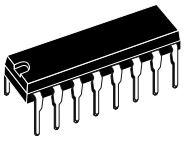
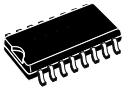
HCF4532B

8-BIT PRIORITY ENCODER

- CONVERTS FROM 1 TO 8 TO INPUTS BINARY
- PROVIDES CASCADING FEATURE TO HANDLE ANY NUMBER OF INPUTS
- GROUP SELECT INDICATES ONE OR MORE PRIORITY INPUTS
- QUIESCENT CURRENT SPECIFIED UP TO 20V
- STANDARDIZED SYMMETRICAL OUTPUT CHARACTERISTICS
- 5V, 10V AND 15V PARAMETRIC RATINGS
- INPUT LEAKAGE CURRENT I_I = 100nA (MAX) AT V_{DD} = 18V T_A = 25°C
- 100% TESTED FOR QUIESCENT CURRENT
- MEETS ALL REQUIREMENTS OF JEDEC JESD13B "STANDARD SPECIFICATIONS FOR DESCRIPTION OF B SERIES CMOS DEVICES"



DIP



SOP

ORDER CODES

PACKAGE	TUBE	T & R
DIP	HCF4532BEY	
SOP	HCF4532BM1	HCF4532M013TR

DESCRIPTION

HCF4532B is a monolithic integrated circuit fabricated in Metal Oxide Semiconductor technology available in DIP and SOP packages.
HCF4532B consists of a combinational logic that encodes the highest priority input (D7-D0) to a 3-bit binary code. The eight inputs, D7 through D0, each have an assigned priority. D7 is the highest priority and D0 is the lowest. The priority encoder is inhibited when the chip enable input E_I is low. When E_I is high, the binary representation of the highest priority input appears on output lines Q2-Q0, and the group select line GS is high to indicate that priority inputs are present. The enable out (E_O) is high when no priority inputs are present. If any input is high, E_O is low and all cascaded lower order stages are disabled.

PIN CONNECTION

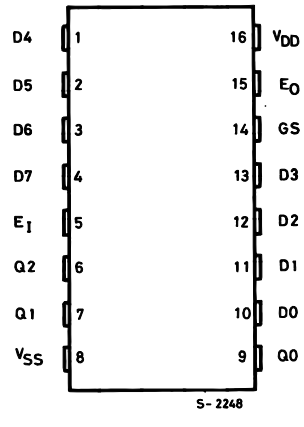


Figure 1: Input Equivalent Circuit

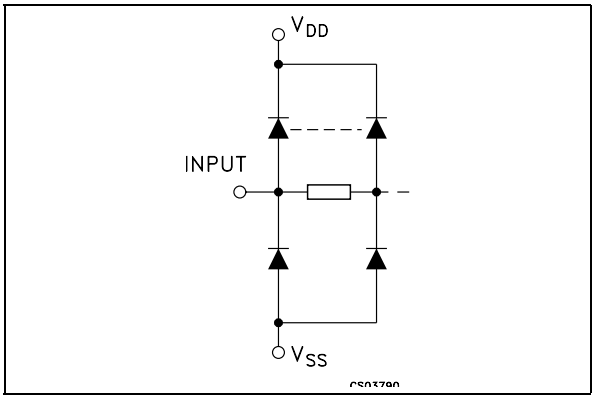


Table 1: Pin Description

PIN N°	SYMBOL	NAME AND FUNCTION
10, 11, 12, 13, 1, 2, 3, 4	D0 to D7	Data Inputs
9, 7, 6	Q0 to Q2	Data Output Lines
5	E_I	Chip Enable Input
15	E_O	Enable Output
14	GS	Group Select Line
8	V_{SS}	Negative Supply Voltage
16	V_{DD}	Positive Supply Voltage

