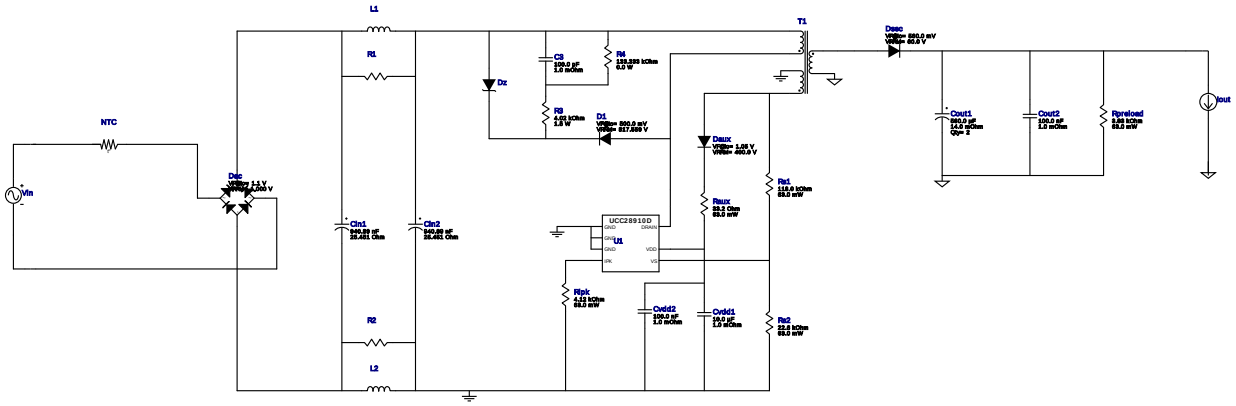
VinMin = 200.0V
VinMax = 265.0V
Vout = 6.0V
Iout = 0.7A

Device = UCC28910D
Topology = Flyback
Created = 2018-02-04 23:05:47.546
BOM Cost = $0.00
BOM Count = 23
Total Pd = 0.82W

WEBENCH® Design Report

Design : 1982740/49 UCC28910D
UCC28910D 200.0V-265.0V to 6.00V @ 0.7A

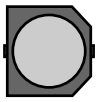


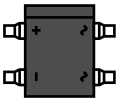
1. The EMI filter shown in the schematic is a placeholder. It has not yet been designed for the application.

