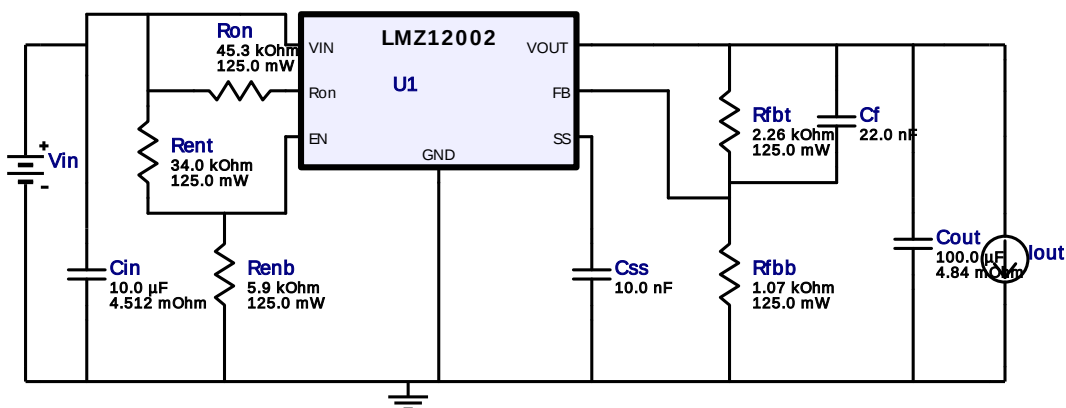


WEBENCH® Design Report

Design : 4648186/3 LMZ12002TZ-ADJ/NOPB
LMZ12002TZ-ADJ/NOPB 8.0V-16.0V to 2.50V @ 1.5A

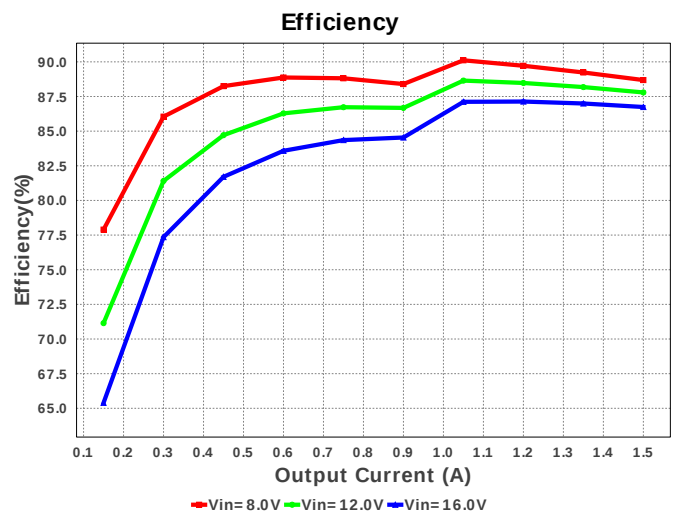
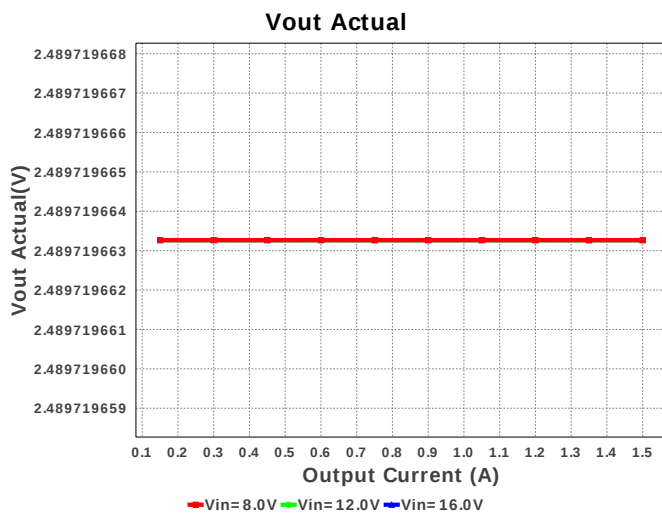
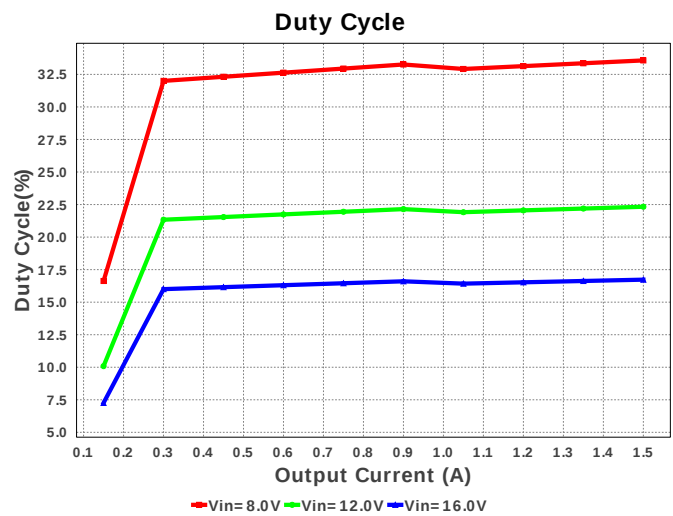
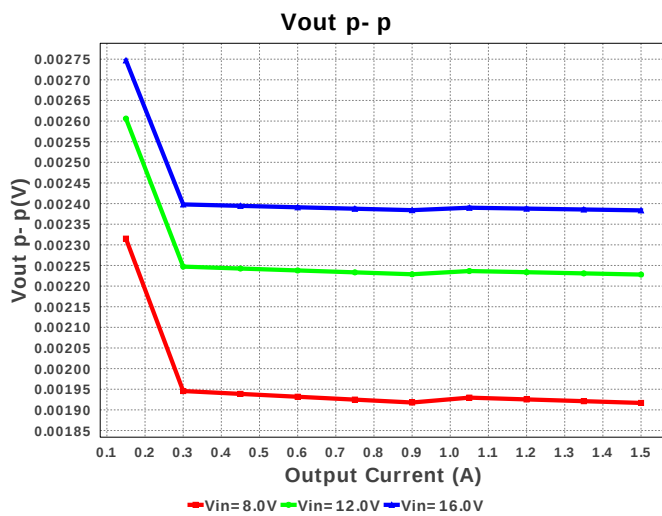
Vout = 2.5V
Iout = 1.5A

