



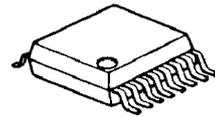
Sound Enhancement Processor For Telephone

GENERAL DESCRIPTION

The **NJU7087** is a Sound Enhancement Processor for telephone, using a low power C-MOS technology. Sound enhancement and LPF circuit improve quality of conversation without increasing noise.

The **NJU7087** is suitable for limited band-width application, such as telephone, and answer phone.

PACKAGE OUTLINE

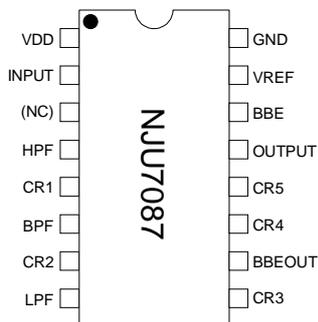


NJU7087

FEATURES

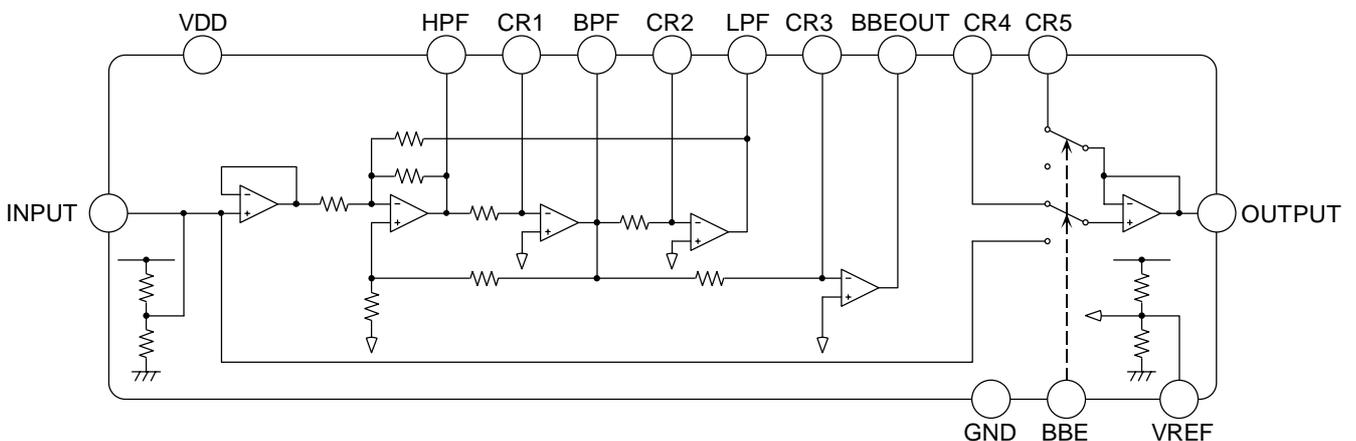
- Operating Voltage ($V_{DD}=2.4$ to $5.5V$)
- Low Operating Current ($2mA$ typ. at $V_{DD}=3V$)
- Low Output Noise ($31.6\mu V_{rms}$ typ. at BBE ON)
- Bypass Gain ($0dB$ typ.)
- Adjustable Boost Level(High)
- Package Outline (SSOP16)

PIN CONFIGURATION



| No. | SYMBOL | FUNCTION | No. | SYMBOL | FUNCTION |
|-----|--------|----------------|-----|--------|-------------------|
| 1 | VDD | Power Supply | 9 | CR3 | Filter |
| 2 | INPUT | Signal Input | 10 | BBEOUT | BBE Output |
| 3 | (NC) | (No Connected) | 11 | CR4 | Filter |
| 4 | HPF | HPF Output | 12 | CR5 | Filter |
| 5 | CR1 | Filter | 13 | OUTPUT | Signal Output |
| 6 | BPF | BPF Output | 14 | BBE | BBE ON/OFF |
| 7 | CR2 | Filter | 15 | VREF | Reference Voltage |
| 8 | LPF | LPF Output | 16 | GND | GND |

BLOCK DIAGRAM



■ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

| PARAMETER | SYMBOL | RATING | UNIT |
|-----------------------------|------------------|--------------------|------|
| Supply Voltage | V _{DD} | 7.0 | V |
| Input Voltage | V _I | GND-0.5 to VDD+0.5 | V |
| Power Dissipation | PD | 300 | mW |
| Operating Temperature Range | T _{opr} | -40 to +85 | °C |
| Storage Temperature Range | T _{stg} | -55 to +125 | °C |

