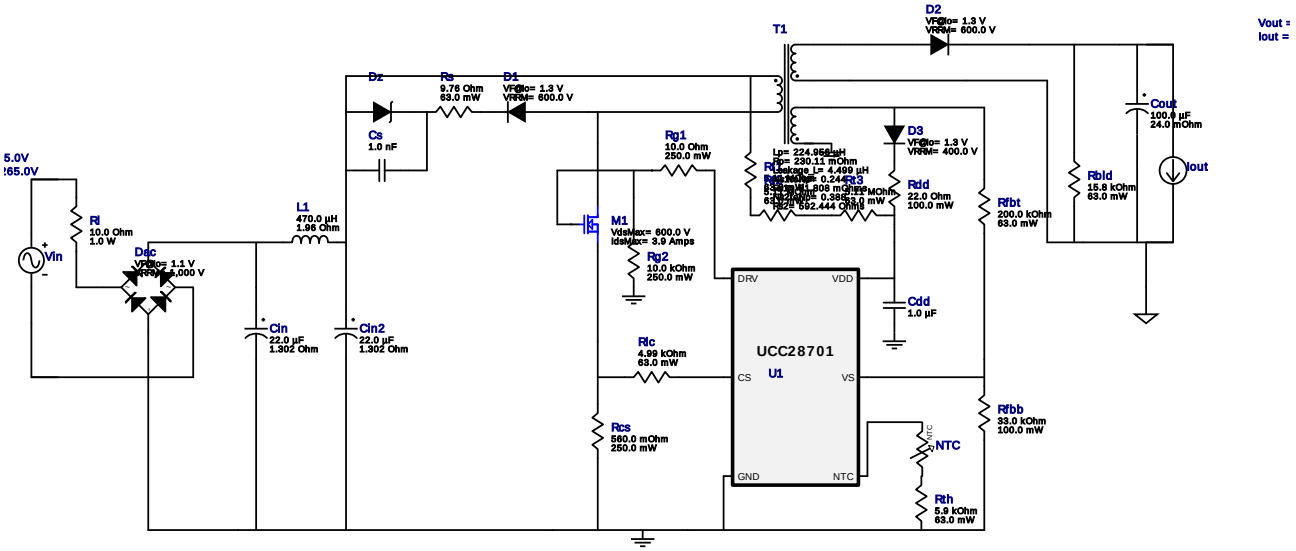
VinMin = 85.0V
VinMax = 265.0V
Vout = 18.0V
Iout = 1.0A

Device = UCC28701DBVR
Topology = Flyback
创建 = 5/21/13 9:39:04 PM
BOM成本 = $0.00
Total Pd = 5.21W
大小 = 1,405.0mm2
BOM 数量 = 31

WEBENCH® 设计报告

Design : 1147140/115 UCC28701DBVR
UCC28701DBVR 85.0V-265.0V to 17.959V @ 1.0A



1. Rbld is a starting point, but may need to be experimented with in order to get minimum current needed to hold Vout at no load. Rlc and the feedback resistors may also need adjustment based on the actual transformer used. For more information please click the design assistance button.

电气材料清单

#	名称	制造商	零件编号	属性	Qty	Price	大小
1.	Cdd	Taiyo Yuden	GMK212B7105KG-T Series= X7R	Cap= 1.0 µF VDC= 35.0 V IRMS= 0.0 A	1	$0.05	0805 13mm2
2.	Cin	Panasonic	EEUED2G220 Series= 286	Cap= 22.0 µF ESR= 1.302 Ohm VDC= 400.0 V IRMS= 500.0 mA	1	$0.41	CAPPR5-12.5X25 210mm2
3.	Cin2	Panasonic	EEUED2G220 Series= 286	Cap= 22.0 µF ESR= 1.302 Ohm VDC= 400.0 V IRMS= 500.0 mA	1	$0.41	CAPPR5-12.5X25 210mm2
4.	Cout	Sanyo	25SVPF100M Series= 1273	Cap= 100.0 µF ESR= 24.0 mOhm VDC= 25.0 V IRMS= 3.2 A	3	NA	CAPSMT_62_E7 106mm2
5.	Cs	MuRata	GRM188R72E102KW07D Series= X7R	Cap= 1.0 nF VDC= 250.0 V IRMS= 0.0 A	1	$0.02	0603 10mm2
6.	D1	Bourns	CD214B-F3600	VF@Io= 1.3 V VRRM= 600.0 V	1	NA	SMB 44mm2
7.	D2	Bourns	CD214B-F3600	VF@Io= 1.3 V VRRM= 600.0 V	1	NA	SMB 44mm2

