

TENTATIVE

OCTAL BUS TRANCEIVER

TC74HC245P 3-STATE, NON-INVERTING

TC74HC640P 3-STATE, INVERTING

TC74HC643P 3-STATE, INVERTING AND NON-INVERTING

The TC74HC245, TC74HC640 and TC74HC643 utilize silicon gate C²MOS technology to achieve operating speed equivalent to LSTTL parts.

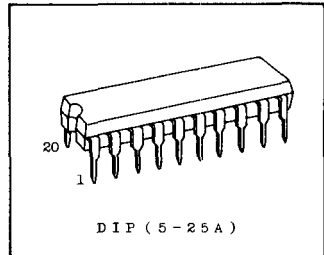
Along with the low power dissipation and high noise immunity of standard C²MOS integrated circuit, it possesses the driving capability of 15 LSTTL loads.

These IC's are intended for two-way asynchronous communication between data buses, and the direction of data transmission is determined by DIR input.

The enable input ($\bar{G}$) can be used to disable the device so that the buses are effectively isolated. All inputs are equipped with protection circuits against static discharge or transient excess voltage.

FEATURES:

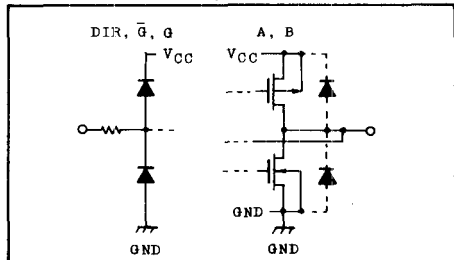
- . High Speed..... $t_{pd}=11ns$ (Typ.) at $V_{CC}=5V$
- . Low Power Dissipation..... $I_{CC}=4\mu A$ (Max.) at $T_a=25^\circ C$
- . High Noise Immunity..... $V_{NIH}=V_{NIL}=28\% V_{CC}$ (Min.)
- . Output Drive Capability.....15 LSTTL Loads
- . Symmetrical Output Impedance... $|I_{OH}|=I_{OL}=6mA$ (Min.)
- . Wide Operating Voltage Range.. $V_{CC}(opr)=2V \sim 6V$
- . Pin and Function Compatible with 74LS245/640/643

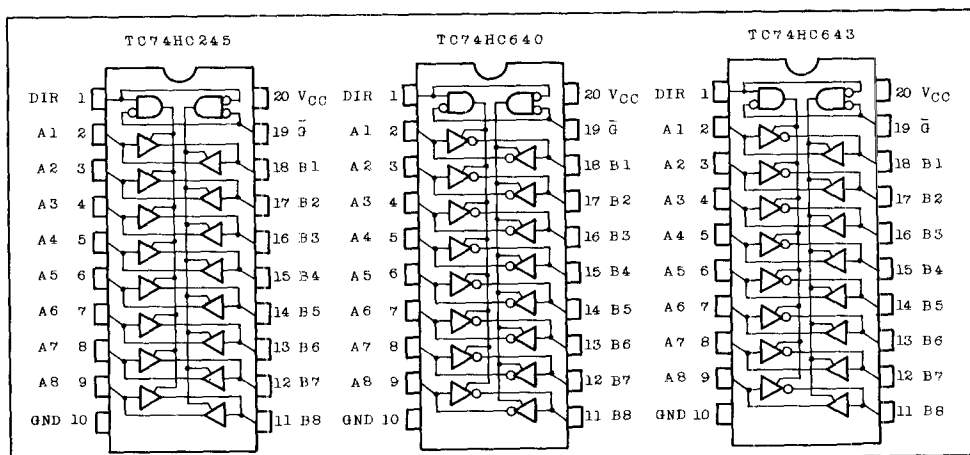


NOTICE FOR APPLICATION

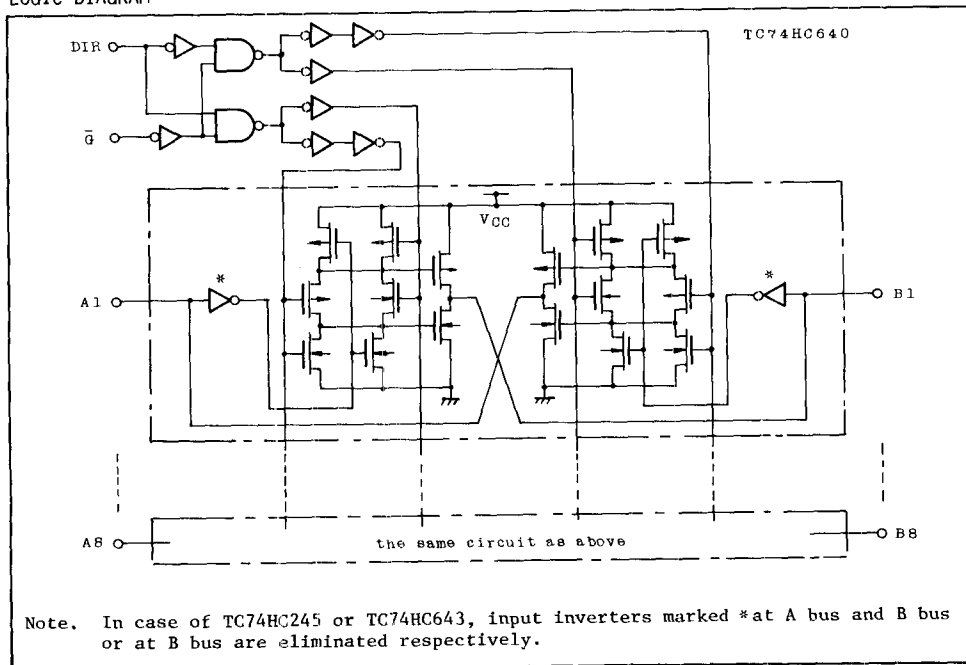
It is prohibited to apply a signal to a bus terminal when it is in output mode. And when a bus terminal is floating (high impedance state), it is requested to fix the input level by means of external pull down or pull up resistor or BUS TERMINATOR IC (TC40117BP).

