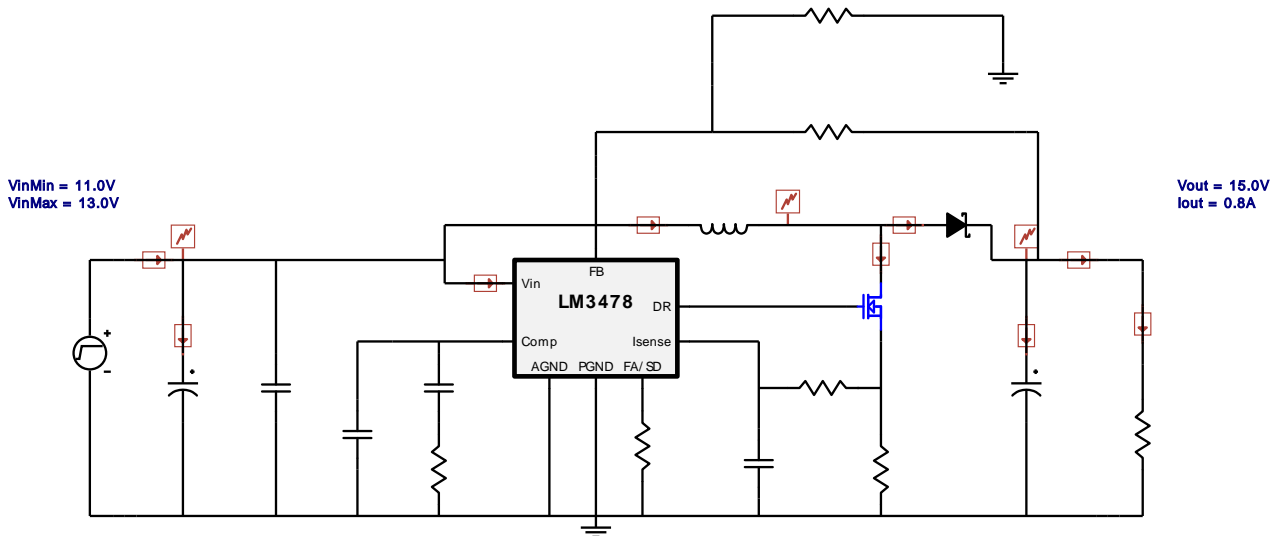




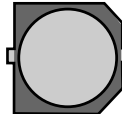




WEBENCH® Electrical Simulation Report


1. With the low turn of voltage of the LM34x8 your power supply may current limit before you reach your working input voltage. If this happens, or to preempt this from happening, you can include a low pass RC filter from input voltage to Vin on the IC. Make sure the rise time on the RC network is slower than your supply's rise time.

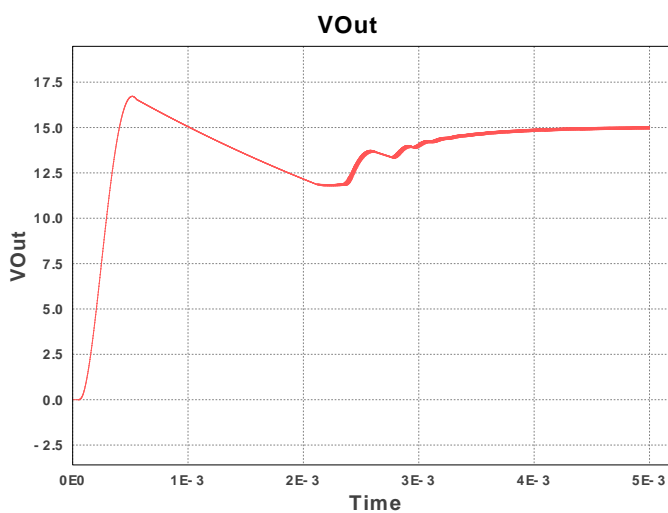
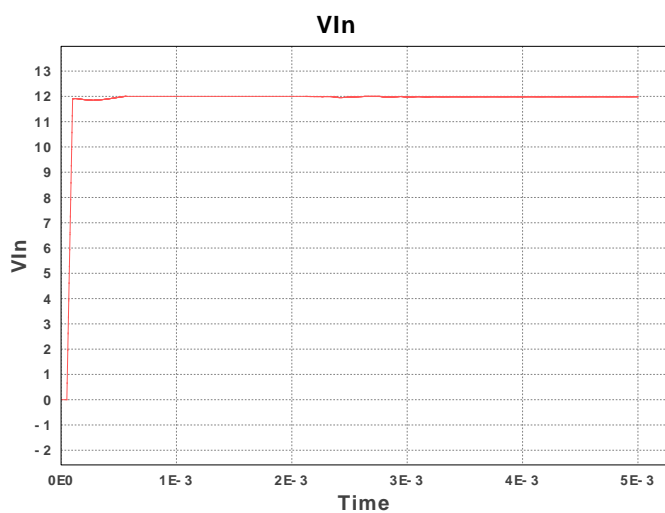
Electrical BOM

