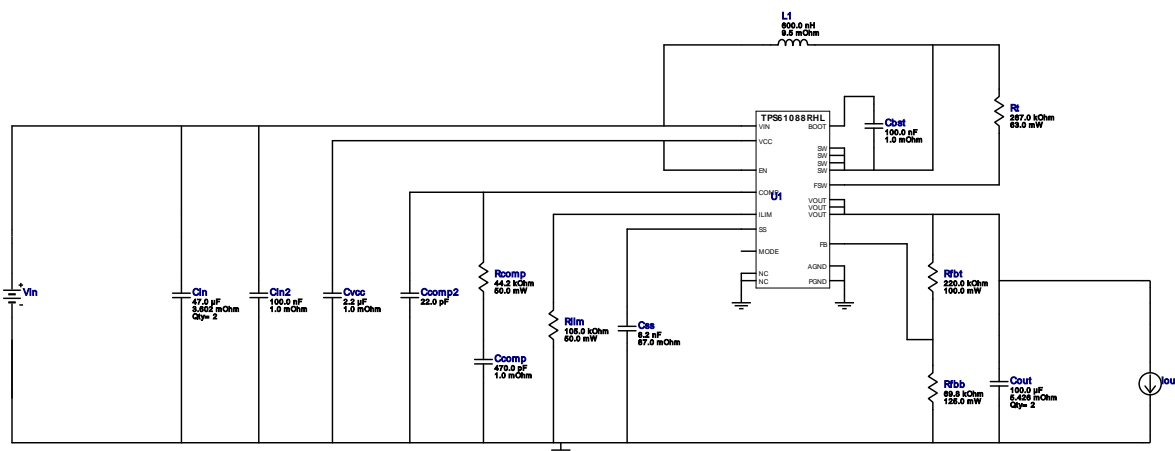


WEBENCH® Design Report

Design : TPS61088RHLL
TPS61088RHLL 2.8V-4.2V to 5.00V @ 4.0A



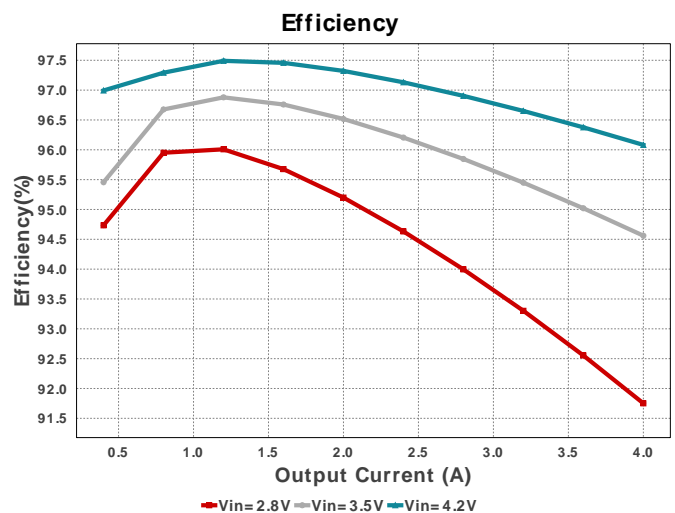
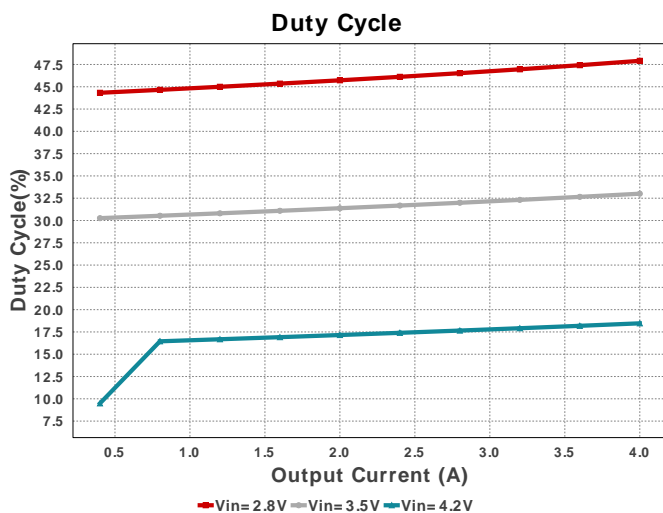
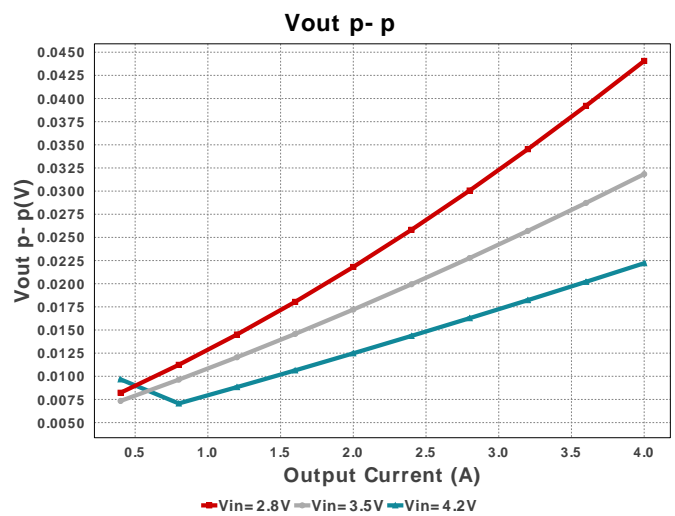
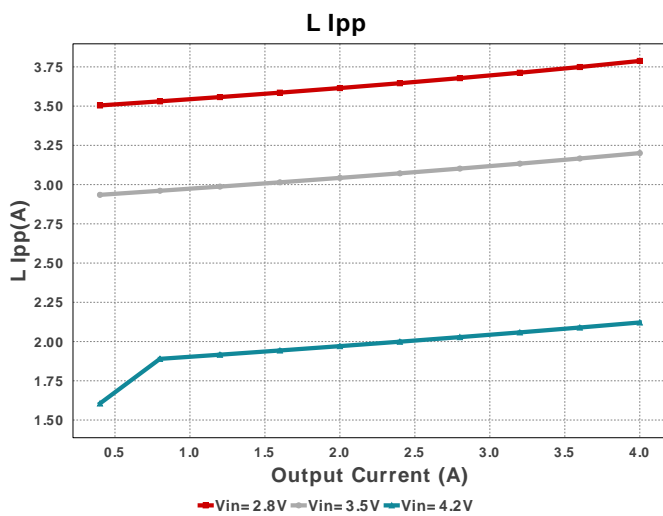
My Comments

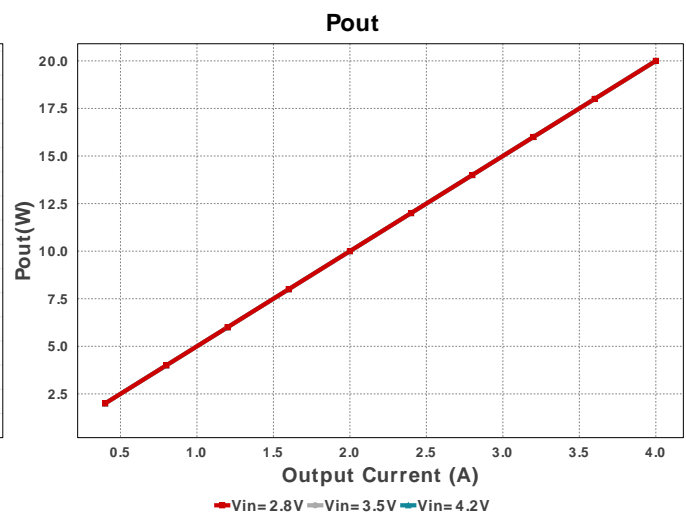
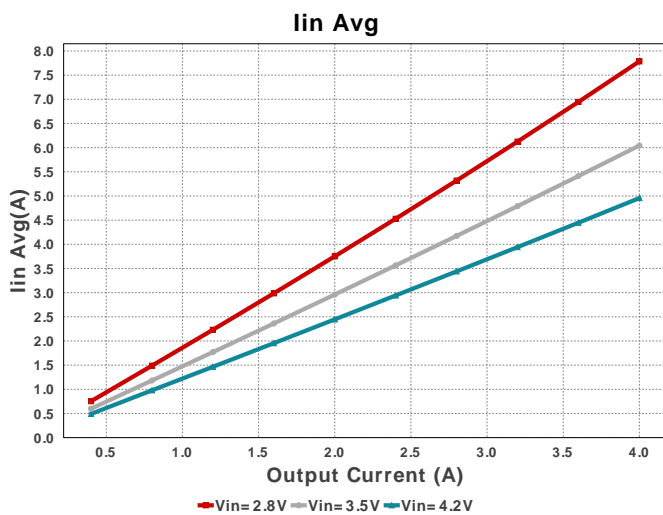
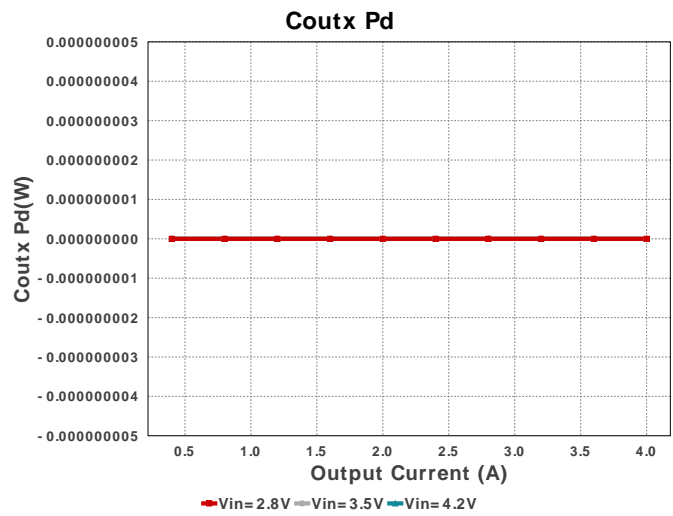
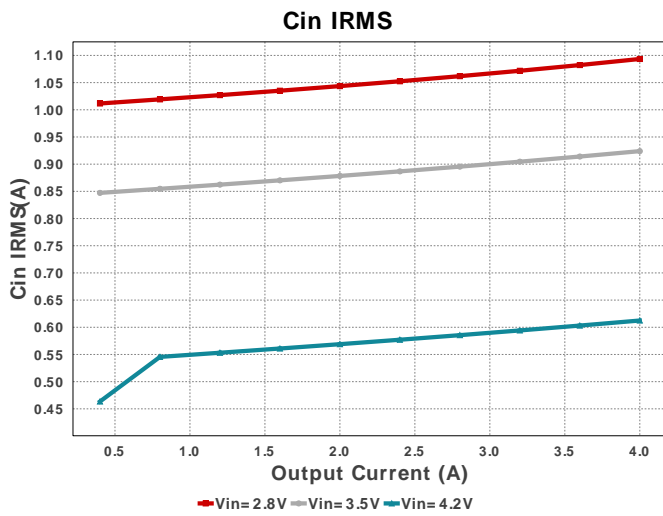
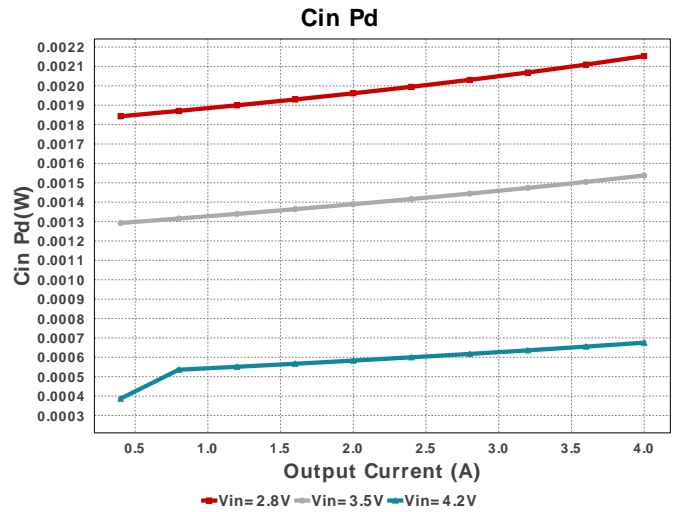
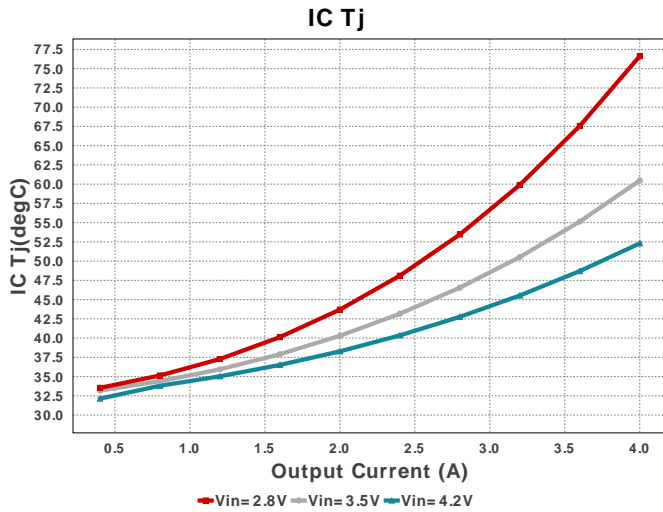
No comments

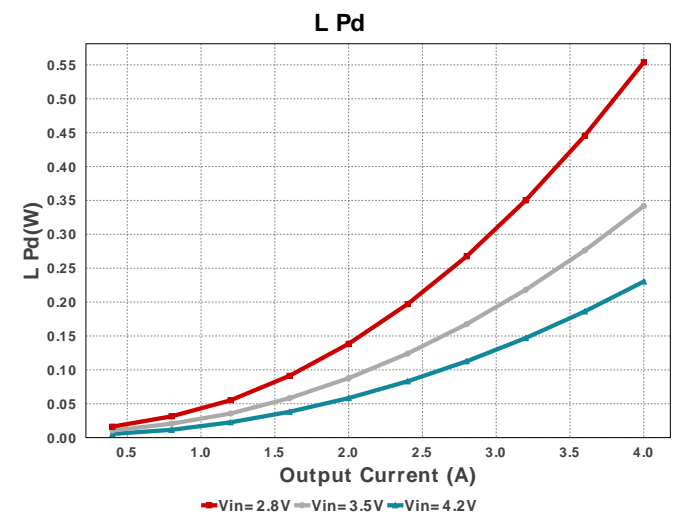
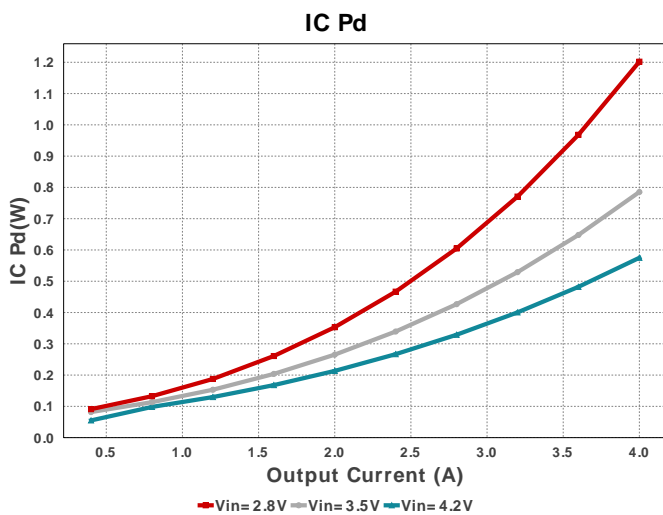