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#	名称	制造商	零件编号	属性	Qty	Price	大小
8.	D3	Diodes Inc.	RS1G-13-F	VF@Io= 1.3 V VRRM= 400.0 V	1	$0.07	SMA 37mm2
9.	Dac	Vishay-Semiconductor	DF10SA	VF@Io= 1.1 V VRRM= 1,000 V	1	$0.14	DF-S 99mm2
10.	Dz	ON Semiconductor	BZG03C150G	Zener	1	$0.13	SMA 37mm2
11.	L1	Bourns	SDR0805-471KL	L= 470.0 µH DCR= 1.96 Ohm	1	$0.21	SDR0805 96mm2
12.	M1	Fairchild Semiconductor	FCD4N60TM	VdsMax= 600.0 V IdsMax= 3.9 Amps	1	$0.49	DPAK 102mm2
13.	Rbld	Vishay-Dale	CRCW040215K8FKED Series= CRCW..e3	Res= 15.8 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8mm2
14.	Rcs	Panasonic	ERJ-8RQFR56V Series= 229	Res= 560.0 mOhm Power= 250.0 mW Tolerance= 1.0%	1	$0.04	1206 19mm2
15.	Rdd	Susumu Co Ltd	RR1220Q-220-D Series= 264	Res= 22.0 Ohm Power= 100.0 mW Tolerance= 0.5%	1	$0.01	0805 13mm2
16.	Rfbb	Susumu Co Ltd	RR1220P-333-D Series= 264	Res= 33.0 kOhm Power= 100.0 mW Tolerance= 0.5%	1	$0.01	0805 13mm2
17.	Rfbt	Vishay-Dale	CRCW0402200KFKED Series= CRCW..e3	Res= 200.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8mm2
18.	Rg1	Panasonic	ERJ-8ENF10R0V Series= ERJ-8E	Res= 10.0 Ohm Power= 250.0 mW Tolerance= 1.0%	1	$0.01	1206 19mm2
19.	Rg2	Panasonic	ERJ-8ENF1002V Series= ERJ-8E	Res= 10.0 kOhm Power= 250.0 mW Tolerance= 1.0%	1	$0.01	1206 19mm2
