74V1T70

SINGLE BUFFER

PRELIMINARY DATA

- HIGH SPEED: t_{PD} = 5.5 ns (TYP.) at V_{CC} = 5V
- LOW POWER DISSIPATION: I_{CC} = 1 µA (MAX.) at T_A = 25 °C
- COMPATIBLE WITH TTL OUTPUTS: V_{IH} = 2V (MIN), V_{IL} = 0.8V (MAX)
- POWER DOWN PROTECTION ON INPUT
- SYMMETRICAL OUTPUT IMPEDANCE: $|I_{OH}| = I_{OL}$ = 8 mA (MIN)
- BALANCED PROPAGATION DELAYS: $t_{PLH} \cong t_{PHL}$
- OPERATING VOLTAGE RANGE: V_{CC} (OPR) = 4.5V to 5.5V
- IMPROVED LATCH-UP IMMUNITY

S
(SOT23-5L)

C
(SC-70)

ORDER CODE:

74V1T70S 74V1T70C

DESCRIPTION

The 74V1T70 is an advanced high-speed CMOS SINGLE BUFFER fabricated with sub-micron silicon gate and double-layer metal wiring C^2MOS technology.

The internal circuit is composed of 2 stages including buffer output, which provide high noise immunity and stable output.

Power down protection is provided on input and 0 to 7V can be accepted on input with no regard to the supply voltage. This device can be used to interface 5V to 3V.

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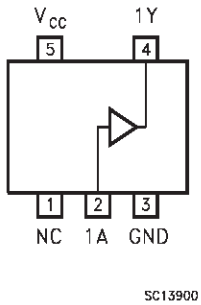
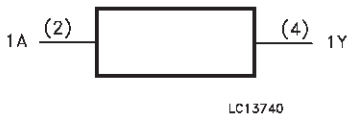
PIN CONNECTION AND IEC LOGIC SYMBOLS

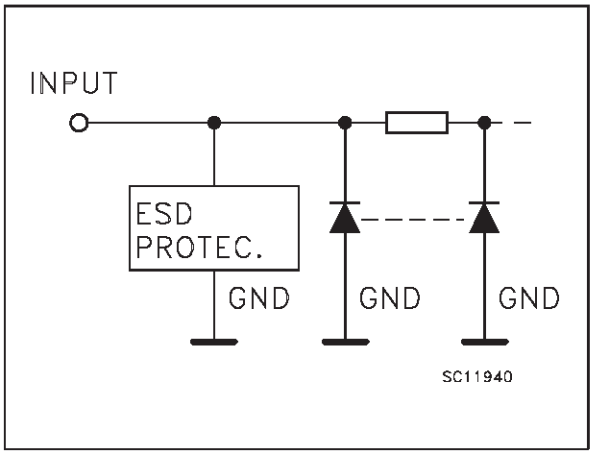


SC13900



LC13740

INPUT EQUIVALENT CIRCUIT



PIN DESCRIPTION

PIN No	SYMBOL	NAME AND FUNCTION
1	N.C.	Not Connected
2	1A	Data Input
4	1Y	Data Output
3	GND	Ground (0V)
5	V_{CC}	Positive Supply Voltage

TRUTH TABLE

A	Y
L	L
H	H

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	-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 condition 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 5.5	V
V_O	Output Voltage	0 to V_{CC}	V
T_{op}	Operating Temperature	-40 to +85	°C
dt/dv	Input Rise and Fall Time (see note 1) (V_{CC} = 5.0 ± 0.5V)	0 to 20	ns/V

1)V_{IN} from 0.8V to 2 V

DC SPECIFICATIONS

Symbol	Parameter	Test Conditions		Value					Unit
		V_{CC} (V)		T_A = 25 °C			-40 to 85 °C		
				Min.	Typ.	Max.	Min.	Max.	
V_{IH}	High Level Input Voltage	4.5 to 5.5		2			2		V
V_{IL}	Low Level Input Voltage	4.5 to 5.5				0.8		0.8	V
V_{OH}	High Level Output Voltage	4.5	I_O=-50 µA	4.4	4.5		4.4		V
		4.5	I_O=-8 mA	3.94			3.8		
V_{OL}	Low Level Output Voltage	4.5	I_O=50 µA		0.0	0.1		0.1	V
		4.5	I_O=8 mA			0.36		0.44	
I_I	Input Leakage Current	0 to 5.5	V_I = 5.5V or GND			±0.1		±1.0	µA
I_{CC}	Quiescent Supply Current	5.5	V_I = V_{CC} or GND			1		10	µA
ΔI_{CC}	Additional Worst Case Supply Current	5.5	One Input at 3.4V, other input at V_{CC} or GND			1.35		1.5	mA

