EDE2008 Pushbutton Debouncer IC

Pushbutton Debouncer with Eight Independent Channels

Button In 1	Output 1
Button In 2	Output 2
Button In 3	Output 3
Button In 4	Output 4
Ground	+5V
Button In 5	Output 5
Button In 6	Output 6
Button In 7	Output 7
Button In 8	Output 8

EDE2008

EDE2008**/P**

EDE2008**/S0**

0-70 ˚C – Standard Temp

EDE2008/x**-I**
-40 to +85 ˚C – Industrial Temp

EDE2008/x**-E**
-40 to +125 ˚C – Extended Temp
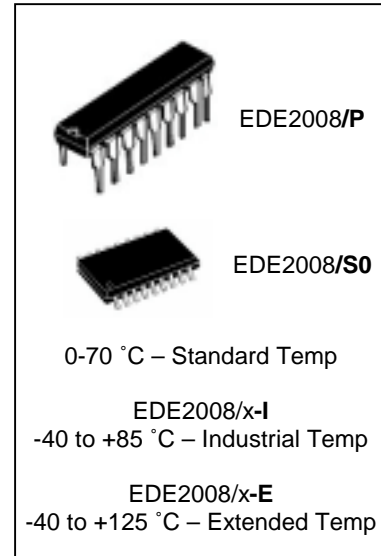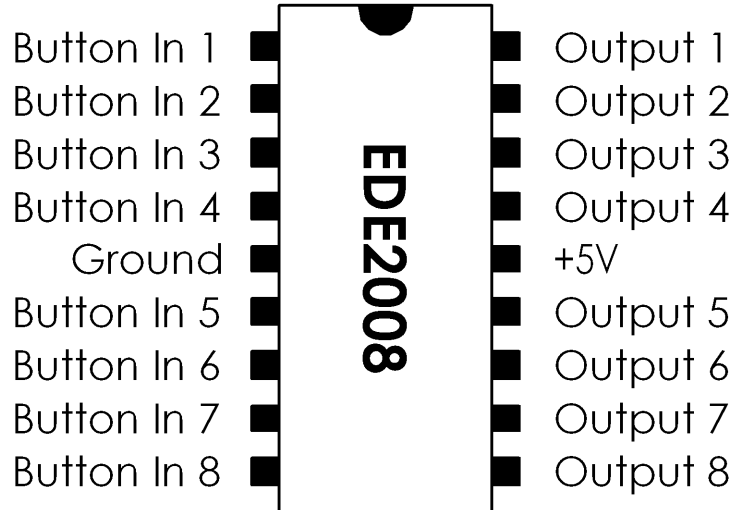
Features:

- *Debounces up to eight independent momentary pushbuttons*
- *Operates in both directions for active high or active low inputs*
- *Works with mechanical & membrane buttons*
- *Eliminates all contact bounce noise and glitch activity to provide clean signal to host circuit*
- *Each channel operates independently*
- *25ms debounce period on both rising and falling edges*
- *TTL/CMOS compatible outputs*
- *Serves to buffer host logic via input clamp diodes*

Description:

The EDE2008 Pushbutton Debouncer IC provides eight independent debouncing channels for use in interfacing mechanical pushbuttons to electronic circuits. All mechanical contacts exhibit contact 'bounce', interpreted to logic circuits as multiple false signals, when they make or break contact. The EDE2008 removes this bounce on both the positive and negative edges of the signal providing a clean output signal from the mechanical switch. Applications include pushbutton interfacing to microcontrollers & other logic, turnstile counters, CNC machine limit switches, and user interface buttons.

PIN DEFINITIONS

Button Connections:

Button In 1 (Pin 1)...................................……………………..mechanical pushbutton input #1

Button In 2 (Pin 2)...................................…………………….. mechanical pushbutton input #2

Button In 3 (Pin 3)...................................…………………... mechanical pushbutton input #3

Button In 4 (Pin 4)...................................……………….... mechanical pushbutton input #4

Button In 5 (Pin 6)...................................……………….... mechanical pushbutton input #5

Button In 6 (Pin 7)...................................……………….... mechanical pushbutton input #6

Button In 7 (Pin 8)...................................……………….... mechanical pushbutton input #7

Button In 8 (Pin 9)...................................……………….... mechanical pushbutton input #8

Debounced Outputs:

Output 1 (Pin 18)...................................………………..... debounced output #1

Output 2 (Pin 17)...................................………………..... debounced output #2

Output 3 (Pin 16)...................................………………..... debounced output #3

Output 4 (Pin 15)...................................………………..... debounced output #4

Output 5 (Pin 13)...................................………………..... debounced output #5

Output 6 (Pin 12)...................................………………..... debounced output #6

Output 7 (Pin 11)...................................………………..... debounced output #7

Output 8 (Pin 10)...................................………………….. debounced output #8

Power:

+5V (Pin 14)...……….….connect to +5V DC

GND (Pin 5)...…..….…....connect to 0V DC (Ground)

