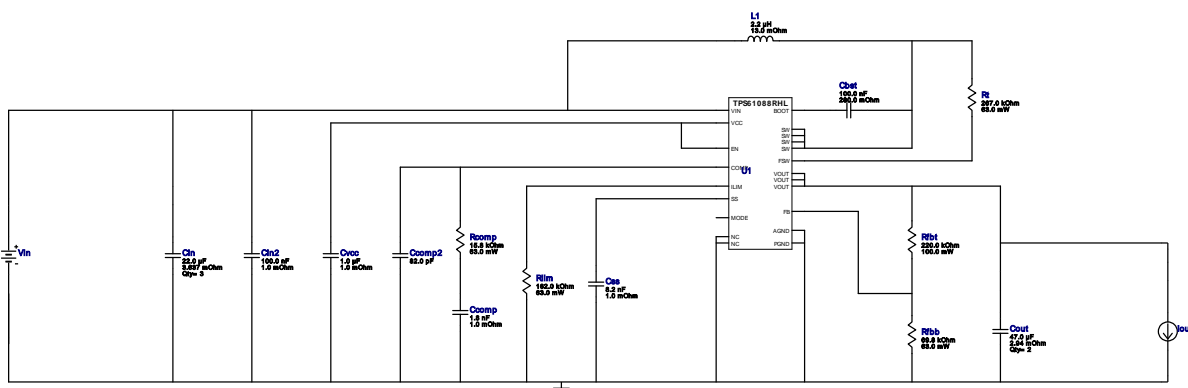













## WEBENCH® Design Report

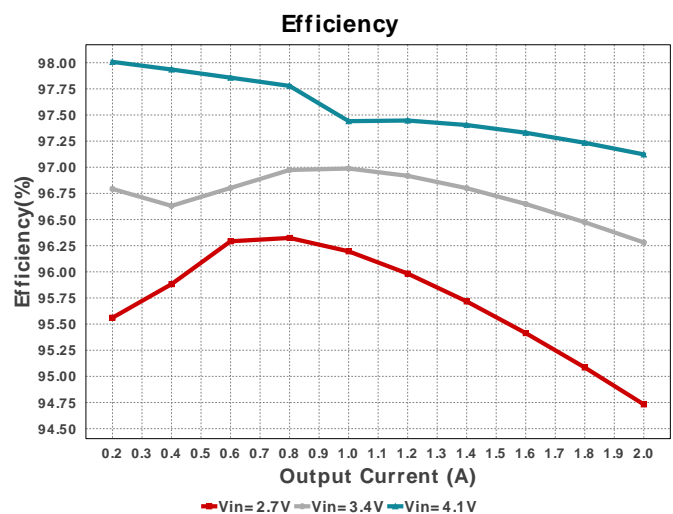
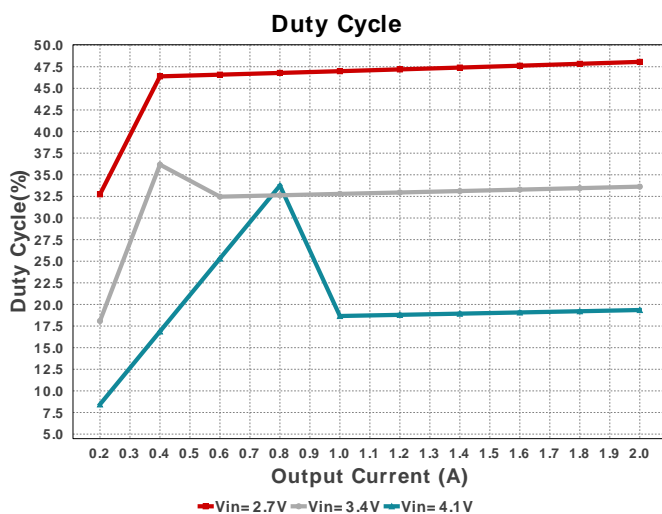
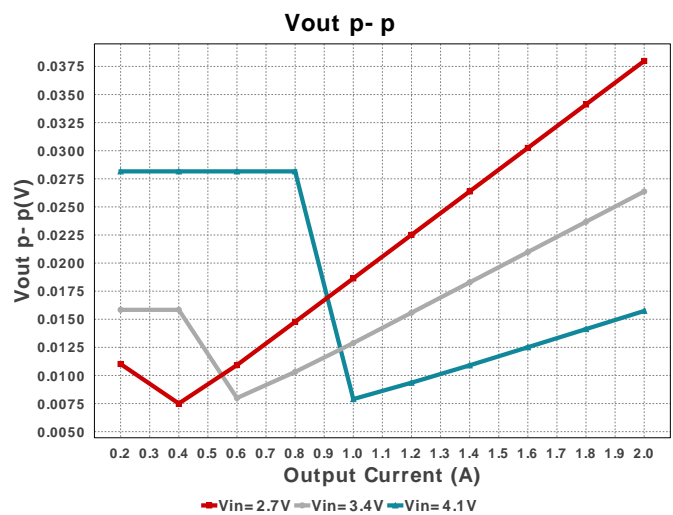
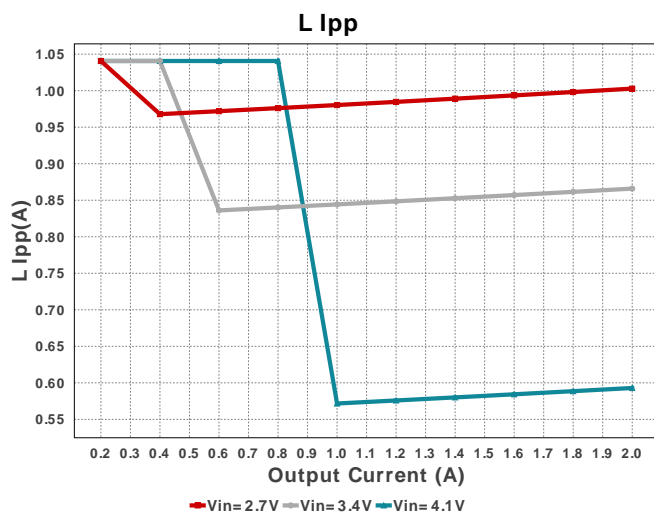
Design : 5175827/4 TPS61088RHLR  
TPS61088RHLR 2.7V-4.1V to 5.00V @ 2.0A

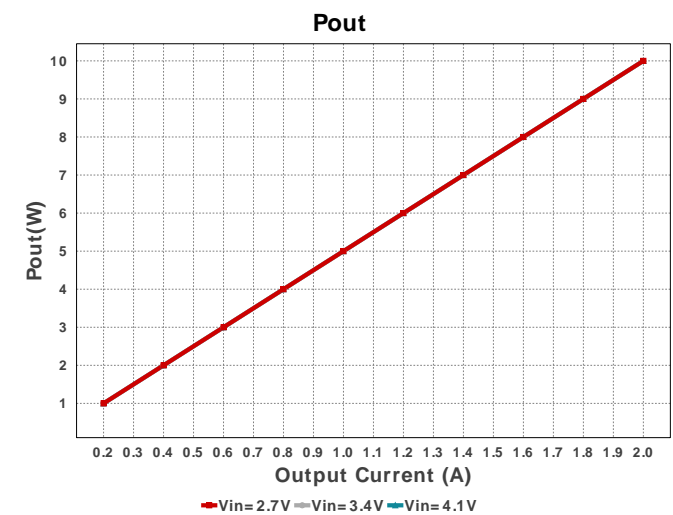
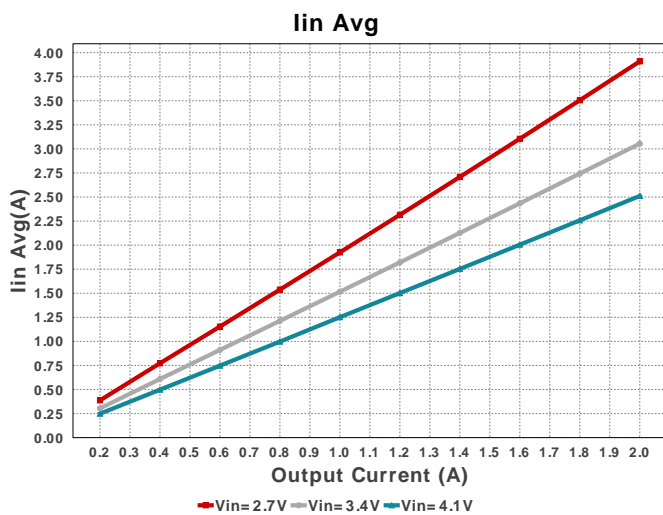
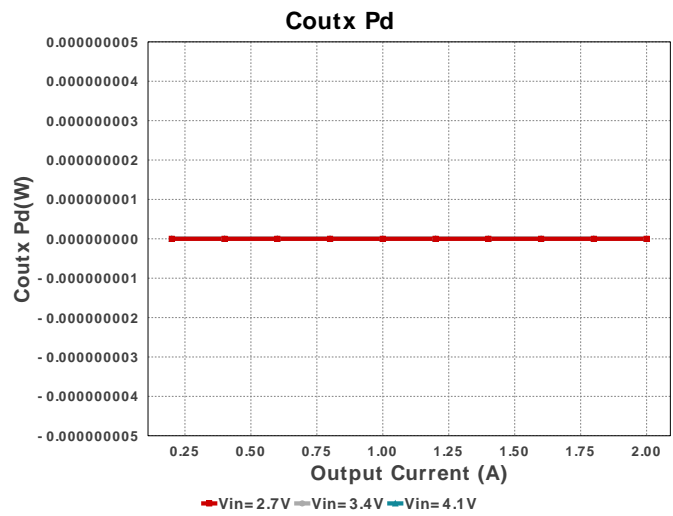
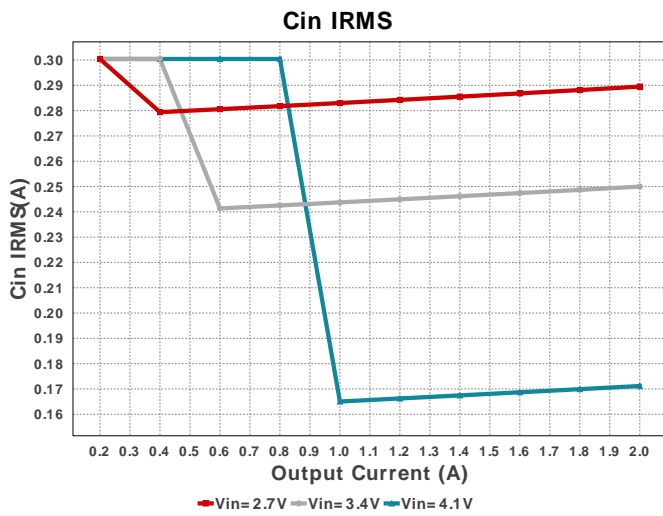
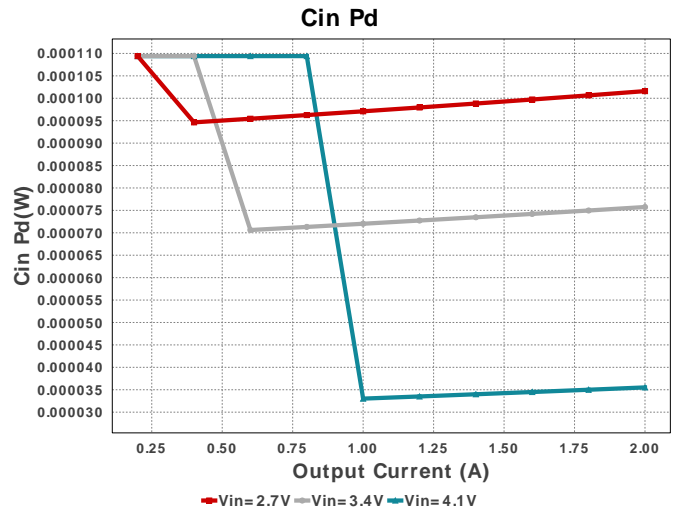
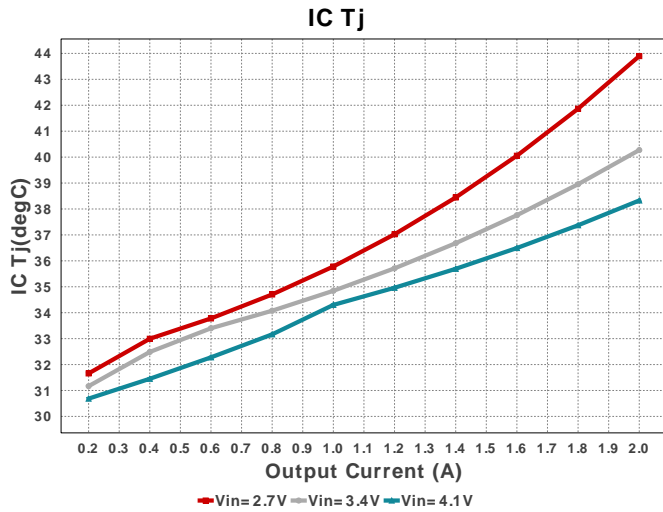


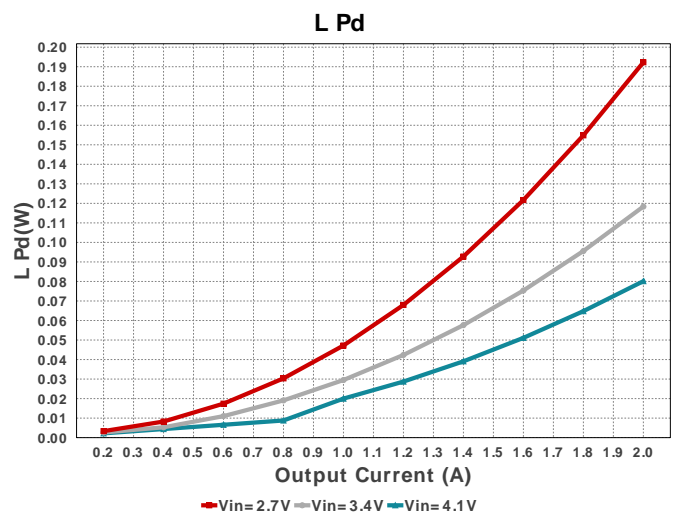
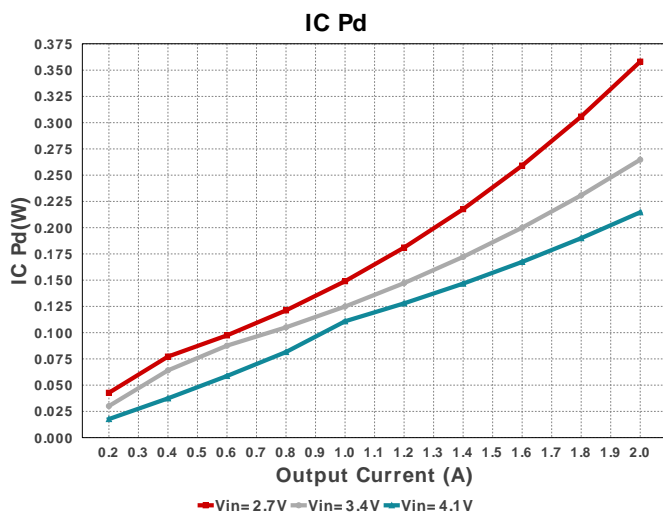
