600MHz Current Feedback Amplifiers with Enable

élantec

The EL5164, EL5165, and EL5364 are current feedback amplifiers with a very high bandwidth of 600MHz. This makes these amplifiers ideal for today's high speed video and monitor applications.

With a supply current of just 5mA and the ability to run from a single supply voltage from 5V to 12V, the amplifiers are also ideal for hand held, portable or battery-powered equipment.

The EL5164 also incorporates an enable and disable function to reduce the supply current to 100µA typical per amplifier. Allowing the $\overline{CE}$ pin to float or applying a low logic level will enable the amplifier.

The EL5165 is offered in the 5-pin SOT23 package, EL5164 is available in the 6-pin SOT23 and the industry-standard 8-pin SO packages, and the EL5364 in a 16-pin SO and 16-pin QSOP packages. All operate over the industrial temperature range of -40°C to +85°C.

Ordering Information

PART NUMBER	PACKAGE	TAPE & REEL	PKG. DWG. #
EL5164IS	8-Pin SO	-	MDP0027
EL5164IS-T7	8-Pin SO	7"	MDP0027
EL5164IS-T13	8-Pin SO	13"	MDP0027
EL5164IW-T7	6-Pin SOT23	7"	MDP0038
EL5164IW-T13	6-Pin SOT23	13"	MDP0038
EL5165IW-T7	5-Pin SOT23	7"	MDP0038
EL5165IW-T13	5-Pin SOT23	13"	MDP0038
EL5364IS (Note)	16-Pin SO	-	MDP0027
EL5364IS-T7	16-Pin SO	7"	MDP0027
EL5364IS-T13	16-Pin SO	13"	MDP0027
EL5364IU (Note)	16-Pin QSOP	-	MDP0040
EL5364IU-T7	16-Pin QSOP	7"	MDP0040
EL5364IU-T13	16-Pin QSOP	13"	MDP0040

NOTE: Triples to be released October 2003

Features

- 600MHz -3dB bandwidth
- 4000V/µs slew rate
- 5mA supply current
- Single and dual supply operation, from 5V to 12V supply span
- Fast enable/disable (EL5164 only)
- Available in SOT-23 packages
- Dual (EL5264 & EL5265) and triple (EL5362 & EL5363) also available
- High speed, 1GHz product available (EL5166 & EL5167)
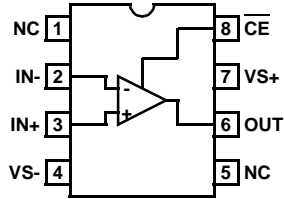- 300MHz product available (EL5162 family)

Applications

- Video amplifiers
- Cable drivers
- RGB amplifiers
- Test equipment
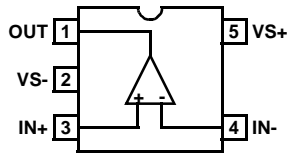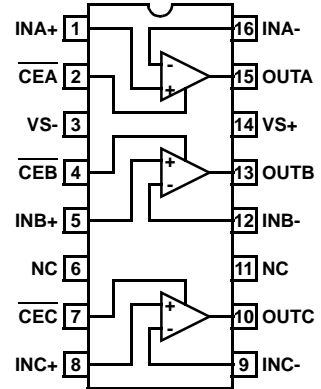- Instrumentation
- Current to voltage converters
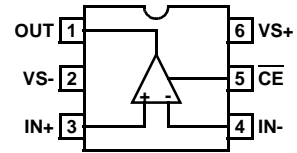
Pinouts

EL5164
(8-PIN SO)
TOP VIEW

NC	1	8	$\overline{CE}$
IN-	2	7	VS+
IN+	3	6	OUT
VS-	4	5	NC

EL5165
(5-PIN SOT-23)
TOP VIEW

OUT	1	5	VS+
VS-	2		
IN+	3	4	IN-

EL5364
(16-PIN SO, QSOP)
TOP VIEW

INA+	1	16	INA-
$\overline{CEA}$	2	15	OUTA
VS-	3	14	VS+
$\overline{CEB}$	4	13	OUTB
INB+	5	12	INB-
NC	6	11	NC
$\overline{CEC}$	7	10	OUTC
INC+	8	9	INC-

EL5164
(6-PIN SOT-23)
TOP VIEW

OUT	1	6	VS+
VS-	2	5	$\overline{CE}$
IN+	3	4	IN-

Absolute Maximum Ratings (T$_A$ = 25°C)

Supply Voltage between V$_S$+ and V$_S$- 13.2V
Maximum Continuous Output Current 50mA
Pin Voltages . . . . V$_S$- -0.5V to V$_S$+ +0.5V
Operating Junction Temperature . . . . 125°C

