

**PRELIMINARY**  
 Notice: This is not a final specification.  
 Some parametric limits are subject to change.

MITSUBISHI SEMICONDUCTOR &lt;TRANSISTOR ARRAY&gt;

**M63805P/FP/KP**

8-UNIT 300mA TRANSISTOR ARRAY

**DESCRIPTION**

M63805P/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**

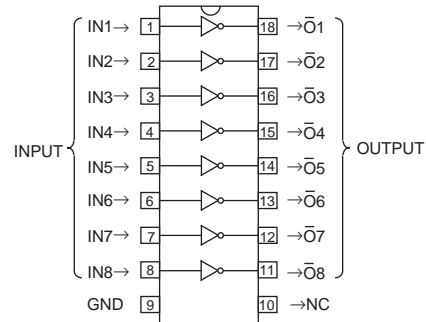
- Three package configurations (P, FP, and KP)
- Medium breakdown voltage ( $BV_{CEO} \geq 35V$ )
- Synchronizing current ( $I_{C(max)} = 300mA$ )
- With zener diodes
- Low output saturation voltage
- Wide operating temperature range ( $T_a = -40$  to  $+85^\circ C$ )

**APPLICATION**

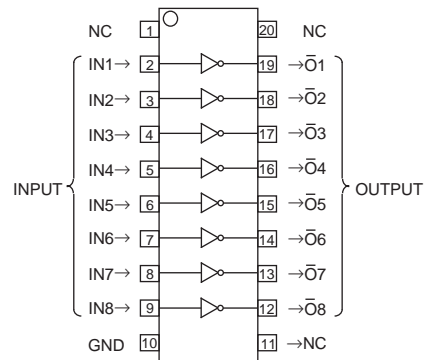
Driving of digit drives of indication elements (LEDs and lamps) with small signals

**FUNCTION**

The M63805P/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**

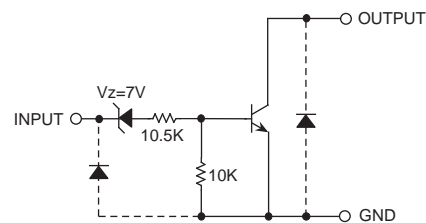
Package type 18P4G(P)



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 | M63805P    | 1.79 | W |
|                  |                           |                                  | M63805FP   | 1.10 |   |
|                  |                           |                                  | M63805KP   | 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 |      |    |
| V <sub>O</sub>  | Output voltage   |                 | 0                            | —   | 35  | V    |    |
| I <sub>C</sub>  | Collector current (Current per 1 circuit when 8 circuits are coming on simultaneously) | M63805P         | Duty Cycle no more than 50%  | 0   | —   | 250  | mA |
|                 |  |                 | Duty Cycle no more than 100% | 0   | —   | 170  |    |
|                 |  | M63805FP        | Duty Cycle no more than 30%  | 0   | —   | 250  |    |
|                 |  |                 | Duty Cycle no more than 100% | 0   | —   | 130  |    |
|                 |  | M63805KP        | Duty Cycle no more than 12%  | 0   | —   | 250  |    |
|                 | Duty Cycle no more than 100%   | 0               | —                            | 100 |     |      |    |
| V <sub>IN</sub> | 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  | 13     | 19  | 23  | V    |
| h <sub>FE</sub>      | DC amplification factor              | V <sub>CE</sub> = 10V, I <sub>C</sub> = 10mA  | 50     | —   | —   | —    |

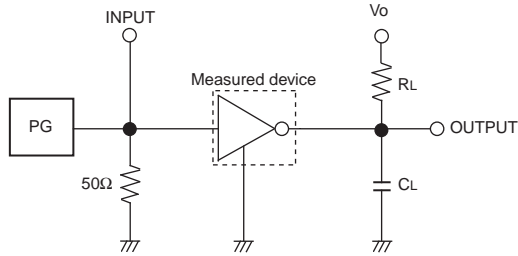
**SWITCHING CHARACTERISTICS** (Unless otherwise noted, Ta = 25°C)

| Symbol           | Parameter     | Test conditions                | Limits |     |     | Unit |
|------------------|---------------|--------------------------------|--------|-----|-----|------|
|                  |               |                                | min    | typ | max |      |
| t <sub>on</sub>  | Turn-on time  | C <sub>L</sub> = 15pF (note 1) | —      | 140 | —   | ns   |
| t <sub>off</sub> | Turn-off time |                                | —      | 240 | —   | ns   |

