

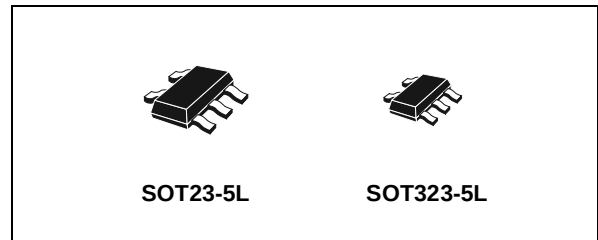
SINGLE BILATERAL SWITCH

- HIGH SPEED:
 $t_{PD} = 0.3ns$ (TYP.) at $V_{CC} = 5V$
 $t_{PD} = 0.4ns$ (TYP.) at $V_{CC} = 3.3V$
- LOW POWER DISSIPATION:
 $I_{CC} = 1\mu A$ (MAX.) at $T_A = 25^\circ C$
- LOW "ON" RESISTANCE:
 $R_{ON} = 6.5\Omega$ (TYP.) AT $V_{CC} = 5V$ $I_{I/O} = 1mA$
 $R_{ON} = 8.5\Omega$ (TYP.) AT $V_{CC} = 3.3V$ $I_{I/O} = 1mA$
- SINE WAVE DISTORTION:
 0.04% AT $V_{CC} = 3.3V$ $f = 1KHz$
- WIDE OPERATING RANGE:
 V_{CC} (OPR) = $2V$ TO $5.5V$
- IMPROVED LATCH-UP IMMUNITY

DESCRIPTION

The 74V1G66 is an advanced high-speed CMOS SINGLE 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

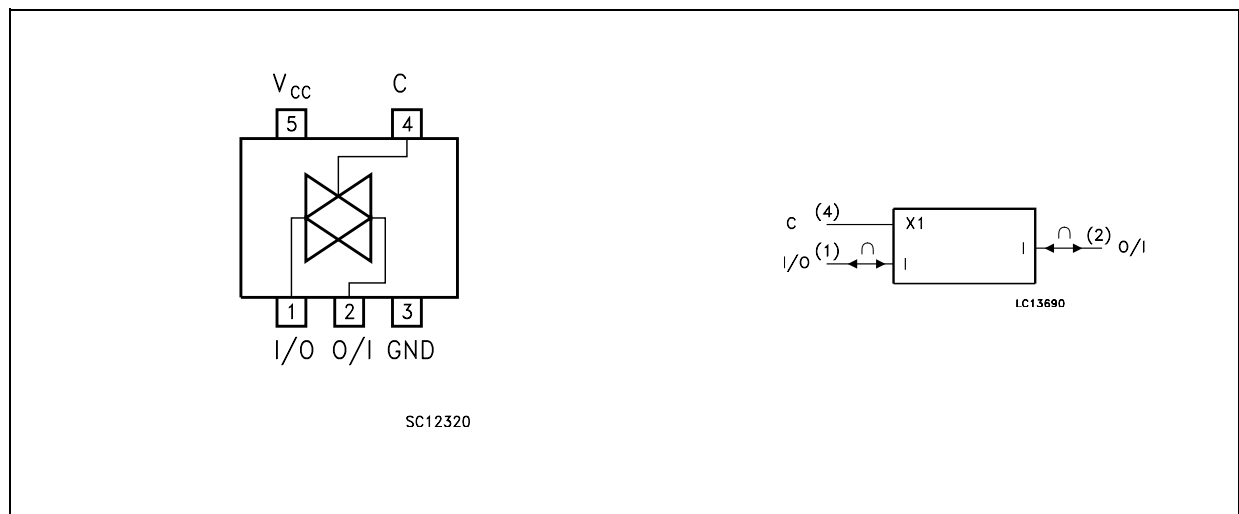


ORDER CODES

PACKAGE	T & R
SOT23-5L	74V1G66STR
SOT323-5L	74V1G66CTR

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 SOT23-5L and SC-70-5L 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



The logic diagram for the LC12380 shows the following components and connections:

- I/O**: Input signal line.
- O/I**: Output signal line.
- C_{IN}**: Input signal line.
- Logic Gates**:
 - A 3-input AND gate with inputs from **I/O**, **C_{IN}**, and an inverter of **I/O**. Its output is **O/I**.
 - A 3-input AND gate with inputs from **I/O**, **C_{IN}**, and an inverter of **C_{IN}**. Its output is **O/I**.
 - A 3-input AND gate with inputs from **I/O**, **C_{IN}**, and an inverter of **O/I**. Its output is **O/I**.
 - A 3-input AND gate with inputs from **I/O**, **C_{IN}**, and an inverter of **O/I**. Its output is **O/I**.
- Inverters**:
 - An inverter for **I/O** (input to the top AND gate).
 - An inverter for **C_{IN}** (input to the second AND gate).
 - An inverter for **O/I** (input to the third and fourth AND gates).

