

DESCRIPTION

M54583WP is eight-circuit collector-current sink type 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
- With input clamping diodes

APPLICATIONS

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

FUNCTION

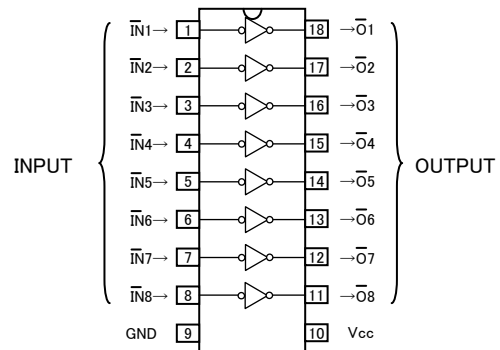
The M54583 is produced by adding PNP transistors to M54523 inputs. Eight circuits having active L-level inputs are provided.

Resistance of $7k\Omega$ and diode are provided in series between each input and PNP transistor base. The input diode is intended to prevent the flow of current from the input to the V_{CC} . Without this diode, the current flow from "H" input to the V_{CC} and the "L" input circuits is activated, in such case where one of the inputs of the 8 circuits is "H" and the others are "L" to save power consumption. The diode is inserted to prevent such misoperation.

This device is most suitable for a driver using NMOS IC output especially for the driver of current sink.

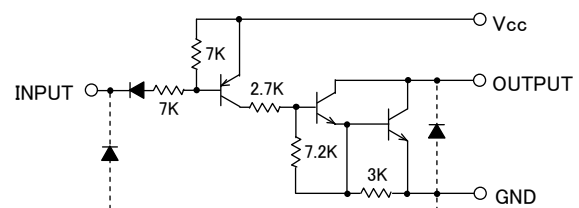
Collector current is 400mA maximum. Collector-emitter supply voltage is 50V.

PIN CONFIGURATION



Package type 18P4X

CIRCUIT DIAGRAM



The eight circuits share the V_{CC} 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_{CC}	Supply voltage		10	V
V_{CEO}	Collector-emitter voltage	Output, H	$-0.5 \sim +50$	V
V_i	Input voltage		$-0.5 \sim V_{CC}$	V
I_C	Collector current	Current per circuit output, L	400	mA
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		$-55 \sim +125$	$^\circ C$

8-UNIT 400mA DARLIGNON TRANSISTOR ARRAY

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

Symbol	Parameter		Limits			Unit
			min	typ	max	
V _{CC}	Supply voltage		4	5	8	V
I _C	Collector current (Current per 1 circuit when 8 circuits are coming on simultaneously)	Duty Cycle no more than 10%	0	—	350	mA
		Duty Cycle no more than 34%	0	—	200	
V _{IH}	“H” input voltage		V _{CC} -0.7	—	V _{CC}	V
V _{IL}	“L” input voltage		0	—	V _{CC} -3.6	V

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

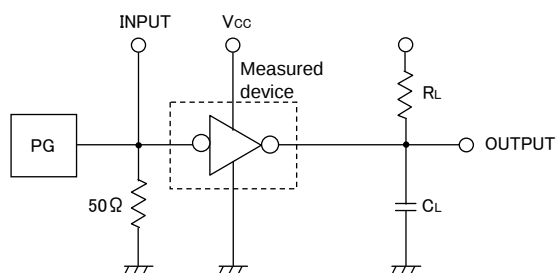
Symbol	Parameter	Test conditions	Limits			Unit
			min	typ*	max	
$V_{(BR)CEO}$	Collector-emitter breakdown voltage	$V_S = 50V, V_I = 0.2V$	50	—	—	V
$V_{CE(sat)}$	Collector-emitter saturation voltage	$V_I = V_{CC} - 3.6V$	—	1.2	2.2	V
		$I_C = 350mA$		0.98	1.6	
I_i	Input current	$V_I = V_{CC} - 3.6V$	—	—320	—600	μA
I_{CC}	Supply current (one circuit coming on)	$V_{CC} = 5V, V_I = V_{CC} - 3.6V$	—	1.9	3.0	mA
h_{FE}	DC amplification factor	$V_{CE} = 4V, V_{CC} = 5V, I_C = 350mA, T_a = 25^\circ\text{C}$	2000	3500	—	—

