M54578P

6-UNIT 700mA TRANSISTOR ARRAY WITH CLAMP DIODE AND STROBE

DESCRIPTION

The M54578P, 6-channel sink driver, consists of 12 NPN transistors connected to form high current gain driver pairs.

FEATURES

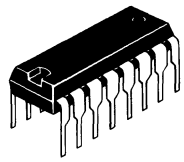
- 20V breakdown
- High output sink current to 700mA
- PMOS Compatible
- Wide operating temperature range (T_a = −20∼+75℃)

APPLICATIONS

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

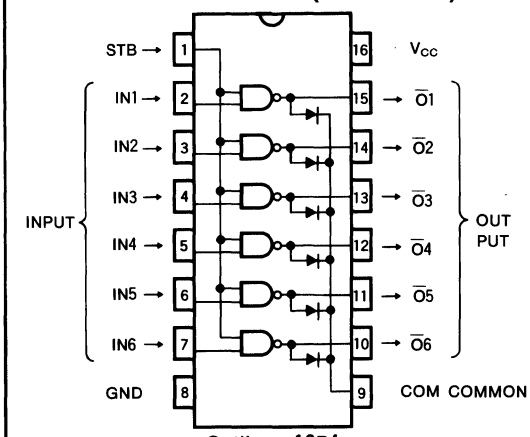
FUNCTION

The M54578P uses a predriver stage. Each input has a diode and 2 kΩ resistor in series to allow a negative voltage input. All input can be controlled simultaneously by a strobe input at pin 1 . 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.



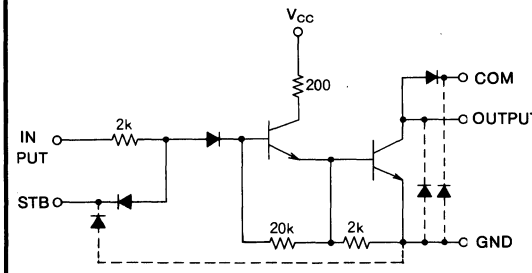
16-pin molded plastic DIL

PIN CONFIGURATION (TOP VIEW)



Outline 16P4

CIRCUIT SCHEMATIC



UNIT : Ω

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

Symbol	Parameter	Conditions	Limits	Unit
V_{CC}	Supply voltage		10	V
V_{CEO}	Output sustaining voltage	Transistor OFF	20	V
I_C	Collector current	Transistor ON	700	mA
V_I	Input voltage		−25, 20	V
$V_{I(STB)}$	Strobo input voltage		20	V
$V_{R(D)}$	Clamp diode reverse voltage		20	V
$I_{F(D)}$	Clamp diode forward current	Pulse width≦35ms, Duty cycle≦5%	700	mA
			350	mA
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	℃

6-UNIT 700mA TRANSISTOR ARRAY WITH CLAMP DIODE AND STROBE

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

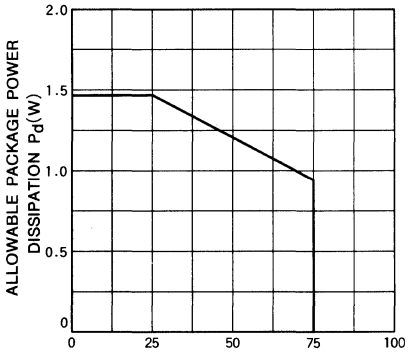
Symbol	Parameter		Limits			Unit
			Min	Typ	Max	
V_{CC}	Supply voltage		3	5	8	V
V_O	Output voltage				20	V
I_C	Collector current per channel	The three outputs conducting simultaneously Percent duty cycle less than 20%			700	mA
		The three outputs conducting simultaneously Percent duty cycle less than 90%			200	
$V_{IH(STB)}$	"H" Input voltage (strobe input)		2.4			V
$V_{IL(STB)}$	"L" Input voltage (strobe input)				0.2	V
V_{IH}	"H" Input voltage	I_C=450mA, V_{CC}=5V	3.5			V
		I_C=700mA, V_{CC}=6V	5			V
V_{IL}	"L" Input voltage	$I_{O(leak)}$=50μA			0.8	V

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

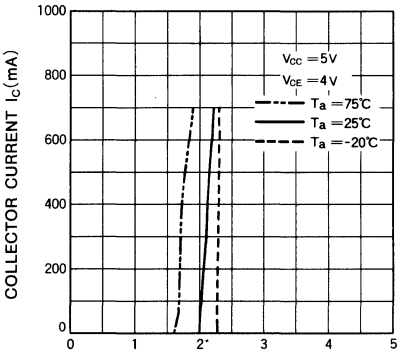
Symbol	Parameter	Test conditions		Limits			Unit
				Min	Typ	Max	
$V_{(BR)CEO}$	Output sustaining voltage	V_{CC}=7V, $V_{I(STB)}$=0.4V V_I=3.5V, I_{CEO}=100μA		20			V
$V_{CE(sat)}$	Collector-emitter saturation voltage	V_{CC}=5V	I_C=450mA			0.8	V
		V_I=3.5V	I_C=200mA			0.45	
I_I	Input current	V_{CC}=7V, V_I=3.5V $V_{I(STB)}$=2.4V				1.4	mA
I_R	Input leakage current	V_{CC}=7V, V_R=−25V				−20	μA
$I_{I(STB)}$	Strobe input current	V_{CC}=7V, $V_{I(STB)}$=0.4V V_I=3.5V (all input)				−10.7	mA
$I_{R(STB)}$	Strobe input leakage current	V_{CC}=7V, V_I=0V, $V_{I(STB)}$=20V				20	μA
$V_{F(D)}$	Clamp diode forward current	$I_{F(D)}$=600mA				5	V
$V_{R(D)}$	Clamp diode reverse voltage	$I_{R(D)}$=100μA		20			V
I_{CC}	Supply current	V_{CC}=8V, $V_{I(STB)}$=2.4V V_I=3.5V (all input)				320	mA
h_{FE}	DC forward current gain	V_{CC}=5V V_{CE}=4V, I_C=450mA, T_a=25℃		2000			

TYPICAL CHARACTERISTICS

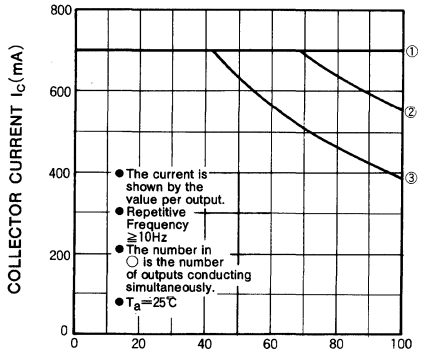
ALLOWABLE AVERAGE POWER DISSIPATION



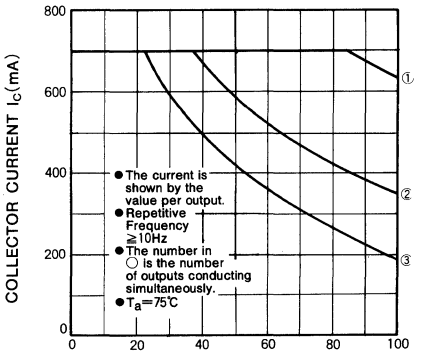
OUTPUT CURRENT CHARACTERISTICS



ALLOWABLE COLLECTOR CURRENT AS A FUNCTION OF DUTY CYCLE



ALLOWABLE COLLECTOR CURRENT AS A FUNCTION OF DUTY CYCLE



DC CURRENT GAIN CHARACTERISTICS