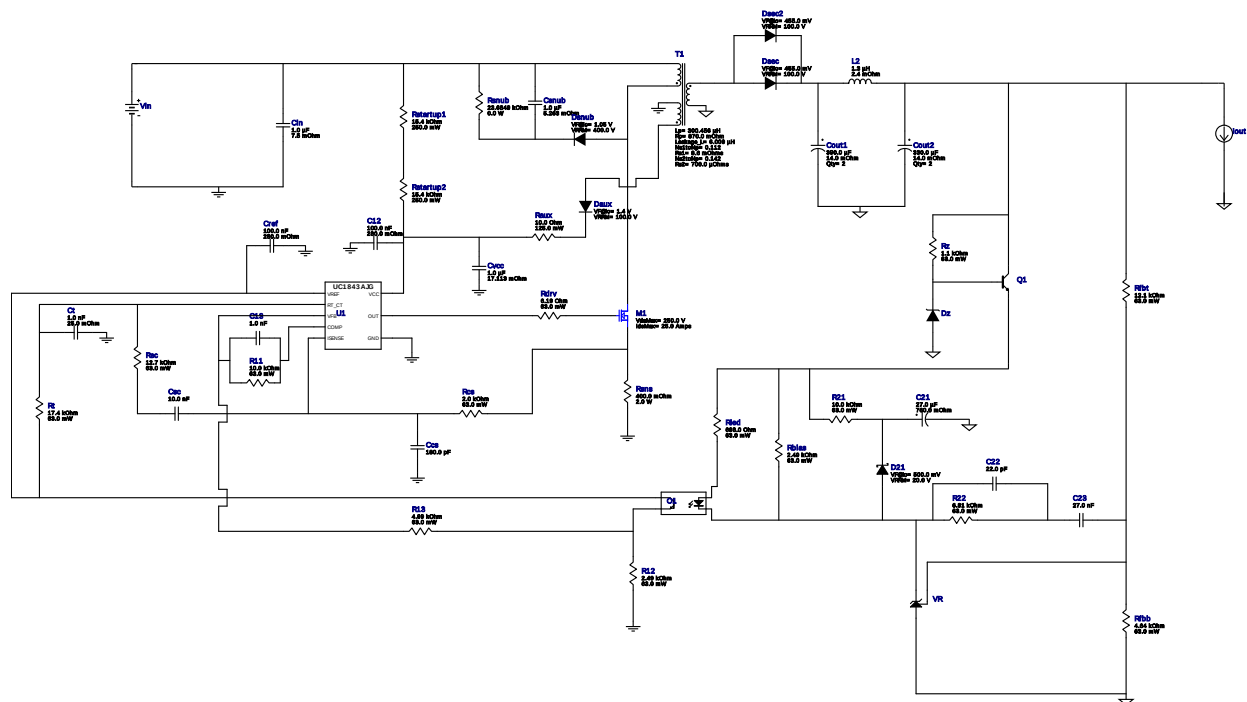
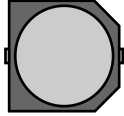
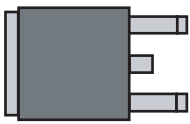
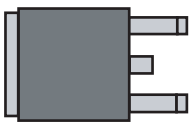




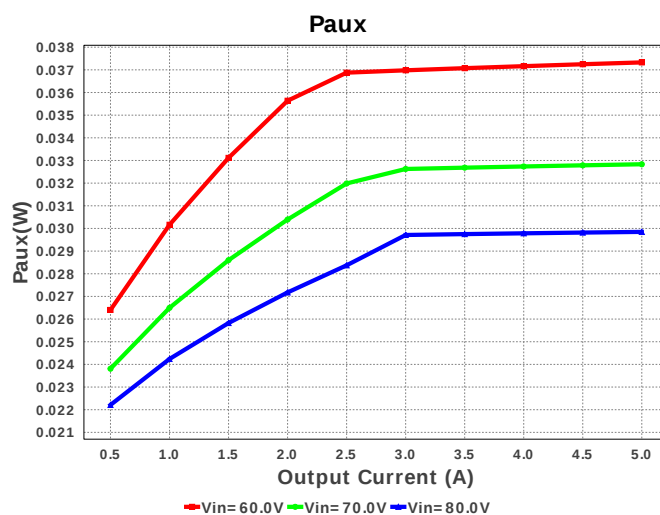
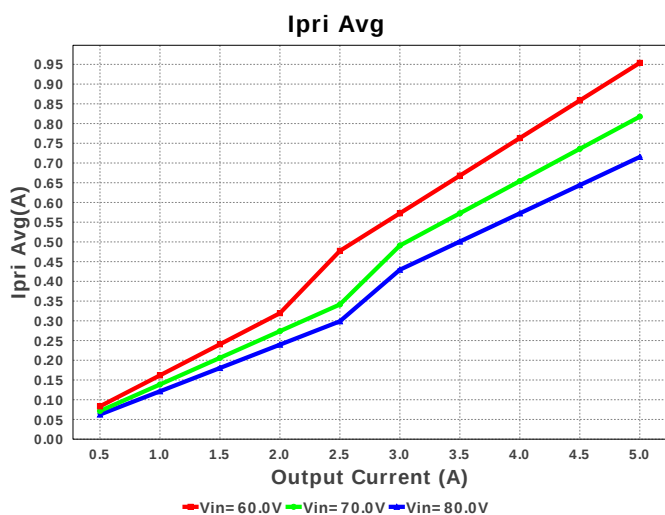
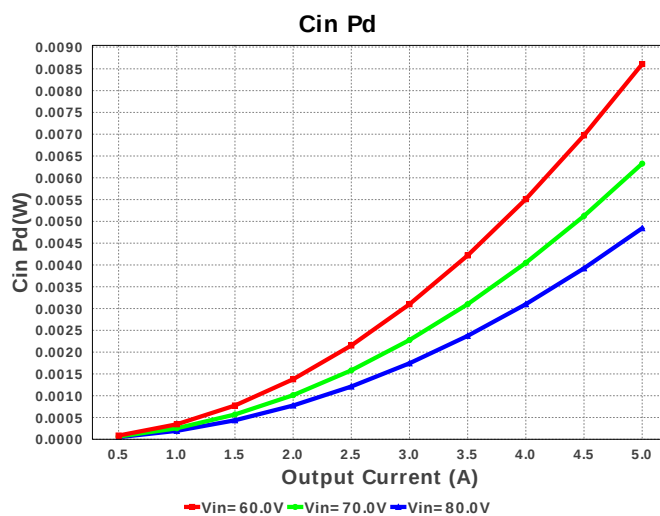
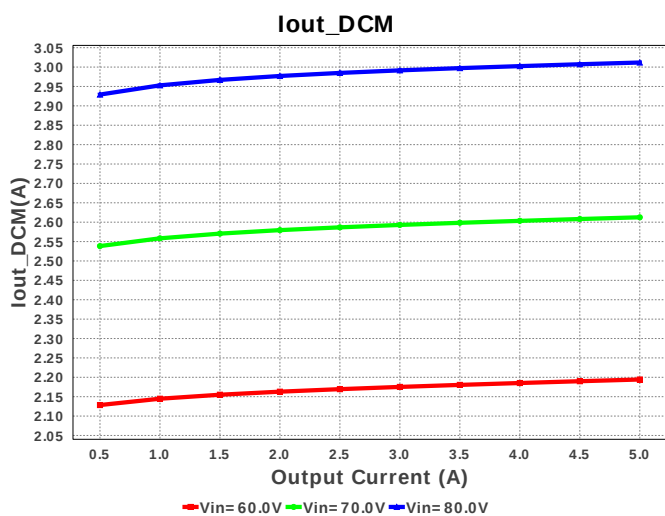
Electrical BOM

