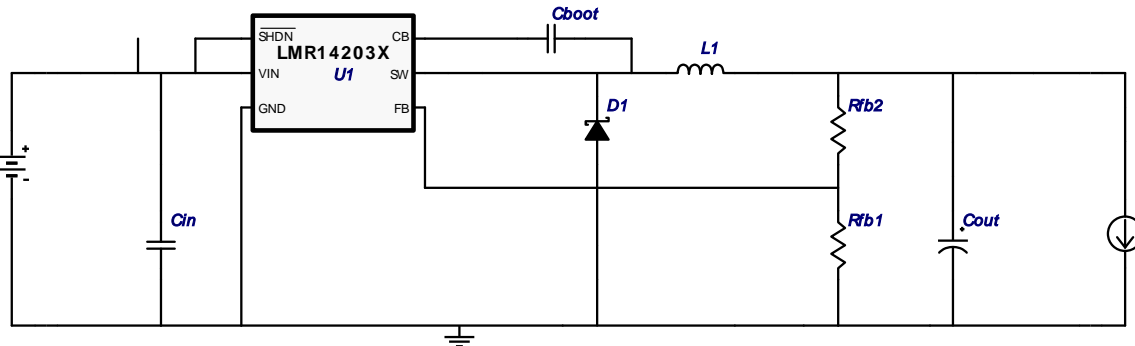


WEBENCH® Design Report

 Design : 692764/342 LMR14203XMKE
 Design 342 - LMR14203XMKE


Electrical BOM

#	Name	Manufacturer	Part Number	Quantity	Price	Properties	Footprint
1.	Cboot	MuRata	GRM155R60J224KE01D Series= X5R	1	\$0.01	Cap= 220.0 nF ESR= 0.0 Ohm VDC= 6.3 V IRMS= 0.0 A	0402 8mm2
2.	Cin	TDK	C2012Y5V1H105Z Series= Y5V	1	\$0.02	Cap= 1.0 µF ESR= 9.0 mOhm VDC= 50.0 V IRMS= 2.9 A	0805 13mm2
3.	Cout	Nippon Chemi-Con	EMVY160ADA470MF55G Series= MVY	1	\$0.09	Cap= 47.0 µF ESR= 1.0 Ohm VDC= 16.0 V IRMS= 140.0 mA	CAPSMT_62_F55 77mm2
4.	D1	Diodes Inc.	B160-13-F	1	\$0.07	VF@Io= 700.0 mV VRRM= 60.0 V	SMA 37mm2
5.	L1	Bourns	SRN6045-101M	1	\$0.18	L= 100.0 µH DCR= 494.0 mOhm	SRN6045 64mm2
6.	Rfb1	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	1	\$0.01	Res= 1,000 Ohm Power= 63.0 mW Tolerance= 1.0%	0402 8mm2
7.	Rfb2	Vishay-Dale	CRCW04024K75FKED Series= CRCW..e3	1	\$0.01	Res= 4.75 kOhm Power= 63.0 mW Tolerance= 1.0%	0402 8mm2
8.	U1	Texas Instruments	LMR14203XMKE	1	\$0.90	Switcher	MK06A 18mm2

Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	84.949 m A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	10.263 m A	Current	Output capacitor RMS ripple current
3.	IC Ipk	267.776 m A	Current	Peak switch current in IC
4.	Iin Avg	51.697 m A	Current	Average input current
5.	L Ipp	35.553 m A	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	102.058 m A	Current	Q Iavg
7.	BOM Count	8.0	General	Total Design BOM count
8.	FootPrint	232.0 mm2	General	Total Foot Print Area of BOM components
9.	Frequency	1.2 M Hz	General	Switching frequency
10.	IC Tolerance	18.0 m V	General	IC Feedback Tolerance

#	Name	Value	Category	Description
11.	M Vds Act	97.542 m V	General	
12.	Mode	CCM	General	Conduction Mode
13.	Pout	1.1 W	General	Total output power
14.	Total BOM	\$1.29	General	Total BOM Cost
15.	D1 Tj	56.105 degC	Op_Point	D1 junction temperature
16.	Vout OP	4.4 V	Op_Point	Operational Output Voltage
17.	Cross Freq	96.393 k Hz	Op_point	Bode plot crossover frequency
18.	Duty Cycle	16.665 %	Op_point	Duty cycle
19.	Efficiency	70.925 %	Op_point	Steady state efficiency
20.	IC Tj	71.456 degC	Op_point	IC junction temperature
21.	ICThetaJA	153.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
22.	IOUT_OP	250.0 m A	Op_point	Iout operating point
23.	Phase Marg	121.4 deg	Op_point	Bode Plot Phase Margin
24.	VIN_OP	30.0 V	Op_point	Vin operating point
25.	Vout p-p	35.553 m V	Op_point	Peak-to-peak output ripple voltage
26.	Cin Pd	64.946 μ W	Power	Input capacitor power dissipation
27.	Cout Pd	105.333 μ W	Power	Output capacitor power dissipation
28.	Diode Pd	145.836 m W	Power	Diode power dissipation
29.	IC Pd	270.955 m W	Power	IC power dissipation
30.	L Pd	33.962 m W	Power	Inductor power dissipation
31.	Total Pd	450.927 m W	Power	Total Power Dissipation
32.	Input Load Capacitance	1.0 μ F	Unknown	Input load capacitance seen by upstream circuit

Design Inputs

#	Name	Value	Description
1.	Iout	250.0 mA	Maximum Output Current
2.	Iout1	250.0 mAmps	Output Current #1
3.	VinMax	30.0 V	Maximum input voltage
4.	VinMin	16.0 V	Minimum input voltage
5.	Vout	4.4 V	Output Voltage
6.	Vout1	4.4 Volt	Output Voltage #1
7.	base_pn	LMR14203X	National Based Product Number
8.	Ta	30.0 degC	Ambient temperature

Design Assistance

1. **LMR14203X** Product Folder : <http://www.national.com/pf/LM/LMR14203.html> : contains the data sheet and other resources.

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