

ASSP

# BIDIRECTIONAL MOTOR DRIVER

## MB3763

### ■ DESCRIPTION

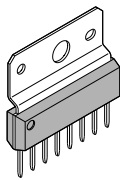
Fujitsu's MB3763 Motor Driver with forward/reverse control capability, is used in applications such as the front-loading mechanism in video tape, or the auto-reverse tape deck, driven by a TTL signal. The MB3763 has 300 mA drive units and braking capability with TTL control.

### ■ FEATURES

- Motor Drive Current : 300 mA maximum in a SIP Package  
: 150 mA maximum in a DIP/FTP Package
- Wide Power Supply Voltage Range: 4V to 18V
- TTL-control capability
- Standby capability when input is off.
- Brake capability at motor stop mode.
- Built-in diode for surge absorption
- Package: 8-pin plastic SIP package (Suffix: -PS)  
8-pin plastic DIP package (Suffix: -P)  
8-pin plastic FPT package (Suffix: -PF)

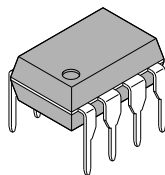
### ■ PACKAGE

Plastic SIP, 8 pin



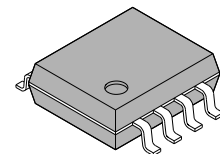
(SIP-08P-M01)

Plastic DIP, 8 pin



(DIP-08P-M01)

