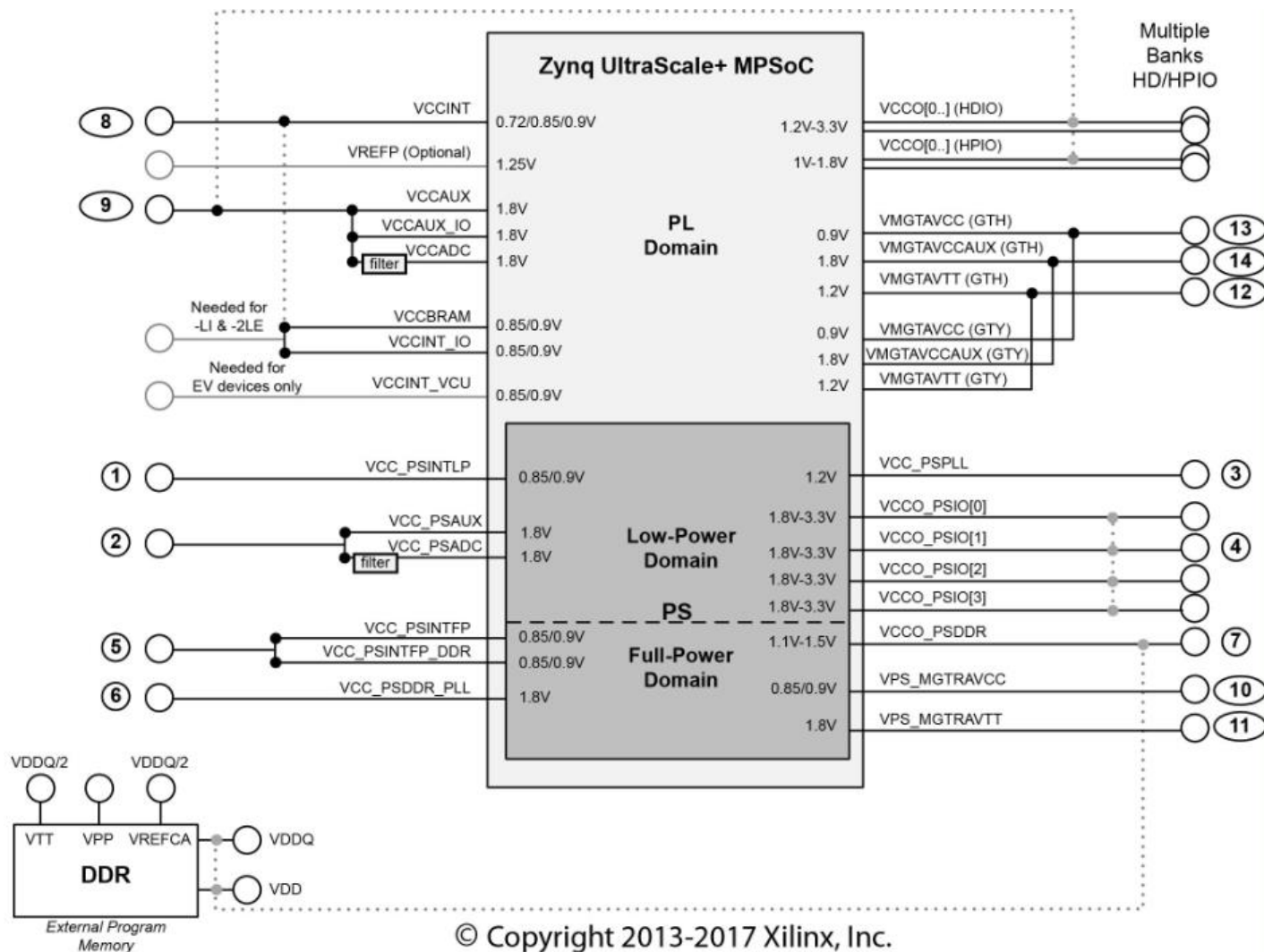


Scalable Power Solutions for Zynq UltraScale+ MPSoC

Last update
Feb 9, 2017



UC4 Full Power Management Flexibility (Battery Power)



