

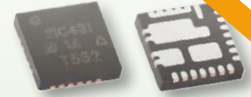


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Vishay Intertechnology, Inc.

# microBUCK<sup>®</sup> Integrated Circuits

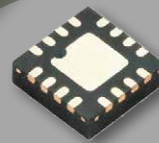
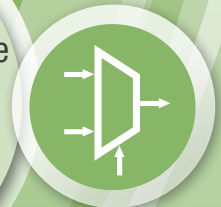
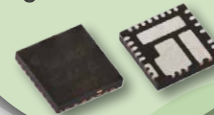


## SiC43X SERIES

3 V to 24 V Input, Scalable  
8 A, 12 A, 15 A, and 20 A  
Regulators

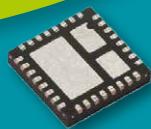
## SiC46X SERIES

4.5 V to 60 V, Scalable  
3 A, 6 A, and 10 A  
Regulators



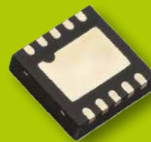
## SiP1210X SERIES

3 A to 6 A Compact  
Regulators with COT  
Architecture



## SiC401 SERIES

3 V to 28 V, Scalable  
6 A, 10 A, and 15 A  
Regulators



## SiP1211X SERIES

3 A Regulators with  
Integrated Compensation

[www.vishay.com](http://www.vishay.com)



# microBUCK® INTEGRATED CIRCUITS

Focus Products

## SiC46x Family of 4.5 V to 60 V Input Buck Regulators

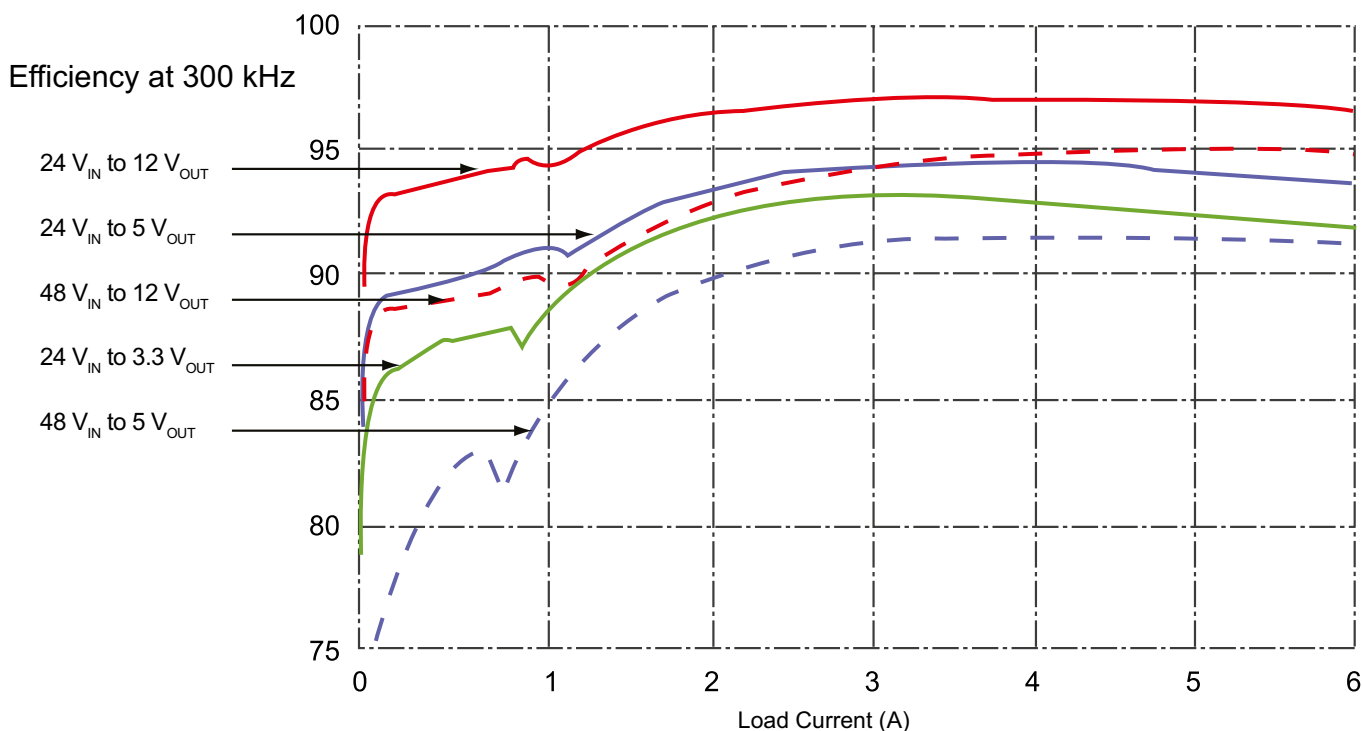
Vishay's SiC46x family integrates high-performance trench MOSFETs and an advanced controller for unsurpassed power density in a compact 5 x 5 package. With an input voltage range of 4.5 V to 60 V, the SiC46x family can step down from a high-voltage bus to an intermediate bus. The constant on-time architecture also allows direct conversion down to low voltages, eliminating the intermediate bus altogether and simplifying power designs.

