

Am1500

Dual Precision Voltage Comparator

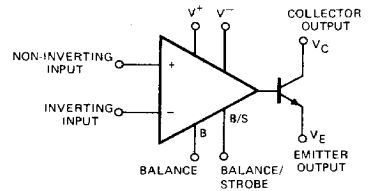
Distinctive Characteristics

- The Am1500 is functionally, electrically, and pin-for-pin equivalent to the National LH2111
- Output Drive — 50V and 50mA
- Input Bias Current — 150nA max.
- Input Offset Voltage — 4.0mV max.
- Differential Input Voltage Range — $\pm 30V$
- Reduced size and weight

FUNCTIONAL DESCRIPTION

The Am1500 is a voltage comparator featuring low input currents, high differential and common mode voltage ranges, wide supply voltage range, and outputs compatible with all bipolar and MOS circuitry. The inputs and outputs can be isolated from system ground, and the output can drive loads referred to ground or either supply. Strobing and offset balancing are available and the outputs can be wire-ORed.

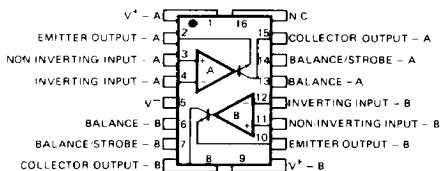
FUNCTIONAL DIAGRAM (each half)



LIC-138

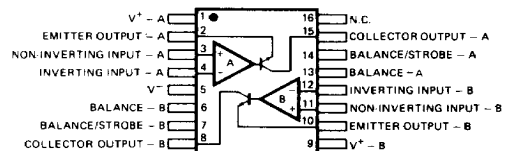
CONNECTION DIAGRAMS Top Views

Hermetic Dual In-Line D-16-1



LIC-139

Flat Package F-16-1



Note: Pin 1 is marked for orientation.

LIC-140

ORDERING INFORMATION*

Part Number	Package Type	Temperature Range	Order Number
Am1500C	Hermetic DIP Flat Pak	0 to +70°C 0 to +70°C	AM1500DC AM1500FC
Am1500L	Hermetic DIP Flat Pak	-25 to +85°C -25 to +85°C	AM1500DL AM1500FL
Am1500M	Hermetic DIP Flat Pak	-55 to +125°C -55 to +125°C	AM1500DM AM1500FM

*Also available with burn-in processing. To order add suffix B to part number.

MAXIMUM RATINGS

Voltage from V^+ to V^-	36V
Voltage from Collector Output to V^- Am1500M, L Am1500C	50V 40V
Voltage from Emitter Output to V^-	30V
Voltage between Inputs	$\pm 30V$
Voltage from Inputs to V^-	+30V, -0V
Voltage from Inputs to V^+	-30V
Power Dissipation (Note 1)	500mW
Output Short Circuit Duration	10 sec
Operating Temperature Range Am1500M Am1500L Am1500C	-55°C to +125°C -25°C to + 85°C 0°C to + 70°C
Storage Temperature Range	-65°C to +150°C
Lead Temperature (soldering, 10 sec)	300°C

ELECTRICAL CHARACTERISTICS

(T_A = 25°C unless otherwise specified) (Note 2)

Parameter (see definitions)	Conditions	Am1500C			Am1500M Am1500L			Units
		Min.	Typ.	Max.	Min.	Typ.	Max.	
Input Offset Voltage (Note 3)			2.0	7.5		0.7	3.0	mV
Input Offset Current (Note 3)			6.0	50.0		4.0	10.0	nA
Input Bias Current (Note 3)			100	250		60	100	nA
Response Time (Note 4)	R _L = 500Ω to +5V, V _E = 0		200			200		ns
Supply Current—Positive (Note 5) —Negative (Note 5)			7.0 4.8	15.0 10.0		7.0 4.8	12.0 10.0	mA
Voltage Gain			200			200		V/mV
Saturation Voltage	V _{in} ≤ -5.0mV, I _C = 50mA V _{in} ≤ -10mV, I _C = 50mA		0.75	1.5		0.75	1.5	V
Output Leakage Current	V _{in} ≥ +5.0mV, V _C to V _E = 50V V _{in} ≥ +10mV, V _C to V _E = 40V		0.2	50.0		0.2	10.0	nA

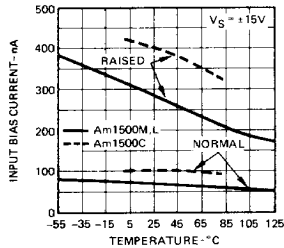
The Following Specifications Apply Over The Operating Temperature Range

Input Offset Voltage (Note 3)				10.0			4.0	mV
Input Offset Current (Note 3)				70.0			20.0	nA
Input Bias Current (Note 3)				300			150	nA
Saturation Voltage	V _{in} ≤ -6.0mV, I _C = 8.0mA V _{in} ≤ -10mV, I _C = 8.0mA		0.23	0.40		0.23	0.40	V
Output Leakage Current	V _{in} ≥ +6.0mV, V _C to V _E = 50V					0.1	0.5	μA
Input Voltage Range		±13	±14		±13	±14		V
Supply Current—Positive (Note 5) —Negative (Note 5)	T _A = +125°C					4.8 3.2	12.0 10.0	mA