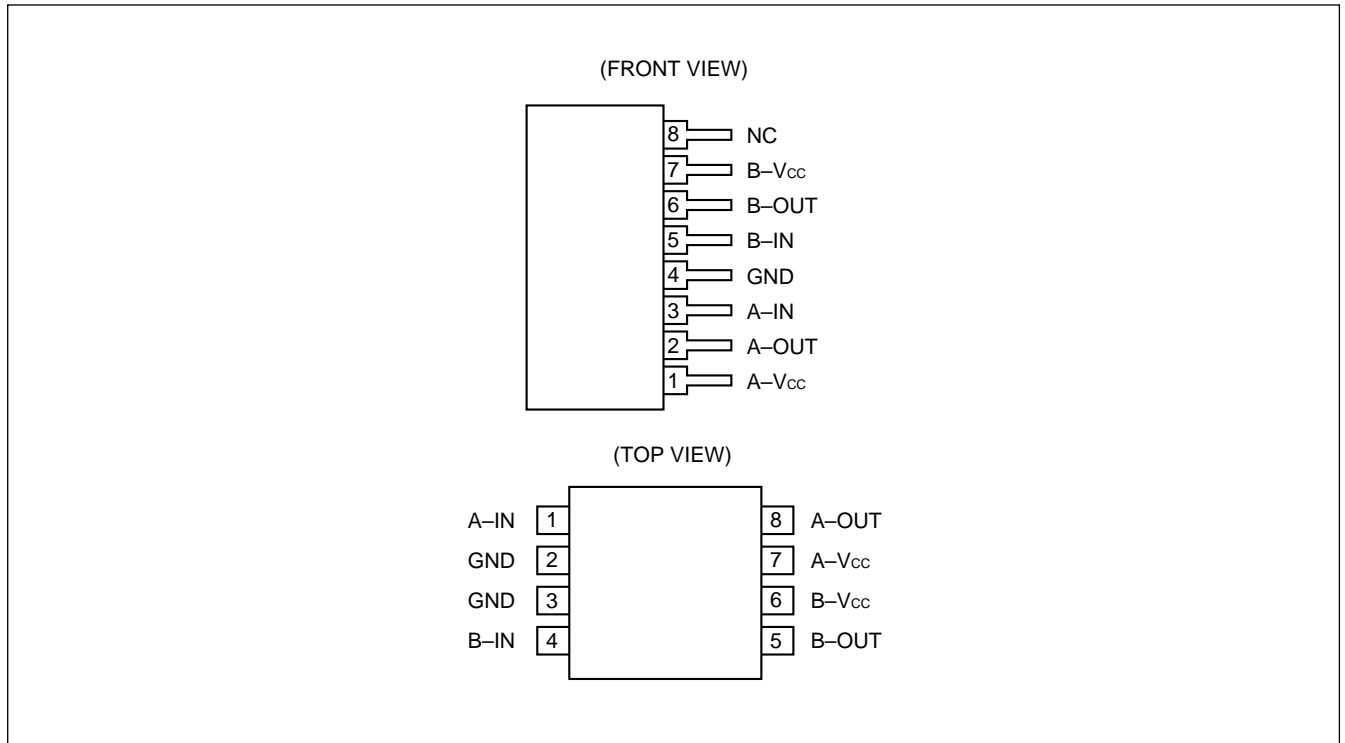
Plastic FPT, 8 pin



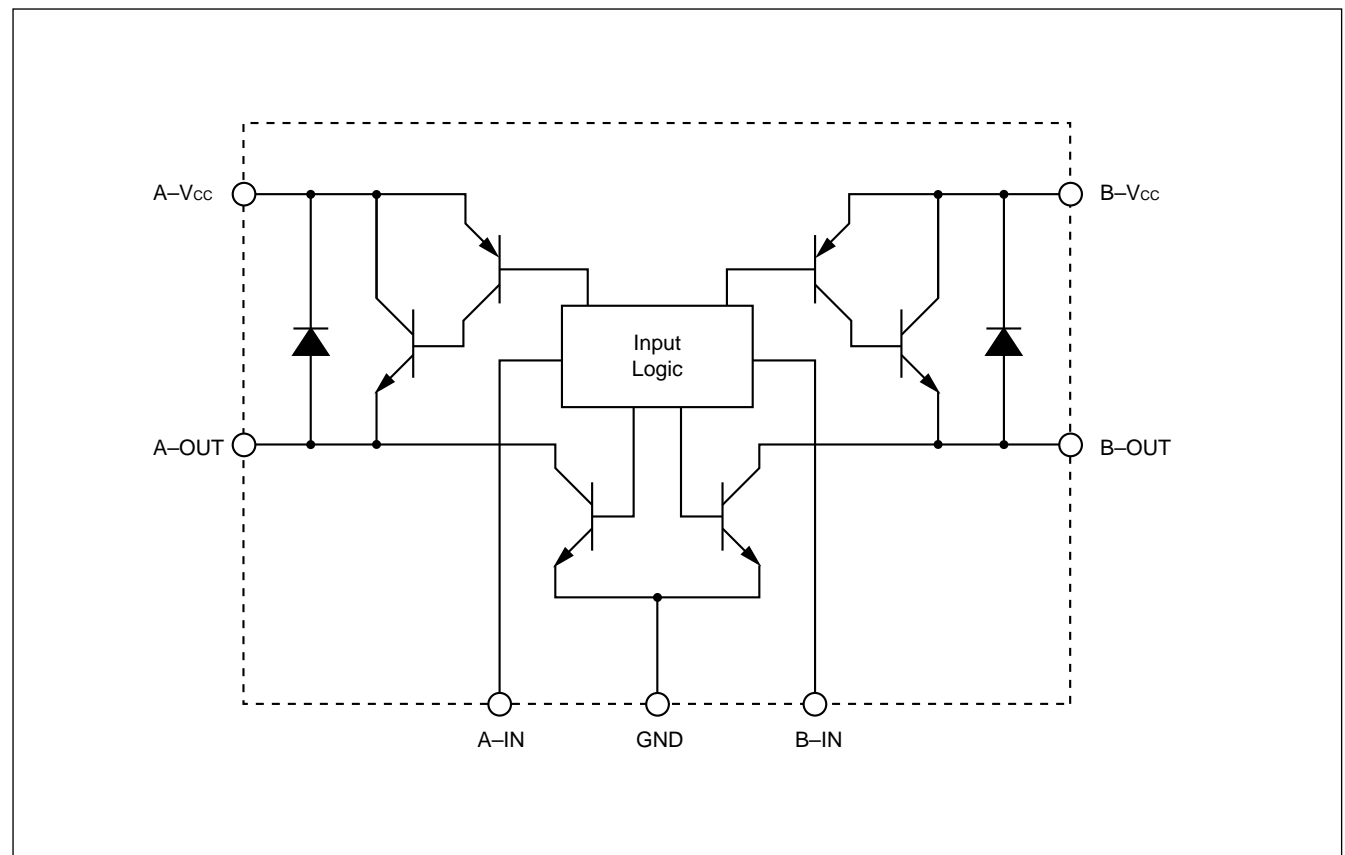
(FPT-08P-M01)

