



VERSAL Module Solution

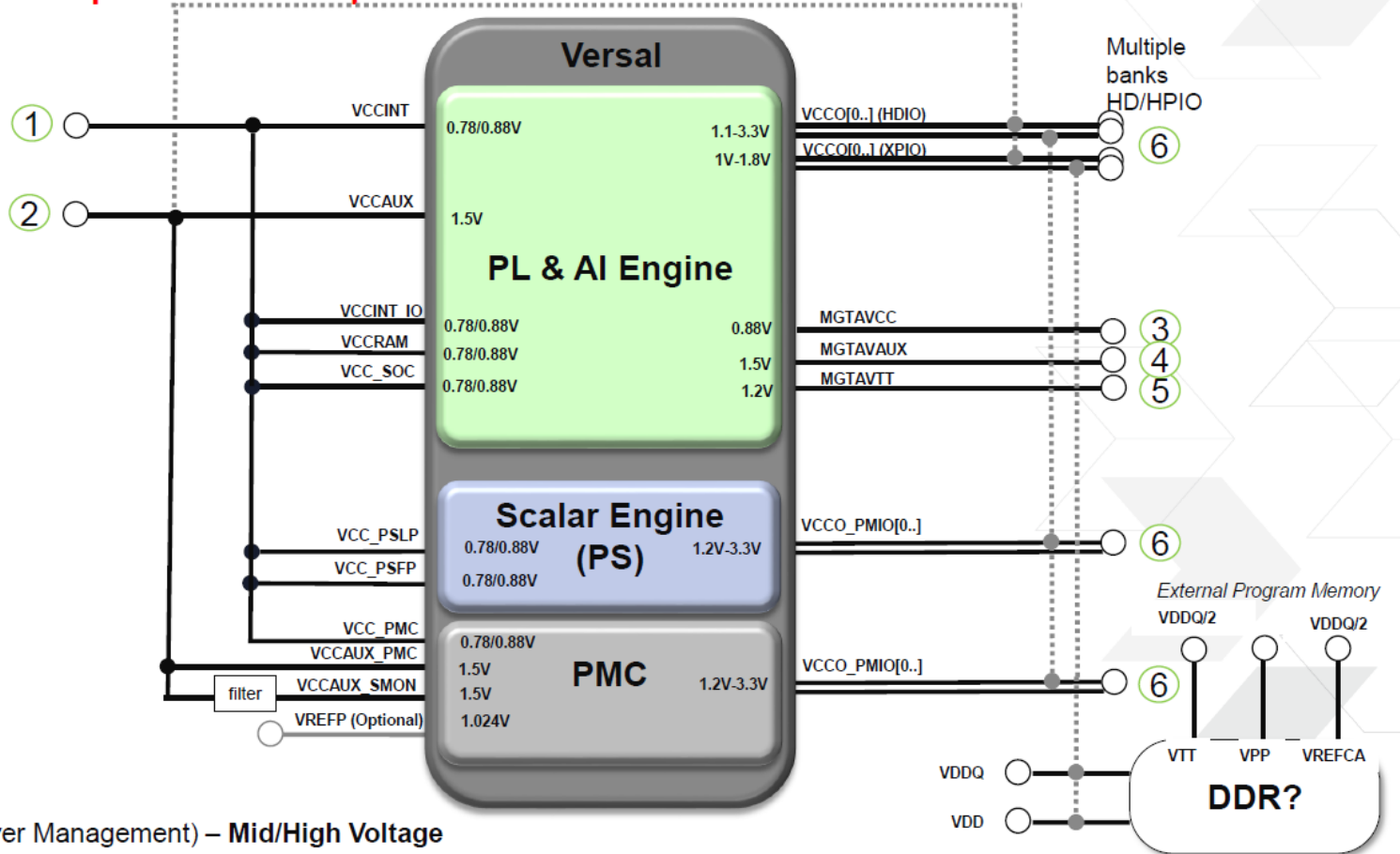
May 01, 2019

MPS[®]
Simple, Easy Solutions™

VERSAL - UC1, UC2
UC1- Always ON, Optimized for cost
UC3 – Always ON, Optimized for PL performance

VERSAL UC1, UC3

UC1: Always on - Optimized for cost
 UC3: Always on - Optimized for PL performance



Minimum Rails (No Power Management) – Mid/High Voltage

MPS solutions for VERSAL UC1,UC3

Always ON, Optimized for cost & performance

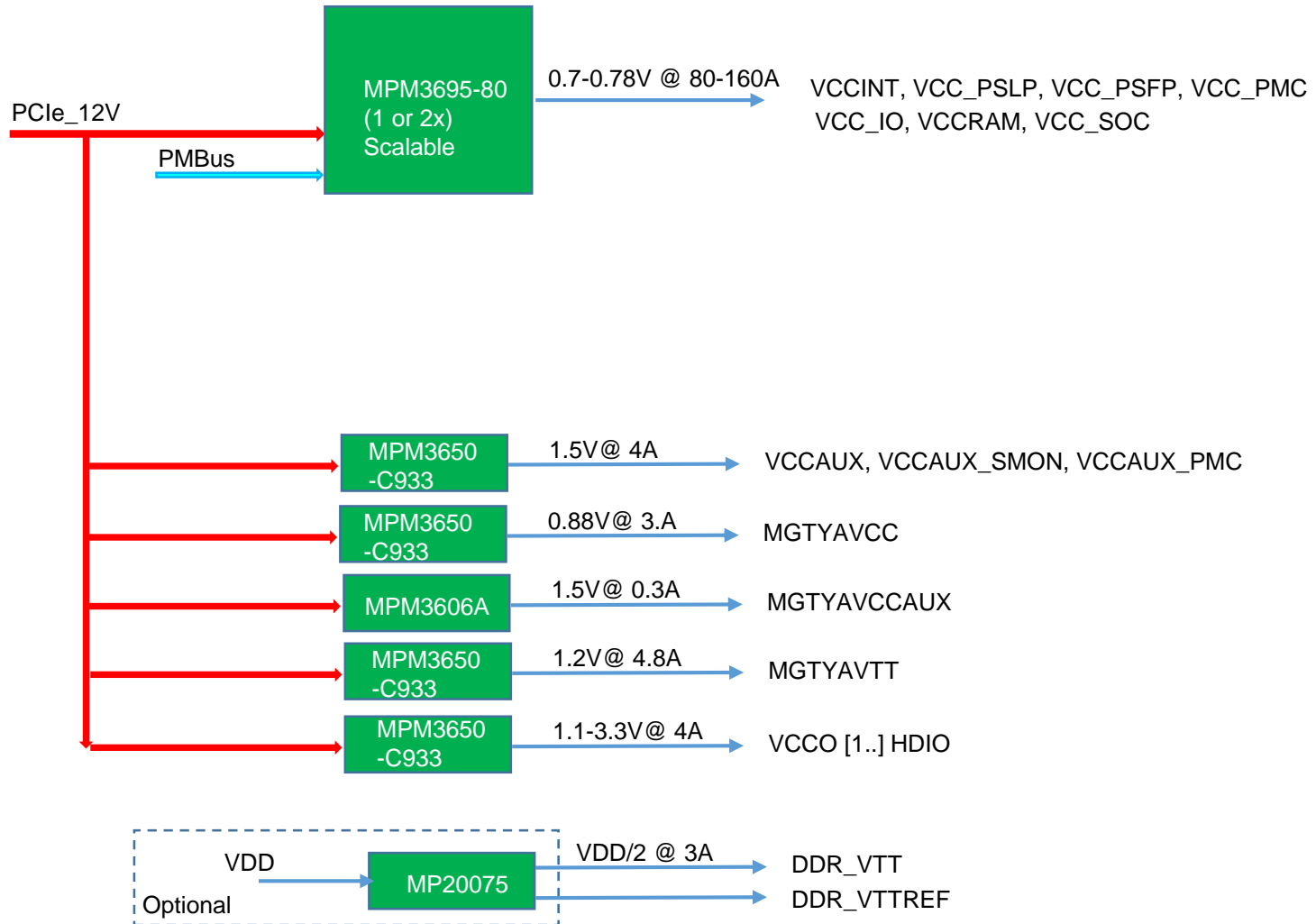
Module (Smallest pcb area)

