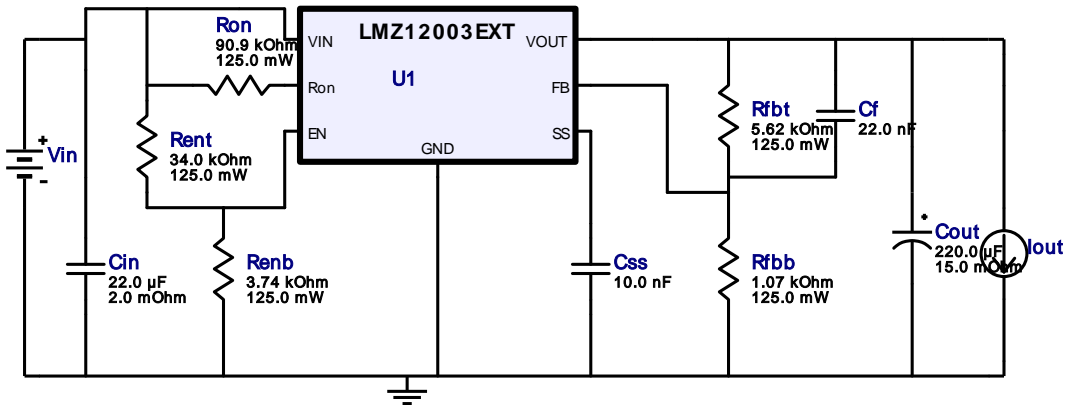
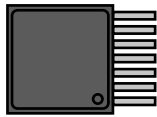


