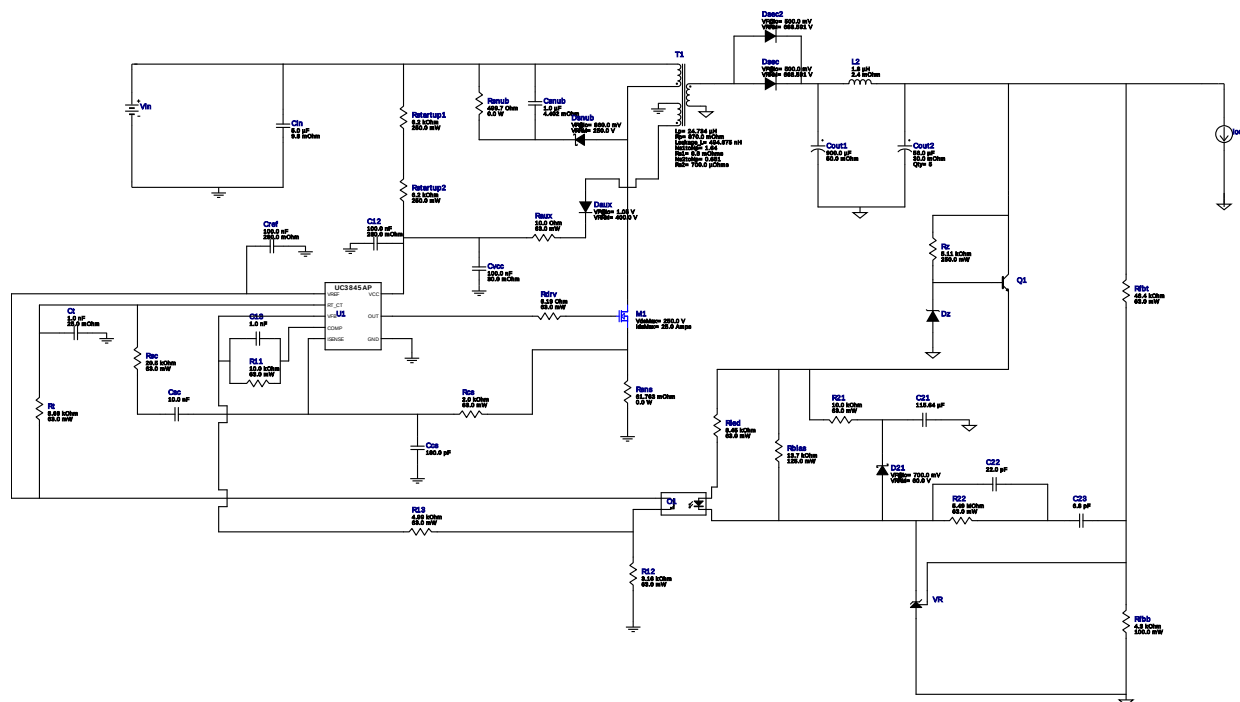


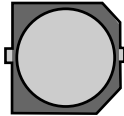
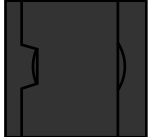
WEBENCH® Design Report

Design : 3692851/1 UC3845AN
UC3845AN 30.0V-150.0V to 29.40V @ 3.0A

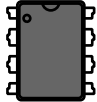


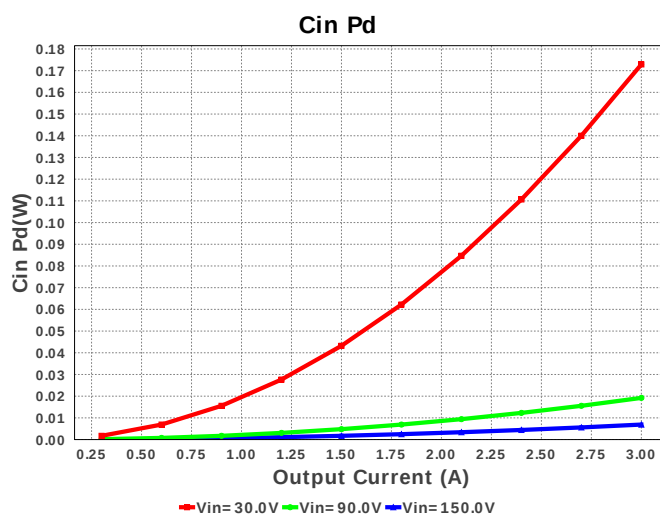
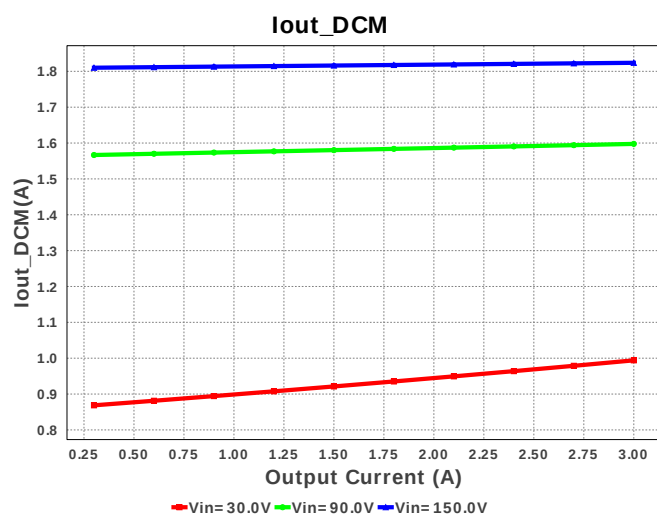
Electrical BOM

