



74V2T66

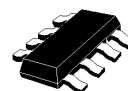
DUAL BILATERAL SWITCH

- HIGH SPEED:
 $t_{PD} = 0.6ns$ (TYP.) at $V_{CC} = 5V$
- COMPATIBLE WITH TTL LEVEL
- LOW POWER DISSIPATION:
 $I_{CC} = 1\mu A$ (MAX.) at $T_A = 25^\circ C$
- LOW "ON" RESISTANCE:
 $R_{ON} = 10\Omega$ (TYP.) AT $V_{CC} = 5V$ $I_{I/O} = 1mA$
- SINE WAVE DISTORTION:
 0.04% AT $V_{CC} = 5.0V$, $f = 1KHz$
- OPERATING VOLTAGE RANGE:
 V_{CC} (OPR) = $4.5V$ TO $5.5V$
- IMPROVED LATCH-UP IMMUNITY

DESCRIPTION

The 74V2T66 is an advanced high-speed CMOS DUAL BILATERAL SWITCH fabricated in silicon gate C²MOS technology. It achieves high speed propagation delay and VERY LOW ON resistances while maintaining true CMOS low power consumption. This bilateral switch handles rail to rail analog and digital signals that may vary across the full power supply range (from GND to V_{CC})

The C input is provided to control the switch and it's compatible with standard CMOS output; the



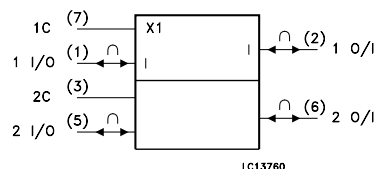
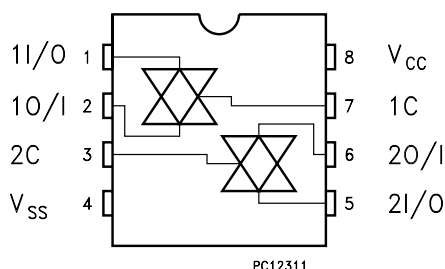
SOT23-8L

ORDER CODES

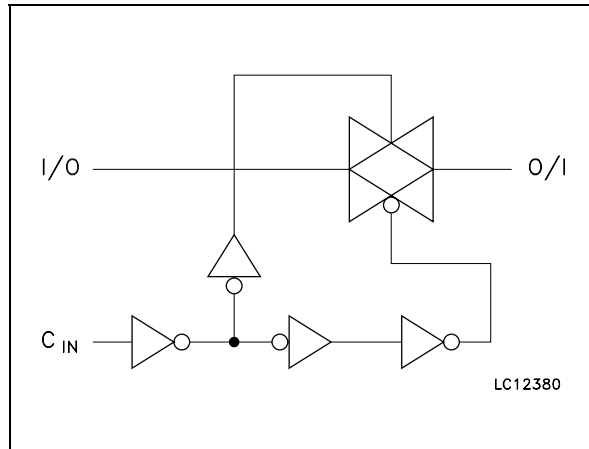
| PACKAGE | T & R |
|----------|------------|
| SOT23-8L | 74V2T66STR |

switch is ON (port I/O is connected to Port O/I) when the C input is held high and OFF (high impedance state exists between the two ports) when C is held low. It can be used in many application as Battery Powered System, Test Equipment. It's available in the commercial and extended temperature range in SOT23-8L package. All inputs and output 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 AND FUNCTION |
|--------|-----------------|----------------------------|
| 1, 5 | 1I/O, 2I/O | Independent Input/Output |
| 2, 6 | 1O/I, 2O/I | Independent Output/Input |
| 7, 3 | 1C, 2C | Enable Input (Active HIGH) |
| 4 | GND | Ground (0V) |
| 8 | V _{CC} | Positive Supply Voltage |

TRUTH TABLE

| CONTROL | SWITCH FUNCTION |
|---------|-----------------|
| H | ON |
| L | OFF * |

* : High Impedance State

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 V _{CC} + 0.5 | V |
| V _{IC} | DC Control 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 _{IK} | DC Control Input Diode Current | - 20 | mA |
| I _{OK} | DC Output Diode Current | ± 20 | mA |
| I _O | DC Output Current | ± 50 | 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) | 300 | °C |

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions 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 V _{CC} | V |
| V _{IC} | Control Input Voltage | 0 to 5.5 | V |
| V _O | Output Voltage | 0 to V _{CC} | V |
| T _{op} | Operating Temperature | -55 to 125 | °C |
| dt/dv | Input Rise and Fall Time (note 1) V _{CC} = 5.0V | 0 to 20 | ns/V |