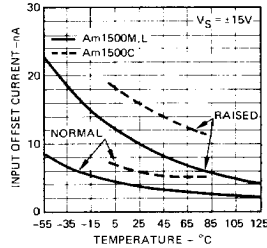
- Notes: 1. For the Flat Package derate at 6.5mW/°C for operation at ambient temperatures above 83°C, and the Dual-In-Line at 9mW/°C for operation at ambient temperatures above 95°C.
2. Unless otherwise specified, these specifications apply for V⁺ = +15V, V⁻ = -15V, V_E = -15V, and R_L at collector output = 7.5kΩ to +15V.
3. The offset voltage, offset current and bias current given are the maximum values required to drive the collector output to within 1V of the supplies with a 7.5kΩ load. These parameters define an error band and take into account the worst case effects of voltage gain and input impedance.
4. The response time specified (see definitions) is for a 100mV input step with 5.0mV overdrive.
5. The Am1500 supply current is the sum of the supply currents required by each side.

PERFORMANCE CURVES

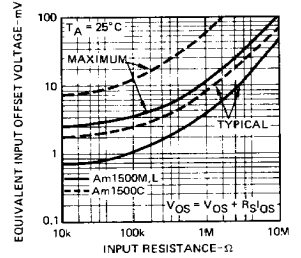
Input Bias Current



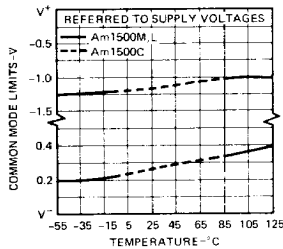
Input Offset Current



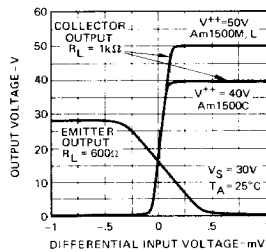
Offset Error



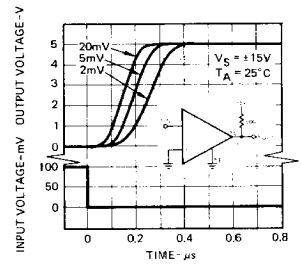
Common Mode Limits



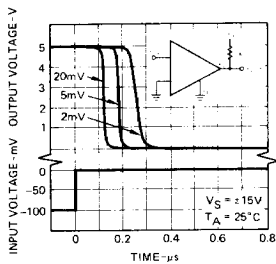
Transfer Function



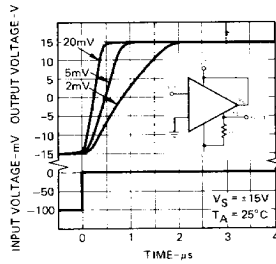
Response Time For Various Input Overdrives



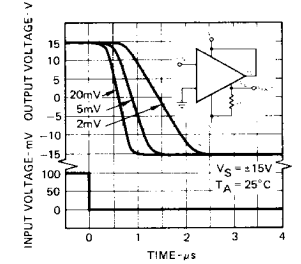
Response Time For Various Input Overdrives



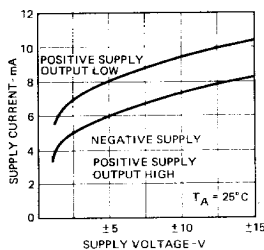
Response Time For Various Input Overdrives



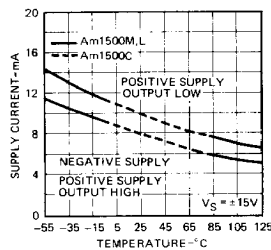
Response Time For Various Input Overdrives



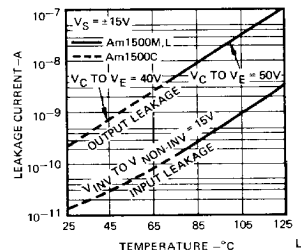
Supply Current



Supply Current

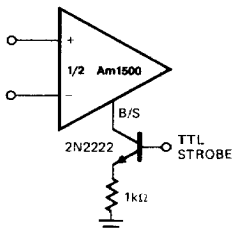


Leakage Current

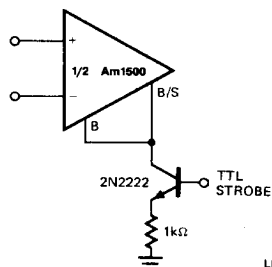


APPLICATIONS

Strobing

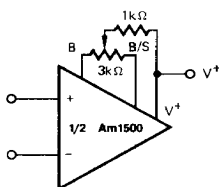


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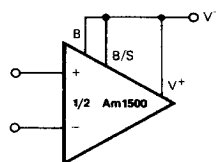
Strobing Off Both
Input and Output Stages**

LIC-143

Offset Balancing



LIC-144

Increasing Input
Stage Current*

LIC-145

*Increases input bias current and common-mode slew rate by a factor of 3.
 **Typical input current = 50 pA with inputs strobed OFF.