

# ILC5062

## SOT-23 Power Supply reset Monitor with 1% precision

### Features

- All-CMOS design in SOT-23 or SC70 package
- A grade  $\pm 1\%$  precision in Reset Detection
- Standard grade :  $\pm 2\%$  precision in Reset Detection
- Only  $1\mu\text{A}$  of  $I_q$
- Over  $2\text{mA}$  of sink current capability
- Built-in hysteresis of 5% of detection voltage
- Voltage options of 2.6, 2.7, 2.8, 2.9, 3.1, 4.4, and 4.6V fit most supervisory applications
- Active low push-pull output

### Applications

- Microprocessor reset circuits
- Memory battery back-up circuitry
- Power-on reset circuits
- Portable and battery powered electronics

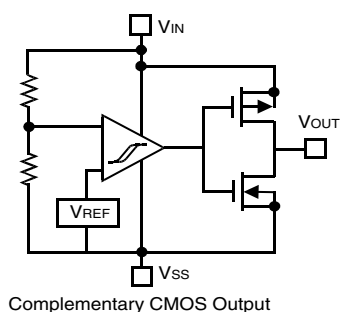
### Description

All-CMOS voltage monitoring circuit in either a 3-lead SOT-23 or SC70 package offers the best performance in power consumption and accuracy.

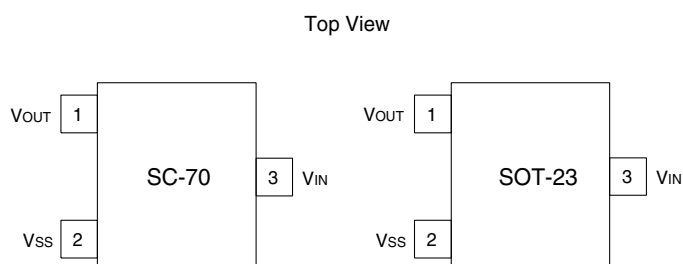
The ILC5062 is available in a series of  $\pm 1\%$  (A-grade) or 2% (standard grade) accurate trip voltages to fit most microprocessor applications. Even though its output can sink over  $2\text{mA}$ , the device draws only  $1\mu\text{A}$  in normal operation.

Additionally, a built-in hysteresis of 5% of detect voltage simplifies system design.

### Block Diagram



### Pin-Package Configurations



## Absolute Maximum Ratings

| Parameter                                   | Symbol    | Ratings                      | Units |
|---------------------------------------------|-----------|------------------------------|-------|
| Input Voltage                               | $V_{IN}$  | 12                           | V     |
| Output Current                              | $I_{OUT}$ | 50                           | mA    |
| Output Voltage                              | $V_{OUT}$ | $V_{SS}-0.3 \sim V_{IN}+0.3$ | V     |
| Continuous Total Power Dissipation (SOT-23) | $P_D$     | 150                          | mW    |
| Operating Ambient Temperature               | $T_{opr}$ | -30~+80                      | °C    |
| Storage Temperature                         | $T_{stg}$ | -40~+125                     | °C    |

