CD4532 CMOS 8-Bit Priority Encoder

1. General Description

1.1 Description

CD4532 consists of 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 anyone input is high, E_O is low and all cascaded lower-order stages are disabled.

1.2 Features

- Converts From 1 of 8 to Binary
- Provides Cascading Feature to Handle Any Number of Inputs
- Group Select Indicates One or More Priority Inputs
- Standardized,symmetrical output characteristics
- 100% tested for quiescent current at 18V
- Maximum input current of 1μA at 18V and +25℃
- 5V,10V, and 15V parametric ratings

1.3 Device Information

PART NUMBER	PACKAGE
CD4532	DIP
	SOP
	TSSOP

2. Pin Description and Functional Diagram

Figure 2.1 Top View

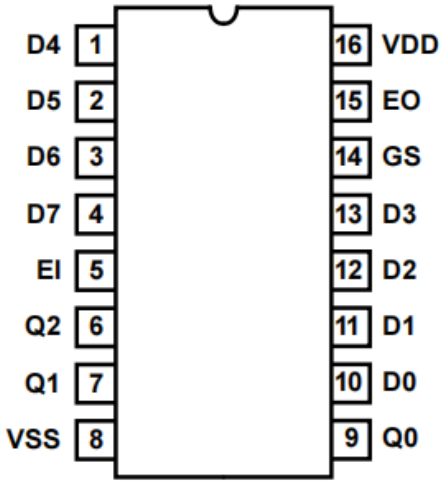
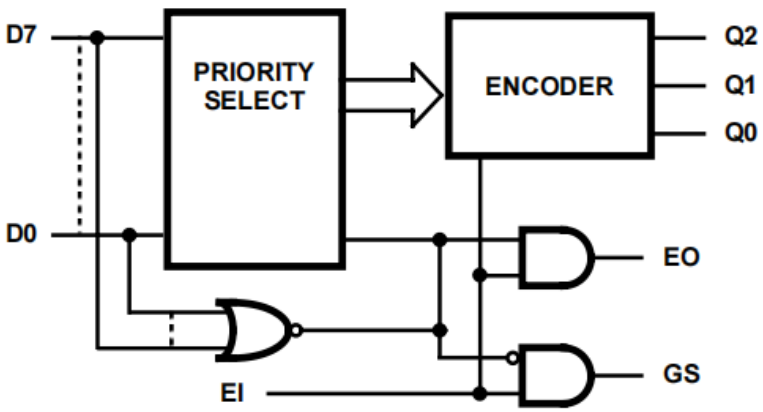


Figure 2.2 Functional Diagram



PIN No.	NAME	I/O	FUNCTION
1	D4	I	Data Input
2	D5	I	Data Input
3	D6	I	Data Input
4	D7	I	Data Input
5	E_I	O	Enable Output
6	Q2	O	Data Output
7	Q1	O	Data Output
8	VSS		Ground
9	Q0	O	Data Output
10	D0	I	Data Input
11	D1	I	Data Input
12	D2	I	Data Input
13	D3	I	Data Input
14	GS	O	Group Select Line Output
15	E_O	O	Enable Output
16	VDD		Supply Voltage

