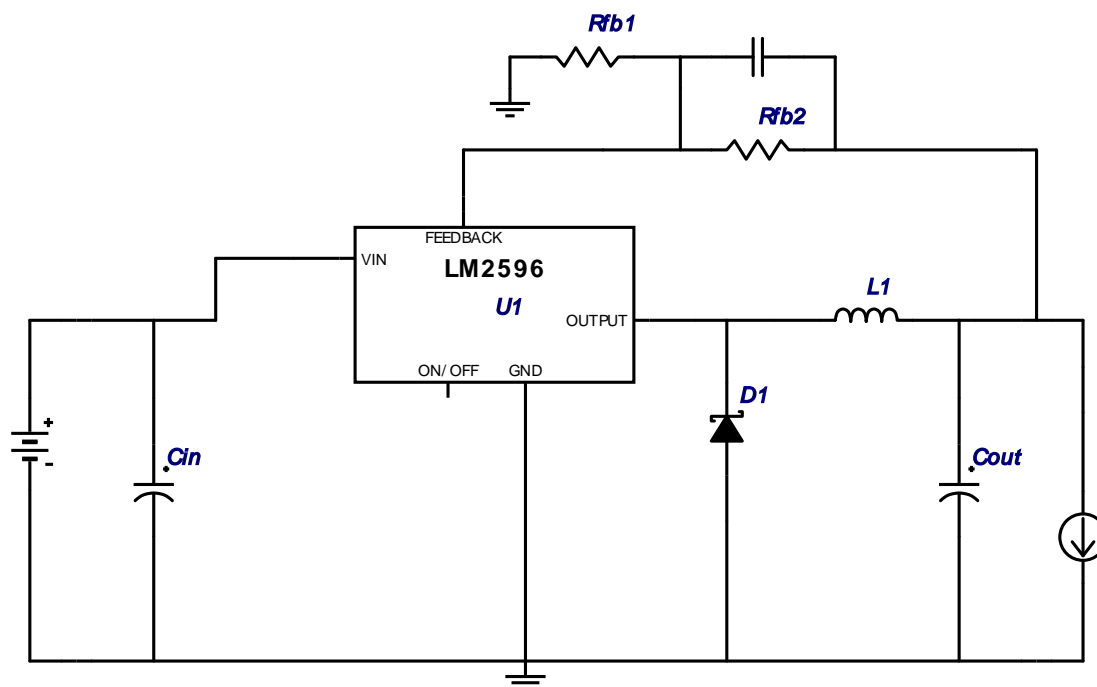


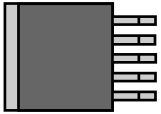
WEBENCH® Design Report

Design : 1229352/7 LM2596T-ADJ
Design 7 - LM2596T-ADJ



Electrical BOM

#	Name	Manufacturer	Part Number	Quantity	Price	Properties	Footprint
1.	Cff	Yageo America	CC0805KRX7R9BB472 Series= X7R	1	\$0.01	Cap= 4.7 nF ESR= 0.0 Ohm VDC= 50.0 V IRMS= 0.0 A	 0805 13mm2
2.	Cin	Nippon Chemi-Con	APXH200ARA470MH70G Series= PXH	1	\$0.59	Cap= 47.0 µF ESR= 45.0 mOhm VDC= 20.0 V IRMS= 2.0 A	 CAPSMT_62_H70 110mm2
3.	Cout	Panasonic	EEE-FC1A471P Series= FC	1	\$0.24	Cap= 470.0 µF ESR= 150.0 mOhm VDC= 10.0 V IRMS= 220.0 mA	 SM_RADIAL_G 172mm2
4.	D1	Diodes Inc.	B220A-13-F	1	\$0.09	VF@Io= 500.0 mV VRRM= 20.0 V	 SMA 37mm2
5.	L1	Bourns	SRR1210-330M	1	\$0.48	L= 33.0 µH DCR= 52.0 mOhm	 SRR1210 196mm2
6.	Rfb1	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	1	\$0.01	Res= 1,000 Ohm Power= 63.0 mW Tolerance= 1.0%	 0402 8mm2

#	Name	Manufacturer	Part Number	Quantity	Price	Properties	Footprint
7.	Rfb2	Vishay-Dale	CRCW04023K83FKED Series= CRCW..e3	1	\$0.01	Res= 3.83 kOhm Power= 63.0 mW Tolerance= 1.0%	0402 8mm2
8.	U1	Texas Instruments	LM2596T-ADJ	1	\$1.95	Switcher	 TO-263-5 199mm2

Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	1.249 A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	181.886 m A	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.815 A	Current	Peak switch current in IC
4.	Iin Avg	1.369 A	Current	Average input current
5.	L Ipp	630.071 m A	Current	Peak-to-peak inductor ripple current
6.	Q Iavg	1.3 A	Current	Q Iavg
7.	BOM Count	8.0	General	Total Design BOM count
8.	FootPrint	743.0 mm2	General	Total Foot Print Area of BOM components
9.	Frequency	150.0 k Hz	General	Switching frequency
10.	IC Tolerance	0.0 V	General	IC Feedback Tolerance
11.	Mode	CCM	General	Conduction Mode
12.	Pout	15.0 W	General	Total output power
13.	Q Vsat Act	1.004 V	General	Q Vsat
14.	Total BOM	\$3.38	General	Total BOM Cost
15.	Cross Freq	91.201 k Hz	Op_point	Bode plot crossover frequency
16.	Duty Cycle	52.018 deg	Op_point	Duty cycle
17.	Efficiency	84.289 %	Op_point	Steady state efficiency
18.	IC Tj	117.805 degC	Op_point	IC junction temperature
19.	ICThetaJA	50.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
20.	IOUT_OP	2.5 A	Op_point	Iout operating point
21.	Phase Marg	101.862 deg	Op_point	Bode Plot Phase Margin
22.	VIN_OP	13.0 V	Op_point	Vin operating point
23.	Vout p-p	94.511 m V	Op_point	Peak-to-peak output ripple voltage
24.	Cin Pd	70.198 m W	Power	Input capacitor power dissipation
25.	Cout Pd	4.962 m W	Power	Output capacitor power dissipation
26.	Diode Pd	599.779 m W	Power	Diode power dissipation
27.	IC Pd	1.756 W	Power	IC power dissipation
28.	L Pd	357.5 m W	Power	Inductor power dissipation
29.	Total Pd	2.796 W	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	2.5 A	Maximum Output Current
2.	Iout1	2.5 Amps	Output Current #1
3.	VinMax	13.0 V	Maximum input voltage
4.	VinMin	8.0 V	Minimum input voltage
5.	Vout	6.0 V	Output Voltage
6.	Vout1	6.0 Volt	Output Voltage #1
7.	base_pn	LM2596	National Based Product Number
8.	Ta	30.0 degC	Ambient temperature

Design Assistance

1. **LM2596** Product Folder : <http://www.national.com/pf/LM/LM2596.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](#).