

AN5421N

TV Synchronizing Signal Detection Circuit

■ Description

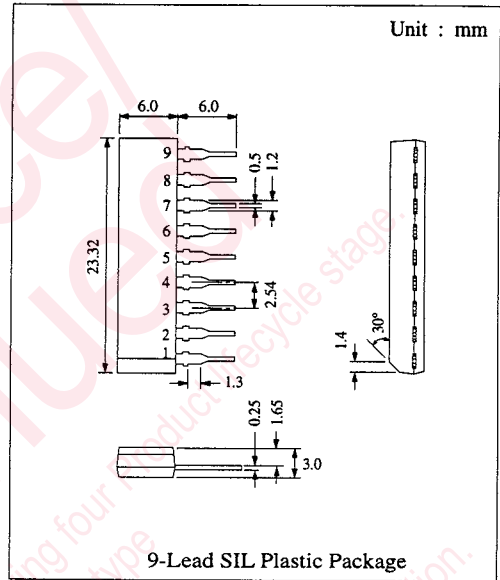
The AN5421N is an integrated circuit designed for TV synchronizing signal detection circuit.

■ Features

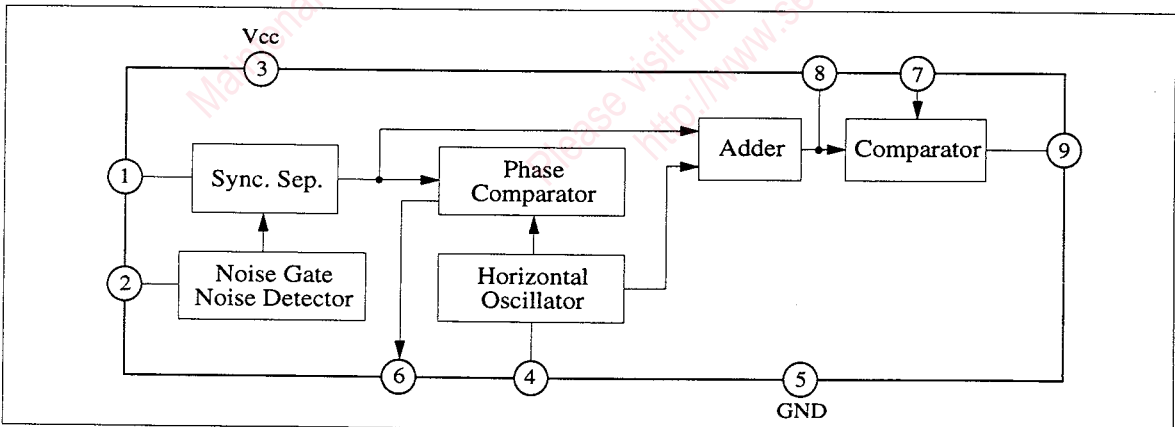
- Signal detection circuit providing stable operation against changes in supply voltage and temperature
- Signal separating circuit providing stable operation against noise

■ Pin Descriptions

Pin No.	Pin Name
1	Video Input
2	Noise Gate Input
3	Vcc
4	Hor. Osc. CR
5	GND
6	Hor. AFC Output
7	Comp. Voltage Input
8	Integral Capacitor
9	Sync. Det. Output



■ Block Diagram



■ Absolute Maximum Ratings (Ta=25°C)

Item		Symbol	Rating		Unit
Voltage	Supply Voltage	V ₃₋₅	14.4		V
	Circuit Voltage	V ₇₋₅	0	V ₃₋₅	V
		V ₈₋₅	0	V ₃₋₅	V
		V ₉₋₅	0	V ₃₋₅	V
Current	Supply Current	I ₃	35		mA
	Circuit Current	I ₁	-3	0	mA
		I ₂	-1	3	mA
		I ₄	0	5	mA
		I ₆	-3	3	mA
		I ₇	0	1	mA
		I ₈	-15	1	mA
I ₉	0	10	mA		
Power Dissipation (Ta = 70 °C)		P _D	510		mW
Operating Ambient Temperature		T _{opr}	-20 ~ +70		°C
Storage Temperature		T _{stg}	-55 ~ +150		°C

