Ordering number:ENN2843

Monolithic Linear IC

LA7938

Electronic Channel Select System Control Circuit for TV/VCR Use

Overview

The SANYO LA7938 monolithic linear TV/VCR electronic tuner system controller IC integrates all the peripheral circuitry for a TV or VTR tuner, with the exception of the microcontroller, into a single chip.

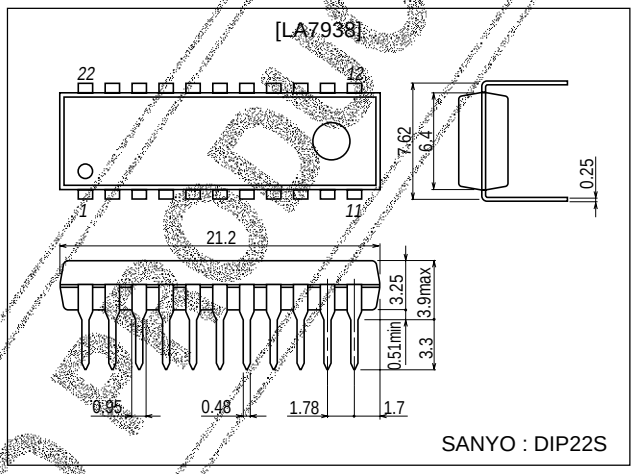
It incorporates a 2-input/4-output band-switch, 5.0V and 5.75V voltage regulators, comparator, sync signal processing circuit, AFT DC shift circuit and constant current circuit. Each PNP output of the band-switch circuit typically sources 40mA, eliminating the need for external current drivers.

The LA7938 operates from a recommended supply voltage range of 8.7 to 12.5V. It is available in 22-pin shrink DIPs.

Package Dimensions

unit:mm

3059-DIP22S



Features

- Integrates all tuner peripheral circuits except controller.
- Band-switch outputs source up to 40mA.
- Regulators each supply up to 50mA.
- 22-pin shrink DIP.

Specifications

Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Allowable power dissipation	Pd max	Ta≤65˚C	1000	mW
Operating temperature	Topr		–20 to +65	˚C
Storage temperature	Tstg		–55 to +150	˚C
[Band-switch]				
V_{CC1} maximum supply voltage	V_{18} max		13	V
Maximum load current	I_{19} max		–50	mA
	I_{20} max		–50	mA
	I_{21} max		–50	mA
	I_{22} max		–50	mA
Applied input voltage	V_6 max		3.5	V
	V_5 max		3.5	V

Continued on next page.

SANYO Electric Co.,Ltd. Semiconductor Company
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

Continued from preceding page.

Parameter	Symbol	Conditions	Ratings	Unit
[Sync detector]				
Positive input voltage	V_1 max		3.5	V
Negative input voltage	$-V_1$ max		–1.4	V
Applied input voltage (Pin 3)	V_3 max	$V_{CC}1$=13V	10	V
Applied input voltage	V_4 max	$V_{CC}1$=$V_{CC}2$=12V	4.6	V
[Voltage regulators]				
V_{CC2} supply voltage	V_{13} max		13	V
+5.75V output current	I_{12} max		–50*	mA
+5.0V output current	I_9 max		–50*	mA
[Comparator]				
Maximum input voltage	V_8 max	$V_{CC}2$=13V	13	V
	V_{10} max	$V_{CC}2$=13V	13	V
Applied output voltage	V_{11} max		6	V
[+31V constant current source]				
Applied voltage	V_{14} max		43	V
[AFT shift circuit]				
Maximum input voltage	V16 max	$V_{CC}1$=13V	13	V

* : The rating for the total current drawn from both the 5.0V and 5.75V supplies is 70mA.

