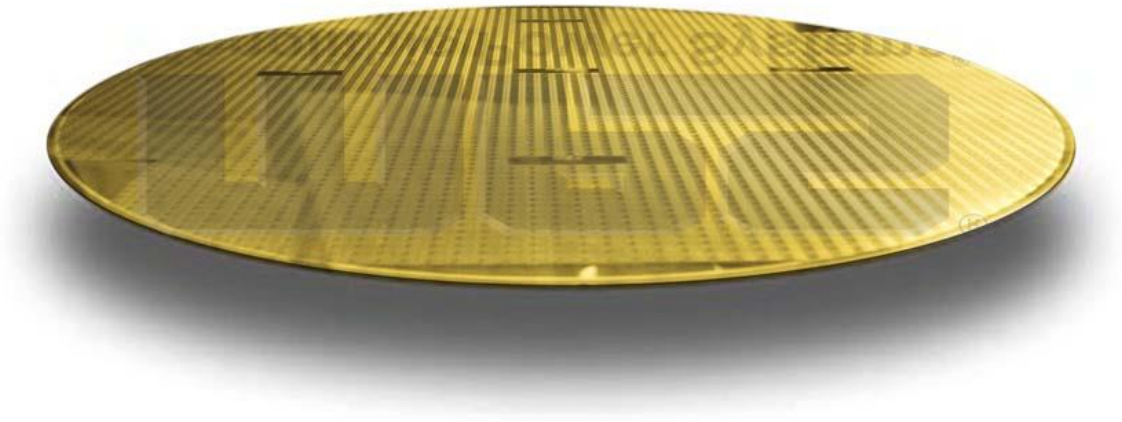
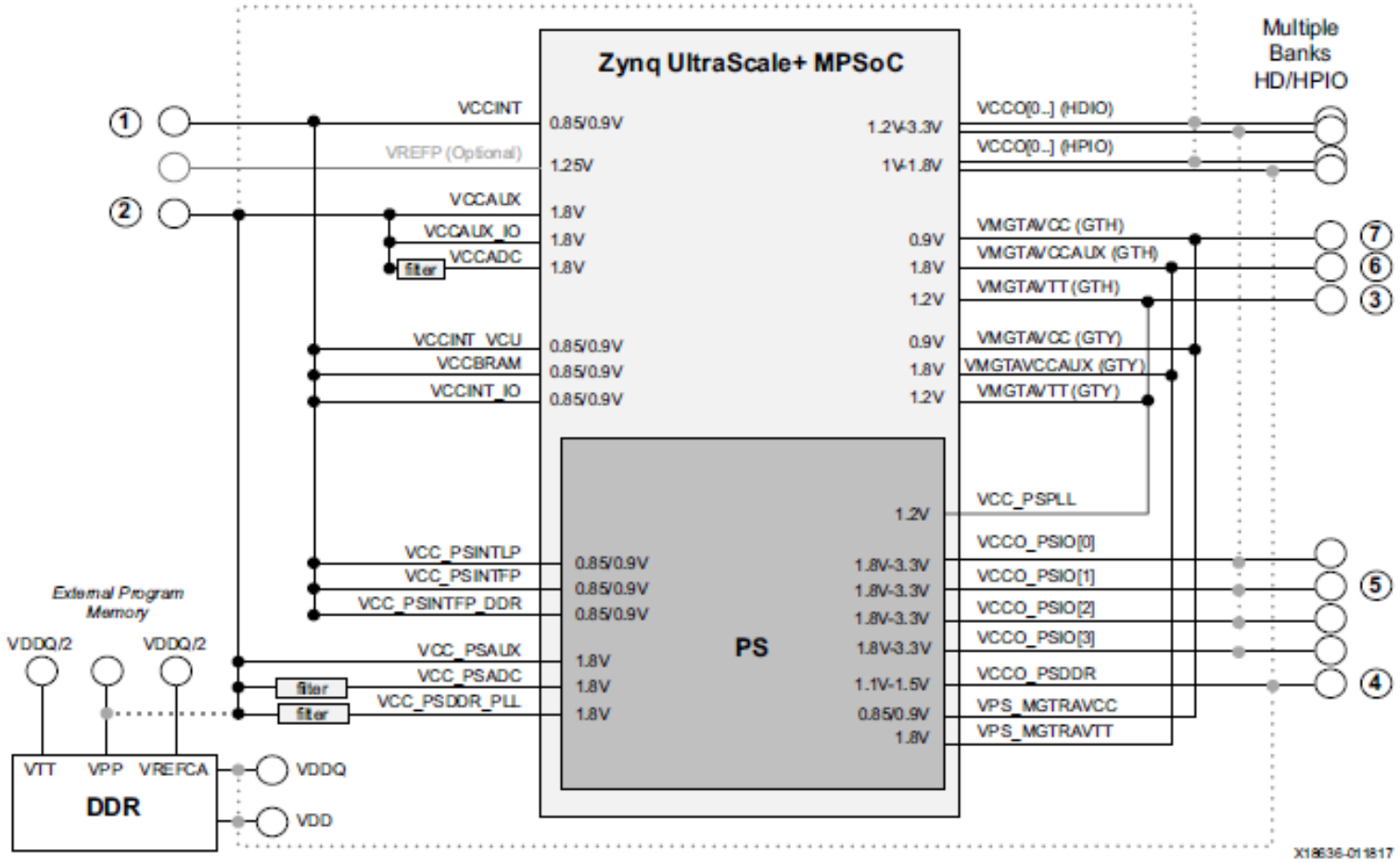
Monolithic Power Systems®