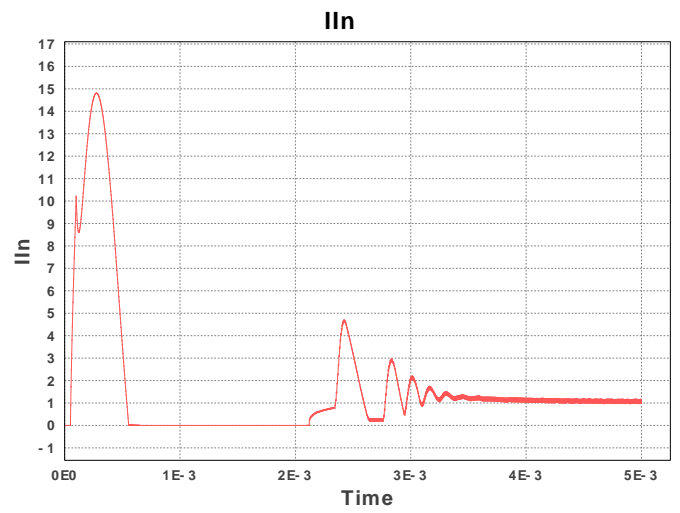
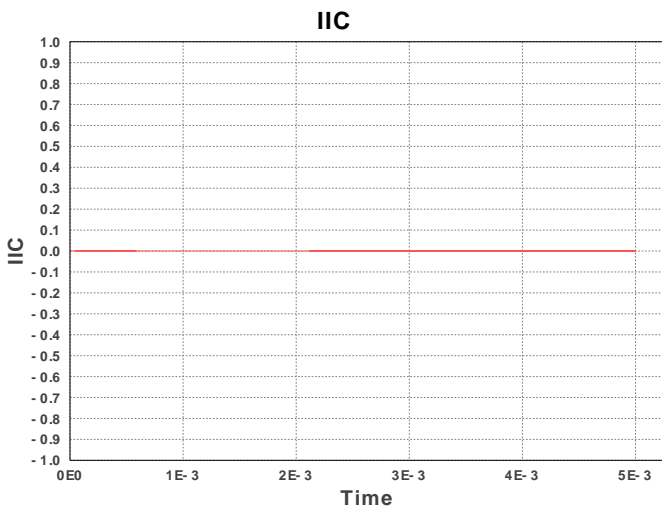
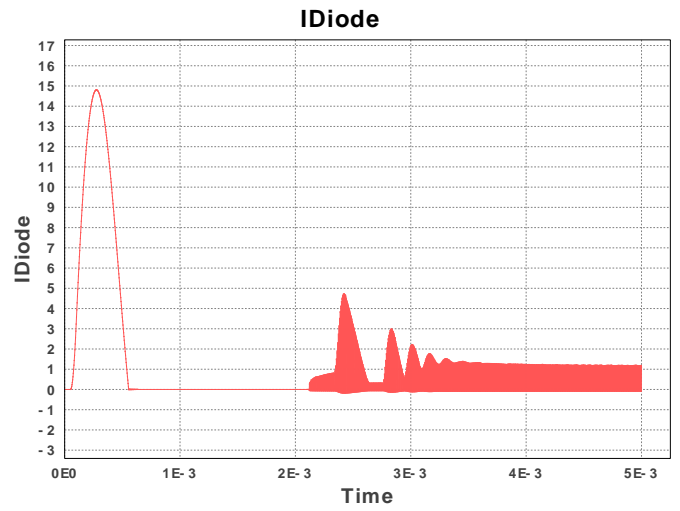
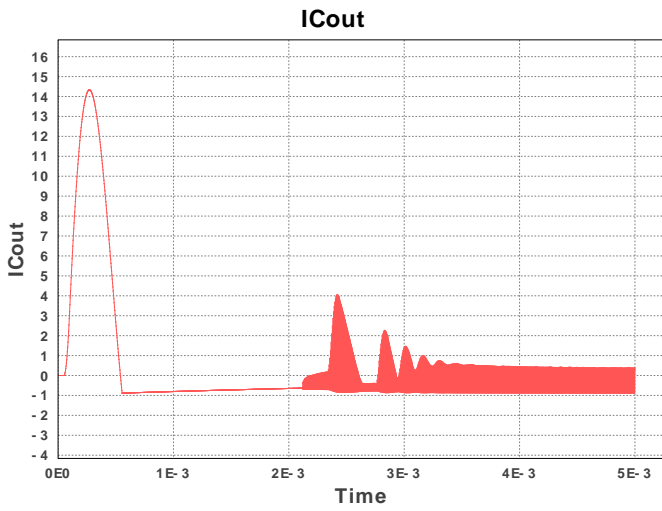
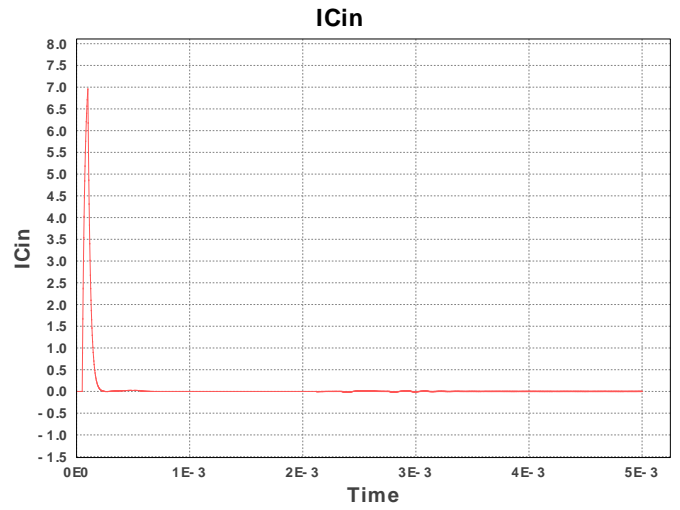
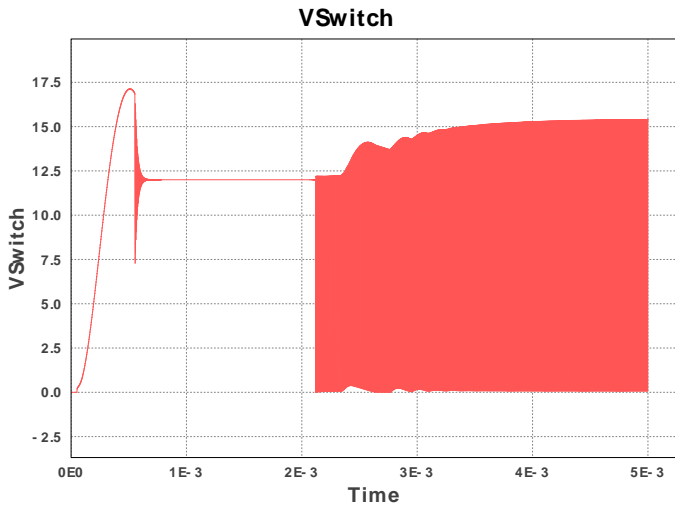
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbyp	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0805 7mm2
2.	Ccomp	Yageo America	CC0805KRX7R9BB153 Series= X7R	Cap= 15.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7mm2
3.	Ccomp2	Yageo America	CC0805KRX7R9BB222 Series= X7R	Cap= 2.2 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7mm2
4.	Cin	Panasonic	EEE-FK1E330UR Series= FK	Cap= 33.0 µF ESR= 700.0 mOhm VDC= 25.0 V IRMS= 160.0 mA	1	\$0.11	 SM_RADIAL_C 62mm2
5.	Cout	Nichicon	UUD1V331MNL1GS Series= uD	Cap= 330.0 µF ESR= 90.0 mOhm VDC= 35.0 V IRMS= 670.0 mA	1	\$0.25	 SM_RADIAL_10BMM 160mm2
6.	Csense	MuRata	GRM216R71H103KA01D Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7mm2
7.	D1	Diodes Inc.	B230A-13-F	VF@Io= 500.0 mV VRRM= 30.0 V	1	\$0.09	 SMA 37mm2

