



The Future of Analog IC Technology®

EV8715DN-00A

100% Duty Cycle Synchronous 4A, 21V, 500kHz Step-Down Converter EV Board

DESCRIPTION

The MP8715 is a 500kHz fixed-frequency PWM synchronous step-down regulator. MP8715 operates from a 4.5V to 21V input and generates an output voltage from 0.8V to V_{IN} with 100% duty cycle operation.

The MP8715 integrates a 120mΩ high-side switch and a 50mΩ synchronous rectifier for high efficiency without an external Schottky diode. It offers a very compact solution to achieve 4A continuous output current over a wide input supply range with excellent load and line regulation.

External soft start and power good indication meet flexible design requirement. The MP8715 is available in a space saving 8-pin SOIC package with an exposed pad.

ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Input Voltage	V_{IN}	4.5 – 21	V
Output Voltage	V_{OUT}	1.2	V
Output Current	I_{OUT}	4	A

FEATURES

- 4A Output Current
- Wide 4.5V to 21V Input Operation Range
- 100% Duty Cycle Support
- 120mΩ/50mΩ Internal Power MOSFET
- All Ceramic Capacitor Design
- Up to 95% Efficiency
- 500kHz Fixed Switching Frequency
- Adjustable Output from 0.8V to V_{in}
- External Soft-Start
- Frequency Synchronization Input
- Power OK Indicator
- Internal Compensation
- Over Current Hiccup and Thermal Protection
- 8-pin SOIC Package with an Exposed Pad

APPLICATIONS

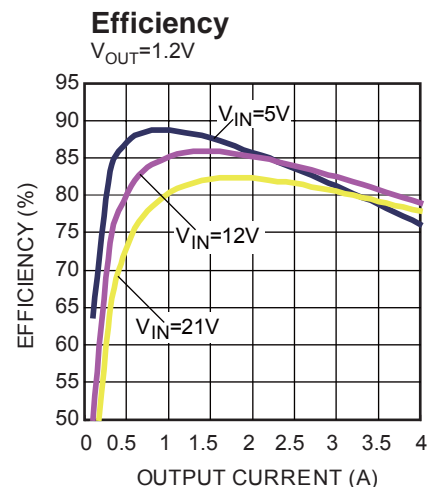
- Cable eMTAs
- μP/ASIC/DSP/FPGA Core and I/O Supplies
- Printers and LCD TVs
- Digital Set Top Boxes
- Network and Telecom Equipment

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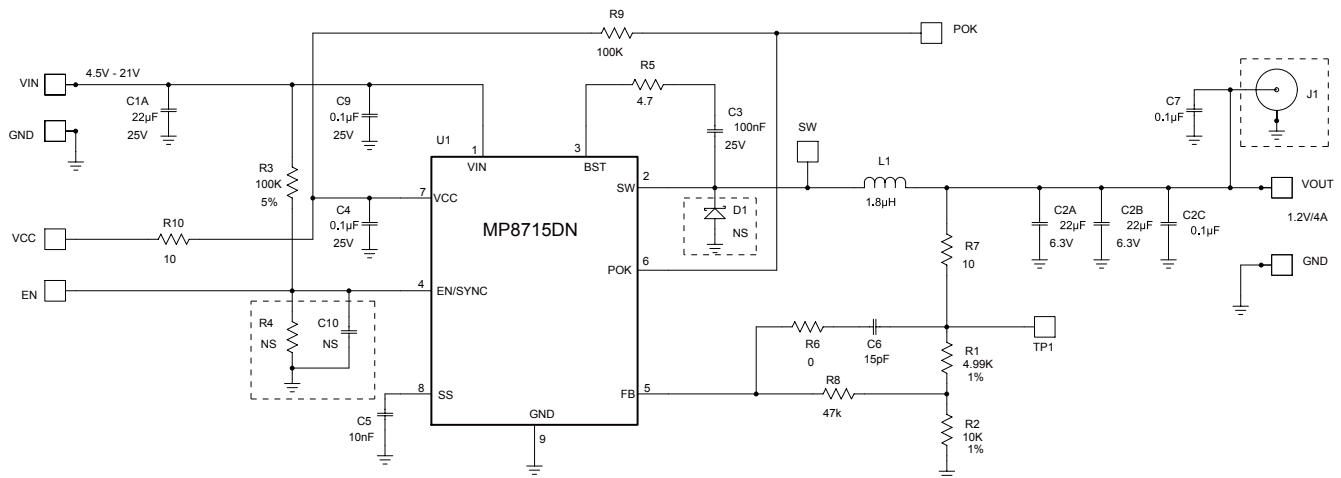
EV8715DN-00A EVALUATION BOARD



