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74AC540 Octal Buffer/Line Driver with 3-STATE Outputs

74AC540 Octal Buffer/Line Driver with 3-STATE Outputs

General Description

FAIRCHILD

SEMICONDUCTOR

The AC540 is an octal buffer/line drivers designed to be employed as memory and address drivers, clock drivers and bus oriented transmitter/receivers.

These devices are similar in function to the AC240 while providing flow-through architecture (inputs on opposite side from outputs). This pinout arrangement makes these devices especially useful as output ports for microprocessors, allowing ease of layout and greater PC board density.

Features

- I_{CC} and I_{OZ} reduced by 50%
- 3-STATE inverting outputs
- Inputs and outputs opposite side of package, allowing easier interface to microprocessors
- Output source/sink 24 mA

Ordering Code:

Order Number	Package Number	Package Description		
74AC540SC	M20B	20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide		
74AC540SJ	M20D	Pb-Free 20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide		
74AC540MTC	MTC20	20-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide		
74AC540PC	N20A	20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide		
Device also available in Tape and Reel. Specify by appending suffix letter "X" to the ordering code.				

Pb-Free package per JEDEC J-STD-020B.



Connection Diagram



Truth Table

	Outputs		
OE ₁	OE ₂	I	
L	L	Н	L
Н	Х	Х	Z
Х	Н	Х	Z
L	L	L	н
H = HIGH Vo	oltage Level Itage Level	X = Im Z = Hiç	material gh Impedance

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Absolute Maximum Ratings(Note 1)

Supply Voltage (V _{CC})	-0.5V to +7.0V
DC Input Diode Current (IIK)	
$V_{I} = -0.5V$	–20 mA
$V_{I} = V_{CC} + 0.5V$	+20 mA
DC Input Voltage (VI)	–0.5V to V _{CC} + 0.5V
DC Output Diode Current (I _{OK})	
$V_0 = -0.5V$	–20 mA
$V_O = V_{CC} + 0.5V$	+20 mA
DC Output Voltage (V _O)	-0.5V to V _{CC} + 0.5V
DC Output Source	
or Sink Current (I _O)	±50 mA
DC V _{CC} or Ground Current	
per Output Pin (I _{CC} or I _{GND})	±50 mA
Storage Temperature (T _{STG})	-65°C to +150°C
Junction Temperature (T _J)	
PDIP	140°C

Recommended Operating Conditions

Supply Voltage (V _{CC})	2.0V to 6.0V
Input Voltage (V _I)	0V to V_{CC}
Output Voltage (V _O)	0V to V_{CC}
Operating Temperature (T _A)	-40°C to +85°C
Minimum Input Edge Rate ($\Delta V / \Delta t$)	125 mV/ns
V_{IN} from 30% to 70% of V_{CC}	
V _{CC} @ 3.3V, 4.5V, 5.5V	

Note 1: Absolute maximum ratings are those values beyond which damage to the device may occur. The databook specifications should be met, without exception, to ensure that the system design is reliable over its power supply, temperature, and output/input loading variables. Fairchild does not recommend operation of FACT[™] circuits outside databook specifications.

