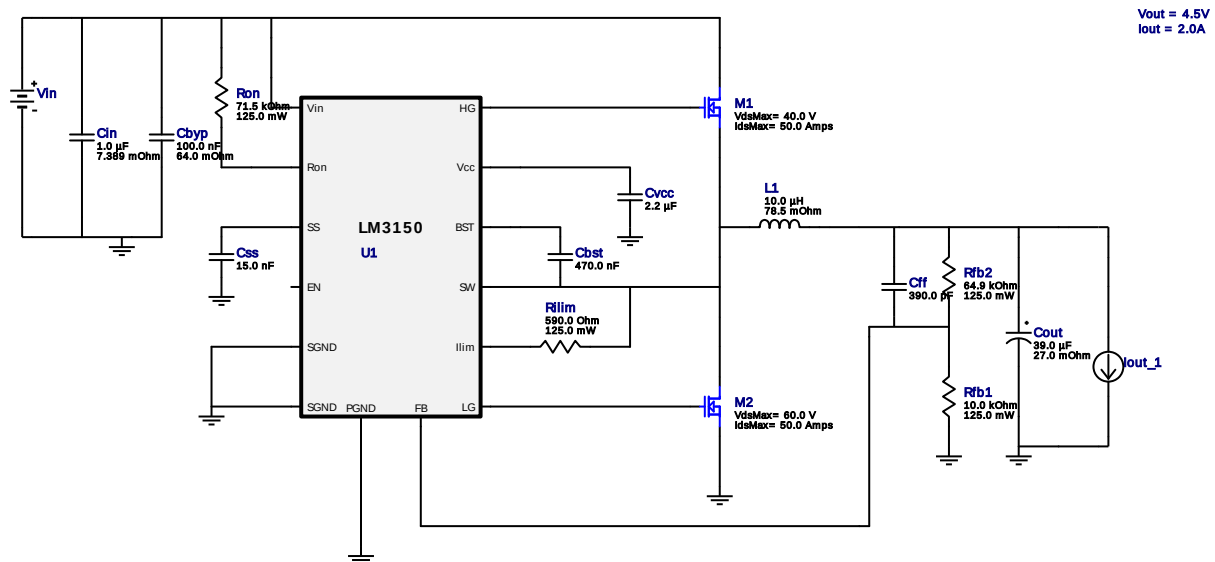


WEBENCH® Design Report

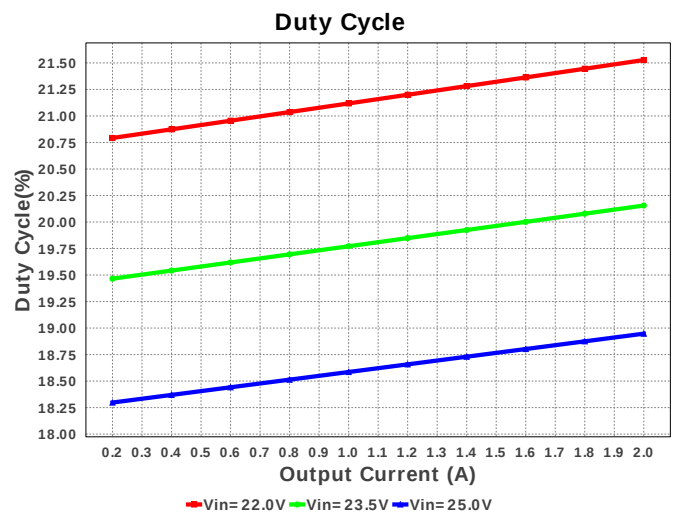
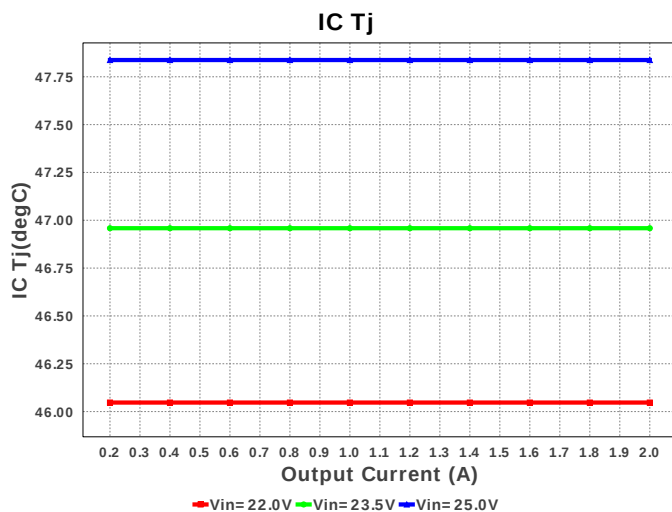
Design : 4770666/29 LM3150MH/NOPB
LM3150MH/NOPB 22.0V-25.0V to 4.50V @ 2.0A

