

ASSP

BIDIRECTIONAL MOTOR DRIVER

MB3763

■ DESCRIPTION

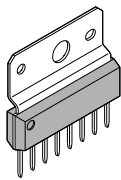
Fujitsu's MB3763 Motor Driver with forward/reverse control capability, is used in applications such as the front-loading mechanism in video tape, or the auto-reverse tape deck, driven by a TTL signal. The MB3763 has 300 mA drive units and braking capability with TTL control.

■ 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)

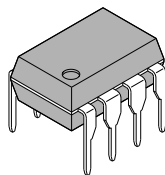
■ PACKAGE

Plastic SIP, 8 pin



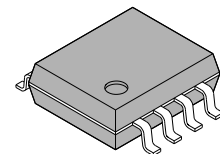
(SIP-08P-M01)

Plastic DIP, 8 pin



(DIP-08P-M01)

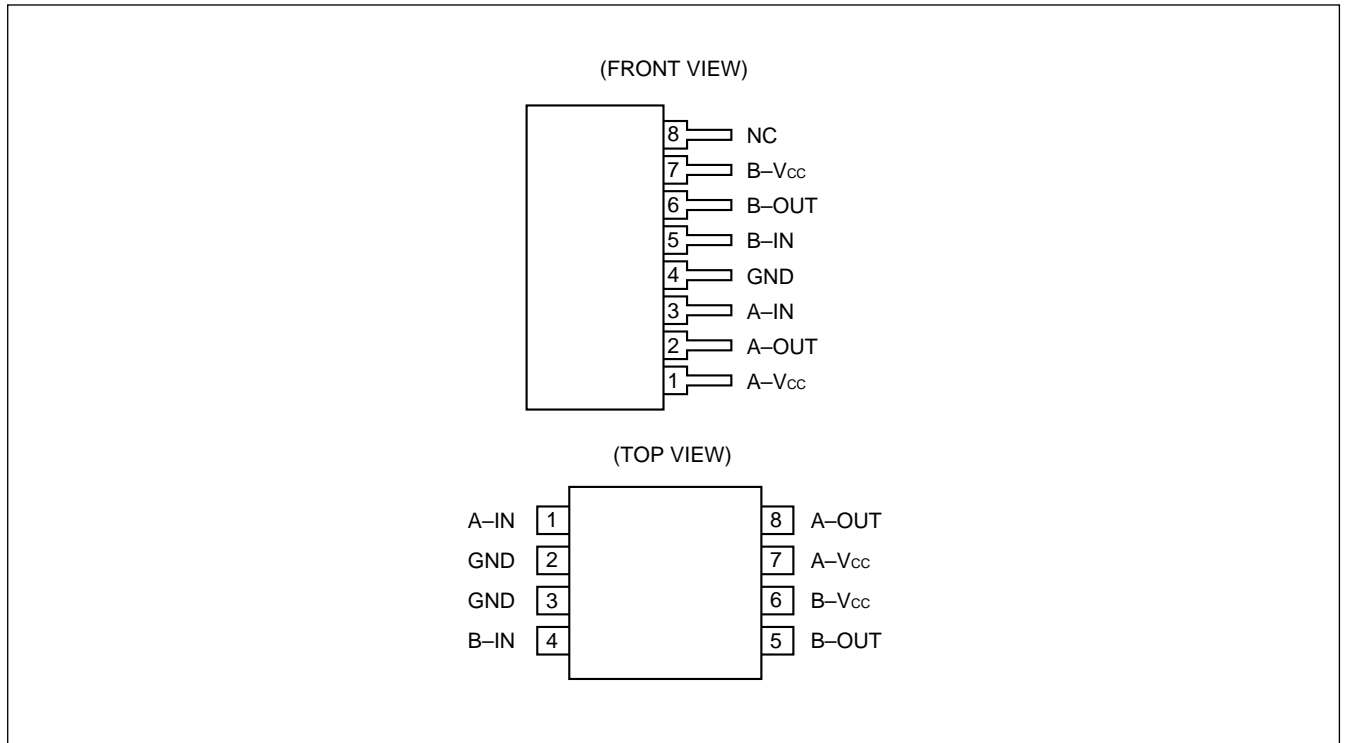
Plastic FPT, 8 pin



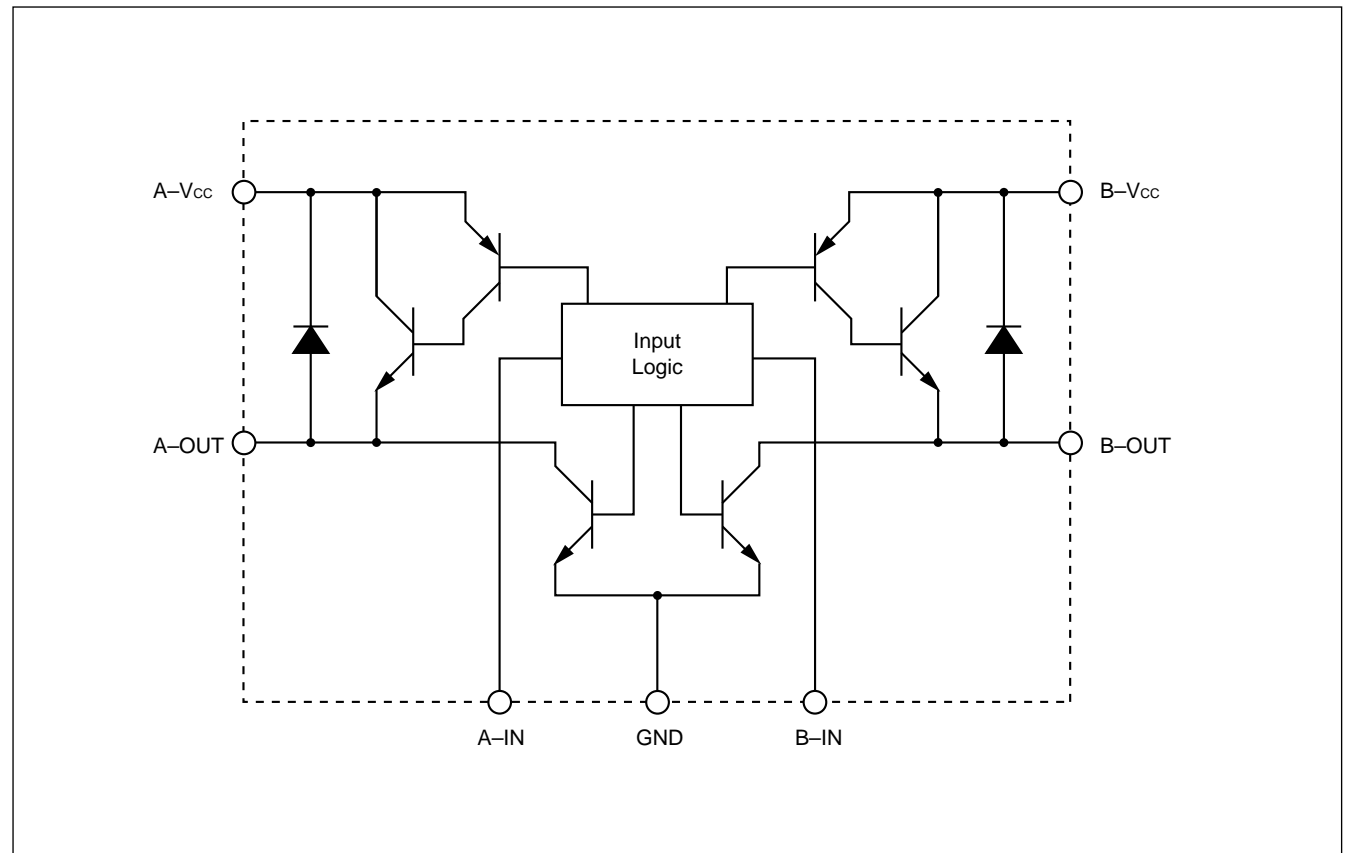
(FPT-08P-M01)

