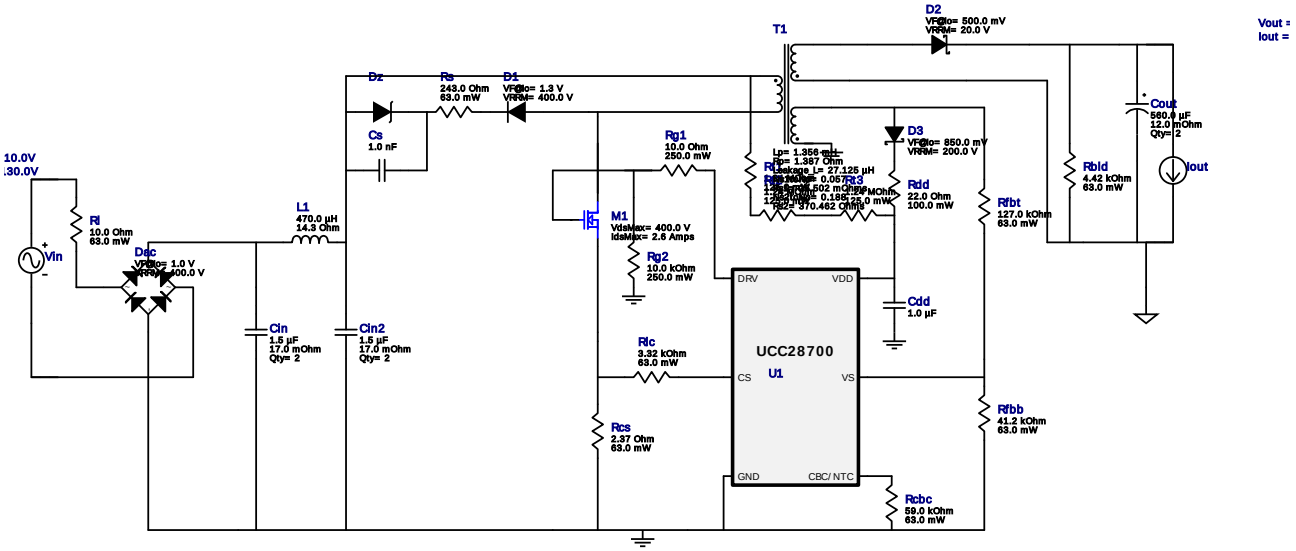
VinMin = 110.0V
VinMax = 130.0V
Vout = 5.0V
Iout = 1.0A

Device = UCC28700DBVR
Topology = Flyback
创建 = 7/23/13 9:56:06 PM
BOM成本 = $0.00
Total Pd = 1.51W
大小 = 2,435.0mm2
BOM 数量 = 31

WEBENCH® 设计报告

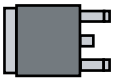
Design : 3686430/69 UCC28700DBVR
UCC28700DBVR 110.0V-130.0V to 5.108V @ 1.0A



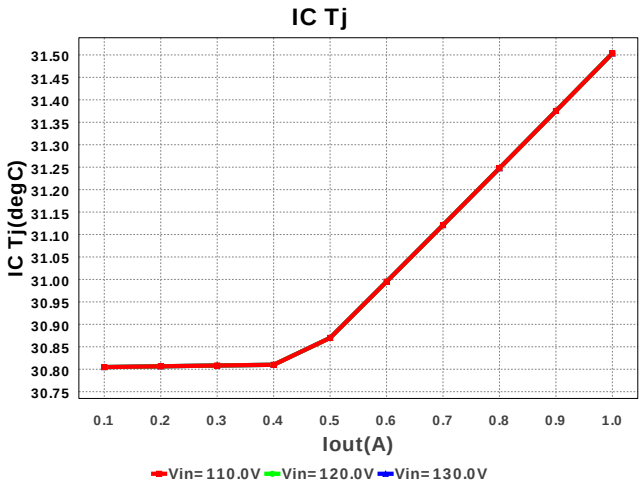
1. Rbld is a starting point, but may need to be experimented with in order to get minimum current needed to hold Vout at no load. Rlc and the feedback resistors may also need adjustment based on the actual transformer used. For more information please click the design assistance button.

