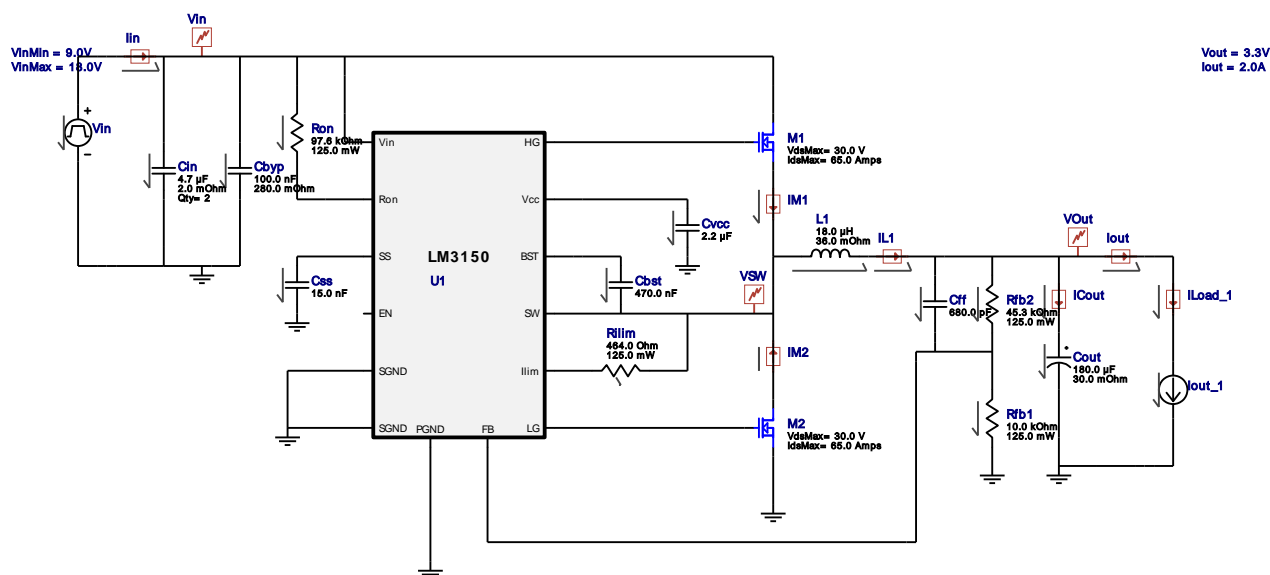








## WEBENCH® Electrical Simulation Report



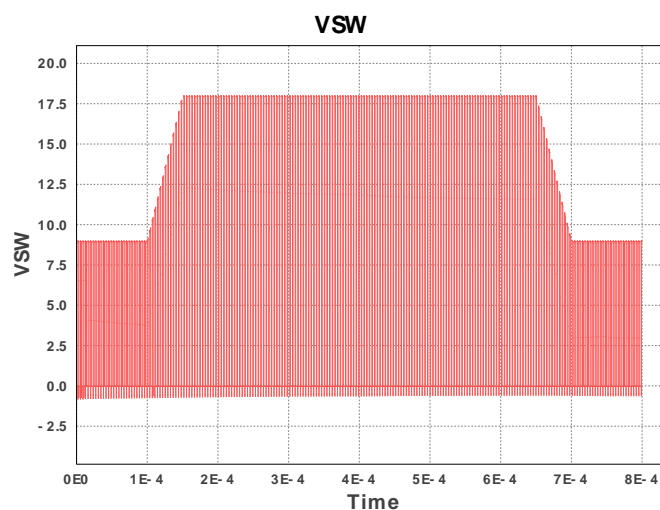
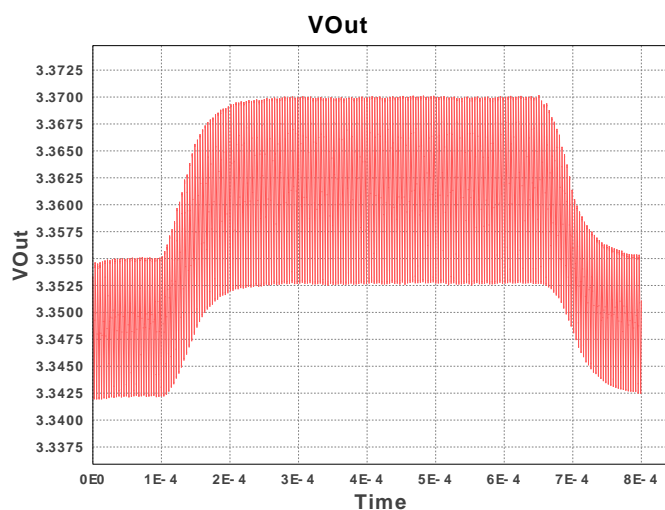
## Electrical BOM

