

M63800FP

7-UNIT 500mA SOURCE TYPE DARLINGTON TRANSISTOR ARRAY WITH CLAMP DIODE

DESCRIPTION

M63800FP is a seven-circuit output-sourcing Darlington transistor array. The circuits are made of PNP and NPN transistors. This semiconductor integrated circuit performs high-current driving with extremely low input-current supply.

FEATURES

- High breakdown voltage ($BV_{CEO} \geq 50V$)
- High-current driving ($I_{O(max)} = -500mA$)
- With output clamping diodes
- Driving available with CMOS IC output of 6-16V or with TTL output
- Wide operating temperature range ($T_a = -20$ to $+75^\circ C$)
- Output current-sourcing type

APPLICATION

Drives of relays, printers, LEDs, fluorescent display tubes and lamps, and interfaces between MOS-bipolar logic systems and relays, solenoids, or small motors

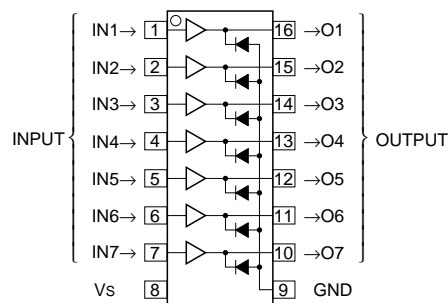
FUNCTION

The M63800FP has seven circuits, which are made of input inverters and current-sourcing outputs. The outputs are made of PNP transistors and NPN Darlington transistors. The PNP transistor base current is constant. A spike-killer clamping diode is provided between each output pin and GND. V_s (pin 8) and GND (pin 9) are used commonly among the eight circuits.

The input has resistance of $3k\Omega$, and a maximum of 10V can be applied. The output current is 500mA maximum. Supply voltage V_s is 50V maximum.

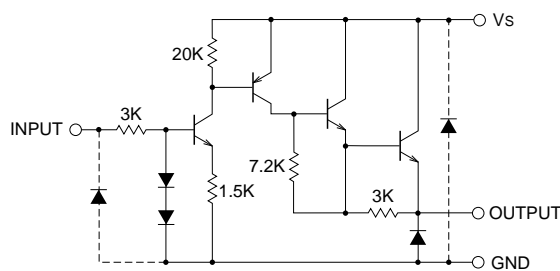
The M63800FP is enclosed in a molded small flat package, enabling space-saving design.

PIN CONFIGURATION



Package type 16P2N-A

CIRCUIT DIAGRAM



The seven circuits share the V_s and GND.
The diode, indicated with the dotted line, is parasitic, and cannot be used.

Unit : Ω

ABSOLUTE MAXIMUM RATINGS (Unless otherwise noted, $T_a = -20 \sim +75^\circ C$)

| Symbol | Parameter | Conditions | Ratings | Unit |
|-------------|--------------------------------|--|------------|------------|
| V_{CEO} # | Collector-emitter voltage | Output, L | -0.5 ~ +50 | V |
| V_s | Supply voltage | | 50 | V |
| V_i | Input voltage | | -0.5 ~ +10 | V |
| I_O | Output current | Current per circuit output, H | -500 | mA |
| 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 | 1.00 | W |
| T_{opr} | Operating temperature | | -20 ~ +75 | $^\circ C$ |
| T_{stg} | Storage temperature | | -55 ~ +125 | $^\circ C$ |

: Unused I/O pins must be connected to GND.

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RECOMMENDED OPERATING CONDITIONS (Unless otherwise noted, Ta = -20 ~ +75°C)

| Symbol | Parameter | Limits | | | Unit | |
|--------|--|-----------------------------|-----|-----|------|----|
| | | min | typ | max | | |
| Vs | Supply voltage | 0 | — | 50 | V | |
| Io | Output current (Current per 1 circuit when 7 circuits are coming on simultaneously) | Duty Cycle no more than 7% | 0 | — | -350 | mA |
| | | Duty Cycle no more than 40% | 0 | — | -100 | |
| VIH | "H" input voltage | 2.4 | 5 | 10 | V | |
| VIL | "L" input voltage | 0 | — | 0.2 | V | |