# MB3763

## ■ PIN ASSIGNMENT



## ■ BLOCK DIAGRAM



## ■ ABSOLUTE MAXIMUM RATINGS

(Ta = 25°C)

| Parameter              | Symbol                           | Value                    |               | Unit |
|------------------------|----------------------------------|--------------------------|---------------|------|
|                        |                                  | DIP/FPT (Plastic)        | SIP (Plastic) |      |
| Power supply voltage   | V <sub>CC</sub>                  | 20                       | 20            | V    |
| Output current         | I <sub>O</sub>                   | 180 (330* <sup>1</sup> ) | 330           | mA   |
| Maximum output current | I <sub>OMAX</sub> * <sup>3</sup> | 1.2                      | 1.2           | A    |
| Power Dissipation      | P <sub>D</sub>                   | 560* <sup>2</sup>        | 1000          | mW   |
| Operating temperature  | T <sub>C</sub>                   | -20 to +75               | -20 to +75    | °C   |
| Storage temperature    | T <sub>STG</sub>                 | -55 to +125              | -55 to +125   | °C   |

\*1: t<sub>ON</sub> ≤ 1 sec, Duty = 50%

\*2: Ta ≤ 60°C

\*3: t ≤ 5 ms

Precautions: Permanent device damage may occur if the above Absolute Maximum Ratings are exceeded. Functional operation should be restricted to the conditions as detailed in the operational sections of this data sheet. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

## ■ RECOMMENDED OPERATING CONDITIONS

| Parameter            | Symbol                         | Value                         |                              | Unit |
|----------------------|--------------------------------|-------------------------------|------------------------------|------|
|                      |                                | DIP/FPT (Plastic)             | SIP (Plastic)                |      |
| Power supply voltage | V <sub>CC</sub>                | 4 to 18                       | 4 to 18                      | V    |
| Output current       | I <sub>O</sub>                 | 0 to 150 (300* <sup>1</sup> ) | 0 to 300                     | mA   |
| Input high voltage   | V <sub>IH</sub> * <sup>2</sup> | 2.4 to V <sub>CC</sub> + 0.3  | 2.4 to V <sub>CC</sub> + 0.3 | V    |
| Input low voltage    | V <sub>IL</sub>                | 0 to 0.4                      | 0 to 0.4                     | V    |

\*1: t<sub>ON</sub> ≤ 1 sec, Duty = 50%\*2: When V<sub>IH</sub> ≥ V<sub>CC</sub>, I<sub>IH</sub> ≤ V<sub>CC</sub> × 0.2 mA

# MB3763

## ■ ELECTRICAL CHARACTERISTICS

( $V_{CC} = 12V$ ,  $I_o = 150/300\text{ mA}$ ,  $T_a = 25^\circ\text{C}$ )

| Parameter                        | Symbol   | Condition                               | Value           |      |      | Unit          |    |
|----------------------------------|--|---|-----------------|------|------|---------------|----|
|                                  |  |   | Min.            | Typ. | Max. |               |    |
| Standby supply current           | $I_{CC0}$                                      | $V_{CC} = 18V$ , $V_{IA} = V_{IB} = 0V$ | —               | —    | 1.0  | mA            |    |
| Power supply current             | $I_{CC1}$                                      | $I_o = 0\text{ mA}$                     | —               | 10   | 20   | mA            |    |
|                                  | $I_{CC2}$                                      | $I_o = 150/300\text{ mA}$               | Plastic DIP/FPT | —    | 10   | —             | mA |
|                                  |  |   | Plastic SIP     | —    | 15   | —             |    |
| $I_{CC3}$                        | $I_o = 0\text{ mA}$ , $V_{IA} = V_{IB} = 2.4V$ | —                                       | 15              | —    | mA   |               |    |
| Output high voltage              | $V_{OH}$                                       | Plastic DIP/FPT                         | 11.0            | 11.2 | —    | V             |    |
|                                  |  | Plastic SIP                             | 10.8            | 11.1 | —    |               |    |
| Output low voltage               | $V_{OL}$                                       | Plastic DIP/FPT                         | —               | 0.1  | 0.2  | V             |    |
|                                  |  | Plastic SIP                             | —               | 0.2  | 0.5  |               |    |
| Output saturation voltage        | $V_{SAT}$                                      | Plastic DIP/FPT                         | —               | 0.9  | 1.2  | V             |    |
|                                  |  | Plastic SIP                             | —               | 1.1  | 1.7  |               |    |
| Input current                    | $I_{IH}$                                       | $V_{IN} = 2.4V$                         | —               | 250  | 400  | $\mu\text{A}$ |    |
| Input switching prohibition time | $T_{OFF}$                                      | —                                       | 10              | —    | —    | $\mu\text{s}$ |    |

