

## Low Voltage Reset IC

### Features

- Monitor Supply Voltages from 0.9V to 1.8V
- $\pm 2\%$  Reset Threshold Accuracy
- Capacitor-Adjustable Reset Timeout Period  
 $t_{RP} (ms) \approx 2.7 \times C_D (nF)$  at  $V_{CC}=3.3V$
- Low Quiescent Current:  $10\mu A$  at  $V_{CC}=3.3V$
- Available in three RESET Output Options  
 Push-Pull RESET Output (G682L)  
 Push-Pull RESET Output (G682H)  
 Open-Drain RESET (G683L)
- Programmable Reset Threshold Application (G68\_\_09T\_)
- Guaranteed Reset Valid to  $V_{CC} = 1V$
- Power-Supply Transient Immunity
- TSOT-23-5, SOT-23-5, SC-70-5, DFN1.6X1.6-6 and ADFN1.5X1.5-6 Packages

### Applications

- Computers
- Controllers
- Intelligent Instruments
- Critical  $\mu P$  and  $\mu C$  Power Monitoring
- Portable/Battery-Powered Equipment
- Telecom/Networking Equipment

### General Description

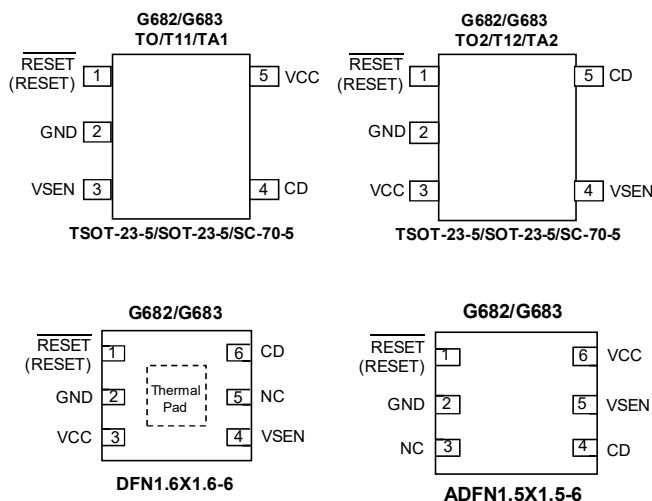
The G682/G683 microprocessor ( $\mu P$ ) supervisory circuits monitor system voltages in  $\mu P$  and digital systems. They provide excellent circuit reliability at low cost by eliminating external components.

Since the sense pin is separated from power supply, it allows the IC to monitor added power supply. Using the IC with the sense pin separated from power supply enables output to maintain the state of detection even when voltage of the monitored power supply drops to 0V. The VSEN pin of G68\_\_09T\_ is high impedance and can be used for application of reset threshold programming.

Moreover, with the built-in delay circuit, connecting the delay capacitance pin to the capacitor enables the IC to provide an arbitrary release delay time.

All of these devices are offered in TSOT-23-5, SOT-23-5, SC-70-5, DFN1.6X1.6-6 and ADFN1.5X1.5-6 packages.

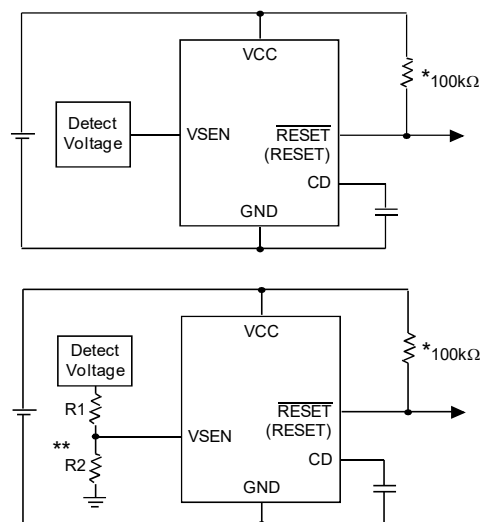
### Pin Configuration



Note: Recommend connecting the Thermal Pad to the Ground for excellent power dissipation.

( ) is for G682H

### Typical Application Circuit



\*The 100kΩ pull up resistor is only for G683L

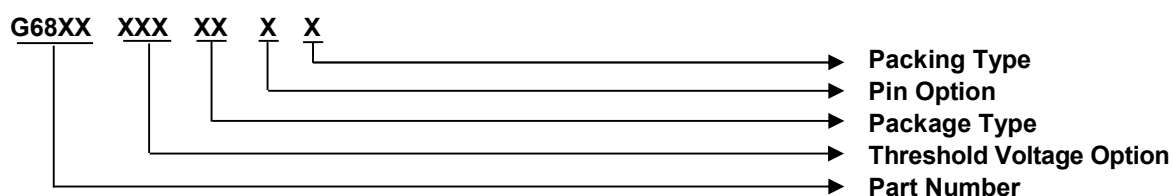
\*\* Adjustable reset threshold voltage is only for G68\_\_09T\_.

$$V_{th} = 0.788 \times \frac{R1+R2}{R2}$$

## Ordering Information

| ORDER NUMBER  | TEMP. RANGE    | OUTPUT TYPE           | PACKAGE (Green)            |
|---------------|----------------|-----------------------|----------------------------|
| G682LxxxTxxU  | -40°C ~ +105°C | Push-Pull Active Low  | TSOT-23-5/SOT-23-5/SC-70-5 |
| G682HxxxTxxU  | -40°C ~ +105°C | Push-Pull Active High | TSOT-23-5/SOT-23-5/SC-70-5 |
| G683LxxxTxxU  | -40°C ~ +105°C | Open Drain            | TSOT-23-5/SOT-23-5/SC-70-5 |
| G682LxxxQL1U  | -40°C ~ +105°C | Push-Pull Active Low  | DFN1.6X1.6-6               |
| G682HxxxQL1U  | -40°C ~ +105°C | Push-Pull Active High | DFN1.6X1.6-6               |
| G683LxxxQL1U  | -40°C ~ +105°C | Open Drain            | DFN1.6X1.6-6               |
| G682LxxxA31U  | -40°C ~ +105°C | Push-Pull Active Low  | ADFN1.5X1.5-6              |
| G682HxxxA31U  | -40°C ~ +105°C | Push-Pull Active High | ADFN1.5X1.5-6              |
| G683Lxxx A31U | -40°C ~ +105°C | Open Drain            | ADFN1.5X1.5-6              |

## Order Number Identification



### PART NUMBER

G682L : Push-Pull Active Low Output  
 G682H : Push-Pull Active High Output  
 G683L : Open-Drain Output

### THRESHOLD VOLTAGE OPTION

xxx specifies the threshold voltage.  
 e.g. 09T denotes the 0.788V threshold voltage.  
 09S denotes the 0.833V threshold voltage.  
 T:87.5%  
 S:92.5%

### PACKAGE TYPE

TO : TSOT-23-5  
 T1 : SOT-23-5  
 TA : SC-70-5  
 QL: DFN1.6X1.6-6  
 A3: ADFN1.5X1.5-6

### PACKING TYPE

U : Tape & Reel

### PIN OPTION

|                                       | 1   | 2    | 3    | 4    | 5   | 6 |
|---------------------------------------|-----|------|------|------|-----|---|
| <b>TSOT-23-5/SOT-23-5/SC-70-5</b>     |     |      |      |      |     |   |
| 1 : $\overline{\text{RESET}}$ (RESET) | GND | VSEN | CD   | VCC  | --- |   |
| 2 : $\overline{\text{RESET}}$ (RESET) | GND | VCC  | VSEN | CD   | --- |   |
| <b>DFN1.6X1.6-6</b>                   |     |      |      |      |     |   |
| 1 : $\overline{\text{RESET}}$ (RESET) | GND | VCC  | VSEN | NC   | CD  |   |
| <b>ADFN1.5X1.5-6</b>                  |     |      |      |      |     |   |
| 1 : $\overline{\text{RESET}}$ (RESET) | GND | NC   | CD   | VSEN | VCC |   |

\*RESET for G682H

## Selector Guide

| ORDER NUMBER | RESET THRESHOLD (V) | OUTPUT TYPE                          | MARKING | PACKAGE (Green) |
|--------------|---------------------|--------------------------------------|---------|-----------------|
| G682L09TTO1U | 0.788(0.9*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62AAx   | TSOT-23-5       |
| G682L09STO1U | 0.833(0.9*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62ABx   | TSOT-23-5       |
| G682L12TTO1U | 1.050(1.2*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62ACx   | TSOT-23-5       |
| G682L12STO1U | 1.110(1.2*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62ADx   | TSOT-23-5       |
| G682L15TTO1U | 1.313(1.5*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62AEx   | TSOT-23-5       |
| G682L15STO1U | 1.388(1.5*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62AFx   | TSOT-23-5       |
| G682L18TTO1U | 1.575(1.8*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62AGx   | TSOT-23-5       |
| G682L18STO1U | 1.665(1.8*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62AHx   | TSOT-23-5       |
| G682H09TTO1U | 0.788(0.9*87.5%)    | Push-Pull RESET                      | 62Alx   | TSOT-23-5       |
| G682H09STO1U | 0.833(0.9*92.5%)    | Push-Pull RESET                      | 62AJx   | TSOT-23-5       |
| G682H12TTO1U | 1.050(1.2*87.5%)    | Push-Pull RESET                      | 62AKx   | TSOT-23-5       |
| G682H12STO1U | 1.110(1.2*92.5%)    | Push-Pull RESET                      | 62ALx   | TSOT-23-5       |
| G682H15TTO1U | 1.313(1.5*87.5%)    | Push-Pull RESET                      | 62AMx   | TSOT-23-5       |
| G682H15STO1U | 1.388(1.5*92.5%)    | Push-Pull RESET                      | 62ANx   | TSOT-23-5       |
| G682H18TTO1U | 1.575(1.8*87.5%)    | Push-Pull RESET                      | 62AOx   | TSOT-23-5       |
| G682H18STO1U | 1.665(1.8*92.5%)    | Push-Pull RESET                      | 62APx   | TSOT-23-5       |
| G683L09TTO1U | 0.788(0.9*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63AAx   | TSOT-23-5       |
| G683L09STO1U | 0.833(0.9*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63ABx   | TSOT-23-5       |
| G683L12TTO1U | 1.050(1.2*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63ACx   | TSOT-23-5       |
| G683L12STO1U | 1.110(1.2*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63ADx   | TSOT-23-5       |
| G683L15TTO1U | 1.313(1.5*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63AEx   | TSOT-23-5       |
| G683L15STO1U | 1.388(1.5*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63AFx   | TSOT-23-5       |
| G683L18TTO1U | 1.575(1.8*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63AGx   | TSOT-23-5       |
| G683L18STO1U | 1.665(1.8*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63AHx   | TSOT-23-5       |

