

AN5138NK

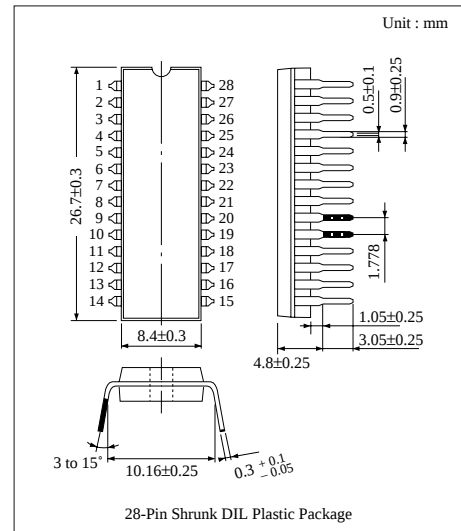
Video IF Amplifier, PLL Detector, AGC, AFC, SIF IC for Color TV

Overview

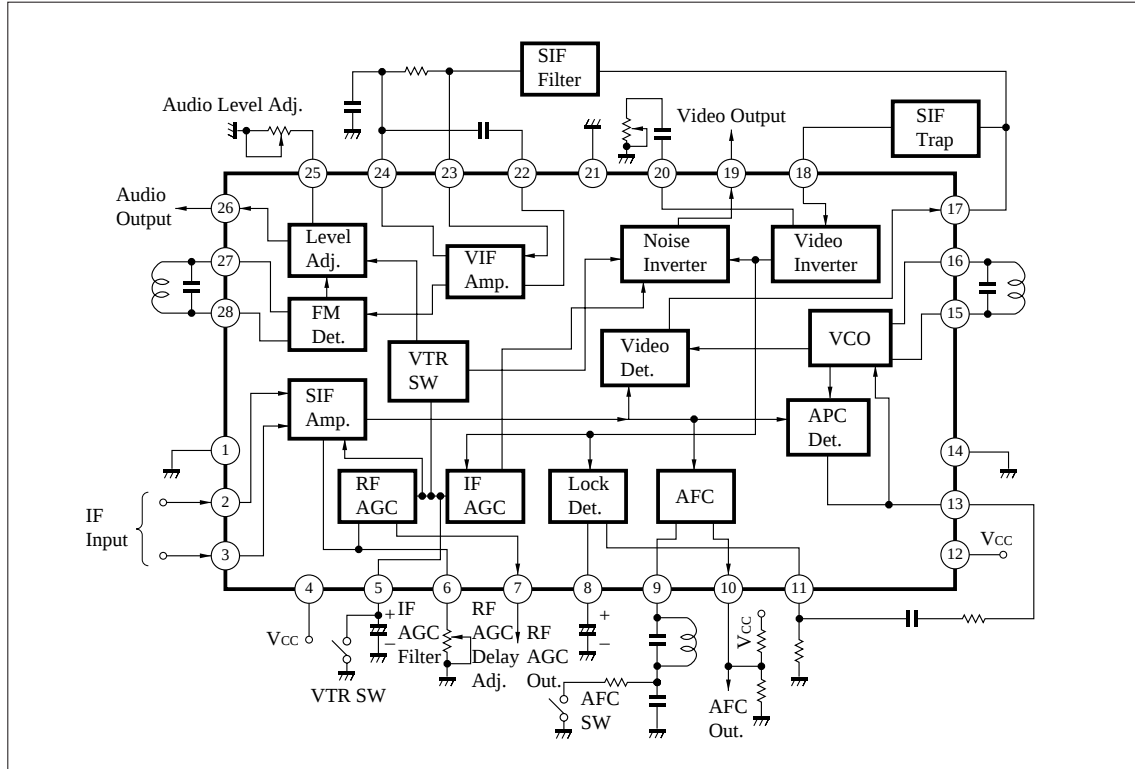
The AN5138NK is an integrated circuit designed for video-IF and audio-IF processing circuits, in color TV and VCR.