**M63805P/FP/KP**

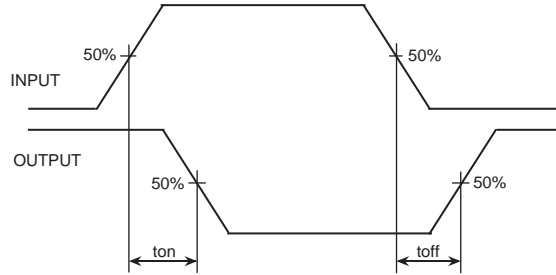
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**NOTE 1 TEST CIRCUIT**

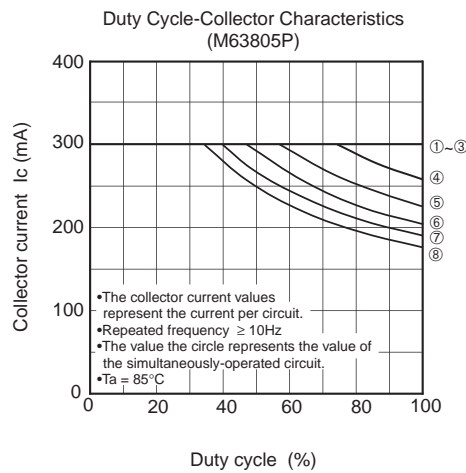
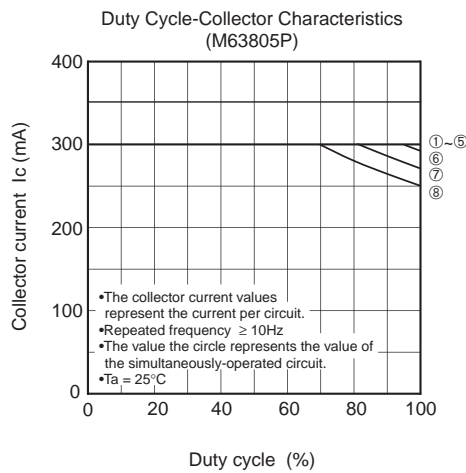
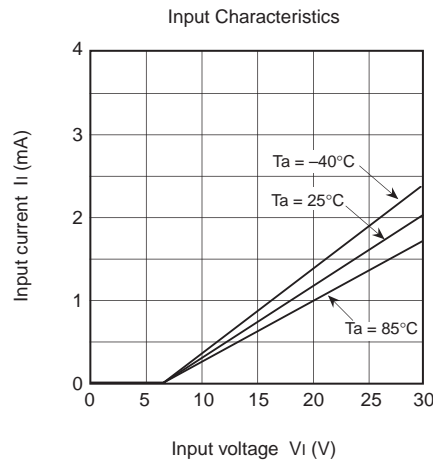
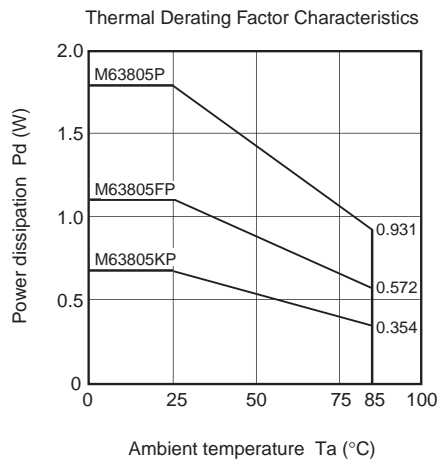


- (1) Pulse generator (PG) characteristics : PRR = 1kHz,  $t_w = 10\mu s$ ,  $t_r = 6ns$ ,  $t_f = 6ns$ ,  $Z_o = 50\Omega$ ,  $V_{IH} = 18V$
- (2) Input-output conditions :  $R_L = 220\Omega$ ,  $V_o = 35V$
- (3) Electrostatic capacity  $C_L$  includes floating capacitance at connections and input capacitance at probes