Note: DIP are SOIC (surface mount) packages of the EDE2008 have identical pinout and pincount. Please specify EDE2008/P (DIP) or EDE2008/SO (SOIC) when ordering. Standard temperature range is 0 to 70˚C.
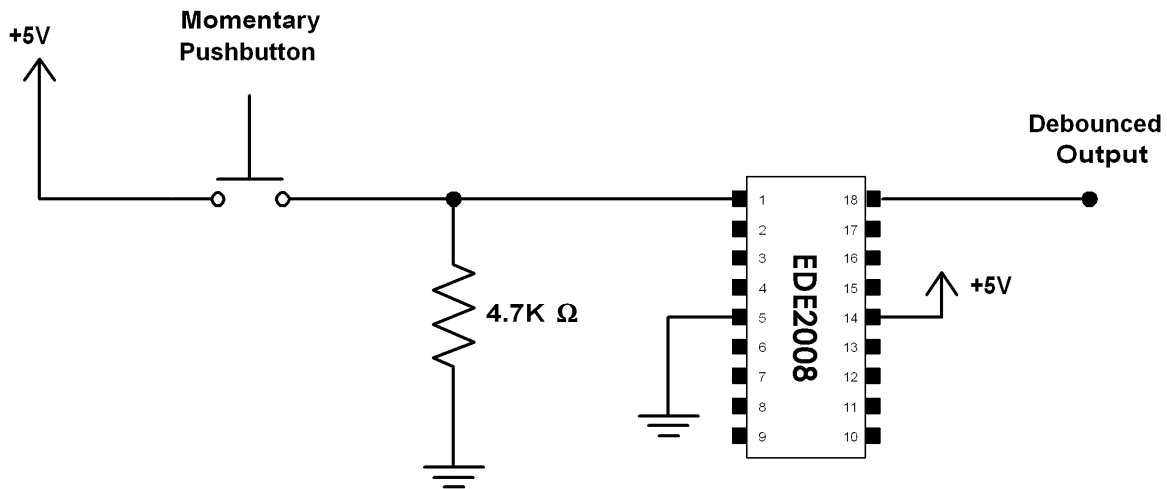
Figure One: Single-Channel Debouncing Example
(Note: unused inputs (pins 2-4, 6-9) should be tied to ground. Pins left unconnected here for clarity.)

As illustrated by Figure One, the EDE2008 connects easily to any momentary pushbutton. In this example, the Button Input 1 (pin 1) is pulled to ground through a 4.7K resistor. Pressing the button connects +5V to the input, turning it from low to high. Upon seeing this transition, the EDE2008 waits 25ms and samples the input. The 25ms waiting period allows the button's contacts to settle at their new state and ensures that contact bounce noise will not be transmitted to the output. The timing diagram in Figure Two illustrates the debouncing of the pushbutton.

Figure Two: A Single Button Press and the Corresponding EDE2008 Debounced Output

As can be seen above, the EDE2008 output lags changes in the corresponding input by 25ms, and also provides noise-free transitions. In the above situation, the EDE2008 output pulse length roughly corresponds to the input pulse length. If the button were held for a longer period of time, the output pulse would also be longer.

The EDE2008 debounces both the positive and negative edges of the transition. For example, in a circuit that is normally high that goes low when the button is pressed, the waveforms would look similar to those seen in Figure Three. Notice that the functionality is identical to that of Figure Two, with the exception of the polarities reversed.
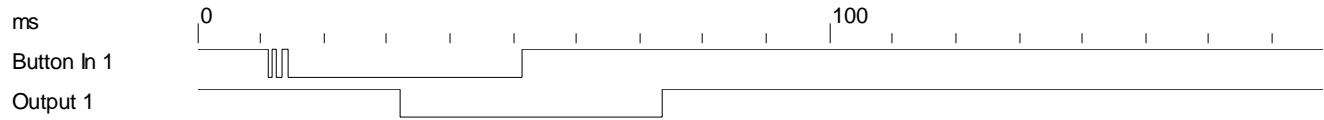
Figure Three: An Active-Low Button Output and the Corresponding EDE2008 Debounced Output

It should be noted that if a button press is shorter in duration that 25ms, the EDE2008 will interpret it as noise and will not produce a change in its output, as illustrated by Figure Four below. For comparison, a standard button press lasts from 100 to 500 ms.

Figure Four: Signals Shorter Than 25ms Will Not Trigger an Output Pulse

Each of the eight input channels of the EDE2008 may be utilized independently from one another. Activity on one channel in no way affects any of the other channels. Channels may be used as active low or active high debouncers, in any combination.

Important Note: **Unused INPUTS of the EDE2008 should be connected to either +5V (Vcc) or Ground to avoid oscillation and excessive power draw. Connection may be direct or through a resistor, such as 4.7K Ohm. Unused OUTPUTS should be left unconnected.**

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Digital Engineering, Inc.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage 5.5V
Max. current sunk by an output pin 25mA
Max. current sourced by an output pin 25mA
Max. current sourced by all 8 outputs.............. 200mA

STANDARD OPERATING CONDITIONS

Supply voltage .... 3.0V to 5.5V
Typical current draw.. 670 uA at 5V Vcc; 370 uA at 3V Vcc
Operating temperature .... 0°C to +70°C (extended temp available)

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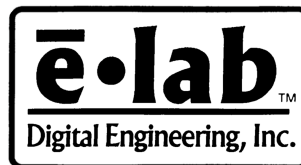
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