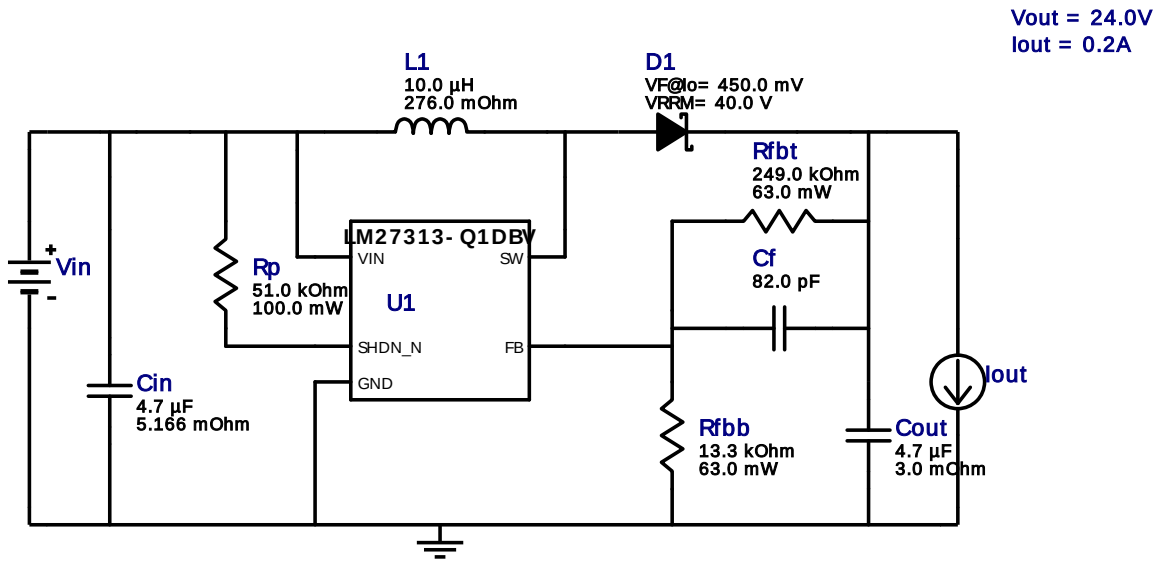
WEBENCH® Design Report

VinMin = 11.0V
VinMax = 13.0V
Vout = 24.0V
Iout = 0.2A

Device = LM27313XQMF/NOPB
Topology = Boost
Created = 7/15/16 8:19:09 PM
BOM Cost = $1.00
BOM Count = 9
Total Pd = 0.51W

Design : 4742013/29 LM27313XQMF/NOPB
LM27313XQMF/NOPB 11.0V-13.0V to 24.00V @ 0.2A

