







Features

- AmP PMIC enables programmable custom PMIC
 - Integrate application targeted Power Components
 - Power Blocks for a variety of topologies
 - Scalable Integrated N-channel MOSFETs (SIM)
 - Voltage, current sense for protection, telemetry, regulation
 - Build Switching topologies - High/Low current buck, single/two phase DrMOS control
 - Build Linear topologies - LDO, Load Switch
- Analog fabric connectivity for sensor signals
 - Digital μ Logic fabric connectivity: Analog/Digital Blocks
 - Industry first: Analog Proficiency - Digital Flexibility

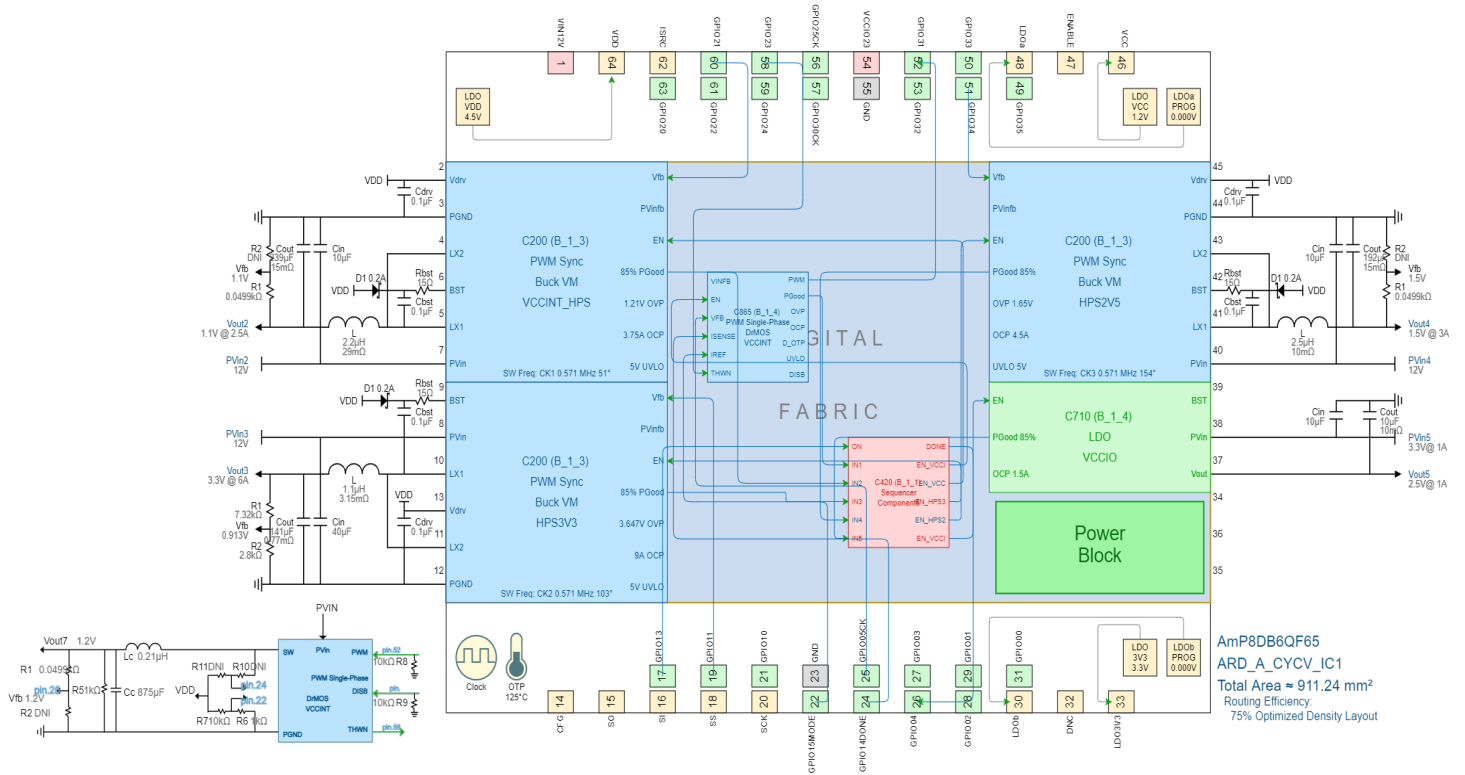
Order Information

Part Number	Package	Body Size
AmP8DB6QF65	QF65	5x5

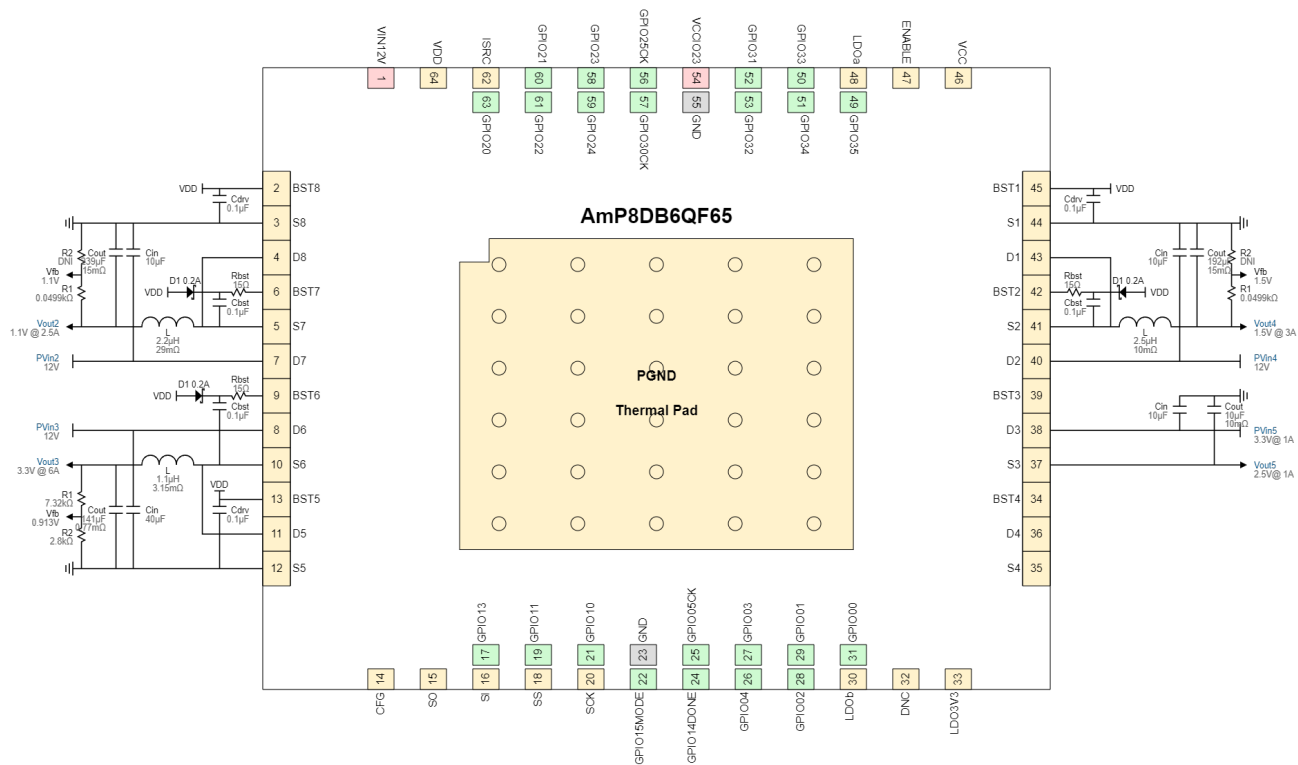
Power Component Summary

Spec	Category	Function	Part	Name	Key Parameter
	PWM Switching Regulator	PWM SyncBuck VM	C200	VCCINT_HPS	1.1V@2.5A
	PWM Switching Regulator	PWM SyncBuck VM	C200	HPS3V3	3.3V@6A
	PWM Switching Regulator	PWM SyncBuck VM	C200	HPS2V5	1.5V@3A
	Linear Regulator	LDO	C710	VCCIO	2.5V@1A
	Supervisor	Sequencer	C420	Component6	
	DrMos Controller	PWM Single-PhaseDrMOS	C865	VCCINT	1.2V@30A

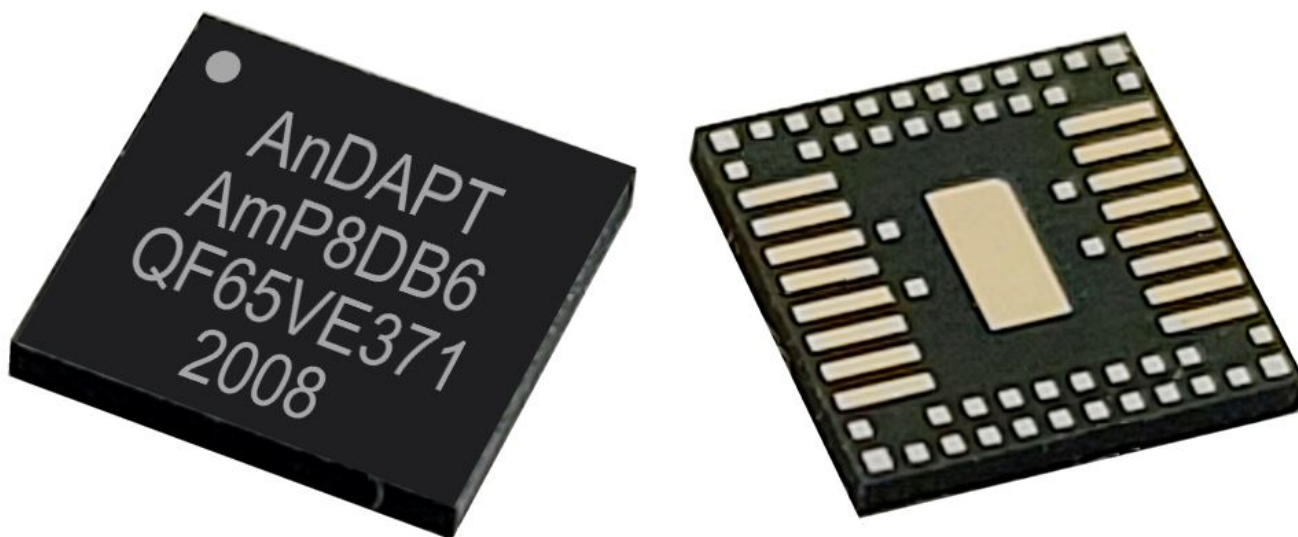
Power Component View



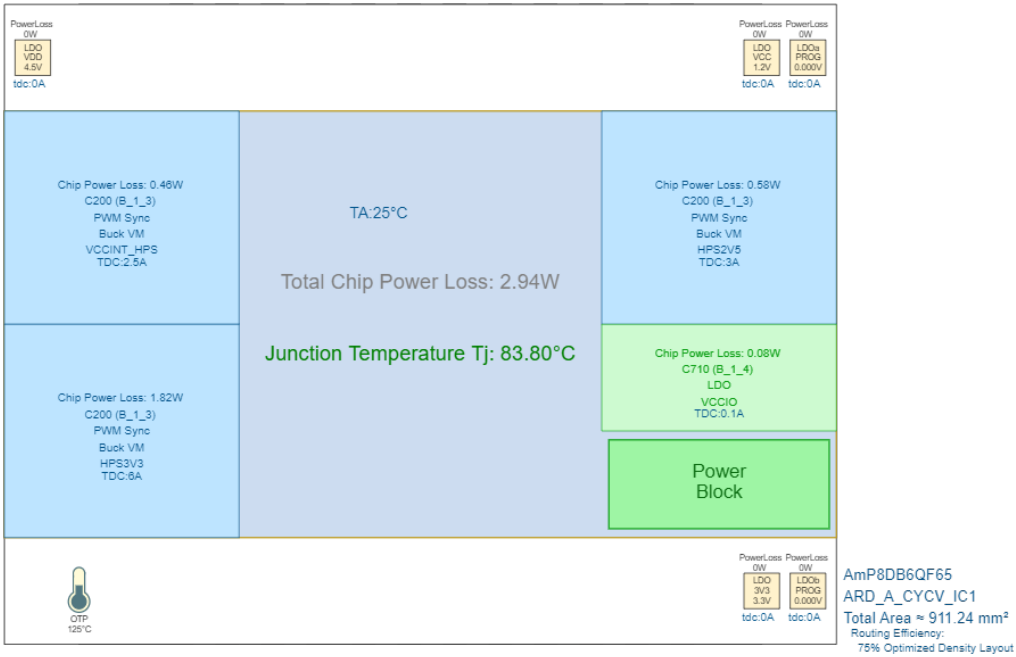
Package Top View (Pin and Thermal Pads are on bottom side)