## Electrical Characterisitcs ILC5062 ( $T_A=25^{\circ}\text{C}$ )

| Parameter                                       | Symbol                                          | Conditions                                                                                                                                                                                                               | Min.                 | Typ.                                          | Max.                            | Units         |
|-------------------------------------------------|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------------------------------------------|---------------------------------|---------------|
| Detect Fail Voltage                             | $V_{DF}$                                        | A grade                                                                                                                                                                                                                  | $V_{DF} \times 0.99$ | $V_{DF}$                                      | $V_{DF} \times 1.01$            | V             |
| Detect Fail Voltage                             | $V_{DF}$                                        | Standard grade                                                                                                                                                                                                           | $V_{DF} \times 0.98$ | $V_{DF}$                                      | $V_{DF} \times 1.02$            | V             |
| Hysteresis Range                                | $V_{HYS}$                                       |                                                                                                                                                                                                                          | $V_{DF} \times 0.02$ | $V_{DF} \times 0.05$                          | $V_{DF} \times 0.08$            | V             |
| Supply Current                                  | $I_{SS}$                                        | $V_{IN} = 1.5\text{V}$<br>$V_{IN} = 2.0\text{V}$<br>$V_{IN} = 3.0\text{V}$<br>$V_{IN} = 4.0\text{V}$<br>$V_{IN} = 5.0\text{V}$                                                                                           |                      | 0.9<br>1.0<br>1.3<br>1.6<br>2.0               | 2.6<br>3.0<br>3.4<br>3.8<br>4.2 | $\mu\text{A}$ |
| Operating Voltage                               | $V_{IN}$                                        | $V_{DF} = 2.1 \sim 6.0\text{V}$                                                                                                                                                                                          | 1.5                  |                                               | 10.0                            | V             |
| Output Current                                  | $I_{OUT}$                                       | N-ch $V_{DS} = 0.5\text{V}$<br>$V_{IN} = 1.0\text{V}$<br>$V_{IN} = 2.0\text{V}$<br>$V_{IN} = 3.0\text{V}$<br>$V_{IN} = 4.0\text{V}$<br>$V_{IN} = 5.0\text{V}$<br><br>P-Ch $V_{DS} = 2.1\text{V}$<br>$V_{IN} = 8\text{V}$ |                      | 2.2<br>7.7<br>10.1<br>11.5<br>13.0<br><br>-10 |                                 | mA            |
| Temperature Characteristics                     | $\Delta V_{DF}/(\Delta T_{opr} \cdot V_{DF})$   | $-30^{\circ}\text{C} \leq T_{opr} \leq 80^{\circ}\text{C}$                                                                                                                                                               | -200                 | $\pm 100$                                     | +200                            | ppm/°C        |
| Delay Time (Release Voltage → Output Inversion) | $t_{DLY}$<br>( $V_{DR}$ to $V_{OUT}$ Inversion) |                                                                                                                                                                                                                          |                      |                                               | 0.1                             | ms            |

Note1: An additional resistor between the  $V_{IN}$  pin and supply voltage may cause deterioration of the characteristics due to increasing of  $V_{DR}$ .

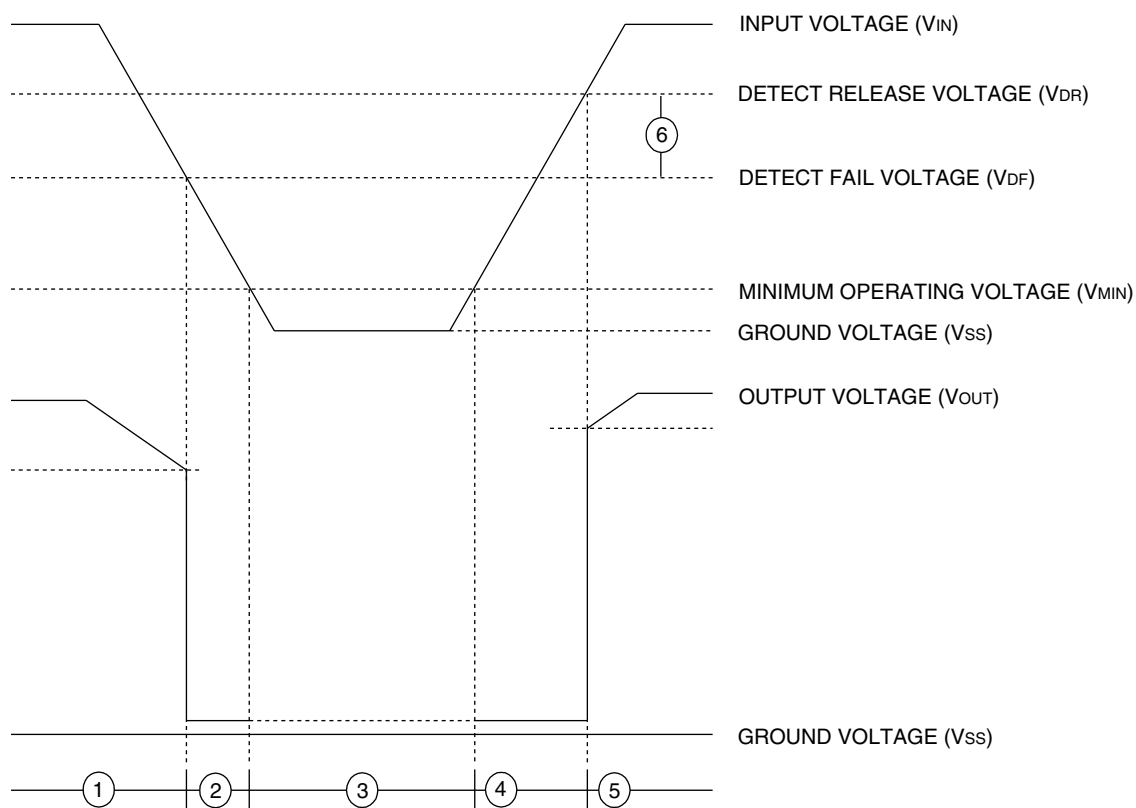
Note2:  $V_{out} = \text{Gnd}$  when  $1\text{V} < V_{IN} < 1.5\text{V}$

