

## LOW VOLTAGE 4Ω SPDT 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:  
 $R_{ON} = 4\Omega$  (MAX.  $T_A = 25^\circ C$ ) AT  $V_{CC} = 5V$   
 $R_{ON} = 6\Omega$  (TYP.) AT  $V_{CC} = 3V$
- WIDE OPERATING VOLTAGE RANGE:  
 $V_{CC}$  (OPR) = 1.8V TO 5.5V SINGLE SUPPLY

### DESCRIPTION

The STG719 is an high-speed spdt CMOS SWITCH fabricated in silicon gate C<sup>2</sup>MOS technology. It designed to operate from 1.8V to 5.5V, making this device ideal fro prtable applications. It offers 4Ω ON-Resistance Max at 5V 25°C. Additional key faetures are fast switching speed ( $t_{ON} = 7ns$ ,  $t_{OFF} = 4.5ns$ ) and Low

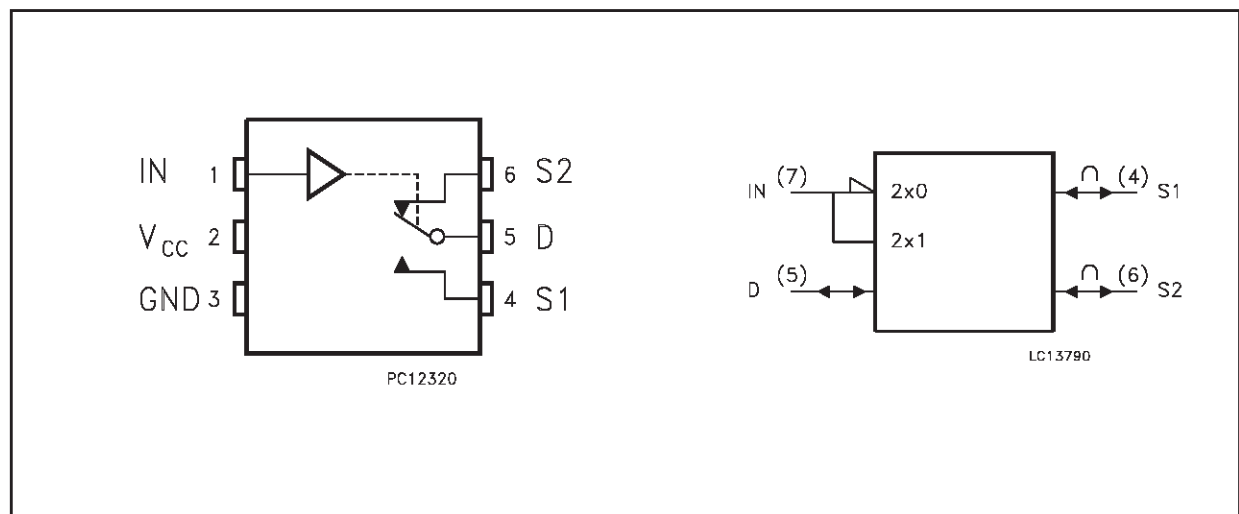


### ORDER CODES

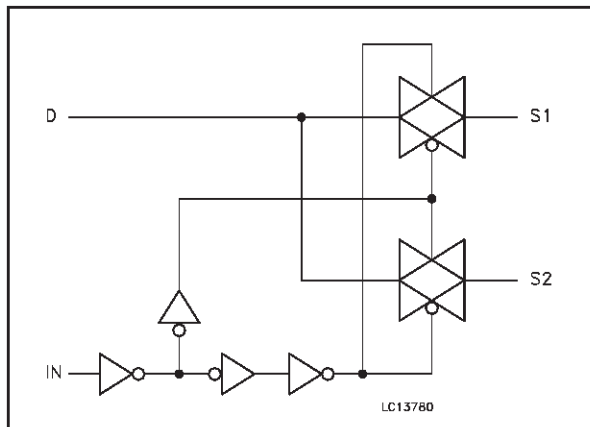
PACKAGE	T & R
SOT23-6L	STG719STR

Power Consumption (<0.001mW typ.). ESD immunity is higher than 1000V per method 3015.7 of MIL-STD-883B. It's available in the commercial temperature range.