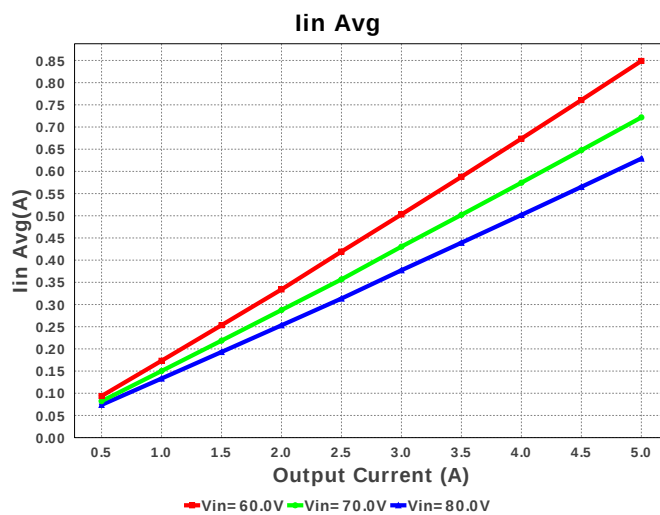
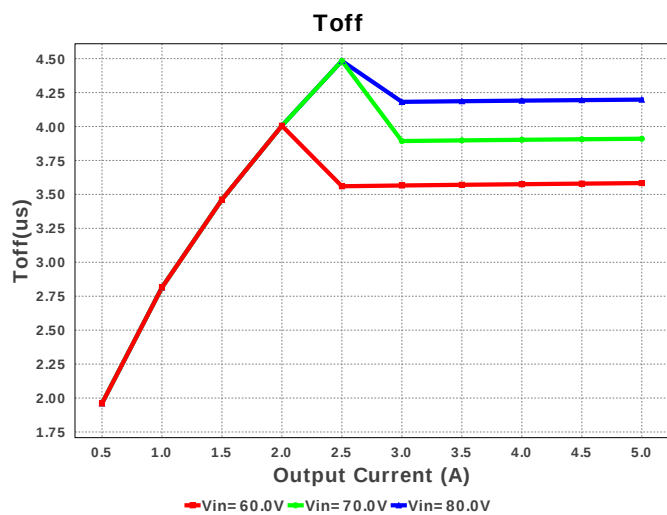
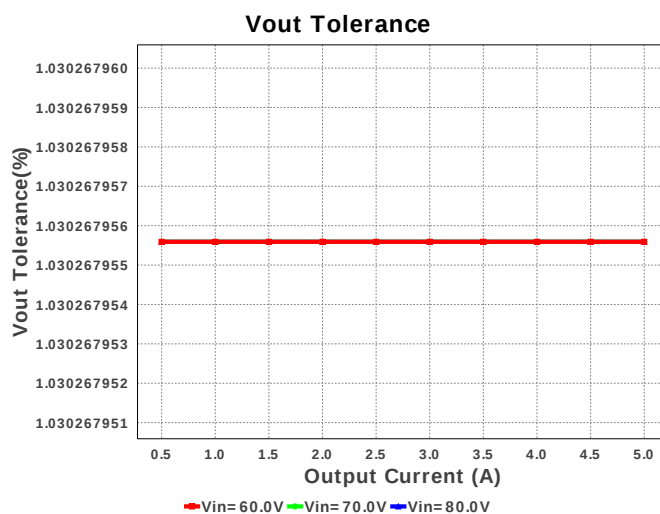
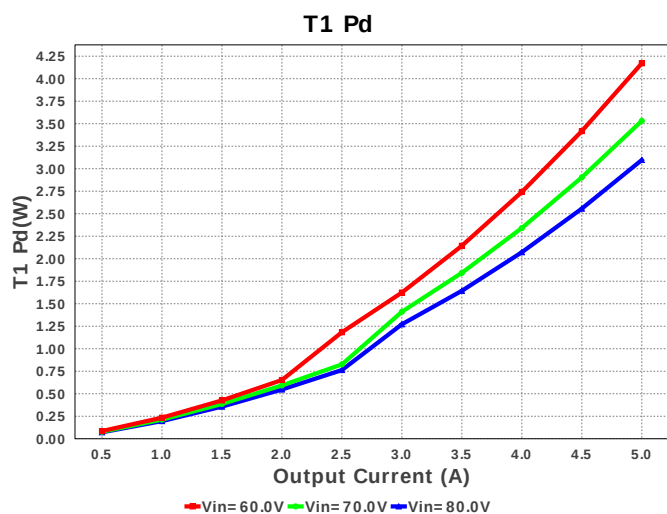
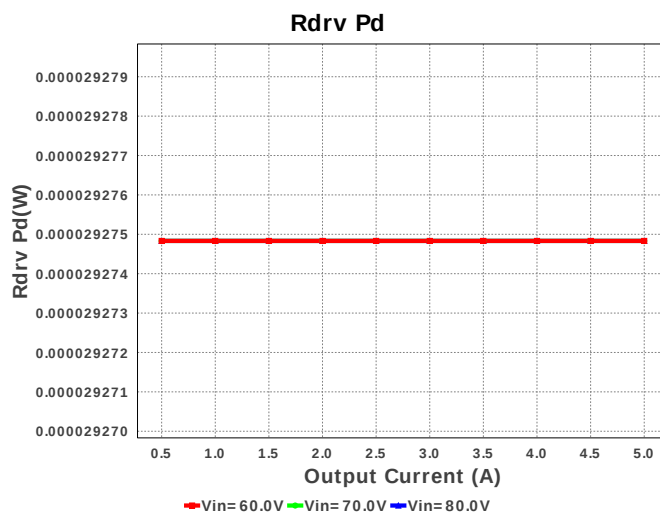
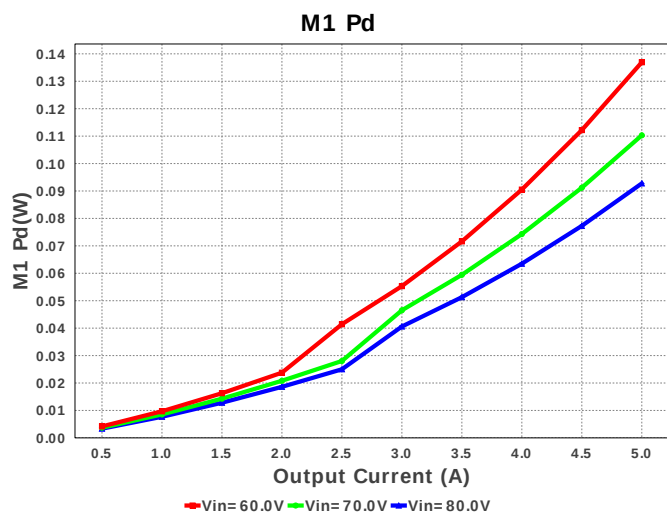
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1.	C12	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
2.	C13	Samsung Electro-Mechanics	CL21C102JBCNFNC Series= C0G/NP0	Cap= 1.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
3.	C21	Nichicon	UUD1C270MCL1GS Series= uD	Cap= 27.0 uF ESR= 760.0 mOhm VDC= 16.0 V IRMS= 150.0 mA	1	\$0.10	SM_RADIAL_5MM 58 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	Yageo America	CC0805KRX7R9BB273 Series= X7R	Cap= 27.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 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
7.	Cin	TDK	C3216X7R2A105M160AA Series= X7R	Cap= 1.0 uF ESR= 7.5 mOhm VDC= 100.0 V IRMS= 5.9235 A	1	\$0.11	1206 11 mm ²

