

DOLBY PRO LOGIC SURROUND DECODER

■ GENERAL DESCRIPTION

The NJM2177 is a higher level integration and high quality audio performance monolithic IC designed for use in Dolby Pro Logic Surround System. The NJM2177 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.

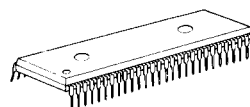
At two channel by pass mode, noise and distortion of NJM2177A are lower than that of NJM2177

(note) Dolby and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation. San Francisco, CA94103-4813, USA.

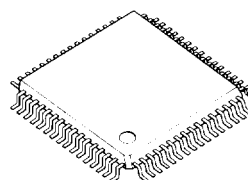
This device available only to licensees of Dolby Lab.

Licensing and application information may be obtained from Dolby Lab.

■ PACKAGE OUTLINE



NJM2177L/2177AL



NJM2177FB3/2177AFB3

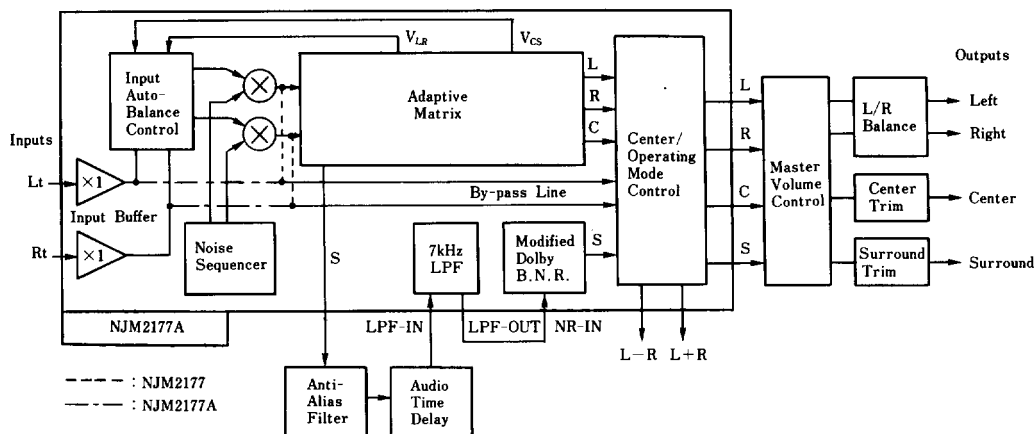
■ FEATURES

- Operating Voltage 9 to 13V
- Dolby operating level 300mVrms
- Lower Operating Current 34mA typ.
- Internal mode control switches
- Package SDIP-56, QFP-56, QFP-64

■ 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



**■ ABSOLUTE MAXIMUM RATINGS**

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V _s	15	V
Power Dissipation	P _D	(SDIP-56) 700	mW
		(QFP-56) 500	mW
		(QFP-64) 500	mW
Operating Temperature Range	T _{opr}	-20~+75	°C
Storage Temperature Range	T _{stg}	-40~+125	°C



NJM2177/2177A

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
Overall						
Operating Voltage Range	V _{OP}		9.0	—	13.0	V
Operating Current	I _{CC}	No signal	—	34.0	40.0	mA
Reference Voltage	V _{ref}	No signal	—	4.0	—	V
Control SW input voltage						
2ch Mode	V _{C-2ch}	MODE-CNT PIN	0.0	—	0.8	V
3ch	V _{C-3ch}	MODE-CNT PIN	—	Open	—	
4ch	V _{C-4ch}	MODE-CNT PIN	3.8	—	7.0	V
Center on	V _{C-con}	CENTER-CNT PIN	2.4	—	7.0	V
Center off	V _{C-coff}	CENTER-CNT PIN	0.0	—	0.8	V
Noise Seq. on	V _{C-nson}	NOISE-CNT-E PIN	0.0	—	0.8	V
Noise Seq. off	V _{C-nsoff}	NOISE-CNT-E PIN	3.2	—	7.0	V
Noise Seq. channel select H	V _{C-nssH}	NOISE-CNT-A and NOISE-CNT-B PIN	3.2	—	7.0	V
Noise Seq. channel select L	V _{C-nssL}	NOISE-CNT-A and NOISE-CNT-B PIN	0.0	—	0.8	V

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

Voltage Gain	GV-BNR	V _{in} = 0dBd, f=100Hz	—	9.0	—	dB
Decode Response 1	D _{ec1}	V _{in} = 0dBd, f=1.0kHz	-1.6	-0.1	1.4	dB
2	D _{ec2}	V _{in} = -15dBd, f=1.4kHz	-3.0	-1.5	0.0	dB
3	D _{ec3}	V _{in} = -20dB, f=1.4kHz	-4.9	-3.4	-1.9	dB
4	D _{ec4}	V _{in} = 40dBd, f=5.0kHz	-6.8	-5.3	-3.8	dB
T.H.D	THD-NR	V _{in} = 0dBd, 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 _{no}		-15	-12.5	-10	dB
Output Noise Level Accuracy relative to Cch Lch Rch S'ch	ΔV _{no}		-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 _{CC} =9V at T.H.D=1%	—	17.0	—	dB