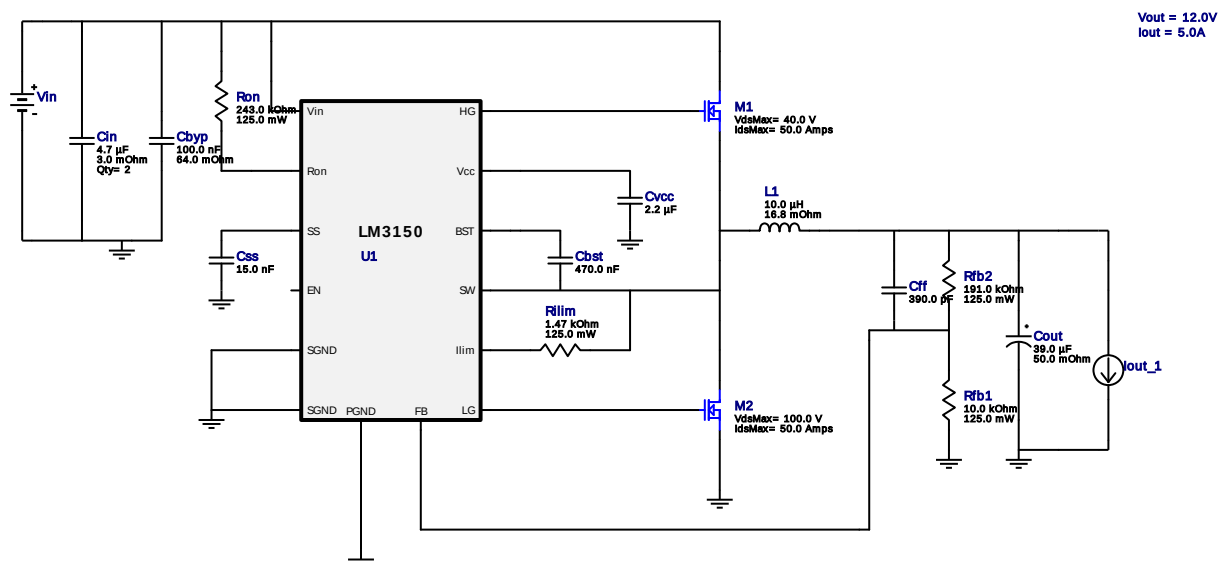


WEBENCH® Design Report

Design : 4148234/163 LM3150MH/NOPB
LM3150MH/NOPB 18.0V-32.0V to 12.00V @ 5.0A



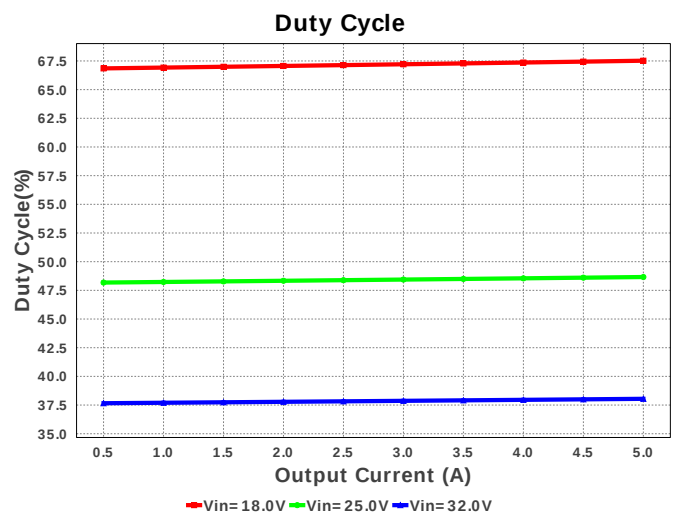
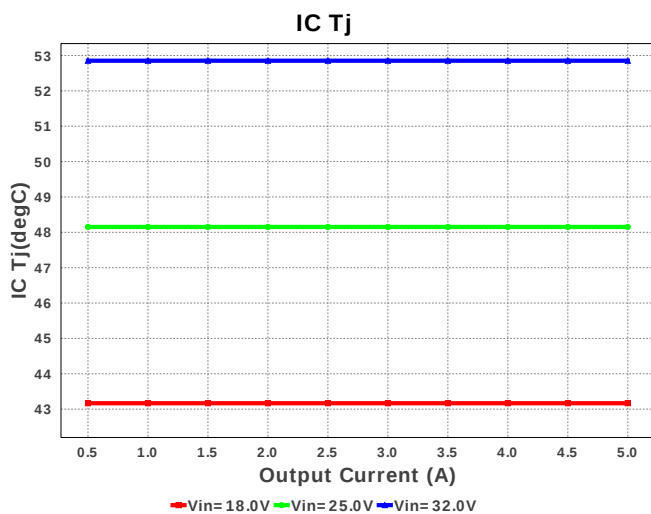
My Comments

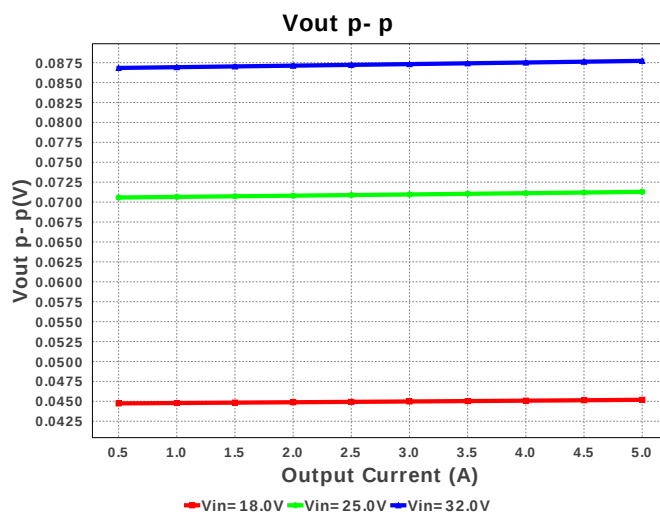
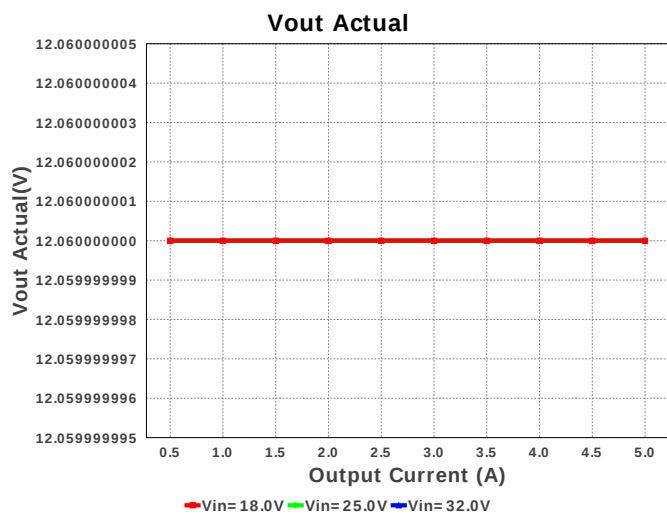
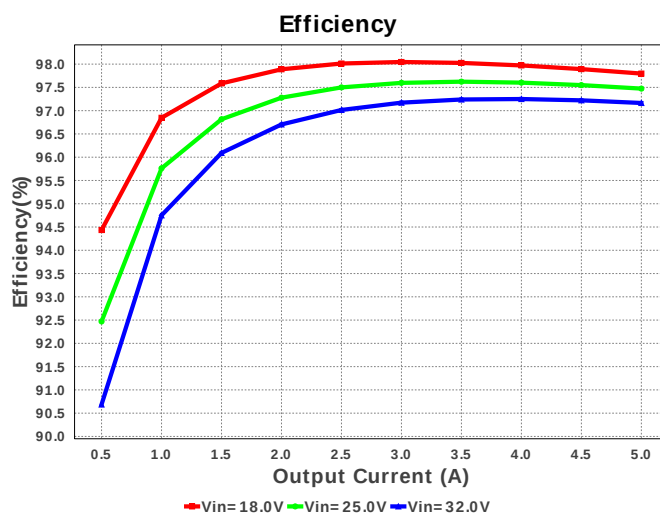
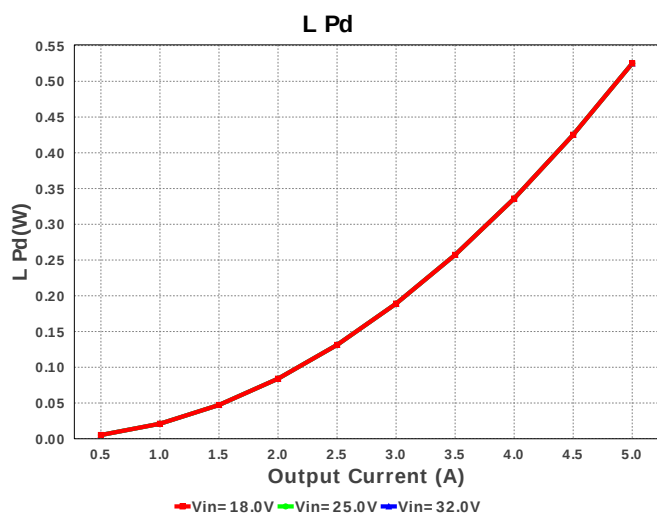
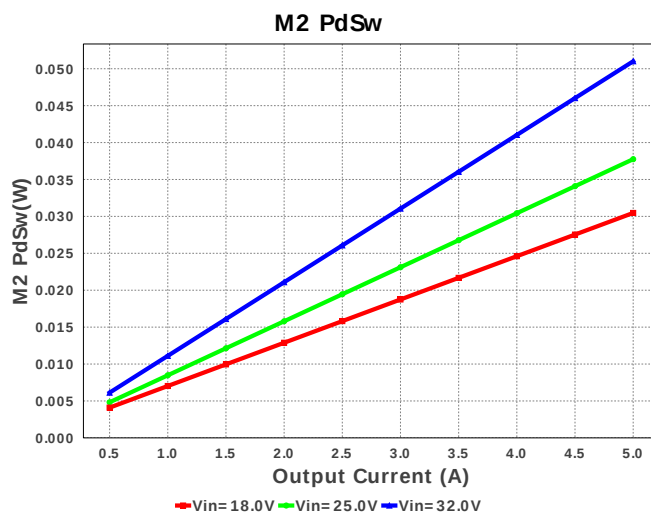
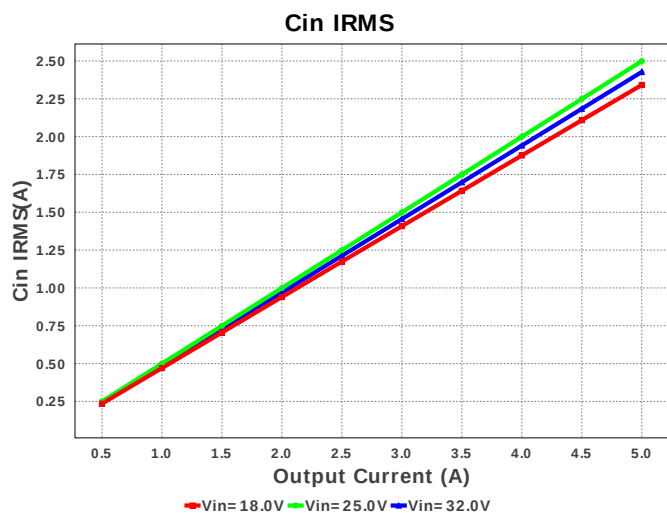
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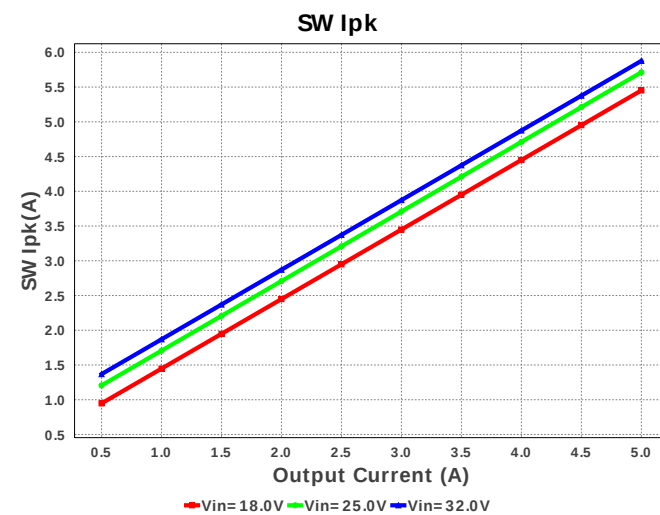
