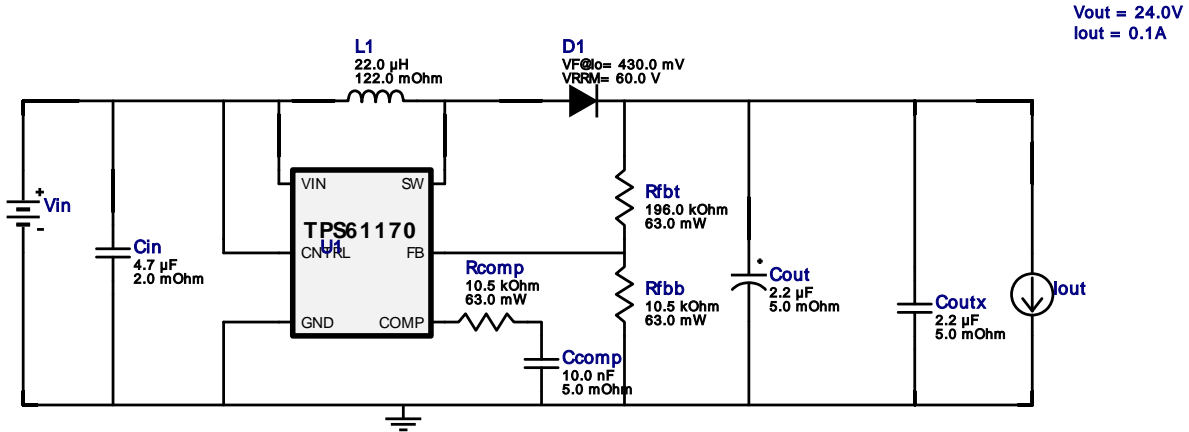




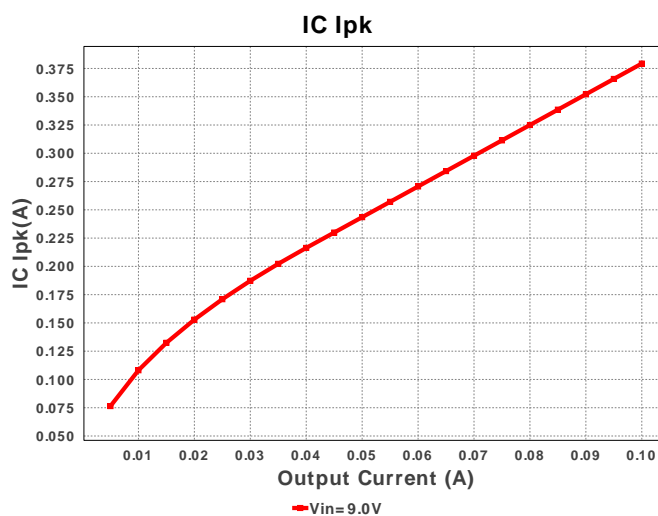
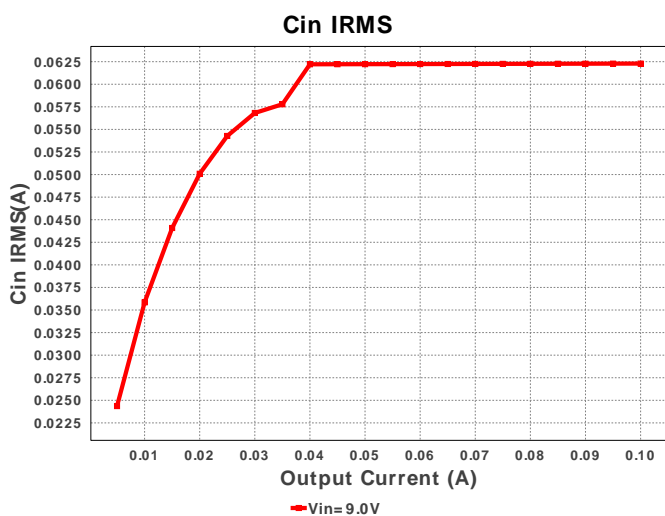
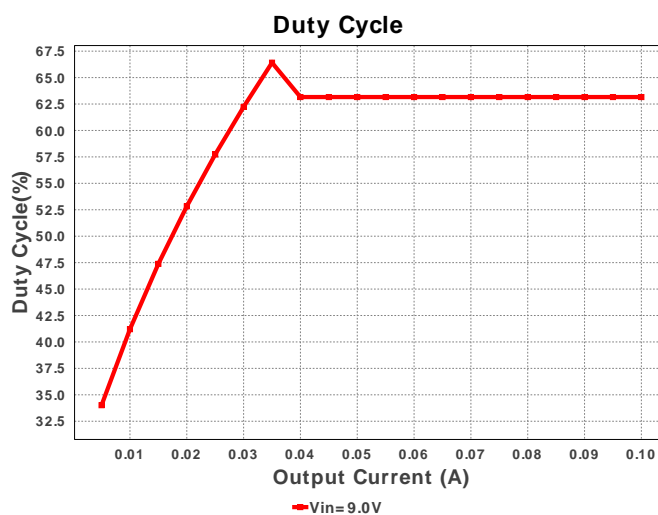
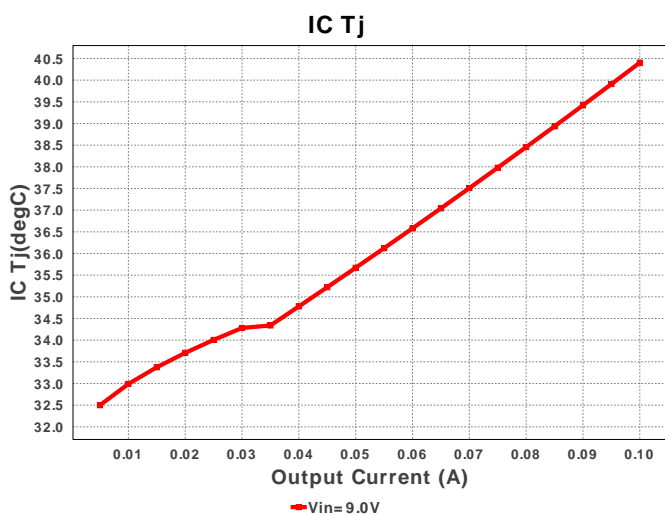
WEBENCH® Design Report

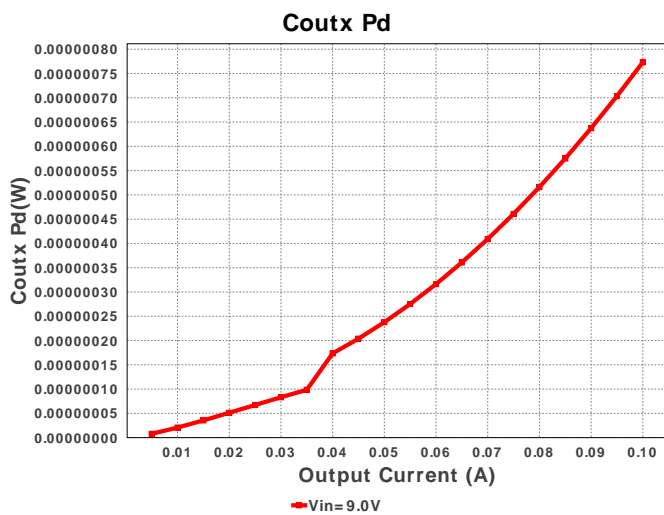
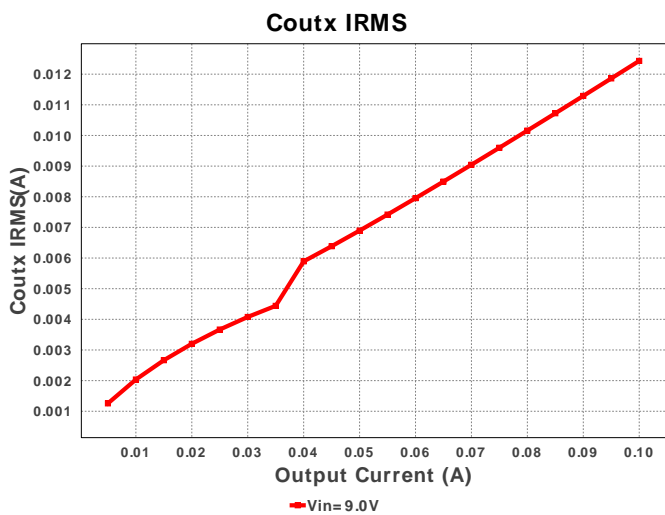
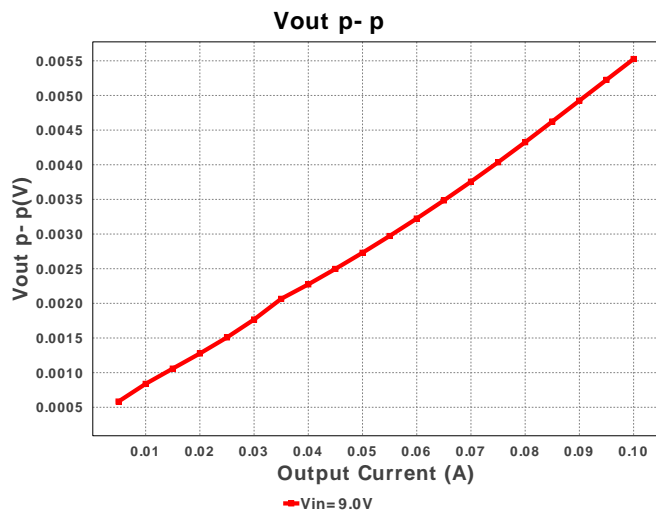
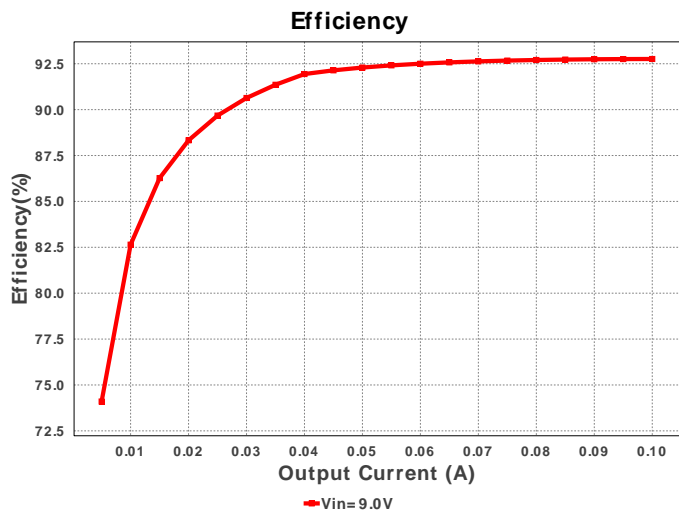
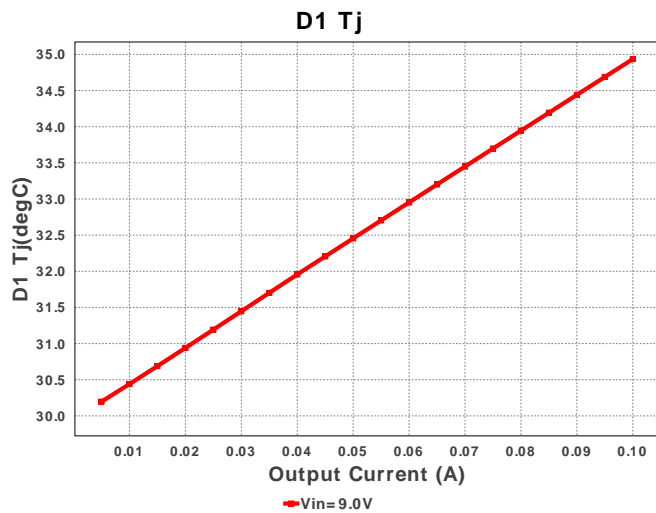
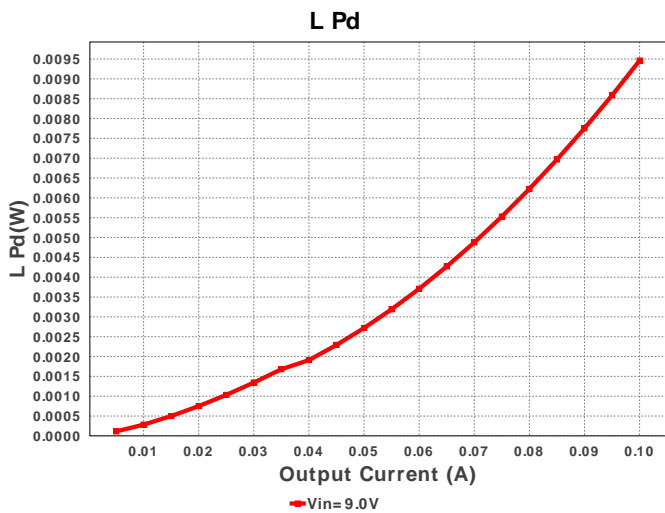
 Design : 4748671/283 TPS61170DRV
 TPS61170DRV 9.0V-9.0V to 24.00V @ 0.1A

My Comments
 No comments

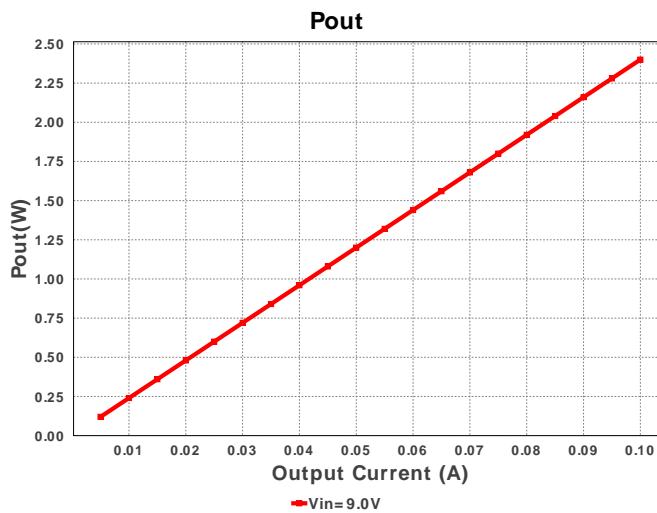
