

DESCRIPTION

The MP21148 is a monolithic, step-down, switch-mode converter with built-in internal power MOSFETs. It achieves 1A continuous output current from a 2.3V-to-5.5V input voltage with excellent load and line regulation. The output voltage can be regulated to as low as 0.6V.

The Constant-On-Time control scheme provides fast transient response and eases loop stabilization. Fault protections include cycle-by-cycle current limiting and thermal shutdown.

The MP21148 is available in an ultra-small QFN-6 (1.0mmx1.5mm) package and requires a minimal number of readily available standard external components.

The MP21148 is ideal for a wide range of applications including high performance DSPs, wireless power, portable and mobile devices, and other low-power systems.

ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Input Voltage	V_{IN}	2.3 – 5.5	V
Output Voltage	V_{OUT}	1.2	V
Output Current	I_{OUT}	1	A

Note: $V_{IN} < 3.3V$ may need more input capacitor.

FEATURES

- 2.2MHz Switching Frequency
- EN for Power Sequencing
- Power Good Only for Fixed Output Version
- Wide 2.3V-to-5.5V Operating Input Range
- Output Adjustable from 0.6V
- Up to 1A Output Current
- 120mΩ and 80mΩ Internal Power MOSFET Switches
- Output Discharge
- 100% Duty Cycle
- Short-Circuit Protection with Hiccup Mode
- Stable with Low ESR Output Ceramic Capacitors
- Available in a QFN-6(1.0mmx1.5mm) Package

APPLICATIONS

- Wireless/Networking Cards
- Portable and Mobile Devices
- Battery Powered Devices
- Low Voltage I/O System Power

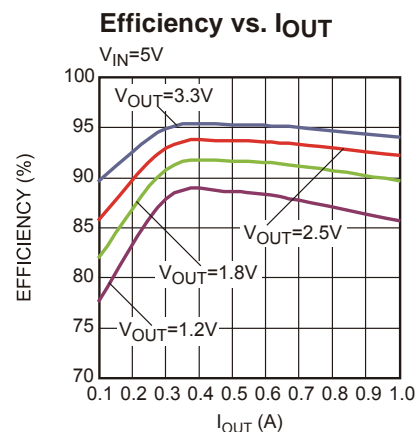
All MPS parts are lead-free, halogen free, and adhere to the RoHS directive. For MPS green status, please visit MPS website under Quality Assurance.

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EV21148-QD-00B EVALUATION BOARD



Board Number	MPS IC Number
EV21148-QD-00B	MP21148GQD



EVALUATION BOARD SCHEMATIC

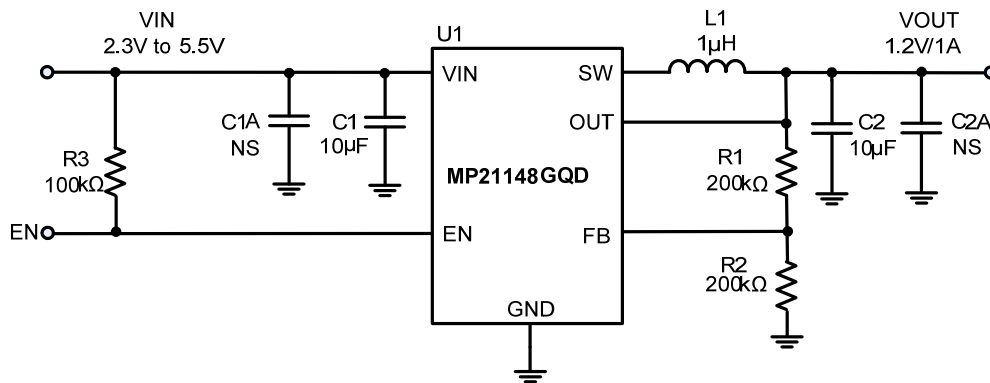


Figure 1—Typical Application Circuit for MP21148GQD

Note: $V_{IN} < 3.3V$ may need more input capacitor.