Figure 2: Functional Diagram

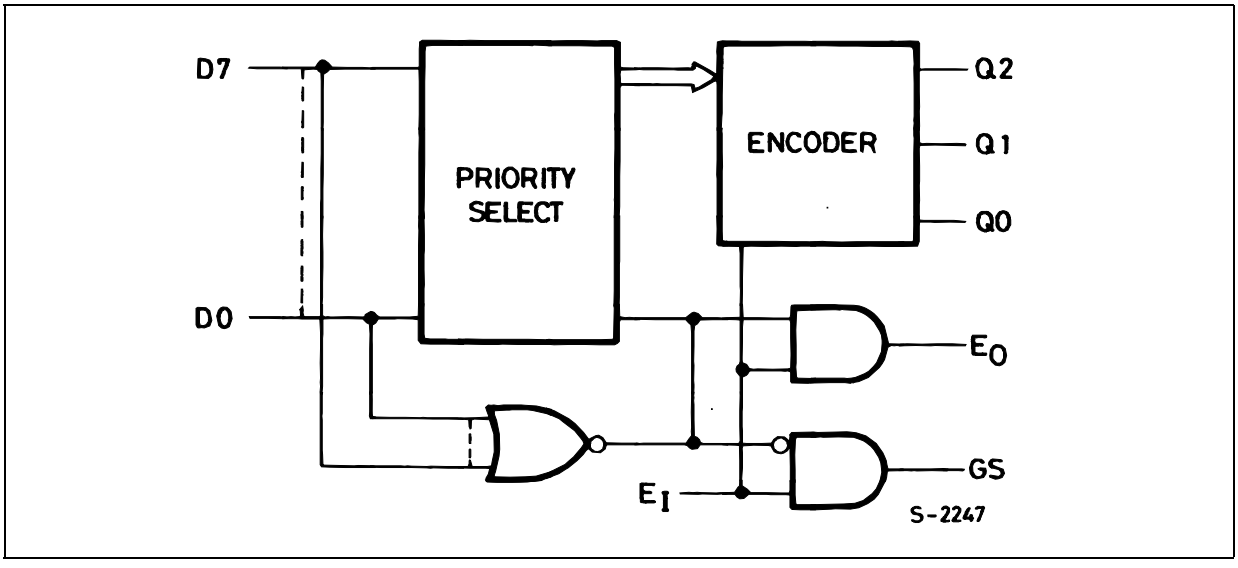


Table 2: Truth Table

INPUTS									OUTPUTS				
E_I	D7	D6	D5	D4	D3	D2	D1	D0	GS	Q2	Q1	Q0	E_O
L	X	X	X	X	X	X	X	X	L	L	L	L	L
H	L	L	L	L	L	L	L	L	L	L	L	L	H
H	H	X	X	X	X	X	X	X	H	H	H	H	L
H	L	H	X	X	X	X	X	X	H	H	H	L	L
H	L	L	H	X	X	X	X	X	H	H	L	H	L
H	L	L	L	H	X	X	X	X	H	H	L	L	L
H	L	L	L	L	H	X	X	X	H	L	H	H	L
H	L	L	L	L	L	H	X	X	H	L	H	L	L
H	L	L	L	L	L	L	H	X	H	L	L	H	L
H	L	L	L	L	L	L	L	H	H	L	L	L	L