Scalable Power Solutions for Zynq UltraScale+ MPSoC

Last update
June 20, 2018

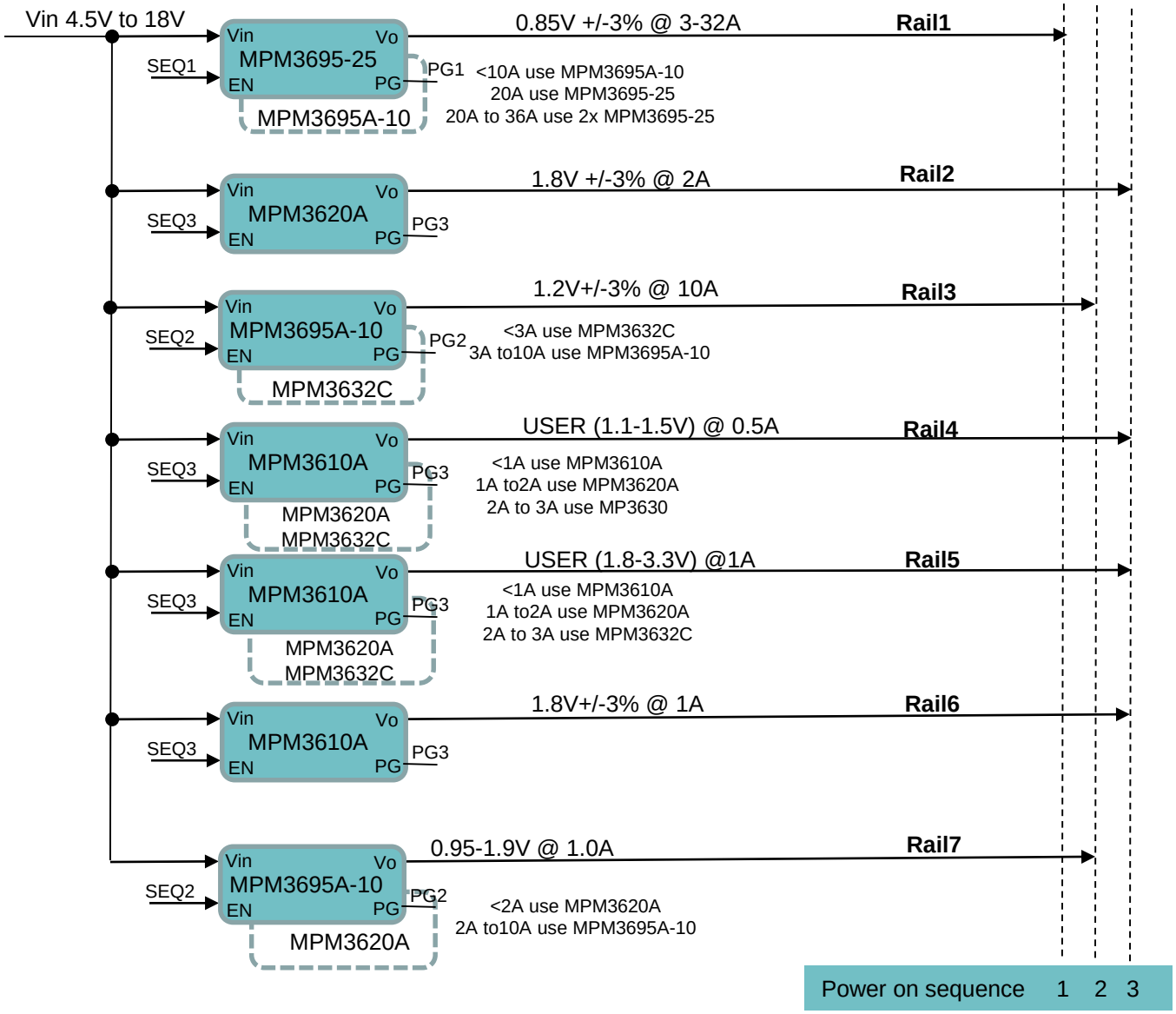
UC1-3 Always ON – 7 Rail solution



Design Specifications – UC1-3 Always ON 7 Rails (Modules)

