7-UNIT 500mA DARLINGTON TRANSISTOR ARRAY WITH CLAMP DIODE

DESCRIPTION

The M54524P, 7-channel sink driver, consists of 14 NPN transistors connected to form high current gain driver pairs.

FEATURES

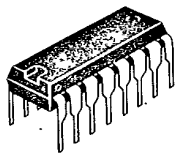
- High output sustaining voltage to 50V
- High output sink current to 500mA
- Integral diodes for transient suppression
- Wide operating temperature range (T_a = −20∼+75℃)

APPLICATION

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

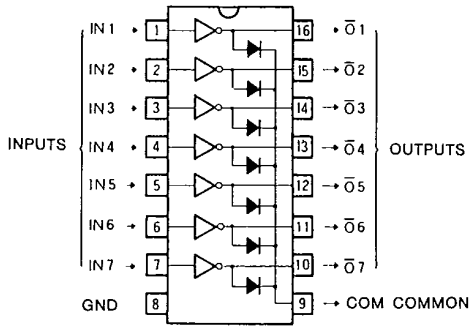
FUNCTION

The M54524P is comprised of seven NPN darlington driver pairs. 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 500mA and will withstand 50V in the OFF state.



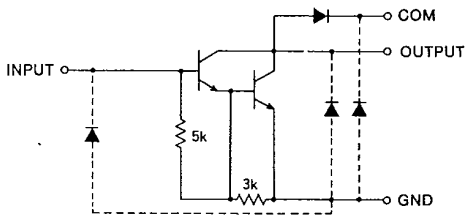
16-pin molded plastic DIP

PIN CONFIGURATION (TOP VIEW)



Outline 16P4

CIRCUIT SCHEMATIC



Unit : Ω

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

Symbol	Parameter	Conditions	Ratings	Unit
V_{CEO}	Output sustaining voltage	Transistor OFF	−0.5∼+50	V
I_C	Collector current	Transistor ON	500	mA
I_F	Clamp diode forward current		500	mA
V_R	Clamp diode reverse voltage		50	V
P_d	Power dissipation	T_a=25℃	1.47	W
T_{opr}	Operating ambient temperature range		−20∼+75	℃
T_{stg}	Storage temperature range		−55∼+125	℃

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

Symbol	Parameter		Limits			Unit
			Min	Typ	Max	
V_O	Output voltage		0		50	V
I_C	Collector current per channel	Percent duty cycle less than 8%	0		400	mA
		Percent duty cycle less than 30%	0		200	
I_{IH}	"H" Input current	I_C=400mA	1		20	mA
I_{IL}	"L" Input current		0		20	μA

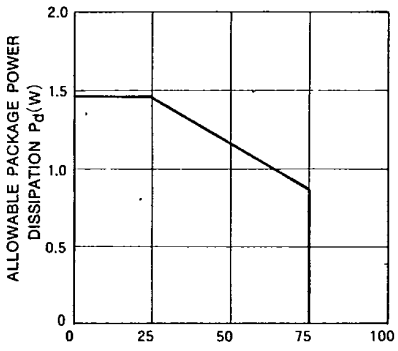
ELECTRICAL CHARACTERISTICS (T_a=−20~+75℃, unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ*	Max	
$I_{O(leak)}$	Output leakage current	V_{CE}=50V			100	μA
$V_{CE(sat)}$	Output saturation voltage	I_I=1mA, I_C=400mA		1.3	2.4	V
		I_I=1mA, I_C=200mA		0.95	1.6	
V_I	Input voltage	I_I=1mA		1.35	1.7	V
V_F	Clamp diode forward voltage	I_F=400mA		1.5	2.4	V
I_R	Clamp diode leakage current	V_R=50V			100	μA
h_{FE}	DC forward current gain	V_{CE}=4V, I_C=350mA, T_a=25℃	1000	2500		—

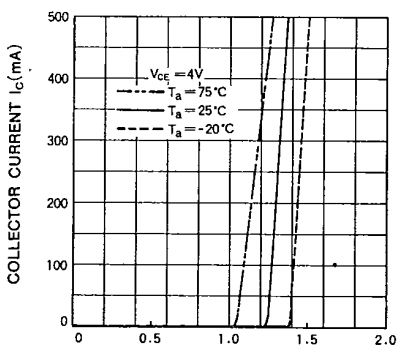
* : All typical values are at T_a=25℃.

TYPICAL CHARACTERISTICS

ALLOWABLE AVERAGE POWER DISSIPATION



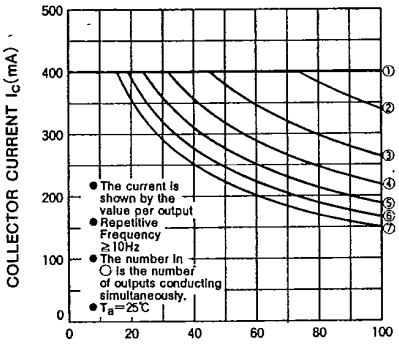
OUTPUT CURRENT CHARACTERISTICS



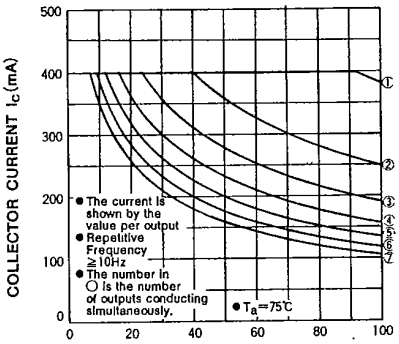
MITSUBISHI ELECTRIC

7-UNIT 500mA DARLINGTON TRANSISTOR ARRAY WITH CLAMP DIODE

ALLOWABLE COLLECTOR CURRENT AS A FUNCTION OF DUTY CYCLE



ALLOWABLE COLLECTOR CURRENT AS A FUNCTION OF DUTY CYCLE



DC CURRENT GAIN CHARACTERISTICS