TEXAS INSTRUMENTS

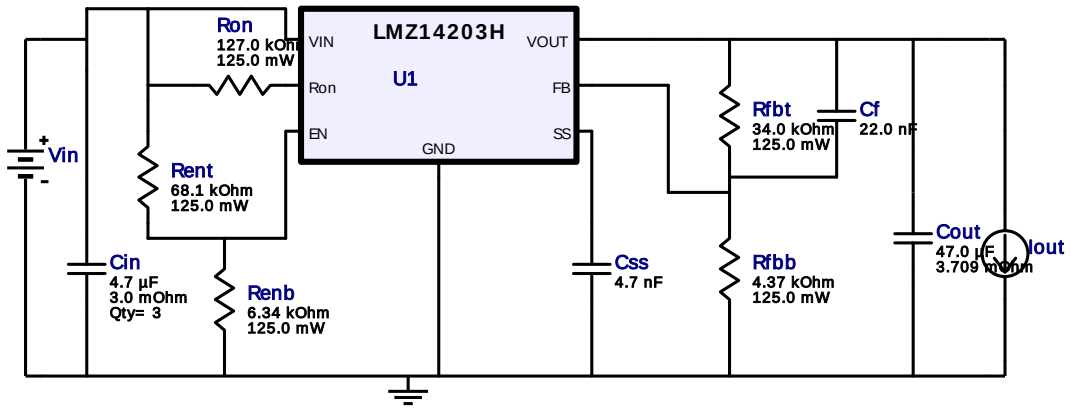
WEBENCH® Design Report

VinMin = 14.0V
VinMax = 36.0V
Vout = 7.0V
Iout = 2.0A

Device = LMZ14203HTZ/NOPB
Topology = Buck
Created = 8/11/16 8:56:19 PM
BOM Cost = $10.25
BOM Count = 12
Total Pd = 1.5W