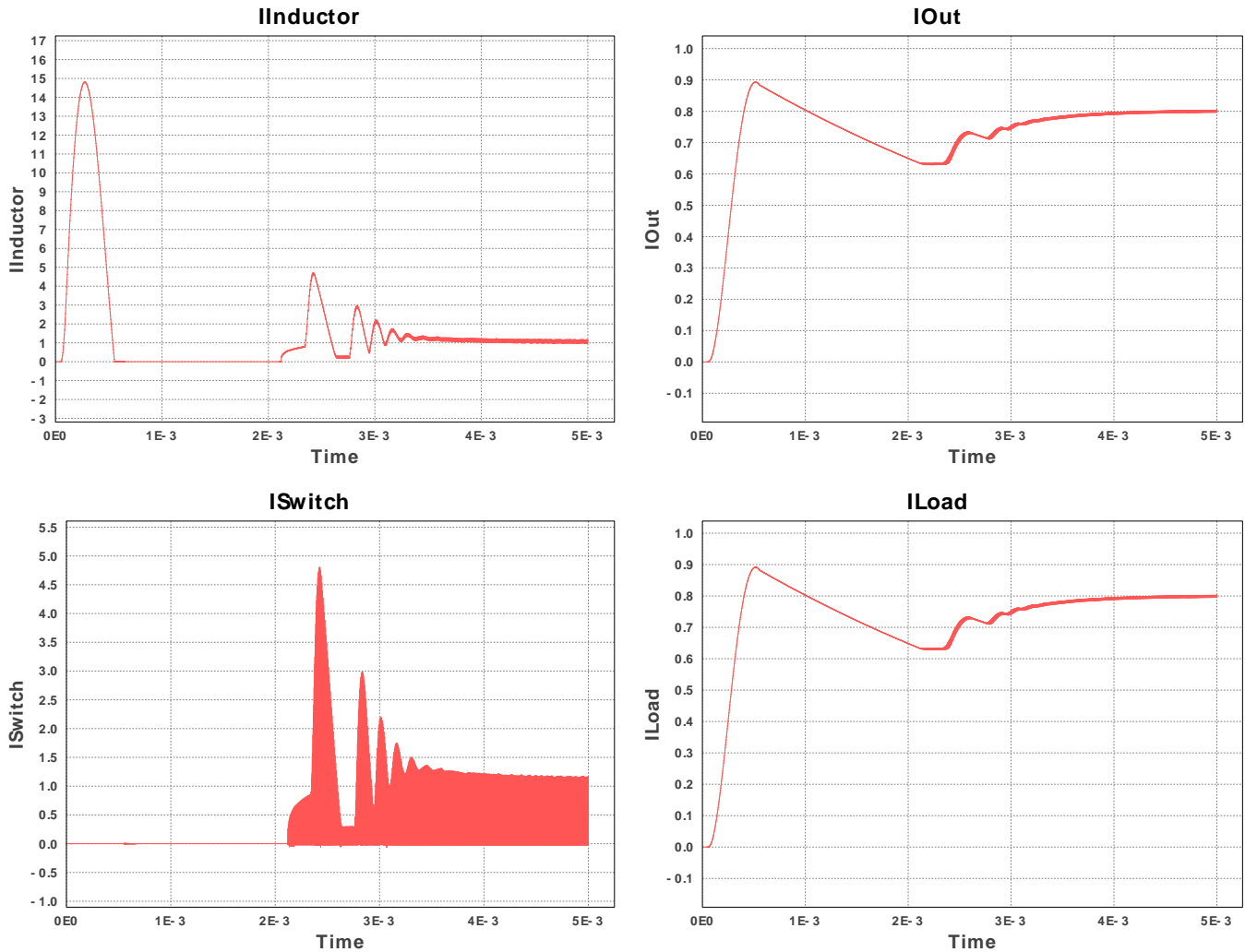
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
8.	L1	Bourns	SRR1260-820M	L= 82.0 μ H DCR= 150.0 mOhm	1	\$0.41	 SRR1260 210mm2
9.	M1	Texas Instruments	CSD16301Q2	VdsMax= 25.0 V IdsMax= 5.0 Amps	1	\$0.17	 TRANS_NexFET_Q2 9mm2
10.	Rcomp	Vishay-Dale	CRCW040212K4FKED Series= CRCW..e3	Res= 12.4 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
11.	Rfadj	Vishay-Dale	CRCW0402113KFKED Series= CRCW..e3	Res= 113.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
12.	Rfb1	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	Res= 1,000 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
13.	Rfb2	Vishay-Dale	CRCW040211K0FKED Series= CRCW..e3	Res= 11.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
14.	Rs1	Vishay-Dale	CRCW0402100RFKED Series= CRCW..e3	Res= 100.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
15.	Rsense	Stackpole Electronics Inc	CSRN2010FK60L0 Series= ?	Res= 60.0 mOhm Power= 1.0 W Tolerance= 1.0%	1	\$0.14	 2010 32mm2
16.	U1	Texas Instruments	LM3478MM/NOPB	Switcher	1	\$0.80	 MUA08A 24mm2