### FEATURES

- Scalable solution: 3 A, 6 A, and 10 A
- Stable with any output capacitor
- Low quiescent current – 250  $\mu$ A
- Adjustable current limit, soft start, switching frequency
- Ability to start up into a pre-biased load
- Protection and monitoring: OVP, OCP, UVP, OTP, UVLO, power good
- -40 °C to +105 °C operating ambient temperature



SiC46x in PowerPAK® MLP 5mm x 5mm



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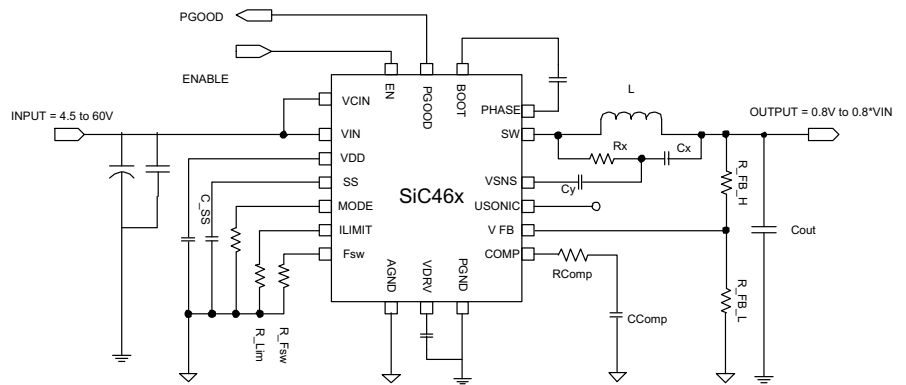
# microBUCK® INTEGRATED CIRCUITS

## Focus Products

### SiC46x APPLICATIONS

The wide 4.5V to 60V input range and output range (0.8 to 0.8\*VIN) of the SiC46x family and the ability to work with a single input supply make it ideal for a wide range of applications:

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



SiC46x APPLICATIONS DIAGRAM





# microBUCK® INTEGRATED CIRCUITS

## Focus Products

### SiC43x Family of 3 V to 24 V Input Buck Regulators

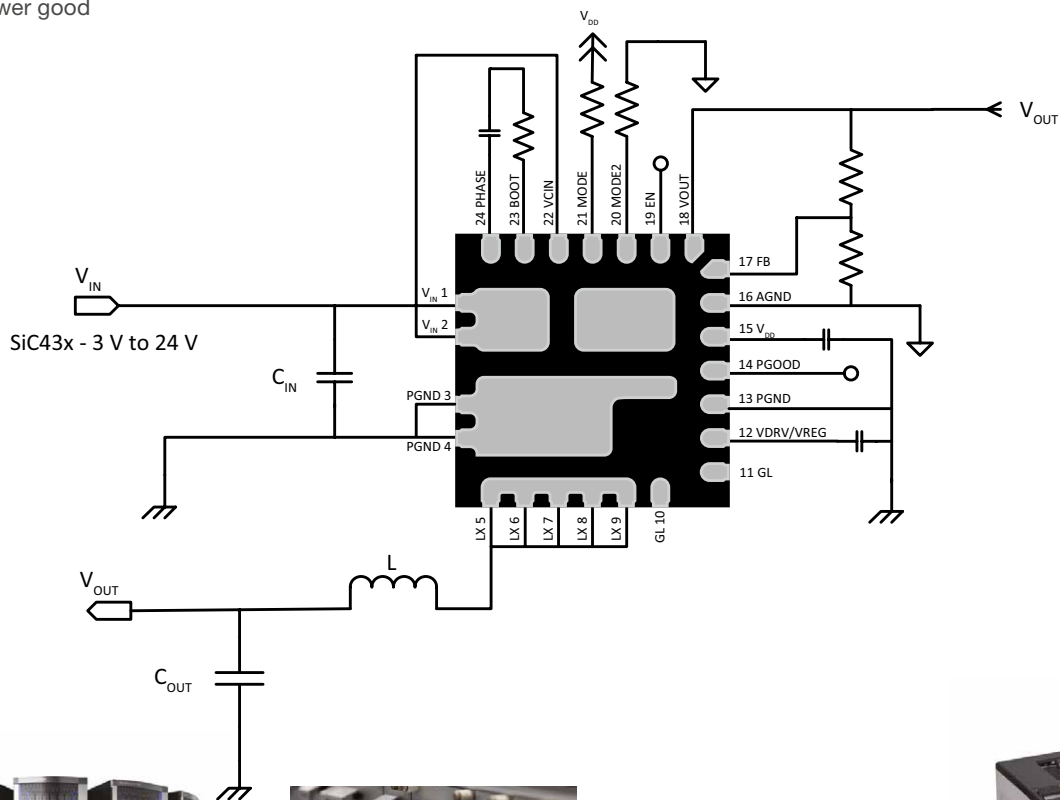
Vishay's 3 V to 24 V input family of 6 A to 20 A regulators are packaged in a compact 4 mm x 4 mm MLP package. Minimal external components are needed for part operation and the part even integrates compensation to further simplify the job of the designer.

