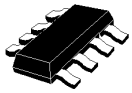
74V2G125

DUAL BUS BUFFER (3-STATE)

- HIGH SPEED: t_{PD} = 3.8ns (TYP.) at V_{CC} = 5V
- LOW POWER DISSIPATION: I_{CC} = 1µA(MAX.) at T_A = 25°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
- BALANCED PROPAGATION DELAYS: $t_{PLH} \cong t_{PHL}$
- OPERATING VOLTAGE RANGE: V_{CC}(OPR) = 2V to 5.5V
- IMPROVED LATCH-UP IMMUNITY



SOT23-8L

ORDER CODES

PACKAGE	T & R
SOT23-8L	74V2G125STR

DESCRIPTION

The 74V2G125 is an advanced high-speed CMOS DUAL BUS BUFFER fabricated with sub-micron silicon gate and double-layer metal wiring C²MOS technology.

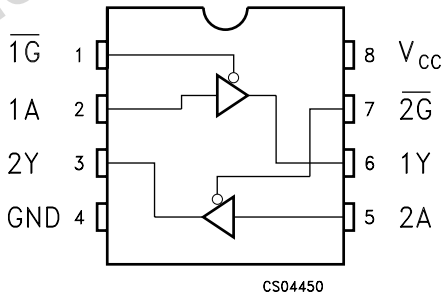
3-STATE control input $\overline{nG}$ has to be set HIGH to place the output into the high impedance state.

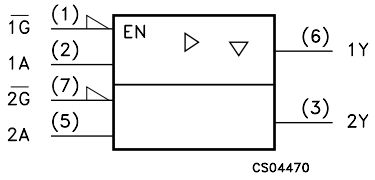
Power down protection is provided on all inputs and outputs and 0 to 7V can be accepted on inputs with no regard to the supply voltage.

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.

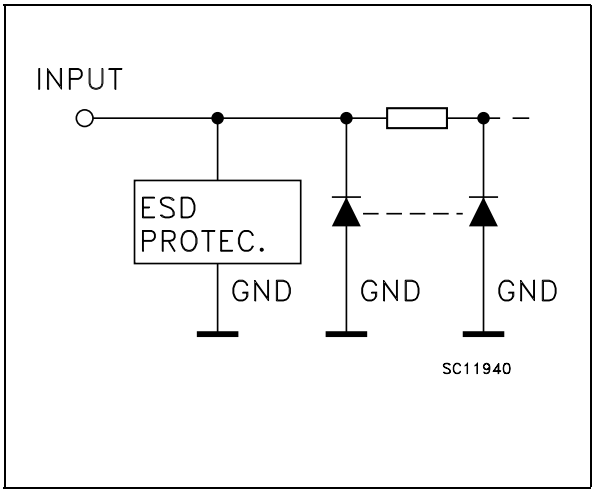
All inputs and outputs are equipped with protection circuits against static discharge, giving them ESD immunity and transient excess voltage.

PIN CONNECTION AND IEC LOGIC SYMBOLS





INPUT EQUIVALENT CIRCUIT



PIN DESCRIPTION

PIN No	SYMBOL	NAME AND FUNCTION
1, 7	$\overline{1G}$, $\overline{2G}$	Output Enable Inputs
2, 5	1A, 2A	Data Inputs
3, 6	2Y, 1Y	Data Outputs
4	GND	Ground (0V)
8	V_{CC}	Positive Supply Voltage

TRUTH TABLE

A	$\overline{G}$	Y
X	H	Z
L	L	L
H	L	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 (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 or $\overline{nG}$= V_{CC}(Output in High Impedance state)
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 or $\overline{nG}$=V_{CC} (Output in High Impedance state)
2) High or Low State
3) V_{IN} from 30% to 70% of V_{CC}

