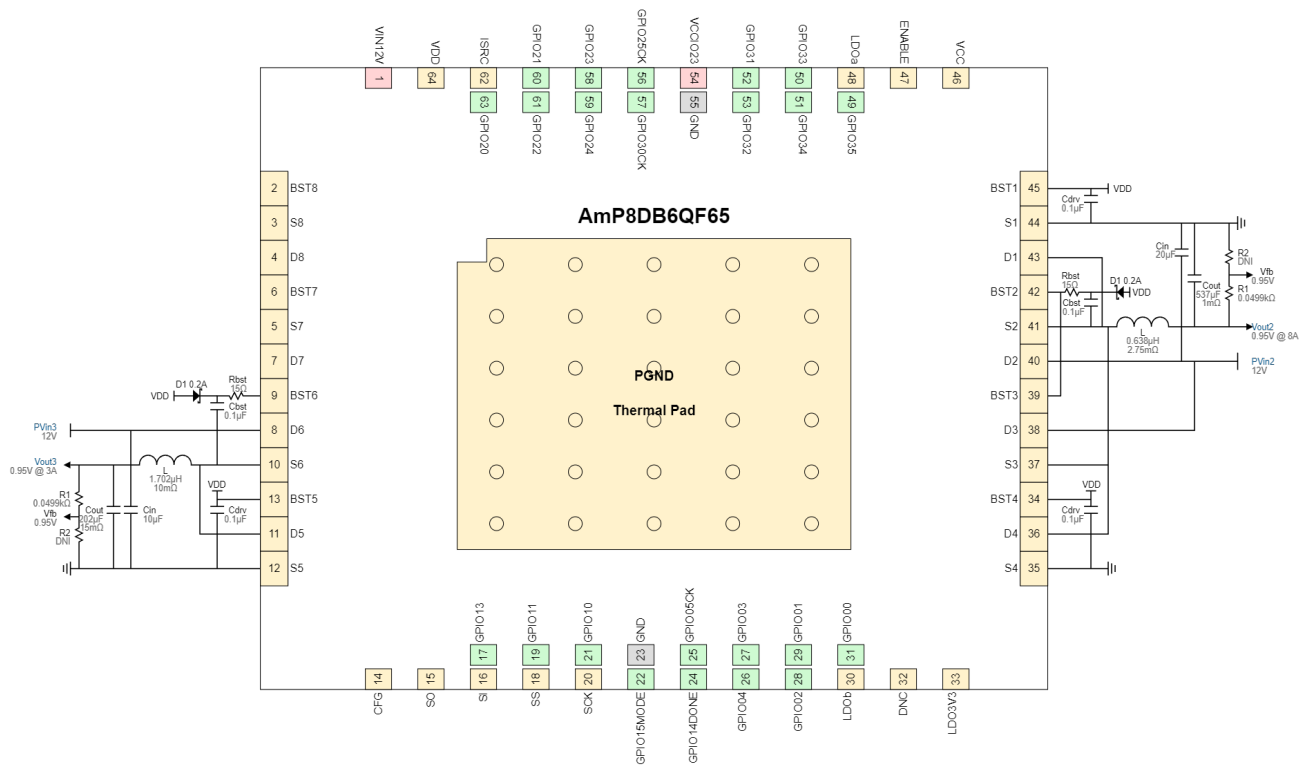


Package Top View (Pin and Thermal Pads are on bottom side)



Package Marking Example - QF65



Pin Configurations

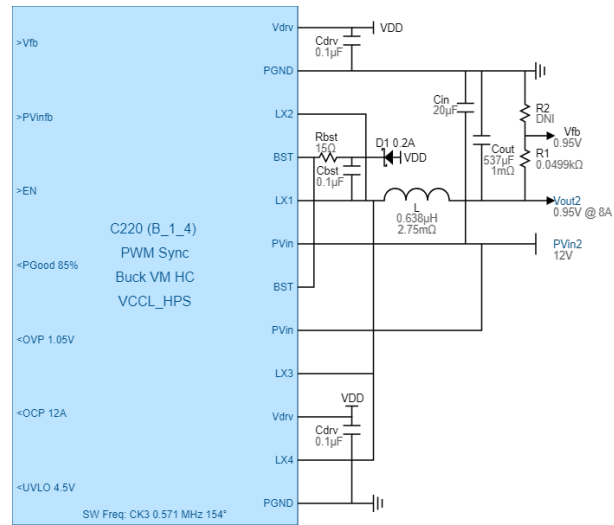
| Pin Name | Design Name | Pin Number | Function |
|------------|-------------|------------|----------------|
| BST8 | | 2 | Boost |
| S8 | | 3 | Source |
| D8 | | 4 | Drain |
| BST7 | | 6 | Boost |
| S7 | | 5 | Source |
| D7 | | 7 | Drain |
| BST6 | | 9 | Boost |
| D6 | | 8 | Drain |
| S6 | | 10 | Source |
| 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 |