1) V_{IN} from 0.8V to 2V on control pin

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 | 5.0(*) | | 2 | | | 2 | | 2 | | V |
| V _{IL} | Low Level Input Voltage | 5.0(*) | | | | 0.8 | | 0.8 | | 0.8 | V |
| R _{ON} | ON Resistance | 5.0(*) | V _{IC} = V _{IH} V _{I/O} = V _{CC} to GND I _{I/O} ≤ 1mA | | 12 | 17 | | 20 | | 24 | V |
| R _{ON} | ON Resistance | 5.0(*) | V _{IC} = V _{IH} V _{I/O} = V _{CC} or GND I _{I/O} ≤ 1mA | | 10 | 14 | | 18 | | 20 | V |
| I _{OFF} | Input/Output Leakage Current (SWITCH OFF) | 5.5 | V _{OS} = V _{CC} to GND V _{IS} = V _{CC} to GND V _{IC} = V _{IL} | | | ±0.1 | | ± 1 | | ± 1 | μA |
| I _{IZ} | Switch Input Leakage Current (SWITCH ON, OUTPUT OPEN) | 5.5 | V _{OS} = V _{CC} to GND V _{IC} = V _{IH} | | | ±0.1 | | ± 1 | | ± 5 | μA |
| I _{IN} | Control Input Leakage Current | 0 to 5.5 | V _{IC} = 5.5V or GND | | | ± 0.1 | | ± 1.0 | | ± 1.0 | μA |
| I _{CC} | Quiescent Supply Current | 5.5 | V _I = V _{CC} or GND | | | 1 | | 10 | | 20 | μA |

(*) Voltage range is 5V ± 0.5V

AC ELECTRICAL CHARACTERISTICS (C_L = 50pF, Input t_r = t_f = 3ns)

| 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. |
| t _{PD} | Delay Time | 5.0(*) | | | 0.6 | 0.7 | | 1.0 | | 2.0 | ns |
| t _{PLZ} t _{PHZ} | Output Disable Time | 5.0(*) | R _L = 500 Ω | | 6.0 | 7.5 | | 9.0 | | 10.0 | ns |
| t _{PZL} t _{PZH} | Output Enable Time | 5.0(*) | R _L = 1 KΩ | | 2.5 | 4.0 | | 5.0 | | 7.0 | ns |

(*) Voltage range is 5.0V ± 0.5V

CAPACITIVE 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 _{I/O} | Output Capacitance | | | 10 | | | | | | pF | |
| C _{PD} | Power Dissipation Capacitance (note 1) | | | 3 | | | | | | pF | |

