

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 $0.2V_{\text{P-P}}$ $\angle B = 0^{\circ}$, $f = 3.59\text{MHz}$, 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)	$e_{\text{O}(1)}$	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	$e_{\text{O}(2)}$	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 $A_{\text{V}1}$ 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

V_{CC}	1	28	B Output
Pedestal Clamp Filter	2	27	G Output
Brightness Control	3	26	R Output
Picture Control	4	25	Demodulator Input
Video Peaking	5	24	Blanking Pulse Input
Picture Peaking	6	23	3.58MHz OSC Filter
Tint Control	7	22	3.58MHz OSC Input
Auto/Manual Switch	8	21	3.58MHz OSC Output
Color Control	9	20	Burst Gate Pulse Input
Contrast Control	10	19	APC Killer Filter
BPA Output	11	18	Color Killer Filter
Chroma Bypass	12	17	APC Filter
Chroma Input	13	16	APC Filter
GND	14	15	APC Filter