MB3763

■ PIN ASSIGNMENT



■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS

(Ta = 25°C)

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

*1: t_{ON} ≤ 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 _{CC} | 4 to 18 | 4 to 18 | V |
| Output current | I _O | 0 to 150 (300* ¹) | 0 to 300 | mA |
| Input high voltage | V _{IH} * ² | 2.4 to V _{CC} + 0.3 | 2.4 to V _{CC} + 0.3 | V |
| Input low voltage | V _{IL} | 0 to 0.4 | 0 to 0.4 | V |

*1: t_{ON} ≤ 1 sec, Duty = 50%*2: When V_{IH} ≥ V_{CC}, I_{IH} ≤ V_{CC} × 0.2 mA

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■ 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 | μA | |
| Input switching prohibition time | T_{OFF} | — | 10 | — | — | μs | |

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.

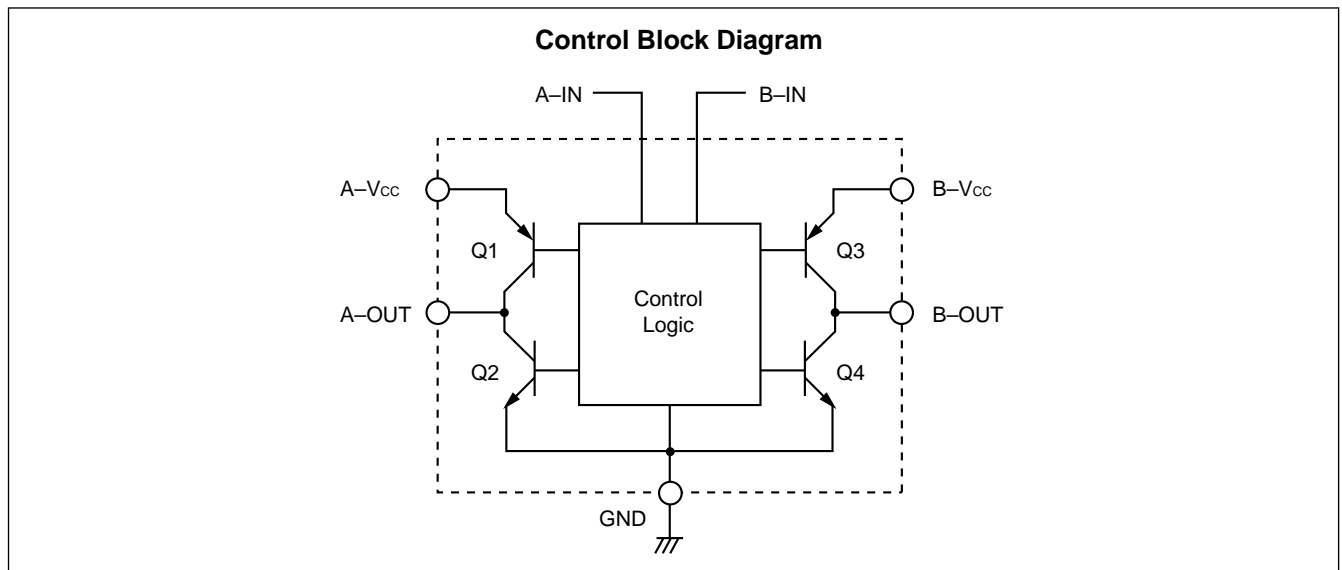
BRAKE/STOP MODE (MODE A)

