



# MPS Power Solutions for Xilinx® Virtex-7

04-2017

**MPS**  
Simple, Easy Solutions™

# Xilinx 7 Series FPG Power Requirements

	Rails	Rail Voltage	Req. Voltage Accuracy	Power-Up Sequence	High	Medium	Low
Aritx-7	VCCINT/BRM	1.0V	5%	1	3.2A	2.1A	1.1A
	VCCAUX	1.8V	5%	2	0.35A	0.3A	0.3A
	VccoDDR	1.5V	5%	3	1.5A	1.5A	1.5A
Kintex-7	VCCINT/BRM	1.0V	3%	1	8.7A	6.1A	1.3A
	VCCAUX	1.8V	3%	2	0.3A	0.3A	0.3A
	VccoDDR	1.5V	3%	3	1.5A	1.5A	1.5A
Virtex-7	VCCINT/BRM	1.0V	3%	1	20A	15A	11A
	VCCAUX	1.8V	3%	2	0.4A	0.4A	0.4A
	VccoDDR	1.5V	3%	3	1.5A	1.5A	1.5A
Zynq-7	VCCINT/BRM	1.0V	5%(70107020) 3%(70307045)	1	6A	2.5A	0.5A
	VCCAUX	1.8V	5%(70107020) 3%(70307045)	2	0.4A	0.4A	0.4A
	VccoDDR	1.5V	5%	3	1.5A	1.5A	1.5A
	PS	1.0V	5%	1	0.52A	0.52A	0.52A
	PS1.8V	1.8V	5%	2	0.2A	0.2A	0.2A

