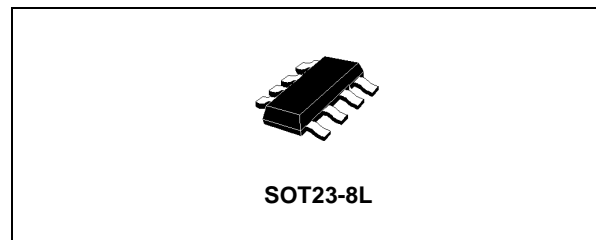


DUAL 2-INPUT OR GATE

- HIGH SPEED: $t_{PD} = 3.0ns$ (TYP.) at $V_{CC} = 5V$
- LOW POWER DISSIPATION:
 $I_{CC} = 1\mu A$ (MAX.) at $T_A=25^\circ C$
- HIGH NOISE IMMUNITY:
 $V_{NIH} = V_{NIL} = 28\% V_{CC}$ (MIN.)
- POWER DOWN PROTECTION ON INPUTS AND OUTPUTS
- SYMMETRICAL OUTPUT IMPEDANCE:
 $|I_{OH}| = I_{OL} = 8mA$ (MIN) at $V_{CC} = 4.5V$
 $|I_{OH}| = I_{OL} = 4mA$ (MIN) at $V_{CC} = 3.0V$
- BALANCED PROPAGATION DELAYS:
 $t_{PLH} \cong t_{PHL}$
- OPERATING VOLTAGE RANGE:
 $V_{CC}(OPR) = 2V$ to $5.5V$
- IMPROVED LATCH-UP IMMUNITY

DESCRIPTION

The 74V2G32 is an advanced high-speed CMOS DUAL 2-INPUT OR GATE fabricated with sub-micron silicon gate and double-layer metal wiring C²MOS technology. The internal circuit is composed of 3 stages including buffer output, which provide high noise immunity and stable output.



ORDER CODES

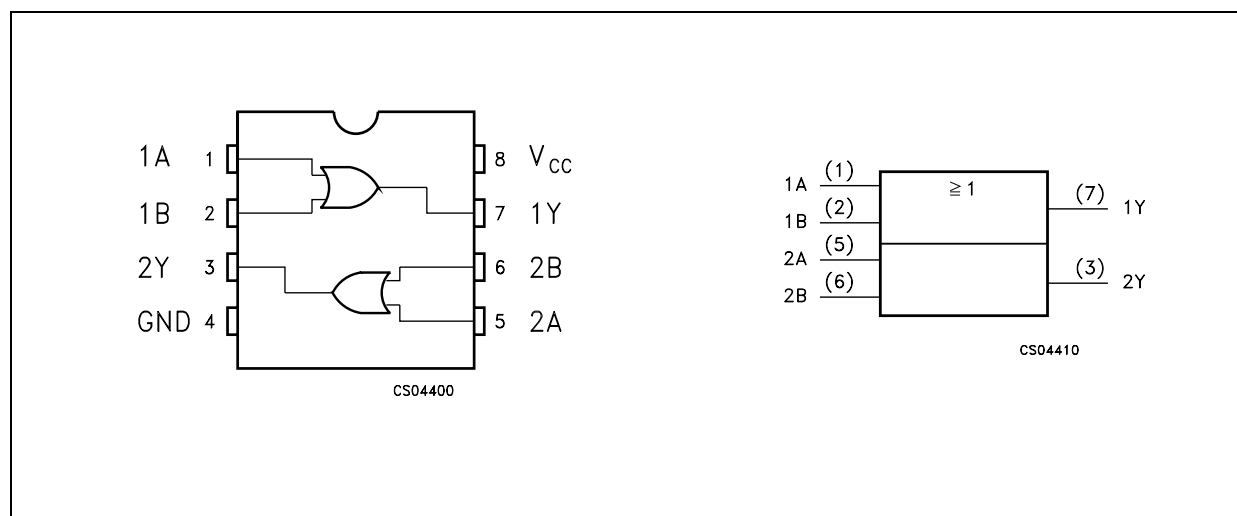
| PACKAGE | T & R |
|----------|------------|
| SOT23-8L | 74V2G08STR |

Power down protection is provided on all inputs and outputs and 0 to 7V can be accepted on inputs with no regard to the supply voltage.

