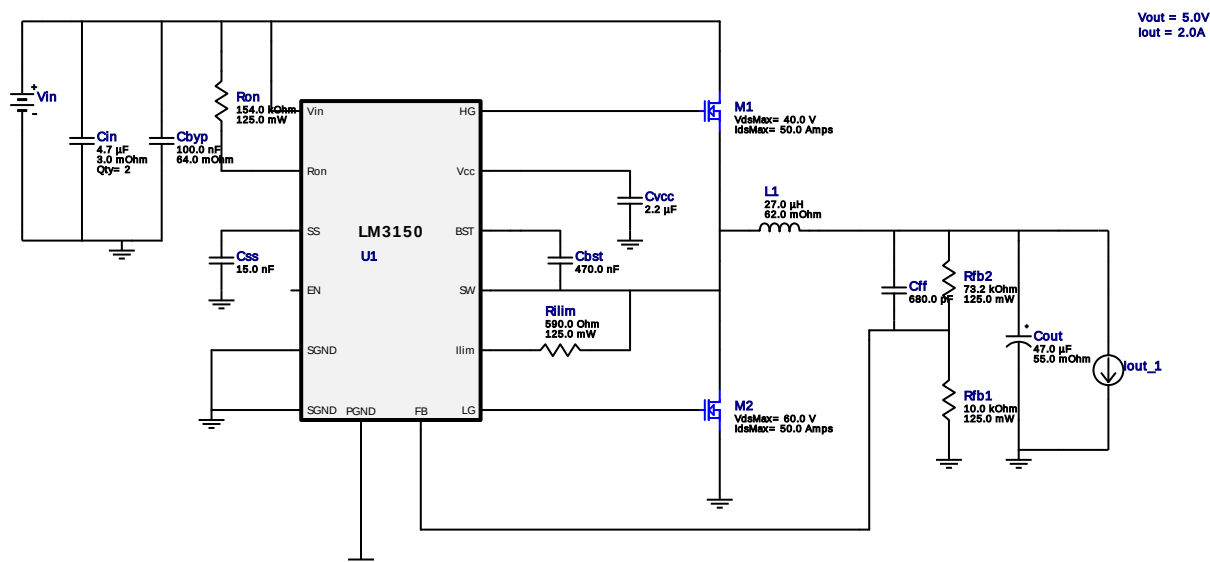


WEBENCH® Design Report

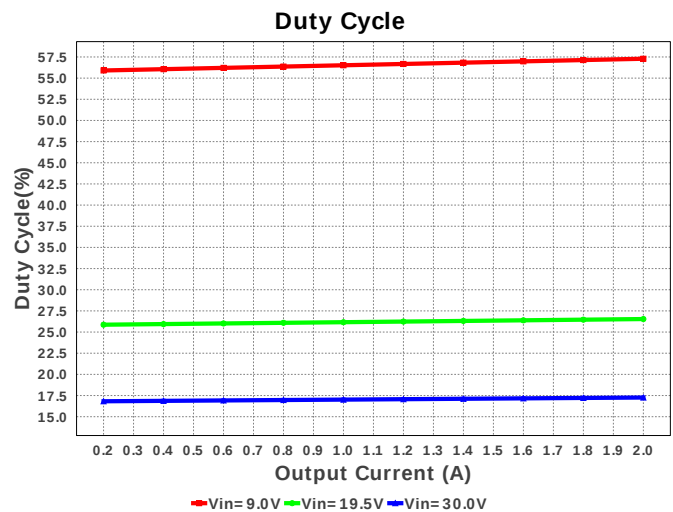
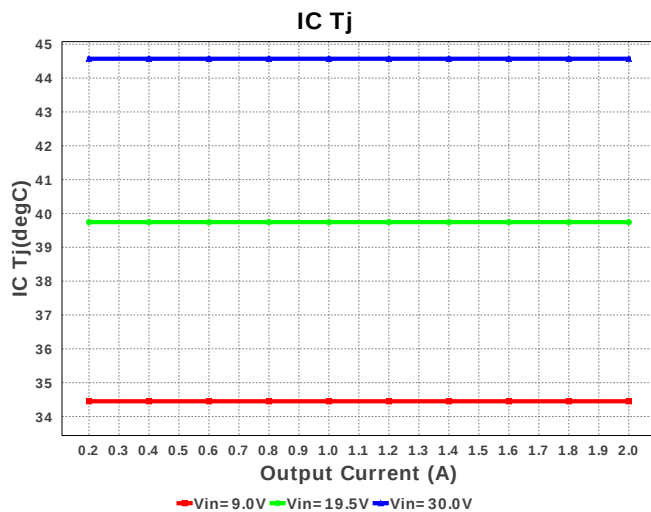
Design : 2350594/21 LM3150MH/NOPB
LM3150MH/NOPB 9.0V-30.0V to 5.00V @ 2.0A



