EV3910A-S-00A

Peak Current Mode PWM Controller Boost EV Board

The Future of Analog IC Technology

DESCRIPTION

EV3910A-S-00A Evaluation Board is designed to demonstrate the capabilities of MP3910A. MP3910A is a Peak Current Mode PWM controller that can drives 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.

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

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

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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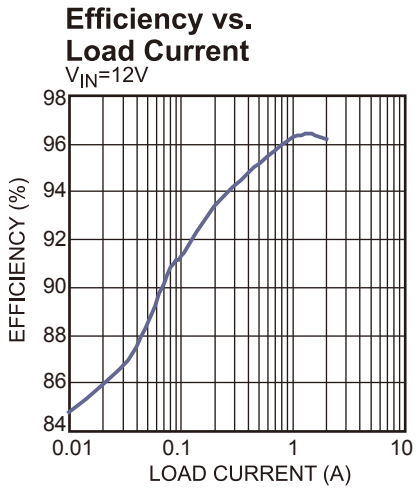
EV3910A-S-00A EVALUATION BOARD

(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



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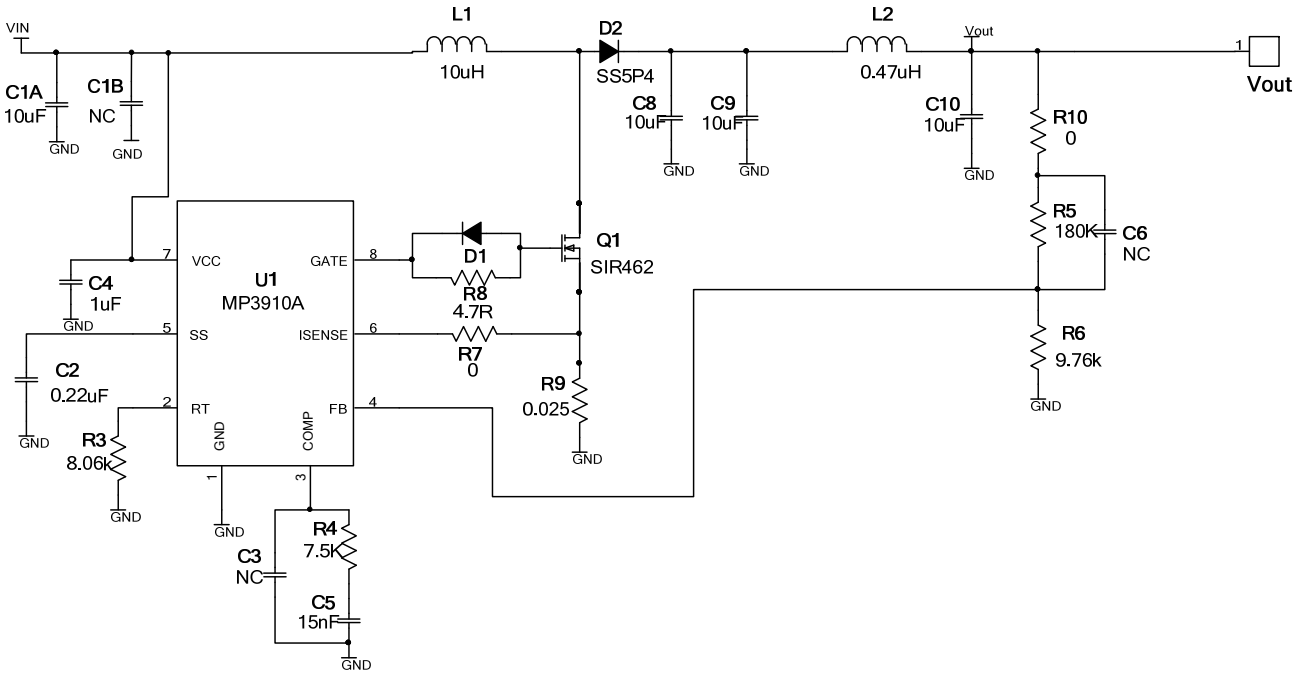
EVALUATION BOARD SCHEMATIC



