μA7300

DOLBY B-TYPE NOISE REDUCTION SYSTEM

FAIRCHILD LINEAR INTEGRATED CIRCUIT

4

GENERAL DESCRIPTION — The μA7300 is a monolithic circuit which performs *Dolby B-Type noise reduction processing on an audio signal. The Dolby B-Type noise reduction system is used to reduce hiss in consumer tape recording equipment and in FM broadcast receivers. The circuit is constructed using the Fairchild Planar** process.

The versatile circuit configuration of the μA7300 allows a complete record/playback system for a stereo tape recorder, or a complete stereo Dolby FM decoder, to be built with just two μA7300's and a few discrete components.

- **VERSATILE CONFIGURATION WITH PROGRAMMABLE INPUT, OUTPUT AMPLIFIERS**
- **SUPERIOR MATCHING TO DOLBY B-TYPE STANDARD**
- **EXCELLENT HIGH-FIDELITY CHARACTERISTICS**
- **WIDE OPERATING VOLTAGE RANGE: 10-20 V**

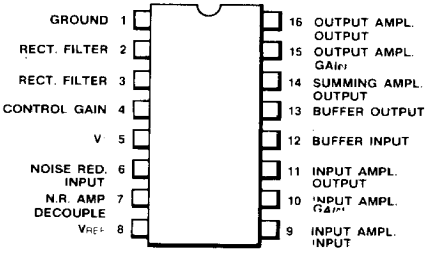
CONNECTION DIAGRAM

16-PIN DIP

TOP VIEW

PACKAGE OUTLINE 9B

PACKAGE CODE P



ORDER INFORMATION

TYPE	PART NO.	
μA7300	μA7300PC	(Note 1)

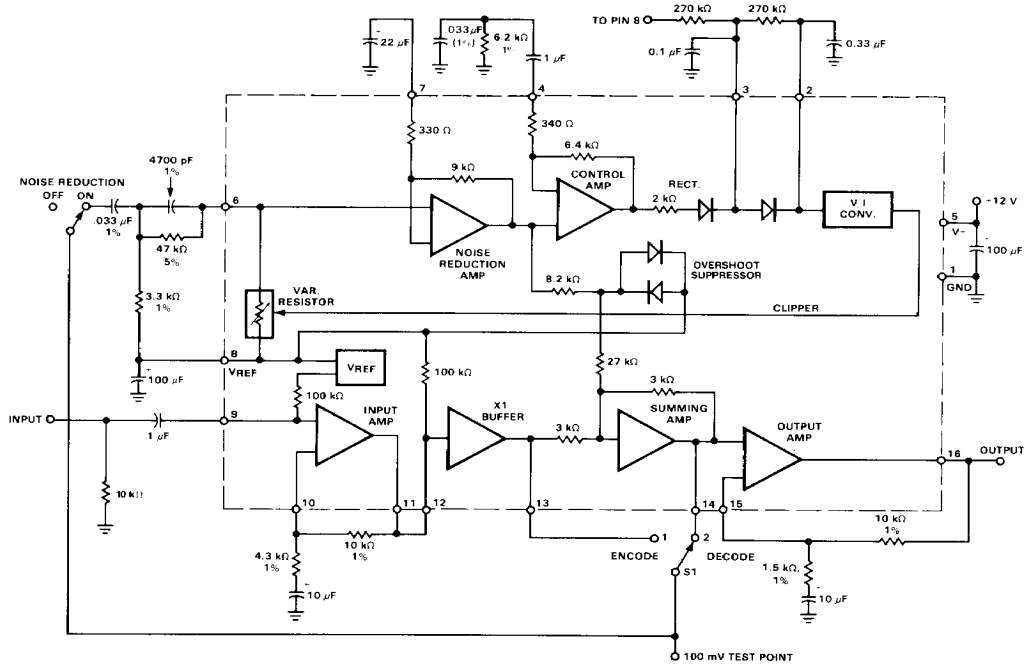
ABSOLUTE MAXIMUM RATINGS:

Supply Voltage	24 V
Operating Temperature Range	0° C to +70° C
Storage Temperature Range	-65° C to +150° C
Power Dissipation ($T_A \leq 70°C$)	730 mW
Pin Temperature Soldering 10 s	280° C

