



# R&E International

A Subsidiary of Microchip Technology Inc.

## RE46C117

DC to DC Converter and Piezoelectric Horn Driver  
Product Specification

### General Description

The RE46C117 is intended for use in 3V or 4.5V battery or battery-backed applications. The circuit features a DC-to-DC up-converter and driver circuit suitable for driving a piezoelectric horn

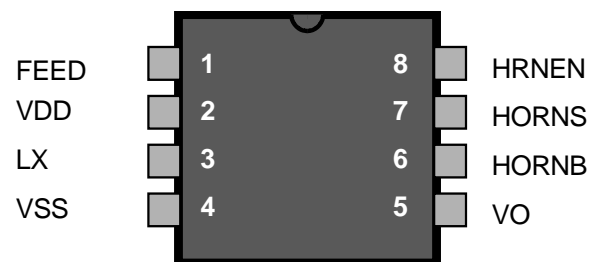
### Applications

Smoke detectors  
CO Detectors  
Personal Security Products  
Electronic Toys

### Features

- Low Quiescent Current
- 10V Up Converter
- Low Horn Driver Ron
- Available in Standard Packaging or RoHS Compliant Pb Free Packaging

### Pin Configuration



### ABSOLUTE MAXIMUM RATINGS

#### PARAMETER

Supply Voltage

Input Voltage Range Except FEED

FEED Input Voltage Range

Input Current except FEED

Operating Temperature

Storage Temperature

Continuous Operating Current  
(HornS, HornB, VO)

#### SYMBOL

$V_{DD}$

$V_{OUT}$

$V_{in}$

$V_{infd}$

$I_{in}$

$T_A$

$T_{STG}$

$I_O$

#### VALUE

5

12

-.3 to  $V_{dd} + .3$

-10 to +22

10

0 to 50

-55 to 125

40

#### UNITS

V

V

V

V

mA

°C

°C

mA

Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only and operation at these conditions for extended periods may affect device reliability.

This product utilizes CMOS technology with static protection; however proper ESD prevention procedures should be used when handling this product. Damage can occur when exposed to extremely high static electrical charge



## Electrical Characteristics

Limits apply at Vdd=3V, Vss=0V, Cvo=10uF, TA=0°C to 50°C, unless otherwise noted.  
Typical values are at TA=27°C.

Parameter	Symbol	Test Conditions	Limits			Units
			Min	Typ	Max	
Supply Voltage	Vdd	Operating	2.0	—	5.0	V
Standby Supply Current	Iddstby	HRNEN low; No loads; DC-DC Running	—	14	—	uA
Quiescent Supply Current	Iddq	HRNEN low; No loads; VO=5V; Vlx=0.5V	—	7	10.5	uA
Quiescent Ivo	Ivoq	Same conditions as above for Iddq	—	4	7.5	uA
Input Leakage	Iin	HRNEN Input, Vin=VDD or VSS	-100	—	100	nA
	Iihf	FEED=+22V; VO=10V	—	20	50	uA
	Iilf	FEED=-10V; VO=10V	-50	-15	—	uA
Input Voltage Low	Vil	HRNEN Input	—	—	1	V
Input Voltage High	Vih	HRNEN Input	2.3	—	—	V
Output Low Voltage	Vol1	HORNB or HORNS; Iout=16mA; Vdd=3V	—	.3	.5	V
Output High Voltage	Voh1	HORNB or HORNS; VO=10V; Iout=-16mA; Vdd=HRNEN=3V	9.5	9.7	—	V
VO Output Voltage	Vvo1	Vdd=3V; HRNEN=3V; Iout=10mA	8.5	10	11	V
	Vvo2	Vdd=3V; HRNEN=0V; Iout=10mA	3.5	4	4.4	V
VO Efficiency	Voeff1	Iload= 10mA, Vdd=3V; HRNEN=0V	—	85	—	%
	Voeff2	Iload=100uA; Vdd=3V; HRNEN=0V	—	75	—	%
Brownout Threshold	Vobvt	Falling edge of VO	3.2	3.6	4.0	V