Package Marking Example - QF65



Thermal View



Pin Configurations

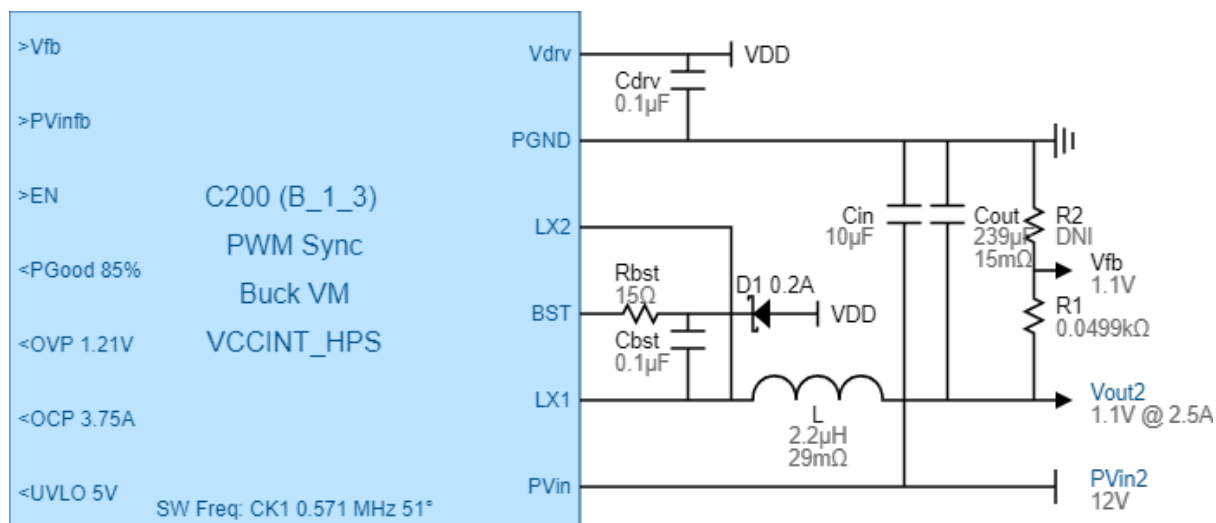
Pin Name	Design Name	Pin Number	Function
BST8		2	Boost
S8		3	Source
D8		4	Drain
BST7		6	Boost
S7		5	Source
D7		7	Drain
BST6		9	Boost
D6		8	Drain
S6		10	Source
BST5		13	Boost
D5		11	Drain
S5		12	Source
CFG		14	Configuration
SO		15	SPI serial out
SI		16	SPI serial in
GPIO13		17	GPIO
SS		18	SPI slave
GPIO11		19	GPIO
SCK		20	SPI clock
GPIO10		21	GPIO
GPIO15MODE		22	GPIO
GND		23	GND
GPIO14DONE		24	GPIO
GPIO05CK		25	GPIO
GPIO04		26	GPIO
GPIO03		27	GPIO
GPIO02		28	GPIO
GPIO01		29	GPIO
LDOb		30	LDO Prog.
GPIO00		31	GPIO
DNC		32	DNC
LDO3V3		33	LDO 3.3 V
S4		35	Source

Pin Name	Design Name	Pin Number	Function
D4		36	Drain
BST4		34	Boost
S3		37	Source
D3		38	Drain
BST3		39	Boost
D2		40	Drain
S2		41	Source
BST2		42	Boost
D1		43	Drain
S1		44	Source
BST1		45	Boost
VCC		46	LDO, 1.2 V
ENABLE		47	Enable AmP
LDOa		48	LDO, Prog.
GPIO35		49	GPIO
GPIO33		50	GPIO
GPIO34		51	GPIO
GPIO31		52	GPIO
GPIO32		53	GPIO
VCCIO23		54	IO bank supply
GND		55	GND
GPIO25CK		56	GPIO
GPIO30CK		57	GPIO
GPIO23		58	GPIO
GPIO24		59	GPIO
GPIO21		60	GPIO
GPIO22		61	GPIO
ISRC		62	LDO 3.3 V
GPIO20		63	GPIO
VDD		64	LDO 6 V
VIN		1	Supply
GND		65	GND Thermal Pad

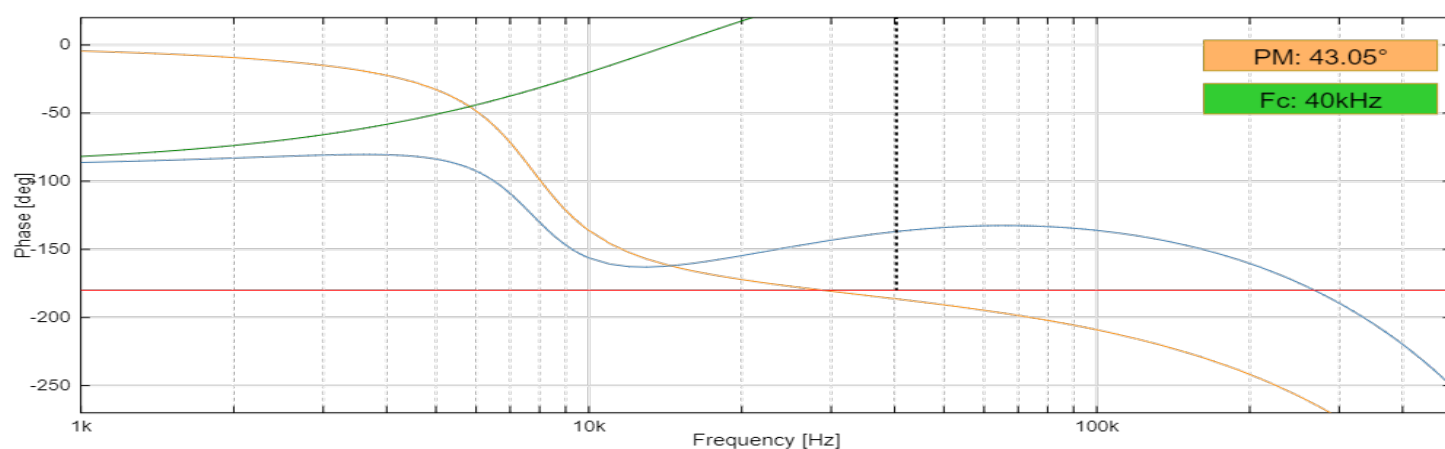
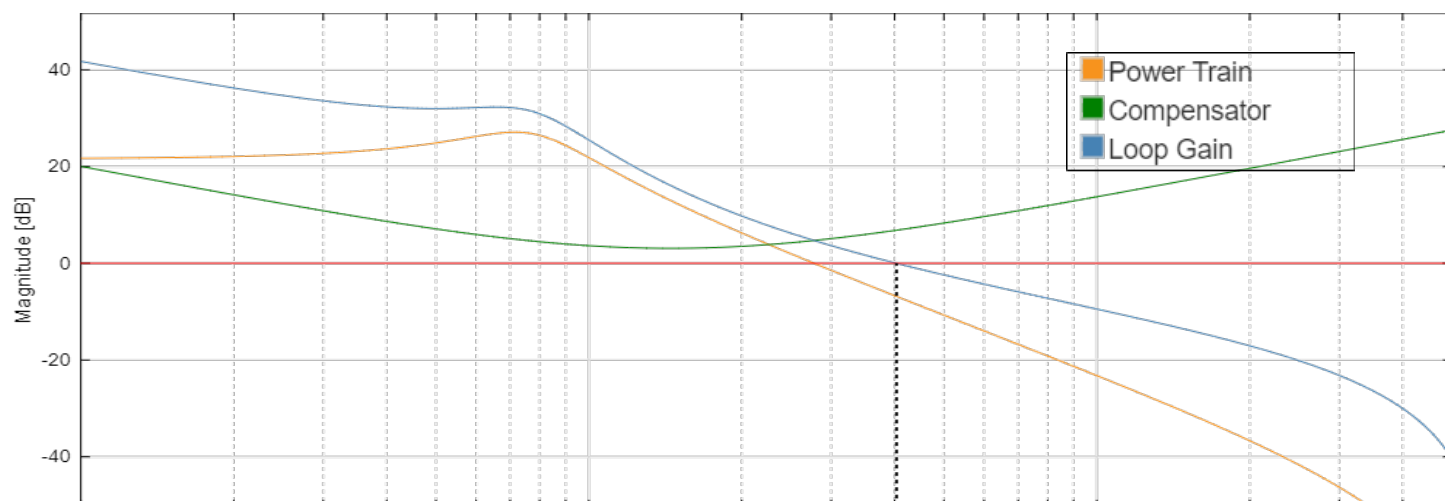
C200 PWM Sync Buck VM

