

DESCRIPTION

EV3910A-S-00A Evaluation Board is designed to demonstrate the capabilities of MP3910A. MP3910A is a Peak Current Mode PWM controller that can drive an external MOSFET capable of handling >10A current. It has a typical operational current of 400µA and can accommodate flyback, boost for nonisolated and isolated applications.

While designed for Boost applications, the 1A gate driver minimizes the power loss of the external MOSFET while allowing the use of a wide variety of standard threshold devices. Additionally, MP3910A has pulse skipping Mode function that improves the efficiency with light load or no load.

The MP3910A is available in SOIC8 package.

ELECTRICAL SPECIFICATIONS

| Parameter | Symbol | Value | Units |
|----------------|-----------|-------|-------|
| Input voltage | V_{IN} | 9-14 | V |
| Output voltage | V_{OUT} | 24 | V |
| Output current | I_{OUT} | 2 | A |

FEATURES

- 9V to 14V Supply Voltage Range
- 1A MOSFET Gate Driver
- External Soft-Start
- Pulse Skipping Operation with Light Load
- Programmable Switching Frequency (30kHz-to-400kHz)
- Cycle-by-Cycle Current Limit
- Over Voltage Protection
- Available in an SOIC8 Package


APPLICATIONS

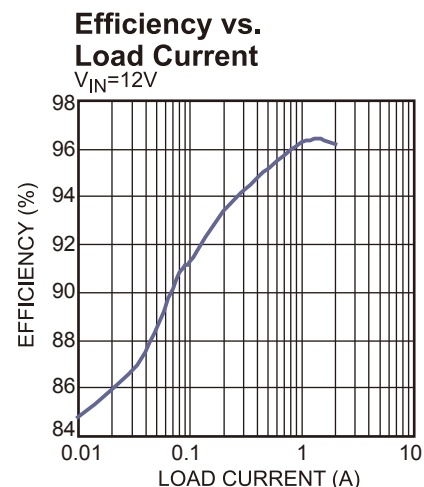
- Telecom Isolated Power
- Brick Modules
- Off-line Controller
- General Step Up Applications

All MPS parts are lead-free and adhere to the RoHS directive. For MPS green status, please visit MPS website under Products, Quality Assurance page.

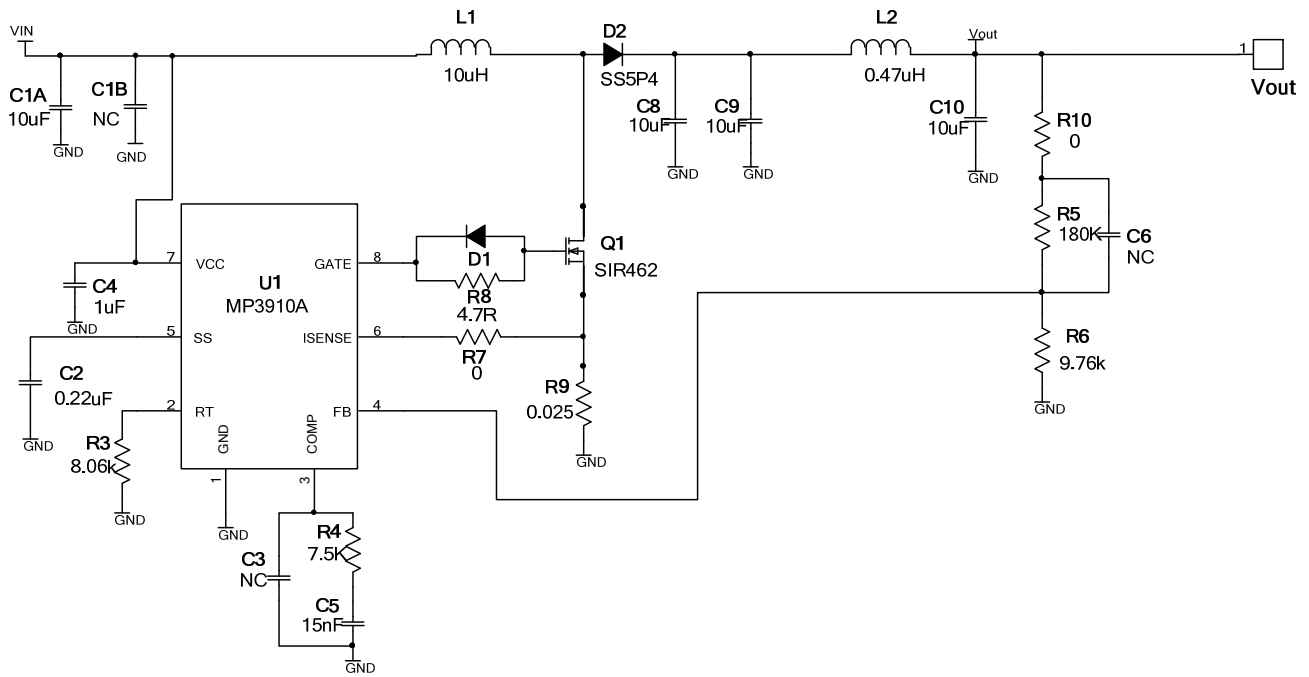
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EV3910A-S-00A EVALUATION BOARD

| | |
|---|----------------------|
|  | |
| (L x W x H) 2.5" x 2.5" x 0.5" (6.35cm x 6.35cm x 1.2cm) | |
| Board Number | MPS IC Number |
| EV3910A-S-00A | MP3910A |