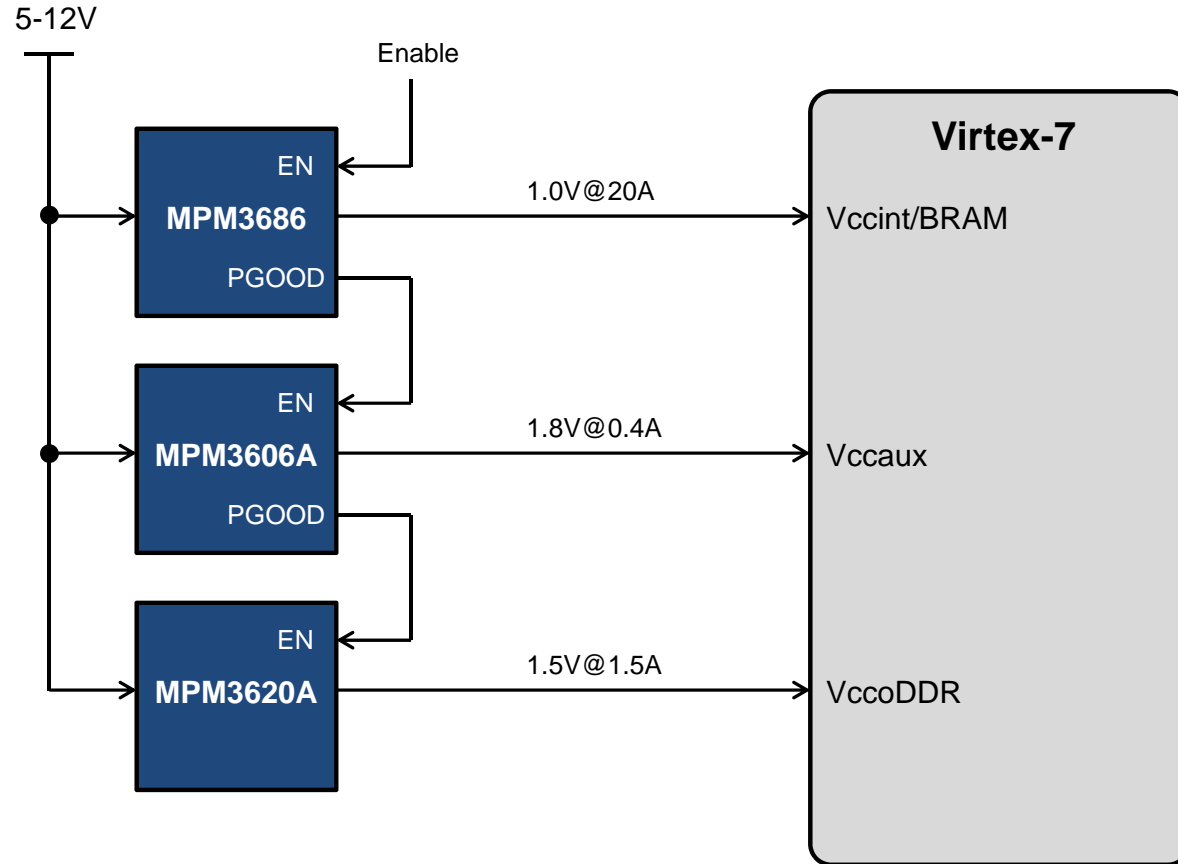
# MPS Power Solutions For Virtex-7

## 5V & 12V Input

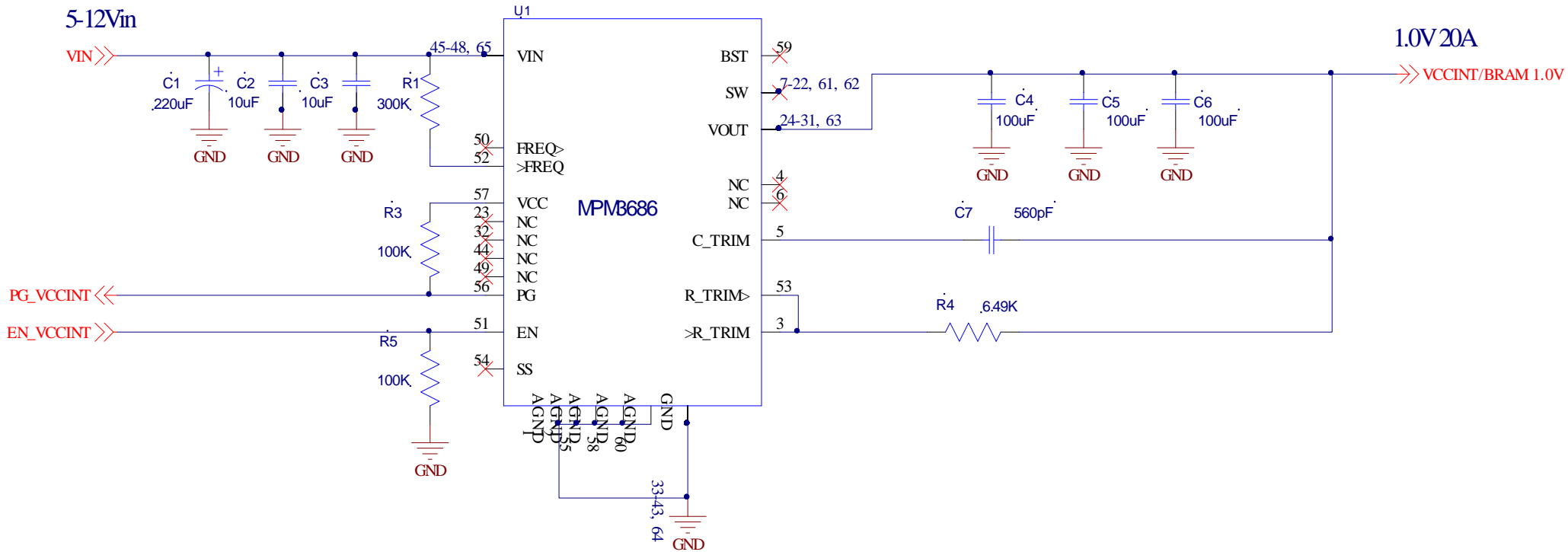
		Accuracy	Power Sequence	High	MPS PN	Medium	MPS PN	Low	MPS PN
Virtex-7	Vccint/BRAM	3%	1	1V/20A	MPM3686	1V/15A	MPM3684	1V/11A	MPM3684
	Vccaux	3%	2	1.8V/0.4A	MPM3606A	1.8V/0.4A	MPM3606A	1.8V/0.4A	MPM3606A
	VccoDDR	3%	3	1.5V/1.5A	MPM3620A	1.5V/1.5A	MPM3620A	1.5V/1.5A	MPM3620A

