High Speed Buffer

CLM4121 / CLM4321

FEATURES

- **High Slew Rate. 2000V/μs**
- **Wide Bandwidth. 180MHz**
- **Peak Output Current 300mA**
- **Low Supply Current 7mA**
- **No Oscillations with Capacitive Loads**
- **5V to ±15V Operation Guaranteed**
- **Fully Specified to Drive 50Ω Lines**

APPLICATIONS

- **Coaxial Cable Driver**
- **Flash A/D Converter Driver**
- **Video DAC Buffer**
- **OP Amp Booster**
- **Video Amplifier**
- **High Frequency Filter**
- **Wide Bandwidth Signal Conditioning**
- **Radar**
- **Sonar**

GENERAL DESCRIPTION

The CLM4121 family are high speed unity gain buffers that slew at 2000V/μs, having a small signal bandwidth of 180MHz, delivers 150mA, yet draws only 7mA supply current.

The fast slew rate, wide bandwidth, and high output drive make the CLM4121 family the ideal choice for closed loop buffer applications with wide band op amps.

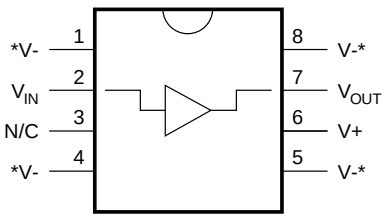
These same characteristics are the excellent choices for open loop applications such as driving coaxial and switched pair cables.

ORDERING INFORMATION

Part	Package	Temperature Range
CLM4121 N	NO8A (Plastic P Dip 8 Lead)	-40°C to 85°C
CLM4121 M	MO8B (SOIC 8 Lead)	-40°C to 85°C
CLM4321 N	NO8A (Plastic P Dip 8 Lead)	-25°C to 70°C
CLM4321 M	MO8B (SOIC 8 Lead)	-25°C to 70°C

CONNECTION DIAGRAMS

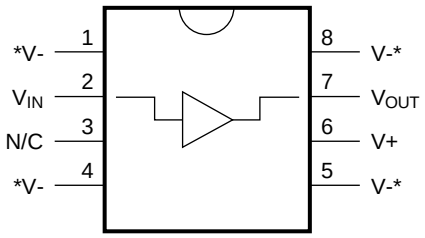
Plastic DIP



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

Package NO8A

Plastic SO



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

Package MO8B

CALOGIC CORPORATION, 237 Whitney Place, Fremont, California 94539, Telephone: 510-656-2900, FAX: 510-651-1076

ABSOLUTE MAXIMUM RATINGS (Note 1)

Supply Voltage . . . . . ±20
Input Voltage . . . . . ±Vsupply
Storage Temperature Range . . . . . -65°C to +150°C
Lead Temperature
(Soldering 10 seconds) . . . . . 260°C
Power Dissipation . . . . . (Note 4)

ESD Tolerance (Note 3) . . . . . ±2000V
Thermal Resistance (θ_{JA}) (Note 6)
N Package . . . . . 50°C/W
M Package . . . . . 60°C/W
Maximum Junction Temperature . . . . . 150°C

DC ELECTRICAL CHARACTERISTICS
The following specifications apply for Supply Voltage = ±15V, V_{CM} = 0, $R_L \geq 100K\Omega$ and $R_S = 50\Omega$ unless otherwise noted.
Boldface limits apply for $T_A = T_J = T_{MIN}$ to T_{MAX}; all other limits $T_A = T_J = 25°C$.

