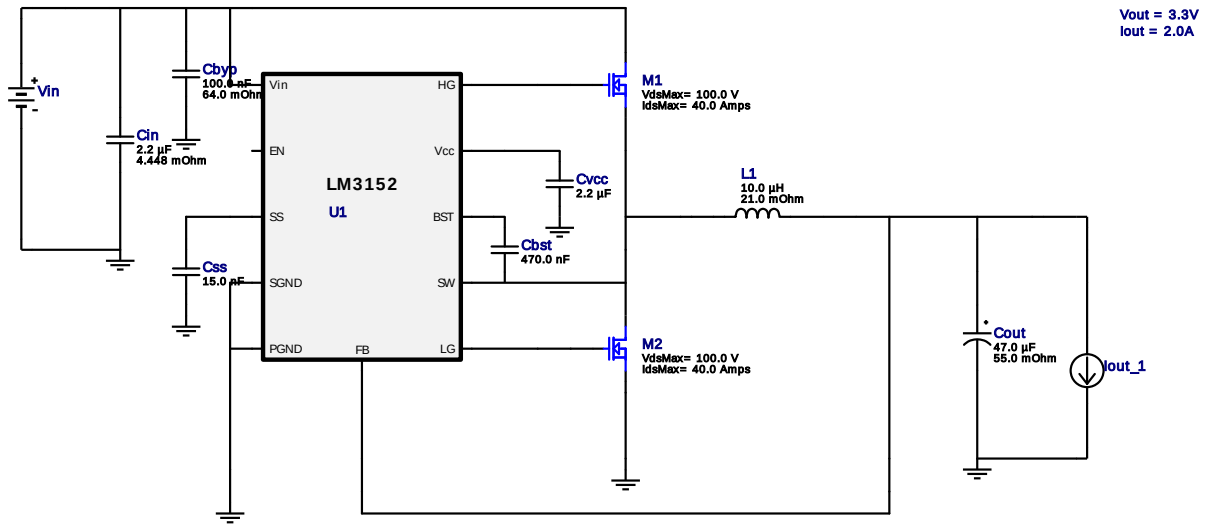
WEBENCH® Design Report

VinMin = 14.0V
VinMax = 22.0V
Vout = 3.3V
Iout = 2.0A

Device = LM3152MHX-3.3/NOPB
Topology = Buck
Created = 7/12/16 1:43:32 AM
BOM Cost = $3.05
BOM Count = 10
Total Pd = 0.92W

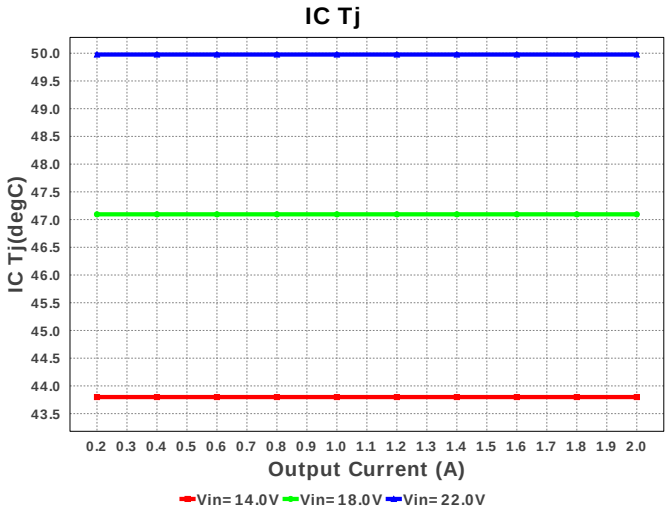
Design : 4737567/62 LM3152MHX-3.3/NOPB
LM3152MHX-3.3/NOPB 14.0V-22.0V to 3.30V @ 2.0A

