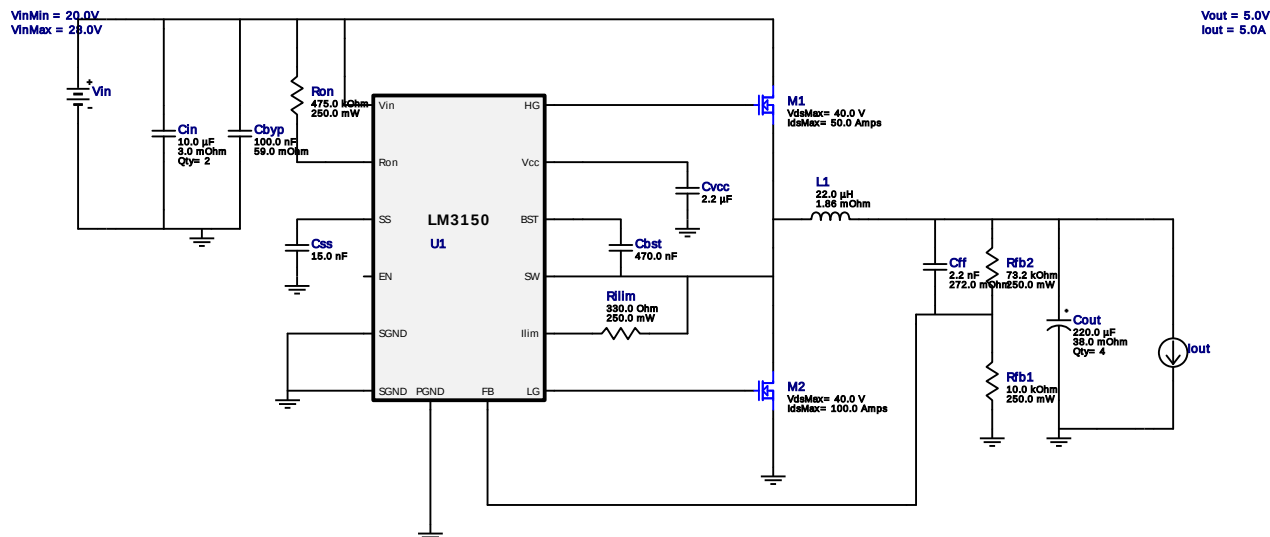


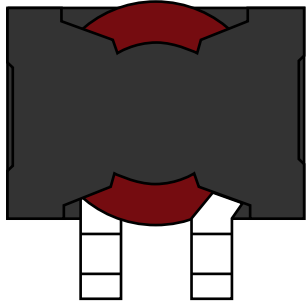
WEBENCH® Design Report

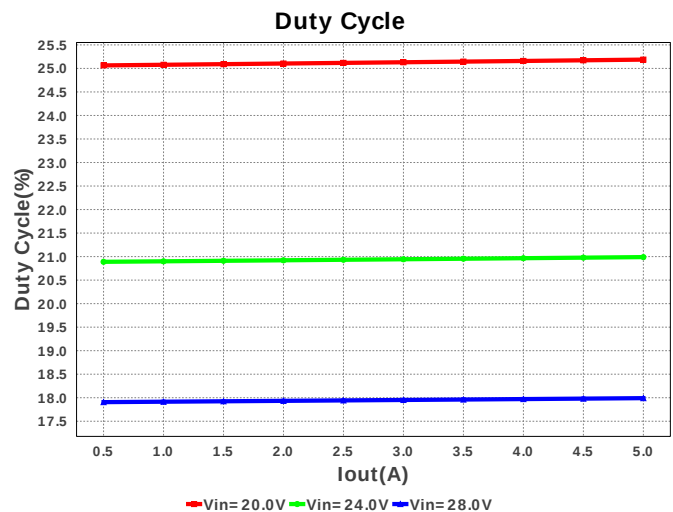
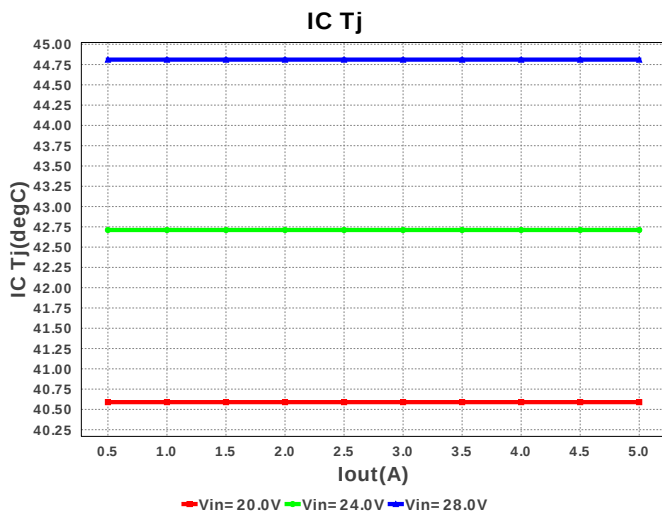
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LM3150MHX/NOPB 20.0V-28.0V to 5.0V @ 5.0A

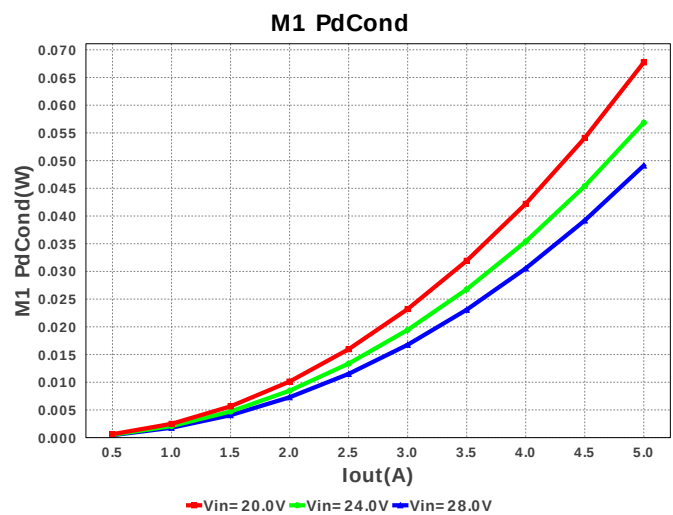
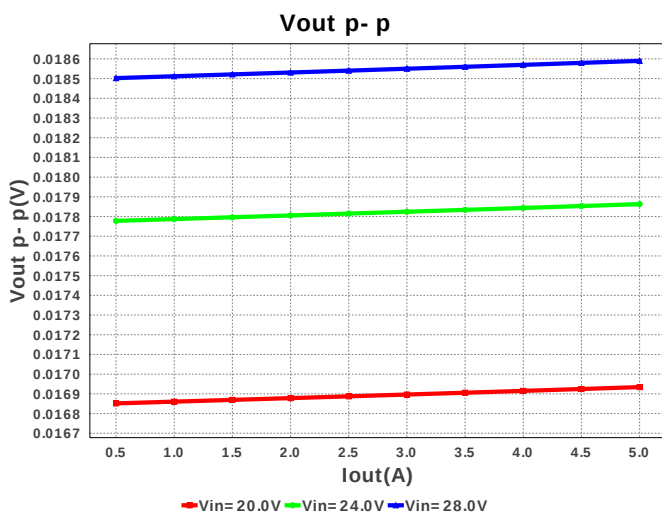
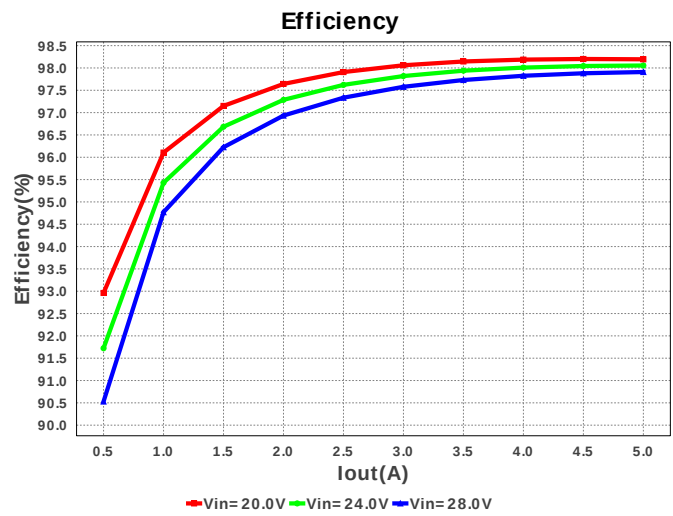
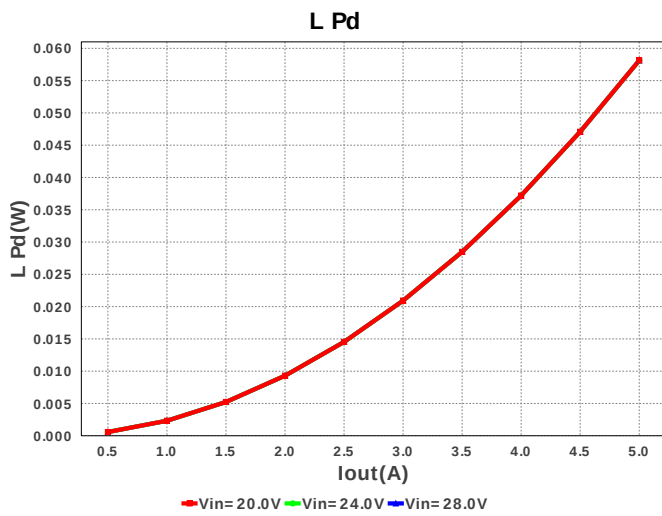
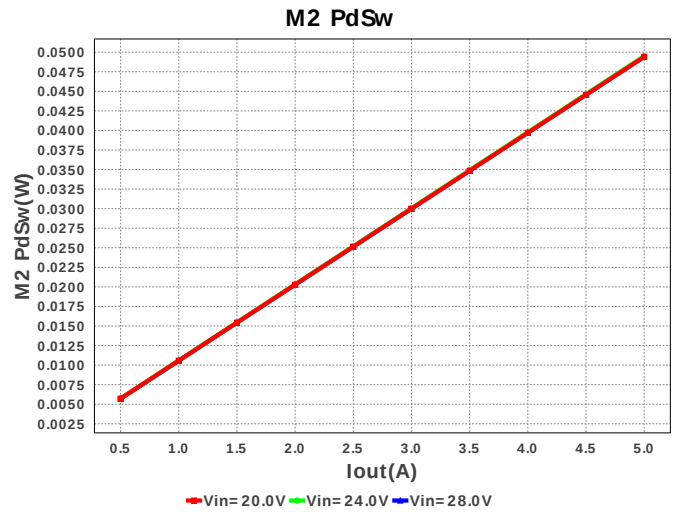
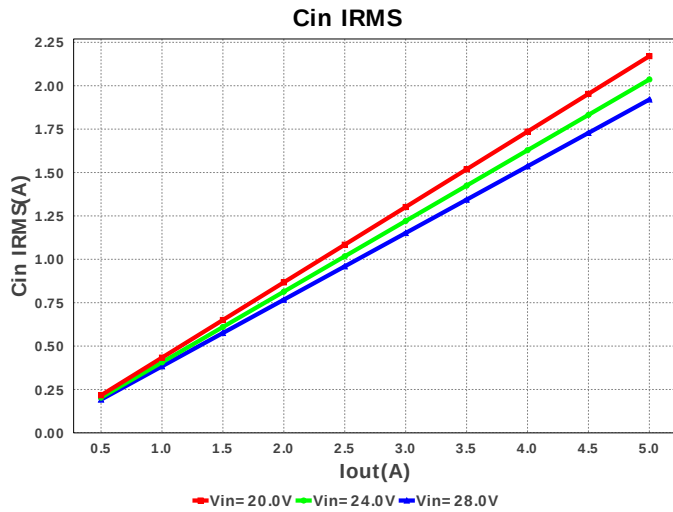


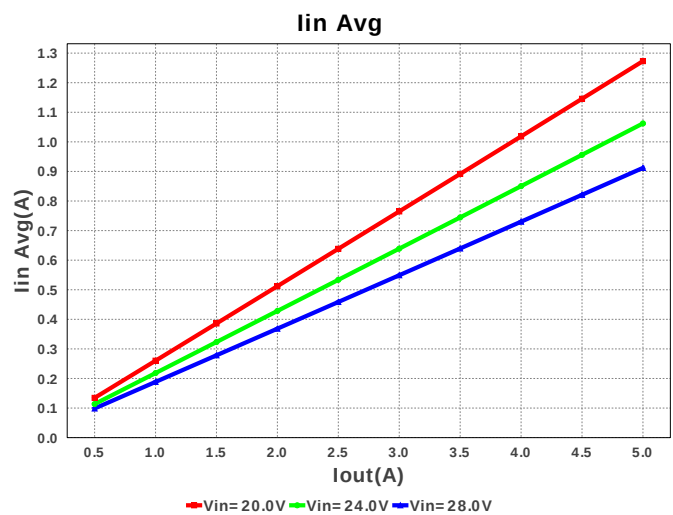
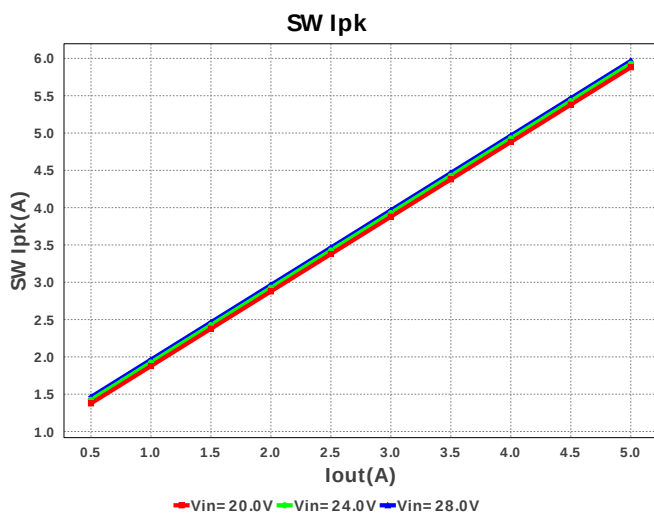
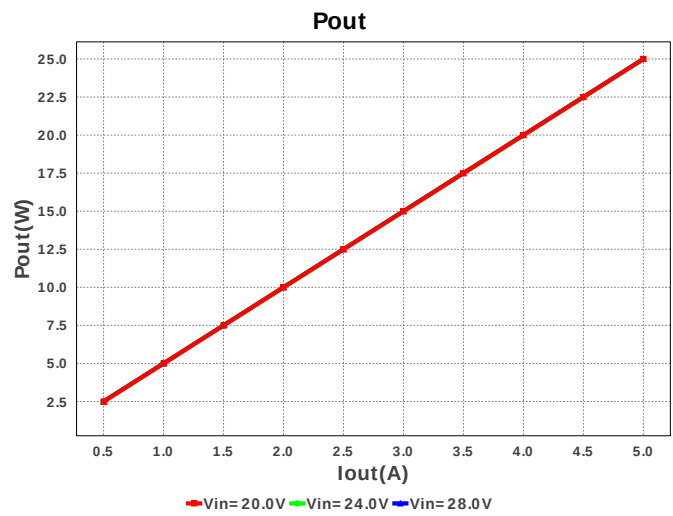