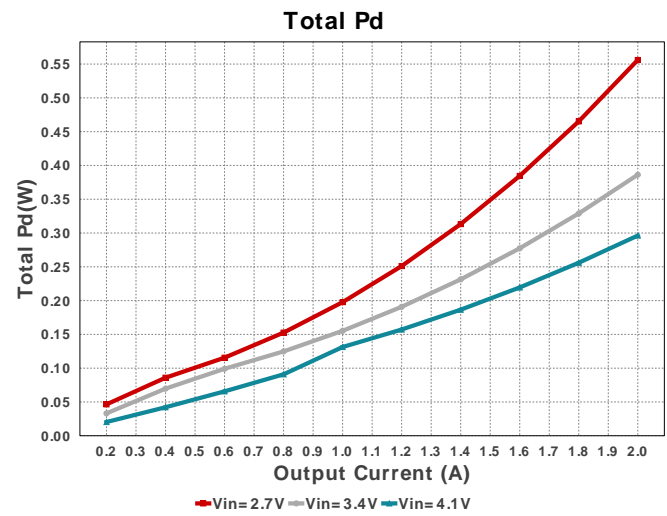
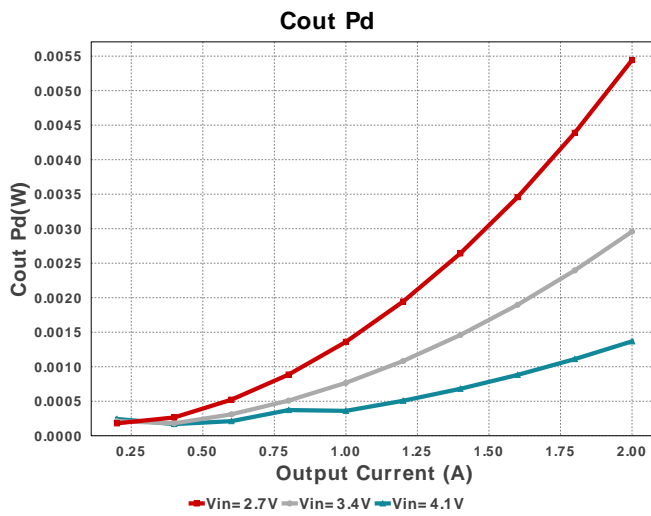
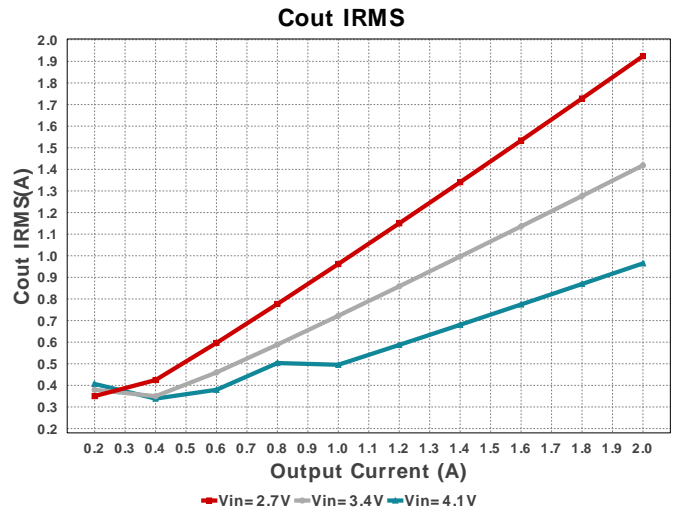
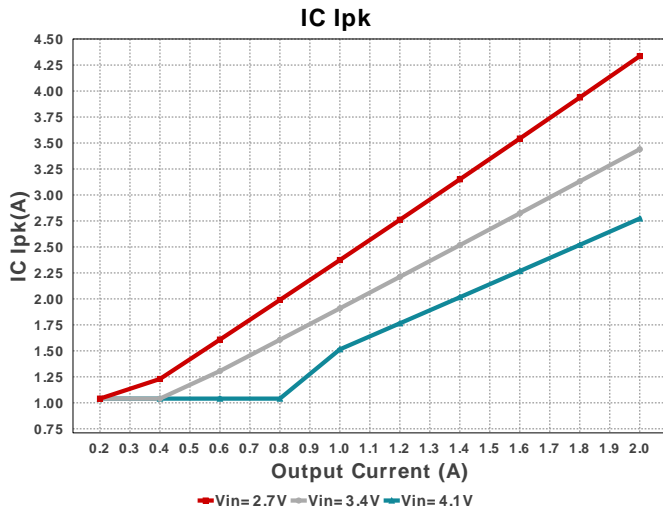
## Electrical BOM

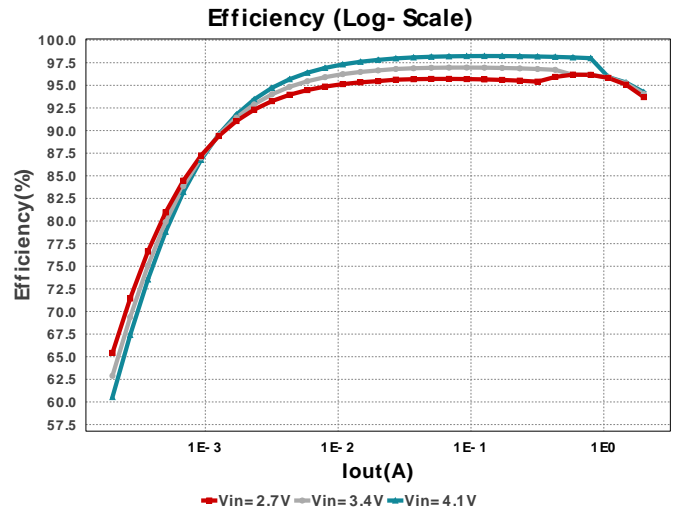
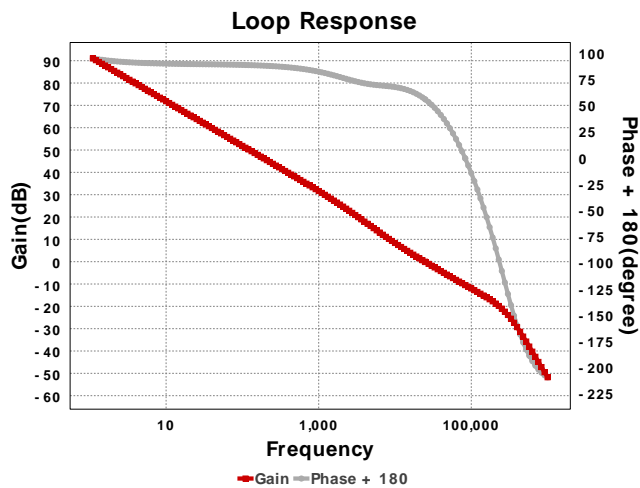
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm²
2.	Ccomp	MuRata	GRM033R71C182KA88D Series= X7R	Cap= 1.8 nF ESR= 1.0 mOhm VDC= 16.0 V IRMS= 0.0 A	1	\$0.01	 0201 2 mm²
3.	Ccomp2	Yageo America	CC0201JRNPO8BN820 Series= C0G/NP0	Cap= 82.0 pF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0201 2 mm²
4.	Cin	MuRata	GRM31CR61A226KE19L Series= X5R	Cap= 22.0 uF ESR= 3.637 mOhm VDC= 10.0 V IRMS= 3.56456 A	3	\$0.08	 1206_190 11 mm²
