

eGaN® FETs and ICs for DC-DC Conversion



DC-DC Power Conversion

eGaN Technology Solutions

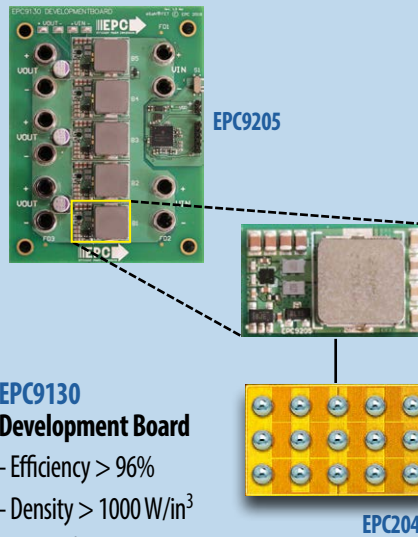
Benefits

48 V – 12 V Regulated Brick Converters



The smallest, most cost effective and highest efficiency non-isolated 48 V – 12 V converter, suitable for high-performance computing and telecommunication applications, can be achieved by employing eGaN® FETs such as the **EPC2045**.

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



EPC9130 Development Board

- Efficiency > 96%
- Density > 1000 W/in³
- Cost < \$0.05 per Watt (>500 ku)

GaN is...

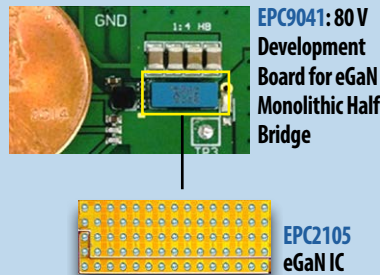
- More efficient
- Smaller
- Lower cost



Point of Load Converters



Single-stage conversion provides higher efficiency, consumes less board space and lowers cost. eGaN FETs and ICs are critical components in achieving single-stage conversion.



EPC9041: 80 V Development Board for eGaN Monolithic Half Bridge

EPC2105 eGaN IC

eGaN FETs and ICs high frequency switching and the FET's extremely small chip-scale packaging enables high power density with outstanding thermal efficiency.

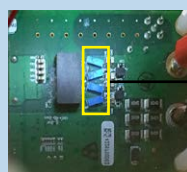
Rethinking the Data Center Power Architecture



Power conversion is at the core of reducing energy consumption of data centers. Highly efficient eGaN FETs and ICs enable the 48 V rack design adopted by Facebook and Google's Open Compute Project (OCP), cutting cloud data center energy bills.

TI Reference Board Design (PMP4435): 48 V_{IN} 300 W 1/8th Brick Digital Module with eGaN FET

(top view)



(bottom view)



TI LMG5200 Module

EPC2023

High frequency switching and extremely small chip-scale packaging of eGaN FETs and ICs enable high power density with outstanding thermal efficiency. These attributes support the power architecture mandated by the Open Compute Project (OCP).

DC-DC Conversion

Part Number	Description	V _{IN}	V _{OUT}	I _{OUT}	Featured Product
EPC9130	48 V – 12 V, Regulated Intermediate Bus Converter	38 - 60	12	50	EPC2045

Development Boards

Part Number	Description	V _{DS} (max)	I _D (max RMS)	Featured Product
EPC9041	Power Stage Evaluation of Monolithic GaN Half Bridge	80	20	EPC2105
EPC9205	100V, 10 A GaN Power Module for 48 V – 12 V Intermediate Bus Conversion	80	10	EPC2045

Recommended Devices and Development Boards for DC-DC Conversion

Part Number	Configuration	V _{DS}	Max R _{DS(on)} (mΩ) (V _{GS} = 5 V _{GS})	Q _G typ (nC)	Q _{GS} typ (nC)	Q _{GD} typ (nC)	Q _{OSS} typ (nC)	Max. Peak Pulsed I _D (A) (25°C, T _{pulse} = 300 μs)	Package (mm)	Half-Bridge Development Boards
EPC2100	Half Bridge	30	8.2 2.1	3.6 15	1.3 4.8	0.6 2.7	6.1 29	100 400	BGA 6.05 x 2.3	EPC9036
EPC2023	Single	30	1.45	19	5.7	3.2	30	590	LGA 6.05 x 2.3	EPC9031
EPC2014C	Single	40	16	2	0.7	0.3	4	60	LGA 1.7 x 1.1	EPC9005C
EPC2015C	Single	40	4	8.7	2.7	1.2	19	235	LGA 4.1 x 1.6	EPC9001C
EPC2030	Single	40	2.4	17	5.8	3.4	32	490	BGA 4.6 x 2.6	EPC9060
EPC2024	Single	40	1.5	18	5.1	2.4	45	560	LGA 6.05 x 2.3	EPC9032
EPC2031	Single	60	2.6	16	5	3.2	48	450	BGA 4.6 x 2.6	EPC9061
EPC2101	Half Bridge	60	11.5 2.8	3.3 13	1.1 3.9	0.5 2.2	9.3 45	80 350	BGA 6.05 x 2.3	EPC9037
EPC2020	Single	60	2.2	16	3.9	2.3	50	470	LGA 6.05 x 2.3	EPC9033
EPC8002	Single	65	480	0.133	0.057	0.015	0.344	2	LGA 2.05 x 0.85	EPC9022
EPC8009	Single	65	130	0.37	0.12	0.055	0.94	7.5	LGA 2.05 x 0.85	EPC9029
EPC2029	Single	80	3.2	13	3.4	1.9	53	360	BGA 4.6 x 2.6	EPC9046
EPC2105	Half Bridge	80	14.5 3.6	2.7 11	0.9 3	0.5 2.1	11 51	70 300	BGA 6.05 x 2.3	EPC9041
EPC2021	Single	80	2.5	15	3.4	2.3	63	420	LGA 6.05 x 2.3	EPC9034
EPC2007C	Single	100	30	1.6	0.6	0.3	8.3	40	LGA 1.7 x 1.1	EPC9006C
EPC2016C	Single	100	16	3.4	1.1	0.55	16	75	LGA 2.1 x 1.6	EPC9010C
EPC2045	Single	100	7	5.2	1.7	1.1	21	130	BGA 2.5 x 1.5	EPC9078
EPC2001C	Single	100	7	7.5	2.4	1.2	31	150	LGA 4.1 x 1.6	EPC9002C
EPC2032	Single	100	4	12	3	2	66	340	BGA 4.6 x 2.6	EPC9062
EPC2022	Single	100	3.2	13.2	3.4	2.4	71	390	LGA 6.05 x 2.3	EPC9035
EPC2033	Single	150	7	12	3.8	3.2	90	260	BGA 4.6 x 2.6	EPC9047
EPC2019	Single	200	50	1.8	0.6	0.35	18	42	LGA 2.77 x 0.95	EPC9014
EPC2010C	Single	200	25	3.7	1.3	0.7	40	90	LGA 3.6 x 1.6	EPC9003C
EPC2046	Single	200	25	2.9	1	0.6	22	55	BGA 2.77 x 0.95	EPC9079
EPC2047	Single	200	10	8.2	2.9	1.8	60	160	BGA 4.6 x 1.6	EPC9081

Table data subject to change. Please refer to the Product section on www.epc-co.com.

Design Support Materials @ www.epc-co.com

DC-DC Converter Handbook

Application Brief: eGaN FETs and ICs for 48 V Buck Converters

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

GaN Talk Blog – “48V-to-1V Conversion – the Rebirth of Direct-to-Chip Power”



For More Information

Please contact info@epc-co.com
or your local sales representative

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