

<TRANSISTOR ARRAY>

# M54585FP

## 8-UNIT 500mA DARLINGTON TRANSISTOR ARRAY WITH CLAMP DIODE SINK TYPE

### DESCRIPTION

M54585FP is eight-circuit Darlington transistor arrays with clamping diodes. 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 ( $BV_{CEO} \geq 50V$ )
- High-current driving ( $I_C(\max) = 500mA$ )
- With clamping diodes
- Driving available with TTL output or with PMOS IC output

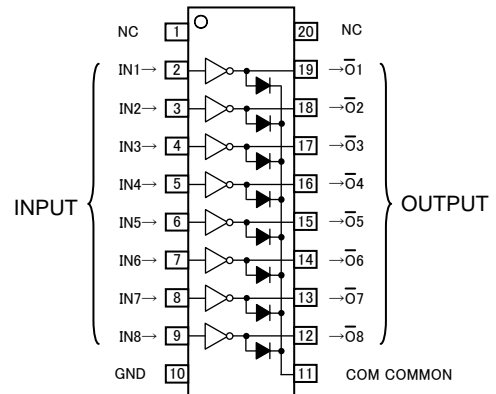
### APPLICATIONS

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

### FUNCTION

The M54585FP is each have eight circuits, which are NPN Darlington transistors. Input transistors have resistance of  $2.7k\Omega$  between the base and input pin. A spikekiller clamping diode is provided between each output pin and GND. Output transistor emitters are all connected to the GND pin. Collector current is 500mA maximum. The maximum collector-emitter voltage is 50V.

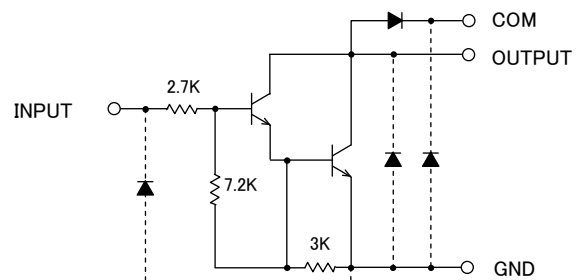
### PIN CONFIGURATION



Package type 20P2N-A

NC : No connection

### CIRCUIT DIAGRAM



The eight circuits share the COM 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
$V_{CEO}$	Collector-emitter voltage	Output , H	-0.5 ~ +50	V
$I_C$	Output current	Current per circuit output, L	500	mA
$V_i$	Input voltage		-0.5 ~ +30	V
$I_F$	Clamping diode forward current		500	mA
$V_R$	Clamping diode reverse voltage		50	V
$P_d$	Power dissipation	$T_a = 25^\circ C$ , when mounted on board	1.10	W
$T_{opr}$	Operating temperature		-20 ~ +75	$^\circ C$
$T_{stg}$	Storage temperature		-55 ~ +125	$^\circ C$

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

Symbol	Parameter	Limits			Unit	
		min	typ	max		
V <sub>o</sub>	Output voltage	0	—	50	V	
I <sub>c</sub>	Collector current (Current per 1 circuit when 8 circuits are coming on simultaneously)	Duty Cycle no more than 4%	0	—	400	mA
		Duty Cycle no more than 20%	0	—	200	
V <sub>IH</sub>	“H” input voltage	I <sub>c</sub> ≤ 400mA	3.85	—	30	V
		I <sub>c</sub> ≤ 200mA	3.4	—		
V <sub>IL</sub>	“L” input voltage	0	—	0.6	V	