DIP: Dual line in package  
 SIP: Single in line package  
 FPT: Flat package

## FUNCTIONAL DESCRIPTIONS

### FORWARD/REVERSE MODE (MODE B & C)

In this mode, the transistor pairs Q2-Q3 and Q1-Q4 work alternatively, changing the output current direction.

When the mode B is selected, Q2 and Q3 are active and Q1 and Q4 are inactive. Therefore A-OUT is at low level and B-OUT is at high level, with the current flowing from B-OUT to A-OUT through the motor. On the other hand, when the mode C is selected, the current flows in the reverse direction.

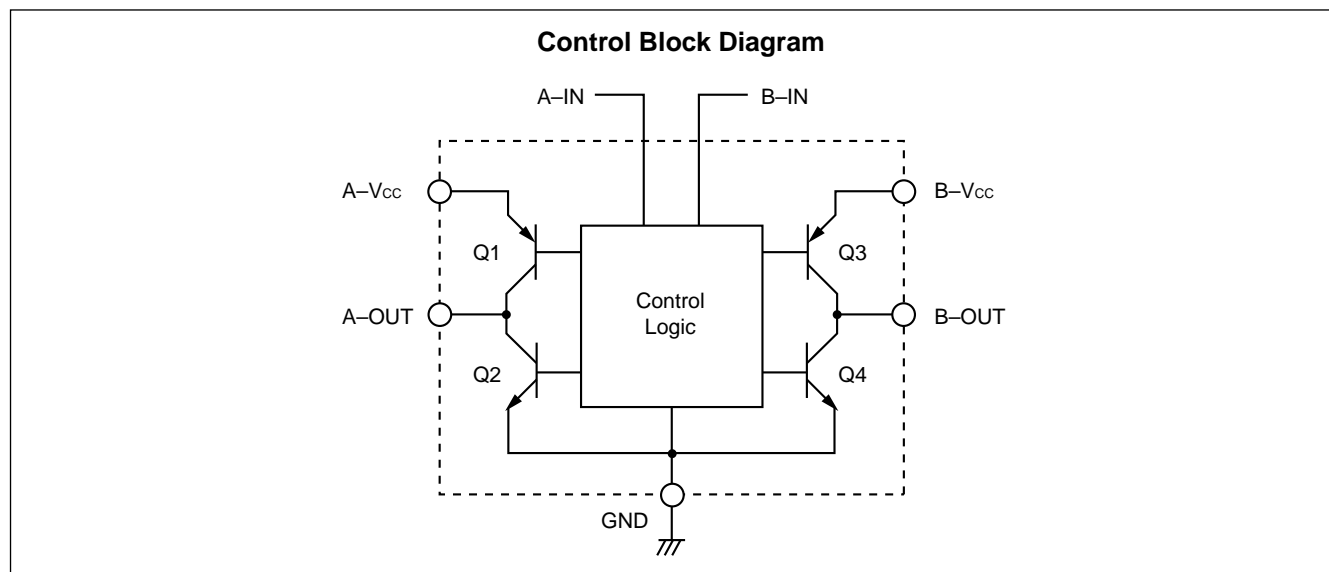
### BRAKE/STOP MODE (MODE A)

When the mode A is selected, Q1 and Q3 are inactive and Q2 and Q4 are active. A-OUT and B-OUT are stuck at low-level; terminals of motor are shorted and the motor is forced to stop.

### STANDBY MODE (MODE D)

In this mode, all transistors are inactive and the current through the motor does not flow. When the power supply voltage is applied to A-Vcc and B-Vcc, the supply current is still less than or equal to 0.1 mA.

