

Features

- AmPMIC enables programmable custom PMIC
- Integrate application targeted Power Components
- Power Blocks for a variety of topologies
 - Scalable Integrated N-channel MOSFETs (SIM)
 - Current sense for protection, telemetry, regulation
 - Build Switching topologies - Buck, Boost, Buck-Boost
 - Build Linear topologies - LDO, Load Switch
 - Build Mixed topologies - Battery Charger
 - Build BLDC topologies - H-Bridge
- Sensor Blocks, sensing voltages and currents
 - Regulation, protection and telemetry
 - Adaptive Digitizer (ADi)
 - Threshold Comparators (ThC)
- Summation AMplifier (SuM)
- Noise-Immune Reference (Nref) Array
- Analog fabric connectivity for sensor signals
- Digital μ Logic fabric connectivity: Analog/Digital Blocks
 - Analog and Digital GPIOs, LUTs for logic & Interface
 - Integrated Compensator RAM (CRAM)
 - On-demand POL control loops and interfaces
 - Precision Modulation Timer Array
- Industry first: Analog Proficiency - Digital Flexibility

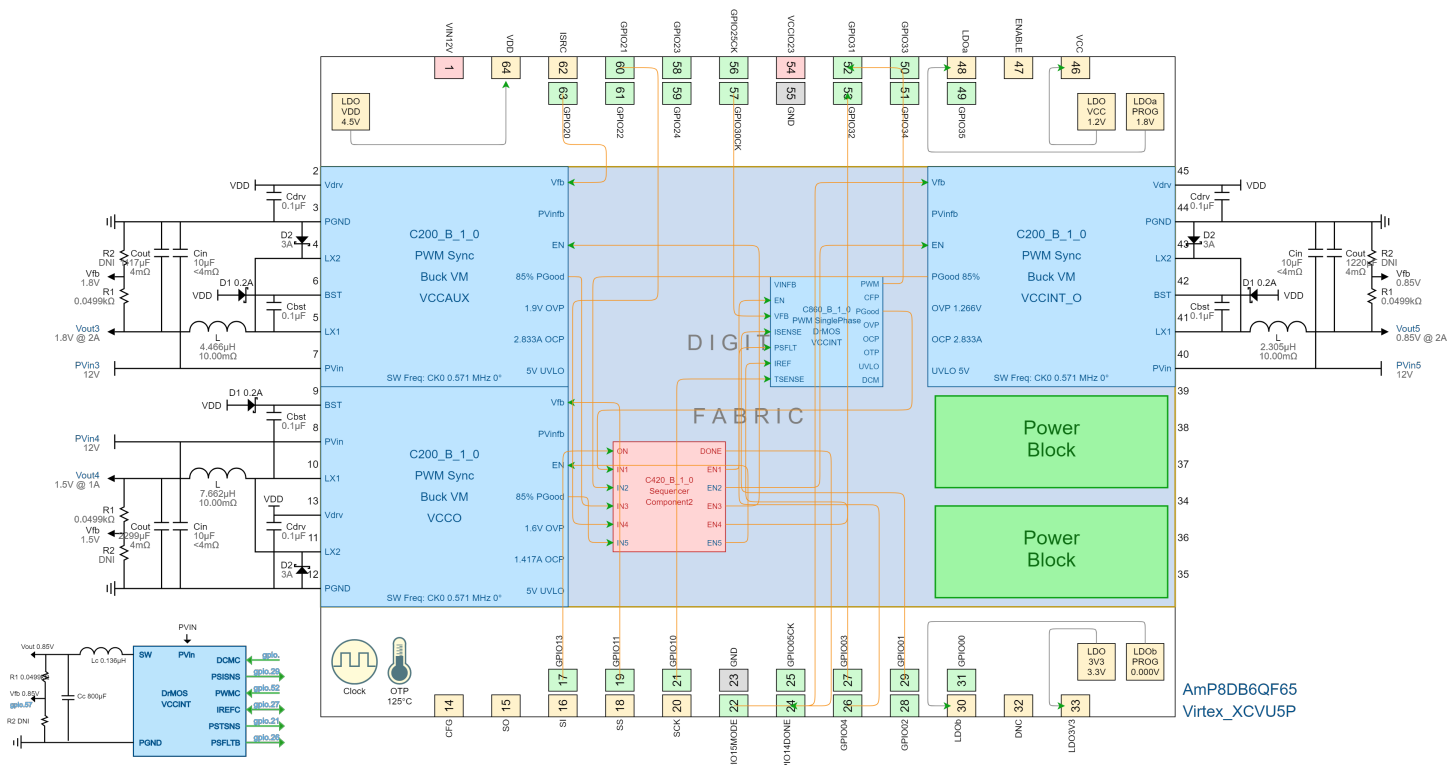
Order Information

Part Number	Package	Body Size
AmP8DB6QF65	QF65	5x5

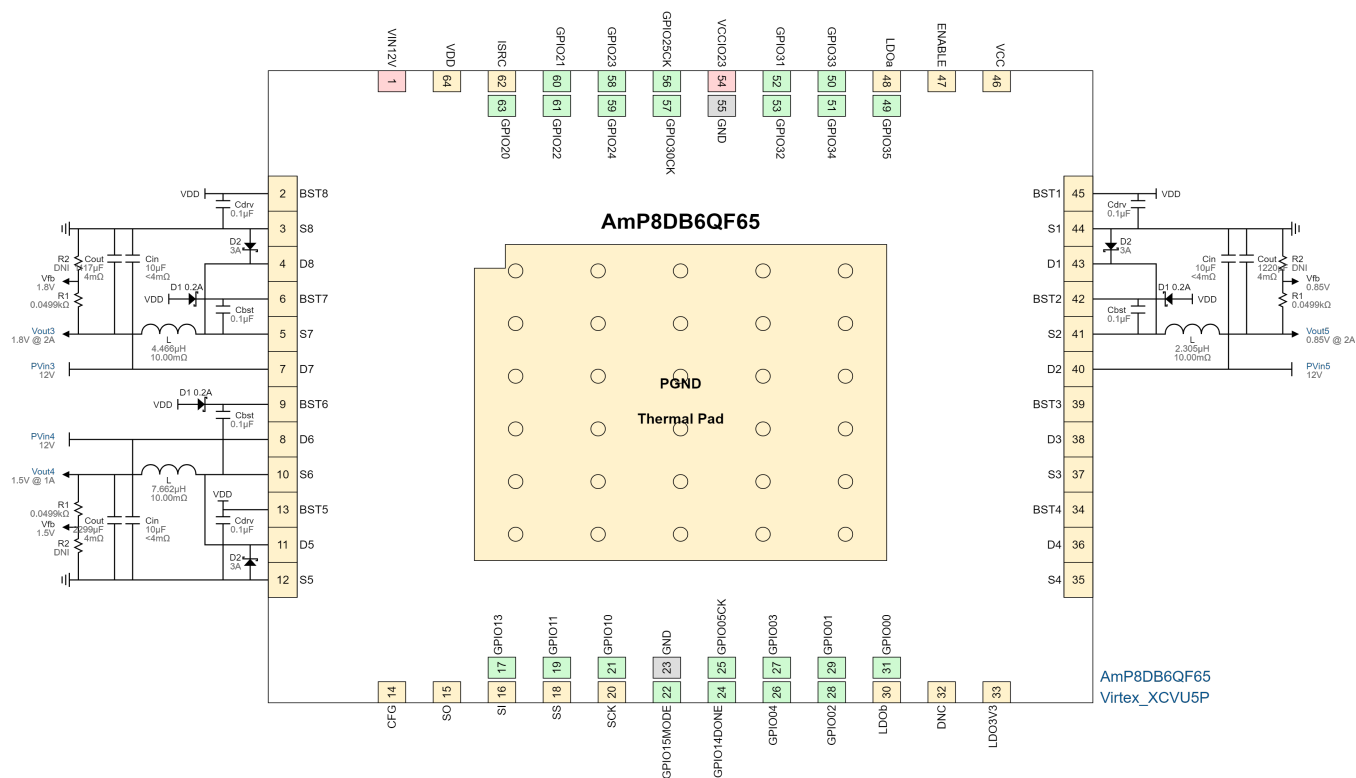
Power Component Summary

Category	Function	Part	Series	Name	Key Parameter
PWM Switching Regulator	PWM Sync Buck VM	C200_B_1_0	Pro	VCCAUX	1.8V@2A
PWM Switching Regulator	PWM Sync Buck VM	C200_B_1_0	Pro	VCCO	1.5V@1A
PWM Switching Regulator	PWM Sync Buck VM	C200_B_1_0	Pro	VCCINT_O	0.85V@2A
DrMos Controller	PWM SinglePhase DrMOS	C860_B_1_0	Pro	VCCINT	0.85V@34A
Supervisor	Sequencer	C420_B_1_0	Pro	Component2	

