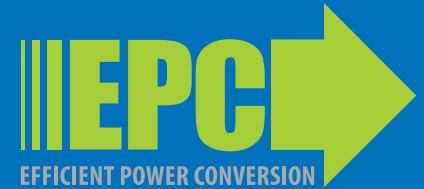


# eGaN® FETs and ICs for DC-DC Conversion

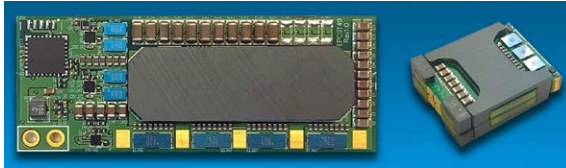


March 13, 2025

## DC-DC Power Conversion

## eGaN Technology Solutions

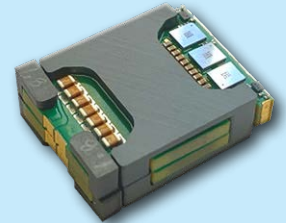
48 V – 12 V  
Power  
Converters  
with  
State-of-the-Art  
Power Density



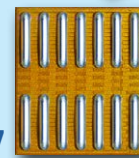
The smallest, most cost effective and highest efficiency non-isolated 48 V – 12 V converter, suitable for high-performance computing and telecommunication applications, can be achieved with eGaN FETs and ICs.

**EPC9159: 1 kW LLC, High Efficiency and High Power Density Evaluation Board**

- Peak efficiency: 98% at 25 A
- Full-load efficiency: 96.2% at 83 A
- High power density: 5130 W/in<sup>3</sup>
- Tiny footprint: 17.5 x 22.8 mm

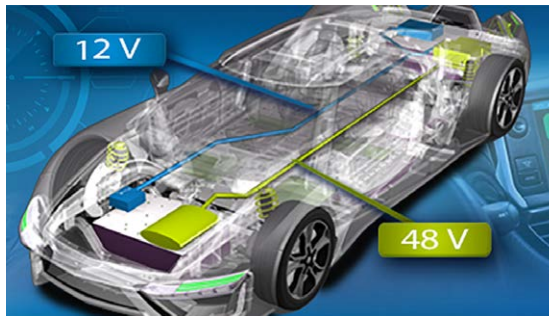


EPC2067



EPC2619

48 V – 12 V  
Power  
Converters  
Regulated  
Output,  
High Power



Automotive electronics can now take full advantage of the improved efficiency, speed, smaller size, and lower cost of eGaN FETs and ICs.

**EPC9165: 2 kW 48 V/14 V, 140 A Bi-directional Power Module**

- High efficiency: 96.1% @ 14.3 V/140 A output (buck)
- Small size
- Designed switching frequency: 500 kHz



EPC2302



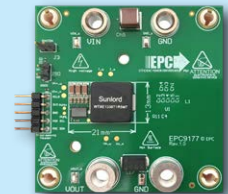
48 V – 12 V  
Power  
Converters  
Regulated  
Output,  
Medium  
Power



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.