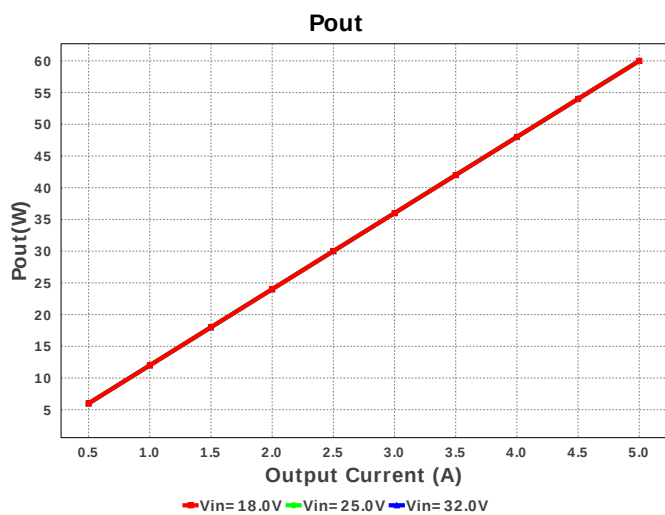
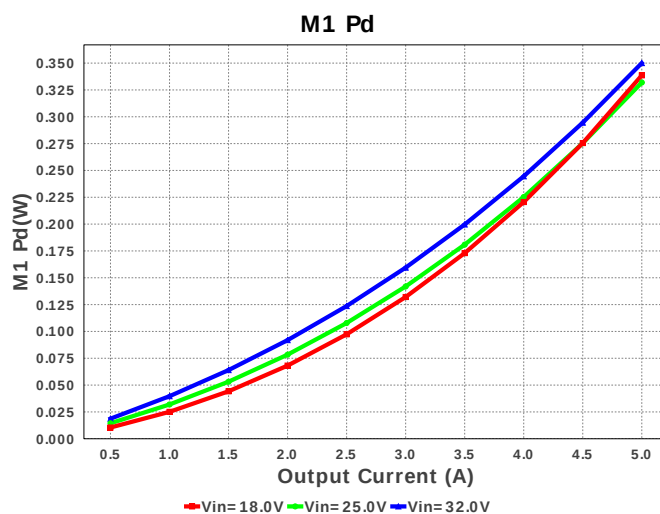
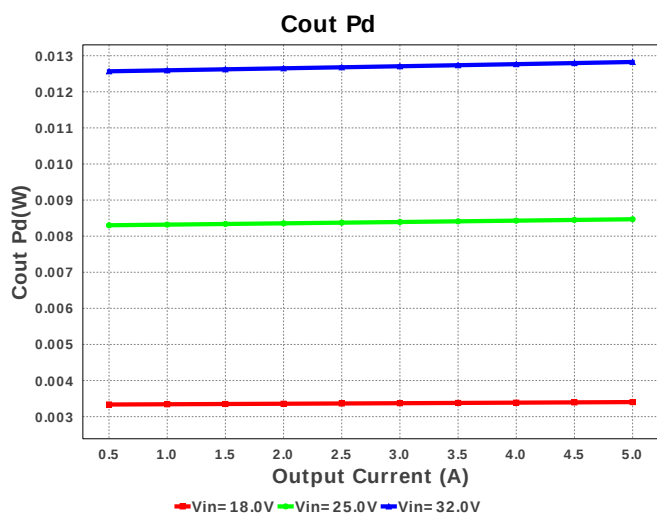
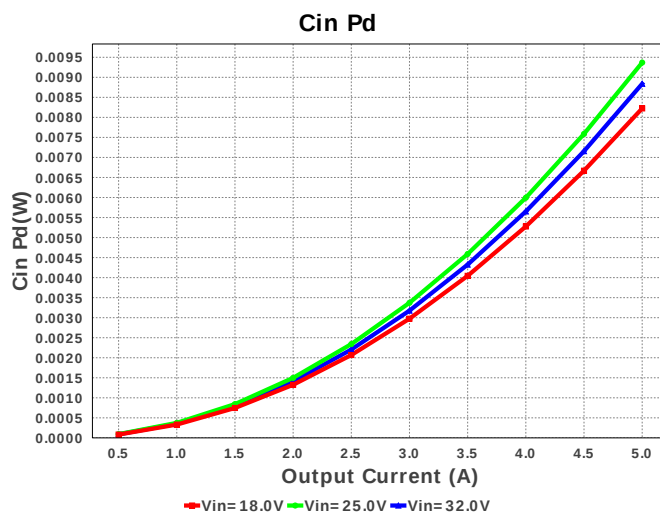
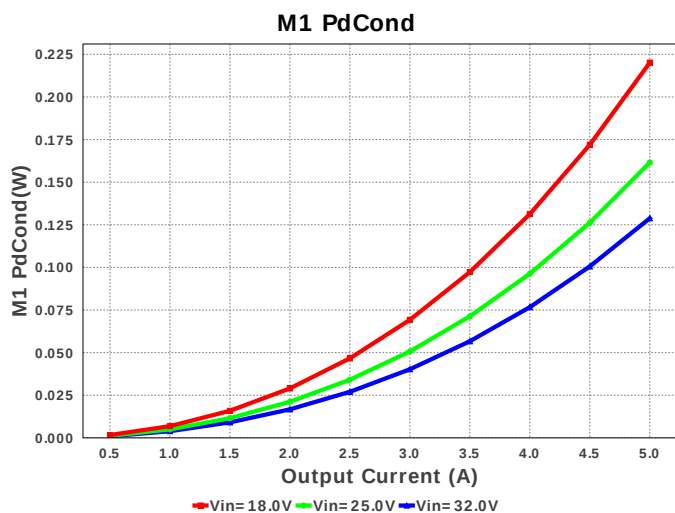
Electrical BOM

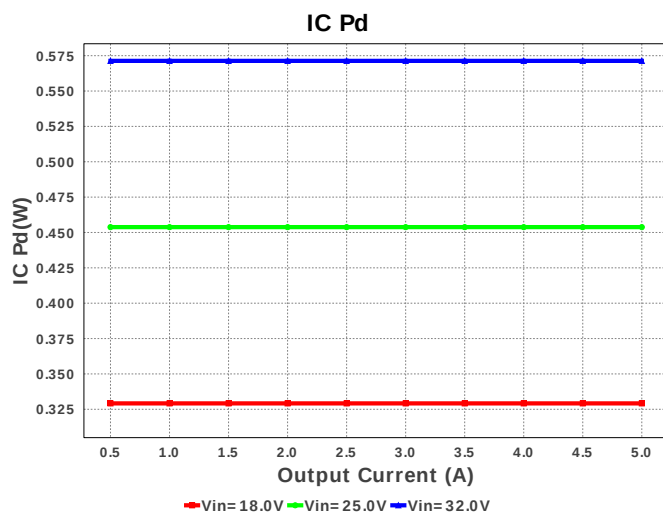
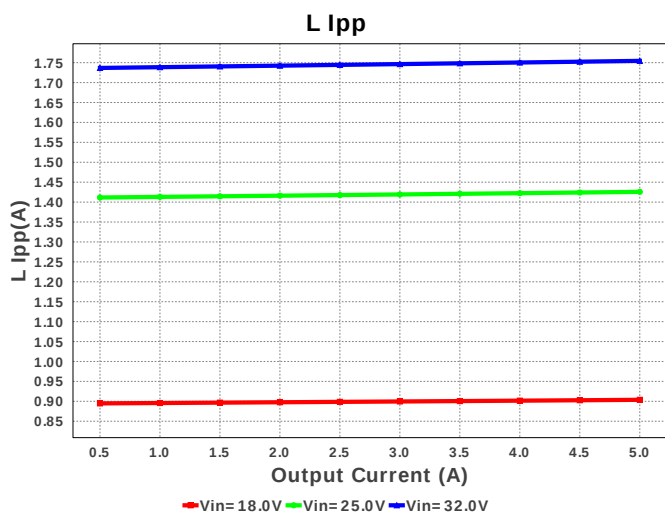
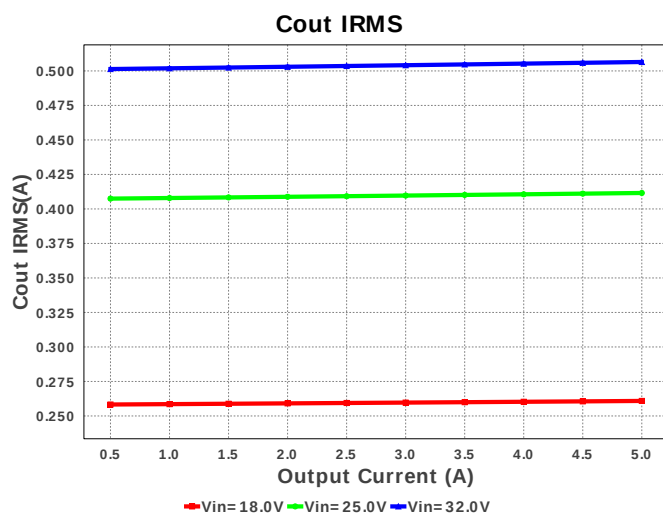
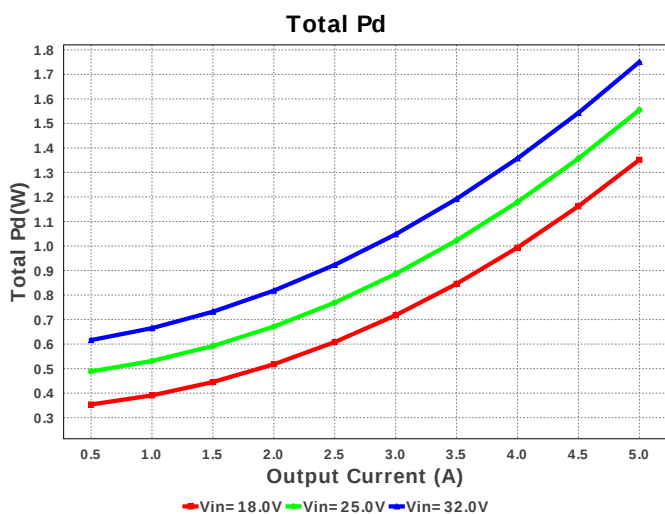
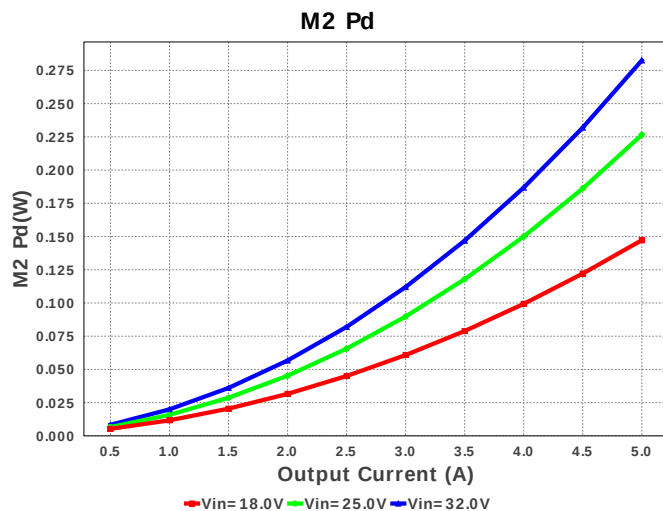
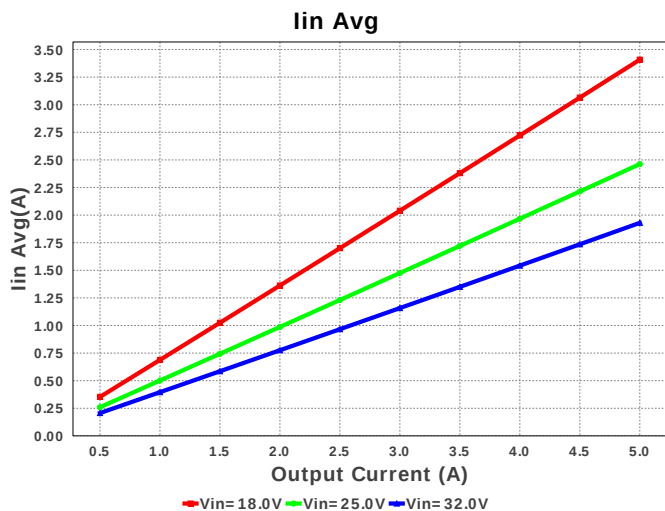
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	Taiyo Yuden	EMK212B7474KD-T Series= X7R	Cap= 470.0 nF VDC= 16.0 V IRMS= 0.0 A	1	\$0.02	 0805 7 mm ²
