

2A, 40V Synchronous Step-Down Converter Evaluation Board

Parameters Subject to Change Without Notice

FEATURES

- 3.6V to 40V operating input range
2A output current
- Up to 94% efficiency
- High efficiency (>78%) at light load
- Internal Soft-Start
- Fixed 440kHz Switching frequency
- Input under voltage lockout
- Available in thermally enhanced
ESOP8 package
- Start-up current run-away protection
- Short circuit protection
- Thermal protection

APPLICATIONS

- Distributed Power Systems
- Networking Systems
- FPGA, DSP, ASIC Power Supplies
- Green Electronics/ Appliances
- Notebook Computers

DESCRIPTION

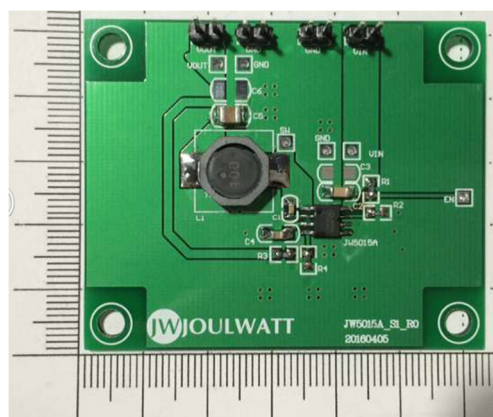
The JW5015A is a current mode monolithic buck switching regulator. Operating with an input range of 3.6V-40V, the JW5015A delivers 2A of continuous output current with two integrated N-Channel MOSFETs. The internal synchronous power switches provide high efficiency without the use of an external Schottky diode. At light loads, regulators operate in low frequency to maintain high efficiency and low output ripple. Current mode control provides tight load transient response and cycle-by-cycle current limit.

The JW5015A guarantees robustness with short-circuit protection, thermal protection, start-up current run-away protection, and input under voltage lockout.

ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Unit
Input Voltage	VIN	5.1~40	V
Output Voltage	VOUT	5	V
Output Current	IOUT	0~2	A

EVALUATION BOARD



PRINTED CIRCUIT BOARD LAYEROUT

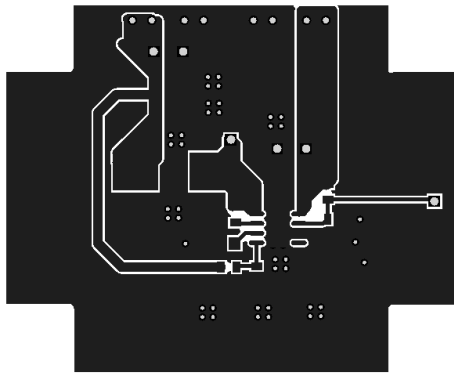


Figure1—Top Layer

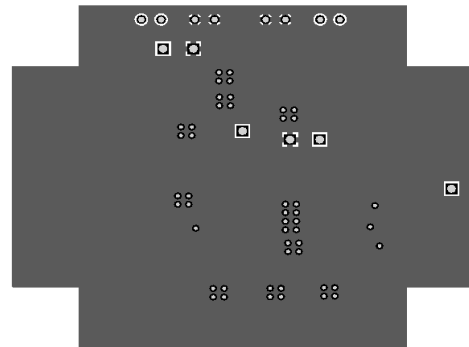


Figure2—Bottom Layer

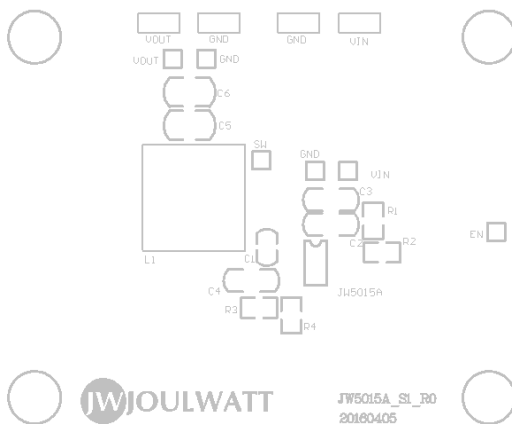


Figure3—Silk Layer

PCB LAYOUT NOTE

1. For minimum noise problem and best EMI performance, the PCB is preferred to following the guidelines and figure 1 as reference.
2. Place the input decoupling capacitor as close to JW5015A (VIN pin and PGND) as possible to eliminate noise at the input pin. The loop area formed by input capacitor and GND must be minimized.
3. Put the feedback trace as far away from the inductor and noisy power traces as possible.
4. Pin 9 GND must be connected to Pin 6 GND as close as possible.
5. To improve thermal conduction, put an array of vias right under the exposed pad. Use small vias (15mil barrel diameter) so that the holes can be filled during the plating process. Very large holes can cause 'solder-wicking' problems during the reflow soldering process. Use a via pitch (distance between the centers of two adjacent vias) of 40mil.