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 to 10A	MPM3695A-10	QFN-45 (8mmx8mmx1.6mm)
			10A to 20A	MPM3695-25	QFN-59 (10mmx12mmx4mm)
			20A to 36A	MPM3695-25 (2x)	QFN-59 (10mmx12mmx4mm) 2x modules
2	VCC_PSAUX, VCC_PSDDR_PLL, VCC_PSADC, VCCAUX, VCCAUX_IO, VCCADC, DDR_VPP1, VCCO(0..)HDIO, VCCO(0..)HPIO	1.8V+/-3%	2A	MPM3620A	QFN20 (3x5x1.6mm)
3	VMMGTAVTT, VCC_PSPLL, VCC_VCU_PLL	1.2V+/-3%	3A	MPM3632C	QFN20 (3x5x1.6mm)
			10A	MPM3695A-10	QFN-45 (8mmx8mmx1.6mm)
4	VCCO_PSDDR, , DDR_VDD2, DDR_VDDQ, VCCO(0..)HDIO	USER (1.1-1.5V)	1A	MPM3610A	QFN20 (3x5x1.6mm)
			2A	MPM3620A	QFN20 (3x5x1.6mm)
			3A	MPM3632C	QFN20 (3x5x1.6mm)
5	VCCO_PSIO[0..2], VCCO(0..)HDIO	USER (1.8-3.3V)	1A	MPM3610A	QFN20 (3x5x1.6mm)
			2A	MPM3620A	QFN20 (3x5x1.6mm)
			3A	MPM3632C	QFN20 (3x5x1.6mm)
6	VMGTAVCCAUX, VMGTYAVCCAUX, VPS_MGTRAVATT	1.8V+/-3%	1A	MPM3610A	QFN20 (3x5x1.6mm)
7	VMGTAVCC, VMGTYAVCC, VPS_MGTRAVACC	0.9V+/-3%	2A	MPM3620A	QFN20 (3x5x1.6mm)
			10A	MPM3695A-10	QFN-45 (8mmx8mmx1.6mm)

Block Diagram – UC1-3 Always ON 7 Rails (Modules)

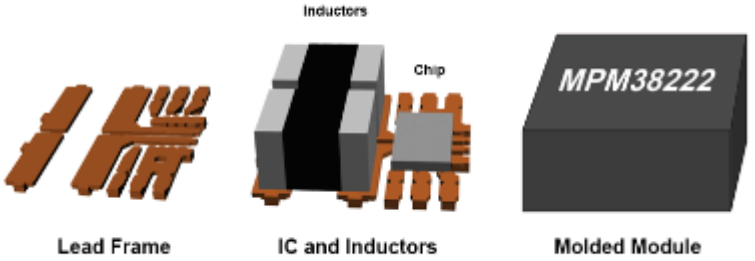


MPS product selector – UC1-3 Always ON 7 Rails (Modules)

7 RAILS (MODULES)	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
Rail 1	0.85/0.9	+/-3%	MPM3695A-10 (max 10 A)					MPM3695-25 (max 20 A)									2x MPM3695-25 (max 40 A)						
Rail 2	1.8	+/-3%*	MPM3620A (max 2 A)																				
Rail 3	1.2	+/-3%*	MPM3632C (max 3 A)																	MPM3695-10 (max 10 A)			
Rail 4	USER (1.1-1.5)		MPM3610A (max 1 A)																				
			MPM3620A (max 2 A)																				
			MPM3632C (max 3 A)																				
Rail 5	USER (1.8-3.3)		MPM3610A (max 1 A)																				
			MPM3620A (max 2 A)																				
			MPM3632C (max 3 A)																				
Rail 6	1.8	+/-3%*	MPM3610A (max 1 A)																				
Rail 7	0.9	+/-3%*	MPM3620A (max 2 A)										MPM3695A-10 (max 10 A)										

