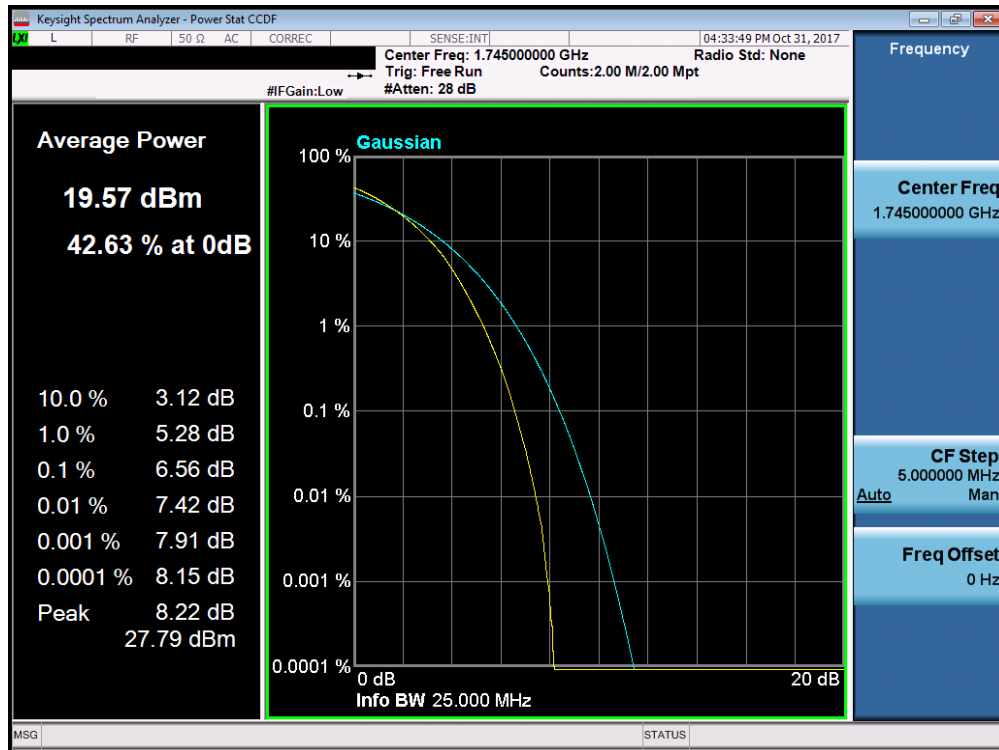


Plot 7-265. PAR Plot (Band 66/4 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-266. PAR Plot (Band 66/4 - 15.0MHz 16-QAM - Full RB Configuration)

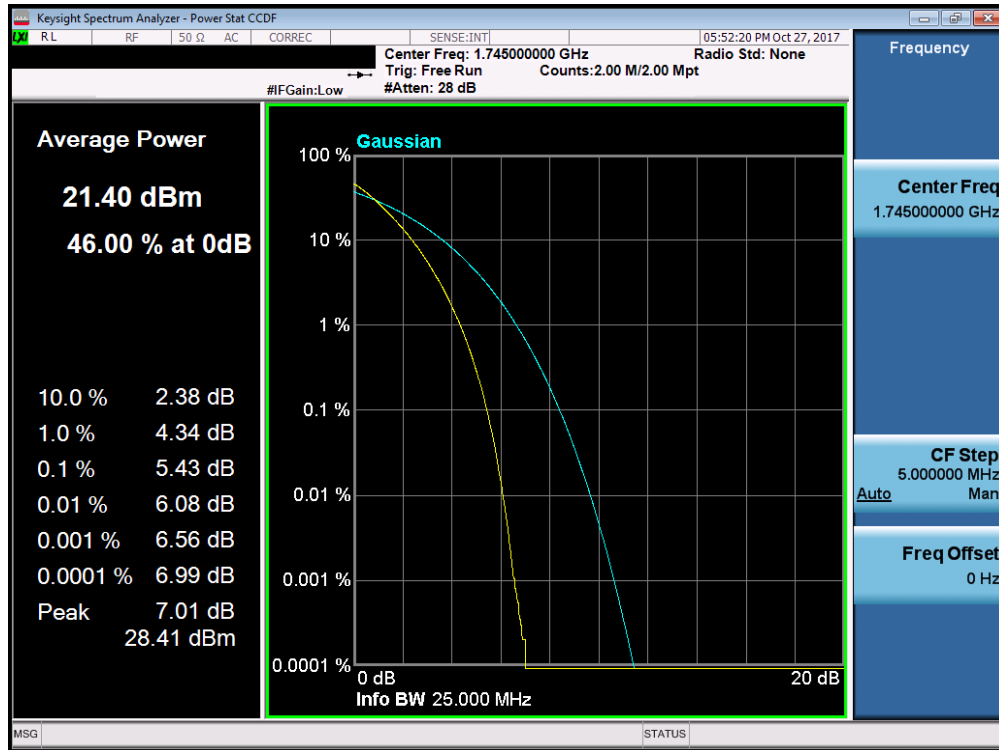
FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset	Page 177 of 236	



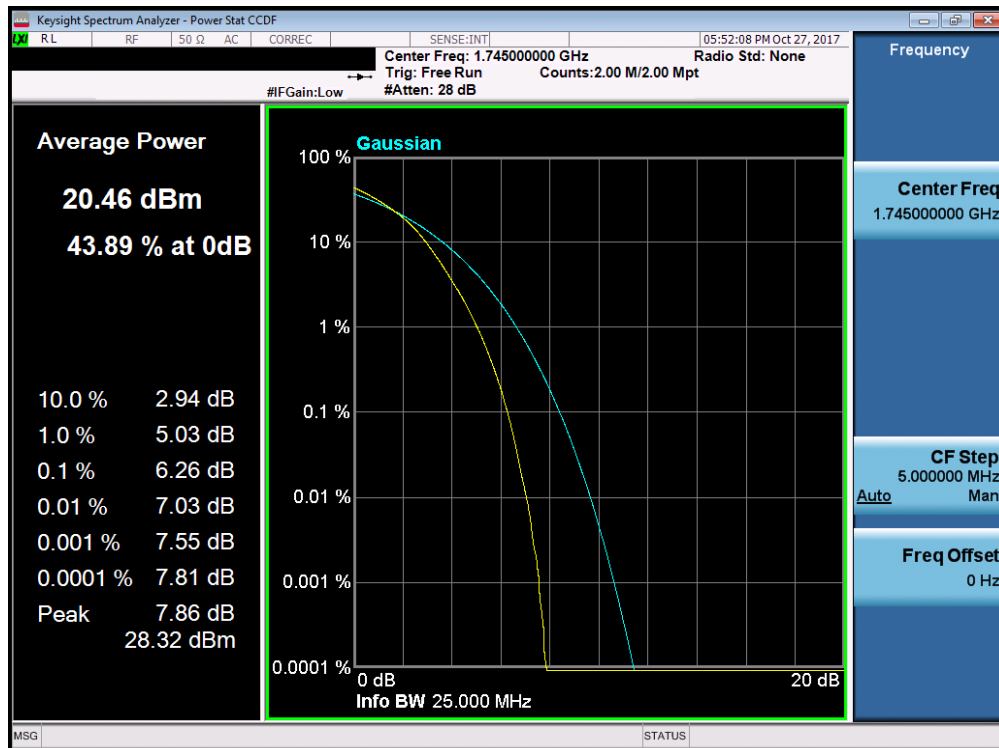
Plot 7-267. PAR Plot (Band 66/4 - 15.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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Band 66/4

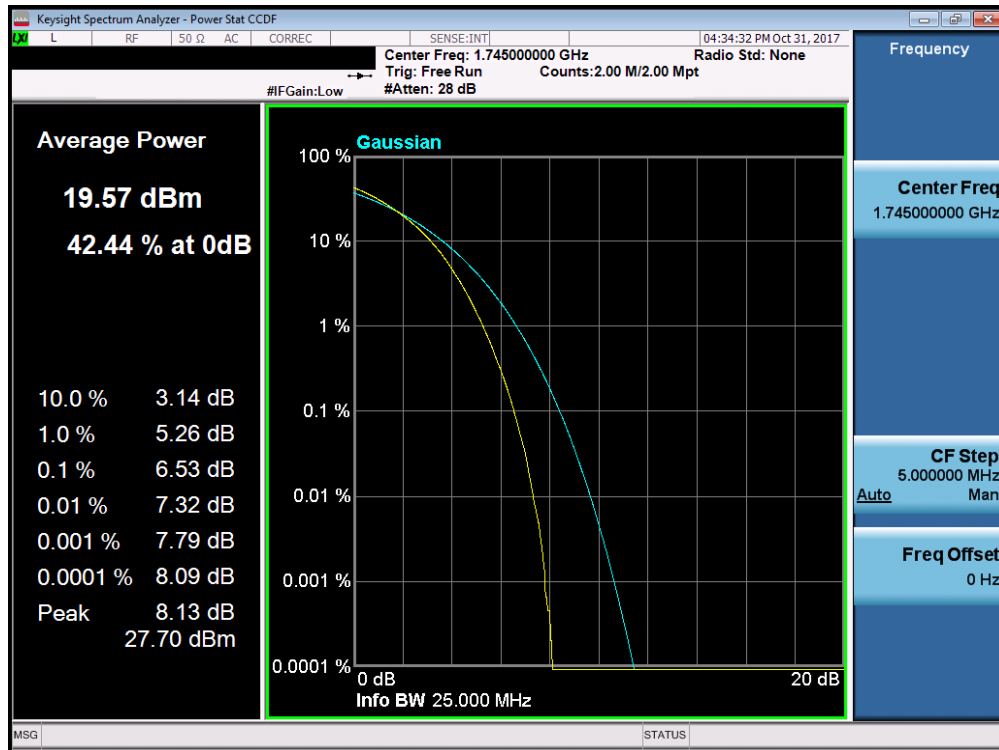


Plot 7-268. PAR Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-269. PAR Plot (Band 66/4 - 20.0MHz 16-QAM - Full RB Configuration)

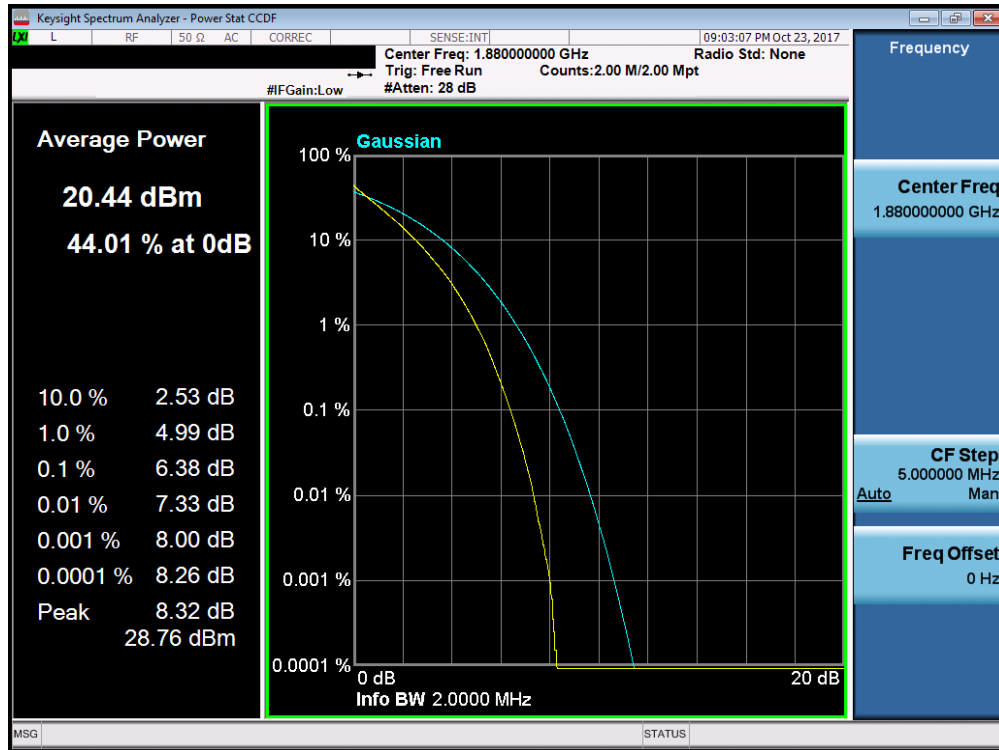
FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset	Page 179 of 236	



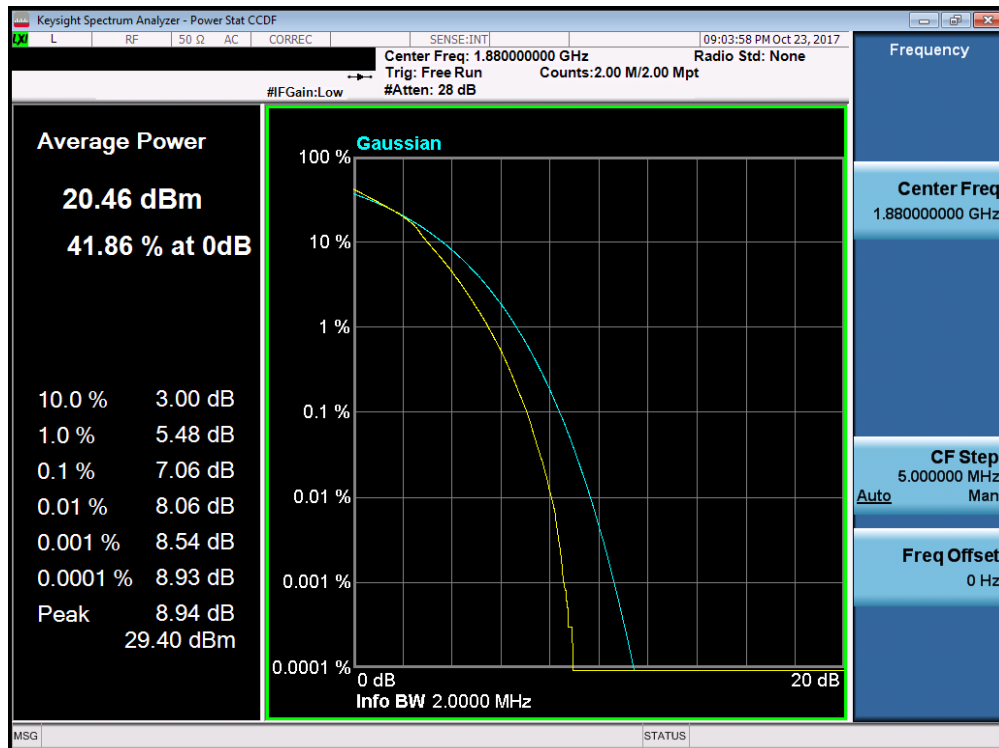
Plot 7-270. PAR Plot (Band 66/4 - 20.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset	Page 180 of 236	

Band 2

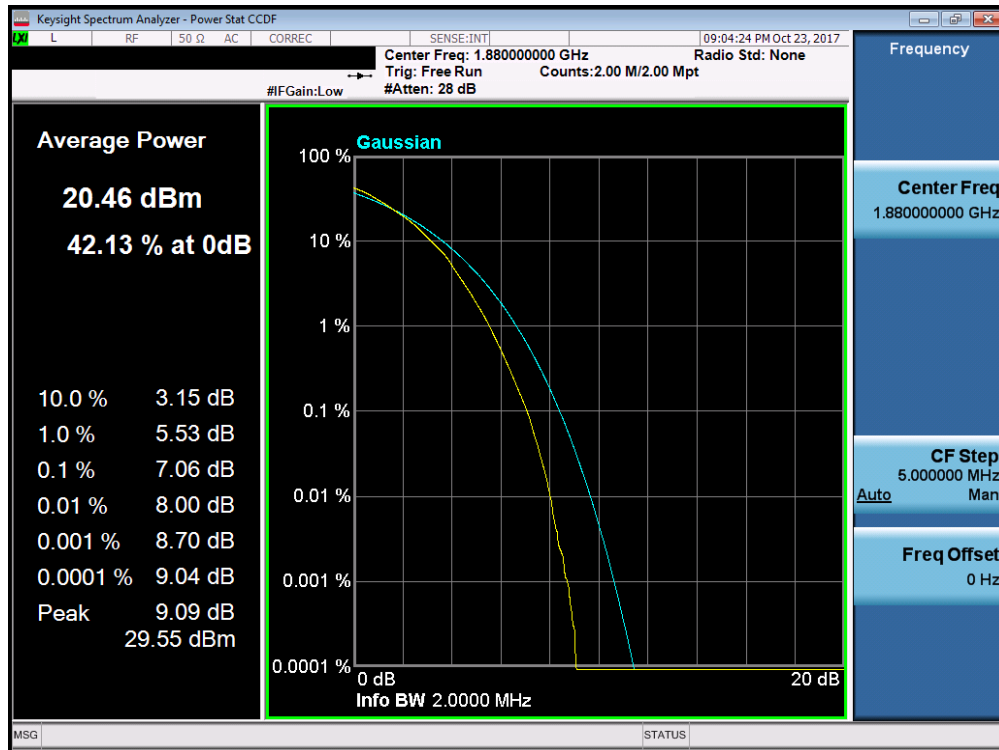


Plot 7-271. PAR Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-272. PAR Plot (Band 2 - 1.4MHz 16-QAM - Full RB Configuration)

