

6427525 N E C ELECTRONICS INC

05E 22852 D

# BIPOLAR ANALOG INTEGRATED CIRCUIT

## $\mu$ PC1284G

### DUAL DOLBY B-TYPE NOISE REDUCTION PROCESSOR

T-77-05-07

**DESCRIPTION**

The  $\mu$ 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.

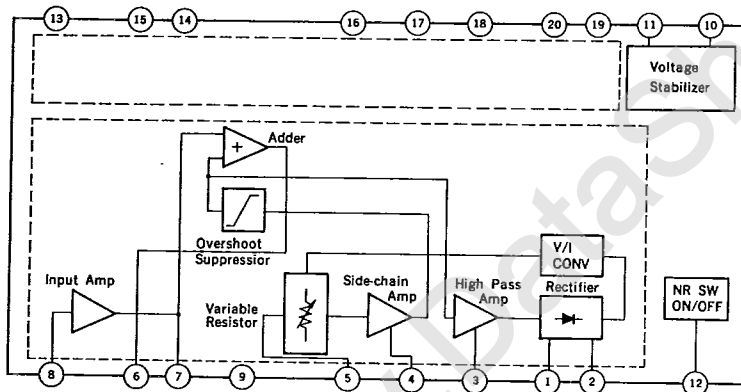
The IC is encapsulated in 20 PIN MINI FLAT plastic package.

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**

6427525 N E C ELECTRONICS INC

 $\mu$ PC1284G  
05E 22853 D

TERMINAL CONNECTION DIAGRAM

T-77-05-07

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

5

**μPC1284G**  
**6427525 N E C ELECTRONICS INC**

05E 22854 D

T-77-05-07

**ABSOLUTE MAXIMUM RATINGS (T<sub>a</sub> = 25 °C)**

Supply Voltage	V <sub>CC</sub>	16	V
Power Dissipation	P <sub>D</sub>	350*	mW
Operating Temperature Range	T <sub>opt</sub>	-20 to +70	°C
Storage Temperature Range	T <sub>stg</sub>	-55 to +150	°C

\* Value at T<sub>a</sub> = 70 °C

**RECOMMENDED OPERATING CONDITIONS (T<sub>a</sub> = 25 °C)**

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage (Enable functional op)	V <sub>CC1</sub>	7	8	13	V
Supply Voltage (Gurantee the Dolby Spec)	V <sub>CC2</sub>	7.5	8	10	V
Dolby Level	V <sub>DL</sub>		450		mV <sub>r.m.s.</sub>

**ELECTRICAL CHARACTERISTICS [T<sub>a</sub> = 25 °C, V<sub>CC</sub> = 8 V, Dolby Level = 450 mV<sub>r.m.s.</sub> (= 0 dB)]**