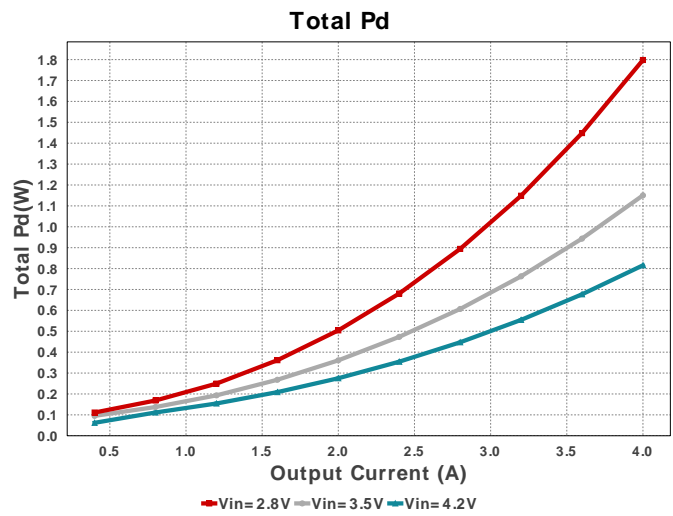
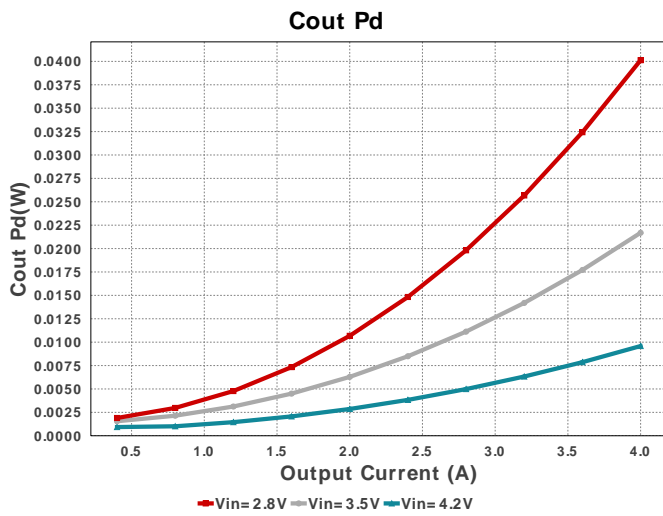
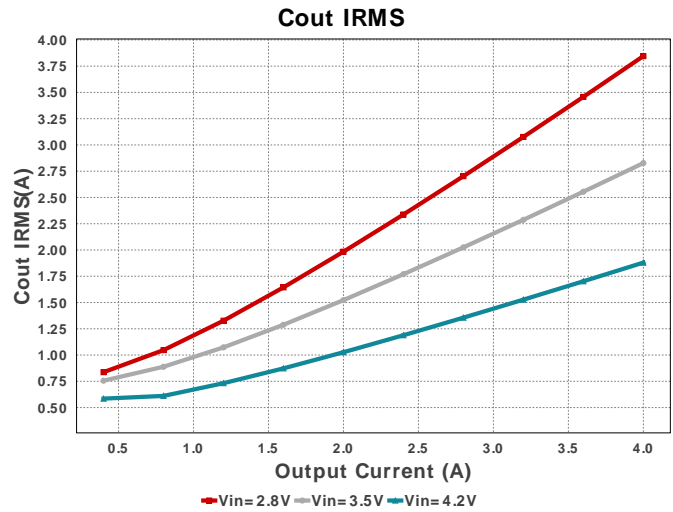
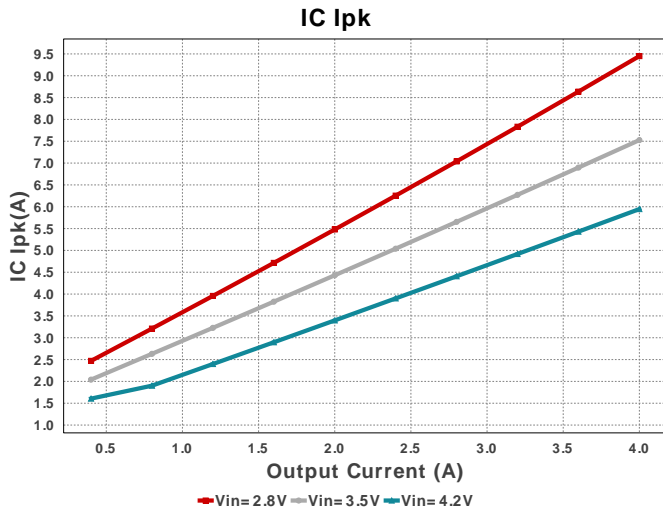
Electrical BOM

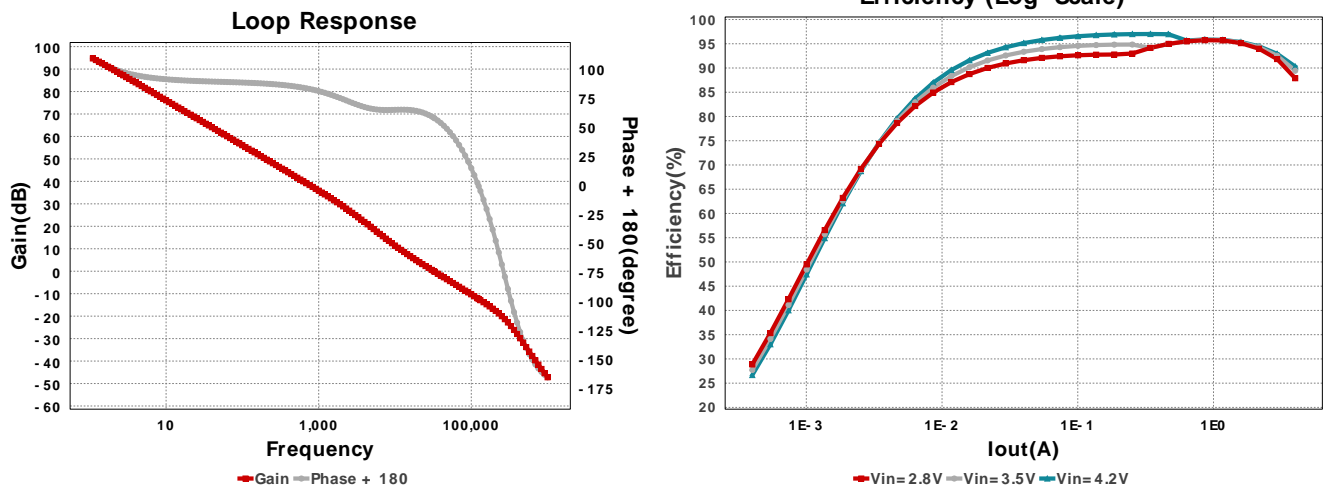
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	MuRata	GRM155R61C104KA88D Series= X5R	Cap= 100.0 nF ESR= 1.0 mOhm VDC= 16.0 V IRMS= 0.0 A	1	\$0.01 0603	 0402 3 mm ²
2.	Ccomp	MuRata	GRM033R71C471KA01D Series= X7R	Cap= 470.0 pF ESR= 1.0 mOhm VDC= 16.0 V IRMS= 0.0 A	1	\$0.01 0603	 0201 2 mm ²
3.	Ccomp2	Kemet	C0805C220K3GACTU Series= C0G/NP0	Cap= 22.0 pF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01 0805	 0805 7 mm ²
