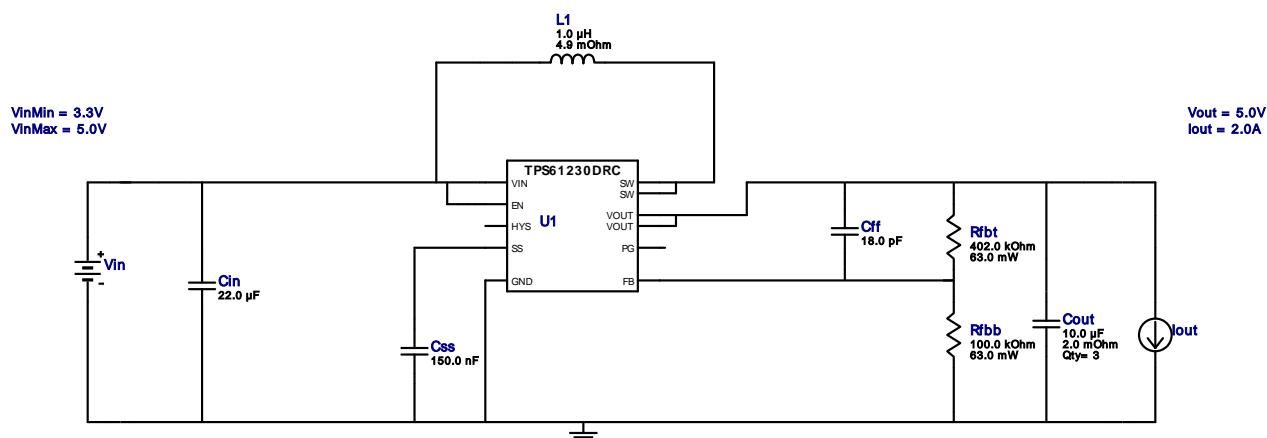


VinMin = 3.3V  
VinMax = 5.0V  
Vout = 5.0V  
Iout = 2.0A


Device = TPS61230DRCR  
Topology = Boost  
Created = 7/19/14 7:06:05 PM  
BOM Cost = \$1.69  
Footprint = 205.0mm<sup>2</sup>  
BOM Count = 10  
Total Pd = 1.19W