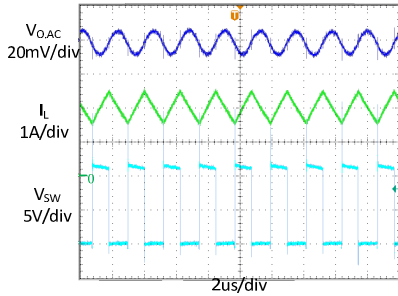
QUICK START GUIDE

1. Connect the positive terminal and negative terminal of the load to Vout and GND of EVB, respectively.
2. Connect a power supply between VIN and GND with the supply in “OFF” state. Set the output voltage of the power supply to 4.6V~40V.
3. Turn on the power supply and the evaluation board starts operating in normal condition.
4. The output voltage can be adjusted by varying the R4 and R5 on EVB.
For example: Fixed R4 to 100K, when adjusting the output voltage to 3.3V,
 $R5 = V_{out} / 0.8 * R4 - R4$.
5. For more information, please refer to the datasheet of JW5015A.

TYPICAL PERFORMANCE CHARACTERISTICS

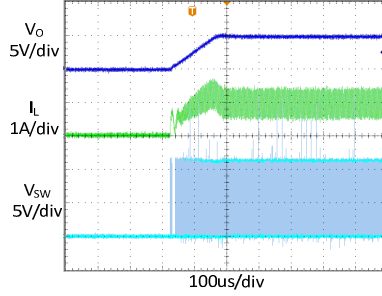
Steady State test

VIN=12V, Vout=5V
Iout=2A, Iin=0.65A



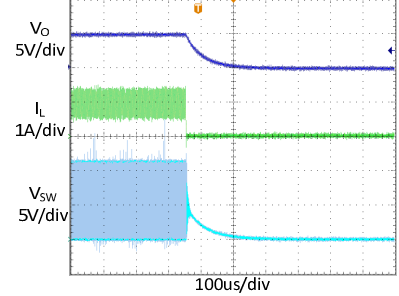
Startup through enable

VIN=12V, Vout=5V
Iout=1A(Resistive load)



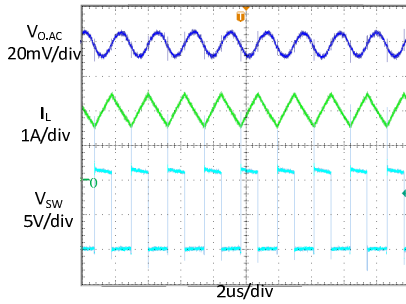
Shutdown through enable

VIN=12V, Vout=5V
Iout=1A(Resistive load)



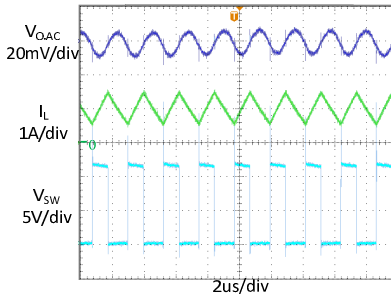
Heavy Load Operation

2A LOAD



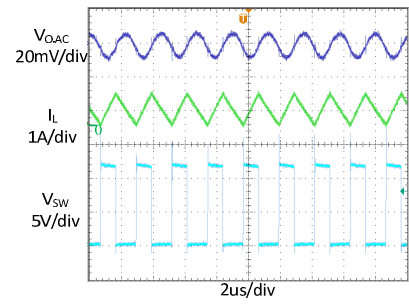
Medium Load Operation

1A LOAD

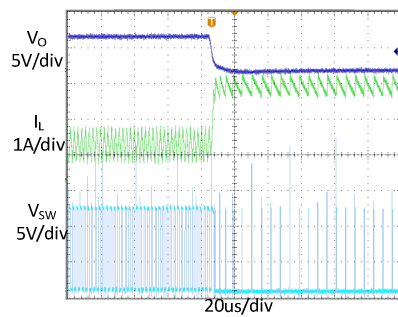


Light Load Operation

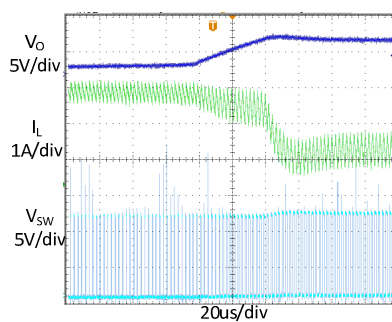
0.3A LOAD



Short Circuit Protection

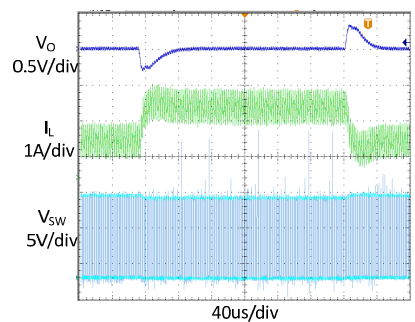


Short Circuit Recovery



Load Transient

(1A load → 2A load → 1A load)



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