**EPC9157: 300 W 1/16<sup>th</sup> Brick Module**



**EPC9177: 240 W Small Area, Low-profile, Synchronous Buck Converter**



**EPC9148: 48 V-19 V Ultra-thin, Multi-level Converter**



**EPC9153: 250 W High Efficiency, Thin Buck Converter**

## DC-DC Conversion

| Part Number | Description   | V <sub>IN</sub>  | V <sub>OUT</sub>                                    | I <sub>OUT</sub>                            | Featured Product  |
|-------------|---|--|---|---|-------------------|
| EPC9163     | Synchronous, buck or boost, digital controller  | 20 – 60 V <sup>(1)</sup><br>11.3 – 16 V <sup>(2)</sup> | 5 – 16 V <sup>(1)</sup><br>20 – 50 V <sup>(2)</sup> | 140 A <sup>(1)</sup>                        | EPC2218           |
| EPC9165     | Synchronous, buck or boost, digital controller, QFN-packaged GaN FETs   | 20 – 60 V <sup>(1)</sup><br>11.3 – 16 V <sup>(2)</sup> | 5 – 16 V <sup>(1)</sup><br>20 – 50 V <sup>(2)</sup> | 140 A <sup>(1)</sup>                        | EPC2302           |
| EPC9170     | Synchronous, buck, digital controller, GaN power IC   | 20 – 60 V <sup>(1)</sup>                               | 5 – 16 V <sup>(1)</sup>                             | 140 A <sup>(1)</sup>                        | EPC23101, EPC2302 |
| EPC9174     | Small (1/8 <sup>th</sup> Brick), LLC, fixed ratio 1:4, bi-directional, for servers  | 48 – 60 V  | 10 – 15 V   | 100 A                                       | EPC2071, EPC2066  |
| EPC9159     | Small, High-Power-Density, Bi-directional LLC, for servers  | Partial power: 12 – 52 V<br>Through power: 9 – 40 V    | 12 V  | 83 A (PP)                                   | EPC2619, EPC2067  |
| EPC9158     | Small, synchronous buck, analog controller  | 14 – 54 V  | 12 V  | 50 A  | EPC2218           |
| EPC90135    | Parallel, half-bridge (4 parallel FETs)   | up to 80 V   | up to 80 V  | 45 A  | EPC2218           |
| EPC9166     | Boost, analog controller  | 9 – 28 V   | Configurable:<br>36 V, 48 V, 60 V                   | 16 A @ 36 V<br>11 A @ 48 V<br>8 A @ 60 V    | EPC2218           |
| EPC9157     | Small (1/16 <sup>th</sup> brick), synchronous buck, analog controller, with motherboard   | 18 – 60 V  | 12 V  | 25 A  | EPC2218           |
| EPC9143     | Small (1/16 <sup>th</sup> brick), synchronous buck, digital controller, with motherboard  | 18 – 60 V  | 12 V  | 25 A  | EPC2053           |
| EPC9151     | Small (1/16 <sup>th</sup> brick), synchronous buck or boost, featuring Power Stage GaN IC, digital controller, with motherboard | 18 – 60 V <sup>(1)</sup><br>12 – 15 V <sup>(2)</sup>   | 12 V <sup>(1)</sup><br>48 V <sup>(2)</sup>          | 25 A <sup>(1)</sup><br>5.5 A <sup>(2)</sup> | EPC2152           |
| EPC9178     | Four switch, Bidirectional Capable Buck–Boost converter   | 30 – 60 V  | 30 – 60 V   | 15 A  | EPC2306           |
| EPC91108    | High power density Synchronous Buck   | 20 – 32 V  | 12 V  | 21 A  | EPC2055           |
| EPC9177     | Synchronous, Buck, digital controller, GaN power IC   | 12 – 64 V  | 12 V  | 20 A  | EPC23102          |
| EPC9195     | High efficiency, small, single-phase, buck converter  | 36 – 60 V  | 13 V  | 16 A  | EPC2619           |
| EPC9160     | Dual output, analog controller, synchronous, buck   | 9 – 24 V   | Dual output:<br>5 V / 3.3 V                         | 15 A  | EPC2055           |
| EPC91106    | High Power Density, Low Profile, Synchronous Buck and Boost Converter   | 12 – 64 V  | 4 – 40 V  | 13 A  | EPC23104          |
| EPC9153     | Thin, 1-phase buck  | 44 – 60 V  | 12 – 20 V   | 12.5 A                                      | EPC2218           |
| EPC9148     | Ultra-thin, multi-level, synchronous, buck  | 44 – 60 V  | 19 V  | 12.5 A                                      | EPC2053           |
| EPC9162     | Boost or buck, synchronous  | 12 V <sup>(2)</sup> / 48 V <sup>(1)</sup>              | 60 V <sup>(2)</sup> / 12 V <sup>(1)</sup>           | 0.85 A <sup>(2)</sup> / 5 A <sup>(1)</sup>  | EPC2052           |