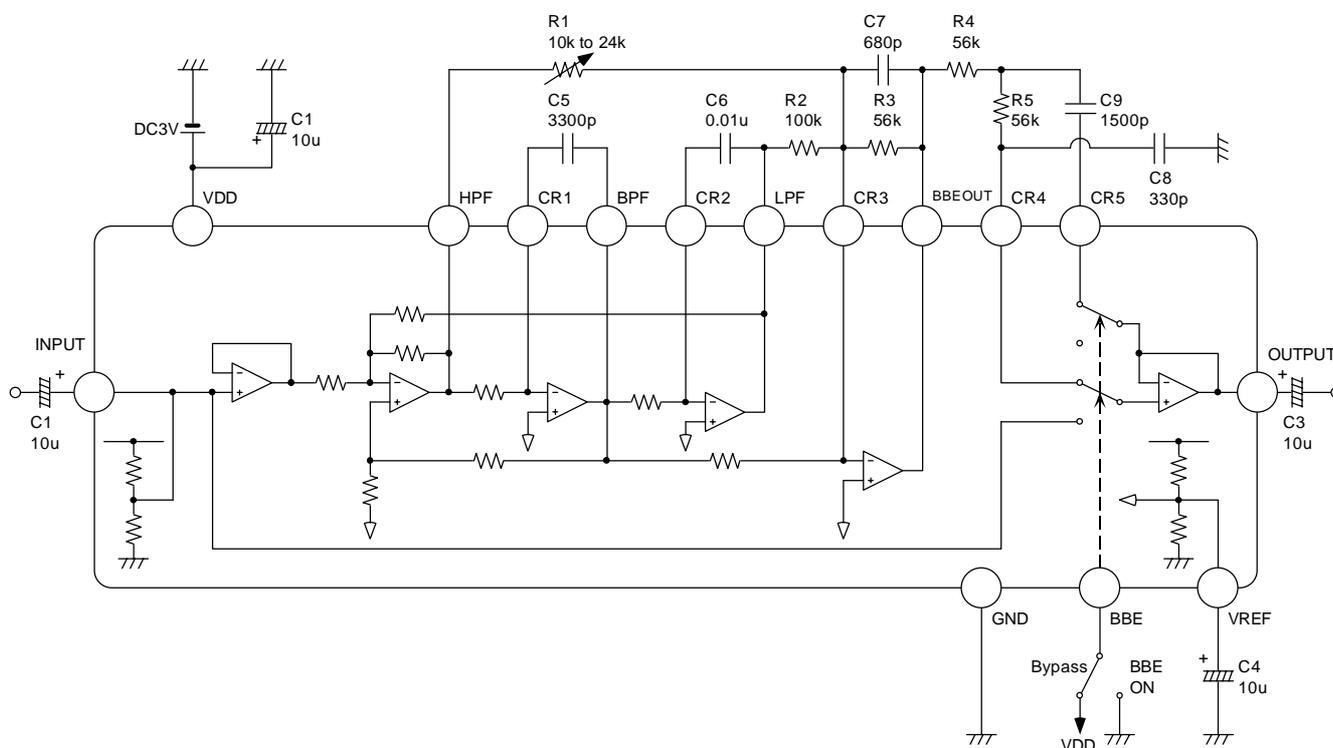
■ELECTRICAL CHARACTERISTICS(VDD=3V,Vss=0V,Ta=25°C)

| PARAMETER | SYMBOL | TEST CONDITION | BBE | MIN. | TYP. | MAX. | UNIT |
|----------------------------|------------------|---------------------------------------|--------|-------------------------|---------------|-------------------------|----------------|
| | | | | | | | |
| Operating Voltage | V _{DD} | | - | 2.4 | - | 5.5 | V |
| Supply Current | I _{DD} | No Signal | - | - | 2.0 | 4.0 | mA |
| Reference Voltage | VREF | | - | - | 1.5 | - | V |
| BBE Terminal Input Current | IBBE | BBE Terminal=3V | - | - | -1.0 | - | μA |
| BBE Terminal Input Voltage | VBBEH | | - | 0.8V _{DD} | - | V _{DD} | V |
| | VBBEL | | - | GND | - | 0.2V _{DD} | V |
| Boost Level | Boost | R1=24kΩ,R3=56kΩ,f=3kHz | ON | | 4.0 | | dB |
| Maximum Input Voltage | VOMH | RL=50kΩ | Bypass | V _{DD} -0.1 | - | - | V |
| | VOML | RL=50kΩ | Bypass | - | - | V _{ss} +0.1 | V |
| Bypass Gain | G _{BYP} | f=1kHz | Bypass | -1 | 0 | 1 | dB |
| Total Harmonic Distortion | THD | f=1kHz,Vin=0.1Vrms, Boost=4.0dB | ON | - | 0.1 | - | % |
| Output Noise | Vno | Input=GND,Boost=4.0dB, A-Weighting | ON | - | -90 (31.6) | -60 (100) | dBV (μVrms) |