### PIN CONNECTION AND IEC LOGIC SYMBOLS



**INPUT EQUIVALENT CIRCUIT**



**PIN DESCRIPTION**

PIN No	SYMBOL	NAME AND FUNCTION
1	IN	Control
4, 6	S1, S2	Independent Channel
5	D	Common Channel
3	V <sub>CC</sub>	Positive Supply Voltage
2	GND	Ground (0V)

**TRUTH TABLE**

CONTROL	SWITCH S1	SWITCH S2
L	ON	OFF
H	OFF	ON

**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Value	Unit
V <sub>CC</sub>	Supply Voltage	-0.5 to +7.0	V
V <sub>I</sub>	DC Input Voltage	-0.5 to V <sub>CC</sub> + 0.5	V
V <sub>IC</sub>	DC Control Input Voltage	-0.5 to V <sub>CC</sub> + 0.5	V
V <sub>O</sub>	DC Output Voltage	-0.5 to V <sub>CC</sub> + 0.5	V
I <sub>IK</sub>	DC Input Diode Current	± 20	mA
I <sub>OK</sub>	DC Output Diode Current	± 20	mA
I <sub>O</sub>	DC Output Current	± 50	mA
I <sub>CC</sub> or I <sub>GND</sub>	DC V <sub>CC</sub> or Ground Current	± 50	mA
T <sub>stg</sub>	Storage Temperature	-65 to +150	°C
T <sub>L</sub>	Lead Temperature (10 sec)	300	°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 <sub>CC</sub>	Supply Voltage (note 1)	1.8 to 5.5	V
V <sub>I</sub>	Input Voltage	0 to V <sub>CC</sub>	V
V <sub>IC</sub>	Control Input Voltage	0 to V <sub>CC</sub>	V
V <sub>O</sub>	Output Voltage	0 to V <sub>CC</sub>	V
T <sub>op</sub>	Operating Temperature	-55 to 125	°C
dt/dv	Input Rise and Fall Time (note 2)	0 to 10	ns/V

1) Truth Table guaranteed: 1.2V to 6V  
 2) V<sub>IN</sub> from 30% to 70% of V<sub>CC</sub>

## DC SPECIFICATION

Symbol	Parameter	Test Condition		Value						Unit	
		V <sub>CC</sub> (V)		T <sub>A</sub> = 25°C			-40 to 85°C		-55 to 125°C		
				Min.	Typ.	Max.	Min.	Max.	Min.		Max.
V <sub>IHC</sub>	High Level Control Input Voltage	3.3(*)		2.0			2.0		2.0		V
		5.0(**)		2.4			2.4		2.4		
V <sub>ILC</sub>	Low Level Control Input Voltage	3.3(*)				0.4		0.4		0.4	V
		5.0(**)				0.8		0.8		0.8	
R <sub>ON</sub>	ON Resistance	3.3(*)	V <sub>S</sub> = 0 to V <sub>CC</sub> I <sub>S</sub> = 10mA		6	7		10			Ω
		5.0(**)				4		5			
ΔR <sub>ON</sub>	ON Resistance	3.3(*)	V <sub>S</sub> = 0 to V <sub>CC</sub> I <sub>S</sub> = 10mA		0.1			0.4			Ω
		5.0(**)			0.1		0.4				
R <sub>FLATON</sub>	ON Resistance fLATNESS	3.3(*)	V <sub>S</sub> = 0 to V <sub>CC</sub> I <sub>S</sub> = 10mA		2.5						Ω
		5.0(**)			0.75						
I <sub>SOFF</sub>	Source OFF Leakage	3.3(*)	V <sub>S</sub> = 1V or V <sub>CC</sub> V <sub>DD</sub> = V <sub>CC</sub> or 1V V <sub>IN</sub> = V <sub>CC</sub> or GND		±0.01	±0.25		± 0.35		± 0.35	μA
		5.0(**)			±0.01	±0.25		± 0.35		± 0.35	
I <sub>SON</sub>	Channel ON Leakage	3.3(*)	V <sub>S</sub> = V <sub>D</sub> = 1V to V <sub>CC</sub> - 2.5V V <sub>IN</sub> = V <sub>IHC</sub>		±0.01	±0.25		± 0.35		± 0.35	μA
		5.0(**)			±0.01	±0.25		± 0.35		± 0.35	
I <sub>IN</sub>	Control Input Leakage Current	3.3(*)	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>		0.005			±0.1			μA
		5.0(**)			0.005		±0.1				
I <sub>CC</sub>	Quiescent Supply Current	3.3(*)	V <sub>I</sub> = V <sub>CC</sub> or GND		0.001	1		1			μA
		5.0(**)			0.001		1				