AmP Power VCCINT_HPS

Schematic



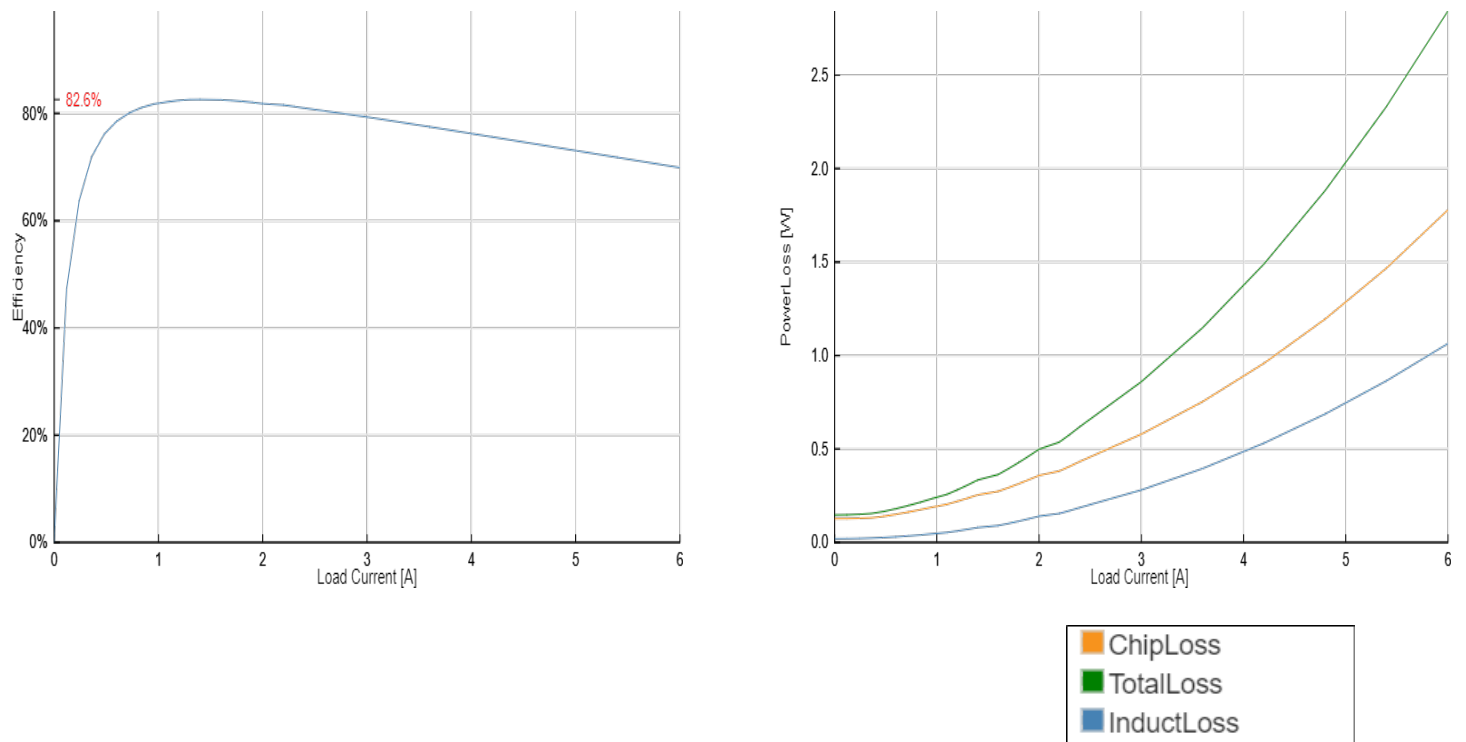
Bode Plot



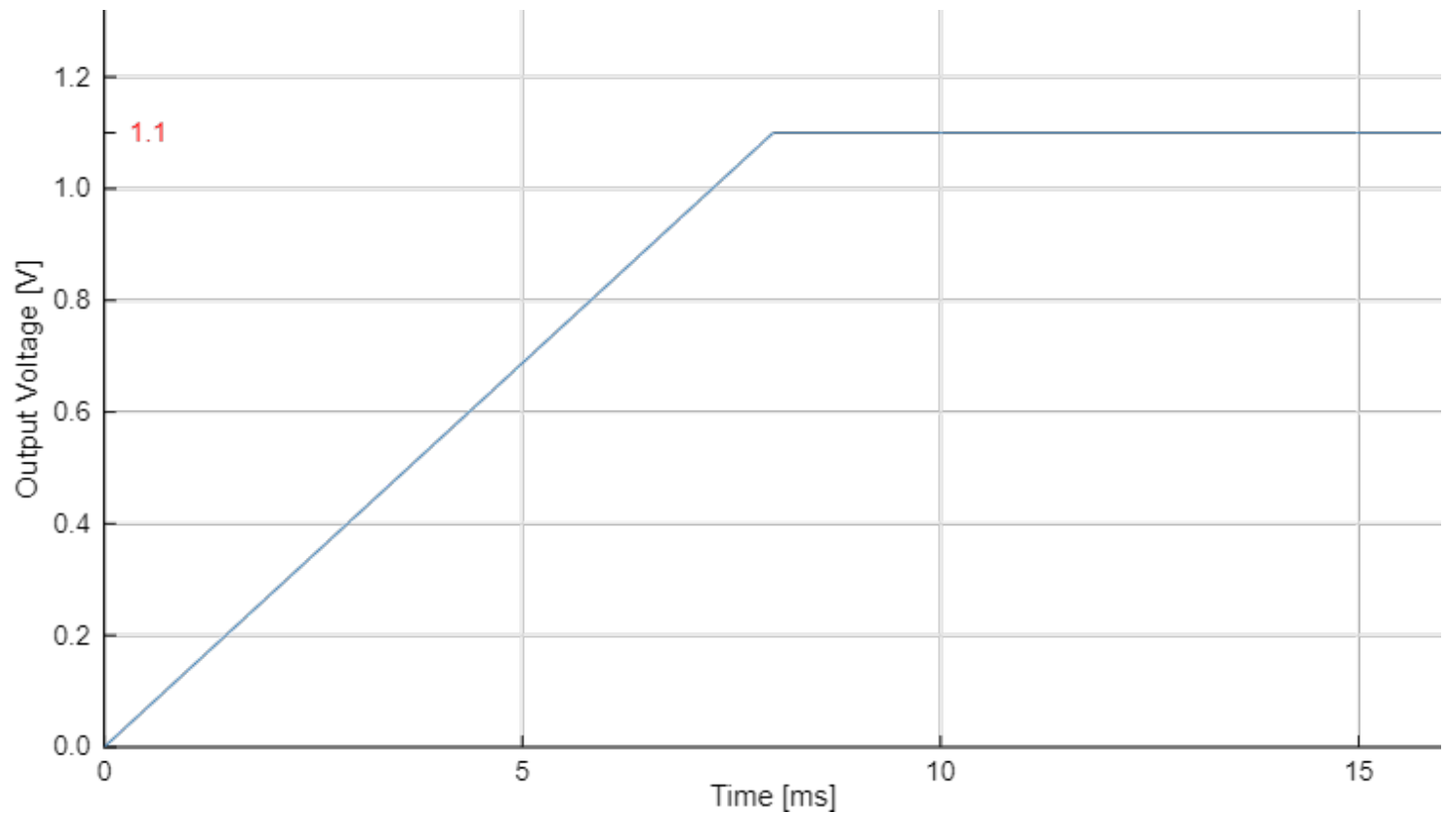
C200 PWM Sync Buck VM

AmP Power VCCINT_HPS

Efficiency









Soft Start



C200 PWM Sync Buck VM

AmP Power VCCINT_HPS

BoM

Part	Description	Recommended Attributes	Attributes	Quantity	Size (Imperial)	X(mm)	Y(mm)	Part Number	Spec	Manufacturer
C200	PWM Sync Buck VM		Vout2, 1.1V @ 2.5A	<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text"/>		<input type="text" value="AnDAPT, LLC"/>
L	Inductor	2.333μH, 10mΩ, >2.5A	2.2μH, 29.00mΩ, 6.2A, 0.018W	<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="4.1"/>	<input type="text" value="4.1"/>	<input type="text" value="74438356022"/>		<input type="text" value="Würth Elektronik"/>
Cout (Ceramic)	Output Capacitor (Ceramic)	413μF, <15mΩ, >1.1V	47μF, 6.3V	<input type="text" value="6"/>	<input type="text" value="0402"/>	<input type="text" value="1"/>	<input type="text" value="0.5"/>	<input type="text" value="885012107006"/>		<input type="text" value="Würth Elektronik"/>
Cout (Bulk)	Output Capacitor (Bulk)		0μF, >1.1V	<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text"/>		<input type="text"/>
Cin	Capacitor	10μF, <15mΩ, >12V	22μF, 3mΩ, 16V	<input type="text" value="1"/>	<input type="text" value="1206"/>	<input type="text" value="3.2"/>	<input type="text" value="1.6"/>	<input type="text" value="885012108018"/>		<input type="text" value="Würth Elektronik"/>
Cbst	Capacitor	0.1μF, >6V	0.1μF, 25V	<input type="text" value="1"/>	<input type="text" value="0402"/>	<input type="text" value="1"/>	<input type="text" value="0.5"/>	<input type="text" value="885012205085R"/>		<input type="text" value="Würth Elektronik"/>
Cdrv	Capacitor	0.1μF, >6V	0.1μF, 25V	<input type="text" value="1"/>	<input type="text" value="0402"/>	<input type="text" value="1"/>	<input type="text" value="0.5"/>	<input type="text" value="885012205085R"/>		<input type="text" value="Würth Elektronik"/>
D1	Schottky Diode	200mA, 0.5V	200mA, 0.5V	<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="1.2"/>	<input type="text" value="0.8"/>	<input type="text" value="RB521S30T5G"/>		<input type="text" value="ON Semiconductor"/>
R1	Resistor	0.0499kΩ, 1%, 0.063W	0.0499kΩ, 1%, 0.063W	<input type="text" value="1"/>	<input type="text" value="0402"/>	<input type="text" value="1"/>	<input type="text" value="0.5"/>	<input type="text"/>		<input type="text"/>
R2	Resistor	DNI	DNI	<input type="text" value="0"/>	<input type="text" value="Optional"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text"/>		<input type="text"/>
Rbst	Resistor	15Ω	15Ω	<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text"/>		<input type="text"/>

Total BoM Area ≈ 70.96 mm²

C200 PWM Sync Buck VM

AmP Power VCCINT_HPS

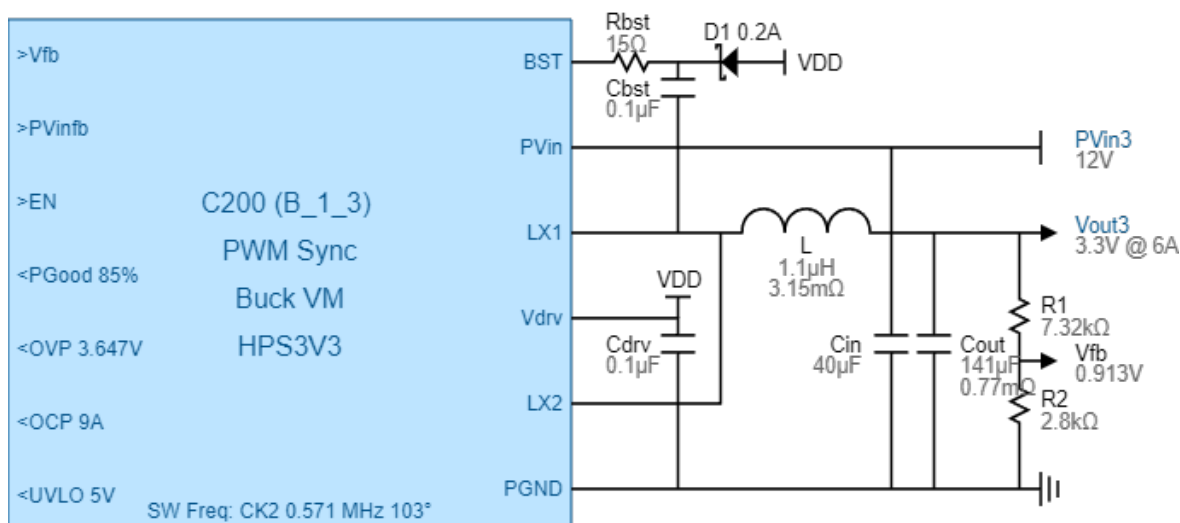
Parameters

Category	Parameter	Description	Value
Basic_Configuration	Fsw	Switching Frequency	571kHz
Basic_Configuration	Vin	Nominal Input Voltage	12V
Basic_Configuration	Vin_Name	Used in The Schematics View	PVin2
Basic_Configuration	Vout	Nominal Output Voltage	1.1V
Basic_Configuration	Vout_Name	Used in The Schematics View	Vout2
Basic_Configuration	V_Ripple	Output Voltage Ripple	0.7mV
Basic_Configuration	V_Overshoot	Max Overshoot for a transient of Iout Delta	0.01V
Basic_Configuration	Iout	Maximum Converter Current	2.5A
Basic_Configuration	I_Ripple	Desired Ripple. Used for LC Recommendations	31.82%
Basic_Configuration	I_Delta	Used to Calculate Overshoot and Transient Response	1.5A
Manual_LC	Inductor	Nominal Inductor Value	2.2μH
Manual_LC	Inductor_DCR	Nominal Inductor DC Resistance	29mΩ
Manual_LC	Capacitor	Nominal Capacitor value	239μF
Manual_LC	Cap_ESR	Nominal Capacitor Equivalent Series Resistance	15mΩ
Manual_LC	CapacitorBlk	Nominal Capacitor value	0μF
Manual_LC	Cap_ESR_BlK	Nominal Capacitor Equivalent Series Resistance	0mΩ
Manual_LC	Inductor_R\$	Nominal Inductor Value	2.333μH
Manual_LC	Inductor_DCR_R\$	Nominal Inductor DC Resistance	10mΩ
Manual_LC	Capacitor_R\$	Nominal Capacitor value	225μF
Manual_LC	Cap_ESR_R\$	Nominal Capacitor Equivalent Series Resistance	15mΩ
Manual_LC	Capacitor_R_BlK\$	Nominal Capacitor value	188μF
Manual_LC	Cap_ESR_R_BlK\$	Nominal Capacitor Equivalent Series Resistance	15mΩ
Manual_LC	fLC	LC Resonant Frequency	6.9kHz
Manual_Resistor	R1		0.0499kΩ
Manual_Resistor	R2		DNI
Manual_Resistor	Vfb	$Vfb = Vout * R2 / (R1 + R2)$	1.1V
Manual_Resistor	R3		1370kΩ
Manual_Resistor	R4		107kΩ
Manual_Resistor	PVinfb		0.362V
Manual_Resistor	Rbst		15Ω
Manual_Resistor	Ext_Div_Ratio		1
Manual_Resistor	Ext_Div_Ratio2		13.804
Controller	Gain	Proportional Gain	1000
Controller	Fz1	First Compensation Zero	7kHz
Controller	Fz2	Second Compensation Zero	30kHz
Controller	Ki	Integral Gain	4.398230e+7
Controller	Kd	Derivative gain	5.305165e-3
Controller	Jitter	jitter/transient performance optimization	Best jitter
Controller	Controller_Type		0
PID_Nonlinear	Kp_a		0
PID_Nonlinear	Ki_a		0
PID_Nonlinear	Kd_a		0
PID_Nonlinear	Kp_b		0
PID_Nonlinear	Ki_b		0
PID_Nonlinear	Kd_b		0
PID_Nonlinear	Kp_alpha		0
PID_Nonlinear	Ki_min		0
PID_Nonlinear	Kd_min		0
PID_Nonlinear	Kd_max		0
UVLO_EN	UVLO	Input Under Voltage Lockout	5V
UVLO_EN	UVLOSense	Internal: Sensed through High Side Drain pin. External: Sensed through a GPIO	Internal
VoUVLO_Group	VoUVLO	Output Under Voltage Lockout Threshold	0.9V
OCP_Group	OCP	Cycle by Cycle Current Protection Level	3.75A
OVP_EN	OVP	Output Over Voltage Protection Level	1.21V
Soft_Start_EN	UseCM	Use CM	enable
Soft_Start_EN	Rise_Time	Soft Start Length	8ms
PGood_EN	PGood	Power Good percentage of Nominal Vout	85%
WebAdapter Compatibility	webAdapterCompatible	Enable Resource Optimization	disable
hidden	Cin		10μF
hidden	Cbst		0.1μF
hidden	Cdrv		0.1μF
hidden	D1		0.2A

