

# MB3735

## BTL AUDIO POWER AMPLIFIER

### 20 WATT BTL AUDIO POWER AMPLIFIER WITH FILTERING CIRCUITRY FOR POWER-ON POP NOISE

The Fujitsu MB3735 is designed for a low-frequency high-power amplifier with internal BTL (Balanced Transformer less) circuitry. The MB3735 is packed in a small plastic 9-pin Single In-Line Package (SIP) which has low thermal resistance, so that a design for heat radiation can be performed with low cost.

Also, the MB3735 requires such a few external components and, the MB3735 can be mounted on printed circuit board with high density.

The MB3735 contains a filtering circuitry for power-on pop noise and various protection circuits. The MB3735 is suitable for car stereo applications.

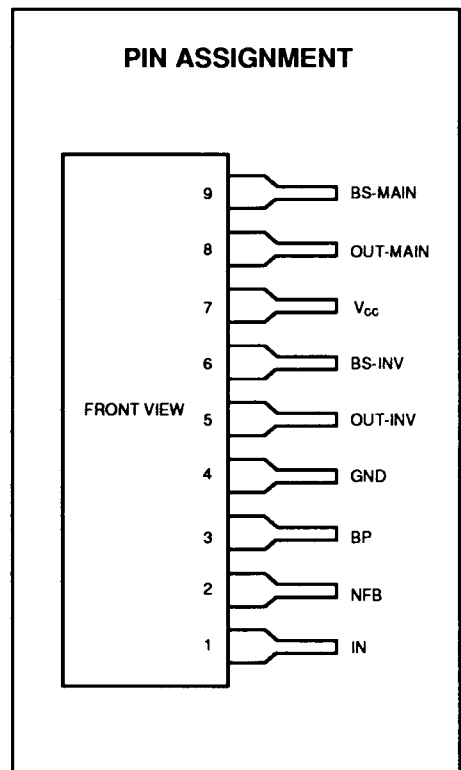
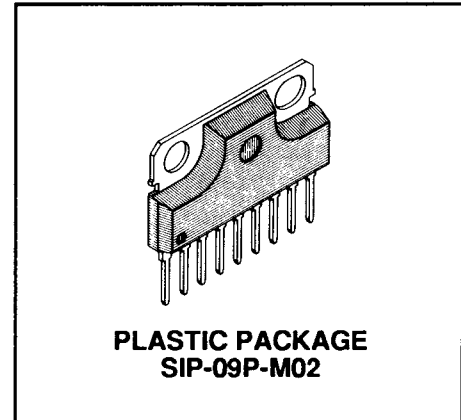
- High Power Output: 20W typ. with  $R_L = 4\Omega$
- Minimum External Components (OCL, 8 capacitors)
- Small Plastic 9-pin Single In-Line Package
- Low Thermal Resistance
- Various Protection Circuitries:
  - Power Supply Surge Protection
  - Excess Voltage Protection
  - Load Short Protection
  - DC Short Protection for Outputs, Power Supply pin, and Ground pin
  - Thermal Protection
- Low Power-on Pop Noise
- THD = 0.07% Typ. ( $P_O = 1\text{ W}$ ,  $R_L = 4\Omega$ )
- Designed against breakdown by load short and Supply Voltage Surge.

#### ABSOLUTE MAXIMUM RATINGS (see NOTE)

Rating	Symbol	Value	Unit
Power Supply Voltage	$V_{CC}$	18	V
Power Supply Voltage (Surge Voltage)	$V_{CCS}$	50*	V
Peak Output Current	$I_O$ (Peak)	4.5	A
Power Dissipation	$P_D$	18	W
Operating Temperature	$T_C$	-20 to +75	°C
Storage Temperature	$T_{STG}$	-55 to +150	°C