Note3:  $I_{out} < 10\mu\text{A}$  when  $V_{IN} < 1\text{V}$

## Functional Description

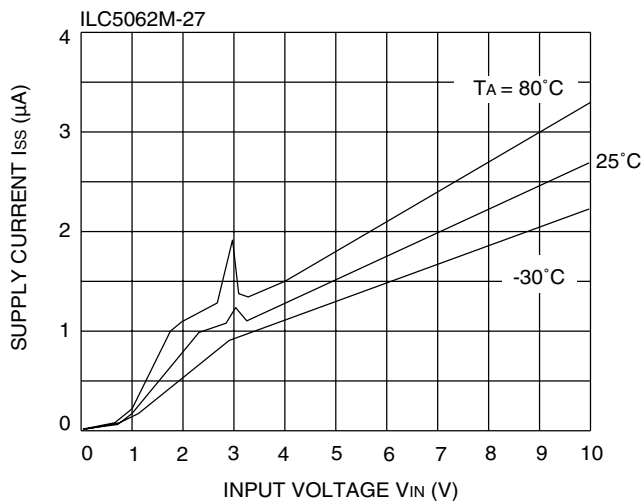
The following designators 1~6 refer to the timing diagram below.

1. While the input voltage ( $V_{IN}$ ) is higher than the detect voltage ( $V_{DF}$ ), the output voltage at  $V_{OUT}$  pin equals the input voltage at  $V_{IN}$  pin.
2. When the input  $V_{IN}$  voltage falls lower than  $V_{DF}$ ,  $V_{OUT}$  drops near ground voltage.
3. If the input voltage decreases below the minimum operating voltage ( $V_{MIN}$ ), the  $V_{OUT}$  output voltage will be undefined.
4. During an increase of the input voltage from the  $V_{SS}$  voltage,  $V_{OUT}$  is undefined at the voltage below  $V_{MIN}$ . Exceeding the  $V_{MIN}$  level, the output stays at the ground level ( $V_{SS}$ ) between the minimum operating voltage ( $V_{MIN}$ ) and the detect release voltage ( $V_{DR}$ ).
5. If the input voltage increases more than  $V_{DR}$ , the output voltage at  $V_{OUT}$  pin equals the input voltage at  $V_{IN}$  pin.
6. The difference between  $V_{DR}$  and  $V_{DF}$  is the hysteresis in the system.