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

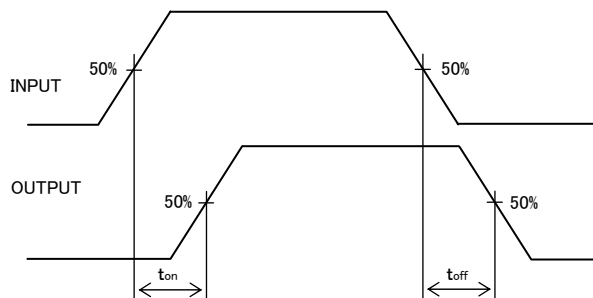
Symbol	Parameter	Test conditions	Limits			Unit
			min	typ	max	
t_{on}	Turn-on time	$C_L = 15pF$ (note 1)	—	130	—	ns
t_{off}	Turn-off time		—	3200	—	ns

NOTE 1 TEST CIRCUIT

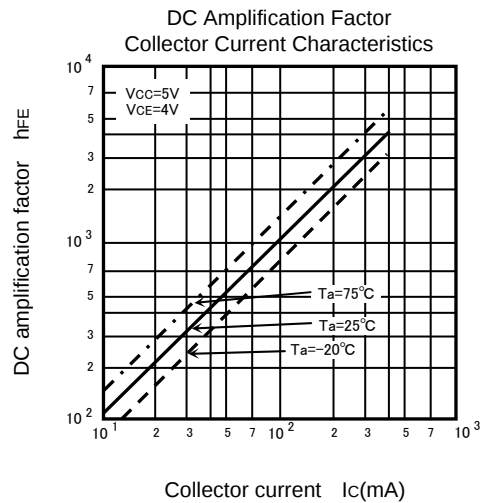
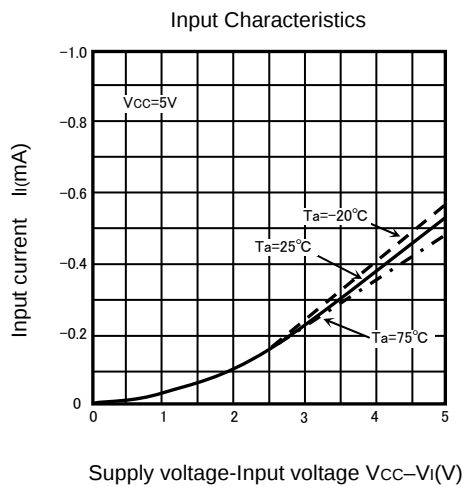
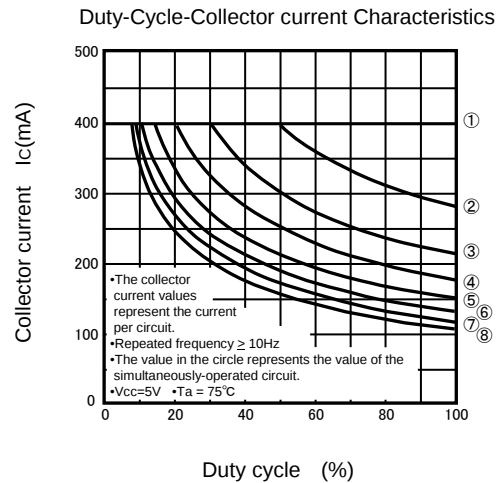
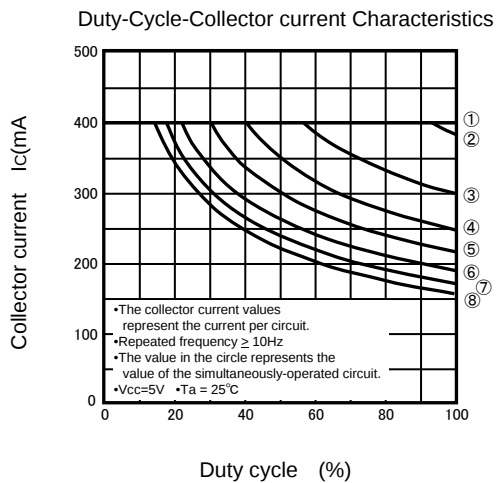
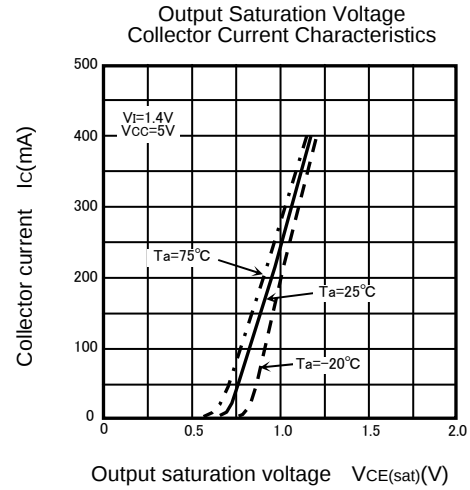
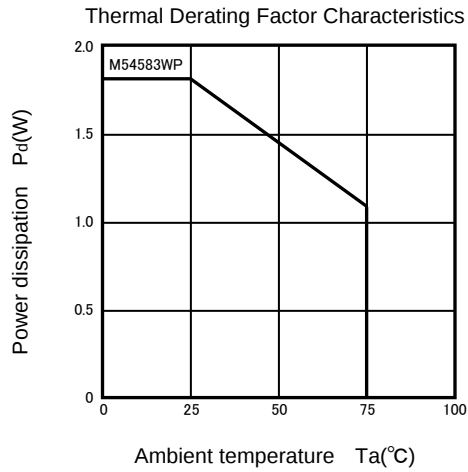


