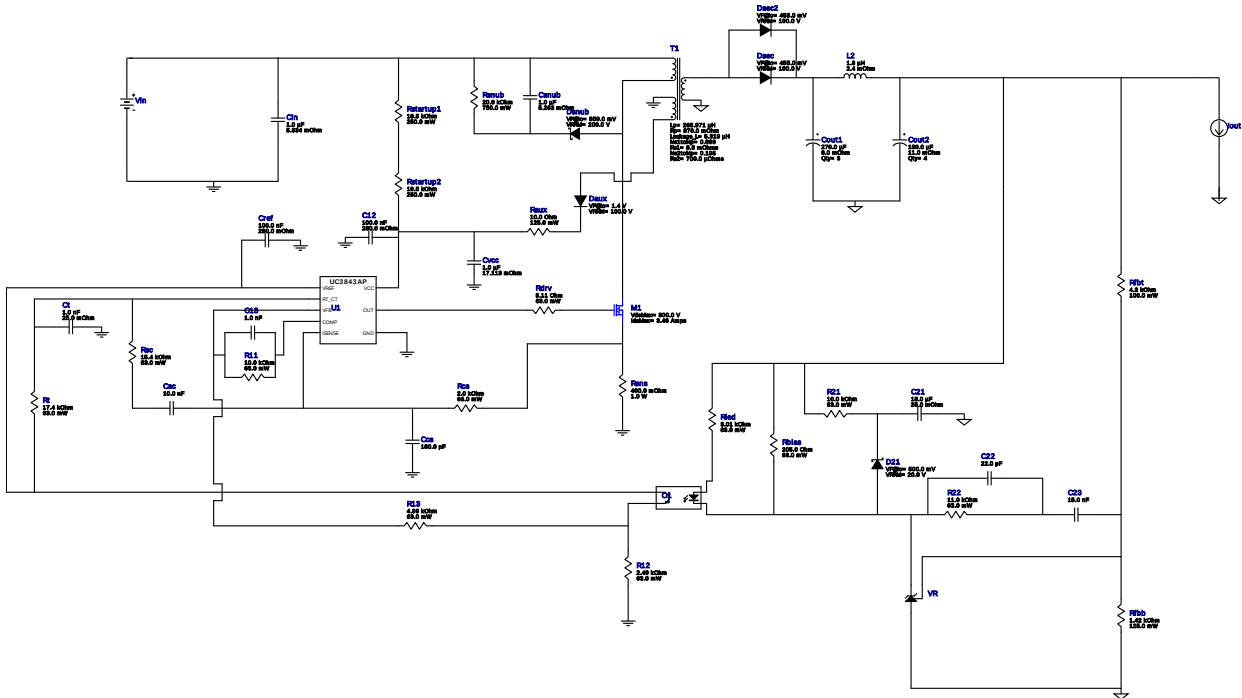
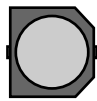
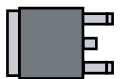


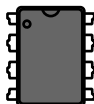
WEBENCH® Design Report

Design : 4766763/4 UC3843AN
UC3843AN 44.0V-56.0V to 5.00V @ 5.0A


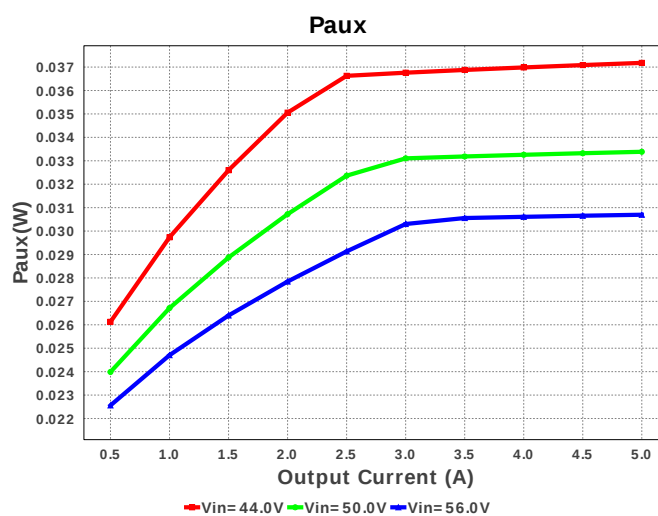
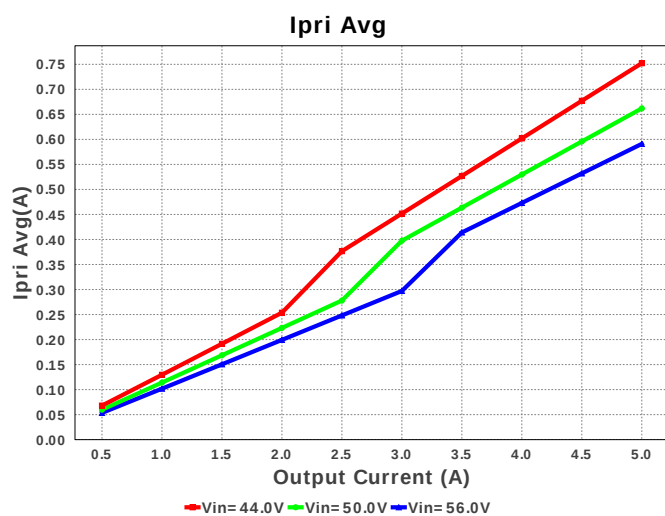
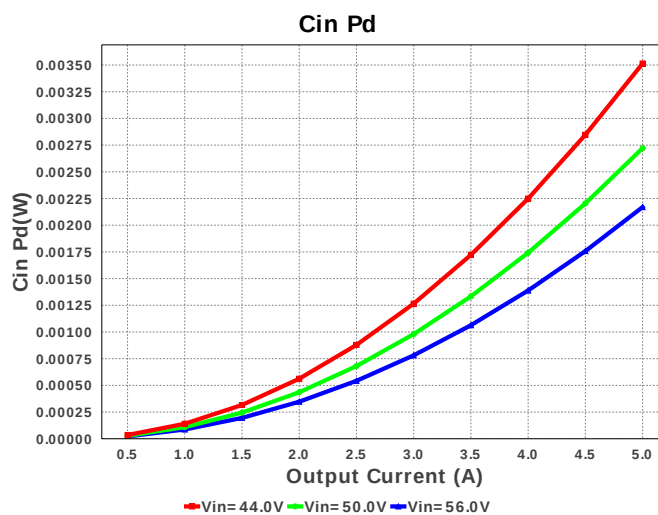
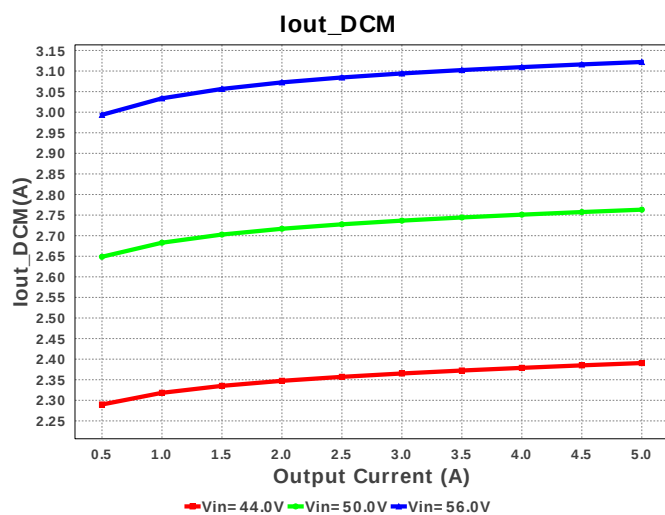
Electrical BOM