2.	Cbyp	Kemet	C0805C104K5RACTU Series= X7R	Cap= 100.0 nF ESR= 64.0 mOhm VDC= 50.0 V IRMS= 1.64 A	1	\$0.01	 0805 7 mm ²
3.	Cff	Yageo 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	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	16SVP39M Series= SVP	Cap= 39.0 uF ESR= 50.0 mOhm VDC= 16.0 V IRMS= 1.62 A	1	\$0.42	 SM_RADIAL_6.3AMM 80 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

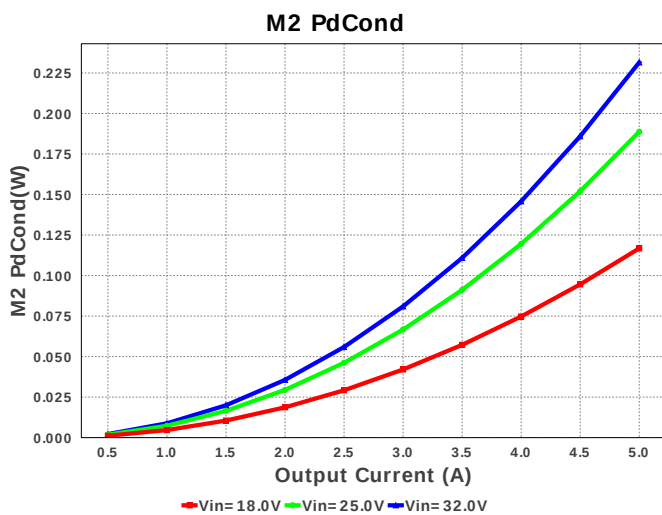
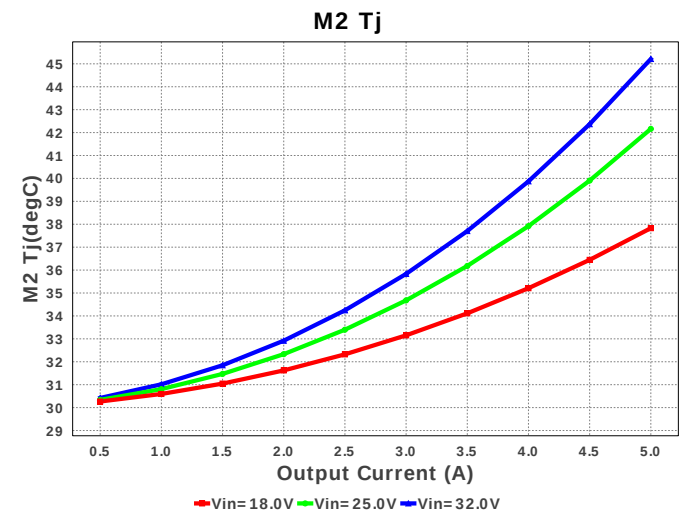
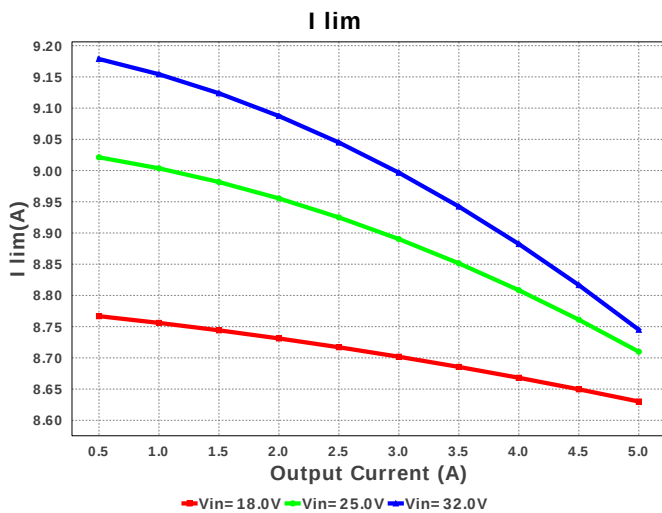