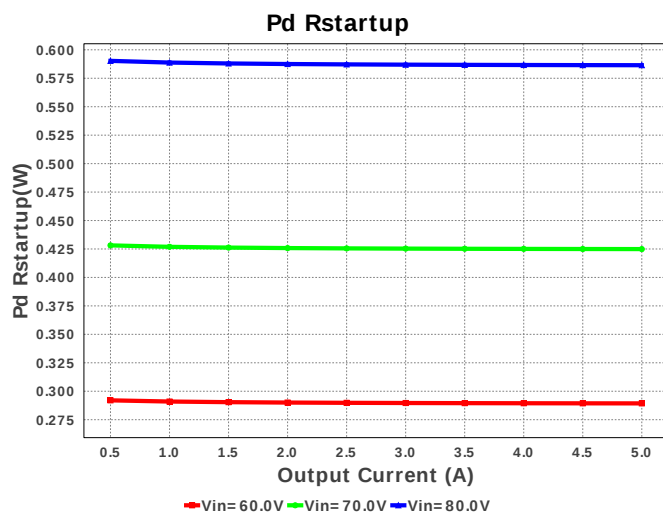
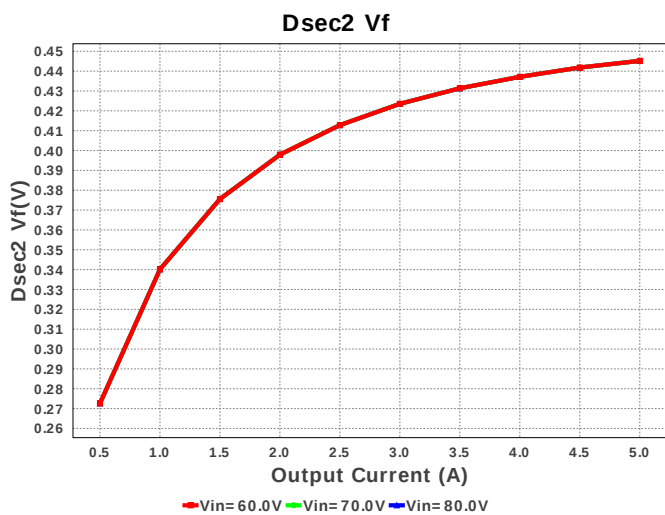
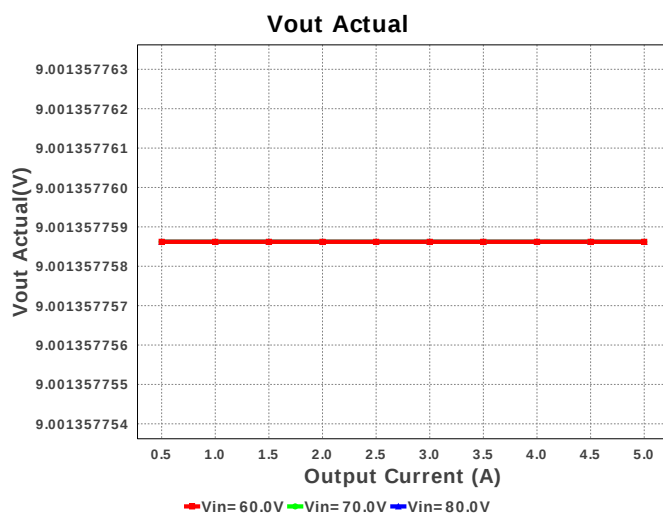
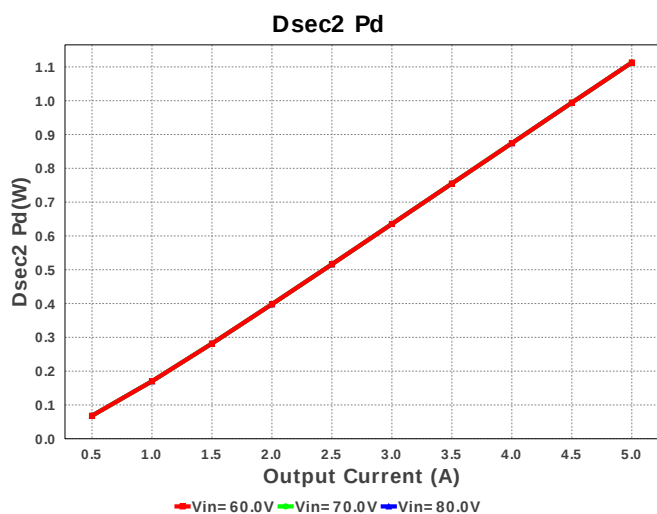
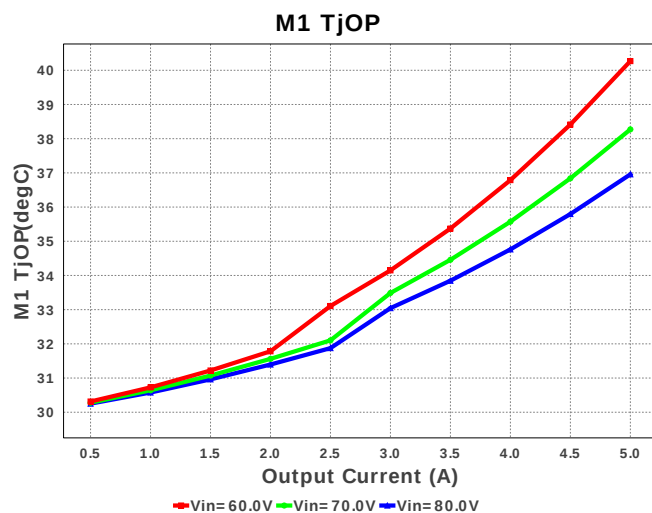
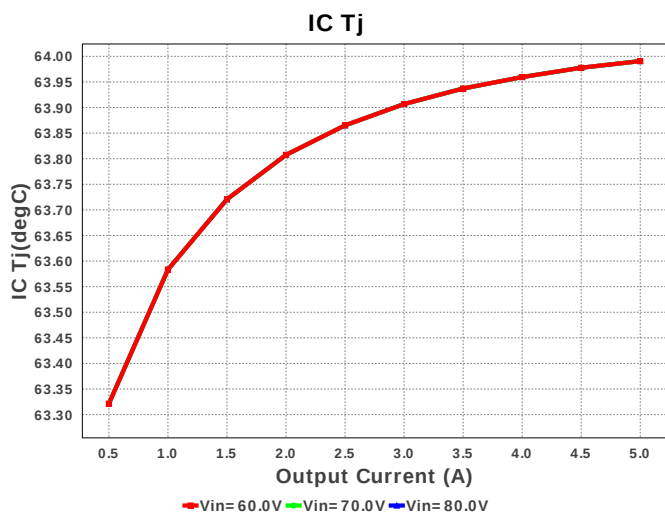
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
8.	Cout1	Panasonic	20SVPF390M Series= SVPF	Cap= 390.0 uF ESR= 14.0 mOhm VDC= 20.0 V IRMS= 4.95 A	2	\$0.63	 CAPSMT_62_E12 106 mm²
9.	Cout2	Panasonic	25SVPF330M Series= SVPF	Cap= 330.0 uF ESR= 14.0 mOhm VDC= 25.0 V IRMS= 5.0 A	2	\$0.70	 CAPSMT_62_F12 151 mm²
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 mm²
11.	Csc	MuRata	GRM216R71H103KA01D Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm²
12.	Csnub	TDK	C5750X6S2W105K Series= X6S	Cap= 1.0 uF ESR= 5.263 mOhm VDC= 400.0 V IRMS= 0.0 A	1	\$1.19	 2220 54 mm²
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 mm²
14.	Cvcc	MuRata	GRM188R61E105KA12D Series= X5R	Cap= 1.0 uF ESR= 17.113 mOhm VDC= 25.0 V IRMS= 979.39 mA	1	\$0.01	 0603 5 mm²
15.	D21	Diodes Inc.	B220-13-F	VF@Io= 500.0 mV VRRM= 20.0 V	1	\$0.08	 SMB 44 mm²
16.	Daux	NXP Semiconductor	BAS316,115	VF@Io= 1.4 V VRRM= 100.0 V	1	\$0.02	 SOD-323 9 mm²
17.	Dsec	STMicroelectronics	STPS20M100SG-TR	VF@Io= 455.0 mV VRRM= 100.0 V	1	\$1.33	 DDPAK 210 mm²
18.	Dsec2	STMicroelectronics	STPS20M100SG-TR	VF@Io= 455.0 mV VRRM= 100.0 V	1	\$1.33	 DDPAK 210 mm²
19.	Dsnub	Bourns	CD1408-FU1400	VF@Io= 1.05 V VRRM= 400.0 V	1	\$0.13	 Diode_1408 13 mm²
20.	Dz	ON Semiconductor	BZX84C6V2LT1G	Zener	1	\$0.02	 SOT-23 14 mm²
21.	L2	Coilcraft	MLC1250-132MLB	L= 1.3 uH DCR= 2.4 mOhm	1	\$0.79	 MLC1250 165 mm²
22.	M1	Infineon Technologies	BSC600N25NS3 G	VdsMax= 250.0 V IdsMax= 25.0 Amps	1	\$1.41	 PG-TDSON-8 55 mm²
23.	O1	Vishay-Semiconductor	TCMT1107	Optocoupler	1	\$0.21	 SOP-4 44 mm²

