



74V2T66

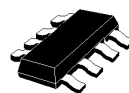
DUAL BILATERAL SWITCH

- 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 C^2MOS 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



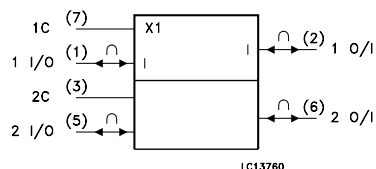
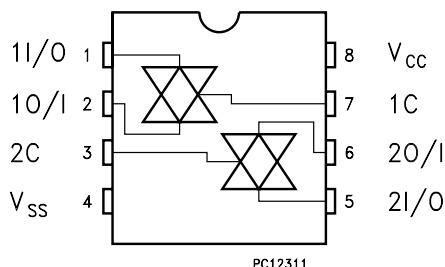
SOT23-8L

ORDER CODES

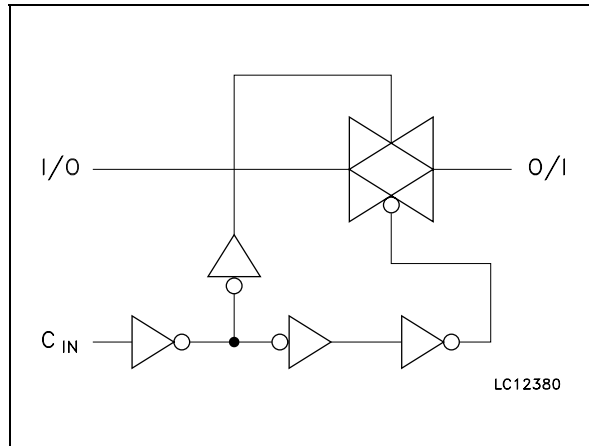
PACKAGE	T & R
SOT23-8L	74V2T66STR

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	

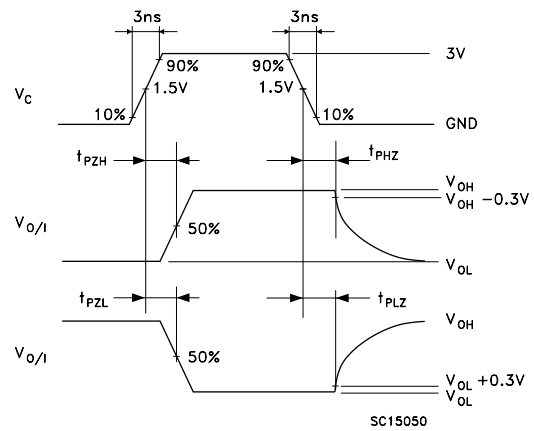
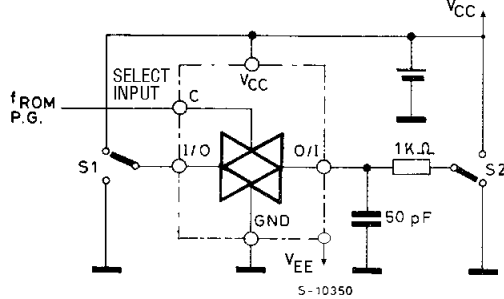
1) C_{PD} is defined as the value of the IC's internal equivalent capacitance which is calculated from the operating current consumption without load. (Refer to Test Circuit). Average operating current can be obtained by the following equation. $I_{CC(opr)} = C_{PD} \times V_{CC} \times f_{IN} + I_{CC}/2$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

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

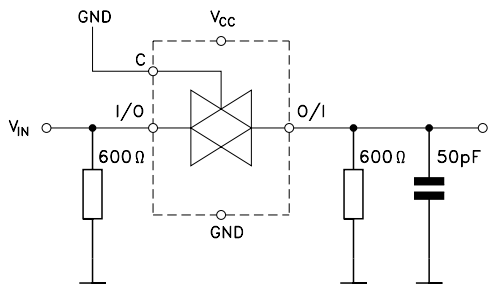
Symbol	Parameter	Test Condition			Value	Unit
		V_{CC} (V)	V_{IN} (V _{p-p})		Typ.	
	Sine Wave Distortion (THD)	5.0(*)	4	$f_{IN} = 1 \text{ KHz}$, $R_L = 10 \text{ K}\Omega$, $C_L = 50 \text{ pF}$	0.04	%
f_{MAX}	Frequency Response (Switch ON)	5.0(*)		Adjust f_{IN} voltage to obtain 0 dBm at V_{OS} . Increase 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 $t_r = t_f = 2.0\text{ns}$	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