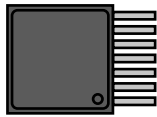
**WEBENCH<sup>®</sup> Design Report**

 Design : 4213411/2 LMZ12003EXTTZ/NOPB  
 LMZ12003EXTTZ/NOPB 12.0V-15.0V to 5.00V @ 1.0A

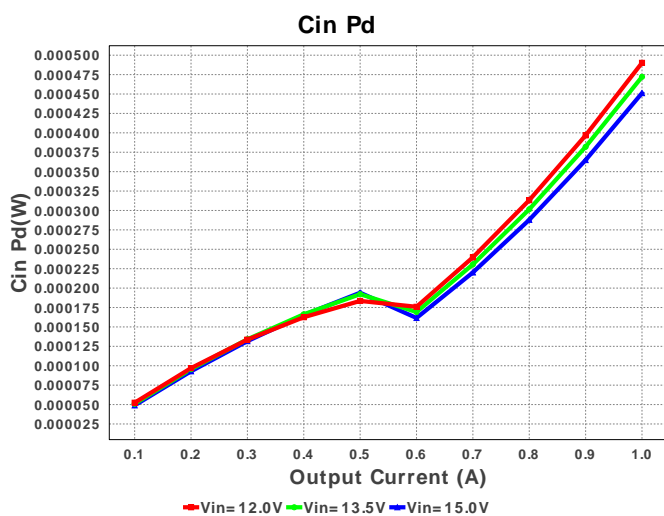
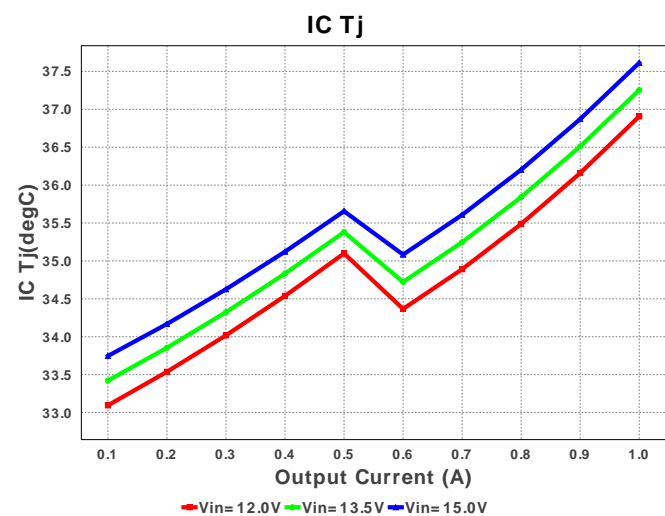
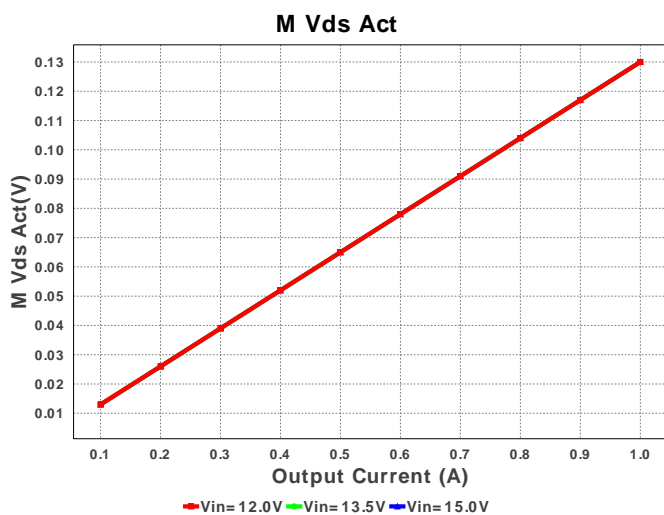
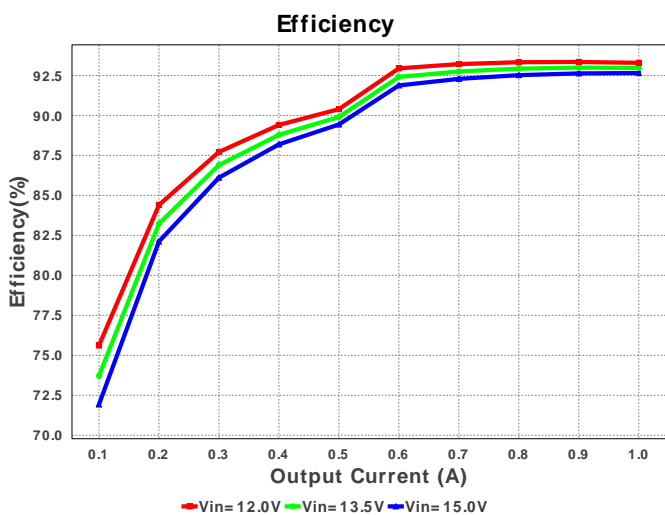
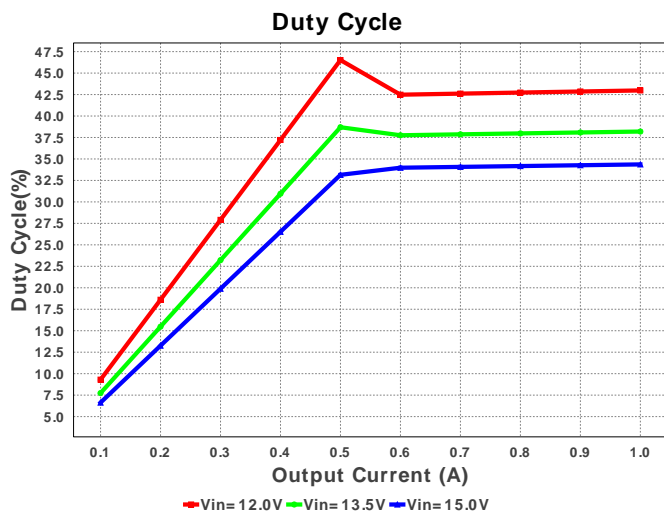
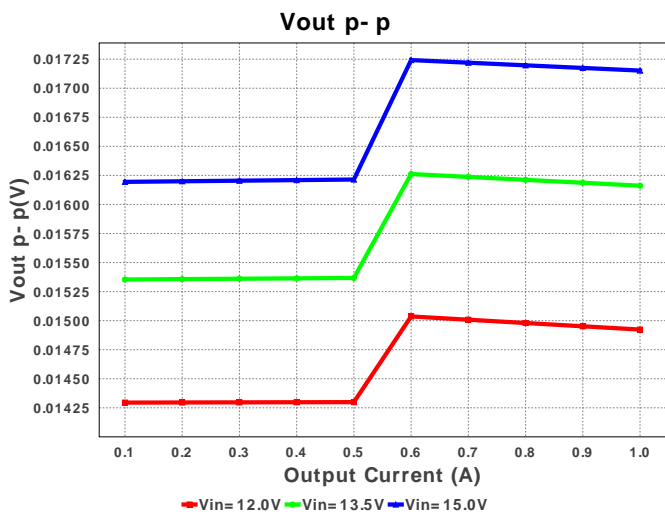
**VinMin = 12.0V**  
**VinMax = 15.0V**
**Vout = 5.0V**  
**Iout = 1.0A**

