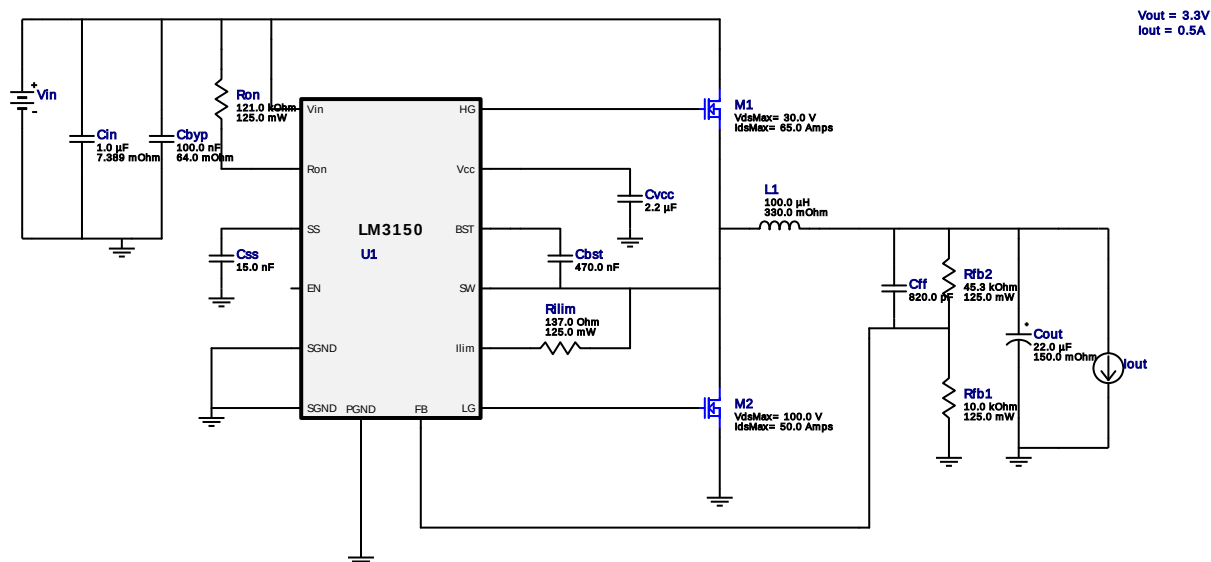


WEBENCH® Design Report

Design : 4725579/4 LM3150MH/NOPB
LM3150MH/NOPB 18.0V-24.0V to 3.30V @ 0.5A



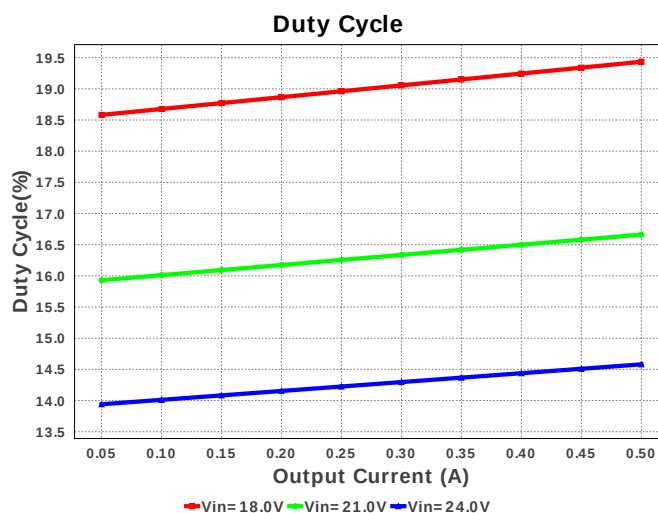
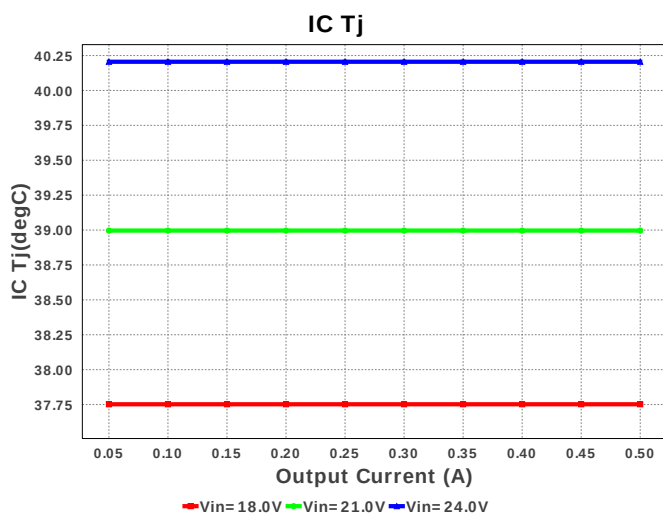
My Comments

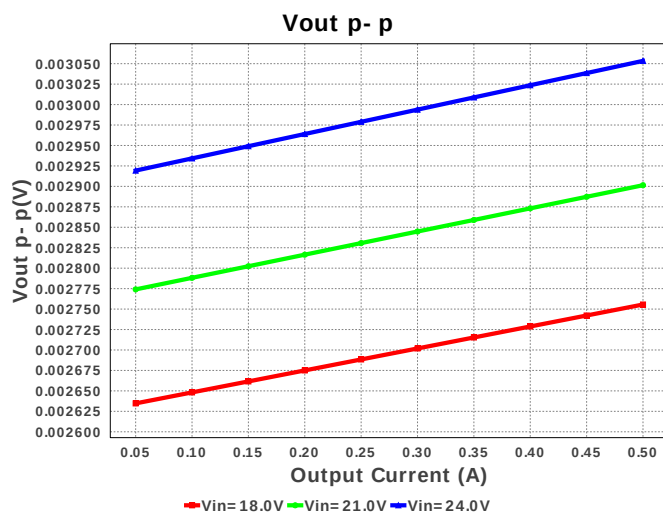
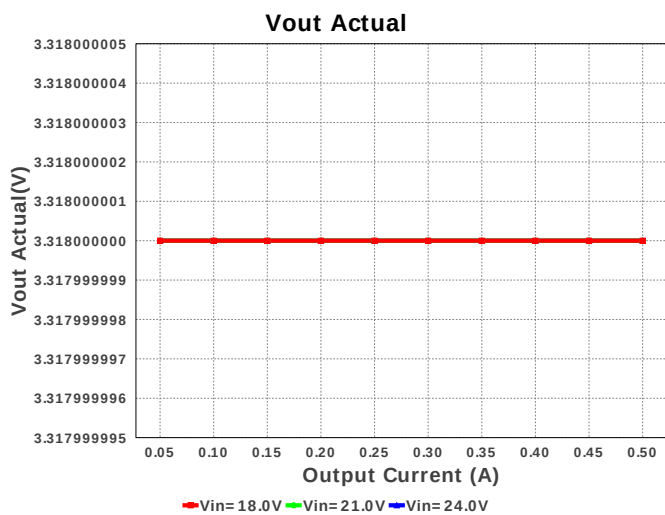
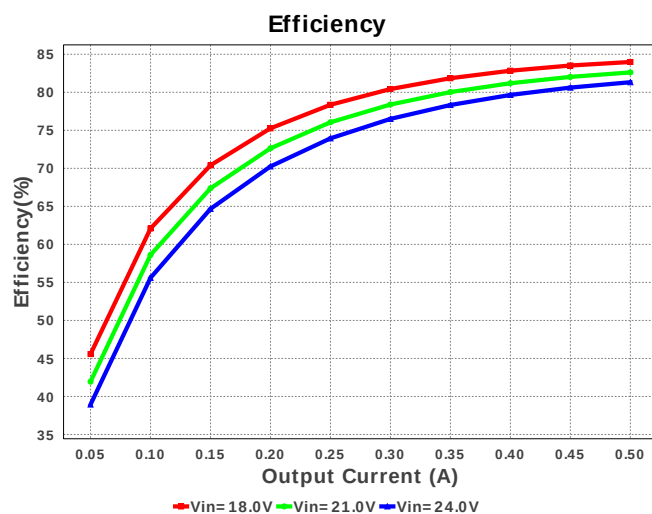
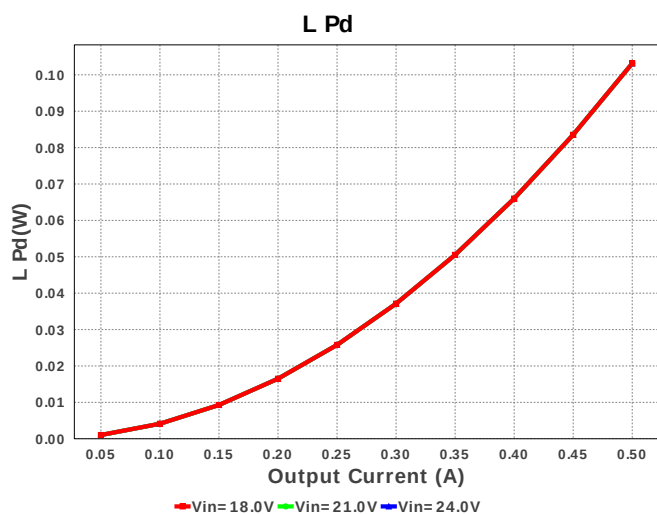
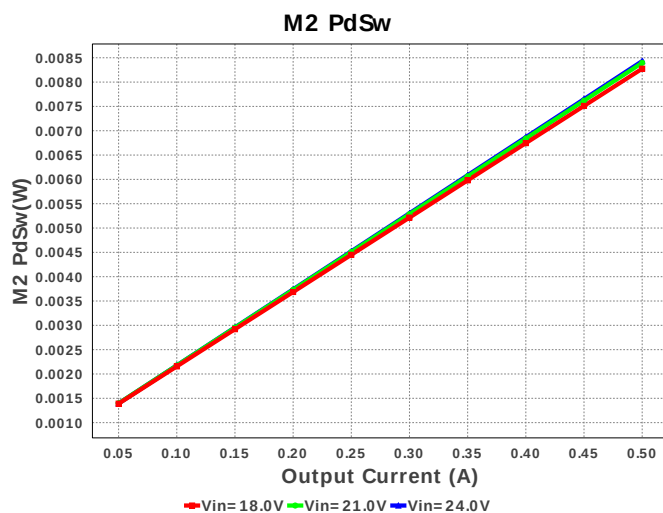
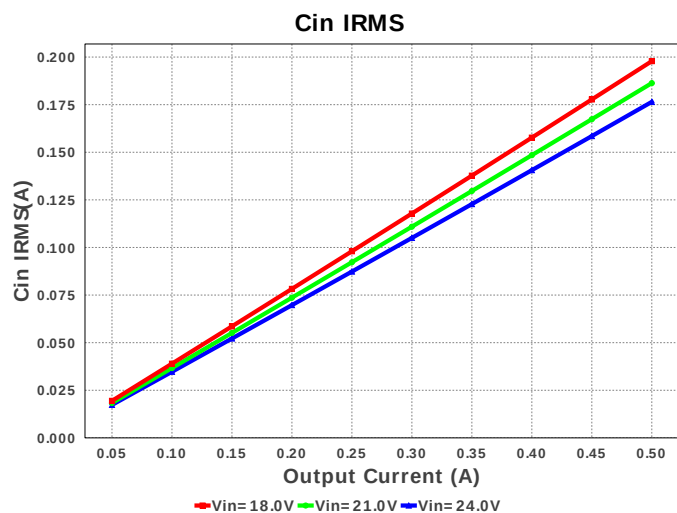