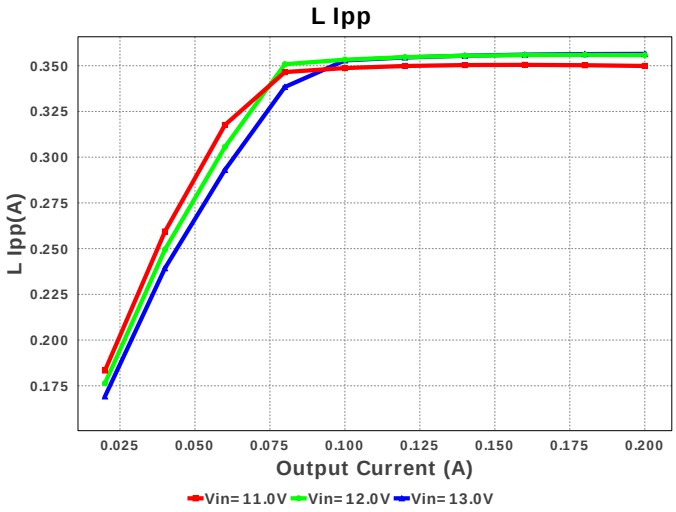


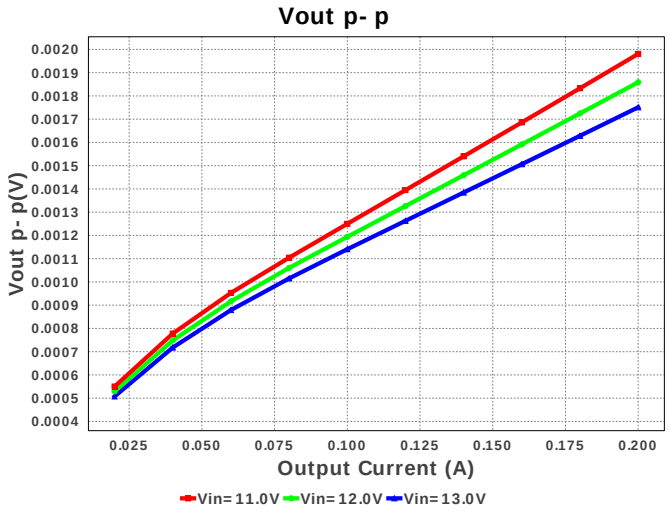
1. This regulator device is qualified for Automotive applications. All passives and other components selected in this design may not be qualified for Automotive applications. The user is required to verify that all components in the design meet the qualification and safety requirements for their specific application.View WEBENCH(R) Disclaimer.

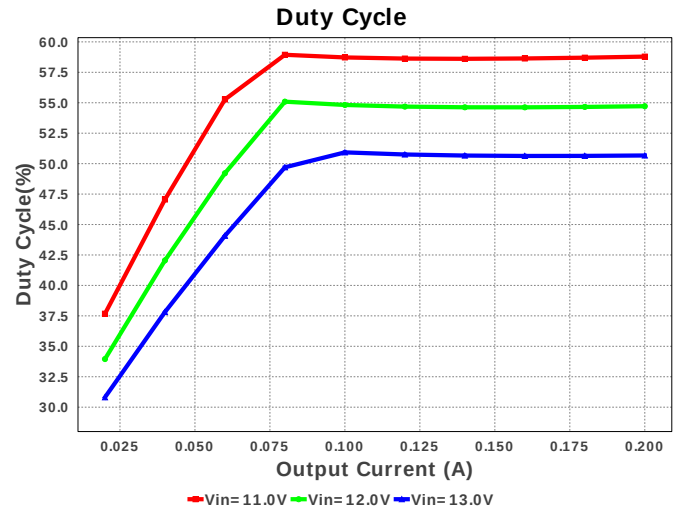
Electrical BOM

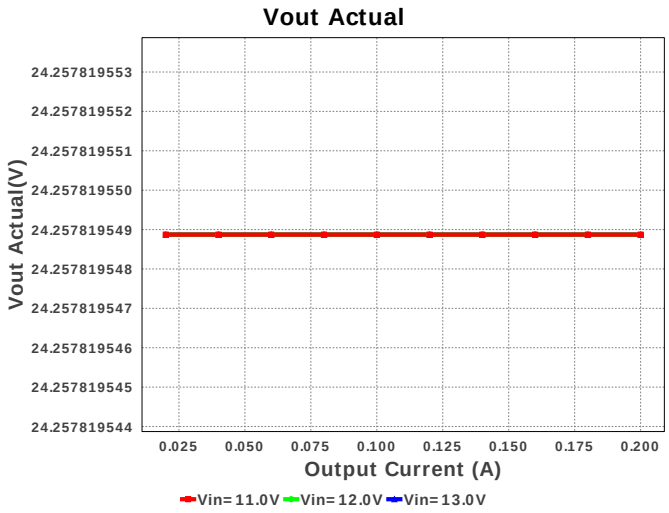
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cf	Yageo America	CC0805JRNPO9BN820 Series= C0G/NP0	Cap= 82.0 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
2.	Cin	MuRata	GRM21BC81E475KA12L Series= X6S	Cap= 4.7 uF ESR= 5.166 mOhm VDC= 25.0 V IRMS= 2.03531 A	1	$0.02	0805 7 mm²
3.	Cout	MuRata	GRM31CR71H475KA12L Series= X7R	Cap= 4.7 uF ESR= 3.0 mOhm VDC= 50.0 V IRMS= 4.98 A	1	$0.07	1206 11 mm²
4.	D1	Diodes Inc.	1N5819HW-7-F	VF@Io= 450.0 mV VRRM= 40.0 V	1	$0.08	SOD-123 13 mm²
5.	L1	Bourns	SRN3015-100M	L= 10.0 µH DCR= 276.0 mOhm	1	$0.14	SRN3015 16 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	CRCW0402249KFKED Series= CRCW..e3	Res= 249.0 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