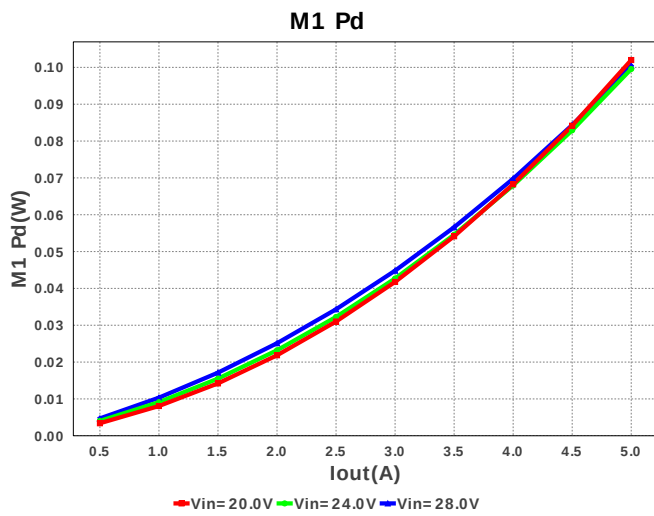
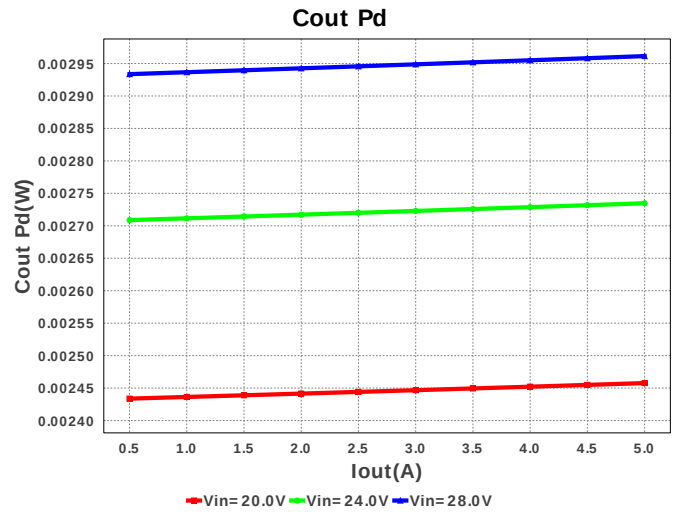
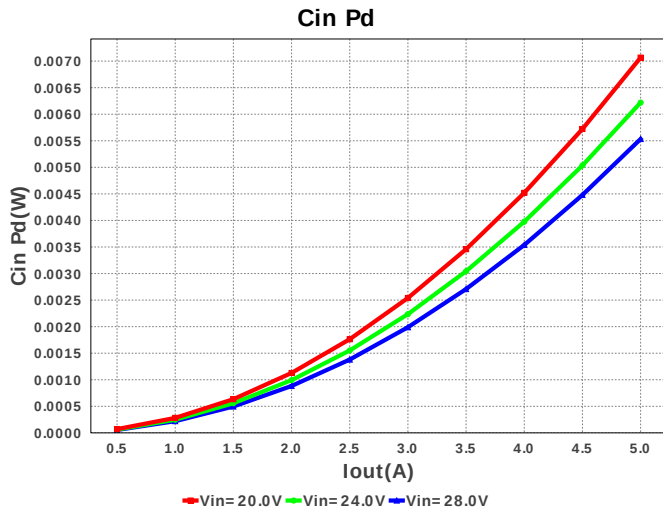
Electrical BOM

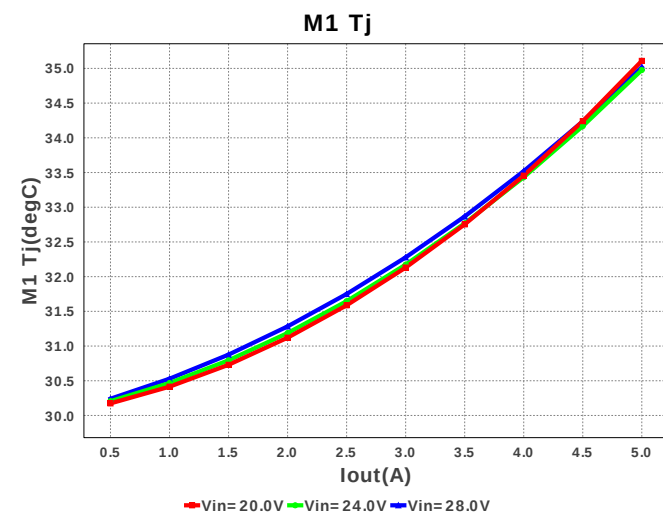
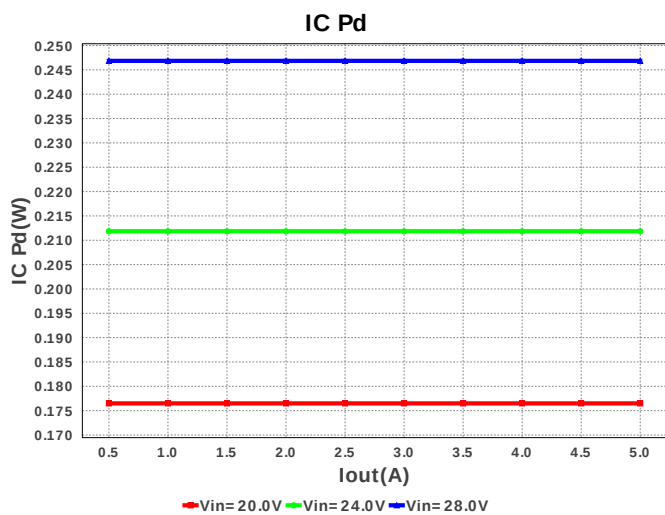
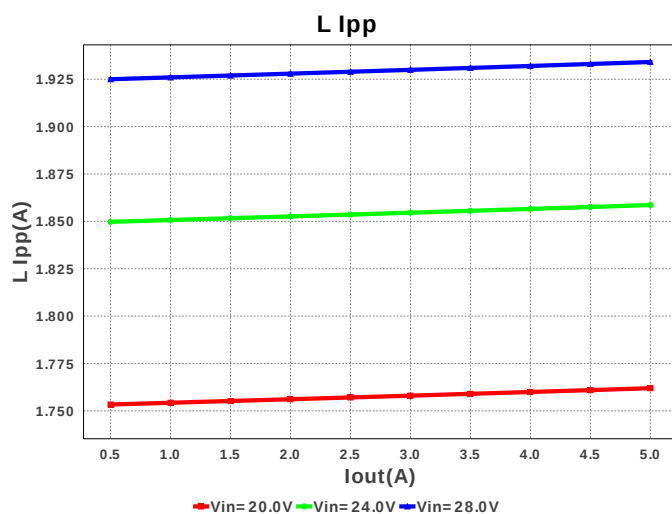
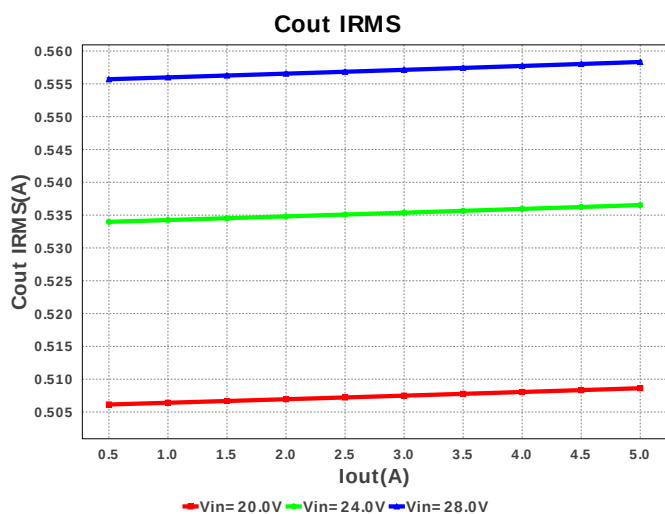
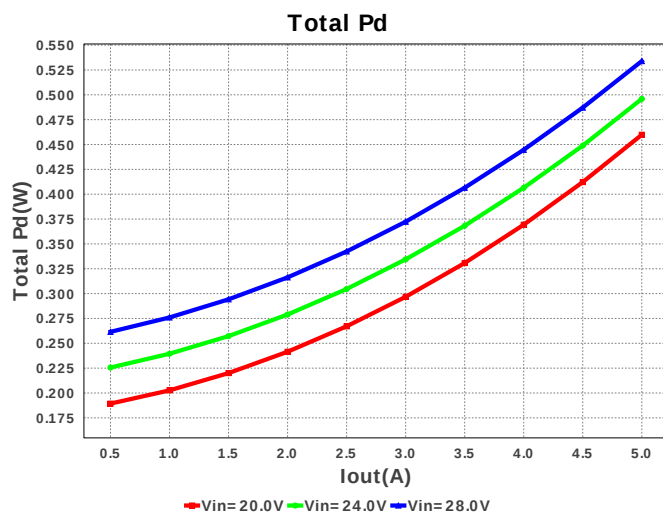
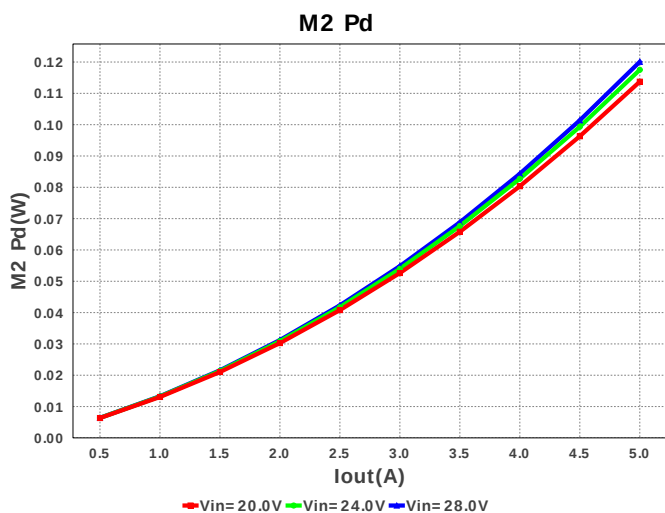
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	MuRata	GRM31MR71H474KA01L Series= X7R	Cap= 470.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.12	 1206 11mm2
2.	Cbyp	Kemet	C1206C104K5RACTU Series= X7R	Cap= 100.0 nF ESR= 59.0 mOhm VDC= 50.0 V IRMS= 1.2 A	1	\$0.01	 1206 11mm2