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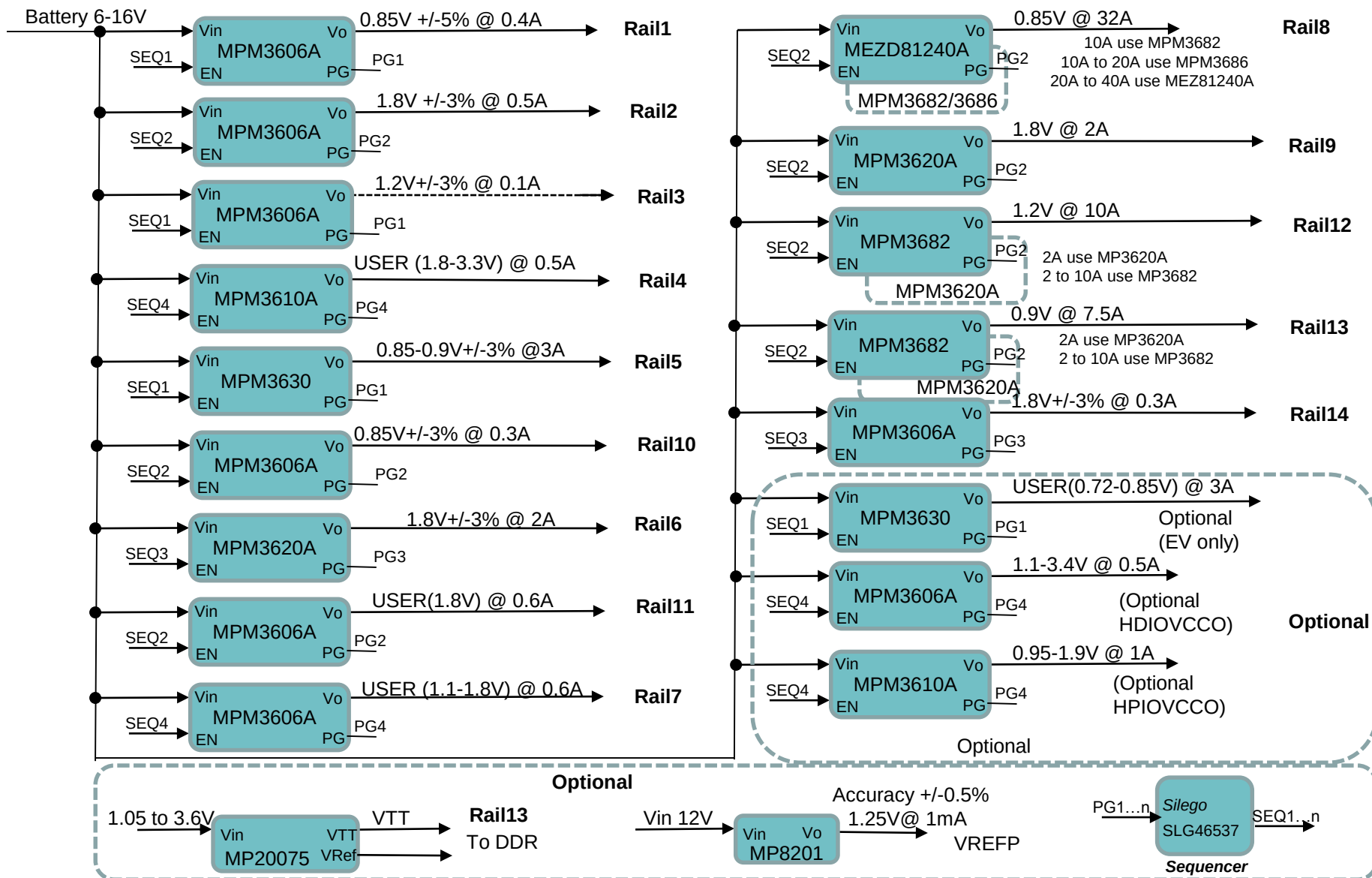


Design Specifications – UC4 Full Power Management Flexibility (Battery Power)

