



# EVQ8623-D-00A

## 16V, 6A, High-Efficiency, Synchronous, Step-Down Converter Evaluation Board

### DESCRIPTION

The EVQ8623-D-00A is an evaluation board for the MPQ8623, a high-efficiency, monolithic, synchronous, step-down converter.

The EV board can deliver 6A of continuous load current over a wide operating input range. High efficiency can be achieved over a wide output current load range.

The MPQ8623 adopts an internally compensated constant-on-time (COT) control mode that provides fast transient response and eases loop stabilization.

This EV board can be turned on or off via a remote on/off input (EN) that is referenced to ground. This input is compatible with popular logic devices.

### ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Input voltage	$V_{IN}$	8-16	V
Output voltage	$V_{OUT}$	1.8	V
Output current	$I_{OUT}$	6	A

### FEATURES

- Wide Input Voltage Range
  - 2.85V to 16V with External 3.3V VCC Bias
  - 4V to 16V with Internal VCC Bias or External 3.3V Bias
- Programmable Accurate Current Limit Level
- 6A Output Current
- Low  $R_{DS(ON)}$  Integrated Power MOSFETs
- Proprietary Switching Loss Reduction Technique
- Adaptive COT for Ultra-Fast Transient Response
- Stable with Zero-ESR Output Capacitor
  - 0.5% Reference Voltage Over 0°C to +70°C Junction Temperature Range
  - 1% Reference Voltage Over -40°C to +125°C Junction Temperature Range
- Selectable Pulse-Skip or Forced CCM Operation
- Excellent Load Regulation
- Output Voltage Tracking
- Output Voltage Discharge
- PGOOD Active Clamped Low Level during Power Failure
- Programmable Soft Start Time from 1.5ms
- Pre-Bias Start-Up
- Selectable Switching Frequency of 600kHz, 1100kHz, and 2000kHz Latch-Off for OCP, OVP, UVP, UVLO, and Thermal Shutdown
- Output Adjustable from 0.9V to 90%\* $V_{in}$ , Up to 6V Max
- Available in a QFN (2mmx3mm) Package

### APPLICATIONS

- Telecom and Networking Systems
- Server, Cloud Computing, Storage
- Base Stations
- General Purpose Point-of-Load (PoL)
- 12V Distribution Power Systems
- High-End TV
- Game Consoles and Graphic Cards

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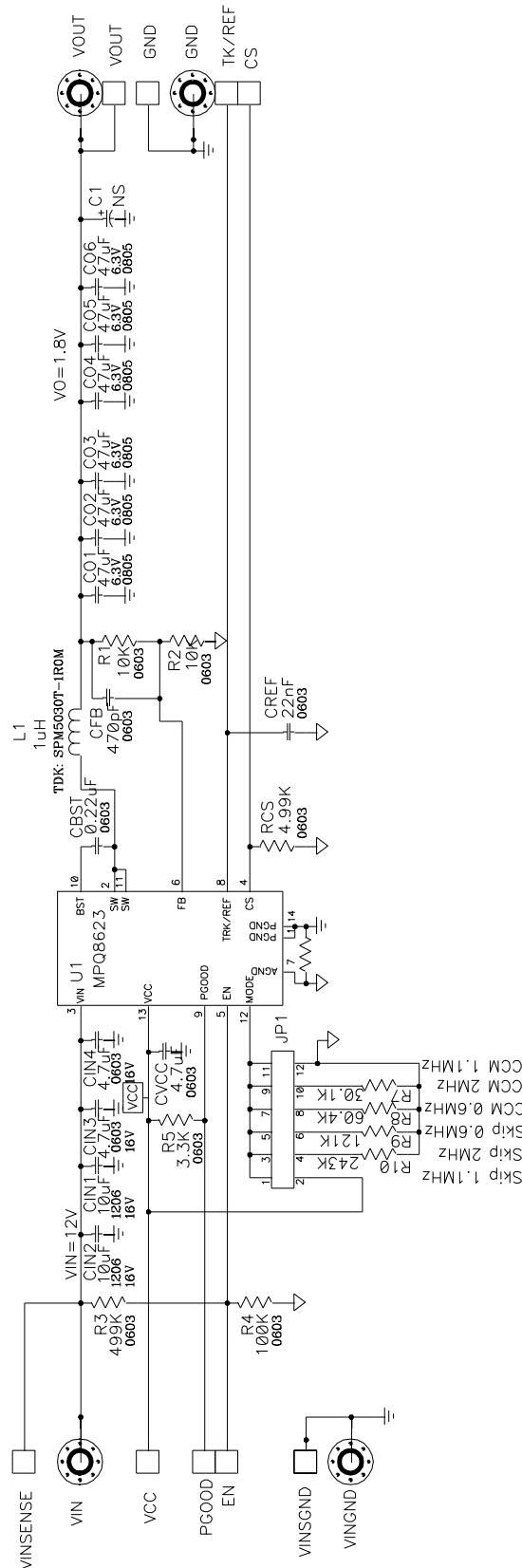
EVQ8623-D-00A EVALUATION BOARD



