



**TRUTH TABLE**

INPUTS		OUTPUTS
$\overline{1OE}$	1A1-1A4	1Y1-1Y4
L	L	L
L	H	H
H	X	Z

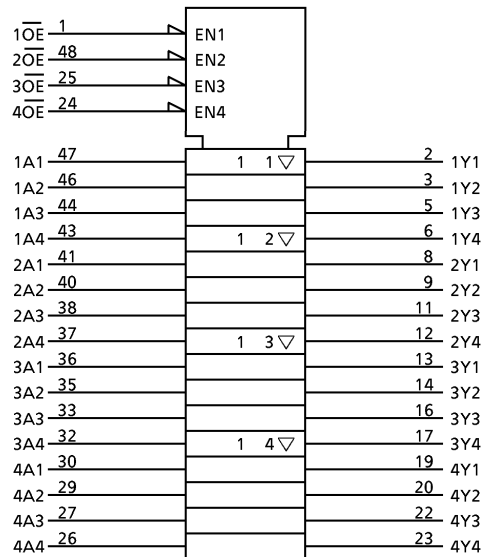
INPUTS		OUTPUTS
$\overline{2OE}$	1A1-2A4	2Y1-2Y4
L	L	L
L	H	H
H	X	Z

INPUTS		OUTPUTS
$\overline{3OE}$	3A1-3A4	3Y1-3Y4
L	L	L
L	H	H
H	X	Z

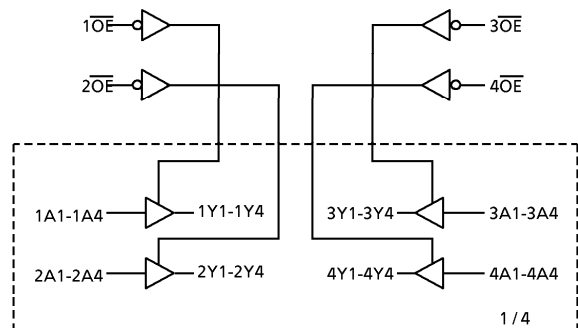
INPUTS		OUTPUTS
$\overline{4OE}$	4A1-4A4	4Y1-4Y4
L	L	L
L	H	H
H	X	Z

X : Don't Care  
Z : High impedance

**IEC LOGIC SYMBOL**



**SYSTEM DIAGRAM**



961001EBA2'

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## MAXIMUM RATINGS

PARAMETER	SYMBOL	RATING	UNIT
Power Supply Voltage	$V_{CC}$	-0.5~7.0	V
Input Voltage	$V_{IN}$	-0.5~7.0	V
Output Voltage	$V_{OUT}$	-0.5~7.0 (Note 1)	V
		-0.5~ $V_{CC} + 0.5$ (Note 2)	
Input Diode Current	$I_{IK}$	-50	mA
Output Diode Current	$I_{OK}$	$\pm 50$ (Note 3)	mA
DC Output Current	$I_{OUT}$	$\pm 50$	mA
Power Dissipation	$P_D$	400	mW
DC $V_{CC}$ / Ground Current Per Supply Pin	$I_{CC} / I_{GND}$	$\pm 100$	mA
Storage Temperature	$T_{stg}$	-65~150	$^{\circ}C$

(Note 1) Output in Off-State

(Note 2) High or Low State.  $I_{OUT}$  absolute maximum rating must be observed.

(Note 3)  $V_{OUT} < GND$ ,  $V_{OUT} > V_{CC}$

## RECOMMENDED OPERATING RANGE

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	$V_{CC}$	2.0~3.6	V
		1.5~3.6 (Note 4)	
Input Voltage	$V_{IN}$	0~5.5	V
Output Voltage	$V_{OUT}$	0~5.5 (Note 5)	V
		0~ $V_{CC}$ (Note 6)	
Output Current	$I_{OH} / I_{OL}$	$\pm 24$ (Note 7)	mA
		$\pm 12$ (Note 8)	
Operating Temperature	$T_{opr}$	-40~85	$^{\circ}C$
Input Rise And Fall Time	$dt / dv$	0~10 (Note 9)	ns / V

(Note 4) Data Retention Only

(Note 5) Output in Off-State

(Note 6) High or Low State

(Note 7)  $V_{CC} = 3.0 \sim 3.6V$

(Note 8)  $V_{CC} = 2.7 \sim 3.0V$

(Note 9)  $V_{IN} = 0.8 \sim 2.0V$ ,  $V_{CC} = 3.0V$

## ELECTRICAL CHARACTERISTICS

DC characteristics (Ta = -40~85°C)

