



EVQ4340A-L-6040-00A

36V, 6A, Ultra-Low Quiescent Current, Synchronous, Step-Down Converter Evaluation Board, AEC-Q100 Qualified

DESCRIPTION

The EVQ4340A-L-6040-00A evaluation board is designed to demonstrate the capabilities of the MPQ4340A-6040, a synchronous, step-down switching regulator with a configurable frequency and integrated, internal high-side and low-side MOSFETs (HS-FET and LS-FET, respectively). The device provides up to 6A of highly efficient output current (I_{OUT}) and employs fixed-frequency zero-delay pulse-width modulation (PWM) (ZDP™) control, an MPS-exclusive technology that enables near optimal transient response.

The wide 3.3V to 36V input voltage (V_{IN}) range accommodates a variety of step-down applications in automotive input environments with 42V load dump support. A 1 μ A shutdown-mode quiescent current (I_Q) allows the device to be used in battery-powered applications.

High power conversion efficiency across a wide load range is achieved by scaling down the switching frequency (f_{SW}) under light-load conditions to reduce switching and gate driving losses.

An open-drain power good (PG) signal indicates whether the output is within 94% to 106% of its nominal voltage. Thermal shutdown provides reliable, fault-tolerant operation.

A high duty cycle and low-dropout (LDO) mode provide support for automotive cold-crank conditions.

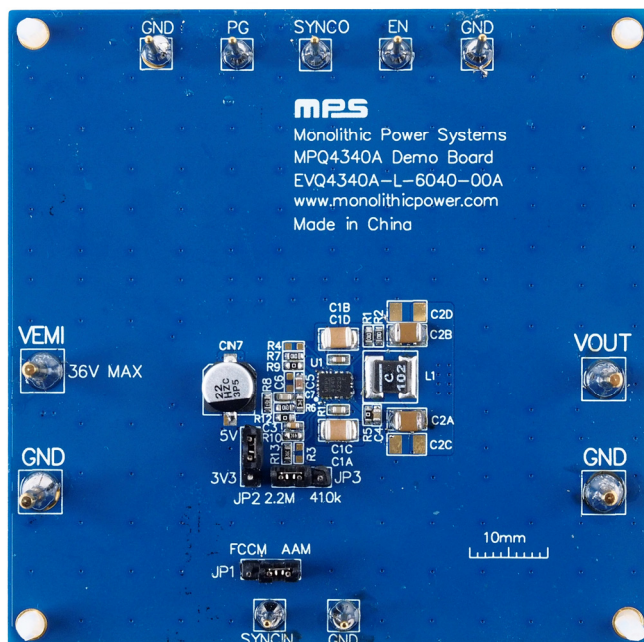
The EVQ4340A-L-6040-00A is a fully assembled and tested evaluation board. The MPQ4340A-6040 is available in a QFN-17 (3mmx4mm) package with wettable flanks, and is available in AEC-Q100 Grade 1.

PERFORMANCE SUMMARY

Specifications are at $T_A = 25^\circ\text{C}$, unless otherwise noted.

Parameters	Conditions	Value
Input voltage (V_{IN}) range		3.3V to 36V
Output voltage (V_{OUT})	$V_{IN} = 3.3\text{V to } 36\text{V}$, $I_{OUT} = 0\text{A to } 6\text{A}$	$V_{OUT} = 5\text{V}$
Maximum output current (I_{OUT})	$V_{IN} = 3.3\text{V to } 36\text{V}$	6A
Typical efficiency	$V_{IN} = 12\text{V}$, $V_{OUT} = 5\text{V}$, $I_{OUT} = 6\text{A}$	89%
Peak efficiency	$V_{IN} = 8\text{V}$, $V_{OUT} = 5\text{V}$, $I_{OUT} = 2\text{A}$	95.1%
Switching frequency (f_{SW})		2.2MHz

EVQ4340A-L-6040-00A EVALUATION BOARD



LxWxH (8.3cmx8.3cmx1.3cm)

Board Number	MPS IC Number
EVQ4340A-L-6040-00A	MPQ4340AGLE-6040-AEC1

QUICK START GUIDE

The EVQ4340A-L-6040-00A evaluation board is easy to set up and use to evaluate the performance of the MPQ4340A-6040. For proper measurement equipment set-up, refer to Figure 3 on page 5 and follow the steps below:

1. Preset the power supply to be between 3.3V and 36V, then turn off the power supply.
2. Set the load current between 0A and 6A. Electronic loads represent a negative impedance to the regulator, and setting a current too high may trigger hiccup mode.
3. If longer cables (>0.5m total) are used between the source and the evaluation board, place a damping capacitor at the input terminals, especially when $V_{IN} \geq 24V$.
4. Connect the power supply terminals to:
 - a. Positive (+): VEMI
 - b. Negative (-): GND
5. Connect the load terminals to:
 - a. Positive (+): VOUT
 - b. Negative (-): GND
6. After making the connections, turn on the power supply. The board should start up automatically.
7. To use the enable (EN) function, apply a digital input to the EN pin. Drive EN above 1V to turn the regulator on; drive EN below 0.85V to turn the regulator off. If the EN function is not used, EN can be connected directly to VIN.
8. The feedback voltage (V_{FB}) is typically 0.6V for the adjustable-output version. The external resistor divider connected to FB sets the output voltage (V_{OUT}) (see Figure 1).

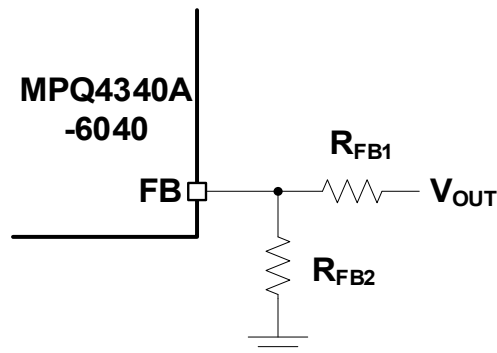


Figure 1: Feedback Divider Network for the Adjustable-Output Version

Table 1 lists the recommended feedback resistance for common output voltages.

Table 1: Feedback Resistor Selection for the Adjustable-Output Version

V_{OUT} (V)	R_{FB1} (k Ω)	R_{FB2} (k Ω)
3.3	100 (1%)	22.1 (1%)
5	100 (1%)	13.7 (1%)

9. The MPQ4340A-6040's switching frequency (f_{SW}) can be configured via R10, the FREQ pin's resistor (R_{FREQ}). R10 can be estimated based on the relationship between f_{SW} and R_{FREQ} (see Figure 2 on page 4).

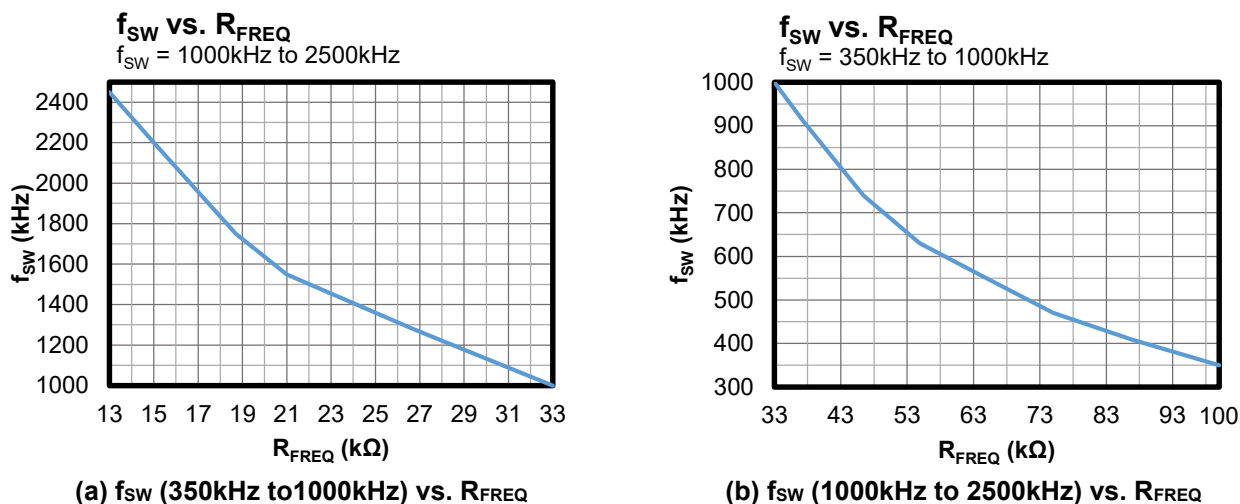


Figure 2: f_{SW} vs. R_{FREQ}

Table 2 shows common values for f_{SW} and R_{FREQ}.

Table 2: f_{SW} vs. R_{FREQ}

R _{FREQ} (kΩ)	f _{SW} (kHz)
100	350
86.6	410
75	470
64.9	550
54.9	630
46.4	740
37.4	910
33	1050
26.7	1280
21	1550
18.7	1750
15	2200
13	2450

10. When the SYNCIN/MODE pin is used as the SYNC input (SYNCIN), f_{SW} can be synchronized to the rising edge of a clock signal applied to SYNCIN/MODE. The recommended SYNCIN frequency range is 90% to 115% of f_{SW}. When the SYNCIN/MODE pin is used for mode selection (MODE), pull the pin high to force the device to operate in forced continuous conduction mode (FCCM); pull the pin low to force the device to work in advanced asynchronous modulation (AAM) mode (see Table 3).

Table 3: Mode Selection

SYNCIN/MODE Input	Operation
<0.4V	AAM mode
>1.8V	FCCM
External clock in	FCCM

Refer to the Application Information section in the MPQ4340A datasheet to calculate the inductance (L) and output capacitance (C_{OUT}).

Figure 3 shows the measurement equipment set-up.