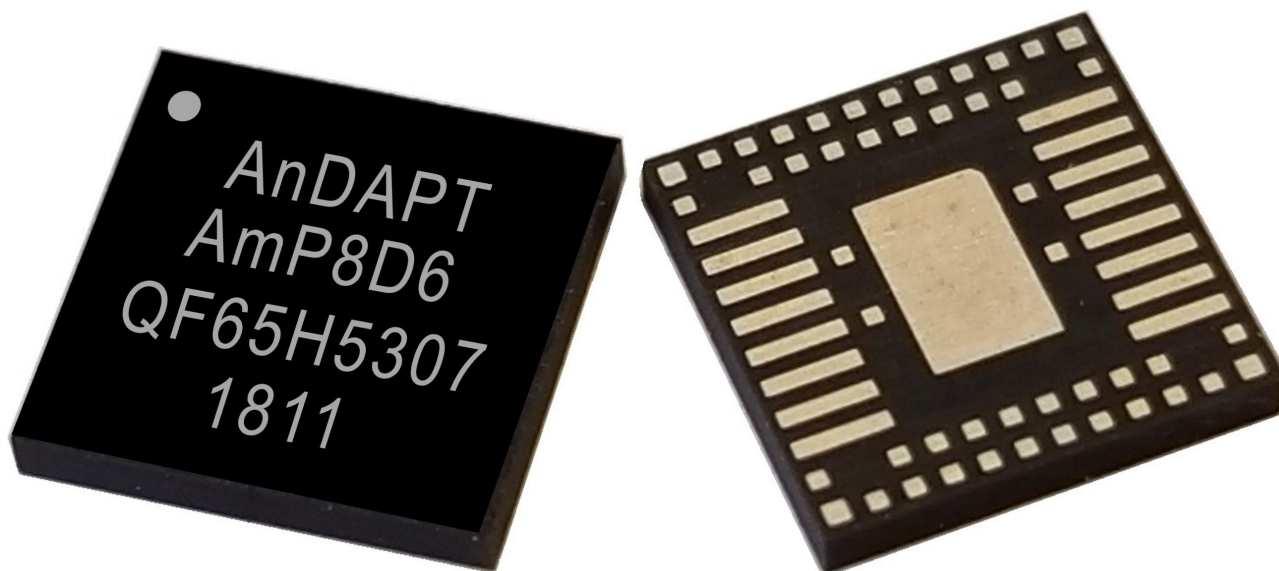
Power Component View



Package Top View (Pin and Thermal Pads are on bottom side)



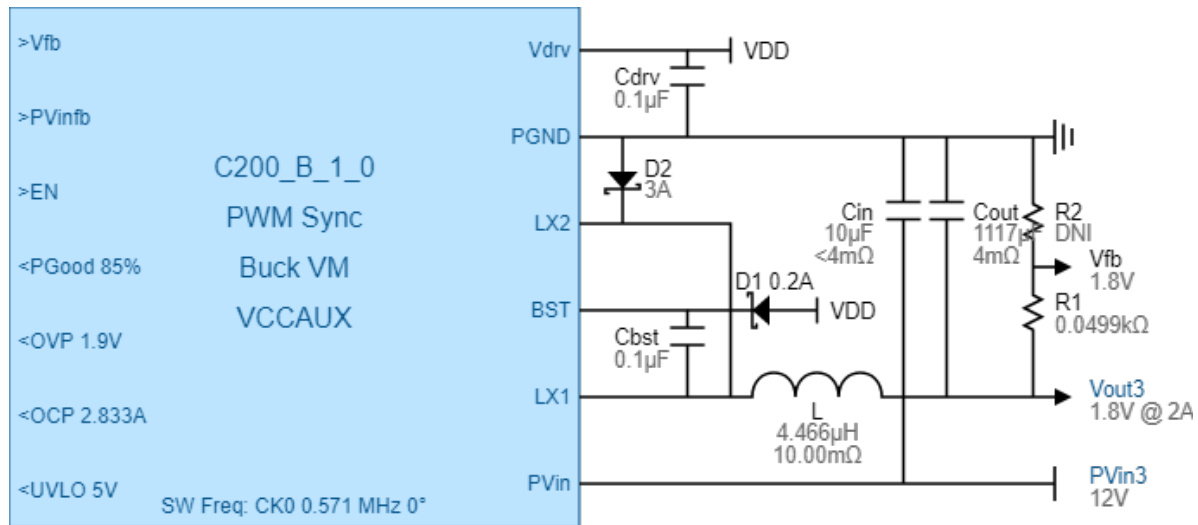
Package Marking Example - QF65



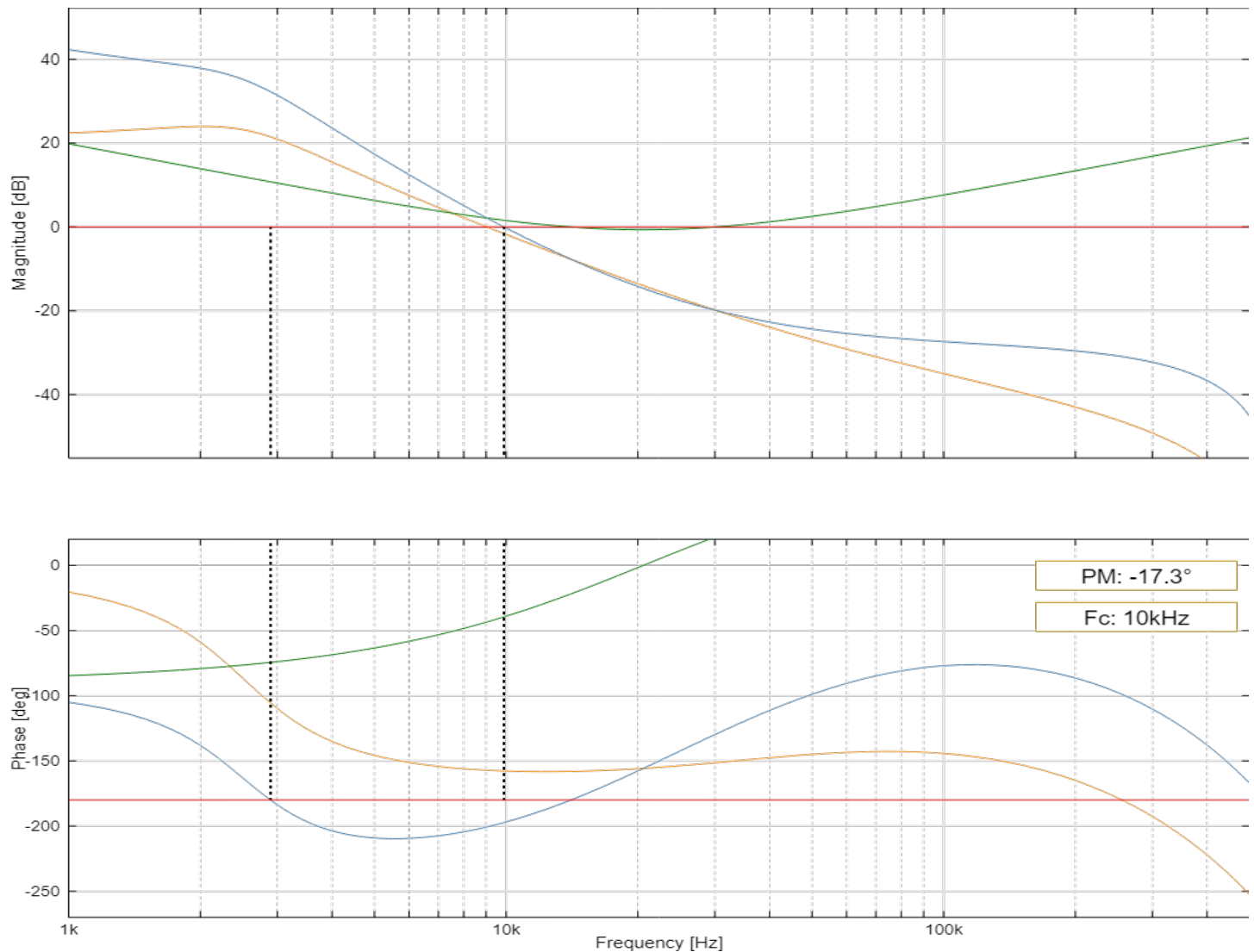
C200_B_1_0 PWM Sync Buck VM

AmP Power VCCAUX

Schematic



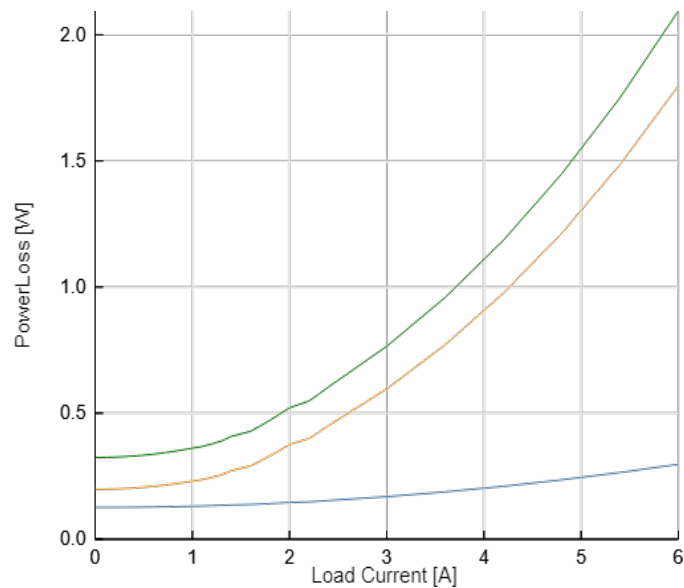
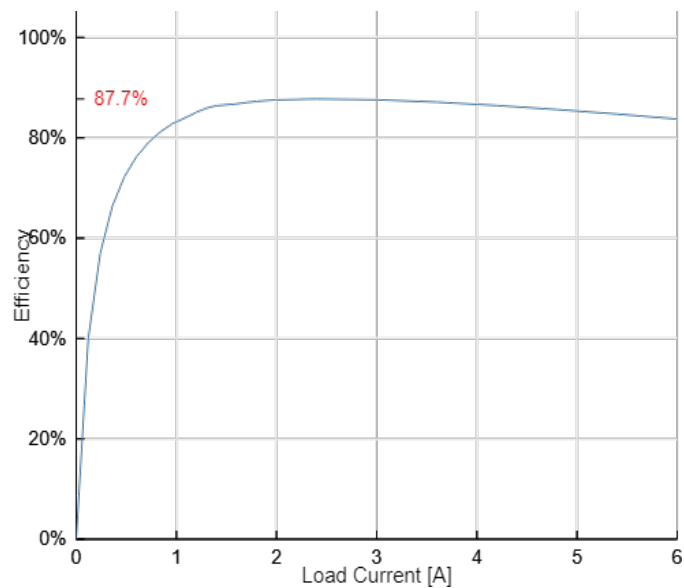
Bode Plot