X : Don't Care

Figure 3: Logic Diagram

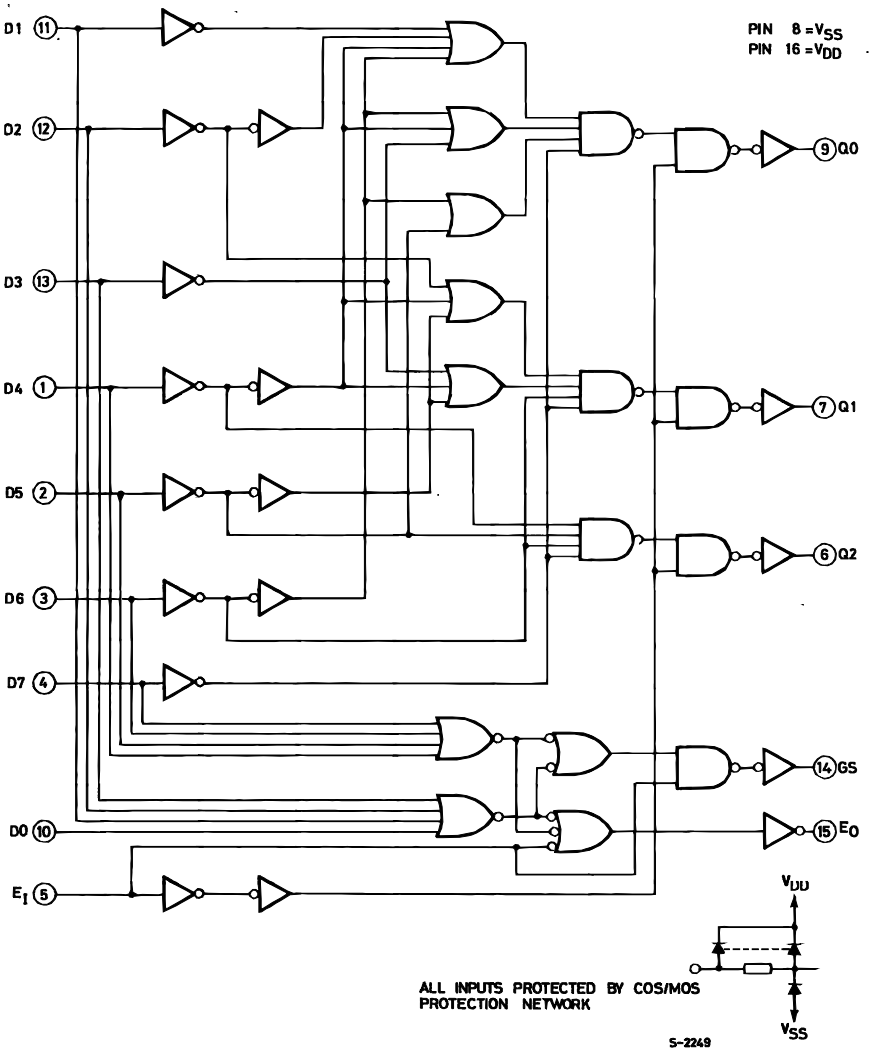


Table 3: Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V_{DD}	Supply Voltage	-0.5 to +22	V
V_I	DC Input Voltage	-0.5 to V_{DD} + 0.5	V
I_I	DC Input Current	± 10	mA
P_D	Power Dissipation per Package	200	mW
	Power Dissipation per Output Transistor	100	mW
T_{op}	Operating Temperature	-55 to +125	°C
T_{stg}	Storage Temperature	-65 to +150	°C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied.
All voltage values are referred to V_{SS} pin voltage.

Table 4: Recommended Operating Conditions

Symbol	Parameter	Value	Unit
V_{DD}	Supply Voltage	3 to 20	V
V_I	Input Voltage	0 to V_{DD}	V
T_{op}	Operating Temperature	-55 to 125	°C

Table 5: DC Specifications

Symbol	Parameter	Test Condition				Value							Unit
		V_I (V)	V_O (V)	$\|I_O\|$ (μA)	V_{DD} (V)	T_A = 25°C			-40 to 85°C		-55 to 125°C		
						Min.	Typ.	Max.	Min.	Max.	Min.	Max.	
I_L	Quiescent Current	0/5			5		0.04	5		150		150	μA
		0/10			10		0.04	10		300		300	
		0/15			15		0.04	20		600		600	
		0/20			20		0.08	100		3000		3000	
V_{OH}	High Level Output Voltage	0/5		<1	5	4.95			4.95		4.95		V
		0/10		<1	10	9.95			9.95		9.95		
		0/15		<1	15	14.95			14.95		14.95		
V_{OL}	Low Level Output Voltage	5/0		<1	5		0.05			0.05		0.05	V
		10/0		<1	10		0.05			0.05		0.05	
		15/0		<1	15		0.05			0.05		0.05	
V_{IH}	High Level Input Voltage		0.5/4.5	<1	5	3.5			3.5		3.5		V
			1/9	<1	10	7			7		7		
			1.5/13.5	<1	15	11			11		11		
V_{IL}	Low Level Input Voltage		4.5/0.5	<1	5			1.5		1.5		1.5	V
			9/1	<1	10			3		3		3	
			13.5/1.5	<1	15			4		4		4	
I_{OH}	Output Drive Current	0/5	2.5	<1	5	-1.36	-3.2		-1.1		-1.1		mA
		0/5	4.6	<1	5	-0.44	-1		-0.36		-0.36		
		0/10	9.5	<1	10	-1.1	-2.6		-0.9		-0.9		
		0/15	13.5	<1	15	-3.0	-6.8		-2.4		-2.4		
I_{OL}	Output Sink Current	0/5	0.4	<1	5	0.44	1		0.36		0.36		mA
		0/10	0.5	<1	10	1.1	2.6		0.9		0.9		
		0/15	1.5	<1	15	3.0	6.8		2.4		2.4		
I_I	Input Leakage Current	0/18	Any Input		18		$\pm 10^{-5}$	±0.1		±1		±1	μA
C_I	Input Capacitance		Any Input				5	7.5					pF

The Noise Margin for both "1" and "0" level is: 1V min. with V_{DD}=5V, 2V min. with V_{DD}=10V, 2.5V min. with V_{DD}=15V

Table 6: Dynamic Electrical Characteristics (T_{amb} = 25°C, C_L = 50pF, R_L = 200KΩ, $t_r = t_f$ = 20 ns)

Symbol	Parameter	Test Condition		Value (*)			Unit
		V_{DD} (V)		Min.	Typ.	Max.	
t_{PLH} t_{PHL}	Propagation Delay Time (E_I to E_O, E_I to GS)	5			110	220	ns
		10			55	110	
		15			45	85	
t_{PLH} t_{PHL}	Propagation Delay Time (E_I to Q_m, D_n to GS)	5			170	340	ns
		10			85	170	
		15			65	125	
t_{PLH} t_{PHL}	Propagation Delay Time (D_n to Q_m)	5			220	440	ns
		10			110	220	
		15			85	160	
t_{TLH} t_{THL}	Transition Time	5			100	200	ns
		10			50	100	
		15			40	80	

(*) Typical temperature coefficient for all V_{DD} value is 0.3 %/°C.

