



ELECTRONICS, INC.  
44 FARRAND STREET  
BLOOMFIELD, NJ 07003  
(973) 748-5089  
<http://www.nteinc.com>

## **NTE1862**

### **Integrated Circuit**

### **TV Vertical Deflection Circuit**

#### **Description:**

The NTE1862 is a monolithic, full performance, very efficient vertical deflection circuit in a 15-Lead SIP type package intended for direct drive of the yoke of 110° color TV picture tubes. This device offers a wide range of applications such as portable CTVs, BW TVs, monitors, and displays.

#### **Features:**

- Synchronization Circuit
- Precision Oscillator and Ramp Generator
- Power Output Amplifier with High Current Capability
- Flyback Generator
- Voltage Regulator
- Precision Blanking Pulse Generator
- Thermal Shutdown Protection
- CRT Screen Protection Circuit which Blanks the Beam Current in the Event of Loss of Vertical Deflection Circuit

#### **Absolute Maximum Ratings:**

|                                                                                 |                               |
|---------------------------------------------------------------------------------|-------------------------------|
| Supply Voltage (Pin14), $V_S$                                                   | 35V                           |
| Flyback Peak Voltage, $V_1, V_2$                                                | 60V                           |
| Sync. Input Voltage, $V_5$                                                      | 20V                           |
| Power Amplifier Input Voltage, $V_{11}, V_{12}$                                 | $V_S - 10V$                   |
| Voltage at Pin13, $V_{13}$                                                      | $V_S$                         |
| Non-Repetitive Output Current ( $t = 2ms$ ), $I_O$                              | 3A                            |
| Output Peak Current, $I_O$                                                      |                               |
| $f = 50Hz, t > 10\mu s$                                                         | 2A                            |
| $f = 50Hz, t \leq 10\mu s$                                                      | 3.5A                          |
| Pin15 Peak to Peak Flyback Current ( $f = 50Hz, t_{fly} \leq 1.5ms$ ), $I_{15}$ | 3A                            |
| Pin15 DC Current ( $V_1 < V_{14}$ ), $I_{15}$                                   | 100mA                         |
| Maximum Power Dissipation ( $T_C \leq +60^\circ C$ ), $P_{tot}$                 | 30W                           |
| Junction Temperature Range, $T_J$                                               | $-40^\circ$ to $+150^\circ C$ |
| Storage Temperature Range, $T_{stg}$                                            | $-40^\circ$ to $+150^\circ C$ |
| Maximum Thermal Resistance, Junction to Case, $R_{\theta JC}$                   | $+3^\circ C/W$                |
| Maximum Thermal Resistance, Junction to Ambient, $R_{\theta JA}$                | $+40^\circ C/W$               |

**DC Electrical Characteristics:** ( $V_S = 35V$ ,  $T_A = +25^\circ C$  unless otherwise specified)

| Parameter                                   | Symbol                          | Test Conditions                                     | Min  | Typ  | Max  | Unit           |
|---------------------------------------------|---------------------------------|-----------------------------------------------------|------|------|------|----------------|
| Pin2 Quiescent Current                      | $I_2$                           | $I_1 = 0$                                           | –    | 18   | 30   | mA             |
| Ramp Generator Bias Current                 | $-I_9$                          | $V_9 = 0$                                           | –    | 0.02 | 1.0  | $\mu A$        |
| Ramp Generator Current                      | $-I_9$                          | $V_9 = 0$ , $-I_7 = 20\mu A$                        | 18.5 | 20.0 | 21.5 | $\mu A$        |
| Ramp Generator Non Linearity                | $ \frac{\Delta I_9}{I_9} $      | $\Delta V_9 = 0$ to $15V$ , $-I_7 = 20\mu A$        | –    | 0.2  | 1.0  | %              |
| Pin14 Quiescent Current                     | $I_{14}$                        |                                                     | –    | 25   | 50   | mA             |
| Quiescent Output Voltage                    | $V_1$                           | $V_S = 35V$ , $R_a = 2.2k\Omega$ , $R_b = 1k\Omega$ | 16.8 | 17.8 | 18.6 | V              |
|                                             |                                 | $V_S = 15V$ , $R_a = 390\Omega$ , $R_b = 1k\Omega$  | 7.0  | 7.5  | 8.0  | V              |
| Output Saturation Voltage to GND            | $V_{1L}$                        | $I_1 = 1.2A$                                        | –    | 1.0  | 1.4  | V              |
| Output Saturation Voltage to Supply         | $V_{1H}$                        | $-I_1 = 1.2A$                                       | –    | 1.6  | 2.2  | V              |
| Oscillator Virtual Ground                   | $V_4$                           |                                                     | –    | 0.45 | –    | V              |
| Regulated Voltage at Pin7                   | $V_7$                           | $-I_7 = 20\mu A$                                    | 6.3  | 6.6  | 7.1  | V              |
| Regulated Voltage Drift with Supply Voltage | $\frac{\Delta V_7}{\Delta V_S}$ | $\Delta V_S = 15$ to $35V$                          | –    | 1    | –    | $\frac{mV}{V}$ |
| Amplifier Input (+) Reference Voltage       | $V_{11}$                        |                                                     | 4.2  | 4.4  | 4.6  | V              |
| Blanking Output Saturation Voltage          | $V_{13}$                        | $I_{13} = 10mA$                                     | –    | 0.35 | –    | V              |
| Pin15 Saturation Voltage to GND             | $V_{15}$                        | $I_{15} = 20mA$                                     | –    | 1.0  | 1.3  | V              |