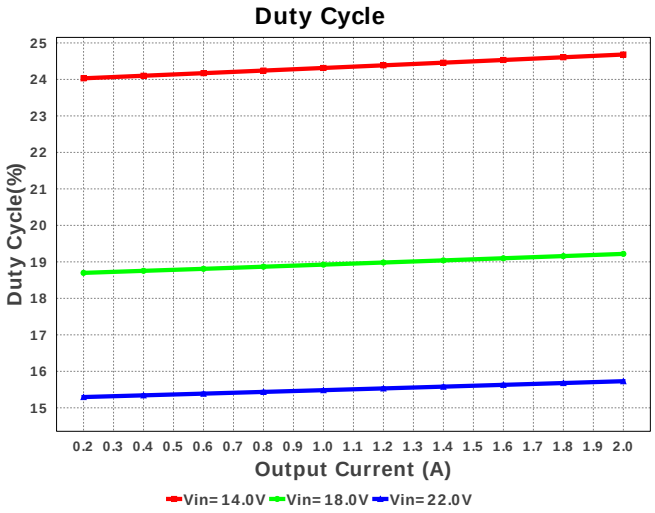


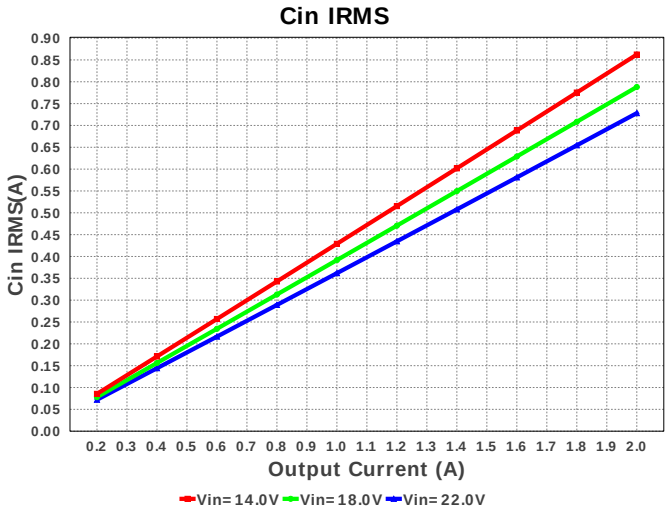
Electrical BOM

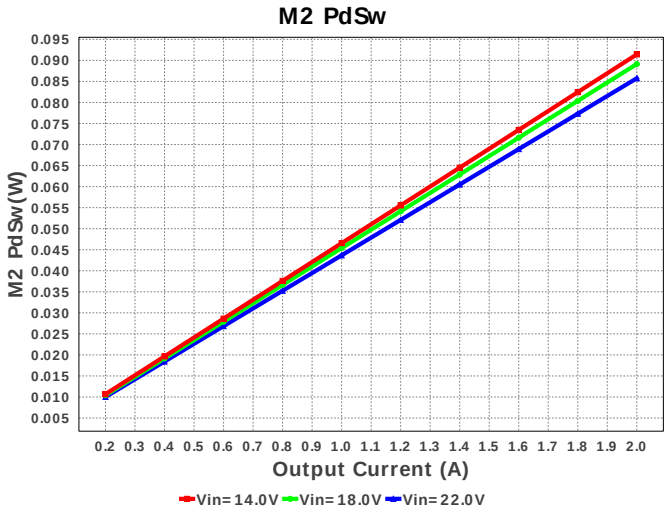
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	Taiyo Yuden	EMK212B7474KD-T Series= X7R	Cap= 470.0 nF VDC= 16.0 V IRMS= 0.0 A	1	$0.02	0805 7 mm²
2.	Cbyp	Kemet	C0805C104K5RACTU Series= X7R	Cap= 100.0 nF ESR= 64.0 mOhm VDC= 50.0 V IRMS= 1.64 A	1	$0.01	0805 7 mm²
3.	Cin	MuRata	GRM31CR71H225KA88L Series= X7R	Cap= 2.2 uF ESR= 4.448 mOhm VDC= 50.0 V IRMS= 2.2252 A	1	$0.05	1206_190 11 mm²
4.	Cout	Panasonic	6TPC47M Series= ?	Cap= 47.0 uF ESR= 55.0 mOhm VDC= 6.3 V IRMS= 1.1 A	1	$0.42	CAPSMT_6_B1G 17 mm²
5.	Css	Yageo America	CC0805KRX7R9BB153 Series= X7R	Cap= 15.0 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
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 mm²
7.	L1	Bourns	SRR1208-100ML	L= 10.0 µH DCR= 21.0 mOhm	1	$0.37	SRR1208 216 mm²
8.	M1	Infineon Technologies	BSC265N10LSF G	VdsMax= 100.0 V IdsMax= 40.0 Amps	1	$0.40	PG-TDSON-8 55 mm²