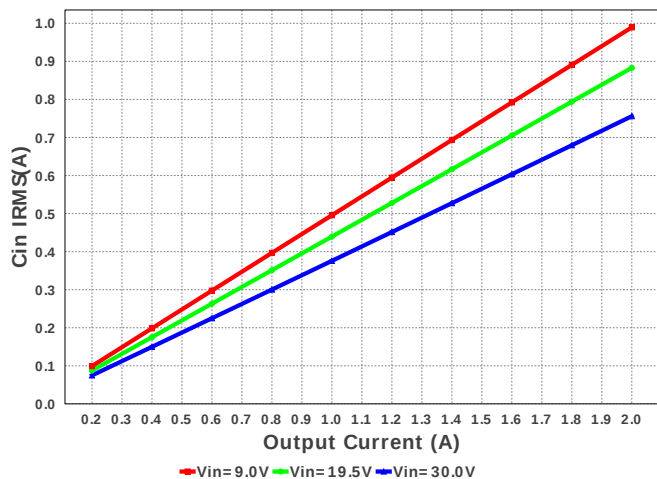
Electrical BOM

#	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 7 mm ²
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 7 mm ²
3.	Cff	Yageo America	CC0805KRX7R9BB681 Series= X7R	Cap= 680.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
4.	Cin	MuRata	GRM31CR71H475KA12L Series= X7R	Cap= 4.7 uF ESR= 3.0 mOhm VDC= 50.0 V IRMS= 4.98 A	2	\$0.07	1206 11 mm ²
5.	Cout	Panasonic	6TPC47M Series= ?	Cap= 47.0 uF ESR= 55.0 mOhm VDC= 6.3 V IRMS= 1.1 A	1	\$0.42	CAPSMT_6_B1G 17 mm ²
6.	Css	Yageo America	CC0805KRX7R9BB153 Series= X7R	Cap= 15.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
7.	Cvcc	Taiyo Yuden	EMK212B7225KG-T Series= X7R	Cap= 2.2 uF VDC= 16.0 V IRMS= 0.0 A	1	\$0.03	0805 7 mm ²
8.	L1	Bourns	SRR1208-270ML	L= 27.0 µH DCR= 62.0 mOhm	1	\$0.37	SRR1208 216 mm ²

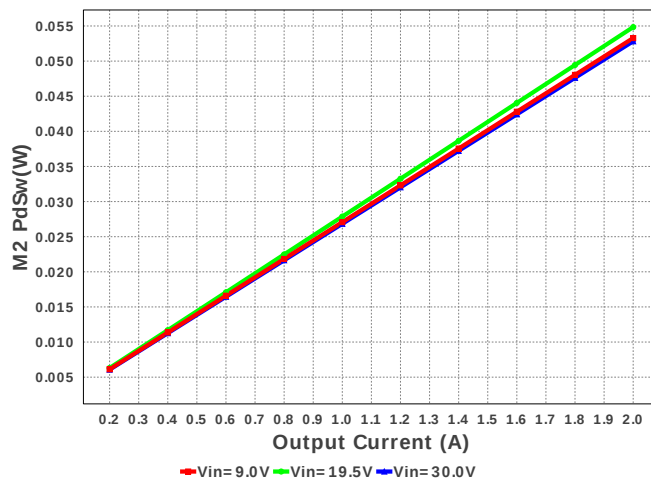
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
9.	M1	Texas Instruments	CSD18504Q5A	VdsMax= 40.0 V IdsMax= 50.0 Amps	1	\$0.37	 TRANS_NexFET_Q5A 55 mm ²
10.	M2	Texas Instruments	CSD18537NQ5A	VdsMax= 60.0 V IdsMax= 50.0 Amps	1	\$0.31	 TRANS_NexFET_Q5A 55 mm ²
11.	Rfb1	Panasonic	ERJ-6ENF1002V Series= ERJ-6E	Res= 10.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
12.	Rfb2	Panasonic	ERJ-6ENF7322V Series= ERJ-6E	Res= 73.2 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
13.	Rilim	Vishay-Dale	CRCW0805590RFKEA Series= CRCW..e3	Res= 590.0 Ohm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
14.	Ron	Panasonic	ERJ-6ENF1543V Series= ERJ-6E	Res= 154.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
15.	U1	Texas Instruments	LM3150MH/NOPB	Switcher	1	\$1.62	 MXA14A 59 mm ²