## CONTROL MODE

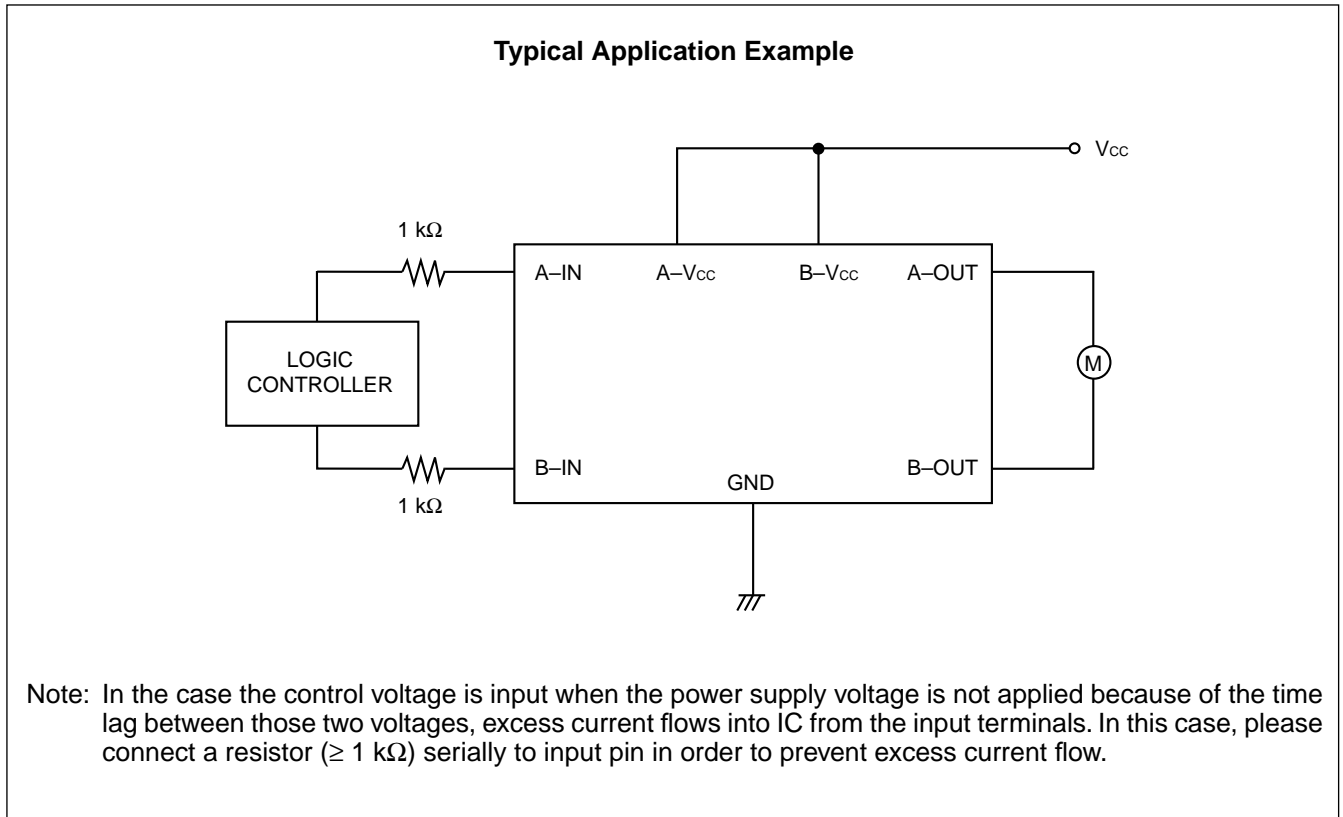


| Mode | Input mode |      | Output mode |       | Operation      |
|------|------------|------|-------------|-------|----------------|
|      | A-IN       | B-IN | A-OUT       | B-OUT |                |
| A    | 1          | 1    | L           | L     | short (Brake)  |
| B    | 1          | 0    | L           | H     | Forward        |
| C    | 0          | 1    | H           | L     | Reverse        |
| D    | 0          | 0    | —           | —     | Open (Standby) |