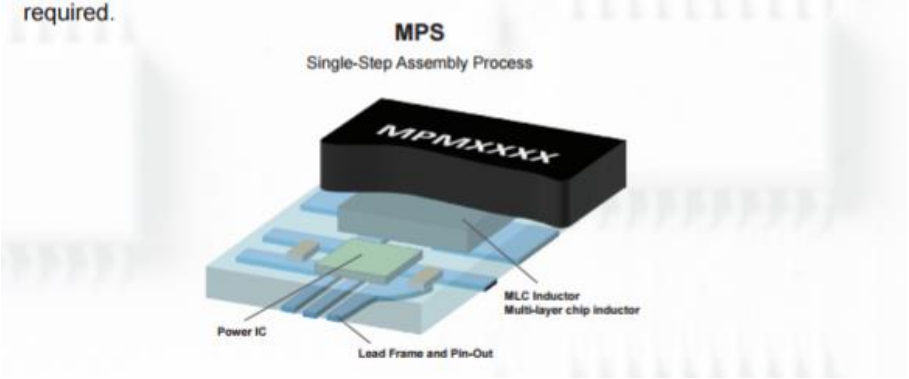
Product Overview

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.

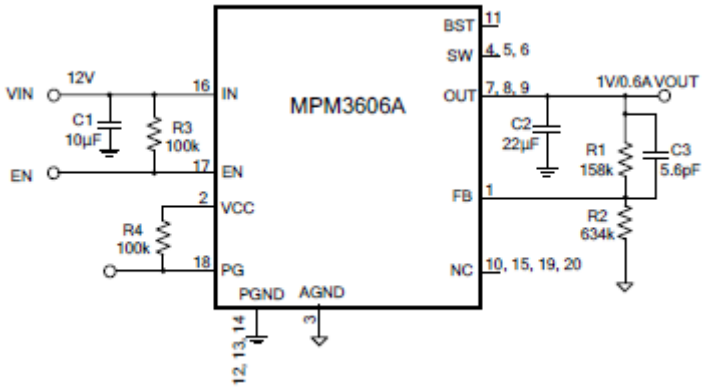


- Benefits
  - Ease of design
  - Simple manufacturing
  - Small footprint
  - High performance
  - Cost effective

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.

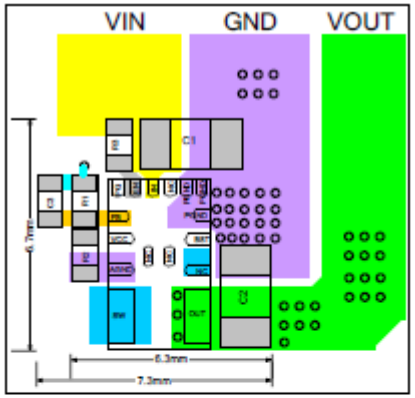


Schematics (Typical)



- Solution footprint: 52mm^2
- External Components:7
- Efficiency: 88% (Vin=12V, Vout=3.3V, Io=0.4A)

Layout guidelines



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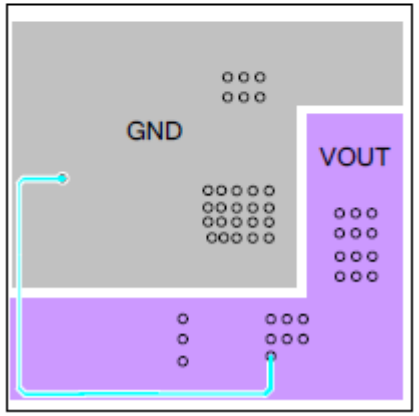
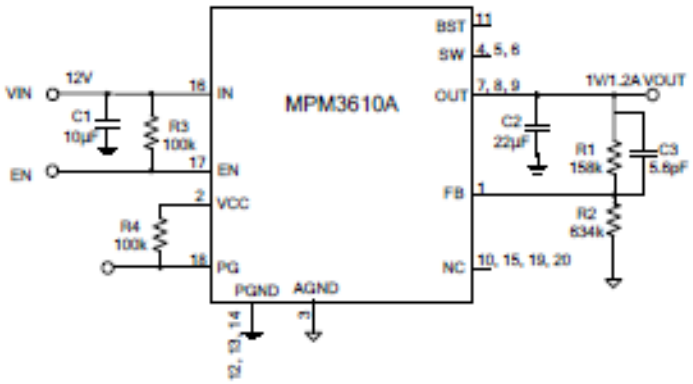


