



The Future of Analog IC Technology®

# EV9485-N-00A

500mA, 100V Input  
Step-Down Converter EV Board

## DESCRIPTION

The EV9485-N-00A Evaluation Board is designed to demonstrate the performances of MPS' MP9485 which is a 4.5V-to-100V-input, 500mA-output step-down converter.

The MP9485 employs hysteresis voltage control method to provide fast response to line or load transient. It integrates a high-side high voltage power MOSFET with higher than 0.75A current limit. MPS's proprietary feedback control scheme minimizes the number of external components.

This board is configured for 5V step-down application. The circuit requires only a minimal number of readily-available, standard, and external components.

## ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Supply Voltage	$V_{IN}$	8 – 95	V
Output Voltage	$V_{OUT}$	5	V
Output Current	$I_{OUT}$	0-0.5	A

## FEATURES

- 8V-to-95V Wide Input Range<sup>(1)</sup>
  - Hysteretic Control: Simple Compensation
  - Up to 1MHz Switching Frequency
  - Hiccup mode Short Circuit Protection
  - Thermal Shut Down
  - 170µA Quiescent Current
  - Available in SOIC8 with Exposed Pad Packages
- Note:** 1) The chip itself can accept 4.5V-to-100V DC input.

## APPLICATIONS

- Scooter, E-bike Control Power Supply
- Solar Energy System
- Automotive System Power
- Industrial Power Supply

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

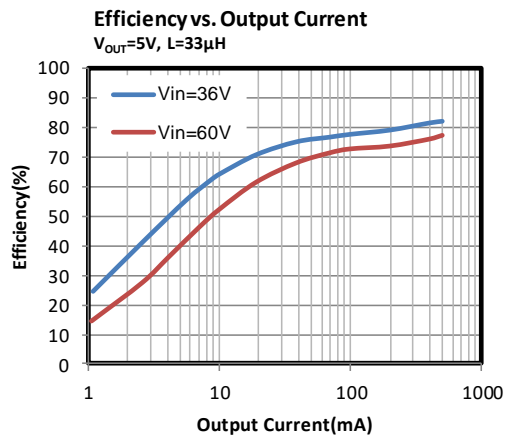
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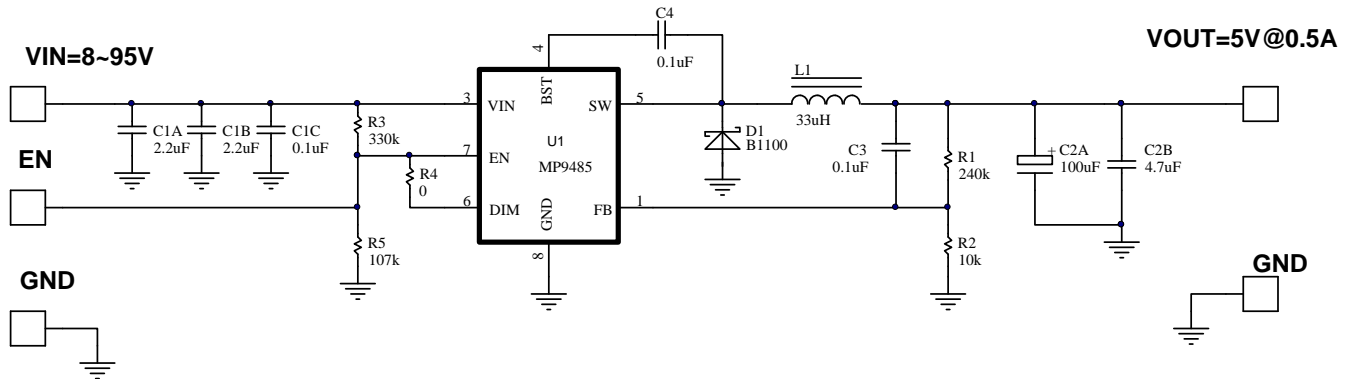
## EV9485-N-00A EVALUATION BOARD