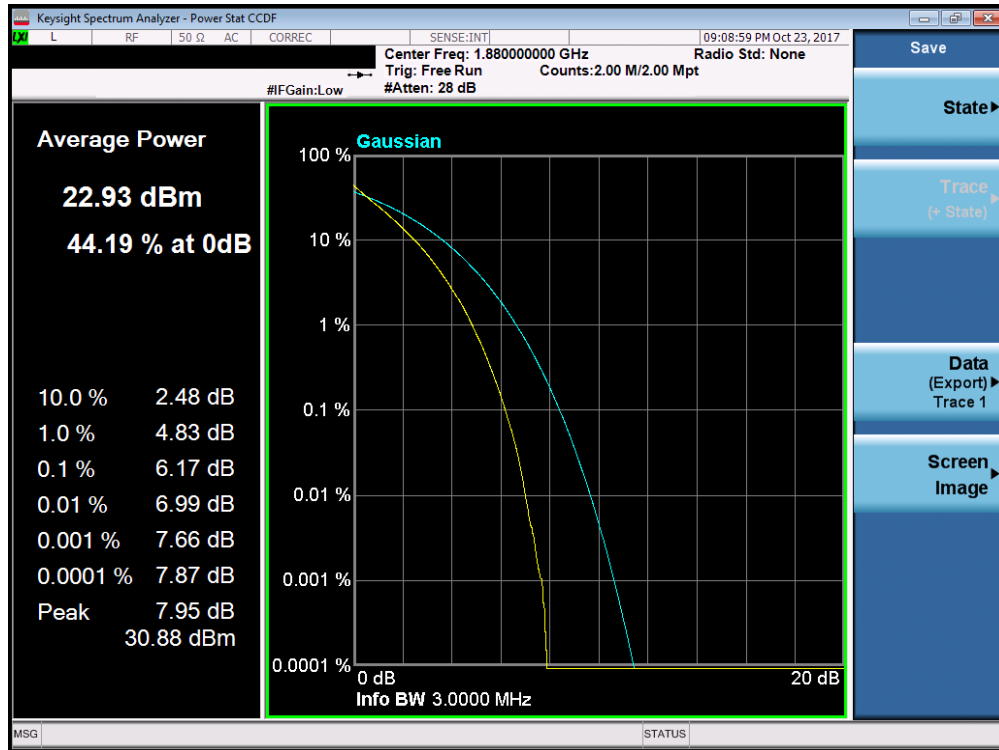
FCC ID: A3LSMA530F	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset		Page 181 of 236



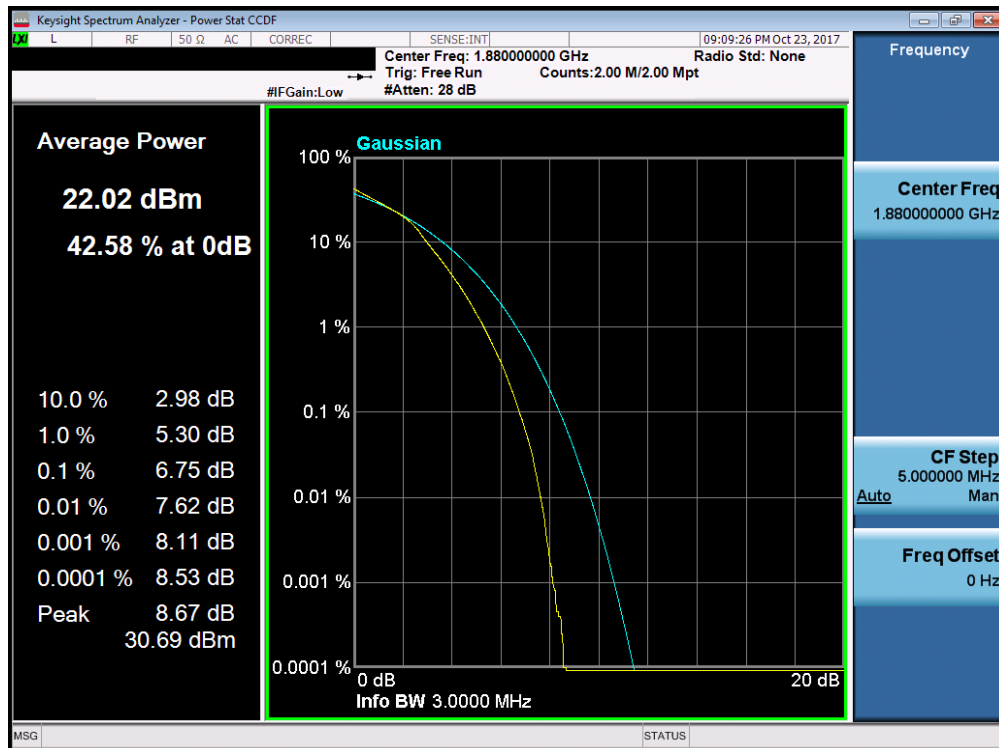
Plot 7-273. PAR Plot (Band 2 - 1.4MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset		Page 182 of 236

Band 2

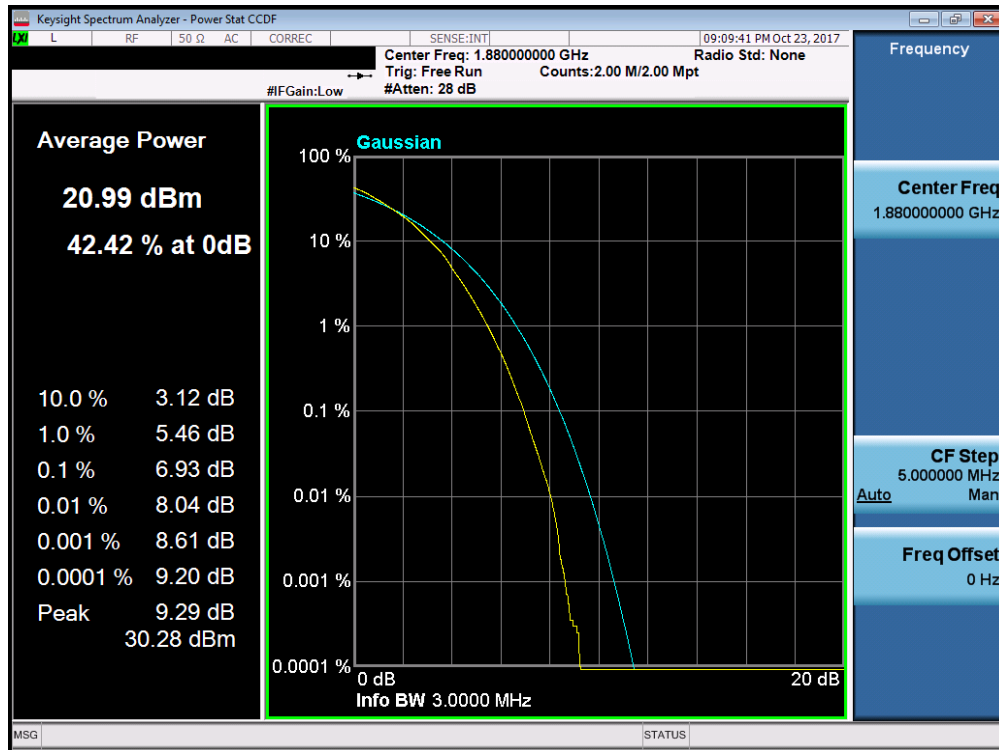


Plot 7-274. PAR Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-275. PAR Plot (Band 2 - 3.0MHz 16-QAM - Full RB Configuration)

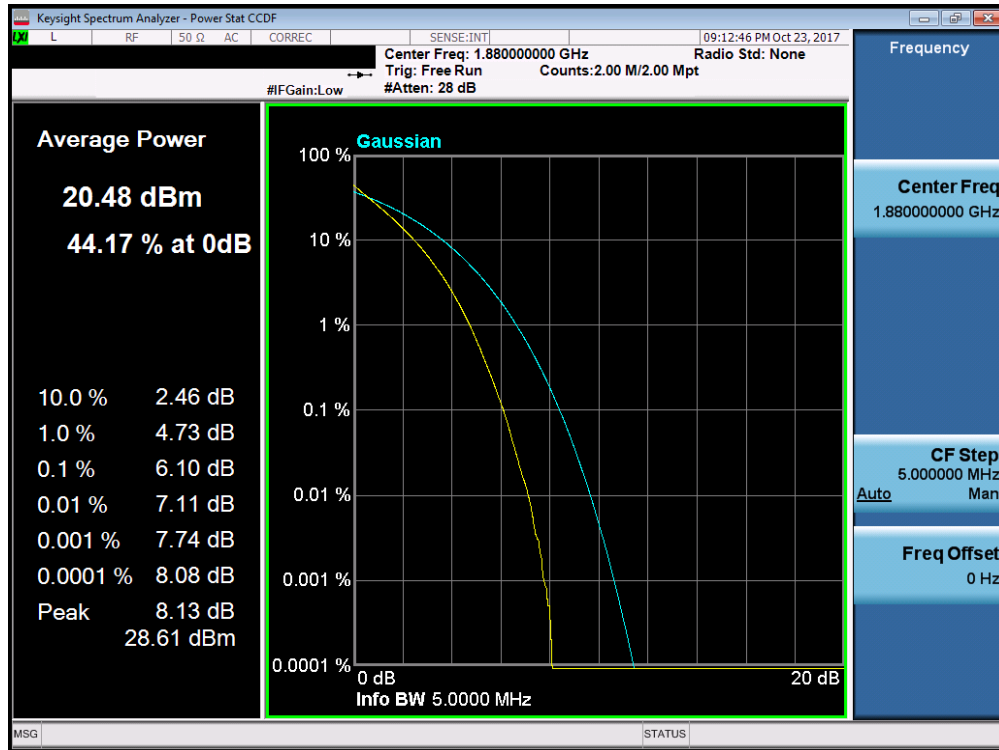
FCC ID: A3LSMA530F	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset		Page 183 of 236



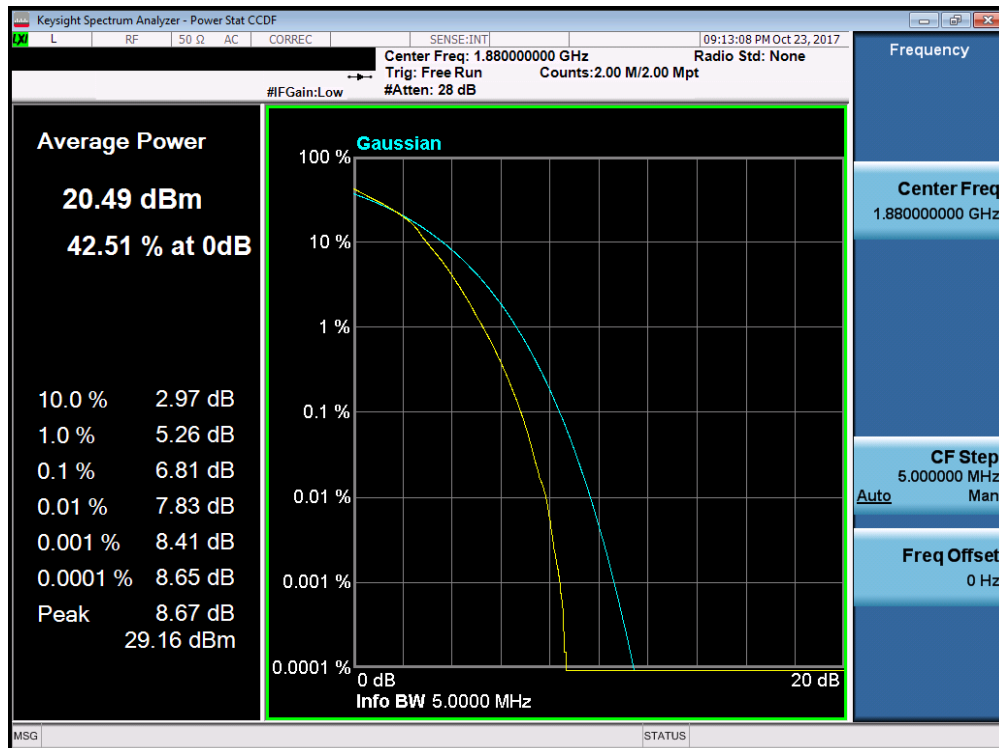
Plot 7-276. PAR Plot (Band 2 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset		Page 184 of 236

Band 2

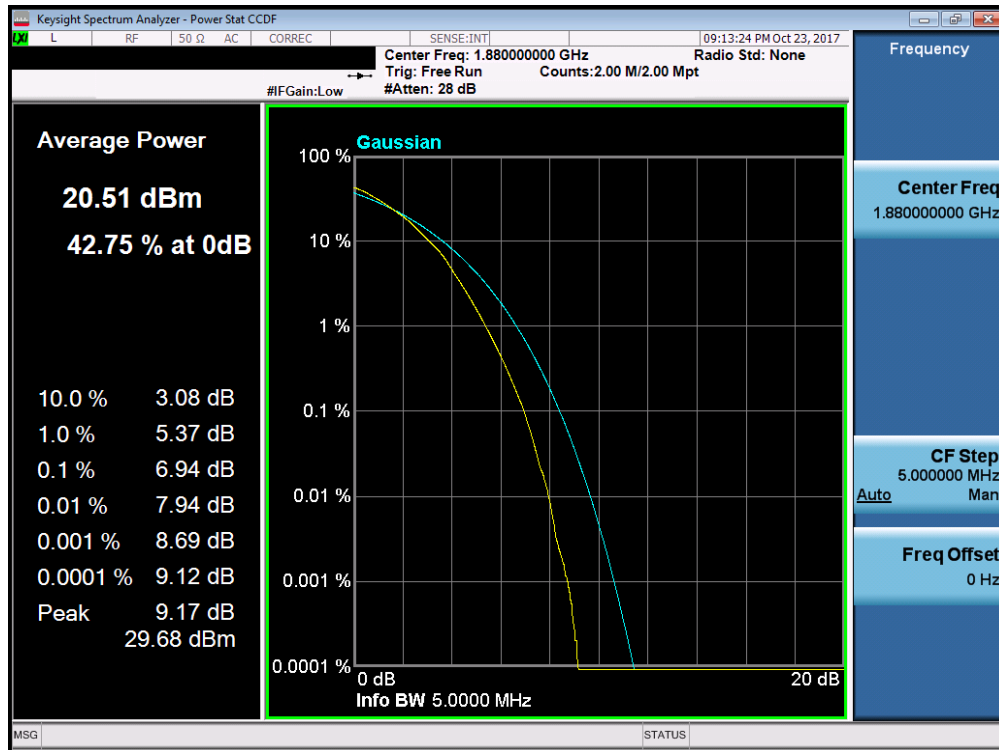


Plot 7-277. PAR Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-278. PAR Plot (Band 2 - 5.0MHz 16-QAM - Full RB Configuration)

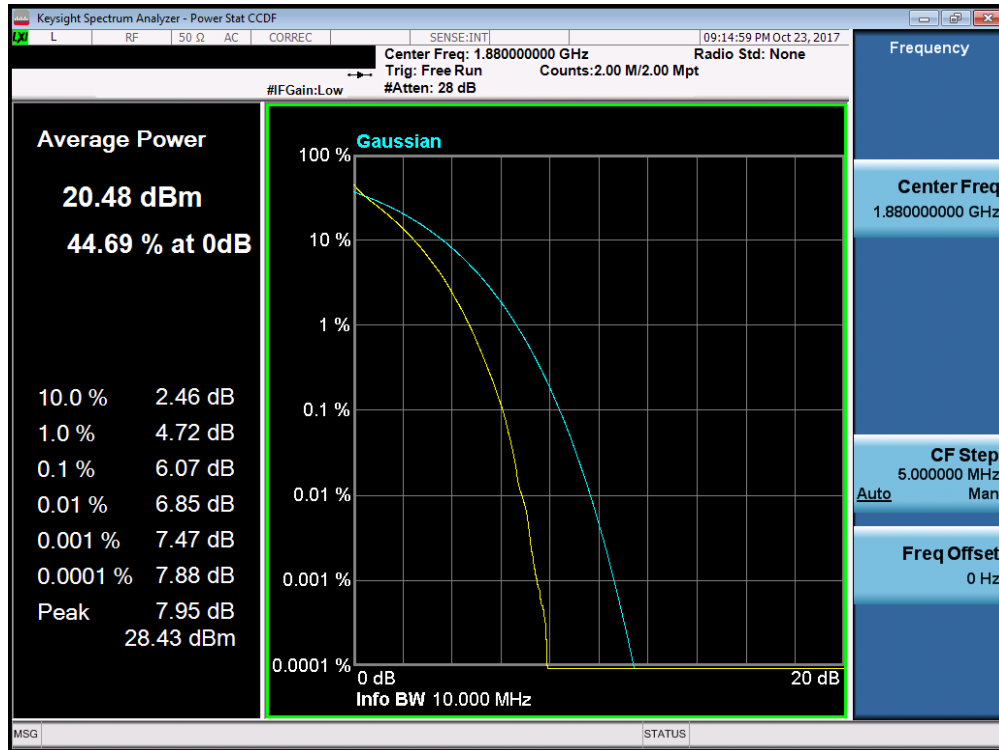
FCC ID: A3LSMA530F	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset		Page 185 of 236



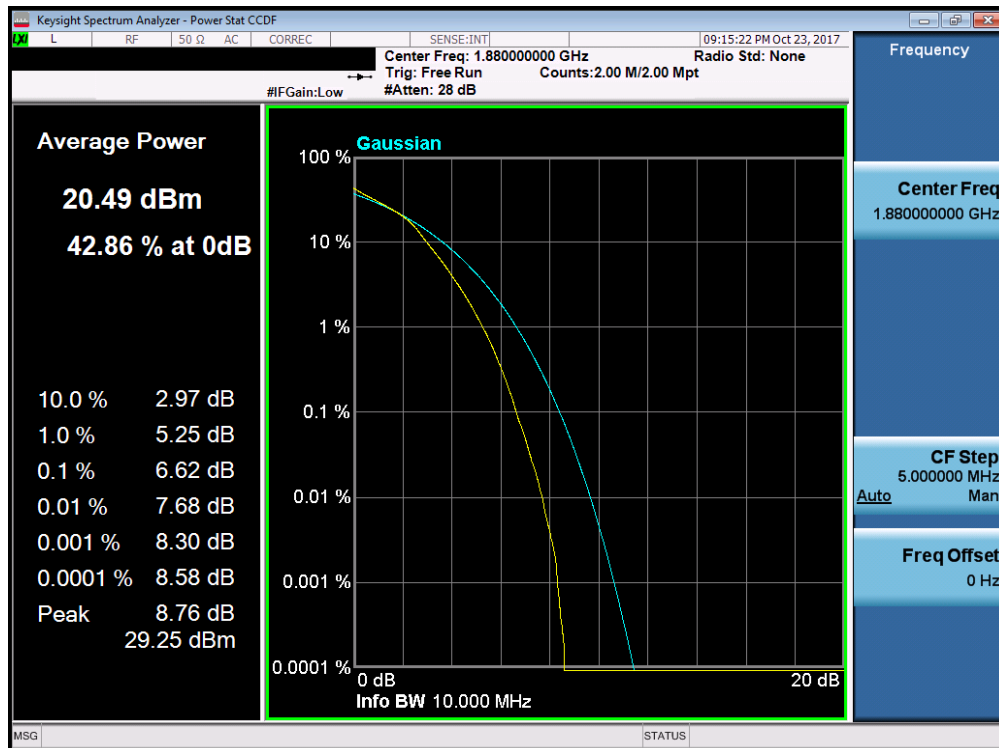
Plot 7-279. PAR Plot (Band 2 - 5.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset		Page 186 of 236