Rail	Power Rail	Vin (V)	Vout (V)	Tolerance (%)	Iout (A)	MPS part#	Area (mm2)	Efficiency	PMBus/I2C
Rail1	VCCINT, VCC_PSLP, VCC_PSFP, VCC_PMC VCC_IO, VCCRAM, VCC_SOC	12	0.8	3%	160	MPM3695-80 (2x)	900	85%	yes
Rail2	VCCAUX, VCCAUX_SMON, VCCAUX_PMC	12	1.5	3%	3.9	MPM3650-C933	76	88%	no
Rail3	MGTYAVCC	12	0.88	3%	3.1	MPM3650-C933	76	83%	no
Rail4	MGTYAUAUX	12	1.5	3%	0.3	MPM3606A	35	70%	no
Rail5	MGTYAVTT	12	1.2	3%	4.8	MPM3650-C933	76	84%	no
Rail6	VCCO [1..] HDIO - 1.1V-3.3V	12	1.8	5%	4	MPM3650-C933	76	88%	no
Total							1239	85.1%	

Please contact MPS for pricing

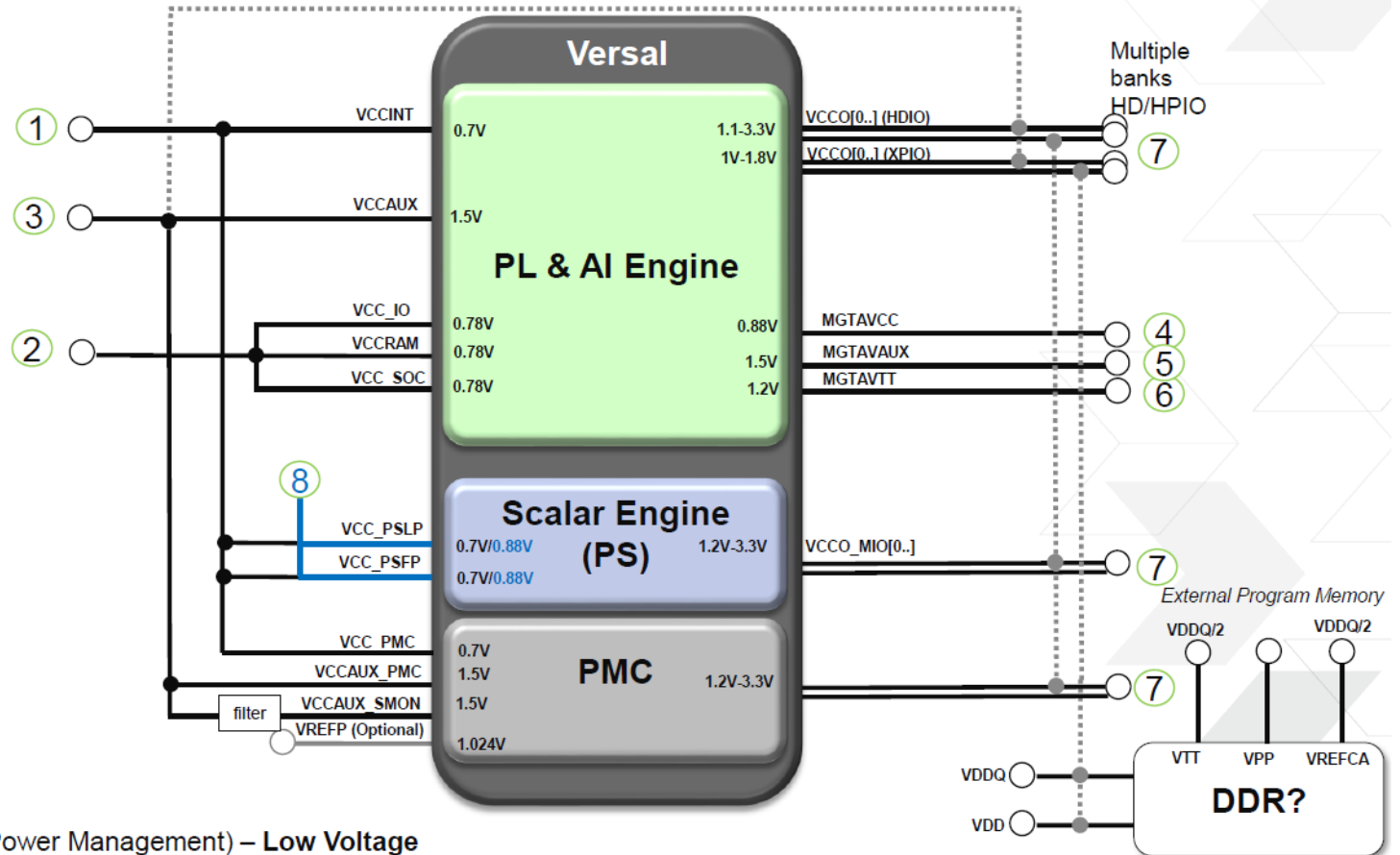
VERSAL UC1,UC3

Smallest size



VERSAL – UC2
UC2- Always ON, Optimized for Efficiency

UC2 – Always On, Optimized for Efficiency