My Comments

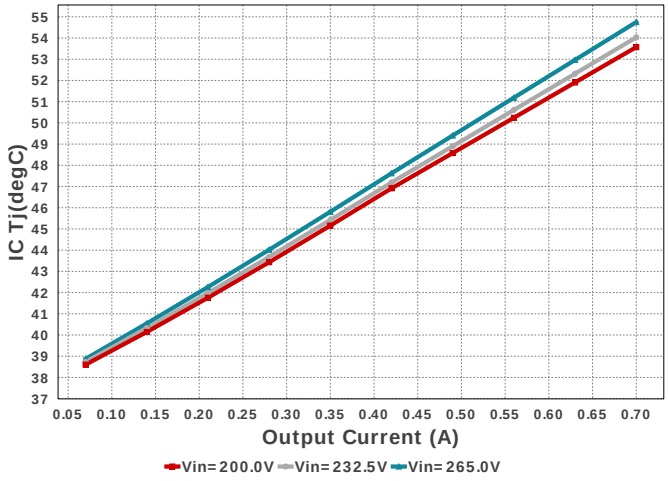
Vin:200-265V, 50Hz, Vout:6V, Iout:0.7A

Electrical BOM

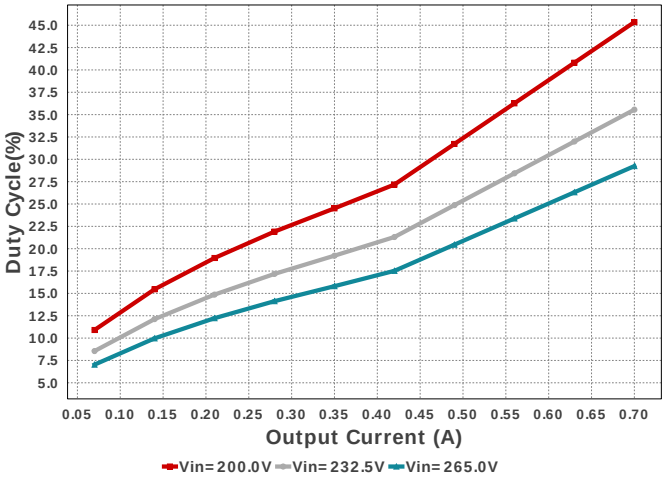
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	C3	Vishay-Vitramon	VJ0805A101JXGAT5Z Series= C0G/NP0	Cap= 100.0 pF ESR= 1.0 mOhm VDC= 1000.0 V IRMS= 0.0 A	1	$0.24	0805 7 mm^2
2.	Cin1	CUSTOM	CUSTOM Series= ?	Cap= 940.89 nF ESR= 25.451 Ohm VDC= 393.5 V IRMS= 27.791 mA	1	NA	CUSTOM 0 mm^2
3.	Cin2	CUSTOM	CUSTOM Series= ?	Cap= 940.89 nF ESR= 25.451 Ohm VDC= 393.5 V IRMS= 27.791 mA	1	NA	CUSTOM 0 mm^2
4.	Cout1	Panasonic	16SVPF560M Series= SVPF	Cap= 560.0 uF ESR= 14.0 mOhm VDC= 16.0 V IRMS= 4.95 A	2	$0.64	 CAPSMT_62_E12 106 mm^2
5.	Cout2	MuRata	GRM155R61A104KA01D Series= X5R	Cap= 100.0 nF ESR= 1.0 mOhm VDC= 10.0 V IRMS= 0.0 A	1	$0.01	0402 3 mm^2
6.	Cvdd1	MuRata	GRM219R61E106KA12 Series= X5R	Cap= 10.0 uF ESR= 1.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	$0.05	0805 7 mm^2
7.	Cvdd2	Kemet	C0603C104K5RACTU Series= X7R	Cap= 100.0 nF ESR= 1.0 mOhm VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0603 5 mm^2
8.	D1	CUSTOM	CUSTOM	VF@Io= 500.0 mV VRRM= 817.559 V	1	NA	CUSTOM 0 mm^2

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
9.	Dac	Vishay-Semiconductor	DF10SA	VF@Io= 1.1 V VRRM= 1,000.0 V	1	$0.25	 DF-S 99 mm²
10.	Daux	Bourns	CD1408-FU1400	VF@Io= 1.05 V VRRM= 400.0 V	1	$0.14	 Diode_1408 13 mm²
11.	Dsec	Diodes Inc.	PDS760-13	VF@Io= 560.0 mV VRRM= 60.0 V	1	$0.66	 PowerDI5 50 mm²
12.	Dz	CUSTOM	CUSTOM	Zener	1	NA	CUSTOM 0 mm²
13.	NTC	Ametherm	SL0310001 Series= miniAMP	Thermistor	1	$0.23	 SL03 16 mm²
14.	R3	Vishay Draloric	CRCW25124K02FKEGHP Series= ?	Res= 4.02 kOhm Power= 1.5 W Tolerance= 1.0%	1	$0.25	 2512 43 mm²
15.	R4	CUSTOM	CUSTOM Series= ?	Res= 133.333 kOhm Power= 0.0 W Tolerance= 0.0%	1	NA	CUSTOM 0 mm²
16.	Raux	Vishay-Dale	CRCW040233R2FKED Series= CRCW..e3	Res= 33.2 Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 3 mm²
17.	Ripk	Vishay-Dale	CRCW04024K12FKED Series= CRCW..e3	Res= 4.12 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 3 mm²
18.	Rpreload	Vishay-Dale	CRCW04023K83FKED Series= CRCW..e3	Res= 3.83 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 3 mm²
19.	Rs1	Vishay-Dale	CRCW0402118KFKED Series= CRCW..e3	Res= 118.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 3 mm²
20.	Rs2	Vishay-Dale	CRCW040222K6FKED Series= CRCW..e3	Res= 22.6 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 3 mm²
21.	T1	Core=TDK , CoilFormer=TDK	Core=B65805P0000R087 , CoilFormer=B65822F1008T001	Lp= 7.813 mH Turns Ratio(Nas)= 20:6 Turns Ratio(Nps)= 168:6 Npri= 168.0 Naux= 20.0 Nsec= 6.0	1	$1.21	 TDK_B65803 103 mm²
22.	U1	Texas Instruments	UCC28910D	Switcher	1	$0.70	 D0007A 55 mm²

