FUJITSU

# LOW NOISE DUAL OPERATIONAL AMPLIFIER

**MB47833**

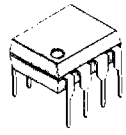
May 1988
Edition 1.0

## LOW NOISE DUAL OPERATIONAL AMPLIFIER

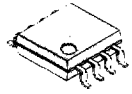
The Fujitsu MB47833 is a dual operational amplifier with a high slew rate, broad bandwidth and low noise characteristics.

The MB47833 is an excellent preamplifier for PCM and high-fidelity audio systems. The device is functionally compatible with the LM833.

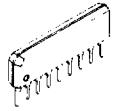
- Wide Power Supply Range: ±1.5V to ±15V
- High Slew Rate: 7 V/μs
- Low Input Noise Voltage: 4.5 nV/$\sqrt{Hz}$
- Wide Gain Bandwidth: 15 MHz
- Internal Phase Compensation



PLASTIC PACKAGE
DIP-08P-M01

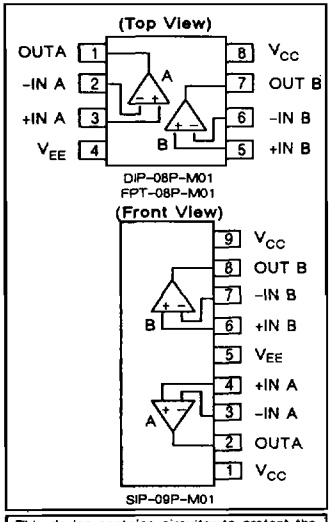


PLASTIC PACKAGE
FPT-08P-M01



PLASTIC PACKAGE
SIP-09P-M01

### PIN ASSIGNMENTS




This device contains circuitry to protect the inputs against damage due to high static voltages or electric fields. However, it is advised that normal precautions be taken to avoid application of any voltage higher than maximum rated voltages to this high impedance circuit.

### ABSOLUTE MAXIMUM RATINGS (See NOTE)

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Power Supply Voltage | $V_{CC}$ | +18 | V |
| | $V_{EE}$ | -18 | V |
| Differential Input Voltage | $V_{ID}$ | ±30 | V |
| Common Mode Input Voltage | $V_I$ | ±15 | V |
| Power Dissipation | $P_D$ | 350 ($T_A \leq 55°C$) | mW |
| Operating Temperature | $T_A$ | -30 to +85 | °C |
| Storage Temperature | $T_{STG}$ | -55 to +125 | °C |

**Note:** Permanent device damage may occur if 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.

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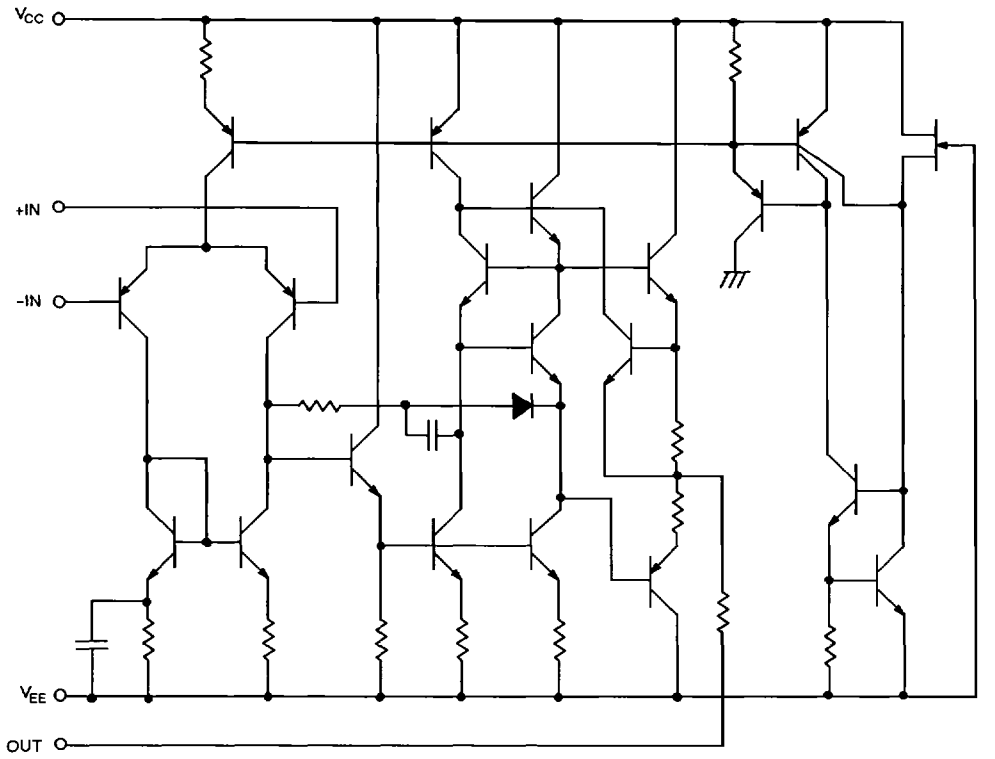
Fig. 1 — EQUIVALENT CIRCUIT



