

MITSUBISHI (DGTL LOGIC)

M54604P**DUAL PERIPHERAL POSITIVE NOR DRIVER****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 ($I_O=300\text{mA}$)
- High breakdown output voltage ($V_O=30\text{V}$)
- High speed switching ($t_{pd}=25\text{ns}$)
- A small 8 pin DIL package

APPLICATION

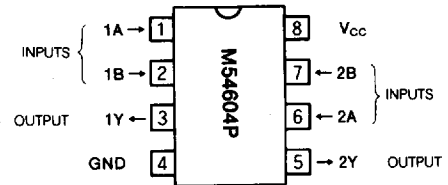
General purpose, for use in industrial and consumer digital equipment.

FUNCTION

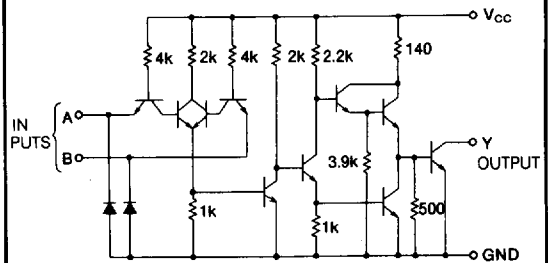
The output being an open collector, each circuit is capable of handling a maximum output current of 300mA when in low-level output and, when in high-level output, a maximum voltage of 30V can be applied. As mean propagation delay time is 25ns, high speed switching is possible. Supply voltage being $5\text{V} \pm 5\%$ 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** ($T_a = 0\sim 75^\circ\text{C}$, 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	$T_a \leq 25^\circ\text{C}$	800	mW
T_{opr}	Operating temperature		0~75	$^\circ\text{C}$
T_{stg}	Storage temperature		-65~+150	$^\circ\text{C}$

DUAL PERIPHERAL POSITIVE NOR DRIVER

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	$V_{CC} = 4.75\text{V}$, $I_C = -12\text{mA}$			-1.5	V	
I_{OH}	High-level output current	$V_{CC} = 4.75\text{V}$, $V_H = 0.8\text{V}$, $V_{OH} = 30\text{V}$			100	μA	
V_{OL}	Low-level output voltage	$V_{CC} = 4.75\text{V}$ $V_H = 2\text{V}$	$I_{OL} = 100\text{mA}$		0.25	0.4	V
			$I_{OL} = 300\text{mA}$		0.5	0.7	
I_{IH}	High-level input current	$V_{CC} = 5.25\text{V}$	$V_i = 2.4\text{V}$		40		μA
			$V_i = 4.5\text{V}$		60		
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)

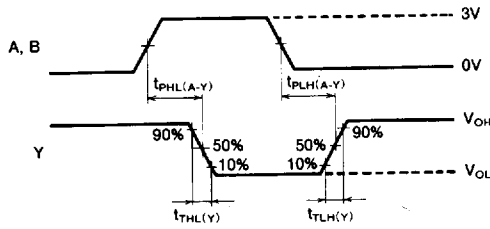
Symbol (Note 1)	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$t_{PLH(A-Y)}$	Low-to-high-level output, high-to-low-level output propagation time; from input A, B to output Y	$I_O \approx 200\text{mA}$		27	35	ns
$t_{PHL(A-Y)}$				24	35	
$t_{TLH(Y)}$	Low-to-high-level output, high-to-low-level output transition time; output Y	$C_L = 15\text{pF}$, $R_L = 50\Omega$ (Notes 2, 3)		6	10	ns
$t_{THL(Y)}$				9	15	

Note 1 : Symbols are representative examples.

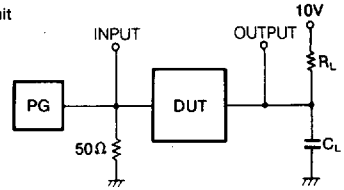
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TIMING DIAGRAM (Reference level = 1.5V)



Note 2 : Test circuit

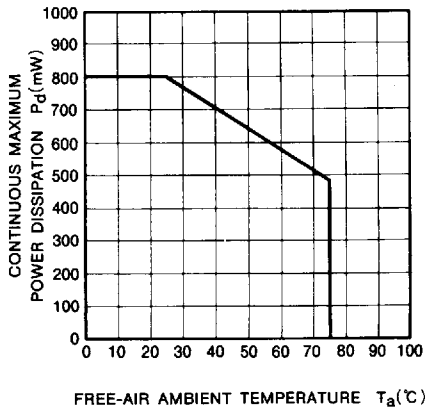


1. The pulse generator (PG) has the following characteristics:
 $t_r \leq 10\text{ns}$, $t_f \leq 5\text{ns}$, $\text{PRR} = 1\text{MHz}$,
 $t_{PW} = 500\text{ns}$, $V_p = 3V_{P-P}$, $Z_o = 50\Omega$.
2. C_L includes probe and jig capacitance.

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

