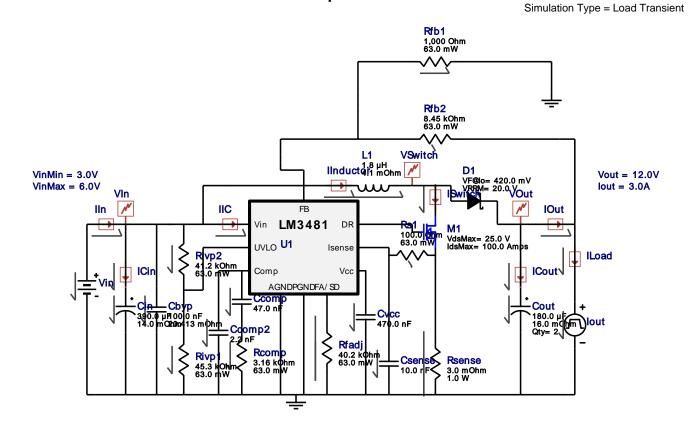


VinMin = 3.0V VinMax = 6.0V Vout = 12.0V Iout = 3.0A Device = LM3481MM/NOPB Topology = Boost Created = 3/15/15 10:03:59 PM User ID = 3789096 Design Id = 1 eSim Id = 3

WEBENCH [®] Electrical Simulation Report



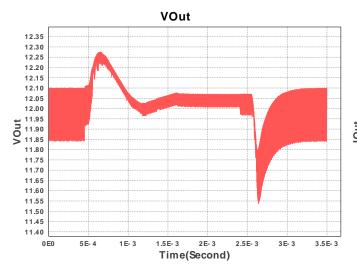
Electrical BOM

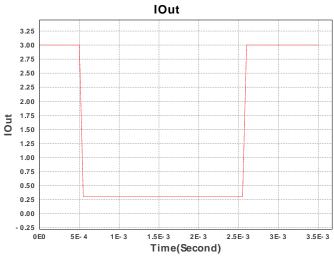
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbyp	TDK	C1005X5R0J104K Series= X5R	Cap= 100.0 nF ESR= 20.413 mOhm VDC= 6.3 V IRMS= 0.0 A	1	\$0.01	1005 3 mm ²
2.	Ccomp	Taiyo Yuden	TMK212B7473KD-T Series= X7R	Cap= 47.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
3.	Ccomp2	Yageo America	CC0805KRX7R9BB222 Series= X7R	Cap= 2.2 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
4.	Cin	Panasonic	20SVPF390M Series= 1273	Cap= 390.0 µF ESR= 14.0 mOhm VDC= 20.0 V IRMS= 4.95 A	1	\$0.63	CAPSMT_62_E12 106 mm²
5.	Cout	Panasonic	25SVPF180M Series= 1273	Cap= 180.0 µF ESR= 16.0 mOhm VDC= 25.0 V IRMS= 4.65 A	2	\$0.61	CAPSMT_62_E12 106 mm²
6.	Csense	MuRata	GRM216R71H103KA01D Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
7.	Cvcc	MuRata	GRM155C80G474KE01D Series= 379	Cap= 470.0 nF VDC= 4.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²

# Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
3. D1	Vishay-Semiconductor	SL42-E3/57T	VF@Io= 420.0 mV VRRM= 20.0 V	1	\$0.32	SMC 83 mm ²
9. L1	Coilcraft	XAL7070-182MEB	L= 1.8 μH DCR= 4.1 mOhm	1	\$1.05	XAL7070 87 mm ²
10. M1	Texas Instruments	CSD16325Q5	VdsMax= 25.0 V IdsMax= 100.0 Amps	1	\$0.84	TRANS_NexFET_Q5 55 mm²
I1. Rcomp	Vishay-Dale	CRCW04023K16FKED Series= CRCWe3	Res= 3.16 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
12. Rfadj	Vishay-Dale	CRCW040240K2FKED Series= CRCWe3	Res= 40.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
13. Rfb1	Vishay-Dale	CRCW04021K00FKED Series= CRCWe3	Res= 1,000 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
14. Rfb2	Vishay-Dale	CRCW04028K45FKED Series= CRCWe3	Res= 8.45 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
15. Rivp1	Vishay-Dale	CRCW040245K3FKED Series= CRCWe3	Res= 45.3 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
16. Rivp2	Vishay-Dale	CRCW040241K2FKED Series= CRCWe3	Res= 41.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
17. Rs1	Vishay-Dale	CRCW0402100RFKED Series= CRCWe3	Res= 100.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
18. Rsense	Stackpole Electronics Inc	CSNL1206FT3L00 Series= 478	Res= 3.0 mOhm Power= 1.0 W Tolerance= 1.0%	1	\$0.19	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	4.5 V
2.	Cout	IC	Initial Condition Across Capacitor	12.0 V
3.	lout	signal_type	Signal Type	PULSE
		I1	Initial Current	3.0 A
		12	Peak Current	0.3 A
		Td	Initial Delay Time	0.5m Sec
		Tr	Rise Time	50u Sec
		Tf	Fall Time	50u Sec
		Pw	Pulse Width	2m Sec