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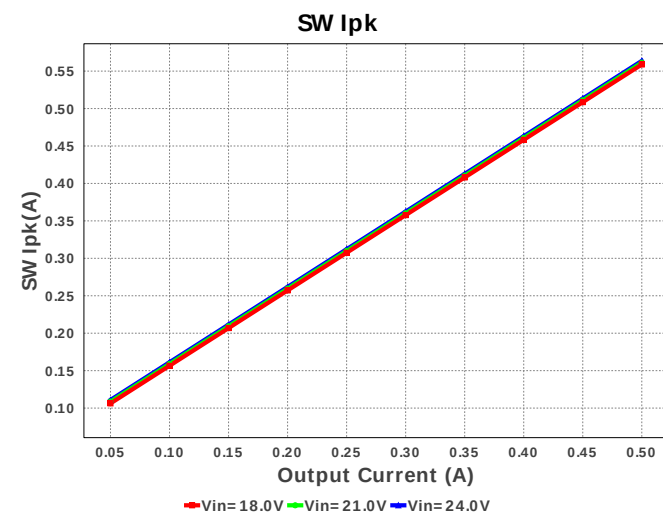
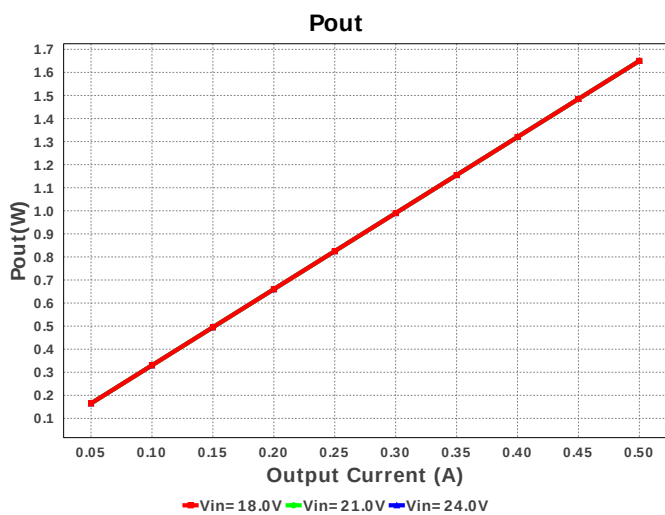
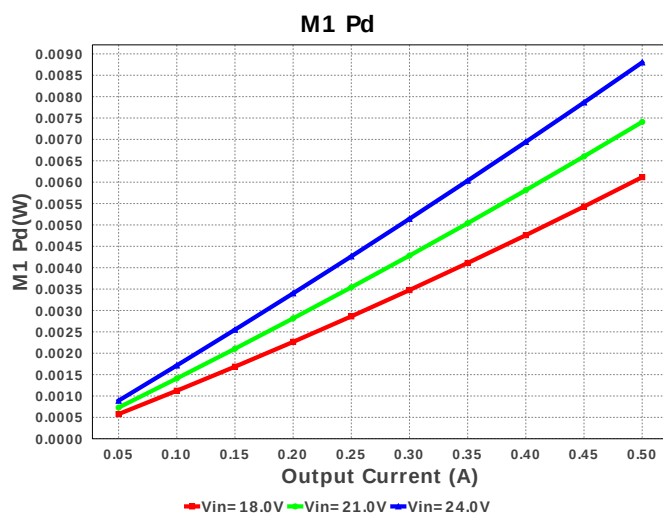
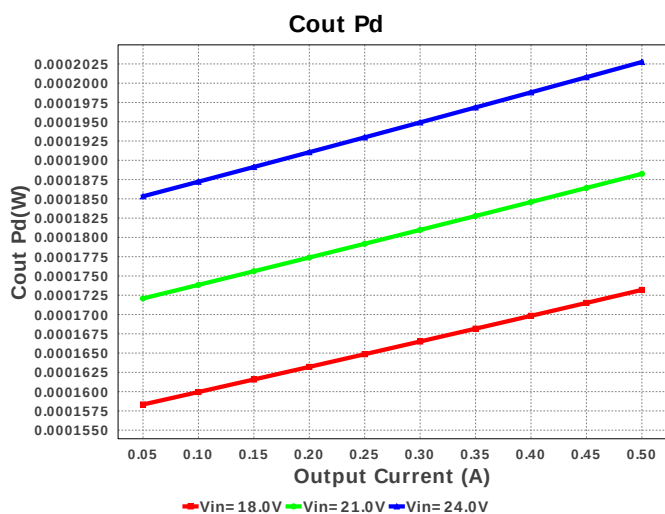
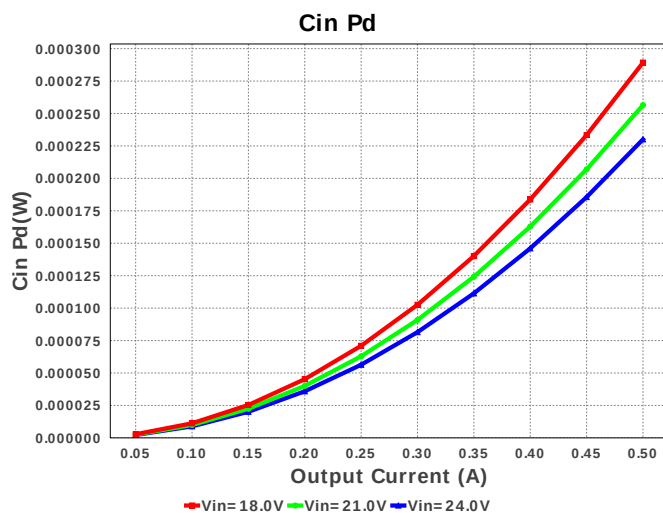
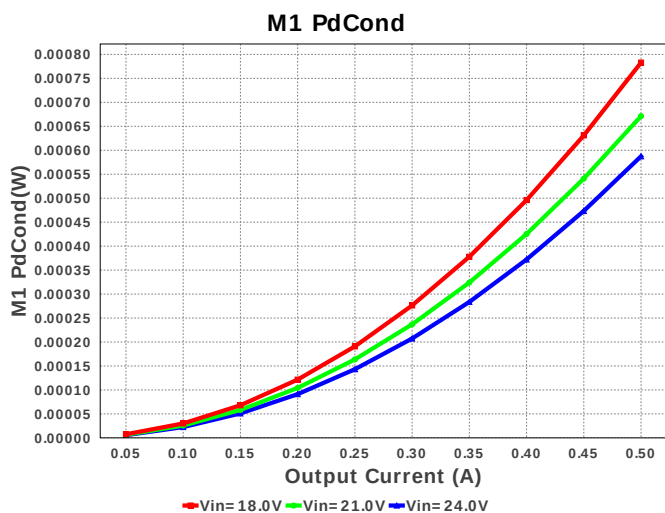
Electrical BOM

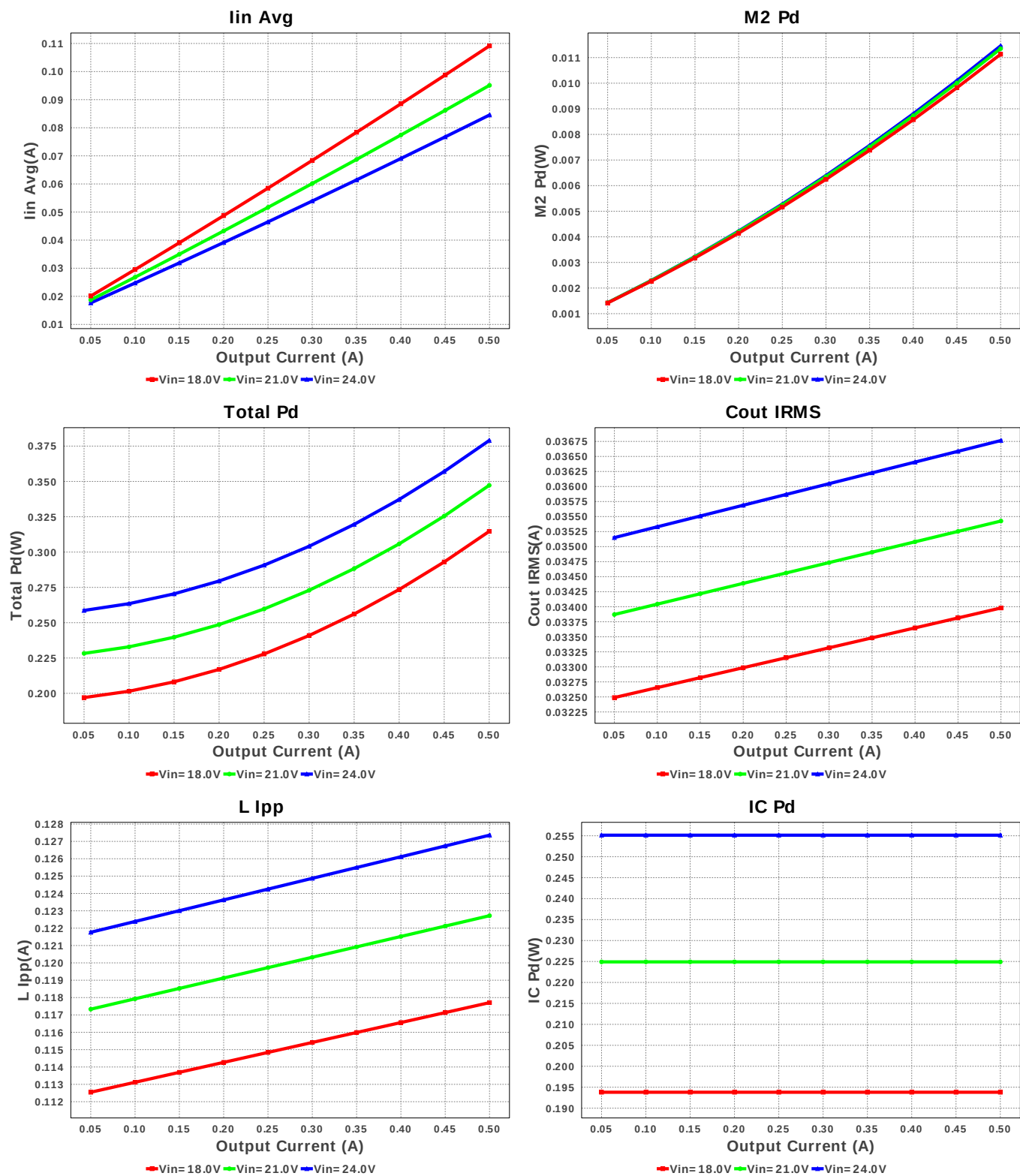
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	Taiyo Yuden	EMK212B7474KD-T Series= X7R	Cap= 470.0 nF VDC= 16.0 V IRMS= 0.0 A	1	\$0.02	0805 7 mm ²
2.	Cby	Kemet	C0805C104K5RACTU Series= X7R	Cap= 100.0 nF ESR= 64.0 mOhm VDC= 50.0 V IRMS= 1.64 A	1	\$0.01	0805 7 mm ²