Note: T: 87.5%    S:92.5%

TO: TSOT-23-5

1: Bonding Code

U: Tape & Reel

Green: Lead Free / Halogen Free

## Selector Guide

| ORDER NUMBER | RESET THRESHOLD (V) | OUTPUT TYPE                          | MARKING | PACKAGE (Green) |
|--------------|---------------------|--------------------------------------|---------|-----------------|
| G682L09TTO2U | 0.788(0.9*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62BAx   | TSOT-23-5       |
| G682L09STO2U | 0.833(0.9*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62BBx   | TSOT-23-5       |
| G682L12TTO2U | 1.050(1.2*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62BCx   | TSOT-23-5       |
| G682L12STO2U | 1.110(1.2*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62BDx   | TSOT-23-5       |
| G682L15TTO2U | 1.313(1.5*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62BEx   | TSOT-23-5       |
| G682L15STO2U | 1.388(1.5*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62BFx   | TSOT-23-5       |
| G682L18TTO2U | 1.575(1.8*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62BGx   | TSOT-23-5       |
| G682L18STO2U | 1.665(1.8*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62BHx   | TSOT-23-5       |
| G682H09TTO2U | 0.788(0.9*87.5%)    | Push-Pull RESET                      | 62Blx   | TSOT-23-5       |
| G682H09STO2U | 0.833(0.9*92.5%)    | Push-Pull RESET                      | 62BJx   | TSOT-23-5       |
| G682H12TTO2U | 1.050(1.2*87.5%)    | Push-Pull RESET                      | 62BKx   | TSOT-23-5       |
| G682H12STO2U | 1.110(1.2*92.5%)    | Push-Pull RESET                      | 62BLx   | TSOT-23-5       |
| G682H15TTO2U | 1.313(1.5*87.5%)    | Push-Pull RESET                      | 62BMx   | TSOT-23-5       |
| G682H15STO2U | 1.388(1.5*92.5%)    | Push-Pull RESET                      | 62BNx   | TSOT-23-5       |
| G682H18TTO2U | 1.575(1.8*87.5%)    | Push-Pull RESET                      | 62BOx   | TSOT-23-5       |
| G682H18STO2U | 1.665(1.8*92.5%)    | Push-Pull RESET                      | 62BPx   | TSOT-23-5       |
| G683L09TTO2U | 0.788(0.9*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63BAx   | TSOT-23-5       |
| G683L09STO2U | 0.833(0.9*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63BBx   | TSOT-23-5       |
| G683L12TTO2U | 1.050(1.2*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63BCx   | TSOT-23-5       |
| G683L12STO2U | 1.110(1.2*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63BDx   | TSOT-23-5       |
| G683L15TTO2U | 1.313(1.5*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63BEx   | TSOT-23-5       |
| G683L15STO2U | 1.388(1.5*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63BFx   | TSOT-23-5       |
| G683L18TTO2U | 1.575(1.8*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63BGx   | TSOT-23-5       |
| G683L18STO2U | 1.665(1.8*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63BHx   | TSOT-23-5       |

Note: T: 87.5%    S:92.5%

TO: TSOT-23-5

2: Bonding Code

U: Tape & Reel

Green: Lead Free / Halogen Free

## Selector Guide

| ORDER NUMBER | RESET THRESHOLD (V) | OUTPUT TYPE                          | MARKING | PACKAGE (Green) |
|--------------|---------------------|--------------------------------------|---------|-----------------|
| G682L09TT11U | 0.788(0.9*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62AAx   | SOT-23-5        |
| G682L09ST11U | 0.833(0.9*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62ABx   | SOT-23-5        |
| G682L12TT11U | 1.050(1.2*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62ACx   | SOT-23-5        |
| G682L12ST11U | 1.110(1.2*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62ADx   | SOT-23-5        |
| G682L15TT11U | 1.313(1.5*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62AEx   | SOT-23-5        |
| G682L15ST11U | 1.388(1.5*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62AFx   | SOT-23-5        |
| G682L18TT11U | 1.575(1.8*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62AGx   | SOT-23-5        |
| G682L18ST11U | 1.665(1.8*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62AHx   | SOT-23-5        |
| G682H09TT11U | 0.788(0.9*87.5%)    | Push-Pull RESET                      | 62Alx   | SOT-23-5        |
| G682H09ST11U | 0.833(0.9*92.5%)    | Push-Pull RESET                      | 62AJx   | SOT-23-5        |
| G682H12TT11U | 1.050(1.2*87.5%)    | Push-Pull RESET                      | 62AKx   | SOT-23-5        |
| G682H12ST11U | 1.110(1.2*92.5%)    | Push-Pull RESET                      | 62ALx   | SOT-23-5        |
| G682H15TT11U | 1.313(1.5*87.5%)    | Push-Pull RESET                      | 62AMx   | SOT-23-5        |
| G682H15ST11U | 1.388(1.5*92.5%)    | Push-Pull RESET                      | 62ANx   | SOT-23-5        |
| G682H18TT11U | 1.575(1.8*87.5%)    | Push-Pull RESET                      | 62AOx   | SOT-23-5        |
| G682H18ST11U | 1.665(1.8*92.5%)    | Push-Pull RESET                      | 62APx   | SOT-23-5        |
| G683L09TT11U | 0.788(0.9*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63AAx   | SOT-23-5        |
| G683L09ST11U | 0.833(0.9*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63ABx   | SOT-23-5        |
| G683L12TT11U | 1.050(1.2*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63ACx   | SOT-23-5        |
| G683L12ST11U | 1.110(1.2*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63ADx   | SOT-23-5        |
| G683L15TT11U | 1.313(1.5*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63AEx   | SOT-23-5        |
| G683L15ST11U | 1.388(1.5*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63AFx   | SOT-23-5        |
| G683L18TT11U | 1.575(1.8*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63AGx   | SOT-23-5        |
| G683L18ST11U | 1.665(1.8*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63AHx   | SOT-23-5        |

Note: T: 87.5% S:92.5%

T1: SOT-23-5

1: Bonding Code

U: Tape & Reel

Green: Lead Free / Halogen Free

## Selector Guide

| ORDER NUMBER | RESET THRESHOLD (V) | OUTPUT TYPE                          | MARKING | PACKAGE (Green) |
|--------------|---------------------|--------------------------------------|---------|-----------------|
| G682L09TT12U | 0.788(0.9*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62BAx   | SOT-23-5        |
| G682L09ST12U | 0.833(0.9*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62BBx   | SOT-23-5        |
| G682L12TT12U | 1.050(1.2*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62BCx   | SOT-23-5        |
| G682L12ST12U | 1.110(1.2*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62BDx   | SOT-23-5        |
| G682L15TT12U | 1.313(1.5*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62BEx   | SOT-23-5        |
| G682L15ST12U | 1.388(1.5*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62BFx   | SOT-23-5        |
| G682L18TT12U | 1.575(1.8*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62BGx   | SOT-23-5        |
| G682L18ST12U | 1.665(1.8*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 62BHx   | SOT-23-5        |
| G682H09TT12U | 0.788(0.9*87.5%)    | Push-Pull RESET                      | 62Blx   | SOT-23-5        |
| G682H09ST12U | 0.833(0.9*92.5%)    | Push-Pull RESET                      | 62BJx   | SOT-23-5        |
| G682H12TT12U | 1.050(1.2*87.5%)    | Push-Pull RESET                      | 62BKx   | SOT-23-5        |
| G682H12ST12U | 1.110(1.2*92.5%)    | Push-Pull RESET                      | 62BLx   | SOT-23-5        |
| G682H15TT12U | 1.313(1.5*87.5%)    | Push-Pull RESET                      | 62BMx   | SOT-23-5        |
| G682H15ST12U | 1.388(1.5*92.5%)    | Push-Pull RESET                      | 62BNx   | SOT-23-5        |
| G682H18TT12U | 1.575(1.8*87.5%)    | Push-Pull RESET                      | 62BOx   | SOT-23-5        |
| G682H18ST12U | 1.665(1.8*92.5%)    | Push-Pull RESET                      | 62BPx   | SOT-23-5        |
| G683L09TT12U | 0.788(0.9*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63BAx   | SOT-23-5        |
| G683L09ST12U | 0.833(0.9*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63BBx   | SOT-23-5        |
| G683L12TT12U | 1.050(1.2*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63BCx   | SOT-23-5        |
| G683L12ST12U | 1.110(1.2*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63BDx   | SOT-23-5        |
| G683L15TT12U | 1.313(1.5*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63BEx   | SOT-23-5        |
| G683L15ST12U | 1.388(1.5*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63BFx   | SOT-23-5        |
| G683L18TT12U | 1.575(1.8*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63BGx   | SOT-23-5        |
| G683L18ST12U | 1.665(1.8*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63BHx   | SOT-23-5        |