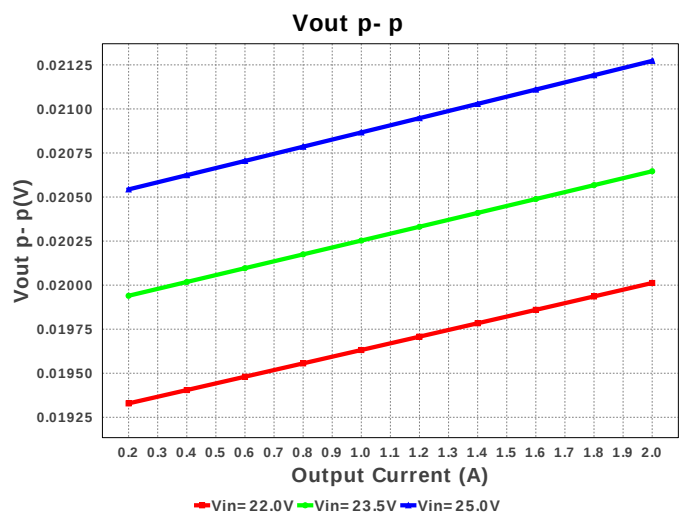
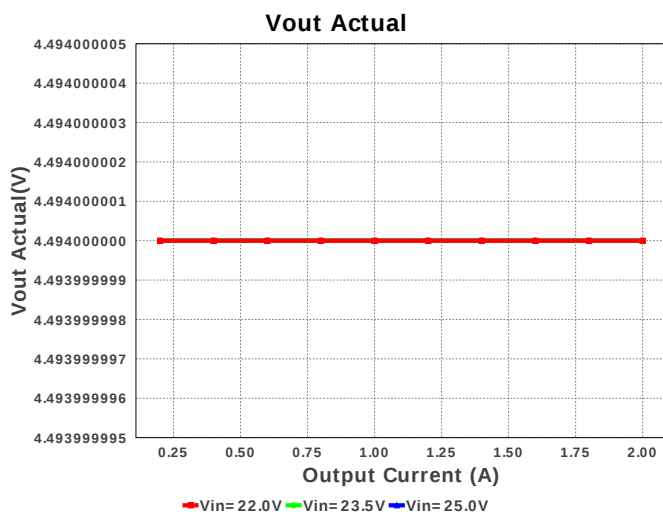
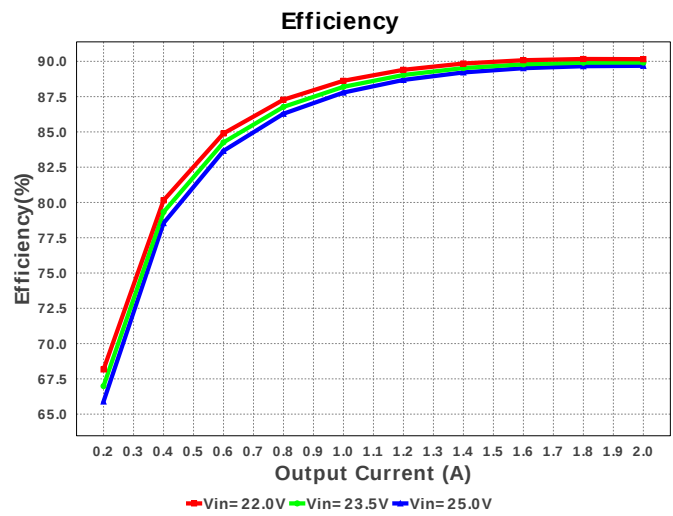
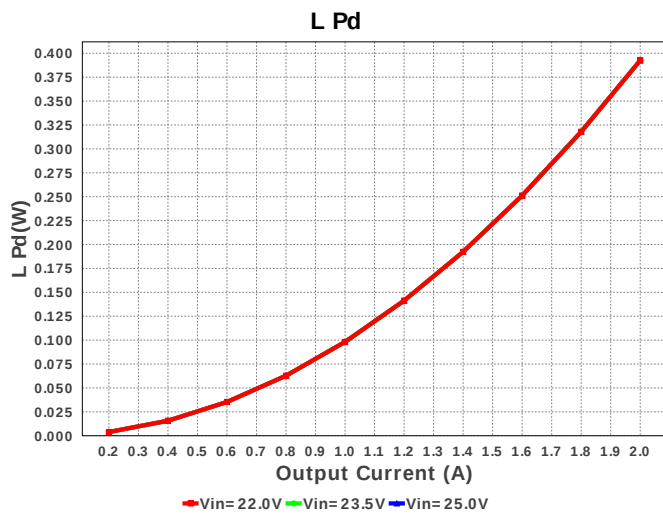
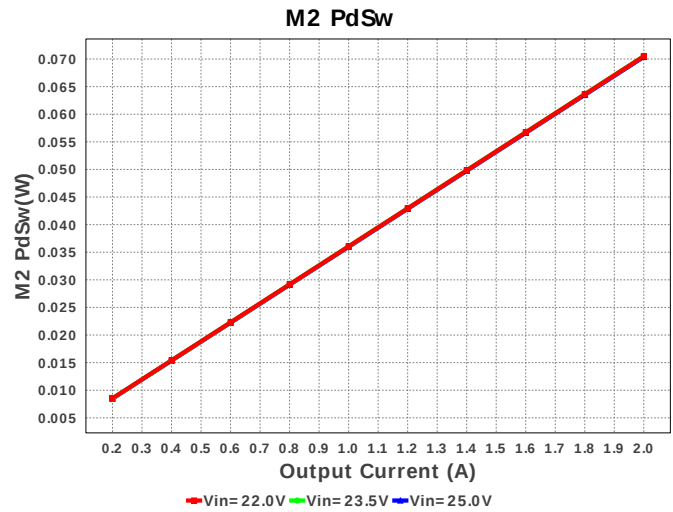
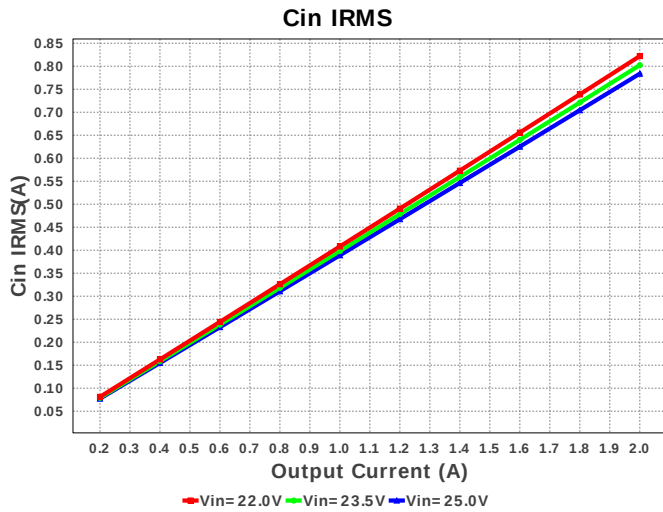


