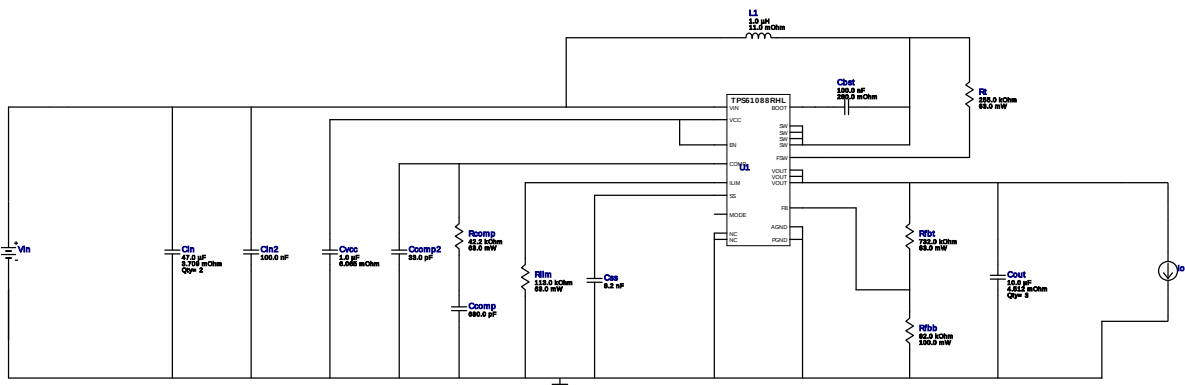


WEBENCH® Design Report

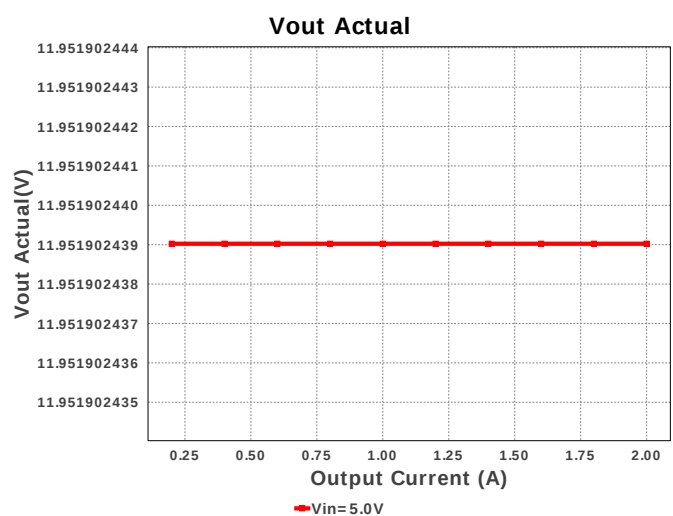
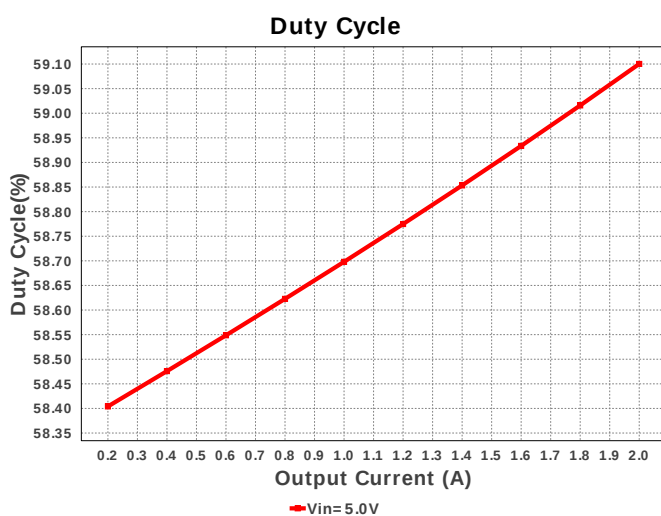
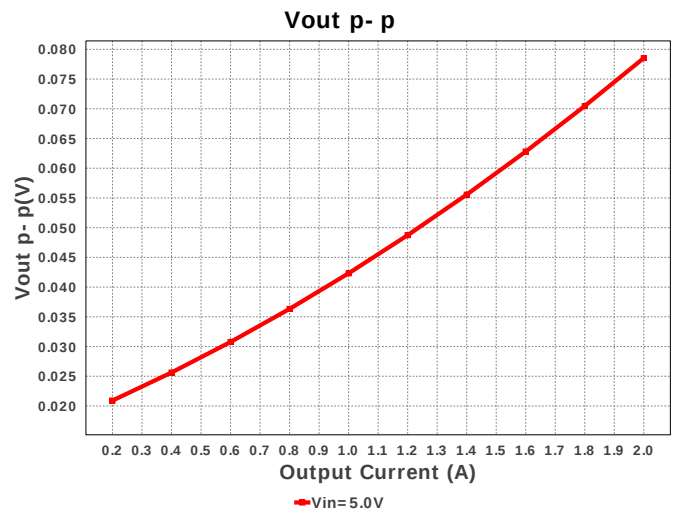
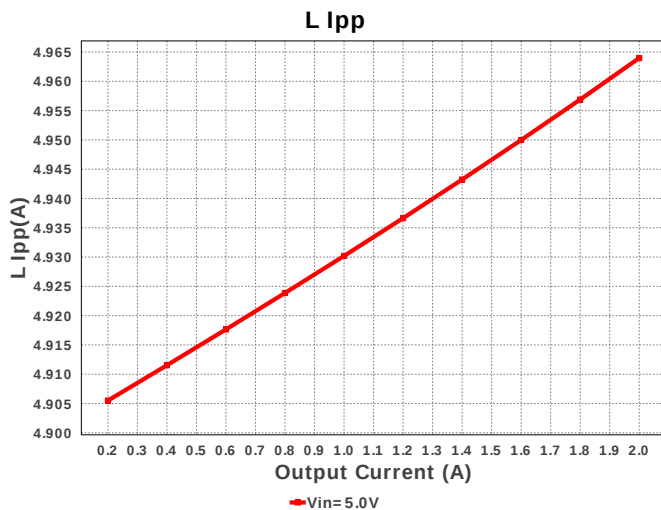
Design : 4077713/21 TPS61088RHLR
TPS61088RHLR 5.0V-5.0V to 12.00V @ 2.0A

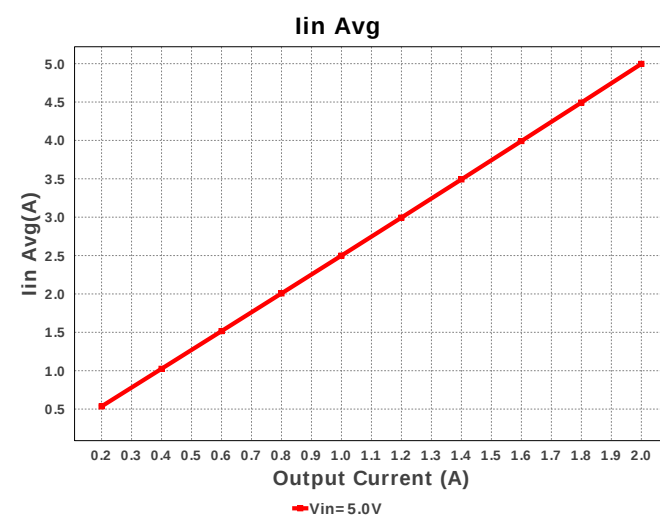
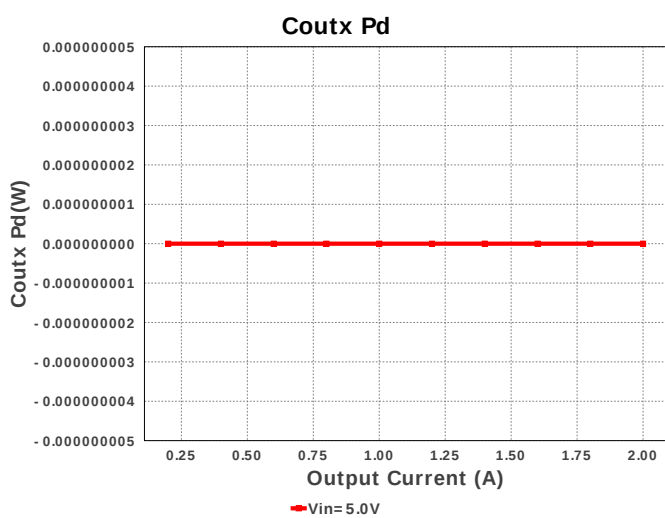
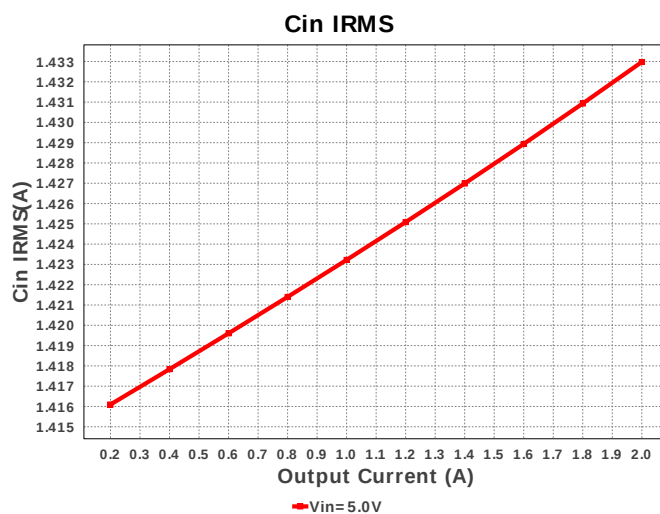
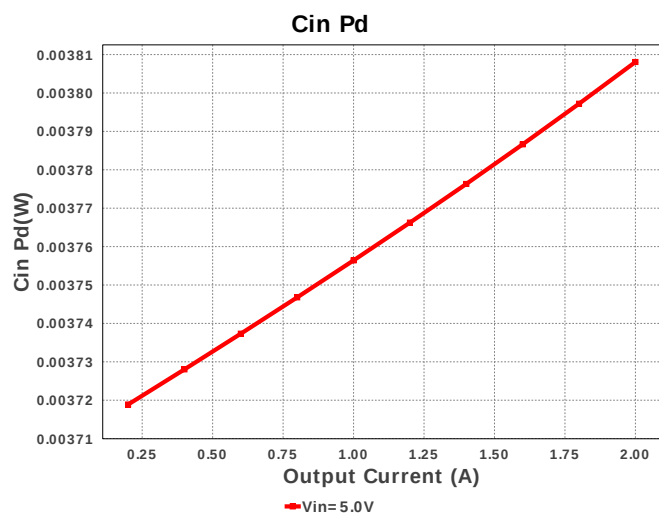
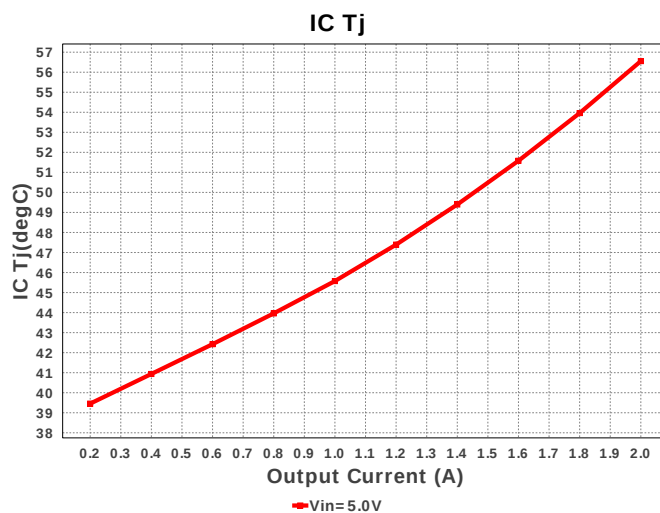
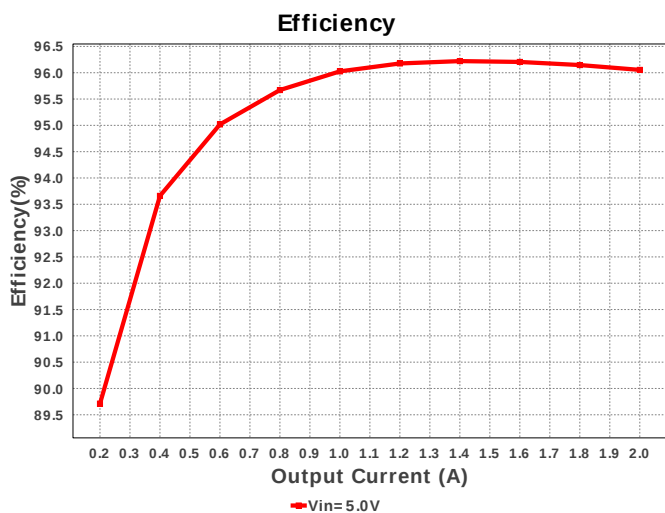


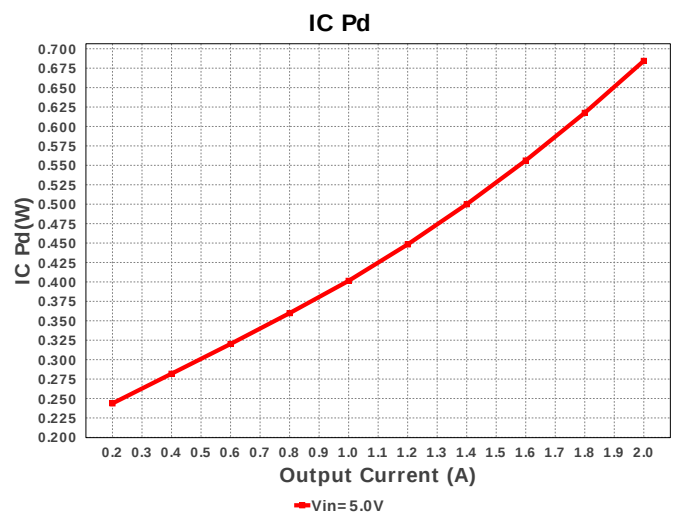
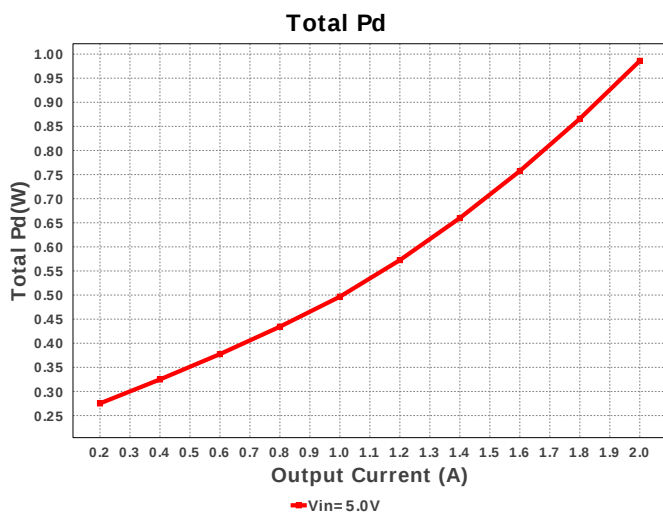