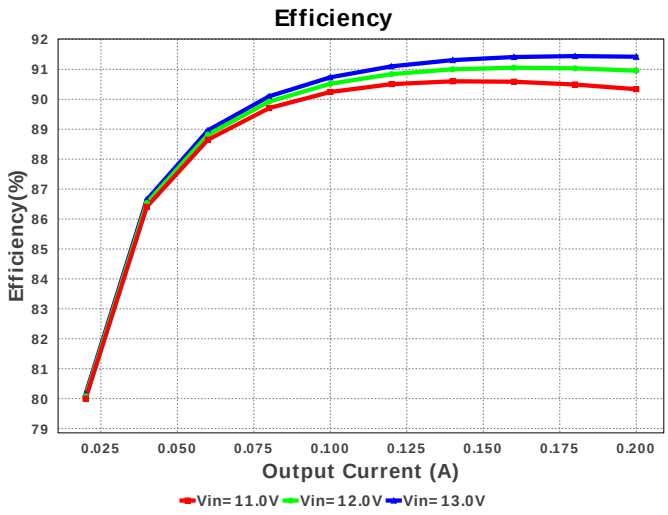
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
9.	U1	Texas Instruments	LM27313XQMF/NOPB	Switcher	1	$0.65	DBV0005A 15 mm²

