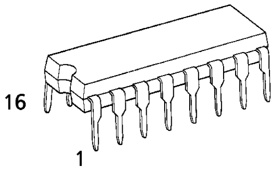
TOSHIBA CMOS DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TC4512BP, TC4512BF, TC4512BFN

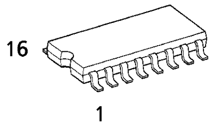
TC4512B 8 – CHANNEL DATA SELECTOR

TC4512B is data selector which selects 8 channel data inputs (X0 through X7) according to binary address inputs A, B and C. Since high impedance can be given to output Z by setting DISABLE input to “H”, the wired-OR arrangement can be achieved. DISABLE input takes precedence over other inputs giving the output high impedance.
If DISABLE = “L” and INHIBIT = “H”, the data select operation is inhibited and output Z becomes “L” Level.

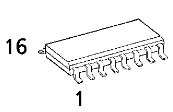
(Note) The JEDEC SOP (FN) is not available in Japan.



P (DIP16-P-300-2.54A)
Weight : 1.00g (Typ.)



F (SOP16-P-300-1.27)
Weight : 0.18g (Typ.)

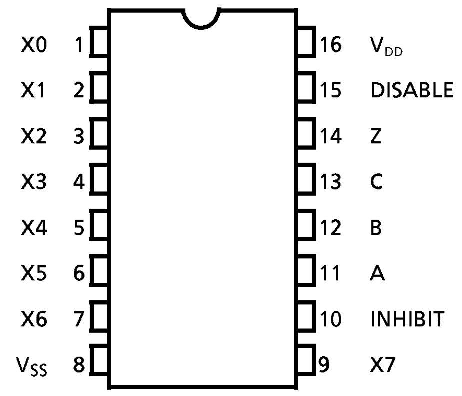


FN (SOL16-P-150-1.27)
Weight : 0.13g (Typ.)

MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	RATING	UNIT
DC Supply Voltage	V_{DD}	$V_{SS} - 0.5 \sim V_{SS} + 20$	V
Input Voltage	V_{IN}	$V_{SS} - 0.5 \sim V_{DD} + 0.5$	V
Output Voltage	V_{OUT}	$V_{SS} - 0.5 \sim V_{DD} + 0.5$	V
DC Input Current	I_{IN}	± 10	mA
Power Dissipation	P_D	300 (DIP) / 180 (SOIC)	mW
Operating Temperature Range	T_{opr}	− 40~85	°C
Storage Temperature Range	T_{stg}	− 65~150	°C