<sup>(1)</sup> Buck converter <sup>(2)</sup> Boost Converter

## ePower™ Stage

| Part Number | Configuration                 | Function      | V   | I <sub>OUT</sub> | I <sub>OUT</sub> Peak | V <sub>DD</sub> | Input Logic  | Frequency (Max) | UVLO  | Package (mm)  | Development Board |
|-------------|-------------------------------|---------------|-----|------------------|-----------------------|-----------------|--------------|-----------------|-------|---------------|-------------------|
| EPC2152     | Half-Bridge ePower™ Stage     | ePower™ Stage | 80  | 12.5             | 90                    | 12              | 3.3 V        | 3 MHz           | 7.5   | LGA 3.9 x 2.6 | EPC90120          |
| EPC23101    | HS FET + Driver + Level Shift | ePower™ Stage | 100 | 65               | 240                   | 6               | 5.5 V        | 3 MHz           | 0.5–4 | QFN 3.5 x 5   | EPC90142          |
| EPC23102    | HS FET + Driver + Level Shift | ePower™ Stage | 100 | 35               | 140                   | 6               | 5.5 V        | 3 MHz           | 0.5–4 | QFN 3.5 x 5   | EPC90147          |
| EPC23104    | HS FET + Driver + Level Shift | ePower™ Stage | 100 | 15               | 44                    | 6               | 3.3 V or 5 V | 3 MHz           |       | QFN 3.5 x 5   | EPC90152          |

## Recommended Devices and Development Boards for DC-DC Conversion

| Part Number | Configuration     | V <sub>DS</sub> | Max R <sub>DS(on)</sub> (mΩ)<br>(V <sub>GS</sub> = 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) | Max. Peak Pulsed I <sub>O</sub> (A)<br>(25°C, T <sub>pulse</sub> = 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                       |
| EPC2055     | Single            | 40              | 3.6  | 6.6                     | 2.3                      | 0.7                      | 13                        | 161  | LGA 2.5 x 1.5   | EPC90132                       |
| EPC2030     | Single            | 40              | 2.4  | 17                      | 5.8                      | 3.4                      | 32                        | 490  | BGA 4.6 x 2.6   | EPC9060                        |
| EPC2067     | Single            | 40              | 1.55   | 17.1                    | 5.3                      | 2.0                      | 37                        | 409  | LGA 2.85 x 3.25 | EPC90138                       |
| EPC2057     | Single            | 50              | 8.5  | 3                       | 1.2                      | 0.5                      | 8                         | 66   | LGA 1.5 x 1.2   | EPC90155                       |
| 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                        |
| EPC2031     | Single            | 60              | 2.6  | 16                      | 5                        | 3.2                      | 48                        | 450  | BGA 4.6 x 2.6   | EPC9061                        |
| EPC2020     | Single            | 60              | 2.2  | 16                      | 3.9                      | 2.3                      | 50                        | 470  | LGA 6.05 x 2.3  | EPC9033                        |
| EPC2252     | Single – AEC-Q101 | 80              | 11   | 3.5                     | 1                        | 0.5                      | 15                        | 75   | BGA 1.5 x 1.5   | EPC9179                        |
| EPC2065     | Single            | 80              | 3.6  | 9.4                     | 2.6                      | 1.7                      | 33                        | 150  | LGA 3.5 x 2     | EPC90137                       |
| 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                        |
| EPC2206     | Single – AEC-Q101 | 80              | 2.2  | 15                      | 4.1                      | 3                        | 72                        | 330  | LGA 6.05 x 2.3  | EPC90122                       |
| EPC2106     | Half Bridge       | 100             | 70   | 0.73                    | 0.24                     | 0.140                    | 3.96 / 4.68               | 18   | BGA 1.35 x 1.35 | EPC9055                        |
| EPC2007C    | Single            | 100             | 30   | 1.6                     | 0.6                      | 0.3                      | 8.3                       | 40   | LGA 1.7 x 1.1   | EPC9006C                       |
| EPC2051     | Single            | 100             | 25   | 1.8                     | 0.6                      | 0.3                      | 7.3                       | 37   | LGA 1.3 x 0.85  | EPC9091                        |
| EPC2016C    | Single            | 100             | 16   | 3.4                     | 1.1                      | 0.55                     | 16                        | 75   | LGA 2.1 x 1.6   | EPC9010C                       |
| EPC2052     | Single            | 100             | 13.5   | 3.5                     | 1.5                      | 0.5                      | 13                        | 74   | BGA 1.5 x 1.5   | EPC9092                        |