#### FEATURES

- Scalable solution: 8 A, 12 A, 15 A, and 20 A
- Stable with any output capacitor
- No external compensation
- Low quiescent current – 50  $\mu$ A
- Adjustable current limit, soft start, switching frequency, and operating mode with just two external resistors
- Ability to start up into a pre-biased load
- Protection and monitoring: OVP, OCP, UVP, OTP, UVLO, power good

#### APPLICATIONS

- General purpose POL
- Computing, desktop, server, and industrial computing
- Telecom, switch/router, data center
- Multi-function printers
- USB car charger
- Set-top boxes, HDTV
- Consumer audio / video

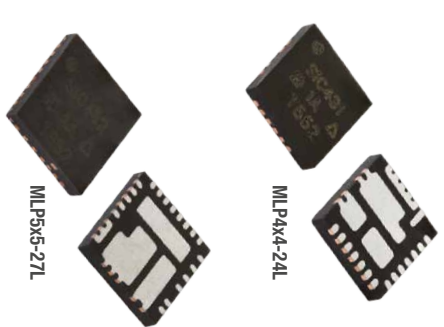




# INTEGRATED CIRCUITS

microBUCK® Family

Spec.	Part Number	SIC431*	SIC432*	SIC433*	SIC434*	SIC461*	SIC462	SIC463*
<b>Voltage</b>	$V_{in}$	3 V to 24 V	3 V to 24 V	3 V to 24 V	3 V to 24 V	4.5 V to 60 V	4.5 V to 60 V	4.5 V to 60 V
	$V_{out}$	0.6 $V_{in}$ to 0.95 $V_{in}$	0.6 $V_{in}$ to 0.95 $V_{in}$	0.6 $V_{in}$ to 0.95 $V_{in}$	0.6 $V_{in}$ to 0.95 $V_{in}$	0.8 $V_{in}$ to 0.80 $V_{in}$	0.8 $V_{in}$ to 0.80 $V_{in}$	0.8 $V_{in}$ to 0.80 $V_{in}$
	$I_{out}$ max.	24 A	18 A	12 A	8 A	10 A	6 A	3 A
<b>MOSFETS</b>	HS (mΩ)	6	7.2	12	15	12	21	40
	LS (mΩ)	2	2.55	5	8	7	12	30
<b>Control</b>	Control scheme	V2 COT	V2 COT	V2 COT	V2 COT	V2 COT	V2 COT	V2 COT
	$f_{sw}$ (Hz)	300 k, 500 k, 750 k, 1000 k	300 k, 500 k, 750 k, 1000 k	300 k, 500 k, 750 k, 1000 k	300 k, 500 k, 750 k, 1000 k	100 K to 500 K	100 kHz to 500 kHz	100 K to 500 K
	Power saving mode	✓	✓	✓	✓	✓	✓	✓
	LDO							
	OCp	✓	✓	✓	✓	✓	✓	✓
<b>Protection</b>	OVP	✓	✓	✓	✓	✓	✓	✓
	UVP	✓	✓	✓	✓	✓	✓	✓
	Soft start	✓	✓	✓	✓	✓	✓	✓
	OTP	✓	✓	✓	✓	✓	✓	✓
	Enable	✓	✓	✓	✓	✓	✓	✓
<b>I/O</b>	Sync							
	PGOOD	✓	✓	✓	✓	✓	✓	✓
	Operation temp. (°C)	-40 to +125	-40 to +125	-40 to +125	-40 to +125	-40 to +125	-40 to +125	-40 to +125
Package	PowerPAK MLP4x4-24L	SIC431/433/434	SIC431/433/434	SIC431/432/434	SIC431/432/433	SIC462/3	SIC461/3	SIC461/2
	PowerPAK MLP5x5-27L							
Scalable part numbers	SIC432/433/434	SIC431/433/434	SIC431/432/434	SIC431/432/433	SIC462/3	SIC461/3	SIC461/2	
Link	Datasheet	*Release 01 2017	*Release 02 2017	*Release 02 2017	*Release 02 2017	*Release 02 2017	<a href="#">SIC462</a>	*Release 02 2017