# RECOMMENDED OPERATING CONDITIONS

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Power Supply Voltage | $V_{CC}$ | ±1.5 to ±15 | V |
| | $V_{EE}$ | | |
| Ambient Operating Temperature | $T_A$ | -30 to +85 | °C |

# ELECTRICAL CHARACTERISTICS

($V_{CC}$ = +15V, $V_{EE}$ = -15V, $T_A$ = 25°C, unless otherwise noted.)

| Parameter | Symbol | Conditions | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | Minimum | Typical | Maximum | |
| Input Offset Voltage | $V_{IO}$ | | | 0.3 | 5.0 | mV |
| Input Offset Current | $I_{IO}$ | | | 10 | 200 | nA |
| Input Bias Current | $I_{IN}$ | | | 500 | 1000 | nA |
| Common Mode Input Voltage | $V_{CM}$ | | ±12 | ±14 | | V |
| Common Mode Rejection Ratio | CMR | | 80 | 100 | | dB |
| Supply Voltage Rejection Ratio | SVR | | 80 | 100 | | dB |
| Voltage Gain | $A_V$ | $R_L$ = 2kΩ | 90 | 110 | | dB |
| Power Supply Current | $I_{CC}$ | | | 5.0 | 8.0 | mA |
| Maximum Output Voltage | $V_{OM}$ | $R_L \geq$ 10kΩ | ±12 | ±13.5 | | V |
| | | $R_L \geq$ 2kΩ | ±10 | ±13.4 | | V |
| Gain Bandwidth Product | GBW | $R_L$ = 2kΩ, f = 100kHz | | 15 | | MHz |
| Slew Rate | SR | $R_L$ = 2kΩ, C = 100pF<br>$A_V$ = 1 | | 7 | | V/μS |
| Channel Separation | CS | f = 1kHz | | 120 | | dB |
| Input Noise Voltage | $V_{NI}$ | NAB, JISA<br>RS = 600Ω, f = 1kHz | | 0.4 | | μV |

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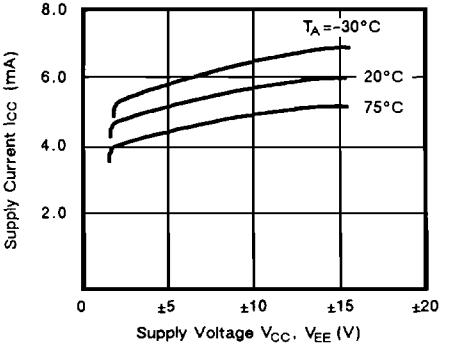
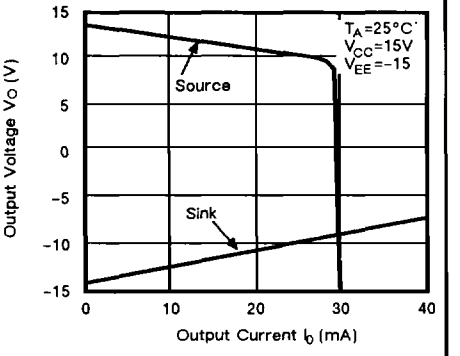
# TYPICAL PERFORMANCE CHARACTERISTICS

