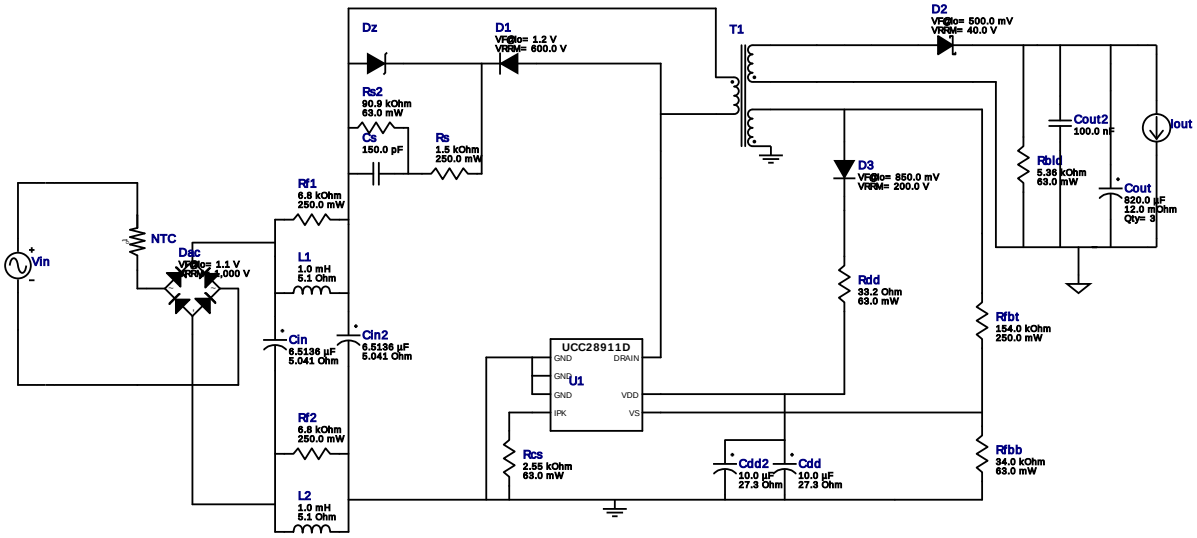
WEBENCH® Design Report

VinMin = 85.0V
VinMax = 265.0V
Vout = 3.3V
Iout = 1.5A

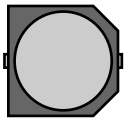
Device = UCC28911D
Topology = Flyback
Created = 5/11/16 9:40:26 AM
BOM Cost = $0.00
BOM Count = 28
Total Pd = 1.86W

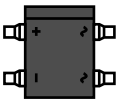
Design : 10925/21 UCC28911D
UCC28911D 85.0V-265.0V to 3.30V @ 1.5A



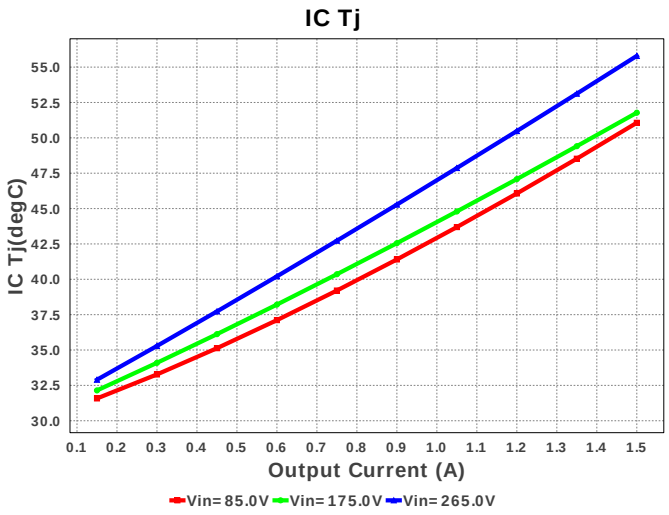
1. Click on the transformer symbol and select 'Design Transformer' to design using specific transformer cores and bobbin