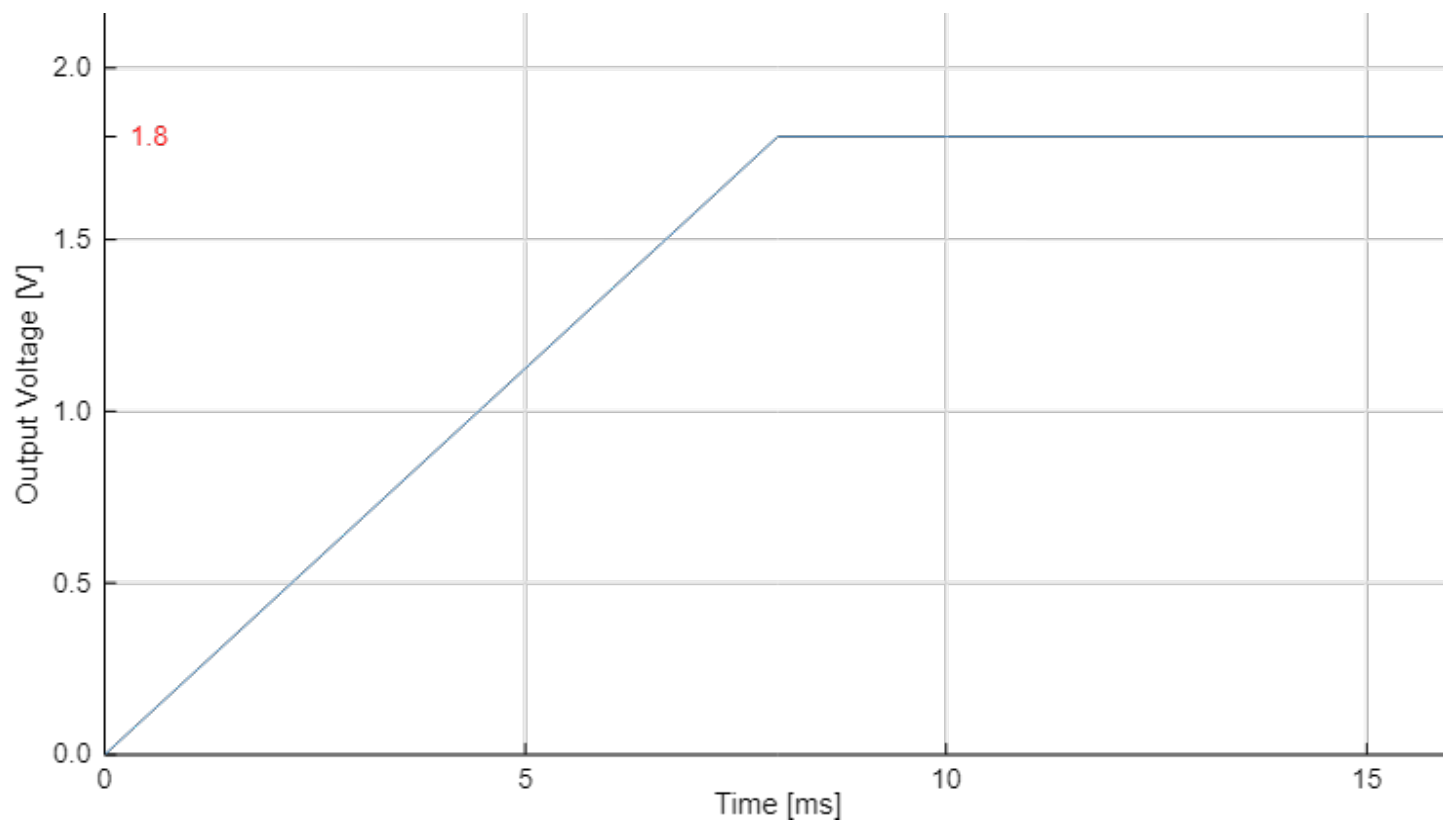
C200_B_1_0 PWM Sync Buck VM

AmP Power VCCAUX

Efficiency



Soft Start



C200_B_1_0 PWM Sync Buck VM

AmP Power VCCAUX

BoM

Part	Description	Recommended Attributes	Attributes	Quantity	Part Number	Spec	Manufacturer
C200_B_1_0	PWM Sync Buck VM		Vout3, 1.8V @ 2A	1	V200709		
L	Inductor	4.466μH, 10mΩ, >2A	4.466μH, 10.0mΩ, >2A	1			
Cout	Capacitor	1117μF, 4mΩ, >1.8V	1117μF, 4mΩ, >1.8V	1			
Cin	Capacitor	10μF, <4mΩ, >12V	10μF, <4mΩ, >12V	1			
Cbst	Capacitor	0.1μF, >6V	0.1μF, >6V	1			
Cdrv	Capacitor	0.1μF, >6V	0.1μF, >6V	1			
D1	Schottky Diode	200mA, 0.5V	200mA, 0.5V	1	RB521S30T5G		ON Semiconductor
D2	Schottky Diode	3A, 0.54V	3A, 0.54V	1	DB2W40300L		Panasonic Electronic Components
R1	Resistor	0.0499kΩ, 1%, 0.063W	0.0499kΩ, 1%, 0.063W	1			
R2	Resistor	DNI	DNI	0			

C200_B_1_0 PWM Sync Buck VM

AmP Power VCCAUX

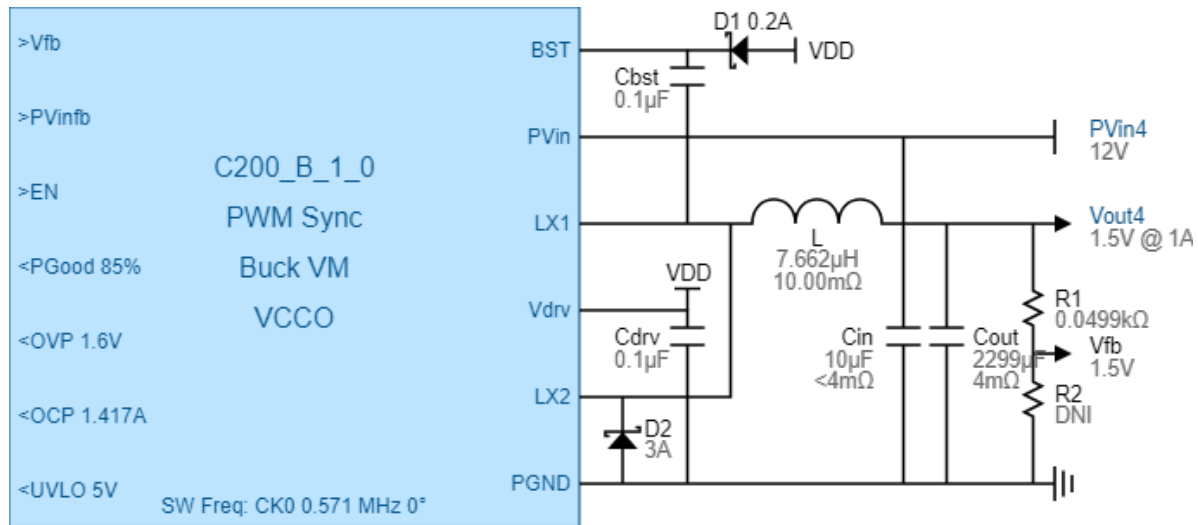
Parameters

Category	Parameter	Description	Value	Units
Basic Configuration	Fsw	Switching Frequency	0	
	Vin	Nominal Input Voltage	12	V
	Vin_Name	Used in The Schematics View	PVin3	
	Vout	Nominal Output Voltage	1.8	V
	Vout_Name	Used in The Schematics View	Vout3	
	V_Ripple	Max Ripple. Used for LC Recommendations	0.01	%
	V_Overshoot	Max Overshoot for a transient of Iout Delta	0.01	V
	Iout	Maximum Converter Current	2	A
	I_Ripple	Desired Ripple. Used for LC Recommendations	30	%
	I_Delta	Used to Calculate Overshoot and Transient Response	3	A
LC Components	Inductor	Nominal Inductor Value	4.466	μH
	Inductor_DCR	Nominal Inductor DC Resistance	10	mΩ
	Capacitor	Nominal Capacitor value	1117	μF
	Cap_ESR	Nominal Capacitor Equivalent Series Resistance	4	mΩ
	fLC	LC Resonant Frequency	2.3	kHz
Vfb Resistor Components	R1		0.0499	kΩ
	R2		Infinity	kΩ
	Vfb	$V_{fb} = V_{out} * R2 / (R1 + R2)$	1.8	V
	R3		1370	kΩ
	R4		107	kΩ
	PVinfb		0.362	V
	Ext_Div_Ratio		1	
	Ext_Div_Ratio2		13.804	
Controller	Gain	Proportional Gain	650	
	Fz1	First Compensation Zero	10.6	kHz
	Fz2	Second Compensation Zero	40	kHz
	Ki	Integral Gain	4.329115e+7	
	Kd	Derivative gain	2.586268e-3	
	Controller_Type		0	
Fault Protection	UVLO	Input Under Voltage Lockout	5	V
	UVLOSense	Internal: Sensed through High Side Drain pin. External: Sensed through a GPIO	Internal	
	VoUVLO	Output Under Voltage Lockout Threshold	1.384	V
	OCP	Cycle by Cycle Current Protection Level	2.833	A
	OVP	Output Over Voltage Protection Level	1.9	V
Constraints	UseCM	Use CM	enable	
	Rise_Time	Soft Start Length	8	ms
	PGood	Power Good percentage of Nominal Vout	85	%
WebAdapter Compatibility	webAdapterCompatible	Enable Resource Optimization	disable	

