

8-UNIT 400mA DARLINGTON TRANSISTOR ARRAY WITH CLAMP DIODE**DESCRIPTION**

The M54522P, 8-channel sink driver, consists of 16 NPN transistors connected to form eight high current gain driver pairs.

FEATURES

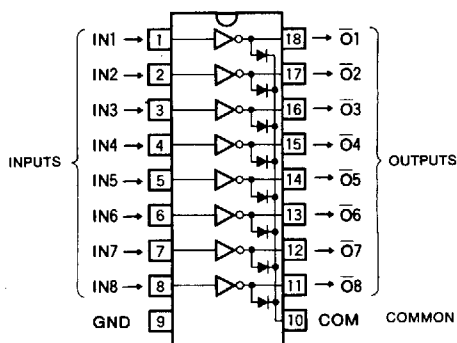
- High output sustaining voltage to 40V
- High output sink current to 400mA
- Integral diodes for transient suppression
- PMOS Compatible input
- Wide operating temperature range ($T_a = -20 \sim +75^\circ\text{C}$)

APPLICATION

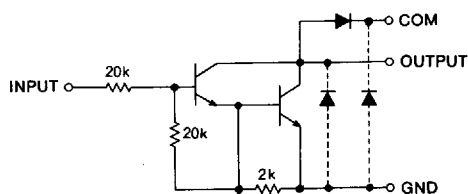
Relay and printer driver, LED or incandescent display digit driver, interfacing between MOS/BIPOLAR logics and high power loads

FUNCTION

The M54522P is comprised of eight NPN darlington driver pairs with $20\text{k}\Omega$ series input resistors. Each output has an integral diode for inductive load transient suppression. The cathodes of the diodes are connected together to pin 10. All emitters and the substrate are connected to pin 9. The output are capable of sinking 400mA and will withstand 40V in the OFF state.

PIN CONFIGURATION (TOP VIEW)

Outline 18P4

CIRCUIT SCHEMATIC

The diodes shown by broken line are parasite diodes and must not be used

Unit : Ω **ABSOLUTE MAXIMUM RATINGS** ($T_a = -20 \sim +75^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CEO}	Output sustaining voltage	Transistor OFF	$-0.5 \sim +40$	V
I_C	Collector current per channel	Transistor ON	400	mA
V_i	Input voltage		$-0.5 \sim +40$	V
I_F	Clamp diode forward current		400	mA
V_R	Clamp diode reverse voltage		$-0.5 \sim +40$	V
P_d	Power dissipation	$T_a = 25^\circ\text{C}$	1.79	W
T_{opr}	Operating temperature		$-20 \sim +75$	$^\circ\text{C}$
T_{stg}	Storage temperature		$-55 \sim +125$	$^\circ\text{C}$

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

Symbol	Parameter		Limits			Unit
			Min	Typ	Max	
V_O	Output voltage		0		40	V
I_C	Collector current per channel	Percent duty cycle less than 7%	0		400	mA
		Percent duty cycle less than 30%	0		200	
V_{IH}	"H" Input voltage	$I_C = 400\text{mA}$	8		30	V
		$I_C = 200\text{mA}$	4		30	
V_{IL}	"L" Input voltage	$I_{\text{leak}} = 50\mu\text{A}$	0		0.5	V

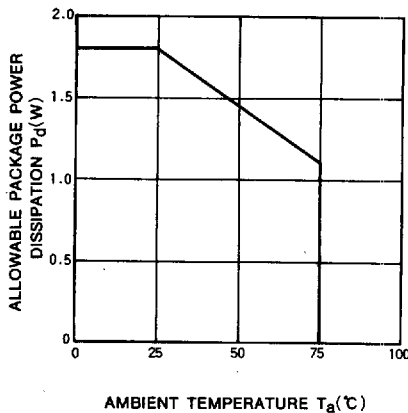
ELECTRICAL CHARACTERISTICS ($T_a = -20 \sim +75^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ*	Max	
$V_{(BR)CEO}$	Output sustaining voltage	$I_{CEO} = 100\mu\text{A}$	40			V
$V_{CE(sat)}$	Output saturation voltage	$V_I = 8\text{V}, I_C = 400\text{mA}$		1.15	2.4	V
		$V_I = 4\text{V}, I_C = 200\text{mA}$		0.94	1.6	
I_I	Input current	$V_I = 17\text{V}$	0.3	0.9	1.8	mA
V_F	Clamp diode forward voltage	$I_F = 400\text{mA}$		1.5	2.4	V
V_R	Clamp diode reverse voltage	$I_R = 100\mu\text{A}$	40			V
β_{FE}	DC forward current gain	$V_{CE} = 4\text{V}, I_C = 300\text{mA}, T_a = 25^\circ\text{C}$	1000	8000		—

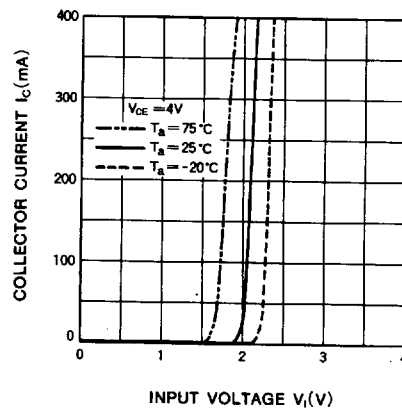
* : Typical values are at $T_a = 25^\circ\text{C}$.

TYPICAL CHARACTERISTICS

ALLOWABLE AVERAGE POWER DISSIPATION

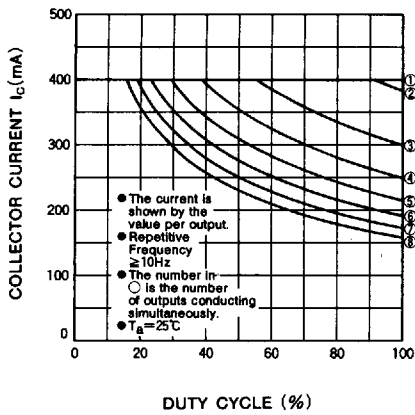


OUTPUT CURRENT CHARACTERISTICS

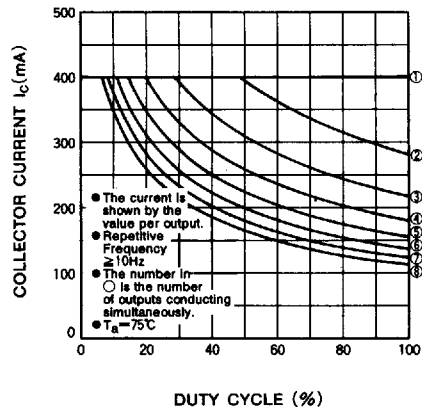


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ALLOWABLE COLLECTOR CURRENT AS A FUNCTION OF DUTY CYCLE



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DC CURRENT GAIN CHARACTERISTICS