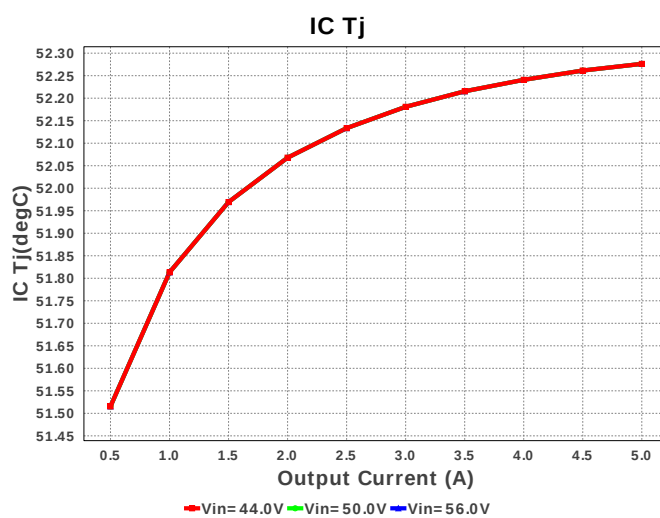
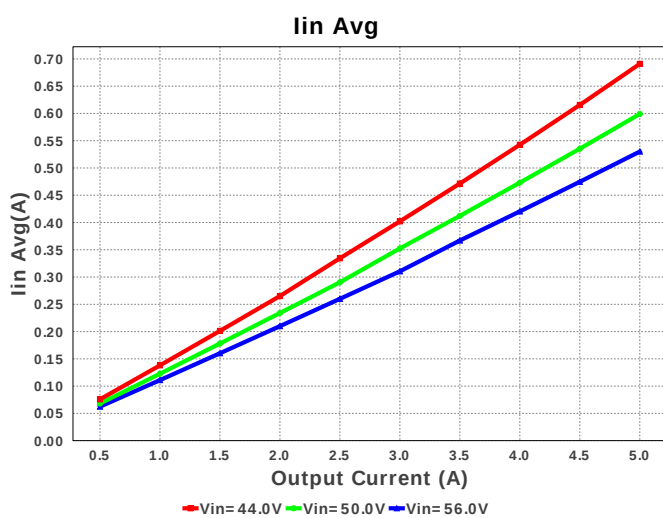
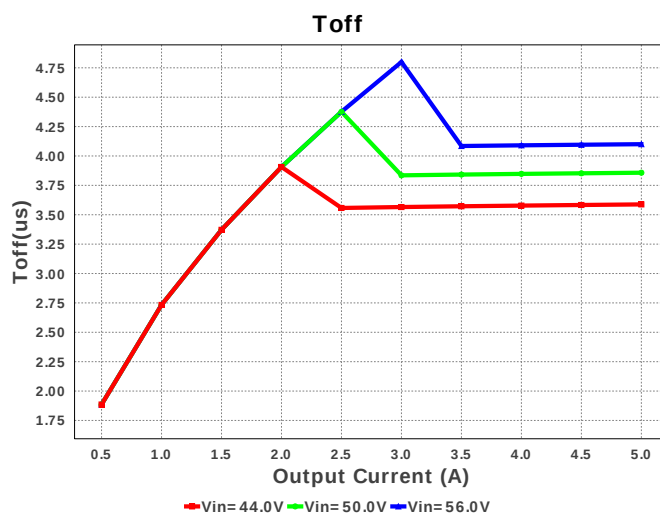
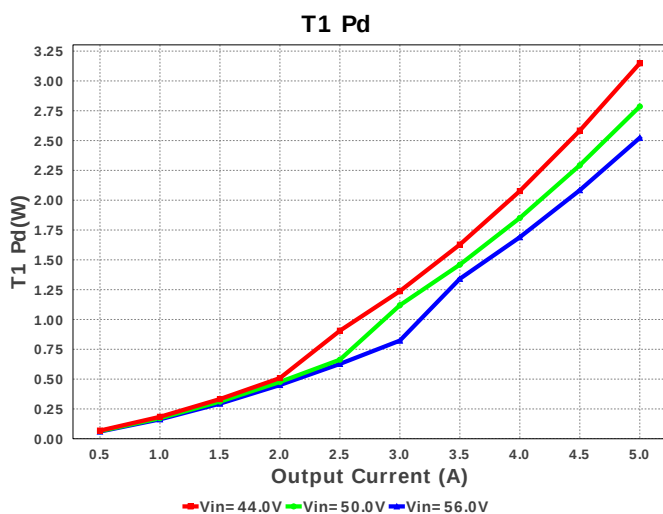
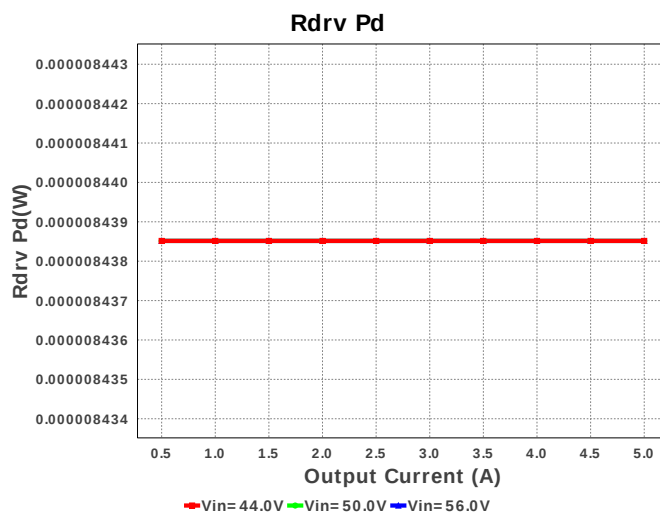
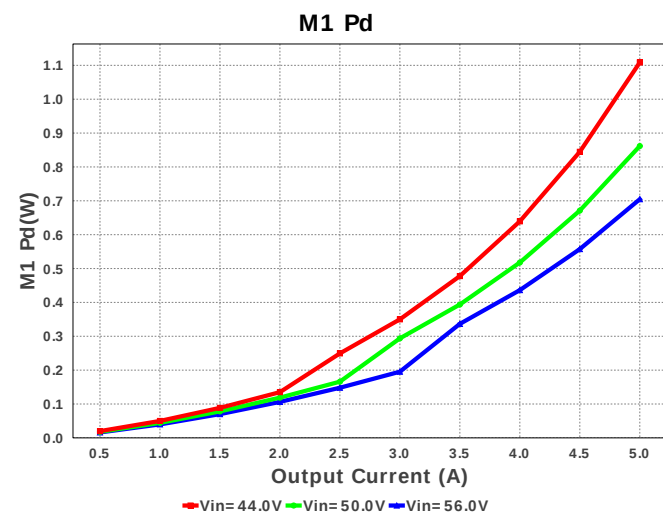
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	C12	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
2.	C13	Samsung Electro-Mechanics	CL21C102JBCNFNC Series= C0G/NP0	Cap= 1.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
3.	C21	Panasonic	50SVPF18M Series= ?	Cap= 18.0 uF ESR= 35.0 mOhm VDC= 50.0 V IRMS= 2.7 A	1	\$0.53	 CAPSMT_62_E7 106 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	CC0805KRX7R9BB153 Series= X7R	Cap= 15.0 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	MuRata	GRM31CR72A105KA01L Series= X7R	Cap= 1.0 uF ESR= 5.334 mOhm VDC= 100.0 V IRMS= 1.55432 A	1	\$0.11	 1206_190 11 mm ²