(\*) Voltage range is 3.3V ± 0.3V

(\*\*) Voltage range is 5V ± 0.5V

AC ELECTRICAL CHARACTERISTICS (C<sub>L</sub> = 35pF, R<sub>L</sub> = 300Ω)

Symbol	Parameter	Test Condition		Value						Unit	
		V <sub>CC</sub> (V)		T <sub>A</sub> = 25°C			-40 to 85°C		-55 to 125°C		
				Min.	Typ.	Max.	Min.	Max.	Min.		Max.
t <sub>PD</sub>	Delay Time	3.3(*)	V <sub>S</sub> = 3V square wave f = 1MHz t <sub>r</sub> = t <sub>f</sub> = 6ns		0.4	0.8		1.2			ns
		5.0(**)			0.3	0.6		1.0			
t <sub>ON</sub>	ON Channel Time	3.3(*)	V <sub>S</sub> = 2V		10			16			ns
		5.0(**)	V <sub>S</sub> = 3V		7			11			
t <sub>OFF</sub>	OFF Channel Time	3.3(*)	V <sub>S</sub> = 2V		5.5			7			ns
		5.0(**)	V <sub>S</sub> = 3V		4.5			6			
t <sub>D</sub>	Break Before Make Time Delay	3.3(*)	V <sub>S</sub> = 2V	1	4						ns
		5.0(**)	V <sub>S</sub> = 3V	1	4						
C <sub>SOFF</sub>	OFF Channel Capacitance										pF
C <sub>SON</sub>	ON Channel Capacitance										pF

(\*) Voltage range is 3.3V ± 0.3V

(\*\*) Voltage range is 5.0V ± 0.5V



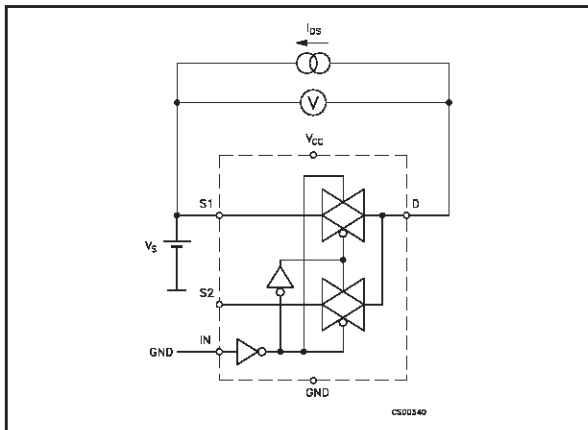
**ANALOG SWITCH CHARACTERISTICS (GND = 0V; T<sub>A</sub> = 25°C)**