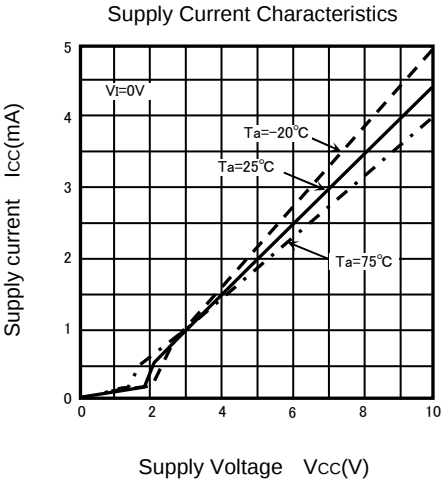
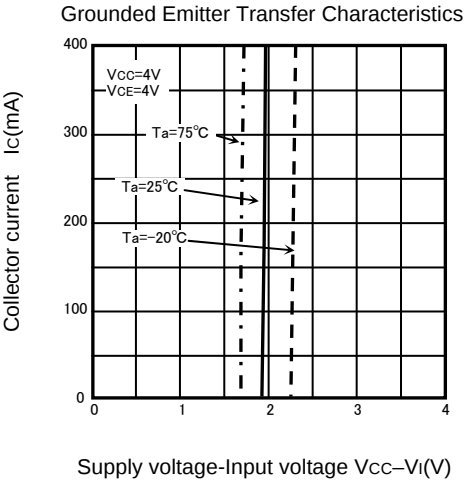
- (1) Pulse generator (PG) characteristics: PRR = 1kHz, $t_w = 10 \mu s$, $t_r = 6ns$, $t_f = 6ns$, $Z_o = 50 \Omega$, $V_i = 0.4$ to $4V$
- (2) Input-output conditions : $R_L = 30 \Omega$, $V_o = 10V$, $V_{CC} = 4V$
- (3) Electrostatic capacity C_L includes floating capacitance at connections and input capacitance at probes

TIMING DIAGRAM



TYPICAL CHARACTERISTICS





M54583WP

8-UNIT 400mA DARLIGNON TRANSISTOR ARRAY

PACKAGE OUTLINE

18P4X

Plastic 18pin 300mil DIP

