Low Power, 400MHz High Speed Buffer

CLM4102 / CLM4302

FEATURES

- **Improved Replacement for EL2002**
- **Slew Rate 11000V/µs**
- **Wide Bandwidth. 400MHz**
- **Output Current. 150mA**
- **Wide Supply Voltage . . . . . ±3V to ±18V**
- **Supply Current. 5mA**
- **Short Circuit Product**
- **Low Bias Current**

APPLICATIONS

- **Op Amp Booster**
- **Coaxial Cable Driver**
- **A/D Input Buffer**
- **Isolation Buffer**

GENERAL DESCRIPTION

The CLM4102 product family is a low power, wide bandwidth buffer amplifier. The 4102 family delivers a -3dB bandwidth of 400MHz, 200mA, and 11000V/µs while only drawing 5mA of supply current. The CLM4102 family operates over a wide supply voltage range of ±3V to ±18V.

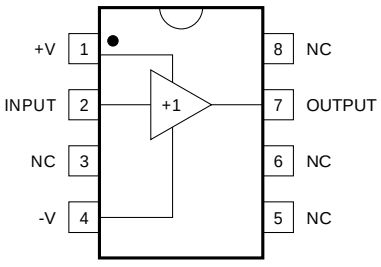
This product is an excellent choice for coaxial cable drivers, A/D converter input buffers and fast op-amp current boosters, in applications for video, test and medical systems and military designs.

ORDERING INFORMATION

Part	Package	Temperature Range
CLM4102M	SOIC 20-Lead	-40°C to +85°C
CLM4102N	Plastic Dip 8-Lead	-40°C to +85°C
CLM4302M	SOIC 20-Lead	-25°C to +85°C
CLM4302N	Plastic Dip 8-Lead	-25°C to +85°C

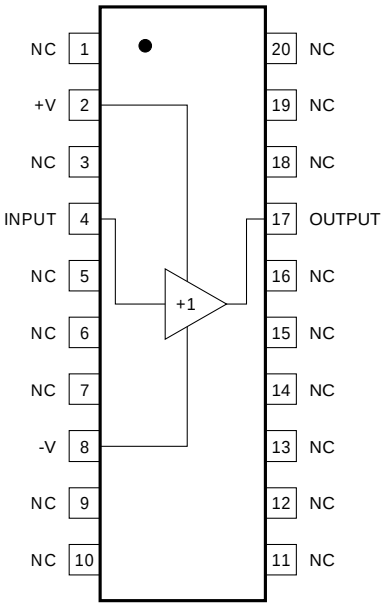
CONNECTION DIAGRAMS

PLASTIC DIP



TOP VIEW

PLASTIC SOIC



TOP VIEW

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ABSOLUTE MAXIMUM RATINGS (Note 1)

Supply Voltage . . . . . ±20V
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})
N Package . . . . . 95°C/W
M Package . . . . . 95°C/W
Thermal Resistance (θ_{JC})
N Package . . . . . 50°C/W
M Package . . . . . 50°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	CLM4102 Limit (Note 5)	CLM4302 Limit (Note 5)	UNITS	CONDITIONS
A_{V1}	Voltage Gain 1	0.99	0.96 **0.96**	0.95 **0.95**	V/V Min	$R_L = \infty$, $V_{IN} = \pm 12V$
A_{V2}	Voltage Gain 2	0.95	0.90 **0.90**	0.90 0.90		$R_L = 100\Omega$, $V_{IN} = \pm 10V$
A_{V3}	Voltage Gain 3	0.92	0.85 **0.85**	0.85 **0.85**		$R_L = 100\Omega$, $V_{IN} = \pm 3V$, $V_S = \pm 5V$
V_{OS}	Offset Voltage	10	15 **20**	30 **40**	mV Max	$R_L = \infty$
I_B	Input Bias Current	1	8 **10**	12	µA Max	$R_L = \infty$
R_{IN}	Input Resistance	0.5	.2	.2	MΩ	$R_L = 100\Omega$
C_{IN}	Input Capacitance	3.5			pF	
R_O	Output Resistance	3	7	10	Ω Max	$R_L = 100\Omega$, $V_{IN} = \pm 2V$
I_S	Supply Current	5	7.5	7.5	mA Max	$R_L = \infty$
V_O	Output Swing	10	10	10	±V Min	$R_L = 100\Omega$, $V_{IN} = \pm 12V$
I_{OUT}	Output Current	200	100	100	mA	$V_{IN} = 12V$

