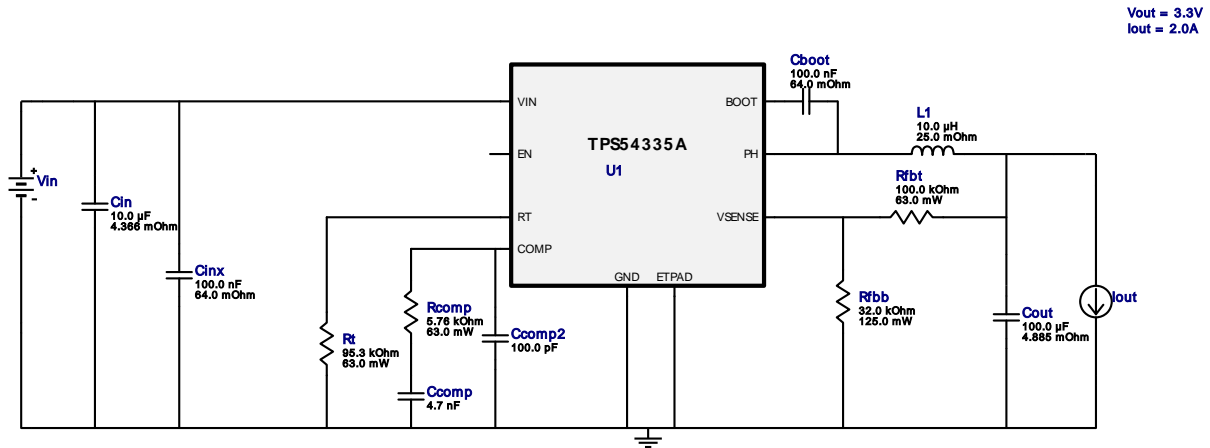


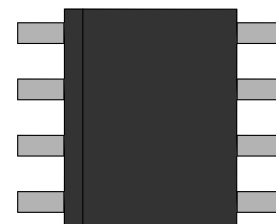
WEBENCH® Design Report

 Design : 4778710/4 TPS54335ADDAR
 TPS54335ADDAR 14.0V-22.0V to 3.30V @ 2.0A

 Vout = 3.3V