Electrical BOM

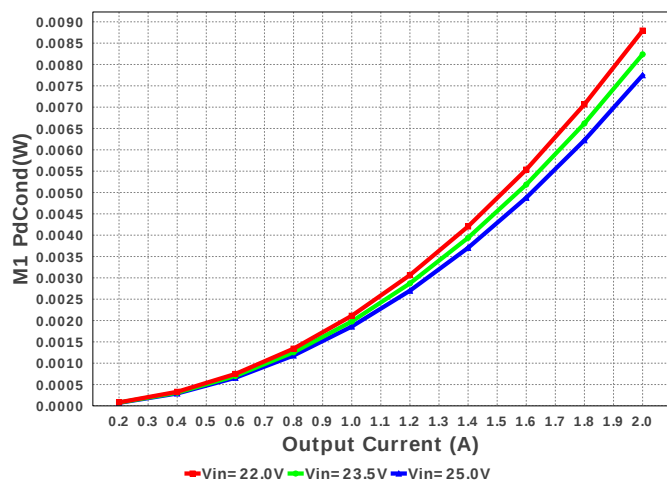
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	Taiyo Yuden	EMK212B7474KD-T Series= X7R	Cap= 470.0 nF VDC= 16.0 V IRMS= 0.0 A	1	\$0.02	0805 7 mm ²
2.	Cbyp	Kemet	C0805C104K5RACTU Series= X7R	Cap= 100.0 nF ESR= 64.0 mOhm VDC= 50.0 V IRMS= 1.64 A	1	\$0.01	0805 7 mm ²
3.	Cff	Yageo America	CC0805KRX7R9BB391 Series= X7R	Cap= 390.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
4.	Cin	MuRata	GRM31MR71H105KA88L Series= X7R	Cap= 1.0 uF ESR= 7.389 mOhm VDC= 50.0 V IRMS= 979.22 mA	1	\$0.03	1206 11 mm ²
5.	Cout	Panasonic	16SVPC39MV Series= SVPC	Cap= 39.0 uF ESR= 27.0 mOhm VDC= 16.0 V IRMS= 2.35 A	1	\$0.28	SM_RADIAL_5MM 58 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	SRP6540-100M	L= 10.0 uH DCR= 78.5 mOhm	1	\$0.49	SRP6540 83 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-6ENF6492V Series= ERJ-6E	Res= 64.9 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-6ENF7152V Series= ERJ-6E	Res= 71.5 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