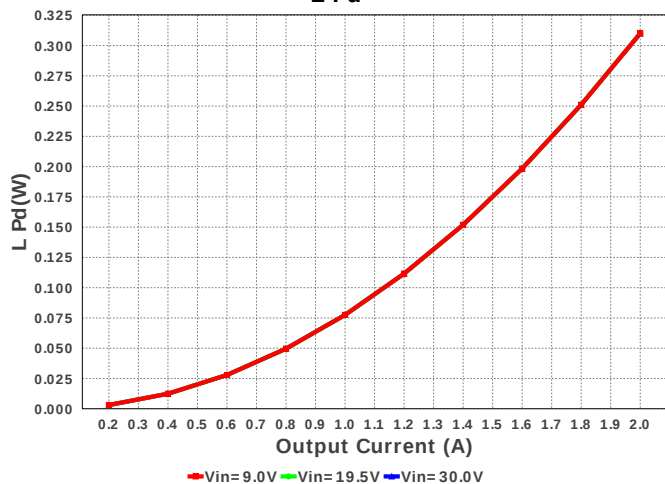
Cin IRMS



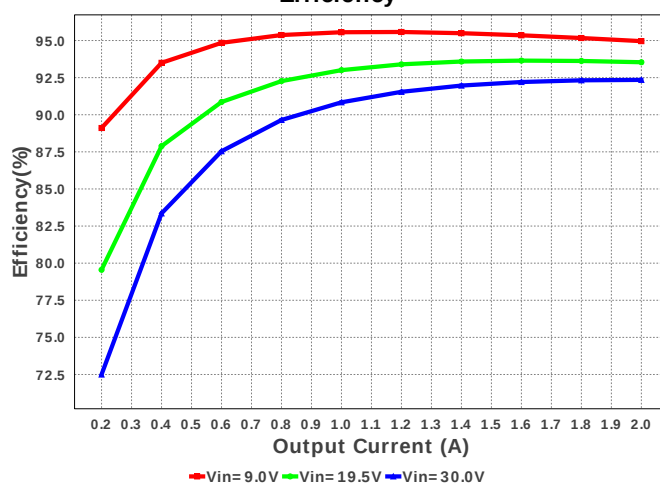
M2 PdSw



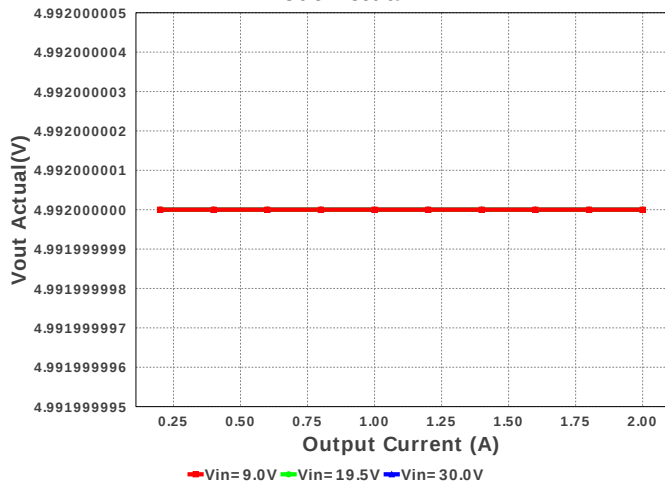
L Pd



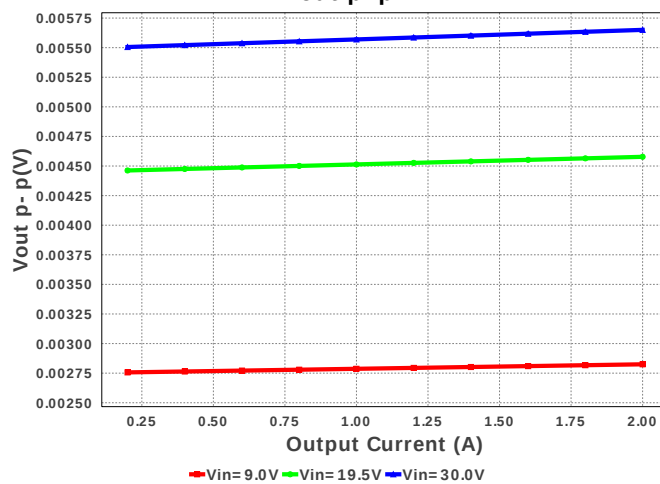
Efficiency