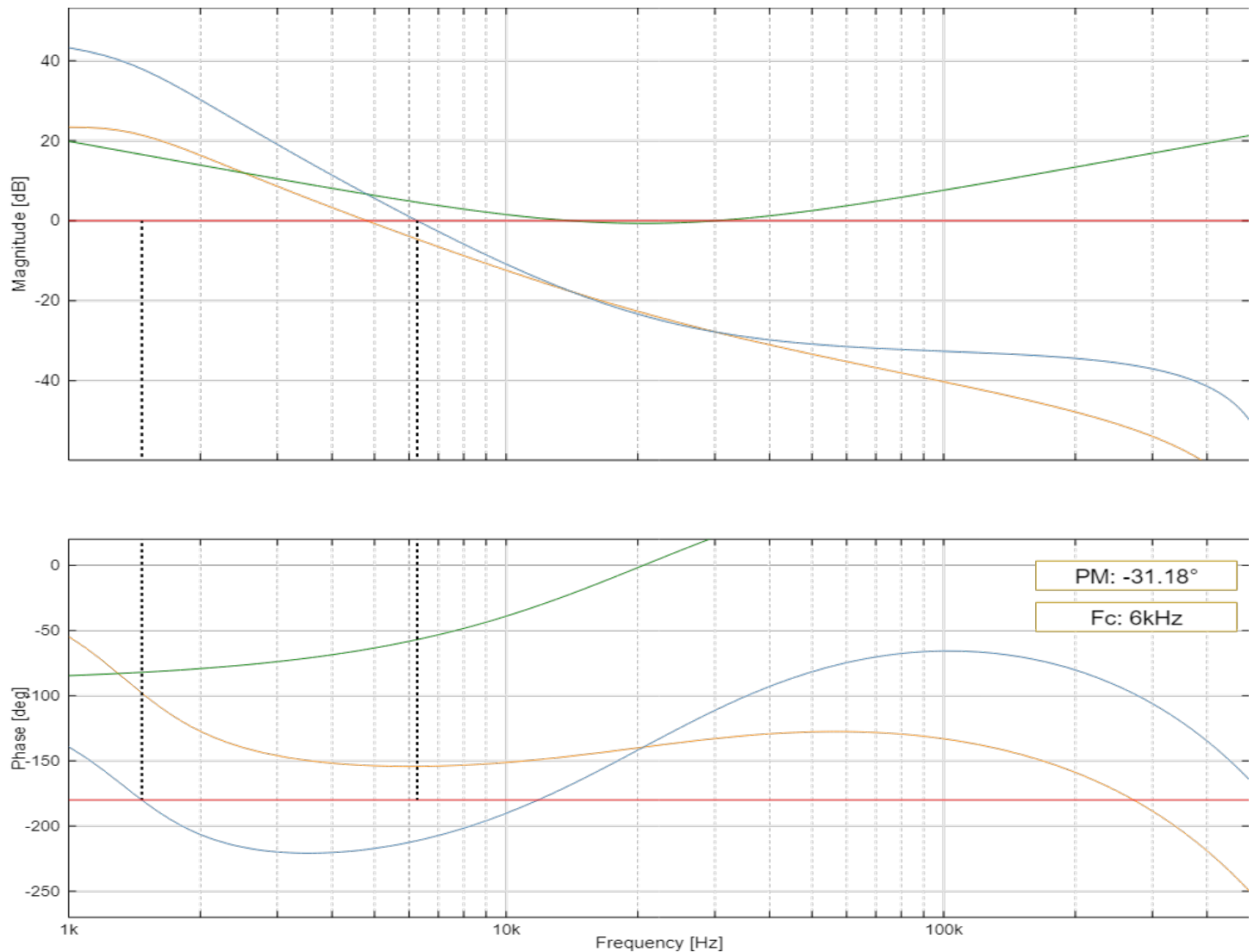
C200_B_1_0 PWM Sync Buck VM

AmP Power VCCO

Schematic



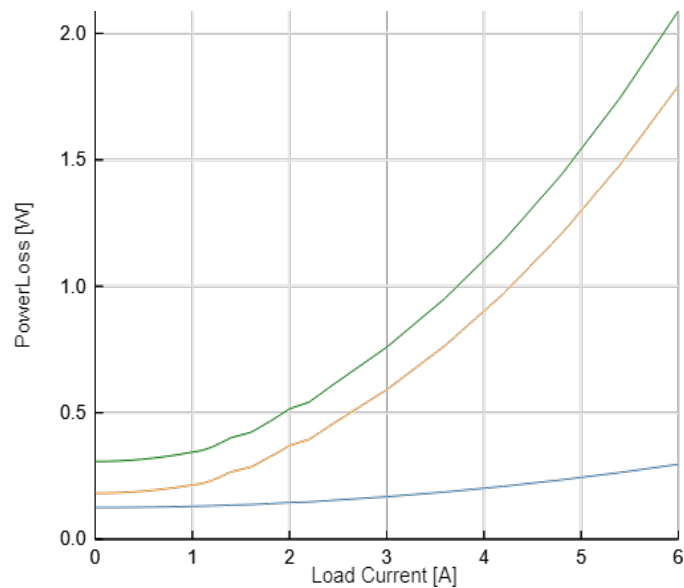
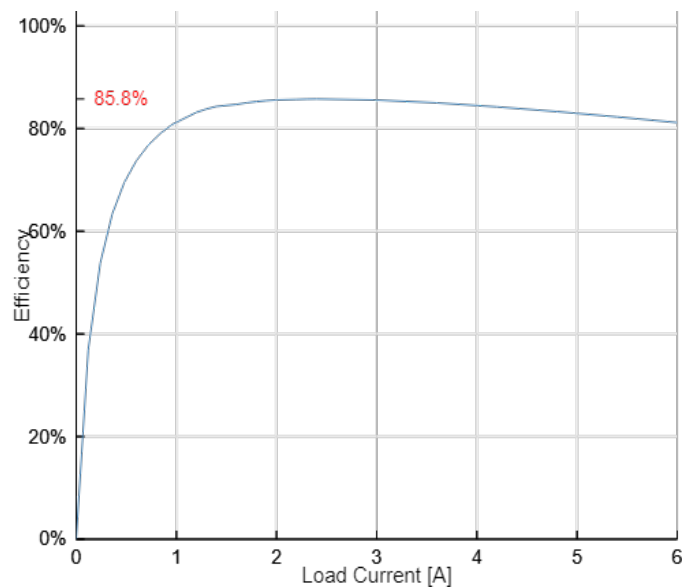
Bode Plot



