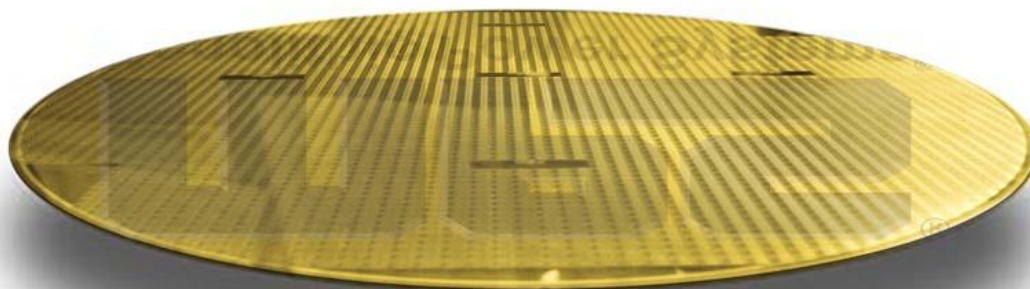


**MPS**<sup>®</sup>

**MPS**<sup>®</sup>

**Monolithic Power Systems**<sup>®</sup>

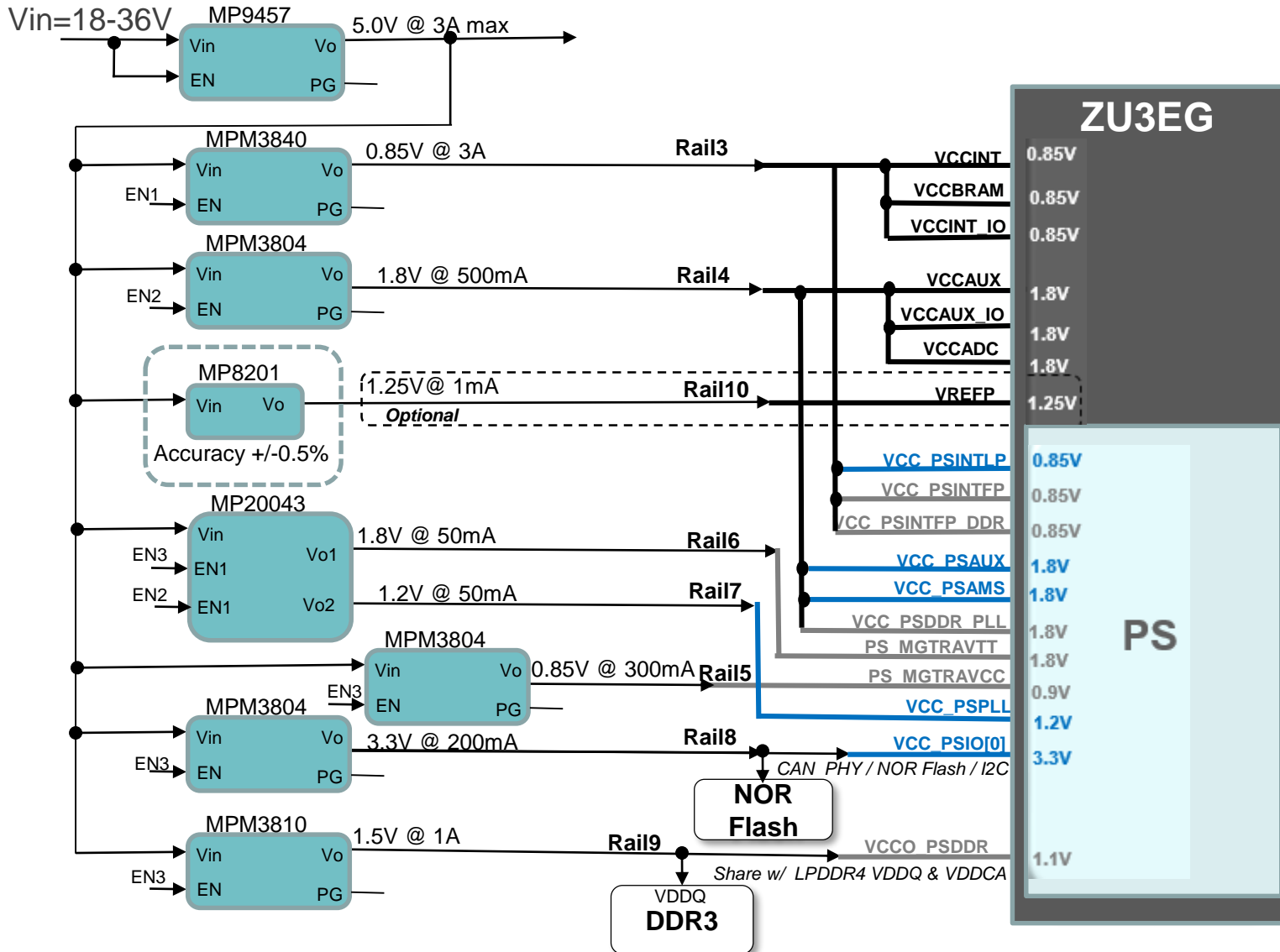


Reference design –  
Xilinx ZU3EG Industrial Networking Solution

Last update: 1/18/17



# ZU3EG Industrial Networking Solution

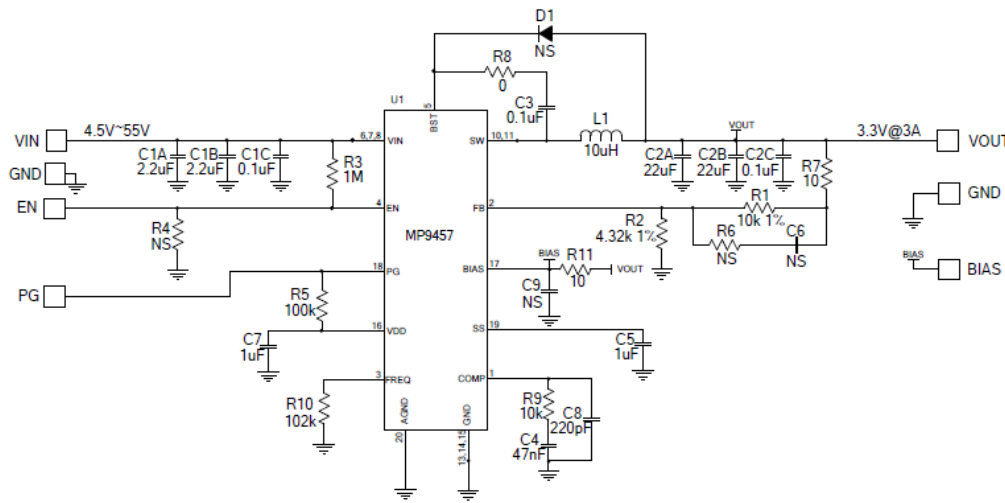




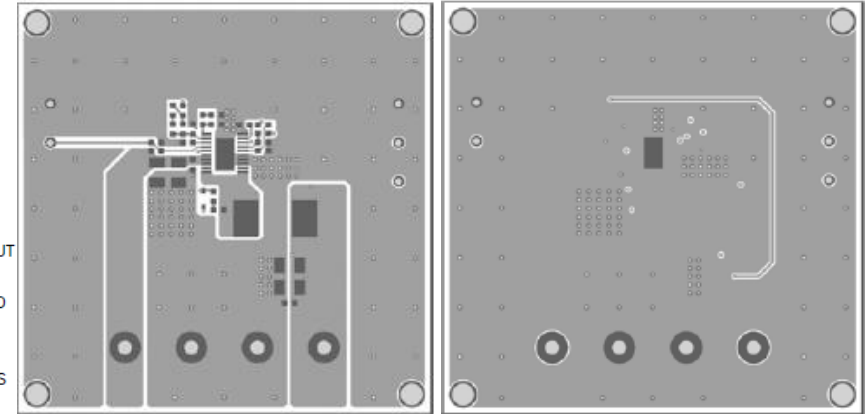
# Power specs— ZU3EG Industrial Networking Solution

Rail #	VIN (V)	Rail	VOUT (V)	Load (mA)	Seq	MPS part#	Footprint
					Up/Dwn	(Iout max)	
2	18-36	Intermediate rail	$5 \pm 5\%$	3000		MP9457 (3A)	TSSOP-20 EP 6.6x6.6mm
