CADEKA
Amplify the Human Experience

Comlinear™ CLC1006

Single, 500MHz Voltage Feedback Amplifier

FEATURES

- 500MHz -3dB bandwidth at G=2
- 1,400V/µs slew rate
- 0.06%/0.06° differential gain/ phase error
- 5.5mA supply current
- 6nV/√Hz input voltage noise
- 100mA output current
- Fully specified at 5V and ±5V supplies
- CLC1006: Lead-free SOT23-5

APPLICATIONS

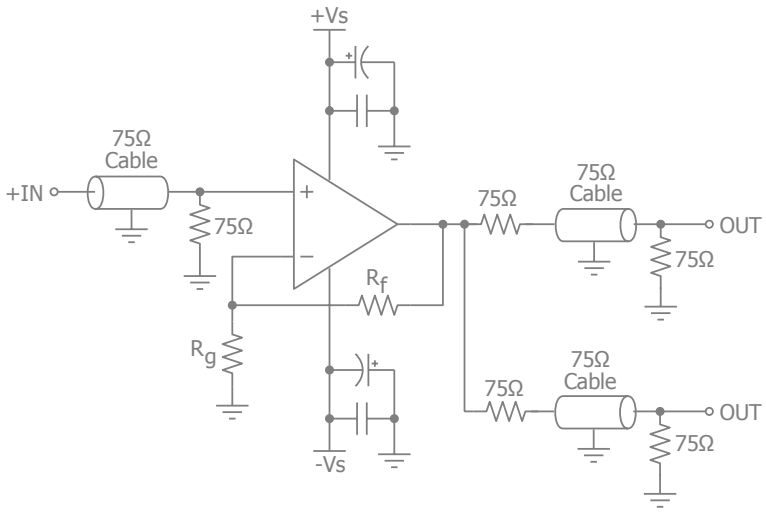
- Video line drivers
- Imaging applications
- Professional cameras
- Differential line receivers
- Photodiode preamps
- Radar or communication receivers

General Description

The *Comlinear* CLC1006 is a high-performance, voltage feedback amplifier that offers bandwidth and slew rate usually found in current feedback amplifiers. The CLC1006 provides 500MHz bandwidth and 1,400V/µs slew rate exceeding the requirements of standard-definition television and other multimedia applications. The *Comlinear* CLC1006 high-performance amplifier also provides ample output current to drive multiple video loads.

The *Comlinear* CLC1006 is designed to operate from ±5V or +5V supplies. It consumes only 5.5mA of supply current. The combination of high-speed, excellent video perfomance, and 10ns settling time make the CLC1006 well suited for use in many general purpose, high-speed applications including standard definition video and imaging applications.

Typical Application - Driving Dual Video Loads



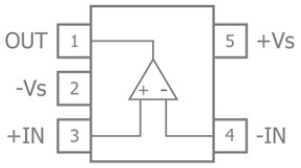
Ordering Information

Part Number	Package	Pb-Free	Operating Temperature Range	Packaging Method
CLC1006IST5X*	SOT23-5	Yes	-40°C to +85°C	Reel
CLC1006IST5*	SOT23-5	Yes	-40°C to +85°C	Rail

*Advance Product Information

Moisture sensitivity level for all parts is MSL-1.

CLC1006 Pin Configuration



CLC1006 Pin Assignments

Pin No.	Pin Name	Description
1	OUT	Output
2	$-V_S$	Negative supply
3	+IN	Positive input
4	-IN	Negative input
5	$+V_S$	Positive supply

Absolute Maximum Ratings

The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the Electrical Characteristics tables are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table defines the conditions for actual device operation.

Parameter	Min	Max	Unit
Supply Voltage	0	14	V
Input Voltage Range	$-V_S$ -0.5V	$+V_S$ +0.5V	V

Reliability Information

Parameter	Min	Typ	Max	Unit
Junction Temperature			150	°C
Storage Temperature Range	-65		150	°C
Lead Temperature (Soldering, 10s)			300	°C
Package Thermal Resistance				
5-Lead SOT23		TBD		°C/W

Notes:
Package thermal resistance (θ_{JA}), JDEC standard, multi-layer test boards, still air.

ESD Protection

Product	SOT23-5
Human Body Model (HBM)	2kV
Charged Device Model (CDM)	1kV

Recommended Operating Conditions

Parameter	Min	Typ	Max	Unit
Operating Temperature Range	-40		+85	°C
Supply Voltage Range	4.5		12	V

Electrical Characteristics at +5V

T_A = 25°C, V_S = +5V, R_f = 150Ω, R_L = 150Ω to V_S/2, G = 2; unless otherwise noted.

