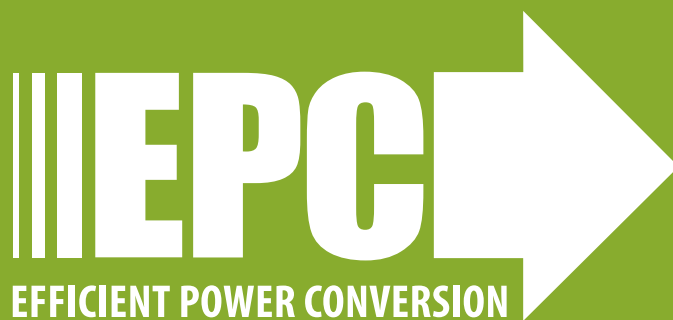


GaN FET Selection Tool for Buck Converters Quick Start Guide

User Instructions

Revision 2.0



OVERVIEW

The **GaN FET Selection Tool for Buck Converters** is an enhanced product selection tool that uses estimation and calculation for a hard-switched buck converter. The objective of this selection tool is to help you find the best GaN FETs to fit your design needs.

Operation

1. The calculator starts with default values. **Note:** To return to default values, click the **Reset Parameters (A)** icon.
2. Key in parameters specific to your design specifications.
3. Control FET controls and Rectifier FET controls are calculated separately. **Control FET (B)** controls are active as the default indicated by the blue colored text. To toggle to the **Rectifier FET (C)** controls, click on its words in the schematic and the words will turn **green**. The **Total Power (W) (D)** column will be highlighted in light blue for the Control FET parameters or light green for Rectifier FET parameters.

