***Abstract*—A technique for characterizing the pulse profile of a radio-frequency (RF) amplifier over a very wide power range under fast-pulsing conditions is presented. A pulse-modulated transmitter is used to drive a device under test (DUT) with a phasecoded signal that allows for an increased measurement range beyond standard techniques. A measurement receiver that samples points on the output pulse power profile and performs the necessary signal processing and coherent pulse integration, improving the detectability of low-power signals, is described. The measurement technique is applied to two sample amplifiers under fast-pulsing conditions with a pulsewidth of 250 ns at 3-GHz carrier frequency. A full measurement range of greater than 160 dB is achieved, extending the current state of the art in pulse-profiling techniques.**