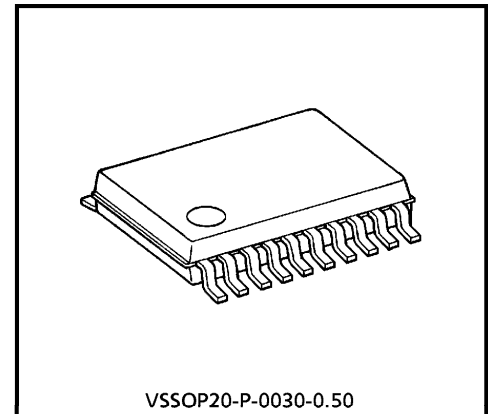


TOSHIBA CMOS DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TC7MB3245FK

OCTAL BUS SWITCH

The TC7MB3245FK provides eight bits of high-speed TTL-compatible bus switching in a standard '245 device pinout. The low on-state resistance of the switch allows connections to be made with minimal propagation delay. The device is organized as one 8-bit switch. When output enable (\overline{OE}) is low, the switch is on and port A is connected to port B. When \overline{OE} is high, the switch is open and a high-impedance state exists between the two ports. All inputs are equipped with protection circuits against static discharge.



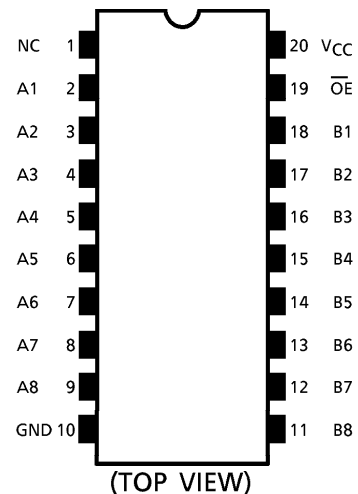
VSSOP20-P-0030-0.50

Weight : 0.03 g (typ.)

FEATURES

- Operating Voltage : $V_{CC} = 4.5\sim 5.5\text{ V}$
- High Speed : $t_{pd} = 0.25\text{ ns (max)}$
- Low On Resistance : $R_{ON} = 5\ \Omega\text{ (typ.)}$
- ESD Performance : Human Body Model $> \pm 2000\text{ V}$
Machine Model $> \pm 200\text{ V}$
- Compatible With TTL Outputs (Control Inputs)
- Package : VSSOP (US20)
- Pin Compatible with the 74xx245 type.
Functionally Equivalent to (FST/CBT) 3245.

PIN ASSIGNMENT



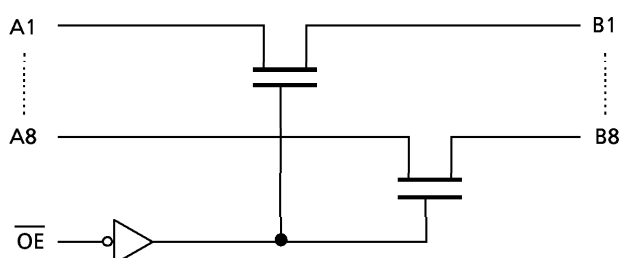
980910EBA1

- TOSHIBA is continually working to improve the quality and the 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 observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product 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 products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.
- 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.

TRUTH TABLE

INPUTS	FUNCTION
\overline{OE}	
L	Aport = Bport
H	Disconnect

SYSTEM DIAGRAM



MAXIMUM RATINGS

PARAMETER	SYMBOL	RATING	UNIT
Power Supply Range	V_{CC}	-0.5~7.0	V
DC Input Voltage	V_{IN}	-0.5~7.0	V
DC Switch Voltage	V_S	-0.5~7.0	V
Input Diode Current	I_{IK}	-50	mA
Continuous Channel Current	I_S	128	mA
Power Dissipation	P_D	180	mW
DC V_{CC} / Ground Current	I_{CC} / I_{GND}	± 100	mA
Storage Temperature	T_{stg}	-65~150	$^{\circ}C$

RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	4.5~5.5	V
Input Voltage	V_{IN}	0~5.5	V
Switch Voltage	V_S	0~5.5	V
Operating Temperature	T_{opr}	-40~85	$^{\circ}C$
Input Rise and Fall Time	dt / dv	0~10	ns/V

ELECTRICAL CHARACTERISTICS

DC Characteristics (Ta = -40~85°C)

PARAMETER	SYMBOL	TEST CONDITION	V _{CC} (V)	Min	Typ. (Note 1)	Max	UNIT	
Input Voltage	"H" Level	V _{IH}	4.5~5.5	2.0	—	—	V	
	"L" Level	V _{IL}	4.5~5.5	—	—	0.8		
Input Leakage Current	I _{IN}	V _{IN} = 0~5.5 V	5.5	—	—	± 1.0	μA	
Off-STATE Leakage Current	I _{SZ}	A, B = 0~5.5 V, $\overline{OE} = V_{CC}$	0~5.5	—	—	± 1.0	μA	
ON Resistance (Note 2)	R _{ON}	V _{IS} = 0 V	I _{IS} = 64 mA	4.5	—	5	7	Ω
			I _{IS} = 30 mA	4.5	—	5	7	
		V _{IS} = 2.4 V, I _{IS} = 15 mA	4.5	—	10	15		
Quiescent Supply Current	I _{CC}	V _{IN} = V _{CC} or GND, I _{OUT} = 0	5.5	—	—	10	μA	
Increase In I _{CC} Per Input	ΔI _{CC}	V _{IN} = 3.4 V (One Input)	5.5	—	—	2.5	mA	

(Note 1) : Typical values are at V_{CC} = 5.0 V and Ta = +25°C.

(Note 2) : Measured by the voltage drop between A and B pins at the indicated current through the switch. On resistance is determined by the lower of the voltages on the two (A or B) pins.

AC Characteristics (Ta = -40~85°C)

PARAMETER	SYMBOL	TEST CONDITION	V _{CC} (V)	Min	Max	UNIT
Propagation Delay Time (Bus to Bus)	t _{pLH} t _{pHL}	(Fig.1, 2) (Note 3)	4.5	—	0.25	ns
Output Enable Time	t _{pZL} t _{pZH}	(Fig1, 3)	4.5	—	5.9	ns
Output Disable Time	t _{pLZ} t _{pHZ}	(Fig1, 3)	4.5	—	5.9	ns

(Note 3) : This parameter is guaranteed by design but is not tested. The bus switch contributes no propagation delay other than the RC delay of the typical On resistance of the switch and the 50 pF load capacitance, when driven by an ideal voltage the source (zero output impedance).

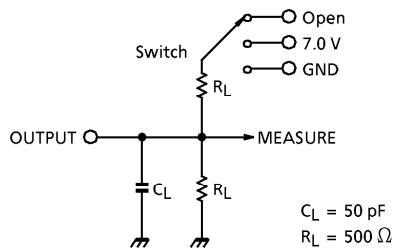
Capacitive Characteristics (Ta = 25°C)

PARAMETER	SYMBOL	TEST CONDITION	V _{CC} (V)	Typ.	UNIT
Control Pin Input Capacitance	C _{IN}	(Note 4)	5.0	3	pF
Switch Terminal Capacitance	C _{I/O}	$\overline{OE} = V_{CC}$ (Note 4)	5.0	10	pF

(Note 4) : Parameter guaranteed by design

TEST CIRCUIT

Fig.1



PARAMETER	SWITCH
t_{pLH}, t_{pHL}	Open
t_{pLZ}, t_{pZL}	7.0 V
t_{pHZ}, t_{pZH}	Open