EVALUATION BOARD SCHEMATIC



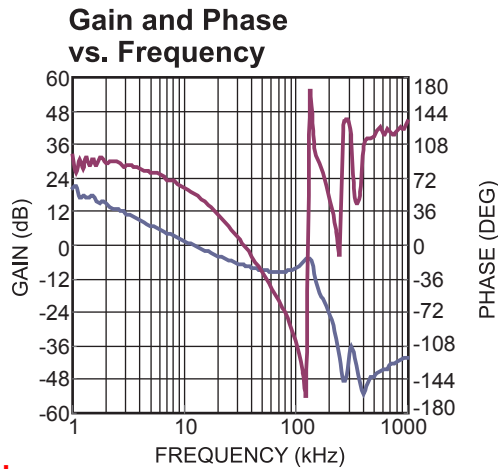
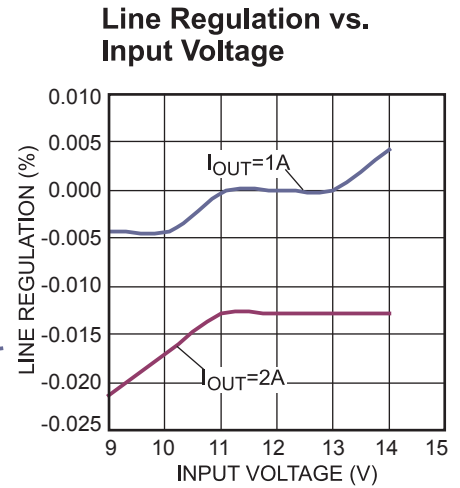
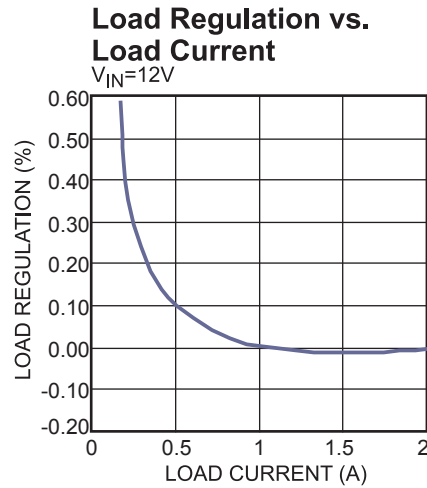
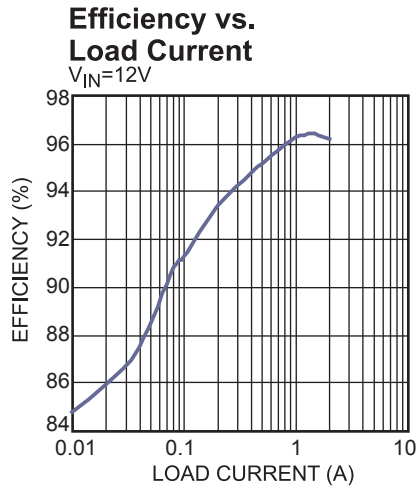
EV3910A-S-00A BILL OF MATERIALS

