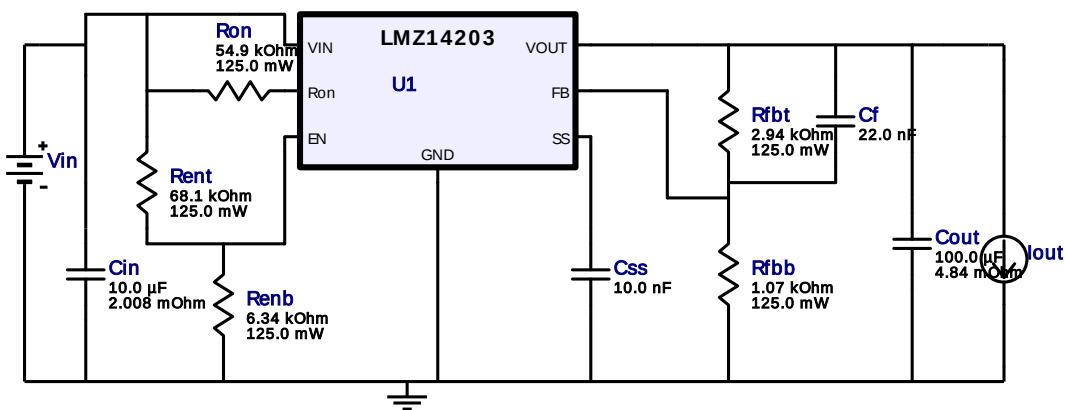


WEBENCH® Design Report

Design : 1913968/1489 LMZ14203TZ-ADJ/NOPB
LMZ14203TZ-ADJ/NOPB 14.0V-22.0V to 3.00V @ 2.0A

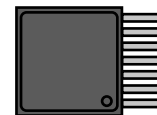
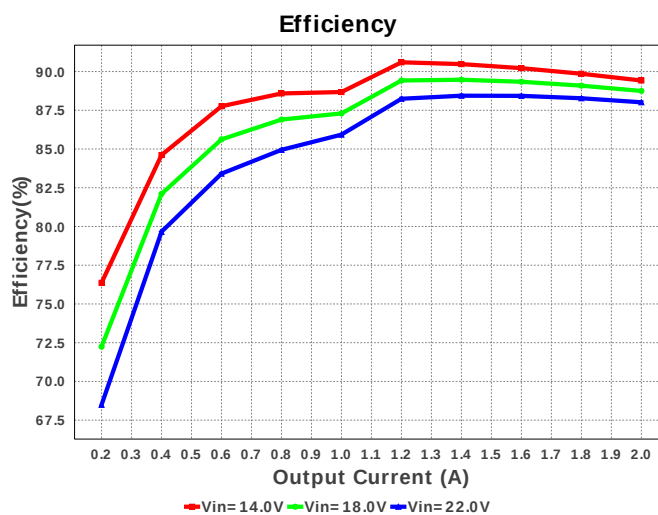
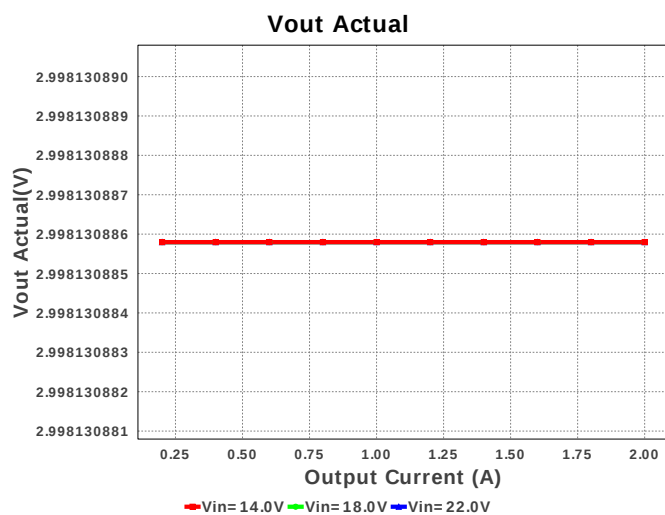
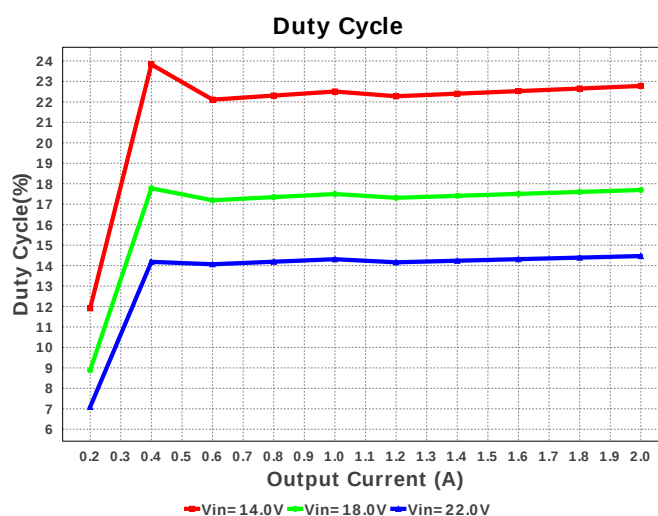
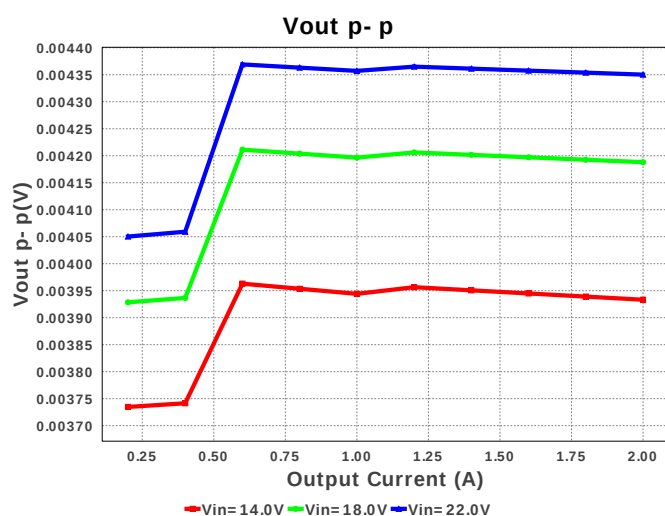
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Iout = 2.0A