 Iout = 2.0A

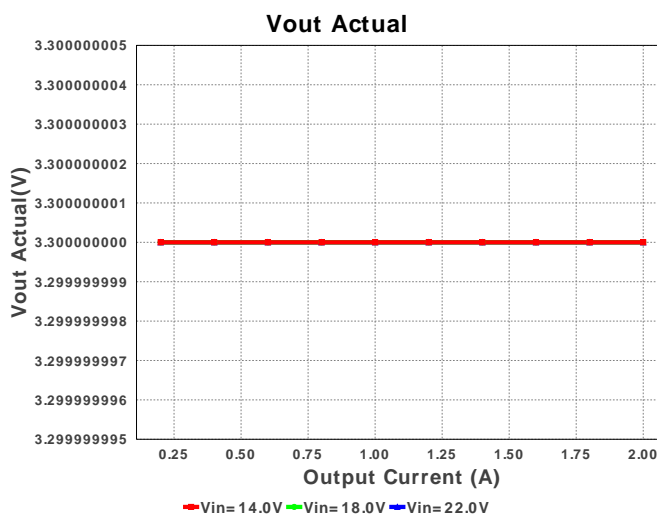
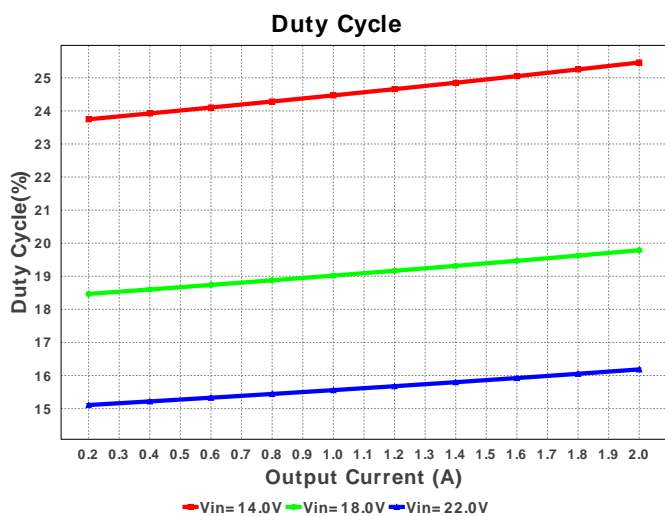
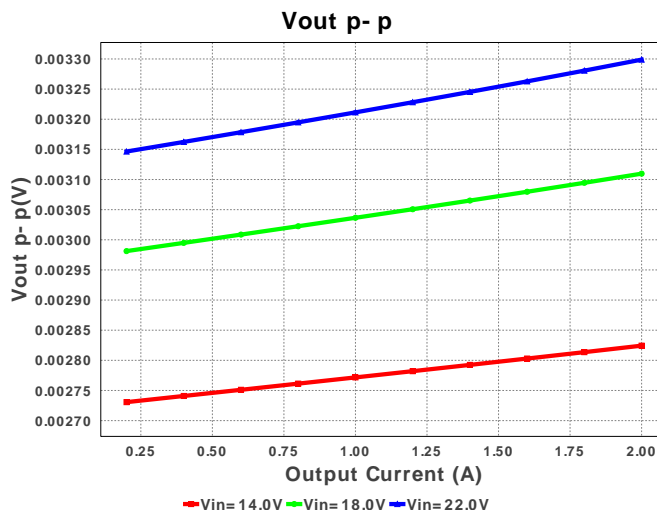
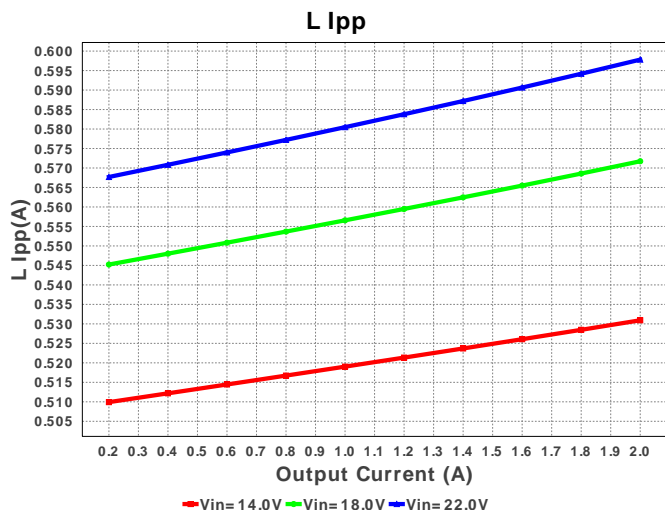
Electrical BOM

