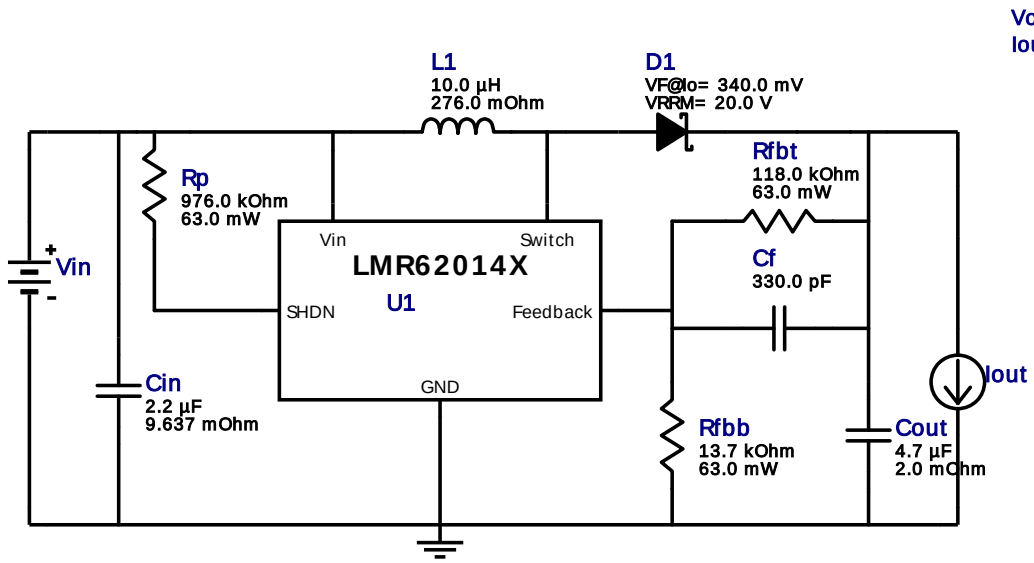
WEBENCH® Design Report

VinMin = 5.0V
VinMax = 5.0V
Vout = 12.0V
Iout = 0.2A

Device = LMR62014XMF/NOPB
Topology = Boost
Created = 2017-12-27 07:08:34.710
BOM Cost = $0.85
BOM Count = 9
Total Pd = 0.34W