Design : 4740075/9 LMZ14203HTZ/NOPB
LMZ14203HTZ/NOPB 14.0V-36.0V to 7.00V @ 2.0A

Vout = 7.0V
Iout = 2.0A

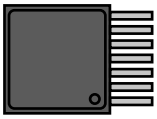


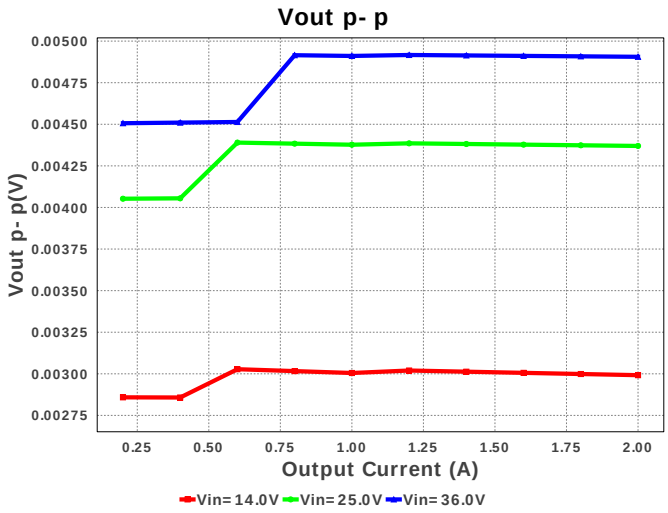
My Comments

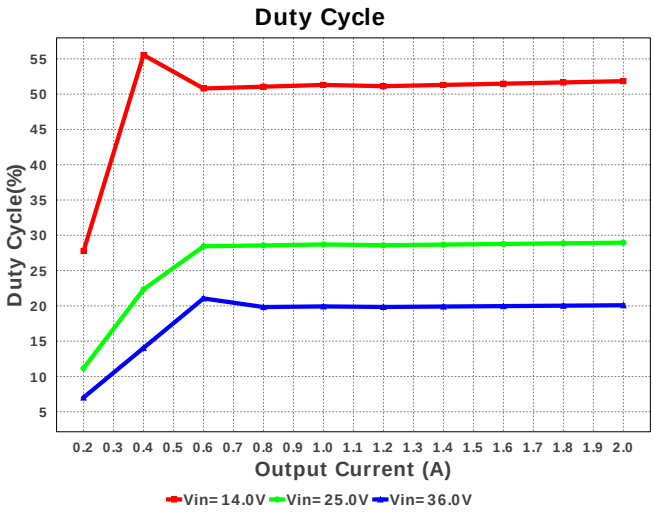
No comments

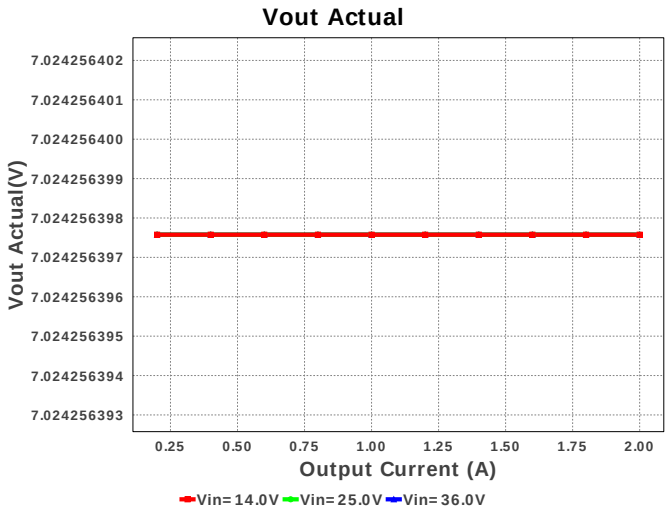
Electrical BOM

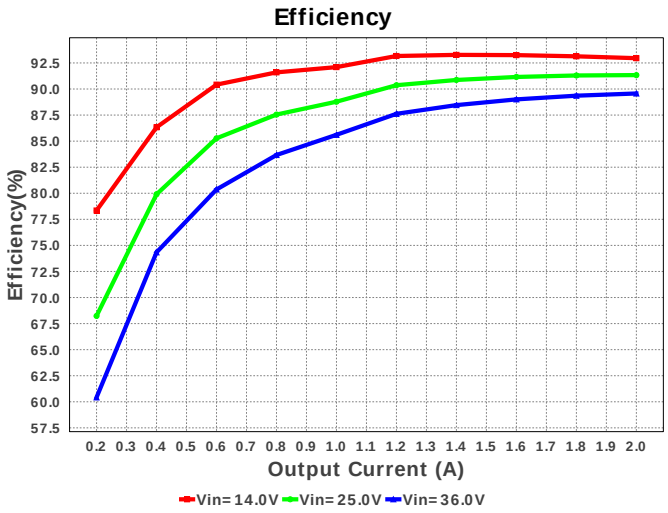
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cf	Yageo America	CC0805KRX7R9BB223 Series= X7R	Cap= 22.0 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
2.	Cin	MuRata	GRM31CR71H475KA12L Series= X7R	Cap= 4.7 uF ESR= 3.0 mOhm VDC= 50.0 V IRMS= 4.98 A	3	$0.07	1206 11 mm²
3.	Cout	MuRata	GRM31CR61A476KE15L Series= X5R	Cap= 47.0 uF ESR= 3.709 mOhm VDC= 10.0 V IRMS= 4.2862 A	1	$0.15	1206_190 11 mm²
4.	Css	Yageo America	CC0805KRX7R9BB472 Series= X7R	Cap= 4.7 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
5.	Renb	Panasonic	ERJ-6ENF6341V Series= ERJ-6E	Res= 6.34 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	Yageo America	RT0805BRD074K37L Series= RT0805	Res= 4.37 kOhm Power= 125.0 mW Tolerance= 0.1%	1	$0.05	0805 7 mm²
8.	Rfbt	Panasonic	ERJ-6ENF3402V Series= ERJ-6E	Res= 34.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	0805 7 mm²
9.	Ron	Panasonic	ERJ-6ENF1273V Series= ERJ-6E	Res= 127.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	0805 7 mm²