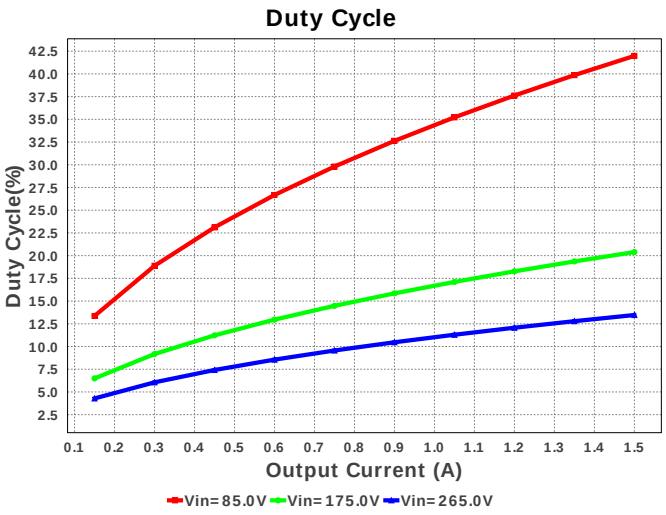
Electrical BOM

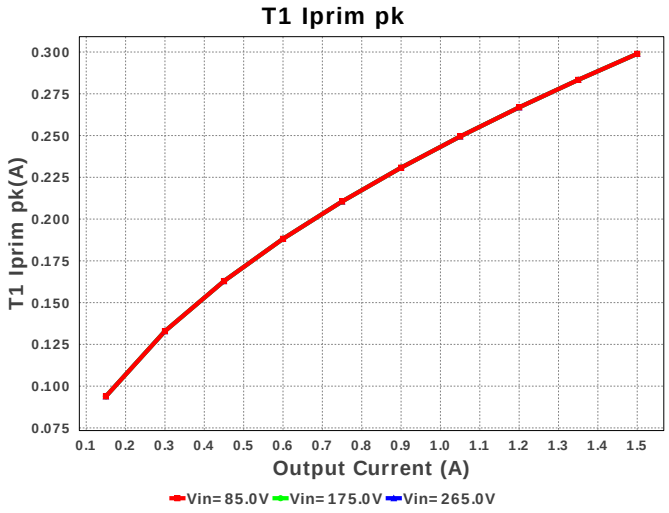
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cdd	Nichicon	UVR1V100MDD1TA Series= ?	Cap= 10.0 uF ESR= 27.3 Ohm VDC= 35.0 V IRMS= 0.0 A	1	$0.03	 CAPPR2-5X11 49 mm^2
2.	Cdd2	Nichicon	UVR1V100MDD1TA Series= ?	Cap= 10.0 uF ESR= 27.3 Ohm VDC= 35.0 V IRMS= 0.0 A	1	$0.03	 CAPPR2-5X11 49 mm^2
3.	Cin	CUSTOM	CUSTOM Series= ?	Cap= 6.5136 uF ESR= 5.0408 Ohm VDC= 449.72 V IRMS= 80.582 mA	1	NA	CUSTOM 0 mm^2
4.	Cin2	CUSTOM	CUSTOM Series= ?	Cap= 6.5136 uF ESR= 5.0408 Ohm VDC= 449.72 V IRMS= 80.582 mA	1	NA	CUSTOM 0 mm^2
5.	Cout	Panasonic	6SVP820M Series= SVP	Cap= 820.0 uF ESR= 12.0 mOhm VDC= 6.3 V IRMS= 5.44 A	3	$0.72	 SM_RADIAL_10AMM 160 mm^2
6.	Cout2	MuRata	GRM155R60J104KA01D Series= X5R	Cap= 100.0 nF VDC= 6.3 V IRMS= 0.0 A	1	$0.01	 0402 3 mm^2
7.	Cs	MuRata	GRM31A5C2J151JW01D Series= C0G/NP0	Cap= 150.0 pF VDC= 630.0 V IRMS= 0.0 A	1	$0.04	 1206 11 mm^2
8.	D1	ON Semiconductor	1N4937G	VF@Io= 1.2 V VRRM= 600.0 V	1	$0.04	 DO-41 43 mm^2

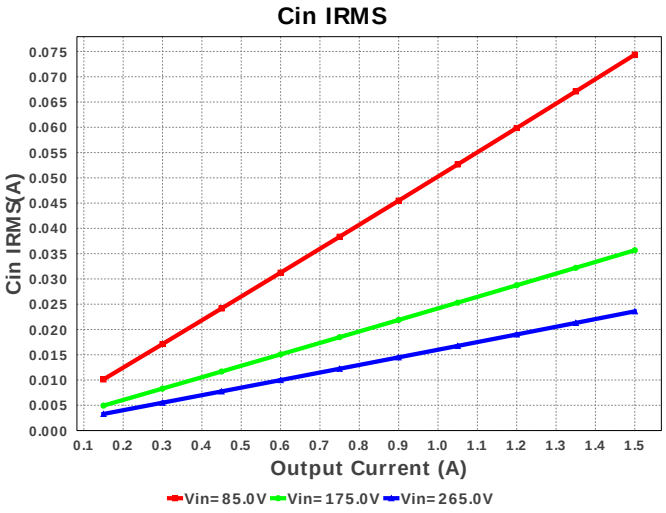
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
9.	D2	Diodes Inc.	B340A-13-F	VF@Io= 500.0 mV VRRM= 40.0 V	1	$0.11	 SMA 37 mm²
10.	D3	Rohm	RF071M2S	VF@Io= 850.0 mV VRRM= 200.0 V	1	$0.09	 SOD-123 13 mm²
11.	Dac	Vishay-Semiconductor	DF10SA	VF@Io= 1.1 V VRRM= 1,000.0 V	1	$0.24	 DF-S 99 mm²
12.	Dz	ON Semiconductor	1SMB5949BT3G	Zener	1	$0.10	 SMB 44 mm²
13.	L1	Coilcraft	LPS5030-105MRB	L= 1.0 mH DCR= 5.1 Ohm	1	$0.44	 LPS5030 34 mm²
14.	L2	Coilcraft	LPS5030-105MRB	L= 1.0 mH DCR= 5.1 Ohm	1	$0.44	 LPS5030 34 mm²
15.	NTC	Ametherm	SL0310001 Series= miniAMP	Thermistor	1	$0.23	SL03 6 mm²
16.	Rbld	Vishay-Dale	CRCW04025K36FKED Series= CRCW..e3	Res= 5.36 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 3 mm²
17.	Rcs	Vishay-Dale	CRCW04022K55FKED Series= CRCW..e3	Res= 2.55 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 3 mm²
18.	Rdd	Vishay-Dale	CRCW040233R2FKED Series= CRCW..e3	Res= 33.2 Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 3 mm²
19.	Rf1	Yageo America	RC1206FR-076K8L Series= ?	Res= 6.8 kOhm Power= 250.0 mW Tolerance= 1.0%	1	$0.01	 1206 11 mm²
20.	Rf2	Yageo America	RC1206FR-076K8L Series= ?	Res= 6.8 kOhm Power= 250.0 mW Tolerance= 1.0%	1	$0.01	 1206 11 mm²
21.	Rfbb	Vishay-Dale	CRCW040234K0FKED Series= CRCW..e3	Res= 34.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 3 mm²
22.	Rfbt	Panasonic	ERJ-8ENF1543V Series= ERJ-8E	Res= 154.0 kOhm Power= 250.0 mW Tolerance= 1.0%	1	$0.01	 1206 11 mm²
23.	Rs	Panasonic	ERJ-8ENF1501V Series= ERJ-8E	Res= 1.5 kOhm Power= 250.0 mW Tolerance= 1.0%	1	$0.01	 1206 11 mm²
24.	Rs2	Vishay-Dale	CRCW040290K9FKED Series= CRCW..e3	Res= 90.9 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 3 mm²
25.	T1	Core=TDK , CoilFormer=TDK	Core=B65841A0000R087 , CoilFormer=B65842W1008D002	Lp= 1.177 mH Turns Ratio(Nas)= 20:4 Turns Ratio(Nps)= 104:4 Npri= 104.0 Naux= 20.0 Nsec= 4.0	1	$0.74	 TDK_B65839 167 mm²

