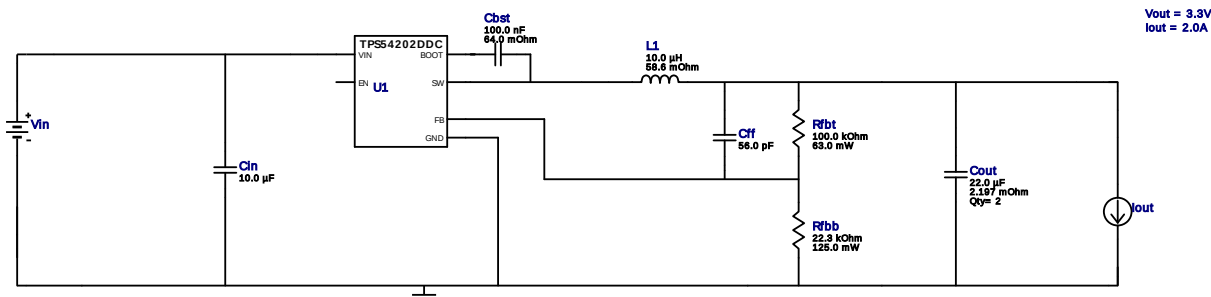


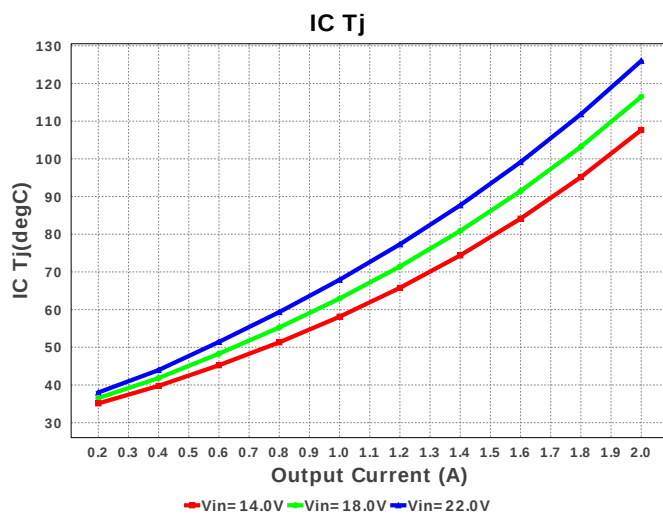
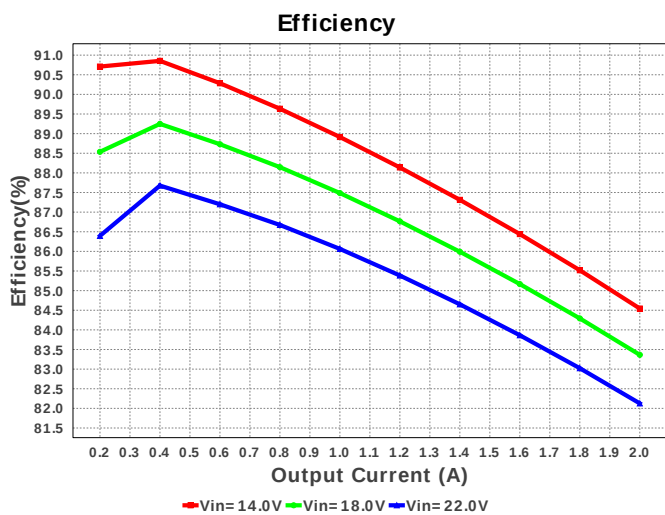
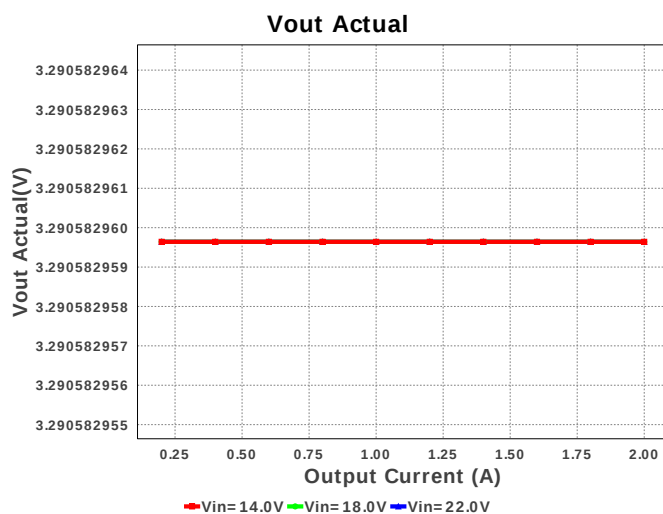
