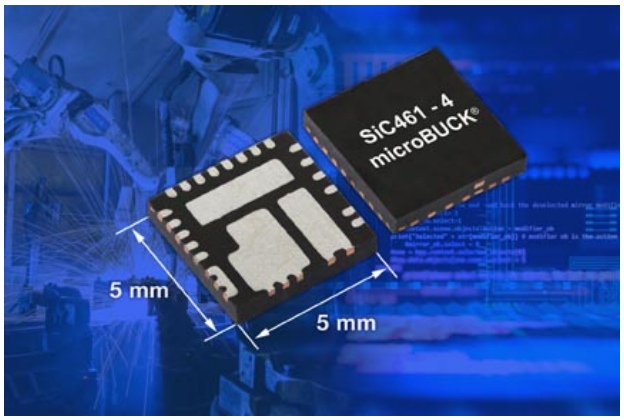
Author: Ralph Monteiro
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New SiC46X Family of Synchronous Buck Regulators With Industry-Leading Output Current From 2 A to 10 A Delivers Output Power of Over 100 W

Versatile New Devices in the microBUCK ® Family Feature Wide Input Voltage Range of 4.5 V to 60 V and Peak Efficiencies of 98 % in Space-Saving 5 mm x 5 mm MLP55-27L Package

Product Benefits:



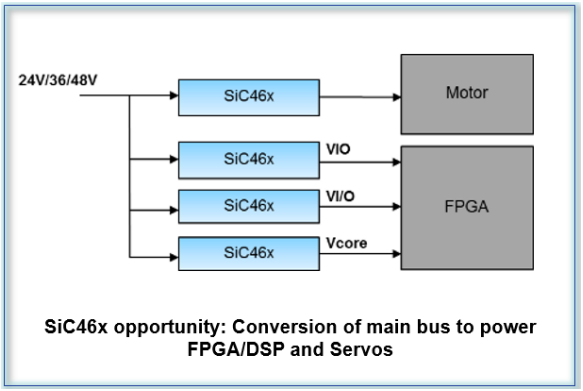
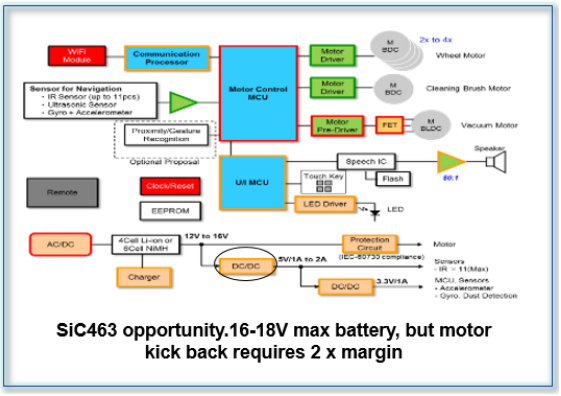
- **Versatile**
  - Single supply operation from 4.5 V to 60 V input voltage
  - Adjustable output voltage down to 0.8 V
  - Scalable solution: 2 A (SiC464), 4 A (SiC463), 6 A (SiC462), 10 A (SiC461)
  - Output voltage tracking and sequencing with pre-bias start up
  - ± 1 % output voltage accuracy at -40 °C to +125 °C
- **Highly efficient**
  - 98 % peak efficiency
  - 5 µA supply current at shutdown
  - 250 µA operating current not switching
- **Highly configurable**
  - Adjustable switching frequency from 100 kHz to 2 MHz
  - Adjustable soft start and adjustable current limit
  - 3 modes of operation, forced continuous conduction, power save or ultrasonic
- **Robust and reliable**
  - Output over-voltage protection
  - Output under-voltage / short circuit protection with auto retry
  - Power good flag and over temperature protection
  - Supported by Vishay PowerCAD online design simulation
- **Design support tools**
  - PowerCAD online design simulation (https://vishay.transim.com)
  - Reference designs available (User Manual)

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Market Applications:

DC/DC converters for the following end applications

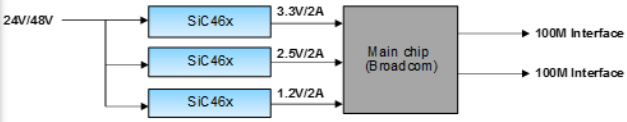
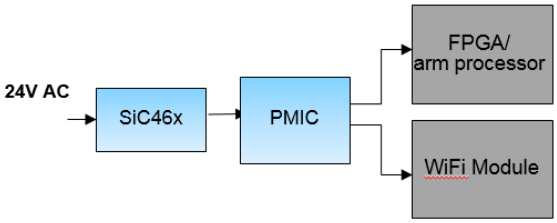
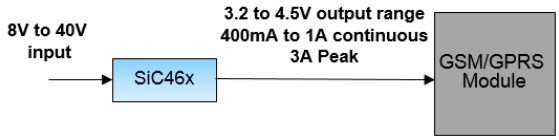
- Industrial and automation
- Home automation
- Industrial computing
- Base station power supplies
- Wall transformer regulation
- Robotics
- Drones
- Battery management systems
- Power tools
- Vending, ATM, and slot machines

END APPLICATION	BLOCK DIAGRAM
Industrial and Factory Automation 	 **SiC46x opportunity: Conversion of main bus to power FPGA/DSP and Servos**
Robotic Vacuum/ Garden Tools / Power Tools 	 **SiC463 opportunity.16-18V max battery, but motor kick back requires 2 x margin**

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NEW PRODUCT INFORMATION

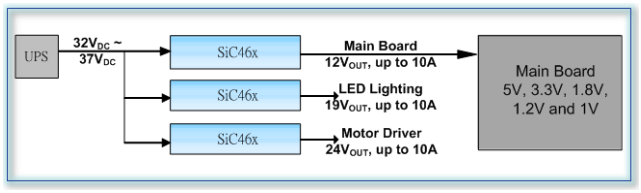
Product Group: Vishay Siliconix, ICs / **September** 2017

END APPLICATION	BLOCK DIAGRAM
Networking 	 **SiC46x provides power to the Broadband chip. Low jitter => low EMI ideal for noise sensitive Ethernet switch applications**
Home Automation 	 **SiC46x steps the 24V AC line to a low voltage to power the low voltage PMIC or the FPGA/Processor and WiFi module**
GSM/GPRS Module 	 **SiC46x steps the wide 8 to 40V input range. The peak current of 3A requires fast transient response that is met by the V2COT architecture**

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NEW PRODUCT INFORMATION

Product Group: Vishay Siliconix, ICs / **September** 2017

END APPLICATION	BLOCK DIAGRAM
Vending/ATM/ Slot Machine 	

The News:

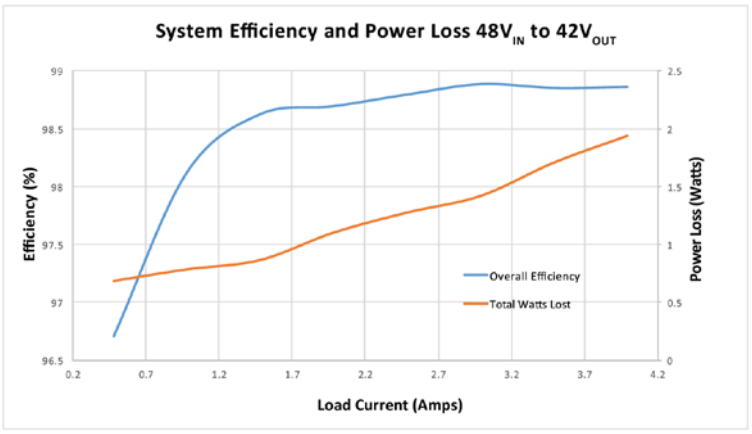
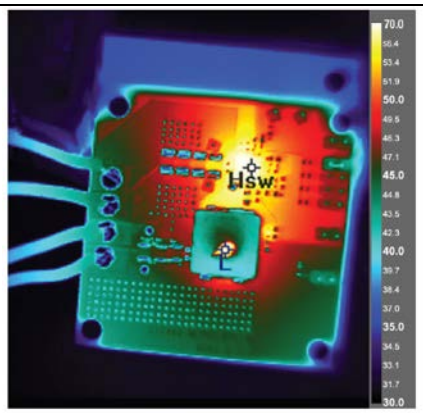
Vishay Intertechnology introduces a new family of 2 A to 10 A synchronous buck regulators featuring a wide input voltage range of 4.5 V to 60 V. Combining high performance n-channel trench MOSFETs with a controller in the compact MLP55-27L package, space-saving Vishay Siliconix SiC46X family devices deliver high efficiency and power density, while improving long term reliability and simplifying thermal management.