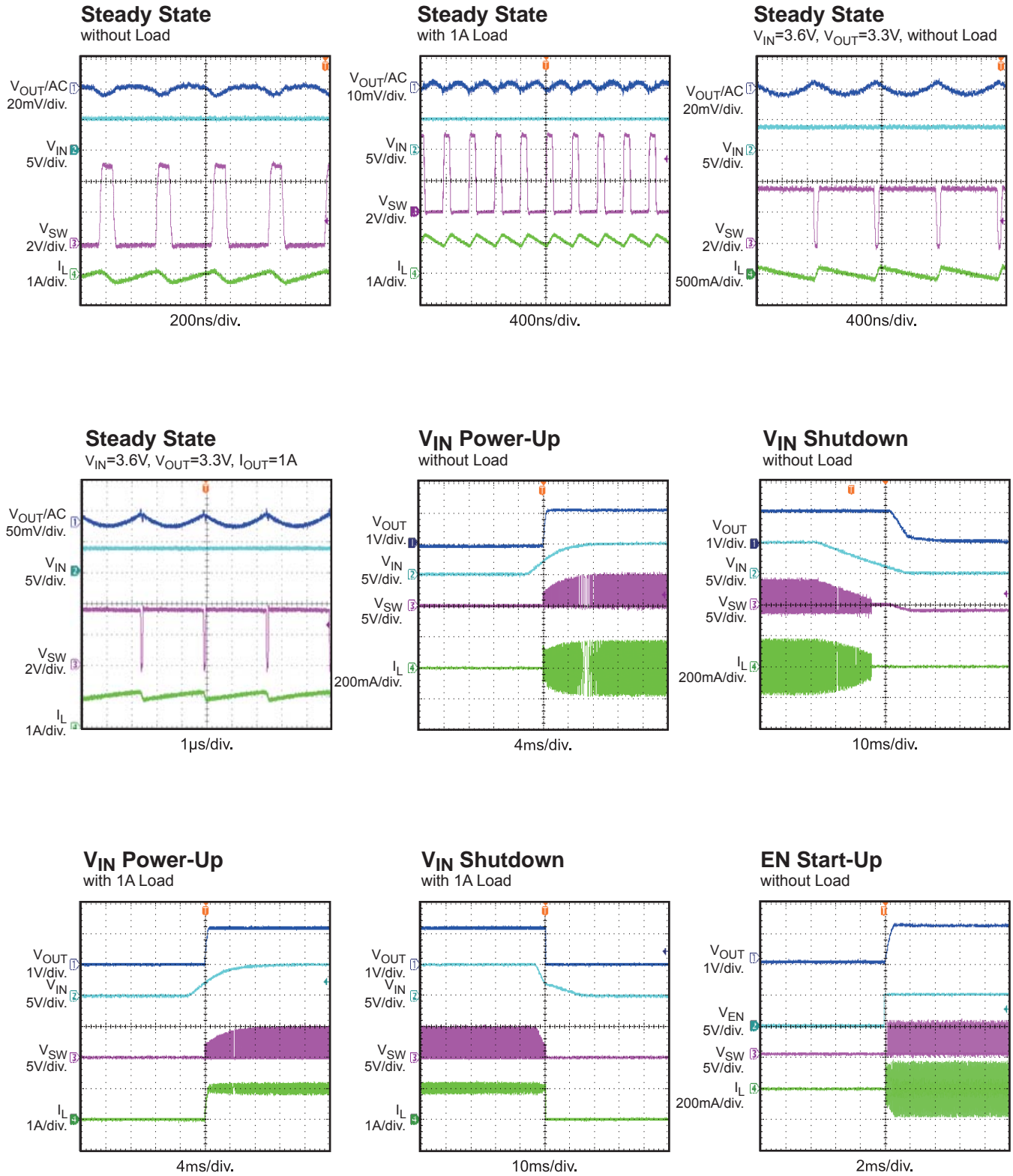
EV21148GQD-00B BILL OF MATERIALS

Qty	RefDes	Value	Description	Package	Manufacturer	Manufacturer P/N
2	C1, C2	10µF	Ceramic Cap,10V,X5R	0805	muRata	GRM21BR61A106KE19L
1	R1	200k	Film Res.1%	0402	any	
1	R2	200k	Film Res.1%	0402	any	
1	R3	100k	Film Res.1%	0402	any	
1	L1	1.0µH	Inductor, Rdc=45mΩ, Isat=3.8A	2520	CYNTEC CO. LTD.	PIFE25201B-1R0MS
1	U1		Step-down Switcher	QFN-6 1.0x1.5mm	MPS	MP21148GQD
0	C1A, C2A	NS				

EVB TEST RESULTS

Performance waveforms are tested on the evaluation board.

