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NTE7129 **Integrated Circuit** **IF Signal Processing (Super PLL-II VIF + SIF)** **Circuit for TVs & VCRs**

Description:

The NTE7129 is an intercarrier-type VIF + SIF integrated circuit in a 24-Lead DIP type package that supports excellent sound and image quality. The pin assignment of the NTE7129 is identical to that of the NTE7130, allowing the NTE7130 to be used for split systems while the NTE7129 is used for intercarrier systems. In addition, the NTE7129 suppresses Nyquist buzz interference by using a PLL (Phase-Lock Loop) detection system with a buzz canceller in order to provide the best sound quality possible.

Features:

- Excellent Buzz and Buzz-Beat Characteristics due to PLL
- Built-In APC Time Constant Switch
- Duplicate Time Constant System Suited for High-Speed AGC
- Excellent DG and DP Characteristics
- RF AGC Adjustment is Simple

Functions:

VIF Block

- | | |
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| <ul style="list-style-type: none">● VIF Amplifier● VCO● APC Filter● B/W NC● AFT● IF AGC | <ul style="list-style-type: none">● PLL Detector● Equalizer Amplifier● Lock Detection● RF AGC● APC Detector● Buzz Cancellor |
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SIF Block

- | | |
|---|--|
| <ul style="list-style-type: none">● Limiter Amplifier | <ul style="list-style-type: none">● FM Quadrature Detector |
|---|--|

Mute

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| <ul style="list-style-type: none">● Audio Mute (Pin2)● IS-15 Switch (Pin13) | <ul style="list-style-type: none">● AV Mute (Pin4) |
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Absolute Maximum Ratings: ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Maximum Supply Voltage, V_{CCmax}	13.8V
Allowable Power Dissipation ($T_A \leq +50^\circ\text{C}$), P_{dmax}	1200mW
Circuit Voltage, V_3, V_{13}	V_{CC}
Circuit Voltage, V_{14}	V_{CC}
Circuit Current, I_1	-1mA
Circuit Current, I_{17}	-10mA
Circuit Current, I_{21}	-3mA
Circuit Current, I_{10}	3mA
Operating Temperature Range (Note 2), T_{opr}	-20° to $+70^\circ\text{C}$
Storage Temperature Range, T_{stg}	-55° to $+150^\circ\text{C}$

Note 1. The current that flows into the IC is positive (no signal); the current that flows out of the IC is negative.

Note 2. $T_{opr} = -20^\circ$ to $+75^\circ\text{C}$ at $V_{CC} = 9\text{V}$.

Recommended Operating Conditions: ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Recommended Supply Voltage	V_{CC}			9 or 12		V
Operating Supply Voltage Range	V_{CCop}		8.2	-	13.2	V

Note 3. Always turn on the protective resistance when drawing a line directly out from the IC at usage. (Pin2, Pin11, Pin12, etc.)

Note 4. A capacitor with favorable humidity characteristics should be used for Pin13. (ex. OS capacitor)

Note 5. Pin8 (N.C.) should always be open.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
VIF Block							
Circuit Current	I_9	$V_{13} = 5\text{V}, S1 = \text{ON}$		42	48	57	mA
			$V_{CC} = 9\text{V}$	36	41	49	mA
No-Signal Video Output Voltage	V_{21}	$V_{13} = 5\text{V}, S1 = \text{ON}$		6.6	7.0	7.4	V
			$V_{CC} = 9\text{V}$	5.0	5.4	5.8	V
Maximum RF AGC Voltage	V_{10H}	$V_{13} = 7\text{V}, S1 = \text{OFF}$		10.6	11.0	11.4	V
			$V_{CC} = 9\text{V}$	7.6	8.0	8.4	V
Minimum RF AGC Voltage	V_{10L}	$V_{13} = 7\text{V}, S1 = \text{ON}$		-	0	0.5	V
			$V_{CC} = 9\text{V}$	-	0	0.5	V
No-Signal AFT Voltage	V_{14}	$V_{13} = 5\text{V}, S1 = \text{ON}$		3.0	5.9	8.0	V
			$V_{CC} = 9\text{V}$	2.6	4.5	6.0	V
Input Sensitivity	V_i	$S1 = \text{OFF}$		33	39	45	dB/ μV
			$V_{CC} = 9\text{V}$	37	43	49	dB/ μV
AGC Range	GR	$S1 = \text{ON}$	60	66	-	dB	
Maximum Allowable Input	$V_{i,max}$	$S1 = \text{ON}$	100	105	-	dB/ μV	
Video Output Amplitude	$V_O(\text{video})$	$S1 = \text{ON}$		1.95	2.25	2.55	V_{P-P}
			$V_{CC} = 9\text{V}$	1.5	1.75	2.0	V_{P-P}
Output S/N	S/N	$S1 = \text{ON}$	49	55	-	dB	

