

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

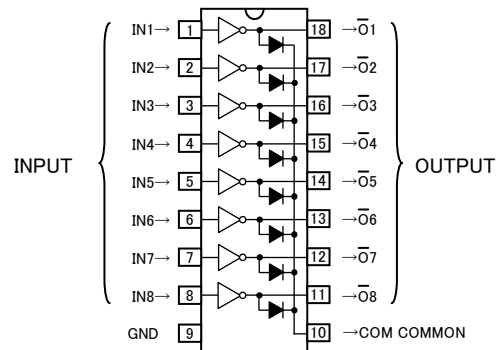
Drives of relays and printers, digit drives of indication elements such as LEDs and lamps, and MOS-bipolar logic IC interfaces

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.

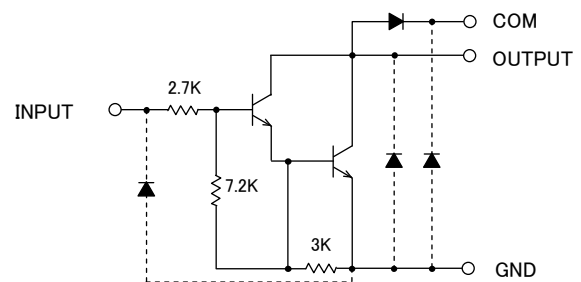
Collector current is 500mA maximum. The maximum collector-emitter voltage is 50V.

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: 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	$-0.5 \sim +50$	V
I_C	Collector current	Current per circuit output, L	500	mA
V_I	Input voltage		$-0.5 \sim +30$	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		$-20 \sim +75$	$^\circ C$
T_{stg}	Storage temperature		$-55 \sim +125$	$^\circ C$

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

Symbol	Parameter	Limits			Unit
		min	typ	max	
V_o	Output voltage	0	—	50	V
I_c	Collector current (Current per 1 circuit when 8 circuits are coming on simultaneously)	Duty Cycle no more than 6%	0	—	mA
		Duty Cycle no more than 34%	0	—	
V_{IH}	“H” input voltage	$I_c \leq 400\text{mA}$	3.85	—	V
		$I_c \leq 200\text{mA}$	3.4	—	
V_{IL}	“L” input voltage	0	—	0.6	V

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

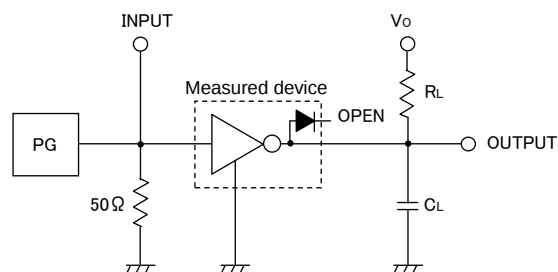
Symbol	Parameter	Test conditions	Limits			Unit
			min	typ*	max	
$V_{(BR)CEO}$	Collector-emitter breakdown voltage	$I_{CEO} = 100 \mu\text{A}$	50	—	—	V
$V_{CE(sat)}$	Collector-emitter saturation voltage	$V_I = 3.85\text{V}$, $I_c = 400\text{mA}$	—	1.3	2.4	V
		$V_I = 3.4\text{V}$, $I_c = 200\text{mA}$	—	1.0	1.6	
I_i	Input current	$V_I = 3.85\text{V}$	—	0.95	1.8	mA
		$V_I = 25\text{V}$	—	8.7	18	
V_F	Clamping diode forward voltage	$I_F = 400\text{mA}$	—	1.5	2.4	V
I_R	Clamping diode reverse current	$V_R = 50\text{V}$	—	—	100	μA
h_{FE}	DC amplification factor	$V_{CE} = 4\text{V}$, $I_c = 350\text{mA}$, $T_a = 25^\circ\text{C}$	1000	2500	—	—

*: 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, $T_a = 25^\circ\text{C}$)

