

BIPOLAR ANALOG INTEGRATED CIRCUIT

μ PC1210C

DOLBY B-TYPE NOISE REDUCTION PROCESSOR



DESCRIPTION

The μ PC1210C is a monolithic integrated circuit specifically designed to realize the Dolby B-Type Noise Reduction System.

This device is used to reduce the hiss noise on magnetic tape and to improve the noise level in FM broadcast reception.

The IC is encapsulated in 16 Pin, dual-in-line plastic package.

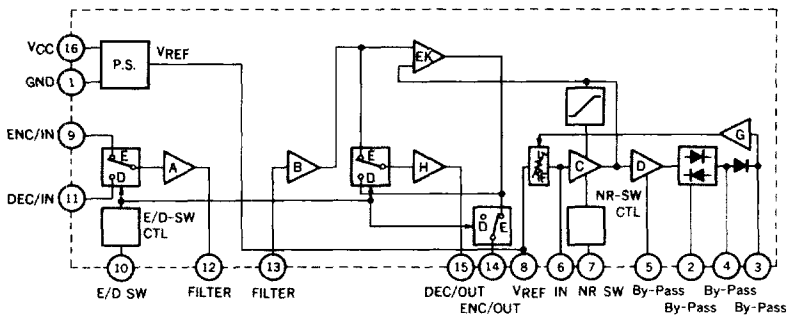
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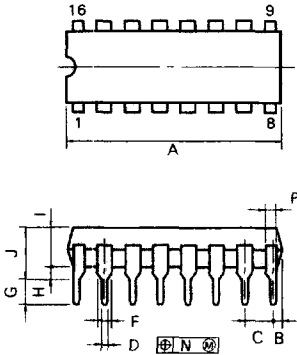
FEATURES

- Very close matching to standard Dolby Characteristics
- Low Noise (CCIR/ARM)
 - SN₁ = 67 dB TYP. (Encode, R_G = 10 k Ω , PIN 14)
 - SN₂ = 80 dB TYP. (Decode, R_G = 10 k Ω , PIN 15)
- Low Total harmonic distortion
 - T.H.D.₁ = 0.05 % TYP. (Encode, f = 1 kHz, 0 dB/10 dB, R_L = 2 k Ω)
 - T.H.D.₂ = 0.05 % TYP. (Decode, f = 1 kHz, 0 dB/10 dB, R_L = 2 k Ω)
- Internal NR and Mode Switches

BLOCK DIAGRAM



16PIN PLASTIC DIP (300 mil)



NOTES

- 1) Each lead centerline is located within 0.25 mm (0.01 inch) of its true position (T.P.) at maximum material condition.
- 2) Item "K" to center of leads when formed parallel.

ITEM	MILLIMETERS	INCHES
A	20.32 MAX.	0.800 MAX.
B	1.27 MAX.	0.050 MAX.
C	2.54 (T.P.)	0.100 (T.P.)
D	0.50 ^{+0.10}	0.020 ^{+0.004}
F	1.1 MIN.	0.043 MIN.
G	3.5 ^{+0.3}	0.138 ^{+0.012}
H	0.51 MIN.	0.020 MIN.
I	4.31 MAX.	0.170 MAX.
J	5.08 MAX.	0.200 MAX.
K	7.62 (T.P.)	0.300 (T.P.)
L	6.5	0.256
M	0.25 ^{+0.08}	0.010 ^{+0.003}
N	0.25	0.01
P	1.1 MIN.	0.043 MIN.

P16C-100-3008

TERMINAL CONNECTION

NO.	CONNECTION	NO.	CONNECTION
1	GND	9	ENC/IN
2	By-Pass	10	E/D SW
3	By-Pass	11	DEC/IN
4	By-Pass	12	FILTER
5	By-Pass	13	FILTER
6	IN	14	ENC/OUT
7	NR SW	15	DEC/OUT
8	V _{REF}	16	V _{CC}

ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

Supply Voltage	V _{CC}	16	V
Power Dissipation	P _D	350*	mW
Operating Temperature Range	T _{opt}	-20 to +75	°C
Storage Temperature Range	T _{stg}	-55 to +125	°C

*Value at T_a = 75 °C

RECOMMENDED OPERATING CONDITIONS (T_a = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V _{CC}	9	12	15	V
Dolby Level	V _{DL}		580		mV _{r.m.s.}

