

# M63827WP/DP

Taiwan A'ssy product 7-UNIT 500mA DARLINGTON TRANSISTOR ARRAY WITH CLAMP DIODE

## DESCRIPTION

M63827WP and M63827DP are seven-circuit Darlington transistor arrays with clamping diodes. The circuits are made of NPN transistors. Both the semiconductor integrated circuits perform high-current driving with extremely low input-current supply.

## FEATURES

- Two package configurations (WP/DP)
- High breakdown voltage ( $BV_{CEO} \geq 50V$ )
- High-current driving ( $I_{C(max)} = 500mA$ )
- With clamping diodes
- Driving available with TTL, PMOS IC output
- Wide operating temperature range ( $T_a = -40$  to  $+85^\circ C$ )

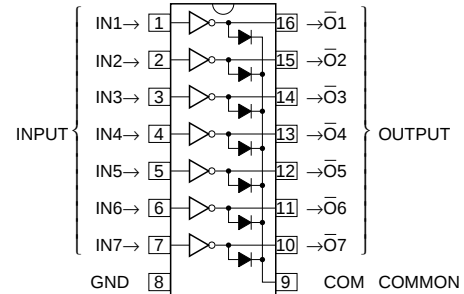
## APPLICATION

Drives of relays and printers, digit drives of indication elements (LEDs and lamps), and MOS-bipolar logic IC interfaces

## FUNCTION

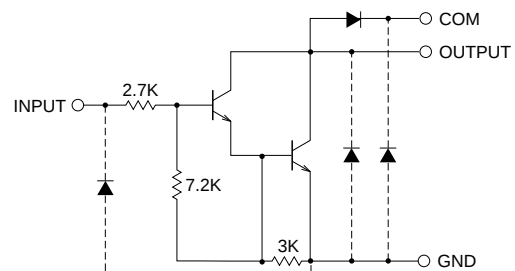
The M63827WP and M63827DP each have seven circuits consisting of NPN Darlington transistors. These ICs have resistance of  $2.7k\Omega$  between input transistor bases and input pins. A spike-killer clamping diode is provided between each output pin (collector) and COM pin (pin 9). The output transistor emitters are all connected to the GND pin (pin 8). The collector current is 500mA maximum. Collector-emitter supply voltage is 50V maximum.

## PIN CONFIGURATION



16P4X-A(WP)  
Package type 16P2X-B(DP)

## CIRCUIT DIAGRAM



The seven circuits share the COM and GND.

The diode, indicated with the dotted line, is parasitic, and cannot be used.

Unit :  $\Omega$

## ABSOLUTE MAXIMUM RATINGS (Unless otherwise noted, $T_a = -40 \sim +85^\circ C$ )

| Symbol    | Parameter                      | Conditions                                 | Ratings           | Unit       |
|-----------|--------------------------------|--------------------------------------------|-------------------|------------|
| $V_{CEO}$ | Collector-emitter voltage      | Output, H                                  | $-0.5 \sim +50$   | V          |
| $I_C$     | Collector current              | Current per circuit output, L              | 500               | mA         |
| $V_i$     | Input voltage                  |                                            | $-0.5 \sim +30$   | V          |
| $I_F$     | Clamping diode forward current |                                            | 500               | mA         |
| $V_R$     | Clamping diode reverse voltage |                                            | 50                | V          |
| $P_d$     | Power dissipation              | $T_a = 25^\circ C$ , when mounted on board | 1.47(WP)/1.00(DP) | W          |
| $T_{opr}$ | Operating temperature          |                                            | $-40 \sim +85$    | $^\circ C$ |
| $T_{stg}$ | Storage temperature            |                                            | $-55 \sim +125$   | $^\circ C$ |