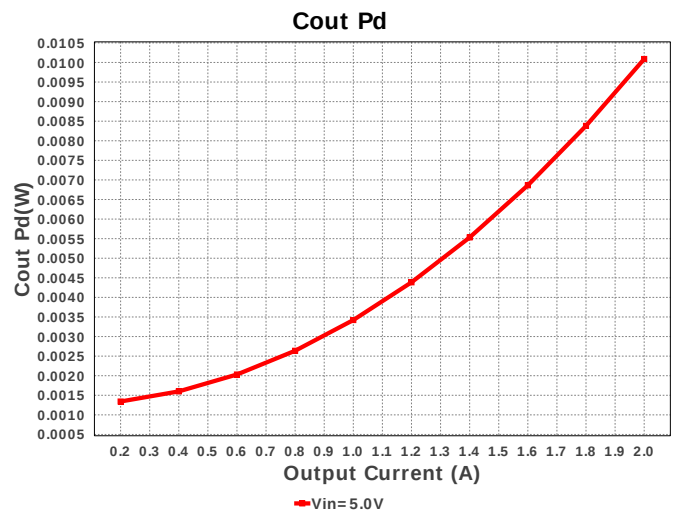
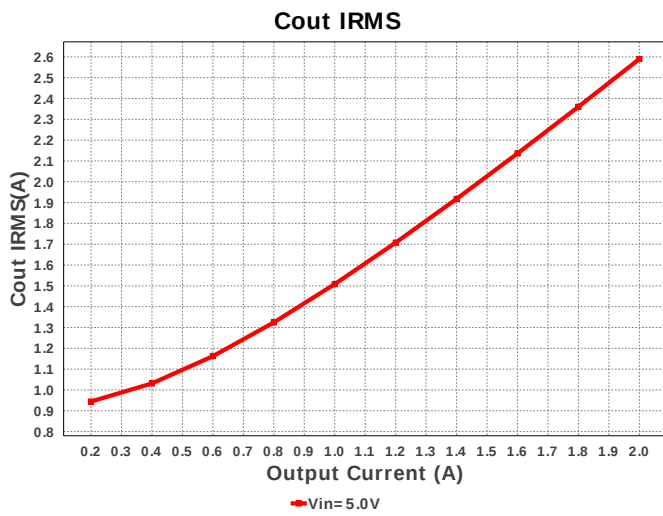
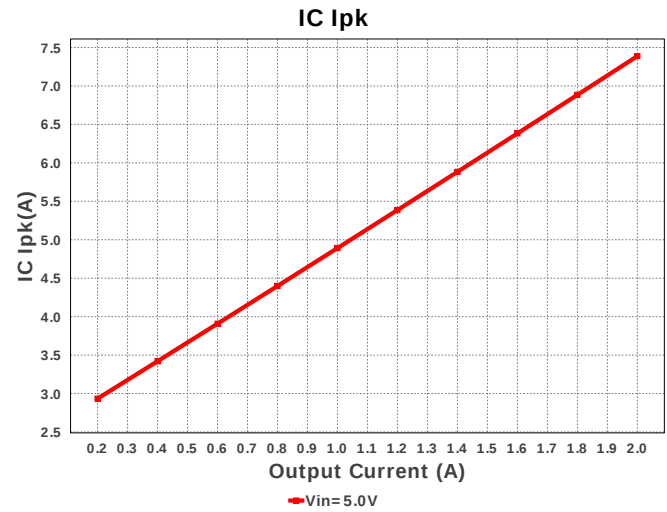
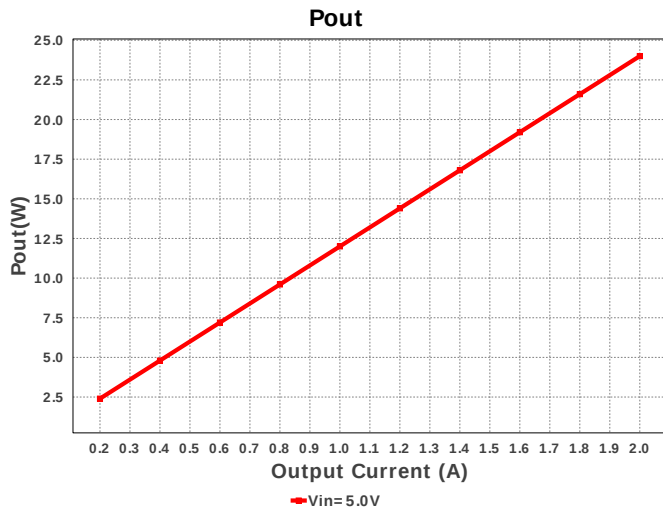
Electrical BOM

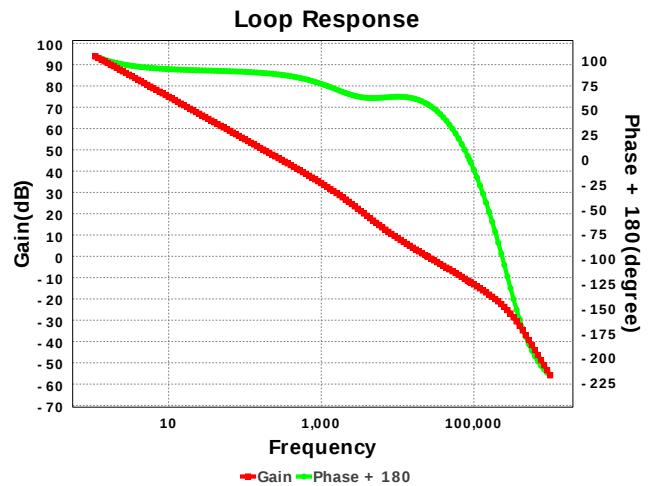
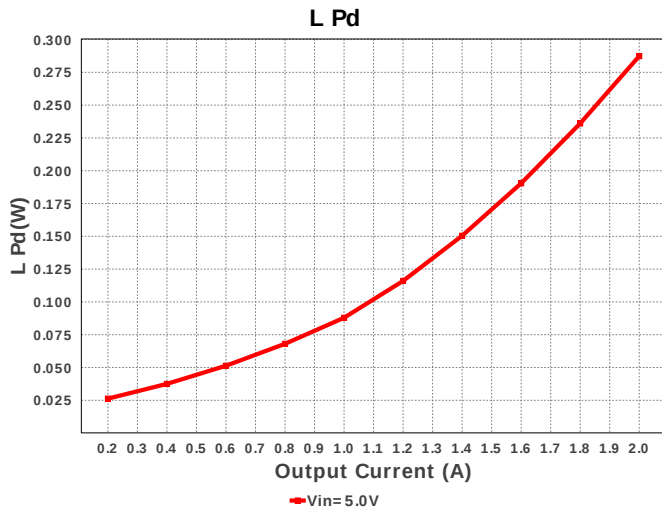
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
2.	Ccomp	MuRata	GRM033R71C681KA01D Series= X7R	Cap= 680.0 pF VDC= 16.0 V IRMS= 0.0 A	1	\$0.01	0201 2 mm ²
3.	Ccomp2	Kemet	C0201C330J3GACTU Series= C0G/NP0	Cap= 33.0 pF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0201 2 mm ²
4.	Cin	MuRata	GRM31CR61A476KE15L Series= X5R	Cap= 47.0 uF ESR= 3.709 mOhm VDC= 10.0 V IRMS= 4.2862 A	2	\$0.15	1206_190 11 mm ²
