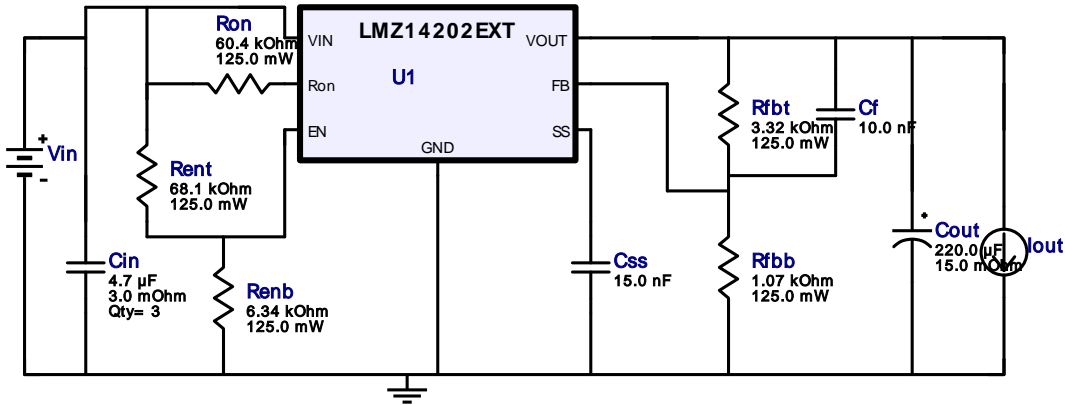


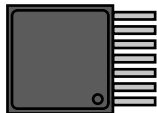
**WEBENCH® Design Report**

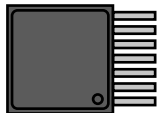
 Design : 4414378/4 LMZ14202EXTTZ/NOPB  
 LMZ14202EXTTZ/NOPB 14.0V-22.0V to 3.30V @ 2.0A

