

M51166P

QUAD RECORDING/PLAYBACK PREAMPLIFIER WITH ALC PEAK DETECTOR FOR DUAL CASSETTE PLAYER

DESCRIPTION

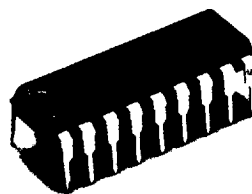
The M51166P is an IC for radio double cassette tape players.

It has a built-in 4 low-noise preamplifiers and 2 channels of ALC.

The built-in peamplifiers are of direct input type. The IC also contains ALC peak detectors and ALC. This configuration makes it possible to construct a recording/playback system with few external parts.

FEATURES

- Four low-noise dual preamplifiers built-in
- High voltage gain 89dB
- Built-in ALC peak detectors
- Easy-to-mount pin configuration grouped into input pins (① to ⑨) and output pins (⑩ to ⑰)



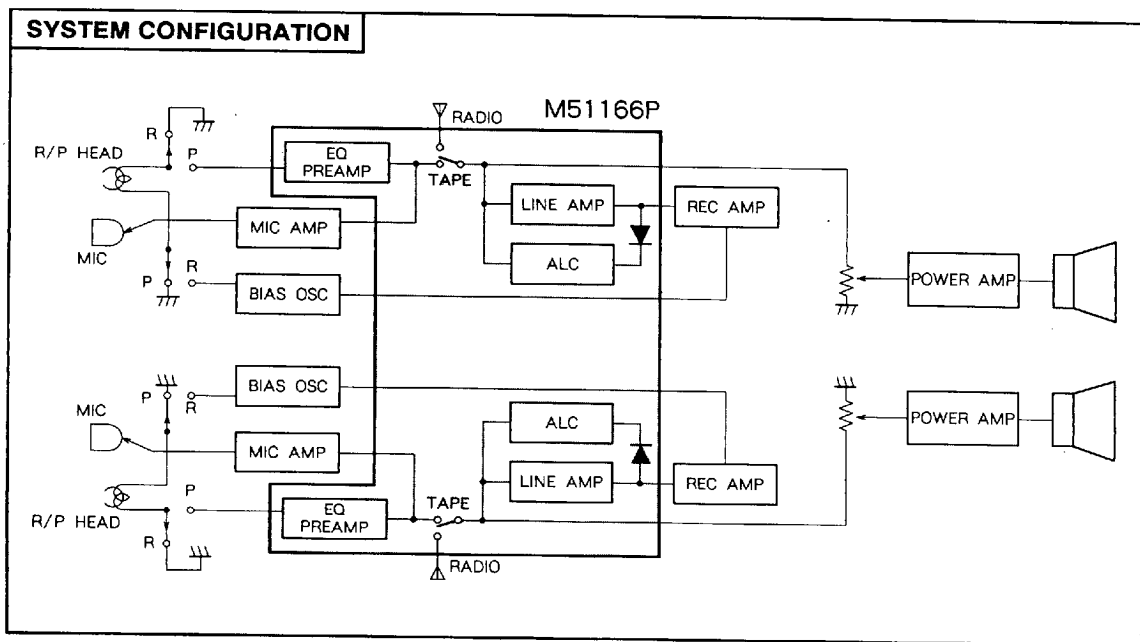
Outline 18P4

2.54mm pitch 300mil DIP
(6.3mm × 24.0mm × 3.3mm)