Minimum Rails (No Power Management) – Low Voltage

MPS solutions for VERSAL UC2

Always ON, Optimized for Power/efficiency

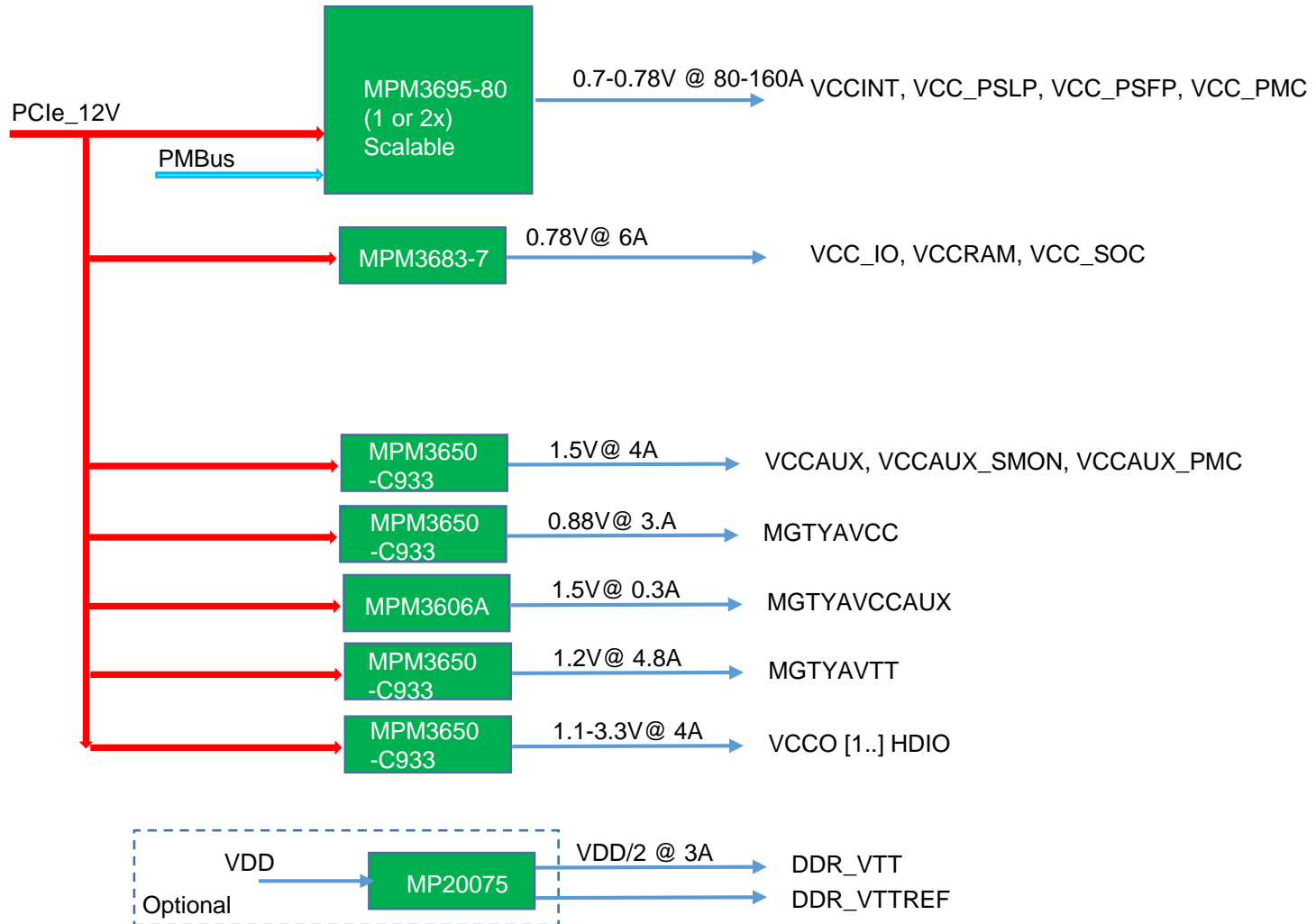
Module (Smallest pcb area)

Rail	Power Rail	Vin (V)	Vout (V)	Tolerance (%)	Iout (A)	MPS part#	Area (mm2)	Efficiency	PMBus/I2C
Rail1	VCCINT, VCC_PSLP, VCC_PSFP, VCC_PMC	12	0.7	3%	160	MPM3695-80 (2x)	900	85%	yes
Rail2	VCC_IO, VCCRAM, VCC_SOC	12	0.78	3%	6	MPM3683-7	80	86%	no
Rail3	VCCAUX, VCCAUX_SMON, VCCAUX_PMC	12	1.5	3%	3.9	MPM3650-C933	76	88%	no
Rail4	MGTYAVCC	12	0.88	3%	3.1	MPM3650-C933	76	83%	no
Rail5	MGTYAUAUX	12	1.5	3%	0.3	MPM3606A	35	70%	no
Rail6	MGTYAVTT	12	1.2	3%	4.8	MPM3650-C933	76	84%	no
Rail7	VCCO [1..] HDIO - 1.1V-3.3V	12	1.8	5%	4	MPM3650-C933	76	88%	no
Total							1319	85.2%	