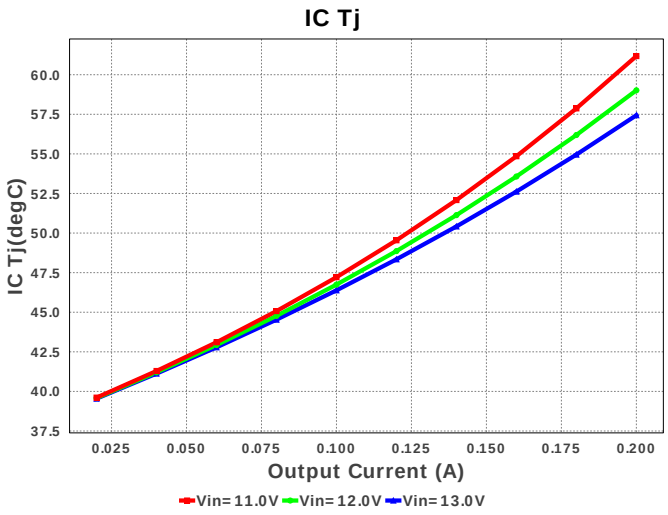


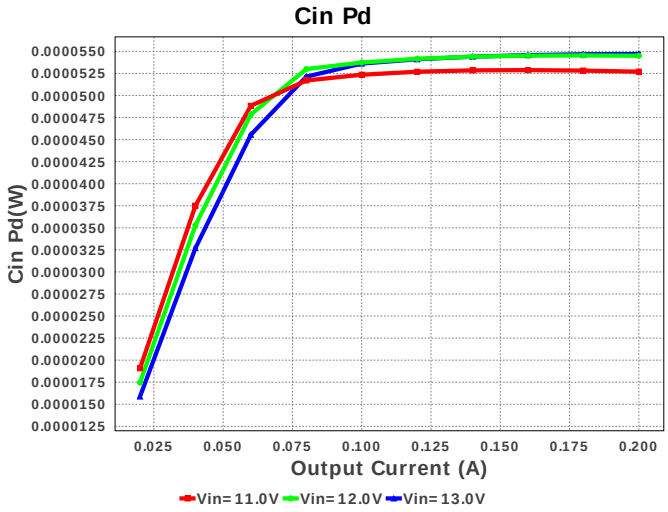


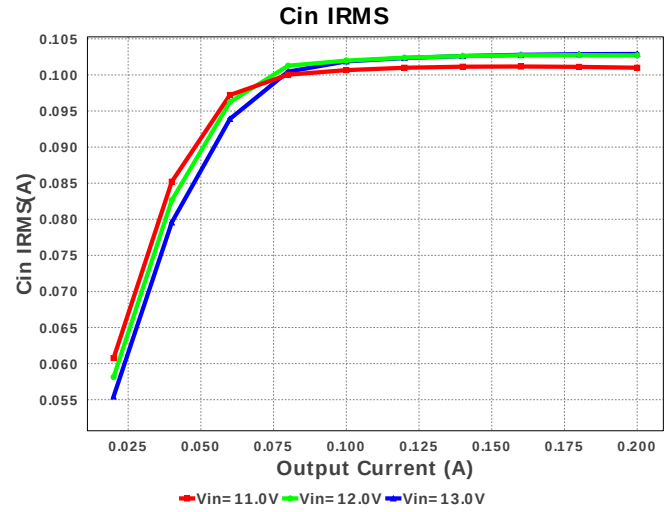


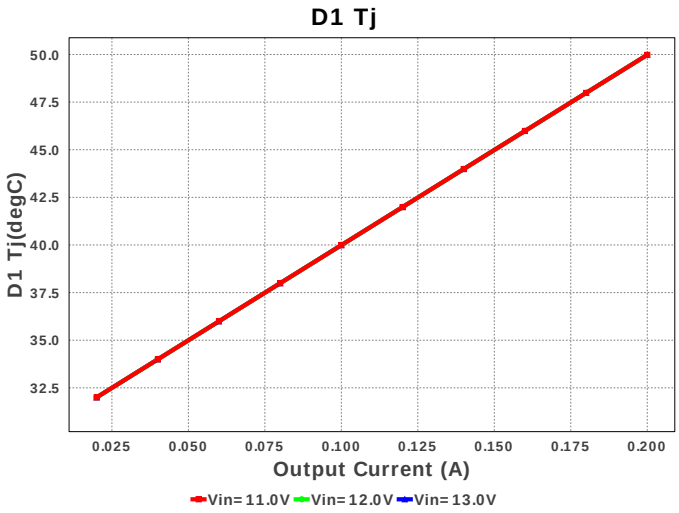


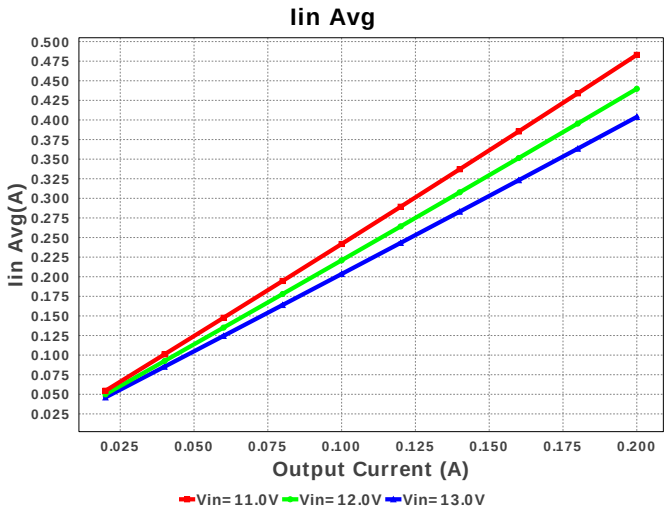


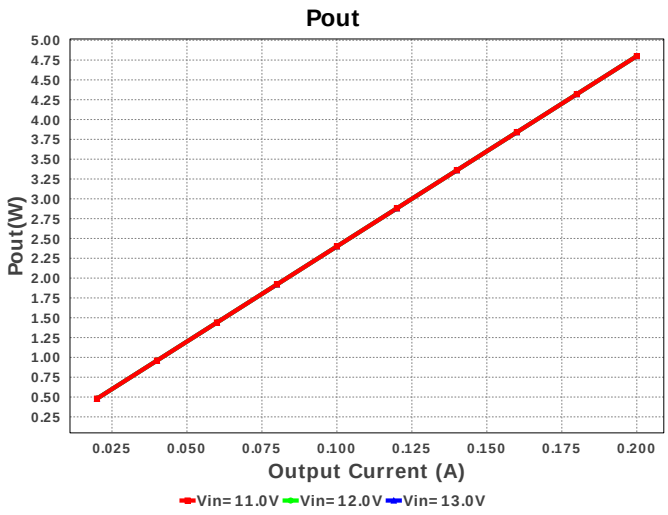


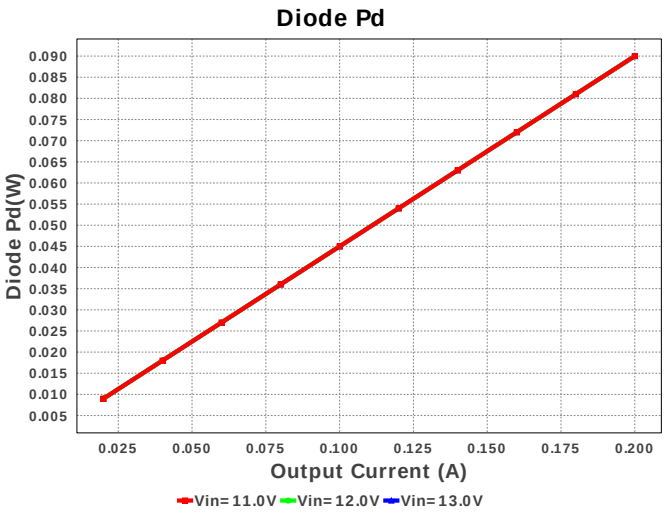


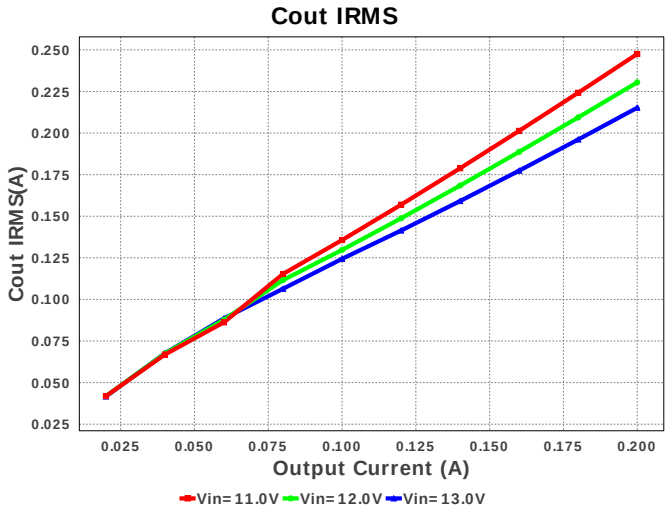


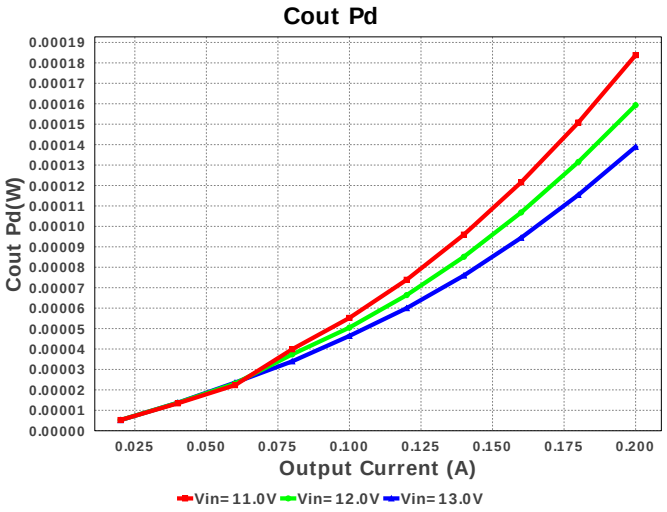


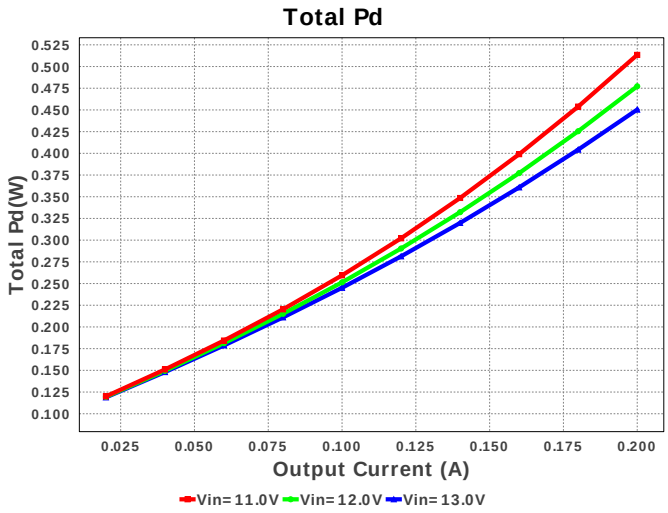


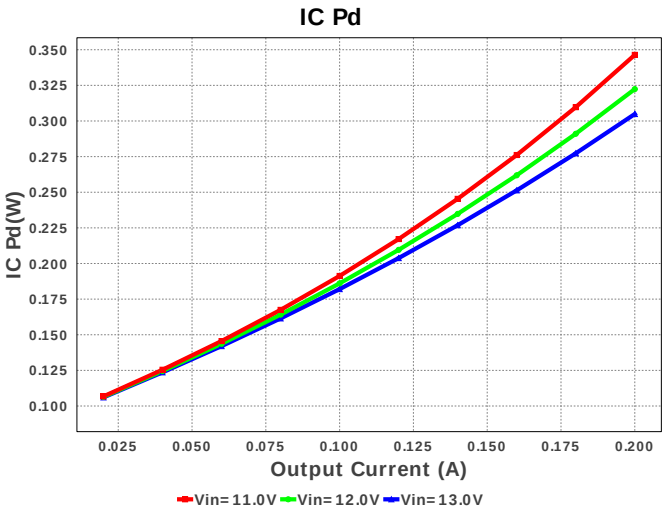


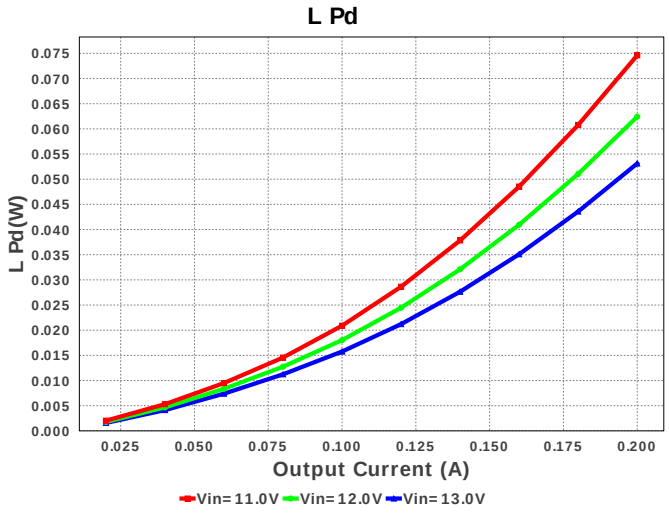












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	100.999 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	247.523 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	483.04 mA	Current	Average input current
4.	L Ipp	349.87 mA	Current	Peak-to-peak inductor ripple current
5.	BOM Count	9	General	Total Design BOM count
