



SANYO Semiconductors

DATA SHEET

LV1116N/NV — Bi-CMOS LSI Surround Processor ICs for Electronic Volume Control

Overview

The LV1116N/NV are sound processor ICs developed for use in TV sets. They incorporate the surround processing functions including (AViSS[®]), pseudo stereo function, (L+R) output, and the major functional blocks of an electronic volume control IC.

Functions

- Input function SWs (stereo inputs [L, R]).
- LINE OUT pin (through output).
- Input gain control (-6dB, -4dB, 0dB, 4dB, 6dB: 5 positions).
- AViSS[®] (ON/OFF/4-stage level control).
- Tone control (BASS: ± 20dB, TREBLE: ± 18dB [in 2dB steps]).
- Master volume control (0dB~-14dB: 1dB steps/-14dB~-80dB: 2dB steps/- =-82dB).
- Balance control.
- THROUGH mode/MUTE mode.
- Pseudo stereo function (ON/OFF/MONO).
- L+R output with LPF (MUTE + 7-stage level control: 8 positions).
- I²C bus control.

* Initial output gain of L+R can be controlled by the resistance value of external resistor.

Specifications

Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V _{CC} max		10.5	V
Allowable power dissipation 1	Pd max1	Ta 70 (DIP)	700	mW
Allowable power dissipation 2	Pd max2	Ta 70 (SSOP)*	550	mW
Operating temperature	Topr		-25 to +70	
Storage temperature	Tstg		-40 to +125	

* When mounted on a 76.1×114.3×1.6 mm glass epoxy board.

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Operating Conditions at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		9.0	V
Operating supply voltage range 1	$V_{CC\ org1}$	DIP	5.0 to 10.0	V
Operating supply voltage range 2	$V_{CC\ org2}$	SSOP	5.0 to 9.0	V
Control data				
"H" level voltage	V_{IH}		2.0 to 5.5	V
"L" level voltage	V_{IL}		0.0 to 1.0	V
Pulse width	$t_{\phi w}$		1.0	μs
Hold time	t_{hold}		1.0	μs
Operating frequency	f_{opg}		500	kHz

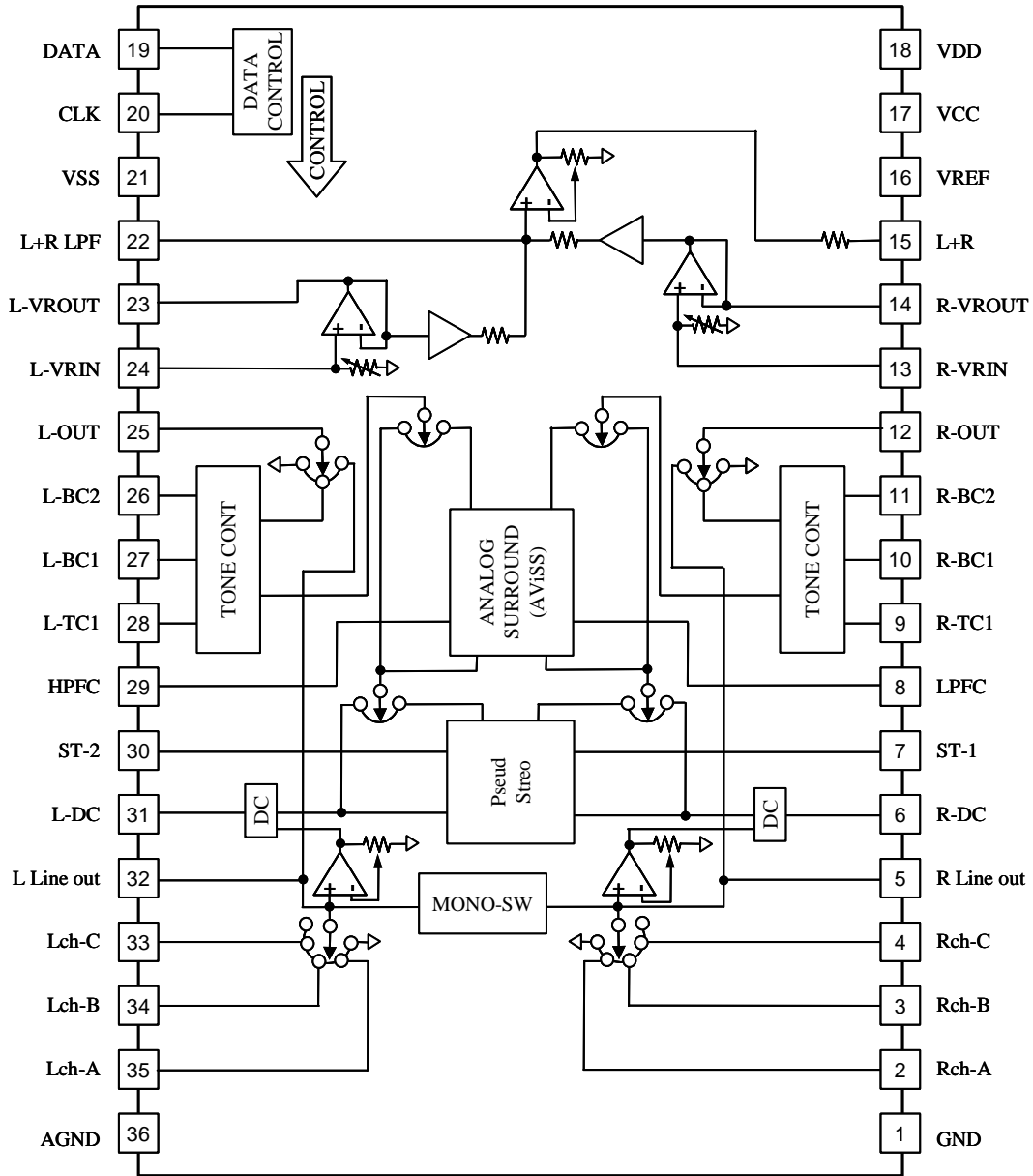
Electrical Characteristics at $T_a=25^\circ\text{C}$, $V_{CC}=9.0\text{V}$, $f_{in}=1\text{kHz}$, $V_{IN}=300\text{mV}_{rms}=0\text{dB}$, $R_L=10\text{k}\Omega$