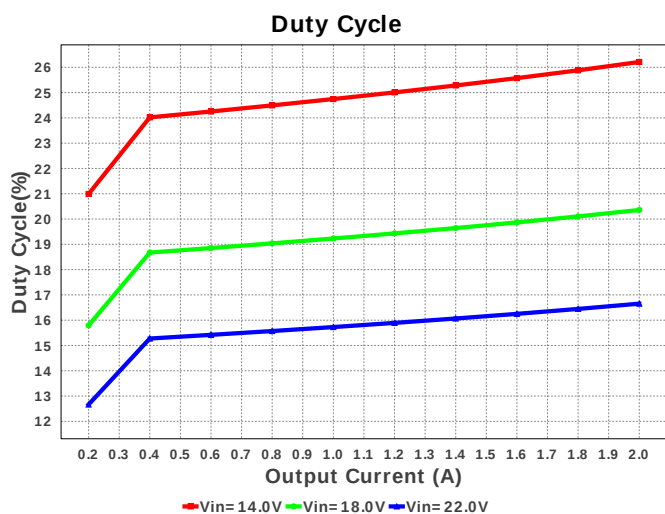
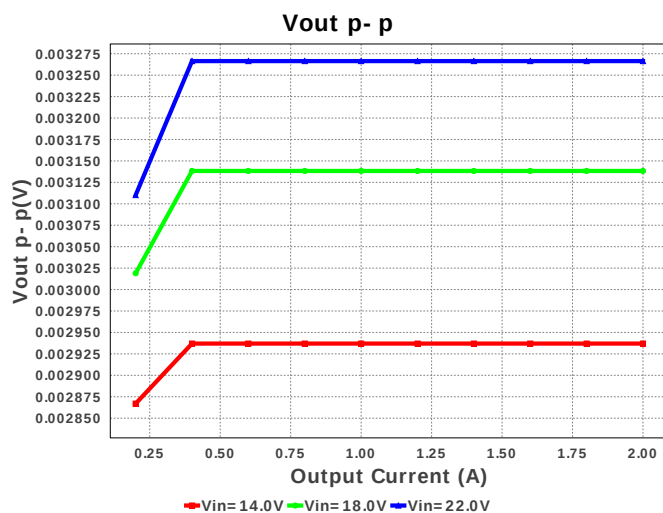
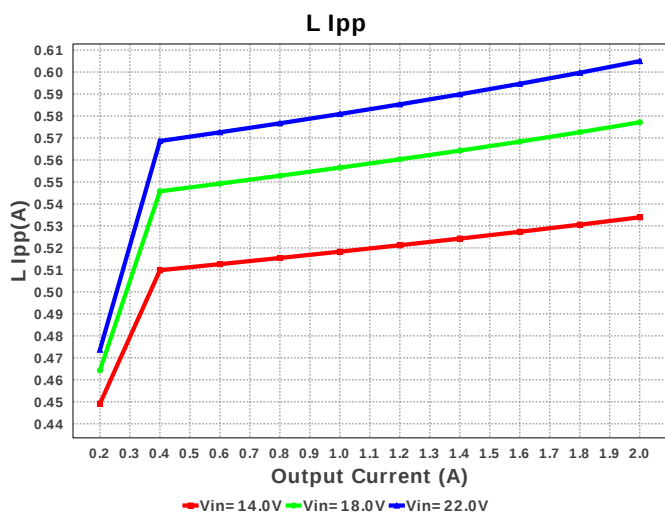
WEBENCH® Design Report