TYPICAL APPLICATIONS

Figure 4: 16-Level Priority Encoder

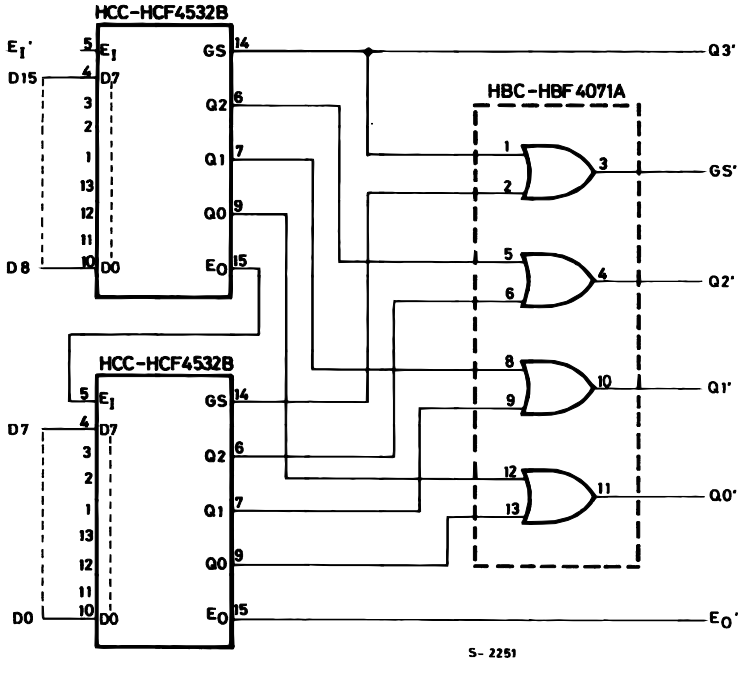


Figure 5: 0 To 9 Keyboard Encoder

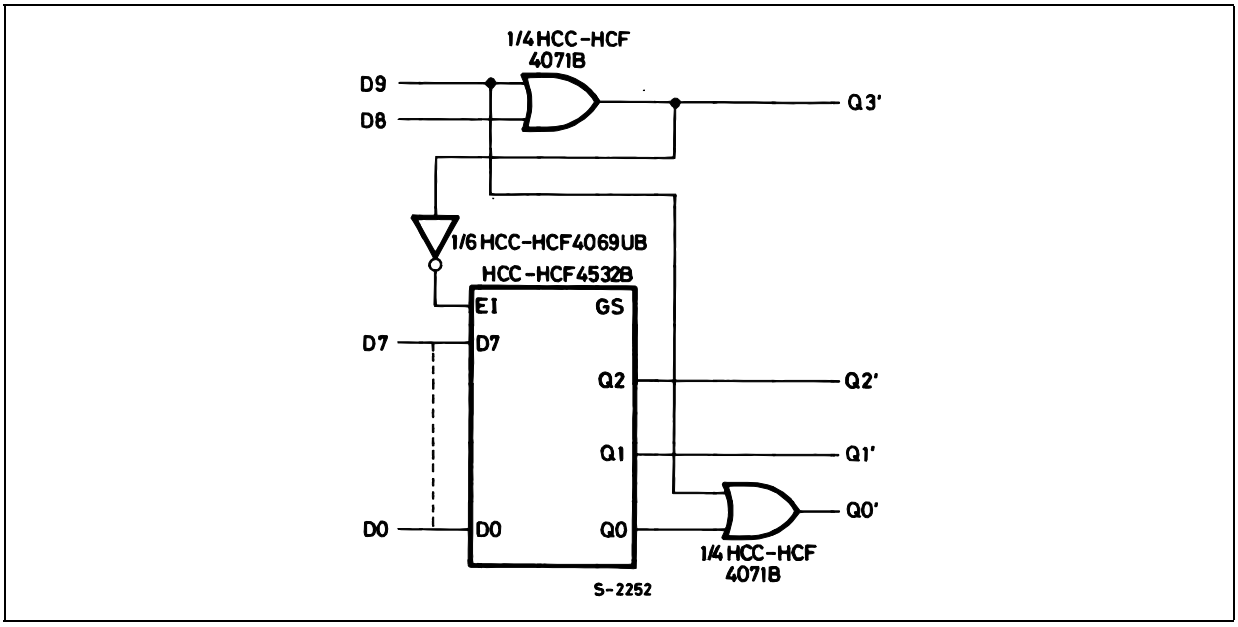


Table 7: Truth Table

INPUTS										OUTPUTS				
D9	D8	D7	D6	D5	D4	D3	D2	D1	D0	GS	Q3'	Q2'	Q1'	Q0
H	X	X	X	X	X	X	X	X	X	L	H	L	L	H
L	H	X	X	X	X	X	X	X	X	L	H	L	L	L
L	L	H	X	X	X	X	X	X	X	H	L	H	H	H
L	L	L	H	X	X	X	X	X	X	H	L	H	H	L
L	L	L	L	H	X	X	X	X	X	H	L	H	L	H
L	L	L	L	L	H	X	X	X	X	H	L	H	L	L
L	L	L	L	L	L	H	X	X	X	H	L	L	H	H
L	L	L	L	L	L	L	H	X	X	H	L	L	H	L
L	L	L	L	L	L	L	L	H	X	H	L	L	L	H
L	L	L	L	L	L	L	L	L	H	H	L	L	L	L