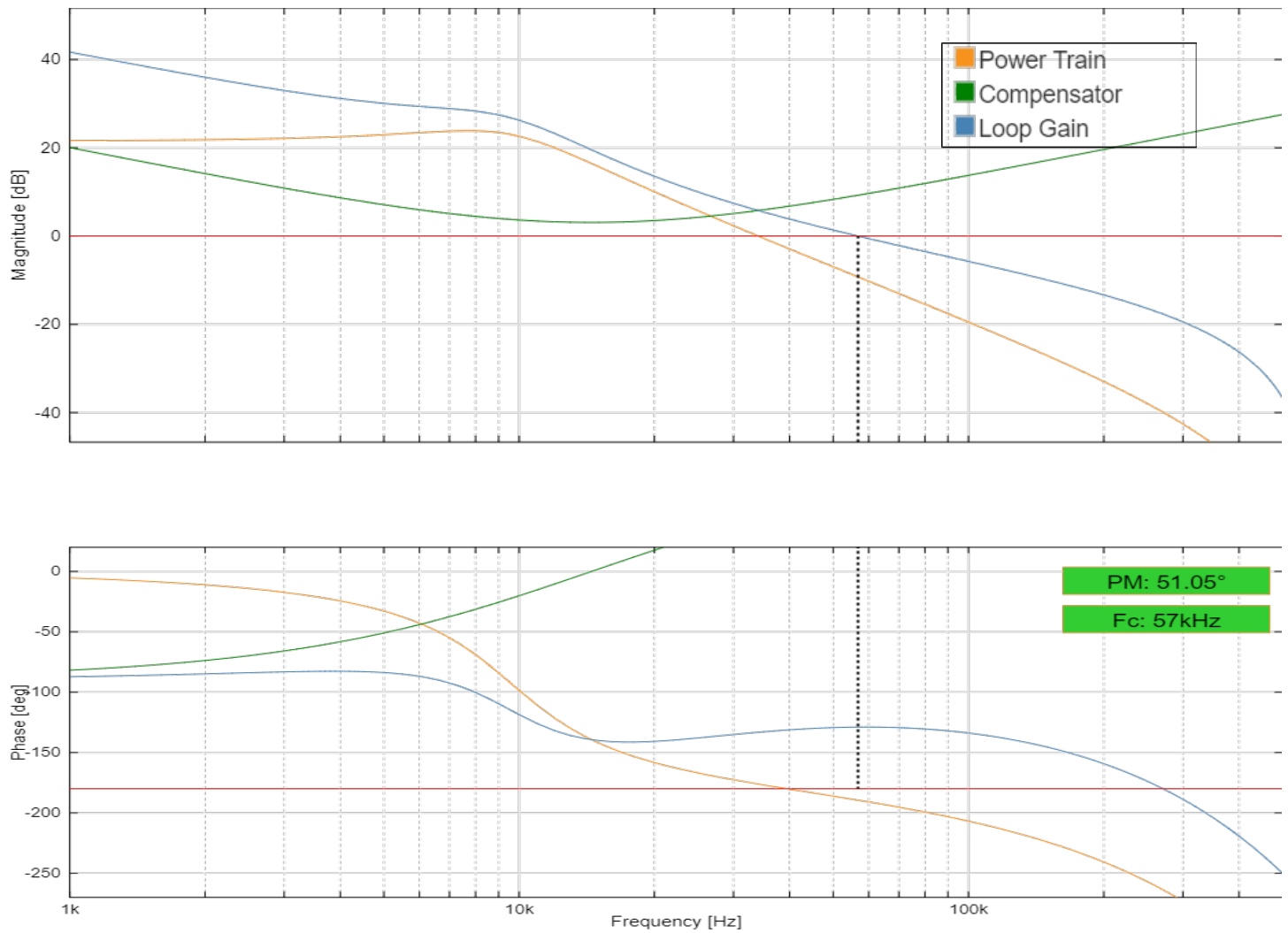
C220 PWM Sync Buck VM HC

AmP Power VCCL_HPS

Schematic



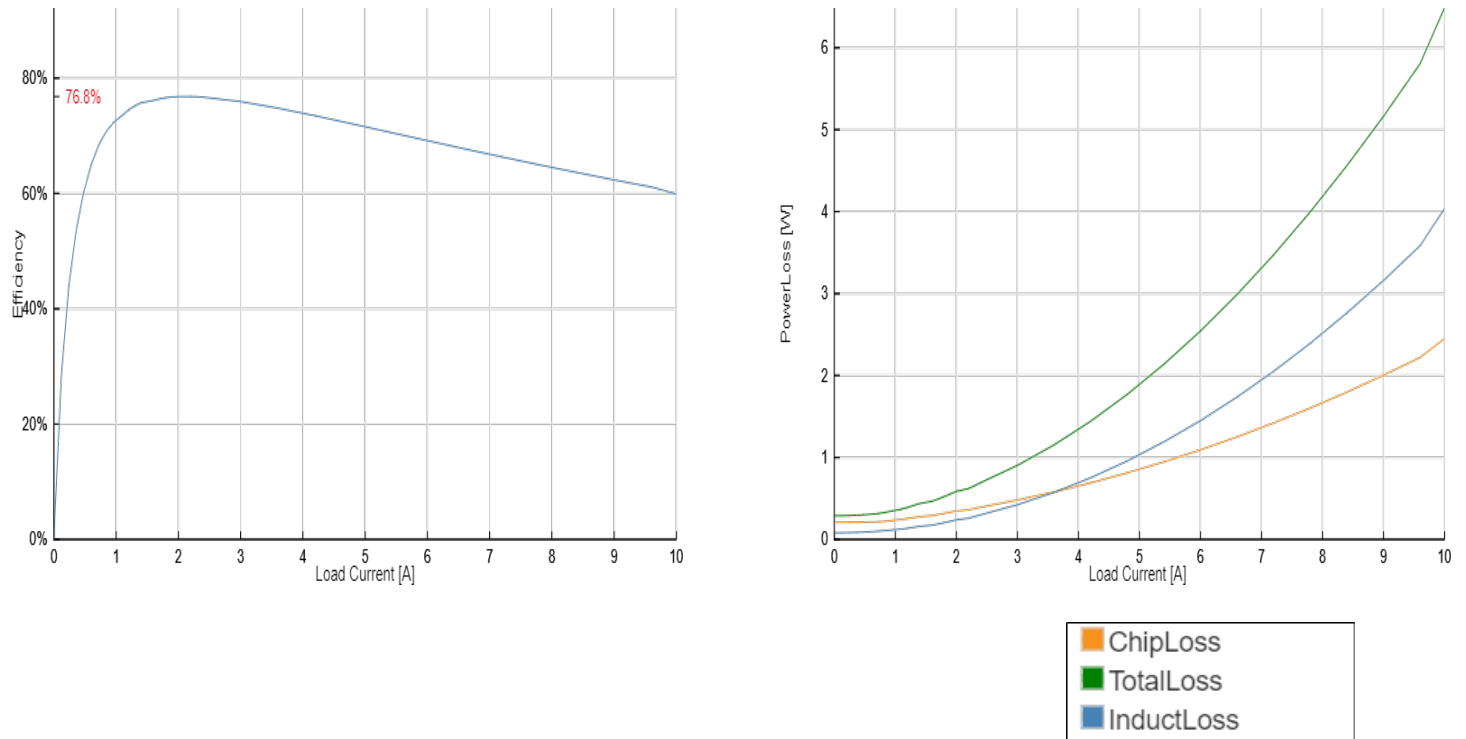
Bode Plot



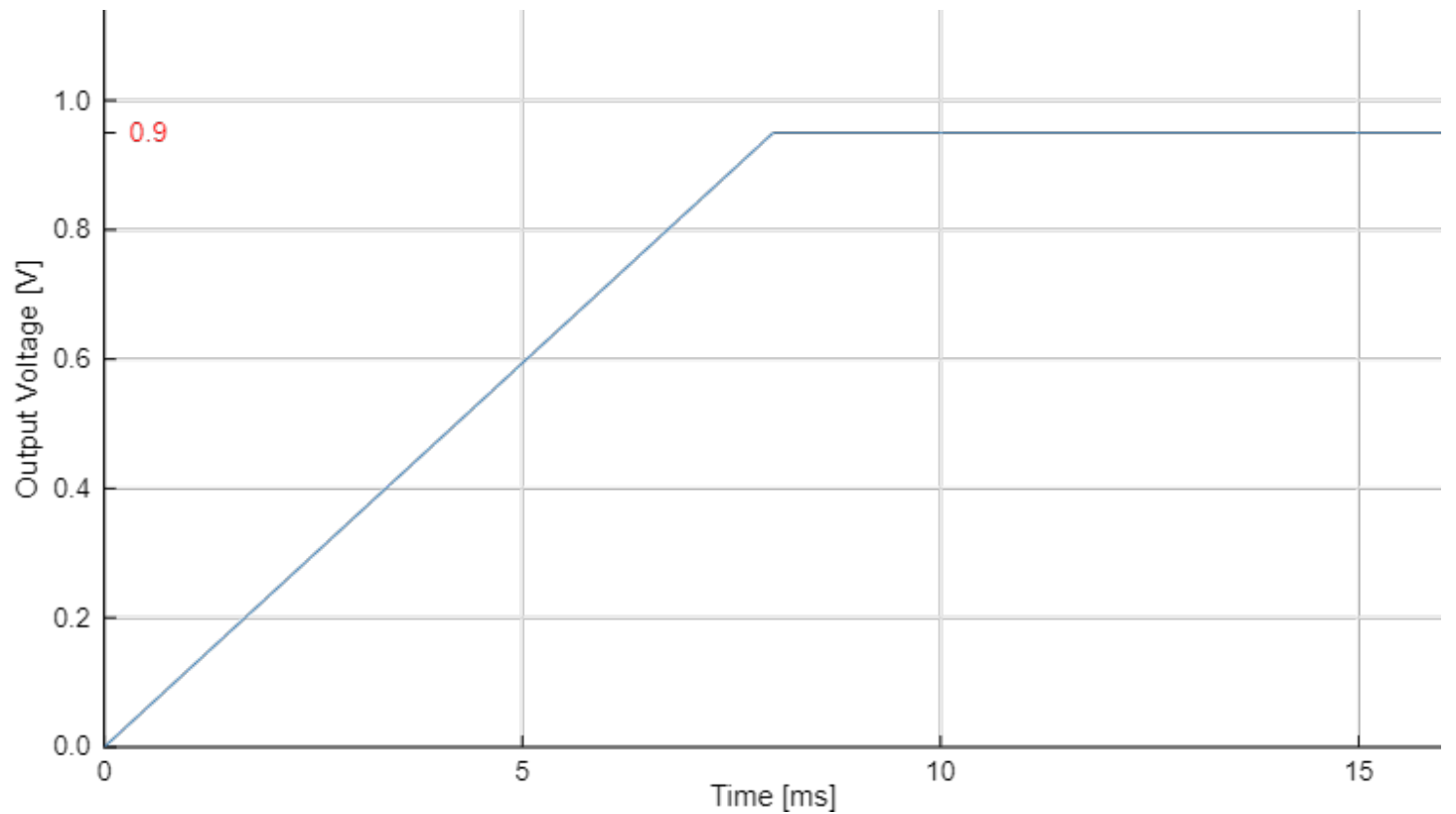
C220 PWM Sync Buck VM HC

AmP Power VCCL_HPS

Efficiency



Soft Start



C220 PWM Sync Buck VM HC

AmP Power VCCL_HPS

BoM

| Part | Description | Recommended Attributes | Attributes | Quantity | Size (Imperial) | X(mm) | Y(mm) | Part Number | Spec | Manufacturer |
|----------------|----------------------------|------------------------|----------------------|---------------------------------|--|-----------------------------------|-----------------------------------|--|------|---|
| C220 | PWM Sync Buck VM HC | | Vout2,0.95V @ 8A | <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 | 0.638μH, 2.75mΩ, >8A | 0.638μH, 2.75mΩ, >8A | <input type="text" value="1"/> | <input type="text" value="Custom Size"/> | <input type="text" value="10.5"/> | <input type="text" value="10.2"/> | <input type="text"/> | | <input type="text"/> |
| Cout (Ceramic) | Output Capacitor (Ceramic) | 537μF, <1mΩ, >0.95V | 47μF, 6.3V | <input type="text" value="12"/> | <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, >0.95V | <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 | 20μF, <1mΩ, >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="0402"/> | <input type="text" value="1"/> | <input type="text" value="0.5"/> | <input type="text"/> | | <input type="text"/> |

Total BoM Area ≈ 273.65 mm²

C220 PWM Sync Buck VM HC

AmP Power VCCL_HPS

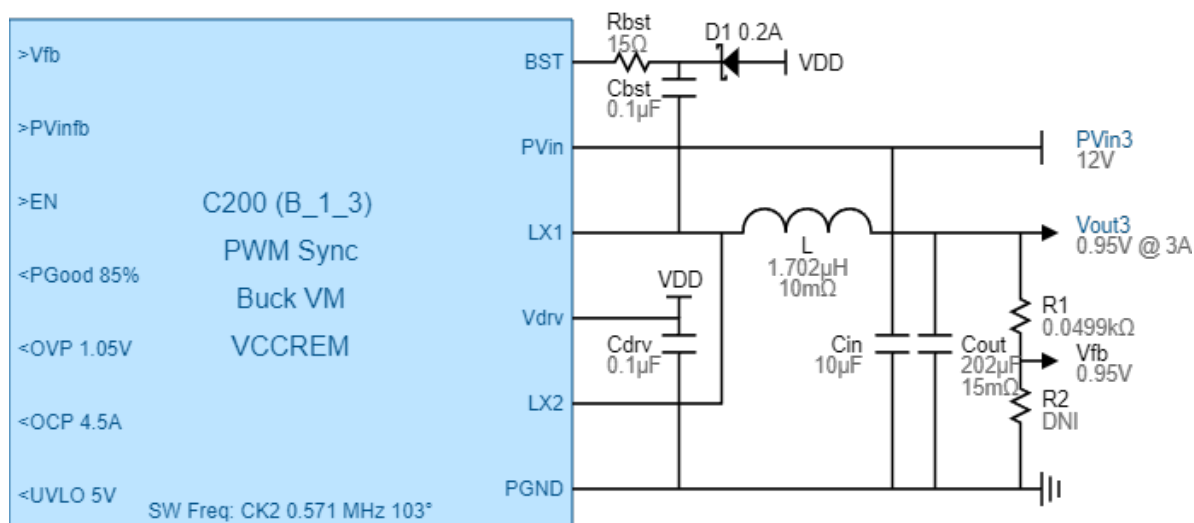
Parameters

| 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 | 0.95V |
| Basic_Configuration | Vout_Name | Used in The Schematics View | Vout2 |
| 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 | 8A |
| Basic_Configuration | I_Ripple | Desired Ripple. Used for LC Recommendations | 30% |
| Basic_Configuration | I_Delta | Used to Calculate Overshoot and Transient Response | 4A |
| Manual_LC | Inductor | Nominal Inductor Value | 0.638μH |
| Manual_LC | Inductor_DCR | Nominal Inductor DC Resistance | 2.75mΩ |
| Manual_LC | Capacitor | Nominal Capacitor value | 537μF |
| Manual_LC | Cap_ESR | Nominal Capacitor Equivalent Series Resistance | 1mΩ |
| 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 | 0.638μH |
| Manual_LC | Inductor_DCR_R\$ | Nominal Inductor DC Resistance | 2.75mΩ |
| Manual_LC | Capacitor_R\$ | Nominal Capacitor value | 537μF |
| Manual_LC | Cap_ESR_R\$ | Nominal Capacitor Equivalent Series Resistance | 1mΩ |
| Manual_LC | fLC | LC Resonant Frequency | 8.6kHz |
| Manual_Resistor | R1 | | 0.0499kΩ |
| Manual_Resistor | R2 | | DNI |
| Manual_Resistor | Vfb | $V_{fb} = V_{out} * R2 / (R1 + R2)$ | 0.95V |
| Manual_Resistor | Rbst | | 15Ω |
| Manual_Resistor | Ext_Div_Ratio | | 1 |
| 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 | 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 | 4.5V |
| UVLO_EN | UVLOSense | Internal: Sensed through High Side Drain pin. External: Sensed through a GPIO | Internal |
| VoUVLO_Group | VoUVLO | Output Under Voltage Lockout Threshold | 0.75V |
| OCP_Group | OCP | Cycle by Cycle Current Protection Level | 12A |
| OVP_EN | OVP | Output Over Voltage Protection Level | 1.05V |
| Soft_Start_EN | Rise_Time | Soft Start Length | 8ms |
| PGood_EN | PGood | Power Good percentage of Nominal Vout | 85% |
| hidden | Cin | | 20μF |
| hidden | Cbst | | 0.1μF |
| hidden | Cdrv | | 0.1μF |
| hidden | D1 | | 0.2A |

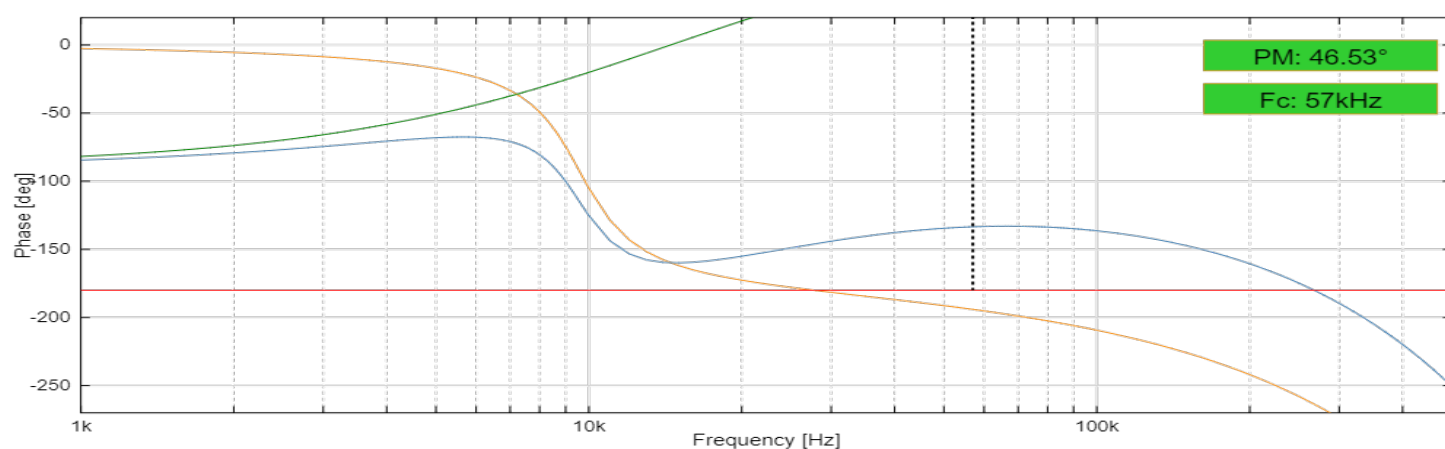
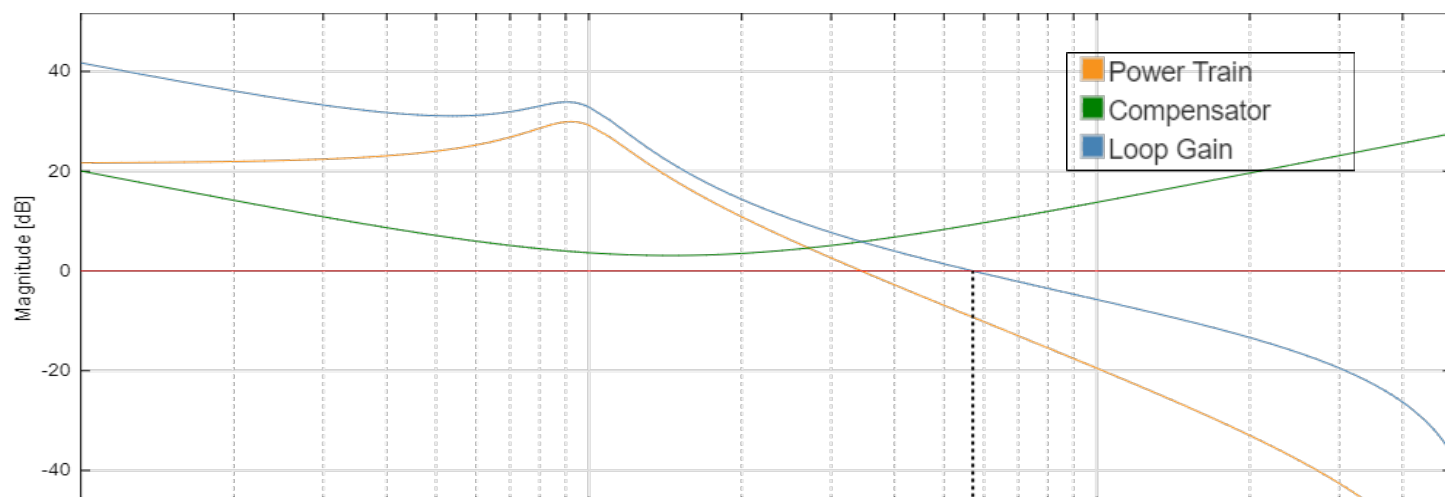
C200 PWM Sync Buck VM

