TOSHIBA TC7W08F/FU/FK

TOSHIBA CMOS DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TC7W08F, TC7W08FU, TC7W08FK

DUAL 2-INPUT AND GATE

The TC7W08 is a high speed C²MOS 2-INPUT AND GATE fabricated with silicon gate C²MOS technology.

It achives the high speed operation similar to equivalent LSTTL while maintaining the C²MOS low power dissipation.

The internal circuit is composed of 3 stages including buffer output, which enables high noise immunity and stable output.

All inputs are equipped with protection circuits against static discharge or transient excess voltage.

FEATURES

•	High Speed	 $t_{pd} = 6ns$ (Ty	p.) at
		\} - \/	

 $V_{CC} = 5V$

• Low Power Dissipation $I_{CC} = 1\mu A$ (Max.) at

 $Ta = 25^{\circ}C$

• High Noise Immunity $V_{NIH} = V_{NIL}$

= 28% V_{CC} (Min.)

Output Drive Capability 10 LSTTL Loads

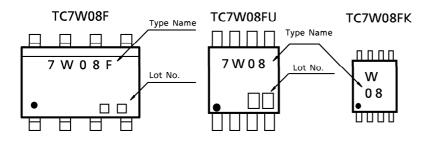
• Symmetrical Output Impedance ... $|I_{OH}| = I_{OL} = 4mA$

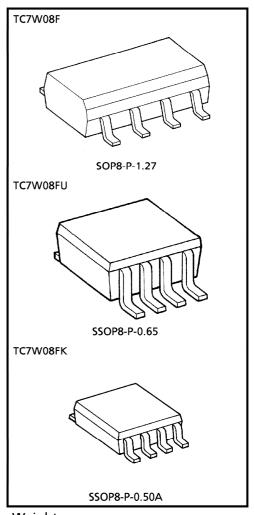
(Min.)

ullet Balanced Propagation Delays $t_{pLH} = t_{pHL}$

Wide Operating Voltage Range ... V_{CC} (opr) = 2~6V

MARKING





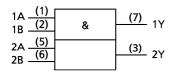
Weight

SOP8-P-1.27 : 0.05g (Typ.) SSOP8-P-0.65 : 0.02g (Typ.) SSOP8-P-0.50A : 0.01g (Typ.)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT	
Supply Voltage Range	Vcc	-0.5~7	V	
DC Input Voltage	VIN	-0.5~V _{CC} +0.5	V	
DC Output Voltage	VOUT	-0.5~V _{CC} +0.5	V	
Input Diode Current	Ικ	± 20	mA	
Output Diode Current	^I ОК	± 20	mA	
DC Output Current	IOUT	± 25	mA	
DC V _{CC} / Ground Current	Icc	± 25	mA	
Davier Dissination	D-	300 (FM8, SM8)	\/	
Power Dissipation	PD	200 (US8)	mW	
Storage Temperature	T _{stg}	- 65~150	°C	
Lead Temperature (10s)	TL	260	°C	

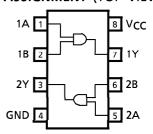
LOGIC DIAGRAM



TRUTH TABLE

Α	В	Y
L	L	L
L	Н	L
Н	Ĺ	Ĺ
Н	Η	Н

PIN ASSIGNMENT (TOP VIEW)



RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	Vcc	2~6	٧
Input Voltage	V _{IN}	0~V _{CC}	٧
Output Voltage	Vout	0~V _{CC}	<
Operating Temperature	T _{opr}	- 40~85	°C
		$0 \sim 1000 \text{ (V}_{CC} = 2.0\text{V)}$	
Input Rise and Fall Time	t _r , t _f	0~ 500 (V _{CC} = 4.5V)	ns
		$0 \sim 400 \ (V_{CC} = 6.0V)$	

