

LTE Base Station MMIC Amplifier

Mini-Circuits PSA-545+ High Dynamic Range MMIC Amplifier is designed specifically for applications which require high linear performance, particularly wideband, advanced digital communications systems such as LTE which require excellent ACLR suppression and low EVM.

The E-PHEMT based PSA-545+ provides typically +35 dBm OIP3 which translates to high linear performance in multi-carrier and complex signal environments such as LTE supporting ACLR₁ Measurements of better than -60 dBc at +4 dBm output.

The PSA-545+ is characterized using a high peak-to-average ratio OFDM signal used for next generation LTE within the 700MHz Downlink Band.



Figure 1 PSA-545+ Test Board

DUT Configuration:

Device: PSA-545+ Test board

Supply Voltage: 3V, 79 mA

Temperature: 25C

Note: All data is referenced to the test board connectors

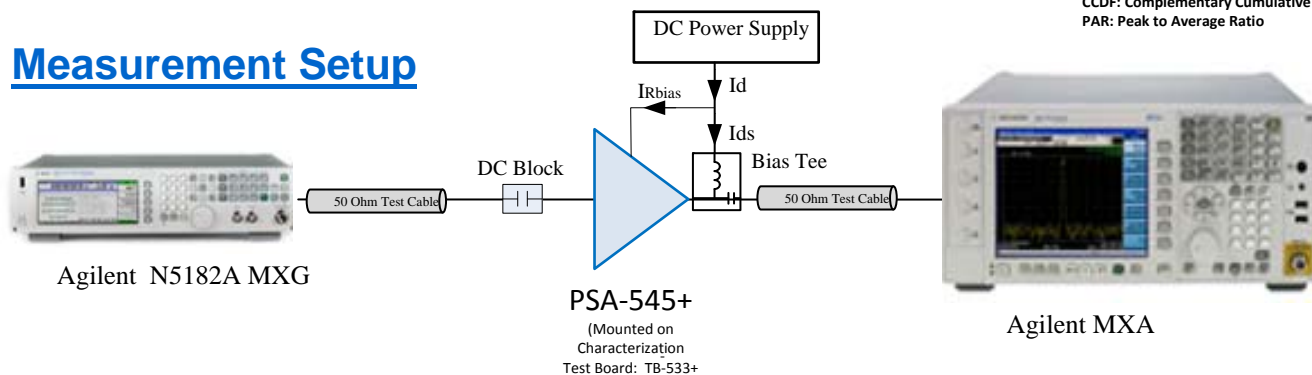
Test Signal:

LTE FDD Downlink (2009-3), Full filled 64 QAM, 10MHz (50 RB) Fc = 700 MHz

CCDF	PAR
10%	3.63 dB
1.0%	6.67 dB
0.1%	8.48 dB
0.01%	10.06 dB
0.001%	10.90 dB
0.0001%	11.05 dB

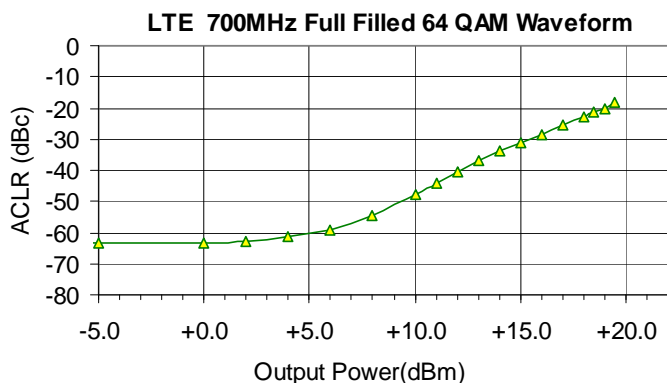
CCDF: Complementary Cumulative Distribution Function
PAR: Peak to Average Ratio