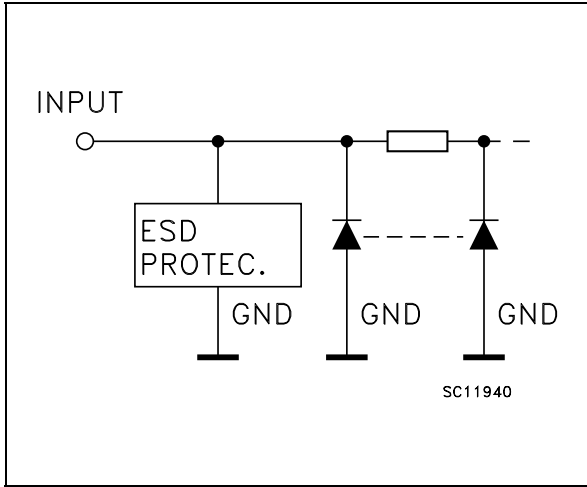
This device can be used to interface 5V to 3V systems and it is ideal for portable applications like personal digital assistant, camcorder and all battery-powered equipment.

All inputs and outputs are equipped with protection circuits against static discharge, giving them ESD immunity and transient excess voltage.

PIN CONNECTION AND IEC LOGIC SYMBOLS



INPUT EQUIVALENT CIRCUIT



PIN DESCRIPTION

| PIN No | SYMBOL | NAME QND FUNCTION |
|--------|-----------------|-------------------------|
| 1, 5 | 1A, 2A | Data Input |
| 2, 6 | 1B, 2B | Data Input |
| 7, 3 | 1Y, 2Y | Data Output |
| 4 | GND | Ground (0V) |
| 8 | V _{CC} | Positive Supply Voltage |

TRUTH TABLE

| nA | nB | nY |
|----|----|----|
| L | L | L |
| L | H | H |
| H | L | H |
| H | H | H |

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 (see note 1) | -0.5 to +7.0 | V |
| V _O | DC Output Voltage (see note 2) | -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 conditions is not implied.

- 1) V_{CC}=0V
- 2) High or Low State

RECOMMENDED OPERATING CONDITIONS

| Symbol | Parameter | Value | Unit |
|-----------------|--|----------------------|--------------|
| V _{CC} | Supply Voltage | 2 to 5.5 | V |
| V _I | Input Voltage | 0 to 5.5 | V |
| V _O | Output Voltage (see note 1) | 0 to 5.5 | V |
| V _O | Output Voltage (see note 2) | 0 to V _{CC} | V |
| T _{op} | Operating Temperature | -55 to 125 | °C |
| dt/dv | Input Rise and Fall Time (note 3) (V _{CC} = 3.3 ± 0.3V) (V _{CC} = 5.0 ± 0.5V) | 0 to 100 0 to 20 | ns/V ns/V |