# MPS Power Solutions For Virtex-7(High)

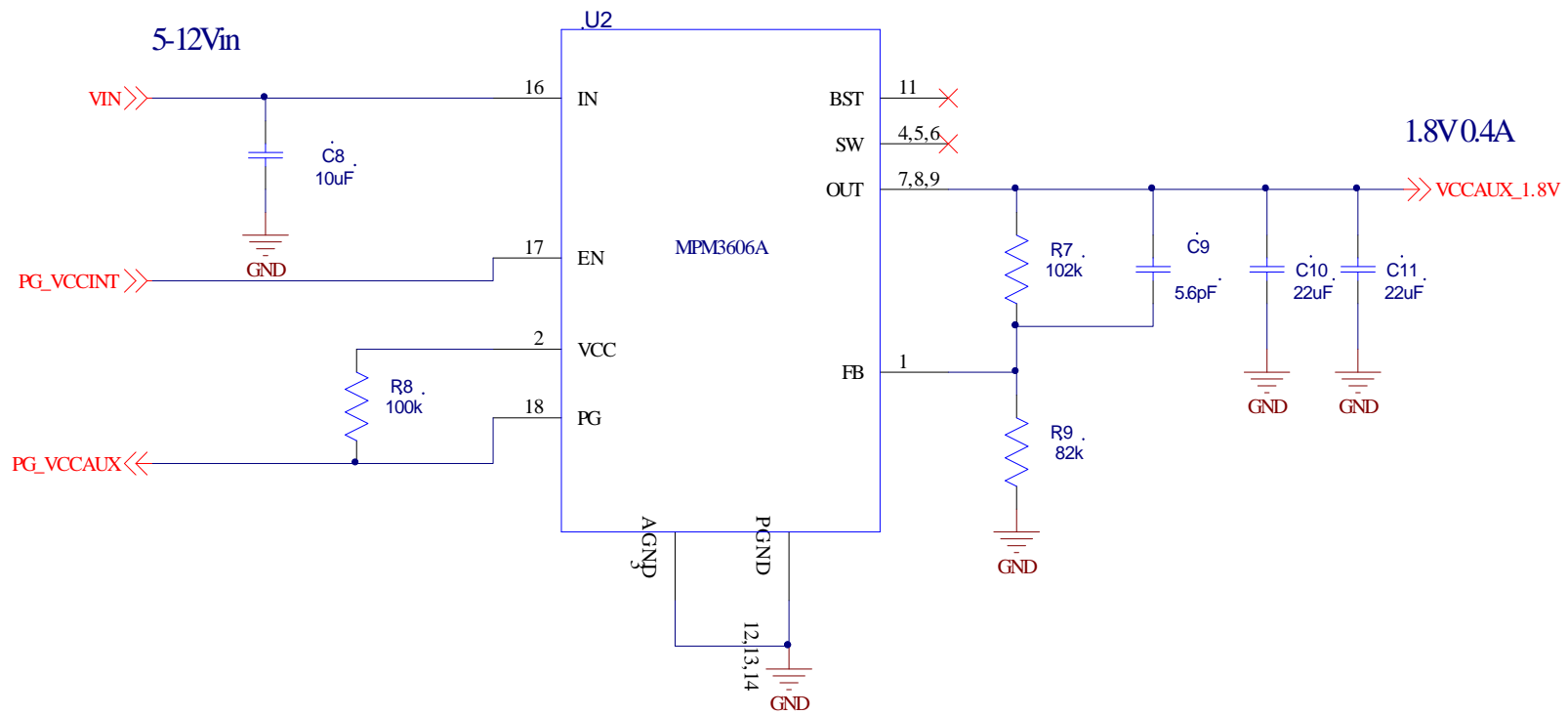
## System Diagram and Sequencing



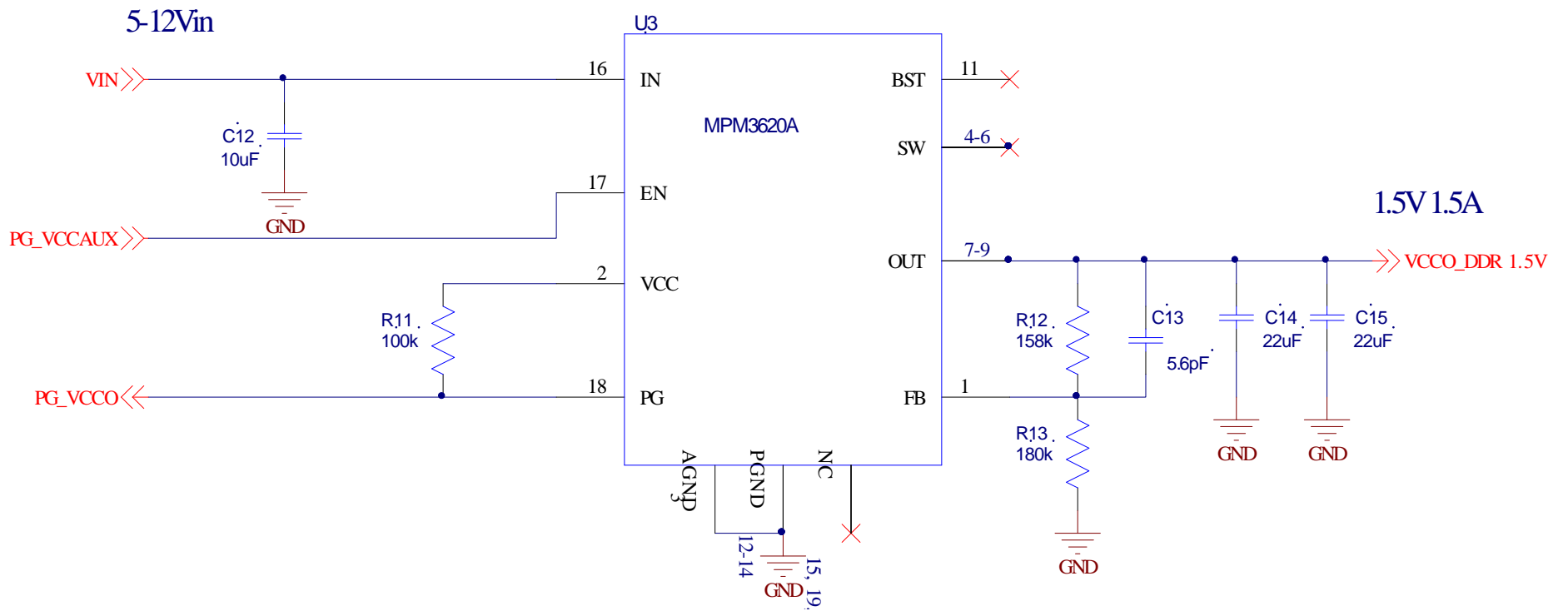
# Virtex-7(High) VCCINT/BRAM 1.0V/20A SCH