Design : 2374553/21 LMR62014XMF/NOPB
LMR62014XMF/NOPB 5.0V-5.0V to 12.00V @ 0.2A



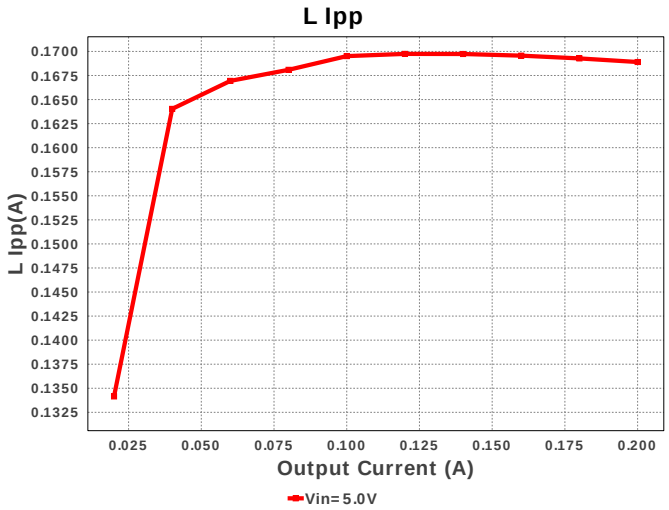
My Comments

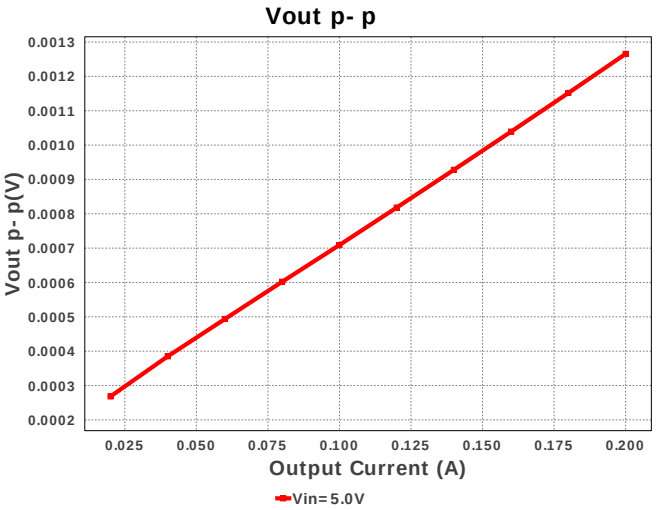
No comments

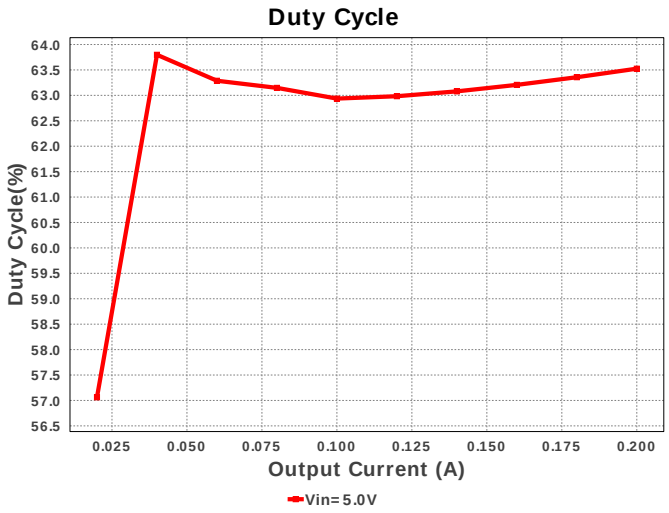
Electrical BOM

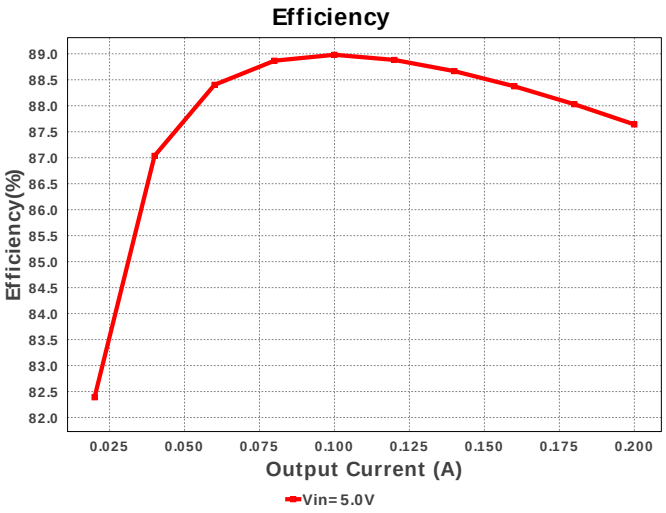
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cf	Samsung Electro-Mechanics	CL21C331JBANFNC Series= C0G/NP0	Cap= 330.0 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
2.	Cin	MuRata	GRM188R61A225KE34D Series= X5R	Cap= 2.2 uF ESR= 9.637 mOhm VDC= 10.0 V IRMS= 1.24283 A	1	$0.02	0603 5 mm²
3.	Cout	MuRata	GRM21BR61E475MA12L Series= X5R	Cap= 4.7 uF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 7.29 A	1	$0.03	0805 7 mm²
4.	D1	Fairchild Semiconductor	MBR1020VL	VF@Io= 340.0 mV VRRM= 20.0 V	1	$0.07	SOD-123F 12 mm²
5.	L1	Bourns	SRN3015-100M	L= 10.0 µH DCR= 276.0 mOhm	1	$0.14	SRN3015 16 mm²
6.	Rfbb	Vishay-Dale	CRCW040213K7FKED Series= CRCW..e3	Res= 13.7 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	Vishay-Dale	CRCW0402976KFKED Series= CRCW..e3	Res= 976.0 kOhm 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	LMR62014XMF/NOPB	Switcher	1	$0.55	DBV0005A 15 mm²

