

6427525 N E C ELECTRONICS INC

05E 22852 D

BIPOLAR ANALOG INTEGRATED CIRCUIT **μ PC1284G****DUAL DOLBY B-TYPE NOISE REDUCTION PROCESSOR****NR**

T-77-05-07

DESCRIPTION

The μ PC1284G is a monolithic integrated circuit specifically designed to realize the Dual Dolby B-Type Noise Reduction System. This device is used to reduce the hiss noise on magnetic tape.

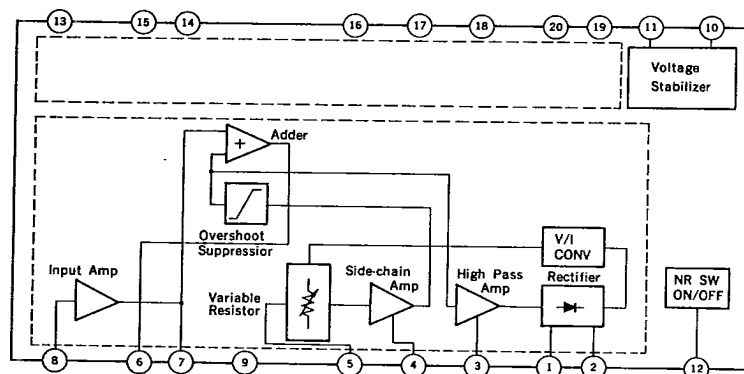
The IC is encapsulated in 20 PIN MINI FLAT plastic package.

Available only to licensees of Dolby Laboratories Licensing Corporation, San Francisco, from whom licensing and application information must be obtained.

"Dolby" and the Double-D symbol are trade marks of Dolby Laboratories Licensing Corporation.

FEATURES

- Stereo Dolby noise reduction with one IC.
- Very high signal/noise ratio. ~ 90 dB decode (CCIR/ARM)
- NR ON/OFF switching are provided internally.
- Small package (20 PIN MINI FLAT).

BLOCK DIAGRAM

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TERMINAL CONNECTION DIAGRAM

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NO.	CONNECTION	NO.	CONNECTION
1	DET ₁₋₂	11	VCC
2	DET ₁₋₁	12	NR SW
3	HPF ₁	13	INPUT ₂
4	BY PASS ₁	14	IN OUT ₂
5	BR IN ₁	15	OUTPUT ₂
6	OUTPUT ₁	16	BR IN ₂
7	IN OUT ₁	17	BY PASS
8	INPUT ₁	18	HPF ₂
9	VREF	19	DET ₁₋₁
10	GND	20	DET ₂₋₂

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ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

Supply Voltage	V_{CC}	16	V
Power Dissipation	P_D	350*	mW
Operating Temperature Range	T_{opt}	-20 to +70	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to +150	$^\circ\text{C}$

* Value at $T_a = 70^\circ\text{C}$

RECOMMENDED OPERATING CONDITIONS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage (Enable functional op)	V_{CC1}	7	8	13	V
Supply Voltage (Guarantee the Dolby Spec)	V_{CC2}	7.5	8	10	V
Dolby Level	V_{DL}		450		mV _{r.m.s.}

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$, $V_{CC} = 8\text{ V}$, Dolby Level = 450 mV_{r.m.s.} (= 0 dB))