**TIMING DIAGRAM**

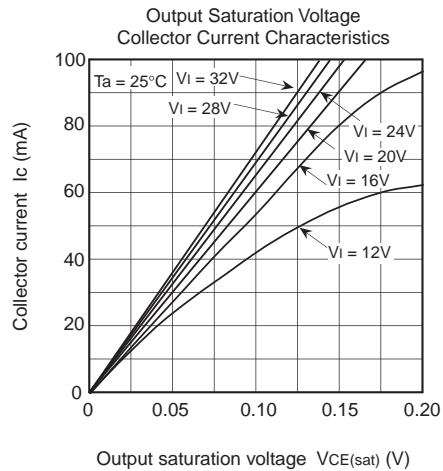
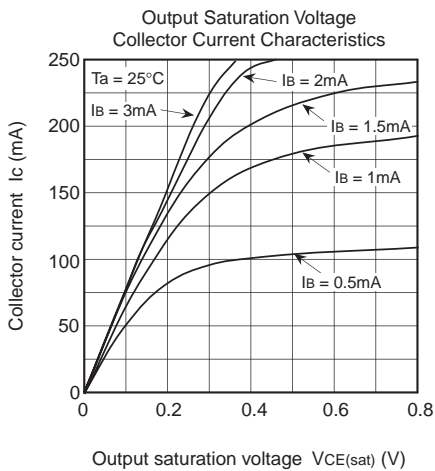
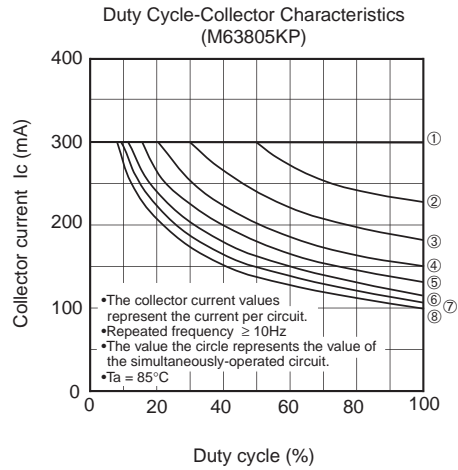
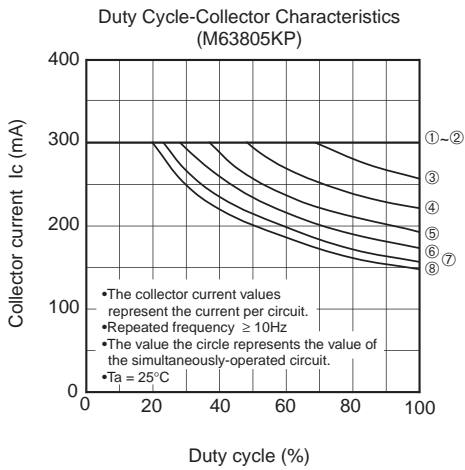
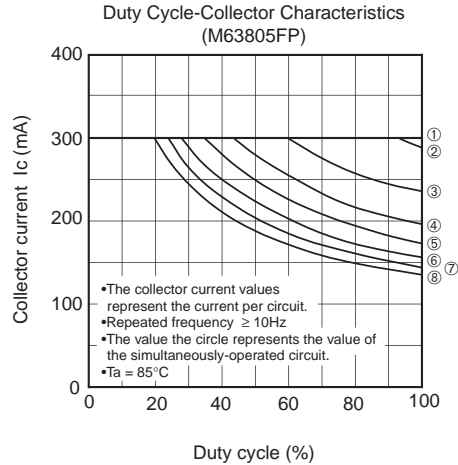
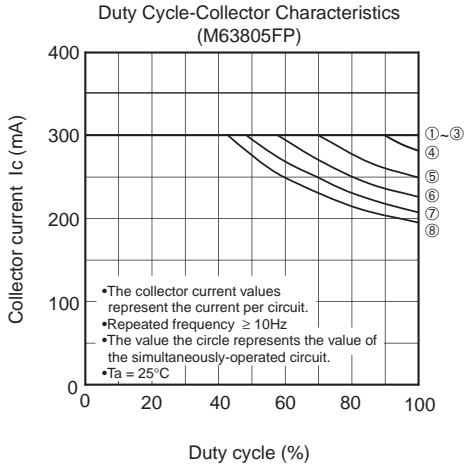


**TYPICAL CHARACTERISTICS**



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