 VinMin = 14.0V  
 VinMax = 22.0V

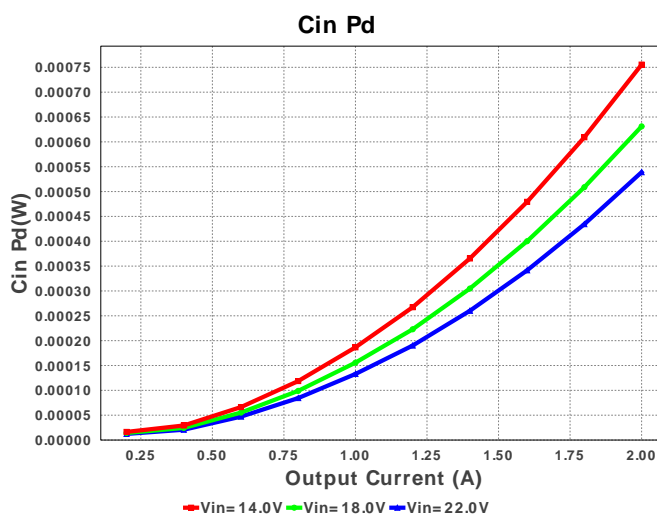
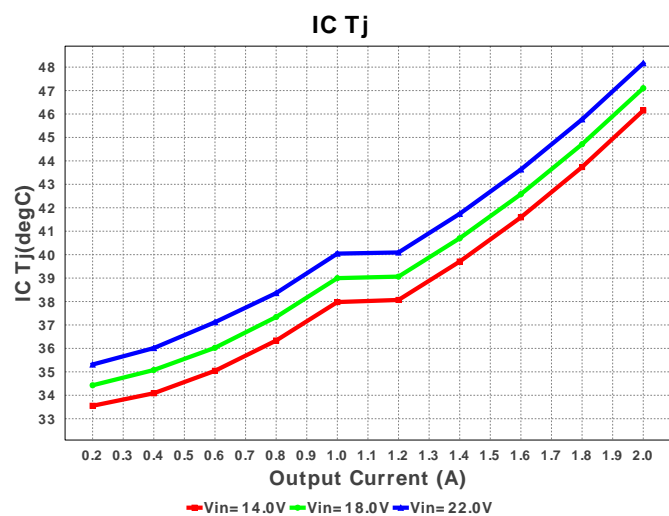
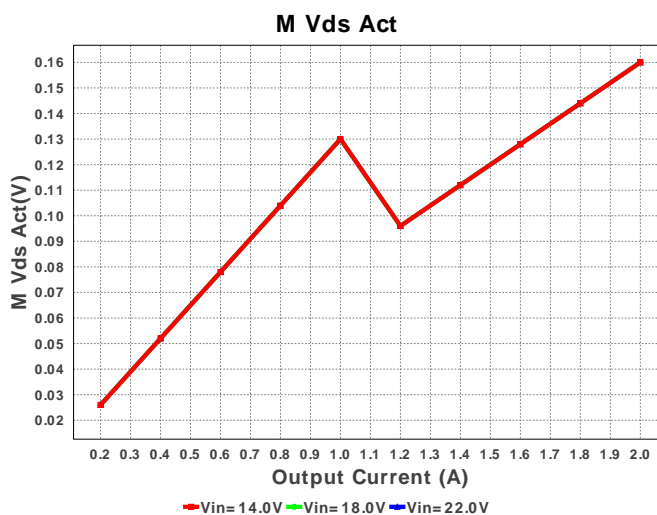
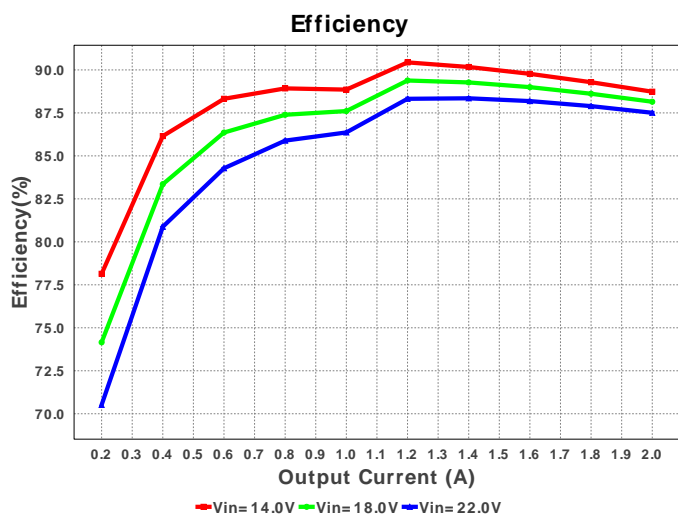
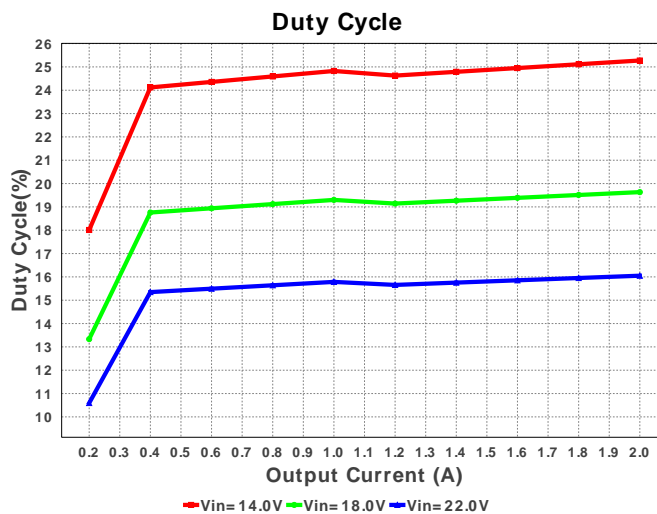
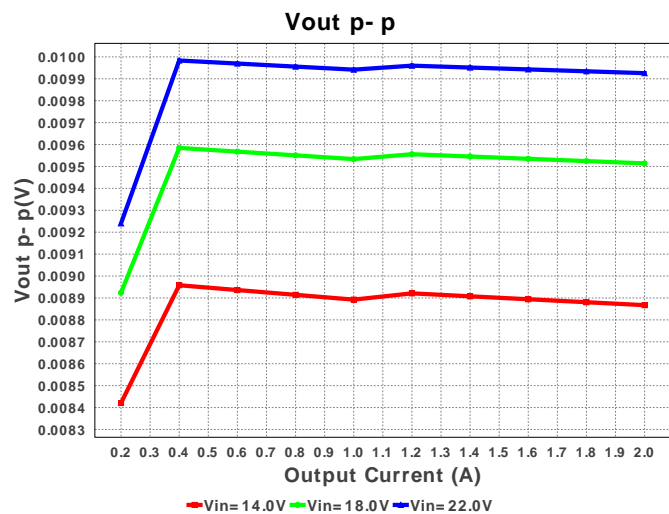
 Vout = 3.3V  
 Iout = 2.0A