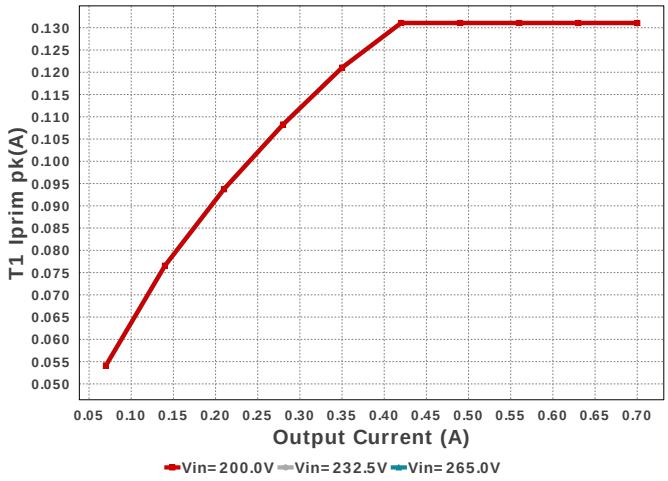
IC Tj



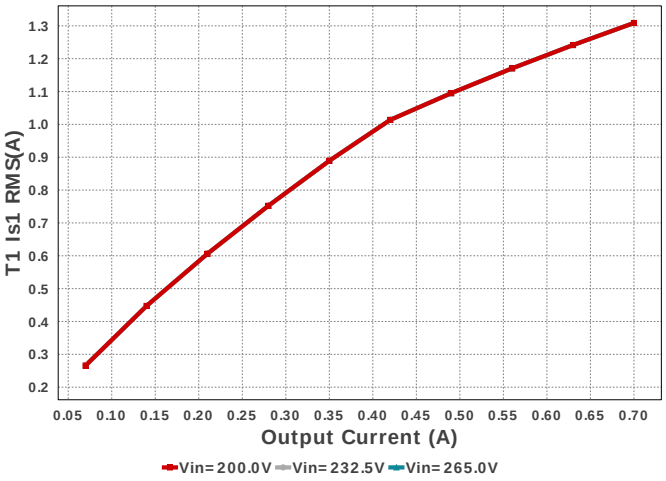
Duty Cycle



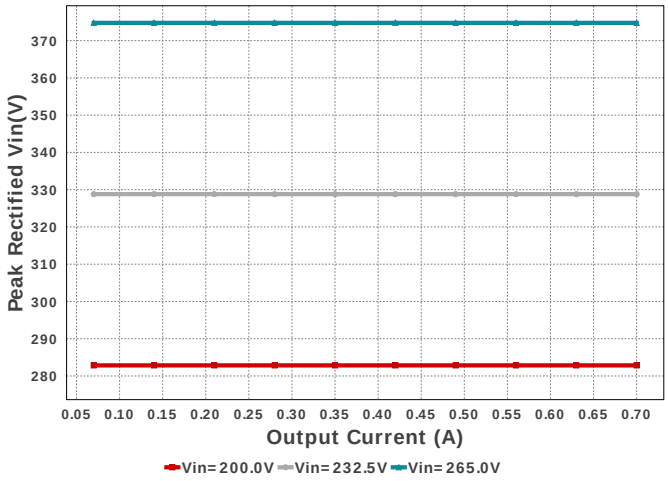
T1 Iprim pk



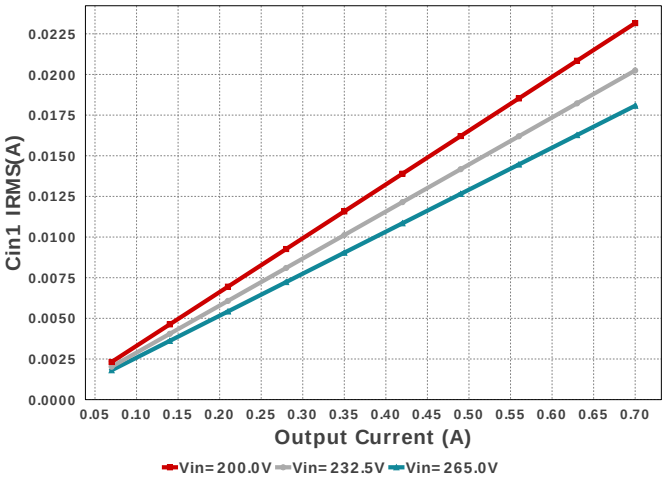
T1 Is1 RMS



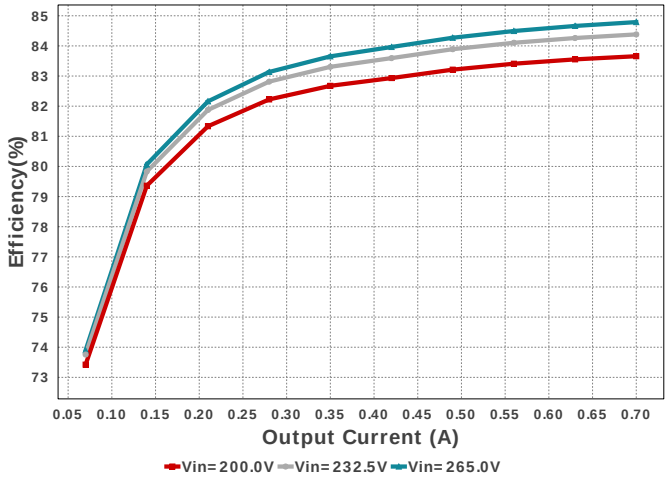
Peak Rectified Vin



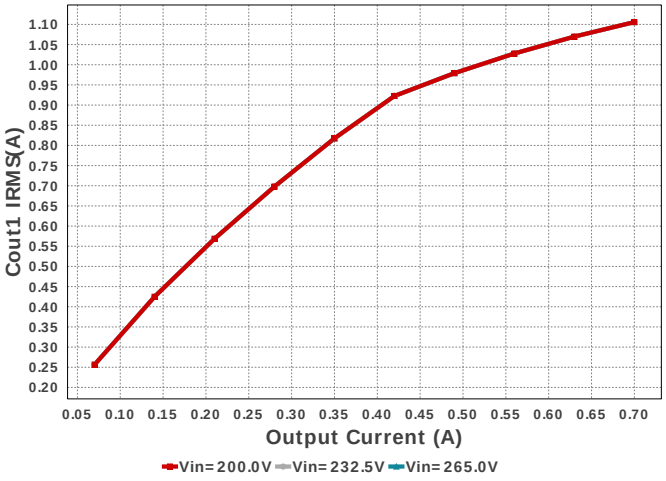
Cin1 IRMS



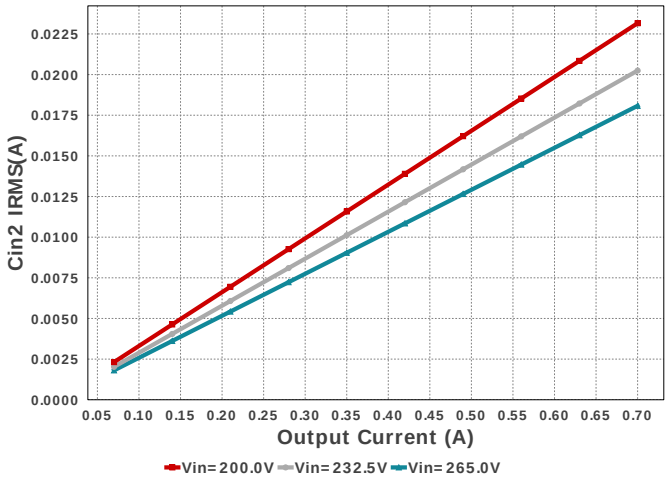
Efficiency



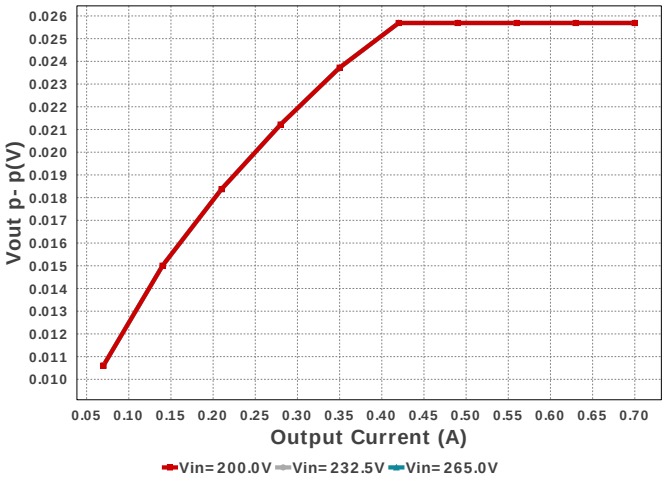
Cout1 IRMS



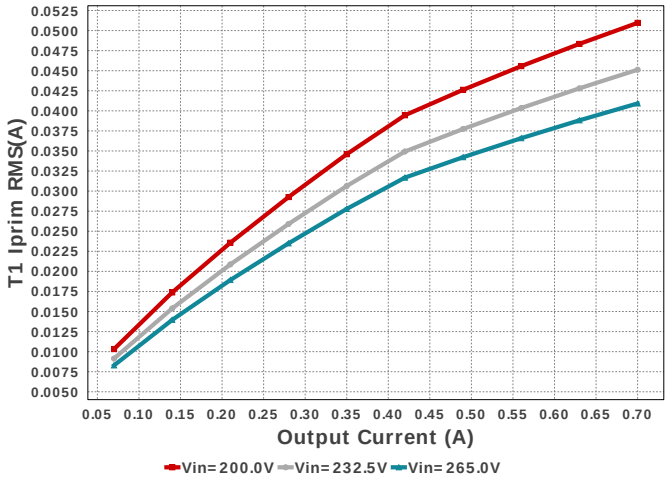
Cin2 IRMS



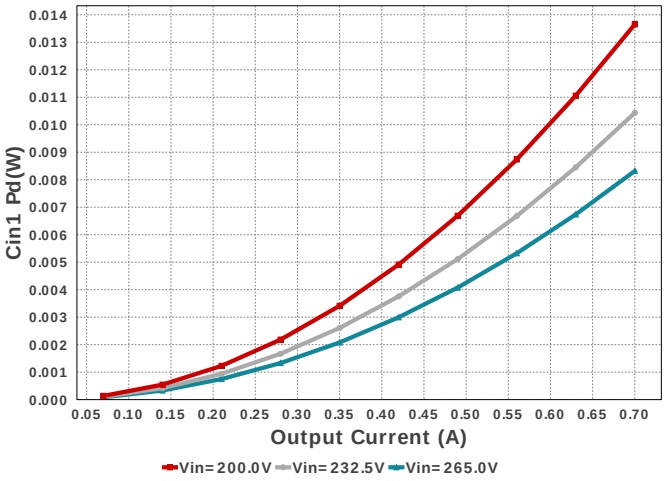
Vout p- p

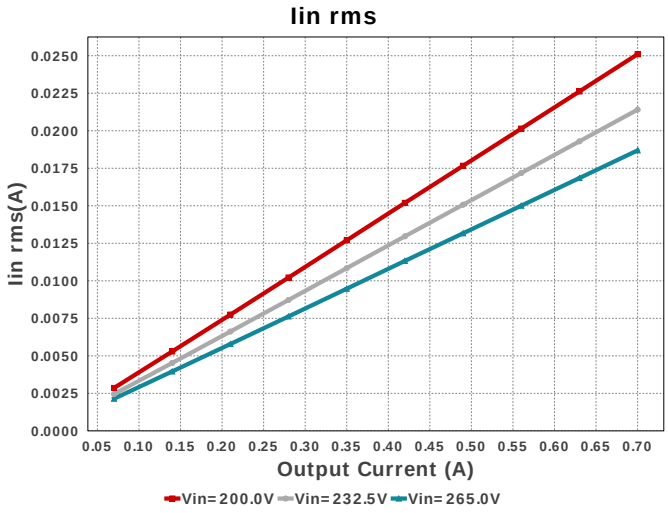


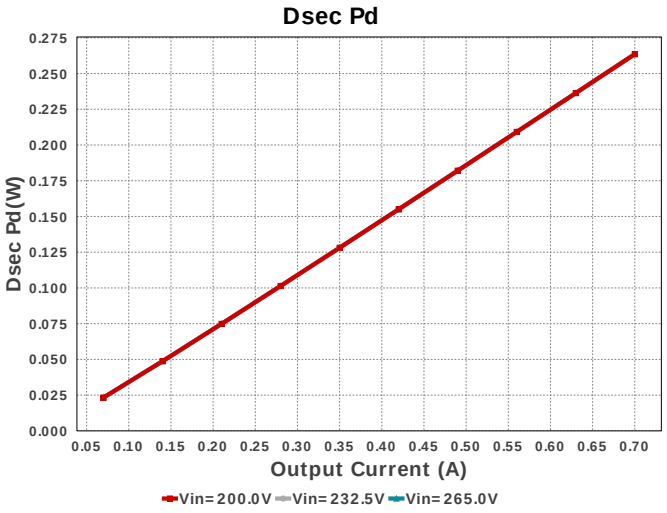
T1 Iprim RMS

