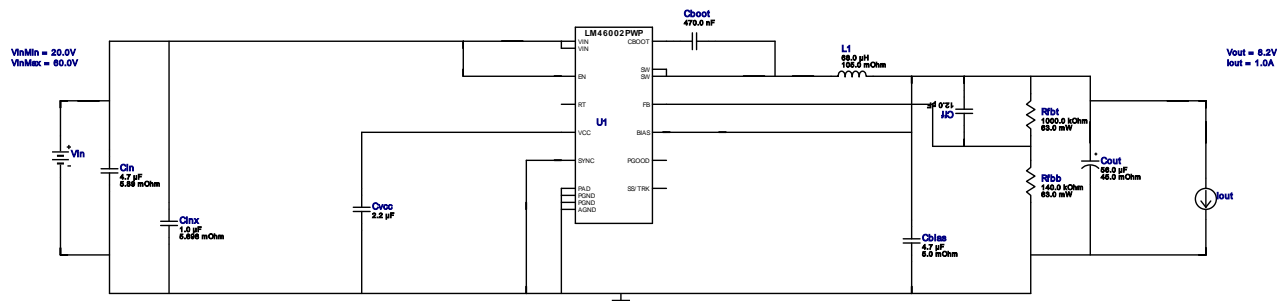





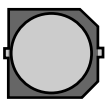

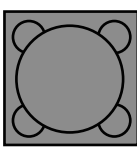





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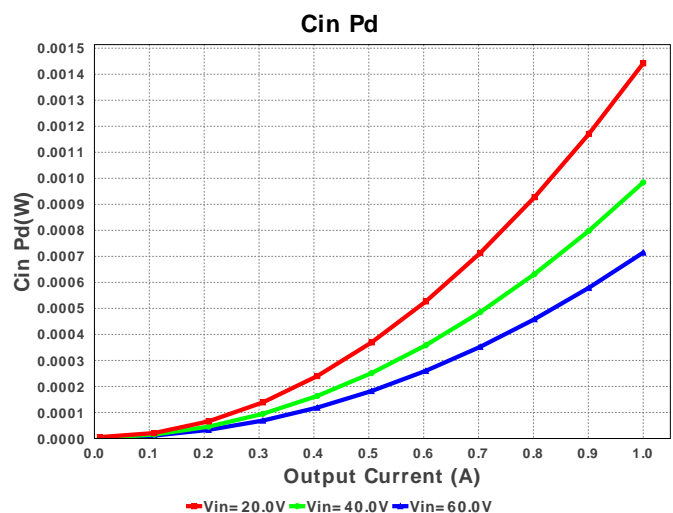