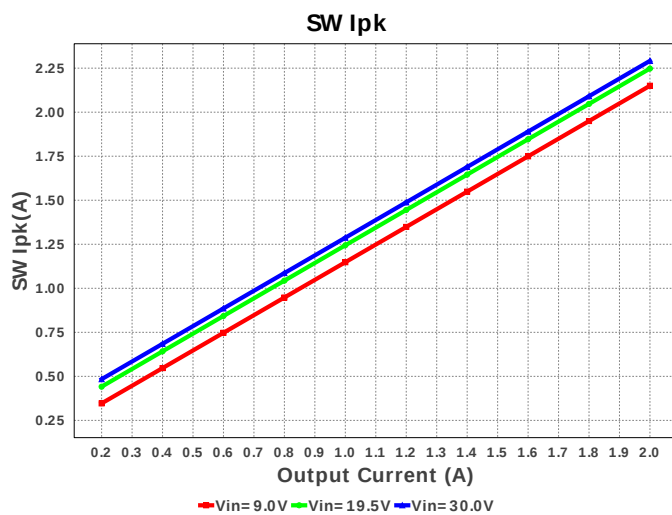
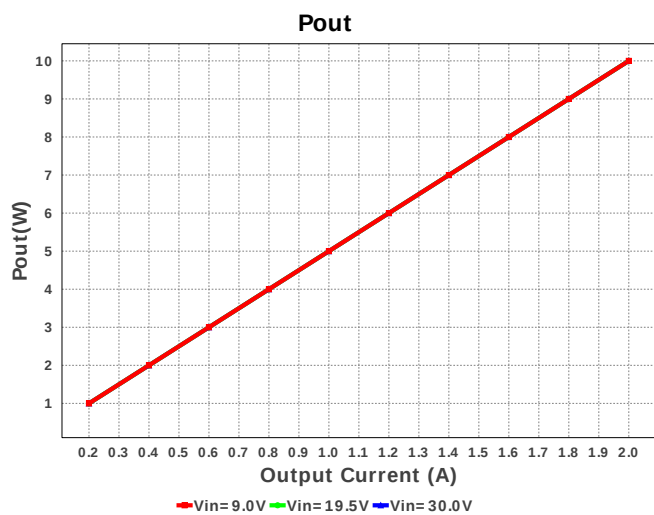
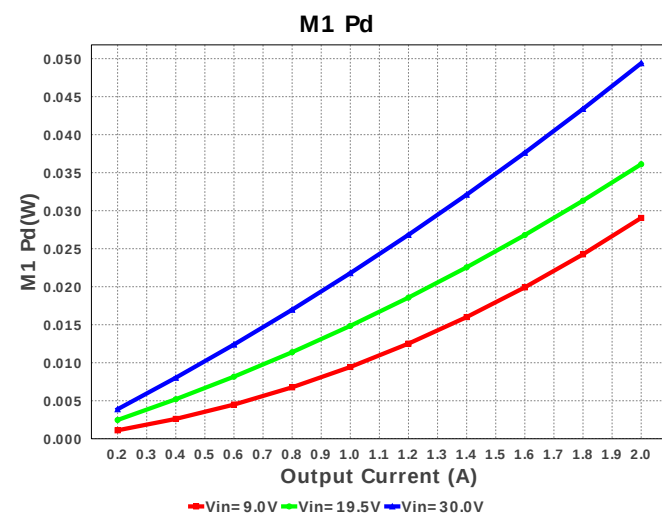
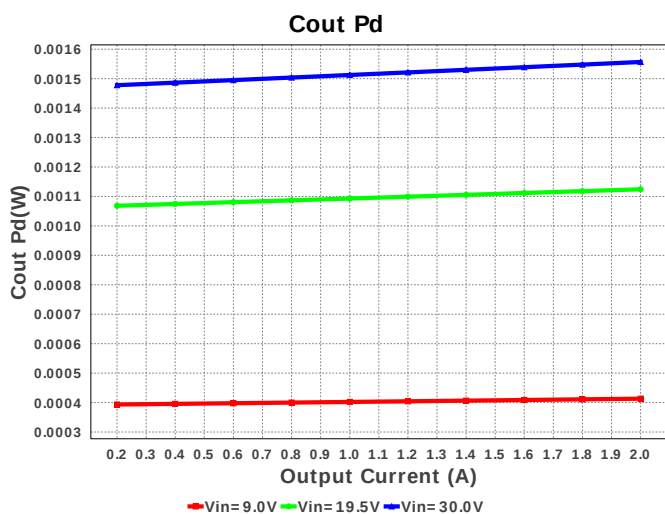
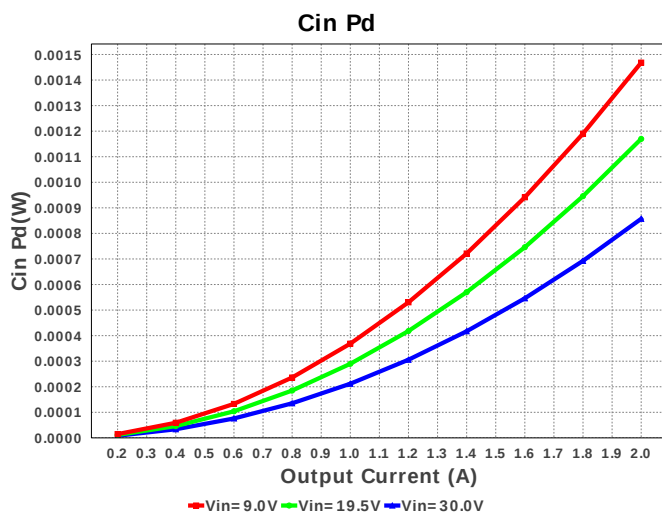
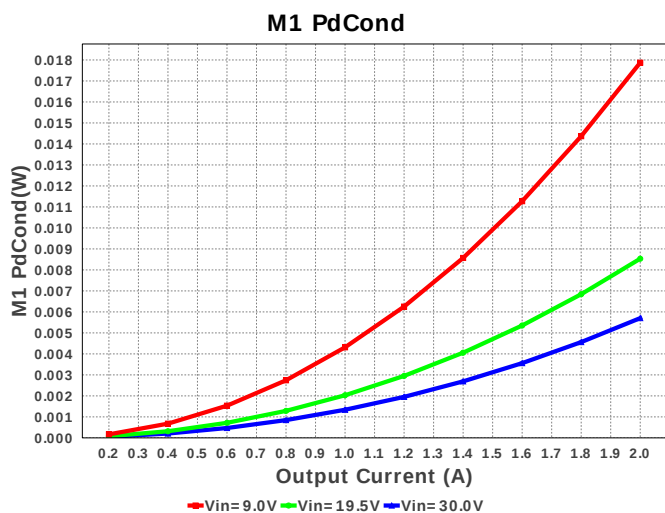


