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## NTE15001 Integrated Circuit VIF & SIF Circuit for VCR

### Description:

The NTE15001 is an integrated circuit in a 30-Lead DIP type package containing the VIF section and SIF on a single chip. Since this device is capable of performing video detection and sound detection independently or simultaneously, it can be applied to various sets from popular type to high-grade type according to the designer's policy.

### Features:

- High-Gain VIF Amp Requiring No Preamp
- High AGC Speed
- Provides Wide-Band Detection Characteristics and Meets Sound MPX Demodulation Requirements because of FM Detection being Quadrature Detection.
- Possible to use Sound REC Pin (Pin2), AUX Pin (Pin3)
- Possible to Mute Video, Sound for VCR
- Pin7 GND: Muting of both Video and Sound
- Pin29 GND: Muting of Sound Only

### Functions:

- VIF Section: VIF Amp Video Det, Peak IF AGC, B/W Noise-Canceller, RF AGC, AFT, SIF DET
- SIF Section: SIF Limiter Amp, FM Det, DC ATT, AF Driver

**Operating Characteristics:** ( $T_A = +25^\circ\text{C}$ ,  $V_{CC} = 12\text{V}$ ,  $f_p = 58.75\text{MHz}$ ,  $f_s = 54.25\text{MHz}$  (VIF),  $f_o = 4.5\text{MHz}$  (SIF) unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>VIH Section</b>						
Total Circuit Current	$I_{23} + I_{24}$	DC	59	74	98	mA
Maximum RF AGC Voltage	$V_{H13H}$	DC	8.5	8.9	9.2	V
Minimum RF AGC Voltage	$V_{13L}$	DC	-	0	0.5	V
Quiescent Video Output Voltage	$V_{22}$	DC	5.6	6.1	6.6	V
Quiescent AFT Output	$V_{17}$	DC	4.5	6.5	7.5	V
Input Sensitivity	$V_i$	$f_m = 400\text{Hz}$ 40% AM, $V_O = 0.8V_{pp}$	30	36	42	dB $\mu$
AGC Range	GR	$f_m = 15\text{kHz}$ 78% AM, $V_O = \pm 1\text{dB}$	60	74	-	dB

**Operating Characteristics (Cont'd):** ( $T_A = +25^\circ\text{C}$ ,  $V_{CC} = 12\text{V}$ ,  $f_p = 58.75\text{MHz}$ ,  $f_s = 54.25\text{MHz}$  (VIF),  $f_o = 4.5\text{MHz}$  (SIF) unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>VIH Section (Cont'd)</b>						
Maximum Allowable Input	$V_{imax}$	$f_m = 15\text{kHz}$ 78% AM, $V_O = \pm 1\text{dB}$				
Video Output Amplitude	$V_{O(22)}$	$V_i = 10\text{mV}_{rms}$ , $f_m = 15\text{kHz}$ 78% AM	1.9	2.2	2.5	$V_{pp}$
Output S/N	S/N	$V_i = 10\text{mV}_{rms}$ , CW	48	54	–	dB
Carrier Leakage	CL	$V_i = 100\text{mV}_{rms}$ , $f_m = 15\text{kHz}$ 78% AM	50	57	–	dB
Maximum AFT Voltage	$V_{17H}$	$V_i = 10\text{mV}_{rms}$ , SWEEP	11.0	11.5	12.0	V
Minimum AFT Voltage	$V_{17L}$	$V_i = 10\text{mV}_{rms}$ , SWEEP	0	0.4	1.0	V
AFT Detection Sensitivity	Sf	$V_i = 10\text{mV}_{rms}$ , SWEEP	70	100	140	mV/kHz
White Noise Threshold Level	$V_{WTH}$	$V_i = 10\text{mV}_{rms}$ , SWEEP	6.4	6.8	7.2	V
Black Noise Threshold Level	$V_{BTH}$	$V_i = 10\text{mV}_{rms}$ , SWEEP	1.9	2.2	2.5	V
Black Noise Clamp Level	$V_{BCL}$	$V_i = 10\text{mV}_{rms}$ , SWEEP	3.8	4.2	4.6	V
SIF Output Signal Voltage	$V_{O(25)}$	P/S = 20dB	40	60	100	$\text{mV}_{rms}$
Frequency Characteristic	$f_o$	-3dB	6	8	–	MHz
Differential Gain	DG	$V_i = 10\text{mV}_{rms}$ 87.5, VIDEOMOD	–	4	10	%
Differential Phase	DP	$V_i + 10\text{mV}_{rms}$ 87.5%, VIDEOMOD	–	3	6	deg
Input Resistance	$R_i$	$V_i = 10\text{mV}_{rms}$ 87.5%, VIDEOMOD	1.0	1.5	2.0	$\text{k}\Omega$
Input Capacitance	$C_i$		–	3.5	7.0	pF
<b>SIF Section</b>						
SIF Limiting Voltage	$V_{iim}$	-3dB	–	200	400	$\mu\text{V}_{rms}$
Detection Output Voltage	$V_{O(2)}$	$V_i = 100\text{mV}_{rms}$ , $f_m = 400\text{Hz}$ , $f = \pm 25\text{kHz}$	450	680	850	$\text{mV}_{rms}$
Distortion	THD(2)	$V_i = 100\text{mV}_{rms}$ , $f_m = 400\text{Hz}$ , $f = \pm 25\text{kHz}$	–	0.5	1.0	%
AM Rejection	AMR	$V_i = 100\text{mV}_{rms}$ , $f_m = 400\text{Hz}$ , $f = \pm 25\text{kHz}$ 30%	50	60	–	dB
DCVR Maximum Attenuation	ATT	$V_i = 200\text{mV}_{rms}$ , $f = 400\text{Hz}$	70	80	–	dB
AF Amp Gain	$G_{AF}$	$V_i = 100\text{mV}_{rms}$ , $f = 400\text{Hz}$	18	20	22	dB
AF Amp Output Voltage	$V_{O(5)}$	$V_{O(5)}$ THD = 10%, $f = 400\text{Hz}$	3	4	–	$V_{rms}$

### Pin Connection Diagram

Ceramic Discriminator	<b>1</b>	<b>30</b>	Ceramic Discriminator
De-Emphasis	<b>2</b>	<b>29</b>	Mute Attenuator
AF Input	<b>3</b>	<b>28</b>	Mute Switch
N.F.	<b>4</b>	<b>27</b>	Ceramic Filter
AF Output	<b>5</b>	<b>26</b>	SIF Input
GND	<b>6</b>	<b>25</b>	SIF Output
IF AGC Filter	<b>7</b>	<b>24</b>	SIF V <sub>CC</sub>
Mute	<b>8</b>	<b>23</b>	VIF V <sub>CC</sub>
VIF Input	<b>9</b>	<b>22</b>	Video Output
VIF Input	<b>10</b>	<b>21</b>	AFT Coil
Mute	<b>11</b>	<b>20</b>	LLD Coil
RF AGC VR	<b>12</b>	<b>19</b>	LLD Coil
RF AGC Filter	<b>13</b>	<b>18</b>	AFT Coil
IF AGC Filter	<b>14</b>	<b>17</b>	AFT Coil
Sound Trap	<b>15</b>	<b>16</b>	Sound Trap

