



**ELECTRONICS, INC.**  
44 FARRAND STREET  
BLOOMFIELD, NJ 07003  
(973) 748-5089

## **NTE7054** **Integrated Circuit** **Single Chip TV Processor**

### **Features:**

#### VIF

- PLL Type Video Detector for the High Picture & Sound Quality
- High Gain VIF Amp (Pre-Amp Unnecessary)
- High Speed AGC
- Built-In APC Time Constant Switch

#### SIF

- Audio IN/OUT at Same Time
- Video/Audio Simultaneous Muting, or Audio-Only Muting Possible

#### Audio/Video Switch

- INT/EXT AV Switch

Delay Line	Video EXT, Audio EXT	SW Condition
OFF	IN	D
OFF	EXT	C
ON	EXT	B
ON	IN	A

#### OSD

- RGB 3 Input
- RGB Linear Amp (-6dB Input: 2V to 5V)
- Fast Blanking (With B In)

#### Chroma

- Built-In ACC Filter, Killer Filter
- Built-In Carrier Filter

#### Video

- Black Expression
- DC Restoration Compensation
- Built-In Delay Line
- Wide Band Width (9MHz): Delay Line Short
- A Quadratic Differentiation Circuit allowing Soft Video Tone Operation also Incorporated
- S Input for VCR
- DC Restoration Variable (By External Circuit)

#### Deflection

- Horizontal and Vertical Sync are not Adjustable
- Dual AFC System with Excellent Horizontal Noise Characteristics
- V-Sync Sensitivity Externally Adjustable
- Vertical Size is Constant with No-Signal (60Hz Constant Frequency)
- High Stability for Copy Guard Tape (Macrovision)
- High Stability for Skew of VCR

**Electrical Characteristics:** ( $T_A = +25^\circ\text{C}$ ,  $V_{CC} = V_{14} = V_{11} = 9\text{V}$ ,  $I_{CC} = I_{30} = 13\text{mA}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>VIF</b> ( $f_p = 45.7\text{MHz}$ )						
Video Detector DC Output Voltage 1	$V_{44}$	Quiescent	4.2	4.6	5.0	V
AFT Output Voltage	$V_{47}$	Quiescent	2.8	4.4	5.8	V
Maximum RF AGC Control Voltage	$V_{49H}$	CW = 35dB $\mu$ , RF AGC VR = min	7.6	8.0	8.3	V
Minimum RF AGC Control Voltage	$V_{49L}$	CW = 35dB $\mu$ , RF AGC VR = max	0	0.01	0.3	V
VIF Input Sensitivity	$V_i$	VIF Input Level at which Video Output is 0.8V $_{P-P}$ (40% MOD)	30	36	42	dB $\mu$
VIF AGC Control Range	GR	Maximum Input ( $V_O = 0.8V_{P-P}$ ) – Input Sensitivity	60	68	–	dB
VIF Maximum Permissible Input	$V_i$	VIF Input Level at which Video Output is +1dB	100	107	–	dB $\mu$
Video Detector Output	$V_{O44}$	$V_i = 80\text{dB}\mu$ , AM = 78% MOD	1.7	2.0	2.3	V $_{P-P}$
Differential Gain	DG	$V_i = 80\text{dB}\mu$ , 87.5% Video MOD	–	3.0	10	%
Differential Phase	DP	$V_i = 80\text{dB}\mu$ , 87.5% Video MOD	–	3.0	10	deg
Video Signal to Noise Ratio	S/N	$V_i = 80\text{dB}\mu$ (AM 78% MOD)/CW	47	53	–	dB
Sync–Tip Level	$V_{44}$ TIP	CW = 80dB $\mu$	2.0	2.3	2.6	V
Video Frequency Characteristic	fc	Frequency at which Video Output is Down 3dB	5.0	7.0	–	MHz
VIF Intermodulation	$I_{920}$	V3.58MHz/V920kHz, $V_i = 80\text{dB}\mu$	35	42	–	dB
Maximum AFT Control Voltage	$V_{47H}$	CW = 80dB $\mu$ , Frequency Change	8.0	8.6	8.9	V
Minimum AFT Control Voltage	$V_{47L}$	CW = 80dB $\mu$ , Frequency Change	0.1	0.4	0.9	V
AFT Detector Sensitivity	Sf	CW = 80dB $\mu$ , Frequency Change	30	45	65	mV/kHz
AFT Switch Operation Start Voltage	$V_{AFT SW}$	Test with Sweep Signal	0.5	1.2	–	V
Black Noise Threshold Level	$V_{BTH}$	Test with Sweep Signal	1.2	1.5	1.8	V
White Noise Threshold Level	$V_{WTH}$	Test with Sweep Signal	4.9	5.3	5.7	V
APC Pull–In Range (U) 1	$f_{PU-1}$		0.45	0.8	–	MHz
APC Pull–In Range (L) 1	$f_{PL-1}$		–	–0.8	–0.45	MHz
APC Pull–In Range (U) 2	$f_{PU-2}$		1.0	1.7	–	MHz
APC Pull–In Range (L) 2	$f_{PL-2}$		–	–1.7	–1.0	MHz
VCO Maximum Variable Range	$\Delta f_U$		1.2	2.1	–	MHz
	$\Delta f_L$		–	–2.1	–1.2	MHz
VCO Control Sensitivity	$\beta$		1.4	2.8	5.6	kHz/mV
<b>SIF, AF</b> ( $f_S = 45.7\text{MHz}$ )						
SIF Input Limiting Sensitivity	$V_i$ (lim)	SIF Input Level at which Detection Output is Down 3dB	–	45	52	dB $\mu$
FM Detector Output Voltage	$V_{DO}$	$V_i = 100\text{dB}\mu$ , $\Delta f = \pm 25\text{kHz}$	380	550	750	mV $_{rms}$
FM Detector Output Distortion	THD	$V_i = 100\text{dB}\mu$ , $\Delta f = \pm 25\text{kHz}$	–	0.4	1.0	%
AM Rejection	AMR	$V_i = 100\text{dB}\mu$ (FM: $\Delta f = \pm 25\text{kHz}$ )/(AM: 30%)	43	56	–	dB
AF Amp Voltage Gain	$G_{AV}$	$V_i = 100\text{mV}_{rms}$ , $f = 400\text{Hz}$	18	20	22	dB

