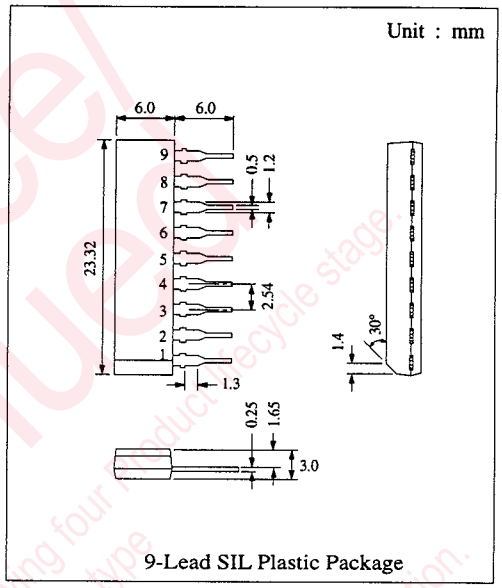
AN5421N

TV Synchronizing Signal Detection Circuit

■ Description

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



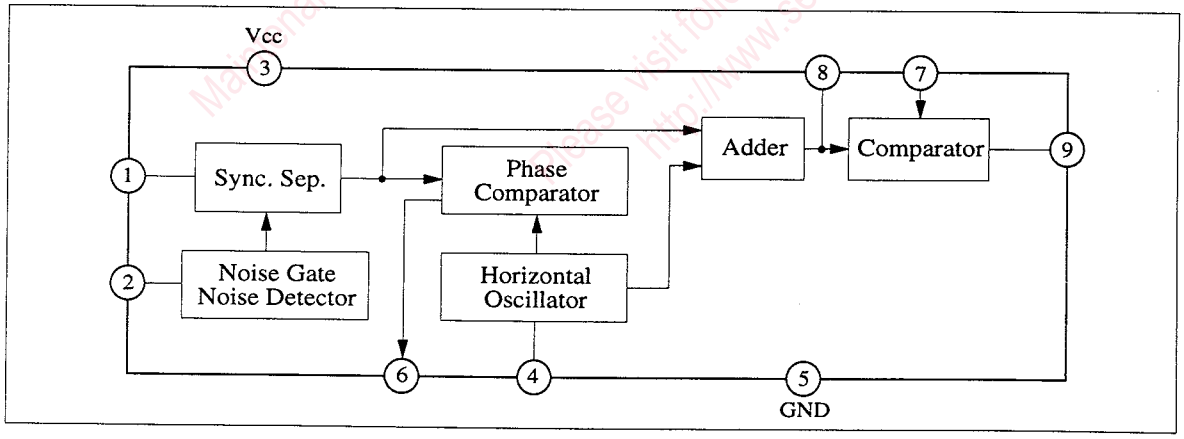
■ Features

- 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)

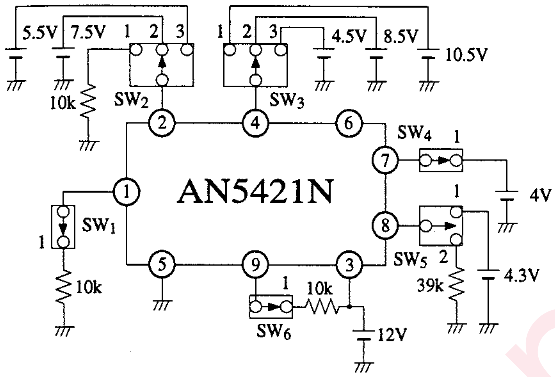
Item		Symbol	Rating		Unit
Voltage	Supply Voltage	V_{3-5}	14.4		V
	Circuit Voltage	V_{7-5}	0	V_{3-5}	V
		V_{8-5}	0	V_{3-5}	V
		V_{9-5}	0	V_{3-5}	V
Current	Supply Current	I_3	35		mA
	Circuit Current	I_1	-3	0	mA
		I_2	-1	3	mA
		I_4	0	5	mA
		I_6	-3	3	mA
		I_7	0	1	mA
		I_8	-15	1	mA
		I_9	0	10	mA
Power Dissipation (Ta = 70 °C)		P_D	510		mW
Operating Ambient Temperature		Topr	-20 ~ +70		°C
Storage Temperature		Tstg	-55 ~ +150		°C

■ Electrical Characteristics (Ta=25°C)

Item	Symbol	Test Cct.	Condition	min.	typ.	max.	Unit
Circuit Current	I_3	1	Vcc = 12V	17	24	31	mA
Circuit Voltage	V_{1-5}	1	Vcc = 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	Vcc = 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	Vcc = 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	Vcc = 12V	14.9	15.6	16.3	kHz
f_{VO} Change with Supply Voltage	$\Delta f_{HO}/Vcc$	2	f_{HO} difference between at Vcc = 6V and at Vcc = 14.4V		45	65	Hz/V
f_{HO} Control Sensitivity	ß	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 $V_8 \leq 0.2V$			0.2	Vpp
f_{HO} Change with Ambient Temperature*	$\Delta f_{HO}/Ta$	2	Vcc = 12V, Ta = -20°C ~ +70°C		-3.5		Hz/°C
AFC Loop Gain*	f_{AFC}	2	µ . ß		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	Vi = 0.3Vpp		8.0		µs
Horizontal Oscillation Pulse Width	τ_{HO}	2	Vcc = 12V		3.2		µs

