AN7299S

Antenna diversity IC for car TV

■ Overview

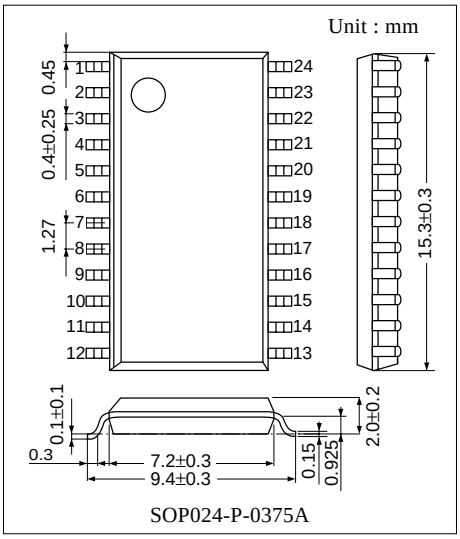
The AN7299S is an antenna diversity IC for car TV. A noise detection circuit and an antenna changeover circuit are integrated on one chip.

■ Features

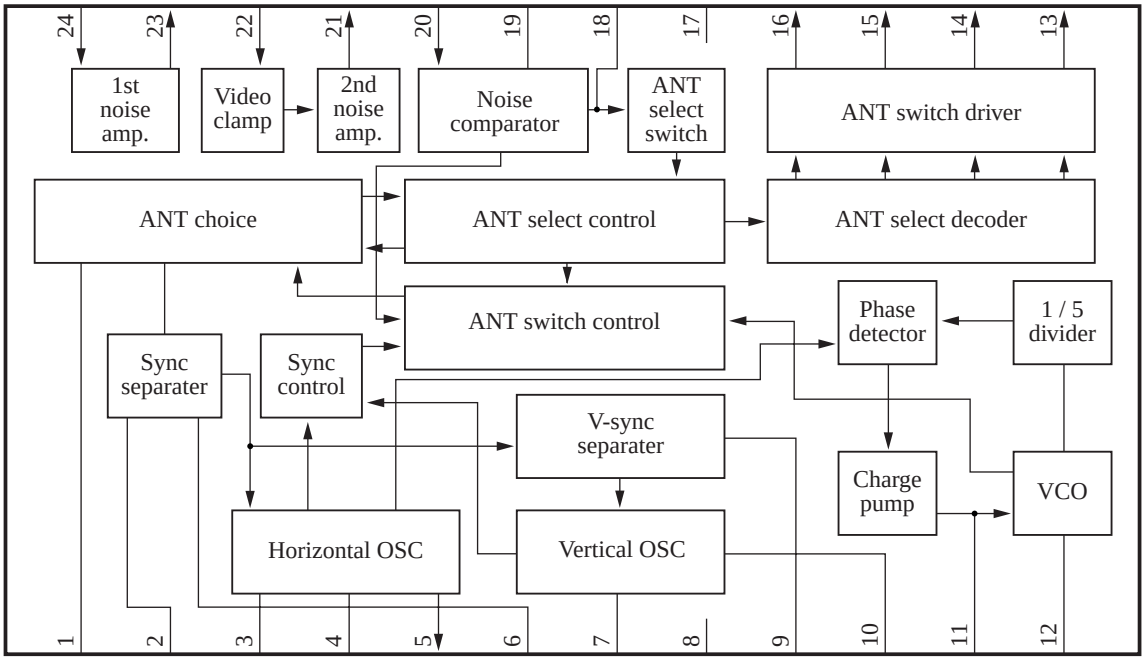
- Built-in vertical and horizontal synchronizing circuit
- Built-in antenna fixing function
- It outputs a composite synchronous signal

■ Applications

- Car TVs



■ Block Diagram



■ Pin Descriptions

Pin No.	Description	Pin No.	Description
1	Antenna selection level-hold capacitor	12	VCO oscillation time-constant setting
2	Sync separation video signal input	13	Antenna selection output 4
3	Horizontal synchronizing signal AFC output	14	Antenna selection output 3
4	Horizontal synchronizing signal oscillation time constant setting	15	Antenna selection output 2
		16	Antenna selection output 1
5	Horizontal synchronizing signal output	17	Power supply
6	Composite synchronizing signal output	18	Noise comparator level setting /Antenna fixing
7	Vertical synchronizing signal output		
8	GND	19	Noise level hold capacitor
9	Vertical synchronizing signal separation time constant setting	20	Noise comparator input
		21	2nd noise amplifier output
10	Vertical synchronizing signal oscillation time constant setting	22	Video clamp input
		23	1st noise amplifier output
11	Charge pump integral time-constant setting	24	Video signal input

■ Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Supply voltage	V_{CC}	5.5	V
Supply current	I_{CC}	25	mA
Power dissipation *2	P_D	180	mW
Operating ambient temperature *1	T_{opr}	−35 to +85	°C
Storage temperature *1	T_{stg}	−55 to +125	°C

