

### CLM6121 / CLM6321

#### FEATURES

- Slew Rate ..... 1200V/ $\mu$ s
- Wide Bandwidth..... 100MHz
- Output current ..... 230mA
- High Input Impedance..... 2M $\Omega$
- No Oscillations with Capacitive Loads
- 5V to  $\pm$ 15V Operation Guaranteed
- Current and Thermal Limiting
- Fully Specified to Drive 50 $\Omega$  Lines

#### APPLICATIONS

- Line Driving
- Radar
- Sonar

#### GENERAL DESCRIPTION

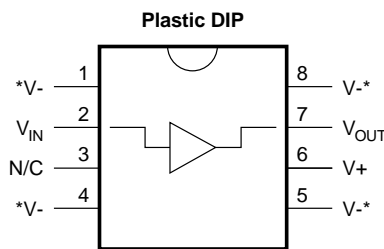
The CLM6121 family are high speed unity gain buffers that slew at 1200V/ $\mu$ s, having a small signal bandwidth of 100MHz, and capable of providing a continuous output current of  $\pm$ 200mA. They are monolithic ICs which are pin to pin compatible with the LH0002H/CH with the additional feature of current limiting.

The internal output short circuit current limiting feature has been designed in the device such that when the junction temperature reaches 170 $^{\circ}$ C, the current is limited to 100mA.

#### ORDERING INFORMATION

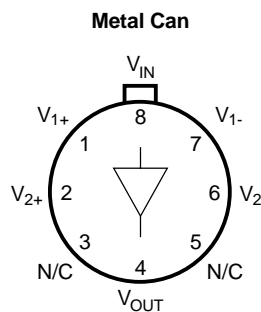
Part	Package	Temperature Range
CLM6121 H	Hermetic TO5 8 Lead	-55 $^{\circ}$ C to 125 $^{\circ}$ C
CLM6321 H	Hermetic TO5 8 Lead	-40 $^{\circ}$ C to 85 $^{\circ}$ C
CLM6121 N	Plastic P Dip 8 Lead	-40 $^{\circ}$ C to 85 $^{\circ}$ C
CLM6321 N	Plastic P Dip 8 Lead	-40 $^{\circ}$ C to 85 $^{\circ}$ C
CLM6121 M	SOIC 8 Lead	-25 $^{\circ}$ C to 70 $^{\circ}$ C
CLM6321 M	SOIC 8 Lead	-25 $^{\circ}$ C to 70 $^{\circ}$ C

#### CONNECTION DIAGRAMS



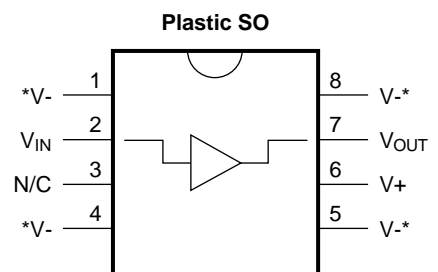
\*Heat-sinking pins. Pin 1 and Pin 8 must be connected to the negative supply.

Package NO8A



Top View

Package HO8A



\*Heat-sinking pins. Pin 1 and Pin 8 must be connected to the negative supply.

Package MO8A

## ABSOLUTE MAXIMUM RATINGS (Note 1)

If Military/Aerospace specified devices are required, please contact the Calogic Sales Office for availability and specifications.

Supply Voltage	±18
Input Voltage	±V <sub>supply</sub>
Short Circuit to GND (Note 2)	Continuous
Storage Temperature Range	-65°C to +150°C
Lead Temperature	
(Soldering 10 seconds)	260°C

ESD Tolerance (Note 4)	±2000V
Thermal Resistance (θ <sub>JA</sub> ) (Note 7)	
H Package	125°C/W
N Package	50°C/W
M Package	60°C/W
Thermal Resistance (θ <sub>JC</sub> )	
H Package	15°C/W

## DC ELECTRICAL CHARACTERISTICS

The following specifications apply for Supply Voltage = ±15V, V<sub>CM</sub> = 0, R<sub>L</sub> ≥ 100kΩ and R<sub>S</sub> = 50Ω unless otherwise noted. **Boldface** limits apply for T<sub>A</sub> = T<sub>J</sub> = T<sub>MIN</sub> to T<sub>MAX</sub>; all other limits T<sub>A</sub> = T<sub>J</sub> = 25°C.

