élantec
HIGH PERFORMANCE ANALOG INTEGRATED CIRCUITS

EL1511C

Medium Power Differential Line Driver

Features

- Drives up to 360mA from a +12V supply
- $16V_{P-P}$ differential output drive into 25Ω and $20V_{P-P}$ differential output drive into 100Ω
- -85dBc typical driver output distortion at full output at 150kHz
- Low quiescent current of 4mA per amplifier at ½ I_S current mode
- Disable down to 1.5mA

Applications

- ADSL CSA line driving
- ADSL full rate CPE line driving
- G.SHDSL, HDSL2 line driver
- Video distribution amplifier
- Video twisted-pair line driver

Ordering Information

Part No	Package	Tape & Reel	Outline #
EL1511CS	16-Pin SOIC		MDP00XX
EL1511CL	16-Pin LPP		MDP00XX

General Description

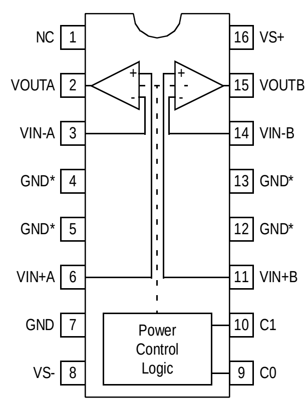
The EL1511C is a dual operational amplifier designed for customer premise line driving in DMT ADSL solutions. This device features a high drive capability of 360mA while consuming only 7.5mA of supply current per amplifier and operating from a single 5 to 12V supply. This driver achieves a typical distortion of less than -85dBc, at 150kHz into a 25Ω load. The EL1511C is available in the thermally-enhanced 16-pin SOIC as well as the 16-pin LPP package. Both are specified for operation over the full -40°C to +85°C temperature range.

The EL1511C has two control pins, C0 and C1 which allow the selection of full I_S power, ¾ I_S, ½ I_S, and power down modes.

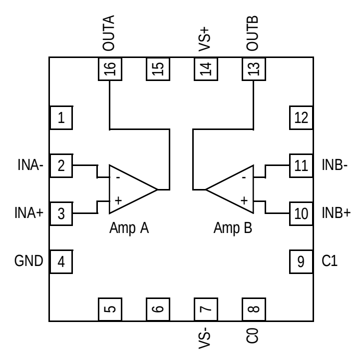
The EL1511C is ideal for ADSL, SDSL, and HDSL2 line driving applications for single power supply, high voltage swing, and low power.

The EL1511C maintains excellent distortion and load driving capabilities even in the lowest power settings.

Connection Diagram



16-Pin SOIC



16-Pin LPP Top View

* These GND pins are heat spreaders

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Absolute Maximum Ratings (T_A = 25°C)

Values beyond absolute maximum ratings can cause the device to be prematurely damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

V_S+ to V_S- Supply Voltage	14.6V
V_S+ Voltage to Ground	-0.3V to +14.6V
V_S- Voltage to Ground	-14.6V to 0.3V
Input C_0/C_1 to Ground	7V
V_{IN}+ Voltage	V_S- to V_S+
Current into any Input	8mA
Continuous Output Current	75mA
Operating Temperature Range	-40°C to +85°C
Storage Temperature Range	-60°C to +150°C
Operating Junction Temperature	-40°C to +150°C
Power Dissipation	See Curves
ESD Voltage	2kV

Important Note:

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

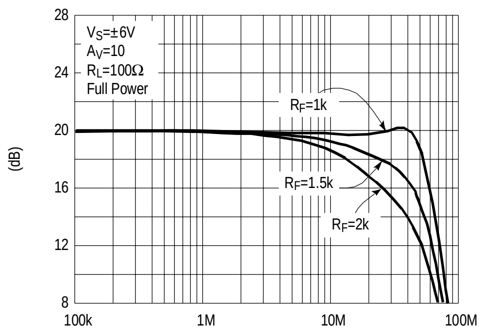
Electrical Characteristics

V_S = +12V, R_F = 1.5kΩ, R_L = 75Ω to mid supply, T_A = 25°C unless otherwise specified.