16

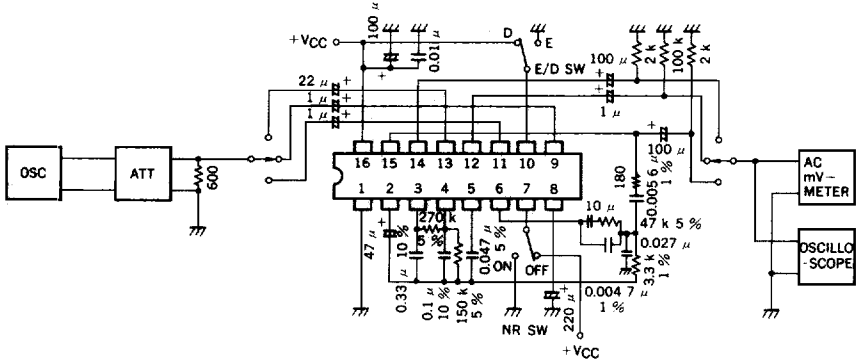
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$, $V_{CC} = 12\text{ V}$, Dolby Level = 580 mV_{r.m.s.} (= 0 dB))

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Supply Current	I _{CC}	7	13.5	20	mA	No Signal
Voltage Gain	A _p (9-12)	10.5	12.0	13.5	dB	f = 1 kHz, R _L ≥ 100 kΩ
	A _p (11-12)	10.5	12.0	13.5	dB	f = 1 kHz, R _L ≥ 100 kΩ
	A _p (13-14)	15.5	17.0	18.5	dB	f = 1 kHz, R _L = 2 kΩ, Encode at Side-chain open
	A _p (13-15)	15.5	17.0	18.5	dB	f = 1 kHz, R _L = 2 kΩ, Encode
Signal Handling	V _{om 1}	12	16		dB	f = 1 kHz, T.H.D. < 0.5 %, R _L = 2 kΩ, Encode
	V _{om 2}	12	16		dB	f = 1 kHz, T.H.D. < 0.5 %, R _L = 2 kΩ, Decode
Total Harmonic Distortion	T.H.D. 1		0.05	0.2	%	f = 1 kHz, 0 dB, R _L = 2 kΩ, Encode
	T.H.D. 2		0.05	0.2	%	f = 1 kHz, 0 dB, R _L = 2 kΩ, Decode
	T.H.D. 3		0.05	0.3	%	f = 10 kHz, +10 dB, R _L = 2 kΩ, Encode
	T.H.D. 4		0.05	0.3	%	f = 10 kHz, +10 dB, R _L = 2 kΩ, Decode
Signal to Noise Ratio (CCIR/ARM)	SN 1	63	67		dB	Encode, R _G = 10 kΩ, Pin 14
	SN 2		80		dB	Decode, R _G = 10 kΩ, Pin 15
	SN 3		80		dB	NR-OFF, R _G = 10 kΩ, Pin 15/14
Frequency Response	F.R.	-1.5	0	1.5	dB	f = 20 Hz to 20 kHz, Back to Back
Input Resistance	R _{in 1}		100		kΩ	Pin 9
	R _{in 2}		100		kΩ	Pin 11
	R _{in 3}		5.6		kΩ	Pin 13
Output Resistance	R _{out 1}		2.4		kΩ	Pin 12
	R _{out 2}			50	Ω	Pin 14
	R _{out 3}			50	Ω	Pin 15
Encode Characteristics at Pin 14	E.R. 1	-1.0	0	+1.0	dB	f = 1.4 kHz, Input at Pin 9 0 dB
	E.R. 2	-17.1	-15.6	-14.1	dB	f = 1.4 kHz, Input at Pin 9 -20 dB
	E.R. 3	-24.0	-22.5	-21.0	dB	f = 1.4 kHz, Input at Pin 9 -30 dB
	E.R. 4	-0.7	+0.3	+1.3	dB	f = 5 kHz, Input at Pin 9 0 dB
	E.R. 5	-18.3	-16.8	-15.3	dB	f = 5 kHz, Input at Pin 9 -20 dB
	E.R. 6	-23.3	-21.8	-20.3	dB	f = 5 kHz, Input at Pin 9 -30 dB
	E.R. 7	-30.7	-29.7	-28.7	dB	f = 5 kHz, Input at Pin 9 -40 dB
	E.R. 8	-0.6	+0.4	+1.4	dB	f = 10 kHz, Input at Pin 9 0 dB
	E.R. 9	-18.9	-17.4	-15.9	dB	f = 10 kHz, Input at Pin 9 -20 dB
	E.R. 10	-25.0	-23.5	-22.0	dB	f = 10 kHz, Input at Pin 9 -30 dB
	E.R. 11	-30.6	-29.6	-28.6	dB	f = 10 kHz, Input at Pin 9 -40 dB
Variation in Encode Characteristics with Temperature	E.R.T	-2.5	0	+2.5	dB	T _a = -20 to +75 °C
Variation in Encode Characteristics with Supply Voltage	E.R.V	-0.3	0	+0.3	dB	V _{CC} = 9 to 15 V
Switching Transients	St 1			100	mV	Encode/Decode/Encode Pin 14
	St 2			100	mV	Encode/Decode/Encode Pin 15
	St 3			50	mV	NR OFF/ON/OFF Pin 14
	St 4			50	mV	NR OFF/ON/OFF Pin 15
Switching Threshold Voltage	V _{s 1}	1.3		1.8	V	NR SW Pin 7
	V _{s 2}	1.8		2.3	V	Encode/Decode SW Pin 10
Supply Voltage Rejection Ratio	S.V.R.		0		dB	f = 100 Hz, U _{TP} = 500 mV _{r.m.s.} , R _G = 10 kΩ

