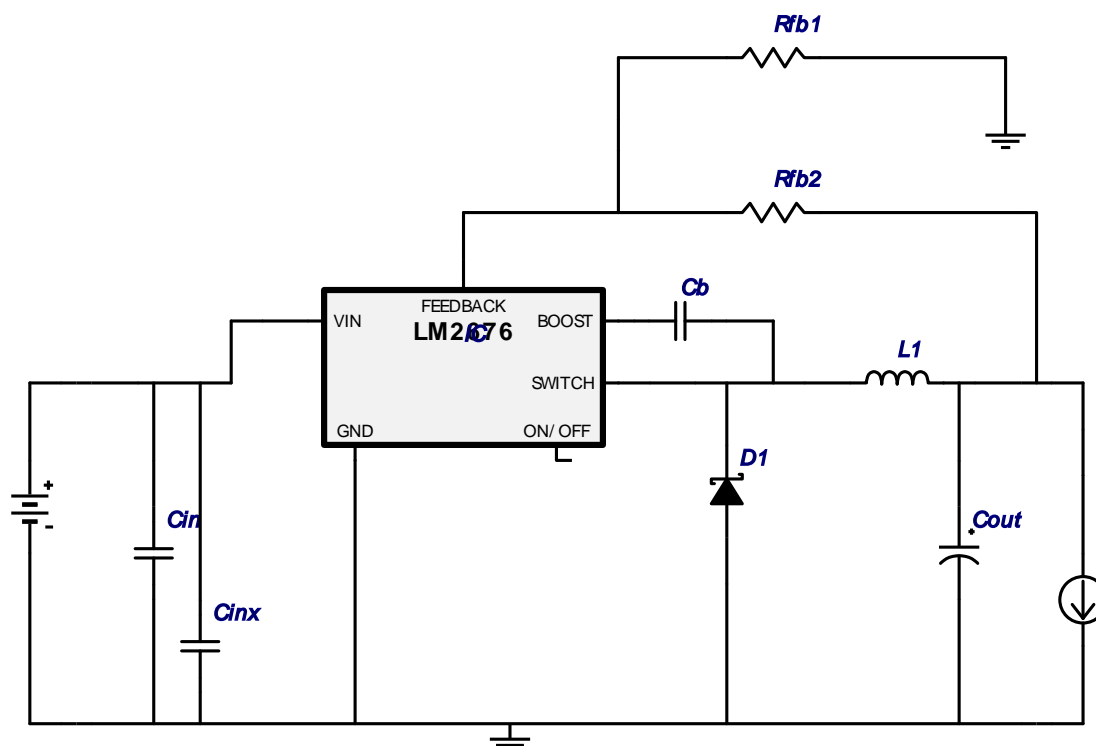


WEBENCH® Design Report






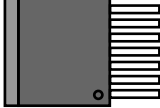
Design : 1168082/1 LM2676T-ADJ
Design 1 - LM2676T-ADJ

VinMin = 12.0V
VinMax = 14.0V
Vout = 7.5V
Iout = 2.0A

Device = LM2676T-ADJ
Topology = Buck
Created = 2/3/12 12:40:39 AM
BOM Cost = \$2.96
Total Pd = 1.22 W
Footprint = 573.0 mm2
BOM Count = 10



Electrical BOM

#	Name	Manufacturer	Part Number	Quantity	Price	Properties	Footprint
1.	Cb	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
2.	Cin	MuRata	GRM21BR61E475MA12L Series= X5R	2	\$0.06	Cap= 4.7 µF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 7.29 A	 0805 13mm2
3.	Cinx	AVX	08053C104KAT2A Series= X7R	1	\$0.01	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	 0805 13mm2
4.	Cout	Nippon Chemi-Con	APXE100ARA680ME61G Series= PXE	1	\$0.38	Cap= 68.0 µF ESR= 28.0 mOhm VDC= 10.0 V IRMS= 2.31 A	 CAPSMT_62_E61 53mm2
5.	D1	Diodes Inc.	B220A-13-F	1	\$0.09	VF@Io= 500.0 mV VRRM= 20.0 V	 SMA 37mm2
6.	IC	Texas Instruments	LM2676T-ADJ	1	\$2.22		 TS7B 199mm2

#	Name	Manufacturer	Part Number	Quantity	Price	Properties	Footprint
7.	L1	Bourns	SRR1208-270ML	1	\$0.41	L= 27.0 μ H DCR= 62.0 mOhm	 SRR1208 216mm2
8.	Rfb1	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	1	\$0.01	Res= 1,000 Ohm Power= 63.0 mW Tolerance= 1.0%	0402 8mm2
9.	Rfb2	Vishay-Dale	CRCW04025K23FKED Series= CRCW..e3	1	\$0.01	Res= 5.23 kOhm Power= 63.0 mW Tolerance= 1.0%	0402 8mm2

Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	882.38 m A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	150.139 m A	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.26 A	Current	Peak switch current in IC
4.	Iin Avg	1.159 A	Current	Average input current
5.	L Ipp	520.096 m A	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	1.499 A	Current	Q Iavg
7.	BOM Count	10.0	General	Total Design BOM count
8.	FootPrint	573.0 mm2	General	Total Foot Print Area of BOM components
9.	Frequency	260.0 k Hz	General	Switching frequency
10.	IC Tolerance	24.0 m V	General	IC Feedback Tolerance
11.	M Vds Act	257.606 m V	General	
12.	Mode	CCM	General	Conduction Mode
13.	Pout	15.0 W	General	Total output power
14.	Total BOM	\$2.96	General	Total BOM Cost
15.	D1 Tj	40.957 degC	Op_Point	D1 junction temperature
16.	Vout OP	7.5 V	Op_Point	Operational Output Voltage
17.	Cross Freq	26.608 k Hz	Op_point	Bode plot crossover frequency
18.	Duty Cycle	56.17 %	Op_point	Duty cycle
19.	Efficiency	92.474 %	Op_point	Steady state efficiency
20.	IC Tj	43.217 degC	Op_point	IC junction temperature
21.	ICThetaJA	26.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
22.	IOUT_OP	2.0 A	Op_point	Iout operating point
23.	Phase Marg	54.061 deg	Op_point	Bode Plot Phase Margin
24.	VIN_OP	14.0 V	Op_point	Vin operating point
25.	Vout p-p	15.02 m V	Op_point	Peak-to-peak output ripple voltage
26.	Cin Pd	778.595 μ W	Power	Input capacitor power dissipation
27.	Cout Pd	631.166 μ W	Power	Output capacitor power dissipation
28.	Diode Pd	438.297 m W	Power	Diode power dissipation
29.	IC Pd	508.33 m W	Power	IC power dissipation
30.	L Pd	272.8 m W	Power	Inductor power dissipation
31.	Total Pd	1.221 W	Power	Total Power Dissipation
32.	Input Load Capacitance	9.4 μ F	Unknown	Input load capacitance seen by upstream circuit

Design Inputs

#	Name	Value	Description
1.	Iout	2.0 A	Maximum Output Current
2.	Iout1	2.0 Amps	Output Current #1
3.	VinMax	14.0 V	Maximum input voltage
4.	VinMin	12.0 V	Minimum input voltage
5.	Vout	7.5 V	Output Voltage
6.	Vout1	7.5 Volt	Output Voltage #1
7.	base_pn	LM2676	National Based Product Number
8.	Ta	30.0 degC	Ambient temperature

Design Assistance

1. **LM2676** Product Folder : <http://www.national.com/pf/LM/LM2676.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](#).