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NTE709 Integrated Circuit TV/FM Sound IF Amplifier

Description:

The NTE709 is a monolithic integrated circuit in a 14-Lead DIP type package providing a multi-stage wideband amplifier/limiter, an FM quadrature detector, and an emitter-follower audio output stage and is designed for use in FM receivers or in sound IF of TV receivers.

Features:

- Good Sensitivity
- Excellent AM Rejection
- Low Harmonic Distortion
- Single-Adjustment Timing
- High gain to 50MHz
- 500mV Recovered Audio at 10.7MHz
- Wide Operating Voltage Range

Absolute Maximum Ratings:

Supply Voltage, V_{CC} 15V
 Package Power Dissipation, P_D 670mW
 Derate Above +70°C 8.3mW/°C
 Operating Ambient Temperature Range, T_A -20° to +85°C
 Storage Temperature Range, T_{stg} -65° to +150°C

Static Electrical Characteristics: ($V_{CC} = 12V$, $T_A = +25°C$ unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|------------------|----------|-----------------|-----|------|-----|------|
| Supply Current | I_{CC} | | 12 | 17 | 27 | mA |
| Terminal Voltage | V_1 | | 4.3 | 5.0 | 6.3 | V |
| | V_2 | | - | 3.65 | - | V |
| | V_6 | | - | 1.45 | - | V |
| | V_9 | | - | 1.5 | - | mV |
| | V_{10} | | - | 1.45 | - | V |

Static Electrical Characteristics (Cont'd): ($V_{CC} = 12V$, $T_A = +25^\circ C$ unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|----------------------------|----------|-----------------|-----|-----|-----|-----------|
| Detector Output Resistance | R_1 | | – | 200 | – | Ω |
| IF Input Resistance | R_4 | | – | 5.0 | – | $k\Omega$ |
| IF Output Resistance | R_{10} | | – | 60 | – | Ω |
| Detector Input Resistance | R_{12} | | – | 70 | – | $k\Omega$ |
| De–Emphasis Resistance | R_{14} | | 6 | 9 | 12 | $k\Omega$ |
| IF Input Capacitance | C_4 | | – | 11 | – | pF |
| Detector Input Capacitance | C_{12} | | – | 2.7 | – | pF |

Dynamic Characteristics: ($V_{CC} = 12V$, $T_A = +25^\circ C$, $f_o = 10.7MHz$, $f_m = 400Hz$, $\Delta f = \pm 75kHz$, Peak Separation = 550kHz unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---------------------------|-----------|--------------------------------|-----|------|-----|---------------|
| Amplifier Voltage Gain | A_e | $V_{in} \leq 300\mu V_{rms}$ | – | 53 | – | dB |
| Amplifier Output Voltage | V_{out} | $V_{in} = 10mV_{rms}$ | – | 1.45 | – | V_{P-P} |
| Input Limiting Threshold | V_{TH} | Note 1 | – | 400 | 800 | μV_{rms} |
| Recovered Audio Output | V_{out} | $V_{12} = 60mV_{rms}$ | – | 500 | – | mV_{rms} |
| Total Harmonic Distortion | THD | 100% FM Modulation | – | 1.0 | – | % |
| AM Rejection | AMR | $V_{in} = 10mV_{rms}$, Note 2 | – | 40 | – | dB |

Note 1. The input limiting threshold is the FM input voltage for a recovered audio output which is 3dB less than the recovered audio for an FM input voltage of $200mV_{rms}$.

Note 2. The amplitude modulation rejection is determined by:

$$AMR_{dB} = 20 \log V_{out} \text{ for } 100\% \text{ FM } V_{in} / V_{out} \text{ for } 30\% \text{ AM } V_{in}$$

Pin Connection Diagram