Rail#	Rails	Vout	Load	Seq up/dwn	MPS part#	Footprint
1	VCC_PSINTLP	0.85V+/-5%	0.4A	1/4	MPM3606A	QFN20 (3x5x1.6mm)
2	VCC_PSAUX, VCC_PSAVC	1.8V+/-3%	0.5A	2/3	MPM3606A	QFN20 (3x5x1.6mm)
3	VCC_PSPLL	1.2V+/-3%	0.1A	1/4	MPM3606A	QFN20 (3x5x1.6mm)
4	VCCO_PSIO[0..3]	USER (1.8-3.3V+/-5%)	0.3A	4/1	MPM3606A	QFN20 (3x5x1.6mm)
5	VCC_PSINTFP, VCC_PSINTFP_DDR	USER (0.85-0.9V+/-5%)	2 to 2.75A	1/4	MPM3630	QFN20 (3x5x1.6mm)
10	VPS_MGTRAVCC	0.85+/-3%	0.3A	2/3	MPM3606A	QFN20 (3x5x1.6mm)
6	VCC_PSDDR_PLL, DDR_VP	USER (1.8+/-5%)	0.1A (max 2A)	3/2	MPM3620A	QFN20 (3x5x1.6mm)
11	VPS_MGTRAVTT	USER (1.8V+/-3%)	max 0.6A	2/3	MPM3606A	QFN20 (3x5x1.6mm)
7	VCCO_PSDDR, DDR_VDD2, DDR_VDDQ	USER (1.1 to 1.8V+/-5%)	max 0.6A	4/1	MPM3606A	QFN20 (3x5x1.6mm)
8	VCCINT, VCCINT_IO, VCCBRAM	0.85V+/-3%	0.6A to 32A	2/3	MPM3682 for <10A MPM3686 for 10 to 20A MEZD81240A >20A	QFN57 (12x12x4mm) QFN65 (12x15x4mm) LGA28 (25x15.5x7mm)
9	VCCAUX, VCCAUX_IO, VCCADC, DDR_VPP1	1.8V+/-3%	0.8A to 1.8A	2/3	MPM3620A	QFN20 (3x5x1.6mm)
12	VMGTAVTT, VMGTAVTT, VCC_VCU_PLL	1.2V+/-3%	0A to 10.5A	2/3	MPM3620A for <2A MPM3682 for >2 to 10A	QFN20 (3x5x1.6mm) QFN57 (12x12x4mm)
13	VMGTAVCC, VMGTAVCC	0.9V+/-3%	0 to 7.5A	2/3	MPM3682	QFN57 (12x12x4mm)
14	VMGTAVCAUX, VMGTAVCAUX	1.8V+/-3%	0 to 0.3A	3/2	MPM3606A	QFN20 (3x5x1.6mm)
Optional Rails						
Optional (EV only)	VCCINT_VCU	0.72V-0.85+/-3%	0 to 3A	1/4	MPM3630	QFN20 (3x5x1.6mm)
Optional	HDIO VCCO	USER (1.1-3.4V+/-3%)	0 to 0.5A	4/1	MPM3606A (optional)	QFN20 (3x5x1.6mm)
Optional	HPIO VCCO	USER (0.95-1.9V+/-3%)	0 to 1A	4/1	MPM3610A (optional)	QFN20 (3x5x1.6mm)
Optional	DDR_VTT, DDR_VREF	USER +/-5%	max 0.6A	4/1	MP20075 (optional)	MSOP8E (3x3mm)
Optional	VREFP (optional)	1.25V+/-0.5%		2/3	MP8201 (optional)	SOT23-3 (2.6x3mm)
Optional	External power sequencer				SLG46537 (optional)	STQFN20 (2x3mm)



Block Diagram— UC4 Full Power Management Flexibility (Battery Power)





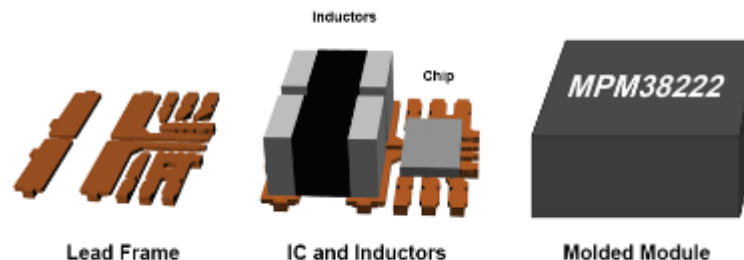
MPS product selector – UC4 Full Power Management Flexibility (Battery Power)

		Voltage (V)	Tolerance	ZU2CG	ZU2EG (A)	ZU3CG	ZU3EG	ZU4CG	ZU4EG	ZU4EV	ZU5CG	ZU5EG	ZU5EV	ZU6CG	ZU6EG	ZU7CG	ZU7EG	ZU7EV	ZU9CG	ZU9EG	ZU11EG	ZU15EG	ZU17EG	ZU19EG
Low Power Domain	Rail 1	0.85	+/-5%	MPM3606A (max 0.6 A)																				
	Rail 2	1.8	+/-5%	MPM3606A (max 0.6 A)																				
	Rail 3	1.2	+/-3%*	MPM3606A (max 0.6 A)																				
	Rail 4	USER	+/-5%	MPM3606A (max 0.6 A)																				
Full Power Domain	Rail 5	0.85	+/-5%	MPM3630A (max 3 A)																				
	Rail 10	0.85	+/-3%*	MPM3606A (max 0.6 A)																				
	Rail 6	1.8	+/-5%*	MPM3606A (max 0.6 A)																				
	Rail 11	1.8	+/-3%*	MPM3606A (max 0.6 A)																				
	Rail 7	USER		MPM3606A (max 0.6 A)																				
PL Domain	Rail 8	0.85	+/-3%	MPM3682 (max 10 A)									MPM3686 (max 20 A)									mEZD81240A (max 40 A)		
	Rail 9	1.8	+/-3%	MPM3610A (max 1 A)												MPM3620A (max 2 A)								
	Rail 12	1.2	+/-3%*	MPM3620A (max 2 A)																MPM3682 (max 10 A)				
	Rail 13	0.9	+/-3%*	MPM3620A (max 2 A)																MPM3682 (max 10 A)				
	Rail 14	1.8	+/-3%*	MPM3606A (max 0.6 A)																				
	Optional (HDIOVC)	USER	+/-3%	MPM3606A (max 0.6 A)																				
	Optional (HPIOVC)	USER	+/-3%	MPM3606A (max 0.6 A)										MPM3610A (max 1 A)										