(L x W ) 81mm x 78mm)

Board Number	MPS IC Number
EVQ8623-D-00A	MPQ8623GD

### EVALUATION BOARD SCHEMATIC



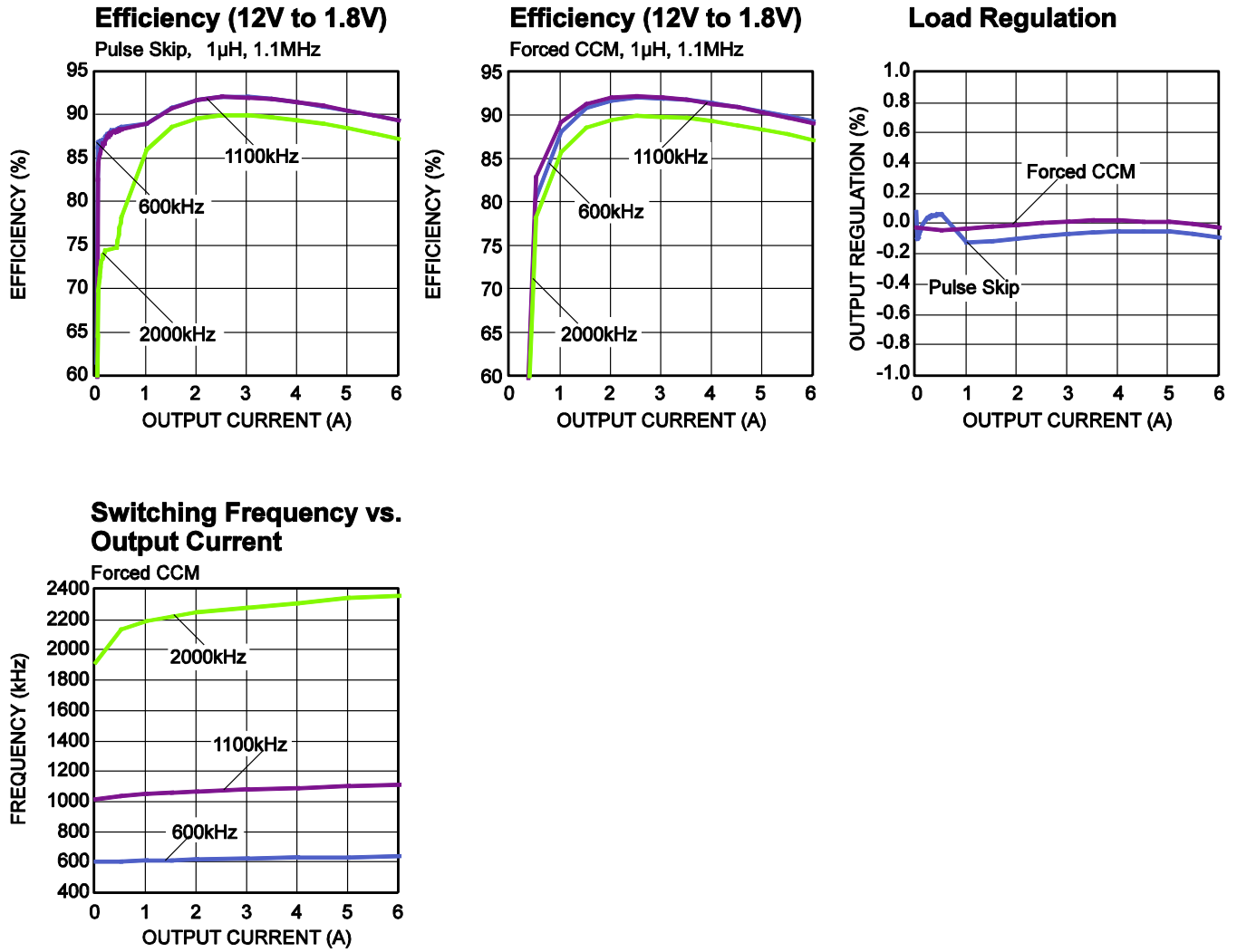
**EVQ8623-D-00A BILL OF MATERIALS**

Qty	Ref	Value	Description	Package	Manufacturer	Part Number
0	C1	NS		Pos-cap/D2		
1	CBST	0.22 $\mu$ F	CAP CER 0.22 $\mu$ F 25V 10% X7R 0603	CAP0603	Generic	
1	CFB	470pF	CAP, 50V, 10%, X7R	CAP0603	Generic	
2	CIN1, CIN2	10 $\mu$ F/25V	Capacitor, 25V, X7R, 10%	CAP1206	Generic	
2	CIN3, CIN4	4.7 $\mu$ F/25V	CAP CER 4.7 $\mu$ F 25V 10% X6S 0603	CAP0603	Generic	
6	CO1, CO2, CO3, CO4, CO5, CO6	47 $\mu$ F	CAP, 6.3V, X5R, 20%	CAP0805	Murata or Generic	GRM21BR60J476ME15L
1	CREF	22nF	CAP CER 22nF 25V 10% X7R 0603	CAP0603	Generic	
1	CVCC	4.7 $\mu$ F	CAP CER 4.7 $\mu$ F 6.3v 10% X7R 0603	CAP0603	Generic	
1	L1	1 $\mu$ H	Inductor	7x7mm	TDK or Others	SPM5030T-1R0M
2	R1, R2	10k	Film Res., 1%	0603	Generic	
1	R3	499k	Film Res., 1%	0603	Generic	
1	R4	100k	Film Res., 1%	0603	Generic	
1	R5	3.3k	Film Res., 1%	0603	Generic	
1	R7	30.1k	Film Res., 1%	0603	Generic	
1	R8	60.4k	Film Res., 1%	0603	Generic	
1	R9	121k	Film Res., 1%	0603	Generic	
1	R10	243k	Film Res., 1%	0603	Generic	
1	RCS	4.99k	Film Res., 1%	0603	Generic	
1	U1	MQ8623GD	16V/6A Step Down Convert	QFN-14 (2x3mm)	MPS	MPQ8623GD

### EVB TEST RESULTS

Performance waveforms are tested on the EVQ8623-D-00A evaluation board.