DC Electrical Characteristics

Symbol	Parameter	V _{CC}	V_{CC} $T_A = +25^{\circ}C$		T _A = -40° C to +85°C		Conditions
Symbol		(V)	Тур	Gu	aranteed Limits	Units	Conditions
V _{IH}	Minimum HIGH Level	3.0	1.5	2.1	2.1		$V_{OUT} = 0.1V$
	Input Voltage	4.5	2.25	3.15	3.15	V	or $V_{CC} - 0.1V$
		5.5	2.75	3.85	3.85		
V _{IL}	Maximum LOW Level	3.0	1.5	0.9	0.9		$V_{OUT} = 0.1V$
	Input Voltage	4.5	2.25	1.35	1.35	V	or $V_{CC} - 0.1V$
		5.5	2.75	1.65	1.65		
V _{OH}	Minimum HIGH Level	3.0	2.99	2.9	2.9		
	Output Voltage	4.5	4.49	4.4	4.4	V	$I_{OUT} = -50 \ \mu A$
		5.5	5.49	5.4	5.4		
							$V_{IN} = V_{IL} \text{ or } V_{IH}$
		3.0		2.56	2.46		$I_{OH} = -12 \text{ mA}$
		4.5		3.86	3.76	V	$I_{OH} = -24 \text{ mA}$
		5.5		4.86	4.76		I _{OH} = -24 mA (Note 2)
V _{OL}	Maximum LOW Level	3.0	0.002	0.1	0.1		
	Output Voltage	4.5	0.001	0.1	0.1	V	$I_{OUT} = 50 \ \mu A$
		5.5	0.001	0.1	0.1		
							$V_{IN} = V_{IL} \text{ or } V_{IH}$
		3.0		0.36	0.44		$I_{OL} = 12 \text{ mA}$
		4.5		0.36	0.44	V	$I_{OL} = 24 \text{ mA}$
		5.5		0.36	0.44		I _{OL} = 24 mA (Note 2)
I _{IN}	Maximum Input	5.5		±0.1	±1.0	μA	$V_I = V_{CC}, GND$
(Note 4)	Leakage Current						
I _{OZ}	Maximum 3-STATE						V_{I} (OE) = V_{IL} , V_{IH}
	Current	5.5		±0.25	±2.5	μA	$V_I = V_{CC}, GND$
							$V_O = V_{CC}$, GND
I _{OLD}	Minimum Dynamic	5.5			75	mA	V _{OLD} = 1.65V Max
I _{OHD}	Output Current (Note 3)	5.5			-75	mA	V _{OHD} = 3.85V Min
I _{CC}	Maximum Quiescent	5.5		4.0	40.0	μΑ	$V_{IN} = V_{CC}$
(Note 4)	Supply Current						or GND

Note 2: All outputs loaded; thresholds on input associated with output under test.

Note 3: Maximum test duration 2.0 ms, one output loaded at a time.

Note 4: I_{IN} and I_{CC} @ 3.0V are guaranteed to be less than or equal to the respective limit @ 5.5V V_{CC}.

AC Electrical Characteristics

Symbol	Parameter	V _{cc} (V)	T _A = +25°C C ₁ = 50 pF			T _A = -40°C to +85°C C ₁ = 50 pF		Units
		(Note 5)	Min	Тур	Max	Min	Max	
t _{PLH}	Propagation Delay	3.3	1.5	5.5	7.5	1.0	8.0	
	Data to Output	5.0	1.5	4.0	6.0	1.0	6.5	ns
t _{PHL}	Propagation Delay	3.3	1.5	5.0	7.0	1.0	7.5	20
	Data to Output	5.0	1.5	4.0	5.5	1.0	6.0	115
t _{PZH}	Output Enable Time	3.3	3.0	8.5	11.0	2.5	12.0	
		5.0	2.0	6.5	8.5	2.0	9.5	ns
t _{PZL}	Output Enable Time	3.3	2.5	7.5	10.0	2.0	11.0	
		5.0	2.0	6.0	7.5	1.5	8.5	ns
t _{PHZ}	Output Disable Time	3.3	2.5	8.5	13.0	1.5	14.0	
		5.0	1.5	7.5	10.5	1.0	11.0	115
t _{PLZ}	Output Disable Time	3.3	2.5	7.0	10.0	2.0	11.0	
		5.0	1.5	6.0	8.0	1.5	9.0	ns

Note 5: Voltage Range 3.3 is $3.3V \pm 0.3V$ Voltage Range 5.0 is $5.0V \pm 0.5V$

Capacitance

Symbol	Parameter	Тур	Units	Conditions
C _{IN}	Input Capacitance	4.5	pF	V _{CC} = OPEN
C _{PD}	Power Dissipation Capacitance	30.0	pF	$V_{CC} = 5.0V$

74AC540

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