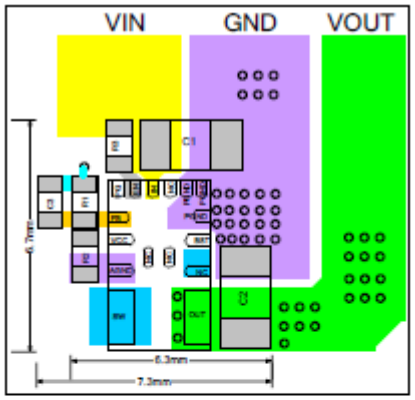
Bottom Layer

Schematics (Typical)



- Solution footprint: 52mm^2
- External Components: 7
- Efficiency: 89% (Vin=12V, Vout=3.3V, Io=1A)

Layout guidelines



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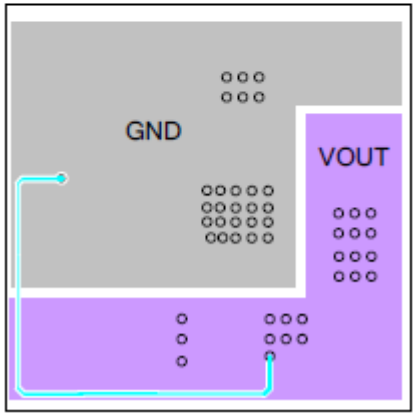
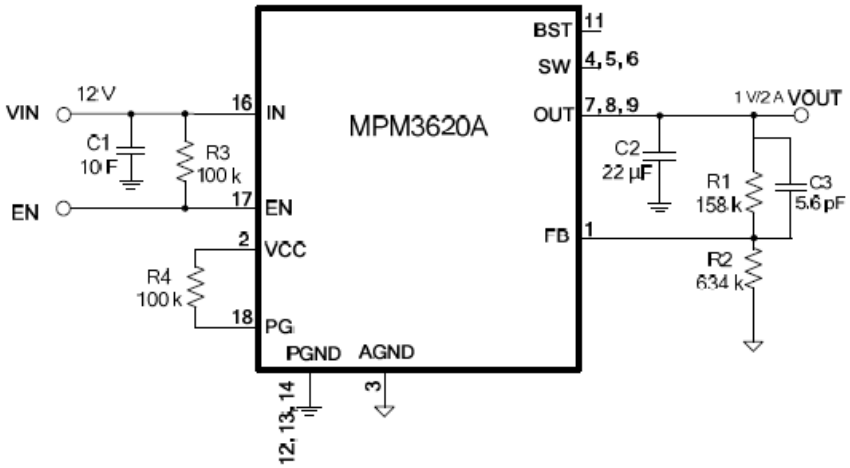


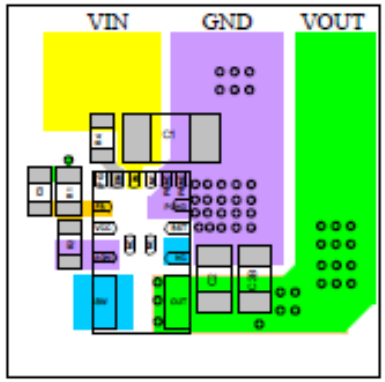
Bottom Layer

Schematics (Typical)



- Solution footprint: 52mm^2
- External Components: 7
- Efficiency: 82% (Vin=12V, Vout=1.8V, Io=1A)

Layout guidelines



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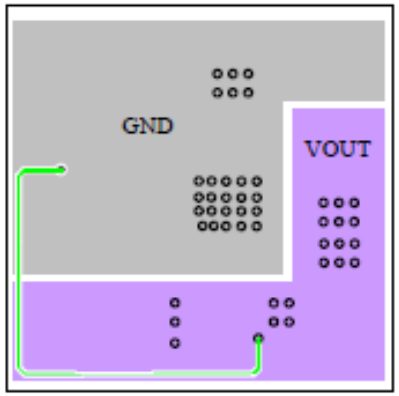
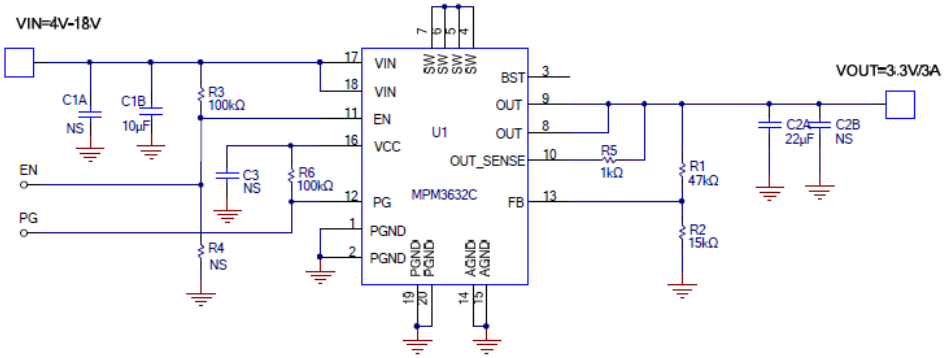
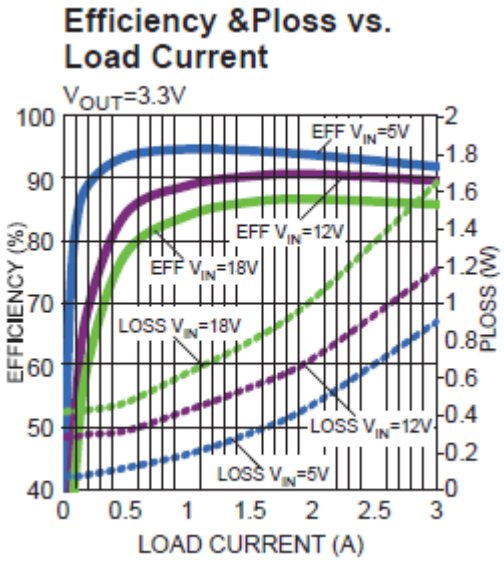


