

Agilent PN 8590-9

Measuring Complex Burst Signals with Time-Gated Spectrum Analysis

Product Note

How to measure TDMA and other digital signals using Agilent Technologies 8590 C/E-series spectrum analyzers with Option 105

Agilent 8590 C/E-series spectrum analyzers with Option 105, Time-Gated Spectrum Analysis, can help make measurements of pulsed signals such as TDMA (Time-Division Multiple-Access) easy.

Digital cellular communication systems require measurements of complex pulsed-amplitude and digital phase-modulated signals. Measurements must be accurately aligned with the TDMA burst of the digitally-modulated carrier. The analyzer's time-gated option along with user-friendly measurement firmware provides these features:

- Displays time and frequency domains simultaneously
- Communication carriers viewed directly
- Graphic display of gate time position
- Continuous measurements
- Analyzer settings optimized automatically

Use the time and frequency windows to view the burst

Often it is necessary to examine the burst shape at a particular time. This requires precise alignment of the spectrum analyzer sweep with the desired portion of the TDMA burst. Time alignment is simple with the spectrum analyzer controls. Time-selective signals are viewed in the time domain on the analyzer's screen with the corresponding frequency response. You set the gate position and interval in real time. Select any part of the TDMA burst by marking

the selected interval in the time-domain (upper) window, and the frequency-domain response will be displayed in the lower window (Fig. 1). To see the spectral effects, simply move the gate over transitions or change the interval.

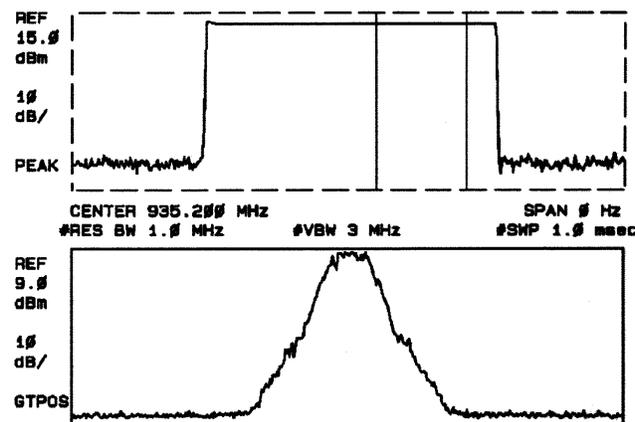


Figure 1. Time-selective spectrum measurements for the GSM continuous modulation test. Vertical lines mark the GSM regulation time-gate position in the upper display.



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Spectrum settings are optimized for time-selective measurements

Resolution bandwidth, video bandwidth and sweep time are optimized automatically to maintain the frequency resolution, pulse response, time resolution, and amplitude accuracy of the spectrum analyzer.

Built-in delay capability eliminates transient effects

Many digital mobile system specifications require separating continuous spectra due to digital and pulse modulation from transient spectra which is due to pulse edges. The spectrum analyzer can focus on the amplitude-stable portion of the burst, effectively eliminating the transient effects.

Repeatable and convenient

Time-selective measurements are repeatable, giving you confidence in the measurement of signals or components over time, temperature and calibration variations. You can select continuous sweep to see changes as they happen, or single sweep to get snapshots of the spectra.

How to get time-selective signal analysis

To obtain time-gated measurement capability, install the Time-Selective Spectrum Analysis Option 105 in any of the 8590 C/E-series spectrum analyzers. The Fast ADC card, Option 101, provides sweep times down to 20 μ sec. Sweeps as fast as 20 msec are available without the option.

Ordering Information

Compatible Spectrum Analyzers:

- 8591C
- 8591E
- 8593E
- 8594E
- 8595E
- 8596E

Required Configuration

- Time-Selective Signal Analysis, Option 105
- Fast ADC Board, Option 101, recommended

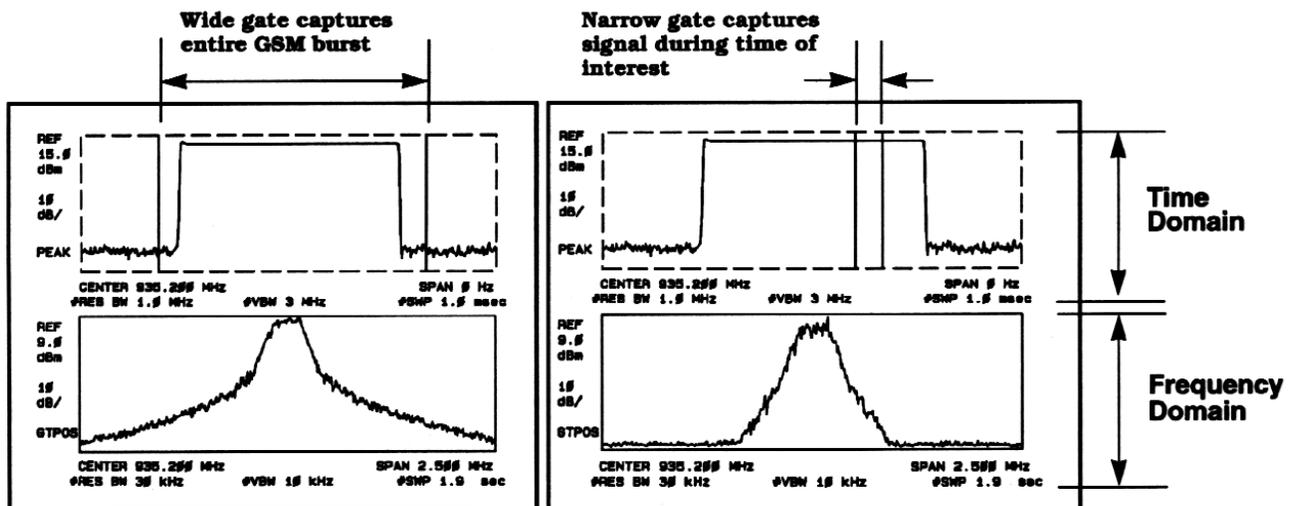


Figure 12. Measuring transient spectral levels. Notice how different gate positions and intervals on a GSM burst reveal that transient energy obscures the low-level features of the continuous modulation spectrum.

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