Symbol	Parameter	Test Condition		Value	Unit
		V <sub>CC</sub> (V)		Typ.	
f <sub>MAX</sub>	Frequency Response (Switch ON)	3.3 <sup>(*)</sup>	Bandwidth at -3dB	200	MHz
		5.0 <sup>(**)</sup>		200	
	Feedthrough Attenuation (Switch OFF)	3.3 <sup>(*)</sup>	f <sub>IN</sub> = 10MHz sine wave	-40	dB
		3.3 <sup>(*)</sup>	f <sub>IN</sub> = 1MHz sine wave	-74	
		5.0 <sup>(**)</sup>	f <sub>IN</sub> = 10MHz sine wave	-40	
		5.0 <sup>(**)</sup>	f <sub>IN</sub> = 1MHz sine wave	-74	
	Crosstalk (Channel to Chabbel)	3.3 <sup>(*)</sup>	f <sub>IN</sub> = 10MHz sine wave	-39	dB
		3.3 <sup>(*)</sup>	f <sub>IN</sub> = 1MHz sine wave	-52	
		5.0 <sup>(**)</sup>	f <sub>IN</sub> = 10MHz sine wave	-39	
		5.0 <sup>(**)</sup>	f <sub>IN</sub> = 1MHz sine wave	-52	

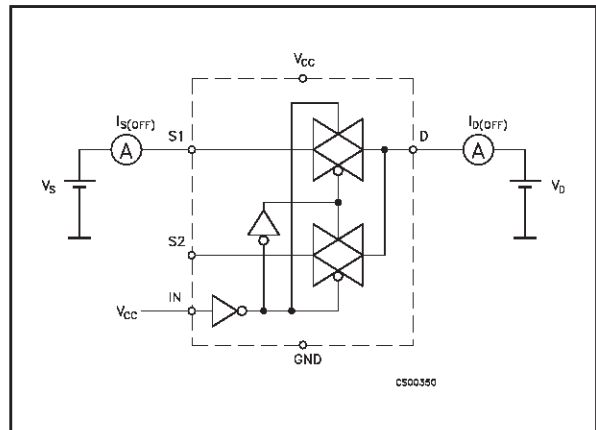
(\*)Voltage range is 3.3V ± 0.3V  
 (\*\*) Voltage range is 5.0V ± 0.5V

