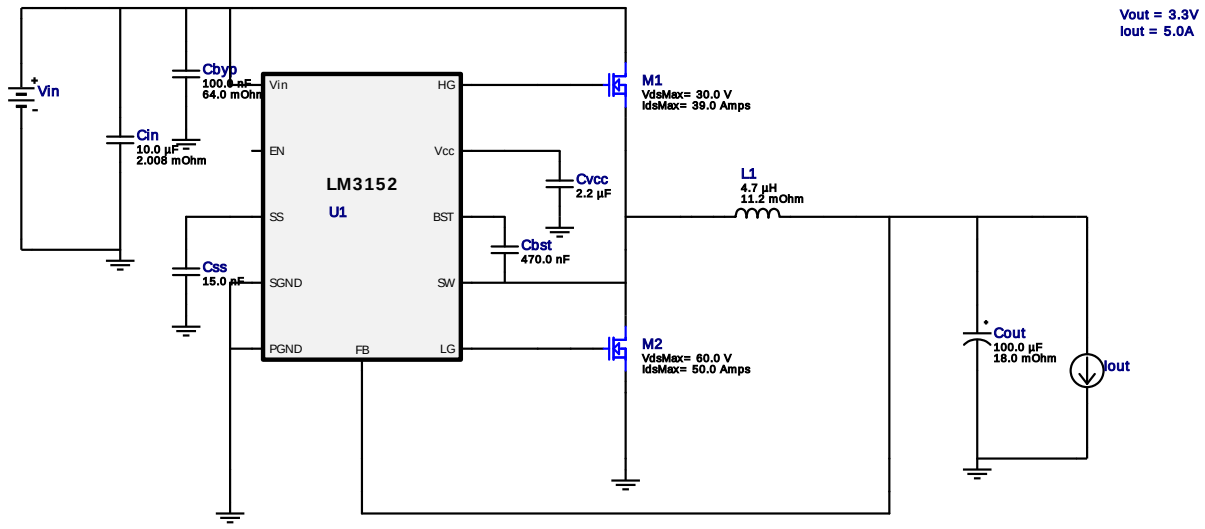
VinMin = 9.0V
VinMax = 24.0V
Vout = 3.3V
Iout = 5.0A

Device = LM3152MHX-3.3/NOPB
Topology = Buck
Created = 7/13/16 12:37:41 AM
BOM Cost = $3.47
BOM Count = 10
Total Pd = 1.66W

WEBENCH® Design Report

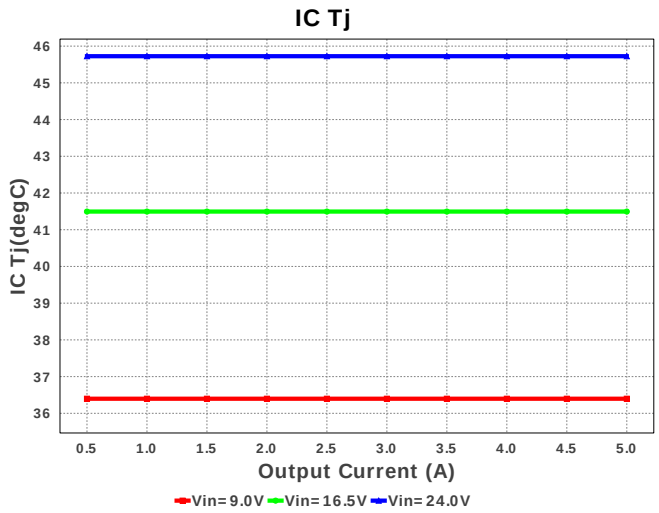
Design : 1165565/9 LM3152MHX-3.3/NOPB
LM3152MHX-3.3/NOPB 9.0V-24.0V to 3.30V @ 5.0A