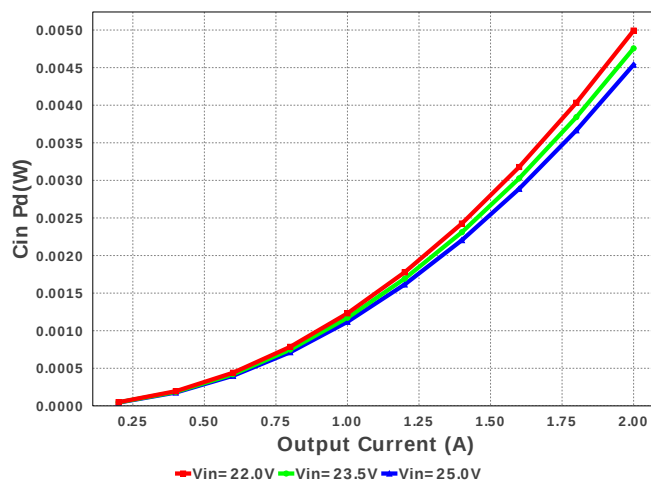




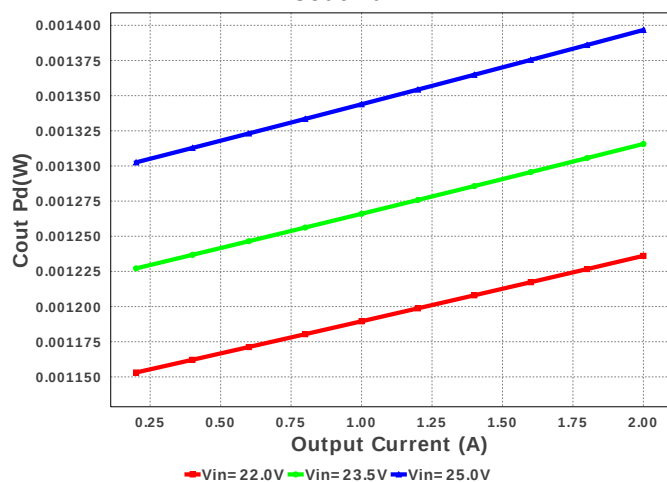
M1 PdCond



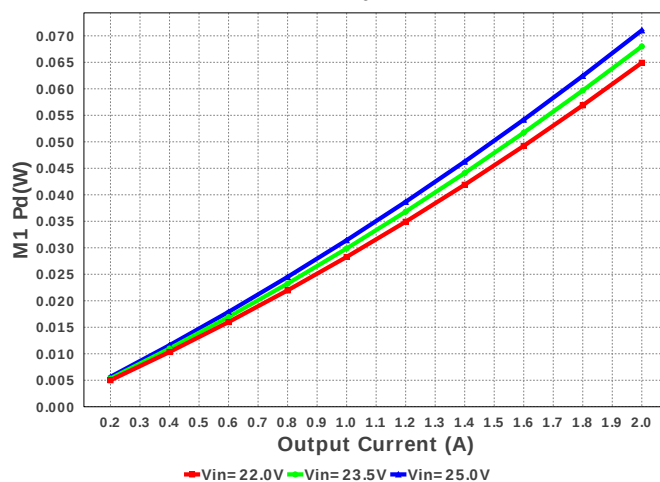
Cin Pd



