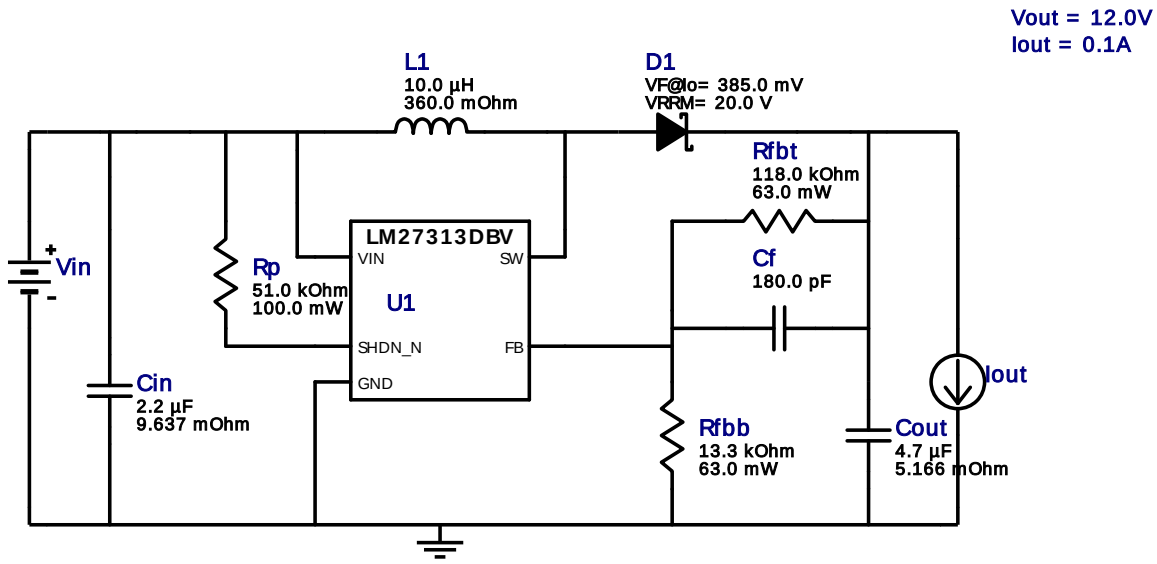
WEBENCH® Design Report

VinMin = 4.5V
VinMax = 5.5V
Vout = 12.0V
Iout = 0.1A

Device = LM27313XMF/NOPB
Topology = Boost
Created = 5/23/16 4:32:29 AM
BOM Cost = $0.80
BOM Count = 9
Total Pd = 0.18W

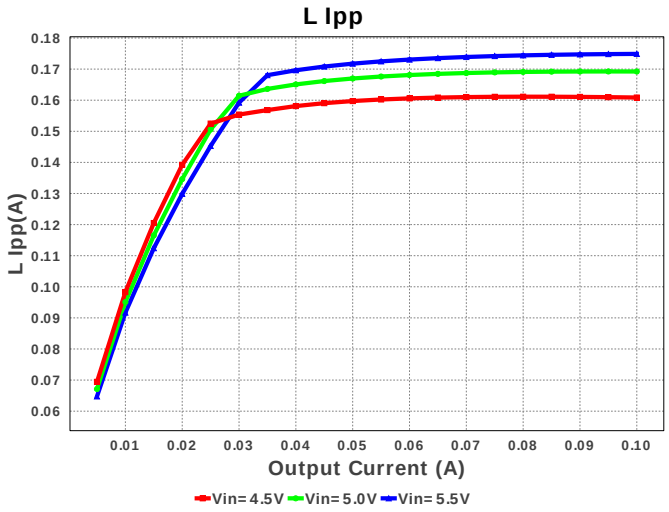
Design : 1181001/2 LM27313XMF/NOPB
LM27313XMF/NOPB 4.5V-5.5V to 12.00V @ 0.1A

