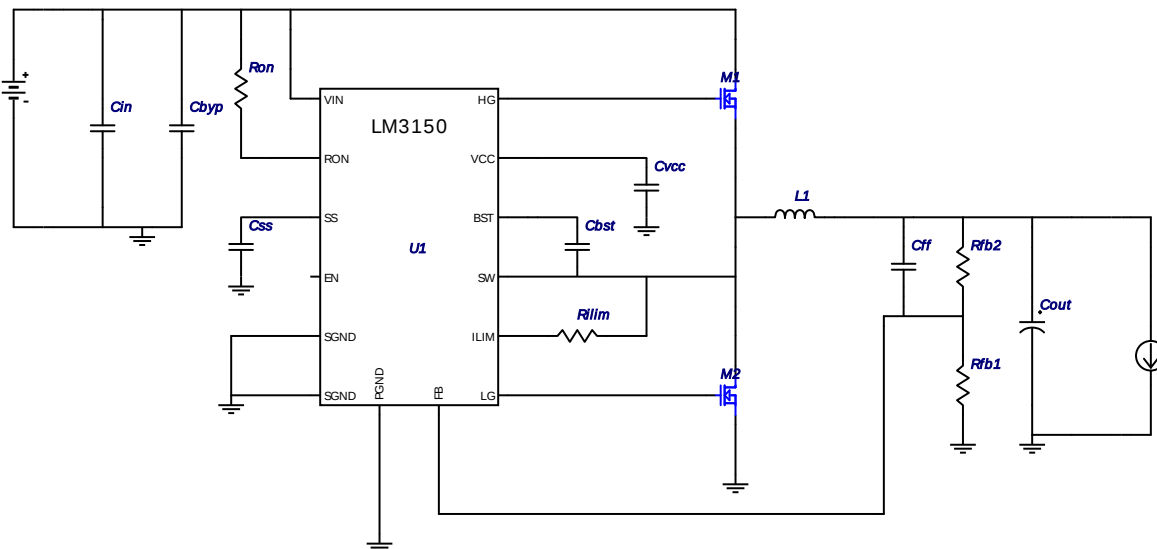


WEBENCH® Design Report

Design : 818224/11 LM3150MHE
Design 11 - LM3150MHE



Electrical BOM

#	Name	Manufacturer	Part Number	Quantity	Price	Properties	Footprint
1.	Cbst	Taiyo Yuden	EMK212B7474KD-T Series= X7R	1	\$0.02	Cap= 470.0 nF ESR= 0.0 Ohm VDC= 16.0 V IRMS= 0.0 A	 0805 13mm2
2.	Cbyp	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
3.	Cff	MuRata	GRM2165C2A431JA01D Series= C0G/NP0	1	\$0.03	Cap= 430.0 pF ESR= 0.0 Ohm VDC= 100.0 V IRMS= 0.0 A	 0805 13mm2
4.	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
5.	Cout	AVX	TPSD107K010R0100 Series= TPS	2	\$0.35	Cap= 100.0 µF ESR= 100.0 mOhm VDC= 10.0 V IRMS= 1.102 A	 7343-31 59mm2
6.	Css	Yageo America	CC0805KRX7R9BB153 Series= X7R	1	\$0.01	Cap= 15.0 nF ESR= 0.0 Ohm VDC= 50.0 V IRMS= 0.0 A	 0805 13mm2
7.	Cvcc	Taiyo Yuden	LMK212B7105KG-T Series= X7R	1	\$0.01	Cap= 1.0 µF ESR= 0.0 Ohm VDC= 10.0 V IRMS= 0.0 A	 0805 13mm2
8.	L1	Coilcraft	XAL7070-332MEB	1	\$0.68	L= 3.3 µH DCR= 10.0 mOhm	 XAL7070 87mm2