**Electrical BOM**

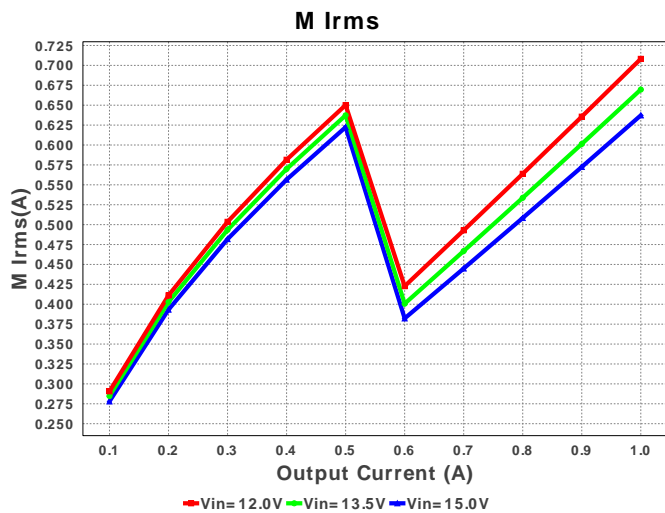
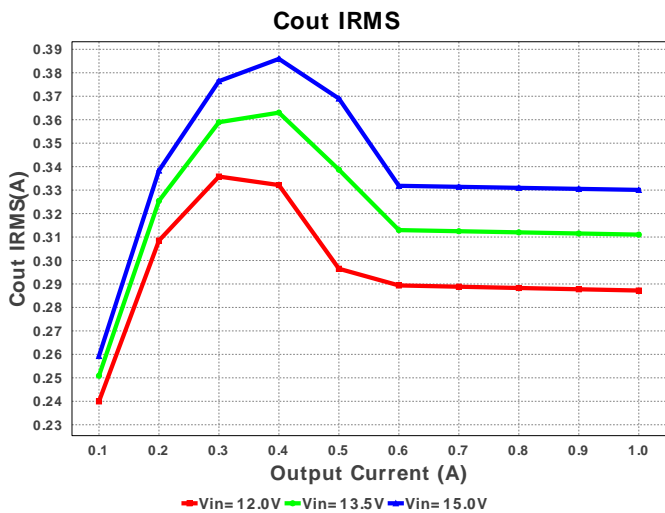
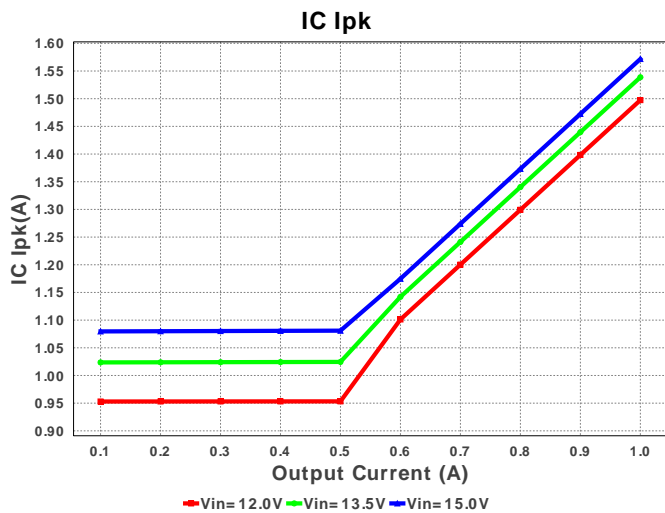
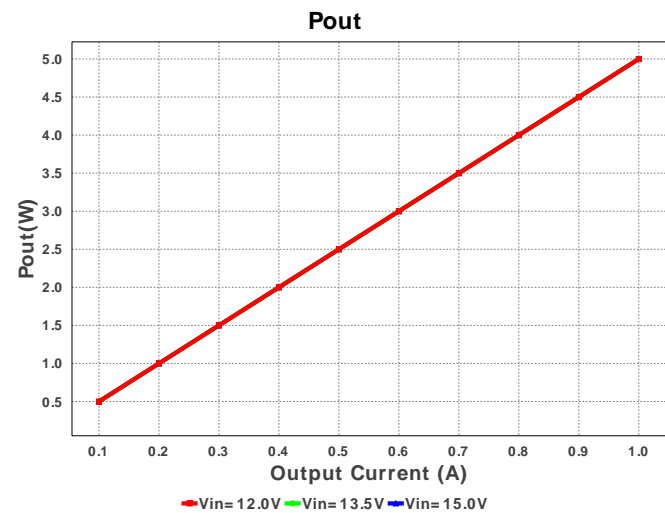
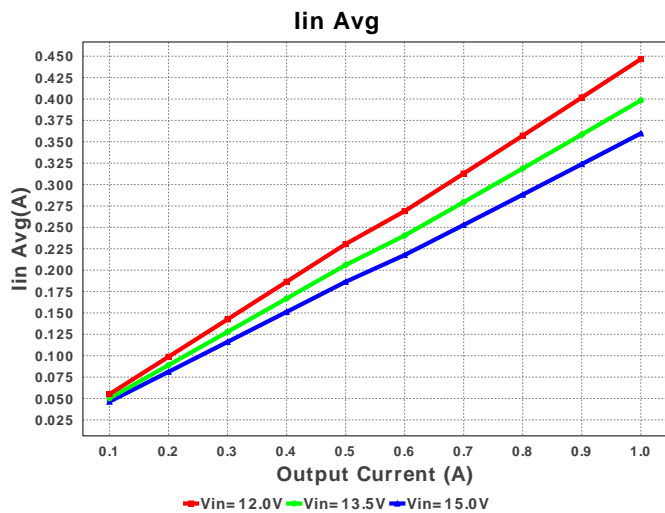
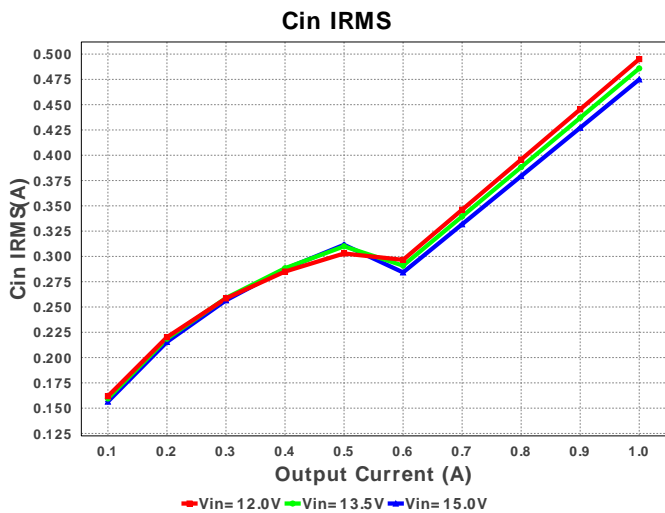
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cf	Yageo America	CC0805KRX7R9BB223 Series= X7R	Cap= 22.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm <sup>2</sup>
2.	Cin	MuRata	GRM32ER61E226KE15L Series= X5R	Cap= 22.0 uF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 3.67 A	1	\$0.16	 1210 15 mm <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	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>
5.	Renb	Panasonic	ERJ-6ENF3741V Series= 225	Res= 3.74 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm <sup>2</sup>
6.	Rent	Panasonic	ERJ-6ENF3402V Series= 225	Res= 34.0 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-6ENF5621V Series= 225	Res= 5.62 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm <sup>2</sup>
9.	Ron	Panasonic	ERJ-6ENF9092V Series= 225	Res= 90.9 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm <sup>2</sup>