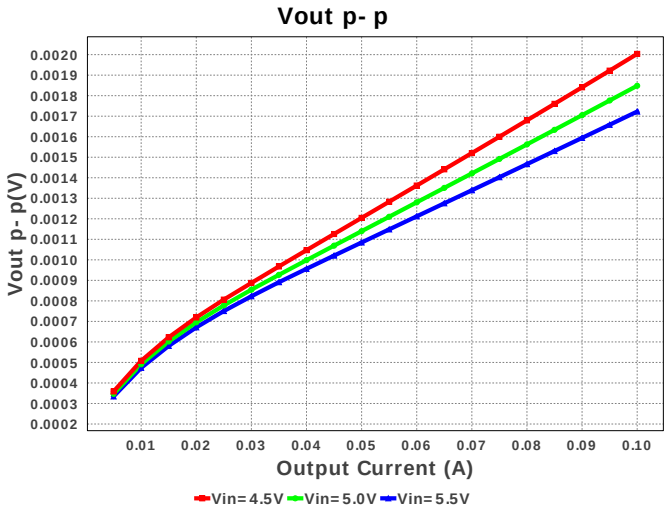


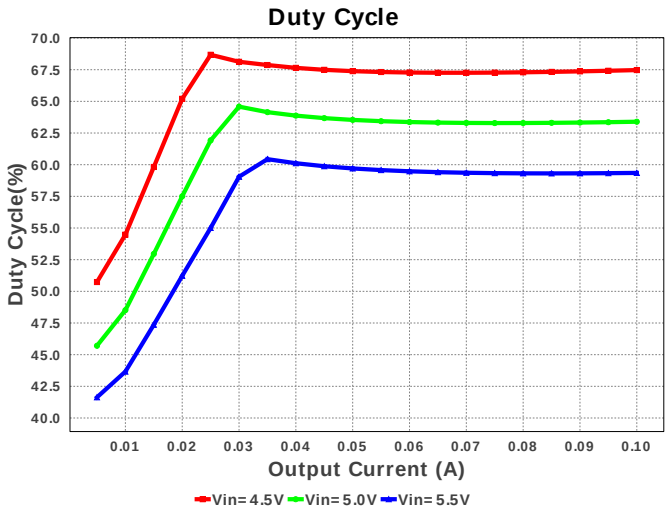
Electrical BOM

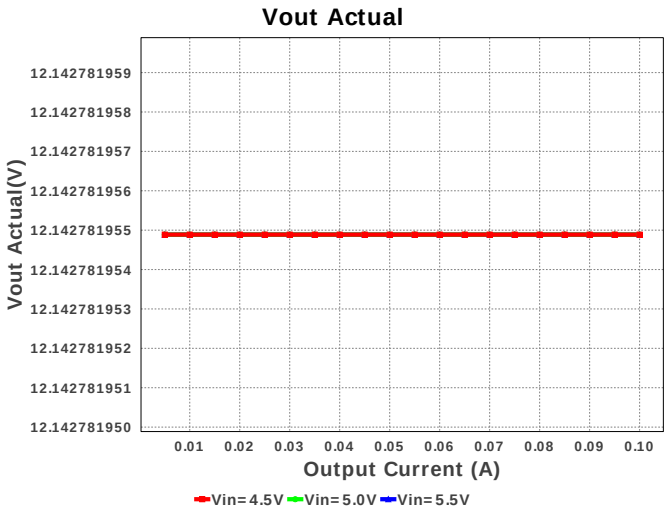
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cf	Kemet	C0805C181K5GACTU Series= C0G/NP0	Cap= 180.0 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
2.	Cin	MuRata	GRM188R61A225KE34D Series= X5R	Cap= 2.2 uF ESR= 9.637 mOhm VDC= 10.0 V IRMS= 1.24283 A	1	$0.02	0603 5 mm²
3.	Cout	MuRata	GRM21BC81E475KA12L Series= X6S	Cap= 4.7 uF ESR= 5.166 mOhm VDC= 25.0 V IRMS= 2.03531 A	1	$0.02	0805 7 mm²
4.	D1	ON Semiconductor	MBR0520LT1G	VF@Io= 385.0 mV VRRM= 20.0 V	1	$0.06	SOD-123 13 mm²
5.	L1	Taiyo Yuden	CBC2518T100M	L= 10.0 µH DCR= 360.0 mOhm	1	$0.06	CBC2518 10 mm²
6.	Rfbb	Vishay-Dale	CRCW040213K3FKED Series= CRCW..e3	Res= 13.3 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
7.	Rfbt	Vishay-Dale	CRCW0402118KFKED Series= CRCW..e3	Res= 118.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
8.	Rp	Yageo America	RC0603FR-0751KL Series= ?	Res= 51.0 kOhm Power= 100.0 mW Tolerance= 1.0%	1	$0.01	0603 5 mm²