3	5	VCCINT, VCCBRAM, VCCINT_IO	$0.85 \pm 3\%$	3000	1 / 3	MPM3840 (4A)	QFN-20 3x5x1.6mm
4	5	VCCAUX, VCCAUX_IO, VCCADC, VCC_PSAUX, VCC_PSAMS, VCC_PSDDR_PLL	$1.8 \pm 3\%$	500	2 / 2	MPM3804 (0.6A)	QFN-10 2x2x0.9mm
5	5	VPS_MGTRAVCC	$0.85 \pm 3\%$	300	3 / 1	MPM3804 (0.6A)	QFN-10 2x2x0.9mm
6	5	VPS_MGTRAVTT	$1.8 \pm 3\%$	50	3 / 1	MP20043 (0.3A)	TQFN-8 2x2mm
7	5	VCCPSPLL	$1.2 \pm 3\%$	50	2 / 2		
8	5	VCC_PSIO	$3.3 \pm 5\%$	200	3 / 1	MPM3804 (0.6A)	QFN-10 2x2x0.9mm
9	5	VCCO_PSDDR	$1.5 \pm 3\%$	1000	3 / 1	MPM3810 (1.2A)	QFN-12 2.5x3x0.9mm
10	5	VREF	$1.25 \pm 0.5\%$	1	3 / 1	MP8201 (0.002A)	SOT-23 3x2.6mm

