

# M54583WP

## 8-UNIT 400mA DARLIGNON TRANSISTOR ARRAY

### 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

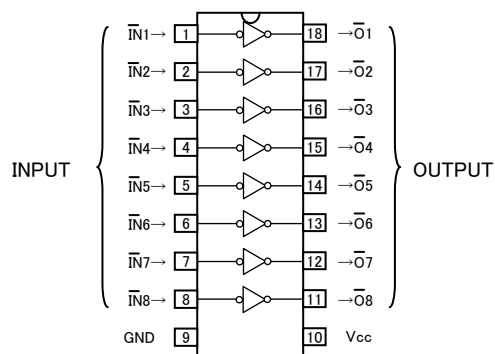
The M54583 is produced by adding PNP transistors to M54523 inputs. Eight circuits having active L-level inputs are provided.

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.

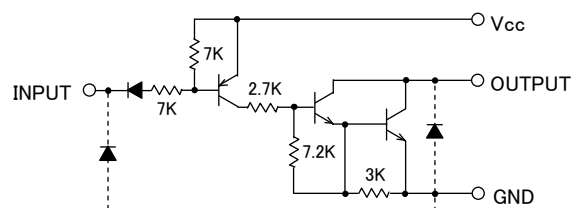
Collector current is 400mA maximum. Collector-emitter supply voltage is 50V.

### 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:  $\Omega$

### 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 ~ + 50	V
$V_i$	Input voltage		- 0.5 ~ $V_{CC}$	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 ~ + 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		
Vcc	Supply voltage	4	5	8	V	
Ic	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	
VIH	“H” input voltage	Vcc-0.7	—	Vcc	V	
VIL	“L” input voltage	0	—	Vcc-3.6	V	

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

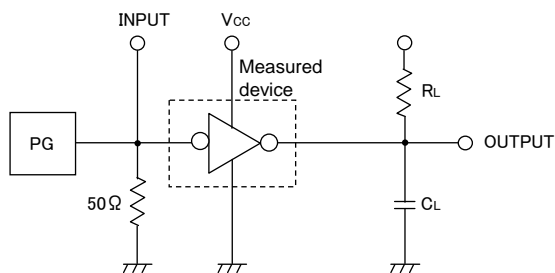
Symbol	Parameter	Test conditions	Limits			Unit	
			min	typ*	max		
V(BR)CEO	Collector-emitter breakdown voltage	Vs = 50V, VI = 0.2V	50	—	—	V	
VCE(sat)	Collector-emitter saturation voltage	VI = Vcc - 3.6V	Ic = 350mA	—	1.2	2.2	V
			Ic = 200mA	—	0.98	1.6	
Ii	Input current	VI = Vcc - 3.6V	—	-320	-600	μA	
ICC	Supply current (one circuit coming on)	Vcc = 5V, VI = Vcc - 3.6V	—	1.9	3.0	mA	
hFE	DC amplification factor	VCE = 4V, Vcc = 5V, Ic = 350mA, Ta = 25°C	2000	3500	—	—	

\*: 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)

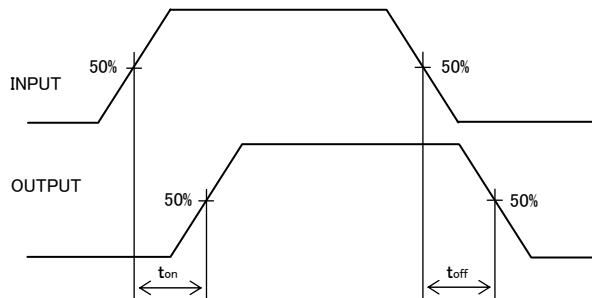
Symbol	Parameter	Test conditions	Limits			Unit
			min	typ	max	
ton	Turn-on time	CL = 15pF (note 1)	—	130	—	ns
toff	Turn-off time		—	3200	—	ns

