74HC540 Octal Buffers and Line Drivers With 3-State Outputs

1. General Description

1.1 Description

These octal buffers and line drivers feature the performance of the popular 'HC240 series and offer a pinout with inputs and outputs on opposite sides of the package. This arrangement greatly facilitates printed circuit board layout.

The 3-state control gate is a 2-input NOR. If either output-enable ($\overline{OE1}$ or $\overline{OE2}$)input is high, all eight outputs are in the high-impedance state.

The 74HC540 devices provide inverted data at the outputs.

1.2 Features

- Wide operating voltage range of 2 V to 6 V
- High-current 3-state outputs drive bus lines directly or up to 15 LSTTL loads
- Low power consumption, 10-μA max Icc
- +6-mA output drive at 5 V
- Low input current of 1μA max
- Data flow-through pinout (all inputs on opposite side from outputs)

1.3 Device Information

PART NUMBER	PACKAGE
74HC540	DIP
	SOP-W
	TSSOP

2. Connection Diagrams and Pin Description

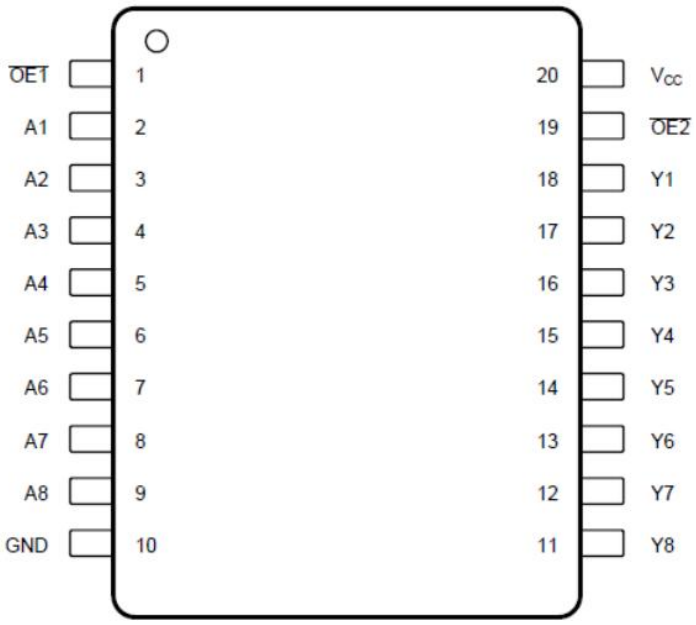


Figure 2.1: Top View

PIN No.	NAME	I/O	FUNCTION
1	$\overline{OE1}$	I	Enable Input
2	A1	I	A1 Input
3	A2	I	A2 Input
4	A3	I	A3 Input
5	A4	I	A4 Input
6	A5	I	A5 Input
7	A6	I	A6 Input
8	A7	I	A7 Input
9	A8	I	A8 Input
10	GND	-	Ground
11	Y8	O	Y8 Output
12	Y7	O	Y7 Output
13	Y6	O	Y6 Output
14	Y5	O	Y5 Output
15	Y4	O	Y4 Output
16	Y3	O	Y3 Output
17	Y2	O	Y2 Output
18	Y1	O	Y1 Output
19	$\overline{OE2}$	I	Enable Input
20	VCC	-	Positive Voltage

3. System Diagram

3.1 Logic Diagram

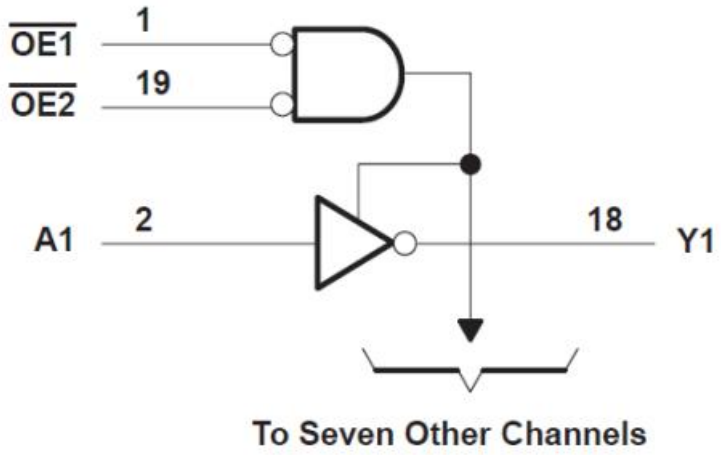


Figure 3.1: 74HC540 Logic Diagram

3.2 Function Table

Input			Output
$\overline{OE1}$	$\overline{OE2}$	A	Y
0	0	0	1
0	0	1	0
1	X	X	Z
X	1	X	Z

X = don’t care, 1≡High State, 0≡Low State,Z=High Impedance.

