



74V1T126

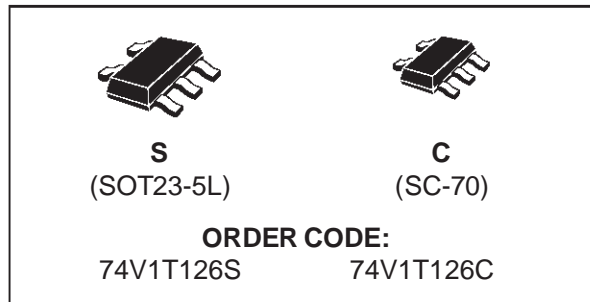
SINGLE BUS BUFFER (3-STATE)

- HIGH SPEED: $t_{PD} = 3.8 \text{ ns}$ (TYP.) at $V_{CC} = 5V$
- LOW POWER DISSIPATION:
 $I_{CC} = 1 \mu\text{A}$ (MAX.) at $T_A = 25^\circ\text{C}$
- COMPATIBLE WITH TTL OUTPUTS:
 $V_{IH} = 2V$ (MIN), $V_{IL} = 0.8V$ (MAX)
- POWER DOWN PROTECTION ON INPUT
- SYMMETRICAL OUTPUT IMPEDANCE:
 $|I_{OH}| = I_{OL} = 8 \text{ mA}$ (MIN)
- BALANCED PROPAGATION DELAYS:
 $t_{PLH} \cong t_{PHL}$
- OPERATING VOLTAGE RANGE:
 $V_{CC} \text{ (OPR)} = 4.5V \text{ to } 5.5V$
- IMPROVED LATCH-UP IMMUNITY

DESCRIPTION

The 74V1T126 is an advanced high-speed CMOS SINGLE BUS BUFFER fabricated with sub-micron silicon gate and double-layer metal wiring C²MOS technology.

