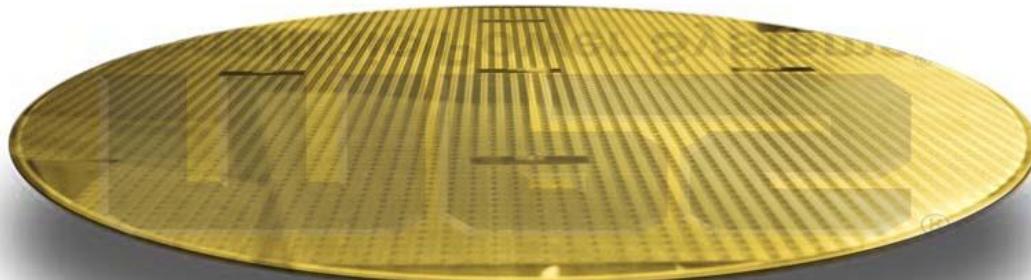


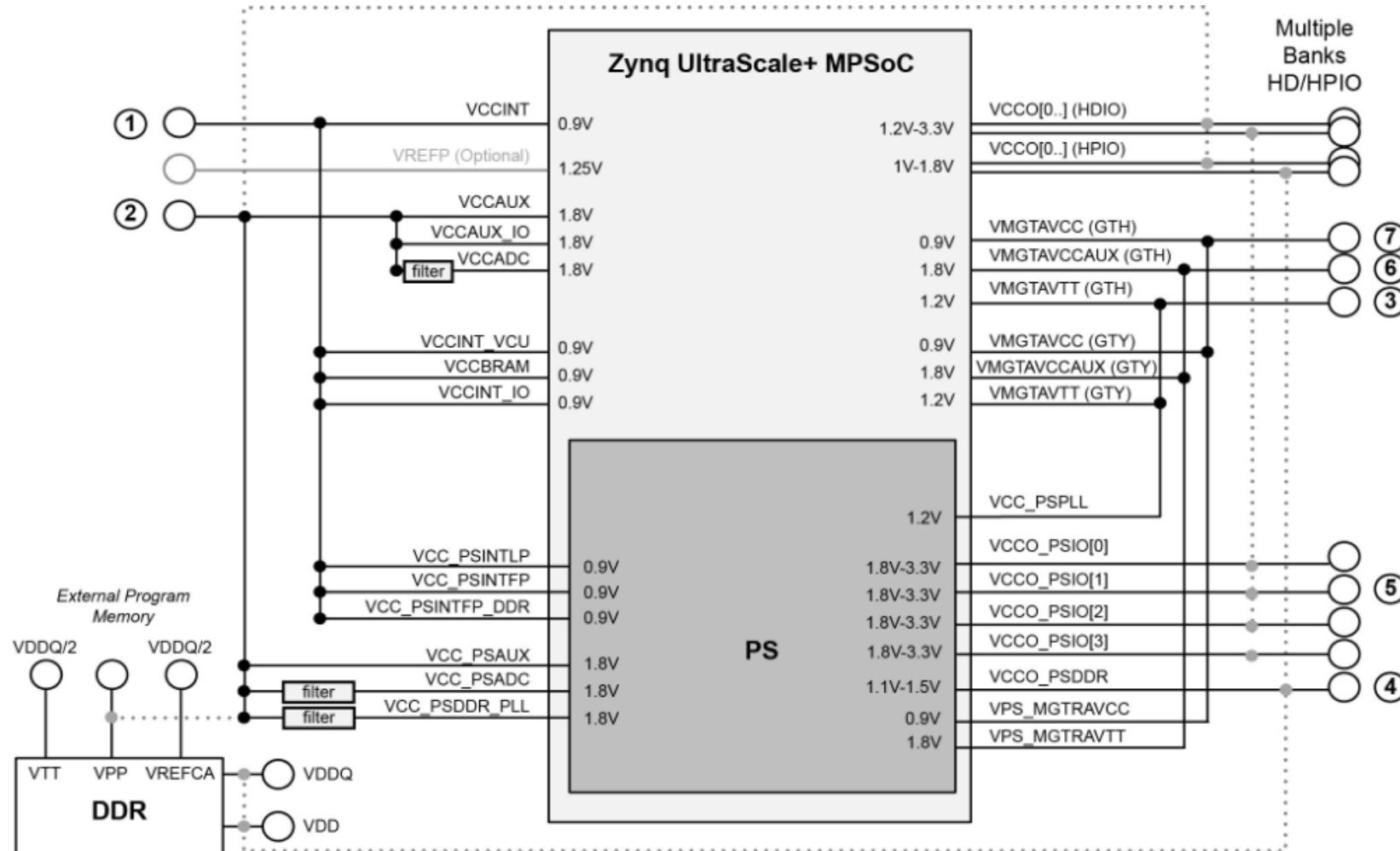
MPS[®]