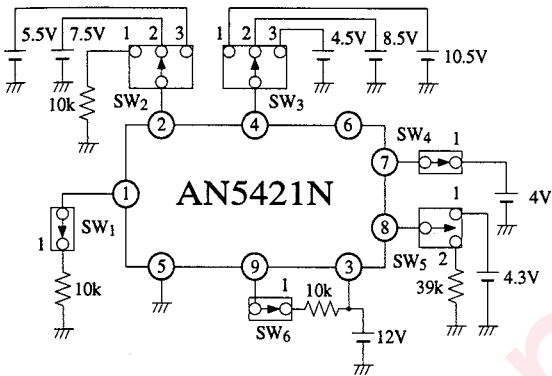
■ Electrical Characteristics (Ta=25°C)

Item	Symbol	Test Cct.	Condition	min.	typ.	max.	Unit
Circuit Current	I ₃	1	V _{cc} = 12V	17	24	31	mA
Circuit Voltage	V ₁₋₅	1	V _{cc} = 12V	6.2	6.6	7.0	V
	V ₂₋₅	1		5.8	6.2	6.6	V
	V ₈₋₅	1		10.1	10.5	10.9	V
Noise Detector (1)	V ₈₋₅₍₁₎	1	V _{cc} = 12V	9.8	10.4	11.0	V
Noise Detector (2)	V ₈₋₅₍₂₎	1				0.2	V
Video Signal Discrimination (1)	V ₈₋₅	1	V _{cc} = 12V			0.2	V
Video Signal Discrimination (2)	V ₈₋₅	1				0.2	V
Video Signal Discrimination (3)	V ₈₋₅	1				0.2	V
Video Signal Discrimination (4)	V ₈₋₅	1		9.8	10.4	11.0	V
Horizontal Oscillation Frequency	f _{HO}	2	V _{cc} = 12V	14.9	15.6	16.3	kHz
f _{VO} Change with Supply Voltage	Δf _{HO} /V _{cc}	2	f _{HO} difference between at V _{cc} = 6V and at V _{cc} = 14.4V		45	65	Hz/V
f _{HO} Control Sensitivity	β	2	f _{HO} difference between at flow-in of I _O = ±100μA	23.0	25.5	28.0	Hz/μA
Video Signal Discriminative Video Input*	V _{i(min)}	2	Video input for V ₈ ≤ 0.2V			0.2	V _{pp}
f _{HO} Change with Ambient Temperature*	Δf _{HO} /Ta	2	V _{cc} = 12V, Ta = -20°C ~ +70°C		-3.5		Hz/°C
AFC Loop Gain*	f _{AFC}	2	μ · β		1.10		kHz/μs
Smoothing Voltage (1)*	V ₈₍₁₎	2	Video input signal detected			0.2	V
Smoothing Voltage (2)*	V ₈₍₂₎	2	Video input signal not detected		6.2		V
Horizontal Sync. Pulse Width*	τ _{sync}	2	V _i = 0.3V _{pp}		8.0		μs
Horizontal Oscillation Pulse Width	τ _{HO}	2	V _{cc} = 12V		3.2		μs

* : Reference values for design

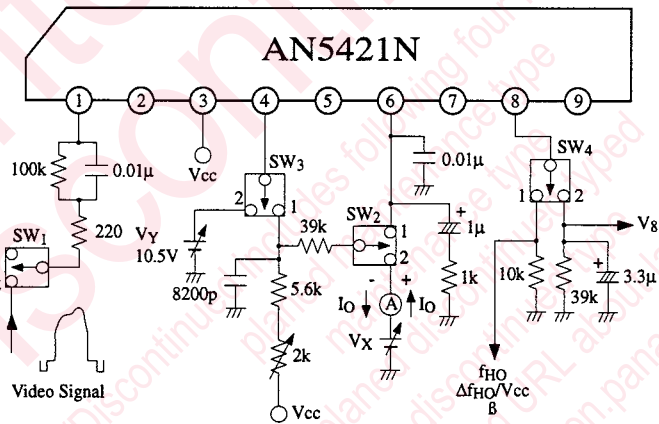
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Test Circuit 1 (I_3 , V_{1-5} , V_{2-5} , V_{8-5})