DC SPECIFICATION

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_{OZ}	High Impedance Output Leakage Current	5.5	$V_I = V_{IH}$ or V_{IL} V_O = 5.5 or GND			±0.25		± 2.5		± 5	µA
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			5.1	7.5	1.0	8.5	1.0	9.5	ns
		3.3(*)	50			5.6	8.0	1.0	9.5	1.0	10.5	
		5.0(**)	15			3.8	5.5	1.0	6.5	1.0	7.5	
		5.0(**)	50			4.3	6.5	1.0	7.5	1.0	8.5	
t_{PLZ} t_{PHZ}	Output Disable Time	3.3(*)	15	R_L = 1 KΩ		5.4	8.0	1.0	9.0	1.0	10.0	ns
		3.3(*)	50	R_L = 1 KΩ		7.9	11.5	1.0	12.5	1.0	13.5	
		5.0(**)	15	R_L = 1 KΩ		3.6	5.0	1.0	6.0	1.0	7.0	
		5.0(**)	50	R_L = 1 KΩ		5.1	7.0	1.0	8.0	1.0	9.0	
t_{PZL} t_{PZH}	Output Enable Time	3.3(*)	15	R_L = 1 KΩ		5.4	7.6	1.0	9.5	1.0	10.5	ns
		3.3(*)	50	R_L = 1 KΩ		5.9	8.5	1.0	10.0	1.0	11.0	
		5.0(**)	15	R_L = 1 KΩ		3.7	5.9	1.0	7.0	1.0	8.0	
		5.0(**)	50	R_L = 1 KΩ		4.1	6.5	1.0	7.5	1.0	8.5	

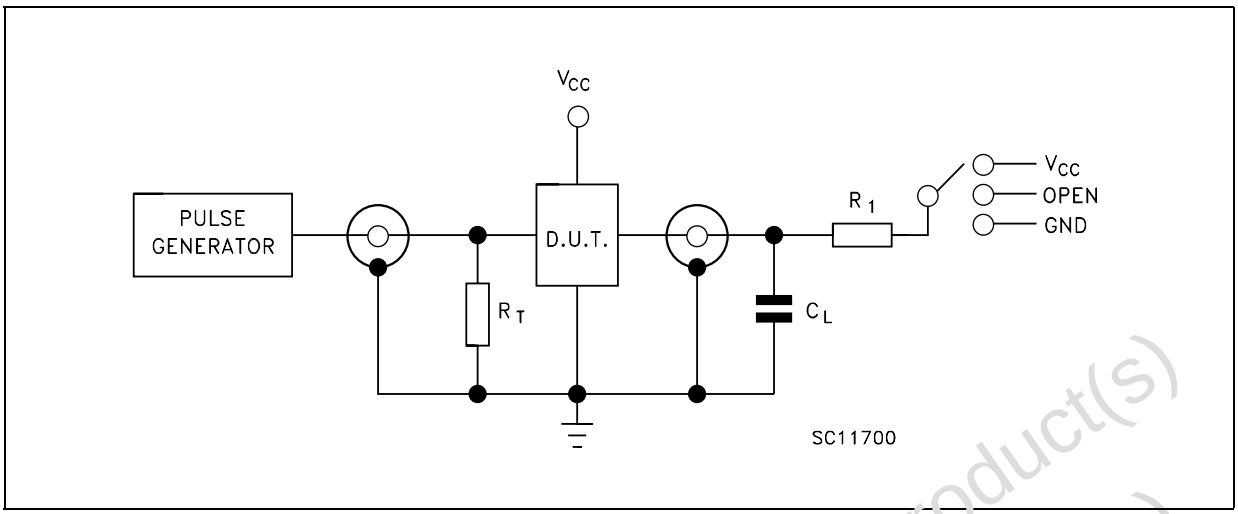
(*) Voltage range is 3.3V ± 0.3V
(**) Voltage range is 5.0V ± 0.5V

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_{OUT}	Output Capacitance			6						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 current can be obtained by the following equation. $I_{CC(opr)} = C_{PD} \times V_{CC} \times f_{IN} + I_{CC}/2$