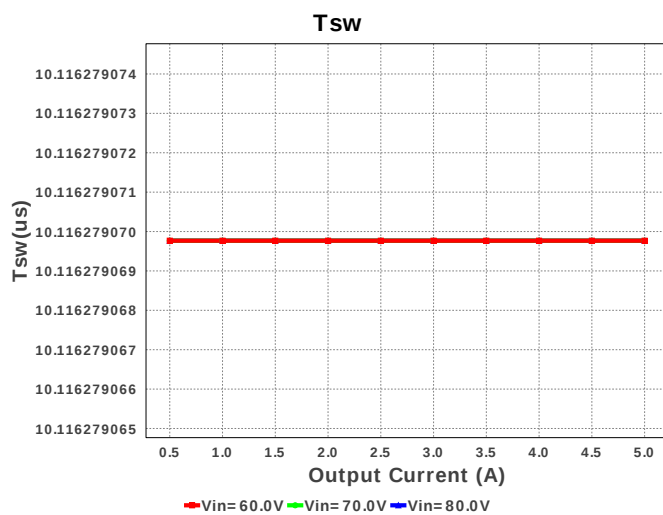
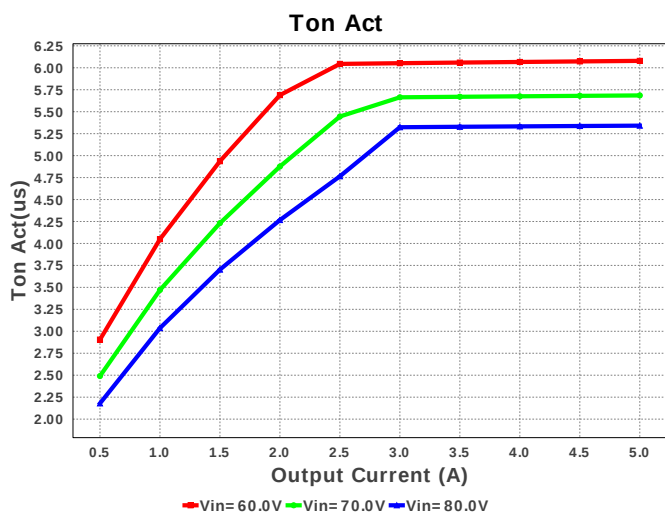
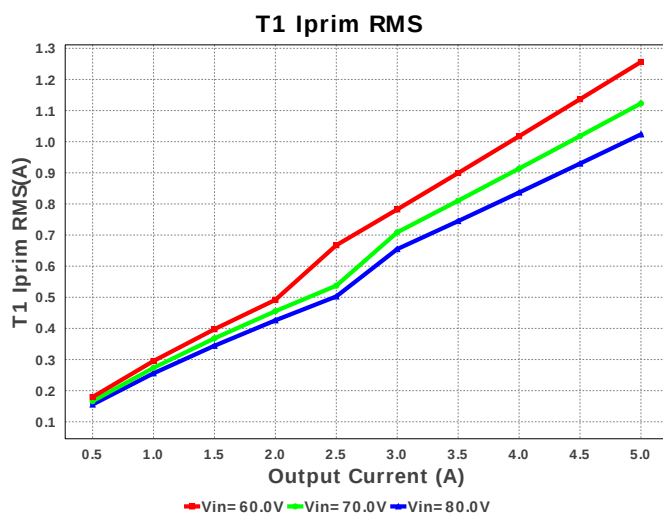
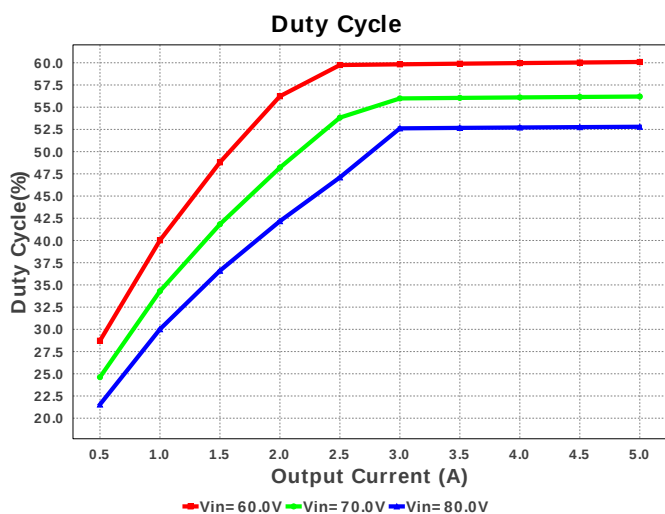
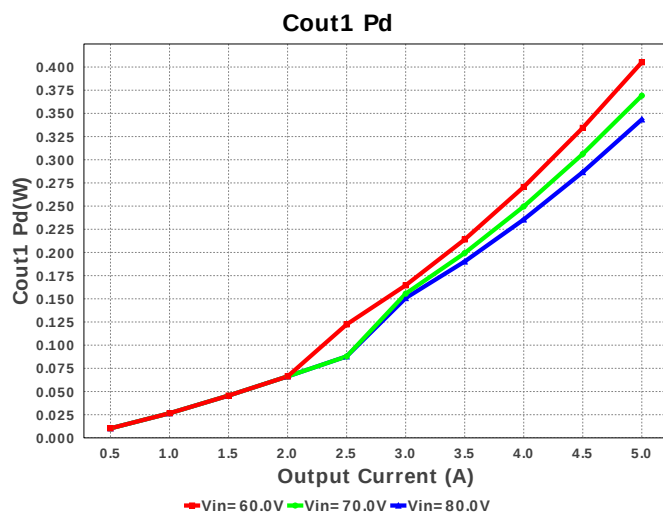
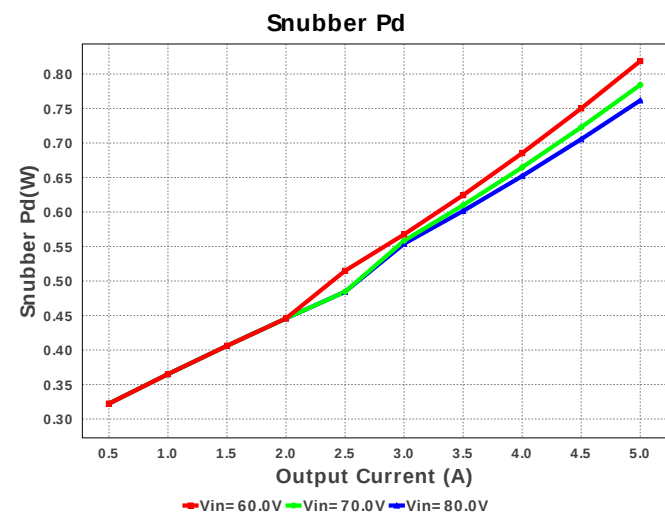
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
24.	Q1	ON Semiconductor	BC848CLT1G	Bipolar Transistor	1	\$0.02	 SOT-23 14 mm ²
25.	R11	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
26.	R12	Vishay-Dale	CRCW04022K49FKED Series= CRCW..e3	Res= 2.49 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	CRCW04026K81FKED Series= CRCW..e3	Res= 6.81 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
30.	Raux	Vishay-Dale	CRCW080510R0FKEA Series= CRCW..e3	Res= 10.0 Ohm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
31.	Rbias	Vishay-Dale	CRCW04022K49FKED Series= CRCW..e3	Res= 2.49 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 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	Vishay-Dale	CRCW04024K64FKED Series= CRCW..e3	Res= 4.64 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
35.	Rfbt	Vishay-Dale	CRCW040212K1FKED Series= CRCW..e3	Res= 12.1 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
36.	Rled	Vishay-Dale	CRCW0402698RFKED Series= CRCW..e3	Res= 698.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
37.	Rsc	Vishay-Dale	CRCW040212K7FKED Series= CRCW..e3	Res= 12.7 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
38.	Rsns	Stackpole Electronics Inc	CSRN2512FKR400 Series= ?	Res= 400.0 mOhm Power= 2.0 W Tolerance= 1.0%	1	\$0.13	 2512 43 mm ²
39.	Rsns	CUSTOM	CUSTOM Series= ?	Res= 23.6849 kOhm Power= 0.0 W Tolerance= 0.0%	1	NA	CUSTOM 0 mm ²
40.	Rstartup1	Panasonic	ERJ-8ENF1542V Series= ERJ-8E	Res= 15.4 kOhm Power= 250.0 mW Tolerance= 1.0%	1	\$0.01	 1206 11 mm ²
41.	Rstartup2	Panasonic	ERJ-8ENF1542V Series= ERJ-8E	Res= 15.4 kOhm Power= 250.0 mW Tolerance= 1.0%	1	\$0.01	 1206 11 mm ²
42.	Rt	Vishay-Dale	CRCW040217K4FKED Series= CRCW..e3	Res= 17.4 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
43.	Rz	Vishay-Dale	CRCW04021K10FKED Series= CRCW..e3	Res= 1.1 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²