ELECTRICAL CHARACTERISTICS (Unless otherwise noted, Ta = -20 ~ +75°C)

| Symbol | Parameter | Test conditions | Limits | | | Unit |
|-------------|--------------------------------------|----------------------------------|--------|------|------|------|
| | | | min | typ* | max | |
| IS (leak) # | Supply leak current | Vs = 50V, Vi = 0.2V | — | — | 100 | µA |
| VCE (sat) | Collector-emitter saturation voltage | Vs = 10V, Vi = 2.4V, Io = -350mA | — | 1.6 | 2.4 | V |
| | | Vs = 10V, Vi = 2.4V, Io = -100mA | — | 1.45 | 2.0 | |
| Ii | Input current | Vi = 3V | — | 0.6 | 1.0 | mA |
| | | Vi = 10V | — | 2.9 | 5.0 | |
| IS | Supply current | Vs = 50V, Vi = 3V (all input) | — | 5.6 | 15.0 | mA |
| VF | Clamping diode forward voltage | IF = -350mA | — | -1.2 | -2.4 | V |
| IR # | Clamping diode reverse current | VR = 50V | — | — | 100 | µA |

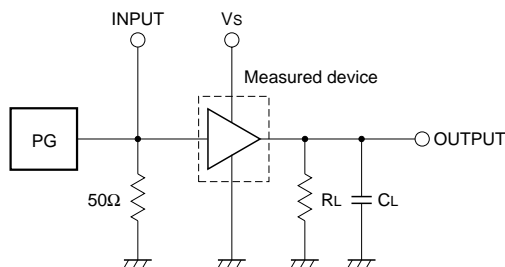
* : The typical values are those measured under ambient temperature (Ta) of 25°C. There is no guarantee that these values are obtained under any conditions.

: Unused I/O pins must be connected to GND.

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

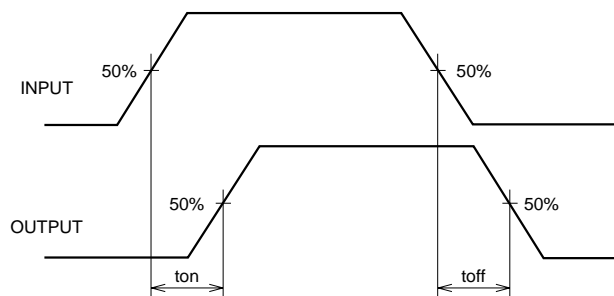
| Symbol | Parameter | Test conditions | Limits | | | Unit |
|--------|---------------|--------------------|--------|------|-----|------|
| | | | min | typ | max | |
| ton | Turn-on time | CL = 15pF (note 1) | — | 100 | — | ns |
| toff | Turn-off time | | — | 4800 | — | ns |