5.	Cin2	MuRata	GRM155R61A104KA01D Series= X5R	Cap= 100.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
6.	Cout	MuRata	GRM31CR61E106KA12L Series= X5R	Cap= 10.0 uF ESR= 4.512 mOhm VDC= 25.0 V IRMS= 2.447 A	3	\$0.05	1206_190 11 mm ²
7.	Css	MuRata	GRM155R71C822KA01D Series= X7R	Cap= 8.2 nF VDC= 16.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
8.	Cvcc	MuRata	GRM188R61A105KA61D Series= X5R	Cap= 1.0 uF ESR= 6.065 mOhm VDC= 10.0 V IRMS= 1.30675 A	1	\$0.01	0603 5 mm ²
9.	L1	TDK	VLP8040T-1R0N	L= 1.0 uH DCR= 11.0 mOhm	1	\$0.22	VLP8040 113 mm ²
10.	Rcomp	Vishay-Dale	CRCW040242K2FKED Series= CRCW..e3	Res= 42.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
11.	Rfbb	Yageo America	RC0603FR-0782KL Series= ?	Res= 82.0 kOhm Power= 100.0 mW Tolerance= 1.0%	1	\$0.01	0603 5 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
12.	Rfbt	Vishay-Dale	CRCW0402732KFKED Series= CRCW..e3	Res= 732.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
13.	Rlim	Vishay-Dale	CRCW0402113KFKED Series= CRCW..e3	Res= 113.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
14.	Rt	Vishay-Dale	CRCW0402255KFKED Series= CRCW..e3	Res= 255.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
15.	U1	Texas Instruments	TPS61088RHLR	Switcher	1	\$2.30	 RHL0020A 25 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	