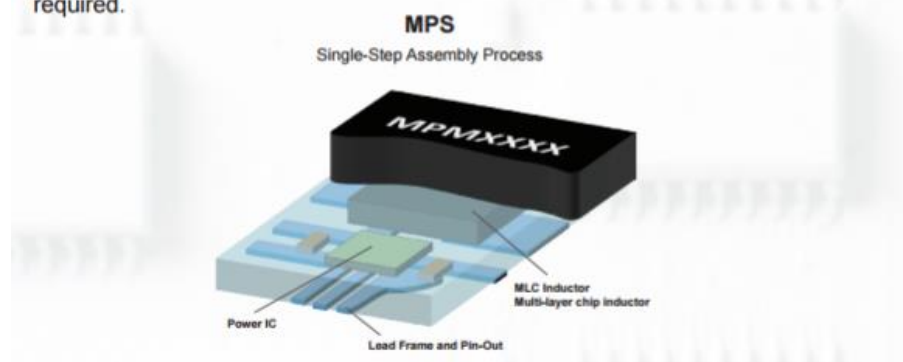
Product Overview

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.

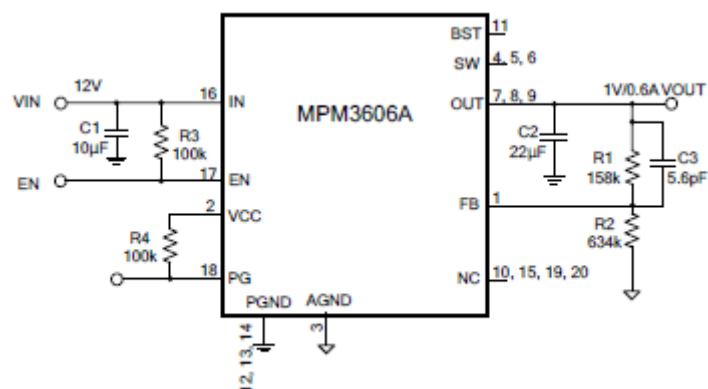
- **Benefits**
 - Ease of design
 - Simple manufacturing
 - Small footprint
 - High performance
 - Cost effective



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.

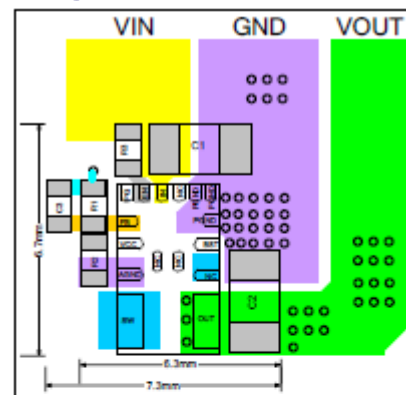


Schematics (Typical)

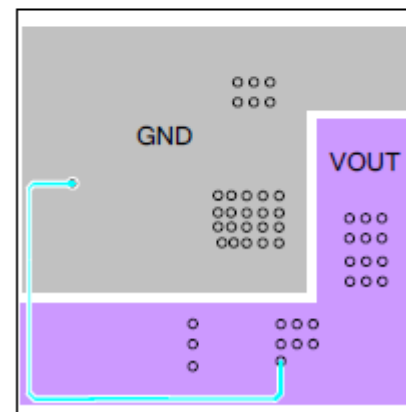


- Solution footprint: 52mm²
- External Components: 7
- Efficiency: 88% (Vin=12V, Vout=3.3V, Io=0.4A)