## Schematics (Typical)

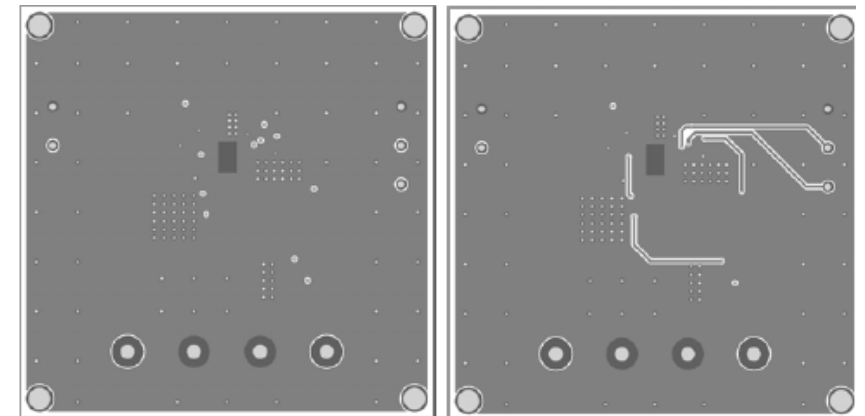


## Layout guidelines



Top Layer

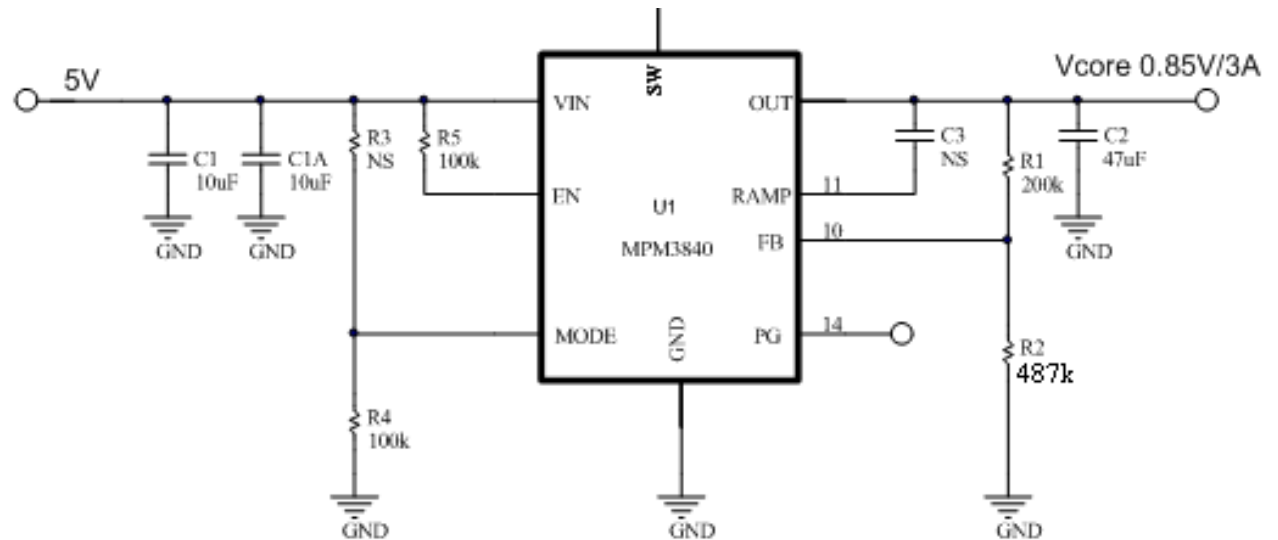
Bottom Layer



Inner Layer 1

Inner Layer 2

## Schematic

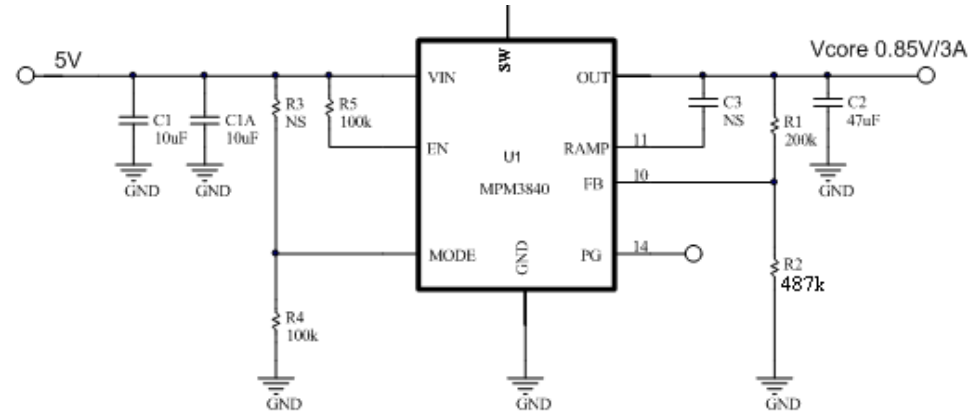
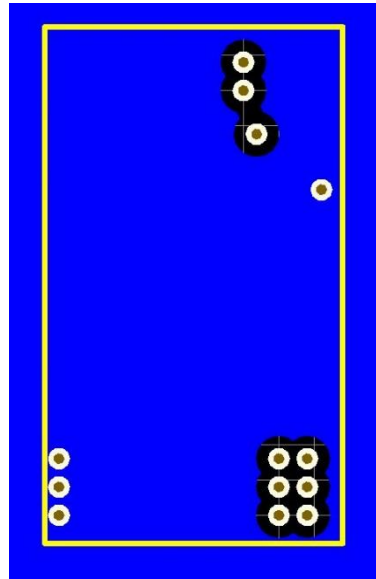
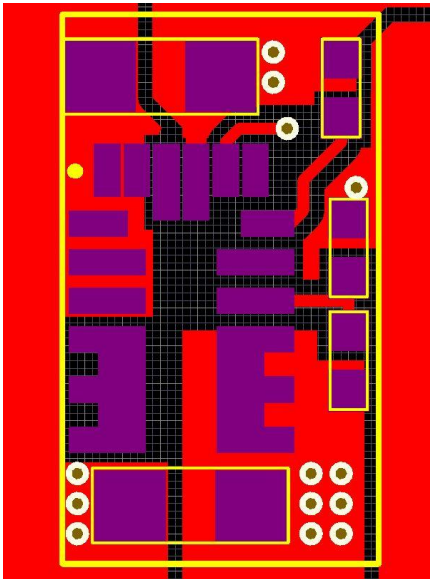


## BOM

Qty.	RefDes	Value	Description	Package	Manufacturer	Manufacturer P/N
2	C1, C1A	10uF	Ceramic Cap,6.3V,X5R	0805	muRata	GRM219R61A106KE44D
