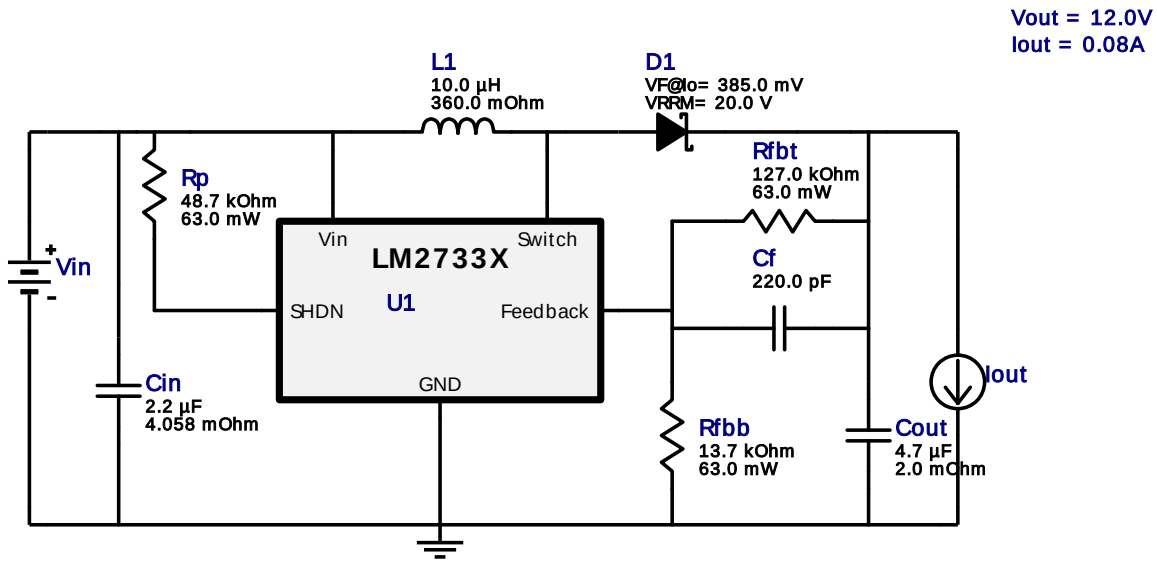
WEBENCH® Design Report

VinMin = 5.0V
VinMax = 5.0V
Vout = 12.0V
Iout = 0.08A

Device = LM2733XMF/NOPB
Topology = Boost
Created = 2019-01-10 22:30:41.232
BOM Cost = $0.99
BOM Count = 9
Total Pd = 0.29W

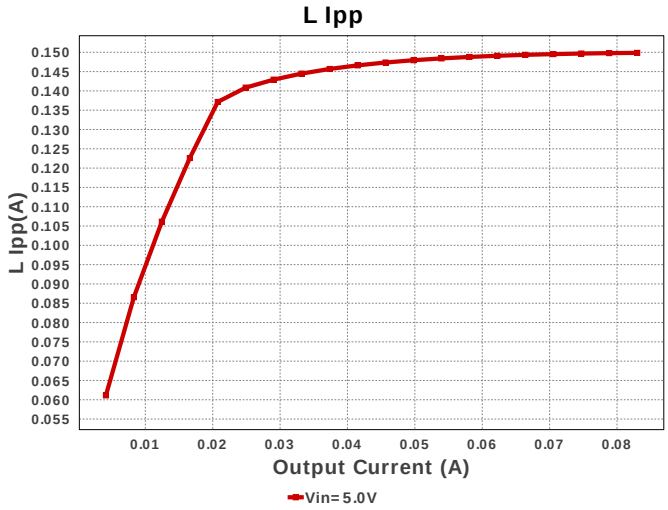
Design : LM2733XMF/NOPB
LM2733XMF/NOPB 5V-5V to 12.00V @ 0.083A