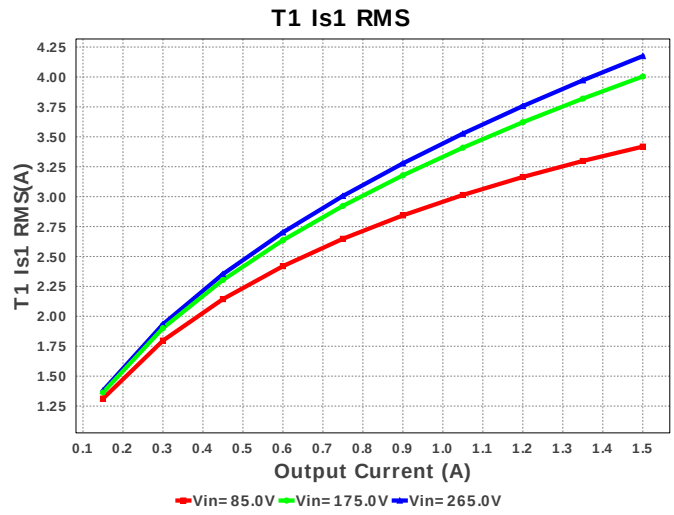
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
26.	U1	Texas Instruments	UCC28911D	Switcher	1	$0.98	D0007A 55 mm²