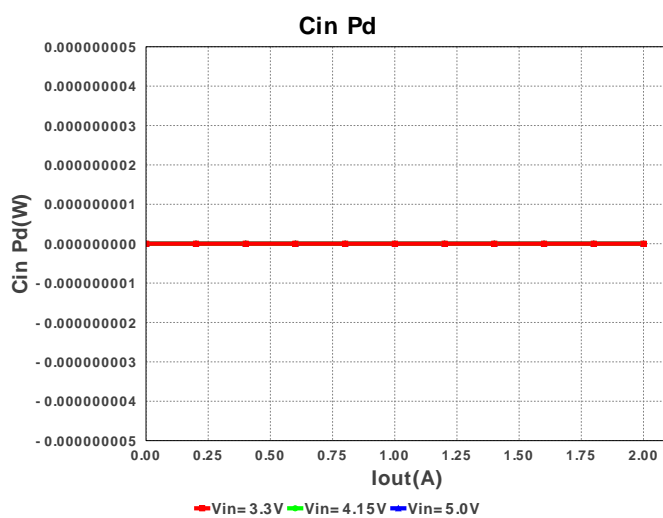
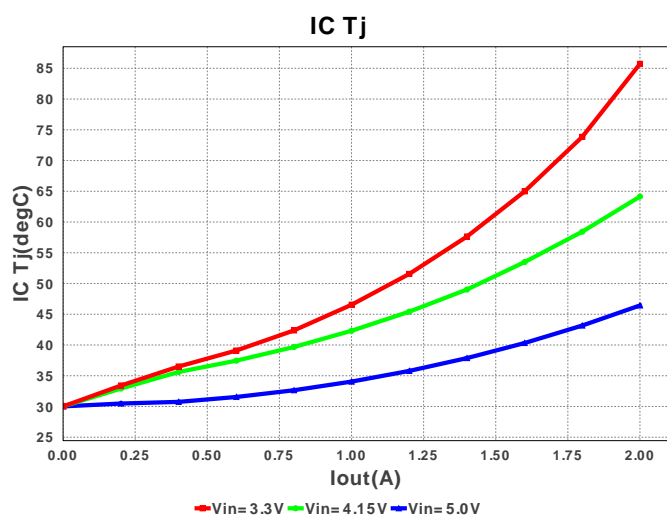
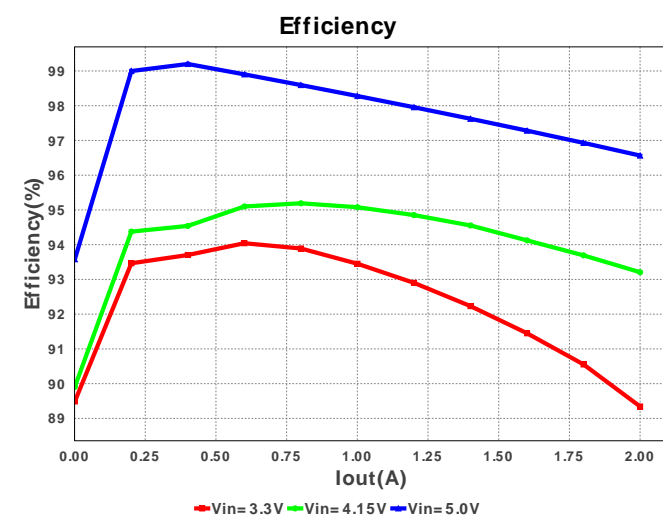
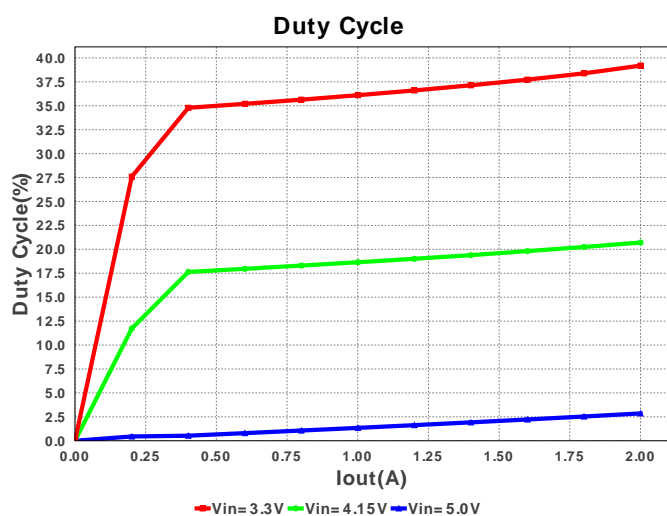
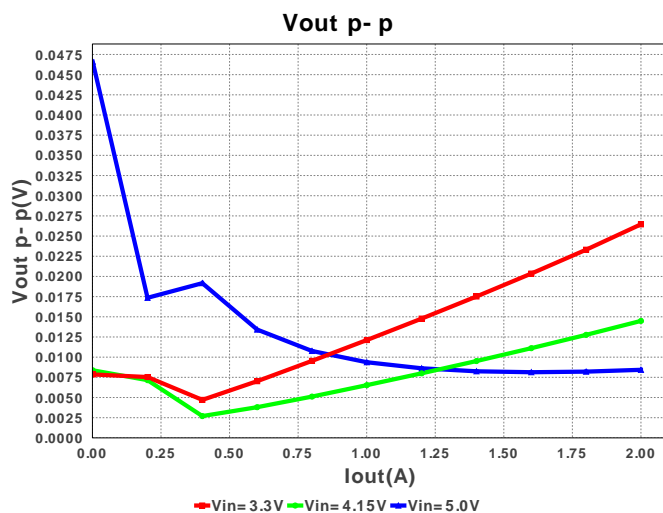
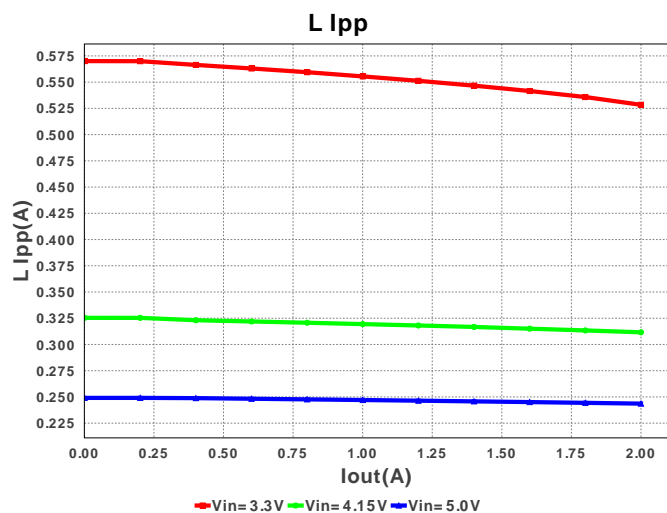
## WEBENCH<sup>®</sup> Design Report