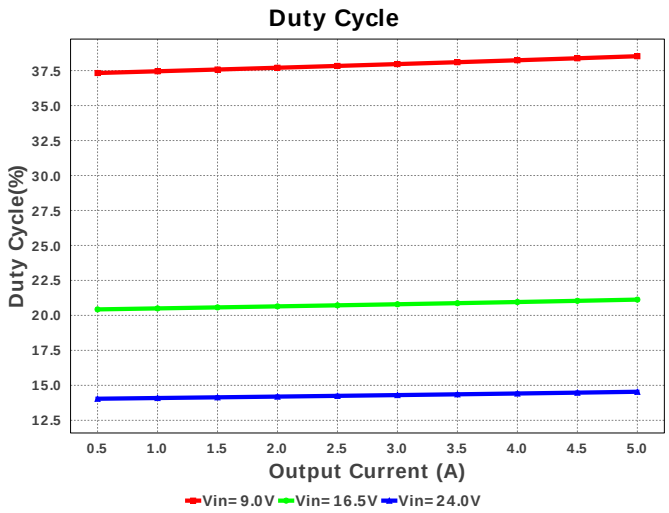


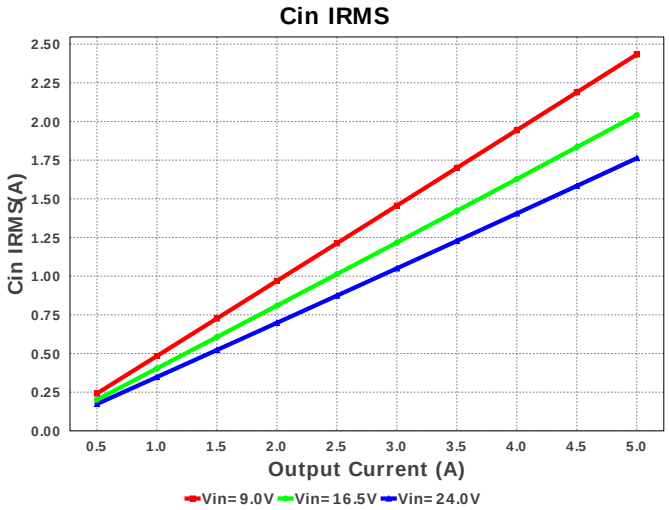
Electrical BOM

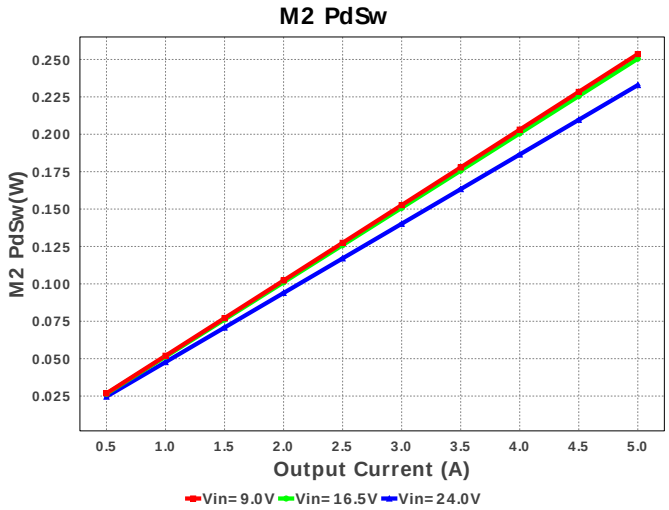
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	Taiyo Yuden	EMK212B7474KD-T Series= X7R	Cap= 470.0 nF VDC= 16.0 V IRMS= 0.0 A	1	$0.02	0805 7 mm²
2.	Cbyp	Kemet	C0805C104K5RACTU Series= X7R	Cap= 100.0 nF ESR= 64.0 mOhm VDC= 50.0 V IRMS= 1.64 A	1	$0.01	0805 7 mm²
3.	Cin	MuRata	GRM32ER7YA106KA12L Series= X7R	Cap= 10.0 uF ESR= 2.008 mOhm VDC= 35.0 V IRMS= 4.6772 A	1	$0.22	1210_280 15 mm²
4.	Cout	Kemet	T520B107M006ATE018 Series= T520	Cap= 100.0 uF ESR= 18.0 mOhm VDC= 6.3 V IRMS= 2.7 A	1	$0.56	3528-21 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	SRP1270-4R7M	L= 4.7 µH DCR= 11.2 mOhm	1	$0.60	SRP1270 246 mm²
8.	M1	Infineon Technologies	BSC120N03LS G	VdsMax= 30.0 V IdsMax= 39.0 Amps	1	$0.21	PG-TDSON-8 55 mm²