4.	Cin	TDK	C3225X5R1A476M250AC Series= X5R	Cap= 47.0 uF ESR= 3.602 mOhm VDC= 10.0 V IRMS= 3.8741 A	2	\$0.35 1210	 1210_280 15 mm ²
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 0603	 0402 3 mm ²
6.	Cout	TDK	C4532X5R1A107M280KC Series= X5R	Cap= 100.0 uF ESR= 5.426 mOhm VDC= 10.0 V IRMS= 3.2928 A	2	\$0.96 1210	 1812_320 23 mm ²
7.	Css	AVX	08055C822KAT2A Series= X7R	Cap= 8.2 nF ESR= 87.0 mOhm VDC= 50.0 V IRMS= 0.0 A	1	\$0.03 0805	 0805 7 mm ²
8.	Cvcc	Kemet	C0603C225K8PACTU Series= X5R	Cap= 2.2 uF ESR= 1.0 mOhm VDC= 10.0 V IRMS= 0.0 A	1	\$0.04 0805	 0603 5 mm ²
9.	L1	Coilcraft	XAL4020-601MEB MPC0750LR60C	L= 600.0 nH DCR= 9.5 mOhm	1	\$0.60 2-SMD	 XAL4020 28 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	Rcomp	Yageo	RC0201FR-0744K2L Series= ?	