

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
VIF ($f_p = 45.7\text{MHz}$)						
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 μ , RF AGC VR = min	7.6	8.0	8.3	V
Minimum RF AGC Control Voltage	V_{49L}	CW = 35dB μ , 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 μ
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 μ
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 μ	2.0	2.3	2.6	V
Video Frequency Characteristic	f_c	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 μ , Frequency Change	8.0	8.6	8.9	V
Minimum AFT Control Voltage	V_{47L}	CW = 80dB μ , Frequency Change	0.1	0.4	0.9	V
AFT Detector Sensitivity	Sf	CW = 80dB μ , 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	Δf_U		1.2	2.1	–	MHz
	Δf_L		–	–2.1	–1.2	MHz
VCO Control Sensitivity	β		1.4	2.8	5.6	kHz/mV
SIF, AF ($f_s = 45.7\text{MHz}$)						
SIF Input Limiting Sensitivity	V_i (lim)	SIF Input Level at which Detection Output is Down 3dB	–	45	52	dB μ
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
SIF, AF (Cont'd) ($f_S = 45.7\text{MHz}$)						
AF Maximum Output Voltage	$V_{O6\text{max}}$	Output Level at which AF Amp Output Distortion is 10%	2.0	2.8	–	Vrms
AF Electronic Attenuator Range	ATT	$V_i = 200\text{mV}_{\text{rms}}$, $f = 400\text{Hz}$	70	80	–	dB
Audio/Video Switch						
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
Video						
Soft Video Tone Variable Range	ΔSoft	$f = 2\text{MHz}$, $100\text{mV}_{\text{P-P}}$, Video Tone VR: $4\text{V} \rightarrow 0\text{V}$	–6	–4	–2	dB
Sharp Video Tone Video Voltage Gain	ΔSharp	$f = 2\text{MHz}$, $100\text{mV}_{\text{P-P}}$, 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: 9V, Video Tone VR: 4V	17	20	23	dB
Contrast Control Ceneter	C_{CEN}	$f = 100\text{kHz}$, $100\text{mV}_{\text{P-P}}$, Contrast VR: 9V	0.45	0.57	0.69	$V_{\text{P-P}}$
Contrast Control Variable Range	ΔC_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	BR_H	Brightness VR: 2.0V	5.8	–	–	V
	BR_{CEN}	Brightness VR: 4.5V	2.6	3.1	3.6	V
	BR_L	Brightness VR: 7.0V	–	–	1.2	V
Frequency Response	fV_1	Contrast VR: 9V, at Delay Line Short, Video Tone VR: 4V, 3dB Down	7	9	–	MHz
	fV_2		3	5	–	MHz
On Screen Display						
Blanking Pulse Threshold Level			0.7	1.0	1.3	V
–Y Output DC Voltage		B– In: 2V	2.7	3.0	2.3	V
RGB Input Threshold Level			1.7	2.0	2.3	V
RGB Output DC Voltage		Input: 3V	–	5.5	–	V
		Input: 4V	–	6.0	–	V
		Input: 5V	–	6.5	–	V
Chroma						
Color Control Minimum	E_{Cmin}	Color VR: 0V, Contrast VR: 9V	–	–	30	$\text{mV}_{\text{P-P}}$
Color Control Center	W_{Ccen}	Color VR: 4.5V, Contrast VR: 6V	1.2	1.5	1.8	$V_{\text{P-P}}$
Color Contrast Variable Range	C_C	Color VR: $B - Y = 2.5V_{\text{P-P}}$, 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: 0V	4.7	5.2	5.7	V
Demodulator Output Offset Voltage	$\Delta V_{C - Y}$	Burst Signal Only, Color VR: 0V	–30	0	+30	mV
Residual Carrier	E_{car}		–	–	0.3	$V_{\text{P-P}}$

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
Chroma (Cont'd)						
APC Pull-In Range	Δf_{AFC}		± 500	–	–	Hz
ACC Amplitude Characteristics	ACC_{M1N}	+6dB	–3	0	+3	dB
	ACC_{M2N}	–20dB	–7	–	+2	dB
ACC Phase Characteristics	ACC_{M1N}	+6dB	–3	0	+3	deg
	ACC_{M2N}	–20dB	–7	–	+7	deg
Tint Control Center	T_{CEN}	Tint VR: 4.5V, Color VR: 4.5V, Contrast VR: 6V	–9	+3	+15	deg
Tint Variable Range	ΔT	Tint VR: $0\text{V} \leftarrow 4.5\text{V} \rightarrow 9\text{V}$, Color VR: 4.5V, Contrast VR: 6V	± 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	$E_C \max_N$	Color VR: 9V, Contrast VR: 9V	4.0	5.0	–	V_{P-P}
Deflection						
Sync Separator Input DC Level	$V_S (\text{DC})$		6.0	6.3	6.6	V
Vertical Maximum Running Period	$T_V \max_{60}$		–	297	–	H
Vertical Minimum Running Period	$T_V \min_{60}$		–	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_{TR}		–	2.5	3.6	$k\Omega$
Vertical Automatic Synchronizer Stop Voltage	V_{SAS}		–	1.9	2.4	V
Vertical Operation Start Voltage	S_{VV}		–	–	4	V
Horizontal Free-Running Frequency Deviation	Δf_H	Deviation from 15.734kHz	–70	+30	+130	Hz
Horizontal Sync Pull-In Range	$\Delta f_H \text{ Pull}$	Deviation from 15.734kHz	–	± 400	–	Hz
Horizontal Operation Start Voltage	S_{HV}		–	4.3	5.0	V
AFC H FBP Peak Voltage	FBP_H		4.1	4.6	5.1	V
VCR SW Input Voltage	VCR		–	1.3	2.0	V

Pin Connection Diagram

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

