

<TRANSISTOR ARRAY>

M54562FP

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

DESCRIPTION

M54562FP 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.

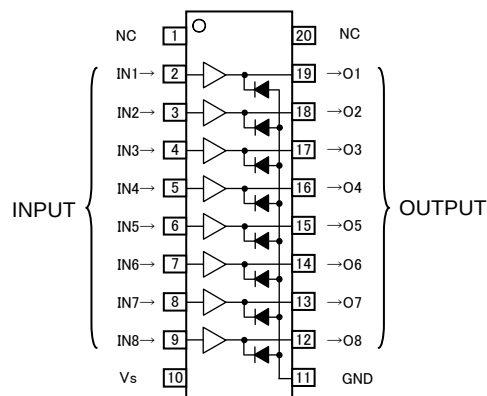
FUNCTION

The M54562FP 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. VS and GND are used commonly among the eight circuits.

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

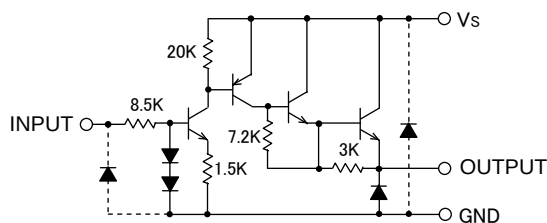
PIN CONFIGURATION



Package type 20P2N-A

NC : No connection

CIRCUIT DIAGRAM



The eight circuits share the VS 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 , 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	1.10	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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M54562FP**8-UNIT 500mA DARLINGTON TRANSISTOR ARRAY WITH CLAMP DIODE
SOURCE TYPE****RECOMMENDED OPERATING** (Unless otherwise noted, $T_a = -20 \sim +75^\circ\text{C}$)

Symbol	Parameter		Limits			Unit
			min	typ	max	
Vs	Supply voltage		0	—	50	V
Io	Output current (Current per 1 circuit when 8 circuits are coming on simultaneously)	Duty Cycle no more than 5%	0	—	−350	mA
		Duty Cycle no more than 30%	0	—	−100	
VIH	“H” input voltage		2.4	5.0	30	V
VIL	“L” input voltage		0	—	0.2	V

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

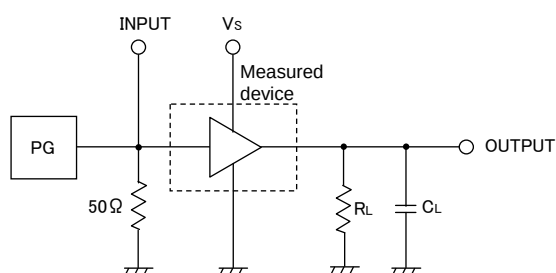
Symbol	Parameter	Test conditions	Limits			Unit
			min	typ*	max	
$I_{s(\text{leak})}$ #	Supply leak current	$V_s = 50\text{V}$, $V_i = 0.2\text{V}$	—	—	100	μA
$V_{CE(\text{sat})}$	Collector-emitter saturation voltage	$V_s = 10\text{V}$, $V_i = 2.4\text{V}$, $I_o = -350\text{mA}$	—	1.75	2.4	V
		$V_s =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

* : 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.

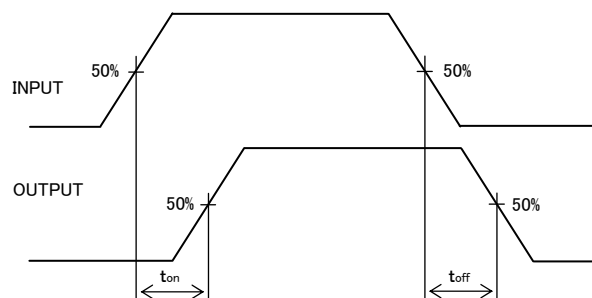
: Unused Input pins must be connected to GND.

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	$C_L = 15\text{pF}$ (note 1)	—	110	—	ns
t_{off}	Turn-off time		—	5200	—	ns

