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# NTE1664
# Integrated Circuit
# TV Hotizontal/Vertical Sync Signal Processor

**Description:**

The NTE1664 is a silicon monolithic integrated circuit in a 22–Lead DIP type package designed for use as a horizontal deflection circuit and vertical deflection circuit for color TV sets. This device contains two synchronization signal separators, a vertical oscillator, vertical sawtooth shaper, vertical pre–driver, vertical retrace blanking pulse generator, horizontal AFC, horizontal oscillator, horizontal pre–driver, and an abnormal high voltage prevention circuit.

**Features:**

- Two Synchronous Signal Separators for Very Stable Synchronization (Horizontal and Vertical Signals are Independent of Each Other)
- Remarkably Improved Interlace Tracking due to Separate Wiring of Horizontal and Vertical Sections
- Wide Range of Vertical Retrace Blanking Time due to Adjust Pin
- Very Low Oscillation Frequency Drift of Vertical and Horizontal Oscillator Against Ambient Temperature

**Absolute Maximum Ratings:** ($T_A$ = +25°C ±3°C unless otherwise specified)

Vertical Power Supply Voltage, $V_{21}$ . . . . . 15V
Horizontal Power Supply Current Drain, $I_{11}$ . . . . . 30mA
Vertical Output Current, $I_{14}$ . . . . . –30mA to +0mA
Horizontal Output Current, $I_{10}$ . . . . . –10mA to +10mA
Power Dissipation ($T_A$ = +75°C), $P_D$ . . . . . 600mW
Operating Temperature Range, $T_{opr}$ . . . . . –20° to +75°C
Storage Temperature Range, $T_{stg}$ . . . . . –40° to +125°C

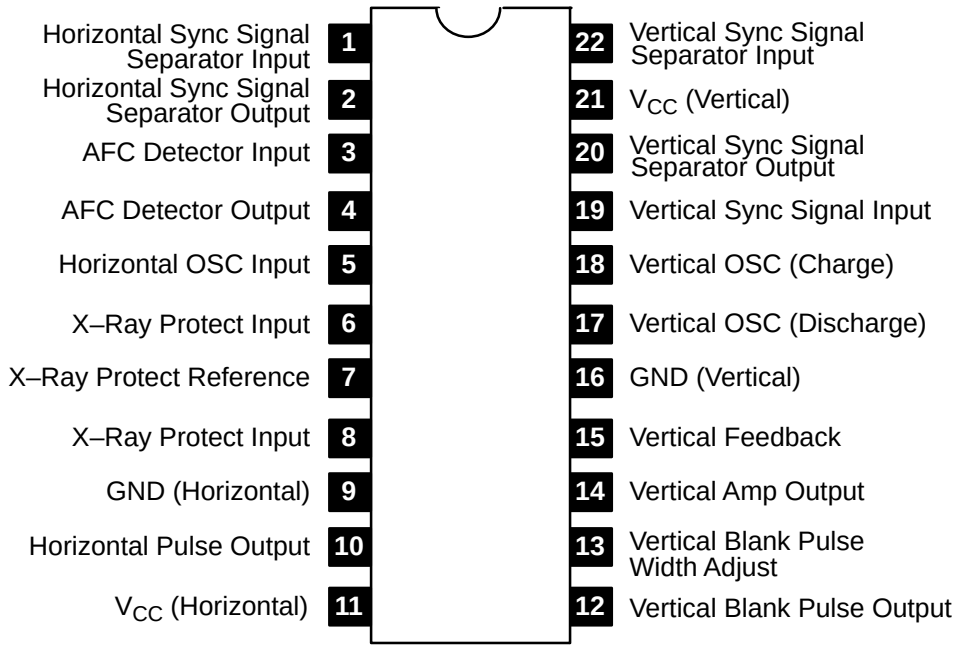
**Recommended Operating Conditions:** ($T_A$ = +25°C unless otherwise specified)

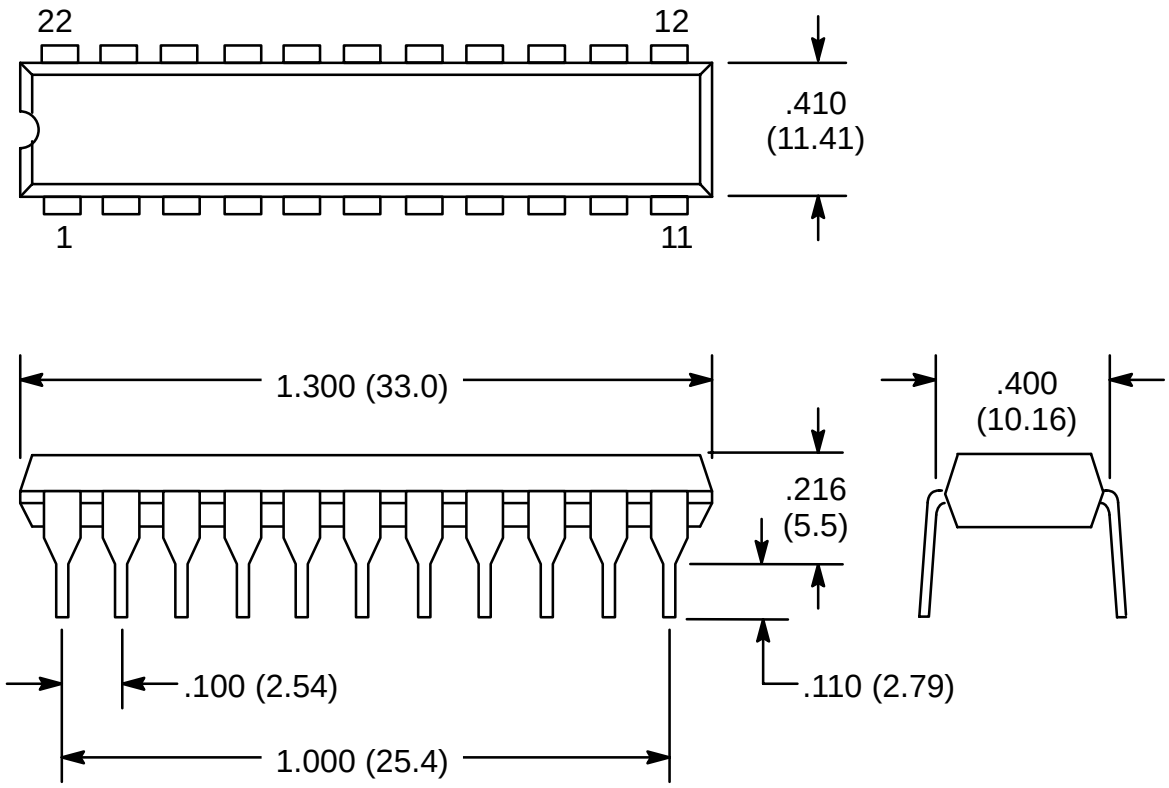
Vertical Power Supply Voltage, $V_{21}$ . . . . . 12V
Horizontal Power Supply Drain Current, $I_{11}$ . . . . . 15mA

