

# M54566P/FP

7-UNIT 400mA DARLINGTON TRANSISTOR ARRAY

## DESCRIPTION

M54566P and M54566FP are seven-circuit collector-current-synchronized Darlington transistor arrays. The circuits are made of PNP and NPN transistors. Both the semiconductor integrated circuits perform high-current driving with extremely low input-current supply.

## FEATURES

- High breakdown voltage ( $BV_{CEO} \geq 50V$ )
- High-current driving ( $I_{c(max)} = 400mA$ )
- Active L-level input
- Wide operating temperature range ( $T_a = -20$  to  $+75^\circ C$ )

## APPLICATION

Interfaces between microcomputers and high-voltage, high-current drive systems, drives of relays and printers, and MOS-bipolar logic IC interfaces

## FUNCTION

The M54566 is produced by adding PNP transistors to M54222 inputs. Seven circuits having active L-level inputs are provided.

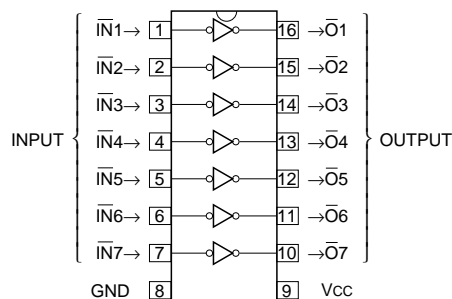
Resistance of  $8k\Omega$  is provided between each input and PNP transistor base. The input emitters are connected to  $V_{cc}$  pin (pin 9). Output transistor emitters are all connected to the GND pin (pin 8).

Collector current is 400mA maximum. Collector-emitter supply voltage is 50V maximum.

These ICs are optimal for drivers that are driven with N-MOS IC output and absorb collector current.

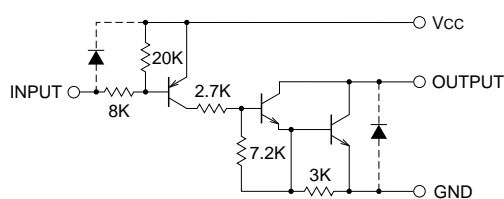
The M54566FP is enclosed in a molded small flat package, enabling space-saving design.

## PIN CONFIGURATION



16P4(P)  
Package type 16P2N-A(FP)

## CIRCUIT DIAGRAM



The seven circuits share the  $V_{cc}$  and GND.  
The diode, indicated with the dotted line, is parasitic, and cannot be used.

Unit :  $\Omega$

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

Symbol	Parameter	Conditions	Ratings	Unit
$V_{CC}$	Supply voltage		10	V
$V_{CEO}$	Collector-emitter voltage	Output, H	$-0.5 \sim +50$	V
$I_C$	Collector current	Current per circuit output, L	400	mA
$V_i$	Input voltage		$-0.5 \sim V_{CC}$	V
$P_d$	Power dissipation	$T_a = 25^\circ C$ , when mounted on board	1.47(P)/1.00(FP)	W
$T_{opr}$	Operating temperature		$-20 \sim +75$	$^\circ C$
$T_{stg}$	Storage temperature		$-55 \sim +125$	$^\circ C$

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### RECOMMENDED OPERATING CONDITIONS (Unless otherwise noted, Ta = -20 ~ +75°C)

Symbol	Parameter	Limits			Unit	
		min	typ	max		
V <sub>CC</sub>	Supply voltage	4	5	8	V	
V <sub>O</sub>	Output voltage	0	—	50	V	
I <sub>C</sub>	Collector current (Current per 1 circuit when 7 circuits are coming on simultaneously)	V <sub>CC</sub> = 5V, Duty Cycle P : no more than 10% FP : no more than 6%	0	—	350	mA
		V <sub>CC</sub> = 5V, Duty Cycle P : no more than 30% FP : no more than 20%	0	—	200	
V <sub>IH</sub>	"H" input voltage	V <sub>CC</sub> -0.2	—	V <sub>CC</sub>	V	
V <sub>IL</sub>	"L" input voltage	0	—	V <sub>CC</sub> -3	V	