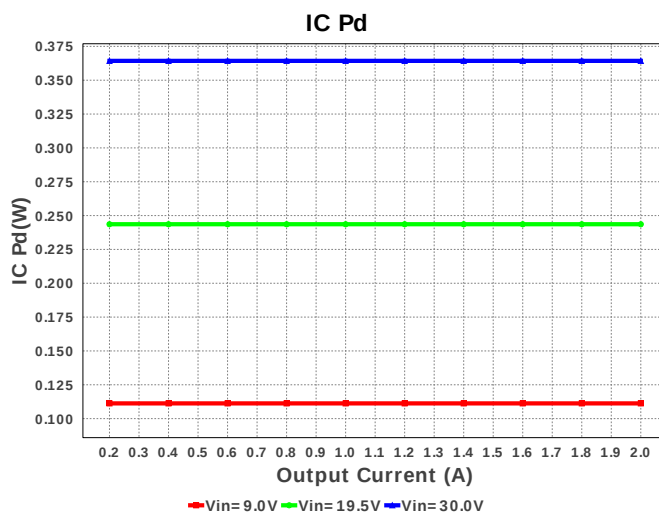
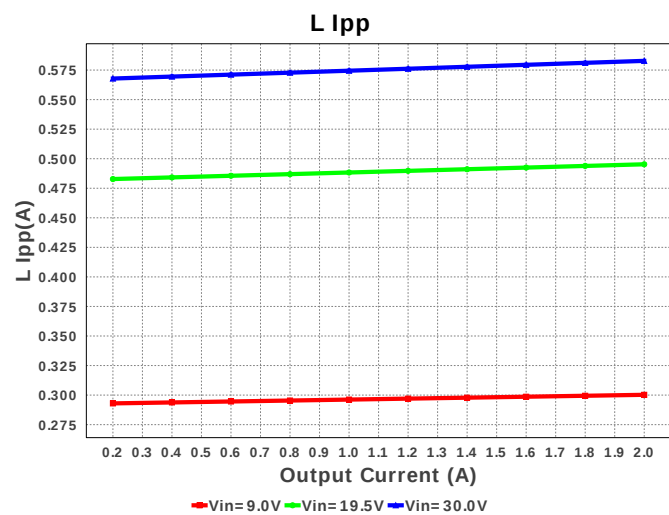
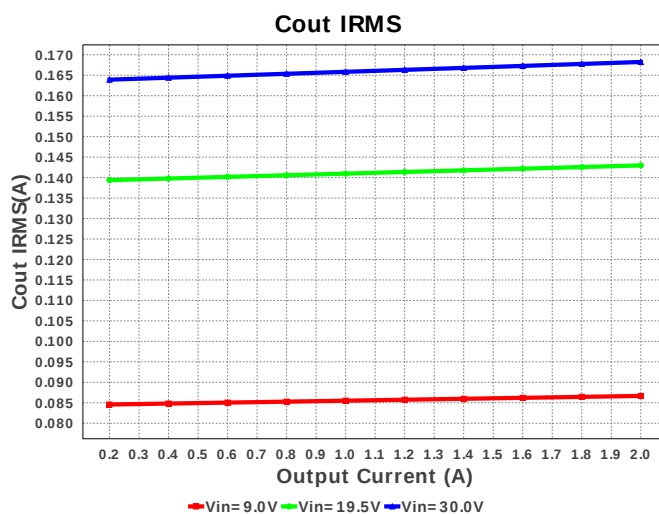
