NTE843
Integrated Circuit
TV Video IF Phase Locked Loop (PLL)
Synchronous Detector

Description:
The NTE843 is a linear IC synchronous detector employing a phase–locked oscillator to demodulate the 45.75MHz video IF signals in color–TV receivers. The NTE843 features AFT voltage for DC control of the tuner; an adjustment for the zero–carrier DC level at the video output terminal; an amplifier arrangement for inverting noise impulses toward the black level; and a separate output terminal (non–inverting) for the sound IF.

The NTE843 is supplied in a 16–lead plastic “power–slab” dual–in–line package. The “power–slab” package has an inherently low junction–to–case (slab) thermal resistance and lends itself to a wide variety of heat–sink methods, depending on the application requirements.

Features:
- PLL Carrier Oscillator with Wide Pull–In and Hold–In Range
- Excellent Low–Level Detector Linearity
- Noise Inversion at Video Output
- Wide Range, Variable Zero–Carrier Level Adjustment
- Automatic Fine Tuning (AFT) Detector
- Separate Output for Sound Take–Off
- 12V Power Supply

Absolute Maximum Ratings:
- Power Supply Voltage ................................................................. 15V
- Power Supply Current ................................................................. 100mA
- Input Signal Voltage ................................................................. \(1\text{V}_{\text{rms}}\)
- Device Dissipation (Up to \(T_A = +45^\circ\text{C}\)), \(P_D\) ........................................ 1.4W
  Derate Above \(T_A = +45^\circ\text{C}\) .................................................. 13.3mW/\(\text{°C}\)
- Thermal Resistance, Junction–to–Ambient, \(R_{\text{thJA}}\) ........................................ 75°C/W
- Operating Ambient Temperature Range, \(T_{\text{opr}}\) ........................................ \(-40^\circ\text{C}\) to \(+85^\circ\text{C}\)
- Storage Temperature Range, \(T_{\text{stg}}\) ........................................ \(-65^\circ\text{C}\) to \(+150^\circ\text{C}\)
- Lead Temperature (During Soldering, 1/16” from case, 10sec max), \(T_L\) .................. \(+265^\circ\text{C}\)
**Electrical Characteristics:** \( V^+ = 12\text{Vdc}, f_c = 45\text{MHz}, T_A = +25^\circ\text{C} \) unless otherwise specified

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Test Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Current</td>
<td>( I_8 + I_{10} )</td>
<td>–</td>
<td>60</td>
<td>80</td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td>Video–Output Voltage</td>
<td>( V_{10} )</td>
<td>Zero Carrier Bias Adjust</td>
<td>–</td>
<td>–</td>
<td>7</td>
<td>V</td>
</tr>
<tr>
<td>Noise–Inversion Offset Voltage</td>
<td>( V_{10} )</td>
<td>Referenced to Zero Carrier Level</td>
<td>–0.2</td>
<td>0.3</td>
<td>+0.8</td>
<td>V</td>
</tr>
<tr>
<td>Sound IF Take–Off Output</td>
<td>( V_9 )</td>
<td>( V_{10} = 7\text{V} )</td>
<td>–</td>
<td>7.7</td>
<td>–</td>
<td>V</td>
</tr>
<tr>
<td>AFT Output Voltage</td>
<td>( V_{12} )</td>
<td>AFT Defeat Switch Closed</td>
<td>2.4</td>
<td>3.0</td>
<td>3.6</td>
<td>V</td>
</tr>
<tr>
<td>Oscillator Pull–In Range</td>
<td>–</td>
<td>–</td>
<td>3</td>
<td>–</td>
<td>MHz</td>
<td></td>
</tr>
<tr>
<td>Oscillator Hold–In Range</td>
<td>–</td>
<td>–</td>
<td>6</td>
<td>–</td>
<td>MHz</td>
<td></td>
</tr>
<tr>
<td>Detector Conversion Gain</td>
<td>–</td>
<td>–</td>
<td>26</td>
<td>30</td>
<td>–</td>
<td>dB</td>
</tr>
<tr>
<td>Video Bandwidth</td>
<td>–</td>
<td>–</td>
<td>9</td>
<td>–</td>
<td>MHz</td>
<td></td>
</tr>
<tr>
<td>Carrier Rejection at Video</td>
<td>( f_c = 45\text{MHz} )</td>
<td>–</td>
<td>30</td>
<td>–</td>
<td>dB</td>
<td></td>
</tr>
<tr>
<td>Video IF Parallel Input Impedance Resistance (Pin4)</td>
<td>( R_P )</td>
<td>–</td>
<td>4</td>
<td>–</td>
<td>kΩ</td>
<td></td>
</tr>
<tr>
<td>Video IF Parallel Input Impedance Capacitance (Pin4)</td>
<td>( C_P )</td>
<td>–</td>
<td>5</td>
<td>–</td>
<td>pF</td>
<td></td>
</tr>
<tr>
<td>Sound Take–Off Output Resistance (Pin9)</td>
<td>( R_O )</td>
<td>1MHz</td>
<td>–</td>
<td>50</td>
<td>–</td>
<td>Ω</td>
</tr>
<tr>
<td>Video Output Resistance (Pin10)</td>
<td>( R_O )</td>
<td>1MHz</td>
<td>–</td>
<td>50</td>
<td>–</td>
<td>Ω</td>
</tr>
</tbody>
</table>

**Pin Connection Diagram**

1. Limiter Tuning
2. Limiter Tuning
3. GND (V)
4. Video IF Input
5. APC Filter
6. VCO Tuning
7. VCO Tuning
8. \( V (+) \)
9. Sound Take–Off Output
10. Video Output (Negative Going Sync)
11. Zero–Carrier Bias Adjust
12. AFT Output
13. GND (V)
14. AFT Defeat
15. AFT Tuning
16. AFT Tuning