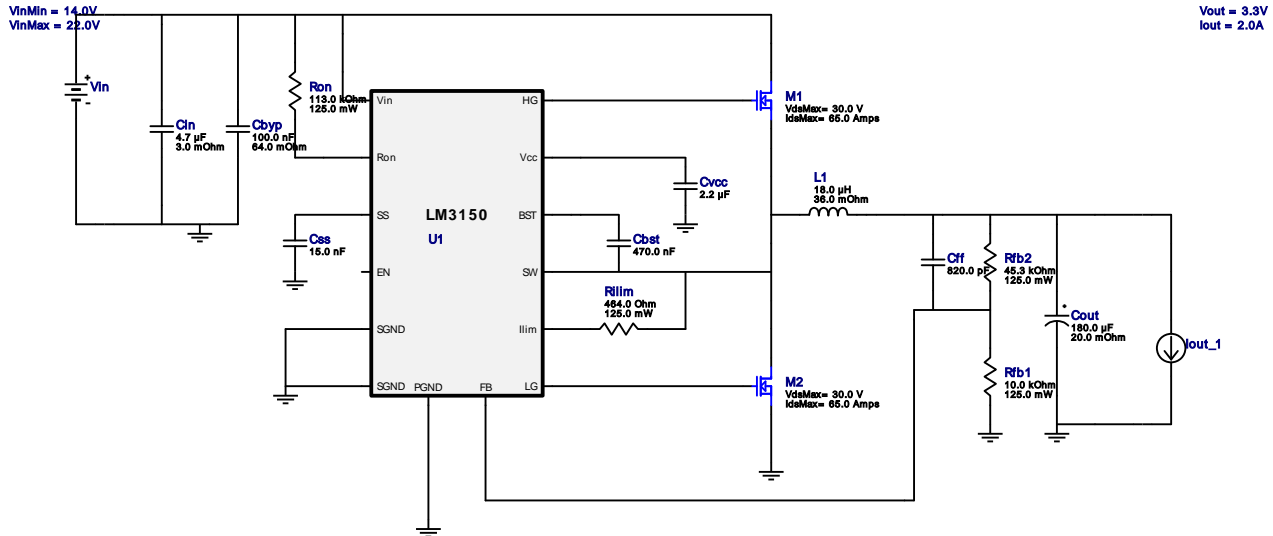







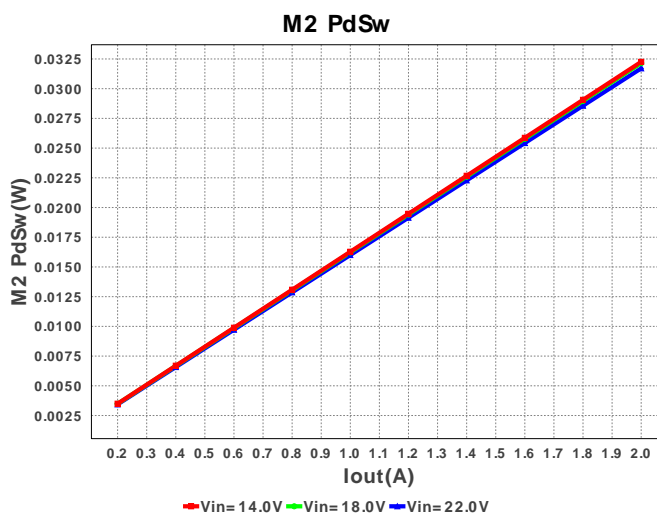
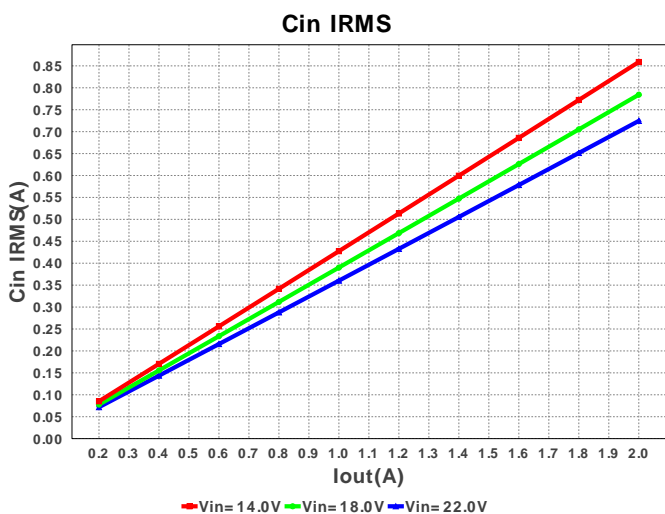
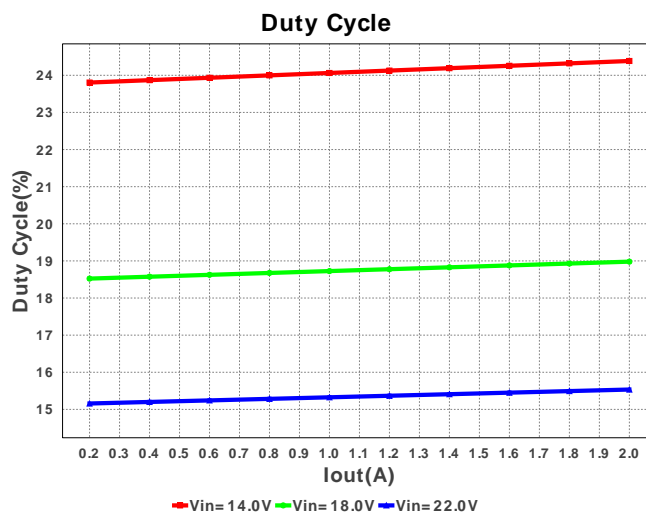
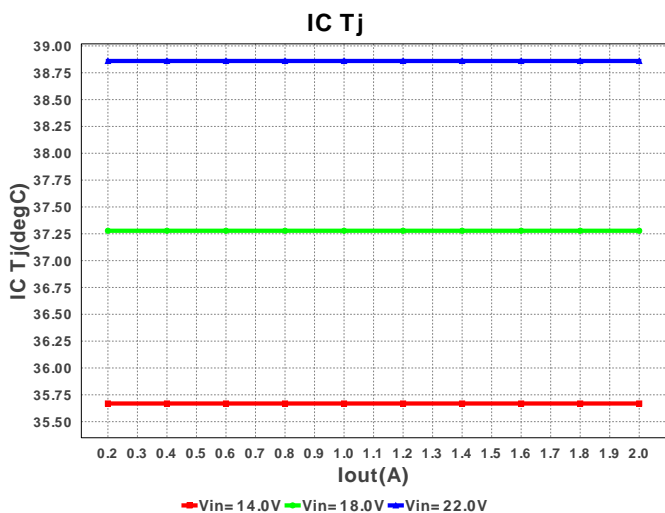


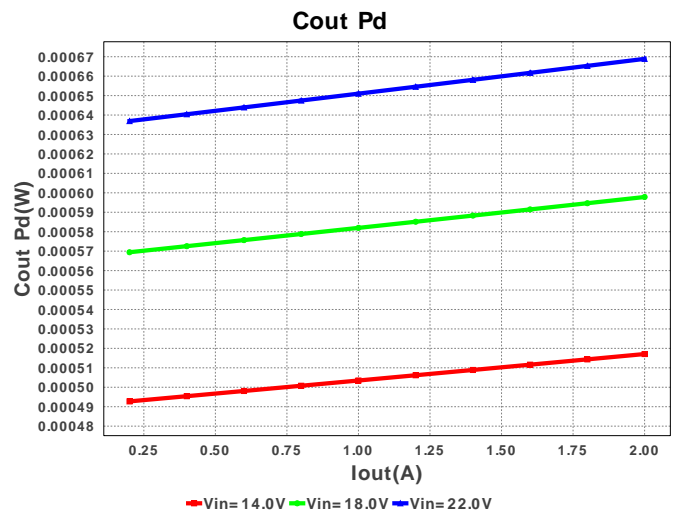
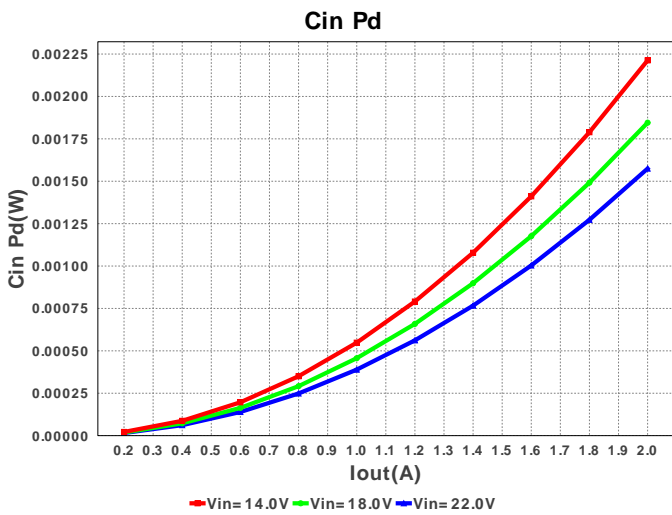
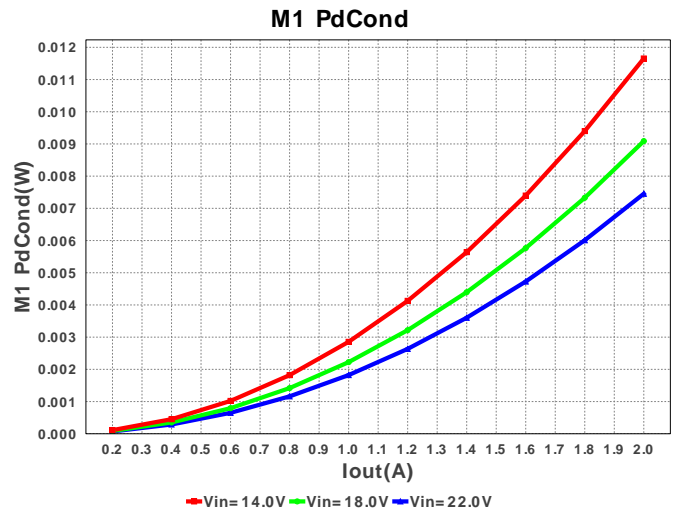
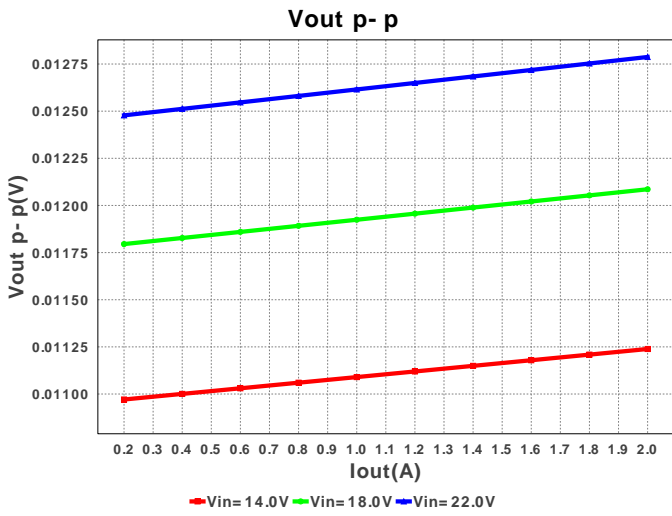
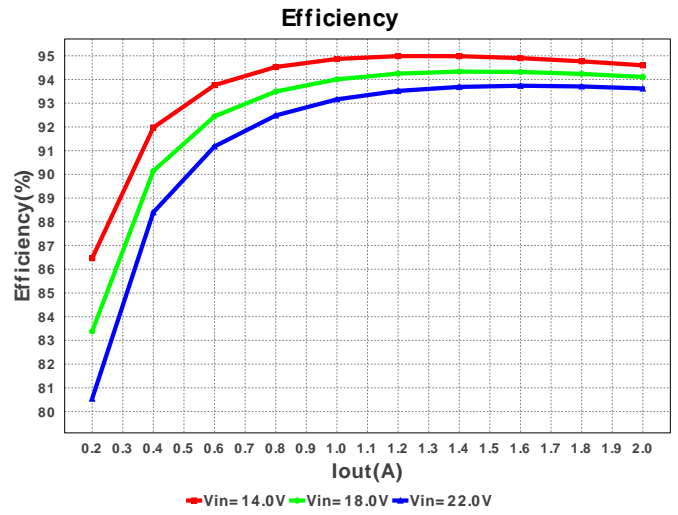
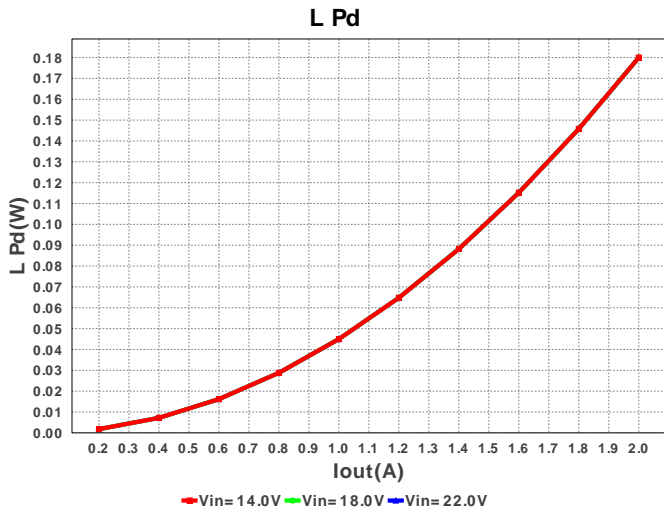
WEBENCH® Design Report

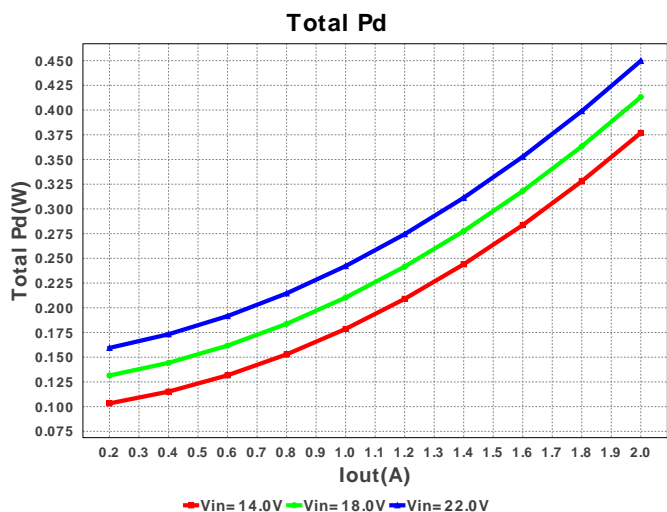
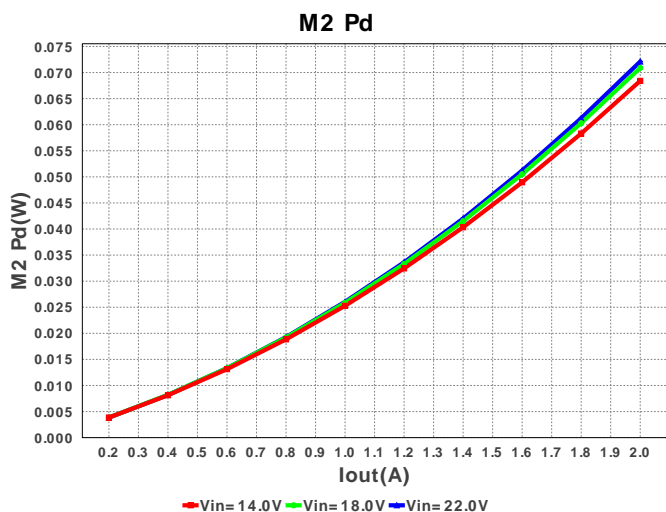
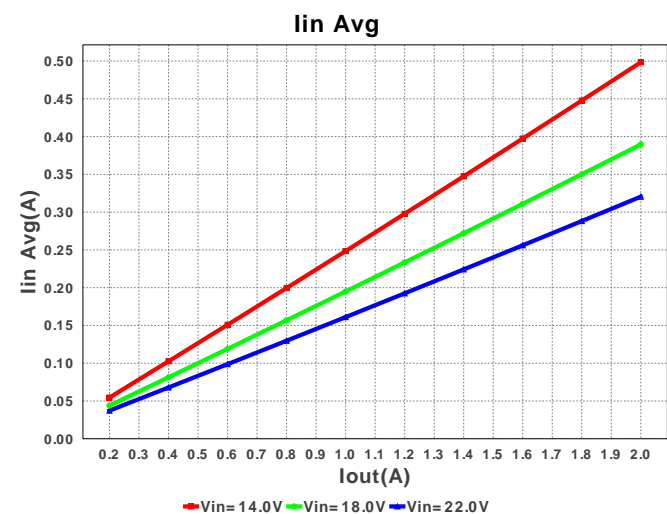
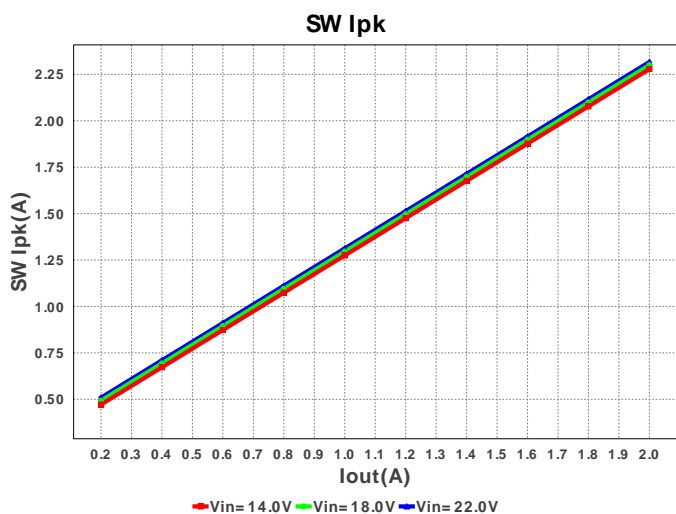
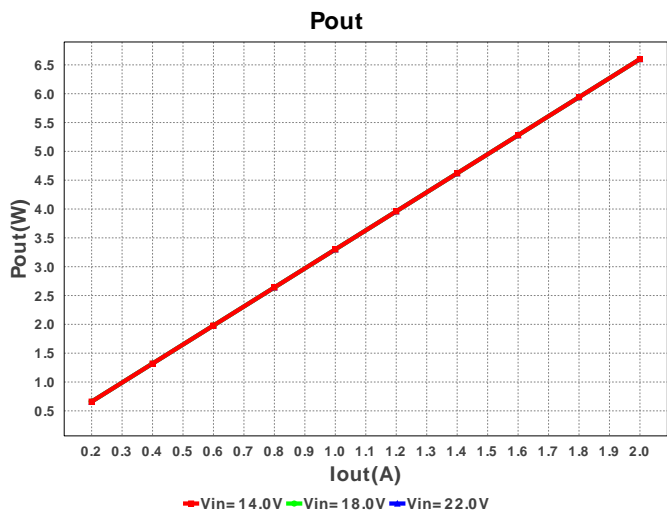
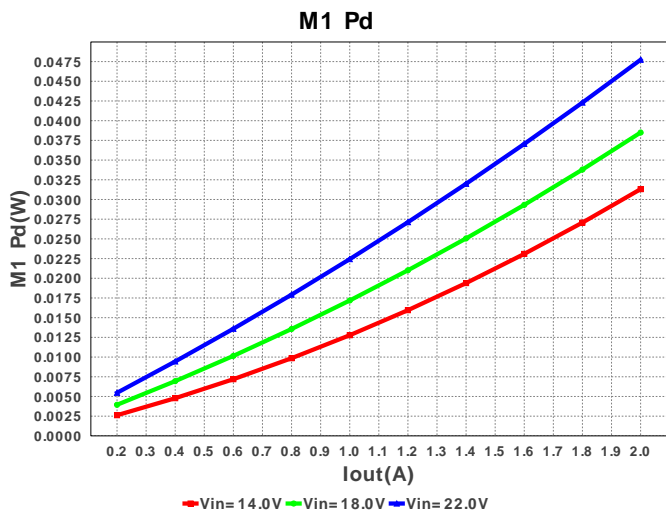