(L x W x H) 6.3cm x 6.3cm x 1.3cm

Board Number	MPS IC Number
EV9485-N-00A	MP9485



**EVALUATION BOARD SCHEMATIC**

**EV9485-N-00A BILL OF MATERIALS**

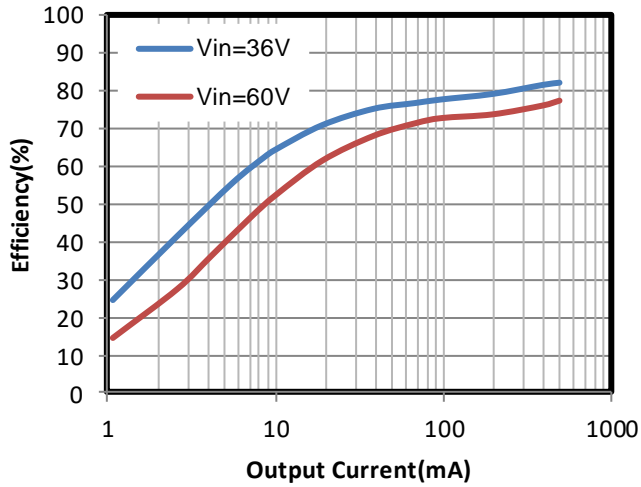
Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
2	C1A, C1B	2.2µF	Ceramic Cap., 100V, X7R	1210	muRata	GRM32ER72A225K
1	C1C	0.1µF	Ceramic Cap., 100V, X7R	0805	muRata	GCM21BR72A104K
1	C2A	100µF	10V, solid tantalum capacitor, ESR=200mΩ	SMD(3.2x6.0)	VISHAY	TR3C107M010C0200
1	C2B	4.7µF	25V X7R Ceramic Capacitor	0805	muRata	GRM21AR71E475KL
2	C3, C4	0.1µF	25V Ceramic Capacitor	0603	muRata	GRM188R71E104KL
1	D1	B1100	100V,1A,schottky diode	SMA	DIODES	B1100-LS
1	L1	33µH	66mΩ, 2.9A inductor	SMD(10X10)	Würth	7447714330
			82 mΩ, 1.9A inductor	SMD(9X10)	Würth	744776133
1	R1	240k	Film resistor, 1%	0603	YAGEO	RC0603FR-07240KL
1	R2	10k	Film resistor, 1%	0603	YAGEO	RC0603FR-0710KL
1	R3	330k	Film resistor, 1%	0603	YAGEO	RC0603FR-07330KL
1	R4	0	Film resistor, 5%	0603	YAGEO	RC0603JR-070RL
1	R5	107k	Film resistor, 1%	0603	YAGEO	RC0603FR-07107KL
1	U1	MP9485	100V INPUT, 0.5A STEP-DOWN CONVERTER	SOIC8	MPS	MP9485GN

## EVB TEST RESULTS

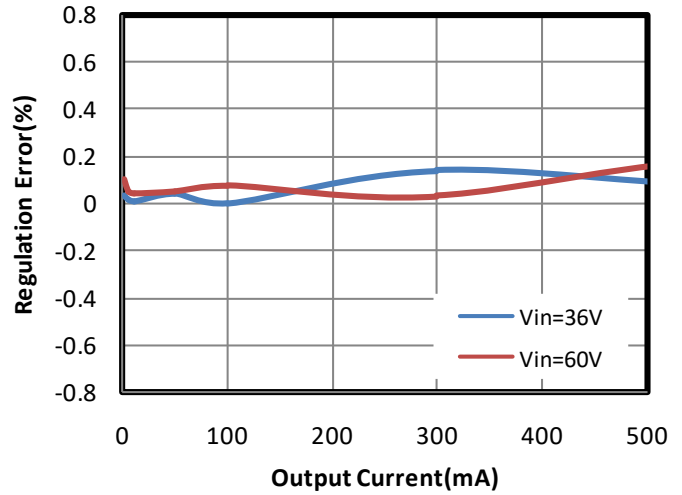
Performance waveforms are tested on the evaluation board.