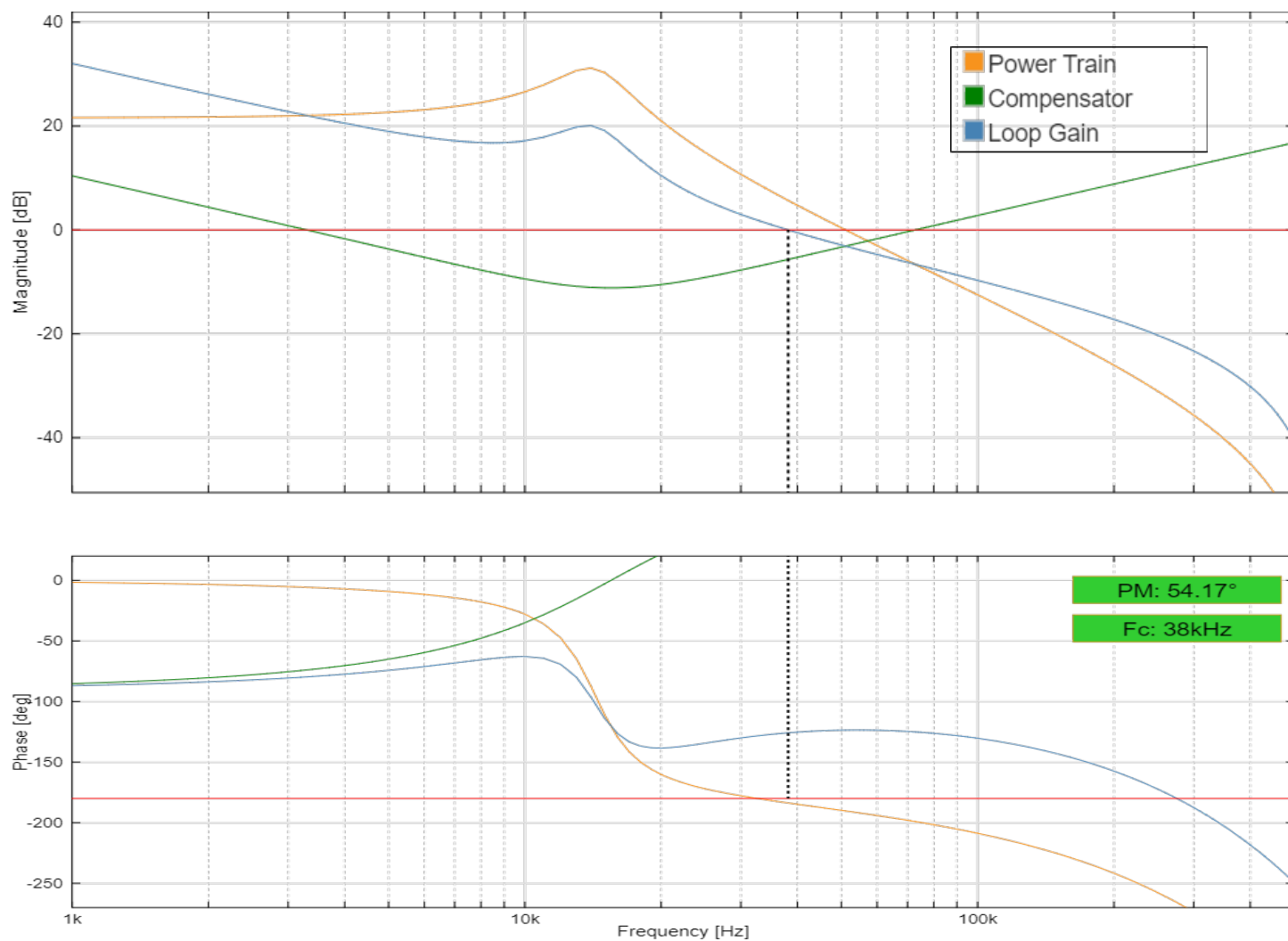
C200 PWM Sync Buck VM

AmP Power HPS3V3

Schematic



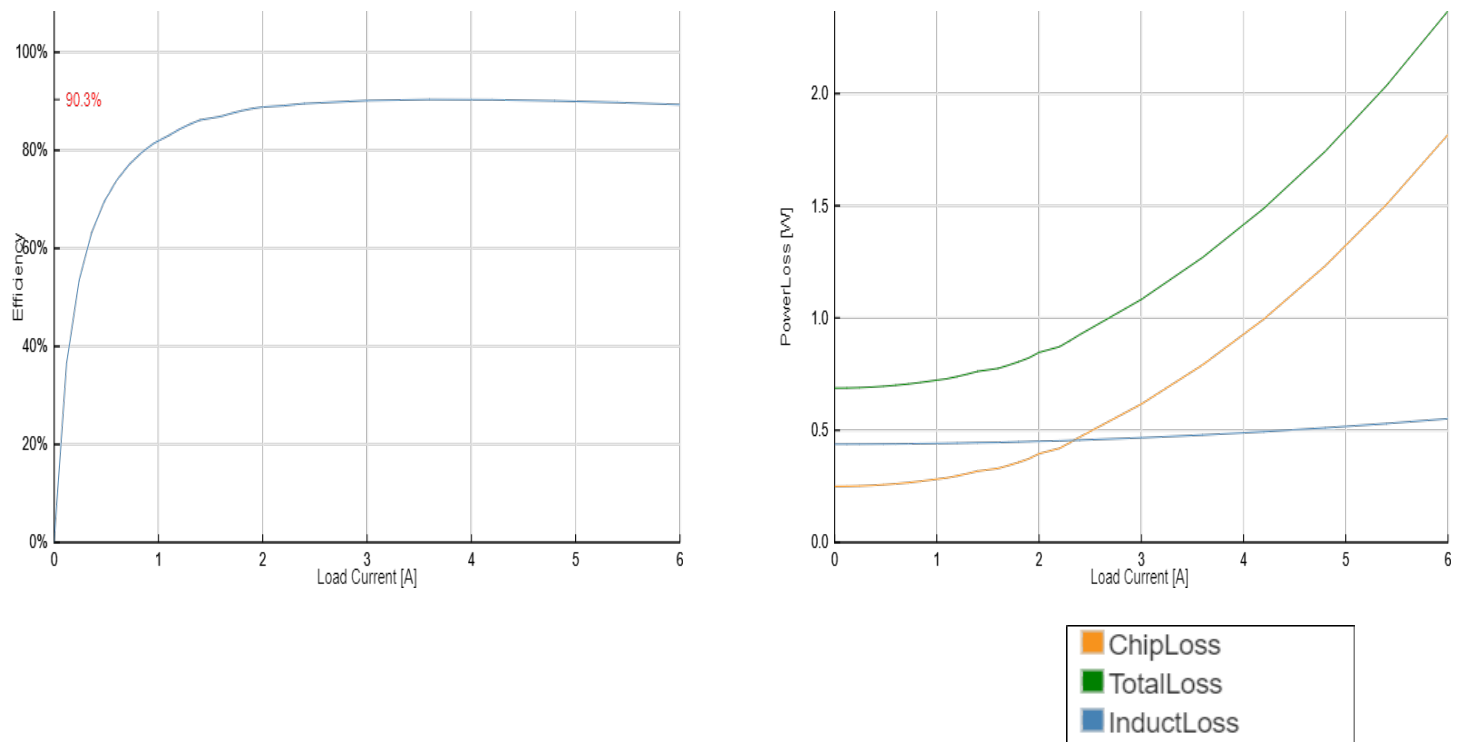
Bode Plot



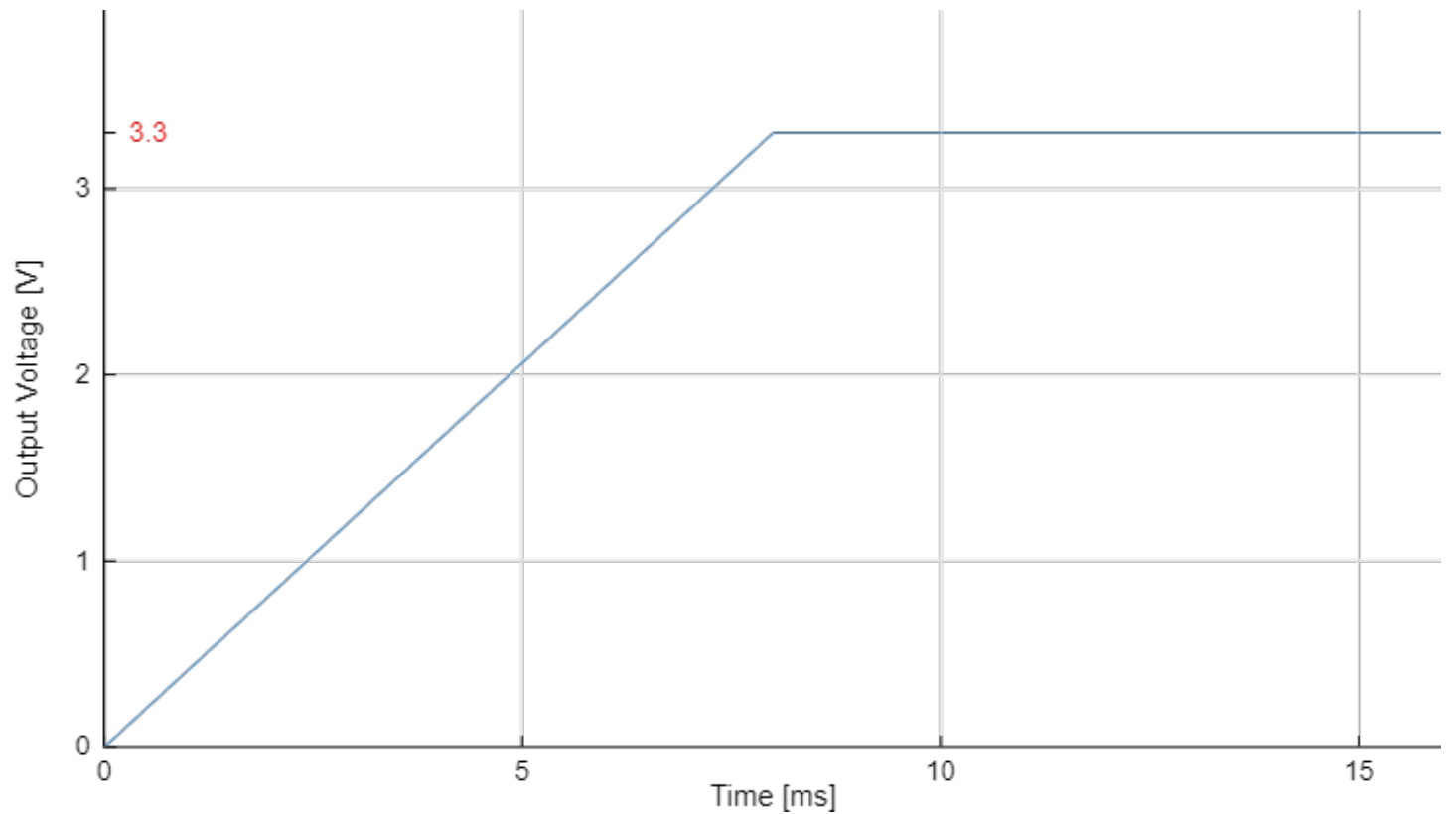
C200 PWM Sync Buck VM

AmP Power HPS3V3

Efficiency



Soft Start



C200 PWM Sync Buck VM

AmP Power HPS3V3

BoM

Part	Description	Recommended Attributes	Attributes	Quantity	Size (Imperial)	X(mm)	Y(mm)	Part Number	Spec	Manufacturer
C200	PWM Sync Buck VM		Vout3,3.3V @ 6A	<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text"/>		<input type="text" value="AnDAPT, LLC"/>
L	Inductor	1.1µH, 10mΩ, >6A	1.1µH, 3.10mΩ, 19.6A, 0.434W	<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="7"/>	<input type="text" value="6.9"/>	<input type="text" value="744314110"/>		<input type="text" value="Würth Elektronik"/>
Cout (Ceramic)	Output Capacitor (Ceramic)	338µF, <15mΩ, >3.3V	47µF, 6.3V	<input type="text" value="3"/>	<input type="text" value="Custom Size"/>	<input type="text" value="2"/>	<input type="text" value="1.25"/>	<input type="text" value="885012107006"/>		<input type="text" value="Würth Elektronik"/>
Cout (Bulk)	Output Capacitor (Bulk)		0µF, >3.3V	<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text"/>		<input type="text"/>
Cin	Capacitor	40µF, <15mΩ, >12V	10µF, 10.4mΩ, 25V	<input type="text" value="4"/>	<input type="text" value="Custom Size"/>	<input type="text" value="1.6"/>	<input type="text" value="0.8"/>	<input type="text" value="885012106031"/>		<input type="text" value="Würth Elektronik"/>
Cbst	Capacitor	0.1µF, >6V	0.1µF, 147.4mΩ, 25V	<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="0.6"/>	<input type="text" value="0.3"/>	<input type="text" value="885012104005"/>		<input type="text" value="Würth Elektronik"/>
Cdrv	Capacitor	0.1µF, >6V	0.1µF, 147.4mΩ, 25V	<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="0.6"/>	<input type="text" value="0.3"/>	<input type="text" value="885012104005"/>		<input type="text" value="Würth Elektronik"/>
D1	Schottky Diode	200mA, 0.5V	200mA, 0.5V	<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="1.2"/>	<input type="text" value="0.8"/>	<input type="text" value="RB521S30T5G"/>		<input type="text" value="ON Semiconductor"/>
R1	Resistor	7.32kΩ, 1%, 0.063W	7.32kΩ, 1%, 0.063W	<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="1.55"/>	<input type="text" value="0.8"/>	<input type="text" value="CPF0603F7K32C1"/>		<input type="text" value="TE Connectivity Passive Prc"/>
R2	Resistor	2.8kΩ, 1%, 0.063W	2.8kΩ, 1%, 0.063W	<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="1.55"/>	<input type="text" value="0.8"/>	<input type="text" value="CPF0603F2K8C1"/>		<input type="text" value="TE Connectivity Passive Prc"/>
Rbst	Resistor	15Ω	15Ω	<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text"/>		<input type="text"/>

