

# M54562WP

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

## DESCRIPTION

M54562WP is an eight-circuit output-sourcing darlington transistor array. The circuits are made of PNP and NPN transistors. This semiconductor integrated circuit performs high current driving with extremely low input-current supply.

## FEATURES

- High breakdown voltage ( $BV_{CEO} \geq 50V$ )
- High-current driving ( $I_o(max) = -500mA$ )
- With clamping diodes
- Driving available with PMOS IC output of 6 ~ 16V or with TTL output
- Output current-sourcing type

## APPLICATIONS

Drives of relays, printers, LEDs, fluorescent display tubes and lamps, and interfaces between MOS-bipolar logic systems and relays, solenoids, or small motors

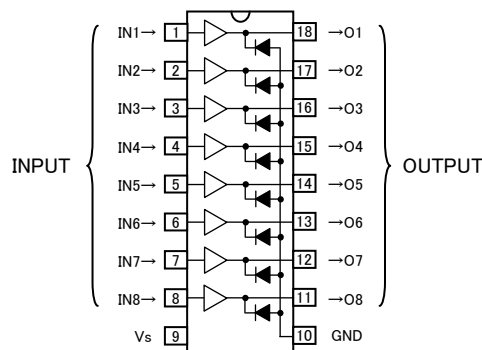
## FUNCTION

The M54562WP each have eight circuits, which are made of input inverters and current-sourcing outputs.

The outputs are made of PNP transistors and NPN Darlington transistors. The PNP transistor base current is constant. A clamping diode is provided between each output and GND.  $V_s$  and GND are used commonly among the eight circuits.

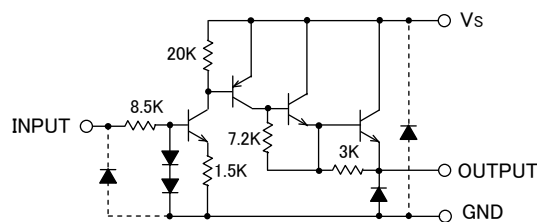
The inputs have resistance of  $8.5k\Omega$ , and voltage of up to 30V is applicable. Output current is 500 mA maximum. Supply voltage  $V_s$  is 50V maximum.

## PIN CONFIGURATION



Package type 18P4X

## CIRCUIT DIAGRAM



The eight circuits share the  $V_s$  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, L	-0.5 ~ +50	V
$V_s$		Supply voltage		50	V
$V_i$		Input voltage		-0.5 ~ +30	V
$I_o$		Output current	Current per circuit output, H	- 500	mA
$I_F$		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	$^\circ C$

# : Unused Input pins must be connected to GND.

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

Symbol	Parameter	Limits			Unit	
		min	typ	max		
$V_s$	Supply voltage	0	—	50	V	
$I_o$	Output current (Current per 1 circuit when 8 circuits are coming on simultaneously)	Duty Cycle no more than 8%	0	—	-350	mA
		Duty Cycle no more than 55%	0	—	-100	
$V_{IH}$	"H" input voltage	2.4	—	30	V	
$V_{IL}$	"L" input voltage	0	—	0.2	V	

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

Symbol	Parameter	Test conditions	Limits			Unit	
			min	typ*	max		
$I_{S(leak)}$ #	Supply leak current	$V_s = 50V, V_i = 0.2V$	—	—	100	$\mu A$	
$V_{CE(sat)}$	Collector-emitter saturation voltage	$V_s = 10V, V_i = 2.4V$	$I_o = -350mA$	—	1.75	2.4	V
			$I_o = -100mA$	—	1.5	2.0	
$I_i$	Input current	$V_i = 5V$	—	0.48	0.75	mA	
		$V_i = 25V$	—	2.8	4.7		
$I_s$	Supply current	$V_s = 50V, V_i = 5V(\text{all input})$	—	5.6	15.0	mA	
$V_F$	Clamping diode forward voltage	$I_F = -350mA$	—	-1.2	-2.4	V	
$I_R$ #	Clamping diode reverse current	$V_R = 50V$	—	—	100	$\mu A$	

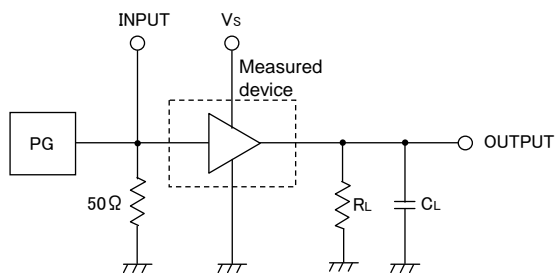
\*: The typical values are those measured under ambient temperature ( $T_a$ ) of  $25^\circ\text{C}$ . There is no guarantee that these values are obtained under any conditions.