## Recommended Devices and Development Boards for DC-DC Conversion (continued)

| Part Number | Configuration     | V <sub>DS</sub> | Max R <sub>DS(on)</sub> (mΩ)<br>(V <sub>GS</sub> = 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) | Max. Peak Pulsed I <sub>p</sub> (A)<br>(25°C, T <sub>pulse</sub> = 300 μs) | Package (mm)    | Half-Bridge Development Boards |
|-------------|-------------------|-----------------|--|-------------------------|--------------------------|--------------------------|---------------------------|--|-----------------|--------------------------------|
| EPC2204     | Single            | 100             | 6  | 5.7                     | 1.8                      | 0.8                      | 25                        | 125  | LGA 2.5 x 1.5   | EPC9097                        |
| EPC2032     | Single            | 100             | 4  | 12                      | 3                        | 2                        | 66                        | 340  | BGA 4.6 x 2.6   | EPC9062                        |
| EPC2367     | Single            | 100             | 1.2 (typ)  | 17                      | 5.3                      | 2.4                      | 54                        | 309  | QFN 3.3 x 3.3   | EPC90164                       |
| EPC2361     | Single            | 100             | 1.0 (typ)  | 28                      | 7.2                      | 2.5                      | 86                        | 519  | QFN 3 x 5       | EPC90156                       |
| EPC2306     | Single            | 100             | 3.8  | 11.0                    |                          | 1.1                      | 41                        | 197  | QFN 3 x 5       | EPC90145                       |
| EPC2088     | Single            | 100             | 3.2  | 12.5                    | 4.4                      | 1.4                      | 47                        | 231  | LGA 3.5 x 1.95  | EPC90123                       |
| EPC2619     | Single            | 100             | 3.3  | 8.3                     | 2.1                      | 1                        | 27                        | 164  | LGA 2.5 x 1.5   | EPC90153                       |
| EPC2071     | Single            | 100             | 2.2  | 18                      | 6                        | 1.8                      | 71                        | 64   | LGA 4.45 x 2.3  | EPC90146                       |
| EPC2302     | Single            | 100             | 1.8  | 23                      | 8                        | 2.3                      | 85                        | 408  | QFN 3 x 5       | EPC90142                       |
| EPC2033     | Single            | 150             | 7  | 12                      | 3.8                      | 3.2                      | 90                        | 260  | BGA 4.6 x 2.6   | EPC9047                        |
| EPC2308     | Single            | 150             | 6  | 11                      | 3.8                      | 1.3                      | 50                        | 157  | QFN 3 x 5       | EPC90148                       |
| EPC2305     | Single            | 150             | 4  | 21                      | 6.3                      | 2.6                      | 105                       | 329  | QFN 3 x 5       | EPC90143                       |
| EPC2234     | Single - AEC Q101 | 160             | 8  | 11                      | 3.8                      | 2.0                      | 96                        | 213  | BGA 4.6 x 2.6   | n/a                            |
| EPC2059     | Single            | 170             | 9  | 5.7                     | 1.3                      | 0.9                      | 35                        | 102  | BGA 2.8 x 1.4   | EPC9098                        |
| 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                       |
| EPC2207     | Single            | 200             | 22   | 4.5                     | 1.3                      | 0.7                      | 23                        | 54   | LGA 2.8 x 0.9   | EPC90124                       |
| EPC2307     | Single            | 200             | 10   | 10.6                    |                          | 1.3                      | 58                        | 130  | QFN 3 x 5       | EPC90150                       |
| EPC2215     | Single            | 200             | 8  | 13.6                    | 3.3                      | 2.1                      | 69                        | 162  | LGA 4.6 x 1.6   | EPC9099                        |
| EPC2304     | Single            | 200             | 5  | 21                      | 0.0                      | 2.6                      | 115                       | 260  | QFN 3 x 5       | EPC90140                       |

Table data subject to change. Please refer to the Product section on <https://epc-co.com/epc/products/gan-fets-and-ics>



## For More Information

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