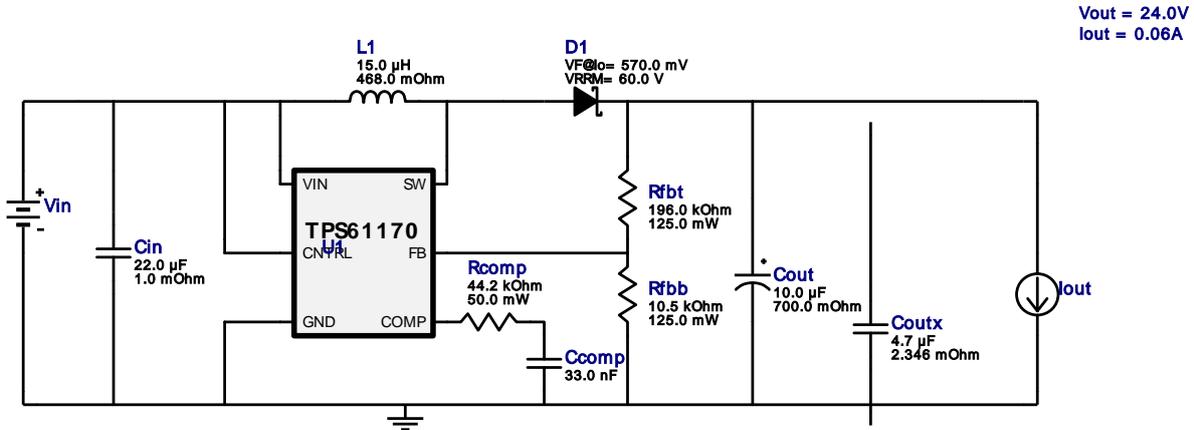
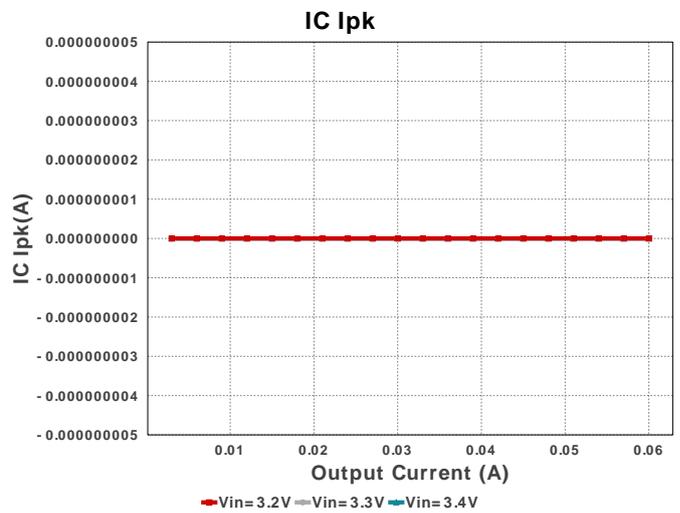
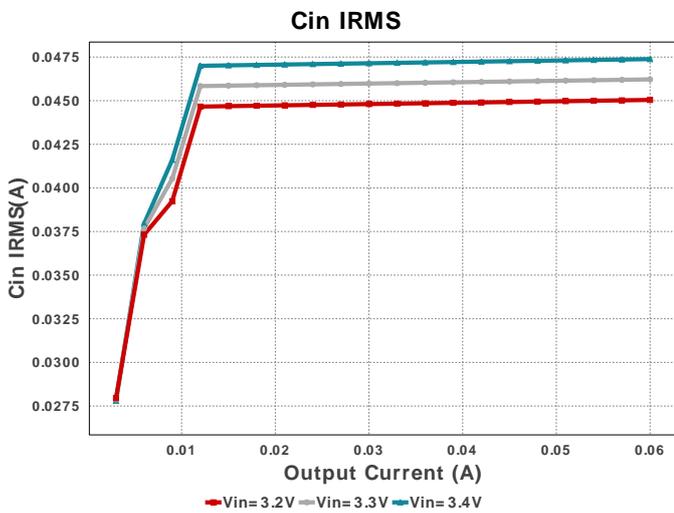
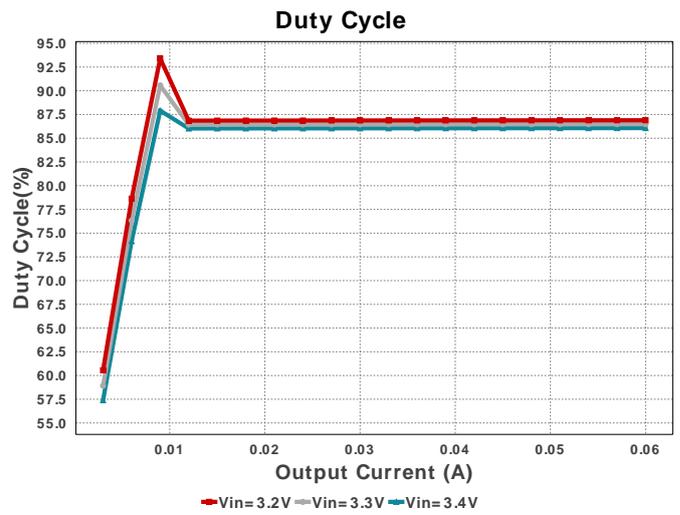
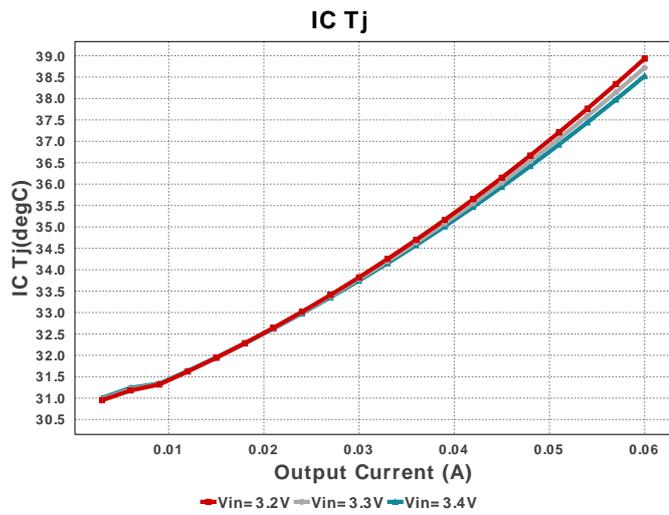


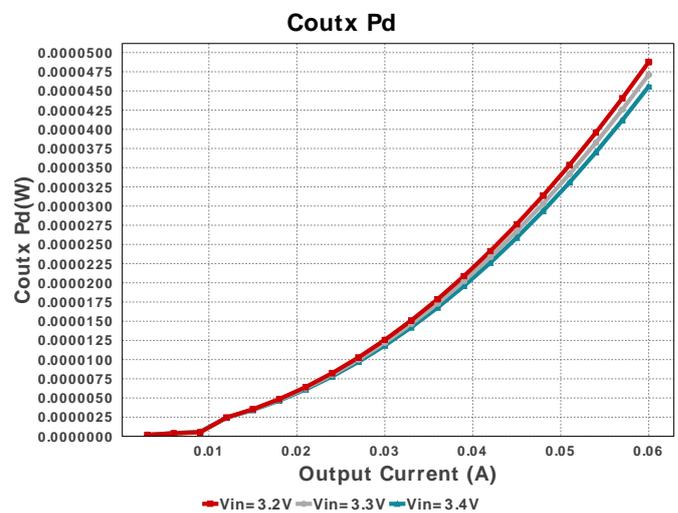
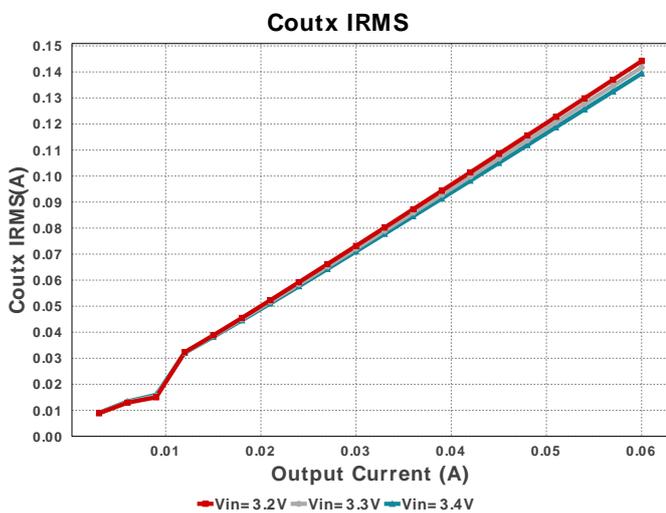
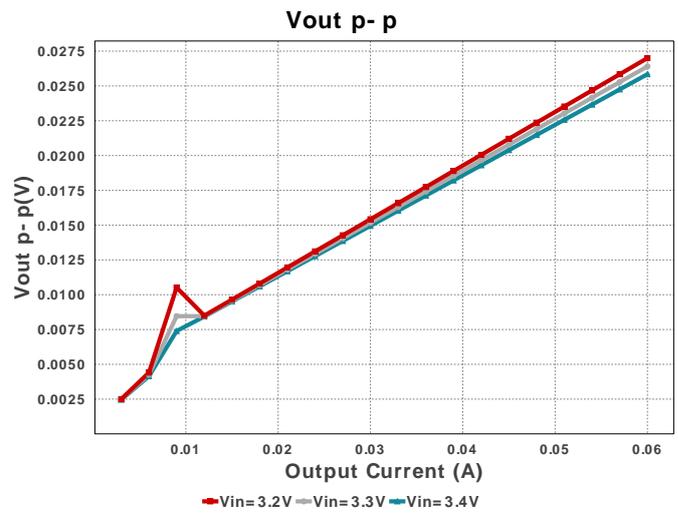
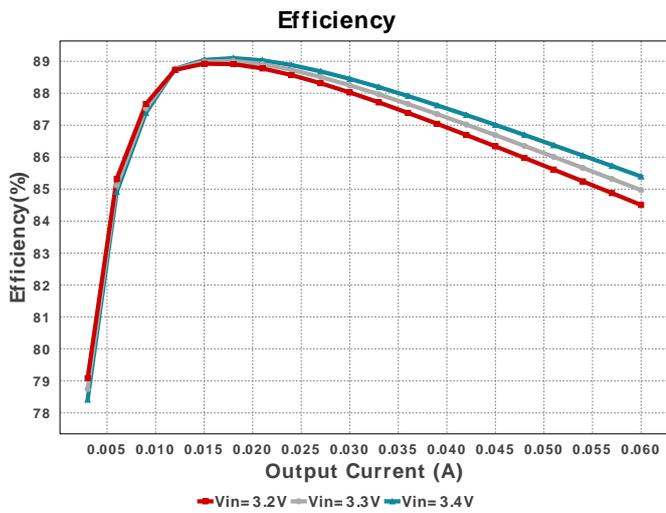
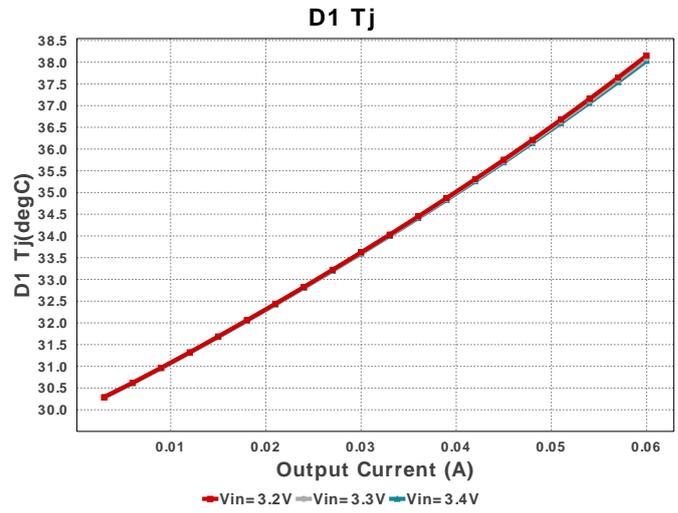
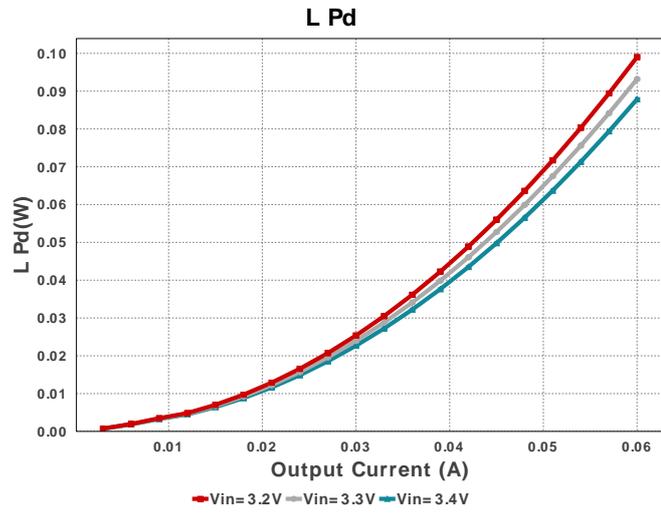
WEBENCH® Design Report

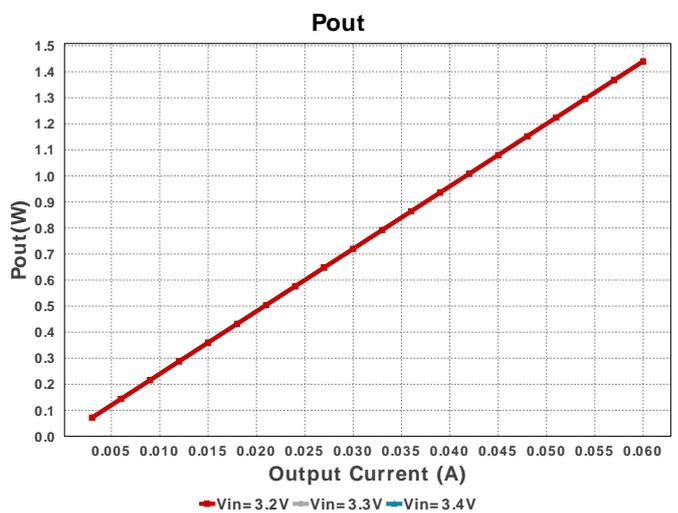
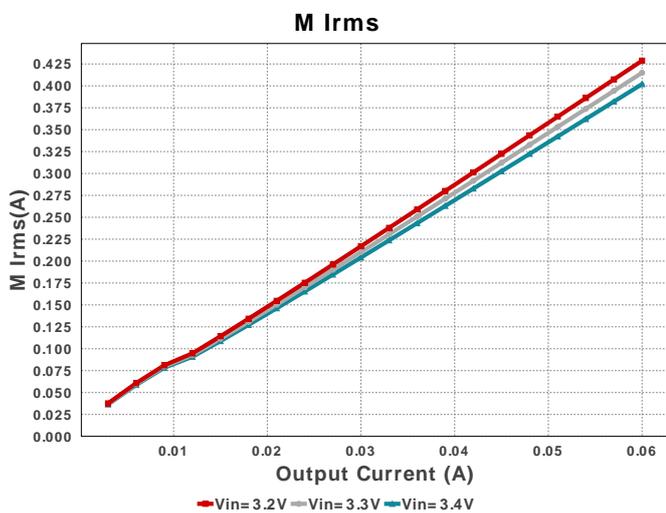
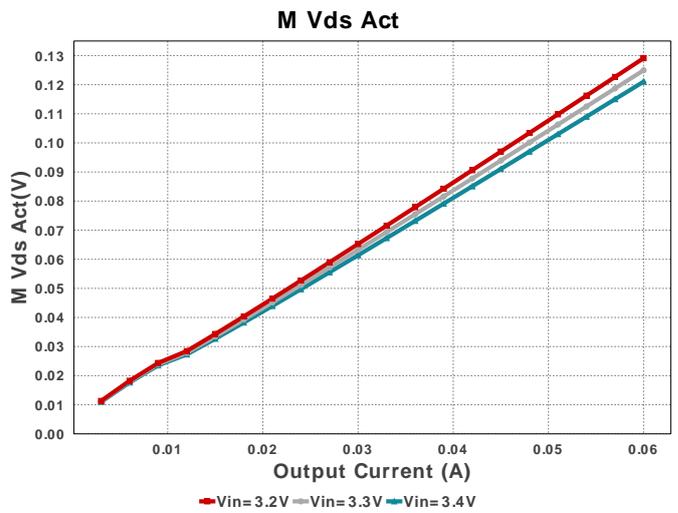
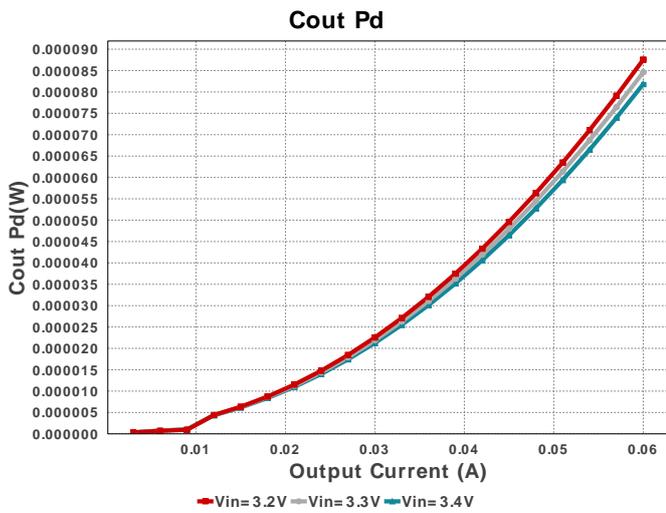