# : Unused Input pins must be connected to GND.

**SWITCHING CHARACTERISTICS** (Unless otherwise noted,  $T_a = 25^\circ\text{C}$ )

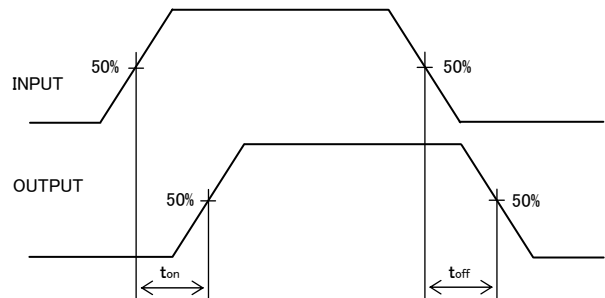
Symbol	Parameter	Test conditions	Limits			Unit
			min	typ	max	
$t_{on}$	Turn-on time	$C_L = 15pF$ (note 1)	—	110	—	ns
$t_{off}$	Turn-off time		—	5200	—	ns

**NOTE 1 TEST CIRCUIT**

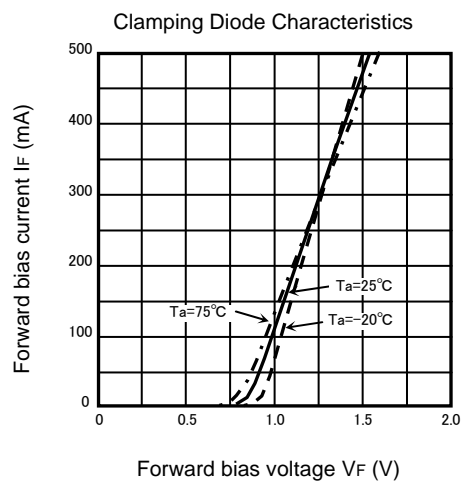
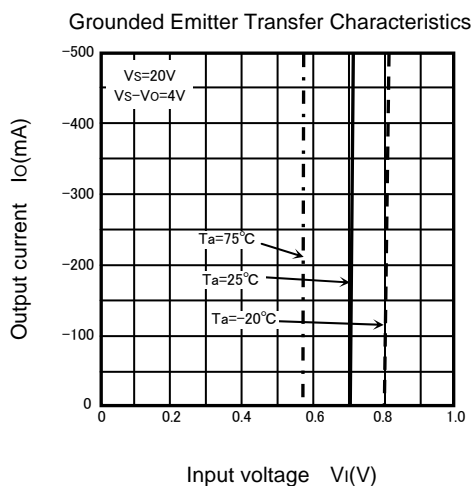
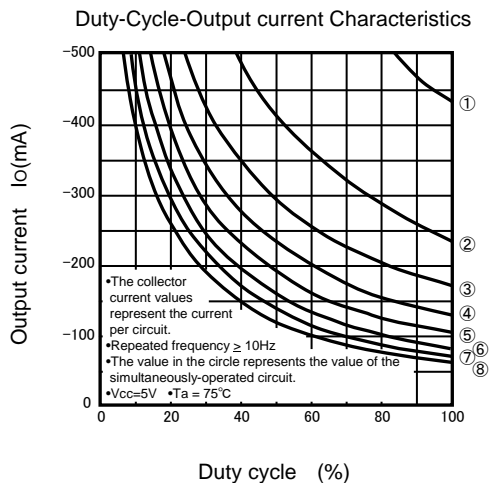
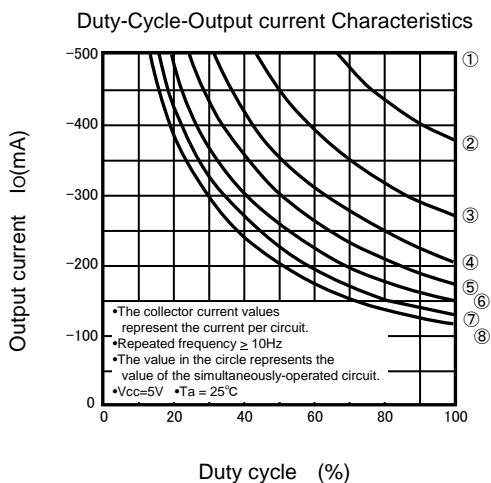
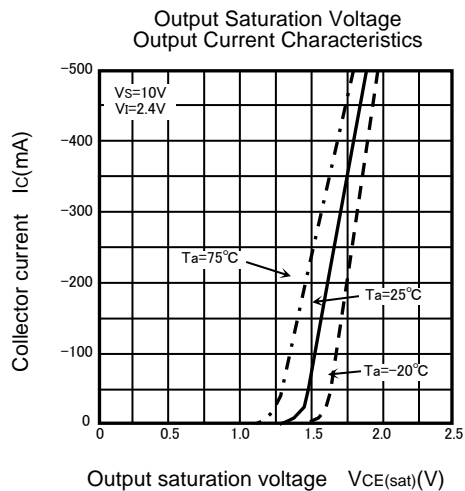
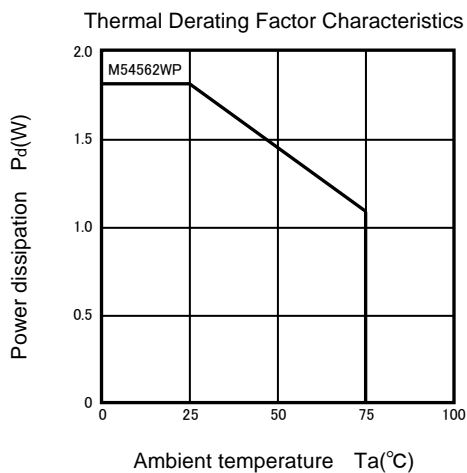


