Ordering number : EN5889

Monolithic Linear IC

LV1041M

Dolby Prologic Decoder

DOLBY SURROUND PRO • LOGIC

Overview

The LV1041M is a Dolby Prologic Surround signal-processing IC that implements in a single chip the functions of the Sanyo LV1016 and LA2786 ICs and a master volume control for the center and surround channels. This IC allows both systems of Dolby Prologic surround and digital surround to be formed into a single IC.

Features

- Implements a Prologic surround decoder in a single chip.
- Wide dynamic range
- All modes can be controlled from control data transmitted serially over four lines: CLOCK, DATA, ENABLE, and ENABLE2. This function is compatible with the LV1016 and the LA2786.

Functions

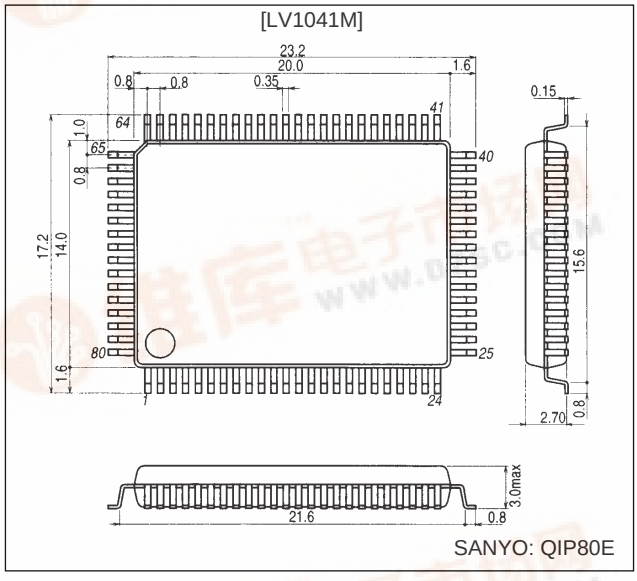
- Adaptive matrix
- Center mode control (normal, phantom, wide)
- 4/3 channel logic control
- Auto-balance (on/off)
- Prologic off mode (bypass and full bypass)
- Center trim (0 to –31 dB in 1-dB steps)
- On-chip memory: (8K SRAM)
- Variable delay time: 15, 20, 25, 30, 40, or 50 ms (15, 20, 25, or 30 ms for Dolby Prologic surround)
- New A/D and D/A converter circuits adopted
- On-chip Dolby B noise reduction
- On-chip input and output filters
- Built-in V_{DD} circuit
- Surround trim (0 to –31 dB in 1-dB steps)
- Input and output muting functions
- Master volume control for the center and surround channels (0 to –44 dB in –2-dB steps, –44 to –76 dB in –4-dB steps, and muted)

Note *: Dolby and the double D symbol are registered trademarks of the Dolby Laboratories Licensing Corporation. This IC can only be used by Dolby licensees. Licensing information and corresponding technical information is available from:Dolby Licensing Corporation
San Francisco, CA 94103-4813
USA

Package Dimensions

unit: mm

3174-QFP80E



Specifications

Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		12	V
Allowable power dissipation	Pd max	Ta ≤ 70°C When mounted on a 114.3 × 76.1 × 1.6 mm fiberglass epoxy printed circuit board.	1300	mW
Operating temperature	Topr		–20 to +70	°C
Storage temperature	Tstg		–40 to +150	°C

Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		9	V
Operating supply voltage range	V_{CC} op		8 to 10	V
Input high-level voltage	V_{IH}		3.5 to 5.5	V
Input low-level voltage	V_{IL}		0 to 1.0	V
Dolby level	V_O Dolby		300	mVrms

Operating Conditions

at Ta = 25°C, V_{CC} = 9 V, V_{IN} = 300 mV rms (left and right inputs), 0.707 × 300 mV rms (center and surround inputs), f = 1 kHz, center trim = 0 dB, surround trim = 0 dB, delay time = 20 ms, in wide mode, and with the center and surround master volume set to 0 dB.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent current	I_{CC}	No signal		80	110	mA
Center channel output level	V_{OC}	C input	–2	0	+2	dB
Output level deviation	V_{OL}	L, R, Sch from Cch, matrix output	–0.5	0	+0.5	dB
Matrix rejection (L)	R_{jL}	L input		–40	–25	dB
Matrix rejection (C)	R_{jC}	C input		–40	–25	dB
Matrix rejection (R)	R_{jR}	R input		–40	–25	dB
Matrix rejection (S)	R_{jS}	S input		–40	–25	dB
Total harmonic distortion (L)	THD_L	L 24-pin output		0.02	0.09	%
Total harmonic distortion (C)	THD_C	C 31-pin output		0.02	0.09	%
Total harmonic distortion (R)	THD_R	R 21-pin output		0.02	0.09	%
Total harmonic distortion (S)	THD_{S2}	S delay 33-pin output		0.1	0.7	%
Signal-to-noise ratio (L)	$SN/_L$	L 24-pin output, CCIR/ARM, R_S = 10 kΩ		–76	–71	dB
Signal-to-noise ratio (C)	$SN/_C$	C 31-pin output, CCIR/ARM, R_S = 10 kΩ		–77	–71	dB
Signal-to-noise ratio (R)	$SN/_R$	R 21-pin output, CCIR/ARM, R_S = 10 kΩ		–76	–71	dB
Signal-to-noise ratio (S)	$SN/_S$	S delay 33-pin output		–75	–65	dB
Signal handling (L)	SH_L	L 24-pin output, V_{CC} = 8.5 V, THD = 1%	15	16		dB
Signal handling (C)	SH_C	C 31-pin output, V_{CC} = 8.5 V, THD = 1%	15	17		dB
Signal handling (R)	SH_R	R 21-pin output, V_{CC} = 8.5 V, THD = 1%	15	16		dB
Signal handling (S)	SH_S	V_{CC} = 8.5 V, THD = 3%, output 33-pin S delay	15	16		dB
Noise sequencer output level	Vns	Each matrix out	53	60	90	mV
Noise reduction frequency characteristics	Dec1	0 dB, 1 kHz	–1.5	0.0	+1.5	dB
	Dec2	–20 dB, 1 kHz	–24.0	–22.5	–21.0	dB
	Dec3	0 dB, 5 kHz	–1.5	0.0	+1.5	dB
	Dec4	–20 dB, 5 kHz	–23.3	–21.8	–20.3	dB
	Dec5	–40 dB, 5 kHz	–46.8	–45.3	–43.8	dB
[Prologic Off Mode]						
Left and right channels total harmonic distortion	THD_{OFF}	L, R, 400 to 30 kHz BPF		0.01	0.03	%
Left and right channels signal-to-noise ratio	S/N_{OFF}	L, R, CCIR/ARM		–90	–80	dB
Left and right channels signal handling	Shoff	L, R, V_{CC} = 8.5 V, THD = 1%	15	16		dB
Master volume muting attenuation	V_{MUTE}	V_{IN} = 1 Vrms		–92	–80	dB

Sample Application Circuit