PRELIMINARY | Data Sheet | February 26, 2004 | FN7384.1

200MHz Amplifiers

The EL5150, EL5151, EL5250, EL5251, and EL5451 are 200MHz bandwidth -3dB voltage mode feedback amplifiers with DC accuracy of 0.01%, 1mV offsets and 10kV/V open loop gains. These amplifiers are ideally suited for applications ranging from precision measurement instrumentation to high speed video and monitor applications. Capable of operating with as little as 1.4mA of current from a single supply ranging from 5V to 12V dual supplies ranging from ±2.5V to ±5.0V, these amplifiers are also well suited for handheld, portable and battery-powered equipment.

Single amplifiers are offered in SOT-23 packages and duals in a 10-pin MSOP package for applications where board space is critical. Quad amplifiers are available in a 14-pin SO package. Additionally, singles and duals are available in the industry-standard 8-pin SO package. All parts operate over the industrial temperature range of -40°C to +85°C.

Ordering Information

PART NUMBER	PACKAGE	TAPE & REEL	PKG. DWG. #
EL5150IS	8-Pin SO	-	MDP0027
EL5150IS-T7	8-Pin SO	7”	MDP0027
EL5150IS-T13	8-Pin SO	13”	MDP0027
EL5150IW-T7	6-Pin SOT-23	7” (3K pcs)	MDP0038
EL5150IW-T7A	6-Pin SOT-23	7” (250 pcs)	MDP0038
EL5151IW-T7	5-Pin SOT-23	7” (3K pcs)	MDP0038
EL5151IW-T7A	5-Pin SOT-23	7” (250 pcs)	MDP0038
EL5250IY	10-Pin MSOP	-	MDP0043
EL5250IY-T7	10-Pin MSOP	7”	MDP0043
EL5250IY-T13	10-Pin MSOP	13”	MDP0043
EL5251IS	8-Pin SO	-	MDP0027
EL5251IS-T7	8-Pin SO	7”	MDP0027
EL5251IS-T13	8-Pin SO	13”	MDP0027
EL5251IY	8-Pin MSOP	-	MDP0043
EL5251IY-T7	8-Pin MSOP	7”	MDP0043
EL5251IY-T13	8-Pin MSOP	13”	MDP0043
EL5451IS	14-Pin SO	-	MDP0027
EL5451IS-T7	14-Pin SO	7”	MDP0027
EL5451IS-T13	14-Pin SO	13”	MDP0027

Features

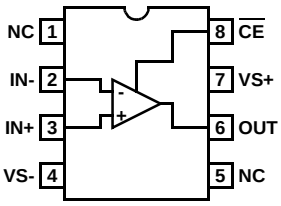
- 200MHz -3dB bandwidth
- 110V/µs slew rate
- Very high open loop gains 50kV/V
- Low supply current = 1.4mA
- Single supplies from 5V to 12V
- Dual supplies from ±2.5V to ±5V
- Fast disable on the EL5150 and EL5250
- Low cost

Applications

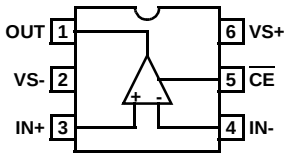
- Imaging
- Instrumentation
- Video
- Communications devices

Pinouts

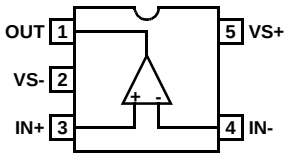
EL5150
(8-PIN SO)
TOP VIEW



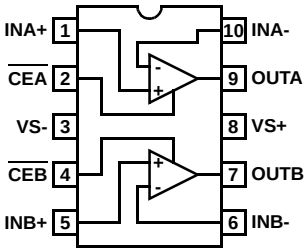
EL5150
(6-PIN SOT-23)
TOP VIEW



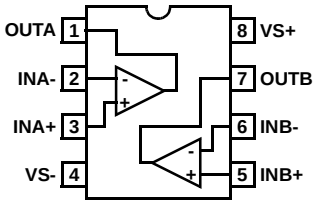
EL5151
(5-PIN SOT-23)
TOP VIEW



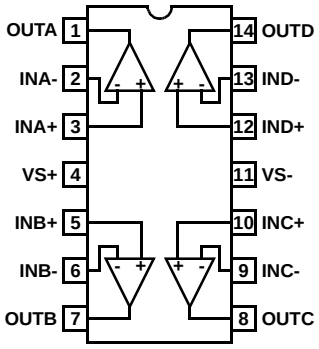
EL5250
(10-PIN MSOP)
TOP VIEW



EL5251
(8-PIN MSOP)
TOP VIEW



EL5451
(14-PIN SO)
TOP VIEW



Absolute Maximum Ratings (T_A = 25°C)

Supply Voltage between V_S and GND 12V
Maximum Continuous Output Current 40mA
Pin Voltages . . . . . GND -0.5V to V_S +0.5V
Power Dissipation . . . . . See Curves

Junction Temperature . . . . . -40°C to +125°C
Storage Temperature . . . . . -65°C to +150°C
Ambient Operating Temperature . . . . . -40°C to +85°C
Current into I_N+, I_N-, CE 5mA

CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

IMPORTANT NOTE: All parameters having Min/Max specifications are guaranteed. Typical values are for information purposes only. Unless otherwise noted, all tests are at the specified temperature and are pulsed tests, therefore: $T_J = T_C = T_A$

Electrical Specifications

V_S+ = +5V, V_S- = ±5V, R_L = 150Ω, T_A = 25°C, unless otherwise specified.