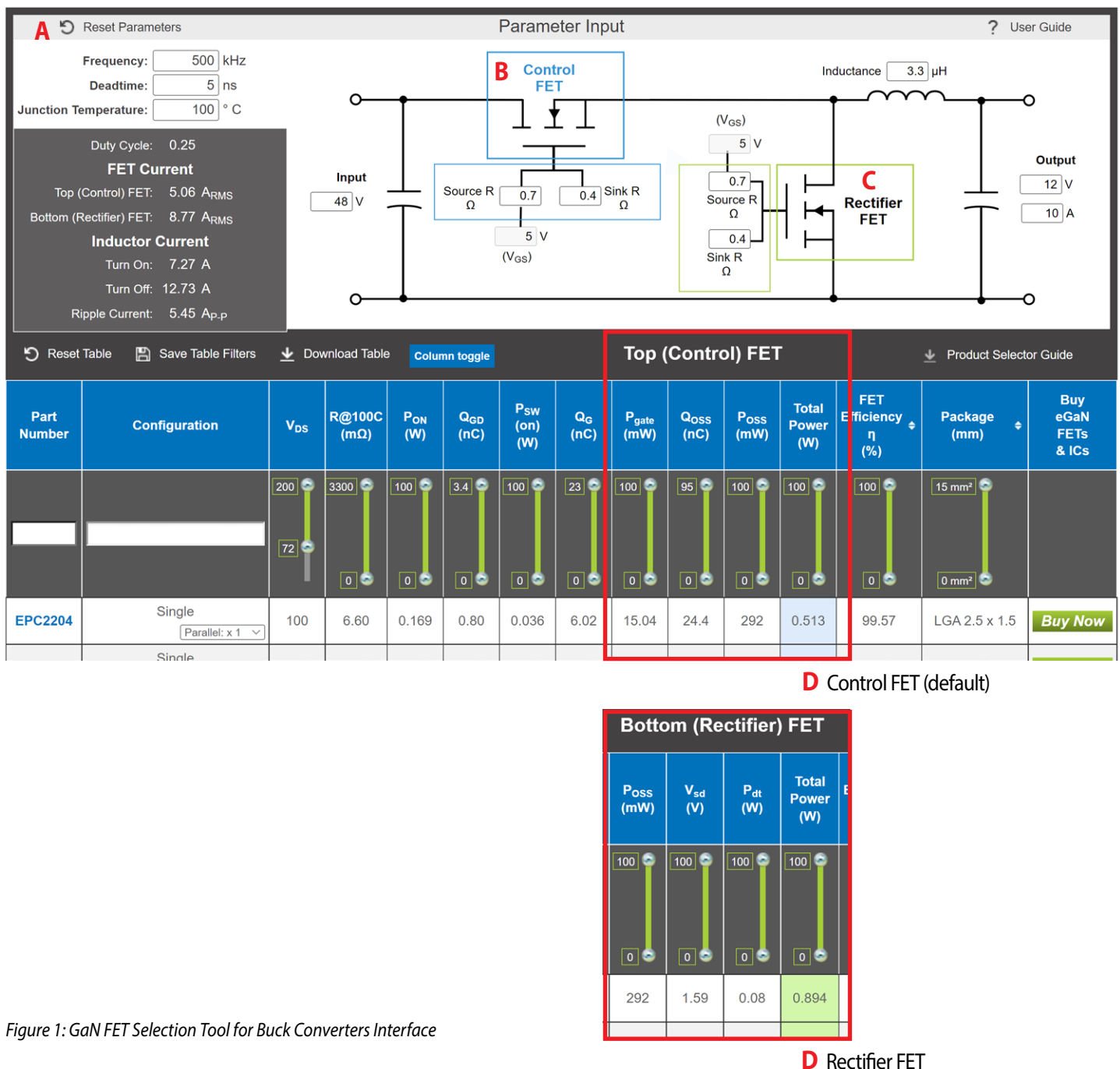


Figure 1: GaN FET Selection Tool for Buck Converters Interface

1 Reset Parameters
Parameter Input
 User Guide

Frequency: kHz **2**

Deadtime: ns **3**

Junction Temperature: °C **4**

Duty Cycle: **5**

FET Current

Top (Control) FET: A_{RMS} **6a**

Bottom (Rectifier) FET: A_{RMS} **6b**

Inductor Current

Turn On: A **7a**

Turn Off: A **7b**

Ripple Current: A_{p-p} **7b**

Reset Table
 Save Table Filters
 Download Table
Column toggle
Top (Control) FET
 Product Selector Guide

Part Number	Configuration	V _{DS}	R@100C (mΩ)	P _{ON} (W)	Q _{GD} (nC)	P _{sw} (on) (W)	Q _G (nC)	P _{gate} (mW)	Q _{oss} (nC)	P _{oss} (mW)	Total Power (W)	FET Efficiency η (%)	Package (mm)	Buy eGaN FETs & ICs
		<input type="text" value="200"/>	<input type="text" value="3300"/>	<input type="text" value="100"/>	<input type="text" value="3.4"/>	<input type="text" value="100"/>	<input type="text" value="23"/>	<input type="text" value="100"/>	<input type="text" value="95"/>	<input type="text" value="100"/>	<input type="text" value="100"/>	<input type="text" value="100"/>	<input type="text" value="15 mm<sup>2</sup>"/>	
EPC2204	Single 12 Parallel: x 1	100	6.60	0.169	0.80	0.036	6.02	15.04	24.4	292	0.513	99.57	LGA 2.5 x 1.5	Buy Now
	Single												<input type="text" value="0 mm<sup>2</sup>"/>	

