



# 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.

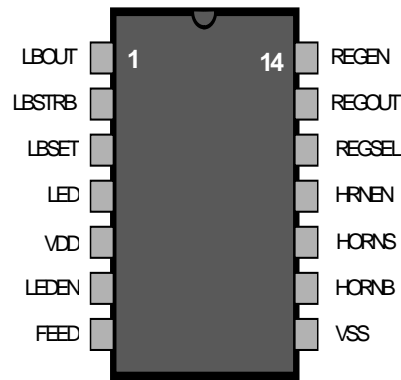
#### Applications

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.

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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	$\mu\text{A}$
Input Leakage	Hrnen,Leden, Lbstrb,Regen	Vin=Vdd or Vss	-100		100	nA
	FEED	Feed = +22V		20	50	$\mu\text{A}$
	FEED	Feed = -10V	-50	-15		$\mu\text{A}$
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 $\mu\text{A}$		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 $\mu\text{A}$ 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 $85^\circ\text{C}$ 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		$\mu\text{s}$
Regulator Voltage	Regout	lout<50mA Regsel=Vdd	4.75	5.0	5.25	V
		lout<50mA Regsel=Vss $T_A = -40$ to $85^\circ\text{C}$ 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

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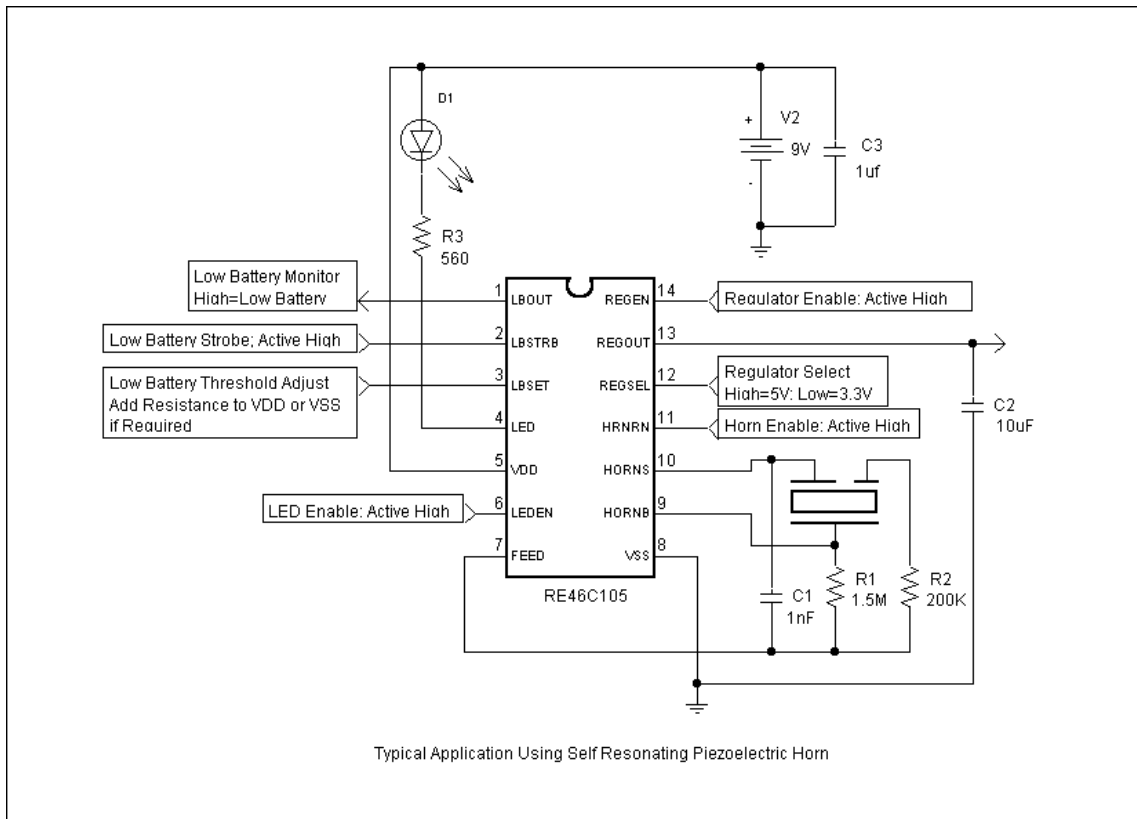