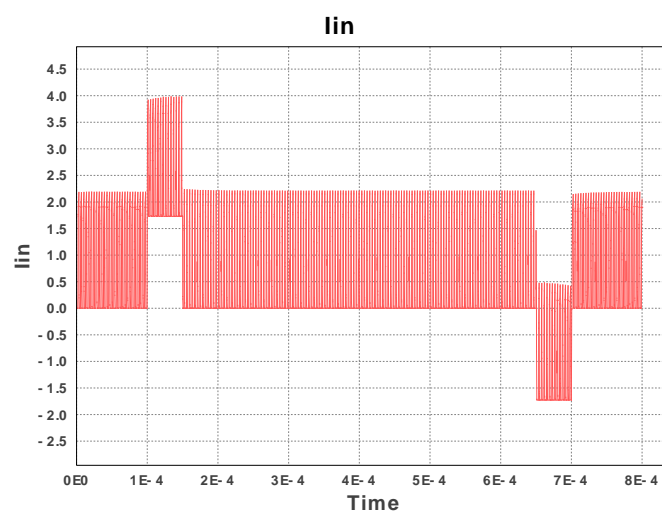
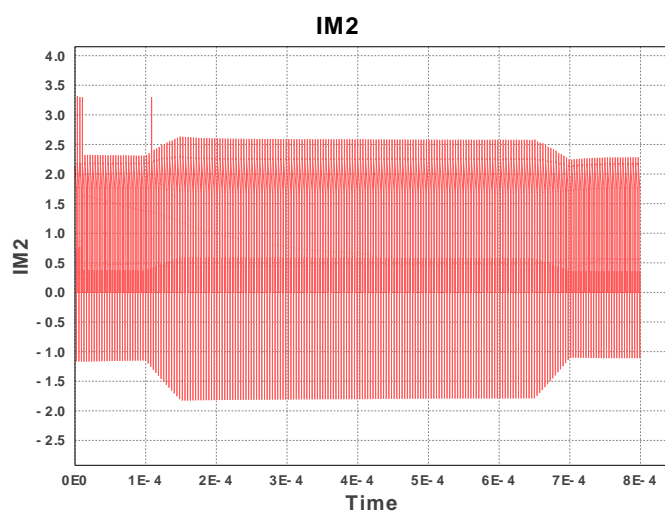
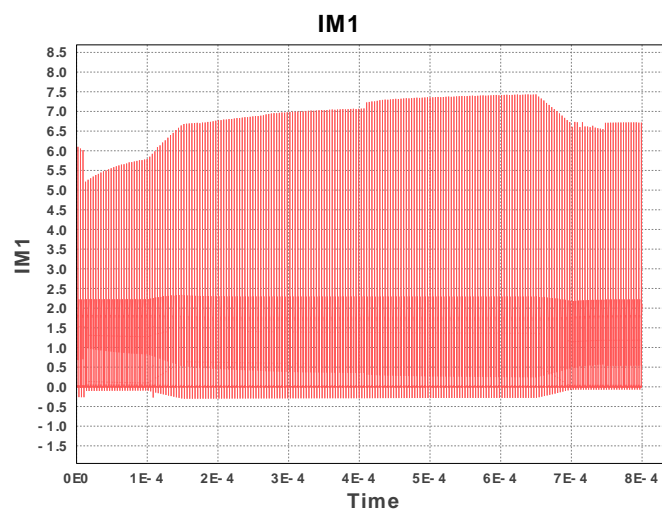
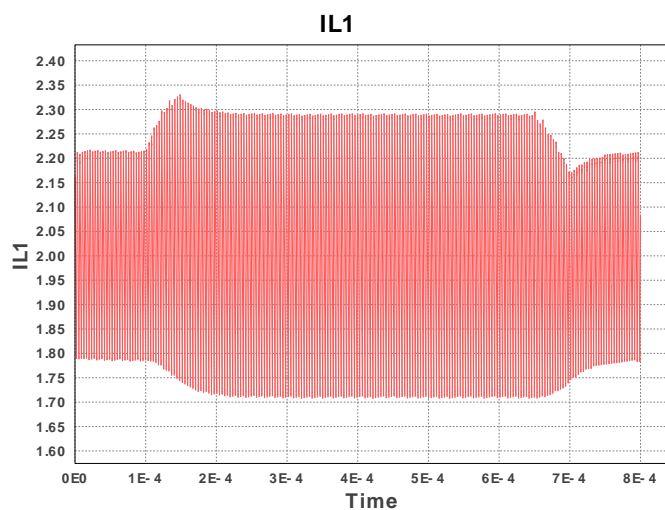
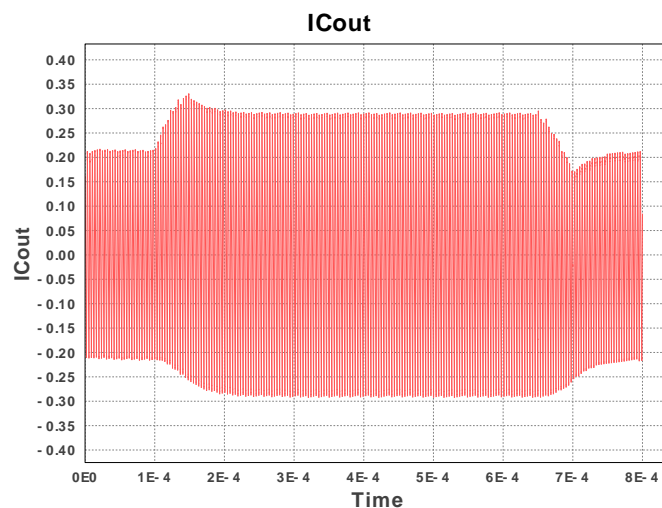
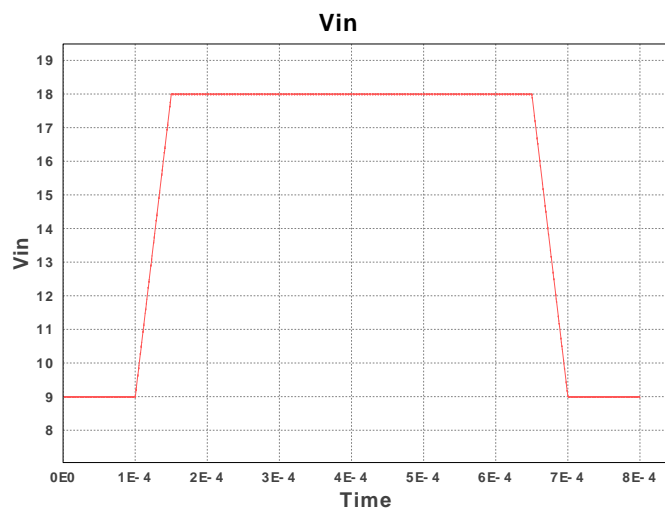
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	Taiyo Yuden	EMK212B7474KD-T Series= X7R	Cap= 470.0 nF VDC= 16.0 V IRMS= 0.0 A	1	\$0.02	 0805 7mm2
2.	Cbyp	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0805 7mm2
3.	Cff	Yageo America	CC0805KRX7R9BB681 Series= X7R	Cap= 680.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7mm2
4.	Cin	MuRata	GRM21BR61E475MA12L Series= X5R	Cap= 4.7 µF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 7.29 A	2	\$0.06	 0805 7mm2
5.	Cout	Panasonic	16SVP180MX Series= 261	Cap= 180.0 µF ESR= 30.0 mOhm VDC= 16.0 V IRMS= 3.02 A	1	\$0.29	 SM_RADIAL_10AMM 160mm2
6.	Css	Yageo America	CC0805KRX7R9BB153 Series= X7R	Cap= 15.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7mm2
7.	Cvcc	Taiyo Yuden	EMK212B7225KG-T Series= X7R	Cap= 2.2 µF VDC= 16.0 V IRMS= 0.0 A	1	\$0.03	 0805 7mm2
8.	L1	Bourns	SRR1260-180M	L= 18.0 µH DCR= 36.0 mOhm	1	\$0.41	 SRR1260 210mm2