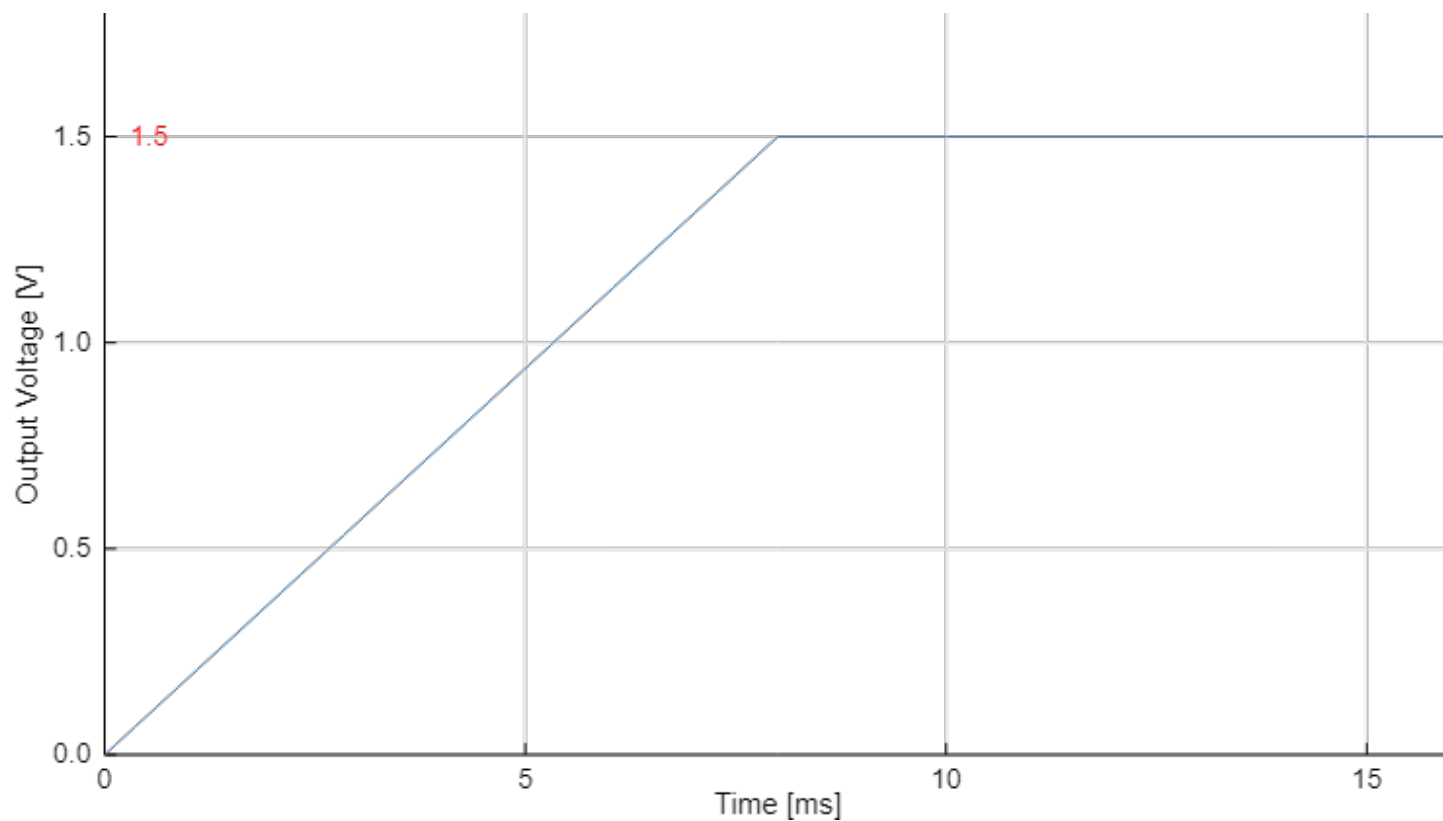
C200_B_1_0 PWM Sync Buck VM

AmP Power VCCO

Efficiency



Soft Start



C200_B_1_0 PWM Sync Buck VM

AmP Power VCCO

BoM

Part	Description	Recommended Attributes	Attributes	Quantity	Part Number	Spec	Manufacturer
C200_B_1_0	PWM Sync Buck VM		Vout4,1.5V @ 1A	1	V200709		
L	Inductor	7.662μH, 10mΩ, >1A	7.662μH, 10.0mΩ, >1A	1			
Cout	Capacitor	2299μF, 4mΩ, >1.5V	2299μF, 4mΩ, >1.5V	1			
Cin	Capacitor	10μF, <4mΩ, >12V	10μF, <4mΩ, >12V	1			
Cbst	Capacitor	0.1μF, >6V	0.1μF, >6V	1			
Cdrv	Capacitor	0.1μF, >6V	0.1μF, >6V	1			
D1	Schottky Diode	200mA, 0.5V	200mA, 0.5V	1	RB521S30T5G		ON Semiconductor
D2	Schottky Diode	3A, 0.54V	3A, 0.54V	1	DB2W40300L		Panasonic Electronic Components
R1	Resistor	0.0499kΩ, 1%, 0.063W	0.0499kΩ, 1%, 0.063W	1			
R2	Resistor	DNI	DNI	0			

C200_B_1_0 PWM Sync Buck VM

AmP Power VCCO

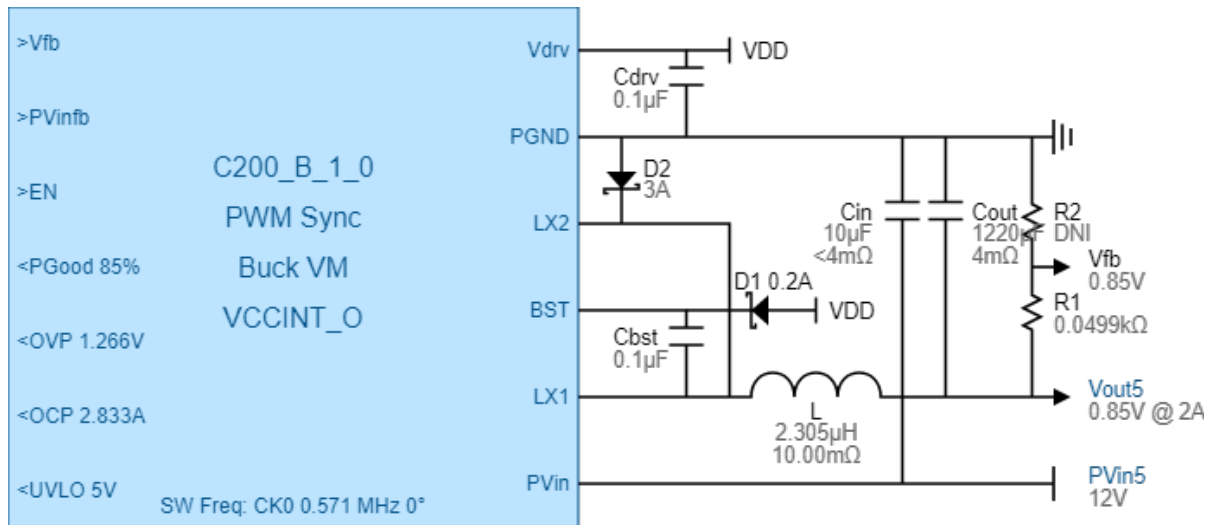
Parameters

Category	Parameter	Description	Value	Units
Basic Configuration	Fsw	Switching Frequency	0	
	Vin	Nominal Input Voltage	12	V
	Vin_Name	Used in The Schematics View	PVin4	
	Vout	Nominal Output Voltage	1.5	V
	Vout_Name	Used in The Schematics View	Vout4	
	V_Ripple	Max Ripple. Used for LC Recommendations	0	%
	V_Overshoot	Max Overshoot for a transient of Iout Delta	0.01	V
	Iout	Maximum Converter Current	1	A
	I_Ripple	Desired Ripple. Used for LC Recommendations	30	%
	I_Delta	Used to Calculate Overshoot and Transient Response	3	A
LC Components	Inductor	Nominal Inductor Value	7.662	μH
	Inductor_DCR	Nominal Inductor DC Resistance	10	mΩ
	Capacitor	Nominal Capacitor value	2299	μF
	Cap_ESR	Nominal Capacitor Equivalent Series Resistance	4	mΩ
	fLC	LC Resonant Frequency	1.2	kHz
Vfb Resistor Components	R1		0.0499	kΩ
	R2		Infinity	kΩ
	Vfb	$V_{fb} = V_{out} * R2 / (R1 + R2)$	1.5	V
	R3		1370	kΩ
	R4		107	kΩ
	PVinfb		0.362	V
	Ext_Div_Ratio		1	
	Ext_Div_Ratio2		13.804	
Controller	Gain	Proportional Gain	650	
	Fz1	First Compensation Zero	10.6	kHz
	Fz2	Second Compensation Zero	40	kHz
	Ki	Integral Gain	4.329115e+7	
	Kd	Derivative gain	2.586268e-3	
	Controller_Type		0	
Fault Protection	UVLO	Input Under Voltage Lockout	5	V
	UVLOSense	Internal: Sensed through High Side Drain pin. External: Sensed through a GPIO	Internal	
	VoUVLO	Output Under Voltage Lockout Threshold	1.084	V
	OCP	Cycle by Cycle Current Protection Level	1.417	A
	OVP	Output Over Voltage Protection Level	1.6	V
Constraints	UseCM	Use CM	enable	
	Rise_Time	Soft Start Length	8	ms
	PGood	Power Good percentage of Nominal Vout	85	%
WebAdapter Compatibility	webAdapterCompatible	Enable Resource Optimization	disable	