Res= 44.2 kOhm Power= 50.0 mW Tolerance= 1.0%	1	\$0.01 0805	0201 2 mm ²
11.	Rfbb	Panasonic	ERJ-6ENF6982V Series= ERJ-6E	Res= 69.8 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	0805 7 mm ²
12.	Rfbt	Susumu Co Ltd	RR1220P-224-D Series= RR12	Res= 220.0 kOhm Power= 100.0 mW Tolerance= 0.5%	1	\$0.01	0805 7 mm ²
13.	Rlim	Yageo	RC0201FR-07105KL Series= ?	Res= 105.0 kOhm Power= 50.0 mW Tolerance= 1.0%	1	\$0.01 0603	0201 2 mm ²
14.	Rt	Vishay-Dale	CRCW0402267KFKED Series= CRCW..e3	Res= 267.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01 0603	0402 3 mm ²
15.	U1	Texas Instruments	TPS61088RHRLR	Switcher	1	\$1.60	RHL0020A 25 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	1.093 A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	3.846 A	Current	Output capacitor RMS ripple current
3.	IC lpk	9.45 A	Current	Peak switch current in IC
4.	Iin Avg	7.785 A	Current	Average input current
5.	L lpp	3.788 A	Current	Peak-to-peak inductor ripple current
6.	BOM Count	17	General	Total Design BOM count
7.	FootPrint	175.0 mm ²	General	Total Foot Print Area of BOM components
8.	Frequency	590.257 kHz	General	Switching frequency
9.	Mode	BOOST CCM	General	PWM/PFM Mode
10.	Pout	20.0 W	General	Total output power
11.	Total BOM	\$4.98	General	Total BOM Cost
