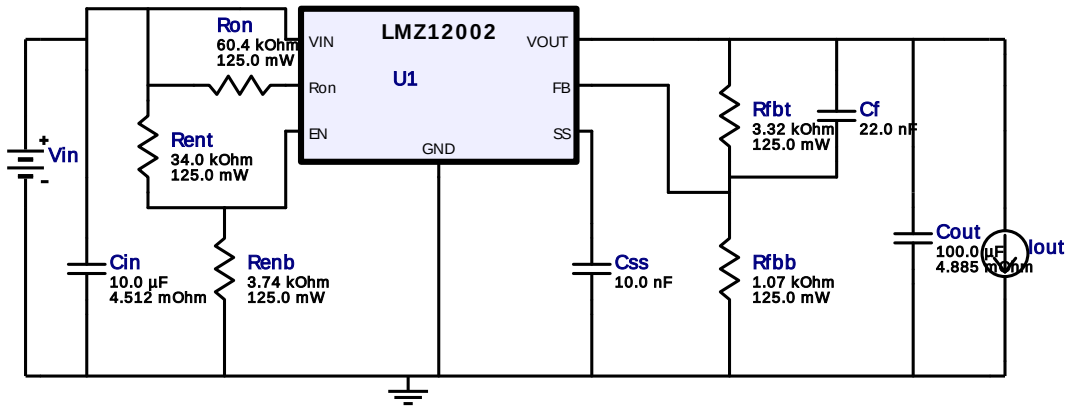
VinMin = 12.0V
VinMax = 15.0V
Vout = 3.3V
Iout = 2.0A

Device = LMZ12002TZ-ADJ/NOPB
Topology = Buck
Created = 8/1/16 12:28:51 AM
BOM Cost = $5.84
BOM Count = 10
Total Pd = 0.89W

WEBENCH® Design Report

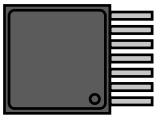
Design : 1762256/1 LMZ12002TZ-ADJ/NOPB
LMZ12002TZ-ADJ/NOPB 12.0V-15.0V to 3.30V @ 2.0A