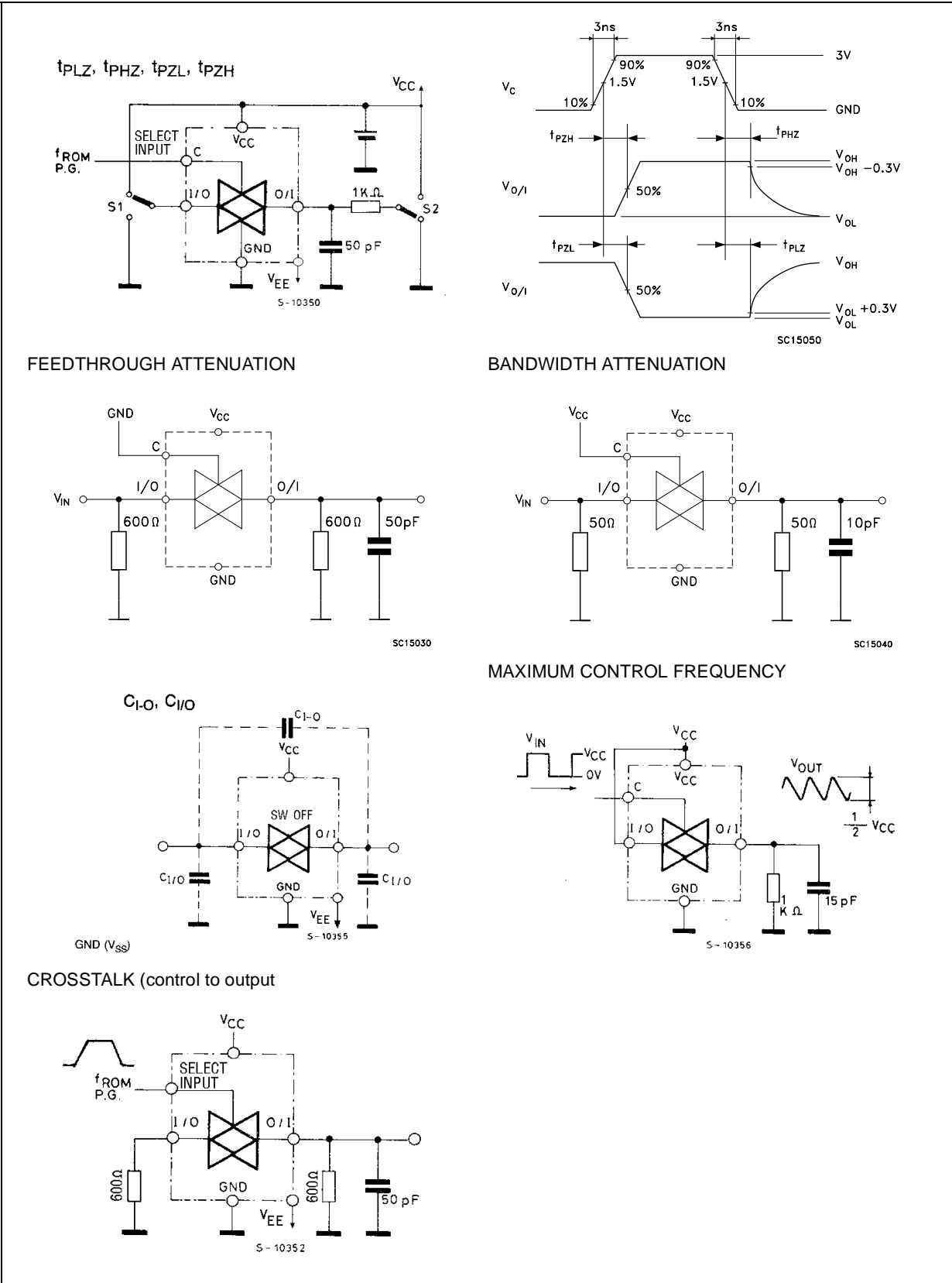
1) C_{PD} is defined as the value of the IC's internal equivalent capacitance which is calculated from the operating current consumption without load. (Refer to Test Circuit). Average operating current can be obtained by the following equation. $I_{CC(opr)} = C_{PD} \times V_{CC} \times f_{IN} + I_{CC}/2$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

ANALOG SWITCH CHARACTERISTICS (GND = 0V; $T_A = 25^\circ\text{C}$)

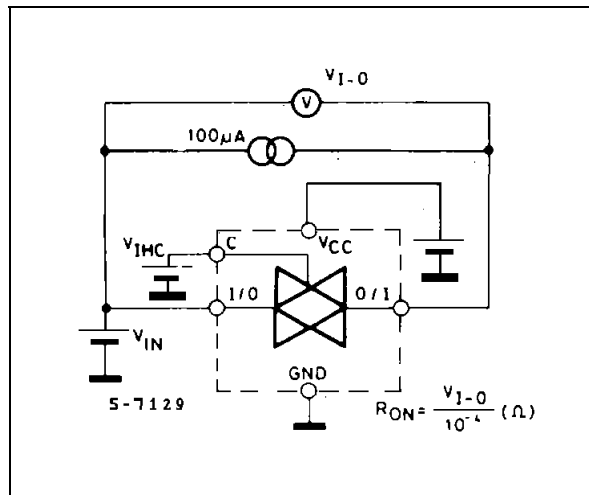
| Symbol | Parameter | Test Condition | | | Value | Unit |
|-----------|--|----------------|------------------------------|--|-------|------|
| | | V_{CC} (V) | V_{IN} (V _{p-p}) | | Typ. | |
| | Sine Wave Distortion (THD) | 5.0(*) | 4 | $f_{IN} = 1 \text{ KHz}$, $R_L = 10 \text{ K}\Omega$, $C_L = 50 \text{ pF}$ | 0.04 | % |
| f_{MAX} | Frequency Response (Switch ON) | 5.0(*) | | Adjust f_{IN} voltage to obtain 0 dBm at V_{OS} . Increase f_{IN} Frequency until dB meter reads -3dB $R_L = 50\Omega$, $C_L = 10 \text{ pF}$ | 180 | MHz |
| | Feedthrough Attenuation (Switch OFF) | 5.0(*) | | V_{IN} is centered at $V_{CC}/2$ Adjust f_{IN} Voltage to obtained 0dBm at V_{IS} $R_L = 600\Omega$, $C_L = 50 \text{ pF}$, $f_{IN} = 1\text{MHz}$ sine wave | -60 | dB |
| | Crosstalk (Control Input to Signal Output) | 5.0(*) | | $R_L = 600\Omega$, $C_L = 50 \text{ pF}$, $f_{IN} = 1\text{MHz}$ square wave $tr=tf= 2.0\text{ns}$ | 60 | mV |
| | Crosstalk Between Switches | 5.0(*) | | $R_L = 600\Omega$, $C_L = 50 \text{ pF}$, $f_{IN} = 1\text{MHz}$ sine wave | -60 | dB |

