



PRELIMINARY



LM1121A/LM1121B/LM1121C

Dolby B-Type Noise Reduction Processor with DC Switching

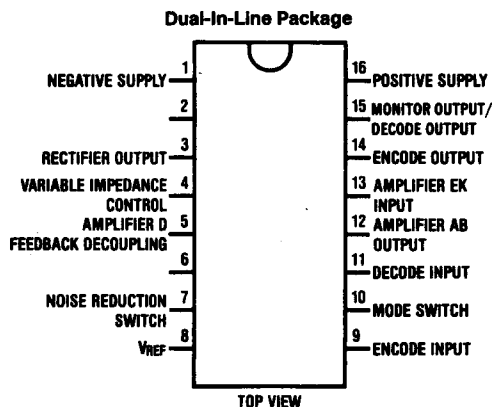
General Description

The LM1121 is a monolithic integrated circuit designed to realize the Dolby B-type noise reduction system. It features two separate inputs and outputs for encode and decode signal paths. Both the mode selection and noise reduction switches are internal and controlled by external DC voltage levels.

Features

- DC switching of both encode/decode and noise reduction ON/OFF
- Separate inputs and outputs for encode and decode
- Full-wave detector circuit
- Very close matching to standard Dolby characteristics
- Very high signal/noise ratio—75 dB encode (CCIR/ARM), 83 dB decode
- Very high signal handling capability, >20 dB ($V_S = 20V$)
- Encode output may be used for meter drive in all modes

Connection Diagram



TL/H/5160-1

Order Number LM1121AN, LM1121BN
or LM1121CN
See NS Package Number N16E

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

Absolute Maximum Ratings

Supply Voltage 21V
 Operating Temperature Range -20°C to $+70^{\circ}\text{C}$

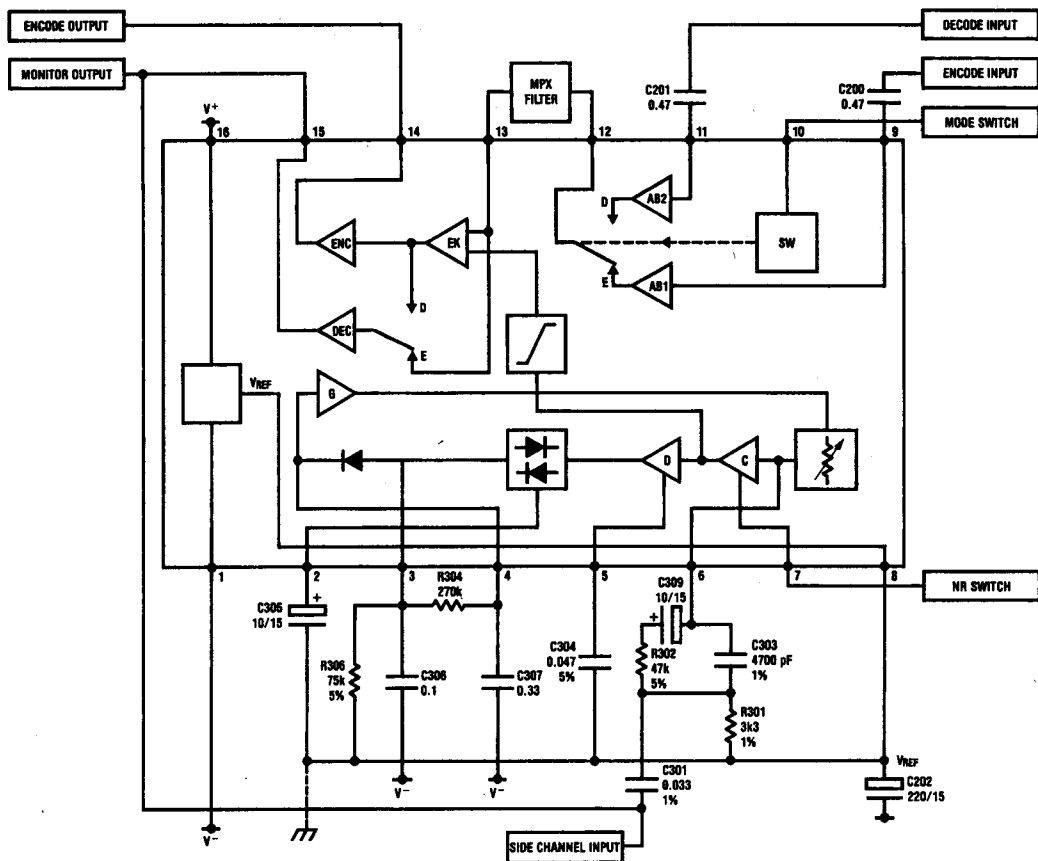
Storage Temperature Range -60°C to $+150^{\circ}\text{C}$
 Lead Temp. (Soldering, 10 seconds) 300°C

Electrical Characteristics

($V_S = 12\text{V}$, $T_A = 25^{\circ}\text{C}$ unless otherwise specified) N.B. 0 dB refers to Dolby level and is 580 mVrms measured at TP1.