$V_{IN} = 60V$ ,  $V_{OUT} = 5V$ ,  $I_{OUT} = 0.5A$ ,  $T_A = +25^{\circ}C$ , unless otherwise noted. Unless otherwise noted.

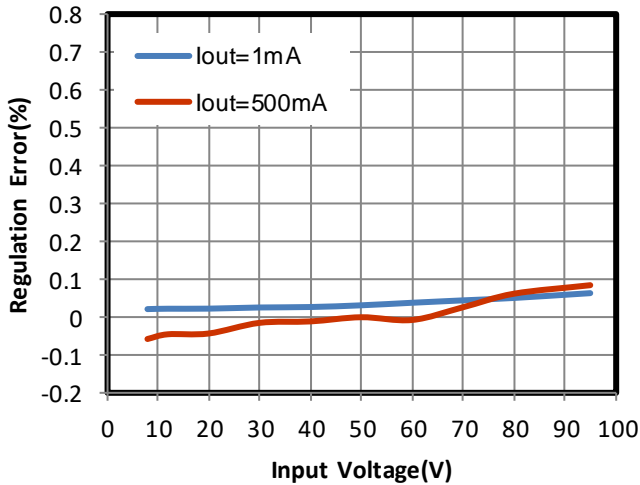
Efficiency vs. Output Current



Load Regulation



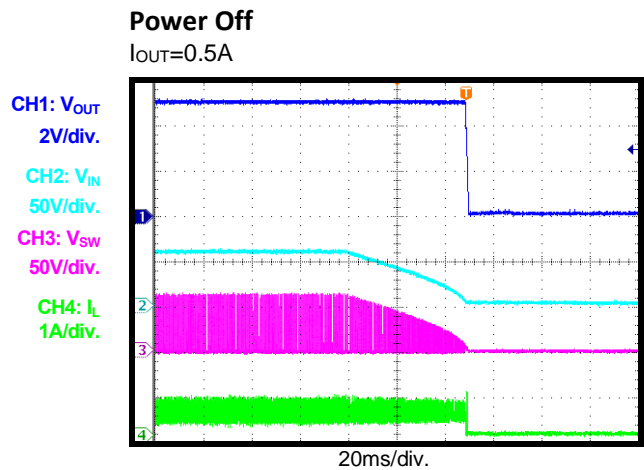
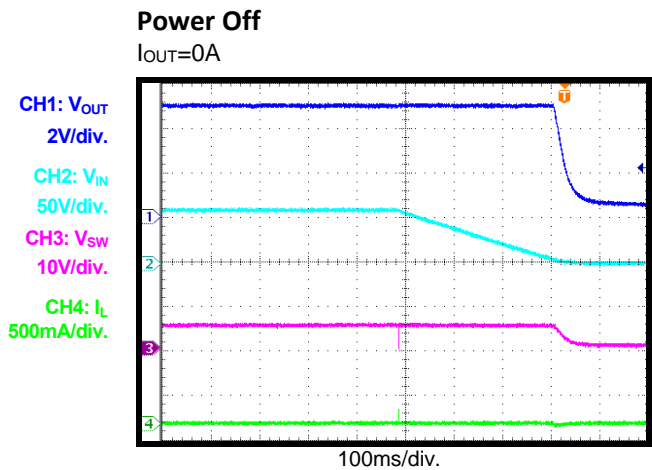