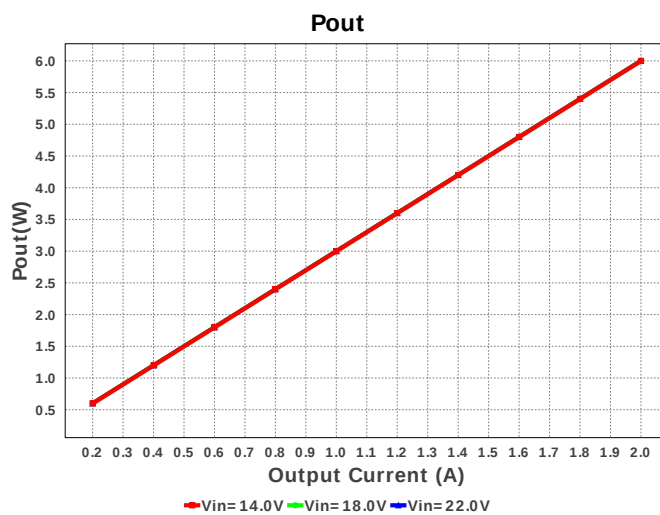
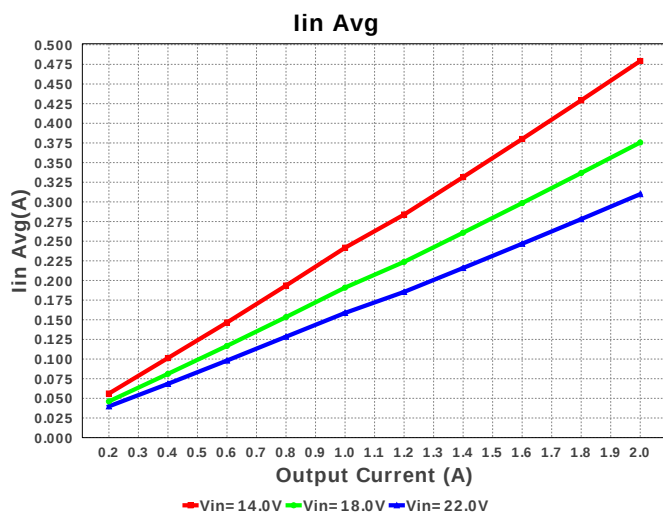
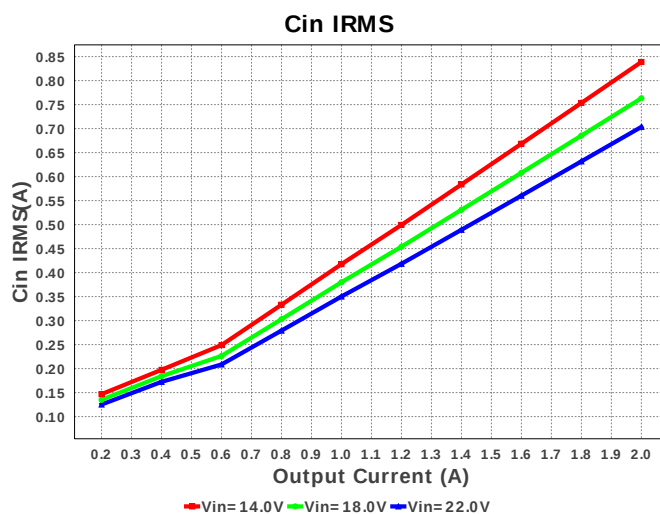
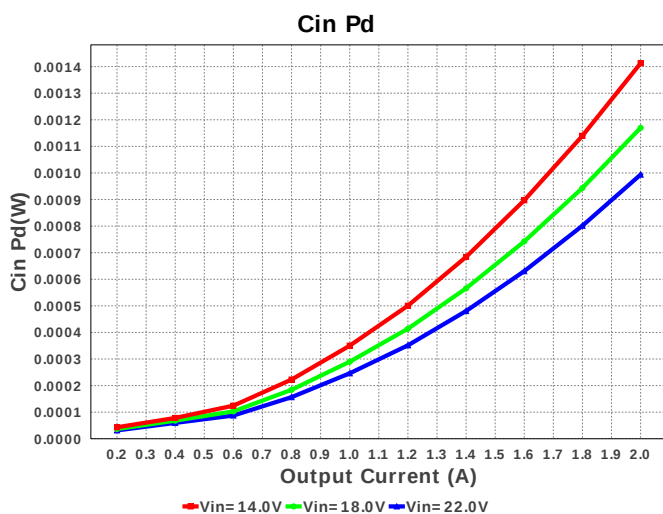
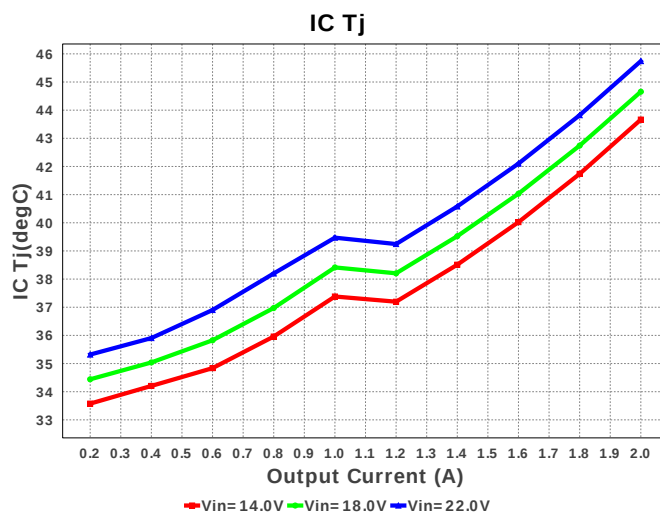
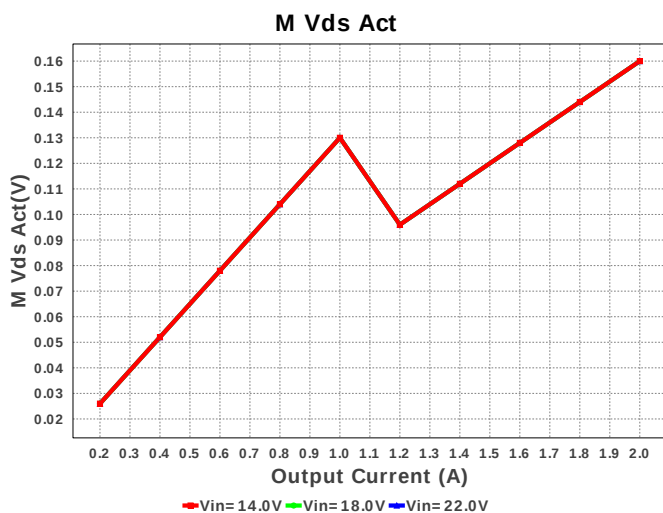