20.	Rl	Vishay-Dale	CRCW121810R0FKEK Series= CRCW..e3	Res= 10.0 Ohm Power= 1.0 W Tolerance= 1.0%	1	NA	1218 0mm2
21.	Rlc	Vishay-Dale	CRCW04024K99FKED Series= CRCW..e3	Res= 4.99 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8mm2
22.	Rs	Vishay-Dale	CRCW04029R76FKED Series= CRCW..e3	Res= 9.76 Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8mm2
23.	Rt1	Vishay-Dale	CRCW04025M11FKED Series= CRCW..e3	Res= 5.11 MOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8mm2
24.	Rt2	Vishay-Dale	CRCW04025M11FKED Series= CRCW..e3	Res= 5.11 MOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8mm2
25.	Rt3	Vishay-Dale	CRCW04025M11FKED Series= CRCW..e3	Res= 5.11 MOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8mm2
26.	Rth	Vishay-Dale	CRCW04025K90FKED Series= CRCW..e3	Res= 5.9 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8mm2

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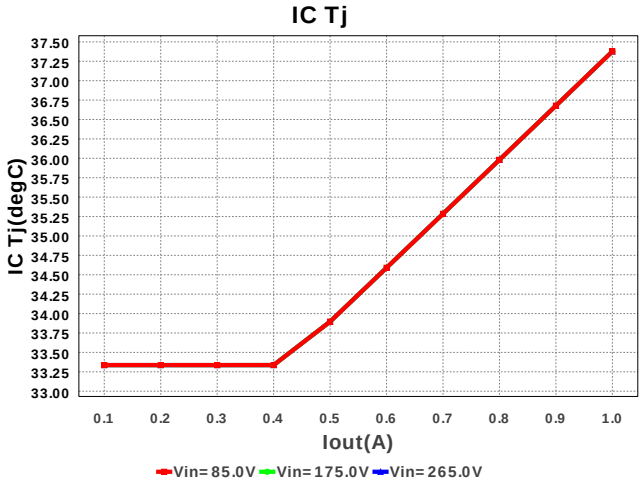
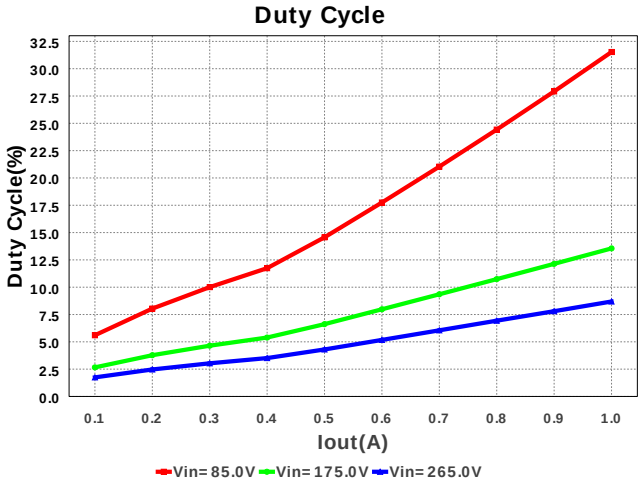
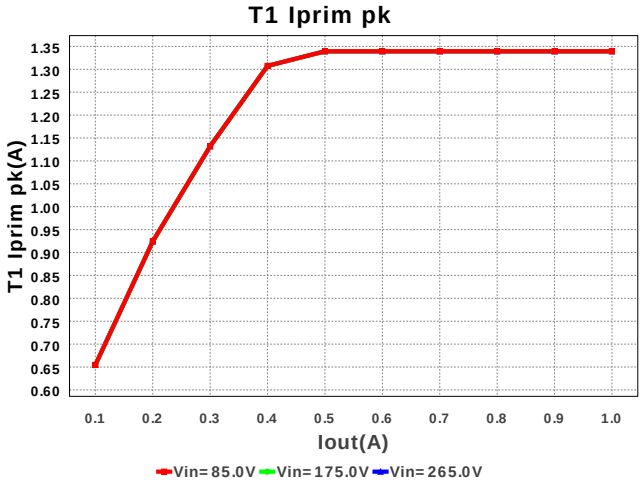
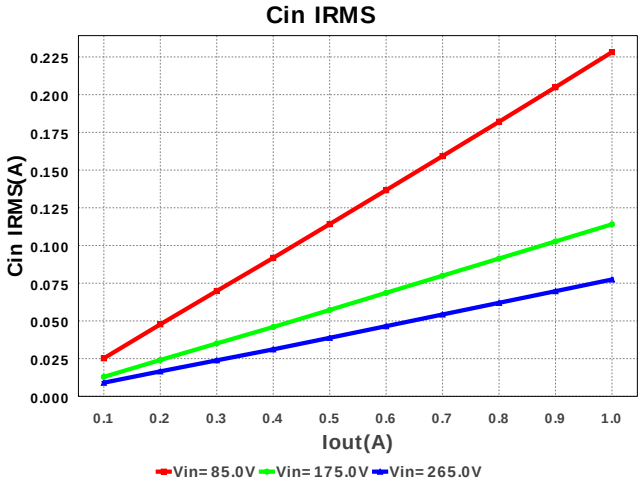
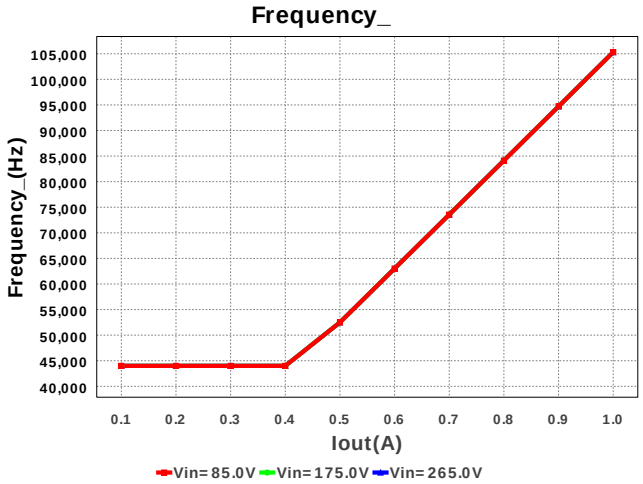
#	名称	制造商	零件编号	属性	Qty	Price	大小
27.	T1	CUSTOM	CUSTOM	Lp= 224.956 µH Rp= 230.11 mOhm Leakage_L= 4.499 µH Ns1toNp= 0.244 Rs1= 91.808 mOhms Ns2toNp= 0.388 Rs2= 592.444 Ohms	1	NA	CUSTOM 0mm2
28.	U1	Texas Instruments	UCC28701DBVR	Switcher	1	$0.35	SOT-23-6 24mm2