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7-UNIT 500mA DARLINGTON TRANSISTOR ARRAY WITH CLAMP DIODE

## RECOMMENDED OPERATING CONDITIONS (Unless otherwise noted, Ta = -40 ~ +85°C)

| Symbol | Parameter                                                                                 |                                                             | Limits |     |     | Unit |
|--------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------|--------|-----|-----|------|
|        |                                                                                           |                                                             | min    | typ | max |      |
| Vo     | Output voltage                                                                            |                                                             | 0      | —   | 50  | V    |
| Ic     | Collector current<br>(Current per 1 circuit when 7 circuits are coming on simultaneously) | Duty Cycle<br>WP : no more than 8%<br>DP : no more than 5%  | 0      | —   | 400 | mA   |
|        |                                                                                           | Duty Cycle<br>WP : no more thn 30%<br>DP : no more than 20% | 0      | —   | 200 |      |
| VIH    | “H” input voltage                                                                         | Ic ≤ 400mA                                                  | 3.85   | —   | 25  | V    |
|        |                                                                                           | Ic ≤ 200mA                                                  | 3.4    | —   |     |      |
| VIL    | “L” input voltage                                                                         |                                                             | 0      | —   | 0.6 | V    |

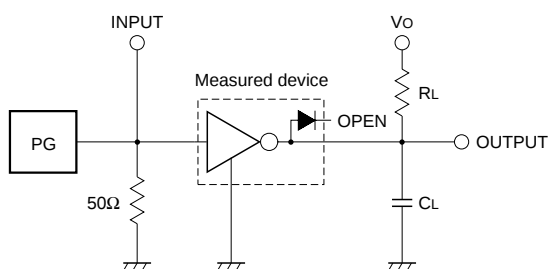
## ELECTRICAL CHARACTERISTICS (Unless otherwise noted, Ta = 25°C)

| Symbol     | Parameter                            | Test conditions        | Limits |      |     | Unit |
|------------|--------------------------------------|------------------------|--------|------|-----|------|
|            |                                      |                        | min    | typ  | max |      |
| V (BR) CEO | Collector-emitter breakdown voltage  | ICEO = 100μA           | 50     | —    | —   | V    |
| VCE (sat)  | Collector-emitter saturation voltage | II = 500μA, IC = 350mA | —      | 1.2  | 1.6 | V    |
|            |                                      | II = 350μA, IC = 200mA | —      | 1.0  | 1.3 |      |
|            |                                      | II = 250μA, IC = 100mA | —      | 0.9  | 1.1 |      |
| II         | Input current                        | VI = 3.85V             | —      | 0.9  | 1.4 | mA   |
| VF         | Clamping diode forward voltage       | IF = 350mA             | —      | 1.4  | 2.0 | V    |
| IR         | Clamping diode reverse current       | VR = 50V               | —      | —    | 100 | μA   |
| hFE        | DC amplification factor              | VCE = 2V, IC = 350mA   | 1000   | 3000 | —   | —    |

## SWITCHING CHARACTERISTICS (Unless otherwise noted, Ta = 25°C)

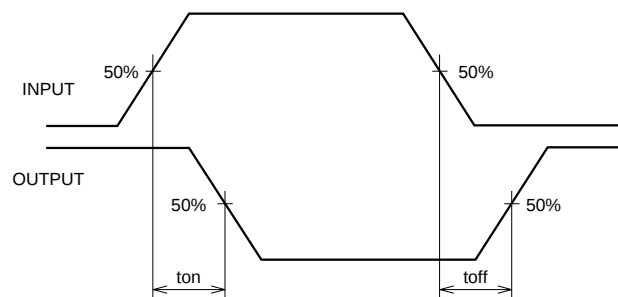
| Symbol | Parameter     | Test conditions    | Limits |     |     | Unit |
|--------|---------------|--------------------|--------|-----|-----|------|
|        |               |                    | min    | typ | max |      |
| ton    | Turn-on time  | CL = 15pF (note 1) | —      | 20  | —   | ns   |
| toff   | Turn-off time |                    | —      | 400 | —   | ns   |