(*) Voltage range is $5.0\text{V} \pm 0.5\text{V}$

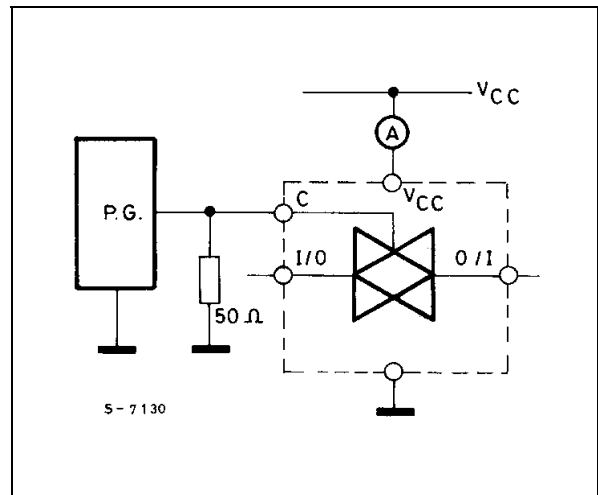
SWITCHING CHARACTERISTICS TEST CIRCUIT



CHANNEL RESISTANCE (R_{ON})

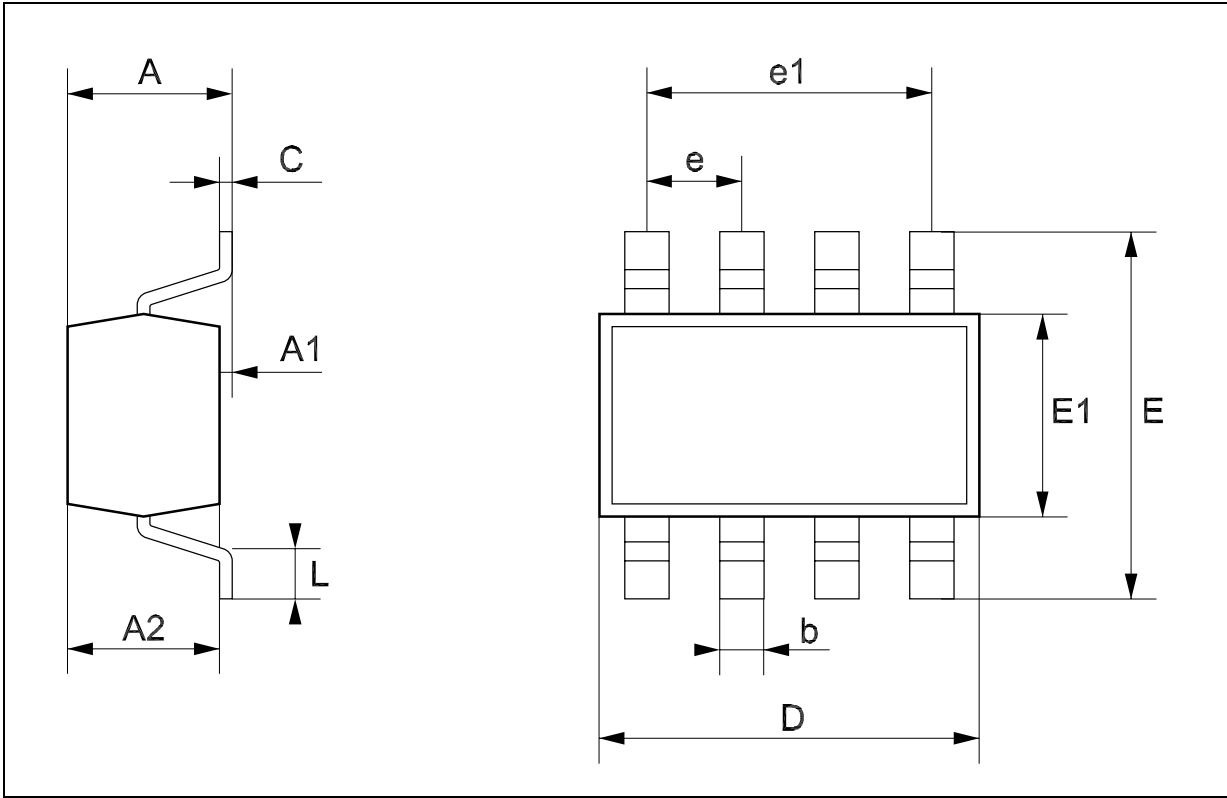


I_{cc} (Opr.)