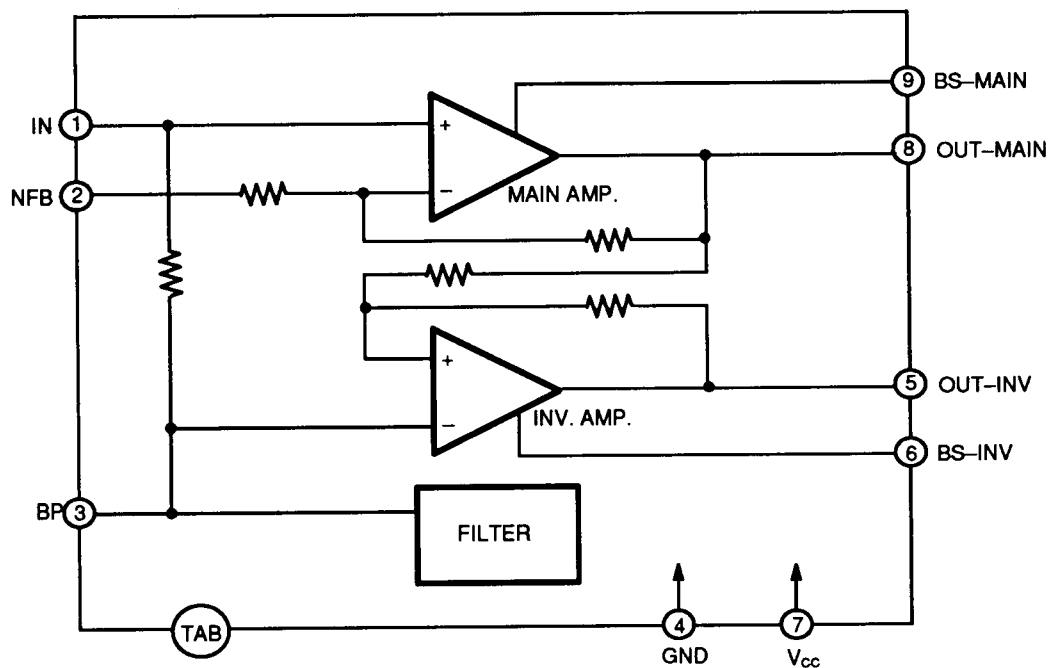
NOTE:  $t_s \leq 0.2$  (s),  $t_r \geq 1$  (ms)

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.



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.

Fig. 1 — BLOCK DIAGRAM OF MB3735



## RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Value	Unit
Power Supply Voltage	$V_{cc}$	8 to 16	V
Case Temperature	$T_c$	-20 to +75	°C