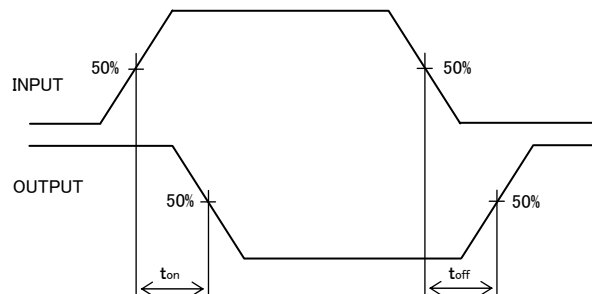
Symbol	Parameter	Test conditions	Limits			Unit
			min	typ	max	
t_{on}	Turn-on time	$C_L = 15\text{pF}$ (note 1)	—	12	—	ns
t_{off}	Turn-off time		—	240	—	ns

NOTE 1 TEST CIRCUIT



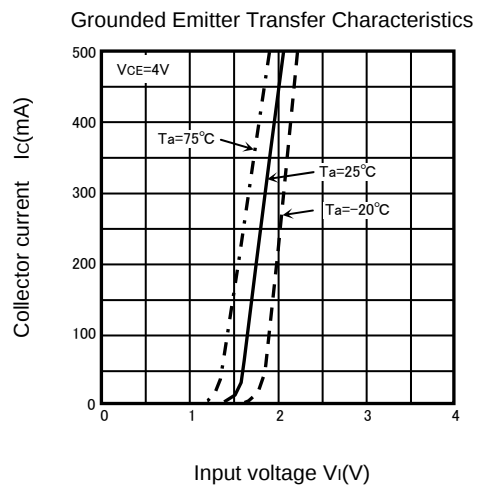
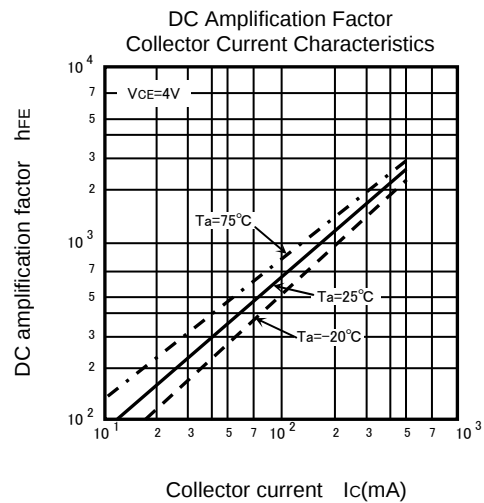
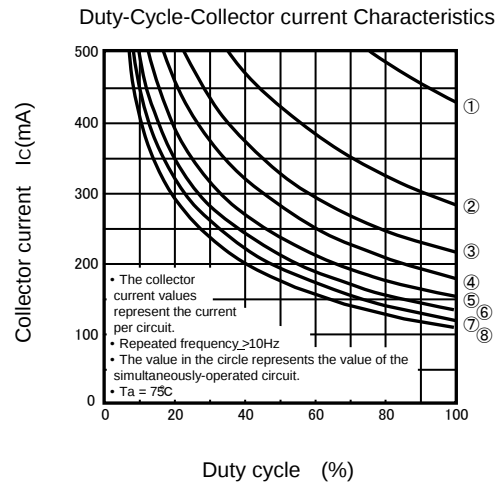
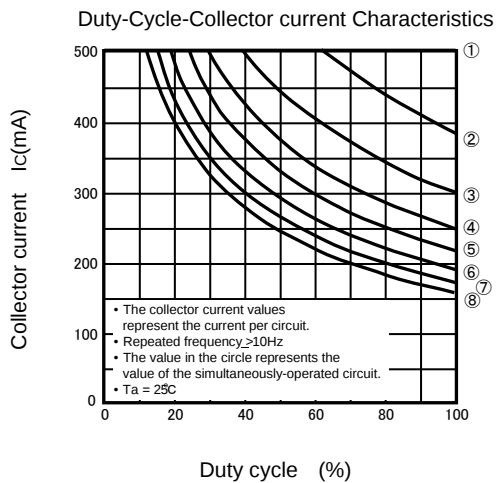
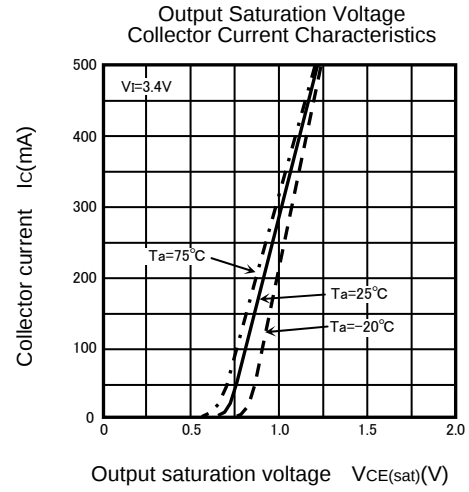
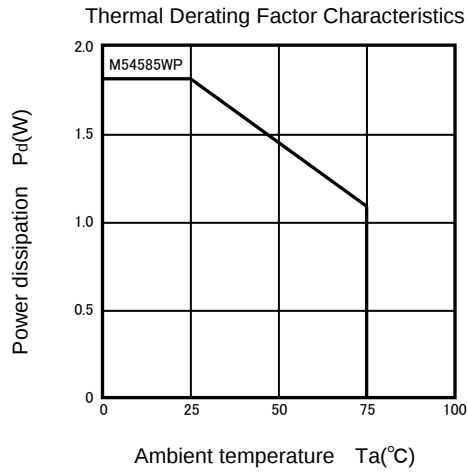
- (1) Pulse generator (PG) characteristics: $\text{PRR} = 1\text{kHz}$, $t_w = 10 \mu\text{s}$, $t_r = 6\text{ns}$, $t_f = 6\text{ns}$, $Z_o = 50 \Omega$, $V_i = 3.85\text{V}$
- (2) Input-output conditions: $R_L = 25 \Omega$, $V_o = 10\text{V}$
- (3) Electrostatic capacity C_L includes floating capacitance at connections and input capacitance at probes