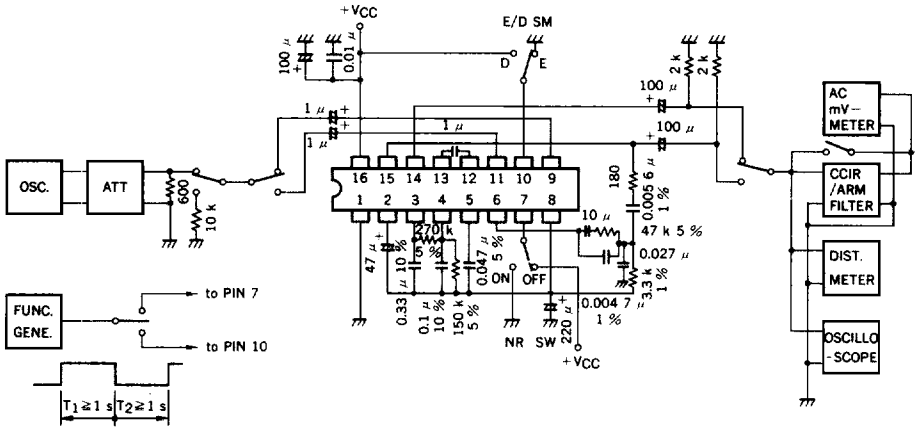
Surely use regulator for power supply.