AmP Power VCCREM

Schematic



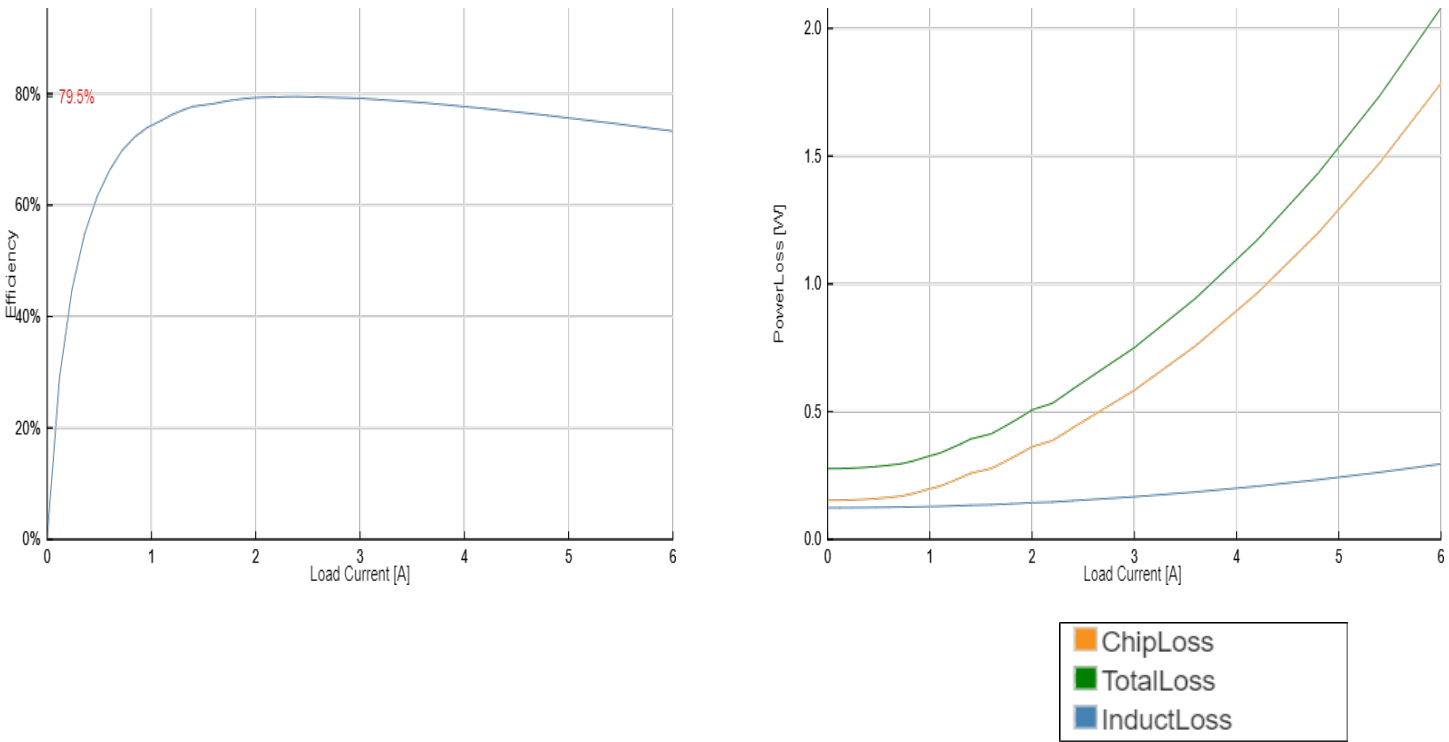
Bode Plot



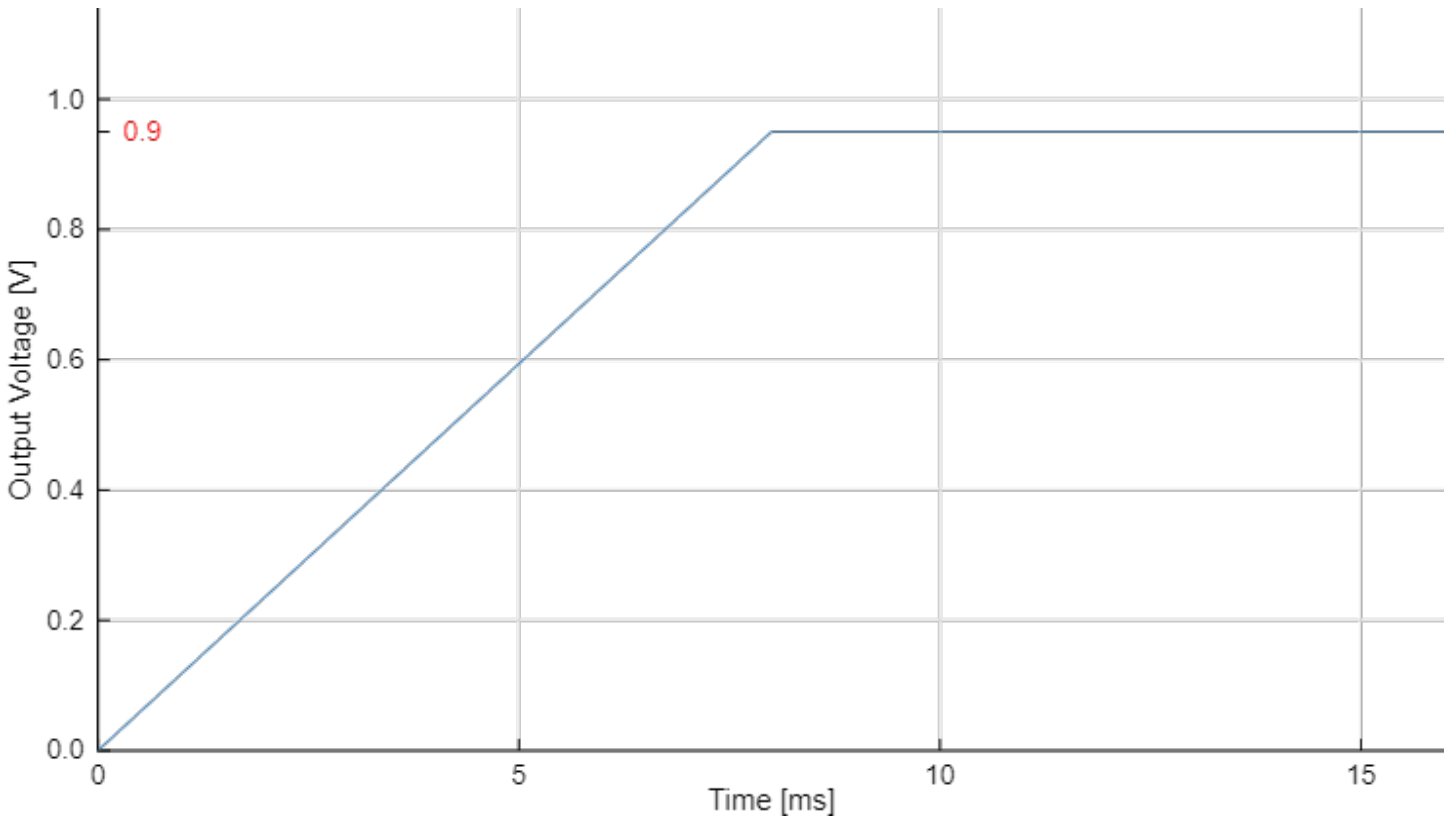
C200 PWM Sync Buck VM

AmP Power VCCREM

Efficiency








Soft Start



C200 PWM Sync Buck VM

AmP Power VCCREM

BoM

| Part | Description | Recommended Attributes | Attributes | Quantity | Size (Imperial) | X(mm) | Y(mm) | Part Number | Spec | Manufacturer |
|----------------|----------------------------|------------------------|----------------------|--------------------------------|--|----------------------------------|-----------------------------------|--|---|---|
| C200 | PWM Sync Buck VM | | Vout3,0.95V @ 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"/> | | AnDAPT, LLC |
| L | Inductor | 1.702μH, 10mΩ, >3A | 1.702μH, 10mΩ, >3A | <input type="text" value="1"/> | <input type="text" value="Custom Size"/> | <input type="text" value="7"/> | <input type="text" value="7"/> | <input type="text"/> | | <input type="text"/> |
| Cout (Ceramic) | Output Capacitor (Ceramic) | 390μF, <15mΩ, >0.95V | 47μF, 6.3V | <input type="text" value="5"/> | <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, >0.95V | <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 ≈ 138.07 mm²

C200 PWM Sync Buck VM

AmP Power VCCREM

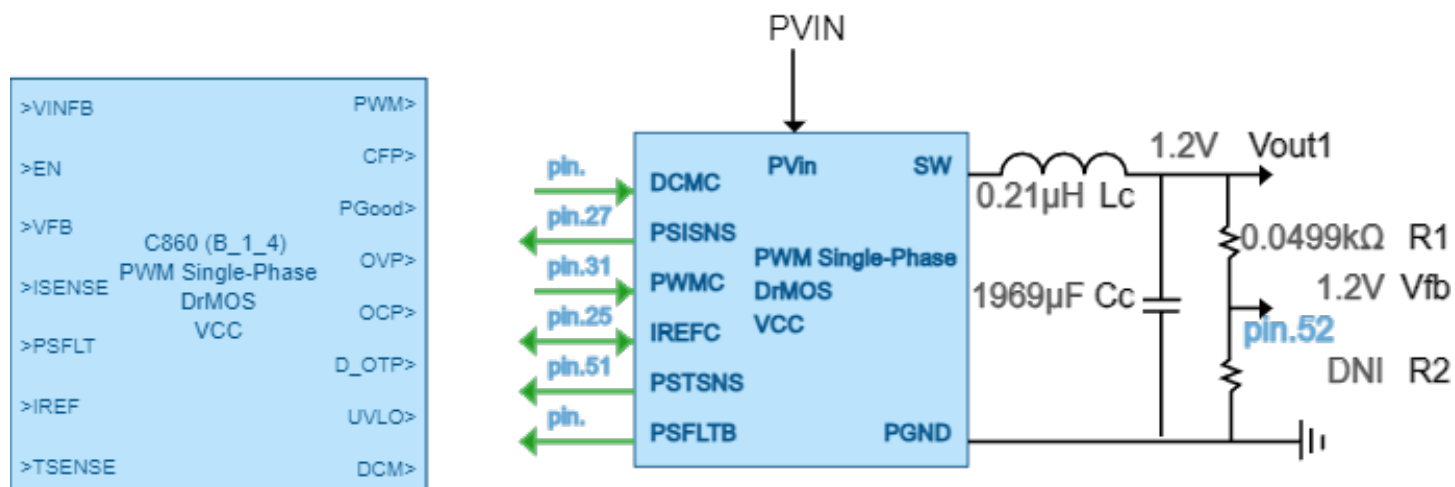
Parameters

| 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 | 0.95V |
| Basic_Configuration | Vout_Name | Used in The Schematics View | Vout3 |
| 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% |
| Basic_Configuration | I_Delta | Used to Calculate Overshoot and Transient Response | 1.5A |
| Manual_LC | Inductor | Nominal Inductor Value | 1.702μH |
| Manual_LC | Inductor_DCR | Nominal Inductor DC Resistance | 10mΩ |
| Manual_LC | Capacitor | Nominal Capacitor value | 202μF |
| 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 | 1.702μH |
| Manual_LC | Inductor_DCR_R\$ | Nominal Inductor DC Resistance | 10mΩ |
| Manual_LC | Capacitor_R\$ | Nominal Capacitor value | 202μF |
| 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 | 8.6kHz |
| Manual_Resistor | R1 | | 0.0499kΩ |
| Manual_Resistor | R2 | | DNI |
| Manual_Resistor | Vfb | $Vfb = Vout * R2 / (R1 + R2)$ | 0.95V |
| 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 | 0.75V |
| OCP_Group | OCP | Cycle by Cycle Current Protection Level | 4.5A |
| OVP_EN | OVP | Output Over Voltage Protection Level | 1.05V |
| 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 |