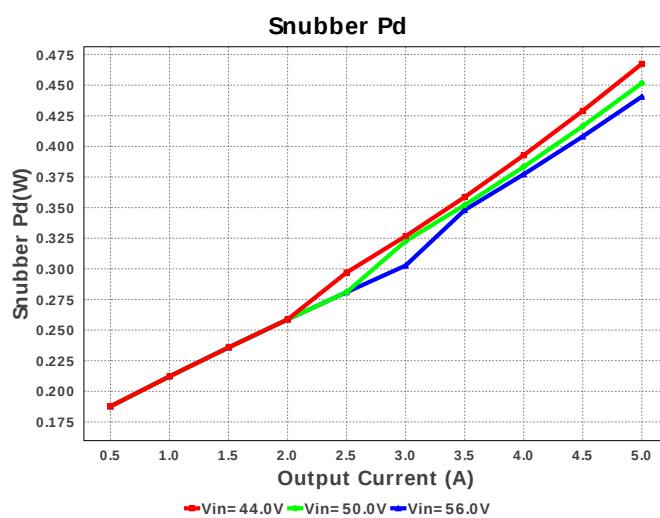
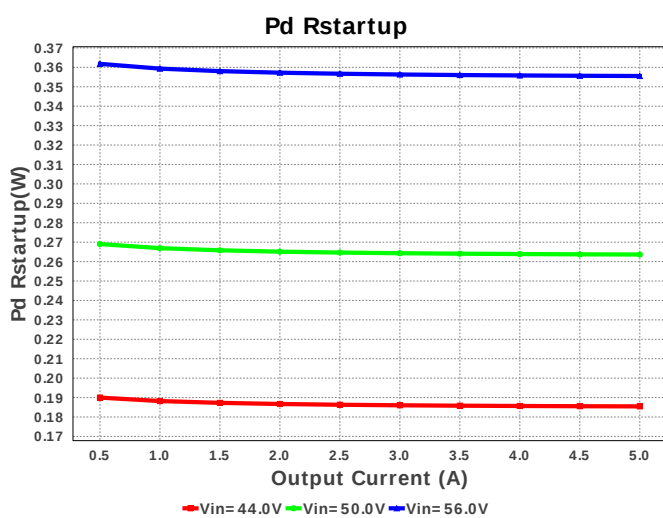
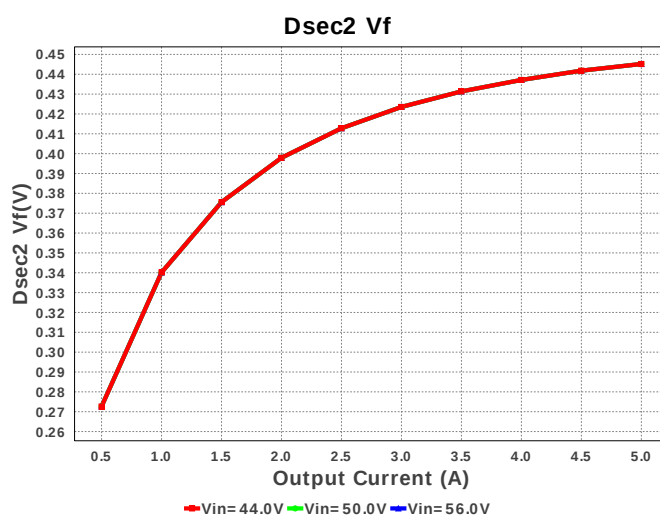
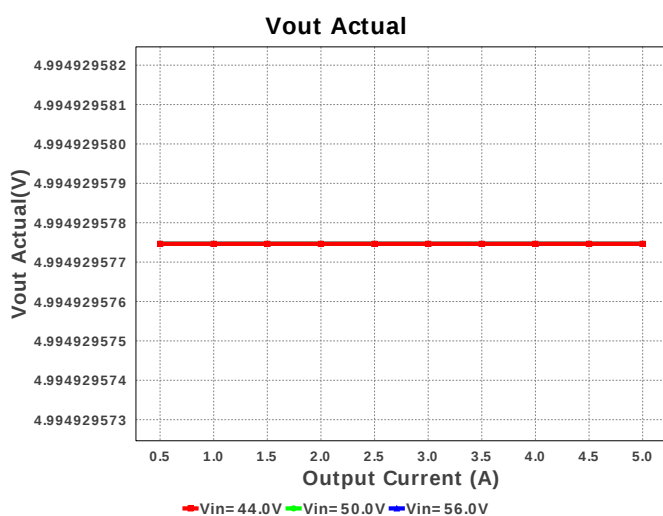
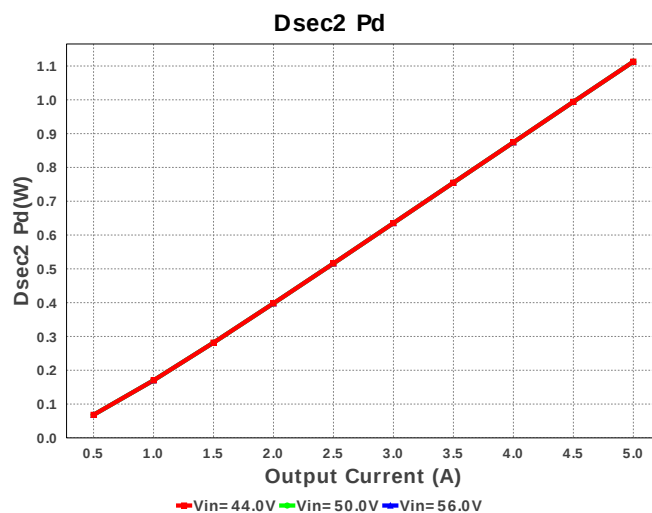
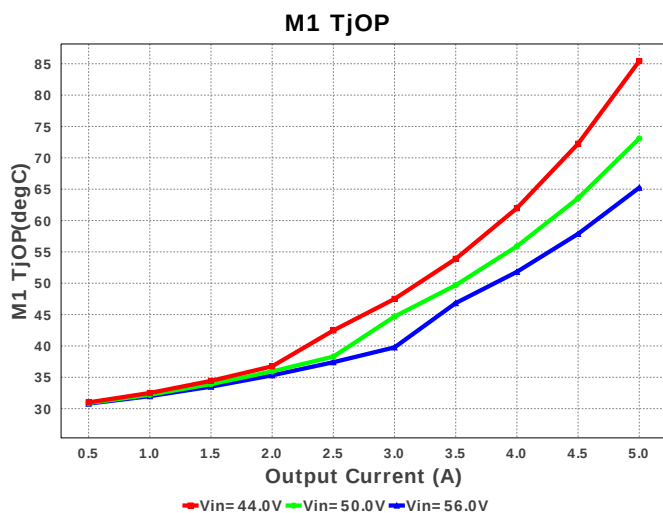
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8.	Cout1	Panasonic	16SVPG270M Series= ?	Cap= 270.0 uF ESR= 8.0 mOhm VDC= 16.0 V IRMS= 5.8 A	3	\$0.70	 CAPSMT_62_C10 74 mm²
9.	Cout2	Panasonic	16SVPE180M Series= SVPE	Cap= 180.0 uF ESR= 11.0 mOhm VDC= 16.0 V IRMS= 4.46 A	4	\$0.49	 CAPSMT_62_C10 74 mm²
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	Diodes Inc.	DFLS1200-7	VF@Io= 850.0 mV VRRM= 200.0 V	1	\$0.21	 PowerDI123 13 mm²
20.	L2	Coilcraft	MLC1250-132MLB	L= 1.3 uH DCR= 2.4 mOhm	1	\$0.79	 MLC1250 165 mm²
21.	M1	Fairchild Semiconductor	FQD7N30TM	VdsMax= 300.0 V IdsMax= 3.48 Amps	1	\$0.40	 DPAK 102 mm²
22.	O1	Vishay-Semiconductor	TCMT1109	Optocoupler	1	\$0.21	 SOP-4 44 mm²
23.	R11	Vishay-Dale	CRCW040210K0FKED Series= CRCW.e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²