1	C2	47uF	Ceramic Cap,10V,X5R	0805	muRata	GRM21BR61A475ME15L
1	R1	200K	Film Res,1%	0603	ROYAL	RL0603FR-07200KL
1	R2	487K	Film Res,1%	0603	YAGEO	RC0603FR-07487KL
2	R4,R5	100K	Film Res,1%	0603	YAGEO	RC0603FR-07100KL
1	U1	MPM3840	Synchronous step-down switcher	QFN	MPS	

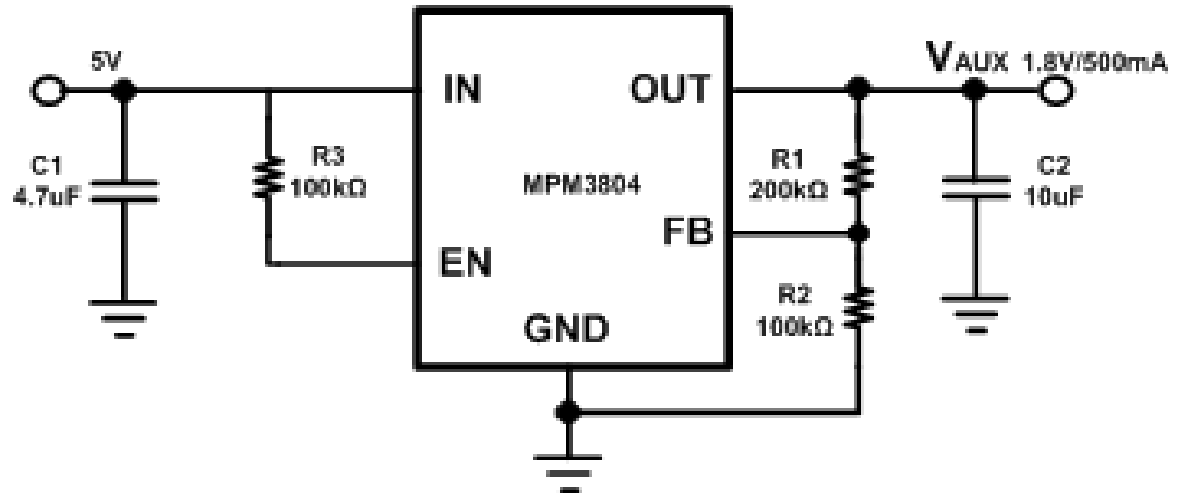
Top Layer

Bottom Layer



- **For Rails:**
  - VCORE
- **External Components: 7**
- **Total PCB : 5.5x8.0mm (double layer PCB)**

