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NTE7121 Integrated Circuit Color TV Complete Signal Processing Circuit

Description:

The NTE7121 is an integrated circuit designed for all NTSC type color TV small signal processing circuits integrated on a single chip.

Features:

- Fewer components, easier for compact set design
- Supply Voltage Range: 8.3V to 10.6V (9.6V Typ.)
- 42-lead shrunk dual-in-line plastic package

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

Supply Voltage, V_{28-27}	10.6V
Supply Current, I_2	18mA
Supply Current, I_{28}	92mA
Power Dissipation ($T_A = +70^\circ\text{C}$), P_D	1100mW
Operating Temperature Range, T_{opr}	-20° to $+70^\circ\text{C}$
Storage Temperature Range, T_{stg}	-55° to $+150^\circ\text{C}$

Electrical Characteristics: ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Video Detector Output	V_O	$v_p = 80\text{dB}\mu$, $m = 87.5\%$, $f_p = 58.75\text{MHz}$	1.55	1.85	2.15	V_{p-p}
Input Sensitivity	V_S	$V_O = 3\text{dB}$	-	49	54	$\text{dB}\mu$
Max. Allowable Input	$V_{I(max)}$	$V_O > +1\text{dB}$	106	109	-	$\text{dB}\mu$
Signal to Noise Ratio	S/N	$v_i = 80\text{dB}\mu$	51	54	-	dB
Differential Gain	DG	$m = 87.5\%$	-	4	8	%
Differential Phase	DP		-	4	8	deg.
Video Frequency Characteristics	f_c	$V_O = -\text{dB}$	4.5	6	8	MHz
RF AGC Max. Voltage	$V_{21(max)}$	$f = 58.75\text{MHz}$	7.6	8.0	8.4	V
RF AGC Min. Voltage	$V_{21(min)}$		-	0.02	0.5	V

Electrical Characteristics (Cont'd): ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
AFC Center Voltage	V_{29}	$v_p = 0V$	3.5	4.5	5.5	V
Total Detector Output	V_o	$f = 4.5\text{MHz}$, $f_m = 1\text{kHz}$, $\Delta f = \pm 25\text{kHz}$, $V_i = 100V_{\text{rms}}$	390	480	570	mV_{rms}
Input Limiting Voltage	$V_{i(\text{lim})}$	$f = 4.5\text{MHz}$, $f_m = 1\text{kHz}$, $\Delta f = \pm 25\text{kHz}$, $V_o = -3\text{dB}$	-	100	350	μV_{rms}
Total Harmonic Distortion	THD	$f = 4.5\text{MHz}$, $f_m = 1\text{kHz}$, $\Delta f = \pm 25\text{kHz}$, $V_i = 100mV_{\text{rms}}$	-	0.3	1.0	%
AM Rejection	AMR	$f = 4.5\text{MHz}$, $f_m = 1\text{kHz}$, $m = 30\%$, $V_i = 100V_{\text{rms}}$	40	45	-	dB
Horizontal Oscillation Frequency	f_{HO}		15.22	15.73	16.23	kHz
Horizontal Oscillation Pulse Width	T_{HO}	Oscillation Pulse Width when $f_{\text{HO}} = 15.73\text{kHz}$	25	28	31	μs
Horizontal Pull-In Range	f_{HP}		± 0.8	± 1.0	± 1.2	kHz
Overvoltage Protection Circuit Operating Start Input Voltage	V_{4-1}		0.61	0.68	0.75	V
Vertical Oscillation Frequency	f_{VO}		52	55	58	Hz
Vertical Oscillation Pulse Width	T_{VO}	Pulse Width when $f_{\text{VO}} = 55\text{Hz}$	0.58	0.69	0.80	ms
Vertical PullIn Range	f_{VP}		39	43	47	Hz
Vertical Blanking Pulse Width	T_{VB}		0.95	1.05	1.15	ms
Max. Color Difference Output	$V_{O(\text{max})}$	Color bar signal, Color max.	3.3	4.1	4.9	$V_{\text{p-p}}$
Min. Color Difference Output (Remaining Color)	$V_{O(\text{min})}$	Color bar signal, Color min.	-	20	50	$mV_{\text{p-p}}$
Oscillation Frequency	f_{OSC}		-	-	± 150	Hz
APC Pull-In Range	f_{APC}	$v_i = 200mV_{\text{p-p}}$	± 0.5	± 0.9	± 3	kHz
Tint Variable Range	$\theta_{(\text{tint})}$	Tint Voltage	± 35	± 45	± 55	deg.
Demodulation Output Ratio	R/B	Color Bar Signal	0.84	0.94	1.04	times
	G/B		0.20	0.28	0.35	times
Demodulation Angle	<R	Phase Difference from B-Y axis	87.5	97.5	107.5	deg.
	<G		225	235	245	deg.
Contrast Variable Range	Δe_{oc}	Contrast Voltage, $V_{21} = 0v$ to $9.3V$	2.0	2.5	3.0	times
Video Voltage Gain	G_V	$f = 20\text{kHz}$, Input $0.3V_{\text{p-p}}$	7.1	7.8	8.5	times
Contrast Variable Range	Δe_{vc}	Contrast Voltage, $V_{21} = 0$ to $9.3V$	2.7	3.2	3.7	times
Shapness Variable Range	Δf_{VP}	$f = 3\text{MHz}$, Input $0.1 V_{\text{p-p}}$	16	19	22	dB
Brightness Control Sensitivity	Y_{Bright}	Brightness Voltage, $\Delta V_{33} = 0.3V$	7.5	9	10.5	times

Pin Connection Diagram

GND (2)	1	42	Y Output
V _{CC} 2	2	41	(R - Y) Output
Horizontal Output	3	40	(G - Y) Output
Overvoltage Protection	4	39	(B - Y) Output
FB Pulse Input	5	38	APC Filter
Horizontal VCO	6	37	3.58MHz VCO
Horizontal AFC Output	7	36	Tint Control
Vertical OSC	8	35	ACC Filter
Vertical Sawtooth	9	34	Color Control
Vertical Output	10	33	Brightness Control
Color Killer Filter	11	32	Pedestal Clamp Filter
Video Input	12	31	Contrast Control
Chrominance Input	13	30	Sharpness Control
Tuner AFC Coil	14	29	Tuner AFC Output
Video Detect Coil (1)	15	28	V _{CC} 1
Video Detect Coil (2)	16	27	GND (1)
Sync Sep Input	17	26	VIF Input
Video Output	18	25	IF AGC
Input Bias	19	24	RF AGC Delay Adjust
SIF Input	20	23	Sound Output
RF AGC Output	21	22	SIF Detect Coil