### ELECTRICAL CHARACTERISTICS (Unless otherwise noted, Ta = -20 ~ +75°C)

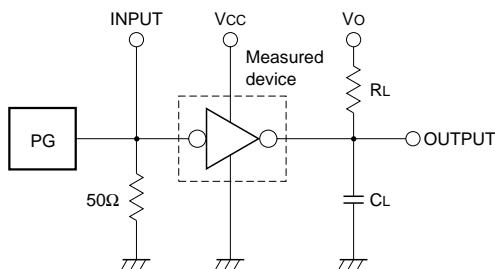
Symbol	Parameter	Test conditions	Limits			Unit
			min	typ*	max	
V (BR) CEO	Collector-emitter breakdown voltage	I <sub>CEO</sub> = 100μA	50	—	—	V
V <sub>CE</sub> (sat)	Collector-emitter saturation voltage	V <sub>I</sub> = V <sub>CC</sub> -3V, I <sub>C</sub> = 350mA	—	1.1	2.2	V
		V <sub>I</sub> = V <sub>CC</sub> -3V, I <sub>C</sub> = 200mA	—	0.9	1.6	
I <sub>I</sub>	Input current	V <sub>I</sub> = V <sub>CC</sub> -3.5V	—	-0.38	-0.58	mA
I <sub>CC</sub>	Supply current (one circuit coming on)	V <sub>CC</sub> = 5V, V <sub>I</sub> = V <sub>CC</sub> -3.5V	—	1.4	3.0	mA
hFE	DC amplification factor	V <sub>CE</sub> = 4V, V <sub>CC</sub> = 5V, I <sub>C</sub> = 350mA, Ta = 25°C	2000	10000	—	—

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

### SWITCHING CHARACTERISTICS (Unless otherwise noted, Ta = 25°C)

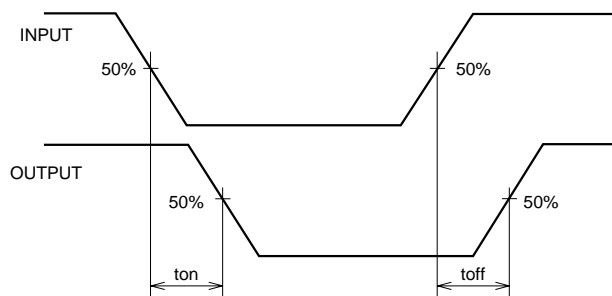
Symbol	Parameter	Test conditions	Limits			Unit
			min	typ	max	
t <sub>on</sub>	Turn-on time	C <sub>L</sub> = 15pF (note 1)	—	95	—	ns
t <sub>off</sub>	Turn-off time		—	2500	—	ns

#### NOTE 1 TEST CIRCUIT



- (1) Pulse generator (PG) characteristics : PRR = 1kHz,  
tw = 10μs, tr = 6ns, tf = 6ns, Zo = 50Ω  
Vi = 1 to 4V
- (2) Input-output conditions : RL = 30Ω, Vo = 10V, Vcc = 4V
- (3) Electrostatic capacity CL includes floating capacitance at connections and input capacitance at probes