1.433 A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	2.59 A	Current	Output capacitor RMS ripple current
3.	IC IpK	7.388 A	Current	Peak switch current in IC
4.	Iin Avg	4.997 A	Current	Average input current
5.	L Ipp	4.964 A	Current	Peak-to-peak inductor ripple current
6.	BOM Count	18	General	Total Design BOM count
7.	FootPrint	231.0 mm ²	General	Total Foot Print Area of BOM components
8.	Frequency	595.291 kHz	General	Switching frequency
9.	Pout	24.0 W	General	Total output power
10.	Total BOM	\$3.08	General	Total BOM Cost
11.	Low Freq Gain	93.849 dB	Op_Point	Gain at 10Hz
12.	Vout Actual	11.952 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
13.	Cross Freq	24.508 kHz	Op_point	Bode plot crossover frequency
14.	Duty Cycle	59.1 %	Op_point	Duty cycle
15.	Efficiency	96.054 %	Op_point	Steady state efficiency
16.	Gain Marg	-11.915 dB	Op_point	Bode Plot Gain Margin
17.	IC Tj	56.555 degC	Op_point	IC junction temperature
18.	ICThetaJA	38.8 degC/W	Op_point	IC junction-to-ambient thermal resistance
19.	IOUT_OP	2.0 A	Op_point	Iout operating point
20.	Phase Marg	56.266 deg	Op_point	Bode Plot Phase Margin
21.	VIN_OP	5.0 V	Op_point	Vin operating point
22.	Vout p-p	78.539 mV	Op_point	Peak-to-peak output ripple voltage
23.	Cin Pd	3.808 mW	Power	Input capacitor power dissipation
24.	Cout Pd	10.089 mW	Power	Output capacitor power dissipation
25.	Coutx Pd	0.0 W	Power	Output capacitor_x power loss
26.	IC Pd	684.405 mW	Power	IC power dissipation
27.	L Pd	287.375 mW	Power	Inductor power dissipation
28.	Total Pd	985.948 mW	Power	Total Power Dissipation
29.	Vout Tolerance	4.481 %		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	5.0	Maximum input voltage
3.	VinMin	5.0	Minimum input voltage
4.	Vout	12.0	Output Voltage
5.	base_pn	TPS61088	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS61088** Product Folder : <http://www.ti.com/product/TPS61088> : 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](#).