

M74HCT245

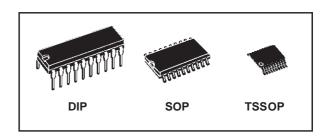
OCTAL BUS TRANSCEIVER WITH 3 STATE OUTPUTS (NON INVERTED)

- HIGH SPEED:
 - t_{PD} = 13ns (TYP.) at V_{CC} = 4.5V
- LOW POWER DISSIPATION: $I_{CC} = 4\mu A(MAX.)$ at $T_A=25^{\circ}C$
- COMPATIBLE WITH TTL OUTPUTS : V_{IH} = 2V (MIN.) V_{IL} = 0.8V (MAX)
- SYMMETRICAL OUTPUT IMPEDANCE: |I_{OH}| = I_{OL} = 6mA (MIN)
- BALANCED PROPAGATION DELAYS: t_{PLH} ≅ t_{PHL}
- PIN AND FUNCTION COMPATIBLE WITH 74 SERIES 245



The M74HCT245 is an advanced high-speed CMOS OCTAL BUS TRANSCEIVER (3-STATE) fabricated with silicon gate C²MOS technology.

This IC is intended for two-way asynchronous communication between data buses, and the direction of data transmission is determined by DIR input. The enable input \overline{G} can be used to disable the device so that the buses are effectively isolated.



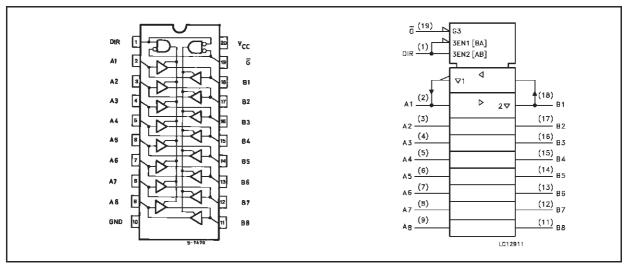
ORDER CODES

PACKAGE	TUBE	T & R
DIP	M74HCT245B1R	
SOP	M74HCT245M1R	M74HCT245RM13TR
TSSOP		M74HCT245TTR

All inputs are equipped with protection circuits against static discharge and transient excess voltage.

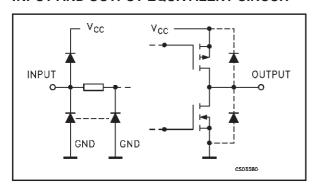
All floating bus terminals during High Z State must be held HIGH or LOW.

PIN CONNECTION AND IEC LOGIC SYMBOLS



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INPUT AND OUTPUT EQUIVALENT CIRCUIT



PIN DESCRIPTION

PIN No	SYMBOL	NAME AND FUNCTION
1	DIR	Directional Control
2, 3, 4, 5, 6, 7, 8, 9	A1 to A8	Data Inputs/Outputs
18, 17, 16, 15, 14, 13, 12, 11	B1 to B8	Data Inputs/Outputs
19	G	Output Enable Input
10	GND	Ground (0V)
20	V _{CC}	Positive Supply Voltage

TRUTH TABLE

INP	UTS	FUNC	OUTPUT	
G	DIR	A BUS B BUS		Yn
L	L	OUTPUT	INPUT	A = B
L	Н	INPUT	OUTPUT	B = A
Н	X	Z	Z	Z

X : Don't Care Z : High Impedance

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{CC}	Supply Voltage	-0.5 to +7	V
V _I	DC Input Voltage	-0.5 to V _{CC} + 0.5	V
Vo	DC Output Voltage	-0.5 to V _{CC} + 0.5	V
I _{IK}	DC Input Diode Current	± 20	mA
l _{ok}	DC Output Diode Current	± 20	mA
Io	DC Output Current	± 35	mA
I _{CC} or I _{GND}	DC V _{CC} or Ground Current	± 70	mA
P _D	Power Dissipation	500(*)	mW
T _{stg}	Storage Temperature	-65 to +150	°C
T _L	Lead Temperature (10 sec)	300	°C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied
(*) 500mW at 65 °C; derate to 300mW by 10mW/°C from 65°C to 85°C

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Value	Unit
V _{CC}	Supply Voltage	4.5 to 5.5	V
VI	Input Voltage	0 to V _{CC}	V
Vo	Output Voltage	0 to V _{CC}	V
T _{op}	Operating Temperature	-55 to 125	°C
t _r , t _f	Input Rise and Fall Time (V _{CC} = 4.5 to 5.5V)	0 to 500	ns