SYMBOL	CHARACTERISTICS	TYP	CLM4121 Limit (Note 5)	CLM4321 Limit (Note 5)	UNITS	CONDITIONS
A_{V1}	Voltage Gain 1	0.970	0.950 **0.950**	0.950 **0.950**	V/V Min	R_L = 1KΩ, V_{IN} = ±10V
A_{V2}	Voltage Gain 2	0.900	0.800 **0.800**	0.800 **0.800**		R_L = 50Ω, V_{IN} = ±6V
A_{V3}	Voltage Gain 3	0.840	0.780 **0.750**	0.750 **0.700**		R_L = 50Ω, V^+ = 5V $V_{IN} = 2V_{PP}$
V_{OS}	Offset Voltage	15	20 **30**	30 **30**	mV Max	R_L = 1KΩ
I_B	Input Bias Current	1	5 **7**	10 **10**	µA Max	R_L = 1KΩ, R_S = 10kΩ,
R_{IN}	Input Resistance	0.5	.2	.2	MΩ	R_L = 50Ω
C_{IN}	Input Capacitance	3.5			pF	
R_O	Output Resistance	3	5 **10**	5 **6**	Ω Max	I_{OUT} = ±10mA
I_{S1}	Supply Current 1	7.5	10 **10**	10 **10**	mA Max	R_L = ∞
I_{S2}	Supply Current 2	2.5	5 **5**	5 **5**		R_L = ∞, V^+ = 5V
V_{O1}	Output Swing 1	13.5	13.3 **13**	13.2 **13**	±V Min	R_L = 1K
V_{O2}	Output Swing 2	12.7	10 **9**	10 **9**		R_L = 100Ω
V_{O3}	Output Swing 3	1.8	1.6 **1.3**	1.6 **1.5**	V_{PP} Min	R_L = 50Ω, V^+ = 5V (Note 5)
I_{OUT}	Output Current	200	140	140	mA	V_{IN} = ±13V
PSSR	Power Supply Rejection Ratio	70	60 **60**	60 **60**	dB Min	$V^{\pm}$ = ±5V to ±15V

AC ELECTRICAL CHARACTERISTICS

The following specifications apply for Supply Voltage = ±15V, V_{CM} = 0, $R_L \geq 100K\Omega$ and $R_S = 50\Omega$ unless otherwise noted. **Boldface** limits apply for $T_A = T_J = T_{MIN}$ to T_{MAX}; all other limits $T_A = T_J = 25^oC$.

SYMBOL	CHARACTERISTICS	TYP	CLM4121	CLM4321	UNITS	CONDITIONS
			Limit (Note 5)	Limit (Note 5)		
SR_1	Slew Rate 1	4000	3500	2500	V/µs	V_{IN} = ±11V, R_L = 1KΩ (Note 2)
SR_2	Slew Rate 2	2000	1500	1000		V_{IN} = ±5V, R_L = 50Ω (Note 2)
SS_{BW}	Small Signal Bandwidth	180	140	100	MHz	V_{IN} = ±100mV_{PP}, R_L = 50Ω $C_L \leq$ 10pF
LS_{BW}	Large Signal Bandwidth	65	55	40		V_{IN} = ±11V, R_L = 1K $C_L \leq$ 10pF
P_{BW}	Power Bandwidth	40	30	20		V_{IN} = ±8V, R_L = 50Ω $C_L \leq$ 10pF
t_r, t_f	Rise Time Fall Time	2.0	2.5	3.5	ns	R_L = 50Ω, $C_L \leq$ 10pF V_O = 100mV_{PP}
t_{pd}	Propagation Delay Time	3.0			ns	R_L = 50Ω, $C_L \leq$ 10pF V_O = 100mV_{PP}
O_S	Overshoot	10			%	R_L = 50Ω, $C_L \leq$ 10pF V_O = 100mV_{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: Slew rate is measured with 50Ω source impedance at 25°C. For accurate measurements, the input slew rate should be at least 5000V/µs.

Note 3: The test circuit consists of the human body model of 120pF in series with 1500Ω.

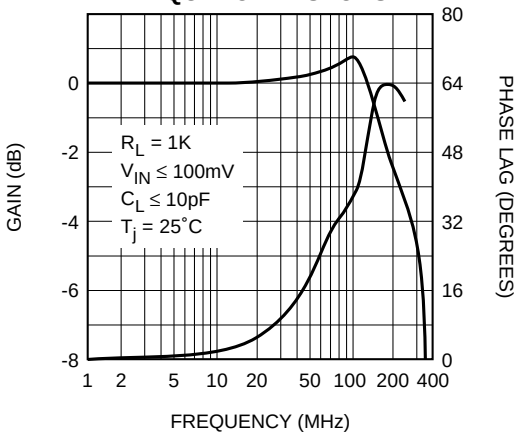
Note 4: The maximum power dissipation is a function of $T_{J(max)}$, θ_{JA} and T_A. The maximum allowable power dissipation at any ambient temperature is $P_D = (T_{J(max)} - T_A)/\theta_{JA}$.