RECOMMENDED OPERATING CONDITIONS

Supply voltage range $V_{cc} = 5$ to $10V$

Rated supply voltage $V_{cc} = 9V$



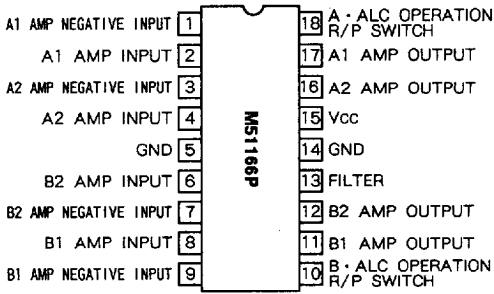
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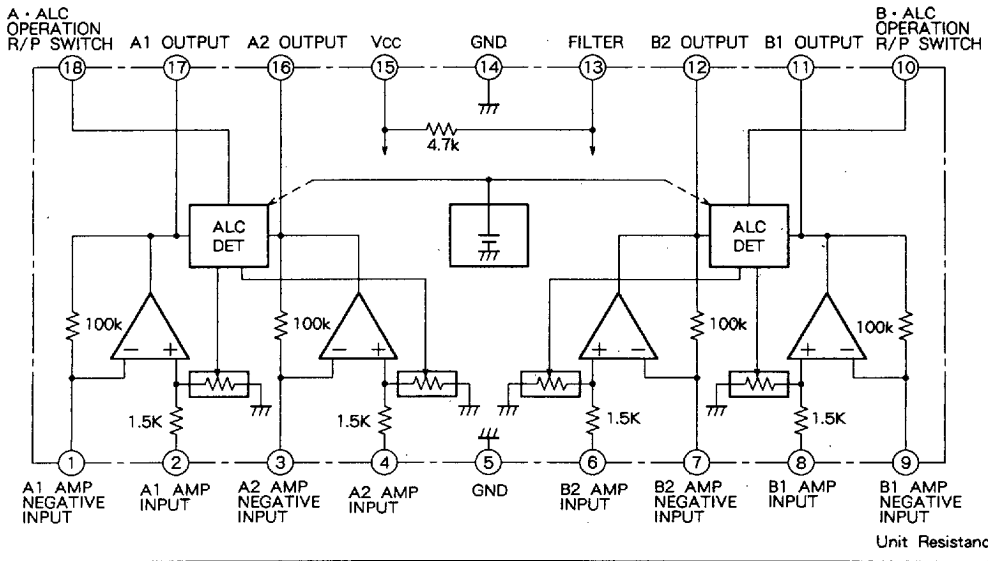
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PIN CONFIGURATION (TOP VIEW)



Outline 18P4

IC INTERNAL BLOCK DIAGRAM



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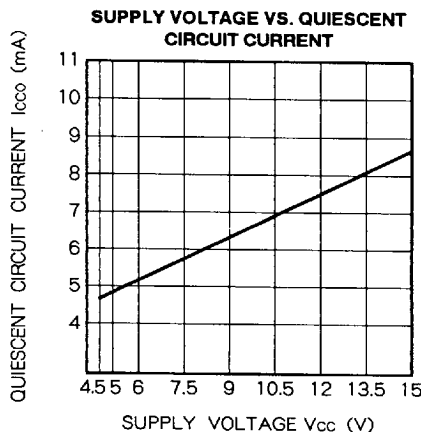
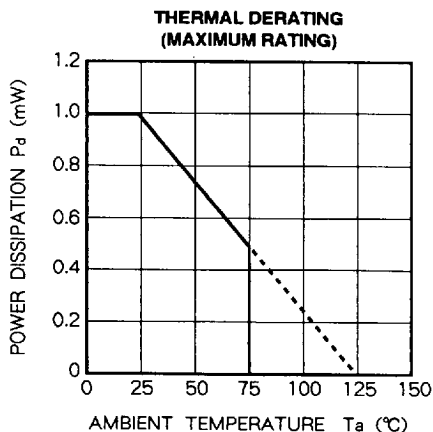
ABSOLUTE MAXIMUM RATINGS (Ta = 25 °C, unless otherwise noted)

| Symbol | Parameter | Conditions | Ratings | Unit |
|--------|-----------------------|------------|-------------|-------|
| Vcc | Supply voltage | Quiescent | 15 | V |
| Icc | Circuit current | | 50 | mA |
| Pd | Power dissipation | | 1000 | mW |
| Kθ | Thermal derating | Ta ≥ 25 °C | 10 | mW/°C |
| Topr | Operating temperature | | -20 to +75 | °C |
| Tstg | Storage temperature | | -40 to +125 | °C |

ELECTRICAL CHARACTERISTICS (Ta = 25 °C, Vcc = 9V, RL = 10k Ω, f = 1kHz, unless otherwise noted)

| Symbol | Parameter | Test conditions | Limits | | | Unit |
|--------|------------------------------|---|-------------------------|------|------|-------|
| | | | Min | Typ | Max | |
| Icco | Quiescent circuit current | | - | 6 | - | mA |
| Gvo | Open loop voltage gain | Vo = 1Vrms, CNF = 100 μF | - | 89 | - | dB |
| Gvc | | Closed loop voltage gain | Vo = 1Vrms, RNF = 240 Ω | 50 | 53 | 55 |
| THD | Total harmonic distortion | Vo = 1Vrms, RNF = 240 Ω | - | 0.1 | 0.6 | % |
| Vo | Maximum output voltage | THD = 3% | 2.0 | 2.5 | - | Vrms |
| Ni | Input-referred noise voltage | Rθ = 0 Ω, BPF (20 to 20kHz - 3dB) | - | 1.5 | 2.5 | μVrms |
| ALCA | ALC range | Input voltage range from start of ALC operation with an output voltage of Vi = -72dBV to the point where the output voltage is 3dB higher. Re = 12Ω | 40 | 46 | - | dB |
| ALCb | | | 0.8 | 1.05 | 1.25 | Vrms |
| ALCTHD | ALC distortion | Output voltage and distortion at an input voltage signal of Vi = -50dBV. Re = 24Ω | - | 0.5 | 2 | % |
| ALC1 | ALC output voltage | | - | 0 | 2 | dB |
| ALC2 | ALC balance | | | | | |