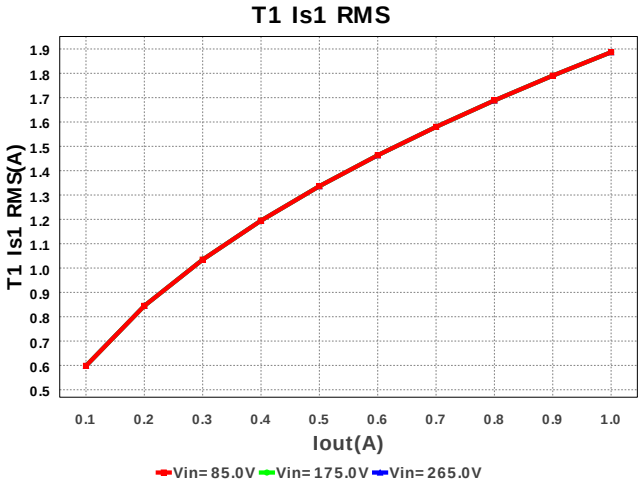


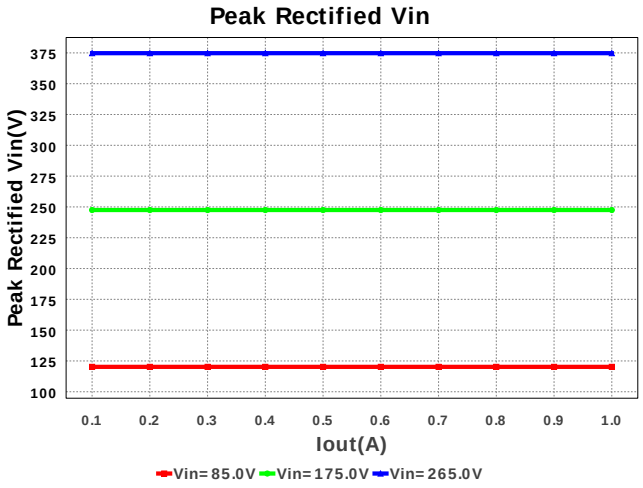


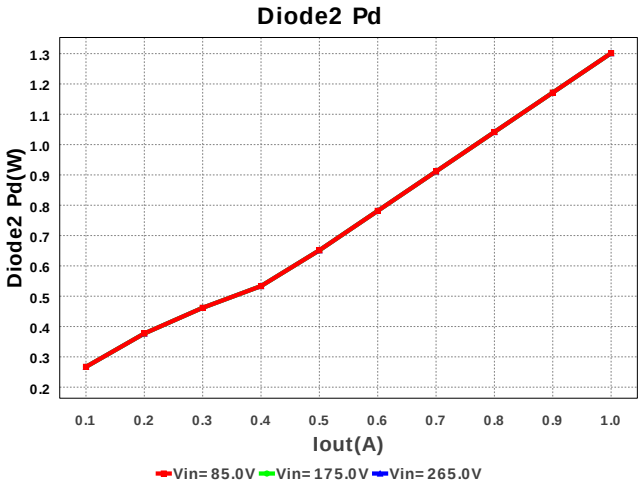


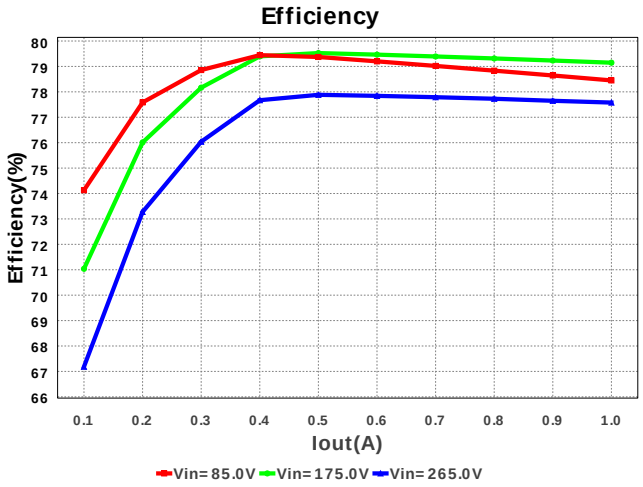


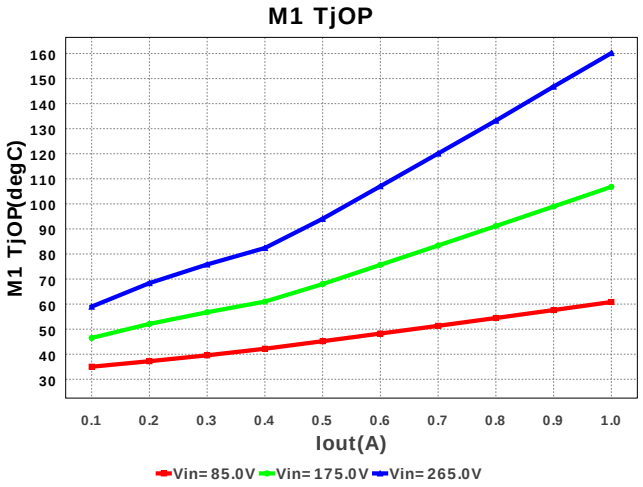


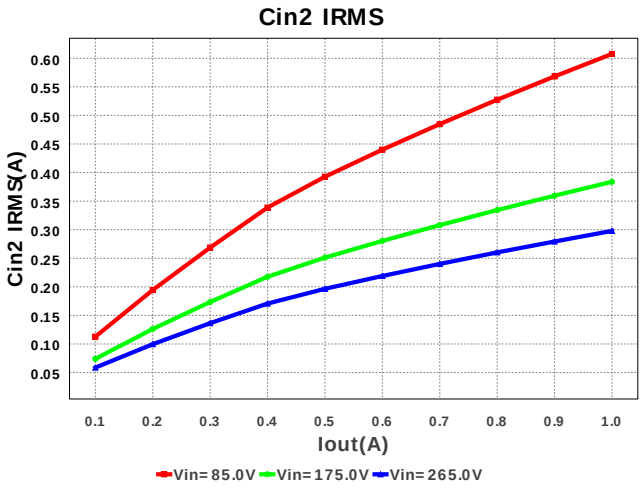


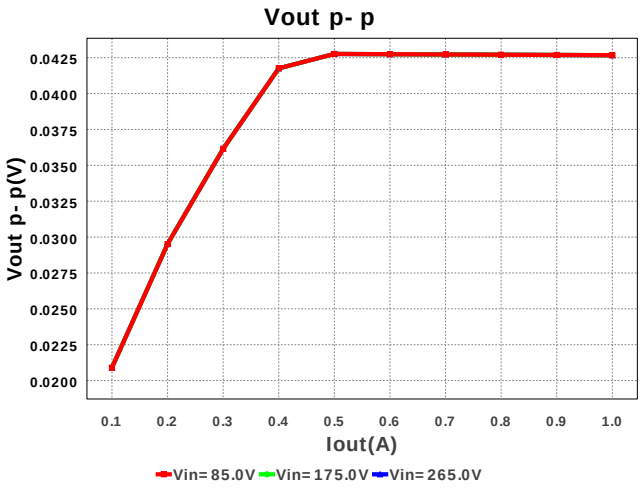












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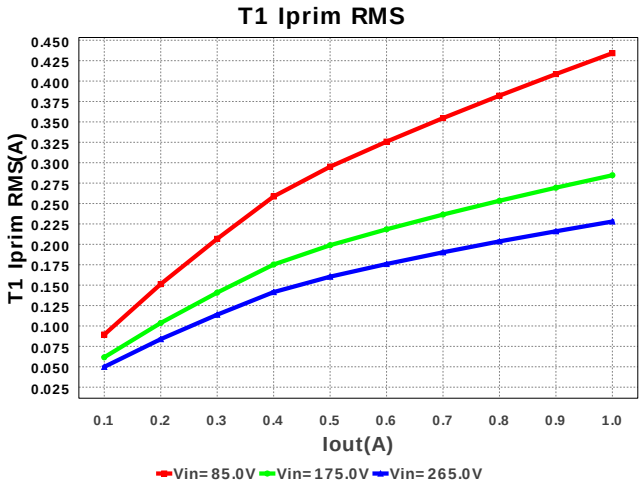