INPUT and OUTPUT EQUIVALENT CIRCUIT





LOGIC DIAGRAM



TRUTH TABLE

INPUT		FUNCTION		OUTPUT		
$\overline{G}$	DIR	A BUS	B BUS	HC245	HC640	HC643
L	L	OUTPUT	INPUT	A = B	A = $\overline{B}$	A = B
L	H	INPUT	OUTPUT	B = A	B = $\overline{A}$	B = $\overline{A}$
H	*	Z		Z	Z	Z

* : "H" or "L"

Z : High Impedance

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage Range	V _{CC}	-0.5 ~ 7	V
DC Input Voltage	V _{IN}	-0.5 ~ V _{CC} +0.5	V
DC Output Voltage	V _{OUT}	-0.5 ~ V _{CC} +0.5	V
Input Diode Current	I _{IK}	±20	mA
Output Diode Current	I _{OK}	±20	mA
DC Output Current	I _{OUT}	±35	mA
DC V _{CC} /Ground Current	I _{CC}	±70	mA
Power Dissipation	P _D	500 *	mW
Storage Temperature	T _{stg}	-65 ~ 150	°C
Lead Temperature 10sec	T _L	300	°C

* 500mW in the range of
Ta=-40°C ~ 65°C.
and from Ta=65°C up to
85°C derating factor
of -10mW/°C shall be
applied until 300mW.

RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	LIMIT	UNIT
Supply Voltage	V _{CC}	2 ~ 6	V
Input Voltage	V _{IN}	0 ~ V _{CC}	V
Output Voltage	V _{OUT}	0 ~ V _{CC}	V
Operating Temperature	T _{opr}	-40 ~ 85	°C
Input Rise and Fall Time	t _{r,tf}	0 ~ 500	ns

TC74HC245P • TC74HC640P
TC74HC640P

DC ELECTRICAL CHARACTERISTICS

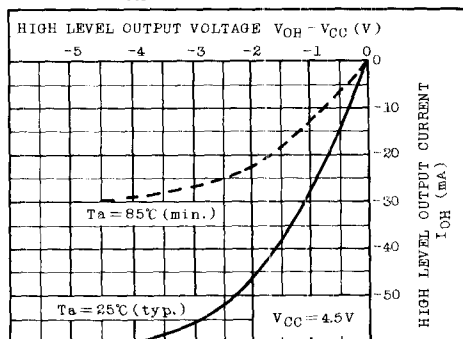
PARAMETER	SYMBOL	TEST CONDITION		Ta=25°C			Ta=-40~85°C		UNIT
				V _{CC}	MIN.	TYP.	MAX.	MIN.	
High-Level Input Voltage	V _{IH}			2.0	1.5	-	-	1.5	V
				4.5	3.15	-	-	3.15	
				6.0	4.2	-	-	4.2	
Low-Level Input Voltage	V _{IL}			2.0	-	-	0.5	0.5	V
				4.5	-	-	1.35	1.35	
				6.0	-	-	1.8	1.8	
High-Level Output Voltage	V _{OH}	V _{IN} [≠] V _{IH} or V _{IL}	I _{OH} =-20μA	2.0	1.9	2.0	-	1.9	V
				4.5	4.4	4.5	-	4.4	
				6.0	5.9	6.0	-	5.9	
		I _{OH} =-6mA I _{OH} =-7.8mA		4.5	4.18	4.31	-	4.13	
				6.0	5.68	5.80	-	5.63	
Low-Level Output Voltage	V _{OL}	V _{IN} [≠] V _{IH} or V _{IL}	I _{OL} =20μA	2.0	-	0.0	0.1	0.1	V
				4.5	-	0.0	0.1	0.1	
				6.0	-	0.0	0.1	0.1	
		I _{OL} =6mA I _{OL} =7.8mA		4.5	-	0.17	0.32	0.37	
				6.0	-	0.18	0.32	0.37	
3-State Output Off-State Current	I _{OZ}	V _{IN} =V _{IH} or V _{IL} V _{OUT} =V _{CC} or GND		6.0	-	-	±0.5	±5.0	μA
Input Leakage Current*	I _{IN}	V _{IN} =V _{CC} or GND		6.0	-	-	±0.1	±1.0	
Quiescent Supply Current	I _{CC}	V _{IN} =V _{CC} or GND		6.0	-	-	4.0	40.0	

* Applicable only to DIR, G, $\bar{G}$ input.