PIN N°	SYMBOL	NAME AND FUNCTION
1	I/O	Independent Input/Output
2	O/I	Independent Output/Input
4	C	Enable Input (Active HIGH)
3	GND	Ground (0V)
5	V _{CC}	Positive Supply Voltage

CONTROL	SWITCH FUNCTION
H	ON
L	OFF *

ABSOLUTE MAXIMUM RATINGS

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

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	2 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

2/11

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
		2.7 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
		2.7 to 5.5				0.3V _{CC}		0.3V _{CC}		0.3V _{CC}	
R _{ON}	ON Resistance	3.3 ^(*)	V _{IC} = V _{IH}		12.5	19		23		27	Ω
		5.0 ^(**)	V _{I/O} = V _{CC} to GND I _{I/O} ≤ 1mA		7.5	10		12		14	
R _{ON}	ON Resistance	3.3 ^(*)	V _{IC} = V _{IH}		8.5	10.5		12.5		15	Ω
		5.0 ^(**)	V _{I/O} = V _{CC} or GND I _{I/O} ≤ 1mA		6.5	8.5		10		12	
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		± 5	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 3.3V ± 0.3V

(**) 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	3.3 ^(*)	t _r = t _f = 6ns		0.4	0.8		1.2		2.4	ns
		5.0 ^(**)			0.3	0.6		1.0		2.0	
t _{PLZ} t _{PHZ}	Output Disable Time	3.3 ^(*)	R _L = 500 Ω		5.0	7.5		9.0		10.0	ns
		5.0 ^(**)			5.0	7.5		9.0		10.0	
t _{PZL} t _{PZH}	Output Enable Time	3.3 ^(*)	R _L = 1 KΩ		2.5	4.0		5.0		7.0	ns
		5.0 ^(**)			2.0	4.0		5.0		7.0	

(*) Voltage range is 3.3V ± 0.3V

(**) Voltage range is 5.0V ± 0.5V

CAPACITIVE CHARACTERISTICS

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.
C _{IN}	Input Capacitance				3	10		10		10	pF
C _{I/O}	Output Capacitance				10						pF
C _{PD}	Power Dissipation Capacitance (note 1)	3.3			2.5						pF
		5.0			3						

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. $I_{CC(opr)} = C_{PD} \times V_{CC} \times f_{IN} + I_{CC}$

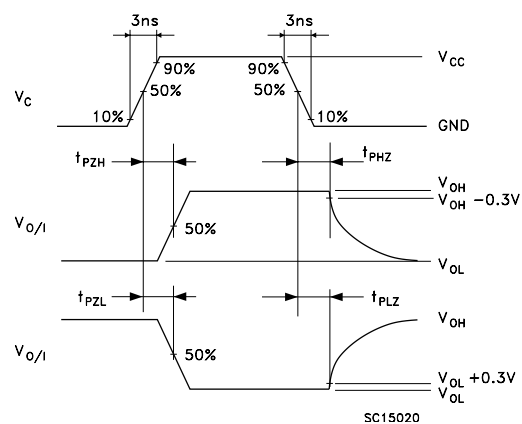
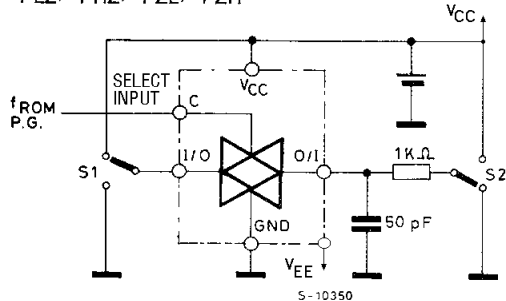
ANALOG SWITCH CHARACTERISTICS (GND = 0V; T_A = 25°C)