(Input=L/R-A, Output=L/R-VROUT)

Parameter	Symbol	Conditions	min	typ	max	unit
Quiescent current	ICCO			48		mA
Total Through (Total Through mode, Volume control: 0dB)						
Volume gain	VG_T		-1.6	-0.6	+0.6	dB
Maximum output voltage	VO_T	THD=1%	2.0	2.6		V _{rms}
Total harmonic distortion	THD_T	DIN AUDIO		0.03	0.1	%
Output voltage noise	VNO_T	DIN AUDIO		-99	-85	dBV
Cross talk	CT_T	DIN AUDIO	85	95		dB
Matrix through (Matrix mode, Input gain: 0dB, Volume control: 0dB)						
Volume gain	VG_F		-1.7	-0.7	+0.7	dB
Maximum output voltage	VO_M	THD=1%	1.5	2.0		V _{rms}
Total harmonic distortion	THD_M	DIN AUDIO		0.04	0.1	%
Output voltage noise	VNO_M	DIN AUDIO		-95	-85	dBV
Cross talk	CT_M	DIN AUDIO	85	93		DB
MONO mode (MONO mode, Input gain: 0dB, Volume control: 0dB)						
Maximum output voltage	VO_S	THD=1%	1.5	2.0		V _{rms}
Total harmonic distortion	THD_S	DIN AUDIO		0.04	0.5	%
Output voltage noise	VNO_S	DIN AUDIO		-95	-85	dBV
Surround (Surround mode-A, Input gain: 0dB, Volume control: 0dB)						
Maximum output voltage	VO_S	THD=1%	1.5	2.0		V _{rms}
Total harmonic distortion	THD_S	DIN AUDIO		0.2	0.5	%
Output voltage noise	VNO_S	DIN AUDIO		-92	-85	dBV
Pseudo stereo (Pseudo stereo mode, Input gain: 0dB, Volume control: 0dB)						
Maximum output voltage	VO_S	THD=1%	1.5	2.0		V _{rms}
Total harmonic distortion	THD_S	DIN AUDIO		0.07	0.5	%
Output voltage noise	VNO_S	DIN AUDIO		-92	-85	dBV
Bass band EQ (Matrix through mode, Input gain: 0dB, Volume control: 0dB)						
Maximum output voltage	Geq_B	max.Boost/Cut	± 17	± 20	± 23	dB
Step resolution	$Estep_B$		1.0	2.0	3.0	dB
Treble band EQ (Matrix through mode, Input gain: 0dB, Volume control: 0dB)						
Maximum output voltage	Geq_T	max.Boost/Cut	± 15	± 18	± 21	dB
Step resolution	$Estep_T$		1.0	2.0	3.0	dB
L+R output (Output=L+R-OUT, Step=0dB, L+R_Step=Step4)						
Gain	VG_F		-2.3	-1.3	-0.3	dB
Maximum output voltage	VO_F	THD=1%	2.0	2.5		V _{rms}
Total harmonic distortion	THD_F	DIN AUDIO		0.03	0.1	%
Output voltage noise	VNO_F	DIN AUDIO		-99	-85	dBV

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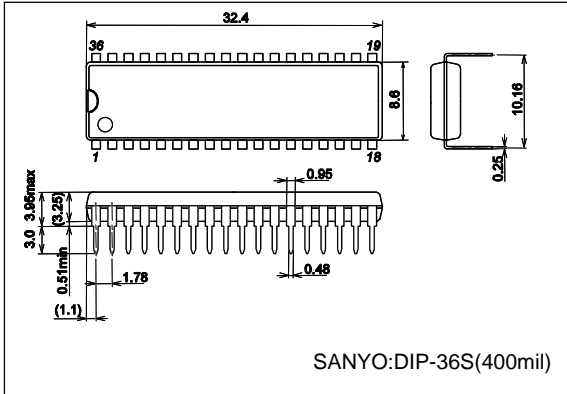
Block Diagram



LV1116N/NV

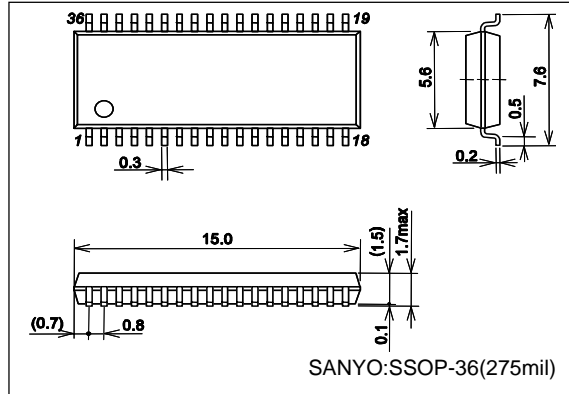
LV1116N Package Dimensions

Unit: mm
3061



LV1116NV Package Dimensions

Unit: mm
3247A



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