TEST CIRCUIT

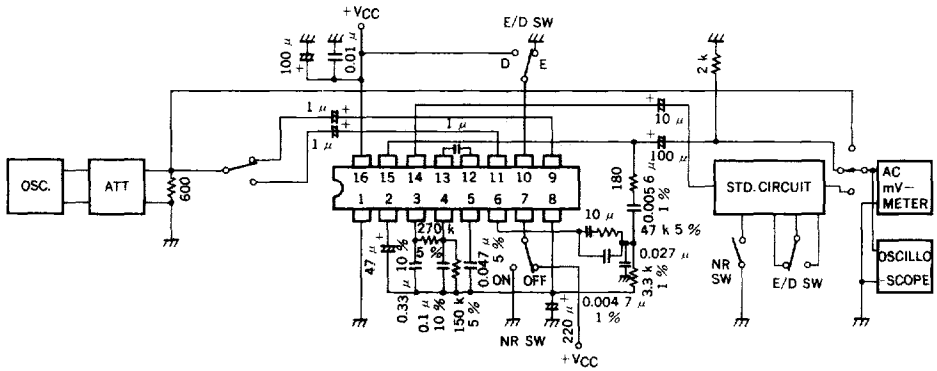
1. VOLTAGE GAIN



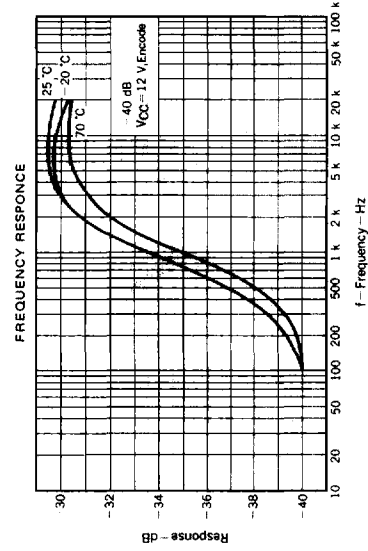
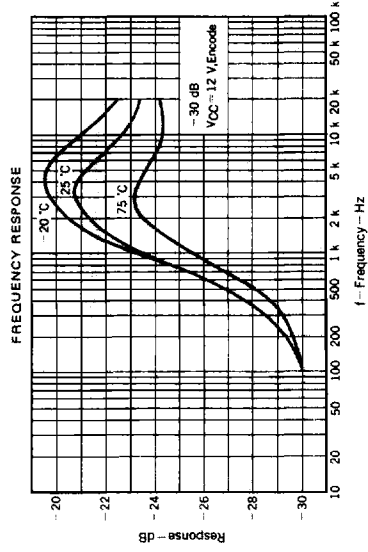
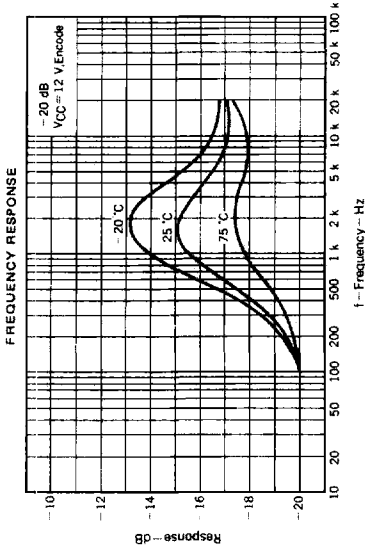
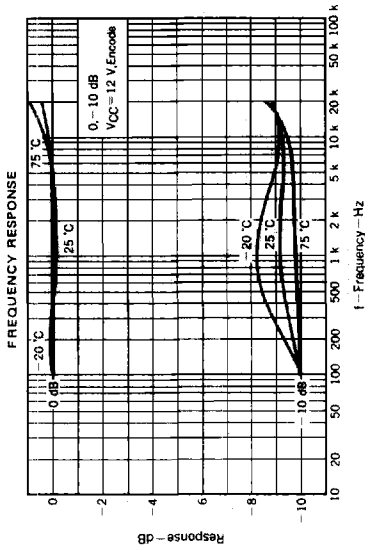
2. SIGNAL HANDLING, TOTAL HARMONIC DISTORTION, SIGNAL TO NOISE RATIO
ENCODE CHARACTERISTICS, VARIATION CHARACTERISTICS, SWITCHING TRANSIENTS
SUPPLY VOLTAGE REJECTION RATIO.