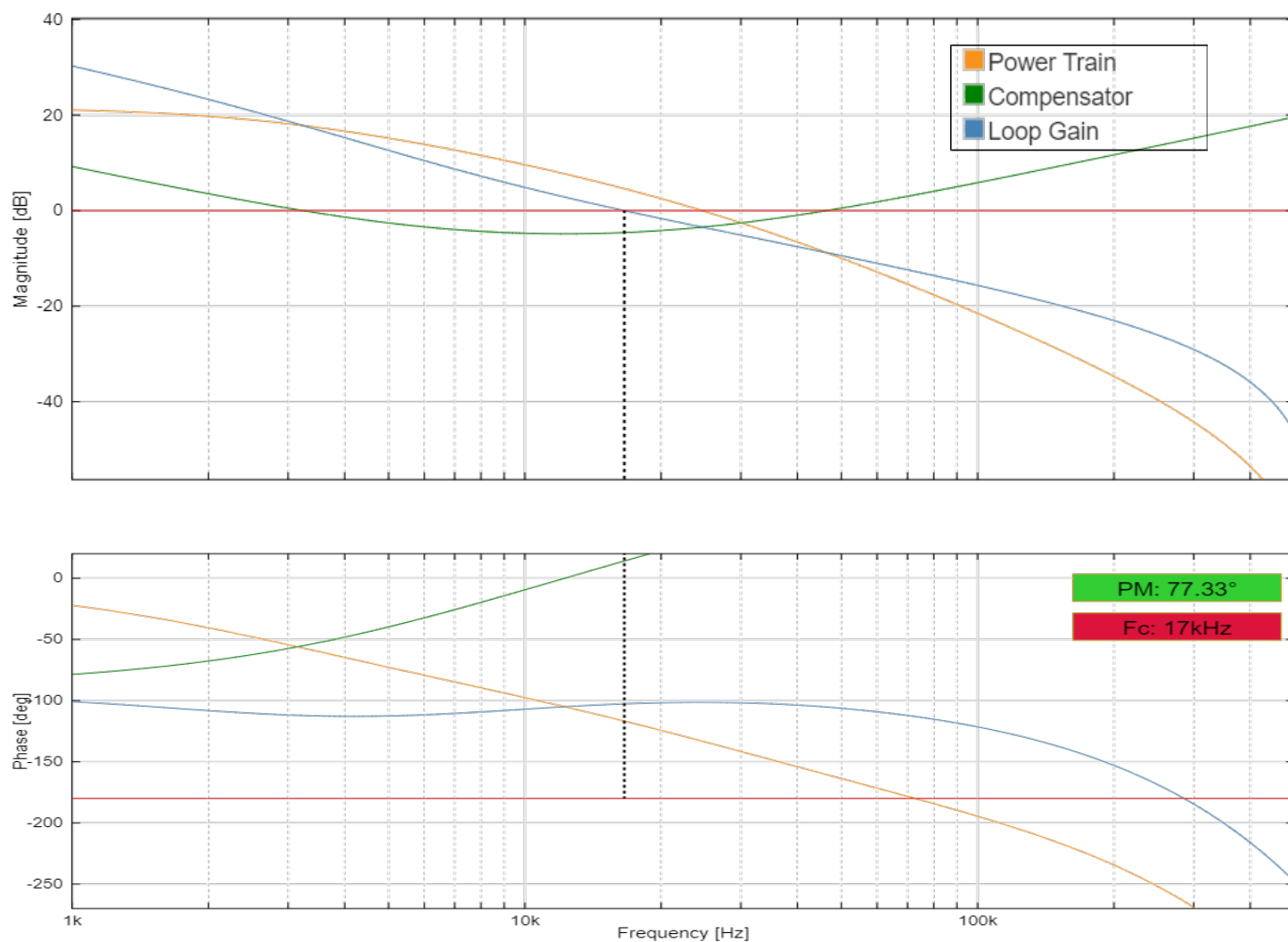
C860 PWM Single-Phase DrMOS

AmP Power VCC

Schematic



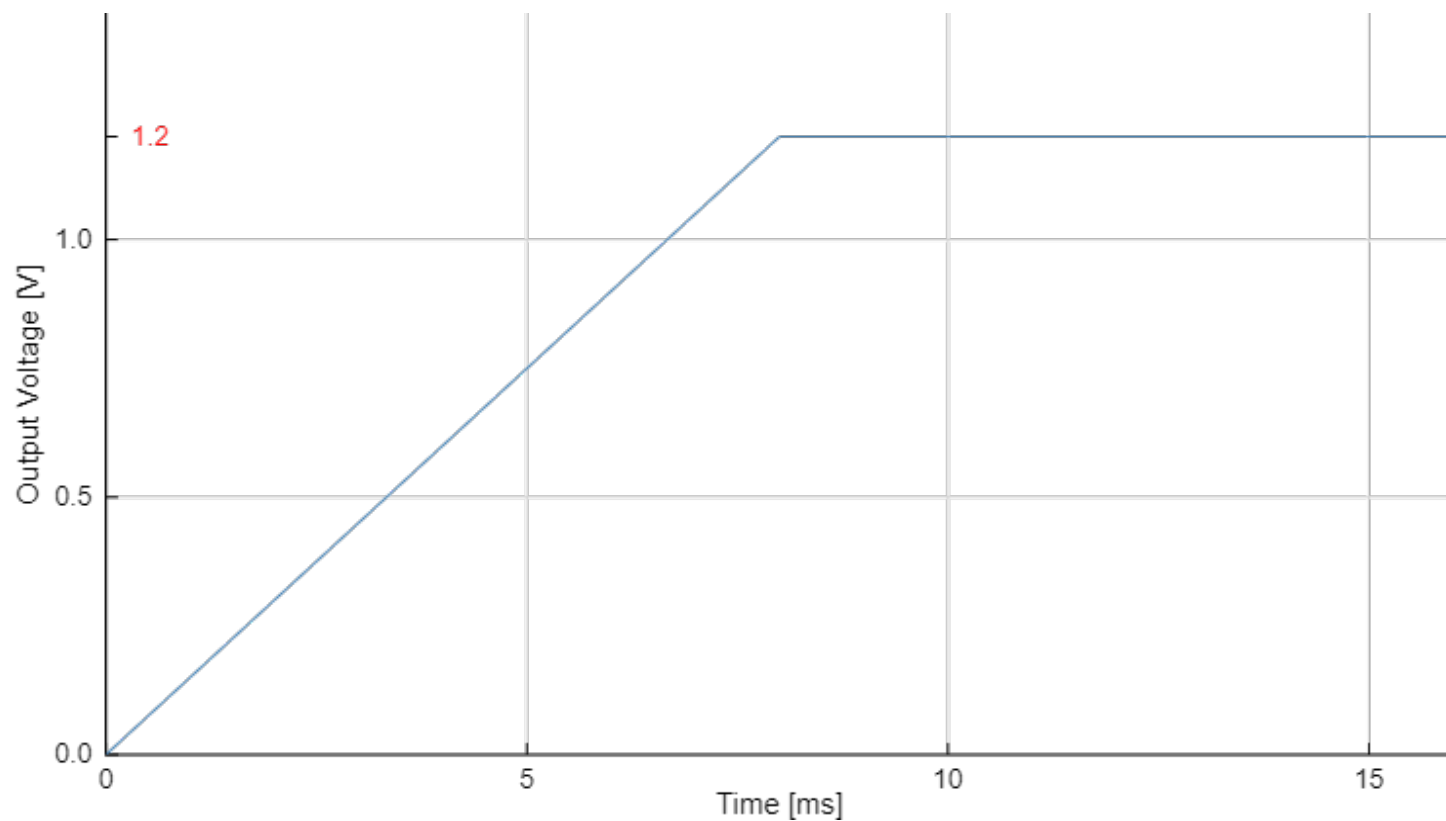
Bode Plot



C860 PWM Single-Phase DrMOS

AmP Power VCC

Soft Start



C860 PWM Single-Phase DrMOS

AmP Power VCC

BoM

| Part | Description | Recommended Attributes | Attributes | Quantity | Size (Imperial) | X(mm) | Y(mm) | Part Number | Spec | Manufacturer |
|----------------|----------------------------|------------------------|----------------------|---------------------------------|--|-----------------------------------|-----------------------------------|---|------|---|
| C860 | PWM Single-Phase DrMOS | | Vout1, 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="SiC645A"/> | | <input type="text" value="Vishay"/> |
| 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) | 1969µF, <15mΩ, >1.2V | 47µF, 6.3V | <input type="text" value="42"/> | <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"/> |

Total BoM Area ≈ 587.88 mm²

C860 PWM Single-Phase DrMOS

AmP Power VCC

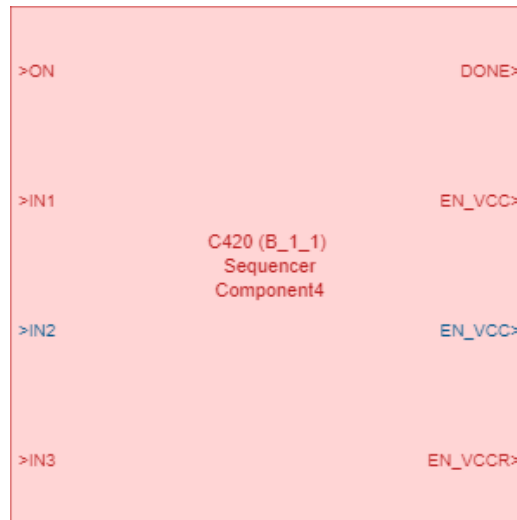
Parameters

| 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 | PVin1 |
| Basic_Configuration | Vout | Nominal Output Voltage | 1.2V |
| Basic_Configuration | Vout_Name | Used in The Schematics View | Vout1 |
| 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 | 30A |
| Basic_Configuration | I_Ripple | Desired Ripple. Used for LC Recommendations | 30% |
| Basic_Configuration | I_Delta | Used to Calculate Overshoot and Transient Response | 15A |
| DrMOS | DrMOS_Chip | Select the DrMOS Vendor | Vishay SiC645A |
| DrMOS | FLTMONCombo | | 0 |
| DrMOS | FLTBar | | 1 |
| DrMOS | VTypeIMON | | 1 |
| Manual_LC | Inductor | Nominal Inductor Value | 0.21μH |
| Manual_LC | Inductor_DCR | Nominal Inductor DC Resistance | 10mΩ |
| Manual_LC | Capacitor | Nominal Capacitor value | 1969μF |
| 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 | 0.21μH |
| Manual_LC | Inductor_DCR_R\$ | Nominal Inductor DC Resistance | 10mΩ |
| Manual_LC | Capacitor_R\$ | Nominal Capacitor value | 1969μF |
| Manual_LC | Cap_ESR_R\$ | Nominal Capacitor Equivalent Series Resistance | 15mΩ |
| Manual_LC | fLC | LC Resonant Frequency | 7.8kHz |
| Manual_Resistor | R1 | | 0.0499kΩ |
| Manual_Resistor | R2 | | DNI |
| Manual_Resistor | Vfb | $Vfb = Vout * R2 / (R1 + R2)$ | 1.2V |
| Manual_Resistor | R3 | | 39kΩ |
| Manual_Resistor | R4 | | 10kΩ |
| Manual_Resistor | PVinfb | | 1.02V |
| Manual_Resistor | Ext_Div_Ratio | | 1 |
| Manual_Resistor | Ext_Div_Ratio2 | | 4.9 |
| ControllerIP860 | Gain | Proportional Gain | 400 |
| ControllerIP860 | Fz1 | First Compensation Zero | 5kHz |
| ControllerIP860 | Fz2 | Second Compensation Zero | 30kHz |
| ControllerIP860 | Ki | Integral Gain | 1.256637e+7 |
| ControllerIP860 | Kd | Derivative gain | 2.122066e-3 |
| ControllerIP860 | 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 |
| OCP_EN | OCP | Current Protection Level | 45A |
| OVP_EN | OVP | Output Over Voltage Protection Level | 1.5V |
| OTP_EN | Temperature | | 125 |
| OTP_EN | OTP_Sutdown_Hiccup | | OTP Shutdown |
| OTP_EN | OTP_Shutdown | | enable |
| OTP_EN | OTP_Hiccup | | disable |
| UVLO_POWER | UVLO_Shutdown | | disable |
| UVLO_POWER | UVLO_Hiccup | | enable |
| OVER_CURRENT | OCP_Shutdown | | enable |
| OVER_CURRENT | OCP_Hiccup | | disable |
| OVER_TEMPERATURE | OTP_Shutdown2 | | enable |
| OVER_TEMPERATURE | OTP_Hiccup2 | | 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 |

