25Ω Octal Bidirectional Transceiver With 3-State Inputs and Outputs

MC74F2245

25Ω OCTAL BIDIRECTIONAL TRANSCEIVER WITH 3–STATE INPUTS AND OUTPUTS

FAST™ SCHOTTKY TTL

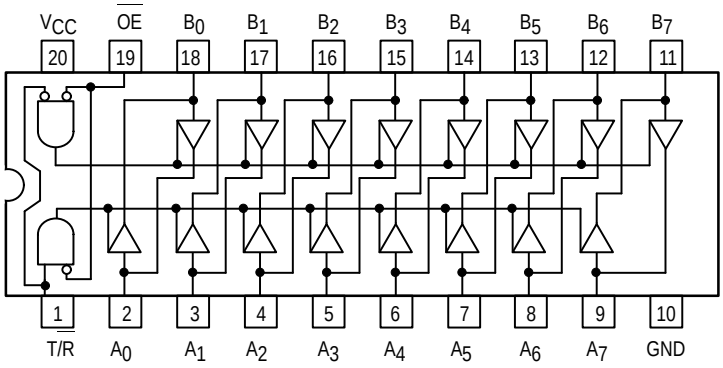
The MC74F2245 is designed for asynchronous communication between data buses. The device transmits data from the A bus to the B bus or from the B bus to the A bus depending upon the logic level at the direction control (DIR) input. The output enable (OE) input disables the device so the buses are effectively isolated.

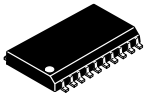
Both A and B outputs can sink up to 12mA; 25Ω resistors are included in the lower output circuit to reduce overshoot and undershoot.

The MC74F2245 is characterized for operation from 0°C to 70°C.

- 3–State Outputs Drive Bus Lines or Buffer Memory Address Registers
- Package Options Include Plastic SOIC (DW–Suffix) and Plastic SSOP (SD–Suffix)

CONNECTION DIAGRAM (TOP VIEW)





DW SUFFIX
PLASTIC SOIC
CASE 751D–04

SD SUFFIX*
PLASTIC SSOP
CASE 940C–03

Thermal Mounting Techniques are Recommended. Please refer to Motorola Application Note AN1567/D.

GUARANTEED OPERATING RANGES

Symbol	Parameter		Min	Typ	Max	Unit
V_{CC}	Supply Voltage		4.5	5.0	5.5	V
T_A	Operating Ambient Temperature Range		0	25	70	°C
I_{OH}	Output Current — High	Outputs			–3.0	mA
I_{OL}	Output Current — Low	Outputs			12	mA

MOTOROLA

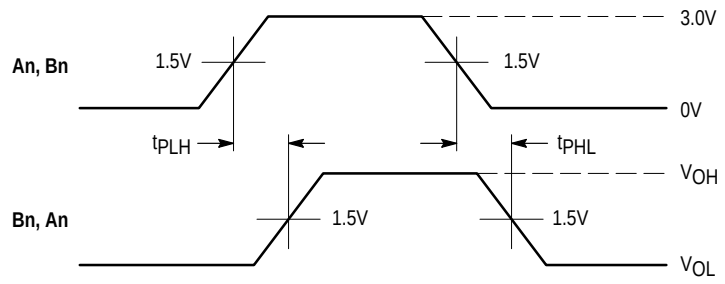
DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

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, Outputs		2.5			V	I_{OH} = –1.0 mA	V_{CC} = 4.50 V
			2.4	3.0		V	I_{OH} = –3.0 mA	V_{CC} = 4.50 V
			2.7	3.2		V	I_{OH} = –3.0 mA	V_{CC} = 4.75 V
V_{OL}	Output LOW Voltage, Outputs			0.2	0.5	V	I_{OL} = 1 mA	V_{CC} = MIN
V_{OL}	Output LOW Voltage, Outputs			0.5	0.75	V	I_{OL} = 12 mA	V_{CC} = MIN
$I_{OZH} + I_{IH}$	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	