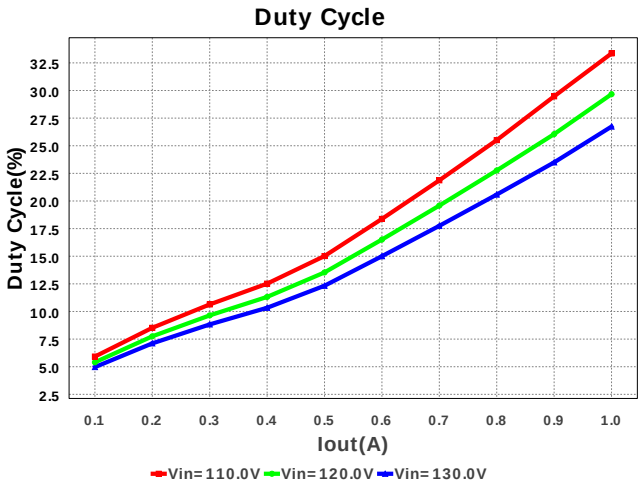
电气材料清单

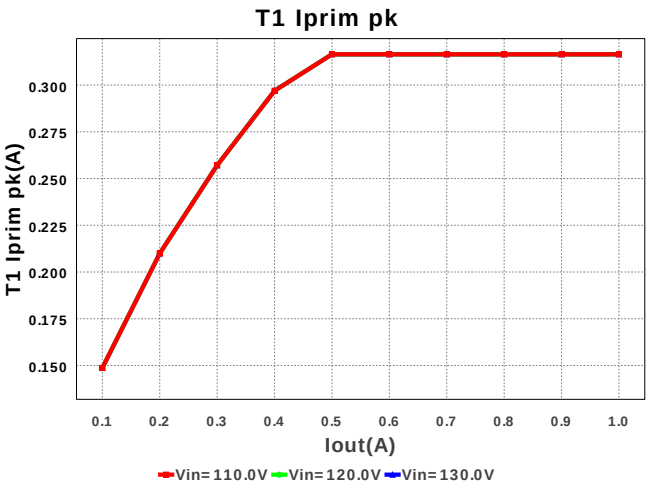
#	名称	制造商	零件编号	属性	Qty	Price	大小
1.	Cdd	MuRata	GRM188R61E105KA12D Series= X5R	Cap= 1.0 µF VDC= 25.0 V IRMS= 0.0 A	1	$0.02	0603 10mm2
2.	Cin	EPCOS Inc	B32923C3155M Series= 302	Cap= 1.5 µF ESR= 17.0 mOhm VDC= 630.0 V IRMS= 146.0 mA	2	$0.71	B32923_22mm 399mm2
3.	Cin2	EPCOS Inc	B32923C3155M Series= 302	Cap= 1.5 µF ESR= 17.0 mOhm VDC= 630.0 V IRMS= 146.0 mA	2	$0.71	B32923_22mm 399mm2
4.	Cout	Nippon Chemi-Con	APXA100ARA561MJC0G Series= PXA	Cap= 560.0 µF ESR= 12.0 mOhm VDC= 10.0 V IRMS= 5.3 A	2	$1.57	CAPSMT_62_JC0 156mm2
5.	Cs	MuRata	GRM188R72E102KW07D Series= X7R	Cap= 1.0 nF VDC= 250.0 V IRMS= 0.0 A	1	$0.02	0603 10mm2

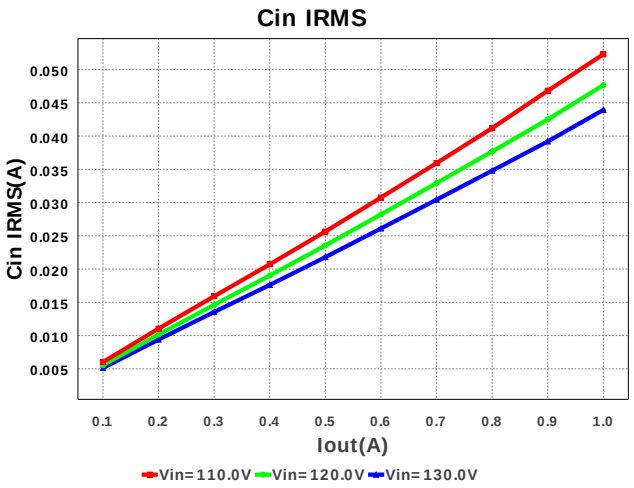
#	名称	制造商	零件编号	属性	Qty	Price	大小
6.	D1	Diodes Inc.	RS1G-13-F	VF@Io= 1.3 V VRRM= 400.0 V	1	$0.07	 SMA 37mm2
7.	D2	Diodes Inc.	B220A-13-F	VF@Io= 500.0 mV VRRM= 20.0 V	1	$0.09	 SMA 37mm2
8.	D3	Diodes Inc.	DFLS1200-7	VF@Io= 850.0 mV VRRM= 200.0 V	1	$0.21	 PowerDI123 22mm2
9.	Dac	Diodes Inc.	HD04-T	VF@Io= 1.0 V VRRM= 400.0 V	1	$0.12	 MiniDIP 62mm2
10.	Dz	ON Semiconductor	1SMB5949BT3G	Zener	1	$0.08	 SMB 44mm2
11.	L1	Bourns	SDR0302-471KL	L= 470.0 µH DCR= 14.3 Ohm	1	$0.17	 SDR0302 24mm2
12.	M1	AOS	AOD3N40	VdsMax= 400.0 V IdsMax= 2.6 Amps	1	$0.23	 DPAK 102mm2
13.	Rbld	Vishay-Dale	CRCW04024K42FKED Series= CRCW..e3	Res= 4.42 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 8mm2
14.	Rcbc	Vishay-Dale	CRCW040259K0FKED Series= CRCW..e3	Res= 59.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 8mm2
15.	Rcs	Vishay-Dale	CRCW04022R37FKED Series= CRCW..e3	Res= 2.37 Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 8mm2
16.	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
17.	Rfbb	Vishay-Dale	CRCW040241K2FKED Series= CRCW..e3	Res= 41.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 8mm2
18.	Rfbt	Vishay-Dale	CRCW0402127KFKED Series= CRCW..e3	Res= 127.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 8mm2
19.	Rg1	Panasonic	ERJ-8ENF10R0V Series= ERJ-8E	Res= 10.0 Ohm Power= 250.0 mW Tolerance= 1.0%	1	$0.01	 1206 19mm2
20.	Rg2	Panasonic	ERJ-8ENF1002V Series= ERJ-8E	Res= 10.0 kOhm Power= 250.0 mW Tolerance= 1.0%	1	$0.01	 1206 19mm2
21.	Rl	Vishay-Dale	CRCW040210R0FKED Series= CRCW..e3	Res= 10.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 8mm2
22.	Rlc	Vishay-Dale	CRCW04023K32FKED Series= CRCW..e3	Res= 3.32 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 8mm2
23.	Rs	Vishay-Dale	CRCW0402243RFKED Series= CRCW..e3	Res= 243.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 8mm2
24.	Rt1	Vishay-Dale	CRCW08051M24FKEA Series= CRCW..e3	Res= 1.24 MOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	 0805 13mm2
25.	Rt2	Vishay-Dale	CRCW08051M24FKEA Series= CRCW..e3	Res= 1.24 MOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	 0805 13mm2
26.	Rt3	Vishay-Dale	CRCW08051M24FKEA Series= CRCW..e3	Res= 1.24 MOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	 0805 13mm2