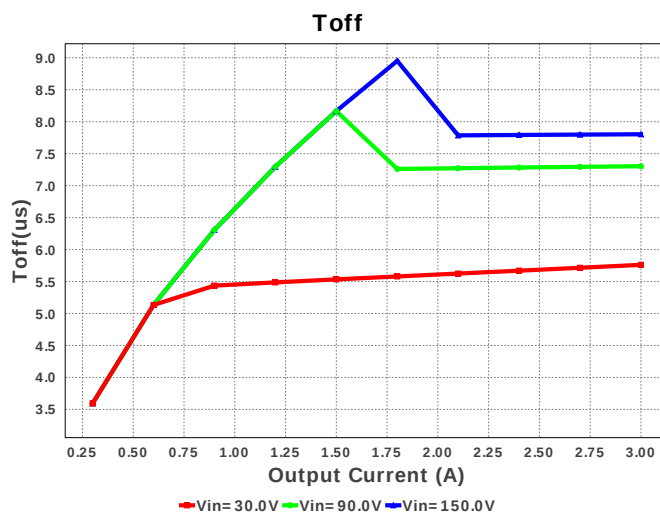
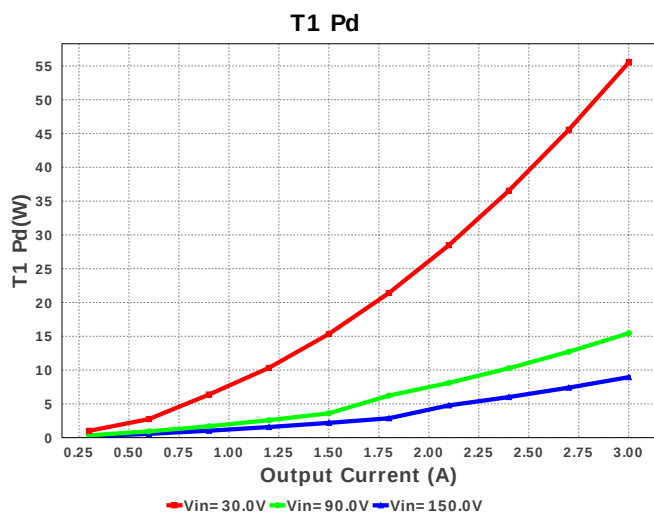
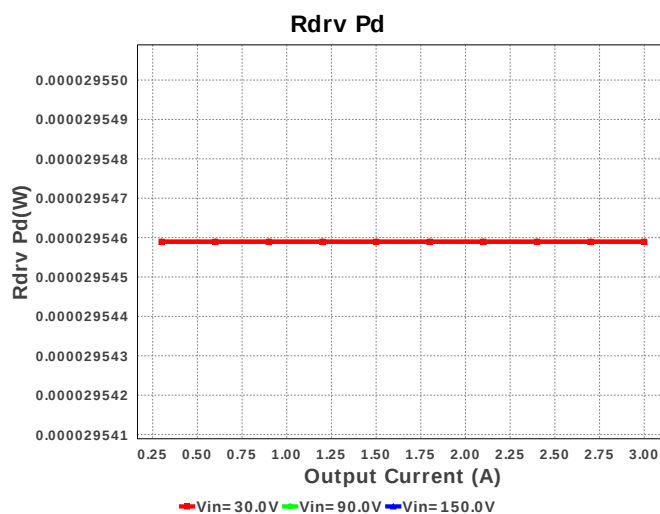
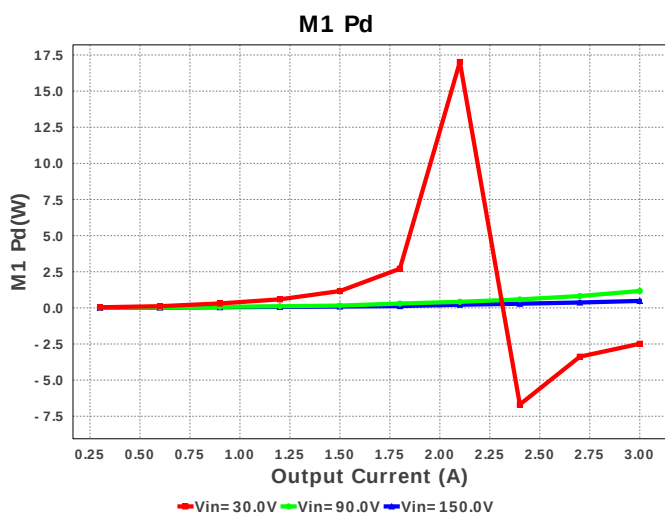
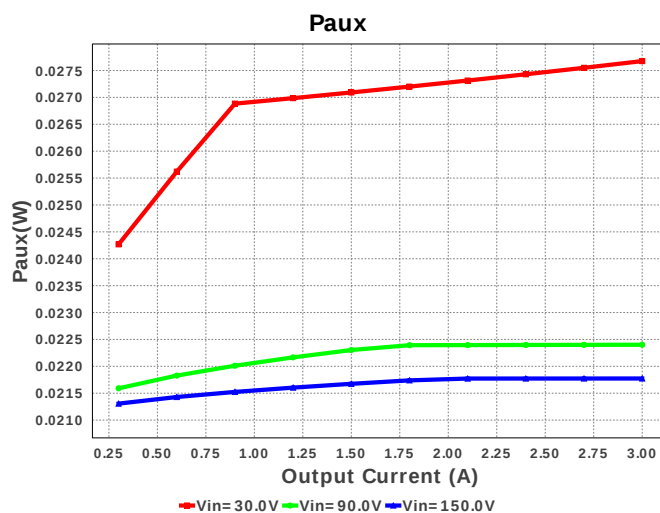
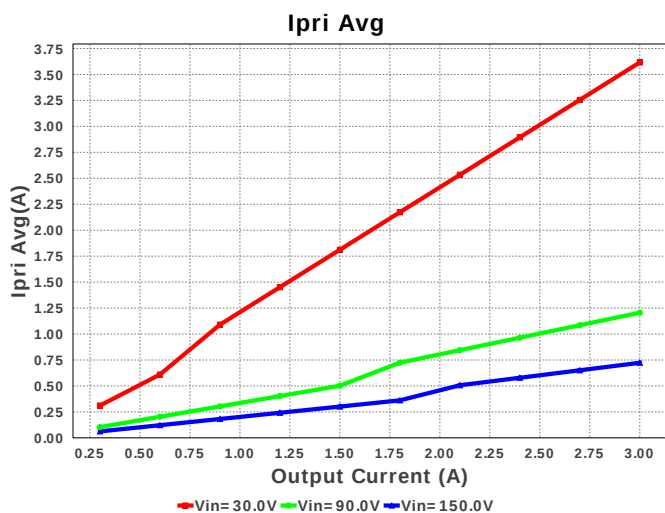
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	C12	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
2.	C13	Samsung Electro-Mechanics	CL21C102JBCNFNC Series= C0G/NP0	Cap= 1.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
3.	C21	CUSTOM	CUSTOM Series= ?	Cap= 115.64 uF VDC= 40.0 V IRMS= 0.0 A	1	NA	CUSTOM 0 mm ²
4.	C22	Kemet	C0805C220K3GACTU Series= C0G/NP0	Cap= 22.0 pF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
5.	C23	MuRata	GRM1555C1H6R8CA01D Series= C0G/NP0	Cap= 6.8 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
6.	Ccs	Kemet	C0805C181K5GACTU Series= C0G/NP0	Cap= 180.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²

