

DS345 AS A PULSE GENERATOR

Introduction

The DS345 can be easily used as a pulse generator. Pulse widths down to 500 ns with rise/fall times of 30 ns and repetition rates up to 10 kHz internally and 500 kHz externally triggered are possible. You can even do bursts of groups of pulses (each pulse has to be the same width and separated by 1 pulse width).

Procedure

Start with a square wave as the main waveform, selecting the square wave frequency (1 MHz max. for this purpose) so that half of a period is the width of the pulse you want. Then choose burst modulation, with a burst count of 1 and turn on sweep mode. 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 Volts. 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 Volts into high impedance or 5 Volts into 50 Ohms.

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 AWC software. This technique is a little more complicated and does not allow the same ease of changing pulse width or repetition rates, but pulse widths down to 50 ns and externally triggered repetition rates up to 2 MHz are possible. See other sections of this manual for instructions for arbitrary waveform generation and AWC software.