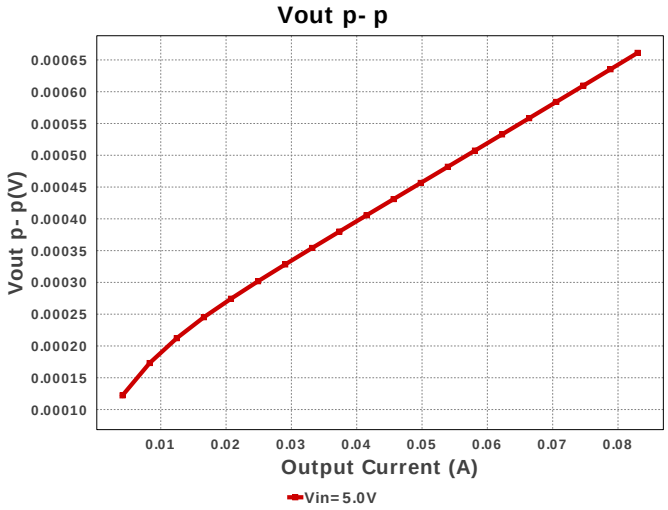


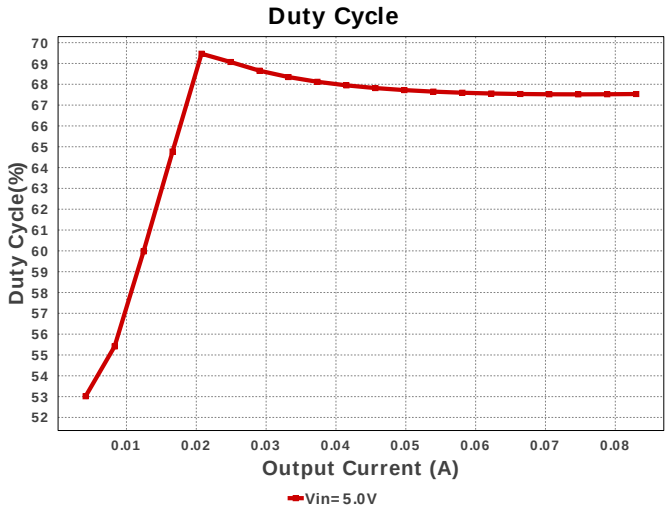
Electrical BOM

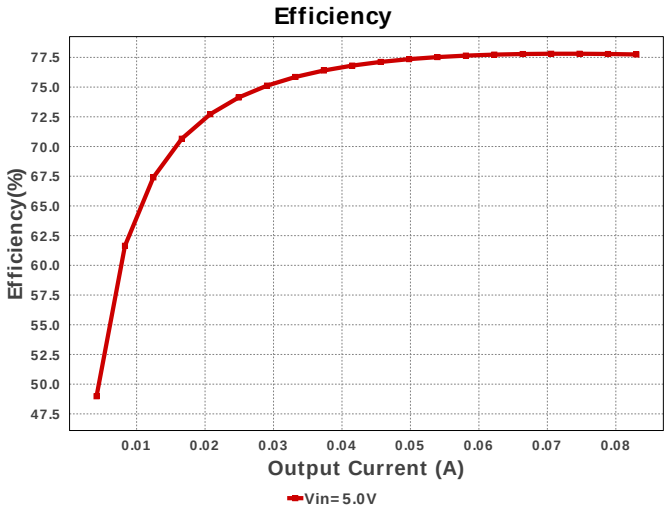
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cf	Samsung Electro-Mechanics	CL21C221KBANNNC Series= C0G/NP0	Cap= 220.0 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
2.	Cin	TDK	C1608X7R1A225K080AC Series= X7R	Cap= 2.2 uF ESR= 4.058 mOhm VDC= 10.0 V IRMS= 2.58266 A	1	$0.05	0603 5 mm²
3.	Cout	MuRata	GRM21BR61E475MA12L Series= X5R	Cap= 4.7 uF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 7.29 A	1	$0.06	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	CRCW040213K7FKED Series= CRCW..e3	Res= 13700.0Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
7.	Rfbt	Vishay-Dale	CRCW0402127KFKED Series= CRCW..e3	Res= 127000.0Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
8.	Rp	Vishay-Dale	CRCW040248K7FKED Series= CRCW..e3	Res= 48700.0Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²