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EV3910A-S-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Part Number
1	C1A	10µF	Ceramic Cap., 25V,X7R	1210	muRata	GRM32DR71E106KA12L
1	C2	0.22µF	Ceramic Cap.,16V,X7R	0603	muRata	GRM188R71C224KA01D
3	C1B,C3, C6	NC				
1	C4	1.0µF	Ceramic Cap.,25V,X7R	0805	muRata	GRM21BR71E105KA99L
1	C5	15nF	Ceramic Cap.,50V,X7R	0603	muRata	GRM188R71H153KA01D
3	C8, C9, C10	10µF	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	10µH	In=9A,Isat=10A		Wurth	744 332 100 0
1	L2	0.47µH	IR=6.8A,Isat=14.5A	SMD	Wurth	744 373 240 047
1	Q1	SIR462	Vds=30V, Rds-on=7.9mΩ	PowerPAK® SO-8	Vishay	SiR462DP
1	U1	MP3910A	Controller	SOIC8	MPS	MP3910A

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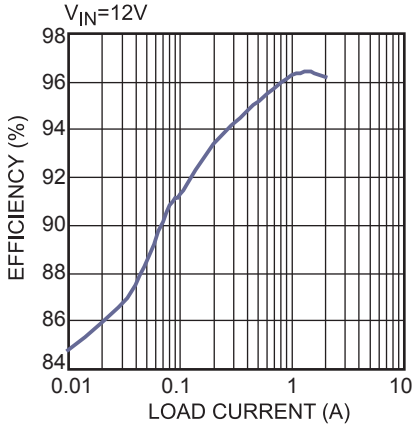
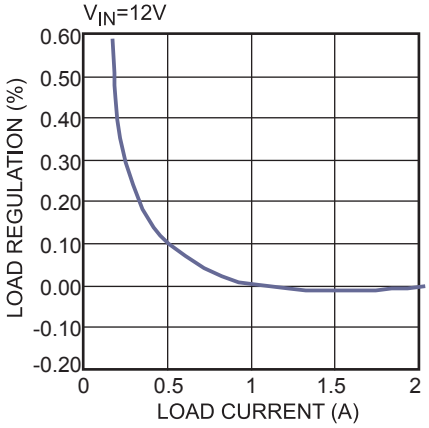
EVB TEST RESULTS

Performance waveforms are tested on the evaluation board.
V_{IN}=12V, V_{OUT}=24V, I_{OUT}=2A, T_A=25ºC, unless otherwise noted.