12.	Cross Freq	31.732 kHz	Op Point	Bode plot crossover frequency
13.	Duty Cycle	47.909 %	Op Point	Duty cycle
14.	Efficiency	91.751 %	Op Point	Steady state efficiency
15.	Gain Marg	-12.215 dB	Op Point	Bode Plot Gain Margin
16.	IC Tj	76.635 degC	Op Point	IC junction temperature
17.	ICThetaJA	38.8 degC/W	Op Point	IC junction-to-ambient thermal resistance
18.	IOUT_OP	4.0 A	Op Point	Iout operating point
19.	Low Freq Gain	94.811 dB	Op Point	Gain at 1Hz
20.	Phase Marg	58.468 deg	Op Point	Bode Plot Phase Margin
21.	VIN_OP	2.8 V	Op Point	Vin operating point
22.	Vout Actual	4.999 V	Op Point	Vout Actual calculated based on selected voltage divider resistors
23.	Vout Tolerance	3.797 %	Op Point	Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable
24.	Vout p-p	44.058 mV	Op Point	Peak-to-peak output ripple voltage
25.	Cin Pd	2.153 mW	Power	Input capacitor power dissipation
26.	Cout Pd	40.127 mW	Power	Output capacitor power dissipation
27.	Coutx Pd	0.0 W	Power	Output capacitor_x power loss
28.	IC Pd	1.202 W	Power	IC power dissipation
29.	L Pd	553.765 mW	Power	Inductor power dissipation
30.	Total Pd	1.798 W	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	4.0	Maximum Output Current
2.	VinMax	4.2	Maximum input voltage
3.	VinMin	2.8	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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