**Electrical BOM**

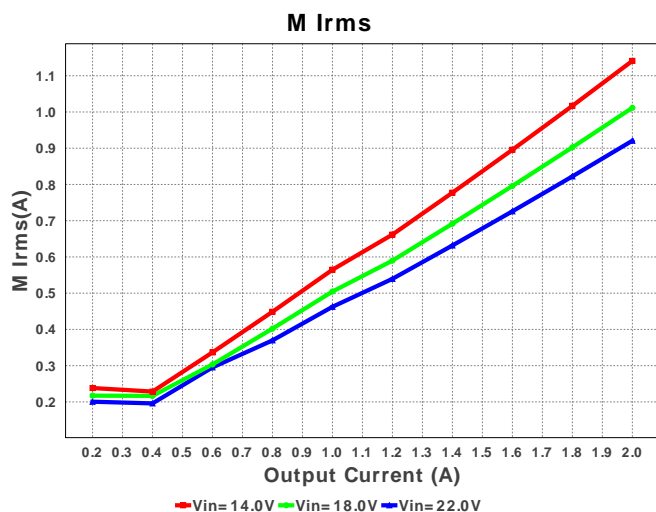
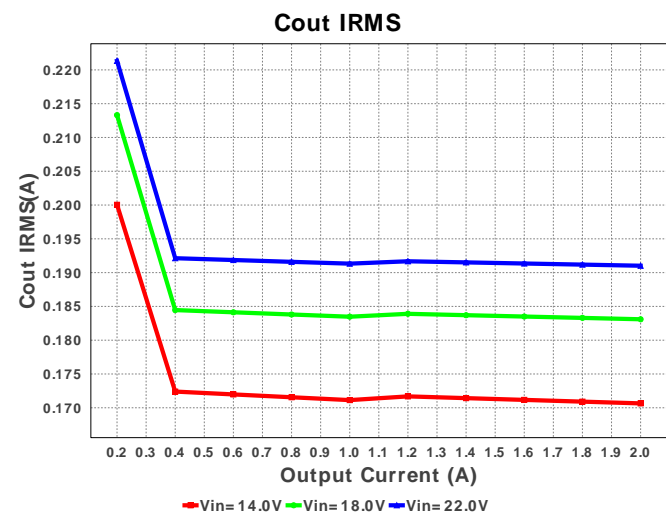
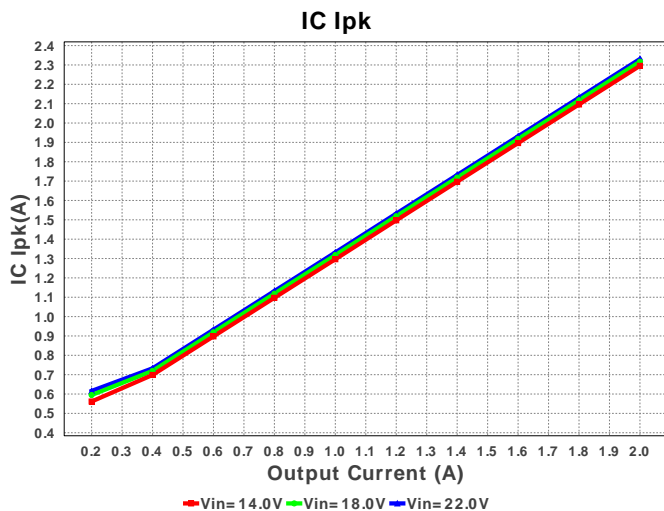
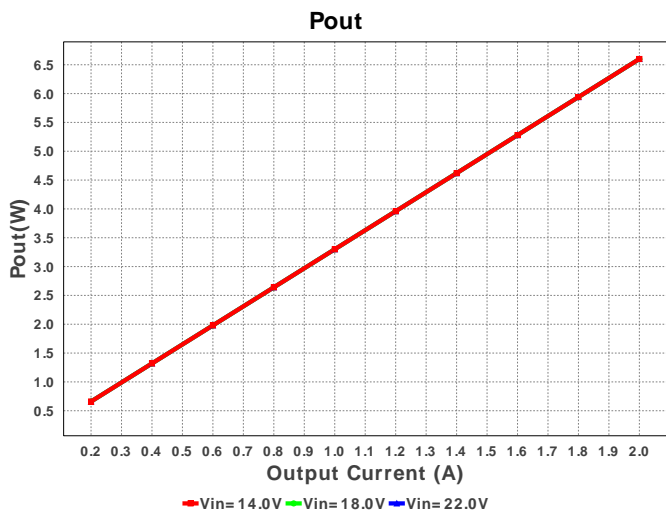
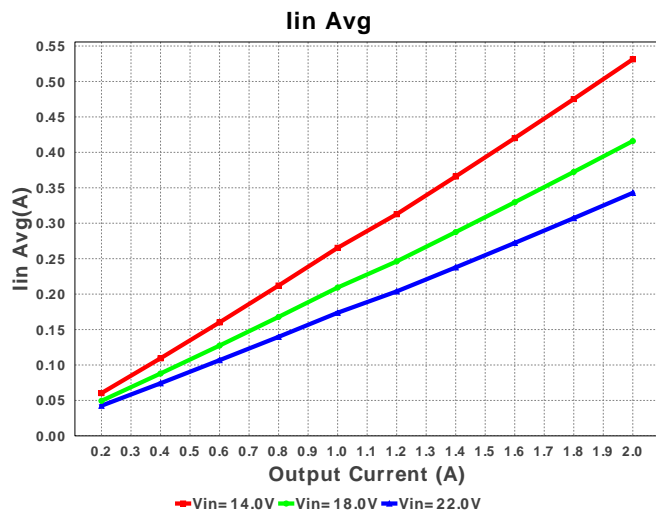
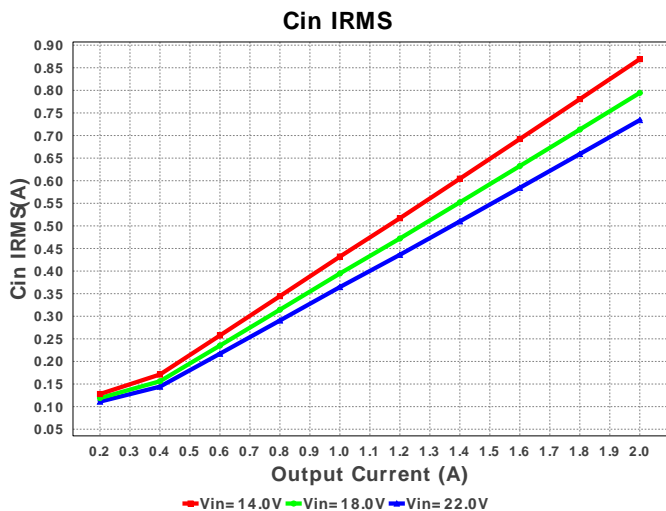
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cf	MuRata	GRM216R71H103KA01D Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm <sup>2</sup>
2.	Cin	MuRata	GRM31CR71H475KA12L Series= X7R	Cap= 4.7 uF ESR= 3.0 mOhm VDC= 50.0 V IRMS= 4.98 A	3	\$0.07	 1206 11 mm <sup>2</sup>
3.	Cout	Panasonic	6SVPE220MW Series= 259	Cap= 220.0 uF ESR= 15.0 mOhm VDC= 6.3 V IRMS= 3.15 A	1	\$0.14	 CAPSMT_62_E61 53 mm <sup>2</sup>
4.	Css	Yageo America	CC0805KRX7R9BB153 Series= X7R	Cap= 15.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm <sup>2</sup>
5.	Renb	Panasonic	ERJ-6ENF6341V Series= 225	Res= 6.34 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm <sup>2</sup>
6.	Rent	Panasonic	ERJ-6ENF6812V Series= 225	Res= 68.1 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm <sup>2</sup>
7.	Rfbb	Panasonic	ERJ-6ENF1071V Series= 225	Res= 1.07 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm <sup>2</sup>
8.	Rfbt	Panasonic	ERJ-6ENF3321V Series= 225	Res= 3.32 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm <sup>2</sup>
9.	Ron	Panasonic	ERJ-6ENF6042V Series= 225	Res= 60.4 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm <sup>2</sup>