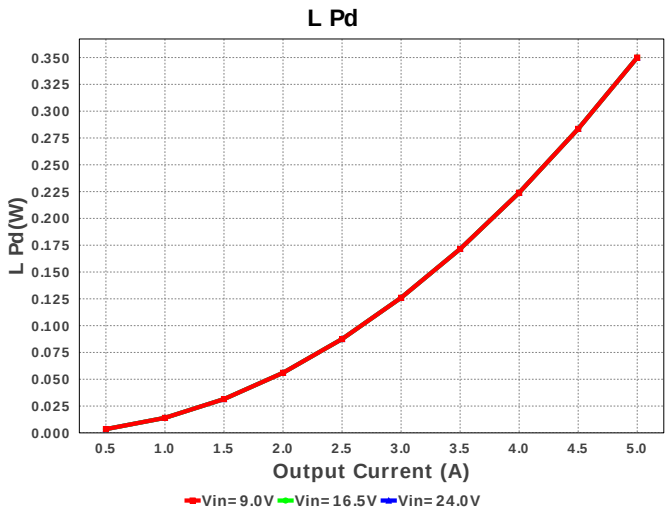
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
9.	M2	Texas Instruments	CSD18537NQ5A	VdsMax= 60.0 V IdsMax= 50.0 Amps	1	$0.46	 TRANS_NexFET_Q5A 55 mm^2
10.	U1	Texas Instruments	LM3152MHX-3.3/NOPB	Switcher	1	$1.35	 MXA14A 59 mm^2

