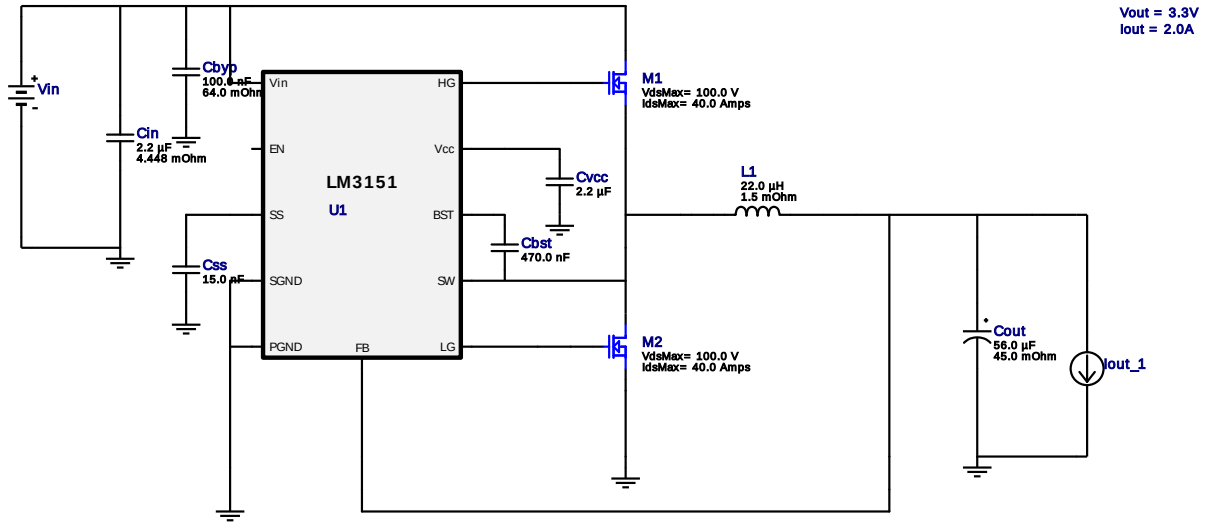
VinMin = 20.0V
VinMax = 22.0V
Vout = 3.3V
Iout = 2.0A

Device = LM3151MHX-3.3/NOPB
Topology = Buck
Created = 8/20/16 3:59:30 AM
BOM Cost = $4.56
BOM Count = 10
Total Pd = 0.56W

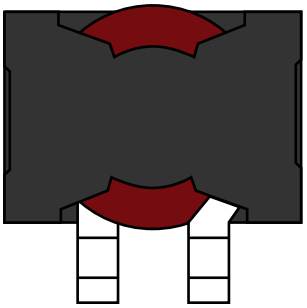
WEBENCH® Design Report

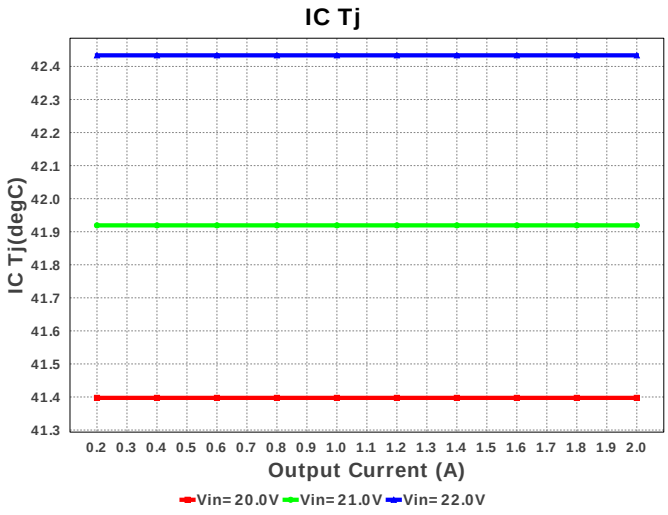
Design : 4772434/5 LM3151MHX-3.3/NOPB
LM3151MHX-3.3/NOPB 20.0V-22.0V to 3.30V @ 2.0A