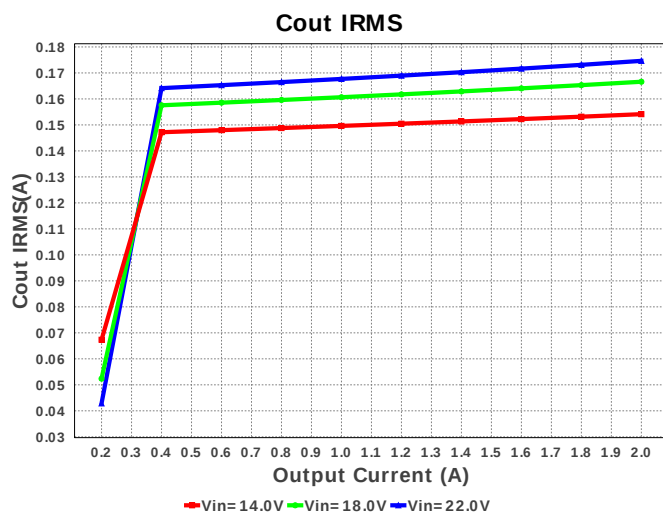
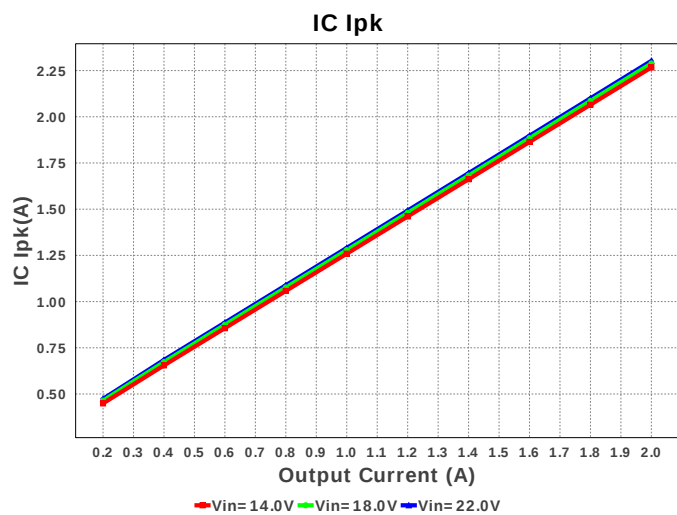
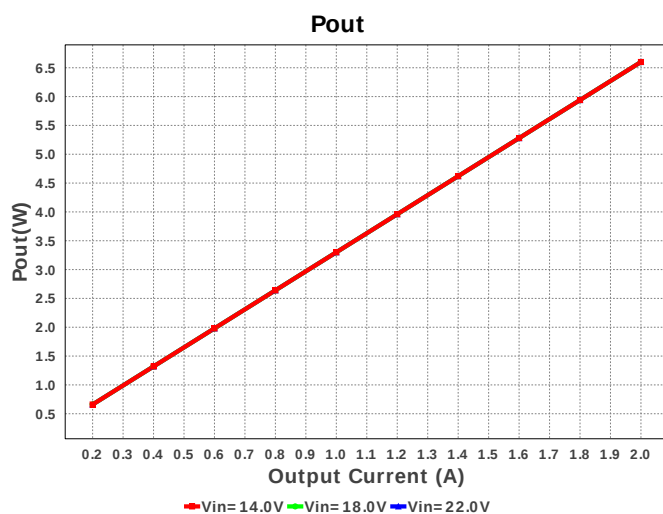
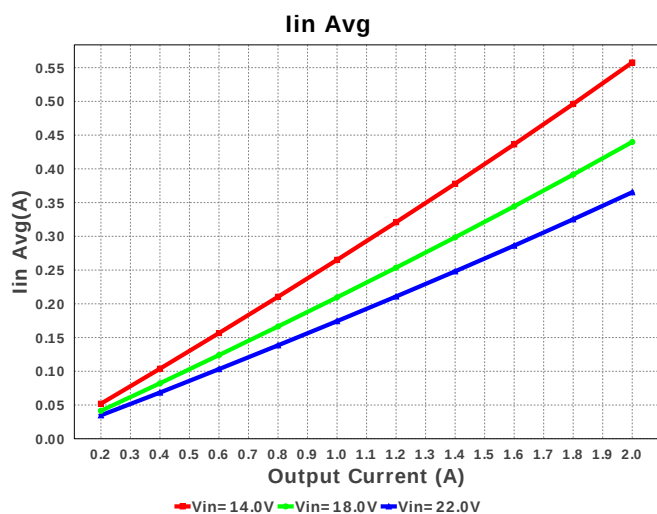