Symbol	Parameter	Test Condition			Value	Unit
		V _{CC} (V)	V _{IN} (V _{p-p})		Typ.	
	Sine Wave Distortion (THD)	3.3 ^(*)	2.75	f _{IN} = 1 KHz R _L = 10 KΩ, C _L = 50 pF	0.04	%
		5.0 ^(**)	4		0.04	
f _{MAX}	Frequency Response (Switch ON)	3.3 ^(*)	Adjust f _{IN} voltage to obtain 0 dBm at V _{OS} . Increase f _{IN} Frequency until dB meter reads -3dB R _L = 50Ω, C _L = 10 pF		150	MHz
		5.0 ^(**)			180	
	Feed through Attenuation (Switch OFF)	3.3 ^(*)	V _{IN} is centered at V _{CC} /2 Adjust f _{IN} Voltage to obtained 0dBm at V _{IS} R _L = 600Ω, C _L = 50 pF, f _{IN} = 1KHz sine wave		-60	dB
		5.0 ^(**)			-60	
	Crosstalk (Control Input to Signal Output)	3.3 ^(*)	R _L = 600Ω, C _L = 50 pF, f _{IN} = 1KHz square wave t _r = t _f = 6ns		60	mV
		5.0 ^(**)			60	

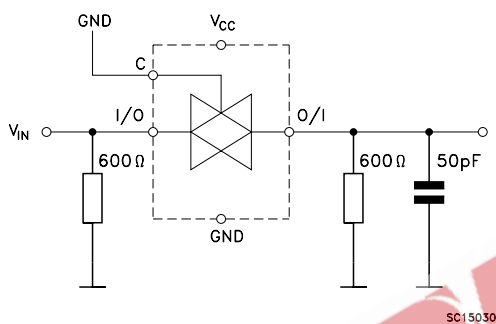
(*) Voltage range is 3.3V ± 0.3V

(**) Voltage range is 5.0V ± 0.5V

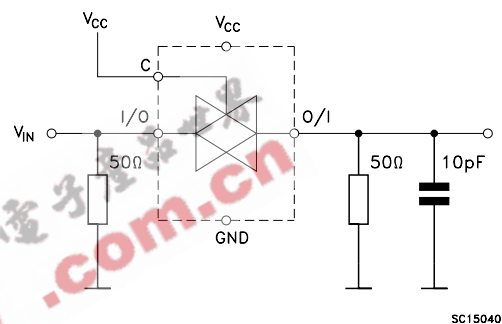
SWITCHING CHARACTERISTICS TEST CIRCUIT

 t_{PLZ} , t_{PHZ} , t_{PZL} , t_{PZH} 

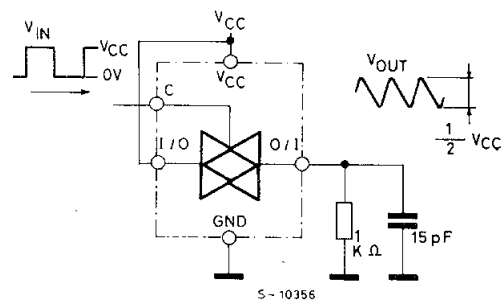
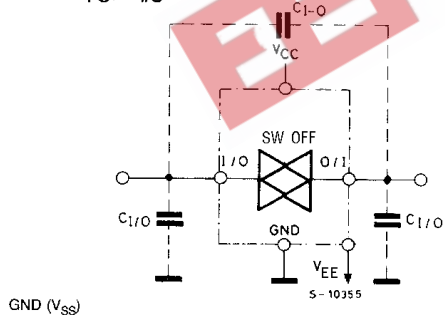
FEEDTHROUGH ATTENUATION