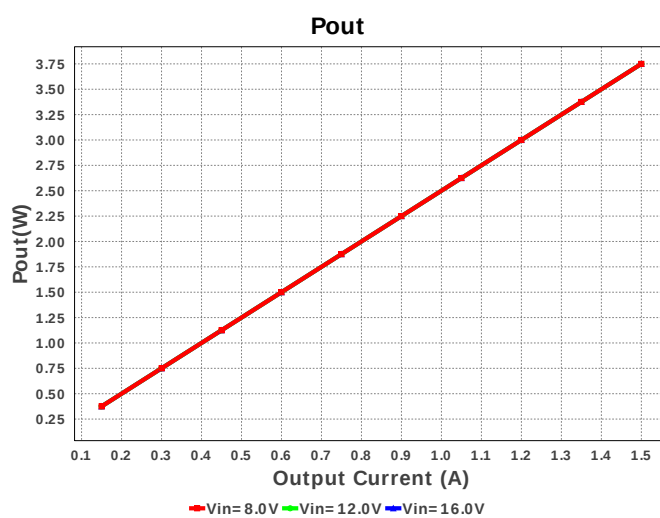
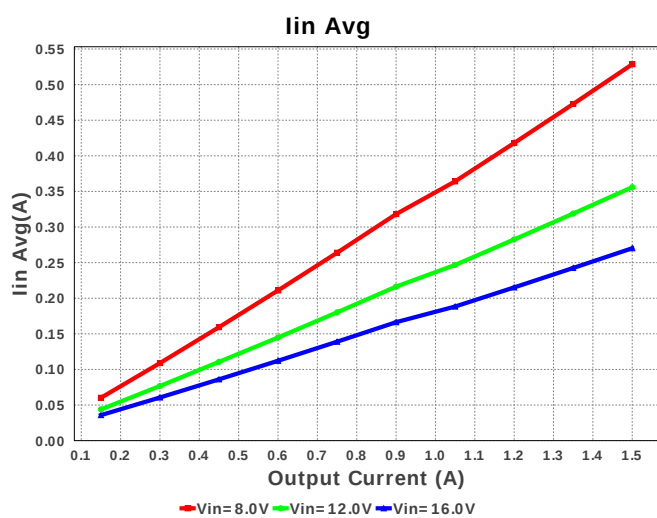
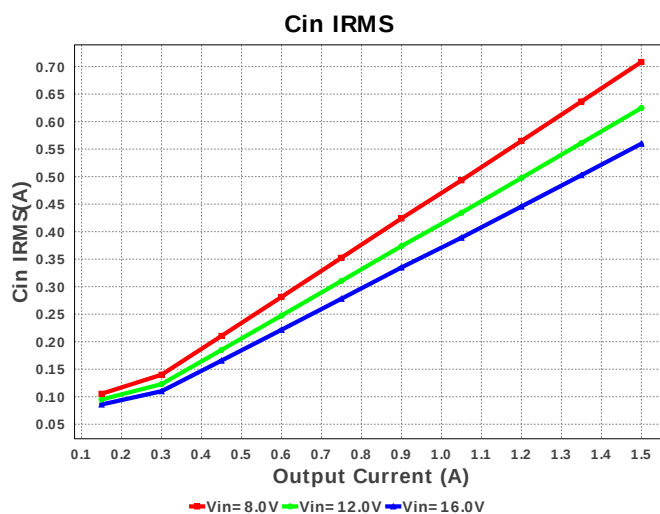