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



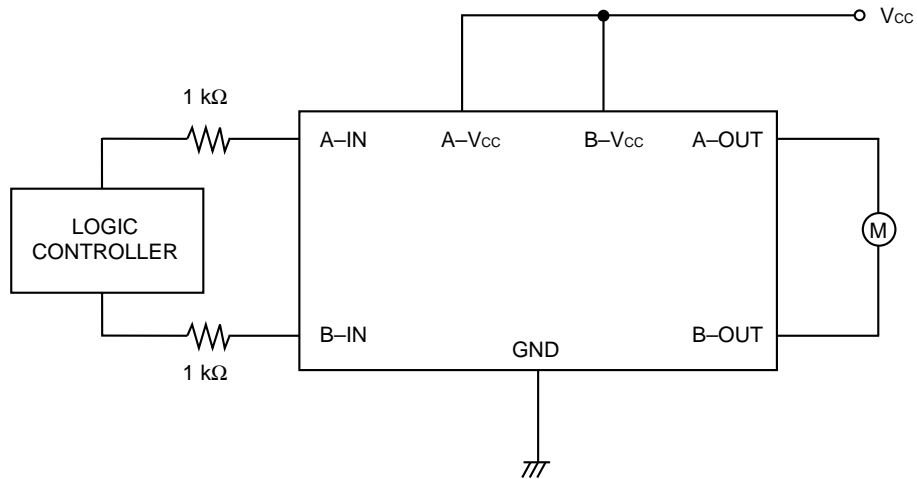
| Mode | Input mode | | Output mode | | Operation |
|------|------------|------|-------------|-------|----------------|
| | A-IN | B-IN | A-OUT | B-OUT | |
| A | 1 | 1 | L | L | short (Brake) |
| B | 1 | 0 | L | H | Forward |
| C | 0 | 1 | H | L | Reverse |
| D | 0 | 0 | — | — | Open (Standby) |

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

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■ TYPICAL APPLICATION

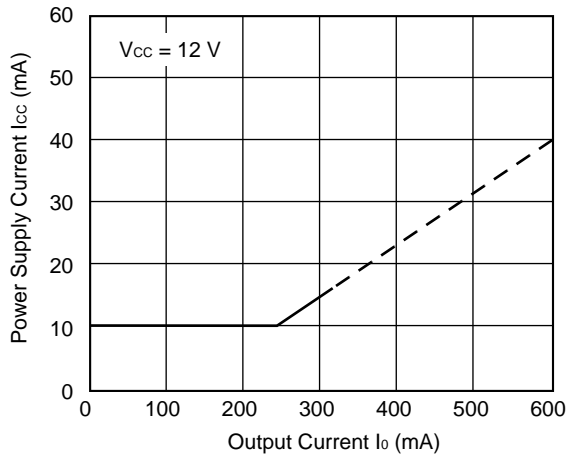
Typical Application Example



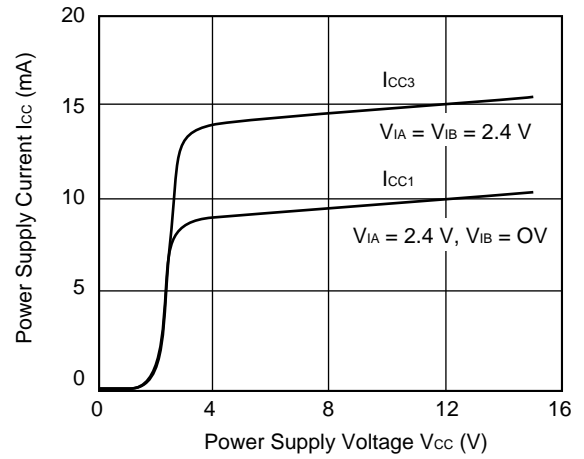
Note: In the case the control voltage is input when the power supply voltage is not applied because of the time lag between those two voltages, excess current flows into IC from the input terminals. In this case, please connect a resistor ($\geq 1\text{ k}\Omega$) serially to input pin in order to prevent excess current flow.