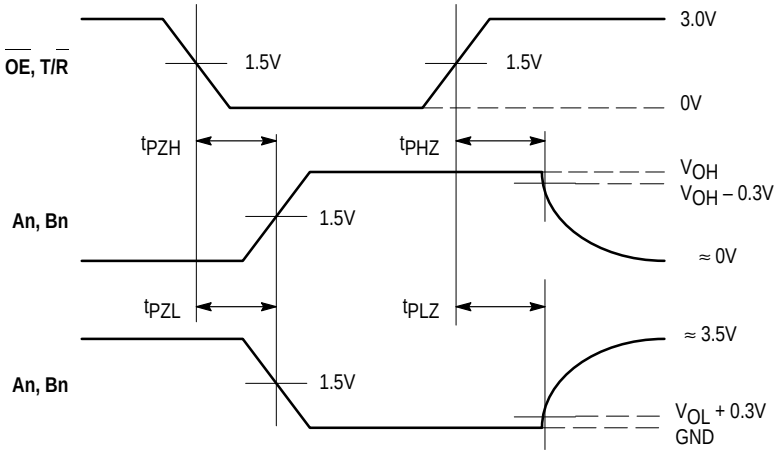
NOTES:
1. For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable device type.
2. Not more than one output should be shorted at a time.

AC CHARACTERISTICS

Symbol	Parameter	T_A = +25°C, V_{CC} = +5.0 V, C_L = 50 pF Min	Max	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 6.6	2.5 2.5	7.0 7.1	ns
t_{PZH} t_{PZL}	Output Enable Time	3.0 3.5	7.3 10.6	3.0 3.5	8.5 12.0	ns
t_{PHZ} t_{PLZ}	Output Disable Time	2.5 2.0	6.5 6.5	2.5 2.0	7.5 7.5	ns

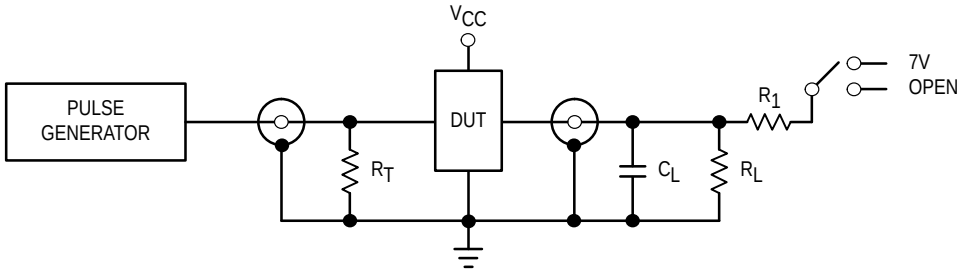


WAVEFORM 1 – PROPAGATION DELAYS
$t_R = t_F$ = 2.5ns, 10% to 90%; f = 1MHz; t_W = 500ns



WAVEFORM 2 – OUTPUT ENABLE AND DISABLE TIMES
$t_R = t_F$ = 2.5ns, 10% to 90%; f = 1MHz; t_W = 500ns

Figure 1. AC Waveforms



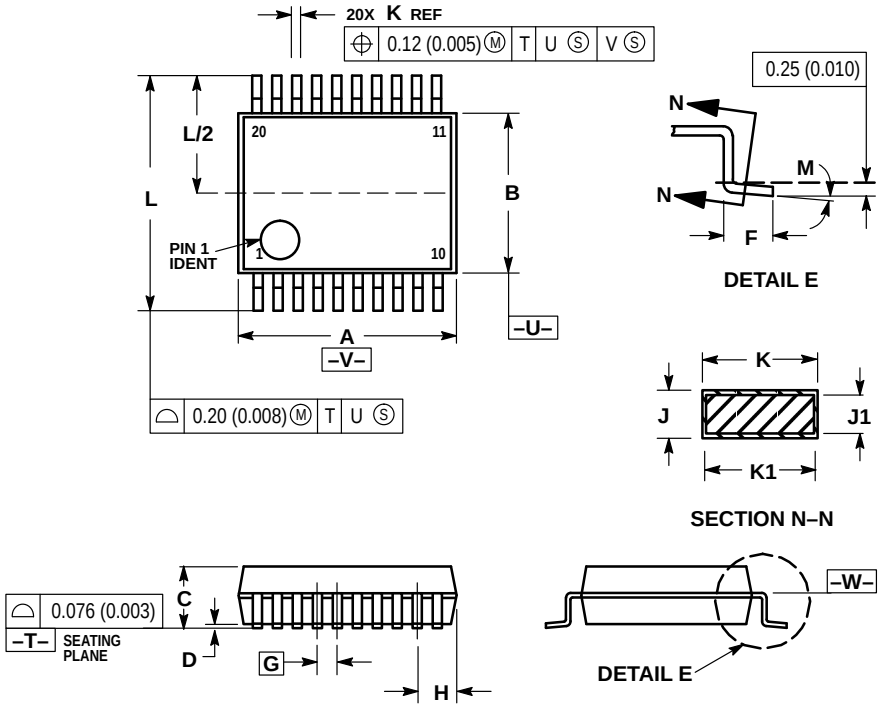
TEST	SWITCH
t_{PLH}, t_{PHL}	Open
t_{PZL}, t_{PLZ}	7V
t_{PZH}, t_{PHZ}	Open