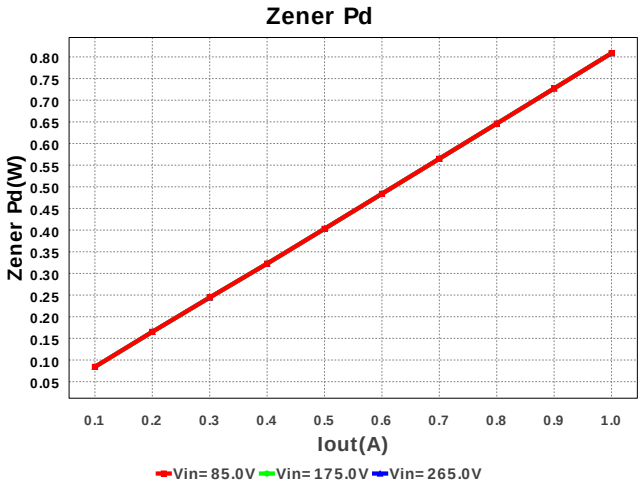

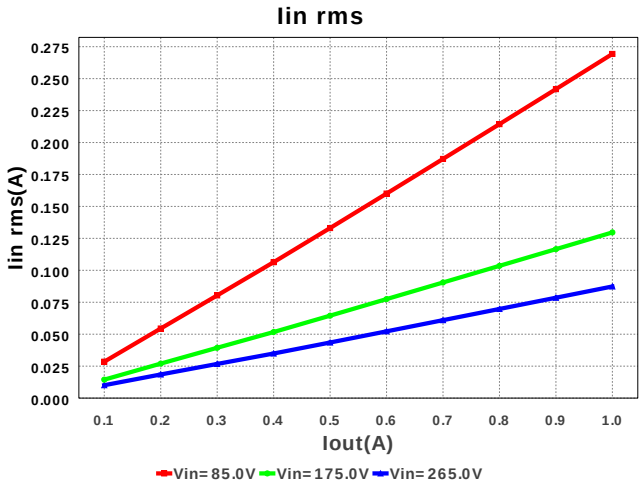

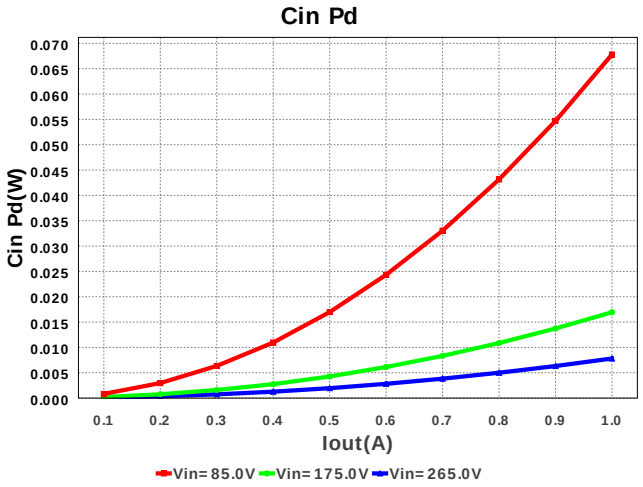

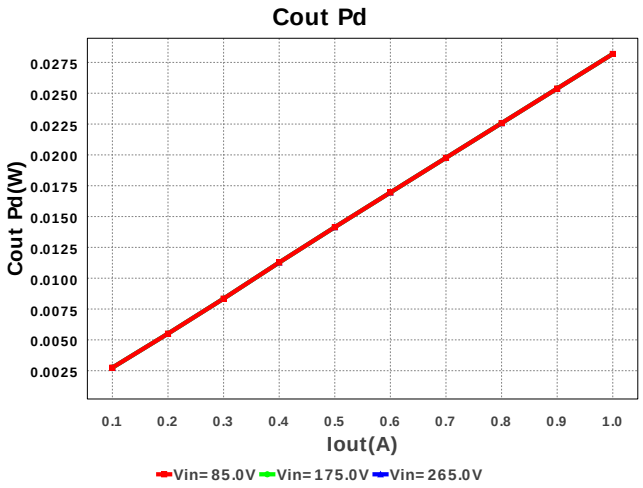

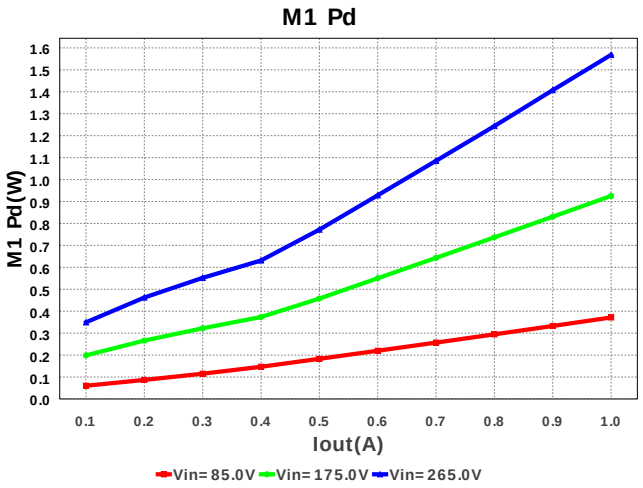

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