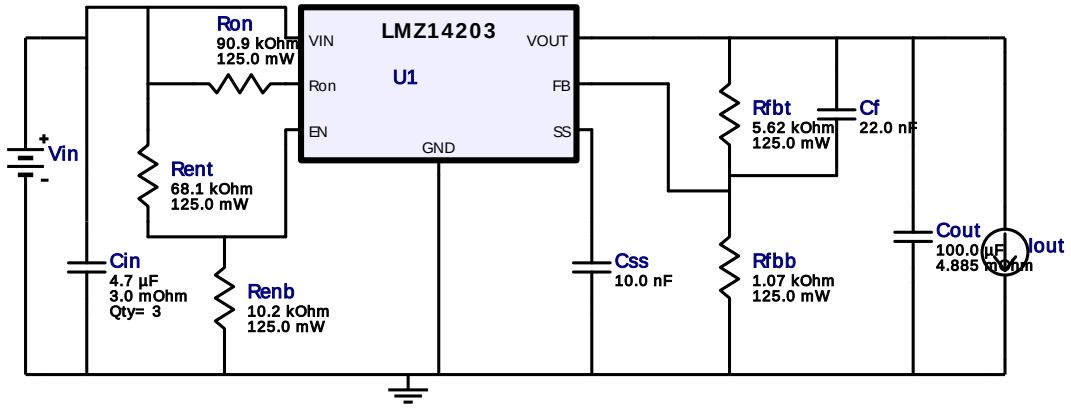
VinMin = 9.0V
VinMax = 30.0V
Vout = 5.0V
Iout = 3.0A

Device = LMZ14203TZ-ADJ/NOPB
Topology = Buck
Created = 8/9/16 10:27:28 PM
BOM Cost = $10.20
BOM Count = 12
Total Pd = 1.43W

WEBENCH® Design Report

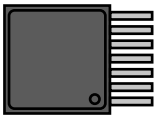
Design : 1984151/1 LMZ14203TZ-ADJ/NOPB
LMZ14203TZ-ADJ/NOPB 9.0V-30.0V to 5.00V @ 3.0A