- 1) V_{CC}=0V
- 2) High or Low State
- 3) V_{IN} from 30% to 70% of V_{CC}

DC SPECIFICATIONS

| Symbol | Parameter | Test Condition | | Value | | | | | | Unit | |
|------------------|-----------------------------------|------------------------|---|-----------------------|------|--------------------|--------------------|--------------------|--------------------|--------------------|------|
| | | V _{CC} (V) | | T _A = 25°C | | | -40 to 85°C | | -55 to 125°C | | |
| | | | | Min. | Typ. | Max. | Min. | Max. | Min. | | Max. |
| V _{IH} | High Level Input Voltage | 2.0 | | 1.5 | | | 1.5 | | 1.5 | | V |
| | | 3.0 to 5.5 | | 0.7V _{CC} | | | 0.7V _{CC} | | 0.7V _{CC} | | |
| V _{IL} | Low Level Input Voltage | 2.0 | | | | 0.5 | | 0.5 | | 0.5 | V |
| | | 3.0 to 5.5 | | | | 0.3V _{CC} | | 0.3V _{CC} | | 0.3V _{CC} | |
| V _{OH} | High Level Output Voltage | 2.0 | I _O =-50 μA | 1.9 | 2.0 | | 1.9 | | 1.9 | | V |
| | | 3.0 | I _O =-50 μA | 2.9 | 3.0 | | 2.9 | | 2.9 | | |
| | | 4.5 | I _O =-50 μA | 4.4 | 4.5 | | 4.4 | | 4.4 | | |
| | | 3.0 | I _O =-4 mA | 2.58 | | | 2.48 | | 2.4 | | |
| | | 4.5 | I _O =-8 mA | 3.94 | | | 3.8 | | 3.7 | | |
| V _{OL} | Low Level Output Voltage | 2.0 | I _O =50 μA | | 0.0 | 0.1 | | 0.1 | | 0.1 | V |
| | | 3.0 | I _O =50 μA | | 0.0 | 0.1 | | 0.1 | | 0.1 | |
| | | 4.5 | I _O =50 μA | | 0.0 | 0.1 | | 0.1 | | 0.1 | |
| | | 3.0 | I _O =4 mA | | | 0.36 | | 0.44 | | 0.55 | |
| | | 4.5 | I _O =8 mA | | | 0.36 | | 0.44 | | 0.55 | |
| I _I | Input Leakage Current | 0 to 5.5 | V _I = 5.5V or GND | | | ± 0.1 | | ± 1 | | ± 1 | μA |
| I _{CC} | Quiescent Supply Current | 5.5 | V _I = V _{CC} or GND | | | 1 | | 10 | | 20 | μA |
| I _{OPD} | Power down Output Leakage Current | 0 | V _O = 5.5 | | | 0.5 | | 5 | | 10 | μA |

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

| Symbol | Parameter | Test Condition | | Value | | | | | | Unit | |
|-----------------------------------|------------------------|------------------------|------------------------|-----------------------|------|------|-------------|------|--------------|------|------|
| | | V _{CC} (V) | C _L (pF) | T _A = 25°C | | | -40 to 85°C | | -55 to 125°C | | |
| | | | | Min. | Typ. | Max. | Min. | Max. | Min. | | Max. |
| t _{PLH} t _{PHL} | Propagation Delay Time | 3.3 ^(*) | 15 | | 3.7 | 7.0 | 1.0 | 8.0 | 1.0 | 9.0 | ns |
| | | 3.3 ^(*) | 50 | | 5.3 | 8.0 | 1.0 | 9.5 | 1.0 | 10.5 | |
| | | 5.0 ^(**) | 15 | | 3.0 | 5.0 | 1.0 | 6.0 | 1.0 | 7.0 | |
| | | 5.0 ^(**) | 50 | | 4.1 | 6.5 | 1.0 | 7.5 | 1.0 | 8.5 | |

(*) Voltage range is 3.3V ± 0.3V

(**) Voltage range is 5.0V ± 0.5V

CAPACITANCE CHARACTERISTICS

| Symbol | Parameter | Test Condition | Value | | | | | | Unit | | |
|-----------------|--|----------------|-----------------------|------|------|-------------|------|--------------|------|------|----|
| | | | T _A = 25°C | | | -40 to 85°C | | -55 to 125°C | | | |
| | | | Min. | Typ. | Max. | Min. | Max. | Min. | | Max. | |
| C _{IN} | Input Capacitance | | | 4 | 10 | | | 10 | | 10 | pF |
| C _{PD} | Power Dissipation Capacitance (note 1) | | | 12 | | | | | | | pF |

