M54581P

8-UNIT 500mA SOURCE TYPE DARLINGTON TRANSISTOR ARRAY WITH CLAMP DIODE

DESCRIPTION

The M54581P, 8-channel source driver, consists of 8 NPN and 8 PNP source type darlington transistors connected to form high current gain driver.

FEATURES

- High output sustaining voltage to 50V (BV_{CEO}>50V)
- High output source current to 500mA ($I_{O(max)}$=−500mA)
- "L" active input level
- Internal input diode
- Integral clamp diode for transient suppression
- Wide operating temperature range (T_a=−20−+75℃)

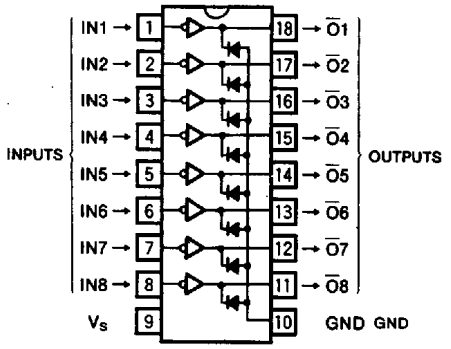
APPLICATION

Relay and printer driver, LED or incandescent or fluorescent display driver, Interfacing for standard MOS/BIPOLAR logics and interfacing for relay, solenoid or small printer

FUNCTION

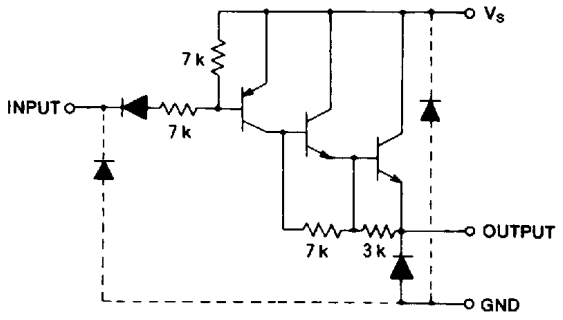
The M54581P is composed of 8 PNP and 8 NPN source type darlington transistors. A diode and a resistor of 7kΩ is connected between the input pin and the base of PNP transistor. The emitter and the collector of NPN transistor are connected to V_S (pin 9), and the output NPN transistors are in darlington configuration. An integral clamp diode is inserted between each output and GND, and V_S (pin 9) and GND (pin 10) are common to the 8 circuits.
The outputs are capable of driving 500mA and are rated for operation with output voltage up to 50V.
The device is activated with "L" level input.

PIN CONFIGURATION (TOP VIEW)



Outline 18P4

CIRCUIT SCHEMATIC (EACH CIRCUIT)



V_S and GND are common to the 8 circuits.

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

Unit : Ω

ABSOLUTE MAXIMUM RATINGS (T_a=−20~+75℃, unless otherwise noted)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CEO}	Output sustaining voltage	Output is in "L"	−0.5~+50	V
V_S	Supply voltage		−0.5~+50	V
V_I	Input voltage		0~V_S−30	V
I_O	Output current	Per channel current at "H" output	−500	mA
I_F	Clamp diode forward current	Per channel current	−500	mA
V_R	Clamp diode reverse voltage		−0.5~+50	V
P_d	Power dissipation	T_a=25℃	1.79	W
Topr	Operating temperature		−20~+75	℃
Tstg	Storage temperature		−55~+125	℃

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RECOMMENDED OPERATIONAL CONDITIONS (T_a=−20+75℃, unless otherwise noted)

Symbol	Parameter	Conditions	Limits			Unit
			Min	Typ	Max	
V_S	Supply voltage		0		50	V
I_O	Output current per channel	Percent duty cycle less than 8%	0		−350	mA
		Percent duty cycle less than 55%	0		−100	
V_{IH}	"H" Input voltage	$I_{O(leak)}$=−50μA	V_S−0.7		V_S	V
V_{IL}	"L" Input voltage	I_C=−350mA	0		V_S−3.6	V