### Notes on Electrical Characteristics:

1. DC-DC converter in high boost mode (normal VO=10V) can draw current pulses of greater than 1 Amp and is therefore very sensitive to series resistance. Critical components of this resistance are the inductor DC resistance, the internal resistance of the battery and the resistance in the connections from the inductor to the battery, from the inductor to the LX pin and from the Vss2 pin to the battery. In order to function properly under full load at Vdd=2V, the total of the inductor and the interconnect resistances should not exceed 0.3 ohm. The internal battery resistance should be no more than 0.5 ohm and a low ESR capacitor of 10uF or more should be connected in parallel with the battery to average current over the boost converter cycle.
2. In the Electrical Characteristics Table, wherever a specific VO value is listed under test conditions, the VO is forced externally with the inductor disconnected and the DC-DC converter is not running.
3. The brown-out threshold voltage is the VO voltage at which the horn will be disabled.
4. The limits shown are 100% tested at 25C only. Test limits are guard-banded based on temperature characterization to guarantee compliance at temperature extremes.

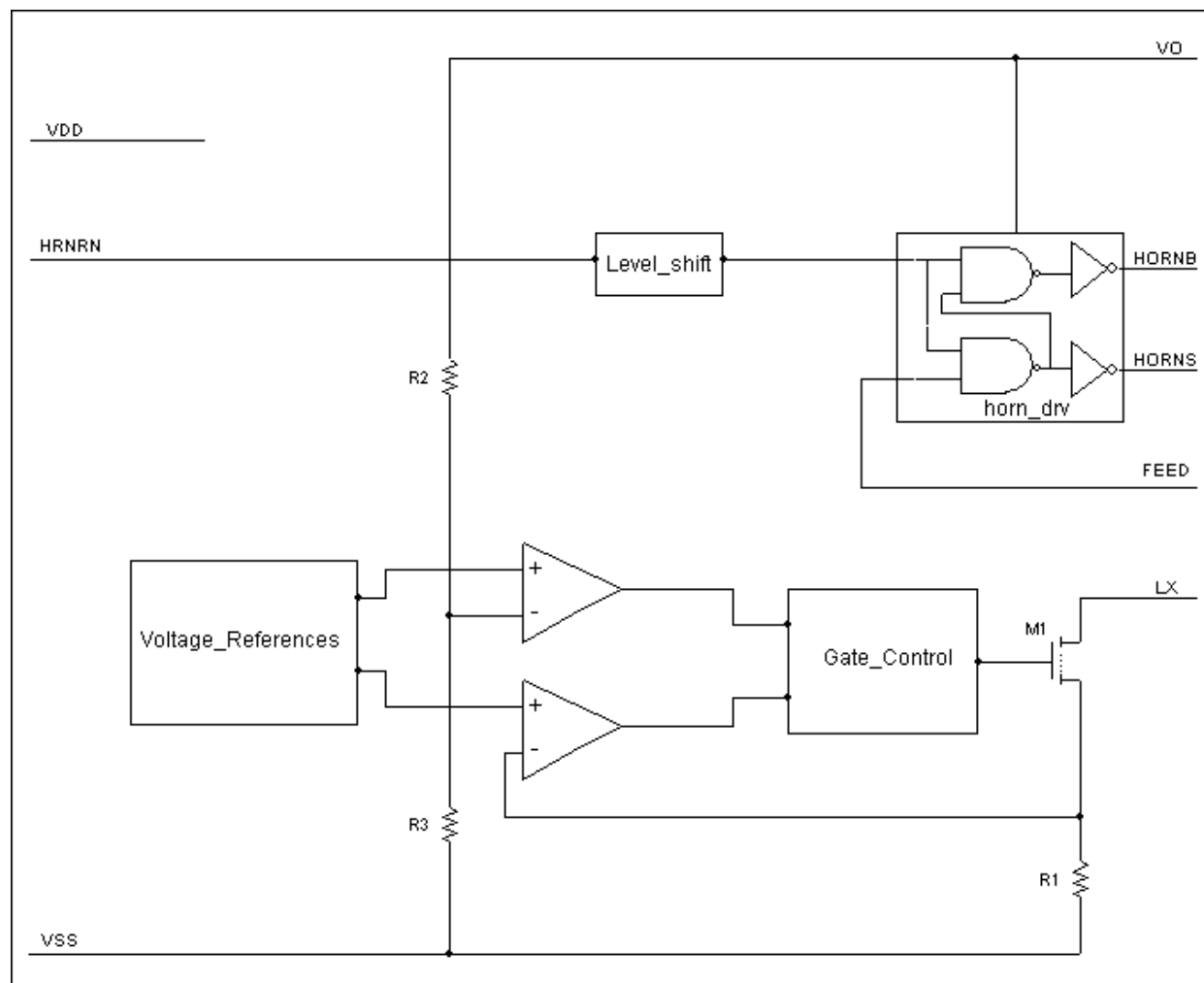
# RE46C117

DC to DC Converter and Piezoelectric Horn Driver  
Product Specification



**R&E International**  
A Subsidiary of Microchip Technology Inc.

## Functional Block Diagram



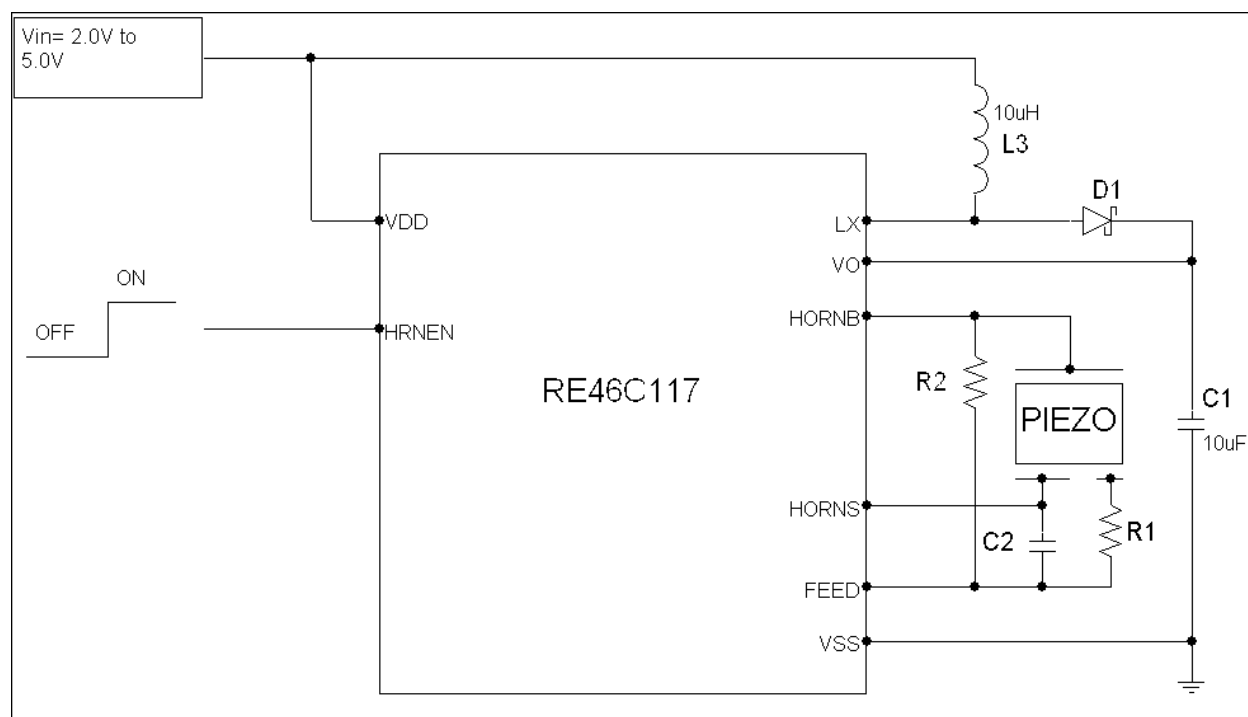
# RE46C117

DC to DC Converter and Piezoelectric Horn Driver  
Product Specification



**R&E International**  
A Subsidiary of Microchip Technology Inc.