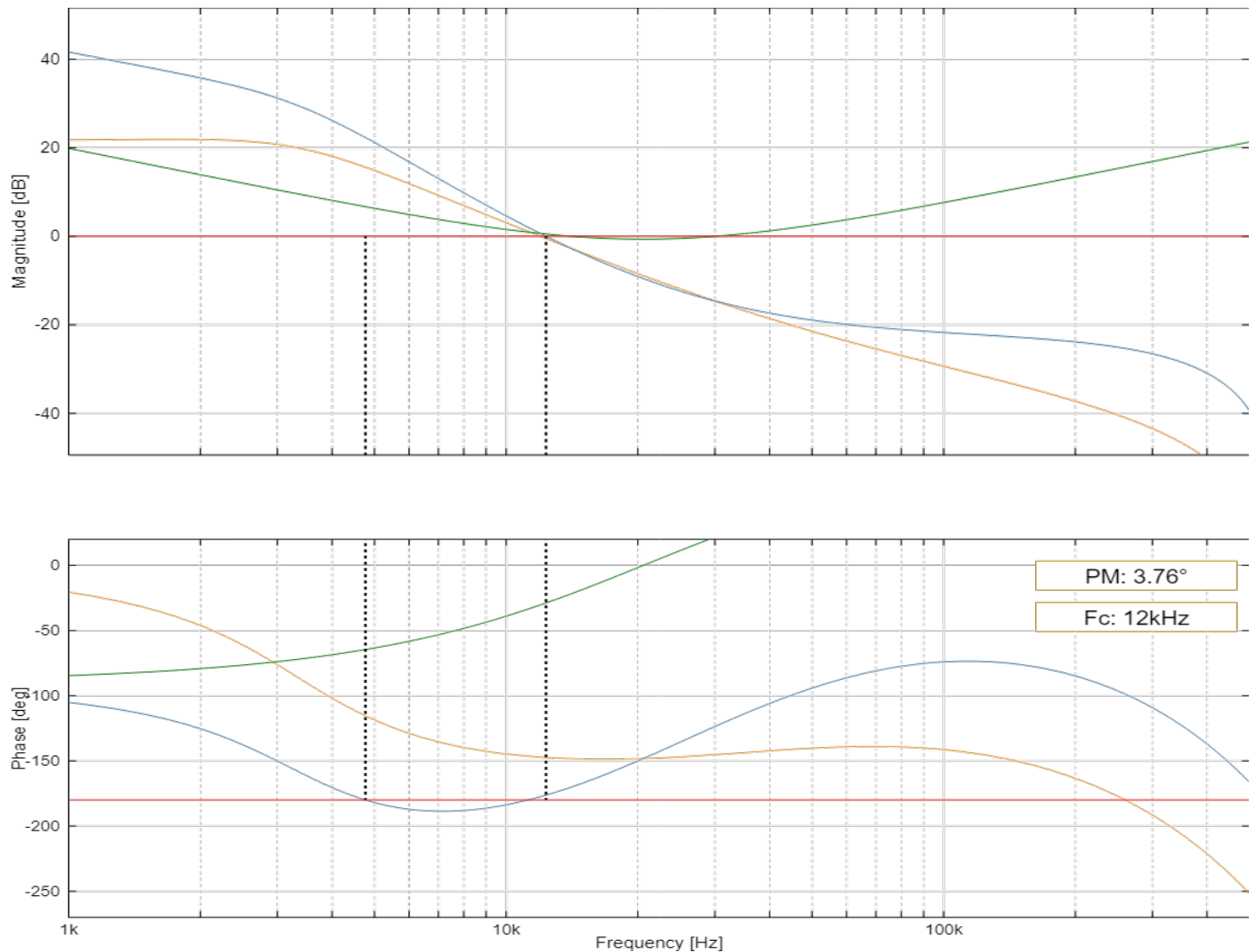
C200_B_1_0 PWM Sync Buck VM

AmP Power VCCINT_O

Schematic



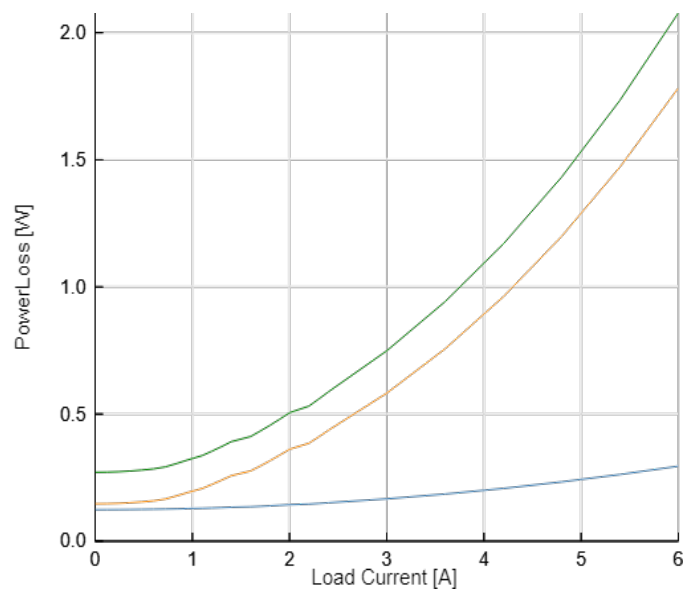
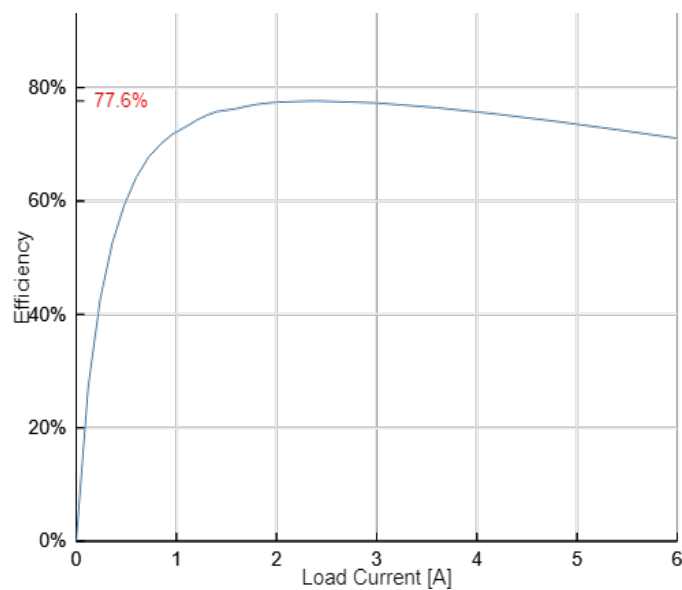
Bode Plot



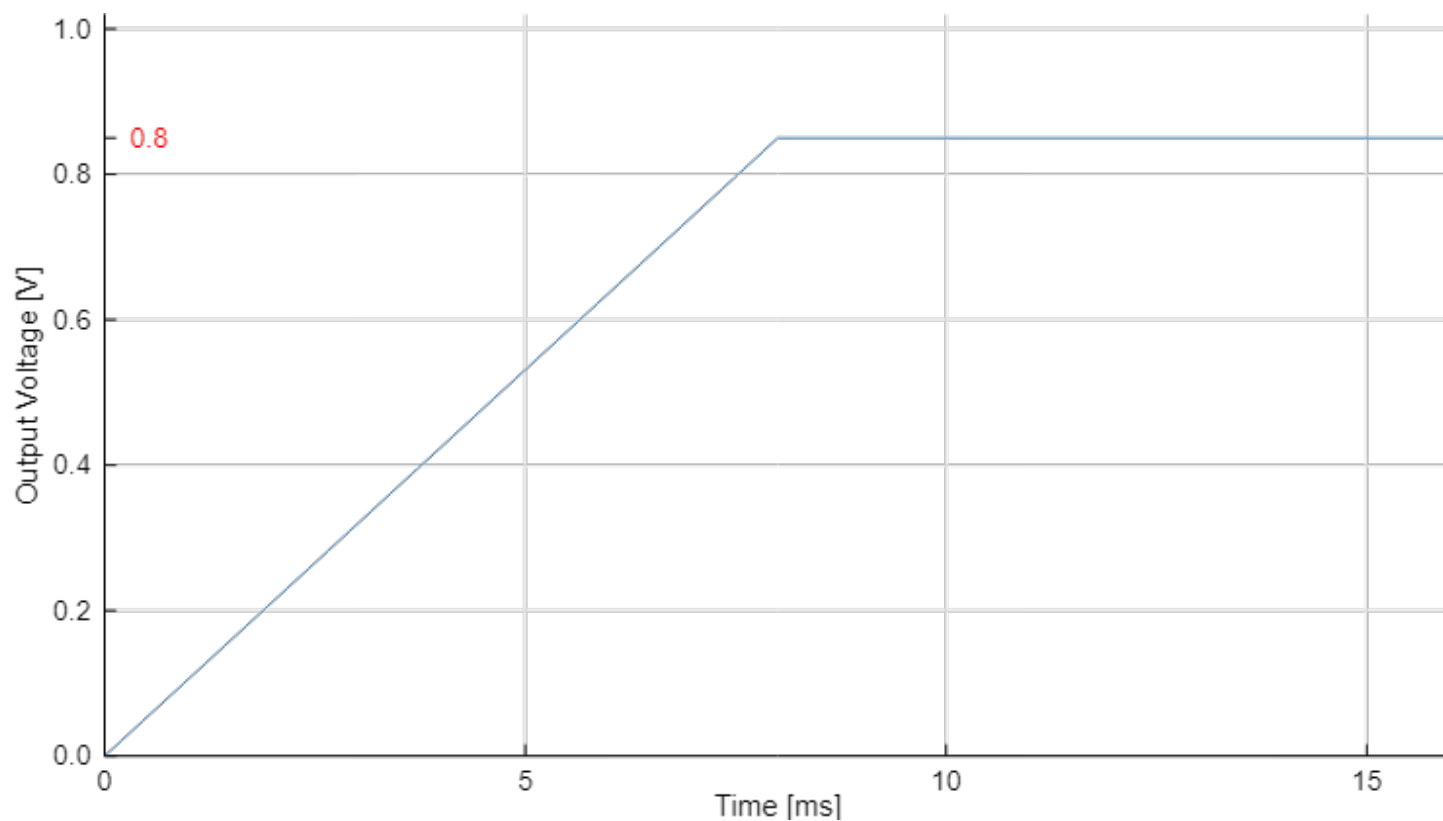
C200_B_1_0 PWM Sync Buck VM

AmP Power VCCINT_O

Efficiency



Soft Start



C200_B_1_0 PWM Sync Buck VM

AmP Power VCCINT_O

BoM

Part	Description	Recommended Attributes	Attributes	Quantity	Part Number	Spec	Manufacturer
C200_B_1_0	PWM Sync Buck VM		Vout5,0.85V @ 2A	1	V200709		
L	Inductor	2.305μH, 10mΩ, >2A	2.305μH, 10.0mΩ, >2A	1			
Cout	Capacitor	1220μF, 4mΩ, >0.85V	1220μF, 4mΩ, >0.85V	1			
Cin	Capacitor	10μF, <4mΩ, >12V	10μF, <4mΩ, >12V	1			
Cbst	Capacitor	0.1μF, >6V	0.1μF, >6V	1			
Cdrv	Capacitor	0.1μF, >6V	0.1μF, >6V	1			
D1	Schottky Diode	200mA, 0.5V	200mA, 0.5V	1	RB521S30T5G		ON Semiconductor
D2	Schottky Diode	3A, 0.54V	3A, 0.54V	1	DB2W40300L		Panasonic Electronic Components
R1	Resistor	0.0499kΩ, 1%, 0.063W	0.0499kΩ, 1%, 0.063W	1			
R2	Resistor	DNI	DNI	0			