PIN ASSIGNMENT



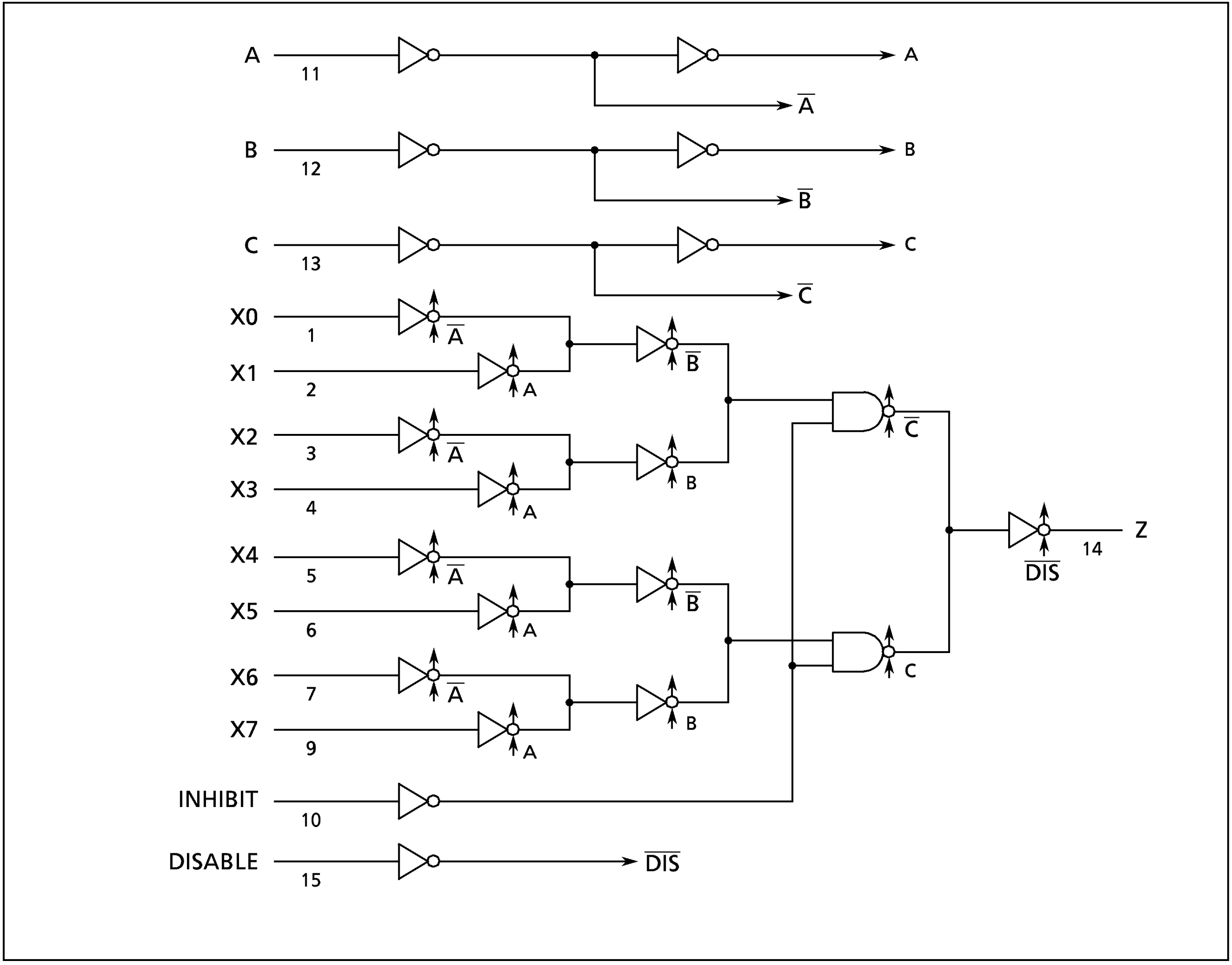
(TOP VIEW)

TRUTH TABLE

INPUTS					OUTPUT
A	B	C	INHIBIT	DISABLE	Z
L	L	L	L	L	X0
H	L	L	L	L	X1
L	H	L	L	L	X2
H	H	L	L	L	X3
L	L	H	L	L	X4
H	L	H	L	L	X5
L	H	H	L	L	X6
H	H	H	L	L	X7
*	*	*	H	L	L
*	*	*	*	H	HZ

* : DON’T CARE
HZ : HIGH IMPEDANCE

LOGIC DIAGRAM



RECOMMENDED OPERATING CONDITIONS ($V_{SS} = 0V$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
DC Supply Voltage	V_{DD}		3	—	18	V
Input Voltage	V_{IN}		0	—	V_{DD}	V

