TOSHIBA CMOS Digital Integrated Circuit Silicon Monolithic

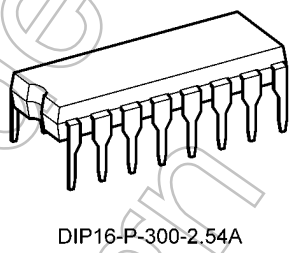
TC4512BP, TC4512BF

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.

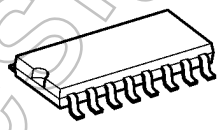
If DISABLE = "L" and INHIBIT = "H", the data select operation is inhibited and output Z becomes "L" Level.

TC4512BP



DIP16-P-300-2.54A

TC4512BF



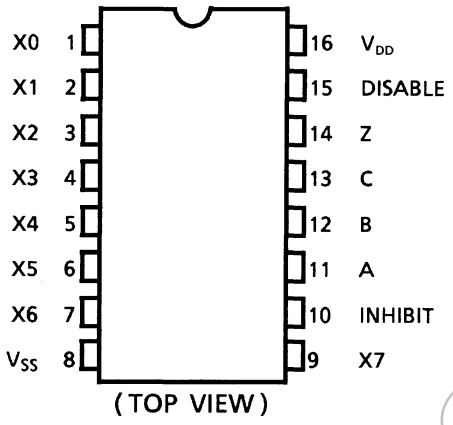
SOP16-P-300-1.27A

Weight

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

SOP16-P-300-1.27A : 0.18 g (typ.)

Pin Assignment



Truth Table

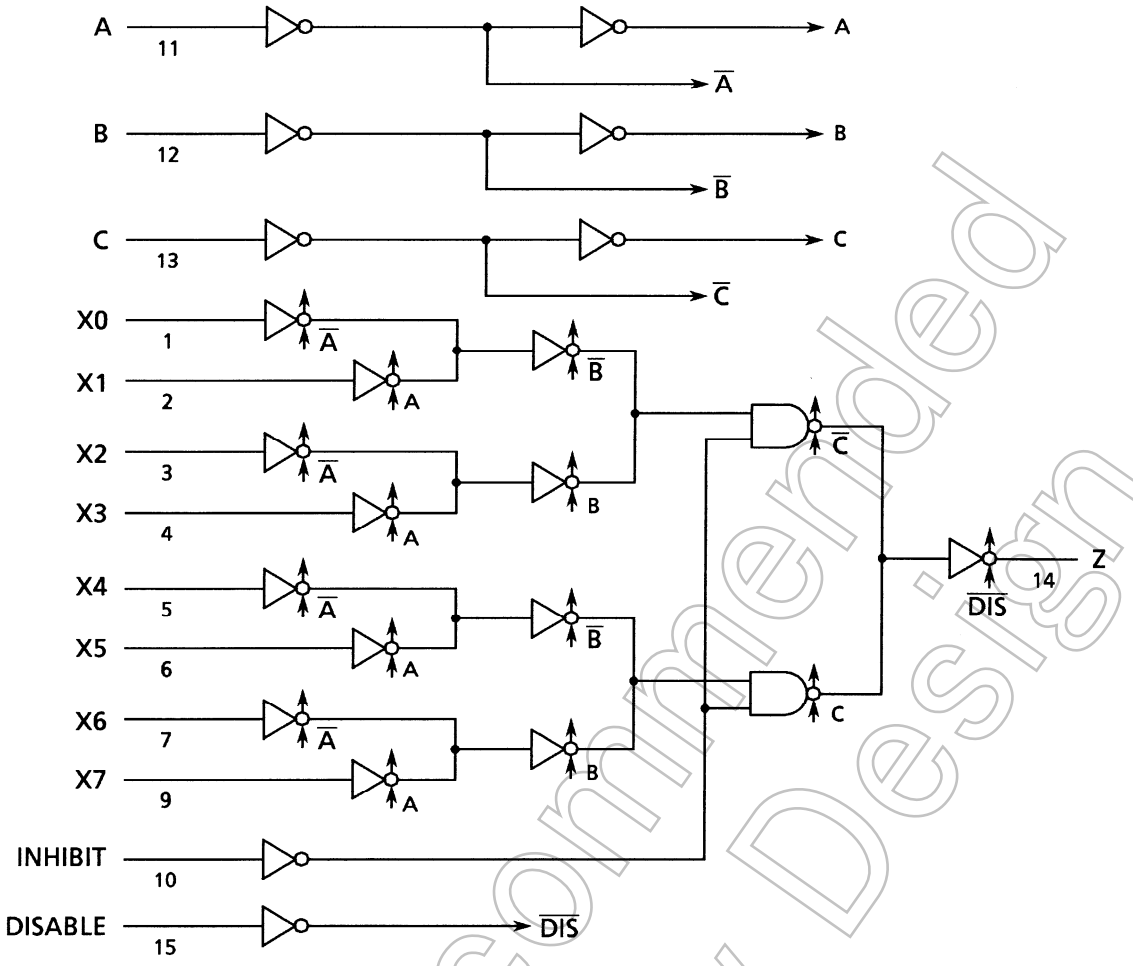
Inputs					Output
A	B	C	Inhibit	Disable	Z
L	L	L	L	L	X0
H	L	L	L	L	X1
L	H	L	L	L	X2
H	H	L	L	L	X3
L	L	H	L	L	X4
H	L	H	L	L	X5
L	H	H	L	L	X6
H	H	H	L	L	X7
*	*	*	H	L	L
*	*	*	*	H	HZ