C200_B_1_0 PWM Sync Buck VM

AmP Power VCCINT_O

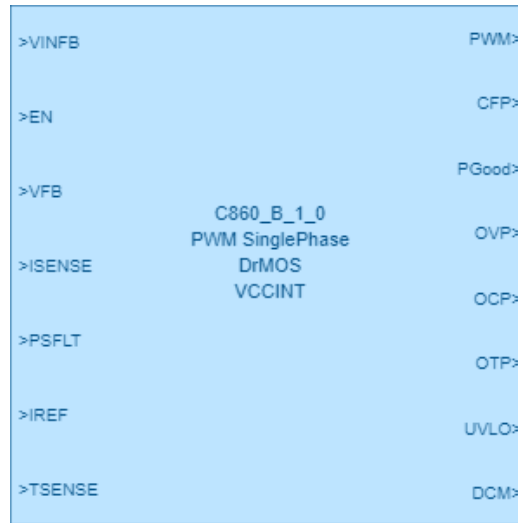
Parameters

Category	Parameter	Description	Value	Units
Basic Configuration	Fsw	Switching Frequency	0	
	Vin	Nominal Input Voltage	12	V
	Vin_Name	Used in The Schematics View	PVin5	
	Vout	Nominal Output Voltage	0.85	V
	Vout_Name	Used in The Schematics View	Vout5	
	V_Ripple	Max Ripple. Used for LC Recommendations	0.01	%
	V_Overshoot	Max Overshoot for a transient of Iout Delta	0.01	V
	Iout	Maximum Converter Current	2	A
	I_Ripple	Desired Ripple. Used for LC Recommendations	30	%
	I_Delta	Used to Calculate Overshoot and Transient Response	3	A
LC Components	Inductor	Nominal Inductor Value	2.305	μH
	Inductor_DCR	Nominal Inductor DC Resistance	10	mΩ
	Capacitor	Nominal Capacitor value	1220	μF
	Cap_ESR	Nominal Capacitor Equivalent Series Resistance	4	mΩ
	fLC	LC Resonant Frequency	3.0	kHz
Vfb Resistor Components	R1		0.0499	kΩ
	R2		Infinity	kΩ
	Vfb	$V_{fb} = V_{out} * R2 / (R1 + R2)$	0.85	V
	R3		1370	kΩ
	R4		107	kΩ
	PVinfb		0.362	V
	Ext_Div_Ratio		1	
	Ext_Div_Ratio2		13.804	
Controller	Gain	Proportional Gain	650	
	Fz1	First Compensation Zero	10.6	kHz
	Fz2	Second Compensation Zero	40	kHz
	Ki	Integral Gain	4.329115e+7	
	Kd	Derivative gain	2.586268e-3	
	Controller_Type		0	
Fault Protection	UVLO	Input Under Voltage Lockout	5	V
	UVLOSense	Internal: Sensed through High Side Drain pin. External: Sensed through a GPIO	Internal	
	VoUVLO	Output Under Voltage Lockout Threshold	0.65	V
	OCP	Cycle by Cycle Current Protection Level	2.833	A
	OVP	Output Over Voltage Protection Level	1.266	V
Constraints	UseCM	Use CM	enable	
	Rise_Time	Soft Start Length	8	ms
	PGood	Power Good percentage of Nominal Vout	85	%
WebAdapter Compatibility	webAdapterCompatible	Enable Resource Optimization	disable	

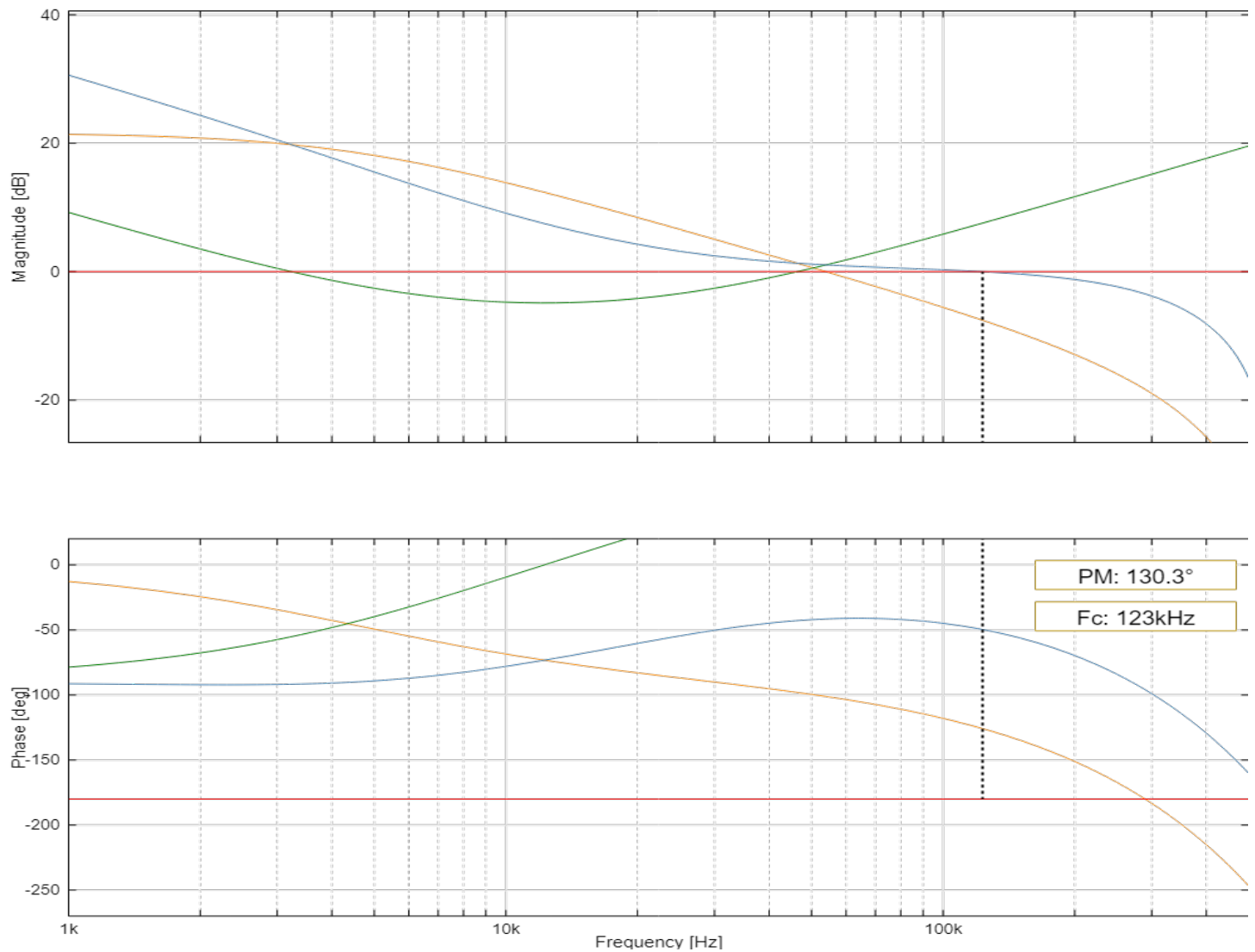
C860_B_1_0 PWM SinglePhase DrMOS

AmP Power VCCINT

Schematic



Bode Plot



C860_B_1_0 PWM SinglePhase DrMOS

AmP Power VCCINT

BoM

Part	Description	Recommended Attributes	Attributes	Quantity	Part Number	Spec	Manufacturer
C860_B_1_0	PWM SinglePhase DrMOS		Vout1,0.85V @ 34A	1	V200709		
L	Inductor	0.136μH, 10mΩ, >34A	0.136μH, 10.0mΩ, >34A	1			
Cout	Capacitor	800μF, 4mΩ, >0.85V	800μF, 4mΩ, >0.85V	1			
Cin	Capacitor	60μF, <4mΩ, >12V	60μF, <4mΩ, >12V	1			
Cbst	Capacitor	0.1μF, >6V	0.1μF, >6V	1			
Cdrv	Capacitor	0.1μF, >6V	0.1μF, >6V	1			
R1	Resistor	0.0499kΩ, 1%, 0.063W	0.0499kΩ, 1%, 0.063W	1			
R2	Resistor	DNI	DNI	0			