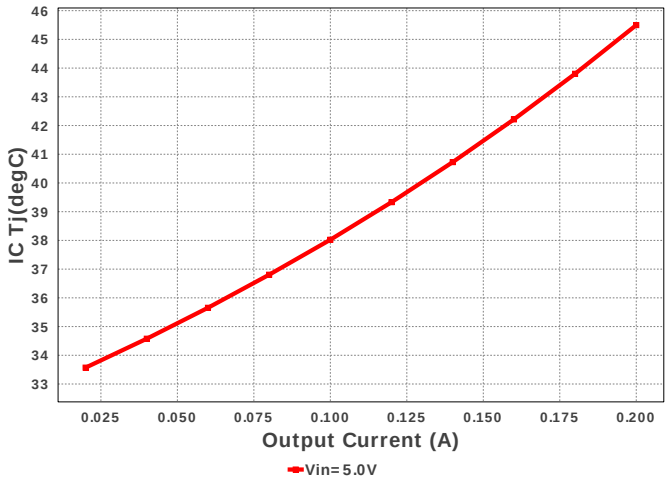




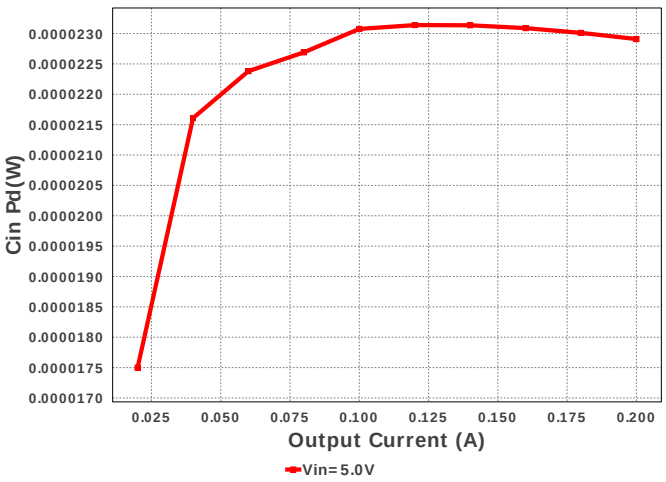




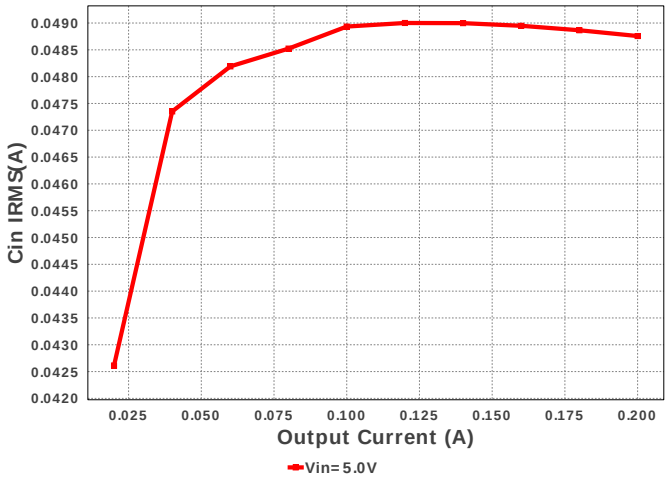
IC Tj



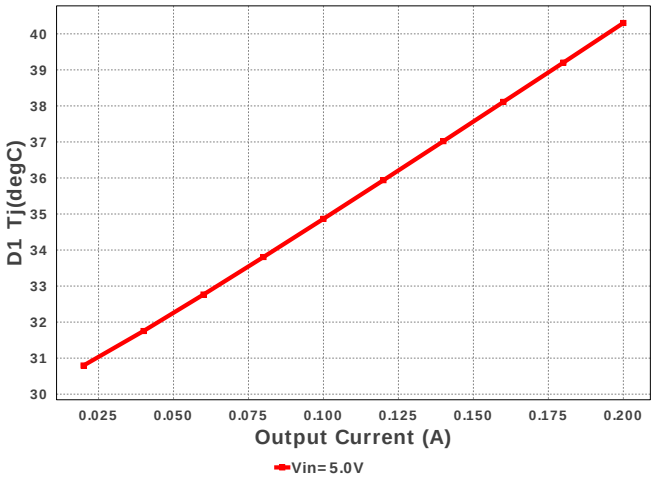
Cin Pd



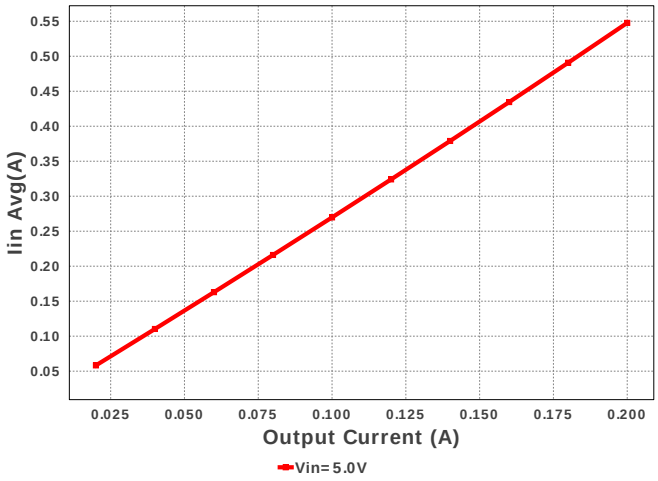
Cin IRMS



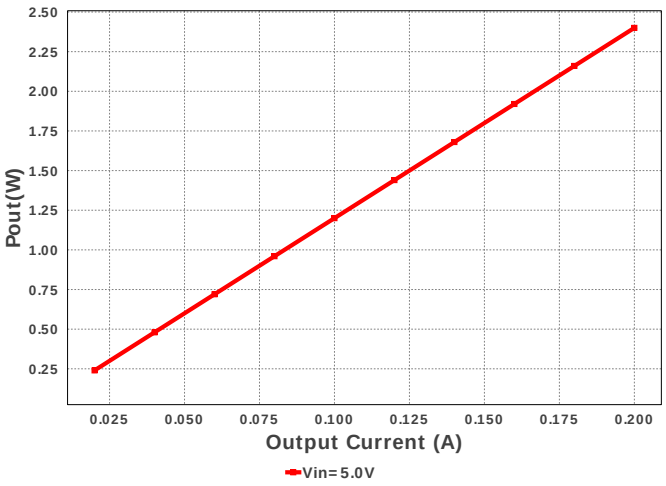
D1 Tj

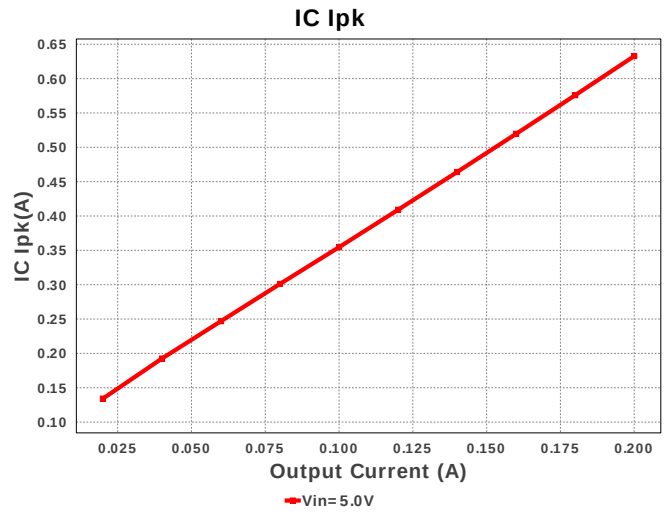


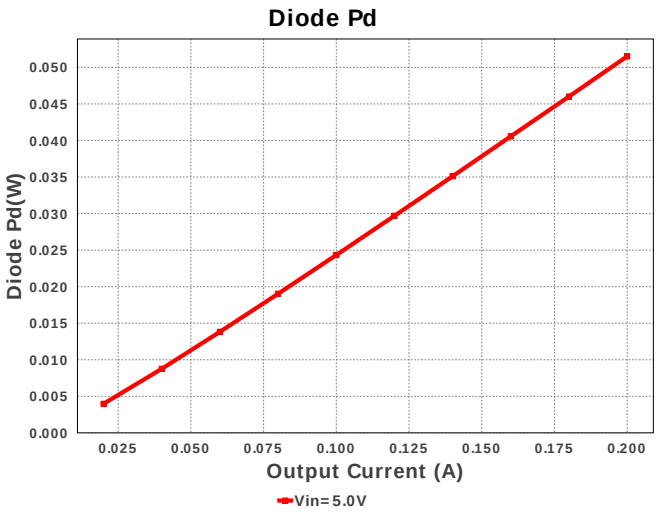
Iin Avg

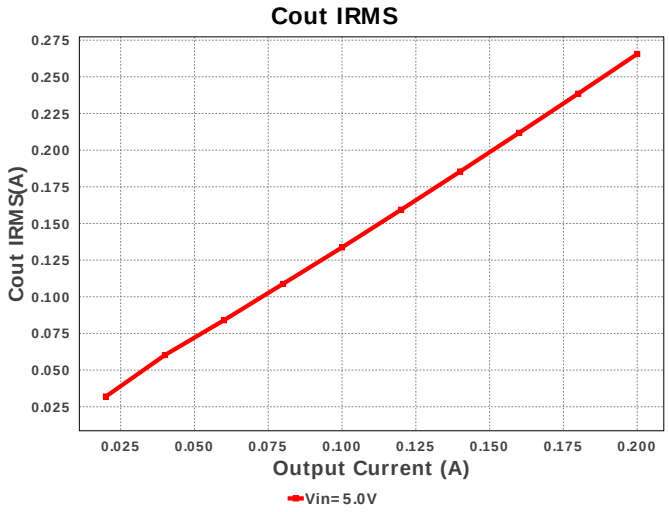


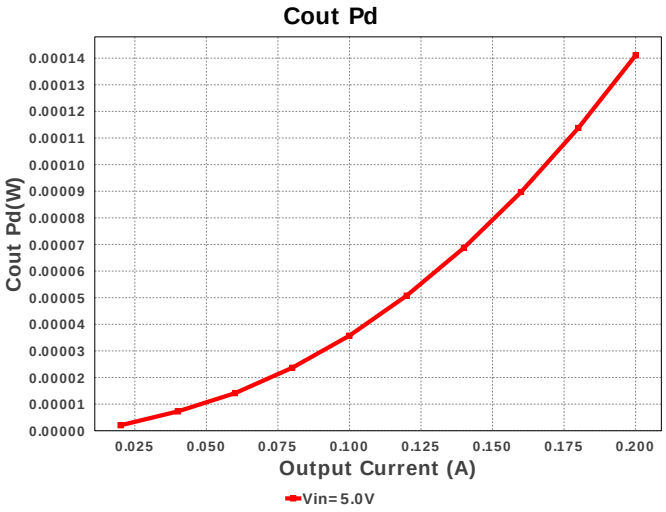
Pout

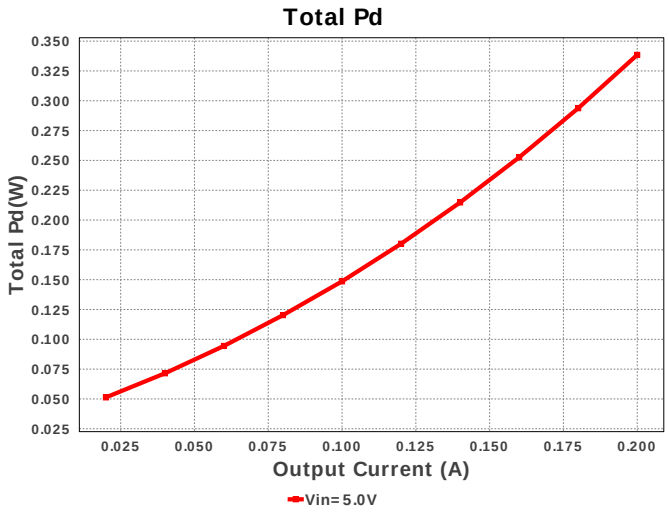


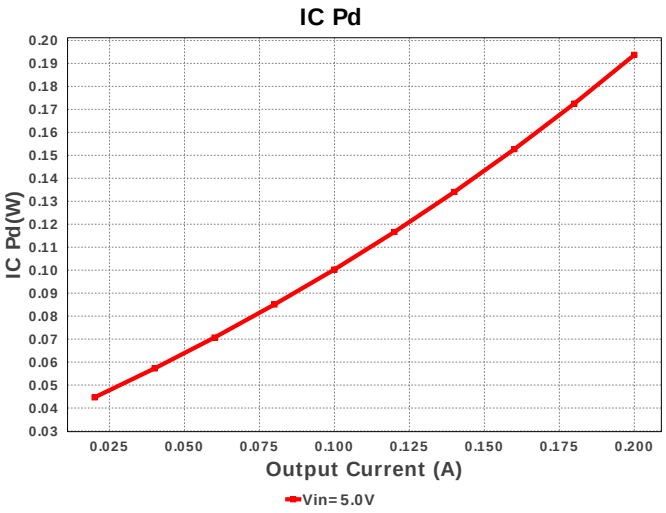


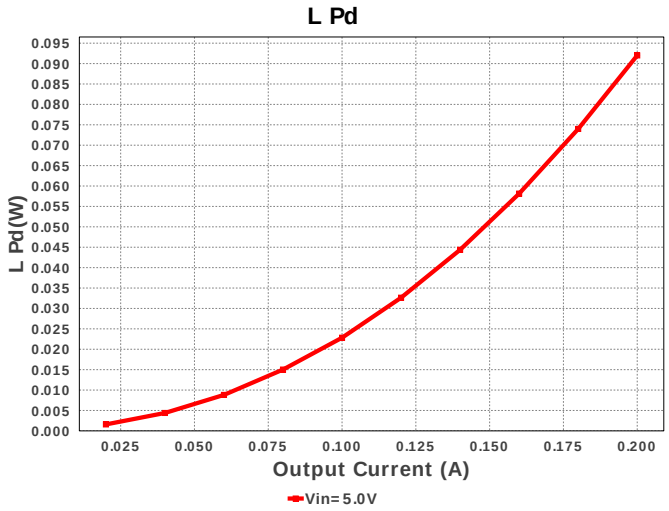












