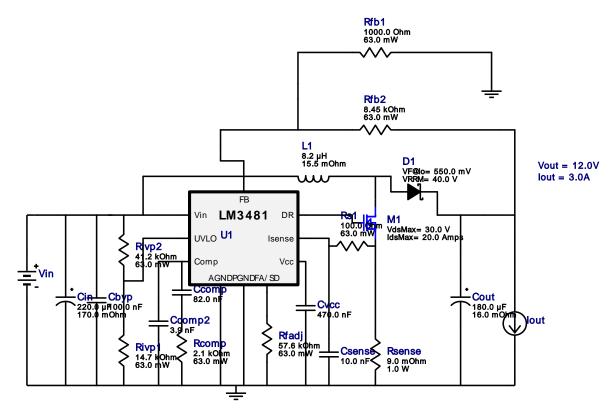


WEBENCH® Design Report

VinMin = 6.0V VinMax = 11.0V Vout = 12.0V Iout = 3.0A Device = LM3481MM/NOPB Topology = Boost Created = 11/13/16 12:00:52 PM BOM Cost = \$2.82 BOM Count = 19 Total Pd = 3.44W

Design: 4584502/34 LM3481MM/NOPB LM3481MM/NOPB 6.0V-11.0V to 12.00V @ 3.0A



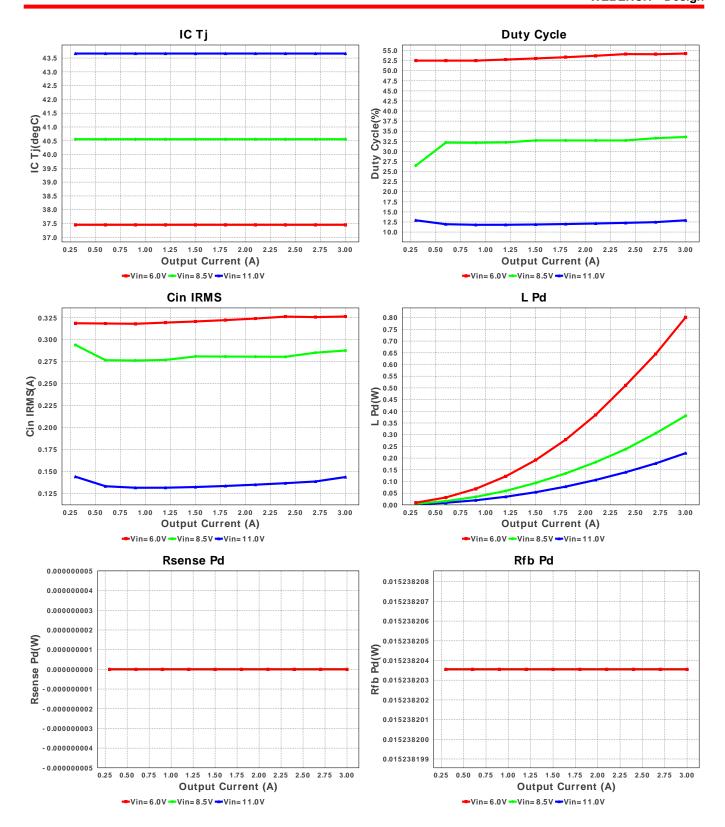
My Comments

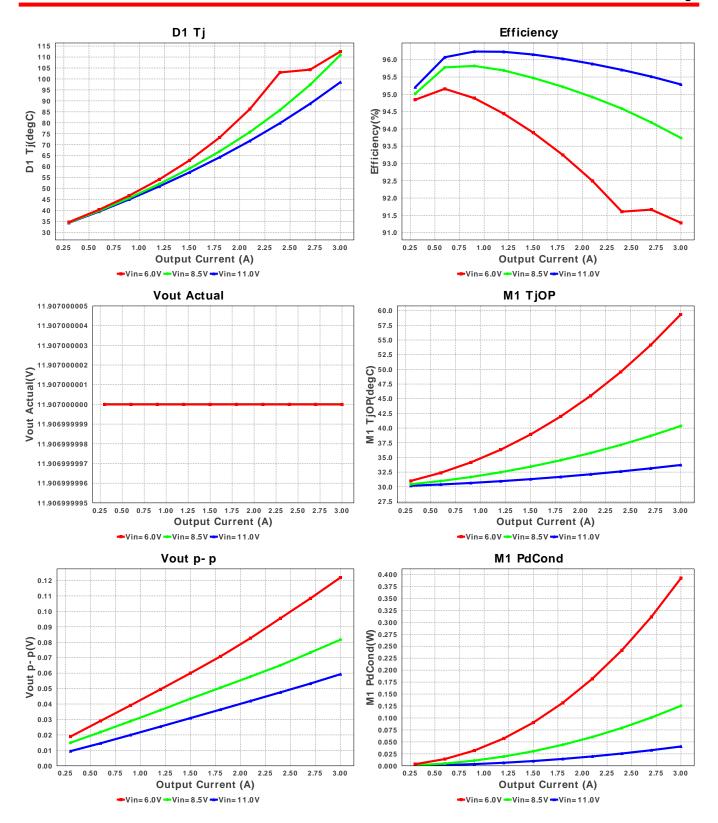
No comments

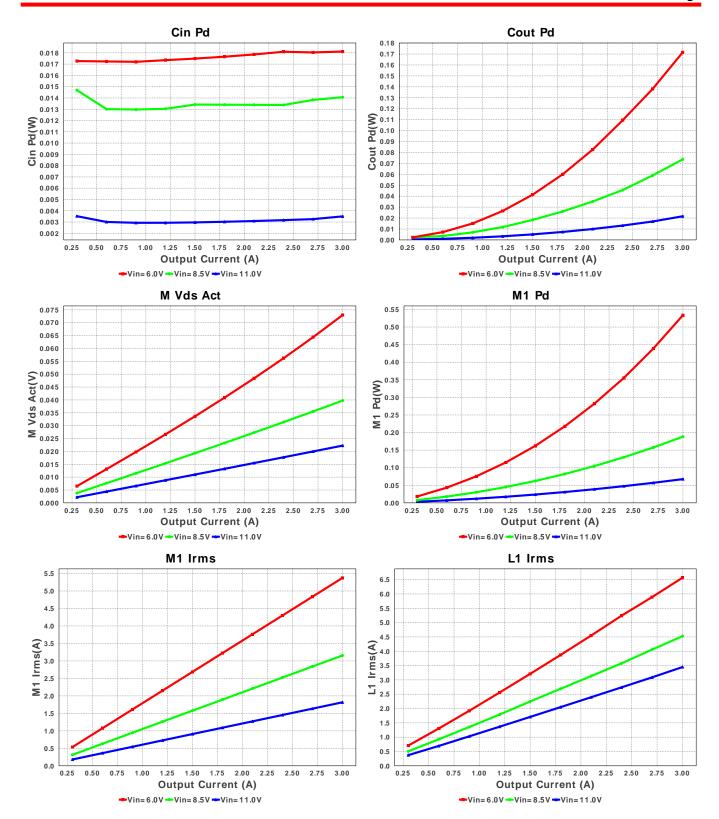
Electrical BOM

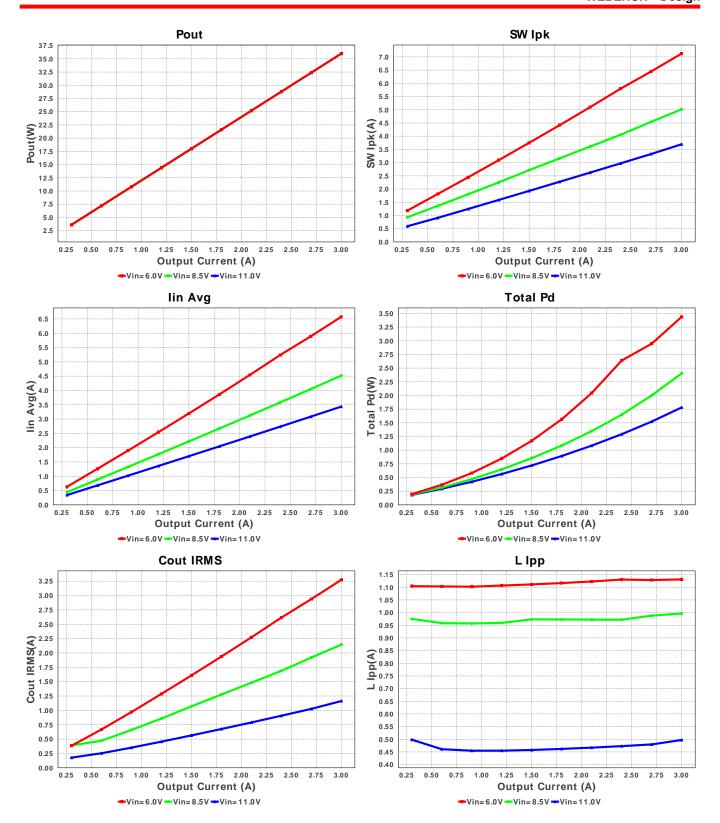
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbyp	MuRata	GRM155R61C104KA88D Series= X5R	Cap= 100.0 nF VDC= 16.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
2.	Ccomp	MuRata	GRM155R61A823KA01D Series= X5R	Cap= 82.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
3.	Ccomp2	MuRata	GRM033R71A392KA01D Series= X7R	Cap= 3.9 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	0201 2 mm ²
4.	Cin	Nichicon	UUD1E221MNL1GS Series= uD	Cap= 220.0 uF ESR= 170.0 mOhm VDC= 25.0 V IRMS= 450.0 mA	1	\$0.16	SM_RADIAL_8MM 113 mm ²
5.	Cout	Panasonic	25SVPF180M Series= ?	Cap= 180.0 uF ESR= 16.0 mOhm VDC= 25.0 V IRMS= 4.65 A	1	\$0.61	CAPSMT_62_E12 106 mm ²
6.	Csense	MuRata	GRM033R60J103KA01D Series= X5R	Cap= 10.0 nF VDC= 6.3 V IRMS= 0.0 A	1	\$0.01	0201 2 mm ²

