



R&E International

A Subsidiary of Microchip Technology Inc.

RE46C105

Piezoelectric Horn Driver with Voltage Regulator and LED Driver

Product Specification

General Description

The RE46C105 is a piezoelectric horn driver with a voltage regulator and an open drain NMOS driver suitable for use with a light emitting diode. It is intended for 9V battery applications which require a low voltage logic supply. The regulator can be operated at either 3.3V or 5V. The horn feedback control pin is designed for use with self-oscillating piezoelectric horn but can also be used in direct drive applications. A low battery detection circuit is also provided.

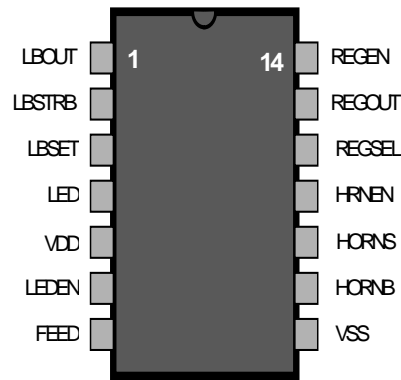
Applications

- Smoke detectors
- CO Detectors
- Personal Security Products
- Electronic Toys

Features

- Low Quiescent Current
- Low Horn Driver Ron
- Voltage Regulation to 3.3V or 5V
- Low Battery Detection
- Available in DIP and SOIC packaging
- Available in Standard Packaging or RoHS Compliant Pb Free Packaging

Pin Configuration



Absolute maximum ratings

| | |
|--|-----------------------------------|
| Supply Voltage V_{DD} | -5V to +14V |
| Input voltage Range V_{in} | -.3V to $V_{DD}+3V$, except FEED |
| FEED Input Voltage Range V_{inf} | -10V to +22V |
| Input Current I_{in} | 10mA, except FEED |
| Operating Temperature | -40 to 85°C |
| Continuous Output Current (HornS, HornB) | 30mA |
| Continuous Output Current (REGOUT) | 55mA |

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 charges.

RE46C105

Piezoelectric Horn Driver with Voltage Regulator and LED Driver
Product Specification



R&E International
A Subsidiary of Microchip Technology Inc.

Electrical Characteristics at $T_A = 25^\circ\text{C}$, $V_{DD} = 9\text{V}$, $V_{SS} = 0\text{V}$ (unless otherwise noted).

| Parameter | Test Pin | Test Conditions | Limits | | | Units |
|---|------------------------------|---|--------|------|------|---------------|
| | | | Min | Typ | Max | |
| Supply Voltage | Vdd | Operating | 6.0 | 9.0 | 13.8 | V |
| Standby Supply Current | Vdd | Hrnen=Lbstrb=Leden=Vss Regen=Vdd; No Loads | | | 3.5 | μA |
| Input Leakage | Hrnen,Leden, Lbstrb,Regen | Vin=Vdd or Vss | -100 | | 100 | nA |
| | FEED | Feed = +22V | | 20 | 50 | μA |
| | FEED | Feed = -10V | -50 | -15 | | μA |
| Input Voltage Low | Hrnen,Leden, Lbstrb,Regen | | | | 1.0 | V |
| Input Voltage High | Hrnen,Leden Lbstrb,Regen | | 2.3 | | | V |
| Output Low Voltage | Horns or Hornb | lout=16mA Vdd=9V | | 0.3 | 0.5 | V |
| | | Vdd=7.2V | | | 0.9 | V |
| | LED | lout=10mA Vdd=7.2V | | 0.5 | 1.0 | V |
| | LBout | lout=100 μA | | 0.3 | 0.5 | V |
| Output High Voltage | Horns or Hornb | lout=-16mA Vdd=9V | 8.5 | 8.7 | | V |
| | | Vdd=7.2V | 6.3 | | | V |
| | LBout | lout=-100 μA Regsel=Vdd | 4.5 | 4.75 | | V |
| | | Regsel=Vss | 2.8 | 3.0 | | V |
| Low Battery Voltage Threshold | Vdd | Lbstrb=Vdd, Vdd decreasing in voltage $T_A = -40$ to 85°C See note #3 | 7.2 | | 7.80 | V |
| Low Battery Voltage Hysteresis | Lbstrb | Lbstrb=Vdd Vdd increasing in voltage | | 300 | | mV |
| Lbstrb to Lbout Active delay | Lbstrb, Lbout | Lbstrb=Vdd | | 500 | | μs |
| Regulator Voltage | Regout | lout<50mA Regsel=Vdd | 4.75 | 5.0 | 5.25 | V |
| | | lout<50mA Regsel=Vss $T_A = -40$ to 85°C See note #3 | 3.10 | 3.3 | 3.50 | V |
| Line Regulation | Regout | 6V<Vdd<12V No load | | 30 | | mV |
| Load Regulation | Regout | 0mA<lout<50mA | | 100 | | mV |
| Brown-Out Threshold Voltage *See note #1 | Vdd | Regsel=Vdd or Vss Falling edge of Vdd | 4.5 | 5.0 | 5.5 | V |
| Brown-Out Pull Down Current | Regout | Vdd=4.5V; Regout=2V | 15 | 25 | | mA |
| Regout Overvoltage Clamp *See note #2 | Regout | Regsel=Vdd; lout > 1mA | 5.5 | 6.0 | 6.5 | V |
| | | Regsel=Vss; lout > 1mA | 3.7 | 4.0 | 4.3 | V |