Board Number	MPS IC Number
EV8715DN-00A	MP8715DN



EVALUATION BOARD SCHEMATIC



EV8715DN-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Part Number
1	C1A	22µF	Ceramic Cap., 25V, X5R	1210	muRata	GRM32ER61E226KE15L
2	C2A,C2B	22µF	Ceramic Cap., 6.3V, X5R	1210	muRata	GRM32DR60J226KA01L
2	C2C,C9	0.1µF	Ceramic Cap., 25V, X7R	0805	muRata	GRM21BR71E104KA01L
3	C3,C4,C7	0.1µF	Ceramic Cap., 25V, X7R	0603	muRata	GRM188R71E104KA01
1	C5	10nF	Ceramic Cap., 25V, X7R	0603	muRata	GRM188R71E103KA01D
1	C6	15pF	Ceramic Cap., 50V, C0G	0603	muRata	GRM1885C1H150JA01D
0	C10	NS		0603		
0	D1	NS	Diode	SMA		
1	L1	1.8µH	3.5mΩ, DCR, 16A		Würth	744325180
		1.8µH	7.6mΩ, DCR, 10.4A		TOKO	D104C-#919AS-1R8N
0	J1	NS				
1	R1	4.99K	Film Res., 1%	0603	Yageo	RC00603FR-074K99L
1	R2	10K	Film Res., 1%	0603	Yageo	RC00603FR-0710KL
2	R3,R9	100K	Film Res., 5%	0603	Yageo	RC0603JR-07100KL
0	R4	NS		0603		
1	R5	4.7Ω	Film Res., 5%	0603	Yageo	RC0603JR-074R7L
1	R6	0Ω	Film Res., 5%	0603	Yageo	RC0603JR-070RL
1	R8	47K	Film Res., 1%	0603	Yageo	RC00603FR-0747KL
2	R7, R10	10Ω	Film Res., 1%	0603	Yageo	RC0603JR-0710RL
1	U1		Step-Down Converter	SOIC8E	MPS	MP8715DN

PRINTED CIRCUIT BOARD LAYOUT

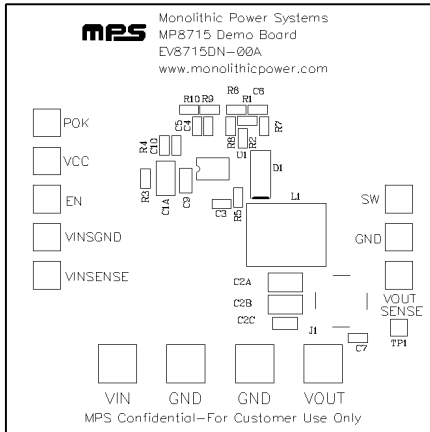


Figure 1—Top Silk Layer

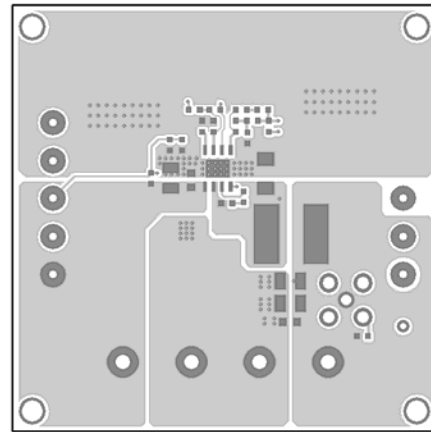


Figure 2—Top Layer

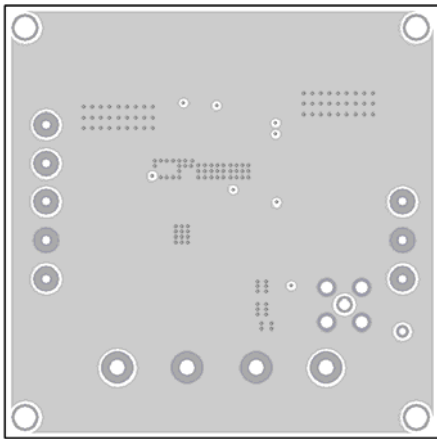


Figure 3—Inner1 Layer

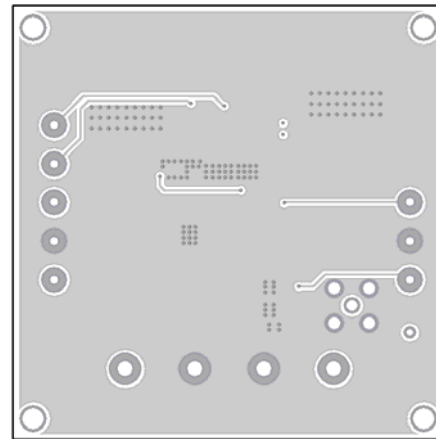


Figure 4—Inner2 Layer

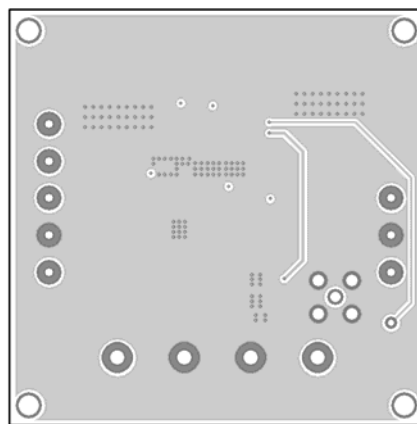


Figure 5—Bottom Layer

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 4.5V and 21V, 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 board will automatically startup.
5. To use the Enable function, apply a digital input to the EN pin. Drive EN higher than 2V to turn on the regulator or less than 0.4V to turn it off.
6. Apply up to 2MHz frequency logic level clock signal to the EN pin to synchronize the device to an external clock. The duty cycle is not critical.

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