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Monolithic Power Systems[®]



Scalable Power Solutions for Zynq UltraScale+ MPSOC

Last update
Feb 9, 2017



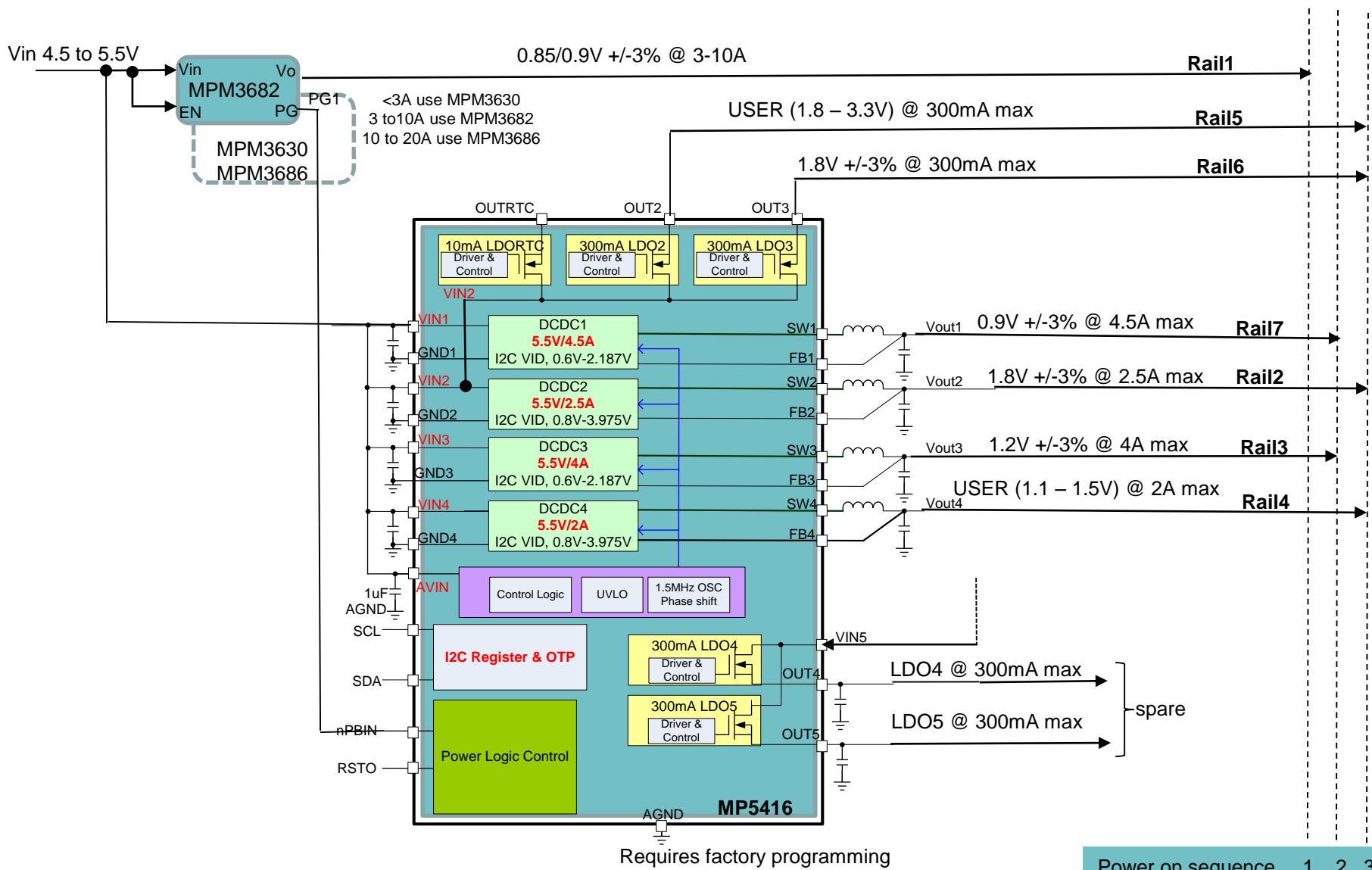
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Design Specifications – UC1-3 Always ON 7 Rails (PMIC+Module)