STATIC ELECTRICAL CHARACTERISTICS ($V_{SS} = 0V$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	V_{DD} (V)	−40°C		25°C			85°C		UNIT
				MIN.	MAX.	MIN.	TYP.	MAX.	MIN.	MAX.	
High-Level Output Voltage	V_{OH}	$\lvert I_{OUT} \rvert < 1\mu A$ $V_{IN} = V_{SS}, V_{DD}$	5	4.95	—	4.95	5.00	—	4.95	—	V
			10	9.95	—	9.95	10.00	—	9.95	—	
			15	14.95	—	14.95	15.00	—	14.95	—	
Low-Level Output Voltage	V_{OL}	$\lvert I_{OUT} \rvert < 1\mu A$ $V_{IN} = V_{SS}, V_{DD}$	5	—	0.05	—	0.00	0.05	—	0.05	
			10	—	0.05	—	0.00	0.05	—	0.05	
			15	—	0.05	—	0.00	0.05	—	0.05	
Output High Current	I_{OH}	$V_{OH} = 4.6V$	5	−0.61	—	−0.51	−1.0	—	−0.42	—	mA
		$V_{OH} = 2.5V$	5	−2.5	—	−2.1	−4.0	—	−1.7	—	
		$V_{OH} = 9.5V$	10	−1.5	—	−1.3	−2.2	—	−1.1	—	
		$V_{OH} = 13.5V$	15	−4.0	—	−3.4	−9.0	—	−2.8	—	
		$V_{IN} = V_{SS}, V_{DD}$									
Output Low Current	I_{OL}	$V_{OL} = 0.4V$	5	0.61	—	0.51	1.2	—	0.42	—	
		$V_{OL} = 0.5V$	10	1.5	—	1.3	3.2	—	1.1	—	
		$V_{OL} = 1.5V$	15	4.0	—	3.4	12.0	—	2.8	—	
		$V_{IN} = V_{SS}, V_{DD}$									
Input High Voltage	V_{IH}	$V_{OUT} = 0.5V, 4.5V$	5	3.5	—	3.5	2.75	—	3.5	—	V
		$V_{OUT} = 1.0V, 9.0V$	10	7.0	—	7.0	5.5	—	7.0	—	
		$V_{OUT} = 1.5V, 13.5V$	15	11.0	—	11.0	8.25	—	11.0	—	
		$\lvert I_{OUT} \rvert < 1\mu A$									
Input Low Voltage	V_{IL}	$V_{OUT} = 0.5V, 4.5V$	5	—	1.5	—	2.25	1.5	—	1.5	
		$V_{OUT} = 1.0V, 9.0V$	10	—	3.0	—	4.5	3.0	—	3.0	
		$V_{OUT} = 1.5V, 13.5V$	15	—	4.0	—	6.75	4.0	—	4.0	
		$\lvert I_{OUT} \rvert < 1\mu A$									
Input Current "H" Level	I_{IH}	$V_{IH} = 18V$	18	—	0.1	—	10^{-5}	0.1	—	1.0	μA
Input Current "L" Level	I_{IL}	$V_{IL} = 0V$	18	—	−0.1	—	-10^{-5}	−0.1	—	−1.0	
3-State Output Leakage Current "H" Level	I_{DH}	$V_{OH} = 18V$	18	—	0.4	—	10^{-4}	0.4	—	12	μA
3-State Output Leakage Current "L" Level	I_{DL}	$V_{OL} = 0V$	18	—	−0.4	—	-10^{-4}	−0.4	—	−12	
Quiescent Supply Current	I_{DD}	$V_{IN} = V_{SS}, V_{DD}$ *	5	—	5	—	0.005	5	—	150	μA
			10	—	10	—	0.010	10	—	300	
			15	—	20	—	0.015	20	—	600	

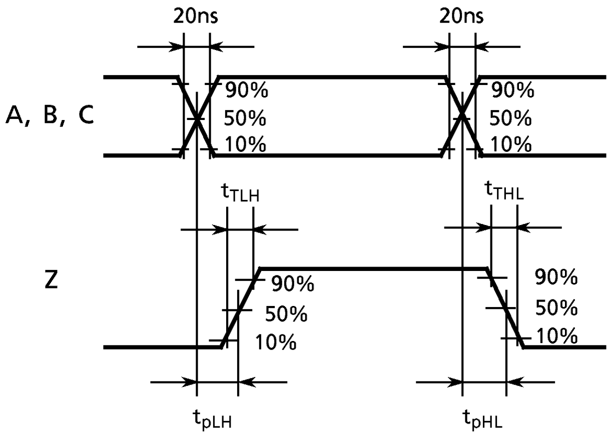
* All valid input combinations.

DYNAMIC ELECTRICAL CHARACTERISTICS (Ta = 25°C, Vss = 0V, C_L = 50pF)

