R&E International

RE46C116

DC to DC Converter, Voltage Regulator and Piezoelectric Horn Driver

Preliminary Product Specification

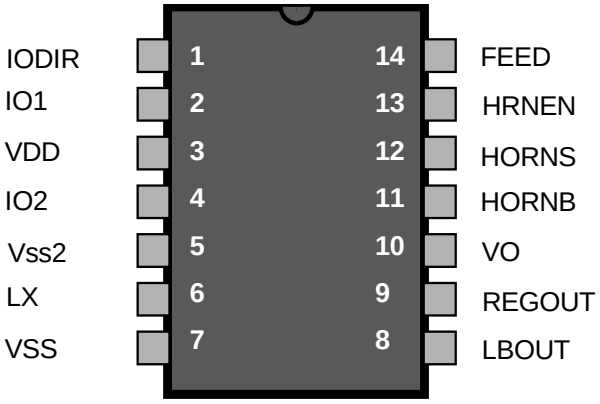
General Description

The RE46C116 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 sounding a piezoelectric horn, a 3.3V regulator for microprocessor voltage regulation and an I/O for communication with interconnected units.

Features

- Low Quiescent Current
- 10V Up Converter
- Low Horn Driver Ron
- Voltage Regulation to 3.3V
- Low Battery Detection
- Available in Standard Packaging or RoHS Compliant Pb Free Packaging

Preliminary Pin Configuration



14 Lead 300 mil PDIP

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNITS
Supply Voltage	V_{DD}	5	V
	VO	14	V
Input Voltage Range Except FEED	V_{in}	-.3 to V_{dd} +.3	V
FEED Input Voltage Range	V_{infd}	-10 to +22	V
Input Current except FEED	I_{in}	10	mA
Operating Temperature	T_A	-40 to 85	°C
Storage Temperature	T_{STG}	-55 to 125	°C
Junction Temperature	Tj	150	°C
Continuous Operating Current (HornS, HornB, Vreg)	I_O	40	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=Vss2=0V, Creg=10uF, Cvo=10uF, T_A=27°C, unless otherwise noted.

Parameter	Symbol	Test Conditions	Limits Min	Typ	Max	Units
Supply Voltage	Vdd	Operating	2.0		5.0	V
Standby Supply Current	Iddstby	HRNEN=Vss; Other inputs low; No loads; DC-DC Running; IO2=Float		22		uA
Quiescent Supply Current	Iddq	HRNEN=Vss; Other inputs low; No loads; VO=5V; IO2=Float		8	12	uA
Quiescent Ivo	Ivoq	HRNEN=Vss; Other inputs low; No loads; VO=5V; IO2=Float		10	15	uA
Input Leakage	Iin	All Inputs except FEED 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	All Inputs except FEED and IO1			1	V
		FEED Input; VO=10V			3	V
Input Voltage High	Vih	All Inputs Except FEED and IO1	2.3			V
		FEED Input; VO=10V	7			V
Output Low Voltage	Vol1	HORNB or HORNS; Iout=16mA;		.3	.5	V
	Vol2	LBOUT; Iout=100uA		.3	.5	V
	Vol3	IO2, Iout=100uA; IODIR=0V		.3	.5	V
Output High Voltage	Voh1	HORNB or HORNS; VO=10V; Iout=-16mA; Vdd=HRNEN=3V	9.5	9.7		V
	Voh2	LBOUT; Iout=-100uA; Vdd<Vlbat	Vreg-.5	Vreg-.3		V
	Voh3	IO2, Iout=-100uA; IODIR=0V	Vreg-.5	Vreg-.3		V
	Voh4	IO1, Iout=-4mA; IODIR=Vih		5		V
VO Output Voltage	Vvo1	HRNEN=3V: Iout=10mA		10		V
	Vvo2	HRNEN=Vss; Iout=10mA		4		V
VO Efficiency	Voeff1	HRNEN=Vss; Iload= 10mA		85		%
	Voeff2	HRNEN=Vss; Iload=100uA		75		%
Low Battery Threshold	Vlbat	T_A=0 to 50°C		2.4		V
VREG Voltage	Vreg1	Iout<20mA	3.1	3.3	3.5	V
VREG Load Regulation	Vregld1	Iout=0 to 20mA; HRNEN=3V		50		mV
	Vregld2	Iout=0 to 20mA; HRNEN=Vss		50		mV
Brownout Threshold	Vobvt	Falling edge of VO		3.6		V
Brownout Pull down	Ibt	VO=3.0V; Vreg=2.0V	20	40		mA
VREG over voltage clamp	Vcl1		3.75	4	4.25	V
IO1 Output Current	IO1ih1	IODIR=0V, IO1=1V	25		60	uA
	IO1ih2	IODIR=0V, IO1=17V			150	uA
	IO1ioh1	IODIR, IO2=Vih, IO1=3V	-4	-5		mA
	IO1ioh2	IODIR, IO2=Vih, IO1=Vss		-5	-16	mA
	IO1iol1	IO dump current IODIR= Vih, IO2=0V, IO1=1V		10		mA
IO1 Alarm Voltage	IO1vih	IODIR=0V	3			V
	IO1vil	IODIR=0V			1.5	V

