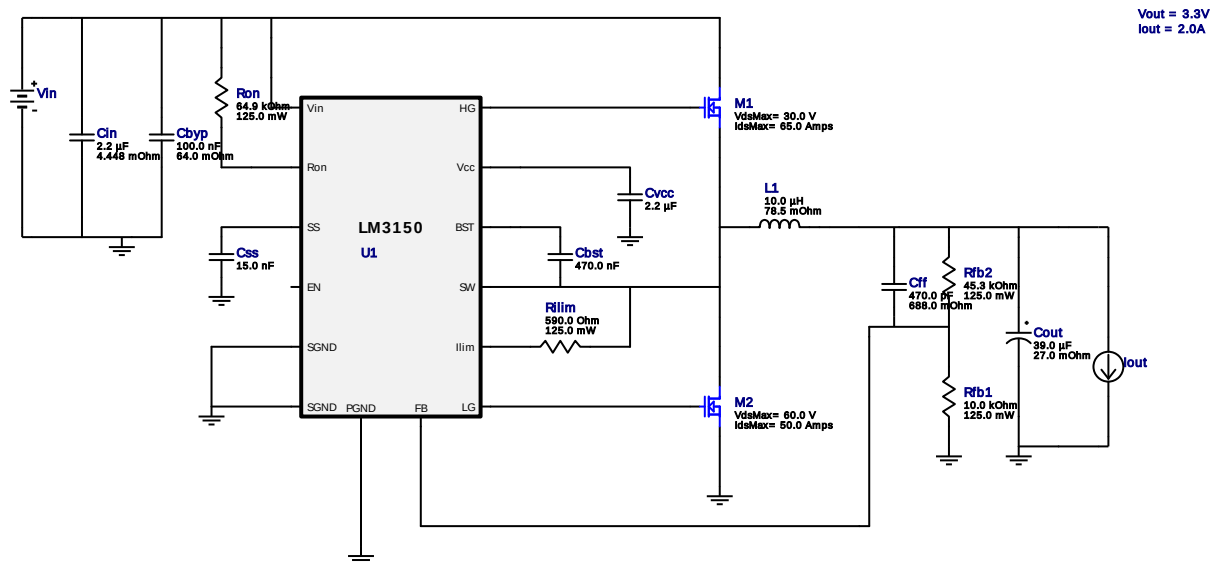


WEBENCH® Design Report

Design : 4227416/83 LM3150MH/NOPB
LM3150MH/NOPB 14.0V-22.0V to 3.30V @ 2.0A



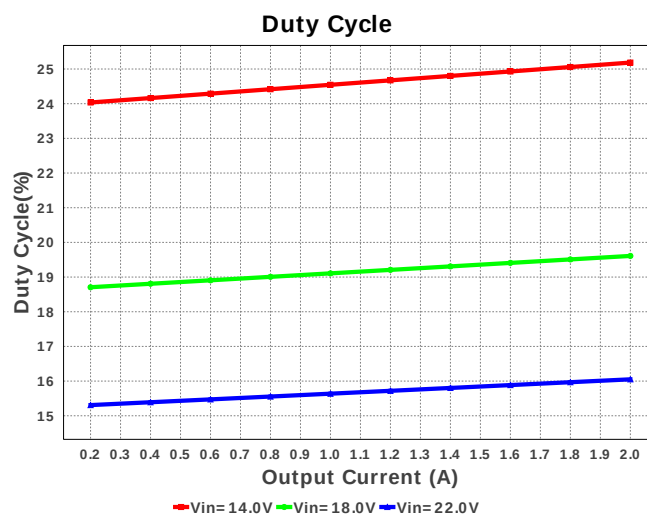
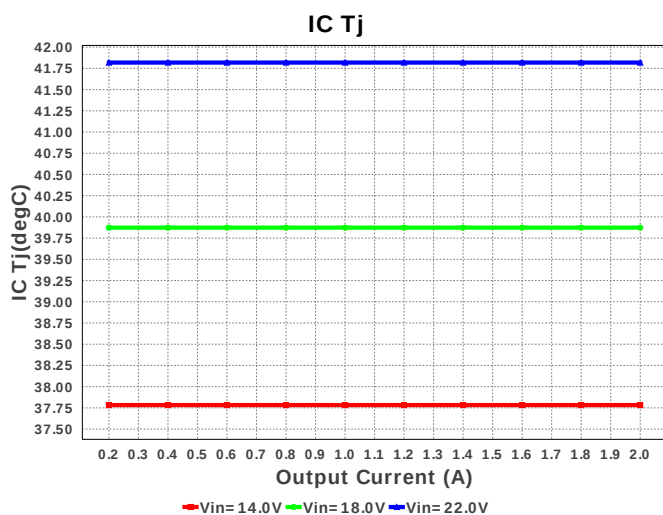
My Comments

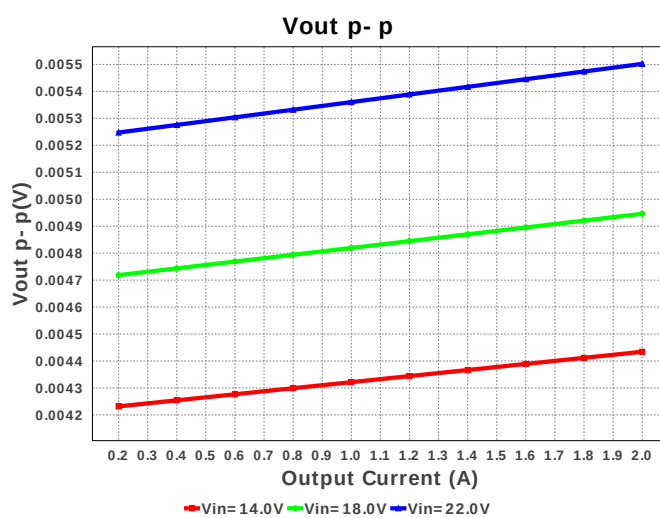
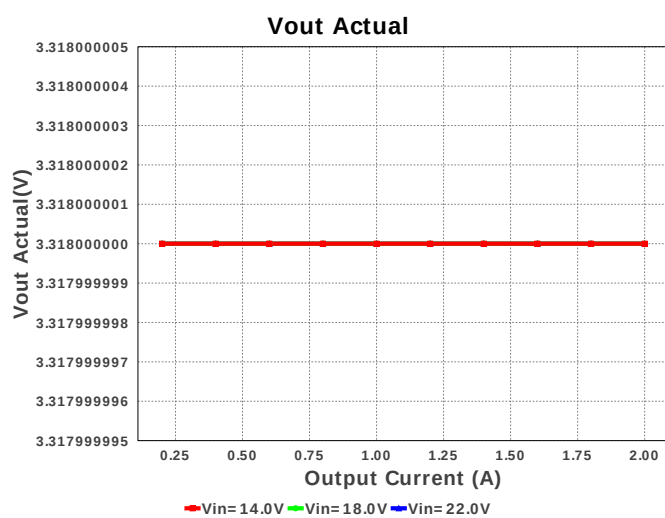
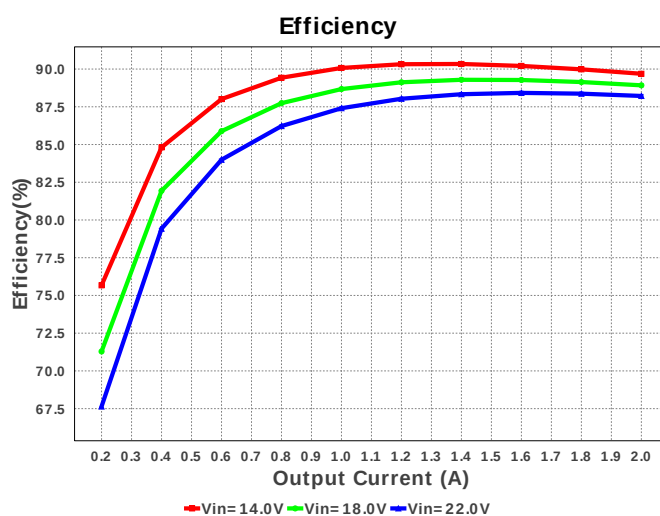
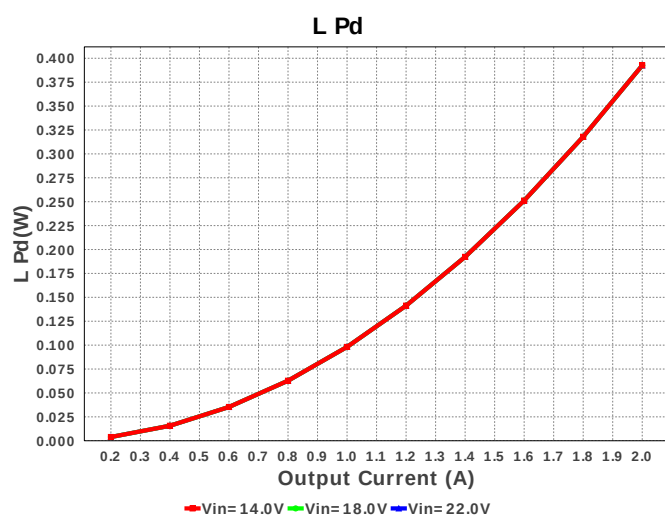
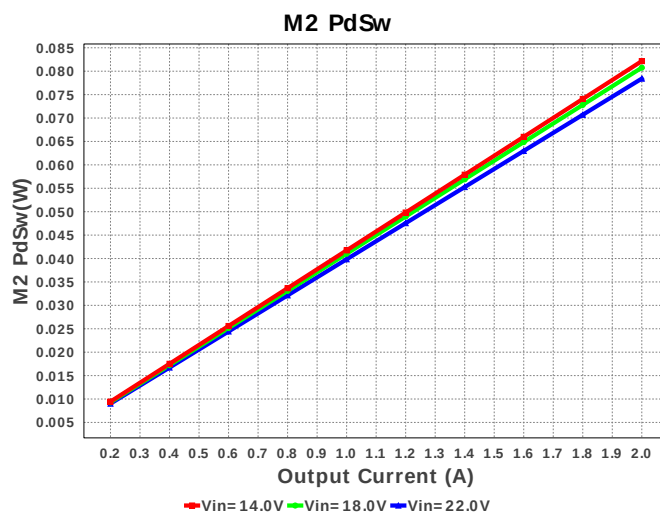
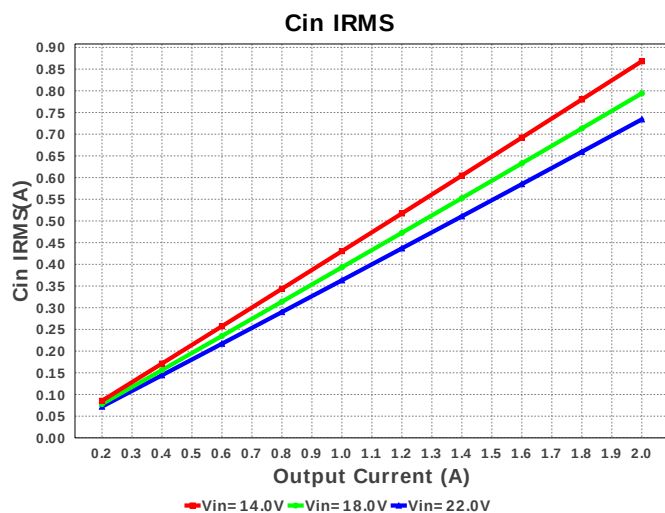
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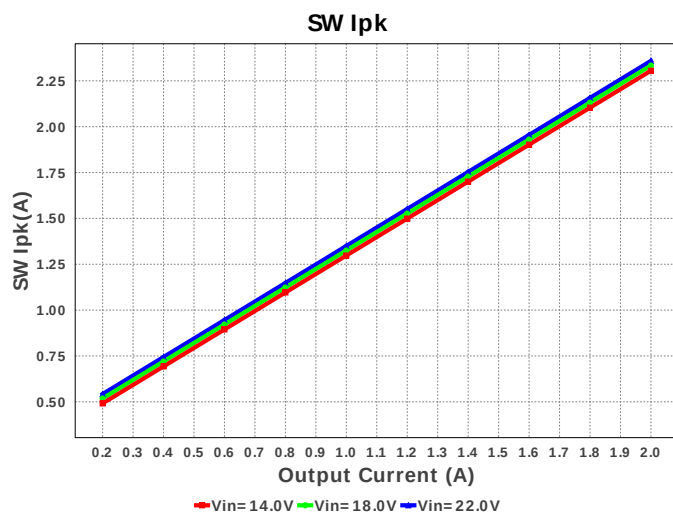