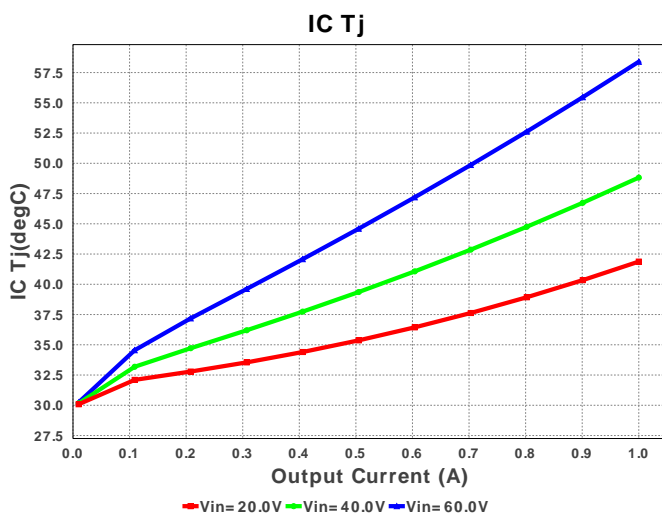
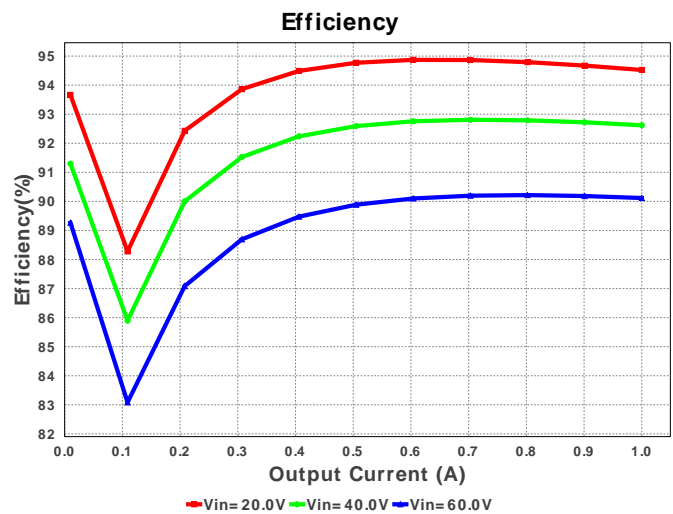
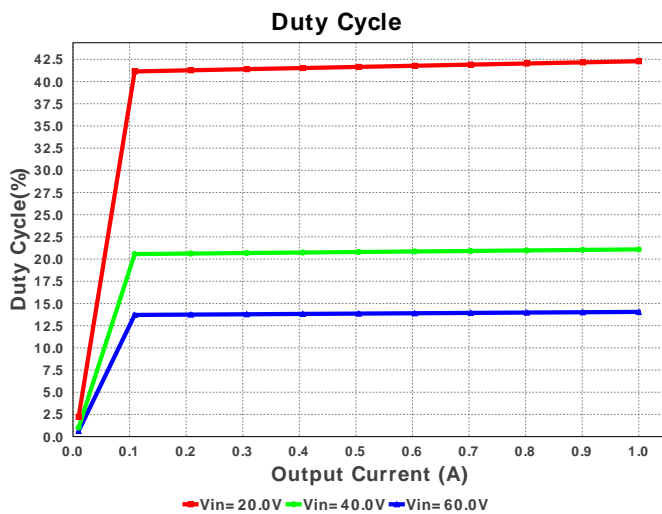
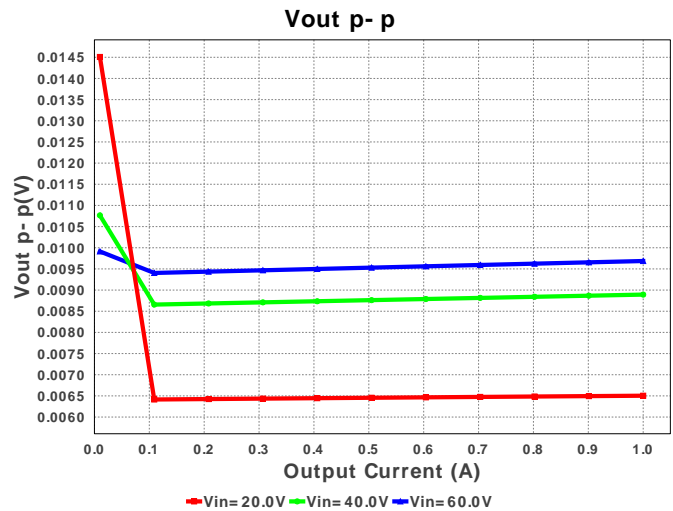
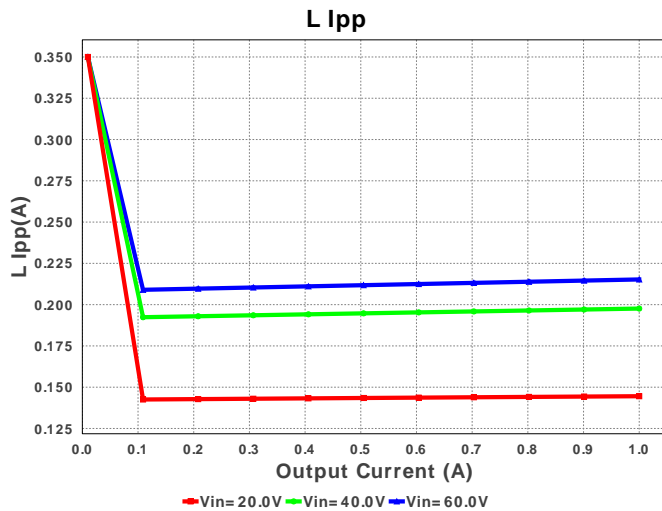
Design : 73500/47 LM46002PWPR
solarelectronicload-lipo


