

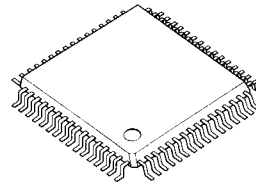
DOLBY PRO LOGIC SURROUND DECODER

■ GENERAL DESCRIPTION

The NJM2177A is a higher level integration and high quality audio performance monolithic IC designed for use in Dolby Pro Logic Surround System. The NJM2177A provides all the necessary function for a complete Pro Logic processor except time delay; Automatic input balance, noise sequencer, adaptive matrix, center mode control, and modified B-type noise reduction all on chip.

In addition to Dolby Pro Logic function including Dolby 3-stereo, this device provides two channel bypass mode and two special outputs used for other surround conveniently.

■ PACKAGE OUTLINE



NJM2177AFG1

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This device available only to licensees of Dolby Lab.

Licensing and application information may be obtained from Dolby Lab.

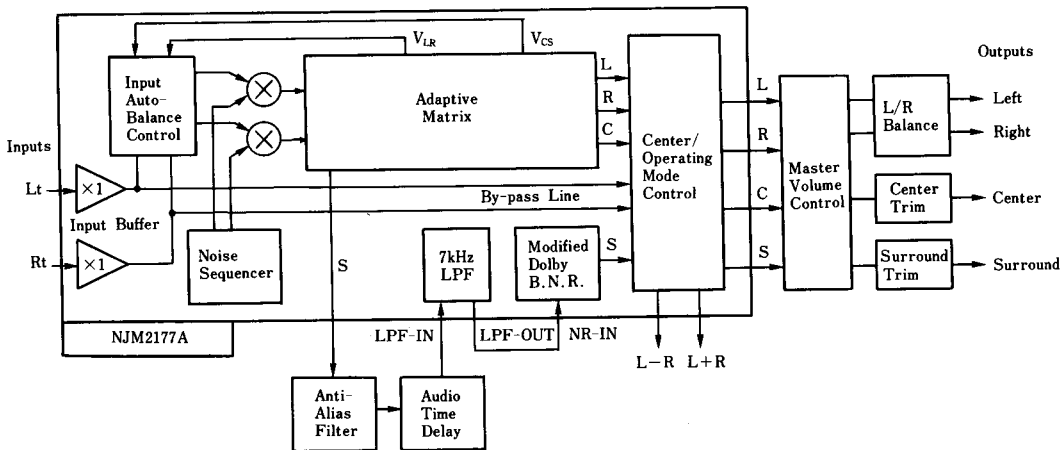
■ FEATURES

- Operating Voltage 9 to 13V
- Dolby operating level 300mVrms
- Lower Operating Current 34mA typ.
- Internal mode control switches
- Package TQFP64

■ FUNCTIONS

- Auto input balance and buffer
- Noise sequencer; a Noise generator, a sequencer controlled by external two bits
- Adaptive Matrix
- Center mode control; ON/OFF, Normal/Phantom/Wideband
- Modified Dolby B Type Noise Reduction and OP amp. for 7kHz low-pass filter
- Operating mode control; 4ch(L,C,R), 3ch(L,C,R), 2ch(no processing)
- L + R and L - R output