### NOTE 1 TEST CIRCUIT



- (1) Pulse generator (PG) characteristics : PRR = 1kHz,  
tw = 10μs, tr = 6ns, tf = 6ns, Zo = 50Ω  
VI = 3.85V
- (2) Input-output conditions : RL = 25Ω, Vo = 10V
- (3) Electrostatic capacity CL includes floating capacitance at connections and input capacitance at probes

### TIMING DIAGRAM

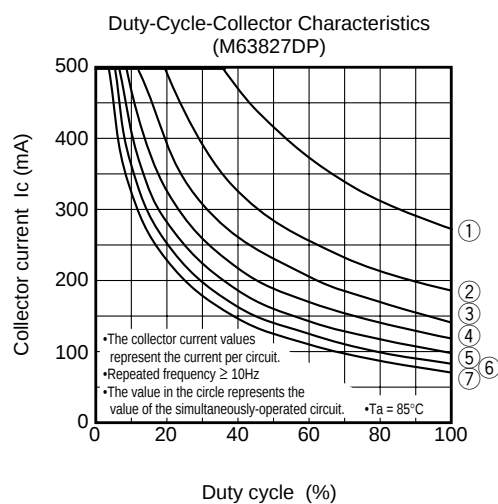
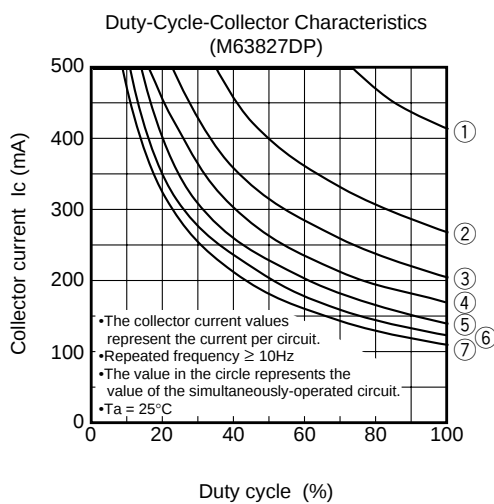
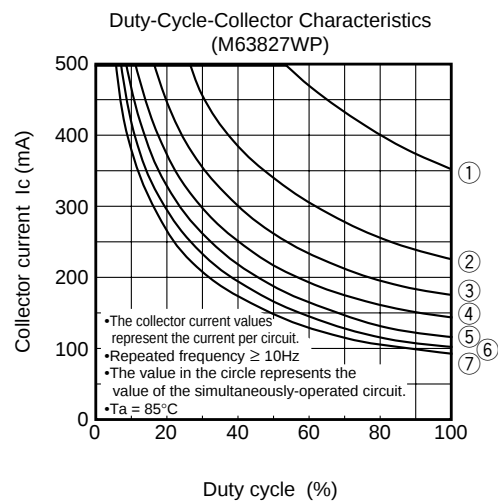
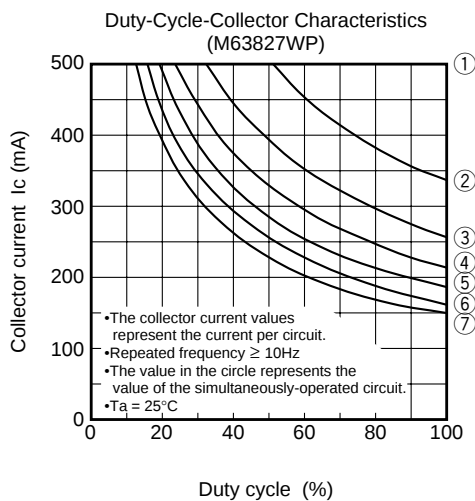
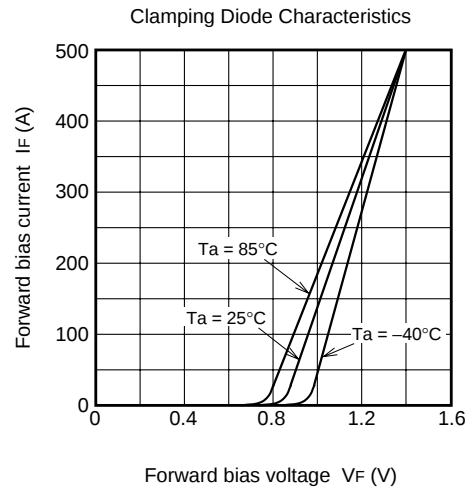
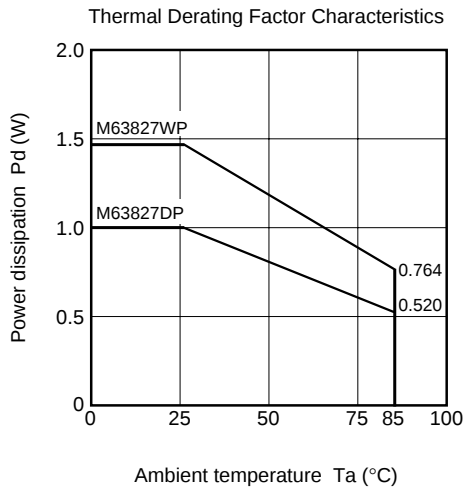