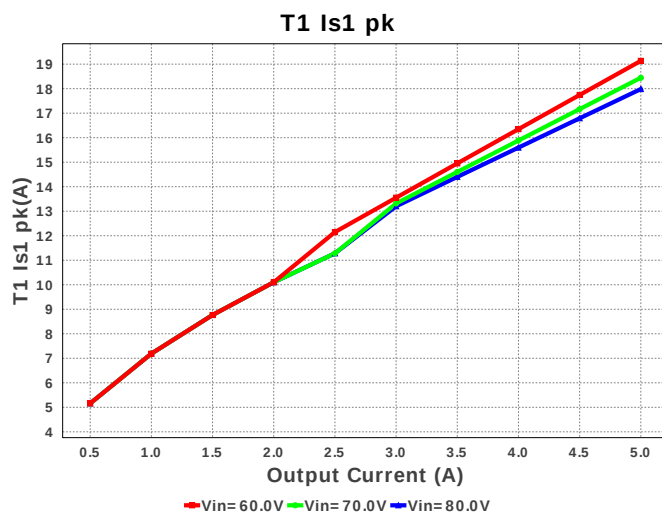
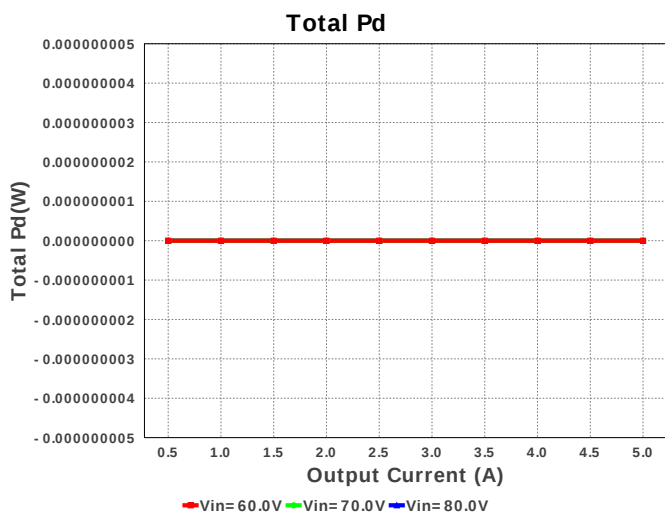
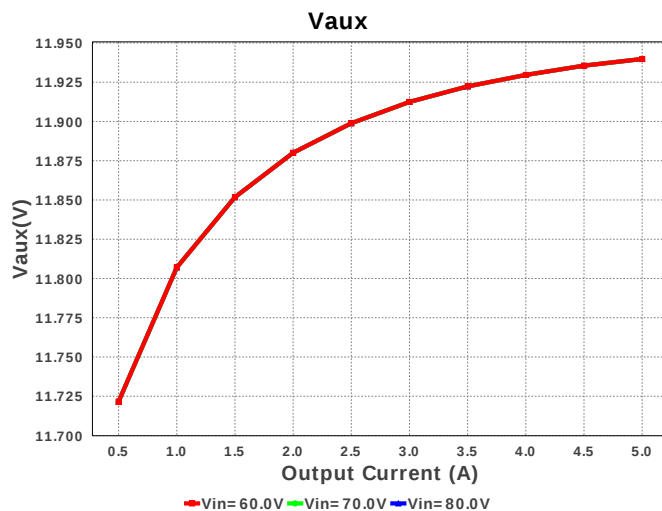
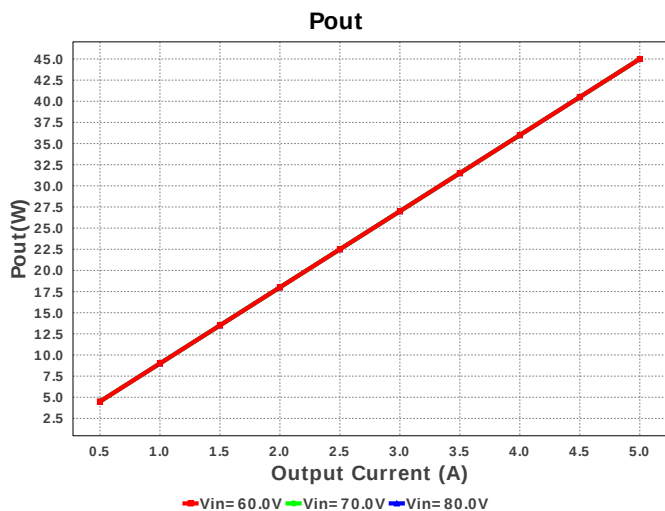
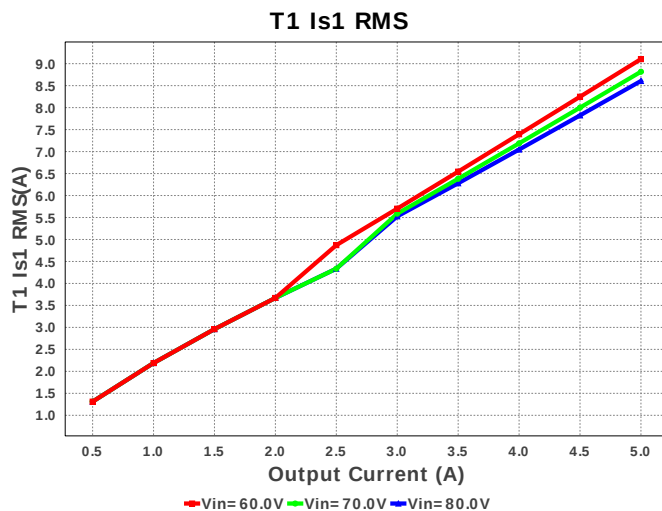
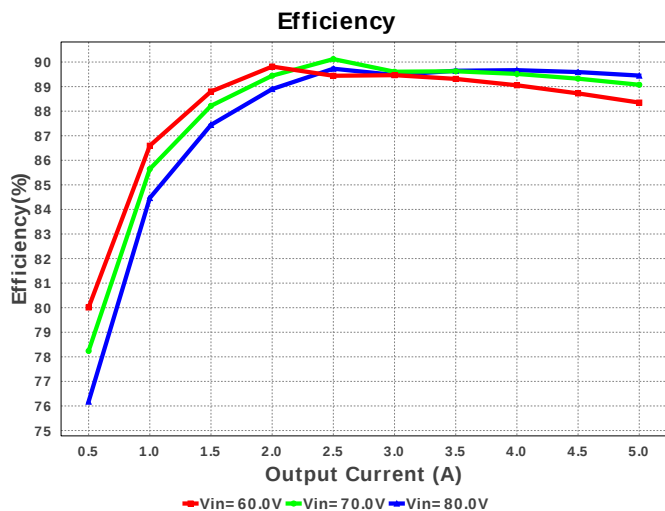
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
44.	T1	CUSTOM	CUSTOM	Lp= 300.456 μ H Rp= 870.0 mOhm Leakage_L= 6.009 μ H Ns1toNp= 0.112 Rs1= 8.6 mOhms Ns2toNp= 0.142 Rs2= 700.0 μ Ohms	1	NA	CUSTOM 0 mm ²
45.	U1	Texas Instruments	UC1843AJ	Switcher	1	NA	
46.	VR	Texas Instruments	TL431AIDBZR	Voltage References	1	\$0.08	JG0008A 111 mm ² DBZ0003A 14 mm ²