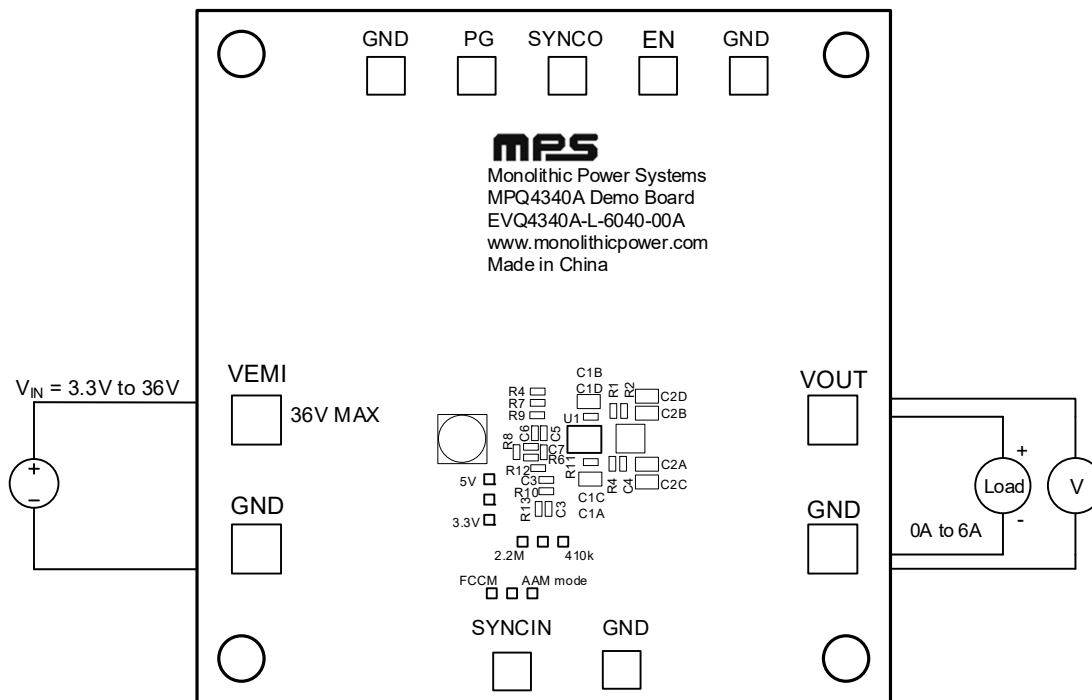


Figure 3: Measurement Equipment Set-Up

EVALUATION BOARD SCHEMATIC

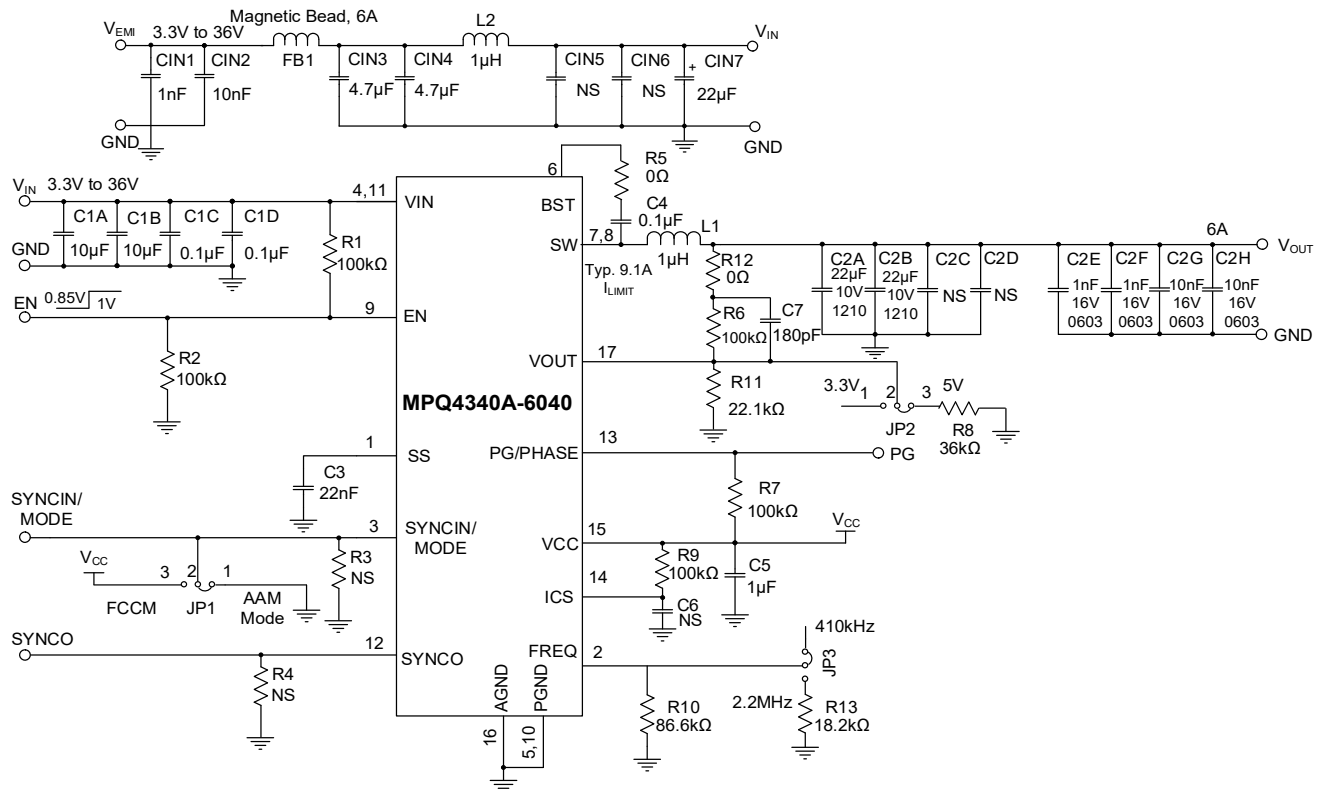
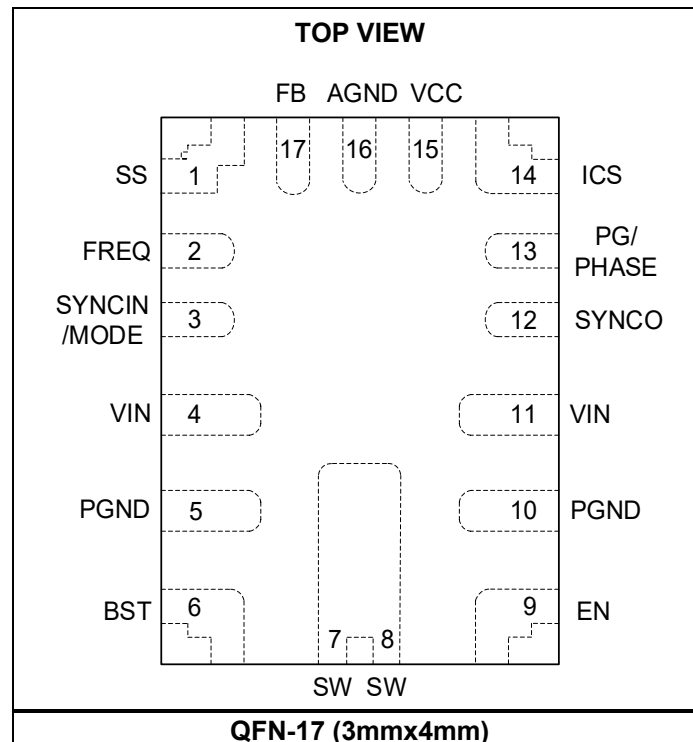


Figure 4: Evaluation Board Schematic

PACKAGE REFERENCE



EVQ4340A-L-6040-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer PN
3	CIN1, C2E, C2F	1nF	Ceramic capacitor, 50V, X7R	0603	Murata	GRM216R71H102KA01
3	CIN2, C2G, C2H	10nF	Ceramic capacitor, 50V, X7R	0603	Murata	GRM188R71H103KA01D
2	CIN3, CIN4	4.7μF	Ceramic capacitor, 50V, X7R	0805	Murata	CGA4J1X7R1H475K
3	CIN5, CIN6, C6	NS				
1	CIN7	22μF	Aluminum capacitor, 50V	SMD	Panasonic	EEH2C1H220P
2	C1A, C1B	10μF	Ceramic capacitor, 50V, X7R	1210	Murata	GRM32ER71H106KA12L
2	C1C, C1D	0.1μF	Ceramic capacitor, 50V, X7R	0603	Murata	GCJ188R71H104KA12D
2	C2A, C2B	22μF	Ceramic capacitor, 25V, X7R	1210	Murata	GRM32ER71E226KE15L
1	C3	22nF	Ceramic capacitor, 50V, X7R	0603	Murata	GRM188R71H223KA01D
1	C4	0.1μF	Ceramic capacitor, 16V, X5R	0603	Murata	GRM188R61C104KA01D
1	C5	4.7μF	Ceramic capacitor, 10V, X5R	0603	Murata	GRM188R61A475KE15D
1	C7	180pF	Ceramic capacitor, 50V, C0G	0603	Murata	GRM1885C1H181JA01D
2	C2C, C2D	NS				
1	FB1	FB	Magnetic bead, 6A	1806	Murata	BLM41PG600SN1L
1	L1	1μH	Inductor, 8.2mΩ, 8.8A	SMD	Coilcraft	XGL4020-102MEB
1	L2	1μH	Inductor, 14.6mΩ, 9.6A	SMD	Coilcraft	XEL4020-102MEB
4	R1, R2, R6, R7	100kΩ	Film resistor, 1%	0603	Yageo	RC0603FR-07100KL
2	R3, R4	NS				
3	R5, R9, R12	0Ω	Film resistor, 5%	0603	Yageo	RC0603JR-070RL
1	R8	36kΩ	Film resistor, 1%	0603	Yageo	RC0603FR-0736KL
1	R10	86.6kΩ	Film resistor, 1%	0603	Yageo	RC0603FR-0786K6L
1	R11	22.1kΩ	Film resistor, 1%	0603	Yageo	RC0603FR-0722K1L
1	R13	18.2kΩ	Film resistor, 1%	0603	Yageo	RC0603FR-0718K2L
3	JP1, JP2, JP3	2.54mm	Test pin, 3-pin	DIP	Any	
4	VEMI GND, VOUT, GND	2mm	Golden pin	DIP	Custom ⁽¹⁾	
7	SYNCIN PG, SYNCO, EN, GND	1mm	Golden pin	DIP	Custom ⁽¹⁾	
1	U1	MPQ4340A-AEC1	36V, 6A, step-down converter, AEC-Q100	QFN-17 (3mmx4mm)	MPS	MPQ4340AGLE-6040-AEC1

Note:

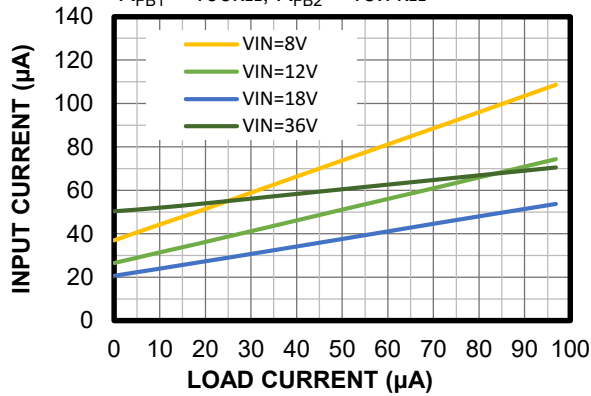
1) MPS custom-produces these pins. Contact an MPS FAE for more information.

EVB TEST RESULTS

Performance curves and waveforms are tested on the evaluation board. $V_{IN} = 12V$, $V_{OUT} = 5V$, $C_{OUT} = 2 \times 22\mu F$, $L = 1\mu H$, $T_A = 25^\circ C$, unless otherwise noted.

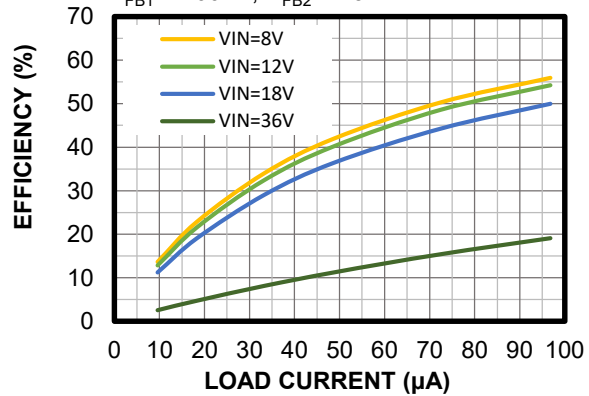
Input Current vs. Load Current

AAM mode, $V_{OUT} = 5V$, $f_{SW} = 2.2MHz$,
 $R_{FB1} = 100k\Omega$, $R_{FB2} = 13.7k\Omega$



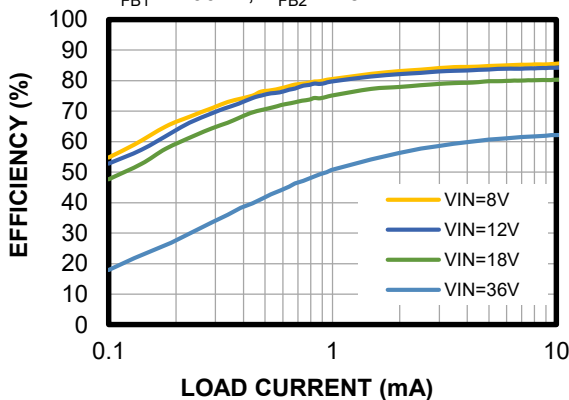
Efficiency vs. Load Current

AAM mode, $V_{OUT} = 5V$, $f_{SW} = 2.2MHz$,
 $R_{FB1} = 100k\Omega$, $R_{FB2} = 13.7k\Omega$



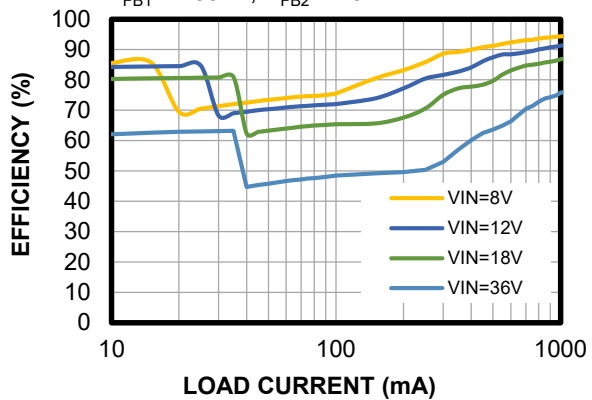
Efficiency vs. Load Current

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 $R_{FB1} = 100k\Omega$, $R_{FB2} = 13.7k\Omega$



