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.

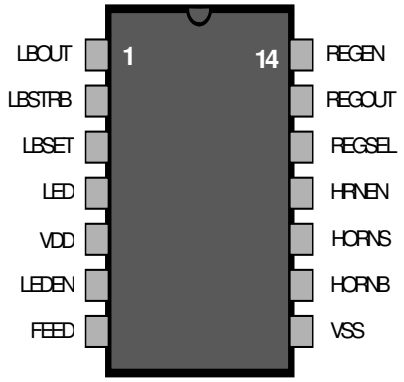
Applications

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 Vinf ..... -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.

Electrical Characteristics at T_A = 25°C, V_{DD} = 9V, V_{SS} = 0V (unless otherwise noted).

Parameter	Test Pin	Test Conditions	Limits Min	Typ	Max	Units
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	uA
Input Leakage	Hrnen,Leden, Lbstrb,Regen	Vin=Vdd or Vss	-100		100	nA
	FEED	Feed = +22V		20	50	uA
	FEED	Feed = -10V	-50	-15		uA
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	Iout=16mA Vdd=9V		0.3	0.5	V
		Vdd=7.2V			0.9	V
	LED	Iout=10mA Vdd=7.2V		0.5	1.0	V
	LBout	Iout=100uA		0.3	0.5	V
Output High Voltage	Horns or Hornb	Iout=-16mA Vdd=9V	8.5	8.7		V
		Vdd=7.2V	6.3			V
	LBout	Iout=-100uA Regsel=Vdd	4.5	4.75		V
		Regsel=Vss	2.8	3.0		V
Low Battery VoltageThreshold	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		uS
Regulator Voltage	Regout	Iout<50mA Regsel=Vdd	4.75	5.0	5.25	V
		Iout<50mA Regsel=Vss	3.10	3.3	3.50	V
		T_A=-40 to 85°C See note #3				
Line Regulation	Regout	6V<Vdd<12V No load		30		mV
Load Regulation	Regout	0mA<Iout<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; Iout > 1mA	5.5	6.0	6.5	V
		Regsel=Vss; Iout > 1mA	3.7	4.0	4.3	V

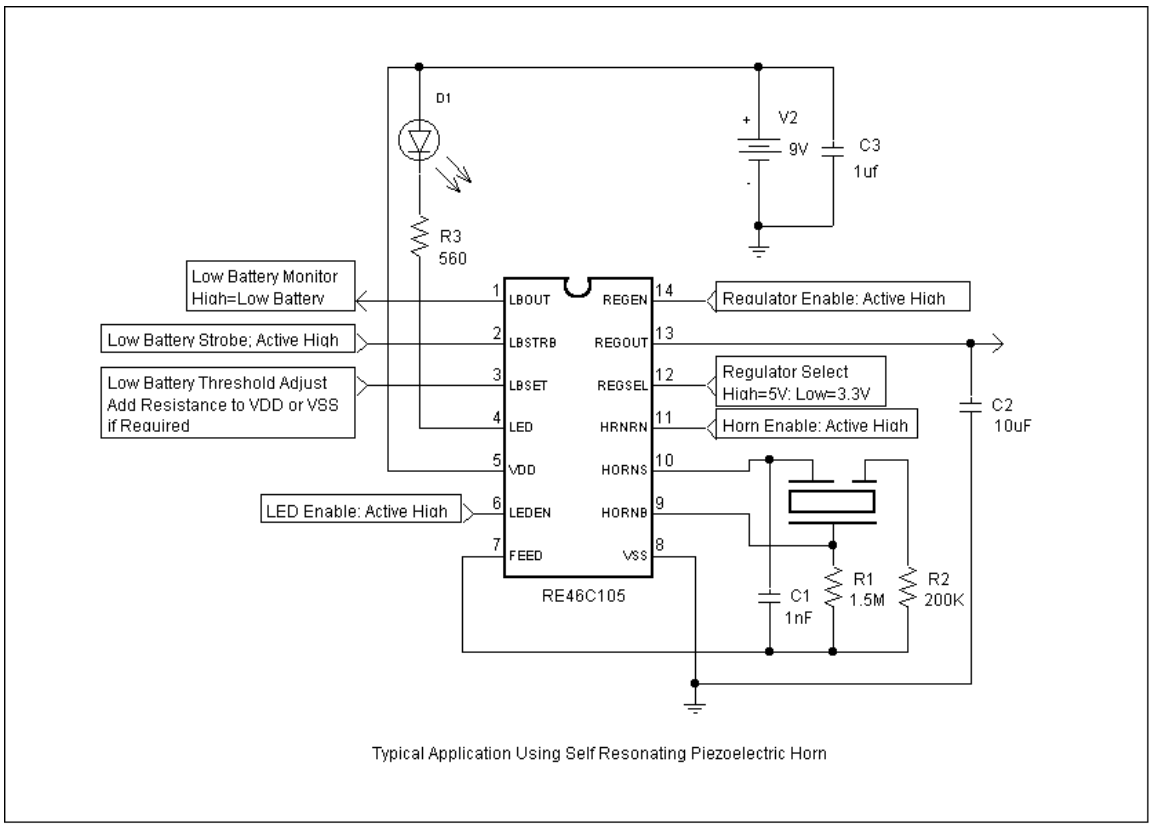
Notes:

1/ The brown-out threshold voltage is the Vdd voltage at which the regulator will be disabled and Regout will be pulled to Vss.