3.	Cff	AVX	12065C222KAT2A Series= X7R	Cap= 2.2 nF ESR= 272.0 mOhm VDC= 50.0 V IRMS= 0.0 A	1	\$0.05	 1206 11mm2
4.	Cin	TDK	C5750X7R1H106M Series= X7R	Cap= 10.0 µF ESR= 3.0 mOhm VDC= 50.0 V IRMS= 5.5 A	2	\$0.68	 2220 60mm2
5.	Cout	CUSTOM	CUSTOM Series= CUSTOM	Cap= 220.0 µF ESR= 38.0 mOhm VDC= 35.0 V IRMS= 1.29 A	4	\$0.10	CUSTOM 113mm2
6.	Css	TDK	C3216C0G1H153J Series= C0G/NP0	Cap= 15.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.10	 1206 11mm2
7.	Cvcc	MuRata	GRM31CR61H225KA88L Series= X5R	Cap= 2.2 µF VDC= 50.0 V IRMS= 0.0 A	1	\$0.07	 1206 11mm2

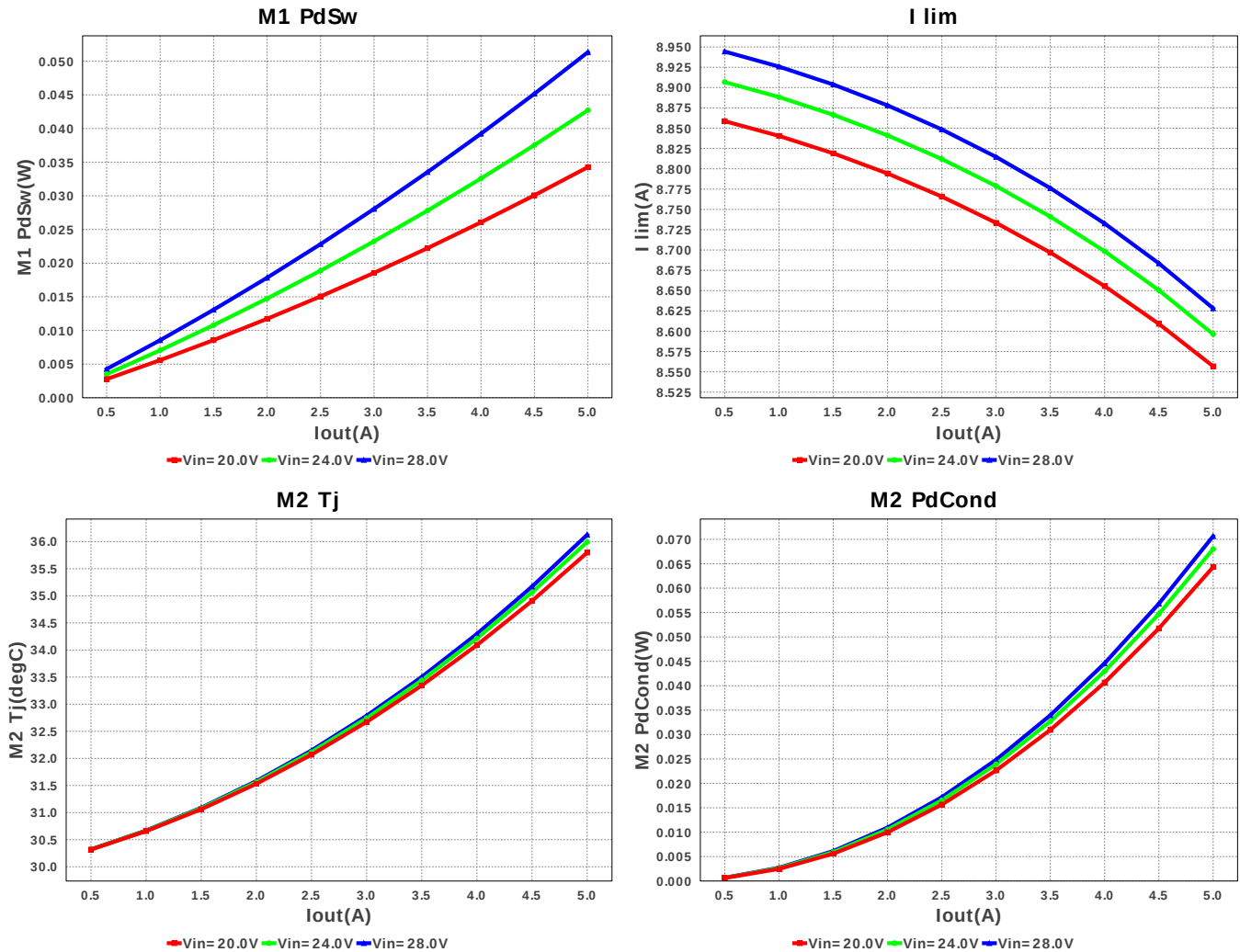