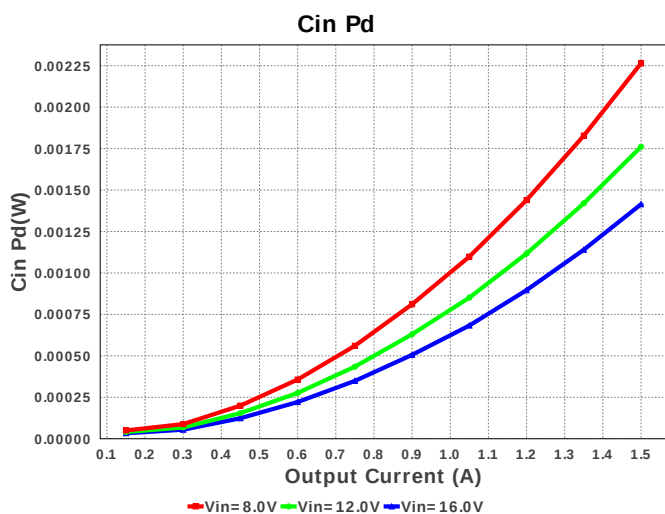
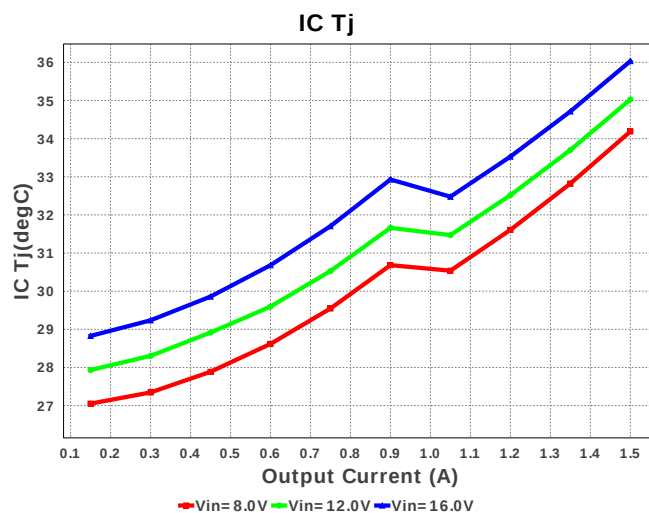
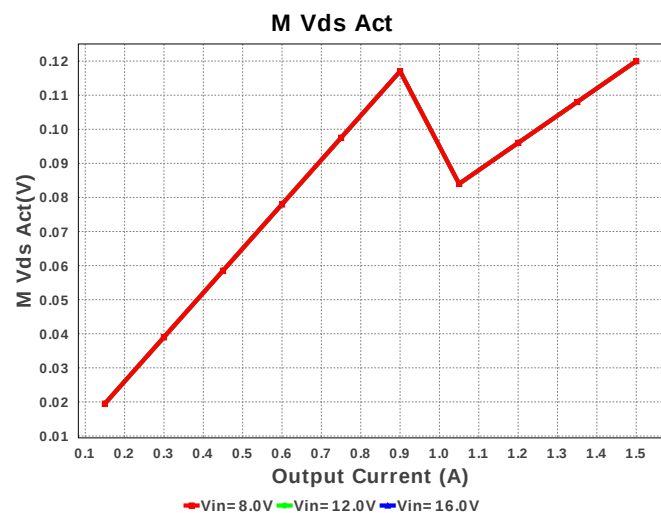