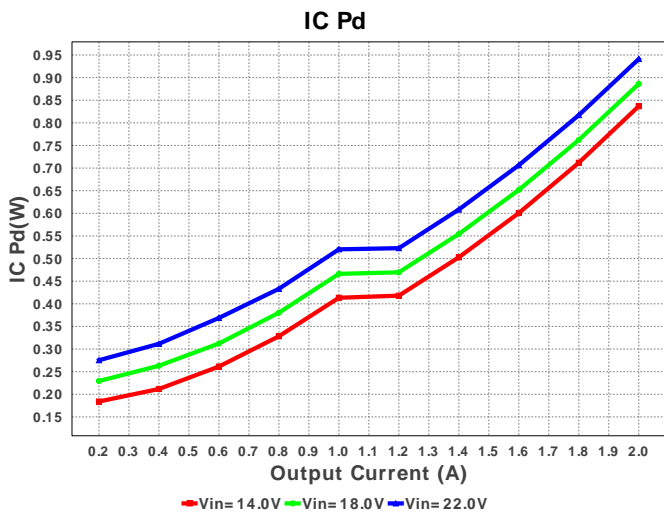
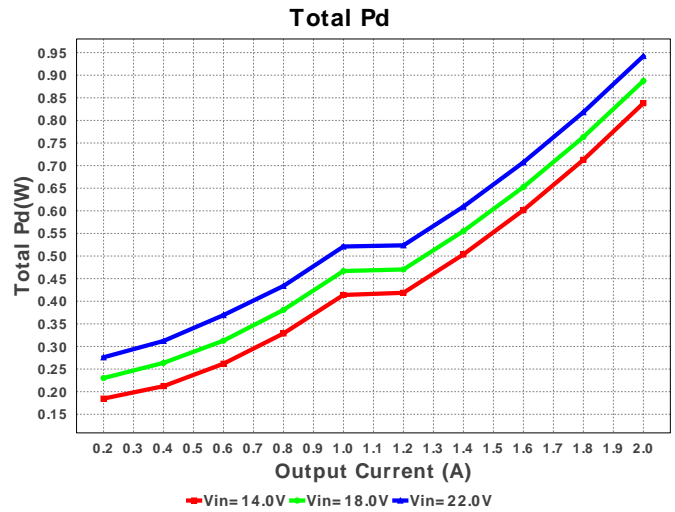
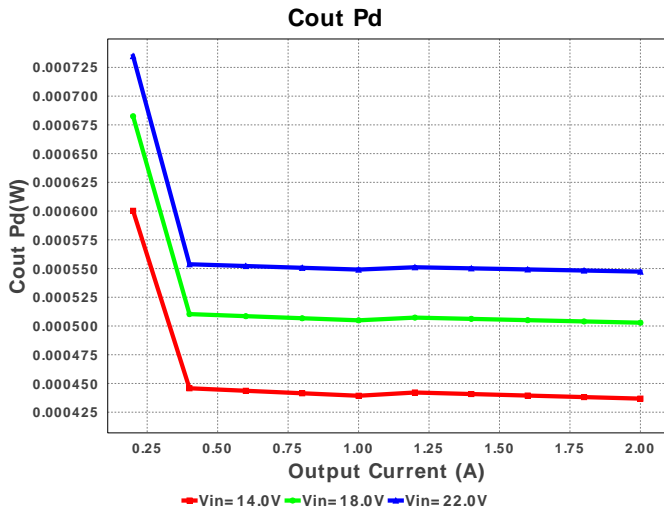
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	U1	Texas Instruments	LMZ14202EXTTZ/NOPB	Switcher	1	\$15.30	 TZA07A 199 mm <sup>2</sup>



