

# M54585WP

## 8-Unit 500mA DARLINGTON TRANSISTOR ARRAY WITH CLAMP DIODE

### DESCRIPTION

M54585WP 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

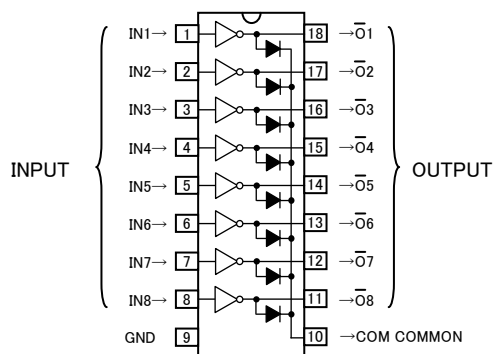
Drives of relays and printers, digit drives of indication elements such as LEDs and lamps, and MOS-bipolar logic IC interfaces

### FUNCTION

The M54585 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.

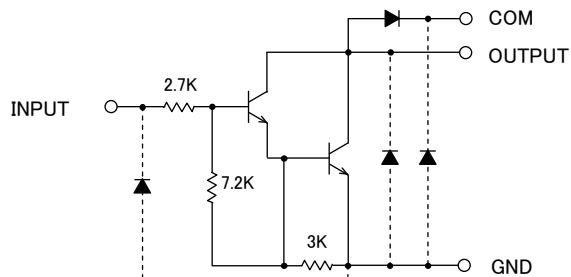
Collector current is 500mA maximum. The maximum collector-emitter voltage is 50V.

### PIN CONFIGURATION



Package type 18P4X

### 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
$I_c$	Collector 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	1.79	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	
Vo	Output voltage		0	—	50	V
Ic	Collector current (Current per 1 circuit when 8 circuits are coming on simultaneously)	Duty Cycle no more than 6%	0	—	400	mA
		Duty Cycle no more than 34%	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)

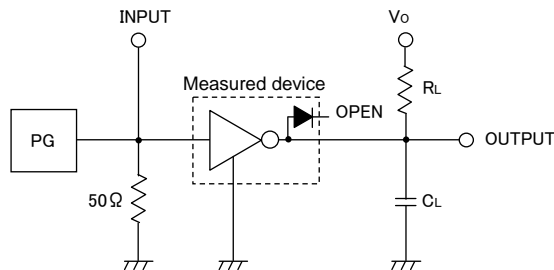
Symbol	Parameter	Test conditions	Limits			Unit
			min	typ*	max	
V <sub>(BR)CEO</sub>	Collector-emitter breakdown voltage	I <sub>CEO</sub> = 100 μA	50	—	—	V
V <sub>CE(sat)</sub>	Collector-emitter saturation voltage	V <sub>I</sub> = 3.85V, I <sub>c</sub> = 400mA	—	1.3	2.4	V
		V <sub>I</sub> = 3.4V, I <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)

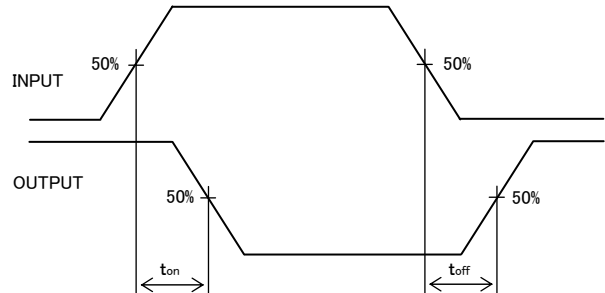
Symbol	Parameter	Test conditions	Limits			Unit
			min	typ	max	
t <sub>on</sub>	Turn-on time	C <sub>L</sub> = 15pF (note 1)	—	12	—	ns
t <sub>off</sub>	Turn-off time		—	240	—	ns