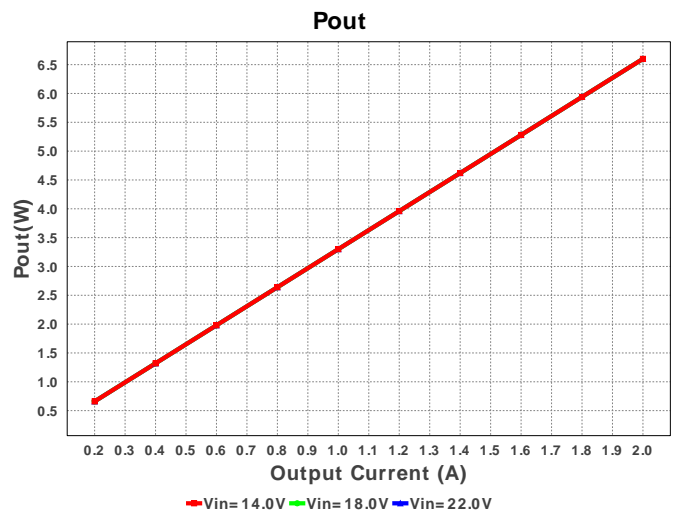
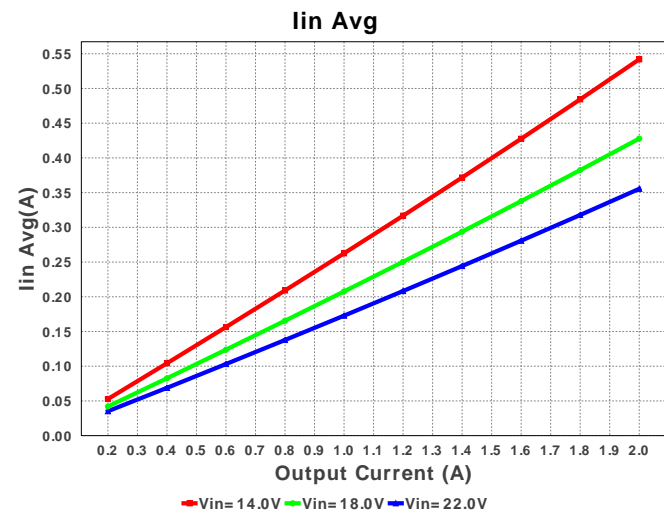
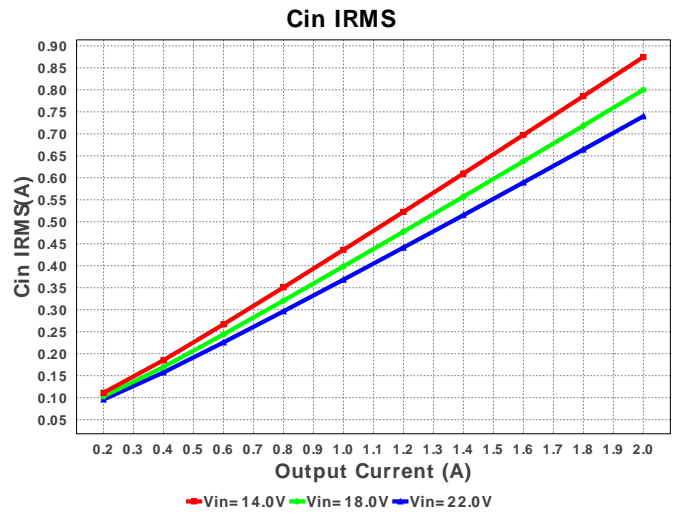
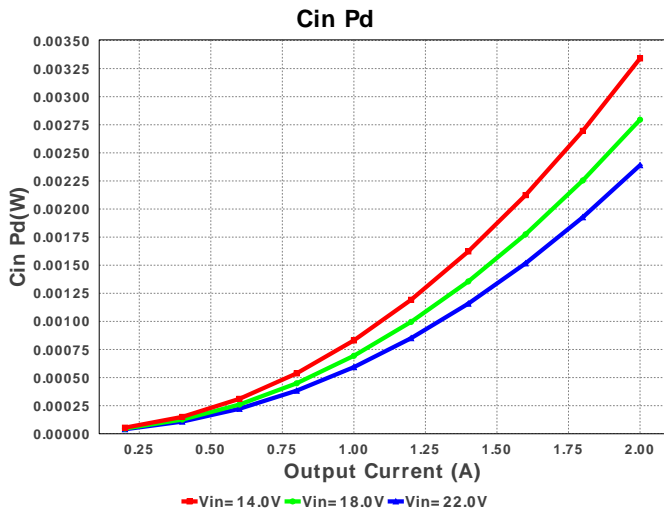
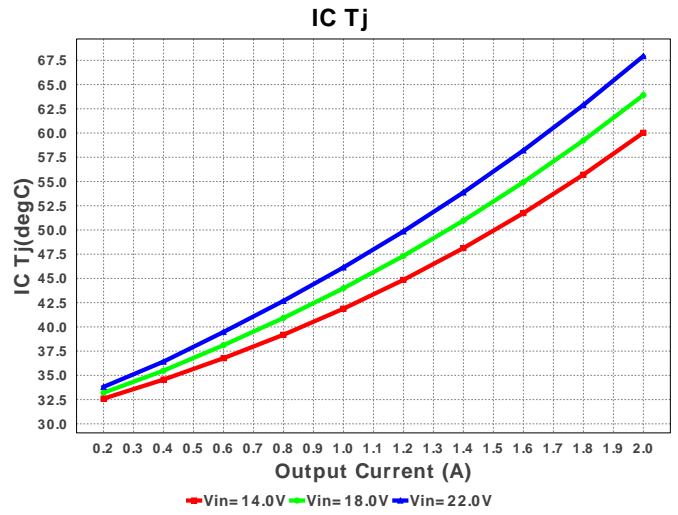
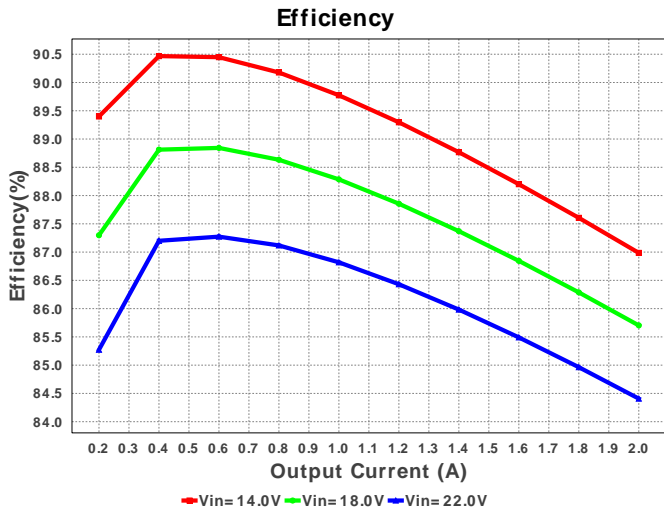
| # | Name | Manufacturer | Part Number | Properties | Qty | Price | Footprint |
|-----|--------|---------------|--------------------------------------|--|-----|--------|--|
| 1. | Cboot | Kemet | C0805C104K5RACTU Series= X7R | Cap= 100.0 nF ESR= 64.0 mOhm VDC= 50.0 V IRMS= 1.64 A | 1 | \$0.01 | 0805 7 mm ² |
| 2. | Ccomp | Yageo America | CC0805KRX7R9BB472 Series= X7R | Cap= 4.7 nF VDC= 50.0 V IRMS= 0.0 A | 1 | \$0.01 | 0805 7 mm ² |
| 3. | Ccomp2 | Yageo America | CC0805JRNPO9BN101 Series= C0G/NP0 | Cap= 100.0 pF VDC= 50.0 V IRMS= 0.0 A | 1 | \$0.01 | 0805 7 mm ² |