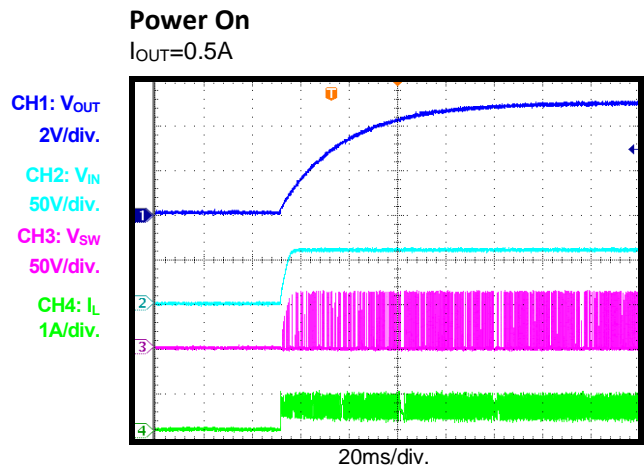
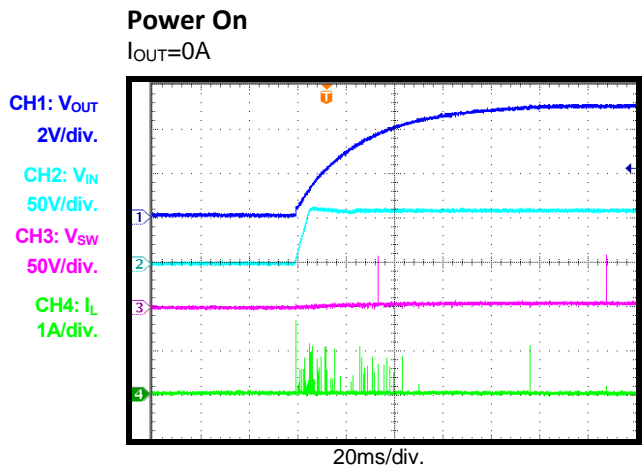
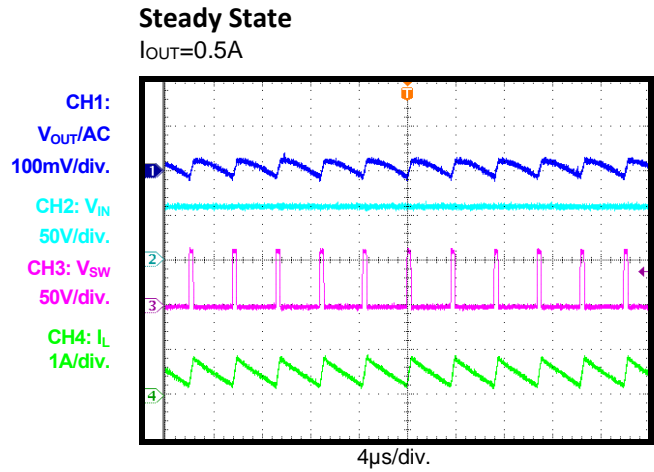
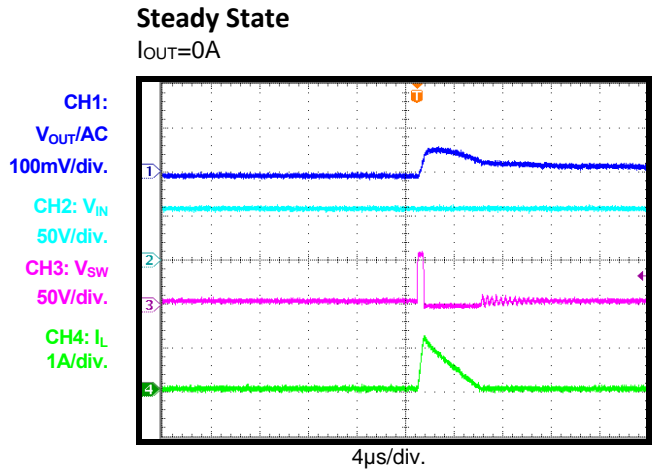
Line Regulation



## EVB TEST RESULTS *(continued)*

Performance waveforms are tested on the evaluation board.

