

NTE7086 Integrated Circuit Sync Deflection Circuit for CRT Display

Description:

The NTE7086 is a sync•deflection circuit IC in a 20-Lead DIP type package dedicated to CRT display use. This device can be connected to the NTE1773/NTE1797 (for vertical output use) to form a sync•deflection circuit that meets every requirement for CRT display use.

So far, IC's for color TV use have been applied to the sync•deflection circuit for CRT display use and general-purpose IC's such as one-shot multivibrators, inverters, and a lot of transistors have been used to form the peripherals such as the sync input interface and horizontal phase shifter.

The NTE7086 contains these peripherals on chip and adopts a stable circuit for horizontal oscillation from 15kHz to 100kHz aiming at improving the characteristics required for CRT display use.

Features:

- The Horizontal Oscillation Frequency can be Adjusted Stably from 15kHz to 100kHz.
- The Horizontal Display can be Shifted Right/Left.
- The Horizontal/Vertical Sync Input can be used intact Regardless of the Difference in Pulse Polarity and Pulse Width.
- The AFC Feedback Sawtooth Wave can be Obtained by Simply Applying a Flyback Pulse to the IC as a Trigger Pulse.
- Any Duty of the Horizontal Pulse Can be Set.
- Good Linearity because DC Bias at Vertical Output Stage is Subjected to Sampling Control within Retrace Time.

On-Chip Functions:

Horizontal Block

- AFC
- Horizontal OSC
- X-Ray Protector
- Horizontal Phase Shifter
- AFC Sawtooth Wave Generator
- Horizontal Pulse Duty Setting

Vertical Block

- Vertical OSC
- Vertical Sawtooth Wave Generator
- Sampling Type DC Voltage Control

Absolute Maximum Ratings: ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Maximum Supply Voltage, $V_{10\text{max}}, V_{20\text{max}}$	14V
Allowable Power Dissipation ($T_A \leq +65^\circ\text{C}$), $P_{D\text{max}}$	780mW
Operating Temperature Range, T_{opr}	-20° to $+85^\circ\text{C}$
Storage Temperature Range, T_{stg}	-55° to $+125^\circ\text{C}$

Recommended Operating Conditions: ($T_A = +25^{\circ}\text{C}$ unless otherwise specified)Operating Voltage Range, $V_{10\text{opr}}$, $V_{20\text{opr}}$ 9.0V to 13.5VRecommended Supply Voltage, V_{10} , V_{20} 12V**Electrical Characteristics:** ($T_A = +25^{\circ}\text{C}$, $V_{CC10} = V_{CC20} = 12\text{V}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Current Dissipation	I_{10}	V_{CC10}	12	—	30	mA
	I_{20}	V_{CC20}	5	—	12	mA
Vertical Frequency Pull-In Range	V_{p-in}	Vertical Sync 60Hz	10	—	12	Hz
Vertical Free-Running Frequency with Increased/Reduced Voltage	f_V	f_V center 55Hz	50	—	60	Hz
	Δf_{VV}	$V_{20} = 12\text{V} \pm 1\text{V}$	-0.5	—	0.5	Hz
Characteristic of Vertical Frequency Middle-Point Voltage Control		55Hz at 12V	3.8	—	4.4	V
Threshold Level						
Vertical OSC Start Voltage			—	—	4.0	V
Temperature Coefficient of Amplitude Frequency		$T_A = -10^{\circ}$ to $+60^{\circ}\text{C}$	-0.028	—	0.028	Hz/ $^{\circ}\text{C}$
			12	—	18	dB
Vertical Driver Amplification Factor (V_{GV}) with Horizontal AFC Loop Current	I_{AFC}		± 1.0	—	± 1.9	mA
Horizontal Free-Running Frequency	f_H	f_H center 15.734kHz	-750	—	750	Hz
Horizontal OSC Start Voltage with Increased/Reduced Voltage			—	—	4	V
	Δf_{HV}	$V_{10} = 12\text{V} \pm 1\text{V}$	-50	—	50	Hz
Characteristic of Horizontal Frequency with Temperature Characteristic of Horizontal Frequency		15.735kHz at 12V, $T_A = -10^{\circ}$ to $+60^{\circ}\text{C}$	-2.9	—	2.9	Hz/ $^{\circ}\text{C}$
Comparison Wave Generation Input	V_4		0.6	—	0.9	V
Operating Voltage						
Holddown Operation Start Voltage	V_{13}		0.5	—	0.8	V
Horizontal Drive Current	I_{12}		6.0	—	12.0	mA

Pin Connection Diagram

Horiz Trigger Input	1	20	Vert Power Supply
Phase Adjust Time Constant	2	19	Vert Trigger Input
Sync Pulse Width Time Constant	3	18	Vert OSC Time Constant
FBP Trigger Input	4	17	Middle-Point Voltage Control Point
Sawtooth Wave Generating Cap	5	16	Vert Sawtooth Wave Generation
Comparison Voltage Generating Cap	6	15	Vert Drive Output
AFC Output	7	14	GND
Horiz OSC Time Constant	8	13	X-Ray Protect Input
Discharge Resistor	9	12	Horiz Drive Output
Horiz Power Supply	10	11	Horiz Drive Pulse Width Setting