Layout guidelines

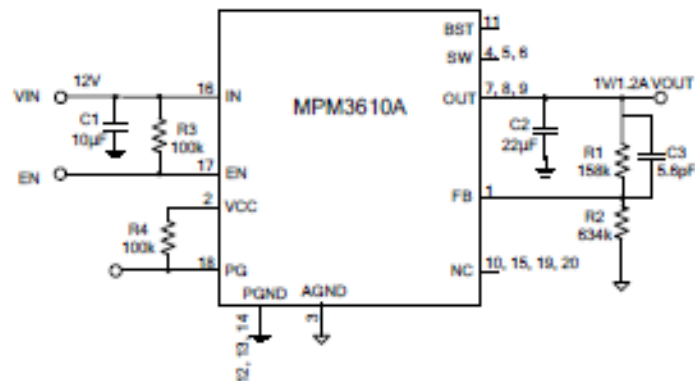


Top Layer



Bottom Layer

Schematics (Typical)

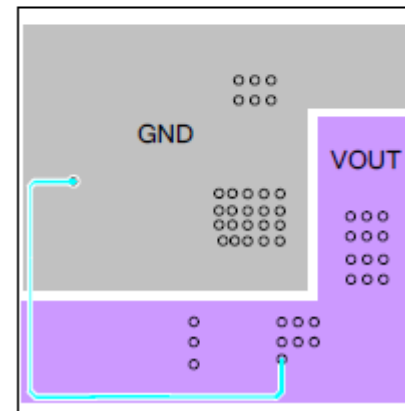


- Solution footprint: 52mm²
- External Components: 7
- Efficiency: 89% (Vin=12V, Vout=3.3V, Io=1A)

Layout guidelines

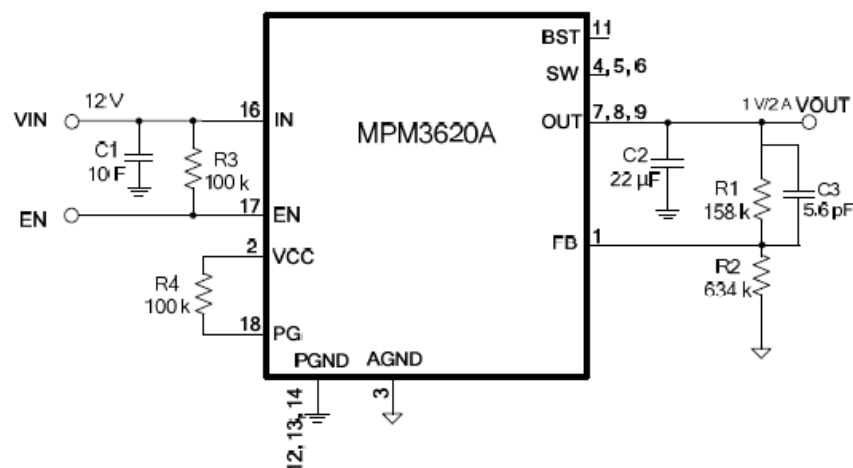


Top Layer



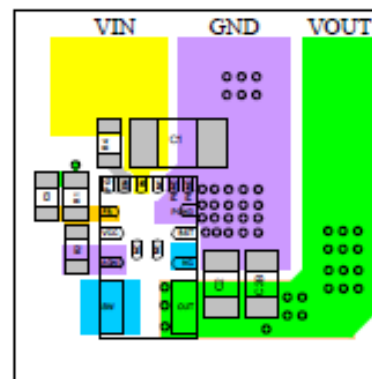
Bottom Layer

Schematics (Typical)

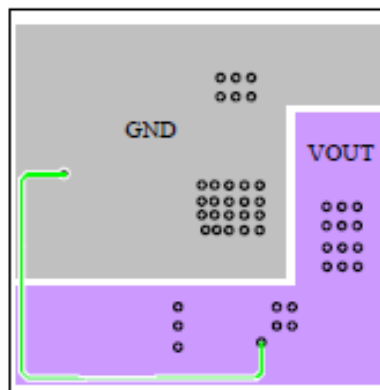


- Solution footprint: 52mm²
- External Components: 7
- Efficiency: 82% ($V_{in}=12V$, $V_{out}=1.8V$, $I_o=1A$)