AC WAVEFORM

Fig.2 t_{pLH}, t_{pHL}

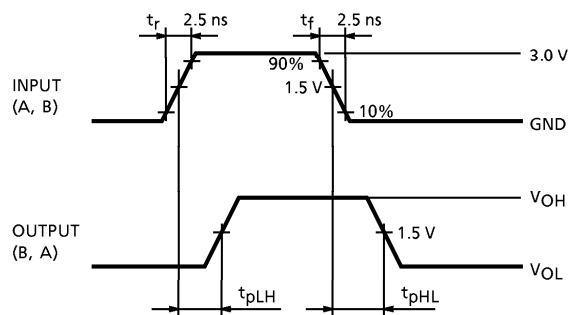
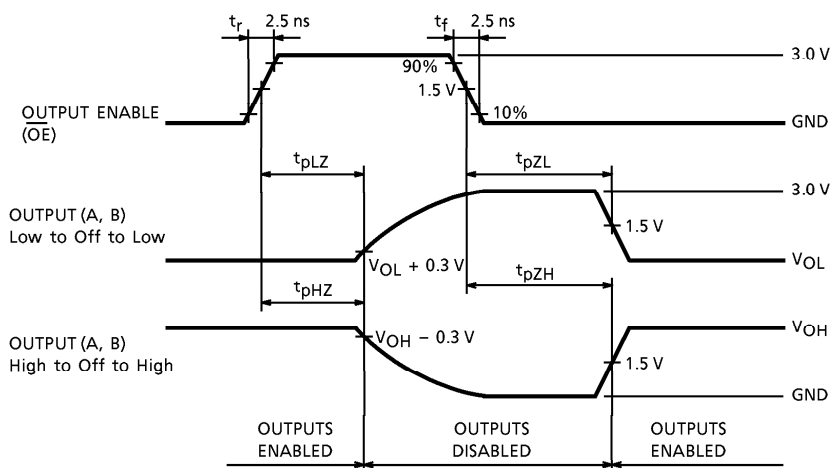
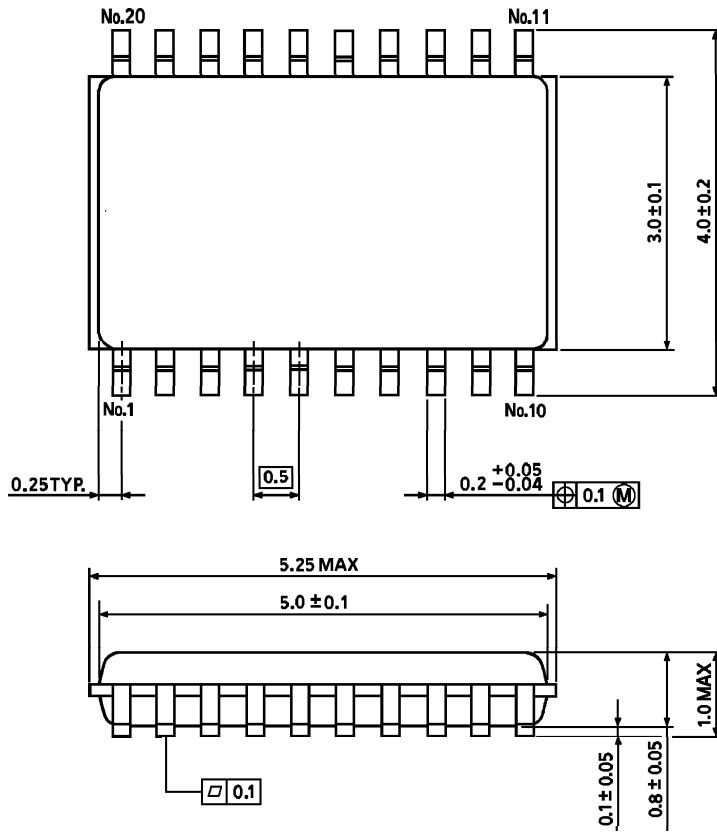


Fig.3 $t_{pLZ}, t_{pHZ}, t_{pZL}, t_{pZH}$



PACKAGE DIMENSIONS
VSSOP20-P-0030-0.50

Unit : mm



Weight : 0.03 g (typ.)