4. Specifications

4.1 Absolute Maximum Ratings

Symbol	Parameter	MIN	MAX	Unit
V_{CC}	Supply Voltage	-0.5	7	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 normal operating conditions.

4.2 Recommended Operating Conditions

Symbol	Parameter	Test Condition	MIN	NOM	MAX	Unit
V_{CC}	Supply Voltage		2	5	6	V
V_{IH}	High Level Input Voltage	V_{CC}=2V	1.5			V
		V_{CC}=4.5V	3.15			V
		V_{CC}=6V	4.2			V
V_{IL}	Low Level Input Voltage	V_{CC}=2V			0.5	V
		V_{CC}=4.5V			1.35	V
		V_{CC}=6V			1.8	V
V_I	Input voltage		0		V_{CC}	V

4.3 Electrical Characteristics

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

Symbol	Parameter	Test Condition	MIN	TYP	MAX	Unit
V_{OH}	High Level Output Voltage	V_{CC}=2V,I_O=-20uA	1.9	--	--	V
		V_{CC}=4.5V,I_O=-20uA	4.4	--	--	V
		V_{CC}=6V,I_O=-20uA	5.9	--	--	V
		V_{CC}=4.5V,I_O=-6mA	4.0	--	--	V
		V_{CC}=6V,I_O=-7.8mA	5.5	--	--	V
V_{OL}	Low Level Output Voltage	V_{CC}=2V,I_O=20uA	--	--	0.1	V
		V_{CC}=4.5V,I_O=20uA	--	--	0.1	V
		V_{CC}=6V,I_O=20uA	--	--	0.1	V
		V_{CC}=4.5V,I_O=6mA	--	--	0.3	V
		V_{CC}=6V,I_O=7.8mA	--	--	0.3	V
I_I	Input Leakage Current	V_{CC}=6V,V_I=V_{CC} or GND	--	0	±1	uA
I_{CC}	Quiescent Supply Current	V_{CC}=6V,V_I=V_{CC}/GND,I_O=0	--	0	10	uA
I_{OZ}	High impedance state current	V_{CC}=6V,V_O=V_{CC} or 0	--	--	±2	uA