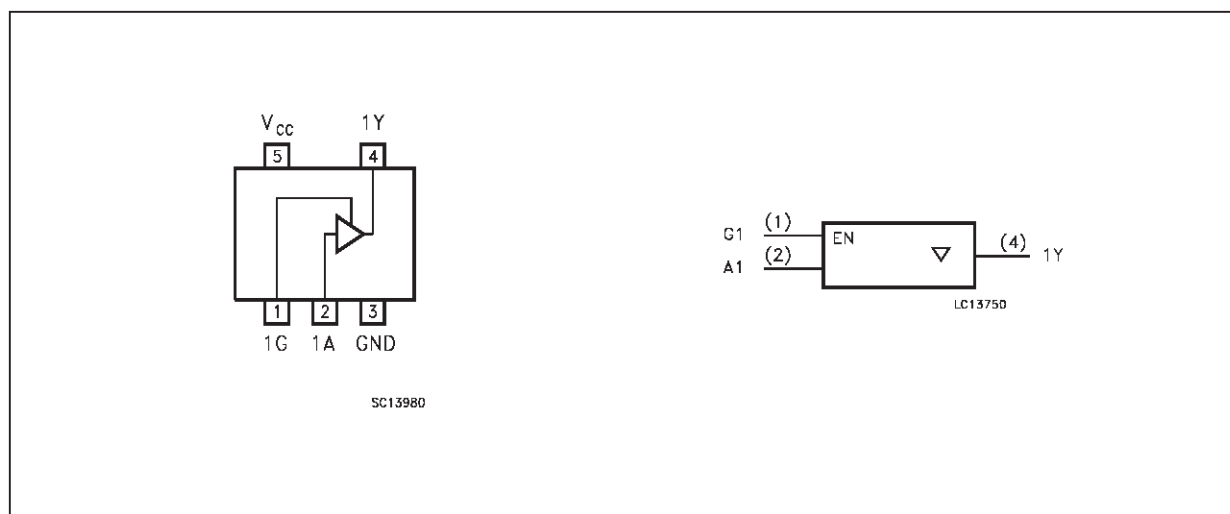
PRELIMINARY DATA



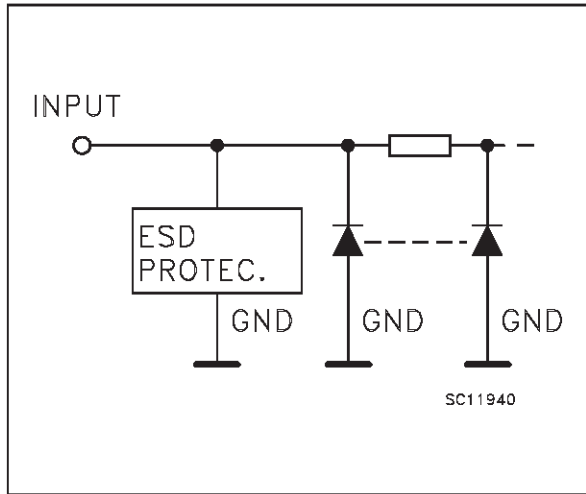
3-STATE control input G has to be set LOW to place the output into the high impedance state.

Power down protection is provided on all inputs and 0 to 7V can be accepted on inputs with no regard to the supply voltage. This device can be used to interface 5V to 3V.

PIN CONNECTION AND IEC LOGIC SYMBOLS



INPUT EQUIVALENT CIRCUIT



PIN DESCRIPTION

| PIN No | SYMBOL | NAME AND FUNCTION |
|--------|-----------------|-------------------------|
| 1 | 1G | Output Enable Input |
| 2 | 1A | Data Input |
| 4 | 1Y | Data Output |
| 3 | GND | Ground (0V) |
| 5 | V _{CC} | Positive Supply Voltage |

TRUTH TABLE

| A | G | Y |
|---|---|---|
| X | L | Z |
| L | H | L |
| H | H | H |

X: "H" or "L" Z: High Impedance

ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|-------------------------------------|--------------------------------------|-------------------------------|------|
| V _{CC} | Supply Voltage | -0.5 to +7.0 | V |
| V _I | DC Input Voltage | -0.5 to +7.0 | V |
| V _O | DC Output Voltage | -0.5 to V _{CC} + 0.5 | V |
| I _{IK} | DC Input Diode Current | - 20 | mA |
| I _{OK} | DC Output Diode Current | ± 20 | mA |
| I _O | DC Output Current | ± 25 | mA |
| I _{CC} or I _{GND} | DC V _{CC} or Ground Current | ± 50 | mA |
| T _{stg} | Storage Temperature | -65 to +150 | °C |
| T _L | Lead Temperature (10 sec) | 260 | °C |

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these condition is not implied.

RECOMMENDED OPERATING CONDITIONS

| Symbol | Parameter | Value | Unit |
|-----------------|--|----------------------|------|
| V _{CC} | Supply Voltage | 4.5 to 5.5 | V |
| V _I | Input Voltage | 0 to 5.5 | V |
| V _O | Output Voltage | 0 to V _{CC} | V |
| T _{op} | Operating Temperature | -40 to +85 | °C |
| dt/dv | Input Rise and Fall Time (see note 1) (V _{CC} = 5.0 ± 0.5V) | 0 to 20 | ns/V |