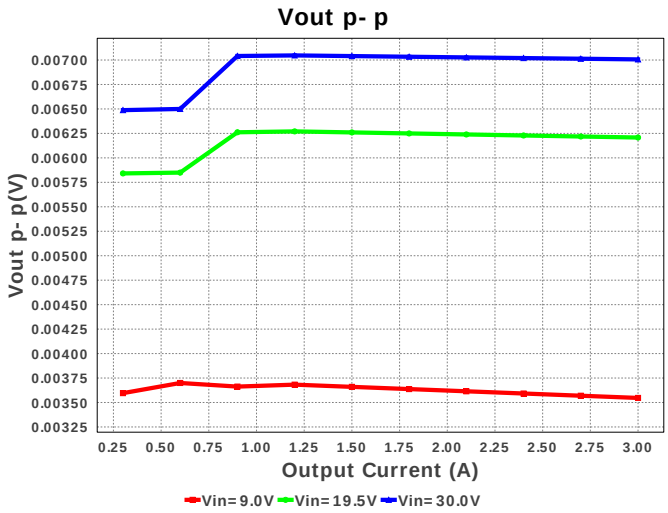
Vout = 5.0V
Iout = 3.0A

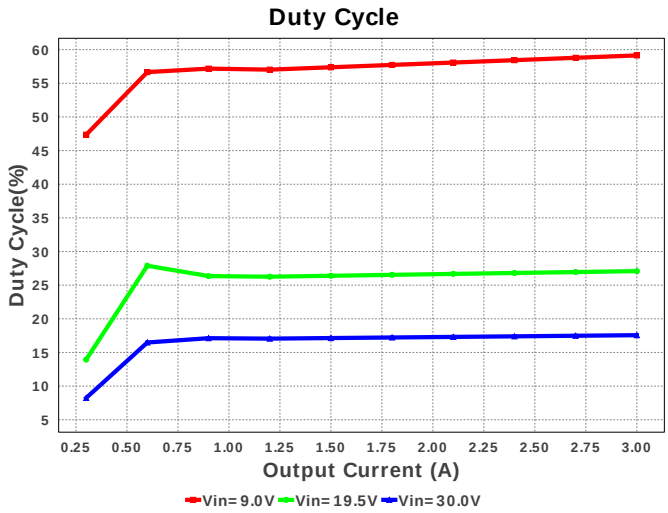


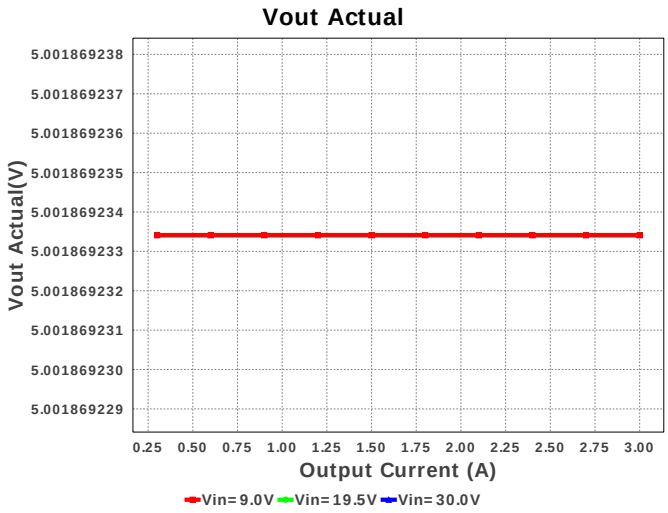
Electrical BOM

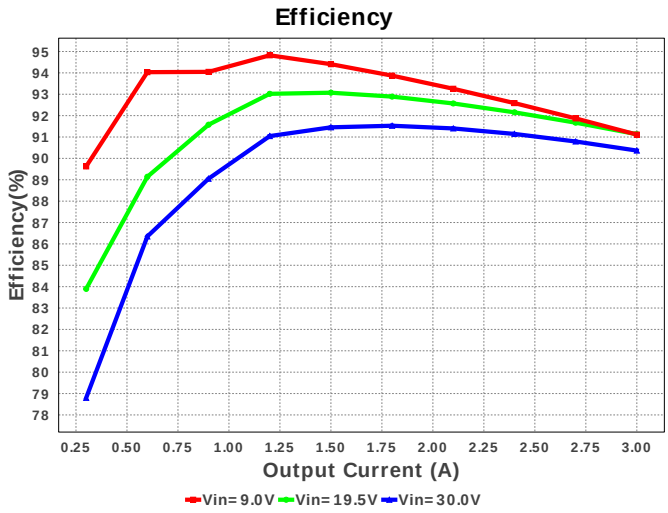
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cf	Yageo America	CC0805KRX7R9BB223 Series= X7R	Cap= 22.0 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
2.	Cin	MuRata	GRM31CR71H475KA12L Series= X7R	Cap= 4.7 uF ESR= 3.0 mOhm VDC= 50.0 V IRMS= 4.98 A	3	$0.07	1206 11 mm²
3.	Cout	MuRata	GRM31CR60J107ME39L Series= X5R	Cap= 100.0 uF ESR= 4.885 mOhm VDC= 6.3 V IRMS= 4.4118 A	1	$0.14	1206_190 11 mm²
4.	Css	MuRata	GRM216R71H103KA01D Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
5.	Renb	Panasonic	ERJ-6ENF1022V Series= ERJ-6E	Res= 10.2 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	0805 7 mm²
6.	Rent	Panasonic	ERJ-6ENF6812V Series= ERJ-6E	Res= 68.1 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	0805 7 mm²
7.	Rfbb	Panasonic	ERJ-6ENF1071V Series= ERJ-6E	Res= 1.07 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	0805 7 mm²
8.	Rfbt	Panasonic	ERJ-6ENF5621V Series= ERJ-6E	Res= 5.62 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	0805 7 mm²
9.	Ron	Panasonic	ERJ-6ENF9092V Series= ERJ-6E	Res= 90.9 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	0805 7 mm²