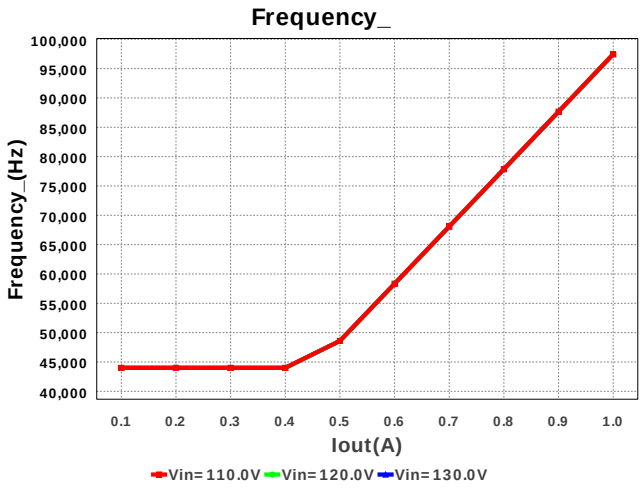
#	名称	制造商	零件编号	属性	Qty	Price	大小
27.	T1	CUSTOM	CUSTOM	Lp= 1.356 mH Rp= 1.387 Ohm Leakage_L= 27.125 µH Ns1toNp= 0.057 Rs1= 25.502 mOhms Ns2toNp= 0.188 Rs2= 370.462 Ohms	1	NA	CUSTOM 0mm2
28.	U1	Texas Instruments	UCC28700DBVR	Switcher	1	$0.35	SOT-23-6 24mm2