Please contact MPS for pricing

VERSAL UC2

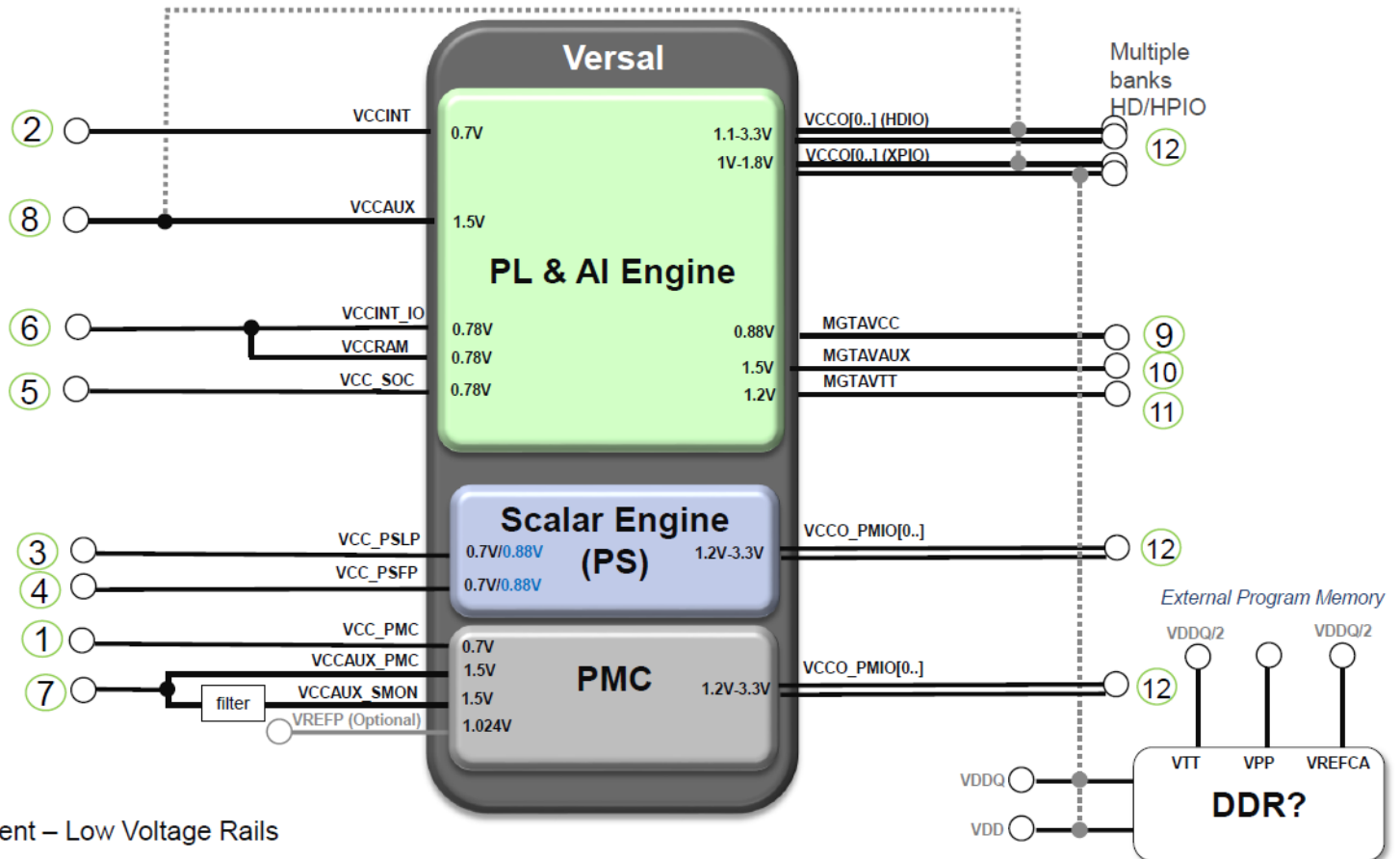
Smallest size



VERSAL – UC4

UC4- Full Power Management Flexibility

UC4 - Full Power Management Flexibility – Low Voltage



Full Power Management – Low Voltage Rails

MPS solutions for VERSAL UC4

UC4 – Full Power Management Flexibility

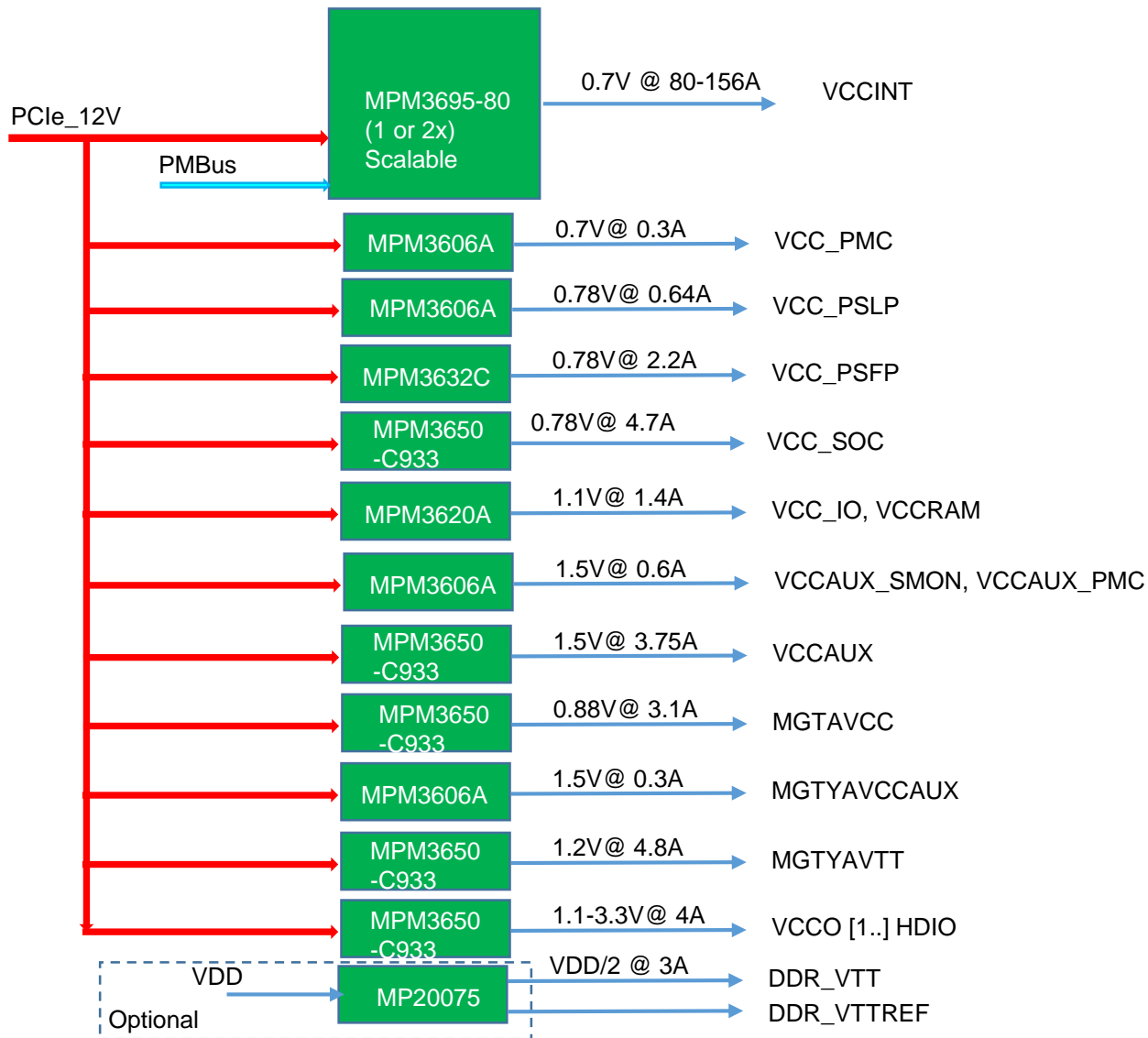
Module (Smallest pcb area)