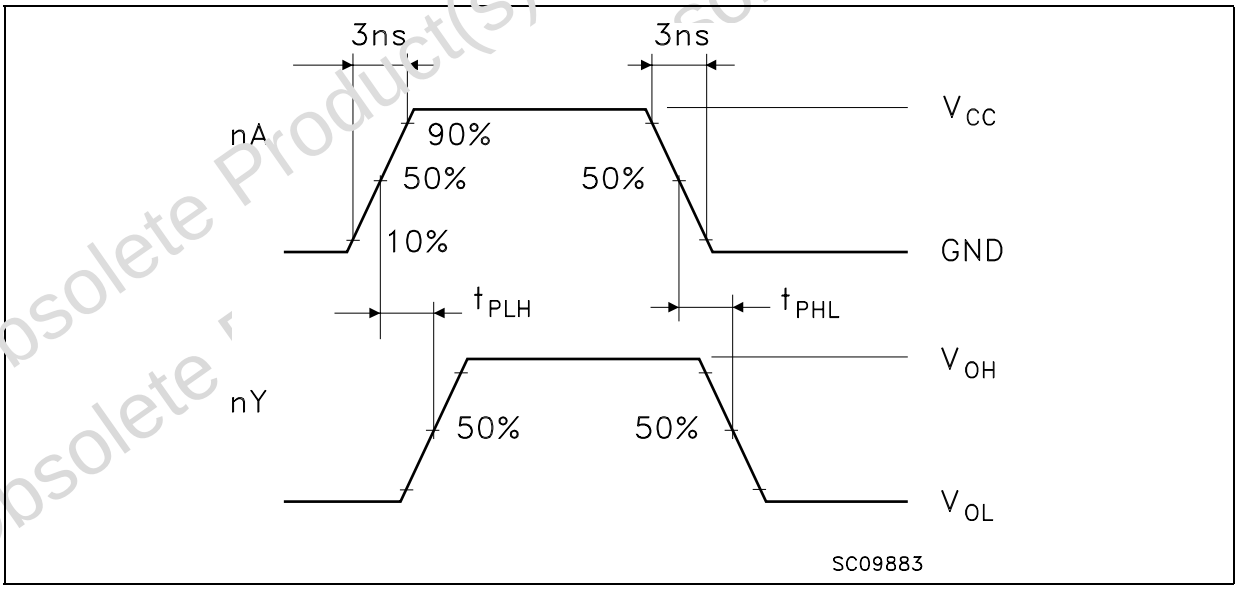
TEST CIRCUIT TEST CIRCUIT



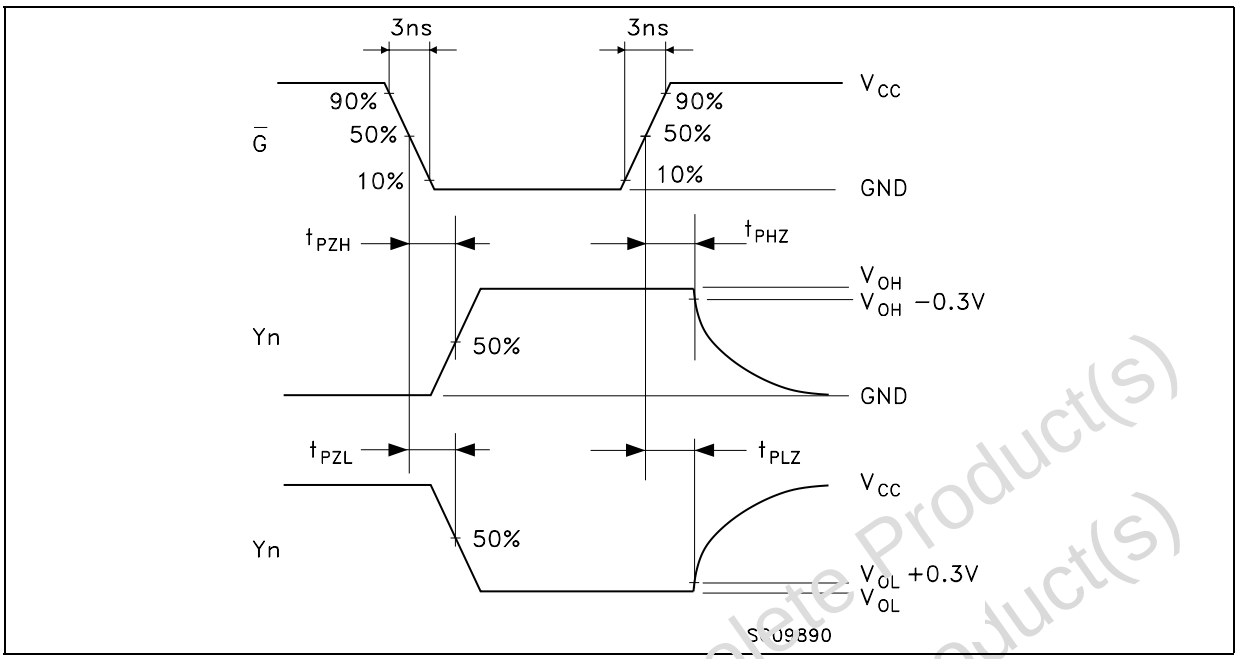
TEST	SWITCH
t_{PLH}, t_{PHL}	Open
t_{PZL}, t_{PLZ}	V_{CC}
t_{PZH}, t_{PHZ}	GND