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
8.	L1	Coilcraft	SER2915H-223KL	L= 22.0 μ H DCR= 1.86 mOhm	1	\$2.17	 SER2915 895mm2
9.	M1	Texas Instruments	CSD18504Q5A	VdsMax= 40.0 V IdsMax= 50.0 Amps	1	\$0.63	 TRANS_NexFET_Q5A 55mm2
10.	M2	Texas Instruments	CSD18502Q5B	VdsMax= 40.0 V IdsMax= 100.0 Amps	1	\$1.23	 TRANS_NexFET_Q5B 58mm2
11.	Rfb1	Yageo America	RC1206FR-0710KL Series= 235	Res= 10.0 kOhm Power= 250.0 mW Tolerance= 1.0%	1	\$0.01	 1206 11mm2
12.	Rfb2	Vishay-Dale	CRCW120673K2FKEA Series= CRCW..e3	Res= 73.2 kOhm Power= 250.0 mW Tolerance= 1.0%	1	\$0.01	 1206 11mm2
13.	Rilim	Yageo America	RC1206FR-07330RL Series= 235	Res= 330.0 Ohm Power= 250.0 mW Tolerance= 1.0%	1	\$0.01	 1206 11mm2
14.	Ron	Panasonic	ERJ-8ENF4753V Series= ERJ-8E	Res= 475.0 kOhm Power= 250.0 mW Tolerance= 1.0%	1	\$0.01	 1206 11mm2
15.	U1	Texas Instruments	LM3150MHX/NOPB	Switcher	1	\$1.55	 MXA14A 59mm2











Operating Values

#	Name	Value	Category	Description
1.	BOM Count	19		Total Design BOM count
2.	Total BOM	\$7.73		Total BOM Cost
3.	Cin IRMS	1.921 A	Current	Input capacitor RMS ripple current
4.	Cout IRMS	558.329 mA	Current	Output capacitor RMS ripple current
5.	I lim	8.628 A	Current	Current limit threshold
6.	Iin Avg	911.93 mA	Current	Average input current