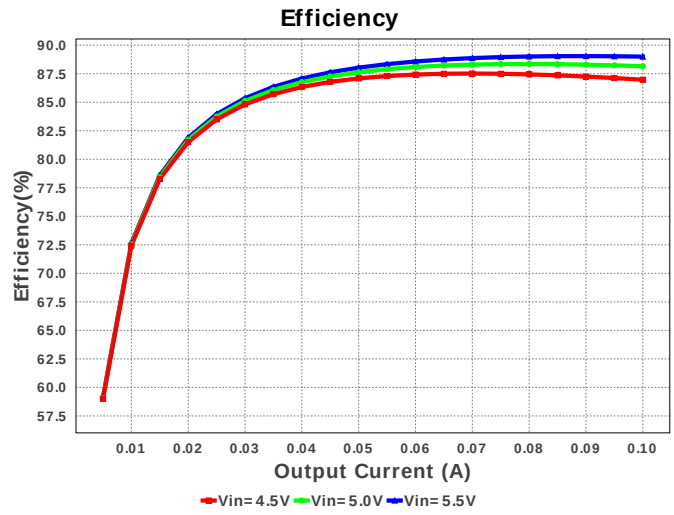
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
9.	U1	Texas Instruments	LM27313XMF/NOPB	Switcher	1	$0.60	DBV0005A 15 mm²