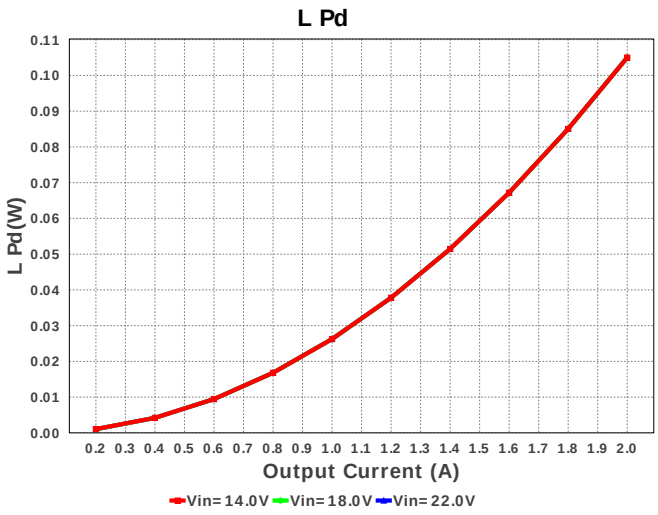
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
9.	M2	Infineon Technologies	BSC265N10LSF G	VdsMax= 100.0 V IdsMax= 40.0 Amps	1	$0.40	 PG-TDSON-8 55 mm^2
10.	U1	Texas Instruments	LM3152MHX-3.3/NOPB	Switcher	1	$1.35	 MXA14A 59 mm^2