PARAMETER		SYMBOL	TEST CONDITION		V <sub>CC</sub> (V)	MIN.	MAX.	UNIT
Input Voltage	"H" Level	V <sub>IH</sub>			2.7~3.6	2.0	—	V
	"L" Level	V <sub>IL</sub>			2.7~3.6	—	0.8	V
Output Voltage	"H" Level	V <sub>OH</sub>	V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub>	I <sub>OH</sub> = -100μA	2.7~3.6	V <sub>CC</sub> - 0.2	—	V
				I <sub>OH</sub> = -12μA	2.7	2.2	—	
				I <sub>OH</sub> = -18mA	3.0	2.4	—	
				I <sub>OH</sub> = -24mA	3.0	2.2	—	
	"L" Level	V <sub>OL</sub>	V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub>	I <sub>OL</sub> = 100μA	2.7~3.6	—	0.2	V
				I <sub>OL</sub> = 12mA	2.7	—	0.4	
				I <sub>OL</sub> = 16mA	3.0	—	0.4	
				I <sub>OL</sub> = 24mA	3.0	—	0.55	
Input Leakage Current		I <sub>IN</sub>	V <sub>IN</sub> = 0~5.5V		2.7~3.6	—	±5.0	μA
3-State Output Off-State Current		I <sub>OZ</sub>	V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub> V <sub>OUT</sub> = 0~5.5V		2.7~3.6	—	±5.0	μA
Power Off Leakage Current		I <sub>OFF</sub>	V <sub>IN</sub> / V <sub>OUT</sub> = 5.5V		0	—	10.0	μA
Quiescent Supply Current		I <sub>CC</sub>	V <sub>IN</sub> = V <sub>CC</sub> or GND		2.7~3.6	—	20.0	μA
			V <sub>IN</sub> / V <sub>OUT</sub> = 3.6~5.5V		2.7~3.6	—	±20.0	
Increase In I <sub>CC</sub> Per Input		ΔI <sub>CC</sub>	V <sub>IH</sub> = V <sub>CC</sub> - 0.6V		2.7~3.6	—	500	μA

## AC characteristics (Ta = -40~85°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	V <sub>CC</sub> (V)	MIN.	MAX.	UNIT
Propagation Delay Time	t <sub>pLH</sub>	(Fig.1, 2)	2.7	—	6.2	ns
	t <sub>pHL</sub>		3.3 ± 0.3	1.5	5.2	
3-State Output Enable Time	t <sub>pZL</sub>	(Fig.1, 3)	2.7	—	7.5	ns
	t <sub>pZH</sub>		3.3 ± 0.3	1.5	6.5	
3-State Output Disable Time	t <sub>pLZ</sub>	(Fig.1, 3)	2.7	—	6.5	ns
	t <sub>pHZ</sub>		3.3 ± 0.3	1.5	5.5	
Output To Output Skew	t <sub>osLH</sub>	(Note 10)	2.7	—	—	ns
	t <sub>osHL</sub>		3.3 ± 0.3	—	1.0	

(Note 10) Parameter guaranteed by design.

$$(t_{osLH} = |t_{pLHm} - t_{pLHn}|, t_{osHL} = |t_{pHLm} - t_{pHLn}|)$$

## Dynamic switching characteristics

(Ta = 25°C, Input t<sub>r</sub> = t<sub>f</sub> = 2.5ns, C<sub>L</sub> = 50pF, R<sub>L</sub> = 500Ω)

CHARACTERISTIC	SYMBOL	TEST CONDITION	V <sub>CC</sub> (V)	TYP	UNIT
Quiet Output Maximum Dynamic V <sub>OL</sub>	V <sub>OLP</sub>	V <sub>IH</sub> = 3.3V, V <sub>IL</sub> = 0V	3.3	0.8	V
Quiet Output Minimum Dynamic V <sub>OL</sub>	V <sub>OLV</sub>	V <sub>IH</sub> = 3.3V, V <sub>IL</sub> = 0V	3.3	0.8	V

## Capacitive characteristics (Ta = 25°C)

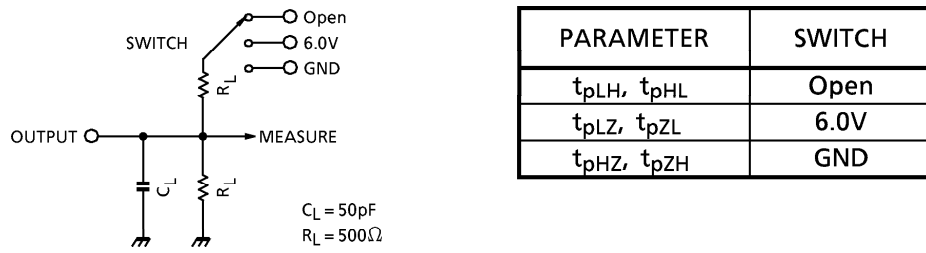
CHARACTERISTIC	SYMBOL	TEST CONDITION	V <sub>CC</sub> (V)	TYP	UNIT
Input Capacitance	C <sub>IN</sub>	—	3.3	7	pF
Output Capacitance	C <sub>OUT</sub>		3.3	8	pF
Power Dissipation Capacitance	C <sub>PD</sub>	f <sub>IN</sub> = 10MHz (Note 11)	3.3	25	pF

(Note 11) C<sub>PD</sub> is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load.

