

DESCRIPTION

M54604P is a semiconductor integrated circuit containing 2 circuits with TTL constructed logical NOR drivers, each having high output current and high breakdown output voltage characteristics.

FEATURES

- High output current ($I_o=300mA$)
- High breakdown output voltage ($V_o=30V$)
- High speed switching ($t_{pd}=25ns$)
- A small 8 pin DIL package

APPLICATION

General purpose, for use in industrial and consumer digital equipment.

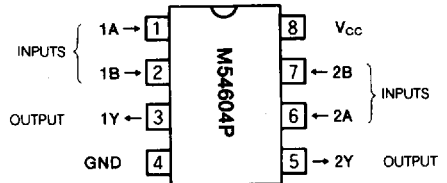
FUNCTION

The output being an open collector, each circuit is capable of handling a maximum output current of 300mA when in low-level output and, when in high-level output, a maximum voltage of 30V can be applied. As mean propagation delay time is 25ns, high speed switching is possible. Supply voltage being $5V \pm 5\%$ and input being TTL, this IC can be connected directly to TTL. This IC has a broad range of application as a relay and lamp driver as well as a MOS MEMORY driver.

FUNCTION TABLE

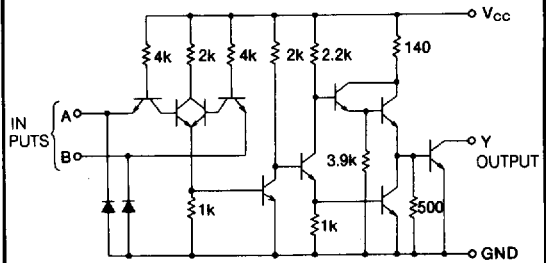
A	B	Y
L	L	H
L	H	L
H	L	L
H	H	L

PIN CONFIGURATION (TOP VIEW)



Outline 8P4

CIRCUIT SCHEMATIC (EACH DRIVER)



Unit : Ω

ABSOLUTE MAXIMUM RATINGS ($T_a = 0 \sim 75^\circ C$, unless otherwise noted)

Symbol	Parameter	Conditions	Ratings	Unit
V_{cc}	Supply voltage		7	V
V_i	Input voltage		5.5	V
V_{IE}	Interemitter voltage		5.5	V
V_o	Output voltage	High-level state	30	V
I_o	Output current	Low-level state	300	mA
P_d	Power dissipation	$T_a \leq 25^\circ C$		mW
T_{opr}	Operating temperature		0 ~ 75	$^\circ C$
T_{stg}	Storage temperature		-65 ~ +150	$^\circ C$

DUAL PERIPHERAL POSITIVE NOR DRIVER

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RECOMMENDED OPERATING CONDITIONS ($T_a = 0 \sim 75^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter		Limits			Unit
			Min	Typ	Max	
V_{CC}	Supply voltage		4.75	5	5.25	V
V_O	Output voltage	High-level state			24	V
I_{OL}	Low-level output current	$V_{OL} = 0.4\text{V}$			100	mA
		$V_{OL} = 0.7\text{V}$			300	

ELECTRICAL CHARACTERISTICS ($T_a = 0 \sim 75^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ*	Max	
V_{IH}	High-level input voltage		2			V
V_{IL}	Low-level input voltage				0.8	V
V_{IC}	Input clamp voltage	$V_{CC} = 4.75\text{V}$, $I_{IC} = -12\text{mA}$			-1.5	V
I_{OH}	High-level output current	$V_{CC} = 4.75\text{V}$, $V_{IH} = 0.8\text{V}$, $V_{OH} = 30\text{V}$			100	μA
V_{OL}	Low-level output voltage	$V_{CC} = 4.75\text{V}$ $V_{IH} = 2\text{V}$		0.25	0.4	V
		$I_{OL} = 100\text{mA}$ $I_{OL} = 300\text{mA}$		0.5	0.7	
I_{IH}	High-level input current	$V_{CC} = 5.25\text{V}$			40	μA
			$V_I = 2.4\text{V}$ $V_I = 4.5\text{V}$			
I_{IL}	Low-level input current	$V_{CC} = 5.25\text{V}$, $V_I = 0.4\text{V}$		-1	-1.6	mA
I_{CCH}	Supply current, all outputs high	$V_{CC} = 5.25\text{V}$, $V_I = 0\text{V}$		13	.17	mA
I_{CCL}	Supply current, all outputs low	$V_{CC} = 5.25\text{V}$, $V_I = 5\text{V}$		61	79	mA

* : A typical value at $T_a = 25^\circ\text{C}$.

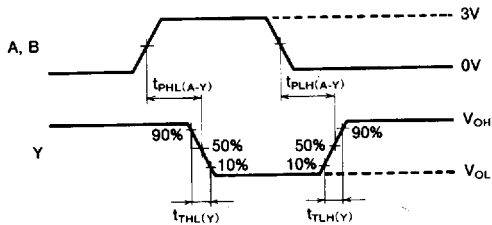
SWITCHING CHARACTERISTICS ($V_{CC} = 5\text{V}$, $T_a = 25^\circ\text{C}$, unless otherwise noted)

Symbol (Note 1)	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$t_{PLH(A-Y)}$	Low-to-high-level output, high-to-low-level output propagation time: from input A, B to output Y	$I_O \approx 200\text{mA}$ $C_L = 15\text{pF}$, $R_L = 50\Omega$ (Notes 2, 3)		27	35	ns
$t_{PHL(A-Y)}$				24	35	
$t_{TLH(Y)}$	Low-to-high-level output, high-to-low-level output transition time: output Y			6	10	ns
$t_{THL(Y)}$					6	

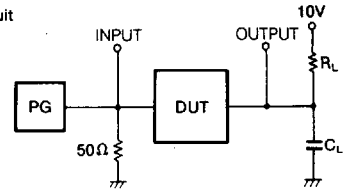
Note 1 : Symbols are representative examples.

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TIMING DIAGRAM (Reference level = 1.5V)



Note 2 : Test circuit

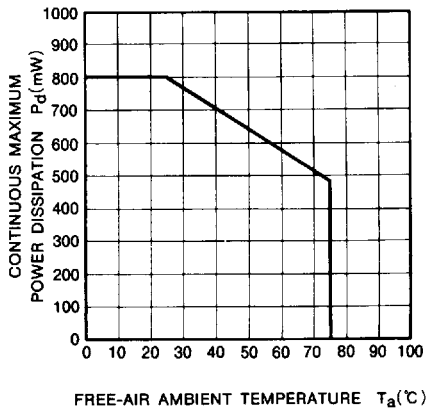


1. The pulse generator (PG) has the following characteristics:
 $t_r \leq 10\text{ns}$, $t_f \leq 5\text{ns}$, $\text{PRR} = 1\text{MHz}$,
 $t_{pw} = 500\text{ns}$, $V_p = 3V_{p-p}$, $Z_o = 50\Omega$.
2. C_L includes probe and jig capacitance.

Note 3 : Output breakdown voltage drops upon switching.
 Examples: $I_{OL} \cong 300\text{mA}$ @ $V_o \cong 15\text{V}$ and $I_{OL} \cong 100\text{mA}$ @ $V_o \cong 20\text{V}$. In case of inductive load use, lower supply voltage.
 When driving a relay be sure to use a diode in the relay coil to protect against the IC being damaged by relay coil generated counter-electromotive force or when relay coil voltage drops below 12V.

TYPICAL CHARACTERISTICS

HEAT DISSIPATION CHARACTERISTICS



APPLICATION EXAMPLE

ALARM DETECTOR