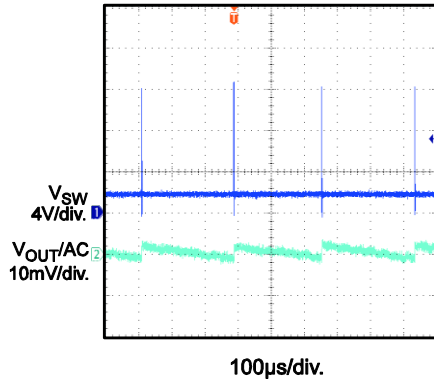
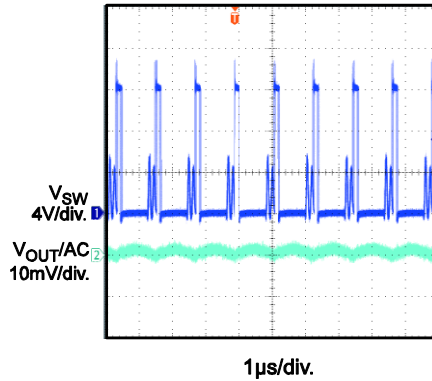
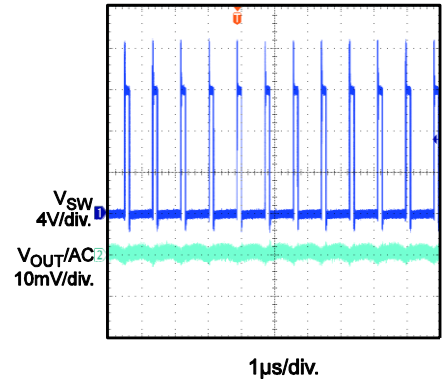
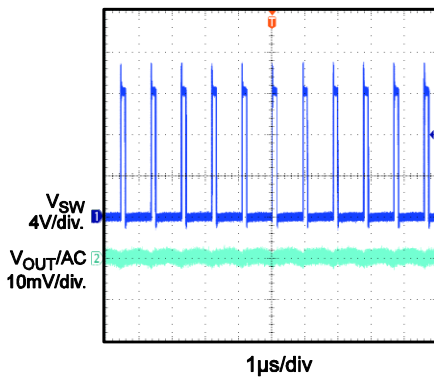
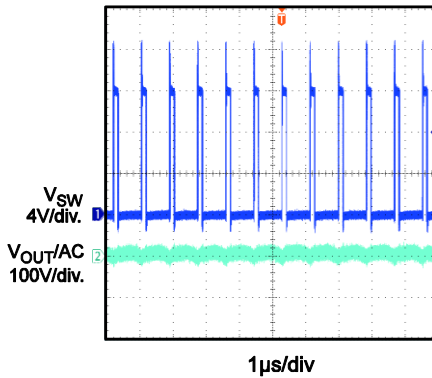
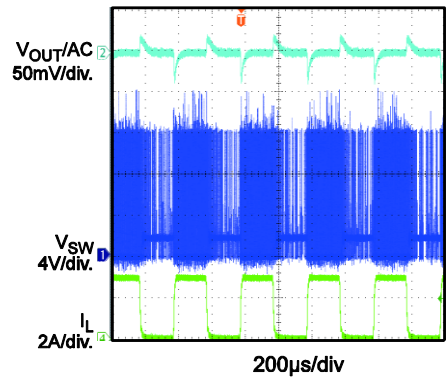
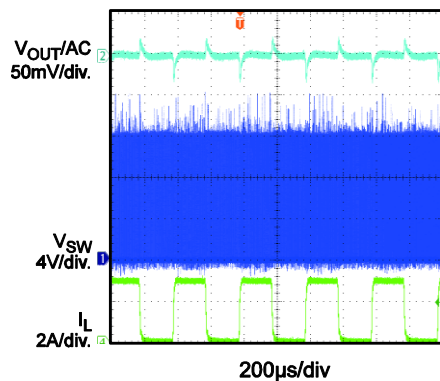
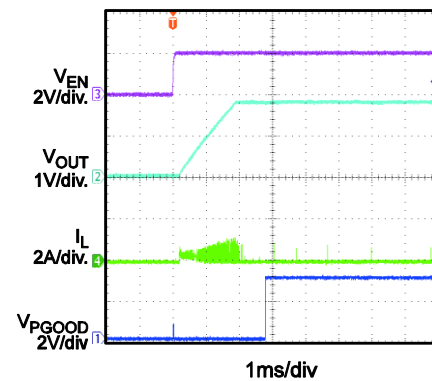
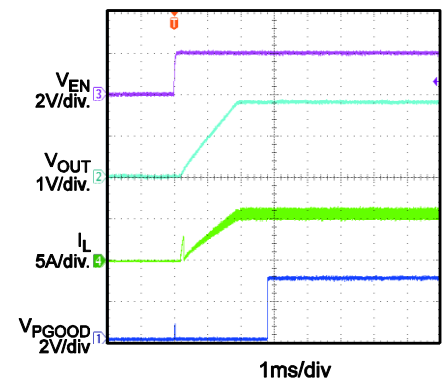
$V_{IN} = 12V$ ,  $V_{OUT} = 1.8V$ ,  $L = 1\mu H$ ,  $T_A = +25^\circ C$ , unless otherwise noted.