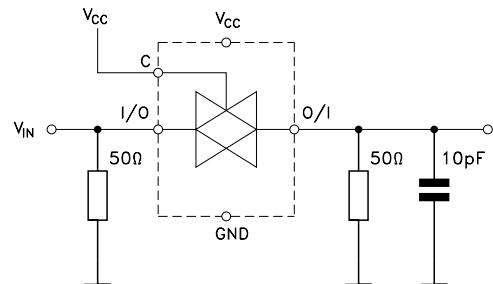
 t_{PLZ} , t_{PHZ} , t_{PZL} , t_{PZH} 

FEEDTHROUGH ATTENUATION



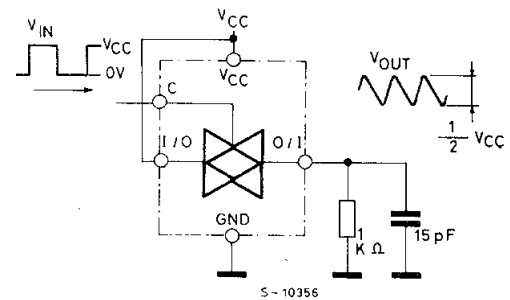
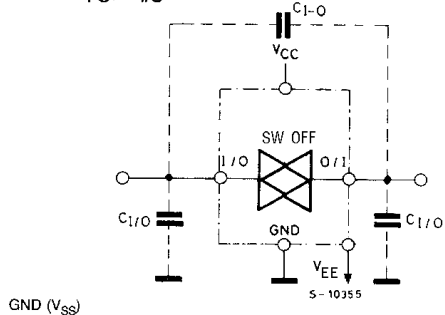
SC15030

BANDWIDTH ATTENUATION

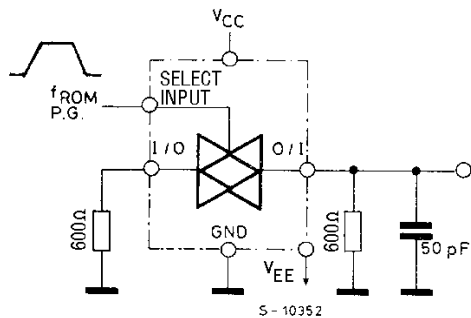


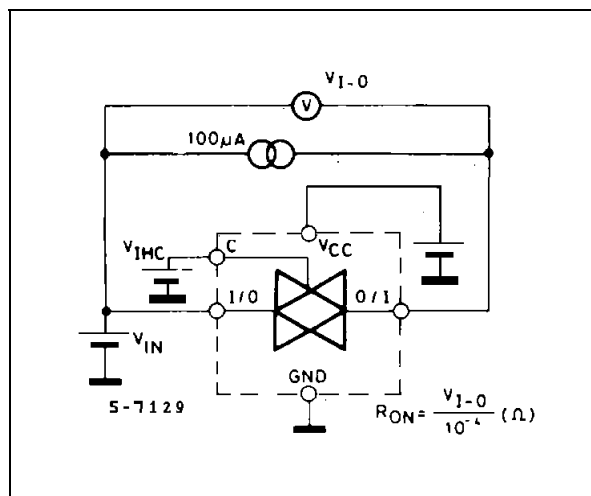
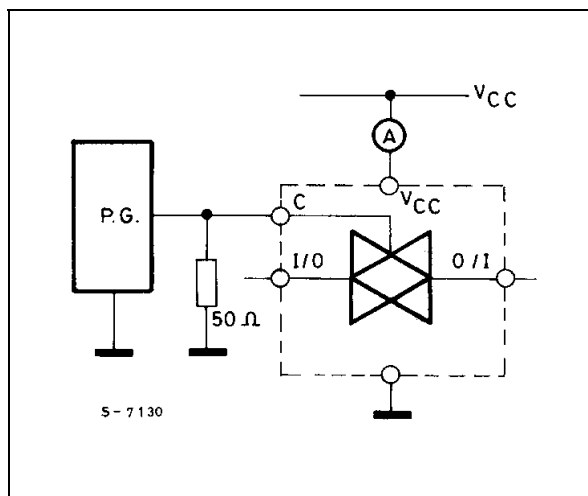
SC15040

