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NTE821
Integrated Circuit
TV Chroma Demodulator

Description:

Specifically designed to match advances in color picture tube phosphors, the NTE821 is a monolithic silicon integrated circuit in a 14–Lead DIP type package and consists of three output amplifiers, a new resistor matrix, two double–balanced chroma demodulators, and a very stable bias circuit. When used with the NTE714 subcarrier regeneration system and the NTE715 chroma amplifier, this device completes the typical three–block chroma system. Alternatively, the NTE821 chroma demodulator can be used with the NTE738 chroma processor to form a complete two–block chroma system.

The output amplifiers are specifically designed to meet the low impedance, short–circuit protected driving requirements of high–level color output amplifiers. Internal ripple filter capacitors greatly reduce the high–frequency components of demodulation and thereby extend the output voltage swing capability of the output stages and at the same time eliminates the need for external output filtering components.

Features:

- Output Short–Circuit Protection
- Excellent Subcarrier Rejection
- 600mV Maximum Offset Voltage
- 2mV/°C Typical Temperature Stability
- Good Chroma Sensitivity

Absolute Maximum Ratings: (T_A = +25°C unless otherwise specified)

Operating Ambient Temperature Range, T_{opr} . . . . . –40° to +85°C
Storage Temperature Range, T_{stg} . . . . . –65° to +150°C
Maximum Voltage and Current Ratings (T_A = +25°C) . . . . . See Table

Pin #	Voltage Range in Volts	Current in mA		Pin #	Voltage Range in Volts	Current in mA	
		Input	Output			Input	Output
1	No Connection	–	–	8	0 to +27	Note 2	1.0
2	No Connection	–	–	9	0 to +20	1.0	Note 1
3	0 to +5.0	–	–	10	No Connection	–	–
4	0 to +5.0	–	–	11	0 to +20	1.0	Note 1
5	No Connection	–	–	12	No Connection	–	–
6	0 to +12	–	–	13	0 to +20	1.0	Note 1
7	0 to +12	–	–	14	Reference	1.0	Note 2

Note 1. Maximum continuous current output is 20mA and is limited by package power dissipation. Short circuit current is typically 50mA.

Note 2. Limited by package power dissipation.

Electrical Characteristics: (T_A = +25°C, V_{CC} = 24V, R_L = 3.3kΩ, Reference Input Voltage = $1V_{P-P}$ unless otherwise specified)

Parameter	Test Pin	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Quiescent Output Voltage	9, 11, 13		13.0	14.3	16.0	V
Quiescent Input Current	8	R_L = ∞, Chroma and Reference Voltage = 0	–	6.0	–	mA
		Chroma and Reference Voltage = 0	16.5	19.0	25.5	mA
Reference Input Voltage	6, 7		–	6.6	–	V
Chroma Input Voltage	3, 4		–	3.5	–	V
Differential Output Voltage	9, 11, 13	Note 3	–	200	600	mV
Output Temperature Coefficient	9, 11, 13	No Output Differential Voltage, Note 3	–	2.0	–	mV/°C
Dynamic Characteristics						
Detector Output Voltage (B–Y)	13	Note 4	8	13	–	V_{P-P}
Chroma Input Voltage	3	B–Y Output = $5V_{P-P}$, Note 5	–	300	700	mV_{P-P}
Detector Output Voltage (G–Y)	9	Adjust B–Y Output to $5V_{P-P}$, Note 6	1.4	1.75	2.1	V_{P-P}
Detector Output Voltage (R–Y)	11	Adjust B–Y Output to $5V_{P-P}$, Note 6	4.3	4.65	5.0	V_{P-P}
Relative Output Phase (B–Y to R–Y)	13–11	B–Y Output = $5V_{P-P}$	85	90	95	deg
Relative Output Phase (B–Y to G–Y)	13–9	B–Y Output = $5V_{P-P}$	236	244	252	deg
Demodulator Unbalanced Voltage	9, 11, 13	No Chroma Input Voltage and Normal Reference Signal Input Voltage	–	250	500	mV_{P-P}
Residual Carrier and Harmonics	9, 11, 13	With Input Signal Voltage, Normal Reference Signal Voltage and B–Y = $5V_{P-P}$	–	–	1.5	V_{P-P}
Reference Input Resistance	6, 7	Chroma Input = 0	–	2.0	–	kΩ
Reference Input Capacitance	6, 7	Chroma Input = 0	–	6.0	–	pF
Chroma Input Resistance	3, 4		–	1.0	–	kΩ
Chroma Input Capacitance	3, 4		–	2.0	–	pF

Note 3. With chroma input signal voltage = 0 and normal reference input signal voltage ($1V_{P-P}$), all output voltages will be within specified limits and will not differ from each other by greater than 0.6V.

Note 4. With normal reference input signal voltage, adjust chroma input signal voltage to $1.2V_{P-P}$.

Note 5. With normal reference input signal voltage, adjust chroma input signal voltage until the B–Y output voltage = $5V_{P-P}$. The chroma input voltage at this point should be equal to or less than $0.7V_{P-P}$.

Note 6. With normal reference input signal voltage, adjust the chroma input signal until the B–Y output voltage = $5V_{P-P}$. At this point, the R–Y and G–Y voltages will fall within the specified limits.

Pin Connection Diagram