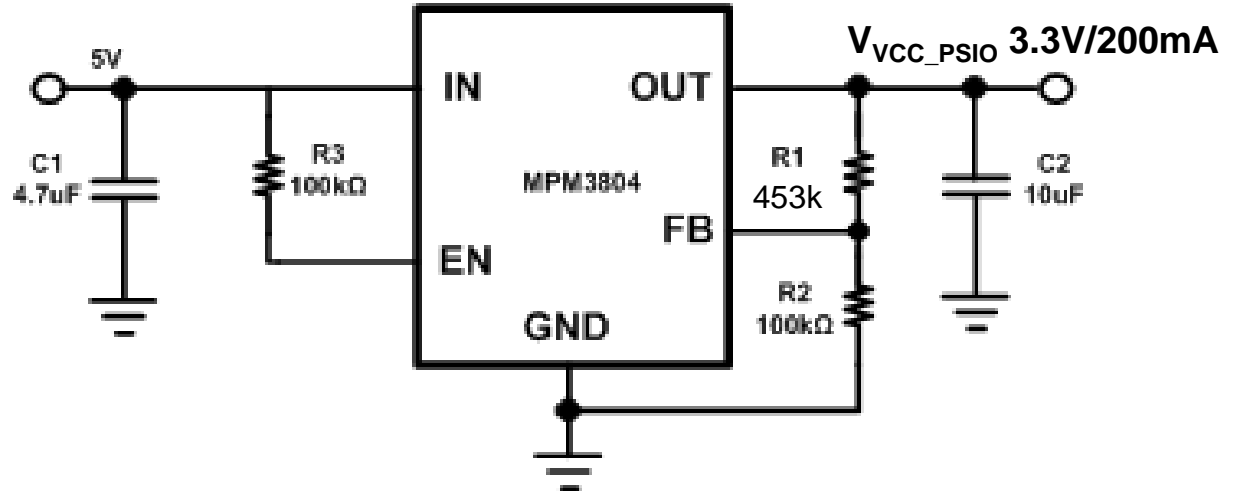
## Schematic



## BOM

Qty	RefDes	Value	Description	Package	Manufacturer	Manufacturer P/N
1	C1	4.7uF	Ceramic Cap,6.3V,X5R	0603	muRata	GRM188R60J475KE19D
1	C2	10uF	Ceramic Cap,6.3V,X5R	0603	muRata	GRM188R60J106ME47D
1	R1	200K	Film Res,1%	0402	YAGEO	RI0402L2003FT
2	R2,R3	100k	Film Res,1%	0402	YAGEO	RI0402L1003FT
1	U1	MPM3804	Synchronous step-down switcher	QFN	MPS	