Rail#	Rails	Vout	max Load	MPS part#	Footprint
1	VCCINT, VCCINT_VCU, VCCINT_IO, VCCBRAM, VCC_PSINTF, VCC_PSINTLP, VCC_PSINTFP_DDR	0.85/0.9V +/-5%	3A	MPM3630	QFN20 (3x5x1.6mm)
			10A	MPM3682	QFN57 (12x12x4mm)
			20A	MPM3686	QFN65 (12x15x4mm)
2	VCC_PSAUX, VCC_PSDDR_PLL, VCC_PSADC, VCCAUX, VCCAUX_IO, VCCADC, DDR_VPP1, VCCO(0..)HDIO, VCCO(0..)HPIO	1.8V+/-3%	2.5A	PMIC MP5416	QFN-28(4mmx4mm)
3	VMMGTAVTT, VCC_PSPLL, VCC_VCU_PLL	1.2V+/-3%	4A		
4	VCCO_PSDDR, , DDR_VDD2, DDR_VDDQ, VCCO(0..)HDIO	USER (1.1-1.5V)	2A		
5	VCCO_PSIO[0..2], VCCO(0..)HDIO	USER (1.8-3.3V)	300mA		
6	VMGTAVCCAUX, VMGTYAVCCAUX, VPS_MGTRAVATT	1.8V+/-3%	300mA		
7	VMGTAVCC, VMGTYAVCC, VPS_MGTRAVACC	0.9V+/-3%	4A		

Block Diagram – UC1-3 Always ON 7 Rails (PMIC+Module)



Requires factory programming

Power on sequence 1 2 3

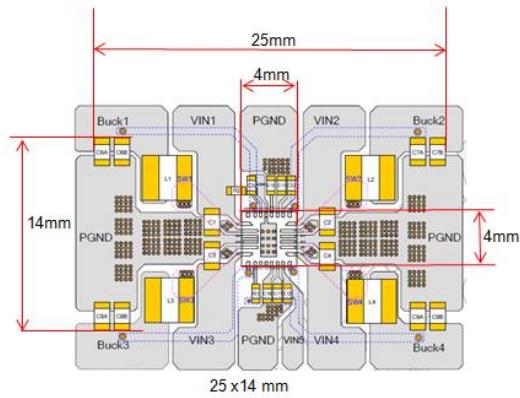
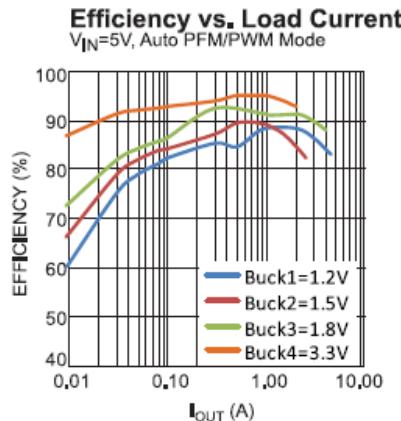


MPS product selector – UC1-3 Always ON 7 Rails (PMIC+Module)