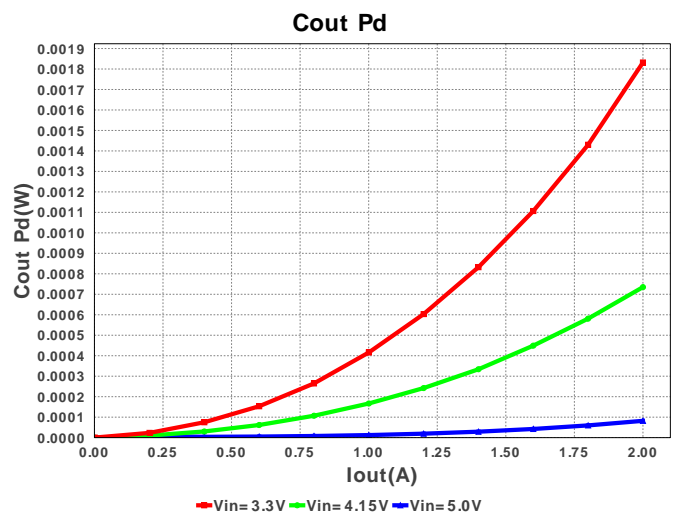
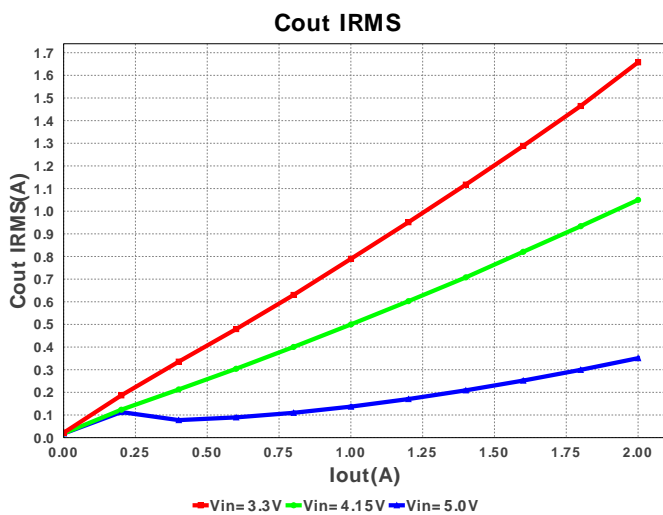
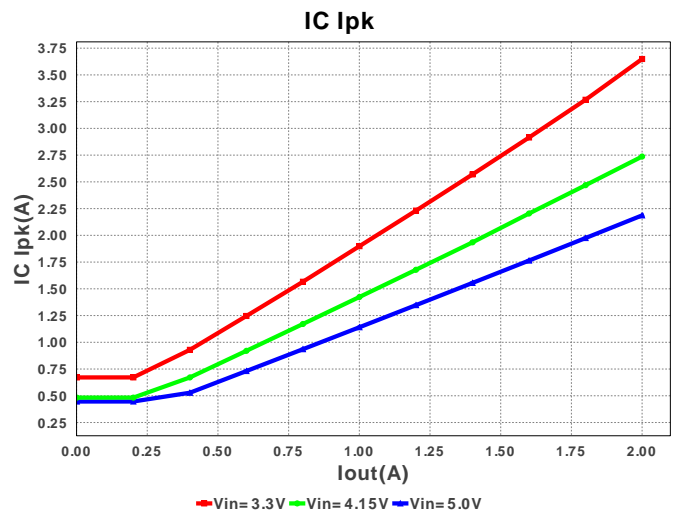
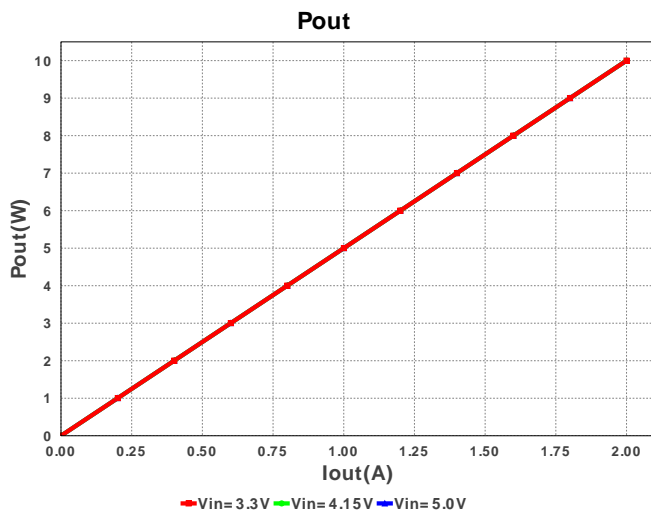
