7-UNIT 400mA DARLINGTON TRANSISTOR ARRAY WITH CLAMP DIODE

DESCRIPTION

The M54531P, 7-channel sink driver, consists of 14 NPN transistors connected to form high current gain driver pairs.

FEATURES

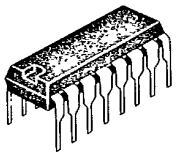
- High output sustaining voltage to 40V
- High output sink current to 400mA
- Integral diodes for transient suppression
- PMOS compatible input
- Wide input voltage range from −40V to +40V
- Wide operating temperature range (T_a = −20~+75℃)

APPLICATION

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

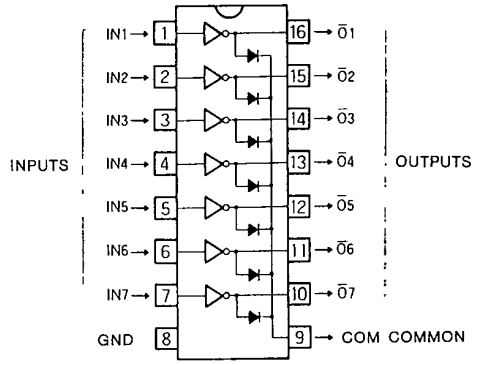
FUNCTION

The M54531P is comprised of seven NPN darlington driver pairs. Each input has a diode and 20kΩ resistor in series to allow a negative voltage input. Between pin 9 and each out, 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 400mA and will withstand 40V in the OFF state.



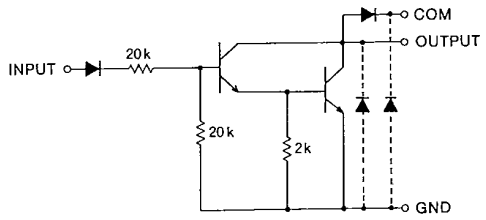
16-pin molded plastic DIP

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~+40	V
I_C	Collector current	Transistor ON	400	mA
V_I	Input voltage		−40~+40	V
$I_{F(D)}$	Clamp diode forward current		400	mA
$V_{R(D)}$	Clamp diode reverse voltage		40	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	℃

M54531P

7-UNIT 400mA DARLINGTON TRANSISTOR ARRAY WITH CLAMP DIODE

6249826 MITSUBISHI ELEK (LINEAR) 80C 09273 D T-43-25

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

Symbol	Parameter		Limits Min	Limits Typ	Limits Max	Unit
V_O	Output voltage		0		40	V
I_C	Collector current per channel	Percent duty cycle less than 8%	0		400	mA
		Percent duty cycle less than 30%	0		200	
V_{IH}	"H" Input voltage	I_C=400mA	9		35	V
		I_C=200mA	6		35	
V_{IL}	"L" Input voltage	$I_{O(leak)}$=50μA	0		1	V

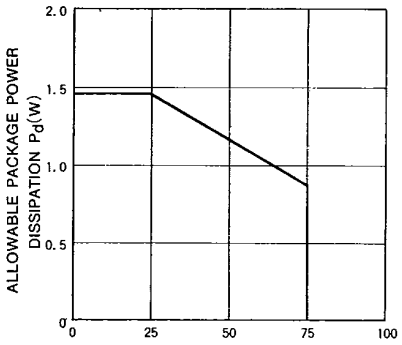
ELECTRICAL CHARACTERISTICS (T_a=−20∼+75℃, unless otherwise noted)

Symbol	Parameter	Test conditions	Limits Min	Limits Typ*	Limits Max	Unit
$V_{(BR)CEO}$	Output sustaining voltage	I_{CEO}=100μA	40			V
$V_{CE(sat)}$	Output saturation voltage	V_I=9V, I_C=400mA		1.3	2.4	V
		V_I=6V, I_C=200mA		1	1.6	
I_I	Input current	V_I=18V		0.85	1.8	mA
		V_I=35V		2.0	3.8	
I_R	Input leakage current	V_I=−35V			−20	μA
$V_{F(D)}$	Clamp diode forward voltage	$I_{F(D)}$=400mA		1.5	2.4	V
$V_{R(D)}$	Clamp diode reverse voltage	$I_{R(D)}$=100μA	40			V
h_{FE}	DC forward current gain	V_{CE}=4V, I_C=300mA, T_a=25℃	1000	3500		—

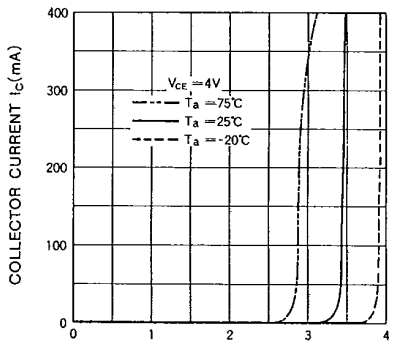
* : All typical values are at T_a=25℃.

TYPICAL CHARACTERISTICS

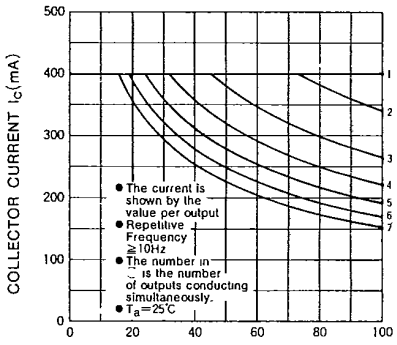
ALLOWABLE AVERAGE POWER DISSIPATION



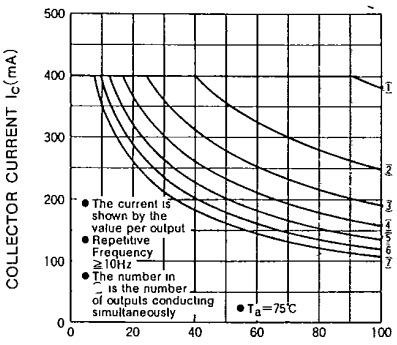
OUTPUT CURRENT CHARACTERISTICS



ALLOWABLE COLLECTOR CURRENT AS A FUNCTION OF DUTY CYCLE



ALLOWABLE COLLECTOR CURRENT AS A FUNCTION OF DUTY CYCLE



DC CURRENT GAIN CHARACTERISTICS

