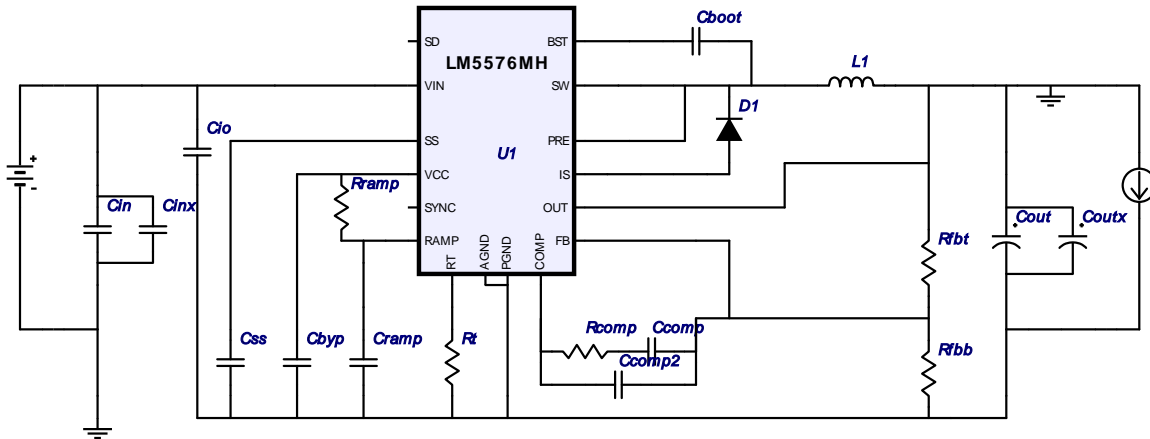







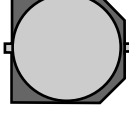




WEBENCH® Design Report

 Design : 2371596/2 LM5576MH
 LM5576MH 11.5V-12.5V to -48.0V @ 0.2A

Electrical BOM

| # | Name | Manufacturer | Part Number | Quantity | Price | Properties | Footprint |
|-----|--------|---------------|--------------------------------------|----------|--------|--|---|
| 1. | Cboot | MuRata | GRM155R71E223KA61D Series= X7R | 1 | \$0.01 | Cap= 22.0 nF VDC= 25.0 V IRMS= 0.0 A |  0402 8mm2 |
| 2. | Cbyp | MuRata | GRM155R61A154KE19D Series= X5R | 1 | \$0.01 | Cap= 150.0 nF VDC= 10.0 V IRMS= 0.0 A |  0402 8mm2 |
| 3. | Ccomp | Yageo America | CC0805JRNP09BN820 Series= C0G/NP0 | 1 | \$0.01 | Cap= 82.0 pF VDC= 50.0 V IRMS= 0.0 A |  0805 13mm2 |
| 4. | Ccomp2 | Yageo America | CC0805JRNP09BN100 Series= C0G/NP0 | 1 | \$0.01 | Cap= 10.0 pF VDC= 50.0 V IRMS= 0.0 A |  0805 13mm2 |
| 5. | Cin | Kemet | C1206C334K3RACTU Series= X7R | 1 | \$0.04 | Cap= 330.0 nF ESR= 70.0 mOhm VDC= 25.0 V IRMS= 905.0 mA |  1206 19mm2 |
| 6. | Cinx | AVX | 08053C104KAT2A Series= X7R | 1 | \$0.01 | Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A |  0805 13mm2 |
| 7. | Cio | TDK | C3216X7R2A105M Series= 285 | 1 | \$0.11 | Cap= 1.0 µF ESR= 6.0 mOhm VDC= 100.0 V IRMS= 4.5 A |  1206 19mm2 |
| 8. | Cout | Panasonic | EEE-FK1J680UP Series= FK | 2 | \$0.24 | Cap= 68.0 µF ESR= 350.0 mOhm VDC= 63.0 V IRMS= 400.0 mA |  SM_RADIAL_G 172mm2 |
| 9. | Coutx | Panasonic | EEE-FK1K4R7P Series= FK | 1 | \$0.13 | Cap= 4.7 µF ESR= 3.0 Ohm VDC= 80.0 V IRMS= 40.0 mA |  SM_RADIAL_D 84mm2 |
| 10. | Cramp | Yageo America | CC0805KRX7R9BB561 Series= X7R | 1 | \$0.01 | Cap= 560.0 pF VDC= 50.0 V IRMS= 0.0 A |  0805 13mm2 |