TIMING DIAGRAM

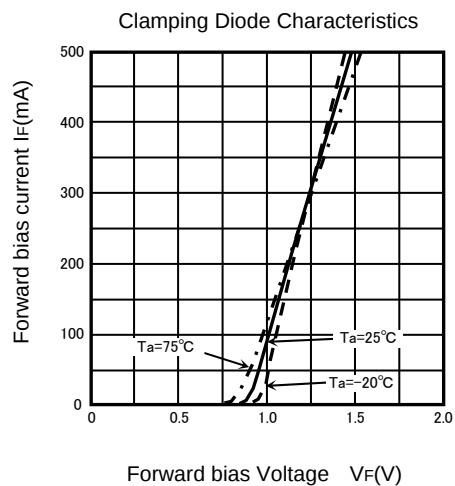
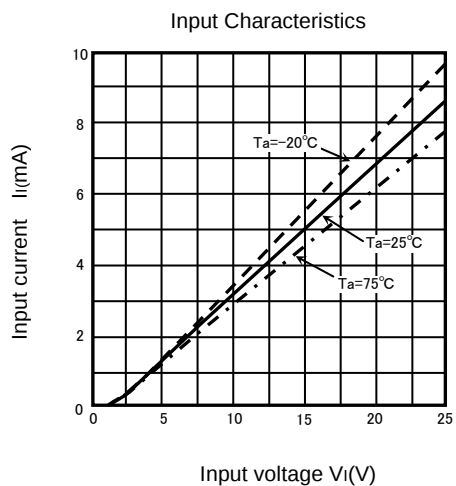


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TYPICAL CHARACTERISTICS



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PACKAGE OUTLINE

18P4X

Plastic 18pin 300mil DIP