Total BoM Area ≈ 133.75 mm²

C200 PWM Sync Buck VM

AmP Power HPS3V3

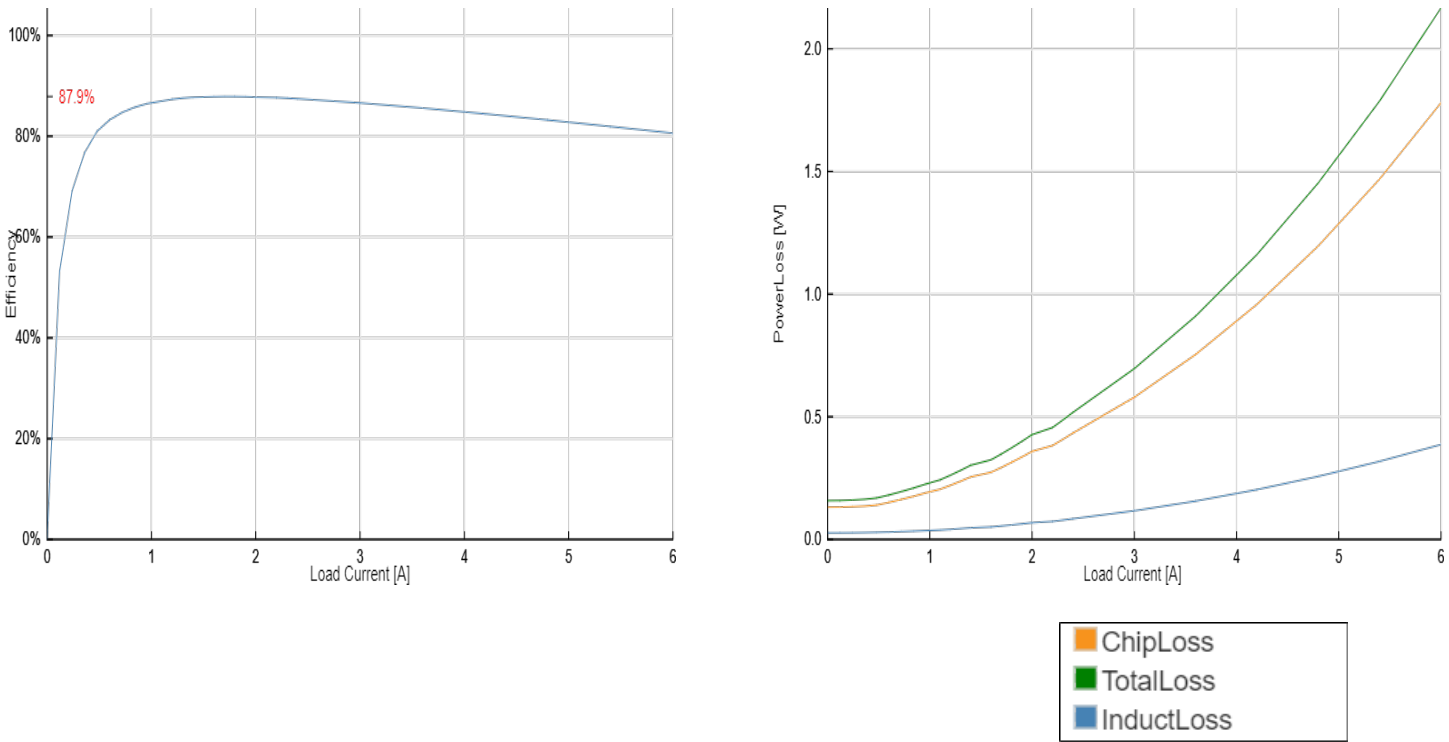
Parameters

Category	Parameter	Description	Value
Basic_Configuration	Fsw	Switching Frequency	571kHz
Basic_Configuration	Vin	Nominal Input Voltage	12V
Basic_Configuration	Vin_Name	Used in The Schematics View	PVin3
Basic_Configuration	Vout	Nominal Output Voltage	3.3V
Basic_Configuration	Vout_Name	Used in The Schematics View	Vout3
Basic_Configuration	V_Ripple	Output Voltage Ripple	5.9mV
Basic_Configuration	V_Overshoot	Max Overshoot for a transient of Iout Delta	0.01V
Basic_Configuration	Iout	Maximum Converter Current	6A
Basic_Configuration	I_Ripple	Desired Ripple. Used for LC Recommendations	63.49%
Basic_Configuration	I_Delta	Used to Calculate Overshoot and Transient Response	3A
Manual_LC	Inductor	Nominal Inductor Value	1.1μH
Manual_LC	Inductor_DCR	Nominal Inductor DC Resistance	3.15mΩ
Manual_LC	Capacitor	Nominal Capacitor value	141μF
Manual_LC	Cap_ESR	Nominal Capacitor Equivalent Series Resistance	0.77mΩ
Manual_LC	CapacitorBlk	Nominal Capacitor value	0μF
Manual_LC	Cap_ESR_BlK	Nominal Capacitor Equivalent Series Resistance	0mΩ
Manual_LC	Inductor_R\$	Nominal Inductor Value	1.1μH
Manual_LC	Inductor_DCR_R\$	Nominal Inductor DC Resistance	10mΩ
Manual_LC	Capacitor_R\$	Nominal Capacitor value	150μF
Manual_LC	Cap_ESR_R\$	Nominal Capacitor Equivalent Series Resistance	15mΩ
Manual_LC	Capacitor_R_BlK\$	Nominal Capacitor value	188μF
Manual_LC	Cap_ESR_R_BlK\$	Nominal Capacitor Equivalent Series Resistance	15mΩ
Manual_LC	fLC	LC Resonant Frequency	12.8kHz
Manual_Resistor	R1		7.32kΩ
Manual_Resistor	R2		2.8kΩ
Manual_Resistor	Vfb	$Vfb = Vout * R2 / (R1 + R2)$	0.913V
Manual_Resistor	R3		1370kΩ
Manual_Resistor	R4		107kΩ
Manual_Resistor	PVinfb		0.362V
Manual_Resistor	Rbst		15Ω
Manual_Resistor	Ext_Div_Ratio		3.614
Manual_Resistor	Ext_Div_Ratio2		13.804
Controller	Gain	Proportional Gain	700
Controller	Fz1	First Compensation Zero	12kHz
Controller	Fz2	Second Compensation Zero	20kHz
Controller	Ki	Integral Gain	5.277876e+7
Controller	Kd	Derivative gain	5.570423e-3
Controller	Jitter	jitter/transient performance optimization	Best jitter
Controller	Controller_Type		0
PID_Nonlinear	Kp_a		0
PID_Nonlinear	Ki_a		0
PID_Nonlinear	Kd_a		0
PID_Nonlinear	Kp_b		0
PID_Nonlinear	Ki_b		0
PID_Nonlinear	Kd_b		0
PID_Nonlinear	Kp_alpha		0
PID_Nonlinear	Ki_min		0
PID_Nonlinear	Kd_min		0
PID_Nonlinear	Kd_max		0
UVLO_EN	UVLO	Input Under Voltage Lockout	5V
UVLO_EN	UVLOSense	Internal: Sensed through High Side Drain pin. External: Sensed through a GPIO	Internal
VoUVLO_Group	VoUVLO	Output Under Voltage Lockout Threshold	1.797V
OCP_Group	OCP	Cycle by Cycle Current Protection Level	9A
OVP_EN	OVP	Output Over Voltage Protection Level	3.647V
Soft_Start_EN	UseCM	Use CM	enable
Soft_Start_EN	Rise_Time	Soft Start Length	8ms
PGood_EN	PGood	Power Good percentage of Nominal Vout	85%
WebAdapter Compatibility	webAdapterCompatible	Enable Resource Optimization	disable
hidden	Cin		40μF
hidden	Cbst		0.1μF
hidden	Cdrv		0.1μF
hidden	D1		0.2A

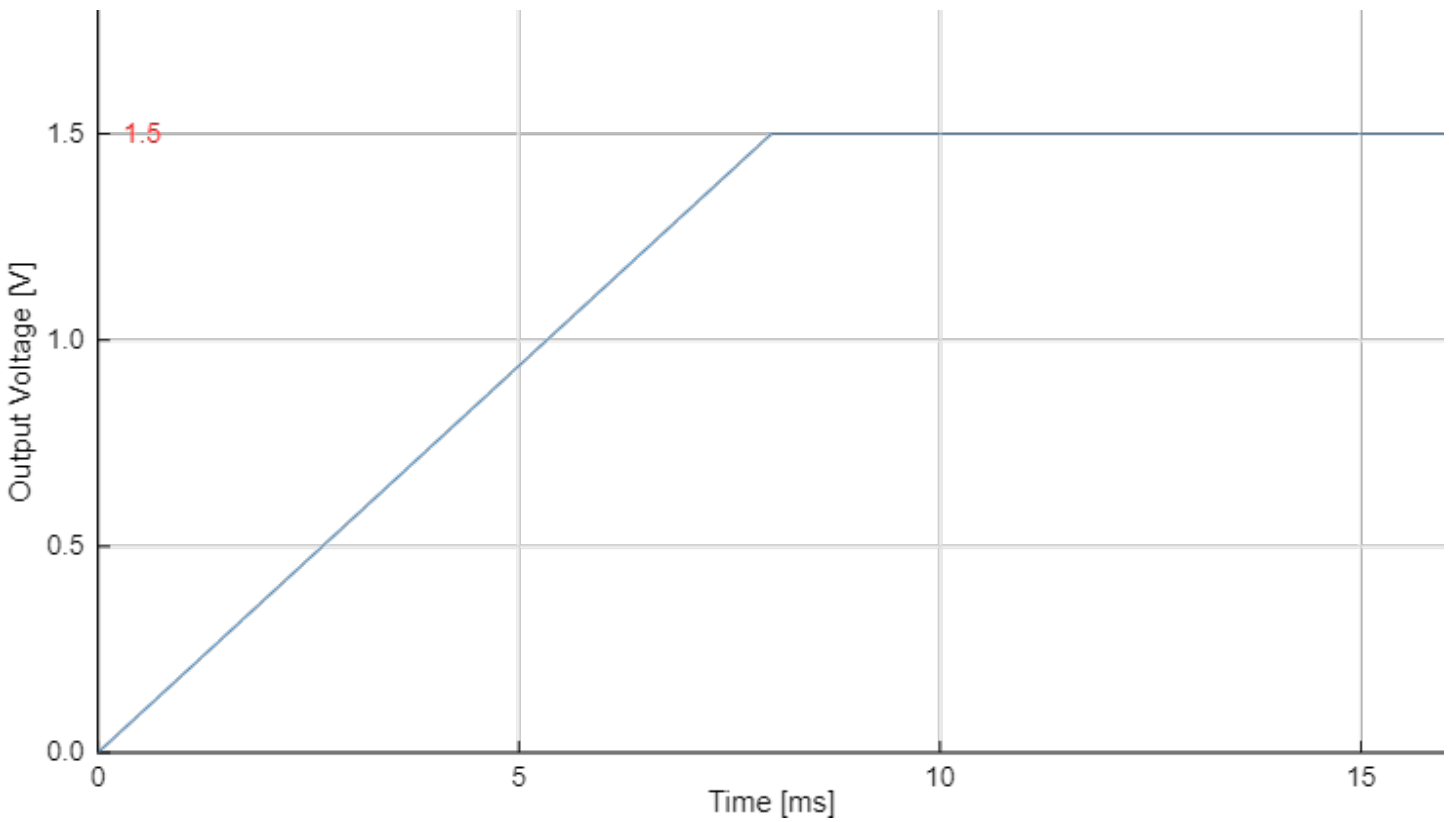
C200 PWM Sync Buck VM

AmP Power HPS2V5

Efficiency



Soft Start



C200 PWM Sync Buck VM

AmP Power HPS2V5

BoM

Part	Description	Recommended Attributes	Attributes	Quantity	Size (Imperial)	X(mm)	Y(mm)	Part Number	Spec	Manufacturer
C200	PWM Sync Buck VM		Vout4, 1.5V @ 3A	<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text"/>		<input type="text" value="AnDAPT, LLC"/>
L	Inductor	2.554μH, 10mΩ, >3A	2.5μH, 10.00mΩ, 5.3A, nullIW	<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="9"/>	<input type="text" value="10"/>	<input type="text" value="744776025"/>		<input type="text" value="Würth Elektronik"/>
Cout (Ceramic)	Output Capacitor (Ceramic)	376μF, <15mΩ, >1.5V	47μF, 6.3V	<input type="text" value="5"/>	<input type="text" value="0402"/>	<input type="text" value="1"/>	<input type="text" value="0.5"/>	<input type="text" value="885012107006"/>		<input type="text" value="Würth Elektronik"/>
Cout (Bulk)	Output Capacitor (Bulk)		0μF, >1.5V	<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text"/>		<input type="text"/>
Cin	Capacitor	10μF, <15mΩ, >12V	22μF, 3mΩ, 16V	<input type="text" value="1"/>	<input type="text" value="1206"/>	<input type="text" value="3.2"/>	<input type="text" value="1.6"/>	<input type="text" value="885012108018"/>		<input type="text" value="Würth Elektronik"/>
Cbst	Capacitor	0.1μF, >6V	0.1μF, 25V	<input type="text" value="1"/>	<input type="text" value="0402"/>	<input type="text" value="1"/>	<input type="text" value="0.5"/>	<input type="text" value="885012205085R"/>		<input type="text" value="Würth Elektronik"/>
Cdrv	Capacitor	0.1μF, >6V	0.1μF, 25V	<input type="text" value="1"/>	<input type="text" value="0402"/>	<input type="text" value="1"/>	<input type="text" value="0.5"/>	<input type="text" value="885012205085R"/>		<input type="text" value="Würth Elektronik"/>
D1	Schottky Diode	200mA, 0.5V	200mA, 0.5V	<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="1.2"/>	<input type="text" value="0.8"/>	<input type="text" value="RB521S30T5G"/>		<input type="text" value="ON Semiconductor"/>
R1	Resistor	0.0499kΩ, 1%, 0.063W	0.0499kΩ, 1%, 0.063W	<input type="text" value="1"/>	<input type="text" value="0402"/>	<input type="text" value="1"/>	<input type="text" value="0.5"/>	<input type="text"/>		<input type="text"/>
R2	Resistor	DNI	DNI	<input type="text" value="0"/>	<input type="text" value="Optional"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text"/>		<input type="text"/>
Rbst	Resistor	15Ω	15Ω	<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text"/>		<input type="text"/>
Total BoM Area ≈ 175.91 mm²										