NOTE 1 TEST CIRCUIT



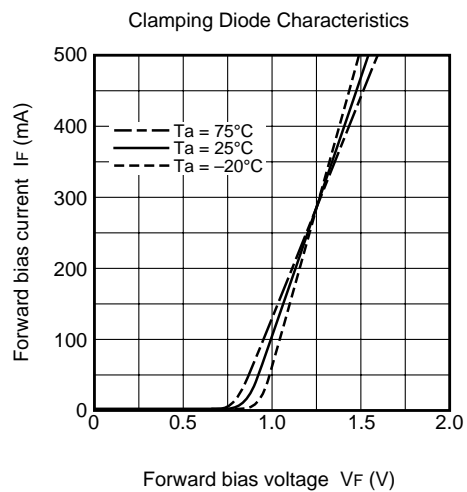
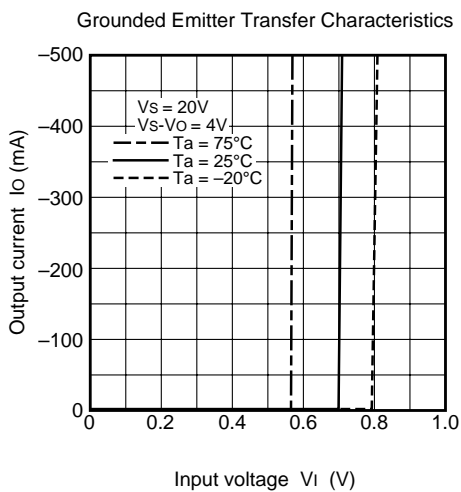
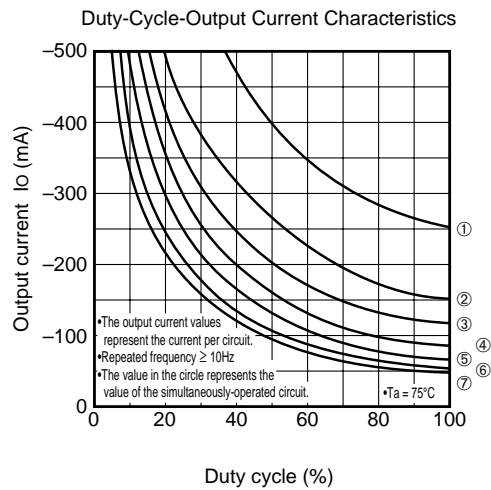
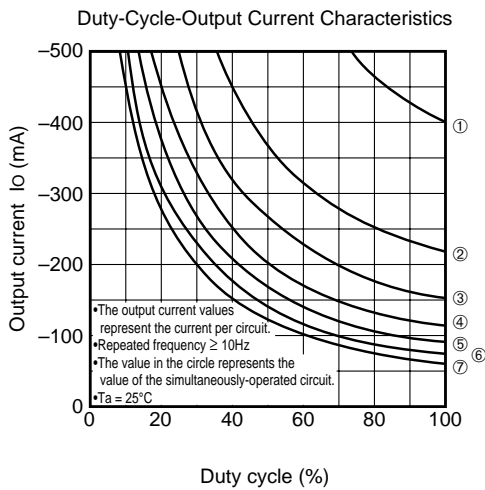
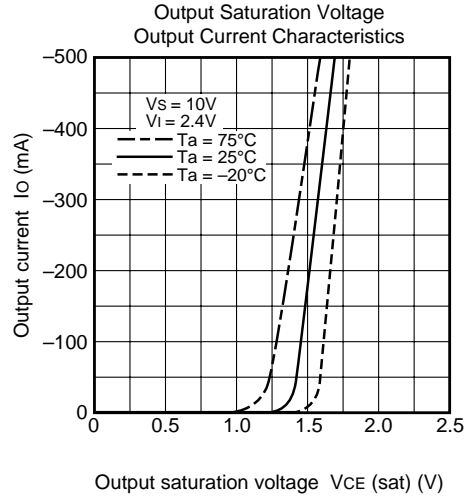
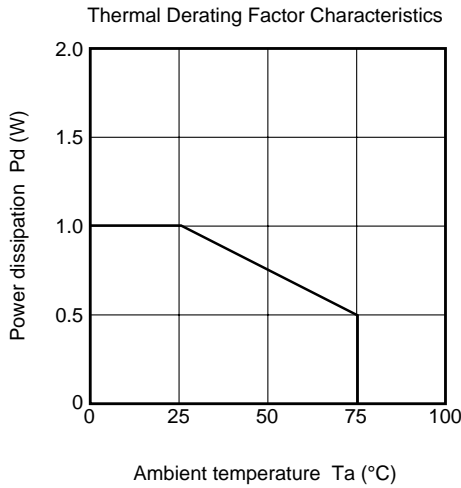
- (1) Pulse generator (PG) characteristics : PRR = 1kHz,
tw = 10µs, tr = 6ns, tf = 6ns, Zo = 50Ω
Vi = 0 to 2.4V
- (2) Input-output conditions : RL = 30Ω, Vs = 10V
- (3) Electrostatic capacity CL includes floating capacitance at connections and input capacitance at probes

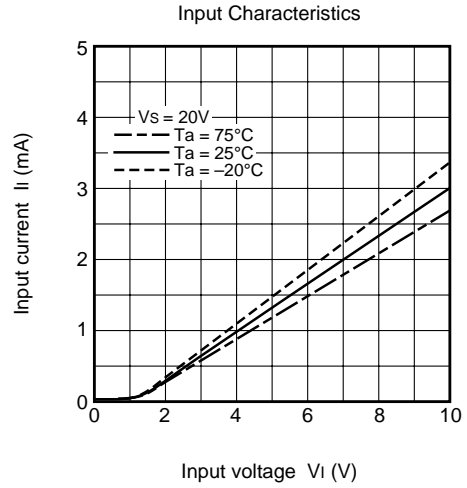
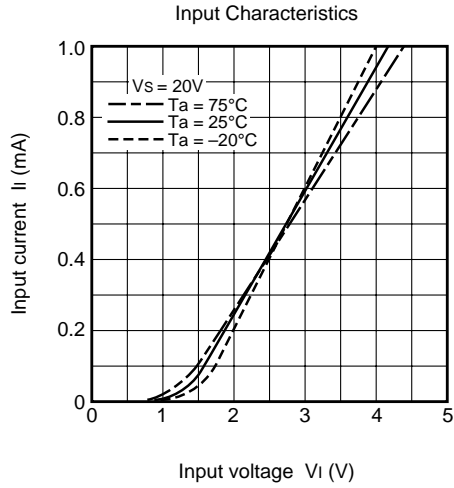
TIMING DIAGRAM



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TYPICAL CHARACTERISTICS





This datasheet has been download from:

www.datasheetcatalog.com

Datasheets for electronics components.