Layout guidelines

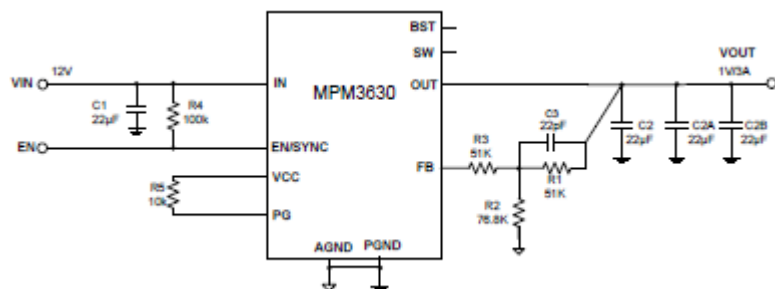


Top Layer



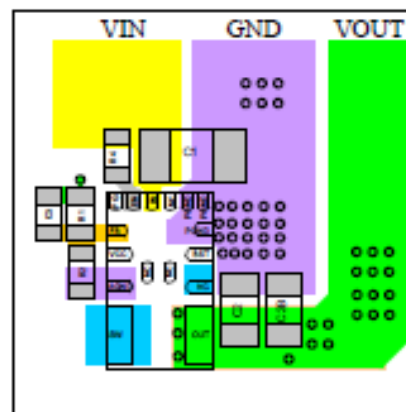
Bottom Layer

Schematics (Typical)

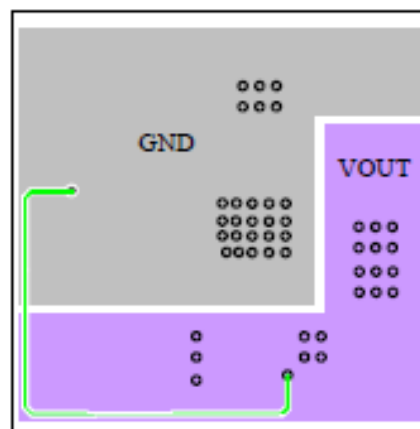


- Solution footprint: 55mm²
- External Components: 11
- Efficiency: 82% (Vin=12V, Vout=3.3V, Io=3A)

Layout guidelines

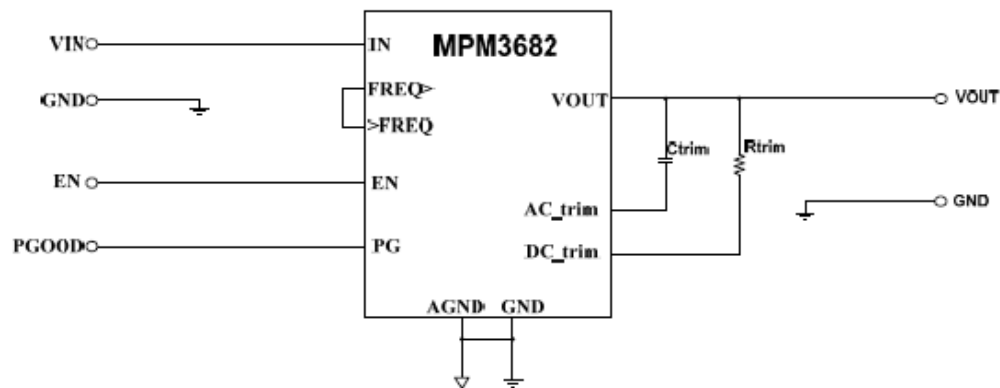


Top Layer



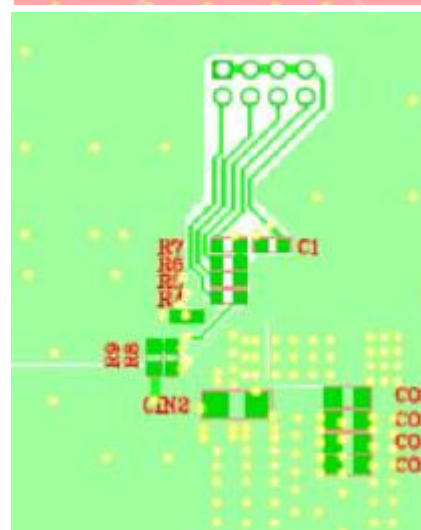
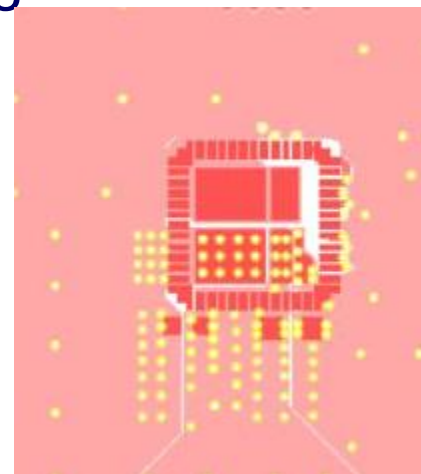
Bottom Layer

Schematics (Typical)

