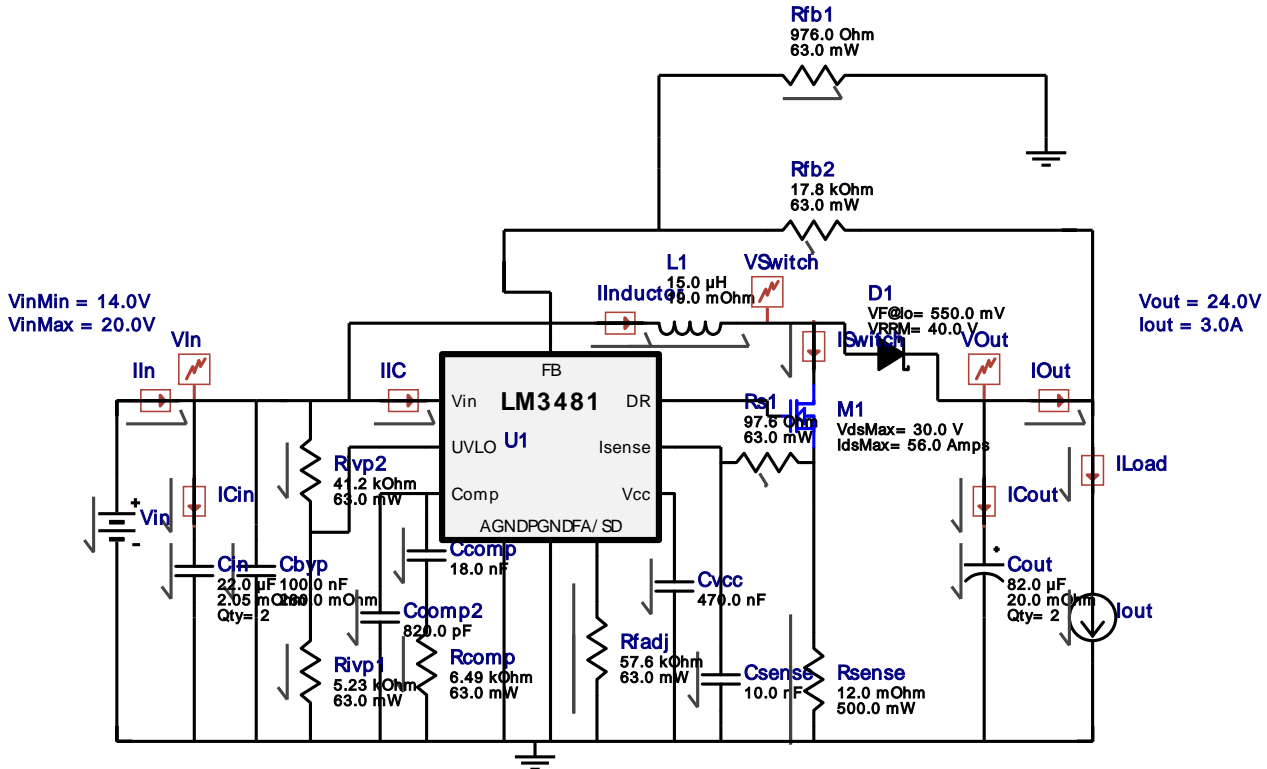


WEBENCH® Electrical Simulation Report



My Comments

No comments

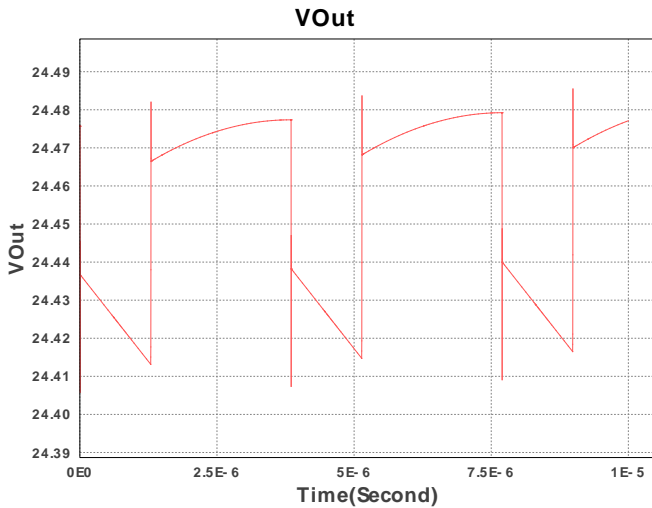
Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbyp	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
2.	Ccomp	Yageo America	CC0805KRX7R9BB183 Series= X7R	Cap= 18.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
3.	Ccomp2	Yageo America	CC0805KRX7R9BB821 Series= X7R	Cap= 820.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
4.	Cin	TDK	C2012X5R1V226M125AC Series= X5R	Cap= 22.0 µF ESR= 2.05 mOhm VDC= 35.0 V IRMS= 4.556 A	2	\$0.33	0805 7 mm ²
5.	Cout	Panasonic	35SVPF82M Series= SVPF	Cap= 82.0 µF ESR= 20.0 mOhm VDC= 35.0 V IRMS= 4.0 A	2	\$0.64	 CAPSMT_62_E12 106 mm ²
6.	Csense	Yageo America	CC0805KRX7R9BB103 Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
7.	Cvcc	MuRata	GRM155R60J474KE19D Series= X5R	Cap= 470.0 nF VDC= 6.3 V IRMS= 0.0 A	1	\$0.01	 0402 3 mm ²
8.	D1	Diodes Inc.	B540C-13-F	VF@Io= 550.0 mV VRRM= 40.0 V	1	\$0.19	 SMC 83 mm ²
9.	L1	Coilcraft	MSS1210-153MEB	L= 15.0 µH DCR= 19.0 mOhm	1	\$0.81	 MSS1210 204 mm ²
10.	M1	Texas Instruments	CSD17304Q3	VdsMax= 30.0 V IdsMax= 56.0 Amps	1	\$0.29	 DQG0008A 18 mm ²
11.	Rcomp	Vishay-Dale	CRCW04026K49FKED Series= CRCW..e3	Res= 6.49 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
12.	Rfadj	Vishay-Dale	CRCW040257K6FKED Series= CRCW..e3	Res= 57.6 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
13.	Rfb1	Vishay-Dale	CRCW0402976RFKED Series= CRCW..e3	Res= 976.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
14.	Rfb2	Vishay-Dale	CRCW040217K8FKED Series= CRCW..e3	Res= 17.8 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
15.	Rivp1	Vishay-Dale	CRCW04025K23FKED Series= CRCW..e3	Res= 5.23 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
16.	Rivp2	Vishay-Dale	CRCW040241K2FKED Series= CRCW..e3	Res= 41.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
17.	Rs1	Vishay-Dale	CRCW040297R6FKED Series= CRCW..e3	Res= 97.6 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
18.	Rsense	Stackpole Electronics Inc	CSR1206FK12L0 Series= ?	Res= 12.0 mOhm Power= 500.0 mW Tolerance= 1.0%	1	\$0.11	 1206 11 mm ²
19.	U1	Texas Instruments	LM3481MM/NOPB	Switcher	1	\$0.80	 MUB10A 24 mm ²

