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## **NTE730 Integrated Circuit TV Video IF System**

### **Description:**

The NTE730 is a monolithic integrated circuit in a 20-Lead Quad-In-Line package that incorporates an entire video TV-IF subsystem on a single chip. Innovations in integrated circuit design, in addition to the many active devices and closely matched components utilized in the circuit, make the NTE730 ideally suited for use in color and black and white TV receivers.

The primary functions performed by the IF subsystem are video IF amplification, linear detection, video output amplification, AGC from a keyed supply, AGC delay for tuner, sound carrier detection, sound carrier amplification, and a buffered AFT output. The advanced circuit design of the NTE730 also includes secondary functions for improved noise immunity and minimal airplane flutter. An isolated zener reference diode, incorporated in the IC, provides a convenient and economical means for controlling the regulated voltage supply. The inherent wide bandwidth capability (10-70MHz) and high overall gain (87dB) make the NTE730 suitable for other AM IF applications whose frequencies range within this bandwidth.

### **Features:**

- High Gain Wide Band IF Amplifier: 75dB typ at 45MHz
- Gain Reduction with Excellent Stability: 50dB typ at 45MHz
- Video Detector with Linear Characteristics
- Video Amplifier: 12dB gain
- Impulse Noise Limiter
- Keyed AGC With Noise Immunity Circuits
- Delayed AGC for Tuner
- Buffered AFT Output
- Separate Sound IF Intercarrier Amplification
- Sound Carrier Detector
- 4.5MHz Sound Carrier Amplifier
- Isolated Zener Reference Diode For Regulated Voltage Supply

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

DC Supply Voltage:

Between Pin15 and Pin5 (Note 1) .....	11.3V
Pin7 (Collector to GND) .....	20V
Pin9 (Collector to GND) .....	20V

DC Current (into Pin18) ..... 2mA

Device Dissipation ( $T_A \leq +60^\circ\text{C}$ ) ..... 600mW

Derate Linearly Above  $T_A = +60^\circ\text{C}$  ..... 6.7mW/ $^\circ\text{C}$

Operating Ambient Temperature Range .....  $-40^\circ$  to  $+85^\circ\text{C}$

Storage Temperature Range .....  $-65^\circ$  to  $+150^\circ\text{C}$

Lead Temperature (During Soldering 1/32" (0.79mm) from case, 10sec max.) .....  $+265^\circ\text{C}$

Note 1. This rating does not apply when using the internal zener reference in conjunction with the pass transistor.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static (DC) Characteristics</b>						
Quiescent Circuit Current	$I_{15}$		15	-	45	mA
DC Voltages						
Sound (Pin2)	$V_2$		-	6	-	V
Keying Input (Pin3)	$V_3$		6.4	-	10	V
AGC 1 (Pin7)	$V_7$		16	-	21	V
AGC 2 (Pin7)	$V_7$		-	1	-	V
AGC Delay (Pin8)	$V_8$		-	4	-	V
Cascode Collector (Pin9)	$V_9$		-	8.5	-	V
Bias (Pin16)	$V_{16}$		1.1	-	2.3	V
Zener (Pin18)	$V_{18}$	$V_5 = V_{17} = 0\text{V}, I_{18} = 1\text{mA}$	10.6	11.9	13.2	V
White Level (Pin19)	$V_{19}$		6	-	10	V
<b>Dynamic Characteristics</b>						
Video Sensitivity	$e_1$	$f_O = 45.75\text{MHz}$ , MOD (AM) = 85% at 400Hz; Adjust $e_1$ for $4V_{P-P}$ at Pin19	40	100	200	$\mu\text{V}$
Sync. Tip Level Voltage	$V_{19}$	$f_O = 45.75\text{MHz}$ , $e_1$ (CW) = 10mV	0.4	0.8	1.6	V
AFT Drive Level Voltage	$V_{14}$		-	15	-	mV
Delay Bias Voltage	$V_7$	$f_O = 45.75\text{MHz}$ , $e_1$ (CW) = 20mV; Adjust $R_1$ for $V_7 = 14\text{V}$	16	-	-	V
At $e_1 = 10\text{mV}$			0.5	-	2.0	V
At $e_1 = 30\text{mV}$						
3.58MHz Chroma Output Voltage	$V_{19}$	$f_O = 45.75\text{MHz}$ , $e_1$ (step mod.) = 10mV; $f_1 = 42.17\text{MHz}$ , $e_1$ (step mod.) = 3.33mV	0.5	0.8	-	V
4.5MHz Sound Output Voltage	$V_2$	$f_O = 45.75\text{MHz}$ , $e_1$ (step mod.) = 10mV; $f_2 = 41.25\text{MHz}$ , $e_1$ (step mod.) = 2.5mV	50	200	-	mV
Parallel Input Impedance		$f_O = 45.75\text{MHz}$				
Resistance at Pin6	$R_{I-6}$		4	-	-	k $\Omega$
Capacitance at Pin6	$C_{I-6}$		-	2	-	pF
Resistance at Pin12	$R_{I-12}$		-	4.5	-	k $\Omega$
Capacitance at Pin12	$C_{I-12}$		-	4	-	pF
Resistance at Pin13	$R_{I-13}$		-	5	-	k $\Omega$
Capacitance at Pin13	$C_{I-13}$	-	4	-	pF	

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Parallel Output Impedance Resistance at Pin9	$R_{O-9}$	$f_O = 45.75\text{MHz}$	30	-	-	$k\Omega$
Capacitance at Pin9	$C_{O-9}$		-	3	-	pF
Cascode Transfer Characteristics Magnitude of Forward Transadmittance	$ y_f $		-	50	-	mmho
Reverse Transfer Capacitance	$C_r$		-	0.001	-	pF

**Pin Connection Diagram**