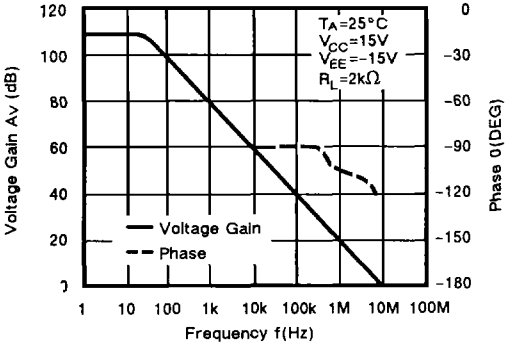
Supply Current vs Supply Voltage



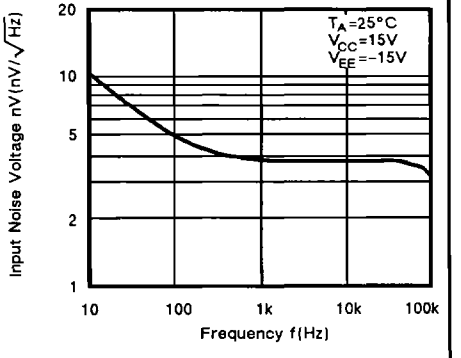

Output Voltage vs Output Current




Voltage Gain vs Frequency




Input Noise Voltage vs Frequency



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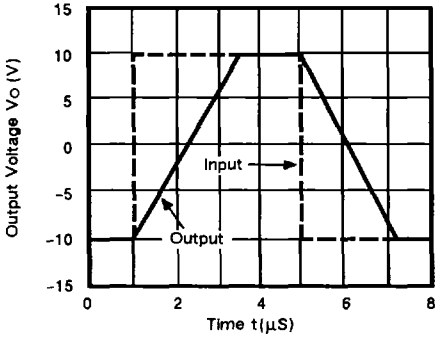
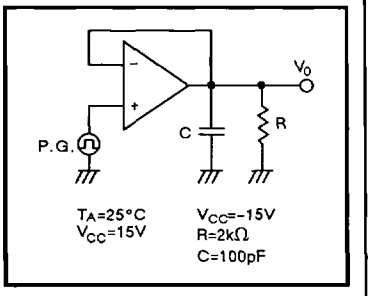
# TYPICAL PERFORMANCE CHARACTERISTICS (continued)

**Pulse Response Characteristics**




**Pulse Response vs Measurement Circuit**



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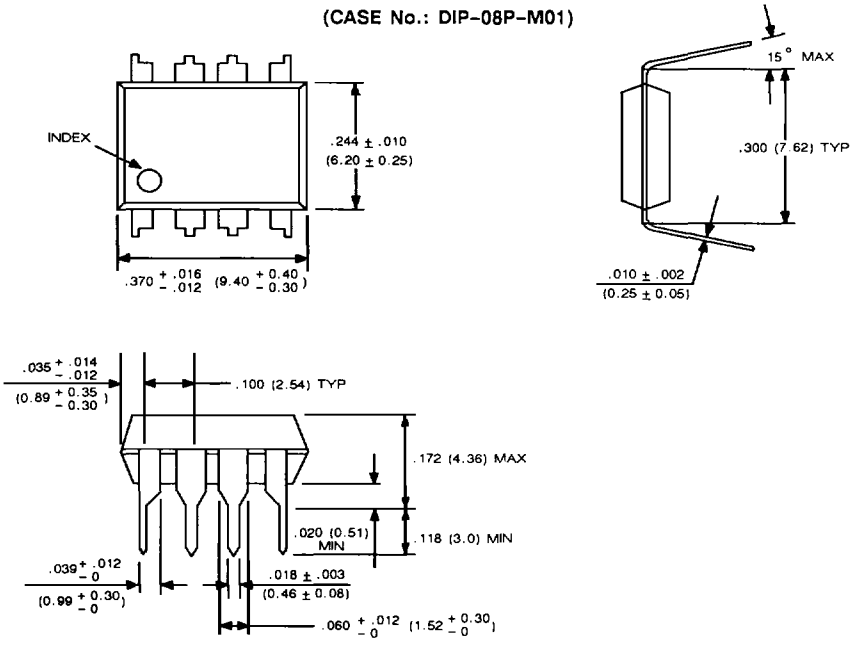
# PACKAGE DIMENSIONS