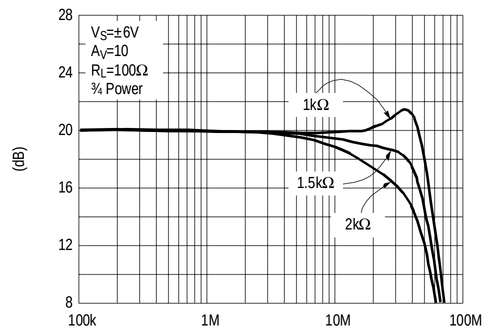
Parameter	Description	Conditions	Min	Typ	Max	Unit
AC Performance						
BW	-3dB Bandwidth	A_V = +4		70		MHz
HD	Total Harmonic Distortion	f = 150kHz, V_O = 16V_{P-P}, R_L = 25Ω		-85		dBc
dG	Differential Gain	A_V = +2, R_L = 37.5Ω		0.17		%
dθ	Differential Phase	A_V = +2, R_L = 37.5Ω		0.1		°
SR	Slewrate	V_{OUT} from -4.5V to +4.5V		500		V/µS
DC Performance						
V_{OS}	Offset Voltage		-20		20	mV
ΔV_{OS}	V_{OS} Mismatch		-10		10	mV
R_{OL}	Transimpedance	V_{OUT} from -4.5V to +4.5V		1.4		MΩ
Input Characteristics						
I_B+	Non-Inverting Input Bias Current		-3		3	µA
I_B-	Inverting Input Bias Current		-30		30	µA
ΔI_B-	I_B- Mismatch		-40		40	µA
e_N	Input Noise Voltage			2.8		nV/√Hz
i_N	-Input Noise Current			19		pA/√Hz
Output Characteristics						
V_{OUT}	Loaded Output Swing (single ended)	R_L = 100Ω to GND		11		V
		R_L = 25Ω to GND		9.4		V
I_{OUT}	Output Current	R_L = 0Ω		1		A
Supply						
V_S	Supply Voltage	Single Supply	5		12	V
$I_S+_{(Full Power)}$	Positive Supply Current per Amplifier	All Outputs at 0V, $C_0 = C_1$ = 0V		7	8	mA
$I_S-_{(Full Power)}$	Negative Supply Current per Amplifier	All Outputs at 0V, $C_0 = C_1$ = 0V		-6.4	-7.1	mA
$I_S+_{(Low Power)}$	Positive Supply Current per Amplifier	All Outputs at 0V, C_0 = 5V, C_1 = 0V		5.3	6	mA
$I_S-_{(Low Power)}$	Negative Supply Current per Amplifier	All Outputs at 0V, C_0 = 5V, C_1 = 0V		-4.7	-5.3	mA
$I_S+_{(Terminate)}$	Positive Supply Current per Amplifier	All Outputs at 0V, C_0 = 0V, C_1 = 5V		3.3	3.8	mA
$I_S-_{(Terminate)}$	Negative Supply Current per Amplifier	All Outputs at 0V, C_0 = 0V, C_1 = 5V		-2.7	-3.1	mA
$I_S+_{(Power Down)}$	Positive Supply Current per Amplifier	All Outputs at 0V, $C_0 = C_1$ = 5V		0.6	2	mA
$I_S-_{(Power Down)}$	Negative Supply Current per Amplifier	All Outputs at 0V, $C_0 = C_1$ = 5V		0	1.5	mA
I_{GND}	GND Supply Current per Amplifier	All Outputs at 0V		0.6	2	mA

