General Description

The EV0015 is a 3A Evaluation Board designed to demonstrate the MP1583's capabilities. The MP1583 is a monolithic step down (buck) converter with a built in internal Power MOSFET.

The MP1583 achieves 3A continuous output current over a wide input supply range with excellent load and line regulation. Current mode operation provides fast transient response and eases loop stabilization. Fault condition protection includes cycle-by-cycle current limiting and thermal shutdown. In shutdown mode the regulator draws 20µA of supply current.

Ordering Information

Board Number	MPS IC Number
EV0015	MP1583DN

Figure 1: EV0015 Evaluation Board



(Actual Size Shown: 2"X x 1.25"Y)

Absolute Maximum Ratings

Recommended Operating Conditions

Input Voltage V _{IN}	4.75 to 23V
Output Regulation Voltage	1.25 to 25V
Load Current	0 to 3A

Features

- 3A Output Current
- Programmable Soft-Start
- 100mΩ Internal Power MOSFET Switch
- Stable with Low ESR Output Ceramic Capacitors
- Up to 95% Efficiency
- 20µA Shutdown Mode
- Fixed 385KHz Frequency
- Thermal Shutdown
- Cycle-by-Cycle Over Current Protection
- Wide 4.75 to 23V Operating Input Range
- Output Adjustable From 1.22 to 21V
- Under Voltage Lockout

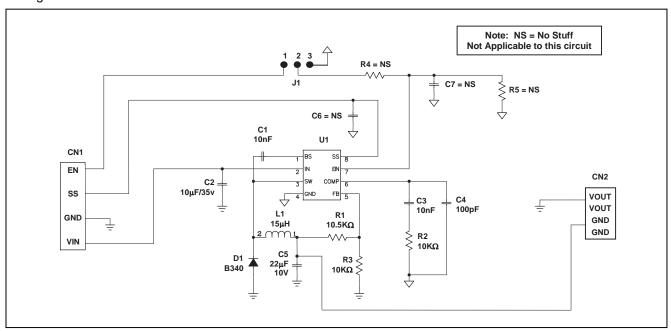
Applications

- Distributed Power Systems
- Battery Charger
- Pre-Regulator for Linear Regulators



Figure 2: EV0015 Evaluation Board Schematic

This board accommodates most commonly used Inductors and Output Capacitors and can be programmed for most standard Output Voltages. See the <u>MP1583 datasheet</u> for information on re-programming the output voltage.



Board Operation

This output voltage of this board is set to 2.5V. The board layout accommodates most commonly used inductors and output capacitors.

- 1. Attach positive end of load to VOUT pins and negative end of load to GND pins of connector CN2.
- 2. Attach input voltage (V_{IN}) and input ground (GND) to Pin 1 and 2 of connector CN1 respectively. **Note** V_{IN} must be 4.75V < V_{IN} < 25V.
- Applying a voltage greater than 2.495V to pin 4 of CN1 enables the MP1580. Leave the input unconnected if unused. An Under Voltage Lockout (UVLO) function can be implemented by the addition of a resistor divider from VIN to GND. For complete low current shutdown its needs to be less than 0.7V.
- 4. To use Enable function stuff R4 with a $10K\Omega$ resistor and connect pins 1 and 2 of Jumper J1.

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Table 1: EV0015 Evaluation Board Schematic Bill of Materials

Parts	Component	Package	QTY		
ICs	1				
MP1583DS	U1	SOIC8	1		
Capacitors					
10nF, Ceramic	C1, C3	0603	2		
10μF, 35V, Ceramic	C2	1210	1		
22μF, 10V, Ceramic	C5	1210	1		
100pF, 50V, Ceramic	C4	0603	1		
Not Stuffed	C6, C7	0603	2		
Resistors					
10.5ΚΩ, 1%	R1	0603	1		
10ΚΩ, 1%	R2, R3	0603	2		
Not Stuffed	R4, R5	0603	2		
Diodes					
B340	D1	1812	1		
Inductor	·				
22μH, Sumida	L1	CDRH104R-220	1		

Table 2: Recommended components for standard output voltages

V _{out}	R1	R3	L1 minimum
1.22V	Short	Open	6.8μΗ
1.5V	2.2KΩ	10ΚΩ	6.8μH
1.8V	4.7KΩ	10ΚΩ	10μΗ
2.5V	10.5KΩ	10ΚΩ	10 μΗ
3.3V	17.0ΚΩ	10ΚΩ	15 μΗ
5.0V	30.9KΩ	10ΚΩ	22 μΗ

Note: Refer to the MP1583 Datasheet's Table IV Inductor Selection Guide for choosing L



Figure 3: EV0015 Top Side

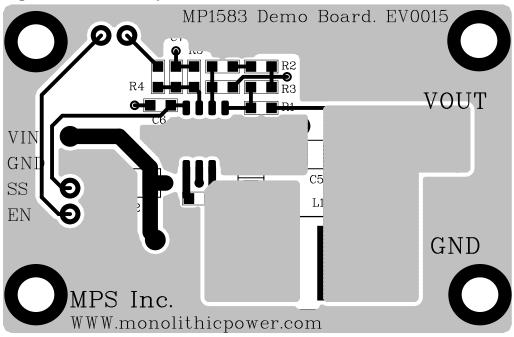
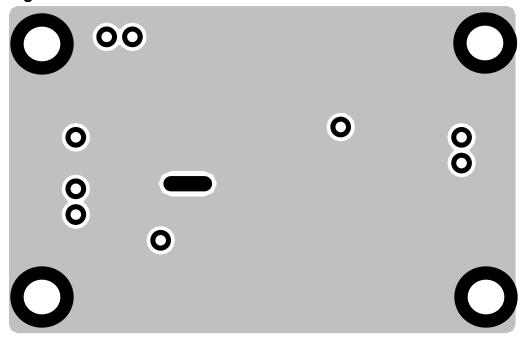


Figure 3: EV0015 Bottom Side



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