

# M63807P/FP/KP

8-UNIT 300mA TRANSISTOR ARRAY

## DESCRIPTION

M63807P/FP/KP are eight-circuit Single transistor arrays. The circuits are made of NPN transistors. Both the semiconductor integrated circuits perform high-current driving with extremely low input-current supply.

## FEATURES

- Three package configurations (P, FP, and KP)
- Medium breakdown voltage ( $BV_{CEO} \geq 35V$ )
- Synchronizing current ( $I_{C(max)} = 300mA$ )
- Low output saturation voltage
- Wide operating temperature range ( $T_a = -40$  to  $+85^\circ C$ )

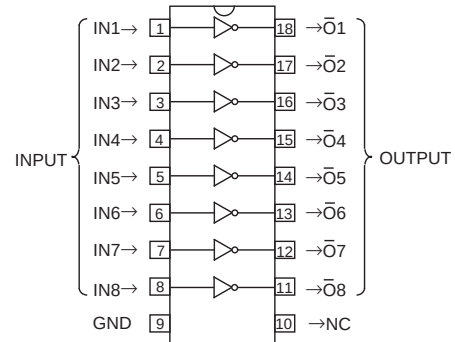
## APPLICATION

Driving of digit drives of indication elements (LEDs and lamps) with small signals

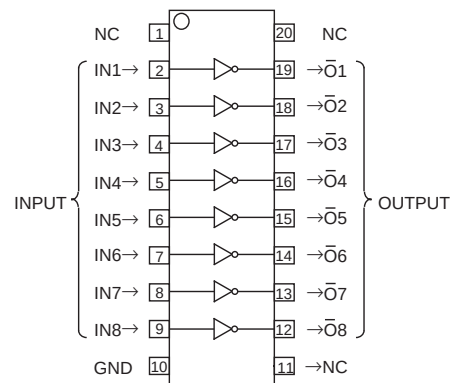
## FUNCTION

The M63807P/FP/KP each have eight circuits consisting of NPN transistor. The transistor emitters are all connected to the GND pin. The transistors allow synchronous flow of 300mA collector current. A maximum of 35V voltage can be applied between the collector and emitter.

## PIN CONFIGURATION



Package type 18P4G(P)

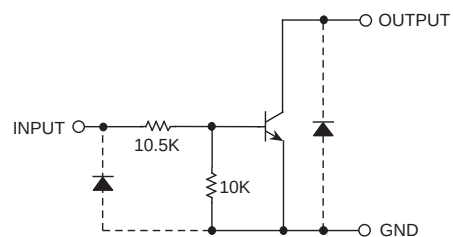


NC : No connection

20P2N-A(FP)

Package type 20P2E-A(KP)

## CIRCUIT DIAGRAM



The eight circuits share the GND.

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

Unit:  $\Omega$

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## ABSOLUTE MAXIMUM RATINGS (Unless otherwise noted, Ta = -40 ~ +85°C)

| Symbol           | Parameter                 | Conditions                       |          | Ratings    | Unit |
|------------------|---------------------------|----------------------------------|----------|------------|------|
| V <sub>CEO</sub> | Collector-emitter voltage | Output, H                        |          | −0.5 ~ +35 | V    |
| I <sub>C</sub>   | Collector current         | Current per circuit output, L    |          | 300        | mA   |
| V <sub>I</sub>   | Input voltage             |                                  |          | −0.5 ~ +35 | V    |
| P <sub>d</sub>   | Power dissipation         | Ta = 25°C, when mounted on board | M63807P  | 1.79       | W    |
|                  |                           |                                  | M63807FP | 1.10       |      |
|                  |                           |                                  | M63807KP | 0.68       |      |
| T <sub>opr</sub> | Operating temperature     |                                  |          | −40 ~ +85  | °C   |
| T <sub>stg</sub> | Storage temperature       |                                  |          | −55 ~ +125 | °C   |

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

| Symbol | Parameter                                                                                 |          | Test conditions              | Limits |     |     | Unit |
|--------|-------------------------------------------------------------------------------------------|----------|------------------------------|--------|-----|-----|------|
|        |                                                                                           |          |                              | min    | typ | max |      |
| Vo     | Output voltage                                                                            |          |                              | 0      | —   | 35  | V    |
| Ic     | Collector current<br>(Current per 1 circuit when 8 circuits are coming on simultaneously) | M63807P  | Duty Cycle no more than 50%  | 0      | —   | 250 | mA   |
|        |                                                                                           |          | Duty Cycle no more than 100% | 0      | —   | 170 |      |
|        |                                                                                           | M63807FP | Duty Cycle no more than 30%  | 0      | —   | 250 |      |
|        |                                                                                           |          | Duty Cycle no more than 100% | 0      | —   | 130 |      |
|        |                                                                                           | M63807KP | Duty Cycle no more than 12%  | 0      | —   | 250 |      |
|        |                                                                                           |          | Duty Cycle no more than 100% | 0      | —   | 100 |      |
| VIN    | Input voltage                                                                             |          |                              | 0      | —   | 30  | 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  | I <sub>CEO</sub> = 10μA                       | 35     | —    | —    | V    |
| V <sub>CE(sat)</sub> | Collector-emitter saturation voltage | I <sub>IN</sub> = 1mA, I <sub>C</sub> = 10mA  | —      | —    | 0.2  | V    |
|                      |                                      | I <sub>IN</sub> = 2mA, I <sub>C</sub> = 150mA | —      | —    | 0.8  |      |
| V <sub>IN(on)</sub>  | "On" input voltage                   | I <sub>IN</sub> = 1mA, I <sub>C</sub> = 10mA  | 7.5    | 11.0 | 15.0 | V    |
| h <sub>FE</sub>      | DC amplification factor              | V <sub>CE</sub> = 10V, I <sub>C</sub> = 10mA  | 50     | —    | —    | —    |