Rail	Power Rail	Vin (V)	Vout (V)	Tolerance (%)	Iout (A)	MPS part#	Area (mm ²)	Efficiency	PMBus/I ² C
Rail1	VCC_PMC	12	0.7	3%	0.3	MPM3606A	35	70%	no
Rail2	VCCINT	12	0.7	3%	156	MPM3695-80 (2x)	900	85%	yes
Rail3	VCC_PSLP	12	0.78	3%	0.64	MPM3606A	35	70%	no
Rail4	VCC_PSFPP	12	0.78	3%	2.2	MPM3632C	55	78%	no
Rail5	VCC_SOC	12	0.78	3%	4.7	MPM3650-C933	76	83%	no
Rail6	VCC_IO, VCCRAM	12	1.1	3%	1.4	MPM3620A	35	75%	no
Rail7	VCCAUX_SMON, VCCAUX_PMC	12	1.5	3%	0.16	MPM3606A	35	75%	no
Rail8	VCCAUX	12	1.5	3%	3.75	MPM3650-C933	76	88%	no
Rail9	MGTYAVCC	12	0.88	3%	3.1	MPM3650-C933	76	83%	no
Rail10	MGTYAVAUX	12	1.5	3%	0.3	MPM3606A	35	70%	no
Rail11	MGTYAVTT	12	1.2	3%	4.8	MPM3650-C933	76	84%	no
Rail12	VCCO [1..] HDIO - 1.1V-3.3V	12	1.8	5%	4	MPM3650-C933	76	88%	no
Total							1510	84.7%	

Please contact MPS for pricing

VERSAL UC4

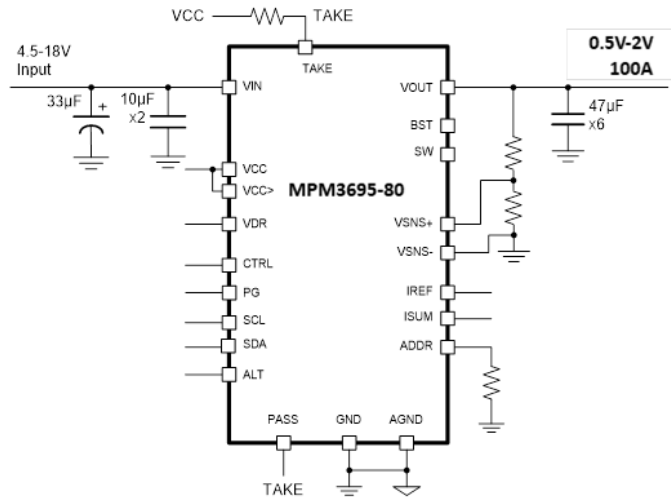
Smallest size



Modules

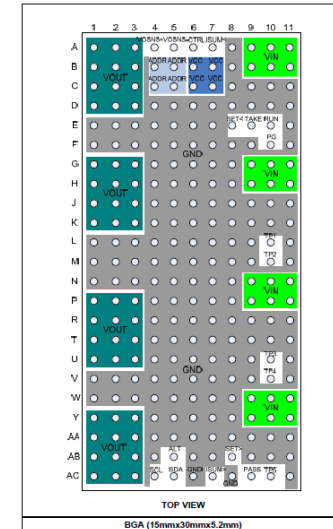
- MPM3695-80
- MPM3683-7
- MPM3650
- MPM3632C
- MPM3620A
- MPM3606A