Notes: 1:  $\geq 2.4V$   
0:  $\leq 0.4V$

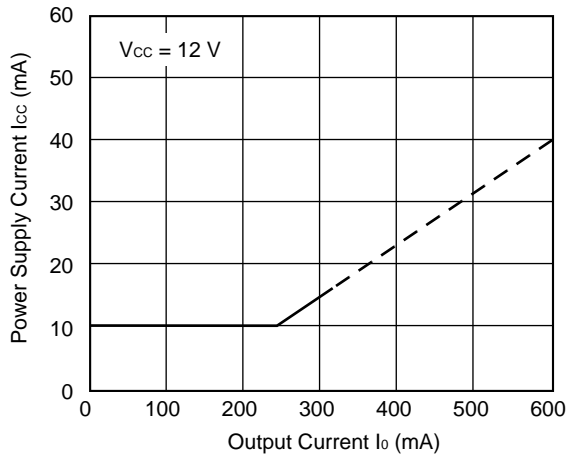
# MB3763

## ■ TYPICAL APPLICATION

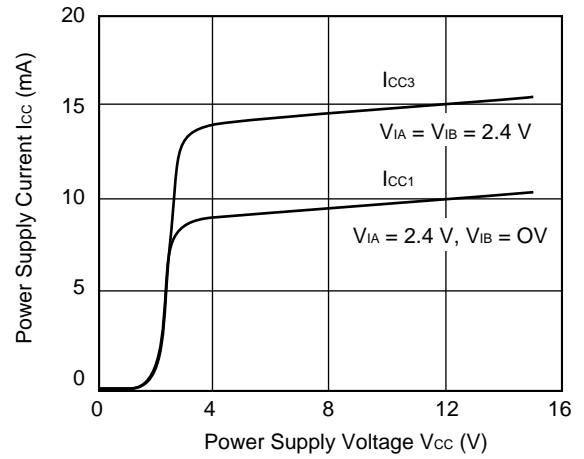


## ■ TYPICAL PERFORMANCE CHARACTERISTICS

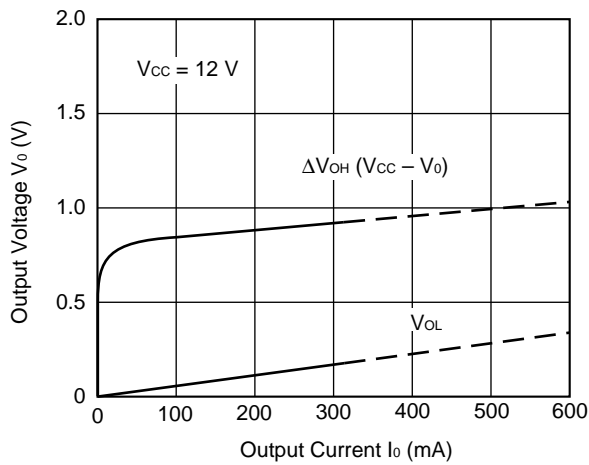
**Output Current vs. Power Supply Current**



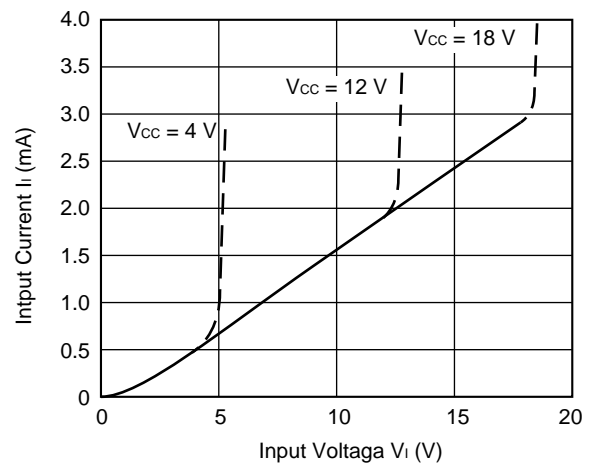
**Power Supply Voltage vs. Power Supply Current**