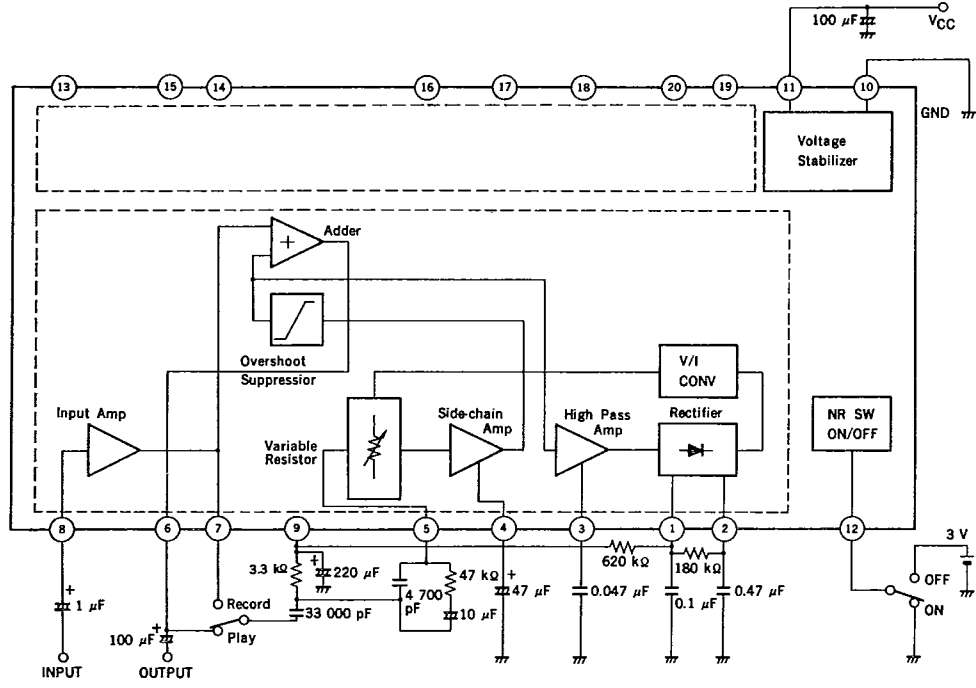
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Supply Current	I <sub>CC</sub>		20	29	mA	No Signal, NR ON
Voltage Gain (Input AHP)	A <sub>v1</sub>	25.0	26.5	28.0	dB	NR OFF, f = 1 kHz, 0 dB
Voltage Gain (Processor)	A <sub>v2</sub>		0		dB	NR OFF, f = 1 kHz, 0 dB
Signal Handling	V <sub>om1</sub>	12	13		dB	V <sub>CC</sub> = 7.5 V, f = 1 kHz, THD = 0.5 %, Encode
	V <sub>om2</sub>	12	13		dB	V <sub>CC</sub> = 7.5 V, f = 1 kHz, THD = 0.5 %, Decode
Distortion	THD <sub>1</sub>		0.05	0.2	%	f = 1 kHz, 0 dB, 80 kHz LPF, Encode
	THD <sub>2</sub>		0.05	0.2	%	f = 1 kHz, 0 dB, 80 kHz LPF, Decode
	THD <sub>3</sub>		0.1	0.3	%	f = 10 kHz, +10 dB, 80 kHz LPF, Encode
	THD <sub>4</sub>		0.1	0.3	%	f = 10 kHz, +10 dB, 80 kHz LPF, Decode
Signal to Noise Ratio	S/N <sub>1</sub>		80		dB	NR OFF, R <sub>S</sub> = 10 kΩ (CCIR/ARM)
	S/N <sub>2</sub>	65	70		dB	R <sub>S</sub> = 10 kΩ (CCIR/ARM) Encode
	S/N <sub>3</sub>		90		dB	R <sub>S</sub> = 10 kΩ (CCIR/ARM) Decode
Frequency Response	FR	-1.5	0	+1.5	dB	f = 20 Hz to 20 kHz, Back to Back
Channel Balance	CB	-1.0	0	+1.0	dB	f = 1 kHz, 0 dB, NR OFF
Crosstalk	CT	50	53		dB	f = 1 kHz, 0 dB, R <sub>S</sub> = 10 kΩ
Input Resistance	R <sub>IN</sub>	50	65		kΩ	f = 1 kHz
Encode Characteristics	ER <sub>1</sub>	-17.1	-15.6	-14.1	dB	f = 1.4 kHz, -20 dB
	ER <sub>2</sub>	-24.0	-22.5	-21.0	dB	f = 1.4 kHz, -30 dB
	ER <sub>3</sub>	-18.3	-16.8	-15.3	dB	f = 5 kHz, -20 dB
	ER <sub>4</sub>	-23.3	-21.8	-20.3	dB	f = 5 kHz, -30 dB
	ER <sub>5</sub>	-0.6	0.4	1.4	dB	f = 10 kHz, 0 dB
	ER <sub>6</sub>	-30.6	-29.6	-28.6	dB	f = 10 kHz, -40 dB
Variation in Encode Characteristics with Temperature	ERT	-2.5	0	+2.5	dB	T <sub>a</sub> = -20 to +70 °C
Variation in Encode Characteristics with Supply Voltage	ERV	-1.0	0	+1.0	dB	V <sub>CC</sub> = 7.5 to 10 V
Switching Transient Noise	St		10		mV <sub>p-p</sub>	NR ON/OFF/ON
Control Voltage for NR ON	V <sub>C(ON)</sub>		0	1.5	V	NR SW
Control Voltage for NR OFF	V <sub>C(OFF)</sub>	3			V	NR SW
Supply Voltage Rejection Ratio	SVR		34		dB	f <sub>rip</sub> = 100 Hz, R <sub>S</sub> = 10 kΩ, NR OFF