| Qty | Ref | Value | Description | Package | Manufacturer | Part Number |
|-----|----------------|--------------|----------------------------------|-------------------------------|--------------|--------------------|
| 1 | C1A | 10 μ F | Ceramic Cap., 25V,X7R | 1210 | muRata | GRM32DR71E106KA12L |
| 1 | C2 | 0.22 μ F | Ceramic Cap.,16V,X7R | 0603 | muRata | GRM188R71C224KA01D |
| 3 | C1B,C3, C6 | NC | | | | |
| 1 | C4 | 1.0 μ F | Ceramic Cap.,25V,X7R | 0805 | muRata | GRM21BR71E105KA99L |
| 1 | C5 | 15nF | Ceramic Cap.,50V,X7R | 0603 | muRata | GRM188R71H153KA01D |
| 3 | C8, C9, C10 | 10 μ F | Ceramic Cap.,50V,X5R | 1210 | muRata | GRM32ER61H106KA12L |
| 1 | R3 | 8.06k | Film Res,1% | 0603 | ROYAL | RL0603FR-078K06L |
| 1 | R4 | 7.5k | Film Res,1% | 0603 | ROYAL | RL0603FR-077K5L |
| 1 | R5 | 180k | Film Res,1% | 0603 | ROYAL | RL0603FR-07180KL |
| 1 | R6 | 9.76k | Film Res,1% | 0603 | ROYAL | RL0603FR-079K76L |
| 2 | R7, R10 | 0R | Film Res,1% | 0603 | Yageo | RC0603FR-070RL |
| 1 | R8 | 4.7R | Film Res,1% | 0603 | ROYAL | RL0603FR-074R7L |
| 1 | R9 | 0.025 | | 2512 | Yageo | RL2512FK-070R025L |
| 1 | D1 | 1N4148 | Diode 75V 250mW | SOD-323 | Diodes Inc | 1N4148WS-7 |
| 1 | D2 | SS5P4 | Switching Diode 40V 5A | TO-277A | Vishay | SS5P4 |
| 1 | L1 | 10 μ H | In=9A,Isat=10A | | Würth | 744 332 100 0 |
| 1 | L2 | 0.47 μ H | IR=6.8A,Isat=14.5A | SMD | Würth | 744 373 240 047 |
| 1 | Q1 | SIR462 | Vds=30V, Rds-on=7.9m Ω | PowerPAK [®] SO-8 | Vishay | SiR462DP |
| 1 | U1 | MP3910A | Controller | SOIC8 | MPS | MP3910A |

EVB TEST RESULTS

Performance waveforms are tested on the evaluation board.

$V_{IN}=12V$, $V_{OUT}=24V$, $I_{OUT}=2A$, $T_A=25^{\circ}C$, unless otherwise noted.



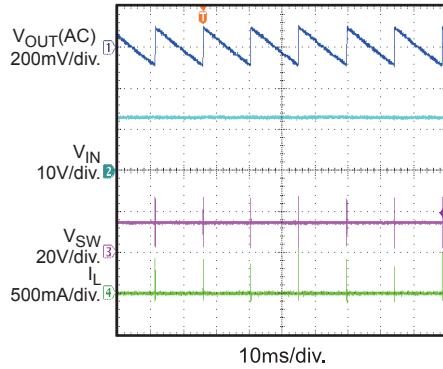
EVB TEST RESULTS *(continued)*

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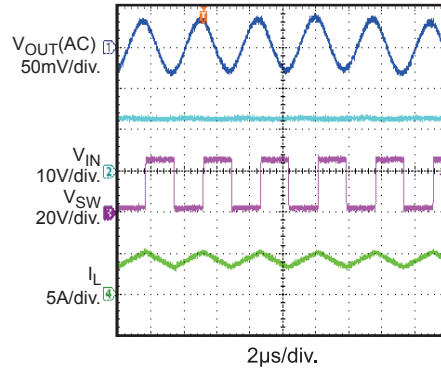
Steady State