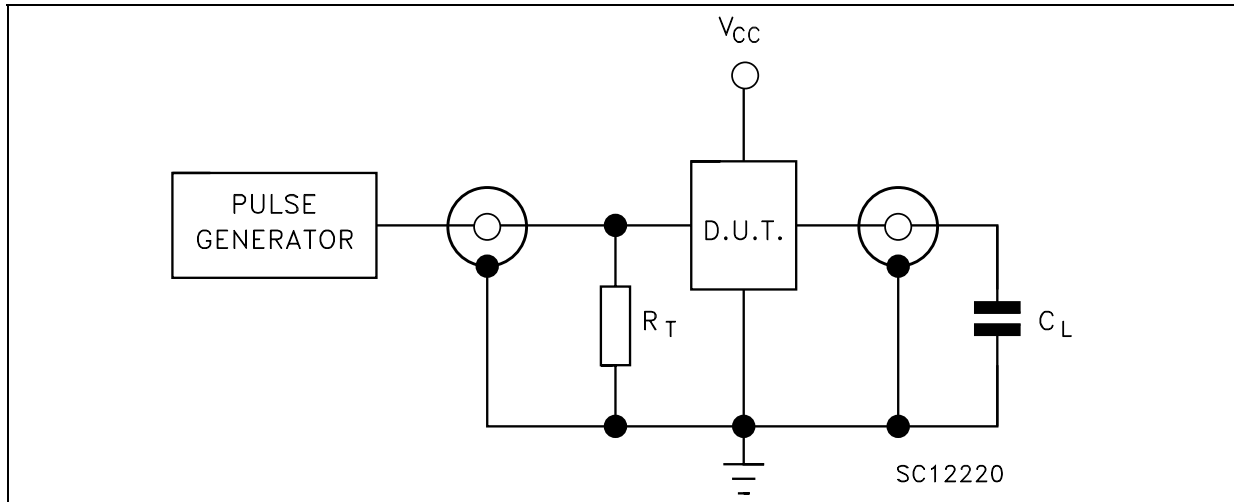
1) C_{PD} is defined as the value of the IC's internal equivalent capacitance which is calculated from the operating current consumption without load. (Refer to Test Circuit). Average current can be obtained by the following equation. $I_{CC(opr)} = C_{PD} \times V_{CC} \times f_{IN} + I_{CC}/2$

DYNAMIC SWITCHING CHARACTERISTICS

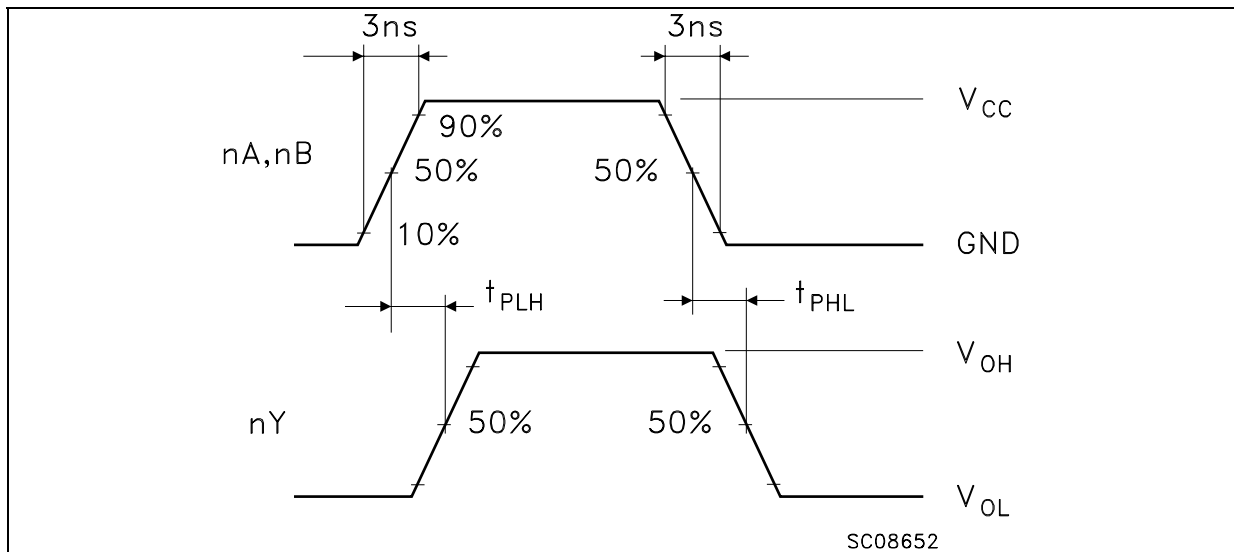
| Symbol | Parameter | Test Condition | | Value | | Unit |
|------------------|---|---------------------|---|------------------------|------|------|
| | | V _{CC} (V) | | T _A = 25 °C | | |
| | | | | Min. | Max. | |
| V _{OLP} | Dynamic Low Level Quiet Output (note 1) | 5.0 | C _L = 50pF V _{IL} = 0V, V _{IH} = 3.3V | | 0.8 | V |
| V _{OLV} | | | | -0.8 | | |

1) Number of output defined as "n". Measured with "n-1" outputs switching from HIGH to LOW or LOW to HIGH. The remaining outputs is measured in the LOW state.