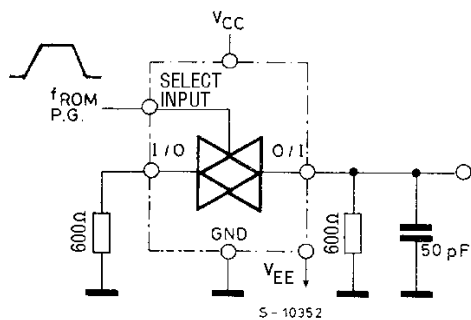
BANDWIDTH ATTENUATION

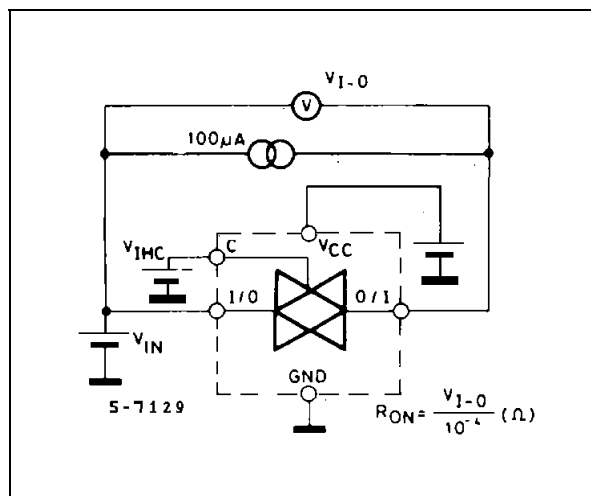
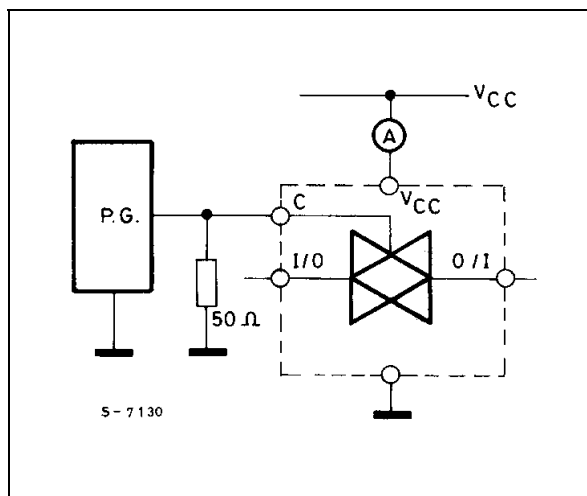


MAXIMUM CONTROL FREQUENCY

 $C_{I/O}$, $C_{I/O}$ 

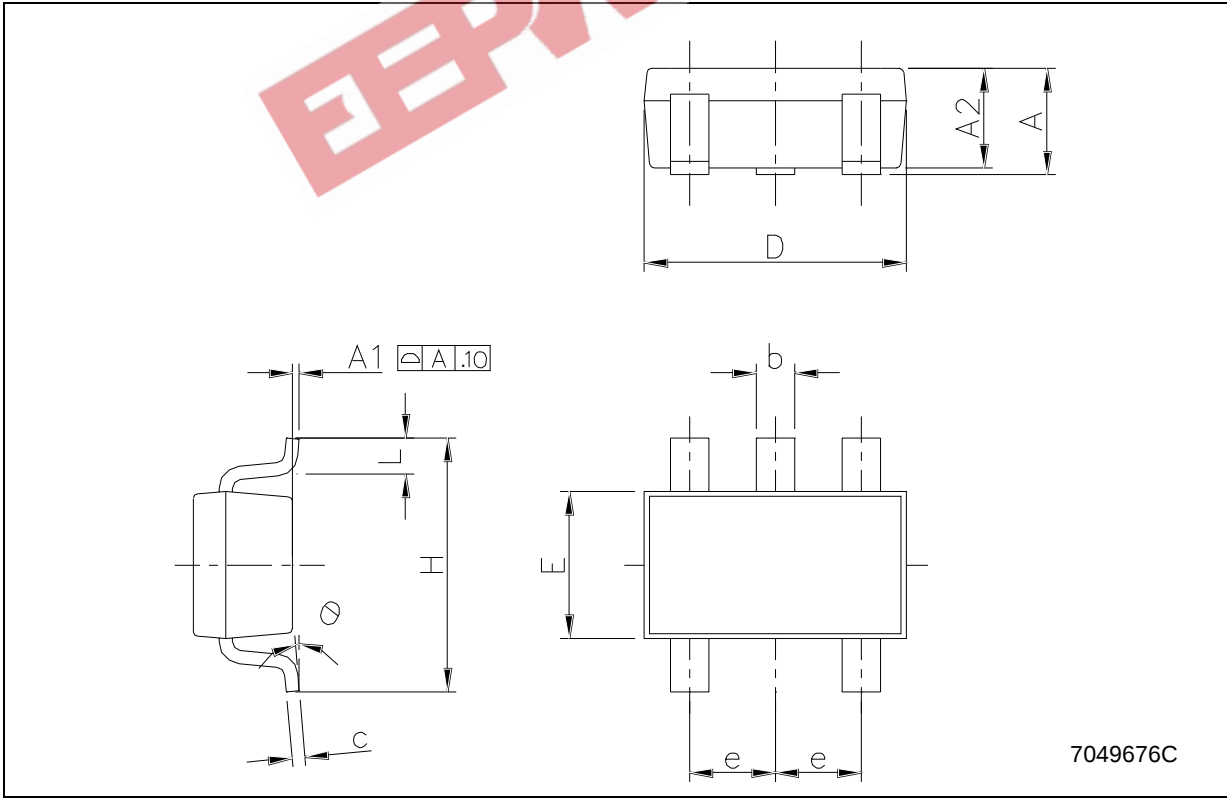
CROSSTALK (control to output)



