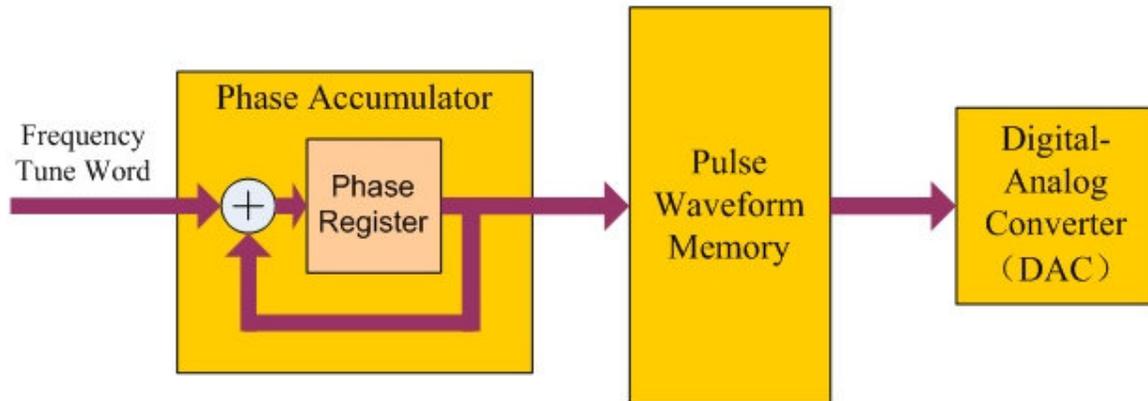


## EasyPulse Technology of Siglent's New-Generation Waveform Generator

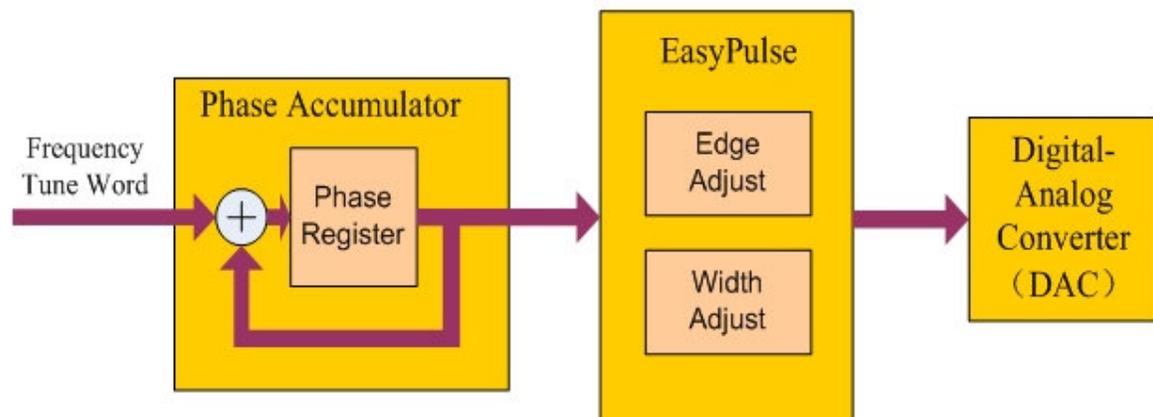
At present, the method used to generate pulse signal by most of the signal generator is to fill the DDS waveform memory with the original pulse data. Editing the pulse waveform data table in advance, DDS can output the right pulse waveform corresponding to different rising and falling edge. Such kind of pulse waveform's edge and width can be fine adjusted, also with low jitter. Please see the block diagram below:



But there are some big defects for the methods:

- Be affected by frequency parameter, the rising and falling edge would be very slow under low frequency;
- Be limited by waveform length, the duty cycle can't be very small;
- Waveform data need to be updated when changing the pulse's frequency, edge and width. If the waveform length is large, it need long time to change parameters of pulse.