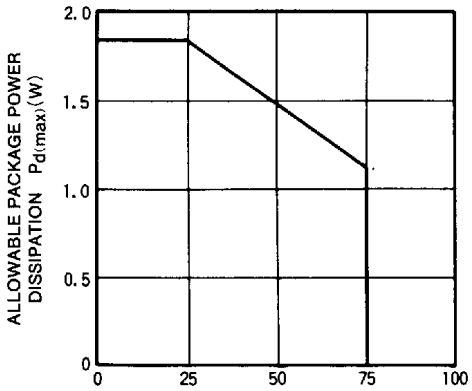
ELECTRICAL CHARACTERISTICS (T_a=−20+75℃, unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ*	Max	
I_{CEO}	Output leakage current	V_{CEO}=50V			−100	μA
$V_{CE(sat)}$	Output saturation voltage	V_I=V_S−3.2V, I_O=−100mA		1.6	2.0	V
		V_I=V_S−3.6V, I_O=−350mA		1.8	2.4	
I_I	Input current	V_I=V_S−3.6V		−320	−600	μA
		V_I=V_S−15V			−3.2	mA
V_R	Clamp diode reverse voltage	I_R=100μA	50			V
V_F	Clamp diode forward voltage	I_F=−350mA			−2.4	V

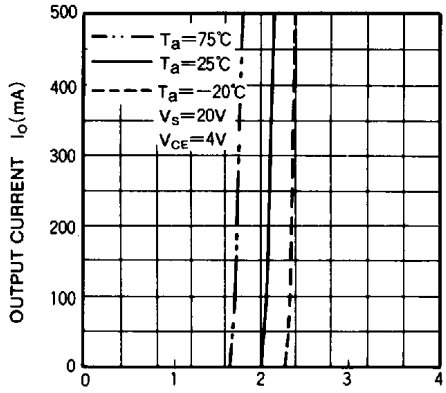
* : A Typical values are at T_a=25℃

TYPICAL CHARACTERISTICS

ALLOWABLE AVERAGE POWER DISSIPATION



OUTPUT CURRENT CHARACTERISTICS



MITSUBISHI ELECTRIC

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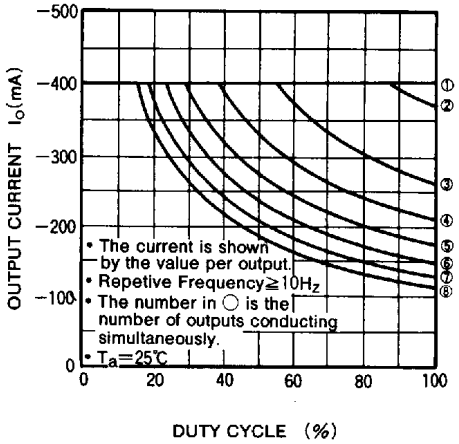
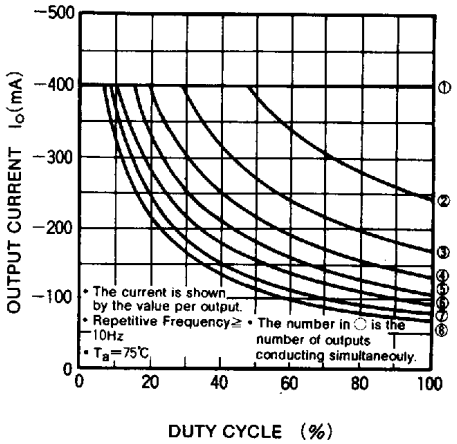
8-UNIT 500mA SOURCE TYPE DARLINGTON TRANSISTOR ARRAY WITH CLAMP DIODE

ALLOWABLE OUTPUT CURRENT AS A FUNCTION OF DUTY CYCLE



ALLOWABLE OUTPUT CURRENT AS A FUNCTION OF DUTY CYCLE



CURRENT GAIN VS OUTPUT CURRENT