**Electrical Characteristics (Cont'd):** ( $T_A = +25^\circ\text{C}$ ,  $V_{CC} = V_{14} = V_{11} = 9\text{V}$ ,  $I_{CC} = I_{30} = 13\text{mA}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>SIF, AF (Cont'd)</b> ( $f_S = 45.7\text{MHz}$ )						
AF Maximum Output Voltage	$V_{O6\text{max}}$	Output Level at which AF Amp Output Distortion is 10%	2.0	2.8	–	V <sub>rms</sub>
AF Electronic Attenuator Range	ATT	$V_i = 200\text{mV}_{\text{rms}}$ , $f = 400\text{Hz}$	70	80	–	dB
<b>Audio/Video Switch</b>						
Video Detector DC Output Voltage 2	$V_{38}$	Quiescent	–	3.3	–	V
Internal Video Input Voltage	$V_{42}$	Quiescent	–	4.8	–	V
External Video Input Voltage	$V_{40}$	Quiescent	–	4.8	–	V
External Audio Input Voltage	$V_3$	Quiescent	–	5.6	–	V
<b>Video</b>						
Soft Video Tone Variable Range	$\Delta\text{Soft}$	$f = 2\text{MHz}$ , $100\text{mV}_{\text{P-P}}$ , Video Tone VR: $4\text{V} \rightarrow 0\text{V}$	–6	–4	–2	dB
Sharp Video Tone Video Voltage Gain	$\Delta\text{Sharp}$	$f = 2\text{MHz}$ , $100\text{mV}_{\text{P-P}}$ , Video Tone VR: $4\text{V} \rightarrow 9\text{V}$	3	6	9	dB
Video Voltage Gain	$G_V$	$f = 100\text{kHz}$ , $100\text{mV}_{\text{P-P}}$ , Contrast VR: $9\text{V}$ , Video Tone VR: $4\text{V}$	17	20	23	dB
Contrast Control Center	$C_{\text{CEN}}$	$f = 100\text{kHz}$ , $100\text{mV}_{\text{P-P}}$ , Contrast VR: $9\text{V}$	0.45	0.57	0.69	V <sub>P-P</sub>
Contrast Control Variable Range	$\Delta C_V$	$f = 100\text{kHz}$ , $100\text{mV}_{\text{P-P}}$ , Contrast VR: $3\text{V} \rightarrow 9\text{V}$	20	22	24	dB
Brightness Control	$\text{BR}_H$	Brightness VR: $2.0\text{V}$	5.8	–	–	V
	$\text{BR}_{\text{CEN}}$	Brightness VR: $4.5\text{V}$	2.6	3.1	3.6	V
	$\text{BR}_L$	Brightness VR: $7.0\text{V}$	–	–	1.2	V
Frequency Response	$f_{V1}$	Contrast VR: $9\text{V}$ , at Delay Line Short, Video Tone VR: $4\text{V}$ , 3dB Down	7	9	–	MHz
	$f_{V2}$		3	5	–	MHz
<b>On Screen Display</b>						
Blanking Pulse Threshold Level			0.7	1.0	1.3	V
–Y Output DC Voltage		B– In: $2\text{V}$	2.7	3.0	2.3	V
RGB Input Threshold Level			1.7	2.0	2.3	V
RGB Output DC Voltage		Input: $3\text{V}$	–	5.5	–	V
		Input: $4\text{V}$	–	6.0	–	V
		Input: $5\text{V}$	–	6.5	–	V
<b>Chroma</b>						
Color Control Minimum	$E_{\text{Cmin}}$	Color VR: $0\text{V}$ , Contrast VR: $9\text{V}$	–	–	30	mV <sub>P-P</sub>
Color Control Center	$W_{\text{Ccen}}$	Color VR: $4.5\text{V}$ , Contrast VR: $6\text{V}$	1.2	1.5	1.8	V <sub>P-P</sub>
Color Contrast Variable Range	$C_C$	Color VR: $B - Y = 2.5\text{V}_{\text{P-P}}$ , Contrast VR: $3\text{V} \rightarrow 9\text{V}$	18.5	20.0	21.5	dB
Demodulator Output DC Voltage	$V_{C-Y}$	Burst Signal Only, Color VR: $0\text{V}$	4.7	5.2	5.7	V
Demodulator Output Offset Voltage	$\Delta V_{C-Y}$	Burst Signal Only, Color VR: $0\text{V}$	–30	0	+30	mV
Residual Carrier	$E_{\text{car}}$		–	–	0.3	V <sub>P-P</sub>

