

MITSUBISHI (DGTL LOGIC)

**M54528P**

**7-UNIT 150mA DARLINGTON TRANSISTOR ARRAY WITH CLAMP DIODE**

**DESCRIPTION**

The M54528P, 7-channel sink driver, consists of 14 NPN transistors connected to form high current gain driver pairs.

**FEATURES**

- High output sustaining voltage to 40V
- Output sink current to 150mA
- Efficient I/O pin layout
- PMOS compatible input
- Integral diodes for transient suppression
- Wide input voltage range from -40V to +40V
- Wide operating temperature range ( $T_a = -20 \sim +75^\circ\text{C}$ )

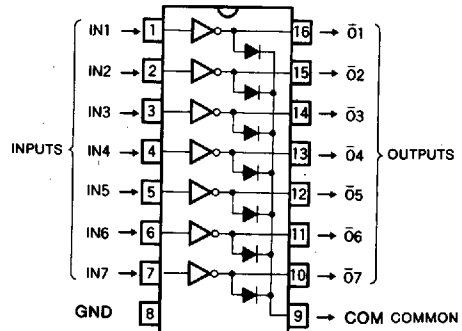
**APPLICATION**

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

**FUNCTION**

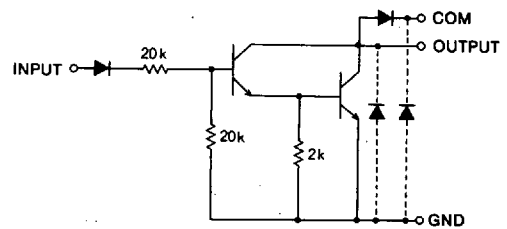
The M54528P is comprised of seven darlington driver pairs. Each input has a diode and 20kΩ resistor in series to allow a negative voltage input. Between pin 9 and each output, there are integral diodes for inductive load transient suppression. All emitters and the substrate are connected together to pin 8. The outputs are capable of sinking 150mA and will withstand 40V in the OFF state.

**PIN CONFIGURATION (TOP VIEW)**



Outline 16P4

**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 ~ +40	V
$I_C$	Collector current per channel	Transistor ON	150	mA
$V_I$	Input voltage		-40 ~ +40	V
$I_F$	Clamp diode forward current		150	mA
$V_R$	Clamp diode reverse voltage		-0.5 ~ +40	V
$P_d$	Power dissipation	$T_a = 25^\circ\text{C}$	1.47	W
$T_{opr}$	Operating temperature		-20 ~ +75	$^\circ\text{C}$
$T_{stg}$	Storage temperature		-55 ~ +125	$^\circ\text{C}$

**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	0		150	mA
		less than 40%				
$V_{IH}$	"H" Input voltage	$I_C = 150\text{mA}$	7		35	V
$V_{IL}$	"L" Input voltage	$I_{O(leak)} = 50\mu\text{A}$	0		1	V

7-UNIT 150mA DARLINGTON TRANSISTOR ARRAY WITH CLAMP DIODE

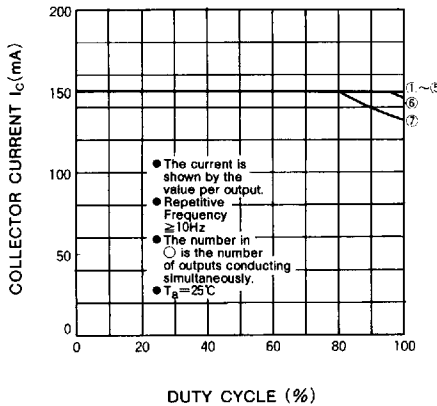
ELECTRICAL CHARACTERISTICS (T<sub>a</sub> = -20 ~ +75°C, unless otherwise noted)

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> = 7V, I <sub>C</sub> = 150mA		1.4	1.7	V
		V <sub>I</sub> = 7V, I <sub>C</sub> = 100mA		1.2	1.4	V
I <sub>I</sub>	Input current	V <sub>I</sub> = 18V		0.9	1.8	mA
		V <sub>I</sub> = 35V		1.9	5	mA
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>R(D)</sub> = 150mA		1.15	1.6	V
I <sub>R(D)</sub>	Clamp diode leakage current	V <sub>R(D)</sub> = 40V			100	μA
h <sub>FE</sub>	DC forward current gain	V <sub>CE</sub> = 4V, I <sub>C</sub> = 150mA, T <sub>a</sub> = 25°C	800	2500		—

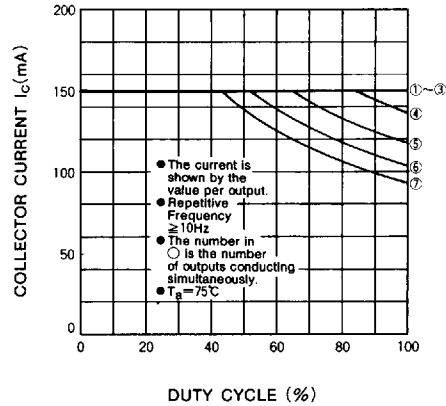
\* : Typical values are at T<sub>a</sub> = 25°C.

TYPICAL CHARACTERISTICS

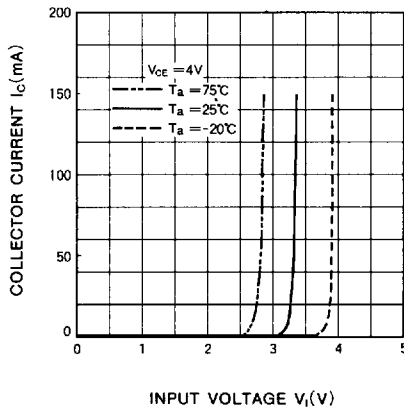
ALLOWABLE COLLECTOR CURRENT AS A FUNCTION OF DUTY CYCLE



ALLOWABLE COLLECTOR CURRENT AS A FUNCTION OF DUTY CYCLE



OUTPUT CURRENT CHARACTERISTICS



DC CURRENT GAIN CHARACTERISTICS