- Feature high and low side MOSFETs with five times lower on-resistance than competing devices
  - Combined with their ultra low quiescent current, this results in high efficiencies over the full load range
  - Synchronous buck topology reduces component count and weight
- High efficiency reduces power losses, enabling system designers to increase power density
- Combined with the superior thermal design of the MLP55-27L package, the devices' high efficiency enables cooler operation for improved long term reliability, while eliminating the need for a heatsink
  - Allows designers to shrink the PCB size, simplify thermal management, and reduce system costs
- Wide input voltage range is ideal for several applications:
  - Loosely regulated nominal 24 V, 36 V, and 48 V inputs in noisy industrial environments
  - Voltages up to 60 V cover the kick-back transients caused by motors in power tools, battery operated vehicles, robotic vacuum/garden equipment
  - Wide range of battery packs up to 14S and fuel cells
  - Battery management systems
  - High voltage battery chargers
  - After market automotive applications
- All devices are footprint-compatible to provide designers with a scalable solution
- Voltage mode COT architecture delivers ultra fast transient response with minimum output capacitance and tight ripple regulation at light loads
- Compatible with any output capacitor type
- Low jitter reduces EMC and EMI in noise sensitive applications

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Shown below is an example of the output power the SiC46x family is capable of: 168 W with a device temperature of 66 °C, all thanks to efficiency of ~99%. Read more at: http://www.vishay.com/docs/48285/48285.pdf

48V Input to 42V output, 4A Industrial Battery Charger

Efficiency	Thermals
	

$T_{ambient}$ = 30 °C
Highest Temp at 168 W = 66 °C

The Key Specifications:

Part Number	Current Rating (A)	V_{in} Range (V)	V_{out} Range (V)	F_{sw} (kHz)	Package
SiC464	2	4.5 to 60	0.8V to 0.9*Vin	100-2000	MLP55-27L
SiC463	4	4.5 to 60	0.8V to 0.9*Vin	100-2000	MLP55-27L
SiC462	6	4.5 to 60	0.8V to 0.9*Vin	100-2000	MLP55-27L
SiC461	10	4.5 to 60	0.8V to 0.9*Vin	100-2000	MLP55-27L

The Perspective:

Ideal for applications needing high voltage inputs or required to work with various battery voltage stacks, Vishay Siliconix SiC46X family devices contain all the silicon needed to design a high performance buck regulator in a 5 mm by 5 mm package. To save space and simplify designs, they can be used instead of synchronous controllers that rely on external MOSFETs. The devices can also replace non-synchronous buck regulators, which provide lower efficiency in larger footprints. Compared to monolithic regulators, which rely on an IC process, the trench MOSFETs of SiC46X family devices provide higher efficiency and a more robust solution with higher immunity to voltage spikes and a wider operating temperature range. The buck regulators allow one part to be used for a variety of input voltages, reducing the need to qualify multiple devices and improving safety margins for rugged and reliable operation.

Availability:
Samples and production quantities of the SiC46X family are available now, with lead times of eight weeks for large orders.

To access the product datasheets, application notes, infographics, and Did You Know documentation on the Vishay website, go to http:/www.vishay.com/ppg?65124.

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