Simulation Parameters

#	Name	Parameter Name	Description	Values
1.	Rload	R	Load Resistance	18.75 Ohm







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	69.336 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	542.134 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	1.164 A	Current	Average input current
4.	L Ipp	240.188 mA	Current	Peak-to-peak inductor ripple current
5.	L1 Irms	1.165 A	Current	Inductor ripple current
6.	M1 Irms	1.089 A	Current	M1 MOSFET Irms
7.	SW Ipk	1.283 A	Current	Peak switch current
8.	BOM Count	16	General	Total Design BOM count
9.	FootPrint	576.0 mm2	General	Total Foot Print Area of BOM components
10.	Frequency	173.3 kHz	General	Switching frequency
11.	IC Tolerance	24.3 mV	General	IC Feedback Tolerance
12.	M Vds Act	25.916 mV	General	M Vds
13.	M1 Rdson	23.798 mOhm	General	Drain-Source On-resistance
14.	M1 ThetaJA	69.0 degC/W	General	MOSFET junction-to-ambient thermal resistance
15.	Mode	CCM	General	Conduction Mode
16.	Pout	12.0 W	General	Total output power
17.	Total BOM	\$2.06	General	Total BOM Cost
18.	D1 Tj	40.0 degC	Op_Point	D1 junction temperature
19.	Vout OP	15.0 V	Op_Point	Operational Output Voltage
20.	Cross Freq	2.021 kHz	Op_point	Bode plot crossover frequency
21.	Duty Cycle	31.227 %	Op_point	Duty cycle
22.	Efficiency	93.716 %	Op_point	Steady state efficiency
23.	IC Tj	39.715 degC	Op_point	IC junction temperature
24.	ICThetaJA	200.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
25.	IOUT_OP	800.0 mA	Op_point	Iout operating point
26.	M1 TjOP	32.605 degC	Op_point	M1 MOSFET junction temperature
27.	Phase Marg	60.969 deg	Op_point	Bode Plot Phase Margin
28.	VIN_OP	11.0 V	Op_point	Vin operating point
29.	Vout p-p	115.501 mV	Op_point	Peak-to-peak output ripple voltage
30.	Cin Pd	3.365 mW	Power	Input capacitor power dissipation
31.	Cout Pd	26.452 mW	Power	Output capacitor power dissipation
32.	Diode Pd	400.0 mW	Power	Diode power dissipation

#	Name	Value	Category	Description
33.	IC Pd	48.575 mW	Power	IC power dissipation
34.	L Pd	244.434 mW	Power	Inductor power dissipation
35.	M1 Pd	37.752 mW	Power	M1 MOSFET total power dissipation
36.	M1 PdCond	28.222 mW	Power	M1 MOSFET conduction losses
37.	M1 PdSw	9.53 mW	Power	M1 MOSFET switching losses
38.	Rfb Pd	18.75 mW	Power	Rfb Power Dissipation
39.	Total Pd	804.672 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	800.0 mA	Maximum Output Current
2.	Iout1	800.0 mAmps	Output Current #1
3.	VinMax	13.0 V	Maximum input voltage
4.	VinMin	11.0 V	Minimum input voltage
5.	Vout	15.0 V	Output Voltage
6.	Vout1	15.0 Volt	Output Voltage #1
7.	base_pn	LM3478	Base Product Number
8.	source	DC	Input Source Type
9.	Ta	30.0 degC	Ambient temperature
10.	UserFsw	173.3 kHz	Customer Selected Frequency

Design Assistance

1. **LM3478** Product Folder : <http://www.ti.com/product/lm3478> : contains the data sheet and other resources.

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