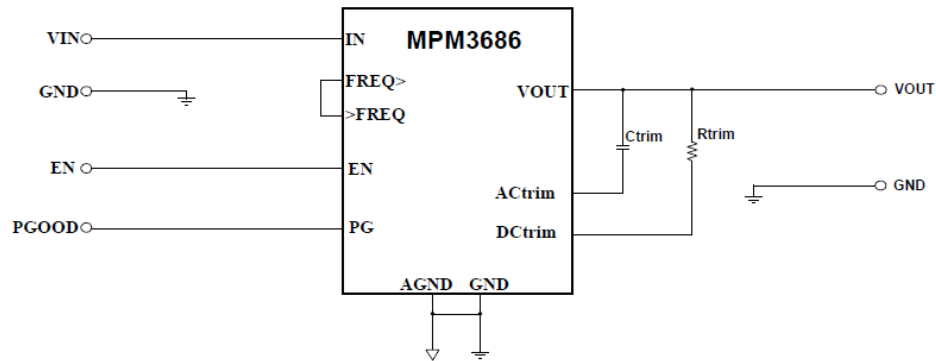


- Solution footprint: 164mm²
- External Components: 4
- Efficiency: 91% ($V_{in}=12V$, $V_{out}=1.2V$, $I_o=8A$)

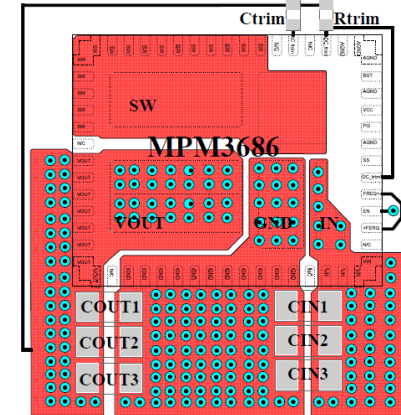
Layout guidelines



Schematics (Typical)

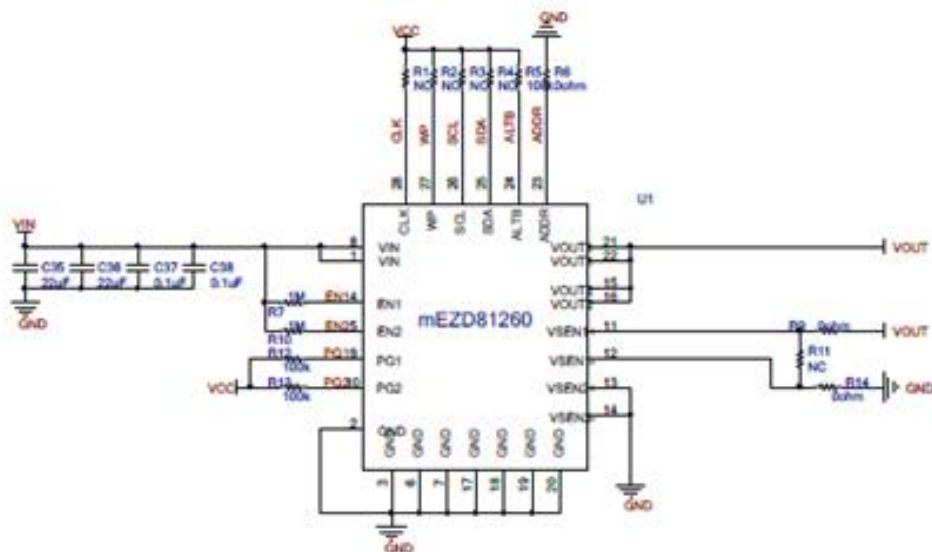


Layout guidelines



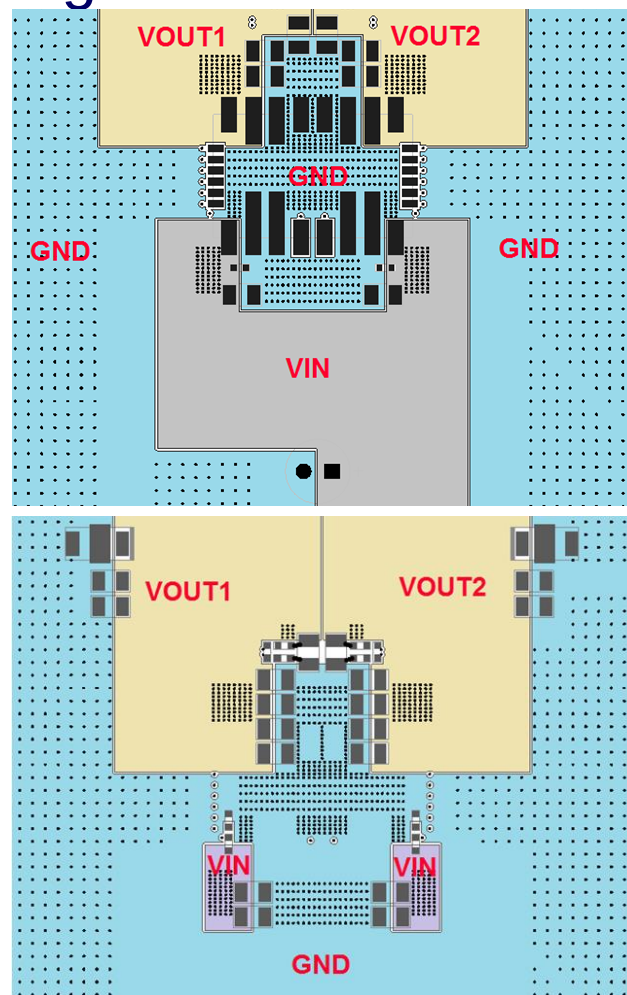
- Solution footprint: 200mm²
- External Components: 4
- Efficiency: 87% (Vin=12V, Vout=1.2V, Io=15A)