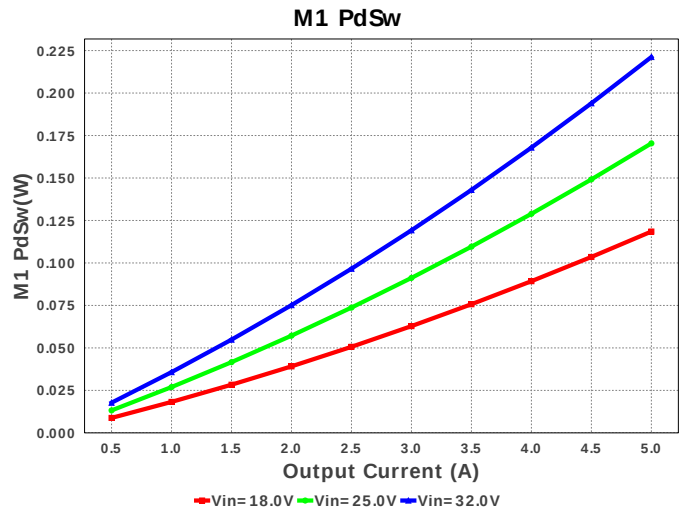
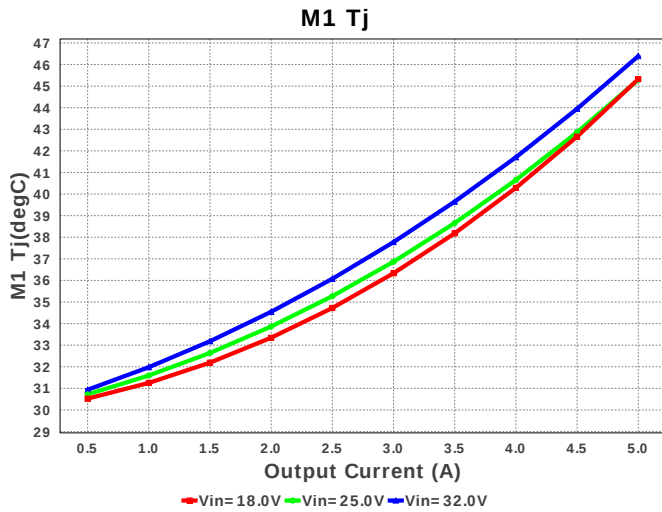
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
8.	L1	Bourns	SRP1270-100M	L= 10.0 μ H DCR= 16.8 mOhm	1	\$0.60	 SRP1270 246 mm ²
9.	M1	Texas Instruments	CSD18504Q5A	VdsMax= 40.0 V IdsMax= 50.0 Amps	1	\$0.37	 TRANS_NexFET_Q5A 55 mm ²
10.	M2	Texas Instruments	CSD19534Q5A	VdsMax= 100.0 V IdsMax= 50.0 Amps	1	\$0.38	 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-6ENF1913V Series= ERJ-6E	Res= 191.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