Measurement Setup

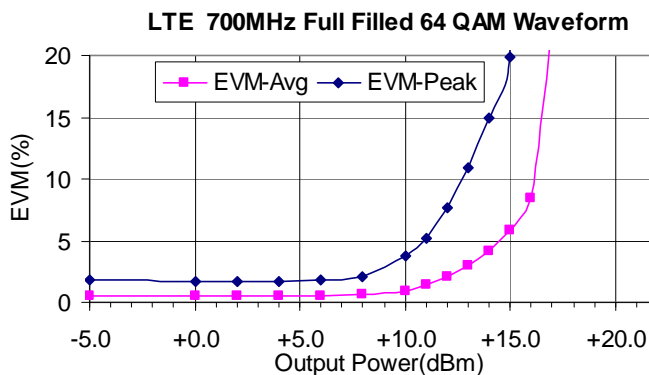


Summary Data

ACLR₁ vs. Output Power



EVM vs. Output Power



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Table 1 Data of ACLR and EVM vs. Output Power

Output Power (carrier) dBm	ACLR (dBc)				EVM (%)	
	ACLR2 LOW 20MHz	ACLR1 LOW 10MHz	ACLR1 HIGH 10MHz	ACLR2 HIGH 20MHz	RMS	Peak
+19.5	-34.7	-18.0	-18.0	-34.8	47.510	133.25
+19	-40.2	-20.1	-20.2	-40.4	46.796	119.16
+18.5	-43.9	-21.5	-21.6	-44.1	45.537	109.82
+18	-46.6	-23.0	-23.2	-47.2	43.150	103.83
+17	-50.1	-25.7	-25.9	-50.9	22.432	97.20
+16	-52.4	-28.5	-28.7	-52.9	8.504	90.35
+15	-54.1	-31.2	-31.4	-54.7	5.853	19.90
+14	-56.3	-33.9	-34.2	-56.6	4.216	14.90
+13	-58.4	-37.1	-37.4	-58.7	2.979	10.89
+12	-60.2	-40.4	-40.7	-60.6	2.035	7.61
+11	-61.9	-43.9	-44.2	-62.1	1.376	5.25
+10.84	-62.0	-44.6	-44.9	-62.2	1.309	5.07
+10	-62.9	-47.6	-48.1	-63.1	0.956	3.81
+8	-63.6	-54.6	-55.5	-64.0	0.599	2.11
+6	-63.8	-59.0	-59.9	-64.0	0.525	1.85
+4	-63.6	-61.1	-62.0	-63.8	0.494	1.74
+2	-63.9	-62.7	-62.8	-63.9	0.497	1.69
+0	-63.7	-63.3	-63.2	-63.9	0.482	1.68
-5	-63.8	-63.5	-63.4	64.0	0.478	1.88

Note:

For output powers less than -5dBm, ACLR measurement accuracy is limited by the dynamic range of the test equipment.

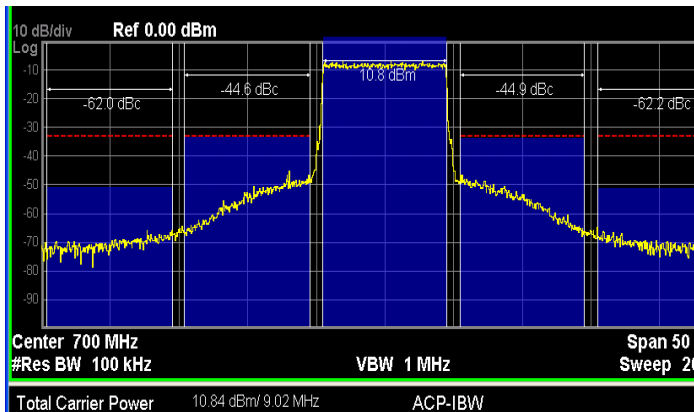


Figure 2 ACLR Plot at Output Power of +10.84 dBm

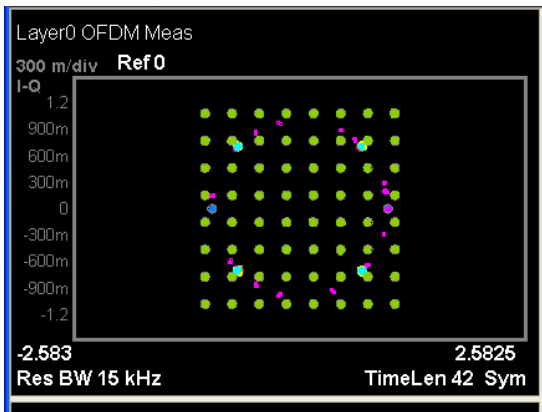


Figure 3 EVM Plot at Output Power of +10.84 dBm

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