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DC SPECIFICATIONS

		7	Test Condition				Value				
Symbol	Parameter	v _{cc}		$T_A = 25^{\circ}C$			-40 to	85°C	-55 to 125°C		Unit
		(V)		Min.	Тур.	Max.	Min.	Max.	Min.	Max.	
V _{IH}	High Level Input Voltage	4.5 to 5.5		2.0			2.0		2.0		V
V _{IL}	Low Level Input Voltage	4.5 to 5.5				0.8		0.8		0.8	V
V _{OH}	High Level Output	4.5	I _O =-20 μA	4.4	4.5		4.4		4.4		V
	Voltage	4.5	I _O =-6.0 mA	4.18	4.31		4.13		4.10		V
V _{OL}	Low Level Output	4.5	I _O =20 μA		0.0	0.1		0.1		0.1	V
	Voltage	4.5	I _O =6.0 mA		0.17	0.26		0.33		0.40	V
l _l	Input Leakage Current	5.5	$V_I = V_{CC}$ or GND			± 0.1		± 1		± 1	μА
I _{OZ}	High Impedance Output Leakage Current	5.5	$V_I = V_{IH} \text{ or } V_{IL}$ $V_O = V_{CC} \text{ or GND}$			± 0.5		± 5		± 10	μΑ
I _{CC}	Quiescent Supply Current	5.5	$V_I = V_{CC}$ or GND			4		40		80	μА
ΔI _{CC}	Additional Worst Case Supply Current	5.5	Per Input pin $V_I = 0.5V$ or $V_I = 2.4V$ Other Inputs at V_{CC} or GND $I_O = 0$			2.0		2.9		3.0	mA

AC ELECTRICAL CHARACTERISTICS ($C_L = 50 \ pF$, Input $t_r = t_f = 6 ns$)

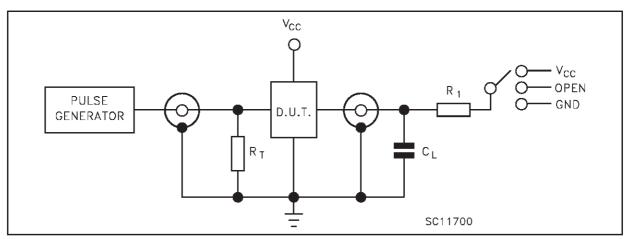
		Test Condition			Value							
Symbol Parameter	Parameter	v _{cc}	CC V) C _L (pF)		Т	T _A = 25°C		-40 to 85°C		-55 to 125°C		Unit
		(V)			Min.	Тур.	Max.	Min.	Max.	Min.	Max.	
t _{TLH} t _{THL}	Output Transition Time	4.5	50			7	12		15		18	ns
t _{PLH} t _{PHL}	Propagation Delay	4.5	50			13	22		28		33	ns
	Time	4.5	150			18	30		38		45	115
t _{PZL} t _{PZH}	High Impedance	4.5	50	$R_L = 1 \text{ K}\Omega$		19	30		38		45	
	Output Enable Time	4.5	150	$R_L = 1 \text{ K}\Omega$		24	38		48		57	ns
t _{PLZ} t _{PHZ}	High Impedance Output Disable Time	4.5	50	R _L = 1 KΩ		17	30		38		45	ns

CAPACITIVE CHARACTERISTICS

		Test Condition			Value							
Symbol	Parameter	v _{cc}				T _A = 25°C			-40 to 85°C		-55 to 125°C	
		(V)				Тур.	Max.	Min.	Max.	Min.	Max.	
C _{IN}	Input Capacitance			DIR, G		5	10		10		10	pF
C _{I/OUT}	Output Capacitance			An, Bn		13						pF
C _{PD}	Power Dissipation Capacitance (note 1)					41						pF

¹⁾ C_{PD} is defined as the value of the IC's internal equivalent capacitance which is calculated from the operating current consumption without load. (Refer to Test Circuit). Average operating current can be obtained by the following equation. $I_{CC(opr)} = C_{PD} \times V_{CC} \times f_{IN} + I_{CC}/8$ (per circuit)

TEST CIRCUIT

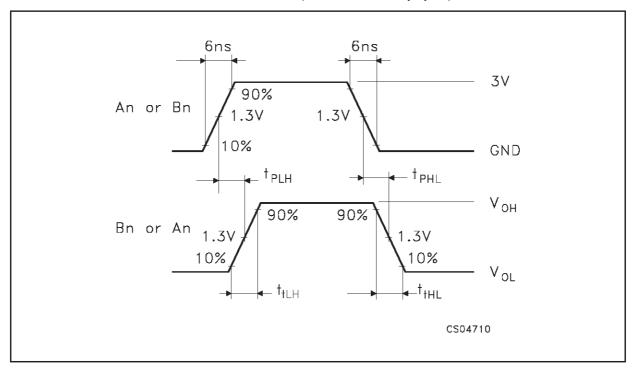


TEST	SWITCH
t _{PLH} , t _{PHL}	Open
t _{PZL} , t _{PLZ}	V _{CC}
t _{PZH} , t _{PHZ}	GND