Features

- By adopting built-in VCO PLL-type video-detector circuit, the high performance IC-detector system can be realized for sound multiplex and tele-text broadcasting.
- Quadrature sound FM detector built-in.
- Frequency characteristics compensation pin (Pin20)
- VCR-switch pin (Pin5)
- Sound-output level-adjustment pin (Pin25)



Block Diagram



■ Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Rating		Unit
Voltage	Supply Voltage	V _{CC}	13.8		V
	Circuit Voltage	V _{5-1, 14, 21}	V _{4, 12-1, 14, 21}	0	V
		V _{6-1, 14, 21}	V _{4, 12-1, 14, 21}	0	V
		V _{7-1, 14, 21}	V _{4, 12-1, 14, 21}	0	V
		V _{10-1, 14, 21}	V _{4, 12-1, 14, 21}	0	V
		V _{18-1, 14, 21}	V _{4, 12-1, 14, 21}	0	V
		V _{25-1, 14, 21}	8.0	0	V
Current	Circuit Current	I ₁₇	−7	+ 0.5	mA
		I ₁₉	−7	+ 0.5	mA
		I ₂₆	−5	+ 0.5	mA
Power Dissipation (Ta=70°C)		P _D	1,300		mW
Temperature	Operating Ambient Temperature	T _{opr}	−20 to + 70		°C
	Storage Temperature	T _{stg}	−55 to + 150		°C

■ Electrical Characteristics (V_{CC}=12V, Ta=25°C)

Parameter	Symbol	Condition	min	typ	max	Unit
IF Amplifier · Detection · AGC · AFC Circuit						
Video detector output	V_O	$f = 58.75\text{MHz}$, $V_i = 80\text{dB}\mu$, $m = 87.5\%$	1.9	2.2	2.5	V_{P-P}
Input sensitivity	$S_{(IN)}$	$V_O = -3\text{dB}$	49	53	57	$\text{dB}\mu$
Max. allowable input	$V_{1(max)}$		103	108	—	$\text{dB}\mu$
Differential gain	DG	$f = 58.75\text{MHz}$, $V_i = 80\text{dB}\mu$, $m = 87.5\%$	—	2	6	%
Differential phase	DP	$f = 58.75\text{MHz}$, $V_i = 80\text{dB}\mu$, $m = 87.5\%$	—	2	5	deg
Frequency characteristics	fc	$V_O = -3\text{dB}$	5.5	6.5	7.5	MHz
RF AGC gain	G_{RFAGC}	$f = 10\text{kHz}$, $V_i = 10\text{mV}$	40	44	48	dB
AFC phase det. sensitivity	μ	$R_L = 68\text{k}\Omega // 82\text{k}\Omega$	30	45	60	mV/kHz
AFC center voltage	V_{10}	$R_L = 68\text{k}\Omega // 82\text{k}\Omega$	4.2	6.5	8.2	V
VCO · APC Circuit						
VCO max. variable range (1)	$\Delta f_{V(1)}$	$V_{13} = 2\text{V}$	0.8	1.5	2.5	MHz
VCO max. variable range (2)	$\Delta f_{V(2)}$	$V_{13} = 3\text{V}$	-3.4	-2.4	-1.4	MHz
VCO control sensitivity	β		3	4.5	6	kHz/mV
APC pull-in range (1)	$f_{APC(1)}$		+ 0.85	+1.5	+ 2.5	MHz
APC pull-in range (2)	$f_{APC(2)}$		-3.5	-2.5	-1.6	MHz
SIF Circuit						
Total detector output	V_O	$f_o = 4.5\text{MHz}$, $f_m = 400\text{Hz}$ $\Delta f = \pm 25\text{kHz}$, $V_i = 100\text{dB}\mu$	490	620	950	mV_{rms}
Input limiting voltage	$V_{i(lim)}$	$f_o = 4.5\text{MHz}$, $f_m = 400\text{Hz}$ $\Delta f = \pm 25\text{kHz}$, $V_i = 100\text{dB}\mu$	—	42	47	$\text{dB}\mu$
DC Characteristics						
Circuit current	$I_4 + I_{12}$		50	70	90	mA

■ Application Circuit