Note: T: 87.5%    S:92.5%

T1: SOT-23-5

2: Bonding Code

U: Tape & Reel

Green: Lead Free / Halogen Free

## Selector Guide

| ORDER NUMBER | RESET THRESHOLD (V) | OUTPUT TYPE                          | MARKING | PACKAGE (Green) |
|--------------|---------------------|--------------------------------------|---------|-----------------|
| G682L09TTA1U | 0.788(0.9*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 6AAx    | SC-70-5         |
| G682L09STA1U | 0.833(0.9*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 6ABx    | SC-70-5         |
| G682L12TTA1U | 1.050(1.2*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 6ACx    | SC-70-5         |
| G682L12STA1U | 1.110(1.2*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 6ADx    | SC-70-5         |
| G682L15TTA1U | 1.313(1.5*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 6AEx    | SC-70-5         |
| G682L15STA1U | 1.388(1.5*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 6AFx    | SC-70-5         |
| G682L18TTA1U | 1.575(1.8*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 6AGx    | SC-70-5         |
| G682L18STA1U | 1.665(1.8*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 6AHx    | SC-70-5         |
| G682H09TTA1U | 0.788(0.9*87.5%)    | Push-Pull RESET                      | 6Aix    | SC-70-5         |
| G682H09STA1U | 0.833(0.9*92.5%)    | Push-Pull RESET                      | 6AJx    | SC-70-5         |
| G682H12TTA1U | 1.050(1.2*87.5%)    | Push-Pull RESET                      | 6AKx    | SC-70-5         |
| G682H12STA1U | 1.110(1.2*92.5%)    | Push-Pull RESET                      | 6ALx    | SC-70-5         |
| G682H15TTA1U | 1.313(1.5*87.5%)    | Push-Pull RESET                      | 6AMx    | SC-70-5         |
| G682H15STA1U | 1.388(1.5*92.5%)    | Push-Pull RESET                      | 6ANx    | SC-70-5         |
| G682H18TTA1U | 1.575(1.8*87.5%)    | Push-Pull RESET                      | 6AOx    | SC-70-5         |
| G682H18STA1U | 1.665(1.8*92.5%)    | Push-Pull RESET                      | 6APx    | SC-70-5         |
| G683L09TTA1U | 0.788(0.9*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63Ax    | SC-70-5         |
| G683L09STA1U | 0.833(0.9*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63Bx    | SC-70-5         |
| G683L12TTA1U | 1.050(1.2*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63Cx    | SC-70-5         |
| G683L12STA1U | 1.110(1.2*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63Dx    | SC-70-5         |
| G683L15TTA1U | 1.313(1.5*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63Ex    | SC-70-5         |
| G683L15STA1U | 1.388(1.5*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63Fx    | SC-70-5         |
| G683L18TTA1U | 1.575(1.8*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63Gx    | SC-70-5         |
| G683L18STA1U | 1.665(1.8*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63Hx    | SC-70-5         |

Note: T: 87.5%    S:92.5%

TA: SC-70-5

1: Bonding Code

U: Tape & Reel

Green: Lead Free / Halogen Free

## Selector Guide

| ORDER NUMBER | RESET THRESHOLD (V) | OUTPUT TYPE                          | MARKING | PACKAGE (Green) |
|--------------|---------------------|--------------------------------------|---------|-----------------|
| G682L09TTA2U | 0.788(0.9*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 6BAx    | SC-70-5         |
| G682L09STA2U | 0.833(0.9*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 6BBx    | SC-70-5         |
| G682L12TTA2U | 1.050(1.2*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 6BCx    | SC-70-5         |
| G682L12STA2U | 1.110(1.2*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 6BDx    | SC-70-5         |
| G682L15TTA2U | 1.313(1.5*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 6BEx    | SC-70-5         |
| G682L15STA2U | 1.388(1.5*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 6BFx    | SC-70-5         |
| G682L18TTA2U | 1.575(1.8*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 6BGx    | SC-70-5         |
| G682L18STA2U | 1.665(1.8*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 6BHx    | SC-70-5         |
| G682H09TTA2U | 0.788(0.9*87.5%)    | Push-Pull RESET                      | 6BIx    | SC-70-5         |
| G682H09STA2U | 0.833(0.9*92.5%)    | Push-Pull RESET                      | 6BJx    | SC-70-5         |
| G682H12TTA2U | 1.050(1.2*87.5%)    | Push-Pull RESET                      | 6BKx    | SC-70-5         |
| G682H12STA2U | 1.110(1.2*92.5%)    | Push-Pull RESET                      | 6BLx    | SC-70-5         |
| G682H15TTA2U | 1.313(1.5*87.5%)    | Push-Pull RESET                      | 6BMx    | SC-70-5         |
| G682H15STA2U | 1.388(1.5*92.5%)    | Push-Pull RESET                      | 6BNx    | SC-70-5         |
| G682H18TTA2U | 1.575(1.8*87.5%)    | Push-Pull RESET                      | 6BOx    | SC-70-5         |
| G682H18STA2U | 1.665(1.8*92.5%)    | Push-Pull RESET                      | 6BPx    | SC-70-5         |
| G683L09TTA2U | 0.788(0.9*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63Ix    | SC-70-5         |
| G683L09STA2U | 0.833(0.9*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63Jx    | SC-70-5         |
| G683L12TTA2U | 1.050(1.2*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63Kx    | SC-70-5         |
| G683L12STA2U | 1.110(1.2*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63Lx    | SC-70-5         |
| G683L15TTA2U | 1.313(1.5*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63Mx    | SC-70-5         |
| G683L15STA2U | 1.388(1.5*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63Nx    | SC-70-5         |
| G683L18TTA2U | 1.575(1.8*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63Ox    | SC-70-5         |
| G683L18STA2U | 1.665(1.8*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 63Px    | SC-70-5         |

Note: T: 87.5%    S:92.5%

TA: SC-70-5

2: Bonding Code

U: Tape & Reel

Green: Lead Free / Halogen Free

## Selector Guide

| ORDER NUMBER | RESET THRESHOLD (V) | OUTPUT TYPE                          | MARKING | PACKAGE (Green) |
|--------------|---------------------|--------------------------------------|---------|-----------------|
| G682L09TQL1U | 0.788(0.9*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 682 ATx | DFN1.6X1.6-6    |
| G682L09SQL1U | 0.833(0.9*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 682 ASx | DFN1.6X1.6-6    |
| G682L12TQL1U | 1.050(1.2*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 682 BTx | DFN1.6X1.6-6    |
| G682L12SQL1U | 1.110(1.2*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 682 BSx | DFN1.6X1.6-6    |
| G682L15TQL1U | 1.313(1.5*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 682 CTx | DFN1.6X1.6-6    |
| G682L15SQL1U | 1.388(1.5*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 682 CSx | DFN1.6X1.6-6    |
| G682L18TQL1U | 1.575(1.8*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 682 DTx | DFN1.6X1.6-6    |
| G682L18SQL1U | 1.665(1.8*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 682 DSx | DFN1.6X1.6-6    |
| G682H09TQL1U | 0.788(0.9*87.5%)    | Push-Pull RESET                      | 682 ETx | DFN1.6X1.6-6    |
| G682H09SQL1U | 0.833(0.9*92.5%)    | Push-Pull RESET                      | 682 ESx | DFN1.6X1.6-6    |
| G682H12TQL1U | 1.050(1.2*87.5%)    | Push-Pull RESET                      | 682 FTx | DFN1.6X1.6-6    |
| G682H12SQL1U | 1.110(1.2*92.5%)    | Push-Pull RESET                      | 682 FSx | DFN1.6X1.6-6    |
| G682H15TQL1U | 1.313(1.5*87.5%)    | Push-Pull RESET                      | 682 GTx | DFN1.6X1.6-6    |
| G682H15SQL1U | 1.388(1.5*92.5%)    | Push-Pull RESET                      | 682 GSx | DFN1.6X1.6-6    |
| G682H18TQL1U | 1.575(1.8*87.5%)    | Push-Pull RESET                      | 682 HTx | DFN1.6X1.6-6    |
| G682H18SQL1U | 1.665(1.8*92.5%)    | Push-Pull RESET                      | 682 HSx | DFN1.6X1.6-6    |
| G683L09TQL1U | 0.788(0.9*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 683 ATx | DFN1.6X1.6-6    |
| G683L09SQL1U | 0.833(0.9*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 683 ASx | DFN1.6X1.6-6    |
| G683L12TQL1U | 1.050(1.2*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 683 BTx | DFN1.6X1.6-6    |
| G683L12SQL1U | 1.110(1.2*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 683 BSx | DFN1.6X1.6-6    |
| G683L15TQL1U | 1.313(1.5*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 683 CTx | DFN1.6X1.6-6    |
| G683L15SQL1U | 1.388(1.5*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 683 CSx | DFN1.6X1.6-6    |
| G683L18TQL1U | 1.575(1.8*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 683 DTx | DFN1.6X1.6-6    |
| G683L18SQL1U | 1.665(1.8*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 683 DSx | DFN1.6X1.6-6    |