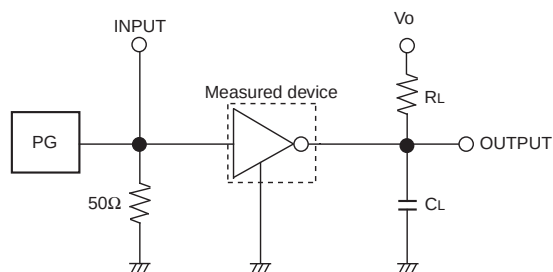
## SWITCHING CHARACTERISTICS (Unless otherwise noted, Ta = 25°C)

| Symbol           | Parameter     | Test conditions                | Limits |     |     | Unit |
|------------------|---------------|--------------------------------|--------|-----|-----|------|
|                  |               |                                | min    | typ | max |      |
| t <sub>on</sub>  | Turn-on time  | C <sub>L</sub> = 15pF (note 1) | —      | 120 | —   | ns   |
| t <sub>off</sub> | Turn-off time |                                | —      | 240 | —   | ns   |

# M63807P/FP/KP

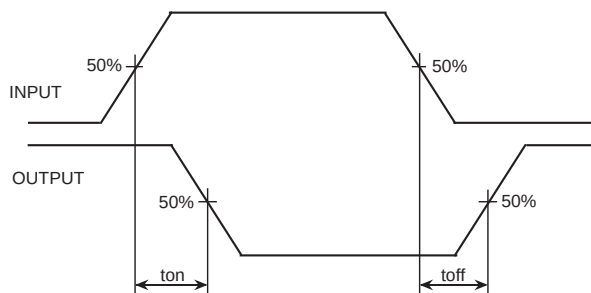
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## NOTE 1 TEST CIRCUIT

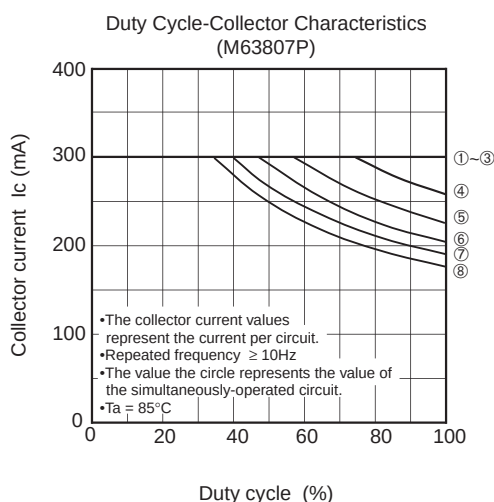
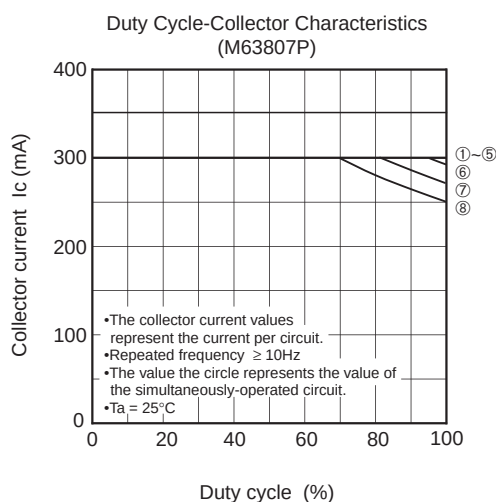
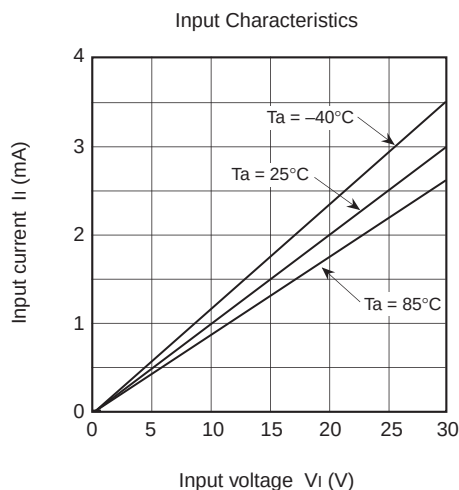
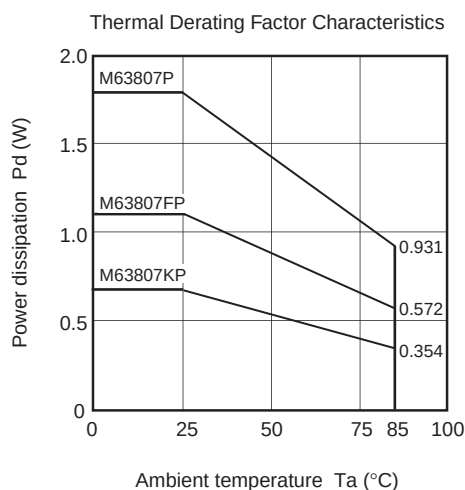


- (1) Pulse generator (PG) characteristics : PRR = 1kHz,  
 $t_w = 10\mu s$ ,  $t_r = 6ns$ ,  $t_f = 6ns$ ,  $Z_o = 50\Omega$ ,  $V_{IH} = 11V$
- (2) Input-output conditions :  $R_L = 220\Omega$ ,  $V_o = 35V$
- (3) Electrostatic capacity  $C_L$  includes floating capacitance at connections and input capacitance at probes

## TIMING DIAGRAM



## TYPICAL CHARACTERISTICS



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