TYPICAL CHARACTERISTICS



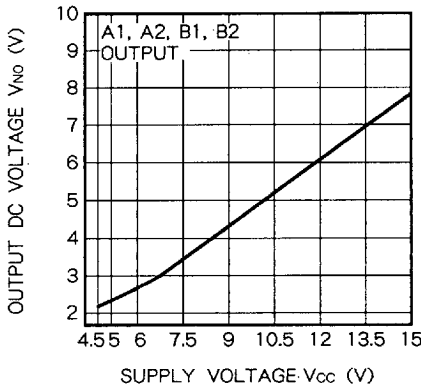
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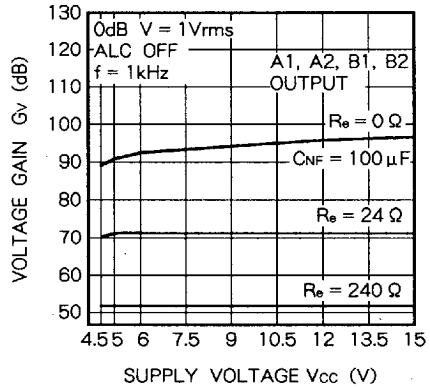
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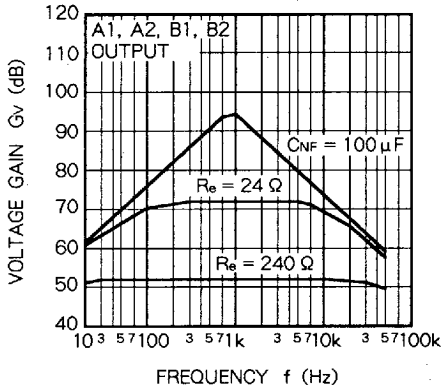
OUTPUT DC VOLTAGE VS. SUPPLY VOLTAGE



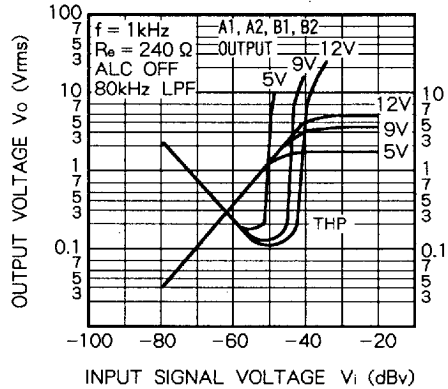
VOLTAGE GAIN VS. SUPPLY VOLTAGE



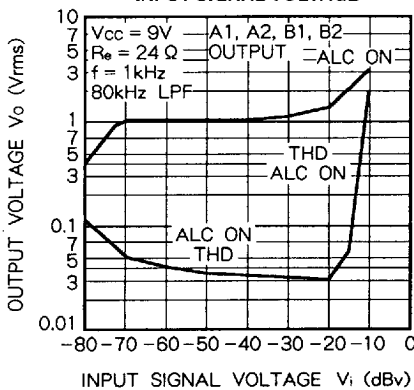
VOLTAGE GAIN VS. FREQUENCY



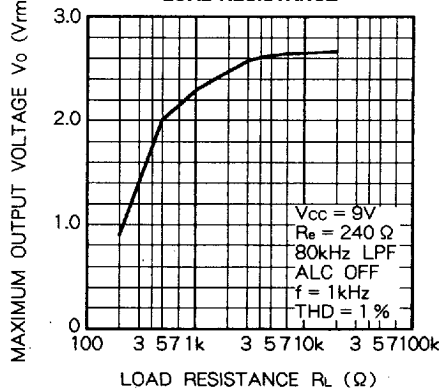
OUTPUT VOLTAGE VS. INPUT SIGNAL VOLTAGE



OUTPUT VOLTAGE VS. INPUT SIGNAL VOLTAGE



MAXIMUM OUTPUT VOLTAGE VS. LOAD RESISTANCE



TOTAL HARMONIC DISTORTION THD (%)