3. System Diagram

3.1 Logic Diagram

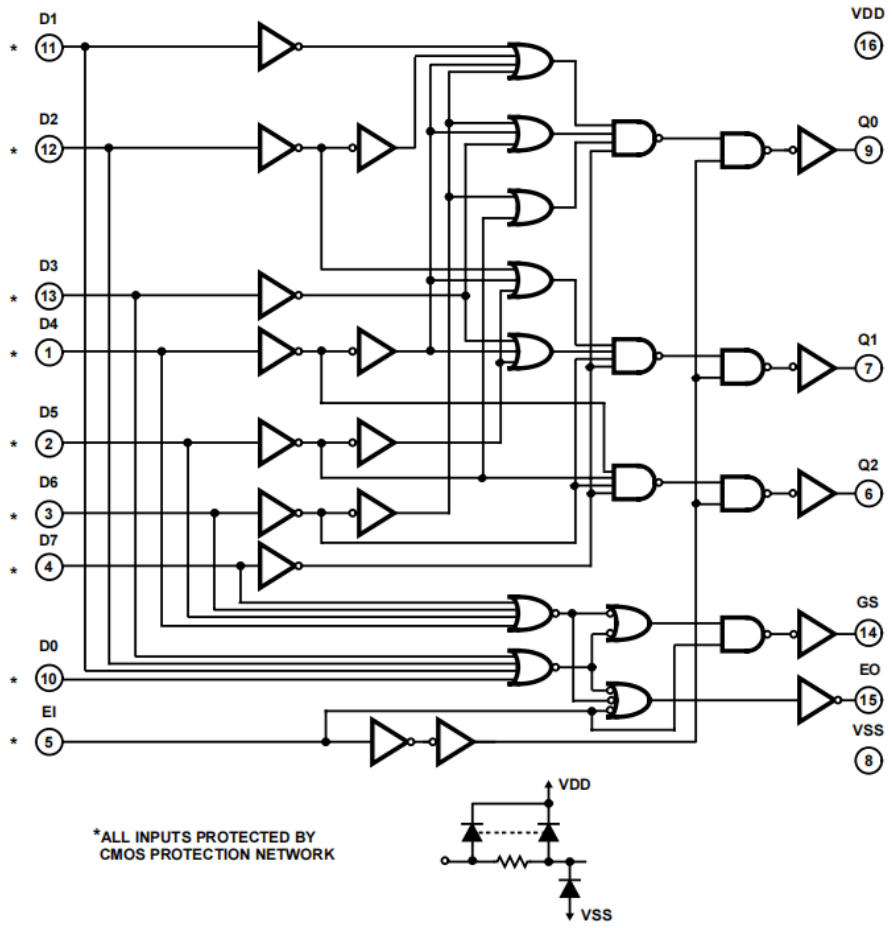


Figure 3.1：CD4532 Logic Diagram

3.2 Truth Table

Input									Output				
E_I	D7	D6	D5	D4	D3	D2	D1	D0	GS	Q2	Q1	Q0	E_O
0	X	X	X	X	X	X	X	X	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	1
1	1	X	X	X	X	X	X	X	1	1	1	1	0
1	0	1	X	X	X	X	X	X	1	1	1	0	0
1	0	0	1	X	X	X	X	X	1	1	0	1	0
1	0	0	0	1	X	X	X	X	1	1	0	0	0
1	0	0	0	0	1	X	X	X	1	0	1	1	0
1	0	0	0	0	0	1	X	X	1	0	1	0	0
1	0	0	0	0	0	0	1	X	1	0	0	1	0
1	0	0	0	0	0	0	0	1	1	0	0	0	0

X = Don’t Care, 1 ≡ High State, 0 ≡ Low State

4. Specifications

4.1 Absolute Maximum Ratings

Symbol	Parameter	MIN	MAX	Unit
VDD	DC Supply Voltage Range (Voltage Referenced to VSS Terminals)	-0.5	20	V
V_I	Input Voltage Range, All Inputs	0.5	VDD+0.5	V
P_D	Power Dissipation		500	mW
T_J	Junction Temperature		125	℃
T_{OP}	Operating Temperature	0	70	℃

Absolute maximum ratings are those values beyond which the device could be permanently damaged,These are stress ratings only,which do not imply functional operation of the device at these or any other conditions beyond those indicated under Recommended Operating Conditions.

4.2 Electrical Characteristics

4.2.1 DC Specifications

(T_a=25℃, voltages are referenced to VSS (ground=0V), unless otherwise specified)

Symbol	Parameter	Test Condition			MIN	TYP	MAX	Unit
		VO	VIN	VDD				
I_{DD}	Supply Current	--	0,5	5	--	0.0	1	uA
		--	0,10	10	--	0.0	1	uA
		--	0,18	18	--	0.0	1	uA
I_{OL}	Low Level Output Current	0.4	0,5	5	1.5	3.5	--	mA
		0.5	0,10	10	4	8	--	mA
		1.5	0,15	15	15	30	--	mA
I_{OH}	High Level Output Current	4.6	0,5	5	-1	-2	--	mA
		2.5	0,5	5	-4	-8	--	mA
		9.5	0,10	10	-2	-4	--	mA
		13.5	0,15	15	-7	-15	--	mA
V_{OL}	Low Level Output Voltage	--	0,5	5	--	0	0.05	V
		--	0,10	10	--	0	0.05	V
		--	0,15	15	--	0	0.05	V
V_{OH}	High Level Output Voltage	--	0,5	5	4.95	5	--	V
		--	0,10	10	9.95	10	--	V
		--	0,15	15	14.95	15	--	V
V_{IL}	Low Level Input Voltage	0.5,4.5	--	5	--	--	1.5	V
		1,9	--	10	--	--	3	V
		1.5,13.5	--	15	--	--	4	V
V_{IH}	High Level Input Voltage	0.5,4.5	--	5	3.5	--	--	V
		1,9	--	10	7	--	--	V
		1.5,13.5	--	15	11	--	--	V
I_{IN}	Input Leakage Current	--	0,18	18	--	0	±1	uA