Schematics

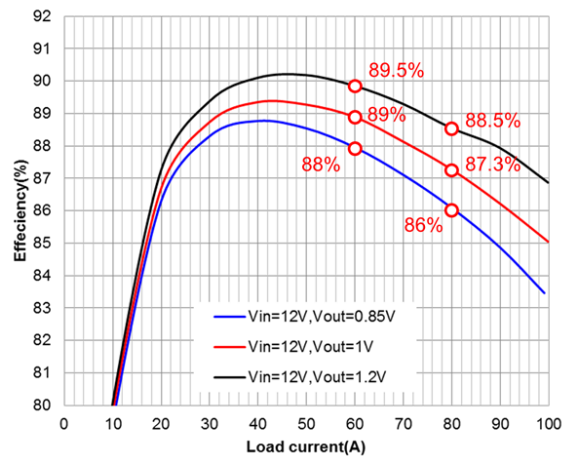


Typical Application Circuit

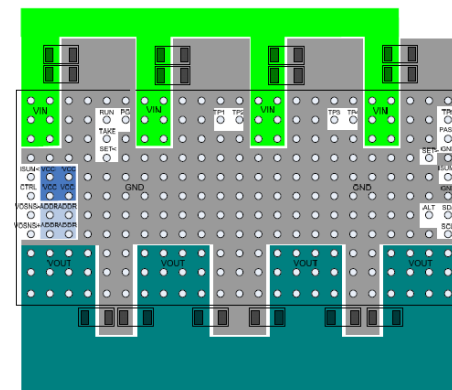
Package



Efficiency



Layout

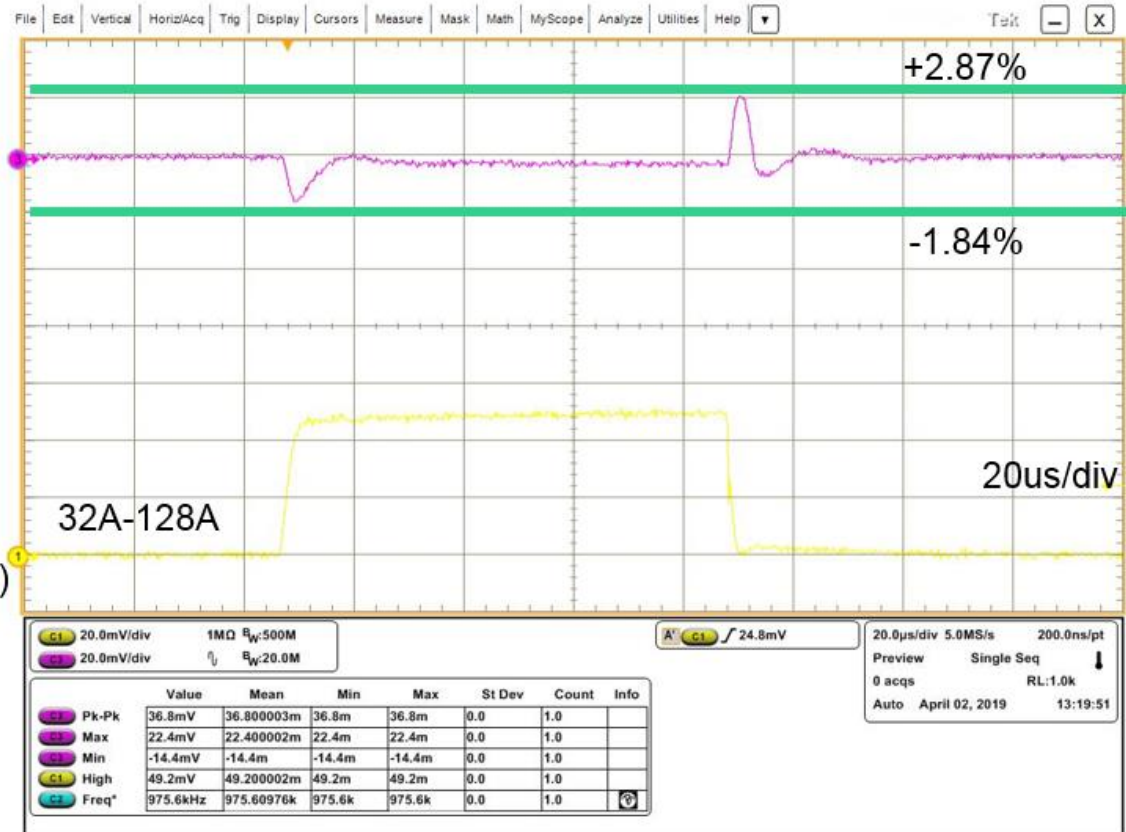


MPM3695-80 Transient performance

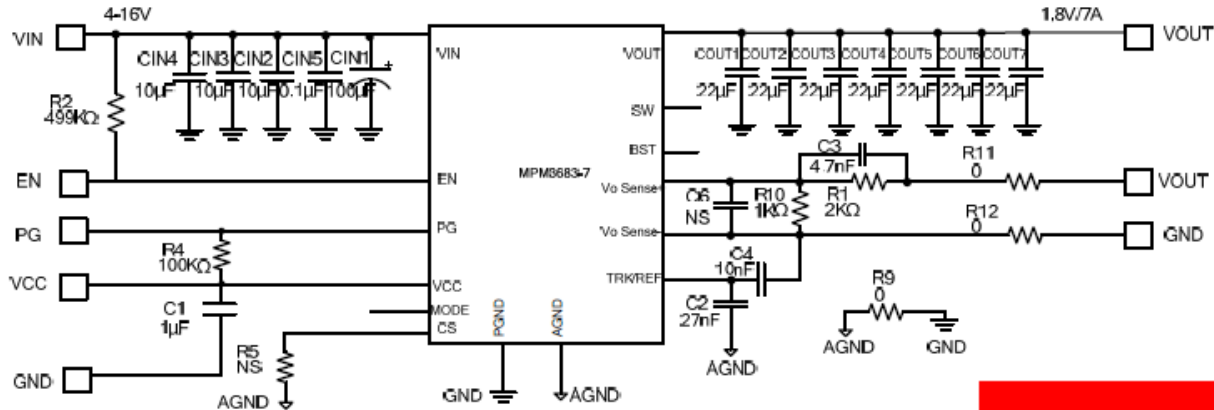
Parameter	Value
Input voltage	12V
Output voltage	0.78V
Transient load step	96A
Slew rate	100A/us
Switching frequency	600kHz
Number of power modules	2
Maximum output current	200A
Ceramic output capacitor	47uFx16 per module 6.3V 0805
SP-Cap output capacitor	220uFx8 total

VOUT/AC
(20mV/div)

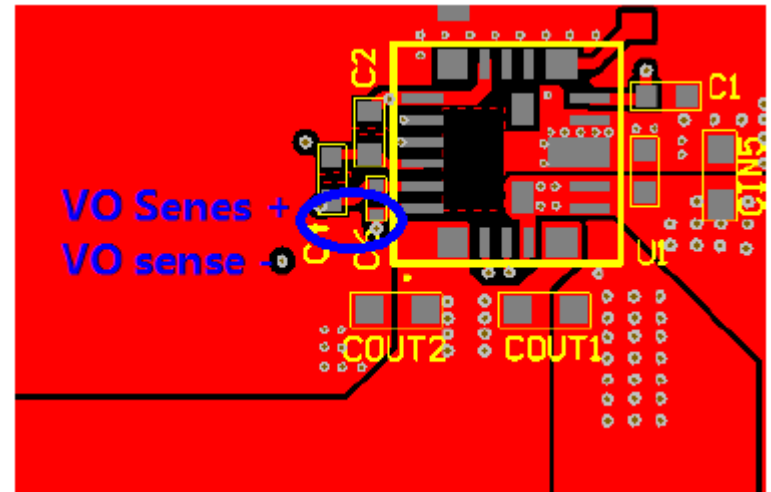
IOUT
(0.5mV/A)



