



LA7311

VCR-Use PAL/SECAM Discriminator S-VHS Discriminator

Overview

The LA7311 is a PAL/SECAM discriminator and S-VHS discriminator IC. When used as PAL/SECAM discriminator, the LA7311 is highly resistant to noise and is capable of providing high sensitive discrimination, because it uses the FM demodulation, peak detection method. Further, the LA7311 uses very few external parts, making the space-saving and low-cost discrimination block available, because it requires neither ceramic filter nor resonance coil. When used as S-VHS discriminator, the LA7311 is also capable of providing high sensitive discrimination.

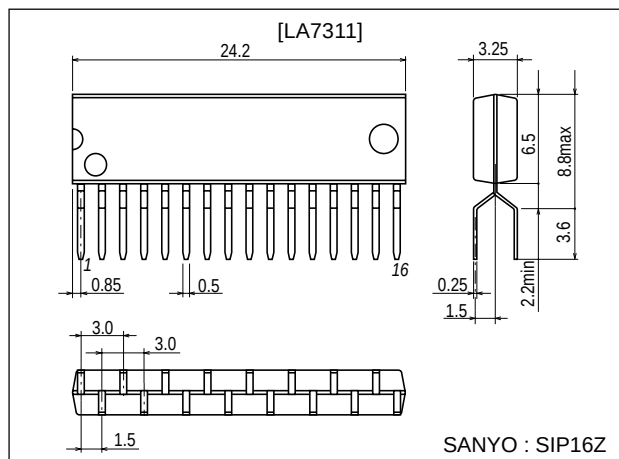
Features

- Highly resistant to noise and burst input level variations and capable of providing high sensitive discrimination.
- Fewer external parts required (Neither ceramic filter nor resonance coil required).
- On-chip display LED drivers.
- The polarity of burst gate pulse may be either positive or negative.

Package Dimensions

unit:mm

3193-SIP16Z



Specifications

Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V _{CC} max		7.0	V
Allowable power dissipation	P _d max		130	mW
Operating temperature	T _{opr}		-10 to +70	°C
Storage temperature	T _{stg}		-40 to +125	°C

Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V _{CC}		5.0	V
Operating voltage range	V _{CC} op		4.5 to 6.0	V

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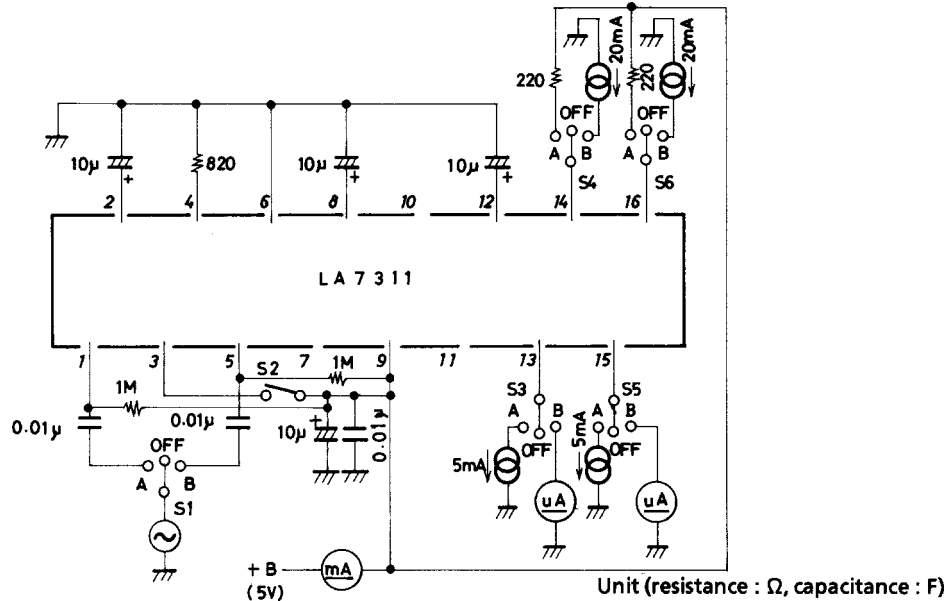
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