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
VIF Block (Cont'd)							
Sync Signal Tip Voltage	$V_{21}(\text{tip})$	$V_i = 10\text{mV}$, $S1 = \text{ON}$		4.15	4.45	4.75	V
			$V_{CC} = 9\text{V}$	3.25	3.55	3.85	V
920kHz Beat Level	I_{920}	$P = 0$, $C = -4\text{dB}$, $S = -14\text{dB}$, $S1 = \text{ON}$	37	43	–	dB	
Frequency Characteristics	f_c	$P = 0$, $S = -14\text{dB}$	6	8	–	MHz	
Differential Gain	DG	$V_i = 10\text{mV}$, 87.5% MOD, $f_p = 58.75\text{MHz}$	–	3	6	%	
Differential Phase	DP		–	2	5	deg	
Maximum AFT Voltage	V_{14H}			11.0	11.5	12.0	V
			$V_{CC} = 9\text{V}$	8.0	8.5	9.0	V
Minimum AFT Voltage	V_{14L}			0	0.4	1.0	V
			$V_{CC} = 9\text{V}$	–	0.3	1.0	V
White Noise Threshold Voltage	V_{WTH}			8.9	9.3	9.7	V
			$V_{CC} = 9\text{V}$	6.8	7.2	7.6	V
White Noise Clamp Voltage	V_{WCL}			5.3	5.7	6.1	V
			$V_{CC} = 9\text{V}$	4.0	4.4	4.8	V
Black Noise Threshold Voltage	V_{BTH}	$S1 = \text{ON}$		3.4	3.7	4.0	V
			$V_{CC} = 9\text{V}$	2.5	2.8	3.1	V
Black Noise Clamp Voltage	V_{BCL}	$S1 = \text{ON}$		5.3	5.7	6.1	V
			$V_{CC} = 9\text{V}$	3.7	4.1	4.5	V
AFT Detection Sensitivity	S_f			50	70	100	mV/kHz
			$V_{CC} = 9\text{V}$	30	43	60	mV/kHz
VIF Input Resistance	R_i (VIF)	$f = 58.75\text{MHz}$	0.8	1.3	1.75	$k\Omega$	
VIF Input Capacitance	C_i (VIF)	$f = 58.75\text{MHz}$	–	3.0	6.0	pF	
APC Pull-In Range	f_{PU-2}	$S1 = \text{ON}$	0.6	1.6	–	MHz	
	f_{PL-2}		–	–1.6	–0.8	MHz	
VCO Maximum Variable Range	Δf_U	$V_{18} = 3\text{V}$, $S1 = \text{ON}$	0.6	1.6	–	MHz	
	Δf_L		–	–1.6	–0.8	MHz	
VCO Control Sensitivity	β	$V_{18} = 5\text{V to } 2.6\text{V}$	1.5	3.1	6.2	kHz/mV	
SIF Output Signal Voltage	V_O (SIF)	$P/S = 20\text{dB}$		120	170	240	mV_{rms}
			$V_{CC} = 9\text{V}$	90	130	180	mV_{rms}
SIF Block ($V_{13} = 5\text{V}$)							
SIF Limiting Sensitivity	V_i (lim)		–	33	39	dB/ μV	
FM Detection Output Voltage	V_O			400	600	790	mV_{rms}
			$V_{CC} = 9\text{V}$	400	600	790	mV_{rms}
AMR	AMR		40	49	–	dB	
Total Harmonic Distortion	THD		–	0.5	1.0	%	
SIF S/N	S/N (SIF)		60	78	–	dB	

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Mute Defeat						
AFT Defeat Start Voltage	VD ₁₁		0.5	2.3	-	V
		V _{CC} = 9V	0.5	1.6	-	V
AV Mute	V _{4TH}		0.5	1.9	-	V
		V _{CC} = 9V	0.5	1.1	-	V
FM Mute	V _{2TH}		0.5	2.0	-	V
		V _{CC} = 9V	0.5	1.9	-	V
AFT Defeat Voltage	VD ₁₄		5.4	6.0	6.6	V
		V _{CC} = 9V	3.9	4.5	5.1	V

Pin Connection Diagram