Band 2

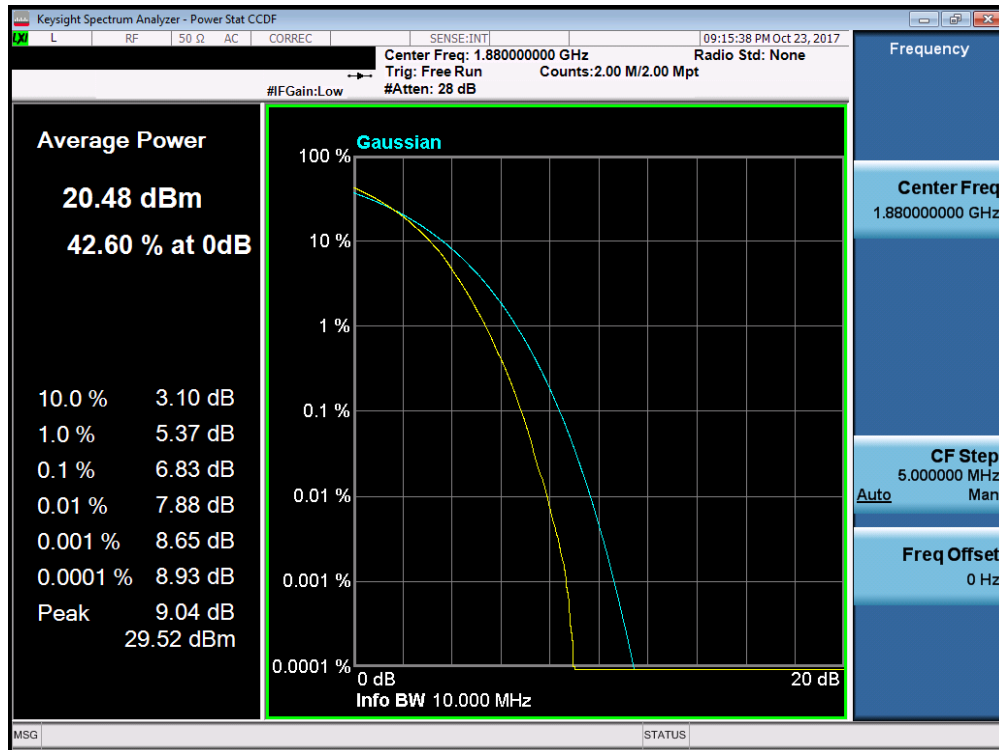


Plot 7-280. PAR Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-281. PAR Plot (Band 2 - 10.0MHz 16-QAM - Full RB Configuration)

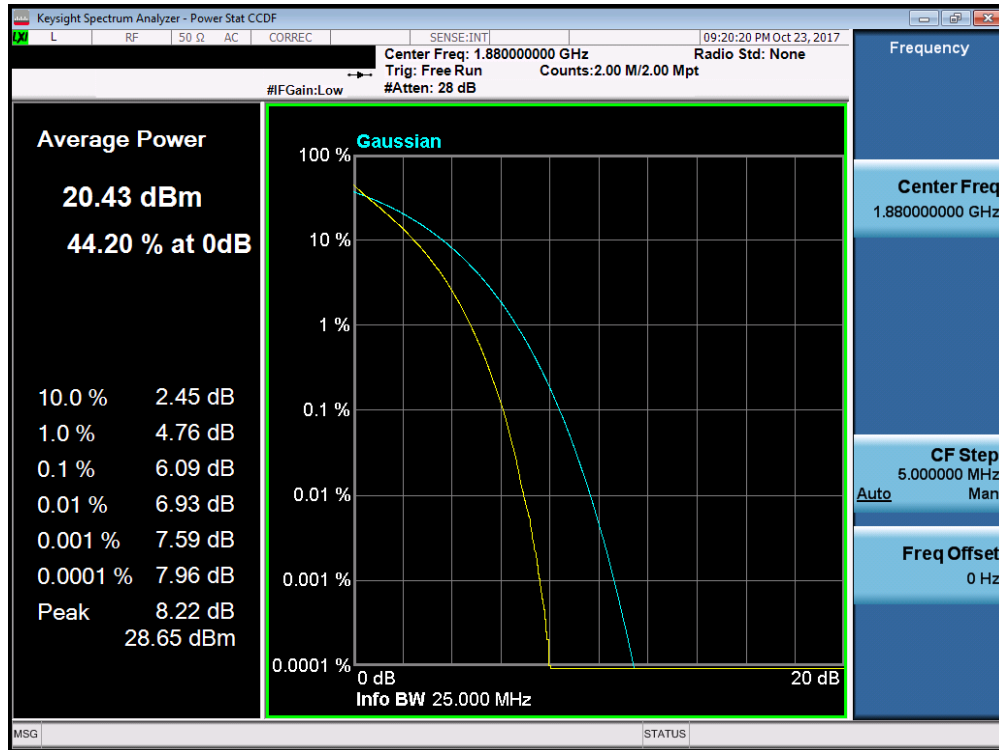
FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset	Page 187 of 236	



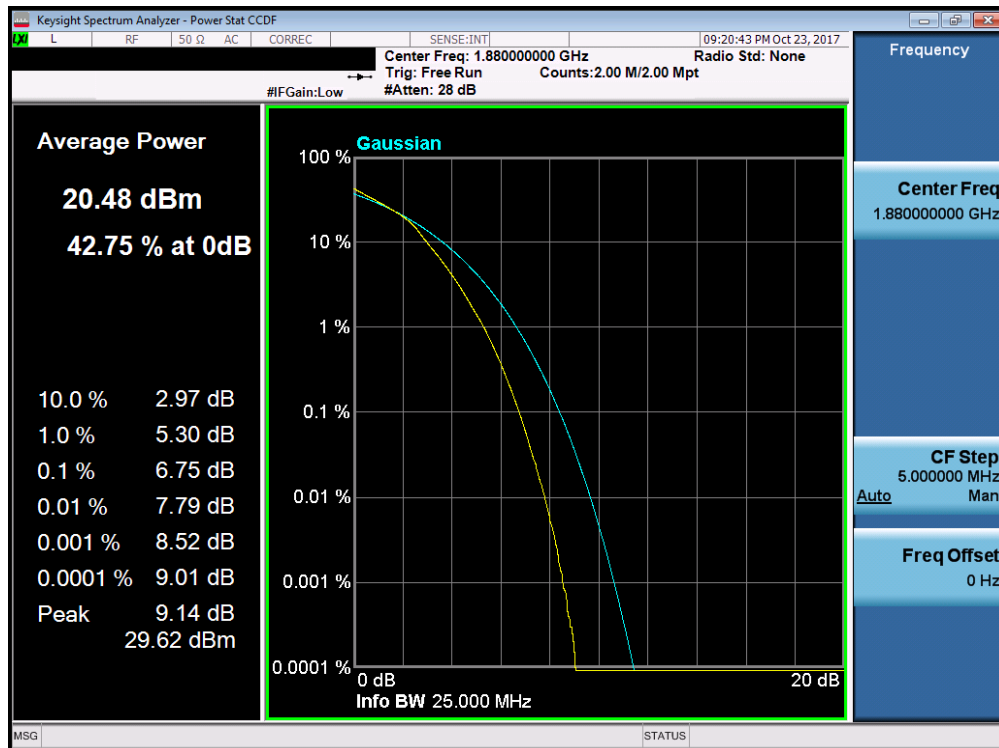
Plot 7-282. PAR Plot (Band 2 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset		Page 188 of 236

Band 2

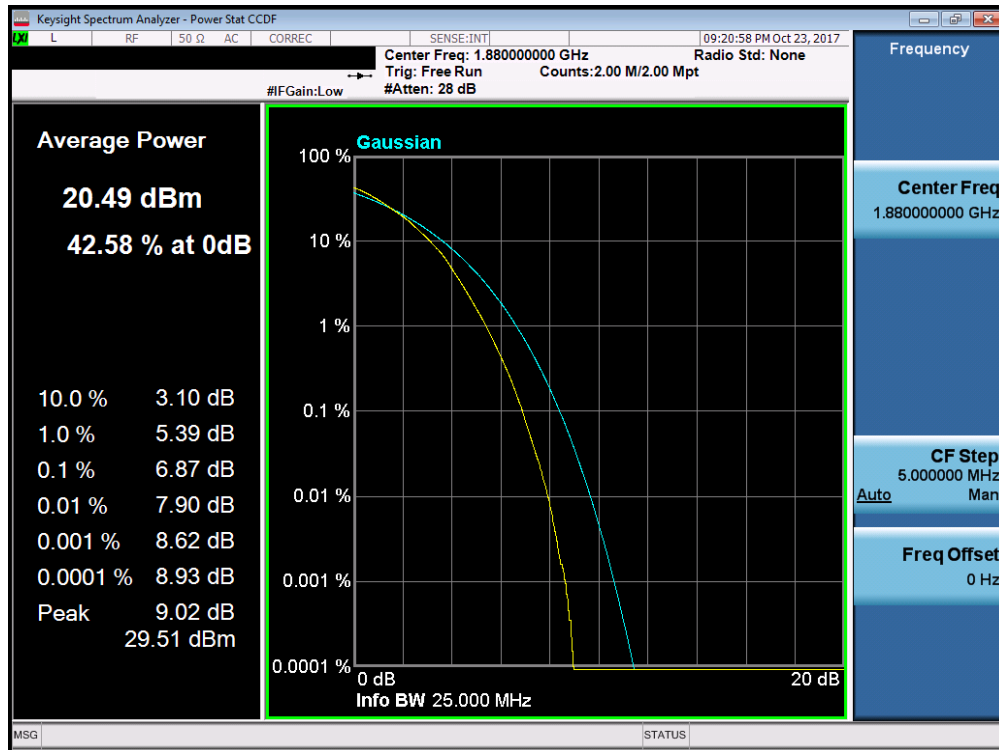


Plot 7-283. PAR Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-284. PAR Plot (Band 2 - 15.0MHz 16-QAM - Full RB Configuration)

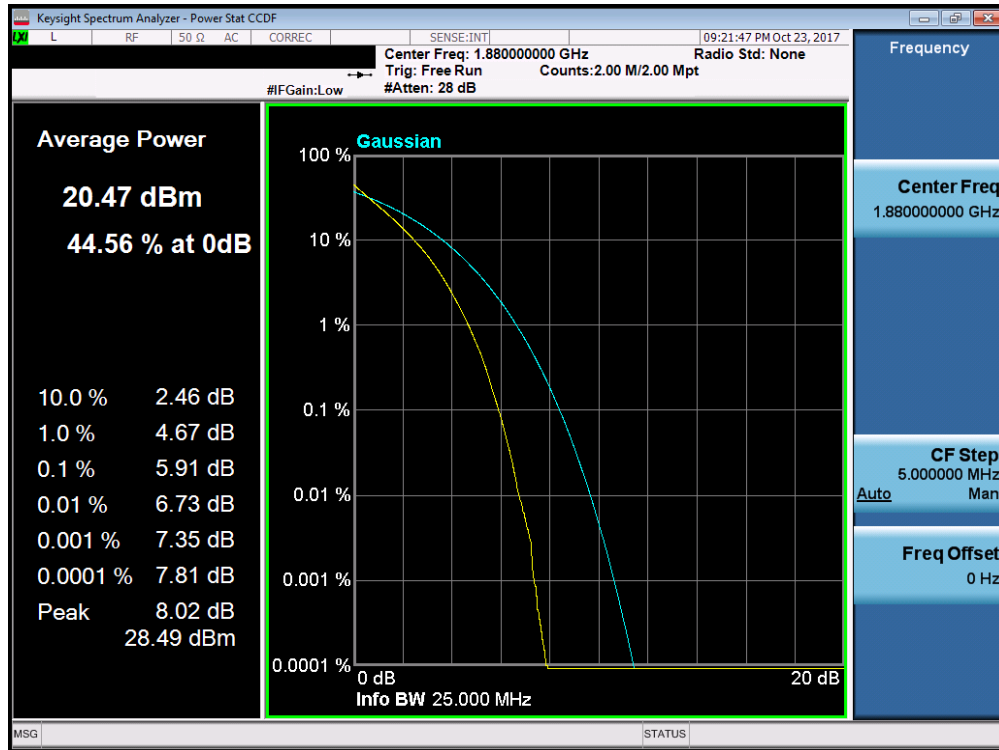
FCC ID: A3LSMA530F	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset		Page 189 of 236



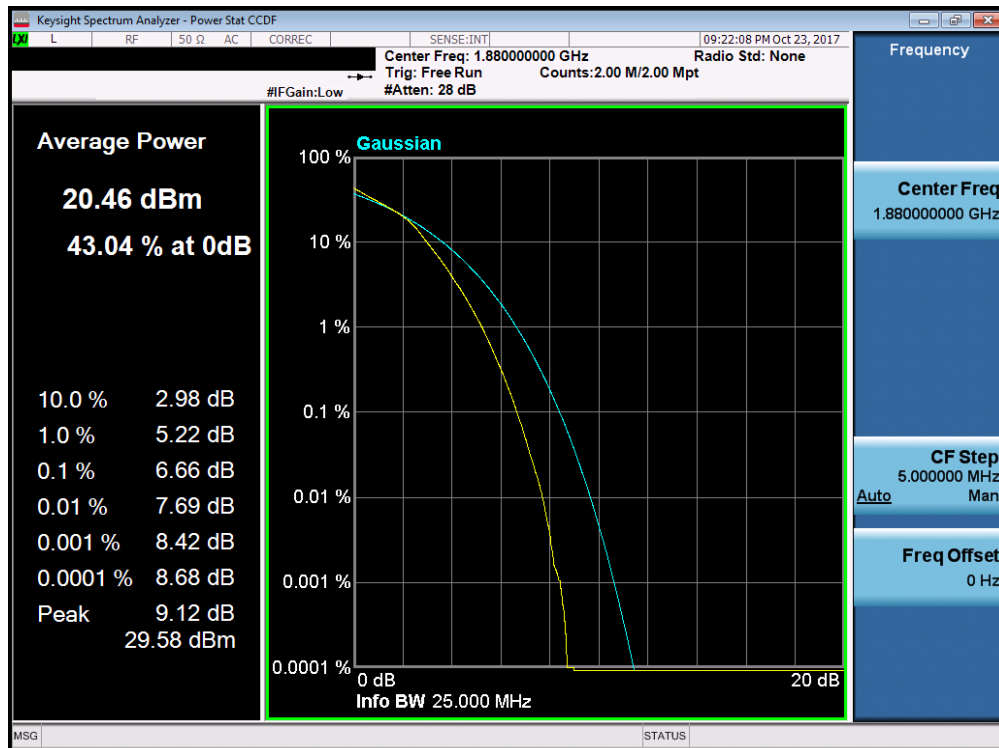
Plot 7-285. PAR Plot (Band 2 - 15.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset	Page 190 of 236

Band 2

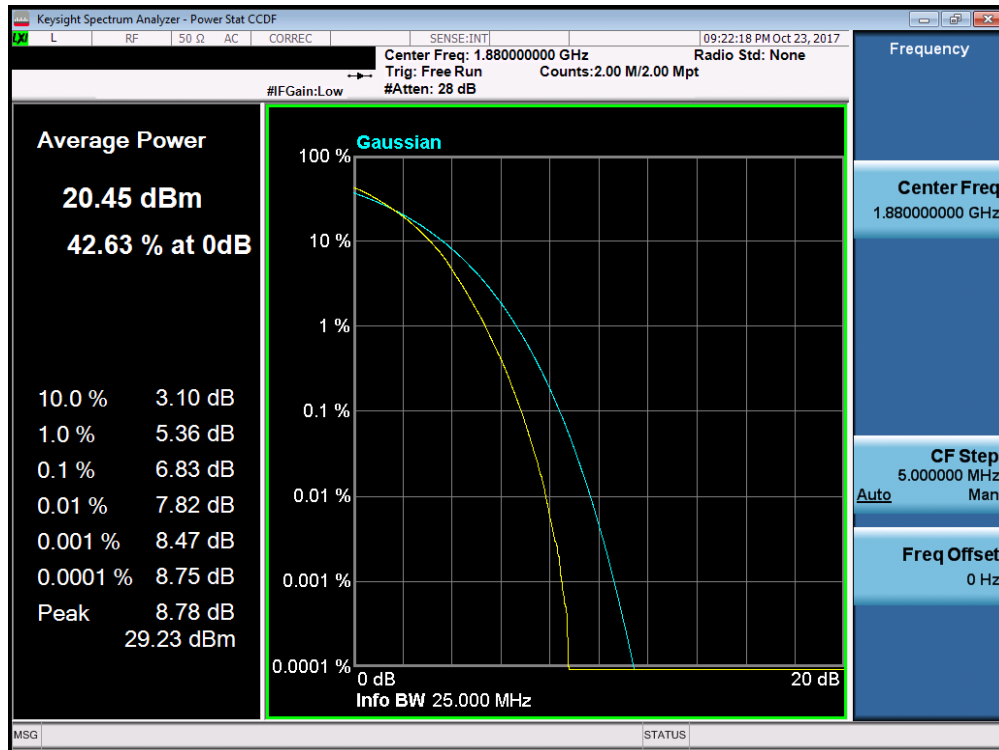


Plot 7-286. PAR Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-287. PAR Plot (Band 2 - 20.0MHz 16-QAM - Full RB Configuration)