X : Don't Care

Figure 6: Digital To Analog Conversion

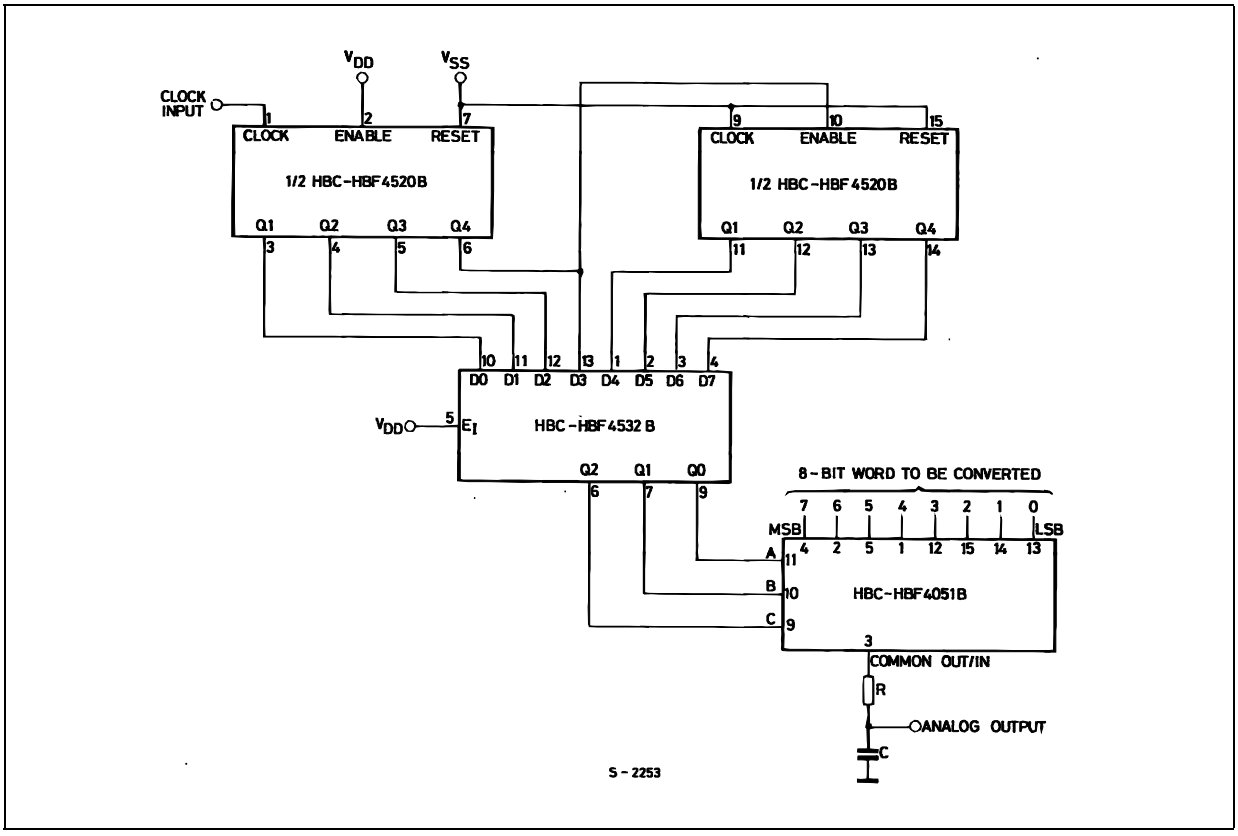