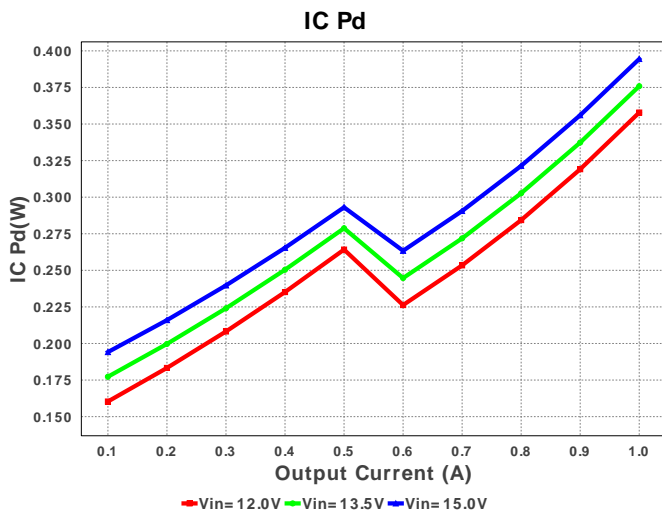
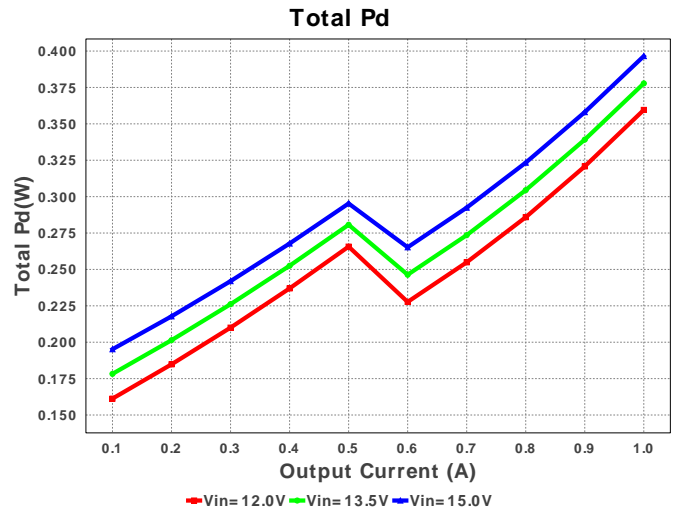
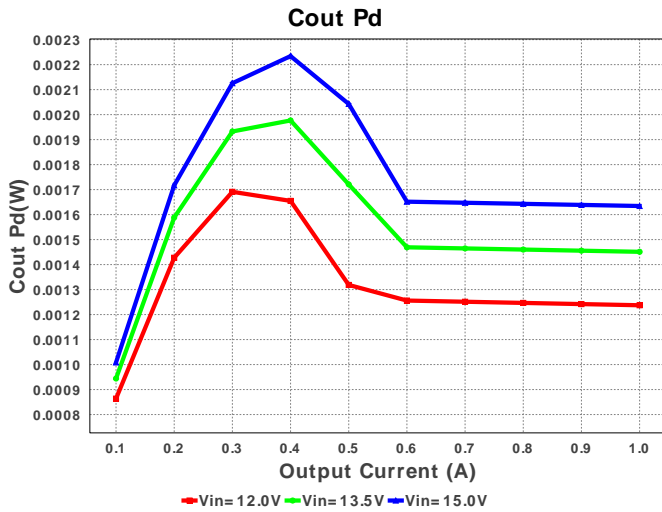
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	U1	Texas Instruments	LMZ12003EXTTZ/NOPB	Switcher	1	\$14.00	 TZA07A 199 mm <sup>2</sup>



