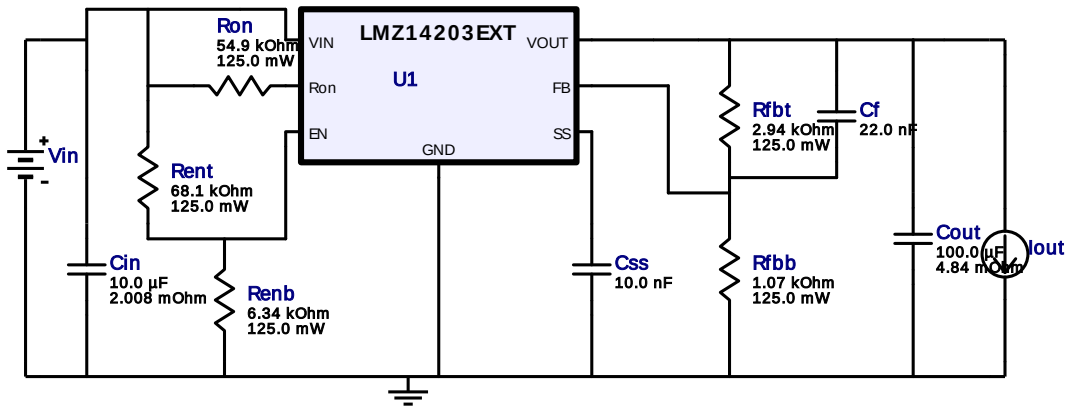
VinMin = 14.0V
VinMax = 22.0V
Vout = 3.0V
Iout = 2.1A

Device = LMZ14203EXTTZ/NOPB
Topology = Buck
Created = 9/27/16 8:07:41 PM
BOM Cost = $18.73
BOM Count = 10
Total Pd = 0.79W

WEBENCH® Design Report

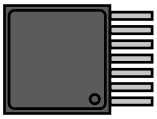
Design : 4748706/20 LMZ14203EXTTZ/NOPB
LMZ14203EXTTZ/NOPB 14.0V-22.0V to 3.00V @ 2.1A