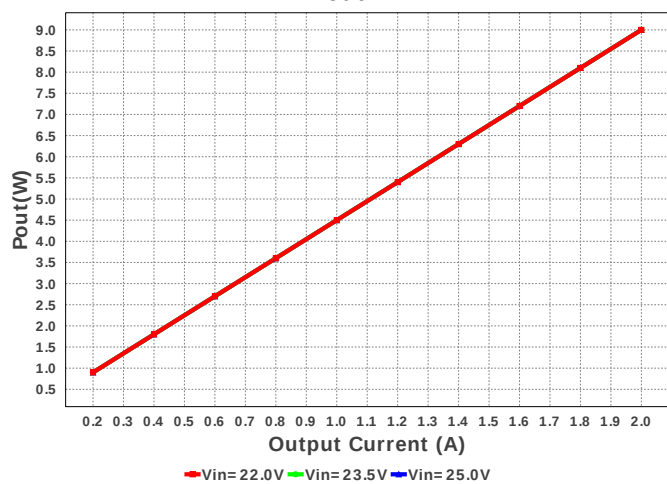
Cout Pd



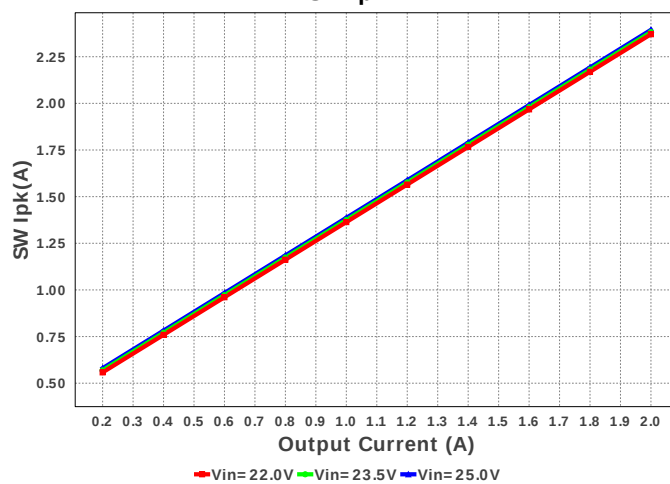
M1 Pd

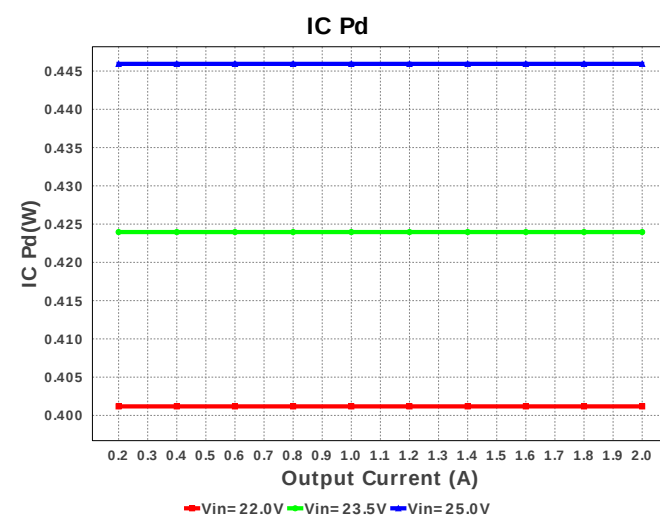
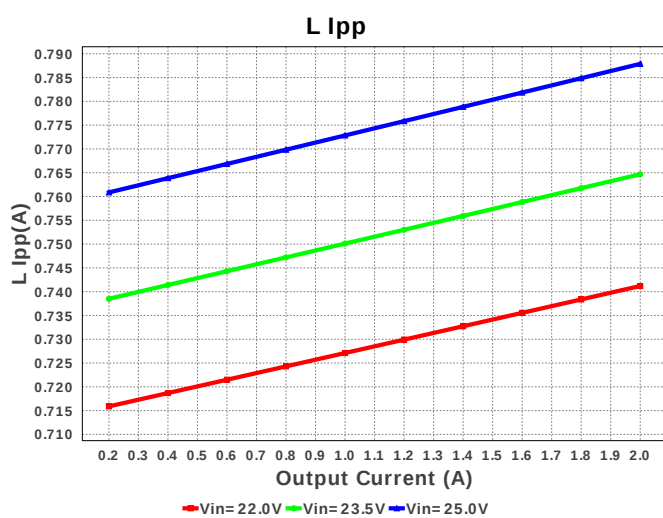