Electrical Table Notes:

1/ The brown-out threshold voltage is the VO voltage at which the regulator and horn will be disabled. At VO voltages below the brown-out threshold Regout will be pulled to Vss.

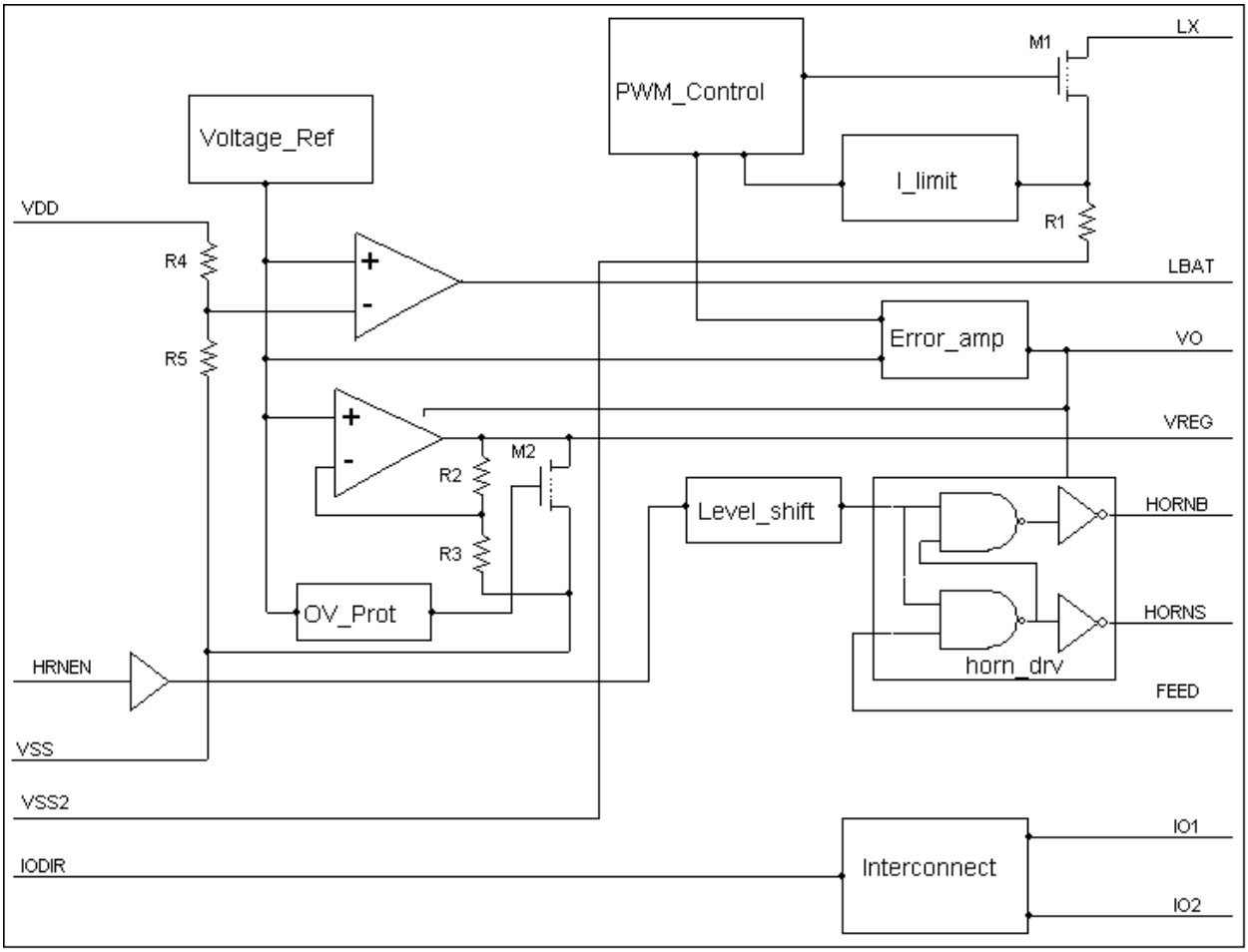
2/ In normal operation, the regulator will provide high-side current of up to 20mA, but current sinking capability is typically under 1uA. The overvoltage clamp is intended to limit the voltage at Regout when it is pulled up by an external source.