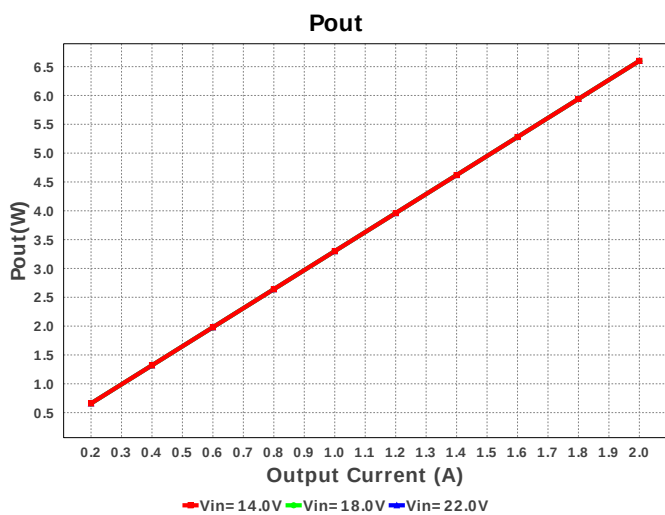
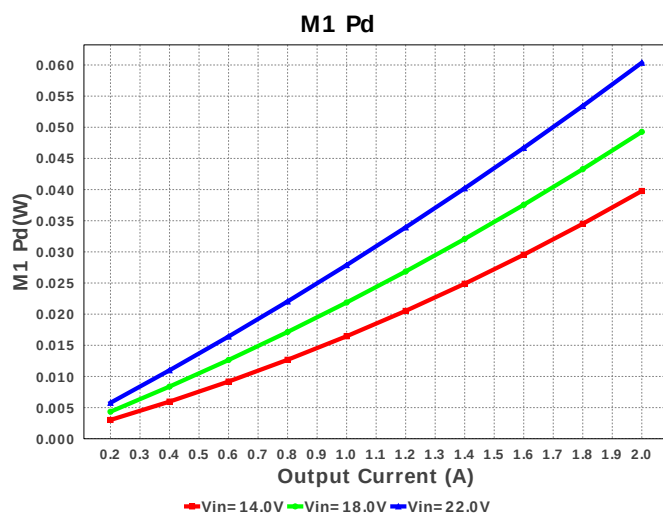
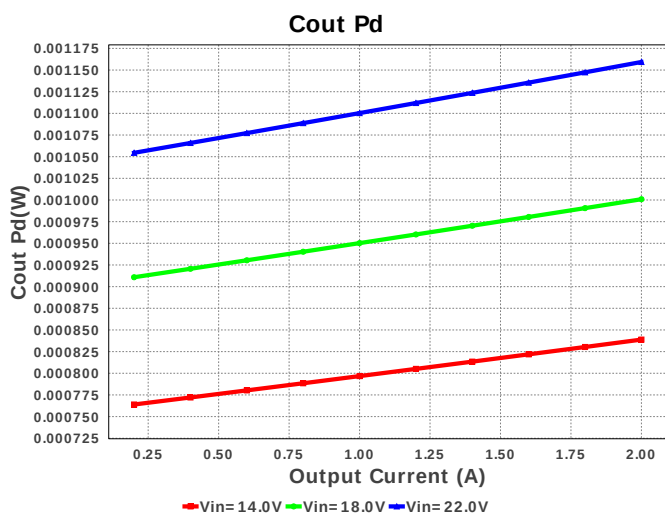
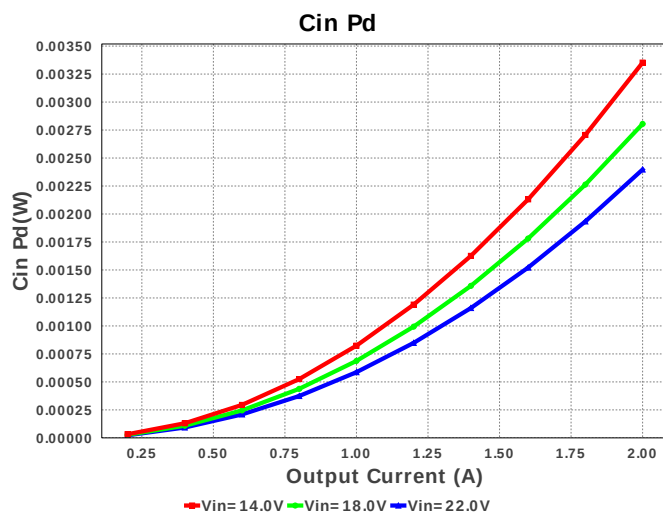
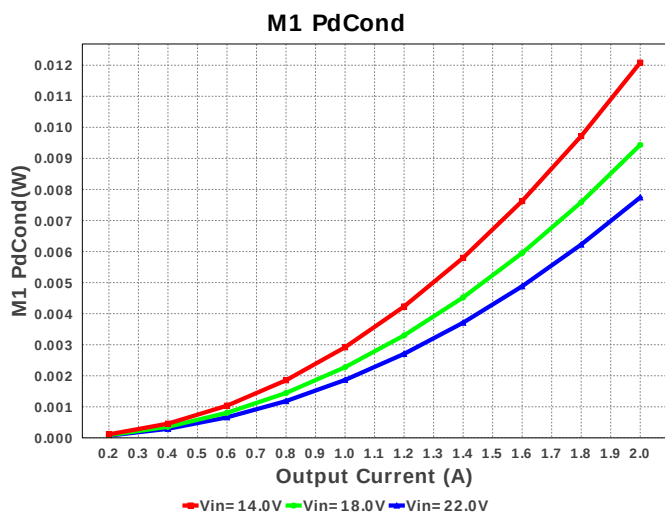
Electrical BOM

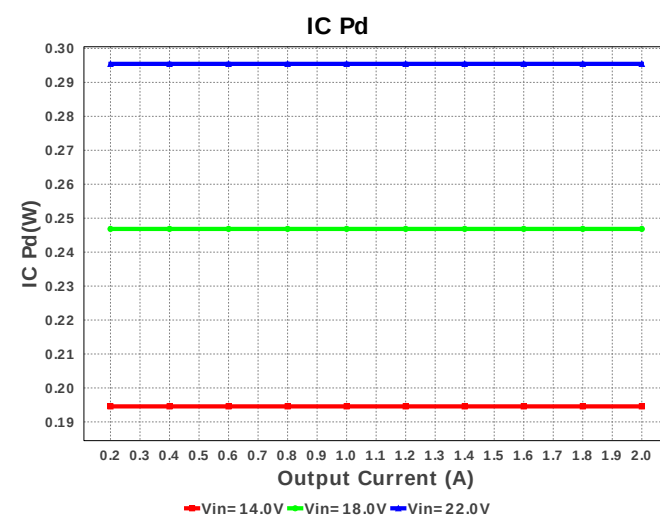
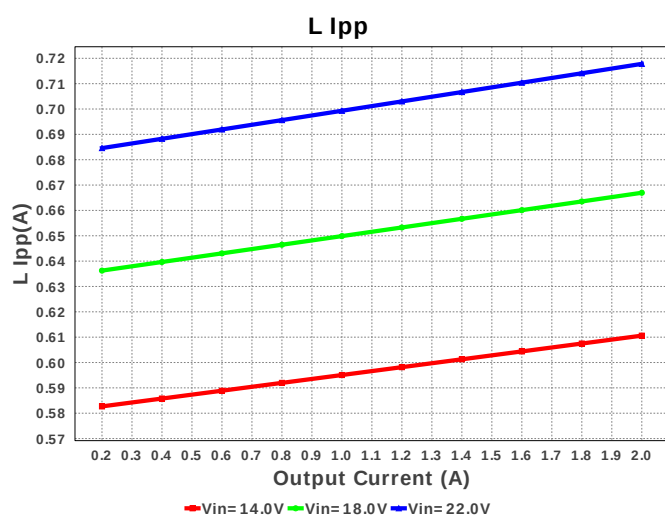
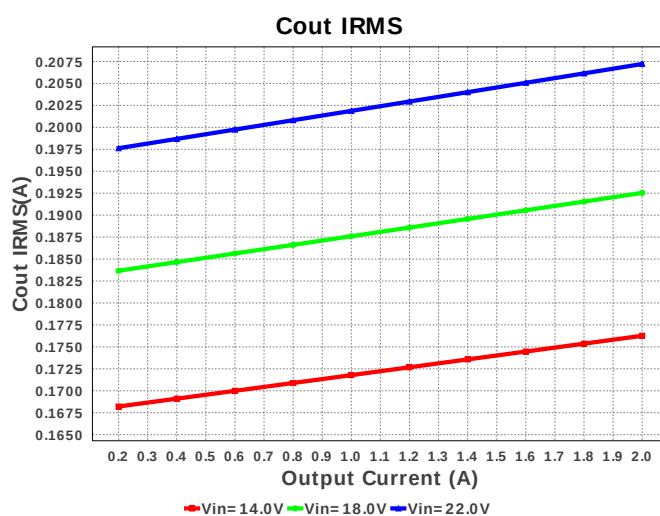
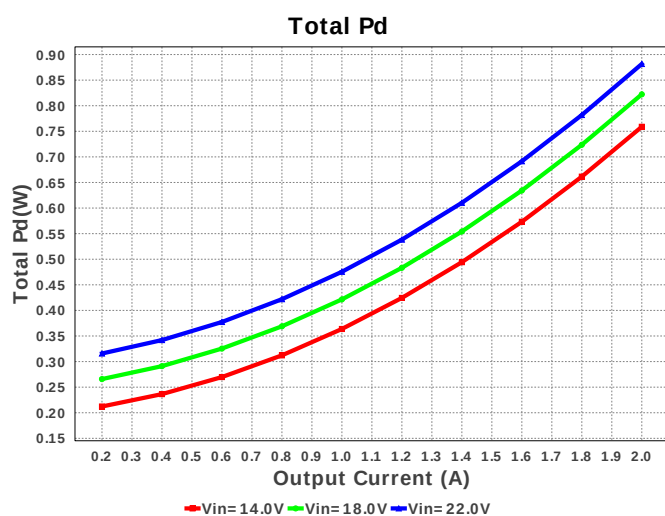
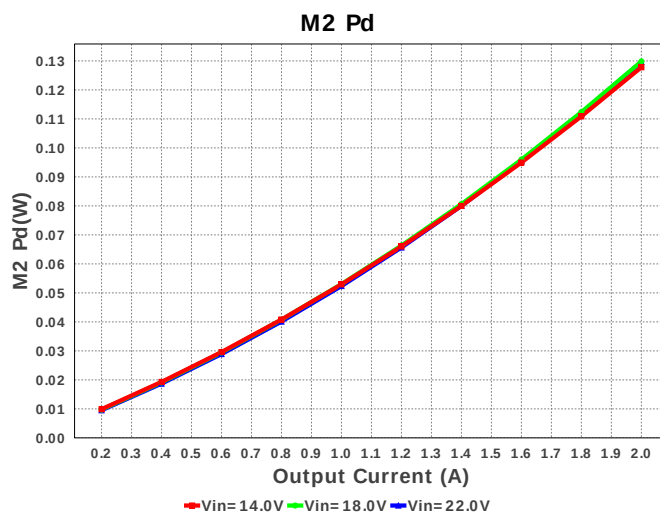
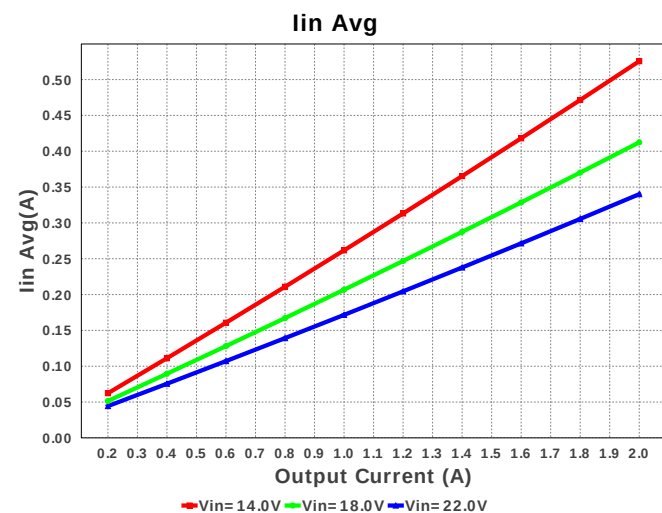