SYMBOL	CHARACTERISTICS	TYP	CLM6121	CLM6321	UNITS	CONDITIONS
			Limit (Note 6)	Limit (Note 6)		
A <sub>V1</sub>	Voltage Gain 1	0.990	0.980 <b>0.970</b>	0.970 <b>0.950</b>	V/V Min	R <sub>L</sub> = 1kΩ, V <sub>IN</sub> = ±10V
A <sub>V2</sub>	Voltage Gain 2	0.900	0.860 <b>0.800</b>	0.850 <b>0.820</b>		R <sub>L</sub> = 50Ω, V <sub>IN</sub> = ±10V
A <sub>V3</sub>	Voltage Gain 3	0.840	0.780 <b>0.750</b>	0.750 <b>0.700</b>		R <sub>L</sub> = 50Ω, V <sup>+</sup> = 5V V <sub>IN</sub> = 2V <sub>PP</sub>
V <sub>OS</sub>	Offset Voltage	15	30 <b>50</b>	50 <b>100</b>	mV Max	R <sub>L</sub> = 1kΩ
I <sub>B</sub>	Input Bias Current	1	4 <b>7</b>	5 <b>7</b>	μA Max	R <sub>L</sub> = 1kΩ, R <sub>S</sub> = 10kΩ,
R <sub>IN</sub>	Input Resistance	5			MΩ	R <sub>L</sub> = 50Ω
C <sub>IN</sub>	Input Capacitance	3.5			pF	
R <sub>O</sub>	Output Resistance	3	5 <b>10</b>	5 <b>6</b>	Ω Max	I <sub>OUT</sub> = ±10mA
I <sub>S1</sub>	Supply Current 1	15	18 <b>20</b>	20 <b>22</b>	mA Max	R <sub>L</sub> = ∞
I <sub>S2</sub>	Supply Current 2	14	16 <b>18</b>	18 <b>20</b>		R <sub>L</sub> = ∞, V <sup>+</sup> = 5V
V <sub>O1</sub>	Output Swing 1	13.5	13.3 <b>13</b>	13.2 <b>13</b>	±V Min	R <sub>L</sub> = 1k
V <sub>O2</sub>	Output Swing 2	12.7	11.5 <b>10</b>	11 <b>10</b>		R <sub>L</sub> = 100Ω
V <sub>O3</sub>	Output Swing 3	12	11 <b>9</b>	10 <b>9</b>		R <sub>L</sub> = 50Ω
V <sub>O4</sub>	Output Swing 4	1.8	1.6 <b>1.3</b>	1.6 <b>1.5</b>	V <sub>PP</sub> Min	R <sub>L</sub> = 50Ω, V <sup>+</sup> = 5V (Note 6)
PSSR	Power Supply Rejection Ratio	70	60 <b>55</b>	60 <b>50</b>	dB Min	V <sup>±</sup> = ±5V to ±15V

**AC ELECTRICAL CHARACTERISTICS**

The following specifications apply for Supply Voltage =  $\pm 15\text{V}$ ,  $V_{\text{CM}} = 0$ ,  $R_{\text{L}} \geq 100\text{k}\Omega$  and  $R_{\text{S}} = 50\Omega$  unless otherwise noted. **Boldface** limits apply for  $T_{\text{A}} = T_{\text{J}} = T_{\text{MIN}}$  to  $T_{\text{MAX}}$ ; all other limits  $T_{\text{A}} = T_{\text{J}} = 25^{\circ}\text{C}$ .

SYMBOL	CHARACTERISTICS	TYP	CLM6121	CLM6321	UNITS	CONDITIONS
			Limit (Note 6)	Limit (Note 6)		
SR <sub>1</sub>	Slew Rate 1	1200	550	550	V/ $\mu\text{s}$	$V_{\text{IN}} = \pm 11\text{V}$ , $R_{\text{L}} = 1\text{k}\Omega$
SR <sub>2</sub>	Slew Rate 2	800	550	550	V/ $\mu\text{s}$	$V_{\text{IN}} = \pm 5\text{V}$ , $R_{\text{L}} = 50\Omega$ (Note 3)
SR <sub>3</sub>	Slew Rate 3	650	550	550	V/ $\mu\text{s}$	$V_{\text{IN}} = 2 V_{\text{PP}}$ , $R_{\text{L}} = 50\Omega$ $V^+ = 5\text{V}$
BW	-3 dB Bandwidth	50	30	30	MHz	$V_{\text{IN}} = \pm 100 \text{mV}_{\text{PP}}$ , $R_{\text{L}} = 50\Omega$ $C_{\text{L}} \leq 10\text{pF}$
t <sub>r</sub> , t <sub>f</sub>	Rise Time Fall Time	7.0			ns	$R_{\text{L}} = 50\Omega$ , $C_{\text{L}} \leq 10\text{pF}$ $V_{\text{O}} = 100\text{mV}_{\text{PP}}$
t <sub>pd</sub>	Propagation Delay Time	4.0			ns	$R_{\text{L}} = 50\Omega$ , $C_{\text{L}} \leq 10\text{pF}$ $V_{\text{O}} = 100\text{mV}_{\text{PP}}$
O <sub>S</sub>	Overshoot	10			%	$R_{\text{L}} = 50\Omega$ , $C_{\text{L}} \leq 10\text{pF}$ $V_{\text{O}} = 100\text{mV}_{\text{PP}}$

**Note 1:** Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. DC and AC electrical specifications do not apply when operating the device beyond its rated operating conditions.

**Note 2:** The CLM6121 series buffers contain current limit and thermal shutdown to protect against fault conditions.

**Note 3:** Slew rate is measured with a  $\pm 11\text{V}$  input pulse and  $50\Omega$  source impedance at  $25^{\circ}\text{C}$ . For accurate measurements, the input slew rate should be at least  $1700\text{V}/\mu\text{s}$ .

**Note 4:** The test circuit consists of the human body model of  $120\text{pF}$  in series with  $1500\Omega$ .

**Note 5:** The maximum power dissipation is a function of  $T_{\text{J(max)}}$ ,  $\theta_{\text{JA}}$  and  $T_{\text{A}}$ . The maximum allowable power dissipation at any ambient temperature is  $P_{\text{D}} = (T_{\text{J(max)}} - T_{\text{A}})/\theta_{\text{JA}}$ .

**Note 6:** Limits are guaranteed by testing, correlation or periodic characterization.

**Note 7:** For M & N package,  $\theta_{\text{JA}}$  is measured by soldering the unit directly on a printed circuit board and V pins are connected to 2 square inches of 2 oz copper.