1) V_{IN} from 0.8V to 2 V

DC SPECIFICATIONS

| Symbol | Parameter | Test Conditions | | Value | | | | | Unit |
|------------------|---------------------------------------|-----------------|--|------------------------|------|-------|--------------|------|------|
| | | | | T _A = 25 °C | | | -40 to 85 °C | | |
| | | | | V _{CC} (V) | Min. | Typ. | Max. | Min. | |
| V _{IH} | High Level Input Voltage | 4.5 to 5.5 | | 2 | | | 2 | | V |
| V _{IL} | Low Level Input Voltage | 4.5 to 5.5 | | | | 0.8 | | 0.8 | V |
| V _{OH} | High Level Output Voltage | 4.5 | I _O =-50 μA | 4.4 | 4.5 | | 4.4 | | V |
| | | 4.5 | I _O =-8 mA | 3.94 | | | 3.8 | | |
| V _{OL} | Low Level Output Voltage | 4.5 | I _O =50 μA | | 0.0 | 0.1 | | 0.1 | V |
| | | 4.5 | I _O =8 mA | | | 0.36 | | 0.44 | |
| I _{OZ} | High Impedance Output Leakage Current | 5.5 | V _I = V _{IH} or V _{IL} V _O = V _{CC} or GND | | | ±0.25 | | ±2.5 | μA |
| I _I | Input Leakage Current | 0 to 5.5 | V _I = 5.5V or GND | | | ±0.1 | | ±1.0 | μA |
| I _{CC} | Quiescent Supply Current | 5.5 | V _I = V _{CC} or GND | | | 1 | | 10 | μA |
| ΔI _{CC} | Additional Worst Case Supply Current | 5.5 | One Input at 3.4V, other input at V _{CC} or GND | | | 1.35 | | 1.5 | mA |

AC ELECTRICAL CHARACTERISTICS (Input t_r = t_f = 3 ns)

| Symbol | Parameter | Test Condition | | Value | | | | | Unit |
|--------------------------------------|------------------------|----------------|----|-------------------------|---------------------|------|--------------|------|------|
| | | | | T _A = 25 °C | | | -40 to 85 °C | | |
| | | | | V _{CC} (*) (V) | C _L (pF) | Min. | Typ. | Max. | |
| t _{PLH} t _{PHL} | Propagation Delay Time | 5.0 | 15 | | 3.8 | 5.5 | 1.0 | 6.5 | ns |
| | | 5.0 | 50 | | 5.3 | 7.5 | 1.0 | 8.5 | |
| t _{PLZ} t _{PHZ} | Output Disable Time | 5.0 | 15 | | 4.6 | 6.8 | 1.0 | 8.0 | ns |
| | | 5.0 | 50 | | 6.1 | 8.8 | 1.0 | 10.0 | |
| t _{PZH} t _{PZL} | Output Enable Time | 5.0 | 15 | | 3.6 | 5.1 | 1.0 | 6.0 | ns |
| | | 5.0 | 50 | | 5.1 | 7.1 | 1.0 | 8.0 | |

