LX1734

1.2MHz Inverting DC/DC Converter

PRELIMINARY

DESCRIPTION

The LX1734 is an inverting DC/DC current-mode controller. With a 1A integrated switch, the LX1734 can generate large output currents in a small footprint. The LX1734 minimizes external component size and cost by implementing a high switching frequency of 1.2MHz, while generating -5V at 250mA or -12V at 100mA.

The LX1734 operates in a dual inductor inverting topology that filters both the input side and output side current. Very low output voltage ripple approaching $1mV_{P-P}$ can be achieved when used in conjunction with ceramic output capacitors.

Fixed frequency operation ensures a clean output free from low frequency noise typically present with charge pump solutions. The low impedance output remains within 1% of nominal during large load steps. The 20V switch allows high voltage outputs to be generated.

The LX1734 is available in the space saving 5-lead SOT-23 package, enabling a complete inverter function that utilizes only 0.3 inches square of PCB space.

IMPORTANT: For the most current data, consult *MICROSEMI*'s website: **http://www.microsemi.com**

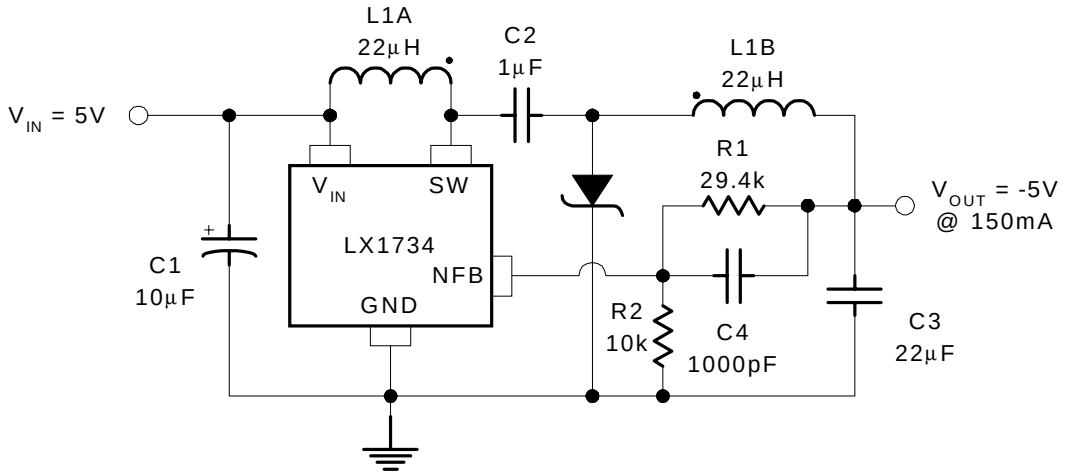
KEY FEATURES

- Fixed Frequency 1.2MHz Operation
- Very Low Noise: 1mVP-P Output Ripple
- Stable Operation With Ceramic or Tantalum Capacitors
- -5V at 250mA from 5V Input
- -12V at 100mA from 5V Input
- Uses Small Surface Mount L/C Components
- Wide Input Range: 4V to 10V
- Low VCESAT Switch: 600mV at 1A
- 5-Lead SOT-23 Package

APPLICATIONS/BENEFITS

- Disk Drive MR Head Bias
- Digital Camera CCD Bias
- LCD Bias
- GaAs FET Bias
- Local -5V or -12V Supplies

PRODUCT HIGHLIGHT



Note: L1A and L1B are shown as coupled. If individual inductors are used then: L1=L2=47µH
C1, C2, C3 are ceramic capacitors

PACKAGE ORDER INFO

T_A (°C)	SE Plastic SOT-23 5-Pin
0 to 85	LX1734-CSE

Note: Available in Tape & Reel.
Append the letter "T" to the part number. (i.e. LX1734-CSET)

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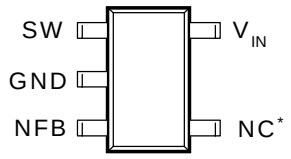
Microsemi
Linfinity Microelectronics Division
11861 Western Avenue, Garden Grove, CA. 92841, 714-898-8121, Fax: 714-893-2570

ABSOLUTE MAXIMUM RATINGS

Supply Voltage (V_{IN}) 16V
SW Voltage ..... -0.4V to 20V
NFB Voltage ..... -2V
Current Into NFB Pin ..... ±1mA
Operating Temperature Range ..... 0°C to 85°C
Maximum Junction Temperature ..... 125°C
Storage Temperature ..... -65°C to 150°C
Lead Temperature (Soldering, 10sec) ..... 300°C

Note: Exceeding these ratings could cause damage to the device. All voltages are with respect to Ground. Currents are positive into, negative out of specified terminal.