 Design : 4046158/6 LM3150MHX/NOPB
 LM3150MHX/NOPB 14.0V-22.0V to 3.3V @ 2.0A

Electrical BOM

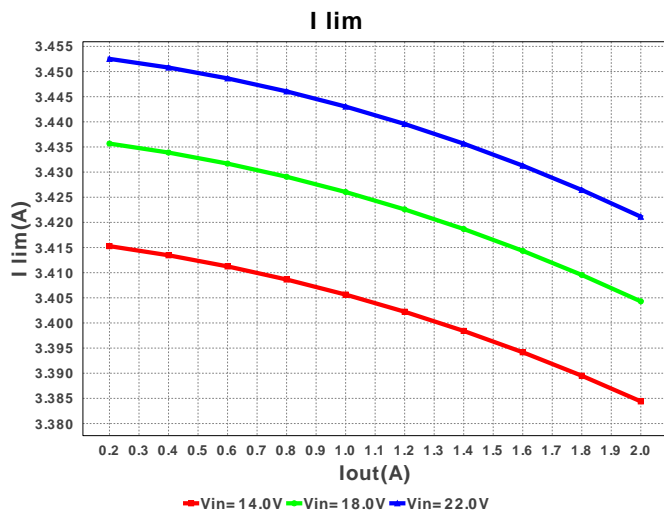
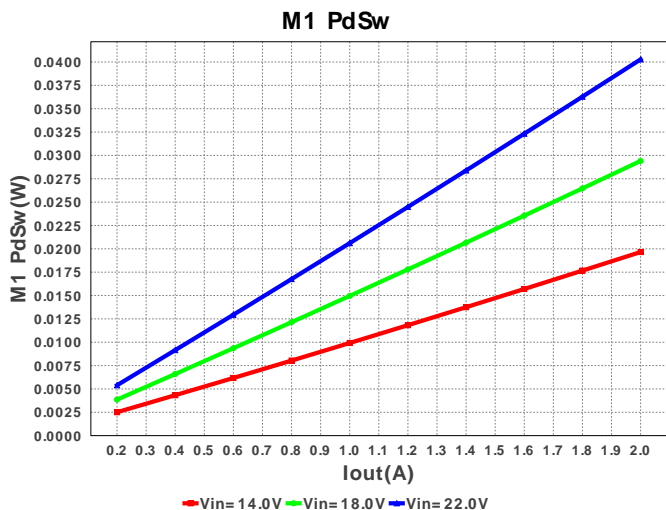
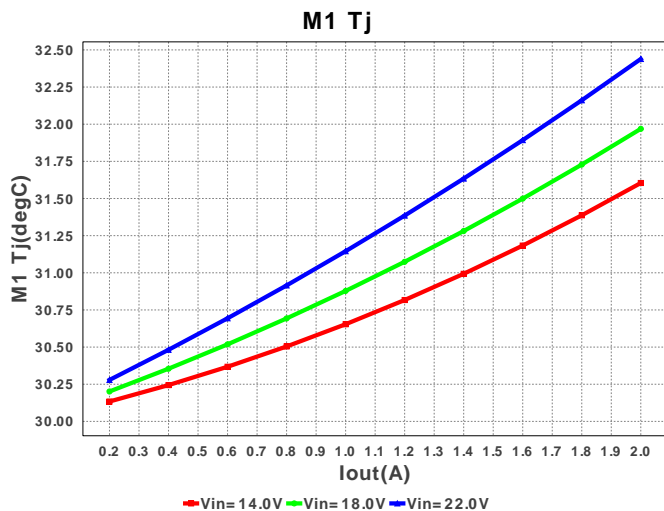
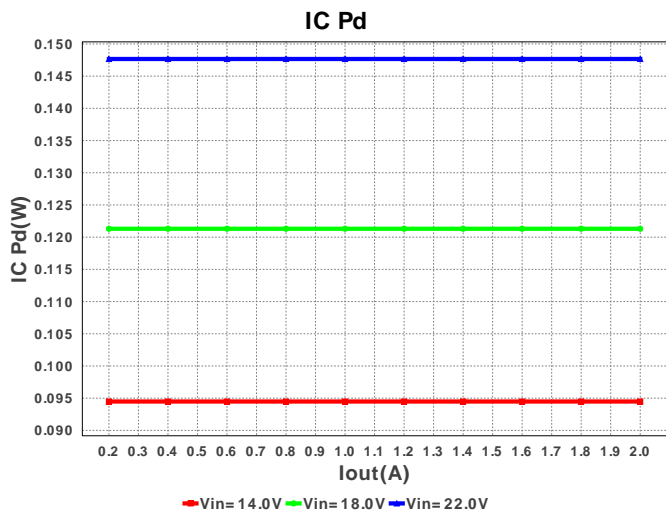
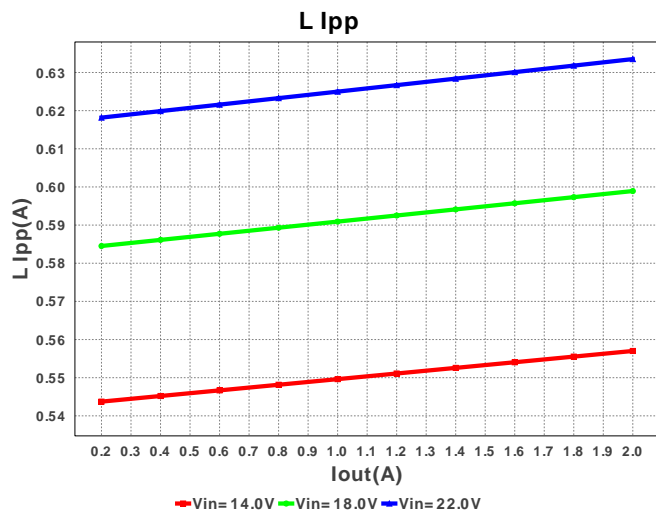
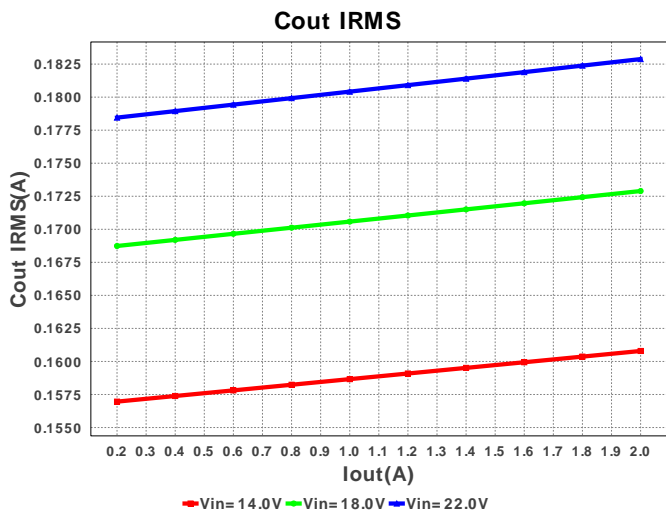
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	Taiyo Yuden	EMK212B7474KD-T Series= X7R	Cap= 470.0 nF VDC= 16.0 V IRMS= 0.0 A	1	\$0.02	 0805 7mm2
2.	Cbyp	Kemet	C0805C104K5RACTU Series= X7R	Cap= 100.0 nF ESR= 64.0 mOhm VDC= 50.0 V IRMS= 1.64 A	1	\$0.01	 0805 7mm2
3.	Cff	Yageo America	CC0805KRX7R9BB821 Series= X7R	Cap= 820.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7mm2