C420 Sequencer

AmP Power Component4

Schematic



C420 Sequencer

AmP Power Component4

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 Component4

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 | 0 | 4 | 4 |
| Group 5 | 0 | 0 | 2 |
| Group 6 | 0 | 0 | 2 |
| Group 7 | 0 | 0 | 2 |
| Group 8 | 0 | 0 | 2 |

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 | Cvccio23 | Capacitor | 0.1μF, 25V | 1 | 885012205085R | Würth Elektronik |
| VCCL_HPS | C220 | PWM Sync Buck VM HC | Vout2,0.95V @ 8A | 1 | 20240610 | |
| VCCL_HPS | L | Inductor | 0.638μH, 2.75mΩ, >8A | 1 | | |
| VCCL_HPS | Cout (Ceramic) | Output Capacitor (Ceramic) | 47μF, 6.3V | 12 | 885012107006 | Würth Elektronik |
| VCCL_HPS | Cout (Bulk) | Output Capacitor (Bulk) | 0μF, >0.95V | 1 | | |
| VCCL_HPS | Cin | Capacitor | 22μF, 3mΩ, 16V | 1 | 885012108018 | Würth Elektronik |
| VCCL_HPS | Cbst | Capacitor | 0.1μF, 25V | 1 | 885012205085R | Würth Elektronik |
| VCCL_HPS | Cdrv | Capacitor | 0.1μF, 25V | 1 | 885012205085R | Würth Elektronik |
| VCCL_HPS | D1 | Schottky Diode | 200mA, 0.5V | 1 | RB521S30T5G | ON Semiconductor |
| VCCL_HPS | R1 | Resistor | 0.0499kΩ, 1%, 0.063W | 1 | | |
| VCCL_HPS | R2 | Resistor | DNI | 0 | | |
| VCCL_HPS | Rbst | Resistor | 15Ω | 1 | | |
| VCCREM | C200 | PWM Sync Buck VM | Vout3,0.95V @ 3A | 1 | 20240610 | |
| VCCREM | L | Inductor | 1.702μH, 10mΩ, >3A | 1 | | |
| VCCREM | Cout (Ceramic) | Output Capacitor (Ceramic) | 47μF, 6.3V | 5 | 885012107006 | Würth Elektronik |
| VCCREM | Cout (Bulk) | Output Capacitor (Bulk) | 0μF, >0.95V | 1 | | |
| VCCREM | Cin | Capacitor | 22μF, 3mΩ, 16V | 1 | 885012108018 | Würth Elektronik |
| VCCREM | Cbst | Capacitor | 0.1μF, 25V | 1 | 885012205085R | Würth Elektronik |
| VCCREM | Cdrv | Capacitor | 0.1μF, 25V | 1 | 885012205085R | Würth Elektronik |
| VCCREM | D1 | Schottky Diode | 200mA, 0.5V | 1 | RB521S30T5G | ON Semiconductor |
| VCCREM | R1 | Resistor | 0.0499kΩ, 1%, 0.063W | 1 | | |
| VCCREM | R2 | Resistor | DNI | 0 | | |
| VCCREM | Rbst | Resistor | 15Ω | 1 | | |
| VCC | C860 | PWM Single-Phase DrMOS | Vout1,1.2V @ 30A | 1 | 20240610 | |
| VCC | DrMOS Chip | | | 1 | SiC645A | Vishay |
| VCC | L | Inductor | 0.25μH, 0.32mΩ, 56A | 1 | 744301025 | Würth Elektronik |
| VCC | Cout (Ceramic) | Output Capacitor (Ceramic) | 47μF, 6.3V | 42 | 885012107006 | Würth Elektronik |
| VCC | Cout (Bulk) | Output Capacitor (Bulk) | 0μF, >1.2V | 1 | | |
| VCC | Cin | Capacitor | 22μF, 3mΩ, 16V | 5 | 885012108018 | Würth Elektronik |
| VCC | R1 | Resistor | 0.0499kΩ, 1%, 0.063W | 1 | | |
| VCC | R2 | Resistor | DNI | 0 | | |
| Component4 | C420 | Sequencer | | 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 HC | C220 | https://www.andapt.com/docs/pc/AnDAPT_C220_B_PWM_Sync_Buck_VM_HC.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 |
| DrMos Controller | PWM Single-Phase DrMOS | C860 | https://www.andapt.com/docs/pc/AnDAPT_C860_B_I860_B_DrMOS_Ctrl_Single_Phase.pdf |



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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

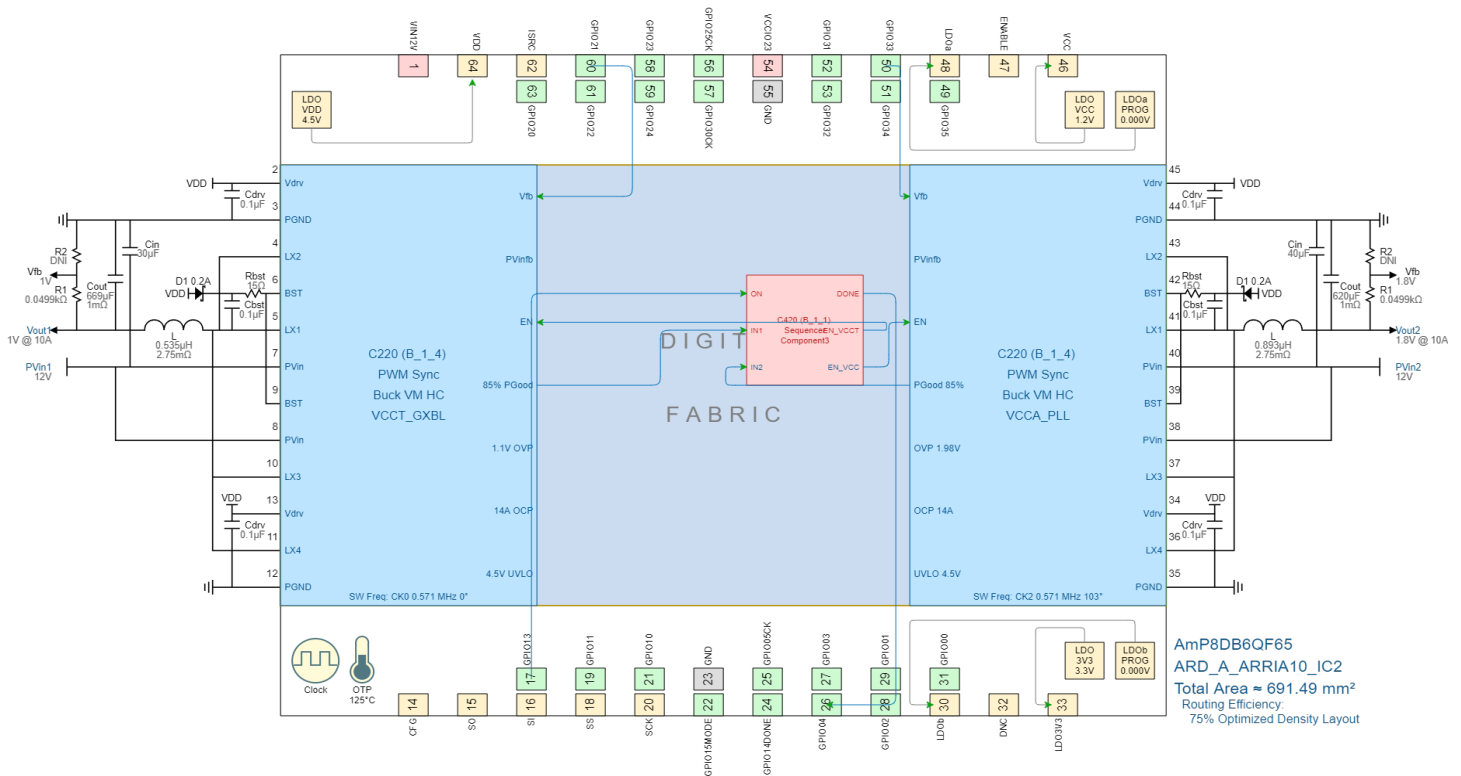
Order Information

| Part Number | Package | Body Size |
|-------------|---------|-----------|
| AmP8DB6QF65 | QF65 | 5x5 |

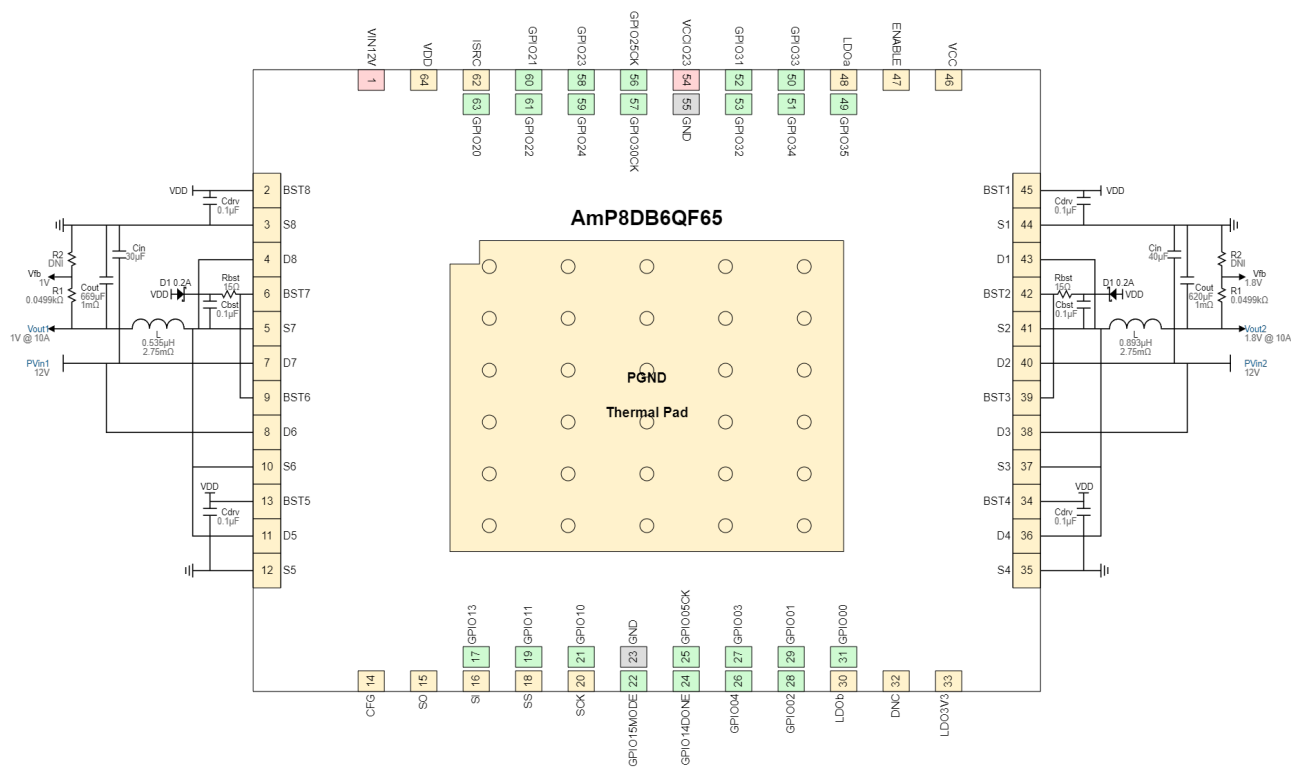
Power Component Summary

| Spec | Category | Function | Part | Name | Key Parameter |
|------|-------------------------|--------------------|------|------------|---------------|
| | PWM Switching Regulator | PWM SyncBuck VM HC | C220 | VCCT_GXBL | 1V@10A |
| | PWM Switching Regulator | PWM SyncBuck VM HC | C220 | VCCA_PLL | 1.8V@10A |
| | Supervisor | Sequencer | C420 | Component3 | |