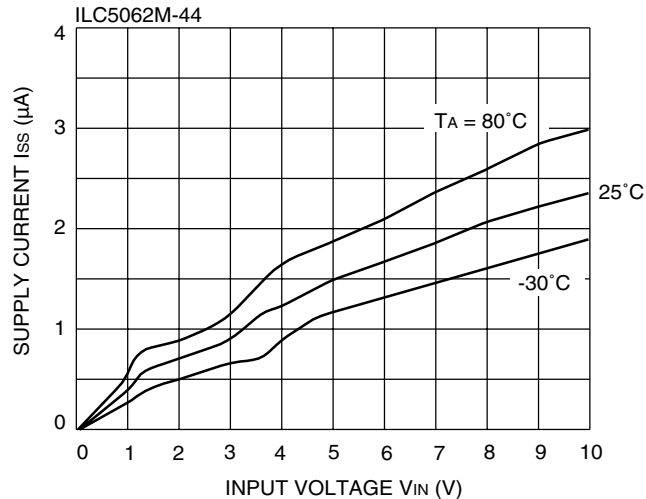


## Typical Performance Characteristics - General conditions for all curves

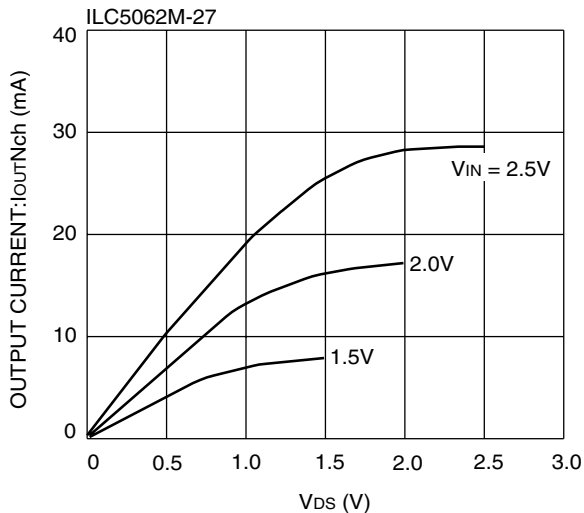
### Supply Current vs Input Voltage



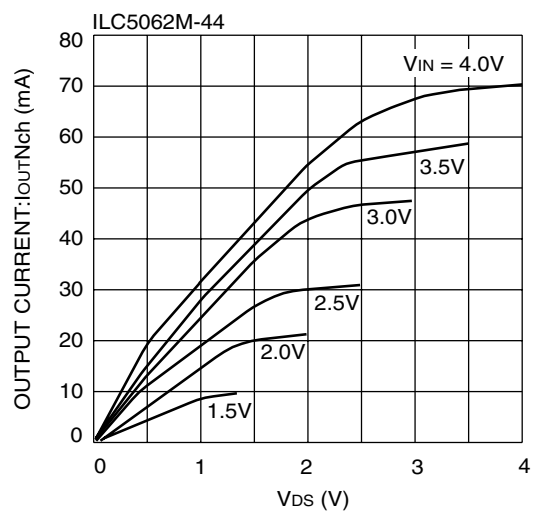
### Supply Current vs Input Voltage



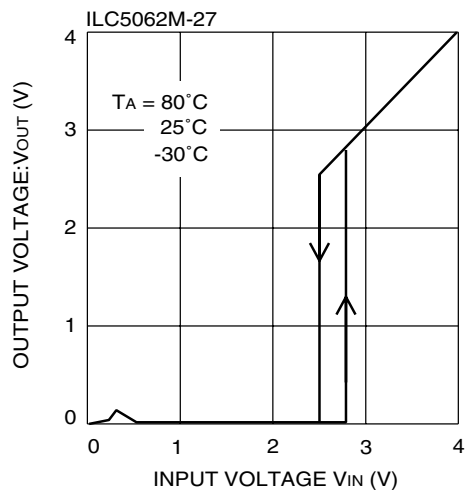
### N-ch Driver Output Current vs $V_{DS}$



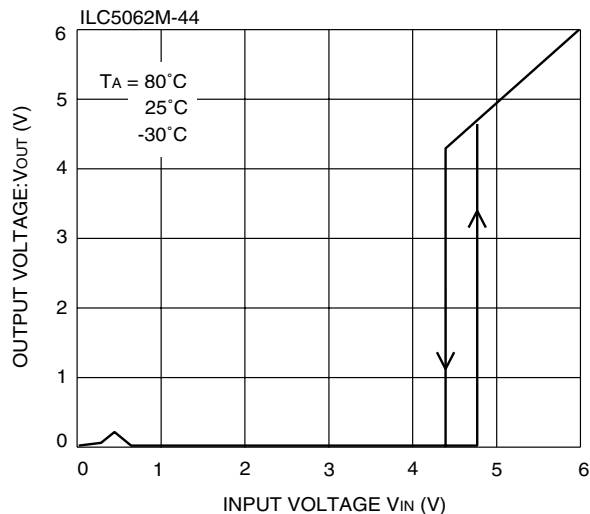
### N-ch Driver Output Current vs $V_{DS}$



