

SupIRBuck Design Tool Log in Page

- On line design tool featuring parametric search, schematic capture, AC, Steady State, Transient Analysis, Thermal Analysis, BOM creation, and more...

Design Tool Landing Page Capabilities Overview

International Rectifier MyPower – Online Design Center for DC/DC Converters

- Design Requirements Interview**
Simply enter your design requirements, such as input and output voltage and current, switching frequency etc.
- Design Configuration**
MyPower automatically calculates optimum loop compensation and appropriate values for inductors and capacitors.
- Design Verification by Remote Simulation**
Your design is displayed in an Online Schematic, which allows you to test your application in a virtual test bed. MyPower allows AC, transient, and steady state analysis.
- PCB Layout and Thermal analysis**
MyPower allows easy drag and drop PCB layout editing, and state-of-the-art thermal analysis.
- Summary, Download, Design & More**
Once the design has been verified, MyPower generates a Bill of Materials and a comprehensive design report including simulation results, schematic and design data.

Compatibility Checks

- ✓ Javascript
- ✗ Pop-up Windows
- ✓ Adobe Flash Player 8 or higher
- ✓ Server Response Time
- ✓ Cookies

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http://web.transim.com/IR/Pages/DesignReq.aspx

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IR International Rectifier

THE POWER MANAGEMENT LEADER
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Welcome to MyPower, International Rectifier's premier site for power design.

Part Selection Electrical Design PCB Design Thermal Analysis Summary Saved Designs

Design Inputs

Input Voltage	<input type="text" value="12"/>	V
Output Voltage	<input type="text" value="1.8"/>	V
Output Current	<input type="text" value="2"/>	A
Switching Frequency	<input type="text" value="600"/>	KHz
VCC Bias	<input type="text" value="5"/>	V

Required Features

- DDR Tracking
- Enable
- External Synchronization
- Overvoltage Detection
- Power Good
- Programmable Frequency
- Programmable Soft Start
- Sequencing

**1.5V – 16V Voltage range input
2A – 12A Continuous output**

*Higher frequency reduces solution size, lower frequencies increase solution efficiency.

Note: All parts include Current Limit, Internal Bootstrap Diode, Pre-bias Startup Protection, Soft Start, and Thermal Protection.

User Selected Inputs allows Wide Design Flexibility

Give Feedback

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Legal Disclaimer

The information given in this Simulation tool shall in no event be regarded as a guarantee of conditions, characteristics or results. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, International Rectifier hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party.

If you experience any problems in the use of the program or have doubts in the exactness of results don't hesitate to contact our support team via the feedback function of the tool.

Done

One active download (Unknown time remaining)

Design Tool Screen Shots Progression



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International Rectifier THE POWER MANAGEMENT LEADER

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Part Selection | Electrical Design | PCB Design | Thermal Analysis | Summary | Saved Designs

Design Inputs

Input Voltage: 12 V
 Output Voltage: 1.8 V
 Output Current: 2 A
 Switching Frequency: 800 KHz
 VCC Bias: 5 V

Required Features

- DDR Tracking
- Enable
- External Synchronization
- Overvoltage Detection
- Power Good
- Programmable Frequency
- Programmable Soft Start
- Sequencing

*Higher frequency reduces solution size, lower frequencies increase solution efficiency.

Note: All parts include Current Limit, Internal Bootstrap Diode, Pre-bias Startup Protection, Soft Start, and Thermal Protection.

Select Part

Part	Package Size (mm)	VIN Range	VOUT Range	Iout Max	Switching Fsw (kHz)	Device Cost	Eff @ 10% Iout	Eff @ 50% Iout	Eff @ 100% Iout	Additional Features
Design IR3843W	5 x 6	1.5 - 16	0.7 - 90%Vin	2	250 - 1,500	\$1.38	60.7%	84.3%	86.1%	Enable, Power Good, Programmable Frequency, Sequencing
Design IR3842W	5 x 6	1.5 - 16	0.7 - 90%Vin	4	250 - 1,500	\$1.56	60.1%	84.3%	86.5%	Enable, Power Good, Programmable Frequency, Sequencing
Design IR3841W	5 x 6	1.5 - 16	0.7 - 90%Vin	8	250 - 1,500	\$1.81	58.8%	83.9%	86.6%	Enable, Power Good, Programmable Frequency, Sequencing
Design IR3840W	5 x 6	1.5 - 16	0.7 - 90%Vin	12	250 - 1,500	\$2.31	48.9%	78.9%	83.7%	Enable, Power Good, Programmable Frequency, Sequencing