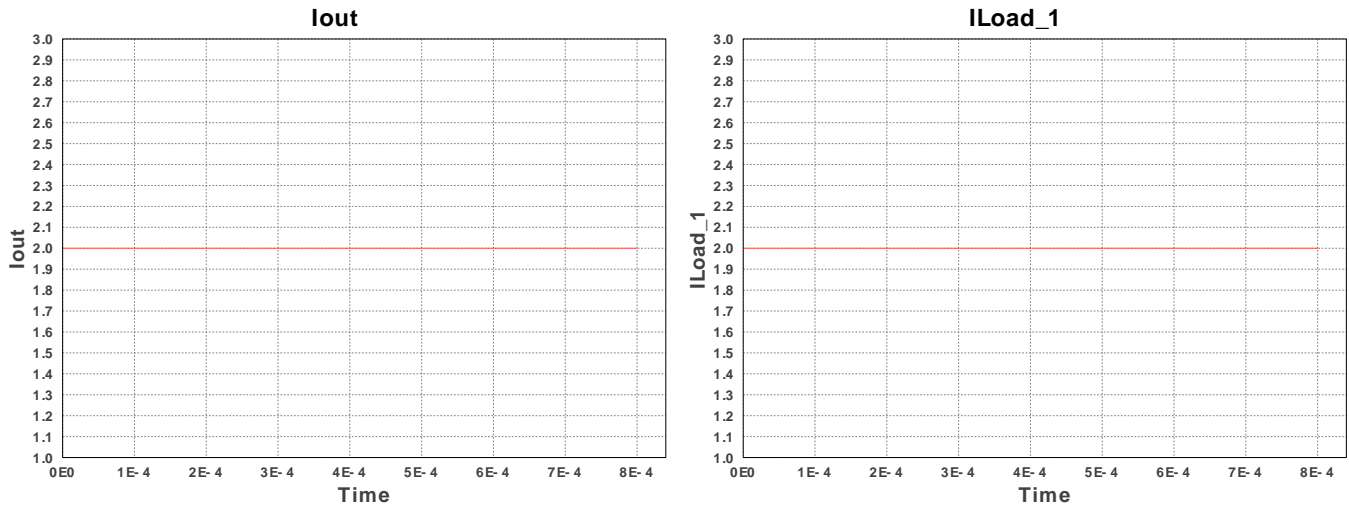
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
9.	M1	Texas Instruments	CSD17507Q5A	VdsMax= 30.0 V IdsMax= 65.0 Amps	1	\$0.34	 TRANS_NexFET_Q5A 55mm2
10.	M2	Texas Instruments	CSD17507Q5A	VdsMax= 30.0 V IdsMax= 65.0 Amps	1	\$0.34	 TRANS_NexFET_Q5A 55mm2
11.	Rfb1	Panasonic	ERJ-6ENF1002V Series= 225	Res= 10.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7mm2
12.	Rfb2	Panasonic	ERJ-6ENF4532V Series= 225	Res= 45.3 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7mm2
13.	Rilim	Vishay-Dale	CRCW0805464RFKEA Series= CRCW..e3	Res= 464.0 Ohm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7mm2
14.	Ron	Panasonic	ERJ-6ENF9762V Series= 225	Res= 97.6 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7mm2
15.	U1	Texas Instruments	LM3150MH/NOPB	Switcher	1	\$1.55	 MXA14A 59mm2