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## Notes:

- 1/ The brown-out threshold voltage is the V<sub>dd</sub> voltage at which the regulator will be disabled and Regout will be pulled to V<sub>ss</sub>.
- 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



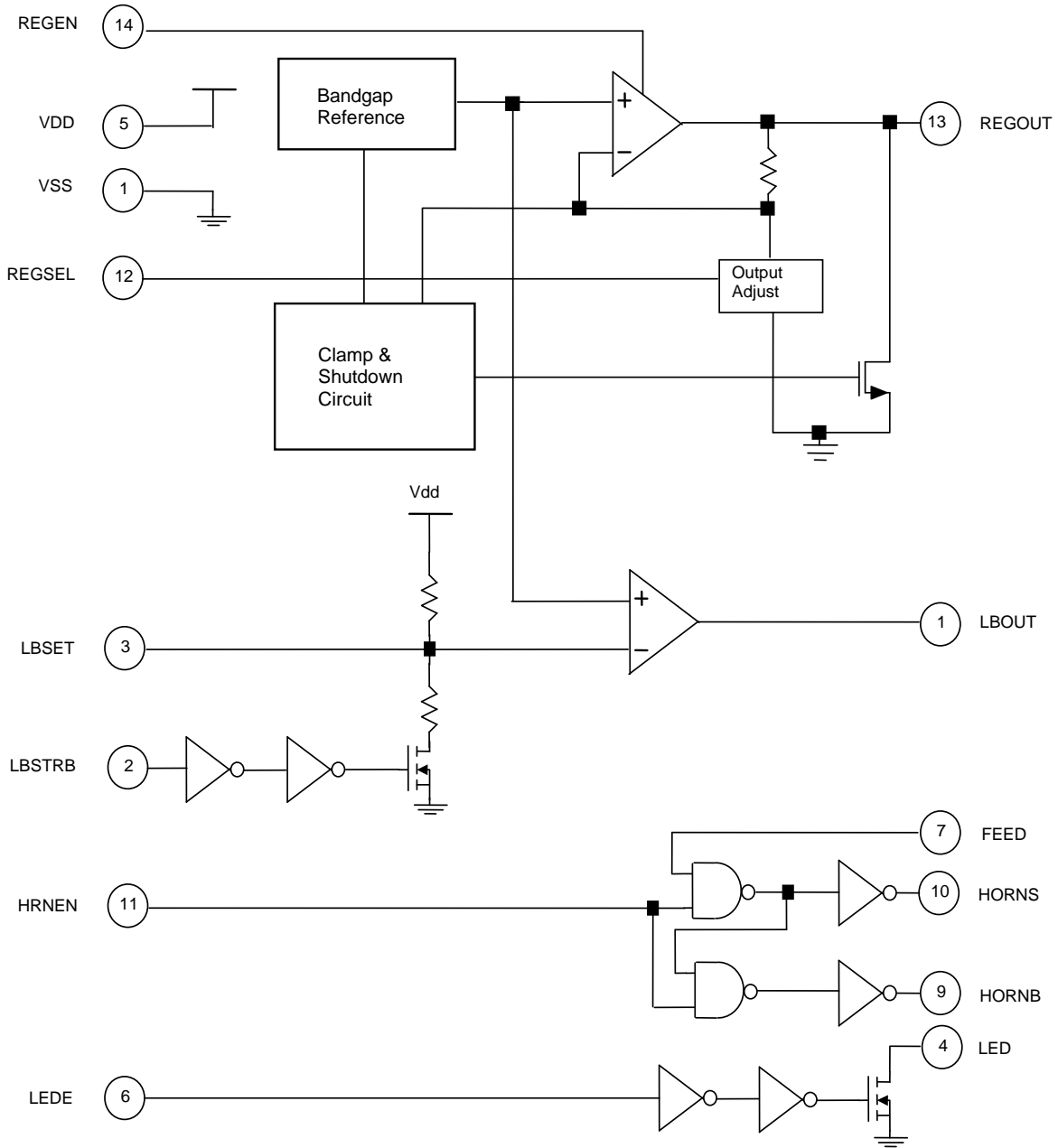
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## Functional Block Diagram



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#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.