PREAMPLIFIER AND DOLBY B TYPE NOISE REDUCTION SYSTEM

■ GENERAL DESCRIPTION

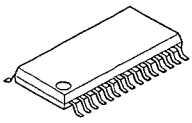
The NJM2085 is a monolithic BiCMOS IC designed for use in the car stereo cassette player system. The audio signal system for cassette player can be realized very easy, as the device includes two channel low noise preamplifiers. Dolby B type noise reduction decorders and an audiomusic sensor.

(note) Dolby and the double-D symbol are trade marks of Dolby Labo-latories 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 requring very low noise performances. Each channel consisits 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 eqalizing networks.
- The audio music sensor detects the interprogram space and then the starting point of musical program.
- Dolby B Type Noise Reduction Decorders 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

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■ ABSOLUTE MAXIMUM RATINGS AT TA=25℃

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	12	V
Total Power Dissipation	P_D	700	mW
Operating Temperature Range	T_{opr}	−40~+85	℃
Storage Temperature Range	T_{stg}	−40~+125	℃

■ ELECTRICAL CHARACTERISTICS

(Ta=25℃, 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	Gv	pin4~5 and 26~27 shorted	32.5	35.5	38.5	dB
Voltage Gain Matching	ΔGv		−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	Rg=600Ω B=20−20kHz	—	0.8	—	μV
	en 2	Rg=600Ω, A-Weight	—	0.5	—	
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	Ro		—	1.2	1.7	Ω

□AUDIO MUSIC SENSOR

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Low Level Voltage	VI		—	—	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	VTH 1		1.2	1.45	1.7	V
Interspace Threshold Voltage	VTH 2		4.0	4.3	4.6	V
AMS Threshold	AMSVTH 1		1.19	1.39	1.59	V
	AMSVTH 2		0.6	0.8	1.0	V
Switch Pin Current	Vol		—	18	—	μA

□ DOLBY SECTION

PARAMETER	SYMBOL	TEST CONDITION			MIN.	TYP.	MAX.	UNIT
		NR	f(Hz)	OTHER CONDITIONS				
Voltage Gain	Gv	OFF	1K		−1	0	1	dB
Channel Matching	ΔGv	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	Vout=0dB	−1.1	0.4	1.9	dB
	B-DEC2	ON	500	Vout=−25dB	1.4	2.9	4.4	dB
$20\log\frac{\text{Vout (off)}}{\text{Vout (on)}}$	B-DEC3	ON	2K	Vout=−25dB	5.5	7.0	8.5	dB
	B-DEC4	ON	5K	Vout=−25dB	3.9	5.4	6.9	dB
	B-DEC5	ON	10K	Vout=−40dB	8.9	10.4	11.9	dB
ON/OFF Low Level	NRoff				0	—	0.8	V
ON/OFF Hight 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		Rg=600Ω, V_O=0dB	—	60	—	dB
	S/N2	ON		CCIR/ARM	—	70	—	dB
Channel Separation	CS1	OFF	1K	Rg=600Ω	—	55	—	dB
	CS2	ON	1K	Rg=600Ω	—	60	—	dB
Channel Cross Talk	CT1	OFF	1K	Rg=600Ω	—	58	—	dB
	CT2	ON	1K	R_g=600Ω	—	67	—	dB
Supply Voltage Rejection	SVR1	OFF	1K	Rg=600Ω	—	90	—	dB
	SVR2	ON	1K	Rg=600Ω	—	95	—	dB

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