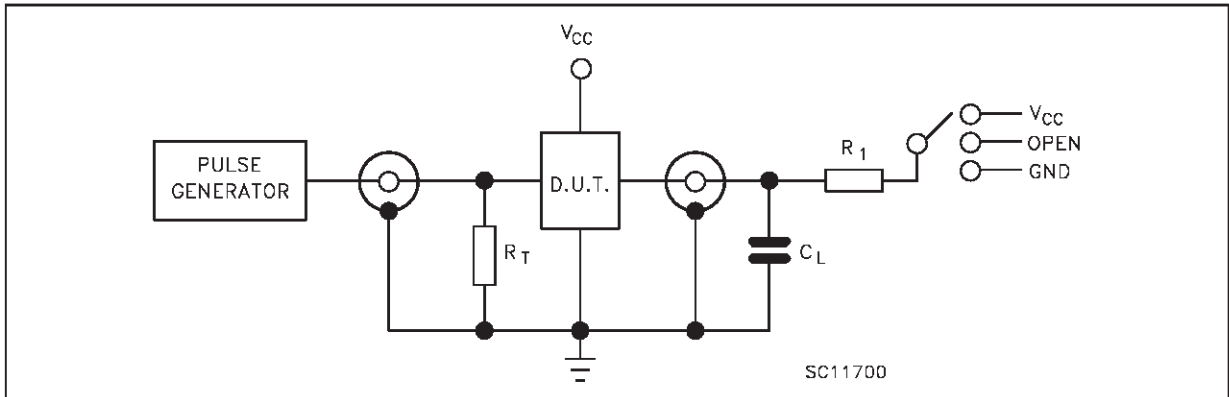
(*) Voltage range is 5V ± 0.5V

CAPACITIVE CHARACTERISTICS

| Symbol | Parameter | Test Conditions | | Value | | | | | Unit |
|------------------|--|-----------------|----|------------------------|------|------|--------------|------|------|
| | | | | T _A = 25 °C | | | -40 to 85 °C | | |
| | | | | Min. | Typ. | Max. | Min. | Max. | |
| C _{IN} | Input Capacitance | | 4 | 10 | | | 10 | pF | |
| C _{OUT} | Output Capacitance | | 10 | | | | | pF | |
| C _{PD} | Power Dissipation Capacitance (note 1) | | 14 | | | | | pF | |

1) C_{PD} is defined as the value of the IC's internal equivalent capacitance which is calculated from the operating current consumption without load. (Refer to Test Circuit). Average operating current can be obtained by the following equation. I_{CC(oper)} = C_{PD} • V_{CC} • f_{IN} + I_{CC}

TEST CIRCUIT



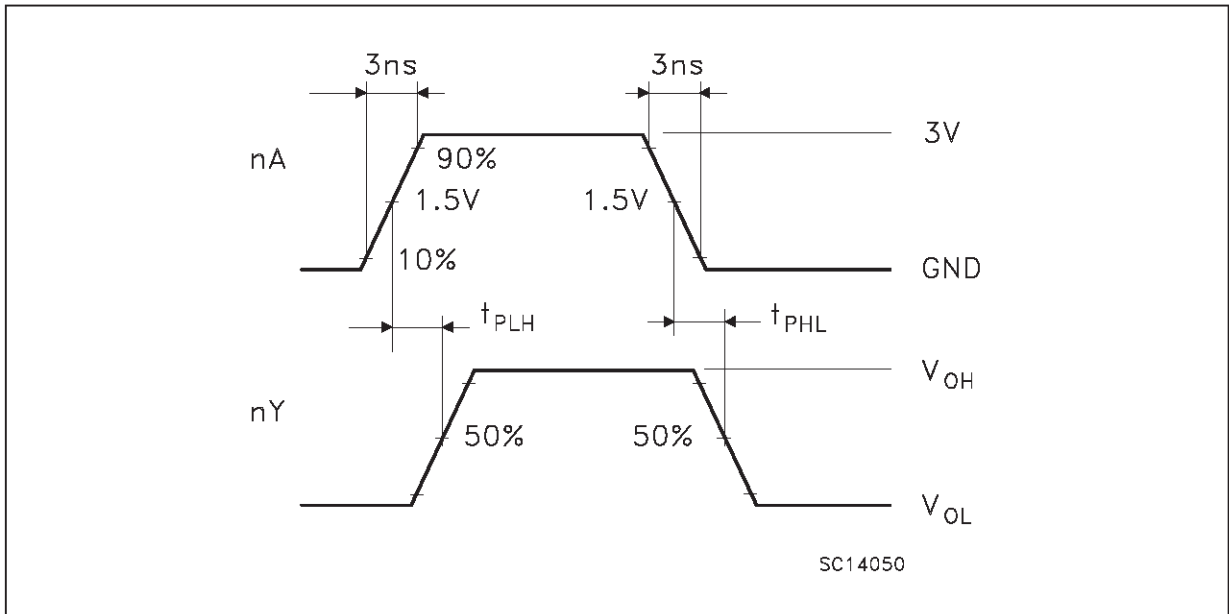
| TEST | SWITCH |
|-----------------------|-----------------|
| t_{PLH} , t_{PHL} | Open |
| t_{PZL} , t_{PLZ} | V _{CC} |
| t_{PZH} , t_{PHZ} | GND |