Typical Performance Curves

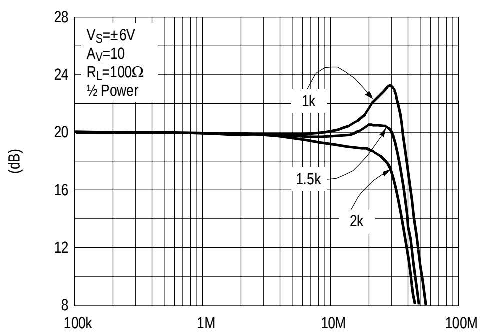
Differential Frequency Response vs R_F



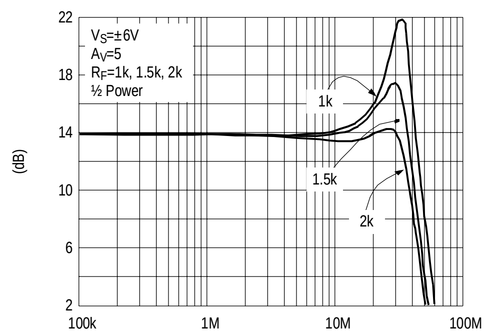
Differential Frequency vs R_F



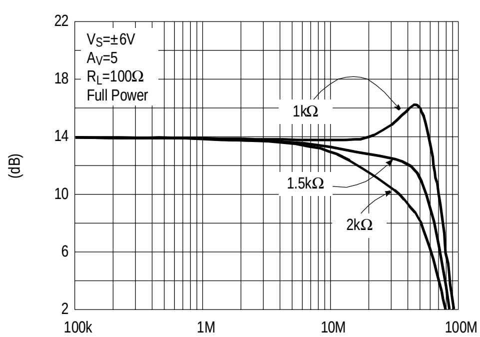
DIfferential Frequency Response vs R_F



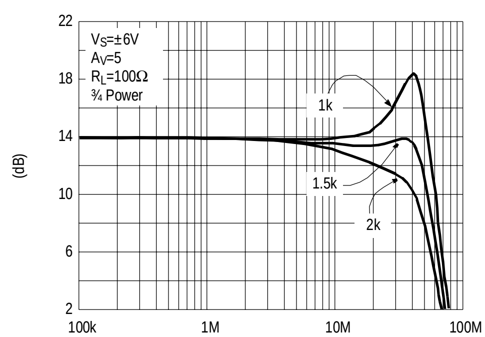
DIfferential Frequency Response vs R_F



DIfferential Frequency Response vs R_F



DIfferential Frequency Response vs R_F



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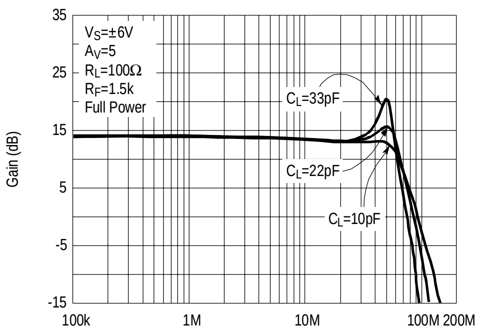
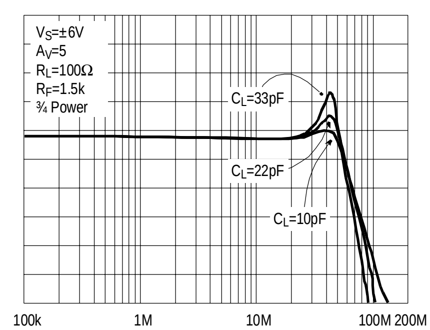
Typical Performance Curves

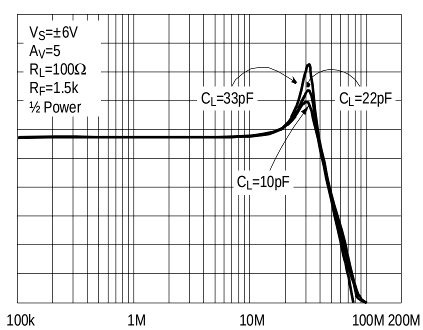
Differential Frequency Response vs C_{LOAD}



Differential Frequency Response vs C_{LOAD}



Differential Frequency vs C_{LOAD}



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General Disclaimer

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