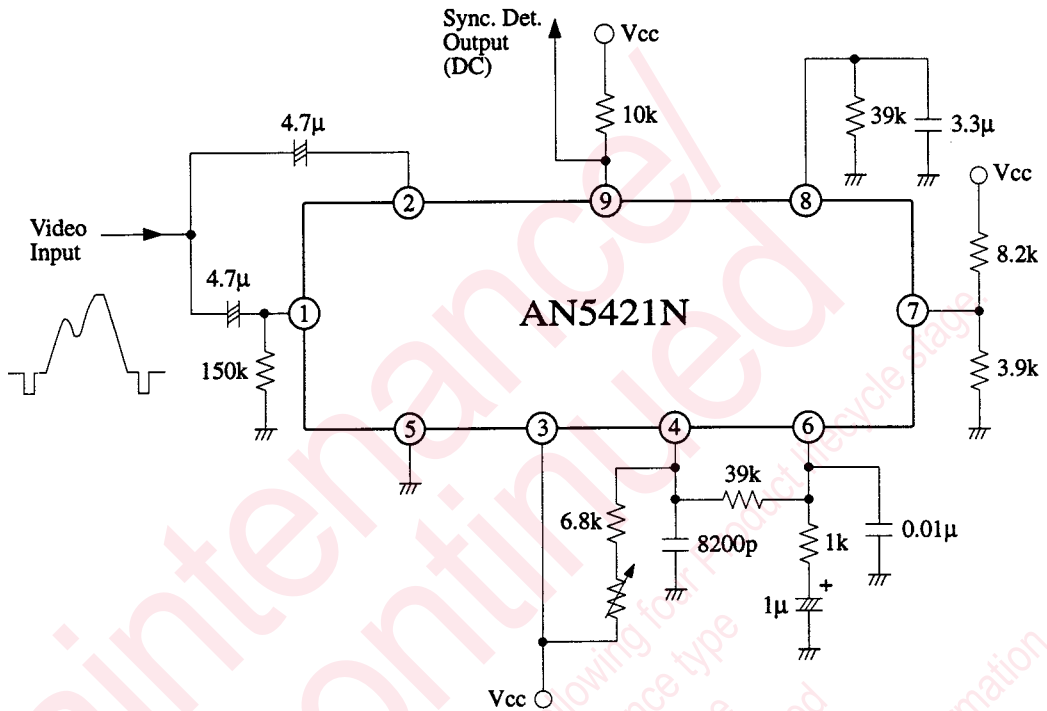
Item	Symbol	SW ₁	SW ₂	SW ₃	SW ₄	SW ₅	SW ₆
Circuit Current	I_3	1	-	-	1	2	1
Circuit Voltage	V_{1-5}	1	-	-	-	-	-
Circuit Voltage	V_{2-5}	-	1	-	-	-	-
Circuit Voltage	V_{8-5}	-	-	1	-	2	-
Noise Detector (1)	V_{8-5}	1	3	1	-	2	-
Noise Detector (2)	V_{8-5}	1	2	1	-	2	-
Video Sig. Discrimination (1)	V_{8-5}	1	-	2	-	2	-
Video Sig. Discrimination (2)	V_{8-5}	1	-	1	-	2	-
Video Sig. Discrimination (3)	V_{8-5}	-	-	3	-	2	-
Video Sig. Discrimination (4)	V_{8-5}	-	-	1	-	2	-

Test Circuit 2 (f_{HO} , $\Delta f_{HO}/V_{CC}$, B , $V_{i(min)}$, $\Delta f_{HO}/T_a$, f_{AFC} , $V_{8(1)}$, $V_{8(2)}$, $\tau_{sync.}$, τ_{HO})



Item	Symbol	SW ₁	SW ₂	SW ₃	SW ₄
Horizontal Oscillation Frequency	f_{HO}	1	1	1	1
f_{HO} Change with Supply Voltage	$\Delta f_{HO}/V_{CC}$	1	1	1	1
Control Sensitivity	B	1	2	1	1
Video Signal Discriminative Input	$V_{i(min)}$	2	1	2	1
f_{HO} Change with Ambient Temperature	$\Delta f_{HO}/T_a$	1	1	1	1
Smoothing (1)	$V_{8(1)}$	2	1	1	2
Smoothing (2)	$V_{8(2)}$	1	1	1	2
Horizontal Sync. Pulse Width	$\tau_{sync.}$	2	1	2	1
Horizontal Oscillation Pulse Width	τ_{HO}	1	1	1	1

Application Circuit



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