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Frequency Domain Response						
UGBW	-3dB Bandwidth	G = +1, V_{OUT} = 0.2V_{pp}		TBD		MHz
BW_{SS}	-3dB Bandwidth	G = +2, V_{OUT} = 0.2V_{pp}		400		MHz
BW_{LS}	Large Signal Bandwidth	G = +2, V_{OUT} = 1V_{pp}		200		MHz
$BW_{0.1dBSS}$	0.1dB Gain Flatness	G = +2, V_{OUT} = 0.2V_{pp}		10		MHz
$BW_{0.1dBLS}$	0.1dB Gain Flatness	G = +2, V_{OUT} = 2V_{pp}		TBD		MHz
Time Domain Response						
t_R, t_F	Rise and Fall Time	V_{OUT} = 1V step; (10% to 90%)		2.2		ns
t_S	Settling Time to 0.1%	V_{OUT} = 1V step		10		ns
OS	Overshoot	V_{OUT} = 0.2V step		TBD		%
SR	Slew Rate	2V step		800		V/µs
Distortion/Noise Response						
HD2	2nd Harmonic Distortion	1V_{pp}, 5MHz		-60		dBc
HD3	3rd Harmonic Distortion	1V_{pp}, 5MHz		-67		dBc
THD	Total Harmonic Distortion	1V_{pp}, 5MHz		-59		dB
IP3	Third-Order Intercept	0.5V_{pp}, 10MHz		35		dBm
SFDR	Spurious-Free Dynamic Range	1V_{pp}, 5MHz		60		dBc
D_G	Differential Gain	NTSC (3.58MHz), DC-coupled, R_L = 150Ω		0.07		%
D_P	Differential Phase	NTSC (3.58MHz), DC-coupled, R_L = 150Ω		0.06		°
e_n	Input Voltage Noise	> 1MHz		6		nV/√Hz
i_n	Input Voltage Noise	> 1MHz		3		pA/√Hz
DC Performance						
V_{IO}	Input Offset Voltage			0		mV
dV_{IO}	Average Drift			6.0		µV/°C
I_{bn}	Input Bias Current			±3.2		µA
dI_b	Average Drift			40		nA/°C
PSRR	Power Supply Rejection Ratio	DC		60		dB
A_{OL}	Open-Loop Gain			TBD		dB
I_S	Supply Current			5.2		mA
Input Characteristics						
R_{IN}	Input Resistance	Non-inverting		4.5		MΩ
C_{IN}	Input Capacitance			1.0		pF
CMIR	Common Mode Input Range			±1.5		V
CMRR	Common Mode Rejection Ratio	DC		50		dB
Output Characteristics						
R_O	Output Resistance	Closed Loop, DC		0.1		Ω
V_{OUT}	Output Voltage Swing	R_L = 150Ω		±1.5		V
		R_L = 1kΩ		TBD		V
I_{OUT}	Output Current			±100		mA
I_{SC}	Short-Circuit Output Current	V_{OUT} = V_S / 2		TBD		mA

Notes:

1.

Electrical Characteristics at ±5V

T_A = 25°C, V_S = ±5V, R_f = 150Ω, R_L = 150Ω, G = 2; unless otherwise noted.