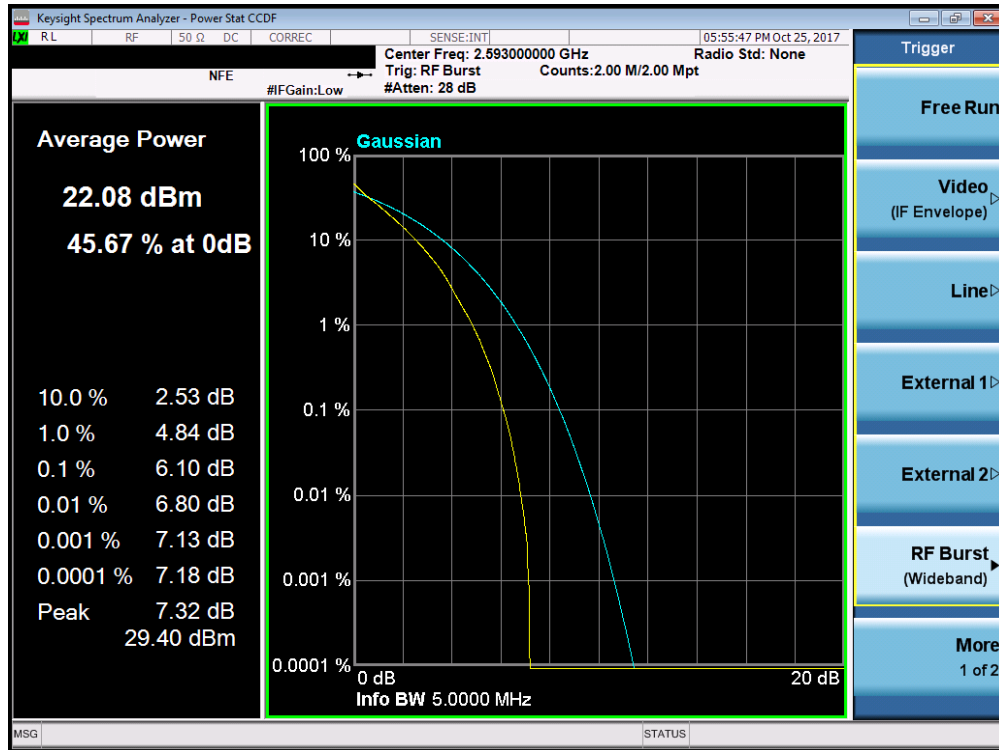
FCC ID: A3LSMA530F	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset		Page 191 of 236



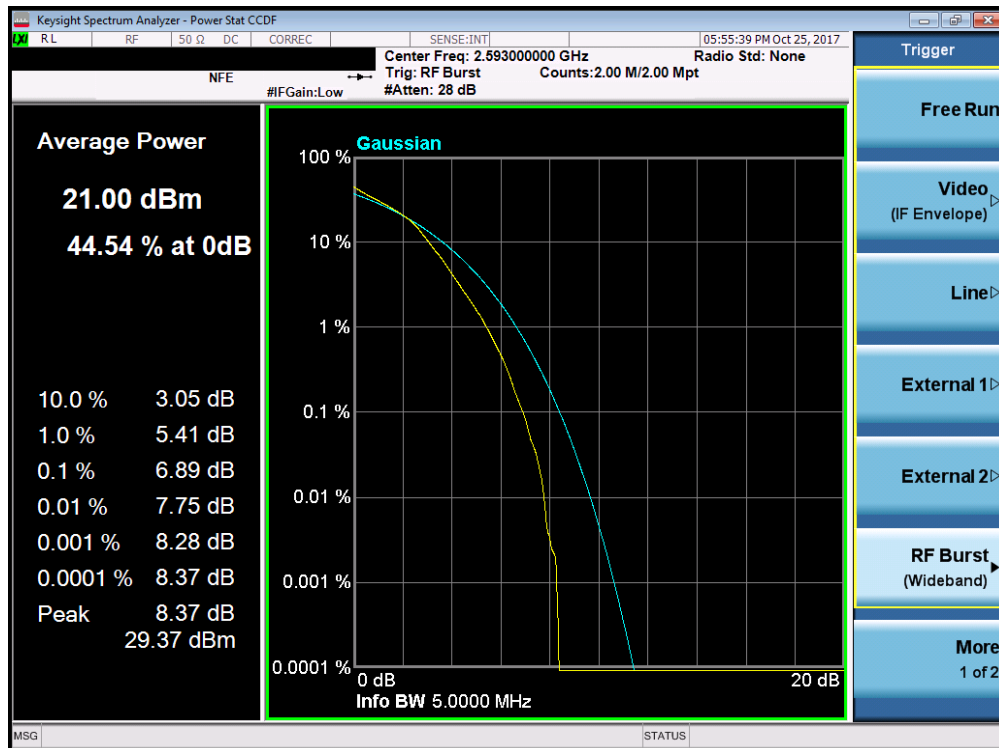
Plot 7-288. PAR Plot (Band 2 - 20.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset	Page 192 of 236	

Band 41

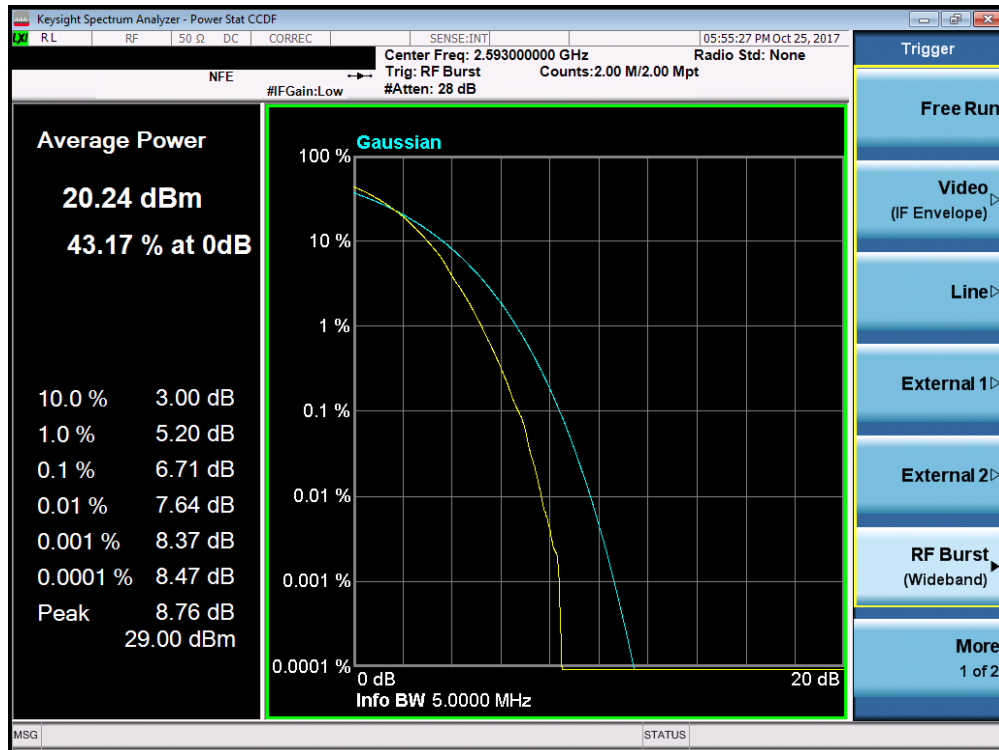


Plot 7-289. PAR Plot (Band 41 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-290. PAR Plot (Band 41 - 5.0MHz 16-QAM - Full RB Configuration)

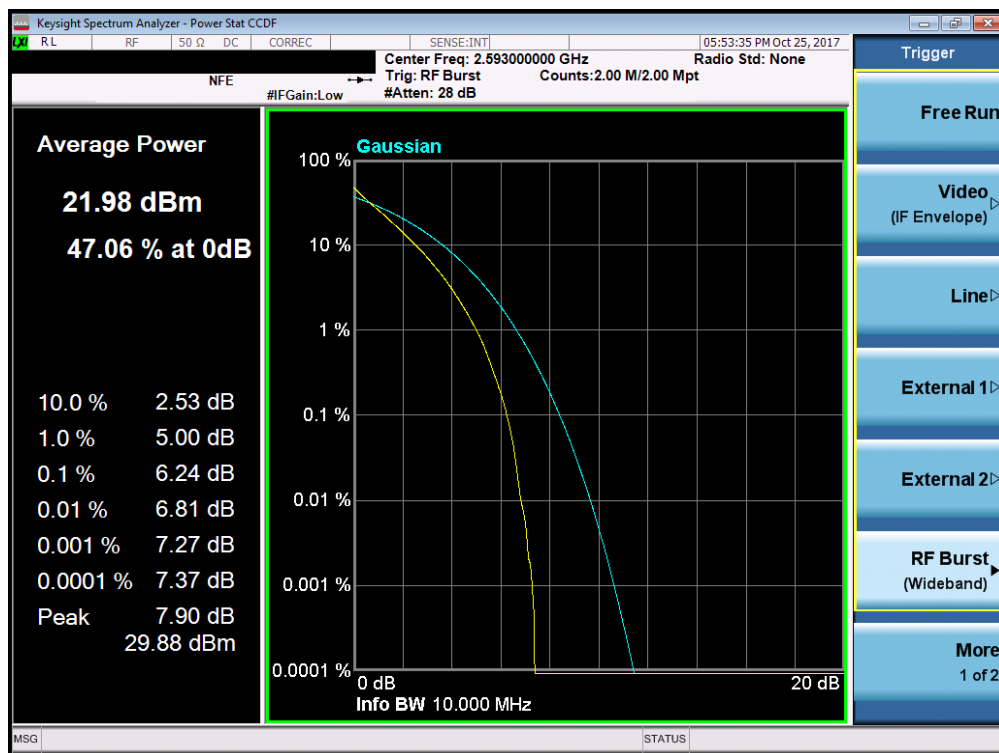
FCC ID: A3LSMA530F	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset		Page 193 of 236



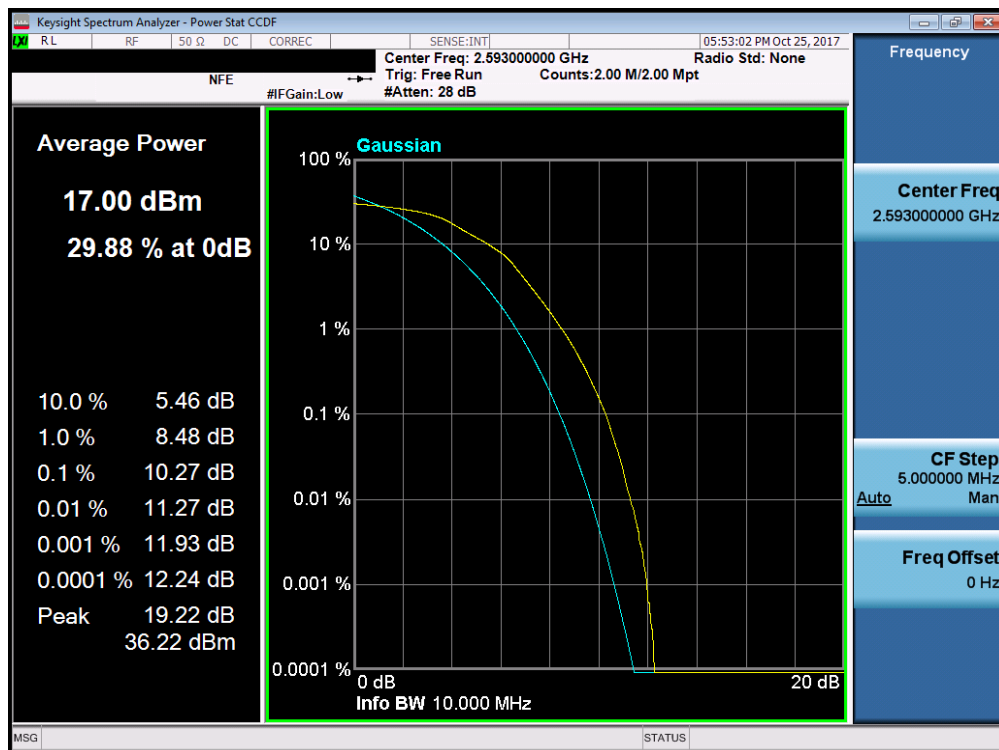
Plot 7-291. PAR Plot (Band 41 - 5.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset		Page 194 of 236

Band 41

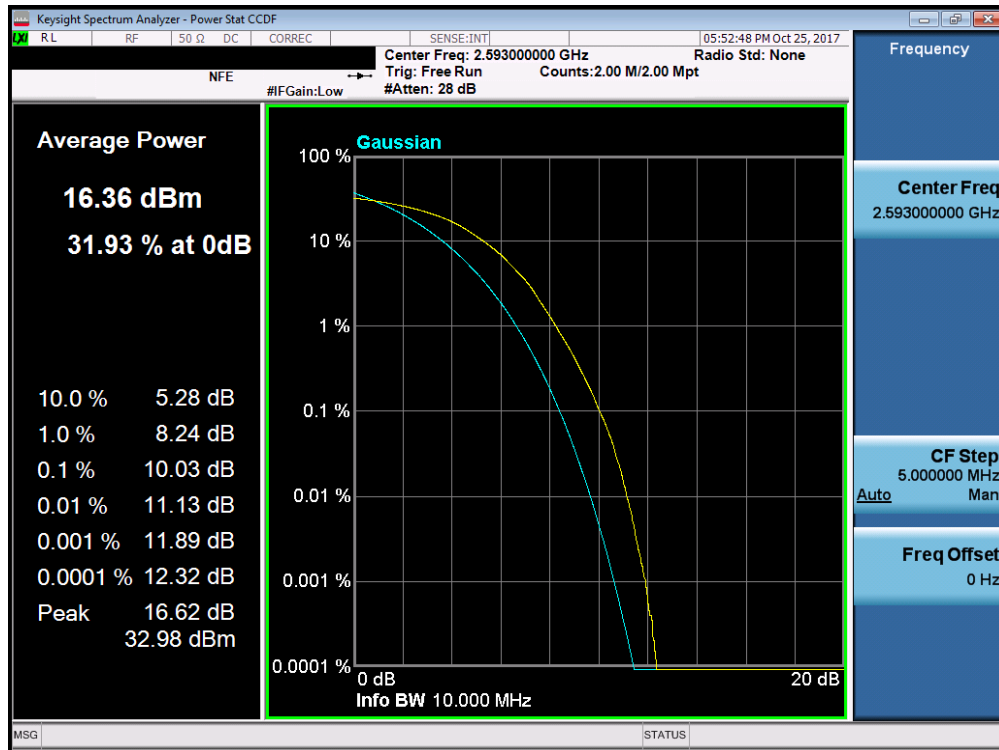


Plot 7-292. PAR Plot (Band 41 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-293. PAR Plot (Band 41 - 10.0MHz 16-QAM - Full RB Configuration)

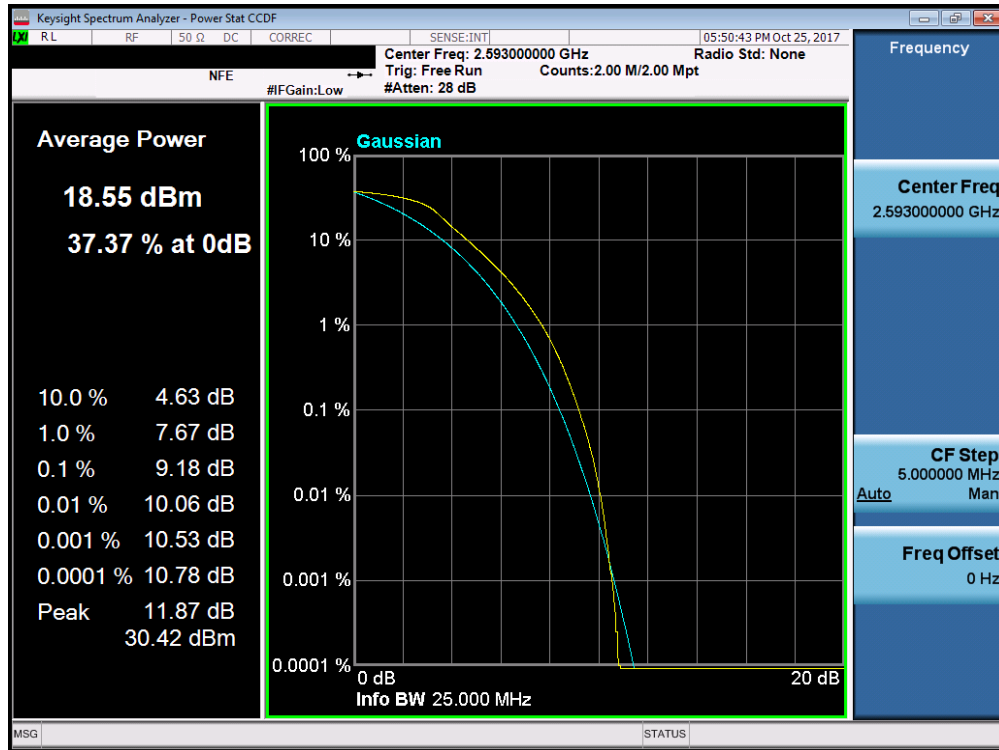
FCC ID: A3LSMA530F	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset		Page 195 of 236



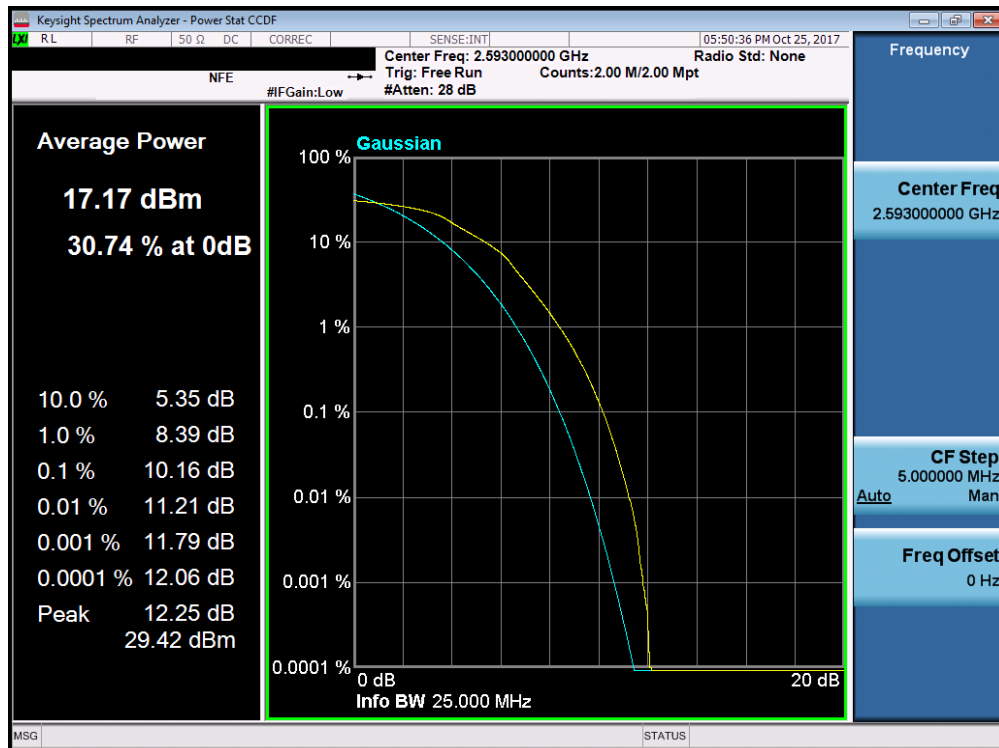
Plot 7-294. PAR Plot (Band 41 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset		Page 196 of 236