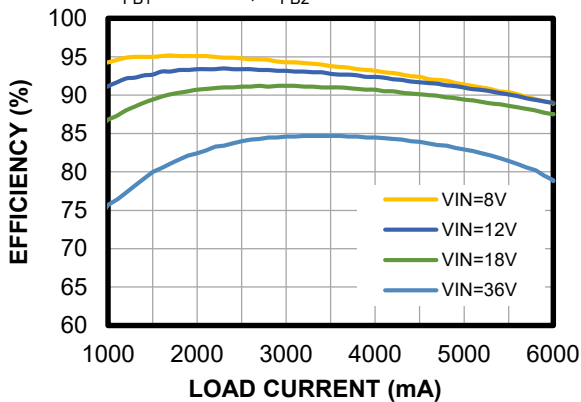
Efficiency vs. Load Current

AAM mode, $V_{OUT} = 5V$, $f_{SW} = 2.2MHz$,
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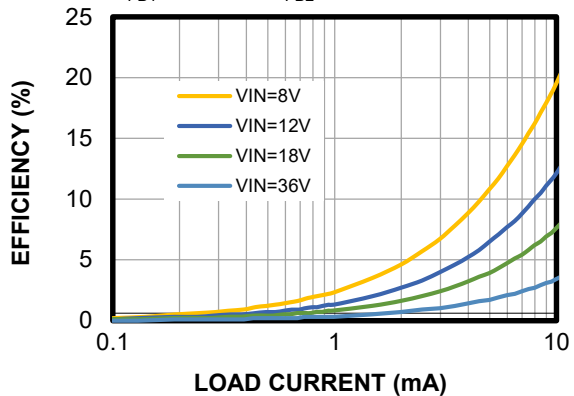
Efficiency vs. Load Current

AAM mode, $V_{OUT} = 5V$, $f_{SW} = 2.2MHz$,
 $R_{FB1} = 100k\Omega$, $R_{FB2} = 13.7k\Omega$



Efficiency vs. Load Current

FCCM, $V_{OUT} = 5V$, $f_{SW} = 2.2MHz$,
 $R_{FB1} = 100k\Omega$, $R_{FB2} = 13.7k\Omega$

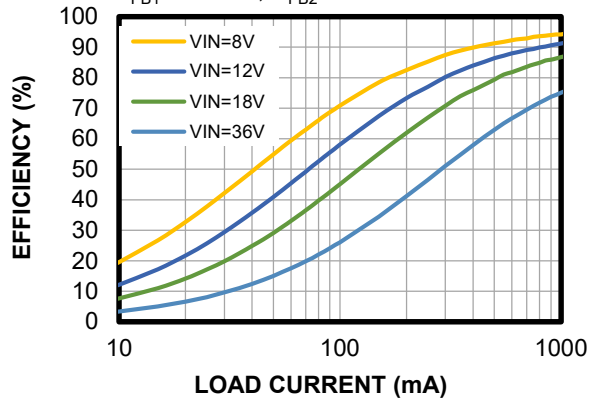


EVB TEST RESULTS (continued)

Performance curves and waveforms are tested on the evaluation board. $V_{IN} = 12V$, $V_{OUT} = 5V$, $C_{OUT} = 2 \times 22\mu F$, $L = 1\mu H$, $T_A = 25^\circ C$, unless otherwise noted.

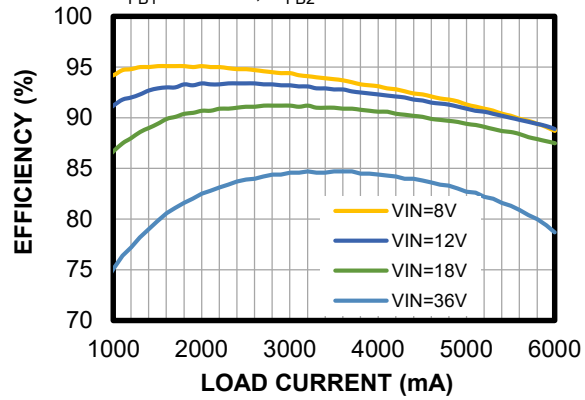
Efficiency vs. Load Current

FCCM, $V_{OUT} = 5V$, $f_{SW} = 2.2MHz$,
 $R_{FB1} = 100k\Omega$, $R_{FB2} = 13.7k\Omega$



Efficiency vs. Load Current

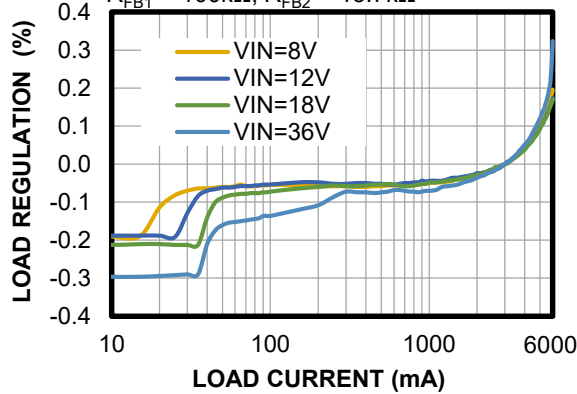
FCCM, $V_{OUT} = 5V$, $f_{SW} = 2.2MHz$,
 $R_{FB1} = 100k\Omega$, $R_{FB2} = 13.7k\Omega$



Load Regulation

MPQ4340A-6040

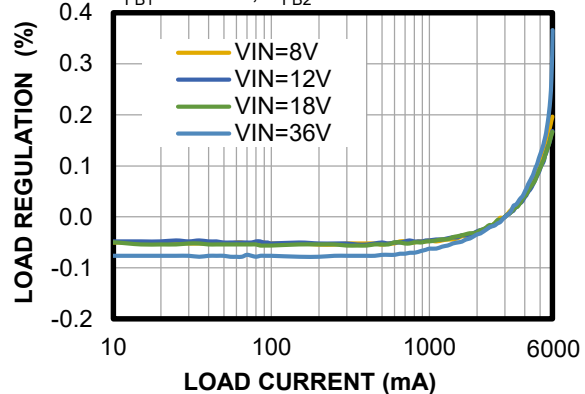
AAM mode, $V_{OUT} = 5V$, $f_{SW} = 2.2MHz$,
 $R_{FB1} = 100k\Omega$, $R_{FB2} = 13.7k\Omega$



Load Regulation

MPQ4340A-6040

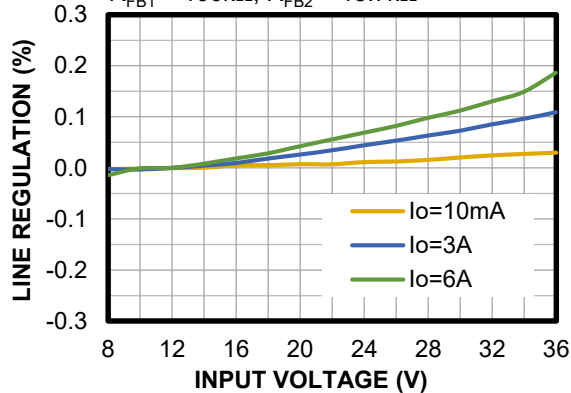
FCCM, $V_{OUT} = 5V$, $f_{SW} = 2.2MHz$,
 $R_{FB1} = 100k\Omega$, $R_{FB2} = 13.7k\Omega$



Line Regulation

MPQ4340A-6040

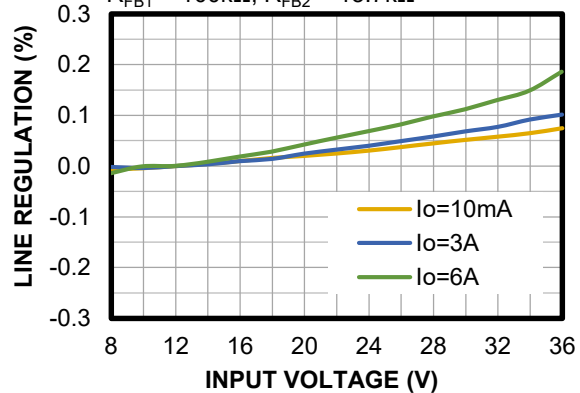
AAM mode, $V_{OUT} = 5V$, $f_{SW} = 2.2MHz$,
 $R_{FB1} = 100k\Omega$, $R_{FB2} = 13.7k\Omega$



Line Regulation

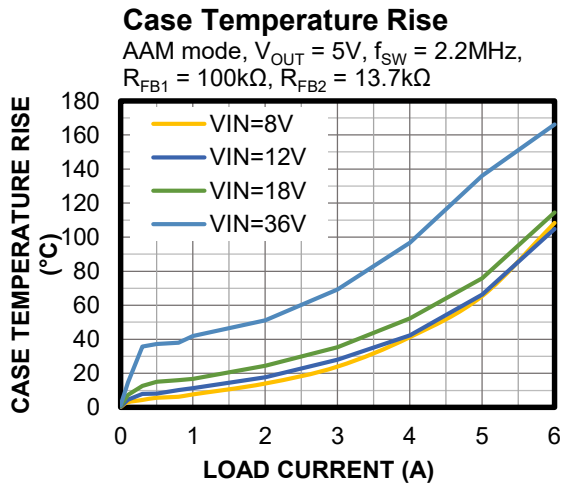
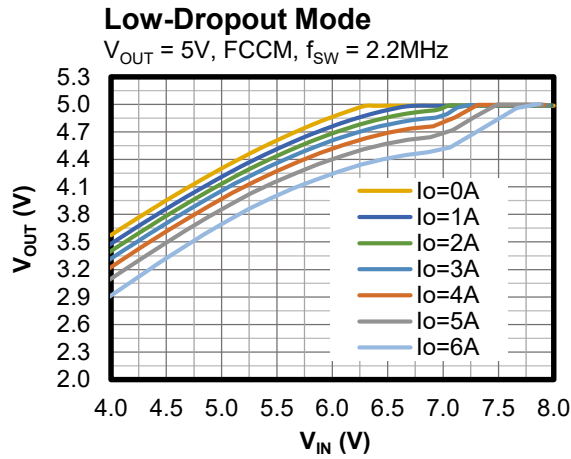
MPQ4340A-6040

FCCM, $V_{OUT} = 5V$, $f_{SW} = 2.2MHz$,
 $R_{FB1} = 100k\Omega$, $R_{FB2} = 13.7k\Omega$



EVB TEST RESULTS *(continued)*

Performance curves and waveforms are tested on the evaluation board. $V_{IN} = 12V$, $V_{OUT} = 5V$, $C_{OUT} = 2 \times 22\mu F$, $L = 1\mu H$, $T_A = 25^\circ C$, unless otherwise noted.

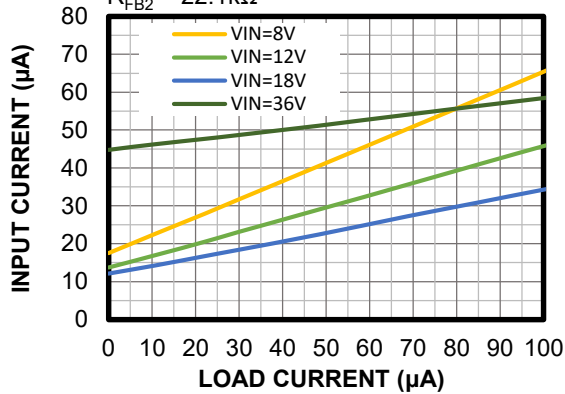


EVB TEST RESULTS (continued)

Performance curves and waveforms are tested on the evaluation board. $V_{IN} = 12V$, $V_{OUT} = 3.3V$, $C_{OUT} = 2 \times 22\mu F$, $L = 1\mu H$, $T_A = 25^\circ C$, unless otherwise noted.