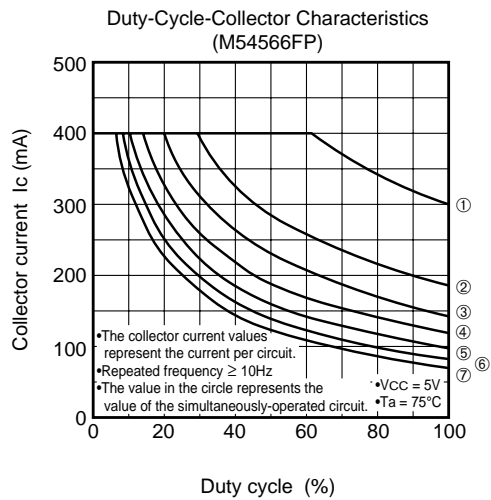
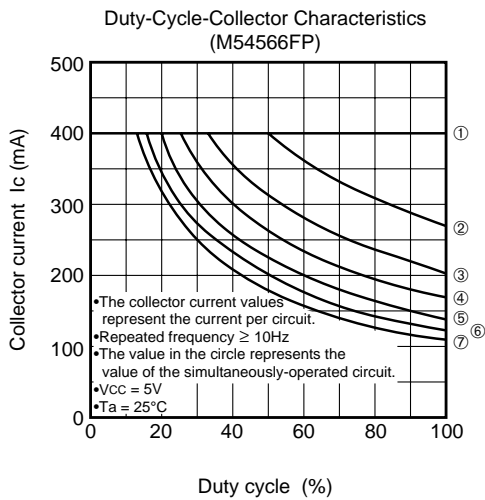
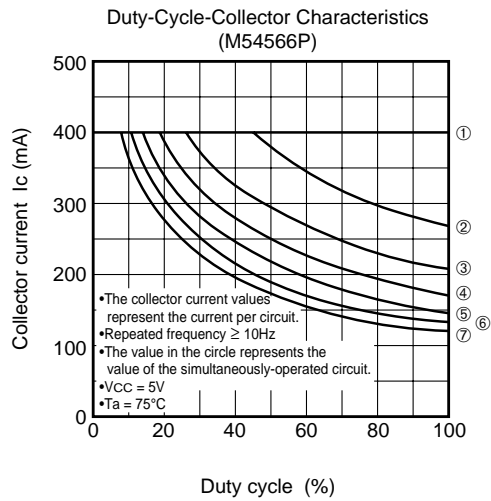
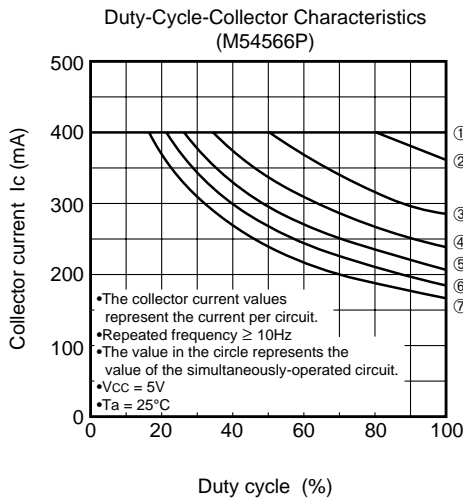
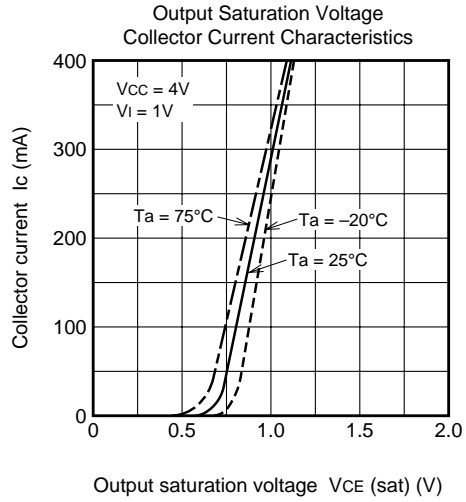
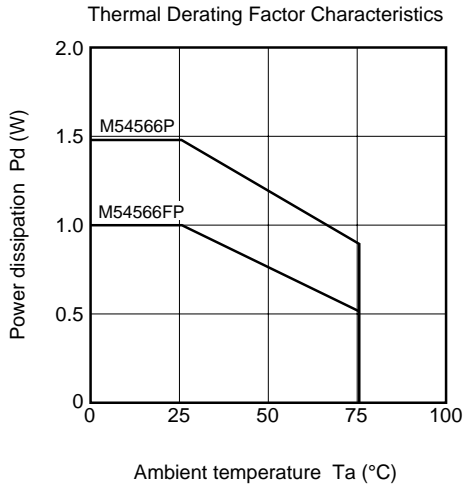
#### TIMING DIAGRAM



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TYPICAL CHARACTERISTICS



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