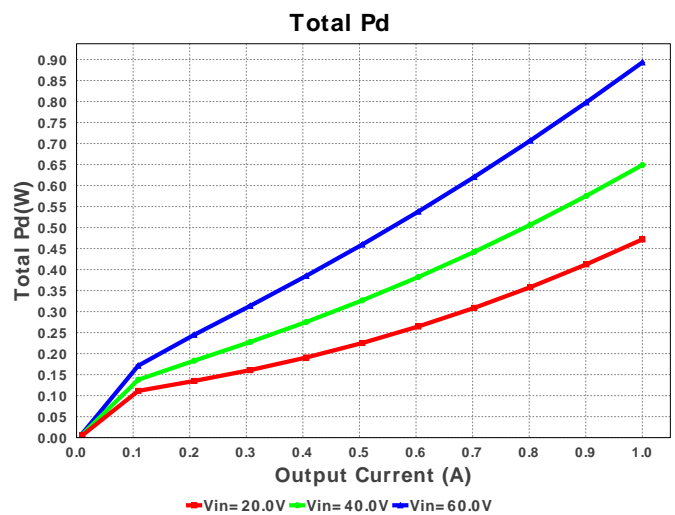
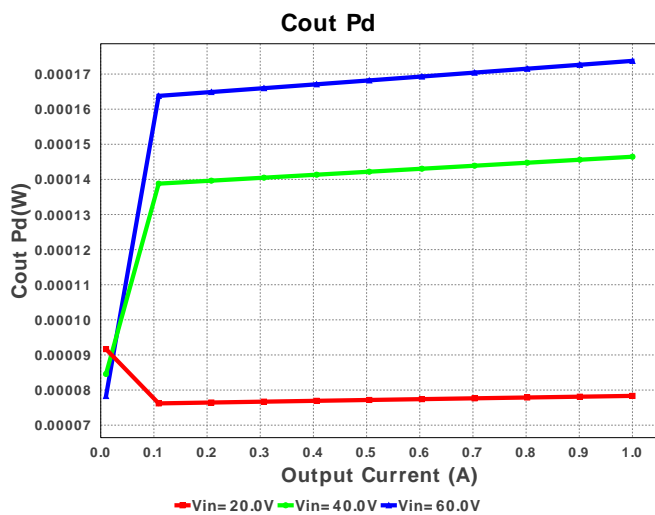
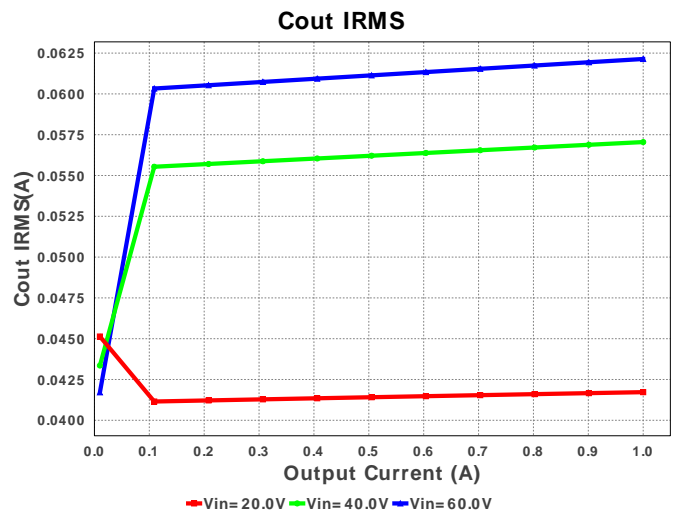
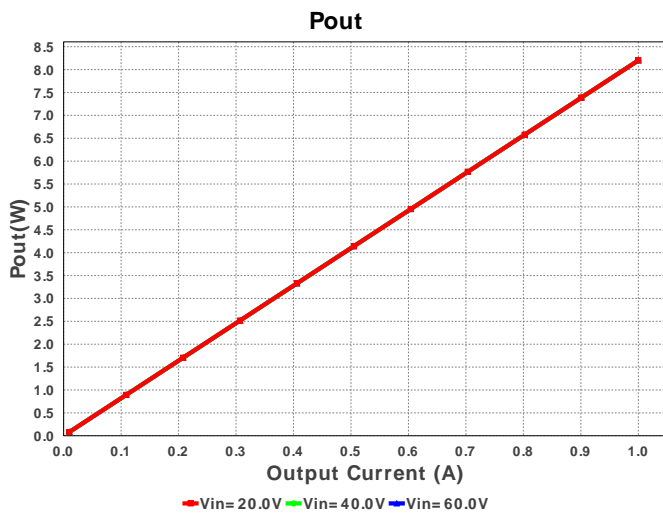
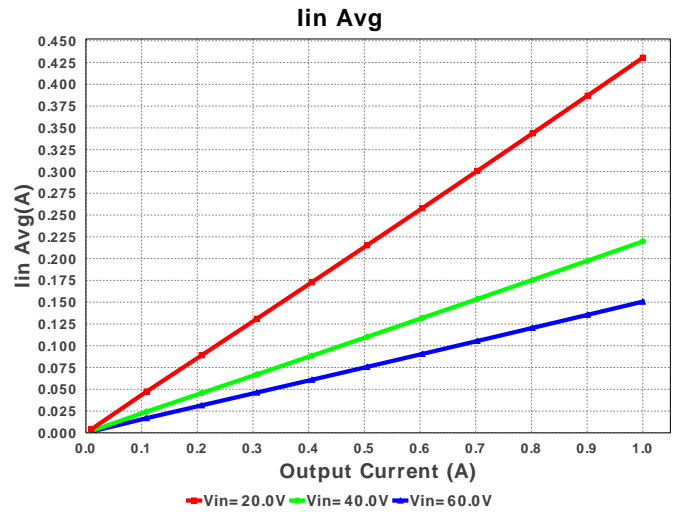
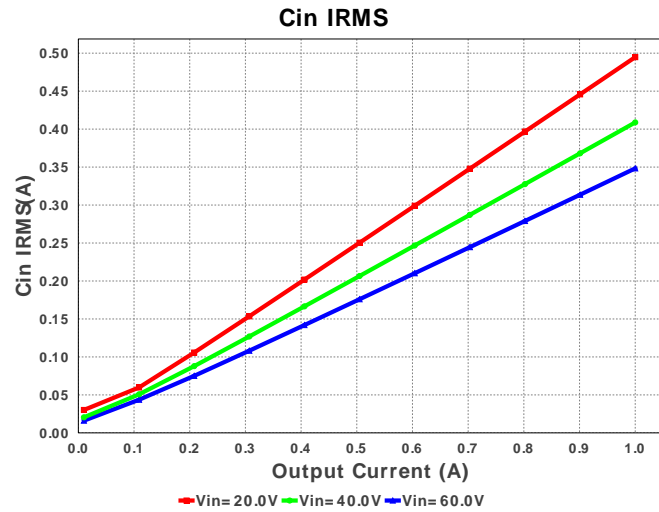
1. The input capacitor included in the BOM only contains a small filter capacitor that should be placed near the IC. Depending on where the power supply is laid out in the system additional bulk capacitance may need to be added to filter the line ripple.
2. If there is no VinTyp specified, WEBENCH will use the VinMax value. To change the VinTyp value, click on the "Change Design Inputs" button under the Optimization Tuning knob. In some applications, while the design requires the input voltage to be a wide range, for a majority of the time, it is operating at a much lower voltage than the maximum input voltage. Sizing the inductor based on the maximum input voltage may yield an inductance much larger than typically needed, causing a larger footprint for the overall design. At the same time, components such as the input capacitor must be rated based on the maximum input voltage. WEBENCH now supports the use of this additional input voltage specification.