Note 5: Limits are guaranteed by testing, correlation or periodic characterization.

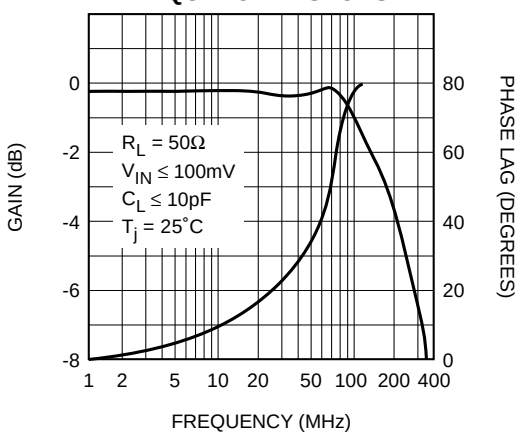
Note 6: For M & N package, θ_{JA} is measured by soldering the unit directly on a printed circuit board and V^- pins are connected to 2 square inches of 2 oz copper.

TYPICAL PERFORMANCE CHARACTERISTICS

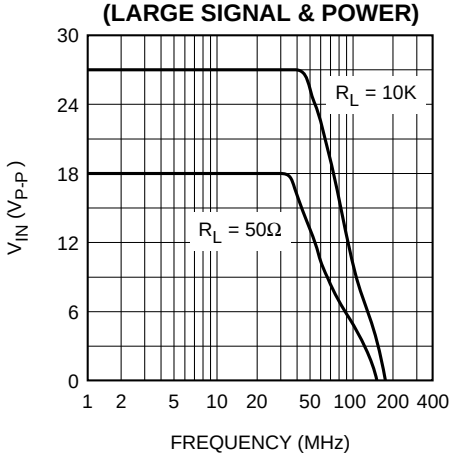
FREQUENCY RESPONSE



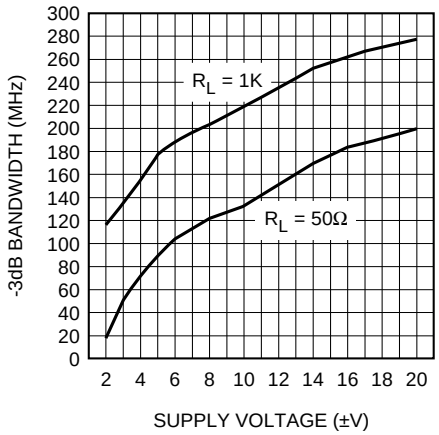
FREQUENCY RESPONSE



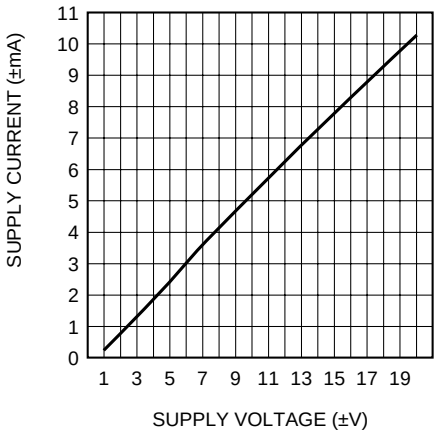
BANDWIDTH (LARGE SIGNAL & POWER)