**EVB TEST RESULTS (continued)**

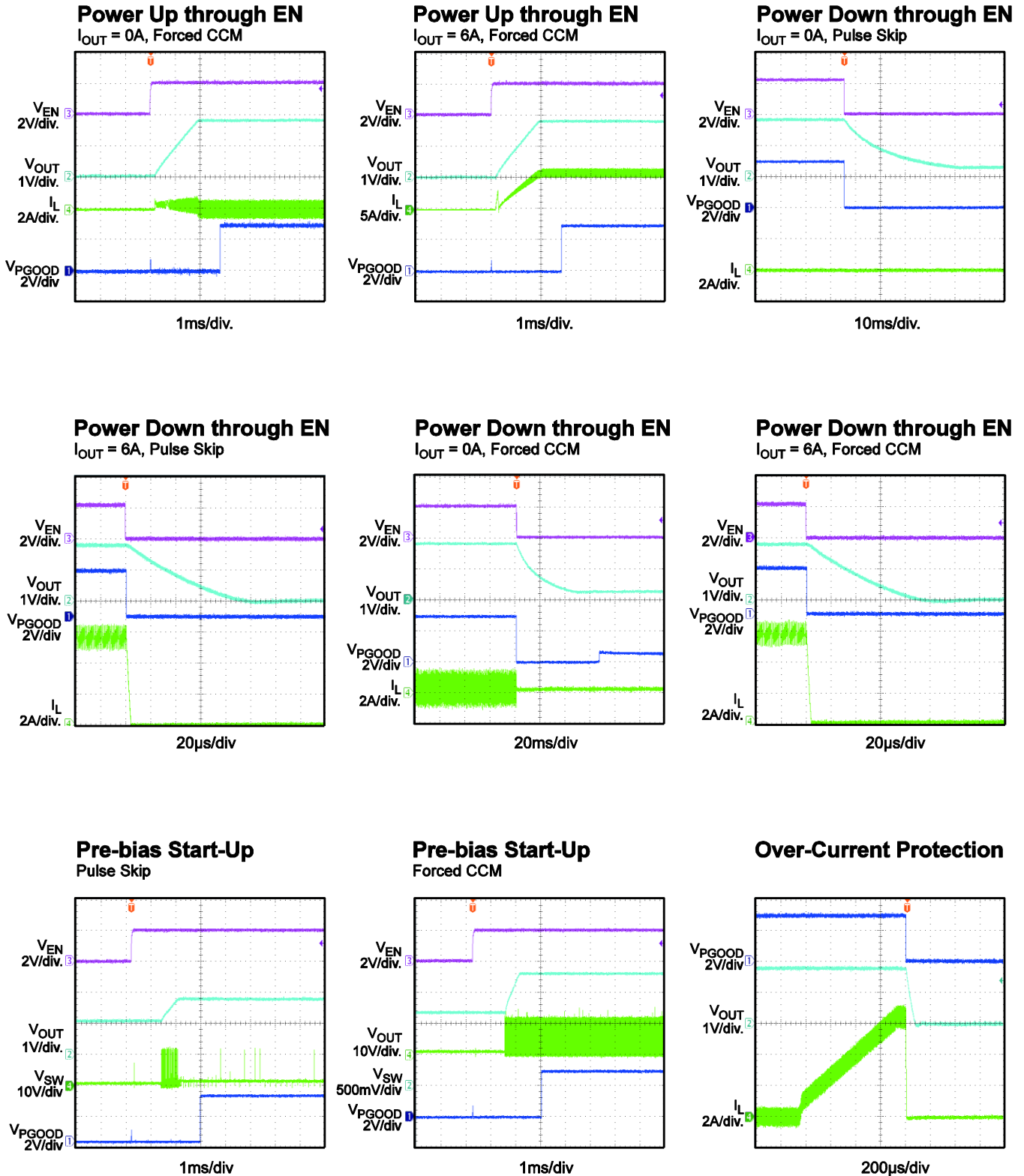
Performance waveforms are tested on the EVQ8623-D-00A evaluation board.