| 4. | Cin | MuRata | GRM31CR71E106KA12L Series= X7R | Cap= 10.0 uF ESR= 4.366 mOhm VDC= 25.0 V IRMS= 2.8022 A | 1 | \$0.05 | 1206_190 11 mm ² |
| 5. | Cinx | Kemet | C0805C104K5RACTU Series= X7R | Cap= 100.0 nF ESR= 64.0 mOhm VDC= 50.0 V IRMS= 1.64 A | 1 | \$0.01 | 0805 7 mm ² |
| 6. | Cout | MuRata | GRM31CR60J107ME39L Series= X5R | Cap= 100.0 uF ESR= 4.885 mOhm VDC= 6.3 V IRMS= 4.4118 A | 1 | \$0.14 | 1206_190 11 mm ² |
| 7. | L1 | Bourns | SRU1038-100Y | L= 10.0 uH DCR= 25.0 mOhm | 1 | \$0.33 |  SRU1038 144 mm ² |
| 8. | Rcomp | Vishay-Dale | CRCW04025K76FKED Series= CRCW..e3 | Res= 5.76 kOhm Power= 63.0 mW Tolerance= 1.0% | 1 | \$0.01 | 0402 3 mm ² |
| 9. | Rfbb | Yageo America | RT0805BRD0732KL Series= ? | Res= 32.0 kOhm Power= 125.0 mW Tolerance= 0.1% | 1 | \$0.05 | 0805 7 mm ² |
| 10. | Rfht | Vishay-Dale | CRCW0402100KFKED Series= CRCW..e3 | Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0% | 1 | \$0.01 | 0402 3 mm ² |