### $V_{OUT}$ vs $V_{IN}$

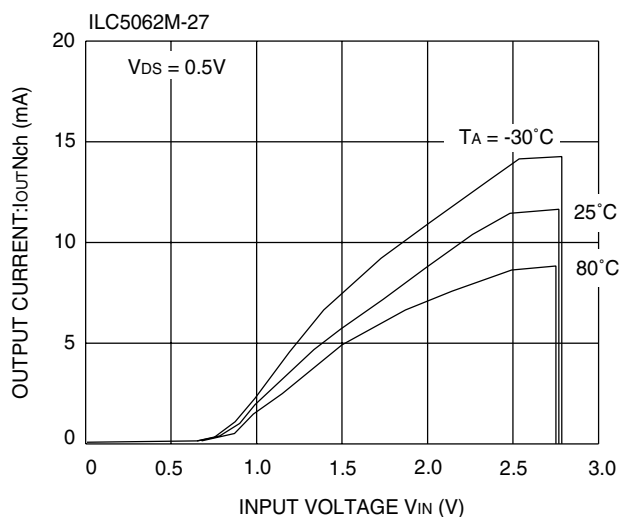


### $V_{OUT}$ vs $V_{IN}$

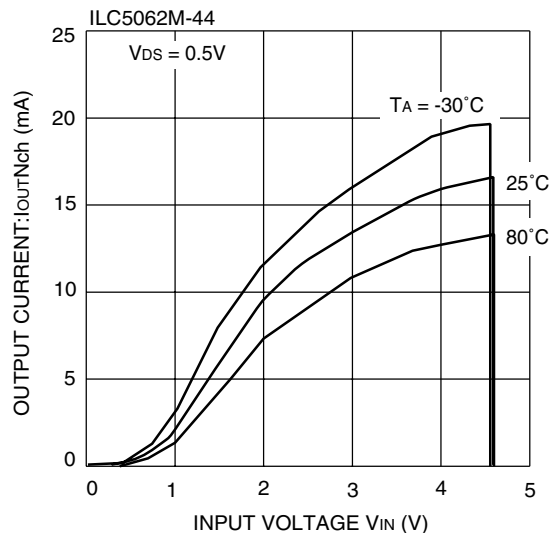


## Typical Performance Characteristics - General conditions for all curves

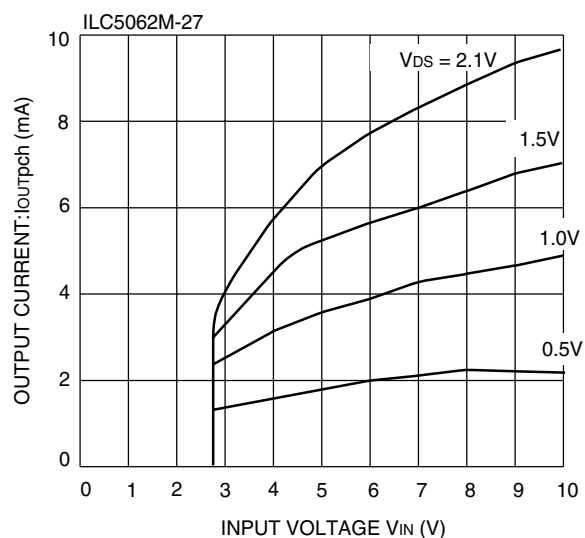
### N-ch Driver Output Current vs Input Voltage



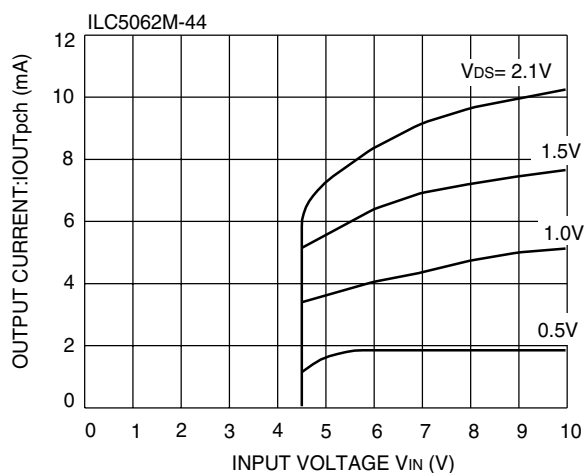
### N-ch Driver Output Current vs Input Voltage



