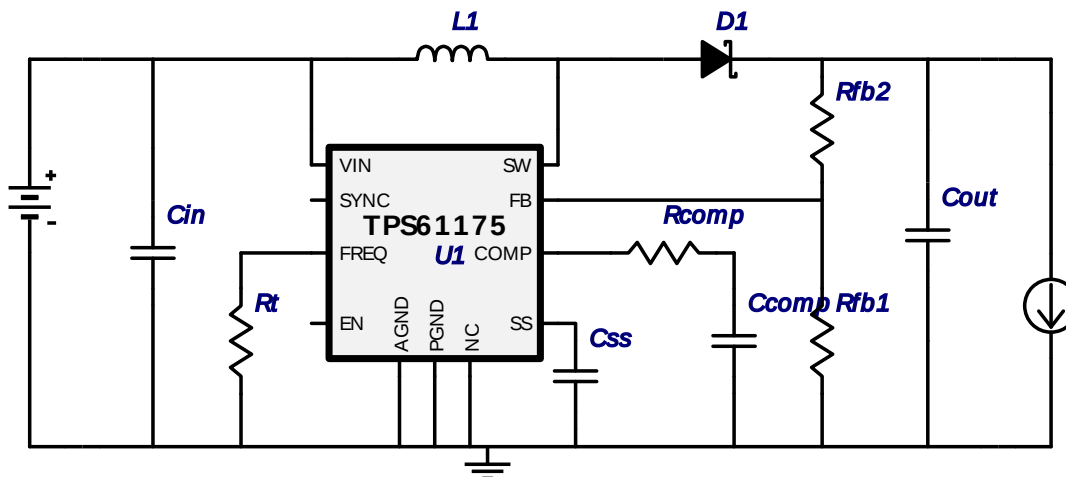


WEBENCH® Design Report

Design : 487676/6 TPS61175PWP
TPS61175PWP 3.0V-4.2V to 12.0V @ 0.5A



Electrical BOM

#	Name	Manufacturer	Part Number	Quantity	Price	Properties	Footprint
1.	Ccomp	MuRata	GRM155R61A154KE19D Series= X5R	1	\$0.01	Cap= 150.0 nF VDC= 10.0 V IRMS= 0.0 A	 0402 8mm2
2.	Cin	Kemet	C0603C475K9PACTU Series= X5R	1	\$0.02	Cap= 4.7 µF ESR= 6.0 mOhm VDC= 6.3 V IRMS= 7.24 A	 0603 10mm2
3.	Cout	TDK	C3225X5R1E106K Series= X5R	1	\$0.15	Cap= 10.0 µF ESR= 15.0 mOhm VDC= 25.0 V IRMS= 3.0 A	 1210 23mm2
4.	Css	Taiyo Yuden	TMK212B7473KD-T Series= X7R	1	\$0.01	Cap= 47.0 nF VDC= 25.0 V IRMS= 0.0 A	 0805 13mm2
5.	D1	Vishay-Semiconductor	SS32-E3/57T	1	\$0.18	VF@Io= 500.0 mV VRRM= 20.0 V	 SMC 83mm2
6.	L1	Bourns	SRN8040-6R8Y	1	\$0.24	L= 6.8 µH DCR= 33.0 mOhm	 SRN8040 100mm2
7.	Rcomp	Vishay-Dale	CRCW04021K69FKED Series= CRCW..e3	1	\$0.01	Res= 1.69 kOhm Power= 63.0 mW Tolerance= 1.0%	 0402 8mm2
8.	Rfb1	Vishay-Dale	CRCW040216K2FKED Series= CRCW..e3	1	\$0.01	Res= 16.2 kOhm Power= 63.0 mW Tolerance= 1.0%	 0402 8mm2
9.	Rfb2	Vishay-Dale	CRCW0402143KFKED Series= CRCW..e3	1	\$0.01	Res= 143.0 kOhm Power= 63.0 mW Tolerance= 1.0%	 0402 8mm2
10.	Rt	Vishay-Dale	CRCW040284K5FKED Series= CRCW..e3	1	\$0.01	Res= 84.5 kOhm Power= 63.0 mW Tolerance= 1.0%	 0402 8mm2

#	Name	Manufacturer	Part Number	Quantity	Price	Properties	Footprint
11.	U1	Texas Instruments	TPS61175PWP	1	\$1.80	Switcher	PWP 59mm2

Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	68.46 m A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	994.376 m A	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.594 A	Current	Peak switch current in IC
4.	Iin Avg	2.5 A	Current	Average input current
5.	L Ipp	237.153 m A	Current	Peak-to-peak inductor ripple current
6.	M Iavg	2.476 A	Current	MOSFET Average current
7.	M1 Irms	2.212 A	Current	Q Iavg
8.	BOM Count	11.0	General	Total Design BOM count
9.	FootPrint	326.0 mm2	General	Total Foot Print Area of BOM components
10.	Frequency	1.2 M Hz	General	Switching frequency
11.	IC Tolerance	20.0 m V	General	IC Feedback Tolerance
12.	M Vds Act	290.995 m V	General	Voltage drop across the MosFET
13.	Mode	CCM	General	Conduction Mode
14.	Pout	6.0 W	General	Total output power
15.	Total BOM	\$2.45	General	Total BOM Cost
16.	D1 Tj	43.75 degC	Op_Point	D1 junction temperature
17.	Vout OP	12.0 V	Op_Point	Operational Output Voltage
18.	Cross Freq	5.239 k Hz	Op_point	Bode plot crossover frequency
19.	Duty Cycle	79.803 %	Op_point	Duty cycle
20.	Efficiency	80.003 %	Op_point	Steady state efficiency
21.	IC Tj	75.906 degC	Op_point	IC junction temperature
22.	ICThetaJA	44.5 degC/W	Op_point	IC junction-to-ambient thermal resistance
23.	IOUT_OP	500.0 m A	Op_point	Iout operating point
24.	Phase Marg	83.452 deg	Op_point	Bode Plot Phase Margin
25.	VIN_OP	3.0 V	Op_point	Vin operating point
26.	Vout p-p	22.658 m V	Op_point	Peak-to-peak output ripple voltage
27.	Cin Pd	28.121 μ W	Power	Input capacitor power dissipation
28.	Cout Pd	14.832 m W	Power	Output capacitor power dissipation
29.	Diode Pd	250.0 m W	Power	Diode power dissipation
30.	IC Pd	1.032 W	Power	IC power dissipation
31.	L Pd	202.411 m W	Power	Inductor power dissipation
32.	Total Pd	1.5 W	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	500.0 mA	Maximum Output Current
2.	Iout1	500.0 mAmps	Output Current #1
3.	VinMax	4.2 V	Maximum input voltage
4.	VinMin	3.0 V	Minimum input voltage
5.	Vout	12.0 V	Output Voltage
6.	Vout1	12.0 Volt	Output Voltage #1
7.	base_pn	TPS61175	National Based Product Number
8.	Ta	30.0 degC	Ambient temperature

Design Assistance

1. **TPS61175** Product Folder : <http://www.ti.com/product/tps61175> : contains the data sheet and other resources.

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