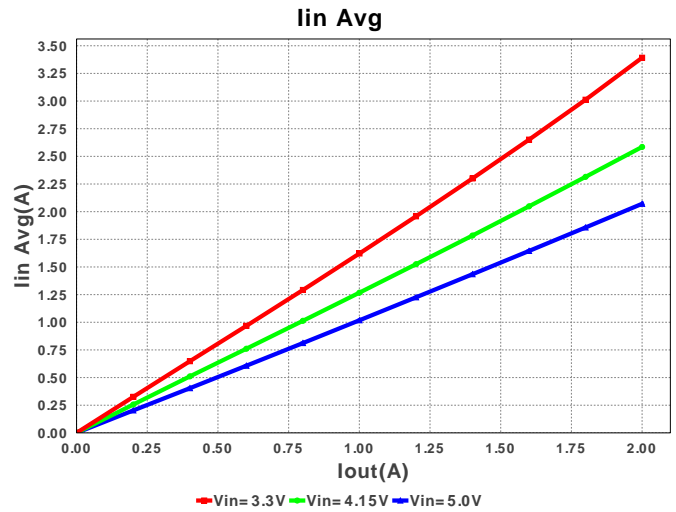
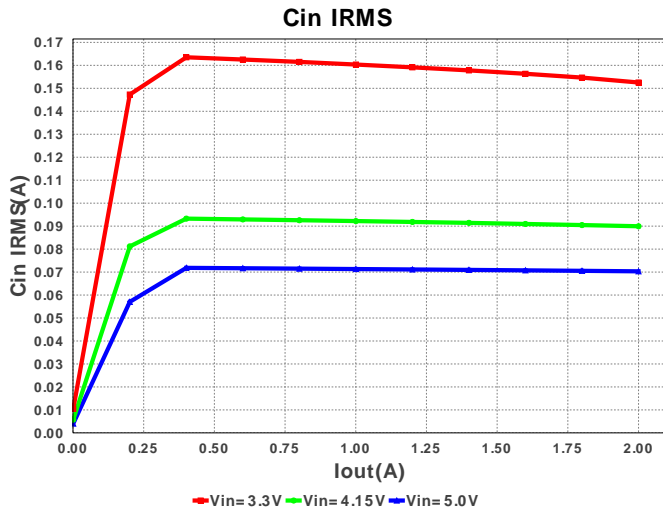
Design : 1221144/13 TPS61230DRCR  
TPS61230DRCR 3.3V-5.0V to 5.0V @ 2.0A