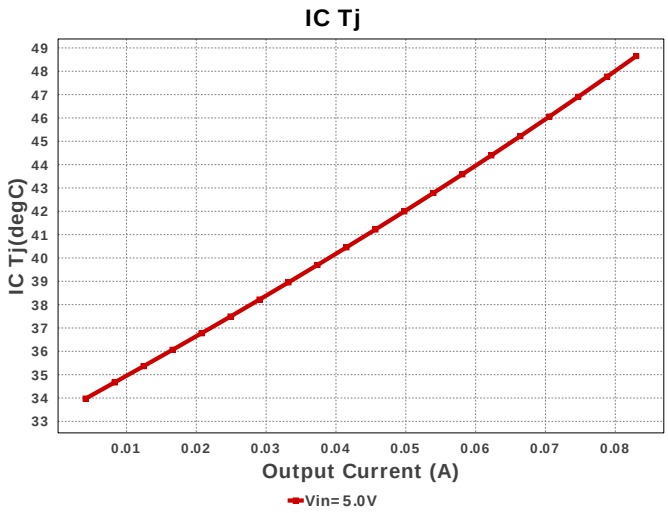
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
9.	U1	Texas Instruments	LM2733XMF/NOPB	Switcher	1	$0.72	MF05A 15 mm²

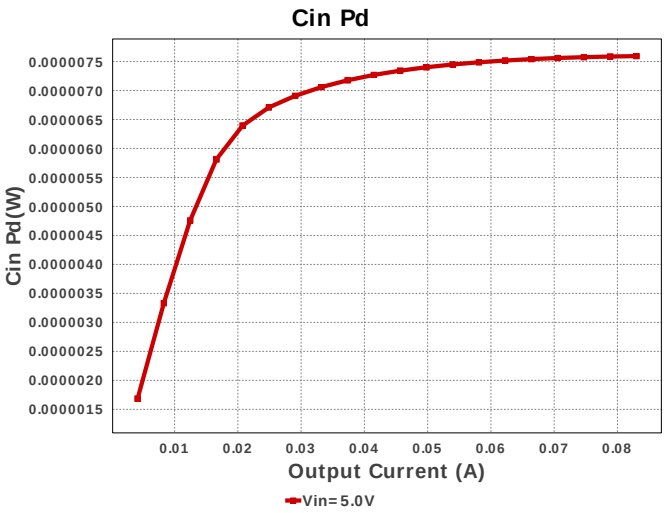


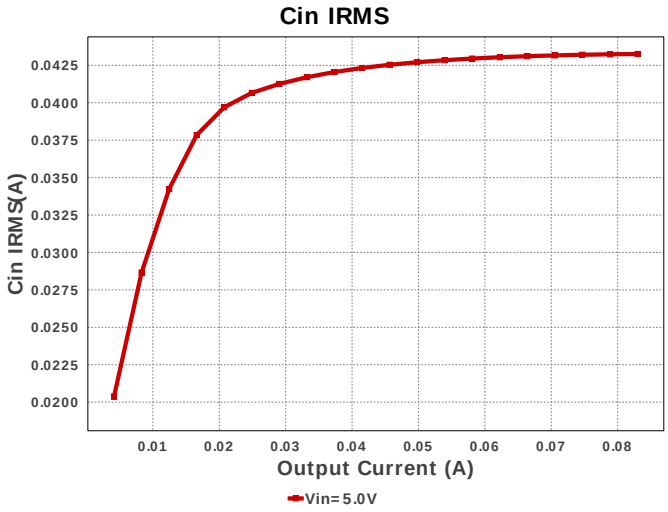


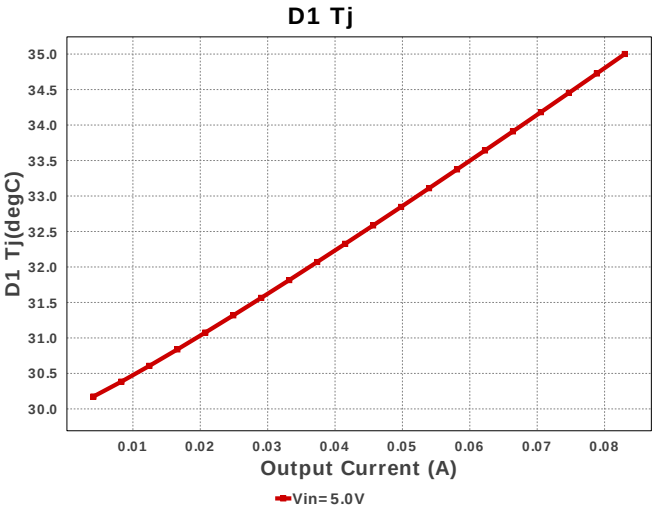


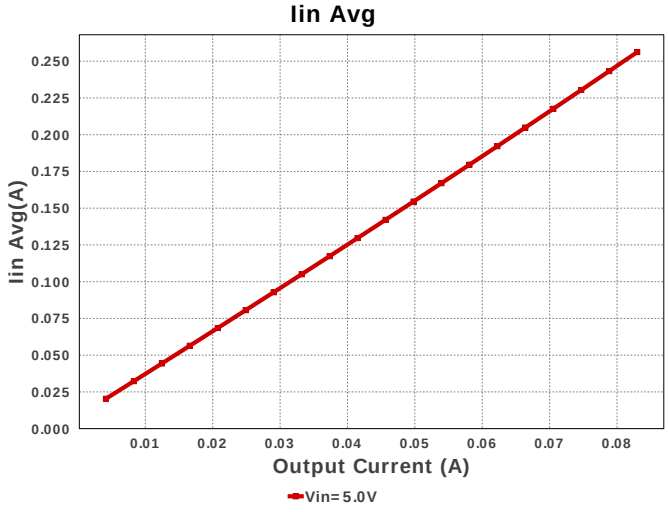


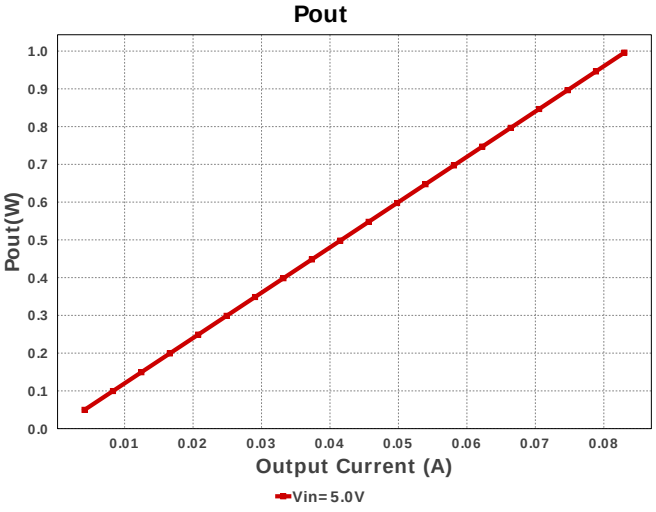


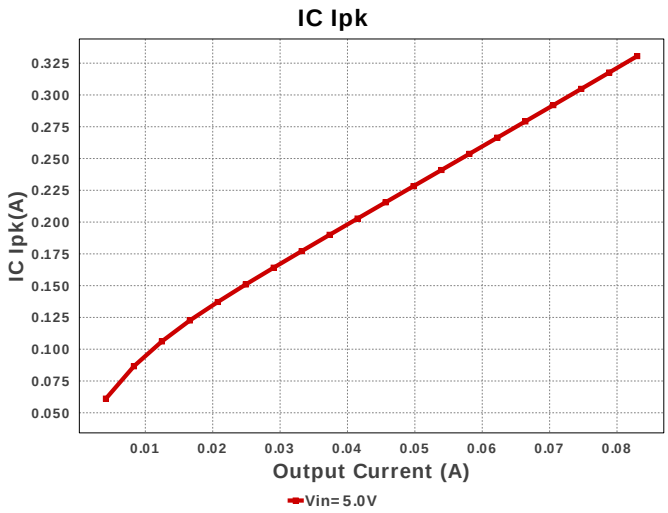


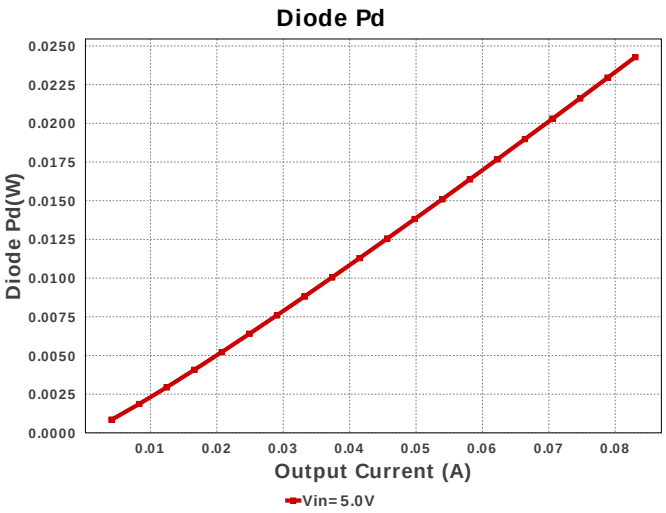


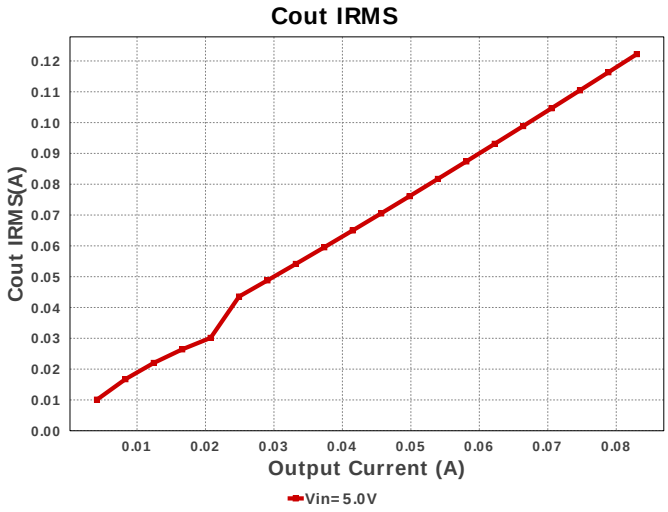


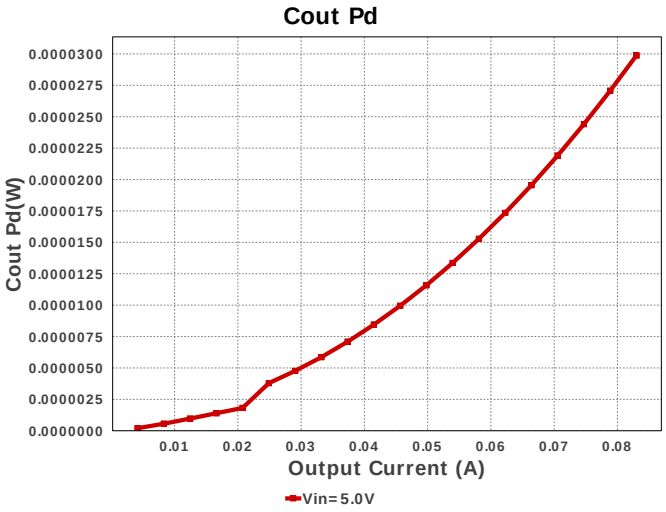


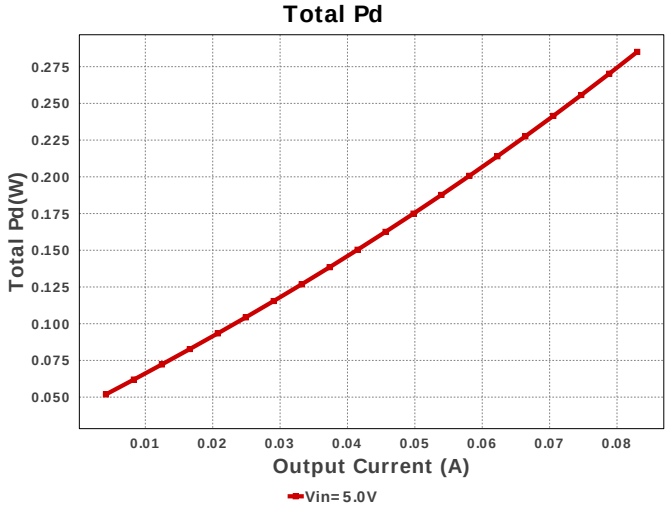


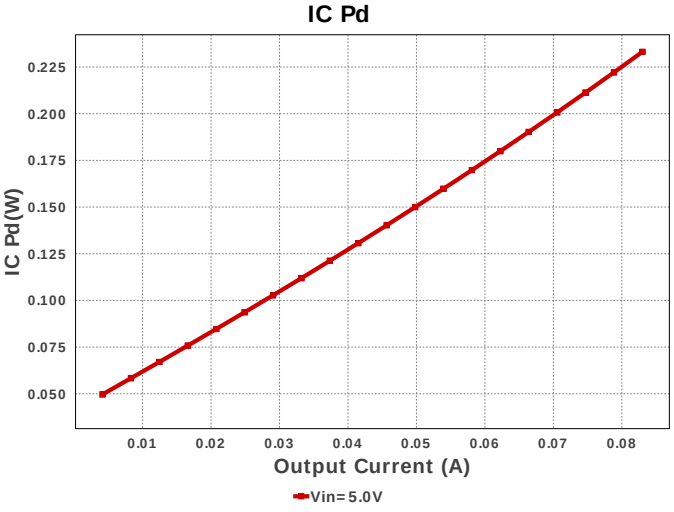


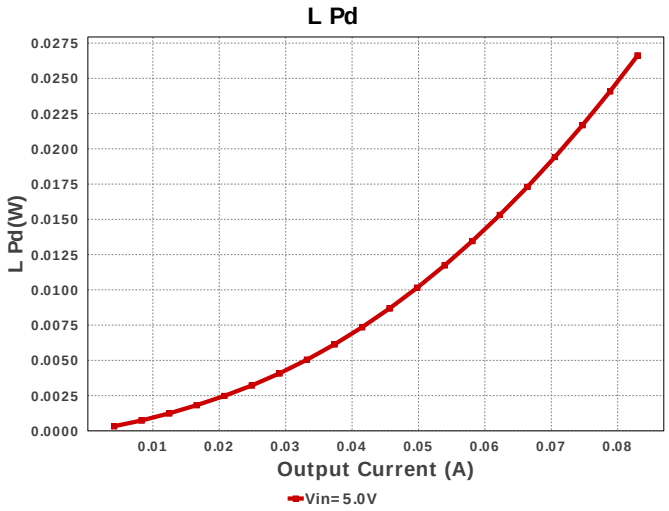












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	43.258 mA	Capacitor	Input capacitor RMS ripple current