6427525 N E C ELECTRONICS INC

$\mu$ PC1284G  
05E 22855 D

TEST CIRCUIT

T-77-05-07



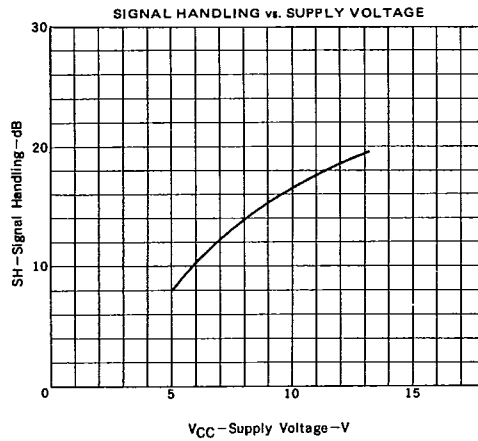
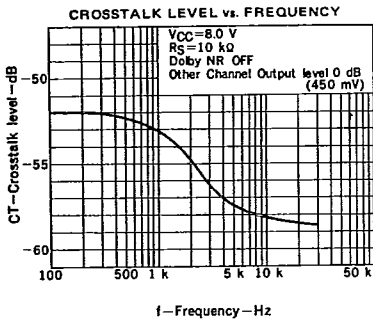
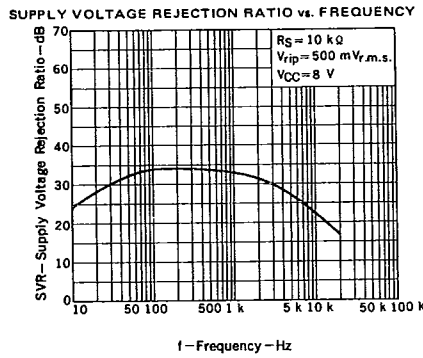
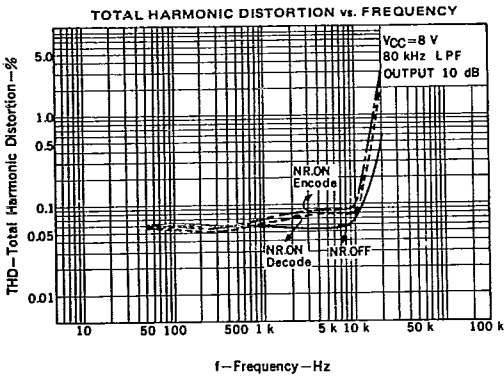
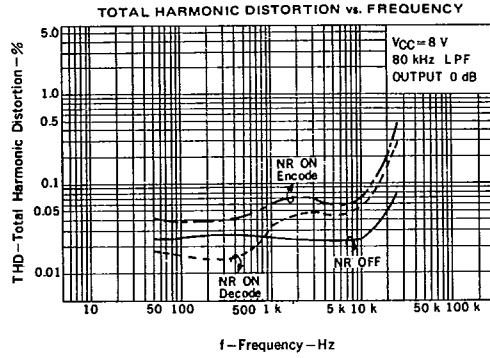
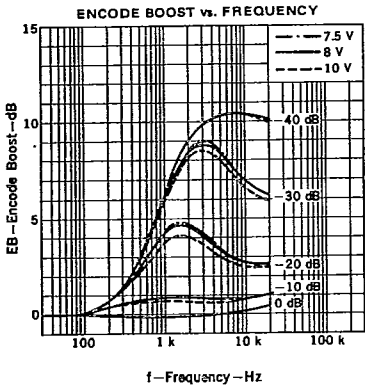
5