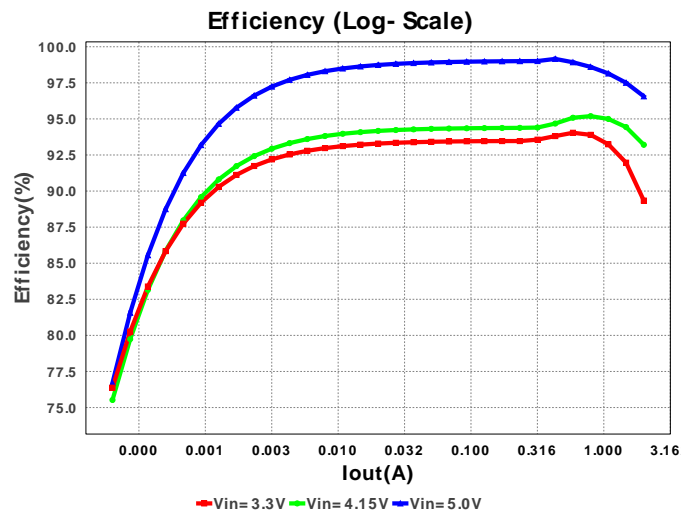
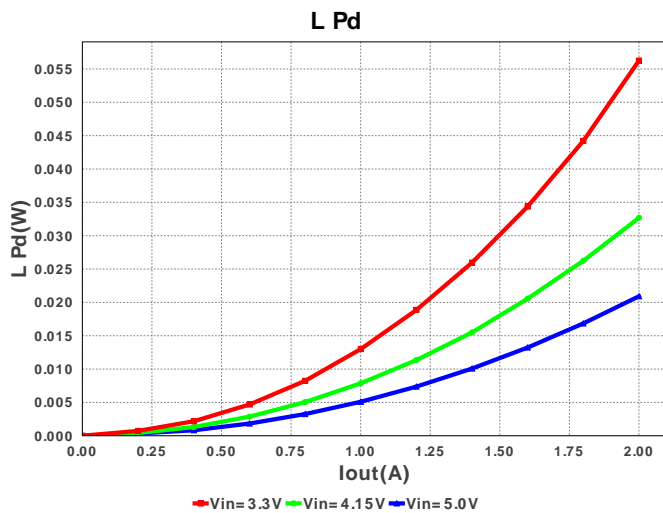
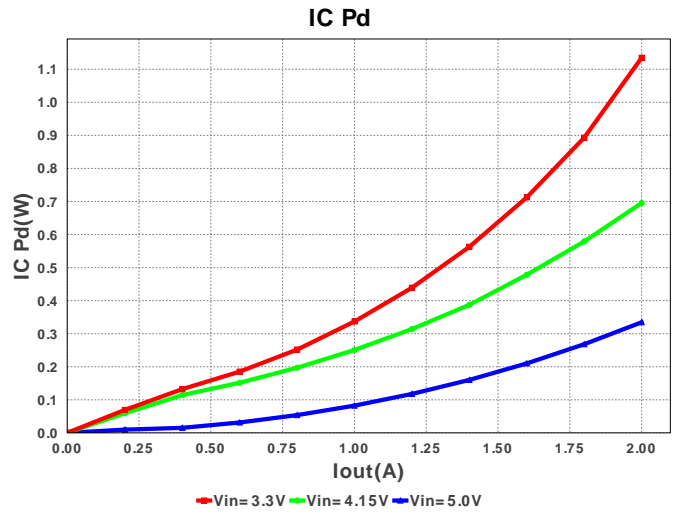
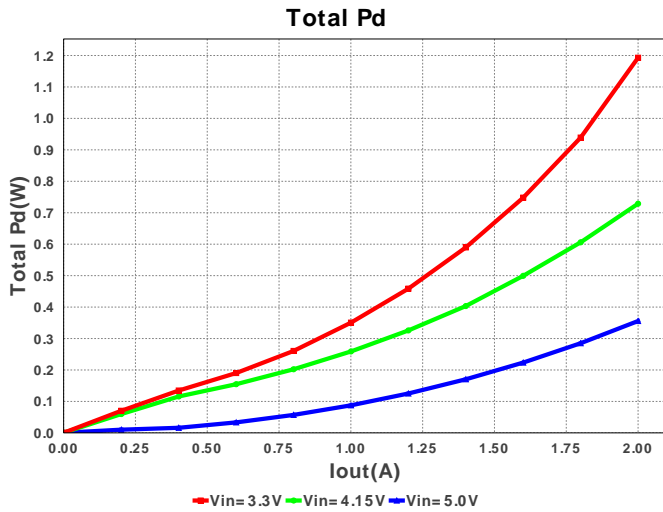