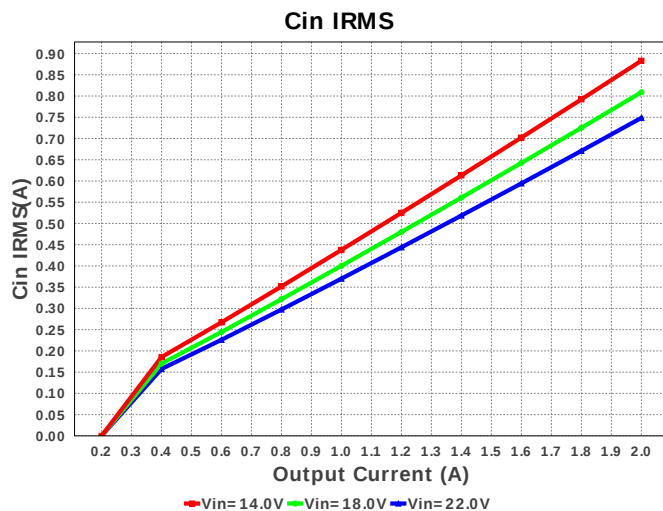
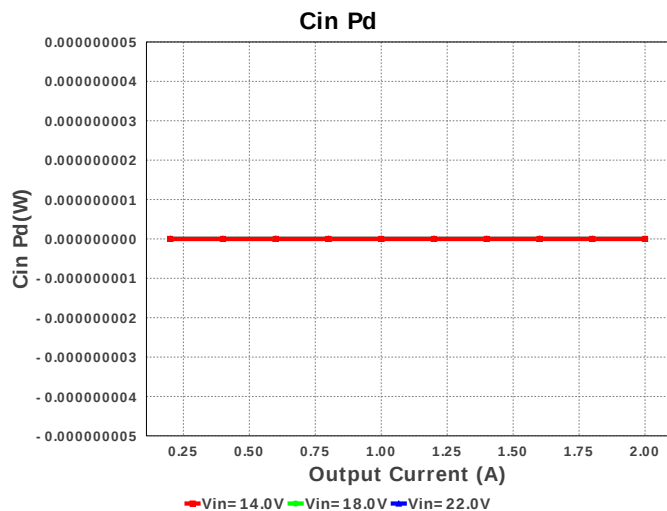
Design : 4763193/2 TPS54202DDCR
TPS54202DDCR 14.0V-22.0V to 3.30V @ 2.0A