**Output Current vs. Output Voltage**



**Input Voltage vs. Input Current**

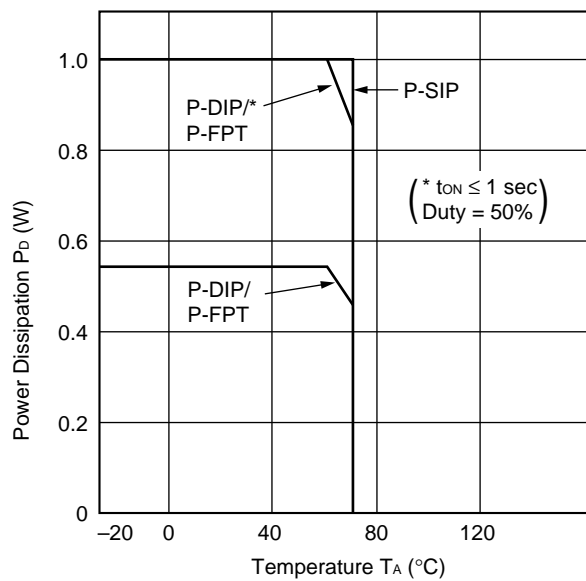


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**Temperature vs. Power Dissipation**



PF'S value is measured on the ceramic board  
(3.0 cm x 3.0 cm x 0.05 cm)

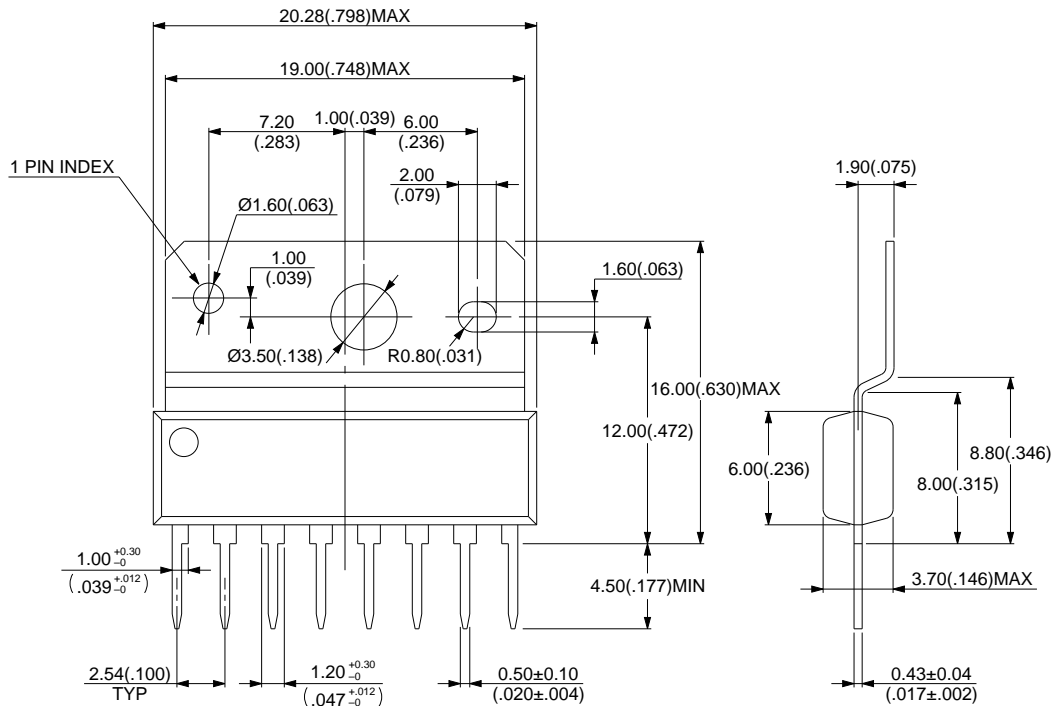
Notes P :Plastic DIP  
PF :Plastic Flat Package  
PS :Plastic SIP

Maximum power dissipation must be kept.



## ■ PACKAGE DIMENSIONS

8 pin, Plastic SIP  
(SIP-08P-M01)