■ TYPICAL PERFORMANCE CHARACTERISTICS

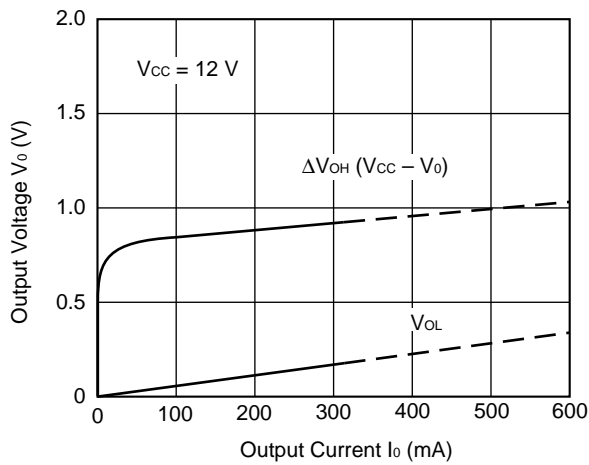
Output Current vs. Power Supply Current



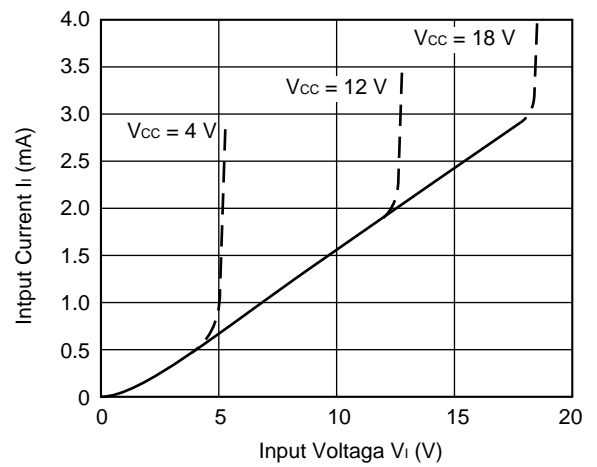
Power Supply Voltage vs. Power Supply Current



Output Current vs. Output Voltage



Input Voltage vs. Input Current

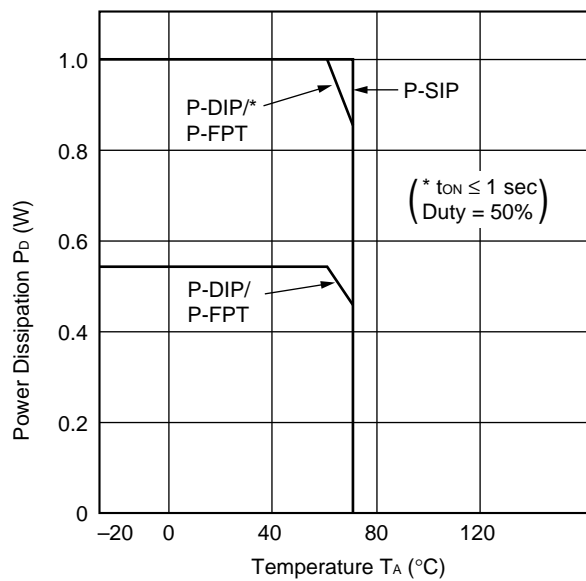


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Temperature vs. Power Dissipation