# Virtex-7(High) VCCAUX 1.8V/0.4A SCH



# Virtex-7(High) VccoDDR 1.5V/1.5A SCH

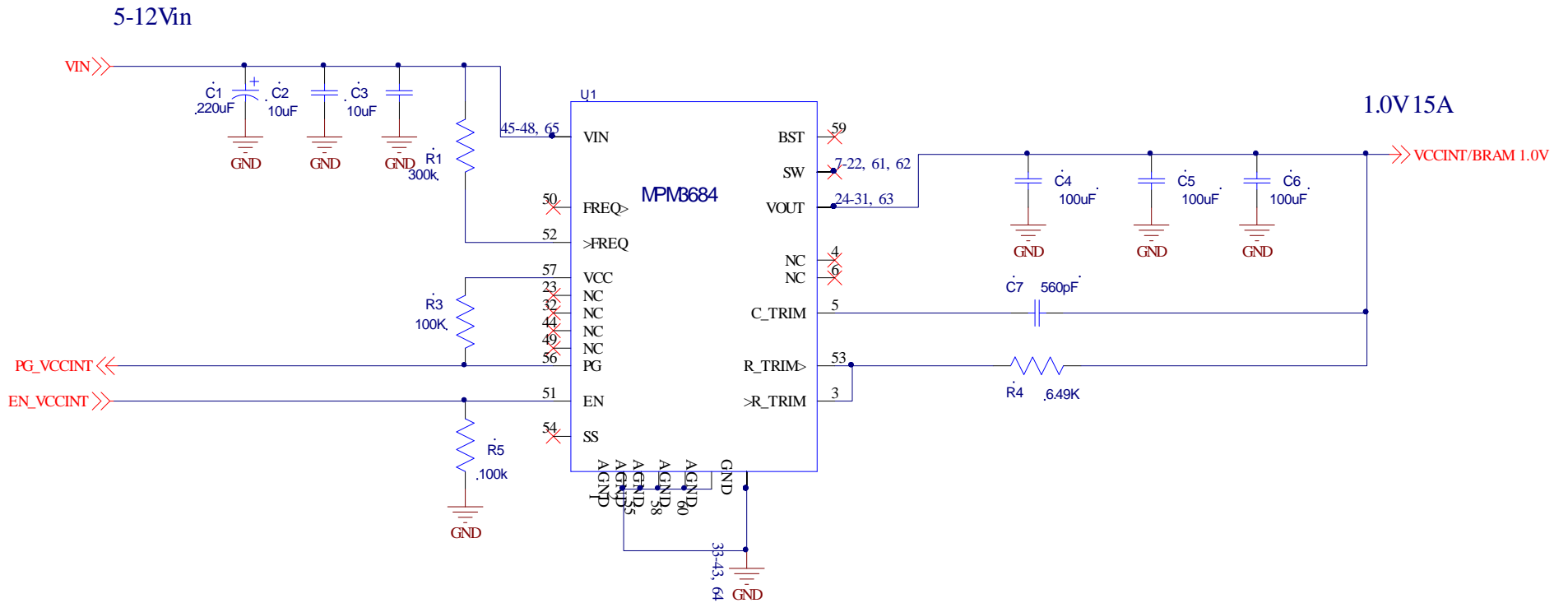


# Virtex-7(High) BOM

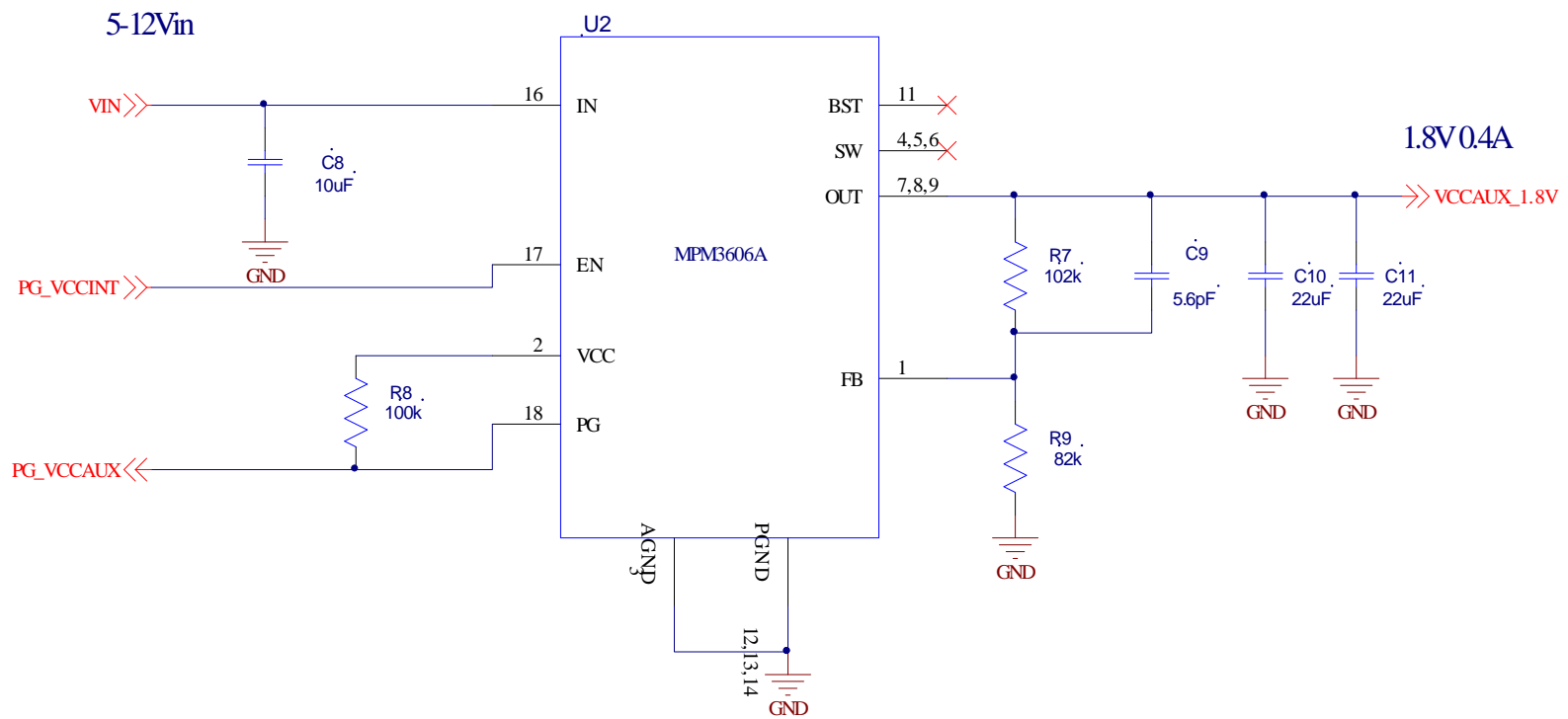
Item	Qty	RefDes	Value	Description	Package	Manufacturer
1	1	C1	220uF	220uF, 25V, 20%,22mOhm ESR	SM8x12mm	Nichicon
2	2	C2, C3	10uF	Capacitor, 25V, X7R, 10%	CAP1206	Murata
3	3	C4, C5, C6	100uF		CAP1206	
4	1	C7	560pF	CAP, 25V, 5%, NP0	CAP0603	Murata
5	2	C8, C12	10uF	Ceramic Cap,25V,X5R	CAP0805	Murata
6	2	C9, C13	5.6pF		CAP0402	
7	4	C10, C11, C14, C15	22uF	Ceramic Cap,16V,X5R	CAP0805	Murata
8	1	R1	300k	Film Res., 1%	RES0603	Yageo
9	2	R2, R4	100k	Film Res., 1%	RES0603	Yageo
10	1	R3	6.49k	Film Res., 1%	RES0603	Yageo
11	2	R6, R8	100k	Film Res., 1%	RES0402	Yageo
12	1	R5	102k	Film Res., 1%	RES0402	Yageo
13	1	R7	82k	Film Res., 1%	RES0402	Yageo
14	1	R9	158k	Film Res., 1%	RES0402	Yageo
15	1	R10	180k	Film Res., 1%	RES0402	Yageo
16	1	U1	MPM3686	18V/20A Power Stage Module	QFN60-12X15mm	MPS
17	1	U2	MPM3606A	Synchronous Step-Down Module Converter	QFN20-3X5mm	MPS
18	1	U3	MPM3620A	Synchronous Step-Down Module Converter	QFN18-2X3.5mm	MPS



