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Burst Measurements with the RTP Series Measurement Buffer Mode Application

Oftentimes it is necessary to take measurements of a pulsed signal over an extended period of time. This is important, for instance, in the test and measurement of high-power amplifiers where excessive heat dissipation can eventually distort or degrade the waveform. In addition to power droop, an amplifier may turn off altogether causing a momentary signal dropout, and extended measurement times can pinpoint these missing pulses. Furthermore, engineers often need to verify that the spacing between pulses remains the same over long time periods to ensure no drift has occurred. While extended measurements windows help catch important waveform phenomenon, zooming into specific portions of a signal burst also reveals valuable information. Engineers can utilize time gating techniques to include or exclude desired pulse regions from power measurement results. Boonton's USB RF power sensors with Real-Time Power Processing (RTPP) technology deliver industry-leading performance, extended measurement duration, and packet time gating for efficient RF and microwave testing.

Boonton's real-time power sensors capture only the peak, average, and minimum power during each pulse period, as well as the start time and measurement duration. Therefore, extraneous information is discarded during non-relevant intervals, which reduces the amount of storage required for the acquired data points. As a result, Boonton's RF power sensors with RTPP technology can capture essential power measurements of an infinitely long pulse train in virtually real time with zero gaps in data acquisition or analysis. The complementary software that enables users to make power measurements with the RTP4000 or RTP5000 series of real-time power sensors over long durations is known as the RTP Series Measurement Buffer Mode Application.

Within the convenient, vendor-supplied utility, users can set various qualify and delay options that dictate the conditions on determining the peak, average, and minimum power (see Figure 1). For instance, OFDM signals such as 5G, LTE, and Wi-Fi have a noise-like appearance in the time domain, and any noise spikes or modulation dips that go above or below the preset gate threshold can become false triggers and skew measurement results. As a preventative measure, users can set a start qualifier that defines a certain amount of time that the signal must satisfy while above the gate threshold before starting the measurement. This ensures that brief noise spikes while the burst is off will not be recognized as valid events. Similarly, users can also set an end qualifier that defines a time interval that the signal must satisfy while below the gate threshold before closing the measurement window, which minimizes the likelihood of prematurely ending the gate interval due to modulation dips.

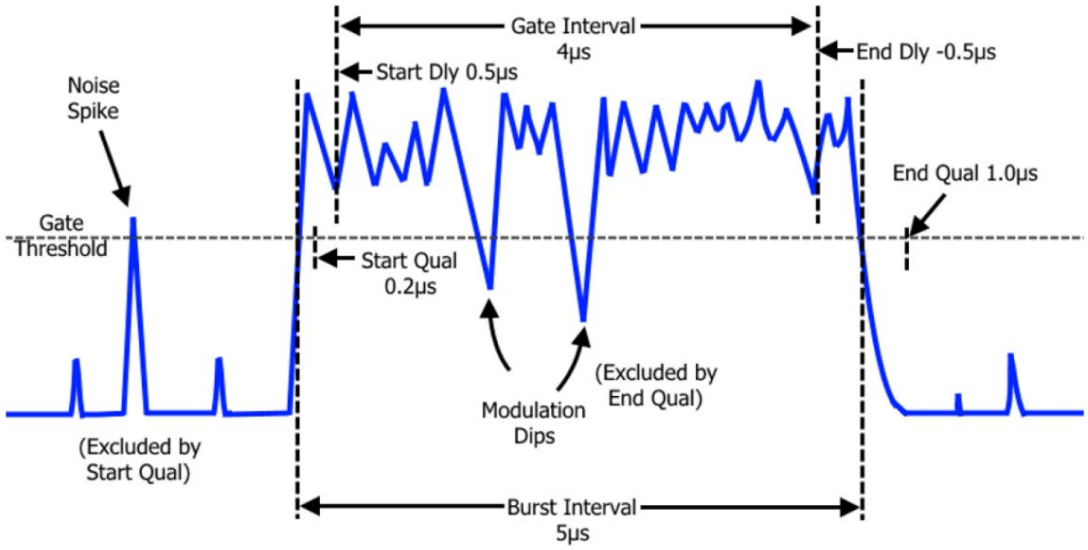

Figure 1 – Gate qualify and delay options can be set to align the desired buffer gate with a signal burst.

Once a signal passes the gate threshold and satisfies the start qualifier, users can also define a start delay, which waits a set amount of time before gathering measurements while within the pulse. Furthermore, the end delay can close the gate interval early, dictated by a preset, user-defined time parameter. Both the start and end delays enable users to pick a portion of the waveform on which to determine the peak, average, and minimum power, such as excluding or narrowing in on the beginning preamble portion of a Wi-Fi signal.

Solutions like the Boonton USB RF power sensors with RTPP technology coupled with the convenient and complementary RTP Series Measurement Buffer Mode Application utility provide the superior performance metrics and measurement windows needed to support power readings of signal bursts as well as entire waveforms. Along with extended measurement duration times and packet time gating, Boonton's real-time power sensors also provide the widest video bandwidth of 195 MHz, quickest 3-ns rise time, fastest measurement rate at 100,000 measurements per second, and finest 100-ps time resolution. To learn more about Boonton's test and measurement solutions, visit www.boonton.com.