*: Don't care

HZ: High impedance

Start of commercial production
1978-04

Logic Diagram



Absolute Maximum Ratings (Note)

Characteristics	Symbol	Rating	Unit
DC supply voltage	V_{DD}	V_{SS} − 0.5 to V_{SS} + 20	V
Input voltage	V_{IN}	V_{SS} − 0.5 to V_{DD} + 0.5	V
Output voltage	V_{OUT}	V_{SS} − 0.5 to 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 to 85	°C
Storage temperature range	T_{stg}	−65 to 150	°C

Note: Exceeding any of the absolute maximum ratings, even briefly, lead to deterioration in IC performance or even destruction.
Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings and the operating ranges.
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook (“Handling Precautions”/“Derating Concept and Methods”) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Operating Ranges (V_{SS} = 0 V) (Note)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
DC supply voltage	V_{DD}	—	3	—	18	V
Input voltage	V_{IN}	—	0	—	V_{DD}	V

Note: The operating ranges must be maintained to ensure the normal operation of the device.
Unused inputs must be tied to either V_{DD} or V_{SS}.

Static Electrical Characteristics (V_{SS} = 0 V)

Characteristics		Sym-bol	Test Condition		−40°C		25°C			85°C		Unit
				V_{DD} (V)	Min	Max	Min	Typ.	Max	Min	Max	
High-level output voltage		V_{OH}	$\|I_{OUT}\| < 1$ μA $V_{IN} = V_{SS}, V_{DD}$	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}	$\|I_{OUT}\| < 1$ μA $V_{IN} = V_{SS}, V_{DD}$	5	—	0.05	—	0.00	0.05	—	0.05	V
				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} = 4.6 V	5	−0.61	—	−0.51	−1.0	—	−0.42	—	mA
			V_{OH} = 2.5 V	5	−2.5	—	−2.1	−4.0	—	−1.7	—	
			V_{OH} = 9.5 V	10	−1.5	—	−1.3	−2.2	—	−1.1	—	
			V_{OH} = 13.5 V	15	−4.0	—	−3.4	−9.0	—	−2.8	—	
			$V_{IN} = V_{SS}, V_{DD}$									
Output low current		I_{OL}	V_{OL} = 0.4 V	5	0.61	—	0.51	1.2	—	0.42	—	mA
			V_{OL} = 0.5 V	10	1.5	—	1.3	3.2	—	1.1	—	
			V_{OL} = 1.5 V	15	4.0	—	3.4	12.0	—	2.8	—	
			$V_{IN} = V_{SS}, V_{DD}$									
Input high voltage		V_{IH}	V_{OUT} = 0.5 V, 4.5 V	5	3.5	—	3.5	2.75	—	3.5	—	V
			V_{OUT} = 1.0 V, 9.0 V	10	7.0	—	7.0	5.5	—	7.0	—	
			V_{OUT} = 1.5 V, 13.5 V	15	11.0	—	11.0	8.25	—	11.0	—	
			$\|I_{OUT}\| < 1$ μA									
Input low voltage		V_{IL}	V_{OUT} = 0.5 V, 4.5 V	5	—	1.5	—	2.25	1.5	—	1.5	V
			V_{OUT} = 1.0 V, 9.0 V	10	—	3.0	—	4.5	3.0	—	3.0	
			V_{OUT} = 1.5 V, 13.5 V	15	—	4.0	—	6.75	4.0	—	4.0	
			$\|I_{OUT}\| < 1$ μA									
Input current	"H" level	I_{IH}	V_{IH} = 18 V	18	—	0.1	—	10^{-5}	0.1	—	1.0	μA
	"L" level	I_{IL}	V_{IL} = 0 V	18	—	−0.1	—	-10^{-5}	−0.1	—	−1.0	
3-state output leakage current	"H" level	I_{DH}	V_{OH} = 18 V	18	—	0.4	—	10^{-4}	0.4	—	12	μA
	"L" level	I_{DL}	V_{OL} = 0 V	18	—	−0.4	—	-10^{-4}	−0.4	—	−12	
Quiescent supply current		I_{DD}	$V_{IN} = V_{SS}, V_{DD}$ (Note)	5	—	5	—	0.005	5	—	150	μA
				10	—	10	—	0.010	10	—	300	
				15	—	20	—	0.015	20	—	600	