PACKAGE PIN OUT



SE PACKAGE
(TOP VIEW)
*Not Internally Connected

THERMAL DATA

SE **Plastic SOT-23 5-Pin**

THERMAL RESISTANCE-JUNCTION TO AMBIENT, θ_{JA}	220°C/W

Junction Temperature Calculation: $T_J = T_A + (P_D \times \theta_{JC})$.
The θ_{JA} numbers are guidelines for the thermal performance of the device/pc-board system. All of the above assume no ambient airflow.

FUNCTIONAL PIN DESCRIPTION

NAME	DESCRIPTION
SW	Power Switch Pin
GND	Common ground reference
NFB	Feedback Pin - Connect to a resistive divider in order to set the output voltage. Feedback threshold is -1.242V. Given the typical NFB bias current (I_{NFB}) of 4µA flows out of the pin, the suggested value for R2 is 10K. Given R_2, set R_1 according to: $$R_1 = \frac{\lvert V_{OUT}\rvert - 1.242}{\frac{1.242}{R_2} + (I_{NFB})}$$
V_{IN}	Input Supply – Input pin must be locally bypassed.

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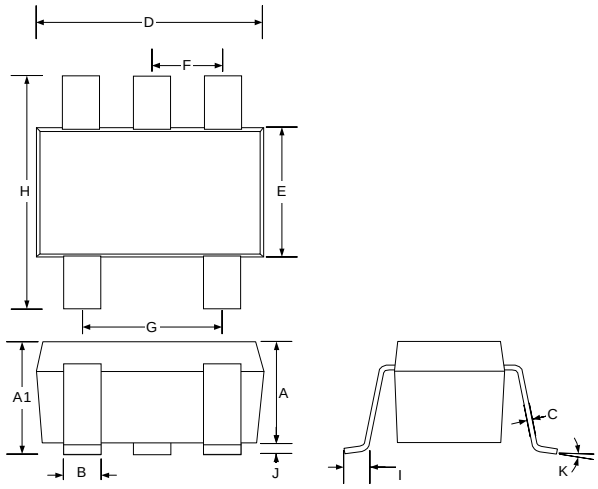
ELECTRICAL CHARACTERISTICS

Unless otherwise specified, the following specifications apply over the operating ambient temperature $0°C \leq T_A \leq 85°C$ and the following test conditions: $V_{IN} = 5V$

Parameter	Symbol	Test Conditions	LX1734			Units
			Min	Typ	Max	
Minimum Operating Voltage	V_{IN}				4	V
Maximum Operating Voltage	V_{IN}				10	V
Reference Voltage	V_{NFB}		-1.217	-1.242	-1.267	V
Reference Voltage Line Regulation		$4V \leq V_{IN} \leq 10V$			0.25	%/V
NFB Pin Bias Current	I_{NFB}			-4	-8	µA
Quiescent Current	I_Q	(Regulator Not Switching)		0.25	1	mA
		I_{OUT} = 1mA			5	mA
Switching Frequency			0.9		1.4	MHz
Maximum Duty Cycle			82			%
Switch V_{CESAT}		I_{SW} = 350mA		270	350	mV
		I_{SW} = 700mA		600	750	
Switch Leakage Current		V_{SW} = 10V			1	µA
Switch Circuit Current Limit		Duty Cycle < 50%	1			A
Maximum Switch Voltage	V_{SW}				20	V

PACKAGE DIMENSIONS

SE 5-Pin SOT-23



Dim	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.90	1.30	0.035	0.051
A1	0.90	1.45	0.035	0.057
B	0.25	0.50	0.010	0.020
C	0.09	0.20	0.004	0.008
D	2.80	3.10	0.110	0.122
E	1.50	1.75	0.059	0.069
F	0.95 BSC		0.038 BSC	
G	1.90 BSC		0.075 BSC	
H	2.60	3.00	0.102	0.118
I	0.35	0.55	0.014	0.022
J	0.00	0.15	0.000	0.006
K	10° MAX		10° MAX	

Note: Dimensions do not include mold flash or protrusions; these shall not exceed 0.155mm(.006") on any side. Lead dimension shall not include solder coverage.

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