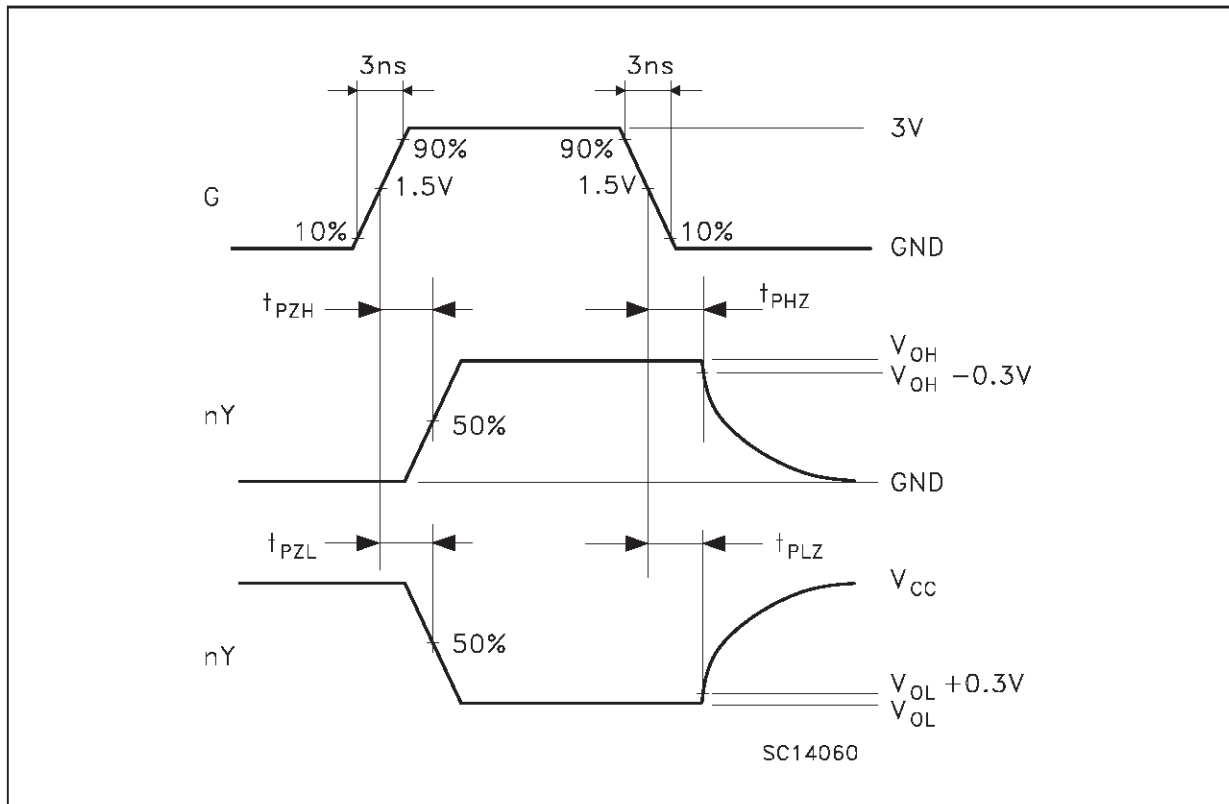
C_L = 15/50 pF or equivalent (includes jig and probe capacitance)

$R_L = R_1 = 1K\Omega$ or equivalent

$R_T = Z_{OUT}$ of pulse generator (typically 50 Ω)