$I_{OUT} = 0A$



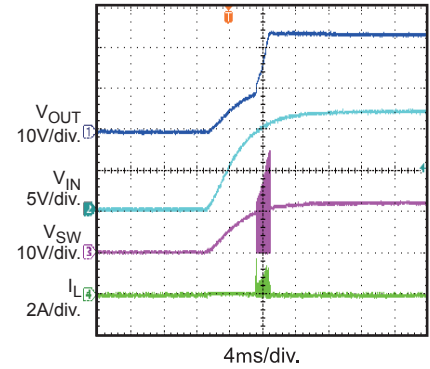
Steady State

$I_{OUT} = 2A$



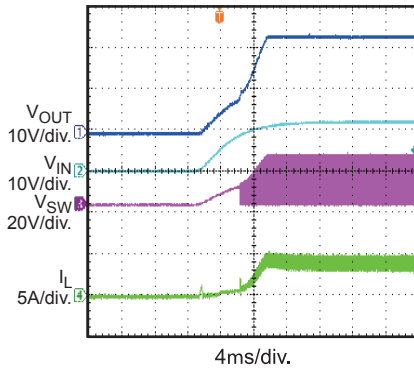
Start-Up through V_{IN}

$I_{OUT} = 0A$



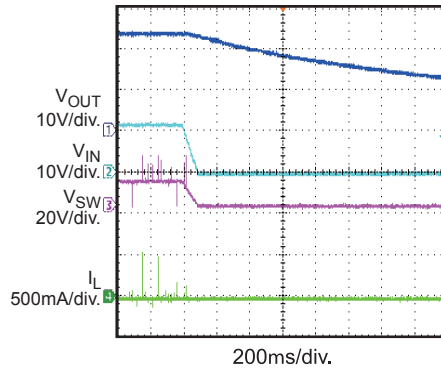
Start-Up through V_{IN}

$I_{OUT} = 2A$



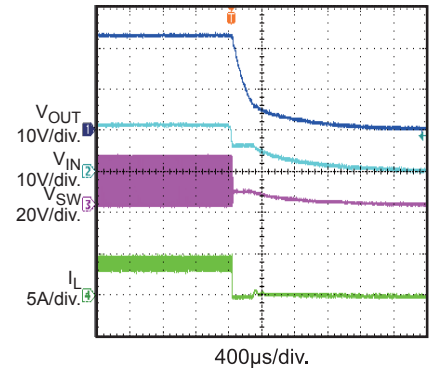
Shutdown through V_{IN}

$I_{OUT} = 0A$



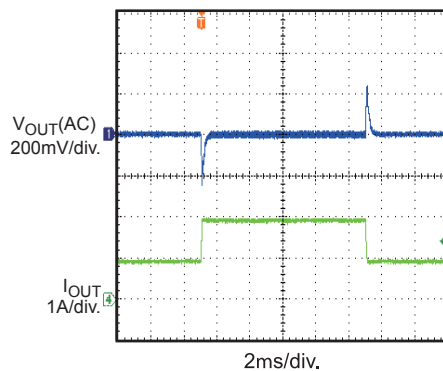
Shutdown through V_{IN}

$I_{OUT} = 2A$



Load Transient

$I_{OUT} = 1A$ to $2A$, $I_{RAMP} = 25mA/\mu s$



PRINTED CIRCUIT BOARD LAYOUT

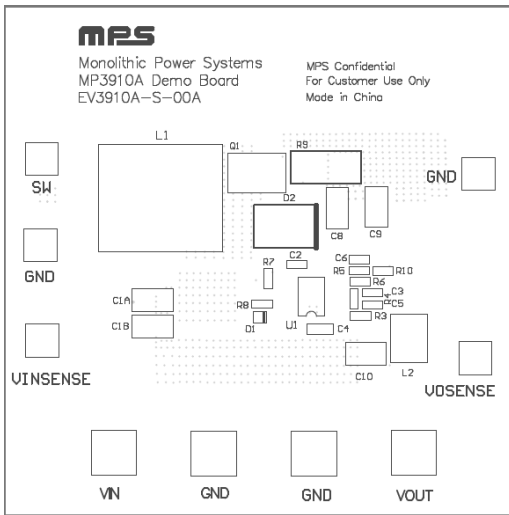


Figure 1: Top Silk Layer

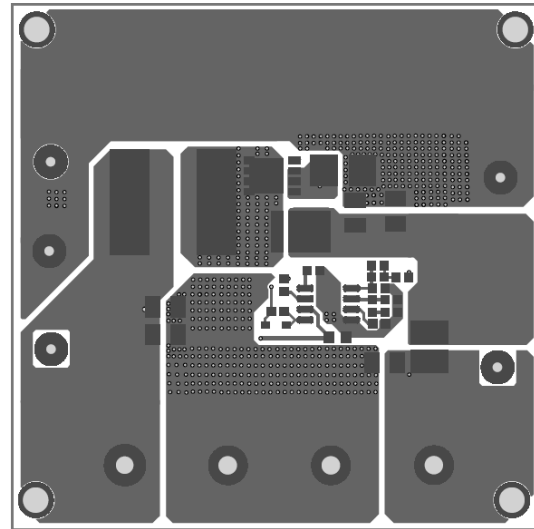


Figure 2: Top Layer

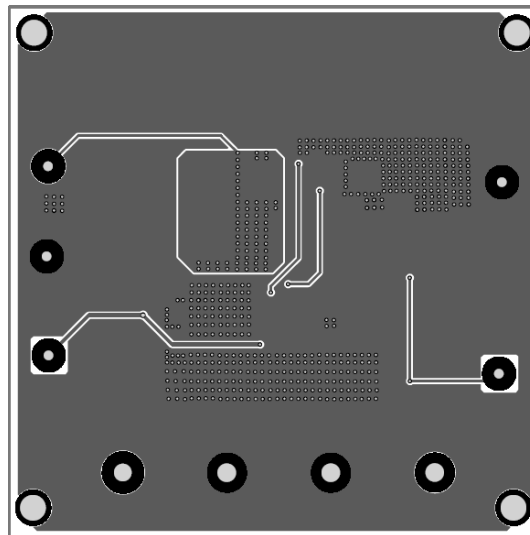


Figure 3: Bottom Layer

QUICK START GUIDE

1. Connect the positive and negative terminals of the load to the VOUT and GND pins respectively.
2. Preset the power supply output between 9V and 14V, and then turn off the power supply.
3. Connect the positive and negative terminals of the power supply output to the VIN and GND pins, respectively.
4. Turn the power supply on. The EV3910A-S-00A will automatically startup.

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