**Electrical Characteristics (Cont'd):** ( $T_A = +25^{\circ}\text{C}$ ,  $V_{CC} = V_{14} = V_{11} = 9\text{V}$ ,  $I_{CC} = I_{30} = 13\text{mA}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Chroma (Cont'd)</b>						
APC Pull-In Range	$\Delta f_{\text{AFC}}$		$\pm 500$	–	–	Hz
ACC Amplitude Characteristics	$\text{ACC}_{\text{M1N}}$	+6dB	–3	0	+3	dB
	$\text{ACC}_{\text{M2N}}$	–20dB	–7	–	+2	dB
ACC Phase Characteristics	$\text{ACC}_{\text{M1N}}$	+6dB	–3	0	+3	deg
	$\text{ACC}_{\text{M2N}}$	–20dB	–7	–	+7	deg
Tint Control Center	$T_{\text{CEN}}$	Tint VR: 4.5V, Color VR: 4.5V, Contrast VR: 6V	–9	+3	+15	deg
Tint Variable Range	$\Delta T$	Tint VR: 0V $\leftarrow$ 4.5V $\rightarrow$ 9V, Color VR: 4.5V, Contrast VR: 6V	$\pm 40$	–	–	deg
Demodulator Output Ratio	$R/B_N$		0.81	0.9	0.98	
	$G/B_N$		0.24	0.3	0.38	
Demodulator Phase Angle	$\Delta R B_N$		99	105	111	deg
	$\Delta G B_N$		–130	–120	–110	deg
Maximum Demodulator Output	$E_C \text{ max}_N$	Color VR: 9V, Contrast VR: 9V	4.0	5.0	–	$V_{\text{P-P}}$
<b>Deflection</b>						
Sync Separator Input DC Level	$V_S \text{ (DC)}$		6.0	6.3	6.6	V
Vertical Maximum Running Period	$T_V \text{ max}_{60}$		–	297	–	H
Vertical Minimum Running Period	$T_V \text{ min}_{60}$		–	225	–	H
Vertical Blanking Pulse Voltage	$V_H \text{ VBL}$		7.0	7.5	–	V
Vertical Output Pulse Width	$P_W \text{ VOUT}$		–	8.5	–	H
Vertical Output Pulse Voltage	$V_{\text{OUT H}}$		–	6.0	–	V
	$V_{\text{OUT M}}$		–	4.6	–	V
	$V_{\text{OUT L}}$		–	–	0.3	V
Vertical External Trigger Load Resistor	$R_{\text{TR}}$		–	2.5	3.6	$\text{k}\Omega$
Vertical Automatic Synchronizer Stop Voltage	$V_{\text{SAS}}$		–	1.9	2.4	V
Vertical Operation Start Voltage	$S_{\text{VV}}$		–	–	4	V
Horizontal Free-Running Frequency Deviation	$\Delta f_H$	Deviation from 15.734kHz	–70	+30	+130	Hz
Horizontal Sync Pull-In Range	$\Delta f_H \text{ Pull}$	Deviation from 15.734kHz	–	$\pm 400$	–	Hz
Horizontal Operation Start Voltage	$S_{\text{HV}}$		–	4.3	5.0	V
AFC H FBP Peak Voltage	$\text{FBP}_H$		4.1	4.6	5.1	V
VCR SW Input Voltage	VCR		–	1.3	2.0	V