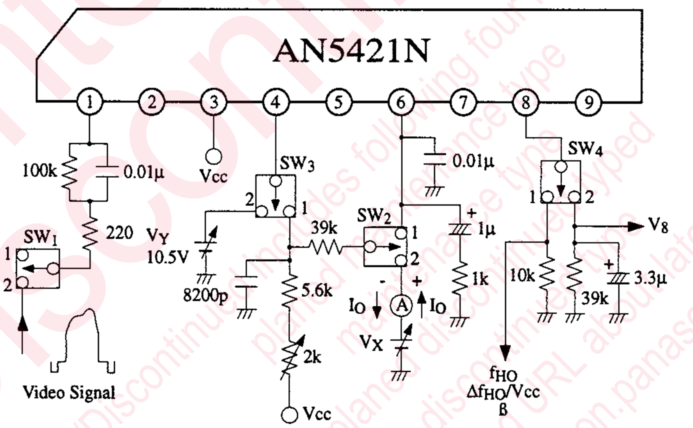
∗ : Reference values for design

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



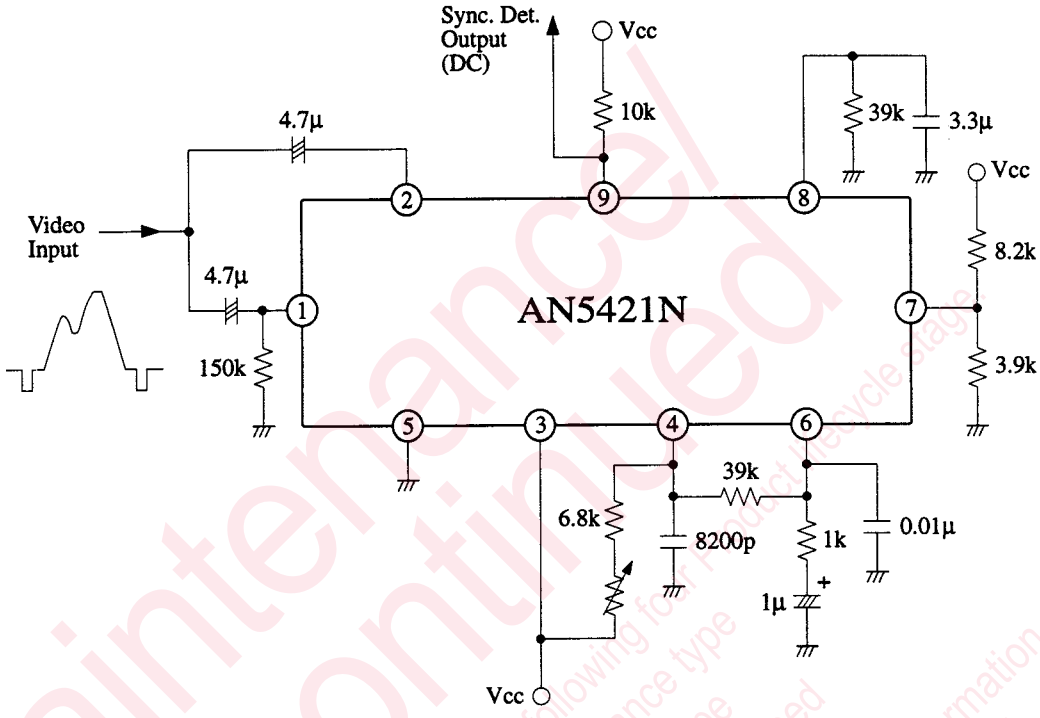
Item	Symbol	SW1	SW2	SW3	SW4	SW5	SW6
Circuit Current	I_3	1	-	-	1	2	1
Circuit Voltage	$V_{1\text{-}5}$	1	-	-	-	-	-
Circuit Voltage	$V_{2\text{-}5}$	-	1	-	-	-	-
Circuit Voltage	$V_{8\text{-}5}$	-	-	1	-	2	-
Noise Detector (1)	$V_{8\text{-}5}$	1	3	1	-	2	-
Noise Detector (2)	$V_{8\text{-}5}$	1	2	1	-	2	-
Video Sig. Discrimination (1)	$V_{8\text{-}5}$	1	-	2	-	2	-
Video Sig. Discrimination (2)	$V_{8\text{-}5}$	1	-	1	-	2	-
Video Sig. Discrimination (3)	$V_{8\text{-}5}$	-	-	3	-	2	-
Video Sig. Discrimination (4)	$V_{8\text{-}5}$	-	-	1	-	2	-

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



Item	Symbol	SW1	SW2	SW3	SW4
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	ß	1	2	1	1
Video Signal Discriminative Input	$V_{i(min)}$	2	1	2	1
f_{HO} Change with Ambient Temperature	$\Delta f_{HO}/Ta$	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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