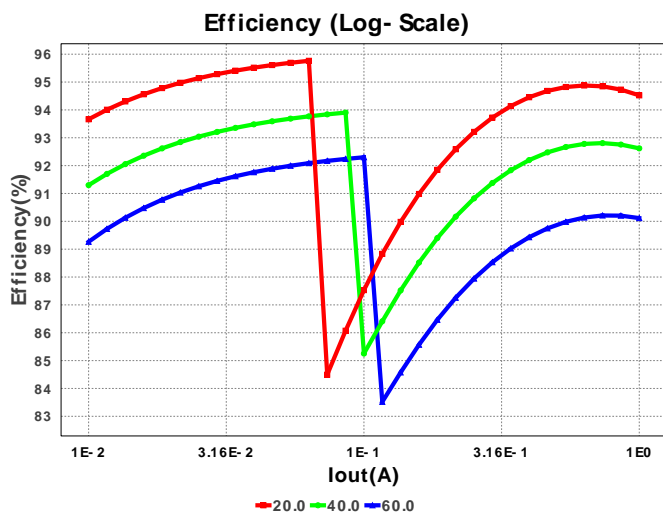
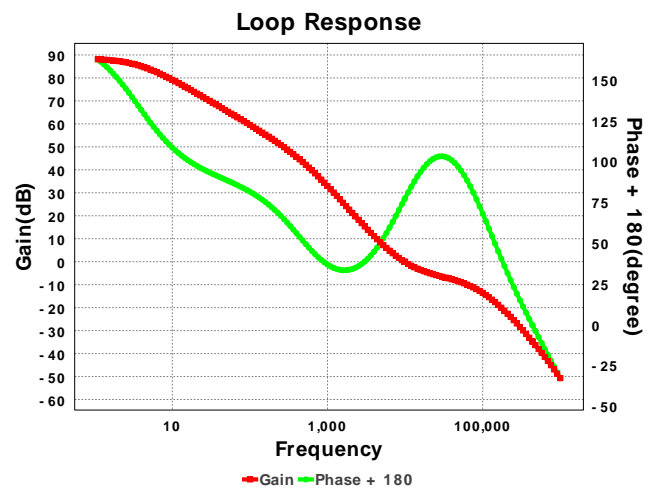
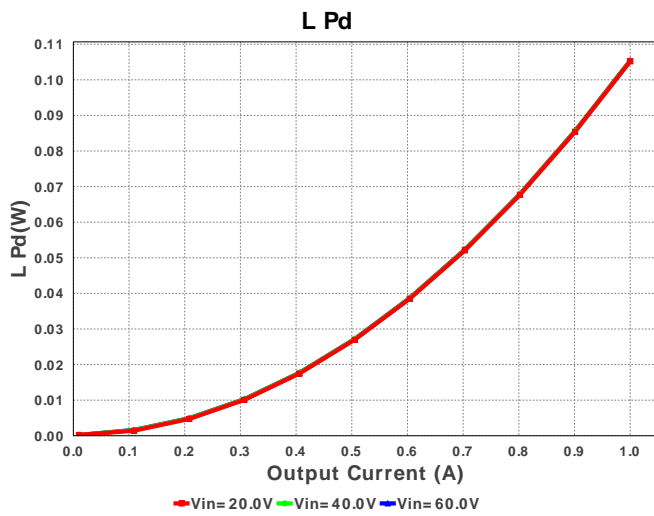
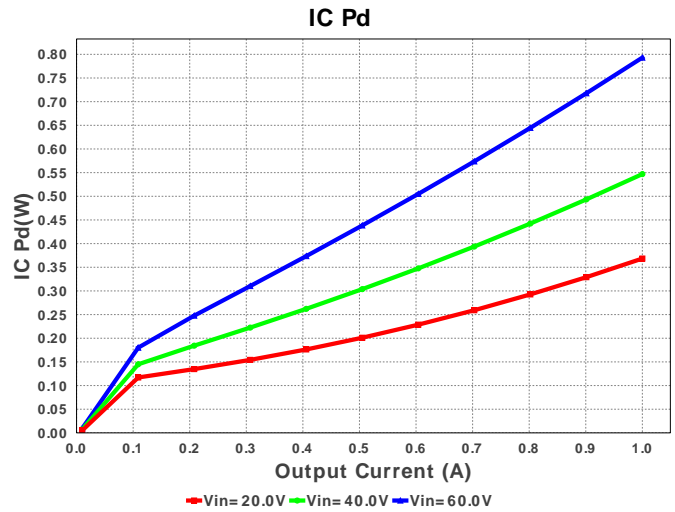
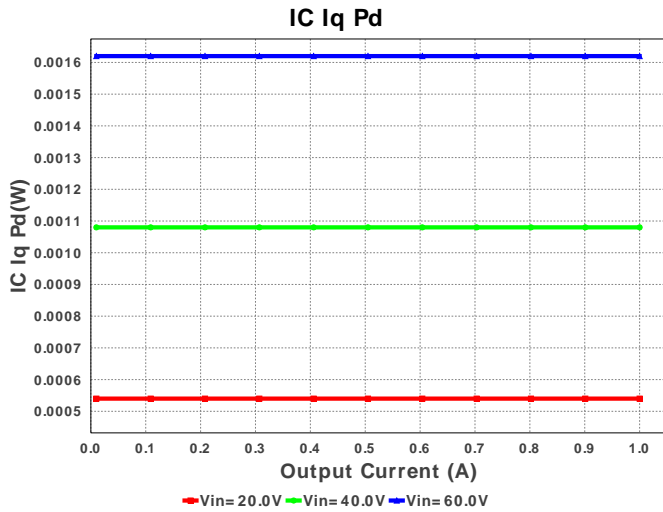
Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbias	MuRata	GRM21BR61C475KA88L Series= X5R	Cap= 4.7 uF ESR= 5.0 mOhm VDC= 16.0 V IRMS= 0.0 A	1	\$0.04	 0805 7 mm ²
2.	Cboot	MuRata	GRM21BR72A474KA73L Series= X7R	Cap= 470.0 nF VDC= 100.0 V IRMS= 0.0 A	1	\$0.13	 0805 7 mm ²
3.	Cff	AVX	06033A120FAT2A Series= C0G/NP0	Cap= 12.0 pF VDC= 25.0 V IRMS= 0.0 A	1	\$0.10	 0603 5 mm ²
4.	Cin	TDK	C3225X7S2A475M200AB Series= X7R	Cap= 4.7 uF ESR= 5.89 mOhm VDC= 100.0 V IRMS= 6.7739 A	1	\$0.42	 1210 15 mm ²
5.	Cinx	TDK	C3216JB2A105K Series= 285	Cap= 1.0 uF ESR= 5.698 mOhm VDC= 100.0 V IRMS= 0.0 A	1	\$0.11	 1206 11 mm ²
6.	Cout	Panasonic	16SVP56M Series= 261	Cap= 56.0 uF ESR= 45.0 mOhm VDC= 16.0 V IRMS= 1.89 A	1	\$0.49	 SM_RADIAL_8MM 113 mm ²
7.	Cvcc	Kemet	C0603C225K9PACTU Series= X5R	Cap= 2.2 uF VDC= 6.3 V IRMS= 0.0 A	1	\$0.02	 0603 5 mm ²
8.	L1	Coiltronics	DR127-680-R	L= 68.0 uH DCR= 105.0 mOhm	1	\$0.62	 DR127 210 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
9.	Rfbb	Vishay-Dale	CRCW0402140KFKED Series= CRCW..e3	Res= 140.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
10.	Rfbt	Vishay-Dale	CRCW04021M00FKED Series= CRCW..e3	Res= 1000.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
11.	U1	Texas Instruments	LM46002PWPR	Switcher	1	\$1.85	 PWP0016F 42 mm²







