

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.

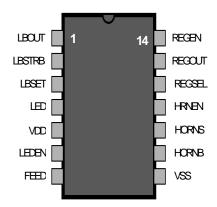
Applications

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).

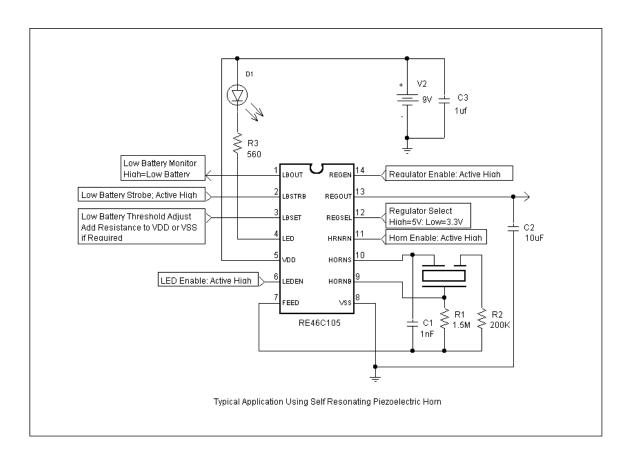
Parameter		Test	, - <u>DD</u> , - 35 (Limits	S	
Standby Supply Current Current	Parameter	Pin	Test Conditions	Min	Тур	Max	Units
Current Regen=Vdd; No Loads Vin=Vdd or Vss -100 nA	Supply Voltage	Vdd		6.0	9.0	13.8	V
Input Leakage	Standby Supply	Vdd	Hrnen=Lbstrb=Leden=Vss			3.5	uA
Lbstrb.Regen FEED Feed = +22V 20 50 UA	Current						
FEED Feed = -10V -50 -15 UA	Input Leakage	Lbstrb,Regen		-100			
Input Voltage Low						50	
Input Voltage High			Feed = -10V	-50	-15		
Dutput Low Voltage		Lbstrb,Regen				1.0	,
LED LBout		Lbstrb, Regen		2.3			-
LED LBout Iout=10mA Vdd=7.2V 0.5 1.0 V Iout=100uA 0.3 0.5 V	Output Low Voltage	Horns or Hornb			0.3		
LBout Iout=100uA 0.3 0.5 V							
Output High Voltage Horns or Hornb Iout=-16mA Vdd=9V 8.5 8.7 V LBout Iout=-100uA Regsel=Vdd Regsel=Vdd Regsel=Vss 4.5 4.75 V Low Battery VoltageThreshold Vdd Lbstrb=Vdd, Vdd decreasing in voltage The Vdd Vdd increasing in voltage The Vdd Vdd increasing in voltage 3.00 mV Lbstrb Voltage Hysteresis Lbstrb Ubstrb=Vdd Vdd increasing in voltage 300 mV Lbstrb to Lbout Active delay Lbstrb, Lbout Ibout Active delay Lbstrb=Vdd SomA Regsel=Vdd Iout<50mA Regsel=Vdd Iout<50mA Regsel=Vss The Vdd Iout<50mA Regsel=Vss The Vdd							
Voltage Hornb LBout Vdd=7.2V lout=-100uA Regsel=Vdd Regsel=Vss 6.3 4.5 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 Lbstrb=Vdd Vdd increasing in voltage 300 mV Lbstrb to Lbout Active delay Lbstrb, Lbout lout<50mA Regsel=Vdd lout<50mA Regsel=Vdd lout<50mA Regsel=Vss T _A =-40 to 85°C See note #3 4.75 3.10 3.3 3.50 5.0 5.25 V 5.0 0 5.25 V Line Regulation Regout No load 6V <vdd<12v No load 30 mV Load Regulation Regout Vdd 0mA<lout<50ma< td=""> 100 mV Brown-Out Threshold Voltage *See note #1 Vdd Regsel=Vdd or Vss Falling edge of Vdd 4.5 5.0 5.5 5.0 5.5 MA Brown-Out Pull Down Current Regout Vdd=4.5V; Regout=2V 15 5.5 6.0 6.0 6.5 V</lout<50ma<></vdd<12v 	0					0.5	
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Low Battery	Voltage	1101110			4 75		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		LBout					
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Low Bottony				3.0	7.90	\ \/
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		Vdd		1.2		7.00	V
Low Battery Lbstrb Lbstrb=Vdd 300 mV Voltage Hysteresis Lbstrb Vdd increasing in voltage 500 uS Lbstrb to Lbout Active delay Lbstrb, Lbout Active delay Lbstrb=Vdd 500 uS Regulator Voltage Regout Iout<50mA Regsel=Vdd Iout<50mA Regsel=Vss TA=-40 to 85°C See note #3	Voltage Tilleshold						
Voltage Hysteresis Lbstrb Vdd increasing in voltage S00 uS Lbstrb to Lbout Active delay Lbstrb, Lbout Lbstrb=Vdd 500 uS Regulator Voltage Regout Iout<50mA Regsel=Vdd Iout<50mA Regsel=Vss TA=-40 to 85°C See note #3	Low Battery				300		m\/
Lbstrb to Lbout Active delay Lbstrb, Lbout Active delay Lbstrb=Vdd 500 uS Regulator Voltage Regout Iout<50mA Regsel=Vdd Iout<50mA Regsel=Vss TA=-40 to 85°C See note #3		Lbstrb			300		111 V
Active delay Regulator Voltage Regout Iout<50mA Regsel=Vdd Iout<50mA Regsel=Vss Iout<50mA Regsel=Vss Iout<50mA Regsel=Vss Iout<50mA Regsel=Vss Iout<50mA Regout 3.10 3.3 3.50 V Line Regulation Regout 6V <vdd<12v load<="" no="" td=""> 30 mV Load Regulation Regout 0mA<lout<50ma< td=""> 100 mV Brown-Out Threshold Voltage *See note #1 Vdd 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 Regsel=Vdd; Iout > 1mA 5.5 6.0 6.5 V</lout<50ma<></vdd<12v>		Lbstrb, Lbout			500		uS
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Active delay						
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Regulator Voltage	Regout					
Line Regulation Regout 6V <vdd<12v No load 30 mV Load Regulation Regout 0mA<lout<50ma< td=""> 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 Regsel=Vdd; lout > 1mA 5.5 6.0 6.5 V</lout<50ma<></vdd<12v 				3.10	3.3	3.50	V
Regout No load							
Load Regulation Regout 0mA <lout<50ma< th=""> 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 Regsel=Vdd; lout > 1mA 5.5 6.0 6.5 V</lout<50ma<>	Line Regulation	Regout			30		mV
Brown-Out Threshold Voltage *See note #1 Brown-Out Pull Down Current Regout Regout	Load Regulation	Regout			100		mV
Threshold Voltage *See note #1 Brown-Out Pull Down Current Regout Regout Regout Vdd Falling edge of Vdd Vdd=4.5V; Regout=2V 15 25 mA Regout Regout Overvoltage Regsel=Vdd; lout > 1mA 5.5 6.0 6.5 V				4.5		5.5	
Brown-Out Pull Down Current Regout Regout Vdd=4.5V; Regout=2V 15 25 mA Regout Overvoltage Regsel=Vdd; lout > 1mA 5.5 6.0 6.5 V	Threshold Voltage	Vdd					-
Regout Overvoltage Regsel=Vdd; lout > 1mA 5.5 6.0 6.5 V	Brown-Out Pull	Regout	Vdd=4.5V; Regout=2V	15	25		mA
			Reasel=Vdd: lout > 1mA	5.5	6.0	6.5	V
	Clamp *See note #2	Regout	Regsel=Vss; lout > 1mA	3.7	4.0	4.3	V