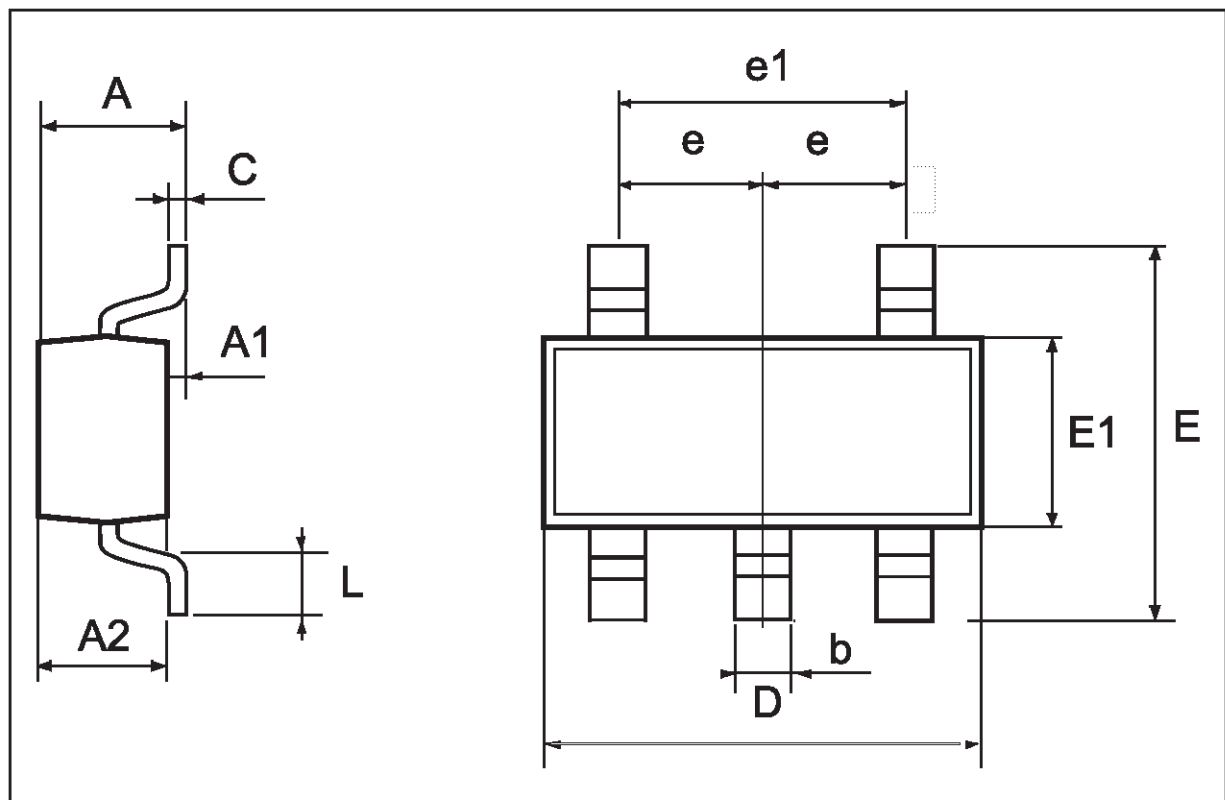
WAVEFORM 1: PROPAGATION DELAYS (f=1MHz; 50% duty cycle)



WAVEFORM 2: OUTPUT ENABLE AND DISABLE TIME ($f=1\text{MHz}$; 50% duty cycle)