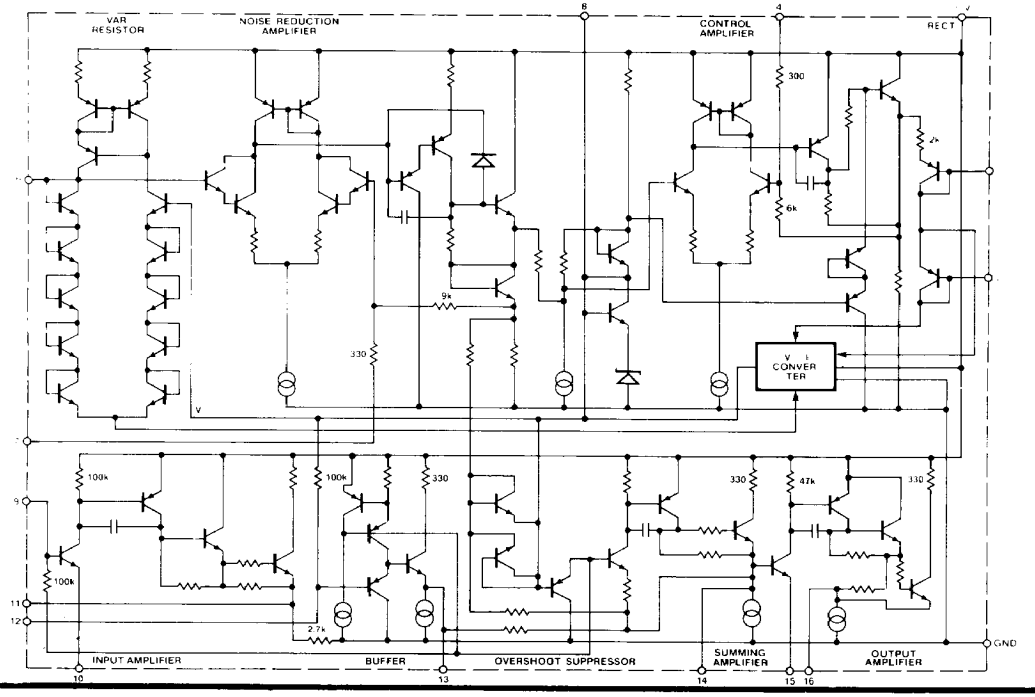
Note 1

This circuit is available only to licensees of Dolby Laboratories. Licensing and application information may be obtained from Dolby Laboratories, San Francisco.

μA7300 TEST CIRCUIT



μA7300 DOLBY NOISE REDUCTION SYSTEM EQUIVALENT CIRCUIT



ELECTRICAL CHARACTERISTICS:

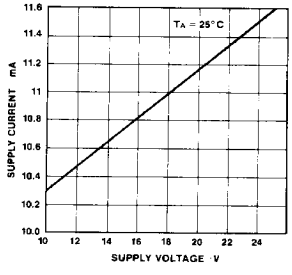
(T_A = 25° C, V+ = 12 V, input amplifier gain = 10 dB, source impedance less than 10 K, output amplifier gain = 17.7 dB (Output Level equals 775 mV for Dolby Level), encode mode, 0 dB = 100 mV_{rms} at test point unless otherwise specified. (See test circuit).

CHARACTERISTICS	TEST CONDITIONS		MIN	TYP	MAX	UNITS
Operating Voltage Range			10		20	V
Supply Current				11	17	mA
Input Amplifier Current (Pins 10-11)				6		μA
Output Amplifier Current (Pins 15-16)				13		μA
Total Harmonic Distortion (Pin 16)	0 dB at Pin 13 +10 dB at Pin 13	f = 20-20,000 Hz f = 1 kHz		.04 0.1	0.1 0.3	% %
Signal Handling (Pin 16)	THD = 1.0%	R_L = 2 kΩ		6.4		V_{pk-pk}
Signal Handling (Pin 14)	THD = 1.0%		20			dB
Signal to Noise Ratio (Pin 16) Noise Level Relative to Dolby Level	CCIR/ARM Weighting Noise Reduction (ON)	ENCODE DECODE	65 75	68 78		dB dB
Encode Mode Frequency Response	f = 1.4 kHz Input at Pin 9	0 dB -20 dB -30 dB	-1 -17.1 -24.0	0 -15.6 -22.5	+1 -14.1 -21.0	dB dB dB
	f = 5 kHz Input at Pin 9	0 dB -20 dB -30 dB -40 dB	-0.7 -18.3 -23.3 -29.0	+0.3 -16.8 -21.8 -29.7	+1.3 -15.3 -20.3 -30.2	dB dB dB dB
	f = 20 kHz Input at Pin 9	0 dB -20 dB -30 dB -40 dB	-0.3 -18.8 -25.0 -29.0	+0.7 -17.3 -23.5 -29.7	+1.7 -15.8 -22.0 -30.2	dB dB dB dB
Back-to-Back Frequency Response	f = 20 - 20 kHz with respect to standard	+10 dB 0 dB -10 dB -20 dB -30 dB -40 dB	-1.0 -1.0 -1.0 -1.5 -1.5 -0.5		+1.0 +1.0 +1.0 +1.5 +1.5 +0.7	dB dB dB dB dB dB
Reference Voltage	I_B = -100 μA		6.0	6.6	7.2	V
Input Resistance	Pin 9		50	100		kΩ
Input Resistance	Pin 12		50	100		kΩ
Voltage Gain	Pin 12 to Pin 13;	f = 1 kHz		0		dB
Voltage Gain	Pin 12 to Pin 14;	f = 1 kHz		0		dB
Power Supply Ripple Rejection	f_R = 120 Hz			45		dB