Notes:

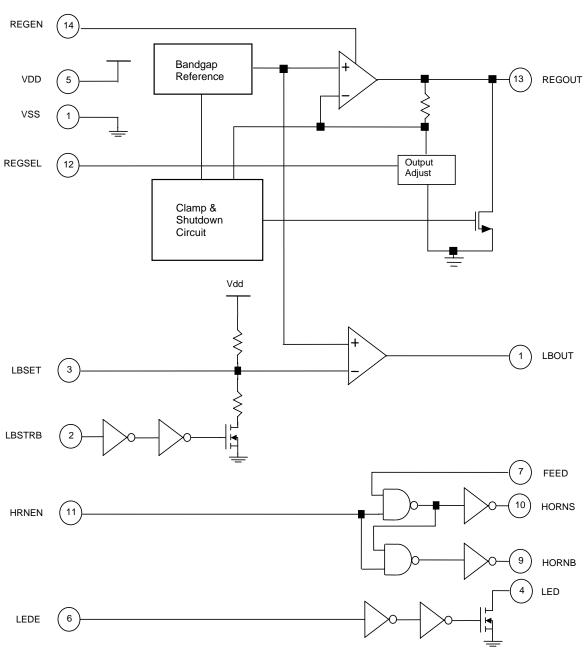
- 1/ The brown-out threshold voltage is the Vdd voltage at which the regulator will be disabled and Regout will be pulled to Vss.
- 2/ In normal operation, the regulator will provide high-side current of up to 20mA, but current sinking capability is typically under 1uA. The over-voltage clamp is intended 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





Functional Block Diagram



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