**TEST CIRCUITS**

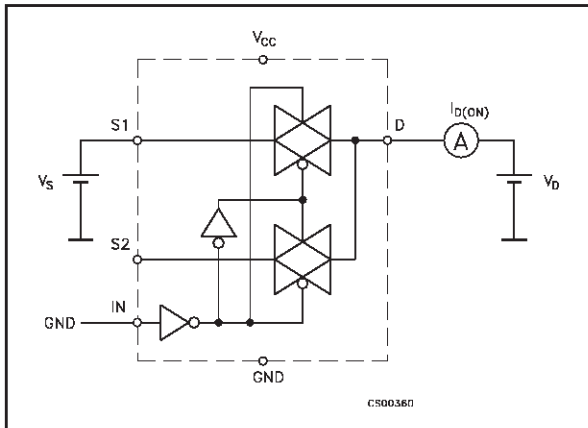
**ON RESISTANCE**



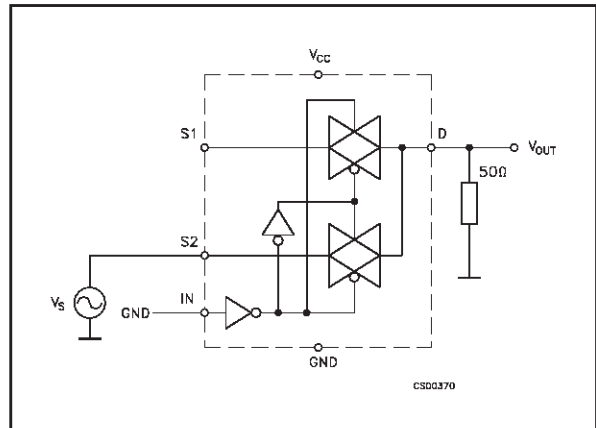
**OFF LEAKAGE**



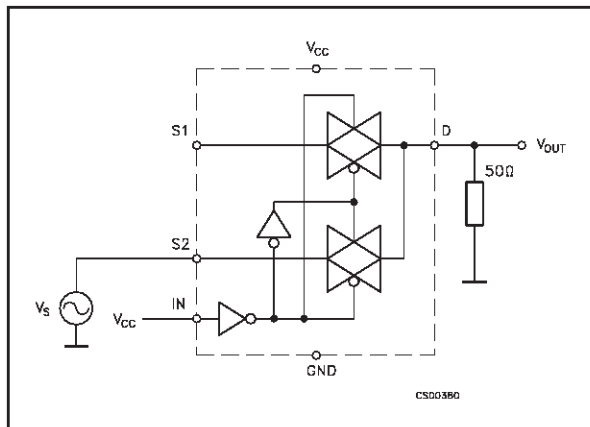
**ON LEAKAGE**



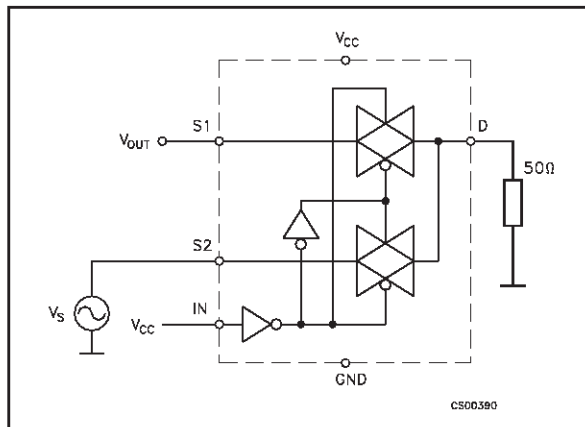
**OFF ISOLATION**



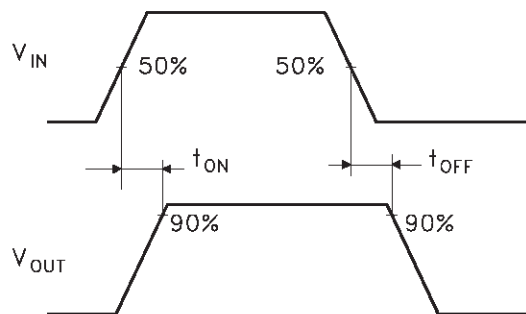
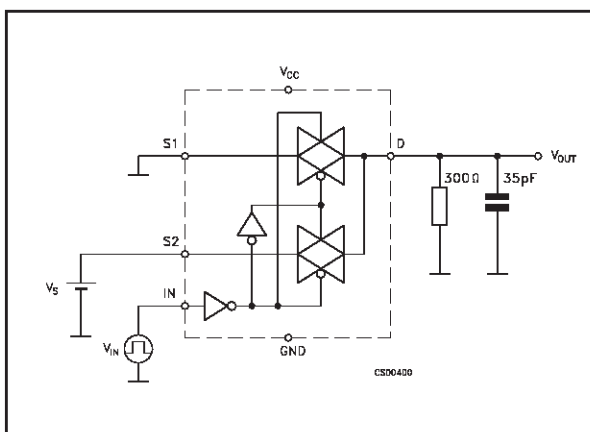
**BANDWIDTH**



**CHANNEL TO CHANNEL CROSSTALK**

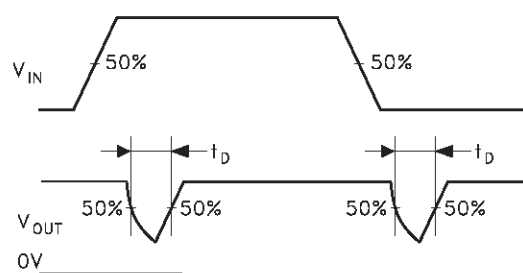
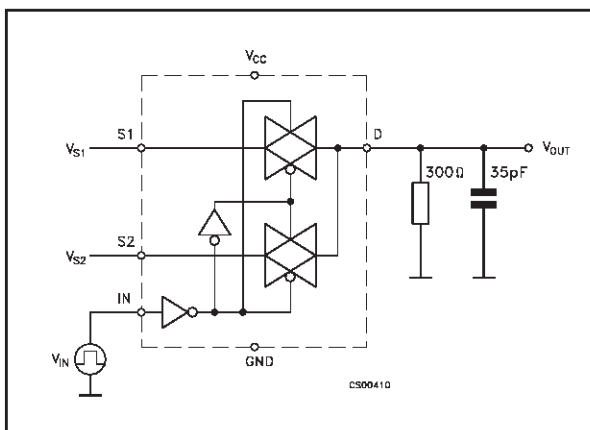