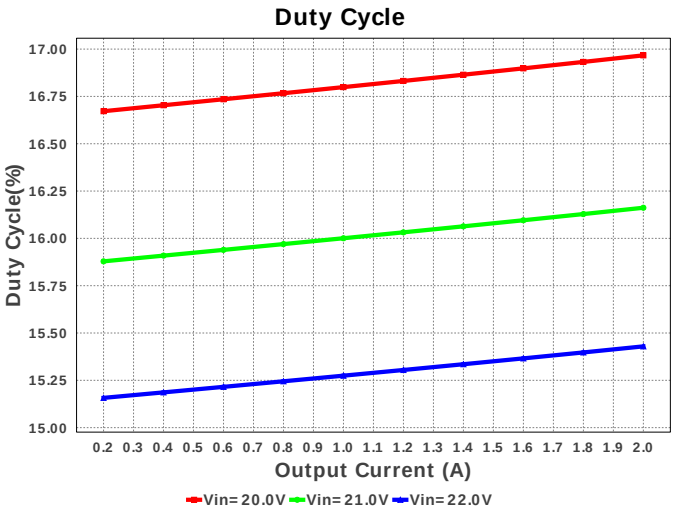


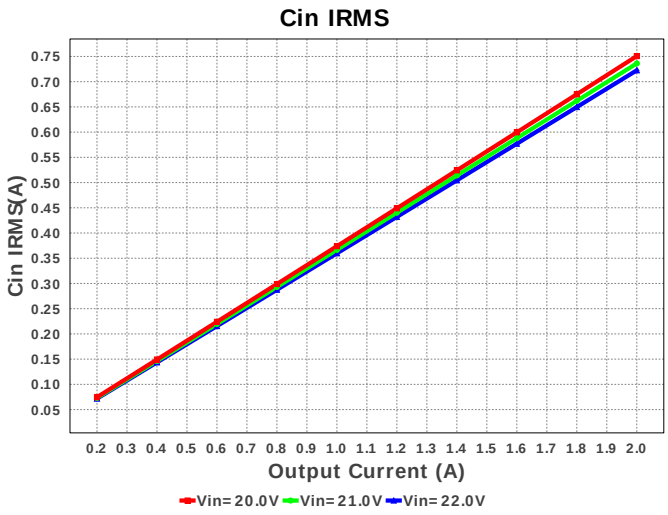
Electrical BOM

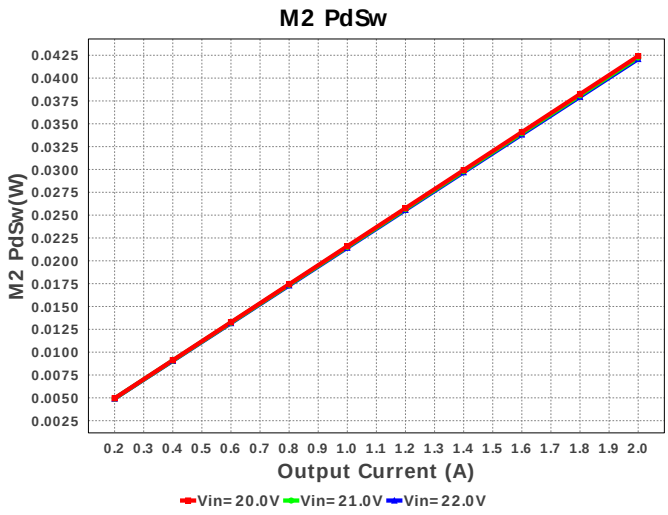
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	Taiyo Yuden	EMK212B7474KD-T Series= X7R	Cap= 470.0 nF VDC= 16.0 V IRMS= 0.0 A	1	$0.02	0805 7 mm^2
2.	Cbyp	Kemet	C0805C104K5RACTU Series= X7R	Cap= 100.0 nF ESR= 64.0 mOhm VDC= 50.0 V IRMS= 1.64 A	1	$0.01	0805 7 mm^2
3.	Cin	MuRata	GRM31CR71H225KA88L 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
4.	Cout	Panasonic	10SVP56M Series= SVP	Cap= 56.0 uF ESR= 45.0 mOhm VDC= 10.0 V IRMS= 1.7 A	1	$0.42	SM_RADIAL_6.3AMM 80 mm^2
5.	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
6.	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

