

M54516P

5-UNIT 500mA DARLINGTON TRANSISTOR ARRAY

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 ($I_{c(max)} = 500mA$)
- Driving available with PMOS IC output
- Wide operating temperature range ($T_a = -20$ to $+75^\circ C$)

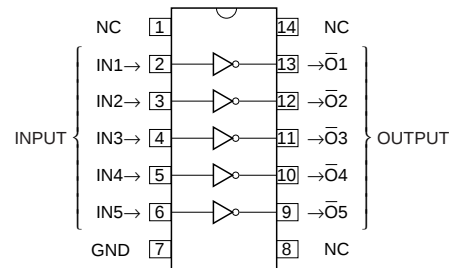
APPLICATION

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

FUNCTION

The M54516P has five circuits consisting of NPN Darlington transistors. These ICs have resistance of $20k\Omega$ 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.

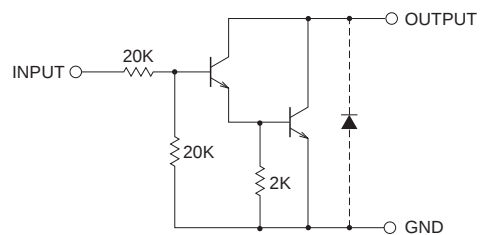
PIN CONFIGURATION



Package type 14P4(P)

NC : No connection

CIRCUIT DIAGRAM



The five circuits share the GND.

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

Unit : Ω

ABSOLUTE MAXIMUM RATINGS (Unless otherwise noted, $T_a = -20 \sim +75^\circ C$)

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

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)	Duty Cycle no more than 10%	0	—	400	mA
		Duty Cycle no more than 55%	0	—	200	
VIH	“H” input voltage	Ic ≤ 400mA	8	—	20	V
		Ic ≤ 200mA	5	—		
VIL	“L” input voltage		0	—	0.5	V

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

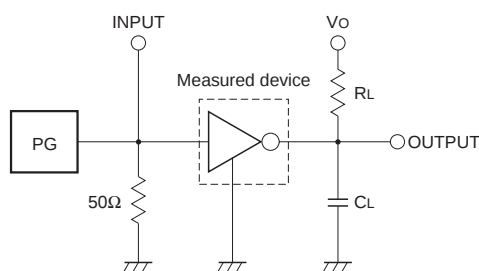
Symbol	Parameter	Test conditions	Limits			Unit
			min	typ*	max	
$V_{(BR)CEO}$	Collector-emitter breakdown voltage	$I_{CEO} = 100\mu\text{A}$	25	—	—	V
$V_{CE(sat)}$	Collector-emitter saturation voltage	$V_I = 8\text{V}, I_c = 400\text{mA}$	—	1.15	2.2	V
		$V_I = 5\text{V}, I_c = 200\text{mA}$	—	0.9	1.4	
I_i	Input current	$V_I = 17\text{V}$	0.3	0.8	1.8	mA
h_{FE}	DC amplification factor	$V_{CE} = 4\text{V}, I_c = 400\text{mA}, T_a = 25^\circ\text{C}$	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, $T_a = 25^\circ\text{C}$)

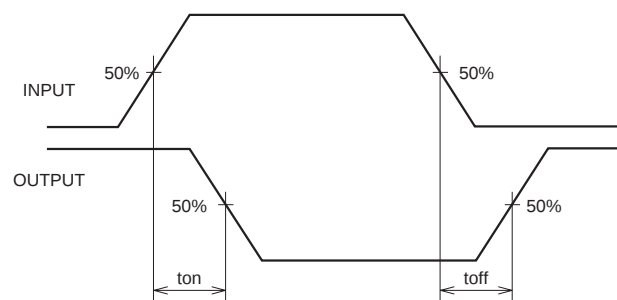
Symbol	Parameter	Test conditions	Limits			Unit
			min	typ	max	
t_{on}	Turn-on time	$C_L = 15\text{pF}$ (note 1)	—	40	—	ns
t_{off}	Turn-off time		—	500	—	ns

NOTE 1 TEST CIRCUIT



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

TIMING DIAGRAM



TYPICAL CHARACTERISTICS