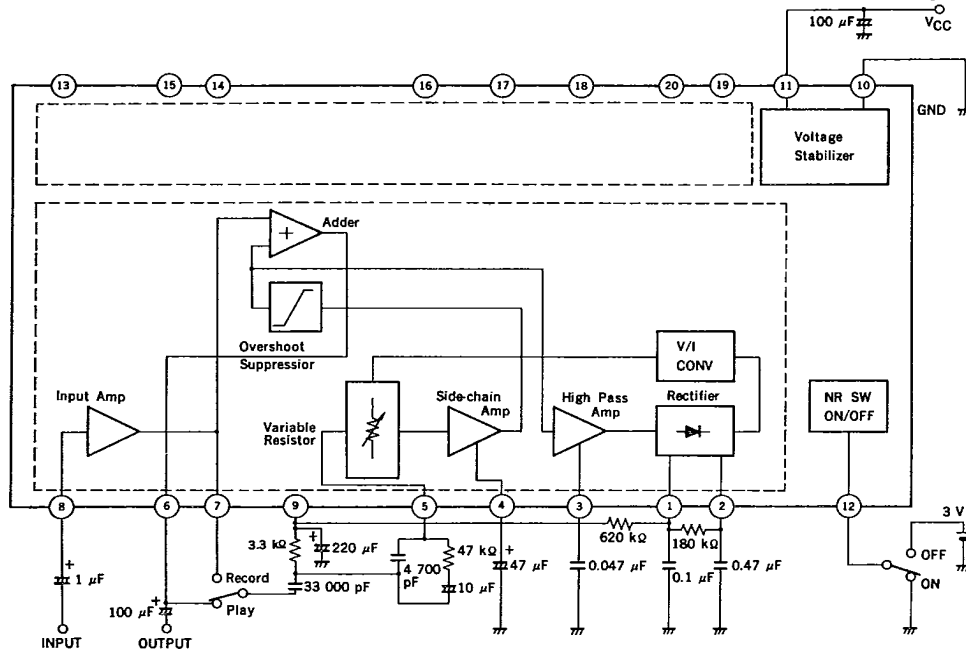
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Supply Current	I_{CC}		20	29	mA	No Signal, NR ON
Voltage Gain (Input AHP)	A_{v1}	25.0	26.5	28.0	dB	NR.OFF, $f = 1\text{ kHz}$, 0 dB
Voltage Gain (Processor)	A_{v2}		0		dB	NR.OFF, $f = 1\text{ kHz}$, 0 dB
Signal Handling	V_{om1}	12	13		dB	$V_{CC} = 7.5\text{ V}$, $f = 1\text{ kHz}$, THD = 0.5 %, Encode
	V_{om2}	12	13		dB	$V_{CC} = 7.5\text{ V}$, $f = 1\text{ kHz}$, THD = 0.5 %, Decode
Distortion	THD ₁		0.05	0.2	%	$f = 1\text{ kHz}$, 0 dB, 80 kHzLPP, Encode
	THD ₂		0.05	0.2	%	$f = 1\text{ kHz}$, 0 dB, 80 kHzLPP, Decode
	THD ₃		0.1	0.3	%	$f = 10\text{ kHz}$, +10 dB, 80 kHzLPP, Encode
	THD ₄		0.1	0.3	%	$f = 10\text{ kHz}$, +10 dB, 80 kHzLPP, Decode
Signal to Noise Ratio	S/N_1		80		dB	NR OFF, $R_S = 10\text{ k}\Omega$ (CCIR/ARM)
	S/N_2	65	70		dB	$R_S = 10\text{ k}\Omega$ (CCIR/ARM) Encode
	S/N_3		90		dB	$R_S = 10\text{ k}\Omega$ (CCIR/ARM) Decode
Frequency Response	FR	-1.5	0	+1.5	dB	$f = 20\text{ Hz}$ to 20 kHz , Back to Back
Channel Balance	CB	-1.0	0	+1.0	dB	$f = 1\text{ kHz}$, 0 dB, NR OFF
Crosstalk	CT	50	53		dB	$f = 1\text{ kHz}$, 0 dB, $R_S = 10\text{ k}\Omega$
Input Resistance	R_{IN}	50	65		k Ω	$f = 1\text{ kHz}$
Encode Characteristics	ER ₁	-17.1	-15.6	-14.1	dB	$f = 1.4\text{ kHz}$, -20 dB
	ER ₂	-24.0	-22.5	-21.0	dB	$f = 1.4\text{ kHz}$, -30 dB
	ER ₃	-18.3	-16.8	-15.3	dB	$f = 5\text{ kHz}$, -20 dB
	ER ₄	-23.3	-21.8	-20.3	dB	$f = 5\text{ kHz}$, -30 dB
	ER ₅	-0.6	0.4	1.4	dB	$f = 10\text{ kHz}$, 0 dB
	ER ₆	-30.6	-29.6	-28.6	dB	$f = 10\text{ kHz}$, -40 dB
Variation in Encode Characteristics with Temperature	ERT	-2.5	0	+2.5	dB	$T_a = -20$ to $+70^\circ\text{C}$
Variation in Encode Characteristics with Supply Voltage	ERV	-1.0	0	+1.0	dB	$V_{CC} = 7.5$ to 10 V
Switching Transient Noise	St		10		mV _{p-p}	NR ON/OFF/ON
Control Voltage for NR ON	$V_{C(ON)}$		0	1.5	V	NR SW
Control Voltage for NR OFF	$V_{C(OFF)}$	3			V	NR SW
Supply Voltage Rejection Ratio	SVR		34		dB	$f_{rip} = 100\text{ Hz}$, $R_S = 10\text{ k}\Omega$, NR OFF