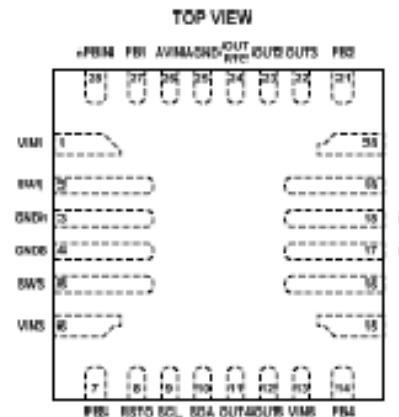
7 RAILS (PMIC)	Voltage (V)	Tolerance	ZU2CG	ZU2EG (A)	ZU3CG	ZU3EG	ZU4CG	ZU4EG	ZU4EV	ZU5CG	ZU5EG	ZU5EV	ZU6CG	ZU6EG	ZU7CG	ZU7EG
Rail 1	0.85/0.9	+/-3%		MPM3630 (max 3 A)									MPM3686 (max 20 A)			
Rail 2	1.8	+/-3%*														
Rail 3	1.2	+/-3%*														
Rail 4	USER (1.1-1.5)												MP5416			
Rail 5	USER (1.8-3.3)															
Rail 6	1.8	+/-3%*														
Rail 7	0.9	+/-3%*														

FEATURES:

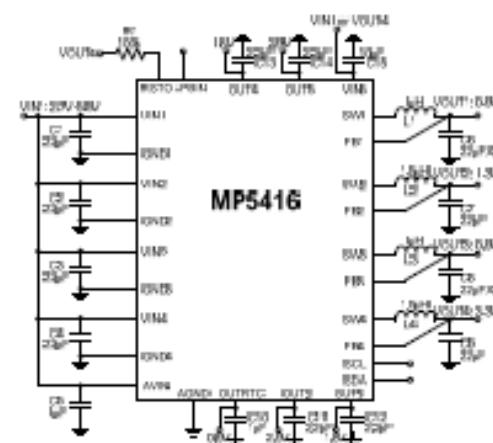
- High Efficiency Step-Down Converters
 - 4.5A / 2.5A / 4A / 2A Bucks
 - 2.7V to 5.5V Operating Input Range
 - Adjustable Switching Frequency
 - Programmable Forced PWM/Auto PFM/PWM Mode
 - Hiccup Over Current Protection
- Low Dropout Regulators
 - One RTC Dedicated LDO
 - Four Low Noise LDOs
 - Two Separate Input Power Supplies
 - 100mV Dropout at 300mA Load
- System
 - I₂C Bus and OTP
 - Power On/off Button
 - Power On Reset Output
 - Flexible Power On/off Sequence via OTP
 - Flexible DC/DC, LDO On/off via OTP