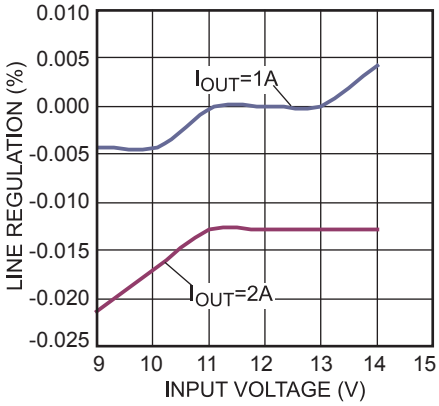
Efficiency vs. Load Current



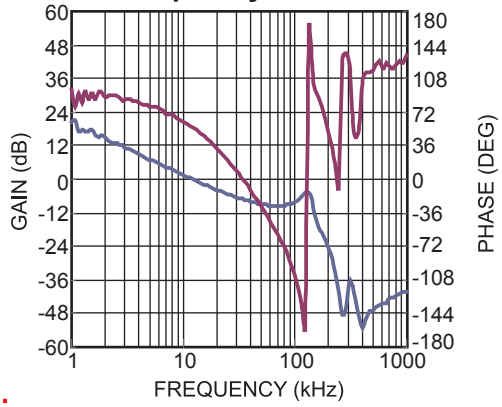
Load Regulation vs. Load Current



Line Regulation vs. Input Voltage



Gain and Phase vs. Frequency



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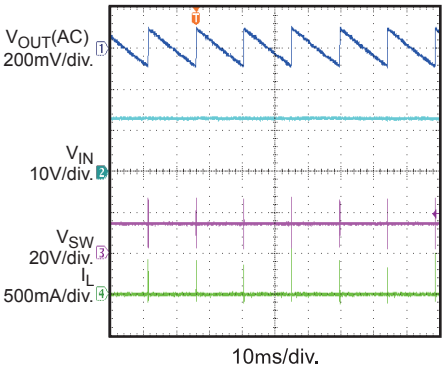
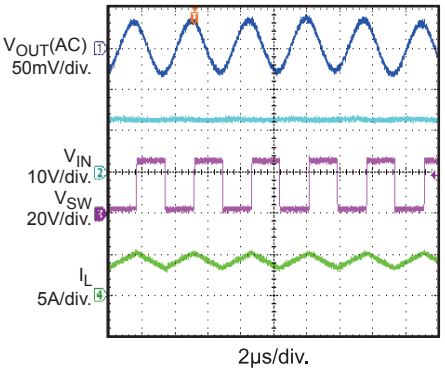
EVB TEST RESULTS *(continued)*

Performance waveforms are tested on the evaluation board.
V_{IN}=12V, V_{OUT}=24V, I_{OUT}=2A, T_A=25ºC, unless otherwise noted.