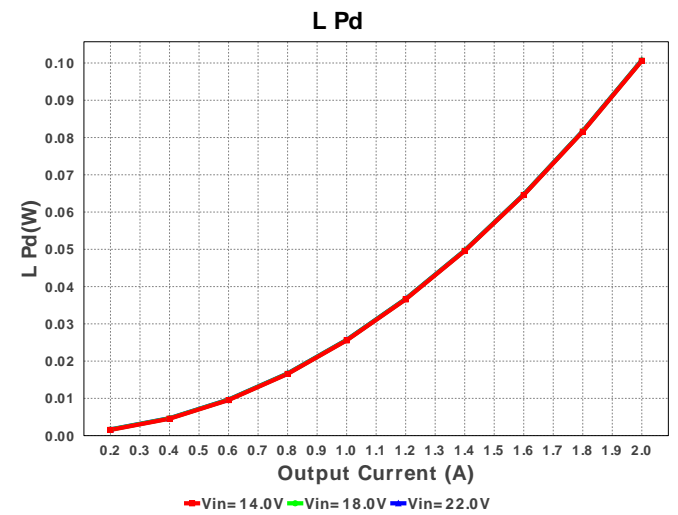
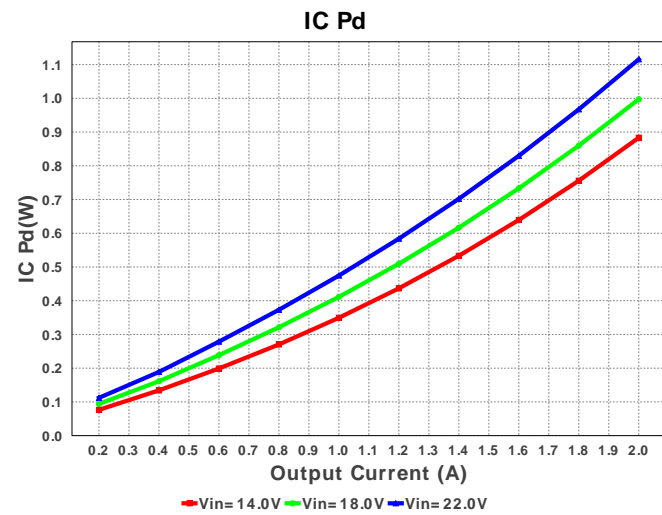
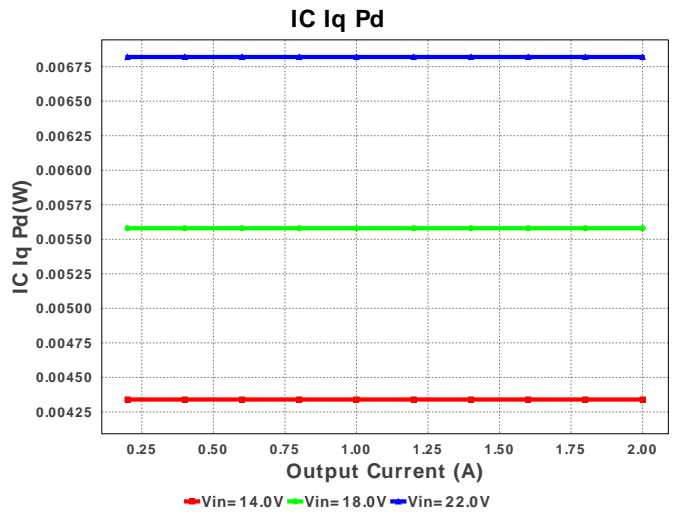
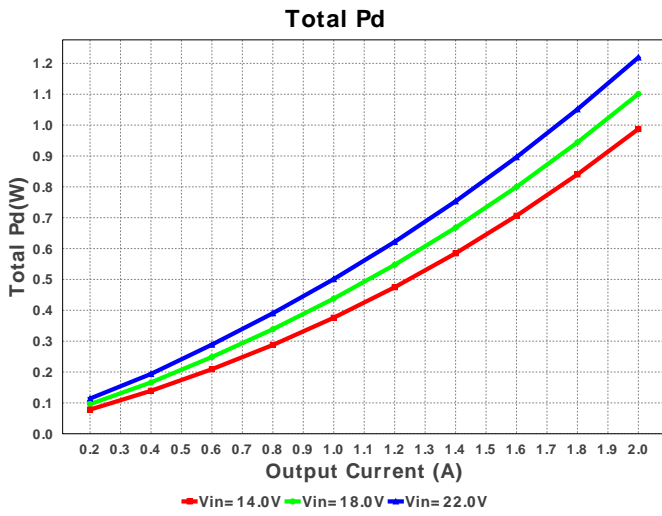
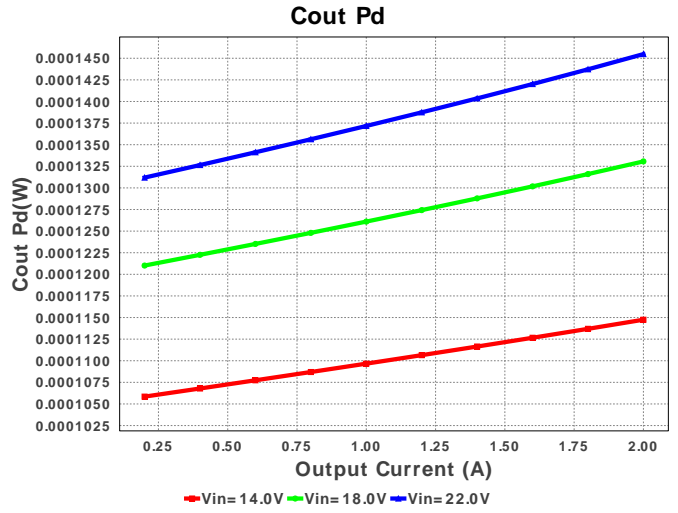
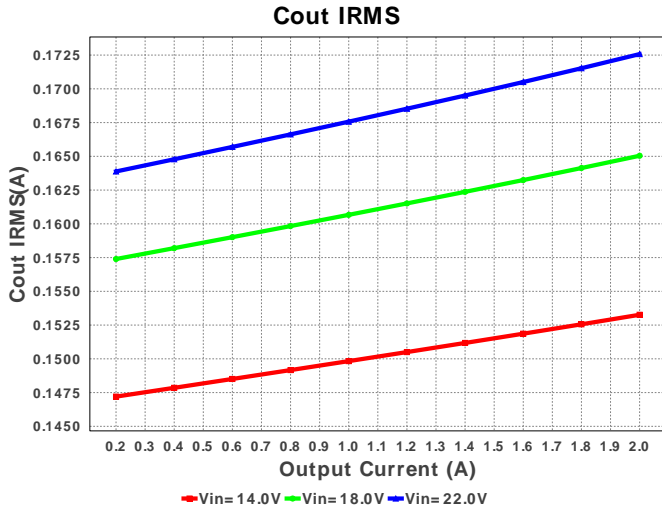
| # | Name | Manufacturer | Part Number | Properties | Qty | Price | Footprint |
|-----|------|-------------------|--------------------------------------|---|-----|--------|------------------------|
| 11. | Rt | Vishay-Dale | CRCW040295K3FKED Series= CRCW..e3 | Res= 95.3 kOhm Power= 63.0 mW Tolerance= 1.0% | 1 | \$0.01 | 0402 3 mm ² |
| 12. | U1 | Texas Instruments | TPS54335ADDAR | Switcher | 1 | \$0.90 | |