5. Applications information

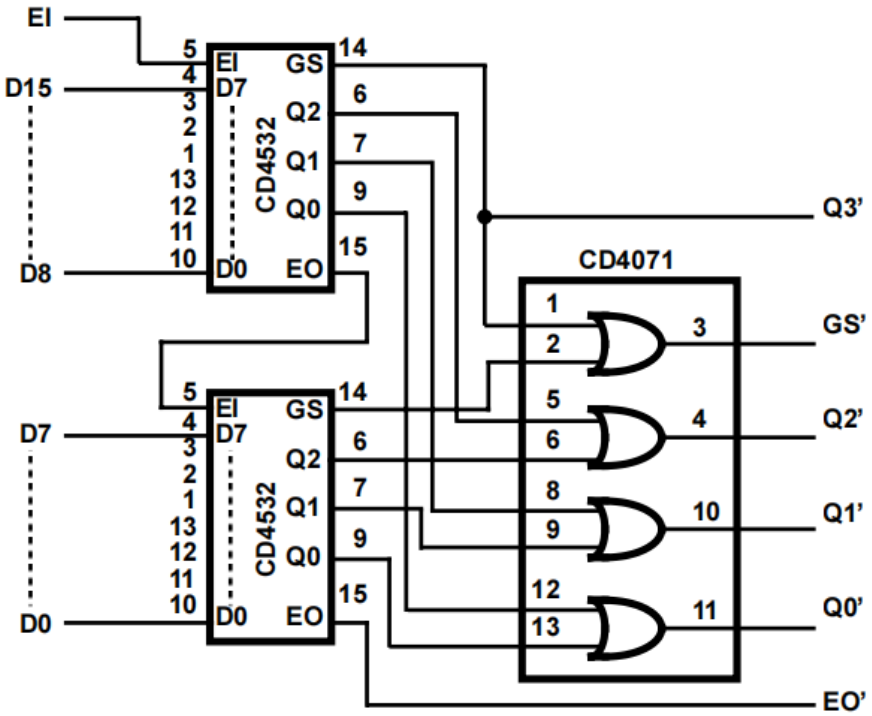


Figure 5.1：16-Level priority encoder

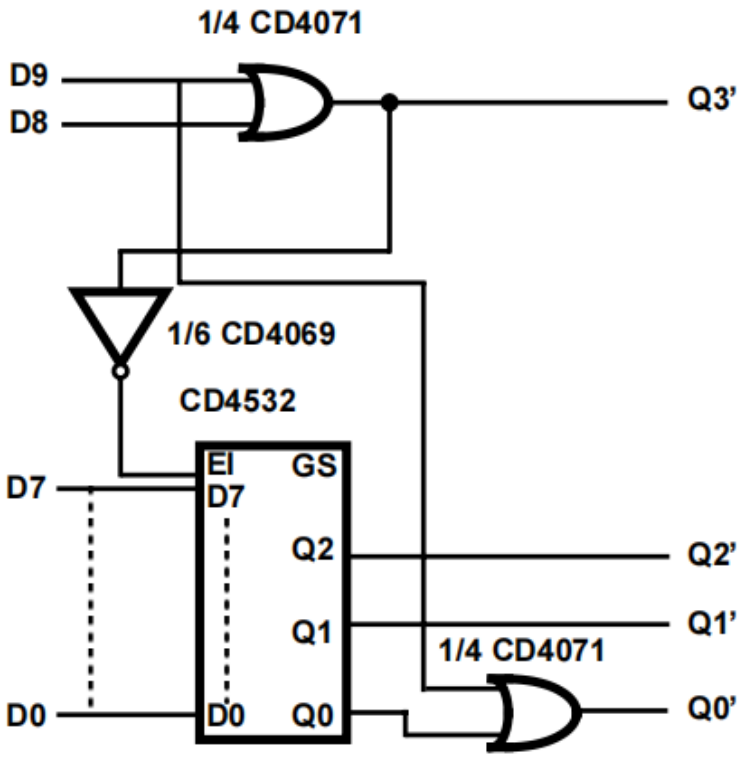


Figure 5.2：0-to-9 keyboard encoder

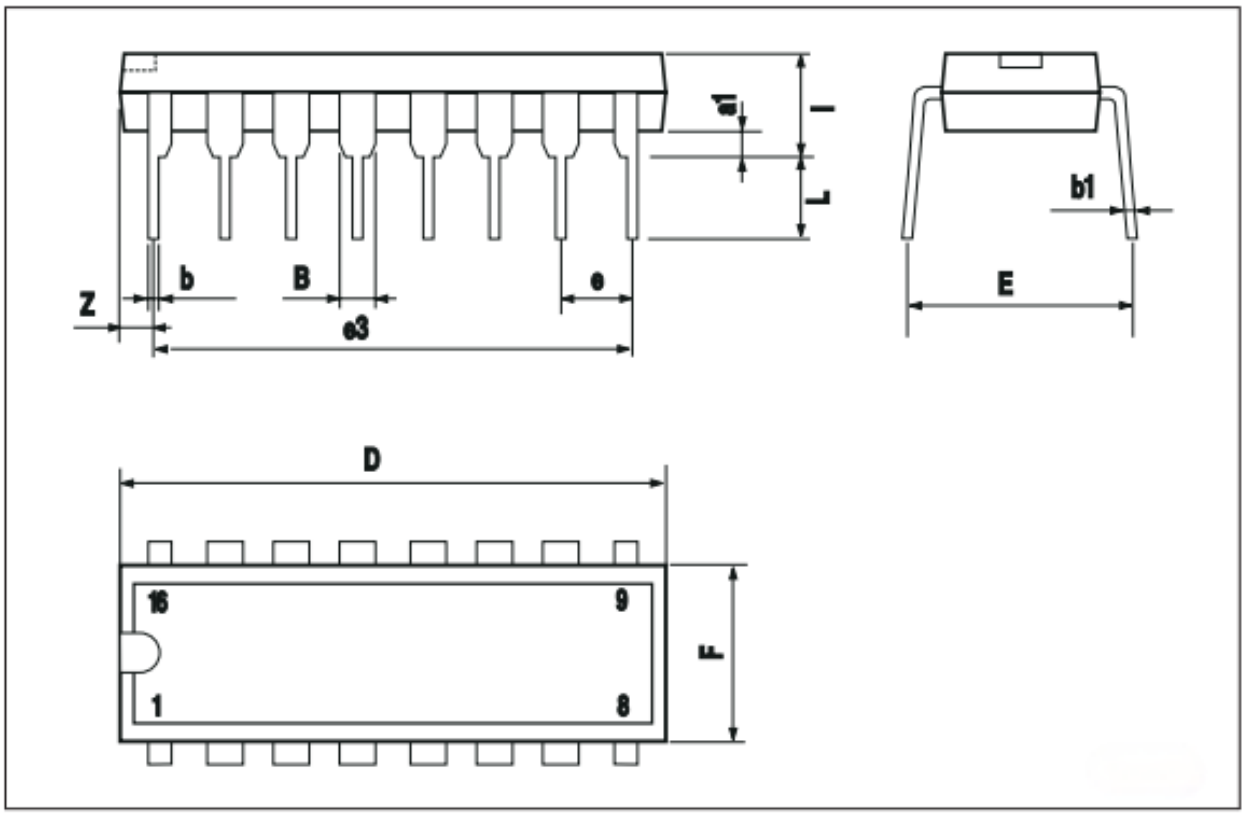
6. Ordering Information

Orderable Device	Package Type	Pins	Packing	Package Qty
CD4532ND16ATBE	DIP	16	Tube	25
CD4532NS16ARDQ	SOP	16	Tape & Reel	4000
CD4532TS16ARDQ	TSSOP	16	Tape & Reel	4000