4.	Cin	MuRata	GRM31CR71H475KA12L Series= X7R	Cap= 4.7 µF ESR= 3.0 mOhm VDC= 50.0 V IRMS= 4.98 A	1	\$0.10	 1206 11mm2
5.	Cout	Panasonic	16SVP180M Series= 261	Cap= 180.0 µF ESR= 20.0 mOhm VDC= 16.0 V IRMS= 3.64 A	1	\$0.29	 SM_RADIAL_8MM 113mm2
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

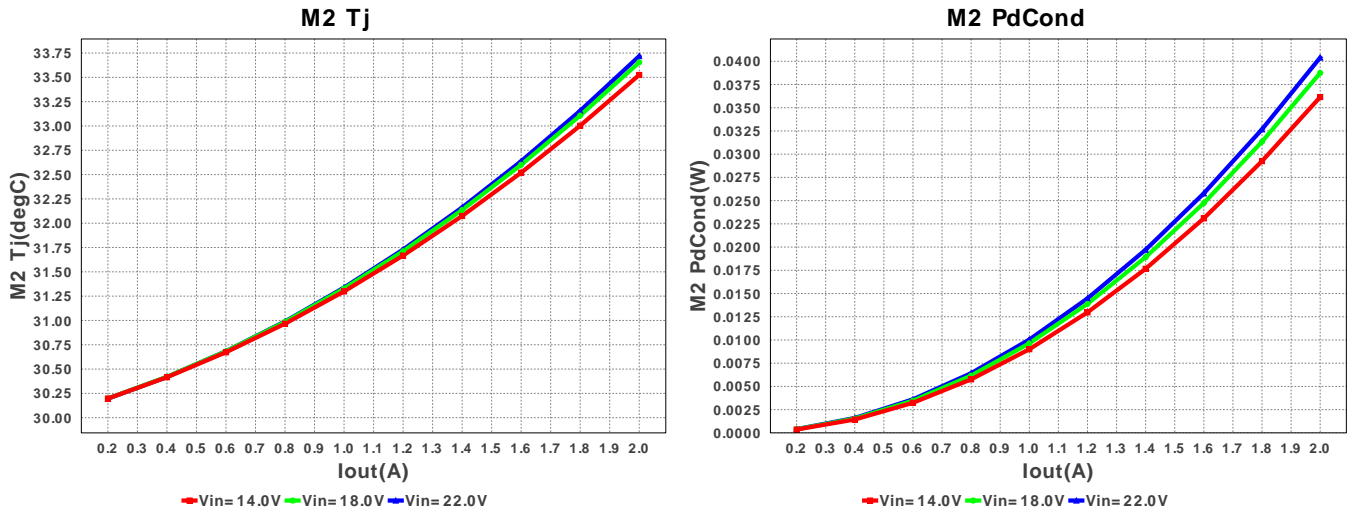
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
9.	M1	Texas Instruments	CSD17507Q5A	VdsMax= 30.0 V IdsMax= 65.0 Amps	1	\$0.34	 TRANS_NexFET_Q5A 55mm2
10.	M2	Texas Instruments	CSD17507Q5A	VdsMax= 30.0 V IdsMax= 65.0 Amps	1	\$0.34	 TRANS_NexFET_Q5A 55mm2
11.	Rfb1	Panasonic	ERJ-6ENF1002V 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-6ENF1133V Series= 225	Res= 113.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7mm2
