

MITSUBISHI (DGTL LOGIC)

**M54561P****7-UNIT 300mA SOURCE TYPE DARLINGTON TRANSISTOR ARRAY  
WITH CLAMP DIODE****DESCRIPTION**

The M54561P, 7-channel source driver, consists of 7 PNP and 14 NPN transistors connected to form high current gain driver with PNP action.

**FEATURES**

- High output sustaining voltage to 40V
- High output source current to 300mA
- Integral diode for transient suppression
- Active "L" input
- Wide operating temperature range ( $T_a = -20 \sim +75^\circ\text{C}$ )

**APPLICATION**

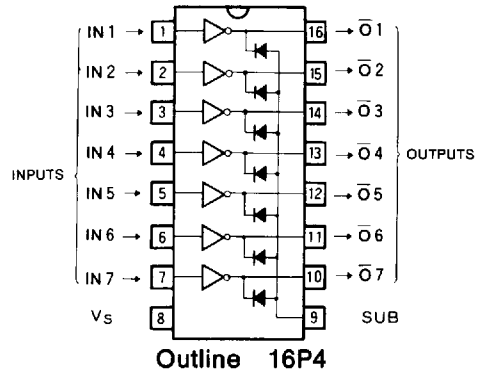
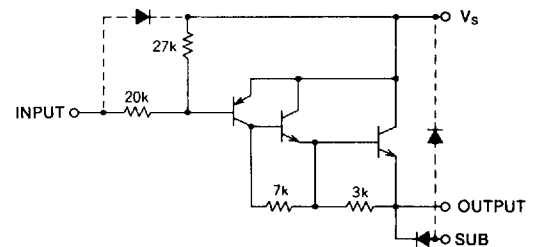
Relay and printer driver, LED, incandescent or fluorescent display driver, Active "L" input, Interfacing for standard MOS/BIPOLAR logics

**FUNCTION**

The M54561P functions like a PNP transistor and the compound PNP/NPN/NPN output provides high current gain. Each output has an integral diode for inductive load transient suppression and the anodes of the diodes and the substrate are connected together to pin 9.

The output are capable of driving 300mA and are rated for operation with output voltage up to 40V.

The output is turned ON by switching the input low.

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

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

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

Symbol	Parameter	Conditions	Ratings	Unit
$V_{CEO}$	Output sustaining voltage	Output is in "L"	-0, 5 ~ +40	V
$V_S$	Supply voltage		40	V
$V_i$	Input voltage		0 ~ +40	V
$I_O$	Output current	Per channel current at "H" output	-300	mA
$I_F$	Clamp diode forward current		-300	mA
$V_R$	Clamp diode reverse voltage		40	V
$P_d$	Power dissipation	$T_a = 25^\circ\text{C}$	1.47	W
$T_{op}$	Operating temperature		-20 ~ +75	$^\circ\text{C}$
$T_{stg}$	Storage temperature		-55 ~ +125	$^\circ\text{C}$

### 7-UNIT 300mA SOURCE TYPE DARLINGTON TRANSISTOR ARRAY WITH CLAMP DIODE

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

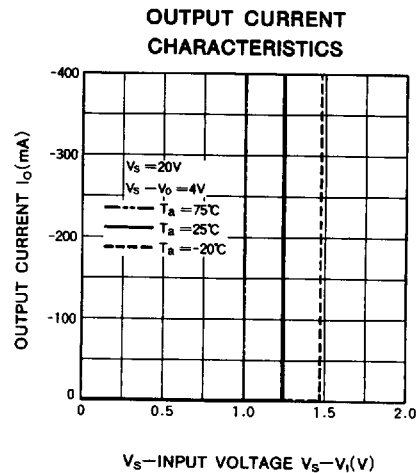
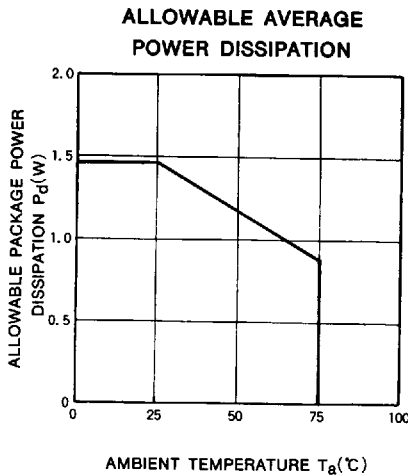
Symbol	Parameter		Limits			Unit
			Min	Typ	Max	
$V_S$	Supply voltage		0		40	V
$I_O$	Output current per channel	Percent duty cycle less than 15%	0		-250	mA
		Percent duty cycle less than 50%	0		-100	
$V_{IH}$	High-level Input voltage		$V_S - 0.2$		$V_S + 0.3$	V
$V_{IL}$	Low-level Input voltage	$I_O = -250\text{mA}$	0		$V_S - 3$	V

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

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ*	Max	
$I_S(\text{leak})$	Supply leakage current	$V_S = 40\text{V}$			100	$\mu\text{A}$
$V_{CE(\text{sat})}$	Output saturation voltage	$V_I = V_S - 3\text{V}$ , $I_O = -250\text{mA}$		1.6	2.3	V
		$V_I = V_S - 3\text{V}$ , $I_O = -100\text{mA}$		1.45	2.0	
$I_I$	Input current	$V_I = V_S - 3.5\text{V}$		-150	-250	$\mu\text{A}$
$V_F$	Clamp diode forward voltage	$I_F = -300\text{mA}$		-1.6	-2.4	V
$V_R$	Clamp diode reverse voltage	$I_R = 100\mu\text{A}$	40			V
$h_{FE}$	DC forward current gain	$V_S - V_O = 4\text{V}$ , $I_O = -300\text{mA}$ , $T_a = 25^\circ\text{C}$	1000	8000		—

\* : A typical value at  $T_a = 25^\circ\text{C}$ .

#### TYPICAL CHARACTERISTICS

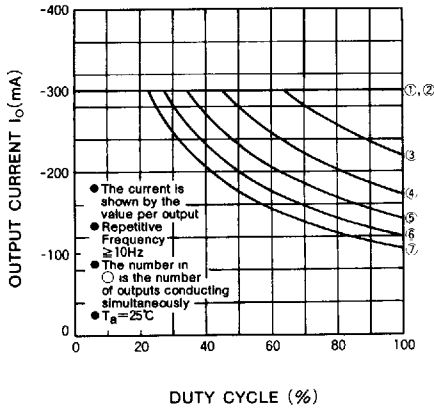


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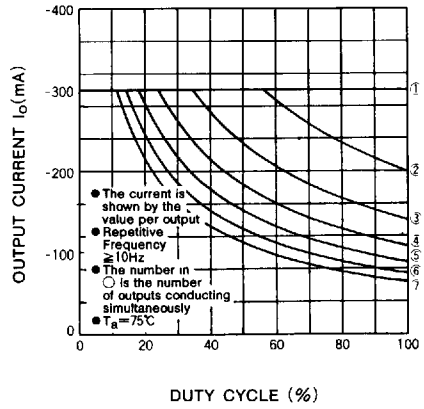
M54561P

7-UNIT 300mA SOURCE TYPE DARLINGTON TRANSISTOR ARRAY WITH CLAMP DIODE

ALLOWABLE OUTPUT CURRENT AS A FUNCTIONAL OF DUTY CYCLE



ALLOWABLE OUTPUT CURRENT AS A FUNCTIONAL OF DUTY CYCLE



DC CURRENT GAIN CHARACTERISTICS