#	Name	Manufacturer	Part Number	Quantity	Price	Properties	Footprint
9.	M1	Texas Instruments	CSD17308Q3	1	\$0.42	VdsMax= 30.0 V IdsMax= 47.0 Amps	 TRANS_NexFET_Q3 29mm2
10.	M2	Texas Instruments	CSD16323Q3	1	\$0.54	VdsMax= 25.0 V IdsMax= 60.0 Amps	 TRANS_NexFET_Q3 29mm2
11.	Rfb1	Vishay-Dale	CRCW080510K0FKEA Series= CRCW..e3	1	\$0.01	Res= 10.0 kOhm Power= 125.0 mW Tolerance= 1.0%	 0805 13mm2
12.	Rfb2	Vishay-Dale	CRCW080545K3FKEA Series= CRCW..e3	1	\$0.01	Res= 45.3 kOhm Power= 125.0 mW Tolerance= 1.0%	 0805 13mm2
13.	Rilim	Vishay-Dale	CRCW0805768RFKEA Series= CRCW..e3	1	\$0.01	Res= 768.0 Ohm Power= 125.0 mW Tolerance= 1.0%	 0805 13mm2
14.	Ron	Vishay-Dale	CRCW080554K9FKEA Series= CRCW..e3	1	\$0.01	Res= 54.9 kOhm Power= 125.0 mW Tolerance= 1.0%	 0805 13mm2
15.	U1	Texas Instruments	LM3150MHE	1	\$1.77	Switcher	 MXA14A 59mm2

Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	3.154 A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	497.842 m A	Current	Output capacitor RMS ripple current
3.	I lim	13.282 A	Current	Current limit threshold
4.	Iin Avg	1.585 A	Current	Average input current
5.	L Ipp	1.725 A	Current	Peak-to-peak inductor ripple current
6.	SW Ipk	8.862 A	Current	Peak switch current
7.	BOM Count	17.0	General	Total Design BOM count
8.	FootPrint	486.0 mm2	General	Total Foot Print Area of BOM components
9.	Frequency	497.073 k Hz	General	Switching frequency
10.	IC Tolerance	12.0 m V	General	IC Feedback Tolerance
11.	Mode	CCM	General	Conduction Mode
12.	Pout	26.4 W	General	Total output power
13.	Total BOM	\$4.59	General	Total BOM Cost
14.	Duty Cycle	19.244 %	Op_point	Duty cycle
15.	Efficiency	92.544 %	Op_point	Steady state efficiency
16.	IC Tj	42.899 degC	Op_point	IC junction temperature
17.	IOUT_OP	8.0 A	Op_point	Iout operating point
18.	M1 Tj	63.611 degC	Op_point	M1 MOSFET junction temperature
19.	M2 Tj	60.239 degC	Op_point	M2 MOSFET junction temperature
20.	VIN_OP	18.0 V	Op_point	Vin operating point
21.	Vout p-p	86.256 m V	Op_point	Peak-to-peak output ripple voltage
22.	Cin Pd	13.427 m W	Power	Input capacitor power dissipation
23.	Cout Pd	12.392 m W	Power	Output capacitor power dissipation
24.	IC Pd	198.441 m W	Power	IC power dissipation
25.	L Pd	800.0 m W	Power	Inductor power dissipation
26.	M1 Pd	585.038 m W	Power	M1 MOSFET total power dissipation
27.	M1 PdCond	135.975 m W	Power	M1 MOSFET conduction losses
28.	M1 PdSw	449.063 m W	Power	M1 MOSFET switching losses
29.	M2 Pd	517.572 m W	Power	M2 MOSFET total power dissipation
30.	M2 PdCond	255.678 m W	Power	M2 MOSFET conduction losses
31.	M2 PdSw	261.893 m W	Power	M2 MOSFET switching losses
32.	Total Pd	2.127 W	Power	Total Power Dissipation
33.	Input Load Capacitance	20.0 µ F	Unknown	Input load capacitance seen by upstream circuit

Design Inputs

#	Name	Value	Description
1.	Iout	8.0 A	Maximum Output Current
2.	Iout1	8.0 Amps	Output Current #1
3.	VinMax	18.0 V	Maximum input voltage
4.	VinMin	8.0 V	Minimum input voltage
5.	Vout	3.3 V	Output Voltage
6.	Vout1	3.3 Volt	Output Voltage #1

#	Name	Value	Description
7.	base_pn	LM3150	National Based Product Number
8.	Ta	30.0 degC	Ambient temperature

Design Assistance

1. **LM3150** Product Folder : <http://www.national.com/pf/LM/LM3150.html> : contains the data sheet and other resources.

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