Operating Values

Ope	rating values			
#	Name	Value	Category	Description
1.	Cin IRMS	764.578 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	5.528 A	Current	Output capacitor RMS ripple current
3.	lin Avg	13.18 A	Current	Average input current
4.	L lpp	2.649 A	Current	Peak-to-peak inductor ripple current
5.	L1 Irms	13.165 A	Current	Inductor ripple current
6.	M1 Irms	15.597 A	Current	M1 MOSFET Irms
7.	SW lpk	14.467 A	Current	Peak switch current
8.	BOM Count	20	General	Total Design BOM count
9.	FootPrint	626.0 mm ²	General	Total Foot Print Area of BOM components
10.	Frequency	479.249 kHz	General	Switching frequency
11.	IC Tolerance	19.0 mV	General	IC Feedback Tolerance
12.	M Vds Act	39.877 mV	General	M Vds
13.	M1 Rdson	2.557 mOhm	General	Drain-Source On-resistance
14.	M1 ThetaJA	50.0 degC/W	General	MOSFET junction-to-ambient thermal resistance
15.	Mode	CCM	General	Conduction Mode
16.	Pout	36.0 W	General	Total output power
17.	Total BOM	\$5.17	General	Total BOM Cost
18.	D1 Tj	93.0 degC	Op_Point	D1 junction temperature
19.	Vout OP	12.0 V	Op_Point	Operational Output Voltage
20.	Cross Freq	2.566 kHz	Op_point	Bode plot crossover frequency
21.	Duty Cycle	77.174 %	Op_point	Duty cycle
22.	Efficiency	91.045 %	Op_point	Steady state efficiency
23.	Gain Marg	-17.043 dB	Op_point	Bode Plot Gain Margin
24.	IC Tj	38.628 degC	Op_point	IC junction temperature
25.		200.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
26.	IOUT_OP	3.0 A	Op_point	lout operating point
27.	, -	65.861 degC	Op_point	M1 MOSFET junction temperature
	Phase Marg	56.206 deg	Op_point	Bode Plot Phase Margin
	VIN_OP	3.0 V	Op_point	Vin operating point
30.	Vout p-p	115.737 mV	Op_point	Peak-to-peak output ripple voltage
31.		8.184 mW	Power	Input capacitor power dissipation
32.	Cout Pd	244.497 mW	Power	Output capacitor power dissipation
33.		1.26 W	Power	Diode power dissipation
	IC Pd	43.14 mW	Power	IC power dissipation
	L Pd	852.735 mW	Power	Inductor power dissipation
36.	M1 Pd	717.225 mW	Power	M1 MOSFET total power dissipation
37.		621.951 mW	Power	M1 MOSFET conduction losses
38.	M1 PdSw	95.274 mW	Power	M1 MOSFET switching losses
39.		15.238 mW	Power	Rfb Power Dissipation
40.	Total Pd	3.541 W	Power	Total Power Dissipation
41.	Low Freq Gain	51.113 dB	Unknown	Gain at 10Hz

Design Inputs

#	Name	Value	Description
1.	lout	3.0 A	Maximum Output Current
2.	lout1	3.0 Amps	Output Current #1
3.	VinMax	6.0 V	Maximum input voltage
4.	VinMin	3.0 V	Minimum input voltage
5.	Vout	12.0 V	Output Voltage
6.	Vout1	12.0 Volt	Output Voltage #1
7.	base_pn	LM3481	Base Product Number

#	Name	Value	Description
8.	source	DC	Input Source Type
9.	Ta	30.0 degC	Ambient temperature

Design Assistance

1. LM3481 Product Folder: http://www.ti.com/product/lm3481: contains the data sheet and other resources.

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