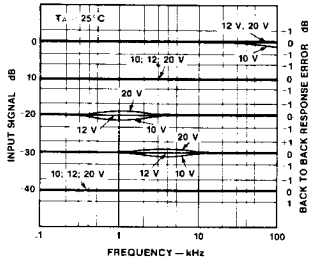
See Dolby Laboratories Engineering Field Bulletin 19/2.

TYPICAL PERFORMANCE CURVES

SUPPLY CURRENT AS A FUNCTION OF SUPPLY VOLTAGE

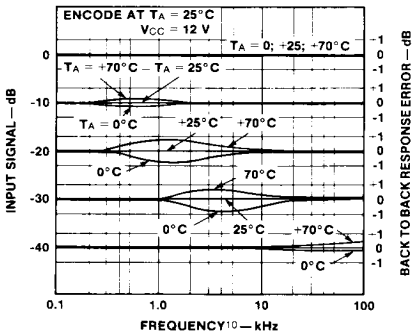


BACK TO BACK RESPONSE AS A FUNCTION OF POWER SUPPLY VOLTAGE

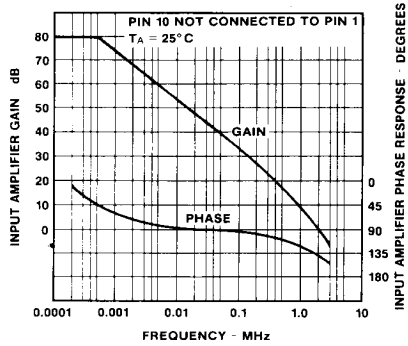


TYPICAL PERFORMANCE CURVES

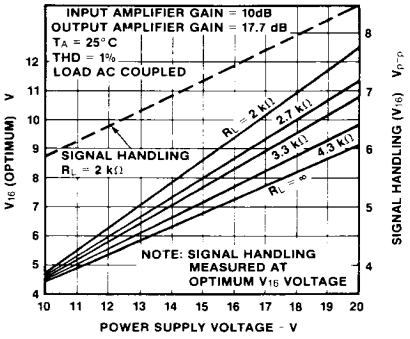
BACK TO BACK RESPONSE AS A FUNCTION OF TEMPERATURE



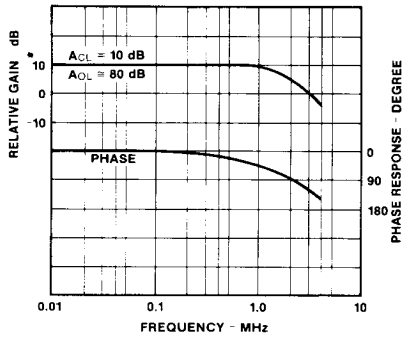
INPUT AMPLIFIER OPEN LOOP, GAIN, AND PHASE RESPONSE AS A FUNCTION OF FREQUENCY



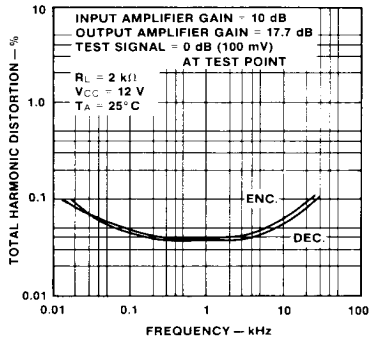
OUTPUT AMPLIFIER OPTIMUM V_{16} VOLTAGE AND SIGNAL HANDLING AS A FUNCTION OF POWER SUPPLY VOLTAGE



INPUT AMPLIFIER AMPLITUDE AND PHASE RESPONSE



TOTAL HARMONIC DISTORTION AS A FUNCTION OF FREQUENCY



SIGNAL TO NOISE AS A FUNCTION OF INPUT AMPLIFIER GAIN