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	CLM4102	CLM4302	UNITS	CONDITIONS
			Limit (Note 5)	Limit (Note 5)		
SR_1	Slew Rate 1	11000	8000	6000	V/µs	V_{IN} = ±10V, R_L = 100Ω (Note 2)
SS_{BW}	Small Signal Bandwidth	400	200	200	MHz	V_{IN} = ±100mV_{PP}, R_L = 100Ω $C_L \leq$ 10pF
P_{BW}	Power Bandwidth	100				V_{IN} = ±4V, R_L = 100Ω $C_L \leq$ 10pF
t_r, t_f	Rise Time Fall Time	1.2	1.7	1.7	ns	R_L = 100Ω, $C_L \leq$ 10pF V_{IN} = 0.5V
t_{pd}	Propagation Delay Time	2.0			ns	R_L = 100Ω, $C_L \leq$ 10pF V_{IN} = 0.5V

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. Slew rate is measured between V_O = +5V and -5V.

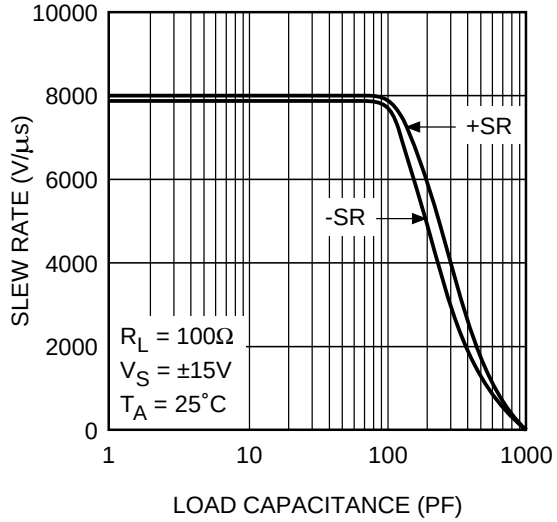
Note 3: The test circuit consists of the human body model of 120pF in series with 1500Ω.

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 $P_D = (T_{J(max)} - T_A)/\theta_{JA}$.

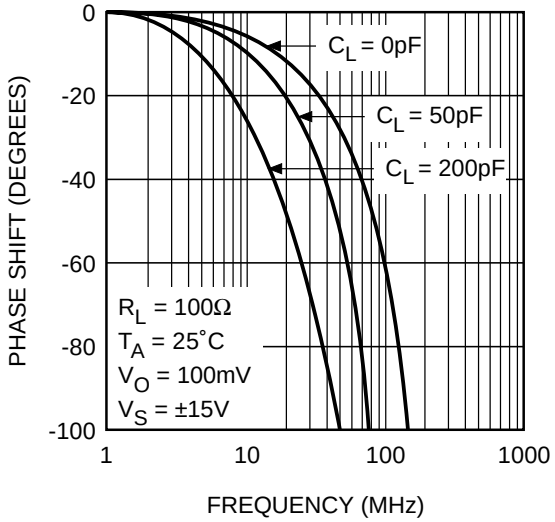
Note 5: Limits are guaranteed by testing, correlation or periodic characterization.