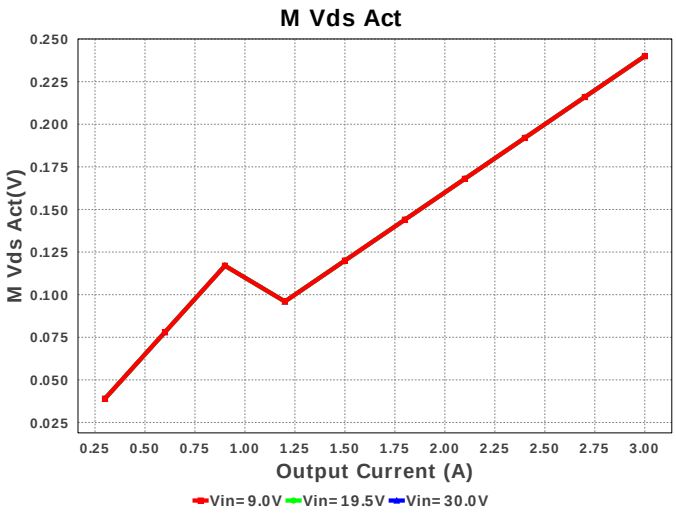
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	U1	Texas Instruments	LMZ14203TZ-ADJ/NOPB	Switcher	1	$9.78	 TZA07A 199 mm^2