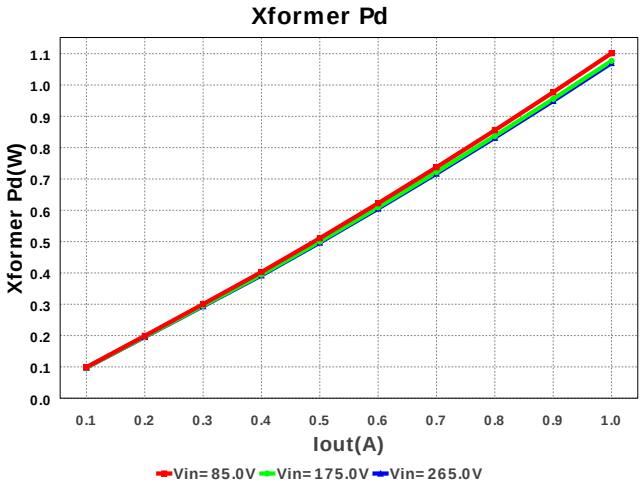
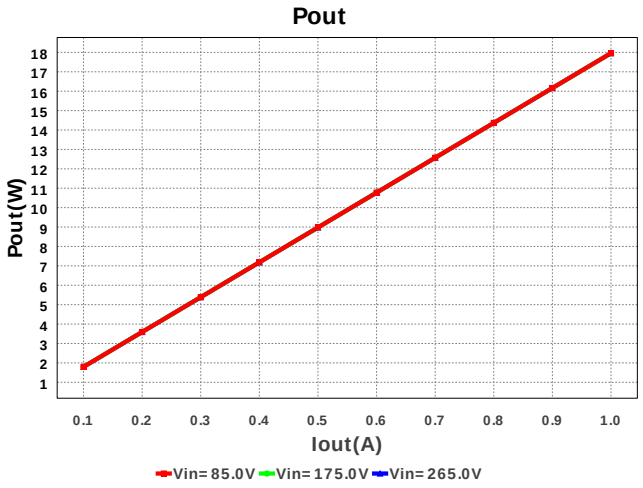
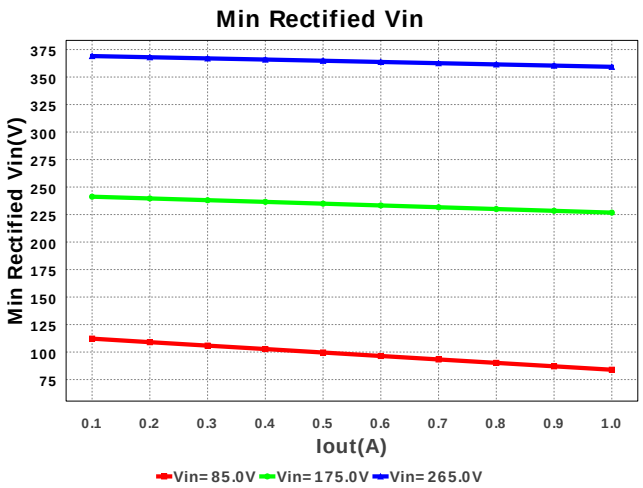
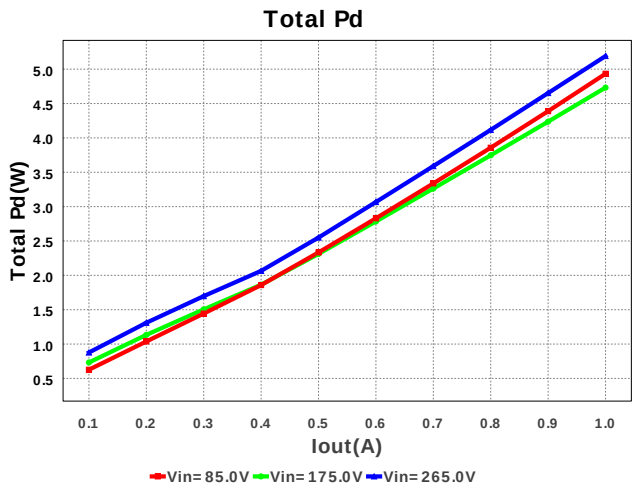
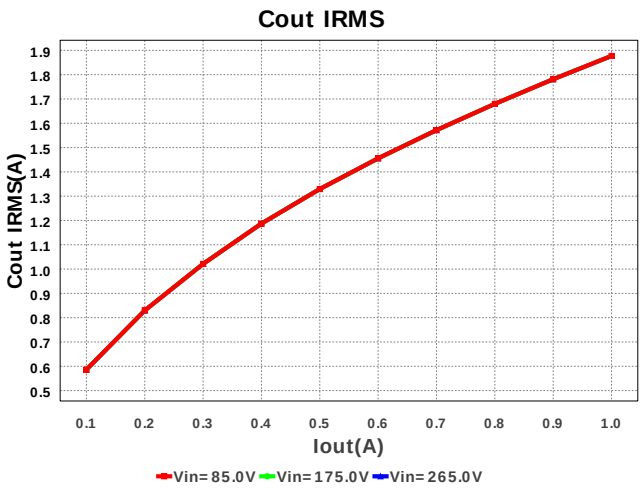
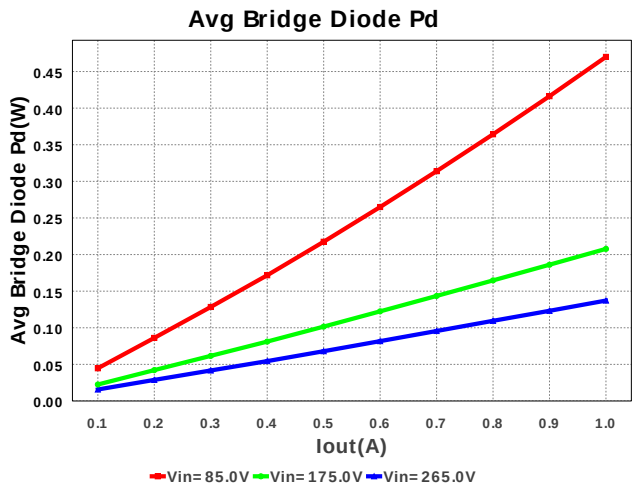