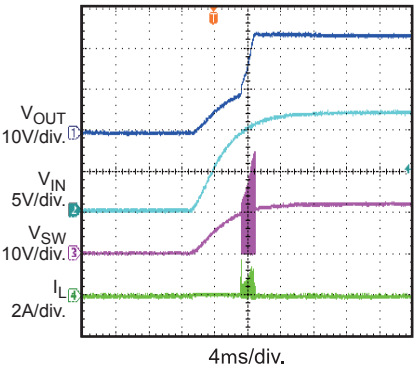
Steady State
I_{OUT} = 0A



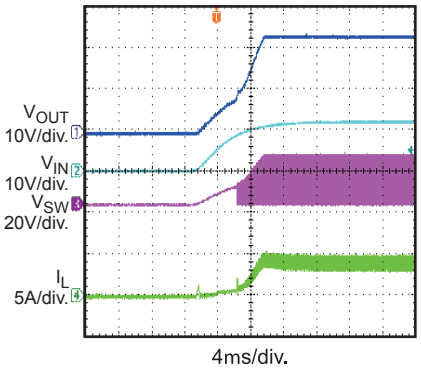
Steady State
I_{OUT} = 2A



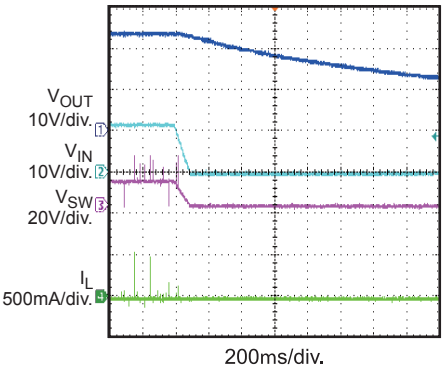
Start-Up through V_{IN}
I_{OUT} = 0A



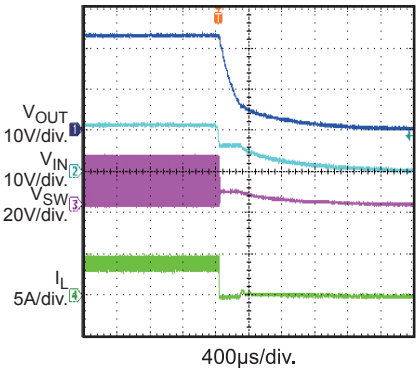
Start-Up through V_{IN}
I_{OUT} = 2A



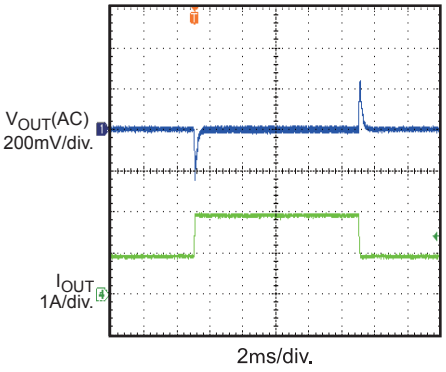
Shutdown through V_{IN}
I_{OUT} = 0A



Shutdown through V_{IN}
I_{OUT} = 2A



Load Transient
I_{OUT} = 1A to 2A, I_{RAMP} = 25mA/µs



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PRINTED CIRCUIT BOARD LAYOUT

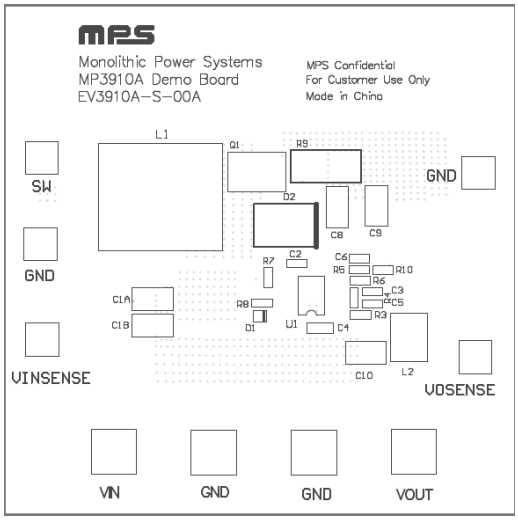

Figure 1：Top Silk Layer

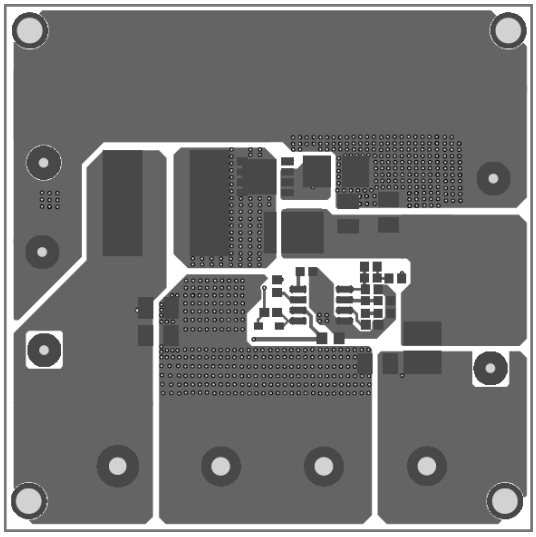

Figure 2: Top Layer

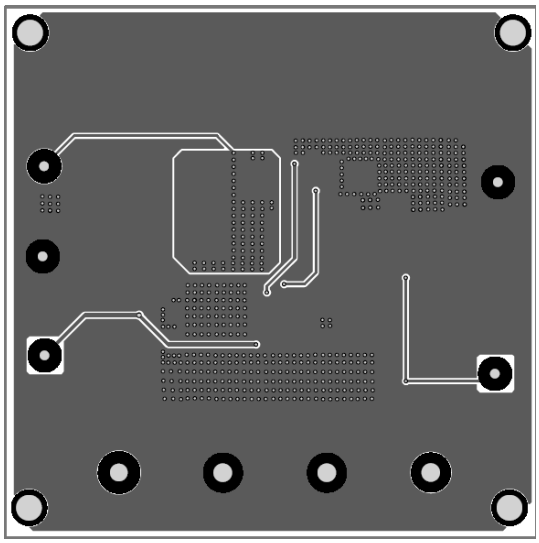

Figure 3: Bottom Layer

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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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