Band 41

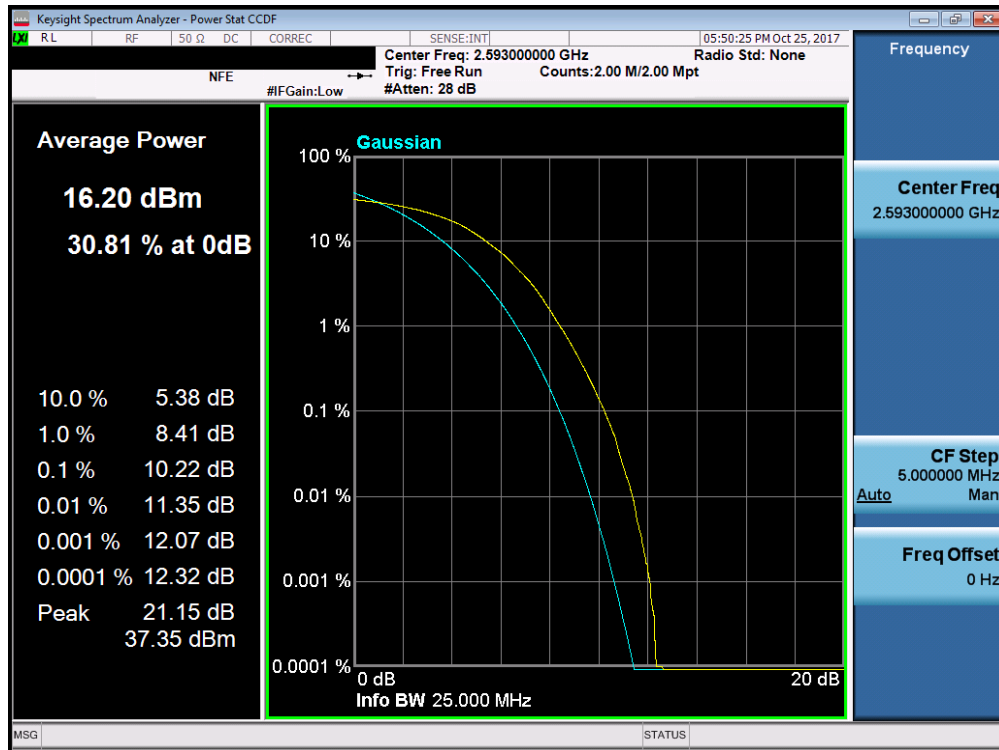


Plot 7-295. PAR Plot (Band 41 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-296. PAR Plot (Band 41 - 15.0MHz 16-QAM - Full RB Configuration)

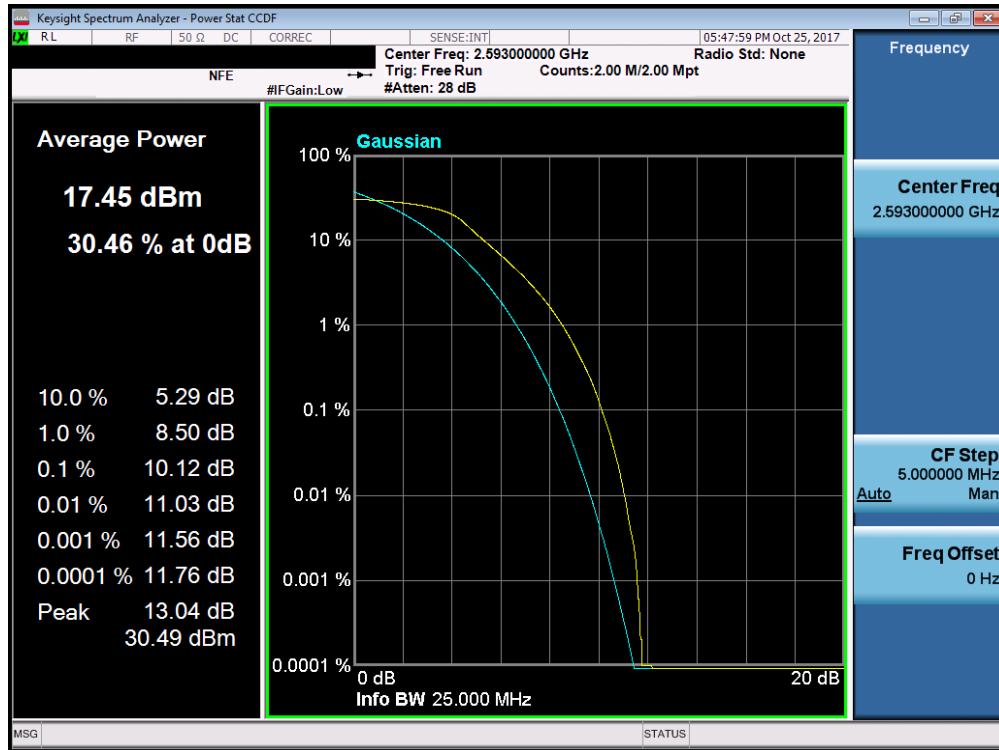
FCC ID: A3LSMA530F	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset		Page 197 of 236



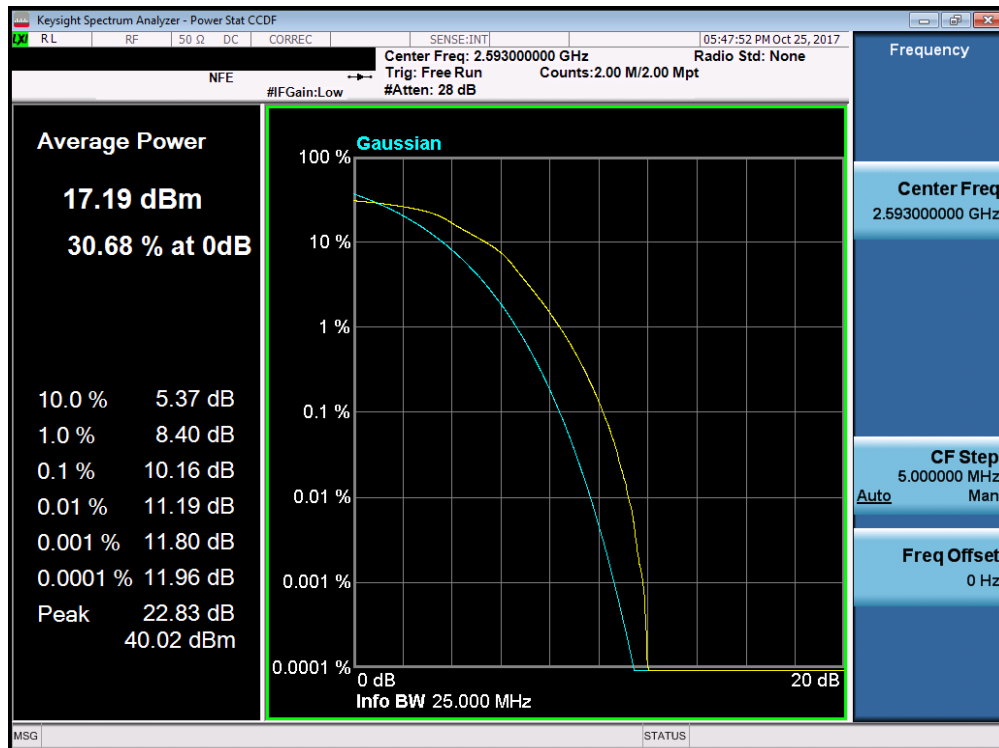
Plot 7-297. PAR Plot (Band 41 - 15.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset	Page 198 of 236	

Band 41

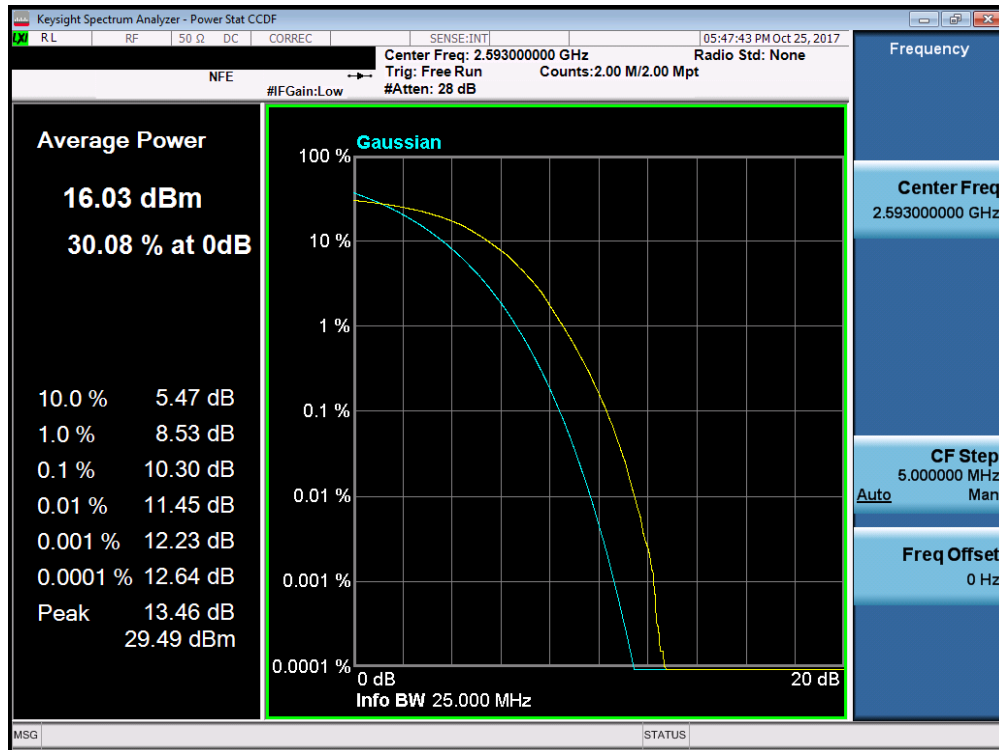


Plot 7-298. PAR Plot (Band 41 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-299. PAR Plot (Band 41 - 20.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset		Page 199 of 236



Plot 7-300. PAR Plot (Band 41 - 20.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMA530F	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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7.6 Radiated Power (ERP/EIRP)

§22.913(a)(2) §24.232(c.2) §27.50(h)(2) §27.50(b)(10) §27.50(c)(10) §27.50(d)(4) RSS-130(4.4) RSS-132(5.4) RSS-133(6.4) RSS-139(6.5) RSS-199(4.4)

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 its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v03 – 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: A3LSMA530F	 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.

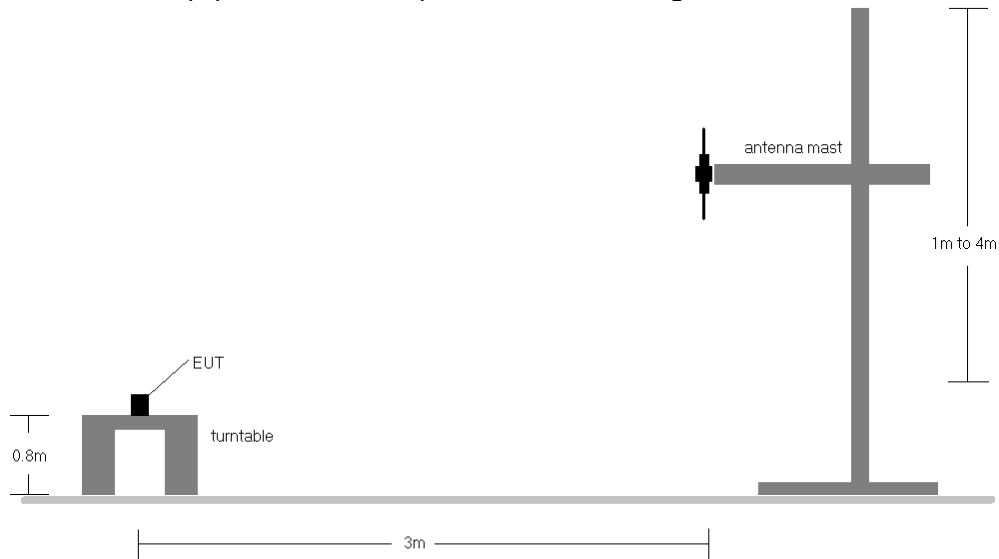


Figure 7-5. Radiated Test Setup <1GHz

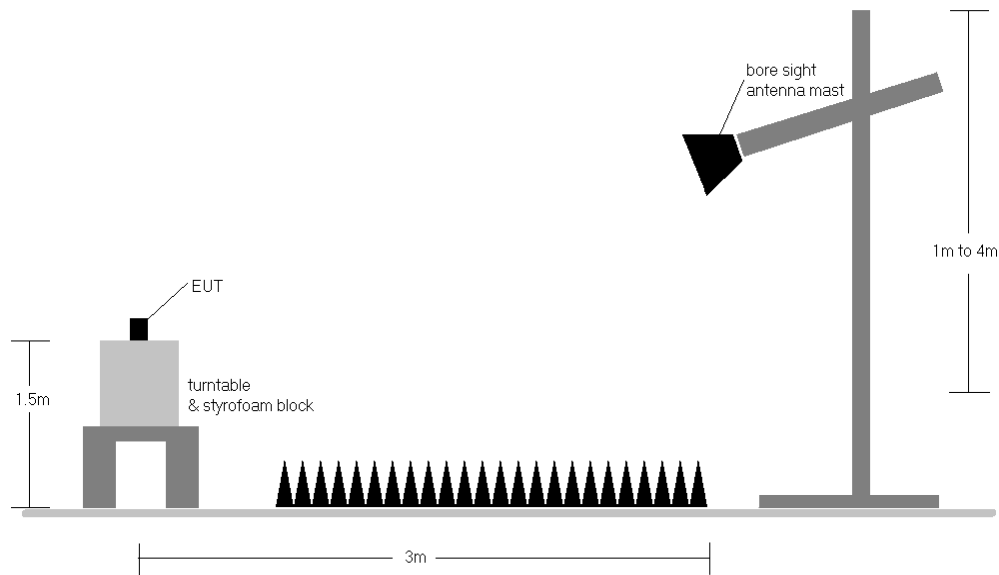


Figure 7-6. Radiated Test Setup >1GHz

Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	Margin [dB]
699.70	1.4	QPSK	V	150	3	1 / 0	17.69	1.10	16.64	0.046	34.77	-18.13	18.79	0.076	-21.82
707.50	1.4	QPSK	V	150	5	1 / 5	18.40	1.13	17.38	0.055	34.77	-17.39	19.53	0.090	-21.08
715.30	1.4	QPSK	V	150	358	1 / 5	18.40	1.16	17.41	0.055	34.77	-17.36	19.56	0.090	-21.05
707.50	1.4	16-QAM	V	150	5	1 / 5	17.34	1.13	16.32	0.043	34.77	-18.45	18.47	0.070	-22.14
715.30	1.4	64-QAM	V	150	358	1 / 5	16.74	1.16	15.75	0.038	34.77	-19.02	17.90	0.062	-22.71
700.50	3	QPSK	V	150	351	1 / 14	16.66	1.10	15.61	0.036	34.77	-19.16	17.76	0.060	-22.84
707.50	3	QPSK	V	150	350	1 / 0	18.21	1.13	17.19	0.052	34.77	-17.58	19.34	0.086	-21.27
714.50	3	QPSK	V	150	354	1 / 14	18.43	1.16	17.44	0.055	34.77	-17.33	19.59	0.091	-21.02
714.50	3	16-QAM	V	150	354	1 / 14	17.43	1.16	16.44	0.044	34.77	-18.33	18.59	0.072	-22.02
714.50	3	64-QAM	V	150	354	1 / 14	16.48	1.16	15.49	0.035	34.77	-19.28	17.64	0.058	-22.97

Table 7-3. ERP/EIRP Data (Band 12)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	Margin [dB]
701.50	5	QPSK	V	150	351	1 / 24	18.17	1.11	17.13	0.052	34.77	-17.65	19.28	0.085	-21.33
707.50	5	QPSK	V	150	347	1 / 24	18.38	1.13	17.36	0.054	34.77	-17.41	19.51	0.089	-21.10
713.50	5	QPSK	V	150	346	1 / 24	18.39	1.15	17.39	0.055	34.77	-17.38	19.54	0.090	-21.06
713.50	5	16-QAM	V	150	346	1 / 24	17.13	1.15	16.13	0.041	34.77	-18.64	18.28	0.067	-22.32
713.50	5	64-QAM	V	150	346	1 / 24	16.84	1.15	15.84	0.038	34.77	-18.93	17.99	0.063	-22.61
704.00	10	QPSK	V	150	354	1 / 49	17.81	1.12	16.78	0.048	34.77	-17.99	18.93	0.078	-21.68
707.50	10	QPSK	V	150	347	1 / 49	18.83	1.13	17.81	0.060	34.77	-16.96	19.96	0.099	-20.65
711.00	10	QPSK	V	150	349	1 / 49	18.53	1.14	17.52	0.057	34.77	-17.25	19.67	0.093	-20.93
711.00	10	16-QAM	V	150	349	1 / 49	17.65	1.14	16.64	0.046	34.77	-18.13	18.79	0.076	-21.81
707.50	10	64-QAM	V	150	347	1 / 49	16.91	1.13	15.89	0.039	34.77	-18.88	18.04	0.064	-22.57
707.50	10	QPSK	H	150	154	1 / 74	15.26	1.13	14.24	0.027	34.77	-20.53	16.39	0.044	-24.22