Package: QFN28 - 4mmx4mm



Application Circuit

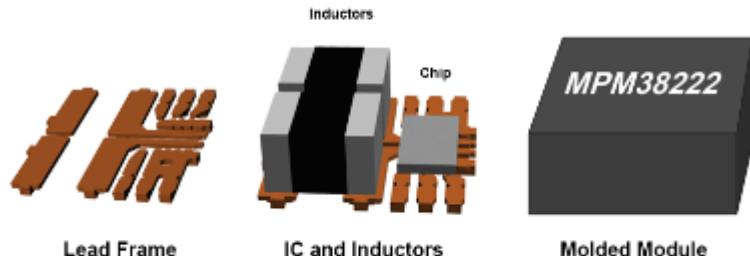


Product Overview

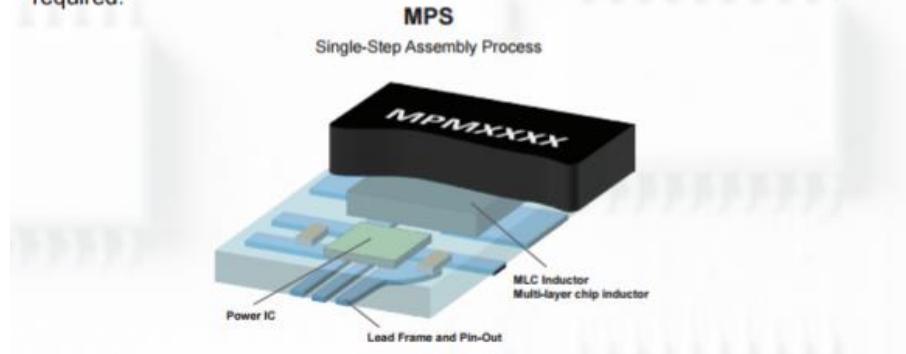
Through the use of MPS' innovative single-step assembly process, our modules have superior performance and inherent reliability by eliminating unnecessary assembly steps and minimizing external components. They are easy to use and rework due to our standard QFN packaging, which eliminates some of the disadvantages that may have been associated with BGA or NDY packages. As a result, MPS modules are also inherently more cost effective.

- **Benefits**

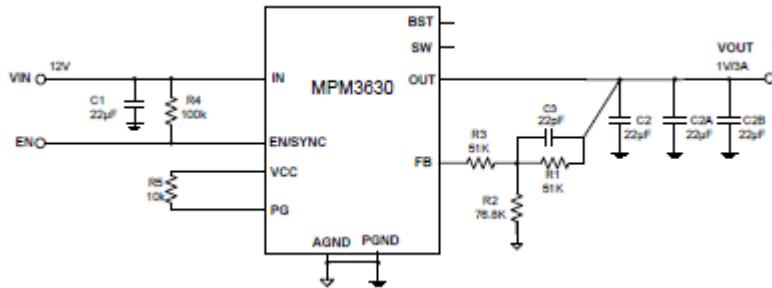
- Ease of design
- Simple manufacturing
- Small footprint
- High performance
- Cost effective



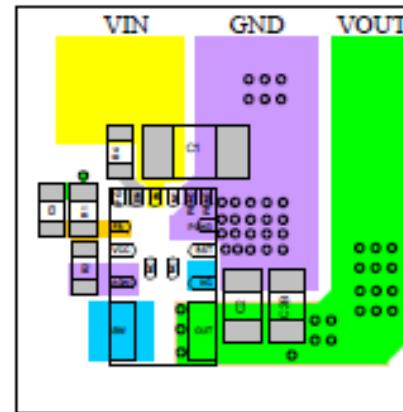
Lead-frame with all components (regulator IC, inductor, and other passives) integrated onto the same lead frame. Utilizing standard IC assembly process, packaging, and test equipment to cost effectively mass produce. Our modules can be easily implemented during system circuit development; they are easier to test, solder, and rework; No expensive Optical alignment BGA rework machines and X-ray inspection required.



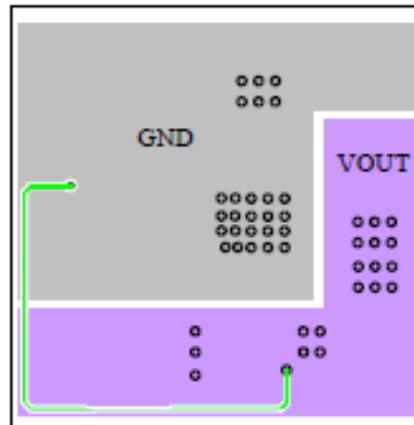
Schematics (Typical)