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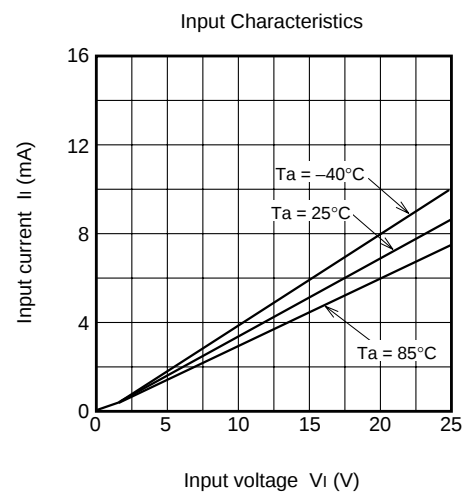
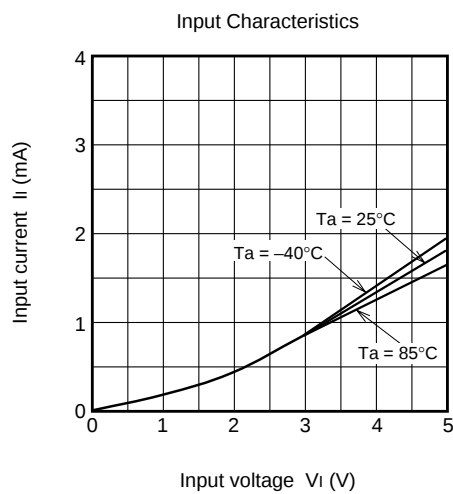
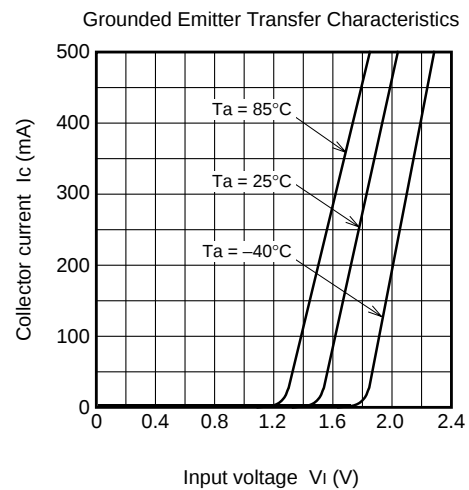
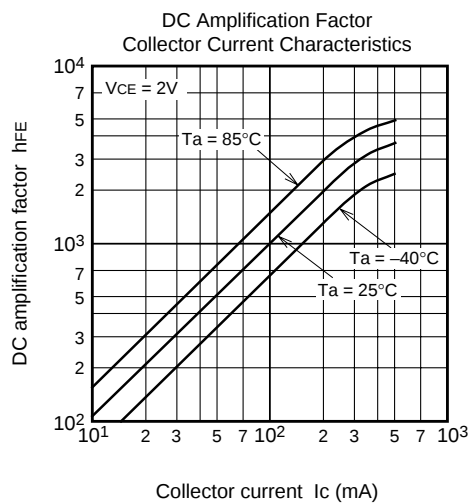
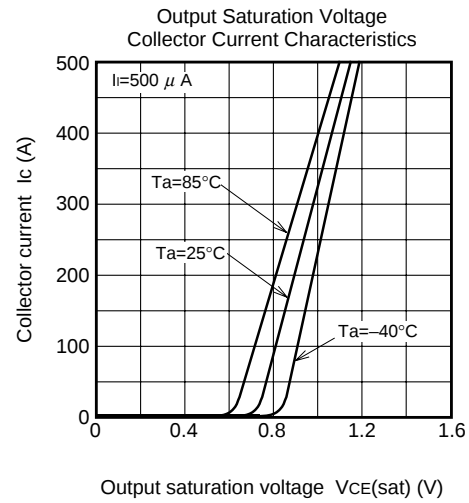
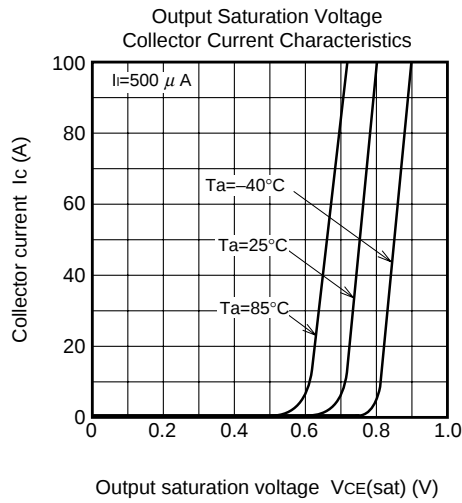
## TYPICAL CHARACTERISTICS