Note: T: 87.5% S:92.5%

QL: DFN1.6X1.6-6

1: Bonding Code

U: Tape & Reel

Green: Lead Free / Halogen Free

## Selector Guide

| ORDER NUMBER | RESET THRESHOLD (V) | OUTPUT TYPE                          | MARKING  | PACKAGE (Green) |
|--------------|---------------------|--------------------------------------|----------|-----------------|
| G682L09TA31U | 0.788(0.9*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 6A<br>Tx | ADFN1..5X1.5-6  |
| G682L09SA31U | 0.833(0.9*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 6A<br>Sx | ADFN1..5X1.5-6  |
| G682L12TA31U | 1.050(1.2*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 6B<br>Tx | ADFN1..5X1.5-6  |
| G682L12SA31U | 1.110(1.2*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 6B<br>Sx | ADFN1..5X1.5-6  |
| G682L15TA31U | 1.313(1.5*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 6C<br>Tx | ADFN1..5X1.5-6  |
| G682L15SA31U | 1.388(1.5*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 6C<br>Sx | ADFN1..5X1.5-6  |
| G682L18TA31U | 1.575(1.8*87.5%)    | Push-Pull $\overline{\text{RESET}}$  | 6D<br>Tx | ADFN1..5X1.5-6  |
| G682L18SA31U | 1.665(1.8*92.5%)    | Push-Pull $\overline{\text{RESET}}$  | 6D<br>Sx | ADFN1..5X1.5-6  |
| G682H09TA31U | 0.788(0.9*87.5%)    | Push-Pull RESET                      | 6E<br>Tx | ADFN1..5X1.5-6  |
| G682H09SA31U | 0.833(0.9*92.5%)    | Push-Pull RESET                      | 6E<br>Sx | ADFN1..5X1.5-6  |
| G682H12TA31U | 1.050(1.2*87.5%)    | Push-Pull RESET                      | 6F<br>Tx | ADFN1..5X1.5-6  |
| G682H12SA31U | 1.110(1.2*92.5%)    | Push-Pull RESET                      | 6F<br>Sx | ADFN1..5X1.5-6  |
| G682H15TA31U | 1.313(1.5*87.5%)    | Push-Pull RESET                      | 6G<br>Tx | ADFN1..5X1.5-6  |
| G682H15SA31U | 1.388(1.5*92.5%)    | Push-Pull RESET                      | 6G<br>Sx | ADFN1..5X1.5-6  |
| G682H18TA31U | 1.575(1.8*87.5%)    | Push-Pull RESET                      | 6H<br>Tx | ADFN1..5X1.5-6  |
| G682H18SA31U | 1.665(1.8*92.5%)    | Push-Pull RESET                      | 6H<br>Sx | ADFN1..5X1.5-6  |
| G683L09TA31U | 0.788(0.9*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 6I<br>Tx | ADFN1..5X1.5-6  |
| G683L09SA31U | 0.833(0.9*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 6I<br>Sx | ADFN1..5X1.5-6  |
| G683L12TA31U | 1.050(1.2*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 6J<br>Tx | ADFN1..5X1.5-6  |
| G683L12SA31U | 1.110(1.2*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 6J<br>Sx | ADFN1..5X1.5-6  |
| G683L15TA31U | 1.313(1.5*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 6K<br>Tx | ADFN1..5X1.5-6  |
| G683L15SA31U | 1.388(1.5*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 6K<br>Sx | ADFN1..5X1.5-6  |
| G683L18TA31U | 1.575(1.8*87.5%)    | Open-Drain $\overline{\text{RESET}}$ | 6L<br>Tx | ADFN1..5X1.5-6  |
| G683L18SA31U | 1.665(1.8*92.5%)    | Open-Drain $\overline{\text{RESET}}$ | 6L<br>Sx | ADFN1..5X1.5-6  |

Note: T: 87.5%    S:92.5%

A3: ADFN1.5X1.5-6

1: Bonding Code

U: Tape & Reel

Green: Lead Free / Halogen Free

## Absolute Maximum Ratings

All Voltages Referenced to GND

|                                                            |                             |
|------------------------------------------------------------|-----------------------------|
| $V_{CC}$ , $V_{SEN}$ .....                                 | -0.3V to +6.0V              |
| CD.....                                                    | -0.3V to ( $V_{CC}$ +0.3V)  |
| $\overline{RESET}$ , RESET (Push-Pull) ....                | -0.3V to ( $V_{CC}$ + 0.3V) |
| $\overline{RESET}$ (Open Drain) .....                      | -0.3V to +6.0V              |
| Input Current (All Pins) .....                             | $\pm 20\text{mA}$           |
| Output Current ( $\overline{RESET}$ , RESET) .....         | $\pm 20\text{mA}$           |
| Thermal Resistance Junction to Ambient, ( $\theta_{JA}$ )* |                             |
| TSOT-23-5/SOT-23-5 .....                                   | 250°C/W                     |
| SC-70-5 .....                                              | 430°C/W                     |
| DFN1.6X1.6-6 .....                                         | TBD                         |
| ADFN1.5X1.5-6 .....                                        | TBD                         |

Continuous Power Dissipation ( $T_A = +25^\circ\text{C}$ )\*

|                                                        |                 |
|--------------------------------------------------------|-----------------|
| TSOT-23-5/SOT-23-5 .....                               | 0.5W            |
| SC-70-5 .....                                          | 0.3W            |
| DFN1.6X1.6-6 .....                                     | TBD             |
| ADFN1.5X1.5-6 .....                                    | TBD             |
| Thermal Resistance Junction to Case, ( $\theta_{JC}$ ) |                 |
| TSOT-23-5/SOT-23-5 .....                               | 60°C/W          |
| SC-70-5 .....                                          | 180°C/W         |
| DFN1.6X1.6-6 .....                                     | TBD             |
| ADFN1.5X1.5-6 .....                                    | TBD             |
| Operating Temperature Range .....                      | -40°C to +125°C |
| Storage Temperature Range .....                        | -65°C to +150°C |
| Reflow Temperature (soldering, 10sec) .....            | 260°C           |
| ESD (HBM) <sup>(1)</sup> .....                         | 2kV             |

\*Please refer to Minimum Footprint PCB Layout Section.

(1) Human body model is a 100pF capacitor discharged through a 1.5k $\Omega$  resistor into each pin.

## Electrical Characteristics

$V_{CC} = 3.3\text{V}$ ,  $T_A = 25^\circ\text{C}$ .

The device is not guaranteed to function outside its operating conditions. Parameters with MIN and/or MAX limits are 100% tested at +25°C, unless otherwise specified.

| PARAMETER                                 | SYMBOL        | CONDITIONS                                              | MIN                 | TYP   | MAX            | UNIT          |
|-------------------------------------------|---------------|---------------------------------------------------------|---------------------|-------|----------------|---------------|
| Supply Voltage Range                      | $V_{CC}$      |                                                         | 2.7                 | ---   | 5.5            | V             |
| Supply Current                            | $I_{CC}$      | $V_{CC} = 5\text{V}$                                    | ---                 | 12    | 25             | $\mu\text{A}$ |
|                                           |               | $V_{CC} = 3.3\text{V}$                                  | ---                 | 10    | 20             |               |
| $V_{SEN}$ Reset Threshold Accuracy        | $V_{TH}$      | $V_{SEN}$ from high to low                              | $V_{TH} - 2\%$      | ---   | $V_{TH} + 2\%$ | V             |
| Hysteresis                                | $V_{HYST}$    | $V_{TH} = 0.788$                                        | ---                 | 0     | ---            | %             |
|                                           |               | Other Versions                                          | ---                 | 2     | ---            |               |
| $V_{SEN}$ to RESET Delay                  | $T_{RD}$      | $V_{SEN} < V_{TH} - 0.2\text{V}$                        | ---                 | 30    | 80             | $\mu\text{s}$ |
| RESET Timeout Period                      | $T_{RP}$      | $C_D = 4.7\text{nF}$ , $V_{SEN} > V_{TH} + 0.2\text{V}$ | 7.2                 | 9     | 12.5           | mS            |
| $V_{CD}$ Ramp Threshold                   | $V_{CD-RAMP}$ | $V_{CC} = 2.7$ to $5.5\text{V}$ ( $V_{CD}$ rising)      | 0.774               | 0.788 | 0.818          | V             |
| RESET Output Voltage LOW                  | $V_{OL}$      | $V_{CC} = 4.5\text{V}$ , $I_{SINK} = 3.2\text{mA}$      | ---                 | ---   | 0.3            | V             |
| RESET Output Voltage High                 | $V_{OH}$      | $V_{CC} = 4.5\text{V}$ , $I_{SOURCE} = 800\mu\text{A}$  | $0.8 \times V_{CC}$ | ---   | ---            | V             |
| RESET Output Leakage Current (Open-drain) | $I_{LKG}$     | $V_{SEN} > V_{TH}$ , reset not asserted                 | ---                 | ---   | 1              | $\mu\text{A}$ |
| RESET Output Voltage LOW                  | $V_{OL}$      | $V_{CC} = 4.5\text{V}$ , $I_{SINK} = 3.2\text{mA}$      | ---                 | ---   | 0.3            | V             |
| RESET Output Voltage High                 | $V_{OH}$      | $V_{CC} = 4.5\text{V}$ , $I_{SOURCE} = 800\mu\text{A}$  | $0.8 \times V_{CC}$ | ---   | ---            | V             |
| $V_{SEN}$ Leakage Current                 |               | $V_{TH} = 0.788$                                        | ---                 | ---   | 1              | $\mu\text{A}$ |
|                                           |               | Other Versions ( $V_{SEN} = 3\text{V}$ )                | ---                 | ---   | 5              |               |

