

# M5248P/M5286P

## 4-UNIT 1.5A DARLINGTON CURRENT DRIVER

### DESCRIPTION

The M5248P/M5286P, 4-channel sink driver, consists of 4 PNP and 14 NPN transistors to form high current gain driver pairs.

### FEATURES

- High output sustaining voltage to 80V (M5248P)/60V (M5286P)
- High output current to 1.5A
- Integral diodes for transient suppression
- Micro Computer Compatible input.
- Wide operating temperature range ( $T_a = -40 \sim +85^\circ\text{C}$ )

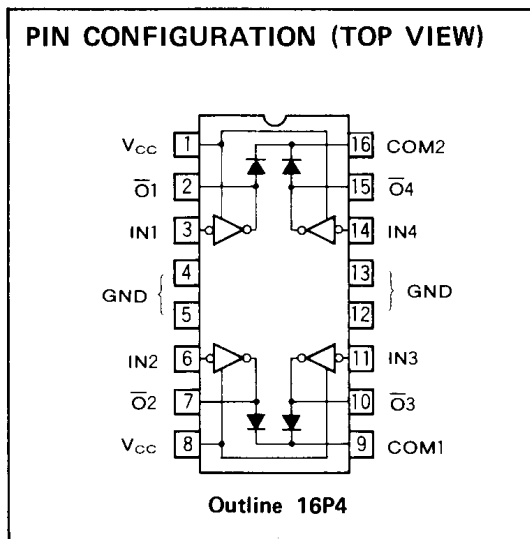
### APPLICATION

Relay and printer driver, LED or incandescent display digit driver

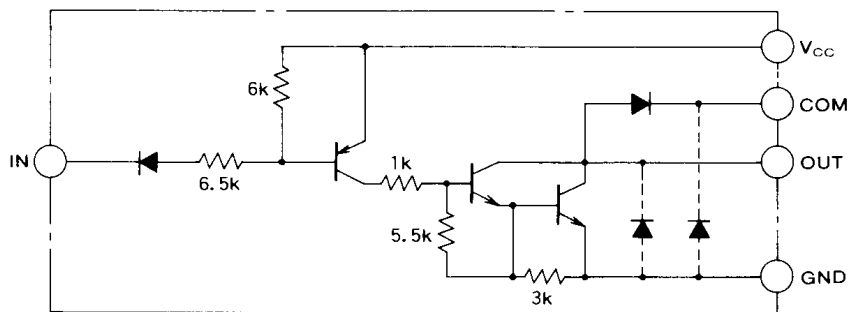
### FUNCTION

The M5248P/M5286P is comprised of four PNP invertors with  $6.5\text{k}\Omega$  series input resistors and NPN darlington sink drivers. Each output has an integral diode for inductive load suppression and the anodes of the diode connected to pins 9 and 16. The outputs are capable of sinking 1.5A and will withstand 80V (M5248P)/60V (M5286P) in the OFF state.

### PIN CONFIGURATION (TOP VIEW)



### CIRCUIT DIAGRAM



Unit:  $\Omega$

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**ABSOLUTE MAXIMUM RATINGS** ( $T_a = 25^\circ\text{C}$ , unless otherwise noted)

Symbol	Parameter	Conditions	Ratings	Unit
$V_{CC}$	Supply voltage		20	V
$V_{CE0}$	Output sustaining voltage	Transistor OFF	80 (M5248P) / 60 (M5286P)	V
$V_i$	Input voltage		20	V
$I_C$	Collector current	Transistor ON	1.5	A
$V_R$	Clamp diode reverse voltage		80	V
$I_F$	Clamp diode forward current		1.5	A
$P_d$	Power dissipation	GND with Cu foil (900mm, 35 $\mu$ m)	2.7	W
$T_{opr}$	Operating ambient temperature range		-40 ~ +85	$^\circ\text{C}$
$T_{stg}$	Storage temperature range		-55 ~ +125	$^\circ\text{C}$

**RECOMMENDED OPERATIONAL CONDITIONS** ( $T_a = -40 \sim +85^\circ\text{C}$  unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$V_C$	Supply voltage		4	5	6	V
$V_O$	Output voltage		0		70 (M5248P) / 50 (M5286P)	V
$I_C$	Collector current		0		1.25	A
$V_R$	Clamp diode reverse voltage		0		70 (M5248P) / 50 (M5286P)	V
$I_F$	Clamp diode forward current		0		1.25	A
$P_d$	Power dissipation		0		1.0	W

