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## NTE15013 Integrated Circuit TV VIF Amp, Phase Lock Loop (PLL)

### **Description:**

The NTE15013 is an integrated circuit in a 22-Lead DIP type package designed for color TV video IF signal processing circuits.

### **Features:**

- High Density One-Chip Integration of Video IF Amplifier, PLL Detector, Video Pre-Amplifier, AGC and AFC Circuits
- PLL True Synchronous Detector Incorporates VCO
- Wide Pull-In Range by Time-Constant Auto-Changer of PLL Loop-Filter
- Selective Transformerless AFC Circuit

### **Absolute Maximum Ratings:**

Supply Voltage, $V_{CC}$ .....	14.4V
Circuit Voltage	
$V_{1-8,16}/V_{9-8,16}$ .....	0V
$V_{2-8,16}/V_{9-8,16}$ .....	0V
$V_{3-8,16}/V_{9-8,16}$ .....	0V
$V_{11-8,16}/V_{9-8,16}$ .....	0V
$V_{19-8,16}/V_{9-8,16}$ .....	0V
Circuit Voltage	
$I_{10}$ .....	-10/0.5mA
$I_{12}$ .....	-10/1mA
$I_{17}$ .....	-2/5mA
Power Dissipation ( $T_A = +70^\circ\text{C}$ ), $P_D$ .....	1100mW
Operating Ambient Temperature Range, $T_{opr}$ .....	-20° to +70°C
Storage Temperature Range, $T_{stg}$ .....	-55° to +150°C

### **Electrical Characteristics:** ( $V_{CC} = 12V$ , $T_A = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>IF Amplifier Detector</b>						
Video Detector Output	$V_O$	$f = 58.75\text{MHz}$ , $V_i = 80\text{dB}\mu$ , $m = 87.5\%$	1.8	2.05	2.3	$V_{P-P}$
		$f = 58.75\text{MHz}$ , $V_i = 80\text{dB}\mu$ , $m = 110\%$	2.1	2.6	3.1	$V_{P-P}$
Input Sensitivity	$S_{(IN)}$	$V_O = -3\text{dB}$	51	55	60	$\text{dB}\mu$
Maximum Allowable Input	$V_{I9max}$		101	104	-	$\text{dB}\mu$
Differential Gain	DG	$f = 58.75\text{MHz}$ , $V_i = 80\text{dB}\mu$ , $m = 87.5\%$	-	2	6	%
		$f = 58.75\text{MHz}$ , $V_i = 80\text{dB}\mu$ , $m = 110\%$	-	5	13	%
Differential Phase	DP	$f = 58.75\text{MHz}$ , $V_i = 80\text{dB}\mu$ , $m = 87.5\%$	-	2	5	deg
		$f = 58.75\text{MHz}$ , $V_i = 80\text{dB}\mu$ , $m = 110\%$	-	5	12	deg
Output Voltage (SIF)	$V_O$	$P/S = 20\text{dB}$	98	101	104	$\text{dB}\mu$

**Electrical Characteristics (Cont'd):** ( $V_{CC} = 12V$ ,  $T_A = +25^{\circ}C$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>AGC Circuit</b>						
RF AGC Voltage Gain	$G_V$	$f = 10kHz$ , $V_i = 10mV$	33	37	41	dB
<b>AFC Circuit</b>						
Phase Detector Sensitivity		$R_L = 30\Omega/39k\Omega$	28	35	45	mV/kHz
AFC Center Voltage	$V_{19}$	$R_L = 30k\Omega/39k\Omega$	5.3	6.6	7.3	V
<b>VCO Circuit</b>						
Maximum Variable Range	$\Delta f_V$	$V_{18} = 2V$	0.85	1.1	-	MHz
		$V_{18} = 3V$	-	-1.6	-1.3	MHz
Control Sensitivity	$\beta$		2.9	3.3	3.7	mV/kHz
<b>APC Circuit</b>						
APC Pull-In Range	$f_{APC}$	APC Filter SW is set to OFF	+0.8	+1.0	+1.5	MHz
			-2.5	-2.0	-1.7	MHz
<b>Serial Characteristics</b>						
Circuit Current	$I_9$		45	54	68	mA
	$I_{15}$		7	9	12	mA

**Pin Connection Diagram**