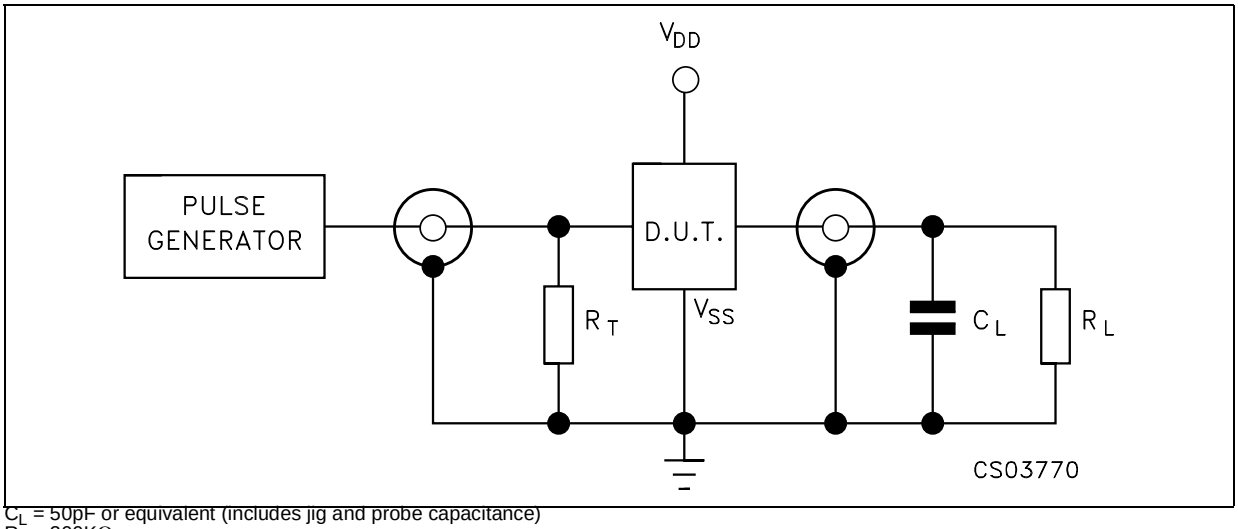
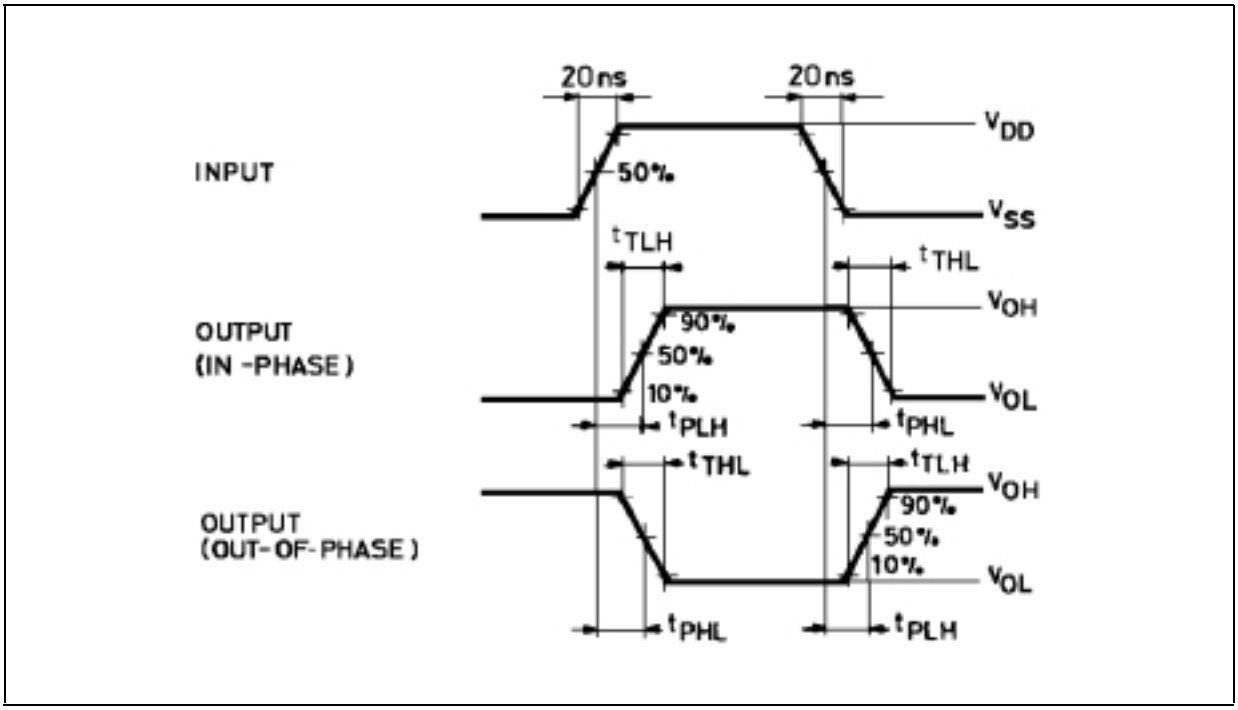