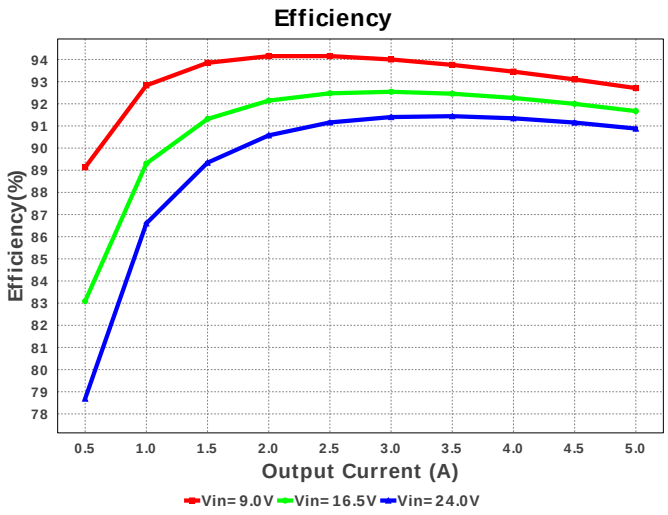


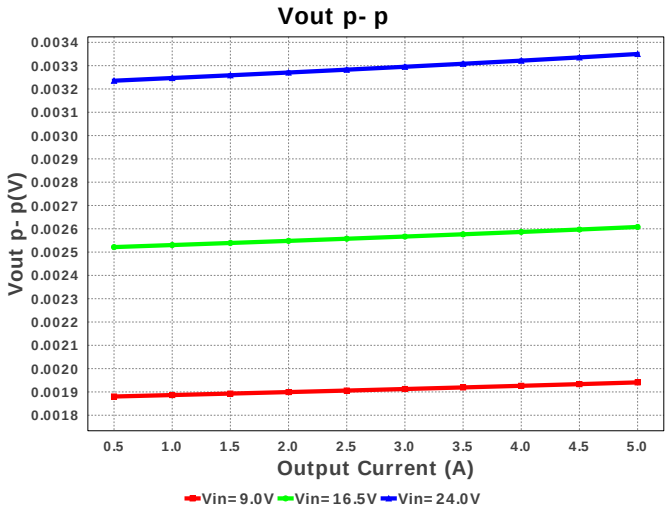


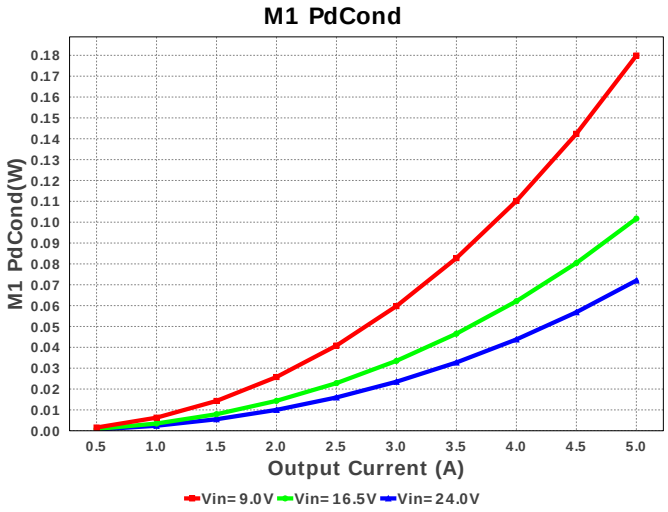


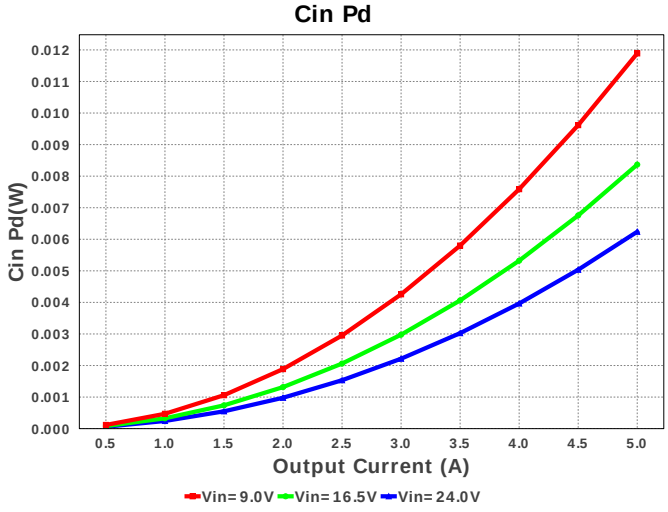


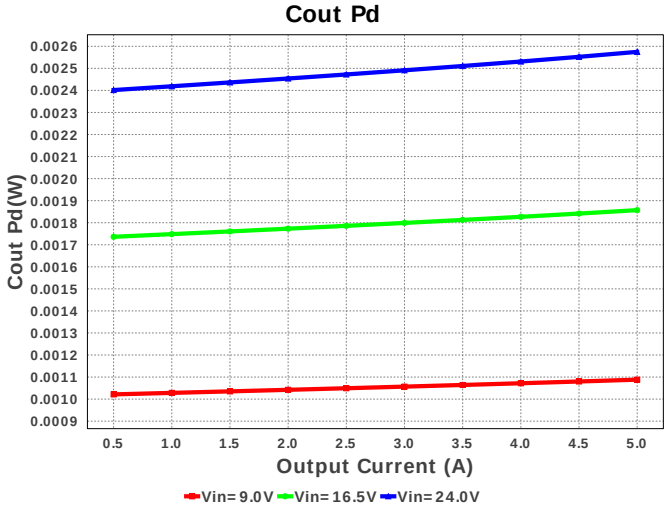


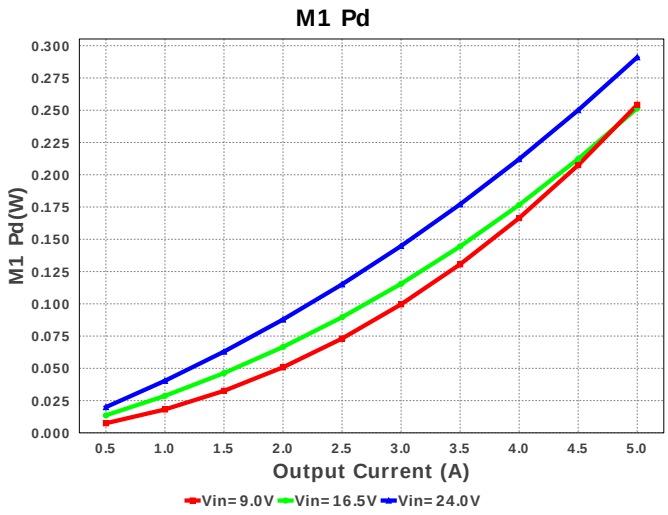


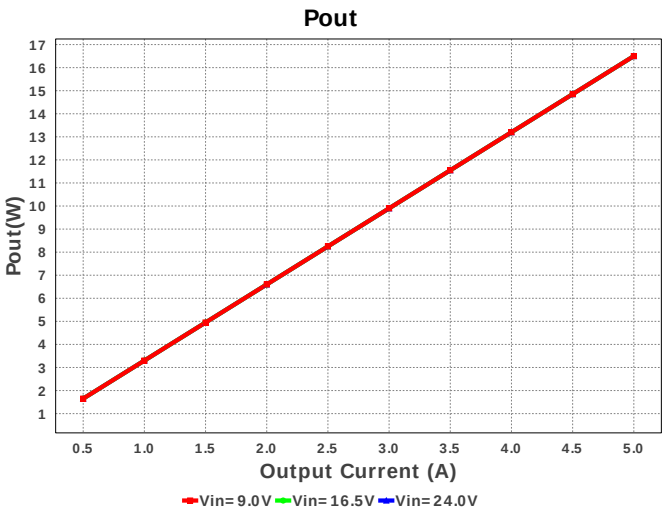


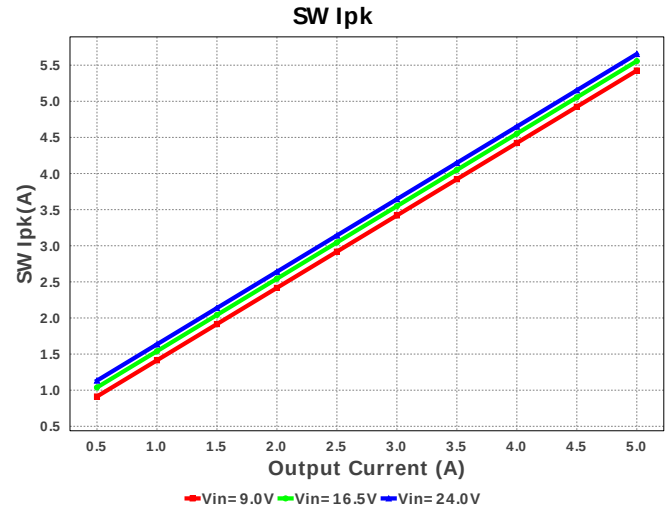


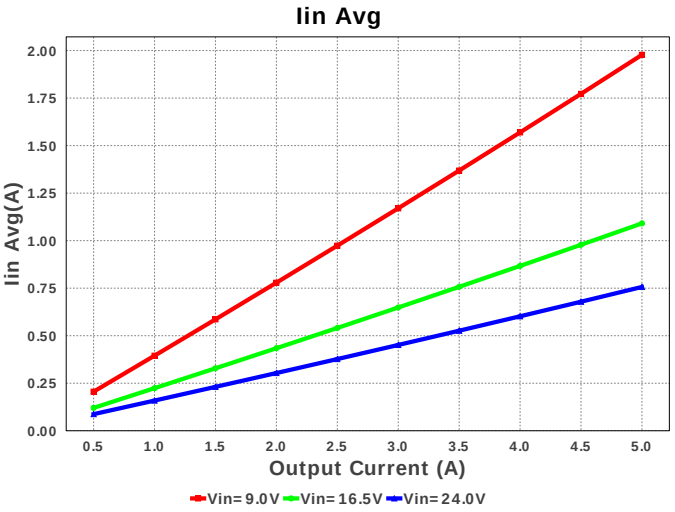


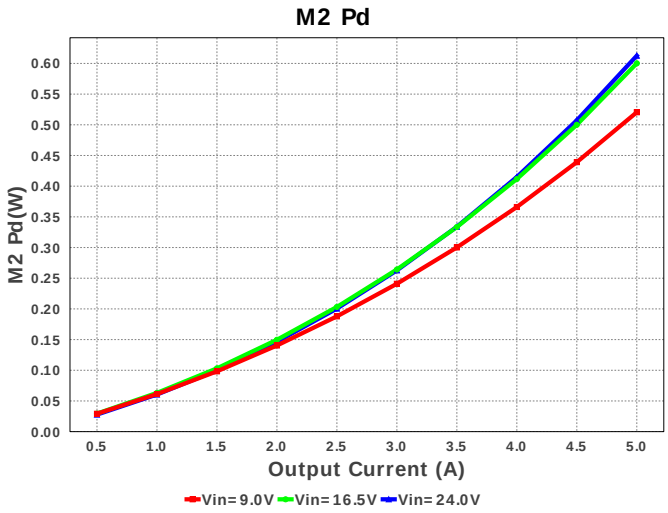


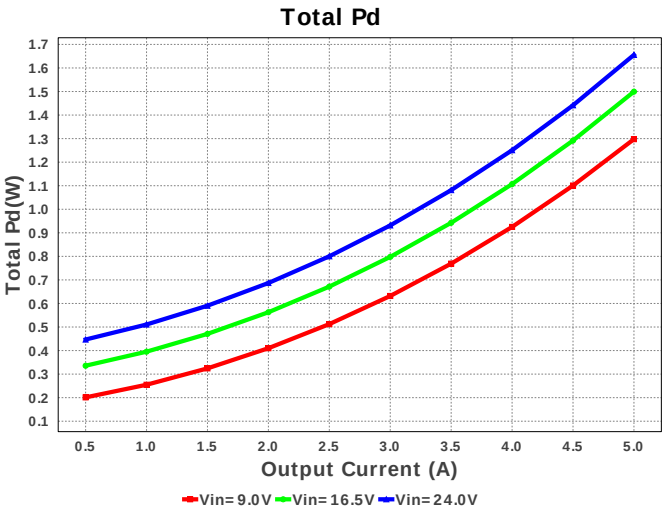


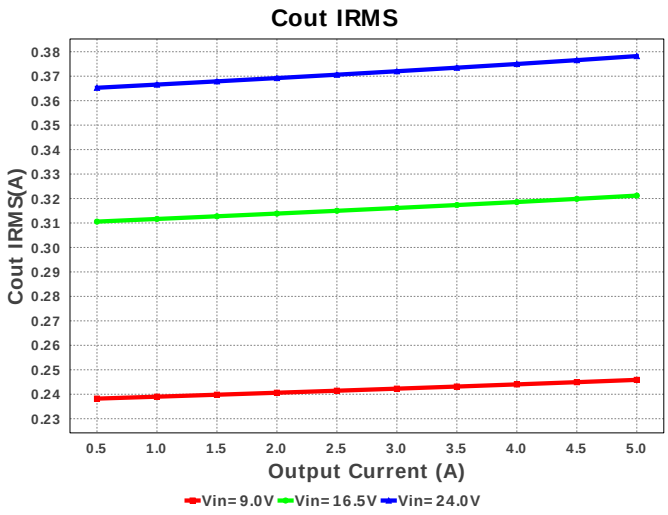


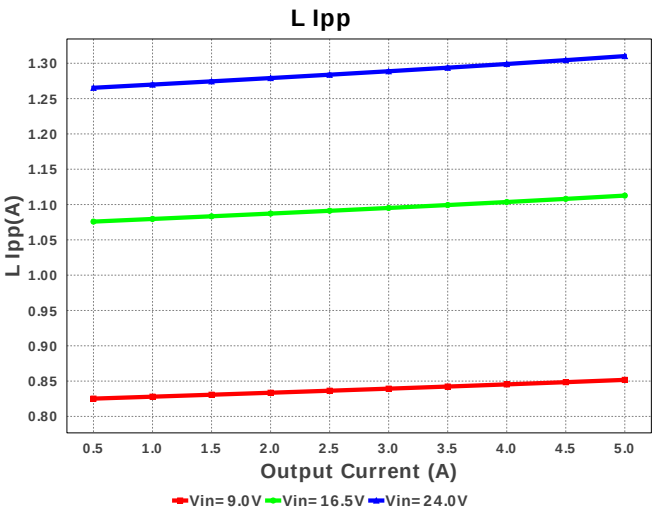