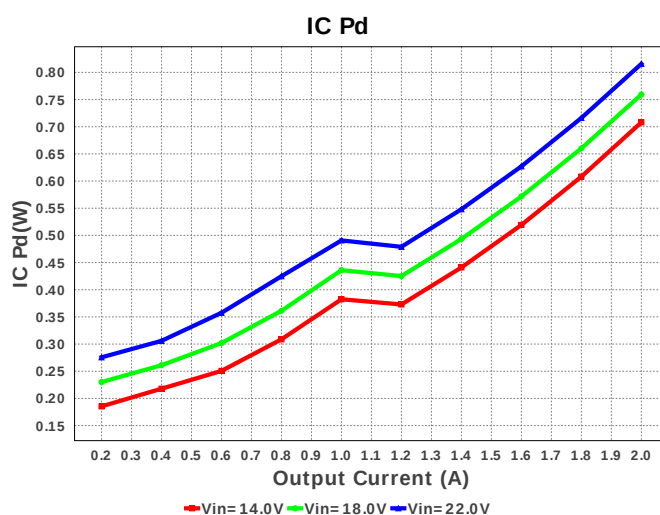
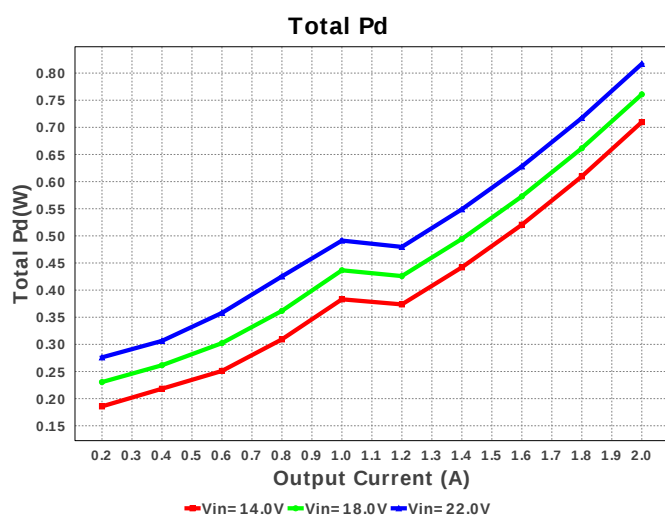
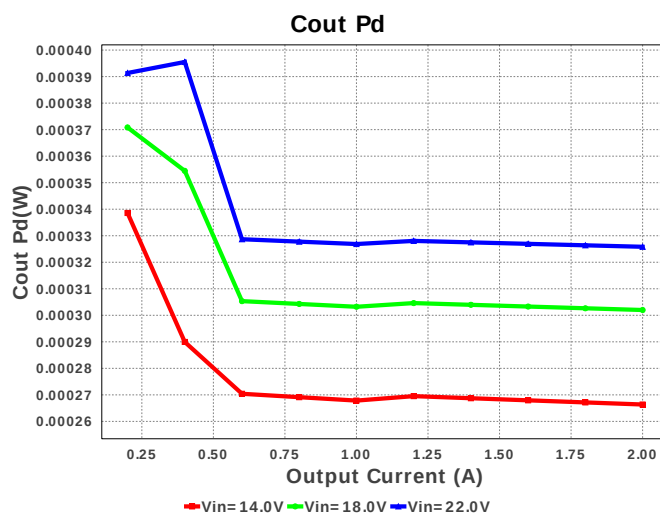
