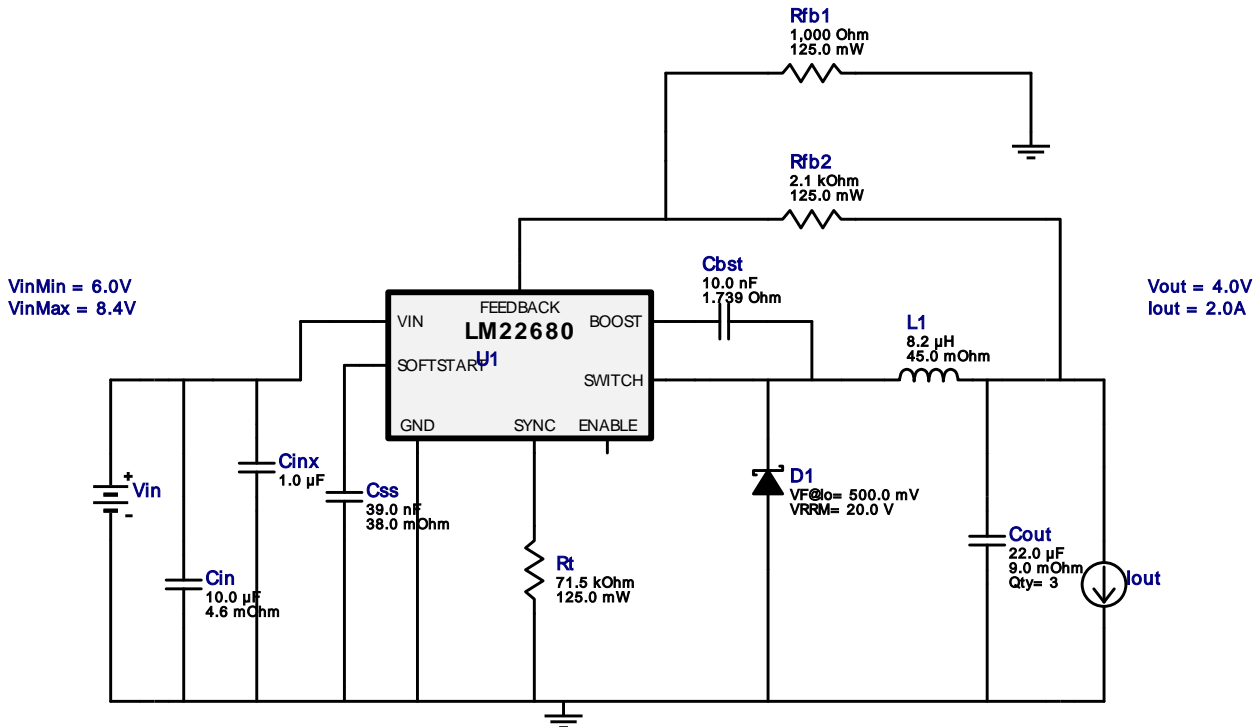








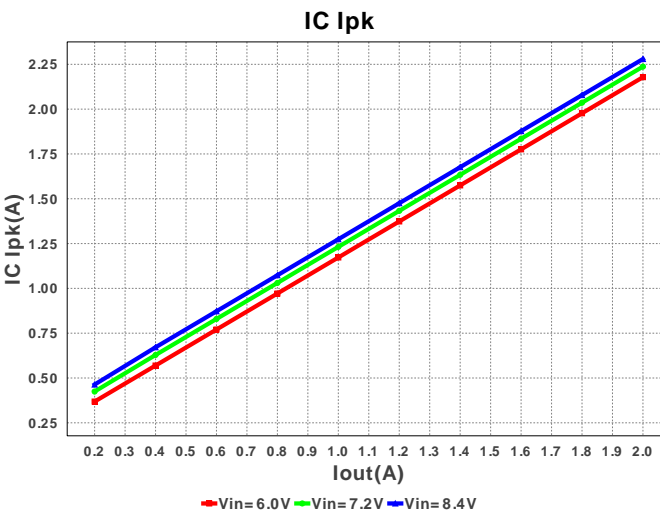
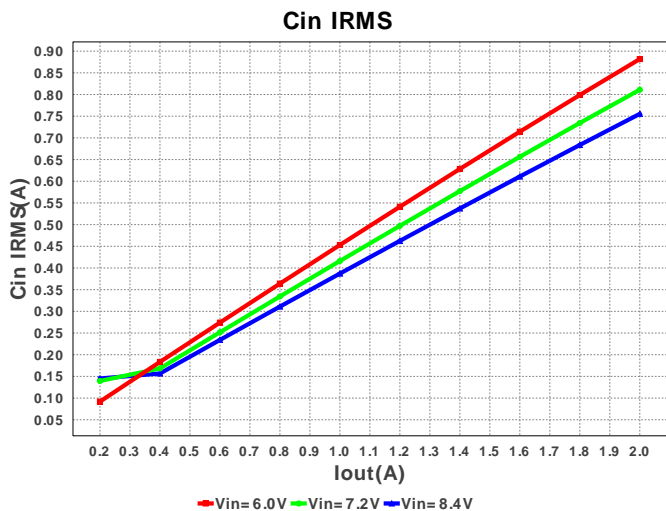
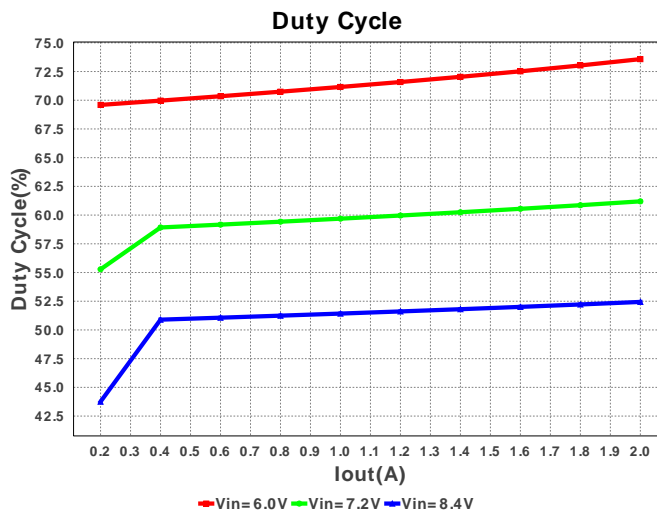
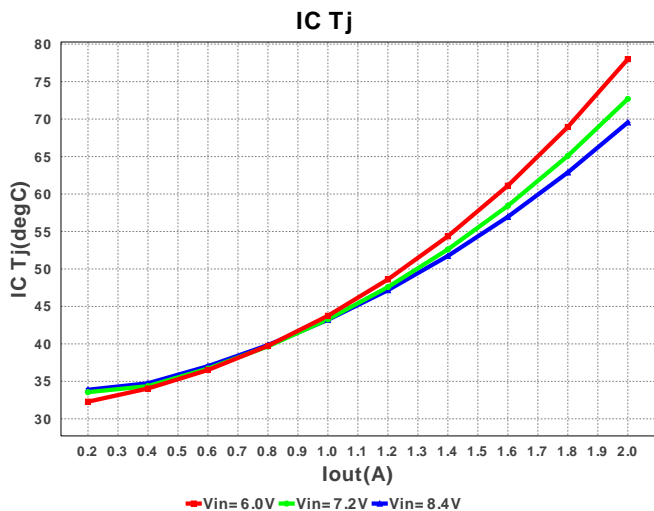


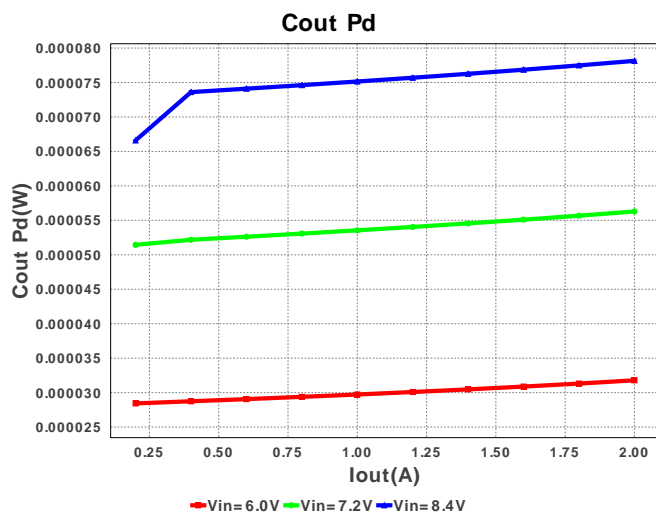
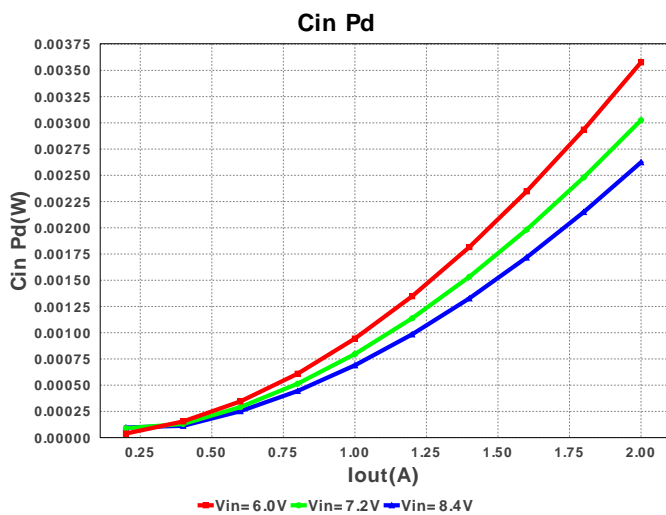
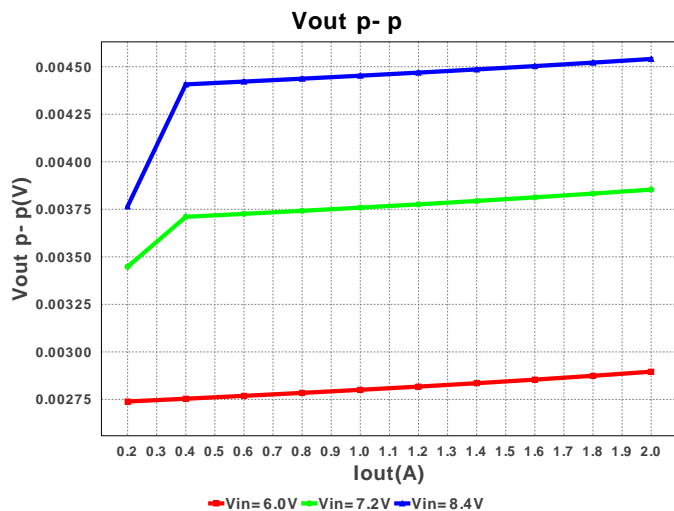
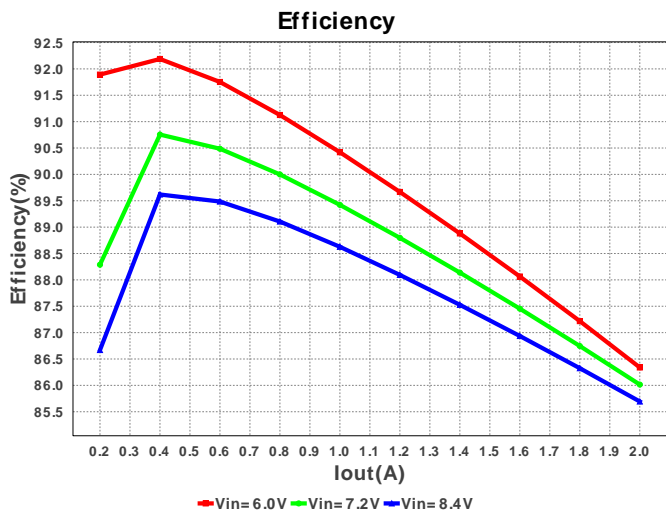
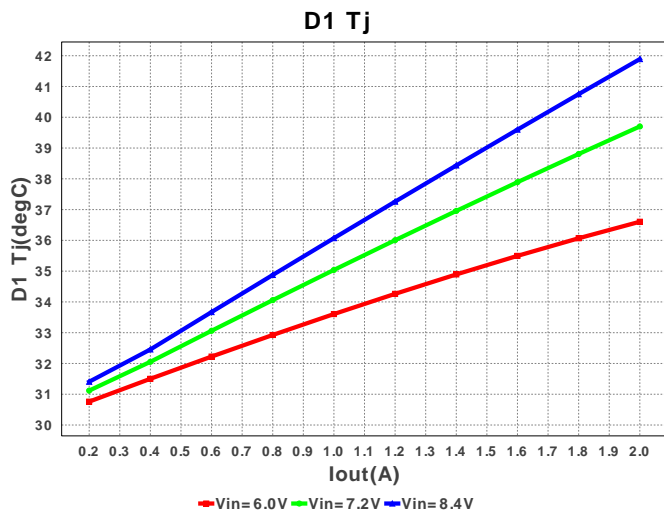
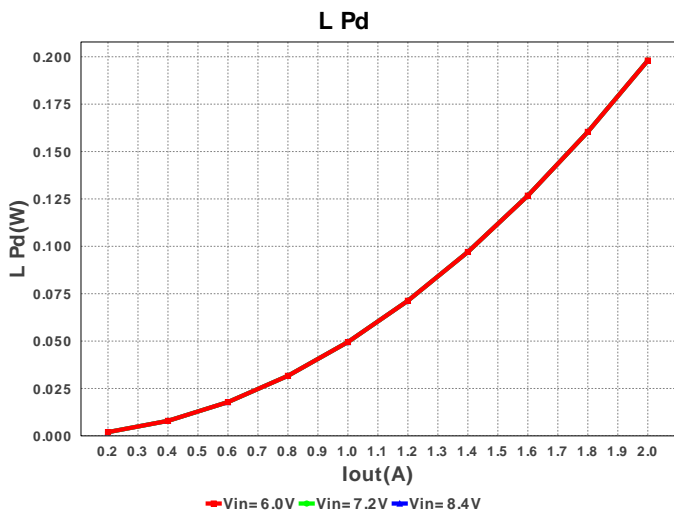
**WEBENCH<sup>®</sup> Design Report**

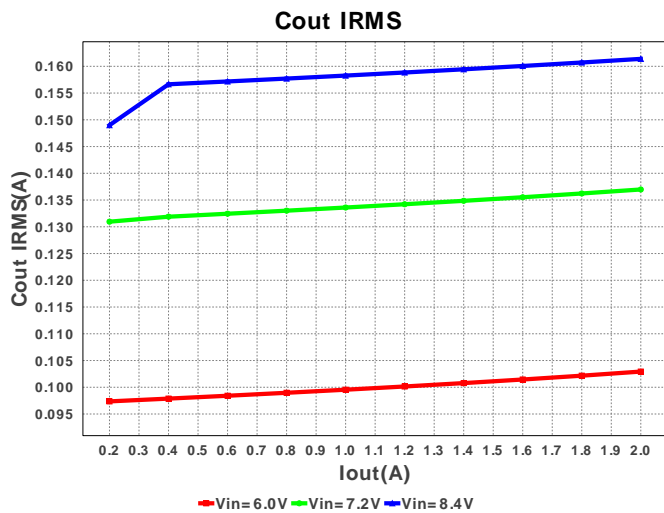