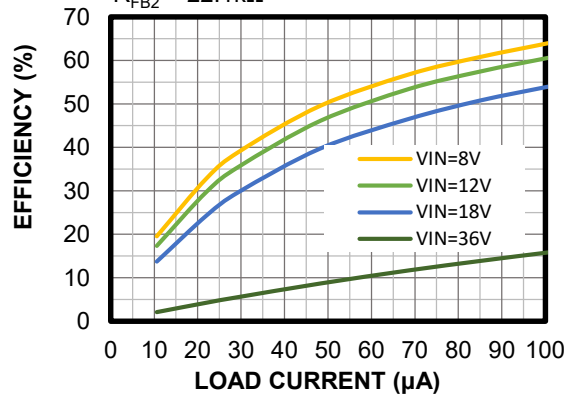
Input Current vs. Load Current

AAM mode, $V_{OUT} = 3.3V$,
 $f_{SW} = 2.2MHz$, $R_{FB1} = 100k\Omega$,
 $R_{FB2} = 22.1k\Omega$



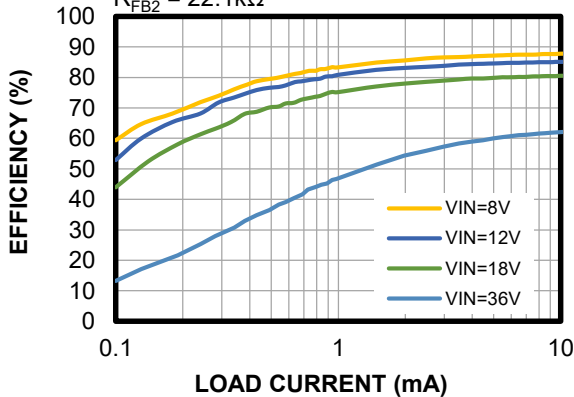
Efficiency vs. Load Current

AAM mode, $V_{OUT} = 3.3V$,
 $f_{SW} = 2.2MHz$, $R_{FB1} = 100k\Omega$,
 $R_{FB2} = 22.1k\Omega$



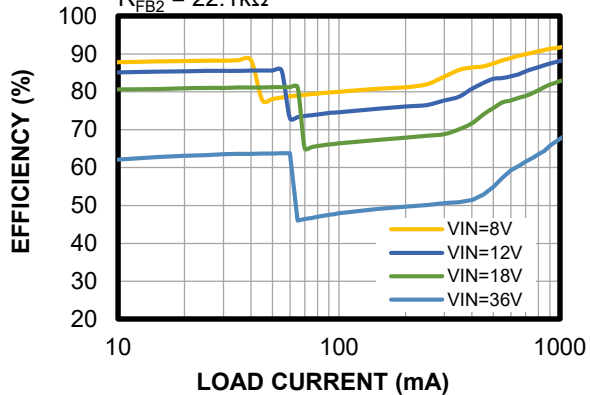
Efficiency vs. Load Current

AAM mode, $V_{OUT} = 3.3V$,
 $f_{SW} = 2.2MHz$, $R_{FB1} = 100k\Omega$,
 $R_{FB2} = 22.1k\Omega$



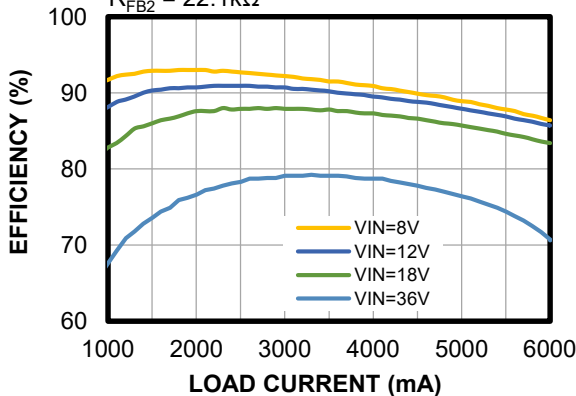
Efficiency vs. Load Current

AAM mode, $V_{OUT} = 3.3V$,
 $f_{SW} = 2.2MHz$, $R_{FB1} = 100k\Omega$,
 $R_{FB2} = 22.1k\Omega$



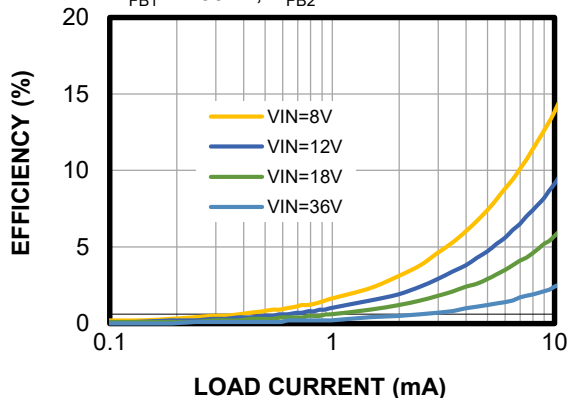
Efficiency vs. Load Current

AAM mode, $V_{OUT} = 3.3V$,
 $f_{SW} = 2.2MHz$, $R_{FB1} = 100k\Omega$,
 $R_{FB2} = 22.1k\Omega$



Efficiency vs. Load Current

FCCM, $V_{OUT} = 3.3V$, $f_{SW} = 2.2MHz$,
 $R_{FB1} = 100k\Omega$, $R_{FB2} = 22.1k\Omega$

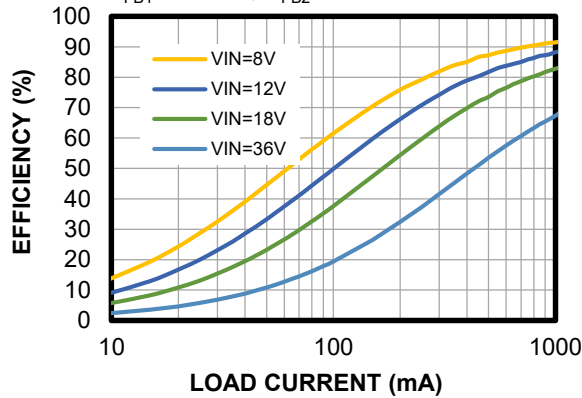


EVB TEST RESULTS *(continued)*

Performance curves and waveforms are tested on the evaluation board. $V_{IN} = 12V$, $V_{OUT} = 3.3V$, $C_{OUT} = 2 \times 22\mu F$, $L = 1\mu H$, $T_A = 25^\circ C$, unless otherwise noted.

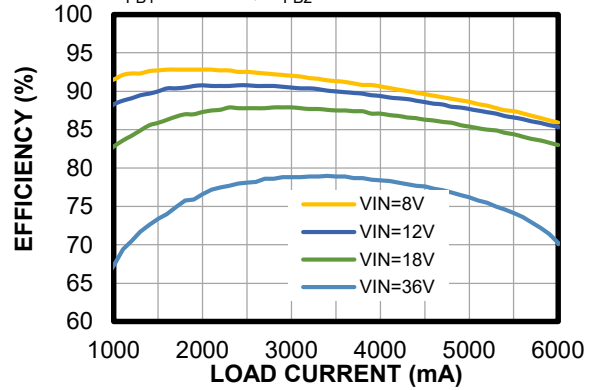
Efficiency vs. Load Current

FCCM, $V_{OUT} = 3.3V$, $f_{SW} = 2.2MHz$,
 $R_{FB1} = 100k\Omega$, $R_{FB2} = 22.1k\Omega$



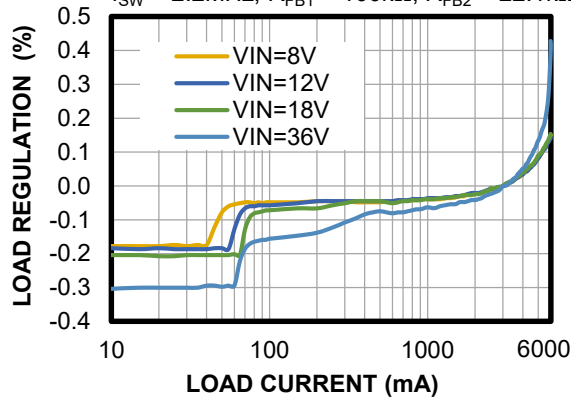
Efficiency vs. Load Current

FCCM, $V_{OUT} = 3.3V$, $f_{SW} = 2.2MHz$,
 $R_{FB1} = 100k\Omega$, $R_{FB2} = 22.1k\Omega$



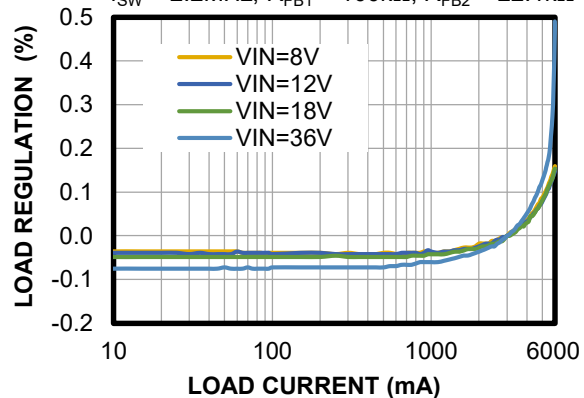
Load Regulation

MPQ4340A-6040, AAM mode, $V_{OUT} = 3.3V$,
 $f_{SW} = 2.2MHz$, $R_{FB1} = 100k\Omega$, $R_{FB2} = 22.1k\Omega$



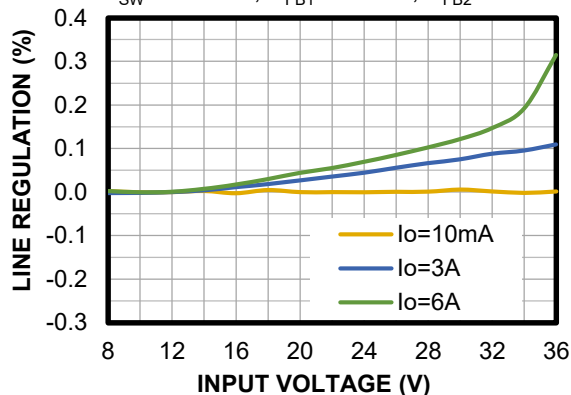
Load Regulation

MPQ4340A-6040, FCCM, $V_{OUT} = 3.3V$,
 $f_{SW} = 2.2MHz$, $R_{FB1} = 100k\Omega$, $R_{FB2} = 22.1k\Omega$



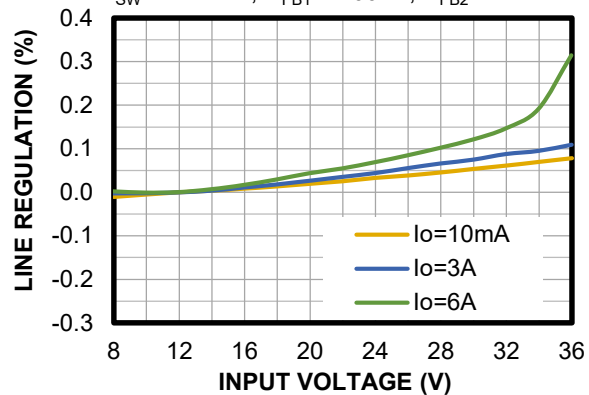
Line Regulation

MPQ4340A-6040, AAM mode, $V_{OUT} = 3.3V$,
 $f_{SW} = 2.2MHz$, $R_{FB1} = 100k\Omega$, $R_{FB2} = 22.1k\Omega$



Line Regulation

MPQ4340A-6040, FCCM, $V_{OUT} = 3.3V$,
 $f_{SW} = 2.2MHz$, $R_{FB1} = 100k\Omega$, $R_{FB2} = 22.1k\Omega$

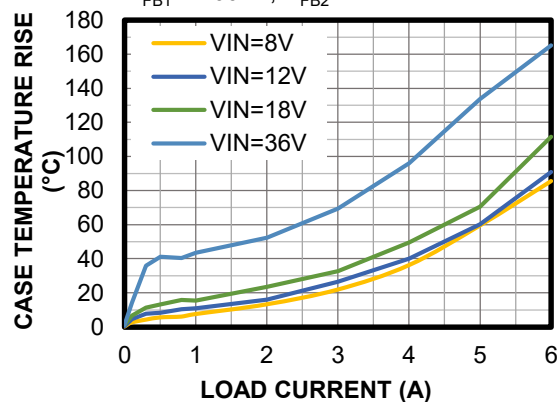


EVB TEST RESULTS *(continued)*

Performance curves and waveforms are tested on the evaluation board. $V_{IN} = 12V$, $V_{OUT} = 3.3V$, $C_{OUT} = 2 \times 22\mu F$, $L = 1\mu H$, $T_A = 25^\circ C$, unless otherwise noted.

Case Temperature Rise

AAM mode, $V_{OUT} = 3.3V$, $f_{SW} = 2.2MHz$,
 $R_{FB1} = 100k\Omega$, $R_{FB2} = 22.1k\Omega$

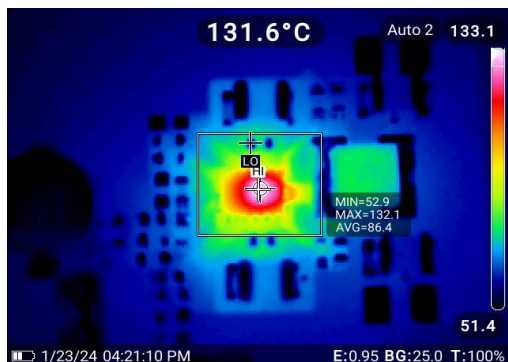


EVB TEST RESULTS *(continued)*

Performance curves and waveforms are tested on the evaluation board. $V_{IN} = 12V$, $V_{OUT} = 5V$, $C_{OUT} = 2 \times 22\mu F$, $L = 1\mu H$, $T_A = 25^\circ C$, unless otherwise noted.