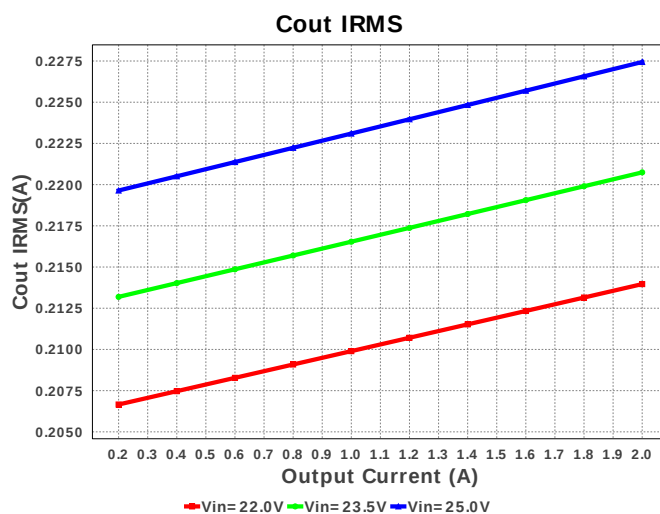
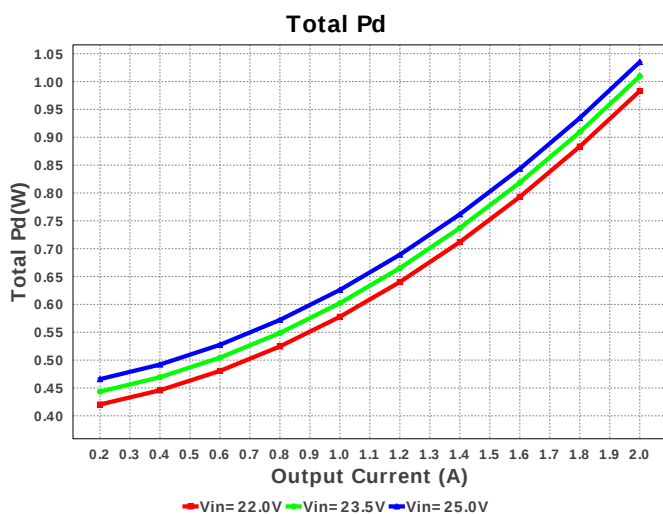
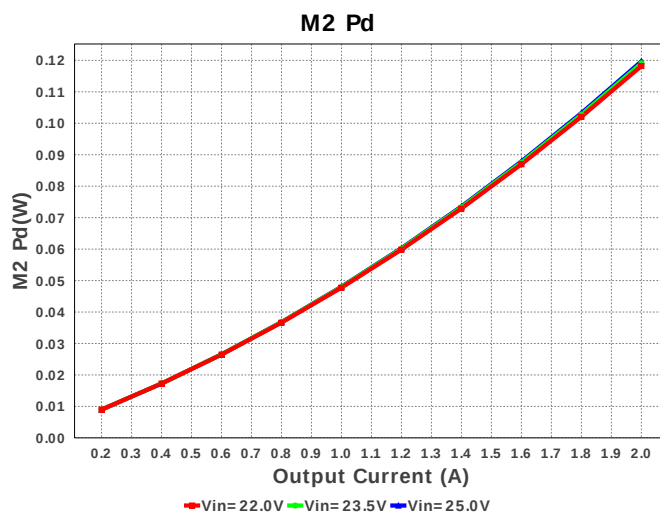
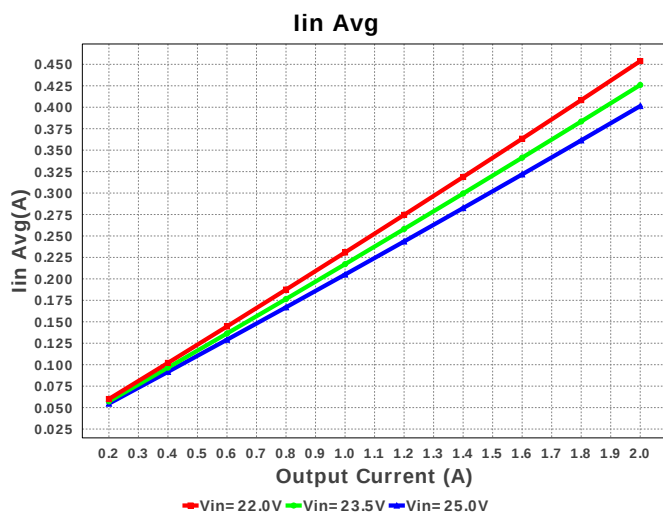