AC ELECTRICAL CHARACTERISTICS (Input t_r = t_f =3 ns)

Symbol	Parameter	Test Condition			Value				Unit
		V_{CC} (*) (V)	C_L (pF)		T_A = 25 °C			-40 to 85 °C	
					Min.	Typ.	Max.	Min.	Max.	
t_{PLH} t_{PHL}	Propagation Delay Time	5.0	15			4.7	6.7	1.0	7.5	ns
		5.0	50			5.5	7.7	1.0	8.5	

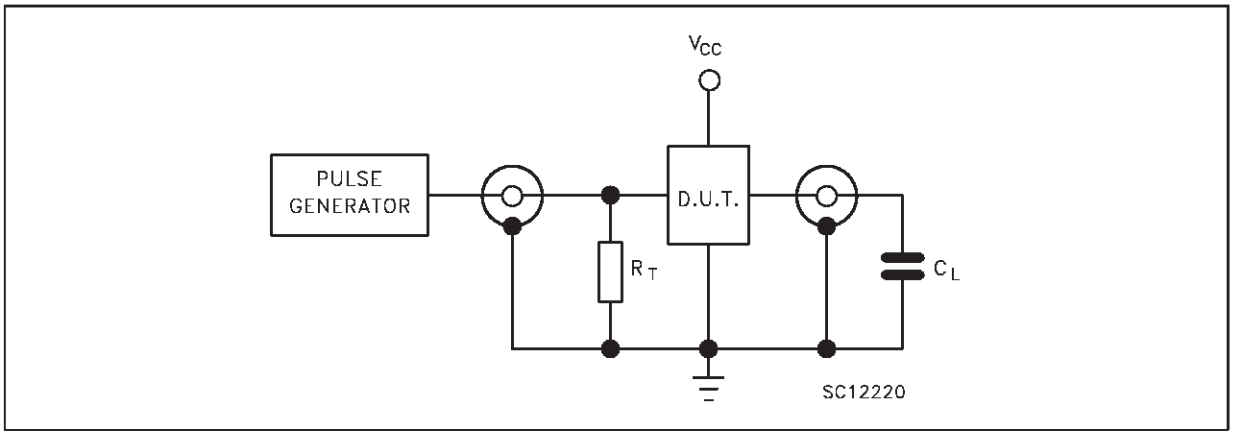
(*) Voltage range is 5V ± 0.5V

CAPACITIVE CHARACTERISTICS

Symbol	Parameter	Test Conditions	Value					Unit
			T_A = 25 °C			-40 to 85 °C		
			Min.	Typ.	Max.	Min.	Max.	
C_{IN}	Input Capacitance			4	10		10	pF
C_{PD}	Power Dissipation Capacitance (note 1)			11				pF