3.	Cff	Yageo America	CC0805KRX7R9BB821 Series= X7R	Cap= 820.0 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	6TPU22MSI Series= ?	Cap= 22.0 uF ESR= 150.0 mOhm VDC= 6.3 V IRMS= 510.0 mA	1	\$0.44	CAPSMT_6_S09 7 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	TDK	VLP8040T-101M	L= 100.0 uH DCR= 330.0 mOhm	1	\$0.22	VLP8040 113 mm ²

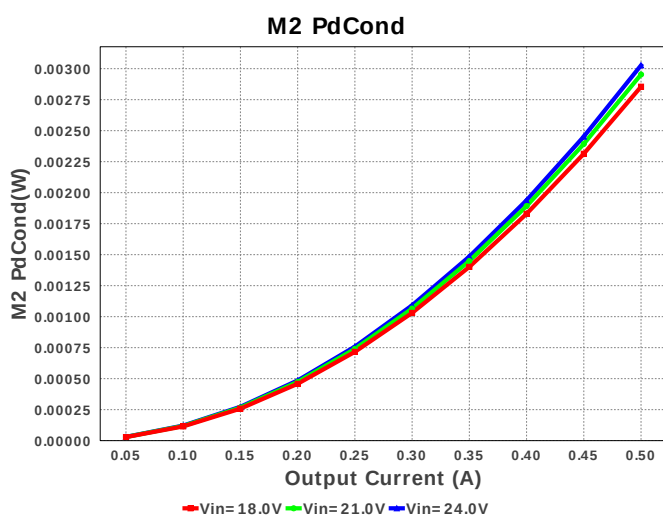
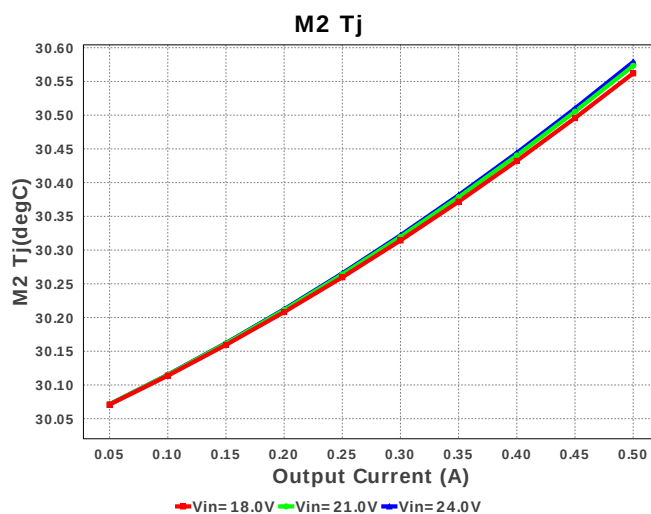
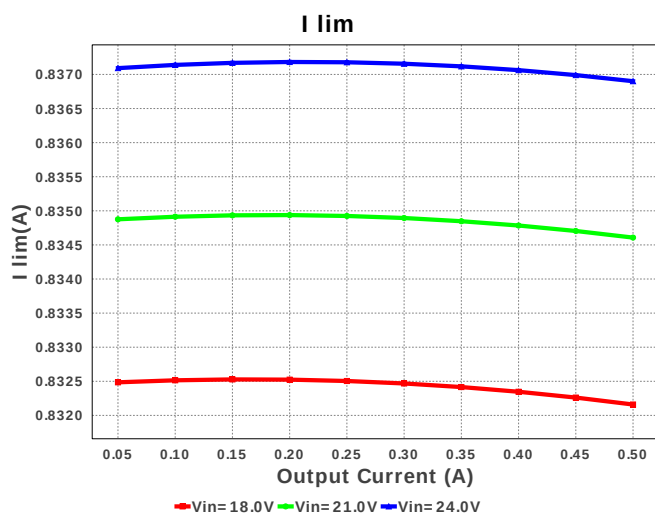