PARAMETER	DESCRIPTION	CONDITIONS	MIN	TYP	MAX	UNIT
AC PERFORMANCE						
BW	-3dB Bandwidth	A_V = +1, R_L = 500Ω		200		MHz
		A_V = +2, R_L = 150Ω		36		MHz
GBWP	Gain Bandwidth Product	A_V = 500		86		MHz
BW1	0.1dB Bandwidth	A_V = +1, R_L = 500Ω		10		MHz
SR	Slew Rate	V_O = ±2.5V, A_V = +2	50	67		V/µs
		V_O = ±3.0V, A_V = 1, R_L = 500Ω		100		V/µs
t_S	0.1% Settling Time	V_{OUT} = -1V to +1V, A_V = -2		80		ns
dG	Differential Gain Error (Note 1)	A_V = +2, R_L = 150Ω		0.1		%
dP	Differential Phase Error (Note 1)	A_V = +2, R_L = 150Ω		1.17		°
V_N	Input Referred Voltage Noise			12		nV/√Hz
I_N	Input Referred Current Noise			1.6		pA/√Hz
DC PERFORMANCE						
V_{OS}	Offset Voltage		-1	0.5	1	mV
T_CV_{OS}	Input Offset Voltage Temperature Coefficient	Measured from T_{MIN} to T_{MAX}		-2		µV/°C
A_{VOL}	Open Loop Gain		15	56		kV/V
INPUT CHARACTERISTICS						
CMIR	Common Mode Input Range	Guaranteed by CMRR test	TBD		TBD	V
CMRR	Common Mode Rejection Ratio		85	100		dB
I_B	Input Bias Current		-100	20	+100	mA
I_{OS}	Input Offset Current		-30	6	30	nA
R_{IN}	Input Resistance		80	170		MΩ
C_{IN}	Input Capacitance			1		pF
OUTPUT CHARACTERISTICS						
V_{OUT}	Output Voltage Swing Low	R_L = 150Ω to GND	±2.5	±2.8		V
		R_L = 500Ω to GND	±3.1	±3.4		V
I_{OUT}	Output Current	R_L = 10Ω to GND	±40	±70		mA
ENABLE (SELECTED PACKAGES ONLY)						
t_{EN}	Enable Time			170		ns
t_{DIS}	Disable Time			1.25		µs
I_{IHCE}	$\overline{CE}$ Pin Input High Current	$\overline{CE}$ = V_S+		0	-1	µA

Electrical Specifications $V_S+ = +5V$, $V_S- = \pm5V$, $R_L = 150\Omega$, $T_A = 25°C$, unless otherwise specified. **(Continued)**

PARAMETER	DESCRIPTION	CONDITIONS	MIN	TYP	MAX	UNIT
I_{ILCE}	$\overline{CE}$ Pin Input Low Current	$\overline{CE} = V_S-$	5	13	25	µA
V_{IHCE}	$\overline{CE}$ Input High Voltage for Power-down		$V_S+ -1$			V
V_{ILCE}	$\overline{CE}$ Input Low Voltage for Power-down				$V_S+ -3$	V
SUPPLY						
I_{SON}	Supply Current - Enabled (per amplifier)	No load, $V_{IN} = 0V$, CE = +5V	1.12	1.35	1.6	mA
I_{SOFF}	Supply Current - Disabled	No load, $V_{IN} = 0V$	5	13	25	µA
PSRR	Power Supply Rejection Ratio	DC, $V_S = \pm3.0V$ to $\pm6.0V$	80	110		dB

NOTE:

1. Standard NTSC test, AC signal amplitude = $286mV_{P-P}$, f = 3.58MHz, V_{OUT} is swept from 0.8V to 3.4V, R_L is DC coupled

Typical Performance Curves

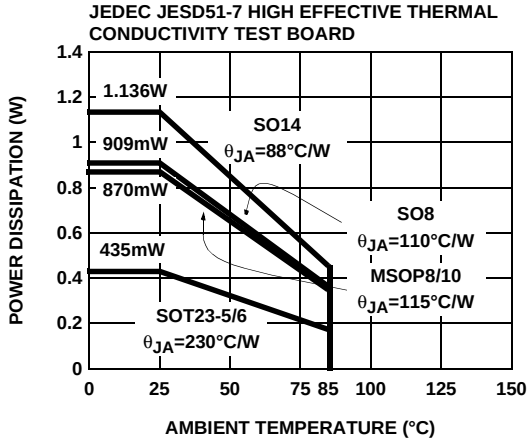


FIGURE 1. PACKAGE POWER DISSIPATION vs AMBIENT TEMPERATURE

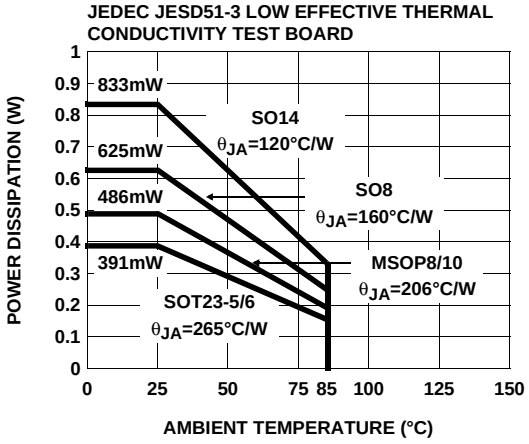


FIGURE 2. PACKAGE POWER DISSIPATION vs AMBIENT TEMPERATURE