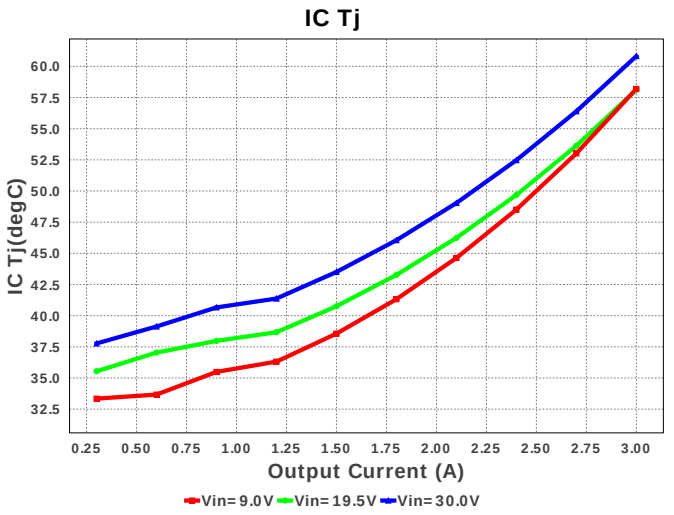


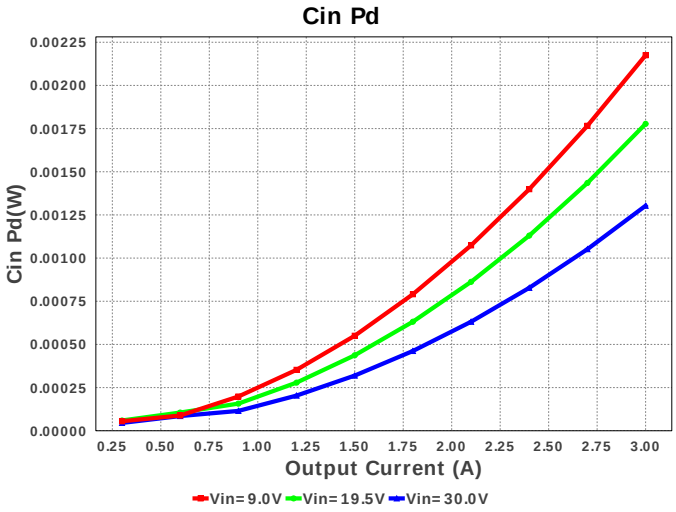


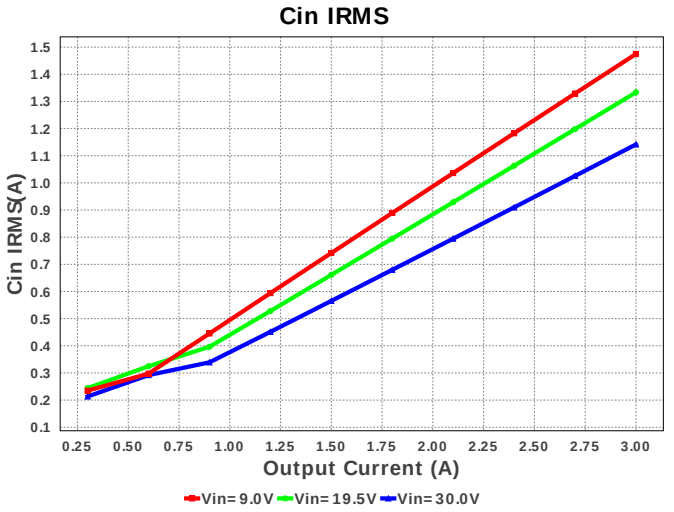


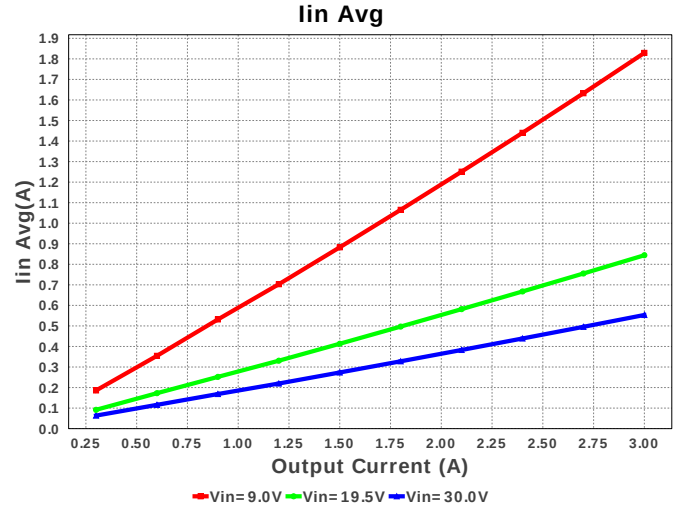


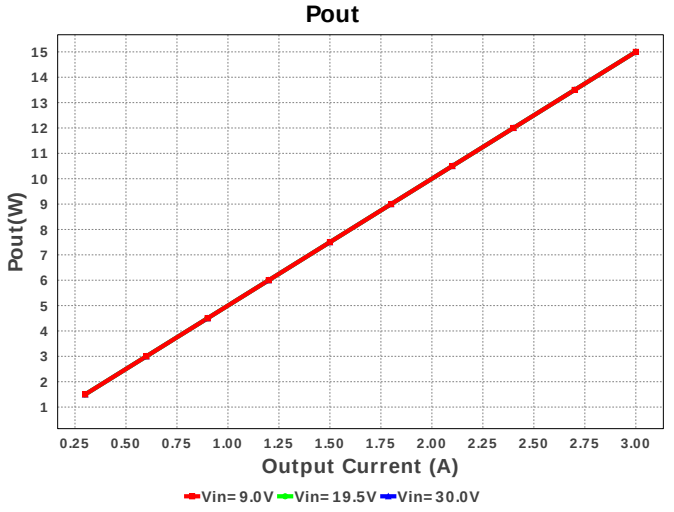


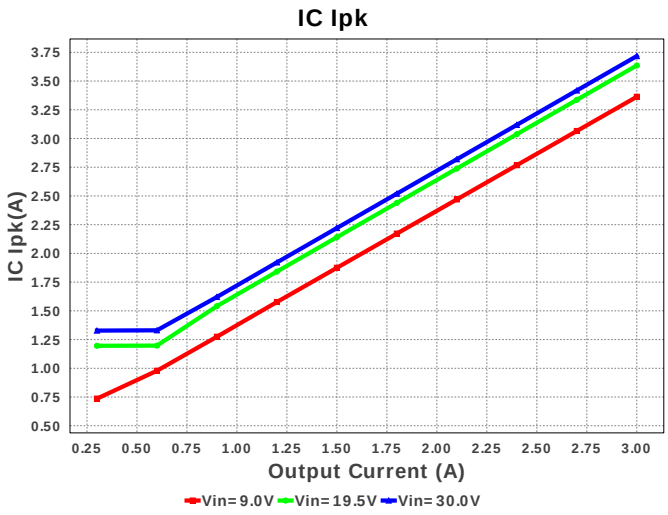


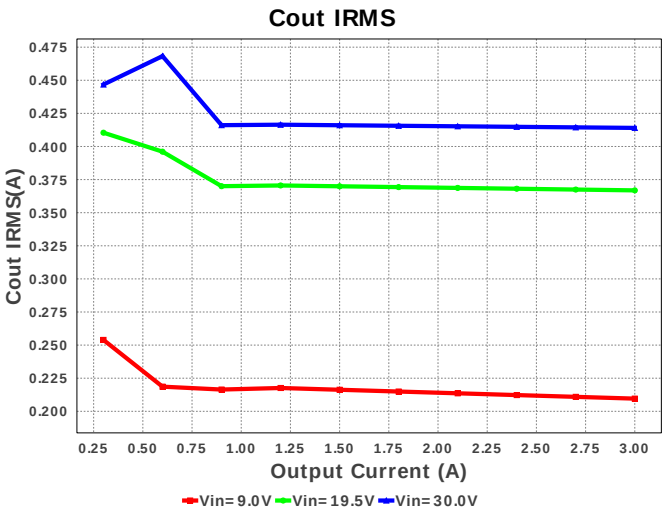


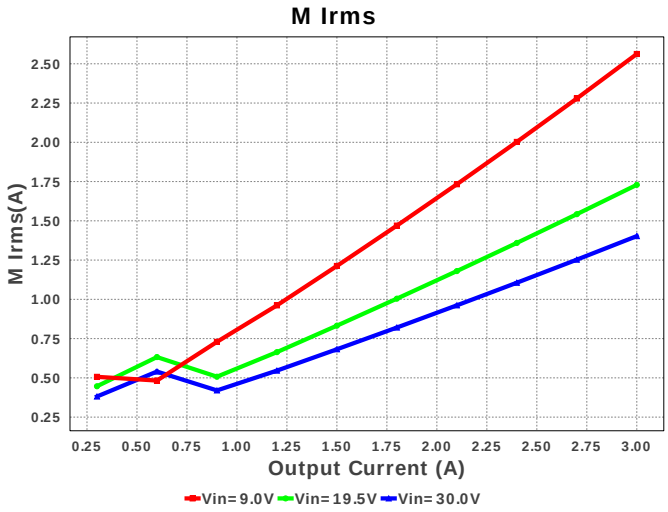


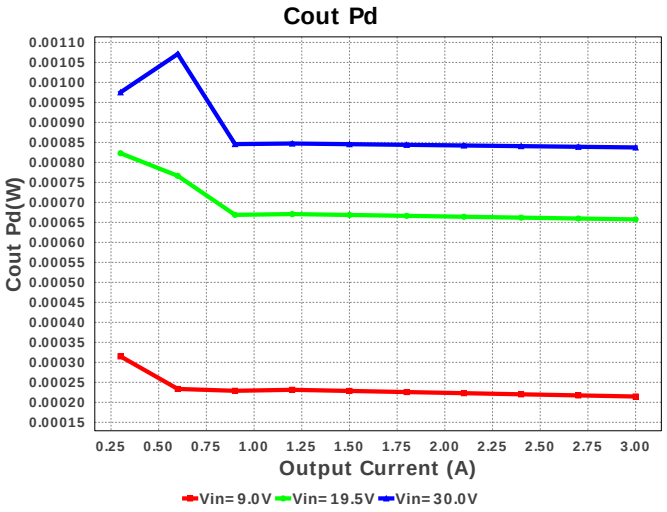


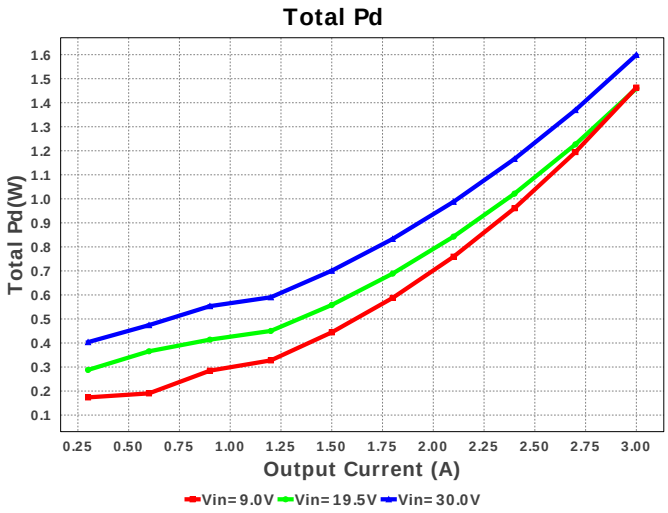


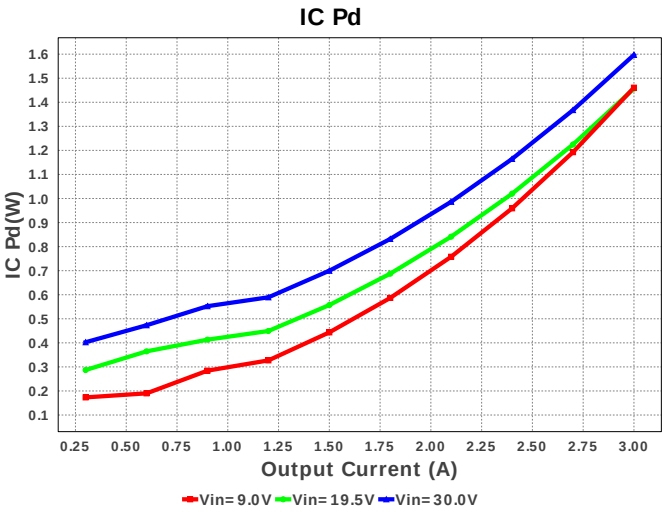












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	1.142 A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	414.035 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	3.717 A	Current	Peak switch current in IC
4.	Iin Avg	547.65 mA	Current	Average input current
5.	M1 Irms	1.389 A	Current	Q Iavg
6.	BOM Count	12	General	Total Design BOM count
