

# AN5138NK

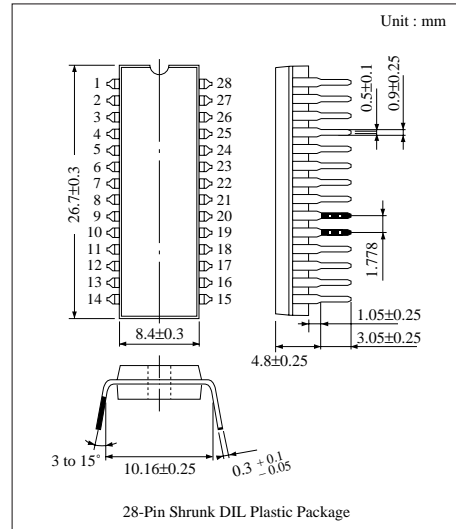
Video IF Amplifier, PLL Detector, AGC, AFC, SIF IC for Color TV

## ■ Overview

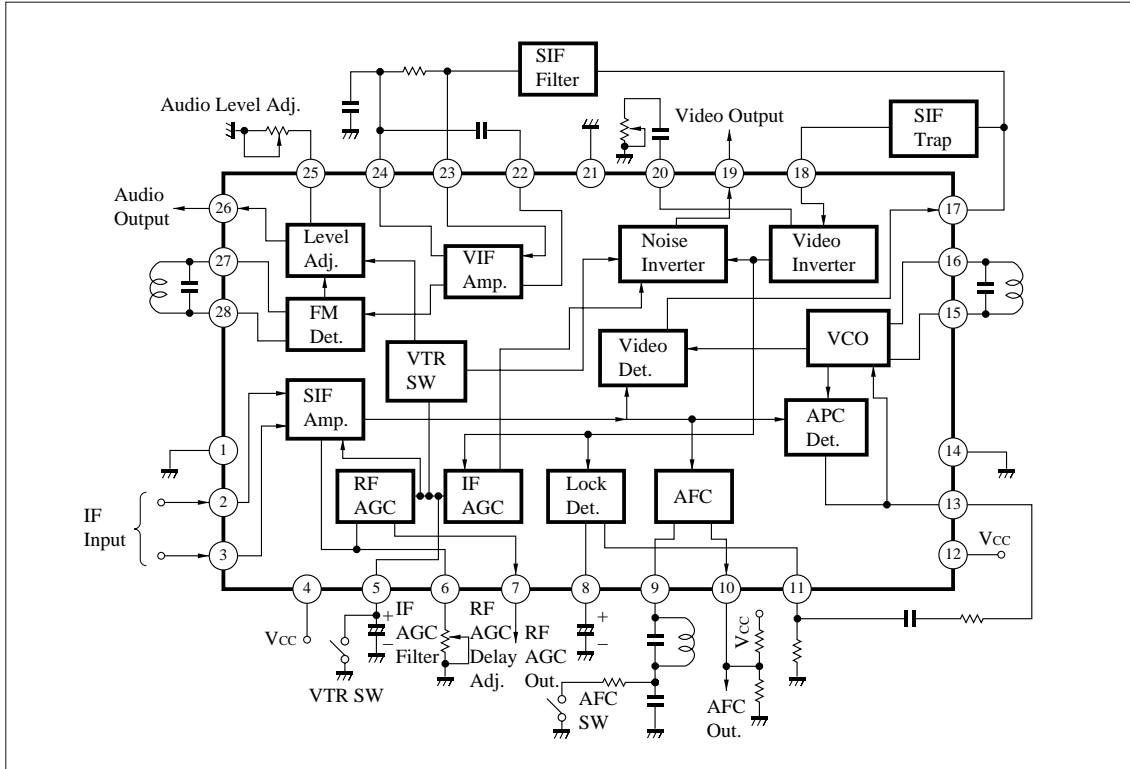
The AN5138NK is an integrated circuit designed for video-IF and audio-IF processing circuits, in color TV and VCR.