Power Dissipation . . . . See Curves
Storage Temperature . . . . -65°C to +150°C
Operating Temperature . . . . -40°C to +85°C

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$_F$ = 750Ω for A$_V$ = 1, R$_F$ = 375Ω for A$_V$ = 2, R$_L$ = 150Ω, V$_{ENABLE}$ = V$_S$+ - 1V, 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		630		MHz
		A$_V$ = +2, R$_L$ = 150Ω		450		MHz
BW1	0.1dB Bandwidth	A$_V$ = +2, R$_L$ = 150Ω		50		MHz
SR	Slew Rate	V$_{OUT}$ = -3V to +3V, A$_V$ = +2, R$_L$ = 100Ω	3500	4700	7000	V/µs
t$_S$	0.1% Settling Time	V$_{OUT}$ = -2.5V to +2.5V, A$_V$ = +2, R$_F$ = R$_G$ = 1kΩ		15		ns
e$_N$	Input Voltage Noise	f = 1MHz		2.1		nV/√Hz
i$_N$-	IN- Input Current Noise	f = 1MHz		13		pA/√Hz
i$_N$+	IN+ Input Current Noise	f = 1MHz		13		pA/√Hz
HD2		5MHz, 2.5V$_{P-P}$		-81		dBc
HD3		5MHz, 2.5V$_{P-P}$		-74		dBc
IP3		100Ω				
		500Ω				
dG	Differential Gain Error (Note 1)	A$_V$ = +2		0.01		%
dP	Differential Phase Error (Note 1)	A$_V$ = +2		0.01		°
DC PERFORMANCE						
V$_{OS}$	Offset Voltage		-3.5	0	+3.5	mV
T$_C$V$_{OS}$	Input Offset Voltage Temperature Coefficient	Measured from T$_{MIN}$ to T$_{MAX}$		3		µV/°C
R$_{OL}$+	Transimpedance		1.1	3		MΩ
R$_{OL}$-	Transimpedance		1.1	3		MΩ
INPUT CHARACTERISTICS						
CMIR	Common Mode Input Range		±3	±3.3		V
CMRR	Common Mode Rejection Ratio		50	62	75	dB
-ICMR	- Input Current Common Mode Rejection		-1	0.1	1	µA/V
+I$_{IN}$	+ Input Current		-10	2	10	µA
-I$_{IN}$	- Input Current		-10	2	10	µA
R$_{IN}$	Input Resistance	+ Input	300	650	1200	kΩ
C$_{IN}$	Input Capacitance			1		pF

Electrical Specifications $V_S+ = +5V$, $V_S- = -5V$, $R_F = 750\Omega$ for $A_V = 1$, $R_F = 375\Omega$ for $A_V = 2$, $R_L = 150\Omega$, $V_{ENABLE} = V_S+ - 1V$, $T_A = 25°C$ unless otherwise specified.

PARAMETER	DESCRIPTION	CONDITIONS	MIN	TYP	MAX	UNIT
OUTPUT CHARACTERISTICS						
V_O	Output Voltage Swing	$R_L = 150\Omega$ to GND	±3.6	±3.8	±4.0	V
		$R_L = 1k\Omega$ to GND	±3.9	±4.18	±4.2	V
I_{OUT}	Output Current	$R_L = 10\Omega$ to GND	100	140	190	mA
SUPPLY						
I_{SON}	Supply Current - Enabled	No load, $V_{IN} = 0V$	3.2	3.5	3.82	mA
I_{SOFF+}	Supply Current		-2	0	2	µA
I_{SOFF-}	Supply Current - Disabled (EL5164 only)	No load, $V_{IN} = 0V$	-25	-14	-5	µA
PSRR	Power Supply Rejection Ratio	DC, $V_S = ±4.75V$ to ±5.25V	65	79	90	dB
-IPSR	- Input Current Power Supply Rejection	DC, $V_S = ±4.75V$ to ±5.25V	-1	0	1	µA/V
ENABLE (EL5164 ONLY)						
t_{EN}	Enable Time			200		ns
t_{DIS}	Disable Time			800		ns
I_{IHCE}	$\overline{CE}$ Pin Input High Current	$\overline{CE} = V_S+$	5	10	25	µA
I_{ILCE}	$\overline{CE}$ Pin Input Low Current	$\overline{CE} = V_S-$	-1	0	1	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

NOTE:

1. Standard NTSC test, AC signal amplitude = 286mV_{P-P}, f = 3.58MHz

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