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 ~ +85°C)

APPLICATION
Relay and printer driver, LED or incandescent display digit driver

FUNCTION
The M5248P/M5286P is comprised of four PNP invertors with 6.5kΩ series input resistors and NPN darlington sink drivers. Each output has an integral diode for inductive load transient 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)

V_{CC} 1	16 COM2
$\overline{O}1$ 2	15 $\overline{O}4$
IN1 3	14 IN4
GND 4	13 GND
5	12
IN2 6	11 IN3
$\overline{O}2$ 7	10 $\overline{O}3$
V_{CC} 8	9 COM1
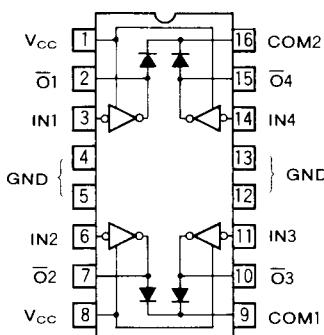
Outline 16P4

CIRCUIT DIAGRAM

Unit: Ω

MITSUBISHI ELECTRIC
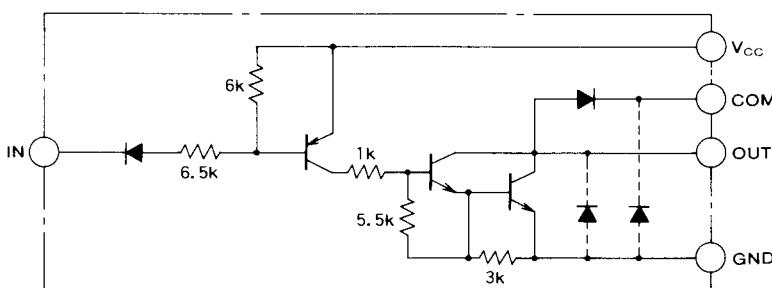
4-UNIT 1.5A DARLINGTON CURRENT DRIVER

ABSOLUTE MAXIMUM RATINGS (Ta=25℃, unless otherwise noted)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CC}	Supply voltage		20	V
V_{CEO}	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, 35μ m)	2.7	W
T_{opr}	Operating ambient temperature range		−40 ~ +85	℃
T_{stg}	Storage temperature range		−55 ~ +125	℃

RECOMMENDED OPERATIONAL CONDITIONS (Ta=−40 ~ +85℃ 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 curent		0		1.25	A
P_d	Power dissipation		0		1.0	W

ELECTRICAL CHARACTERISTICS (Ta=−40 ~ +85℃ unless otherwise noted)

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

4-UNIT 1.5A DARLINGTON CURRENT DRIVER

TYPICAL CHARACTERISTICS

THERMAL DERATING

POWER DISSIPATION P_d (mW)

AMBIENT TEMPERATURE T_a (°C)
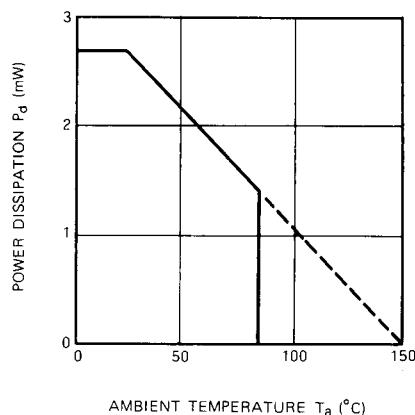
SUPPLY CURRENT VS. AMBIENT TEMPERATURE

$V_{CC} = 6V$
$V_I = 0.5V$

SUPPLY CURRENT I_{CC} (mA)

AMBIENT TEMPERATURE T_a (°C)

INPUT CURRENT VS. AMBIENT TEMPERATURE

$V_{CC} = 6V$

$V_I = V_{CC} - 6V$

$V_I = V_{CC} - 3.5V$
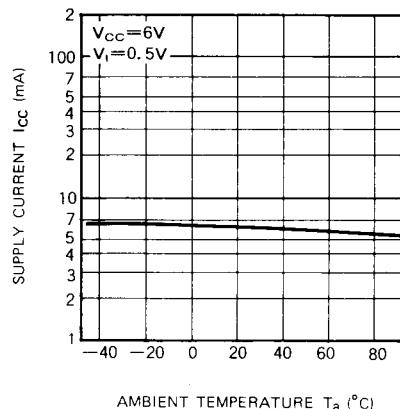
INPUT CURRENT I_I (mA)

AMBIENT TEMPERATURE T_a (°C)
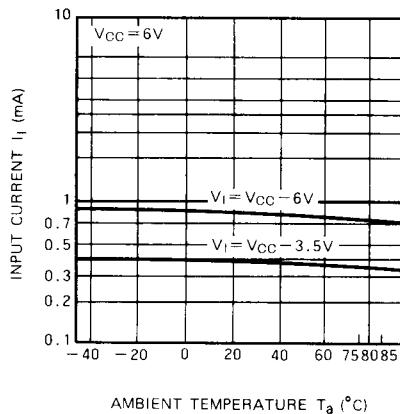
OUTPUT SATURATION VOLTAGE VS. AMBIENT TEMPERATURE

$I_{OUT} = 1.25A$
$V_{CC} = 4.0V$
$V_I = 0.5V$

OUTPUT SATURATION VOLTAGE $V_{CE(sat)}$ (V)

AMBIENT TEMPERATURE T_a (°C)
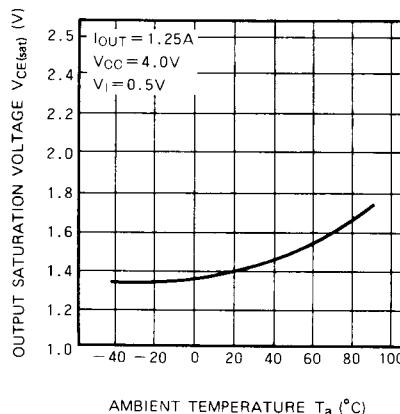
OUTPUT SATURATION VOLTAGE VS. OUTPUT CURRENT

$V_{CC} = 4V$
$V_I = 0.5V$

$-40°C$
$+25°C$
$+85°C$

OUTPUT SATURATION VOLTAGE $V_{CE(sat)}$ (V)

OUTPUT CURRENT I_{OUT} (A)
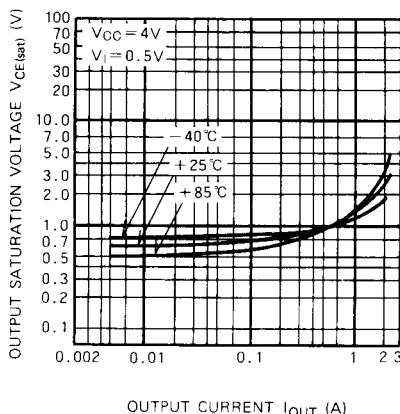
CLAMP DIODE CHARACTERISTICS

$T_a = -40, +25, +85°C$

$+85°C$
$+25°C$
$-40°C$

FORWARD CURRENT I_F (A)

FORWARD VOLTAGE V_F (V)

MITSUBISHI ELECTRIC