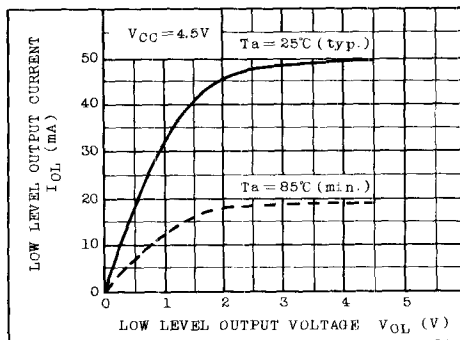
AC ELECTRICAL CHARACTERISTICS (C_L=50pF, Input t_r=t_f=6ns)

PARAMETER	SYMBOL	TEST CONDITION	Ta=25°C			Ta=-40~85°C		UNIT
			V _{CC}	MIN.	TYP.	MAX.	MIN.	
Output Transition Time	t _{TLH} t _{THL}		2.0	-	25	60	-	75
			4.5	-	8	12	-	15
			6.0	-	7	11	-	13
Propagation Delay Time	t _{PLH} t _{PHL}		2.0	-	50	110	-	135
			4.5	-	13	22	-	27
			6.0	-	11	19	-	23

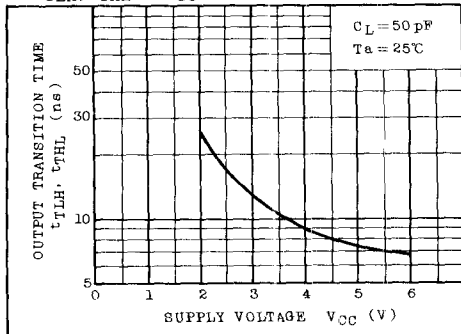
I_{OH} CHARACTERISTICS



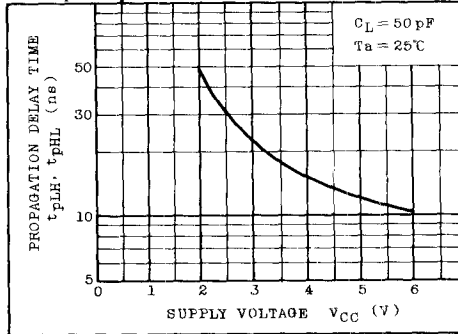
I_{OL} CHARACTERISTICS



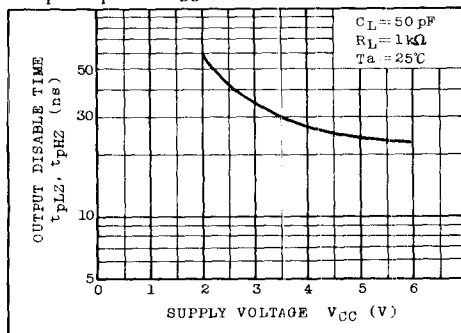
$t_{TLH}, t_{THL} - V_{CC}$ CHARACTERISTICS



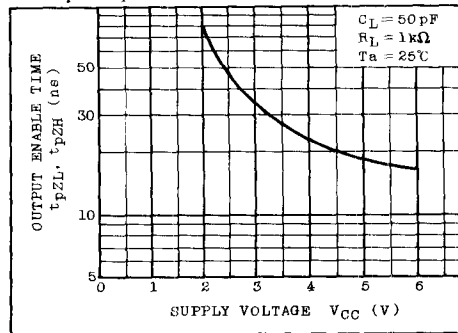
$t_{PLH}, t_{PHL} - V_{CC}$ CHARACTERISTICS



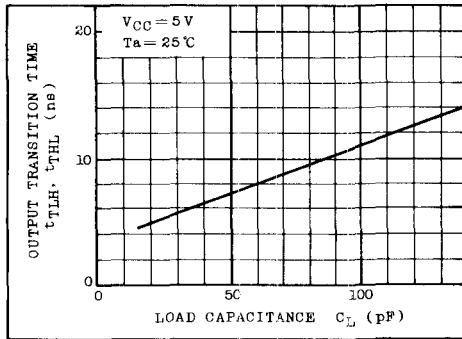
$t_{PLZ}, t_{PHZ} - V_{CC}$ CHARACTERISTICS



$t_{PZL}, t_{PZH} - V_{CC}$ CHARACTERISTICS



$t_{TLH}, t_{THL} - C_L$ CHARACTERISTICS (TYP.)



$t_{PLH}, t_{PHL} - C_L$ CHARACTERISTICS (TYP.)