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	48.757 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	265.576 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	632.768 mA	Current	Peak switch current in IC
4.	Iin Avg	547.7 mA	Current	Average input current
5.	L Ipp	168.9 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	9	General	Total Design BOM count
7.	FootPrint	70.0 mm^2	General	Total Foot Print Area of BOM components
8.	Frequency	1.6 MHz	General	Switching frequency
9.	Mode	CCM	General	Conduction Mode
10.	Pout	2.4 W	General	Total output power
11.	Total BOM	$0.85	General	Total BOM Cost
12.	D1 Tj	40.301 degC	Op_Point	D1 junction temperature
13.	Vout Actual	11.824 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
14.	Duty Cycle	63.525 %	Op_point	Duty cycle
15.	Efficiency	87.64 %	Op_point	Steady state efficiency
16.	IC Tj	45.497 degC	Op_point	IC junction temperature
17.	IOUT_OP	200.0 mA	Op_point	Iout operating point
18.	VIN_OP	5.0 V	Op_point	Vin operating point
19.	Vout p-p	1.266 mV	Op_point	Peak-to-peak output ripple voltage
20.	Cin Pd	22.91 µW	Power	Input capacitor power dissipation
21.	Cout Pd	141.061 µW	Power	Output capacitor power dissipation
22.	Diode Pd	51.507 mW	Power	Diode power dissipation
23.	IC Pd	193.712 mW	Power	IC power dissipation
24.	L Pd	92.0 mW	Power	Inductor power dissipation
25.	Total Pd	338.479 mW	Power	Total Power Dissipation
26.	Vout Tolerance	3.879 %		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	5.0	Maximum input voltage
3.	VinMin	5.0	Minimum input voltage
4.	Vout	12.0	Output Voltage
5.	base_pn	LMR62014X	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **LMR62014X** Product Folder : http://www.ti.com/product/LMR62014 : contains the data sheet and other resources.