CHANNEL RESISTANCE (R_{ON}) I_{CC} (Opr.)

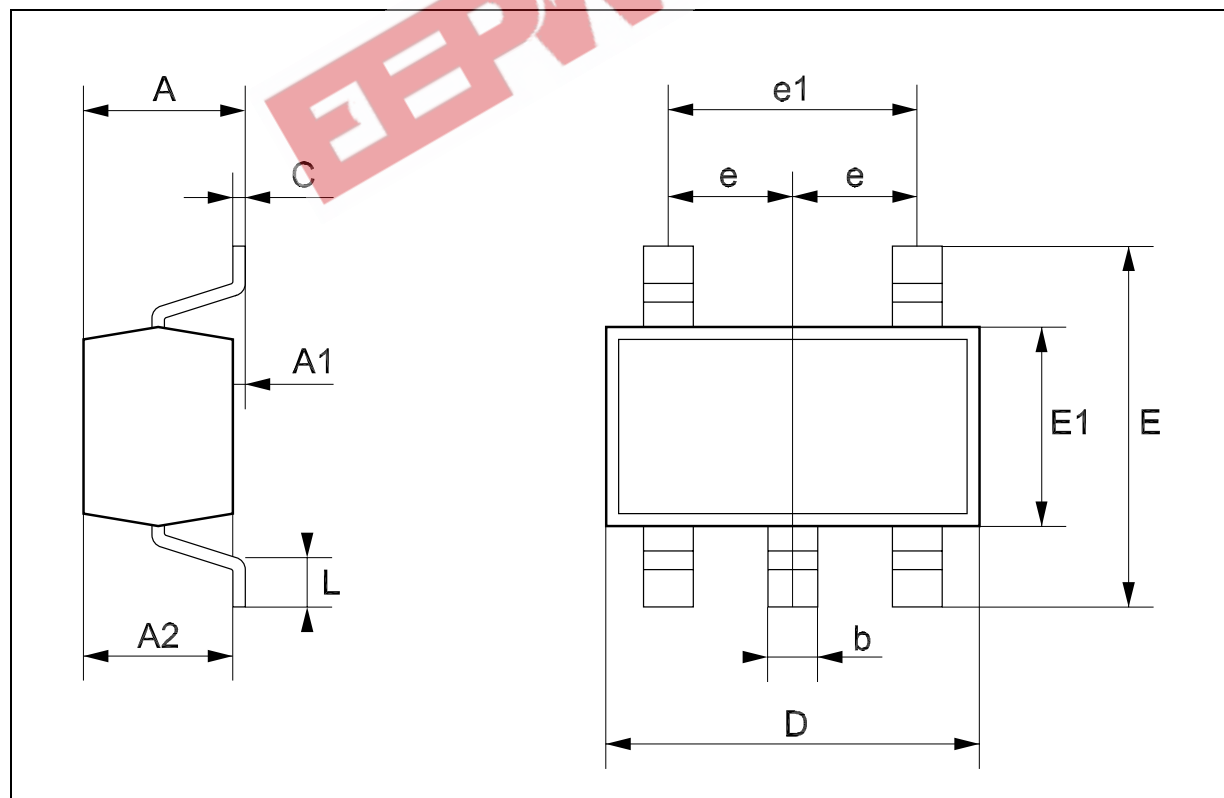
SOT23-5L MECHANICAL DATA

DIM.	mm.			mils		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	0.90		1.45	35.4		57.1
A1	0.00		0.10	0.0		3.9
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	1.50		1.75	59.0		68.8
e		0.95			37.4	
H	2.60		3.00	102.3		118.1
L	0.10		0.60	3.9		23.6