C_L = 50pF or equivalent (Includes jig and probe capacitance)
$R_L = R_1$ = 500Ω or equivalent
$R_T = Z_{OUT}$ of pulse generator (typically 50Ω)

Figure 2. Test Circuit

OUTLINE DIMENSIONS

SD SUFFIX
PLASTIC SSOP PACKAGE
CASE 940C–03
ISSUE B

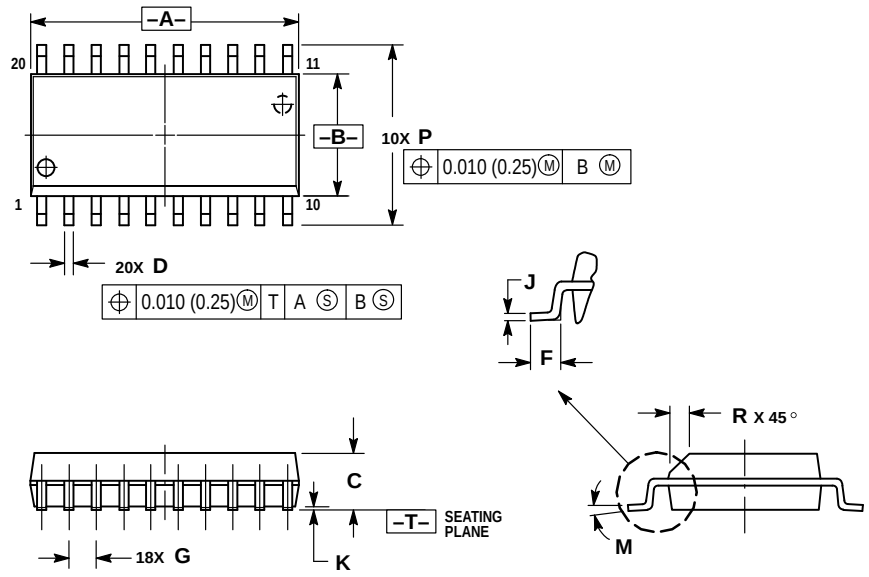


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH OR GATE BURRS SHALL NOT EXCEED 0.15 (0.006) PER SIDE.
4. DIMENSION B DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.15 (0.006) PER SIDE.
5. DIMENSION K DOES NOT INCLUDE DAMBAR PROTRUSION/INTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.13 (0.005) TOTAL IN EXCESS OF K DIMENSION AT MAXIMUM MATERIAL CONDITION. DAMBAR INTRUSION SHALL NOT REDUCE DIMENSION K BY MORE THAN 0.07 (0.002) AT LEAST MATERIAL CONDITION.
6. TERMINAL NUMBERS ARE SHOWN FOR REFERENCE ONLY.
7. DIMENSION A AND B ARE TO BE DETERMINED AT DATUM PLANE –W–.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	7.07	7.33	0.278	0.288
B	5.20	5.38	0.205	0.212
C	1.73	1.99	0.068	0.078
D	0.05	0.21	0.002	0.008
F	0.63	0.95	0.024	0.037
G	0.65 BSC		0.026 BSC	
H	0.59	0.75	0.023	0.030
J	0.09	0.20	0.003	0.008
J1	0.09	0.16	0.003	0.006
K	0.25	0.38	0.010	0.015
K1	0.25	0.33	0.010	0.013
L	7.65	7.90	0.301	0.311
M	0 °	8 °	0 °	8 °

OUTLINE DIMENSIONS

DW SUFFIX
PLASTIC SOIC PACKAGE
CASE 751D–04
ISSUE E



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.150 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.13 (0.005) TOTAL IN EXCESS OF D DIMENSION AT MAXIMUM MATERIAL CONDITION.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	12.65	12.95	0.499	0.510
B	7.40	7.60	0.292	0.299
C	2.35	2.65	0.093	0.104
D	0.35	0.49	0.014	0.019
F	0.50	0.90	0.020	0.035
G	1.27 BSC		0.050 BSC	
J	0.25	0.32	0.010	0.012
K	0.10	0.25	0.004	0.009
M	0°	7°	0°	7°
P	10.05	10.55	0.395	0.415
R	0.25	0.75	0.010	0.029

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