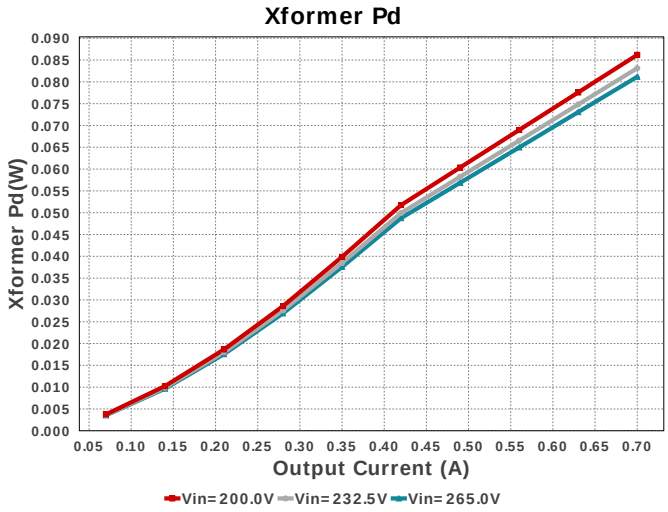


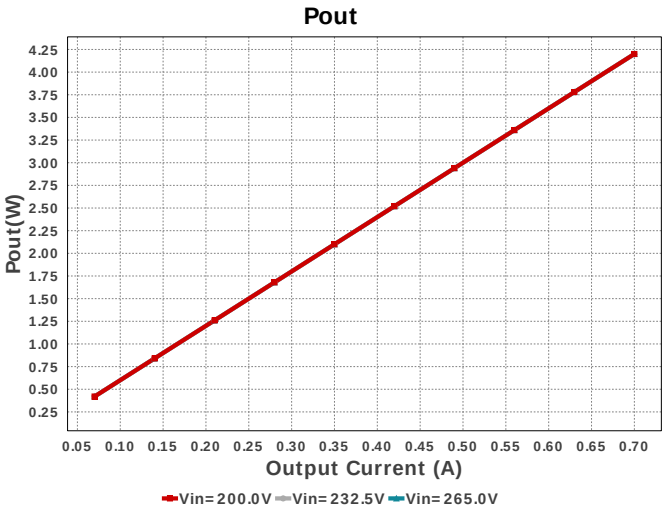
Cin1 Pd

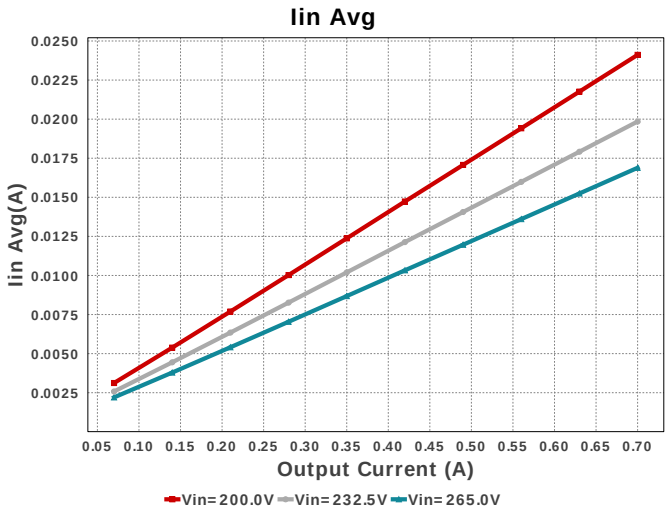


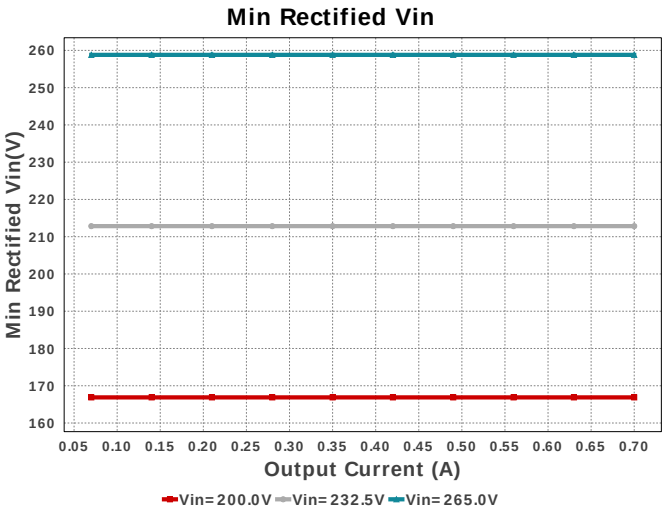


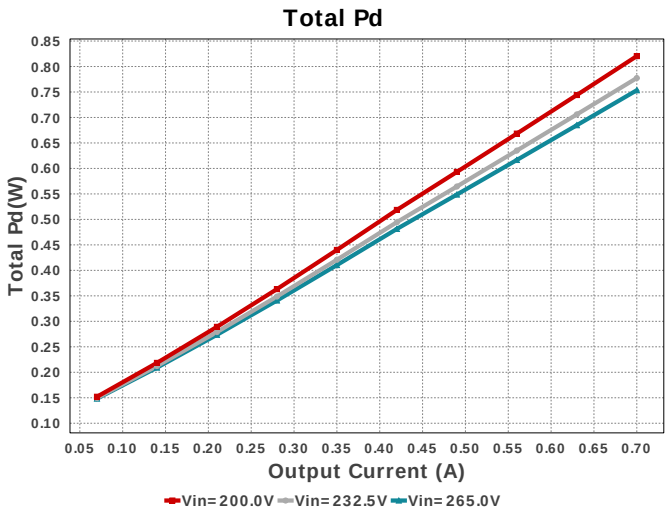


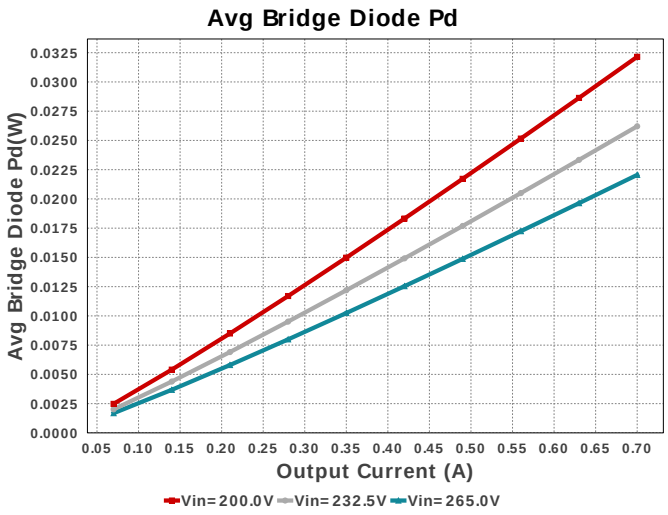


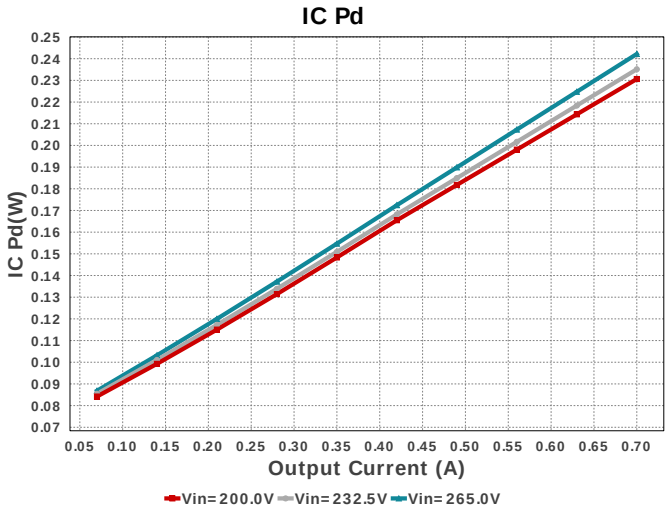


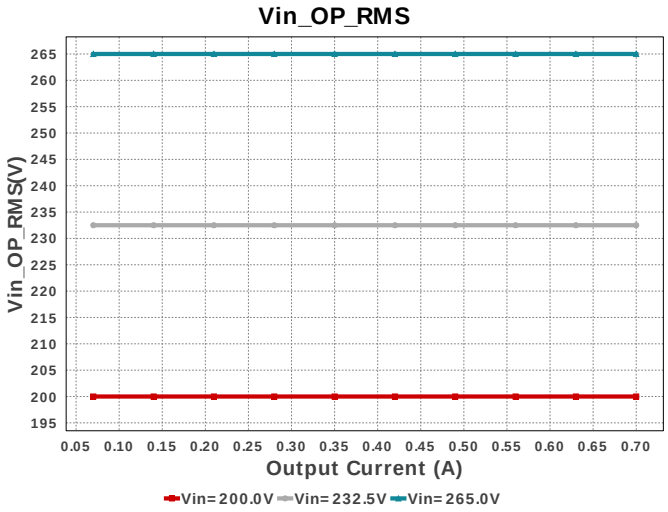


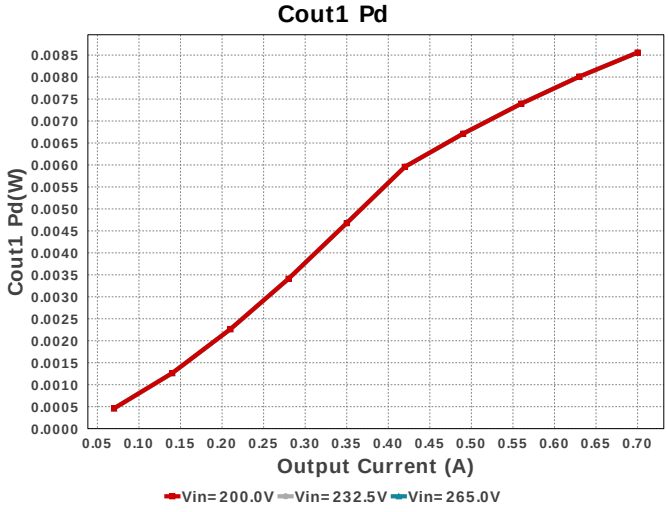


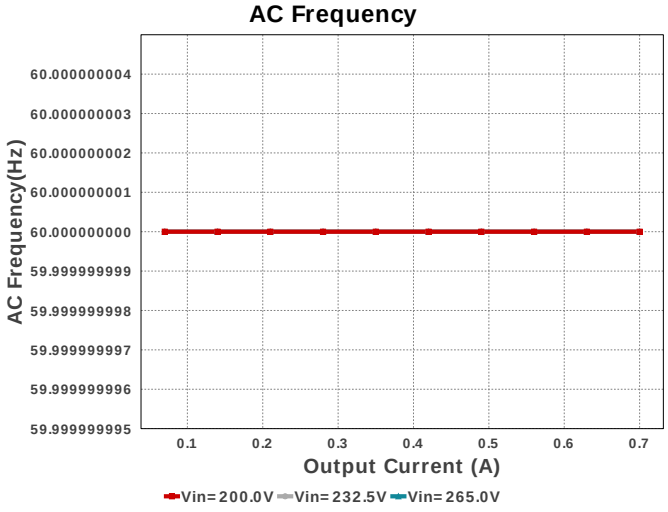


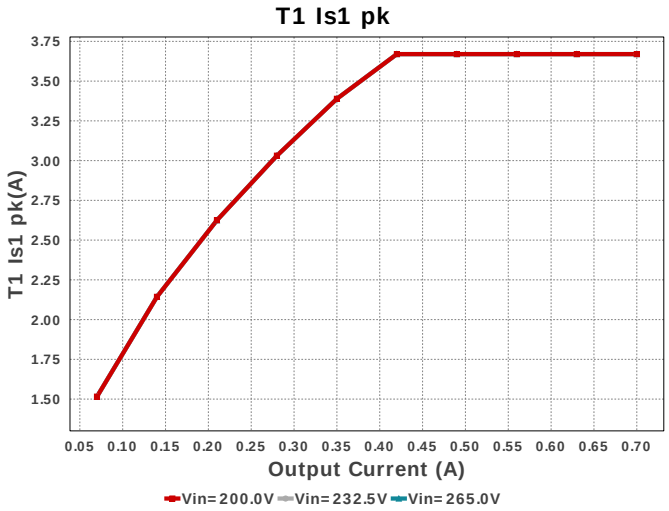












Operating Values

#	Name	Value	Category	Description
1.	Cin1 IRMS	23.159 mA	Current	Input Capacitor Cin1 RMS Ripple Current
2.	Cin2 IRMS	23.159 mA	Current	Input Capacitor Cin2 RMS Ripple Current
