

DS345 as a Pulse Generator

Application Note #12

DS345 as a Pulse Generator with Variable Duty Cycle

The DS345 can easily be used as a pulse generator. Pulse widths down to 500 ns with rise/fall times of 30 ns are possible. You can even do bursts of groups of pulses (each pulse has to be the same width and separated by one pulse width).

Procedure

Start with a square wave as the main waveform, selecting the square wave frequency (1 MHz max.) so that half of a period is the width of the pulse you want. Then choose burst modulation, with a burst count of one, and turn on the Burst/Sweep function. Use the phase control to adjust the phase of the square wave within the burst so that only a positive going (or negative going) half cycle is visible (generally a phase shift of 180 degrees for a positive pulse). Note that by varying the phase you can also delay a pulse by up to one half a period of the frequency, with respect to an external trigger. Finally, use the offset control to adjust the baseline of the pulse to be 0 V. You will have to start with a square wave amplitude of at most one half of the maximum DS345 peak-to-peak amplitude. This gives a maximum pulse

amplitude of 10 V into high impedance loads, or 5 V into 50 ohm loads.

After setting this up, changing the burst rate will change the pulse repetition rate, and changing the square wave frequency will change the pulse width. To do groups of pulses, simply increase the burst count to the number of pulses you want in the burst. Use the trigger input connector and set the trigger control to external (positive or negative) for externally triggered bursts. If the source of the trigger has a 10 MHz clock input, connecting this to the DS345 clock output will reduce pulse-to-pulse jitter.

Arbitrary Waveform

The other way to create pulses is using arbitrary waveforms, which can be done from the front panel using vector entry mode, or through the GPIB or RS-232 interfaces. Pulse widths down to 50 ns, with repetition rates of up to 2 MHz, are possible.