5.	Cin2	MuRata	GRM155R60J104KA01D Series= X5R	Cap= 100.0 nF ESR= 1.0 mOhm VDC= 6.3 V IRMS= 0.0 A	1	\$0.01	 0402 3 mm²
6.	Cout	TDK	C2012X5R1A476M125AC Series= X5R	Cap= 47.0 uF ESR= 2.94 mOhm VDC= 10.0 V IRMS= 3.80451 A	2	\$0.29	 0805 7 mm²
7.	Css	MuRata	GRM155R71C822KA01D Series= X7R	Cap= 8.2 nF ESR= 1.0 mOhm VDC= 16.0 V IRMS= 0.0 A	1	\$0.01	 0402 3 mm²
8.	Cvcc	Kemet	C0603C105Z8VACTU Series= Y5V	Cap= 1.0 uF ESR= 1.0 mOhm VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	 0603 5 mm²
9.	L1	Bourns	SRN8040-2R2Y	L= 2.2 uH DCR= 13.0 mOhm	1	\$0.24	 SRN8040 100 mm²
10.	Rcomp	Vishay-Dale	CRCW040215K8FKED Series= CRCW..e3	Res= 15.8 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
11.	Rfbb	Vishay-Dale	CRCW040269K8FKED Series= CRCW..e3	Res= 69.8 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>
12.	Rfbt	Yageo America	RC0603FR-07220KL Series= ?	Res= 220.0 kOhm Power= 100.0 mW Tolerance= 1.0%	1	\$0.01	 0603 5 mm <sup>2</sup>
13.	Rlim	Vishay-Dale	CRCW0402162KFKED Series= CRCW..e3	Res= 162.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>
14.	Rt	Vishay-Dale	CRCW0402267KFKED Series= CRCW..e3	Res= 267.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm <sup>2</sup>
15.	U1	Texas Instruments	TPS61088RHLR	Switcher	1	\$1.60	 RHL0020A 25 mm <sup>2</sup>









## Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	289.487 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	1.924 A	Current	Output capacitor RMS ripple current
3.	IC Ipk	4.336 A	Current	Peak switch current in IC
4.	Iin Avg	3.91 A	Current	Average input current
5.	L Ipp	1.003 A	Current	Peak-to-peak inductor ripple current
6.	BOM Count	18	General	Total Design BOM count
7.	FootPrint	209.0 mm <sup>2</sup>	General	Total Foot Print Area of BOM components
8.	Frequency	588.213 kHz	General	Switching frequency
9.	Mode	BOOST CCM	General	PWM/PFM Mode
10.	Pout	10.0 W	General	Total output power
11.	Total BOM	\$2.77	General	Total BOM Cost
12.	Low Freq Gain	90.212 dB	Op_Point	Gain at 1Hz
13.	Vout Actual	4.999 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
14.	Cross Freq	24.529 kHz	Op_point	Bode plot crossover frequency
15.	Duty Cycle	48.063 %	Op_point	Duty cycle
16.	Efficiency	94.732 %	Op_point	Steady state efficiency
17.	Gain Marg	-10.337 dB	Op_point	Bode Plot Gain Margin
18.	IC Tj	43.896 degC	Op_point	IC junction temperature
19.	ICThetaJA	38.8 degC/W	Op_point	IC junction-to-ambient thermal resistance
20.	IOUT_OP	2.0 A	Op_point	Iout operating point
21.	Phase Marg	57.042 deg	Op_point	Bode Plot Phase Margin
22.	VIN_OP	2.7 V	Op_point	Vin operating point
23.	Vout p-p	37.985 mV	Op_point	Peak-to-peak output ripple voltage
24.	Cin Pd	101.597 μW	Power	Input capacitor power dissipation
25.	Cout Pd	5.443 mW	Power	Output capacitor power dissipation
26.	Coutx Pd	0.0 W	Power	Output capacitor_x power loss
27.	IC Pd	358.149 mW	Power	IC power dissipation
28.	L Pd	192.261 mW	Power	Inductor power dissipation
29.	Total Pd	556.086 mW	Power	Total Power Dissipation
30.	Vout Tolerance	4.19 %		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	4.1	Maximum input voltage
3.	VinMin	2.7	Minimum input voltage
4.	Vout	5.0	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.

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