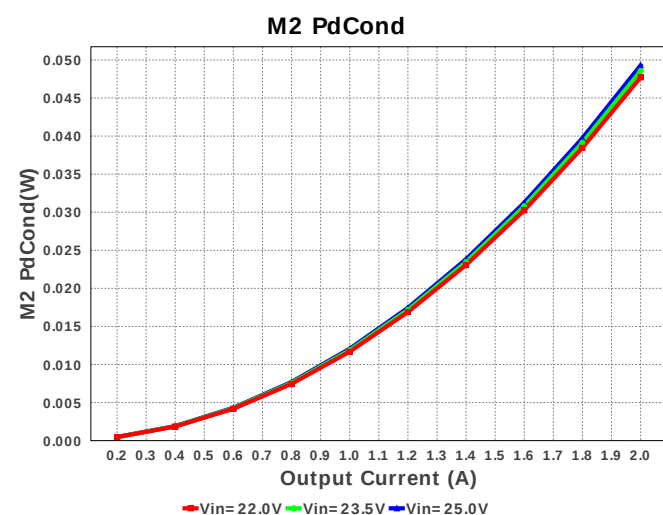
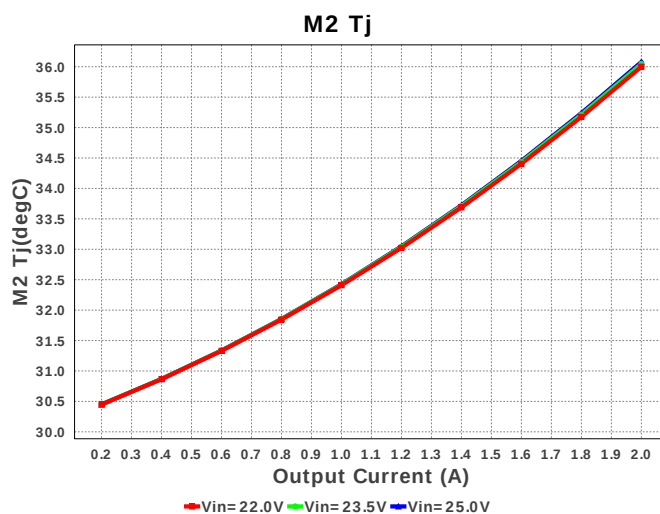
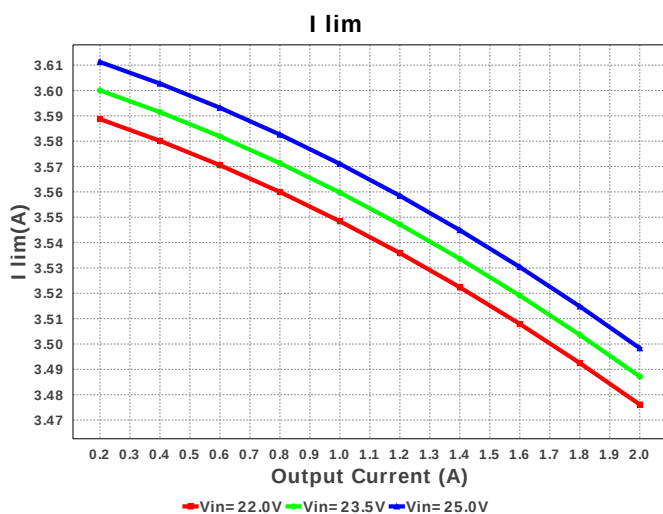
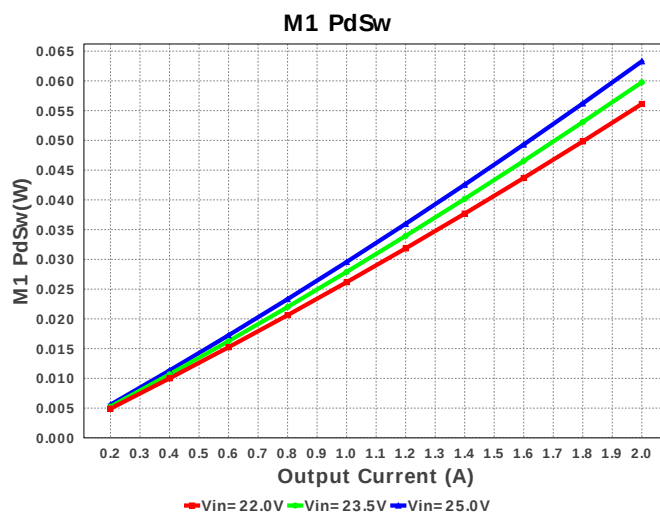
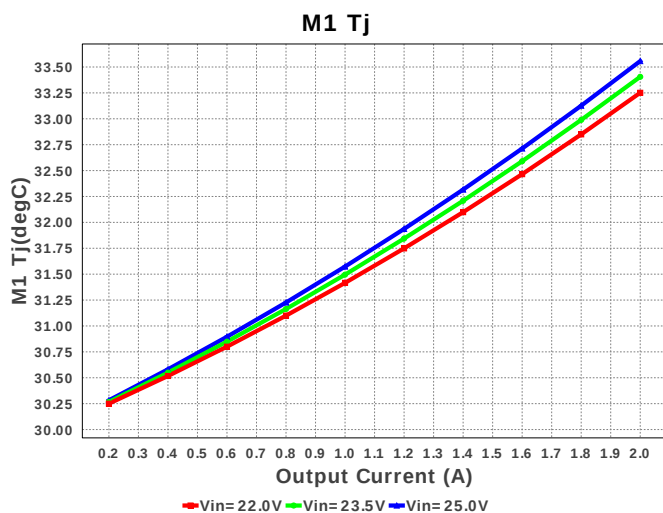
Pout