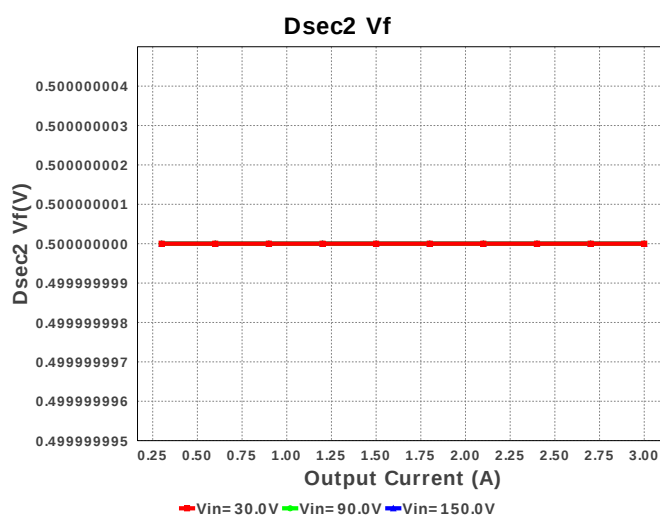
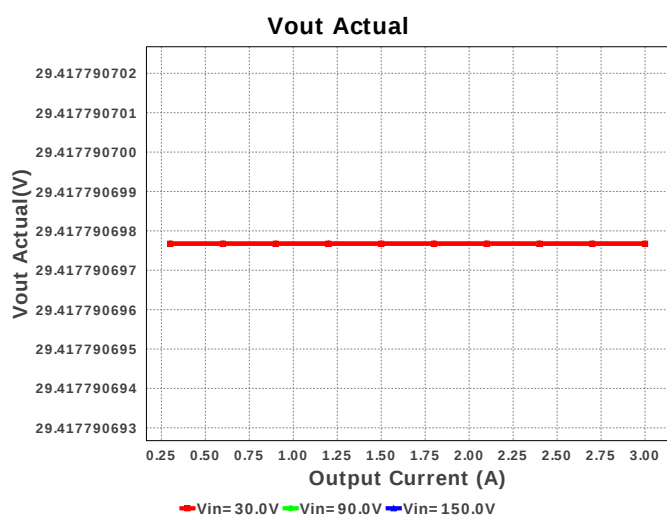
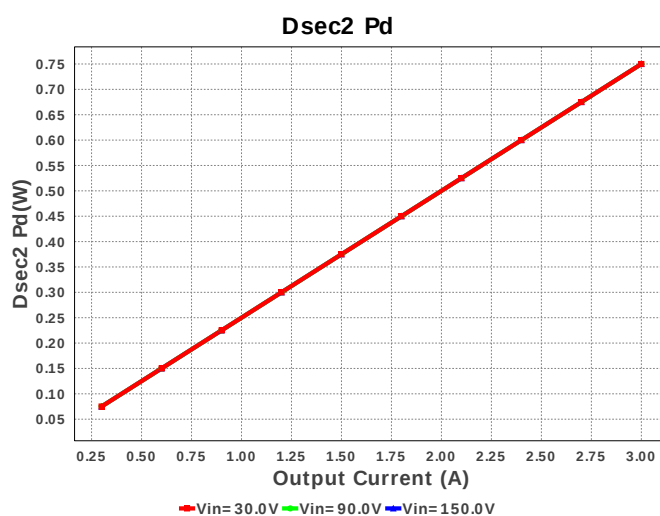
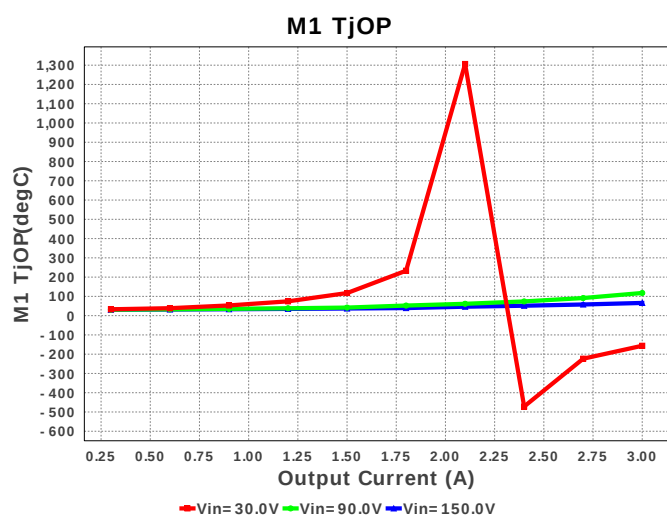
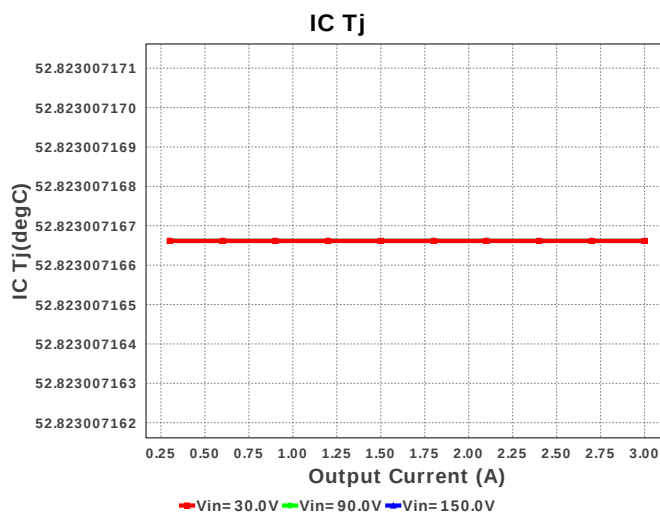
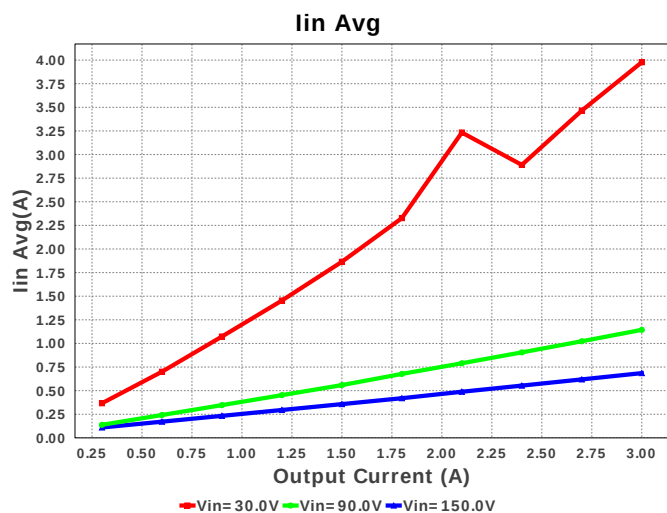
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7.	Cin	TDK	B32774D1505K Series= B32774	Cap= 5.0 uF ESR= 9.8 mOhm VDC= 1.3 kV IRMS= 10.5 A	1	\$3.08	 B32774_3150x2200x3650 804 mm ²
8.	Cout1	TDK	B41607A8907M008 Series= 2360	Cap= 900.0 uF ESR= 50.0 mOhm VDC= 63.0 V IRMS= 10.2 A	1	\$4.84	B41607_2200x4000_8 576 mm ²
9.	Cout2	Panasonic	EEHZA1J560P Series= ?	Cap= 56.0 uF ESR= 30.0 mOhm VDC= 63.0 V IRMS= 1.8 A	5	\$1.05	 SM_RADIAL_10BMM 160 mm ²
10.	Cref	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
11.	Csc	MuRata	GRM216R71H103KA01D Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
12.	Csnub	MuRata	GRM21BR71H105KA12L Series= X7R	Cap= 1.0 uF ESR= 4.402 mOhm VDC= 50.0 V IRMS= 1.677 A	1	\$0.05	 0805 7 mm ²
13.	Ct	Kemet	C0805C102J5GACTU Series= C0G/NP0	Cap= 1.0 nF ESR= 25.0 mOhm VDC= 50.0 V IRMS= 1.71 A	1	\$0.01	 0805 7 mm ²
14.	Cvcc	MuRata	GRM188R71E104KA01D Series= X7R	Cap= 100.0 nF ESR= 30.0 mOhm VDC= 25.0 V IRMS= 1.51 A	1	\$0.01	 0603 5 mm ²
15.	D21	Diodes Inc.	B260A-13-F	VF@Io= 700.0 mV VRRM= 60.0 V	1	\$0.09	 SMA 37 mm ²
16.	Daux	Bourns	CD1408-FU1400	VF@Io= 1.05 V VRRM= 400.0 V	1	\$0.13	 Diode_1408 13 mm ²
17.	Dsec	CUSTOM	CUSTOM	VF@Io= 500.0 mV VRRM= 688.591 V	1	NA	CUSTOM 0 mm ²
18.	Dsec2	CUSTOM	CUSTOM	VF@Io= 500.0 mV VRRM= 688.591 V	1	NA	CUSTOM 0 mm ²
19.	Dsnub	ON Semiconductor	MBRB40250TG	VF@Io= 860.0 mV VRRM= 250.0 V	1	\$0.94	 DDPAK 210 mm ²
20.	Dz	Diodes Inc.	MMSZ5250B-7-F	Zener	1	\$0.03	 SOD-123 13 mm ²
21.	L2	Coilcraft	SER1360-182KLB	L= 1.8 uH DCR= 2.4 mOhm	1	\$0.72	 SER1360 225 mm ²