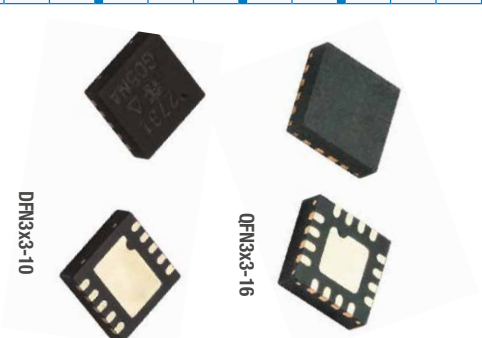


VISHAY INTERTECHNOLOGY, INC.

# INTEGRATED CIRCUITS

microBUCK® Family

Spec.	Part Number	SIP12107	SIP12108/A	SIP12109	SIP12110	SIP12116	SIP12117
Voltage	$V_M$	2.8 V to 5.5 V	2.8 V to 5.5 V	4.5 V to 16 V	4.5 V to 16 V	4.5 V to 15 V	4.5 V to 15 V
	$V_{out}$	0.6 V to 5.5 V	0.6 V to 5.5 V	0.6 V to 5.5 V	0.6 V to 5.5 V	0.6 V to 5.5 V	0.6 V to 5.5 V
	$I_{out\ max}$	3 A	5 A	4 A	6 A	3 A	3 A
MOSFETS	HS (m $\Omega$ )	56	35	45	45	80	80
	LS (m $\Omega$ )	33	21	26	26	50	50
	Control scheme	CM COT	CM COT	CM COT	CM COT	CM COT	CM COT
Control	$f_{sw}$ (Hz)	200 KHz to 4 MHz	200 KHz to 4 MHz	400 KHz to 1.5 MHz	400 KHz to 1.5 MHz	600K	600K
	Light Load Mode	✓	✓	✓	✓	X	✓
	OCP	✓	✓	✓	✓	✓	✓
Protection	OVP	✓	✓	✓	✓	✓	✓
	UVP	✓	✓	✓	✓	✓	✓
	Soft start	1.5 ms	1.5 ms	✓	✓	1.5 ms	1.5 ms
I/O	OTP	✓	✓	✓	✓	✓	✓
	Enable	✓	✓	✓	✓	✓	✓
	PGOOD	✓	✓	✓	✓	✓	✓
Link	Operation temp. (°C)	-40 to +85	-40 to +85	-40 to +85	-40 to +85	-40 to +85	-40 to +85
	Package	QFN3x3-16L	QFN3x3-16L	QFN3x3-16L	QFN3x3-16L	DFN10-3x3	DFN10-3x3
	Scalable part numbers	SIP12108	SIP12107	SIP12110	SIP12109	-	-
Link	Datasheet	<a href="#">SIP12107</a>	<a href="#">SIP12108/A</a>	<a href="#">SIP12109</a>	<a href="#">SIP12110</a>	<a href="#">SIP12116</a>	<a href="#">SIP12117</a>



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# ACHIEVE HIGH EFFICIENCY WHILE REDUCING COSTS BY USING VISHAY'S microBUCK® SCALABLE DC/DC REGULATORS



## Advantages of Vishay's microBUCK®

- Compact and scalable family
- High efficiency at both light and full loads
- Ultra-fast transient response
  - Fully protected against voltage, current, and temperature overstress



## For the Following Applications

- Point-of-load regulation for low-power processors, network processors, DSPs, FPGAs, and ASICs
- Computing, broadband, networking, LAN / WAN
- AV, high-density cards, storage, DSL, STB, DVR, and DTV
- Industrial power supplies



Use Vishay's compact 8 A, 12 A, 15 A, and 20 A microBUCK® regulators to efficiently power your next-generation server and telecommunication design



To save board space, use Vishay's SiC46x in your next industrial power supply design



## Useful Links

- [www.vishay.com/power-ics/integrated-microbuck/](http://www.vishay.com/power-ics/integrated-microbuck/)
- Simulation tool <http://vishay.transim.com>
- For technical questions, contact [PowerCtechsupport@vishay.com](mailto:PowerCtechsupport@vishay.com)



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