Average operating current can be obtained by the equation :

$$I_{CC}(\text{opr.}) = C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC} / 16. (\text{Per bit})$$

Fig.1 Test circuit



**AC WAVEFORM**

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

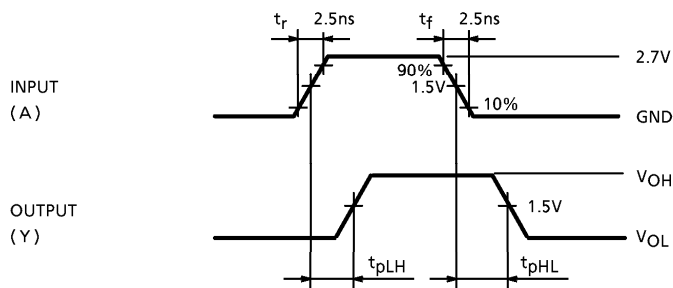
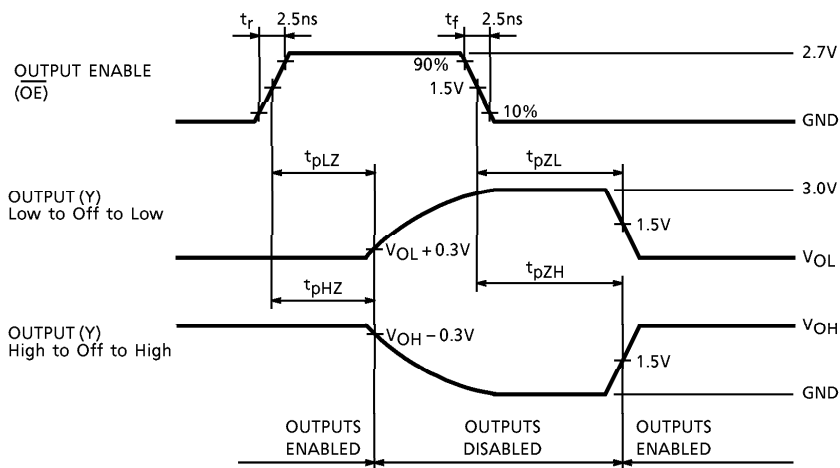
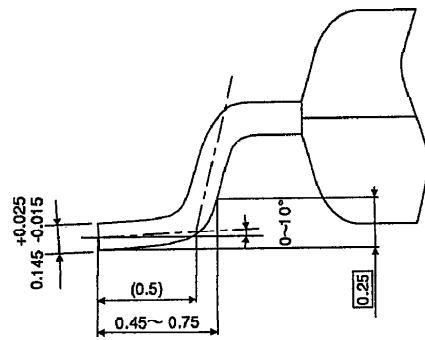
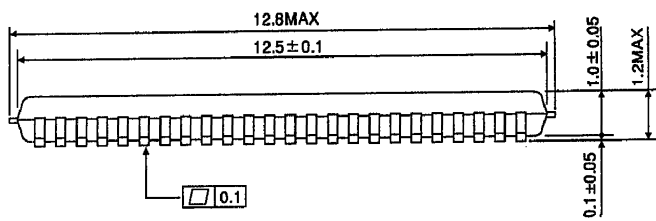
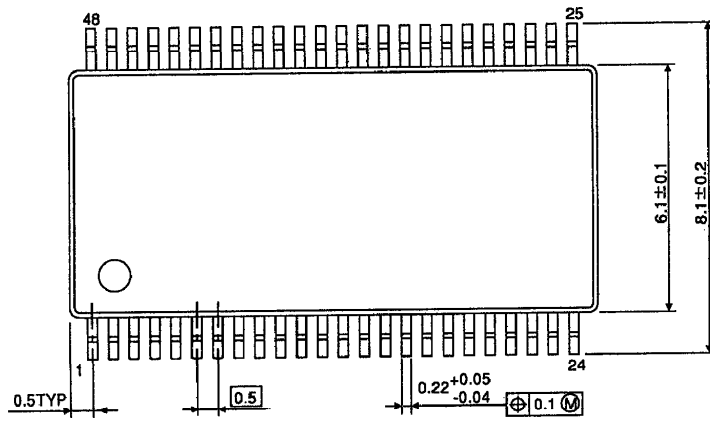


Fig.3  $t_{pLZ}, t_{pHZ}, t_{pZL}, t_{pZH}$



**OUTLINE DRAWING**  
TSSOP48-P-0061-0.50

Unit : mm



Weight : 0.25g (Typ.)