8-LEAD PLASTIC DUAL-IN-LINE PACKAGE
(CASE No.: DIP-08P-M01)




Dimensions in
inches (millimeters)

D08006S-2C

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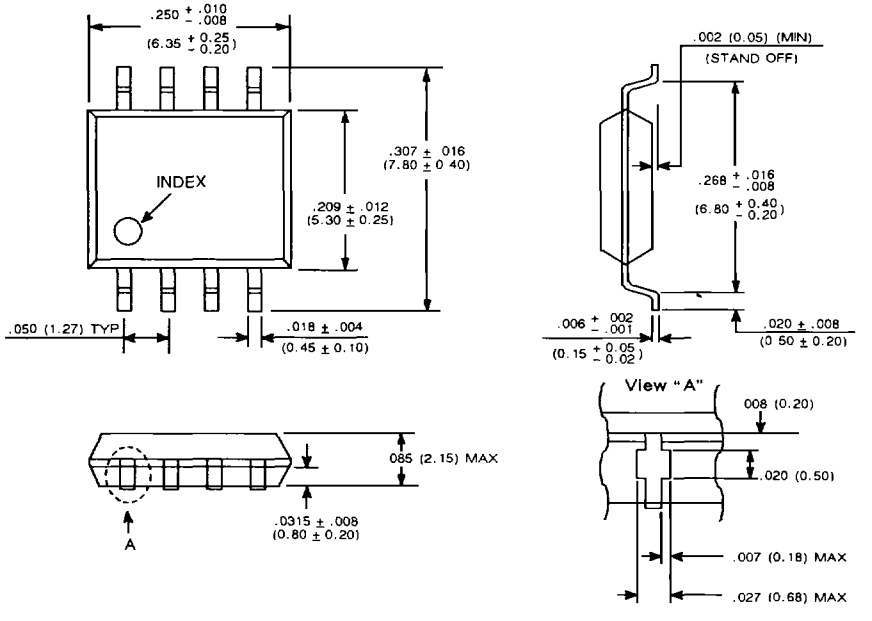
# PACKAGE DIMENSIONS (continued)

**8-LEAD PLASTIC FLAT PACKAGE**
**(CASE No.: FPT-08P-M01)**




Dimensions in
inches (millimeters)

F08002S-2C

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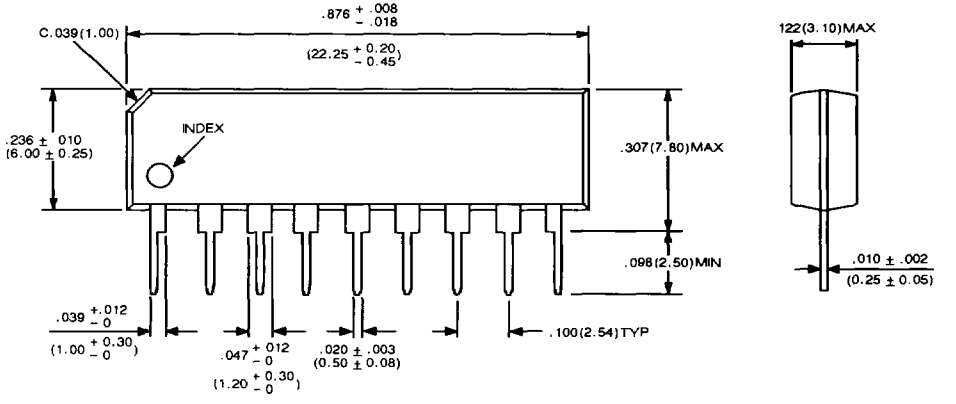
# PACKAGE DIMENSIONS (continued)

**9-LEAD PLASTIC SINGLE-IN-LINE PACKAGE**
**(CASE No.: SIP-09P-M01)**




Dimensions in
inches (millimeters)

S09002S-2C