MOTOROLA

MC54/74F245

OCTAL BIDIRECTIONAL TRANSCEIVER WITH 3-STATE INPUTS/OUTPUTS

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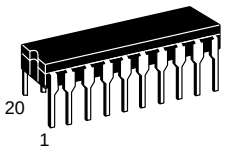
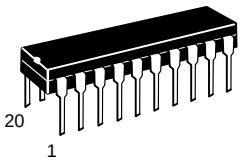
FAST™ SCHOTTKY TTL

The MC54/74F245 contains eight noninverting bidirectional buffers with 3-state outputs and is intended for bus-oriented applications. Current sinking capability is 24 mA at the A ports and 64 mA at the B ports. The Transmit/Receive ($T/\overline{R}$) input determines the direction of data flow through the bidirectional transceiver. Transmit (active HIGH) enables data from A ports to B ports; Receive (active LOW) enables data from B ports to A ports. The Output Enable input, when HIGH, disables both A and B ports by placing them in a high-Z condition.

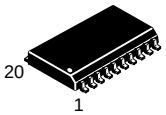
- Noninverting Buffers
- Bidirectional Data Path
- B Outputs Sink 64 mA
- ESD > 4000 Volts



J SUFFIX
CERAMIC
CASE 732-03



N SUFFIX
PLASTIC
CASE 738-03

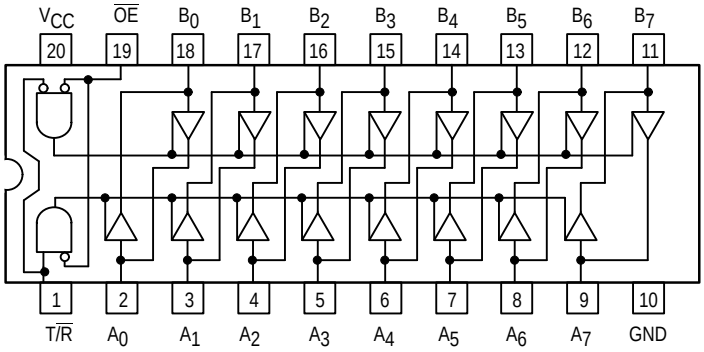


DW SUFFIX
SOIC
CASE 751D-03

ORDERING INFORMATION

MC54FXXXJ	Ceramic
MC74FXXXN	Plastic
MC74FXXXDW	SOIC

CONNECTION DIAGRAM (TOP VIEW)



FUNCTION TABLE

Inputs		Output
$\overline{OE}$	$T/\overline{R}$	
L	L	Bus B Data to Bus A
L	H	Bus A Data to Bus B
H	X	High-Z State

H = HIGH Voltage Level
L = LOW Voltage Level
X = Don't Care

GUARANTEED OPERATING RANGES

Symbol	Parameter			Min	Typ	Max	Unit
V_{CC}	Supply Voltage		54, 74	4.5	5.0	5.5	V
T_A	Operating Ambient Temperature Range		54	–55	25	125	°C
			74	0	25	70	
I_{OH}	Output Current — High	A_n Outputs	54, 74			–3.0	mA
I_{OL}	Output Current — Low	A_n Outputs	74			24	mA
			54			20	mA
I_{OH}	Output Current — High	B_n Outputs	54			–12	mA
			74			–15	
I_{OL}	Output Current — Low	B_n Outputs	54			48	mA
			74			64	

DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

Symbol	Parameter		Limits Min	Typ	Max	Unit	Test Conditions	
V_{IH}	Input HIGH Voltage		2.0			V	Guaranteed Input HIGH Voltage	
V_{IL}	Input LOW Voltage				0.8	V	Guaranteed Input LOW Voltage	
V_{IK}	Input Clamp Diode Voltage				–1.2	V	I_{IN} = –18 mA	V_{CC} = MIN
V_{OH}	Output HIGH Voltage, A_n Outputs	54, 74	2.4	3.3		V	I_{OH} = –3.0 mA	V_{CC} = 4.50 V
		74	2.7	3.3		V	I_{OH} = –3.0 mA	V_{CC} = 4.75 V
V_{OH}	Output HIGH Voltage, B_n Outputs	54, 74	2.4	3.4		V	I_{OH} = –3.0 mA	V_{CC} = 4.50 V
		74	2.7	3.4		V	I_{OH} = –3.0 mA	V_{CC} = 4.75 V
		54	2.0			V	I_{OH} = –12 mA	V_{CC} = 4.50 V
		74	2.0			V	I_{OH} = –15 mA	
V_{OL}	Output LOW Voltage, A_n Outputs	54		0.35	0.5	V	I_{OL} = 20 mA	V_{CC} = MIN
		74		0.35	0.5	V	I_{OL} = 24 mA	
V_{OL}	Output LOW Voltage, B_n Outputs	54			0.55	V	I_{OL} = 48 mA	V_{CC} = MIN
		74			0.55	V	I_{OL} = 64 mA	
$I_{OZH} + I_{IH}$	Output Off Current HIGH				70	µA	V_{OUT} = 2.7 V	V_{CC} = MAX
$I_{OZL} + I_{IL}$	Output Off Current LOW				–650	mA	V_{OUT} = 0.5 V	V_{CC} = MAX
I_{IH}	Input HIGH Current	OE, T/R Inputs			20	µA	V_{IN} = 2.7 V	V_{CC} = MAX
		OE, T/R Inputs			100	µA	V_{IN} = 7.0 V	
		A_n, B_n Inputs			1.0	mA	V_{IN} = 5.5 V	
I_{IL}	Input LOW Current	T/R Input			–0.8	mA	V_{IN} = 0.5 V	V_{CC} = MAX
		OE Input			–1.2	mA		
I_{OS}	Output Short Circuit Current (Note 2)	A_n Outputs	–60		–150	mA	V_{OUT} = GND	V_{CC} = MAX
		B_n Outputs	–100		–225	mA	V_{OUT} = GND	V_{CC} = MAX
I_{CCH}	Power Supply Current HIGH				90	mA	V_{CC} = MAX, Outputs HIGH	
I_{CCL}	Power Supply Current LOW				120	mA	V_{CC} = MAX, Outputs LOW	
I_{CCZ}	Power Supply Current OFF				110	mA	V_{CC} = MAX, Outputs OFF	

NOTES:
1. For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable device type.
2. Not more than one output should be shorted at a time.

AC CHARACTERISTICS

Symbol	Parameter	54/74F T_A = +25°C V_{CC} = +5.0 V C_L = 50 pF Min	Max	54F T_A = -55°C to +125°C V_{CC} = 5.0 V ± 10% C_L = 50 pF Min	Max	74F T_A = 0°C to +70°C V_{CC} = 5.0 V ± 10% C_L = 50 pF Min	Max	Unit
t_{PLH} t_{PHL}	Propagation Delay A_n to B_n or B_n to A_n	2.5 2.5	6.0 6.0	2.5 2.5	8.0 8.0	2.5 2.5	7.0 7.0	ns
t_{PZH} t_{PZL}	Output Enable Time	3.0 3.5	7.0 8.0	3.0 3.5	9.0 10	3.0 3.5	8.0 9.0	ns
t_{PHZ} t_{PLZ}	Output Disable Time	2.5 2.0	6.5 6.5	2.5 2.0	8.5 8.5	2.5 2.0	7.5 7.5	ns