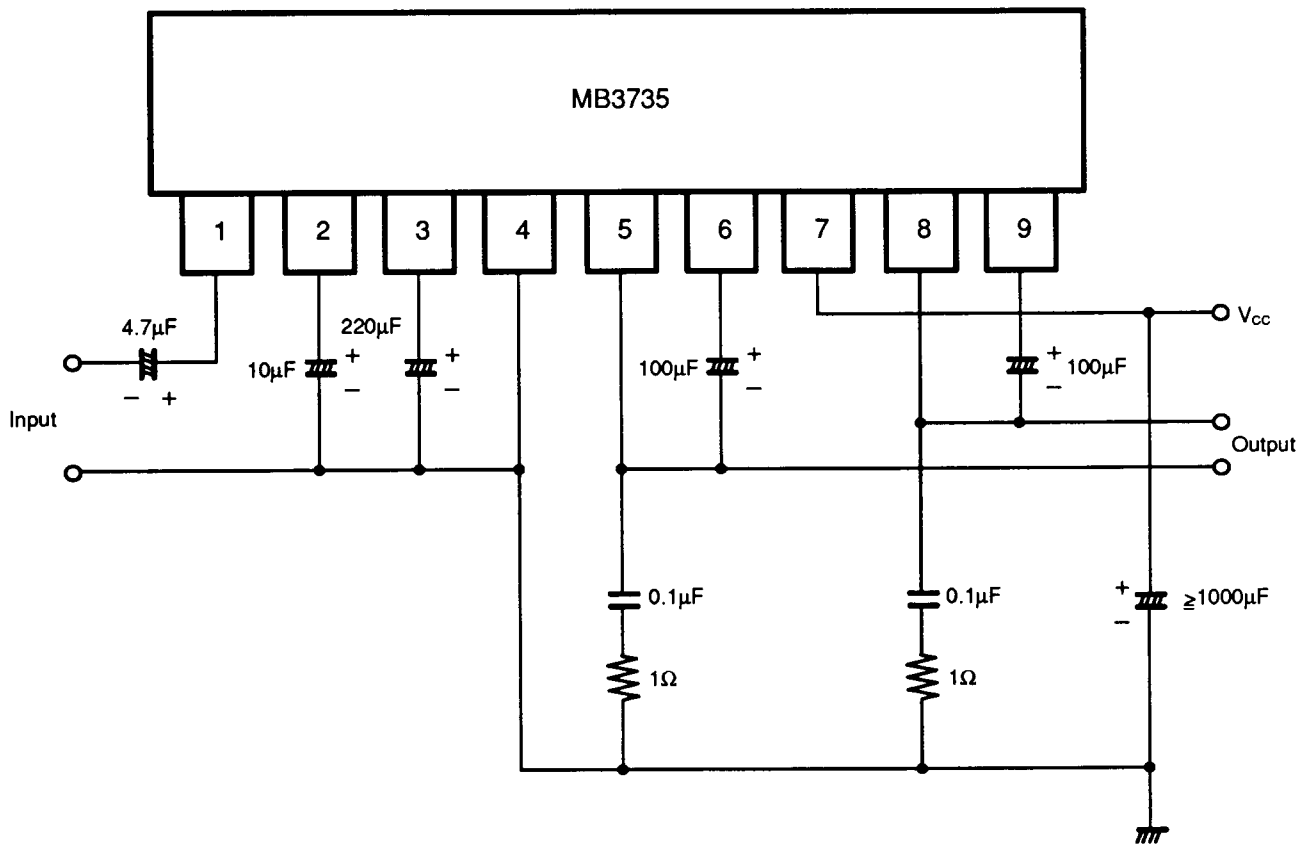
# ELECTRICAL CHARACTERISTICS

( $T_C = 25^\circ\text{C}$ ,  $V_{CC} = 13.2\text{V}$ ,  $R_L = 4\Omega$ ,  $f = 1\text{kHz}$ )

Parameter	Condition	Symbol	Value			Unit
			Min	Typ	Max	
Quiescent Power Supply Current	$V_{IN} = 0\text{V}$ , $R_L = \infty$	$I_Q$		80	160	mA
Voltage Gain		$A_V$	45	47	49	dB
Output Power	THD = 10%	$P_{O1}$	16	20		W
	THD = 1%	$P_{O2}$		14		W
Total Harmonic Distortion	$P_O = 1\text{W}$	THD		0.07	0.5	%
Output Noise Voltage	$R_g = 0\Omega$ BW = 20 Hz to 20 kHz	$V_{NO1}$		0.3		mV
	$R_g = 10\text{k}\Omega$ BW = 20 Hz to 20 kHz	$V_{NO2}$		0.5	1.0	mV
Input Resistance		$R_{IN}$	20	30		$\text{k}\Omega$
Output Offset Voltage		$V_{OFFSET}$		$\pm 0.1$	$\pm 0.3$	V
Supply Current in DC MUTE mode	BP = 0V	$I_{CCO}$		15		mA

# ELECTRICAL CHARACTERISTICS (Continued)

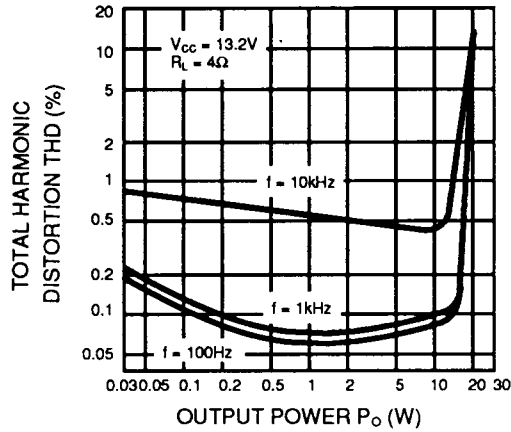
Fig. 2 – MEASUREMENT CIRCUIT



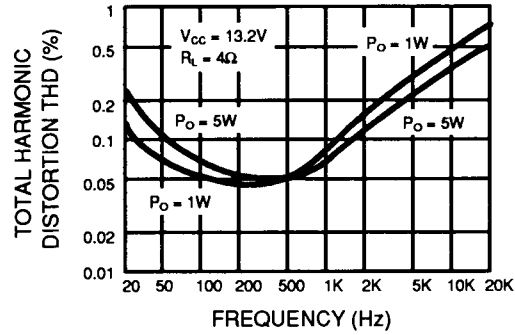
**Note:** When BP (Pin 3) is grounded, DC Muting can be used.  
 The capacitor ( $0.1\mu\text{F}$ ) between  $V_{CC}$  and GND can be controlled the unstable operating conditions of board level.