TEST CIRCUIT

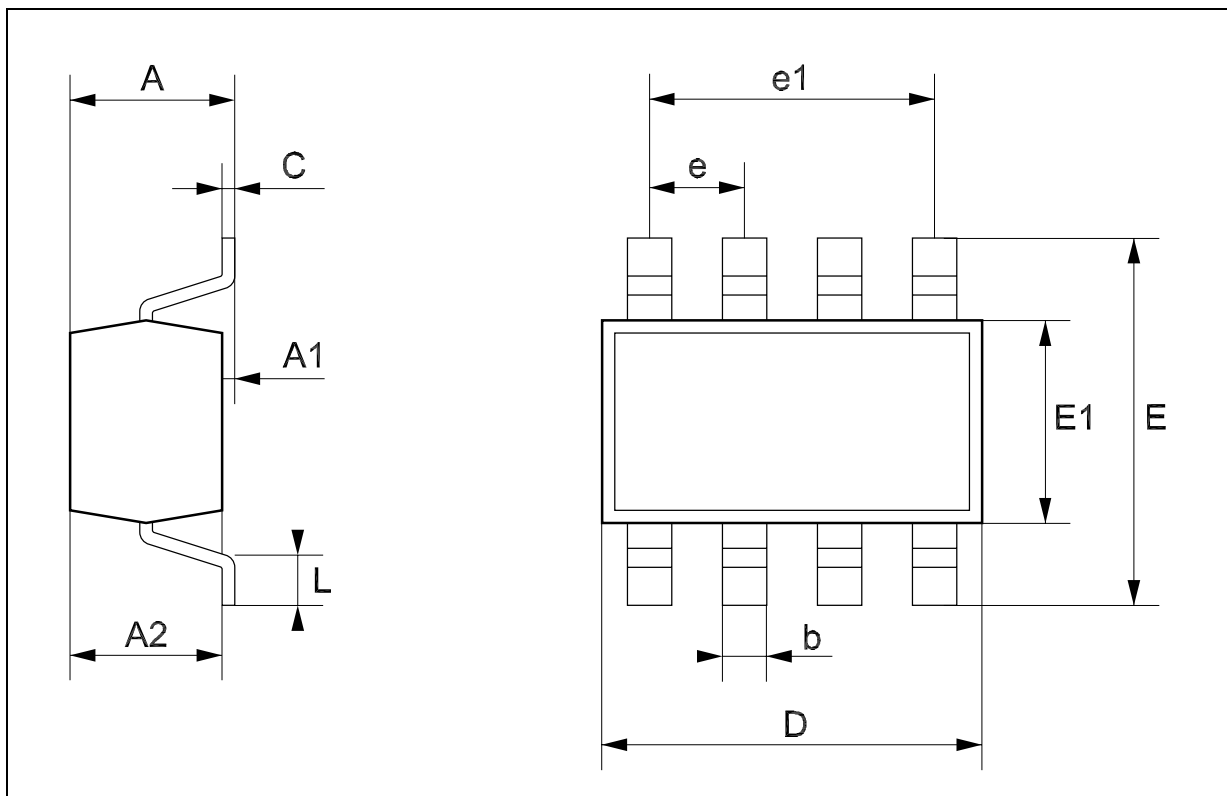


$C_L = 15/50\text{pF}$ or equivalent (includes jig and probe capacitance)
 $R_T = Z_{\text{OUT}}$ of pulse generator (typically 50Ω)

WAVEFORM: PROPAGATION DELAY ($f=1\text{MHz}$; 50% duty cycle)