**Electrical Characteristics:** ($T_A$ = +25°C, $V_{21}$ = 12V, $I_{11}$ = 15mA unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Vertical Power Supply Current | $I_{21}$ | $V_{21}$ = 12V | 10.5 | 14.0 | 17.5 | mA |
| Horizontal Power Supply Voltage | $V_{11}$ | $I_{11}$ = 15mA | 12.0 | 13.0 | 14.5 | V |
| Vertical Free–Running Frequency | $f_{\upsilon o}$ | $C_{18}$ = 1μF, $R_{17}$ = 33kΩ | 48 | 50 | 53 | Hz |
| Vertical Free–Running Frequency Drift | $\Delta f_{\upsilon o}(V_{CC})$ | $\Delta f_{\upsilon o}(V_{CC}) = \lvert f_{\upsilon o}(9.6V) - f_{\upsilon o}(14.4V)\rvert$ | 0 | 0.8 | 1.0 | Hz |
| | $\Delta f_{\upsilon o}(T_A)$ | $\Delta f_{\upsilon o}(T_A) = \lvert f_{\upsilon o}(–20°C) - f_{\upsilon o}(+75°C)\rvert$ | 0 | 0.6 | 1.0 | Hz |
| Vertical Synchronizing Capture Frequency | $f_{p\upsilon}$ | | 46 | 48 | 50 | Hz |
| Output Middle Voltage | $V_{MID}$ | Output Power: NTE1676 | 12 | 13 | 14 | V |
| Output Middle Voltage Drift | $\Delta V_{MID}(T_A)$ | $\Delta V_{MID}(T_A) = \lvert V_{MID}(–20°C) - V_{MID}(+75°C)\rvert$ | 0 | – | 1.0 | V |
| Retrace Pulse Width | RPW (1) | $C_{13}$ = 0.047μF, $R_{13}$ = 30.75kΩ | 0.95 | 1.0 | 1.05 | ms |
| | RPW (2) | $C_{13}$ = 0.1μF, $R_{13}$ = 28.5kΩ | 1.9 | 2.0 | 2.1 | ms |
| Retrace Pulse Voltage | RPV | | 10 | 11 | – | $V_{P–P}$ |
| Horizontal Power Supply Voltage Drift | $\Delta V_{11}(T_A)$ | $\Delta V_{11}(T_A) = \lvert\Delta V_{11}(–20°C) - \Delta V_{11}(+75°C)\rvert$ | – | – | 130 | mV |
| Horizontal Synchronizing Capture Frequency | $f_{PH}$ | $C_5$ = 5600pF | ±500 | ±700 | ±900 | Hz |
| Efficiency of Horizontal Oscillation Control | β | | 38 | 40 | 45 | Hz/μA |
| AFC Detector Gain | μ | | 190 | 300 | 420 | μA/rad |
| Horizontal Free–Running Frequency | $f_{HO}$ | $C_5$ = 5600pF, $R_5$ = 14.5kΩ | 15.00 | 15.75 | 16.50 | kHz |
| Horizontal Free–Running Frequency Drift | $\Delta f_{HO}(I_{11})$ | $\Delta f_{HO}(I_{11}) = \lvert f_{HO}(15mA) - f_{HO}(9mA)\rvert$ | 0 | – | 50 | Hz |
| | $\Delta f_{HO}(T_A)$ | $\Delta f_{HO}(T_A) = \lvert f_{HO}(–20°C) - f_{HO}(+75°C)\rvert$ | 0 | 40 | 100 | Hz |
| Horizontal Output Pulse Width | PWH | | 24.5 | 26.0 | 27.5 | μ |
| Horizontal Output Pulse Voltage | PWV | | 10 | 11 | – | $V_{P–P}$ |
| Horizontal Output Current | $I_{10}$ | | –3.5 | –4.5 | –6.0 | mA |
| X–Ray Protector Input Voltage | $V_6$ | $V_7$ = 6.2V | –0.1 | – | +0.1 | V |

**Pin Connection Diagram**




22
12
.410
(11.41)
1
11
1.300 (33.0)
.400
(10.16)
.216
(5.5)
.100 (2.54)
.110 (2.79)
1.000 (25.4)