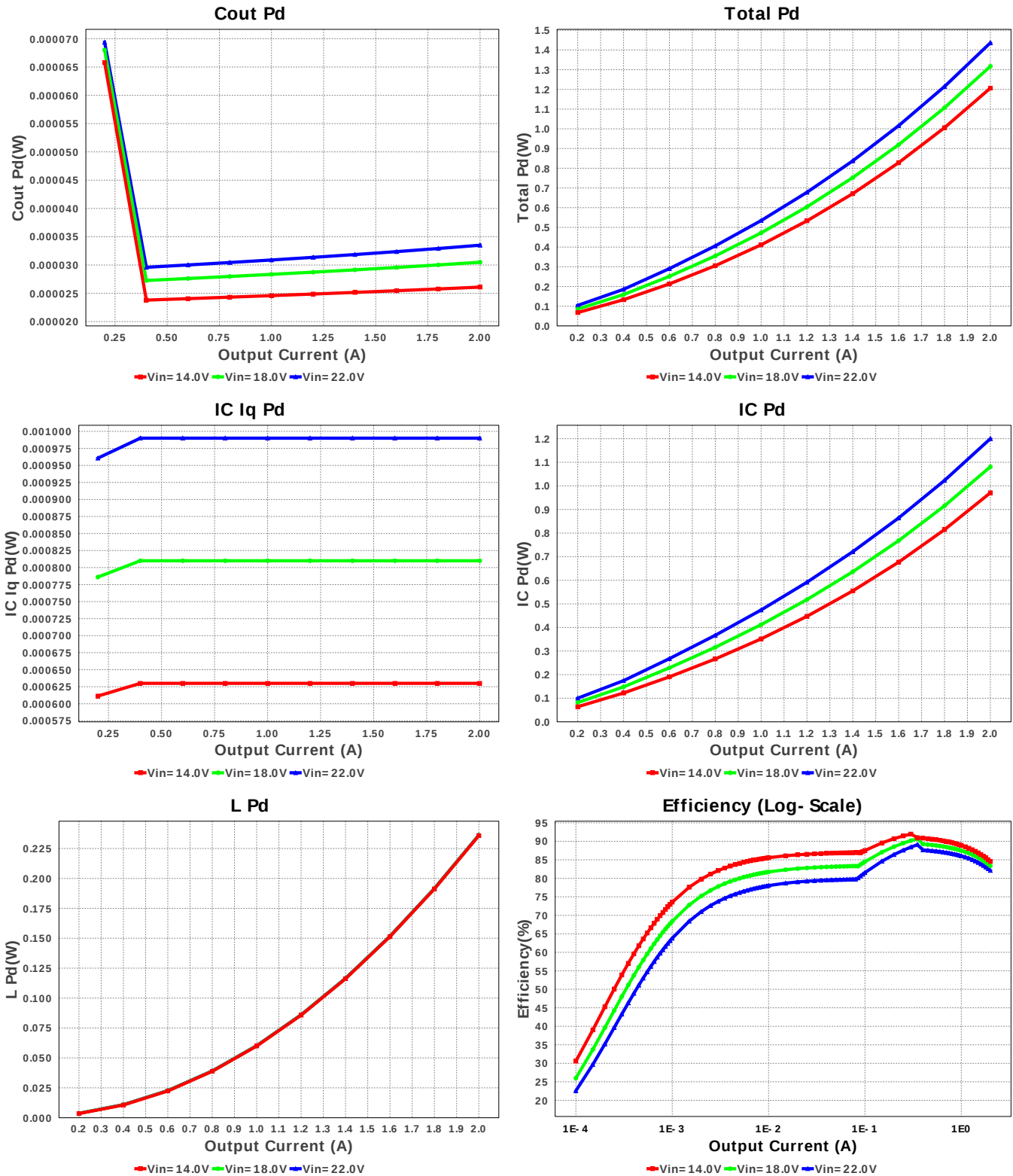


Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	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.	Cff	Kemet	C0201C560J3GACTU Series= C0G/NP0	Cap= 56.0 pF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0201 2 mm ²
3.	Cin	MuRata	GRM32ER71J106KA12L Series= X7R	Cap= 10.0 uF VDC= 63.0 V IRMS= 0.0 A	1	\$0.27	 1210_280 15 mm ²
4.	Cout	TDK	C4532X5R1E226M Series= X5R	Cap= 22.0 uF ESR= 2.197 mOhm VDC= 25.0 V IRMS= 0.0 A	2	\$0.50	 1812 23 mm ²
5.	L1	Bourns	SRN6045-100M	L= 10.0 µH DCR= 58.6 mOhm	1	\$0.16	 SRN6045 64 mm ²
6.	Rfbb	Yageo America	RT0805BRD0722K3L Series= RT0805	Res= 22.3 kOhm Power= 125.0 mW Tolerance= 0.1%	1	\$0.05	 0805 7 mm ²
7.	Rfbs	Vishay-Dale	CRCW0402100KFKED Series= CRCW...e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
8.	U1	Texas Instruments	TPS54202DDCR	Switcher	1	\$0.50	 DDC0006A_N 10 mm ²







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	748.527 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	174.642 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.302 A	Current	Peak switch current in IC
4.	Iin Avg	365.29 mA	Current	Average input current
5.	L Ipp	604.98 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	9	General	Total Design BOM count
7.	FootPrint	154.0 mm ²	General	Total Foot Print Area of BOM components
8.	Frequency	500.0 kHz	General	Switching frequency
9.	Pout	6.6 W	General	Total output power
10.	Total BOM	\$2.02	General	Total BOM Cost
11.	ICThetaJA Effective	80.0 degC/W	Op_Point	Effective IC Junction-to-Ambient Thermal Resistance

#	Name	Value	Category	Description
12.	Vout Actual	3.291 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
13.	Duty Cycle	16.654 %	Op_point	Duty cycle
14.	Efficiency	82.127 %	Op_point	Steady state efficiency
15.	IC Tj	125.999 degC	Op_point	IC junction temperature
16.	IOUT_OP	2.0 A	Op_point	Iout operating point
17.	VIN_OP	22.0 V	Op_point	Vin operating point
18.	Vout p-p	3.266 mV	Op_point	Peak-to-peak output ripple voltage