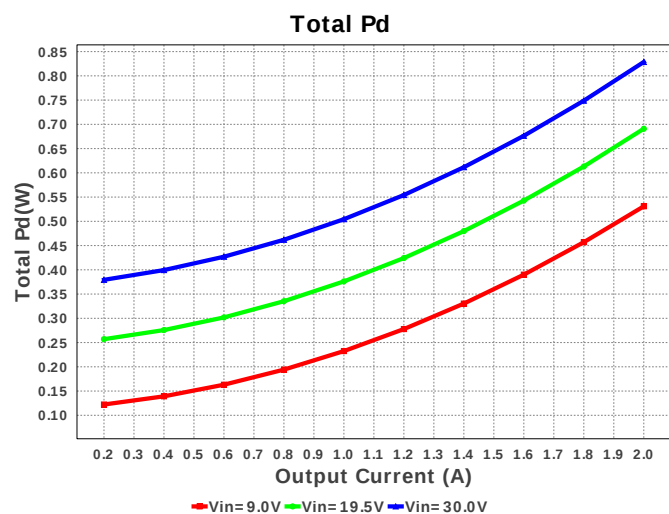
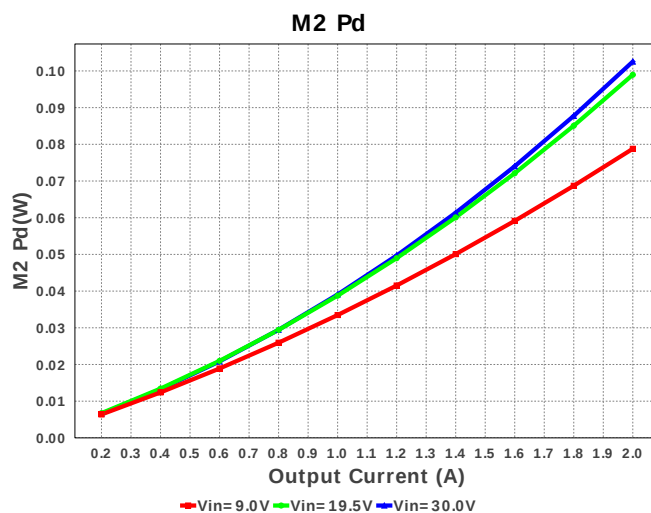
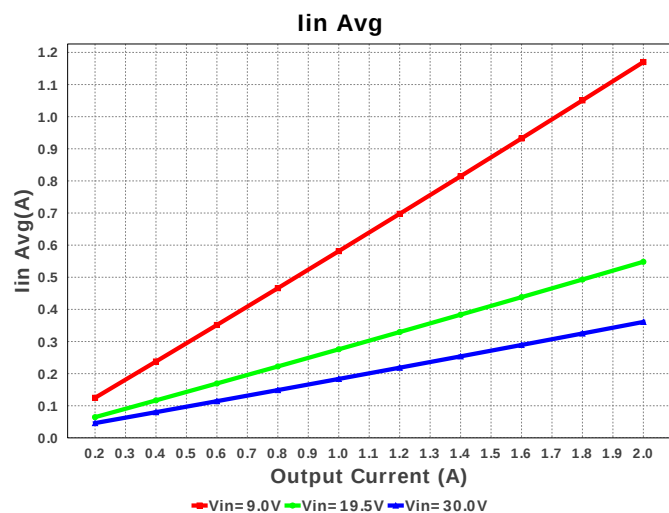
Vout Actual