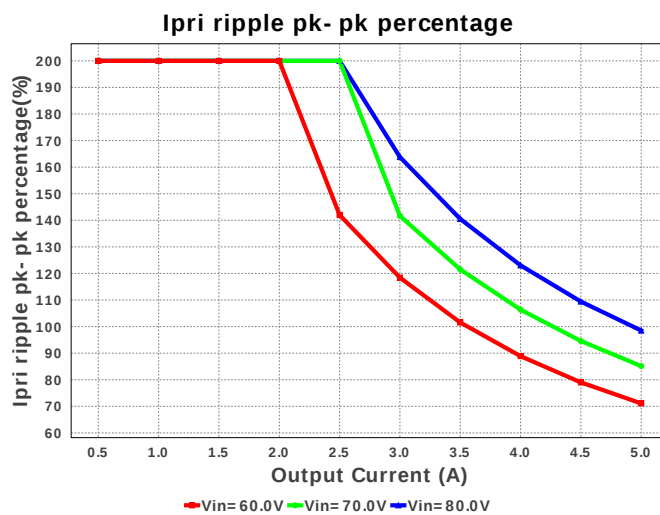
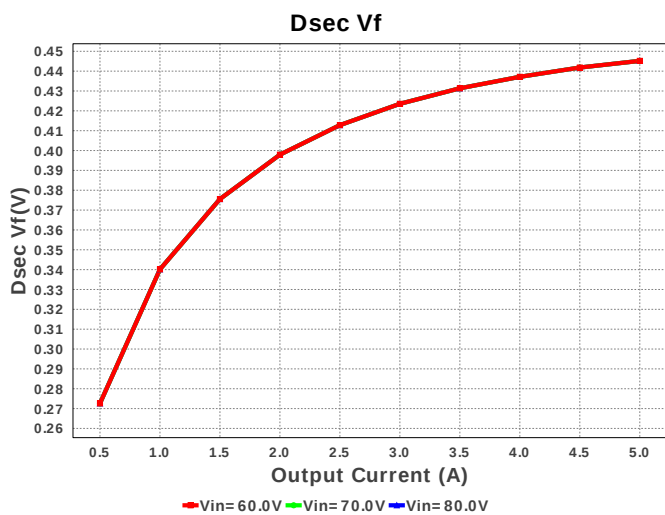
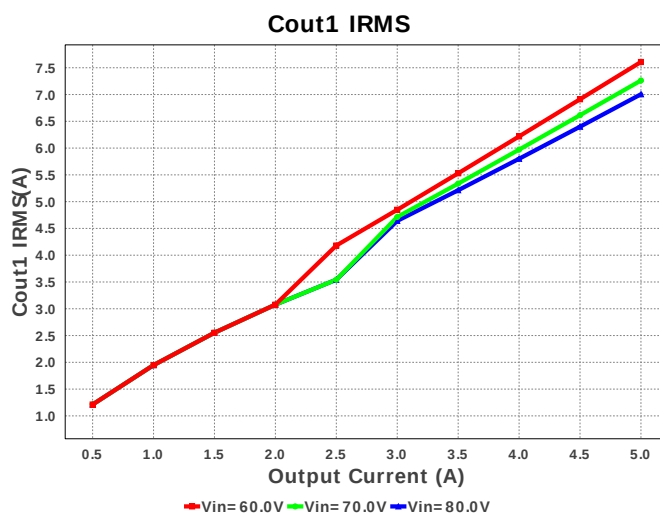
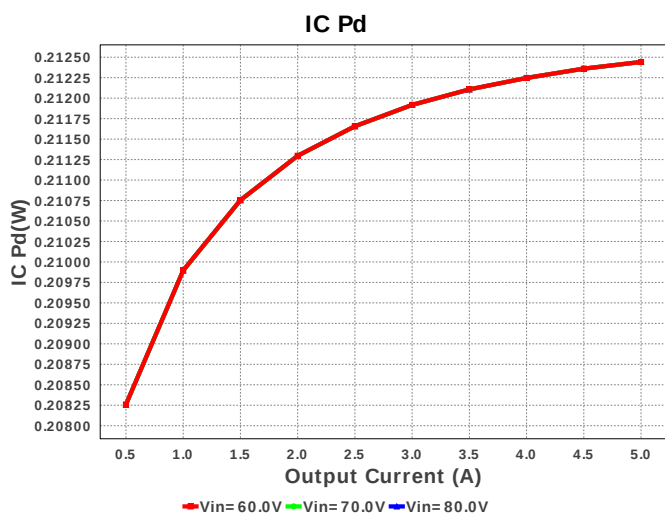
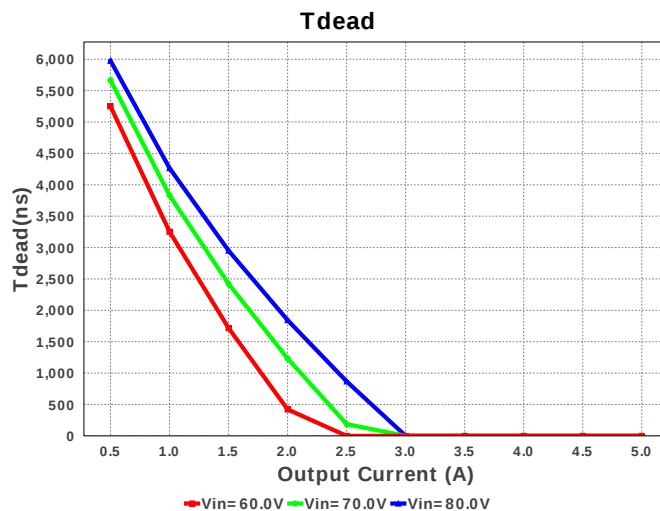
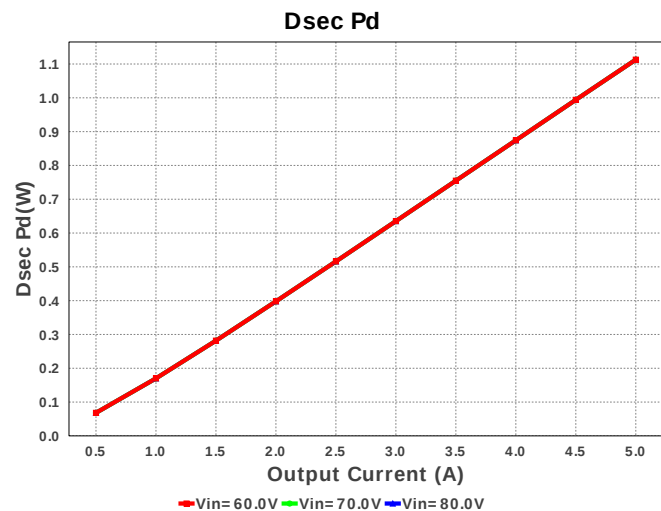