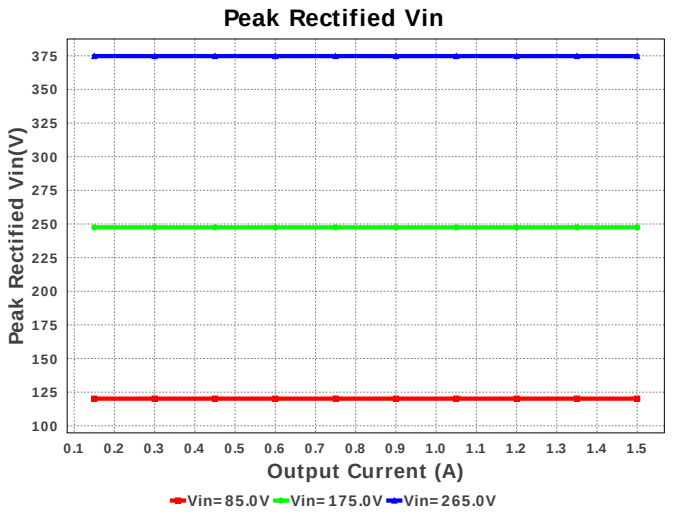


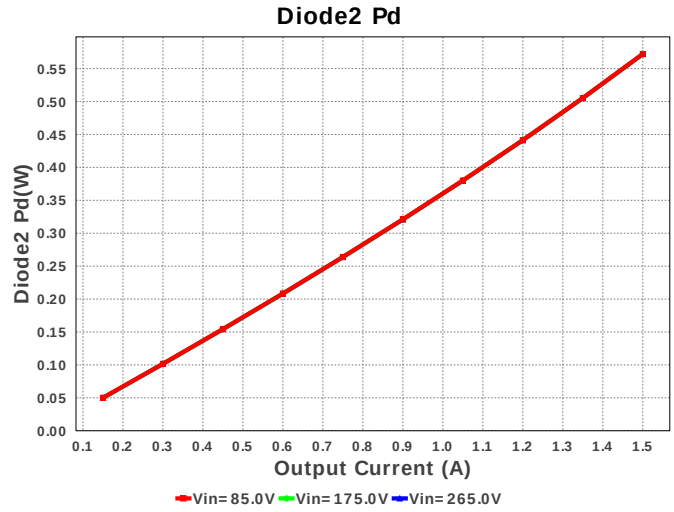


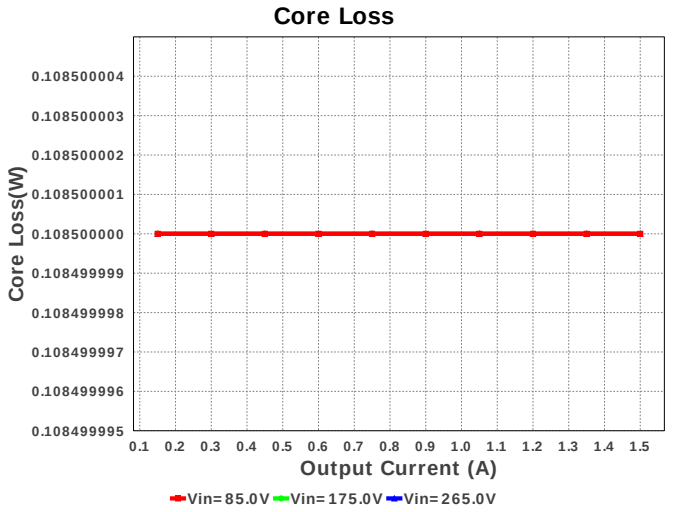


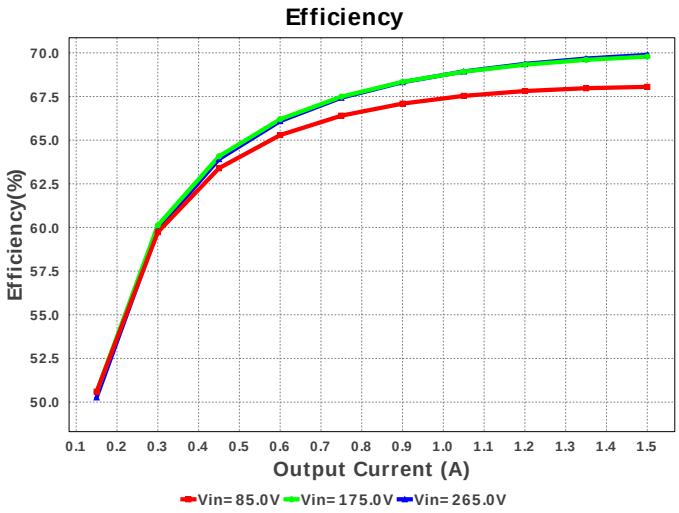


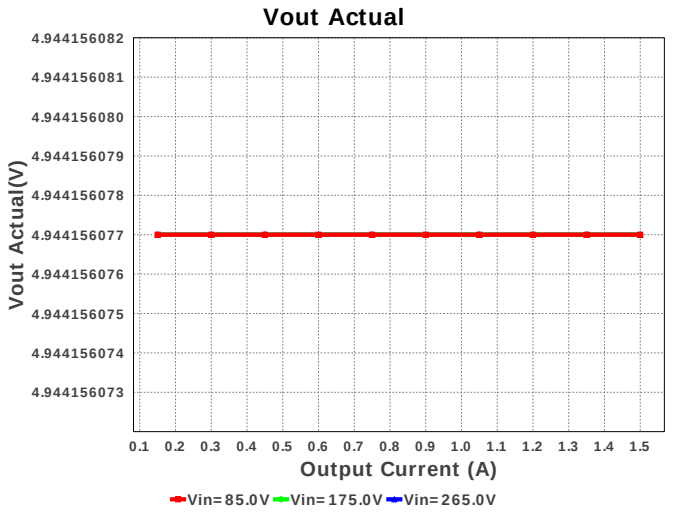


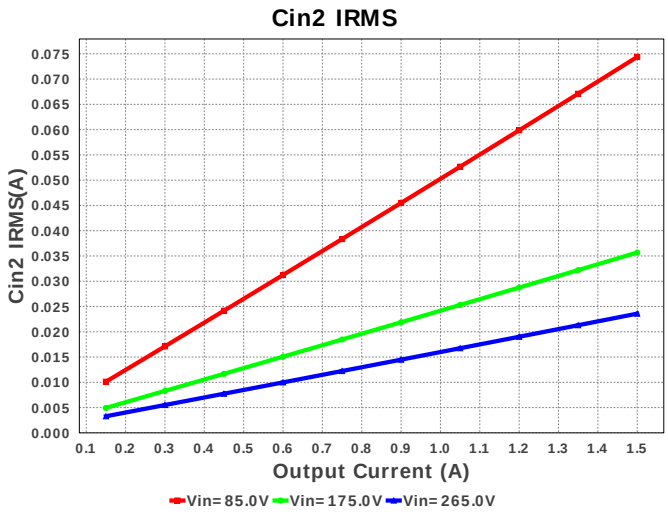


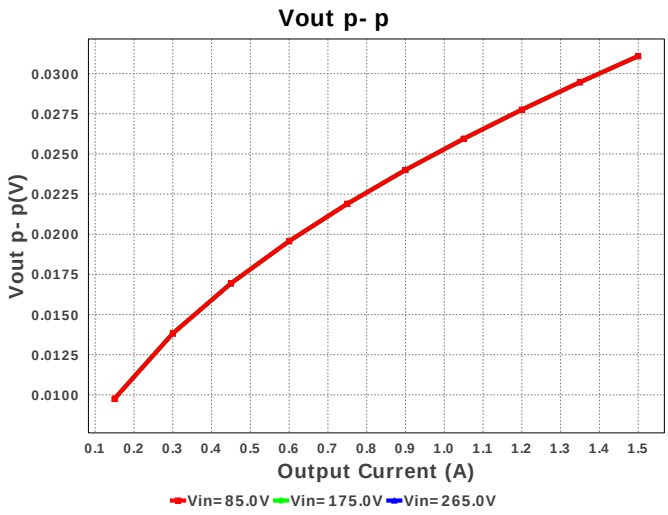


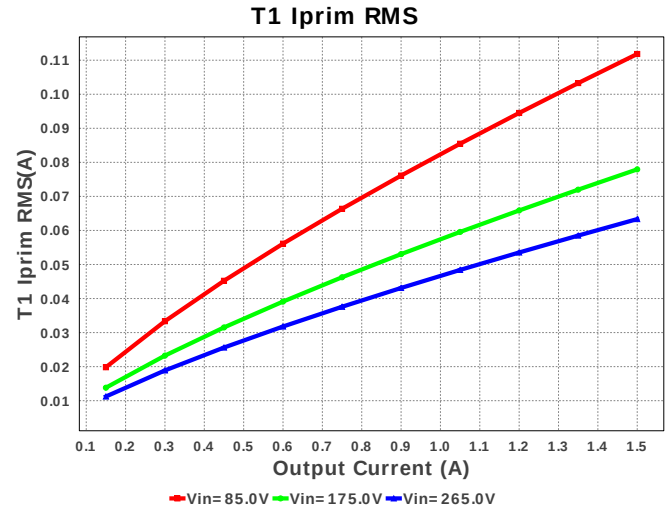


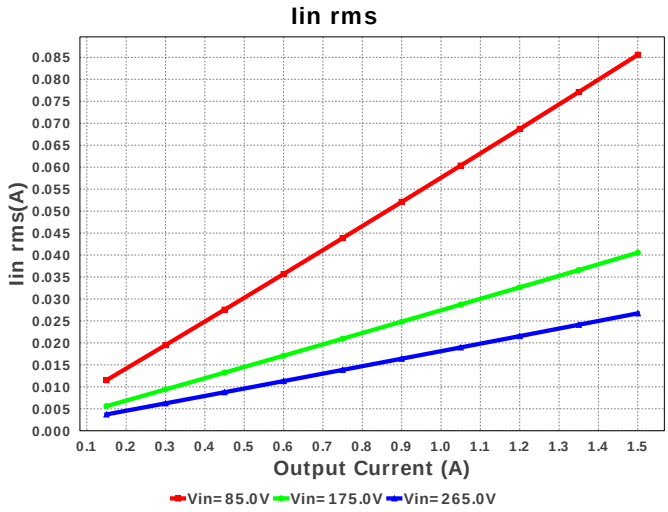


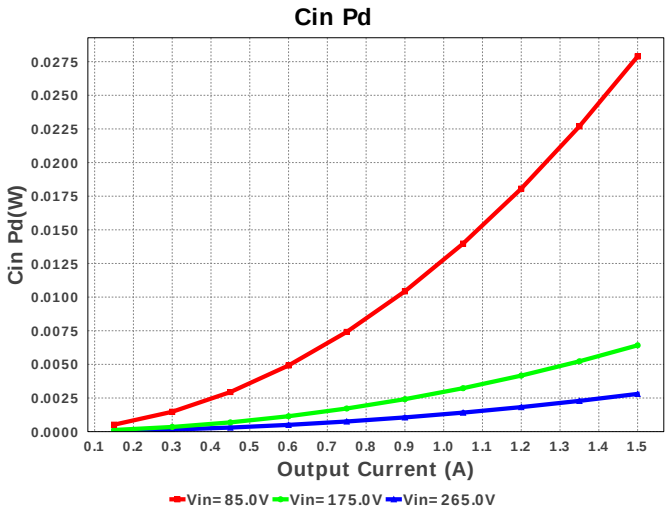


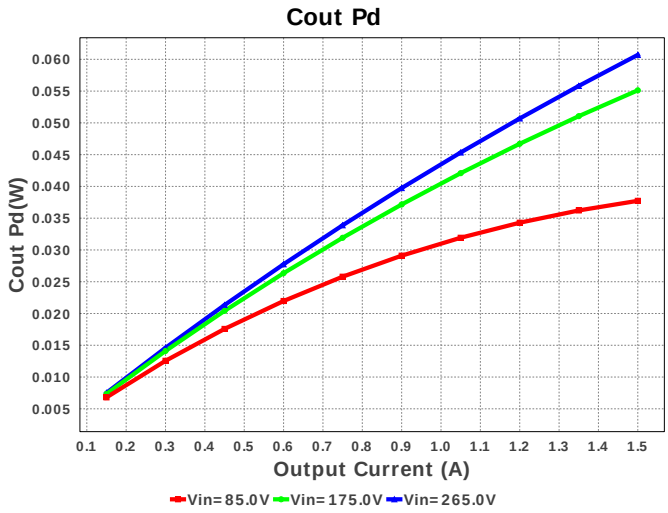


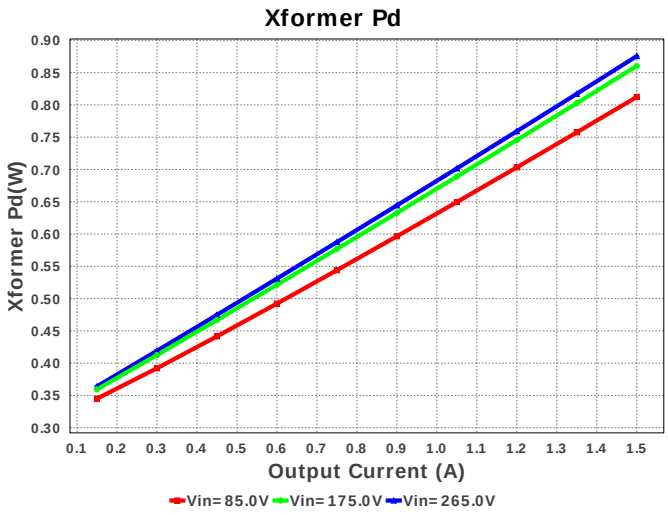


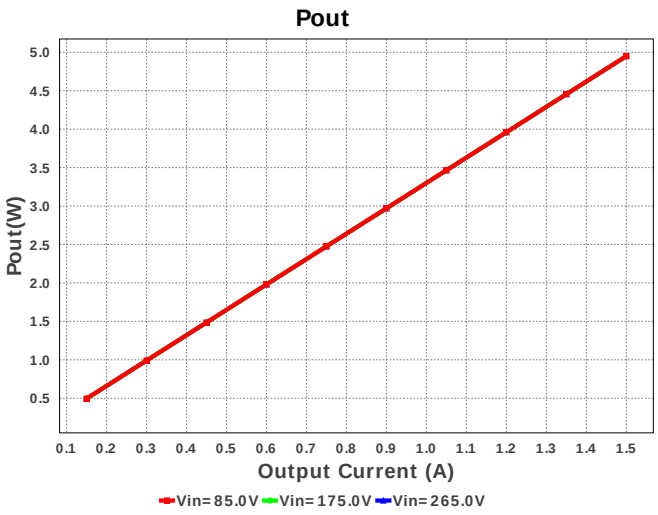


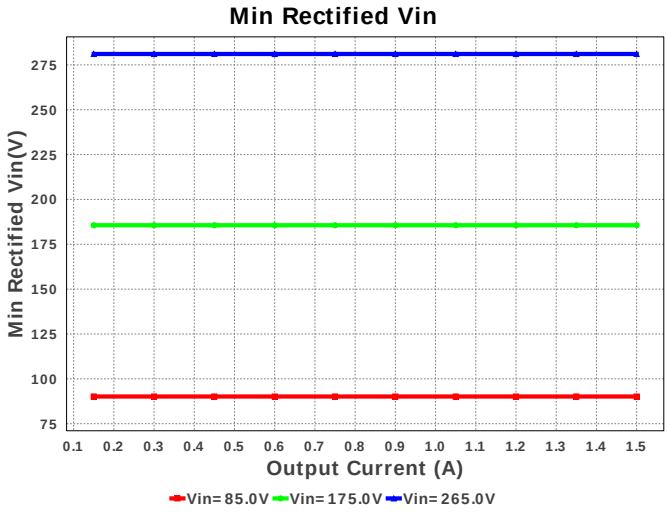


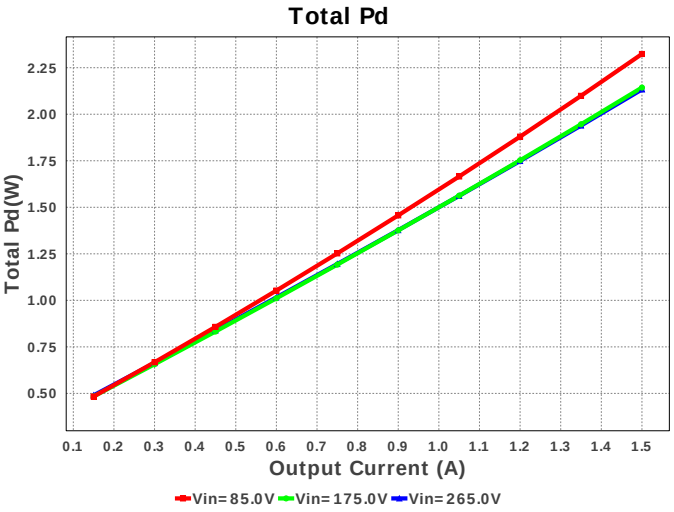


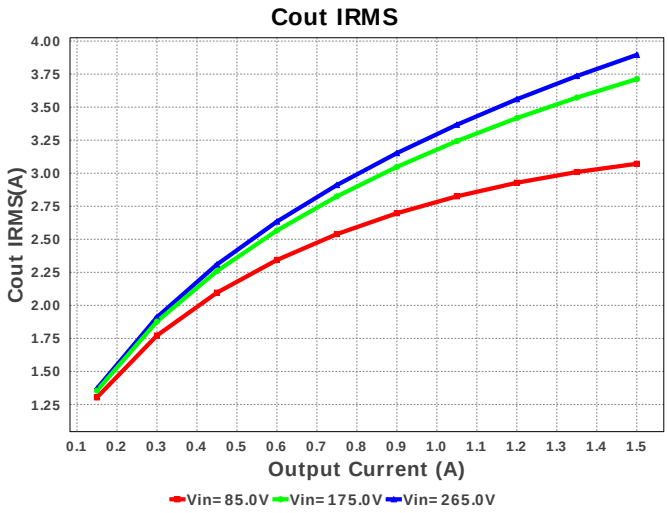


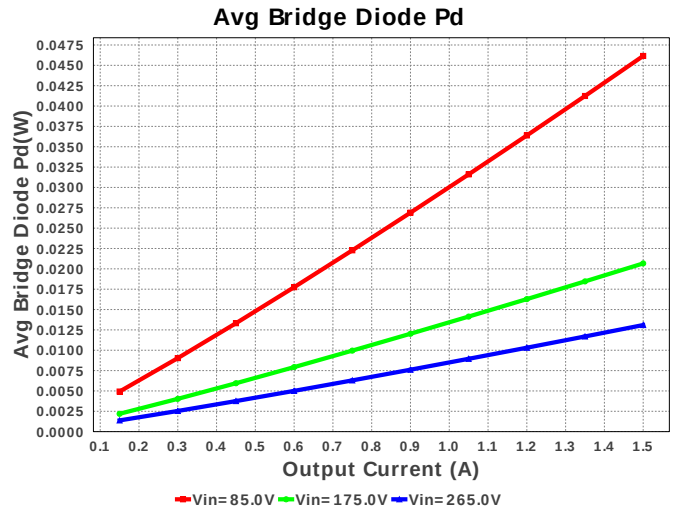