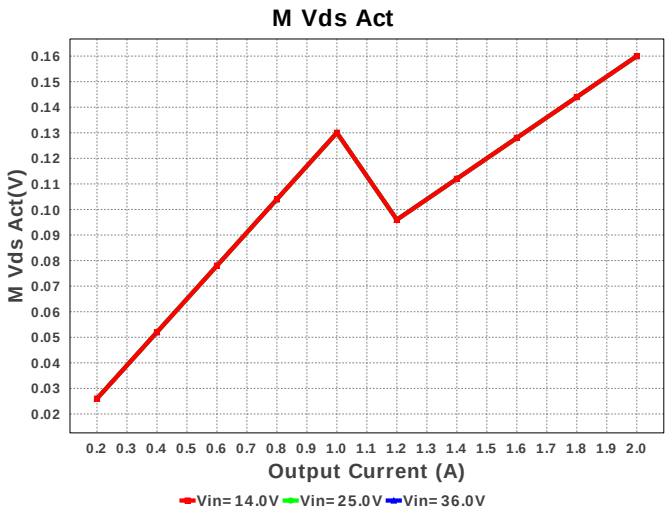
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	U1	Texas Instruments	LMZ14203HTZ/NOPB	Switcher	1	$9.78	 TZA07A 199 mm^2

