Ordering number : ENN*7900

Preliminary

SANYO Semiconductors
DATA SHEET

Bi-CMOS IC

LV23002M — For Radio Cassette and Mini Component System 1-chip Tuner IC Incorporating PLL

Overview

The LV23002M is a one-chip tuner IC incorporating PLL for radio cassette and mini component system.

Features

- AM
- FM-FE
- FM-IF
- MPX
- PLL

Specifications

Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max	V_{CC}	7.0	V
	V_{DD} max	V_{DD}	5.0	V
Maximum input voltage	$V_{IN}1$ max	CE, DI, CL	5.0	V
	$V_{IN}2$ max	XIN	V_{DD}+0.3	V
Maximum output voltage	V_O1 max	DO	6.0	V
	V_O2 max	XOUT, PD	V_{DD}+0.3	V
	V_O3 max	BO1, BO2, AOUT	12.0	V
Allowable power dissipation	Pd max	Ta≤70°C Mounted on a glass epoxy board. Board size : 114.3 mm×76.1mm = 1.6mm	400	mW
Operating temperature	Topr		-20 to +70	°C
Storage temperature	Tstg		-40 to +125	°C

Note : This product should be handled with care because the resistance of one pin against electrostatic discharge damage is low.

■ Any and all SANYO products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your SANYO representative nearest you before using any SANYO products described or contained herein in such applications.

■ SANYO assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all SANYO products described or contained herein.

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

Operating Condition at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		5.0	V
	V_{DD}		3.0	V
Operating supply voltage range	V_{CC} op		4.0 to 6.0	V
	V_{DD} op		2.5 to 3.6	V

Note : Use the product with the supply voltage applied to V_{CC} and V_{DD}.

PLL block Allowable Operating Range at Ta = -20 to +70°C, V_{SS} = 0V

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Supply voltage	V_{DD}		2.5		3.6	V
Input high level voltage	V_{IH}	CE, CL, DI	$0.7V_{DD}$		5.0	V
Input low level voltage	V_{IL}	CE, CL, DI	0		$0.3V_{DD}$	V
Output voltage	V_O1	DO	0		6.0	V
	V_O2	BO1, BO2, AOUT	0		10	V
Operating frequency	$f_{IN}1$	XIN ; $V_{IN}1$		75		kHz
	$f_{IN}2$	FMIN ; $V_{IN}2$	10		160	MHz
	$f_{IN}3$	AMIN (SNS = 1) ; $V_{IN}3$	2		40	MHz
	$f_{IN}4$	AMIN (SNS = 0) ; $V_{IN}4$	0.5		10	MHz

Note : Due attention must be paid on leak because the XIN pin has an extremely high input impedance.

Operating Characteristics at Ta = 25°C, V_{CC} = 5.0V, V_{DD} = 3.0V, See the specified circuit.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[FM-FE characteristics] : fc = 98MHz, fm = 1kHz, 22.5kHzdev.						
3dB sensitivity	3dB LS	60dBμV EMF, 30%mod output reference, -3dB input		3		dBμV EMF
Actual sensitivity	QS	S/N = Input at S/N = 30dB		10		dBμV EMF
[FM-IF monaural characteristics] : fc = 10.7MHz, fm = 1kHz, 75kHzdev.						
Demodulation output	V_O	100dBμV, 12pin output	210	330	420	mVrms
Channel balance	CB	100dBμV, 13pin output /12pin output	-1.5	0	+1.5	dB
Signal-to-noise ratio	S/N	100dBμV, 12pin output	68	75		dB
Total harmonic distortion (Monaural)	THD	100dBμV, 12pin output		0.3	1.5	%
3dB sensitivity	3dB LS	V_O reference, Input level at which V_O reference is -3dB.		38	44	dBμV
IF count sensitivity	IF-C3	SDC0 = 1, SDC1 = 0,18pin(DO) output	45	51	61	dBμV
Mute attenuation	Mute-Att	100dBμV, 12pin output		68		dB
[FM-IF stereo characteristics] : fc = 10.7MHz, fm = 1kHz, L+R = 90%, Pilot = 10%, V_{IN} = 100dBμV						
Separation	SEP	L-mod, 12pin output /13pin output	28	40		dB
Total harmonic distortion (Main)	THD	Main-mod, 12pin output		0.5	1.5	%
Stereo ON sensitivity	ST-ON	Stereo operation ON at Pilot = 5.5% Stereo not ON at Pilot = 0.6%				
Cap challenge	CR	Stereo ON at fm = 18.6 kHz and 10% modulation fm = 19.4kHz, Stereo ON at fm = 19.4 kHz and 10% modulation				

Continued on next page.