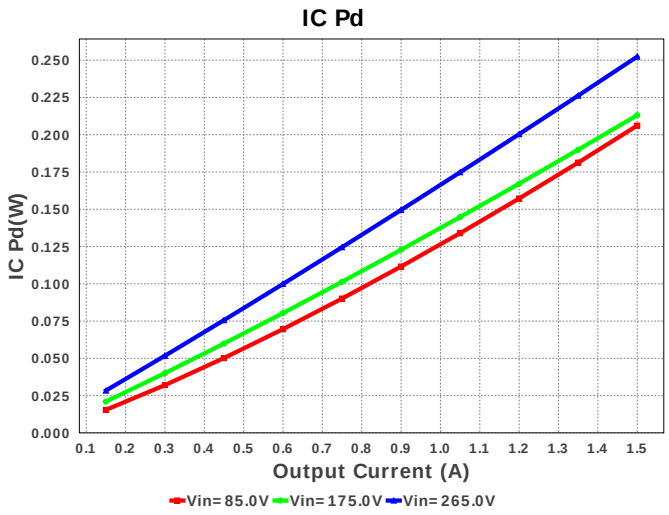


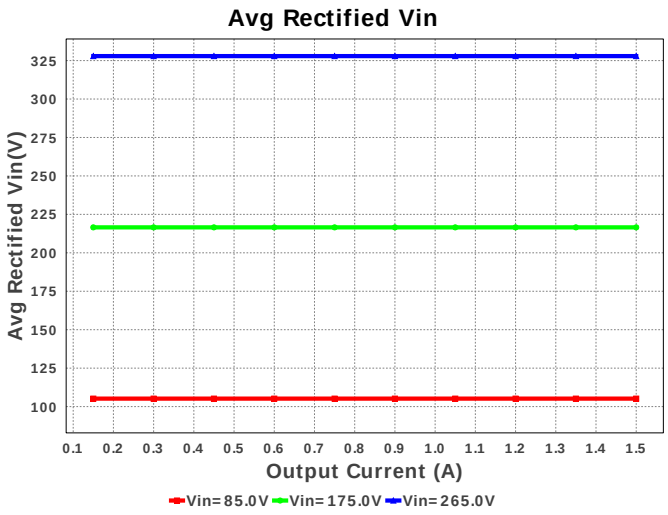


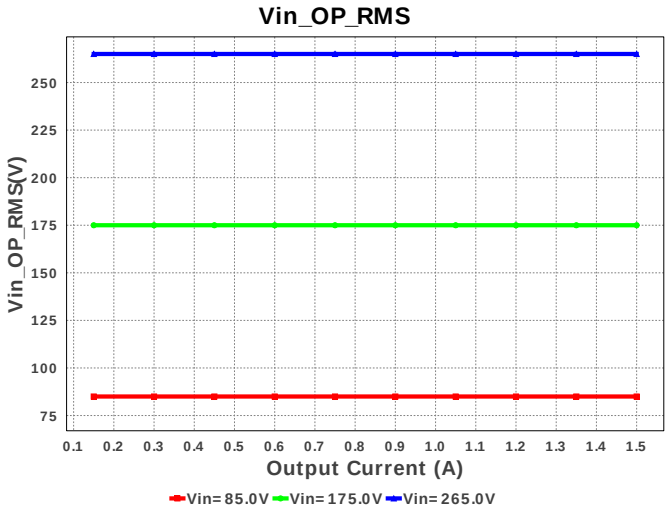


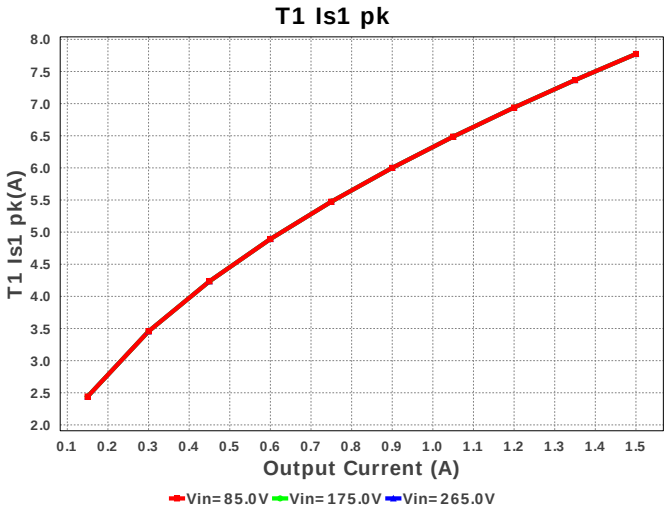












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	69.39 mA	Current	Input capacitor RMS ripple current
2.	Cin2 IRMS	69.39 mA	Current	Input Capacitor Cin2 RMS Ripple Current
3.	Cout IRMS	1.4 A	Current	Output capacitor RMS ripple current
4.	Iin rms	80.076 mA	Current	RMS Input Current
5.	T1 Iprim RMS	94.239 mA	Current	Transformer Primary RMS Current
6.	T1 Iprim pk	212.299 mA	Current	Transformer Primary Peak Current
7.	T1 Is1 RMS	2.052 A	Current	Transformer Secondary1 RMS Current
8.	T1 Is1 pk	5.558 A	Current	Transformer Secondary1 Peak Current