Table 7-4. ERP/EIRP Data (Band 12/17)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	Margin [dB]
779.50	5	QPSK	H	150	279	1 / 0	19.44	1.32	18.61	0.073	34.77	-16.16	20.76	0.119	-19.85
782.00	5	QPSK	H	150	288	1 / 0	19.59	1.33	18.77	0.075	34.77	-16.00	20.92	0.124	-19.69
784.50	5	QPSK	H	150	290	1 / 0	19.41	1.34	18.60	0.072	34.77	-16.17	20.75	0.119	-19.86
784.50	5	16-QAM	H	150	294	1 / 0	18.50	1.34	17.69	0.059	34.77	-17.08	19.84	0.096	-20.77
782.00	5	64-QAM	H	150	293	1 / 0	16.81	1.33	15.99	0.040	34.77	-18.78	18.14	0.065	-22.47
782.00	10	QPSK	H	150	296	1 / 0	19.86	1.33	19.04	0.080	34.77	-15.73	21.19	0.131	-19.42
782.00	10	16-QAM	H	150	296	1 / 0	18.91	1.33	18.09	0.064	34.77	-16.68	20.24	0.106	-20.37
782.00	10	64-QAM	H	150	296	1 / 0	17.20	1.33	16.38	0.043	34.77	-18.39	18.53	0.071	-22.08
782.00	10	QPSK	V	150	260	1 / 0	18.49	1.33	17.67	0.058	34.77	-17.10	19.82	0.096	-20.79

Table 7-5. ERP/EIRP Data (Band 13)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset	Page 203 of 236	

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	Margin [dB]
824.70	1.4	QPSK	H	243	5	1 / 0	14.81	7.51	20.17	0.104	38.45	-18.28	22.32	0.171	-14.67
836.50	1.4	QPSK	H	243	5	1 / 0	14.32	7.30	19.47	0.089	38.45	-18.98	21.62	0.145	-15.37
848.30	1.4	QPSK	H	234	4	1 / 0	13.73	7.31	18.89	0.077	38.45	-19.56	21.04	0.127	-15.95
824.70	1.4	16-QAM	H	243	5	1 / 0	13.53	7.51	18.89	0.077	38.45	-19.56	21.04	0.127	-15.95
824.70	1.4	64-QAM	H	243	5	1 / 0	12.62	7.51	17.98	0.063	38.45	-20.47	20.13	0.103	-16.86
825.50	3	QPSK	H	242	5	1 / 0	15.15	7.50	20.50	0.112	38.45	-17.95	22.65	0.184	-14.34
836.50	3	QPSK	H	243	5	1 / 0	14.60	7.30	19.75	0.094	38.45	-18.70	21.90	0.155	-15.09
847.50	3	QPSK	H	241	5	1 / 0	13.72	7.29	18.86	0.077	38.45	-19.59	21.01	0.126	-15.98
825.50	3	16-QAM	H	242	5	1 / 0	14.01	7.50	19.36	0.086	38.45	-19.09	21.51	0.142	-15.48
825.50	3	64-QAM	H	242	5	1 / 0	13.12	7.50	18.47	0.070	38.45	-19.98	20.62	0.115	-16.37
826.50	5	QPSK	H	236	5	1 / 0	15.45	7.49	20.79	0.120	38.45	-17.66	22.94	0.197	-14.05
836.50	5	QPSK	H	236	5	1 / 0	14.71	7.30	19.86	0.097	38.45	-18.59	22.01	0.159	-14.98
846.50	5	QPSK	H	236	5	1 / 0	14.18	7.28	19.31	0.085	38.45	-19.14	21.46	0.140	-15.53
826.50	5	16-QAM	H	236	5	1 / 0	14.30	7.49	19.64	0.092	38.45	-18.81	21.79	0.151	-15.20
826.50	5	64-QAM	H	236	5	1 / 0	13.40	7.49	18.74	0.075	38.45	-19.71	20.89	0.123	-16.10
829.00	10	QPSK	H	243	16	1 / 0	14.76	7.45	20.06	0.101	38.45	-18.39	22.21	0.166	-14.78
836.50	10	QPSK	H	243	16	1 / 0	14.56	7.30	19.71	0.094	38.45	-18.74	21.86	0.153	-15.13
844.00	10	QPSK	H	243	16	1 / 0	14.09	7.26	19.20	0.083	38.45	-19.25	21.35	0.136	-15.64
829.00	10	16-QAM	H	243	16	1 / 0	13.61	7.45	18.91	0.078	38.45	-19.54	21.06	0.128	-15.93
829.00	10	64-QAM	H	243	16	1 / 0	12.64	7.45	17.94	0.062	38.45	-20.51	20.09	0.102	-16.90
826.50	5	QPSK	V	238	5	75 / 0	11.98	7.49	17.32	0.054	38.45	-21.13	19.47	0.088	-17.52

Table 7-6. ERP/EIRP Data (Band 26/5)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	Margin [dB]
831.50	15	QPSK	H	237	5	1 / 0	14.90	7.40	20.15	0.103	38.45	-18.31	22.30	0.170	-14.69
836.50	15	QPSK	H	237	20	1 / 0	14.57	7.30	19.72	0.094	38.45	-18.73	21.87	0.154	-15.12
841.50	15	QPSK	H	237	20	1 / 0	13.90	7.26	19.01	0.080	38.45	-19.44	21.16	0.131	-15.83
831.50	15	16-QAM	H	237	5	1 / 0	13.80	7.40	19.05	0.080	38.45	-19.41	21.20	0.132	-15.79
831.50	15	64-QAM	H	237	5	1 / 0	12.76	7.40	18.01	0.063	38.45	-20.45	20.16	0.104	-16.83

Table 7-7. ERP/EIRP Data (Band 26)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION) 				Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset			Page 204 of 236

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1710.70	1.4	QPSK	H	150	18	1 / 0	19.16	5.56	24.72	0.296	30.00	-5.28
1745.00	1.4	QPSK	H	150	7	3 / 2	19.32	5.32	24.64	0.291	30.00	-5.36
1779.30	1.4	QPSK	H	150	13	1 / 0	20.04	5.09	25.13	0.326	30.00	-4.87
1779.30	1.4	16-QAM	H	150	13	1 / 5	18.77	5.09	23.86	0.243	30.00	-6.14
1779.30	1.4	64-QAM	H	150	13	1 / 0	17.86	5.09	22.95	0.197	30.00	-7.05
1711.50	3	QPSK	H	150	9	1 / 14	19.07	5.55	24.62	0.290	30.00	-5.38
1745.00	3	QPSK	H	150	14	1 / 14	19.56	5.32	24.88	0.308	30.00	-5.12
1778.50	3	QPSK	H	150	11	1 / 0	19.77	5.10	24.87	0.307	30.00	-5.13
1745.00	3	16-QAM	H	150	14	1 / 14	18.34	5.32	23.66	0.232	30.00	-6.34
1745.00	3	64-QAM	H	150	14	1 / 14	17.46	5.32	22.78	0.190	30.00	-7.22
1712.50	5	QPSK	H	150	9	1 / 0	18.75	5.55	24.30	0.269	30.00	-5.70
1745.00	5	QPSK	H	150	14	1 / 24	19.70	5.32	25.02	0.318	30.00	-4.98
1777.50	5	QPSK	H	150	11	1 / 24	20.15	5.10	25.25	0.335	30.00	-4.75
1777.50	5	16-QAM	H	150	11	1 / 24	18.67	5.10	23.77	0.238	30.00	-6.23
1745.00	5	64-QAM	H	150	14	1 / 24	17.34	5.32	22.66	0.185	30.00	-7.34
1715.00	10	QPSK	H	150	15	1 / 49	19.40	5.53	24.93	0.311	30.00	-5.07
1745.00	10	QPSK	H	150	13	1 / 49	19.76	5.32	25.08	0.322	30.00	-4.92
1775.00	10	QPSK	H	150	17	1 / 49	19.95	5.12	25.07	0.321	30.00	-4.93
1745.00	10	16-QAM	H	150	13	1 / 49	18.59	5.32	23.91	0.246	30.00	-6.09
1775.00	10	64-QAM	H	150	17	1 / 49	17.82	5.12	22.94	0.197	30.00	-7.06
1717.50	15	QPSK	H	150	13	1 / 74	19.43	5.51	24.94	0.312	30.00	-5.06
1745.00	15	QPSK	H	150	11	1 / 74	19.57	5.32	24.89	0.309	30.00	-5.11
1772.50	15	QPSK	H	150	8	1 / 74	19.75	5.14	24.89	0.308	30.00	-5.11
1772.50	15	16-QAM	H	150	8	1 / 74	18.79	5.14	23.93	0.247	30.00	-6.07
1745.00	15	64-QAM	H	150	11	1 / 74	17.55	5.32	22.87	0.194	30.00	-7.13
1720.00	20	QPSK	H	150	2	1 / 99	18.91	5.49	24.40	0.276	30.00	-5.60
1745.00	20	QPSK	H	150	7	1 / 99	19.38	5.32	24.70	0.295	30.00	-5.30
1770.00	20	QPSK	H	150	17	1 / 99	20.03	5.15	25.18	0.330	30.00	-4.82
1770.00	20	16-QAM	H	150	17	1 / 99	18.58	5.15	23.73	0.236	30.00	-6.27
1770.00	20	64-QAM	H	150	17	1 / 99	17.72	5.15	22.87	0.194	30.00	-7.13
1777.50	5	QPSK	V	150	78	1 / 99	15.62	4.92	20.54	0.113	30.00	-9.46

Table 7-8. EIRP Data (Band 66/4)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset	Page 205 of 236	

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	H	150	271	1 / 0	20.64	4.82	25.46	0.351	33.01	-7.55
1880.00	1.4	QPSK	H	150	276	1 / 5	20.39	4.74	25.13	0.326	33.01	-7.88
1909.30	1.4	QPSK	H	150	275	1 / 0	19.04	4.68	23.72	0.236	33.01	-9.29
1850.70	1.4	16-QAM	H	150	279	1 / 0	19.36	4.82	24.18	0.262	33.01	-8.83
1850.70	1.4	64-QAM	H	150	277	1 / 0	18.39	4.82	23.21	0.209	33.01	-9.80
1851.50	3	QPSK	H	150	279	1 / 0	20.55	4.82	25.37	0.344	33.01	-7.64
1880.00	3	QPSK	H	150	273	1 / 0	20.45	4.74	25.19	0.330	33.01	-7.82
1908.50	3	QPSK	H	150	279	1 / 0	19.22	4.68	23.90	0.246	33.01	-9.11
1851.50	3	16-QAM	H	150	279	1 / 0	19.42	4.82	24.24	0.265	33.01	-8.77
1851.50	3	64-QAM	H	150	275	1 / 0	18.59	4.82	23.41	0.219	33.01	-9.60
1852.50	5	QPSK	H	150	269	1 / 24	20.68	4.81	25.49	0.354	33.01	-7.52
1880.00	5	QPSK	H	150	269	1 / 0	21.06	4.74	25.80	0.380	33.01	-7.21
1907.50	5	QPSK	H	150	283	1 / 0	19.65	4.68	24.33	0.271	33.01	-8.68
1880.00	5	16-QAM	H	150	269	1 / 0	19.85	4.74	24.59	0.288	33.01	-8.42
1880.00	5	64-QAM	H	150	269	1 / 0	18.92	4.74	23.66	0.232	33.01	-9.35
1855.00	10	QPSK	H	150	277	1 / 49	20.51	4.81	25.32	0.340	33.01	-7.69
1880.00	10	QPSK	H	150	273	1 / 0	20.37	4.74	25.11	0.324	33.01	-7.90
1905.00	10	QPSK	H	150	282	1 / 0	19.55	4.68	24.23	0.265	33.01	-8.78
1855.00	10	16-QAM	H	150	277	1 / 49	19.45	4.81	24.26	0.266	33.01	-8.75
1855.00	10	64-QAM	H	150	277	1 / 49	18.50	4.81	23.31	0.214	33.01	-9.70
1857.50	15	QPSK	H	150	275	1 / 0	20.67	4.80	25.47	0.352	33.01	-7.54
1880.00	15	QPSK	H	150	276	1 / 0	20.55	4.74	25.29	0.338	33.01	-7.72
1902.50	15	QPSK	H	150	279	1 / 0	19.67	4.69	24.36	0.273	33.01	-8.65
1857.50	15	16-QAM	H	150	275	1 / 0	19.44	4.80	24.24	0.265	33.01	-8.77
1857.50	15	64-QAM	H	150	275	1 / 0	18.39	4.80	23.19	0.208	33.01	-9.82
1860.00	20	QPSK	H	150	279	1 / 0	20.64	4.79	25.43	0.349	33.01	-7.58
1880.00	20	QPSK	H	150	276	1 / 0	20.56	4.74	25.30	0.339	33.01	-7.71
1900.00	20	QPSK	H	150	275	1 / 0	20.54	4.69	25.23	0.333	33.01	-7.78
1860.00	20	16-QAM	H	150	274	1 / 0	19.61	4.79	24.40	0.276	33.01	-8.61
1880.00	20	64-QAM	H	150	279	1 / 0	18.64	4.74	23.38	0.218	33.01	-9.63
1880.00	5	QPSK	V	150	140	1 / 0	19.06	4.84	23.90	0.246	33.01	-9.11

Table 7-9. EIRP Data (Band 2)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
2498.50	5	QPSK	H	150	226	1 / 24	15.64	5.73	21.37	0.137	33.01	-11.64
2593.00	5	QPSK	H	150	289	1 / 24	13.54	6.07	19.61	0.091	33.01	-13.40
2687.50	5	QPSK	H	150	287	1 / 24	10.47	6.48	16.95	0.050	33.01	-16.06
2498.50	5	16-QAM	H	150	226	1 / 24	14.12	5.73	19.85	0.097	33.01	-13.16
2498.50	5	64-QAM	H	150	226	1 / 24	13.71	5.73	19.44	0.088	33.01	-13.57
2501.00	10	QPSK	H	150	263	1 / 25	15.08	5.73	20.81	0.121	33.01	-12.20
2593.00	10	QPSK	H	150	290	1 / 25	13.71	6.07	19.78	0.095	33.01	-13.23
2685.00	10	QPSK	H	150	313	1 / 25	11.46	6.47	17.93	0.062	33.01	-15.08
2501.00	10	16-QAM	H	150	263	1 / 25	14.69	5.73	20.42	0.110	33.01	-12.59
2501.00	10	64-QAM	H	150	263	1 / 25	13.22	5.73	18.95	0.079	33.01	-14.06
2503.50	15	QPSK	H	150	296	1 / 74	16.17	5.74	21.91	0.155	33.01	-11.10
2593.00	15	QPSK	H	150	271	1 / 36	13.56	6.07	19.63	0.092	33.01	-13.38
2682.50	15	QPSK	H	150	279	1 / 74	11.11	6.46	17.57	0.057	33.01	-15.44
2503.50	15	16-QAM	H	150	296	1 / 74	12.14	5.74	17.88	0.061	33.01	-15.13
2503.50	15	64-QAM	H	150	296	1 / 74	10.89	5.74	16.63	0.046	33.01	-16.38
2506.00	20	QPSK	H	150	310	1 / 50	15.68	5.75	21.43	0.139	33.01	-11.58
2593.00	20	QPSK	H	150	289	1 / 0	14.00	6.07	20.07	0.102	33.01	-12.94
2680.00	20	QPSK	H	150	100	1 / 0	11.83	6.45	18.28	0.067	33.01	-14.73
2506.00	20	16-QAM	H	150	310	1 / 50	14.61	5.75	20.36	0.109	33.01	-12.65
2506.00	20	64-QAM	H	150	310	1 / 50	12.52	5.75	18.27	0.067	33.01	-14.74
2503.50	15	QPSK	V	150	296	1 / 74	15.48	5.61	21.09	0.129	33.01	-11.92

Table 7-10. EIRP Data (Band 41)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset	Page 207 of 236

7.7 Radiated Spurious Emissions Measurements

§2.1053 §22.917(a) §24.238(a) §27.53(c) §27.53(f) §27.53(g) §27.53(h) §27.53(m) RSS-130(4.6) RSS-132(5.5) RSS-133(6.5) RSS-139(6.6) RSS-199(4.5)

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 vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas.

Test Procedures Used

KDB 971168 D01 v03 – 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.

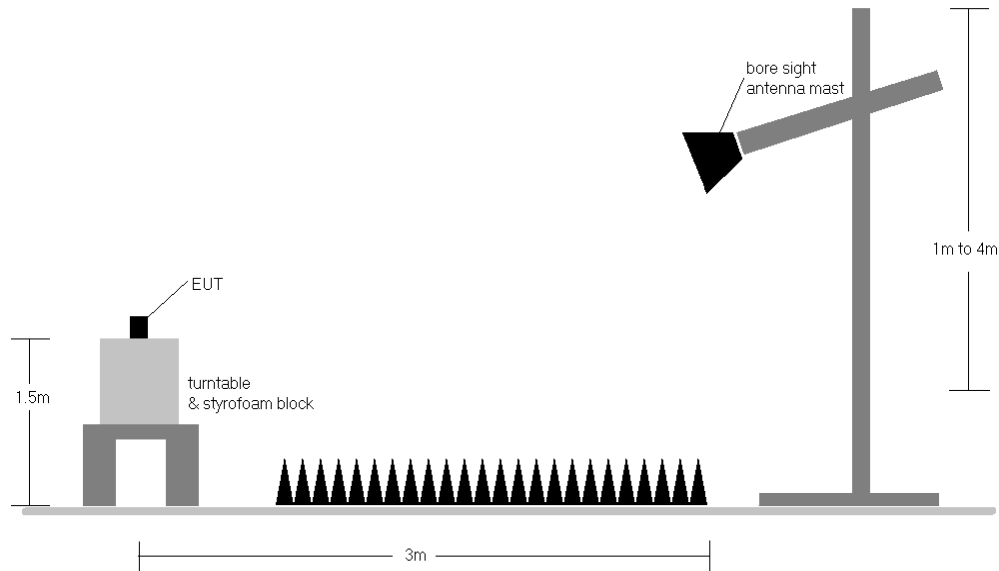


Figure 7-7. Test Instrument & Measurement Setup

Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.
- 3) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 4) 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.
- 5) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

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Band 12/17

OPERATING FREQUENCY: 704.00 MHz
CHANNEL: 23060
MODULATION SIGNAL: QPSK
BANDWIDTH: 10.0 MHz
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]
1408.00	H	161	155	-63.68	7.92	-55.76	-42.8
2112.00	H	155	185	-72.19	8.80	-63.38	-50.4
2816.00	H	151	90	-71.14	10.04	-61.10	-48.1
3520.00	H	329	202	-68.26	9.91	-58.35	-45.3
4224.00	H	112	48	-70.08	10.50	-59.57	-46.6
4928.00	H	117	141	-68.62	10.78	-57.84	-44.8
5632.00	H	-	-	-71.25	11.13	-60.13	-47.1

Table 7-11. Radiated Spurious Data (Band 12/17 – Low Channel)

