

7-UNIT 400mA DARLINGTON TRANSISTOR ARRAY WITH CLAMP DIODE  
 6249826 MITSUBISHI ELEK (LINEAR) 80C 09272 D7-43-25

**DESCRIPTION**

The M54531P, 7-channel sink driver, consists of 14 NPN transistors connected to form 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 input voltage range from -40V to +40V
- Wide operating temperature range ( $T_a = -20 \sim +75^\circ\text{C}$ )

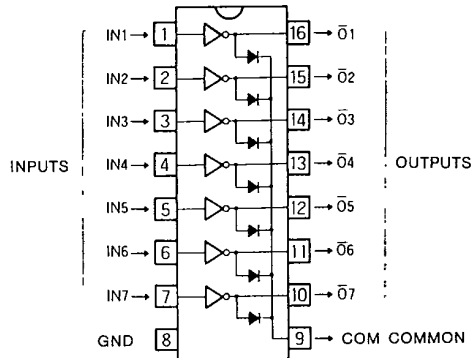
**APPLICATION**

Relay and printer driver, LED and incandescent display digit driver, interfacing for standard MOS/BIPOLAR logics

**FUNCTION**

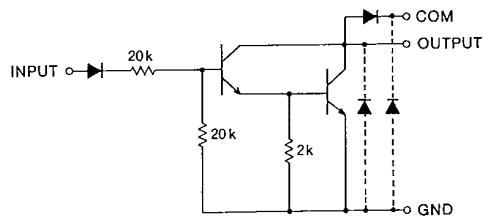
The M54531P is comprised of seven NPN darlington driver pairs. Each input has a diode and 20kΩ resistor in series to allow a negative voltage input. Between pin 9 and each output, there are integral diodes for inductive load transient suppression. All emitters and the substrate are connected together to pin 8. The outputs are capable of sinking 400mA and will withstand 40V in the OFF state.

**PIN CONFIGURATION (TOP VIEW)**

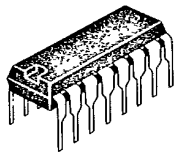


Outline 16P4

**CIRCUIT SCHEMATIC**



Unit : Ω



16-pin molded plastic DIP

**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 ~ +40	V
$I_C$	Collector current	Transistor ON	400	mA
$V_i$	Input voltage		-40 ~ +40	V
$I_{F(D)}$	Clamp diode forward current		400	mA
$V_{R(D)}$	Clamp diode reverse voltage		40	V
$P_d$	Power dissipation	$T_a = 25^\circ\text{C}$	1.47	W
$T_{opr}$	Operating ambient temperature range		-20 ~ +75	$^\circ\text{C}$
$T_{stg}$	Storage temperature range		-55 ~ +125	$^\circ\text{C}$

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RECOMMENDED OPERATIONAL CONDITIONS (T<sub>a</sub> = -20~+75°C, unless otherwise noted)

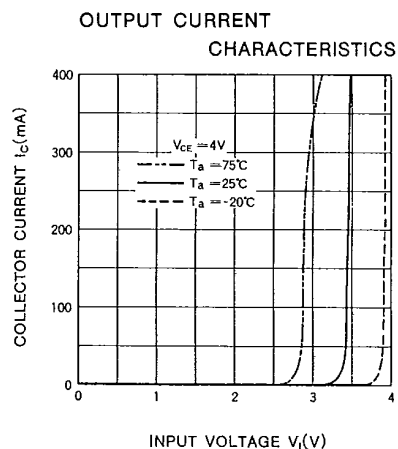
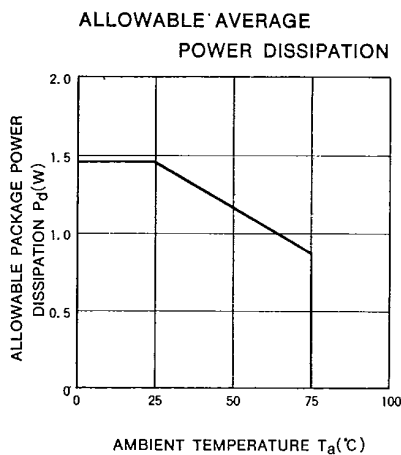
Symbol	Parameter	Limits			Unit
		Min	Typ	Max	
V <sub>O</sub>	Output voltage	0		40	V
I <sub>C</sub>	Collector current per channel	Percent duty cycle less than 8%	0	400	mA
		Percent duty cycle less than 30%	0	200	
V <sub>IH</sub>	"H" Input voltage	I <sub>C</sub> =400mA	9	35	V
		I <sub>C</sub> =200mA	6	35	
V <sub>IL</sub>	"L" Input voltage	I <sub>OL</sub> (leak)=50μA	0	1	V

ELECTRICAL CHARACTERISTICS (T<sub>a</sub> = -20~+75°C, unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ*	Max	
V <sub>(BR)CEO</sub>	Output sustaining voltage	I <sub>CEO</sub> =100μA	40			V
V <sub>CE(sat)</sub>	Output saturation voltage	V <sub>I</sub> =9V, I <sub>C</sub> =400mA		1.3	2.4	V
		V <sub>I</sub> =6V, I <sub>C</sub> =200mA		1	1.6	
I <sub>I</sub>	Input current	V <sub>I</sub> =18V		0.85	1.8	mA
		V <sub>I</sub> =35V		2.0	3.8	
I <sub>R</sub>	Input leakage current	V <sub>I</sub> =-35V			-20	μA
V <sub>F(D)</sub>	Clamp diode forward voltage	I <sub>F(D)</sub> =400mA		1.5	2.4	V
V <sub>R(D)</sub>	Clamp diode reverse voltage	I <sub>R(D)</sub> =100μA	40			V
h <sub>FE</sub>	DC forward current gain	V <sub>CE</sub> =4V, I <sub>C</sub> =300mA, T <sub>a</sub> =25°C	1000	3500		-

\* : All typical values are at T<sub>a</sub>=25°C.

TYPICAL CHARACTERISTICS



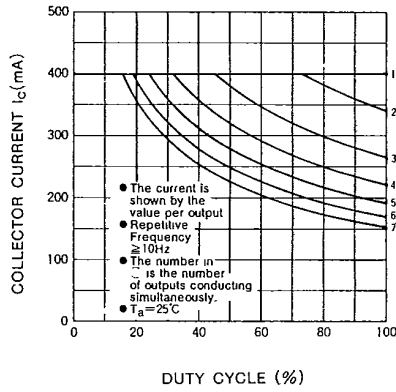
**M54531P**

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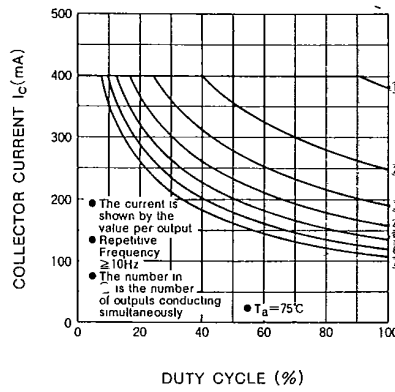
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ALLOWABLE COLLECTOR CURRENT AS A FUNCTION OF DUTY CYCLE



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DC CURRENT GAIN CHARACTERISTICS