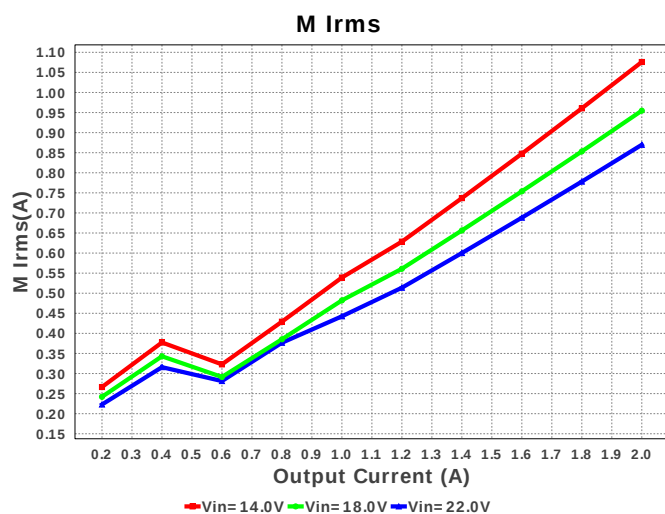
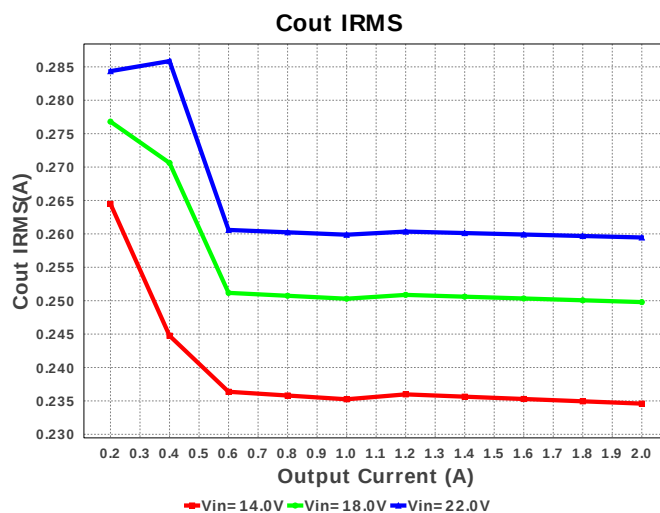
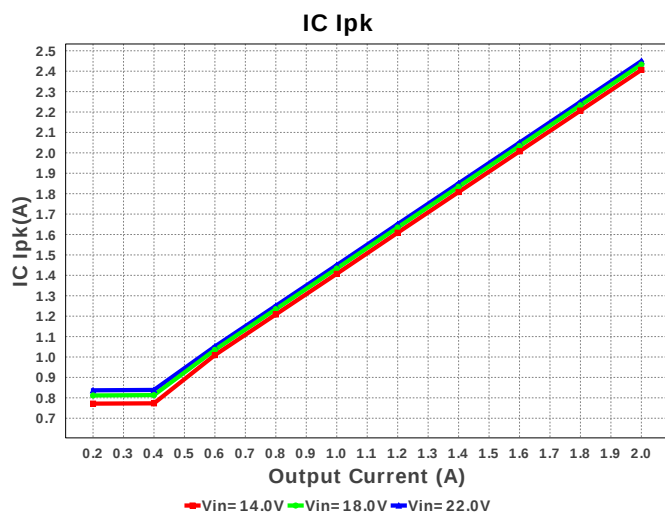
Electrical BOM