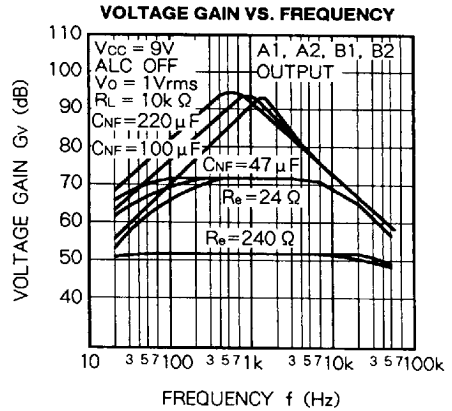
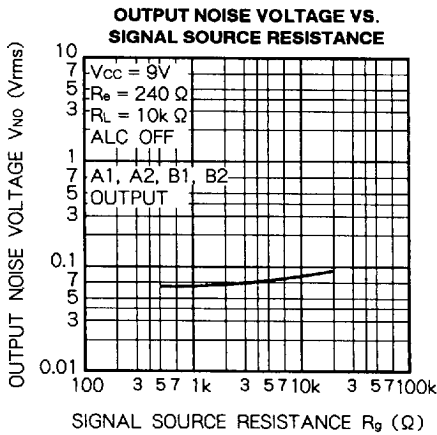
TOTAL HARMONIC DISTORTION THD (%)

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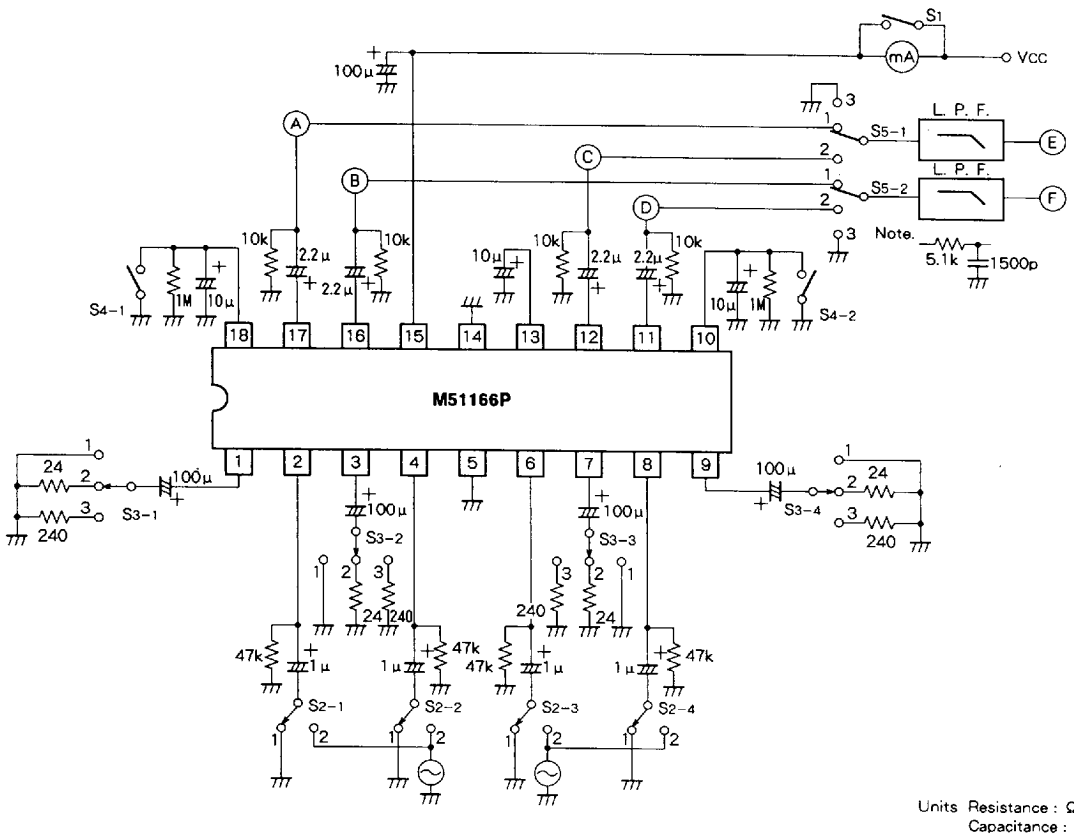