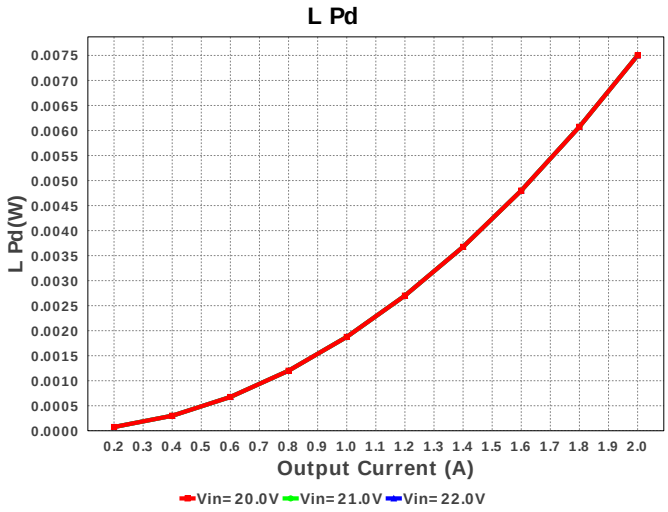
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
7.	L1	Coilcraft	SER2915L-223KL	L= 22.0 µH DCR= 1.5 mOhm	1	$1.88	 SER2915L 652 mm^2
8.	M1	Infineon Technologies	BSC265N10LSF G	VdsMax= 100.0 V IdsMax= 40.0 Amps	1	$0.40	 PG-TDSON-8 55 mm^2
9.	M2	Infineon Technologies	BSC265N10LSF G	VdsMax= 100.0 V IdsMax= 40.0 Amps	1	$0.40	 PG-TDSON-8 55 mm^2
10.	U1	Texas Instruments	LM3151MHX-3.3/NOPB	Switcher	1	$1.35	 MXA14A 59 mm^2