Simulation Parameters

#	Name	Parameter Name	Description	Values
1.	Cin	IC	Initial Condition across the capacitor	17.0 V
2.	Cout	IC	Initial Condition Across Capacitor	24.0 V
3.	Iout	I	Load Current	3.0 A



Design Inputs

#	Name	Value	Description
1.	Iout	3.0 A	Maximum Output Current
2.	VinMax	20.0 V	Maximum input voltage
3.	VinMin	14.0 V	Minimum input voltage
4.	Vout	24.0 V	Output Voltage
5.	base_pn	LM3481	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0 degC	Ambient temperature

Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	339.317 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	2.67 A	Current	Output capacitor RMS ripple current
3.	Iin Avg	5.353 A	Current	Average input current
4.	L Ipp	1.175 A	Current	Peak-to-peak inductor ripple current
5.	L1 Irms	5.366 A	Current	Inductor ripple current
6.	M1 Irms	4.303 A	Current	M1 MOSFET Irms
7.	SW Ipk	5.943 A	Current	Peak switch current
8.	BOM Count	21	General	Total Design BOM count
9.	FootPrint	617.0 mm ²	General	Total Foot Print Area of BOM components
10.	Frequency	347.59 kHz	General	Switching frequency
11.	IC Tolerance	19.0 mV	General	IC Feedback Tolerance
12.	M Vds Act	32.309 mV	General	M Vds
13.	M1 Rdson	7.508 mOhm	General	Drain-Source On-resistance
14.	M1 ThetaJA	55.0 degC/W	General	MOSFET junction-to-ambient thermal resistance
15.	Mode	CCM	General	Conduction Mode
16.	Pout	72.0 W	General	Total output power
17.	Total BOM	\$4.26	General	Total BOM Cost
18.	D1 Tj	112.5 degC	Op_Point	D1 junction temperature
19.	Low Freq Gain	46.871 dB	Op_Point	Gain at 10Hz
20.	Vout Actual	24.24 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
21.	Vout OP	24.0 V	Op_Point	Operational Output Voltage
22.	Cross Freq	3.311 kHz	Op_point	Bode plot crossover frequency
23.	Duty Cycle	43.977 %	Op_point	Duty cycle
24.	Efficiency	96.067 %	Op_point	Steady state efficiency
25.	Gain Marg	-16.452 dB	Op_point	Bode Plot Gain Margin
26.	IC Tj	47.22 degC	Op_point	IC junction temperature
27.	ICThetaJA	200.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
28.	IOUT_OP	3.0 A	Op_point	Iout operating point
29.	M1 TjOP	46.604 degC	Op_point	M1 MOSFET junction temperature
30.	Phase Marg	55.316 deg	Op_point	Bode Plot Phase Margin
31.	VIN_OP	14.0 V	Op_point	Vin operating point
32.	Vout p-p	70.816 mV	Op_point	Peak-to-peak output ripple voltage
33.	Cin Pd	118.014 μW	Power	Input capacitor power dissipation
34.	Cout Pd	71.294 mW	Power	Output capacitor power dissipation
35.	Diode Pd	1.65 W	Power	Diode power dissipation
36.	IC Pd	86.098 mW	Power	IC power dissipation
37.	L Pd	656.43 mW	Power	Inductor power dissipation
38.	M1 Pd	301.882 mW	Power	M1 MOSFET total power dissipation
39.	M1 PdCond	139.035 mW	Power	M1 MOSFET conduction losses
40.	M1 PdSw	162.847 mW	Power	M1 MOSFET switching losses
41.	Rfb Pd	30.678 mW	Power	Rfb Power Dissipation

#	Name	Value	Category	Description
42.	Rsense Pd	332.708 mW	Power	LED Current Rsns Power Dissipation
43.	Total Pd	2.948 W	Power	Total Power Dissipation
44.	Vout Tolerance	3.452 %	Unknown	Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Assistance

1. **LM3481** Product Folder : <http://www.ti.com/product/LM3481> : contains the data sheet and other resources.

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