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	Taiyo Yuden	EMK212B7474KD-T Series= X7R	Cap= 470.0 nF VDC= 16.0 V IRMS= 0.0 A	1	\$0.02	0805 7 mm ²
2.	Cbyp	Kemet	C0805C104K5RACTU Series= X7R	Cap= 100.0 nF ESR= 64.0 mOhm VDC= 50.0 V IRMS= 1.64 A	1	\$0.01	0805 7 mm ²
3.	Cff	Kemet	C0805C471K5RACTU Series= X7R	Cap= 470.0 pF ESR= 688.0 mOhm VDC= 50.0 V IRMS= 213.0 mA	1	\$0.01	0805 7 mm ²
4.	Cin	MuRata	GRM31CR71H225KA88L Series= X7R	Cap= 2.2 uF ESR= 4.448 mOhm VDC= 50.0 V IRMS= 2.2252 A	1	\$0.05	1206_190 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

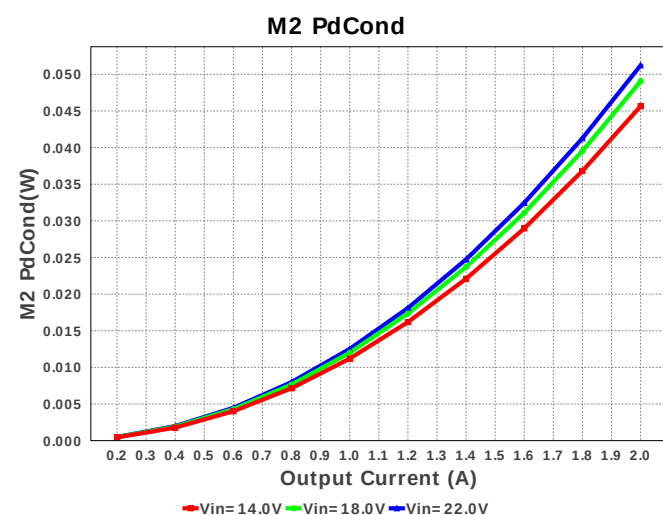
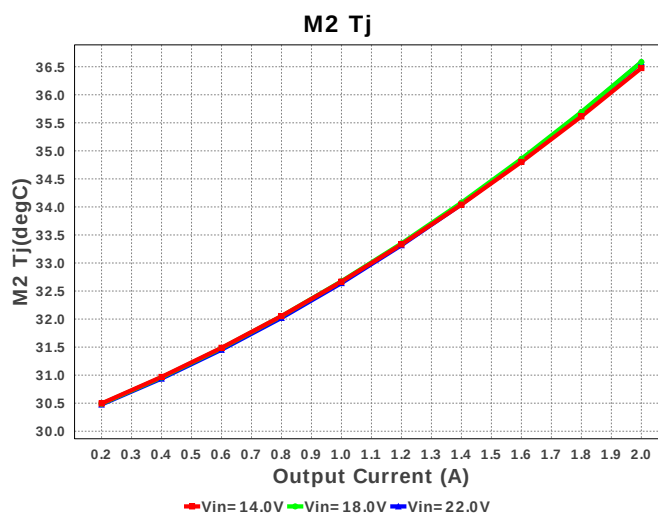
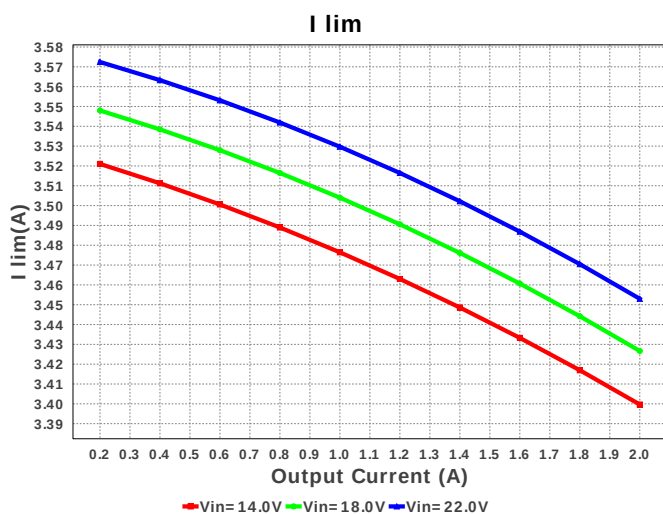
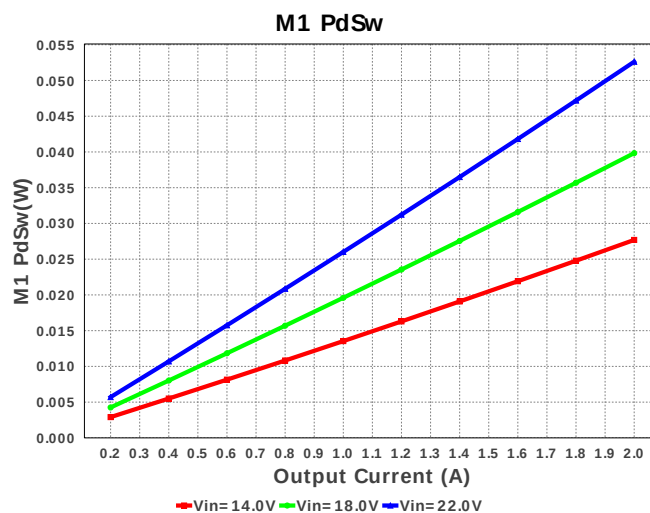
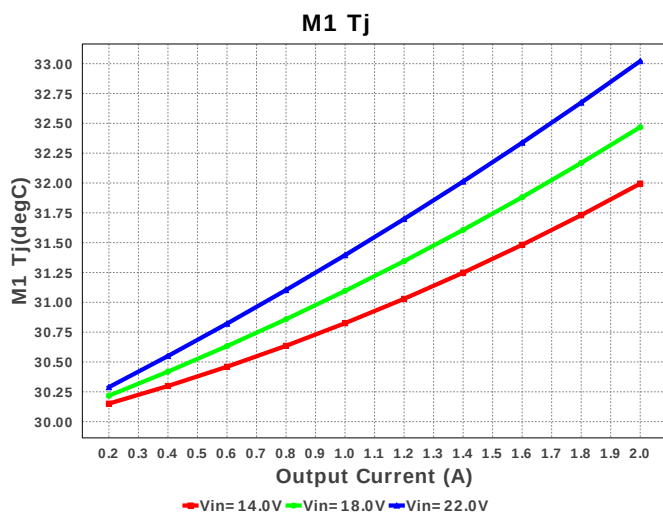
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
8.	L1	Bourns	SRP6540-100M	L= 10.0 μ H DCR= 78.5 mOhm	1	\$0.49	 SRP6540 83 mm ²
9.	M1	Texas Instruments	CSD17507Q5A	VdsMax= 30.0 V IdsMax= 65.0 Amps	1	\$0.25	 TRANS_NexFET_Q5A 55 mm ²
10.	M2	Texas Instruments	CSD18537NQ5A	VdsMax= 60.0 V IdsMax= 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-6ENF4532V