Schematics

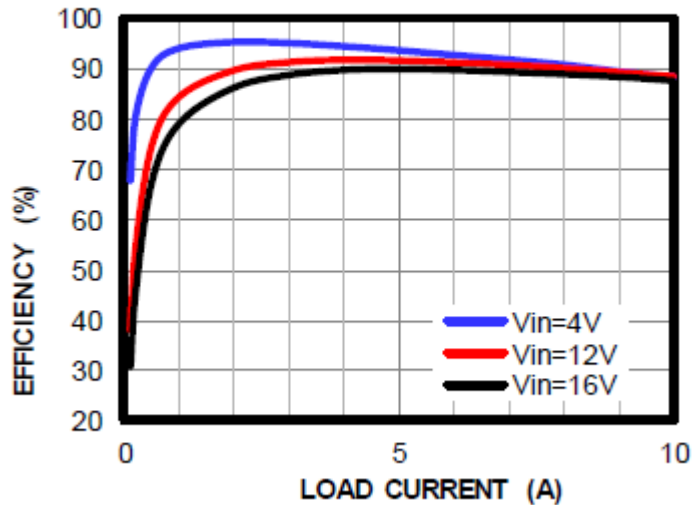


Layout guidelines

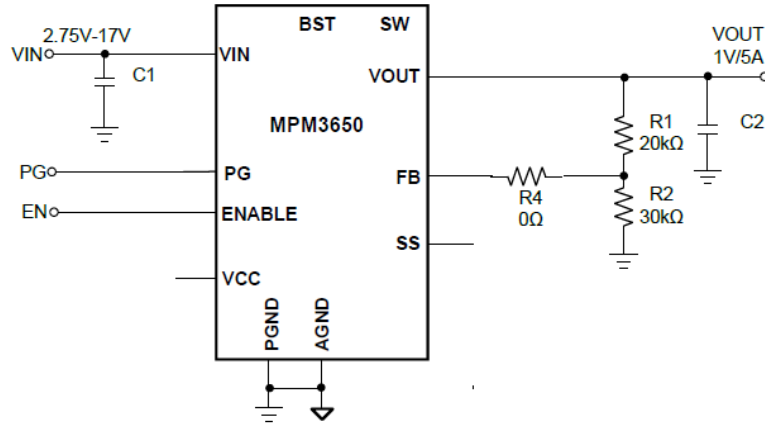


Efficiency

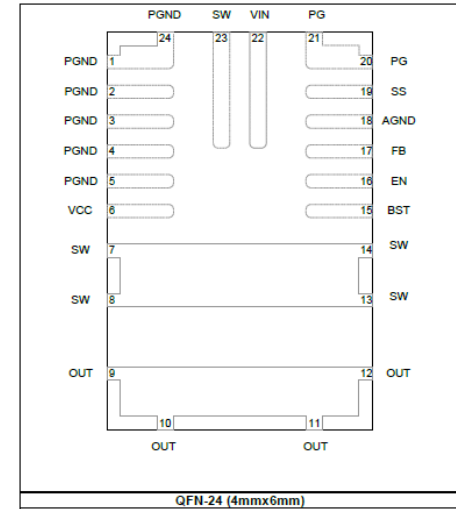
$V_{IN}=4V/12V/16V, V_{OUT}=1.8V, I_{OUT}=0-10A$



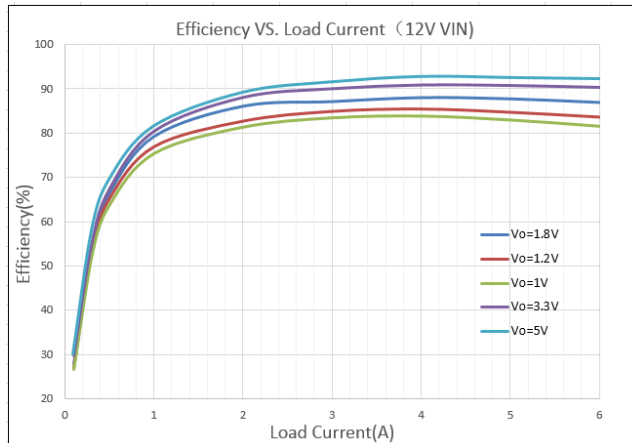
Schematics



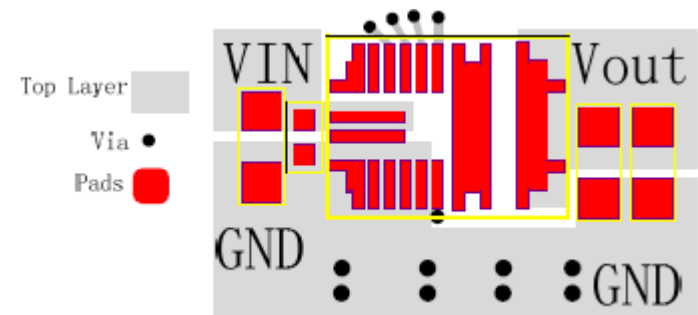
Package



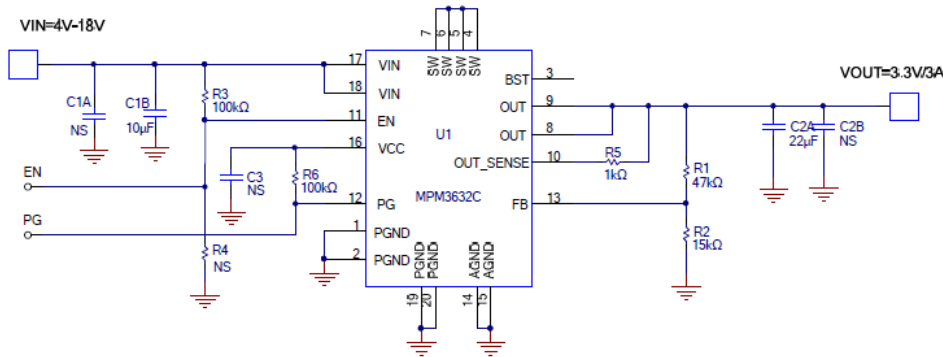
Efficiency



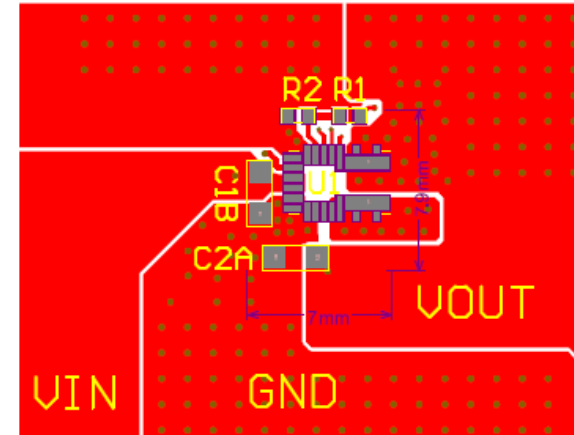
Layout



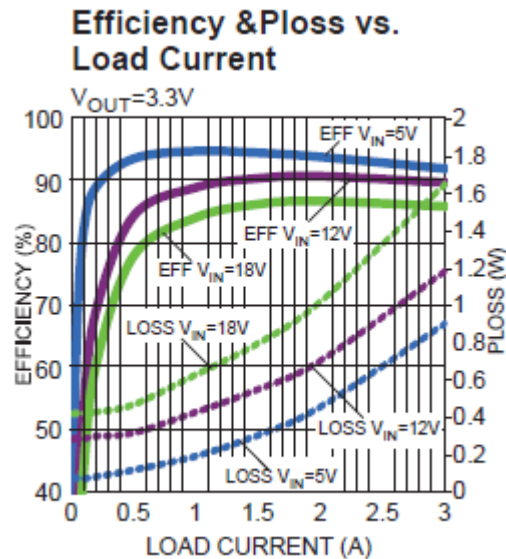
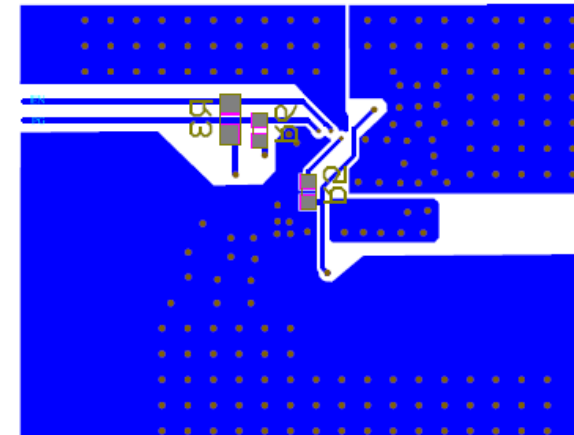
Schematics