 $V_{IN} = 12V$ ,  $V_{OUT} = 1.8V$ ,  $L = 1\mu H$ ,  $T_A = +25^\circ C$ , unless otherwise noted.

**Steady State**  
 $I_{OUT} = 0A$ , Pulse Skip

**Steady State**  
 $I_{OUT} = 0.5A$ , Pulse Skip

**Steady State**  
 $I_{OUT} = 6A$ , Pulse Skip

**Steady State**  
 $I_{OUT} = 0A$ , Forced CCM

**Steady State**  
 $I_{OUT} = 6A$ , Forced CCM

**Load Transient**  
 $I_{OUT} = 0A-3A$ , Pulse Skip

**Load Transient**  
 $I_{OUT} = 0A-3A$ , Forced CCM

**Power Up through EN**  
 $I_{OUT} = 0A$ , Pulse Skip

**Power Up through EN**  
 $I_{OUT} = 6A$ , Pulse Skip


**EVB TEST RESULTS (continued)**

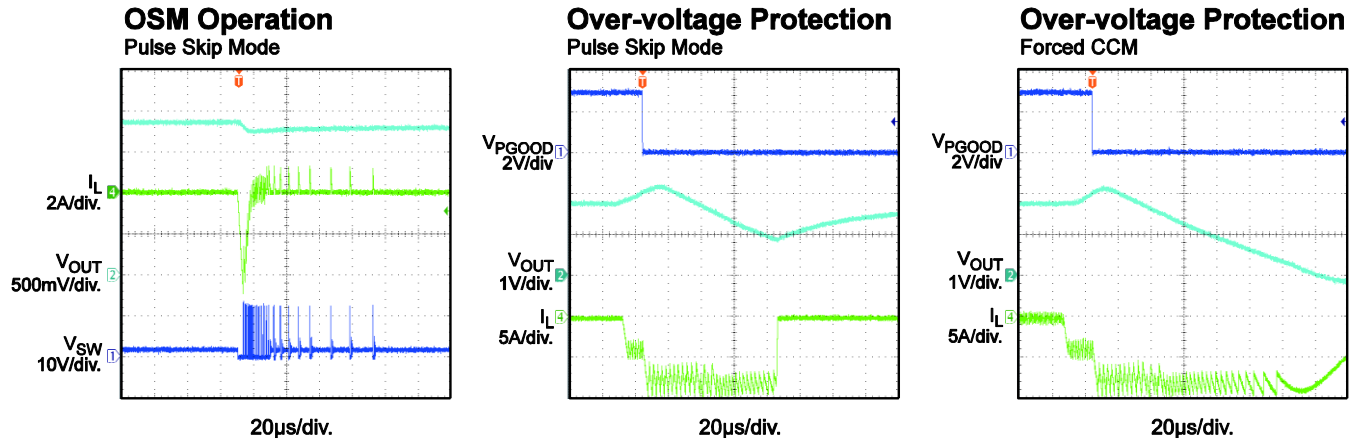
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## EVB TEST RESULTS *(continued)*

Performance waveforms are tested on the EVQ8623-D-00A evaluation board.