7. Package Information

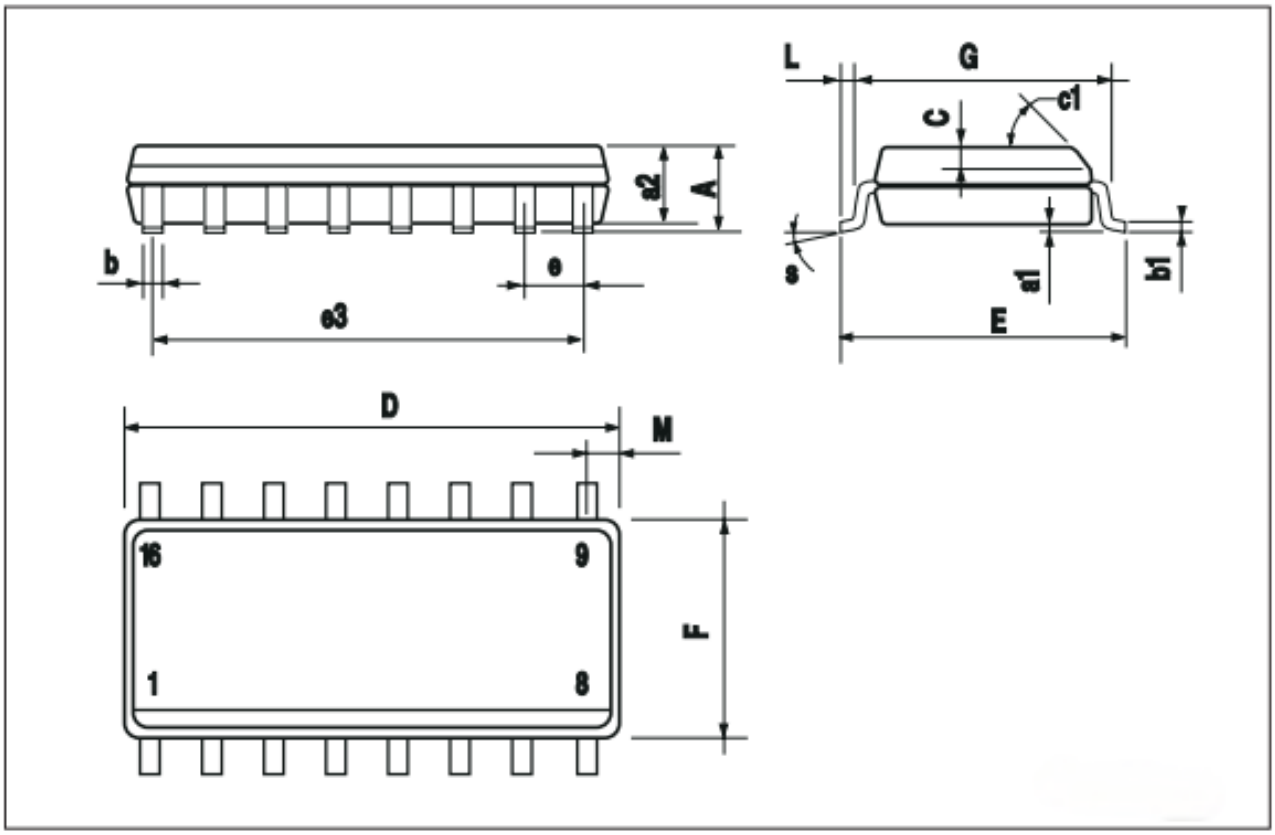
7.1 DIP16

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



7.2 SOP16

Dim.	mm.			inch.		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			1.75			0.068
a1	0.1		0.25	0.004		0.010
a2			1.64			0.063
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.)					



7.3 TSSOP16

Dim.	mm.			inch.		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			1.2			0.047
A1	0.05		0.15	0.002	0.004	0.006
A2	0.8	1	1.05	0.031	0.039	0.041
b	0.19		0.30	0.007		0.012
c	0.09		0.20	0.004		0.0079
D	4.9	5	5.1	0.193	0.197	0.201
E	6.2	6.4	6.6	0.244	0.252	0.260
E1	4.3	4.4	4.48	0.169	0.173	0.176
e		0.65 BSC			0.0256 BSC	
K	0°		8°	0°		8°
L	0.45	0.60	0.75	0.018	0.024	0.030