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.

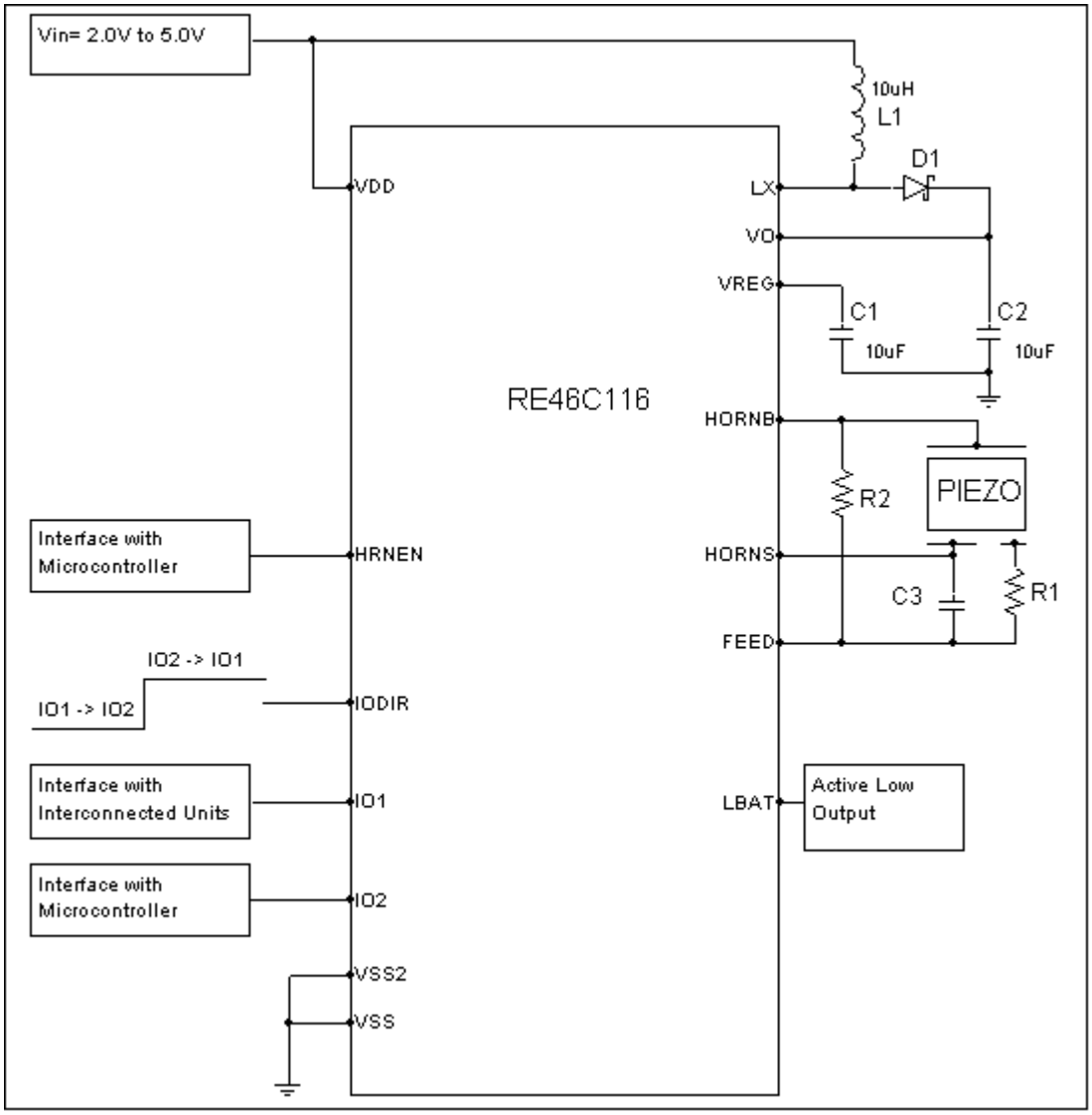
Interconnect Logic Truth Table

IODIR	IO2		IO1	
	Input	Output	Input	Output
1	0			0
1	1			1
0		0	0	
0		1	1	

Functional Block Diagram



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.

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