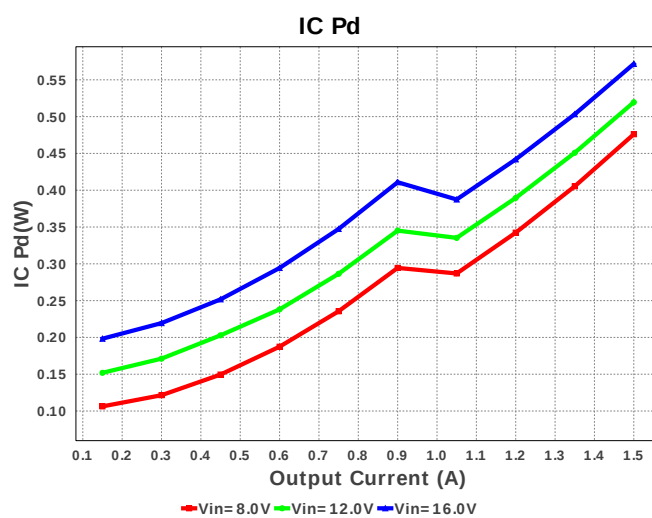
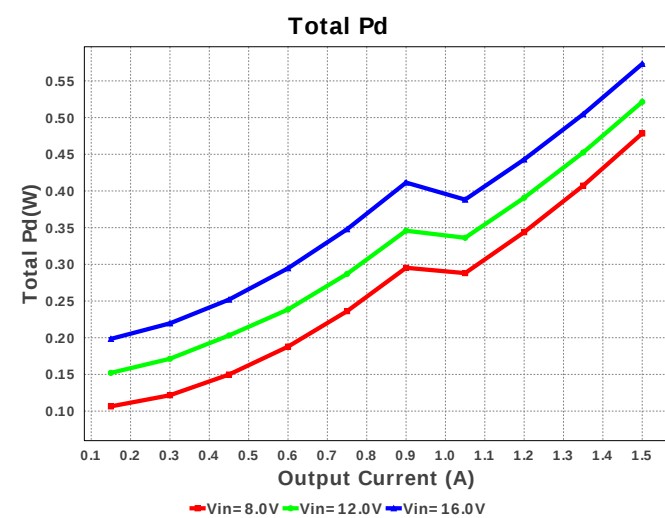
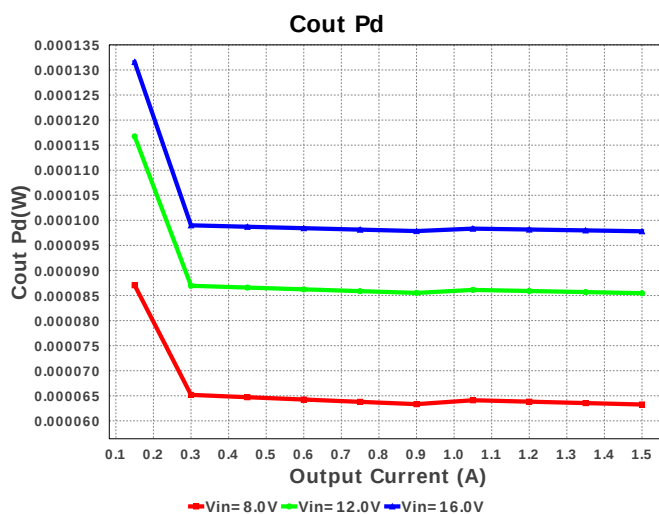