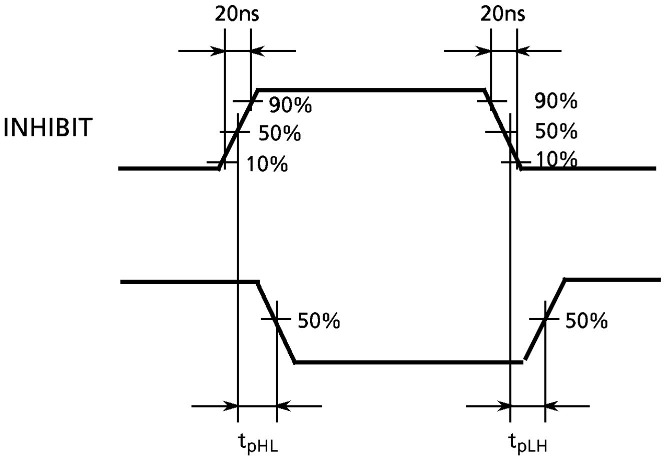
CHARACTERISTIC	SYMBOL	TEST CONDITION	V_{DD}(V)	MIN.	TYP.	MAX.	UNIT
Output Transition Time (Low to High)	t_{TLH}		5	—	80	200	ns
			10	—	50	100	
			15	—	40	80	
Output Transition Time (High to Low)	t_{THL}		5	—	80	200	
			10	—	50	100	
			15	—	40	80	
Propagation Delay Time (INHIBIT - Z)	t_{pLH} t_{pHL}		5	—	140	280	
			10	—	60	140	
			15	—	40	100	
Propagation Delay Time (A, B, C - Z)	t_{pLH} t_{pHL}		5	—	240	400	
			10	—	95	170	
			15	—	65	120	
Propagation Delay Time (X - Z)	t_{pLH} t_{pHL}		5	—	210	360	
			10	—	85	150	
			15	—	60	110	
Three State Disable Time (DISABLE - Z)	t_{pZL} , t_{pLZ} t_{pHZ} , t_{pZH}	$R_L = 1k\Omega$	5	—	60	120	
			10	—	25	60	
			15	—	20	40	
Input Capacitance	C_{IN}			—	5	7.5	pF

WAVEFORM FOR MEASUREMENT OF DYNAMIC CHARACTERISTICS

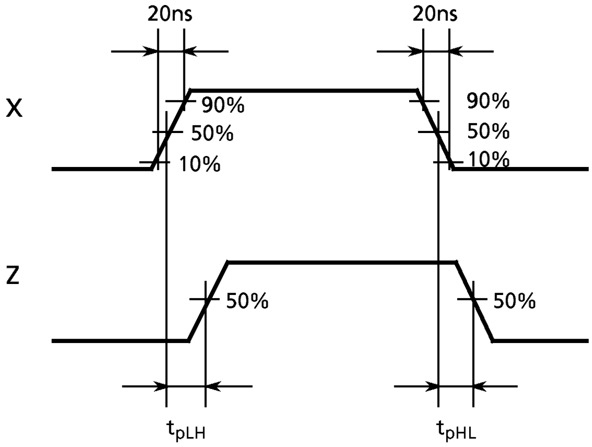
WAVEFORM 1



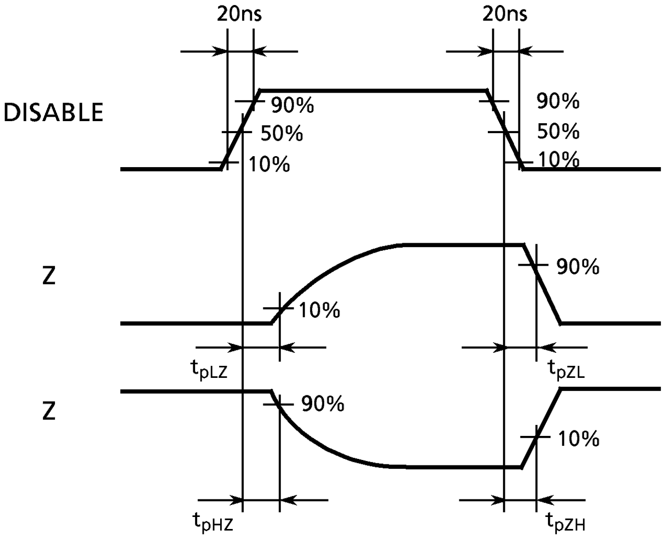
WAVEFORM 2 (X = "H")



