

## NTE1289 Integrated Circuit TV Vertical Deflection System

### **Description:**

The NTE1289 is a monolithic integrated circuit in a 12-Lead quad in-line package designed for use in black and white and color TV receivers.

### **Features:**

- Synchronization Circuit
- Oscillator and Ramp Generator
- High Power Gain Amplifier
- Flyback Generator
- Voltage Regulator

### **Absolute Maximum Ratings:**

Supply Voltage (Pin2), $V_S$	35V
Flyback Peak Voltage, $V_4$ , $V_5$	60V
Power Amplifier Input Voltage, $V_{10}$	+10, -0.5V
Output Peak Current (Non-Repetitive, $t = 2\text{msec}$ ), $I_O$	2A
Output Peak Current, $I_O$	
( $f = 50\text{Hz}$ , $t \leq 10\mu\text{s}$ )	2.5A
( $f = 50\text{Hz}$ , $t > 10\mu\text{s}$ )	1.5A
Pin3 DC Current ( $V_4 < V_2$ ), $I_3$	100mA
Pin3 Peak-to-Peak Flyback Current ( $f = 50\text{Hz}$ , $t_{\text{fly}} \leq 1.5\text{msec}$ ), $I_3$	1.8A
Pin8 Current, $I_8$	$\pm 20\text{mA}$
Power Dissipation, $P_{\text{tot}}$	
$T_A = +80^\circ\text{C}$	1W
$T_{\text{tab}} = +90^\circ\text{C}$	5W
Operating Junction Temperature Range, $T_J$	$-40^\circ$ to $+150^\circ\text{C}$
Storage Temperature Range, $T_{\text{stg}}$	$-40^\circ$ to $+150^\circ\text{C}$
Thermal Resistance, Junction-to-Tab, $R_{\text{thJ-TAB}}$	$12^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient (Note 1), $R_{\text{thJA}}$	$70^\circ\text{C/W}$

Note 1. Obtained with tabs soldered to printed circuit with minimized copper area.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Pin2 Quiescent Current	$I_2$	$I_3 = 0$	–	7	14	mA
Pin5 Quiescent Current	$I_5$	$I_4 = 0$	–	8	15	mA
Oscillator Bias Current	$-I_9$	$V_9 = 1\text{V}$	–	0.1	1.0	$\mu\text{A}$
Amplifier Input Bias Current	$-I_{10}$	$V_{10} = 1\text{V}$	–	0.1	1.0	$\mu\text{A}$
Ramp Generator Bias Current	$-I_{12}$	$V_{12} = 0$	–	0.02	0.3	$\mu\text{A}$
Ramp Generator Current	$-I_{12}$	$I_7 = 20\mu\text{A}$ , $V_{12} = 0$	19	20	24	$\mu\text{A}$
Ramp Generator Non-Linearity	$\Delta I_{12}/I_{12}$	$\Delta I_{12} = 0\text{V to } 12\text{V}$ , $I_7 = 20\mu\text{A}$	–	0.2	1.0	%
Supply Voltage Range	$V_S$		10	–	36	V
Pin1 Saturation Voltage to GND	$V_1$	$I_1 = 1\text{mA}$	–	1	14	V
Pin3 Saturation Voltage to GND	$V_3$	$I_3 = 10\text{mA}$	–	1.7	2.6	V
Quiescent Output Voltage	$V_4$	$V_S = 10\text{V}$ , $R_1 = 10\text{k}\Omega$ , $R_2 = 10\text{k}\Omega$	4.17	4.40	4.63	V
		$V_S = 35\text{V}$ , $R_1 = 30\text{k}\Omega$ , $R_2 = 10\text{k}\Omega$	8.35	8.80	9.25	V
Output Saturation Voltage to GND	$V_{4L}$	$-I_4 = 100\text{mA}$	–	0.9	1.2	V
		$-I_4 = 800\text{mA}$	–	1.9	2.3	V
Output Saturation Voltage to $V_S$	$V_{4H}$	$I_4 = 100\text{mA}$	–	1.4	2.1	V
		$I_4 = 800\text{mA}$	–	2.8	3.2	V
Regulated Voltage at Pin6	$V_6$		6.1	6.5	6.9	V
Regulated Voltage at Pin7	$V_7$	$I_7 = 20\mu\text{A}$	6.2	6.6	7.0	V
Regulated Voltage Drift with $V_S$		$\Delta V_S = 10\text{V to } 35\text{V}$	–	1	–	mV/V
Amplifier Input Reference Voltage	$V_{10}$		2.07	2.20	2.30	V
Pin8 Input Resistance	$R_8$	$V_8 \leq 400\text{mV}$	1	–	–	$\text{M}\Omega$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Supply Current	$I_S$	$I_y = 1\text{A}_{\text{P-P}}$	–	140	–	mA
Sync. Input Current (Positive or Negative)	$I_8$		500	–	–	$\mu\text{A}$
Flyback Voltage	$V_4$	$I_y = 1\text{A}_{\text{P-P}}$	–	51	–	V
Peak-to-Peak Oscillator Sawtooth Voltage	$V_9$		–	2.4	–	V
Flyback Time	$t_{\text{fly}}$	$I_y = 1\text{A}_{\text{P-P}}$	–	0.7	–	ms
Free Running Time	$f_o$	$(P_1 + R_1) = 300\text{k}\Omega$ , $C_2 = 100\text{nF}$	–	44	–	Hz
		$(P_1 + R_1) = 260\text{k}\Omega$ , $C_2 = 100\text{nF}$	–	52	–	Hz
Synchronization Range	$\Delta f$	$I_8 = 0.5\text{mA}$	14	–	–	Hz
Frequency Drift with $V_S$	$\Delta f/\Delta V_S$	$V_S = 10\text{V to } 35\text{V}$	–	0.005	–	Hz/V
Frequency Drift with $T_{\text{tab}}$	$\Delta f/\Delta T_{\text{tab}}$	$T_{\text{tab}} = +40^{\circ} \text{ to } +120^{\circ}\text{C}$	–	0.01	–	Hz/ $^{\circ}\text{C}$

# Pin Connection Diagram