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

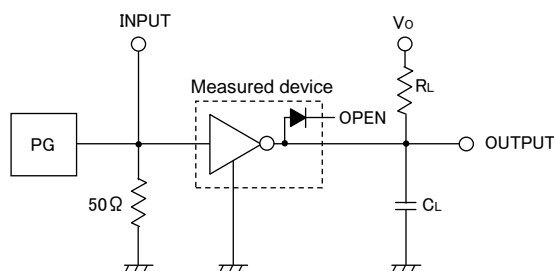
Symbol	Parameter	Test conditions	Limits			Unit
			min	typ *	max	
V <sub>(BR)CEO</sub>	Collector-emitter breakdown voltage	I <sub>CEO</sub> = 100 μA	50	—	—	V
V <sub>CE(sat)</sub>	Collector-emitter saturation voltage	V <sub>I</sub> = 3.85V, I <sub>c</sub> = 400mA	—	1.3	2.4	V
		V <sub>I</sub> = 3.4V, I <sub>c</sub> = 200mA	—	1.0	1.6	
I <sub>i</sub>	Input current	V <sub>I</sub> = 3.85V	—	0.95	1.8	mA
		V <sub>I</sub> = 25V	—	8.7	18	
V <sub>F</sub>	Clamping diode forward voltage	I <sub>F</sub> = 400mA	—	1.5	2.4	V
I <sub>R</sub>	Clamping diode reverse current	V <sub>R</sub> = 50V	—	—	100	μA
h <sub>FE</sub>	DC amplification factor	V <sub>CE</sub> = 4V, I <sub>c</sub> = 350mA, Ta = 25°C	1000	2500	—	—

\* : 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 )

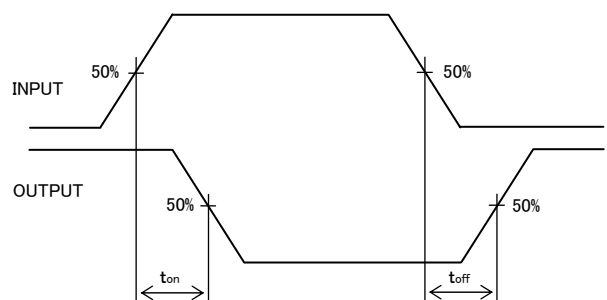
Symbol	Parameter	Test conditions	Limits			Unit
			min	typ	max	
t <sub>on</sub>	Turn-on time	C <sub>L</sub> = 15pF (note 1)	—	12	—	ns
t <sub>off</sub>	Turn-off time		—	240	—	ns

#### NOTE 1 TEST CIRCUIT



- (1) Pulse generator (PG) characteristics: PRR = 1kHz, tw = 10μs, tr = 6ns, tf = 6ns, ZO = 50Ω, VI = 3.85V
- (2) Input-output conditions : RL = 25Ω, Vo = 10V
- (3) Electrostatic capacity CL includes floating capacitance at connections and input capacitance at probes