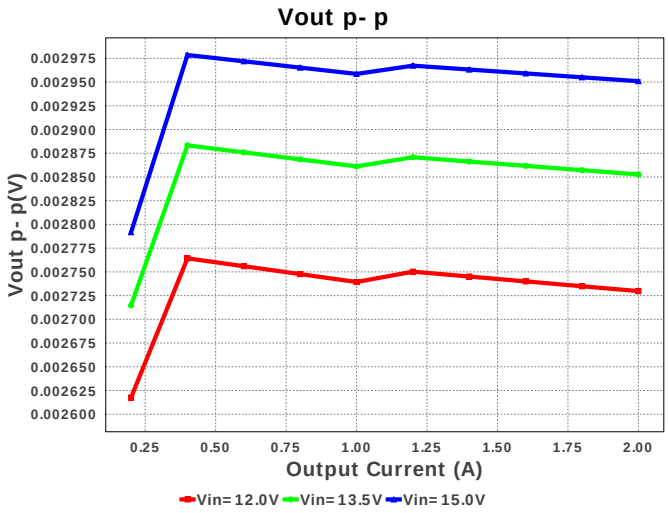
Vout = 3.3V
Iout = 2.0A

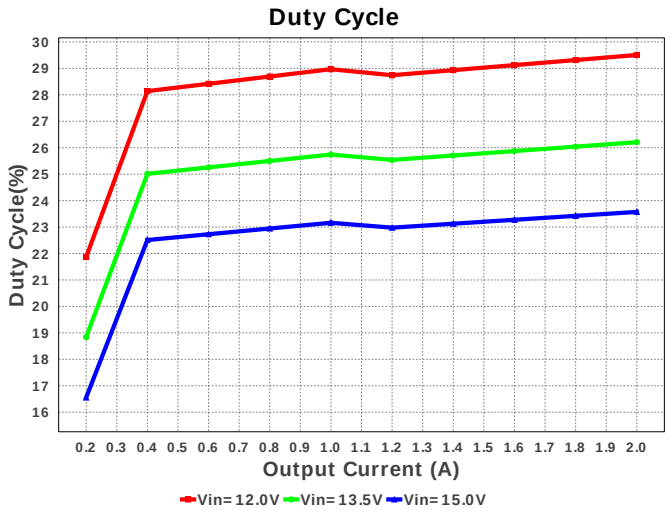


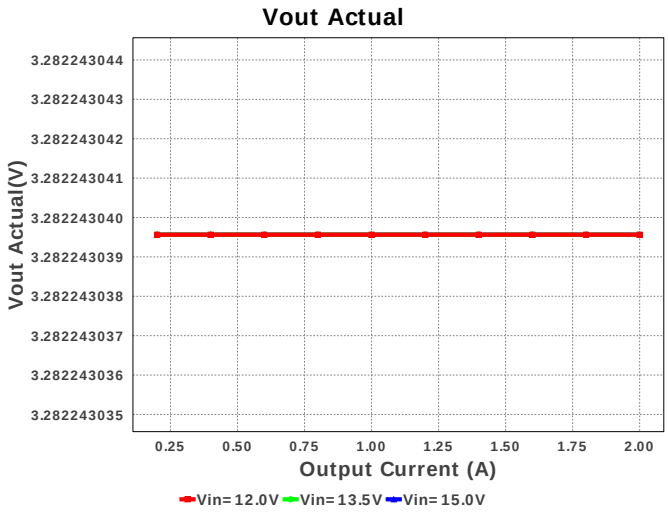
Electrical BOM

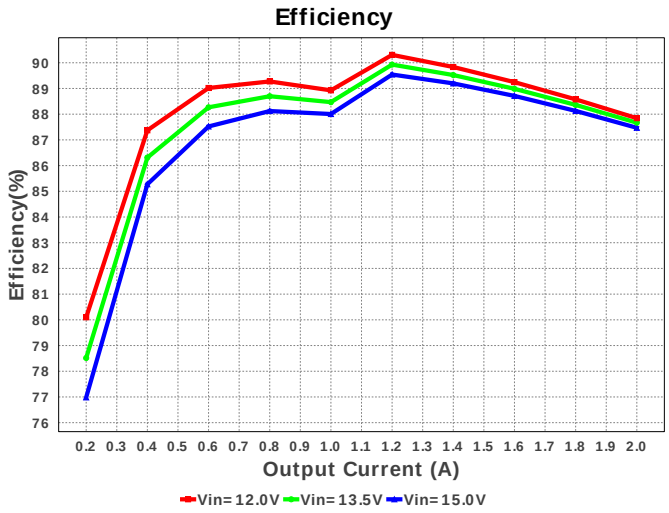
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cf	Yageo America	CC0805KRX7R9BB223 Series= X7R	Cap= 22.0 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
2.	Cin	MuRata	GRM31CR61E106KA12L Series= X5R	Cap= 10.0 uF ESR= 4.512 mOhm VDC= 25.0 V IRMS= 2.447 A	1	$0.05	1206_190 11 mm²
3.	Cout	MuRata	GRM31CR60J107ME39L Series= X5R	Cap= 100.0 uF ESR= 4.885 mOhm VDC= 6.3 V IRMS= 4.4118 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-6ENF3741V Series= ERJ-6E	Res= 3.74 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	0805 7 mm²
6.	Rent	Panasonic	ERJ-6ENF3402V Series= ERJ-6E	Res= 34.0 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-6ENF3321V Series= ERJ-6E	Res= 3.32 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	0805 7 mm²
9.	Ron	Panasonic	ERJ-6ENF6042V Series= ERJ-6E	Res= 60.4 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	0805 7 mm²