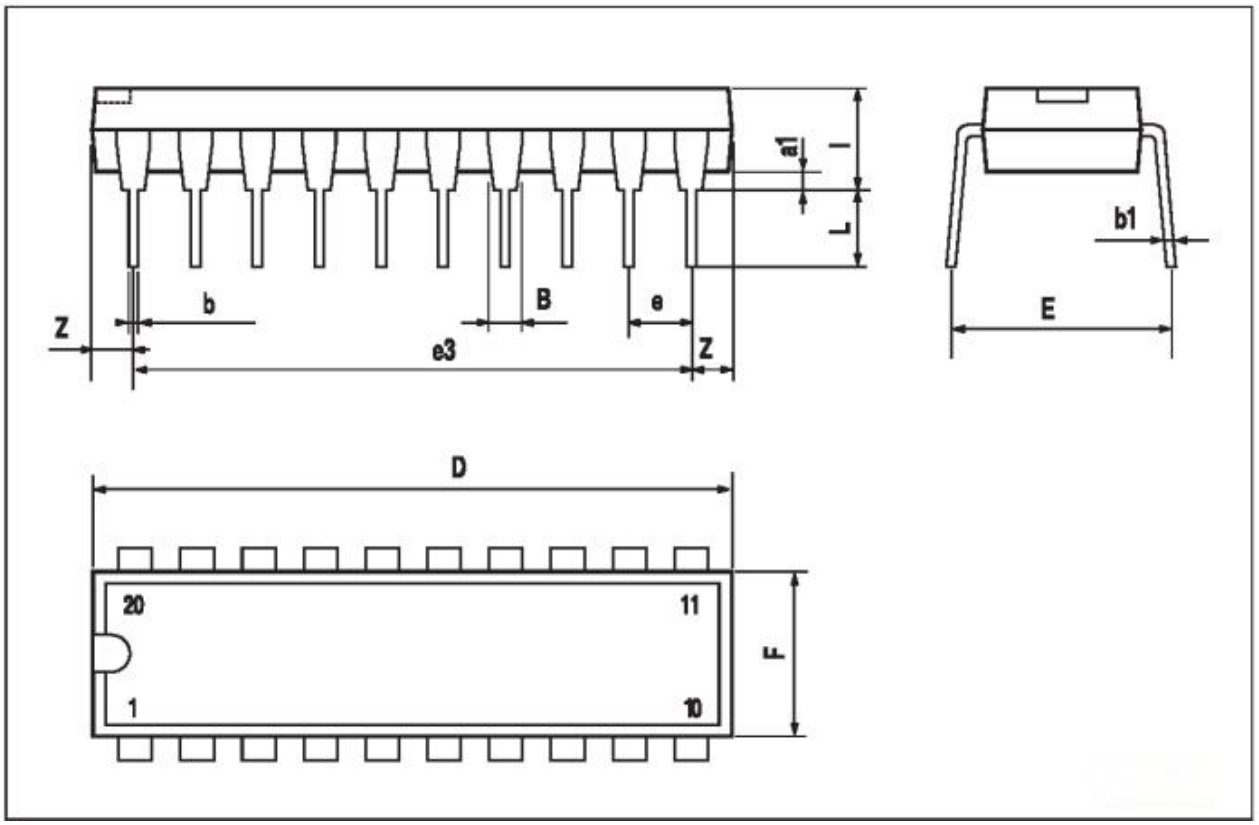
5. Ordering Information

Orderable Device	Package Type	Pins	Packing	Package Qty
74HC540ND20ATAH	DIP	20	Tube	18
74HC540WS20ARBQ	SOP-W	20	Tape & Reel	2000
74HC540TS20ARCQ	TSSOP	20	Tape & Reel	3000

6. Package Information

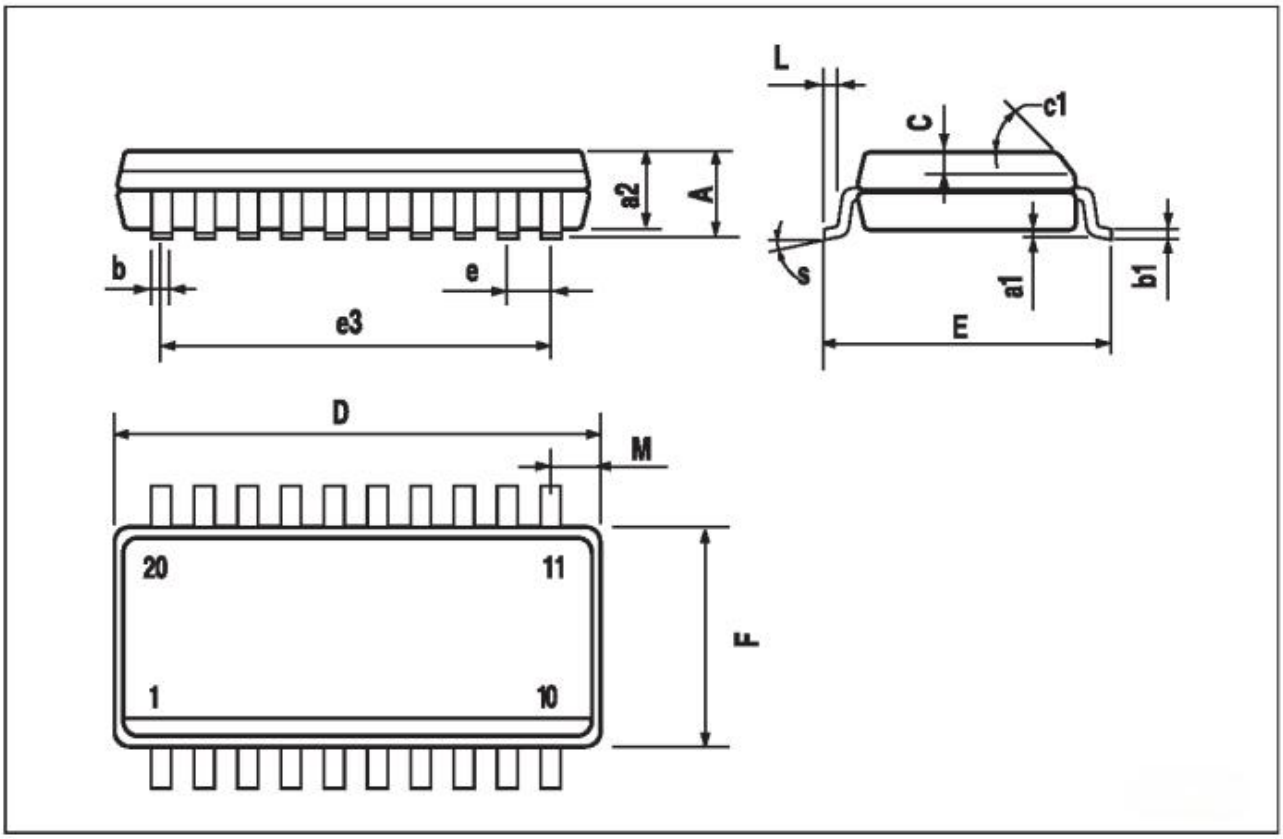
6.1 DIP20

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
a1	0.254			0.010		
B	1.39		1.65	0.055		0.065
b		0.45			0.018	
b1		0.25			0.010	
D			25.4			1.000
E		8.5			0.335	
e		2.54			0.100	
e3		22.86			0.900	
F			7.1			0.280
I			3.93			0.155
L		3.3			0.130	
Z			1.34			0.053