13.	Rilim	Panasonic	ERJ-6ENF1471V Series= ERJ-6E	Res= 1.47 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
14.	Ron	Panasonic	ERJ-6ENF2433V Series= ERJ-6E	Res= 243.0 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











Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	2.427 A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	506.483 mA	Current	Output capacitor RMS ripple current
3.	I lim	8.743 A	Current	Current limit threshold
4.	Iin Avg	1.93 A	Current	Average input current
5.	L Ipp	1.754 A	Current	Peak-to-peak inductor ripple current
6.	SW Ipk	5.877 A	Current	Peak switch current
7.	BOM Count	16	General	Total Design BOM count
8.	FootPrint	578.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	433.669 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	60.0 W	General	Total output power
13.	Total BOM	\$3.65	General	Total BOM Cost
14.	Vout Actual	12.06 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
15.	Duty Cycle	38.044 %	Op_point	Duty cycle
16.	Efficiency	97.163 %	Op_point	Steady state efficiency
17.	IC Tj	67.136 degC	Op_point	IC junction temperature
18.	IOUT_OP	5.0 A	Op_point	Iout operating point
19.	M1 Tj	46.39 degC	Op_point	M1 MOSFET junction temperature
20.	M2 Tj	45.253 degC	Op_point	M2 MOSFET junction temperature
21.	VIN_OP	32.0 V	Op_point	Vin operating point
22.	Vout p-p	87.725 mV	Op_point	Peak-to-peak output ripple voltage
23.	Cin Pd	8.839 mW	Power	Input capacitor power dissipation
24.	Cout Pd	12.826 mW	Power	Output capacitor power dissipation
25.	IC Pd	571.326 mW	Power	IC power dissipation
26.	L Pd	525.0 mW	Power	Inductor power dissipation
27.	M1 Pd	350.47 mW	Power	M1 MOSFET total power dissipation
28.	M1 PdCond	129.272 mW	Power	M1 MOSFET conduction losses
29.	M1 PdSw	221.199 mW	Power	M1 MOSFET switching losses
30.	M2 Pd	283.36 mW	Power	M2 MOSFET total power dissipation
31.	M2 PdCond	231.582 mW	Power	M2 MOSFET conduction losses
32.	M2 PdSw	51.778 mW	Power	M2 MOSFET switching losses
33.	Total Pd	1.752 W	Power	Total Power Dissipation
34.	Vout Tolerance	3.958 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	5.0	Maximum Output Current
2.	VinMax	32.0	Maximum input voltage
3.	VinMin	18.0	Minimum input voltage
4.	Vout	12.0	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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