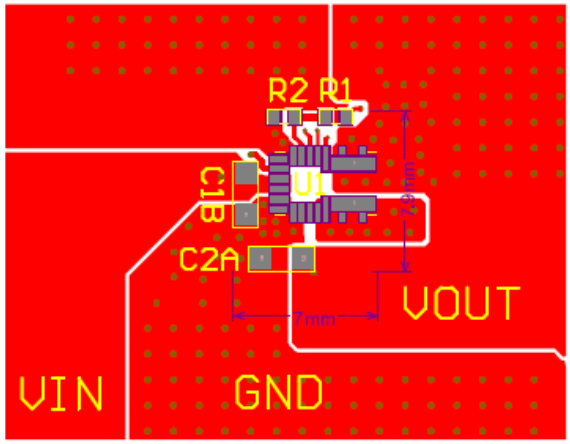
Bottom Layer

Schematics





Layout guidelines



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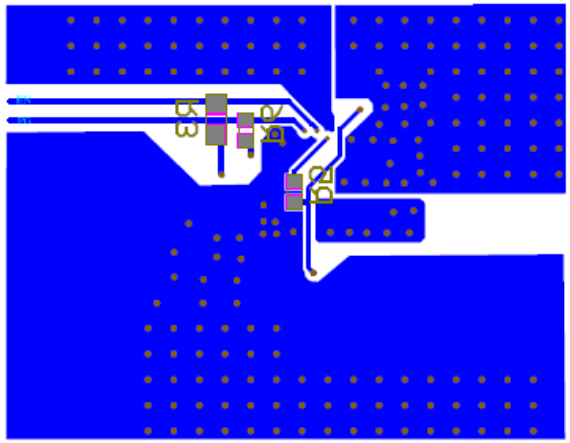