Series= ERJ-6E	Res= 45.3 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-6ENF6492V Series= ERJ-6E	Res= 64.9 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











Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	734.153 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	207.215 mA	Current	Output capacitor RMS ripple current
3.	I lim	3.451 A	Current	Current limit threshold
4.	Iin Avg	340.15 mA	Current	Average input current
5.	L Ipp	717.81 mA	Current	Peak-to-peak inductor ripple current
6.	SW Ipk	2.359 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	418.146 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	6.6 W	General	Total output power
13.	Total BOM	\$3.12	General	Total BOM Cost
14.	Vout Actual	3.318 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
15.	Duty Cycle	16.051 %	Op_point	Duty cycle
16.	Efficiency	88.196 %	Op_point	Steady state efficiency
17.	IC Tj	49.205 degC	Op_point	IC junction temperature
18.	IOUT_OP	2.0 A	Op_point	Iout operating point
19.	M1 Tj	33.021 degC	Op_point	M1 MOSFET junction temperature
20.	M2 Tj	36.671 degC	Op_point	M2 MOSFET junction temperature
21.	VIN_OP	22.0 V	Op_point	Vin operating point
22.	Vout p-p	5.502 mV	Op_point	Peak-to-peak output ripple voltage
23.	Cin Pd	2.397 mW	Power	Input capacitor power dissipation
24.	Cout Pd	1.159 mW	Power	Output capacitor power dissipation
25.	IC Pd	295.456 mW	Power	IC power dissipation
26.	L Pd	392.5 mW	Power	Inductor power dissipation
27.	M1 Pd	60.367 mW	Power	M1 MOSFET total power dissipation
28.	M1 PdCond	7.747 mW	Power	M1 MOSFET conduction losses
29.	M1 PdSw	52.62 mW	Power	M1 MOSFET switching losses
30.	M2 Pd	131.446 mW	Power	M2 MOSFET total power dissipation
31.	M2 PdCond	51.259 mW	Power	M2 MOSFET conduction losses
32.	M2 PdSw	80.187 mW	Power	M2 MOSFET switching losses
33.	Total Pd	883.329 mW	Power	Total Power Dissipation
34.	Vout Tolerance	3.688 %		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	22.0	Maximum input voltage
3.	VinMin	14.0	Minimum input voltage
4.	Vout	3.3	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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