TYPICAL PERFORMANCE CHARACTERISTICS

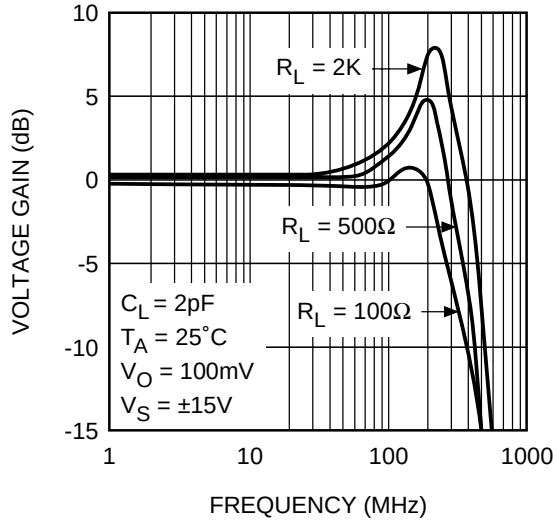
SLEW RATE vs LOAD CAPACITANCE



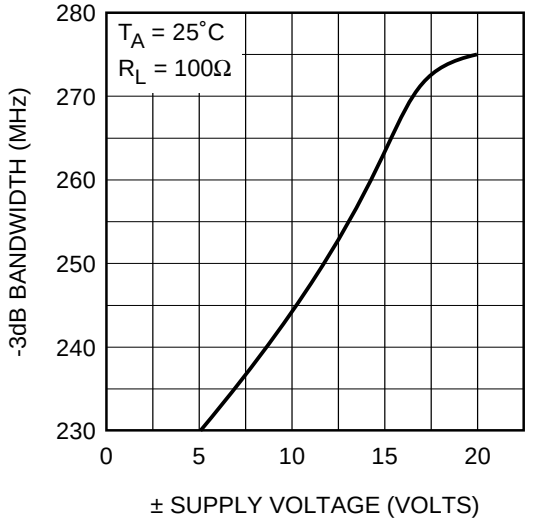
PHASE SHIFT vs FREQUENCY FOR VARIOUS CAPACITIVE LOADS



VOLTAGE GAIN vs FREQUENCY FOR VARIOUS RESISTIVE LOADS

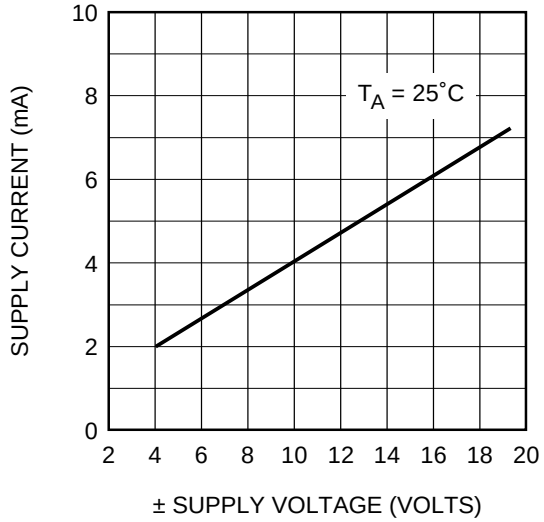


-3dB BANDWIDTH vs SUPPLY VOLTAGE

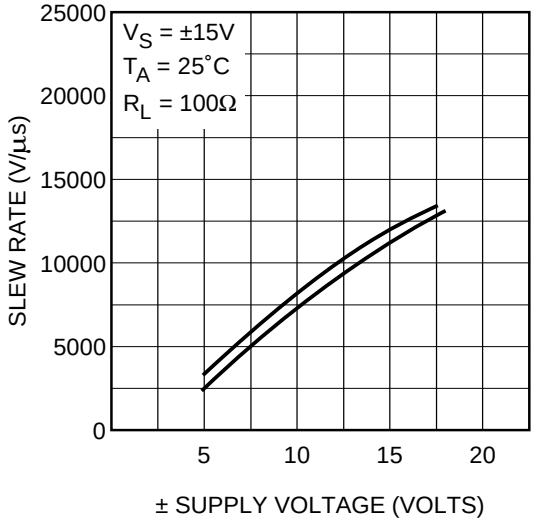


TYPICAL PERFORMANCE CHARACTERISTICS (continued)

SUPPLY CURRENT vs SUPPLY VOLTAGE



SLEW RATE vs SUPPLY VOLTAGE



VOLTAGE GAIN vs FREQUENCY FOR VARIOUS CAPACITIVE LOADS, R_L = 100Ω