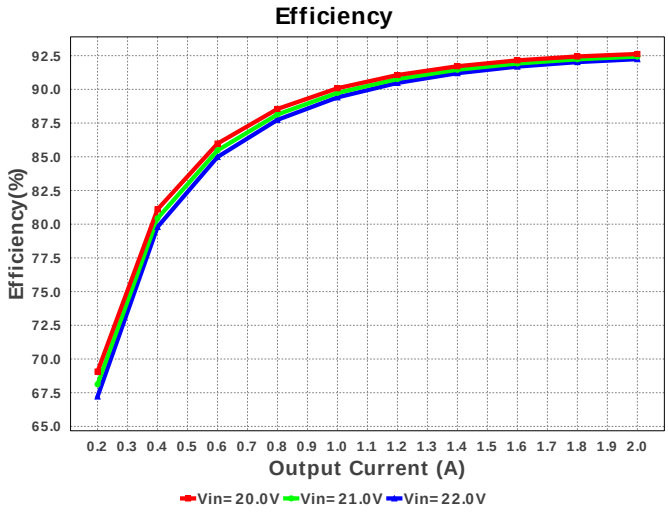


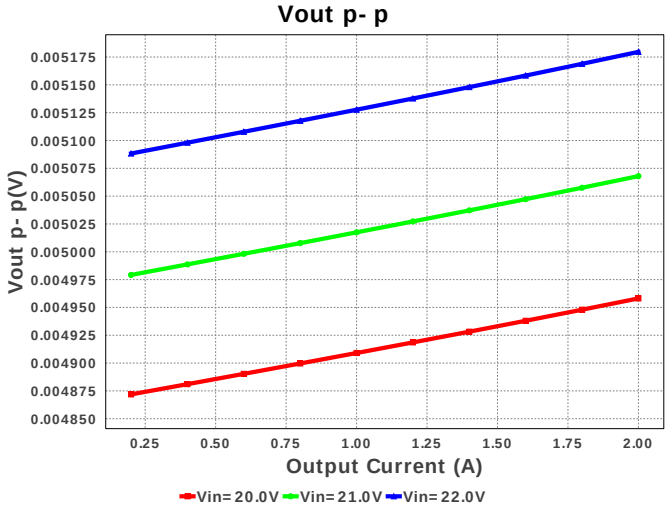


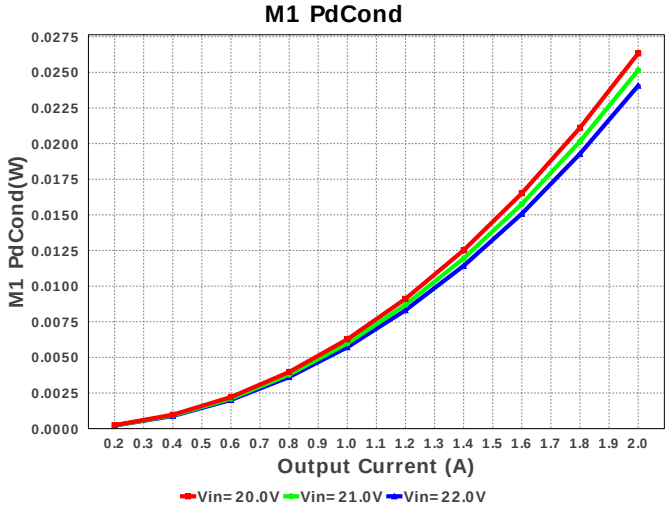


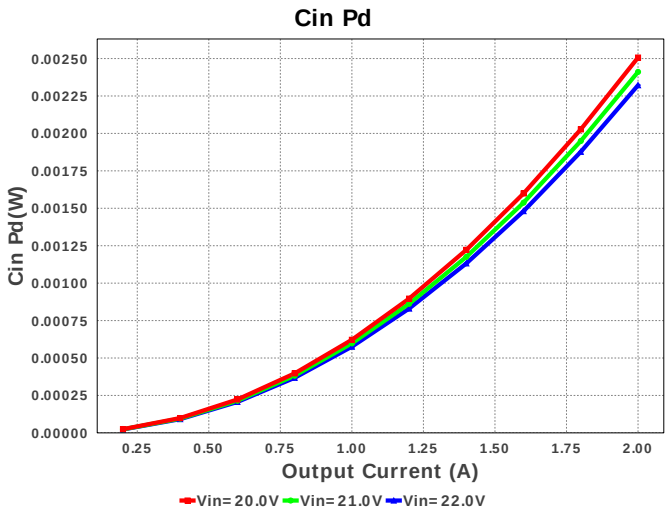


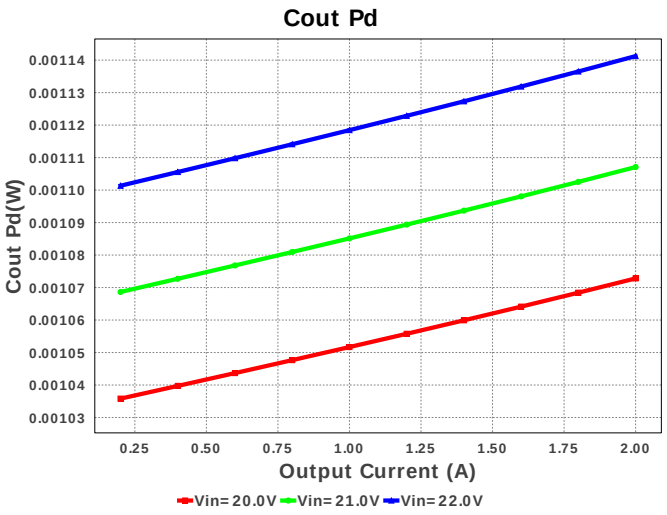


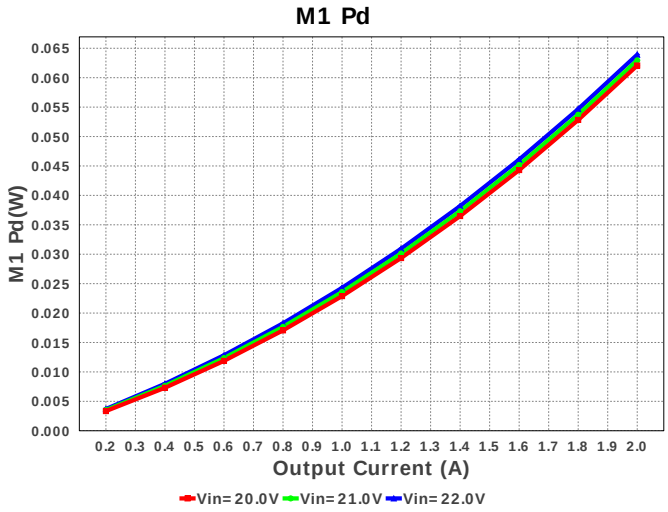


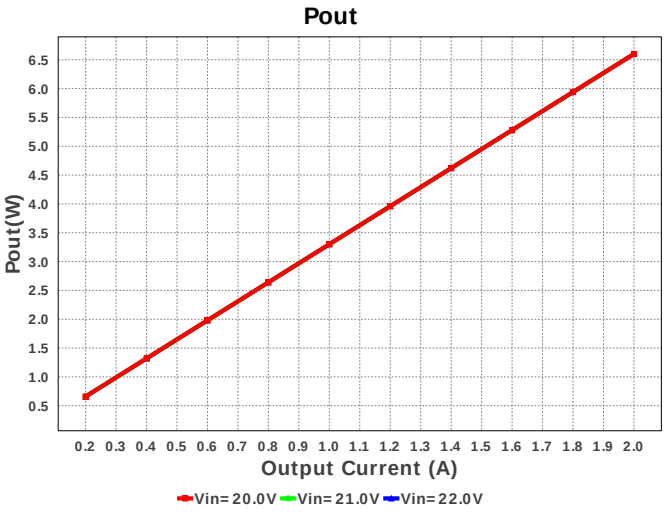


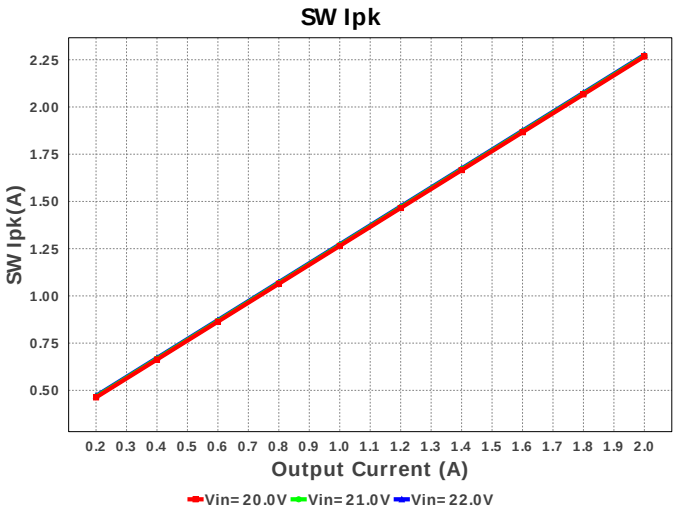


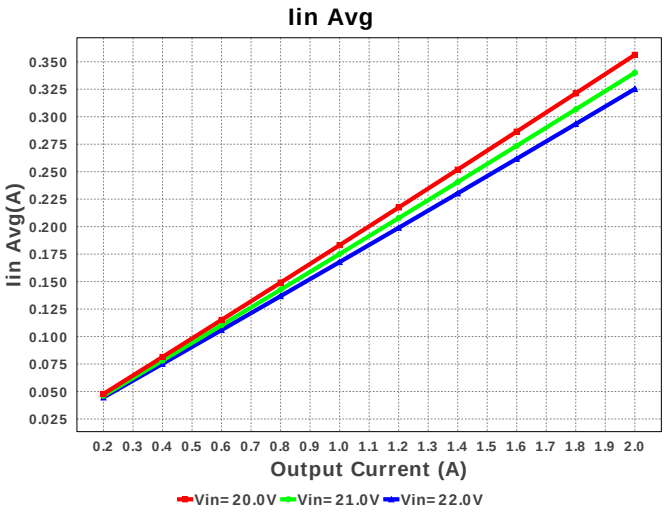


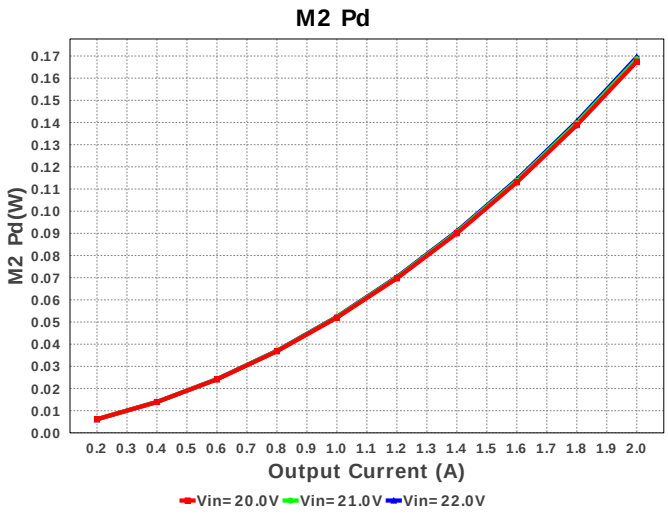


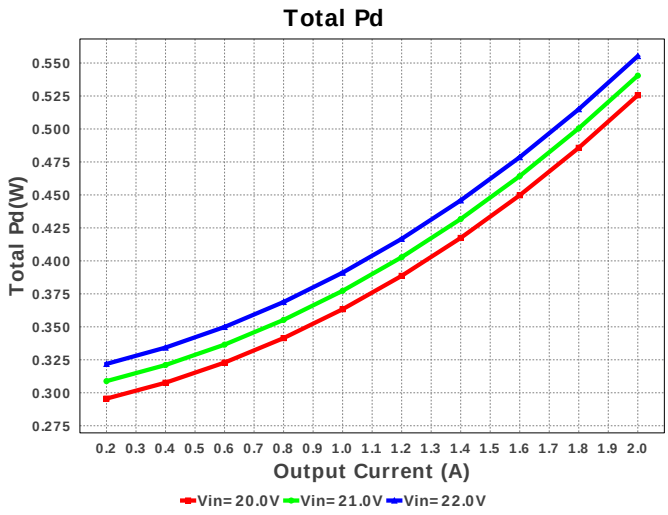


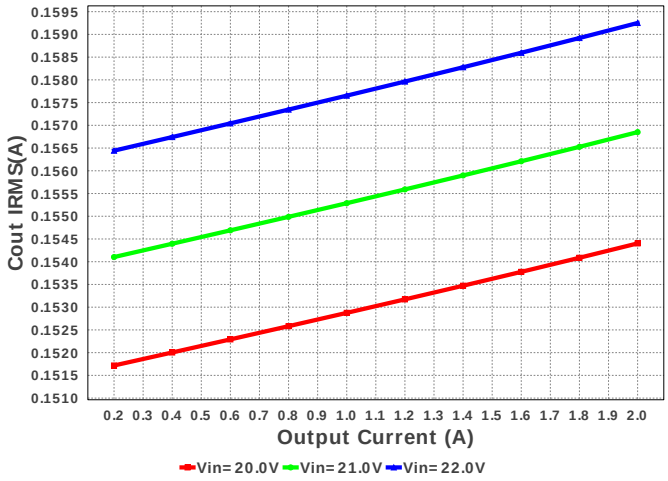


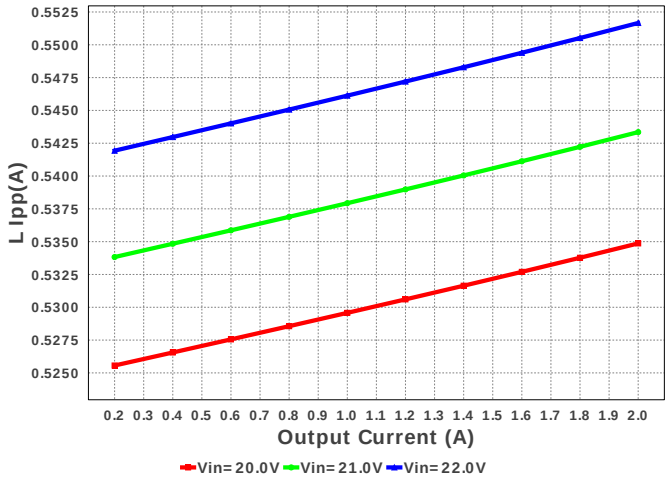


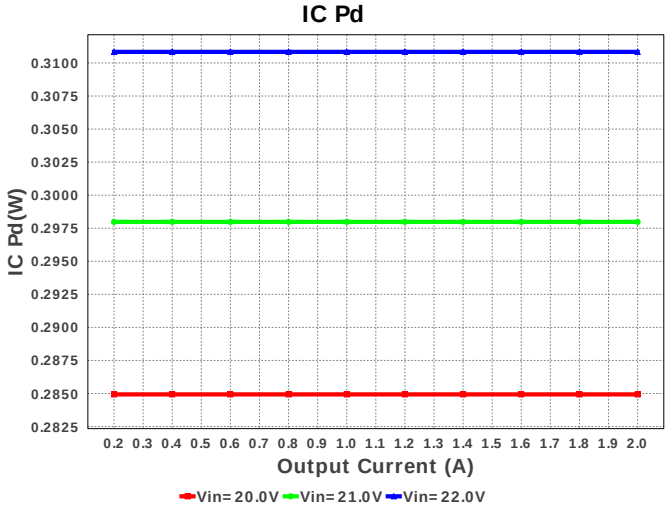


