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NTE7081
Integrated Circuit
RGB Video Amplifier System

Description:

The NTE7081 is a wideband video amplifier system in a 28–Lead DIP type package intended for high resolution RGB color monitor applications. In addition to three matched video amplifiers, the NTE7081 contains three gated differential input black level clamp comparators for brightness control and three matched attenuator circuits for contrast control. Each video amplifier contains a gain set or “Drive” node for setting maximum system gain (A_V = 4 to 10) as well as providing trim capability. The NTE7081 also contains a voltage reference for the video inputs.

Features:

- Three Wideband Video Amplifiers (70MHz @ –3dB)
- Inherently Matched (±0.5dB) Attenuators for Contrast Control
- Three Externally Gated Comparators for Brightness Control
- Provisions for Independent Gain Control (Drive) of each Video Amplifier
- Video Input Voltage Reference
- Low Impedance Output Driver

Absolute Maximum Ratings:

Supply Voltage (Pin1, Pin13, Pin23, Pin28, Note 1), V_{CC} 13.5V
Voltage at Any Input Pin, V_{IN} . . . . . $V_{CC} \geq V_{IN} \geq GND$
Video Output Current, I_{16}, I_{20}, or I_{28} 28mA
Power Dissipation (Note 2), P_D 2.5W
Junction Temperature, T_J . . . . . +150°C
Operating Temperature Range, T_A . . . . . 0° to +70°C
Storage Temperature Range, T_{stg} . . . . . –65° to +150°C
Thermal Resistance, Junction–to–Ambient, R_{thJA} . . . . . 50°C/W
Lead Temperature (During Soldering, 10sec.) , T_L . . . . . +265°C
ESD susceptibility 2kV

Note 1. V_{CC} supply pins 1, 13, 23, and 28 must be externally wired together to prevent internal damage during V_{CC} power ON/OFF cycles.

Note 2. Derate above +25°C based on R_{thJA} and T_J.

Electrical Characteristics: (T_A = +25°C, V_{CC1} = V_{CC2} = 12V unless otherwise specified)

Parameter	Symbol	Test Conditions	Typ	Tested (Note 3)	(Limits) Unit
DC Static Test (S17, S21, S26 Open, V_{12} = 6V, V_{14} = 0V, V_{15} = 2V unless otherwise specified)					
Supply Current	I_S	V_{CC}1 Only	73	90	mA Max
Video Input Reference Voltage	V_{11}		2.4	2.2	V_{MIN}
			–	2.6	V_{MAX}
Video Input Bias Current	I_b	Any One Amplifier	5	20	µA Max
Clamp Gate Low Input Voltage	V_{14L}	Clamp Comparators ON	1.2	0.8	V_{MIN}
Clamp Gate High Input Voltage	V_{14H}	Clamp Comparators OFF	1.6	2.0	V_{MAX}
Clamp Gate Low Input Current	I_{14L}	V_{14} = 0V	–0.5	–5.0	µA Max
Clamp Gate High Input Current	I_{14H}	V_{14} = V_{CC}	0.005	1.0	µA Max
Clamp Cap Charge Current	$I_{clamp(+)}$	V_5, V_8, or V_{10} = 0V	850	–	µA
Clamp Cap Discharge Current	$I_{clamp(–)}$	V_5, V_8, or V_{10} = 5V	–850	–	µA
Video Output Low Voltage	V_{OL}	V_5, V_8, or V_{10} = 0V	1.2	–	V
Video Output High Voltage	V_{OH}	V_5, V_8, or V_{10} = 5V	8.9	–	V
Video Output Offset Voltage	ΔV_O(2V)	Between Any Two Amplifiers, V_{15} = 2V	±0.5	±50	mV Max
	ΔV_O(4V)	Between Any Two Amplifiers, V_{15} = 4V	±0.5	±50	mV Max
AC Dymanic Test (S17, S21, S26 Closed, V_{14} = 0V, V_{15} = 4V, f = 10kHz unless otherwise specified)					
Video Amplifier Gain	$A_V$max	V_{12} = 12V, V_{IN} = 560m$V_{P–P}$	6.6	–	V/V
	$A_V$mid	V_{12} = 5V, V_{IN} = 560m$V_{P–P}$	2.0	–	V/V
V_{12} for A_V Low	V_{12}low	V_{IN} = 1$V_{P–P}$, Note 4	2.0	–	V
Video Gain Match at $A_V$max	ΔA_Vmax	V_{12} = 12V, Note 5	±0.2	–	dB
Video Gain Match at $A_V$mid	ΔA_Vmid	V_{12} = 5V, Note 5	±0.2	–	dB
Video Gain Match at $A_V$low	ΔA_Vlow	V_{12} = V_{12}low, Note 4, Note 5	±0.3	–	dB
Video Amplifier Distortion	THD	V_{12} = 3V, V_{IN} = 1$V_{P–P}$	0.5	–	%
Video Amplifier Bandwidth	f (–3dB)	V_{12} = 12V, Note 6, Note 8	70	–	MHz
Video Amplifier, 10kHz Isolation	V_{sep}10kHz	V_{12} = 12V, Note 7	–60	–	dB
Video Amplifier, 10MHz Isolation	V_{sep}10MHz	V_{12} = 12V, Note 7, Note 8	–40	–	dB

Note 3. These parameters are guaranteed and 100% tested.

Note 4. Determine V_{12} low for –40dB attenuation of output. Reference A_V to max.

Note 5. Measure gain difference between any two amplifiers. V_{IN} = 1$V_{P–P}$.

Note 6. Adjust input frequency, f_{IN}, from 10kHz (A_V max ref level) to the –3dB corner frequency (f –3dB). V_{IN} = 560m$V_{P–P}$.

Note 7. V_{IN} = 560m$V_{P–P}$ at f_{IN} = 10kHz to any one amplifier. Measure output levels of the other two undriven amplifiers relative to driven amplifier to determine channel separation. Terminate the undriven amplifier inputs to simulate generator loading. Repeat test at f_{IN} = 10MHz for V_{sep} = 10MHz.

Note 8. Special test fixture without socket required.

Pin Connection Diagram