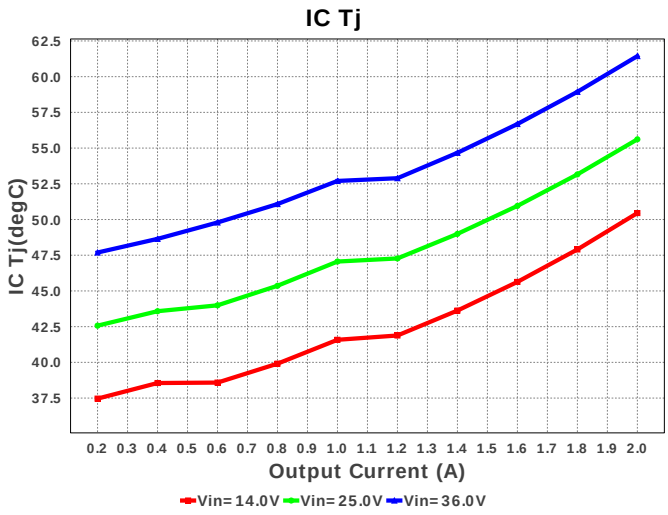


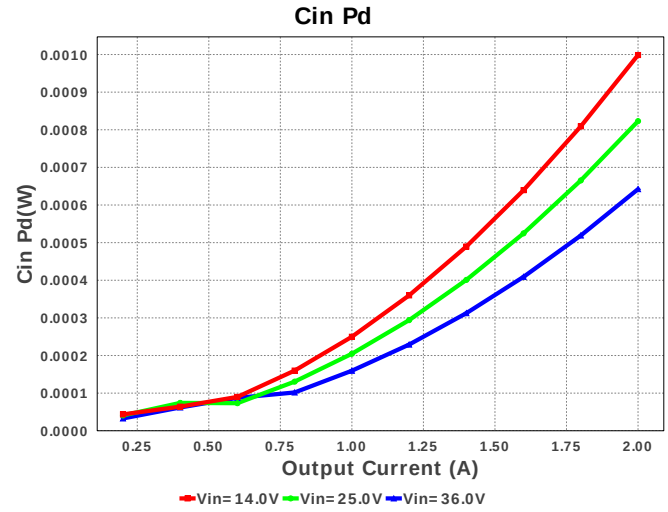


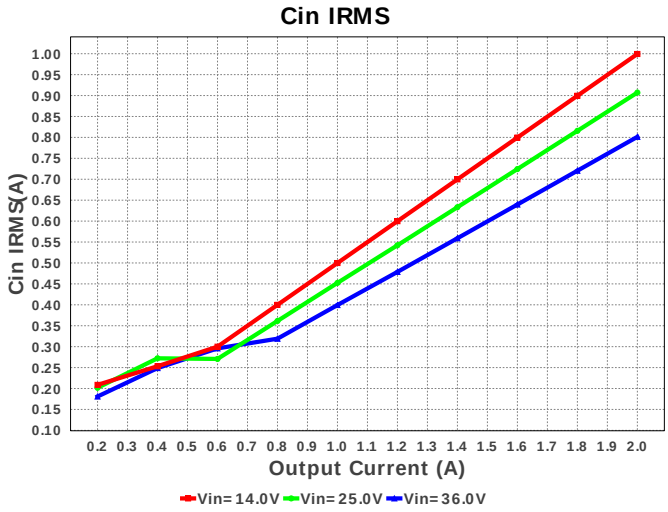


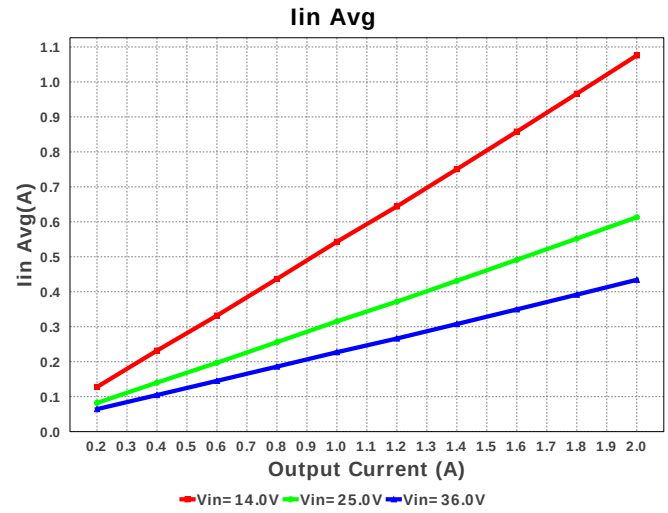


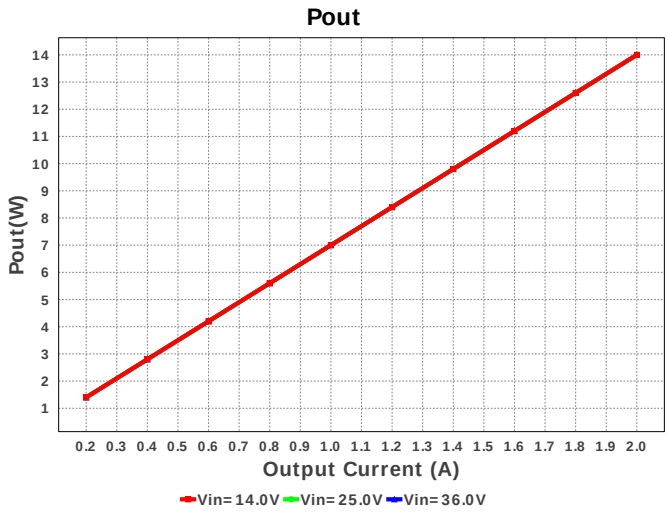


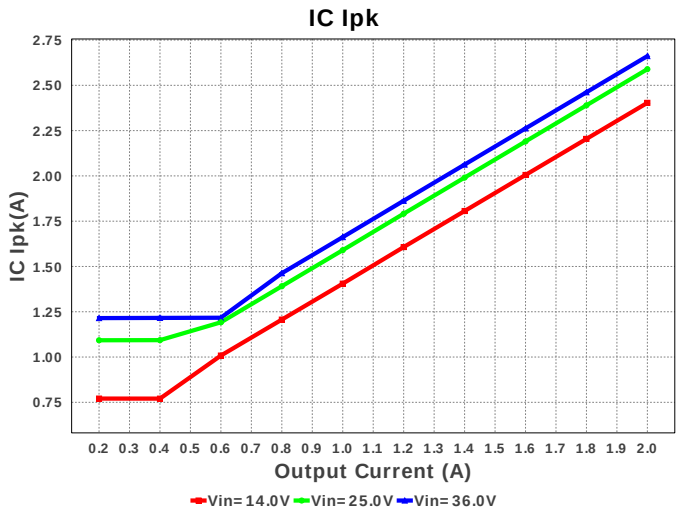


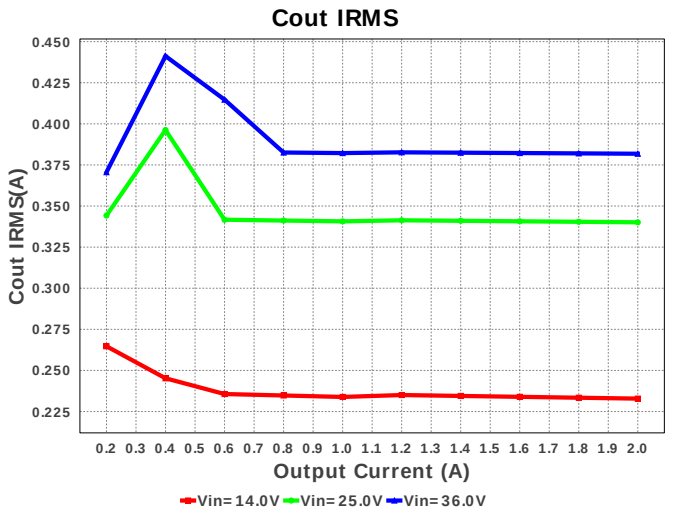


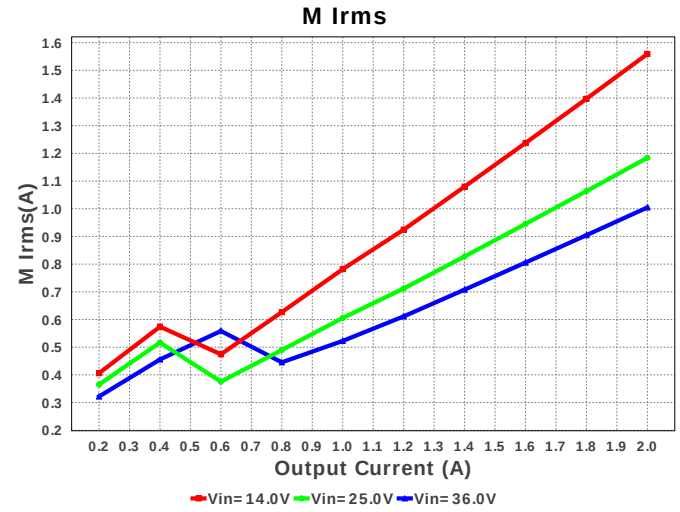


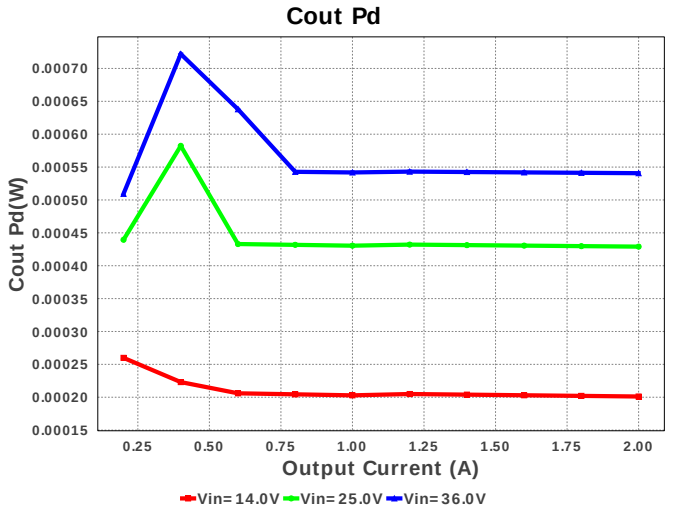


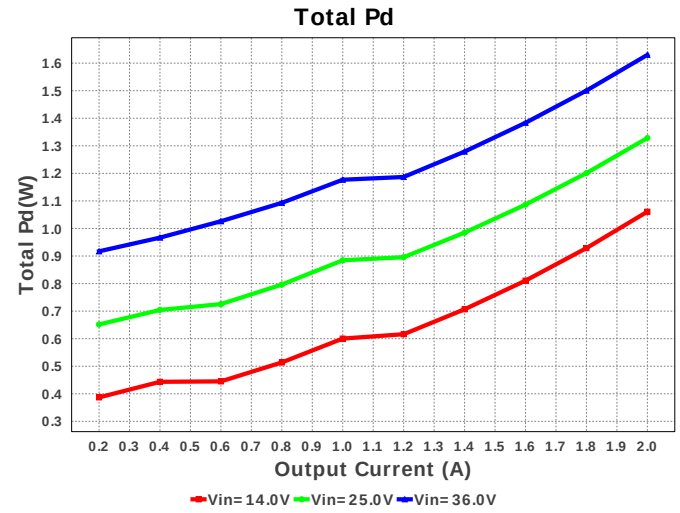


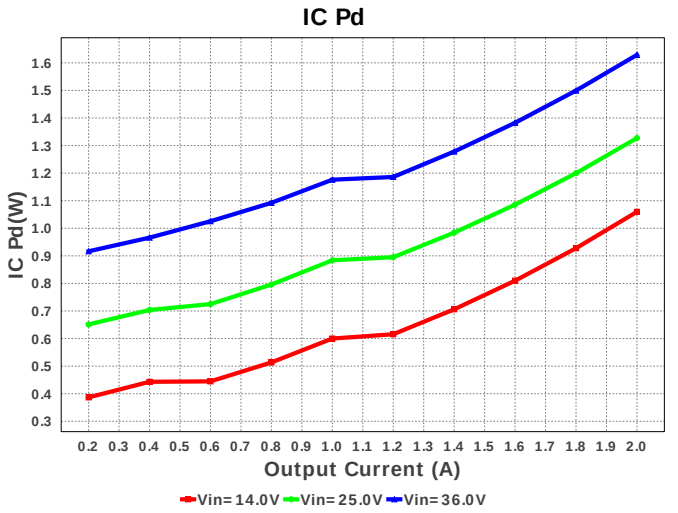












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	801.352 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	381.812 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.661 A	Current	Peak switch current in IC
4.	Iin Avg	430.65 mA	Current	Average input current
5.	M Irms	996.782 mA	Current	MOSFET RMS current