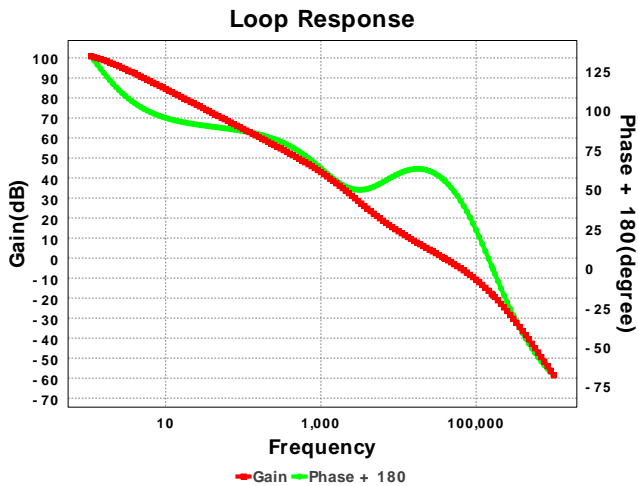


R-PDSO-G8 55 mm²









Operating Values

| # | Name | Value | Category | Description |
|-----|---------------------|-----------------------|----------|--|
| 1. | Cin IRMS | 739.877 mA | Current | Input capacitor RMS ripple current |
| 2. | Cout IRMS | 172.573 mA | Current | Output capacitor RMS ripple current |
| 3. | Iin Avg | 355.42 mA | Current | Average input current |
| 4. | L Ipp | 597.81 mA | Current | Peak-to-peak inductor ripple current |
| 5. | BOM Count | 12 | General | Total Design BOM count |
| 6. | FootPrint | 264.0 mm ² | General | Total Foot Print Area of BOM components |
| 7. | Frequency | 496.814 kHz | General | Switching frequency |
| 8. | IC Tolerance | 12.0 mV | General | IC Feedback Tolerance |
| 9. | Mode | CCM | General | Conduction Mode |
| 10. | Pout | 6.6 W | General | Total output power |
| 11. | Total BOM | \$1.54 | General | Total BOM Cost |
| 12. | ICThetaJA Effective | 34.0 degC/W | Op_Point | Effective IC Junction-to-Ambient Thermal Resistance |
| 13. | Low Freq Gain | 100.743 dB | Op_Point | Gain at 10Hz |
| 14. | Vout Actual | 3.3 V | Op_Point | Vout Actual calculated based on selected voltage divider resistors |
| 15. | Vout OP | 3.3 V | Op_Point | Operational Output Voltage |
| 16. | Cross Freq | 38.81 kHz | Op_point | Bode plot crossover frequency |
| 17. | Duty Cycle | 16.184 % | Op_point | Duty cycle |
| 18. | Efficiency | 84.408 % | Op_point | Steady state efficiency |
| 19. | Gain Marg | -18.499 dB | Op_point | Bode Plot Gain Margin |
| 20. | IC Tj | 67.937 degC | Op_point | IC junction temperature |
| 21. | IOUT_OP | 2.0 A | Op_point | Iout operating point |
| 22. | Phase Marg | 56.318 deg | Op_point | Bode Plot Phase Margin |
| 23. | VIN_OP | 22.0 V | Op_point | Vin operating point |
| 24. | Vout p-p | 3.299 mV | Op_point | Peak-to-peak output ripple voltage |
| 25. | Cin Pd | 2.39 mW | Power | Input capacitor power dissipation |
| 26. | Cout Pd | 145.482 μW | Power | Output capacitor power dissipation |
| 27. | IC Iq Pd | 6.82 mW | Power | IC Iq Pd |
| 28. | IC Pd | 1.116 W | Power | IC power dissipation |
| 29. | L Pd | 100.745 mW | Power | Inductor power dissipation |
| 30. | Total Pd | 1.219 W | Power | Total Power Dissipation |
| 31. | Vout Tolerance | 2.347 % | | Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable |

Design Inputs

| # | Name | Value | Description |
|----|---------|-----------|------------------------|
| 1. | Iout | 2.0 | Maximum Output Current |
| 2. | VinMax | 22.0 | Maximum input voltage |
| 3. | VinMin | 14.0 | Minimum input voltage |
| 4. | Vout | 3.3 | Output Voltage |
| 5. | base_pn | TPS54335A | Base Product Number |
| 6. | source | DC | Input Source Type |
| 7. | Ta | 30.0 | Ambient temperature |

Design Assistance

1. **TPS54335A** Product Folder : <http://www.ti.com/product/TPS54335A> : contains the data sheet and other resources.

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