

MITSUBISHI (DGTL LOGIC)

M54567P**4-UNIT 1.5A DARLINGTON TRANSISTOR ARRAY WITH CLAMP DIODE****DESCRIPTION**

The M54567P, 4-channel sink driver, consists of 4 PNP and 8 NPN transistors to form high current gain driver pairs.

FEATURES

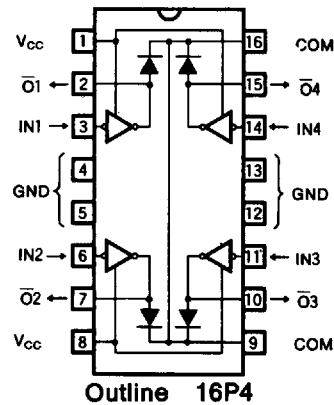
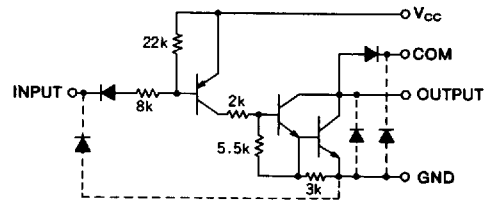
- High output sustaining voltage to 50V
- High output current to 1.5A
- Integral diodes for transient suppression
- NMOS Compatible input
- Wide operating temperature range ($T_a = -20 \sim +75^\circ\text{C}$)

APPLICATION

Relay and printer driver, LED or incandescent display digit driver

FUNCTION

The M54567P is comprised of four PNP invertors with 8k Ω series input resistors and NPN darlington sink drivers. Each output has an integral diode for inductive load transient suppression and the anodes of the diode connected to pins 9 and 16. The outputs are capable of sinking 1.5A and will withstand 50V in the OFF state.

PIN CONFIGURATION (TOP VIEW)**CIRCUIT SCHEMATIC**

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

Unit : Ω **ABSOLUTE MAXIMUM RATINGS** ($T_a = -20 \sim +75^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CC}	Supply voltage		10	V
V_{CEO}	Output sustaining voltage	Transistor OFF	$-0.5 \sim +50$	V
V_I	Input voltage		30	V
I_C	Collector current	Transistor ON	1.5	A
V_R	Clamp diode reverse voltage		50	V
I_F	Clamp diode forward current	Pulse width $\leq 10\text{ms}$, Repetitive cycle $\leq 10\text{Hz}$	1.5	A
			1	
P_d	Power dissipation	$T_a = 25^\circ\text{C}$	1.92	W
T_{opr}	Operating temperature		$-20 \sim +75$	$^\circ\text{C}$
T_{stg}	Storage temperature		$-55 \sim +125$	$^\circ\text{C}$

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RECOMMENDED OPERATIONAL CONDITIONS ($T_a = -20 \sim +75^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter		Limits			Unit
			Min	Typ	Max	
V_{CC}	Supply voltage		4	5	6	V
V_O	Output voltage		0		40	V
I_C	Collector current per channel	All units ON Percent duty cycle $\leq 4\%$	0		1.25	A
		All units ON Percent duty cycle $\leq 18\%$	0		0.7	
V_{IH}	High-level Input voltage	$I_O(\text{leak}) = 50\mu\text{A}$	$V_{CC} - 0.5$		V_{CC}	V
V_{IL}	Low-level Input voltage	$I_C = 1.25\text{A}$	0		$V_{CC} - 3.5$	V

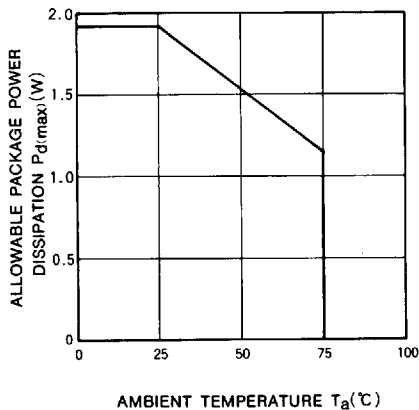
ELECTRICAL CHARACTERISTICS ($T_a = -20 \sim +75^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ*	Max	
$V_{(BR)CEO}$	Output sustaining voltage	$I_{CEO} = 100\mu\text{A}$	50			V
I_{CC}	Supply current	$V_{CC} = 6\text{V}$, $V_i = 0.5\text{V}$		3.0	4.5	mA
$V_{CE(sat)}$	Output saturation voltage	$V_{CC} = 4\text{V}$ $V_i = 0.5\text{V}$		1.6	2.2	V
		$I_C = 1.25\text{A}$ $I_C = 0.7\text{A}$		1.1	1.7	
I_i	Input current	$V_i = V_{CC} - 3.5\text{V}$		-0.3	-0.6	mA
		$V_i = V_{CC} - 6\text{V}$		-0.58	-0.95	
V_R	Clamp diode reverse voltage	$I_R = 100\mu\text{A}$	50			V
V_F	Clamp diode forward voltage	$I_F = 1.25\text{A}$		1.6	2.3	V
h_{FE}	DC forward current gain	$V_{CC} = 4\text{V}$, $V_{CE} = 4\text{V}$, $I_C = 1\text{A}$, $T_a = 25^\circ\text{C}$	4000	30000		—

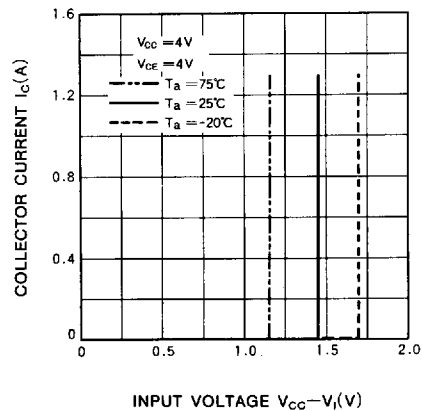
* : Typical values are at $T_a = 25^\circ\text{C}$.

TYPICAL CHARACTERISTICS

ALLOWABLE AVERAGE POWER DISSIPATION

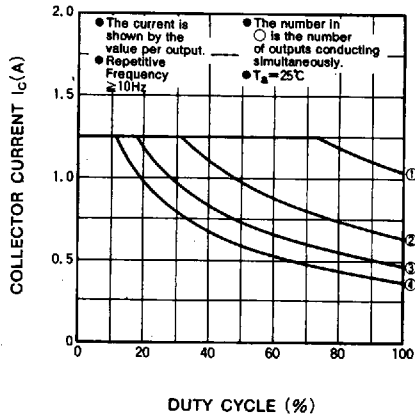


OUTPUT CURRENT CHARACTERISTICS

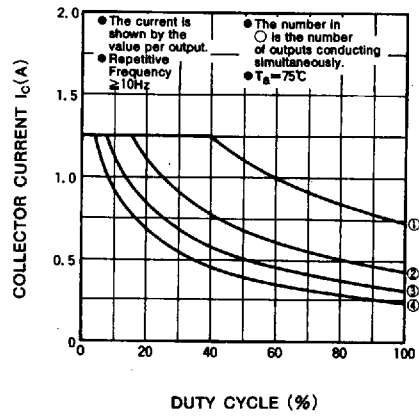


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ALLOWABLE COLLECTOR CURRENT AS A FUNCTION OF DUTY CYCLE



ALLOWABLE COLLECTOR CURRENT AS A FUNCTION OF DUTY CYCLE



DC CURRENT GAIN CHARACTERISTICS