## Typical Application Circuit



### Notes:

1/ Schottky diode D1 must have maximum peak current rating of at least 1.5A and for best results should have forward voltage spec of less than 0.5V at 1 Amp.

2/ Inductor L3 must have maximum peak current rating of at least 1.5A and for best results should have DC resistance of less than 0.5 ohm.

# **RE46C117**

**DC to DC Converter and Piezoelectric Horn Driver**  
*Product Specification*



**R&E International**  
*A Subsidiary of Microchip Technology Inc.*

---

## **Notes**

# RE46C117

## DC to DC Converter and Piezoelectric Horn Driver Product Specification



**R&E International**

A Subsidiary of Microchip Technology Inc.

Information contained in this publication regarding device applications and the like is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications. MICROCHIP MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION, INCLUDING BUT NOT LIMITED TO ITS CONDITION, QUALITY, PERFORMANCE, MERCHANTABILITY OR FITNESS FOR PURPOSE. Microchip disclaims all liability arising from this information and its use. Use of Microchip devices in life support and/or safety applications is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold harmless Microchip from any and all damages, claims, suits, or expenses resulting from such use. No licenses are conveyed, implicitly or otherwise, under any Microchip intellectual property rights.

### Trademarks

The Microchip name and logo, the Microchip logo, Accuron, dsPIC, KEELQ, KEELQ logo, MPLAB, PIC, PICmicro, PICSTART, rfPIC, SmartShunt and UNI/O are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.