C200 PWM Sync Buck VM

AmP Power HPS2V5

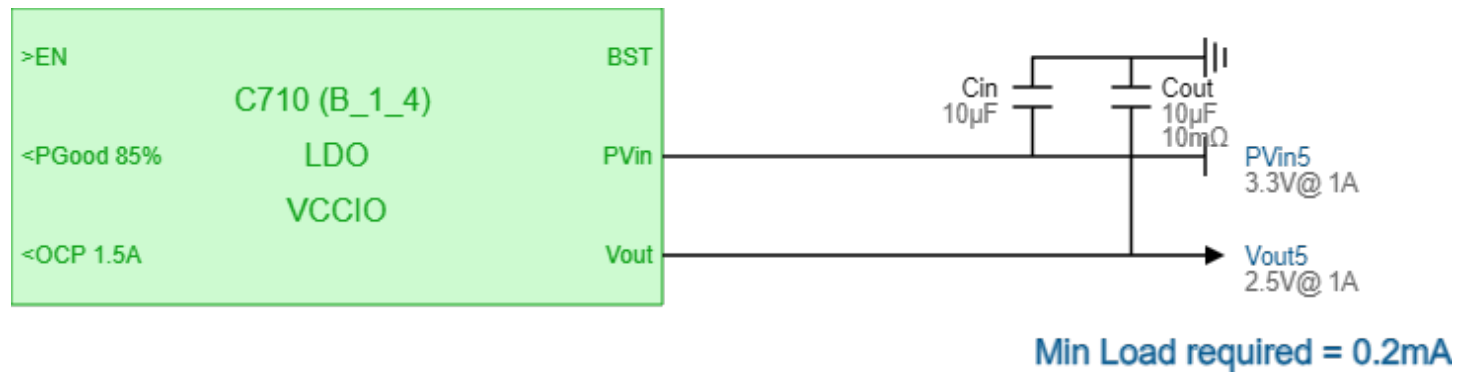
Parameters

Category	Parameter	Description	Value
Basic_Configuration	Fsw	Switching Frequency	571kHz
Basic_Configuration	Vin	Nominal Input Voltage	12V
Basic_Configuration	Vin_Name	Used in The Schematics View	PVin4
Basic_Configuration	Vout	Nominal Output Voltage	1.5V
Basic_Configuration	Vout_Name	Used in The Schematics View	Vout4
Basic_Configuration	V_Ripple	Output Voltage Ripple	1mV
Basic_Configuration	V_Overshoot	Max Overshoot for a transient of Iout Delta	0.01V
Basic_Configuration	Iout	Maximum Converter Current	3A
Basic_Configuration	I_Ripple	Desired Ripple. Used for LC Recommendations	30.65%
Basic_Configuration	I_Delta	Used to Calculate Overshoot and Transient Response	1.5A
Manual_LC	Inductor	Nominal Inductor Value	2.5μH
Manual_LC	Inductor_DCR	Nominal Inductor DC Resistance	10mΩ
Manual_LC	Capacitor	Nominal Capacitor value	192μF
Manual_LC	Cap_ESR	Nominal Capacitor Equivalent Series Resistance	15mΩ
Manual_LC	CapacitorBlk	Nominal Capacitor value	0μF
Manual_LC	Cap_ESR_BlK	Nominal Capacitor Equivalent Series Resistance	0mΩ
Manual_LC	Inductor_R\$	Nominal Inductor Value	2.554μH
Manual_LC	Inductor_DCR_R\$	Nominal Inductor DC Resistance	10mΩ
Manual_LC	Capacitor_R\$	Nominal Capacitor value	188μF
Manual_LC	Cap_ESR_R\$	Nominal Capacitor Equivalent Series Resistance	15mΩ
Manual_LC	Capacitor_R_BlK\$	Nominal Capacitor value	188μF
Manual_LC	Cap_ESR_R_BlK\$	Nominal Capacitor Equivalent Series Resistance	15mΩ
Manual_LC	fLC	LC Resonant Frequency	7.3kHz
Manual_Resistor	R1		0.0499kΩ
Manual_Resistor	R2		DNI
Manual_Resistor	Vfb	$Vfb = Vout * R2 / (R1 + R2)$	1.5V
Manual_Resistor	R3		1370kΩ
Manual_Resistor	R4		107kΩ
Manual_Resistor	PVinfb		0.362V
Manual_Resistor	Rbst		15Ω
Manual_Resistor	Ext_Div_Ratio		1
Manual_Resistor	Ext_Div_Ratio2		13.804
Controller	Gain	Proportional Gain	1000
Controller	Fz1	First Compensation Zero	7kHz
Controller	Fz2	Second Compensation Zero	30kHz
Controller	Ki	Integral Gain	4.398230e+7
Controller	Kd	Derivative gain	5.305165e-3
Controller	Jitter	jitter/transient performance optimization	Best jitter
Controller	Controller_Type		0
PID_Nonlinear	Kp_a		0
PID_Nonlinear	Ki_a		0
PID_Nonlinear	Kd_a		0
PID_Nonlinear	Kp_b		0
PID_Nonlinear	Ki_b		0
PID_Nonlinear	Kd_b		0
PID_Nonlinear	Kp_alpha		0
PID_Nonlinear	Ki_min		0
PID_Nonlinear	Kd_min		0
PID_Nonlinear	Kd_max		0
UVLO_EN	UVLO	Input Under Voltage Lockout	5V
UVLO_EN	UVLOSense	Internal: Sensed through High Side Drain pin. External: Sensed through a GPIO	Internal
VoUVLO_Group	VoUVLO	Output Under Voltage Lockout Threshold	1.084V
OCP_Group	OCP	Cycle by Cycle Current Protection Level	4.5A
OVP_EN	OVP	Output Over Voltage Protection Level	1.65V
Soft_Start_EN	UseCM	Use CM	enable
Soft_Start_EN	Rise_Time	Soft Start Length	8ms
PGood_EN	PGood	Power Good percentage of Nominal Vout	85%
WebAdapter Compatibility	webAdapterCompatible	Enable Resource Optimization	disable
hidden	Cin		10μF
hidden	Cbst		0.1μF
hidden	Cdrv		0.1μF
hidden	D1		0.2A

C710 LDO

AmP Power VCCIO

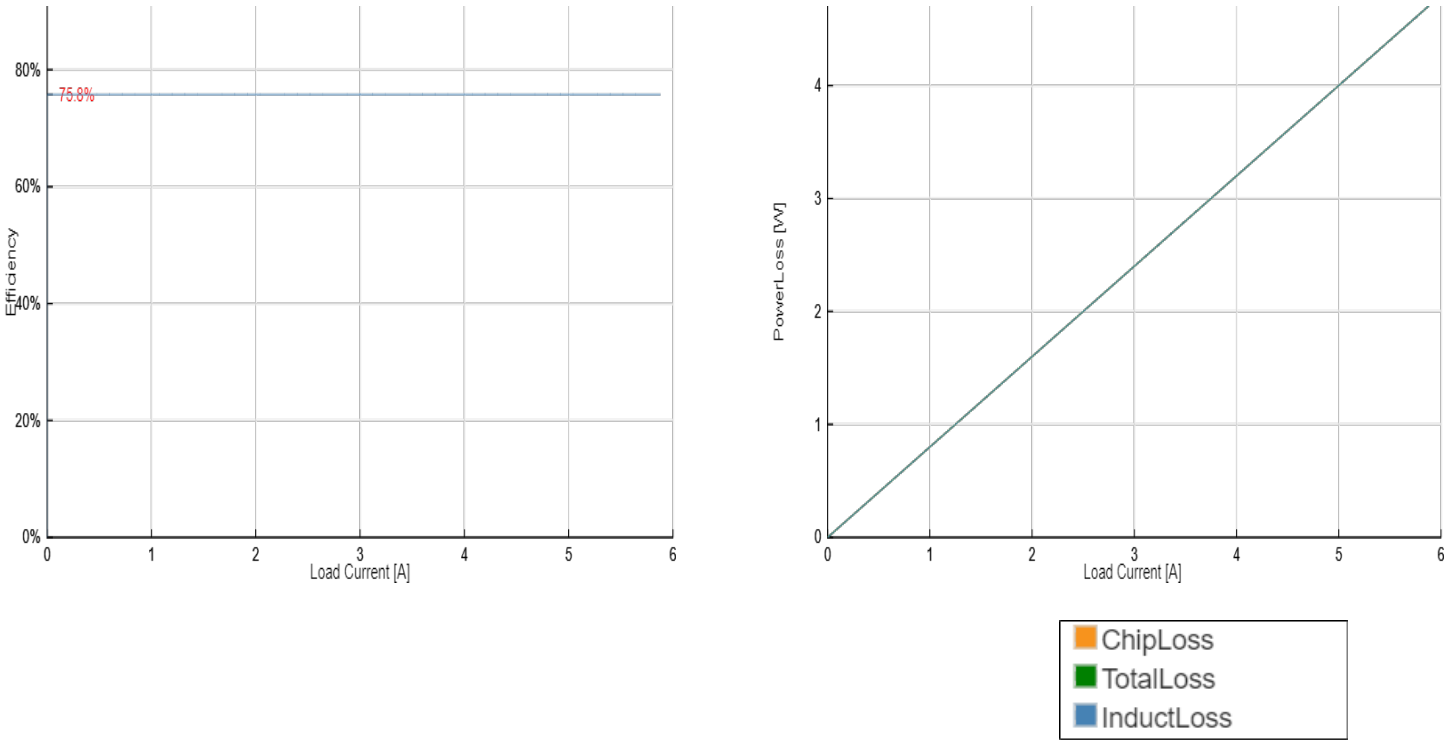
Schematic



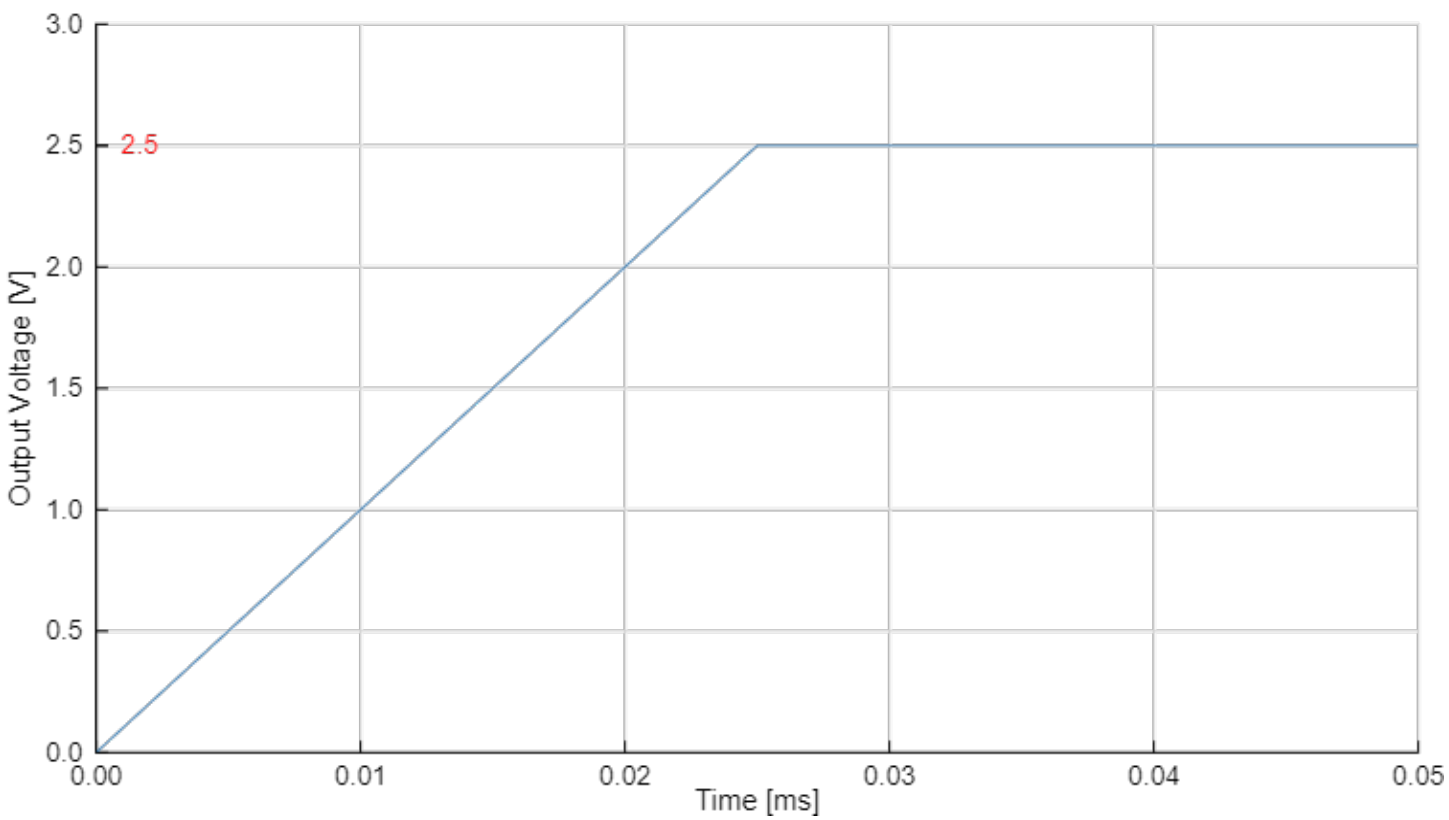
C710 LDO

AmP Power VCCIO

Efficiency





Soft Start



C710 LDO

AmP Power VCCIO

BoM

Part	Description	Recommended Attributes	Attributes	Quantity	Size (Imperial)	X(mm)	Y(mm)	Part Number	Spec	Manufacturer
C710	LDO		Vout5,2.5V @ 1A	<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text"/>		<input type="text" value="AnDAPT, LLC"/>
Cout	Capacitor	10µF, 5.9mΩ, 6.3V	10µF, 5.9mΩ, 6.3V	<input type="text" value="1"/>	<input type="text" value="0402"/>	<input type="text" value="1"/>	<input type="text" value="0.5"/>	<input type="text" value="885012105020"/>		<input type="text" value="Wurth Elektronik"/>
Cin	Capacitor	10µF, >3.3V	10µF, 5.9mΩ, 6.3V	<input type="text" value="1"/>	<input type="text" value="0402"/>	<input type="text" value="1"/>	<input type="text" value="0.5"/>	<input type="text" value="885012105020"/>		<input type="text" value="Wurth Elektronik"/>

Total BoM Area ≈ 5.44 mm²

C710 LDO

AmP Power VCCIO

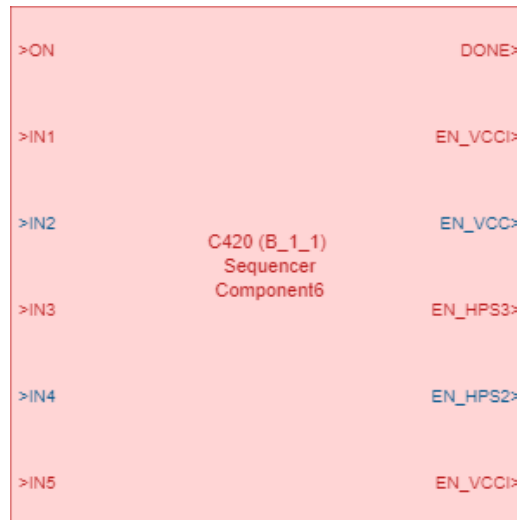
Parameters

Category	Parameter	Description	Value
Basic_Configuration	Vin	Nominal Input Voltage	3.3V
Basic_Configuration	Vin_Name	Used in The Schematics View	PVin5
Basic_Configuration	Vout	Nominal Output Voltage	2.5V
Basic_Configuration	Vout_Name	Used in The Schematics View	Vout5
Basic_Configuration	Iout	Maximum Converter Current	1A
Basic_Configuration	Min_Load		null
Cout	Capacitor		10μF
Cout	Cap_ESR		10mΩ
Manual_Resistor	R1		7.32kΩ
Manual_Resistor	R2		4.53kΩ
Manual_Resistor	Vfb	$V_{fb} = V_{out} * R2 / (R1 + R2)$	0.956V
Manual_Resistor	Ext_Div_Ratio		2.616
OCP_EN	OCP	Current Protection Level	1.5A
Constraints	SoftStartSense		Internal
Program_Soft_Start	Soft_Start_Current	Current	1A
Program_Soft_Start	Use_Rdiv		0
PGood_EN	PGood	Power Good percentage of Nominal Vout	85%
hidden	Cin		10μF
hidden	D1		0.2A