Power Component View



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



Package Marking Example - QF65



Pin Configurations

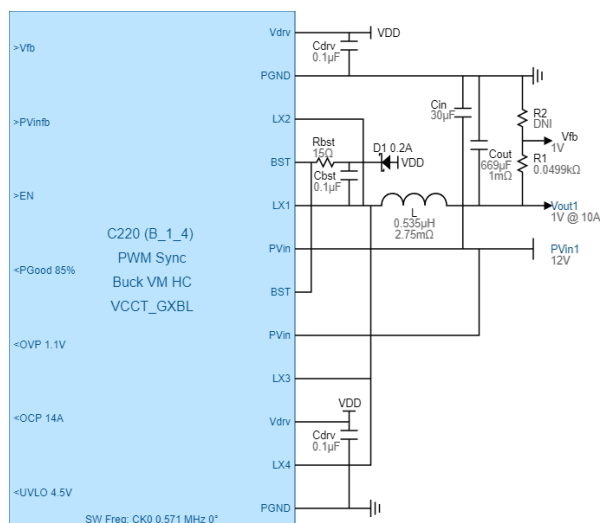
| Pin Name | Design Name | Pin Number | Function |
|------------|-------------|------------|----------------|
| BST8 | | 2 | Boost |
| S8 | | 3 | Source |
| D8 | | 4 | Drain |
| BST7 | | 6 | Boost |
| S7 | | 5 | Source |
| D7 | | 7 | Drain |
| BST6 | | 9 | Boost |
| D6 | | 8 | Drain |
| S6 | | 10 | Source |
| 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 |

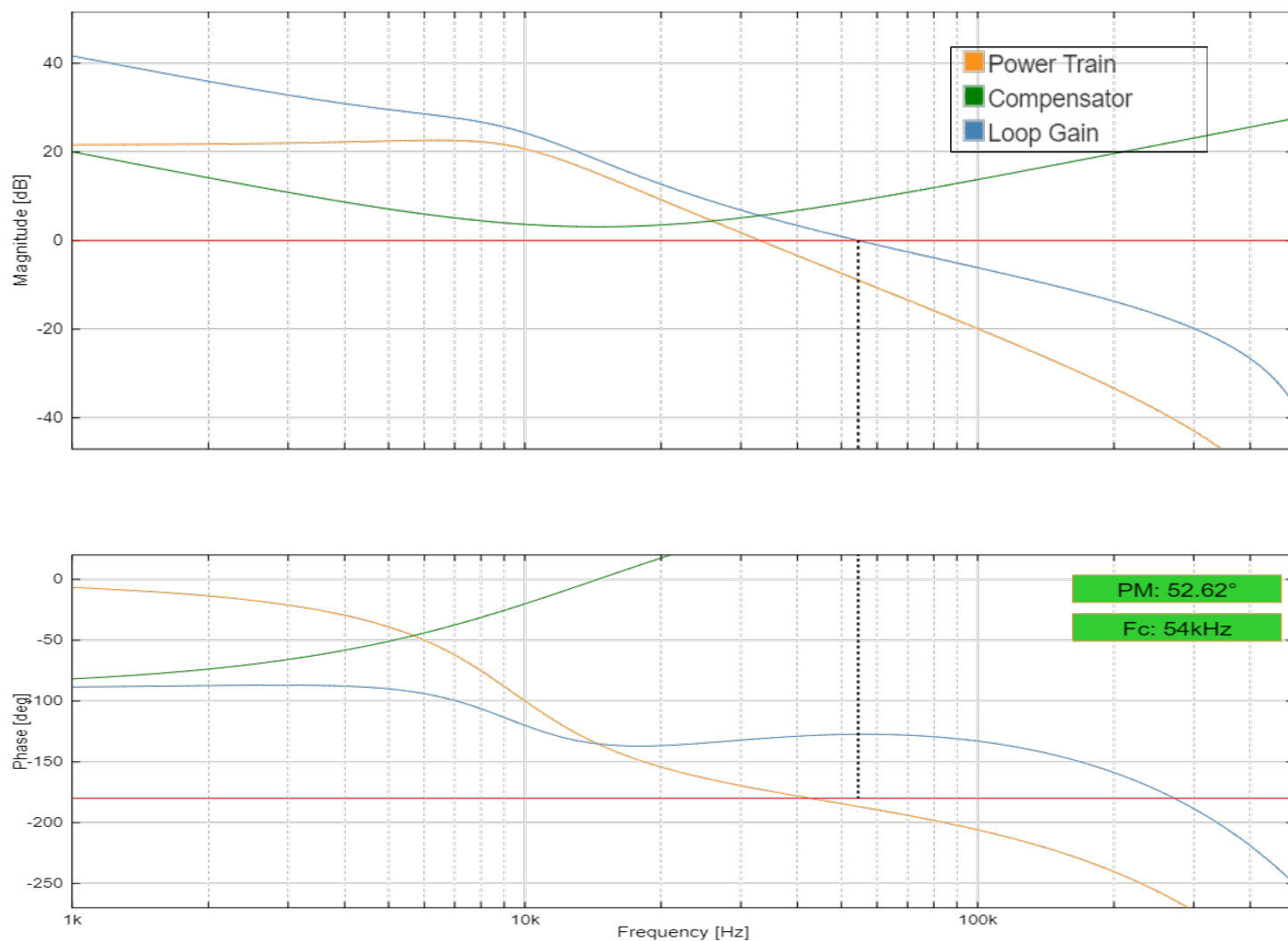
C220 PWM Sync Buck VM HC

AmP Power VCCT_GXBL

Schematic



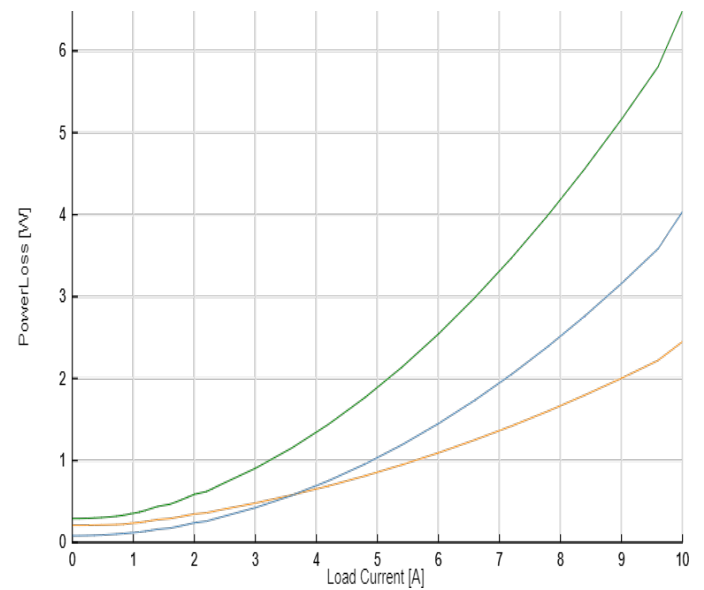
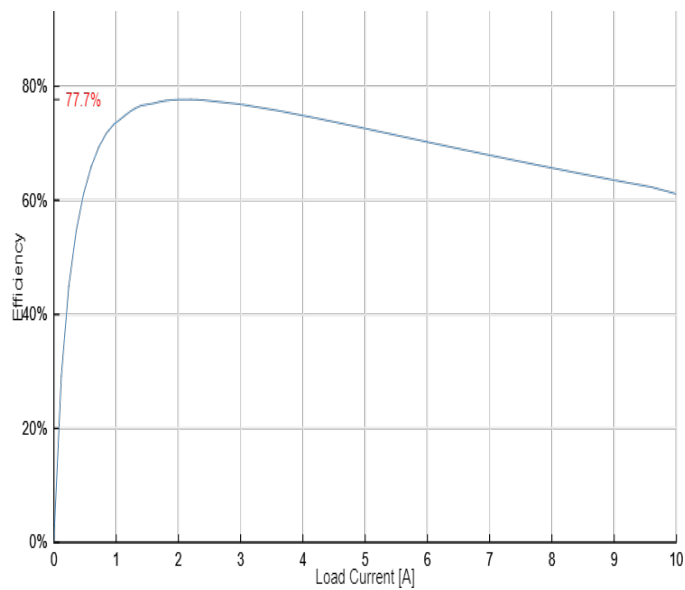
Bode Plot



C220 PWM Sync Buck VM HC

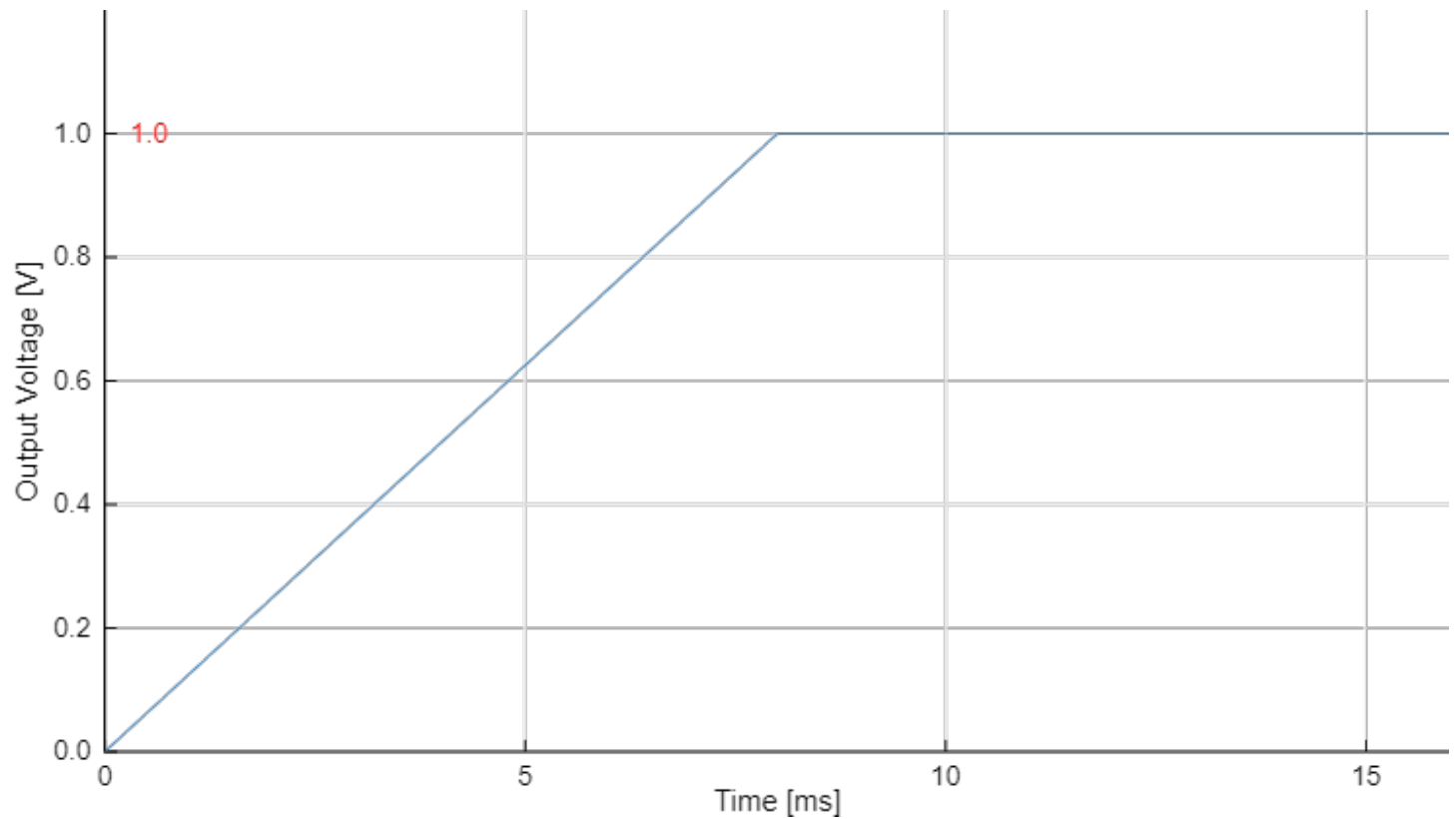
AmP Power VCCT_GXBL

Efficiency



ChipLoss
TotalLoss
InductLoss






Soft Start



C220 PWM Sync Buck VM HC

AmP Power VCCT_GXBL

BoM

| Part | Description | Recommended Attributes | Attributes | Quantity | Size (Imperial) | X(mm) | Y(mm) | Part Number | Spec | Manufacturer |
|----------------|----------------------------|------------------------|-----------------------|---------------------------------|--|-----------------------------------|-----------------------------------|--|---|---|
| C220 | PWM Sync Buck VM HC | | Vout1,1V @ 10A | <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 | 0.535μH, 2.75mΩ, >10A | 0.535μH, 2.75mΩ, >10A | <input type="text" value="1"/> | <input type="text" value="Custom Size"/> | <input type="text" value="10.5"/> | <input type="text" value="10.2"/> | <input type="text"/> | | <input type="text"/> |
| Cout (Ceramic) | Output Capacitor (Ceramic) | 669μF, <1mΩ, >1V | 47μF, 6.3V | <input type="text" value="15"/> | <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, >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 | 30μF, <1mΩ, >12V | 22μF, 3mΩ, 16V | <input type="text" value="2"/> | <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="0402"/> | <input type="text" value="1"/> | <input type="text" value="0.5"/> | <input type="text"/> | | <input type="text"/> |