WAVEFORM 3

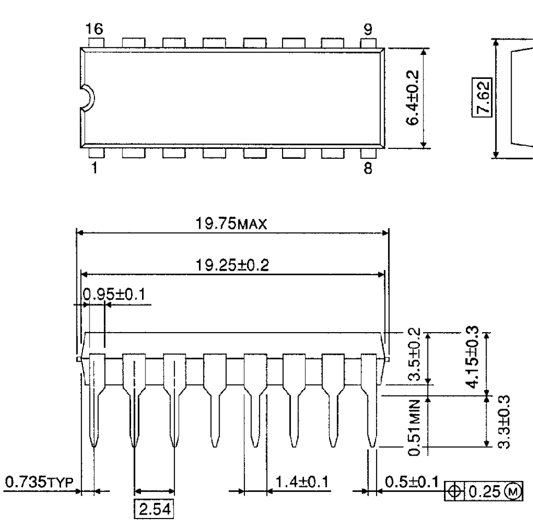


WAVEFORM 4



DIP 16PIN PACKAGE DIMENSIONS (DIP16-P-300-2.54A)

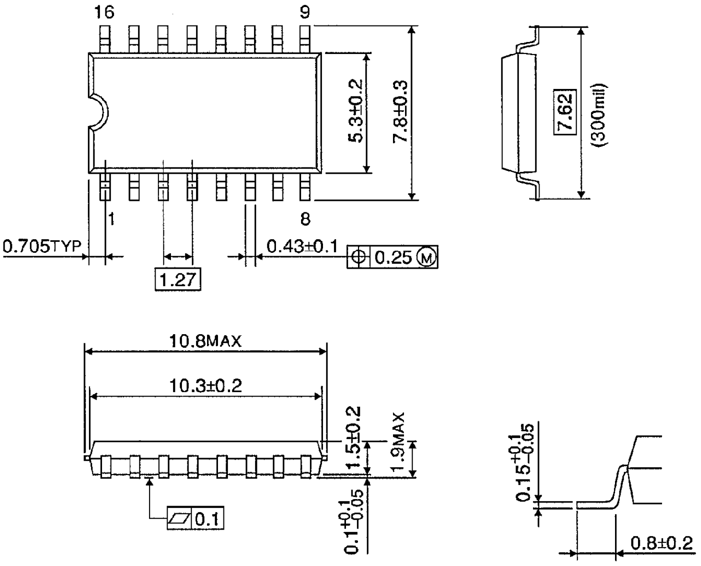
Unit in mm



Weight : 1.00g (Typ.)

SOP 16PIN (200mil BODY) PACKAGE DIMENSIONS (SOP16-P-300-1.27)

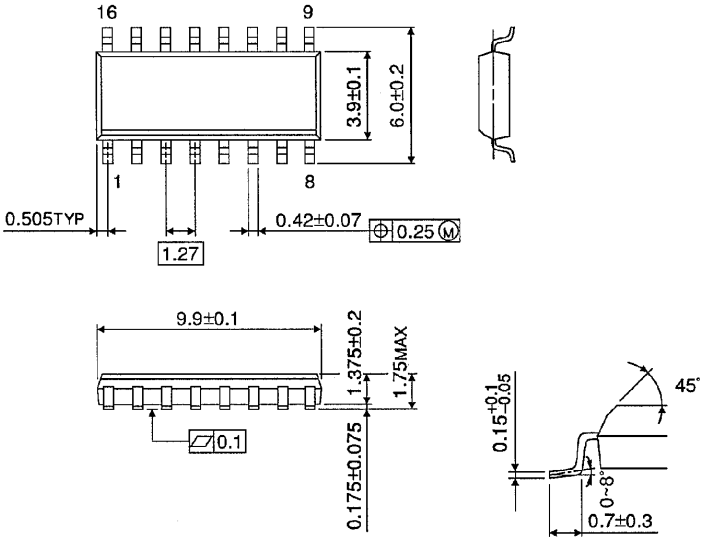
Unit in mm



Weight : 0.18g (Typ.)

SOP 16PIN (150mil BODY) PACKAGE DIMENSIONS (SOL16-P-150 -1.27) Unit in mm

(Note) This package is not available in Japan.



Weight : 0.13g (Typ.)

RESTRICTIONS ON PRODUCT USE

000707EBA

- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.
  In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handling Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc..
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer's own risk.
- The products described in this document are subject to the foreign exchange and foreign trade laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.