### Pin Connection Diagram

De-Emphasis	<b>1</b>	<b>52</b>	APC Filter
IF AGC Filter 1	<b>2</b>	<b>51</b>	VCO Coil
External Audio Input	<b>3</b>	<b>50</b>	VCO Coil
Discriminator/Mute	<b>4</b>	<b>49</b>	AGC Output
Audio NFB	<b>5</b>	<b>48</b>	SIF Input
Audio Output	<b>6</b>	<b>47</b>	AFT Output
GND (VIF SIF)	<b>7</b>	<b>46</b>	AFT Coil
VIF Input	<b>8</b>	<b>45</b>	AFT Coil
VIF Input	<b>9</b>	<b>44</b>	Video Output 1
IF AGC Filter 2/RF AGC VR	<b>10</b>	<b>43</b>	AV Switch
V <sub>CC</sub> (VIF SIF)	<b>11</b>	<b>42</b>	Internal Video Input
APC Filter	<b>12</b>	<b>41</b>	Tint VR/Service Sw
X'tal	<b>13</b>	<b>40</b>	External Video Input
V <sub>CC</sub> (Jungle Video Chroma)	<b>14</b>	<b>39</b>	Contrast VR
R Input	<b>15</b>	<b>38</b>	Video Output 2
G Input	<b>16</b>	<b>37</b>	GND (Jungle Video Chroma)
B Input/ Blanking Input	<b>17</b>	<b>36</b>	Chroma Input/Color VR
R - Y Output	<b>18</b>	<b>35</b>	Black Filter
G - Y Output	<b>19</b>	<b>34</b>	Video Input
B - Y Output	<b>20</b>	<b>33</b>	Videotone Input
-Y Output	<b>21</b>	<b>32</b>	Clamp Filter
FBP Input/BGP Output	<b>22</b>	<b>31</b>	Brightness VR
Horiz Driver Output	<b>23</b>	<b>30</b>	Horizontal V <sub>CC</sub>
Hold Down Input	<b>24</b>	<b>29</b>	Sync Input
CE Filter	<b>25</b>	<b>28</b>	Vertical Output
AFC Filter	<b>26</b>	<b>27</b>	Horiz Coincidence Filter