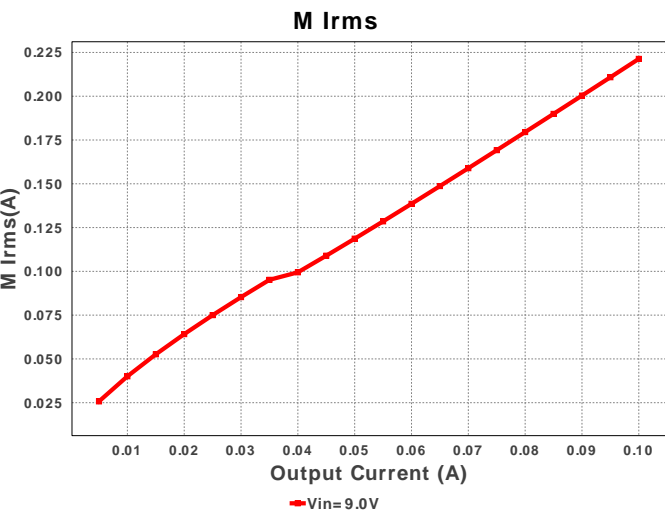
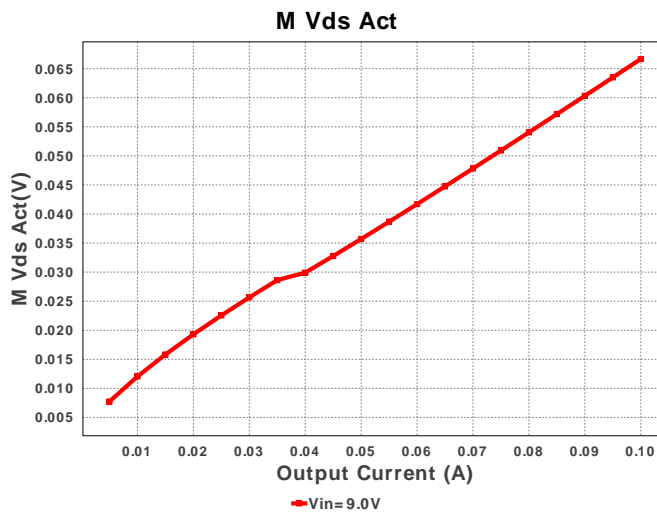
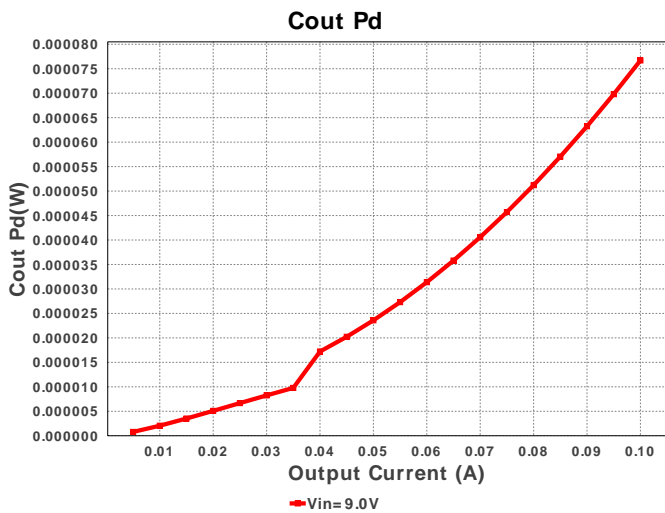
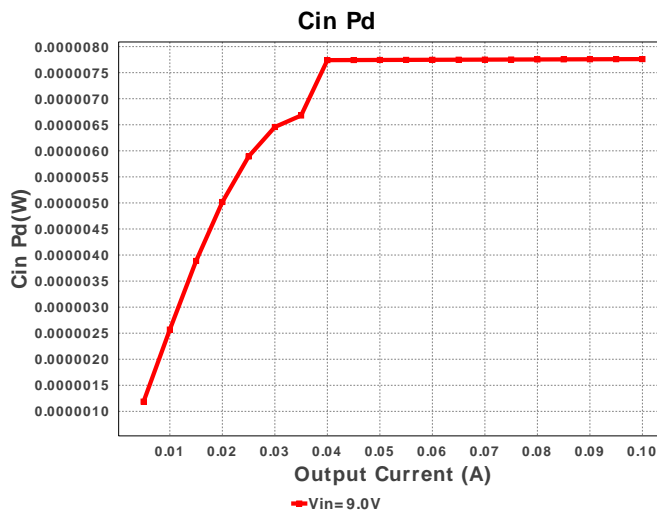
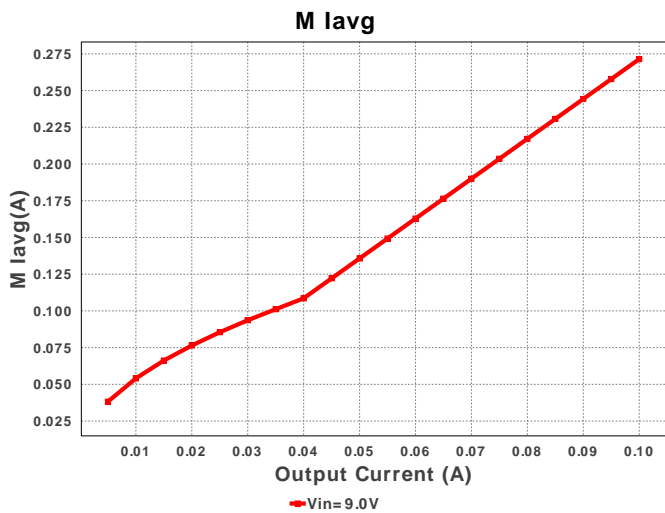
Electrical BOM

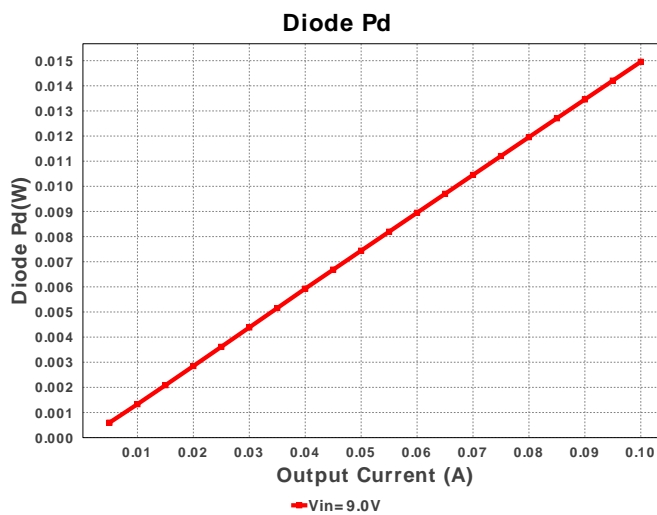
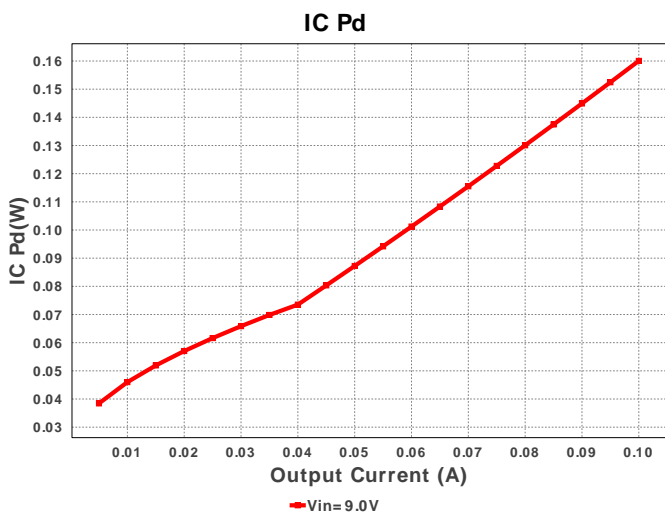
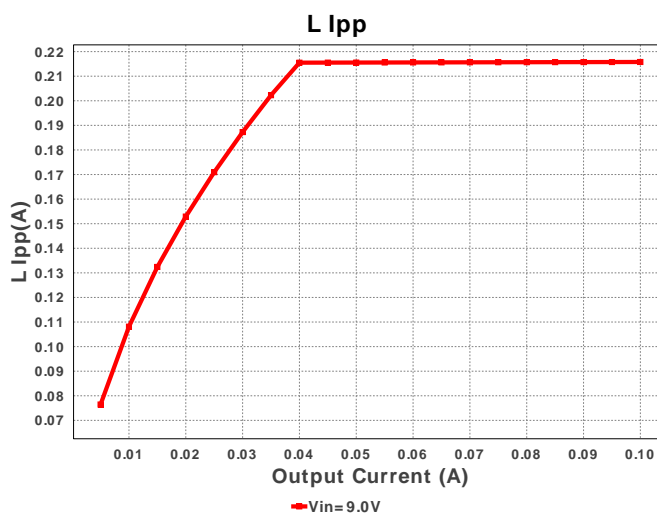
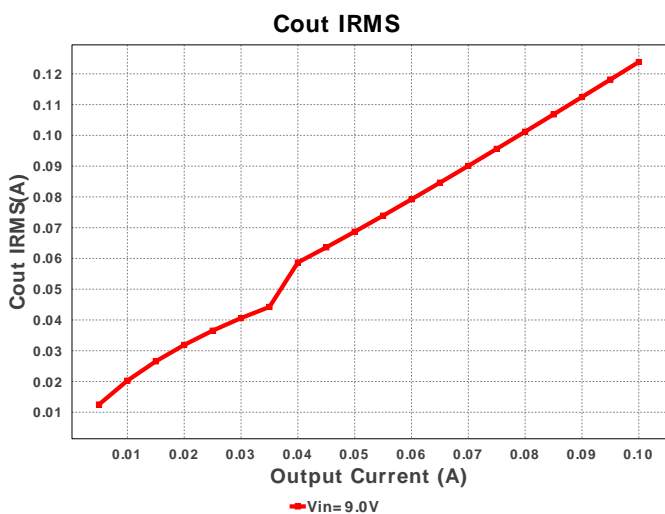
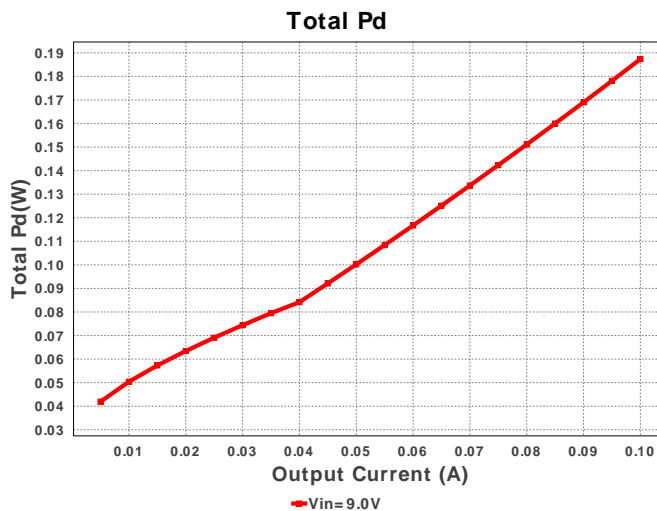
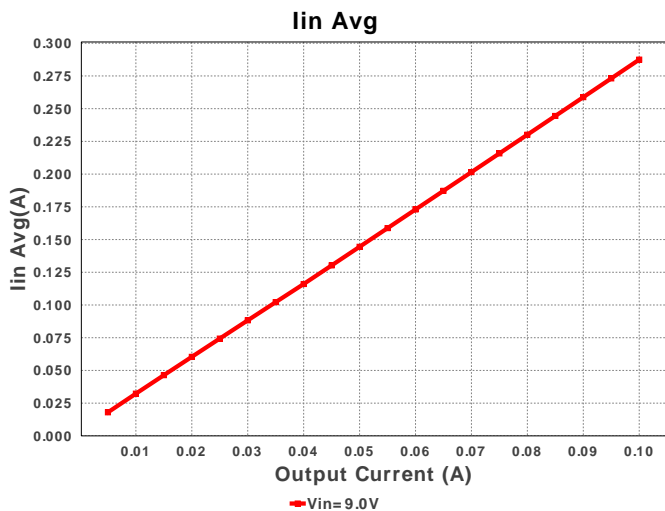
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Ccomp	CUSTOM	CUSTOM_CAP_MD Series= CUSTOM	Cap= 10.0 nF ESR= 5.0 mOhm VDC= 25.0 V IRMS= 1.0 A	1	\$0.10	1210 3 mm ²