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Frequency Domain Response						
UGBW	-3dB Bandwidth	G = +1, V_{OUT} = 0.2V_{pp}		TBD		MHz
BW_{SS}	-3dB Bandwidth	G = +2, V_{OUT} = 0.2V_{pp}		500		MHz
BW_{LS}	Large Signal Bandwidth	G = +2, V_{OUT} = 2V_{pp}		300		MHz
$BW_{0.1dBSS}$	0.1dB Gain Flatness	G = +2, V_{OUT} = 0.2V_{pp}		15		MHz
$BW_{0.1dBLS}$	0.1dB Gain Flatness	G = +2, V_{OUT} = 2V_{pp}		TBD		MHz
Time Domain Response						
t_R, t_F	Rise and Fall Time	V_{OUT} = 2V step; (10% to 90%)		2.4		ns
t_S	Settling Time to 0.1%	V_{OUT} = 2V step		10		ns
OS	Overshoot	V_{OUT} = 0.2V step		TBD		%
SR	Slew Rate	2V step		1400		V/µs
Distortion/Noise Response						
HD2	2nd Harmonic Distortion	2V_{pp}, 5MHz		-68		dBc
HD3	3rd Harmonic Distortion	2V_{pp}, 5MHz		-63		dBc
THD	Total Harmonic Distortion	2V_{pp}, 5MHz		-62		dB
IP3	Third-Order Intercept	0.5V_{pp}, 10MHz		40		dBm
SFDR	Spurious-Free Dynamic Range	2V_{pp}, 5MHz		63		dBc
D_G	Differential Gain	NTSC (3.58MHz), DC-coupled, R_L = 150Ω		0.06		%
D_P	Differential Phase	NTSC (3.58MHz), DC-coupled, R_L = 150Ω		0.06		°
e_n	Input Voltage Noise	> 1MHz		6		nV/√Hz
i_{ni}	Input Voltage Noise - Inverting	> 1MHz		3		pA/√Hz
DC Performance						
V_{IO}	Input Offset Voltage(1)		-10	0	10	mV
dV_{IO}	Average Drift			6.0		µV/°C
I_b	Input Bias Current (1)		-20	±3.2	20	µA
dI_b	Average Drift			40		nA/°C
PSRR	Power Supply Rejection Ratio (1)	DC	40	60		dB
A_{OL}	Open-Loop Gain			TBD		dB
I_S	Supply Current (1)			5.5	10	mA
Input Characteristics						
R_{IN}	Input Resistance	Non-inverting		4.5		MΩ
C_{IN}	Input Capacitance			1.0		pF
CMIR	Common Mode Input Range			±4.0		V
CMRR	Common Mode Rejection Ratio (1)	DC	40	50		dB
Output Characteristics						
R_O	Output Resistance	Closed Loop, DC		0.1		Ω
V_{OUT}	Output Voltage Swing	R_L = 150Ω (1)	±3.0	±4.0		V
		R_L = 1kΩ		TBD		V
I_{OUT}	Output Current			±100		mA
I_{SC}	Short-Circuit Output Current	V_{OUT} = V_S / 2		TBD		mA

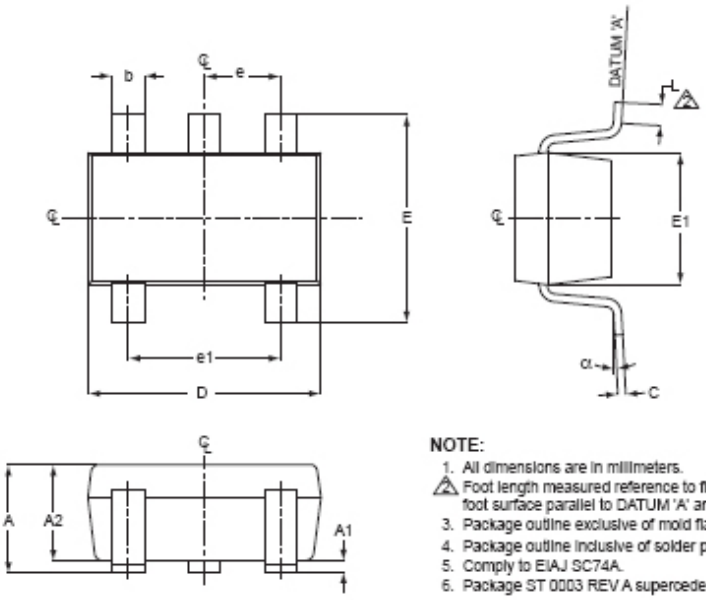
Notes:

1. 100% tested at 25°C

Mechanical Dimensions

SOT23-5 Package

SOT23-5



SYMBOL	MIN	MAX
A	0.90	1.45
A1	0.00	0.15
A2	0.90	1.30
b	0.25	0.50
C	0.09	0.20
D	2.60	3.10
E	2.60	3.00
E1	1.50	1.75
L	0.35	0.55
e	0.95 ref	
e1	1.90 ref	
α	0°	10°

NOTE:

1. All dimensions are in millimeters.
2. Foot length measured reference to flat foot surface parallel to DATUM 'A' and lead surface.
3. Package outline exclusive of mold flash & metal burr.
4. Package outline inclusive of solder plating.
5. Comply to EIAJ SC74A.
6. Package ST 0003 REV A supercedes SOT-D-2005 REV C.

For additional information regarding our products, please visit CADEKA at: cadeka.com

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