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### PRINTED CIRCUIT BOARD (PCB) LAYOUT

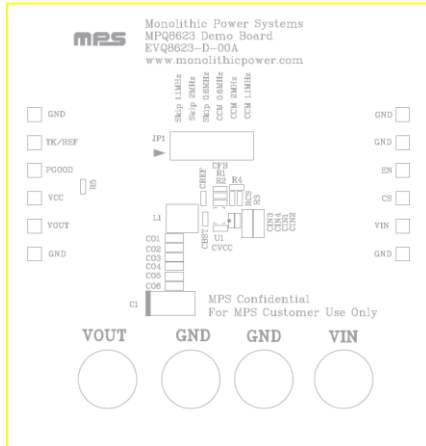


Figure 1: Top Silk Layer

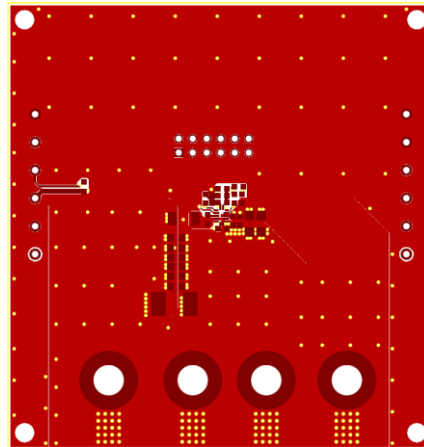


Figure 2: Top Layer

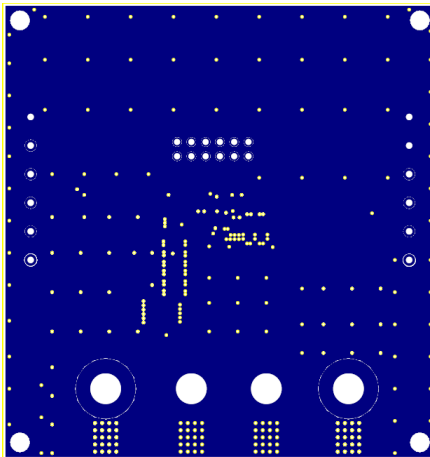


Figure 3: Inner Layer 1

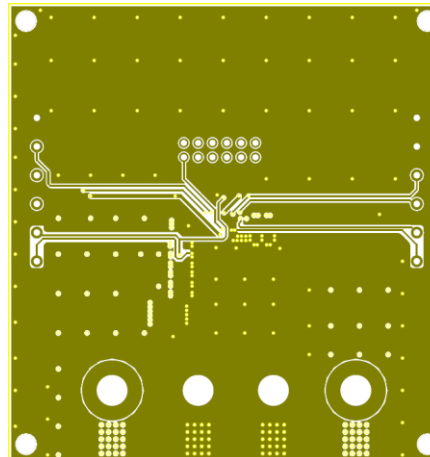


Figure 4: Inner Layer 2

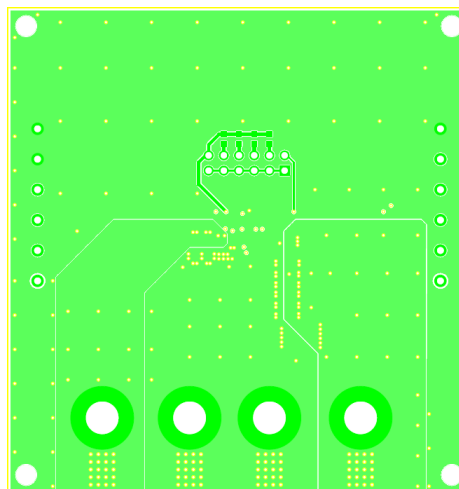


Figure 5: Bottom Layer