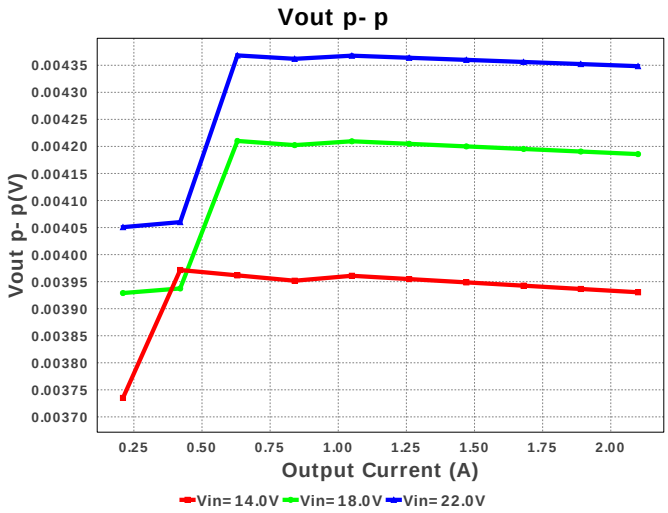
Vout = 3.0V
Iout = 2.1A

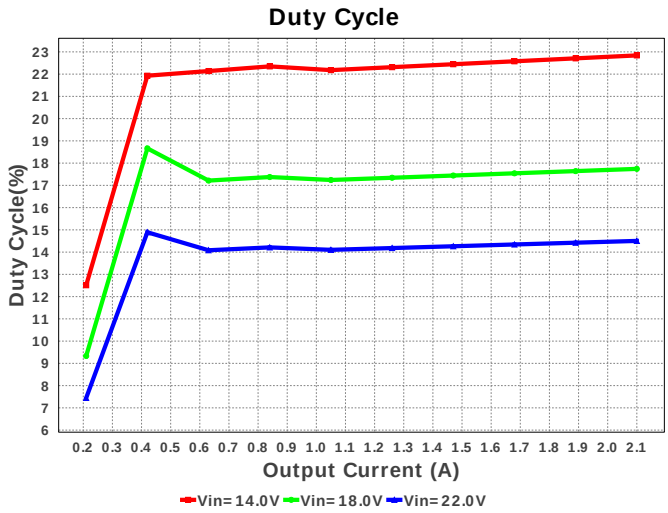


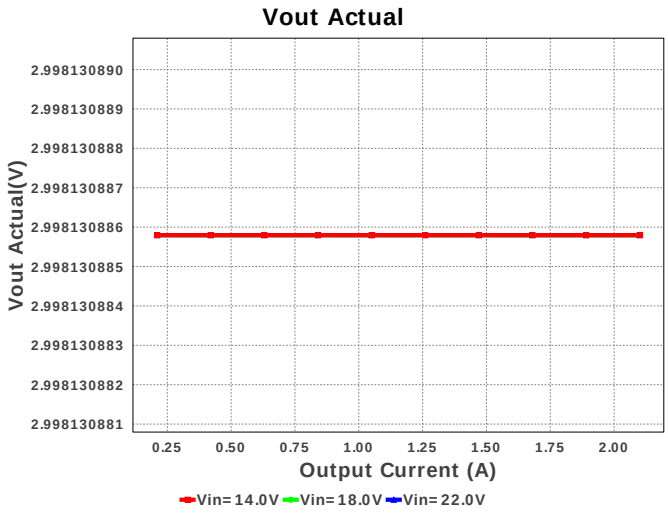
Electrical BOM

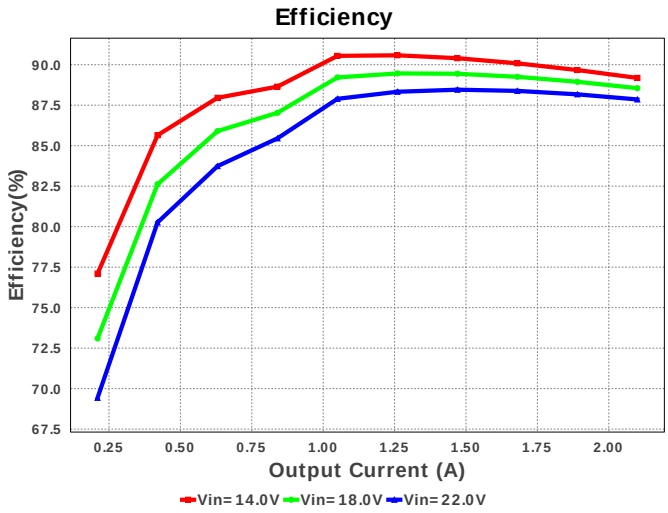
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cf	Yageo America	CC0805KRX7R9BB223 Series= X7R	Cap= 22.0 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
2.	Cin	MuRata	GRM32ER7YA106KA12L Series= X7R	Cap= 10.0 uF ESR= 2.008 mOhm VDC= 35.0 V IRMS= 4.6772 A	1	$0.22	1210_280 15 mm²
3.	Cout	MuRata	GRM31CD80G107ME39L Series= X6T	Cap= 100.0 uF ESR= 4.84 mOhm VDC= 4.0 V IRMS= 4.3381 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-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	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-6ENF2941V Series= ERJ-6E	Res= 2.94 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	0805 7 mm²
9.	Ron	Panasonic	ERJ-6ENF5492V Series= ERJ-6E	Res= 54.9 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	LMZ14203EXTTZ/NOPB	Switcher	1	$18.30	 TZA07A 199 mm^2