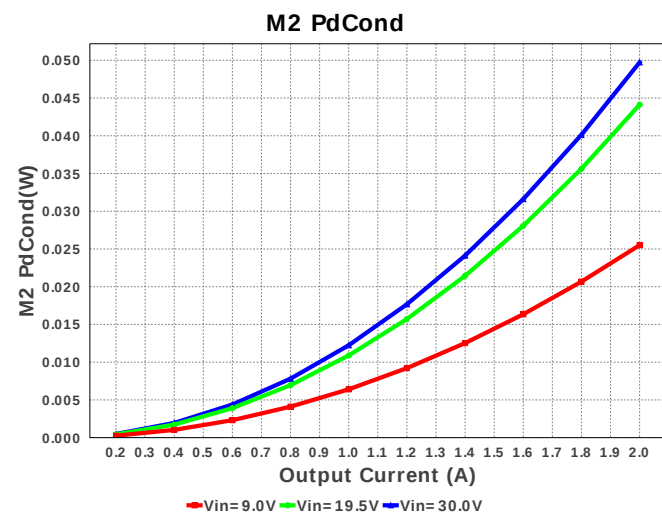
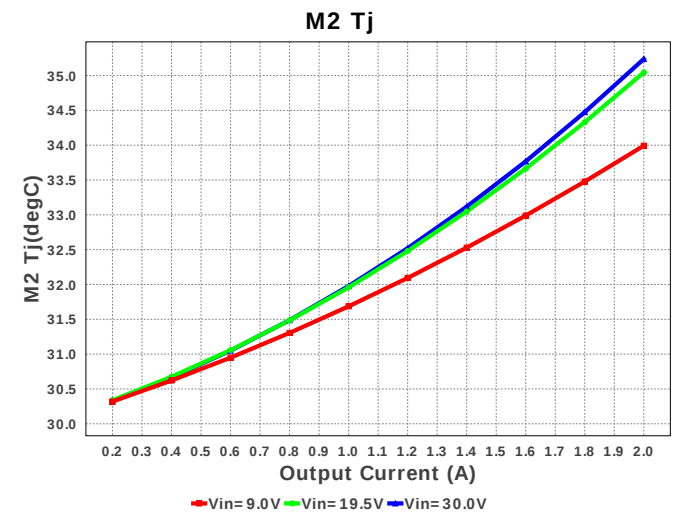
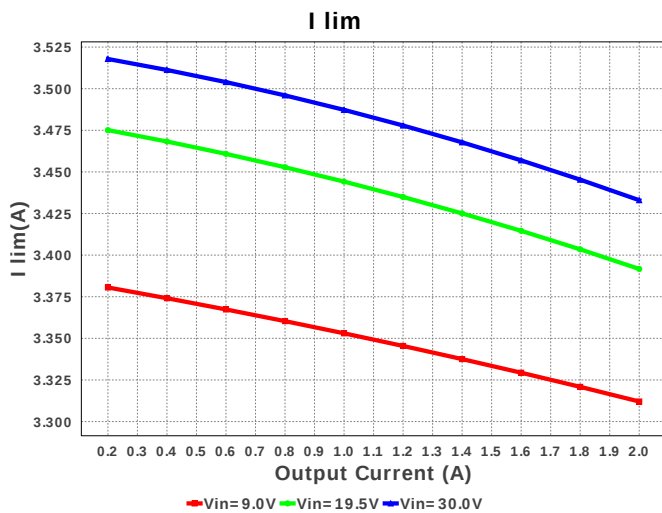
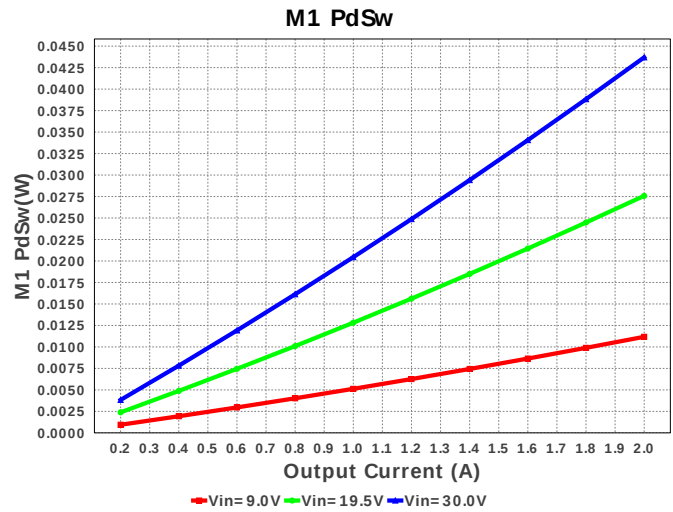
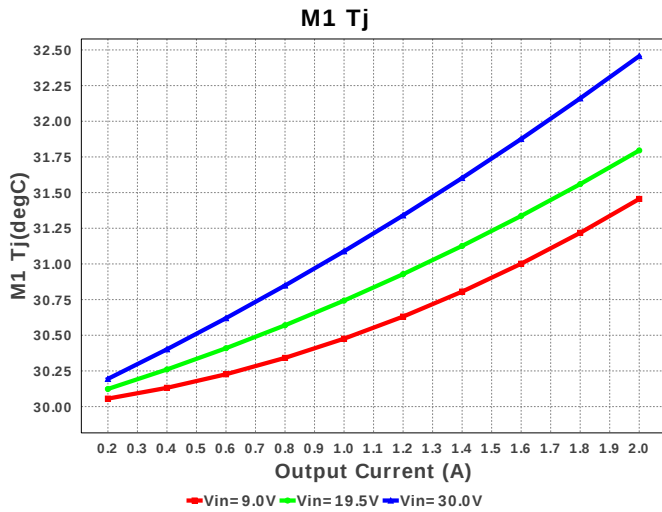