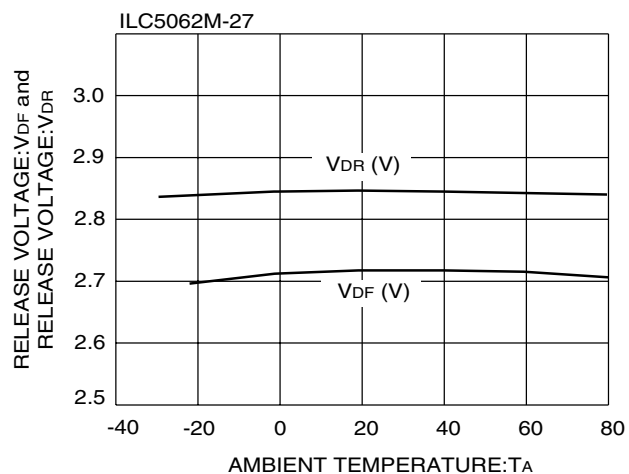
### P\_ch Driver Output Current vs Input Voltage



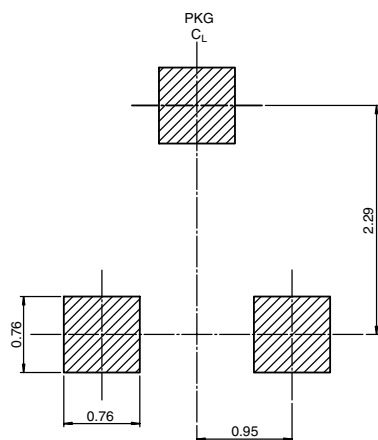
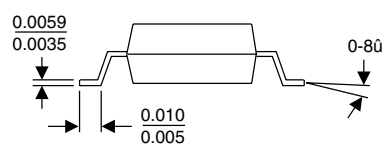
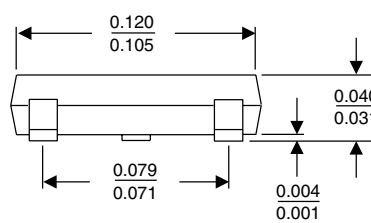
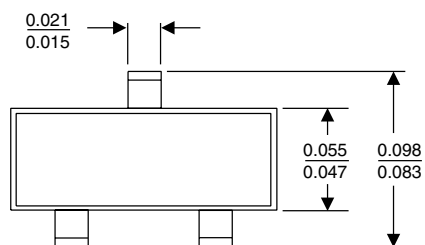
### P\_ch Driver Output Current vs Input Voltage