To solve these problems, Siglent innovate a new algorithm about pulse generation. It is called EasyPulse technology which is built in the new SDG5000 series waveform generator. Based upon the EasyPulse, SDG5000 can produce low jitter, rapid rise and fall edge, without affected by frequency; extreme duty cycle; edge and width can be adjusted in large range, and fine. Here's the block diagram:



Advantages of the innovative EasyPulse can be listed as following:

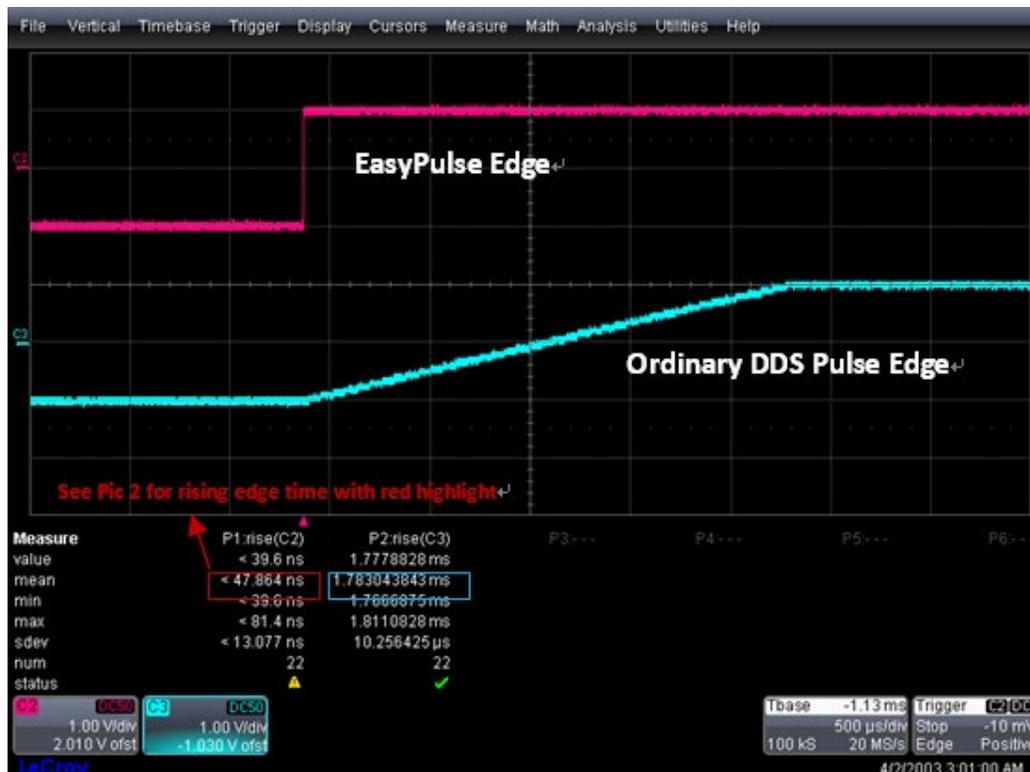
- Can output rapid rise and fall edge (6ns) under very low frequency (less than 1Hz);
- Pulse width can be 12ns under low frequency, with extreme duty cycle;
- Parameters of pulse can be easily and immediate changed without updating any waveform data;
- Edge and pulse width can be adjusted widely.

Technical specifications for pulse signal of SDG5162 waveform generator:

Period	Maximum 1000000s: Minimum 25 ns
Pulse width	≥ 12ns, 100ps resolution
Duty Cycle	0.0001% ~ 99.9999%
Rise/Fall time	6ns ~ 6s, 100ps resolution
Over shoot	< 3%
Jitter (Cycle to Cycle )	< 100ps(typical values, RMS)

Here're several measurements, to verify the outstanding performance of EasyPulse:

1. As indicated in P1, EasyPulse can kept rapid rise edge and fall edge (6ns); but ordinary DDS pulse edge is very slow (in millisecond).



P1 Comparison of Pulse signal edge under 1Hz low frequency

2. For 1Hz pulse waveform, minimum width of EasyPulse can be 12ns with small duty ratio (less than 0.0001%). But pulse width of ordinary DDS is large and duty cycle can't be adjusted small.



P2 Comparison of pulse duty cycle under 1Hz low frequency

3. When waveform generator outputs 0.1Hz pulse waveform. Edge of EasyPulse can be adjusted in large range, minimum edge is 6ns, and maximum edge is 6s; however there's limitation for adjustment of ordinary DDS pulse edge.



P3 Comparison of edge adjustment of low frequency 0.1Hz pulse signal

4. Using Siglent oscilloscope to measure the cycle to cycle jitter of EasyPulse, the RMS value (sdev value) is under 100ps.



P4 EasyPulse waveform with low jitter

As seen from these pictures, the performance and parameters of EasyPulse is perfect, any kinds of pulse signal can be easily output. No matter for high frequency or low frequency, EasyPulse performance can be kept.

SDG5000 from Siglent, with perfect EasyPulse. You, deserve it!