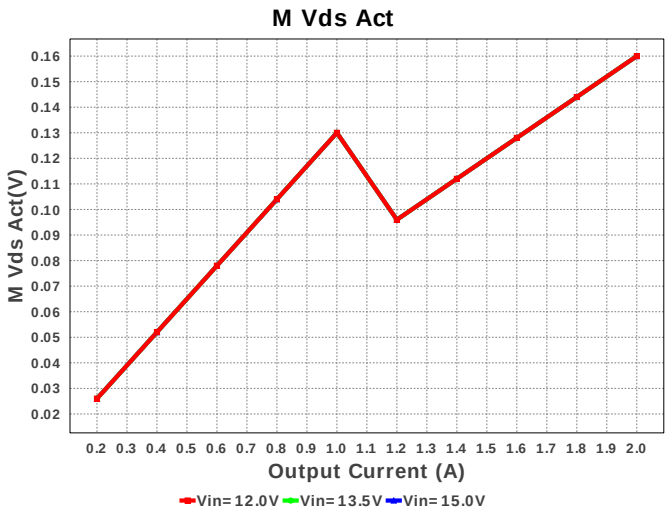
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	U1	Texas Instruments	LMZ12002TZ-ADJ/NOPB	Switcher	1	$5.58	 TZA07A 199 mm^2