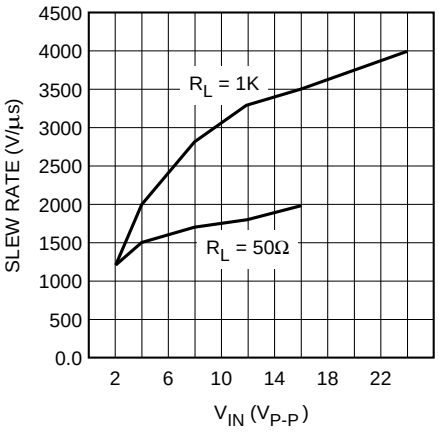
SUPPLY VOLTAGE vs BANDWIDTH



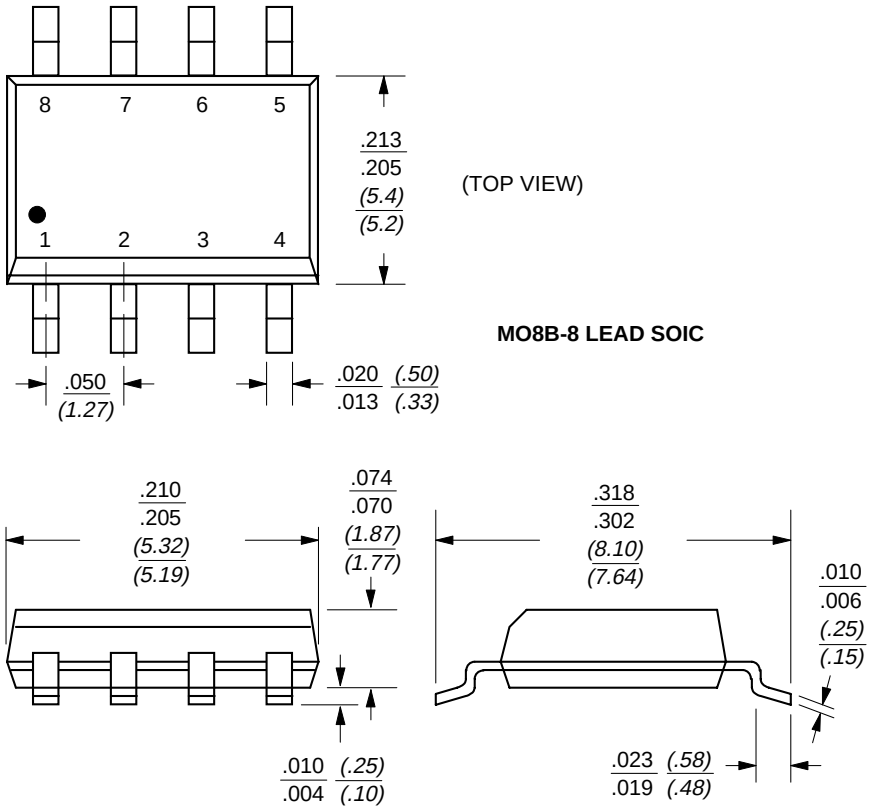
SUPPLY VOLTAGE vs SUPPLY CURRENT



INPUT VOLTAGE vs SLEW RATE

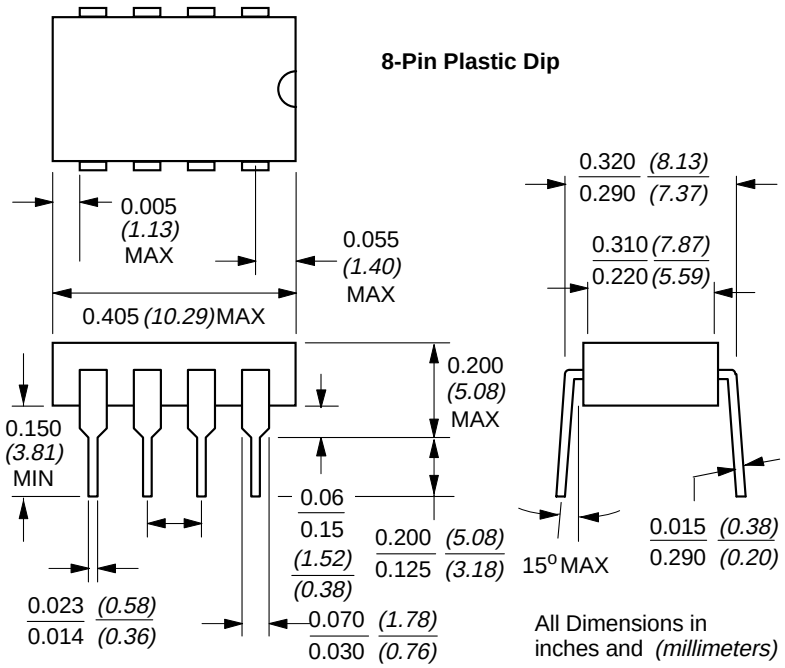


MO8B DIMENSIONS



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NO8A DIMENSIONS



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