**μPC1284G**  
**6427525 N E C ELECTRONICS INC**

05E 22856 D

T-77-05-07

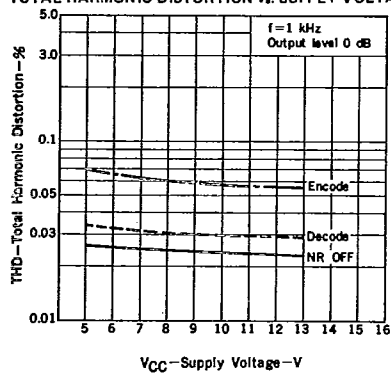
TYPICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )



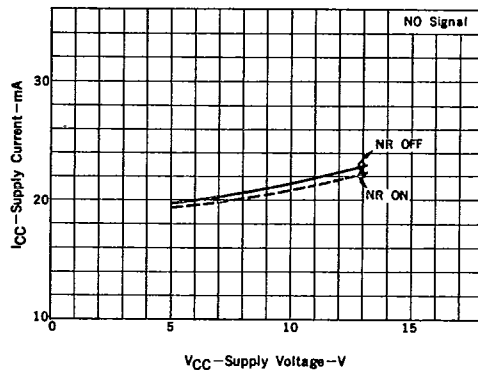
6427525 N E C ELECTRONICS INC

$\mu$ PC1284G  
05E 22857 D  
T-77-05-07

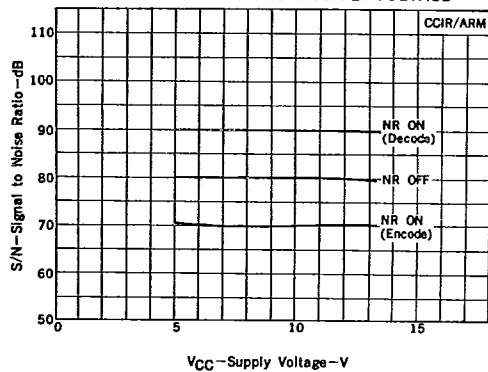
TOTAL HARMONIC DISTORTION vs. SUPPLY VOLTAGE



SUPPLY CURRENT vs. SUPPLY VOLTAGE



SIGNAL TO NOISE RATIO vs. SUPPLY VOLTAGE



5

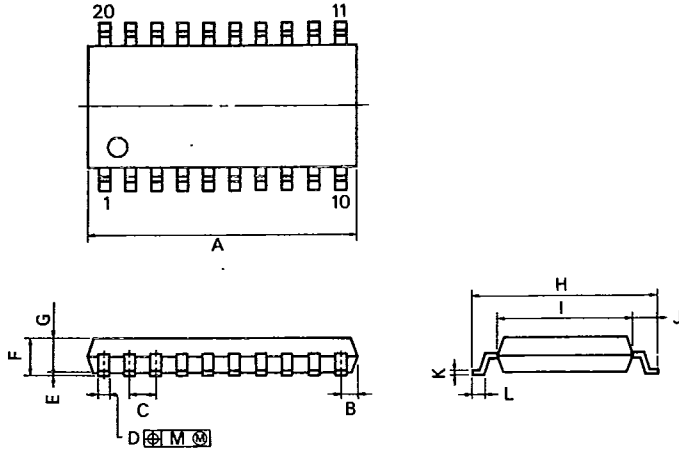
**μPC1284G**

**6427525 N E C ELECTRONICS INC**

**05E 22858 D**

*T-77-05-07*

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 <sup>+0.10</sup>	0.016 <sup>+0.004</sup>
E	0.1 <sup>±0.1</sup>	0.004 <sup>±0.004</sup>
F	1.8 MAX.	0.071 MAX.
G	1.55	0.061
H	7.7 <sup>±0.3</sup>	0.303 <sup>±0.012</sup>
I	5.6	0.220
J	1.1	0.043
K	0.20 <sup>+0.10</sup>	0.008 <sup>+0.004</sup>
L	0.6 <sup>±0.2</sup>	0.024 <sup>±0.008</sup>
M	0.12	0.005