Thermal Performance

$V_{IN} = 12V$, $V_{OUT} = 5V$, $I_{OUT} = 6A$, $f_{SW} = 2.2MHz$,
no forced airflow, $T_{CASE} = 132.1^\circ C$



Thermal Performance

$V_{IN} = 12V$, $V_{OUT} = 3.3V$, $I_{OUT} = 6A$, $f_{SW} = 2.2MHz$,
no forced airflow, $T_{CASE} = 117.9^\circ C$

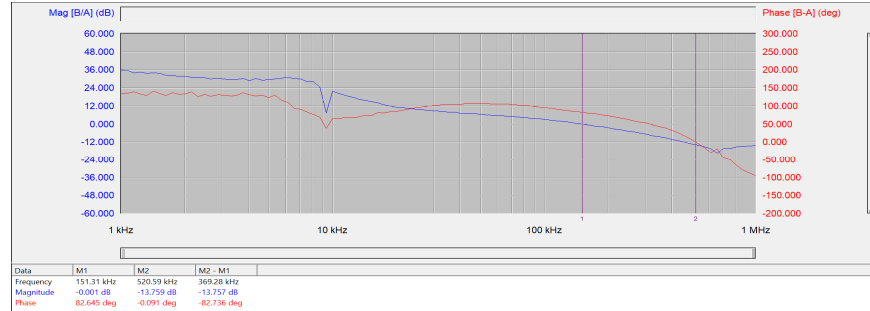


EVB TEST RESULTS *(continued)*

Performance curves and waveforms are tested on the evaluation board. $V_{IN} = 12V$, $V_{OUT} = 5V$, $C_{OUT} = 2 \times 22\mu F$, $L = 1\mu H$, $T_A = 25^\circ C$, unless otherwise noted.

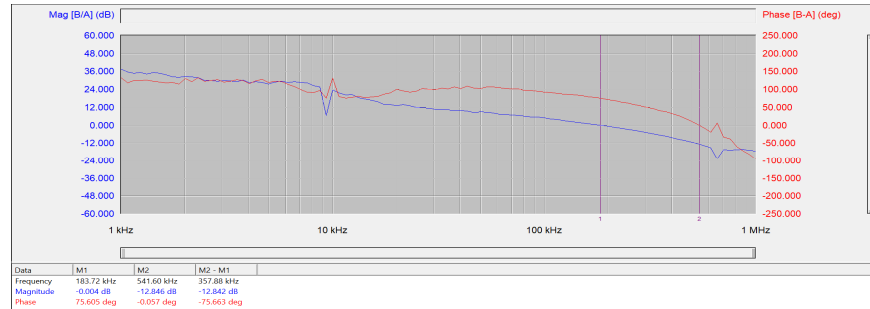
Loop Performance

$I_{OUT} = 6A$, $T_A = 25^\circ C$



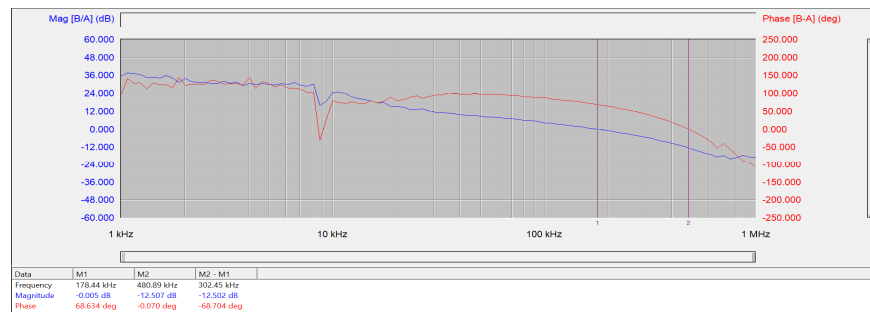
Loop Performance

$I_{OUT} = 6A$, $T_A = -40^\circ C$



Loop Performance

$I_{OUT} = 6A$, $T_A = 85^\circ C$ (2)



Note:

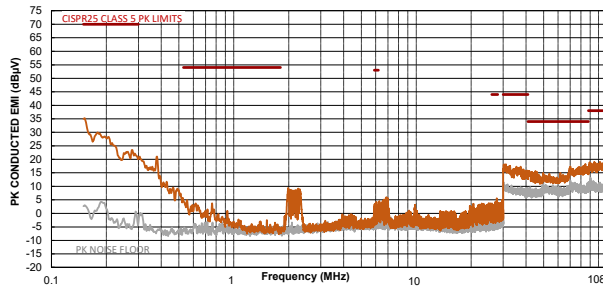
- 2) Reduce the ambient temperature (T_A) to avoid triggering over-temperature protection (OTP).

EVB TEST RESULTS *(continued)*

Performance curves and waveforms are tested on the evaluation board. $V_{IN} = 12V$, $V_{OUT} = 5V$, $C_{OUT} = 2 \times 22\mu F$, $L = 1\mu H$, $T_A = 25^\circ C$, unless otherwise noted.

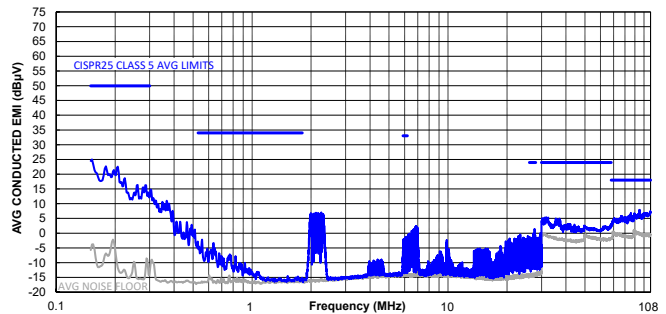
CISPR 25 Class 5 Peak Conducted Emissions

150kHz to 108MHz



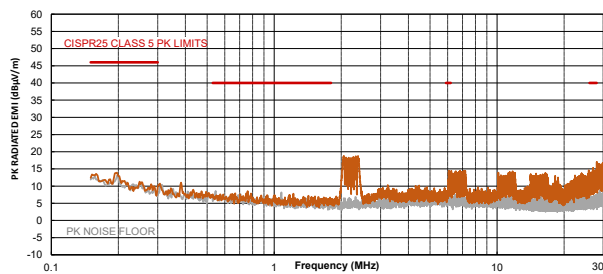
CISPR 25 Class 5 Average Conducted Emissions

150kHz to 108MHz



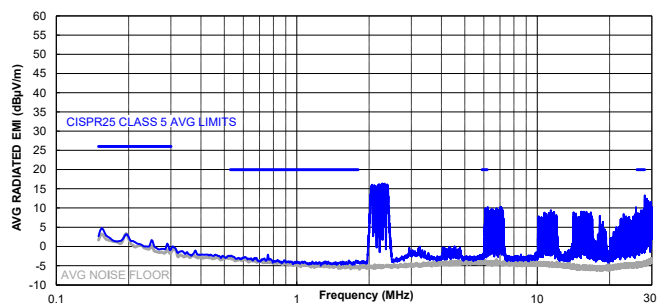
CISPR 25 Class 5 Peak Radiated Emissions

150kHz to 30MHz



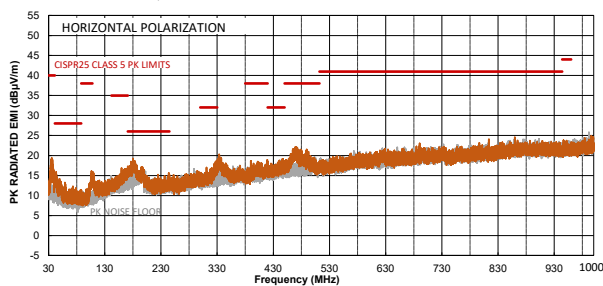
CISPR 25 Class 5 Average Radiated Emissions

150kHz to 30MHz



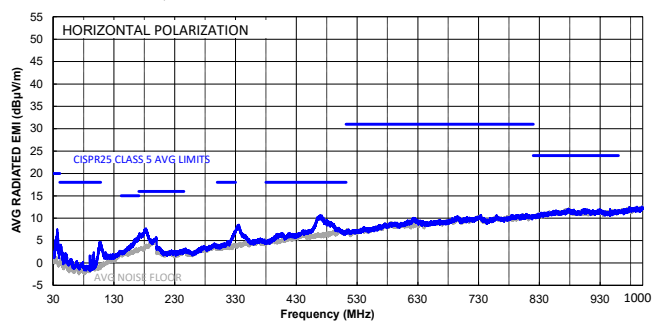
CISPR 25 Class 5 Peak Radiated Emissions

Horizontal, 30MHz to 1GHz



CISPR 25 Class 5 Average Radiated Emissions

Horizontal, 30MHz to 1GHz

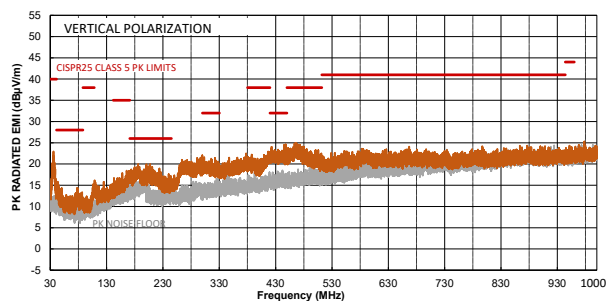


EVB TEST RESULTS *(continued)*

Performance curves and waveforms are tested on the evaluation board. $V_{IN} = 12V$, $V_{OUT} = 5V$, $C_{OUT} = 2 \times 22\mu F$, $L = 1\mu H$, $T_A = 25^\circ C$, unless otherwise noted.

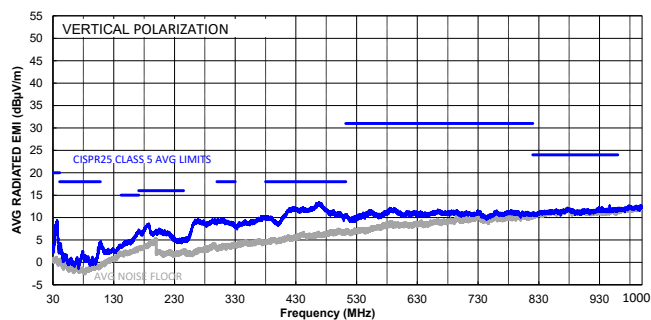
CISPR 25 Class 5 Peak Radiated Emissions

Vertical, 30MHz to 1GHz



CISPR 25 Class 5 Average Radiated Emissions

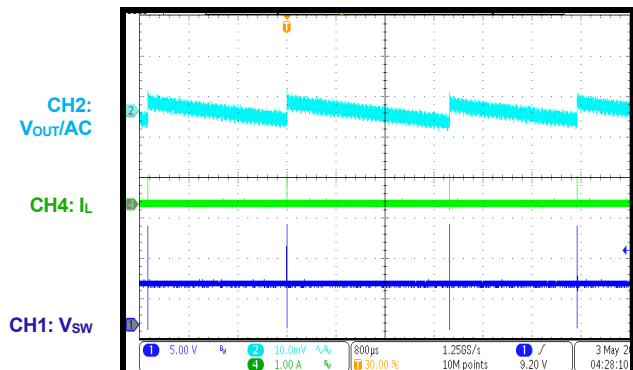
Vertical, 30MHz to 1GHz



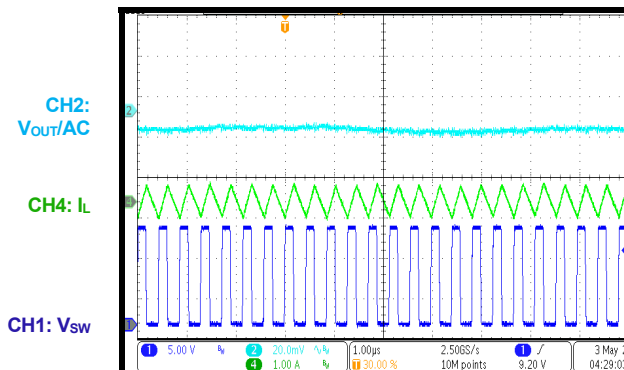
EVB TEST RESULTS *(continued)*

Performance curves and waveforms are tested on the evaluation board. $V_{IN} = 12V$, $V_{OUT} = 5V$, $C_{OUT} = 2 \times 22\mu F$, $L = 1\mu H$, $T_A = 25^\circ C$, unless otherwise noted.