## Schematic

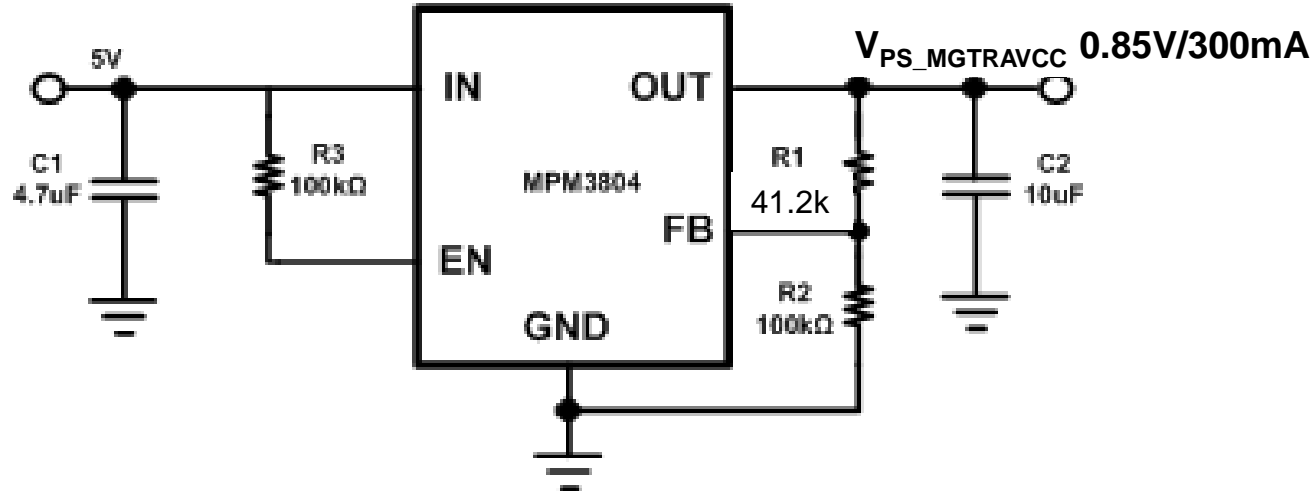


## BOM

Qty	RefDes	Value	Description	Package	Manufacturer	Manufacturer P/N
1	C1	4.7uF	Ceramic Cap,6.3V,X5R	0603	muRata	GRM188R60J475KE19D
1	C2	10uF	Ceramic Cap,6.3V,X5R	0603	muRata	GRM188R60J106ME47D
1	R1	453K	Film Res,1%	0402	YAGEO	RC0402FR-07453KL
2	R2,R3	100k	Film Res,1%	0402	YAGEO	RC0402FR-07100KL
1	U1	MPM3804	Synchronous step-down switcher	QFN	MPS	

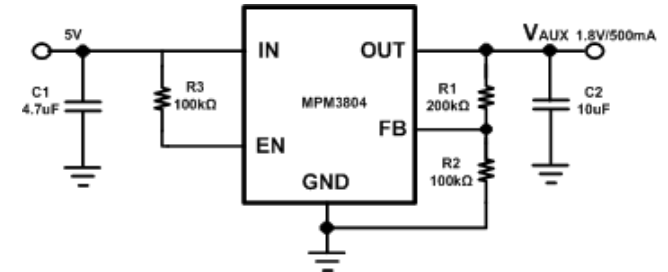
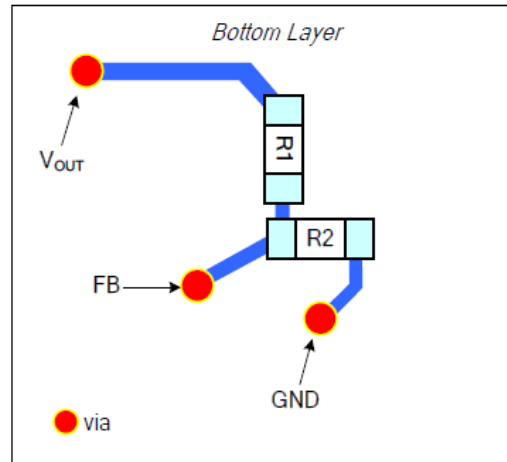
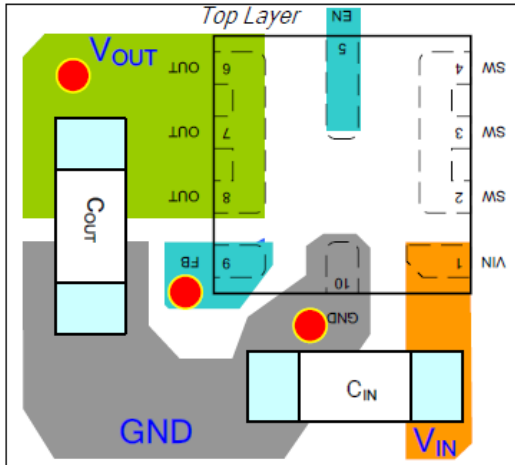


## Schematic



## BOM

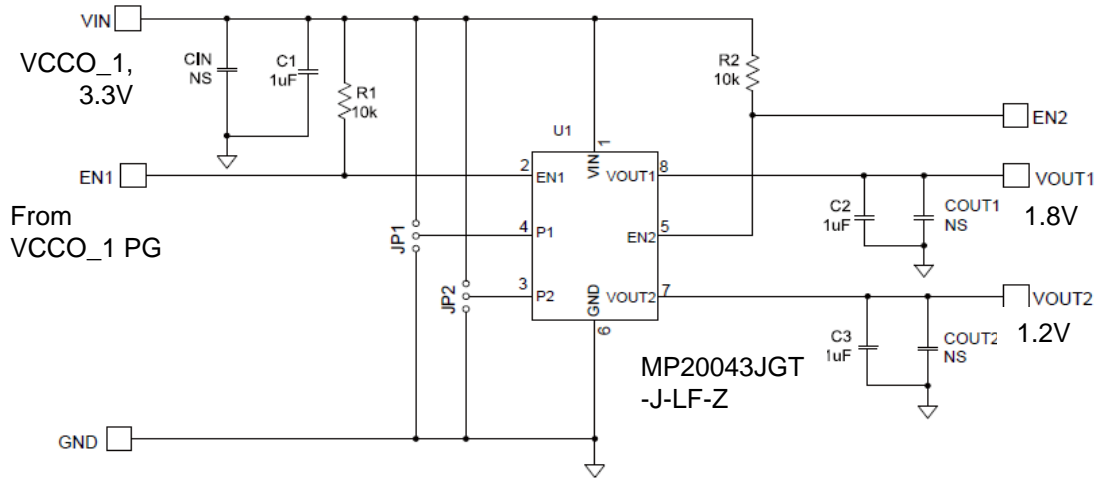
Qty	RefDes	Value	Description	Package	Manufacturer	Manufacturer P/N
1	C1	4.7uF	Ceramic Cap,6.3V,X5R	0603	muRata	GRM188R60J475KE19D
1	C2	10uF	Ceramic Cap,6.3V,X5R	0603	muRata	GRM188R60J106ME47D
1	R1	41.2K	Film Res,1%	0402	YAGEO	RC0402FR-0741K2L
2	R2,R3	100k	Film Res,1%	0402	YAGEO	RC0402FR-07100KL
1	U1	MPM3804	Synchronous step-down switcher	QFN	MPS	MPM3804