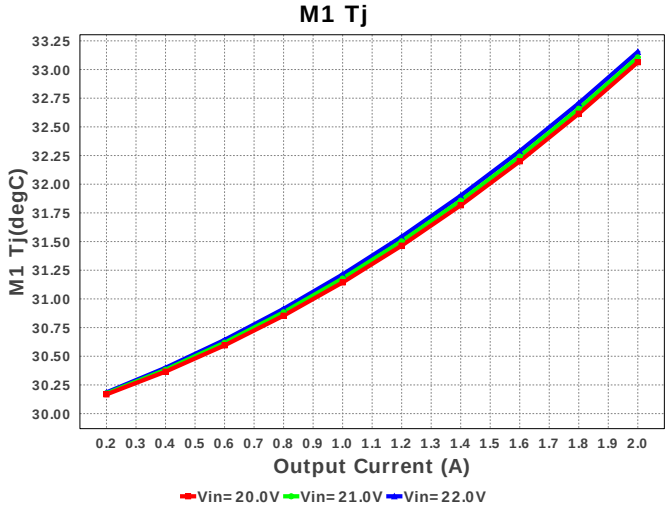


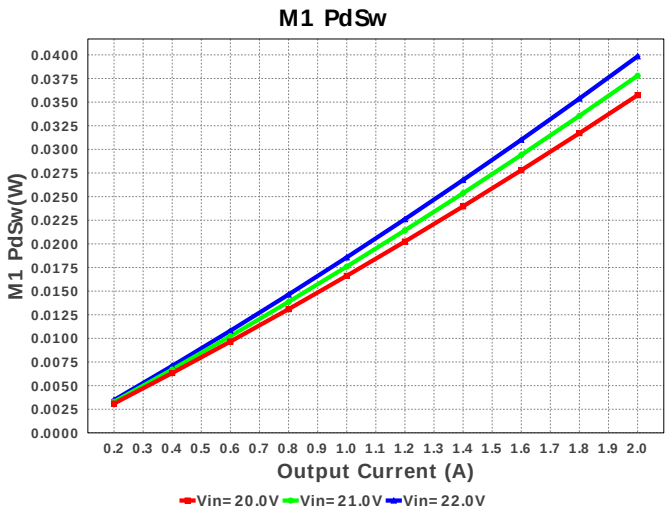


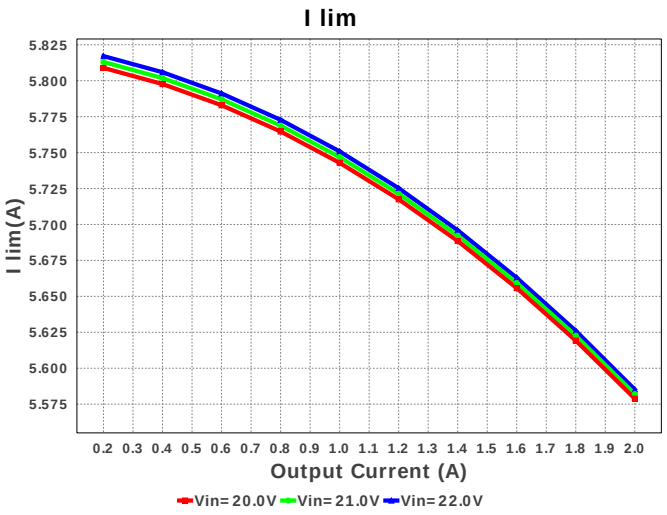


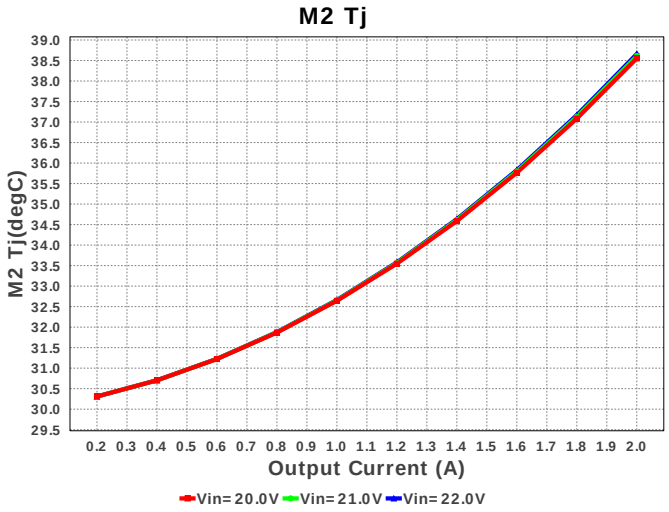


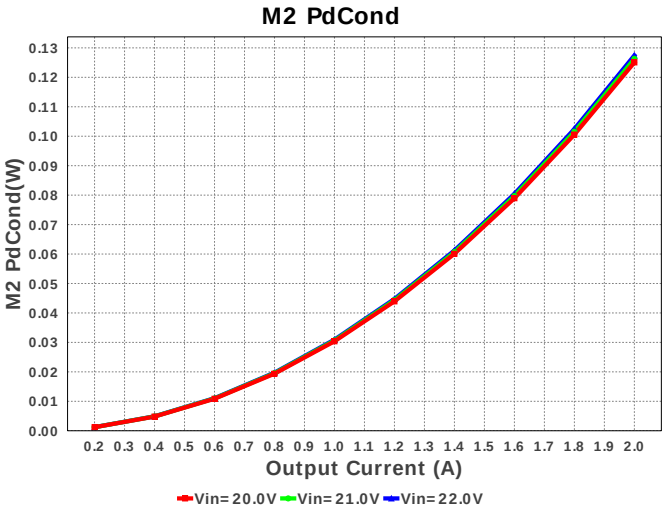












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	722.461 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	159.251 mA	Current	Output capacitor RMS ripple current
3.	I lim	5.585 A	Current	Current limit threshold
4.	Iin Avg	325.24 mA	Current	Average input current
5.	L Ipp	551.66 mA	Current	Peak-to-peak inductor ripple current
6.	SW Ipk	2.276 A	Current	Peak switch current