#	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 mm ²
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 mm ²
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 mm ²
4.	Css	MuRata	GRM216R71H103KA01D Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
5.	Renb	Panasonic	ERJ-6ENF6341V Series= ERJ-6E	Res= 6.34 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	0805 7 mm ²
6.	Rent	Panasonic	ERJ-6ENF6812V Series= ERJ-6E	Res= 68.1 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	0805 7 mm ²
7.	Rfbb	Panasonic	ERJ-6ENF1071V Series= ERJ-6E	Res= 1.07 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	0805 7 mm ²
8.	Rfbb	Panasonic	ERJ-6ENF2941V Series= ERJ-6E	Res= 2.94 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	0805 7 mm ²
9.	Ron	Panasonic	ERJ-6ENF5492V Series= ERJ-6E	Res= 54.9 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	0805 7 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	U1	Texas Instruments	LMZ14203TZ-ADJ/NOPB	Switcher	1	\$9.78	

TZA07A 199 mm²





Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	703.498 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	259.462 mA	Current	Output capacitor RMS ripple current
3.	IC Ip _k	2.449 A	Current	Peak switch current in IC
4.	I _{in} Avg	306.26 mA	Current	Average input current
5.	M1 Irms	860.196 mA	Current	Q ₁ I _{avg}
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 V _{ds} Act	160.0 mV	General	Voltage drop across the MosFET
11.	Mode	CCM	General	Conduction Mode

#	Name	Value	Category	Description
12.	Pout	6.0 W	General	Total output power
13.	Total BOM	\$10.21	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	14.465 %	Op_point	Duty cycle
17.	Efficiency	89.052 %	Op_point	Steady state efficiency
18.	IC Tj	44.211 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	22.0 V	Op_point	Vin operating point
22.	Vout p-p	4.35 mV	Op_point	Peak-to-peak output ripple voltage
23.	Cin Pd	993.778 μ W	Power	Input capacitor power dissipation
24.	Cout Pd	325.832 μ W	Power	Output capacitor power dissipation
25.	IC Pd	736.324 mW	Power	IC power dissipation
26.	Total Pd	737.646 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	2.0	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	LMZ14203	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

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

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