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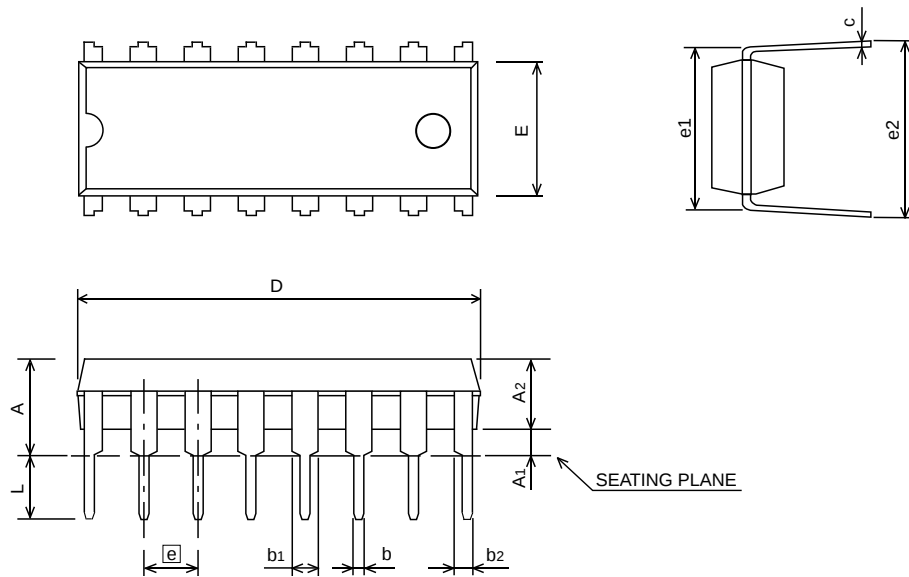
## PACKAGE OUTLINE

### 16P4X-A

PACKAGE TYPE :