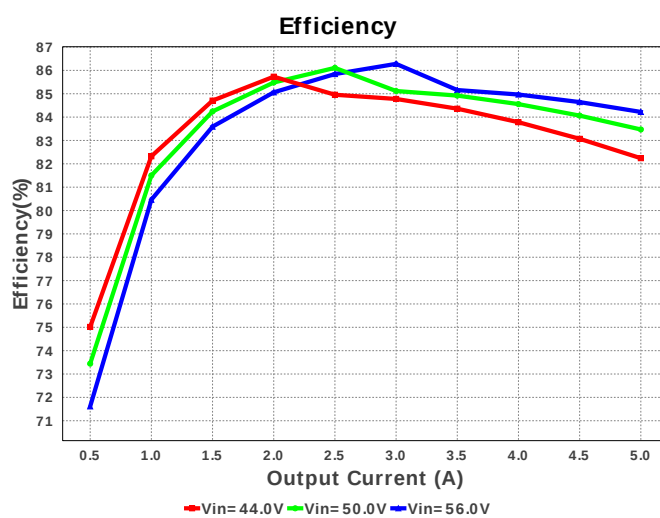
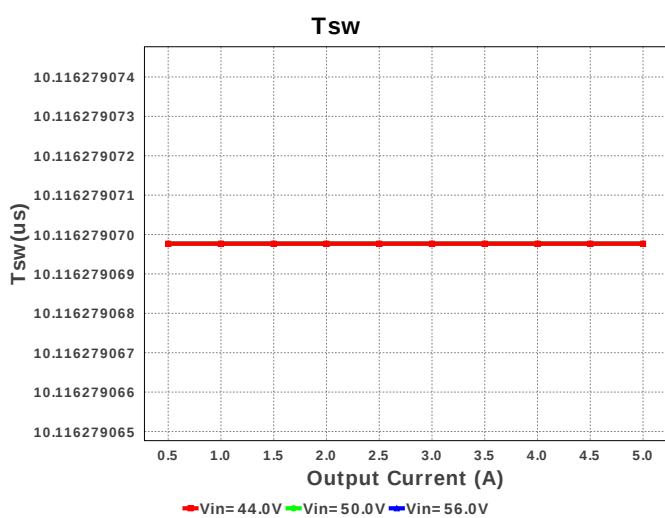
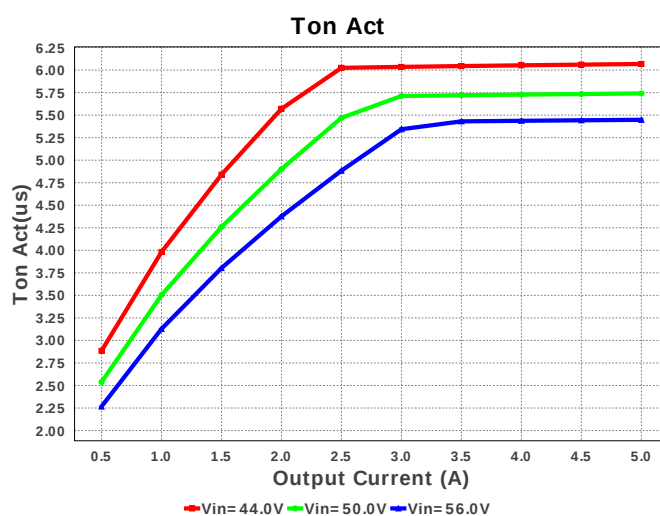
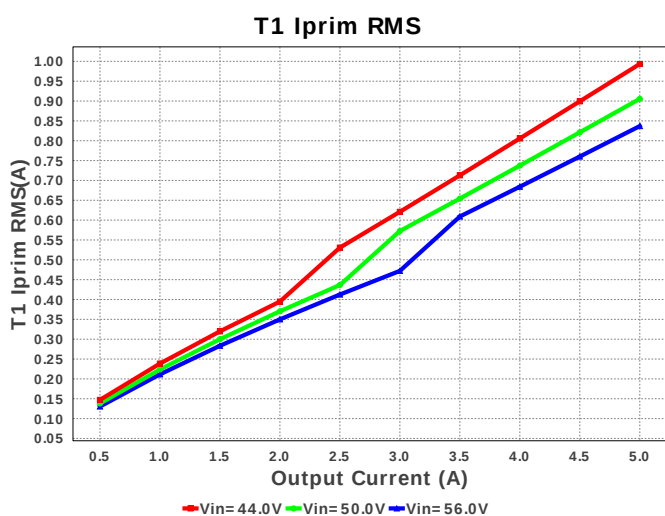
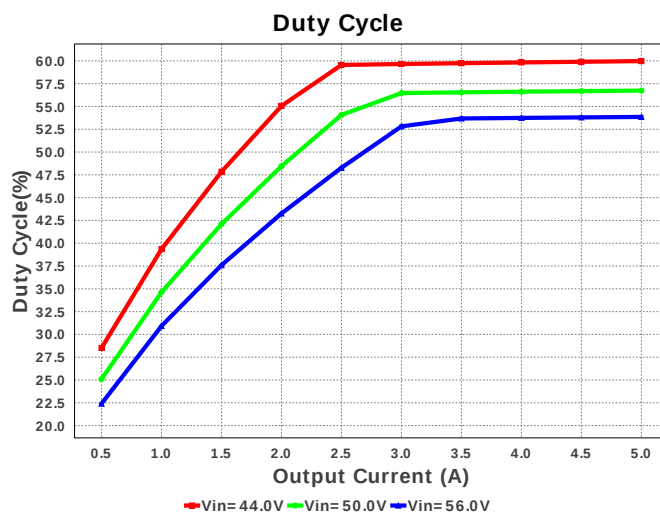
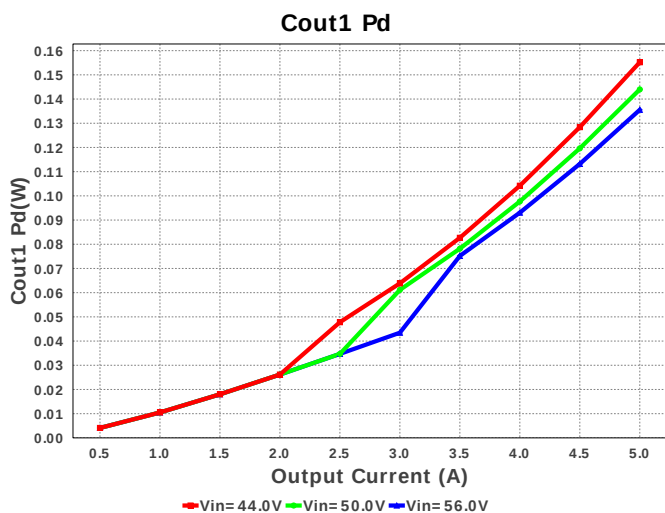
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
24.	R12	Vishay-Dale	CRCW04022K49FKED Series= CRCW..e3	Res= 2.49 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
25.	R13	Vishay-Dale	CRCW04024K99FKED Series= CRCW..e3	Res= 4.99 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
26.	R21	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
27.	R22	Vishay-Dale	CRCW040211K0FKED Series= CRCW..e3	Res= 11.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
28.	Raux	Vishay-Dale	CRCW080510R0FKEA Series= CRCW..e3	Res= 10.0 Ohm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm²
29.	Rbias	Vishay-Dale	CRCW0402205RFKED Series= CRCW..e3	Res= 205.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
30.	Rcs	Vishay-Dale	CRCW04022K00FKED Series= CRCW..e3	Res= 2.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
31.	Rdrv	Vishay-Dale	CRCW04025R11FKED Series= CRCW..e3	Res= 5.11 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
32.	Rfbb	Yageo America	RT0805BRD071K42L Series= RT0805	Res= 1.42 kOhm Power= 125.0 mW Tolerance= 0.1%	1	\$0.05	 0805 7 mm²
33.	Rfbt	Yageo America	RC0603FR-074K3L Series= ?	Res= 4.3 kOhm Power= 100.0 mW Tolerance= 1.0%	1	\$0.01	 0603 5 mm²
34.	Rled	Vishay-Dale	CRCW04023K01FKED Series= CRCW..e3	Res= 3.01 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
35.	Rsc	Vishay-Dale	CRCW040215K4FKED Series= CRCW..e3	Res= 15.4 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
36.	Rsns	Stackpole Electronics Inc	CSRN2010FKR400 Series= ?	Res= 400.0 mOhm Power= 1.0 W Tolerance= 1.0%	1	\$0.11	 2010 32 mm²
37.	Rsnu	Vishay-Dale	CRCW201020K0FKEF Series= CRCW..e3	Res= 20.0 kOhm Power= 750.0 mW Tolerance= 1.0%	1	\$0.03	 2010 32 mm²
38.	Rstartup1	Panasonic	ERJ-8ENF1052V Series= ERJ-8E	Res= 10.5 kOhm Power= 250.0 mW Tolerance= 1.0%	1	\$0.01	 1206 11 mm²
39.	Rstartup2	Panasonic	ERJ-8ENF1052V Series= ERJ-8E	Res= 10.5 kOhm Power= 250.0 mW Tolerance= 1.0%	1	\$0.01	 1206 11 mm²
40.	Rt	Vishay-Dale	CRCW040217K4FKED Series= CRCW..e3	Res= 17.4 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
41.	T1	CUSTOM	CUSTOM	Lp= 265.971 µH Rp= 870.0 mOhm Leakage_L= 5.319 µH Ns1toNp= 0.089 Rs1= 8.6 mOhms Ns2toNp= 0.195 Rs2= 700.0 µOhms	1	NA	CUSTOM 0 mm²
42.	U1	Texas Instruments	UC3843AN	Switcher	1	\$0.56	 P0008A 116 mm²