Total BoM Area ≈ 306.67 mm²

C220 PWM Sync Buck VM HC

AmP Power VCCT_GXBL

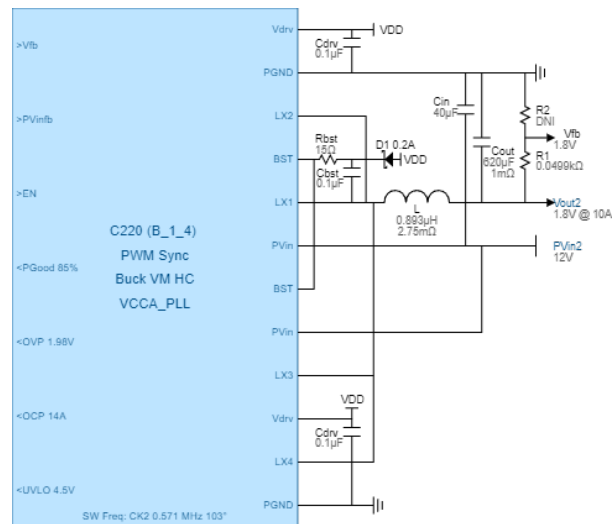
Parameters

| 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 | PVin1 |
| Basic_Configuration | Vout | Nominal Output Voltage | 1V |
| Basic_Configuration | Vout_Name | Used in The Schematics View | Vout1 |
| 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 | 10A |
| Basic_Configuration | I_Ripple | Desired Ripple. Used for LC Recommendations | 30% |
| Basic_Configuration | I_Delta | Used to Calculate Overshoot and Transient Response | 5A |
| Manual_LC | Inductor | Nominal Inductor Value | 0.535μH |
| Manual_LC | Inductor_DCR | Nominal Inductor DC Resistance | 2.75mΩ |
| Manual_LC | Capacitor | Nominal Capacitor value | 669μF |
| Manual_LC | Cap_ESR | Nominal Capacitor Equivalent Series Resistance | 1mΩ |
| 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 | 0.535μH |
| Manual_LC | Inductor_DCR_R\$ | Nominal Inductor DC Resistance | 2.75mΩ |
| Manual_LC | Capacitor_R\$ | Nominal Capacitor value | 669μF |
| Manual_LC | Cap_ESR_R\$ | Nominal Capacitor Equivalent Series Resistance | 1mΩ |
| Manual_LC | fLC | LC Resonant Frequency | 8.4kHz |
| Manual_Resistor | R1 | | 0.0499kΩ |
| Manual_Resistor | R2 | | DNI |
| Manual_Resistor | Vfb | $V_{fb} = V_{out} * R2 / (R1 + R2)$ | 1V |
| Manual_Resistor | Rbst | | 15Ω |
| Manual_Resistor | Ext_Div_Ratio | | 1 |
| 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 | 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 | 4.5V |
| UVLO_EN | UVLOSense | Internal: Sensed through High Side Drain pin. External: Sensed through a GPIO | Internal |
| VoUVLO_Group | VoUVLO | Output Under Voltage Lockout Threshold | 0.8V |
| OCP_Group | OCP | Cycle by Cycle Current Protection Level | 14A |
| OVP_EN | OVP | Output Over Voltage Protection Level | 1.1V |
| Soft_Start_EN | Rise_Time | Soft Start Length | 8ms |
| PGood_EN | PGood | Power Good percentage of Nominal Vout | 85% |
| hidden | Cin | | 30μF |
| hidden | Cbst | | 0.1μF |
| hidden | Cdrv | | 0.1μF |
| hidden | D1 | | 0.2A |

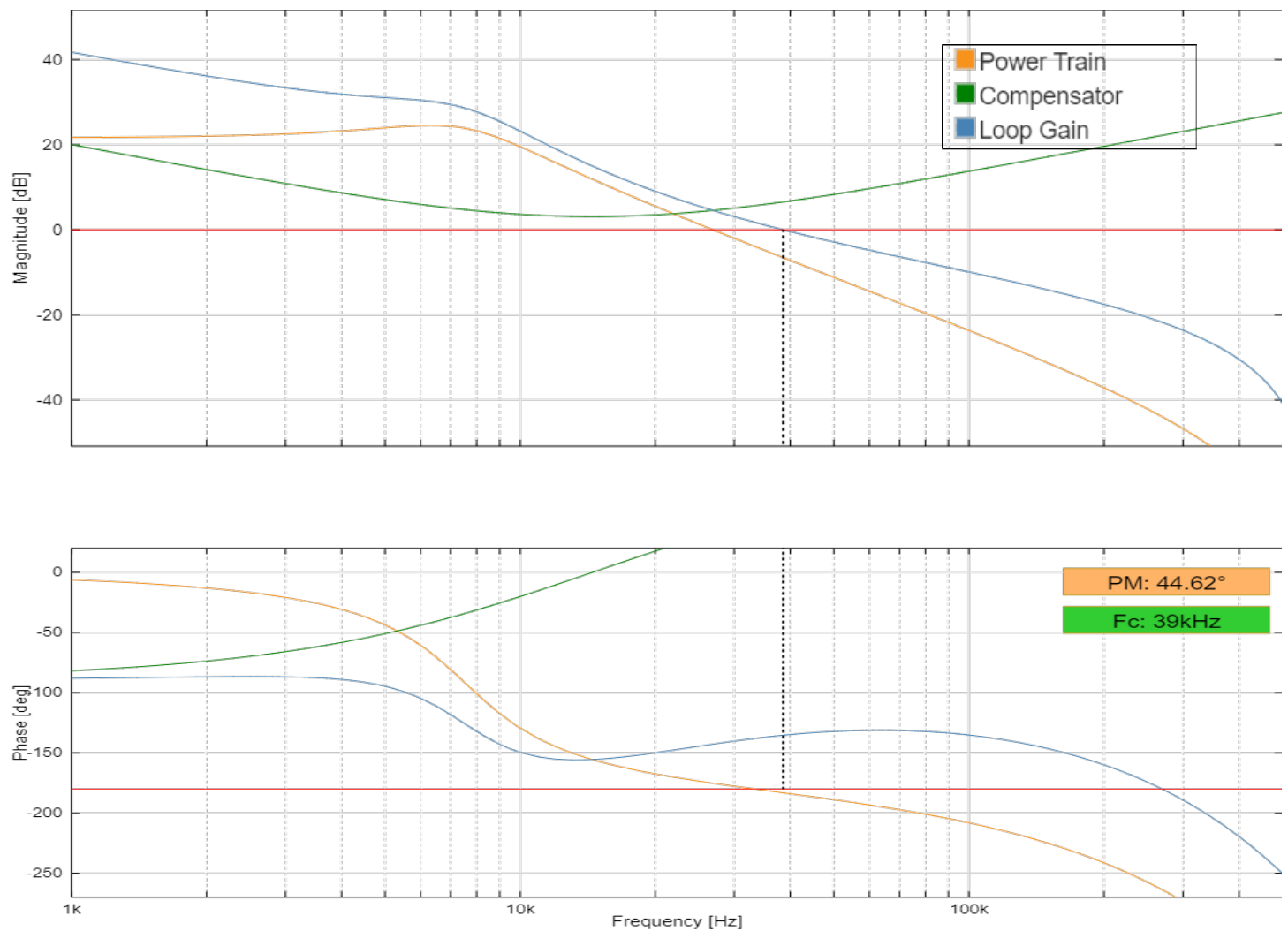
C220 PWM Sync Buck VM HC

AmP Power VCCA_PLL

Schematic



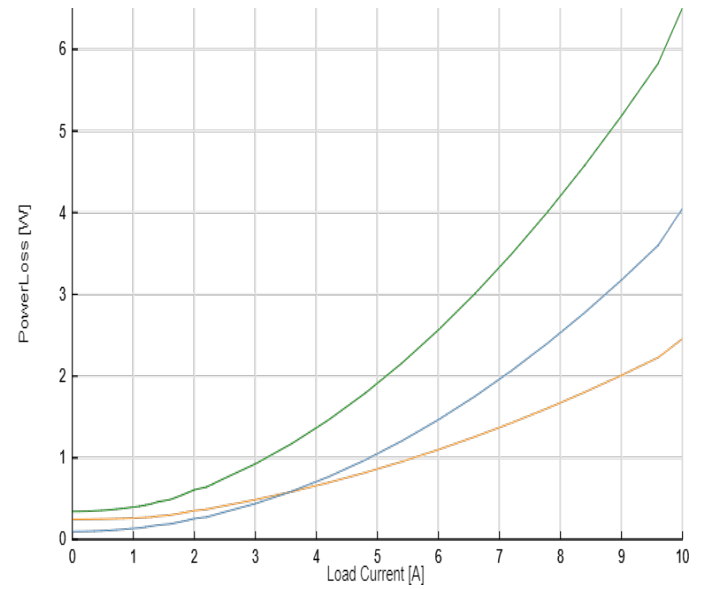
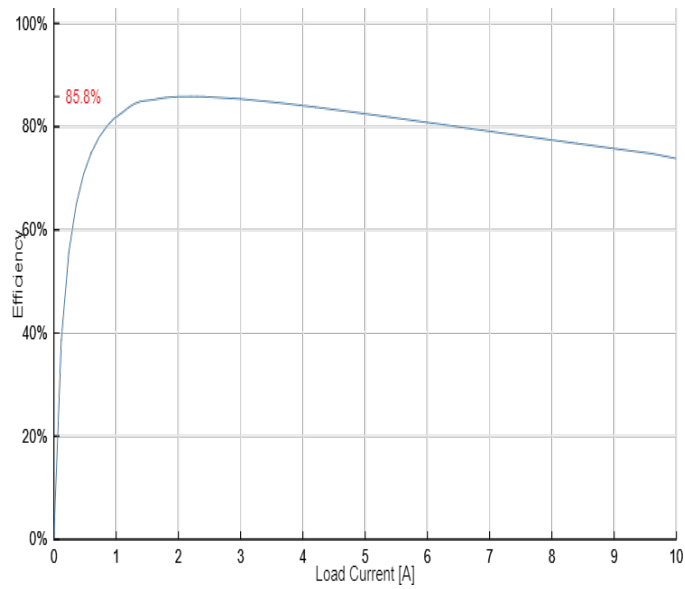
Bode Plot



