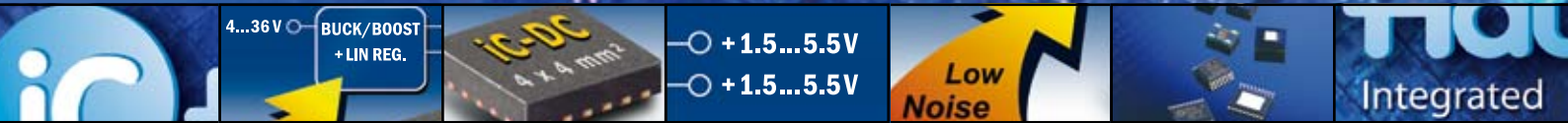
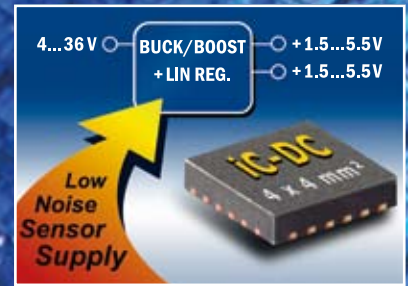


# iC-DC

## 2-CHANNEL BUCK/BOOST DC/DC CONVERTER



iC-DC is a monolithic switching converter with two back-end linear regulators. The output voltages of the two linear regulators can be individually pinconfigured within a range of 1.5 V to 5.5 V. The switching converter supplies up to 300 mA which can be drawn from the two linear regulators in the ratio required.

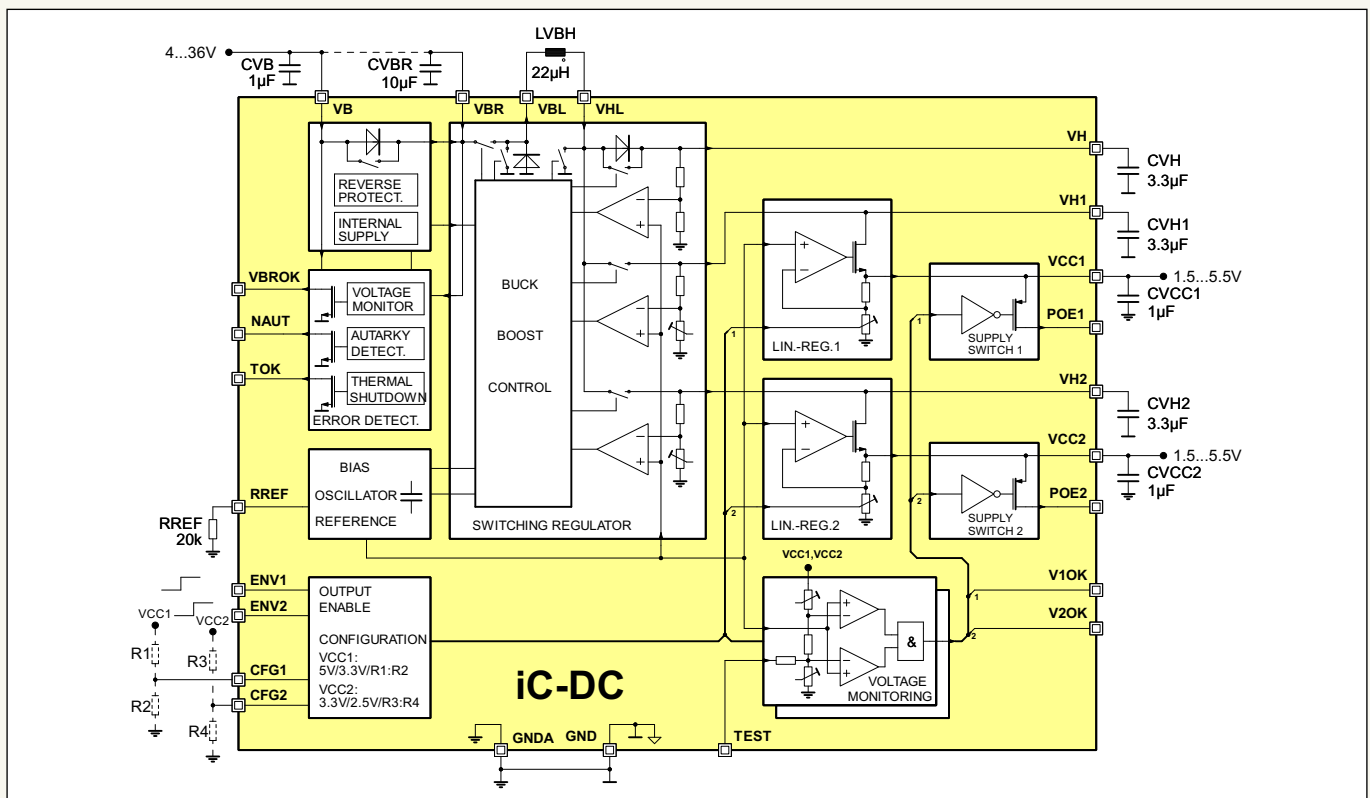
The high efficiency of the buck/boost converter for an input voltage range of 4 V to 36 V makes iC-DC suitable for industrial applications. Using very few external components, a DC/DC power pack can be created with a stabilized supply voltage and minimum power dissipation.

