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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

- | | |
|-----------------|-----------------------|
| ● VIF Amplifier | ● PLL Detector |
| ● VCO | ● Equalizer Amplifier |
| ● APC Filter | ● Lock Detection |
| ● B/W NC | ● RF AGC |
| ● AFT | ● APC Detector |
| ● IF AGC | ● Buzz Canceller |

SIF Block

- | | |
|---------------------|--------------------------|
| ● Limiter Amplifier | ● FM Quadrature Detector |
|---------------------|--------------------------|

Mute

- | | |
|------------------------|------------------|
| ● Audio Mute (Pin2) | ● AV Mute (Pin4) |
| ● IS-15 Switch (Pin13) | |

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

Maximum Supply Voltage, $V_{CC\text{max}}$	13.8V
Allowable Power Dissipation ($T_A \leq +50^{\circ}\text{C}$), $P_{d\text{max}}$	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	$V_{i\text{max}}$	$S1 = \text{ON}$	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 (tip)	V _i = 10mV, S1 = ON		4.15	4.45	4.75	V
			V _{CC} = 9V	3.25	3.55	3.85	V
920kHz Beat Level	I ₉₂₀	P = 0, C = -4dB, S = -14dB, S1 = ON		37	43	-	dB
Frequency Characteristics	f _c	P = 0, S = -14dB		6	8	-	MHz
Differential Gain	DG	V _i = 10mV, 87.5% MOD, f _p = 58.75MHz		-	3	6	%
Differential Phase	DP			-	2	5	deg
Maximum AFT Voltage	V _{14H}			11.0	11.5	12.0	V
			V _{CC} = 9V	8.0	8.5	9.0	V
Minimum AFT Voltage	V _{14L}			0	0.4	1.0	V
			V _{CC} = 9V	-	0.3	1.0	V
White Noise Threshold Voltage	V _{WTH}			8.9	9.3	9.7	V
			V _{CC} = 9V	6.8	7.2	7.6	V
White Noise Clamp Voltage	V _{WCL}			5.3	5.7	6.1	V
			V _{CC} = 9V	4.0	4.4	4.8	V
Black Noise Threshold Voltage	V _{BTH}	S1 = ON		3.4	3.7	4.0	V
			V _{CC} = 9V	2.5	2.8	3.1	V
Black Noise Clamp Voltage	V _{BCL}	S1 = ON		5.3	5.7	6.1	V
			V _{CC} = 9V	3.7	4.1	4.5	V
AFT Detection Sensitivity	S _f			50	70	100	mV/kHz
			V _{CC} = 9V	30	43	60	mV/kHz
VIF Input Resistance	R _i (VIF)	f = 58.75MHz		0.8	1.3	1.75	kΩ
VIF Input Capacitance	C _i (VIF)	f = 58.75MHz		-	3.0	6.0	pF
APC Pull-In Range	f _{PU-2}	S1 = ON		0.6	1.6	-	MHz
	f _{PL-2}			-	-1.6	-0.8	MHz
VCO Maximum Variable Range	Δf _U	V ₁₈ = 3V, S1 = ON		0.6	1.6	-	MHz
	Δf _L			-	-1.6	-0.8	MHz
VCO Control Sensitivity	β	V ₁₈ = 5V to 2.6V		1.5	3.1	6.2	kHz/mV
SIF Output Signal Voltage	V _O (SIF)	P/S = 20dB		120	170	240	mV _{rms}
			V _{CC} = 9V	90	130	180	mV _{rms}
SIF Block (V ₁₃ = 5V)							
SIF Limiting Sensitivity	V _I (lim)			-	33	39	dB/μV
FM Detection Output Voltage	V _O			400	600	790	mV _{rms}
			V _{CC} = 9V	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
			$V_{CC} = 9\text{V}$	0.5	1.6	V
AV Mute	V_{4TH}			0.5	1.9	V
			$V_{CC} = 9\text{V}$	0.5	1.1	V
FM Mute	V_{2TH}			0.5	2.0	V
			$V_{CC} = 9\text{V}$	0.5	1.9	V
AFT Defeat Voltage	VD_{14}			5.4	6.0	V
			$V_{CC} = 9\text{V}$	3.9	4.5	V

Pin Connection Diagram

FM Detector Output	1	24	SIF Input
FM Discriminator	2	23	GND
IF AGC 2	3	22	GND
RF AGC VR	4	21	Video Output
VIF Input	5	20	EQ Amp GND
VIF Input	6	19	EQ Amp In
GND	7	18	APC Filter
N.C.	8	17	Composite Video Output
V_{CC}	9	16	VCO Tank
RF AGC Output	10	15	VCO Tank
AFT Coil	11	14	AFT Output
AFT Coil	12	13	IF AGC 1