**AC Electrical Characteristics:** ( $V_S = 24V$ ,  $f = 50Hz$ ,  $T_A = +25^\circ C$  unless otherwise specified)

| Parameter                                 | Symbol             | Test Conditions                                |                                                    | Min | Typ  | Max | Unit |
|-------------------------------------------|--------------------|------------------------------------------------|----------------------------------------------------|-----|------|-----|------|
| Supply Current                            | I <sub>S</sub>     | I <sub>y</sub> = 2App                          |                                                    | –   | 295  | –   | mA   |
| Sync Input Current Required to Sync       | I <sub>5</sub>     |                                                |                                                    | 100 | –    | –   | μA   |
| Flyback Voltage                           | v <sub>1</sub>     | I <sub>y</sub> = 2App                          |                                                    | –   | 50   | –   | V    |
| Peak to Peak Oscillator Sawtooth Voltage  | v <sub>3</sub>     | I <sub>5</sub> = 0                             |                                                    | –   | 3.6  | –   | V    |
|                                           |                    | I <sub>5</sub> = 100μA                         |                                                    | –   | 3.4  | –   | V    |
| Start Scan Level of the Input Ramp        | V <sub>10thL</sub> |                                                |                                                    | –   | 1.85 | –   | V    |
| Flyback Time                              | t <sub>fly</sub>   | I <sub>y</sub> = 2App                          |                                                    | –   | 0.6  | –   | ms   |
| Blanking Pulse Duration                   | t <sub>blank</sub> | f <sub>o</sub> = 50Hz                          | T <sub>j</sub> = +75°C                             | –   | 1.4  | –   | ms   |
|                                           |                    | f <sub>o</sub> = 60Hz                          |                                                    | –   | 1.17 | –   | ms   |
| Free Running Frequency                    | f <sub>o</sub>     | R <sub>o</sub> = 7.5kΩ                         | C <sub>o</sub> = 330nF,<br>T <sub>j</sub> = +75°C, | –   | 43.5 | –   | Hz   |
|                                           |                    | R <sub>o</sub> = 6.2kΩ                         |                                                    | –   | 52.5 | –   | Hz   |
| Synchronization Range                     | Δf                 | I <sub>5</sub> = 100μA, T <sub>j</sub> = +75°C |                                                    | –   | 16   | –   | Hz   |
| Junction Temperature for Thermal Shutdown | T <sub>j</sub>     |                                                |                                                    | –   | 145  | –   | °C   |

# **Pin Connection Diagram** (Front View)

|    |                     |
|----|---------------------|
| 15 | Flyback             |
| 14 | Supply              |
| 13 | Blanking Output     |
| 12 | Amplifier Input (-) |
| 11 | Amplifier Input (+) |
| 10 | Ramp Output         |
| 9  | Ramp Generator      |
| 8  | GND                 |
| 7  | Height Adjustment   |
| 6  | Oscillator          |
| 5  | Sync Input          |
| 4  | Oscillator          |
| 3  | Oscillator          |
| 2  | Amplifier Supply    |
| 1  | Amplifier Output    |