7.	L Ipp	1.934 A	Current	Peak-to-peak inductor ripple current
8.	SW Ipk	5.967 A	Current	Peak switch current
9.	FootPrint	1.924 kmm2	General	Total Foot Print Area of BOM components
10.	Frequency	97.247 kHz	General	Switching frequency
11.	IC Tolerance	12.0 mV	General	IC Feedback Tolerance
12.	Pout	25.0 W	General	Total output power
13.	Duty Cycle	17.991 %	Op_point	Duty cycle
14.	Efficiency	97.909 %	Op_point	Steady state efficiency
15.	IC Tj	44.811 degC	Op_point	IC junction temperature
16.	IOUT_OP	5.0 A	Op_point	Iout operating point
17.	M1 Tj	35.018 degC	Op_point	M1 MOSFET junction temperature
18.	M2 Tj	36.125 degC	Op_point	M2 MOSFET junction temperature
19.	VIN_OP	28.0 V	Op_point	Vin operating point
20.	Vout p-p	18.59 mV	Op_point	Peak-to-peak output ripple voltage
21.	Cin Pd	5.533 mW	Power	Input capacitor power dissipation
22.	Cout Pd	2.961 mW	Power	Output capacitor power dissipation
23.	IC Pd	246.847 mW	Power	IC power dissipation
24.	L Pd	58.125 mW	Power	Inductor power dissipation
25.	M1 Pd	100.449 mW	Power	M1 MOSFET total power dissipation
26.	M1 PdCond	49.109 mW	Power	M1 MOSFET conduction losses
27.	M1 PdSw	51.34 mW	Power	M1 MOSFET switching losses
28.	M2 Pd	120.078 mW	Power	M2 MOSFET total power dissipation
29.	M2 PdCond	70.65 mW	Power	M2 MOSFET conduction losses
30.	M2 PdSw	49.428 mW	Power	M2 MOSFET switching losses
31.	Total Pd	533.917 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	5.0 A	Maximum Output Current
2.	Iout1	5.0 Amps	Output Current #1
3.	SoftStart	1.0 ms	Soft Start Time (ms)
4.	VinMax	28.0 V	Maximum input voltage
5.	VinMin	20.0 V	Minimum input voltage
6.	Vout	5.0 V	Output Voltage
7.	Vout1	5.0 Volt	Output Voltage #1
8.	base_pn	LM3150	Base Product Number
9.	source	DC	Input Source Type
10.	Ta	30.0 degC	Ambient temperature
11.	UserFsw	100.0 kHz	Customer Selected Frequency

Design Assistance

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

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