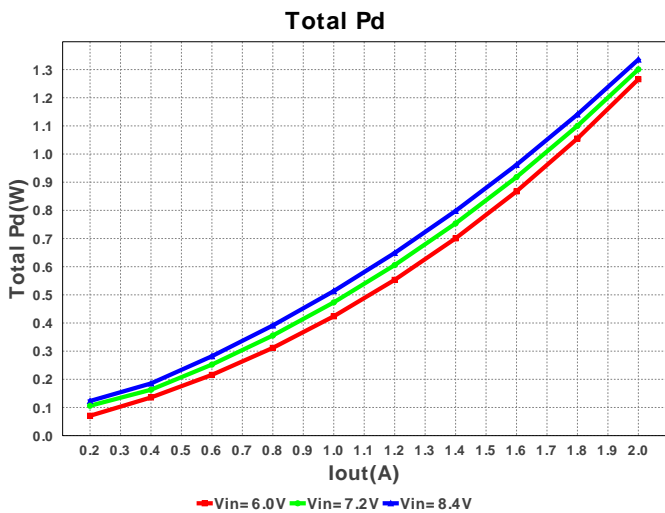
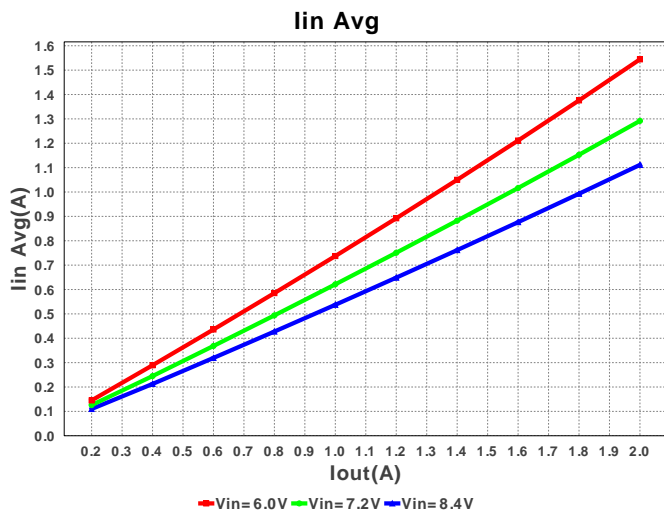
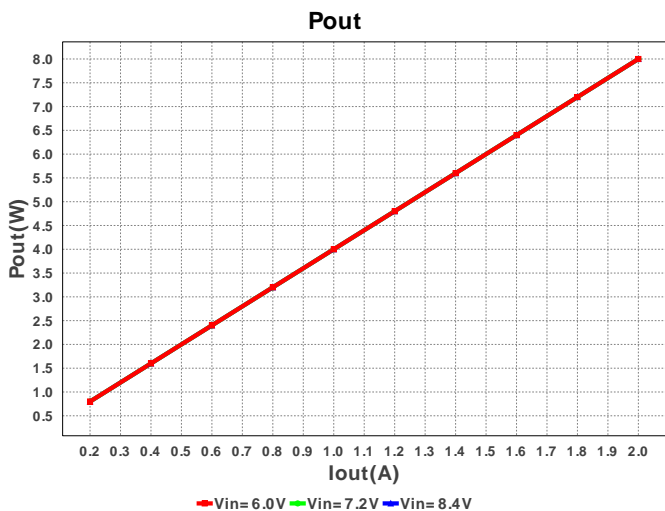
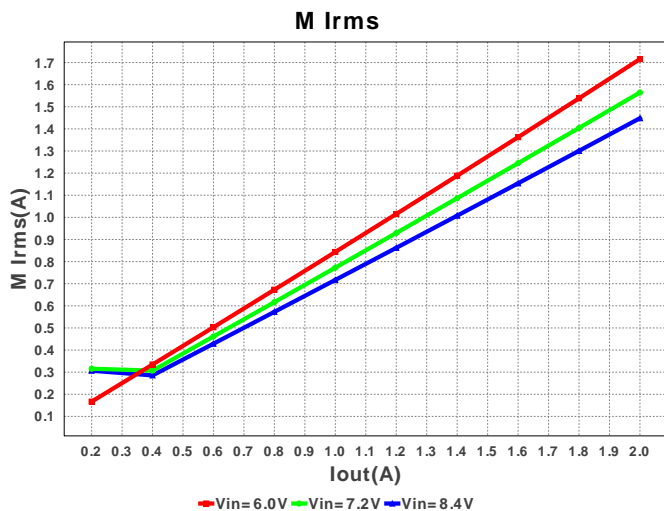
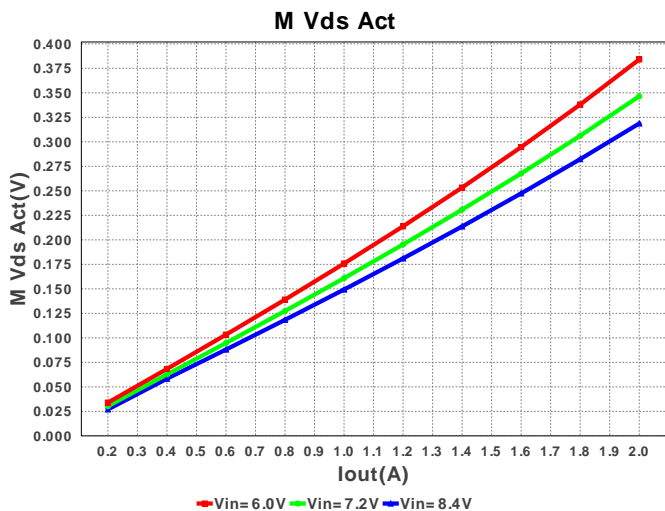
 Design : 3493844/1953 LM22680MRX-ADJ/NOPB  
 LM22680MRX-ADJ/NOPB 6.0V-8.4V to 4.0V @ 2.0A

**Electrical BOM**

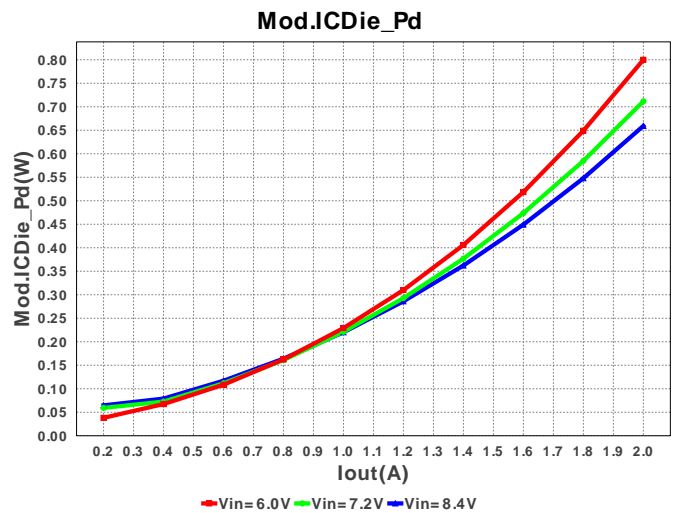
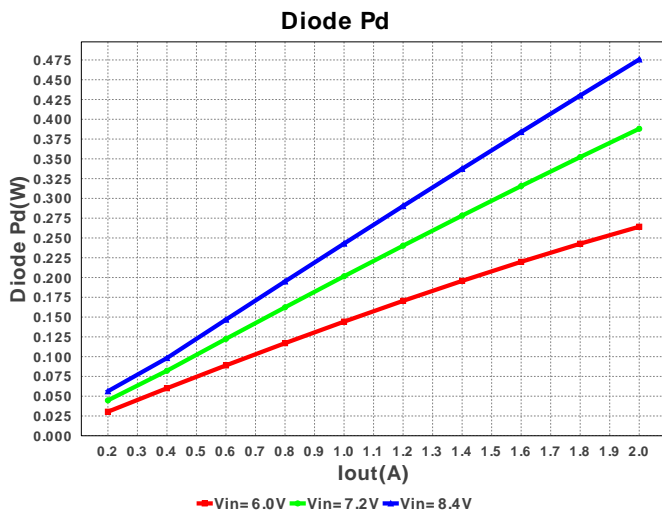
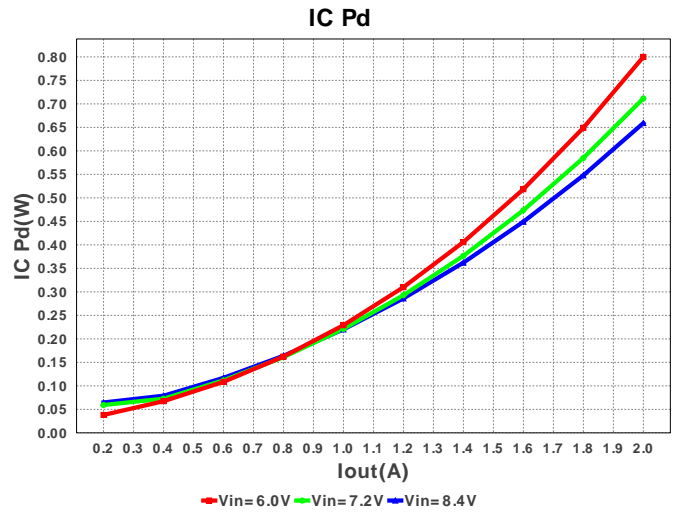
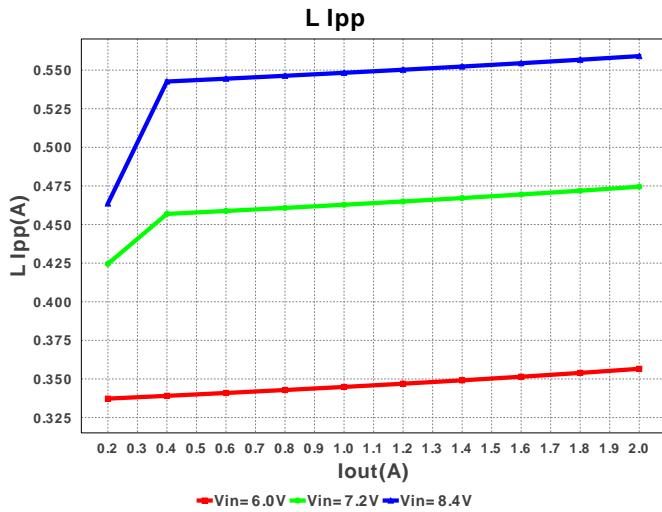