$V_{IN} = 5V$, $V_{OUT} = 1.2V$, $L = 1.0\mu H$, $T_A = +25^\circ C$, unless otherwise noted.

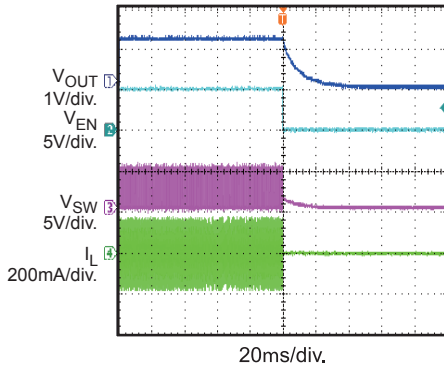


EVB TEST RESULTS (continued)

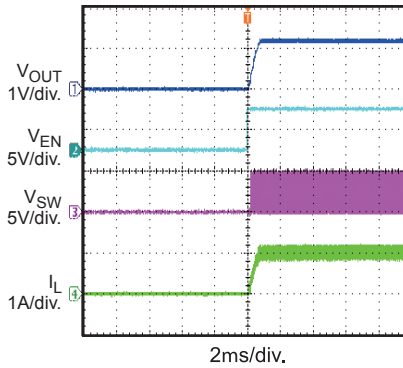
Performance waveforms are tested on the evaluation board.

$V_{IN} = 5V$, $V_{OUT} = 1.2V$, $L = 1.0\mu H$, $T_A = +25^\circ C$, unless otherwise noted.

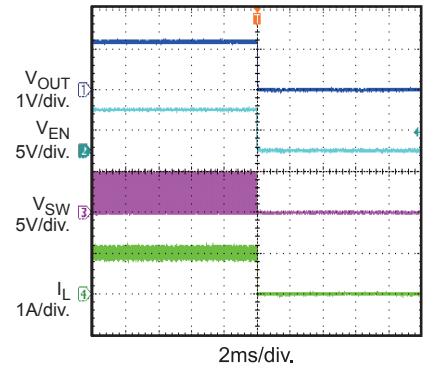
EN Shutdown
without Load



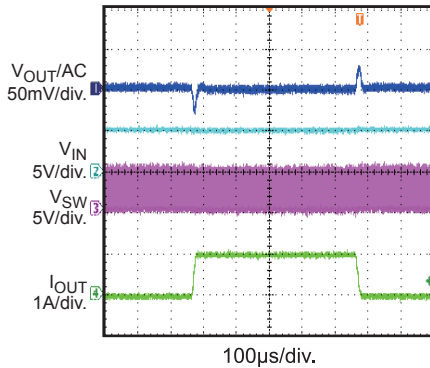
EN Start-Up
with 1A Load



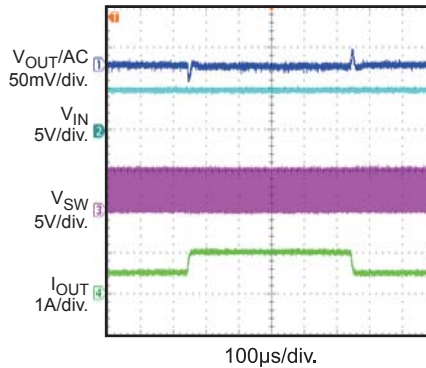
EN Shutdown
with 1A Load



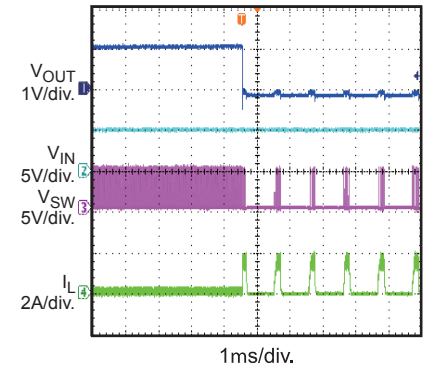
Load Transient Response
 $I_{OUT} = 0A - 1A$