C_L =15/50pF or equivalent (includes jig and probe capacitance)
$R1$ = 1KΩ or equivalent
R_T = Z_{OUT} of pulse generator (typically 50Ω)

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

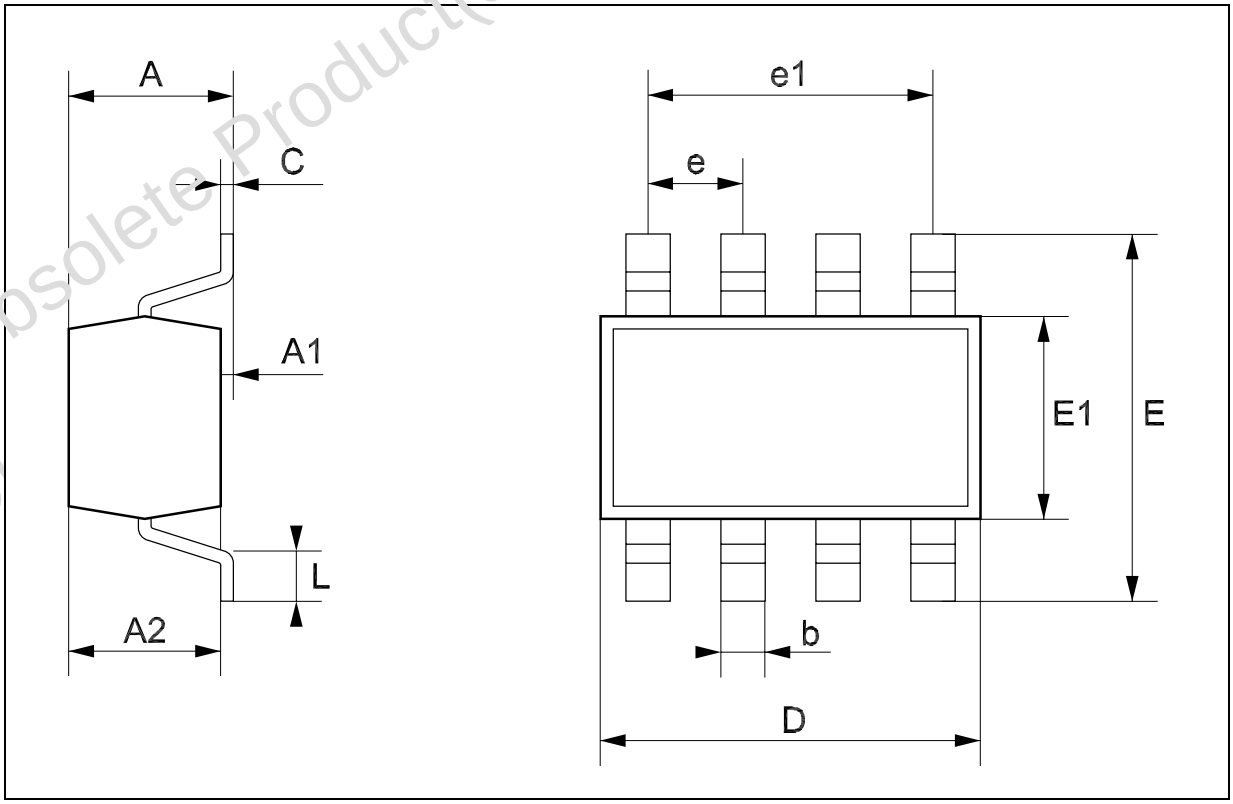


WAVEFORM 2: OUTPUT ENABLE AND DISABLE TIME (f=1MHz; 50% duty cycle)