MAXIMUM CONTROL FREQUENCY

 $C_{I/O}$, $C_{I/O}$ GND (V_{SS})

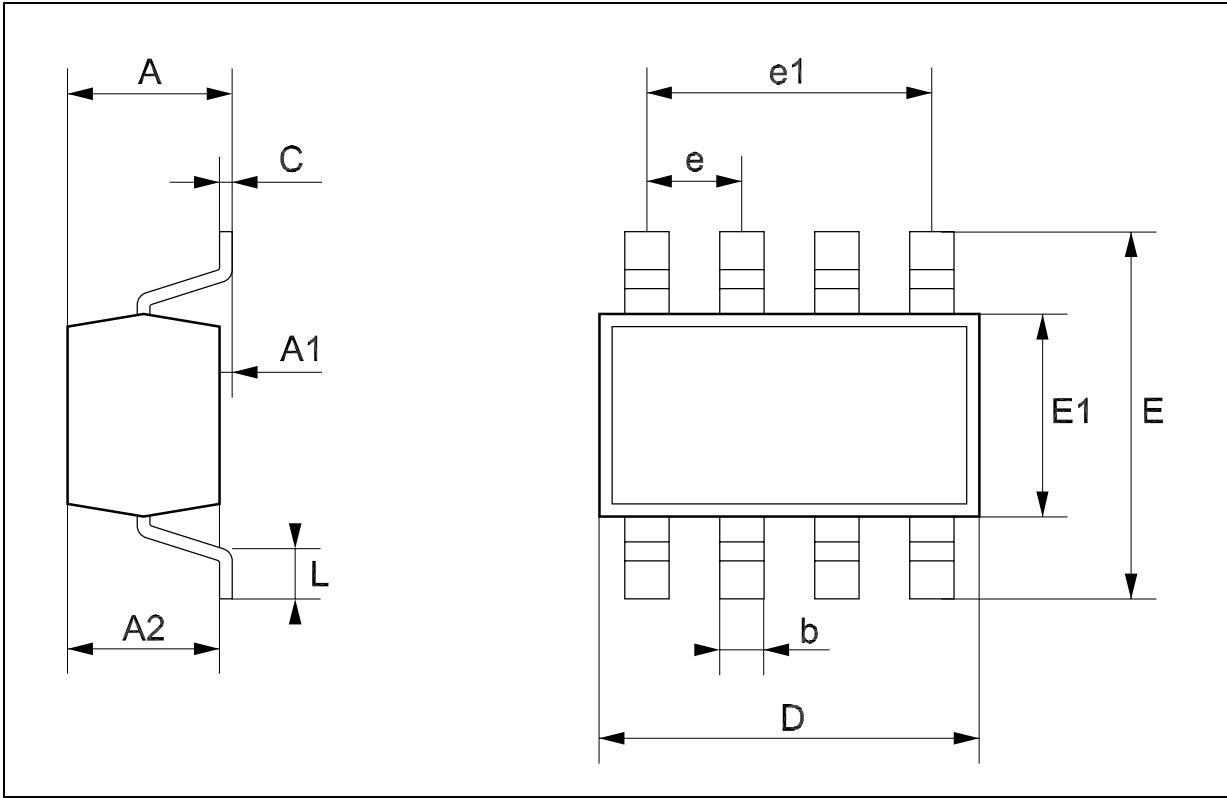
CROSSTALK (control to output)