Give Feedback

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http://web.transim.com/IR/Pages/DesignReq.aspx?LoadPart=IR3843W

SupIRBuck Tool Provides Options After Design Inputs are Added



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Current Design not saved

Part Selection Electrical Design PCB Design Thermal Analysis Summary Saved Designs

Current Design: IR3843W SupIRBuck

AC Analysis Steady State Analysis Transient Analysis

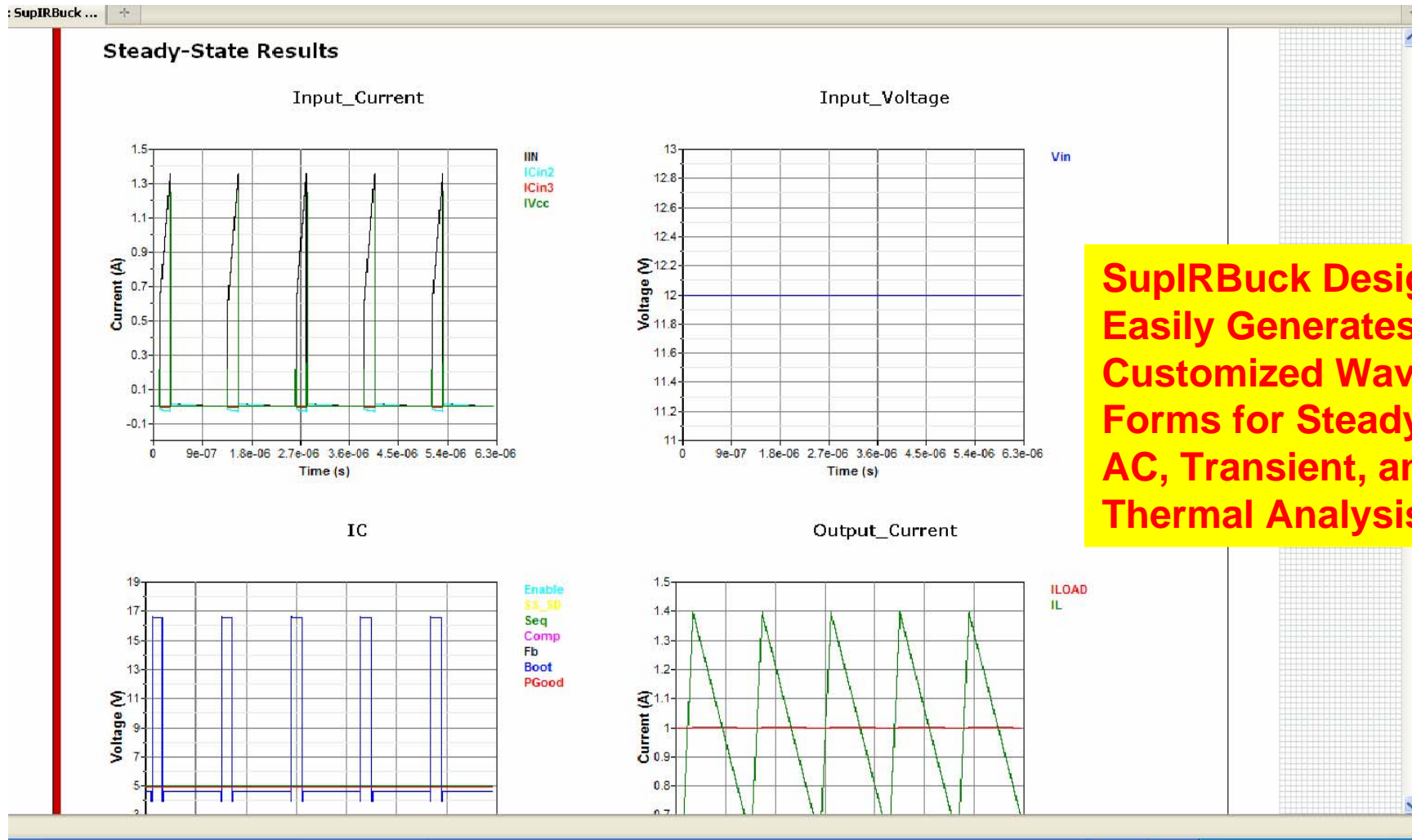
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Schematic Waveforms Losses Redesign

Tool Automatically Creates Schematic / BOM Upon SupIRBuck Part Selection

Transferring data from web.transim.com...