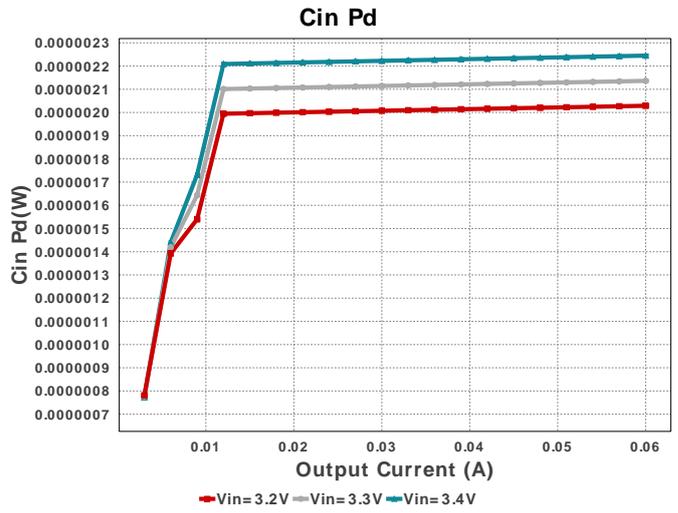
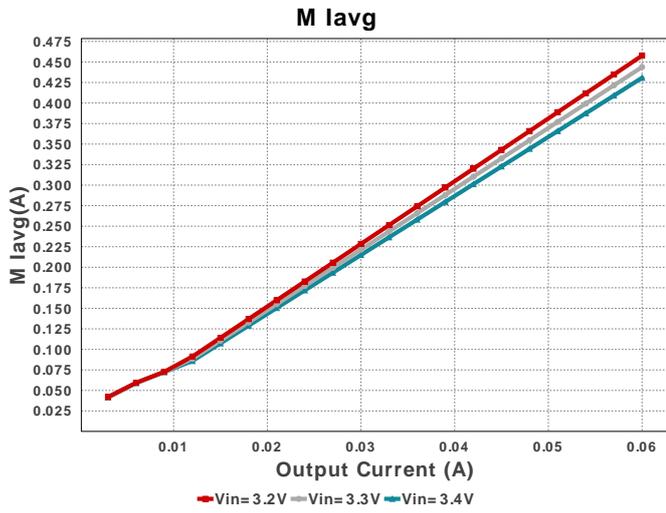
 Design : TPS61170DRVR
 TPS61170DRVR 3.2V-3.4V to 24.00V @ 0.06A

Electrical BOM

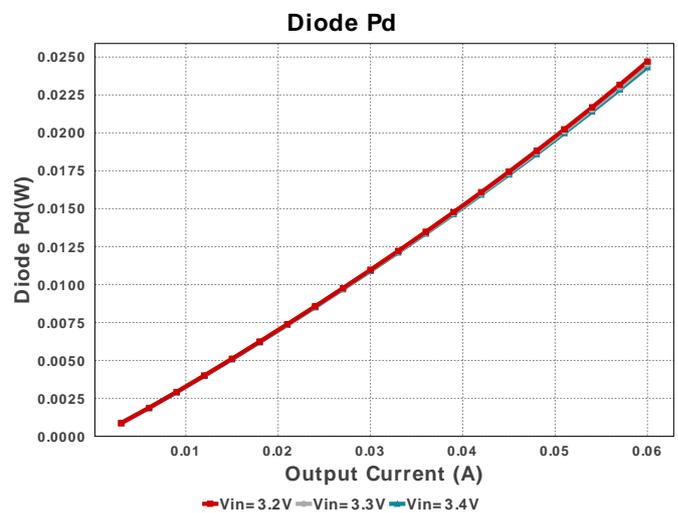
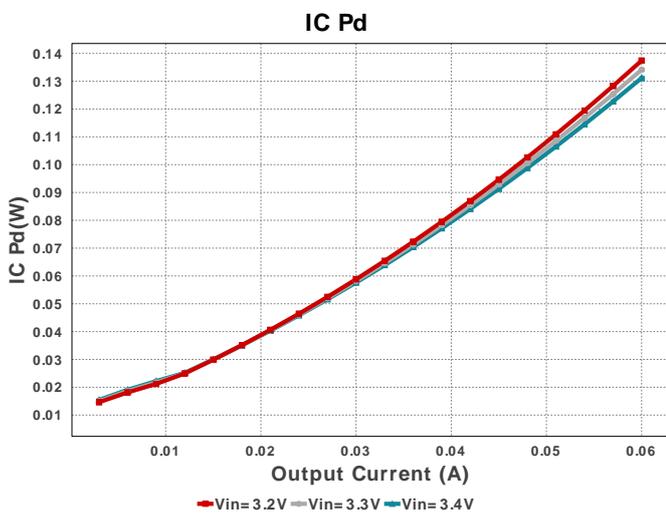
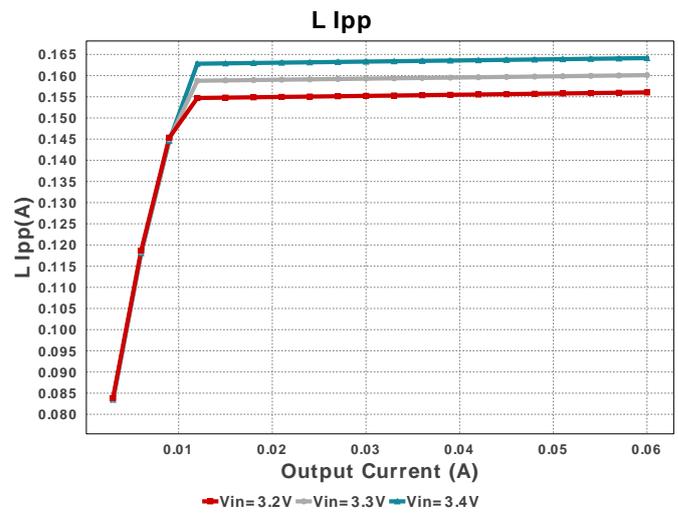
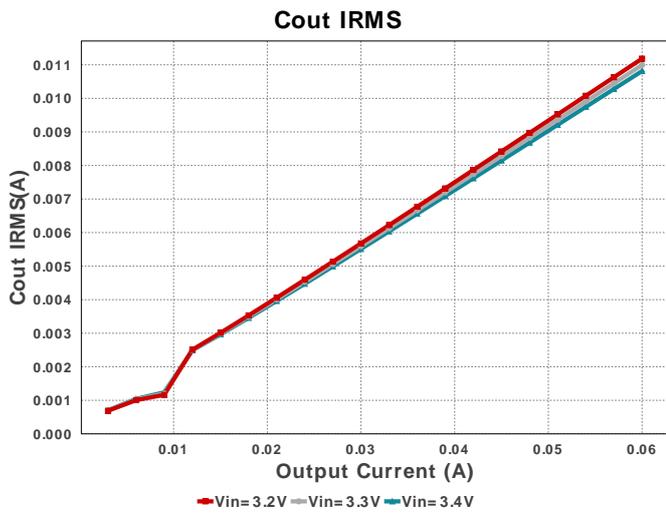
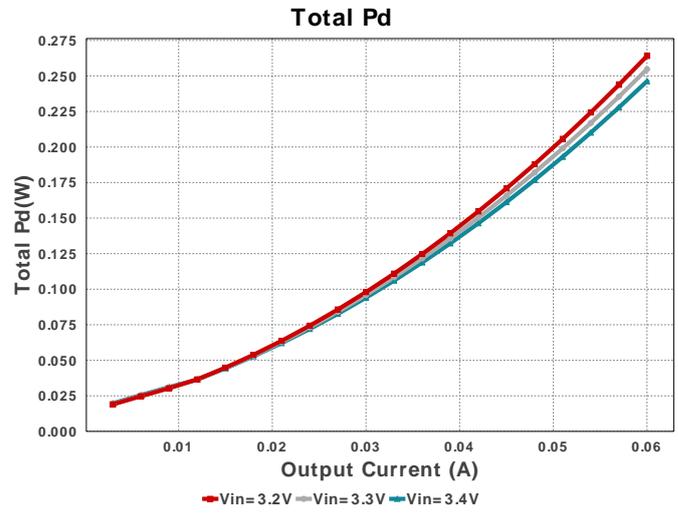
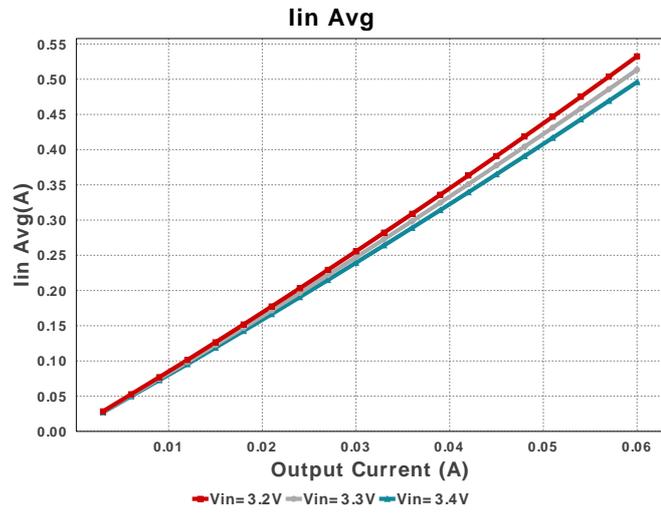
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Ccomp	TDK	CGA4J2C0G1H333J125AA Series= C0G/NP0	Cap= 33.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.10	0805 7 mm ²
2.	Cin	MuRata	GRM188R60J226MEA0D Series= X5R	Cap= 22.0 uF ESR= 1.0 mOhm VDC= 6.3 V IRMS= 6.0 A	1	\$0.05	0603 5 mm ²