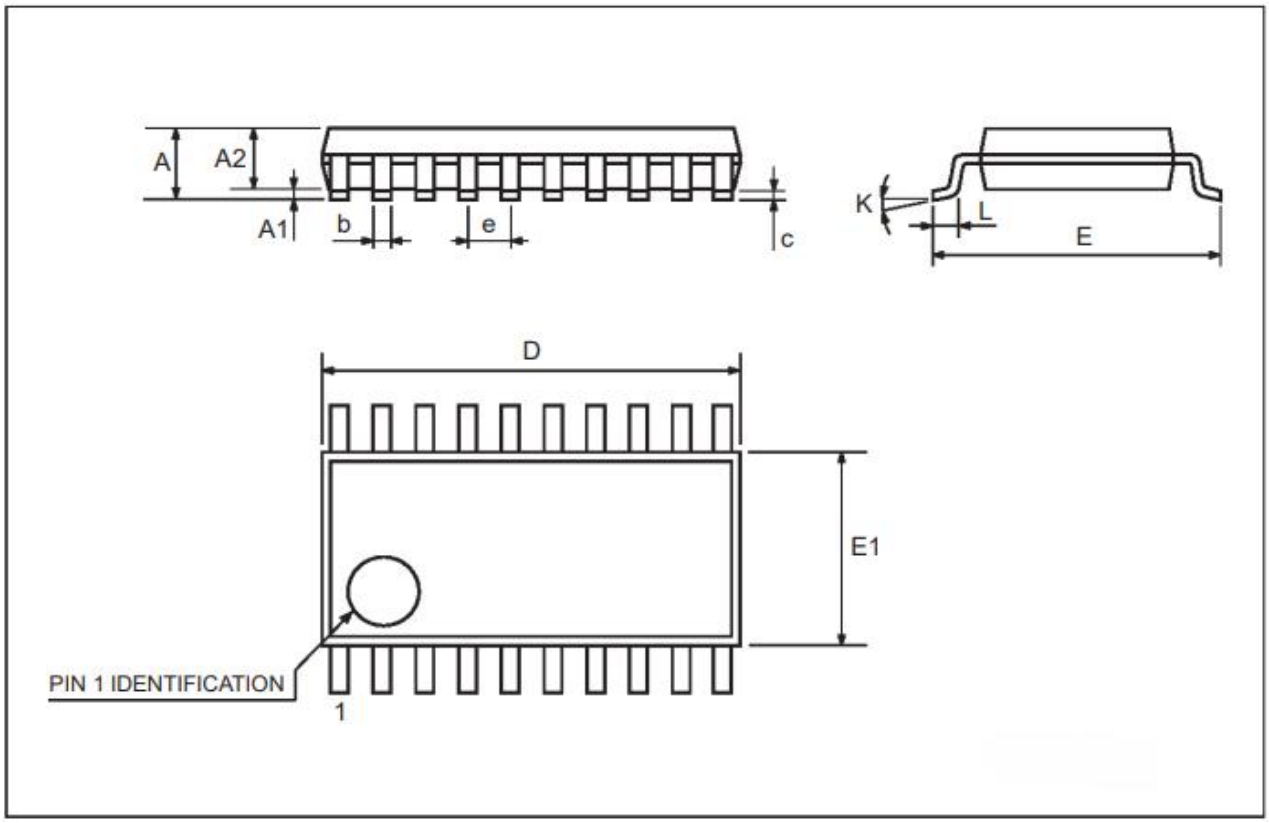
6.2 SOP20-W

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A			2.65			0.104
a1	0.1		0.2	0.004		0.008
a2			2.45			0.096
b	0.35		0.49	0.014		0.019
b1	0.23		0.32	0.009		0.012
C		0.5			0.020	
c1	45° (typ.)					
D	12.60		13.00	0.496		0.512
E	10.00		10.65	0.393		0.419
e		1.27			0.050	
e3		11.43			0.450	
F	7.40		7.60	0.291		0.300
L	0.50		1.27	0.020		0.050
M			0.75			0.029
S	8° (max.)					



6.3 TSSOP20

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		0.0089
D	6.4	6.5	6.6	0.252	0.256	0.260
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



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