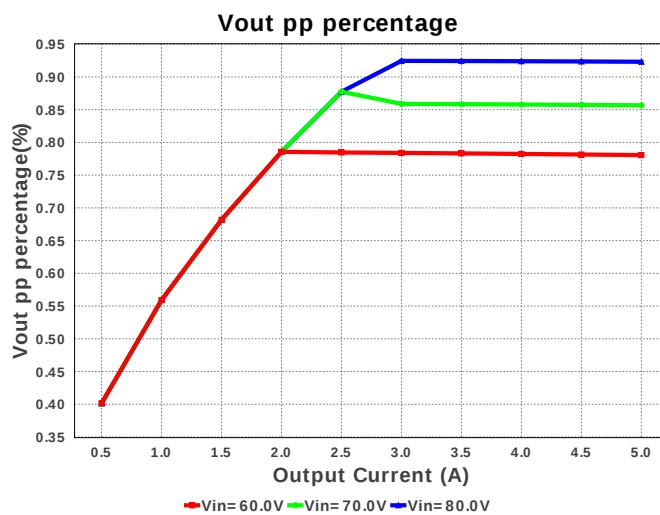
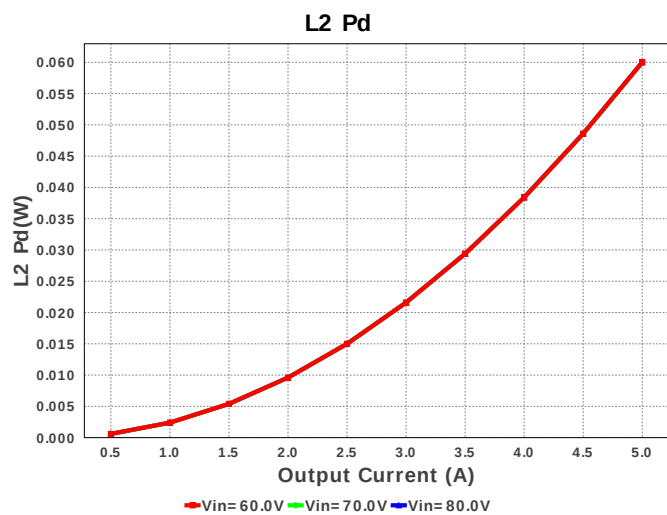
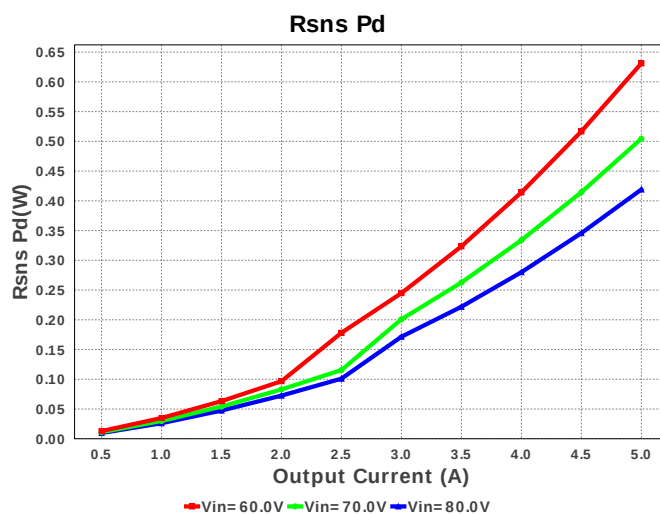
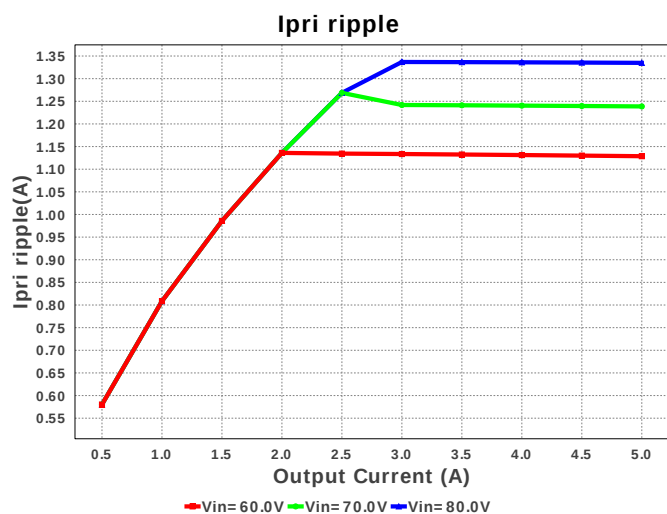
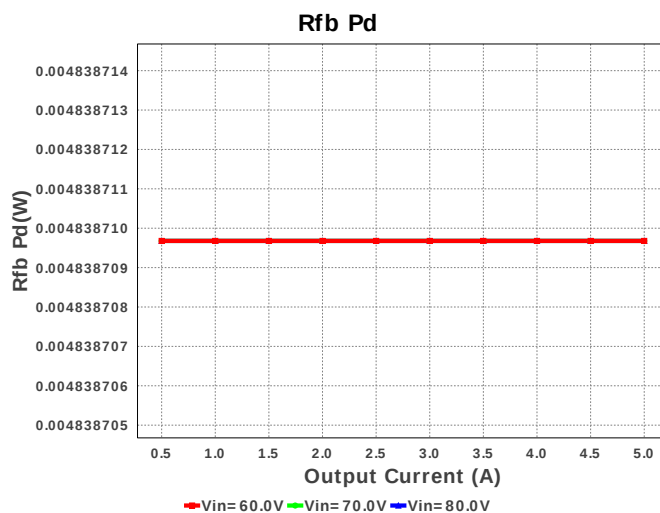
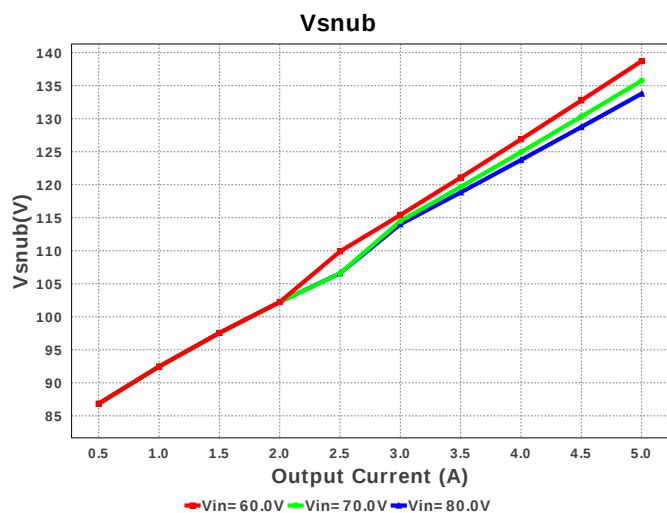