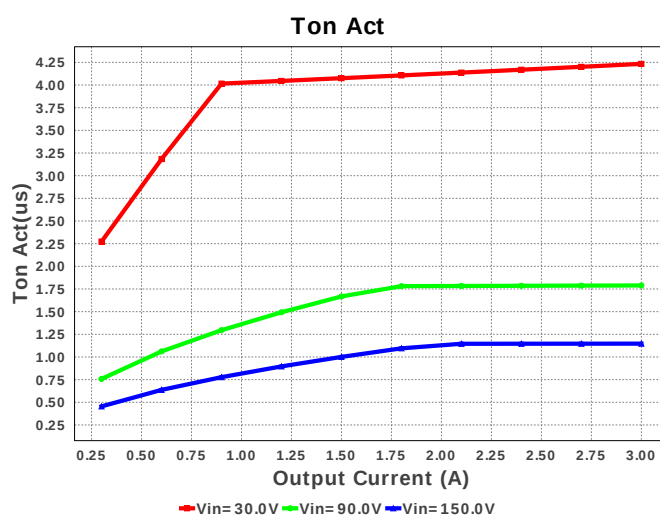
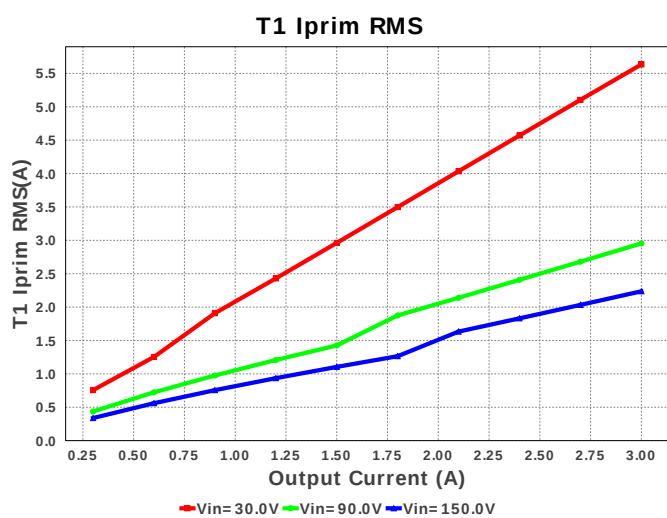
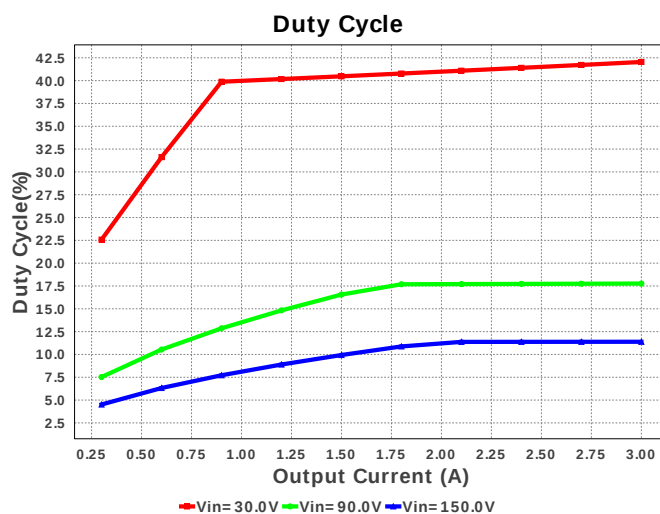
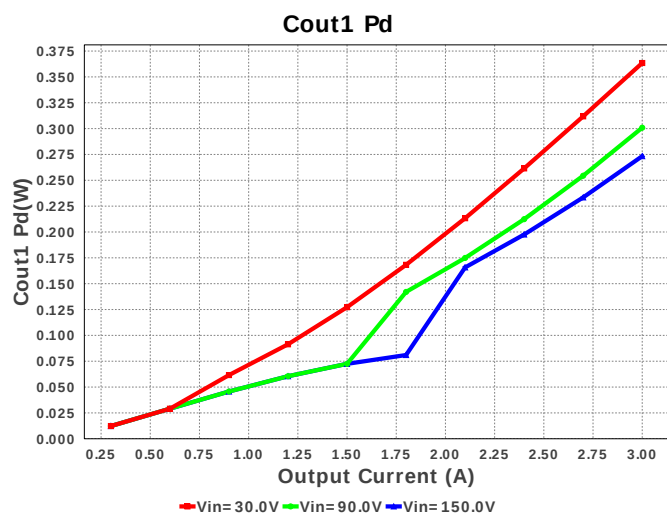
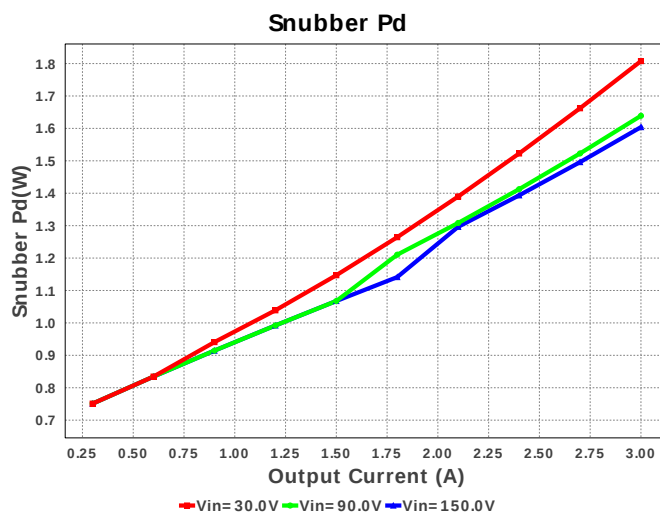
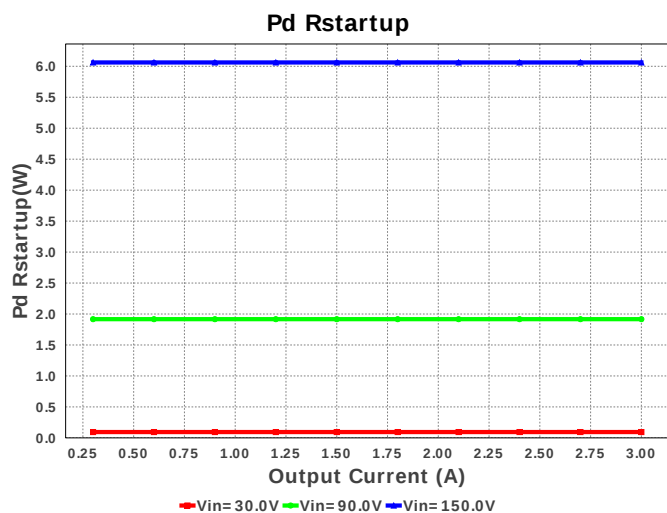
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
22.	M1	Infineon Technologies	BSC600N25NS3 G	VdsMax= 250.0 V IdsMax= 25.0 Amps	1	\$1.41	 PG-TDSON-8 55 mm ²
23.	O1	Vishay-Semiconductor	TCMT1107	Optocoupler	1	\$0.21	 SOP-4 44 mm ²
24.	Q1	ON Semiconductor	BC846BLT1G	Bipolar Transistor	1	\$0.02	 SOT-23 14 mm ²
25.	R11	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
26.	R12	Vishay-Dale	CRCW04023K16FKED Series= CRCW..e3	Res= 3.16 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
27.	R13	Vishay-Dale	CRCW04024K99FKED Series= CRCW..e3	Res= 4.99 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
28.	R21	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
29.	R22	Vishay-Dale	CRCW04025M49FKED Series= CRCW..e3	Res= 5.49 MOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
30.	Raux	Vishay-Dale	CRCW040210R0FKED Series= CRCW..e3	Res= 10.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
31.	Rbias	Panasonic	ERJ-6ENF1372V Series= ERJ-6E	Res= 13.7 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
32.	Rcs	Vishay-Dale	CRCW04022K00FKED Series= CRCW..e3	Res= 2.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
33.	Rdrv	Vishay-Dale	CRCW04026R19FKED Series= CRCW..e3	Res= 6.19 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
34.	Rfbb	Yageo America	RC0603FR-074K3L Series= ?	Res= 4.3 kOhm Power= 100.0 mW Tolerance= 1.0%	1	\$0.01	 0603 5 mm ²
35.	Rfbb	Vishay-Dale	CRCW040246K4FKED Series= CRCW..e3	Res= 46.4 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
36.	Rled	Vishay-Dale	CRCW04028K45FKED Series= CRCW..e3	Res= 8.45 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
37.	Rsc	Vishay-Dale	CRCW040220K5FKED Series= CRCW..e3	Res= 20.5 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
38.	Rsns	CUSTOM	CUSTOM Series= ?	Res= 61.763 mOhm Power= 0.0 W Tolerance= 0.0%	1	NA	CUSTOM 0 mm ²
39.	Rsns	CUSTOM	CUSTOM Series= ?	Res= 499.7 Ohm Power= 0.0 W Tolerance= 0.0%	1	NA	CUSTOM 0 mm ²
40.	Rstartup1	Yageo America	RC1206FR-076K2L Series= ?	Res= 6.2 kOhm Power= 250.0 mW Tolerance= 1.0%	1	\$0.01	 1206 11 mm ²
41.	Rstartup2	Yageo America	RC1206FR-076K2L Series= ?	Res= 6.2 kOhm Power= 250.0 mW Tolerance= 1.0%	1	\$0.01	 1206 11 mm ²

