Data Sheet

CADEKA
Amplify the Human Experience

Comlinear® CLC1606

1GHz Current Feedback Amplifier

FEATURES

- 1GHz -3dB bandwidth at G=2
- 2,500V/µs slew rate
- 0.01%/0.01° differential gain/ phase error
- 7.5mA supply current
- -60dBc THD at 10MHz
- 120mA output current (easily drives three video loads)
- Fully specified at 5V and ±5V supplies
- CLC1606: Pb-free SOT23-5

APPLICATIONS

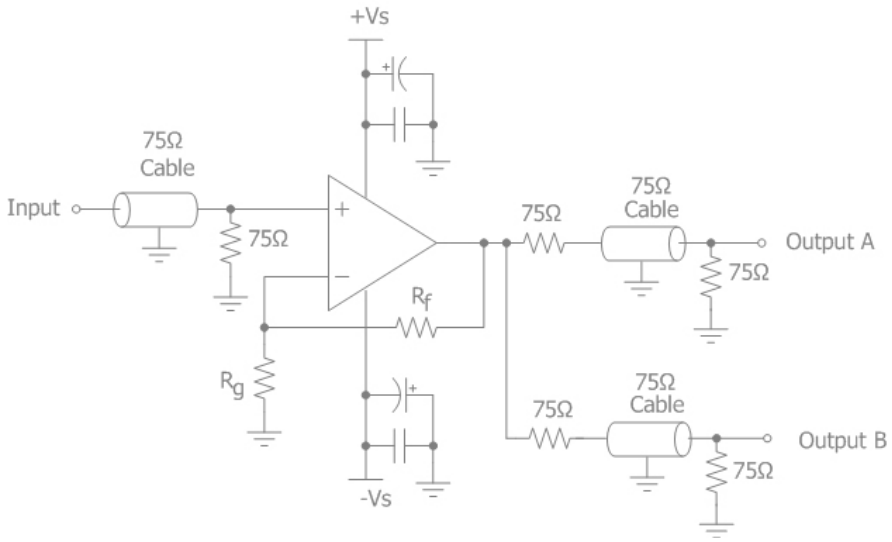
- RGB video line drivers
- High definition video driver
- Video switchers and routers
- ADC buffer
- Active filters
- High-speed instrumentation
- Wide dynamic range IF amp

General Description

The *Comlinear* CLC1606 is a high-performance, current feedback amplifier with superior bandwith and video specifications. The CLC1606 provides 1GHz bandwidth, ±0.1dB gain flatness to 50MHz, and provides 2,500V/µs slew rate exceeding the requirements of high-definition television (HDTV) and other multimedia applications. The *Comlinear* CLC1606 high-performance amplifier also provide ample output current to drive multiple video loads.

The *Comlinear* CLC1606 is designed to operate from ±5V or +5V supplies. It consumes only 7.5mA of supply current. The combination of high-speed and excellent video perfomance make the CLC1606 well suited for use in many general purpose, high-speed applications including standard definition and high definition video. Data communications applications benifit from the CLC1606's total harmonic distortion of -60dBc at 10MHz and fast settling time to 0.1%.

Typical Application - Driving Dual Video Loads

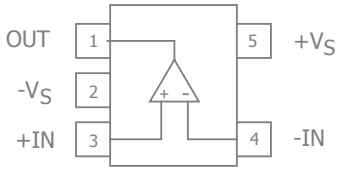


Ordering Information

Part Number	Package	Pb-Free	Operating Temperature Range	Packaging Method
CLC1606IST5X	SOT23-5	Yes	-40°C to +85°C	Reel

Moisture sensitivity level for all parts is MSL-1.

CLC1606 Pin Configuration



CLC1606 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 safety of the device is not guaranteed when it is operated above the "Absolute Maximum Ratings". The device should bot be operated at these "absolute" limits. Adhere to the "Recommended Operating Conditions" for proper device function. The information contained in the Electrical Characteristics tables and Typical Performance plots reflect the operating conditions noted on the tables and plots.

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		221		°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

Notes:

0.8kV between the input pairs +IN and -IN pins only. All other pins are 2kV.