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	Kemet	C0805C103K5RACTU Series= X7R	Cap= 10.0 nF ESR= 1.739 Ohm VDC= 50.0 V IRMS= 411.0 mA	1	\$0.01	 0805 7mm2
2.	Cin	TDK	C3216X5R1C106KT Series= X5R	Cap= 10.0 µF ESR= 4.6 mOhm VDC= 16.0 V IRMS= 2.7 A	1	\$0.08	 1206 11mm2
3.	Cinx	MuRata	GRM188R61C105KA93D Series= X5R	Cap= 1.0 µF VDC= 16.0 V IRMS= 0.0 A	1	\$0.01	 0603 5mm2
4.	Cout	MuRata	GRM21BR60J226ME39L Series= X5R	Cap= 22.0 µF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 3.5 A	3	\$0.03	 0805 7mm2
5.	Css	AVX	08055C393KAT2A Series= X7R	Cap= 39.0 nF ESR= 38.0 mOhm VDC= 50.0 V IRMS= 0.0 A	1	\$0.02	 0805 7mm2
6.	D1	Diodes Inc.	B220A-13-F	VF@Io= 500.0 mV VRRM= 20.0 V	1	\$0.09	 SMA 37mm2
7.	L1	Bourns	SRN8040-8R2Y	L= 8.2 µH DCR= 45.0 mOhm	1	\$0.21	 SRN8040 100mm2

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
8.	Rfb1	Panasonic	ERJ-6ENF1001V Series= 225	Res= 1,000 Ohm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	0805 7mm2
9.	Rfb2	Panasonic	ERJ-6ENF2101V Series= 225	Res= 2.1 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	0805 7mm2
10.	Rt	Panasonic	ERJ-6ENF7152V Series= 225	Res= 71.5 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	0805 7mm2