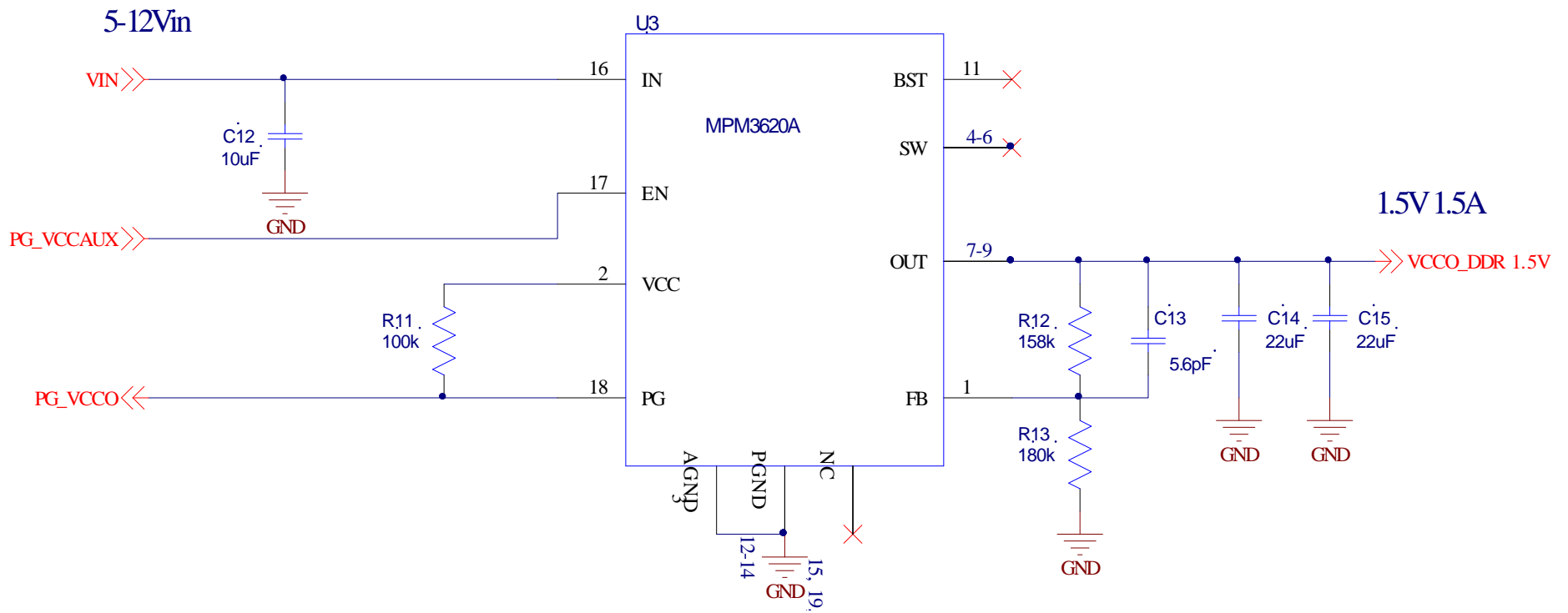
# Virtex-7(Medium) VCCINT/BRAM 1.0V/15A SCH



# Virtex-7(Medium) VCCAUX 1.8V/0.4A SCH



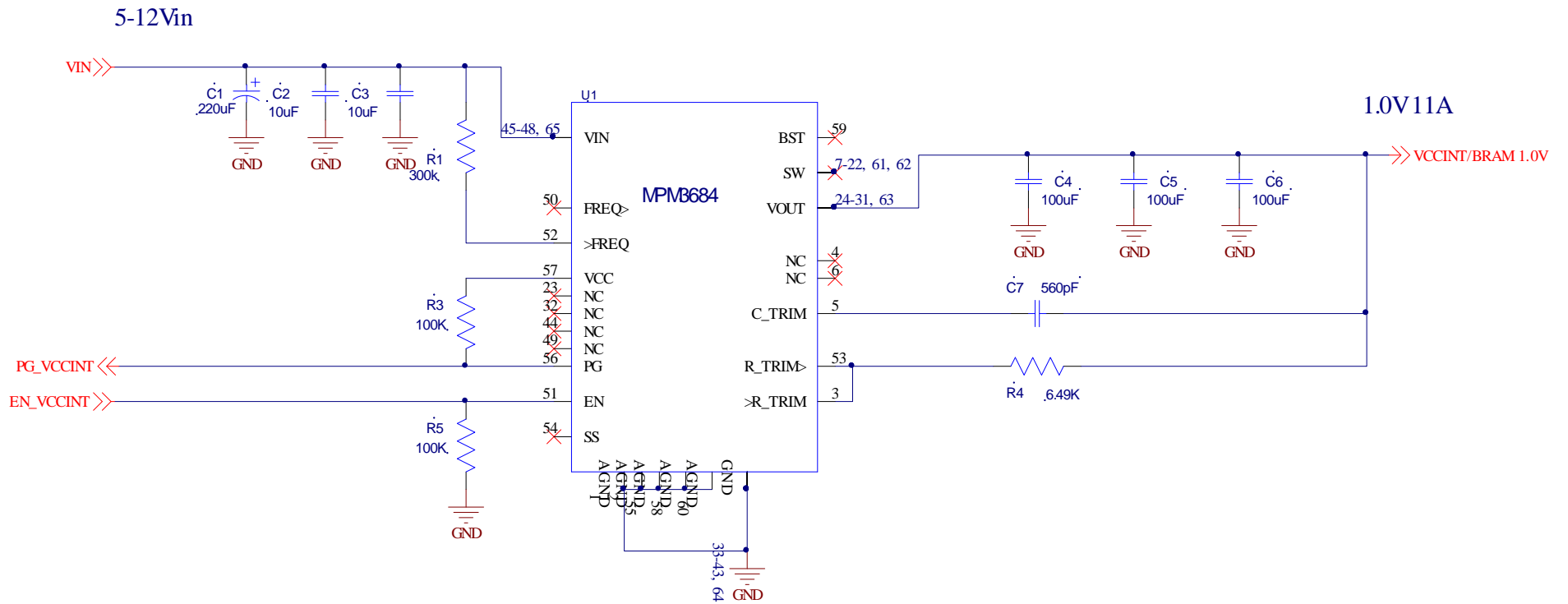
# Virtex-7(Medium) VccoDDR 1.5V/1.5A SCH