Operating Conditions at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Operating voltage range	V_{CC} op		8.7 to 12.5	V

(Band Switch Truth Table)

Input		Output			
A (Pin 6)	B (Pin 5)	F1 (Pin 19)	F2 (Pin 20)	F3 (Pin 21)	F4 (Pin 22)
L	L	H	Z	Z	Z
H	L	Z	H	Z	Z
L	H	Z	Z	H	Z
H	H	Z	Z	Z	H

Z : HIGH-impedance

Operating Characteristics at Ta = 25˚C, $V_{CC}1$, $V_{CC}2$=12V

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent current drain 1	$I_{CC}1$			9.0		mA
Quiescent current drain 2	$I_{CC}2$			7.0		mA
[Band-switch]						
Output saturation voltage	F_1(sat.)	I_O=–40mA			0.7	V
	F_2(sat.)	I_O=–40mA			0.7	V
	F_3(sat.)	I_O=–40mA			0.7	V
	F_4(sat.)	I_O=–40mA			0.7	V
Input high-level voltage	V_{5HI}	Open gate type microcomputer must be in OFF state (pull-up resistance on chip).				
	V_{6HI}					
Input low-level voltage	V_{5LO}				0.8	V
	V_{6LO}				0.8	V
Output leakage current	I_{FL}		–50			µA
[Sync circuit]						
Input threshold voltage	V_{1TH}		0.4	0.72	1.5	V
Pin 2 output saturation voltage	$V_{2(sat)}$	I_{SINK}=10mA			1.0	V
Pin 3 high-level input	V_{3HI}		5.0			V
Pin 3 low-level input	V_{3HO}				3.0	V
Pin 4 output saturation voltage	$V_{4(sat)}$	I_{SINK}=2mA			0.7	V
[+5.75V, +5.0V regulators]						
+5.75V output voltage	V_{12}	I_{12}=–20mA	5.35	5.75	6.15	V
+5.75 output voltage regulation	V_{12Reg}	I_{12}=5mA → 20mA	–25		+25	mV
+5.0V output voltage	V_9	I_9=–20mA	4.6	5.0	5.4	V
+5.0V output voltage regulation	V_{9Reg}	I_9=5mA → 20mA		50	100	mV

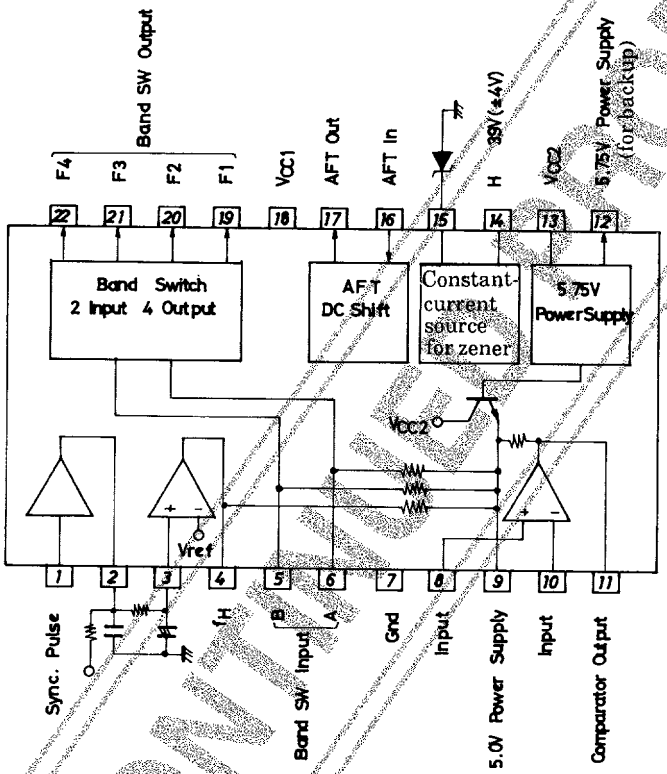
Continued on next page.

Continued from preceding page.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[31V current source]						
Pin 15 output current	I_{15}		4.2	6.0	7.8	mA
[AFT shift current]						
DC shift voltage	V_{16}–V_{17}		4.23	4.73	5.23	V
Pin 17 maximum output voltage	V_{17} max		5.35	5.75	6.15	V
[Comparator]						
Maximum operating input voltage	$V_{8\ to\ 10}$ max		9.0			V
Minimum operating input voltage	$V_{8\ to\ 10}$ min				0.7	V
Output saturation voltage	$V_{11(sat)}$	I_{SINK}=2mA			0.7	V

Block Diagram

[For backup purposes]



- Specifications of any and all SANYO products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.
- SANYO Electric Co., Ltd. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.
- In the event that any or all SANYO products(including technical data,services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.
- No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of SANYO Electric Co., Ltd.
- Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the SANYO product that you intend to use.
- Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. SANYO believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

This catalog provides information as of January, 2001. Specifications and information herein are subject to change without notice.