RE46C105

Piezoelectric Horn Driver with Voltage Regulator and LED Driver
Product Specification

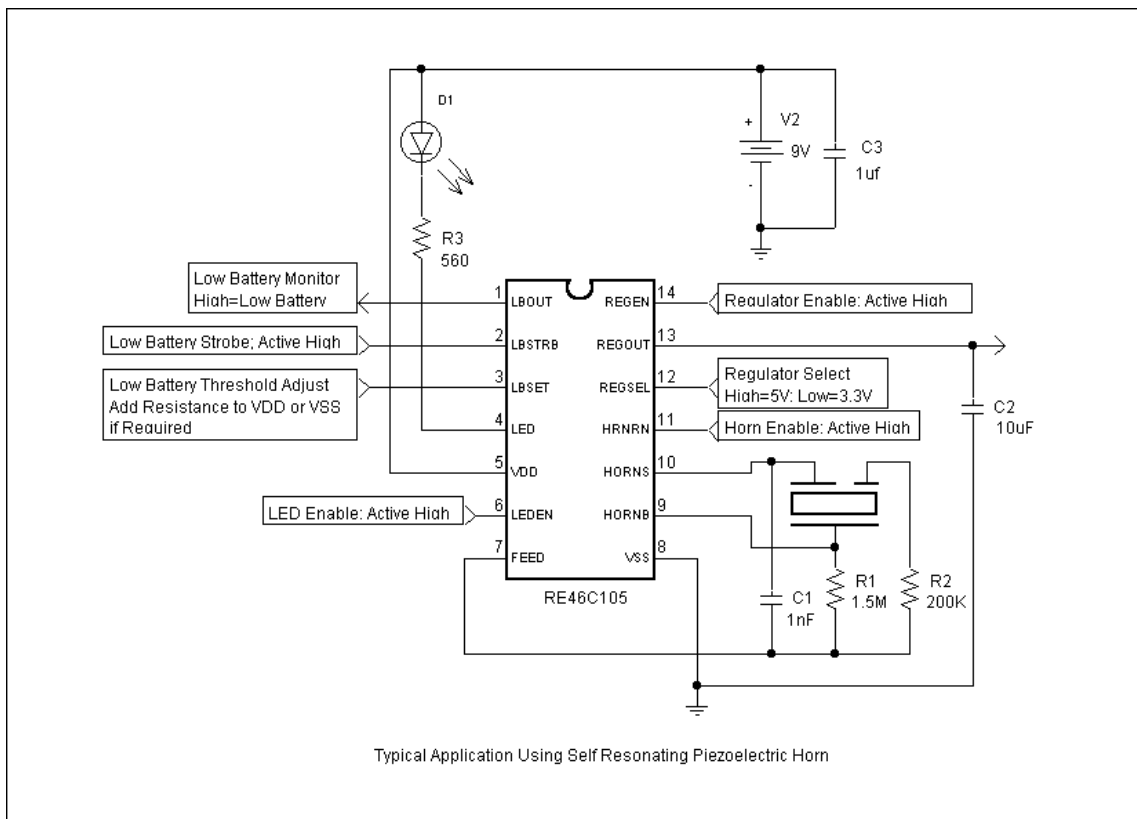


R&E International
A Subsidiary of Microchip Technology Inc.

Notes:

- 1/ The brown-out threshold voltage is the V_{DD} voltage at which the regulator will be disabled and Regout will be pulled to V_{SS}.
- 2/ In normal operation, the regulator will provide high-side current of up to 20mA, but current sinking capability is typically under 1uA. The over-voltage clamp is intended to limit the voltage at REGOUT when it is pulled up by an external source.
- 3/ The limits shown are 100% tested at 25C only. Test limits are guard-banded based on temperature characterization to guarantee compliance at temperature extremes.