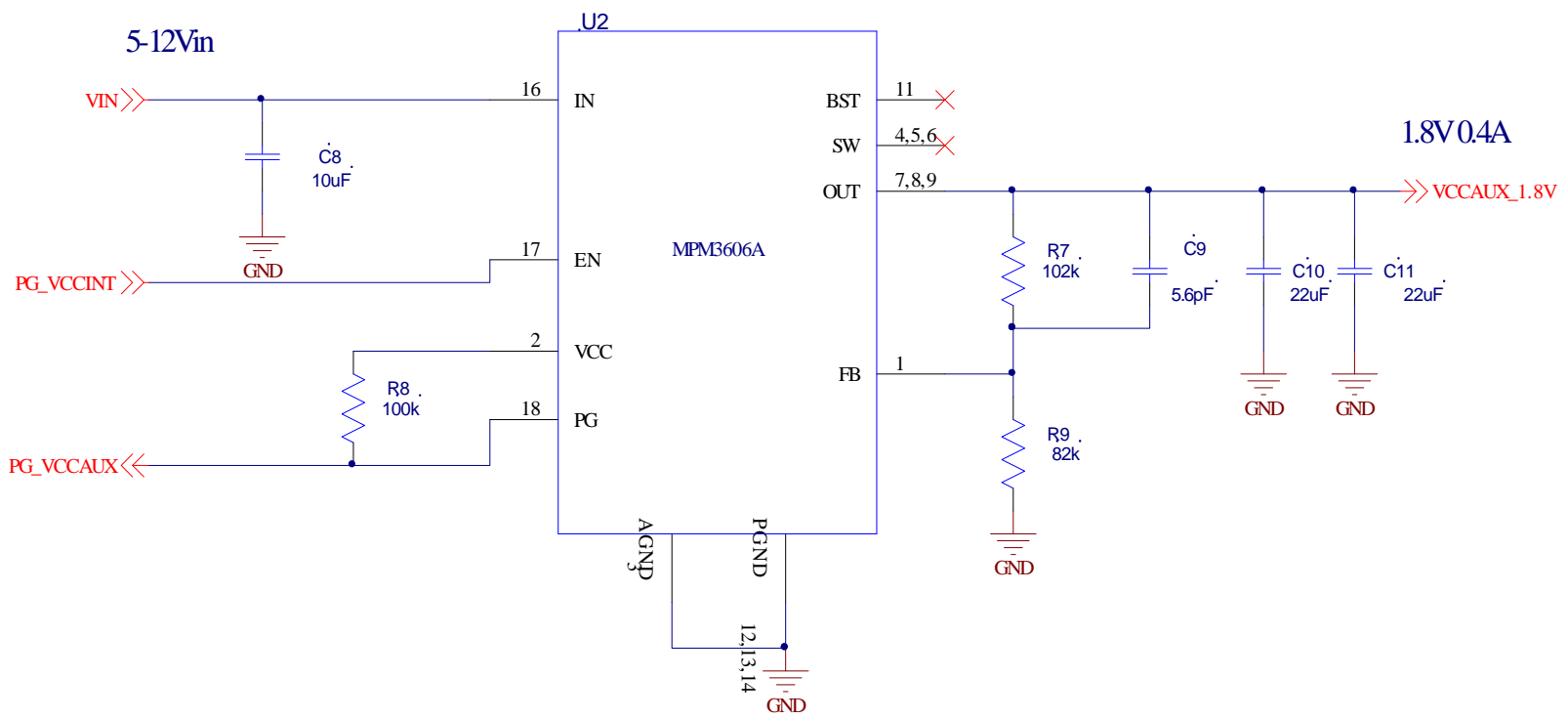
# Virtex-7(Medium) BOM

Item	Qty	RefDes	Value	Description	Package	Manufacturer
1	2	C1, C12	10uF	Ceramic Cap,25V,X5R	CAP0805	Murata
2	2	C2, C13	5.6pF		CAP0402	
3	4	C3, C4, C14, C15	22uF	Ceramic Cap,16V,X5R	CAP0805	Murata
4	1	C5	220uF	220uF, 25V, 20%, 22mOhm ESR	SM8x12mm	Nichicon
5	2	C6, C7	10uF	Capacitor, 25V, X7R,10%	CAP1206	Murata
6	3	C8, C9, C10	100uF		CAP1206	
7	1	C11	560pF	CAP, 25V, 5%, NP0	CAP0603	Murata
8	2	R2, r8	100k	Film Res., 1%	RES0402	Yageo
9	1	R1	102k	Film Res., 1%	RES0402	Yageo
10	1	R3	82k	Film Res., 1%	RES0402	Yageo
11	1	R4	300k	Film Res., 1%	RES0603	Yageo
12	2	R5, R7	100k	Film Res., 1%	RES0603	Yageo
13	1	R6	6.49k	Film Res., 1%	RES0603	Yageo
14	1	R9	158k	Film Res., 1%	RES0402	Yageo
15	1	R10	180k	Film Res., 1%	RES0402	Yageo
16	1	U1	MPM3606A	Synchronous Step-Down Module Converter	QFN20-3X5mm	MPS
17	1	U2	MPM3684	18V/15A Power Stage Module	QFN60-12X15mm	MPS
18	1	U3	MPM3620A	Synchronous Step-Down Module Converter	QFN18-2X3.5mm	MPS