3.	Cout	Panasonic	EEE-FK1V100R Series= FK	Cap= 10.0 uF ESR= 700.0 mOhm VDC= 35.0 V IRMS= 160.0 mA	1	\$0.09	 SM_RADIAL_C 62 mm ²
4.	Coutx	TDK	C2012X6S1H475K125AC Series= X6S	Cap= 4.7 uF ESR= 2.346 mOhm VDC= 50.0 V IRMS= 4.2602 A	1	\$0.20	0805 7 mm ²
5.	D1	Nexperia	PMEG6010CEH,115	Vf@Io= 570.0 mV VRRM= 60.0 V	1	\$0.04	 SOD-123F 12 mm ²
6.	L1	Coilcraft	ME3220-153KLB	L= 15.0 uH DCR= 468.0 mOhm	1	\$0.23	 ME3220 16 mm ²
7.	Rcomp	Yageo	RC0201FR-0744K2L Series= ?	Res= 44200.0Ohm Power= 50.0 mW Tolerance= 1.0%	1	\$0.01	0201 2 mm ²
8.	Rfbb	Panasonic	ERJ-6ENF1052V Series= ERJ-6E	Res= 10500.0Ohm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	0805 7 mm ²
9.	Rfbt	Panasonic	ERJ-6ENF1963V Series= ERJ-6E	Res= 196000.0Ohm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	0805 7 mm ²

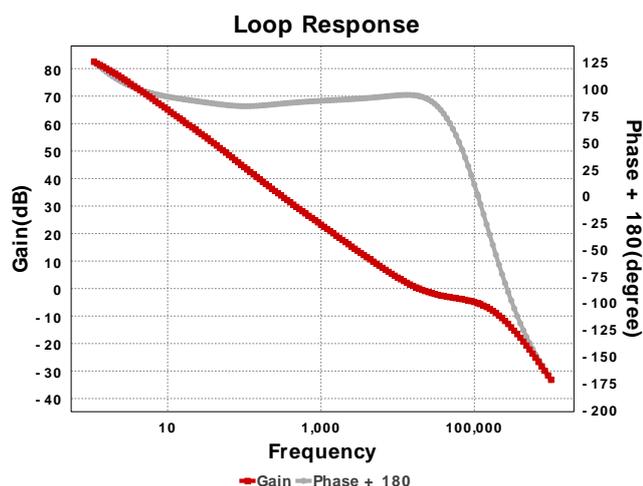
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	U1	Texas Instruments	TPS61170DRVR	Switcher	1	\$0.80	S-PWSON-N6 9 mm ²











Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	45.043 mA	Capacitor	Input capacitor RMS ripple current
2.	Cin Pd	2.029 μ W	Capacitor	Input capacitor power dissipation
3.	Cout IRMS	11.184 mA	Capacitor	Output capacitor RMS ripple current
4.	Cout Pd	87.553 μ W	Capacitor	Output capacitor power dissipation