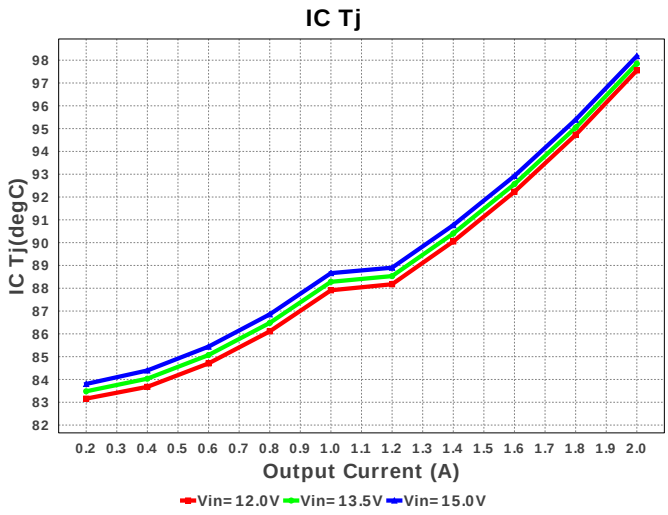


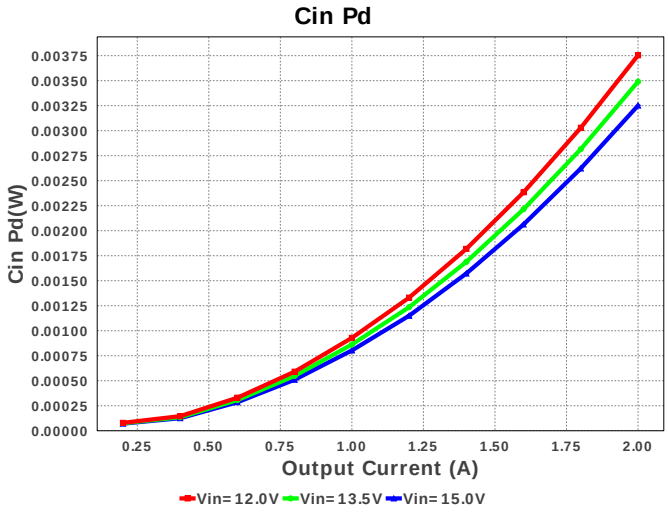


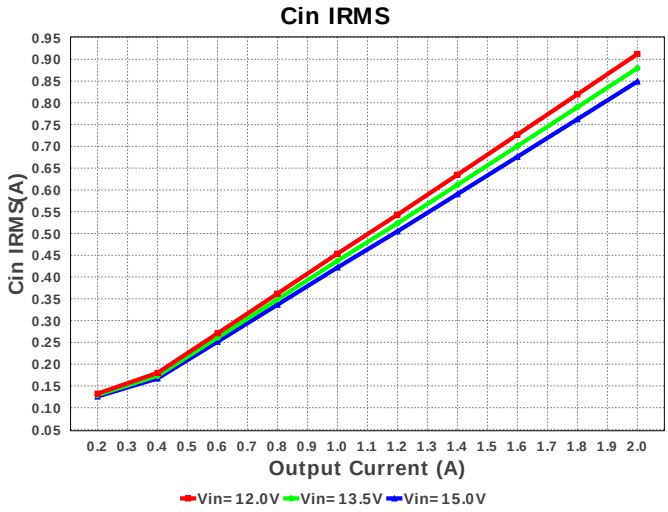


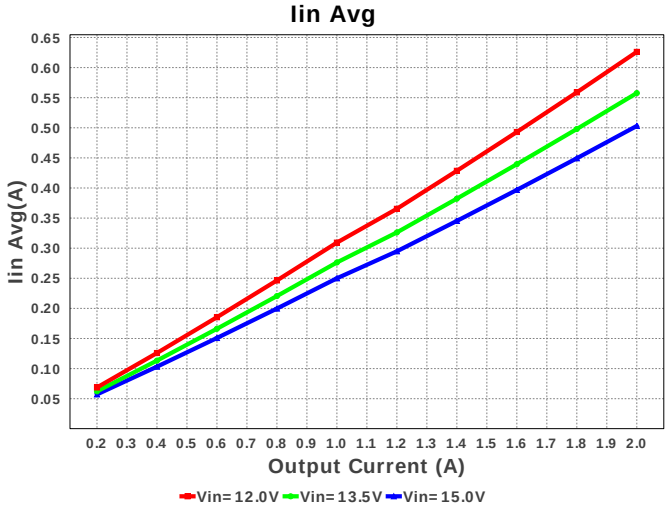


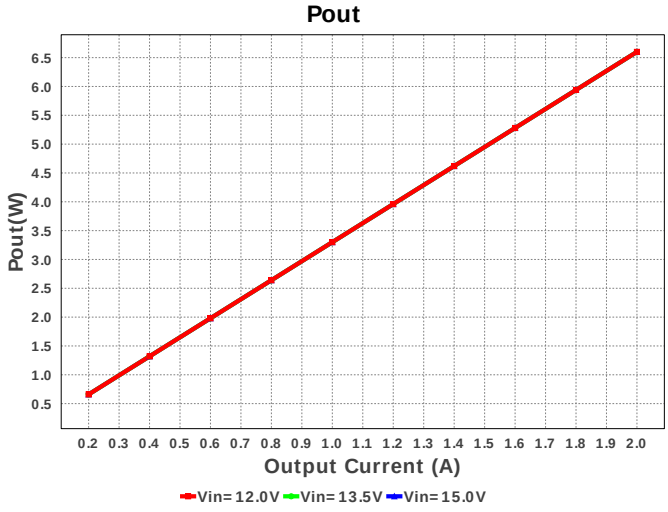


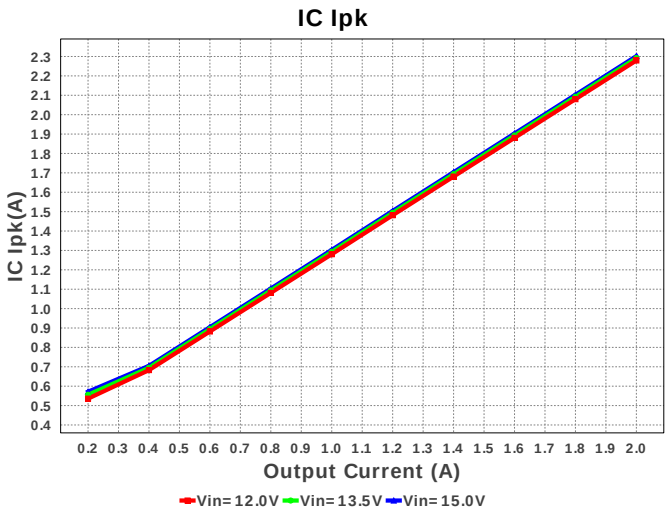


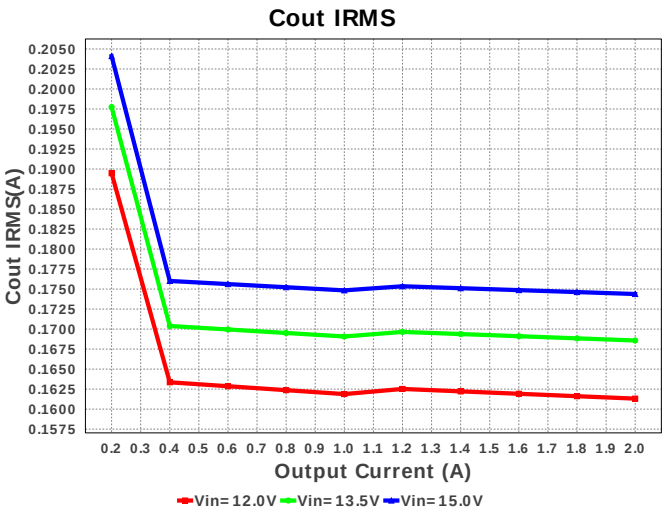


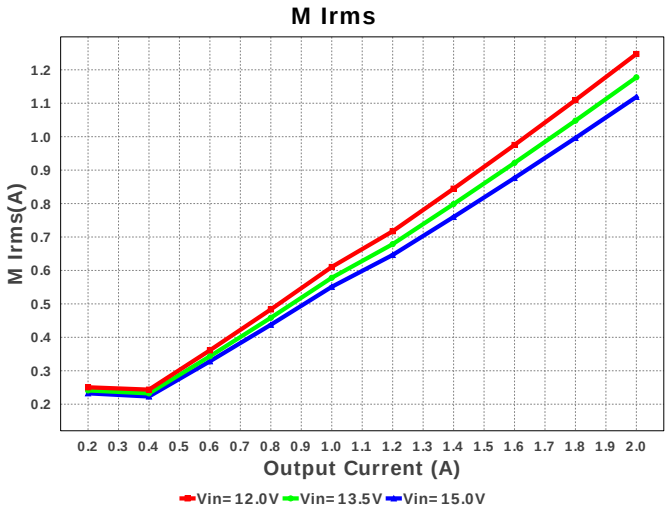


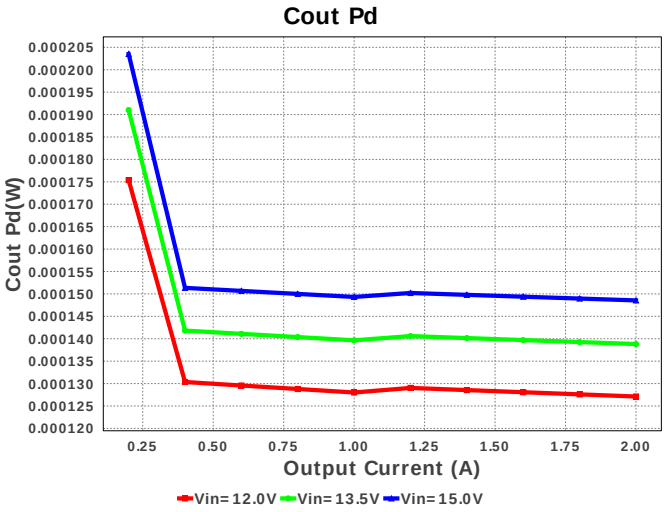


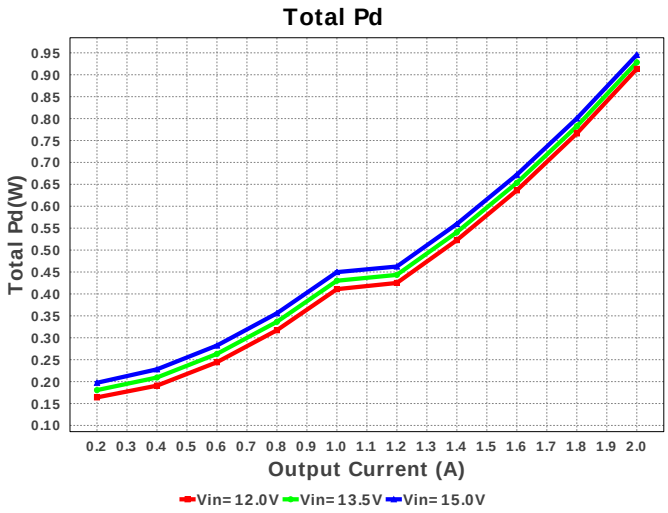


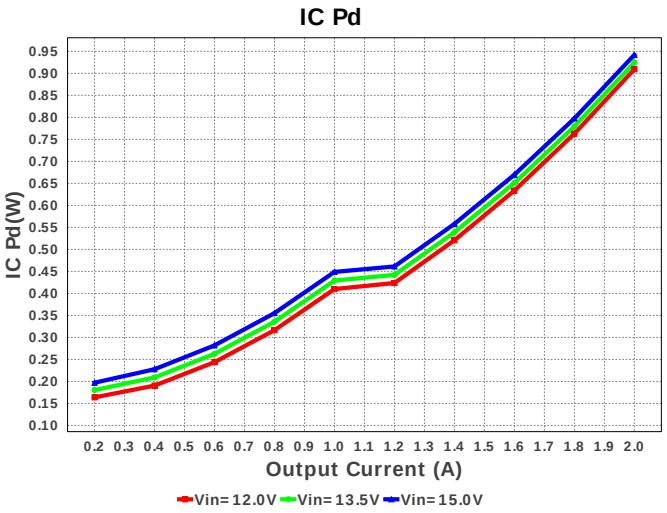












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	848.907 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	174.383 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.302 A	Current	Peak switch current in IC
4.	Iin Avg	499.33 mA	Current	Average input current