6.	FootPrint	79.0 mm^2	General	Total Foot Print Area of BOM components
7.	Frequency	1.6 MHz	General	Switching frequency
8.	Pout	4.8 W	General	Total output power
9.	Total BOM	$1.0	General	Total BOM Cost
10.	D1 Tj	49.98 degC	Op_Point	D1 junction temperature
11.	Vout Actual	24.258 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
12.	Duty Cycle	58.79 %	Op_point	Duty cycle
13.	Efficiency	90.337 %	Op_point	Steady state efficiency
14.	IC Tj	61.175 degC	Op_point	IC junction temperature
15.	IOUT_OP	200.0 mA	Op_point	Iout operating point
16.	VIN_OP	11.0 V	Op_point	Vin operating point
17.	Vout p-p	1.981 mV	Op_point	Peak-to-peak output ripple voltage
18.	Cin Pd	52.697 µW	Power	Input capacitor power dissipation
19.	Cout Pd	183.803 µW	Power	Output capacitor power dissipation
20.	Diode Pd	90.0 mW	Power	Diode power dissipation
21.	IC Pd	346.394 mW	Power	IC power dissipation
22.	L Pd	74.606 mW	Power	Inductor power dissipation
23.	Total Pd	513.438 mW	Power	Total Power Dissipation
24.	Vout Tolerance	1.918 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	200.0 m	Maximum Output Current
2.	VinMax	13.0	Maximum input voltage
3.	VinMin	11.0	Minimum input voltage
4.	Vout	24.0	Output Voltage
5.	base_pn	LM27313-Q1	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. The LM27313-Q1 is qualified for Automotive applications. All passives and other components selected in this design may not be qualified for Automotive applications. The user is required to verify that all components in the design meet the qualification and safety requirements for their specific application

2. **LM27313-Q1** Product Folder : http://www.ti.com/product/LM27313%2DQ1 : contains the data sheet and other resources.