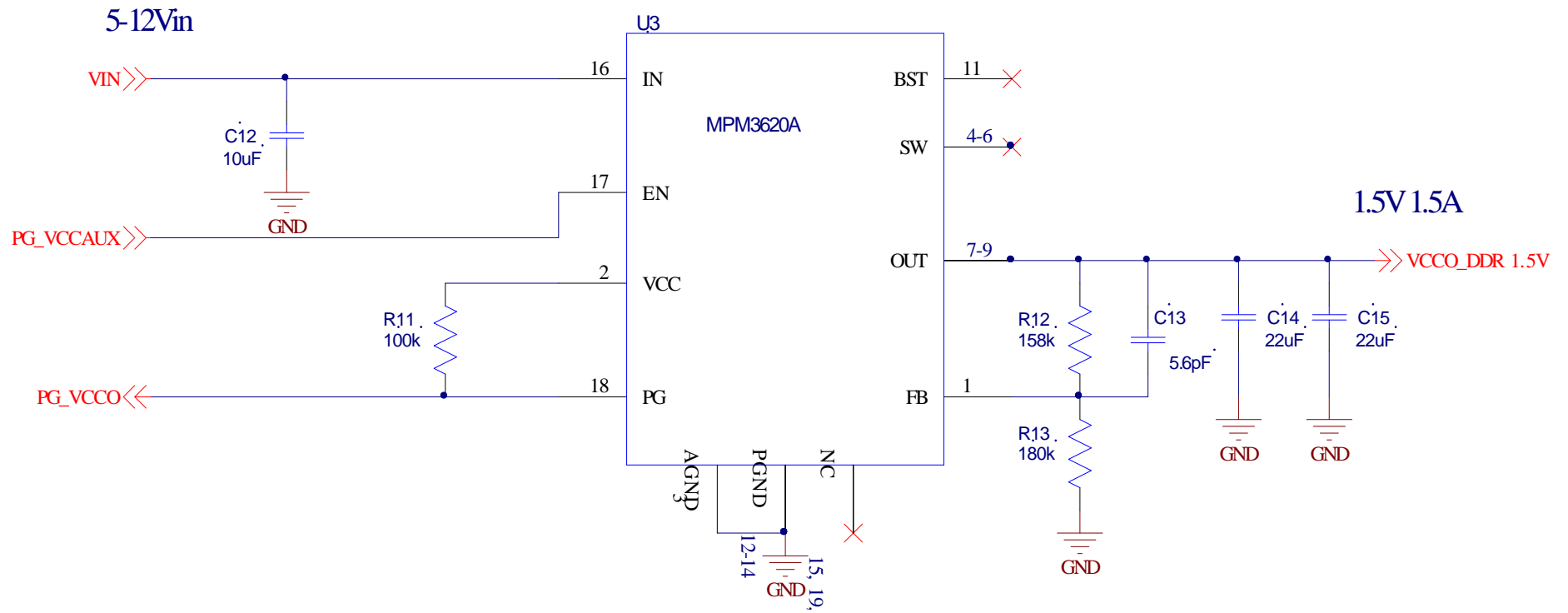
# Virtex-7(Low) VCCINT/BRAM 1.0V/11A SCH



# Virtex-7(Low) VCCAUX 1.8V/0.4A SCH



# Virtex-7(Low) VccoDDR 1.5V/1.5A SCH



# Virtex-7(Low) BOM

Item	Qty	RefDes	Value	Description	Package	Manufacturer
1	1	C1	220uF	220uF, 25V, 20%, 22mOhm ESR	SM8x12mm	Nichicon
2	2	C2, C3	10uF	Capacitor, 25V, X7R, 10%	CAP1206	Murata
3	3	C4, C5, C6	100uF		CAP1206	
4	1	C7	560pF	CAP, 25V, 5%, NP0	CAP0603	Murata
5	2	C8, C12	10uF	Ceramic Cap, 25V, X5R	CAP0805	Murata
6	2	C9, C13	5.6pF		CAP0402	
7	4	C10, C11, C14, C15	22uF	Ceramic Cap, 16V, X5R	CAP0805	Murata
8	1	R1	300k	Film Res., 1%	RES0603	Yageo
9	2	R2, R4	100k	Film Res., 1%	RES0603	Yageo
10	1	R3	6.49k	Film Res., 1%	RES0603	Yageo
11	2	R6, R8	100k	Film Res., 1%	RES0402	Yageo
12	1	R5	102k	Film Res., 1%	RES0402	Yageo
13	1	R7	82k	Film Res., 1%	RES0402	Yageo
14	1	R9	158k	Film Res., 1%	RES0402	Yageo
15	1	R10	180k	Film Res., 1%	RES0402	Yageo
16	1	U1	MPM3684	18V/15A Power Stage Module	QFN60-12X15mm	MPS
17	1	U2	MPM3606A	Synchronous Step-Down Module Converter	QFN20-3X5mm	MPS
18	1	U3	MPM3620A	Synchronous Step-Down Module Converter	QFN18-2X3.5mm	MPS

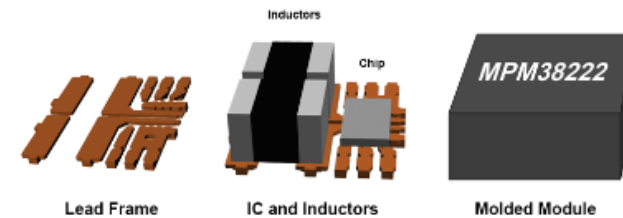


# MPS Power Modules

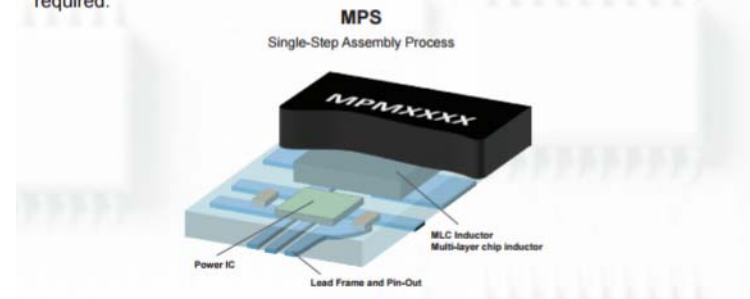
## Product Overview

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.

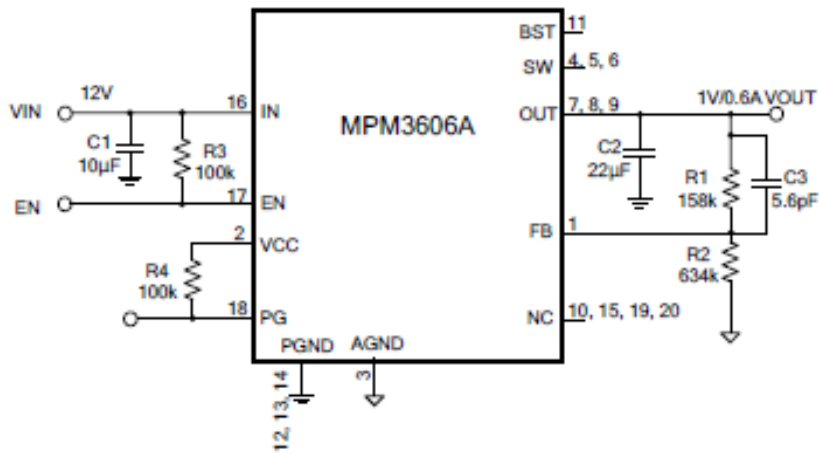
- Benefits
  - Ease of design
  - Simple manufacturing
  - Small footprint
  - High performance
  - Cost effective
  - Short Time-to-Market



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.