SW Ipk







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	783.767 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	227.44 mA	Current	Output capacitor RMS ripple current
3.	I lim	3.5 A	Current	Current limit threshold
4.	Iin Avg	401.36 mA	Current	Average input current
5.	L Ipp	787.88 mA	Current	Peak-to-peak inductor ripple current
6.	SW Ipk	2.394 A	Current	Peak switch current
7.	BOM Count	15	General	Total Design BOM count
8.	FootPrint	382.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	492.994 kHz	General	Switching frequency
10.	IC Tolerance	12.0 mV	General	IC Feedback Tolerance
11.	Mode	CCM	General	Conduction Mode

#	Name	Value	Category	Description
12.	Pout	9.0 W	General	Total output power
13.	Total BOM	\$3.22	General	Total BOM Cost
14.	Vout Actual	4.494 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
15.	Duty Cycle	18.947 %	Op_point	Duty cycle
16.	Efficiency	89.696 %	Op_point	Steady state efficiency
17.	IC Tj	58.986 degC	Op_point	IC junction temperature
18.	IOUT_OP	2.0 A	Op_point	Iout operating point
19.	M1 Tj	33.557 degC	Op_point	M1 MOSFET junction temperature
20.	M2 Tj	36.019 degC	Op_point	M2 MOSFET junction temperature
21.	VIN_OP	25.0 V	Op_point	Vin operating point
22.	Vout p-p	21.273 mV	Op_point	Peak-to-peak output ripple voltage
23.	Cin Pd	4.539 mW	Power	Input capacitor power dissipation
24.	Cout Pd	1.397 mW	Power	Output capacitor power dissipation
25.	IC Pd	445.939 mW	Power	IC power dissipation
26.	L Pd	392.5 mW	Power	Inductor power dissipation
27.	M1 Pd	71.028 mW	Power	M1 MOSFET total power dissipation
28.	M1 PdCond	7.744 mW	Power	M1 MOSFET conduction losses
29.	M1 PdSw	63.284 mW	Power	M1 MOSFET switching losses
30.	M2 Pd	118.499 mW	Power	M2 MOSFET total power dissipation
31.	M2 PdCond	49.273 mW	Power	M2 MOSFET conduction losses
32.	M2 PdSw	69.226 mW	Power	M2 MOSFET switching losses
33.	Total Pd	1.034 W	Power	Total Power Dissipation
34.	Vout Tolerance	3.786 %		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	25.0	Maximum input voltage
3.	VinMin	22.0	Minimum input voltage
4.	Vout	4.5	Output Voltage
5.	base_pn	LM3150	Base Product 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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