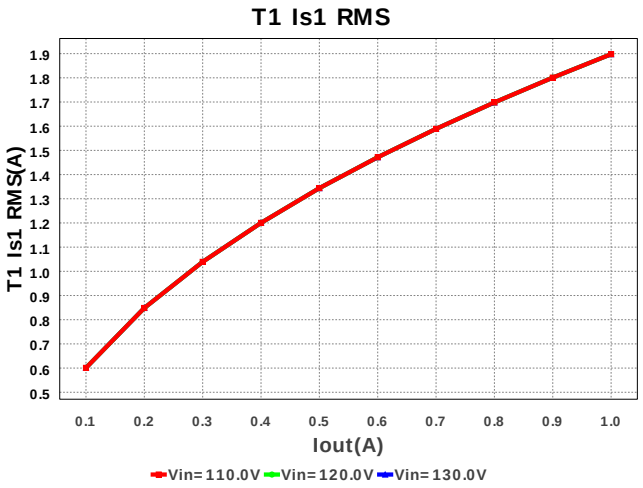




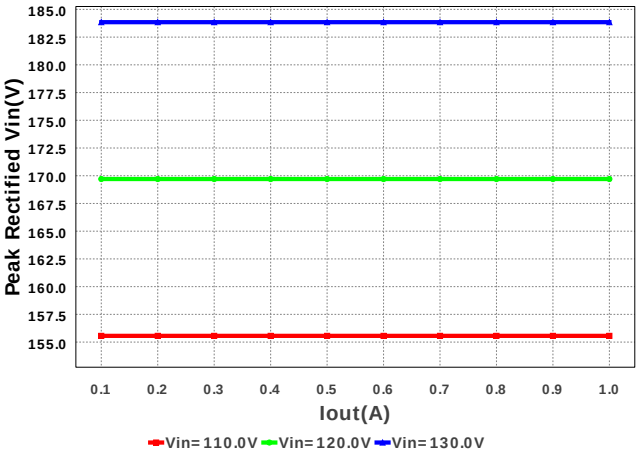




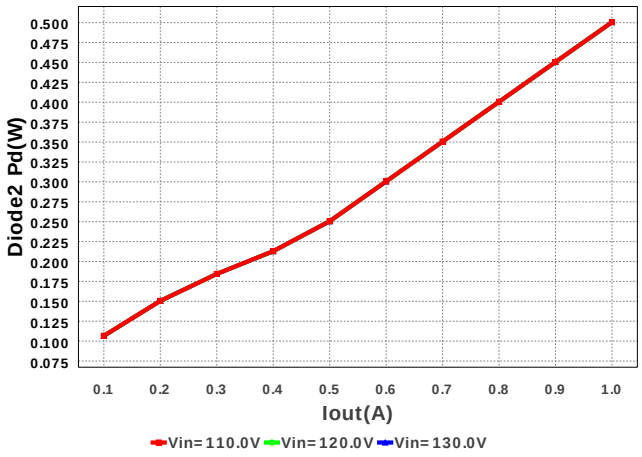




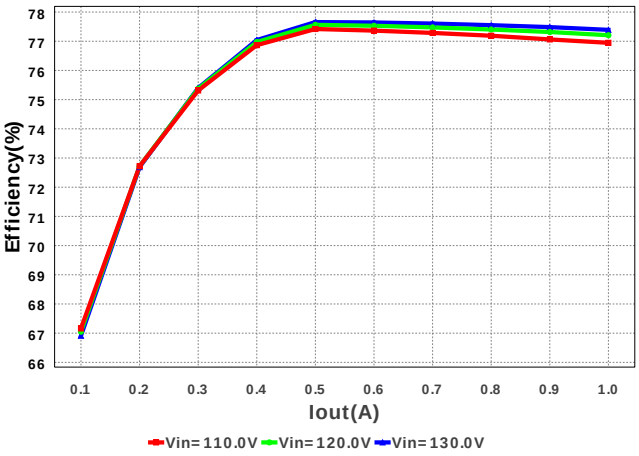
Peak Rectified Vin



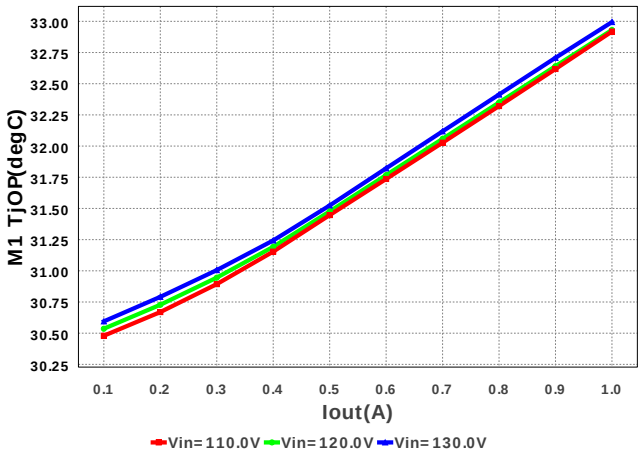
Diode2 Pd



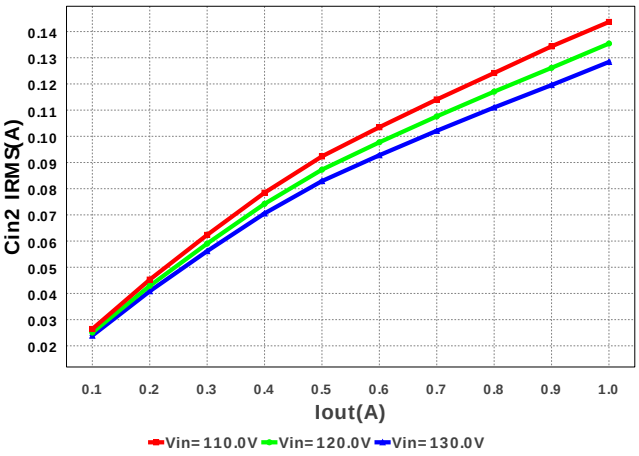
Efficiency



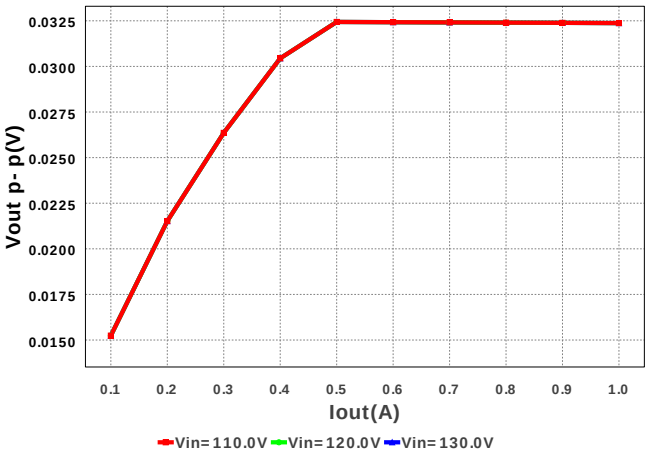
M1 TjOP



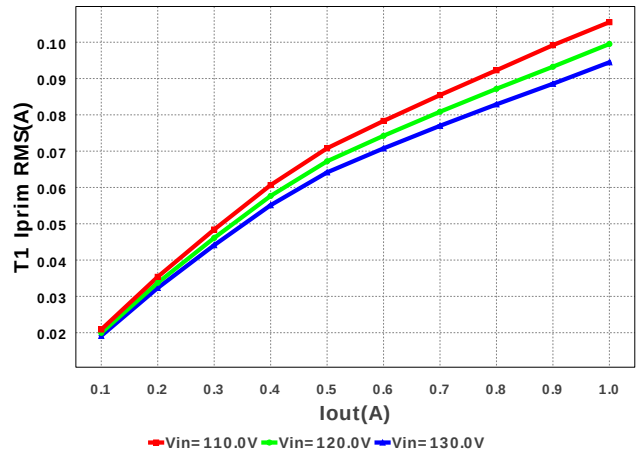
Cin2 IRMS



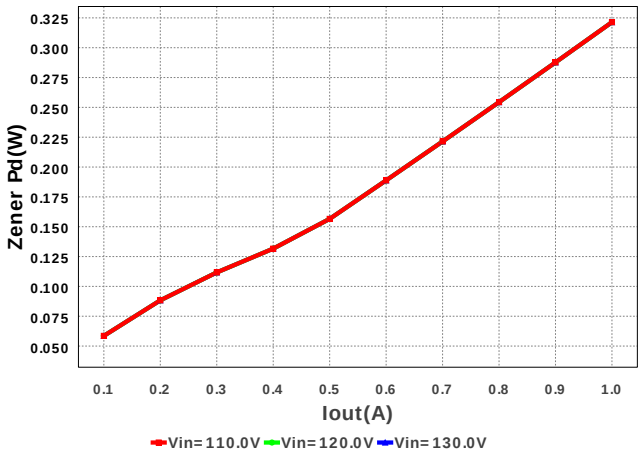
Vout p- p



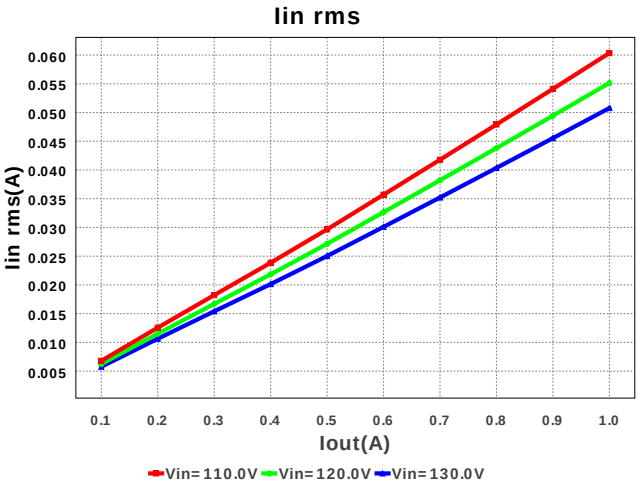
T1 Iprim RMS



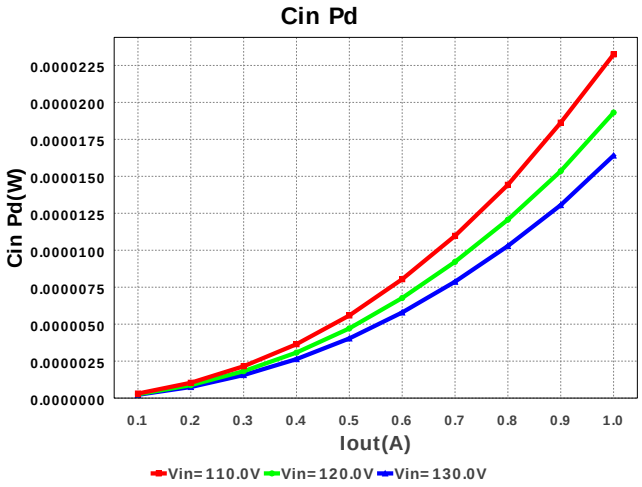
Zener Pd



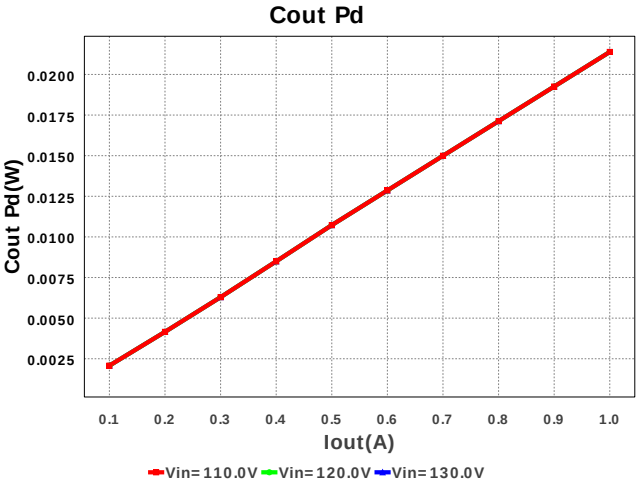
Iin rms