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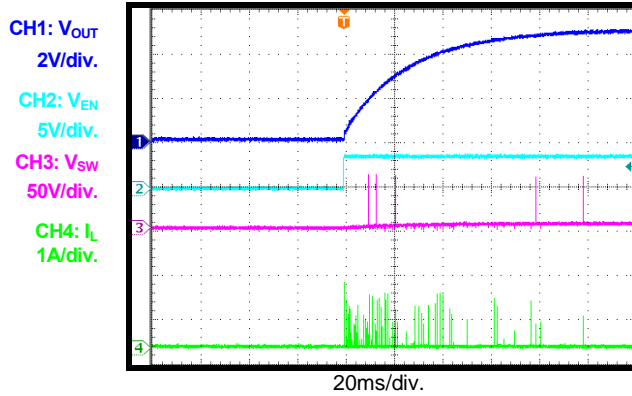
## EVB TEST RESULTS *(continued)*

Performance waveforms are tested on the evaluation board.

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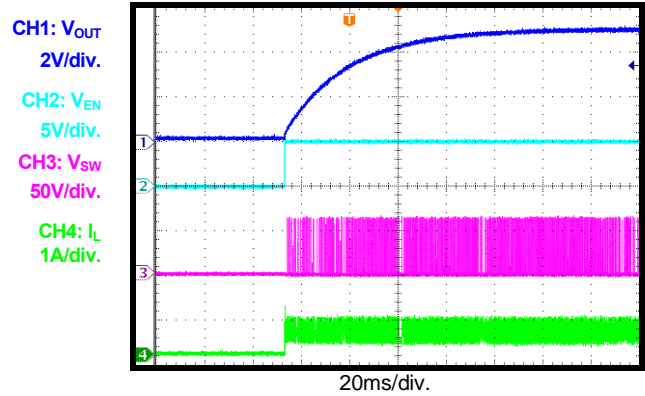
### EN Start-Up