2.	Cin	CUSTOM	CUSTOM_CAP_MD Series= CUSTOM	Cap= 4.7 uF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 7.29 A	1	\$0.10	1210 3 mm ²
3.	Cout	CUSTOM	CUSTOM_CAP_MD Series= CUSTOM	Cap= 2.2 uF ESR= 5.0 mOhm VDC= 35.0 V IRMS= 150.0 mA	1	\$0.10	1210 32 mm ²
4.	Coutx	CUSTOM	CUSTOM_CAP_MD Series= CUSTOM	Cap= 2.2 uF ESR= 5.0 mOhm VDC= 35.0 V IRMS= 1.483 A	1	\$0.10	1210 1 mm ²
5.	D1	CUSTOM	CUSTOM_DIODE_MD	VF@Io= 430.0 mV VRRM= 60.0 V	1	\$0.10	 SMC 6 mm ²
6.	L1	CUSTOM	CUSTOM_INDUCTOR_MD	L= 22.0 uH DCR= 122.0 mOhm	1	\$0.10	 VLS3015ET 10 mm ²
7.	Rcomp	CUSTOM	CUSTOM_RESISTOR_MD Series= CUSTOM	Res= 10.5 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.10	0805 1 mm ²
8.	Rfbb	Vishay-Dale	CRCW040210K5FKED Series= CRCW..e3	Res= 10.5 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
9.	Rfbt	Vishay-Dale	CRCW0402196KFKED Series= CRCW..e3	Res= 196.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

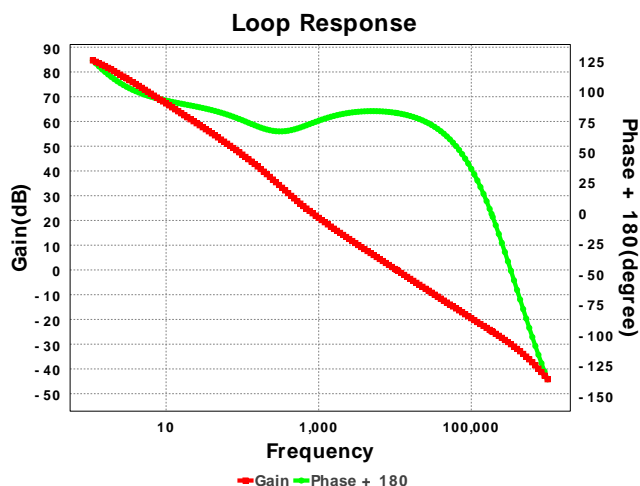
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	U1	Texas Instruments	TPS61170DRVR	Switcher	1	\$0.80	S-PWSON-N6 9 mm ²











Operating Values

#	Name	Value	Category	Description
1.	BOM Count	10		Total Design BOM count
2.	Total BOM	\$1.52		Total BOM Cost