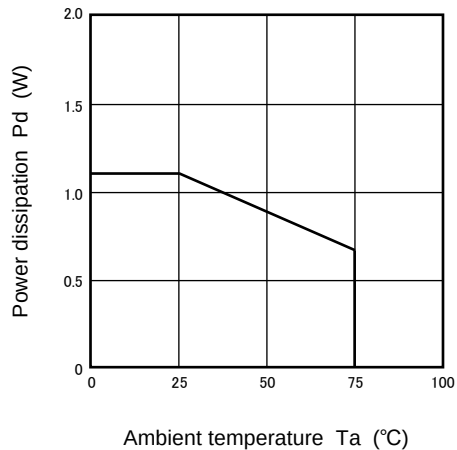
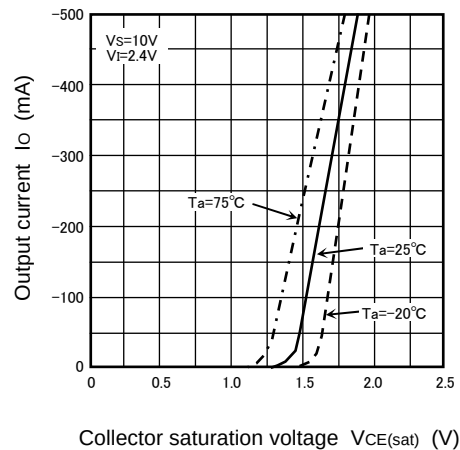
NOTE 1 TEST CIRCUIT

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

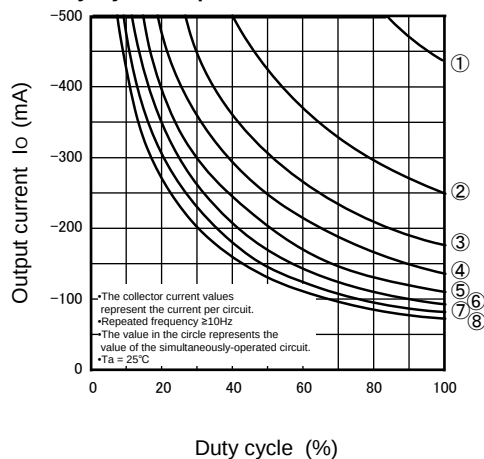
TIMING DIAGRAM

TYPICAL CHARACTERISTICS

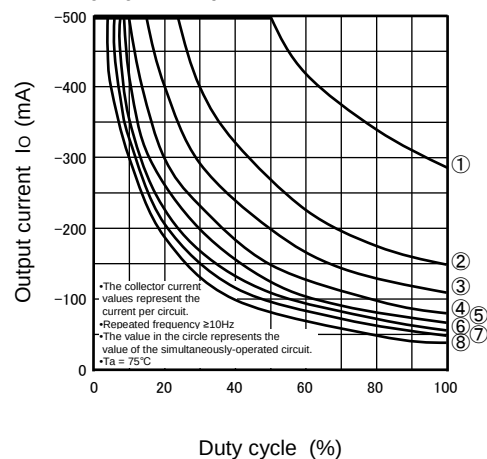
Thermal Derating Factor Characteristics

Output Saturation Voltage
Collector Current Characteristics

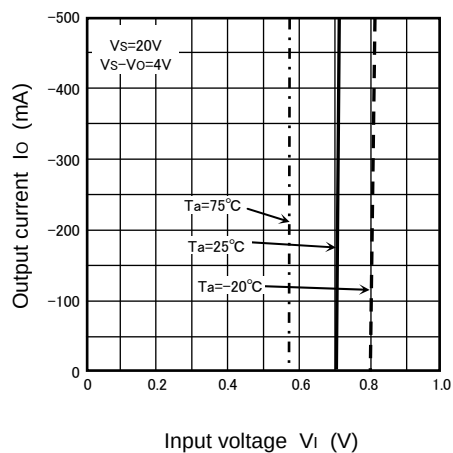
Duty-Cycle-Output current Characteristics



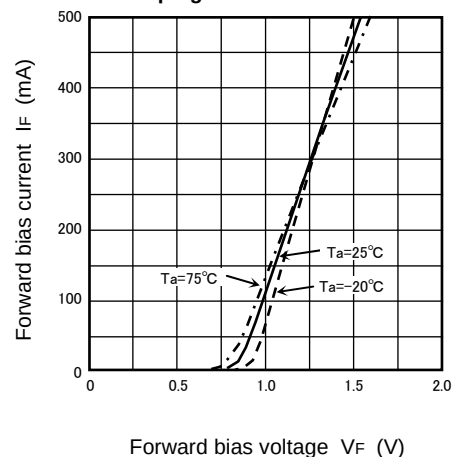
Duty-Cycle-Output current Characteristics