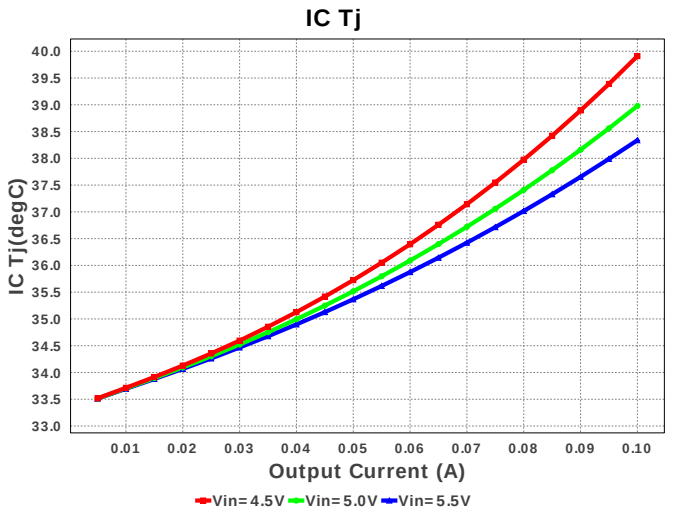


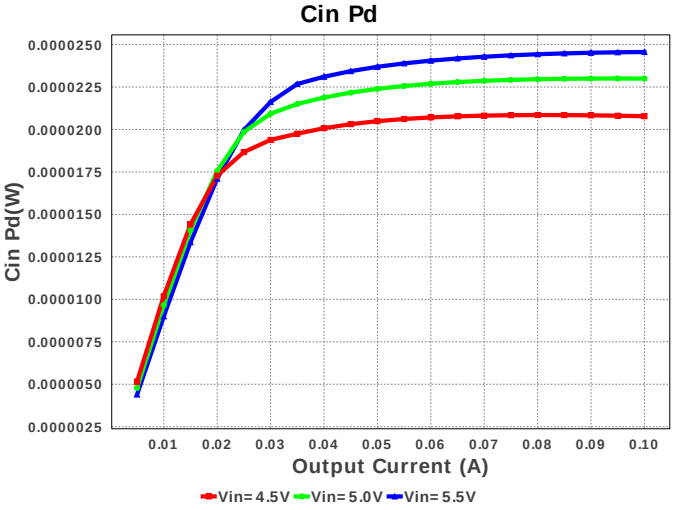


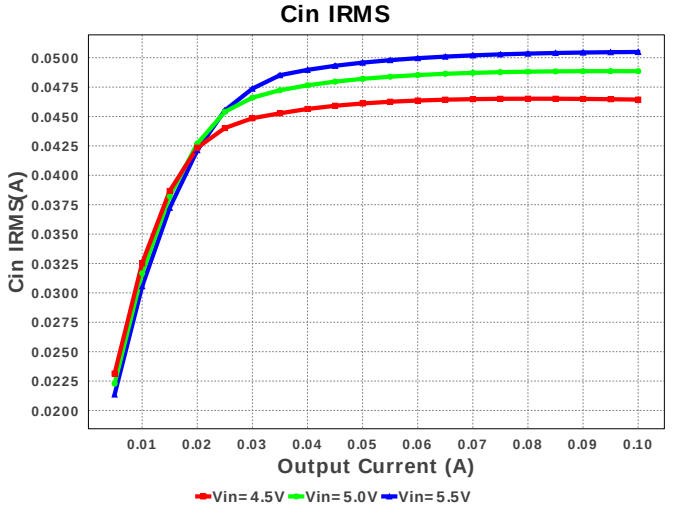


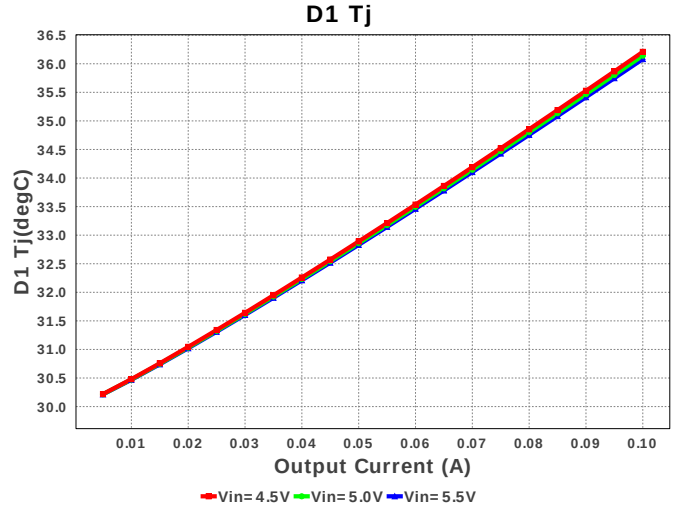


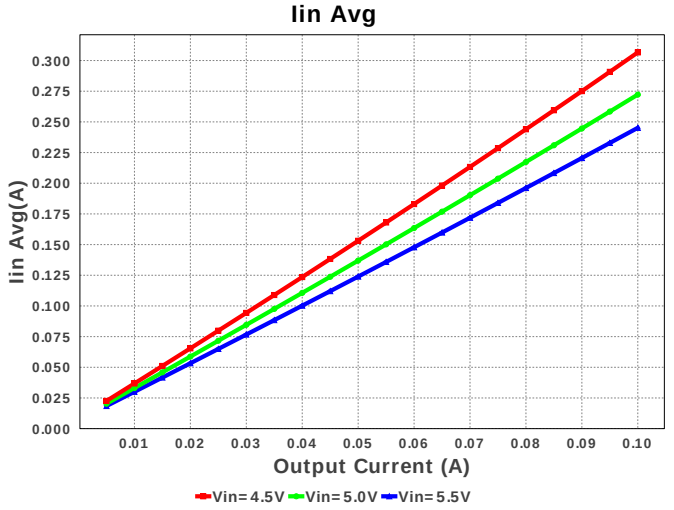


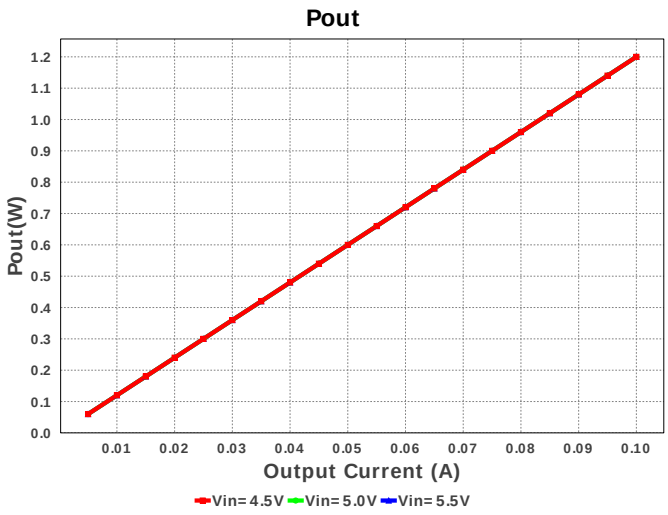


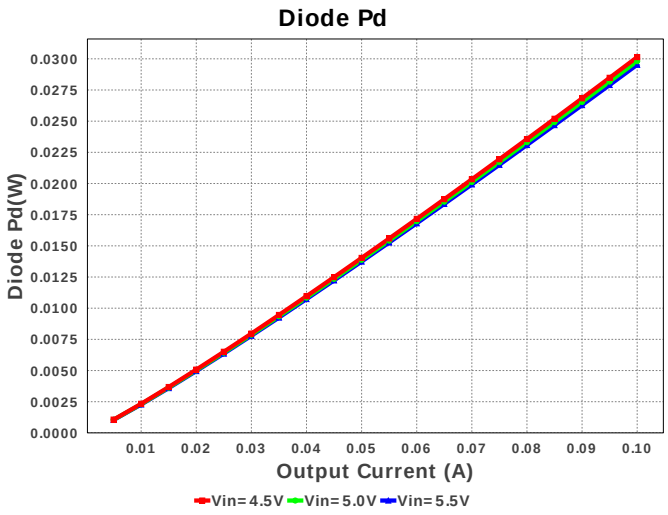


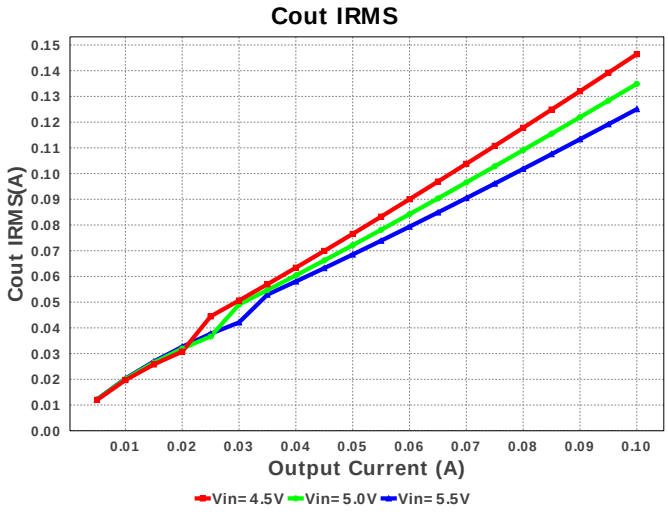


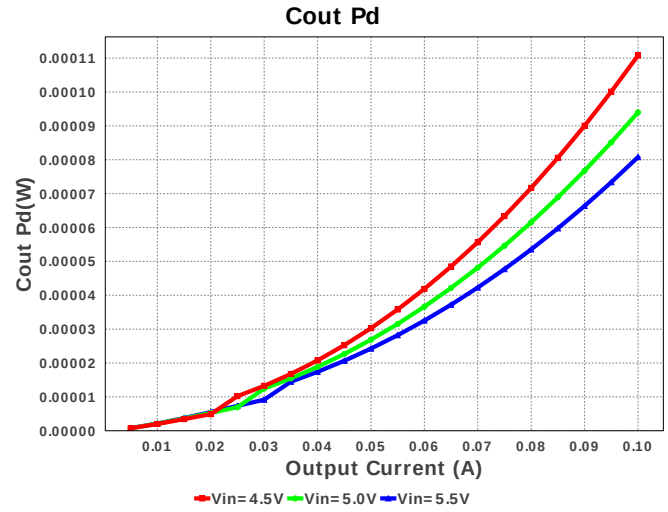


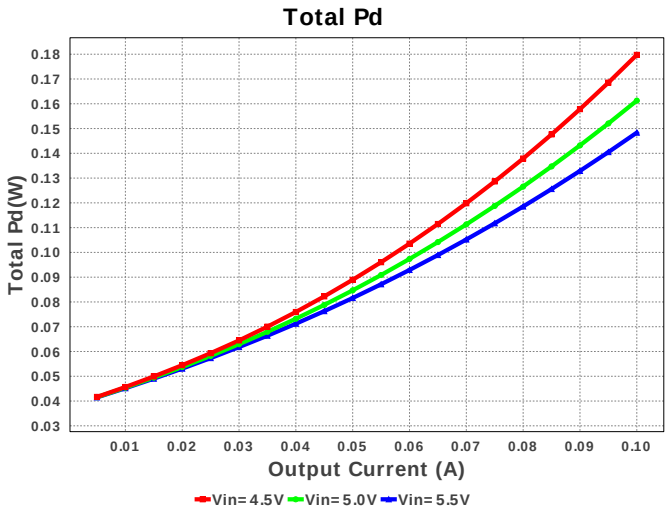


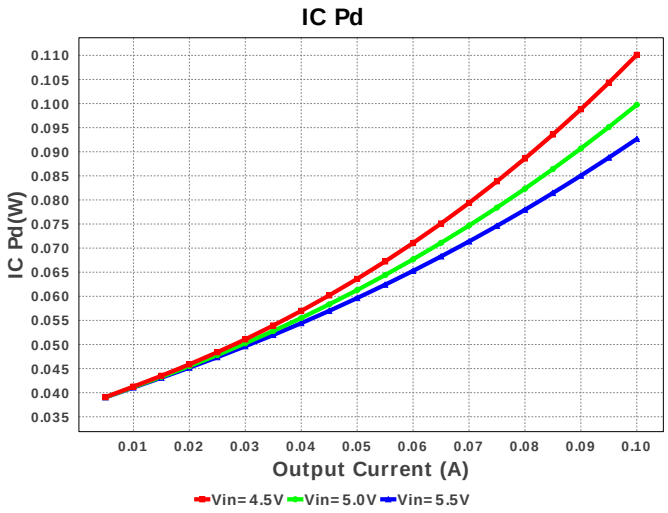


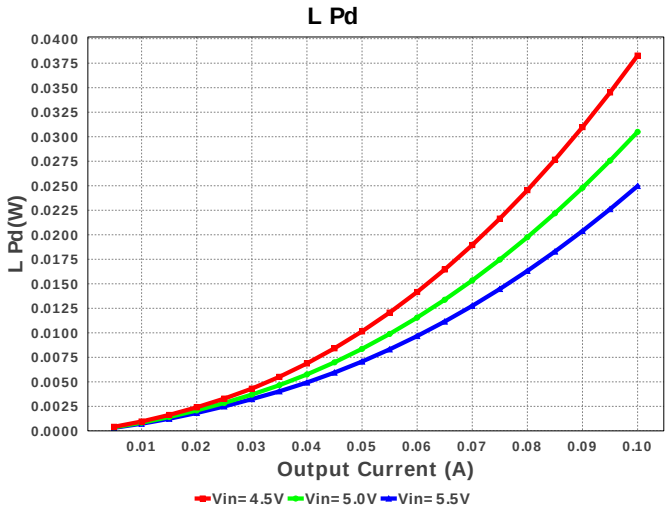












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	46.437 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	146.432 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	306.61 mA	Current	Average input current