3.	Cin IRMS	62.29 mA	Current	Input capacitor RMS ripple current
4.	Cout IRMS	123.852 mA	Current	Output capacitor RMS ripple current
5.	Coutx IRMS	12.434 mA	Current	Output capacitor_x RMS ripple current
6.	IC Ipk	379.335 mA	Current	Peak switch current in IC
7.	Iin Avg	287.48 mA	Current	Average input current
8.	L Ipp	215.78 mA	Current	Peak-to-peak inductor ripple current
9.	M Iavg	271.444 mA	Current	MOSFET Average current
10.	M Irms	221.333 mA	Current	MOSFET RMS current
11.	FootPrint	121.0 mm ²	General	Total Foot Print Area of BOM components
12.	Frequency	1.2 MHz	General	Switching frequency
13.	IC Tolerance	20.0 mV	General	IC Feedback Tolerance
14.	M Vds Act	66.673 mV	General	Voltage drop across the MosFET
15.	Mode	CCM	General	Conduction Mode
16.	Pout	2.4 W	General	Total output power
17.	D1 Tj	34.935 degC	Op_Point	D1 junction temperature
18.	Low Freq Gain	84.657 dB	Op_Point	Gain at 1Hz
19.	Vout Actual	24.17 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
20.	Vout OP	24.0 V	Op_Point	Operational Output Voltage
21.	Cross Freq	10.488 kHz	Op_point	Bode plot crossover frequency
22.	Duty Cycle	63.16 %	Op_point	Duty cycle
23.	Efficiency	92.759 %	Op_point	Steady state efficiency