**NOTE 1 TEST CIRCUIT**

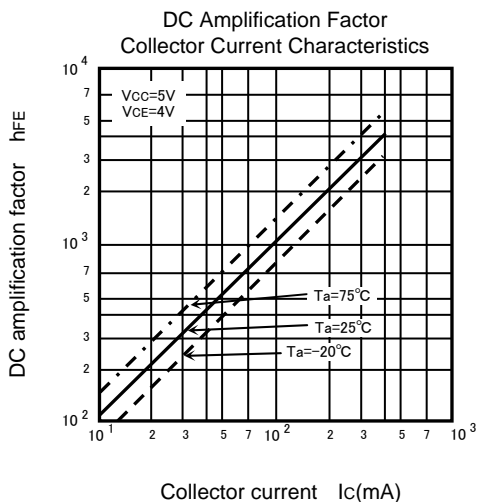
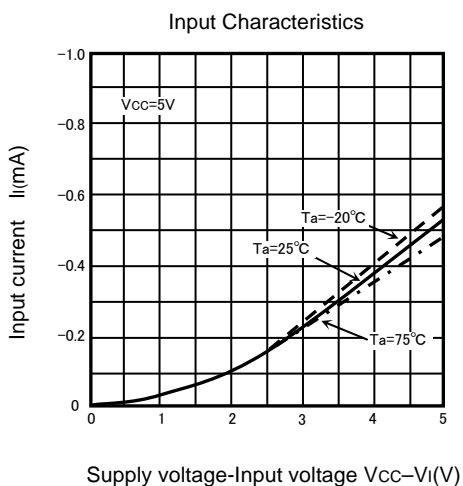
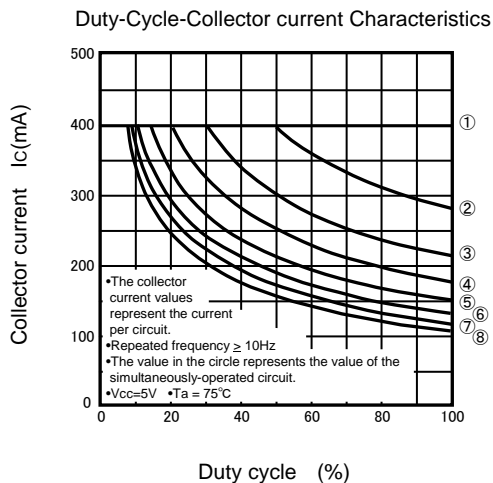
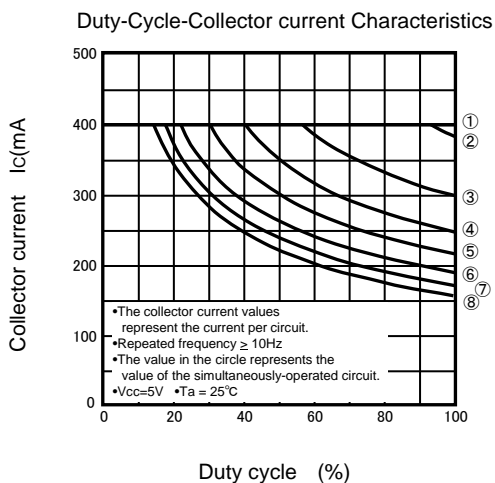
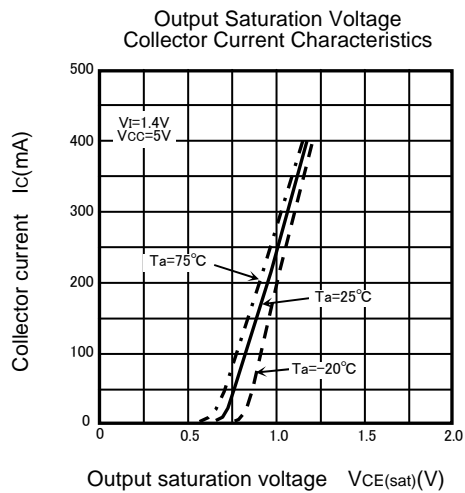
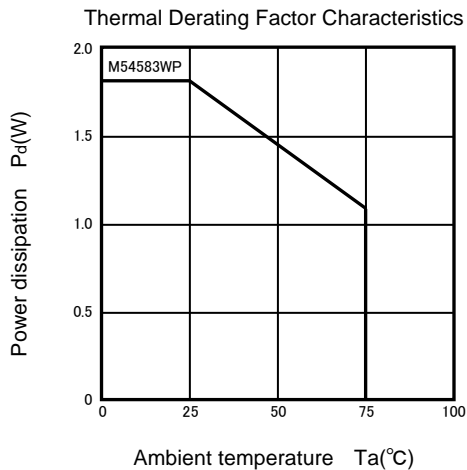


- (1) Pulse generator (PG) characteristics: PRR = 1kHz, tw = 10 μs, tr = 6ns, tf = 6ns, Zo = 50Ω, VI = 0.4 to 4V
- (2) Input-output conditions : RL = 30Ω, Vo = 10V, Vcc = 4V
- (3) Electrostatic capacity CL includes floating capacitance at connections and input capacitance at probes

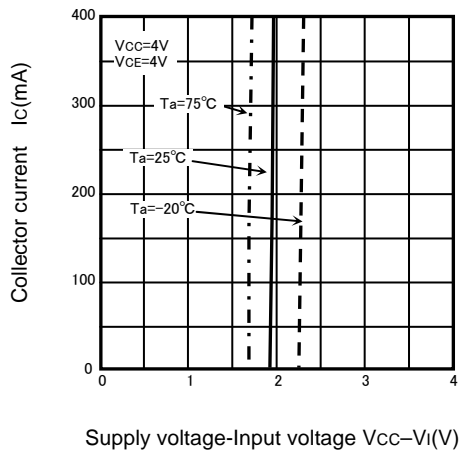
**TIMING DIAGRAM**



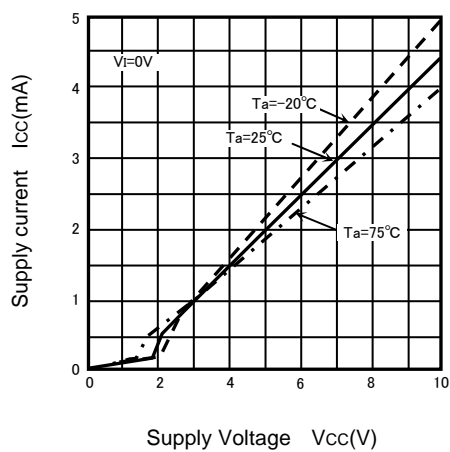
TYPICAL CHARACTERISTICS



Grounded Emitter Transfer Characteristics



Supply Current Characteristics



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PACKAGE OUTLINE

18P4X

Plastic 18pin 300mil DIP