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

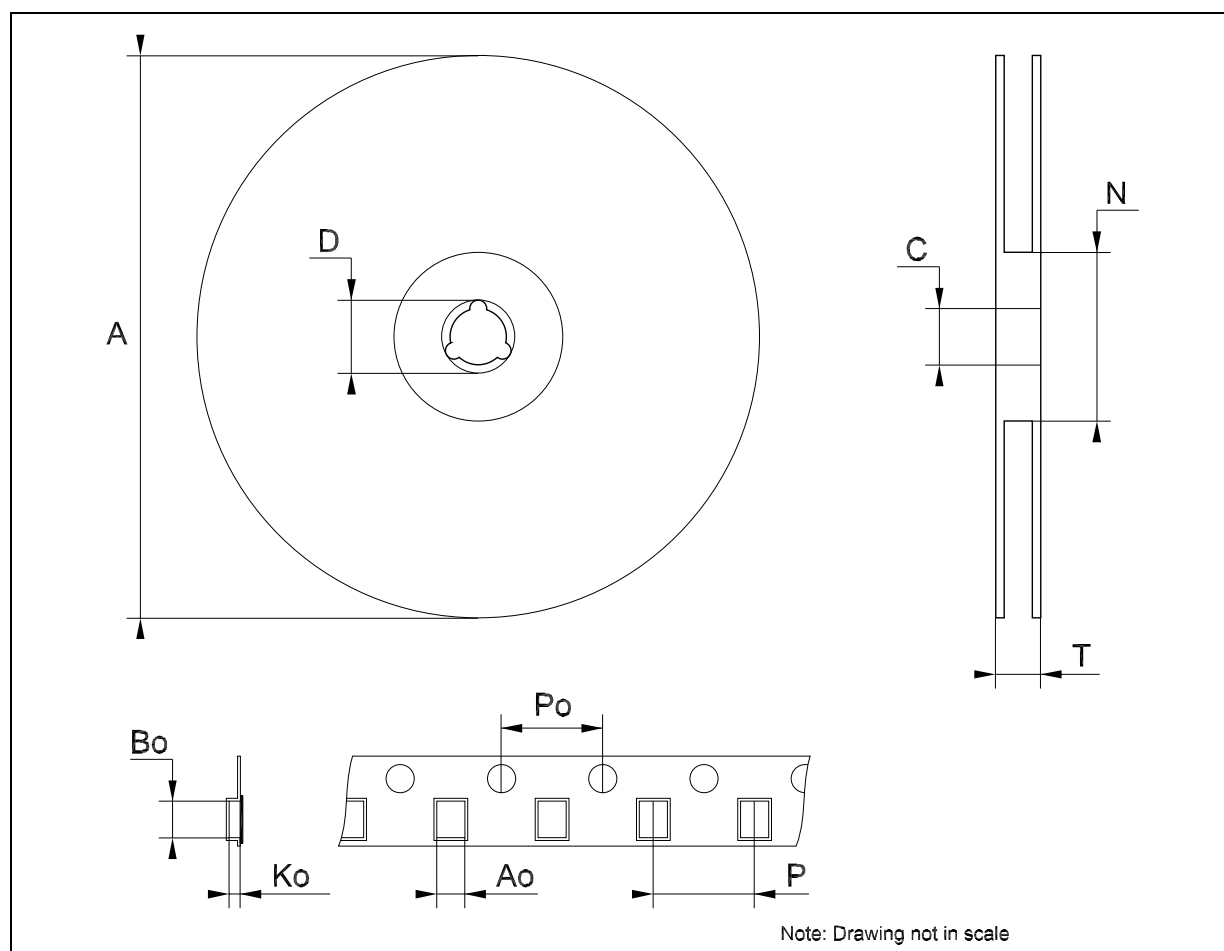
SOT23-8L MECHANICAL DATA

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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