élantec
HIGH PERFORMANCE ANALOG INTEGRATED CIRCUITS

ELH0002H/883/7801301XX
Current Amplifier

Features

- 400 mA pulsed output current
- DC to 30 MHz bandwidth
- 200 V/μs slew rate
- Low harmonic distortion
- High input impedance—400 kΩ
- Low output impedance—6Ω
- High power efficiency
- Operation from ±5V to ±20V
- Output voltage swing approaches supply voltage
- MIL-STD-883 devices manufactured in U.S.A.

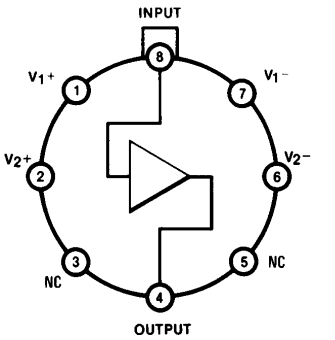
Applications

- Line driver
- 30 MHz buffer
- High-speed D/A conversion
- Instrumentation buffer
- Precision current source

Ordering Information

Part No.	Temp. Range	Pkg.	Outline #
ELH0002H/883B	−55°C to +125°C	TO-5	MDP0001

7801301XX is the DESC version of this device.



Top View

Case is electrically isolated.

General Description

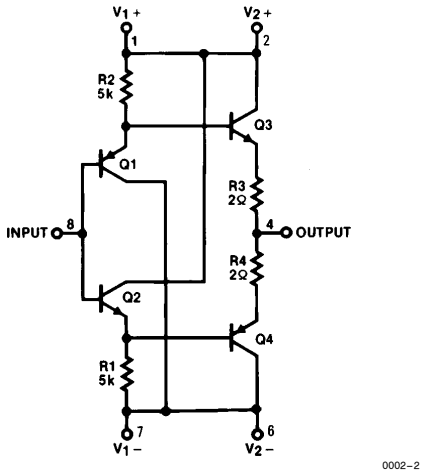
The ELH0002 is a general purpose hybrid current amplifier buffer that is built on a single substrate.

The ELH0002 is ideal for current buffering operational amplifiers without changing the characteristics of the Op Amp. The ELH0002 uses a completely symmetrical circuit to provide a low output impedance when both sourcing and sinking current. This means the output will drive coaxial cables and other capacitive loads with equivalent rise and fall times.

The ELH0002 is specified for operation over the −55°C to +125°C military temperature range.

Elantec facilities comply with MIL-I-45208A and are MIL-STD-1772 certified. Elantec's Military devices comply with MIL-STD-883B Revision C and are manufactured in our rigidly controlled, ultra-clean facilities in Milpitas, California. For additional information on Elantec's Quality and Reliability Assurance Policy and procedures request brochure QRA-1.

Equivalent Schematic



CMS # 0002DS

ELH0002H/883/7801301XX
Current Amplifier

Absolute Maximum Ratings (T_A = 25°C)

V_S	Supply Voltage	±22V	T_A	Operating Temperature Range	
V_{IN}	Input Voltage	±22V		ELH0002	−55°C to +125°C
P_D	Power Dissipation Ambient	600 mW		Steady State Current	±100 mA
T_{ST}	Storage Temperature	−65°C to +150°C		Pulsed Output Current (50 ms On/1 second Off)	±400 mA

Important Note:
All parameters having Min/Max specifications are guaranteed. The Test Level column indicates the specific device testing actually performed during production and Quality inspection. Elantec performs most electrical tests using modern high-speed automatic test equipment, specifically the LTX77 Series system. Unless otherwise noted, all tests are pulsed tests, therefore $T_J = T_C = T_A$.

Test Level	Test Procedure
I	100% production tested and QA sample tested per QA test plan QCX0002.
II	100% production tested at T_A = 25°C and QA sample tested at T_A = 25°C, T_{MAX} and T_{MIN} per QA test plan QCX0002.
III	QA sample tested per QA test plan QCX0002.
IV	Parameter is guaranteed (but not tested) by Design and Characterization Data.
V	Parameter is typical value at T_A = 25°C for information purposes only.