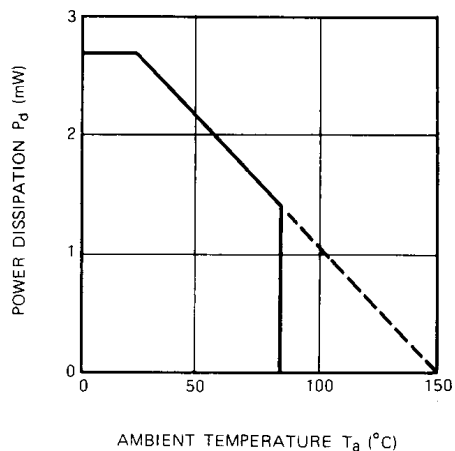
**ELECTRICAL CHARACTERISTICS** ( $T_a = -40 \sim +85^\circ\text{C}$  unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit	
			Min	Typ	Max		
$V_{(BR)CE0}$	Output sustaining voltage	$I_{CE0} = 100\mu\text{A}$	80 (M5248P) / 60 (M5286P)			V	
$I_{CCH}$	Supply current (OUTPUT "H")	$V_{CC} = 6\text{V}$ , $V_i = V_{CC}$			10.9	$\mu\text{A}$	
$I_{CCL}$	Supply current (OUTPUT "L")	$V_{CC} = 6\text{V}$ , $V_i = 0.5\text{V}$			9.0	mA	
$V_{CE(sat)}$	Output saturation voltage	$V = 4\text{V}$		$I_C = 1.25\text{A}$	1.4	1.8	V
		$V_i = 0.5\text{V}$		$I_C = 0.7\text{A}$	1.0	2.3	
$I_i$	Input current	$V_i = V_{CC} - 3.5\text{V}$				-0.6	mA
		$V_i = V_{CC} - 6\text{V}$				-1.2	
$I_{O(leak)}$	Output leak current	$V = 80\text{V}$ , $T_a = 85^\circ\text{C}$ (M5248P) / $V = 60\text{V}$ , $T_a = 85^\circ\text{C}$ (M5286P)				100	$\mu\text{A}$
$I_R$	Clamp diode leak current	$V_R = 80\text{V}$ (M5248P) / $V_R = 60\text{V}$ (M5286P)				50	$\mu\text{A}$
$V_R$	Clamp diode reverse voltage	$I_R = 100\mu\text{A}$	80 (M5248P) / 60 (M5286P)				V
$V_{FE}$	Clamp diode forward voltage	$I_F = 1.25\text{A}$		1.6	2.0		V
$h_{IH}$	DC forward current gain	$V_{CC} = 4\text{V}$ , $V_{CF} = 4\text{V}$ , $I_C = 1\text{A}$		4000			—
$V_{iL}$	"H" Input voltage	$I_{O(leak)} = 50\mu\text{A}$		$V_{CC} - 1.3$			V
$V_{iL}$	"L" Input voltage	$I_C = 1.25\text{A}$				$V_{CC} - 3.5$	V

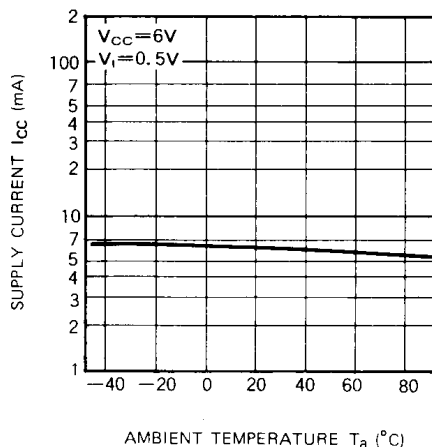
**4-UNIT 1.5A DARLINGTON CURRENT DRIVER**

**TYPICAL CHARACTERISTICS**

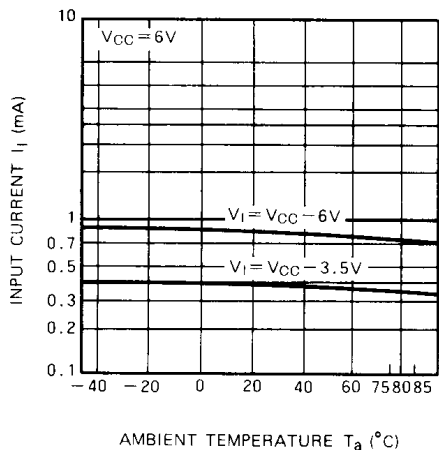
**THERMAL DERATING**



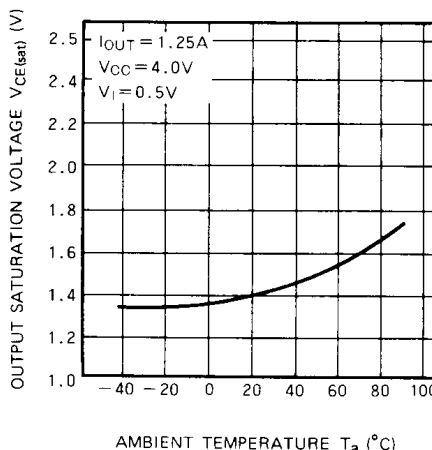
**SUPPLY CURRENT VS. AMBIENT TEMPERATURE**



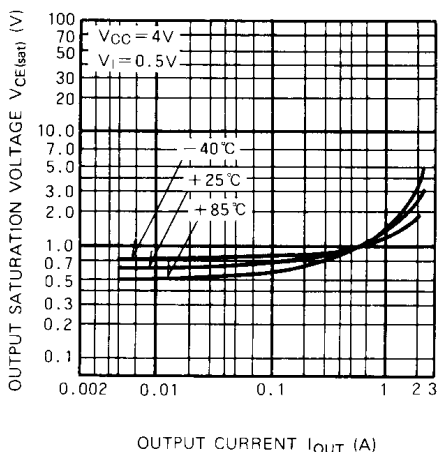
**INPUT CURRENT VS. AMBIENT TEMPERATURE**



**OUTPUT SATURATION VOLTAGE VS. AMBIENT TEMPERATURE**



**OUTPUT SATURATION VOLTAGE VS. OUTPUT CURRENT**



**CLAMP DIODE CHARACTERISTICS**

