ADVANCE DATASHEET

PHYSIOsensiics™ with nanoPower Technology

LinearDimensions SEMICONDUCTOR

LNDINA333A/B/C
INA333 Footprint Compatible Instrumentation Amplifiers (INA) use 50% Less Current

GENERAL DESCRIPTION

The LNDINA333A/B/C are precision instrumentation amplifiers designed to be footprint compatible with the TI INA333. Although the LNDINA333 are footprint compatible they offer similar performance to the INA333 with a 30% reduction in power consumption (25uA typical and 30uA maximum vs. 50uA typical and 80uA maximum for the INA333). The LNDINA333A has a single ended output replicating the INA333A while the outputs of LNDINA333B/C are fully differential.

If an RG resistor is connected between the RG pins then the differential current will be set by the external resistor. On the other hand if the RG inputs remain high impedance then a pulse on RG/DIG- will cause an internal resistor to decrement in value, while a pulse on RG/DIG+ will cause the internal resistor to increment in value. Default is half scale.

The LNDINA333C is an AC only instrumentation amplifier which has a 5Hz 3dB high pass response. Integrators are connected between the output and feedback nodes to form a high pass response as shown in the block diagram below.

The LNDINA333A/B/C features 8kV HBM ESD protection compared to 4kV with the INA333. The inputs are also RFI filtered to reduce EMI susceptibility.

The LNDINA333A/B/C is available in a EPAD DFN-8 package which has a 65°C/W thermal resistance.

BLOCK DIAGRAM

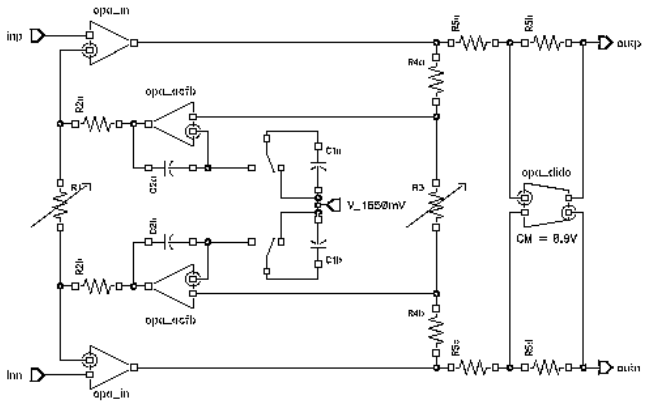


Figure 1 – LNDINA333C Equivalent Block Diagram

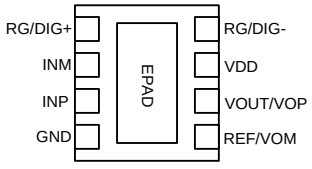
FEATURES

- Instrumentation Amplifier
- Single ended (LNDINA333A)
- Fully differential (LNDINA333B)
- Fully differential AC only (LNDINA333C)
- +2.7V to +5.5V input range
- 25µA typ current consumption (INA333, 50µA)
- 35µA typ current (LNDINA333C)
- 350kHz typical bandwidth
- 25µV typical input offset voltage
- 100dB typical CMRR
- 100nV/√Hz typical input referred noise
- RFI Filtered Inputs
- External resistor or programmable gain
- Minimum gain setting 100V/V
- Input range: GND-0.1V to VDD+0.1V
- Output range: GND+0.05V to VDD-0.05V
- Low drift: 2µV/°C typical
- +/-5pA typical input bias current
- 10mA short circuit current
- 8kV ESD Protection (vs. 4kV for INA333)
- Temperature range: -40°C to 125°C
- Footprint compatible with EPAD DFN-8

APPLICATIONS

- Portable heart rate equipment
- Portable fitness & wellness products
- Non-critical diagnostics
- Vibration measurement equipment
- Instrumentation
- Bridge amplifiers
- Pressure sensors
- Weigh scales
- Sensor amplifiers

PACKAGE



LNDINA333A, LNDINA333B, LNDINA333C					
INPUT					
Offset Voltage		-100	25	100	µV
vs Temperature	-40°C < t < 125°C		**2**		**µV/°C**
Common-Mode Voltage Range		(V-)+0.1		(V+)-0.1	V
Common-Mode Rejection	DC to 60Hz, VCM=(V-)+0.1V to (V+)-0.1V				
Gain = 100		90	100		dB
Gain = 1000		90	100		dB
INPUT BIAS CURRENT					
Input Bias Current			+-5	+-50	pA
Input Offset Current			+-5	+-50	pA
INPUT NOISE					
Input Voltage Noise	G=100				
f = 100Hz			100		nV/√Hz
f = 1kHz			50		nV/√Hz
f = 0.1Hz to 10Hz					µVpp
Input Current Noise					
f = 1kHz			1		fA/√Hz
GAIN					
Gain Equation			1 + 100kΩ/RG		
Range of Gain		100		2000	
Gain Error	VS=3.3V, (V-) + 0.1V < V_O < (V+) - 0.1V				
G = 100			+-0.1	+-0.25	%
G = 1000			+-0.25	+-0.5	%
Gain vs Temperature			**+-15**	**+-50**	**ppm/°C**
Gain Nonlinearity					
G = 250 to 2000			10		ppm
OUTPUT					
Output Voltage Swing From Rail				50	mV
Capacitive Load Drive			200		pF
Short-circuit Current			+-10		mA
FREQUENCY RESPONSE					
Bandwidth, -3dB					
G = 100			3.5		kHz
G = 1000			350		Hz
Slew Rate			0.03		V/µs
Settling Time to 0.01%			500		µs
REFERENCE OUTPUT					
VREF		0.88	0.9	0.92	V
POWER SUPPLY					
Voltage Range		2.7		5.5	V
Quiescent Current			25	27	µA
vs Temperature				**30**	**µA**
LNDINA333B					
Common-Mode Output Voltage		0.88	0.9	0.92	V
LNDINA333C					
Quiescent Current			35	38	µA
vs Temperature				**42**	**µA**
Common-Mode Output Voltage		0.88	0.9	0.92	V
Middle-Point Common Mode Point			V_S/2		V
Low-Pass Filter Cutoff Frequency			2.5	5	Hz