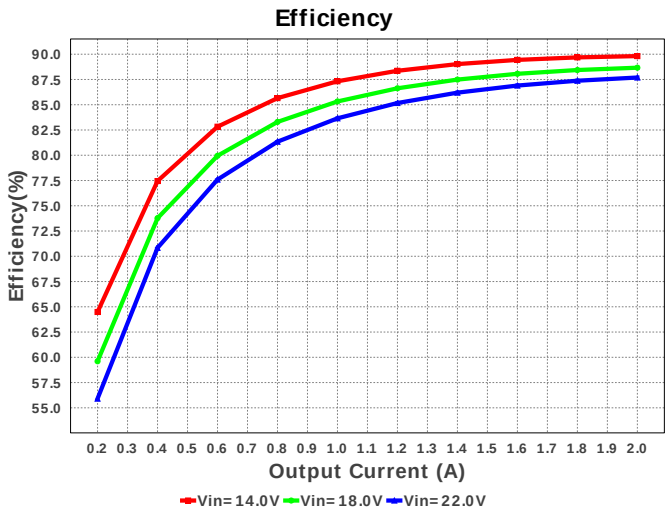


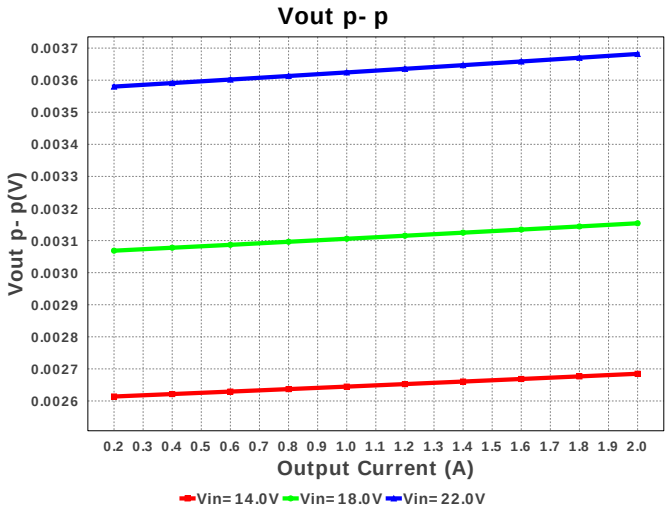


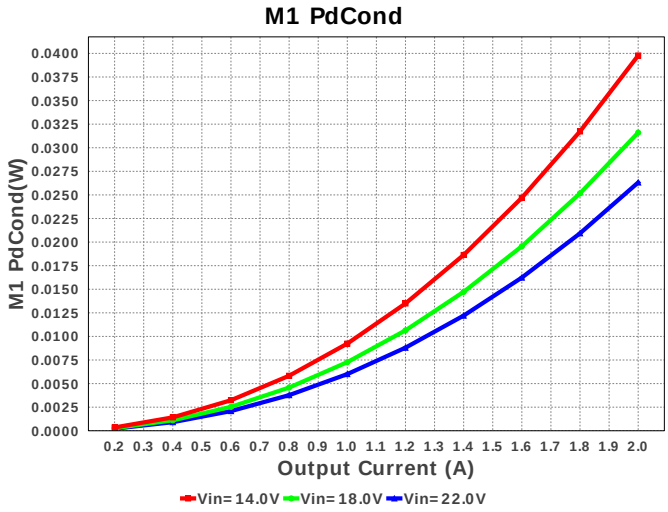


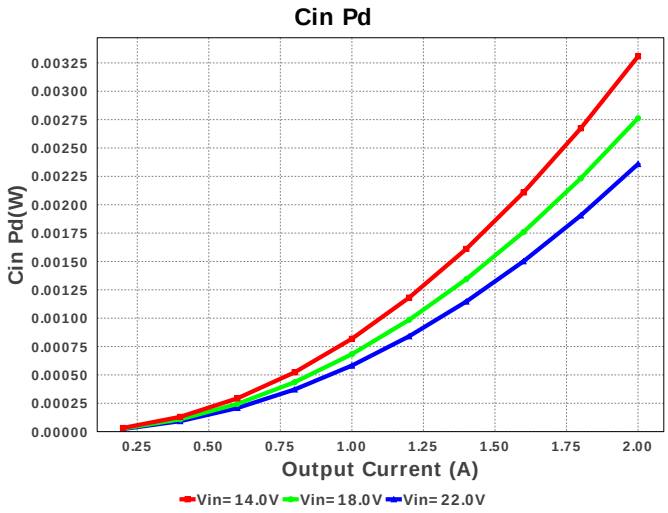


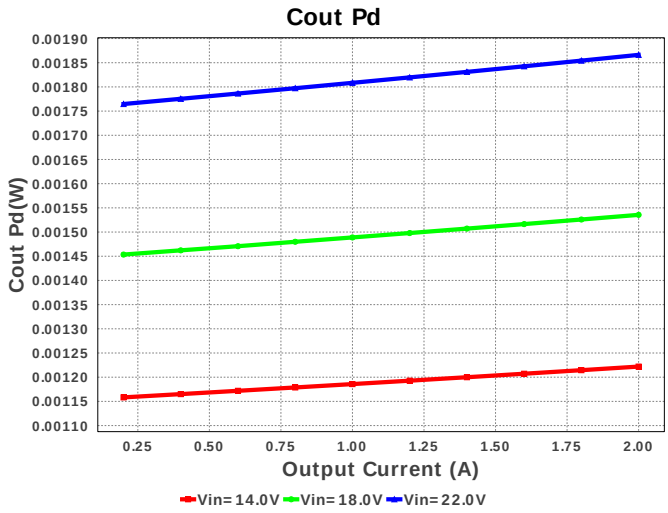


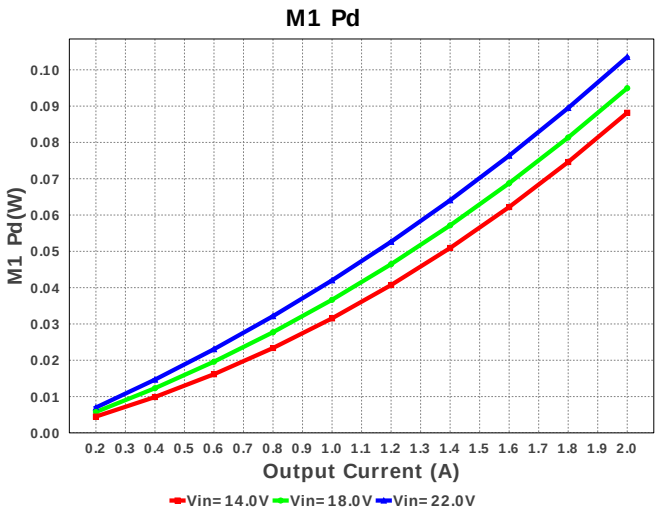


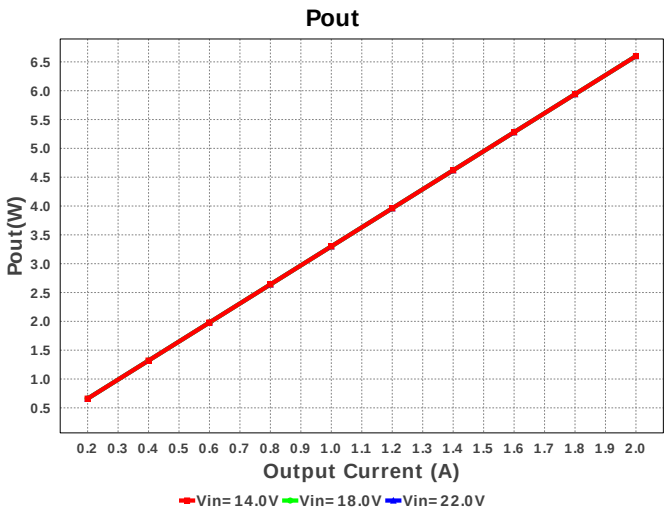


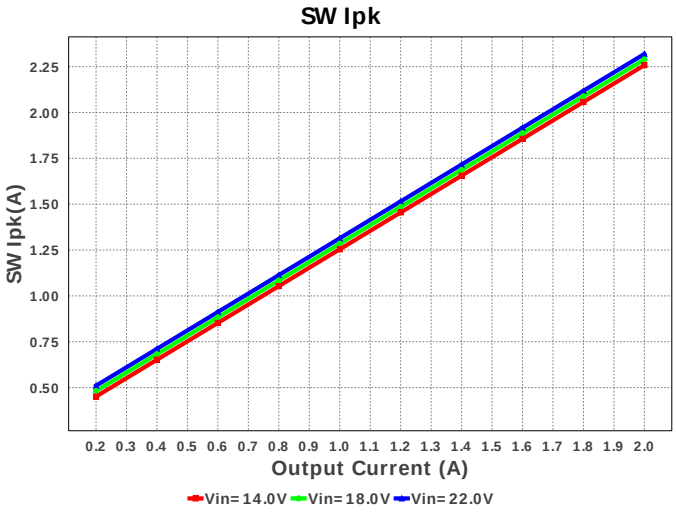


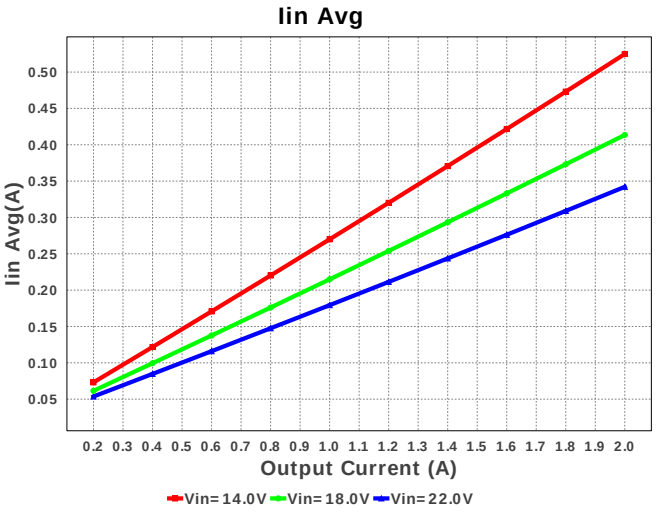


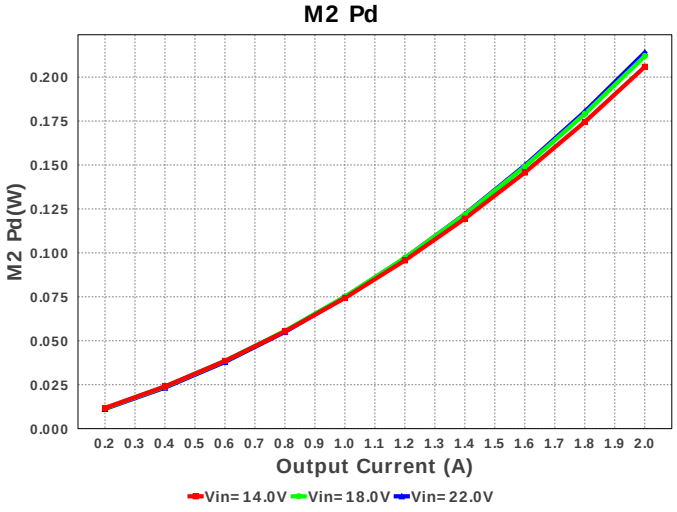


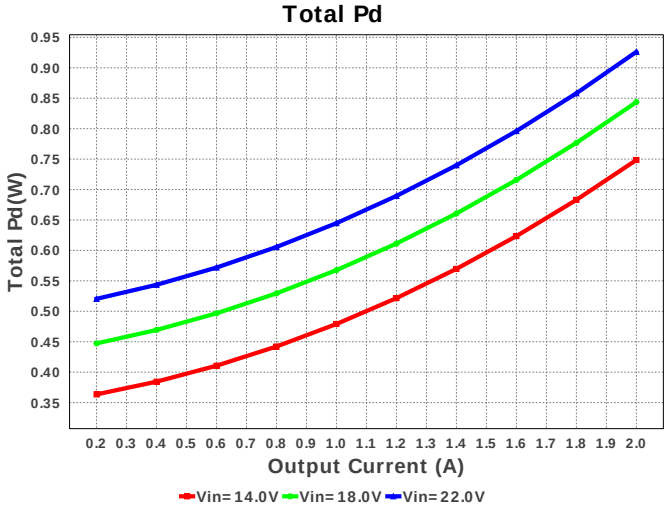


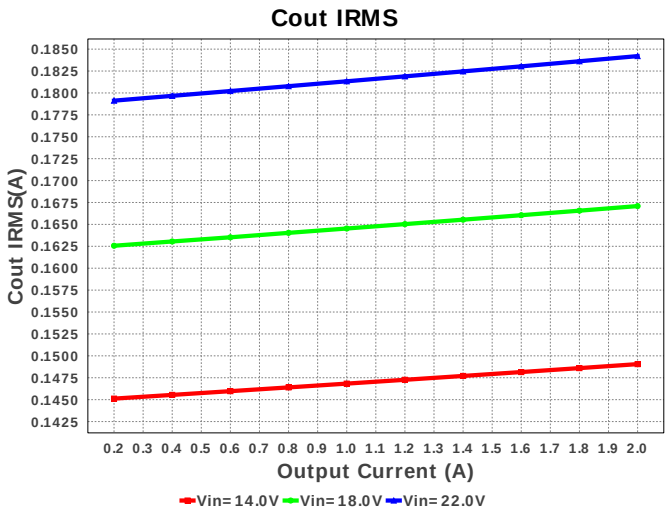


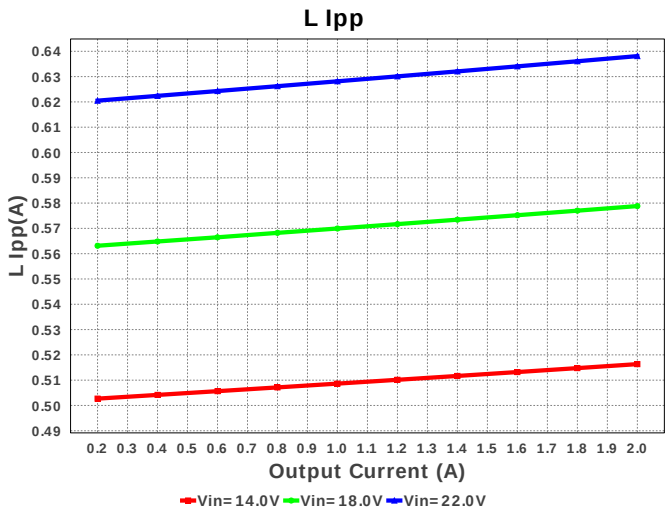


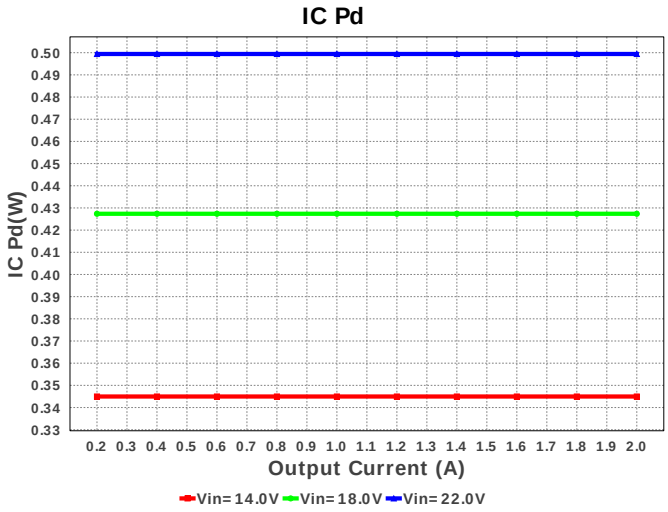