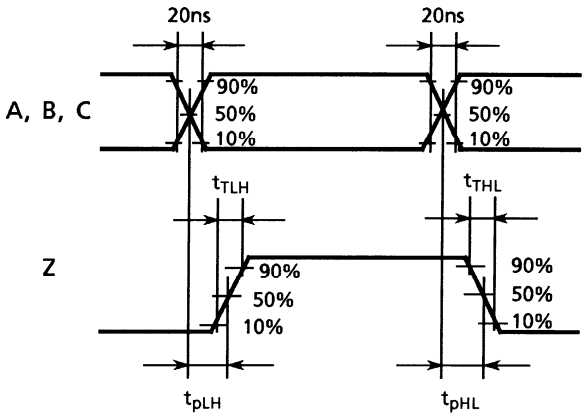
Note: All valid input combinations.

Dynamic Electrical Characteristics (Ta = 25°C, V_{SS} = 0 V, C_L = 50 pF)

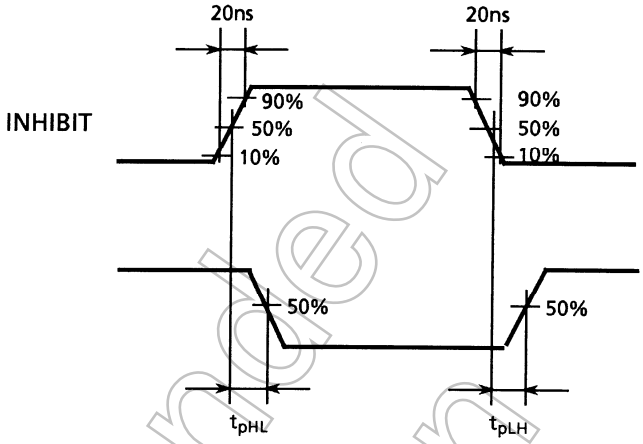
Characteristics	Symbol	Test Condition	V_{DD} (V)	Min	Typ.	Max	Unit
Output transition time (low to high)	t_{TLH}	—	5	—	80	200	ns
			10	—	50	100	
			15		40	80	
Output transition time (high to low)	t_{THL}	—	5	—	80	200	ns
			10	—	50	100	
			15	—	40	80	
Propagation delay time (INHIBIT-Z)	t_{pLH} t_{pHL}	—	5	—	140	280	ns
			10	—	60	140	
			15	—	40	100	
Propagation delay time (A, B, C-Z)	t_{pLH} t_{pHL}	—	5	—	240	400	ns
			10	—	95	170	
			15	—	65	120	
Propagation delay time (X-Z)	t_{pLH} t_{pHL}	—	5	—	210	360	ns
			10	—	85	150	
			15		60	110	
Three state disable time (DISABLE-Z)	t_{pZL}, t_{pLZ} t_{pHZ}, t_{pZH}	R_L = 1 kΩ	5	—	60	120	ns
			10	—	25	60	
			15	—	20	40	
Input capacitance	C_{IN}	—		—	5	7.5	pF

