

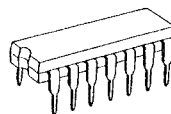
TC4069UBP/UBF/UBFN

C²MOS DIGITAL INTEGRATED CIRCUIT
SILICON MONOLITHIC

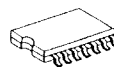
TC4069UB HEX INVERTER

TC4069UB contains six circuits of inverters. The pin allocation is same as TC 7404UB and since the operating current consumption is smaller, this is suitable for the applications of CR oscillator circuits, crystal oscillator circuits and linear amplifiers in addition to its application as inverters.

Because of one stage gate configuration, the propagation time has been reduced.



P (DIP14-P-300)



F (SOP14-P-300)



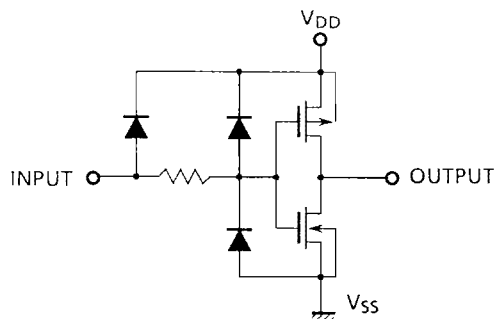
FN (SOL14-P-150)

ABSOLUTE MAXIMUM RATINGS

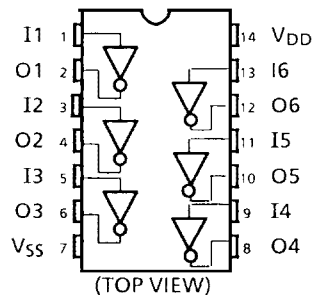
CHARACTERISTIC	SYMBOL	RATING	UNIT
DC Supply Voltage	V_{DD}	$V_{SS} - 0.5 \sim V_{SS} + 20$	V
Input Voltage	V_{IN}	$V_{SS} - 0.5 \sim V_{DD} + 0.5$	V
Output Voltage	V_{OUT}	$V_{SS} - 0.5 \sim V_{DD} + 0.5$	V
DC Input Current	I_{IN}	± 10	mA
Power Dissipation	P_D	300 (DIP) / 180 (SOIC)	mW
Operating Temperature Range	T_A	$-40 \sim 85$	°C
Storage Temperature Range	T_{STG}	$-65 \sim 150$	°C
Lead Temp./Time	T_{SOL}	$260^\circ\text{C} \cdot 10\text{sec}$	

CIRCUIT DIAGRAM

1/6 TC4069UB



PIN ASSIGNMENT



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

CHARACTERISTICS	SYMBOL		MIN.	TYP.	MAX.	UNITS
DC Supply Voltage	V_{DD}		3	–	18	V
Input Voltage	V_{IN}		0	–	V_{DD}	V

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

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	V_{DD} (V)	– 40°C		25°C			85°C		UNITS
				MIN.	MAX.	MIN.	TYP.	MAX.	MIN.	MAX.	
High-Level Output Voltage	V_{OH}	$ I_{OUT} < 1\mu A$ $V_{IN} = V_{SS}, V_{DD}$	5 10 15	4.95 9.95 14.95	– – –	4.95 9.95 14.95	5.00 10.00 15.00	– – –	4.95 9.95 14.95	– – –	V
Low-Level Output Voltage	V_{OL}	$ I_{OUT} < 1\mu A$ $V_{IN} = V_{SS}, V_{DD}$	5 10 15	– – –	0.05 0.05 0.05	– – –	0.00 0.00 0.00	0.05 0.05 0.05	– – –	0.05 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	–	
		$V_{OH} = 13.5V$ $V_{IN} = V_{SS}, V_{DD}$	15	–4.0	–	–3.4	–9.0	–	–2.8	–	
Output Low Current	I_{OL}	$V_{OL} = 0.4V$	5	0.61	–	0.51	1.2	–	0.42	–	mA
		$V_{OL} = 0.5V$	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	4.0	–	4.0	–	–	4.0	–	V
		$V_{OUT} = 1.0V, 9.0V$	10	8.0	–	8.0	–	–	8.0	–	
		$V_{OUT} = 1.5V, 13.5V$	15	12.0	–	12.0	–	–	12.0	–	
		$ I_{OUT} < 1\mu A$									
Input Low Voltage	V_{IL}	$V_{OUT} = 0.5V, 4.5V$	5	–	1.0	–	–	1.0	–	1.0	V
		$V_{OUT} = 1.0V, 9.0V$	10	–	2.0	–	–	2.0	–	2.0	
		$V_{OUT} = 1.5V, 13.5V$	15	–	3.0	–	–	3.0	–	3.0	
		$ I_{OUT} < 1\mu A$									
Input Current	"H" Level	I_{IH} $V_{IH} = 18V$	18	–	0.1	–	10^{-5}	0.1	–	1.0	μA
	"L" Level	I_{IL} $V_{IL} = 0V$	18	–	–0.1	–	-10^{-5}	–0.1	–	–1.0	
Quiescent Device Current	I_{DD}	$V_{IN} = V_{SS}, V_{DD}^*$	5	–	0.25	–	0.001	0.25	–	7.5	μA
			10	–	0.5	–	0.001	0.5	–	15	
			15	–	1.0	–	0.002	1.0	–	30	

* All valid input combinations.

DYNAMIC ELECTRICAL CHARACTERISTICS (Ta = 25°C, VSS = 0V, CL = 50pF)

CHARACTERISTICS	SYMBOL	TEST CONDITION	VDD (V)	MIN.	TYP.	MAX.	UNITS
Output Transition Time (Low to High)	tTLH		5	—	70	200	ns
			10	—	35	100	
			15	—	30	80	
Output Transition Time (High to Low)	tTHL		5	—	70	200	
			10	—	35	100	
			15	—	30	80	
Propagation Delay Time (Low to High)	tPLH		5	—	55	110	
			10	—	30	60	
			15	—	25	50	
Propagation Delay Time (High to Low)	tPHL		5	—	55	110	
			10	—	30	60	
			15	—	25	50	
Input Capacitance	CIN			—	7.5	15	pF

WAVEFORM FOR MEASUREMENT OF DYNAMIC CHARACTERISTICS