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	423.985 kHz	General	Switching frequency
9.	IC Tolerance	20.0 mV	General	IC Feedback Tolerance
10.	M Vds Act	160.0 mV	General	Voltage drop across the MosFET
11.	Mode	CCM	General	Conduction Mode

#	Name	Value	Category	Description
12.	Pout	14.0 W	General	Total output power
13.	Total BOM	$10.25	General	Total BOM Cost
14.	Vout Actual	7.024 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
15.	Vout OP	7.0 V	Op_Point	Operational Output Voltage
16.	Duty Cycle	20.09 %	Op_point	Duty cycle
17.	Efficiency	90.303 %	Op_point	Steady state efficiency
18.	IC Tj	58.991 degC	Op_point	IC junction temperature
19.	ICThetaJA	19.3 degC/W	Op_point	IC junction-to-ambient thermal resistance
20.	IOUT_OP	2.0 A	Op_point	Iout operating point
21.	VIN_OP	36.0 V	Op_point	Vin operating point
22.	Vout p-p	4.906 mV	Op_point	Peak-to-peak output ripple voltage
23.	Cin Pd	642.165 µW	Power	Input capacitor power dissipation
24.	Cout Pd	540.699 µW	Power	Output capacitor power dissipation
25.	IC Pd	1.502 W	Power	IC power dissipation
26.	Total Pd	1.503 W	Power	Total Power Dissipation
27.	Vout Tolerance	3.5 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	2.0	Maximum Output Current
2.	Iout1	2.0	Output Current #1
3.	VinMax	36.0	Maximum input voltage
4.	VinMin	14.0	Minimum input voltage
5.	Vout	7.0	Output Voltage
6.	Vout1	7.0	Output Voltage #1
7.	Vout2	6.0	Output Voltage #2
8.	base_pn	LMZ14203H	Texas Instruments Base Part Number
9.	source	DC	Input Source Type
10.	ta	30.0	Ambient temperature

Design Assistance

1. LMZ14203H Product Folder : http://www.ti.com/product/LMZ14203H : contains the data sheet and other resources.