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TEST CIRCUIT

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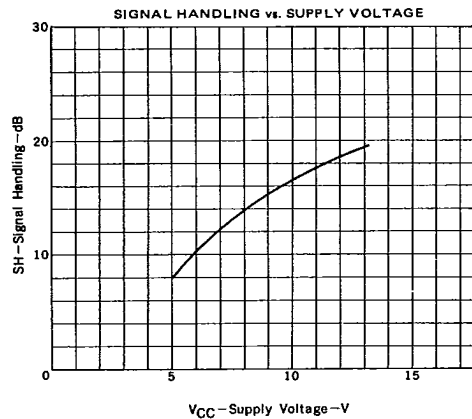
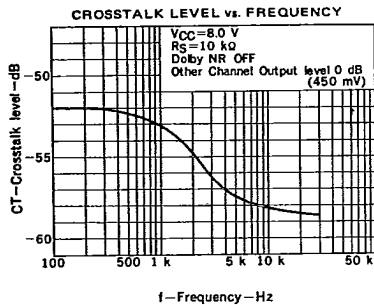
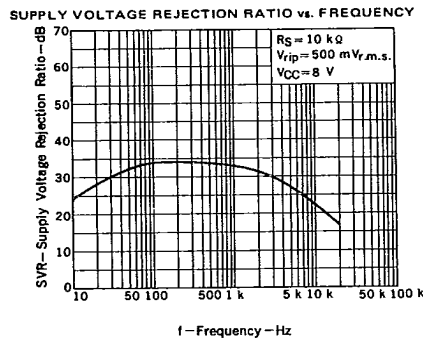
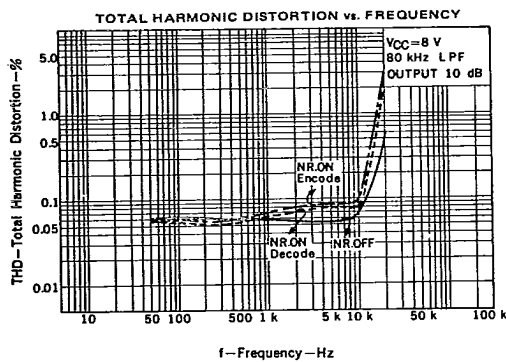
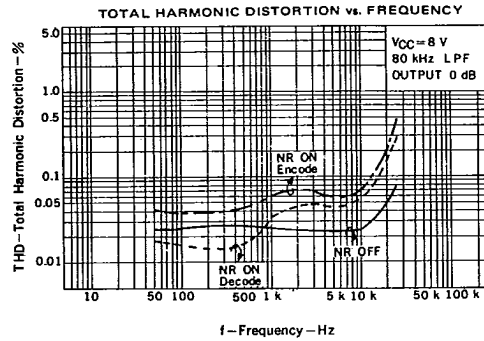
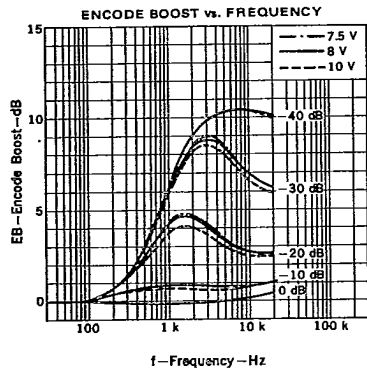
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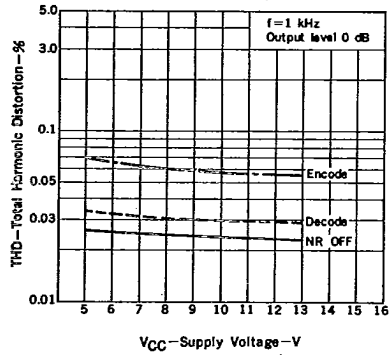
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TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