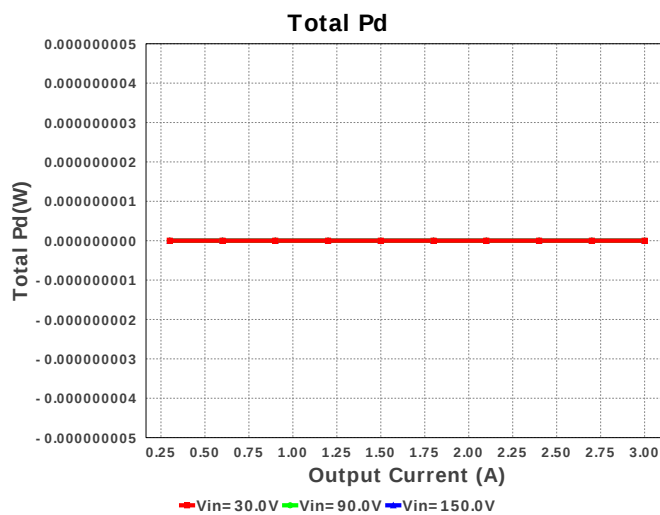
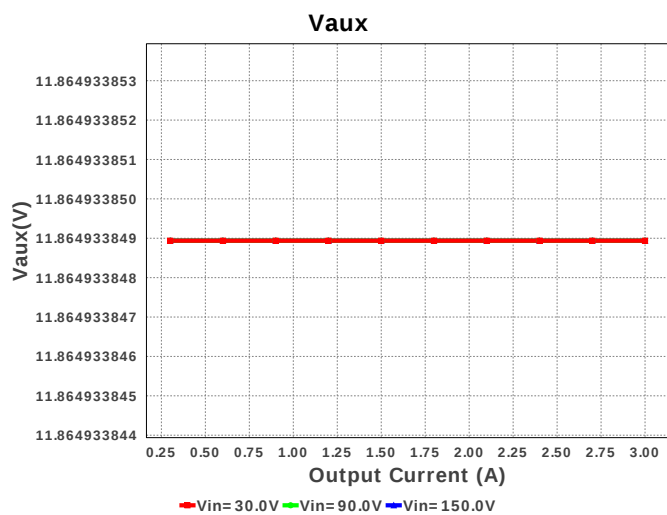
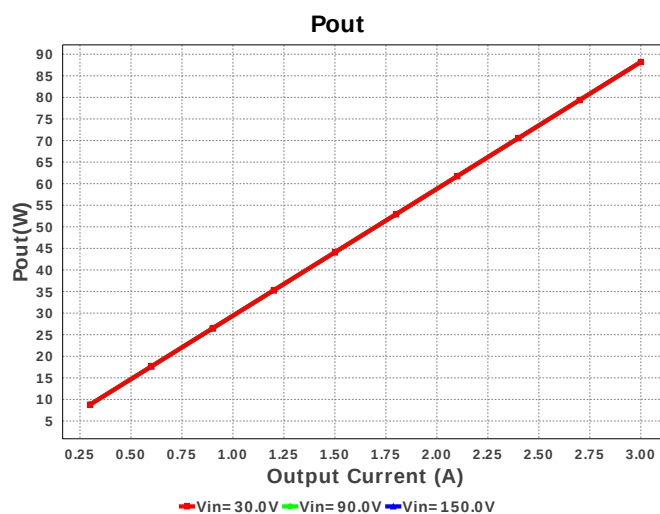
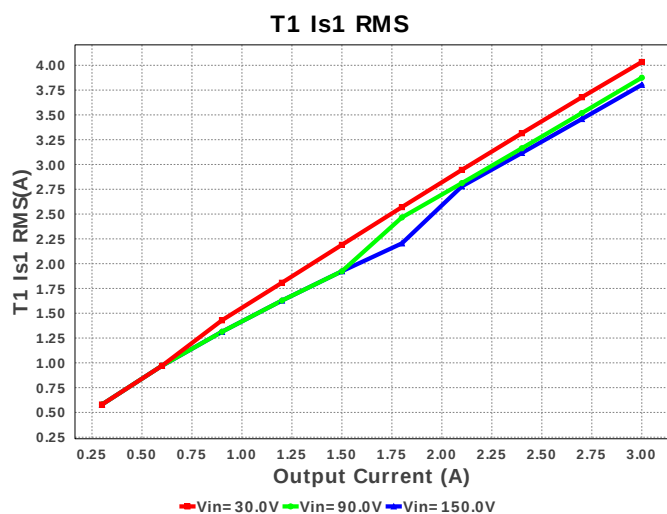
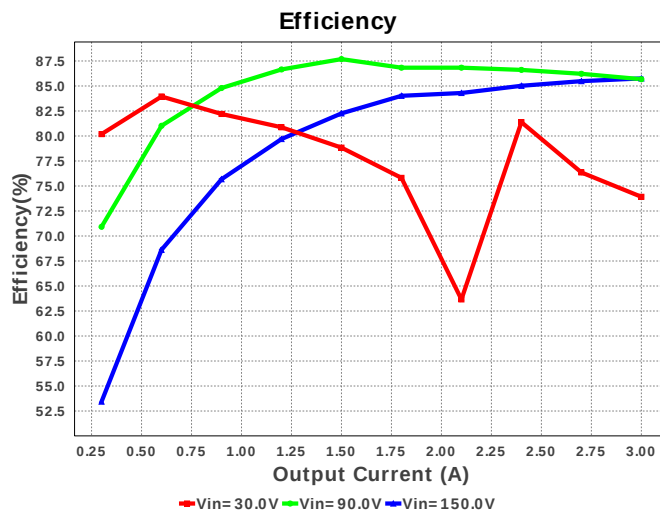
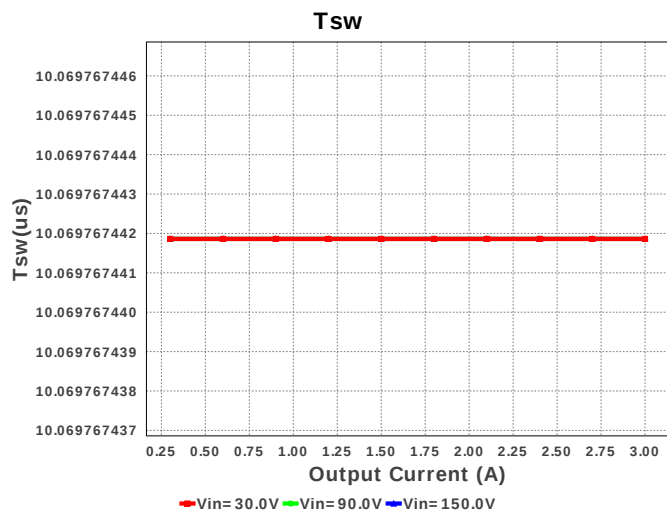
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
42.	Rt	Vishay-Dale	CRCW04028K66FKED Series= CRCW..e3	Res= 8.66 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
43.	Rz	Panasonic	ERJ-8ENF5111V Series= ERJ-8E	Res= 5.11 kOhm Power= 250.0 mW Tolerance= 1.0%	1	\$0.01	 1206 11 mm ²
44.	T1	CUSTOM	CUSTOM	Lp= 24.734 μH Rp= 870.0 mOhm Leakage_L= 494.675 nH Ns1toNp= 1.64 Rs1= 8.6 mOhms Ns2toNp= 0.651 Rs2= 700.0 μOhms	1	NA	CUSTOM 0 mm ²
45.	U1	Texas Instruments	UC3845AN	Switcher	1	\$0.56	 P0008A 116 mm ²
46.	VR	Texas Instruments	TL431AIDBZR	Voltage References	1	\$0.08	 DBZ0003A 14 mm ²