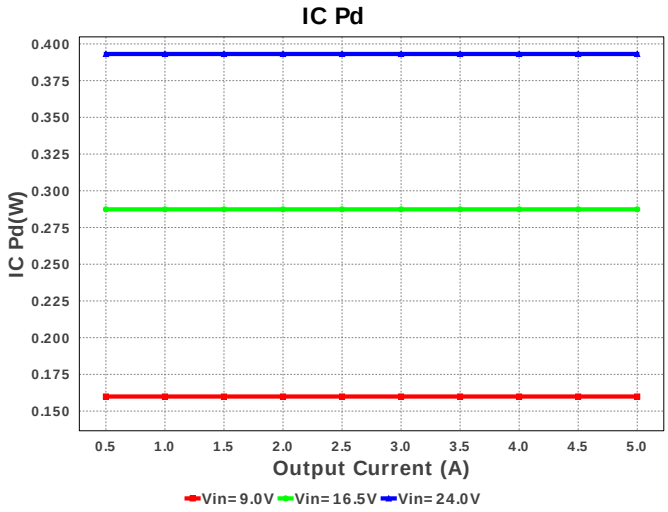


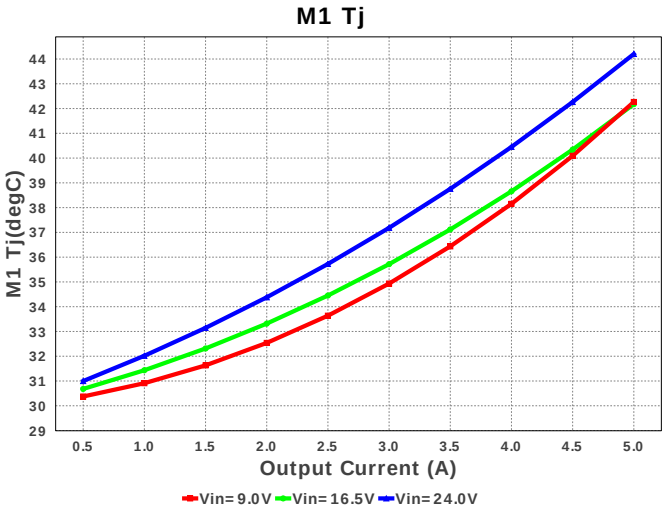


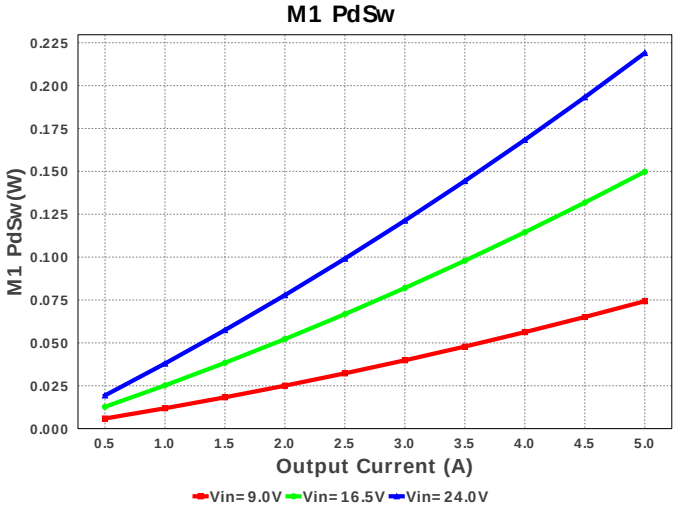


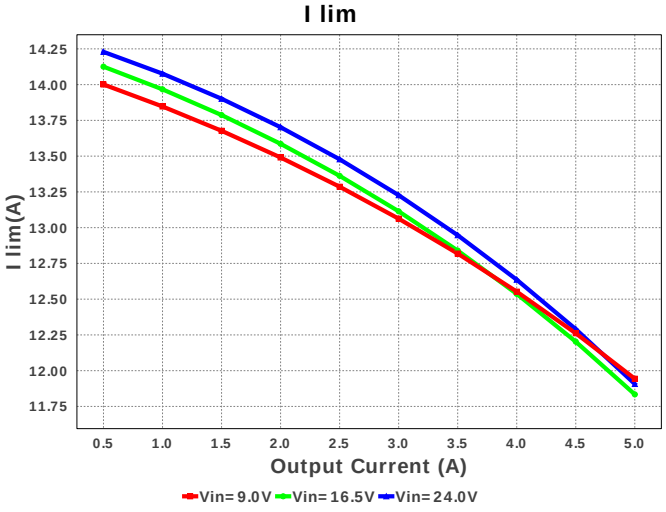


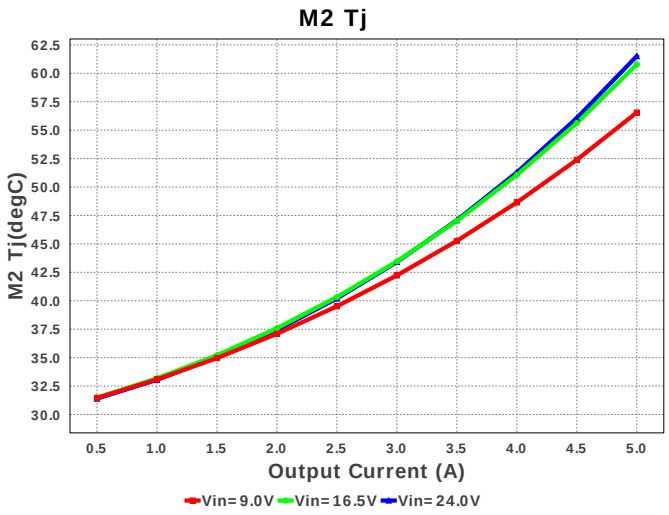


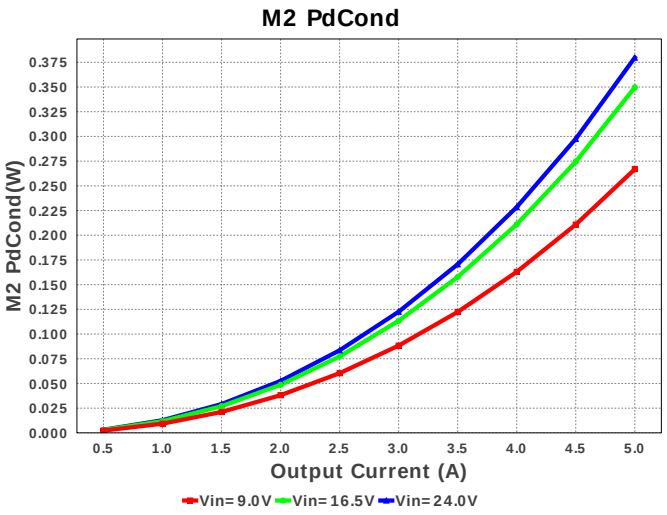












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	1.763 A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	378.215 mA	Current	Output capacitor RMS ripple current
3.	I lim	11.903 A	Current	Current limit threshold
4.	Iin Avg	756.54 mA	Current	Average input current