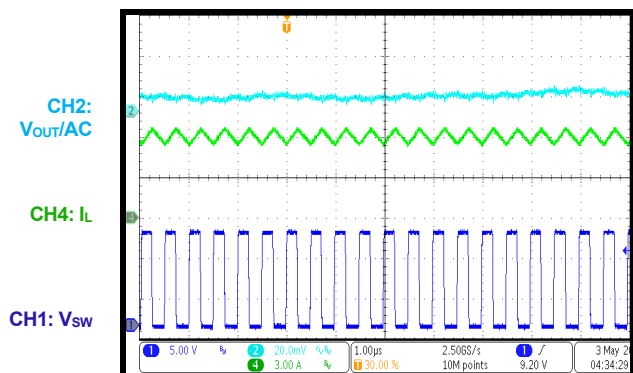
Steady State

 $I_{OUT} = 0A$, AAM mode


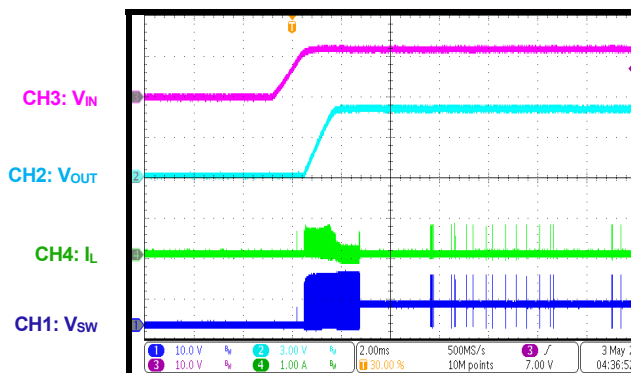
Steady State

 $I_{OUT} = 0A$, FCCM


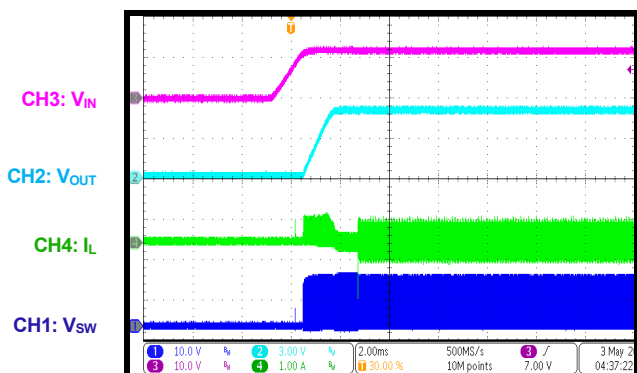
Steady State

 $I_{OUT} = 6A$


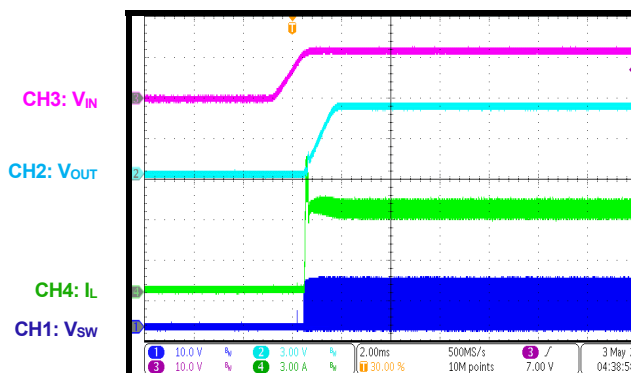
Start-Up through VIN

 $I_{OUT} = 0A$, AAM mode


Start-Up through VIN

 $I_{OUT} = 0A$, FCCM


Start-Up through VIN

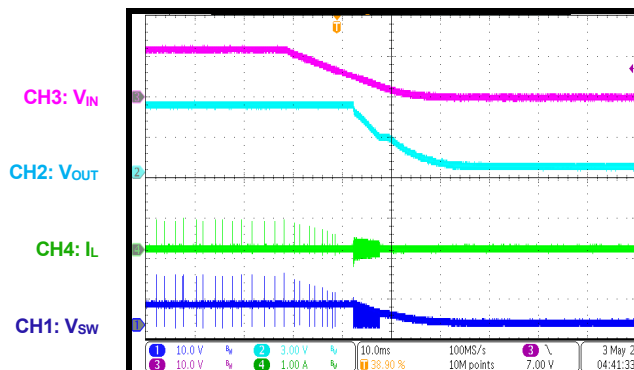
 $I_{OUT} = 6A$


EVB TEST RESULTS *(continued)*

Performance curves and waveforms are tested on the evaluation board. $V_{IN} = 12V$, $V_{OUT} = 5V$, $C_{OUT} = 2 \times 22\mu F$, $L = 1\mu H$, $T_A = 25^\circ C$, unless otherwise noted.

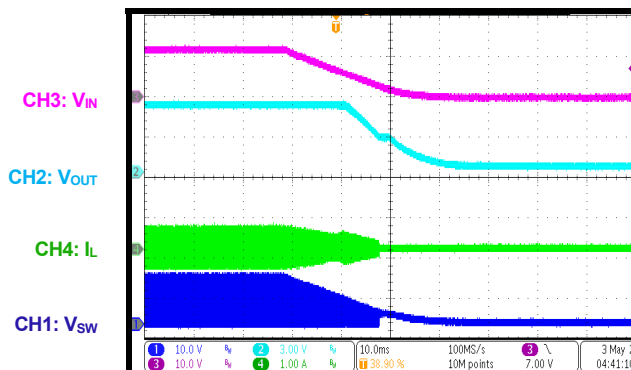
Shutdown through VIN

$I_{OUT} = 0A$, AAM mode



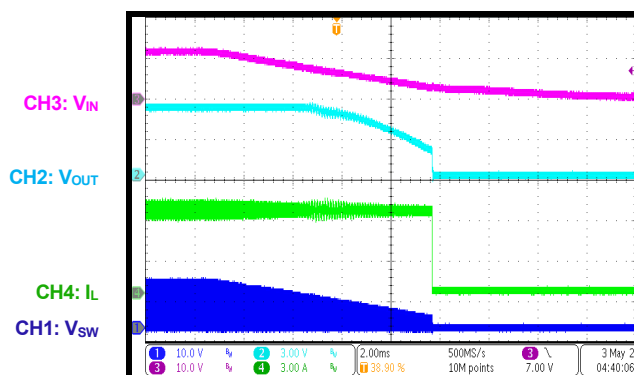
Shutdown through VIN

$I_{OUT} = 0A$, FCCM



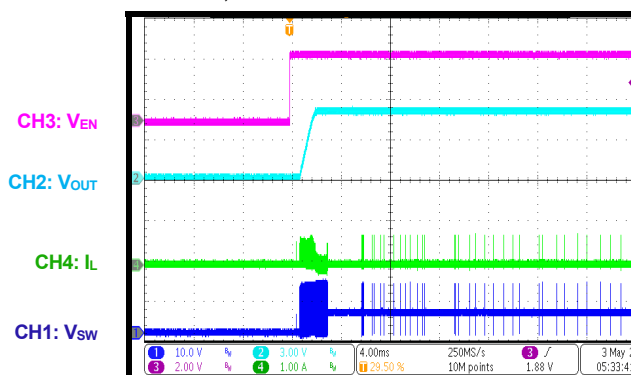
Shutdown through VIN

$I_{OUT} = 6A$



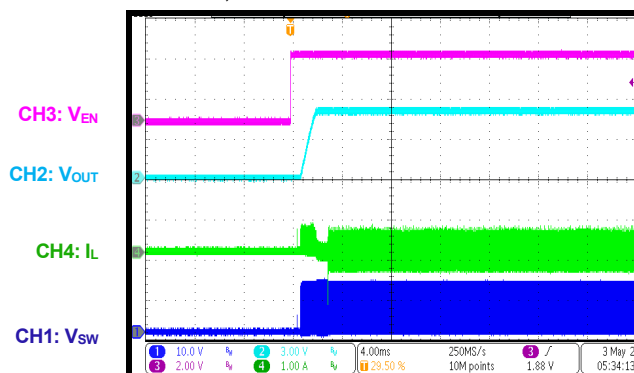
Start-Up through EN

$I_{OUT} = 0A$, AAM mode



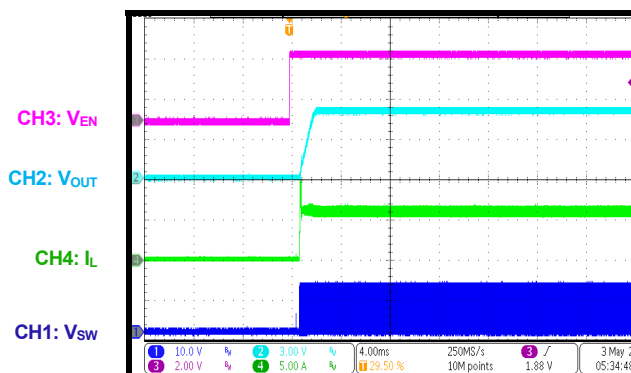
Start-Up through EN

$I_{OUT} = 0A$, FCCM



Start-Up through EN

$I_{OUT} = 6A$

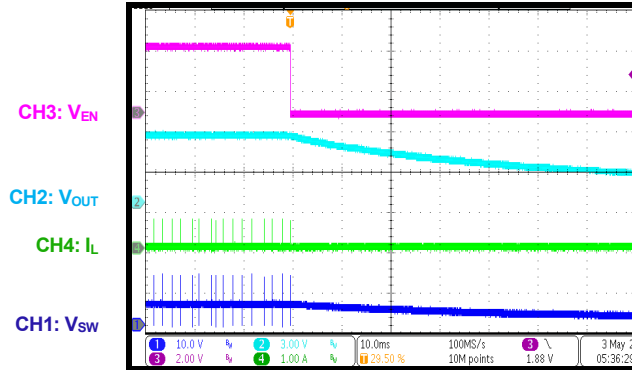


EVB TEST RESULTS *(continued)*

Performance curves and waveforms are tested on the evaluation board. $V_{IN} = 12V$, $V_{OUT} = 5V$, $C_{OUT} = 2 \times 22\mu F$, $L = 1\mu H$, $T_A = 25^\circ C$, unless otherwise noted.

