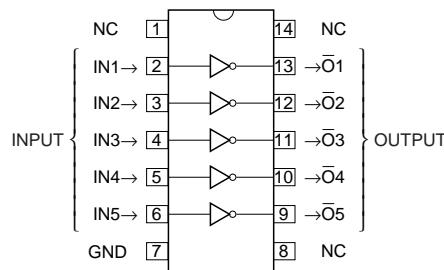


**DESCRIPTION**

M54516P is five-circuit Darlington transistor arrays. The circuits are made of NPN transistors. Both the semiconductor integrated circuits perform high-current driving with extremely low input-current supply.

**FEATURES**

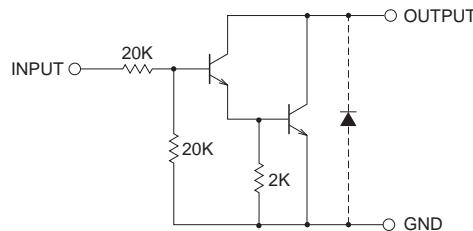
- Medium breakdown voltage ( $BV_{CEO} \geq 25V$ )
- High-current driving ( $I_c(\text{max}) = 500\text{mA}$ )
- Driving available with PMOS IC output
- Wide operating temperature range ( $T_a = -20$  to  $+75^\circ\text{C}$ )

**PIN CONFIGURATION**

Package type 14P4(P)      NC : No connection

**APPLICATION**

Drives of relays and printers, digit drives of indication elements (LEDs and lamps), and MOS-bipolar logic IC interfaces

**CIRCUIT DIAGRAM**

The five circuits share the GND.

The diode, indicated with the dotted line, is parasitic, and cannot be used.

Unit :  $\Omega$

**FUNCTION**

The M54516P has five circuits consisting of NPN Darlington transistors. These ICs have resistance of  $20\text{k}\Omega$  between input transistor bases and input pins. The output transistor emitters are all connected to the GND pin (pin 7).

Collector current is 500mA maximum. Collector-emitter supply voltage is 25V maximum.

**ABSOLUTE MAXIMUM RATINGS** (Unless otherwise noted,  $T_a = -20$  ~  $+75^\circ\text{C}$ )

Symbol	Parameter	Conditions	Ratings	Unit
$V_{CEO}$	Collector-emitter voltage	Output, H	-0.5 ~ +25	V
$I_c$	Collector current	Current per circuit output, L	500	mA
$V_I$	Input voltage		-0.5 ~ +25	V
$P_d$	Power dissipation	$T_a = 25^\circ\text{C}$ , when mounted on board	1.47	W
$T_{opr}$	Operating temperature		-20 ~ +75	$^\circ\text{C}$
$T_{stg}$	Storage temperature		-55 ~ +125	$^\circ\text{C}$

## 5-UNIT 500mA DARLINGTON TRANSISTOR ARRAY

RECOMMENDED OPERATING CONDITIONS (unless otherwise noted,  $T_a = -20 \sim +75^\circ\text{C}$ )

Symbol	Parameter	Limits			Unit
		min	typ	max	
Vo	Output voltage	0	—	25	V
IC	Collector current (Current per 1 circuit when 7 circuits are coming on simultaneously)	0	—	400	mA
	Duty Cycle no more than 55%	0	—	200	
VIH	"H" input voltage	IC $\leq$ 400mA	8	—	V
		IC $\leq$ 200mA	5	—	
VIL	"L" input voltage	0	—	0.5	V

ELECTRICAL CHARACTERISTICS (Unless otherwise noted,  $T_a = -20 \sim +75^\circ\text{C}$ )

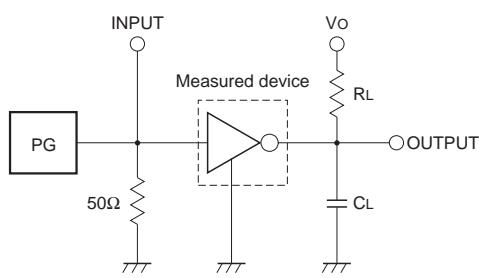
Symbol	Parameter	Test conditions	Limits			Unit
			min	typ*	max	
V (BR) CEO	Collector-emitter breakdown voltage	ICEO = 100µA	25	—	—	V
VCE (sat)	Collector-emitter saturation voltage	VI = 8V, IC = 400mA	—	1.15	2.2	V
		VI = 5V, IC = 200mA	—	0.9	1.4	
II	Input current	VI = 17V	0.3	0.8	1.8	mA
hFE	DC amplification factor	VCE = 4V, IC = 400mA, Ta = 25°C	1000	4000	—	—

\* : The typical values are those measured under ambient temperature ( $T_a$ ) of 25°C. There is no guarantee that these values are obtained under any conditions.

SWITCHING CHARACTERISTICS (Unless otherwise noted,  $T_a = 25^\circ\text{C}$ )

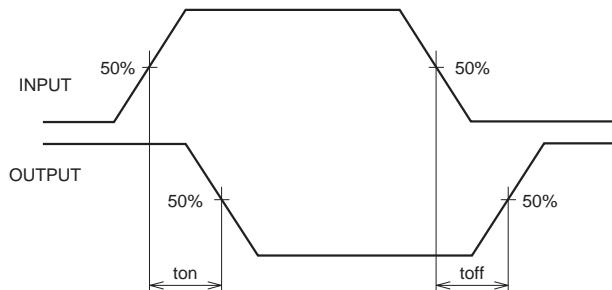
Symbol	Parameter	Test conditions	Limits			Unit
			min	typ	max	
ton	Turn-on time	CL = 15pF (note 1)	—	40	—	ns
toff	Turn-off time	CL = 15pF (note 1)	—	500	—	ns

## NOTE 1 TEST CIRCUIT



- (1) Pulse generator (PG) characteristics : PRR = 1kHz,  
 $t_w = 10\mu\text{s}$ ,  $t_r = 6\text{ns}$ ,  $t_f = 6\text{ns}$ ,  $Z_0 = 50\Omega$   
 $V_P = 8\text{VP-P}$
- (2) Input-output conditions :  $RL = 25\Omega$ ,  $VO = 10\text{V}$
- (3) Electrostatic capacity  $CL$  includes floating capacitance at connections and input capacitance at probes

## TIMING DIAGRAM



**TYPICAL CHARACTERISTICS**