OPERATING FREQUENCY: 707.50 MHz
CHANNEL: 23095
MODULATION SIGNAL: QPSK
BANDWIDTH: 10.0 MHz
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]
1415.00	H	141	180	-58.30	7.95	-50.35	-37.3
2122.50	H	146	192	-72.82	8.86	-63.96	-51.0
2830.00	H	126	89	-67.24	10.03	-57.21	-44.2
3537.50	H	156	63	-65.38	9.90	-55.48	-42.5
4245.00	H	124	50	-69.58	10.57	-59.02	-46.0
4952.50	H	146	62	-68.31	10.82	-57.50	-44.5
5660.00	H	-	-	-70.16	11.21	-58.95	-45.9

Table 7-12. Radiated Spurious Data (Band 12/17 – Mid Channel)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset	Page 210 of 236

OPERATING FREQUENCY: 711.00 MHz
 CHANNEL: 23130
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 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]
1422.00	H	158	169	-60.80	7.99	-52.81	-39.8
2133.00	H	143	180	-73.73	8.92	-64.81	-51.8
2844.00	H	130	91	-68.00	10.02	-57.98	-45.0
3555.00	H	151	64	-66.61	9.90	-56.71	-43.7
4266.00	H	149	61	-70.80	10.63	-60.17	-47.2
4977.00	H	114	134	-68.15	10.85	-57.30	-44.3
5688.00	H	-	-	-70.32	11.29	-59.03	-46.0

Table 7-13. Radiated Spurious Data (Band 12/17 – High Channel)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset	Page 211 of 236

Band 13

OPERATING FREQUENCY: 782.00 MHz
CHANNEL: 23230
MODULATION SIGNAL: QPSK
BANDWIDTH: 10.0 MHz
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]
2346.00	V	104	83	-73.11	9.45	-63.66	-50.7
3128.00	V	177	43	-67.26	9.59	-57.67	-44.7
3910.00	V	399	364	-64.43	9.13	-55.30	-42.3
4692.00	V	313	350	-65.80	11.34	-54.47	-41.5
5474.00	V	390	42	-69.15	10.92	-58.23	-45.2
6256.00	V	319	350	-63.60	11.12	-52.48	-39.5
7038.00	V	151	333	-55.18	10.98	-44.20	-31.2
7820.00	V	389	337	-65.25	11.47	-53.77	-40.8
8602.00	V	104	310	-64.58	11.69	-52.89	-39.9

Table 7-14. Radiated Spurious Data (Band 13 – Mid Channel)

MODULATION SIGNAL: QPSK
BANDWIDTH: 10.00 MHz
DISTANCE: 3 meters
NARROWBAND EMISSION LIMIT: -50 dBm
WIDEBAND EMISSION LIMIT: -40 dBm/MHz

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]
1564.00	V	164	0	-61.70	8.83	-52.87	-12.9

Table 7-15. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

FCC ID: A3LSMA530F		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset		Page 212 of 236

Band 26/5

OPERATING FREQUENCY: 826.50 MHz
CHANNEL: 26815
MODULATION SIGNAL: QPSK
BANDWIDTH: 5.0 MHz
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]
1653.00	V	100	12	-57.56	8.83	-48.73	-35.7
2479.50	V	100	235	-71.50	9.19	-62.30	-49.3
3306.00	V	172	44	-64.01	9.42	-54.59	-41.6
4132.50	V	135	21	-67.84	9.92	-57.92	-44.9
4959.00	V	232	50	-61.95	11.17	-50.78	-37.8
5785.50	V	-	-	-72.76	11.36	-61.40	-48.4
6612.00	V	140	26	-60.14	11.14	-49.00	-36.0
7438.50	V	186	13	-57.26	10.82	-46.44	-33.4
8265.00	V	173	359	-66.85	11.73	-55.12	-42.1

Table 7-16. Radiated Spurious Data (Band 26/5 – Low Channel)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset	Page 213 of 236

OPERATING FREQUENCY: 836.50 MHz
 CHANNEL: 26915
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 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]
1673.00	V	144	16	-61.87	8.71	-53.16	-40.2
2509.50	V	104	305	-72.62	9.24	-63.38	-50.4
3346.00	V	149	234	-66.03	9.34	-56.69	-43.7
4182.50	V	177	4	-68.41	10.25	-58.16	-45.2
5019.00	V	191	49	-60.58	11.09	-49.49	-36.5
5855.50	V	-	-	-72.49	11.29	-61.20	-48.2
6692.00	V	145	22	-61.99	10.95	-51.04	-38.0
7528.50	V	191	9	-60.87	11.01	-49.86	-36.9
8365.00	V	-	-	-67.61	11.76	-55.85	-42.8

Table 7-17. Radiated Spurious Data (Band 26/5 – Mid Channel)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset	Page 214 of 236

OPERATING FREQUENCY: 846.50 MHz
 CHANNEL: 27015
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 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]
1693.00	V	100	9	-60.99	8.58	-52.41	-39.4
2539.50	V	109	313	-71.72	9.20	-62.52	-49.5
3386.00	V	144	353	-63.07	9.43	-53.64	-40.6
4232.50	V	186	359	-69.39	10.46	-58.93	-45.9
5079.00	V	228	48	-59.17	10.92	-48.25	-35.3
5925.50	V	-	-	-71.11	11.23	-59.88	-46.9
6772.00	V	127	29	-61.55	10.78	-50.78	-37.8
7618.50	V	177	343	-64.00	11.25	-52.75	-39.8
8465.00	V	-	-	-67.61	11.73	-55.87	-42.9

Table 7-18. Radiated Spurious Data (Band 26/5 – High Channel)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset	Page 215 of 236

Band 66/4

OPERATING FREQUENCY: 1712.50 MHz
 CHANNEL: 131997
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 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]
3425.00	H	150	318	-43.14	9.87	-33.27	-20.3
5137.50	H	150	11	-57.59	10.76	-46.83	-33.8
6850.00	H	150	326	-54.24	11.67	-42.57	-29.6
8562.50	H	150	346	-54.99	11.06	-43.92	-30.9
10275.00	H	150	5	-51.19	12.37	-38.81	-25.8
11987.50	H	150	46	-58.03	12.67	-45.36	-32.4
13700.00	H	-	-	-61.70	12.01	-49.70	-36.7
15412.50	H	150	333	-67.74	15.63	-52.12	-39.1
17125.00	H	150	2	-57.88	13.33	-44.54	-31.5

Table 7-19. Radiated Spurious Data (Band 66/4 – Low Channel)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1710180270-03.A3L	Test Dates: 9/26-11/08/2017	EUT Type: Portable Handset	Page 216 of 236

OPERATING FREQUENCY: 1745.00 MHz
 CHANNEL: 132322
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 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]
3490.00	H	150	320	-45.93	9.94	-35.99	-23.0
5235.00	H	150	2	-65.61	10.72	-54.89	-41.9
6980.00	H	150	327	-46.11	11.82	-34.30	-21.3
8725.00	H	150	343	-54.50	10.96	-43.54	-30.5
10470.00	H	150	5	-55.34	12.67	-42.67	-29.7
12215.00	H	150	61	-59.40	13.14	-46.25	-33.3
13960.00	H	-	-	-60.99	11.64	-49.36	-36.4
15705.00	H	150	20	-69.10	16.41	-52.69	-39.7
17450.00	H	150	355	-55.20	12.02	-43.18	-30.2

Table 7-20. Radiated Spurious Data (Band 66/4 – Mid Channel)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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OPERATING FREQUENCY: 1777.50 MHz
 CHANNEL: 132647
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 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]
3555.00	H	150	315	-49.34	9.96	-39.38	-26.4
5332.50	H	150	6	-56.51	10.72	-45.80	-32.8
7110.00	H	150	4	-42.45	11.74	-30.71	-17.7
8887.50	H	150	13	-54.60	11.05	-43.55	-30.5
10665.00	H	150	357	-57.18	12.72	-44.46	-31.5
12442.50	H	150	325	-57.22	13.46	-43.75	-30.8
14220.00	H	-	-	-59.57	11.24	-48.33	-35.3
15997.50	H	150	22	-64.41	16.55	-47.86	-34.9
17775.00	H	150	1	-50.02	10.13	-39.89	-26.9

Table 7-21. Radiated Spurious Data (Band 66/4 – High Channel)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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Band 2

OPERATING FREQUENCY: 1852.50 MHz
CHANNEL: 18625
MODULATION SIGNAL: QPSK
BANDWIDTH: 5.0 MHz
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]
3705.00	H	100	44	-55.78	9.81	-45.96	-33.0
5557.50	H	100	332	-55.64	10.98	-44.66	-31.7
7410.00	H	100	55	-44.28	10.74	-33.54	-20.5
9262.50	H	289	82	-59.85	12.31	-47.54	-34.5
11115.00	H	272	63	-52.71	12.97	-39.74	-26.7
12967.50	H	258	303	-63.15	12.71	-50.44	-37.4
14820.00	H	-	-	-59.66	10.51	-49.15	-36.2
16672.50	H	270	345	-66.31	16.11	-50.20	-37.2

Table 7-22. Radiated Spurious Data (Band 2 – Low Channel)

OPERATING FREQUENCY: 1880.00 MHz
CHANNEL: 18900
MODULATION SIGNAL: QPSK
BANDWIDTH: 5.0 MHz
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	100	47	-61.03	9.62	-51.41	-38.4
5640.00	H	109	330	-59.20	11.12	-48.08	-35.1
7520.00	H	104	49	-49.06	11.00	-38.06	-25.1
9400.00	H	100	69	-59.15	12.15	-47.00	-34.0
11280.00	H	255	331	-60.31	13.22	-47.09	-34.1
13160.00	H	269	305	-63.57	12.87	-50.69	-37.7
15040.00	H	-	-	-61.28	11.84	-49.44	-36.4
16920.00	H	100	49	-63.12	15.41	-47.71	-34.7

Table 7-23. Radiated Spurious Data (Band 2 – Mid Channel)

FCC ID: A3LSMA530F		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 1907.50 MHz
 CHANNEL: 19175
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 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]
3815.00	H	107	50	-59.68	9.26	-50.42	-37.4
5722.50	H	300	337	-59.49	11.28	-48.21	-35.2
7630.00	H	100	356	-54.33	11.27	-43.06	-30.1
9537.50	H	239	73	-58.07	12.21	-45.86	-32.9
11445.00	H	260	332	-62.46	13.25	-49.21	-36.2
13352.50	H	-	-	-64.40	12.77	-51.63	-38.6
15260.00	H	-	-	-62.96	12.98	-49.98	-37.0
17167.50	H	196	342	-60.62	13.88	-46.75	-33.7

Table 7-24. Radiated Spurious Data (Band 2 – High Channel)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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Band 41

OPERATING FREQUENCY: 2503.50 MHz
 CHANNEL: 39725
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 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]
5007.00	H	143	362	-53.85	10.92	-42.93	-17.9
7510.50	H	138	321	-47.50	11.08	-36.42	-11.4
10014.00	H	177	9	-43.58	12.06	-31.52	-6.5
12517.50	H	121	349	-54.60	13.54	-41.06	-16.1
15021.00	H	152	29	-47.40	13.50	-33.90	-8.9
17524.50	H	-	-	-48.54	11.60	-36.94	-11.9

Table 7-25. Radiated Spurious Data (Band 41 – Low Channel)

OPERATING FREQUENCY: 2593.00 MHz
 CHANNEL: 40620
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 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]
5186.00	H	118	318	-47.90	10.75	-37.15	-12.1
7779.00	H	128	339	-44.12	11.40	-32.72	-7.7
10372.00	H	112	0	-43.49	12.59	-30.90	-5.9
12965.00	H	112	290	-52.39	13.37	-39.03	-14.0
15558.00	H	166	30	-55.03	16.18	-38.84	-13.8

Table 7-26. Radiated Spurious Data (Band 41 – Mid Channel)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION)		 Approved by: Quality Manager
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OPERATING FREQUENCY: 2682.50 MHz
 CHANNEL: 41515
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 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]
5365.00	H	141	307	-47.14	10.75	-36.39	-11.4
8047.50	H	110	342	-43.65	11.14	-32.50	-7.5
10730.00	H	141	32	-53.71	12.78	-40.92	-15.9
13412.50	H	-	-	-56.21	12.55	-43.67	-18.7
16095.00	H	-	-	-60.20	16.53	-43.66	-18.7

Table 7-27. Radiated Spurious Data (Band 41 – High Channel)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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7.8 Frequency Stability / Temperature Variation

\$2.1055 \$22.355 \$24.235 \$27.54 RSS-130(4.3) RSS-132(5.3) RSS-133(6.3) RSS-139(6.3) RSS-195(5.4) RSS-199(4.3)

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, RSS-130, RSS-139 and RSS-199, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Procedure Used

ANSI/TIA-603-E-2016

Test Settings

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

Test Setup

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

Test Notes

None

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Band 12/17 Frequency Stability Measurements

\$2.1055 \$27.54 RSS-130(4.3)

OPERATING FREQUENCY: 707,500,000 Hz

CHANNEL: 23790

REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	707,499,697	-303	-0.0000428
100 %		- 30	707,499,994	-6	-0.0000008
100 %		- 20	707,500,397	397	0.0000561
100 %		- 10	707,499,988	-12	-0.0000017
100 %		0	707,499,814	-186	-0.0000263
100 %		+ 10	707,500,267	267	0.0000377
100 %		+ 20	707,500,199	199	0.0000281
100 %		+ 30	707,499,888	-112	-0.0000158
100 %		+ 40	707,500,300	300	0.0000424
100 %		+ 50	707,499,969	-31	-0.0000044
BATT. ENDPOINT	3.45	+ 20	707,500,252	252	0.0000356

Table 7-28. Frequency Stability Data (Band 12/17)

Note:

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

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Band 12/17 Frequency Stability Measurements
§2.1055 §27.54 RSS-130(4.3)

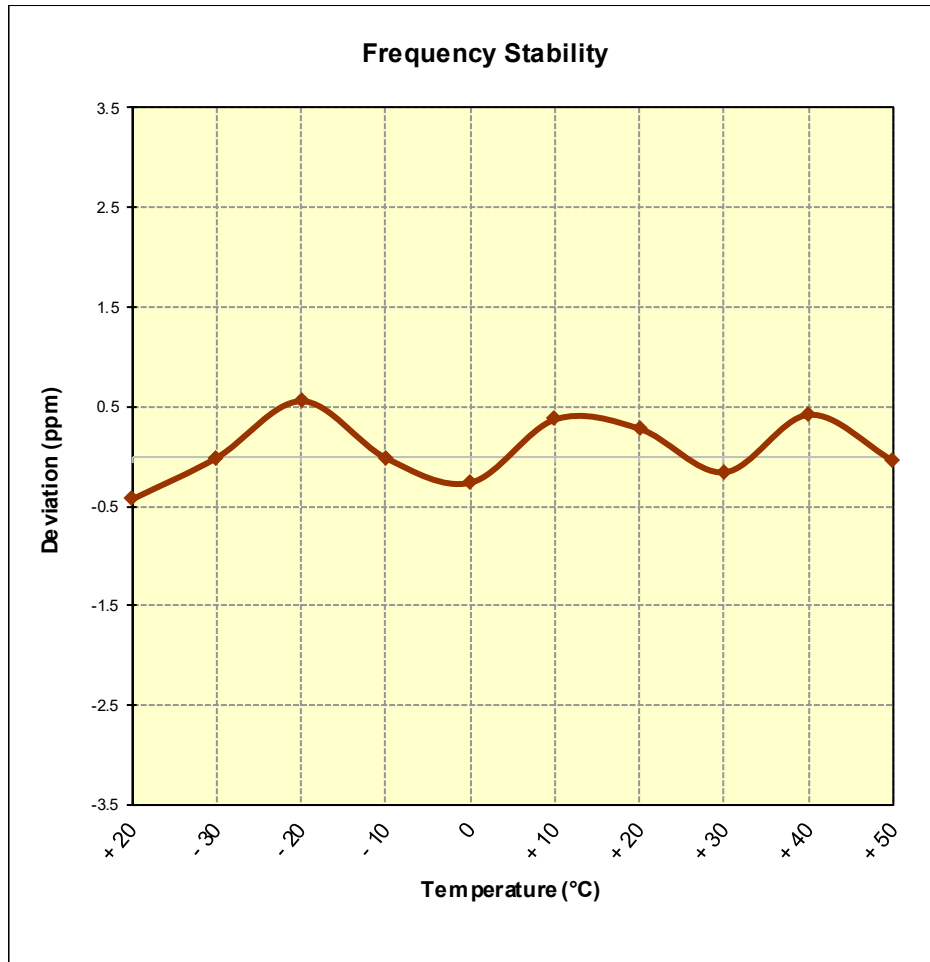


Figure 7-8. Frequency Stability Graph (Band 12/17)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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Band 13 Frequency Stability Measurements

§2.1055 §27.54 RSS-130(4.3)

OPERATING FREQUENCY: 782,000,000 Hz

CHANNEL: 23230

REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	782,000,147	147	0.0000188
100 %		- 30	782,000,035	35	0.0000045
100 %		- 20	781,999,663	-337	-0.0000431
100 %		- 10	781,999,973	-27	-0.0000035
100 %		0	782,000,047	47	0.0000060
100 %		+ 10	781,999,983	-17	-0.0000022
100 %		+ 20	781,999,948	-52	-0.0000066
100 %		+ 30	782,000,295	295	0.0000377
100 %		+ 40	781,999,720	-280	-0.0000358
100 %		+ 50	781,999,912	-88	-0.0000113
BATT. ENDPOINT	3.45	+ 20	782,000,197	197	0.0000252

Table 7-29. Frequency Stability Data (Band 13)

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: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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Band 13 Frequency Stability Measurements
\$2.1055 \$27.54 RSS-130(4.3)