16P4X-A 16PIN PLASTIC MOLD DUAL INLINE PACKAGE

Dimension in mm



| Symbol | Dimension in Millimeters |       |      |
|--------|--------------------------|-------|------|
|        | Min                      | Nom   | Max  |
| A      | —                        | —     | 4.57 |
| A1     | 0.38                     | —     | —    |
| A2     | 3.25                     | 3.3   | 3.45 |
| b      | 0.36                     | 0.46  | 0.56 |
| b1     | 1.14                     | 1.52  | 1.78 |
| b2     | 0.76                     | 0.99  | 1.14 |
| c      | 0.20                     | 0.25  | 0.33 |
| D      | 18.9                     | 19.15 | 19.3 |
| E      | 6.35                     | 6.5   | 6.65 |
| e      | —                        | 2.54  | —    |
| e1     | 7.62                     | 7.94  | 8.26 |
| e2     | 8.64                     | 9.145 | 9.65 |
| L      | 3.18                     | —     | —    |

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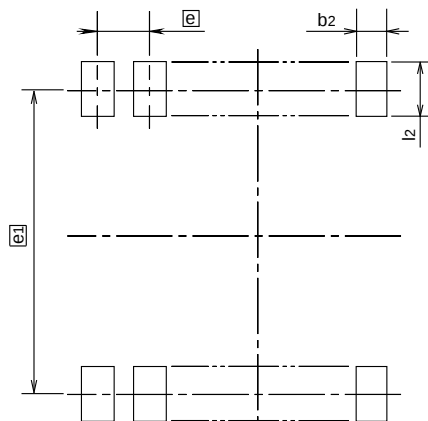
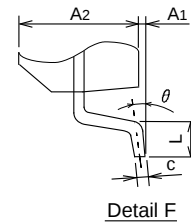
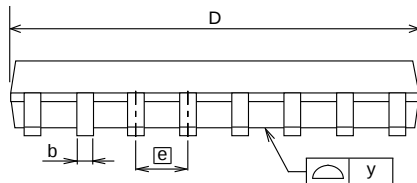
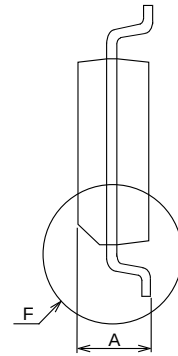
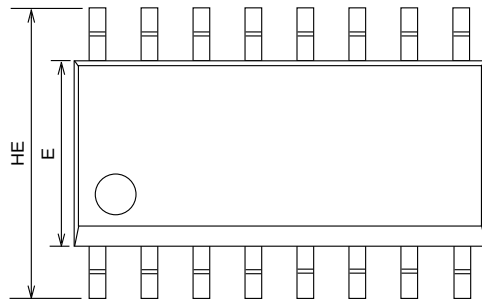
7-UNIT 500mA DARLINGTON TRANSISTOR ARRAY WITH CLAMP DIODE

## 16P2X-B

PACKAGE TYPE :

16P2X-B 16PIN PLASTIC MOLD SMALL OUTLINE PACKAGE

Dimension in mm



Recommended Mount Pad

| Symbol   | Dimension in Millimeters |       |       |
|----------|--------------------------|-------|-------|
|          | Min                      | Nom   | Max   |
| A        | 1.47                     | 1.6   | 1.73  |
| A1       | 0.1                      | 0.175 | 0.25  |
| A2       | —                        | 1.45  | —     |
| b        | 0.402                    | 0.41  | 0.42  |
| c        | 0.19                     | 0.2   | 0.25  |
| D        | 9.8                      | 9.91  | 10.01 |
| E        | 3.81                     | 3.91  | 3.99  |
| e        | —                        | 1.27  | —     |
| HE       | 5.79                     | 5.99  | 6.2   |
| L        | 0.37                     | 0.71  | 1.27  |
| y        | —                        | —     | 0.1   |
| $\theta$ | 0°                       | —     | 8°    |
| b2       | —                        | 0.76  | —     |
| e1       | —                        | 5.72  | —     |
| l2       | 1.27                     | —     | —     |