Waveforms for Measurement of Dynamic Characteristics

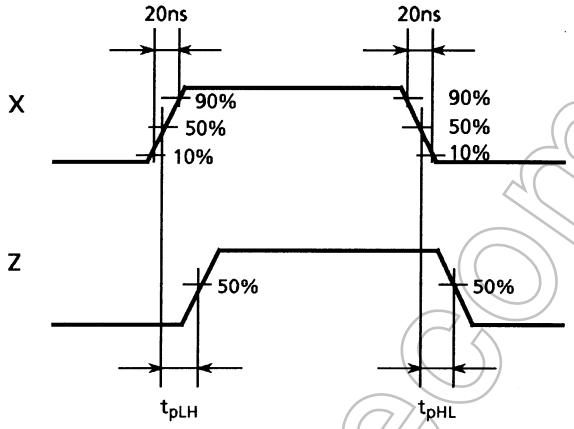
Waveform 1



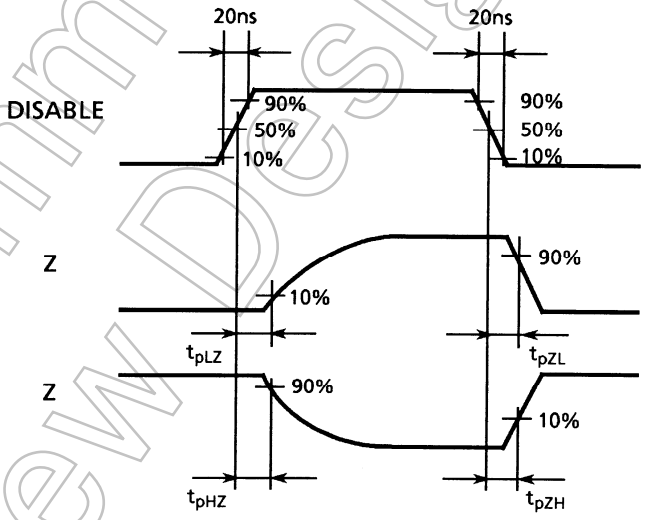
Waveform 2 (X = "H")