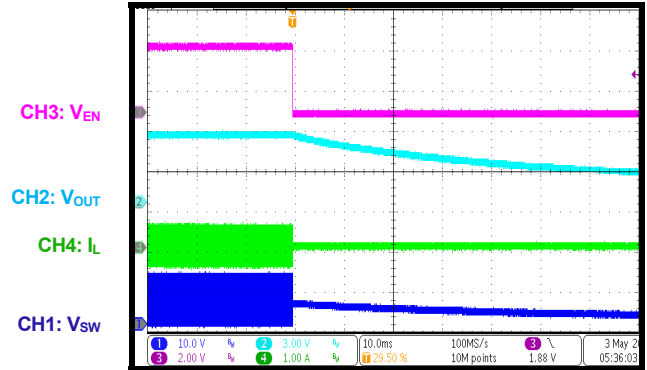
Shutdown through EN

$I_{OUT} = 0A$, AAM mode



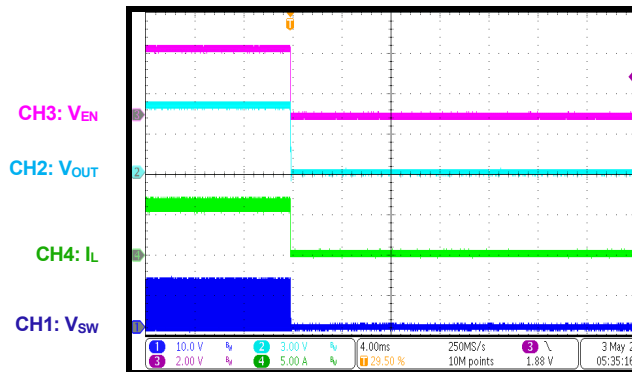
Shutdown through EN

$I_{OUT} = 0A$, FCCM



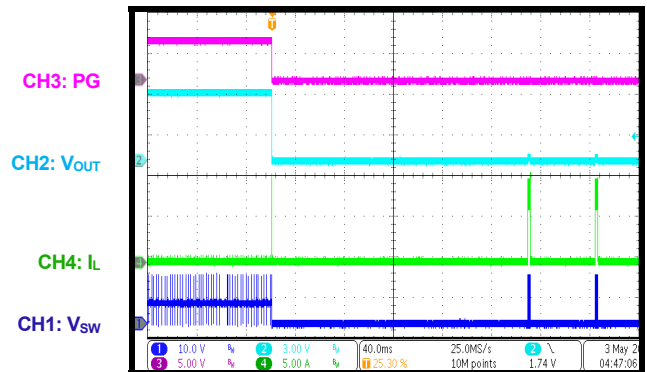
Shutdown through EN

$I_{OUT} = 6A$



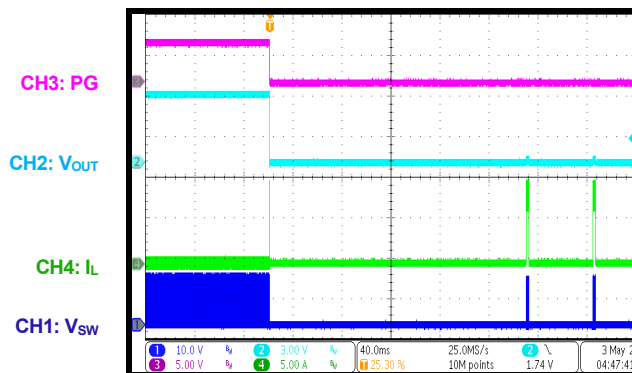
SCP Entry

$I_{OUT} = 0A$, AAM mode



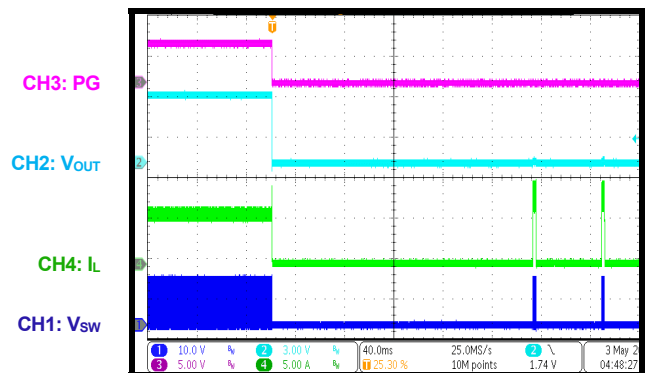
SCP Entry

$I_{OUT} = 0A$, FCCM



SCP Entry

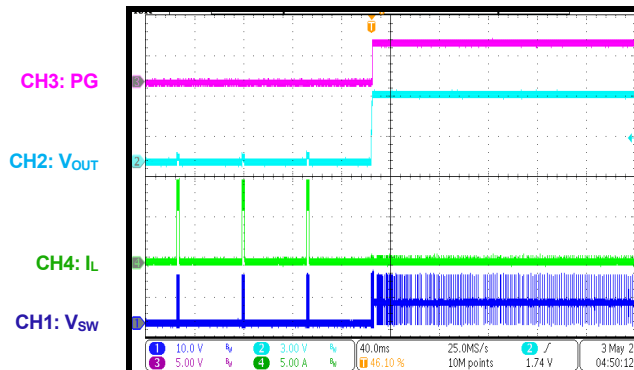
$I_{OUT} = 6A$



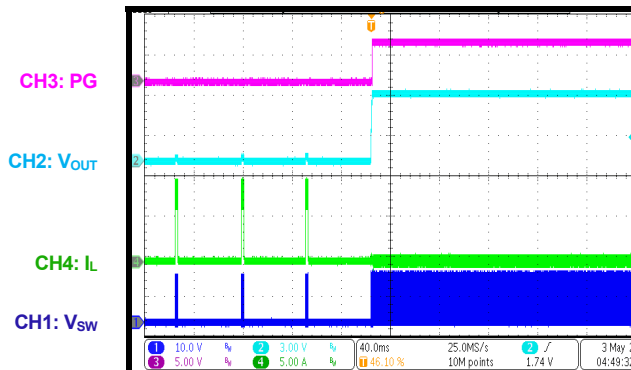
EVB TEST RESULTS *(continued)*

Performance curves and waveforms are tested on the evaluation board. $V_{IN} = 12V$, $V_{OUT} = 5V$, $C_{OUT} = 2 \times 22\mu F$, $L = 1\mu H$, $T_A = 25^\circ C$, unless otherwise noted.

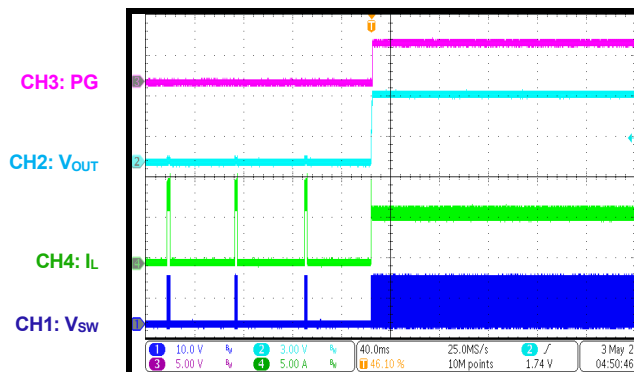
SCP Recovery

 $I_{OUT} = 0A$, AAM mode


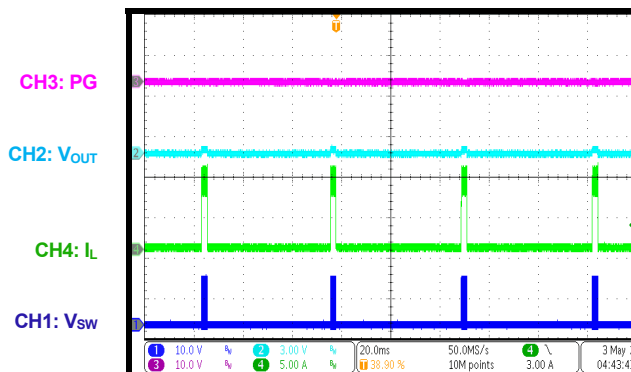
SCP Recovery

 $I_{OUT} = 0A$, FCCM


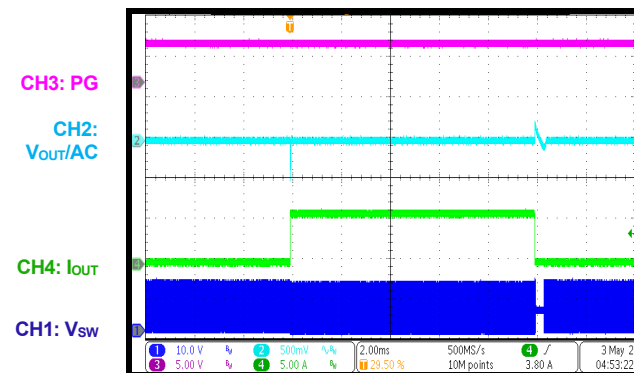
SCP Recovery

 $I_{OUT} = 6A$


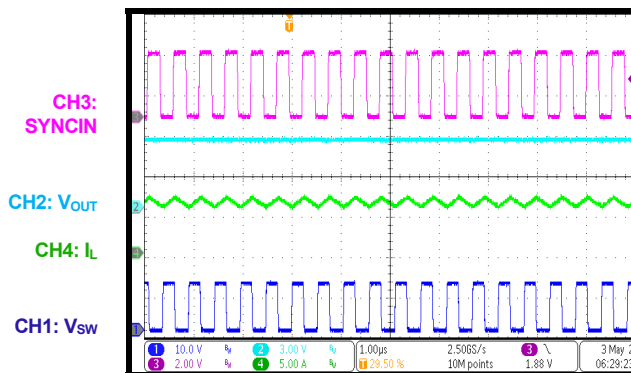
SCP Steady State



Load Transient

 $I_{OUT} = 0A$ to $6A$, $1.6A/\mu s$


SYNCIN Operation

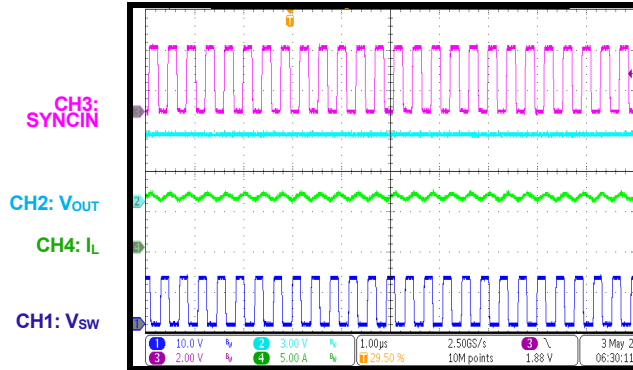
 $I_{OUT} = 6A$, $f_{SW} = 2.2MHz$, $f_{SYNC} = 1.9MHz$


EVB TEST RESULTS *(continued)*

Performance curves and waveforms are tested on the evaluation board. $V_{IN} = 12V$, $V_{OUT} = 5V$, $C_{OUT} = 2 \times 22\mu F$, $L = 1\mu H$, $T_A = 25^\circ C$, unless otherwise noted.

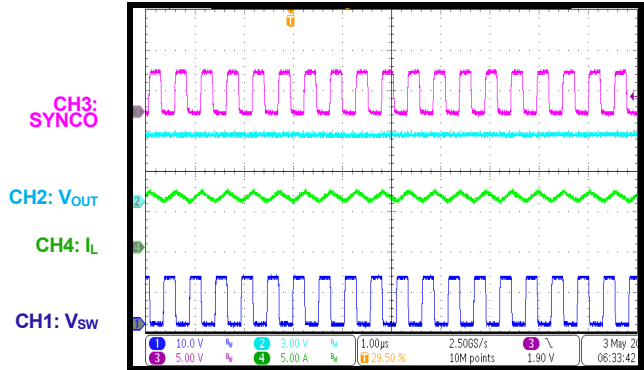
SYNCIN Operation

$I_{OUT} = 6A$, $f_{SW} = 2.2MHz$, $f_{SYNC} = 2.6MHz$



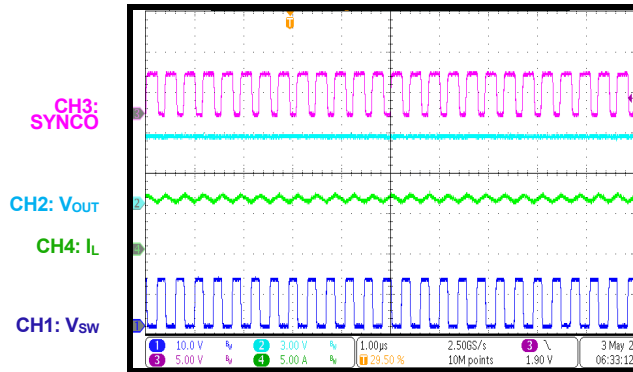
SYNCO Operation

$I_{OUT} = 6A$, $f_{SW} = 2.2MHz$, $f_{SYNC} = 1.9MHz$



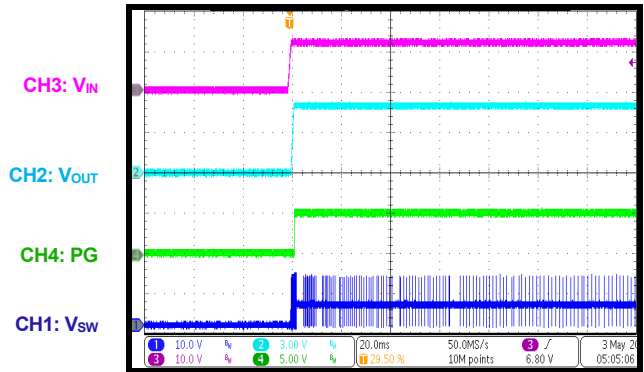
SYNCO Operation

$I_{OUT} = 6A$, $f_{SW} = 2.2MHz$, $f_{SYNC} = 2.6MHz$



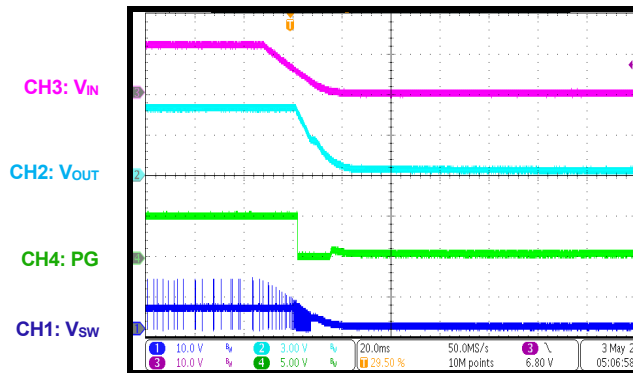
PG in Start-Up through VIN

$I_{OUT} = 0A$, AAM mode



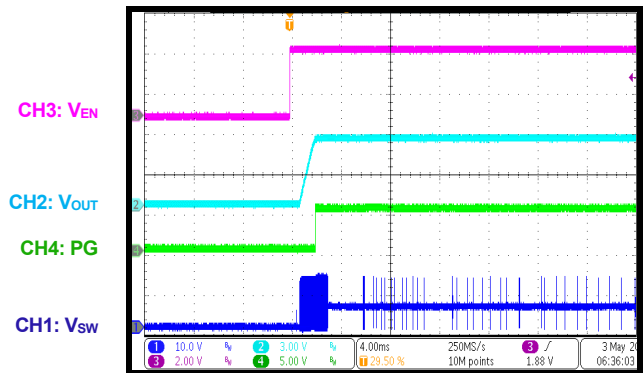
PG in Shutdown through VIN

$I_{OUT} = 0A$, AAM mode



PG in Start-Up through EN

$I_{OUT} = 0A$, AAM mode

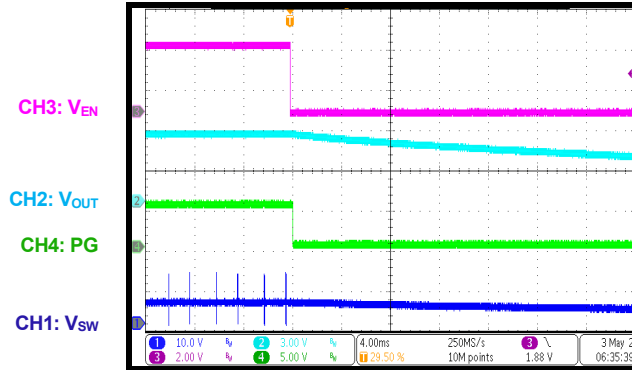


EVB TEST RESULTS *(continued)*

Performance curves and waveforms are tested on the evaluation board. $V_{IN} = 12V$, $V_{OUT} = 5V$, $C_{OUT} = 2 \times 22\mu F$, $L = 1\mu H$, $T_A = 25^\circ C$, unless otherwise noted.