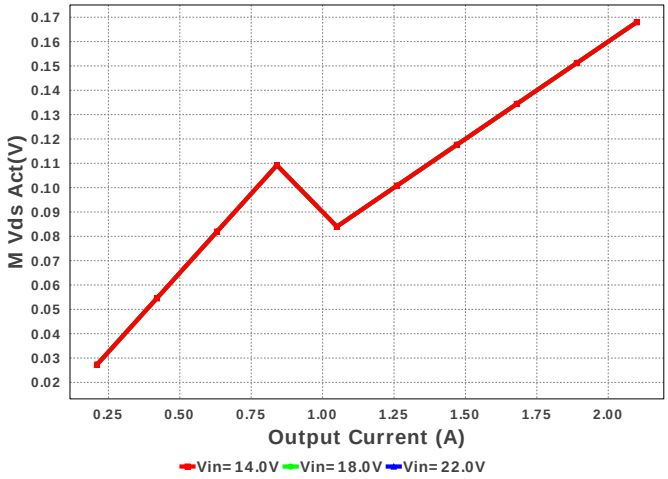




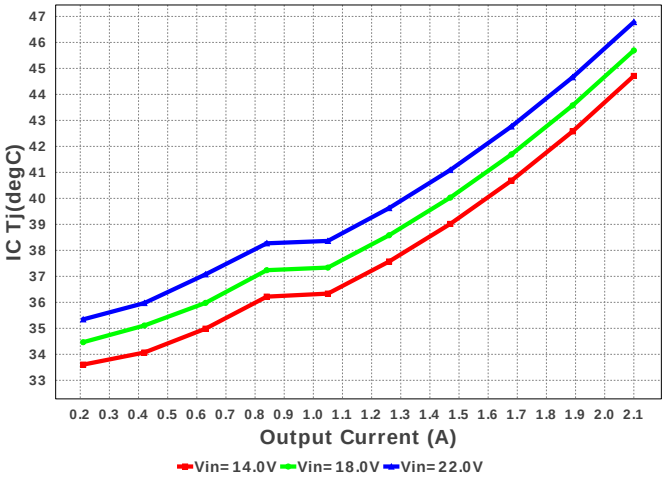




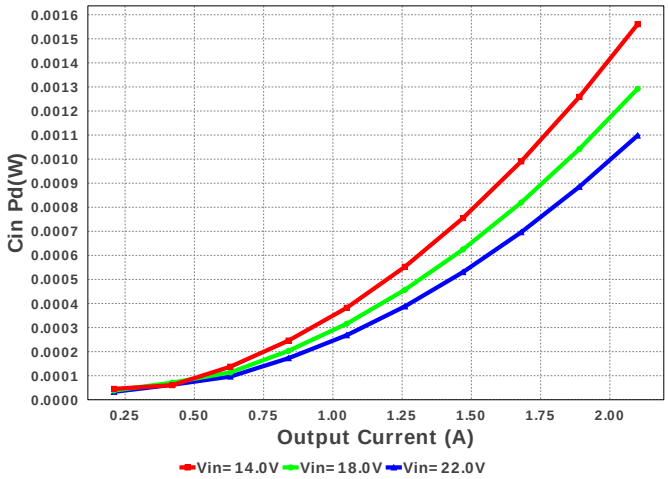
M Vds Act



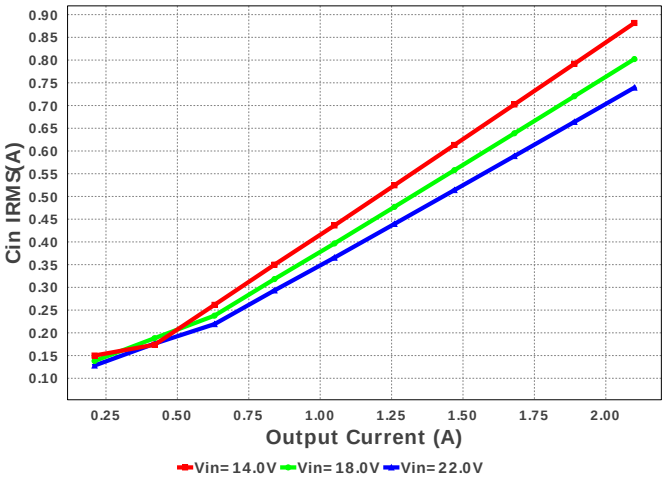
IC Tj



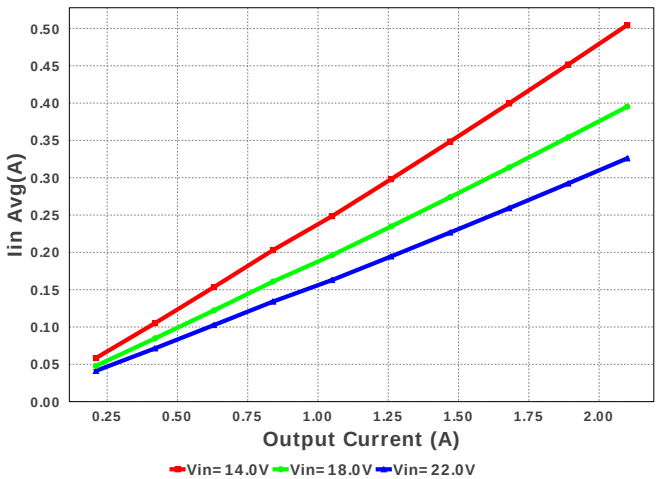
Cin Pd



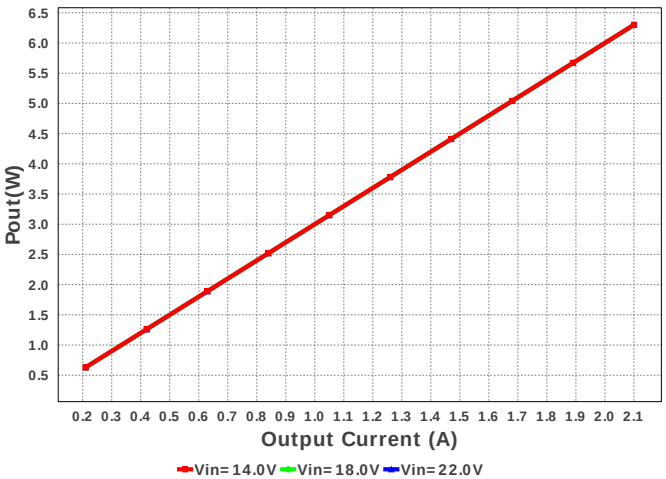
Cin IRMS

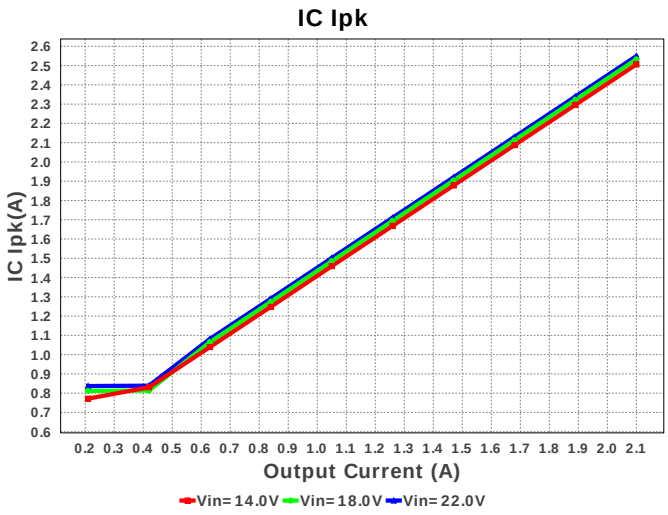


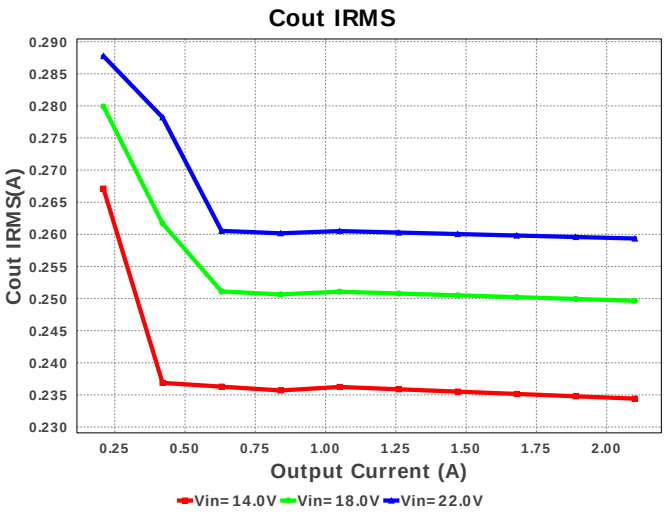
Iin Avg

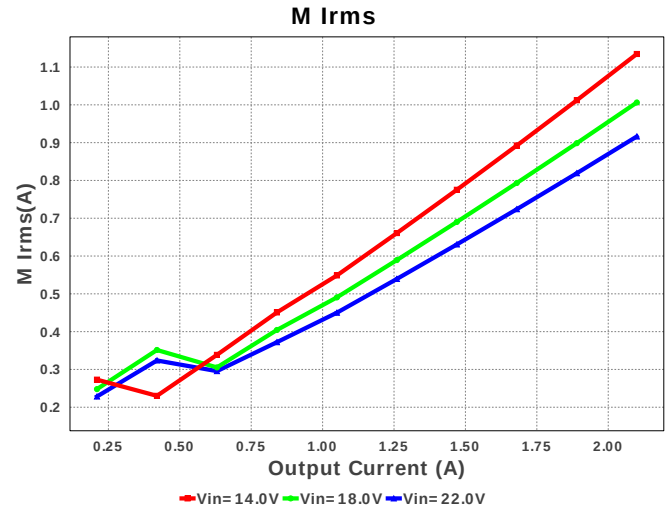


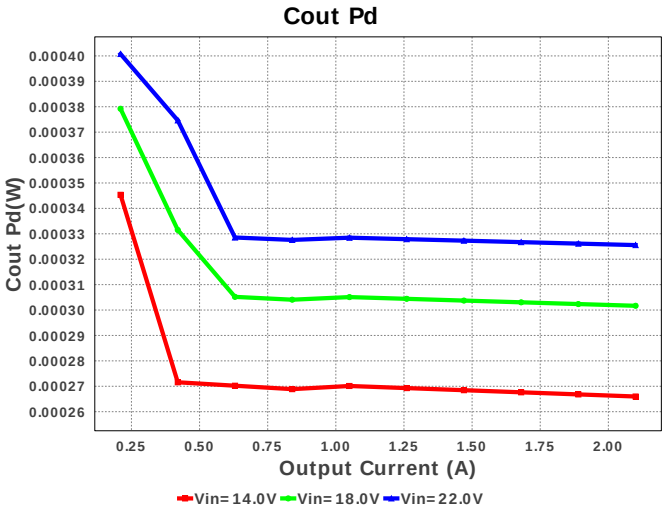
Pout

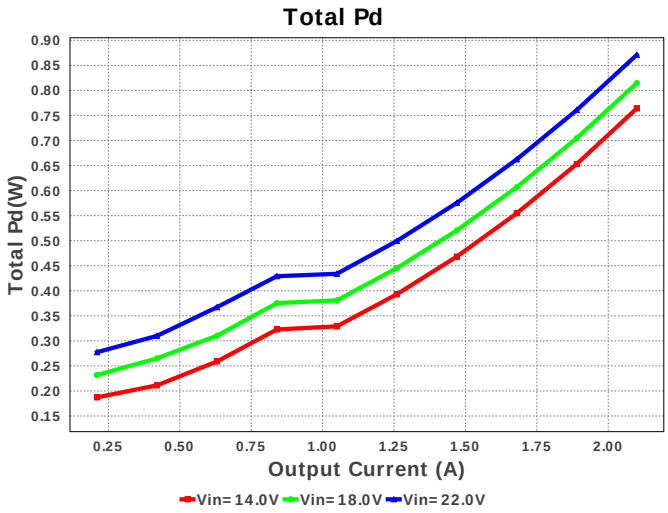


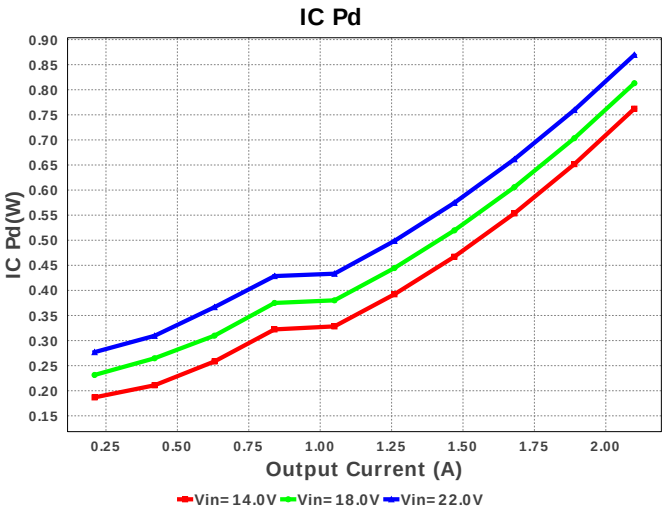












