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NTE1410 Integrated Circuit Chroma Video Signal Processor

Description:

The NTE1410 is an integrated circuit in a 28-Lead DIP type package designed for all color TV video and chrominance signal process circuits.

Features:

- The NTE1410 provides a total video and chrominance signal processing circuitry, allowing compact set design
- Incorporating luminance signal mixing circuit and provides R.G.B. original color output
- All DC control system for simplicity of wiring (color, tint, contrast, picture, luminance)

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

Supply Voltage, V_{CC}	14.4V
Circuit Voltage	
V_{1-14}	0V to 14.4V
$V_{3,4,7,8,9,10-14}$	0V to V_{1-14}
V_{20-14}	V_{1-14}
V_{24-14}	-6V to V_{1-14}
Circuit Current, I_{26}, I_{27}, I_{28}	-40mA
Power Dissipation ($T_A = +70^\circ\text{C}$), P_D	750mW
Operating Ambient Temperature Range, T_{opr}	-20° to +70°C
Storage Temperature Range, T_{stg}	-40° to +125°C

Note 1. \oplus and \ominus are flow-in and flow-out currents to/from the circuit, respectively.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Total Circuit Current	I_{tot}	$V_{CC} = 12V$	33	44	56	mA
Circuit Voltage	V_{11-14}	$V_{CC} = 12V$	7.5	8.5	9.2	V
	$V_{26, 27, 28-14}$		3.5	4.0	4.5	V
Output Voltage (Burst)	$V_{O(1)}$	Rainbow 150mV _{P-P} , Color AUTO Center, Contrast Max.	0.5	0.7	0.9	V _{P-P}
ACC Characteristics	ACC	Rainbow 15mV _{P-P} , Burst Output/ $V_{O(1)}$	0.6	0.8	1.0	times
Output Voltage (Chroma)	$V_{O(2)}$	Rainbow 150mV _{P-P} , Color Max., Contrast Max.	0.5	0.7	0.9	V _{P-P}
Oscillation Frequency	f_{osc}	Pin13 Input Invalid Signal, Trimmer to be Set by Standard Samples, Note 2	-	-	±150	Hz

Note 2. f: Deviation from 3579545Hz.

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

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
f_{OSC} Drift with Supply Voltage	$\Delta f_{\text{OSC}}/V_{\text{CC}}$	Pin16 and pin17 Short-Circuit, $V_{\text{CC}} = 12\text{V}$, Note 3		–	–	± 60	Hz
f_{OSC} Drift with Ambient Temperature	$\Delta f_{\text{OSC}}/T_A$	$T_A = -20^\circ$ to $+70^\circ\text{C}$, Pin16 and Pin17 Short-Circuit, IC Unit, Note 4		0	–1	–2	Hz/deg.
Control Sensitivity (VCO)	β	Burst Input $0.7V_{\text{P-P}}$ Calculation with V_{16-17} for 100Hz Variation		1.2	1.5	2.0	Hz/mV
Phase Detector Sensitivity	μ	Burst Input $0.7V_{\text{P-P}}$ Calculation with Phase Error and V_{16-17} for 100Hz Change		25	45	55	mV/deg.
Phase Hold Characteristics	$\Delta\phi$	Burst Input $0.7V_{\text{P-P}}$ Phase Error for 100Hz Variation		–	1.5	2.5	deg/100Hz
APC Pull-In Range	f_{APC}	Burst Input $0.7V_{\text{P-P}}$ Burst Frequency to be Changed for Measurement		± 450	± 600	–	Hz
Demodulation Output Ratio	R/B ₍₁₎	Demodulation Input $0.2V_{\text{P-P}}$, $f = 3.59\text{MHz}$, Note 5	R Output/ e_0	0.86	0.94	1.04	times
	G/B ₍₂₎		G Output/ e_0	0.25	0.30	0.35	times
Demodulation Angle	$\angle R$	Demodulation Input $0.2V_{\text{P-P}}$, $\angle B = 0$ deg., $f = 3.59\text{MHz}$, Note 5	R–B Phase Difference	94.0	97.5	102	deg.
	$\angle G$		G–B Phase Difference	228	235	242	deg.
Color Difference Output Voltage (Max)	$e_{O(1)}$	Demodulator Input $1.2V_{\text{P}}$, $f = 3.59\text{MHz}$, B R Output, Note 5		4.8	5.7	–	$V_{\text{P-P}}$
Total Color Difference Output Voltage	$e_{O(2)}$	Rainbow $150\text{mV}_{\text{P-P}}$, AUTO Color Center, Contrast Max., R Output, Note 6		1.28	1.70	2.13	$V_{\text{P-P}}$
Color Killer Level	e_K	Attenuation of Pin13 Input Burst Voltage at Killer Operating (Burst Voltage $150\text{mV} = 0\text{dB}$), Note 6		–27	–32	–40	dB
Voltage Amplification (Video)	A_V		Studio Color Bar White Level $1V_{\text{P-P}}$ Contrast Max., Picture Min., Note 7	4.5	5.0	5.5	times
		Note 2		4.6	5.1	5.6	times
Frequency Characteristics (Video)	f_C	Sine Wave $0.1\text{mV}_{\text{rms}}$ Input, Input Frequency in which A_{V1} becomes -6dB , Picture Min., B Output, Note 6		5	6	–	MHz
DC Transfer Rate	T_{DC}	Video Input, $1V_{\text{P-P}}$ (Stair-Step), APL 10 to 90%, B Output		68	75	82	%
Original Color Output Voltage (Max.)	E_O	Output Voltage of each R, G, and B at $V_3 = 1.2\text{V}$		7.0	–	–	V
Differential Gain	DB	Video Input $1V_{\text{P-P}}$ (Stair-Step, 3.58MHz), APL 50%, Contrast Max., Picture Max., Note 7		–	–	5.0	%

Note 2. f: Deviation from 3579545Hz.

Note 3. Max. Width of Variation.

Note 4. Max. Width of Variation 90°C .

Note 5. $A_{24} = 3.5\text{V}$, Brightness VR Setting, No Blanking.

Note 6. $V_{26} = 3.5\text{V}$, Brightness VR Setting.

Note 7. Outputs of each R, G, and B, Pin26: Pedestal 2V, Brightness VR Setting.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Differential Gain	DB	Video Input $1V_{P-P}$ (Stair-Step, 3.58MHz), APL 50%, Contrast Max., Picture Max., Note 7	-	-	5.0	%
Demodulation DC Output Voltage	$E_{O(DC)}$	VCO Oscillation, Output of each R, G, and B, Note 8	2.8	3.5	4.2	V
DC Voltage Difference between Demodulation Outputs	ΔE_{X-Y}	$V_{26} = 3.5V$, VCO Oscillation, Outputs of each R, G, and B	-	0	300	mV
ΔE_{X-Y} Change with Supply Voltage	$\Delta E_{X-Y}/V_{CC}$	$V_{CC} = 12V \pm 20\%$, $V_{26} = 3.5V$ ($V_{CC} = 12V$) for $V_{CC} = 12V$, Note 9	-	0	± 60	mV
ΔE_{X-Y} Change with Ambient Temperature	$\Delta E_{X-Y}/T_A$	$V_{26} = 3.5V$ ($T_A = +25^\circ\text{C}$), $T_A = -20^\circ$ to $+70^\circ\text{C}$, for $T_A = +25^\circ\text{C}$	-	0	± 60	mV

Note 7. Outputs of each R, G, and B, Pin26: Pedestal 2V, Brightness VR Setting.

Note 8. Blanking ON.

Note 9. No Blanking.

Pin Connection Diagram