C860_B_1_0 PWM SinglePhase DrMOS

AmP Power VCCINT

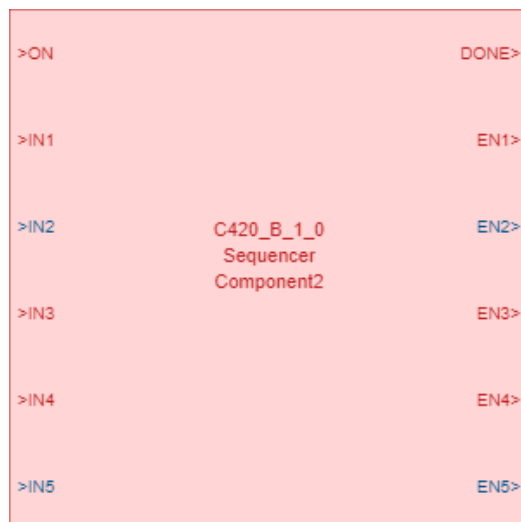
Parameters

Category	Parameter	Description	Value	Units
Basic Configuration	Fsw	Switching Frequency	0	
	Vin	Nominal Input Voltage	12	V
	Vin_Name	Used in The Schematics View	PVin1	
	Vout	Nominal Output Voltage	0.85	V
	Vout_Name	Used in The Schematics View	Vout1	
	V_Ripple	Max Ripple. Used for LC Recommendations	0.33	%
	V_Overshoot	Max Overshoot for a transient of Iout Delta	0.01	V
	Iout	Maximum Converter Current	34	A
	I_Ripple	Desired Ripple. Used for LC Recommendations	30	%
	I_Delta	Used to Calculate Overshoot and Transient Response	10	A
	DrMOS_Chip	Select the DrMOS Vendor	Vishay SiC645A	
DrMOS	FLTTMONCombo		0	
	FLTBar		1	
	VTypeIMON		1	
LC Components	Inductor	Nominal Inductor Value	0.136	μH
	Inductor_DCR	Nominal Inductor DC Resistance	10	mΩ
	Capacitor	Nominal Capacitor value	800	μF
	Cap_ESR	Nominal Capacitor Equivalent Series Resistance	4	mΩ
	fLC	LC Resonant Frequency	15.3	kHz
Vfb Resistor Components	R1		0.0499	kΩ
	R2		Infinity	kΩ
	Vfb	$V_{fb} = V_{out} * R2 / (R1 + R2)$	0.85	V
	Ext_Div_Ratio		1	
ControllerIP860	Gain	Proportional Gain	400	
	Fz1	First Compensation Zero	5	kHz
	Fz2	Second Compensation Zero	30	kHz
	Ki	Integral Gain	1.256637e+7	
	Kd	Derivative gain	2.122066e-3	
	Controller_Type		0	
Fault Protection	UVLO	Input Under Voltage Lockout	5	V
	UVLOSense	Internal: Sensed through High Side Drain pin. External: Sensed through a GPIO	External	
	VoUVLO	Output Under Voltage Lockout Threshold	0.65	V
	OCP	Current Protection Level	51	A
	OVP	Output Over Voltage Protection Level	1.266	V
	Temperature		125	
	OTP_Shutdown		disable	
	OTP_Hiccup		disable	
Power Stage Fault Protection	UVLO_Shutdown		disable	
	UVLO_Hiccup		enable	
	OCP_Shutdown		enable	
	OCP_Hiccup		disable	
	OTP_Shutdown2		enable	
	OTP_Hiccup2		disable	
Constraints	Rise_Time	Soft Start Length	8	ms
	PGood	Power Good percentage of Nominal Vout	85	%

C420_B_1_0 Sequencer

AmP Power Component2

Schematic



C420_B_1_0 Sequencer

AmP Power Component2

BoM

Part	Description	Recommended Attributes	Attributes	Quantity	Part Number	Spec	Manufacturer
C420_B_1_0	Sequencer		undefined,undefinedV @ undefinedA	1	V200709		

C420_B_1_0 Sequencer

AmP Power Component2

Parameters

Category	Parameter	Description	Value	Units
Sequencer	Number_of_POLs	Number of POLs	5	
	Number_of_Seq_Groups	Number of Sequencer Groups	4	
	Time_Step	Time Step	1	ms
	Number_of_Steps	Number of Steps	4	
	Maximum_Delay	Maximum Delay	4	ms
	Groups		11210000	
	Target_Delays		44440000	
	Actual_Delays		44442000	

Global BoM

Component	Part	Description	Attributes	Quantity	Part Number	Manufacturer
Platform	AmP8DB6QF65	AmP Power IC	8 MOSFETS, 6A	1		AnDAPT, Inc
Platform	Cvin1	Capacitor	0.1μF, >25V	1		
Platform	Cvin2	Capacitor	1μF, >25V	1		
Platform	Cvin3	Capacitor	10μF, >25V	1		
Platform	Cvdd1	Capacitor	0.1μF, >6V	1		
Platform	Cvdd2	Capacitor	10μF, >6V	1		
Platform	Cvcc1	Capacitor	0.1μF, >6V	1		
Platform	Cvcc2	Capacitor	1μF, >6V	1		
Platform	C3v31	Capacitor	0.1μF, >6V	1		
Platform	C3v32	Capacitor	1μF, >6V	1		
Platform	Cldoa1	Capacitor	0.1μF, >6V	1		
Platform	Cldoa2	Capacitor	1μF, >6V	1		
Platform	Cldob1	Capacitor	0.1μF, >6V	1		
Platform	Cldob2	Capacitor	1μF, >6V	1		
Platform	Cvccio0	Capacitor	0.1μF, >6V	1		
Platform	Cvccio1	Capacitor	0.1μF, >6V	1		
Platform	Cvccio2	Capacitor	0.1μF, >6V	1		
Platform	Cvccio3	Capacitor	0.1μF, >6V	1		
VCCAUX	C200_B_1_0	PWM Sync Buck VM	Vout3,1.8V @ 2A	1	V200709	
VCCAUX	L	Inductor	4.466μH, 10.0mΩ, >2A	1		
VCCAUX	Cout	Capacitor	1117μF, 4mΩ, >1.8V	1		
VCCAUX	Cin	Capacitor	10μF, <4mΩ, >12V	1		
VCCAUX	Cbst	Capacitor	0.1μF, >6V	1		
VCCAUX	Cdrv	Capacitor	0.1μF, >6V	1		
VCCAUX	D1	Schottky Diode	200mA, 0.5V	1	RB521S30T5G	ON Semiconductor
VCCAUX	D2	Schottky Diode	3A, 0.54V	1	DB2W40300L	Panasonic Electronic Components
VCCAUX	R1	Resistor	0.0499kΩ, 1%, 0.063W	1		
VCCAUX	R2	Resistor	DNI	0		
VCCO	C200_B_1_0	PWM Sync Buck VM	Vout4,1.5V @ 1A	1	V200709	
VCCO	L	Inductor	7.662μH, 10.0mΩ, >1A	1		
VCCO	Cout	Capacitor	2299μF, 4mΩ, >1.5V	1		
VCCO	Cin	Capacitor	10μF, <4mΩ, >12V	1		
VCCO	Cbst	Capacitor	0.1μF, >6V	1		
VCCO	Cdrv	Capacitor	0.1μF, >6V	1		
VCCO	D1	Schottky Diode	200mA, 0.5V	1	RB521S30T5G	ON Semiconductor
VCCO	D2	Schottky Diode	3A, 0.54V	1	DB2W40300L	Panasonic Electronic Components
VCCO	R1	Resistor	0.0499kΩ, 1%, 0.063W	1		
VCCO	R2	Resistor	DNI	0		
VCCINT_O	C200_B_1_0	PWM Sync Buck VM	Vout5,0.85V @ 2A	1	V200709	
VCCINT_O	L	Inductor	2.305μH, 10.0mΩ, >2A	1		
VCCINT_O	Cout	Capacitor	1220μF, 4mΩ, >0.85V	1		
VCCINT_O	Cin	Capacitor	10μF, <4mΩ, >12V	1		
VCCINT_O	Cbst	Capacitor	0.1μF, >6V	1		
VCCINT_O	Cdrv	Capacitor	0.1μF, >6V	1		
VCCINT_O	D1	Schottky Diode	200mA, 0.5V	1	RB521S30T5G	ON Semiconductor
VCCINT_O	D2	Schottky Diode	3A, 0.54V	1	DB2W40300L	Panasonic Electronic Components
VCCINT_O	R1	Resistor	0.0499kΩ, 1%, 0.063W	1		
VCCINT_O	R2	Resistor	DNI	0		
VCCINT	C860_B_1_0	PWM SinglePhase DrMOS	Vout1,0.85V @ 34A	1	V200709	
VCCINT	L	Inductor	0.136μH, 10.0mΩ, >34A	1		
VCCINT	Cout	Capacitor	800μF, 4mΩ, >0.85V	1		
VCCINT	Cin	Capacitor	60μF, <4mΩ, >12V	1		
VCCINT	Cbst	Capacitor	0.1μF, >6V	1		
VCCINT	Cdrv	Capacitor	0.1μF, >6V	1		
VCCINT	R1	Resistor	0.0499kΩ, 1%, 0.063W	1		
VCCINT	R2	Resistor	DNI	0		
Component2	C420_B_1_0	Sequencer	undefined,undefinedV @ undefinedA	1	V200709	

Category	Function	Part	Document Link
AmP Platform	AmPMIC	AmP8DB6QF65	http://andapt.com/?product=amp8db6qf65
PWM Switching Regulator	PWM Sync Buck VM	C200_B_1_0	http://andapt.com/?product=c200_b_1_0
DrMos Controller	PWM SinglePhase DrMOS	C860_B_1_0	http://andapt.com/?product=c860_b_1_0
Supervisor	Sequencer	C420_B_1_0	http://andapt.com/?product=c420_b_1_0



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