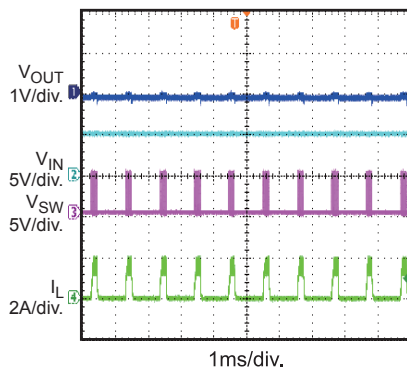
Load Transient Response
 $I_{OUT} = 0.5A \text{ to } 1A$



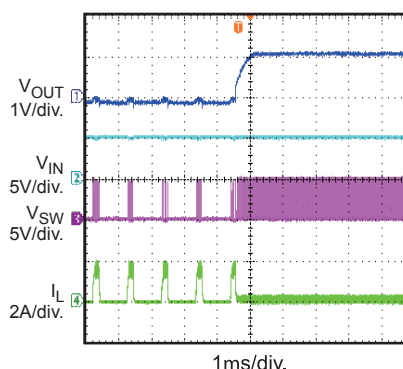
Short-Circuit Entry



Short Circuit



Short-Circuit Recovery



PRINTED CIRCUIT BOARD LAYOUT

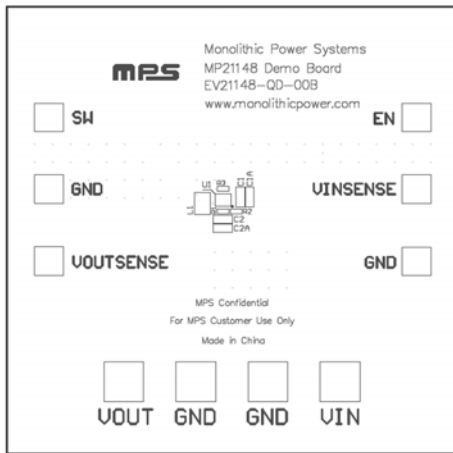


Figure 2—Top Silk Layer

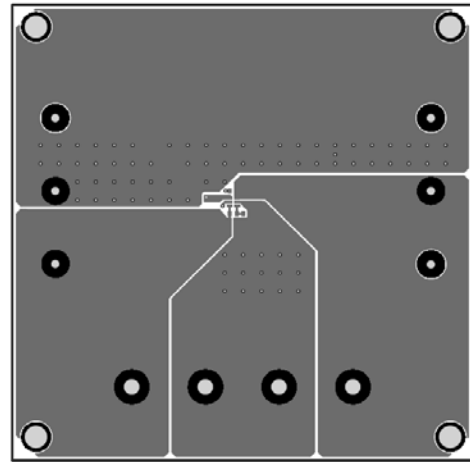


Figure 3—Top Layer

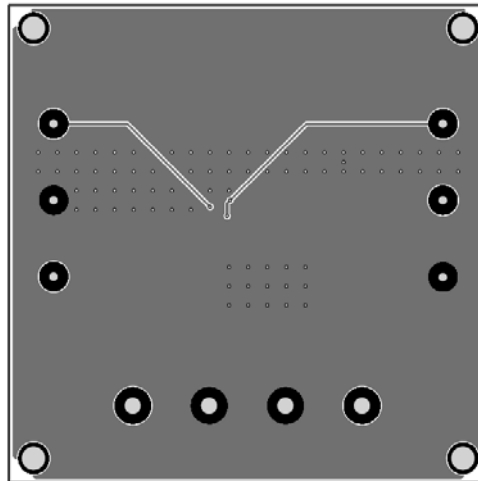


Figure 4—Bottom Layer