19.	Cin Pd	0.0 W	Power	Input capacitor power dissipation
20.	Cout Pd	33.504 μ W	Power	Output capacitor power dissipation
21.	IC Iq Pd	990.0 μ W	Power	IC Iq Pd
22.	IC Pd	1.2 W	Power	IC power dissipation
23.	L Pd	236.187 mW	Power	Inductor power dissipation
24.	Total Pd	1.436 W	Power	Total Power Dissipation
25.	Vout Tolerance	900.33 m%		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	TPS54202	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	Ambient temperature

Design Assistance

1. TPS54202 Product Folder : <http://www.ti.com/product/TPS54202> : contains the data sheet and other resources.

Texas Instruments' WEBENCH simulation tools attempt to recreate the performance of a substantially equivalent physical implementation of the design. Simulations are created using Texas Instruments' published specifications as well as the published specifications of other device manufacturers. While Texas Instruments does update this information periodically, this information may not be current at the time the simulation is built. Texas Instruments does not warrant the accuracy or completeness of the specifications or any information contained therein. Texas Instruments does not warrant that any designs or recommended parts will meet the specifications you entered, will be suitable for your application or fit for any particular purpose, or will operate as shown in the simulation in a physical implementation. Texas Instruments does not warrant that the designs are production worthy.

You should completely validate and test your design implementation to confirm the system functionality for your application prior to production.

Use of Texas Instruments' WEBENCH simulation tools is subject to [Texas Instruments' Site Terms and Conditions of Use](#). Prototype boards based on WEBENCH created designs are provided AS IS without warranty of any kind for evaluation and testing purposes and are subject to the terms of the [Evaluation License Agreement](#).