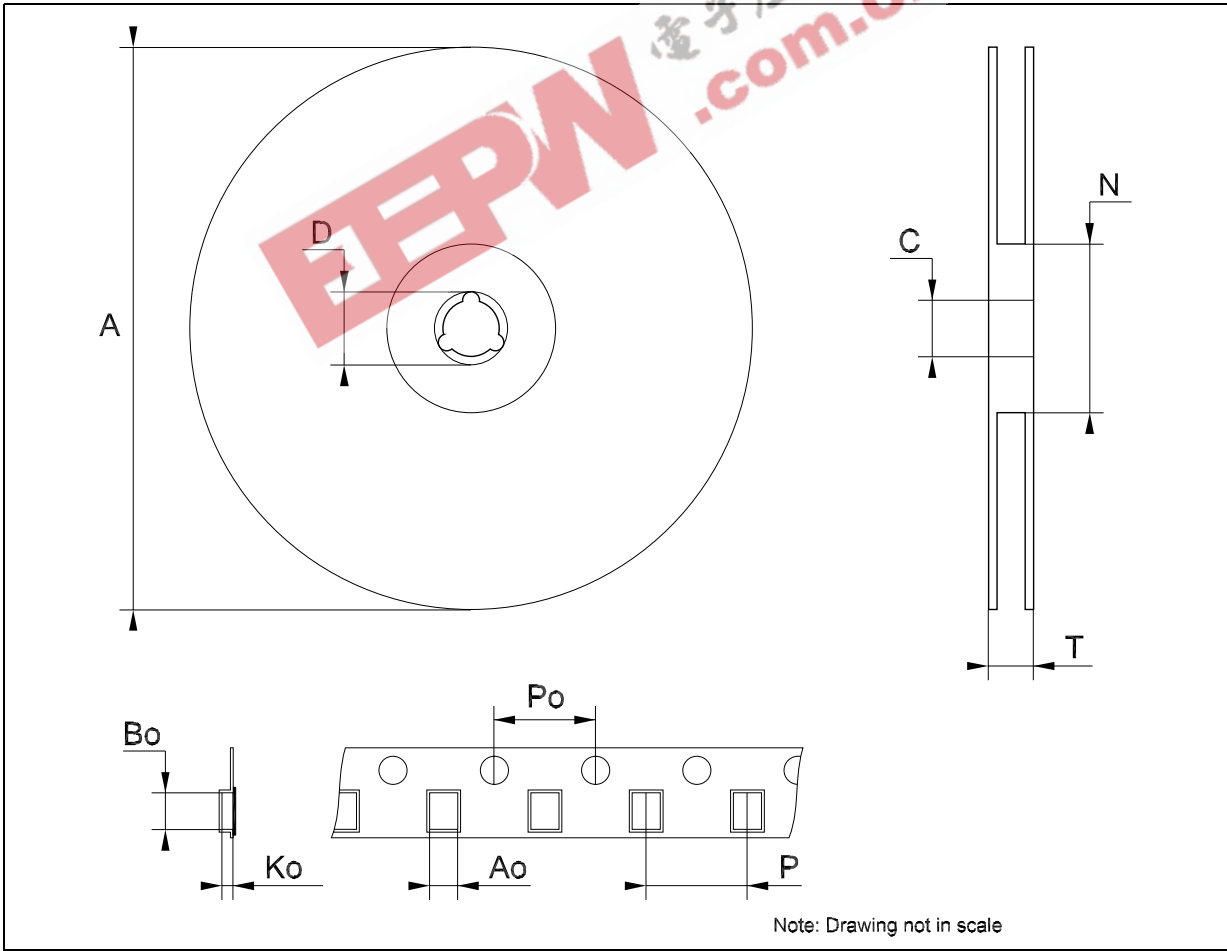
SOT323-5L MECHANICAL DATA

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
e		0.65			25.6	
e1		1.3			51.2	
L	0.10		0.30	3.9		11.8