3.	Cout1 IRMS	1.106 A	Current	Output capacitor1 RMS ripple current
4.	Iin Avg	24.112 mA	Current	Average input current
5.	Iin rms	25.102 mA	Current	RMS Input Current
6.	T1 Iprim RMS	50.96 mA	Current	Transformer Primary RMS Current
7.	T1 Iprim pk	131.068 mA	Current	Transformer Primary Peak Current
8.	T1 Is1 RMS	1.309 A	Current	Transformer Secondary1 RMS Current
9.	T1 Is1 pk	3.67 A	Current	Transformer Secondary1 Peak Current
10.	AC Frequency	60.0 Hz	General	Input AC frequency
11.	BOM Count	23	General	Total Design BOM count
12.	D1 trr	500.0 ns	General	D1 Reverse Recovery Time
13.	Daux trr	35.0 ns	General	Auxiliary Diode Reverse Recovery Time
14.	Dsec trr	0.0 ns	General	Output Diode Reverse Recovery Time
15.	FootPrint	980.0 mm^2	General	Total Foot Print Area of BOM components
16.	Frequency	73.902 kHz	General	Approximate switching frequency
17.	Mode	DCM	General	Conduction Mode
18.	Pout	4.2 W	General	Total output power
19.	Total BOM	$0.0	General	Total BOM Cost
20.	Vout OP	6.0 V	Op_Point	Operational Output Voltage
21.	Duty Cycle	45.35 %	Op_point	Duty cycle at the Minimum voltage seen at the rectified input
22.	Efficiency	83.658 %	Op_point	Steady state efficiency
23.	IC Tj	53.57 degC	Op_point	IC junction temperature
24.	ICThetaJA	102.2 degC/W	Op_point	IC junction-to-ambient thermal resistance
