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NTE1174 Integrated Circuit TV Automatic Fine Tuning (AFT) Circuit

Description:

The NTE1174 is a monolithic TV Automatic Fine Tuning (AFT) circuit in a 14-Lead Staggered DIP type package that provides an AFT voltage and an amplified 4.5MHz intercarrier sound signal. When connected to an output of an IF amplifier the NTE1174 provides the signal processing (amplification and detection) necessary to generate the AFT correction signals required by the TV tuner. It also mixes the video and sound IF carriers and amplifies the resultant 4.5MHz intercarrier sound signal. The sound output may then be connected to an FM detector such as the NTE1175 “TV Sound IF and Audio Output Subsystem,” or the NTE712 “FM Detector and Audio Driver.”

The AFT portion of the NTE1174 is similar the NTE 780 AFT circuit with the following exceptions: (a) the AFT filter capacitors are external and user selectable, allowing the detector to operate as a peak detector and resulting in a higher effective gain for the TV signal; (b) the detector bias resistor is external and user selectable, allowing the gain of the AFT and intercarrier signals to be adjusted; (c) the dynamic resistance of the shunt regulator has been decreased.

Absolute Maximum Ratings:

Device Dissipation ($T_A \leq +55^\circ\text{C}$), P_D 630mW
 Derate Linearly Above $+55^\circ\text{C}$ 6.67mW/ $^\circ\text{C}$
 Operating Ambient Temperature Range, T_{opr} -40° to $+85^\circ\text{C}$
 Storage Temperature Range, T_{stg} -65° to $+150^\circ\text{C}$
 Lead Temperature (During Soldering, 1/16” from case, 10sec max), T_L $+265^\circ\text{C}$

Electrical Characteristics: ($T_A = +25^\circ\text{C}$, $V_+ = 28\text{V}$ unless otherwise specified)

Parameter	Test Conditions	Min	Typ	Max	Unit
No Signal Input					
Supply Current, I_+		15	–	20	mA
Low Voltage at Pin7	$V_+ = 20.8\text{V}$, Note 1	11.0	–	14.5	V
Shunt Regulator Voltage		12.0	–	14.5	V
Quiescent Voltage at Pin3		4.5	–	10	V
Quiescent Voltage at Pin13 and Pin14	Pin13 connected to Pin14, Note 2	6.0	–	8.5	V
Quiescent Voltage at Pin6		1.4	–	2.6	V

Note 1. $I_7 = 12\text{mA}$ maximum at $V_7 = 11\text{V}$.

Note 2. $V_{13} = 0.55 V_Z \pm 0.7\text{V}$.

Electrical Characteristics (Cont'd): ($T_A = +25^\circ\text{C}$, $V_+ = 28\text{V}$ unless otherwise specified)

Parameter	Test Conditions	Min	Typ	Max	Unit
Signal Input = 15mV_{RMS} (Note 3, unless otherwise specified)					
Correction Voltage at Pin13	f = 44.65MHz	2.2	–	4.7	V
	f = 45.69MHz	1.2	–	4.4	V
	f = 45.81MHz	9.6	–	13.8	V
	f = 46.85MHz	9.1	–	12.1	V
Correction Voltage at Pin14	f = 44.65MHz	9.1	–	12.1	V
	f = 45.69MHz	9.6	–	13.8	V
	f = 45.81MHz	1.2	–	4.4	V
	f = 46.85MHz	2.2	–	4.7	V
4.5MHz Output	Two-Tone Input, f ₁ = 45.75MHz at 15mV, f ₂ = 41.25MHz at 5mV	50	–	200	mV _{RMS}

Note 3. Resistor from Pin6 to Pin7 = 9.09kΩ. Crossover steps and “bow-tie” width increases when resistor is decreased in value. Total peak swing decreases slightly.