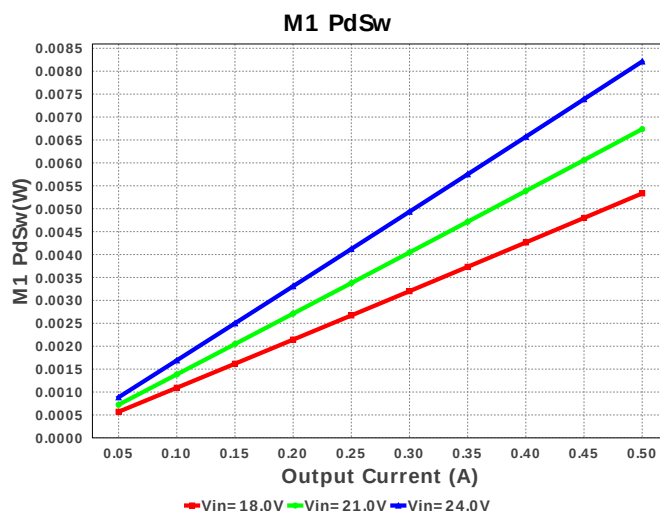
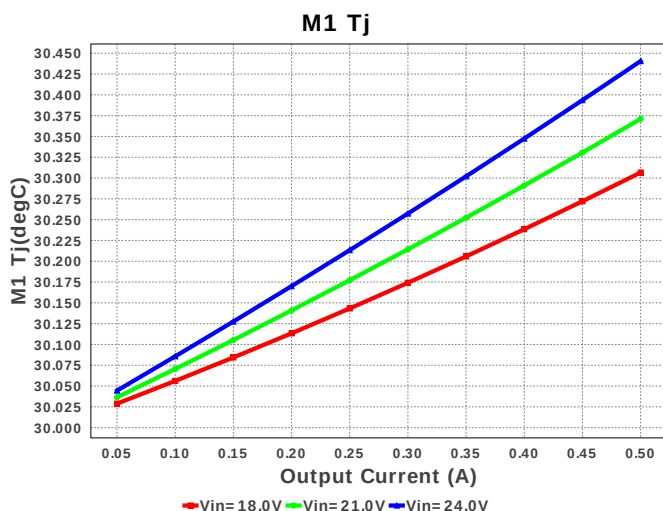
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
9.	M1	Texas Instruments	CSD17507Q5A	VdsMax= 30.0 V IdsMax= 65.0 Amps	1	\$0.25	 TRANS_NexFET_Q5A 55 mm ²
10.	M2	Texas Instruments	CSD19534Q5A	VdsMax= 100.0 V IdsMax= 50.0 Amps	1	\$0.38	 TRANS_NexFET_Q5A 55 mm ²
11.	Rfb1	Panasonic	ERJ-6ENF1002V 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-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	CRCW0805137RFKEA Series= CRCW..e3	Res= 137.0 Ohm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