| # | Name | Manufacturer | Part Number | Quantity | Price | Properties | Footprint |
|-----|-------|-------------------|--------------------------------------|----------|--------|--|--|
| 11. | Css | MuRata | GRM155R61A105KE15D Series= X5R | 1 | \$0.01 | Cap= 1.0 μ F VDC= 10.0 V IRMS= 0.0 A |  0402 8mm2 |
| 12. | D1 | Rohm | RF071M2S | 1 | \$0.11 | VF@Io= 850.0 mV VRRM= 200.0 V |  SOD-123 22mm2 |
| 13. | L1 | Bourns | SRR1208-560YL | 1 | \$0.41 | L= 56.0 μ H DCR= 140.0 mOhm |  SRR1208 216mm2 |
| 14. | Rcomp | Vishay-Dale | CRCW0402768KFKED Series= CRCW..e3 | 1 | \$0.01 | Res= 768.0 kOhm Power= 63.0 mW Tolerance= 1.0% |  0402 8mm2 |
| 15. | Rfbb | Vishay-Dale | CRCW04021K65FKED Series= CRCW..e3 | 1 | \$0.01 | Res= 1.65 kOhm Power= 63.0 mW Tolerance= 1.0% |  0402 8mm2 |
| 16. | Rfbt | Vishay-Dale | CRCW040263K4FKED Series= CRCW..e3 | 1 | \$0.01 | Res= 63.4 kOhm Power= 63.0 mW Tolerance= 1.0% |  0402 8mm2 |
| 17. | Rramp | Vishay-Dale | CRCW040264K9FKED Series= CRCW..e3 | 1 | \$0.01 | Res= 64.9 kOhm Power= 63.0 mW Tolerance= 1.0% |  0402 8mm2 |
| 18. | Rt | Vishay-Dale | CRCW040220K5FKED Series= CRCW..e3 | 1 | \$0.01 | Res= 20.5 kOhm Power= 63.0 mW Tolerance= 1.0% |  0402 8mm2 |
| 19. | U1 | Texas Instruments | LM5576MH | 1 | \$2.60 | Switcher |  MXA20A 71mm2 |

Operating Values

| # | Name | Value | Category | Description |
|-----|--------------|----------------|----------|--|
| 1. | Cin IRMS | 19.232 m A | Current | Input capacitor RMS ripple current |
| 2. | Cio IRMS | 82.75 m A | Current | Input to output capacitor RMS ripple current |
| 3. | Cout IRMS | 176.301 m A | Current | Output capacitor RMS ripple current |
| 4. | D1 Irms | 689.353 m A | Current | D1 Irms |
| 5. | IC Ipk | 4.75 m A | Current | Peak switch current in IC |
| 6. | Iin Avg | 916.98 m A | Current | Average input current |
| 7. | L Ipp | 548.059 m A | Current | Peak-to-peak output inductor ripple current |
| 8. | L1 Ipk | 1.327 A | Current | Inductor peak current |
| 9. | L1 Irms | 765.948 m A | Current | Inductor ripple current |
| 10. | BOM Count | 20.0 | General | Total Design BOM count |
| 11. | FootPrint | 887.0 mm2 | General | Total Foot Print Area of BOM components |
| 12. | Frequency | 300.0 k Hz | General | Switching frequency |
| 13. | IC Tolerance | 18.0 m V | General | IC Feedback Tolerance |
| 14. | Mode | CCM | General | Conduction Mode |
| 15. | Total BOM | \$4.0 | General | Total BOM Cost |
| 16. | D1 Tj | 81.0 degC | Op_Point | D1 junction temperature |
| 17. | Vin p-p | 36.84 m V | Op_Point | Peak-to-peak input voltage |
| 18. | Cross Freq | 2.3 k Hz | Op_point | Bode plot crossover frequency |
| 19. | Duty Cycle | 81.0 % | Op_point | Duty cycle |
| 20. | Efficiency | 91.036 % | Op_point | Steady state efficiency |
| 21. | Gain Marg | 38.051 db | Op_point | Bode Plot Gain Margin |
| 22. | IC Tj | 60.302 degC | Op_point | IC junction temperature |
| 23. | IOUT_OP | 200.0 m A | Op_point | Iout operating point |
| 24. | Phase Marg | 45.43 deg | Op_point | Bode Plot Phase Margin |
| 25. | Phase Shift | 33.408 deg | Op_point | Bode Plot Phase Shift |
| 26. | VIN_OP | 11.5 V | Op_point | Vin operating point |
| 27. | Vout p-p | 54.484 m V | Op_point | Peak-to-peak output ripple voltage |
| 28. | Cin Pd | 25.891 μ W | Power | Input capacitor power dissipation |
| 29. | Cio Pd | 41.085 μ W | Power | Input to output capacitor power dissipation |
| 30. | Cout Pd | 5.439 m W | Power | Output capacitor power dissipation |
| 31. | D1 Pd | 170.0 m W | Power | Diode power dissipation |
| 32. | D1 PdCond | 170.0 m W | Power | Diode conduction losses |
| 33. | D1 PdSw | 0.0 W | Power | Diode switching losses |
| 34. | IC Pd | 757.559 m W | Power | IC power dissipation |
| 35. | L Pd | 11.094 m W | Power | Inductor power dissipation |

| # | Name | Value | Category | Description |
|-----|-----------|-----------------|----------|------------------------------------|
| 36. | Rsense Pd | 500.373 μ W | Power | LED Current Rsns Power Dissipation |
| 37. | Total Pd | 945.284 m W | Power | Total Power Dissipation |

Design Inputs

| # | Name | Value | Description |
|----|---------|-------------|-------------------------------|
| 1. | Iout | 200.0 mA | Maximum Output Current |
| 2. | Iout1 | 200.0 mAmps | Output Current #1 |
| 3. | VinMax | 12.5 V | Maximum input voltage |
| 4. | VinMin | 11.5 V | Minimum input voltage |
| 5. | Vout | -48.0 V | Output Voltage |
| 6. | Vout1 | -48.0 Volt | Output Voltage #1 |
| 7. | base_pn | LM5576 | National Based Product Number |
| 8. | Ta | 30.0 degC | Ambient temperature |

Design Assistance

1. **LM5576** Product Folder : <http://www.ti.com/product/LM5576> : contains the data sheet and other resources.

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