

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: ($V_{CC} = 12V$, $T_A = +25^\circ C$ 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