■SWITCH FUNCTION

| Switch Terminal | Control Voltage Level | FUNCTION |
|-----------------|-----------------------|----------|
| BBE | High | BYPASS |
| | Low | BBE ON |

APPLICATION CIRCUIT



| R1 | Boost Level |
|------|-------------|
| 10kΩ | 12dB |
| 15kΩ | 8dB |
| 24kΩ | 4dB |

High Boost Level is adjusted by value of R1.
 Recommended High Boost Level : 4 to 12dB (R1 : 24k to 10kΩ)

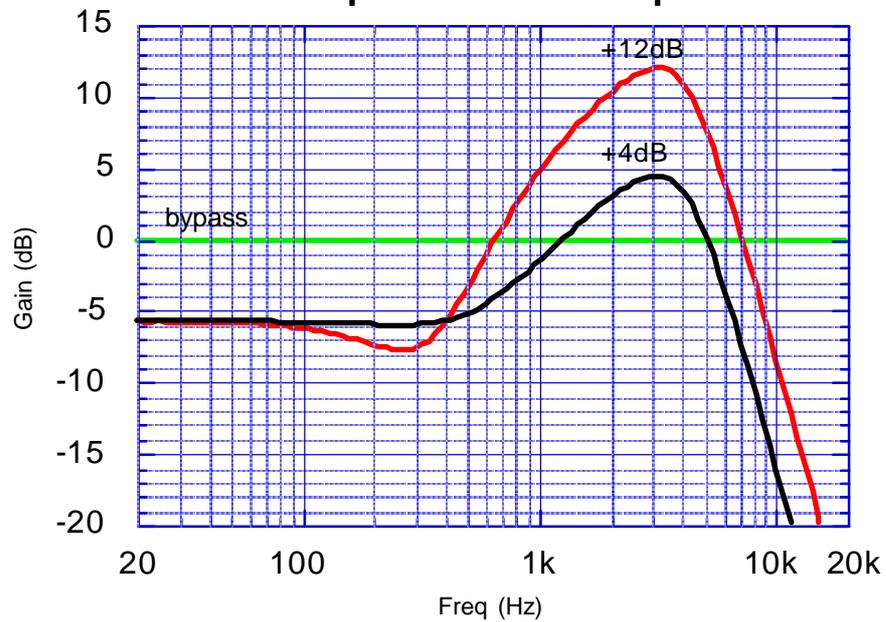
NOTE

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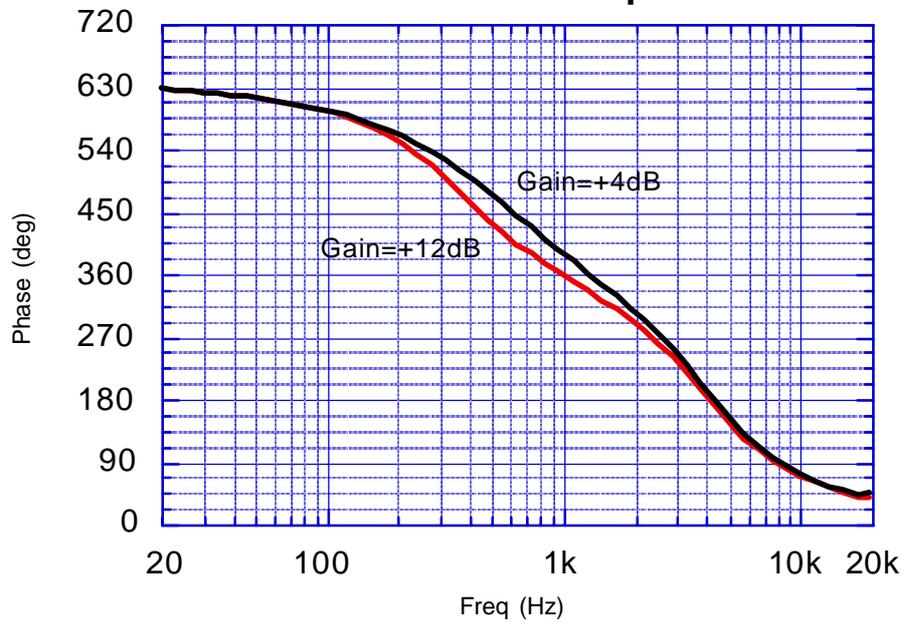
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■ TYPICAL CHARACTERISTICS

Output Gain vs Freq.



Phase vs Freq.



[CAUTION]
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