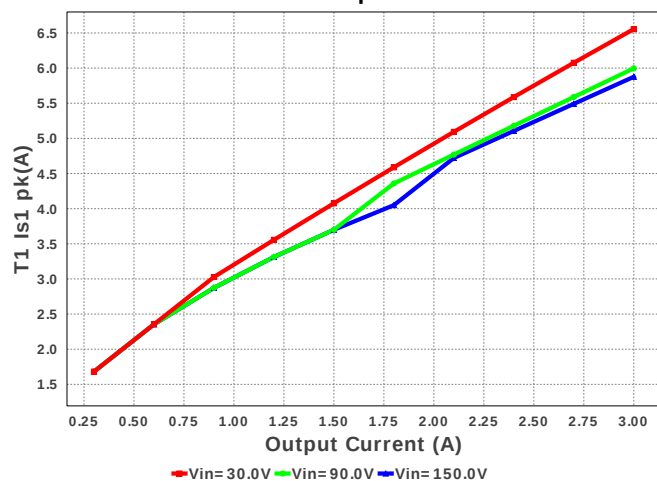




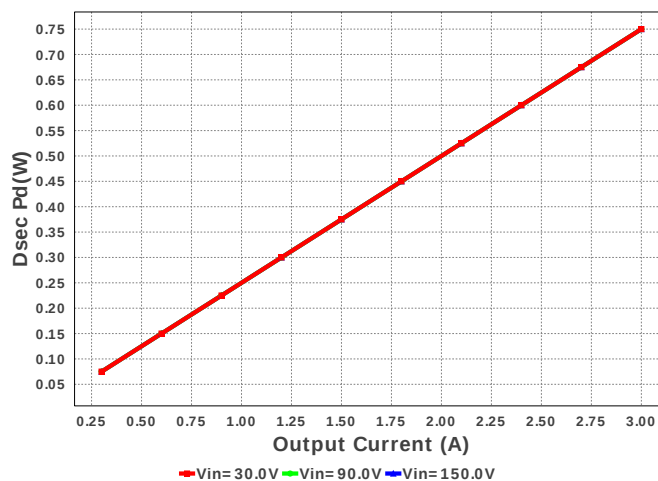




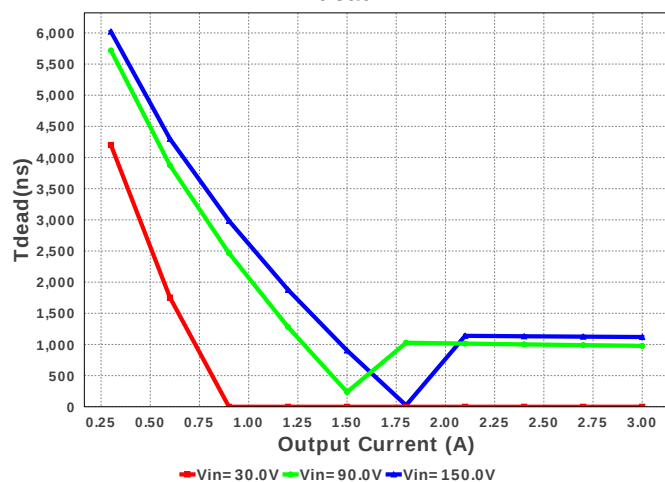
T1 Is1 pk



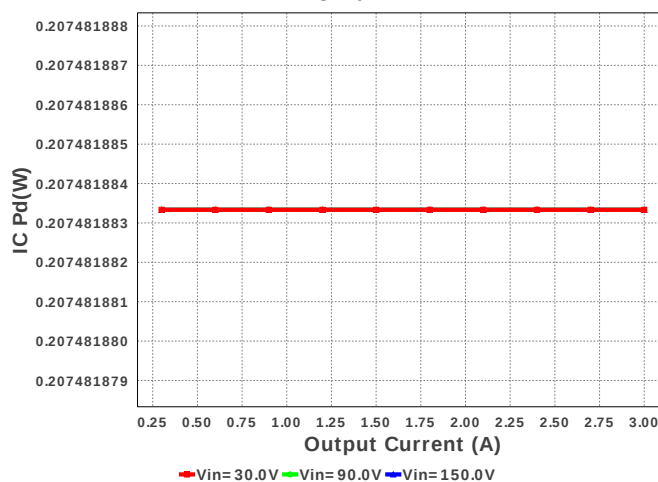
Dsec Pd



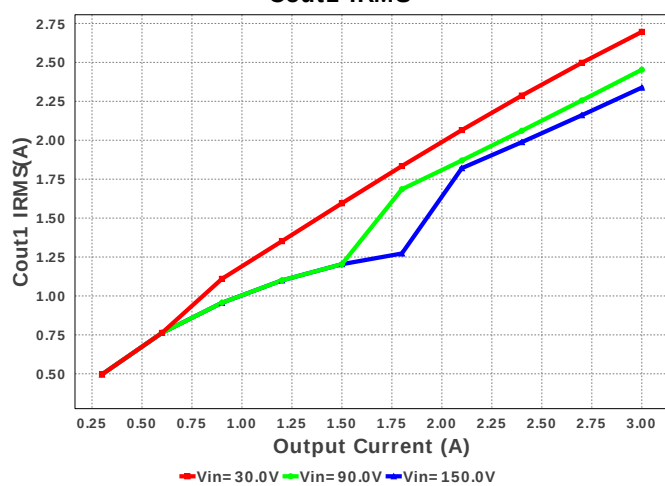
Tdead



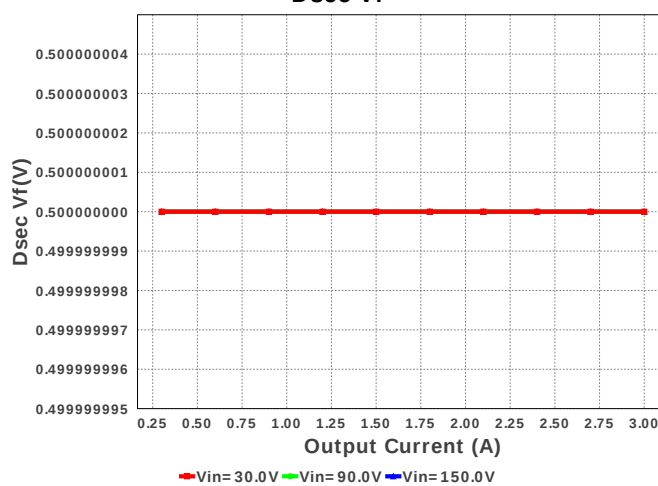