## ■ 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



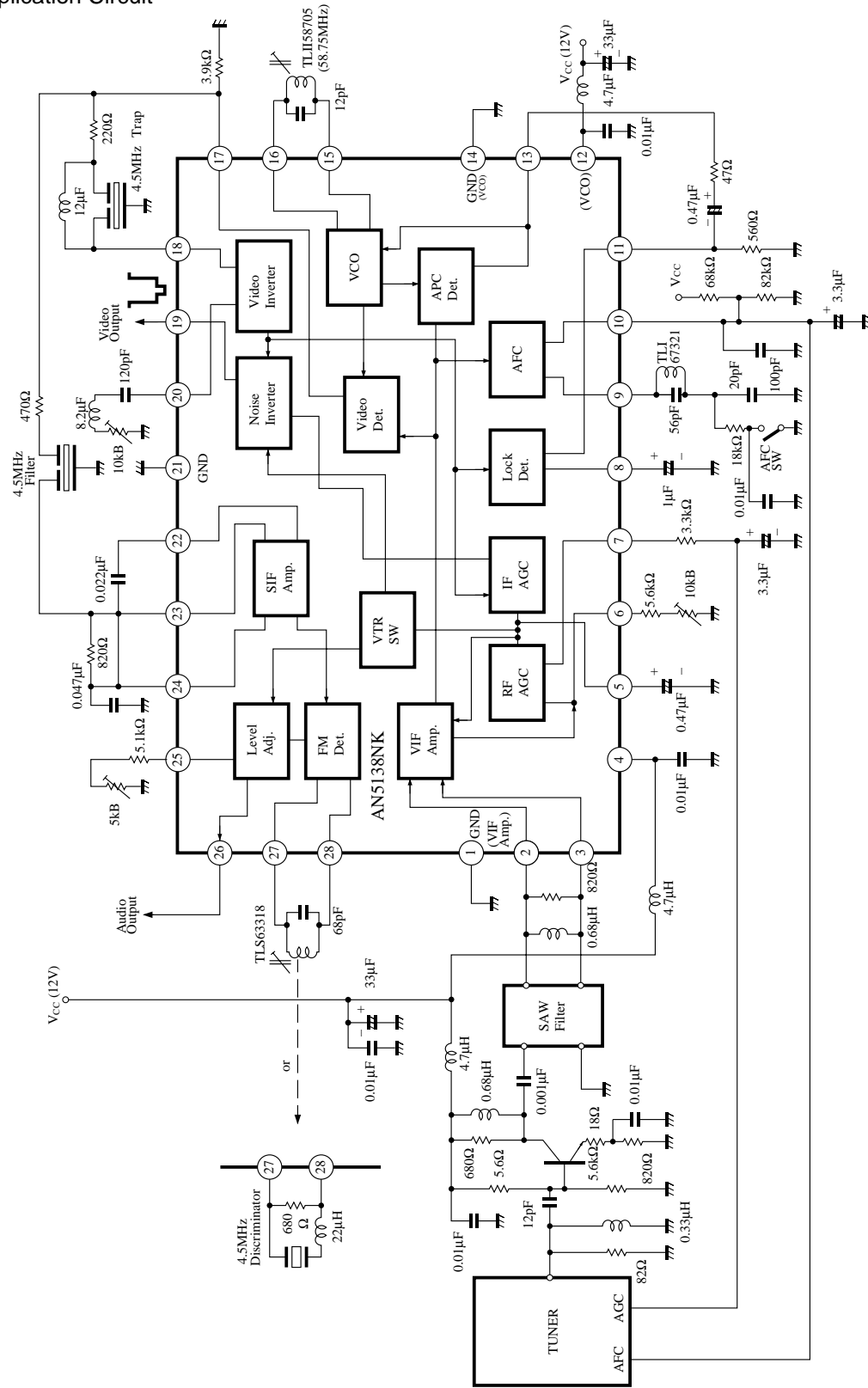
### ■ Absolute Maximum Ratings (Ta=25°C)

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

### ■ Electrical Characteristics (V<sub>CC</sub>=12V, Ta=25°C)

Parameter	Symbol	Condition	min	typ	max	Unit
<b>IF Amplifier · Detection · AGC · AFC Circuit</b>						
Video detector output	V <sub>O</sub>	f = 58.75MHz, V <sub>i</sub> = 80dBμ, m = 87.5%	1.9	2.2	2.5	V <sub>P-P</sub>
Input sensitivity	S <sub>(IN)</sub>	V <sub>O</sub> = -3dB	49	53	57	dBμ
Max. allowable input	V <sub>1(max.)</sub>		103	108	—	dBμ
Differential gain	DG	f = 58.75MHz, V <sub>i</sub> = 80dBμ, m = 87.5%	—	2	6	%
Differential phase	DP	f = 58.75MHz, V <sub>i</sub> = 80dBμ, m = 87.5%	—	2	5	deg
Frequency characteristics	f <sub>c</sub>	V <sub>O</sub> = -3dB	5.5	6.5	7.5	MHz
RF AGC gain	G <sub>RFAGC</sub>	f = 10kHz, V <sub>i</sub> = 10mV	40	44	48	dB
AFC phase det. sensitivity	μ	R <sub>L</sub> = 68kΩ/82kΩ	30	45	60	mV/kHz
AFC center voltage	V <sub>10</sub>	R <sub>L</sub> = 68kΩ/82kΩ	4.2	6.5	8.2	V
<b>VCO · APC Circuit</b>						
VCO max. variable range (1)	Δf <sub>V(1)</sub>	V <sub>13</sub> = 2V	0.8	1.5	2.5	MHz
VCO max. variable range (2)	Δf <sub>V(2)</sub>	V <sub>13</sub> = 3V	-3.4	-2.4	-1.4	MHz
VCO control sensitivity	β		3	4.5	6	kHz/mV
APC pull-in range (1)	f <sub>APC(1)</sub>		+0.85	+1.5	+2.5	MHz
APC pull-in range (2)	f <sub>APC(2)</sub>		-3.5	-2.5	-1.6	MHz
<b>SIF Circuit</b>						
Total detector output	V <sub>O</sub>	f <sub>o</sub> = 4.5MHz, f <sub>m</sub> = 400Hz Δf = ±25kHz, V <sub>i</sub> = 100dBμ	490	620	950	mV <sub>rms</sub>
Input limiting voltage	V <sub>i(lim)</sub>	f <sub>o</sub> = 4.5MHz, f <sub>m</sub> = 400Hz Δf = ±25kHz, V <sub>i</sub> = 100dBμ	—	42	47	dBμ
<b>DC Characteristics</b>						
Circuit current	I <sub>4</sub> + I <sub>12</sub>		50	70	90	mA

■ Application Circuit





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