### VDR and VDF vs Temperature

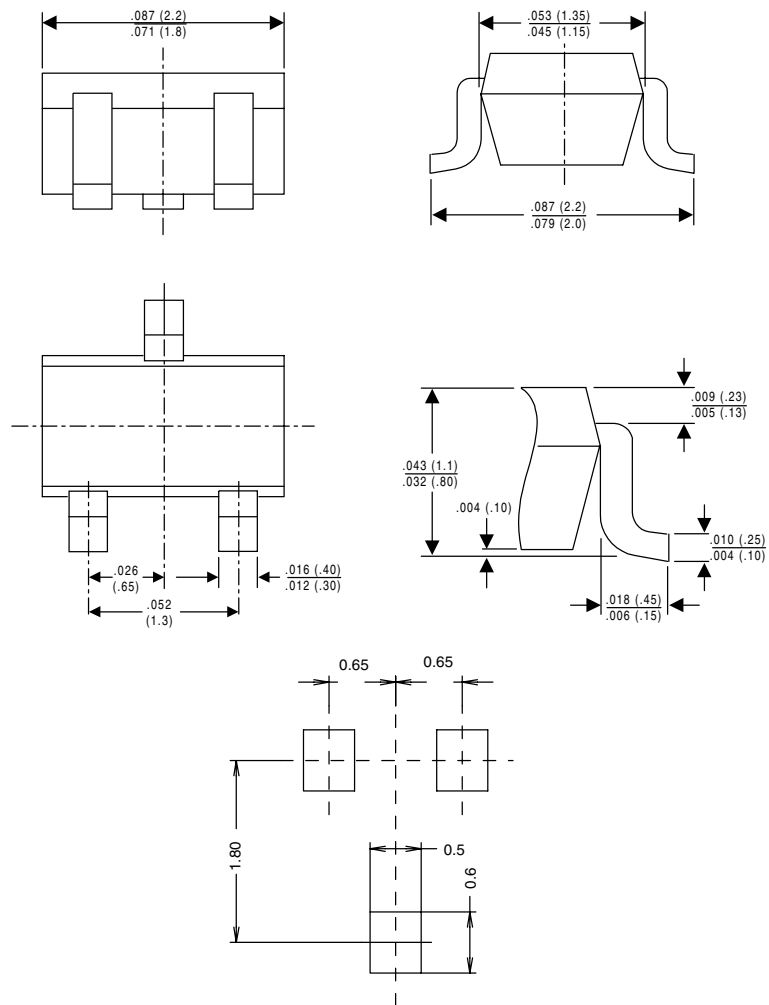


## SOT-23



LAND PATTERN RECOMMENDATION

## SC70



## Ordering Information

| PART NUMBER  | TOP MARKING | RESET THRESHOLD (V) | OUTPUT TYPE           | PACKAGE      | PACKING METHOD  |
|--------------|-------------|---------------------|-----------------------|--------------|-----------------|
| ILC5062AM23X | C3AY        | 2.3 ± 1 %           | Push-Pull, active low | 3-Pin, SOT23 | 3K units in T&R |
| ILC5062AM24X | C4AY        | 2.4 ± 1 %           | Push-Pull, active low | 3-Pin, SOT23 | 3K units in T&R |
| ILC5062AM25X | C5AY        | 2.5 ± 1 %           | Push-Pull, active low | 3-Pin, SOT23 | 3K units in T&R |
| ILC5062AM26X | C6AY        | 2.6 ± 1 %           | Push-Pull, active low | 3-Pin, SOT23 | 3K units in T&R |
| ILC5062AM27X | C7AY        | 2.7 ± 1 %           | Push-Pull, active low | 3-Pin, SOT23 | 3K units in T&R |
| ILC5062AM28X | C8AY        | 2.8 ± 1 %           | Push-Pull, active low | 3-Pin, SOT23 | 3K units in T&R |
| ILC5062AM29X | C9AY        | 2.9 ± 1 %           | Push-Pull, active low | 3-Pin, SOT23 | 3K units in T&R |
| ILC5062AM30X | D0AY        | 3.0 ± 1 %           | Push-Pull, active low | 3-Pin, SOT23 | 3K units in T&R |
| ILC5062AM31X | D1AY        | 3.1 ± 1 %           | Push-Pull, active low | 3-Pin, SOT23 | 3K units in T&R |
| ILC5062AM37X | D7AY        | 3.7 ± 1 %           | Push-Pull, active low | 3-Pin, SOT23 | 3K units in T&R |
| ILC5062AM44X | E4AY        | 4.4 ± 1 %           | Push-Pull, active low | 3-Pin, SOT23 | 3K units in T&R |
| ILC5062AM46X | E6AY        | 4.6 ± 1 %           | Push-Pull, active low | 3-Pin, SOT23 | 3K units in T&R |
| ILC5062M23X  | C3Y         | 2.3 ± 2 %           | Push-Pull, active low | 3-Pin, SOT23 | 3K units in T&R |
| ILC5062M24X  | C4Y         | 2.4 ± 2 %           | Push-Pull, active low | 3-Pin, SOT23 | 3K units in T&R |
| ILC5062M25X  | C5Y         | 2.5 ± 2 %           | Push-Pull, active low | 3-Pin, SOT23 | 3K units in T&R |
| ILC5062M26X  | C6Y         | 2.6 ± 2 %           | Push-Pull, active low | 3-Pin, SOT23 | 3K units in T&R |
| ILC5062M27X  | C7Y         | 2.7 ± 2 %           | Push-Pull, active low | 3-Pin, SOT23 | 3K units in T&R |
| ILC5062M28X  | C8Y         | 2.8 ± 2 %           | Push-Pull, active low | 3-Pin, SOT23 | 3K units in T&R |
| ILC5062M29X  | C9Y         | 2.9 ± 2 %           | Push-Pull, active low | 3-Pin, SOT23 | 3K units in T&R |
| ILC5062M30X  | D0Y         | 3.0 ± 2 %           | Push-Pull, active low | 3-Pin, SOT23 | 3K units in T&R |
| ILC5062M31X  | D1Y         | 3.1 ± 2 %           | Push-Pull, active low | 3-Pin, SOT23 | 3K units in T&R |
| ILC5062M37X  | D7Y         | 3.7 ± 2 %           | Push-Pull, active low | 3-Pin, SOT23 | 3K units in T&R |
| ILC5062M44X  | E4Y         | 4.4 ± 2 %           | Push-Pull, active low | 3-Pin, SOT23 | 3K units in T&R |
| ILC5062M46X  | E6Y         | 4.6 ± 2 %           | Push-Pull, active low | 3-Pin, SOT23 | 3K units in T&R |