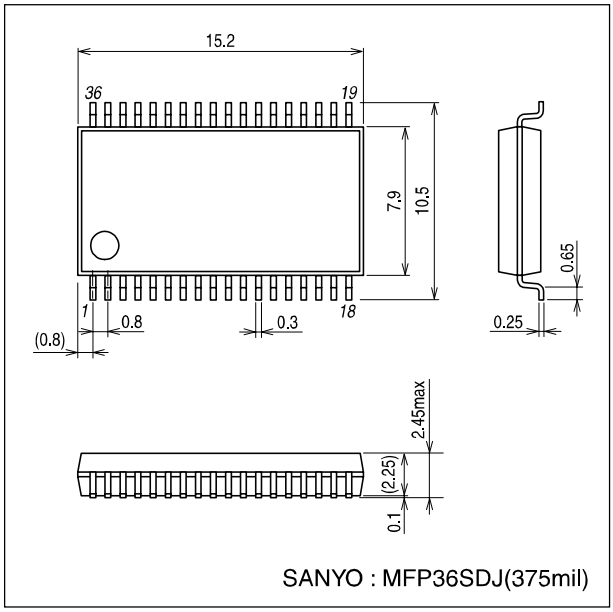
Continued from preceding page.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[AM characteristics] : fc = 1000kHz, fm = 1kHz, 30%mod						
Detection output 1	V_O1	23dBμV, 12pin output	20	40	80	mVrms
Detection output 2	V_O2	80dBμV, 12pin output	60	110	160	mVrms
Signal-to-noise ratio 1	S/N1	23dBμV, 12pin output	15	20		dB
Signal-to-noise ratio 2	S/N2	80dBμV, 12pin output	47	54		dB
Total harmonic distortion	THD	80dBμV, 12pin output		1.2	3.0	%
IF count sensitivity	IF-C	18pin(DO) output	16	26	36	dBμV
Low-range attenuation	LOW-CUT	V_O2 reference, Pin 12 output at fm = 100Hz	5	8	11	dB
[Current dissipation]						
Current dissipation	ICCFM	No input in FM mode	20	30	40	mA
	ICCAM	No input in AM mode	10	20	30	
	I_{DD}	fr = 83MHz, X'tal = 75kHz, No input to tuner	1	2	5	
[PLL characteristics]						
Internal return resistance	Rf	XIN		8		MΩ
Built-in output resistance	Rd	XOUT		250		kΩ
Hysteresis width	VHIS	CE, CL, DI		$0.1V_{DD}$		V
Output high level voltage	V_{OH}	PD ; I_O = -1mA	V_{DD}-1.0			V
Output low level voltage	$V_{OL}1$	PD ; I_O = 1mA			1.0	V
	$V_{OL}2$	BO1, BO2 ; I_O = 1mA			0.25	V
		BO1, BO2 ; I_O = 5mA			1.25	V
	$V_{OL}3$	DO ; I_O= 1mA			0.25	V
	$V_{OL}4$	AOUT ; I_O = 1mA, AIN = 2.0V			0.5	V
Input high level current	$I_{IH}1$	CE, CL, DI ; V_I = 6.0V			5.0	μA
	$I_{IH}2$	XIN ; V_I = V_{DD}	0.16		0.9	μA
	$I_{IH}3$	AIN ; V_I = 6.0V			200	nA
Input low level current	$I_{IL}1$	CE, CL, DI ; V_I = 0V			5.0	μA
	$I_{IL}2$	XIN ; V_I = 0V	0.16		0.9	μA
	$I_{IL}3$	AIN ; V_I = 0V			200	nA
Output off-leak current	IOFF1	BO1, AOUT, BO2 ; V_O = 10V			5.0	μA
	IOFF2	DO ; V_O = 6.0V			5.0	μA
"H" level 3-state off-leak current	IOFFH	PD ; V_O = 6.0V		0.01	200	nA
"L" level 3-state off-leak current	IOFFL	PD ; V_O = 0V		0.01	200	nA

Package Dimensions

unit : mm

3263



- 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 August, 2004. Specifications and information herein are subject to change without notice.

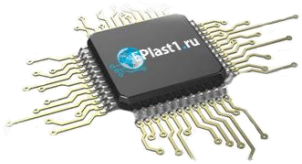
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)
Факс: 8 (812) 320-02-42
Электронная почта: org@eplast1.ru
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.