O2500TN (KT)/7128TA/1127KI, TS (KOTO) No.2310-1/6

Operating Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC}=5\text{V}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Current drain	I _{CC}		6.7	9.6	12.4	mA
F-V conversion gain (PB)	ΔV _P	Difference between output at 4.4MHz and output at 4.25MHz	75	105	135	mV
F-V conversion gain (REC)	ΔV _R	Difference between output at 4.4MHz and output at 4.25MHz	75	105	135	mV
PAL → SECAM inversion voltage difference	V ₈₋₁₂		35	50	65	mV
R/P switching threshold voltage	V _{3TH}		2.0	2.35	2.7	V
BG Threshold voltage 1	V _{7TH}		1.5	1.7	1.9	V
BG Threshold voltage 2	V _{11TH}		3.2	3.4	3.6	V
Forced PAL threshold voltage	V _{10TH}		1.3	1.7	2.2	V
Forced SECAM threshold voltage	V _{2TH}		1.7	2.0	2.3	V
Discrimination output voltage 1	V ₁₃	I _D =5mA	4.0	4.2	4.4	V
Discrimination output voltage 2	V ₁₅	I _D =5mA	4.0	4.2	4.4	V
Discrimination output leakage current 1	I _{13(leak)}			0	5	μA
Discrimination output leakage current 2	I _{15(leak)}			0	5	μA
Pin 12 DC voltage	V ₁₂	4.43MHz, 100mVp-p input	2.1	2.6	3.1	V
Input burst level	V _{IN}		60	100	200	mVp-p
Driver saturation voltage 1	V ₁₄	I _D =20mA		170	400	mV
Driver saturation voltage 2	V ₁₆	I _D =20mA		170	400	mV

Test Circuit

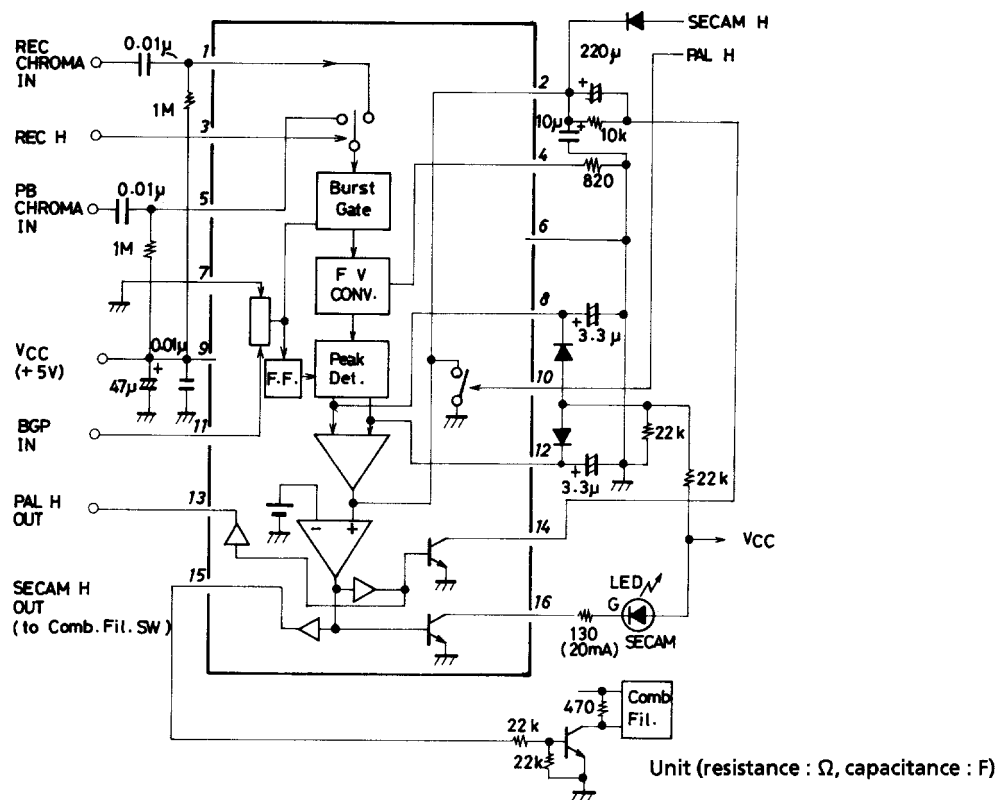


Note : Remove the $1\text{M}\Omega$ resistor connected across pins (1) and (9) and across pins (5) and (9) except when measuring ΔV_P , ΔV_R , V_{I2} , V_{IN} .