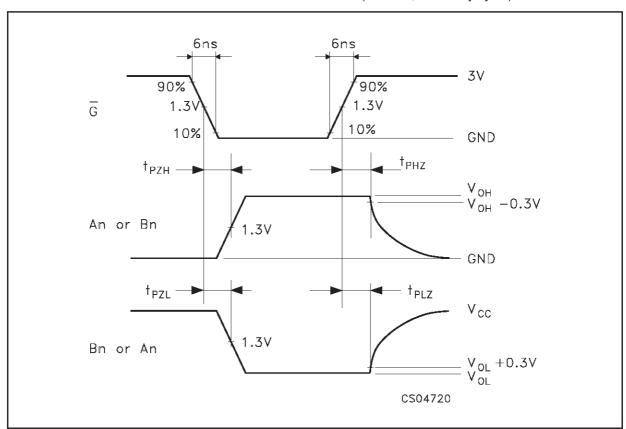
 $[\]begin{array}{l} C_L = 50 pF/150 pF \text{ or equivalent (includes jig and probe capacitance)} \\ R_1 = 1 K\Omega \text{ or equivalent} \\ R_T = Z_{OUT} \text{ of pulse generator (typically } 50\Omega) \end{array}$

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WAVEFORM 1: PROPAGATION DELAY TIME (f=1MHz; 50% duty cycle)

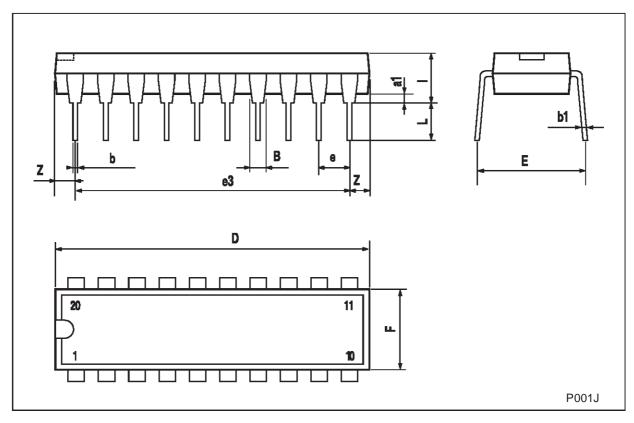


WAVEFORM 2: OUTPUT ENABLE AND DISABLE TIME (f=1MHz; 50% duty cycle)



Plastic DIP-20 (0.25) MECHANICAL DATA

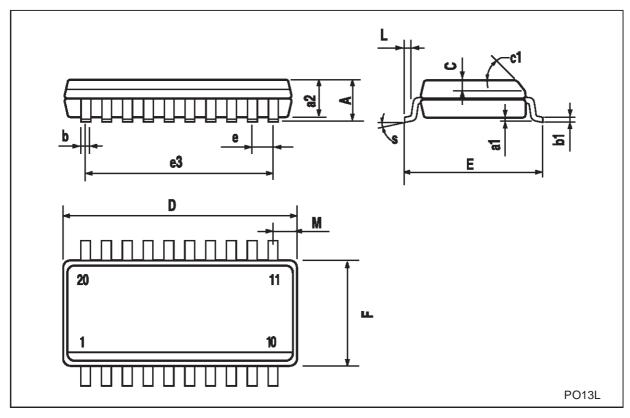
DIM		mm.		inch				
DIM.	MIN.	TYP	MAX.	MIN.	TYP.	MAX.		
a1	0.254			0.010				
В	1.39		1.65	0.055		0.065		
b		0.45			0.018			
b1		0.25			0.010			
D			25.4			1.000		
E		8.5			0.335			
е		2.54			0.100			
e3		22.86			0.900			
F			7.1			0.280		
I			3.93			0.155		
L		3.3			0.130			
Z			1.34			0.053		



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SO-20 MECHANICAL DATA

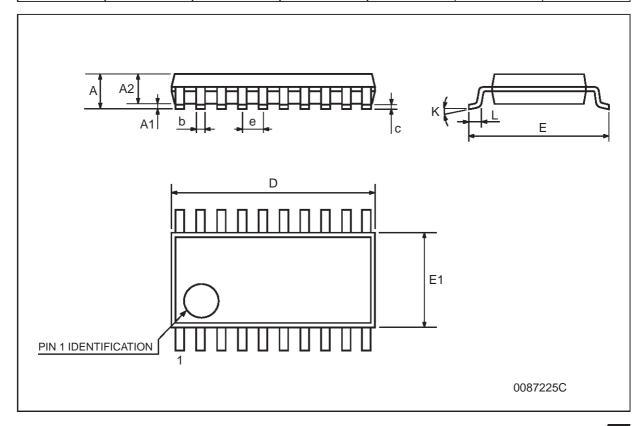
DIM.		mm.		inch					
DIN.	MIN.	TYP	MAX.	MIN.	TYP.	MAX.			
А			2.65			0.104			
a1	0.1		0.2	0.004		0.008			
a2			2.45			0.096			
b	0.35		0.49	0.014		0.019			
b1	0.23		0.32	0.009		0.012			
С		0.5			0.020				
c1			45°	(typ.)		'			
D	12.60		13.00	0.496		0.512			
Е	10.00		10.65	0.393		0.419			
е		1.27			0.050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



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TSSOP20 MECHANICAL DATA

DIM.		mm.		inch			
DIW.	MIN.	TYP	MAX.	MIN.	TYP.	MAX.	
А			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	
С	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	
е		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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