DC Electrical Characteristics V_S = ±12V, $T_{MIN} \le T_A \le T_{MAX}$

Parameter	Description	Test Conditions	ELH0002				Units
			Min	Typ	Max	Test Level	
V_{OS}	Output Offset Voltage	R_S = 300Ω, R_L = 1 kΩ		±10	±30	I	mV
A_V	Voltage Gain	R_S = 10 kΩ, R_L = 1 kΩ, V_{IN} = ±10 V_{dc}	0.95	0.97		I	V/V
R_{IN}	Input Impedance	R_S = 200 kΩ, V_{IN} = ±1 V_{dc}, R_L = 1 kΩ	180	400		I	kΩ
R_{OUT}	Output Impedance	R_S = 50Ω, V_{IN} = ±1 V_{dc}, R_S = 10 kΩ		6Ω			
V_O	Output Voltage Swing	V_{IN} = ±12V, R_L = 1 KΩ	±10	±11		I	V
		V_S = ±15V, V_{IN} = ±12V, R_S = 50Ω, R_L = 100Ω, T_A = 25°C	±10			I	V
I_B	Input Current	R_S = 10 kΩ, R_L = 1 kΩ		±6	±10	I	μA
I_S+	Positive Supply Current	R_S = 10 kΩ, R_L = 1 kΩ		6	10	I	mA
I_S-	Negative Supply Current	R_S = 10 kΩ, R_L = 1 kΩ		−6	−10	I	mA

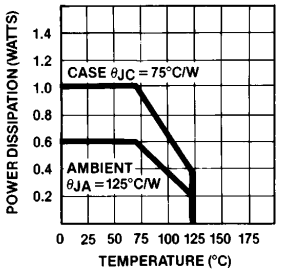
Note 1: Elantec's ELH0002H/200 is tested to the ELH0002 DC limits at −25°C, +25°C and +125°C, and the AC limits at 25°C. In addition, the parts are also tested to the DC limits for V_{OS}, A_{VOL} with R_L = 1 kΩ, I_{IN}, I_S+ and I_S- at 200°C.

AC Electrical Characteristics $V_S = \pm 12V$, $T_A = 25°C$

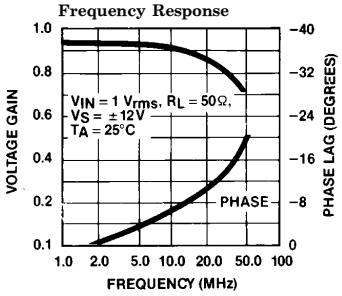
Parameter	Description	Test Conditions	ELH0002				Units
			Min	Typ	Max	Test Level	
A_V	Voltage Gain	$R_S = 10\ k\Omega$, $R_L = 1\ k\Omega$ $V_{IN} = 3\ V_{P-P}$, f = 1 kHz	0.95	0.97		I	V/V
A_I	Current Gain	$V_{IN} = 1\ V_{RMS}$, f = 1 kHz		40			A/mA
R_{IN}	Input Impedance	$R_S = 200\ k\Omega$, $V_{IN} = 1\ V_{RMS}$, $R_L = 1\ k\Omega$, f = 1 kHz	180	400		I	kΩ
R_{OUT}	Output Impedance	$R_L = 50\Omega$, $V_{IN} = 1\ V_{RMS}$, $R_S = 10\ k\Omega$, f = 1 kHz		6	10	I	Ω
HD	Harmonic Distortion	$V_{IN} = 5\ V_{RMS}$, f = 1 kHz		0.1		V	%
t_r	Rise Time	$R_L = 50\Omega$, $\Delta V_{IN} = 100$ mV		7	12	III	ns

Typical Performance Curves

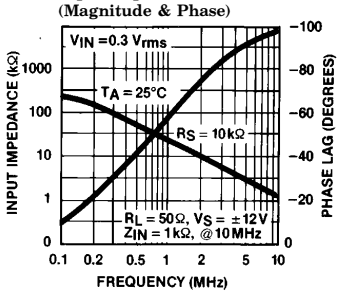
Maximum Power Dissipation



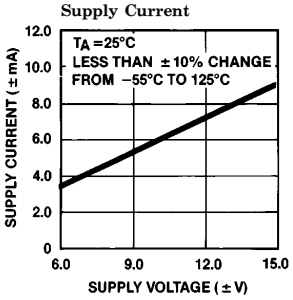
Frequency Response



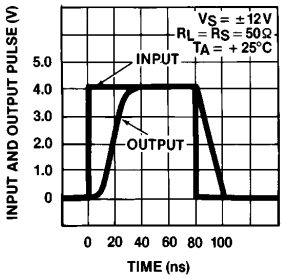
Input Impedance (Magnitude & Phase)