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 = 270Ω, 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} = 0.5V_{pp}		TBD		MHz
BW_{SS}	-3dB Bandwidth	G = +2, V_{OUT} = 0.5V_{pp}		800		MHz
BW_{LS}	Large Signal Bandwidth	G = +2, V_{OUT} = 1V_{pp}		500		MHz
$BW_{0.1dBSS}$	0.1dB Gain Flatness	G = +2, V_{OUT} = 0.5V_{pp}		40		MHz
$BW_{0.1dBLS}$	0.1dB Gain Flatness	G = +2, V_{OUT} = 1V_{pp}		TBD		MHz
Time Domain Response						
t_R, t_F	Rise and Fall Time	V_{OUT} = 1V step; (10% to 90%)		1.2		ns
t_S	Settling Time to 0.1%	V_{OUT} = 1V step		10		ns
OS	Overshoot	V_{OUT} = 0.2V step		1		%
SR	Slew Rate	1V step		1500		V/µs
Distortion/Noise Response						
HD2	2nd Harmonic Distortion	1V_{pp}, 5MHz		-62		dBc
HD3	3rd Harmonic Distortion	1V_{pp}, 5MHz		-60		dBc
THD	Total Harmonic Distortion	1V_{pp}, 5MHz		-57		dB
IP3	Third-Order Intercept	0.5V_{pp}, 10MHz		28		dBm
D_G	Differential Gain	NTSC (3.58MHz), DC-coupled, R_L = 150Ω		0.01		%
D_P	Differential Phase	NTSC (3.58MHz), DC-coupled, R_L = 150Ω		0.01		°
e_n	Input Voltage Noise	> 1MHz		5		nV/√Hz
i_{ni}	Input Current Noise	> 1MHz, Inverting		20		pA/√Hz
		> 1MHz, Non-inverting		30		pA/√Hz
DC Performance						
V_{IO}	Input Offset Voltage			0		mV
dV_{IO}	Average Drift			6.0		µV/°C
I_{bn}	Input Bias Current - Non-Inverting			±3.0		µA
dI_{bn}	Average Drift			40		nA/°C
I_{bi}	Input Bias Current - Inverting			±6.0		µA
dI_{bi}	Average Drift			10		nA/°C
PSRR	Power Supply Rejection Ratio	DC		55		dB
A_{OL}	Open-Loop Transresistance			TBD		mΩ
I_S	Supply Current			6.5		mA
Input Characteristics						
R_{IN}	Input Resistance	Non-inverting		150		kΩ
		Inverting		70		Ω
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
I_{OUT}	Output Current			±120		mA
I_{SC}	Short-Circuit Output Current	V_{OUT} = V_S / 2		±130		mA

Notes:

1.

Electrical Characteristics at ±5V

T_A = 25°C, V_S = ±5V, R_f = 270Ω, R_L = 150Ω, G = 2; unless otherwise noted.

