M54539P

6-UNIT 700mA TRANSISTOR ARRAY WITH CLAMP DIODE

DESCRIPTION

The M54539P, 6-channel sink driver, consists of 12 NPN transistors connected to form high current gain driver pairs.

FEATURES

- Output breakdown voltage to 20V
- High output sink current to 700mA
- Integral diodes for transient suppression
- Wide operating temperature range (T_a=−20∼+75℃)

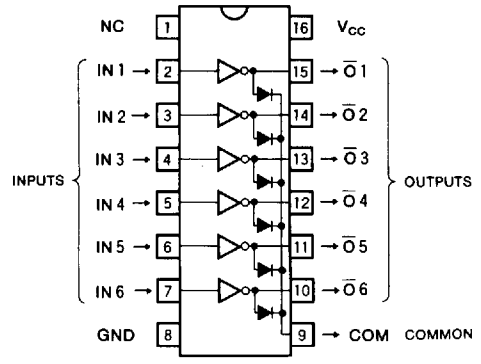
APPLICATION

Relay and solenoid driver, LED or incandescent display driver, Thermal head driver

FUNCTION

The M54539P uses a predriver stage with 2kΩ series input resistor. The power supply of the predrivers is connected to pin 16. Each output has an integral diode for inductive load transient suppression and the cathodes of the diodes are connected to pin 9 . All emitters and the substrate are connected together to pin 8 . The outputs are capable of sinking 700mA and will withstand 20V in the OFF state.

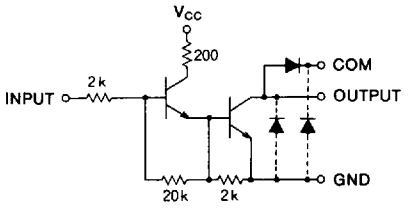
PIN CONFIGURATION (TOP VIEW)



Outline 16P4

NC : No connection

CIRCUIT SCHEMATIC



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_{CC}	Supply voltage		10	V
V_{CEO}	Output sustaining voltage	Transistor OFF	−0.5∼+20	V
I_C	Collector current	Transistor ON	700	mA
V_i	Input voltage		10	V
V_R	Clamp diode reverse voltage		20	V
I_F	Clamp diode forward current	Pulse width≦35ms, Percent duty cycle≦5%	700	mA
			350	
P_d	Power dissipation	T_a=25℃	1.47	W
Topr	Operating temperature		−20∼+75	℃
Tstg	Storage temperature		−55∼+125	℃

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

Symbol	Parameter		Limits			Unit
			Min	Typ	Max	
V_{CC}	Supply voltage		3	5	7	V
V_O	Output voltage		0		20	V
I_C	Collector current per channel	The three outputs conducting simultaneously Percent duty cycle less than 20%	0		700	mA
		The three outputs conducting simultaneously Percent duty cycle less than 90%	0		200	
V_{IH}	"H" Input voltage	I_C=450mA	3		6	V
V_{IL}	"L" Input voltage	$I_{O(leak)}$=50μA	0		0.3	V

6-UNIT 700mA TRANSISTOR ARRAY WITH CLAMP DIODE

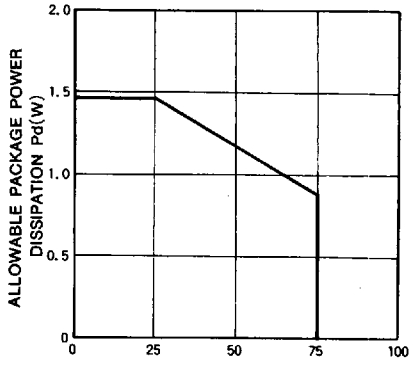
ELECTRICAL CHARACTERISTICS (T_a=−20~+75℃, unless otherwise noted)

Symbol	Parameter	Test conditions		Limits			Unit
				Min	Typ*	Max	
$V_{(BR)CEO}$	Output sustaining voltage	V_{CC}=7V, I_{CEO}=100μA		20			V
$V_{CE(sat)}$	Output saturation voltage	V_{CC}=5V	I_C=450mA		0.46	0.8	V
		V_I=3V	I_C=200mA		0.2	0.45	
I_I	Input current	V_{CC}=7V, V_I=3.2V			0.75	1.4	mA
V_R	Clamp diode reverse voltage	I_R=100μA		20			V
V_F	Clamp diode forward voltage	I_F=350mA			1.5	2.7	V
I_{CC}	Supply current	V_{CC}=7V, V_I=3.2V (all input)			190	300	mA
h_{FE}	DC forward current gain	V_{CE}=4V, V_{CC}=6V, I_C=300mA, T_a=25℃		3000	8000		—

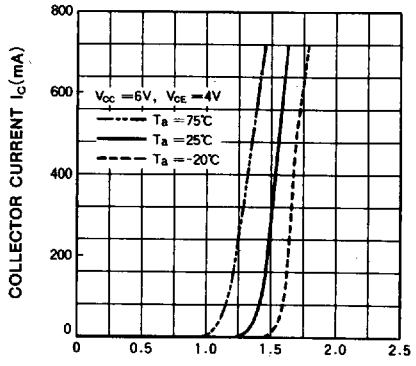
* : Typical values are at T_a=25℃.

TYPICAL CHARACTERISTICS

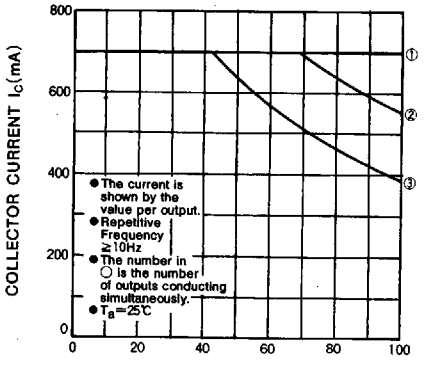
ALLOWABLE AVERAGE POWER DISSIPATION



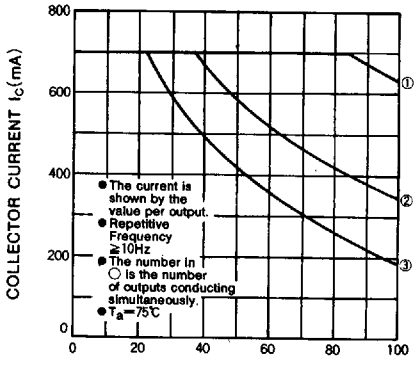
OUTPUT CURRENT CHARACTERISTICS



ALLOWABLE COLLECTOR CURRENT AS A FUNCTION OF DUTY CYCLE



ALLOWABLE COLLECTOR CURRENT AS A FUNCTION OF DUTY CYCLE



DC CURRENT GAIN
CHARACTERISTICS