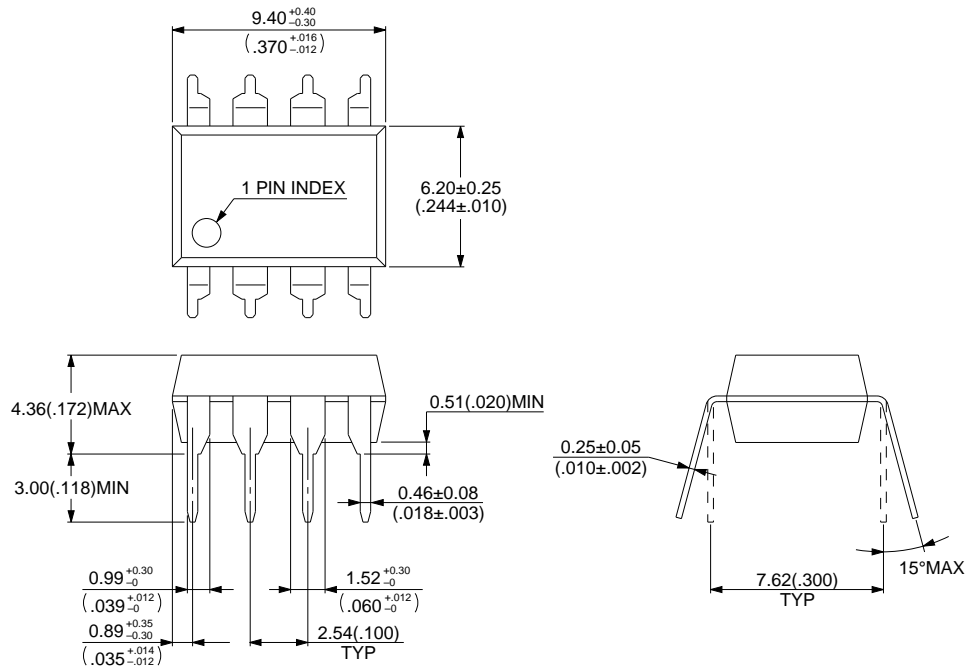
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Dimensions in mm(inches)

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## MB3763

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8 pin, Plastic DIP  
(DIP-08P-M01)

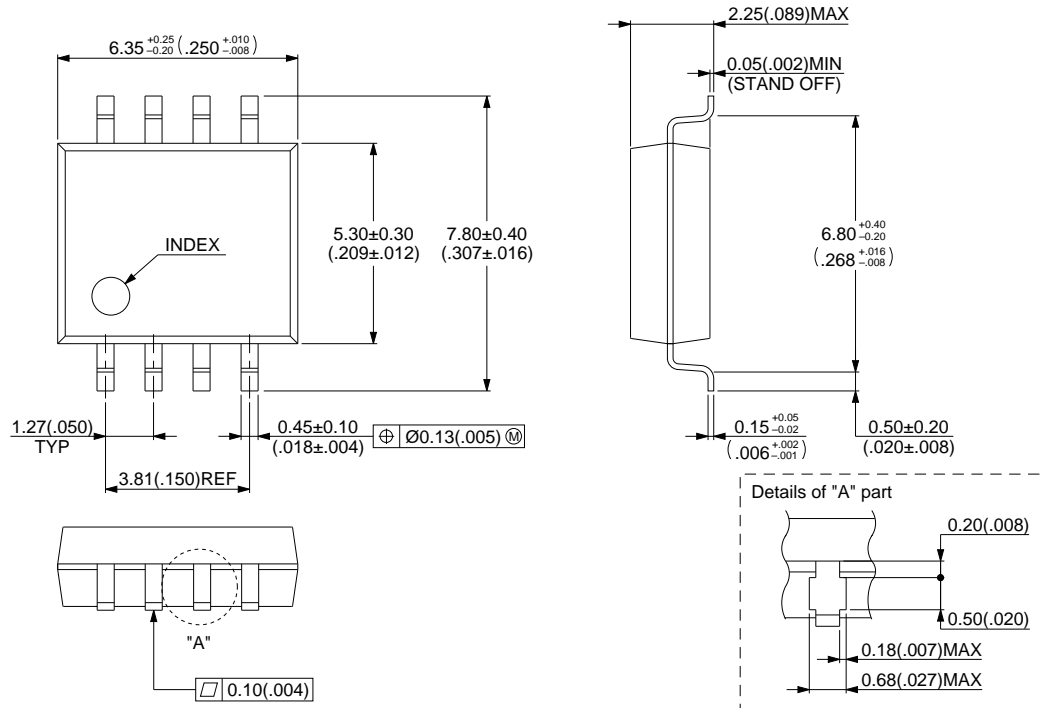
Dimensions in mm(inches)

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8 pin, Plastic SOP  
(FPT-08P-M01)



Dimensions in mm(inches)

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