NOTE 1 TEST CIRCUIT



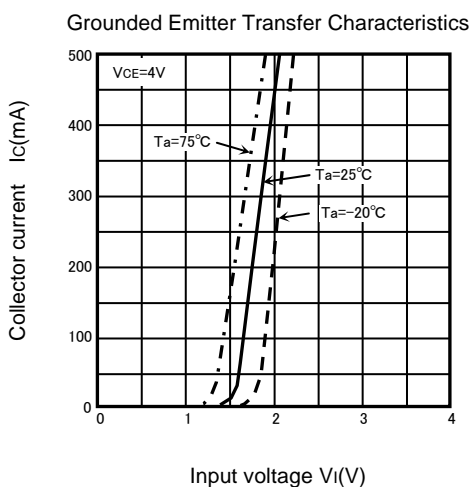
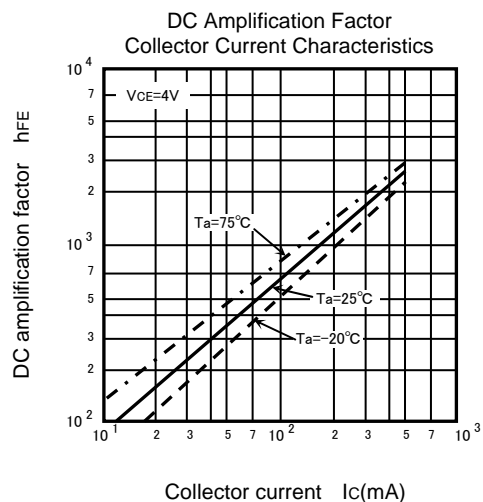
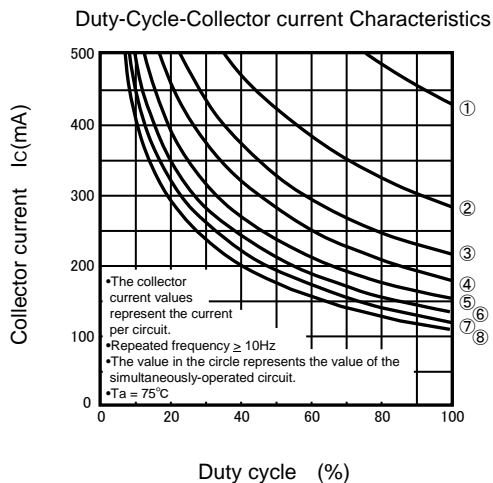
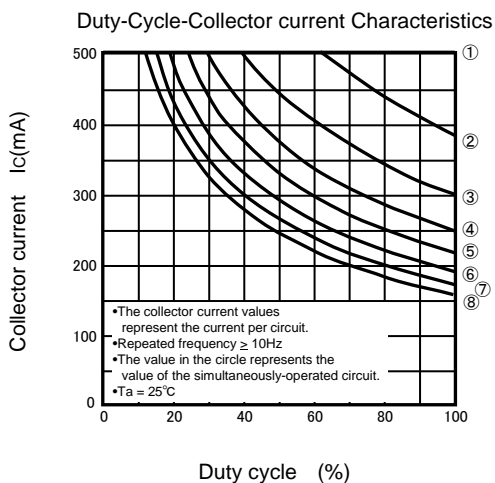
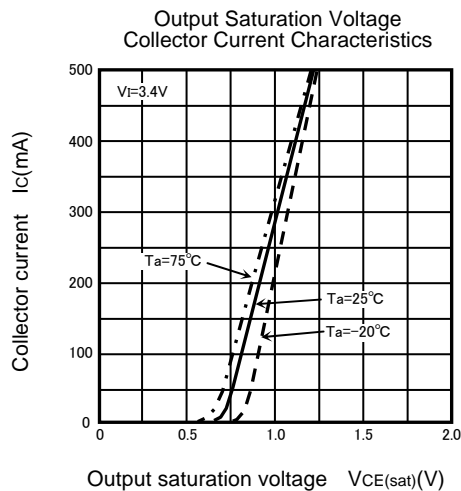
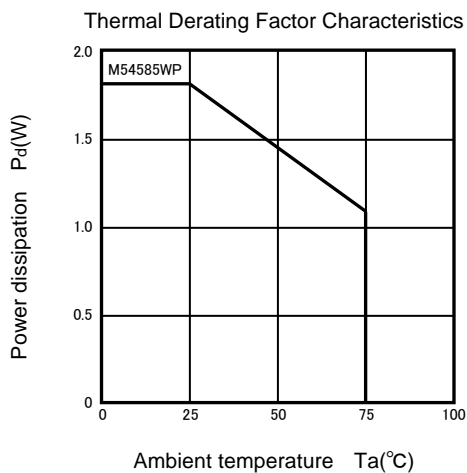
- (1) Pulse generator (PG) characteristics: PRR = 1kHz, tw = 10 μs, tr = 6ns, tf = 6ns, Zo = 50 Ω, Vi = 3.85V
- (2) Input-output conditions : RL = 25 Ω, Vo = 10V
- (3) Electrostatic capacity CL includes floating capacitance at connections and input capacitance at probes

TIMING DIAGRAM

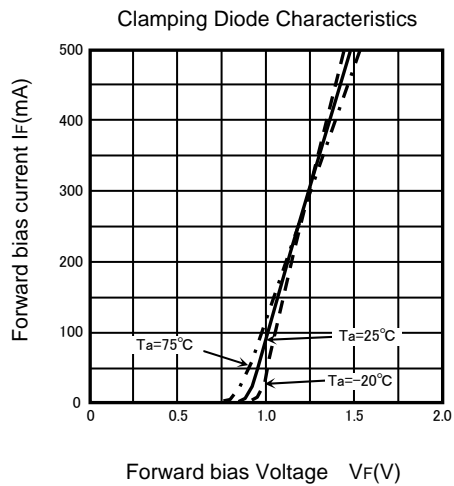
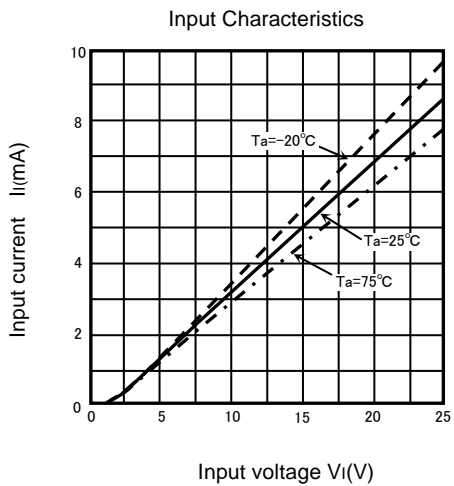


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TYPICAL CHARACTERISTICS



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PACKAGE OUTLINE

18P4X

Plastic 18pin 300mil DIP