Operating Values

#	Name	Value	Category	Description
1.	BOM Count	11		Total Design BOM count
2.	Total BOM	\$3.8		Total BOM Cost
3.	Cin IRMS	348.286 mA	Current	Input capacitor RMS ripple current
4.	Cout IRMS	62.14 mA	Current	Output capacitor RMS ripple current
5.	Iin Avg	150.6 mA	Current	Average input current
6.	L Ipp	215.258 mA	Current	Peak-to-peak inductor ripple current
7.	FootPrint	420.0 mm ²	General	Total Foot Print Area of BOM components
8.	Frequency	500.0 kHz	General	Switching frequency
9.	Pout	8.2 W	General	Total output power
10.	Vout OP	8.2 V	Op_Point	Operational Output Voltage
11.	Cross Freq	9.8 kHz	Op_point	Bode plot crossover frequency

#	Name	Value	Category	Description
12.	Duty Cycle	14.05 %	Op_point	Duty cycle
13.	Efficiency	90.116 %	Op_point	Steady state efficiency
14.	IC Tj	58.395 degC	Op_point	IC junction temperature
15.	ICThetaJA	38.9 degC/W	Op_point	IC junction-to-ambient thermal resistance
16.	IOUT_OP	1.0 A	Op_point	Iout operating point
17.	Phase Marg	77.275 deg	Op_point	Bode Plot Phase Margin
18.	VIN_OP	60.0 V	Op_point	Vin operating point
19.	Vout p-p	9.687 mV	Op_point	Peak-to-peak output ripple voltage
20.	Cin Pd	714.474 μ W	Power	Input capacitor power dissipation
21.	Cout Pd	173.76 μ W	Power	Output capacitor power dissipation
22.	IC Iq Pd	1.62 mW	Power	IC Iq Pd
23.	IC Pd	793.08 mW	Power	IC power dissipation
24.	L Pd	105.405 mW	Power	Inductor power dissipation
25.	Total Pd	893.118 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	1.0	Maximum Output Current
2.	Iout1	1.0	Output Current #1
3.	VinMax	60.0	Maximum input voltage
4.	VinMin	20.0	Minimum input voltage
5.	VinTyp	60.0	Typical input voltage
6.	Vout	8.2	Output Voltage
7.	Vout1	8.2	Output Voltage #1
8.	base_pn	LM46002	Base Product Number
9.	source	DC	Input Source Type
10.	Ta	30.0	Ambient temperature

Design Assistance

1. **LM46002** Product Folder : <http://www.ti.com/product/LM46002> : contains the data sheet and other resources.

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