C420 Sequencer

AmP Power Component6

Schematic



C420 Sequencer

AmP Power Component6

BoM

Part	Description	Recommended Attributes	Attributes	Quantity	Size (Imperial)	X(mm)	Y(mm)	Part Number	Spec	Manufacturer
C420	Sequencer			<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text"/>		<input type="text" value="AnDAPT, LLC"/>

Total BoM Area ≈ 0 mm²

C420 Sequencer

AmP Power Component6

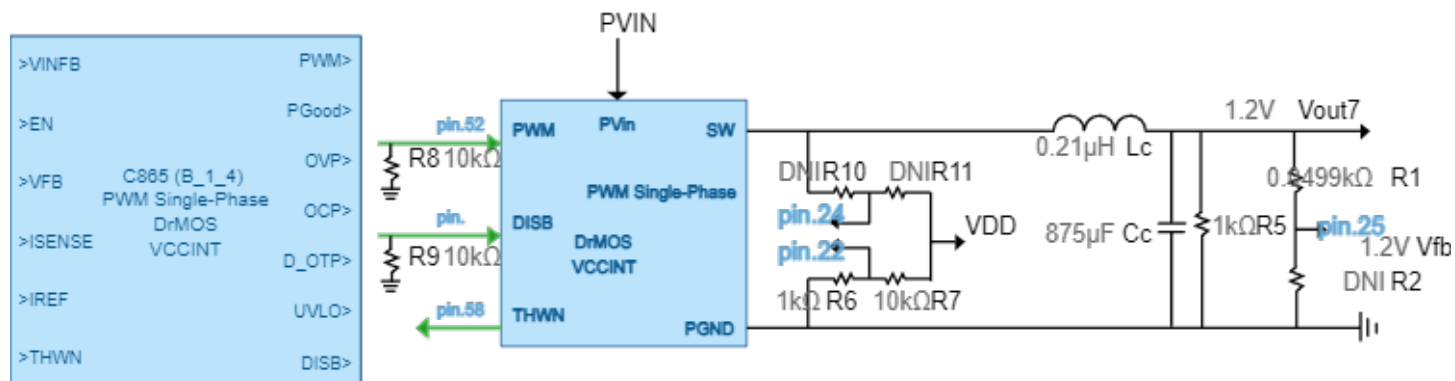
Parameters

	Channels	Target Delay ms	Actual Delay ms
Group 1	1	4	4
Group 2	1	4	4
Group 3	1	4	4
Group 4	1	4	4
Group 5	1	0	2
Group 6	0	0	2
Group 7	0	0	2
Group 8	0	0	2

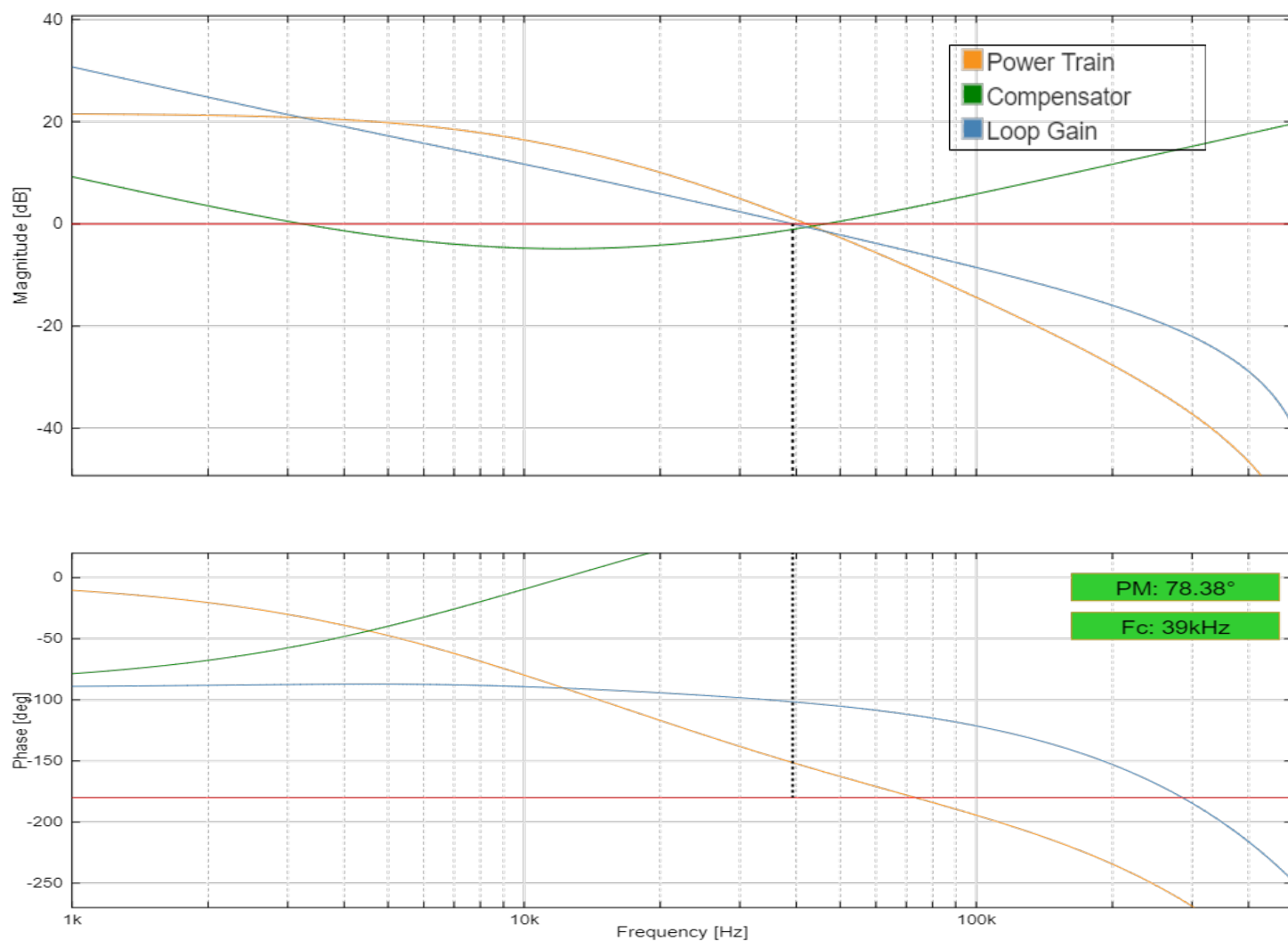
C865 PWM Single-Phase DrMOS

AmP Power VCCINT

Schematic



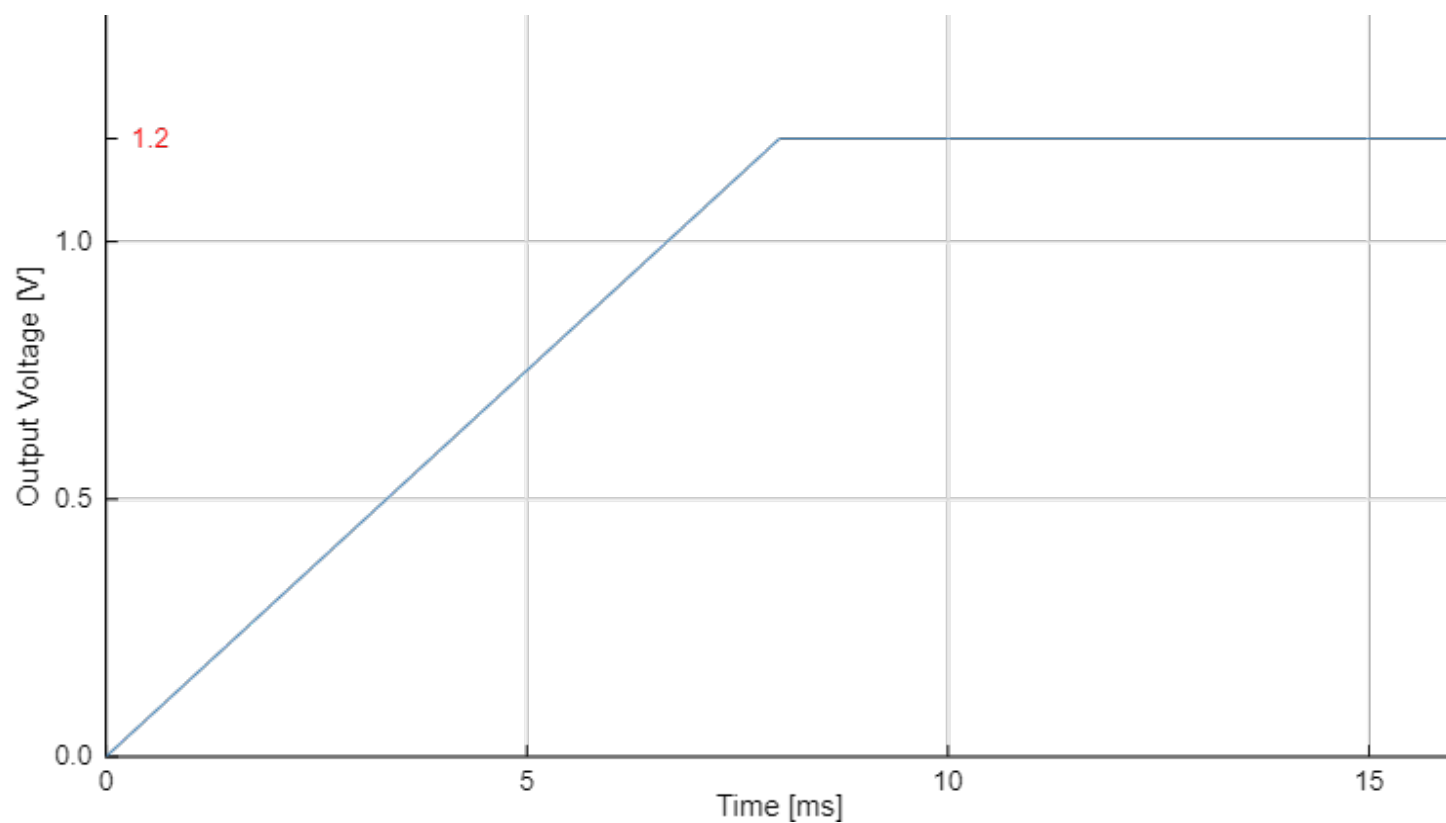
Bode Plot



C865 PWM Single-Phase DrMOS

AmP Power VCCINT

Soft Start



C865 PWM Single-Phase DrMOS

AmP Power VCCINT

BoM

Part	Description	Recommended Attributes	Attributes	Quantity	Size (Imperial)	X(mm)	Y(mm)	Part Number	Spec	Manufacturer
C865	PWM Single-Phase DrMOS		Vout7, 1.2V @ 30A	<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text"/>		<input type="text" value="AnDAPT, LLC"/>
DrMOS Chip		>=36A		<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="NCP302035"/>		<input type="text" value="onsemi"/>
L	Inductor	0.21μH, 10mΩ, >30A	0.25μH, 0.32mΩ, 56A	<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="11.3"/>	<input type="text" value="11"/>	<input type="text" value="744301025"/>		<input type="text" value="Würth Elektronik"/>
Cout (Ceramic)	Output Capacitor (Ceramic)	875μF, <15mΩ, >1.2V	47μF, 6.3V	<input type="text" value="19"/>	<input type="text" value="0805"/>	<input type="text" value="2"/>	<input type="text" value="1.25"/>	<input type="text" value="885012107006"/>		<input type="text" value="Würth Elektronik"/>
Cout (Bulk)	Output Capacitor (Bulk)		0μF, >1.2V	<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text"/>		<input type="text"/>
Cin	Capacitor	80μF, <15mΩ, >12V	22μF, 3mΩ, 16V	<input type="text" value="5"/>	<input type="text" value="1206"/>	<input type="text" value="3.2"/>	<input type="text" value="1.6"/>	<input type="text" value="885012108018"/>		<input type="text" value="Würth Elektronik"/>
R1	Resistor	0.0499kΩ, 1%, 0.063W	0.0499kΩ, 1%, 0.063W	<input type="text" value="1"/>	<input type="text" value="0402"/>	<input type="text" value="1"/>	<input type="text" value="0.5"/>	<input type="text"/>		<input type="text"/>
R2	Resistor	DNI	DNI	<input type="text" value="0"/>	<input type="text" value="Optional"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text"/>		<input type="text"/>
R5	Resistor	1kΩ, 1%, 0.063W	1kΩ, 1%, 0.063W	<input type="text" value="1"/>	<input type="text" value="0402"/>	<input type="text" value="1"/>	<input type="text" value="0.5"/>	<input type="text"/>		<input type="text"/>
R6	Resistor	1kΩ, 1%, 0.063W	1kΩ, 1%, 0.063W	<input type="text" value="1"/>	<input type="text" value="0402"/>	<input type="text" value="1"/>	<input type="text" value="0.5"/>	<input type="text"/>		<input type="text"/>
R7	Resistor	10kΩ, 1%, 0.063W	10kΩ, 1%, 0.063W	<input type="text" value="1"/>	<input type="text" value="0402"/>	<input type="text" value="1"/>	<input type="text" value="0.5"/>	<input type="text"/>		<input type="text"/>
R8	Resistor	10kΩ, 1%, 0.063W	10kΩ, 1%, 0.063W	<input type="text" value="1"/>	<input type="text" value="0402"/>	<input type="text" value="1"/>	<input type="text" value="0.5"/>	<input type="text"/>		<input type="text"/>
R9	Resistor	10kΩ, 1%, 0.063W	10kΩ, 1%, 0.063W	<input type="text" value="1"/>	<input type="text" value="0402"/>	<input type="text" value="1"/>	<input type="text" value="0.5"/>	<input type="text"/>		<input type="text"/>
R10	Resistor	nullkΩ, 1%, 0.063W	nullkΩ, 1%, 0.063W	<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text"/>		<input type="text"/>
R11	Resistor	nullkΩ, 1%, 0.063W	nullkΩ, 1%, 0.063W	<input type="text" value="1"/>	<input type="text" value="Custom Size"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text"/>		<input type="text"/>