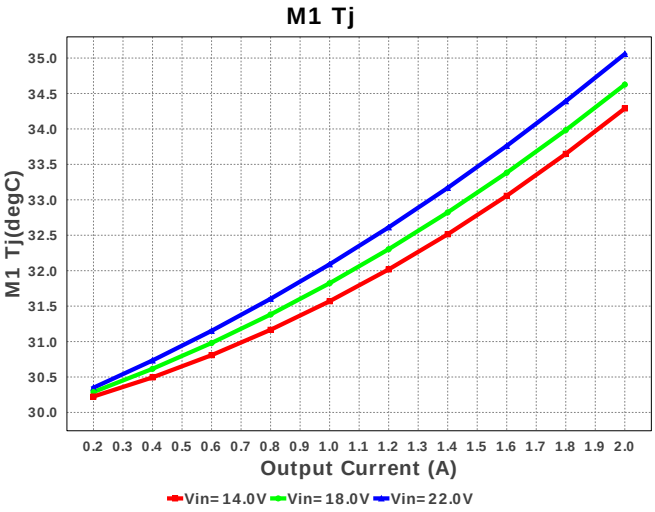


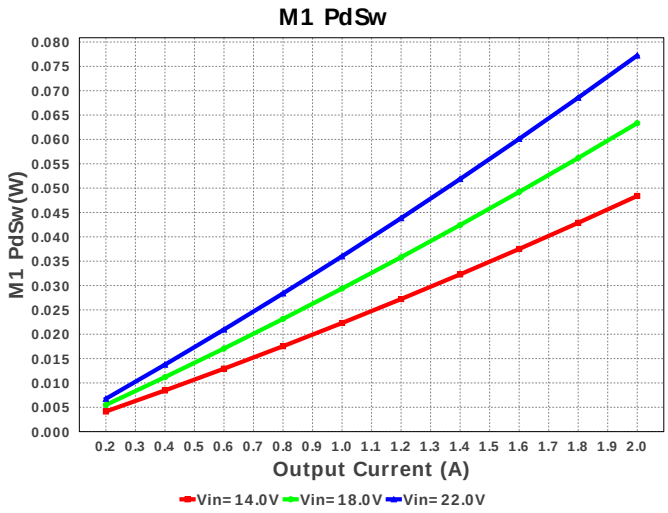


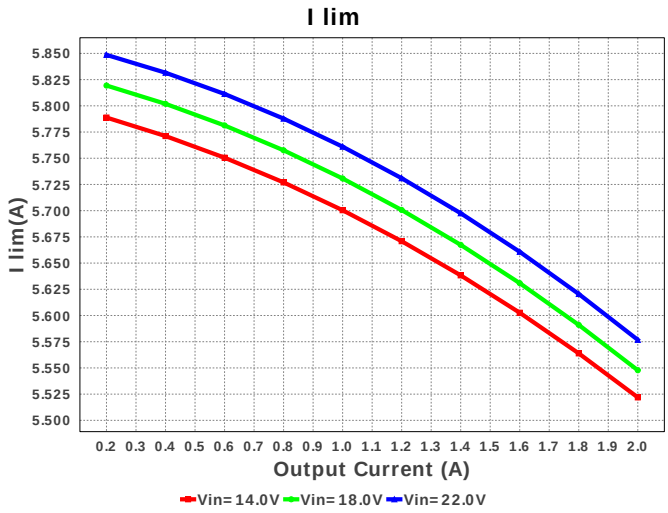


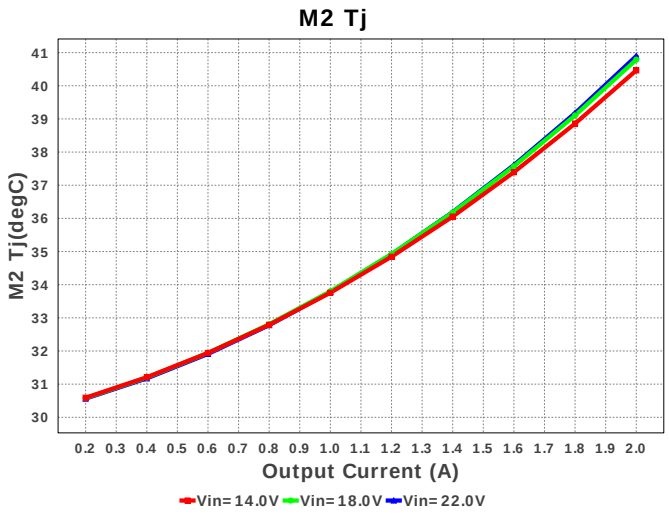


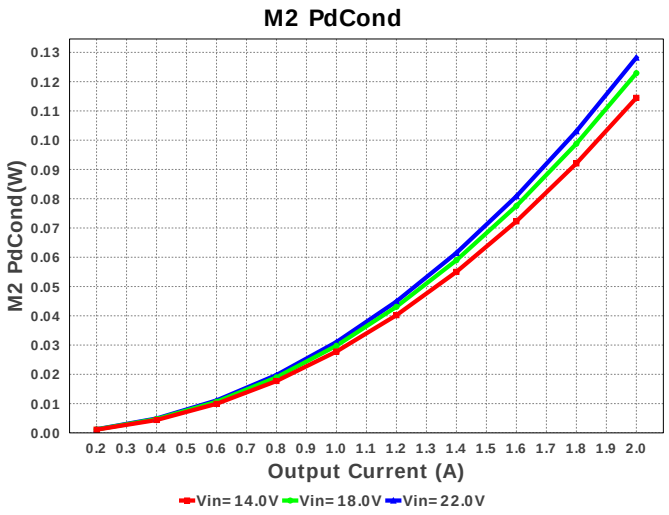












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	728.152 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	184.203 mA	Current	Output capacitor RMS ripple current
3.	I lim	5.579 A	Current	Current limit threshold
4.	Iin Avg	342.02 mA	Current	Average input current
5.	L Ipp	638.1 mA	Current	Peak-to-peak inductor ripple current
