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NTE7063
Integrated Circuit
CRT Display Synchronization Deflection Circuit

Description:

The NTE7063 is a sync–deflection circuit IC dedicated to CRT display use. It can be connected to the NTE1773, NTE1797, or the NTE1855 (for vertical output use) to form a sync–deflection circuit that meets every requirement for CRT use.

So far, ICs for color TV use have been applied to the sync–deflection circuit for CRT display use and general purpose ICs such as one–shot multivibrators, inverters, and a lot of transistors have been used to form the peripherals such as sync input interface, horizontal phase shifter. The NTE7063 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.

The NTE7063 has independent GND pins for the horizontal block and vertical block, thus facilitating pattern layout for applications where the NTE7063 is used at high frequencies.

Features:

- The Vertical Pull–In Range is Approximately 10Hz at f_V = 60Hz.
- 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 Vertical Linearity because DC Bias at Vertical Output Stage is Subjected to Sampling Control Within Retrace Time.
- Excellent Interlace and Vertical Jitter Characteristics on the High–Definition Display Because of Independent GND Pins for the Horizontal Block and Vertical Block.

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°C unless otherwise specified)

Maximum Supply Voltage, V_{11}, V_{22} 14V
Allowable Power Dissipation ($T_A \leq$ +65°C), $P_d$max 780mW
Operating Temperature Range, T_{opr} . . . . . –20° to +85°C
Storage Temperature Range, T_{stg} . . . . . –65° to +125°C

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

Recommended Supply Voltage, V_{11}, V_{22} 12V
Operating Voltage Range, V_{11}, V_{22} . . . . . 9 to 13.5V
Recommended Vertical Pulse Input Peak Value, V_{PULSE} . . . . . $5V_{P-P}$
Operating Vertical Pulse Input Peak Value Range, V_{PULSE} . . . . . 2 to $6V_{P-P}$
Recommended Horizontal Pulse Input Peak Value, H_{PULSE} . . . . . $5V_{P-P}$
Operating Horizontal Pulse Input Peak Value Range, H_{PULSE} . . . . . 2 to $6V_{P-P}$

Electrical Characteristics: (T_A = +25°C, V_{11}, V_{22} = 12V unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
V_{CC11} Current Dissipation	I_{11}		12	–	30	mA
V_{CC22} Current Dissipation	I_{22}		5	–	12	mA
Vertical Frequency Pull–In Range	V_{PIN}	Vertical Sync 60Hz	10	–	12	Hz
Vertical Free–Running Frequency	f_V	f_V center 55Hz	50	–	60	Hz
Increased/Reduced Voltage Characteristic of Vertical Frequency	Δf_{VV}	V_{22} = 12V ±1V, 55Hz at 12V	–0.1	–	0.1	Hz
Midpoint Control Threshold Level			3.8	–	4.4	V
Vertical OSC Start Voltage	F_{vst}		–	–	4.0	V
Temperature Characteristic of Vertical Frequency		T_A = –10° to +60°C	–0.028	–	0.028	Hz/°C
Vertical Driver	G_V		12	–	18	dB
Amplification Factor Horizontal AFC DC Loop Gain	I_{AFC}+		+0.85	–	+1.6	mA
	I_{AFC}–		–1.6	–	–0.85	mA
Horizontal Free–Running Frequency	f_H	f_H center 15.734kHz	–750	–	750	Hz
Horizontal OSC Start Voltage	f_{Hst}		–	–	4.0	V
Increased/Reduced Voltage Characteristic of Horizontal Frequency	Δf_{HV}	V_{11} = 12V ±1V, 15.734kHz at 12V	–50	–	+50	Hz
Horizontal OSC Warm–Up Drift	Δf_H	5sec to 30min after application of power	–50	–	+50	Hz
Temperature Characteristic of Horizontal Frequency		T_A = –10° to +60°C	–2.9	–	+2.9	Hz/°C
Horizontal Output Drive Current	I_{13}		6	–	12	mA
Increased/Reduced Voltage Characteristic of Phase Shifter Delay Time		V_{11} = 12V ±1V	–0.5	–	0.5	%/V
Temperature Characteristic of Phase Shifter Delay Time		T_A = –10° to +60°C	–0.1	–	0.1	%/°C
Increased/Reduced Voltage Characteristic of Phase Shifter Delay Time		V_{11} = 12V ±1V	–1.0	–	1.0	%/V
Temperature Characteristic of Phase Shifter Pulse Width		T_A = –10° to +60°C	–0.13	–	0.13	%/°C

Electrical Characteristics (Cont'd): (T_A = +25°C, V_{11}, V_{22} = 12V unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
AFC Phase Compensation Center Time		15.734kHz after F.P.B. input	9.9	–	11.5	µs
Increased/Reduced Voltage Characteristic of AFC Phase Comparison Center Time		V_{11} = 12V ±1V	–1.5	–	1.5	%/V
Temperature Characteristic of AFC Phase Comparison Center Time		T_A = –10° to +60°C	–0.2	–	0.2	%/°C
Comparison Waveform Generating Input Operation Voltage	V_5		0.6	–	0.9	V
Pin14 Voltage at Hold–Down Operation Start	V_{14}		0.5	–	0.8	V

Pin Connection Diagram