LA7311

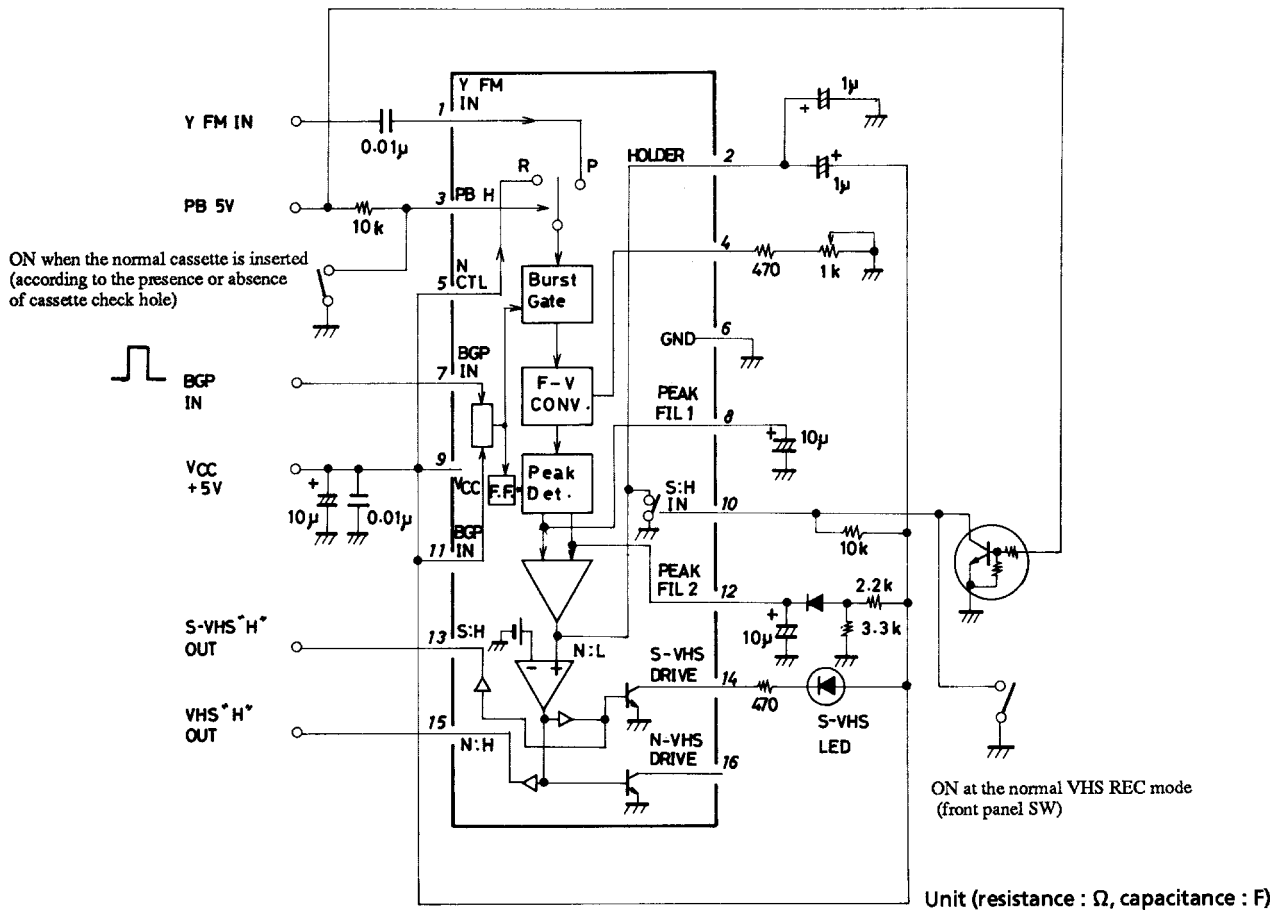
	S1	S2	S3	S4	S5	S6	Conditions
I _{CC}	off	off	off	off	off	off	V _g =5V
ΔV _p	B	↓	↓	↓	↓	↓	100mVp-p, difference between V _g (or V ₁₂) potential at 4.4MHz input and V _g (or V ₁₂) potential at 4.25MHz input
ΔV _R	A	on	↓	↓	↓	↓	100mVp-p, difference between V _g (or V ₁₂) potential at 4.4MHz input and V _g (or V ₁₂) potential at 4.25MHz input
V ₈₋₁₂	off	off	↓	A	↓	↓	a (rise from 0) when V ₇ =0V, V ₁₁ =5V, V ₈ =1.9V, V ₁₂ =1.9V+a, V ₁₄ >4V
V _{3TH}	↓	↓	↓	off	↓	↓	V ₃ (rise from 0) when V ₁ =V ₇ =V ₁₁ =0V, V ₈ <0.1V
V _{7TH}	↓	↓	↓	↓	↓	↓	V ₇ (rise from 0) when V ₁₁ =5V, V ₈ >1.0V
V _{11TH}	↓	↓	↓	↓	↓	↓	V ₁₁ (fall from 5V) when V ₇ =0V, V ₈ >1.0V
V _{10TH}	↓	↓	↓	↓	↓	A	V ₁₀ (rise from 0) when V ₇ =V ₁₁ =0V, V ₁₆ >4V
V _{2TH}	↓	↓	↓	A	↓	off	V ₂ (rise from 0) when V ₈ =V ₁₂ =3V, V ₁₄ >4V
V ₁₃	↓	↓	A	off	↓	↓	Pin 13 potential when V ₂ =0V, drive current 5mA
V ₁₅	↓	↓	off	↓	A	↓	Pin 15 potential when V ₂ =3V, drive current 5mA
I _{13(leak)}	↓	↓	B	↓	off	↓	V ₂ =3V, current which flows when pin 13 is connected to GND
I _{15(leak)}	↓	↓	off	↓	B	↓	V ₂ =0V, current which flows when pin 15 is connected to GND
V _{14(sat)}	↓	↓	↓	B	off	↓	Pin 14 potential when V ₂ =0V, drive current 20mA
V _{16(sat)}	↓	↓	↓	off	↓	B	Pin 6 potential when V ₂ =3V, drive current 20mA
V ₁₂	A	on	↓	↓	↓	off	100mVp-p, 4.43MHz CW input, Apply 4μs BGP input to pin 11.
V _{IN}	A/B	on/off	↓	↓	↓	↓	