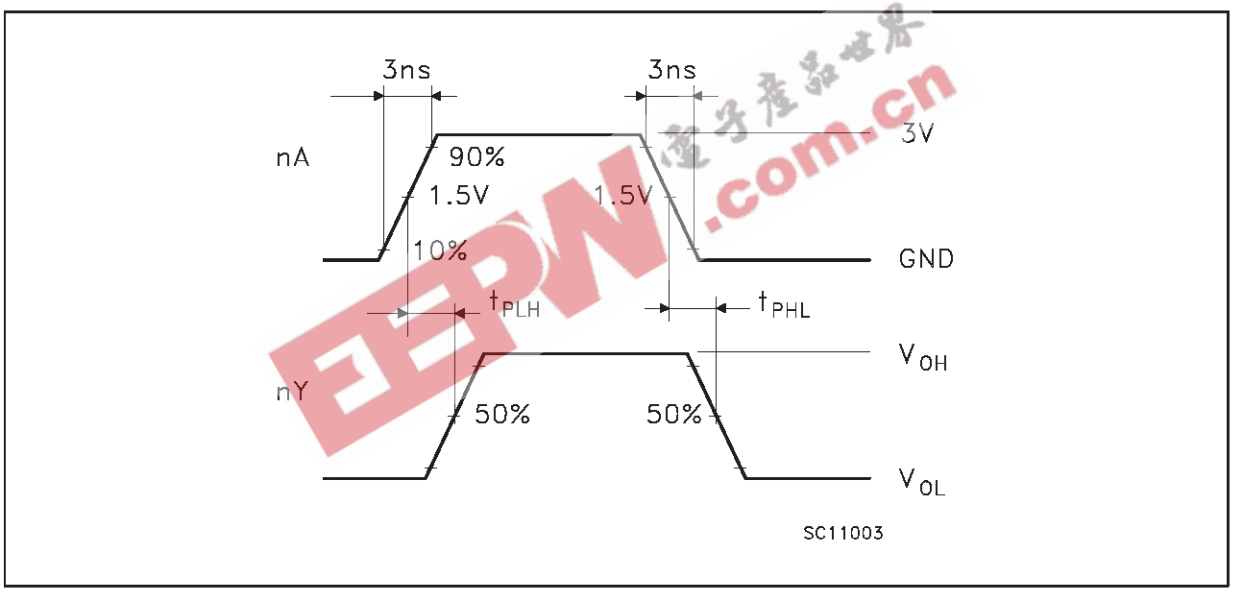
1) C_{PD} is defined as the value of the IC's internal equivalent capacitance which is calculated from the operating current consumption without load. (Refer to Test Circuit). Average operating current can be obtained by the following equation. $I_{CC}(opr) = C_{PD} \bullet V_{CC} \bullet f_{IN} + I_{CC}$