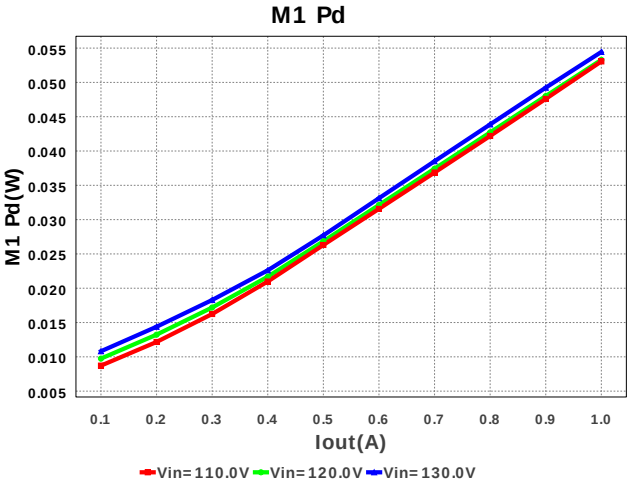
Cin Pd



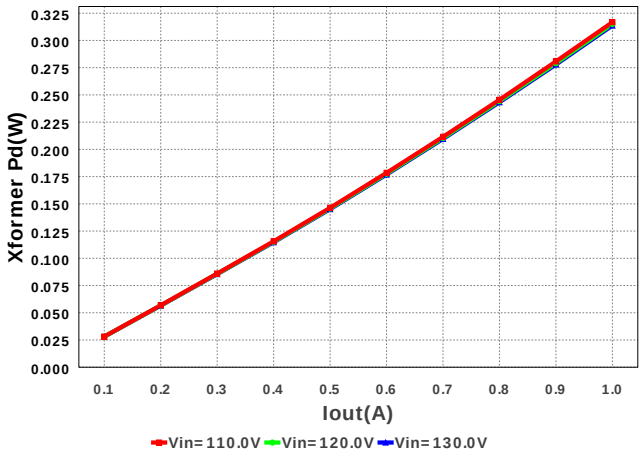
Cout Pd



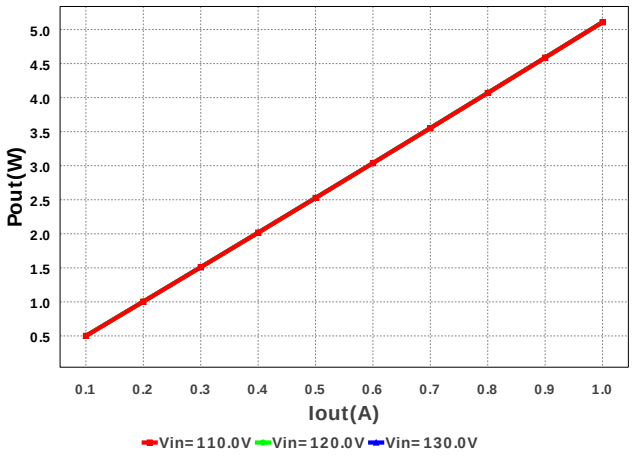
M1 Pd



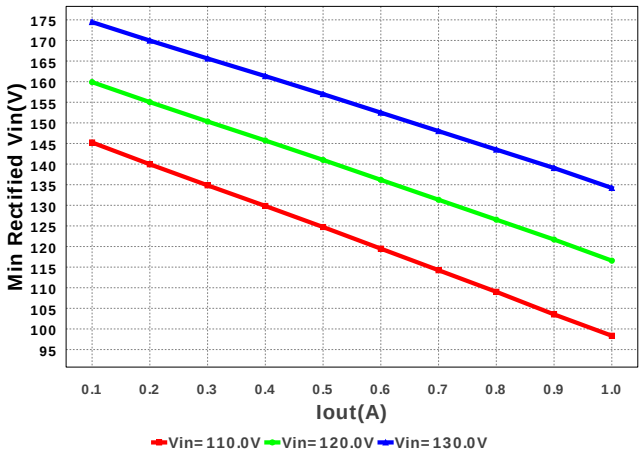
Xformer Pd



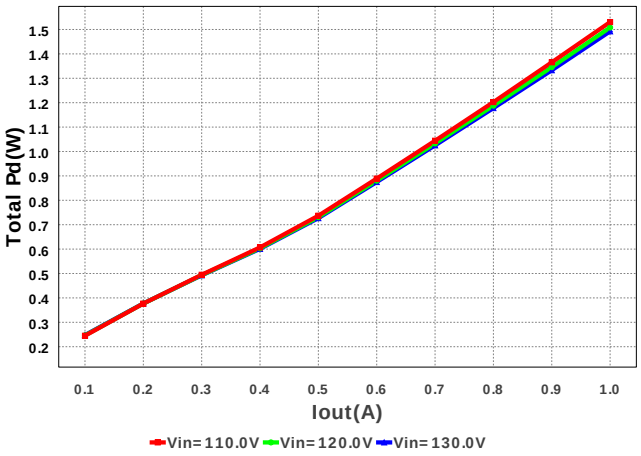
Pout



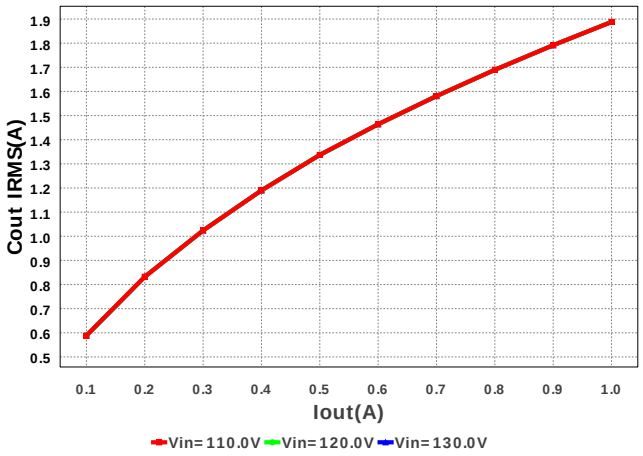
Min Rectified Vin



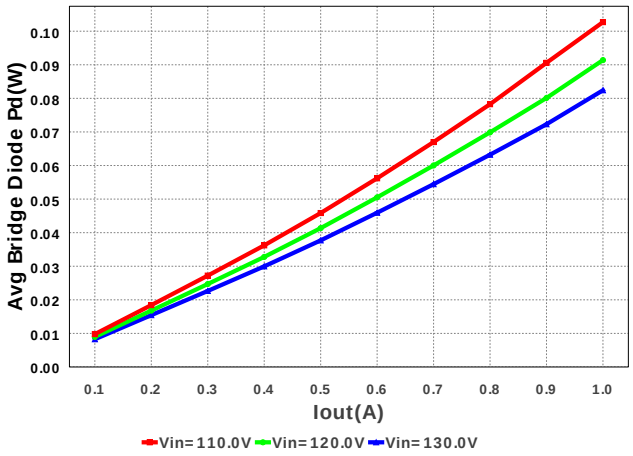
Total Pd

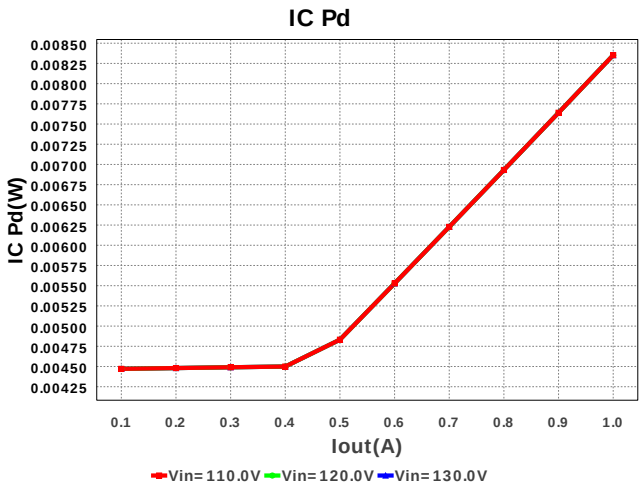


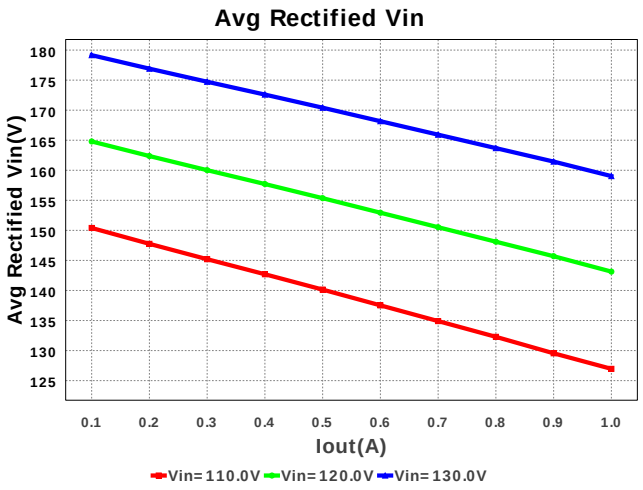
Cout IRMS

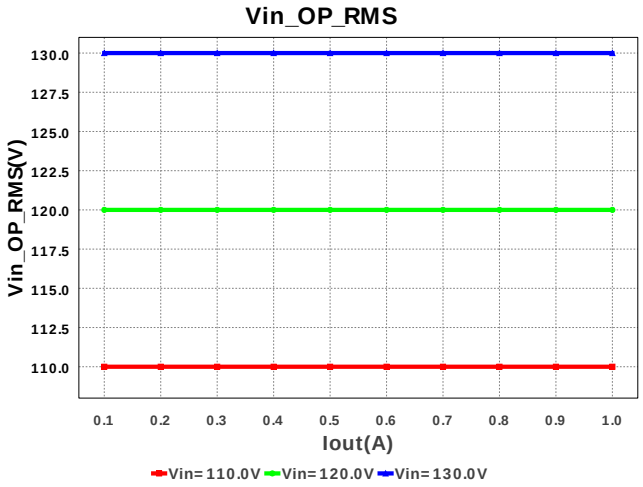


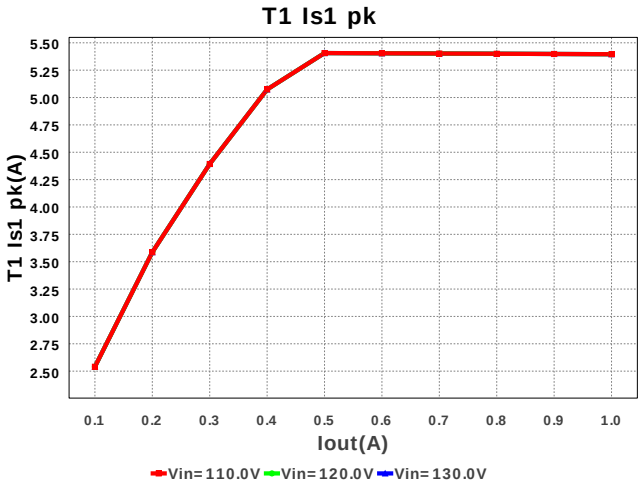
Avg Bridge Diode Pd

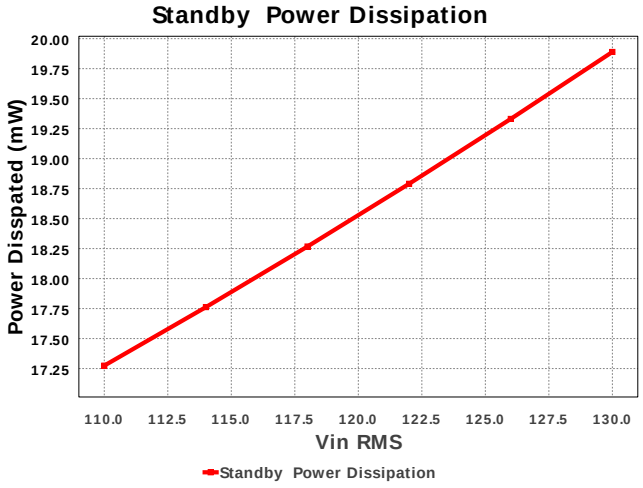