Xformer Pd
Xformer Pd(W)
Iout(A)
Vin=85.0V Vin=175.0V Vin=265.0V

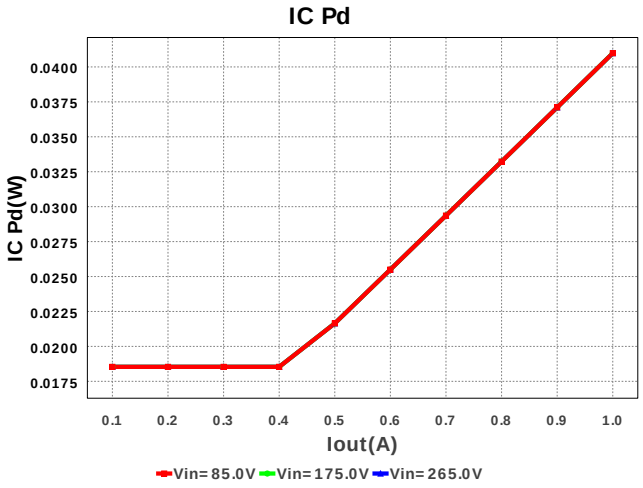

Pout
Pout(W)
Iout(A)
Vin=85.0V Vin=175.0V Vin=265.0V

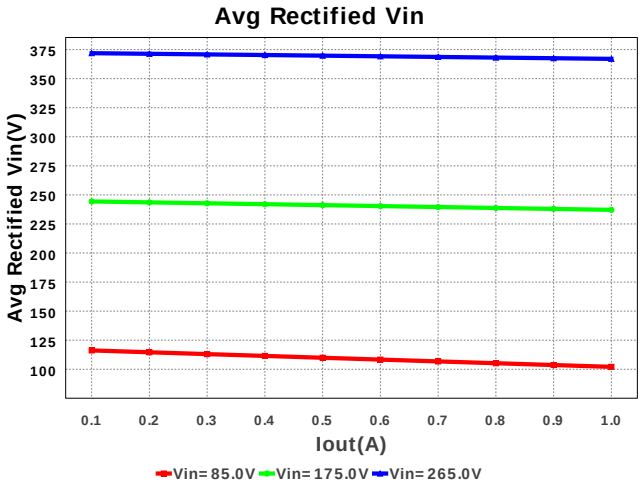

Min Rectified Vin
Min Rectified Vin(V)
Iout(A)
Vin=85.0V Vin=175.0V Vin=265.0V

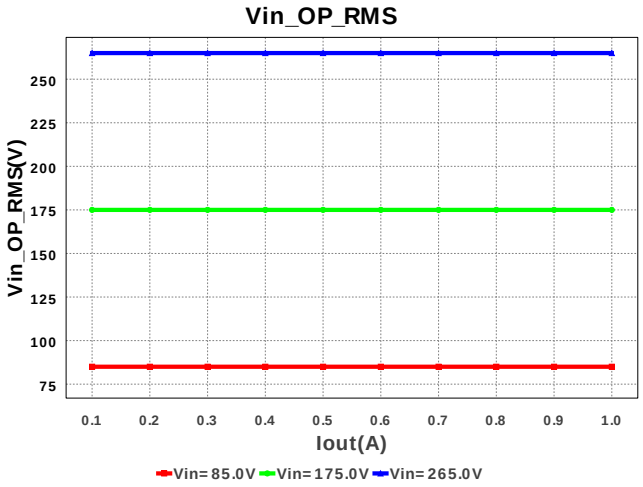

Total Pd
Total Pd(W)
Iout(A)
Vin=85.0V Vin=175.0V Vin=265.0V

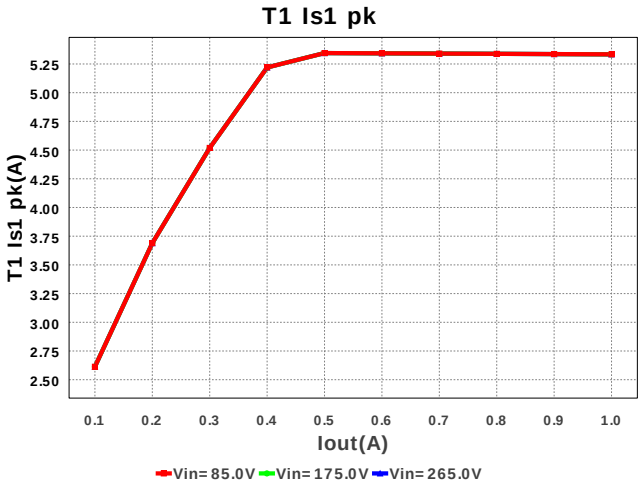

Cout IRMS
Cout IRMS(A)
Iout(A)
Vin=85.0V Vin=175.0V Vin=265.0V

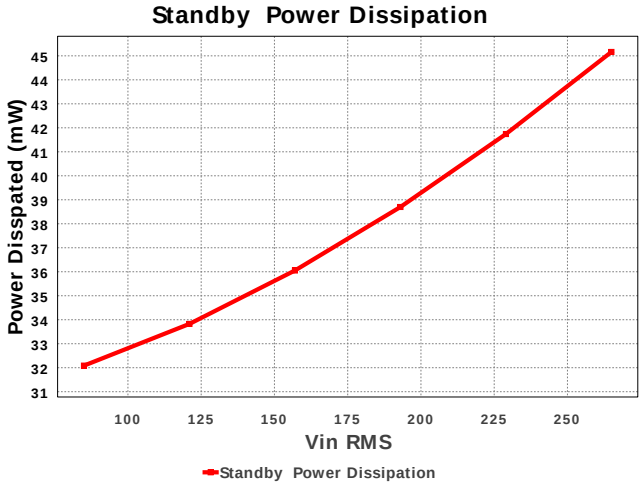

Avg Bridge Diode Pd
Avg Bridge Diode Pd(W)
Iout(A)
Vin=85.0V Vin=175.0V Vin=265.0V