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.

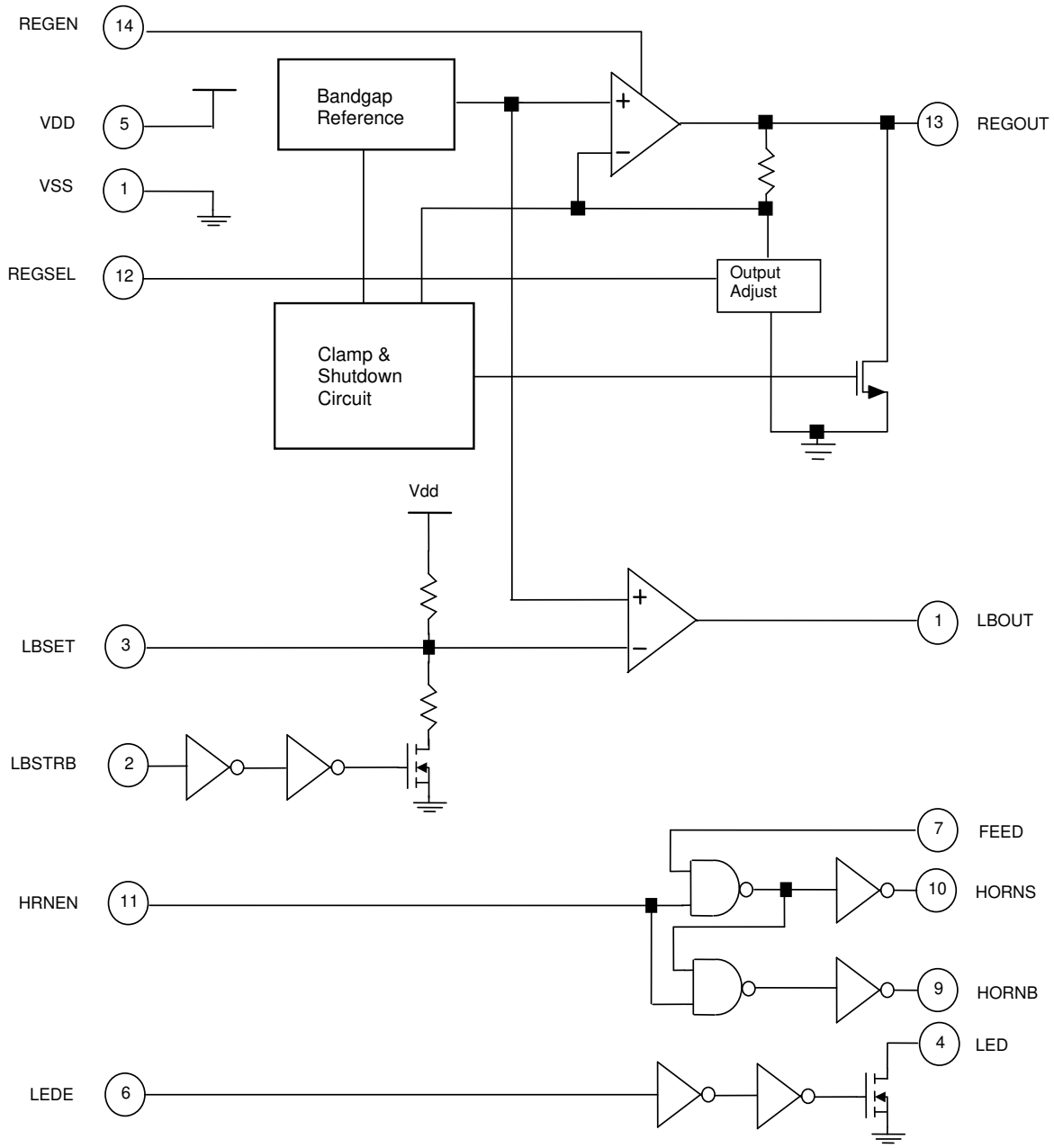
3/ The limits shown are 100% tested at 25C only. Test limits are guard-banded based on temperature characterization to guarantee compliance at temperature extremes.

Typical Application



Typical Application Using Self Resonating Piezoelectric Horn

Functional Block Diagram



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