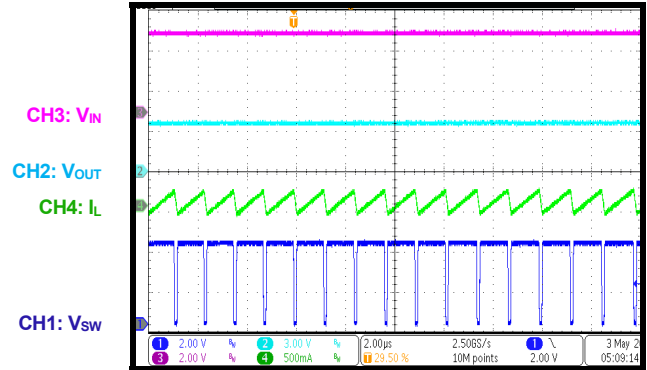
PG in Shutdown through EN

$I_{OUT} = 0A$, AAM mode



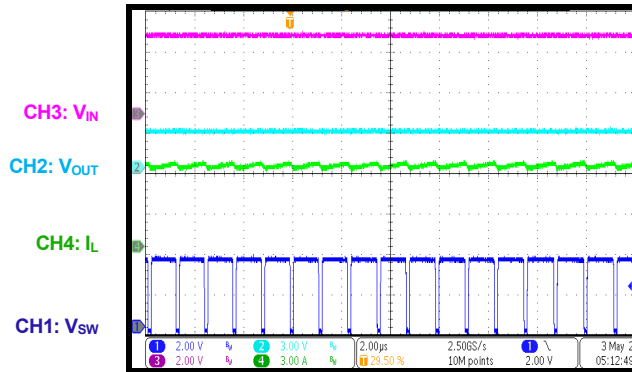
Low-Dropout Mode

$V_{IN} = 3.3V$, V_{OUT} set to 5V, $I_{OUT} = 0A$



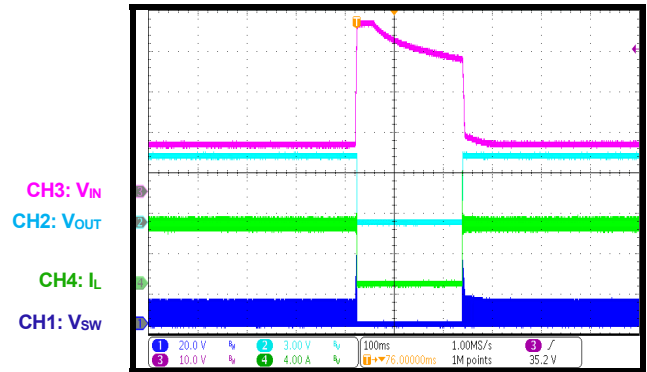
Low-Dropout Mode

$V_{IN} = 3.3V$, V_{OUT} set to 5V, $I_{OUT} = 6A$



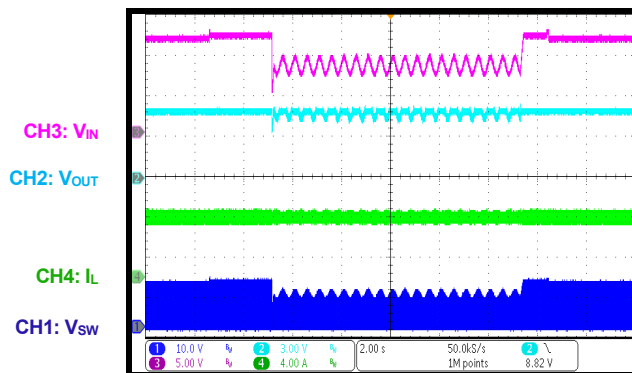
Load Dump

$V_{IN} = 12V$ to 42V, $I_{OUT} = 6A$



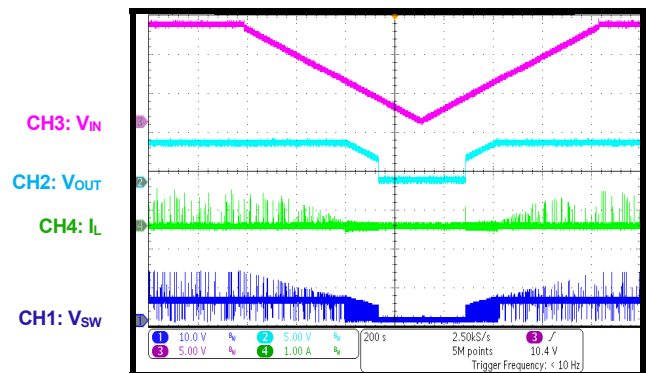
Cold Crank

$I_{OUT} = 6A$



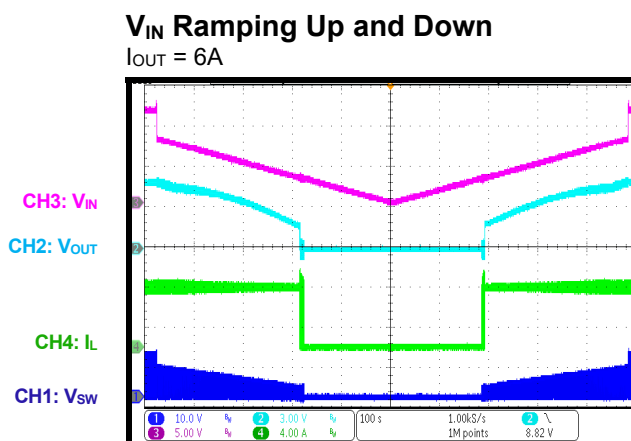
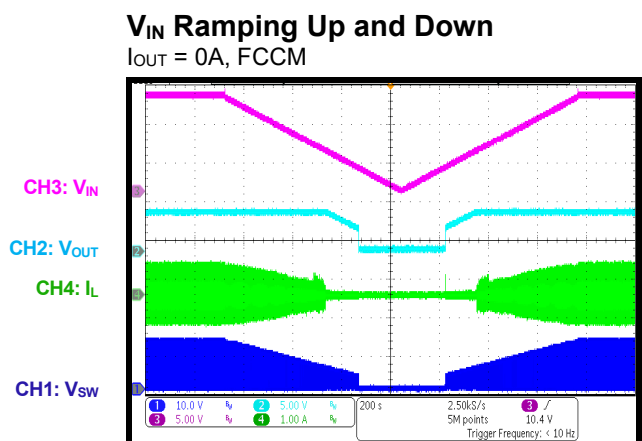
V_{IN} Ramping Up and Down

$I_{OUT} = 0A$, AAM mode



EVB TEST RESULTS *(continued)*

Performance curves and waveforms are tested on the evaluation board. $V_{IN} = 12V$, $V_{OUT} = 5V$, $C_{OUT} = 2 \times 22\mu F$, $L = 1\mu H$, $T_A = 25^\circ C$, unless otherwise noted.



PCB LAYOUT (3)

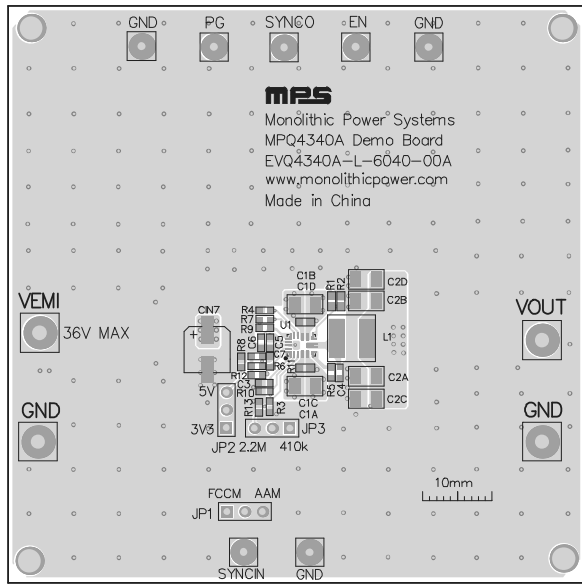


Figure 5: Top Silk and Top Layer

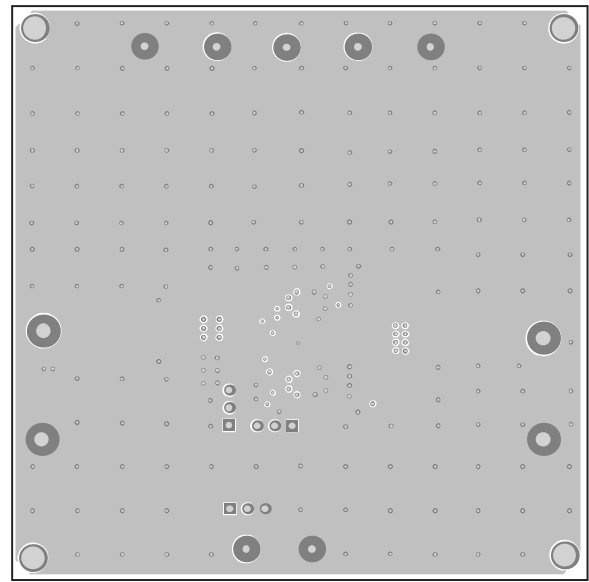


Figure 6: Mid-Layer 1

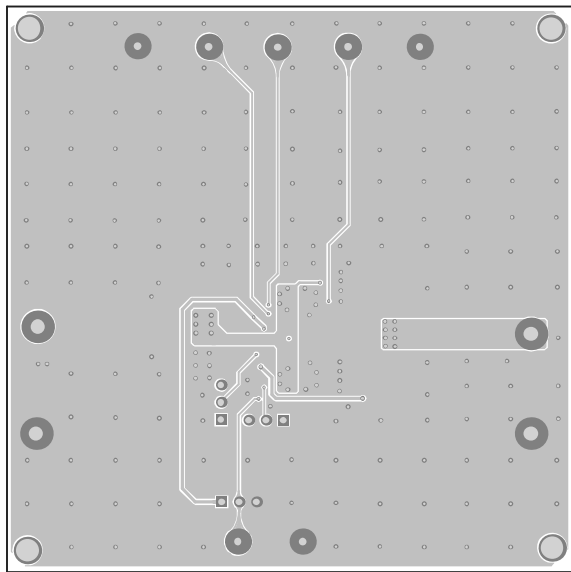


Figure 7: Mid-Layer 2

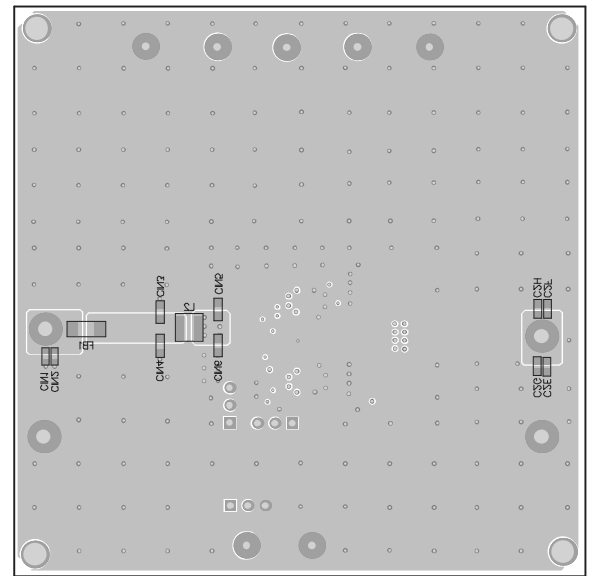


Figure 8: Bottom Layer and Bottom Silk

Note:

- 3) The copper thickness is 2oz.



REVISION HISTORY

Revision #	Revision Date	Description	Pages Updated
1.0	7/1/2024	Initial Release	-

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