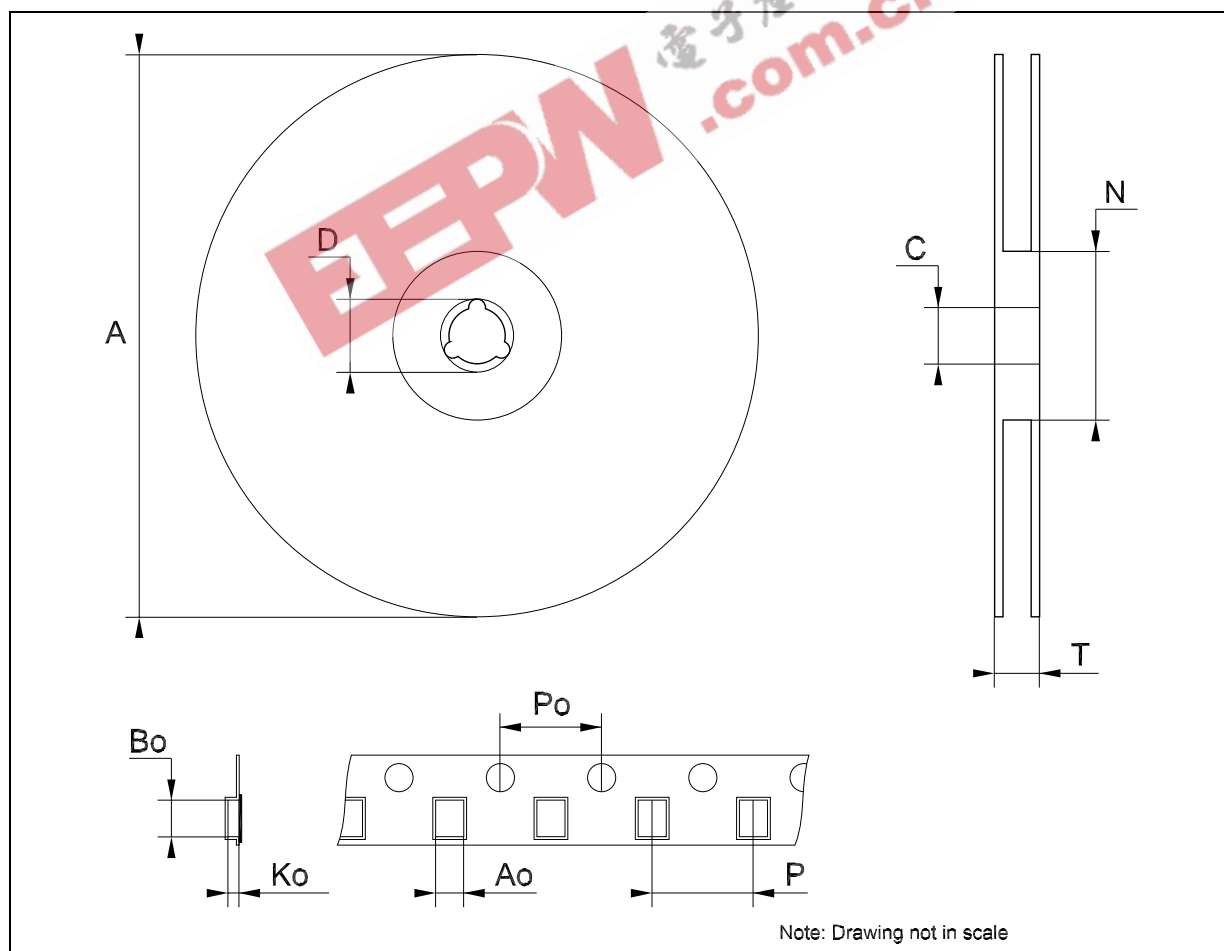
Tape & Reel SOT23-xL MECHANICAL DATA

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



Tape & Reel SOT323-xL MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	175	180	185	6.889	7.086	7.283
C	12.8	13	13.2	0.504	0.512	0.519
D	20.2			0.795		
N	59.5	60	60.5		2.362	
T			14.4			0.567
Ao		2.25			0.088	
Bo		2.7			0.106	
Ko		1.2			0.047	
Po	3.9	4	4.1	0.153	0.157	0.161
P	3.8	4	4.2	0.149	0.157	0.165



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