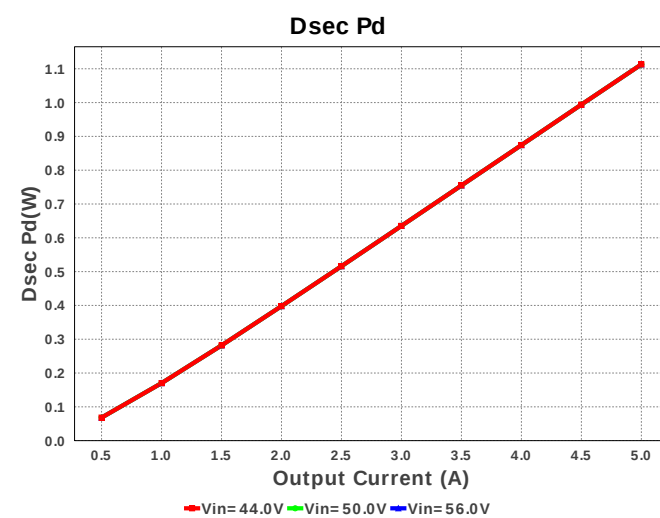
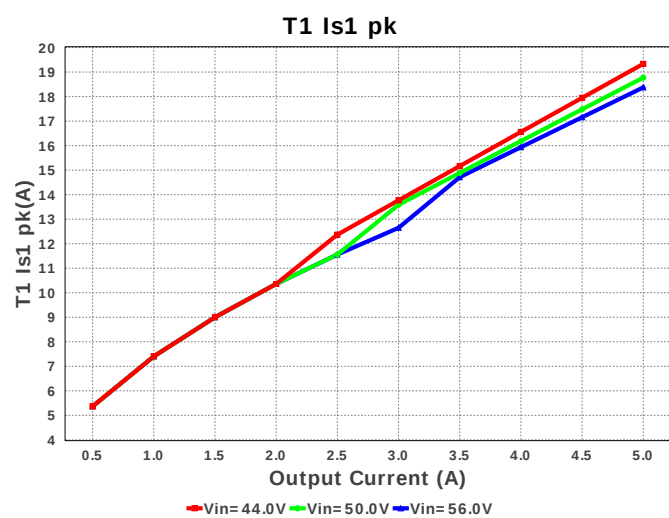
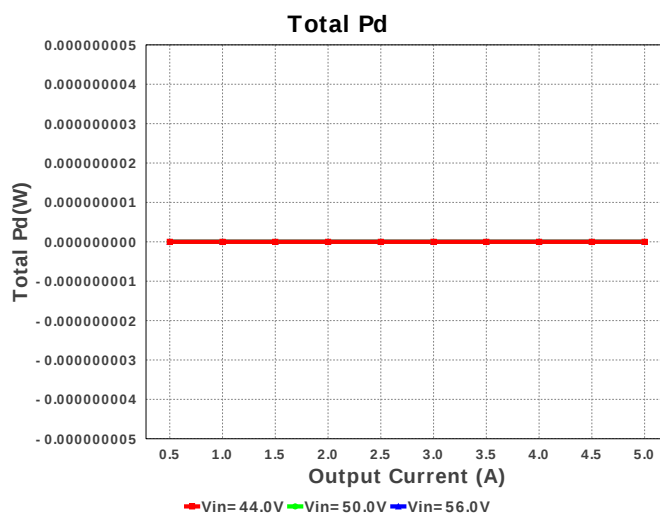
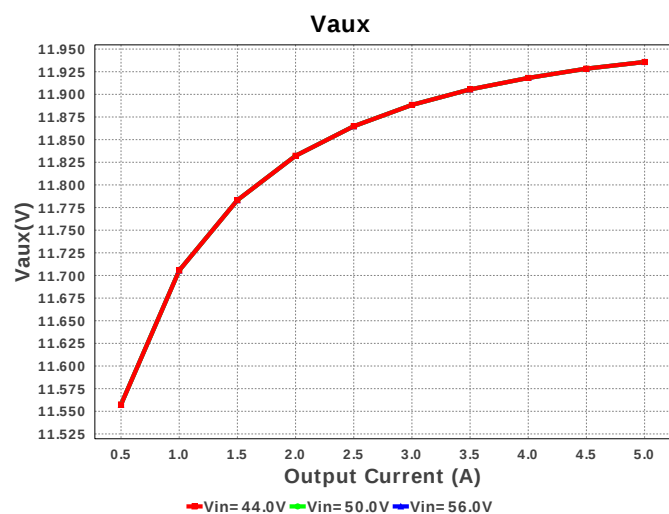
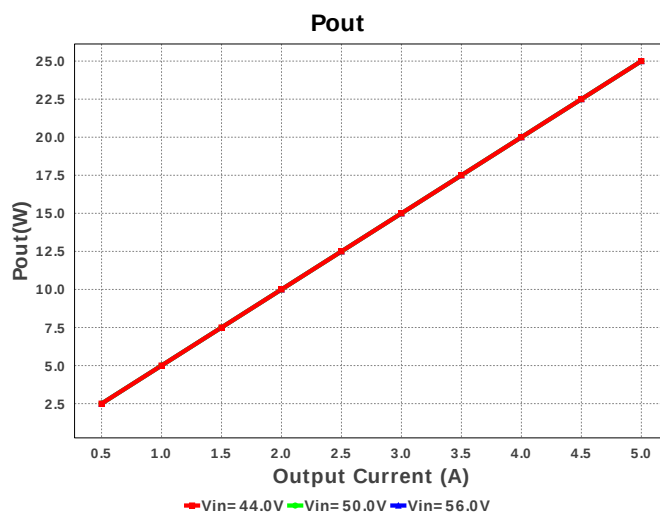
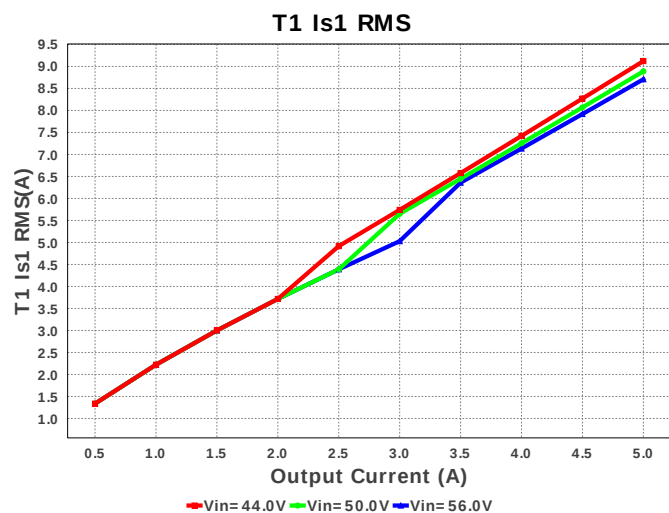
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
43.	VR	Texas Instruments	LMV431CM5/NOPB	Voltage References	1	\$0.16	 R-PDSO-G3 16 mm²