IC Pd

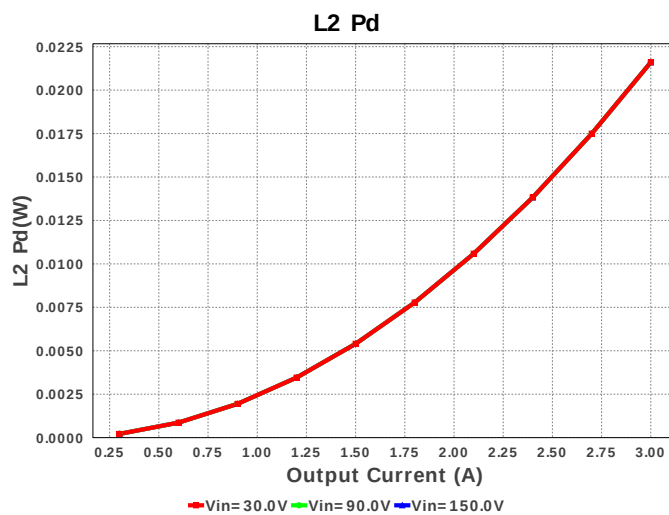
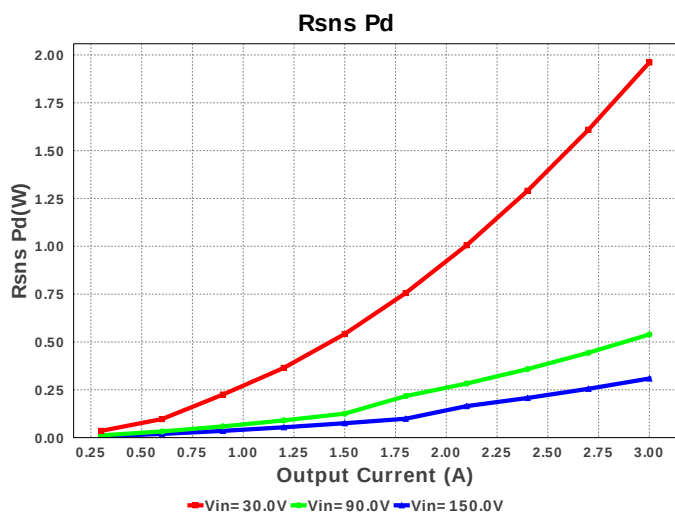
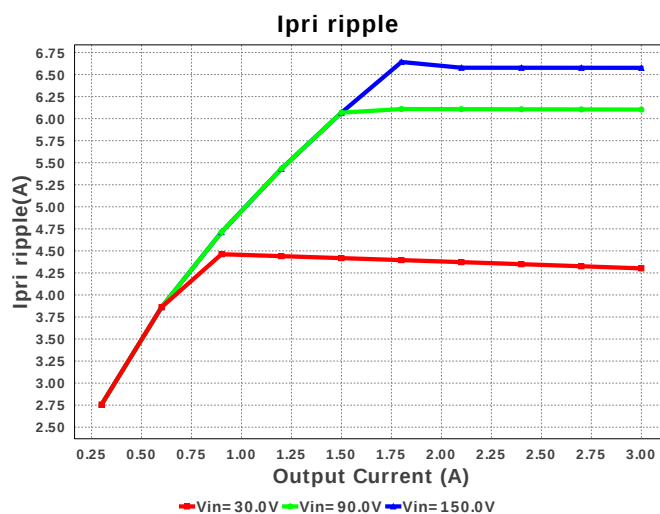
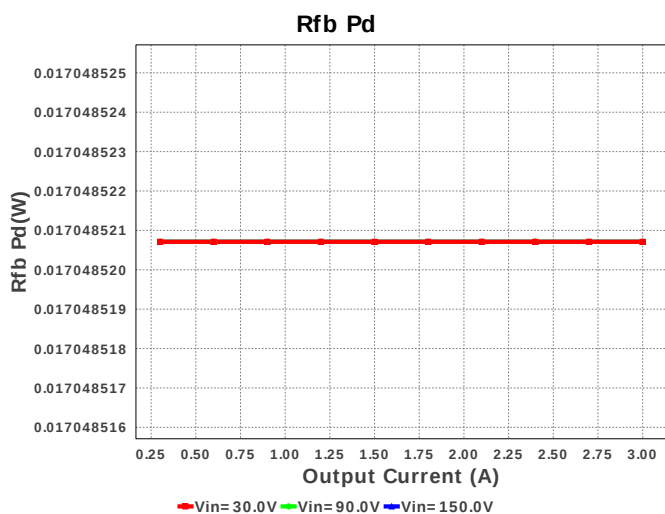
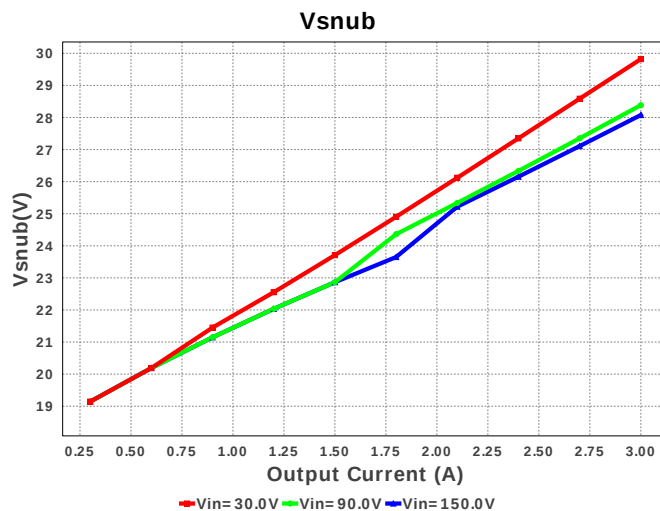
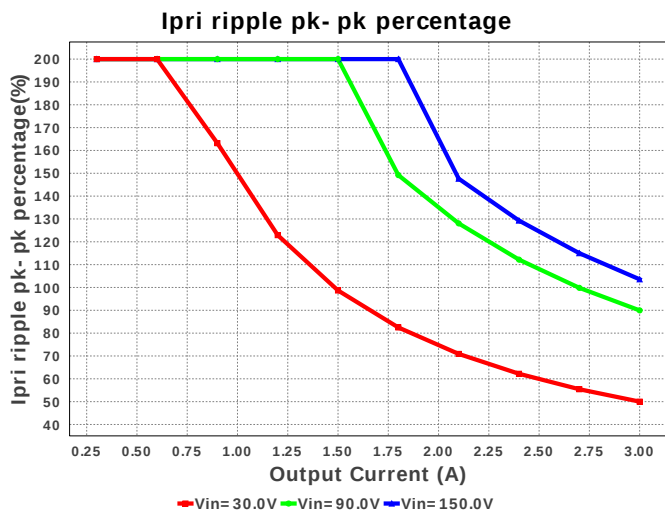