## Simulation Parameters

#	Name	Parameter Name	Description	Values
1.	Cin	IC	Initial Condition Across Cin	9.0 V
2.	Cout	IC	Initial Condition Across Cout	3.3 V
3.	Css	IC	Initial Condition	2 V
4.	Cvcc	IC	Initial Condition	6 V
5.	L1	IC	Initial Condition Through L1	2.0 A
6.	Iout_1	I	Load Current	2.0 A







## Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	784.605 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	150.89 mA	Current	Output capacitor RMS ripple current
3.	I lim	3.365 A	Current	Current limit threshold
4.	Iin Avg	390.37 mA	Current	Average input current
5.	L Ipp	522.699 mA	Current	Peak-to-peak inductor ripple current
6.	SW Ipk	2.261 A	Current	Peak switch current
7.	BOM Count	16	General	Total Design BOM count
8.	FootPrint	614.0 mm2	General	Total Foot Print Area of BOM components
9.	Frequency	296.86 kHz	General	Switching frequency
10.	IC Tolerance	12.0 mV	General	IC Feedback Tolerance
11.	Mode	CCM	General	Conduction Mode
12.	Pout	6.6 W	General	Total output power
13.	Total BOM	\$3.17	General	Total BOM Cost
14.	Duty Cycle	19.0 %	Op_point	Duty cycle
15.	Efficiency	93.929 %	Op_point	Steady state efficiency
16.	IC Tj	38.184 degC	Op_point	IC junction temperature
17.	IOUT_OP	2.0 A	Op_point	Iout operating point
18.	M1 Tj	32.182 degC	Op_point	M1 MOSFET junction temperature
19.	M2 Tj	33.953 degC	Op_point	M2 MOSFET junction temperature
20.	VIN_OP	18.0 V	Op_point	Vin operating point
21.	Vout p-p	15.729 mV	Op_point	Peak-to-peak output ripple voltage
22.	Cin Pd	615.605 $\mu$ W	Power	Input capacitor power dissipation
23.	Cout Pd	683.035 $\mu$ W	Power	Output capacitor power dissipation
24.	IC Pd	125.908 mW	Power	IC power dissipation
25.	L Pd	180.0 mW	Power	Inductor power dissipation
26.	M1 Pd	42.69 mW	Power	M1 MOSFET total power dissipation
27.	M1 PdCond	9.125 mW	Power	M1 MOSFET conduction losses
28.	M1 PdSw	33.565 mW	Power	M1 MOSFET switching losses
29.	M2 Pd	76.716 mW	Power	M2 MOSFET total power dissipation
30.	M2 PdCond	38.744 mW	Power	M2 MOSFET conduction losses
31.	M2 PdSw	37.972 mW	Power	M2 MOSFET switching losses
32.	Total Pd	426.589 mW	Power	Total Power Dissipation

## Design Inputs

#	Name	Value	Description
1.	Iout	2.0 A	Maximum Output Current
2.	Iout1	2.0 Amps	Output Current #1
3.	SoftStart	1.0 ms	Soft Start Time (ms)
4.	VinMax	18.0 V	Maximum input voltage
5.	VinMin	9.0 V	Minimum input voltage
6.	Vout	3.3 V	Output Voltage
7.	Vout1	3.3 Volt	Output Voltage #1
8.	base_pn	LM3150	Base Product Number
9.	source	DC	Input Source Type
10.	Ta	30.0 degC	Ambient temperature
11.	UserFsw	277.593 kHz	Customer Selected Frequency

## Design Assistance

1. **LM3150** Product Folder : <http://www.ti.com/product/lm3150> : contains the data sheet and other resources.

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