### Features

- Wide input voltage range of 4 V to 36 V
- Reverse polarity protection up to -36 V with autarky
- Universal buck/boost converter with high efficiency
- Two back-end, adjustable linear regulators (1.5 V to 5.5 V) with a total of up to 300 mA of output current and a separate output voltage monitor
- Low residual ripple with small capacitors in the  $\mu\text{F}$  range
- Separate enable inputs for the linear regulators
- Two switched linear regulator outputs
- Integrated switching transistors and flyback diodes
- Integrated 3 MHz oscillator with no external components
- Active noise spectrum reduction
- Error messaging with overtemperature, overvoltage, and undervoltage at the current-limited open-collector output
- Wide temperature range of  $-40\text{ }^{\circ}\text{C}$  to  $125\text{ }^{\circ}\text{C}$
- Space saving 24-pin QFN package

### Applications

- Dual voltage supply by buck/boost converters with adjustable, back-end linear regulators
- Power management for laser, encoder and automotive applications



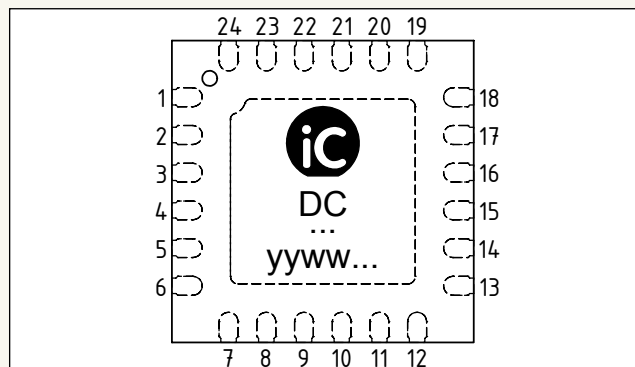
# iC-DC 2-CHANNEL BUCK/BOOST DC/DC CONVERTER

The chip temperature, input voltage, and integrated reverse polarity protection are monitored and errors signaled by current-limited open-collector outputs. With overtemperature the switching converter is disabled to reduce the chip's power dissipation.

The linear regulator output voltages are monitored and once having reached the steady state they are also switched to outputs POE1 and POE2. The output voltages of the two linear regulators VCC1 and VCC2 can be switched on and off by enable inputs ENV1 and ENV2.

The device's standby function can be activated to minimize the current consumption.

## Pin Configuration QFN24 4x4 mm<sup>2</sup>



## Key Specifications

General	
Supply Voltage Range	+4 V to +36 V
Quiescent Current VB VB = 24 V VB = 12 V VB = 4 V	typ. 4 mA typ. 7 mA typ. 25 mA
Operating Current VB VB = 24 V, 5V/100 mA each VB = 12 V, 5V/100 mA each VB = 4 V, 5V/30 mA each	typ. 70 mA typ. 150 mA typ. 150 mA
Standby Current	typ. 100 µA @ 24 V
Thermal Shutdown Threshold	typ. 160 °C
ESD Susceptibility	2 kV (HBM 100 pF, 1.5 kΩ)
Operational Temperature	-40 °C to +125 °C
Package (RoHS compliant)	QFN24 (4.0 mm x 4.0 mm)

### Switching Regulators (x = 1, 2)

Voltage at VH	typ. 7.75 V
Voltage at VHx	typ. VCCx + 400 mV
Inductor LVBH	typ. 22 µH, 1 A

### Internal Oscillator

RREF	20 kΩ ± 1%
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### Linear Regulator (x = 1, 2)

Output Voltage Range	1.5 V to 5.5 V
Output Voltage VCC1 (CFG1 = VCC1) (CFG1 = GNDA)	5.0 V ± 5% 3.3 V ± 5%
Output Voltage VCC2 (CFG2 = VCC2) (CFG2 = GNDA)	3.3 V ± 5% 2.5 V ± 5%
Output Ripple	10 mVpp @ 100 mA
Total Load Current	300 mA max.
Switch Output POEx	VCCx @ 5 mA

### Voltage Monitoring (x = 1, 2)

Undervoltage Threshold	92 % of VCCx
Overvoltage Threshold	108 % of VCCx

## Pin Functions

No.	Name	Function
1	RREF	Reference Resistor
2	GNDA	Analog Ground
3	CFG1	VCC1 Configuration 3.3/5.0 V or 1.5 V to 5.5 V with ext. R Divider
4	CFG2	VCC2 Configuration 2.5/3.3 V or 1.5 V to 5.5 V with ext. R Divider
5	TEST	Test Input
6	POE2	Power Output Enable VCC2 Voltage
7	V20K	Error Output VCC2 Voltage
8	VCC2	1.5 V to 5.5 V Linear Regulator Output 2
9	VH2	Intermediate Voltage 2 for VCC2 Regulator
10	VH1	Intermediate Voltage 1 for VCC1 Regulator
11	VCC1	1.5 V to 5.5 V Linear Regulator Output 1
12	V10K	Error Output VCC1 Voltage
13	POE1	Power Output Enable VCC1 Voltage
14	VH	Intermediate Voltage
15	VHL	Inductor Terminal VH
16	GND	Power Ground
17	VBL	Inductor Terminal VB
18	VBR	Reverse Protected Supply Voltage
19	VB	+4 V to +36 V Supply Voltage
20	ENV1	VCC1 Linear Regulator Activation
21	ENV2	VCC2 Linear Regulator Activation
22	VBROK	Error Output Supply Voltage
23	TOK	Error Output Overtemperature
24	NAUT	Error Output Autarky
	TP	Thermal Pad

This preliminary information is not tantamount to a guarantee of device characteristics. All rights to technical changes reserved.