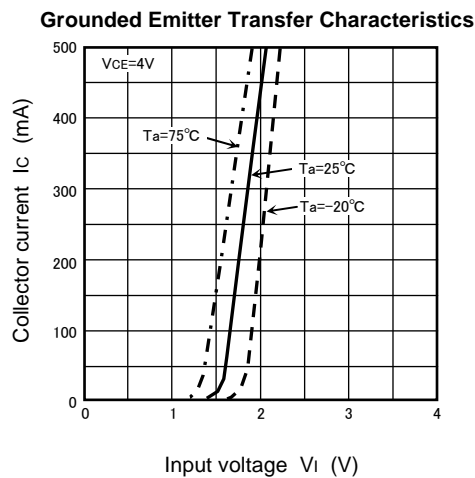
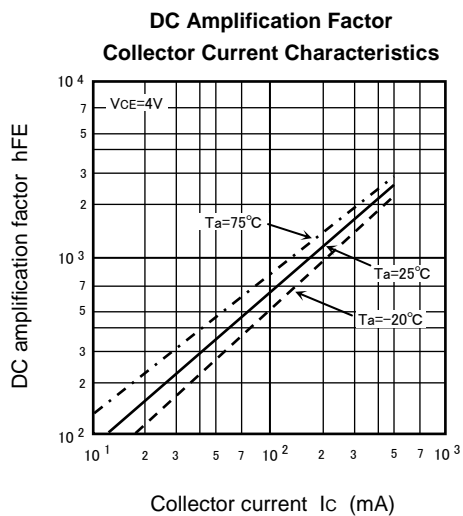
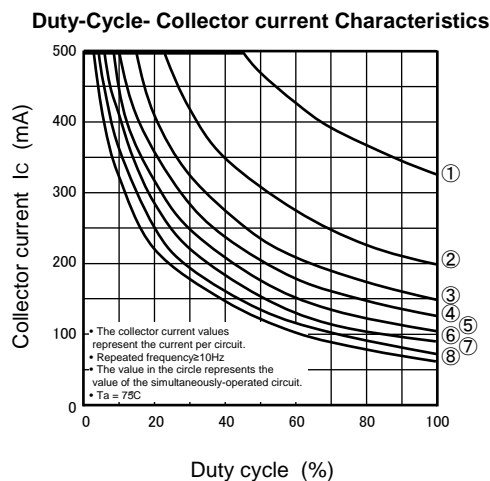
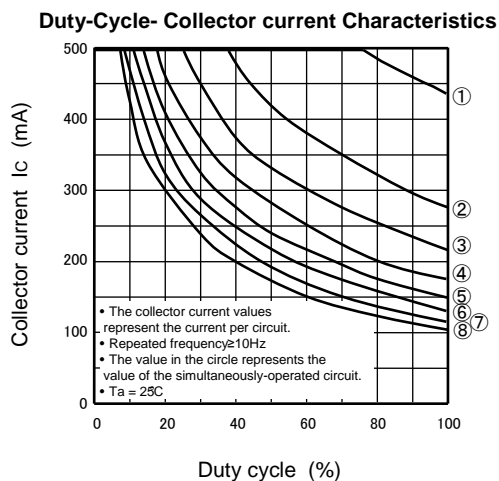
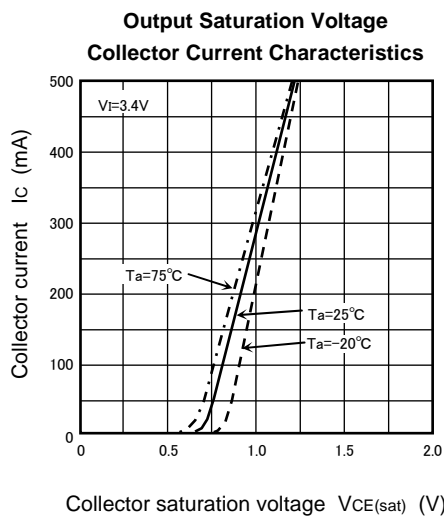
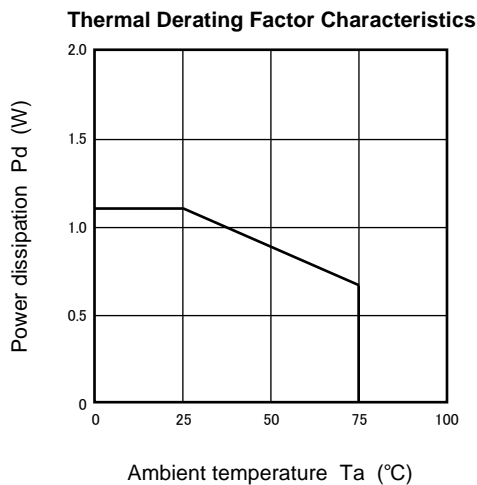
#### TIMING DIAGRAM



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SINK TYPE

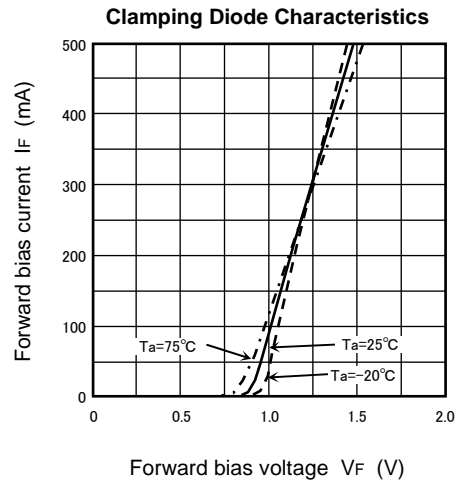
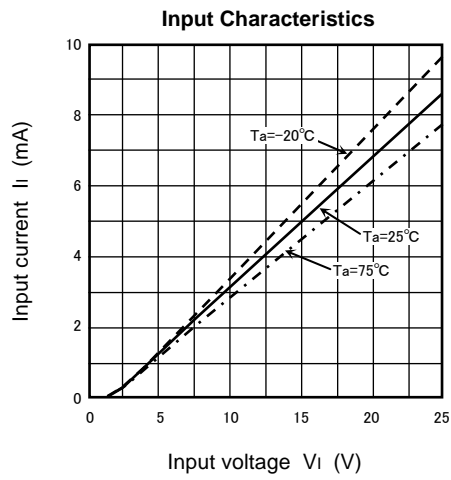
## TYPICAL CHARACTERISTICS