**Note 1:** Last digit in the "Top Marking" information (represented by "Y" in the above table) represents internal assembly lot number

**Note 2:** Orientation of Tape & Reeled devices is Right.

## Ordering Information

| PART NUMBER   | TOP MARKING | RESET THRESHOLD (V) | OUTPUT TYPE           | PACKAGE     | PACKING METHOD  |
|---------------|-------------|---------------------|-----------------------|-------------|-----------------|
| ILC5062AIC23X | C3AY        | 2.3 ± 1 %           | Push-Pull, active low | 3-Pin, SC70 | 3K units in T&R |
| ILC5062AIC24X | C4AY        | 2.4 ± 1 %           | Push-Pull, active low | 3-Pin, SC70 | 3K units in T&R |
| ILC5062AIC25X | C5AY        | 2.5 ± 1 %           | Push-Pull, active low | 3-Pin, SC70 | 3K units in T&R |
| ILC5062AIC26X | C6AY        | 2.6 ± 1 %           | Push-Pull, active low | 3-Pin, SC70 | 3K units in T&R |
| ILC5062AIC27X | C7AY        | 2.7 ± 1 %           | Push-Pull, active low | 3-Pin, SC70 | 3K units in T&R |
| ILC5062AIC28X | C8AY        | 2.8 ± 1 %           | Push-Pull, active low | 3-Pin, SC70 | 3K units in T&R |
| ILC5062AIC29X | C9AY        | 2.9 ± 1 %           | Push-Pull, active low | 3-Pin, SC70 | 3K units in T&R |
| ILC5062AIC30X | D0AY        | 3.0 ± 1 %           | Push-Pull, active low | 3-Pin, SC70 | 3K units in T&R |
| ILC5062AIC31X | D1AY        | 3.1 ± 1 %           | Push-Pull, active low | 3-Pin, SC70 | 3K units in T&R |
| ILC5062AIC37X | D7AY        | 3.7 ± 1 %           | Push-Pull, active low | 3-Pin, SC70 | 3K units in T&R |
| ILC5062AIC44X | E4AY        | 4.4 ± 1 %           | Push-Pull, active low | 3-Pin, SC70 | 3K units in T&R |
| ILC5062AIC46X | E6AY        | 4.6 ± 1 %           | Push-Pull, active low | 3-Pin, SC70 | 3K units in T&R |
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| ILC5062IC24X  | C4Y         | 2.4 ± 2 %           | Push-Pull, active low | 3-Pin, SC70 | 3K units in T&R |
| ILC5062IC25X  | C5Y         | 2.5 ± 2 %           | Push-Pull, active low | 3-Pin, SC70 | 3K units in T&R |
| ILC5062IC26X  | C6Y         | 2.6 ± 2 %           | Push-Pull, active low | 3-Pin, SC70 | 3K units in T&R |
| ILC5062IC27X  | C7Y         | 2.7 ± 2 %           | Push-Pull, active low | 3-Pin, SC70 | 3K units in T&R |
| ILC5062IC28X  | C8Y         | 2.8 ± 2 %           | Push-Pull, active low | 3-Pin, SC70 | 3K units in T&R |
| ILC5062IC29X  | C9Y         | 2.9 ± 2 %           | Push-Pull, active low | 3-Pin, SC70 | 3K units in T&R |
| ILC5062IC30X  | D0Y         | 3.0 ± 2 %           | Push-Pull, active low | 3-Pin, SC70 | 3K units in T&R |
| ILC5062IC31X  | D1Y         | 3.1 ± 2 %           | Push-Pull, active low | 3-Pin, SC70 | 3K units in T&R |
| ILC5062IC37X  | D7Y         | 3.7 ± 2 %           | Push-Pull, active low | 3-Pin, SC70 | 3K units in T&R |
| ILC5062IC44X  | E4Y         | 4.4 ± 2 %           | Push-Pull, active low | 3-Pin, SC70 | 3K units in T&R |
| ILC5062IC46X  | E6Y         | 4.6 ± 2 %           | Push-Pull, active low | 3-Pin, SC70 | 3K units in T&R |

**Note 1:** Last digit in the "Top Marking" information (represented by "Y" in the above table) represents internal assembly lot number

**Note 2:** Orientation of Tape & Reeled devices is Right.

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