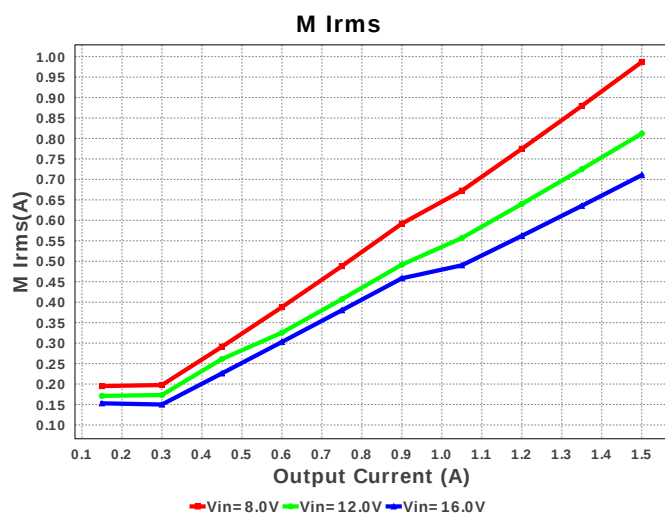
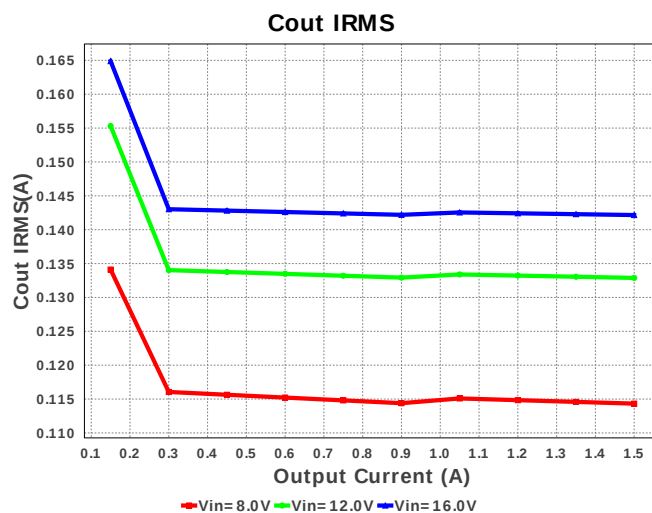
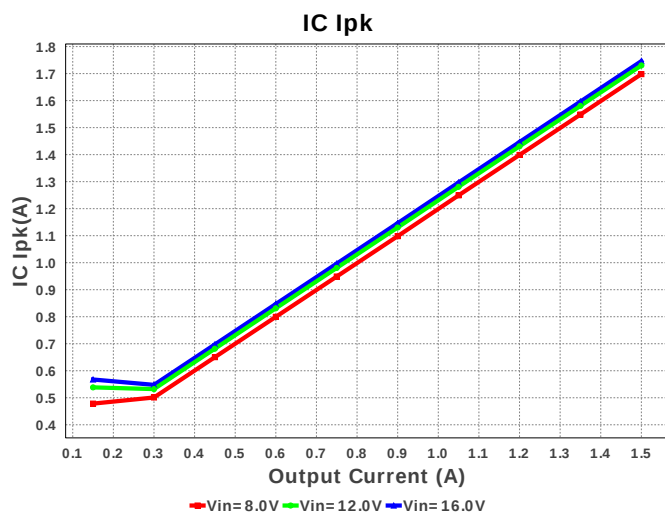
Electrical BOM