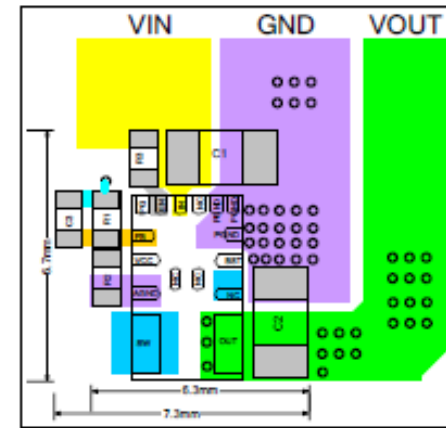


# Layout Example – MPM3606A/MPM3610A/3620A/3630

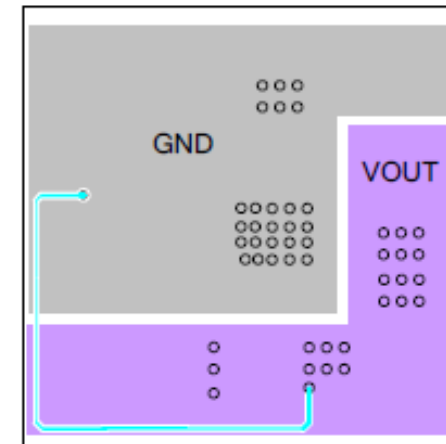


- Solution footprint: 52mm<sup>2</sup>
- External Components:7
- MPM3606A/3610A/3620A/3630 Pin Compatible

## Layout guidelines

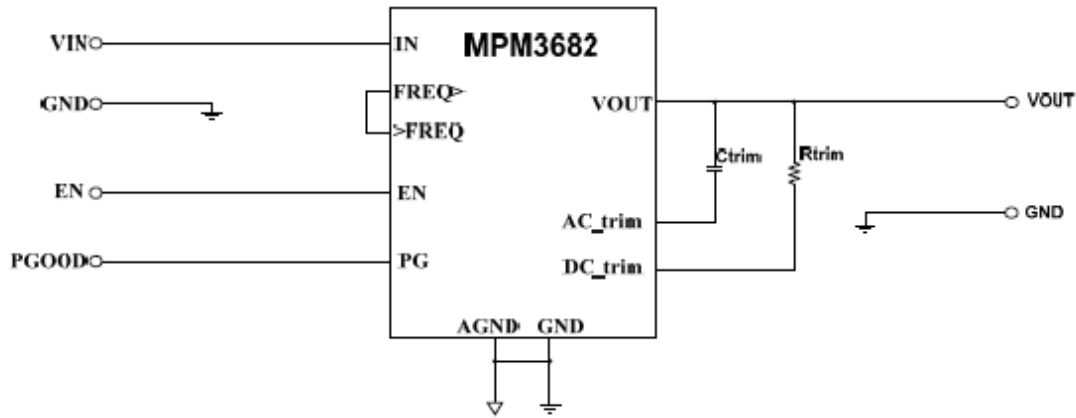


Top Layer



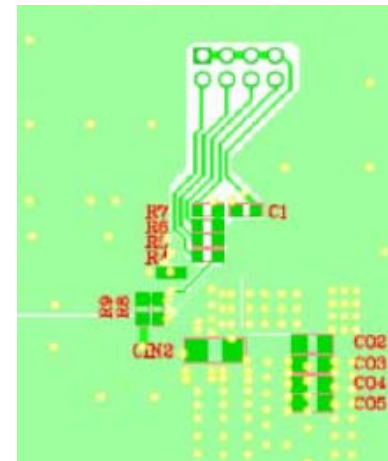
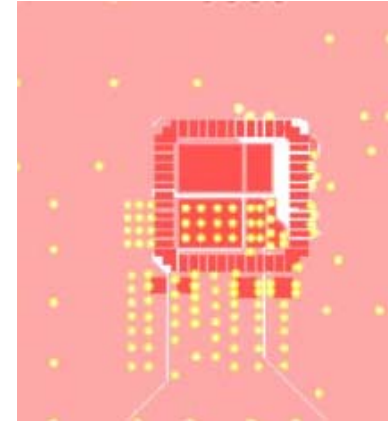
Bottom Layer

## Layout Example – MPM3680/MPM3682

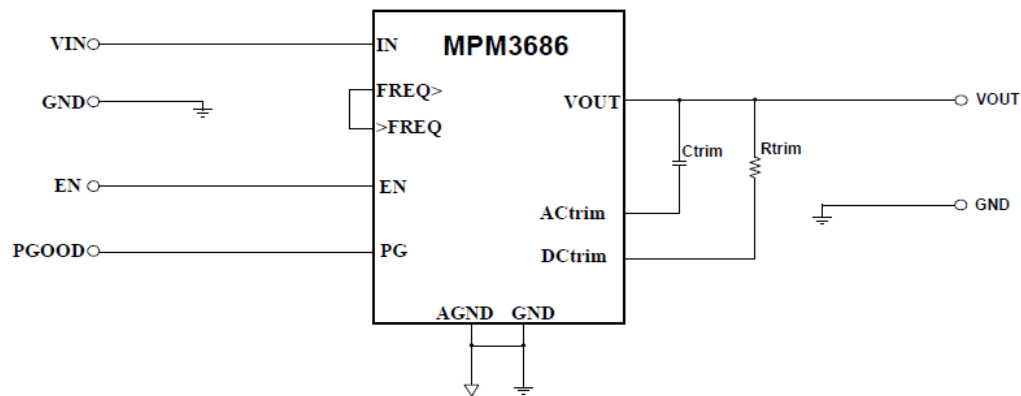


- Solution footprint: 164mm<sup>2</sup>
- External Components: 8
- MPM3680/3682 Pin Compatible

## Layout guidelines



## Layout Example – MPM3684/MPM3686



- Solution footprint: 200mm<sup>2</sup>
- External Components: 12
- MPM3684/3686 Pin Compatible

## Layout guidelines