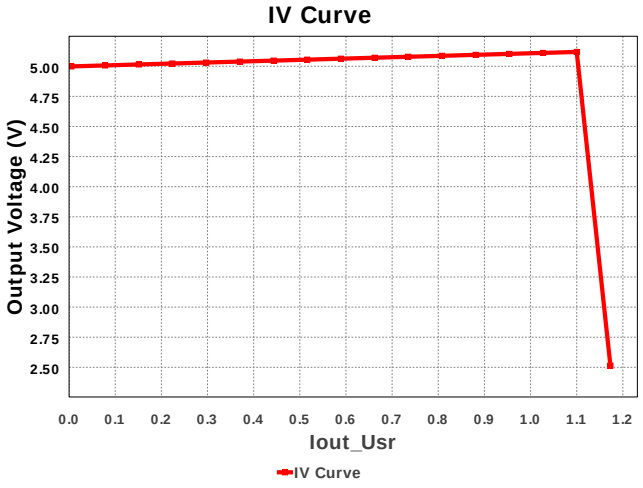












工作数值

#	名称	数值	类别	说明
1.	Cin IRMS	44.161 mA	Current	输入电容器均方根纹波电流
2.	Cin2 IRMS	128.867 mA	Current	Input capacitor2 RMS ripple current
3.	Cout IRMS	1.888 A	Current	输出电容器均方根纹波电流
4.	Iin rms	50.913 mA	Current	RMS 输入电流
5.	T1 Iprim RMS	94.823 mA	Current	Transformer Primary RMS Current
6.	T1 Iprim pk	316.456 mA	Current	Transformer Primary Peak Current
7.	T1 Is1 RMS	1.898 A	Current	Transformer Secondary1 RMS Current
8.	T1 Is1 pk	5.396 A	Current	Transformer Secondary1 Peak Current
9.	平均的整流输入电压	157.772 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	2.435 kmm2	General	BOM组件的总所占面积

#	名称	数值	类别	说明
12.	模式	DCM	General	传导模式
