

Sup/IRBuck™ Integrated POL Voltage Regulator Product Selection Guide















International
IOR Rectifier

The Sup/IRBuck™ Advantage

- Best-in-class efficiency over entire load range with peak efficiency over 96%
- Common series footprint enables “cut and paste” design, and scalability for 2–14 Amps allowing for faster time to market
- Saves energy, size and cost with capability to operate directly from 12 V_{in}
- Integrated solution offers high power density with reduced component count and improved performance
- Low profile and excellent thermal performance allows for back-side board mounting for additional space savings
- Wide input and output voltage range(s) maximizes appeal for broadest range of applications

Gen 2.1 Sup/IRBuck™ Product Offering

| | | | | |
|-----------------|---|--|---|--|
| 14A | IR3840W | | IR3837 | |
| 12A |  | |  | |
| 10A | | | IR3838 | NEW 4x5 mm package |
| 9A | | |  | |
| 8A | IR3841W | IR3831W | | IR3859 |
| 8A |  |  | |  |
| 6A | | | IR3839 | IR3856 |
| 6A | | |  |  |
| 4A | IR3842W | IR3832W | | IR3853 |
| 4A |  |  | |  |
| 2A | IR3843W | | | |
| 2A |  | | | |
| INPUT BIAS | 5 V | | 12 V single rail | |
| DDR TERACKING | N | Y | Y | |
| V _{IN} | 1.5 – 16 V | | 1.5 – 21 V | |

mypower.irf.com/supirbuck

Sup/IRBuck™ Online Design Tool Simplifies Design

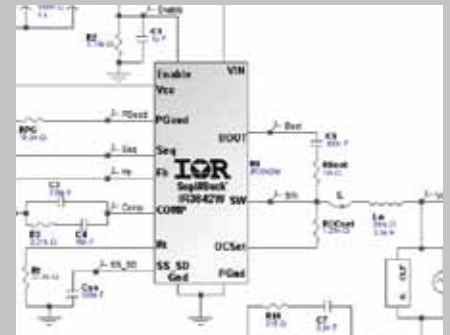
Comprehensive online design tool featuring parametric search, schematic capture, AC, Steady State, Transient Analysis, Thermal Analysis, BOM creation, and more...

Design Requirements

| Part Selection | Electrical Des |
|----------------------|----------------|
| Design Inputs | |
| Input Voltage | 12 V |
| Output Voltage | 1.8 V |
| Output Current | 2 A |
| Switching Frequency | 600 KHz |
| VCC Bias | 5 V |

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

Design Configuration



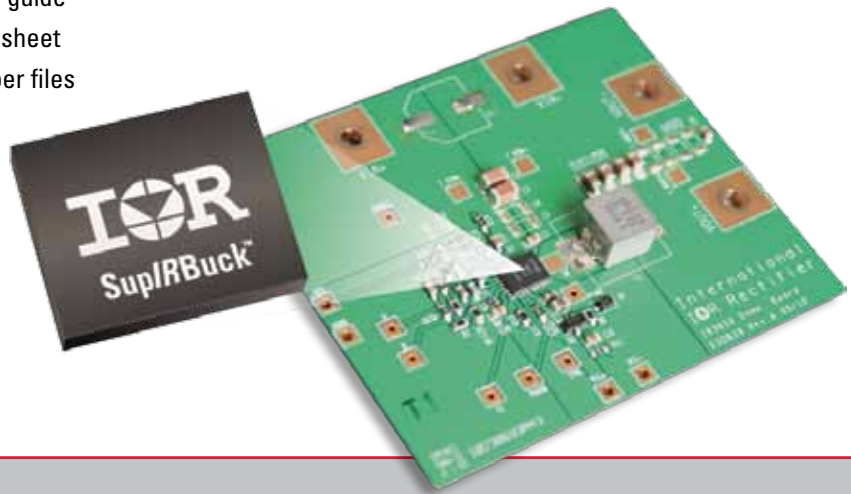
| Part Number | Package size | Max Iout [A] | Max Vin [V] | Max Vbias [V] | Vref [V] | Sequenc. | Program. soft-start | Basic Synch. | Margining | "DDR tracking" | Over Voltage Protection (latch) | Dedicated Vsense pins for DVP |
|-------------|--------------|--------------|-------------|---------------|----------|----------|---------------------|--------------|-----------|----------------|---------------------------------|-------------------------------|
| IR3840W | 5x6mm | 12 | 16 | 5.5 | 0.7 | Y | Y | --- | --- | --- | --- | --- |
| IR3841W | 5x6mm | 8 | 16 | 5.5 | 0.7 | Y | Y | --- | --- | --- | --- | --- |
| IR3842W | 5x6mm | 4 | 16 | 5.5 | 0.7 | Y | Y | --- | --- | --- | --- | --- |
| IR3843W | 5x6mm | 2 | 16 | 5.5 | 0.7 | Y | Y | --- | --- | --- | --- | --- |
| IR3831W | 5x6mm | 8 | 16 | 5.5 | 0.7 | --- | Y | --- | --- | Y | --- | --- |
| IR3832W | 5x6mm | 4 | 16 | 5.5 | 0.7 | --- | Y | --- | --- | Y | --- | --- |
| IR3837 | 5x6mm | 14 | 16 | 16 | 0.6 | Y | --- | Y | Y | Y | --- | --- |
| IR3838 | 5x6mm | 10 | 16 | 16 | 0.6 | Y | --- | Y | Y | Y | --- | --- |
| IR3839 | 5x6mm | 6 | 16 | 16 | 0.6 | Y | --- | Y | Y | Y | --- | --- |
| IR3859 | 4x5mm | 9 | 21 | 5.5 | 0.7 | Y | Y | Y | --- | --- | Y | Y |
| IR3856 | 4x5mm | 6 | 21 | 5.5 | 0.7 | Y | Y | Y | --- | --- | Y | Y |
| IR3853 | 4x5mm | 4 | 21 | 5.5 | 0.7 | Y | Y | Y | --- | --- | Y | Y |