4.	L Ipp	160.86 mA	Current	Peak-to-peak inductor ripple current
5.	BOM Count	9	General	Total Design BOM count
6.	FootPrint	67.0 mm^2	General	Total Foot Print Area of BOM components
7.	Frequency	1.6 MHz	General	Switching frequency
8.	Pout	1.2 W	General	Total output power
9.	Total BOM	$0.8	General	Total BOM Cost
10.	D1 Tj	36.208 degC	Op_Point	D1 junction temperature
11.	Vout Actual	12.143 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
12.	Duty Cycle	67.47 %	Op_point	Duty cycle
13.	Efficiency	86.973 %	Op_point	Steady state efficiency
14.	IC Tj	39.909 degC	Op_point	IC junction temperature
15.	IOUT_OP	100.0 mA	Op_point	Iout operating point
16.	VIN_OP	4.5 V	Op_point	Vin operating point
17.	Vout p-p	2.004 mV	Op_point	Peak-to-peak output ripple voltage
18.	Cin Pd	20.781 µW	Power	Input capacitor power dissipation
19.	Cout Pd	110.771 µW	Power	Output capacitor power dissipation
20.	Diode Pd	30.137 mW	Power	Diode power dissipation
21.	IC Pd	110.103 mW	Power	IC power dissipation
22.	L Pd	38.276 mW	Power	Inductor power dissipation
23.	Total Pd	179.739 mW	Power	Total Power Dissipation
24.	Vout Tolerance	1.816 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	100.0 m	Maximum Output Current
2.	VinMax	5.5	Maximum input voltage
3.	VinMin	4.5	Minimum input voltage
4.	Vout	12.0	Output Voltage
5.	base_pn	LM27313	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **LM27313** Product Folder : http://www.ti.com/product/LM27313 : contains the data sheet and other resources.