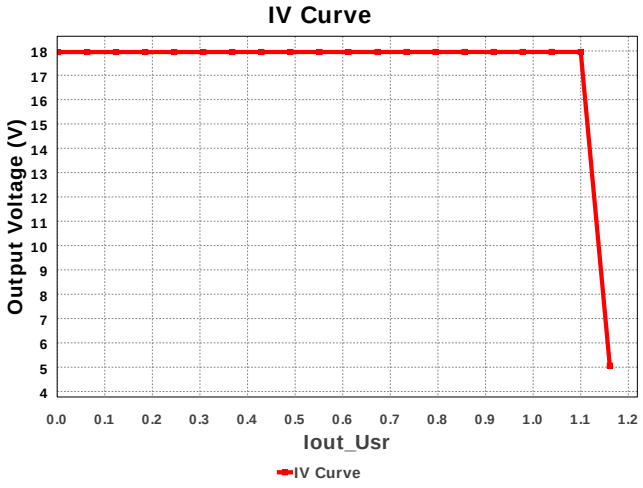












工作数值

#	名称	数值	类别	说明
1.	Cin IRMS	77.793 mA	Current	输入电容器均方根纹波电流
2.	Cin2 IRMS	299.595 mA	Current	Input capacitor2 RMS ripple current
3.	Cout IRMS	1.877 A	Current	输出电容器均方根纹波电流
4.	Iin rms	87.428 mA	Current	RMS 输入电流
5.	T1 Iprim RMS	229.514 mA	Current	Transformer Primary RMS Current
6.	T1 Iprim pk	1.339 A	Current	Transformer Primary Peak Current
7.	T1 Is1 RMS	1.887 A	Current	Transformer Secondary1 RMS Current
8.	T1 Is1 pk	5.334 A	Current	Transformer Secondary1 Peak Current
9.	平均的整流输入电压	363.629 V	General	针对交流线路时段的平均整流电压
10.	BOM 数量	31	General	Total Design BOM count
11.	大小	1.405 kmm2	General	BOM组件的总所占面积

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#	名称	数值	类别	说明
12.	模式	DCM	General	传导模式
13.	Pout	17.959 W	General	总输出功率
14.	总 BOM	$0.0	General	Total BOM Cost
15.	Vout OP	17.959 V	Op_Point	Operational Output Voltage
16.	占空比	8.81 %	Op_point	占空比
17.	效率	77.515 %	Op_point	稳态效率
18.	频率	105.306 kHz	Op_point	开关频率
19.	IC Tj	32.869 degC	Op_point	电路接点温度
20.	ICThetaJA	70.0 degC/W	Op_point	电路接点到环境热敏电阻
21.	IOUT_OP	1.0 A	Op_point	Iout 操作点
22.	M1 TjOP	158.066 degC	Op_point	M1 MOSFET 接点温度
23.	Min Rectified Vin	352.494 V	Op_point	Minimum voltage seen at rectified input
24.	Peak Rectified Vin	374.763 V	Op_point	Peak voltage seen at rectified input
25.	Vin_OP_RMS	265.0 V	Op_point	交流输入均方根电压
26.	Vout p-p	42.672 mV	Op_point	峰值到峰值输出纹波电压
27.	平均桥二极管 Pd	138.938 mW	Power	桥二极管在交流线路期间的平均功率耗散
28.	Cin Pd	7.881 mW	Power	输入电容器功率耗散
29.	Cout Pd	28.186 mW	Power	输出电容器功率耗散
30.	二极管2 Pd	1.301 W	Power	二极管2功率耗散
31.	IC Pd	40.983 mW	Power	电路功率耗散
32.	M1 Pd	1.543 W	Power	M1 MOSFET 总功率耗散
33.	整体 Pd	5.209 W	Power	总功率耗散
34.	Xformer Pd	1.071 W	Power	变压器功率耗散
35.	Zener Pd	808.608 mW	Power	Zener 功率耗散

设计输入

#	名称	数值	说明
1.	输出电流	1.0 A	最大输出电流
2.	Iout1	1.0 Amps	Output Current #1
3.	Vin 最大	265.0 V	最高输入电压
4.	Vin 最小	85.0 V	最低输入电压
5.	输出电压:	18.0 V	输出电压
6.	Vout1	18.0 Volt	Output Voltage #1
7.	base_pn	UCC28701	美国国家半导体的产品编号
8.	源	DC	输入源类别
9.	工作环境温度	30.0 degC	环境温度

设计协助

1. Application Hints Rbld Rbld is used to to set a minimum load for the circuit, so that in standby the output voltage does not float up. The value chosen by WEBENCH should be a good starting point but may need to be adjusted to achieve minimum power dissipation at standby as well. Rlc Rlc provides the function of feed-forward line compensation to eliminate change in IPP due to change in di/dt and the propagation delay of the internal comparator and MOSFET turn-off time. For best results the chosen value may need to be adjusted based on board, FET and transformer parasitics. Rfbt & Rfbb The feedback resistors will set the output voltage of the circuit. The values chosen may need to be fined tuned based on the final Transformer turns ratios and the voltage across the output diode at close to zero current. Part Description The UCC28700 family of flyback power supply controllers provides Constant-Voltage (CV) and Constant-Current (CC) output regulation. Primary-Side Regulation (PSR) eliminates the use of an Opto-Coupler. Please see the datasheet for further design guidance. http://www.ti.com/lit/ds/symlink/ucc28700.pdf

2. UCC28701 Product Folder : http://www.ti.com/product/ucc28701 : contains the data sheet and other resources.

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