5.	L Ipp	1.31 A	Current	Peak-to-peak inductor ripple current
6.	SW Ipk	5.655 A	Current	Peak switch current
7.	BOM Count	10	General	Total Design BOM count
8.	FootPrint	474.0 mm^2	General	Total Foot Print Area of BOM components
9.	Frequency	488.862 kHz	General	Switching frequency
10.	IC Tolerance	66.0 mV	General	IC Feedback Tolerance
11.	Pout	16.5 W	General	Total output power
12.	Total BOM	$3.47	General	Total BOM Cost
13.	Duty Cycle	14.543 %	Op_point	Duty cycle
14.	Efficiency	90.875 %	Op_point	Steady state efficiency
15.	IC Tj	55.554 degC	Op_point	IC junction temperature
16.	IOUT_OP	5.0 A	Op_point	Iout operating point
17.	M1 Tj	44.203 degC	Op_point	M1 MOSFET junction temperature
18.	M2 Tj	61.574 degC	Op_point	M2 MOSFET junction temperature
19.	VIN_OP	24.0 V	Op_point	Vin operating point
20.	Vout p-p	3.35 mV	Op_point	Peak-to-peak output ripple voltage
21.	Cin Pd	6.239 mW	Power	Input capacitor power dissipation
22.	Cout Pd	2.575 mW	Power	Output capacitor power dissipation
23.	IC Pd	393.137 mW	Power	IC power dissipation
24.	L Pd	350.0 mW	Power	Inductor power dissipation
25.	M1 Pd	291.081 mW	Power	M1 MOSFET total power dissipation
26.	M1 PdCond	72.077 mW	Power	M1 MOSFET conduction losses
27.	M1 PdSw	219.004 mW	Power	M1 MOSFET switching losses
28.	M2 Pd	613.832 mW	Power	M2 MOSFET total power dissipation
29.	M2 PdCond	379.888 mW	Power	M2 MOSFET conduction losses
30.	M2 PdSw	233.944 mW	Power	M2 MOSFET switching losses
31.	Total Pd	1.657 W	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	5.0	Maximum Output Current
2.	VinMax	24.0	Maximum input voltage
3.	VinMin	9.0	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.