DC ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITION			Т	$Ta = 25^{\circ}C$ $Ta = -40 \sim 85^{\circ}C$					
CHARACTERISTIC	3 TIVIBUL			Vcc	MIN.	TYP.	MAX.	MIN.	MAX.	UNIT	
High Lovel				2.0	1.5	_	_	1.5	_		
High-Level	∨ _{IH}		_	4.5	3.15	_	—	3.15	_	V	
Input Voltage				6.0	4.2	_	_	4.2	_		
Low-Level				2.0	_	_	0.5	_	0.5		
Input Voltage	V _{IL}		_	4.5	—	_	1.35	_	1.35	V	
input voitage				6.0	_	_	1.8		1.8		
	V _{ОН}				2.0	1.9	2.0	—	1.9	_	
High Lovel			$I_{OH} = -20 \mu A$	4.5	4.4	4.5	—	4.4	_		
High-Level		V _{IN} = V _{IH}		6.0	5.9	6.0	_	5.9	_	V	
Output Voltage			$I_{OH} = -4mA$	4.5	4.18	4.31	_	4.13	_		
			$I_{OH} = -5.2 \text{mA}$	6.0	5.68	5.80	_	5.63	_		
	1 1/01 1			2.0	_	0.0	0.1	_	0.1		
Law Laval			$I_{OL} = 20 \mu A$	4.5	—	0.0	0.1	_	0.1		
Low-Level		V _{IN} = V _{IH} or V _{IL}		6.0	_	0.0	0.1		0.1	V	
Output Voltage			$I_{OL} = 4mA$	4.5	—	0.17	0.26	_	0.33		
			$I_{OL} = 5.2 \text{mA}$	6.0	_	0.18	0.26	1	0.33		
Input Leakage Current	IN	V _{IN} = V _{CC} o	or GND	6.0	_	_	± 0.1	_	± 1.0		
Quiescent Supply Current	lcc	V _{IN} = V _{CC} o	or GND	6.0	_	_	1.0	_	10.0	μΑ	

AC ELECTRICAL CHARACTERISTICS ($C_L = 15pF$, $V_{CC} = 5V$, Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	Ta = 25°C			UNIT
CHARACTERISTIC	3 TIVIBOL	TEST CONDITION	MIN.	TYP.	MAX.	CIVIT
Output Transition	^t TLH			4	8	ns
Time	^t THL	_		4	0	113
Propagation Delay	t _{pLH}			6	12	nc
Time	t _{pHL}	_	_	6	12	ns

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	CONDITION		ON Ta = 25°C			,C	Ta = -4	UNIT
CHARACTERISTIC	3 I WIBOL	TEST CONDITION		MIN.	TYP.	MAX.	MIN.	MAX.	UIVII	
Output Transition	t		2.0	_	25	75	_	95		
1	t _{TLH}	_	4.5	—	7	15	_	19	ns	
Time	^t THL		6.0	—	6	13	_	16		
Propagation Delay	4		2.0	_	27	75	_	95		
	t _{pLH}	_	4.5	l —	8	15	_	19	ns	
Time	t _{pHL}		6.0	—	7	13	_	16		
Input Capacitance	CIN	_		_	5	10	_	10		
Power Dissipation Capacitance	C _{PD}	(Note 1)		_	19	_			pF	

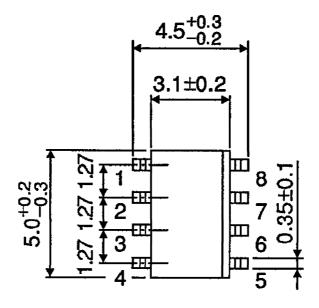
Note 1 : C_{PD} is defined as the value of internal equivalent capacitance of IC which is calculated from the operating current consumption without load (refer to Test Circuit).

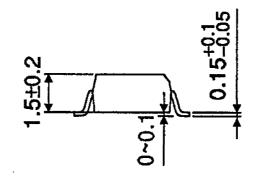
Average operating current can be obtained by the equation hereunder. $I_{CC}(opr) = C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC} / 2$ (per gate)

PACKAGE DIMENSIONS

SOP8-P-1.27

Unit: mm

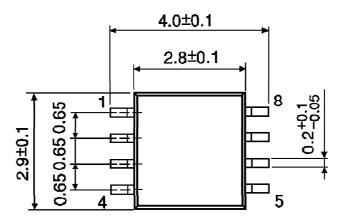


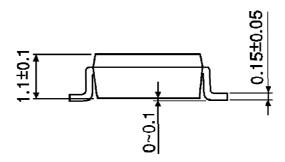


Weight: 0.05g (Typ.)

PACKAGE DIMENSIONS

SSOP8-P-0.65 Unit: mm

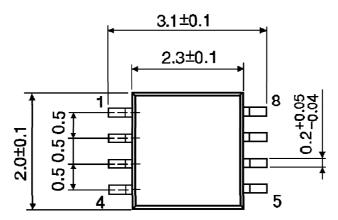


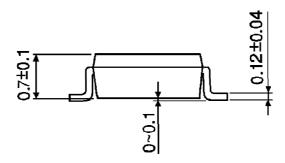


Weight: 0.02g (Typ.)

PACKAGE DIMENSIONS

SSOP8-P-0.50A Unit: mm





Weight: 0.01g (Typ.)

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