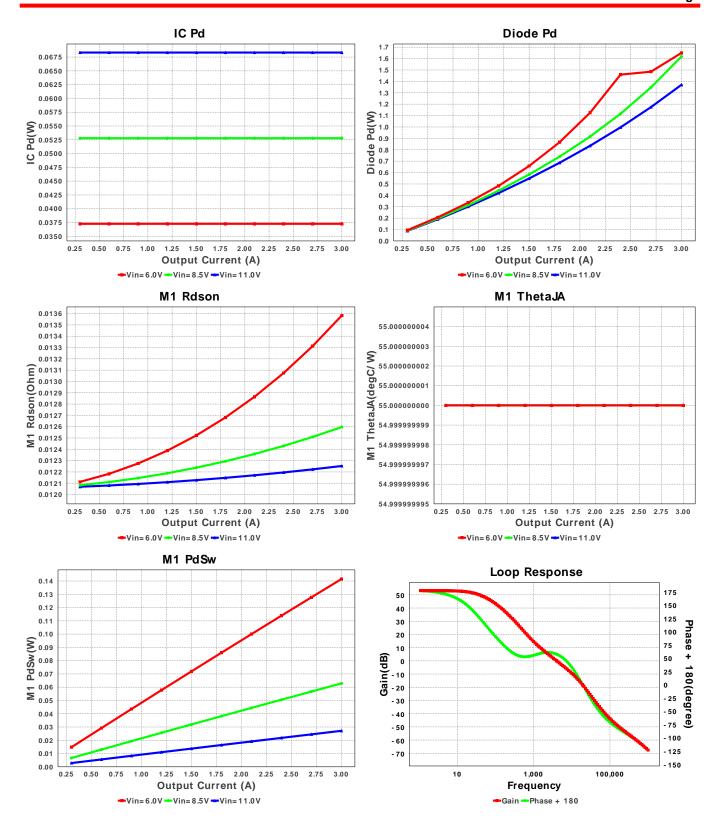
# Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
7. Cvcc	MuRata	GRM155C80J474KE19D Series= X6S	Cap= 470.0 nF VDC= 6.3 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
8. D1	Diodes Inc.	B540C-13-F	VF@Io= 550.0 mV VRRM= 40.0 V	1	\$0.17	SMC 83 mm ²
9. L1	Bourns	SRP1270-8R2M	L= 8.2 μH DCR= 15.5 mOhm	1	\$0.60	SRP1270 246 mm ²
10. M1	Texas Instruments	CSD17579Q3A	VdsMax= 30.0 V IdsMax= 20.0 Amps	1	\$0.17	DNH0008A 18 mm ²
11. Rcomp	Vishay-Dale	CRCW04022K10FKED Series= CRCWe3	Res= 2.1 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
12. Rfadj	Vishay-Dale	CRCW040257K6FKED Series= CRCWe3	Res= 57.6 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
13. Rfb1	Vishay-Dale	CRCW04021K00FKED Series= CRCWe3	Res= 1000.0 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	CRCW040214K7FKED Series= CRCWe3	Res= 14.7 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	Susumu Co Ltd	PRL1632-R009-F-T1 Series= PRL1632	Res= 9.0 mOhm Power= 1.0 W Tolerance= 1.0%	1	\$0.19	0612 11 mm ²
19. U1	Texas Instruments	LM3481MM/NOPB	Switcher	1	\$0.80	MUB10A 24 mm ²