TEST CIRCUIT



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

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



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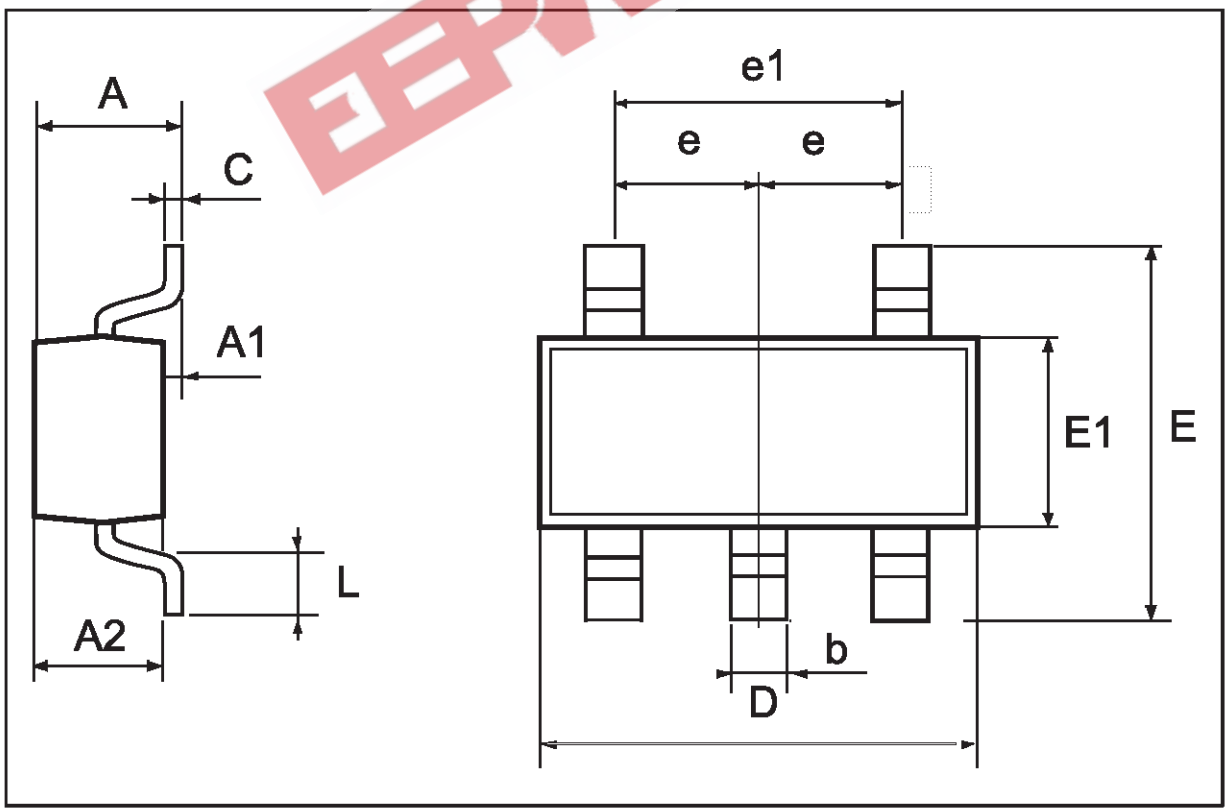
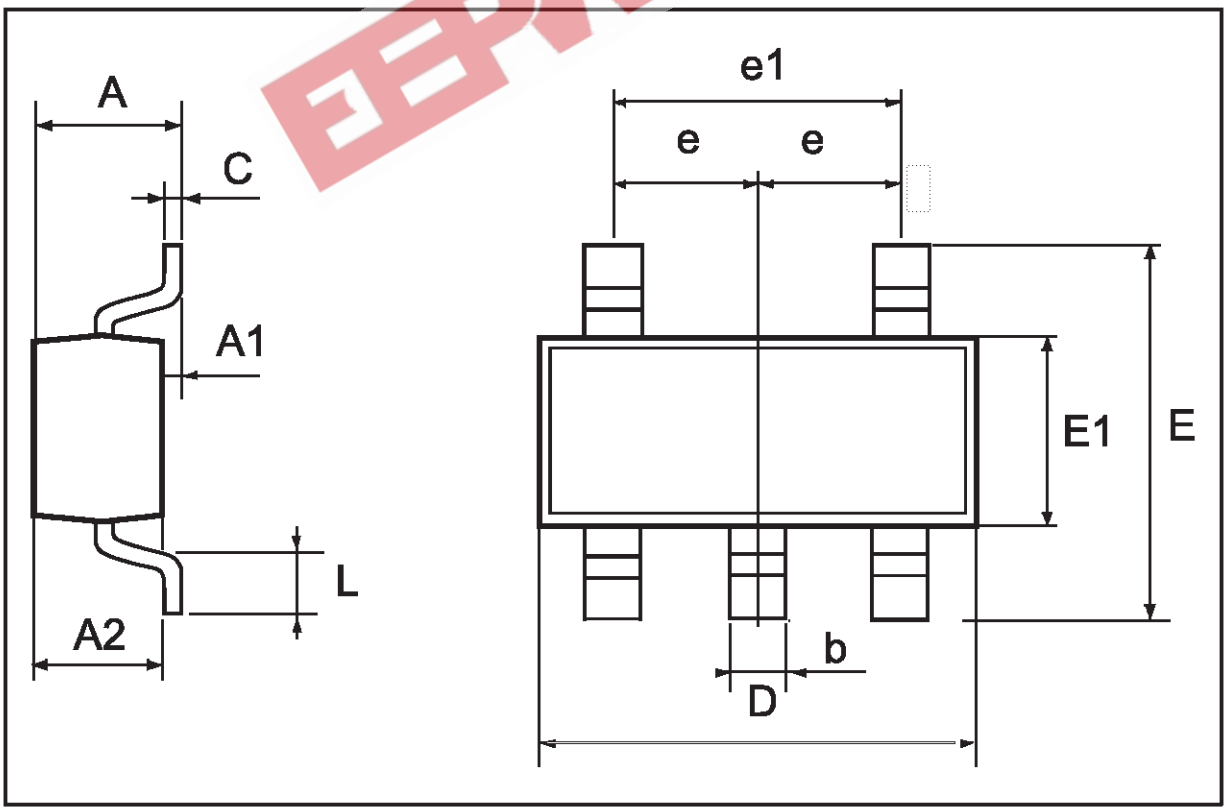
SOT23-5L MECHANICAL DATA

DIM.	mm			mils		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	0.90		1.45	35.4		57.1
A1	0.00		0.15	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
L	0.35		0.55	13.7		21.6
e		0.95			37.4	
e1		1.9			74.8	



SC-70 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
L	0.10		0.30	3.9		11.8
e		0.65			25.6	
e1		1.3			51.2	



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