Note) ∗1 : All items are at T_a = 25°C, except for the operating ambient temperature and storage temperature.
∗2 : T_a = 85°C

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	4.5 to 5.5	V

■ Electrical Characteristics at V_{CC} = 5 V ,T_a = 25°C

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Quiescent current without load	I_{SCC}	—	8.5	11.9	17.7	mA
1st amplifier voltage gain	A_{N1}	V_{IN} = 10 mV_{PP}, f = 10 kHz	15.3	17.0	18.2	dB
1st amplifier input clamp voltage	V_{CL1}	Pin 24 DC voltage	1.87	2.00	2.15	V
1st amplifier output bias voltage	V_{NOB1}	Pin 23 DC voltage	2.11	3.07	3.86	V
2nd amplifier voltage gain	A_{N2}	V_{IN} = 10 mV[p-p], f = 10 kHz, at 2nd amp. active	16.3	17.5	18.5	dB
2nd amplifier input clamp voltage	V_{CL2}	Pin 22 DC voltage at 2nd amp. active	1.96	2.11	2.29	V
2nd amplifier output bias voltage	V_{NOB2}	Pin 21 DC voltage at 2nd amp. active	0.78	1.51	2.10	V
Noise hold input bias current	I_{NHB}	Pin 19 DC current	40.0	110.0	240.0	nA
Noise comparator input bias current	I_{NCB}	Pin 20 DC current	200.0	426.0	820.0	nA
Noise level setting input bias current	I_{NRB}	Pin 18 DC current	350.0	548.0	950.0	nA
Antenna input amplifier voltage gain	A_C	V_{IN} = 50 mV[p-p], f = 10 kHz, at input amp. active	4.5	5.5	6.4	dB
Level hold output bias voltage	V_{LOB}	Pin 1 DC voltage at input amp. active	0.94	1.43	1.91	V
Level hold output bias current	I_{LOB}	Pin 1 DC voltage at input amp. non-active	20.0	56.4	100.0	nA
Sync separation input clamp voltage	V_{SCL}	Pin 2 DC voltage	2.92	3.13	3.32	V
Sync separation comparator on-state current	I_{SCN}	Pin 2 DC current when pin 6 becomes low to high	93.0	116.9	149.3	µA
Composite sync separation output sink current	I_{VH}	Pin 6 current, when pin 6 voltage becomes lower than 0.5 V	1.0	5.0	—	mA
Vertical sync separation block on-state voltage	V_{VSON}	Applied voltage to pin 9 when pin 7 becomes low to high	3.94	4.17	4.40	V
Vertical synchronization time constant sink current	I_{VSN}	RSET = 100 kΩ, pin 9 DC current	8.82	12.19	17.71	µA
Vertical synchronization time constant source current	I_{VSP}	RSET = 10 kΩ, pin 9 DC current	42.57	51.14	62.64	µA
Vertical synchronizing oscillation block on-state voltage	V_{VON}	Applied voltage to pin 10 when pin 7 becomes low to high	2.78	2.94	3.15	V
Vertical synchronizing oscillation block schmidt voltage	V_{VSW}	Difference between pin 10 DC voltage and V_{VON} high to low	0.83	0.90	1.01	V
Vertical synchronizing oscillation block on-state voltage	V_{VLON}	Applied voltage to pin 10 when pin 7 becomes low to high	2.47	2.65	2.79	V
Vertical synchronization output sink current	I_V	Pin 7 current, when pin 7 voltage becomes 0.5 V or less	1.0	5.0	—	mA

■ Electrical Characteristics at V_{CC} = 5 V ,T_a = 25°C

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Horizontal synchronizing oscillation block on-state voltage	V_{HON}	Applied voltage to pin 4 when pin 5 becomes low to high	2.80	3.00	3.18	V
Horizontal synchronizing oscillation block schmidt voltage	V_{HSW}	Applied voltage to pin 4 when Pin 5 becomes high to low	0.82	0.94	1.05	V
AFC sink current	I_{HAN}	$V_4 = V_L$, pin 3 DC current	127.2	160.0	206.0	µA
AFC source current	I_{HAP}	$V_4 = V_H$, Pin 3 DC current	124.1	158.0	206.6	µA
Horizontal synchronization sink current	I_H	Pin 5 current, when pin 5 voltage becomes under 0.5 V	1.0	5.0	—	mA
Antenna switch output sink current	I_{AS}	Antenna selection output pin on-state time DC current	10.0	30.0	—	mA
VCO time constant sink current	I_{VCN}	V_{12} = 1.5 V, pin 12 current	81.40	115.0	166.3	µA
VCO time constant source current	I_{VCP}	V_{12} = 4 V, pin 12 current	81.40	114.8	166.3	µA
Charge pump sink current	I_{CCN}	Pin 11 current after test signal 1 input	80.39	101.7	138.2	µA
Charge pump source current	I_{CCP}	Pin 11 current after test signal 2 input	80.39	108.3	138.2	µA

■ Application System Example