5.	Coutx IRMS	144.152 mA	Capacitor	Output capacitor_x RMS ripple current
6.	Coutx Pd	48.749 μ W	Capacitor	Output capacitor_x power loss
7.	D1 Tj	38.151 degC	Diode	D1 junction temperature
8.	Diode Pd	24.7 mW	Diode	Diode power dissipation
9.	IC Ipk	0.0 A	IC	Peak switch current in IC
10.	IC Pd	137.41 mW	IC	IC power dissipation
11.	IC Tj	38.931 degC	IC	IC junction temperature
12.	IC Tolerance	20.0 mV	IC	IC Feedback Tolerance
13.	ICThetaJA	65.0 degC/W	IC	IC junction-to-ambient thermal resistance
14.	Iin Avg	532.51 mA	IC	Average input current
15.	L Ipp	156.03 mA	Inductor	Peak-to-peak inductor ripple current
16.	L Pd	98.999 mW	Inductor	Inductor power dissipation
17.	M Iavg	457.719 mA	Mosfet	MOSFET Average current
18.	M Irms	428.726 mA	Mosfet	MOSFET RMS ripple current
19.	M Vds Act	129.096 mV	Mosfet	Voltage drop across the MosFET
20.	Cin Pd	2.029 μ W	Power	Input capacitor power dissipation
21.	Cout Pd	87.553 μ W	Power	Output capacitor power dissipation
22.	Coutx Pd	48.749 μ W	Power	Output capacitor_x power loss
23.	Diode Pd	24.7 mW	Power	Diode power dissipation
24.	IC Pd	137.41 mW	Power	IC power dissipation
25.	L Pd	98.999 mW	Power	Inductor power dissipation
26.	Total Pd	264.04 mW	Power	Total Power Dissipation
27.	BOM Count	10	System	Total Design BOM count
28.	Cross Freq	17.219 kHz	System	Bode plot crossover frequency