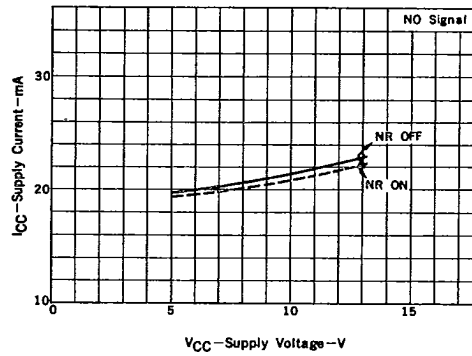
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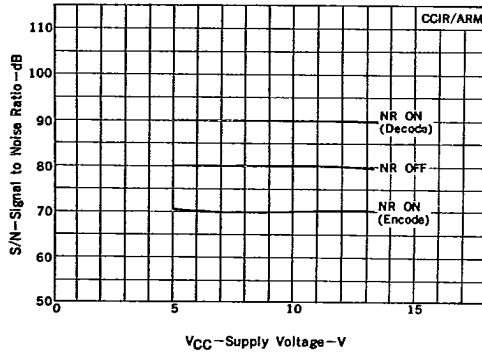
TOTAL HARMONIC DISTORTION vs. SUPPLY VOLTAGE



SUPPLY CURRENT vs. SUPPLY VOLTAGE



SIGNAL TO NOISE RATIO vs. SUPPLY VOLTAGE



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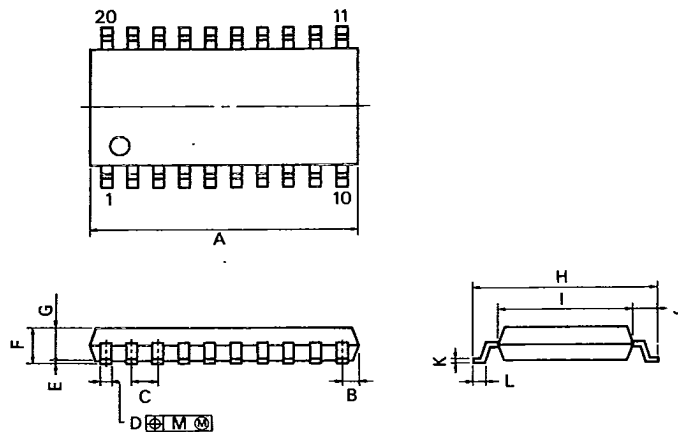
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20PIN PLASTIC SOP (300 mil)



P20GM-50-300B

NOTE

Each lead centerline is located within 0.12 mm (0.005 inch) of its true position (T.P.) at maximum material condition.

ITEM	MILLIMETERS	INCHES
A	13.00 MAX.	0.512 MAX.
B	0.78 MAX.	0.031 MAX.
C	1.27 (T.P.)	0.050 (T.P.)
D	0.40 ^{+0.10} _{-0.08}	0.016 ^{+0.004} _{-0.003}
E	0.1 ^{+0.1}	0.004 ^{+0.004}
F	1.8 MAX.	0.071 MAX.
G	1.55	0.061
H	7.7 ^{+0.3}	0.303 ^{+0.012}
I	5.6	0.220
J	1.1	0.043
K	0.20 ^{+0.10} _{-0.08}	0.008 ^{+0.004} _{-0.003}
L	0.6 ^{+0.2}	0.024 ^{+0.008} _{-0.006}
M	0.12	0.005