Schematics (Typical)

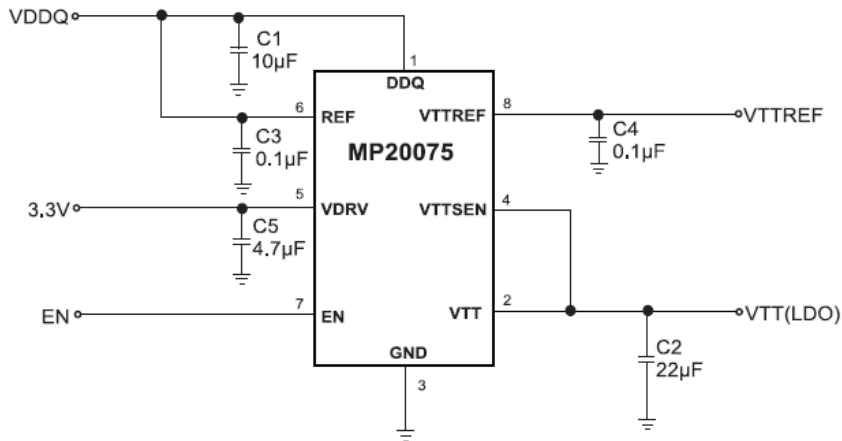


- Solution footprint: Module 387mm² + passive components 36mm²
- External Components: 10
- Efficiency: 92% (Vin=12V, Vout=1.0V, Io=30A)

Layout guidelines

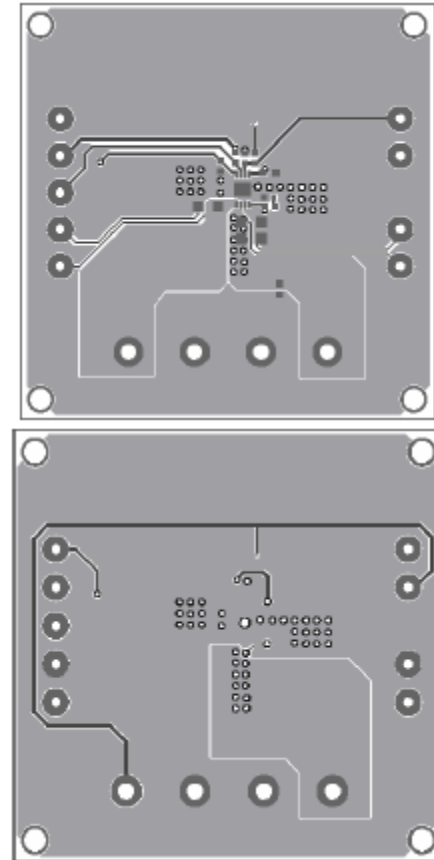


Schematics (Typical)

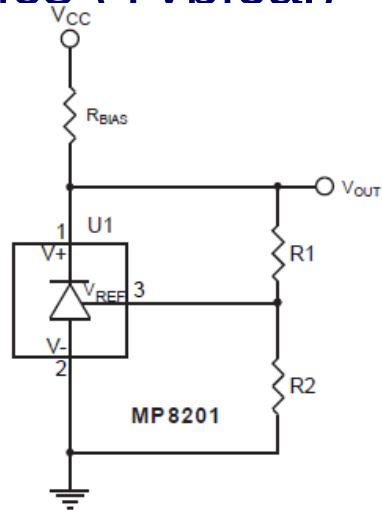


- For Rails:
- Solution footprint: 19mm²
- External Components:5

Layout guidelines



Schematics (Typical)



Layout guidelines

- For Rails: V_{REF}
- Solution footprint: 4.5mm^2
- External Components: 3

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