FilterLab, Hampshire, Linear Active Thermistor, MXDEV, MXLAB, SEEVAL, SmartSensor and The Embedded Control Solutions Company are registered trademarks of Microchip Technology Incorporated in the U.S.A.

Analog-for-the-Digital Age, Application Maestro, CodeGuard, dsPICDEM, dsPICDEM.net, dsPICworks, dsSPEAK, ECAN, ECONOMONITOR, FanSense, In-Circuit Serial Programming, ICSP, ICEPIC, Mindi, MiWi, MPASM, MPLAB Certified logo, MPLIB, MPLINK, mTouch, nanoWatt XLP, PICkit, PICDEM, PICDEM.net, PICTail, PIC<sup>32</sup> logo, PowerCal, PowerInfo, PowerMate, PowerTool, REAL ICE, rfLAB, Select Mode, Total Endurance, TSHARC, WiperLock and ZENA are trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

SQTP is a service mark of Microchip Technology Incorporated in the U.S.A.

All other trademarks mentioned herein are property of their respective companies.

© 2009, Microchip Technology Incorporated, Printed in the U.S.A., All Rights Reserved.

 Printed on recycled paper.

### QUALITY MANAGEMENT SYSTEM

CERTIFIED BY DNV

**== ISO/TS 16949:2002 ==**

Microchip received ISO/TS-16949:2002 certification for its worldwide headquarters, design and wafer fabrication facilities in Chandler and Tempe, Arizona; Gresham, Oregon and design centers in California and India. The Company's quality system processes and procedures are for its PIC<sup>®</sup> MCUs and dsPIC<sup>®</sup> DSCs, KEELQ<sup>®</sup> code hopping devices, Serial EEPROMs, microperipherals, nonvolatile memory and analog products. In addition, Microchip's quality system for the design and manufacture of development systems is ISO 9001:2000 certified.

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Microchip:](#)

[RE46C117E8F](#) [RE46C117S8F](#) [RE46C117S8TF](#)