Typical Application



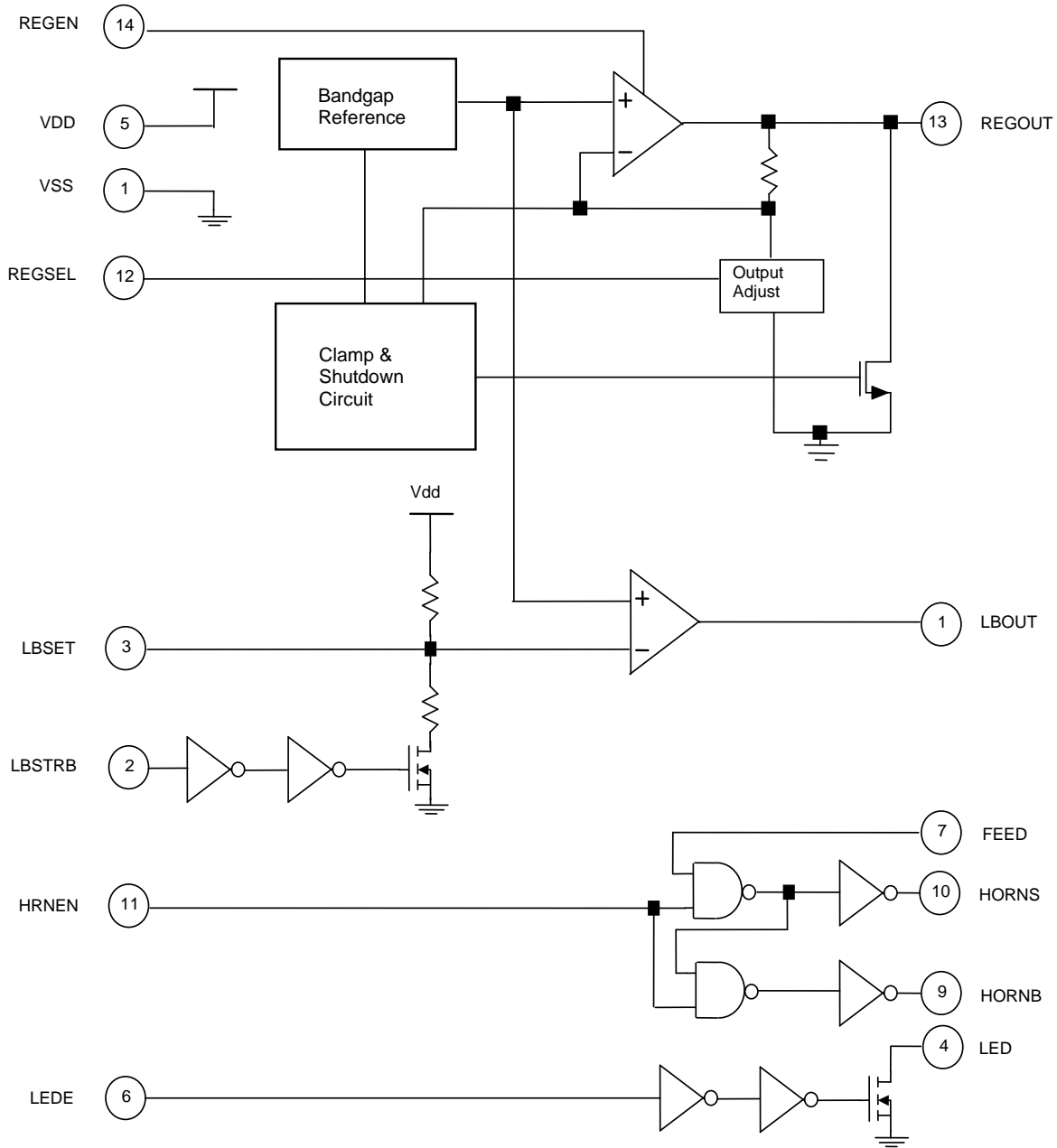
RE46C105

Piezoelectric Horn Driver with Voltage Regulator and LED Driver
Product Specification



R&E International
A Subsidiary of Microchip Technology Inc.

Functional Block Diagram



RE46C105

Piezoelectric Horn Driver with Voltage Regulator and LED 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, KEELOQ, KEELOQ 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, PIC³² 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[®] MCUs and dsPIC[®] DSCs, KEELOQ[®] 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.