

**7-UNIT 500mA DARLINGTON TRANSISTOR ARRAY WITH CLAMP DIODE**

6249826 MITSUBISHI ELEK (LINEAR)

80C 09260 D7-43-25

**DESCRIPTION**

The M54524P, 7-channel sink driver, consists of 14 NPN transistors connected to form high current gain driver pairs.

**FEATURES**

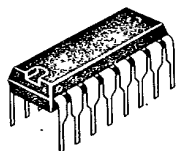
- High output sustaining voltage to 50V
- High output sink current to 500mA
- Integral diodes for transient suppression
- Wide operating temperature range ( $T_a = -20 \sim +75^\circ\text{C}$ )

**APPLICATION**

Relay and printer drivers, LED or incandescent display digit driver, interfacing for standard MOS/BIPOLAR logics

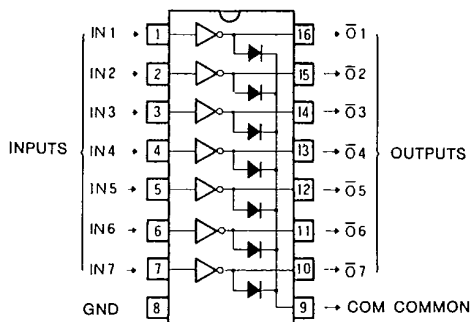
**FUNCTION**

The M54524P is comprised of seven NPN darlington driver pairs. Between pin 9 and each output, 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 500mA and will withstand 50V in the OFF state.



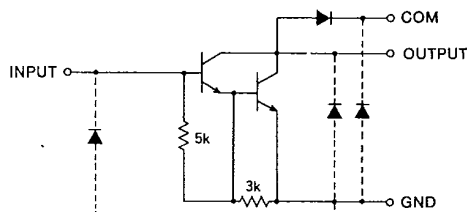
16-pin molded plastic DIP

**PIN CONFIGURATION (TOP VIEW)**



Outline 16P4

**CIRCUIT SCHEMATIC**



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           | Transistor OFF           | $-0.5 \sim +50$ | V                |
| $I_C$     | Collector current                   | Transistor ON            | 500             | mA               |
| $I_F$     | Clamp diode forward current         |                          | 500             | mA               |
| $V_R$     | Clamp diode reverse voltage         |                          | 50              | V                |
| $P_d$     | Power dissipation                   | $T_a = 25^\circ\text{C}$ | 1.47            | W                |
| $T_{opr}$ | Operating ambient temperature range |                          | $-20 \sim +75$  | $^\circ\text{C}$ |
| $T_{stg}$ | Storage temperature range           |                          | $-55 \sim +125$ | $^\circ\text{C}$ |

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80C 09261

**D7-43-25**

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

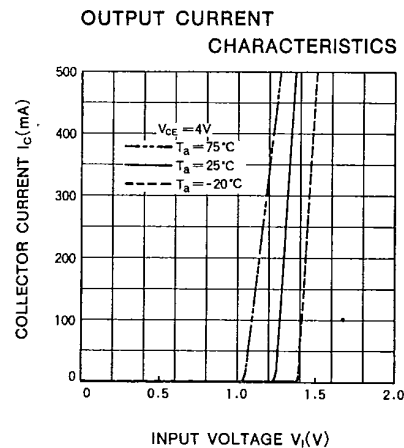
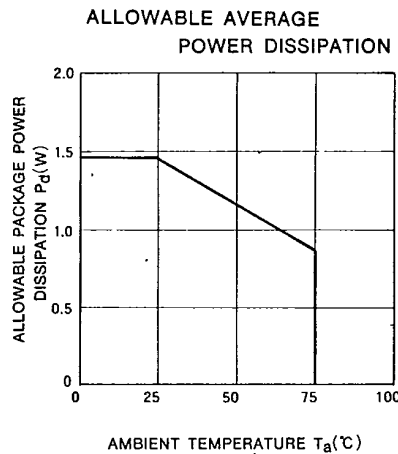
| Symbol   | Parameter                        | Limits |     |     | Unit          |
|----------|----------------------------------|--------|-----|-----|---------------|
|          |                                  | Min    | Typ | Max |               |
| $V_O$    | Output voltage                   | 0      |     | 50  | V             |
| $I_C$    | Collector current per channel    |        |     |     | mA            |
|          |                                  |        |     |     |               |
|          | Percent duty cycle less than 8%  | 0      |     | 400 |               |
|          | Percent duty cycle less than 30% | 0      |     | 200 |               |
| $I_{IH}$ | "H" Input current                | 1      |     | 20  | mA            |
| $I_{IL}$ | "L" Input current                | 0      |     | 20  | $\mu\text{A}$ |

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

| Symbol               | Parameter                   | Test conditions                                                  | Limits |      |     | Unit          |
|----------------------|-----------------------------|------------------------------------------------------------------|--------|------|-----|---------------|
|                      |                             |                                                                  | Min    | Typ* | Max |               |
| $I_{O(\text{leak})}$ | Output leakage current      | $V_{CE} = 50\text{V}$                                            |        |      | 100 | $\mu\text{A}$ |
| $V_{CE(\text{sat})}$ | Output saturation voltage   | $I_I = 1\text{mA}, I_C = 400\text{mA}$                           |        | 1.3  | 2.4 | V             |
|                      |                             | $I_I = 1\text{mA}, I_C = 200\text{mA}$                           |        | 0.95 | 1.6 |               |
| $V_I$                | Input voltage               | $I_I = 1\text{mA}$                                               |        | 1.35 | 1.7 | V             |
| $V_F$                | Clamp diode forward voltage | $I_F = 400\text{mA}$                                             |        | 1.5  | 2.4 | V             |
| $I_R$                | Clamp diode leakage current | $V_R = 50\text{V}$                                               |        |      | 100 | $\mu\text{A}$ |
| $h_{FE}$             | DC forward current gain     | $V_{CE} = 4\text{V}, I_C = 350\text{mA}, T_a = 25^\circ\text{C}$ | 1000   | 2500 |     | —             |

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

**TYPICAL CHARACTERISTICS**



MITSUBISHI ELEK {LINEAR} 80 DE 6249826 0009262 3 M54524P

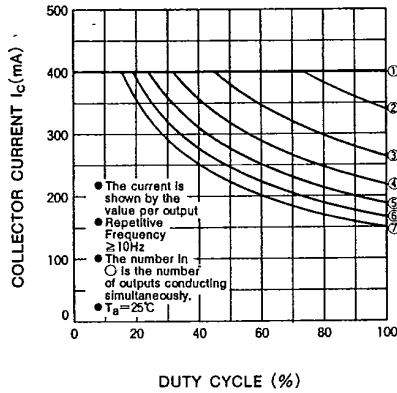
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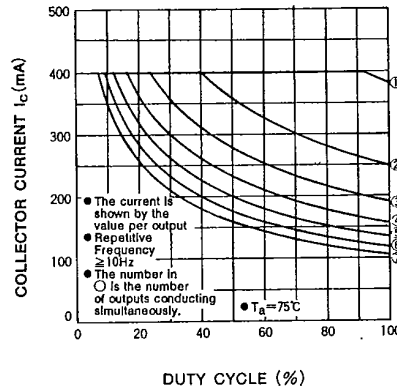
80C 09262

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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