TZA07A 199 mm<sup>2</sup>







## Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	474.932 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	330.091 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	1.572 A	Current	Peak switch current in IC
4.	Iin Avg	358.03 mA	Current	Average input current
5.	M Irms	634.298 mA	Current	MOSFET RMS current
6.	BOM Count	10	General	Total Design BOM count
7.	FootPrint	314.0 mm <sup>2</sup>	General	Total Foot Print Area of BOM components
8.	Frequency	436.237 kHz	General	Switching frequency
9.	IC Tolerance	20.0 mV	General	IC Feedback Tolerance
10.	M Vds Act	130.0 mV	General	Voltage drop across the MosFET
11.	Pout	5.0 W	General	Total output power
12.	Total BOM	\$14.37	General	Total BOM Cost
13.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
14.	Duty Cycle	34.367 %	Op_point	Duty cycle
15.	Efficiency	93.101 %	Op_point	Steady state efficiency
16.	IC Tj	37.111 degC	Op_point	IC junction temperature
17.	ICThetaJA	19.3 degC/W	Op_point	IC junction-to-ambient thermal resistance
18.	IOUT_OP	1.0 A	Op_point	Iout operating point
19.	VIN_OP	15.0 V	Op_point	Vin operating point
20.	Vout p-p	17.152 mV	Op_point	Peak-to-peak output ripple voltage
21.	Cin Pd	451.12 μW	Power	Input capacitor power dissipation
22.	Cout Pd	1.634 mW	Power	Output capacitor power dissipation
23.	IC Pd	368.422 mW	Power	IC power dissipation
24.	Total Pd	370.507 mW	Power	Total Power Dissipation

## Design Inputs

#	Name	Value	Description
1.	Iout	1.0	Maximum Output Current
2.	Iout1	1.0	Output Current #1
3.	VinMax	15.0	Maximum input voltage

#	Name	Value	Description
4.	VinMin	12.0	Minimum input voltage
5.	Vout	5.0	Output Voltage
6.	Vout1	5.0	Output Voltage #1
7.	base_pn	LMZ12003EXT	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0	Ambient temperature

## Design Assistance

1. LMZ12003EXT Product Folder : <http://www.ti.com/product/LMZ12003EXT> : contains the data sheet and other resources.

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