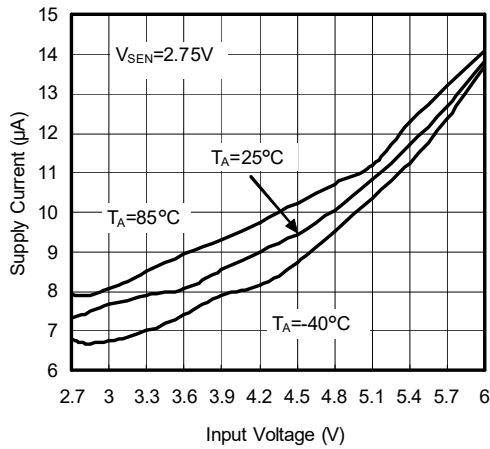
**Pin Description**

| PIN         |             |              |               | NAME             | FUNCTION                          |
|-------------|-------------|--------------|---------------|------------------|-----------------------------------|
| TO1/T11/TA1 | TO2/T12/TA2 | DFN1.6X1.6-6 | ADFN1.5X1.5-6 |                  |                                   |
| 1           | 1           | 1            | 1             | RESET (or RESET) | Active Low (or High) Reset Output |
| 2           | 2           | 2            | 2             | GND              | Ground                            |
| 3           | 4           | 4            | 5             | VSEN             | Voltage Sense                     |
| 4           | 5           | 6            | 4             | CD               | Delay Capacitance                 |
| 5           | 3           | 3            | 6             | VCC              | Supply Voltage                    |
|             |             | 5            | 3             | NC               | No Connection                     |

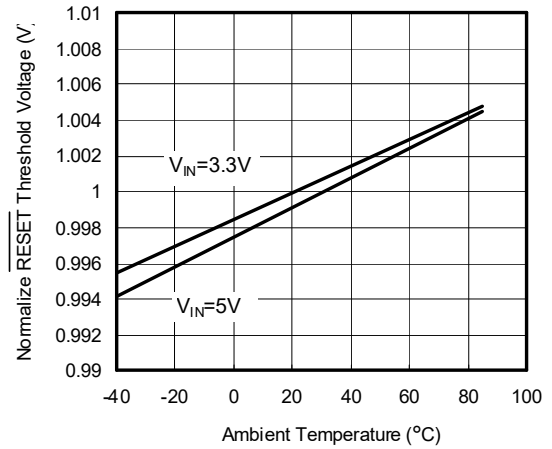
**Typical Performance Characteristics**

$T_A=25^\circ\text{C}$ , unless otherwise noted.

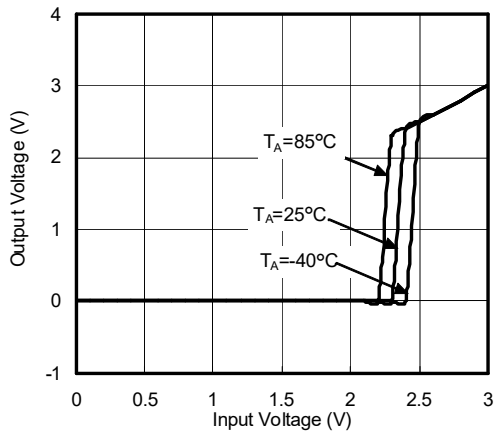
**Supply Current vs. Input Voltage**



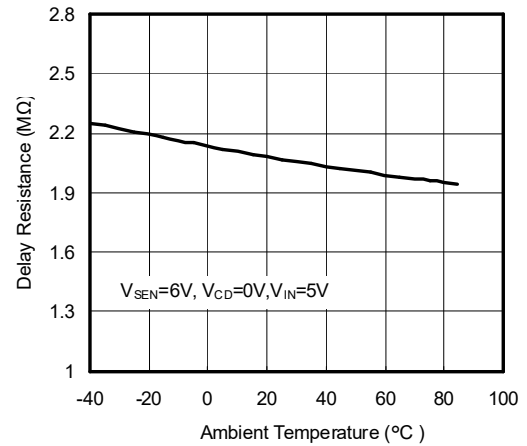
**Normalize RESET Threshold Voltage vs. Ambient Temperature**



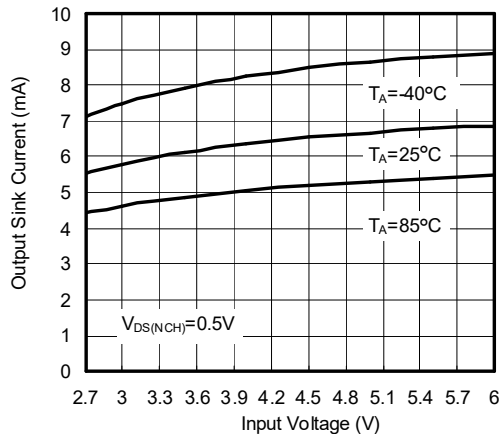
**Output Voltage vs. Input Voltage**



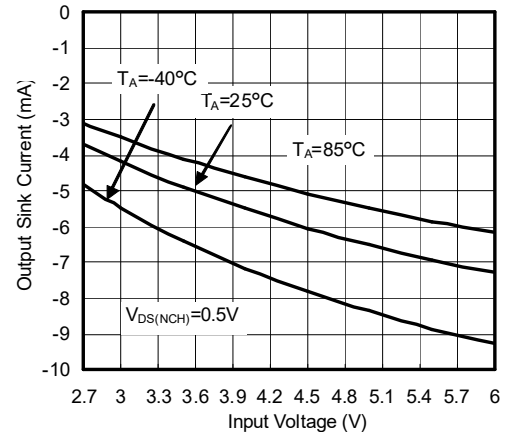
**Delay Resistance vs. Ambient Temperature**



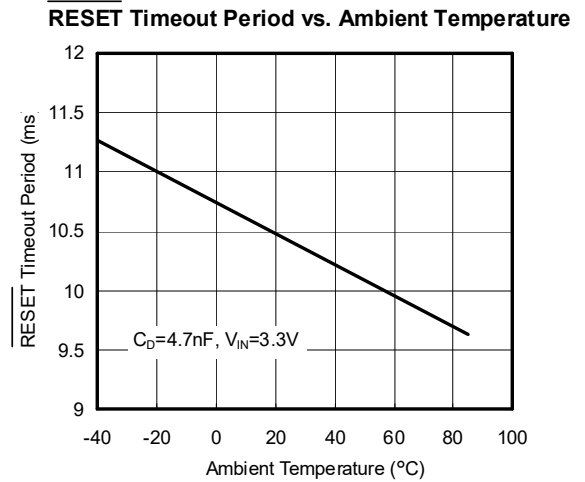
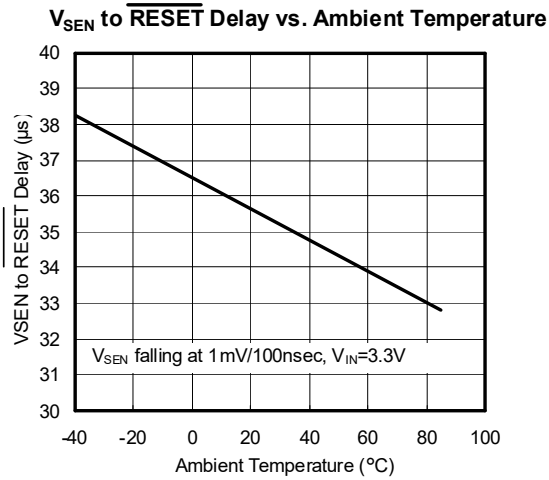
**Output Sink Current vs. Input Voltage**



**Output Source Current vs. Input Voltage**

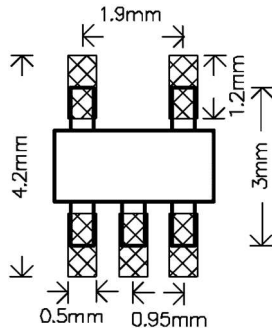


**Typical Performance Characteristics (continued)**

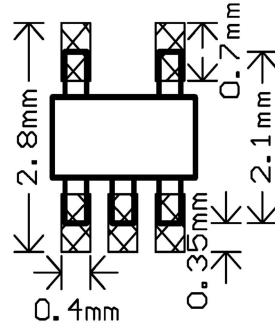


**Minimum Footprint PCB Layout Section**

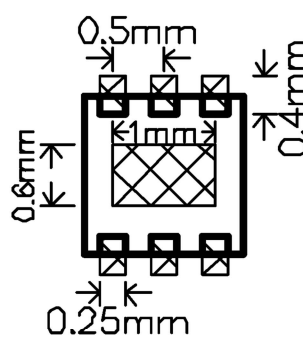
**TSOT-23-5/SOT-23-5**



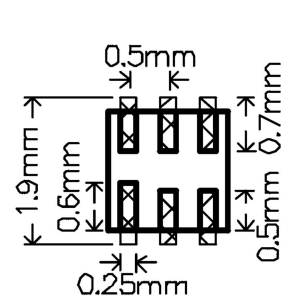
**SC-70-5**



**DFN1.6X1.6**



**ADFN1.5X1.5-6**



## Detailed Description

A microprocessor's ( $\mu P$ 's) reset input starts the  $\mu P$  in a known state. The G682L/G682H/G683L assert reset to prevent code-execution errors during power-up, power-down, or brownout conditions. Since the sense pin is separated from power supply, it allows the IC to monitor added power supply. They assert a reset signal whenever the  $V_{SEN}$  supply voltage declines below a preset threshold ( $V_{TH-}$ ), keeping it asserted for time delay set by capacitor connected to  $C_D$  pin, after  $V_{SEN}$  has risen above the high reset threshold  $V_{TH+}$  ( $V_{TH-} + V_{HYS}$ ). The G683L uses an open-drain output, and the G682L/G682H have a push-pull output stage. Connect

a pull-up resistor on the G683L's  $\overline{RESET}$  output to any supply between 0 and 5.5V. The time delay is set by external capacitor  $C_D$ , and internal pull up current  $I_{CD}$ . When the voltage at  $C_D$  pin exceeds the buffer threshold, typically 0.788V, the  $\overline{RESET}$  output high (RESET output low). The voltage detector and buffer have built-in hysteresis to prevent erratic reset operation. The formula of time delay is  $T (ms) \cong 2.7 \times C_D (nF)$ . Figure1 and Figure2 show Timing and Functional Block Diagrams.