2.	Cin Pd	7.594 µW	Capacitor	Input capacitor power dissipation
3.	Cout IRMS	122.214 mA	Capacitor	Output capacitor RMS ripple current
4.	Cout Pd	29.873 µW	Capacitor	Output capacitor power dissipation
5.	D1 Tj	35.001 degC	Diode	D1 junction temperature
6.	Diode Pd	24.278 mW	Diode	Diode power dissipation
7.	IC Ipk	330.561 mA	IC	Peak switch current in IC
8.	IC Pd	233.12 mW	IC	IC power dissipation
9.	IC Tj	48.649 degC	IC	IC junction temperature
10.	Iin Avg	256.21 mA	IC	Average input current
11.	L Ipp	149.85 mA	Inductor	Peak-to-peak inductor ripple current
12.	L Pd	26.619 mW	Inductor	Inductor power dissipation
13.	Cin Pd	7.594 µW	Power	Input capacitor power dissipation
14.	Cout Pd	29.873 µW	Power	Output capacitor power dissipation
15.	Diode Pd	24.278 mW	Power	Diode power dissipation
16.	IC Pd	233.12 mW	Power	IC power dissipation
17.	L Pd	26.619 mW	Power	Inductor power dissipation
18.	Total Pd	285.072 mW	Power	Total Power Dissipation
19.	BOM Count	9	System Information	Total Design BOM count
20.	Duty Cycle	67.532 %	System Information	Duty cycle
21.	Efficiency	77.747 %	System Information	Steady state efficiency
22.	FootPrint	65.0 mm^2	System Information	Total Foot Print Area of BOM components
23.	Frequency	1.6 MHz	System Information	Switching frequency
24.	Iout	83.0 mA	System Information	Iout operating point
25.	Mode	CCM	System Information	Conduction Mode
26.	Pout	996.0 mW	System Information	Total output power
27.	Total BOM	$0.99	System Information	Total BOM Cost
28.	Vin	5.0 V	System Information	Vin operating point
29.	Vout Actual	12.632 V	System Information	Vout Actual calculated based on selected voltage divider resistors
30.	Vout Tolerance	3.893 %	System Information	Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable
31.	Vout p-p	661.121 µV	System Information	Peak-to-peak output ripple voltage

Design Inputs

#	Name	Value	Description
1.	Iout	83.0 m	Maximum Output Current
2.	VinMax	5.0	Maximum input voltage
3.	VinMin	5.0	Minimum input voltage
4.	Vout	12.0	Output Voltage

#	Name	Value	Description
5.	base_pn	LM2733X	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **LM2733X** Product Folder : http://www.ti.com/product/LM2733 : contains the data sheet and other resources.