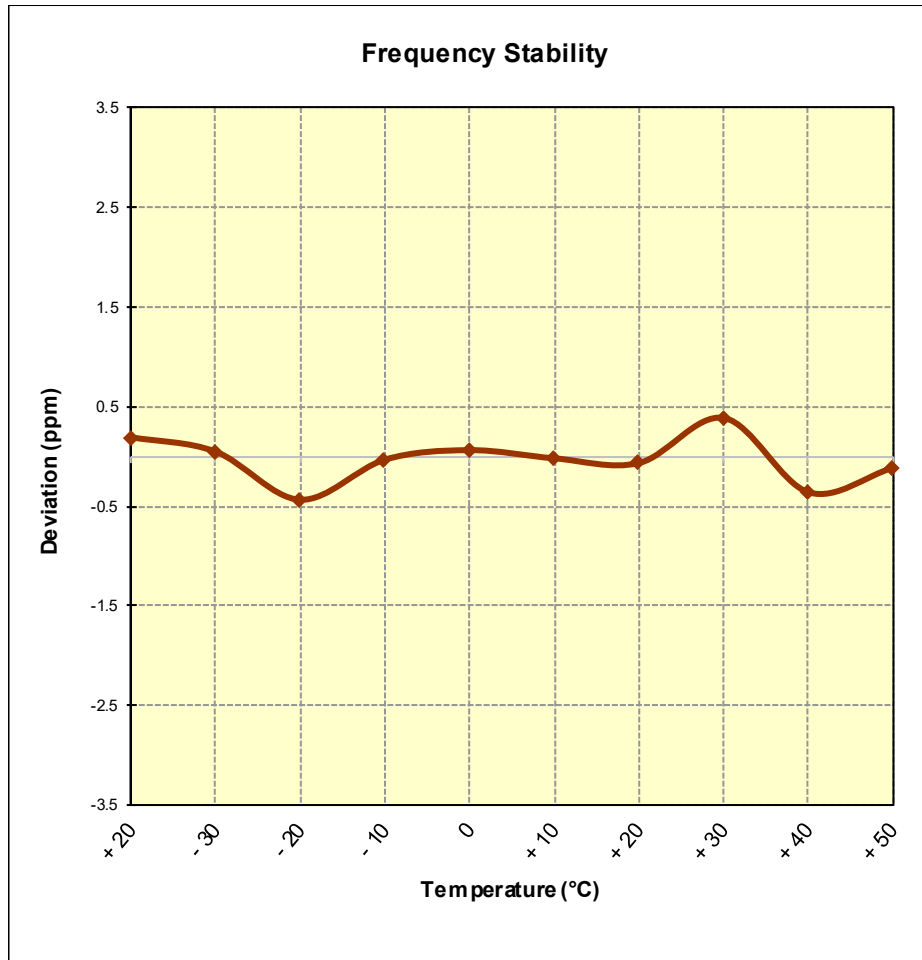


Figure 7-9. Frequency Stability Graph (Band 13)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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Band 26/5 Frequency Stability Measurements

§2.1055 §22.355 RSS-132(5.3)

OPERATING FREQUENCY: 831,500,000 Hz

CHANNEL: 26865

REFERENCE VOLTAGE: 3.85 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	831,500,316	316	0.0000380
100 %		- 30	831,499,835	-165	-0.0000198
100 %		- 20	831,499,782	-218	-0.0000262
100 %		- 10	831,499,627	-373	-0.0000449
100 %		0	831,499,879	-121	-0.0000146
100 %		+ 10	831,499,943	-57	-0.0000069
100 %		+ 20	831,499,913	-87	-0.0000105
100 %		+ 30	831,500,038	38	0.0000046
100 %		+ 40	831,499,899	-101	-0.0000121
100 %		+ 50	831,499,757	-243	-0.0000292
BATT. ENDPOINT	3.45	+ 20	831,500,037	37	0.0000044

Table 7-30. Frequency Stability Data (Band 26/5)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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Band 26/5 Frequency Stability Measurements
§2.1055 §22.355 RSS-132(5.3)

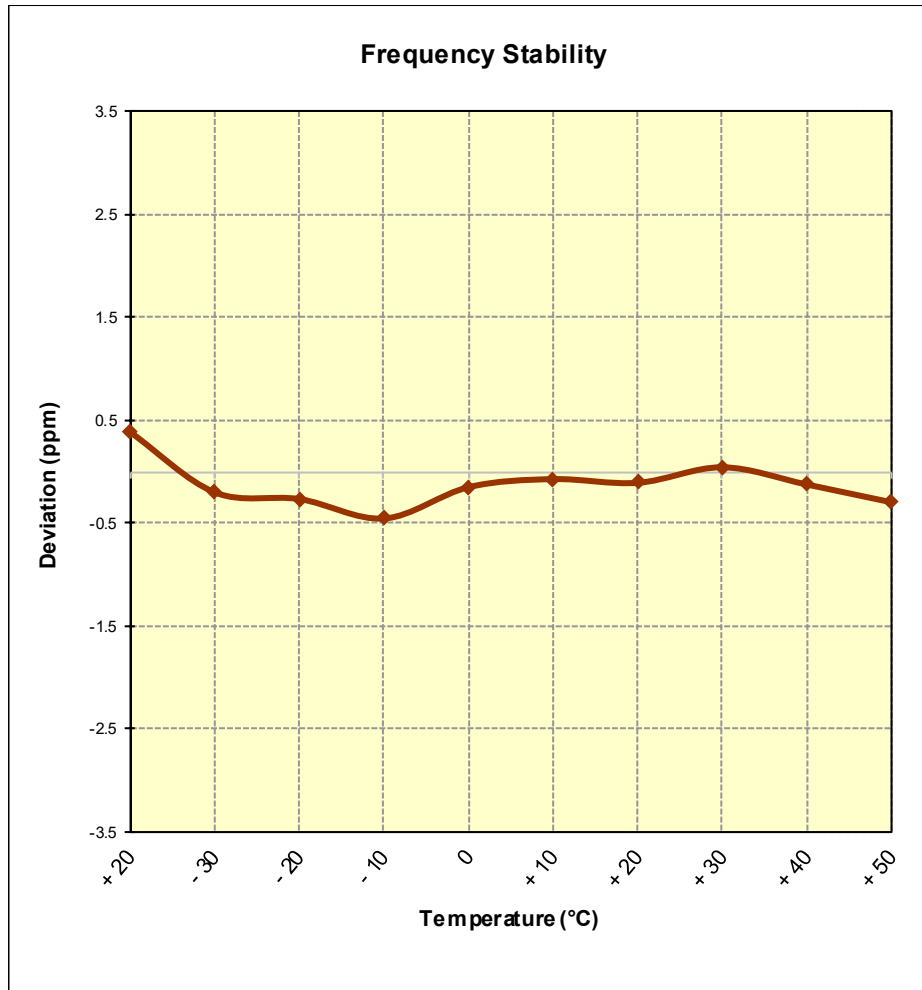


Figure 7-10. Frequency Stability Graph (Band 26/5)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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Band 66/4 Frequency Stability Measurements

§2.1055 §27.54 RSS-139(6.4)

OPERATING FREQUENCY: 1,745,000,000 Hz

CHANNEL: 132322

REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	1,744,999,693	-307	-0.0000176
100 %		- 30	1,744,999,954	-46	-0.0000026
100 %		- 20	1,745,000,073	73	0.0000042
100 %		- 10	1,744,999,915	-85	-0.0000049
100 %		0	1,744,999,824	-176	-0.0000101
100 %		+ 10	1,745,000,255	255	0.0000146
100 %		+ 20	1,745,000,160	160	0.0000092
100 %		+ 30	1,744,999,910	-90	-0.0000052
100 %		+ 40	1,744,999,902	-98	-0.0000056
100 %		+ 50	1,745,000,276	276	0.0000158
BATT. ENDPOINT	3.45	+ 20	1,745,000,153	153	0.0000088

Table 7-31. Frequency Stability Data (Band 66/4)

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: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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Band 66/4 Frequency Stability Measurements
§2.1055 §§27.54 RSS-139(6.4)

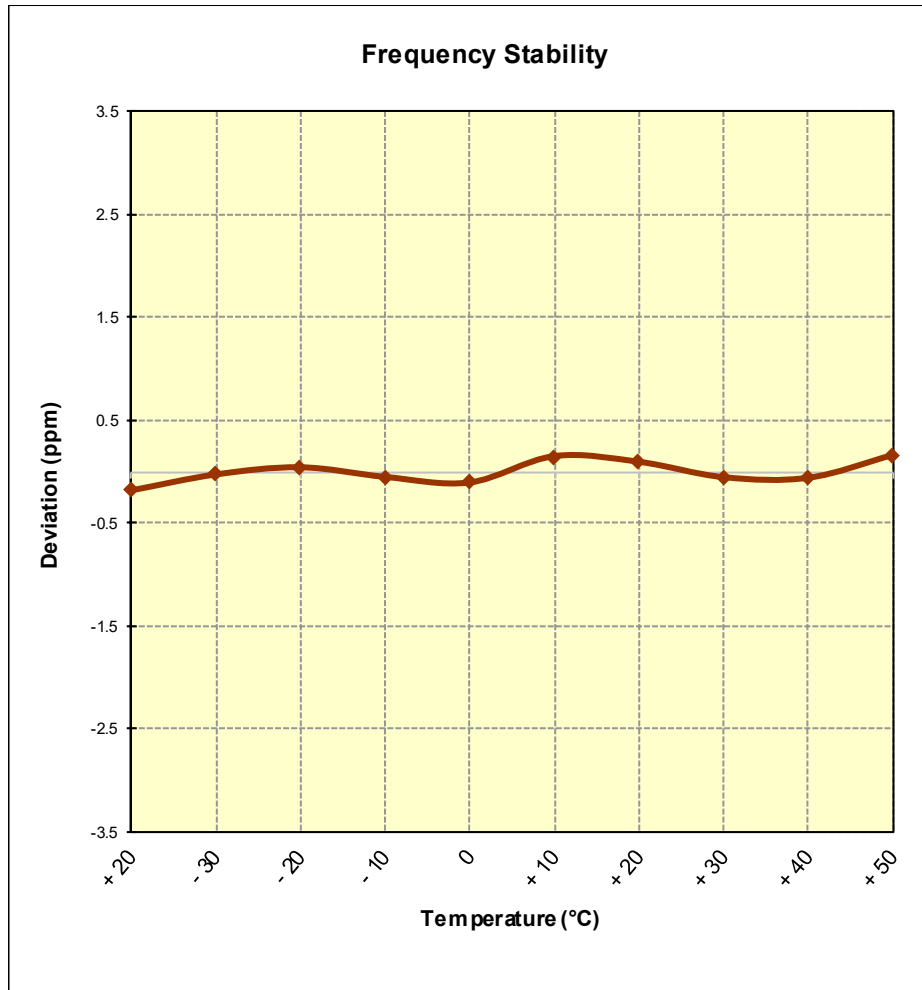


Figure 7-11. Frequency Stability Graph (Band 66/4)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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Band 2 Frequency Stability Measurements

§2.1055 §24.235 RSS-133(6.3)

OPERATING FREQUENCY: 1,880,000,000 Hz

CHANNEL: 18900

REFERENCE VOLTAGE: 3.85 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	1,880,000,164	164	0.0000087
100 %		- 30	1,880,000,120	120	0.0000064
100 %		- 20	1,879,999,829	-171	-0.0000091
100 %		- 10	1,879,999,912	-88	-0.0000047
100 %		0	1,879,999,971	-29	-0.0000015
100 %		+ 10	1,879,999,962	-38	-0.0000020
100 %		+ 20	1,880,000,095	95	0.0000051
100 %		+ 30	1,879,999,738	-262	-0.0000139
100 %		+ 40	1,879,999,899	-101	-0.0000054
100 %		+ 50	1,880,000,008	8	0.0000004
BATT. ENDPOINT	3.45	+ 20	1,879,999,627	-373	-0.0000198

Table 7-32. Frequency Stability Data (Band 2)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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Band 2 Frequency Stability Measurements

§2.1055 §24.235 RSS-133(6.3)

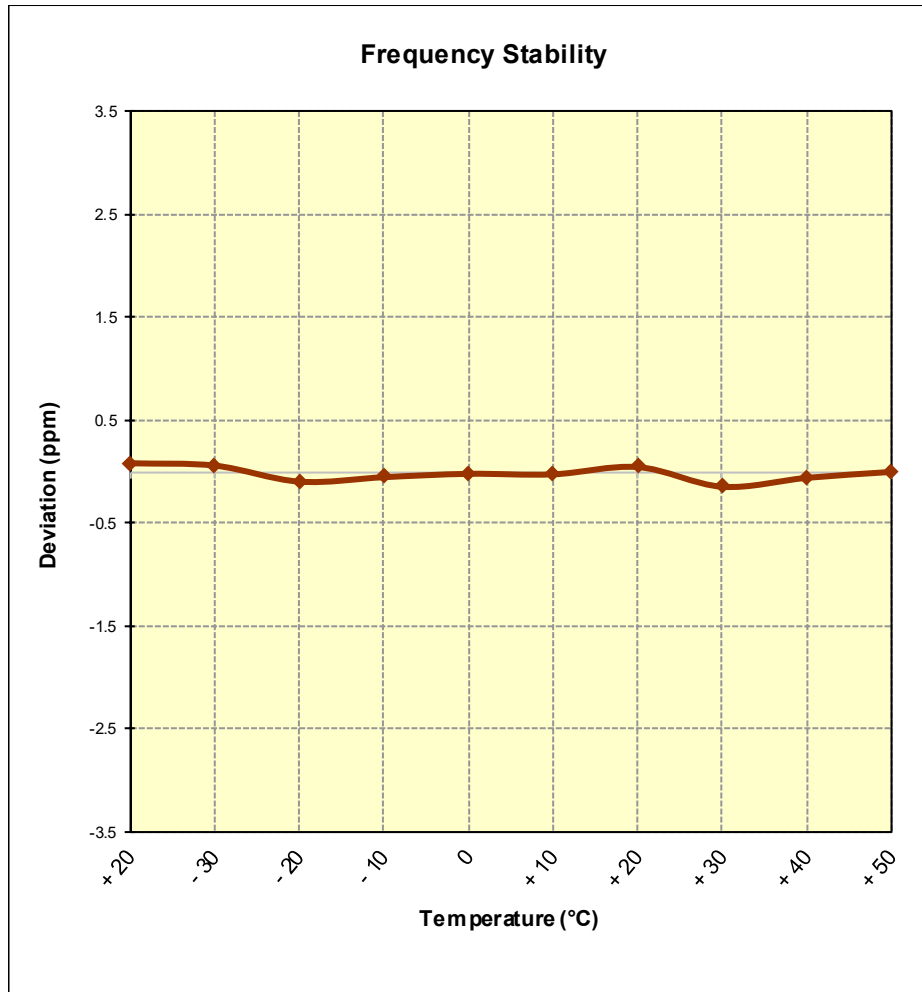


Figure 7-12. Frequency Stability Graph (Band 2)

FCC ID: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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Band 41 Frequency Stability Measurements

§2.1055 §27.54 RSS-199(4.3)

OPERATING FREQUENCY: 2,593,000,000 Hz

CHANNEL: 40620

REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	2,592,999,909	-91	-0.0000035
100 %		- 30	2,593,000,038	38	0.0000015
100 %		- 20	2,592,999,547	-453	-0.0000175
100 %		- 10	2,593,000,024	24	0.0000009
100 %		0	2,592,999,691	-309	-0.0000119
100 %		+ 10	2,593,000,408	408	0.0000157
100 %		+ 20	2,592,999,887	-113	-0.0000044
100 %		+ 30	2,593,000,103	103	0.0000040
100 %		+ 40	2,592,999,881	-119	-0.0000046
100 %		+ 50	2,592,999,611	-389	-0.0000150
BATT. ENDPOINT	3.45	+ 20	2,593,000,152	152	0.0000059

Table 7-33. Frequency Stability Data (Band 41)

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: A3LSMA530F	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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Band 41 Frequency Stability Measurements

§2.1055 §27.54 RSS-199(4.3)

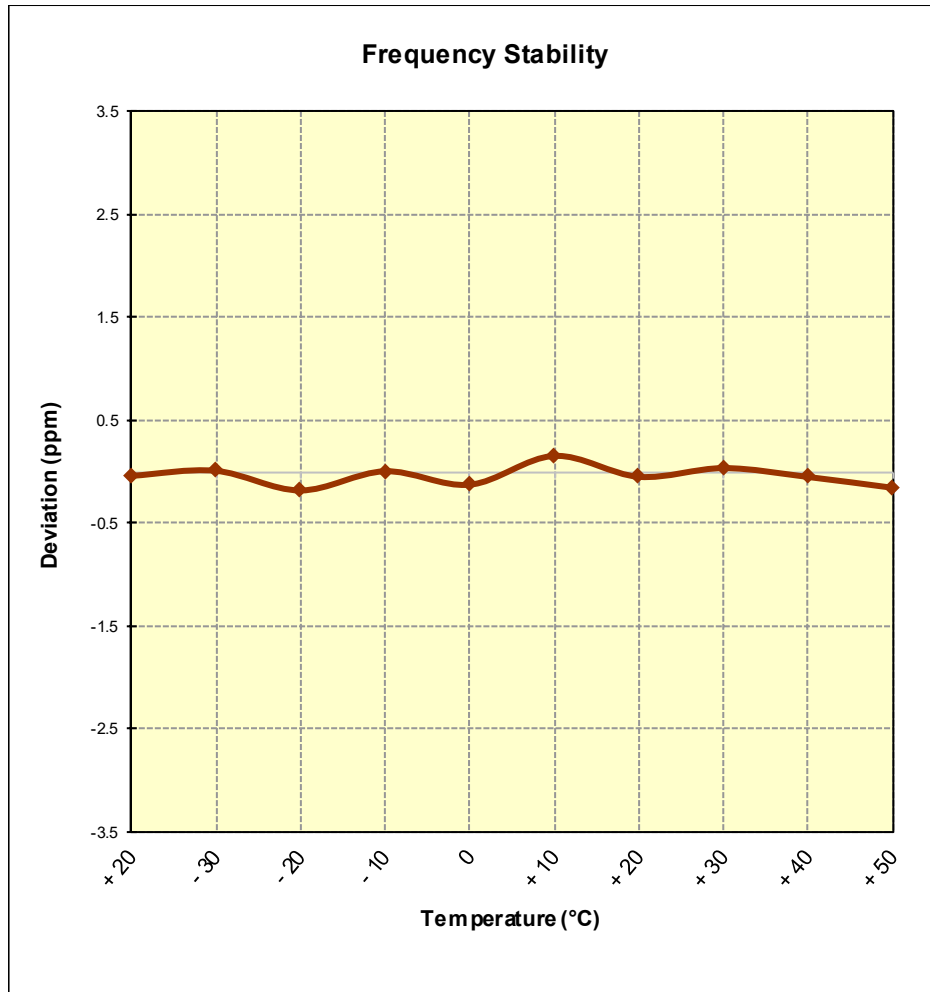


Figure 7-13. Frequency Stability Graph (Band 41)

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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: A3LSMA530F** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.

FCC ID: A3LSMA530F		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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