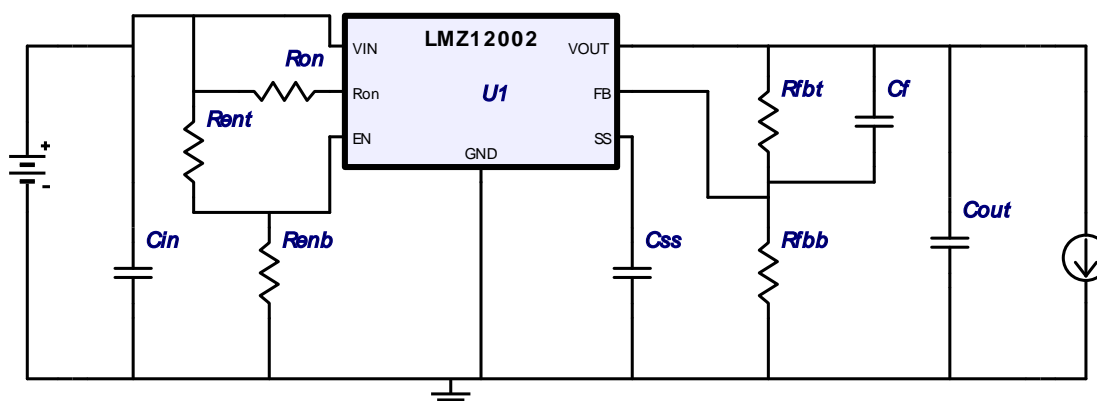



## WEBENCH® Design Report

Design : 1228951/11 LMZ12002TZ-ADJ  
Design 11 - LMZ12002TZ-ADJ



### Electrical BOM

#	Name	Manufacturer	Part Number	Quantity	Price	Properties	Footprint
1.	Cf	Yageo America	CC0805KRX7R9BB223 Series= X7R	1	\$0.01	Cap= 22.0 nF ESR= 0.0 Ohm VDC= 50.0 V IRMS= 0.0 A	 0805 13mm2
2.	Cin	TDK	C3225X7R1E106M Series= X7R	2	\$0.18	Cap= 10.0 µF ESR= 2.7 mOhm VDC= 25.0 V IRMS= 3.0 A	 1210 23mm2
3.	Cout	TDK	C3225X5R0J107M Series= X5R	1	\$0.39	Cap= 100.0 µF ESR= 2.0 mOhm VDC= 6.3 V IRMS= 3.5 A	 1210 23mm2
4.	Css	MuRata	GRM216R71H103KA01D Series= X7R	1	\$0.01	Cap= 10.0 nF ESR= 0.0 Ohm VDC= 50.0 V IRMS= 0.0 A	 0805 13mm2
5.	Renb	Vishay-Dale	CRCW08059K31FKEA Series= CRCW..e3	1	\$0.01	Res= 9.31 kOhm Power= 125.0 mW Tolerance= 1.0%	 0805 13mm2
6.	Rent	Vishay-Dale	CRCW080534K0FKEA Series= CRCW..e3	1	\$0.01	Res= 34.0 kOhm Power= 125.0 mW Tolerance= 1.0%	 0805 13mm2
7.	Rfbb	Vishay-Dale	CRCW08051K27FKEA Series= CRCW..e3	1	\$0.01	Res= 1.27 kOhm Power= 125.0 mW Tolerance= 1.0%	 0805 13mm2
8.	Rfbb	Vishay-Dale	CRCW08056K65FKEA Series= CRCW..e3	1	\$0.01	Res= 6.65 kOhm Power= 125.0 mW Tolerance= 1.0%	 0805 13mm2
9.	Ron	Vishay-Dale	CRCW0805154KFKEA Series= CRCW..e3	1	\$0.01	Res= 154.0 kOhm Power= 125.0 mW Tolerance= 1.0%	 0805 13mm2
10.	U1	Texas Instruments	LMZ12002TZ-ADJ	1	\$5.10	Switcher	 TZA07A-7 199mm2

## Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	467.536 m A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	392.63 m A	Current	Output capacitor RMS ripple current
3.	IC Ipk	1.68 A	Current	Peak switch current in IC
4.	Iin Avg	337.26 m A	Current	Average input current
5.	L Ipp	1.36 A	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	617.539 m A	Current	Q lavg
7.	BOM Count	11.0	General	Total Design BOM count
8.	FootPrint	360.0 mm2	General	Total Foot Print Area of BOM components
9.	Frequency	257.959 k Hz	General	Switching frequency
10.	IC Tolerance	20.0 m V	General	IC Feedback Tolerance
11.	M Vds Act	130.0 m V	General	
12.	Mode	CCM	General	Conduction Mode
13.	Pout	5.0 W	General	Total output power
14.	Total BOM	\$5.92	General	Total BOM Cost
15.	Duty Cycle	32.277 %	Op_point	Duty cycle
16.	Efficiency	92.659 %	Op_point	Steady state efficiency
17.	IC Tj	37.633 degC	Op_point	IC junction temperature
18.	ICThetaJA	19.3 degC/W	Op_point	IC junction-to-ambient thermal resistance
19.	IOUT_OP	1.0 A	Op_point	Iout operating point
20.	VIN_OP	16.0 V	Op_point	Vin operating point
21.	Vout p-p	2.72 m V	Op_point	Peak-to-peak output ripple voltage
22.	Cin Pd	295.096 $\mu$ W	Power	Input capacitor power dissipation
23.	Cout Pd	308.316 $\mu$ W	Power	Output capacitor power dissipation
24.	Total Pd	396.132 m W	Power	Total Power Dissipation
25.	Vout OP	5.0 V	Unknown	Operational Output Voltage

## Design Inputs

#	Name	Value	Description
1.	Iout	1.0 A	Maximum Output Current
2.	Iout1	1.0 Amps	Output Current #1
3.	VinMax	16.0 V	Maximum input voltage
4.	VinMin	5.5 V	Minimum input voltage
5.	Vout	5.0 V	Output Voltage
6.	Vout1	5.0 Volt	Output Voltage #1
7.	base_pn	LMZ12002	National Based Product Number
8.	Ta	30.0 degC	Ambient temperature

## Design Assistance

1. **LMZ12002 Product Folder** : <http://www.national.com/pf/LM/LMZ12002.html> : contains the data sheet and other resources.

National's WEBENCH simulation tools attempt to recreate the performance of a substantially equivalent physical implementation of the design. Simulations are created using National's published specifications as well as the published specifications of other device manufacturers. While National does update this information periodically, this information may not be current at the time the simulation is built. National does not warrant the accuracy or completeness of the specifications or any information contained therein. National does not warrant that any designs or recommended parts will meet the specifications you entered, will be suitable for your application or fit for any particular purpose, or will operate as shown in the simulation in a physical implementation. National does not warrant that the designs are production worthy.

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

Use of National's WEBENCH simulation tools is subject to [National's Site Terms and Conditions of Use](#). Prototype boards based on WEBENCH created designs are provided AS IS without warranty of any kind for evaluation and testing purposes and are subject to the terms of the [Evaluation License Agreement](#).