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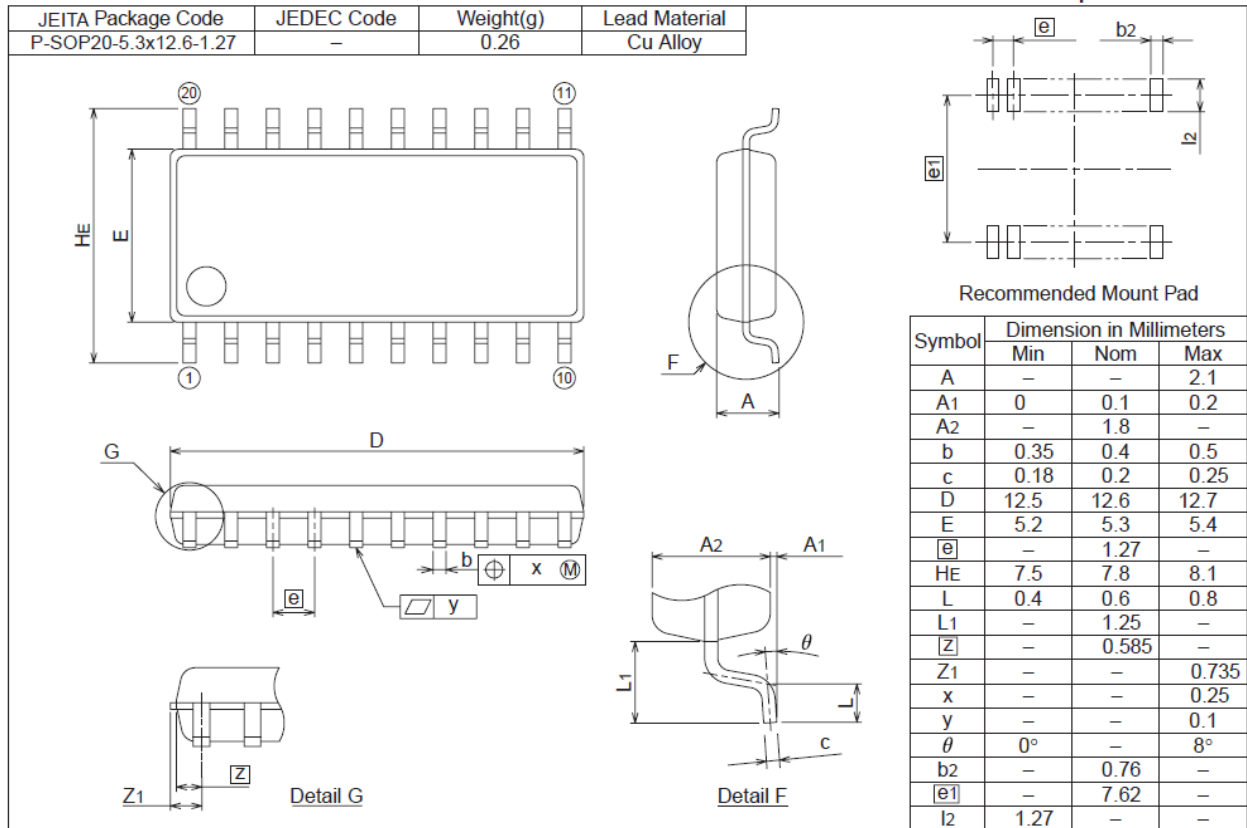
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PACKAGE OUTLINE

## 20P2N-A

JEITA Package Code	JEDEC Code	Weight(g)	Lead Material
P-SOP20-5.3x12.6-1.27	-	0.26	Cu Alloy

Plastic 20pin 300mil SOP



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