14.	Ron	Panasonic	ERJ-6ENF1213V Series= ERJ-6E	Res= 121.0 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	176.457 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	36.765 mA	Current	Output capacitor RMS ripple current
3.	I lim	836.789 mA	Current	Current limit threshold
4.	Iin Avg	84.555 mA	Current	Average input current
5.	L Ipp	127.36 mA	Current	Peak-to-peak inductor ripple current
6.	SW Ipk	563.679 mA	Current	Peak switch current
7.	BOM Count	15	General	Total Design BOM count
8.	FootPrint	361.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	236.987 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	1.65 W	General	Total output power
13.	Total BOM	\$3.06	General	Total BOM Cost
14.	Vout Actual	3.318 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
15.	Duty Cycle	14.581 %	Op_point	Duty cycle
16.	Efficiency	81.308 %	Op_point	Steady state efficiency
17.	IC Tj	46.584 degC	Op_point	IC junction temperature
18.	IOUT_OP	500.0 mA	Op_point	Iout operating point
19.	M1 Tj	30.441 degC	Op_point	M1 MOSFET junction temperature
20.	M2 Tj	30.597 degC	Op_point	M2 MOSFET junction temperature
21.	VIN_OP	24.0 V	Op_point	Vin operating point
22.	Vout p-p	3.053 mV	Op_point	Peak-to-peak output ripple voltage
23.	Cin Pd	230.071 μ W	Power	Input capacitor power dissipation
24.	Cout Pd	202.75 μ W	Power	Output capacitor power dissipation
25.	IC Pd	255.14 mW	Power	IC power dissipation
26.	L Pd	103.125 mW	Power	Inductor power dissipation
27.	M1 Pd	8.8 mW	Power	M1 MOSFET total power dissipation
28.	M1 PdCond	587.424 μ W	Power	M1 MOSFET conduction losses
29.	M1 PdSw	8.212 mW	Power	M1 MOSFET switching losses
30.	M2 Pd	11.829 mW	Power	M2 MOSFET total power dissipation
31.	M2 PdCond	3.027 mW	Power	M2 MOSFET conduction losses
32.	M2 PdSw	8.801 mW	Power	M2 MOSFET switching losses
33.	Total Pd	379.32 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	500.0 m	Maximum Output Current
2.	VinMax	24.0	Maximum input voltage
3.	VinMin	18.0	Minimum input voltage
4.	Vout	3.3	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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