29.	Duty Cycle	86.892 %	System	Duty cycle
30.	Efficiency	84.505 %	System	Steady state efficiency
31.	FootPrint	132.0 mm ²	System	Total Foot Print Area of BOM components
32.	Frequency	1.2 MHz	System	Switching frequency
33.	Gain Marg	-5.218 dB	System	Bode Plot Gain Margin
34.	Iout	60.0 mA	System	Iout operating point
35.	Low Freq Gain	82.066 dB	System	Gain at 1Hz
36.	Mode	CCM	System	Conduction Mode
37.	Phase Marg	92.487 deg	System	Bode Plot Phase Margin
38.	Pout	1.44 W	System	Total output power
39.	Total BOM	\$1.54	System	Total BOM Cost

#	Name	Value	Category	Description
40.	Vin	3.2 V	System Information	Vin operating point
41.	Vout	24.0 V	System Information	Operational Output Voltage
42.	Vout Actual	24.17 V	System Information	Vout Actual calculated based on selected voltage divider resistors
43.	Vout Tolerance	3.576 %	System Information	Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable
44.	Vout p-p	27.0 mV	System Information	Peak-to-peak output ripple voltage

Design Inputs

#	Name	Value	Description
1.	Iout	60.0 m	Maximum Output Current
2.	VinMax	3.4	Maximum input voltage
3.	VinMin	3.2	Minimum input voltage
4.	Vout	24.0	Output Voltage
5.	base_pn	TPS61170	Base Product 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.

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