$I_{OUT}=0A$



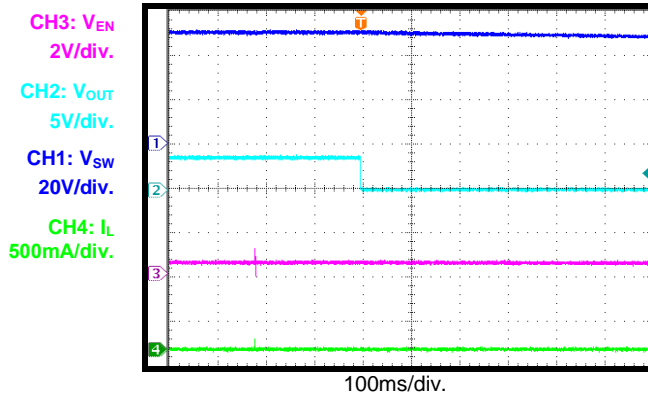
### EN Start-Up

$I_{OUT}=0.5A$



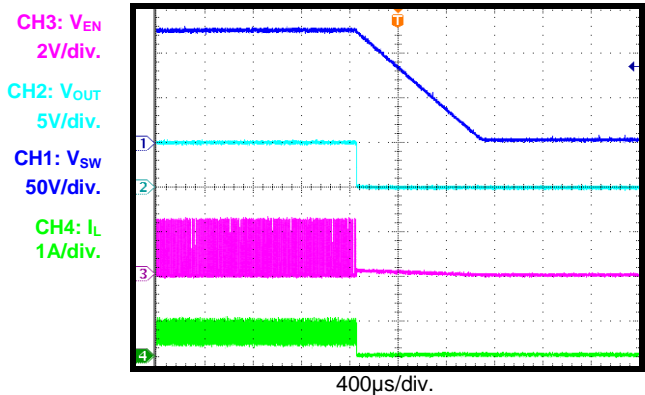
### EN Shutdown

$I_{OUT}=0A$



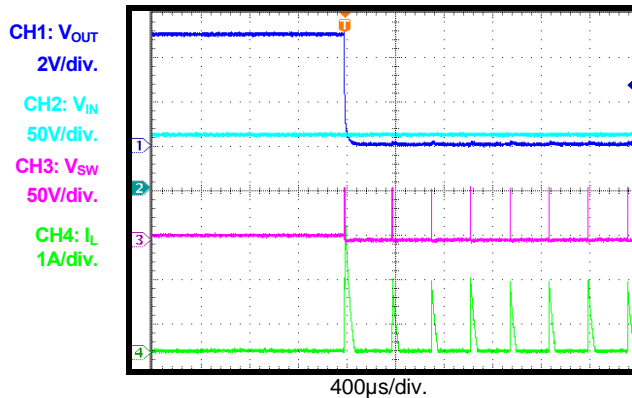
### EN Shutdown

$I_{OUT}=0.5A$



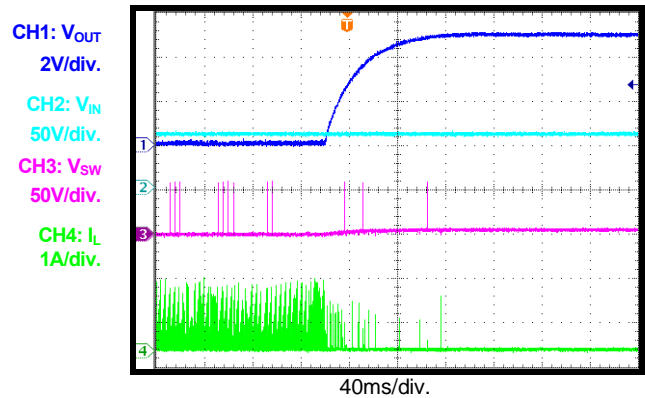
### SCP Entry

$I_{OUT}=0A$



### SCP Recovery

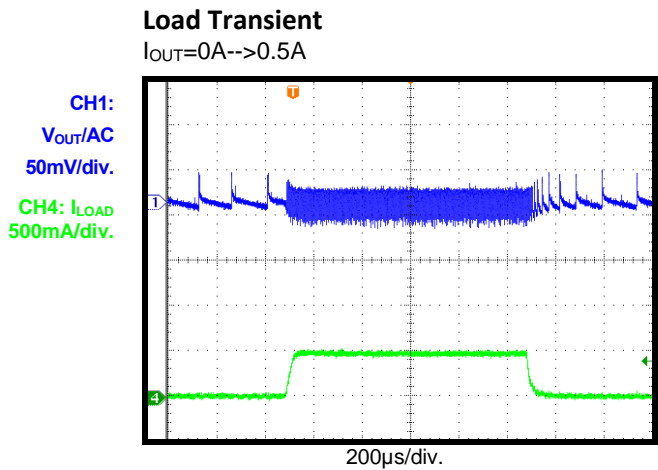
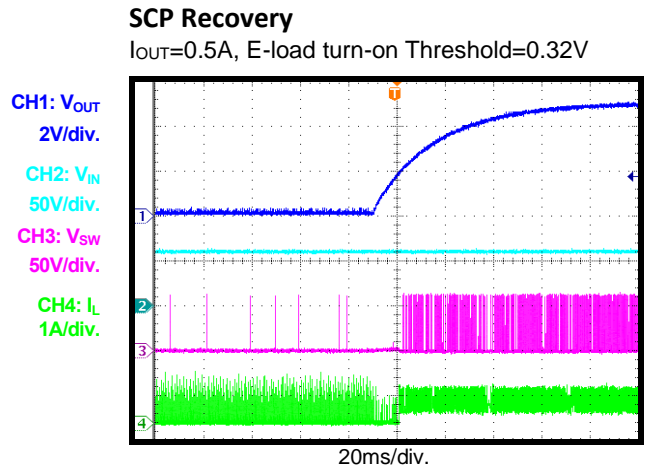
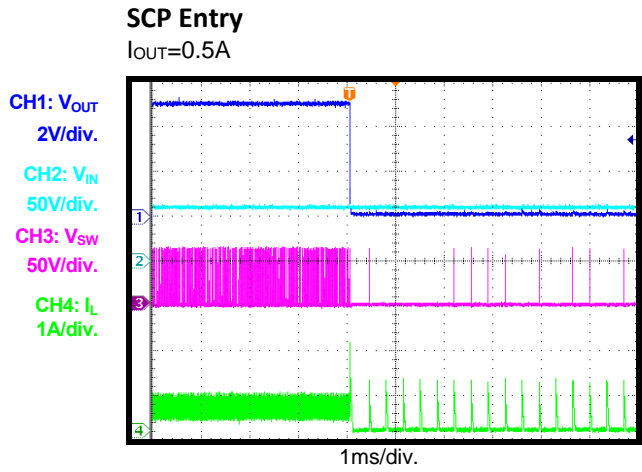
$I_{OUT}=0A$