7.	BOM Count	10	General	Total Design BOM count
8.	FootPrint	939.0 mm^2	General	Total Foot Print Area of BOM components
9.	Frequency	237.736 kHz	General	Switching frequency
10.	IC Tolerance	66.0 mV	General	IC Feedback Tolerance
11.	Mode	CCM	General	Conduction Mode
12.	Pout	6.6 W	General	Total output power
13.	Total BOM	$4.56	General	Total BOM Cost
14.	Duty Cycle	15.429 %	Op_point	Duty cycle
15.	Efficiency	92.24 %	Op_point	Steady state efficiency
16.	IC Tj	50.205 degC	Op_point	IC junction temperature
17.	IOUT_OP	2.0 A	Op_point	Iout operating point
18.	M1 Tj	33.154 degC	Op_point	M1 MOSFET junction temperature
19.	M2 Tj	38.659 degC	Op_point	M2 MOSFET junction temperature
20.	VIN_OP	22.0 V	Op_point	Vin operating point
21.	Vout p-p	5.18 mV	Op_point	Peak-to-peak output ripple voltage
22.	Cin Pd	2.322 mW	Power	Input capacitor power dissipation
23.	Cout Pd	1.141 mW	Power	Output capacitor power dissipation
24.	IC Pd	310.84 mW	Power	IC power dissipation
25.	L Pd	7.5 mW	Power	Inductor power dissipation
26.	M1 Pd	63.911 mW	Power	M1 MOSFET total power dissipation
27.	M1 PdCond	24.066 mW	Power	M1 MOSFET conduction losses
28.	M1 PdSw	39.845 mW	Power	M1 MOSFET switching losses
29.	M2 Pd	169.521 mW	Power	M2 MOSFET total power dissipation
30.	M2 PdCond	127.428 mW	Power	M2 MOSFET conduction losses
31.	M2 PdSw	42.093 mW	Power	M2 MOSFET switching losses

#	Name	Value	Category	Description
32.	Total Pd	555.25 mW	Power	Total Power Dissipation
33.	Vout Tolerance	2.0 %		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	20.0	Minimum input voltage
4.	Vout	3.3	Output Voltage
5.	base_pn	LM3151	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	Ambient temperature

Design Assistance

1. LM3151 Product Folder : http://www.ti.com/product/LM3151 : contains the data sheet and other resources.