Vout p-p









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	755.893 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	168.234 mA	Current	Output capacitor RMS ripple current
3.	I lim	3.432 A	Current	Current limit threshold
4.	Iin Avg	360.98 mA	Current	Average input current
5.	L Ipp	582.78 mA	Current	Peak-to-peak inductor ripple current
6.	SW Ipk	2.291 A	Current	Peak switch current
7.	BOM Count	16	General	Total Design BOM count
8.	FootPrint	485.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	274.312 kHz	General	Switching frequency
10.	IC Tolerance	12.0 mV	General	IC Feedback Tolerance
11.	Pout	10.0 W	General	Total output power

#	Name	Value	Category	Description
12.	Total BOM	\$3.35	General	Total BOM Cost
13.	Vout Actual	4.992 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
14.	Duty Cycle	17.265 %	Op_point	Duty cycle
15.	Efficiency	92.342 %	Op_point	Steady state efficiency
16.	IC Tj	53.679 degC	Op_point	IC junction temperature
17.	IOUT_OP	2.0 A	Op_point	Iout operating point
18.	M1 Tj	32.457 degC	Op_point	M1 MOSFET junction temperature
19.	M2 Tj	35.27 degC	Op_point	M2 MOSFET junction temperature
20.	VIN_OP	30.0 V	Op_point	Vin operating point
21.	Vout p-p	5.65 mV	Op_point	Peak-to-peak output ripple voltage
22.	Cin Pd	857.062 μ W	Power	Input capacitor power dissipation
23.	Cout Pd	1.557 mW	Power	Output capacitor power dissipation
24.	IC Pd	364.292 mW	Power	IC power dissipation
25.	L Pd	310.0 mW	Power	Inductor power dissipation
26.	M1 Pd	49.405 mW	Power	M1 MOSFET total power dissipation
27.	M1 PdCond	5.709 mW	Power	M1 MOSFET conduction losses
28.	M1 PdSw	43.696 mW	Power	M1 MOSFET switching losses
29.	M2 Pd	103.19 mW	Power	M2 MOSFET total power dissipation
30.	M2 PdCond	49.733 mW	Power	M2 MOSFET conduction losses
31.	M2 PdSw	53.458 mW	Power	M2 MOSFET switching losses
32.	Total Pd	829.315 mW	Power	Total Power Dissipation
33.	Vout Tolerance	3.813 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	2.0	Maximum Output Current
2.	VinMax	30.0	Maximum input voltage
3.	VinMin	9.0	Minimum input voltage
4.	Vout	5.0	Output Voltage
5.	base_pn	LM3150	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	Ambient temperature

Design Assistance

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

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