**SWITCHING TIMES**



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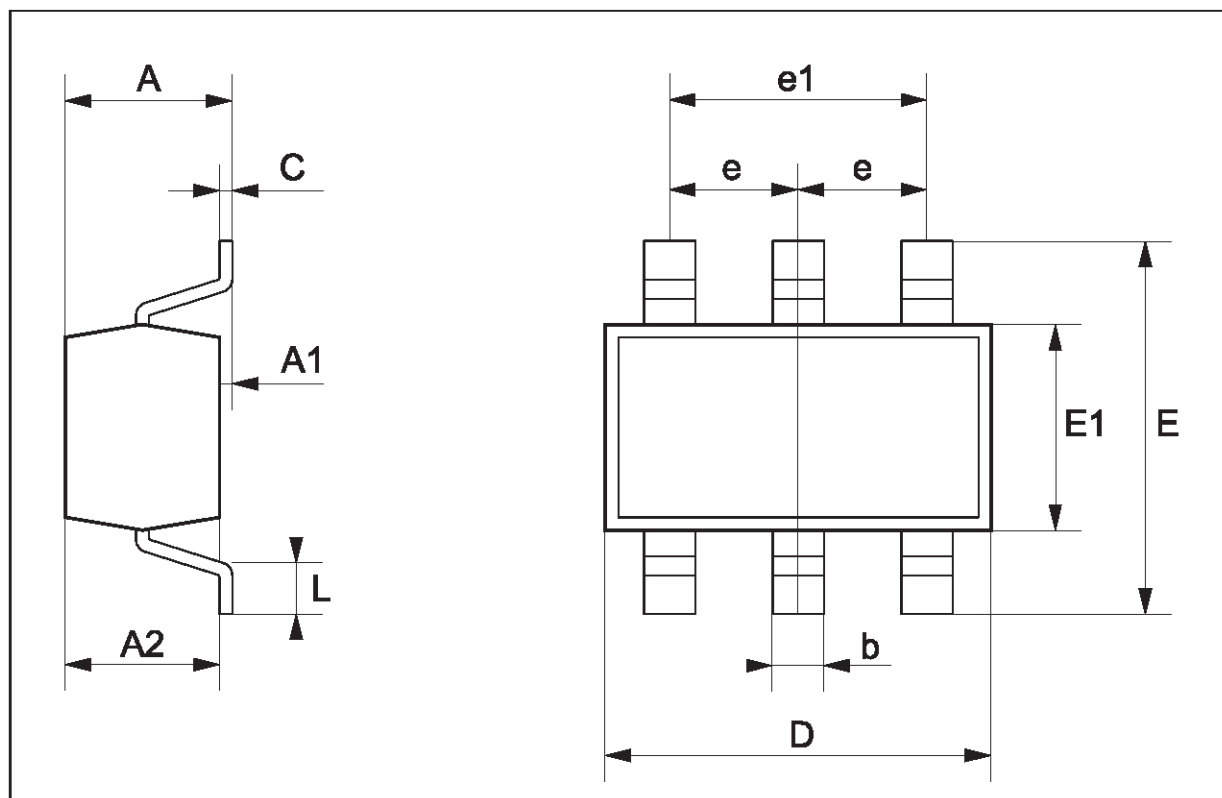
**BREAK BEFORE MAKE TIME DLEAY**