Figure 7: Test Circuit



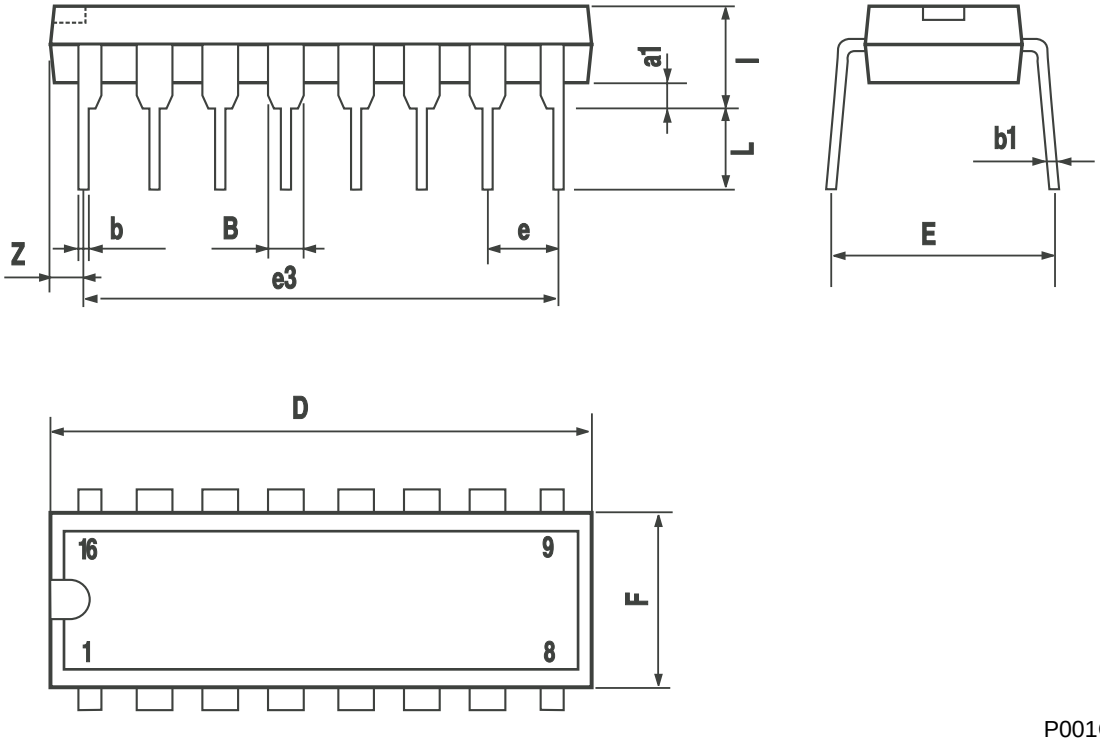
C_L = 50pF or equivalent (includes jig and probe capacitance)
R_L = 200KΩ
R_T = Z_{OUT} of pulse generator (typically 50Ω)

Figure 8: Waveform - Propagation Delay Times (f=1MHz; 50% duty cycle)



Plastic DIP-16 (0.25) MECHANICAL DATA

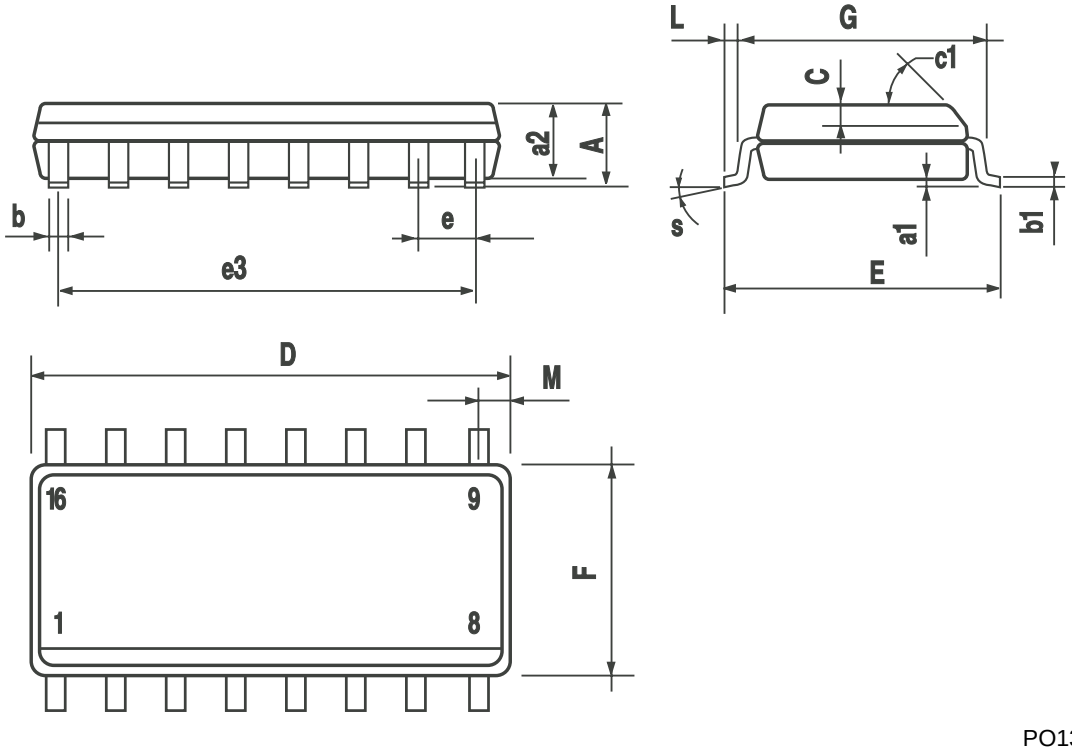
DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
a1	0.51			0.020		
B	0.77		1.65	0.030		0.065
b		0.5			0.020	
b1		0.25			0.010	
D			20			0.787
E		8.5			0.335	
e		2.54			0.100	
e3		17.78			0.700	
F			7.1			0.280
I			5.1			0.201
L		3.3			0.130	
Z			1.27			0.050