## Timing Diagram

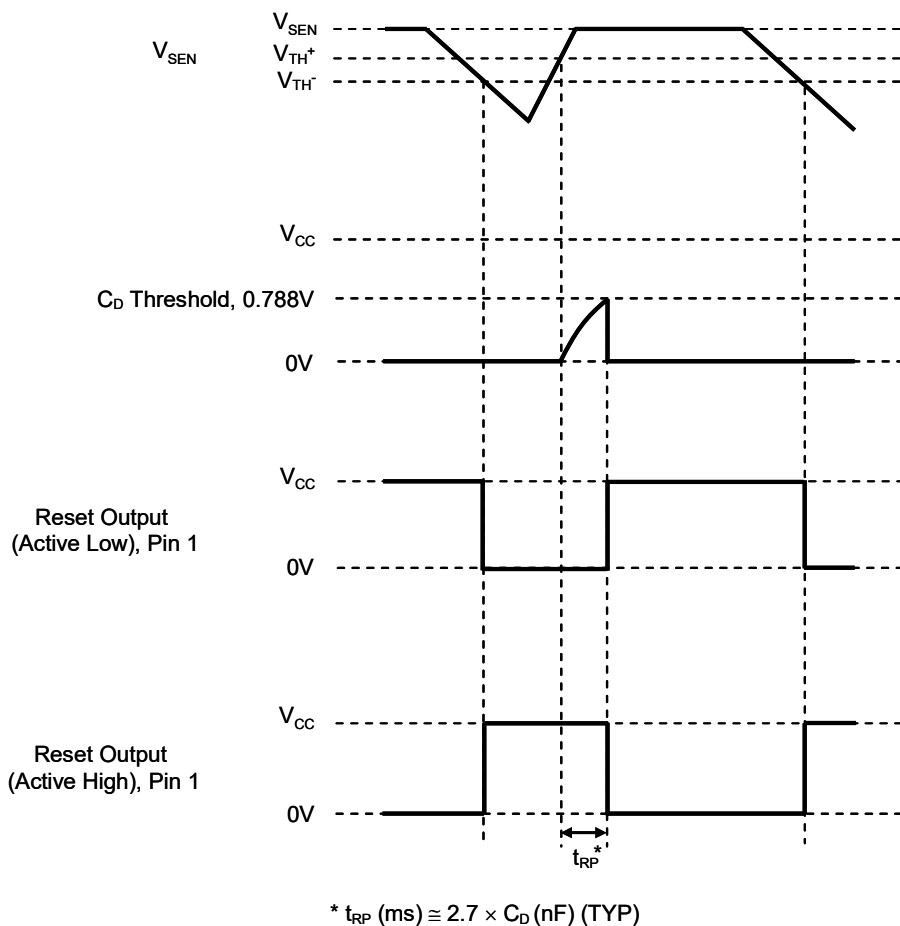
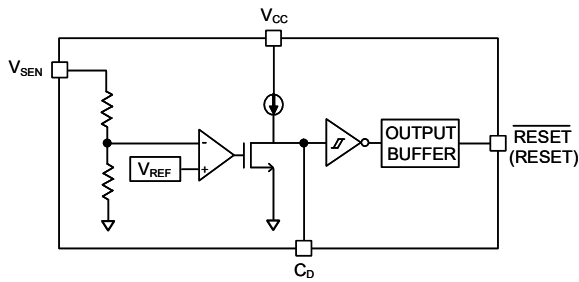
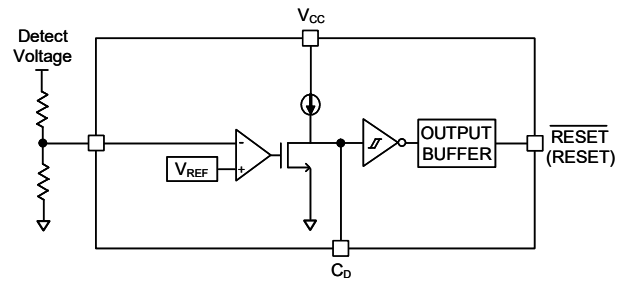


Figure 1

## Functional Diagram



Internal Resistor Divide Sense Voltage



External Resistor Divide Sense Voltage (only G68\_\_09T\_)

Figure 2

### Separated Sense Pin

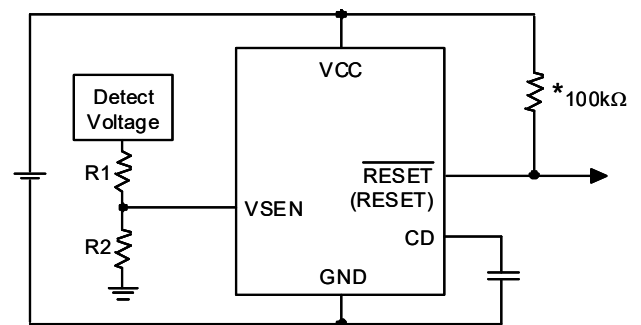
Since the sense pin is separated from power supply, it allows the IC to monitor added power supply. Using the IC with the sense pin separated from power supply enables output to maintain the state of detection even when voltage of the monitored power supply drops to 0V.

### Adjustable Reset Threshold (G68\_\_09T\_)

Since the  $V_{SEN}$  pin of G68\_\_09T\_ is high impedance, it can be used to adjust reset threshold. Connect two resistors in series from the detected power to GND and the divided voltage is compared to reset threshold (0.788V typical). (Figure 3)

The voltage threshold is:

$$V_{th} = 0.788 \times \frac{(R1 + R2)}{R2}$$



\*The 100kΩ pull up resistor is only for G683L

Figure 3

## Ensuring a Valid Reset Output Down to $V_{CC} = 0V$

When  $V_{CC}$  falls below 0.8V, the G682  $\overline{RESET}$  output no longer sinks current and it becomes an open circuit. Therefore, high-impedance CMOS logic inputs connected to  $\overline{RESET}$  can drift to undetermined voltages. This presents no problem in most applications since most  $\mu P$  and other circuitry is inoperative with  $V_{CC}$  below 0.8V. However, in applications where  $\overline{RESET}$  must be valid down to 0V, adding a pull-down resistor to  $\overline{RESET}$  causes any stray leakage currents to flow to ground, holding  $\overline{RESET}$  low (Figure 4).  $R1$ 's value is not critical; 100k $\Omega$  is large enough not to load  $\overline{RESET}$  and small enough to pull  $\overline{RESET}$  to ground. A 100k $\Omega$  pull-up resistor to  $V_{CC}$  is also recommended for the G683L if  $\overline{RESET}$  is required to remain valid for  $V_{CC} < 0.8V$ .

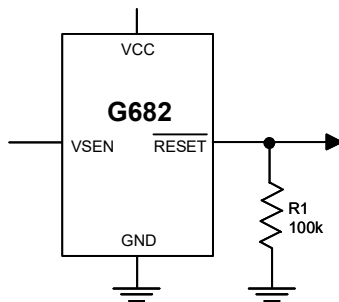


Figure 4

G683L Open-Drain RESET Output Allows Use with

## Multiple Supplies

Generally, the pull-up connected to the G683L will connect to the supply voltage that is being monitored at the IC's  $V_{CC}$  pin. However, some systems may use the open-drain output to level-shift from the monitored supply to reset circuitry powered by some other supply (Figure 5). Note that as the G683L's  $V_{CC}$  decreases below 1V, so does the IC's ability to sink current at  $\overline{RESET}$ . Also, with any pull-up,  $\overline{RESET}$  will be pulled high as  $V_{CC}$  decays toward 0. The voltage where this occurs depends on the pull-up resistor value and the voltage to which it is connected.

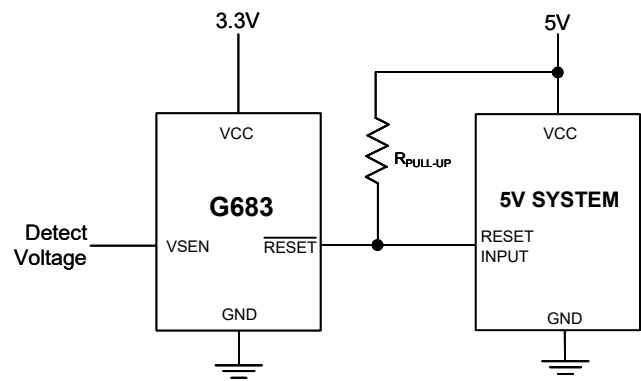
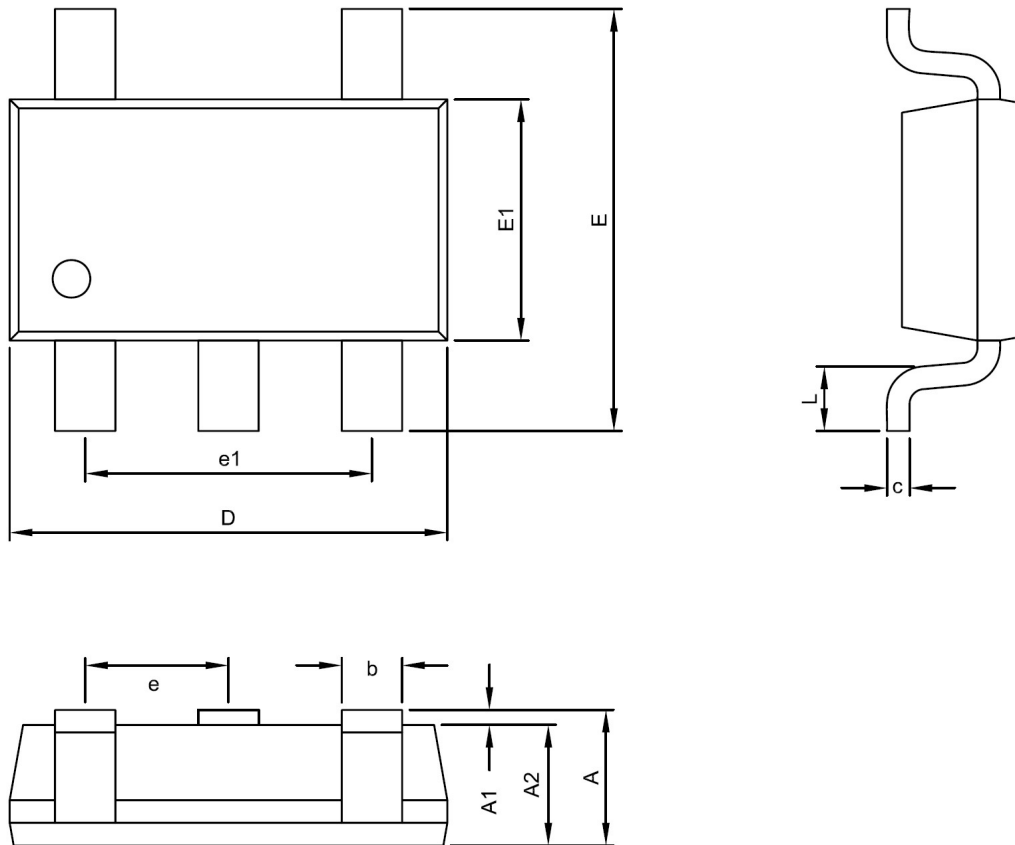


