NJM2177/2177A

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 sepuencer, adaptibve matrix, center mode control, and modified B-type noise reduction all on chip.

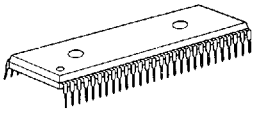
In addition to Dolby Pro Logic function including Dolby 3-stereo, this device provides two channel bypass mode and two special outputs used for other surround conbeniently.

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.

■ Functions

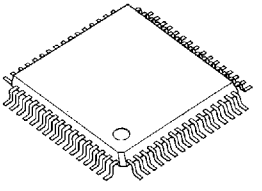
- Auto input balance and buffer
- Noise sequencer; a Noise generator, a sequencer controlled by external two bits
- Adaptive Matrix
- Center mode control; ON/OFF, Normal/Phantom/Wideband
- Modified Dolby B Type Noise Reduction and OP amp. for 7kHz low-pass filter
- Operating mode control; 4ch(L,C,R,S),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



NJM2177L/2177AL

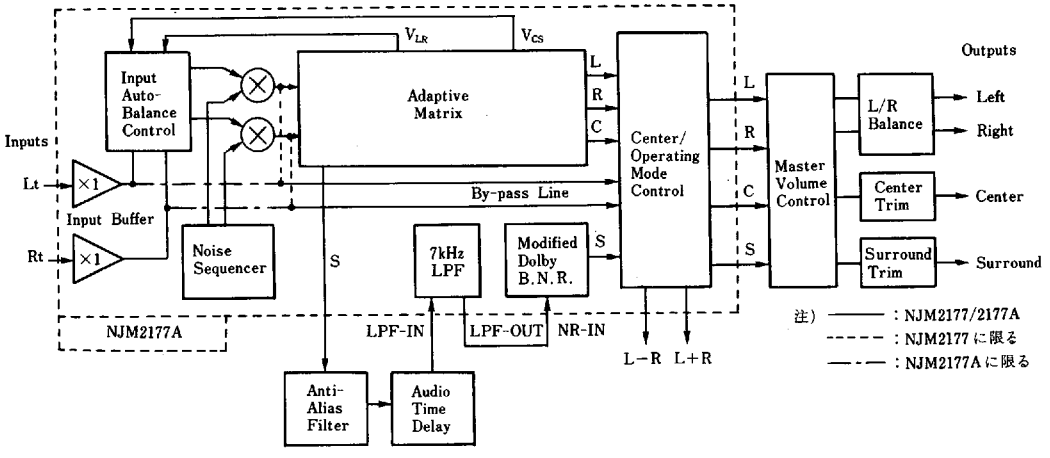
■ Features

- Pakage: SDIP-56, QFP-56, QFP-64
- Dolby operating level: 300mVrms
- Operating supply voltage range: 9 to 13V
- Lower supply current: 34mA typ.
- Internal mode control switches



NJM2177FB3/2177AFB3

■ Active Surround Decoder Block Diagram



■ Absolute Maximum Ratings at Ta=25℃

DC Supply Voltage	V^+	15V
Power dissipation	P_D (L-Type)	700mW
	(F-Type)	500mW
Operating Temperature	T_{opr}	−20~+75℃
Storage Temperature	T_{stg}	−40~+125℃

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
☆ Overall						
Supply Voltage Range	V_{OP}		9.0	—	13.0	V
Supply 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 leve at NR-IN when adjust to 300mV/100Hz at S-OUT)						
Voltage gain	GV-BNR	V_{in}= 0dBd, f=100Hz	—	9.0	—	dB
Decode Responce 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	ΔV_{no}		−0.5	0.0	0.5	dB
Rch S'ch						
☆ 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, R-L 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