Layout guidelines



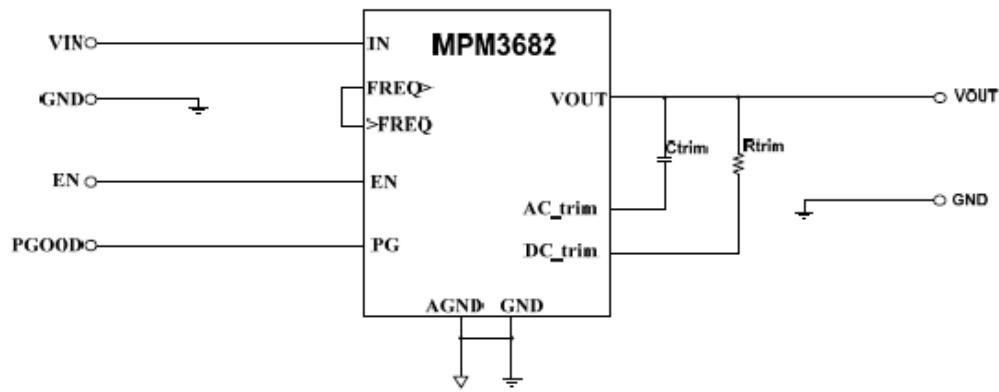
Top Layer



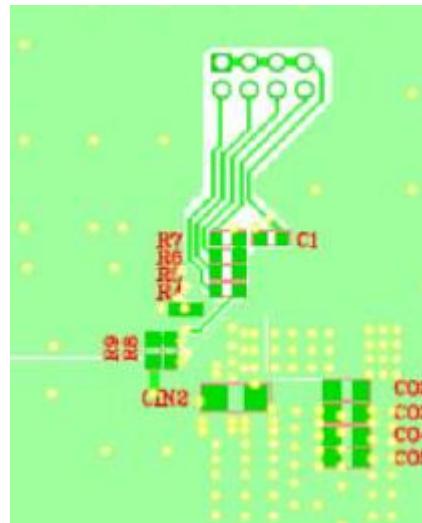
Bottom Layer

- Solution footprint: 55mm²
- External Components: 11
- Efficiency: 82% (Vin=12V, Vout=3.3V, Io=3A)

Schematics (Typical)

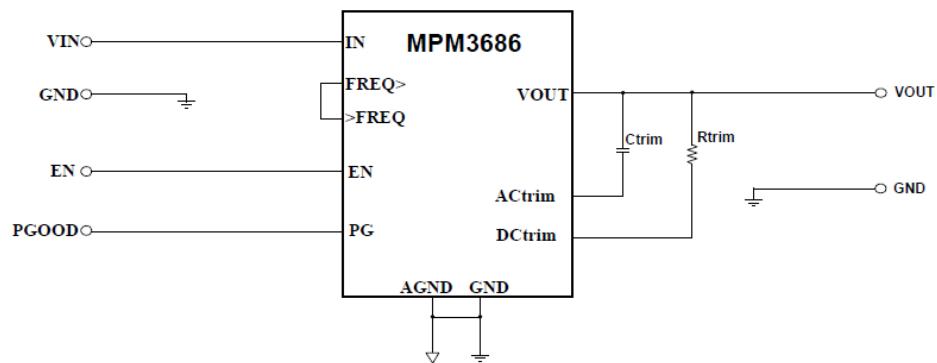


Layout guidelines

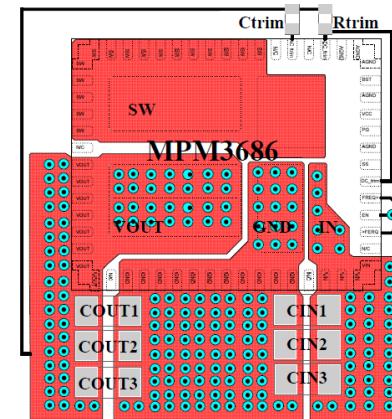


- Solution footprint: 164mm²
- External Components: 4
- Efficiency: 91% (Vin=12V, Vout=1.2V, Io=8A)

Schematics (Typical)



Layout guidelines



- Solution footprint: 200mm²
- External Components: 4
- Efficiency: 87% ($V_{in}=12V$, $V_{out}=1.2V$, $I_o=15A$)

- Maximize coverage of ZU+ family with wide choice of products from MPS
- Use of integrated modules for simplified design and PCB layout
- High Efficiency
- Cost effective
- Smallest Solution Size
- Minimum External Components
- Fast Transient Response and minimum ripple
- Modules are fully tested

Thank you

For additional information please contact
MPS Reference Design Team
at referencedesign@monolithicpower.com

For general information
<http://www.monolithicpower.com>