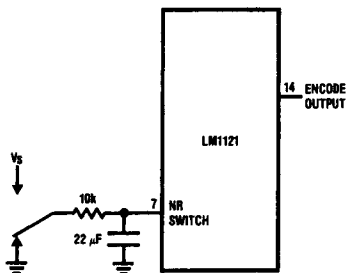
Parameter	Conditions	LM1121A			LM1121B			LM1121C			Units
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
Supply Voltage Range		7		20	7		20	7		20	V
Supply Current			17	24		17	24		17	24	mA
Voltage Gain Pins 9–14 and 11–15	1 kHz, Noise Reduction OFF	25.2	25.7	26.2	24.7	25.7	26.7	24.2	25.7	27.2	dB
Voltage Gain Pin 9 or 11–12	1 kHz, Pin 12 Open		19.7			19.7			19.7		dB
Signal/Noise Ratio Encode Decode NR OFF	CCIR/Arm Filter Pin 14, $R_S = 10\text{k}$ $R_S = 1\text{k}$ Pin 15, $R_S = 10\text{k}$ Pins 14 and 15 $R_S = 10\text{k}$ $R_S = 1\text{k}$	71.5			71			69			dB
			75			75			75		dB
			83			83			83		dB
			83			83			83		dB
Encode Characteristics	10 kHz, 0 dB	0	0.5	1.0	–0.2	0.5	1.2	–0.5	0.5	1.5	dB
	1.3 kHz, –20 dB	–16.2	–15.7	–15.2	–16.7	–15.7	–14.7	–17.2	–15.7	–14.2	dB
	5 kHz, –20 dB	–17.3	–16.8	–16.3	–17.8	–16.8	–15.8	–18.3	–16.8	–15.3	dB
	3 kHz, –30 dB	–21.7	–21.2	–20.7	–22.2	–21.2	–20.2	–22.7	–21.2	–19.7	dB
	5 kHz, –30 dB	–22.3	–21.8	–21.3	–22.8	–21.8	–20.8	–23.3	–21.8	–20.3	dB
	10 kHz, –30 dB	–24.0	–23.5	–23.0	–24.5	–23.5	–22.5	–25.0	–23.5	–22.0	dB
	10 kHz, –40 dB	–30.1	–29.6	–29.1	–30.3	–29.6	–28.9	–30.6	–29.6	–28.6	dB
Variation in Encode Characteristics with Temperature	$0^{\circ}\text{C} - 70^{\circ}\text{C}$		$< \pm 0.5$			$< \pm 0.5$			$< \pm 0.5$		dB
Distortion	1 kHz, 0 dB		0.03	0.1		0.03	0.1		0.03	0.2	%
	10 kHz, 8 dB		0.2			0.2			0.2		%
Signal Handling	1 kHz, Dist = 0.3% $V_S = 7.5\text{V}$ $V_S = 12\text{V}$ $V_S = 20\text{V}$	10	11.2		10	11.2		10	11.2		dB
			16.0			16.0			16.0		dB
			21.0			21.0			21.0		dB
											dB
Switching Transients Measured at Pin 14 or 15 Encode/ Decode/Encode	See Figure 1		20			20			20		mV
NR OFF/ON/OFF			20			20			20		mV
Input Resistance	Pins 9 and 11	45	65	80	45	65	80	45	65	80	k Ω
	Pin 13	4.3	5.6	6.9	4.3	5.6	6.9	4.3	5.6	6.9	k Ω
Output Resistance	Pin 12	1.8	2.4	3.0	1.8	2.4	3.0	1.8	2.4	3.0	k Ω
	Pins 14 and 15		30	55		30	55		30	55	Ω
Control Levels (Pin 7) NR OFF NR OFF NR ON	$V_S = 7\text{V} - 20\text{V}$	3.4		V_S	3.4		V_S	3.4		V_S	V
		–0.2	Open	1.2	–0.2	Open	1.2	–0.2	Open	1.2	V
Control Levels (Pin 10) Encode Decode Decode	$V_S = 7\text{V} - 20\text{V}$	3.4		V_S	3.4		V_S	3.4		V_S	V
		–0.2	Open	1.2	–0.2	Open	1.2	–0.2	Open	1.2	V
											V
Input Resistance	Pins 7 and 10		21			21			21		k Ω

Schematic Diagram



TL/H/5160-2

Circuit Diagram



TL/H/5160-3

FIGURE 1. Measurement—Switching Transients