15.	U1	Texas Instruments	LM3150MHX/NOPB	Switcher	1	\$1.55	 MXA14A 59mm2











Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	724.471 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	182.879 mA	Current	Output capacitor RMS ripple current
3.	I lim	3.42 A	Current	Current limit threshold
4.	Iin Avg	320.49 mA	Current	Average input current
5.	L Ipp	633.511 mA	Current	Peak-to-peak inductor ripple current
6.	SW Ipk	2.317 A	Current	Peak switch current
7.	BOM Count	15	General	Total Design BOM count
8.	FootPrint	564.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	254.753 kHz	General	Switching frequency
10.	IC Tolerance	12.0 mV	General	IC Feedback Tolerance
11.	Pout	6.6 W	General	Total output power
12.	Total BOM	\$3.15	General	Total BOM Cost
13.	Duty Cycle	15.535 %	Op_point	Duty cycle
14.	Efficiency	93.606 %	Op_point	Steady state efficiency
15.	IC Tj	39.598 degC	Op_point	IC junction temperature
16.	IOUT_OP	2.0 A	Op_point	Iout operating point
17.	M1 Tj	32.439 degC	Op_point	M1 MOSFET junction temperature
18.	M2 Tj	33.773 degC	Op_point	M2 MOSFET junction temperature
19.	VIN_OP	22.0 V	Op_point	Vin operating point
20.	Vout p-p	12.787 mV	Op_point	Peak-to-peak output ripple voltage
21.	Cin Pd	1.575 mW	Power	Input capacitor power dissipation
22.	Cout Pd	668.893 μW	Power	Output capacitor power dissipation
23.	IC Pd	147.663 mW	Power	IC power dissipation
24.	L Pd	180.0 mW	Power	Inductor power dissipation