Operating Values

Name	Value	Category	Description
Cin IRMS	326.455 mA	Current	Input capacitor RMS ripple current
Cout IRMS	3.275 A	Current	Output capacitor RMS ripple current
lin Avg	6.574 A	Current	Average input current
L lpp	1.131 A	Current	Peak-to-peak inductor ripple current
L1 Irms	6.566 A	Current	Inductor ripple current
M1 Irms	5.362 A	Current	M1 MOSFET Irms
SW lpk	7.124 A	Current	Peak switch current
BOM Count	19	General	Total Design BOM count
FootPrint	636.0 mm ²	General	Total Foot Print Area of BOM components
Frequency	347.592 kHz	General	Switching frequency
IC Tolerance	19.0 mV	General	IC Feedback Tolerance
	Cin IRMS Cout IRMS lin Avg L Ipp L1 Irms M1 Irms SW Ipk BOM Count FootPrint Frequency	Cin IRMS 326.455 mA Cout IRMS 3.275 A lin Avg 6.574 A L Ipp 1.131 A L1 Irms 6.566 A M1 Irms 5.362 A SW Ipk 7.124 A BOM Count 19 FootPrint 636.0 mm² Frequency 347.592 kHz	Cin IRMS 326.455 mA Current Cout IRMS 3.275 A Current lin Avg 6.574 A Current L Ipp 1.131 A Current L1 Irms 6.566 A Current M1 Irms 5.362 A Current SW Ipk 7.124 A Current BOM Count 19 General FootPrint 636.0 mm² General Frequency 347.592 kHz General

#	Name	Value	Category	Description
12.	M Vds Act	72.875 mV	General	M Vds
13.	M1 Rdson	13.592 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	36.0 W	General	Total output power
17.	Total BOM	\$2.82	General	Total BOM Cost
18.	D1 Tj	112.5 degC	Op_Point	D1 junction temperature
19.	Low Freq Gain	47.606 dB	Op_Point	Gain at 10Hz
20.	Vout Actual	11.907 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
21.	Vout OP	12.0 V	Op_Point	Operational Output Voltage
22.	Cross Freq	2.296 kHz	Op_point	Bode plot crossover frequency
23.	Duty Cycle	54.255 %	Op_point	Duty cycle
24.	Efficiency	91.276 %	Op_point	Steady state efficiency
25.	Gain Marg	-15.94 dB	Op_point	Bode Plot Gain Margin
26.	IC Tj	37.486 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	lout operating point
29.	M1 TjOP	59.52 degC	Op_point	M1 MOSFET junction temperature
30.	Phase Marg	56.931 deg	Op_point	Bode Plot Phase Margin
31.	VIN_OP	6.0 V	Op_point	Vin operating point
32.	Vout p-p	121.897 mV	Op_point	Peak-to-peak output ripple voltage
33.	Cin Pd	18.117 mW	Power	Input capacitor power dissipation
34.	Cout Pd	171.568 mW	Power	Output capacitor power dissipation
35.	Diode Pd	1.65 W	Power	Diode power dissipation
36.	IC Pd	37.429 mW	Power	IC power dissipation
37.	L Pd	801.942 mW	Power	Inductor power dissipation
38.	M1 Pd	536.719 mW	Power	M1 MOSFET total power dissipation
39.	M1 PdCond	390.723 mW	Power	M1 MOSFET conduction losses
40.	M1 PdSw	145.996 mW	Power	M1 MOSFET switching losses
41.	Rfb Pd	15.238 mW	Power	Rfb Power Dissipation
42.	Rsense Pd	358.334 mW	Power	LED Current Rsns Power Dissipation
43.	Total Pd	3.441 W	Power	Total Power Dissipation
44.	Vout Tolerance	3.342 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	lout	3.0	Maximum Output Current
2.	VinMax	11.0	Maximum input voltage
3.	VinMin	6.0	Minimum input voltage
4.	Vout	12.0	Output Voltage
5.	base_pn	LM3481	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature
8.	UserFsw	182.344 k	Customer Selected Frequency

Design Assistance

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

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