# TYPICAL CHARACTERISTICS CURVES

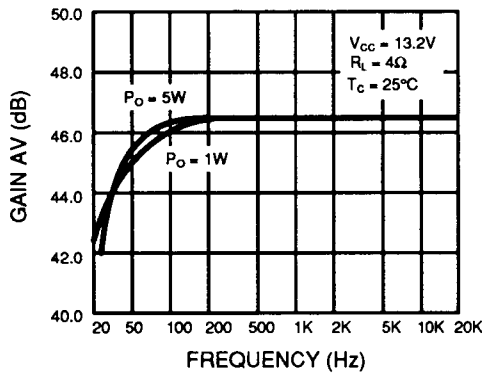
**Fig. 3 – TOTAL HARMONIC DISTORTION vs. OUTPUT POWER**



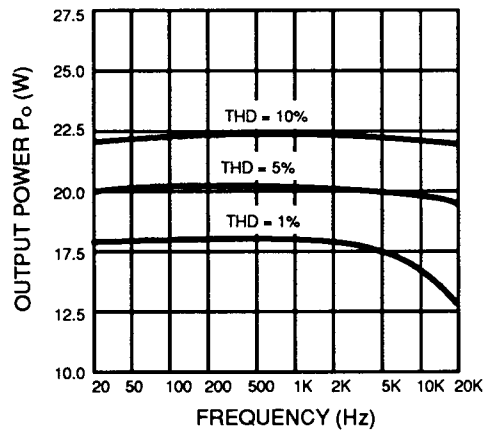
**Fig. 4 – TOTAL HARMONIC DISTORTION vs. FREQUENCY**