## Electrical BOM

| #  | Name | Manufacturer      | Part Number                           | Properties  | Qty | Price  | Footprint   |
|----|------|-------------------|---------------------------------------|---|-----|--------|---|
| 1. | Cff  | Kemet             | C0603C180J5GACTU<br>Series= C0G/NP0   | Cap= 18.0 pF<br>VDC= 50.0 V<br>IRMS= 0.0 A                  | 1   | \$0.01 | <br>0603 5mm2        |
| 2. | Cin  | MuRata            | GRM31CR61A226KE19L<br>Series= X5R     | Cap= 22.0 µF<br>VDC= 10.0 V<br>IRMS= 0.0 A                  | 1   | \$0.08 | <br>1206 11mm2     |
| 3. | Cout | MuRata            | GRM21BR61A106KE19L<br>Series= X5R     | Cap= 10.0 µF<br>ESR= 2.0 mOhm<br>VDC= 10.0 V<br>IRMS= 0.0 A | 3   | \$0.03 | <br>0805 7mm2      |
| 4. | Css  | MuRata            | GRM155R61A154KE19D<br>Series= X5R     | Cap= 150.0 nF<br>VDC= 10.0 V<br>IRMS= 0.0 A                 | 1   | \$0.01 | <br>0402 3mm2      |
| 5. | L1   | Bourns            | SRU1028-1R0Y                          | L= 1.0 µH<br>DCR= 4.9 mOhm                                  | 1   | \$0.33 | <br>SRU1028 144mm2 |
| 6. | Rfbb | Vishay-Dale       | CRCW0402100KFKED<br>Series= CRCW...e3 | Res= 100.0 kOhm<br>Power= 63.0 mW<br>Tolerance= 1.0%        | 1   | \$0.01 | <br>0402 3mm2      |
| 7. | Rfbb | Vishay-Dale       | CRCW0402402KFKED<br>Series= CRCW...e3 | Res= 402.0 kOhm<br>Power= 63.0 mW<br>Tolerance= 1.0%        | 1   | \$0.01 | <br>0402 3mm2      |
| 8. | U1   | Texas Instruments | TPS61230DRCR                          | Switcher  | 1   | \$1.15 | <br>DRC0010G 16mm2 |







## Operating Values

| #   | Name       | Value       | Category | Description                               |
|-----|------------|-------------|----------|---|
| 1.  | Cin IRMS   | 152.532 mA  | Current  | Input capacitor RMS ripple current        |
| 2.  | Cout IRMS  | 1.658 A     | Current  | Output capacitor RMS ripple current       |
| 3.  | IC Ipk     | 3.649 A     | Current  | Peak switch current in IC                 |
| 4.  | Iin Avg    | 3.392 A     | Current  | Average input current                     |
| 5.  | L Ipp      | 528.387 mA  | Current  | Peak-to-peak inductor ripple current      |
| 6.  | BOM Count  | 10          | General  | Total Design BOM count                    |
| 7.  | FootPrint  | 205.0 mm2   | General  | Total Foot Print Area of BOM components   |
| 8.  | Frequency  | 2.0 MHz     | General  | Switching frequency                       |
| 9.  | Pout       | 10.0 W      | General  | Total output power                        |
| 10. | Total BOM  | \$1.69      | General  | Total BOM Cost                            |
| 11. | Duty Cycle | 39.196 %    | Op_point | Duty cycle                                |
| 12. | Efficiency | 89.342 %    | Op_point | Steady state efficiency                   |
| 13. | IC Tj      | 85.722 degC | Op_point | IC junction temperature                   |
| 14. | ICThetaJA  | 49.1 degC/W | Op_point | IC junction-to-ambient thermal resistance |
| 15. | IOUT_OP    | 2.0 A       | Op_point | Iout operating point                      |
| 16. | VIN_OP     | 3.3 V       | Op_point | Vin operating point                       |
| 17. | Vout p-p   | 26.455 mV   | Op_point | Peak-to-peak output ripple voltage        |
| 18. | Cin Pd     | 0.0 W       | Power    | Input capacitor power dissipation         |
| 19. | Cout Pd    | 1.832 mW    | Power    | Output capacitor power dissipation        |
| 20. | IC Pd      | 1.135 W     | Power    | IC power dissipation                      |
| 21. | L Pd       | 56.25 mW    | Power    | Inductor power dissipation                |
| 22. | Total Pd   | 1.193 W     | Power    | Total Power Dissipation                   |

## Design Inputs

| #  | Name   | Value    | Description            |
|----|--------|----------|------------------------|
| 1. | Iout   | 2.0 A    | Maximum Output Current |
| 2. | Iout1  | 2.0 Amps | Output Current #1      |
| 3. | VinMax | 5.0 V    | Maximum input voltage  |
| 4. | VinMin | 3.3 V    | Minimum input voltage  |
| 5. | Vout   | 5.0 V    | Output Voltage         |

| #  | Name    | Value     | Description         |
|----|---------|-----------|---------------------|
| 6. | Vout1   | 5.0 Volt  | Output Voltage #1   |
| 7. | base_pn | TPS61230  | Base Product Number |
| 8. | source  | DC        | Input Source Type   |
| 9. | Ta      | 30.0 degC | Ambient temperature |

## Design Assistance

1. **TPS61230** Product Folder : <http://www.ti.com/product/tps61230> : contains the data sheet and other resources.

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