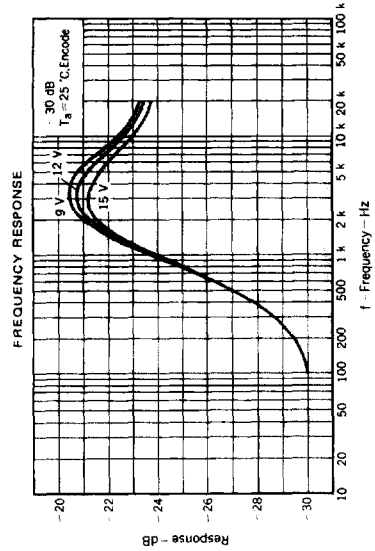
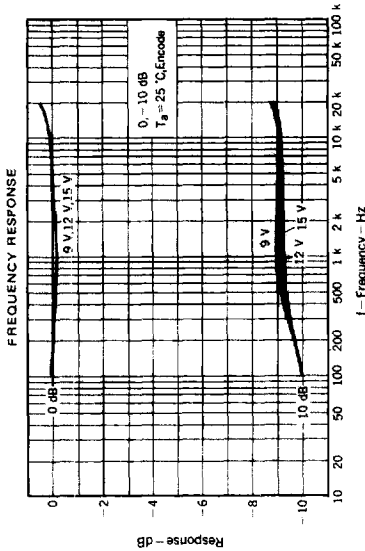
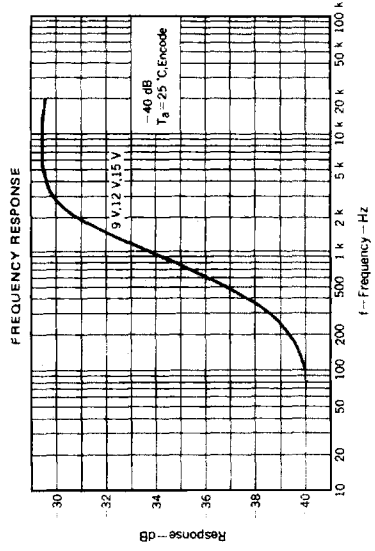
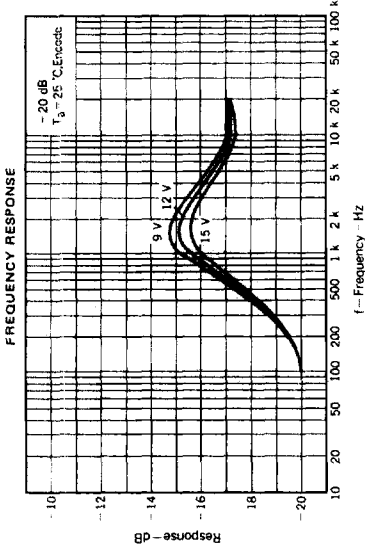


3. BACK TO BACK FREQ. RESPONSE

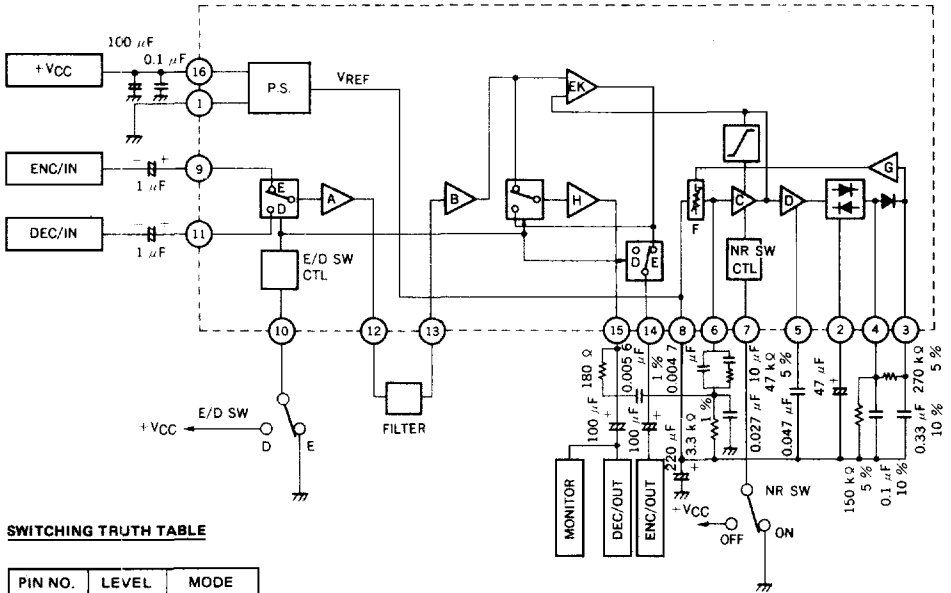


TYPICAL CHARACTERISTICS (T_a = 25 °C)





APPLICATION CIRCUIT



SWITCHING TRUTH TABLE

PIN NO.	LEVEL	MODE
7	HIGH	OFF
	OPEN LOW	ON
10	HIGH	DECODE
	OPEN LOW	ENCODE

NOTES

- 1) Other points shall be applied to the Technical Standard of Dolby Laboratories Licensing Corp.
- 2) IC shall not be broken if adjacent pins short-circuit.
- 3) IC shall not be broken if it will be put reversely.
- 4) Surely use regulator for power supply.