Total BoM Area ≈ 440.02 mm²

C865 PWM Single-Phase DrMOS

AmP Power VCCINT

Parameters

Category	Parameter	Description	Value
Basic_Configuration	Fsw	Switching Frequency	571kHz
Basic_Configuration	Vin	Nominal Input Voltage	12V
Basic_Configuration	Vin_Name	Used in The Schematics View	PVin7
Basic_Configuration	Vout	Nominal Output Voltage	1.2V
Basic_Configuration	Vout_Name	Used in The Schematics View	Vout7
Basic_Configuration	V_Ripple	Output Voltage Ripple	2.3mV
Basic_Configuration	V_Overshoot	Max Overshoot for a transient of Iout Delta	0.01V
Basic_Configuration	Iout	Maximum Converter Current	30A
Basic_Configuration	I_Ripple	Desired Ripple. Used for LC Recommendations	30%
Basic_Configuration	I_Delta	Used to Calculate Overshoot and Transient Response	10A
DrMOS_2	DrMOS_Chip	Select the DrMOS Vendor	onsemi NCP302035
DrMOS_2	Rds		5.15
Manual_LC	Inductor	Nominal Inductor Value	0.21μH
Manual_LC	Inductor_DCR	Nominal Inductor DC Resistance	10mΩ
Manual_LC	Capacitor	Nominal Capacitor value	875μF
Manual_LC	Cap_ESR	Nominal Capacitor Equivalent Series Resistance	15mΩ
Manual_LC	CapacitorBik	Nominal Capacitor value	0μF
Manual_LC	Cap_ESR_Bik	Nominal Capacitor Equivalent Series Resistance	0mΩ
Manual_LC	Inductor_RS	Nominal Inductor Value	0.21μH
Manual_LC	Inductor_DCR_RS	Nominal Inductor DC Resistance	10mΩ
Manual_LC	Capacitor_RS	Nominal Capacitor value	875μF
Manual_LC	Cap_ESR_RS	Nominal Capacitor Equivalent Series Resistance	15mΩ
Manual_LC	Capacitor_R_Bik	Nominal Capacitor value	0μF
Manual_LC	Cap_ESR_R_Bik	Nominal Capacitor Equivalent Series Resistance	999mΩ
Manual_LC	fLC	LC Resonant Frequency	11.7kHz
Manual_Resistor	R1		0.0499kΩ
Manual_Resistor	R2		DNI
Manual_Resistor	Vfb	$Vfb = Vout * R2 / (R1 + R2)$	1.2V
Manual_Resistor	R3		1kΩ
Manual_Resistor	R4		10kΩ
Manual_Resistor	PVinfb		1.02V
Manual_Resistor	R5		1kΩ
Manual_Resistor	R6		1kΩ
Manual_Resistor	R7		10kΩ
Manual_Resistor	R8		10kΩ
Manual_Resistor	R9		10kΩ
Manual_Resistor	R10		DNI
Manual_Resistor	R11		DNI
Manual_Resistor	Ext_Div_Ratio		1
Manual_Resistor	Ext_Div_Ratio2		4.9
ControllerIP865	Gain	Proportional Gain	400
ControllerIP865	Fz1	First Compensation Zero	5kHz
ControllerIP865	Fz2	Second Compensation Zero	30kHz
ControllerIP865	Ki	Integral Gain	1.256637e+7
ControllerIP865	Kd	Derivative gain	2.122066e-3
ControllerIP865	Controller_Type		0
PID_Nonlinear	Kp_a		0
PID_Nonlinear	Ki_a		0
PID_Nonlinear	Kd_a		0
PID_Nonlinear	Kp_b		0
PID_Nonlinear	Ki_b		0
PID_Nonlinear	Kd_b		0
PID_Nonlinear	Kp_alpha		0
PID_Nonlinear	Ki_min		0
PID_Nonlinear	Kd_min		0
PID_Nonlinear	Kd_max		0
UVLO_EN	UVLO	Input Under Voltage Lockout	5V
UVLO_EN	UVLOSense	Internal: Sensed through High Side Drain pin. External: Sensed through a GPIO	External
VoUVLO_Group	VoUVLO	Output Under Voltage Lockout Threshold	0.9V
OVP_EN	OVP	Output Over Voltage Protection Level	1.5V
OTP_EN2	OTP_Sutdown_Hiccup		OTP Shutdown
OTP_EN2	OTP_Shutdown		enable
OTP_EN2	OTP_Hiccup		disable
OVER CURRENT	OverCurrent	Cycle by Cycle Current Protection Level	39A
OVER CURRENT	OCP_Sutdown_Hiccup		OCP Shutdown
OVER CURRENT	OCP_Shutdown		enable
OVER CURRENT	OCP_Hiccup		disable
Soft_Start_EN	Rise_Time	Soft Start Length	8ms
PGood_EN	PGood	Power Good percentage of Nominal Vout	85%
hidden	Cin		80μF
hidden	Phase_Num2		1

Global BoM

Component	Part	Description	Attributes	Quantity	Part Number	Manufacturer
Platform	AmP8DB6QF65	AmP Power IC	8 MOSFETS, 6A	1		AnDAPT, LLC
Platform	Cvin1	Capacitor	0.1µF, 25V	1	885012205085R	Würth Elektronik
Platform	Cvin2	Capacitor	1µF, 25V	1	885012106022	Würth Elektronik
Platform	Cvin3	Capacitor	10µF, 25V	1	885012106031	Würth Elektronik
Platform	Cvdd1	Capacitor	0.1µF, 25V	1	885012205085R	Würth Elektronik
Platform	Cvdd2	Capacitor	10µF, 6.3V	1	885012105020	Würth Elektronik
Platform	Cvcc1	Capacitor	0.1µF, 25V	1	885012205085R	Würth Elektronik
Platform	Cvcc2	Capacitor	1µF, 16V	1	885012105019	Würth Elektronik
Platform	C3v31	Capacitor	0.1µF, 25V	1	885012205085R	Würth Elektronik
Platform	C3v32	Capacitor	1µF, 16V	1	885012105019	Würth Elektronik
Platform	Cldoa1	Capacitor	0.1µF, 25V	1	885012205085R	Würth Elektronik
Platform	Cldoa2	Capacitor	1µF, 16V	1	885012105019	Würth Elektronik
Platform	Cldob1	Capacitor	0.1µF, 25V	1	885012205085R	Würth Elektronik
Platform	Cldob2	Capacitor	1µF, 16V	1	885012105019	Würth Elektronik
Platform	Cvclo23	Capacitor	0.1µF, 25V	1	885012205085R	Würth Elektronik
VCCINT_HPS	C200	PWM Sync Buck VM	Vout2, 1.1V @ 2.5A	1	20240610	
VCCINT_HPS	L	Inductor	2.2µH, 29.00mΩ, 6.2A	1	74438356022	Würth Elektronik
VCCINT_HPS	Cout (Ceramic)	Output Capacitor (Ceramic)	47µF, 6.3V	6	885012107006	Würth Elektronik
VCCINT_HPS	Cout (Bulk)	Output Capacitor (Bulk)	0µF, >1.1V	1		
VCCINT_HPS	Cin	Capacitor	22µF, 3mΩ, 16V	1	885012108018	Würth Elektronik
VCCINT_HPS	Cbst	Capacitor	0.1µF, 25V	1	885012205085R	Würth Elektronik
VCCINT_HPS	Cdrv	Capacitor	0.1µF, 25V	1	885012205085R	Würth Elektronik
VCCINT_HPS	D1	Schottky Diode	200mA, 0.5V	1	RB521S30T5G	ON Semiconductor
VCCINT_HPS	R1	Resistor	0.0499kΩ, 1%, 0.063W	1		
VCCINT_HPS	R2	Resistor	DNI	0		
VCCINT_HPS	Rbst	Resistor	15Ω	1		
HPS3V3	C200	PWM Sync Buck VM	Vout3, 3.3V @ 6A	1	20240610	
HPS3V3	L	Inductor	1.1µH, 3.10mΩ, 19.6A	1	744314110	Würth Elektronik
HPS3V3	Cout (Ceramic)	Output Capacitor (Ceramic)	47µF, 6.3V	3	885012107006	Würth Elektronik
HPS3V3	Cout (Bulk)	Output Capacitor (Bulk)	0µF, >3.3V	1		
HPS3V3	Cin	Capacitor	10µF, 10.4mΩ, 25V	4	885012106031	Würth Elektronik
HPS3V3	Cbst	Capacitor	0.1µF, 147.4mΩ, 25V	1	885012104005	Würth Elektronik
HPS3V3	Cdrv	Capacitor	0.1µF, 147.4mΩ, 25V	1	885012104005	Würth Elektronik
HPS3V3	D1	Schottky Diode	200mA, 0.5V	1	RB521S30T5G	ON Semiconductor
HPS3V3	R1	Resistor	7.32kΩ, 1%, 0.063W	1	CPF0603F7K32C1	TE Connectivity Passive Product
HPS3V3	R2	Resistor	2.8kΩ, 1%, 0.063W	1	CPF0603F2K8C1	TE Connectivity Passive Product
HPS3V3	Rbst	Resistor	15Ω	1		
HPS2V5	C200	PWM Sync Buck VM	Vout4, 1.5V @ 3A	1	20240610	
HPS2V5	L	Inductor	2.5µH, 10.00mΩ, 5.3A	1	744776025	Würth Elektronik
HPS2V5	Cout (Ceramic)	Output Capacitor (Ceramic)	47µF, 6.3V	5	885012107006	Würth Elektronik
HPS2V5	Cout (Bulk)	Output Capacitor (Bulk)	0µF, >1.5V	1		
HPS2V5	Cin	Capacitor	22µF, 3mΩ, 16V	1	885012108018	Würth Elektronik
HPS2V5	Cbst	Capacitor	0.1µF, 25V	1	885012205085R	Würth Elektronik
HPS2V5	Cdrv	Capacitor	0.1µF, 25V	1	885012205085R	Würth Elektronik
HPS2V5	D1	Schottky Diode	200mA, 0.5V	1	RB521S30T5G	ON Semiconductor
HPS2V5	R1	Resistor	0.0499kΩ, 1%, 0.063W	1		
HPS2V5	R2	Resistor	DNI	0		
HPS2V5	Rbst	Resistor	15Ω	1		
VCCIO	C710	LDO	Vout5, 2.5V @ 1A	1	20240610	
VCCIO	Cout	Capacitor	10µF, 5.9mΩ, 6.3V	1	885012105020	Würth Elektronik
VCCIO	Cin	Capacitor	10µF, 5.9mΩ, 6.3V	1	885012105020	Würth Elektronik
Component6	C420	Sequencer		1		
VCCINT	C865	PWM Single-Phase DrMOS	Vout7, 1.2V @ 30A	1	20240610	
VCCINT	DrMOS Chip			1	NCP302035	onsemi
VCCINT	L	Inductor	0.25µH, 0.32mΩ, 56A	1	744301025	Würth Elektronik
VCCINT	Cout (Ceramic)	Output Capacitor (Ceramic)	47µF, 6.3V	19	885012107006	Würth Elektronik
VCCINT	Cout (Bulk)	Output Capacitor (Bulk)	0µF, >1.2V	1		
VCCINT	Cin	Capacitor	22µF, 3mΩ, 16V	5	885012108018	Würth Elektronik
VCCINT	R1	Resistor	0.0499kΩ, 1%, 0.063W	1		
VCCINT	R2	Resistor	DNI	0		
VCCINT	R5	Resistor	1kΩ, 1%, 0.063W	1		
VCCINT	R6	Resistor	1kΩ, 1%, 0.063W	1		
VCCINT	R7	Resistor	10kΩ, 1%, 0.063W	1		
VCCINT	R8	Resistor	10kΩ, 1%, 0.063W	1		
VCCINT	R9	Resistor	10kΩ, 1%, 0.063W	1		
VCCINT	R10	Resistor	nullkΩ, 1%, 0.063W	1		
VCCINT	R11	Resistor	nullkΩ, 1%, 0.063W	1		

Category	Function	Part	Document Link
AmP Platform	AmPMIC	AmP8DB6QF65	https://www.andapt.com/docs/AnDAPT_AmP_Platform_B.pdf
PWM Switching Regulator	PWM Sync Buck VM	C200	https://www.andapt.com/docs/pc/AnDAPT_C200_B_I200_B_PWM_Sync_Buck_VM.pdf
Linear Regulator	LDO	C710	https://www.andapt.com/docs/pc/AnDAPT_C710_B_C711_B_LDO.pdf
DrMos Controller	PWM Single-Phase DrMOS	C865	https://www.andapt.com/docs/pc/AnDAPT_C865_B_DrMOS_Ctrl_Single_Phase.pdf



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