Figure 5

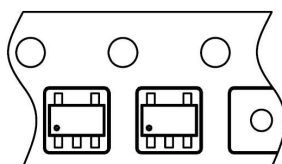
## Package Information



TSOT-23-5 Package

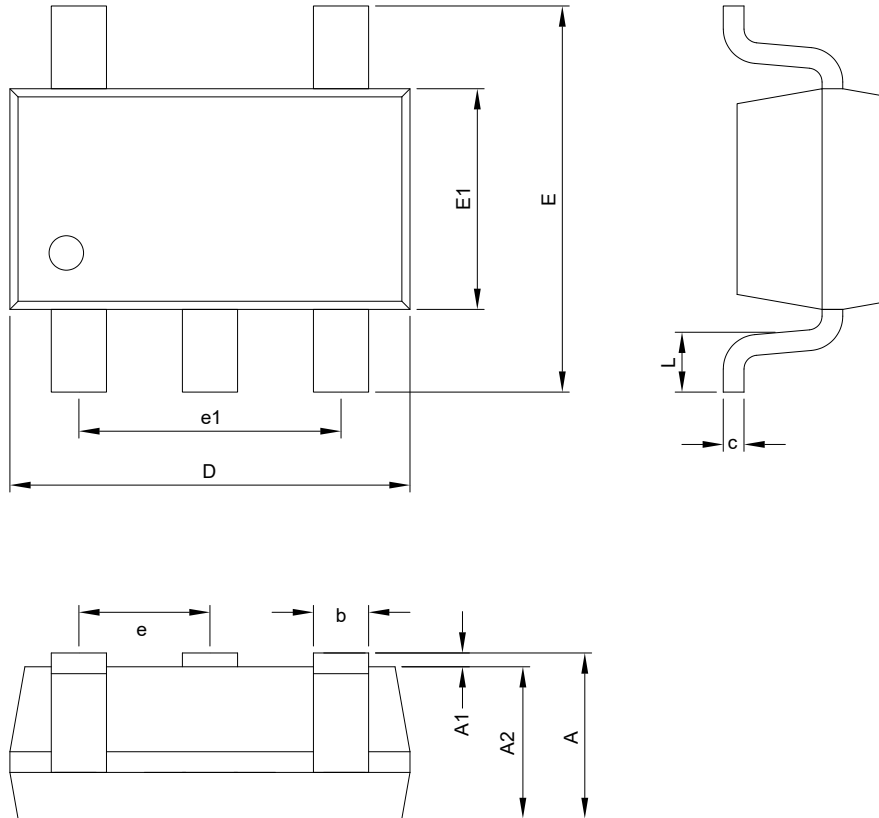
| Symbol | DIMENSION IN MM |      |      | DIMENSION IN INCH |       |       |
|--------|-----------------|------|------|-------------------|-------|-------|
|        | MIN.            | NOM. | MAX. | MIN.              | NOM.  | MAX.  |
| A      | ---             | ---  | 0.90 | ---               | ---   | 0.035 |
| A1     | 0.00            | 0.05 | 0.10 | 0.000             | 0.002 | 0.004 |
| A2     | 0.70            | 0.75 | 0.80 | 0.028             | 0.030 | 0.031 |
| D      | 2.70            | 2.90 | 3.10 | 0.106             | 0.114 | 0.122 |
| E      | 2.60            | 2.80 | 3.00 | 0.102             | 0.110 | 0.118 |
| E1     | 1.50            | 1.60 | 1.70 | 0.059             | 0.063 | 0.067 |
| c      | 0.15 REF        |      |      | 0.006 REF         |       |       |
| b      | 0.30            | 0.40 | 0.50 | 0.012             | 0.016 | 0.020 |
| e      | 0.95 BSC        |      |      | 0.037 BSC         |       |       |
| e1     | 1.90 BSC        |      |      | 0.075 BSC         |       |       |
| L      | 0.30            | 0.45 | 0.60 | 0.012             | 0.018 | 0.024 |

## Taping Specification



Feed Direction

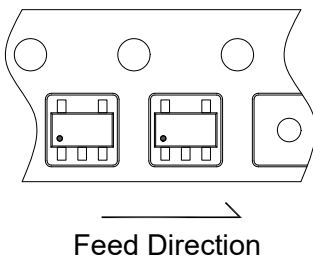
| PACKAGE   | Q'TY/REEL |
|-----------|-----------|
| TSOT-23-5 | 3,000 ea  |



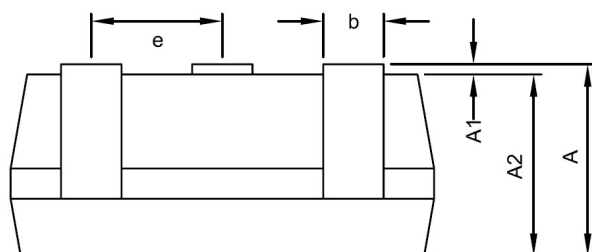
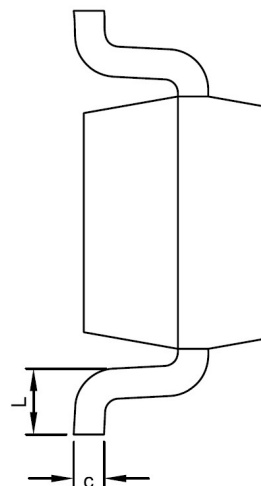
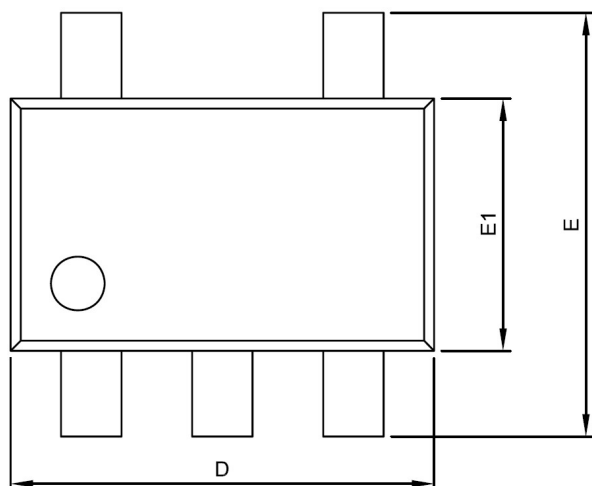
**SOT-23-5 Package**

| Symbol | DIMENSION IN MM |      |      | DIMENSION IN INCH |       |       |
|--------|-----------------|------|------|-------------------|-------|-------|
|        | MIN.            | NOM. | MAX. | MIN.              | NOM.  | MAX.  |
| A      | 1.00            | 1.10 | 1.30 | 0.039             | 0.043 | 0.051 |
| A1     | 0.00            | ---  | 0.15 | 0.000             | ---   | 0.006 |
| A2     | 1.10 REF        |      |      | 0.043 REF         |       |       |
| D      | 2.70            | 2.90 | 3.10 | 0.106             | 0.114 | 0.122 |
| E      | 2.60            | 2.80 | 3.00 | 0.102             | 0.110 | 0.118 |
| E1     | 1.50            | 1.60 | 1.70 | 0.059             | 0.063 | 0.067 |
| c      | 0.08            | 0.15 | 0.25 | 0.003             | 0.006 | 0.010 |
| b      | 0.30            | 0.40 | 0.50 | 0.012             | 0.016 | 0.020 |
| e      | 0.95 BSC        |      |      | 0.037 BSC         |       |       |
| e1     | 1.90 BSC        |      |      | 0.075 BSC         |       |       |
| L      | 0.30            | 0.45 | 0.60 | 0.012             | 0.018 | 0.024 |

## Taping Specification



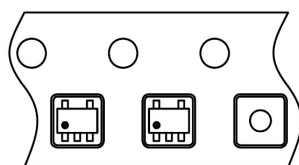
| PACKAGE  | Q'TY/REEL |
|----------|-----------|
| SOT-23-5 | 3,000 ea  |