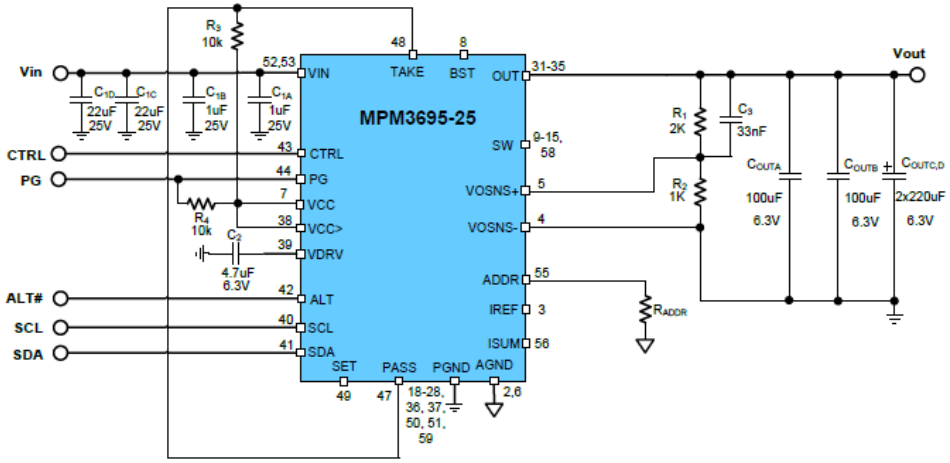
PCB area 55mm2

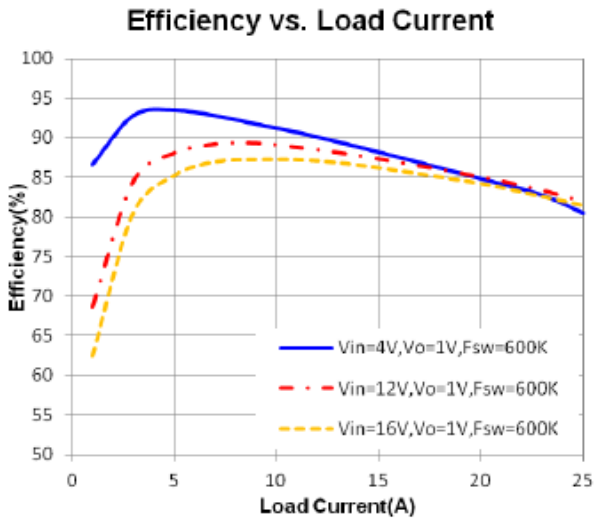
Caps included in area calculations:

Output Caps 1x 22uF 0805

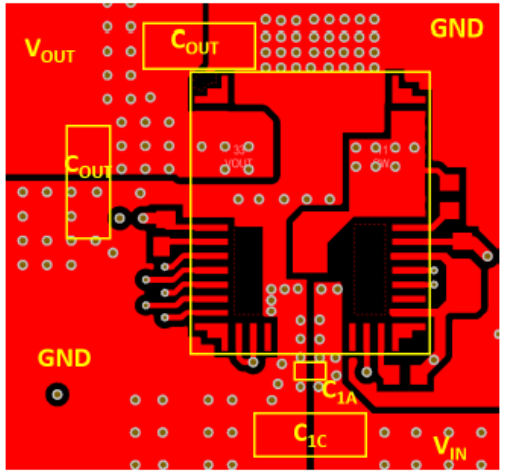
Input Caps: 2x 0603 on PCB bottom

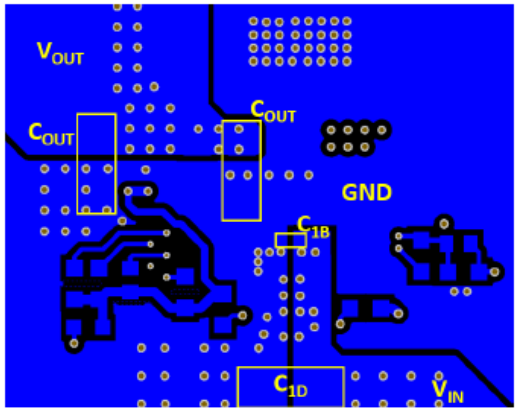
Schematics





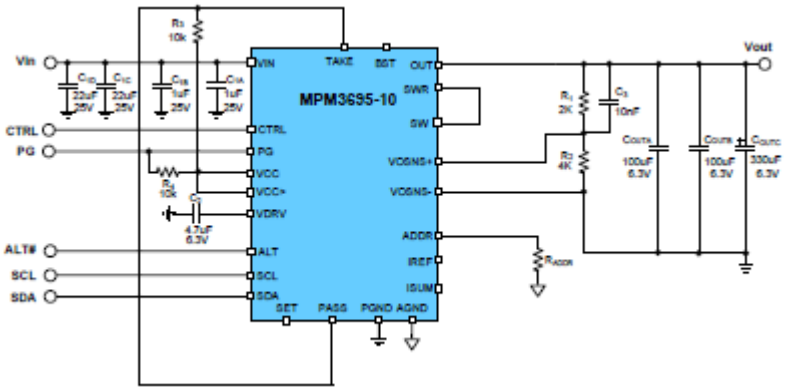
Layout guidelines

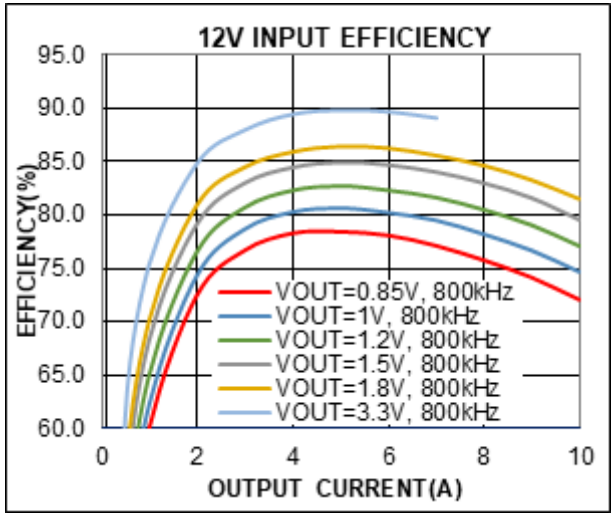




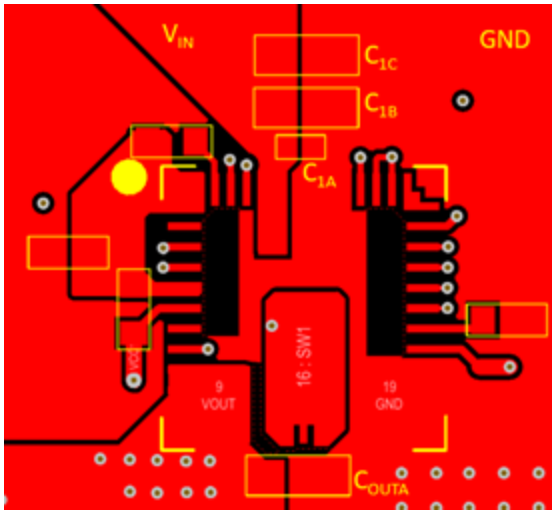
Solution size: 230mm2

Schematics



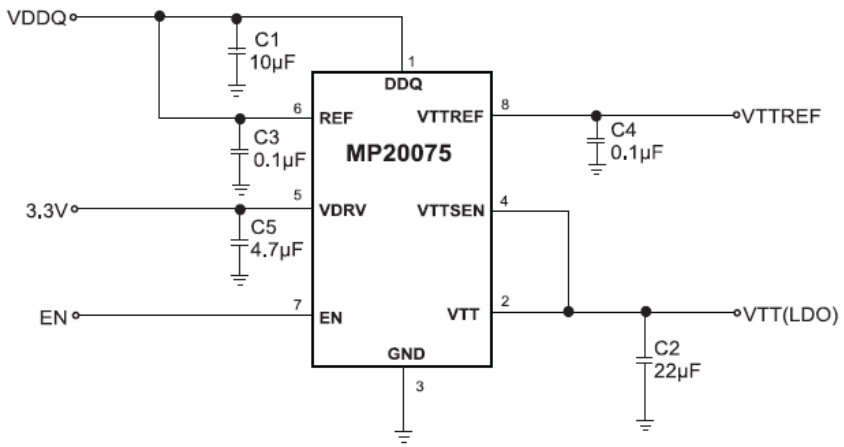


Layout guidelines



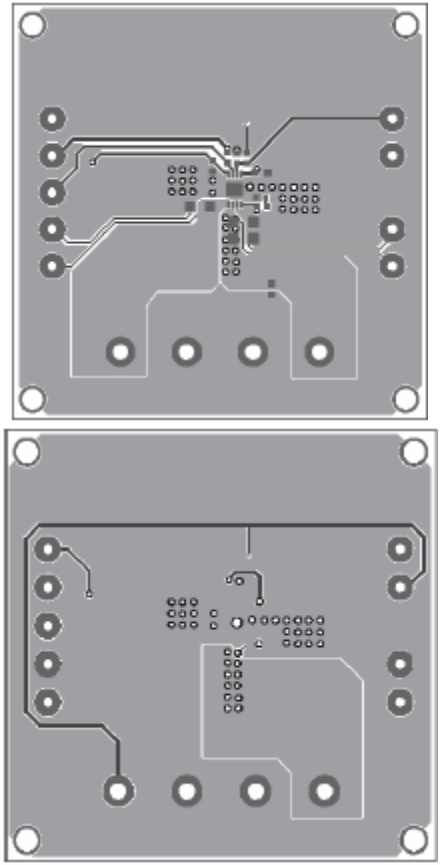
Solution size: 180mm2

Schematics (Typical)

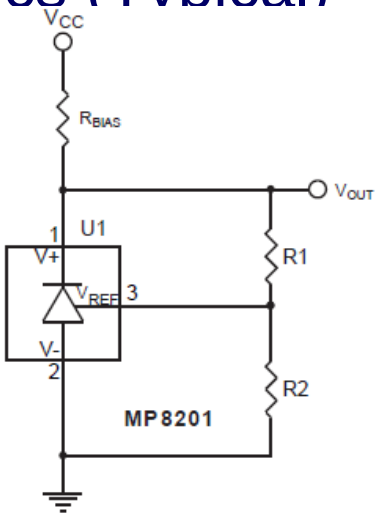


- Solution footprint: 19mm^2
- External Components:5

Layout guidelines



Schematics (Typical)



Layout guidelines

- For Rails: VREF
- Solution footprint: 4.5mm^2
- External Components: 3

MPS design highlights

- 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