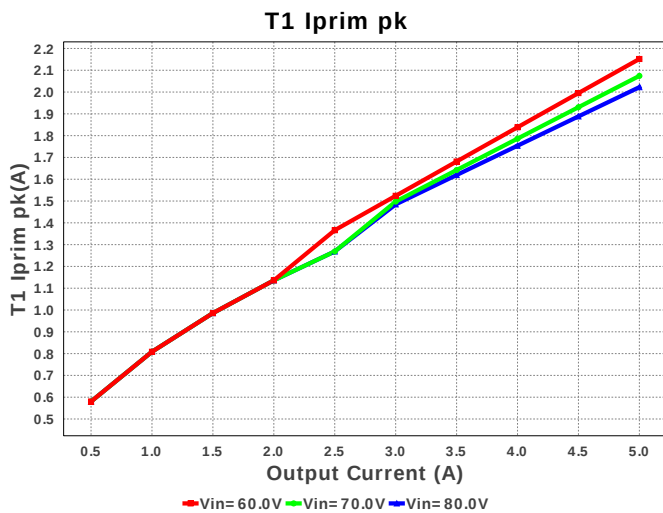
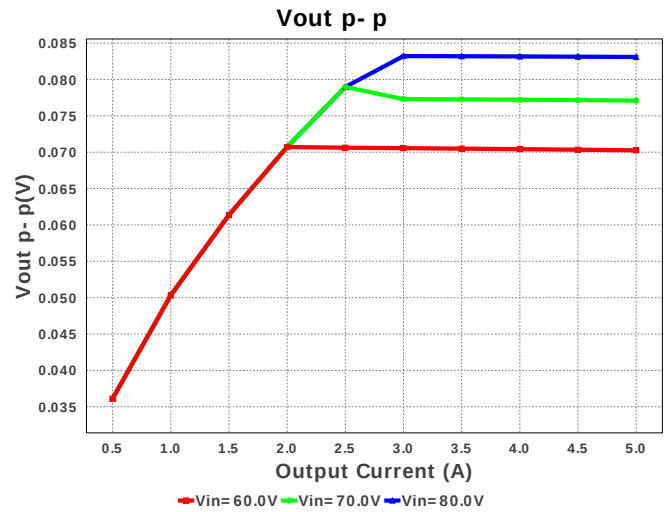
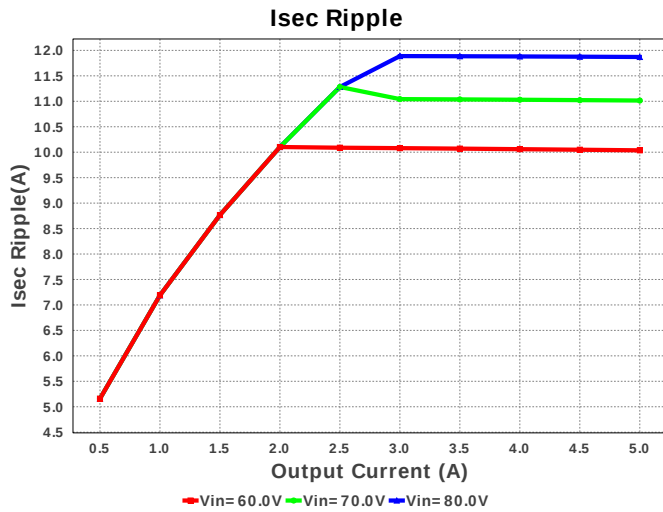












Operating Values

#	Name	Value	Category	Description
1.	Cout1 IRMS	7.608 A	Current	Output capacitor1 RMS ripple current
2.	Iin Avg	848.905 mA	Current	Average input current
3.	Iout_DCM	2.194 A	Current	Approximate Current below which DCM mode of operation will begin
4.	Ipri Avg	953.823 mA	Current	Average Current in Primary Winding over the complete Switching Period
5.	Ipri ripple	1.129 A	Current	Ripple Current in the Primary Winding
6.	Ipri ripple pk-pk percentage	71.104 %	Current	Primary Current pk-pk ripple percentage(of Ipri avg during ton only)
7.	Isec Ripple	10.037 A	Current	Ripple Current in the Secondary Winding
8.	T1 Iprim RMS	1.256 A	Current	Transformer Primary RMS Current
9.	T1 Iprim pk	2.152 A	Current	Transformer Primary Peak Current
10.	T1 Is1 RMS	9.104 A	Current	Transformer Secondary1 RMS Current
11.	T1 Is1 pk	19.134 A	Current	Transformer Secondary1 Peak Current
12.	BOM Count	48	General	Total Design BOM count
13.	Daux trr	4.0 ns	General	Auxiliary Diode Reverse Recovery Time
14.	Dsec Vf	445.177 mV	General	Effective Forward Voltage Drop at the Operating Current
15.	Dsec trr	0.0 ns	General	Output Diode Reverse Recovery Time
16.	Dsec2 Vf	445.177 mV	General	Effective Forward Voltage Drop at the Operating Current
17.	Dsnub trr	35.0 ns	General	Snubber Diode Reverse Recovery Time
18.	FootPrint	1.723 k mm ²	General	Total Foot Print Area of BOM components
19.	Frequency	98.851 kHz	General	Switching frequency
20.	Pout	45.0 W	General	Total output power
21.	Tdead	0.0 ns	General	Approximate Dead Time of the Regulator
22.	Toff	3.583 us	General	Approximate Converter Off Time
23.	Ton Act	6.079 us	General	Approximate Converter On Time
24.	Total BOM	\$0.0	General	Total BOM Cost
25.	Tsw	10.116 us	General	Switching Time Period
26.	Vaux	11.94 V	General	Auxiliary Voltage
27.	Vsnub	138.725 V	General	Voltage Across the Snubber
28.	Vout Actual	9.001 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
29.	Vout OP	9.0 V	Op_Point	Operational Output Voltage

#	Name	Value	Category	Description
30.	Duty Cycle	60.088 %	Op_point	Duty cycle
31.	Efficiency	88.349 %	Op_point	Steady state efficiency
32.	IC Tj	63.991 degC	Op_point	IC junction temperature
33.	ICThetaJA	160.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
34.	IOUT_OP	5.0 A	Op_point	Iout operating point
35.	M1 TjOP	40.269 degC	Op_point	M1 MOSFET junction temperature
36.	Vout p-p	70.258 mV	Op_point	Peak-to-peak output ripple voltage
37.	Cin Pd	8.61 mW	Power	Input capacitor power dissipation
38.	Cout1 Pd	405.132 mW	Power	Output capacitor1 power dissipation
39.	Dsec Pd	1.113 W	Power	Secondary Diode Power Dissipation
40.	Dsec2 Pd	1.113 W	Power	Secondary Diode Power Dissipation
41.	IC Pd	212.442 mW	Power	IC power dissipation
42.	L2 Pd	60.0 mW	Power	Average Power Dissipation in the Inductor Over the AC Line Period
43.	M1 Pd	136.916 mW	Power	M1 MOSFET total power dissipation
44.	Paux	37.328 mW	Power	Power Dissipation in Raux and Daux
45.	Pd Rstartup	289.326 mW	Power	Power Dissipation in Rstartup1 and Rstartup2
46.	Rdrv Pd	29.275 μ W	Power	Power Dissipation in Gate Drive Resistor
47.	Rfb Pd	4.839 mW	Power	Rfb Power Dissipation
48.	Rsns Pd	631.145 mW	Power	Current Limit Sense Resistor Power Dissipation
49.	Snubber Pd	818.682 mW	Power	Snubber Power Dissipation
50.	T1 Pd	4.171 W	Power	Estimated Losses in Transformer
51.	Total Pd	0.0 W	Power	Total Power Dissipation
52.	Vout Tolerance	1.03 %		Vout Tolerance based on IC Tolerance and voltage divider resistors if applicable
53.	Vout pp percentage	780.647 m%		Output Voltage ripple percentage

Design Inputs

#	Name	Value	Description
1.	Iout	5.0	Maximum Output Current
2.	VinMax	80.0	Maximum input voltage
3.	VinMin	60.0	Minimum input voltage
4.	Vout	9.0	Output Voltage
5.	base_pn	UC1843A	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	Ambient temperature

Design Assistance

1. UC1843A Product Folder : <http://www.ti.com/lit/ds/symlink/uc1842a.pdf> : contains the data sheet and other resources.

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