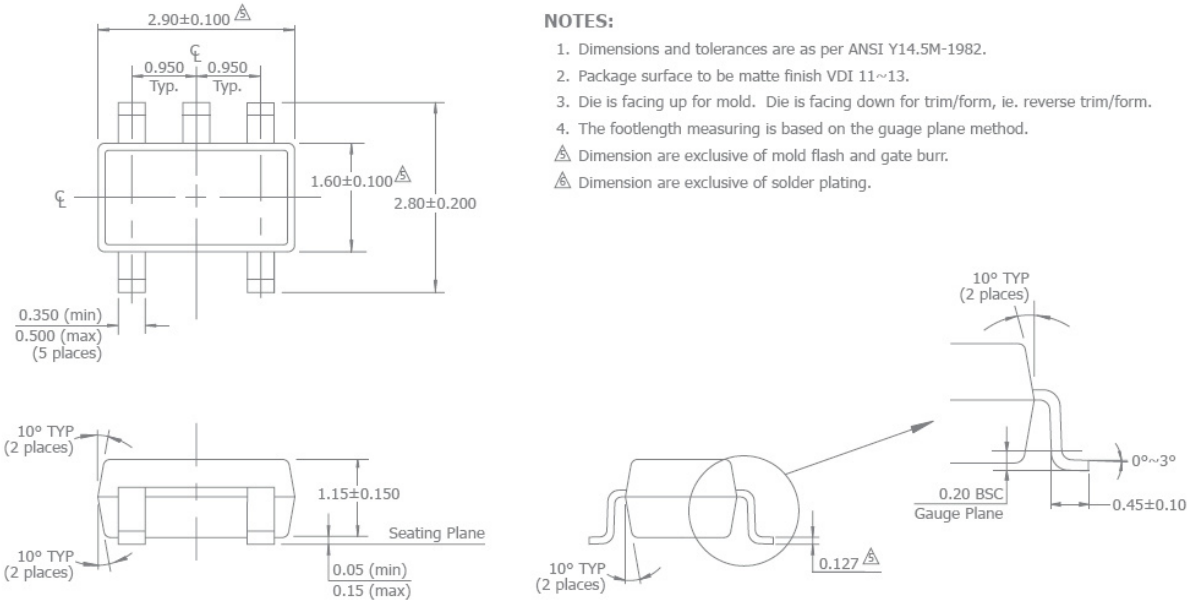
Symbol	Parameter	Conditions	Min	Typ	Max	Units
Frequency Domain Response						
UGBW	-3dB Bandwidth	G = +1, V_{OUT} = 0.5V_{pp}		TBD		MHz
BW_{SS}	-3dB Bandwidth	G = +2, V_{OUT} = 0.5V_{pp}		1000		MHz
BW_{LS}	Large Signal Bandwidth	G = +2, V_{OUT} = 2V_{pp}		800		MHz
$BW_{0.1dBSS}$	0.1dB Gain Flatness	G = +2, V_{OUT} = 0.5V_{pp}		50		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%)		1.5		ns
t_S	Settling Time to 0.1%	V_{OUT} = 2V step		13		ns
OS	Overshoot	V_{OUT} = 0.2V step		1		%
SR	Slew Rate	2V step		2500		V/µs
Distortion/Noise Response						
HD2	2nd Harmonic Distortion	2V_{pp}, 5MHz		-67		dBc
HD3	3rd Harmonic Distortion	2V_{pp}, 5MHz		-72		dBc
THD	Total Harmonic Distortion	2V_{pp}, 5MHz		-70		dB
IP3	Third-Order Intercept	0.5V_{pp}, 10MHz		35		dBm
D_G	Differential Gain	NTSC (3.58MHz), DC-coupled, R_L = 150Ω		0.01		%
D_P	Differential Phase	NTSC (3.58MHz), DC-coupled, R_L = 150Ω		0.01		°
e_n	Input Voltage Noise	> 1MHz		5		nV/√Hz
i_{ni}	Input Current Noise - Inverting	> 1MHz, Inverting		20		pA/√Hz
		> 1MHz, Non-inverting		30		pA/√Hz
DC Performance						
V_{IO}	Input Offset Voltage(1)		-10	0	10	mV
dV_{IO}	Average Drift			6.0		µV/°C
I_{bn}	Input Bias Current - Non-Inverting (1)		-35	±3.0	35	µA
dI_{bn}	Average Drift			40		nA/°C
I_{bi}	Input Bias Current - Inverting (1)		-35	±6.0	35	µA
dI_{bi}	Average Drift			10		nA/°C
PSRR	Power Supply Rejection Ratio (1)	DC	40	55		dB
A_{OL}	Open-Loop Transresistance			TBD		mΩ
I_S	Supply Current (1)			7.5	TBD	mA
Input Characteristics						
R_{IN}	Input Resistance	Non-inverting		150		kΩ
		Inverting		170		k
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
I_{OUT}	Output Current			±120		mA
I_{SC}	Short-Circuit Output Current	V_{OUT} = V_S / 2		±290		mA

Notes:

1. 100% tested at 25°C

Mechanical Dimensions

SOT23-5 Package



NOTES:

1. Dimensions and tolerances are as per ANSI Y14.5M-1982.
2. Package surface to be matte finish VDI 11~13.
3. Die is facing up for mold. Die is facing down for trim/form, ie. reverse trim/form.
4. The footlength measuring is based on the guage plane method.

5 Dimension are exclusive of mold flash and gate burr.

6 Dimension are exclusive of solder plating.

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

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