■ ACTIVE SURROUND DECODER BLOCK DIAGRAM



## ■ ELECTRICAL CHARACTERISTICS

(Ta=25°C, V+=12V, 0dB Reference is 300mV/1kHz at C-OUT. Unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
<b>Overall</b>						
Operating Voltage Range	V <sub>OP</sub>		9.0	—	13.0	V
Operating Current	I <sub>CC</sub>	No signal	—	34.0	40.0	mA
Reference Voltage	V <sub>ref</sub>	No signal	—	4.0	—	V
Control SW input voltage						
2ch Mode	V <sub>C-2ch</sub>	MODE-CNT PIN	0.0	—	0.8	V
3ch	V <sub>C-3ch</sub>	MODE-CNT PIN	—	Open	—	
4ch	V <sub>C-4ch</sub>	MODE-CNT PIN	3.8	—	7.0	V
Center on	V <sub>C-con</sub>	CENTER-CNT PIN	2.4	—	7.0	V
Center off	V <sub>C-coff</sub>	CENTER-CNT PIN	0.0	—	0.8	V
Noise Seq. on	V <sub>C-nson</sub>	NOISE-CNT-E PIN	0.0	—	0.8	V
Noise Seq. off	V <sub>C-nsoff</sub>	NOISE-CNT-E PIN	3.2	—	7.0	V
Noise Seq. channel select H	V <sub>C-nssH</sub>	NOISE-CNT-A and NOISE-CNT-B PIN	3.2	—	7.0	V
Noise Seq. channel select L	V <sub>C-nssL</sub>	NOISE-CNT-A and NOISE-CNT-B PIN	0.0	—	0.8	V

### Modified B Noise Reduction (0dB Reference is input level at NR-IN when adjust to 300mV/100Hz at S-OUT)

Voltage Gain	GV-BNR	V <sub>in</sub> = 0dB, f=100Hz	—	9.0	—	dB
Decode Responce 1	D <sub>ec1</sub>	V <sub>in</sub> = 0dB, f=1.0kHz	-1.6	-0.1	1.4	dB
2	D <sub>ec2</sub>	V <sub>in</sub> = -15dB, f=1.4kHz	-3.0	-1.5	0.0	dB
3	D <sub>ec3</sub>	V <sub>in</sub> = -20dB, f=1.4kHz	-4.9	-3.4	-1.9	dB
4	D <sub>ec4</sub>	V <sub>in</sub> = 40dB, f=5.0kHz	-6.8	-5.3	-3.8	dB
T.H.D	THD-NR	V <sub>in</sub> = 0dB, f=1.0kHz	—	0.07	—	%
Headroom	HR-NR	V+=9V AT T.H.D.=1%	15.0	17.0	—	dB
SN Ratio	SN-NR	Rg=0, weighted CCIR/ARM	76	82	—	dB

### Noise sequencer

OUTPUT Noise level	V <sub>no</sub>		-15	-12.5	-10	dB
Output Noise Level Accuracy relative to Cch Lch Rch S'ch	ΔV <sub>no</sub>		-0.5	0.0	0.5	dB

### Adaptive Matrix

Output Level Accuracy relative to Cch L,R,S'ch out	ΔVol		-0.5	0.0	0.5	dB
Matrix Rejection relative L,R,C,S'ch out	Mr		25.0	40.0	—	dB
T.H.D L,R,C,S'ch out	THD-AM		—	0.02	—	%
Headroom L,R,C,S'ch out	HR-AM	V+=9V at T.H.D=1%	15.0	15.7	—	dB
Signal to Noise Ratio L,R,C,S' ch out	SN-AM	Rg=0, weighted CCIR/ARM	78	83	—	dB

### Auto Balance

Capture Range	CPR		—	±5	—	dB
Error collection	CER		—	±4	—	dB
T.H.D Lt, Rt OUT	THD-AB		—	0.03	—	%
S/N Lt, Rt OUT	SN-AB	Rg=0, weighted CCIR/ARM	78	83	—	dB
Headroom Lt,Rt OUT	HR-AB	V+=9V at T.H.D=1%	15.0	17.0	—	dB

### L+R & L-R OUTPUT

Output Level Accuracy relative to Cch L+R, L-R ch	ΔVol-OP		—	0.0	—	dB
T.H.D	THD-OP		—	0.02	—	%
S/N	SN-OP	Rg=0, weighted CCIR/ARM	—	92	—	dB
Headroom	HR-OP	V <sub>CC</sub> =9V at T.H.D=1%	—	17.0	—	dB

## ■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sup>+</sup>	15	V
Power Dissipation	P <sub>D</sub>	700	mW
Operating Temperature Range	T <sub>opr</sub>	-20~+75	°C
Storage Temperature Range	T <sub>stg</sub>	-40~+125	°C

# NJN2177A

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