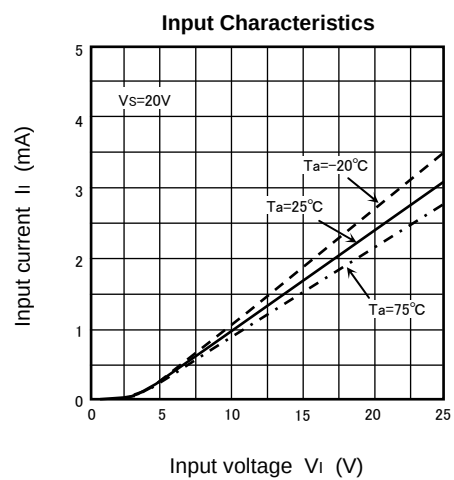
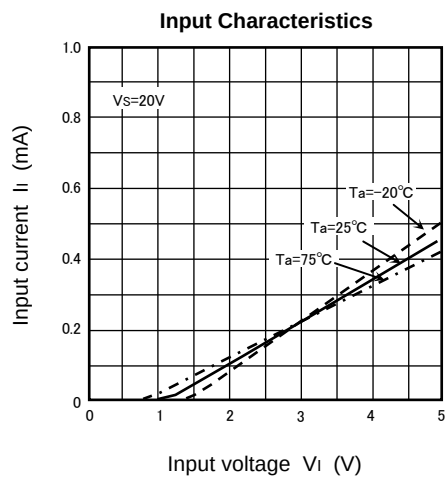


Grounded Emitter Transfer Characteristics



Clamping Diode Characteristics





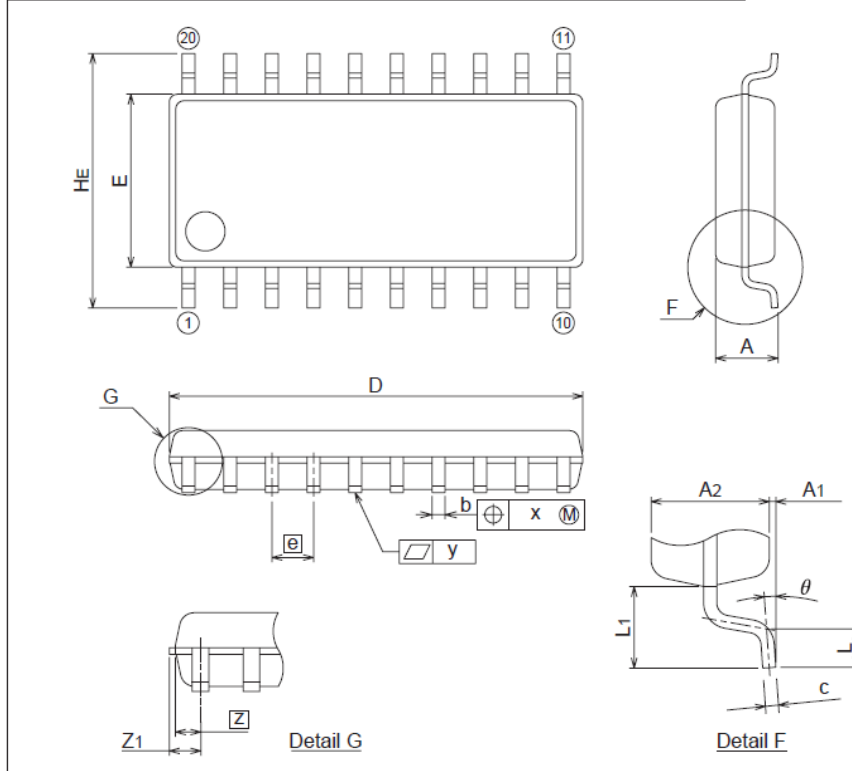
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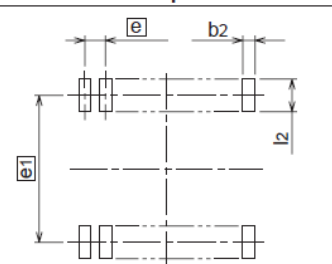
PACKAGE OUTLINE

20P2N-A

JEITA Package Code	JEDEC Code	Weight(g)	Lead Material
P-SOP20-5.3x12.6-1.27	—	0.26	Cu Alloy



Plastic 20pin 300mil SOP



Recommended Mount Pad

Symbol	Dimension in Millimeters		
	Min	Nom	Max
A	—	—	2.1
A1	0	0.1	0.2
A2	—	1.8	—
b	0.35	0.4	0.5
c	0.18	0.2	0.25
D	12.5	12.6	12.7
E	5.2	5.3	5.4
e	—	1.27	—
HE	7.5	7.8	8.1
L	0.4	0.6	0.8
L1	—	1.25	—
Z	—	0.585	—
Z1	—	—	0.735
x	—	—	0.25
y	—	—	0.1
θ	0°	—	8°
b2	—	0.76	—
e1	—	7.62	—
l2	1.27	—	—

Keep safety first in your circuit designs!

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