

# eGaN® FETs and ICs for 48 V – 12 V Regulated Brick Converters



## Higher Efficiency – Smaller – Lower Cost

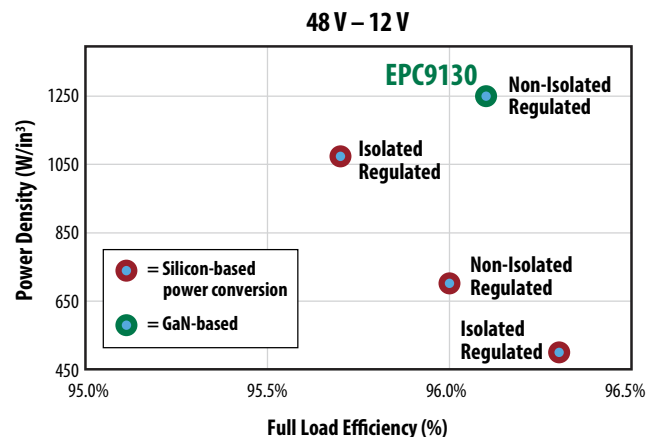
Emerging computing applications demand more power in much smaller form factors. In addition to the expanding needs of the server market, some of the most challenging applications are multi-user gaming systems, autonomous cars, artificial intelligence, and cryptocurrency mining.

These advance computing applications are putting higher demands on the power converters. Silicon-based power conversion is not keeping pace...

GaN technology increases the efficiency, shrinks the size, and reduces system cost.

48 V – 12 V 10 A Buck Converter		
Description	QTY	GaN
Control Transistor	1	EPC2045
Rectifier Transistor	1	EPC2045
Inductor	1	IHLP-4040DZ-01 2.2 $\mu$ H
Input Capacitor	4	C2012X7S2A105M125AB
Output Capacitor	5	C2012X5R1E226M125AC
Driver	1	LMG1205
Controller (5 Phase)	0.2	DSPIC33EP128GS704-E/ML
<b>Total (500 ku)</b>		<b>Less than \$0.05 per Watt</b>

Bill of Materials for an eGaN FET based 48 V – 12 V converter based on 500 k unit pricing.

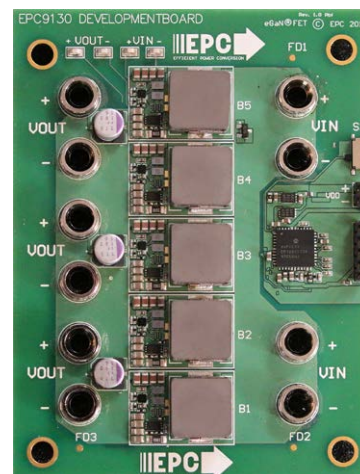


GaN-based power conversion enables simpler, lower cost, higher efficiency 48 V power conversion

## Benefits of eGaN FETs and ICs in 48 V – 12 V Hard Switched Converter Designs

### EPC9130: 48 V – 12 V, 5-Phase Regulated IBC Using EPC2045

- Efficiency > 96%
- Density > 1000 W/in<sup>3</sup>
- Cost < \$0.05 per Watt (>500 ku)



EPC9130: 48 V – 12 V 5-Phase Regulated IBC Using EPC2045

## eGaN FET and ICs

## 48 V – 12 V Demonstration Board

Part Number	Description	V <sub>IN</sub>	V <sub>OUT</sub>	I <sub>OUT</sub> (A)
EPC9130	48 V – 12 V, 500 kHz Non-Isolated, Regulated Converter	38 - 60	12	50