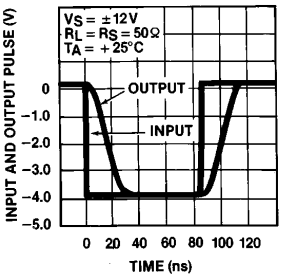
Supply Current



Positive Pulse



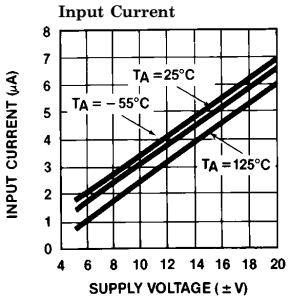
Negative Pulse



0002-3

TD is 2.2in

Typical Performance Curves — Contd.



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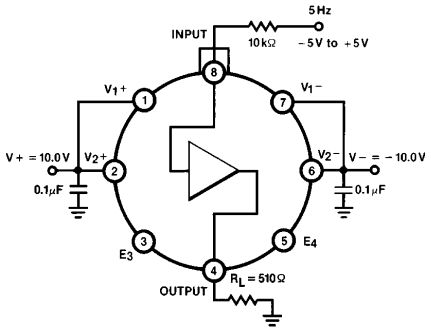
Burn-In Circuit



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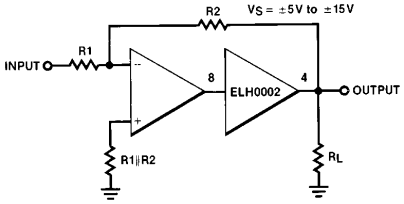
Typical Applications

High Current Operational Amplifier



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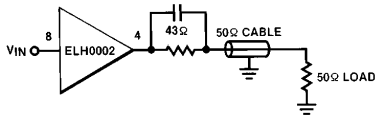
Line Driver



0002–7

Select capacitor to adjust time response of pulse.

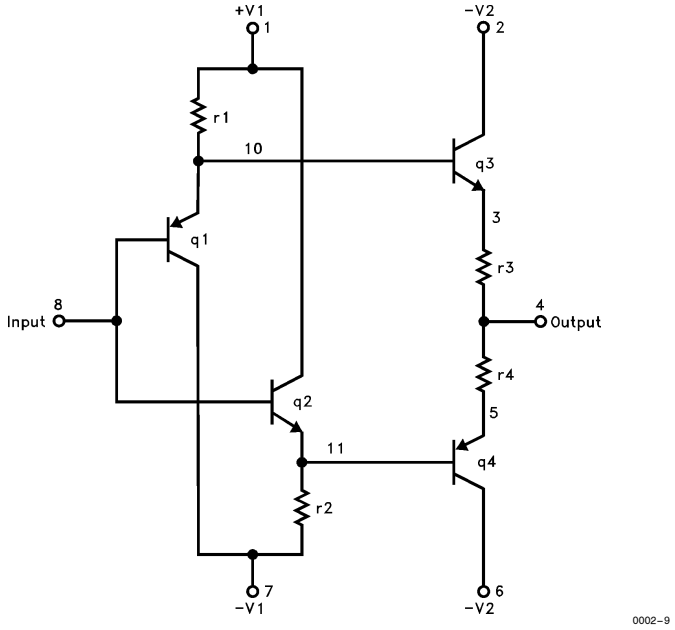
ELH0002 Macromodel

```
* Connections:   input
*                |       V1+
*                |       |       V2+
*                |       |       |       V1−
*                |       |       |       |       V2−
*                |       |       |       |       |       output
*                |       |       |       |       |       |
.subckt M0002    8       1       2       7       6       4
* Models
.model qp pnp (is=10e−14 bf=300 vaf=60 ikf=200mA var=6V br=9
+rb=30 cje=40pF cjc=15pF tf=1nS xtb=2.0)
.model qn npn (is=10e−14 bf=200 vaf=200 ikf=200mA var=12V br=8
+rb=30 cje=27pF cjc=10pF tf=1nS xtb=2.0)
* Resistors
r1 1 10 5K
r2 11 7 5K
r3 3 4 2.0
r4 5 4 2.0
* Transistors
q1 7 8 10 qp
q4 6 11 5 qp
q2 1 8 11 qn
q3 2 10 3 qn
.ends
```

TABWIDE

TD is 3.2in

ELH0002 Macromodel — Contd.



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Current Amplifier

General Disclaimer

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July 1991 Rev G

Printed in U.S.A.

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