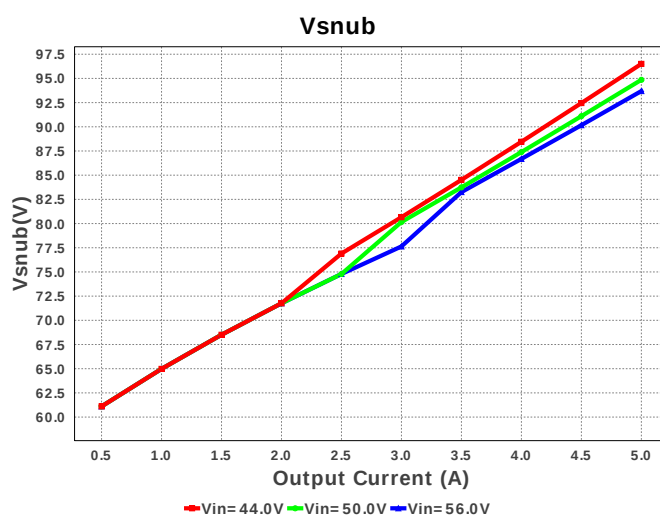
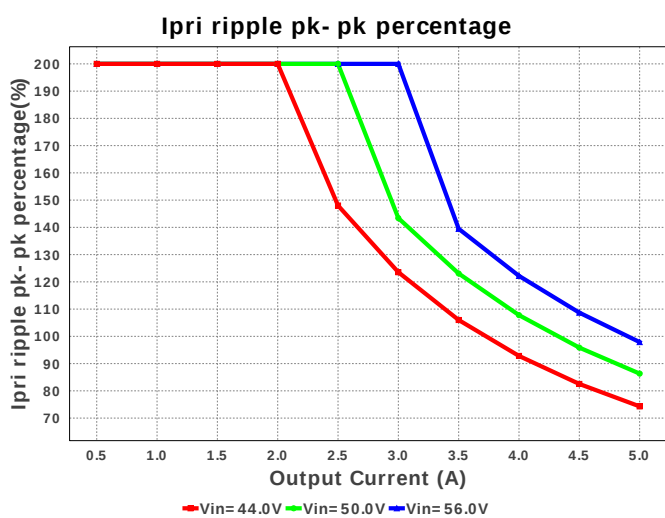
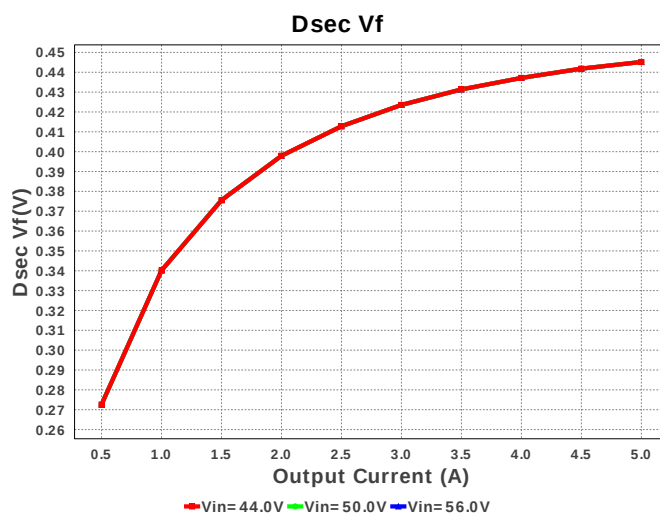
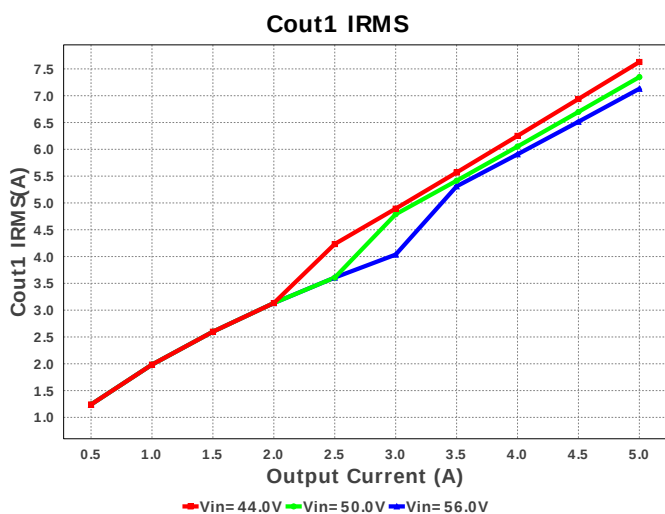
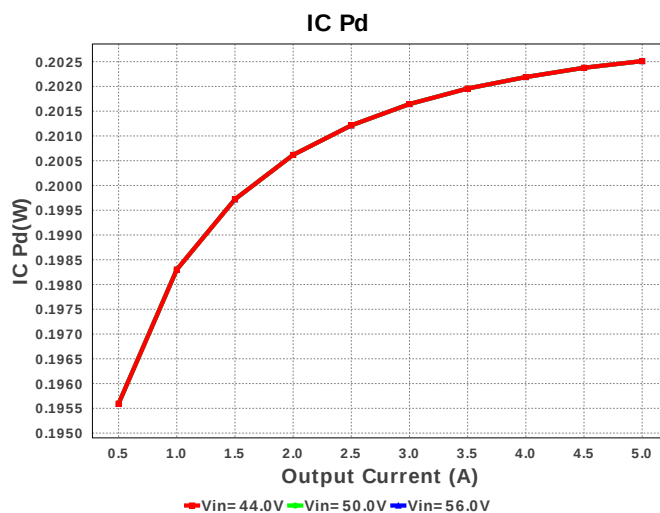
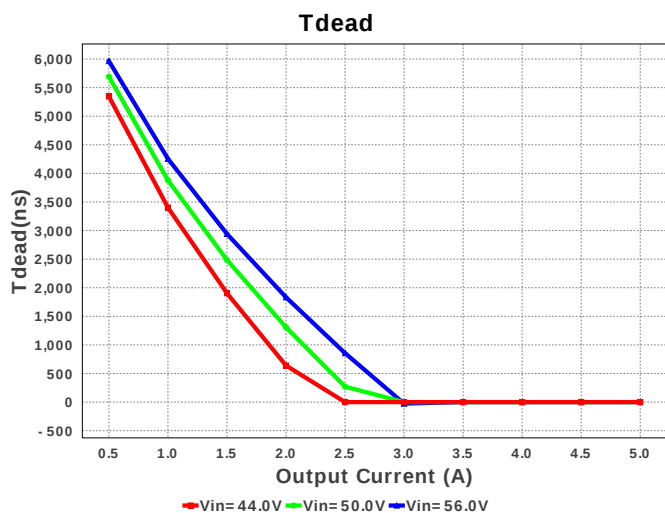


