AN5138NK

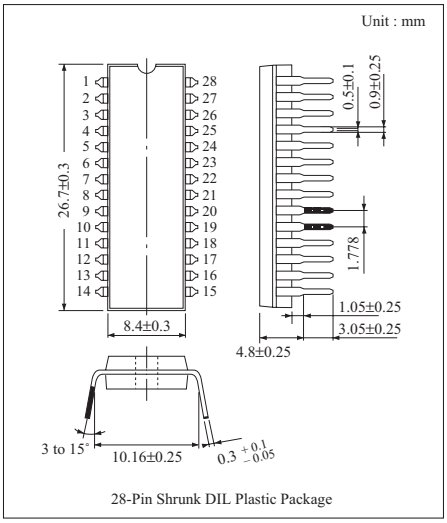
Video IF Amplifier, PLL Detector, AGC, AFC, SIF IC for Color TV

■ Overview

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

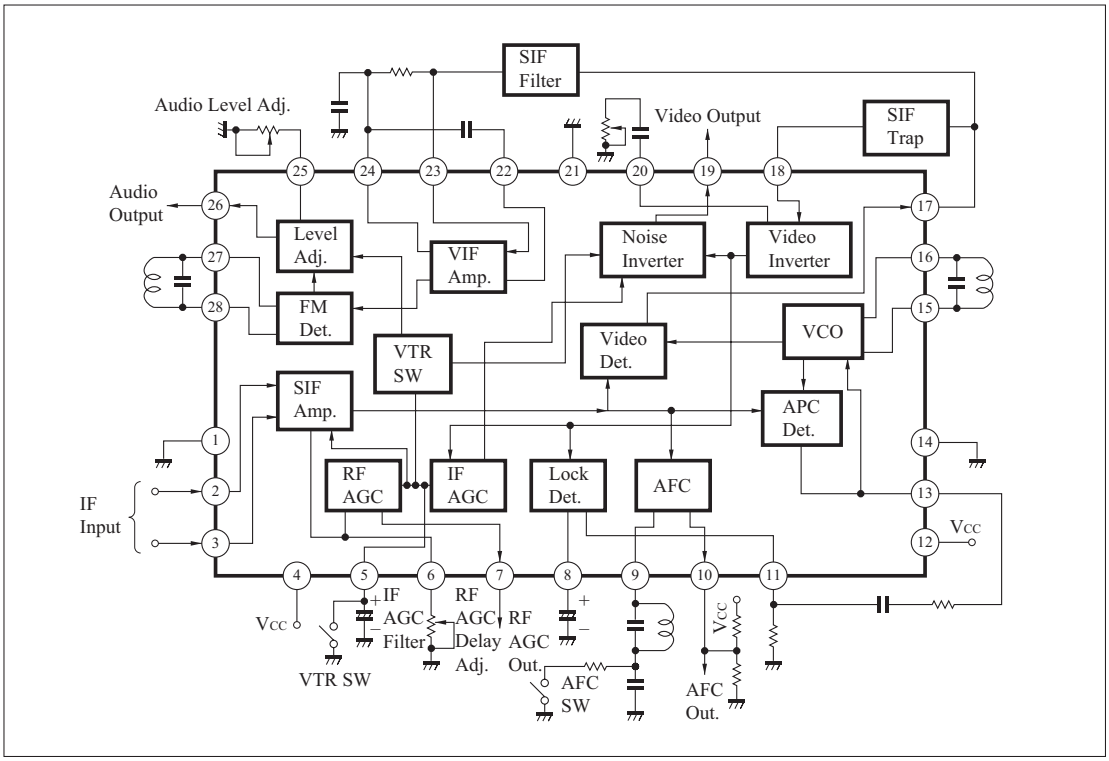
■ Features

- By adopting built-in VCO PLL-type video-detector circuit, the high preformance 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)



28-Pin Shrunk DIL Plastic Package

■ Block Diagram



■ Absolute Maximum Ratings (Ta=25˚C)

Parameter		Symbol	Rating		Unit
Voltage	Supply Voltage	V_{CC}	13.8		V
	Circuit Voltage	$V_{5\text{-}1,\ 14,\ 21}$	$V_{4,\ 12\text{-}1,\ 14,\ 21}$	0	V
		$V_{6\text{-}1,\ 14,\ 21}$	$V_{4,\ 12\text{-}1,\ 14,\ 21}$	0	V
		$V_{7\text{-}1,\ 14,\ 21}$	$V_{4,\ 12\text{-}1,\ 14,\ 21}$	0	V
		$V_{10\text{-}1,\ 14,\ 21}$	$V_{4,\ 12\text{-}1,\ 14,\ 21}$	0	V
		$V_{18\text{-}1,\ 14,\ 21}$	$V_{4,\ 12\text{-}1,\ 14,\ 21}$	0	V
		$V_{25\text{-}1,\ 14,\ 21}$	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= 58.75MHz, V_i= 80dBμ, m= 87.5%	1.9	2.2	2.5	$V_{P\text{-}P}$
Input sensitivity	$S_{(IN)}$	V_O= –3dB	49	53	57	dBμ
Max. allowable input	$V_{I\ (max.)}$		103	108	—	dBμ
Differential gain	DG	f =58.75MHz, V_i= 80dBμ, m= 87.5%	—	2	6	%
Differential phase	DP	f =58.75MHz, V_i= 80dBμ, m= 87.5%	—	2	5	deg
Frequency characteristics	fc	V_O= –3dB	5.5	6.5	7.5	MHz
RF AGC gain	G_{RFAGC}	f =10kHz, V_i=10mV	40	44	48	dB
AFC phase det. sensitivity	μ	R_L= 68kΩ//82kΩ	30	45	60	mV/kHz
AFC center voltage	V_{10}	R_L= 68kΩ//82kΩ	4.2	6.5	8.2	V
VCO · APC Circuit						
VCO max. variable range (1)	$\Delta f_{V\ (1)}$	V_{13}= 2V	0.8	1.5	2.5	MHz
VCO max. variable range (2)	$\Delta f_{V\ (2)}$	V_{13}= 3V	–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= 4.5MHz, f_m= 400Hz Δf= ±25kHz, V_i=100dBμ	490	620	950	mV_{rms}
Input limiting voltage	$V_{i\ (lim)}$	f_o= 4.5MHz, f_m= 400Hz Δf= ±25kHz, V_i=100dBμ••	—	42	47	dBμ
DC Characteristics						
Circuit current	$I_4 + I_{12}$		50	70	90	mA

■ Application Circuit