25.	IOUT_OP	700.0 mA	Op_point	Iout operating point
26.	Min Rectified Vin	166.876 V	Op_point	Minimum voltage seen at rectified input
27.	Peak Rectified Vin	282.84 V	Op_point	Peak voltage seen at rectified input
28.	Vin_OP_RMS	200.0 V	Op_point	AC Input RMS Voltage
29.	Vout p-p	25.689 mV	Op_point	Peak-to-peak output ripple voltage
30.	Avg Bridge Diode Pd	32.149 mW	Power	Average Power Dissipation in the Bridge Diode over the AC Line Period
31.	Cin1 Pd	13.651 mW	Power	Average Power Dissipation in the Input Capacitor Cin1
32.	Cout1 Pd	8.558 mW	Power	Output capacitor1 power dissipation
33.	Dsec Pd	263.558 mW	Power	Secondary Diode Power Dissipation
34.	IC Pd	230.629 mW	Power	IC power dissipation
35.	Total Pd	820.434 mW	Power	Total Power Dissipation
36.	Xformer Pd	86.184 mW	Power	Transformer power dissipation
37.	Vout Tolerance	133.333 m%		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	700.0 m	Maximum Output Current
2.	VinMax	265.0	Maximum input voltage
3.	VinMin	200.0	Minimum input voltage
4.	Vout	6.0	Output Voltage
5.	line_fsw	0.0	Light Output in Lumen
6.	base_pn	UCC28910	Base Product Number
7.	source	AC	Input Source Type
8.	Ta	30.0	Ambient temperature

Design Assistance

1. **UCC28910** Product Folder : http://www.ti.com/product/UCC28910 : contains the data sheet and other resources.