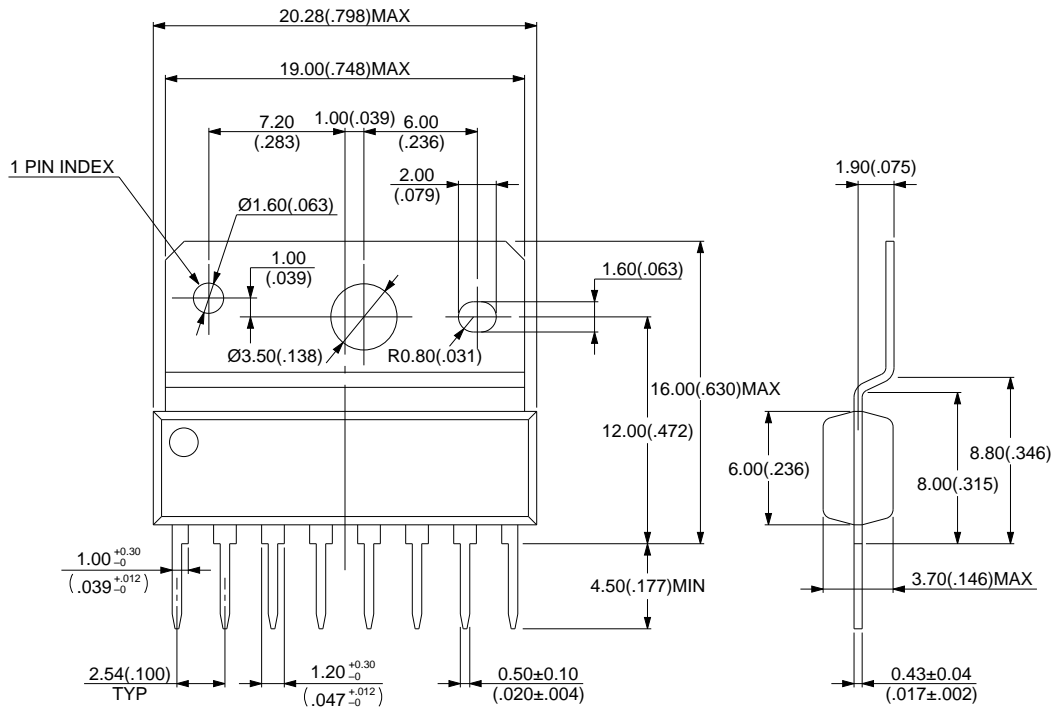
PF'S value is measured on the ceramic board
(3.0 cm x 3.0 cm x 0.05 cm)

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)



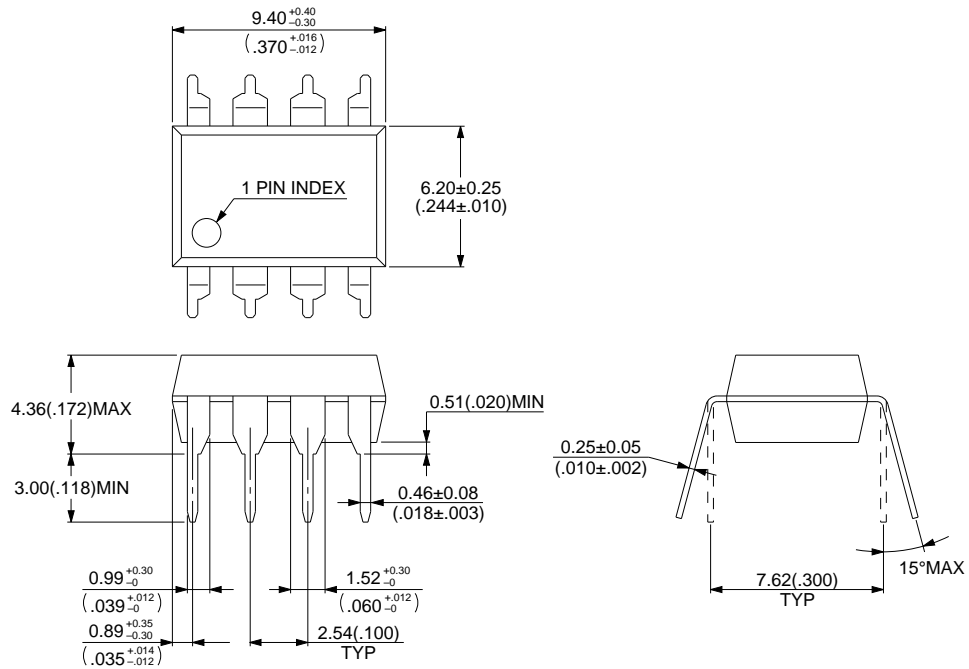
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Dimensions in mm(inches)