7.	FootPrint	290.0 mm^2	General	Total Foot Print Area of BOM components
8.	Frequency	423.119 kHz	General	Switching frequency
9.	IC Tolerance	20.0 mV	General	IC Feedback Tolerance
10.	M Vds Act	240.0 mV	General	Voltage drop across the MosFET
11.	Mode	CCM	General	Conduction Mode

#	Name	Value	Category	Description
12.	Pout	15.0 W	General	Total output power
13.	Total BOM	$10.2	General	Total BOM Cost
14.	Vout Actual	5.002 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
15.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
16.	Duty Cycle	17.566 %	Op_point	Duty cycle
17.	Efficiency	91.299 %	Op_point	Steady state efficiency
18.	IC Tj	57.549 degC	Op_point	IC junction temperature
19.	ICThetaJA	19.3 degC/W	Op_point	IC junction-to-ambient thermal resistance
20.	IOUT_OP	3.0 A	Op_point	Iout operating point
21.	VIN_OP	30.0 V	Op_point	Vin operating point
22.	Vout p-p	7.006 mV	Op_point	Peak-to-peak output ripple voltage
23.	Cin Pd	1.303 mW	Power	Input capacitor power dissipation
24.	Cout Pd	837.411 µW	Power	Output capacitor power dissipation
25.	IC Pd	1.427 W	Power	IC power dissipation
26.	Total Pd	1.43 W	Power	Total Power Dissipation
27.	Vout Tolerance	4.24 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	3.0	Maximum Output Current
2.	SoftStart	1.0 ms	Soft Start Time (ms)
3.	VinMax	30.0	Maximum input voltage
4.	VinMin	9.0	Minimum input voltage
5.	Vout	5.0	Output Voltage
6.	base_pn	LMZ14203	Base Product Number
7.	source	DC	Input Source Type
8.	Ta	30.0	Ambient temperature

Design Assistance

1. **LMZ14203** Product Folder : http://www.ti.com/product/LMZ14203 : contains the data sheet and other resources.