C220 PWM Sync Buck VM HC

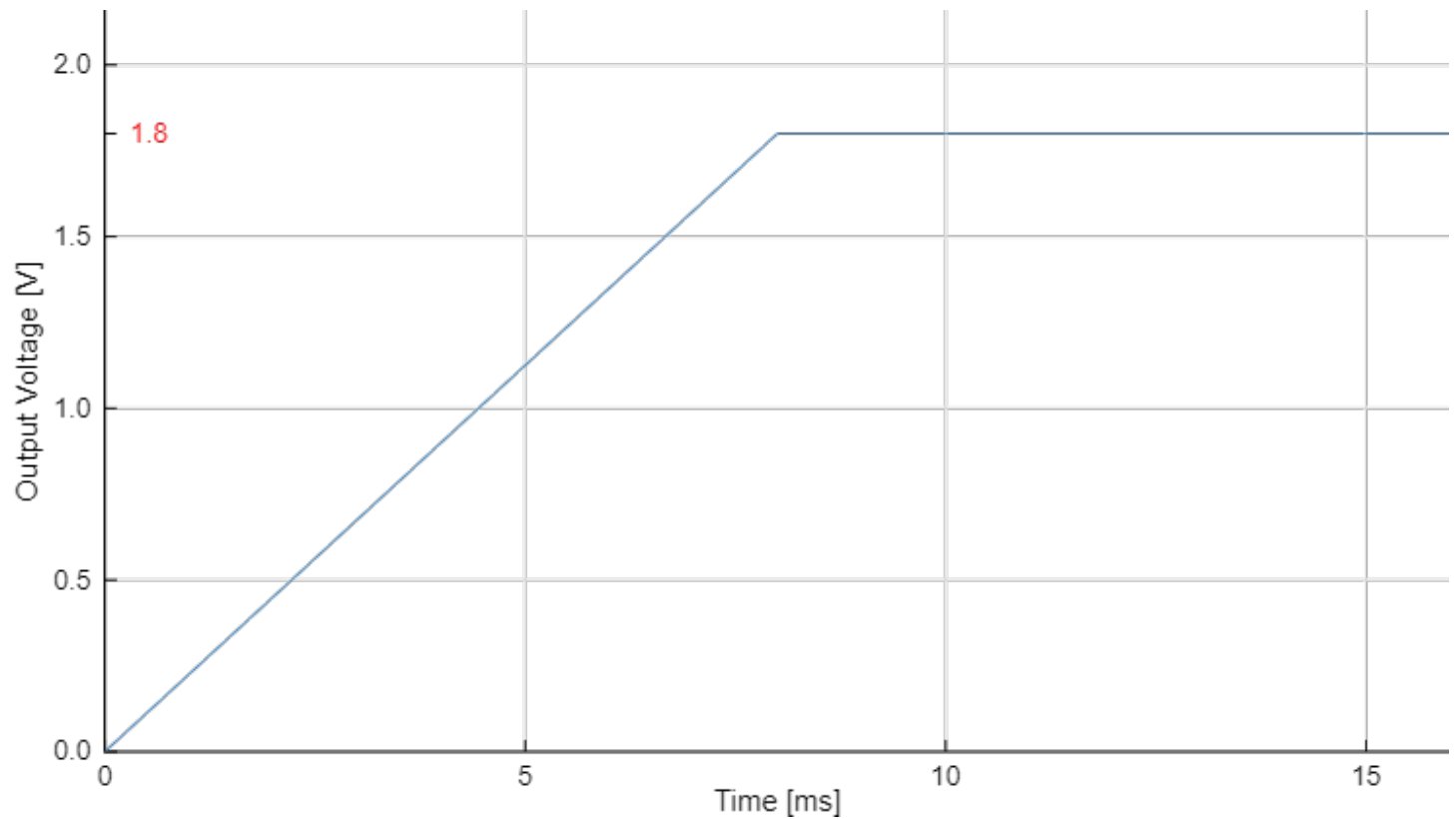
AmP Power VCCA_PLL

Efficiency



ChipLoss
TotalLoss
InductLoss






Soft Start



C220 PWM Sync Buck VM HC

AmP Power VCCA_PLL

BoM

| Part | Description | Recommended Attributes | Attributes | Quantity | Size (Imperial) | X(mm) | Y(mm) | Part Number | Spec | Manufacturer |
|----------------|----------------------------|------------------------|-----------------------|---------------------------------|--|-----------------------------------|-----------------------------------|--|---|---|
| C220 | PWM Sync Buck VM HC | | Vout2, 1.8V @ 10A | <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 | 0.893μH, 2.75mΩ, >10A | 0.893μH, 2.75mΩ, >10A | <input type="text" value="1"/> | <input type="text" value="Custom Size"/> | <input type="text" value="10.5"/> | <input type="text" value="10.2"/> | <input type="text"/> | | <input type="text"/> |
| Cout (Ceramic) | Output Capacitor (Ceramic) | 620μF, <1mΩ, >1.8V | 47μF, 6.3V | <input type="text" value="14"/> | <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, >1.8V | <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, <1mΩ, >12V | 22μF, 3mΩ, 16V | <input type="text" value="2"/> | <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="0402"/> | <input type="text" value="1"/> | <input type="text" value="0.5"/> | <input type="text"/> | | <input type="text"/> |

Total BoM Area ≈ 299.65 mm²

C220 PWM Sync Buck VM HC

AmP Power VCCA_PLL

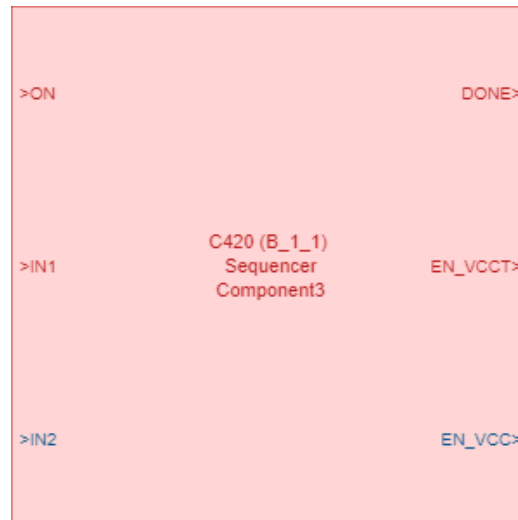
Parameters

| 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 | 1.8V |
| Basic_Configuration | Vout_Name | Used in The Schematics View | Vout2 |
| Basic_Configuration | V_Ripple | Output Voltage Ripple | 1.1mV |
| Basic_Configuration | V_Overshoot | Max Overshoot for a transient of Iout Delta | 0.01V |
| Basic_Configuration | Iout | Maximum Converter Current | 10A |
| Basic_Configuration | I_Ripple | Desired Ripple. Used for LC Recommendations | 30% |
| Basic_Configuration | I_Delta | Used to Calculate Overshoot and Transient Response | 5A |
| Manual_LC | Inductor | Nominal Inductor Value | 0.893μH |
| Manual_LC | Inductor_DCR | Nominal Inductor DC Resistance | 2.75mΩ |
| Manual_LC | Capacitor | Nominal Capacitor value | 620μF |
| Manual_LC | Cap_ESR | Nominal Capacitor Equivalent Series Resistance | 1mΩ |
| 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 | 0.893μH |
| Manual_LC | Inductor_DCR_R\$ | Nominal Inductor DC Resistance | 2.75mΩ |
| Manual_LC | Capacitor_R\$ | Nominal Capacitor value | 620μF |
| Manual_LC | Cap_ESR_R\$ | Nominal Capacitor Equivalent Series Resistance | 1mΩ |
| Manual_LC | fLC | LC Resonant Frequency | 6.8kHz |
| Manual_Resistor | R1 | | 0.0499kΩ |
| Manual_Resistor | R2 | | DNI |
| Manual_Resistor | Vfb | $V_{fb} = V_{out} * R2 / (R1 + R2)$ | 1.8V |
| Manual_Resistor | Rbst | | 15Ω |
| Manual_Resistor | Ext_Div_Ratio | | 1 |
| 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 | 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 | 4.5V |
| UVLO_EN | UVLOSense | Internal: Sensed through High Side Drain pin. External: Sensed through a GPIO | Internal |
| VoUVLO_Group | VoUVLO | Output Under Voltage Lockout Threshold | 1.384V |
| OCP_Group | OCP | Cycle by Cycle Current Protection Level | 14A |
| OVP_EN | OVP | Output Over Voltage Protection Level | 1.98V |
| Soft_Start_EN | Rise_Time | Soft Start Length | 8ms |
| PGood_EN | PGood | Power Good percentage of Nominal Vout | 85% |
| hidden | Cin | | 40μF |
| hidden | Cbst | | 0.1μF |
| hidden | Cdrv | | 0.1μF |
| hidden | D1 | | 0.2A |

C420 Sequencer

AmP Power Component3

Schematic



C420 Sequencer

AmP Power Component3

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 Component3

Parameters

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

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 | Wurth Elektronik |
| Platform | Cvin2 | Capacitor | 1µF, 25V | 1 | 885012106022 | Wurth Elektronik |
| Platform | Cvin3 | Capacitor | 10µF, 25V | 1 | 885012106031 | Wurth Elektronik |
| Platform | Cvdd1 | Capacitor | 0.1µF, 25V | 1 | 885012205085R | Wurth Elektronik |
| Platform | Cvdd2 | Capacitor | 10µF, 6.3V | 1 | 885012105020 | Wurth Elektronik |
| Platform | Cvcc1 | Capacitor | 0.1µF, 25V | 1 | 885012205085R | Wurth Elektronik |
| Platform | Cvcc2 | Capacitor | 1µF, 16V | 1 | 885012105019 | Wurth Elektronik |
| Platform | C3v31 | Capacitor | 0.1µF, 25V | 1 | 885012205085R | Wurth Elektronik |
| Platform | C3v32 | Capacitor | 1µF, 16V | 1 | 885012105019 | Wurth Elektronik |
| Platform | Cldoa1 | Capacitor | 0.1µF, 25V | 1 | 885012205085R | Wurth Elektronik |
| Platform | Cldoa2 | Capacitor | 1µF, 16V | 1 | 885012105019 | Wurth Elektronik |
| Platform | Cldob1 | Capacitor | 0.1µF, 25V | 1 | 885012205085R | Wurth Elektronik |
| Platform | Cldob2 | Capacitor | 1µF, 16V | 1 | 885012105019 | Wurth Elektronik |
| Platform | Cvccio23 | Capacitor | 0.1µF, 25V | 1 | 885012205085R | Wurth Elektronik |
| VCCT_GXBL | C220 | PWM Sync Buck VM HC | Vout1, 1V @ 10A | 1 | 20240610 | |
| VCCT_GXBL | L | Inductor | 0.535µH, 2.75mΩ, >10A | 1 | | |
| VCCT_GXBL | Cout (Ceramic) | Output Capacitor (Ceramic) | 47µF, 6.3V | 15 | 885012107006 | Wurth Elektronik |
| VCCT_GXBL | Cout (Bulk) | Output Capacitor (Bulk) | 0µF, >1V | 1 | | |
| VCCT_GXBL | Cin | Capacitor | 22µF, 3mΩ, 16V | 2 | 885012108018 | Wurth Elektronik |
| VCCT_GXBL | Cbst | Capacitor | 0.1µF, 25V | 1 | 885012205085R | Wurth Elektronik |
| VCCT_GXBL | Cdrv | Capacitor | 0.1µF, 25V | 1 | 885012205085R | Wurth Elektronik |
| VCCT_GXBL | D1 | Schottky Diode | 200mA, 0.5V | 1 | RB521S30T5G | ON Semiconductor |
| VCCT_GXBL | R1 | Resistor | 0.0499kΩ, 1%, 0.063W | 1 | | |
| VCCT_GXBL | R2 | Resistor | DNI | 0 | | |
| VCCT_GXBL | Rbst | Resistor | 15Ω | 1 | | |
| VCCA_PLL | C220 | PWM Sync Buck VM HC | Vout2, 1.8V @ 10A | 1 | 20240610 | |
| VCCA_PLL | L | Inductor | 0.893µH, 2.75mΩ, >10A | 1 | | |
| VCCA_PLL | Cout (Ceramic) | Output Capacitor (Ceramic) | 47µF, 6.3V | 14 | 885012107006 | Wurth Elektronik |
| VCCA_PLL | Cout (Bulk) | Output Capacitor (Bulk) | 0µF, >1.8V | 1 | | |
| VCCA_PLL | Cin | Capacitor | 22µF, 3mΩ, 16V | 2 | 885012108018 | Wurth Elektronik |
| VCCA_PLL | Cbst | Capacitor | 0.1µF, 25V | 1 | 885012205085R | Wurth Elektronik |
| VCCA_PLL | Cdrv | Capacitor | 0.1µF, 25V | 1 | 885012205085R | Wurth Elektronik |
| VCCA_PLL | D1 | Schottky Diode | 200mA, 0.5V | 1 | RB521S30T5G | ON Semiconductor |
| VCCA_PLL | R1 | Resistor | 0.0499kΩ, 1%, 0.063W | 1 | | |
| VCCA_PLL | R2 | Resistor | DNI | 0 | | |
| VCCA_PLL | Rbst | Resistor | 15Ω | 1 | | |
| Component3 | C420 | Sequencer | | 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 HC | C220 | https://www.andapt.com/docs/pc/AnDAPT_C220_B_PWM_Sync_Buck_VM_HC.pdf |



Trademarks

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