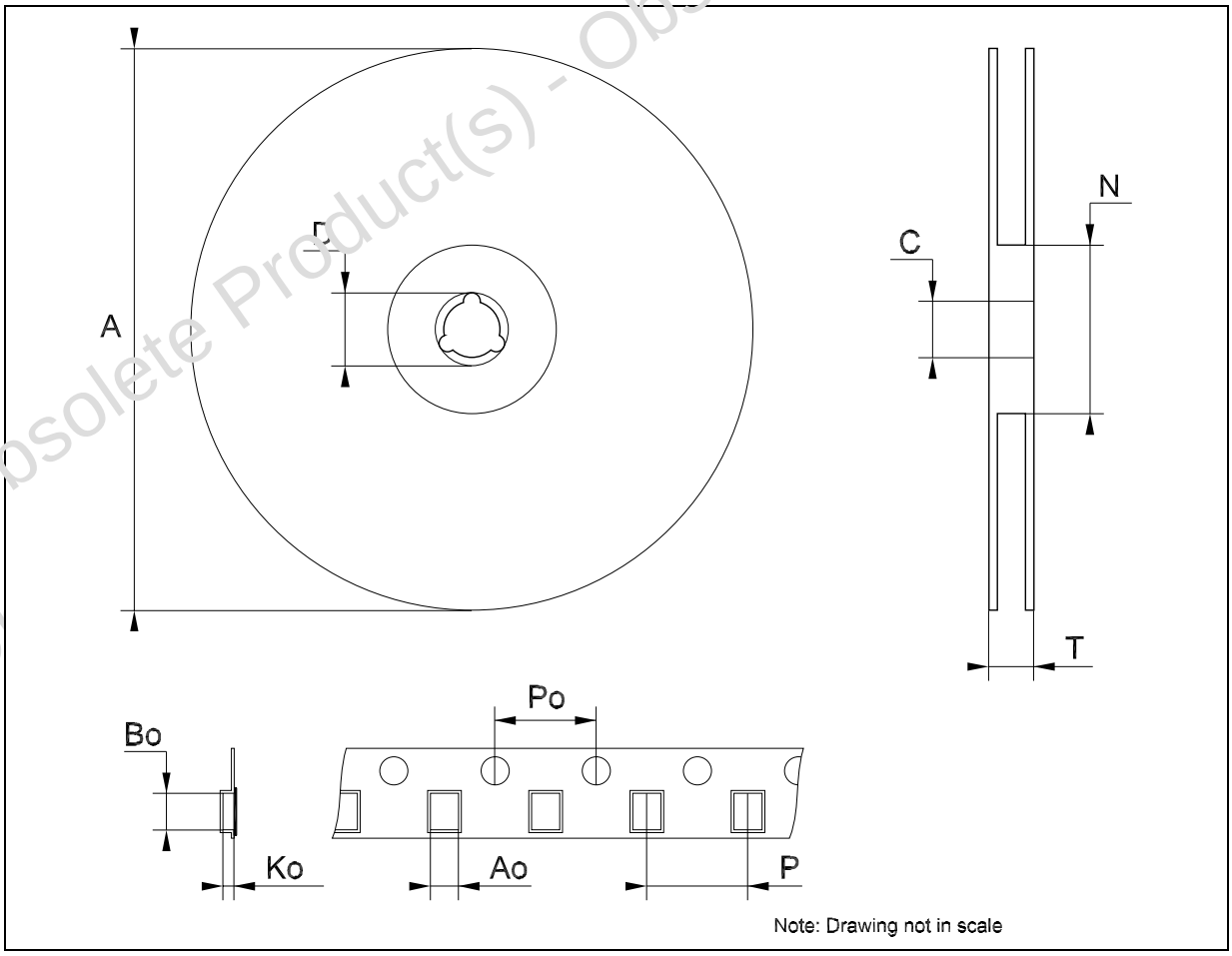
SOT23-8L MECHANICAL DATA

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	0.0.58
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



Note: Drawing not in scale