

## 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	–	$\Omega$
IF Input Resistance	$R_4$		–	5.0	–	$k\Omega$
IF Output Resistance	$R_{10}$		–	60	–	$\Omega$
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	$\mu V_{rms}$
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**