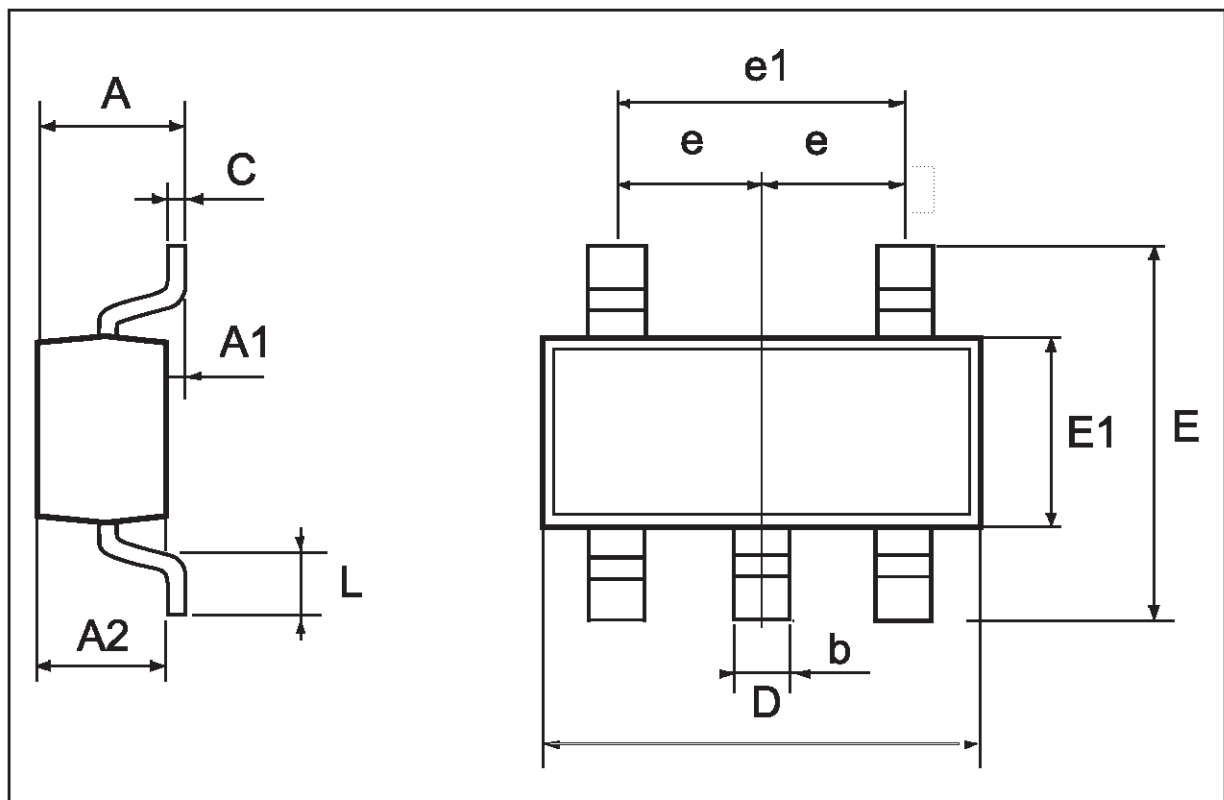
SOT23-5L MECHANICAL DATA

| DIM. | mm | | | mils | | |
|------|------|------|------|-------|------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 0.90 | | 1.45 | 35.4 | | 57.1 |
| A1 | 0.00 | | 0.15 | 0.0 | | 5.9 |
| A2 | 0.90 | | 1.30 | 35.4 | | 51.2 |
| b | 0.35 | | 0.50 | 13.7 | | 19.7 |
| C | 0.09 | | 0.20 | 3.5 | | 7.8 |
| D | 2.80 | | 3.00 | 110.2 | | 118.1 |
| E | 2.60 | | 3.00 | 102.3 | | 118.1 |
| E1 | 1.50 | | 1.75 | 59.0 | | 68.8 |
| L | 0.35 | | 0.55 | 13.7 | | 21.6 |
| e | | 0.95 | | | 37.4 | |
| e1 | | 1.9 | | | 74.8 | |



SC-70 MECHANICAL DATA

| DIM. | mm | | | mils | | |
|------|------|------|------|------|------|------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 0.80 | | 1.10 | 31.5 | | 43.3 |
| A1 | 0.00 | | 0.10 | 0.0 | | 3.9 |
| A2 | 0.80 | | 1.00 | 31.5 | | 39.4 |
| b | 0.15 | | 0.30 | 5.9 | | 11.8 |
| C | 0.10 | | 0.18 | 3.9 | | 7.1 |
| D | 1.80 | | 2.20 | 70.9 | | 86.6 |
| E | 1.80 | | 2.40 | 70.9 | | 94.5 |
| E1 | 1.15 | | 1.35 | 45.3 | | 53.1 |
| L | 0.10 | | 0.30 | 3.9 | | 11.8 |
| e | | 0.65 | | | 25.6 | |
| e1 | | 1.3 | | | 51.2 | |



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