P001C

SO-16 MECHANICAL DATA

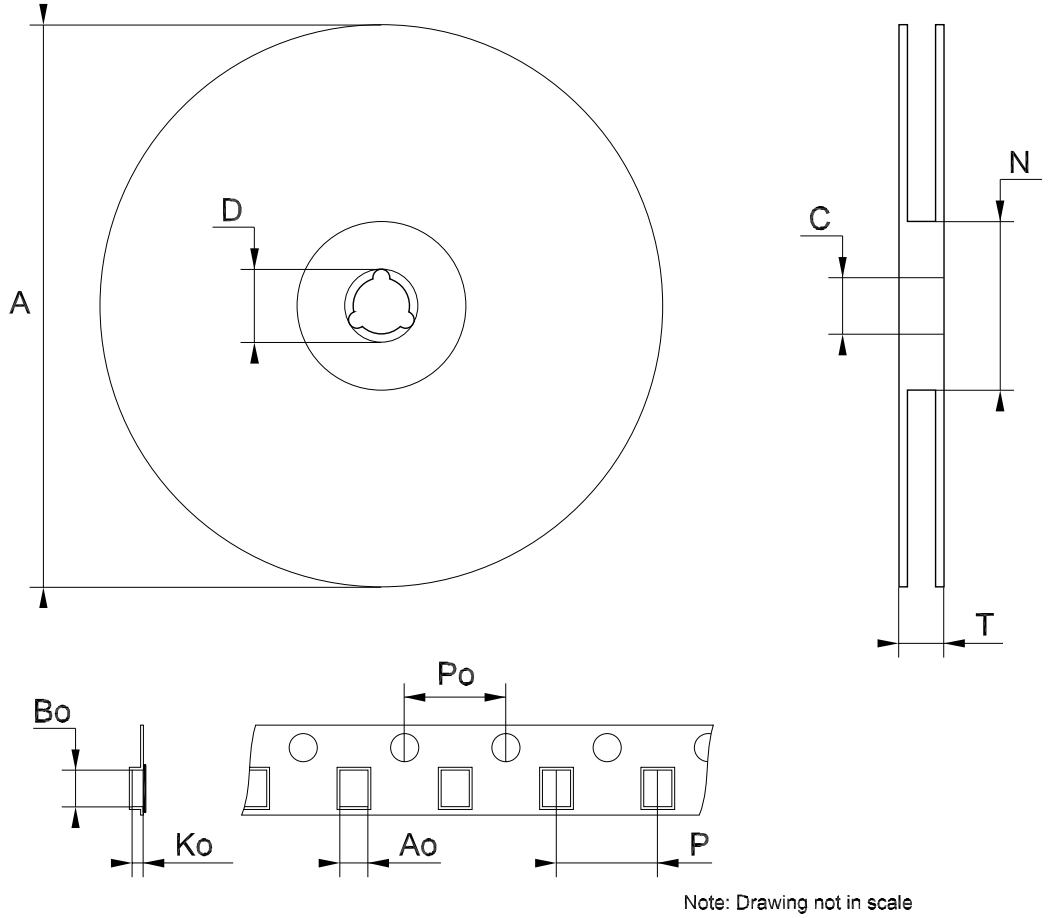
DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A			1.75			0.068
a1	0.1		0.2	0.004		0.008
a2			1.65			0.064
b	0.35		0.46	0.013		0.018
b1	0.19		0.25	0.007		0.010
C		0.5			0.019	
c1	45° (typ.)					
D	9.8		10	0.385		0.393
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		8.89			0.350	
F	3.8		4.0	0.149		0.157
G	4.6		5.3	0.181		0.208
L	0.5		1.27	0.019		0.050
M			0.62			0.024
S	8		° (max.)			



PO13H

Tape & Reel SO-16 MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A			330			12.992
C	12.8		13.2	0.504		0.519
D	20.2			0.795		
N	60			2.362		
T			22.4			0.882
Ao	6.45		6.65	0.254		0.262
Bo	10.3		10.5	0.406		0.414
Ko	2.1		2.3	0.082		0.090
Po	3.9		4.1	0.153		0.161
P	7.9		8.1	0.311		0.319



Note: Drawing not in scale

Table 8: Revision History

Date	Revision	Description of Changes
07-May-2004	2	Mistake Truth Table - Table 2 - Pag. 2