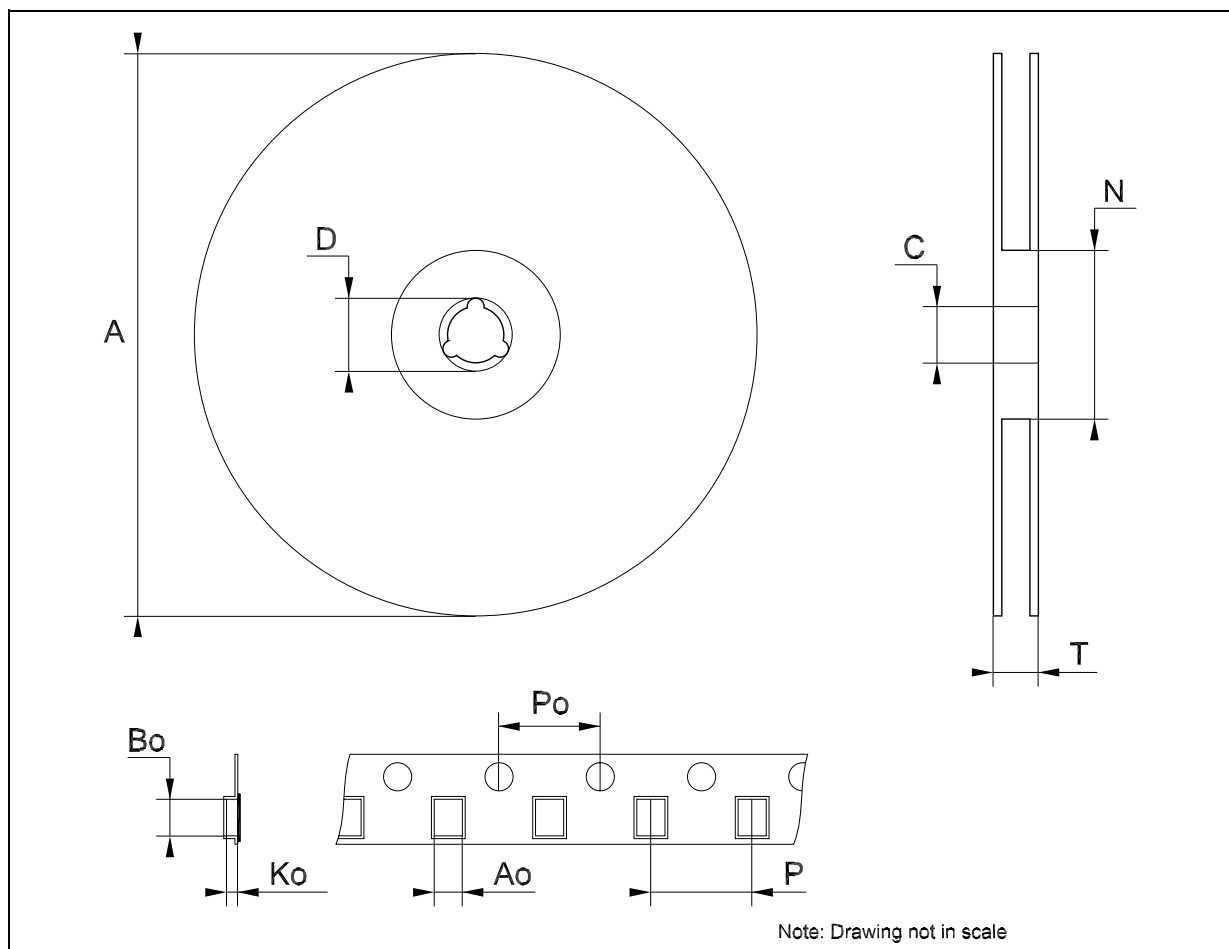
SOT23-8L MECHANICAL DATA

| 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 | 0.22 | | 0.38 | 8.6 | | 14.9 |
| 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 |
| e | 0 | .65 | | | 25.6 | |
| e1 | | 1.95 | | | 76.7 | |
| L | 0.35 | | 0.55 | 13.7 | | 21.6 |



Tape & Reel SOT23-xL MECHANICAL DATA

| DIM. | mm. | | | inch | | |
|------|------|------|------|-------|-------|-------|
| | MIN. | TYP | MAX. | MIN. | TYP. | MAX. |
| A | | | 180 | | | 7.086 |
| C | 12.8 | 13.0 | 13.2 | 0.504 | 0.512 | 0.519 |
| D | 20.2 | | | 0.795 | | |
| N | 60 | | | 2.362 | | |
| T | | | 14.4 | | | 0.567 |
| Ao | 3.13 | 3.23 | 3.33 | 0.123 | 0.127 | 0.131 |
| Bo | 3.07 | 3.17 | 3.27 | 0.120 | 0.124 | 0.128 |
| Ko | 1.27 | 1.37 | 1.47 | 0.050 | 0.054 | 0.058 |
| Po | 3.9 | 4.0 | 4.1 | 0.153 | 0.157 | 0.161 |
| P | 3.9 | 4.0 | 4.1 | 0.153 | 0.157 | 0.161 |



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