- **For Rails:**
  - VAUX
  - VPS\_MGTRAVCC
  - VCC\_PSIO
- **External Components: 5**
- **Total PCB Area : 4mmx4mm (double layer PCB)**

## Schematic

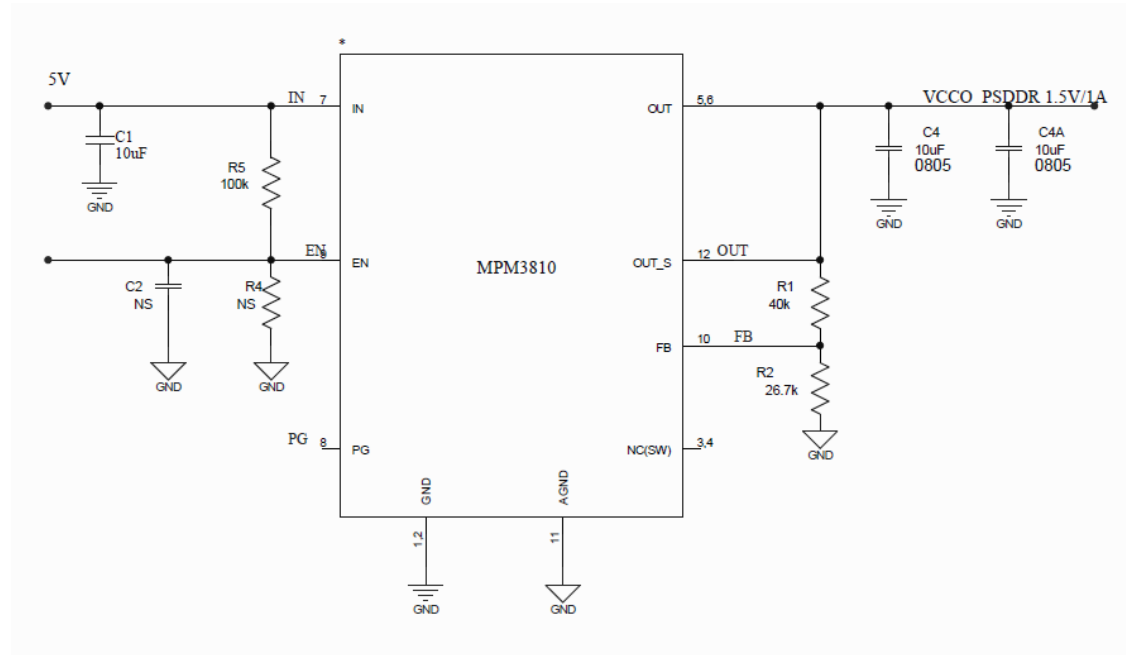
MP20043: 1.8V/1.2V at 50mA each



## BOM

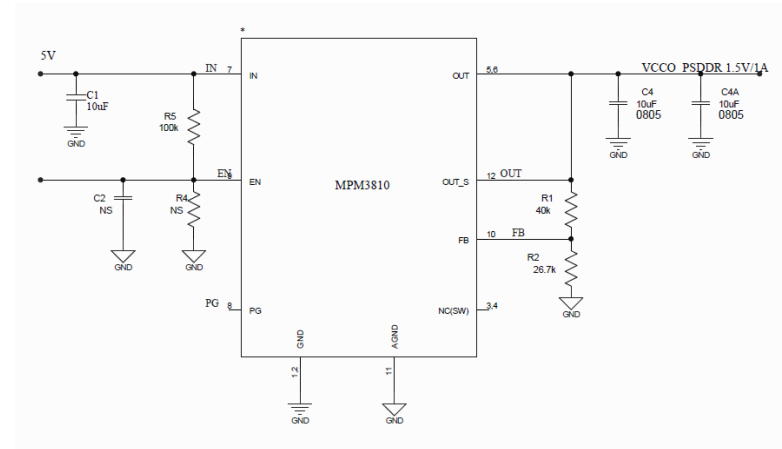
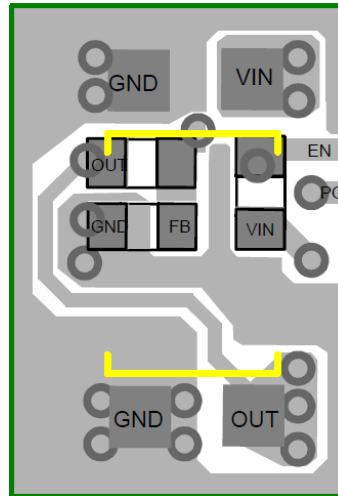
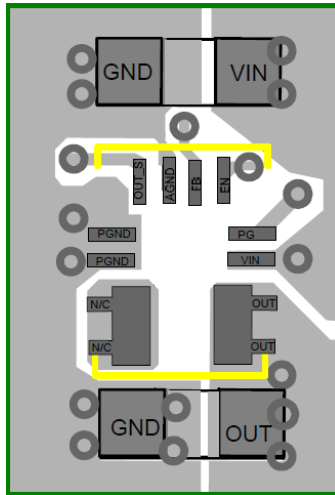
Qty	Ref	Value	Description	Package	Manufacturer	Part Number
3	C1, C2, C3	1uF	Ceramic Capacitor,X7R,10V	0805	TDK	C2012X7R1A105K
3	CIN, COUT1, COUT2	NS				
2	R1, R2	10k	Film Res, 1%	0603	Yageo	RC0603FR-0710KL
1	U1		LDO Regulator	TQFN8 (2mm*2mm)	MPS	MP20043JG

## Schematic



## BOM

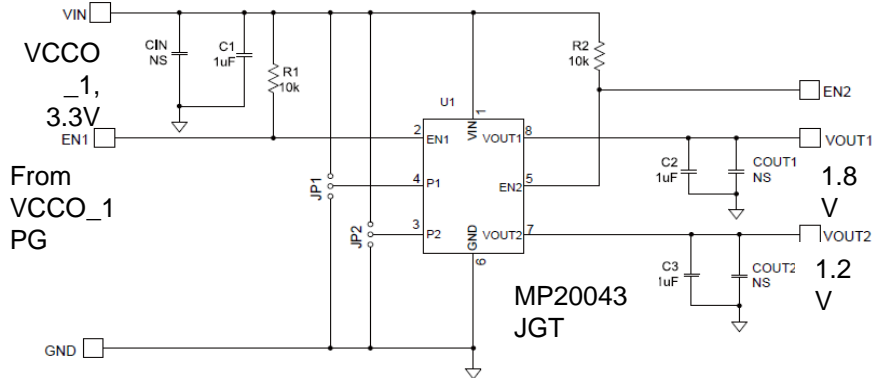
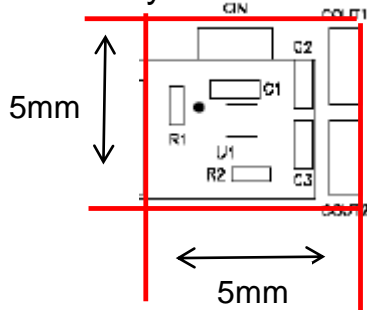
Qty.	RefDes	Value	Description	Package	Manufacturer	Manufacturer P/N
3	C1,C4, C4A	10uF	Ceramic Cap,6.3V,X5R	0805	muRata	GRM219R61A106KE44D
1	R1	40K	Film Res,1%	0603	YAGEO	RC0603FR-0740K2L
1	R2	26.7K	Film Res,1%	0603	YAGEO	RC0402FR-0726K7L
1	R5	100K	Film Res,1%	0603	YAGEO	RC0603FR-07100KL
1	U1	MPM3810	Synchronous step-down switcher	QFN	MPS	



- **For Rails:**
  - VCCO\_PSDDR
- **External Components: 6**
- **Total PCB Area : 4mmx7mm (double layer PCB)**



Sizing:  
Two Layer Board



- **For Rails:**
  - VPS\_MGTRAVTT and VCCPSPLL
- **External Components: 3 Caps**
- **Total PCB Area : 25 sq mm (dual LDO)**



# MPS design highlights – (Modules)

---

- MP9457
  - High Efficiency
  - Cost effective
- MPM3804/3810/3840
  - Small Solution Size:
    - MPM3804:16mm<sup>2</sup>
    - MPM3810:28mm<sup>2</sup>
    - MPM3840:45mm<sup>2</sup>
  - Minimum External Components
  - Fast Transient Reponses
  - Fully tested
  - OCP, OTP
  - Cost Effective
- MP20043
  - Small Solution Size for Dual output
  - Extreme low cost



For additional information please contact  
MPS Reference Design Team  
at [referencedesign@monolithicpower.com](mailto:referencedesign@monolithicpower.com)

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