- (1) Pulse generator (PG) characteristics: PRR = 1kHz,  $t_w = 10ms, t_r = 6ns, t_f = 6ns, Z_o = 50\Omega, V_i = 0$  to 2.4V
- (2) Input-output conditions :  $R_L = 30\Omega, V_s = 10V$
- (3) Electrostatic capacity  $C_L$  includes floating capacitance at connections and input capacitance at probes

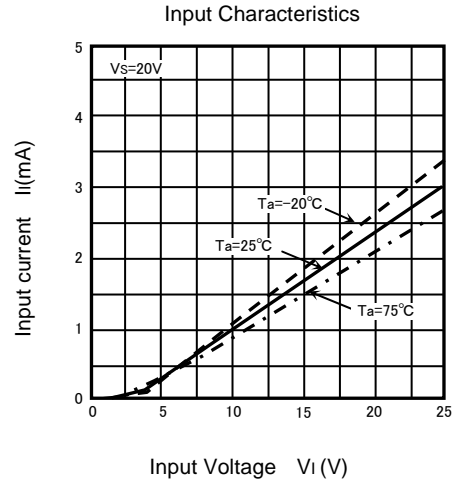
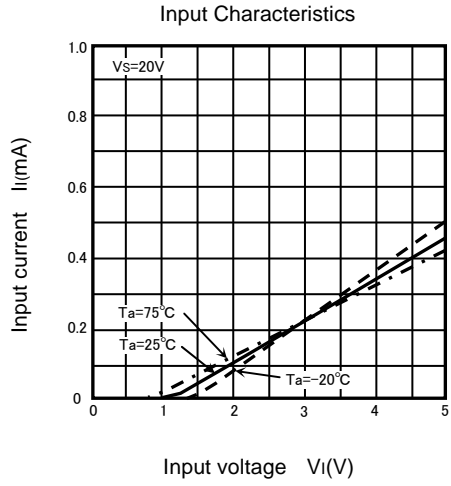
**TIMING DIAGRAM**



TYPICAL CHARACTERISTICS



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PACKAGE OUTLINE

18P4X

Plastic 18pin 300mil DIP