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

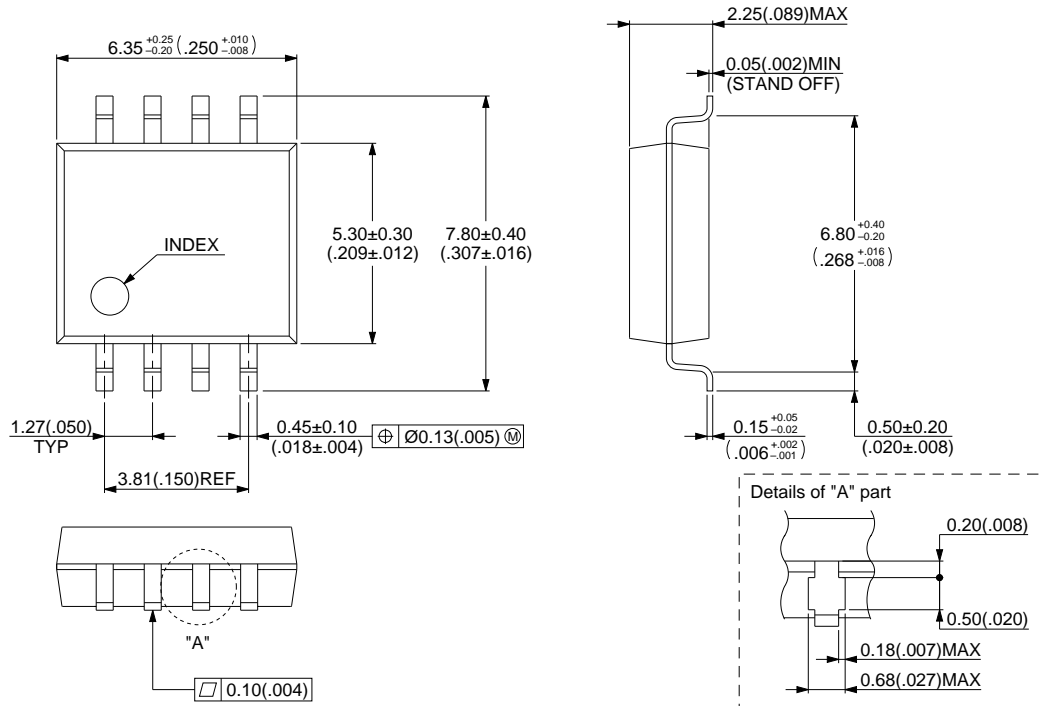
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Dimensions in mm(inches)

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



Dimensions in mm(inches)

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FUJITSU LIMITED

For further information please contact:

Japan

FUJITSU LIMITED
Corporate Global Business Support Division
Electronic Devices
KAWASAKI PLANT, 4-1-1, Kamikodanaka
Nakahara-ku, Kawasaki-shi
Kanagawa 211-88, Japan
Tel: (044) 754-3763
Fax: (044) 754-3329

North and South America

FUJITSU MICROELECTRONICS, INC.
Semiconductor Division
3545 North First Street
San Jose, CA 95134-1804, U.S.A.
Tel: (408) 922-9000
Fax: (408) 432-9044/9045

Europe

FUJITSU MIKROELEKTRONIK GmbH
Am Siebenstein 6-10
63303 Dreieich-Buchsschlag
Germany
Tel: (06103) 690-0
Fax: (06103) 690-122

Asia Pacific

FUJITSU MICROELECTRONICS ASIA PTE. LIMITED
#05-08, 151 Lorong Chuan
New Tech Park
Singapore 556741
Tel: (65) 281-0770
Fax: (65) 281-0220

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