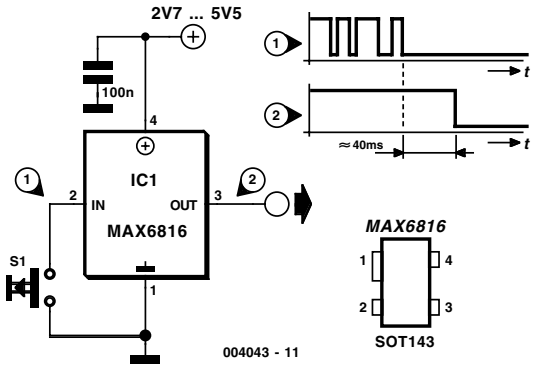
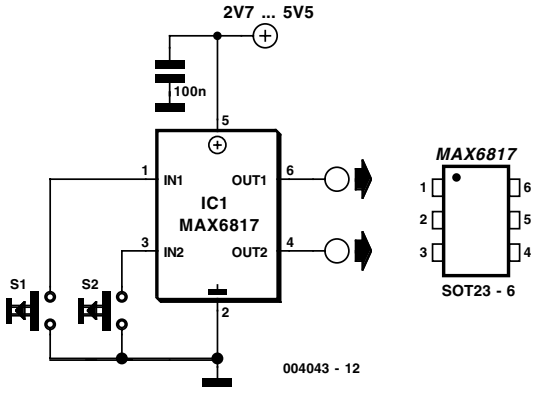
051 Single-Chip Switch Debouncer





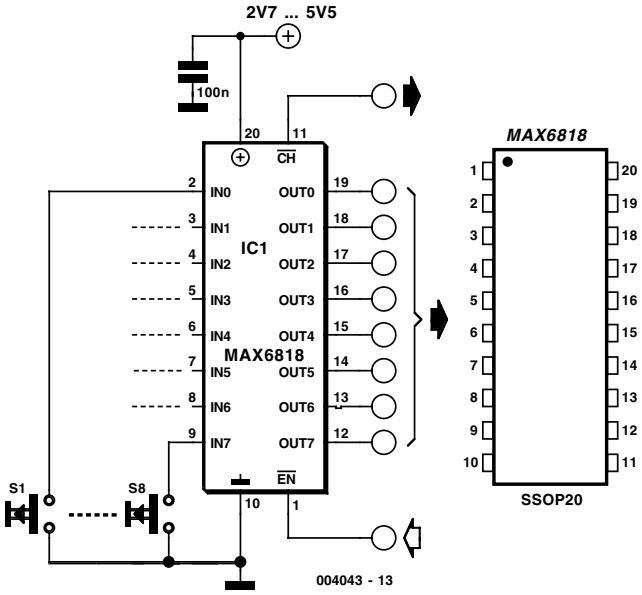
G. Kleine

Contact bounce is an age-old problem with all types of push-button switches and keypads that are connected to digital components. The measures that are used to deal with the repeated closing of the contacts when the switch is first activated include *RC* networks, flip-flop circuits and software routines. Now there is a single IC that takes over this task and delivers clean digital pulses to the following circuitry.

The MAX 6816, MAX 6817 and MAX 6818 ICs are well-protected pushbutton switch debouncers with one, two and eight inputs, respectively. The wiring for these ICs is simple, as shown in **Figure 1**. No external components are needed. The switches connected to the inputs need only make contact to earth. Internal pull-up resistors are provided. These ICs work with supply voltages between 2.7 V and 5.5 V, with a current consumption of less than 20 μA. The inputs can handle (fault) voltages up to ±25 V and electrostatic discharges up to ±15 kV.

Each MAX 681x IC works with an internal oscillator that clocks a counter. The counter is always reset whenever the input level changes within 40 ms. Only after the level applied to the input remains stable for longer than 40 ms will the counter increment to its final count and enable the output signal. This sort of debouncing is used for both closing and opening the switch.

The MAX 6818 can be connected directly to a data bus, since it has an enable input (/EN) that switches the outputs to a high-impedance (tri-state) condition when a High level is applied. There is also a Change output (/CH), which indicates a change of state of one of the pressed keys. The /CH output can be directly connected to the interrupt input of a microprocessor system. The pinout of the MAX 6818 corresponds to that of the well-known 74xx573 latch, so it can be directly substituted for the latter IC.



The MAX 6816 comes in a tiny SOT-143-SMD package, while the MAX 6817 comes in a 6-pin SOT23 SMD package and the MAX 6818 in a SSOP20 package. Data sheets for these debouncer ICs can be obtained via the Internet from *www.maxim-ic.com*.

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