**SC-70-5 Package**

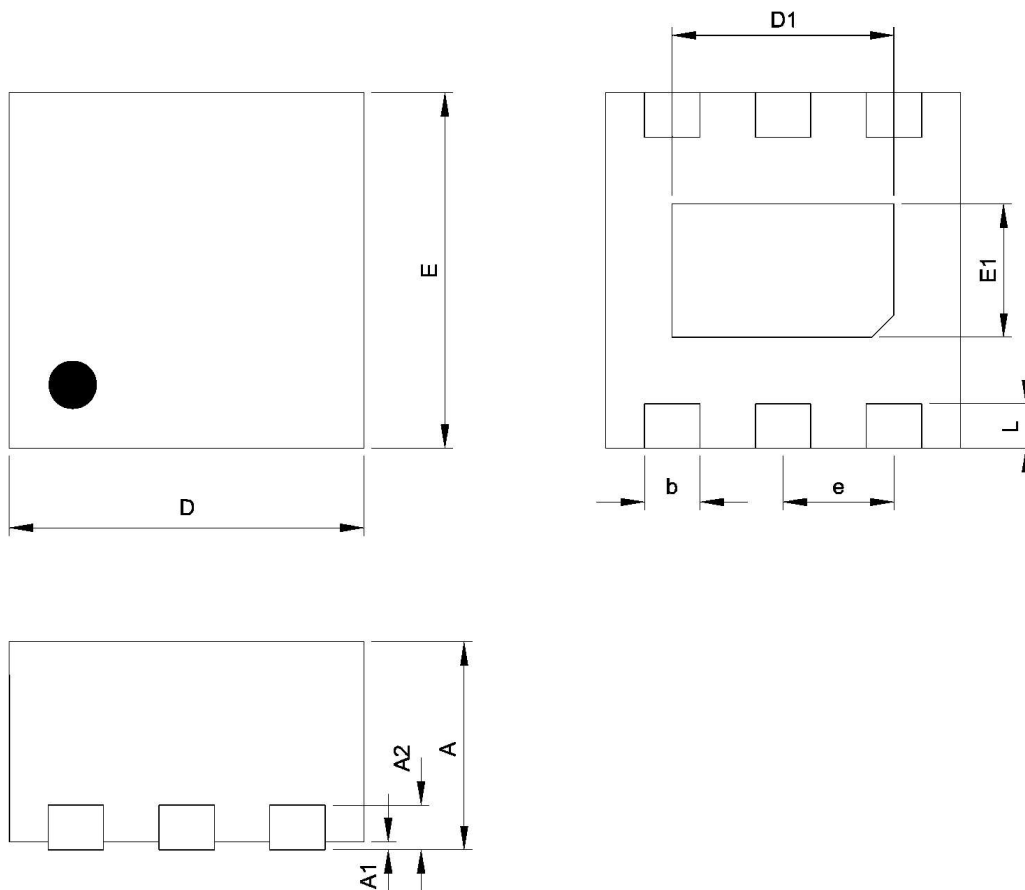
| Symbol | DIMENSION IN MM |      |      | DIMENSION IN INCH |       |       |
|--------|-----------------|------|------|-------------------|-------|-------|
|        | MIN.            | NOM. | MAX. | MIN.              | NOM.  | MAX.  |
| A      | 0.80            | 0.95 | 1.10 | 0.031             | 0.037 | 0.043 |
| A1     | 0.00            | ---  | 0.10 | 0.000             | ---   | 0.004 |
| A2     | 0.70            | 0.90 | 1.00 | 0.028             | 0.035 | 0.039 |
| D      | 1.80            | 2.00 | 2.20 | 0.071             | 0.079 | 0.087 |
| E      | 1.80            | 2.10 | 2.45 | 0.071             | 0.083 | 0.096 |
| E1     | 1.15            | 1.25 | 1.35 | 0.045             | 0.049 | 0.053 |
| c      | 0.08            | 0.15 | 0.25 | 0.003             | 0.006 | 0.010 |
| b      | 0.15            | 0.25 | 0.40 | 0.006             | 0.010 | 0.016 |
| e      | 0.65 BSC        |      |      | 0.026 BSC         |       |       |
| L      | 0.26            | 0.36 | 0.46 | 0.010             | 0.014 | 0.018 |

## Taping Specification



Feed Direction

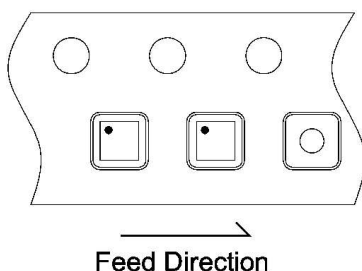
| PACKAGE | Q'TY/REEL |
|---------|-----------|
| SC-70-5 | 3,000 ea  |



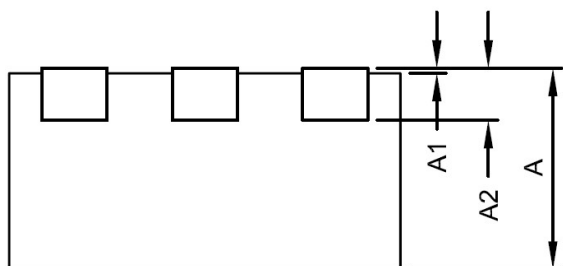
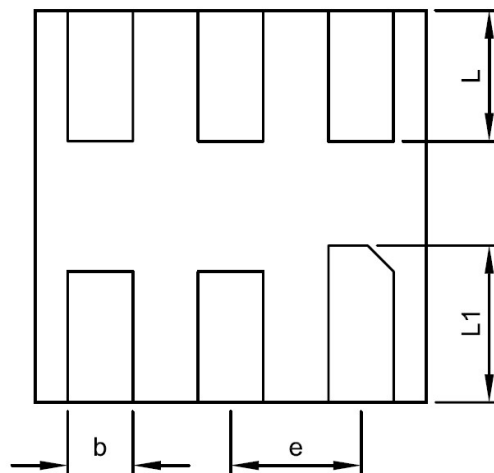
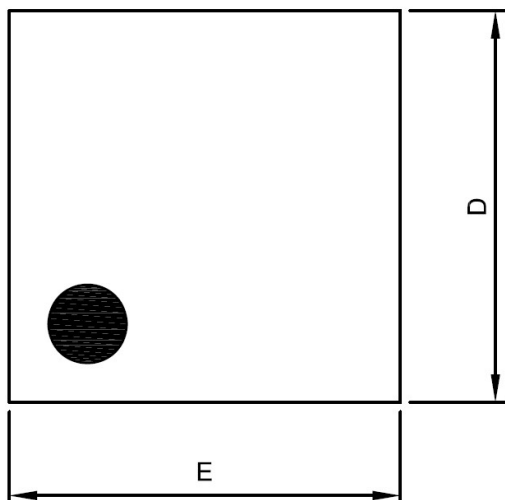
DFN1.6X1.6-6 Package

| Symble | DIMENSION IN MM |      |      | DIMENSION IN INCH |        |        |
|--------|-----------------|------|------|-------------------|--------|--------|
|        | MIN.            | NOM. | MAX. | MIN.              | NOM.   | MAX.   |
| A      | 0.80            | 0.90 | 1.00 | 0.0315            | 0.0354 | 0.0394 |
| A1     | 0.00            | ---  | 0.05 | 0.0000            | ---    | 0.0020 |
| A2     | 0.19            | 0.20 | 0.21 | 0.0075            | 0.0079 | 0.0083 |
| D      | 1.55            | 1.60 | 1.65 | 0.0610            | 0.0630 | 0.0650 |
| E      | 1.55            | 1.60 | 1.65 | 0.0610            | 0.0630 | 0.0650 |
| D1     | 0.95            | 1.00 | 1.05 | 0.0374            | 0.0394 | 0.0413 |
| E1     | 0.55            | 0.60 | 0.65 | 0.0217            | 0.0236 | 0.0256 |
| b      | 0.20            | 0.25 | 0.30 | 0.0079            | 0.0098 | 0.0118 |
| e      | 0.50 BSC        |      |      | 0.0197 BSC        |        |        |
| L      | 0.15            | 0.20 | 0.25 | 0.0059            | 0.0079 | 0.0098 |

## Taping Specification



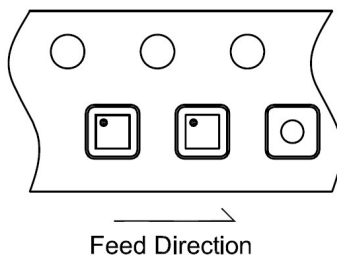
| PACKAGE      | Q'TY/REEL |
|--------------|-----------|
| DFN1.6X1.6-6 | 3,000 ea  |



**ADFN1.5X1.5-6 Package**

| Symbol | DIMENSION IN MM |      |      | DIMENSION IN INCH |        |        |
|--------|-----------------|------|------|-------------------|--------|--------|
|        | MIN.            | NOM. | MAX. | MIN.              | NOM.   | MAX.   |
| A      | 0.70            | 0.75 | 0.80 | 0.0276            | 0.0295 | 0.0315 |
| A1     | 0.00            | ---  | 0.05 | 0.0000            | ---    | 0.0020 |
| A2     | 0.11 REF        |      |      | 0.0043 REF        |        |        |
| D      | 1.45            | 1.50 | 1.55 | 0.0570            | 0.0590 | 0.0610 |
| E      | 1.45            | 1.50 | 1.55 | 0.0570            | 0.0590 | 0.0610 |
| b      | 0.20            | 0.25 | 0.30 | 0.0079            | 0.0098 | 0.0118 |
| e      | 0.50 BSC        |      |      | 0.0197 BSC        |        |        |
| L      | 0.45            | 0.50 | 0.55 | 0.0177            | 0.0197 | 0.0217 |
| L1     | 0.55            | 0.60 | 0.65 | 0.0217            | 0.0236 | 0.0256 |

## Taping Specification



| PACKAGE       | Q'TY/REEL |
|---------------|-----------|
| ADFN1.5X1.5-6 | 3,000 ea  |

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