Equivalent Circuit Block Diagram and Sample Application Circuit (PAL/SECAM Discrimination)



Note 1 : When the BGP is positive, apply an input to pin 7 and connect pin 11 to V_{CC}.
 Note 2 : When pin 10 is not in use, bring pin 10 to the open state or connect to GND.

Sample S-VHS Discriminator



Adjustment method : Adjust the VR (from VR center position) connected to pin 4 so that the DC voltage on pin 8 becomes 2.0V when the FM-Y signal at the (normal) VHS REC tape PB mode is input.

Note 1 : When the BGP is negative, apply an input to pin 11 and connect pin 7 to GND.

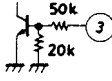
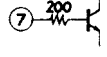
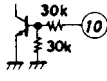
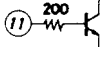
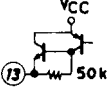
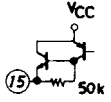
Note 2 : Pin 5 may be connected to GND.

Mode	Type of Cassette	Panel SW	V ₁₀	V ₂	Display
REC	N	S	H	L	S
		N	L	H	N
	S	S	H	L	S
		N	L	H	N
PB	N	S	L	H	N
		N	L	H	N
	S	S	L	Automatic discrimination	
		N	L	Automatic discrimination	

N ; NORMAL VHS, S ; S-VHS

Input/Output Configuration

Unit (resistance : Ω)

Pin	Pin Name	I/O Impedance or I/O Configuration		DC Voltage	Remarks
1	REC CHROMA IN	10k Ω		4.1V	
2	SECAM HOLDER				SECAM at 2.0V or greater
3	R/P CONTROL			0V (PB mode)	REC at 2.4V or greater
4	CURRENT SOURCE	Open emitter		410mV	
5	PB CHROMA IN	10k Ω		4.1V	
6	GND			0V	
7	BGP IN	Base			Burst gate at 1.7V or greater
8	PEAK FILTER 1	Emitter follower			
9	VCC			5V	
10	PAL HIGH IN			0V	Forced PAL at 1.7V or greater
11	BGP IN	Base			Burst gate at 3.4V or less
12	PEAK FILTER 2	Emitter follower			
13	PAL HIGH OUT			4.1V (PAL mode)	Up to 5mA
14	PAL DRIVE	NPN open collector			Up to 25mA
15	SECAM HIGH OUT			4.1V (SECAM mode)	Up to 5mA
16	SECAM DRIVE	NPN open collector			Up to 25mA

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