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	739.481 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	259.352 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.549 A	Current	Peak switch current in IC
4.	Iin Avg	322.14 mA	Current	Average input current
5.	M1 Irms	906.203 mA	Current	Q Iavg
6.	BOM Count	10	General	Total Design BOM count
7.	FootPrint	272.0 mm^2	General	Total Foot Print Area of BOM components
8.	Frequency	420.345 kHz	General	Switching frequency
9.	IC Tolerance	20.0 mV	General	IC Feedback Tolerance
10.	M Vds Act	168.0 mV	General	Voltage drop across the MosFET
11.	Mode	CCM	General	Conduction Mode

#	Name	Value	Category	Description
12.	Pout	6.3 W	General	Total output power
13.	Total BOM	$18.73	General	Total BOM Cost
14.	Vout Actual	2.998 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
15.	Vout OP	3.0 V	Op_Point	Operational Output Voltage
16.	Duty Cycle	14.503 %	Op_point	Duty cycle
17.	Efficiency	88.895 %	Op_point	Steady state efficiency
18.	IC Tj	45.162 degC	Op_point	IC junction temperature
19.	ICThetaJA	19.3 degC/W	Op_point	IC junction-to-ambient thermal resistance
20.	IOUT_OP	2.1 A	Op_point	Iout operating point
21.	VIN_OP	22.0 V	Op_point	Vin operating point
22.	Vout p-p	4.348 mV	Op_point	Peak-to-peak output ripple voltage
23.	Cin Pd	1.098 mW	Power	Input capacitor power dissipation
24.	Cout Pd	325.556 µW	Power	Output capacitor power dissipation
25.	IC Pd	785.612 mW	Power	IC power dissipation
26.	Total Pd	787.02 mW	Power	Total Power Dissipation
27.	Vout Tolerance	4.018 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	2.1	Maximum Output Current
2.	VinMax	22.0	Maximum input voltage
3.	VinMin	14.0	Minimum input voltage
4.	Vout	3.0	Output Voltage
5.	base_pn	LMZ14203EXT	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **LMZ14203EXT** Product Folder : http://www.ti.com/product/LMZ14203EXT : contains the data sheet and other resources.