5.	M Irms	1.111 A	Current	MOSFET RMS current
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	420.275 kHz	General	Switching frequency
9.	IC Tolerance	20.0 mV	General	IC Feedback Tolerance
10.	M Vds Act	160.0 mV	General	Voltage drop across the MosFET
11.	Pout	6.6 W	General	Total output power

#	Name	Value	Category	Description
12.	Total BOM	$5.84	General	Total BOM Cost
13.	Vout Actual	3.282 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
14.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
15.	Duty Cycle	23.573 %	Op_point	Duty cycle
16.	Efficiency	88.118 %	Op_point	Steady state efficiency
17.	IC Tj	97.111 degC	Op_point	IC junction temperature
18.	ICThetaJA	19.3 degC/W	Op_point	IC junction-to-ambient thermal resistance
19.	IOUT_OP	2.0 A	Op_point	Iout operating point
20.	VIN_OP	15.0 V	Op_point	Vin operating point
21.	Vout p-p	2.951 mV	Op_point	Peak-to-peak output ripple voltage
22.	Cin Pd	3.252 mW	Power	Input capacitor power dissipation
23.	Cout Pd	148.55 µW	Power	Output capacitor power dissipation
24.	IC Pd	886.583 mW	Power	IC power dissipation
25.	Total Pd	889.956 mW	Power	Total Power Dissipation
26.	Vout Tolerance	4.066 %		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.	SoftStart	1.0 ms	Soft Start Time (ms)
3.	VinMax	15.0	Maximum input voltage
4.	VinMin	12.0	Minimum input voltage
5.	Vout	3.3	Output Voltage
6.	base_pn	LMZ12002	Texas Instruments Base Part Number
7.	source	DC	Input Source Type
8.	ta	80.0	Ambient temperature

Design Assistance

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