13.	Pout	5.108 W	General	总输出功率
14.	总 BOM	$0.0	General	Total BOM Cost
15.	Vout OP	5.108 V	Op_Point	Operational Output Voltage
16.	占空比	26.936 %	Op_point	占空比
17.	效率	77.176 %	Op_point	稳态效率
18.	频率	97.459 kHz	Op_point	开关频率
19.	IC Tj	30.585 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	32.988 degC	Op_point	M1 MOSFET 接点温度
23.	Min Rectified Vin	131.699 V	Op_point	Minimum voltage seen at rectified input
24.	Peak Rectified Vin	183.846 V	Op_point	Peak voltage seen at rectified input
25.	Vin_OP_RMS	130.0 V	Op_point	交流输入均方根电压
26.	Vout p-p	32.375 mV	Op_point	峰值到峰值输出纹波电压
27.	平均桥二极管 Pd	83.024 mW	Power	桥二极管在交流线路期间的平均功率耗散
28.	Cin Pd	16.577 µW	Power	输入电容器功率耗散
29.	Cout Pd	21.385 mW	Power	输出电容器功率耗散
30.	二极管2 Pd	500.565 mW	Power	二极管2功率耗散
31.	IC Pd	8.352 mW	Power	电路功率耗散
32.	M1 Pd	54.332 mW	Power	M1 MOSFET 总功率耗散
33.	整体 Pd	1.511 W	Power	总功率耗散
34.	Xformer Pd	313.757 mW	Power	变压器功率耗散
35.	Zener Pd	321.387 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	130.0 V	最高输入电压
4.	Vin 最小	110.0 V	最低输入电压
5.	输出电压:	5.0 V	输出电压
6.	Vout1	5.0 Volt	Output Voltage #1
7.	base_pn	UCC28700	美国国家半导体的产品编号
8.	源	AC	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. UCC28700 Product Folder : http://www.ti.com/product/ucc28700 : contains the data sheet and other resources.