## EVB TEST RESULTS *(continued)*

Performance waveforms are tested on the evaluation board.

$V_{IN} = 60V$ ,  $V_{OUT} = 5V$ ,  $I_{OUT} = 0.5A$ ,  $T_A = +25^{\circ}C$ , unless otherwise noted. Unless otherwise noted.



## PRINTED CIRCUIT BOARD LAYOUT

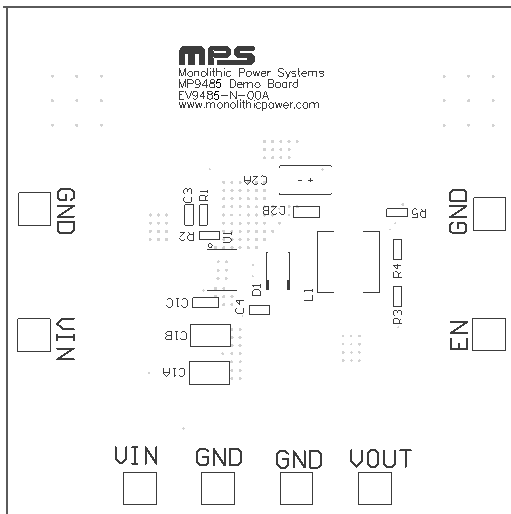


Figure 1: Top Silkscreen Layer

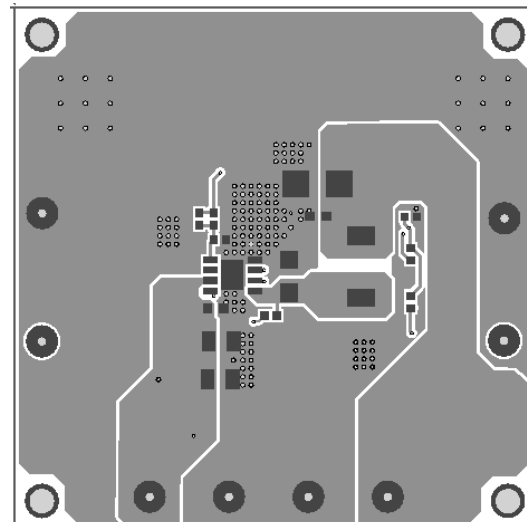


Figure 2: Top Layer

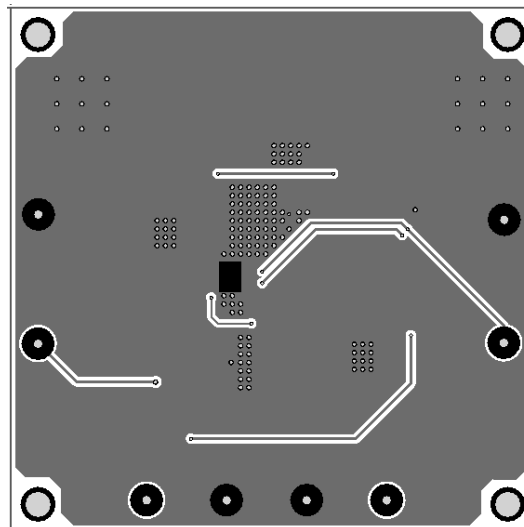


Figure 3: Bottom Layer