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TEST CIRCUIT



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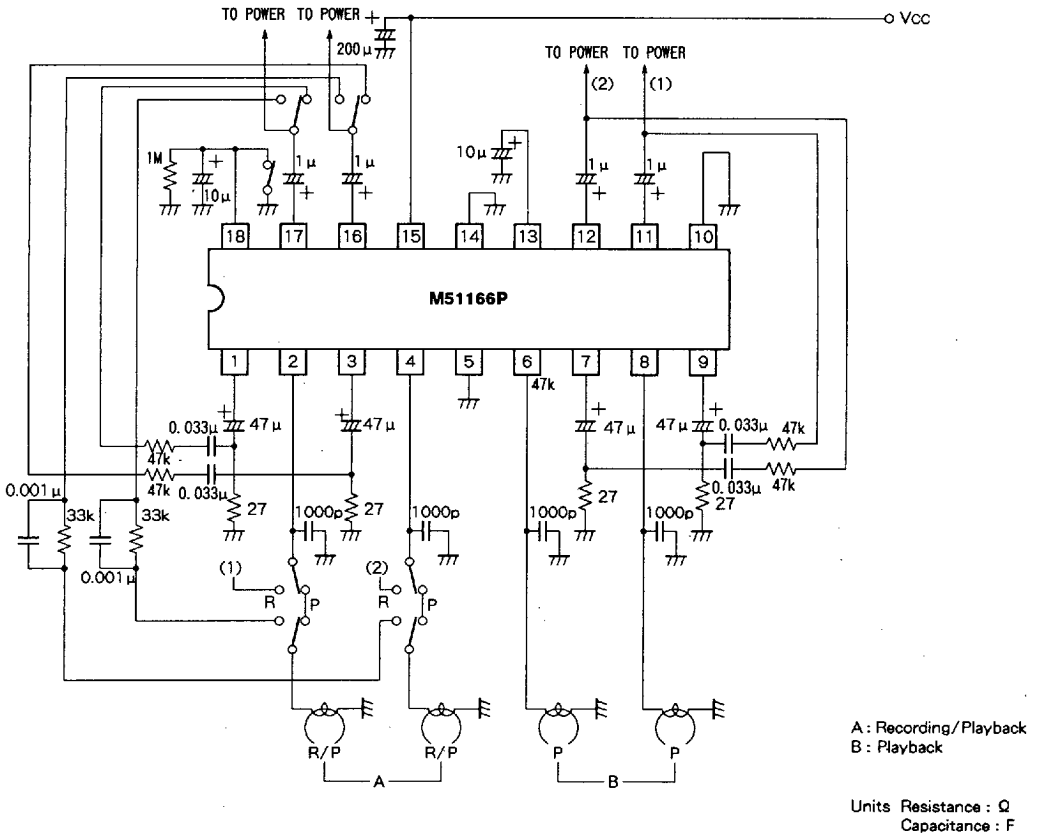
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TEST METHODS (Ta = 25°C, Vcc = 9V, RL = 10k Ω, f = 1kHz, unless otherwise noted)

| Symbol | Test conditions | Switching conditions | | | | | Measure point |
|--------|-------------------------------|----------------------|------------|------------|--------|--------|---------------|
| | | S1 | S2-1,2,3,4 | S3-1,2,3,4 | S4-1,2 | S5-1,2 | |
| Icco | | OFF | 1 | 3 | ON | 3 | mA |
| Gvo | Vi = -80dBV | ON | 2 | 1 | ↑ | ↑ | A,B,C,D |
| Gvc | Vi = -52dBV (2.5mVrms) | ↑ | ↑ | 3 | ↑ | ↑ | ↑ |
| THD | Vi = -52dBV (2.5mVrms) | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ |
| Vo | THD = 3% | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ |
| Ni | 20Hz to 20kHz BPF | ↑ | 1 | 3 | ON | 1/2 | E,F |
| ALCA | Ro = 240 Ω | ↑ | 2 | 2 | OFF | 3 | A/B,C/D |
| ALCo | Output voltage and distortion | | | | | | |
| ALCTHD | Vi = -50dBV | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ |
| ALCB | Output voltage ratio | | | | | | |
| | Vi = -50dBV | ↑ | ↑ | ↑ | ↑ | ↑ | A/B,C/D |

Note 2: ALC balance (ALCB) is measure about output voltage ratio for each A side, B side.

APPLICATION EXAMPLE



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