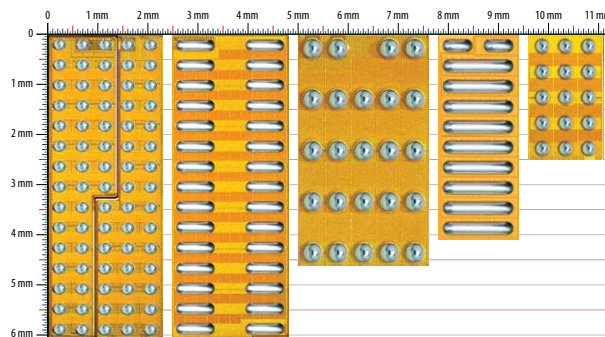
## 48 V – 12 V Demonstration Board

Part Number	Description	V <sub>DS</sub> (max)	I <sub>D</sub> (max RMS)	f <sub>SW</sub>
EPC9205	GaN Power Module for 48 V – 12 V Intermediate Bus Conversion	80	10	up to 1 MHz

## Recommended Devices for Regulated Brick Converters

Part Number	Configuration	V <sub>DS</sub>	Max R <sub>DS(on)</sub> (mΩ) at 5 V <sub>GS</sub>	Q <sub>G</sub> typ (nC)	Q <sub>GS</sub> typ (nC)	Q <sub>GD</sub> typ (nC)	Q <sub>OSS</sub> typ (nC)	Q <sub>RR</sub> (nC)	I <sub>D</sub> (A)	Pulsed I <sub>D</sub> (A)	Package (mm)	Development Board
EPC2023	Single	30	1.45	19	5.7	3.2	30	0	90	590	LGA 6.05 x 2.3	EPC9031
EPC2015C	Single	40	4	8.7	2.7	1.2	19	0	53	235	LGA 4.1 x 1.6	EPC9001C
EPC2030	Single	40	2.4	17	5.8	3.4	32	0	48	490	BGA 4.6 x 2.6	EPC9060
EPC2024	Single	40	1.5	18	5.1	2.4	45	0	90	560	LGA 6.05 x 2.3	EPC9032
EPC2031	Single	60	3	16	5	3	48	0	48	450	BGA 4.6 x 2.6	EPC9061
EPC2020	Single	60	2.2	16	3.9	2.3	50	0	90	470	LGA 6.05 x 2.3	EPC9033
EPC2103	Half Bridge	80	5.5	6.5	2	1.3	29 39	0	23	195	BGA 6.05 x 2.3	EPC9039
EPC2029	Single	80	3.2	13	3.4	1.9	53	0	48	360	BGA 4.6 x 2.6	EPC9046
EPC2021	Single	80	2.5	15	3.4	2.3	63	0	90	420	LGA 6.05 x 2.3	EPC9034
EPC2045	Single	100	7	5.2	1.7	1.1	21	0	16	130	BGA 2.5 x 1.5	EPC9078
EPC2001C	Single	100	7	7.5	2.4	1.2	31	0	36	150	LGA 4.1 x 1.6	EPC9002C
EPC2104	Half Bridge	100	6.3	7	2	1.2	35 47	0	23	165	BGA 6.05 x 2.3	EPC9040
EPC2032	Single	100	4	12	3	2	66	0	48	340	BGA 4.6 x 2.6	EPC9062
EPC2022	Single	100	3.2	13.2	3.4	2.4	71	0	90	390	LGA 6.05 x 2.3	EPC9035

Note: Table data subject to change. Please refer to the Product section on [www.epc-co.com](http://www.epc-co.com).

Design Support Materials @ [www.epc-co.com](http://www.epc-co.com)

DC-DC Handbook  
 GaN Transistors for Efficient Power Conversion Textbook  
 EPC9130: 48 V – 12 V 5-Phase Regulated IBC Using EPC2045  
 EPC9205: 100 V, 10 A GaN Power Module for 48 V – 12 V Intermediate Bus Conversion

Demo Boards  
 Reliability Reports  
 Device Models  
 Assembly Guides

Video: 48 V – 12 V DC-DC with GaN,  
 More Efficient, Smaller and Lower Cost



## For More Information

Please contact [info@epc-co.com](mailto:info@epc-co.com)  
 or your local sales representative

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