Common Features

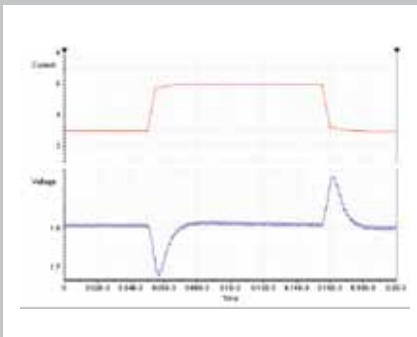
- Maximum switching frequency - 1.5 MHz
- V_{ref} accuracy +/- 1 %
- Enable
- Programmable switching frequency
- PGood
- Pre-bias protection
- Thermal protection
- Programmable hiccup current limit
- Programmable over-current

Evaluation Development kit includes

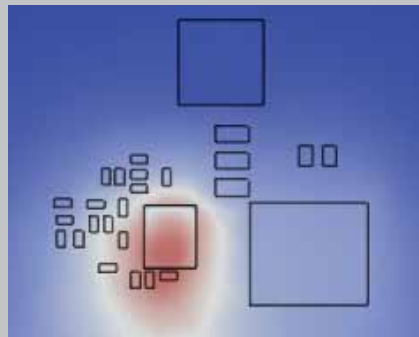
- Development board
- User guide
- Datasheet
- Gerber files



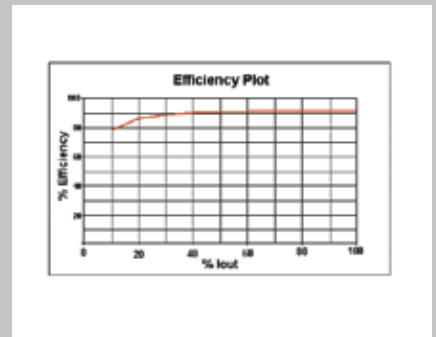
Simulation



PCB Layout and Thermal Analysis



Summary



| Product Line | Applications | Key Products |
|---|---|---|
|  <p>Energy Saving Products Integrated design platforms that enable customers to add energy-conserving features that achieve lower operating energy costs and manufacturing Bill of Material (BOM) costs.</p> | <ul style="list-style-type: none"> • Appliances • Audio • Display • Industrial • Lighting • SMPS | <ul style="list-style-type: none"> • Digital Control ICs • High-Voltage ICs • IGBTs • IRAM Integrated Power Modules • Intelligent Power Switches • MERs |
|  <p>Enterprise Power Optimized power management system solutions that deliver benchmark power density, efficiency and performance in enterprise power.</p> | <ul style="list-style-type: none"> • Servers • Storage Networks • Switchers & Routers • Workstations • Notebooks • Game Stations • Set-Top Box | <ul style="list-style-type: none"> • DirectFET® • Low-Voltage ICs • Sup/IBuck™ • XPhase® • Power Monitor IC • iPOWER® |
|  <p>Automotive Automotive grade power management solutions qualified to meet the needs of 12V, 24V and HE/EV applications with a zero defect goal.</p> | <ul style="list-style-type: none"> • AC and DC Motor Drives • Powertrain / Engine control • Body Electronics • Lighting • Class D Audio • Heavy Loads and Actuators | <p>Automotive Qualified:</p> <ul style="list-style-type: none"> • HEXFET® Power MOSFETs • Intelligent Power Switches • Driver ICs (Low-, Mid- and High-Voltage) • IGBTs for Motor Drives, Various Loads |
|  <p>Benchmark MOSFETs IR continues to lead the industry by offering power MOSFETs with the lowest $R_{DS(on)}$ and widest range of packages up to 250V for a diverse range of applications.</p> | <ul style="list-style-type: none"> • Audio • Computing • Communications • Motor Control • Power Supply • Synchronous Rectification | <ul style="list-style-type: none"> • Discrete HEXFET® MOSFETs • Dual HEXFET® MOSFETs • FETKY® |
|  <p>HiRel Our discrete components, complex hybrid power module assemblies and rugged DC-DC converters utilize leading-edge power technology which, together with demanding environmental specifications help engineers to meet their toughest design challenges.</p> | <ul style="list-style-type: none"> • Space • Military • Commercial Aviation • Rugged Industrial • Medical | <ul style="list-style-type: none"> • RAD-Hard MOSFETs • Power Modules/Hybrid Solutions • Motor Control Solutions • DC-DC Converters |