24.	Gain Marg	-24.704 dB	Op_point	Bode Plot Gain Margin
25.	IC Tj	40.403 degC	Op_point	IC junction temperature
26.	ICThetaJA	65.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
27.	IOUT_OP	100.0 mA	Op_point	Iout operating point
28.	Phase Marg	82.863 deg	Op_point	Bode Plot Phase Margin
29.	VIN_OP	9.0 V	Op_point	Vin operating point
30.	Vout p-p	5.526 mV	Op_point	Peak-to-peak output ripple voltage
31.	Cin Pd	7.76 μ W	Power	Input capacitor power dissipation
32.	Cout Pd	76.696 μ W	Power	Output capacitor power dissipation
33.	Coutx Pd	773.034 nW	Power	Output capacitor_x power loss
34.	Diode Pd	14.955 mW	Power	Diode power dissipation
35.	IC Pd	160.05 mW	Power	IC power dissipation
36.	L Pd	9.463 mW	Power	Inductor power dissipation
37.	Total Pd	187.348 mW	Power	Total Power Dissipation
38.	Vout Tolerance	3.576 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	100.0 m	Maximum Output Current
2.	VinMax	9.0	Maximum input voltage
3.	VinMin	9.0	Minimum input voltage
4.	Vout	24.0	Output Voltage
5.	base_pn	TPS61170	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	Ambient temperature

Design Assistance

1. TPS61170 Product Folder : <http://www.ti.com/product/TPS61170> : 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](#).