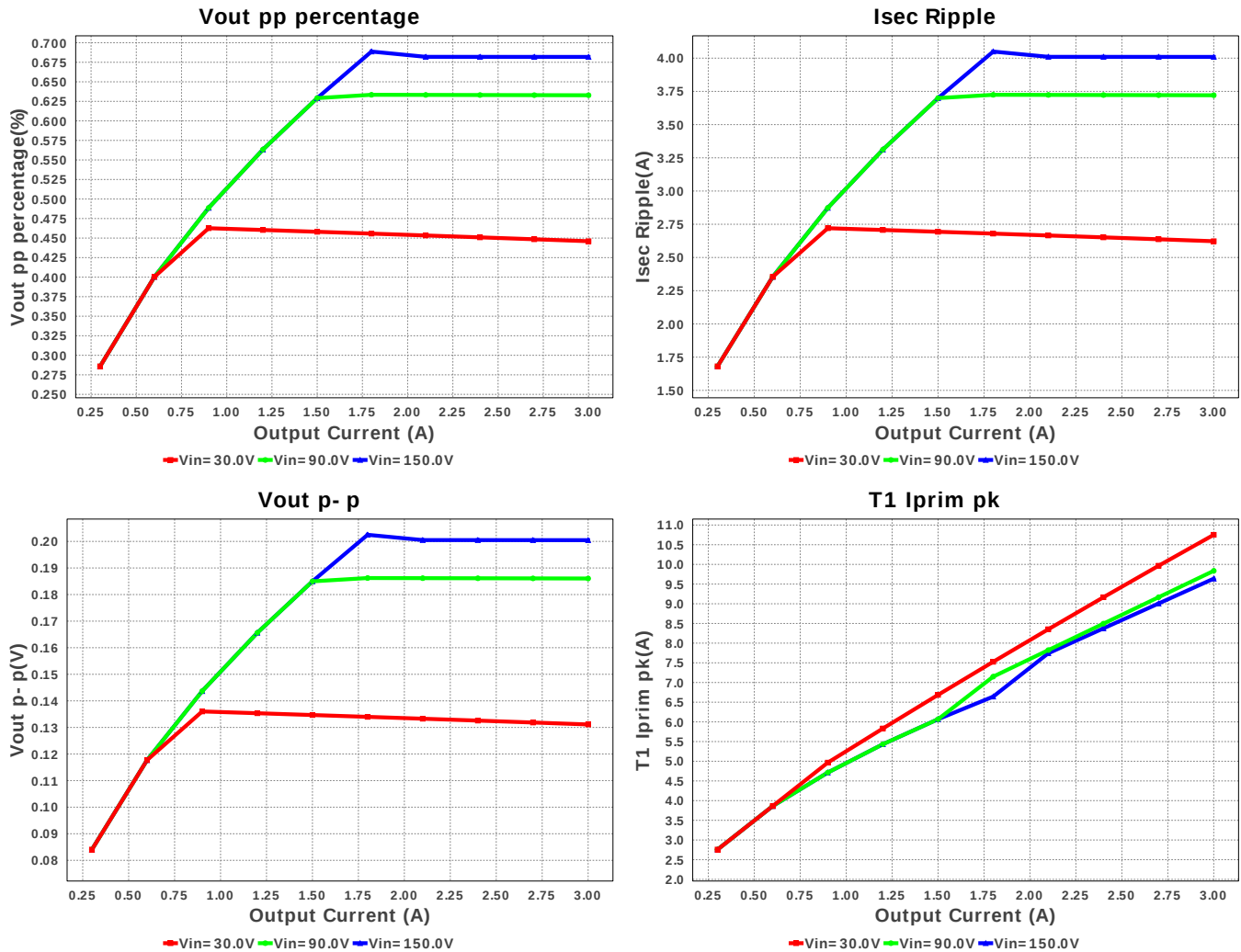
Cout1 IRMS



Dsec Vf







Operating Values

#	Name	Value	Category	Description
1.	Cout1 IRMS	2.696 A	Current	Output capacitor1 RMS ripple current
2.	Iin Avg	3.977 A	Current	Average input current
3.	Iout_DCM	994.017 mA	Current	Approximate Current below which DCM mode of operation will begin
4.	Ipri Avg	3.616 A	Current	Average Current in Primary Winding over the complete Switching Period
5.	Ipri ripple	4.301 A	Current	Ripple Current in the Primary Winding
6.	Ipri ripple pk-pk percentage	50.011 %	Current	Primary Current pk-pk ripple percentage(of Ipri avg during ton only)
7.	Isec Ripple	2.622 A	Current	Ripple Current in the Secondary Winding
8.	T1 Iprim RMS	5.635 A	Current	Transformer Primary RMS Current
9.	T1 Iprim pk	10.752 A	Current	Transformer Primary Peak Current
10.	T1 Is1 RMS	4.033 A	Current	Transformer Secondary1 RMS Current
11.	T1 Is1 pk	6.555 A	Current	Transformer Secondary1 Peak Current
12.	BOM Count	50	General	Total Design BOM count
13.	Daux trr	35.0 ns	General	Auxiliary Diode Reverse Recovery Time
14.	Dsec Vf	500.0 mV	General	Effective Forward Voltage Drop at the Operating Current
15.	Dsec trr	60.0 ns	General	Output Diode Reverse Recovery Time
16.	Dsec2 Vf	500.0 mV	General	Effective Forward Voltage Drop at the Operating Current
17.	Dsnub trr	0.0 ns	General	Snubber Diode Reverse Recovery Time
18.	FootPrint	3.092 k mm ²	General	Total Foot Print Area of BOM components
19.	Frequency	99.307 kHz	General	Switching frequency
20.	Mode	CCM	General	Conduction Mode
21.	Pout	88.2 W	General	Total output power
22.	Tdead	0.0 ns	General	Approximate Dead Time of the Regulator
23.	Toff	5.761 us	General	Approximate Converter Off Time
24.	Ton Act	4.233 us	General	Approximate Converter On Time
25.	Total BOM	\$0.0	General	Total BOM Cost
26.	Tsw	10.07 us	General	Switching Time Period
27.	Vaux	11.865 V	General	Auxiliary Voltage
28.	Vsnub	29.819 V	General	Voltage Across the Snubber
29.	Vout Actual	29.418 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors

#	Name	Value	Category	Description
30.	Vout OP	29.4 V	Op_Point	Operational Output Voltage
31.	Duty Cycle	42.041 %	Op_point	Duty cycle
32.	Efficiency	73.919 %	Op_point	Steady state efficiency
33.	IC Tj	52.823 degC	Op_point	IC junction temperature
34.	ICThetaJA	110.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
35.	IOUT_OP	3.0 A	Op_point	Iout operating point
36.	M1 TjOP	-156.275 degC	Op_point	M1 MOSFET junction temperature
37.	Vout p-p	131.121 mV	Op_point	Peak-to-peak output ripple voltage
38.	Cin Pd	172.872 mW	Power	Input capacitor power dissipation
39.	Cout1 Pd	363.441 mW	Power	Output capacitor1 power dissipation
40.	Dsec Pd	750.0 mW	Power	Secondary Diode Power Dissipation
41.	Dsec2 Pd	750.0 mW	Power	Secondary Diode Power Dissipation
42.	IC Pd	207.482 mW	Power	IC power dissipation
43.	L2 Pd	21.6 mW	Power	Average Power Dissipation in the Inductor Over the AC Line Period
44.	M1 Pd	-2.484 W	Power	M1 MOSFET total power dissipation
45.	Paux	27.675 mW	Power	Power Dissipation in Raux and Daux
46.	Pd Rstartup	94.161 mW	Power	Power Dissipation in Rstartup1 and Rstartup2
47.	Rdrv Pd	29.546 μ W	Power	Power Dissipation in Gate Drive Resistor
48.	Rfb Pd	17.049 mW	Power	Rfb Power Dissipation
49.	Rsns Pd	1.961 W	Power	Current Limit Sense Resistor Power Dissipation
50.	Snubber Pd	1.808 W	Power	Snubber Power Dissipation
51.	T1 Pd	55.523 W	Power	Estimated Losses in Transformer
52.	Total Pd	0.0 W	Power	Total Power Dissipation
53.	Vout Tolerance	2.175 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable
54.	Vout pp percentage	445.991 m%		Output Voltage ripple percentage

Design Inputs

#	Name	Value	Description
1.	Iout	3.0	Maximum Output Current
2.	VinMax	150.0	Maximum input voltage
3.	VinMin	30.0	Minimum input voltage
4.	Vout	29.4	Output Voltage
5.	base_pn	UC3845A	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **UC3845A** Product Folder : <http://www.ti.com/product/UC3845A> : contains the data sheet and other resources.

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