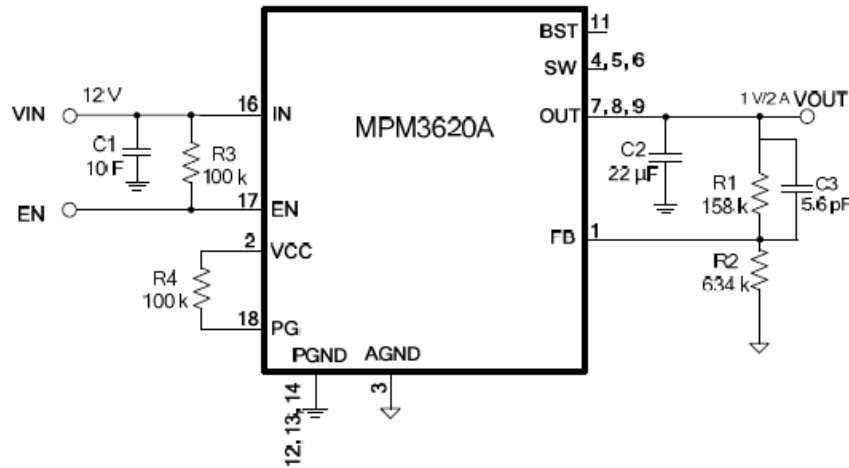
Layout guidelines



Top Layer

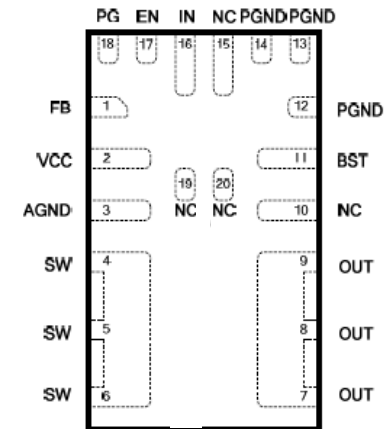


Schematics

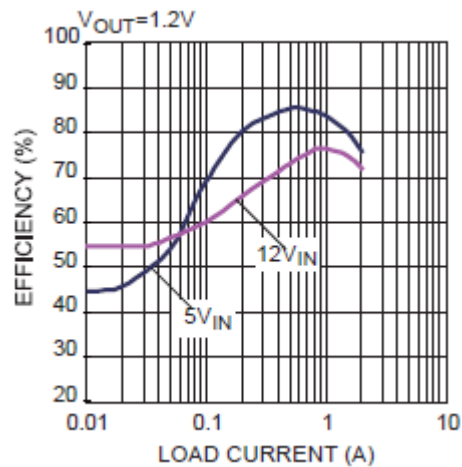


Package

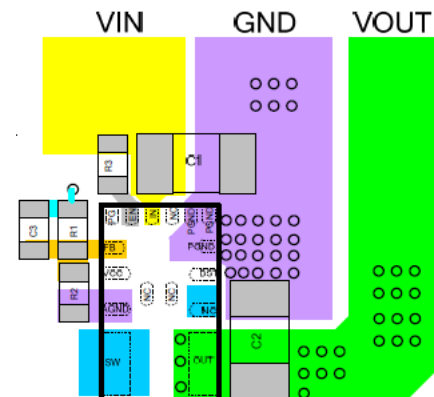
TOP VIEW



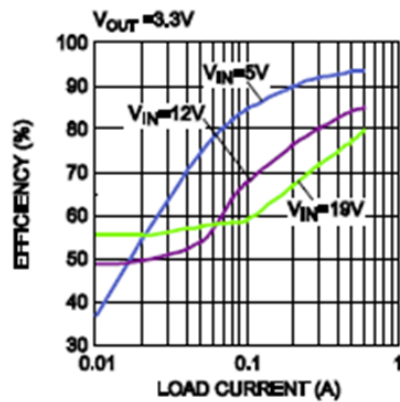
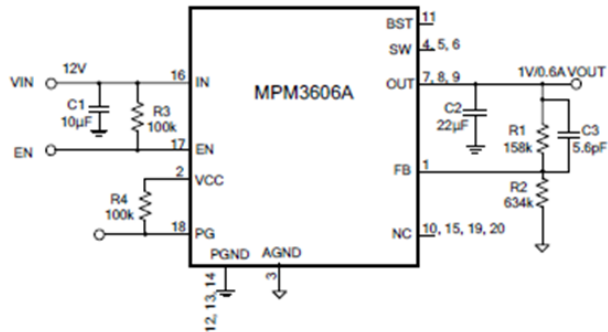
Efficiency



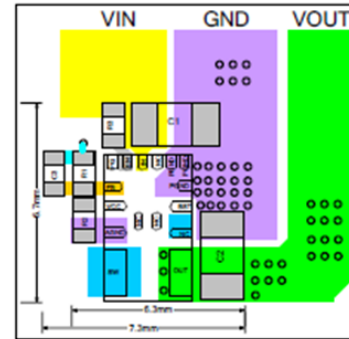
Layout



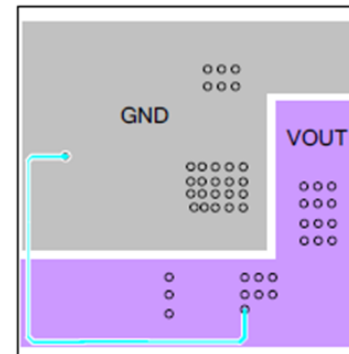
Schematics (Typical)



Layout guidelines



Top Layer



Bottom Layer

- Solution footprint: 32mm²
- External Components: 7

MPS Contact Information

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MPS Reference Design Team at referencedesign@monolithicpower.com

For general information

<http://www.monolithicpower.com>