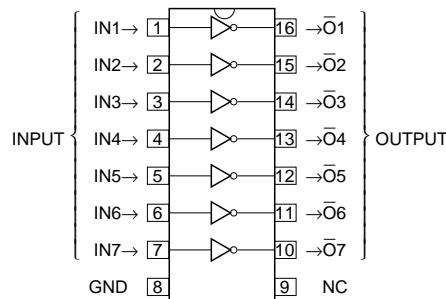


**DESCRIPTION**

M54519P and M54519FP are seven-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**

- High breakdown voltage ( $BV_{CEO} \geq 40V$ )
- High-current driving ( $I_c(\text{max}) = 400\text{mA}$ )
- Driving available with PMOS IC output
- Wide operating temperature range ( $T_a = -20$  to  $+75^\circ\text{C}$ )

**PIN CONFIGURATION**

16P4(P)  
Package type 16P2N-A(FP) NC : No connection

**APPLICATION**

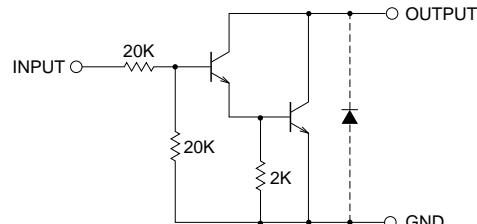
Drives of relays and printers, digit drives of indication elements (LEDs and lamps), and MOS-bipolar logic IC interfaces

**FUNCTION**

The M54519P and M54519FP each have seven 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 8).

Collector current is 400mA maximum. Collector-emitter supply voltage is 40V maximum.

The M54519FP is enclosed in a molded small flat package, enabling space-saving design.

**CIRCUIT DIAGRAM**

The seven circuits share the GND.

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

Unit :  $\Omega$

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

Symbol	Parameter	Conditions	Ratings	Unit
V <sub>CEO</sub>	Collector-emitter voltage	Output, H	-0.5 ~ +40	V
I <sub>c</sub>	Collector current	Current per circuit output, L	400	mA
V <sub>I</sub>	Input voltage		-0.5 ~ +40	V
P <sub>d</sub>	Power dissipation	T <sub>a</sub> = 25°C, when mounted on board	1.47(P)/1.00(FP)	W
T <sub>op</sub>	Operating temperature		-20 ~ +75	°C
T <sub>stg</sub>	Storage temperature		-55 ~ +125	°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	—	40	V
Ic	Collector current (Current per 1 circuit when 7 circuits are coming on simultaneously)	Duty Cycle P : no more than 8% FP : no more than 6%	0	—	400
		Duty Cycle P : no more than 30% FP : no more than 25%	0	—	200
VIH	"H" input voltage	Ic $\leq$ 400mA	8	—	V
		Ic $\leq$ 200mA	5	—	
VIL	"L" input voltage	0	—	0.5	V

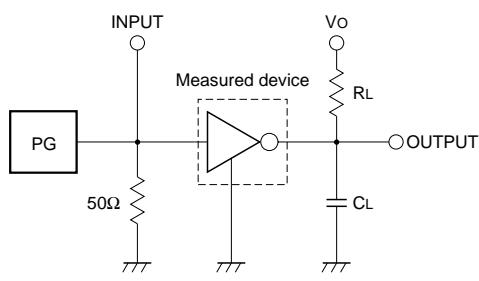
**ELECTRICAL CHARACTERISTICS** (Unless otherwise noted,  $T_a = -20 \sim +75^\circ\text{C}$ )

Symbol	Parameter	Test conditions	Limits			Unit
			min	typ*	max	
V (BR) CEO	Collector-emitter breakdown voltage	ICEO = 100 $\mu\text{A}$	40	—	—	V
VCE (sat)	Collector-emitter saturation voltage	VI = 8V, Ic = 400mA	—	1.3	2.4	V
		VI = 5V, Ic = 200mA	—	1.0	1.6	
II	Input current	VI = 17V	0.3	0.8	1.8	mA
hFE	DC amplification factor	VCE = 4V, Ic = 400mA, Ta = 25°C	1000	6000	—	—

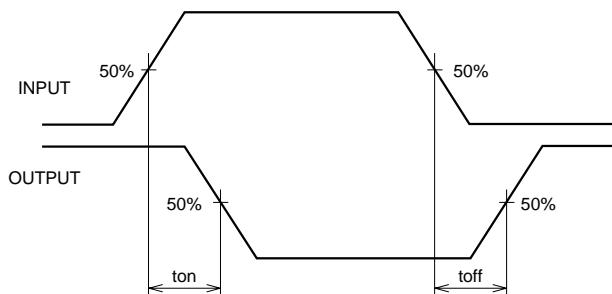
\* : The typical values are those measured under ambient temperature ( $T_a$ ) of 25°C. There is no guarantee that these values are obtained under any conditions.

**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		—	400	—	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 :  $R_L = 25\Omega$ ,  $V_o = 10\text{V}$
- (3) Electrostatic capacity  $C_L$  includes floating capacitance at connections and input capacitance at probes

**TIMING DIAGRAM**

**TYPICAL CHARACTERISTICS**