Waveform 3

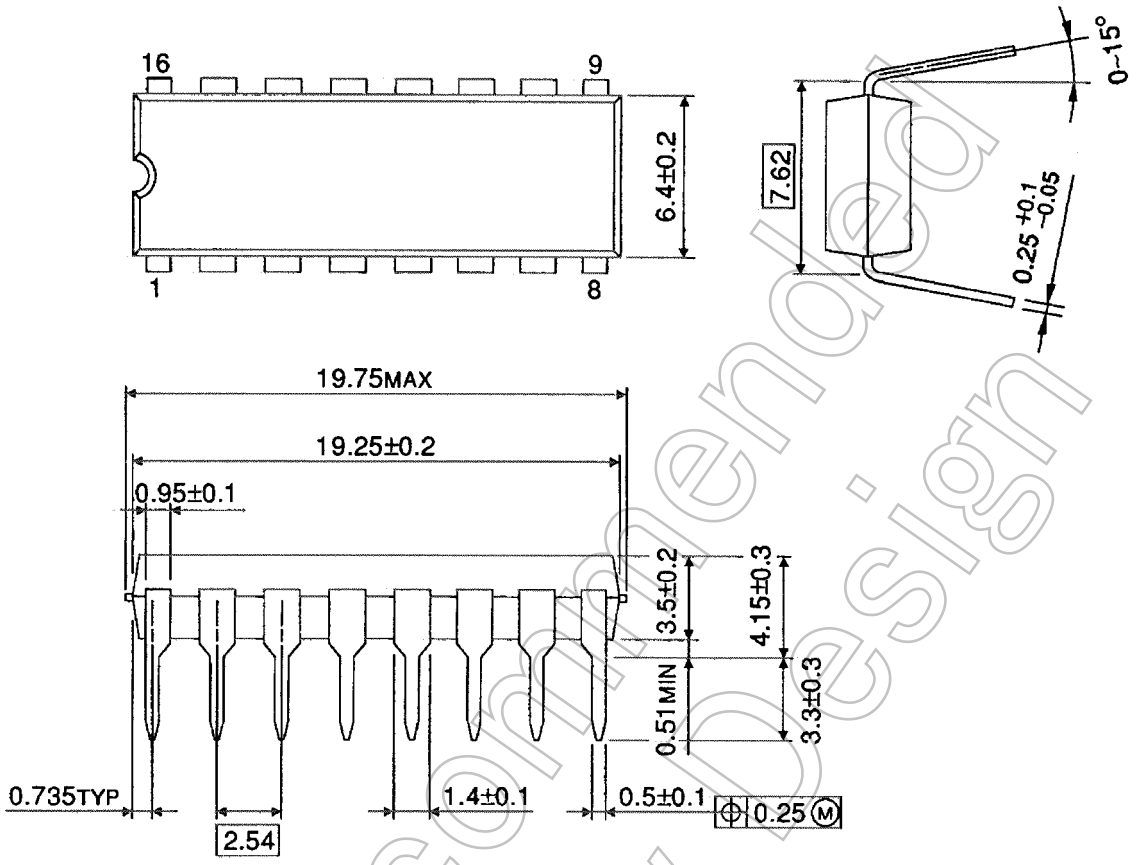


Waveform 4



Package Dimensions

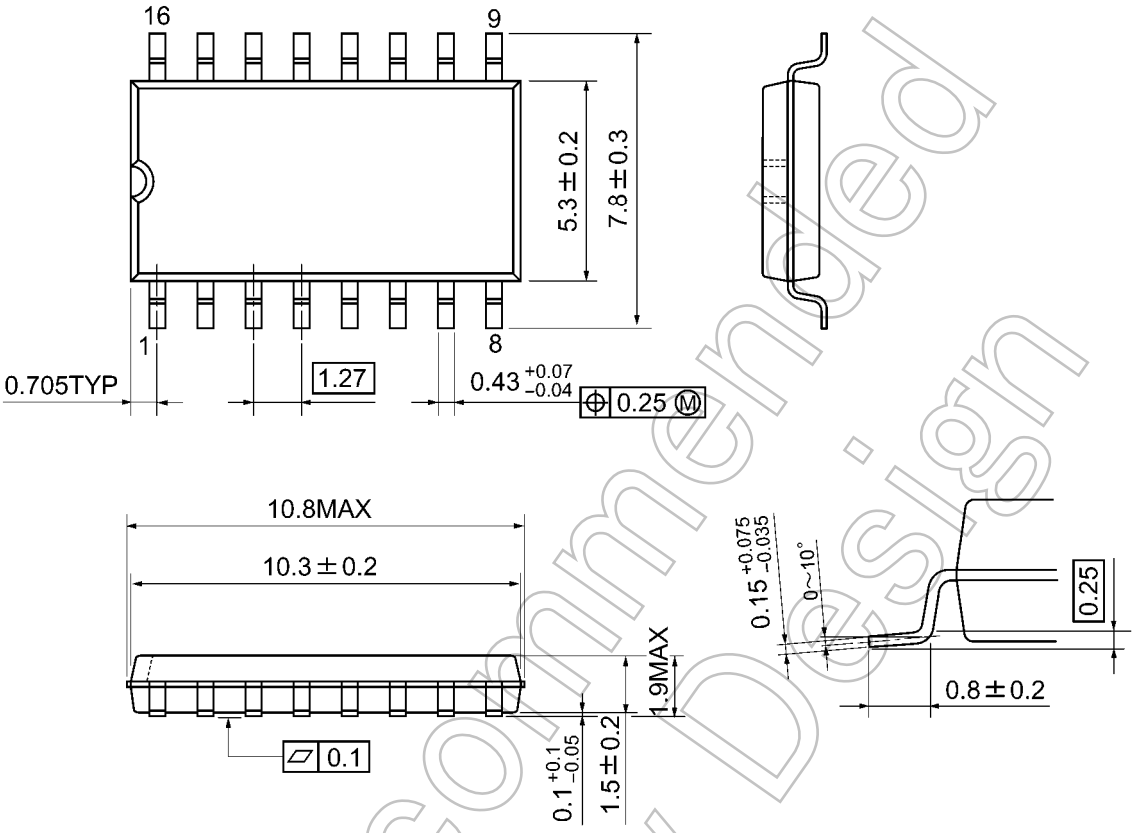
DIP16-P-300-2.54A Unit : mm



Weight: 1.00 g (typ.)

Package Dimensions

SOP16-P-300-1.27A Unit: mm



Weight: 0.18 g (typ.)

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