#	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	GRM31CR61E106KA12L Series= X5R	Cap= 10.0 uF ESR= 4.512 mOhm VDC= 25.0 V IRMS= 2.447 A	1	\$0.05	1206_190 11 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-6ENF5901V Series= ERJ-6E	Res= 5.9 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	0805 7 mm ²
6.	Rent	Panasonic	ERJ-6ENF3402V Series= ERJ-6E	Res= 34.0 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.	Rfbs	Panasonic	ERJ-6ENF2261V Series= ERJ-6E	Res= 2.26 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	0805 7 mm ²
9.	Ron	Panasonic	ERJ-6ENF4532V Series= ERJ-6E	Res= 45.3 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	LMZ12002TZ-ADJ/NOPB	Switcher	1	\$5.58	 TZA07A 199 mm ²







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	559.855 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	142.163 mA	Current	Output capacitor RMS ripple current
3.	IC Ip _{pk}	1.746 A	Current	Peak switch current in IC
4.	I _{in} Avg	267.53 mA	Current	Average input current
5.	M1 Irms	703.951 mA	Current	Q ₁ I _{avg}
6.	BOM Count	10	General	Total Design BOM count
7.	FootPrint	268.0 mm ²	General	Total Foot Print Area of BOM components
8.	Frequency	424.52 kHz	General	Switching frequency
9.	IC Tolerance	20.0 mV	General	IC Feedback Tolerance
10.	M V _{ds} Act	120.0 mV	General	Voltage drop across the MosFET
11.	P _{out}	3.75 W	General	Total output power

#	Name	Value	Category	Description
12.	Total BOM	\$5.84	General	Total BOM Cost
13.	Vout Actual	2.49 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
14.	Vout OP	2.5 V	Op_Point	Operational Output Voltage
15.	Duty Cycle	16.729 %	Op_point	Duty cycle
16.	Efficiency	87.608 %	Op_point	Steady state efficiency
17.	IC Tj	35.208 degC	Op_point	IC junction temperature
18.	ICThetaJA	19.3 degC/W	Op_point	IC junction-to-ambient thermal resistance
19.	IOUT_OP	1.5 A	Op_point	Iout operating point
20.	VIN_OP	16.0 V	Op_point	Vin operating point
21.	Vout p-p	2.384 mV	Op_point	Peak-to-peak output ripple voltage
22.	Cin Pd	1.414 mW	Power	Input capacitor power dissipation
23.	Cout Pd	97.818 μ W	Power	Output capacitor power dissipation
24.	IC Pd	528.904 mW	Power	IC power dissipation
25.	Total Pd	530.437 mW	Power	Total Power Dissipation
26.	Vout Tolerance	3.905 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	1.5	Maximum Output Current
2.	VinMax	16.0	Maximum input voltage
3.	VinMin	8.0	Minimum input voltage
4.	Vout	2.5	Output Voltage
5.	base_pn	LMZ12002	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	25.0	Ambient temperature

Design Assistance

1. **LMZ12002** Product Folder : <http://www.ti.com/product/LMZ12002> : contains the data sheet and other resources.

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