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http://web.transim.com/IR/Pages/Thermal.aspx

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Current Design: Design_1-IR3843W-SupIRBuck

Part Selection | Electrical Design | PCB Design | **Thermal Analysis** | Summary | Saved Designs

Current Design: IR3843W SupIRBuck

Major Device Losses			
PART	CALCULATED LOSS	USER OVERRIDES	
IR3843W (Ctrl Fet)	0.071838 W	0.071838 W	
IR3843W (Sync Fet)	0.208367 W	0.208367 W	
IR3843W (Control IC)	0.03 W	0.03 W	
IR3843W (IC Total)	(0.310205) W	(0.310205) W	
Cin2_0	0.008334 W	0.008334 W	
Cin3_0	0.008334 W	0.008334 W	
Co2_0	0.000421 W	0.000421 W	
Lo	0.091841 W	0.091841 W	
Total Power Loss	0.419 W	0.419 W	

Update

Calculated Power Losses

■ Cin2_0 ■ Cin3_0
■ Co2_0 ■ Lo
■ IR3843W (Ctrl FET) ■ IR3843W (Sync FET)
■ IR3843W (Control IC)

Power Dissipation for Major Components are Shown here. This Includes Losses for the Output Inductor and SupIRBuck IC

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http://web.transim.com/IR/Pages/Summary.aspx

Bill of Materials

Ref	Supplier Part Number	Manufacturer	Qty	Value	Type
U1	IR3843W	International Rectifier	1		IC
C3	GRM1885C1H181JA01D	Murata Electronics North America	1	180pF	Capacitor
C4	Custom		1	12nF	Capacitor
C6	C1608X7R1H104K	TDK Corporation	1	100nF	Capacitor
C7	GRM1885C1H222JA01D	Murata Electronics North America	1	2.2nF	Capacitor
Cin1	C1608X7R1H104K	TDK Corporation	1	100nF	Capacitor
Cin2	ECJ-3YB1C106M	Panasonic - ECG	1	10uF	Capacitor
Cin3	EEV-FK1E331P	Panasonic - ECG	1	330uF	Capacitor
Co1	C1608X7R1H104K	TDK Corporation	1	100nF	Capacitor
Co2	ECJ-2FB0J226M	Panasonic - ECG	1	22uF	Capacitor
Css	C1608X7R1H104K	TDK Corporation	1	100nF	Capacitor
CVcc	C1608X7R1H104K	TDK Corporation	1	100nF	Capacitor
Lo	MPT730-2R5M1IR	Delta	1	2.5uH	Inductor
R1	MCR03EZPFX4992	Rohm Semiconductor	1	49.9kΩ	Resistor
R10	MCR03EZPFX1580	Rohm Semiconductor	1	158Ω	Resistor
R2	MCR03EZPFX7151	Rohm Semiconductor	1	7.15kΩ	Resistor
R3	MCR03EZPFX2051	Rohm Semiconductor	1	2.05kΩ	Resistor
R6	MCR03EZPFX20R0	Rohm Semiconductor	1	20Ω	Resistor
R8	MCR03EZPFX4991	Rohm Semiconductor	1	4.99kΩ	Resistor
R9	MCR03EZPFX3161	Rohm Semiconductor	1	3.16kΩ	Resistor
ROCset	MCR03EZPFX1271	Rohm Semiconductor	1	1.27kΩ	Resistor
RPG	MCR03EZPFX1002	Rohm Semiconductor	1	10.0kΩ	Resistor
Rt	MCR03EZPFX1782	Rohm Semiconductor	1	17.8kΩ	Resistor

[Download BOM](#)

Simulation Results

Design Requirements

Input Voltage 12 V
Output Voltage 1.8 V
Output Current 2 A
Switching Frequency 800 KHz
Max Output Ripple 27 mV
Max Load Step Current 1 A
Max Voltage Deviation 72 mV
Bandwidth 80 KHz
Inductor Ripple Current % 35 %
C7 (Compensation Cap) 2.2 nF