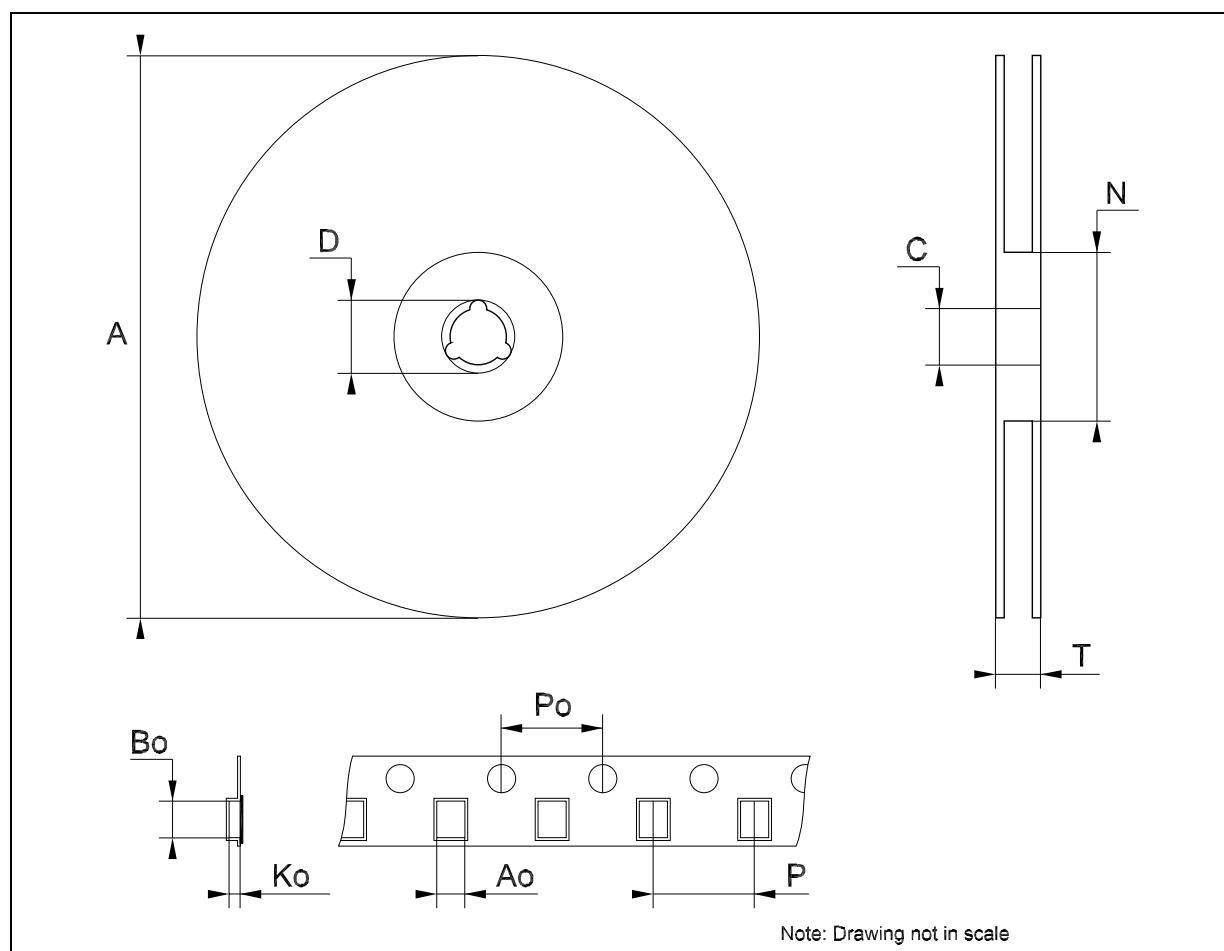
SOT23-8L MECHANICAL DATA

| 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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