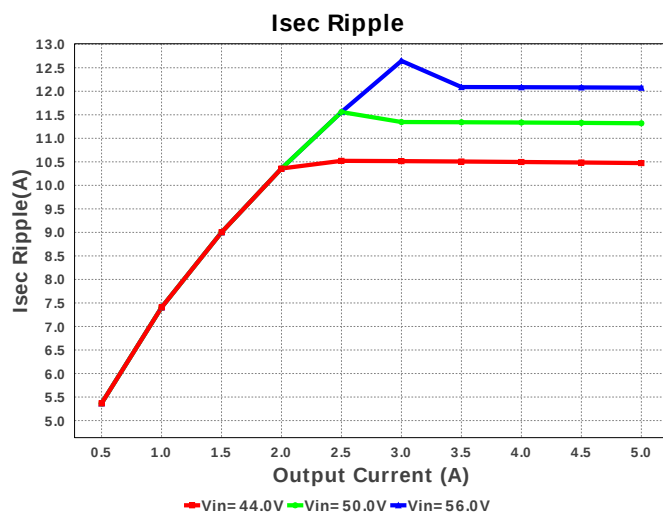
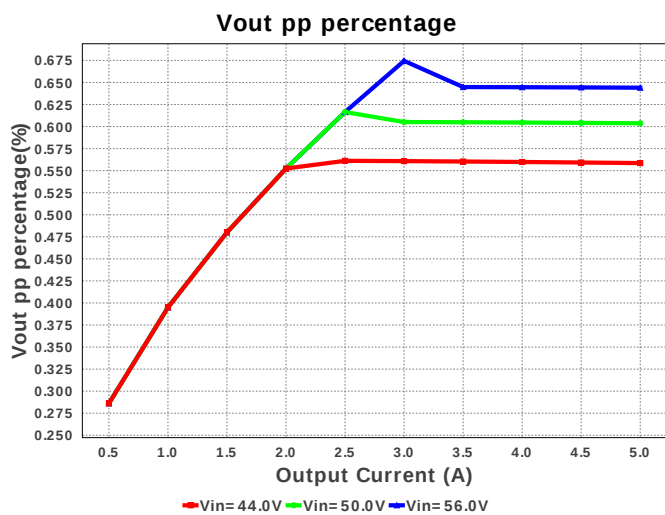
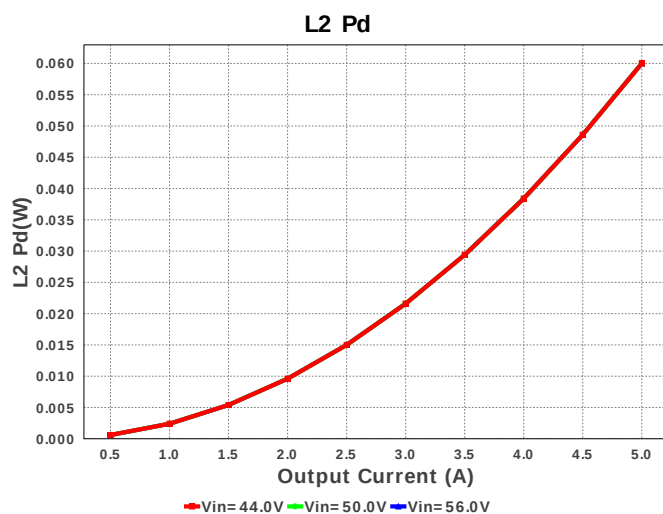
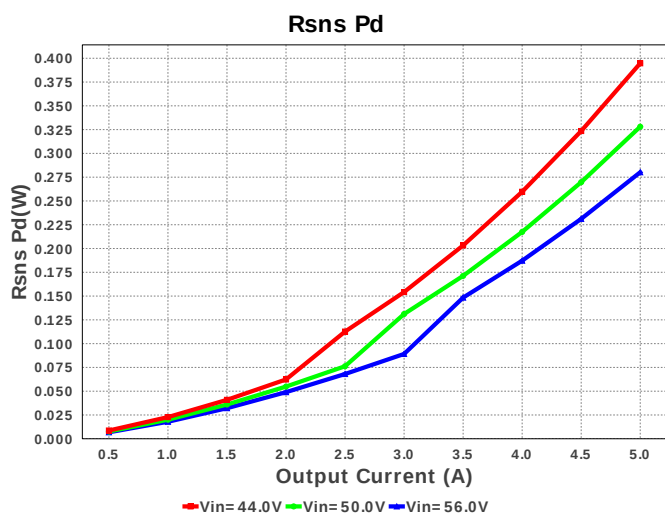
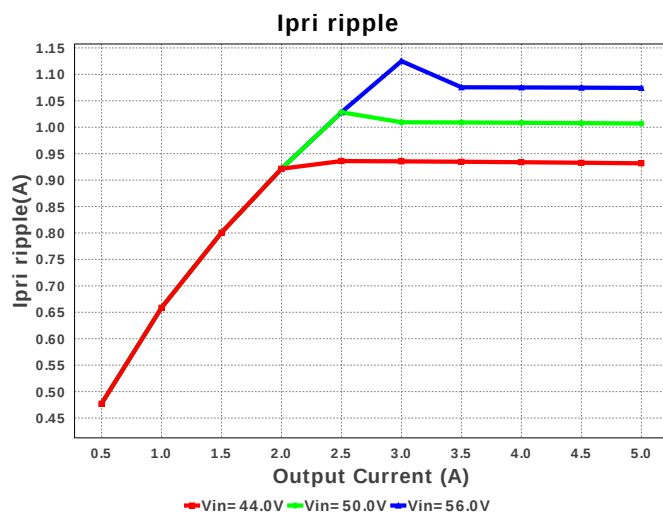
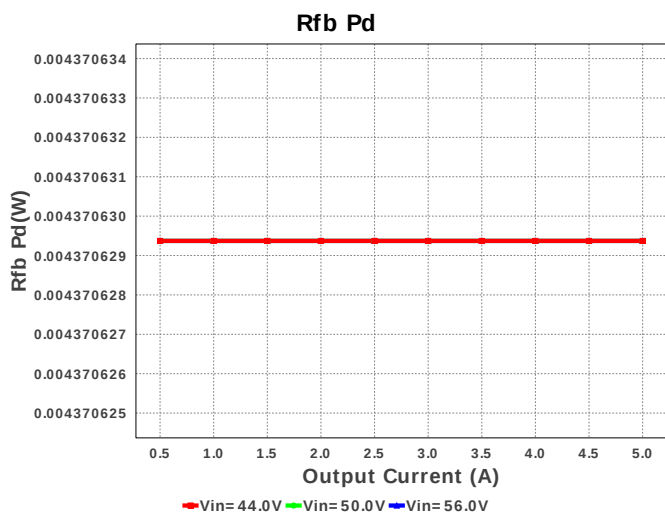