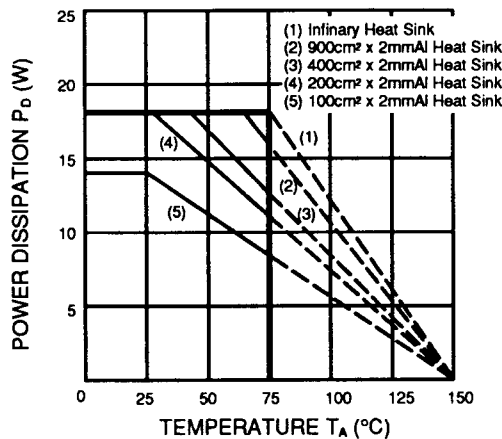
**Fig. 5 – GAIN vs. FREQUENCY**



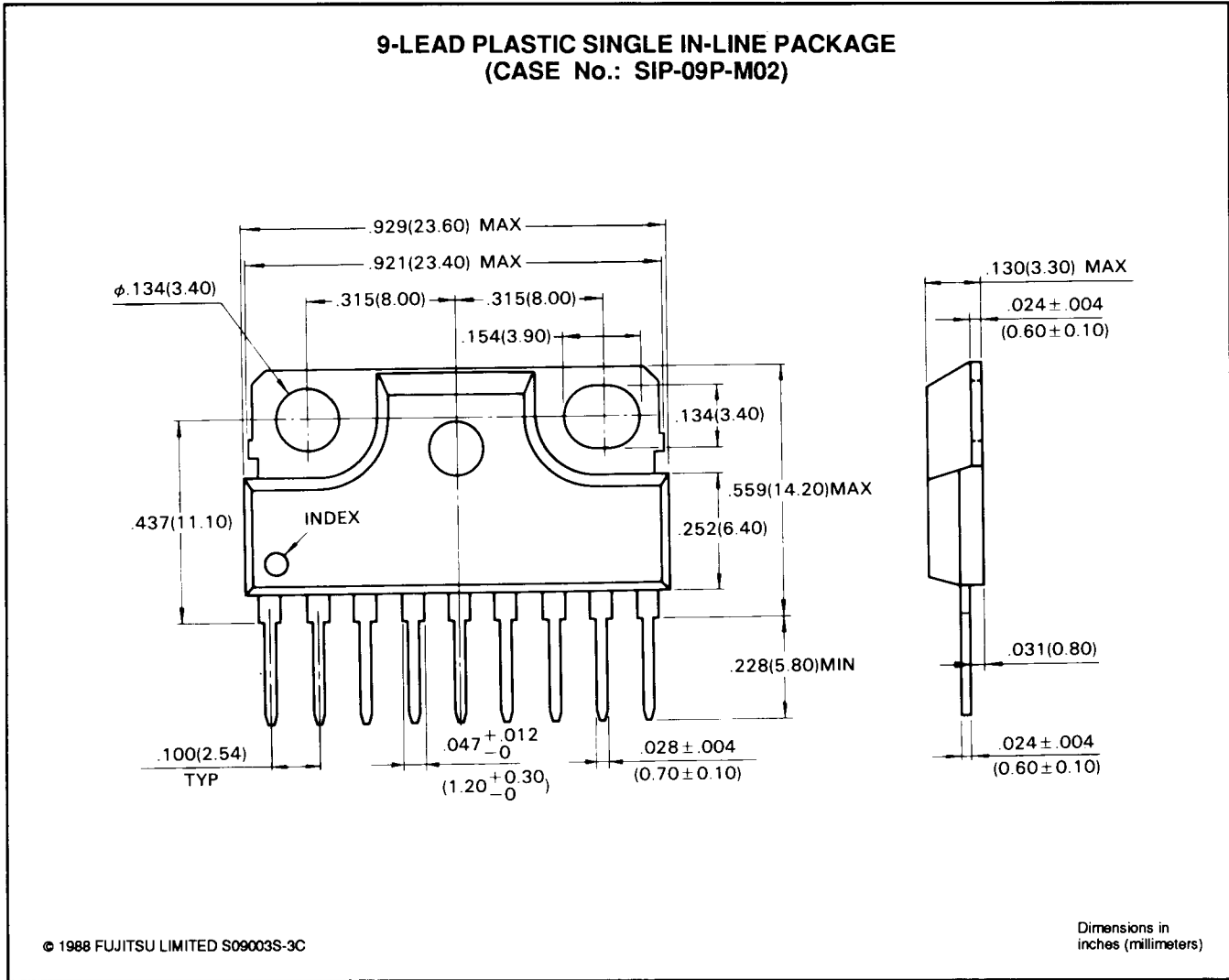
**Fig. 6 – POWER BAND WIDTH vs. FREQUENCY**



**Fig. 7 – POWER DISSIPATION vs. TEMPERATURE**



# PACKAGE DIMENSIONS



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**NOTE**

# FUJITSU LIMITED

For further information please contact:

## **Japan**

FUJITSU LIMITED

Integrated Circuits and Semiconductor Marketing  
Furukawa Sogo Bldg., 6-1, Marunouchi 2-chome  
Chiyoda-ku, Tokyo 100, Japan

Tel: (03) 216-3211

Telex: 781-2224361

FAX: (03) 216-9771

## **North and South America**

FUJITSU MICROELECTRONICS, INC.

Integrated Circuits Division  
3545 North First Street  
San Jose, CA 95134-1804 USA

Tel: 408-922-9000

Telex: 910-338-0190

FAX: 408-432-9044

## **Europe**

FUJITSU MIKROELEKTRONIK GmbH

Arabella Centre 9.0G  
Lyoner Strasse 44-48  
D-6000 Frankfurt 71

F.R. Germany

Tel: (069) 66320

Telex: 411963

FAX: (069) 6632122

## **Asla**

FUJITSU MICROELECTRONICS ASIA PTE LIMITED

#06-04 to #06-07  
Plaza By The Park  
No. 51 Bras Basah Road  
Singapore 0719

Tel: 336-1600

Telex: 55573

FAX: 336-1609

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