

PREAMPLIFIER AND DOLBY B TYPE NOISE REDUCTION SYSTEM

■ GENERAL DESCRIPTION

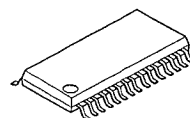
The NJM2085 is a monolithic BiCMOS IC designed for use in the car stereo cassette player system. The audio signal system for cassette player can be realized very easy, as the device includes two channel low noise preamplifiers. Dolby B type noise reduction decoders and an audiomusic sensor.

(note) Dolby and the double-D symbol are trade marks 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



NJM2085M

■ FEATURES

- Operating Voltage (8~10.5V)
- The dual preamplifier contains mute, auto-reverse matel/norm, facilities for application of low level signal in applications requiring very low noise performances. Each channel consists of a 36dB fixed gain amplifier, having switchable input for forward/reverse, allows magnetic heads connection directry to ground and operational amplifier for switching the external equalizing networks.
- The audio music sensor detects the interprogram space and then the starting point of musical program.
- Dolby B Type Noise Reduction Decoders require few external components.
- Package Outline SDMP30
- Bipolar Technology

■ FUNCTIONS

- Low noise head preamplifiers
- Mute and auto-reverse functions
- Internal switches for equalization
- 2 channel Dolby B Type Noise Reduction Decoders
- Audio music sensor

■ ABSOLUTE MAXIMUM RATINGS AT TA=25°C

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V ⁺	12	V
Total Power Dissipation	P _D	700	mW
Operating Temperature Range	T _{opr}	-40~+85	°C
Storage Temperature Range	T _{stg}	-40~+125	°C

■ ELECTRICAL CHARACTERISTICS

(Ta=25°C, all levels reference to -6dBm/400Hz at DOLBY OUT NR OFF, Unless otherwise specified.)

☐ SUPPLY

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Voltage Range	V _{OP}		8	8.5	10.5	V
Operating Current	I _S		—	18	25	mA
Reference Voltage	V _{ref}		4.0	4.3	4.6	V
DC Voltage Pin 14	V _{dc}		1.15	1.25	1.35	V
MUTE ON LEVEL	MUTE ON		0	—	1.2	V
MUTE OFF LEVEL	MUTE OFF		2.2	—	V ⁺	V
MUTE	ATT		55	65	—	dB
MUTE Current	IMUTE		—	10	—	μA

☐ PREAMPLIFIER

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Resistance	R _i		30	50	70	kΩ
Input Bias Current	I _i		—	—	10	μA
Voltage Gain	G _v	pin4~5 and 26~27 shorted	32.5	35.5	38.5	dB
Voltage Gain Matching	ΔG _v		-1	—	1	dB
Resistor Metal Position	R _m		4.35	5.8	7.25	kΩ
Resistor Normal Position	R _n		—	150	400	kΩ
Total Input Noise	en 1	R _g =600Ω B=20~20kHz	—	0.8	—	μV
	en 2	R _g =600Ω, A-Weight	—	0.5	—	μV
Forward/Rev. Low Level	FRL	IN 2=ON; IN 1=OFF	0	—	0.8	V
Forward/Rev. High Level	FRH	IN 2=OFF; IN 1=ON	2	—	V ⁺	V
Metal/Normal Low Level	NML	EQSW=ON	0	—	1.5	V
Metal/Normal High Level	NMH	EQSW=OFF	3.5	—	V ⁺	V
Output Impedance	R _o		—	1.2	1.7	Ω

☐ AUDIO MUSIC SENSOR

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Low Level Voltage	V _I		—	—	800	mV
Input Current	I _{in}		—	—	1	μA
ON/OFF Low level	AMSL		—	—	0.8	V
ON/OFF High Level	ANSH		2	—	V ⁺	V
Interprogram Threshold Voltage	V _{TH} 1		1.2	1.45	1.7	V
Interspace Threshold Voltage	V _{TH} 2		4.0	4.3	4.6	V
AMS Threshold	AMSV _{TH} 1		1.19	1.39	1.59	V
	AMSV _{TH} 2		0.6	0.8	1.0	V
Switch Pin Current	V _{ol}		—	18	—	μA

☐ DOLBY SECTION

PARAMETER	SYMBOL	TEST CONDITION			MIN.	TYP.	MAX.	UNIT
		NR	f(Hz)	OTHER CONDITIONS				
Voltage Gain	G _v	OFF	1K		-1	0	1	dB
Channel Matching	ΔG _v	OFF	1K		-0.5	—	0.5	dB
Signal Handling	S/H	ON	1K	V _{CC} =8V, THD=1%	12	13	—	dB
Decode Cut	B-DEC1	ON	10K	V _{out} =0dB	-1.1	0.4	1.9	dB
	B-DEC2	ON	500	V _{out} =-25dB	1.4	2.9	4.4	dB
20log $\frac{V_{out} (off)}{V_{out} (on)}$	B-DEC3	ON	2K	V _{out} =-25dB	5.5	7.0	8.5	dB
	B-DEC4	ON	5K	V _{out} =-25dB	3.9	5.4	6.9	dB
	B-DEC5	ON	10K	V _{out} =-40dB	8.9	10.4	11.9	dB
ON/OFF Low Level	NRoff				0	—	0.8	V
ON/OFF High Level	NRon				2.0	—	V+	V

☐ GENERAL

PARAMETER	SYMBOL	TEST CONDITION			MIN.	TYP.	MAX.	UNIT
		NR	f(Hz)	OTHER CONDITIONS				
Total Harmonics Distortion	THD1	OFF	1K	V _O =0dB	—	0.12	—	%
	THD2	ON	1K	V _O =0dB	—	0.08	—	%
	THD3	OFF	10K	V _O =0dB	—	0.18	—	%
	THD4	ON	10K	V _O =0dB	—	0.2	—	%
Signal to Noise Ratio	S/N1	OFF		R _g =600Ω, V _O =0dB	—	60	—	dB
	S/N2	ON		CCIR/ARM	—	70	—	dB
Channel Separation	CS1	OFF	1K	R _g =600Ω	—	55	—	dB
	CS2	ON	1K	R _g =600Ω	—	60	—	dB
Channel Cross Talk	CT1	OFF	1K	R _g =600Ω	—	58	—	dB
	CT2	ON	1K	R _g =600Ω	—	67	—	dB
Supply Voltage Rejection	SVR1	OFF	1K	R _g =600Ω	—	90	—	dB
	SVR2	ON	1K	R _g =600Ω	—	95	—	dB

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MEMO

[CAUTION]

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