TZA07A 199 mm<sup>2</sup>







### Operating Values

#	Name	Value	Category	Description
1.	BOM Count	12		Total Design BOM count
2.	Total BOM	\$15.72		Total BOM Cost
3.	Cin IRMS	734.156 mA	Current	Input capacitor RMS ripple current
4.	Cout IRMS	191.019 mA	Current	Output capacitor RMS ripple current
5.	IC Ipk	2.331 A	Current	Peak switch current in IC
6.	Iin Avg	342.83 mA	Current	Average input current
7.	M1 Irms	920.739 mA	Current	Q Iavg
8.	FootPrint	332.0 mm <sup>2</sup>	General	Total Foot Print Area of BOM components
9.	Frequency	449.721 kHz	General	Switching frequency
10.	IC Tolerance	20.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	160.0 mV	General	Voltage drop across the MosFET
12.	Pout	6.6 W	General	Total output power
13.	Vout OP	3.3 V	Op_point	Operational Output Voltage
14.	Duty Cycle	16.051 %	Op_point	Duty cycle
15.	Efficiency	87.507 %	Op_point	Steady state efficiency
16.	IC Tj	48.165 degC	Op_point	IC junction temperature
17.	ICThetaJA	19.3 degC/W	Op_point	IC junction-to-ambient thermal resistance
18.	IOUT_OP	2.0 A	Op_point	Iout operating point
19.	VIN_OP	22.0 V	Op_point	Vin operating point
20.	Vout p-p	9.926 mV	Op_point	Peak-to-peak output ripple voltage
21.	Cin Pd	538.985 μW	Power	Input capacitor power dissipation
22.	Cout Pd	547.324 μW	Power	Output capacitor power dissipation
23.	IC Pd	941.168 mW	Power	IC power dissipation
24.	Total Pd	942.255 mW	Power	Total Power Dissipation

### Design Inputs

#	Name	Value	Description
1.	Iout	2.0	Maximum Output Current
2.	Iout1	2.0	Output Current #1
3.	SoftStart	1.6 ms	Soft Start Time (ms)

#	Name	Value	Description
4.	VinMax	22.0	Maximum input voltage
5.	VinMin	14.0	Minimum input voltage
6.	Vout	3.3	Output Voltage
7.	Vout1	3.3	Output Voltage #1
8.	base_pn	LMZ14202EXT	Base Product Number
9.	source	DC	Input Source Type
10.	Ta	30.0	Ambient temperature
11.	UserFsw	350.0 k	Customer Selected Frequency

## Design Assistance

1. **LMZ14202EXT** Product Folder : <http://www.ti.com/product/LMZ14202EXT> : contains the data sheet and other resources.

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**You should completely validate and test your design implementation to confirm the system functionality for your application prior to production.**

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