CS00430

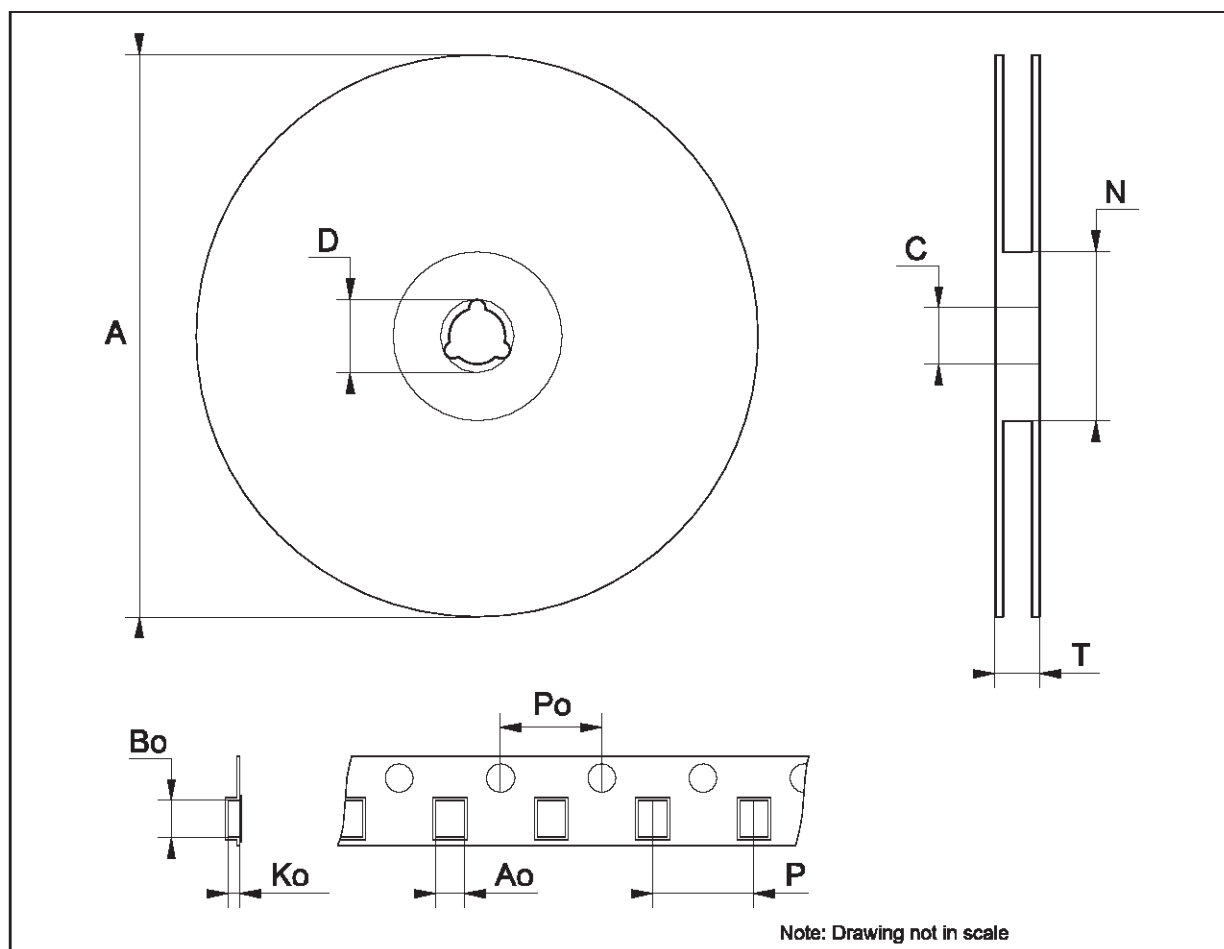
## SOT23-6L MECHANICAL DATA

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
e		0.95			37.4	
e1		1.9			74.8	
L	0.35		0.55	13.7		21.6



## Tape &amp; 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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