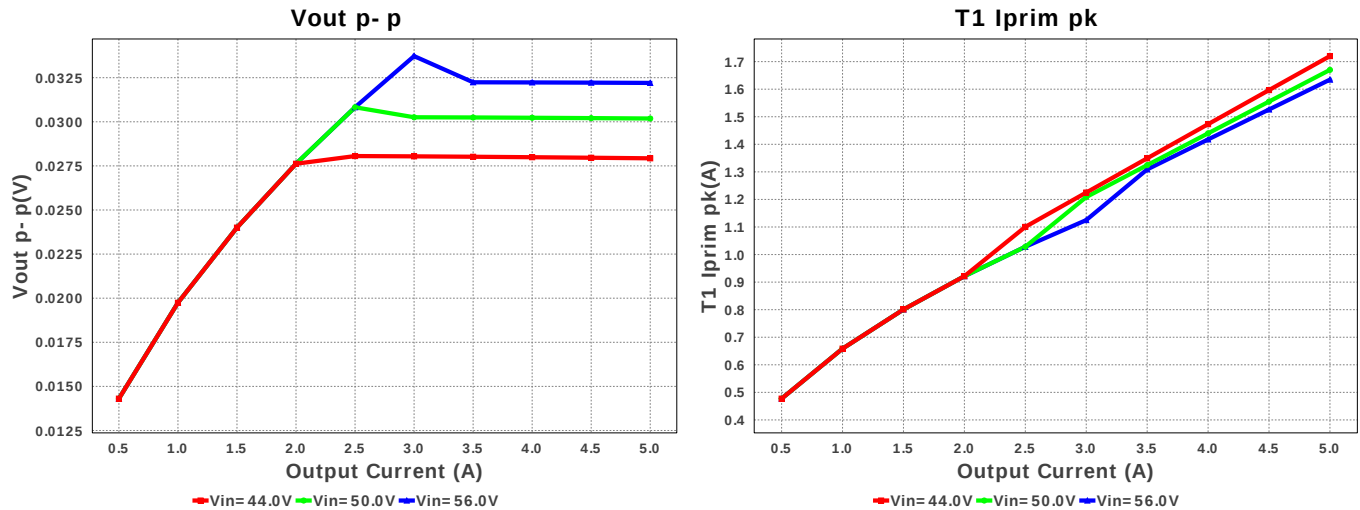












Operating Values

#	Name	Value	Category	Description
1.	Cout1 IRMS	7.629 A	Current	Output capacitor1 RMS ripple current
2.	Iin Avg	690.881 mA	Current	Average input current
3.	Iout_DCM	2.391 A	Current	Approximate Current below which DCM mode of operation will begin
4.	Ipri Avg	752.195 mA	Current	Average Current in Primary Winding over the complete Switching Period
5.	Ipri ripple	931.761 mA	Current	Ripple Current in the Primary Winding
6.	Ipri ripple pk-pk percentage	74.295 %	Current	Primary Current pk-pk ripple percentage(of Ipri avg during ton only)
7.	Isec Ripple	10.474 A	Current	Ripple Current in the Secondary Winding
8.	T1 Iprim RMS	993.355 mA	Current	Transformer Primary RMS Current
9.	T1 Iprim pk	1.72 A	Current	Transformer Primary Peak Current
10.	T1 Is1 RMS	9.121 A	Current	Transformer Secondary1 RMS Current
11.	T1 Is1 pk	19.334 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	0.0 ns	General	Snubber Diode Reverse Recovery Time
18.	FootPrint	1.816 k mm ²	General	Total Foot Print Area of BOM components
19.	Frequency	98.851 kHz	General	Switching frequency
20.	Mode	CCM	General	Conduction Mode
21.	Pout	25.0 W	General	Total output power
22.	Tdead	0.0 ns	General	Approximate Dead Time of the Regulator
23.	Toff	3.588 us	General	Approximate Converter Off Time
24.	Ton Act	6.067 us	General	Approximate Converter On Time
25.	Total BOM	\$0.0	General	Total BOM Cost
26.	Tsw	10.116 us	General	Switching Time Period
27.	Vaux	11.936 V	General	Auxiliary Voltage
28.	Vsnub	96.504 V	General	Voltage Across the Snubber
29.	Vout Actual	4.995 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
30.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
31.	Duty Cycle	59.977 %	Op_point	Duty cycle
32.	Efficiency	82.24 %	Op_point	Steady state efficiency
33.	IC Tj	52.276 degC	Op_point	IC junction temperature
34.	ICThetaJA	110.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
35.	IOUT_OP	5.0 A	Op_point	Iout operating point
36.	M1 TjOP	85.423 degC	Op_point	M1 MOSFET junction temperature
37.	Vout p-p	27.93 mV	Op_point	Peak-to-peak output ripple voltage
38.	Cin Pd	3.514 mW	Power	Input capacitor power dissipation
39.	Cout1 Pd	155.202 mW	Power	Output capacitor1 power dissipation
40.	Dsec Pd	1.113 W	Power	Secondary Diode Power Dissipation
41.	Dsec2 Pd	1.113 W	Power	Secondary Diode Power Dissipation
42.	IC Pd	202.511 mW	Power	IC power dissipation
43.	L2 Pd	60.0 mW	Power	Average Power Dissipation in the Inductor Over the AC Line Period
44.	M1 Pd	1.108 W	Power	M1 MOSFET total power dissipation
45.	Paux	37.179 mW	Power	Power Dissipation in Raux and Daux
46.	Pd Rstartup	185.462 mW	Power	Power Dissipation in Rstartup1 and Rstartup2
47.	Rdrv Pd	8.439 μW	Power	Power Dissipation in Gate Drive Resistor
48.	Rfb Pd	4.371 mW	Power	Rfb Power Dissipation
49.	Rsns Pd	394.702 mW	Power	Current Limit Sense Resistor Power Dissipation
50.	Snubber Pd	467.394 mW	Power	Snubber Power Dissipation

#	Name	Value	Category	Description
51.	T1 Pd	3.148 W	Power	Estimated Losses in Transformer
52.	Total Pd	0.0 W	Power	Total Power Dissipation
53.	Vout Tolerance	1.478 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable
54.	Vout pp percentage	558.595 m%		Output Voltage ripple percentage

Design Inputs

#	Name	Value	Description
1.	Iout	5.0	Maximum Output Current
2.	VinMax	56.0	Maximum input voltage
3.	VinMin	44.0	Minimum input voltage
4.	Vout	5.0	Output Voltage
5.	base_pn	UC3843A	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **UC3843A** Product Folder : <http://www.ti.com/product/UC3843A> : contains the data sheet and other resources.

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