6.	SW Ipk	2.319 A	Current	Peak switch current
7.	BOM Count	10	General	Total Design BOM count
8.	FootPrint	440.0 mm^2	General	Total Foot Print Area of BOM components
9.	Frequency	460.958 kHz	General	Switching frequency
10.	IC Tolerance	66.0 mV	General	IC Feedback Tolerance
11.	Pout	6.6 W	General	Total output power
12.	Total BOM	$3.05	General	Total BOM Cost
13.	Duty Cycle	15.729 %	Op_point	Duty cycle
14.	Efficiency	87.714 %	Op_point	Steady state efficiency
15.	IC Tj	62.462 degC	Op_point	IC junction temperature
16.	IOUT_OP	2.0 A	Op_point	Iout operating point
17.	M1 Tj	35.057 degC	Op_point	M1 MOSFET junction temperature
18.	M2 Tj	40.814 degC	Op_point	M2 MOSFET junction temperature
19.	VIN_OP	22.0 V	Op_point	Vin operating point
20.	Vout p-p	3.682 mV	Op_point	Peak-to-peak output ripple voltage
21.	Cin Pd	2.358 mW	Power	Input capacitor power dissipation
22.	Cout Pd	1.866 mW	Power	Output capacitor power dissipation
23.	IC Pd	499.417 mW	Power	IC power dissipation
24.	L Pd	105.0 mW	Power	Inductor power dissipation
25.	M1 Pd	103.478 mW	Power	M1 MOSFET total power dissipation
26.	M1 PdCond	26.255 mW	Power	M1 MOSFET conduction losses
27.	M1 PdSw	77.224 mW	Power	M1 MOSFET switching losses
28.	M2 Pd	212.355 mW	Power	M2 MOSFET total power dissipation
29.	M2 PdCond	128.169 mW	Power	M2 MOSFET conduction losses
30.	M2 PdSw	84.186 mW	Power	M2 MOSFET switching losses
31.	Total Pd	924.453 mW	Power	Total Power Dissipation
32.	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	14.0	Minimum input voltage
4.	Vout	3.3	Output Voltage
5.	base_pn	LM3152	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	Ambient temperature

Design Assistance

1. LM3152 Product Folder : http://www.ti.com/product/LM3152 : contains the data sheet and other resources.