Buck Converter Tool Parameter Input Panel Controls

- 1 Reset parameters** – Reset Input Parameters and apply default values to calculations.
- 2 Frequency** – Must be greater than 0
- 3 Deadtime** – Must be greater than 0
- 4 Junction Temperature** – The devices thermal system must be applied to power dissipation to estimate junction temperature. Valid ranges are -55–150°C. Default junction temperature is 100°C.
- 5 Duty Cycle** – Automatically calculated by dividing the Output Voltage by the Input Voltage
- 6 FET Current, Amps RMS**
 - 6a Top (Control) FET** – Parameters automatically calculated by converter parameters.
 - 6b Bottom (Rectifier) FET** – Parameters automatically calculated by converter parameters.
- 7 Inductor Current, Amps (peak to peak)**
 - 7a Turn-on and turn-off current** – Inductor current; automatically calculated by converter parameters
 - 7b Ripple Current** – Automatically calculated by converter parameters; verify ripple current and adjust output inductor if necessary. Changing circuit parameters changes the ripple current.
- 8 Inductance** – Must be greater than 0
- 9 Input Voltage** – As with all buck converters, V_{IN} must be higher than V_{OUT}.
- 10 Output Voltage** – As with all buck converters, V_{OUT} must be less than V_{IN}.
- 11 Gate Drives (for both control and rectifier switches)**
 - 11a/11a Source R** – Source Resistance in ohms
 - 11b/11b Sink R** – Sink Resistance in ohms
 - 11c/11c Voltage** – Gate drive voltage, defaults to 5 V.
- 12 Parallel dropdown selector** – Drop down with range to 1–10, located in the **Configuration** column of the results table. Parallel devices may be calculated by varying the x number (i.e., x2 for 2 in parallel). Power dissipation for parallel devices is the total for all devices.

Table Header Functions



- 1 Reset Table** – Resets the tables range selector and search filters.
- 2 Save Table Filters** – Is a toggle button, which will save the tables range selectors and search filters until it is unselected. The values saved will reset when the “Reset Table” button is selected.
- 3 Download Table** – download an Excel spreadsheet of the current calculated filtered table data and parameters.
- 4 Product Selector Guide** – Download a pdf containing all of EPC product offerings, with their parameters.

Table Data Filtering

Part Number	Configuration	V _{DS}	R@100C (mΩ)	P _{ON} (W)	Q _{GD} (nC)	P _{sw (on)} (W)	Q _G (nC)	P _{gate} (mW)	Q _{oss} (nC)	P _{oss} (mW)	Total Power (W)	FET Efficiency η (%)	Package (mm)	Buy eGaN FETs & ICs
1	2	200 72	3300 0	100 0	3.4 0	100 0	23 0	100 0	95 0	100 0	100 0	100 0	15 mm ² 0 mm ²	
EPC2204	Single Parallel: x 1	100	6.60	0.169	0.80	0.036	6.02	15.04	24.4	292	0.513	99.57	LGA 2.5 x 1.5	Buy Now
EPC2045	Single Parallel: x 1	100	7.95	0.204	0.79	0.046	6.38	15.94	24.4	292	0.557	99.54	BGA 2.5 x 1.5	Buy Now
EPC2052	Single Parallel: x 1	100	14.30	0.366	0.49	0.036	3.71	9.29	12.6	151	0.563	99.53	BGA 1.5x1.5	Buy Now
EPC2105	Half Bridge Parallel: x 1	80	14.70	0.376	0.52	0.051	2.87	7.19	12.4	148	0.582	99.52	BGA 6.05 x 2.3	Buy Now
EPC2059	Single Parallel: x 1	170	9.93	0.254	0.84	0.040	5.96	14.89	25.3	303	0.612	99.49	LGA 2.8 x 1.4	Buy Now

- 1 Part Number input Field** – Enter a part number or partial number to display parts containing that value. For example, “EPC21” will show all of the EPC2100 series parts.
- 2 Configuration Field** – Filter the table based on the FET **Configuration** type
- 3 Range sliders** – Narrow down value ranges with selector handles. The values could reset when parameters are on the **Parameter Input** panel. Not all ranges will be available on the mobile version.

Note: Table parameters are scaled for the inputted converter conditions. For device parameters please refer to the datasheet.

Calculations and Final Note

While we strive to provide the best data calculations possible, EPC is not responsible for errors in the results. Refer to FET datasheet for accurate part parameters to calculate and verify component power dissipation. If you have any questions or notice an anomaly, please contact EPC at info@epc-co.com.

For More Information:

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

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