25.	M1 Pd	47.737 mW	Power	M1 MOSFET total power dissipation
26.	M1 PdCond	7.456 mW	Power	M1 MOSFET conduction losses
27.	M1 PdSw	40.28 mW	Power	M1 MOSFET switching losses
28.	M2 Pd	73.177 mW	Power	M2 MOSFET total power dissipation
29.	M2 PdCond	40.407 mW	Power	M2 MOSFET conduction losses
30.	M2 PdSw	32.77 mW	Power	M2 MOSFET switching losses
31.	Total Pd	450.827 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	22.0 V	Maximum input voltage
5.	VinMin	14.0 V	Minimum input voltage
6.	Vout	3.3 V	Output Voltage
7.	Vout1	3.3 Volt	Output Voltage #1
8.	base_pn	LM3150	Texas Instruments Base Part Number
9.	source	DC	Input Source Type
10.	ta	30.0 degC	Ambient temperature
11.	userfsw	343.73 kHz	Customer Selected Frequency

Design Assistance

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

Texas Instruments' WEBENCH simulation tools attempt to recreate the performance of a substantially equivalent physical implementation of the design. Simulations are created using Texas Instruments' published specifications as well as the published specifications of other device manufacturers. While Texas Instruments does update this information periodically, this information may not be current at the time the simulation is built. Texas Instruments does not warrant the accuracy or completeness of the specifications or any information contained therein. Texas Instruments does not warrant that any designs or recommended parts will meet the specifications you entered, will be suitable for your application or fit for any particular purpose, or will operate as shown in the simulation in a physical implementation. Texas Instruments does not warrant that the designs are production worthy.

You should completely validate and test your design implementation to confirm the system functionality for your application prior to production.

Use of Texas Instruments' WEBENCH simulation tools is subject to [Texas Instruments' Site Terms and Conditions of Use](#). Prototype boards based on WEBENCH created designs are provided AS IS without warranty of any kind for evaluation and testing purposes and are subject to the terms of the [Evaluation License Agreement](#).