9.	Avg Rectified Vin	105.181 V	General	Average Rectified Voltage for the AC Line Period
10.	BOM Count	28	General	Total Design BOM count
11.	D1 trr	300.0 ns	General	D1 Reverse Recovery Time
12.	D2 trr	0.0 ns	General	Output Diode Reverse Recovery Time
13.	D3 trr	25.0 ns	General	Auxiliary Diode Reverse Recovery Time
14.	FootPrint	1.251 k mm^2	General	Total Foot Print Area of BOM components
15.	Frequency	105.0 kHz	General	Switching frequency
16.	Pout	4.95 W	General	Total output power
17.	Total BOM	$0.0	General	Total BOM Cost
18.	Vout Actual	4.944 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
19.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
20.	Duty Cycle	59.114 %	Op_point	Duty cycle
21.	Efficiency	72.725 %	Op_point	Steady state efficiency
22.	IC Tj	56.161 degC	Op_point	IC junction temperature
23.	ICThetaJA	102.2 degC/W	Op_point	IC junction-to-ambient thermal resistance
24.	IOUT_OP	1.5 A	Op_point	Iout operating point
25.	Min Rectified Vin	90.155 V	Op_point	Minimum voltage seen at rectified input
26.	Peak Rectified Vin	120.207 V	Op_point	Peak voltage seen at rectified input
27.	Vin_OP_RMS	85.0 V	Op_point	AC Input RMS Voltage
28.	Vout p-p	22.23 mV	Op_point	Peak-to-peak output ripple voltage
29.	Avg Bridge Diode Pd	43.057 mW	Power	Average Power Dissipation in the Bridge Diode over the AC Line Period
30.	Cin Pd	24.271 mW	Power	Input capacitor power dissipation
31.	Core Loss	39.905 mW	Power	

#	Name	Value	Category	Description
32.	Cout Pd	7.838 mW	Power	Output capacitor power dissipation
33.	Diode2 Pd	572.128 mW	Power	Diode2 power dissipation
34.	IC Pd	255.976 mW	Power	IC power dissipation
35.	Total Pd	1.856 W	Power	Total Power Dissipation
36.	Xformer Pd	307.753 mW	Power	Transformer power dissipation
37.	Vout Tolerance	8.405 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	1.5	Maximum Output Current
2.	VinMax	265.0	Maximum input voltage
3.	VinMin	85.0	Minimum input voltage
4.	Vout	3.3	Output Voltage
5.	line_fsw	60.0	Light Output in Lumen
6.	base_pn	UCC28911	Base Product Number
7.	source	AC	Input Source Type
8.	Ta	30.0	Ambient temperature

Design Assistance

1. **UCC28911** Product Folder : http://www.ti.com/product/UCC28911 : contains the data sheet and other resources.