11.	U1	Texas Instruments	LM22680MRX-ADJ/NOPB	Switcher	1	\$1.70	 MRA08B 56mm2









## Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	755.34 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	161.392 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.28 A	Current	Peak switch current in IC
4.	Iin Avg	1.111 A	Current	Average input current
5.	L Ipp	559.08 mA	Current	Peak-to-peak inductor ripple current
6.	M Irms	1.448 A	Current	MOSFET RMS current
7.	BOM Count	13	General	Total Design BOM count
8.	FootPrint	263.0 mm2	General	Total Foot Print Area of BOM components
9.	Frequency	503.297 kHz	General	Switching frequency
10.	IC Tolerance	19.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	318.698 mV	General	Voltage drop across the MosFET
12.	Pout	8.0 W	General	Total output power
13.	Total BOM	\$2.23	General	Total BOM Cost
14.	D1 Tj	41.89 degC	Op_Point	D1 junction temperature
15.	Vout OP	4.0 V	Op_Point	Operational Output Voltage
16.	Cross Freq	80.783 kHz	Op_point	Bode plot crossover frequency
17.	Duty Cycle	52.44 %	Op_point	Duty cycle
18.	Efficiency	85.694 %	Op_point	Steady state efficiency
19.	IC Tj	69.554 degC	Op_point	IC junction temperature
20.	ICThetaJA	60.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
21.	IOUT_OP	2.0 A	Op_point	Iout operating point
22.	Phase Marg	39.027 deg	Op_point	Bode Plot Phase Margin
23.	VIN_OP	8.4 V	Op_point	Vin operating point
24.	Vout p-p	4.541 mV	Op_point	Peak-to-peak output ripple voltage
25.	Cin Pd	2.624 mW	Power	Input capacitor power dissipation
26.	Cout Pd	78.143 μW	Power	Output capacitor power dissipation
27.	Diode Pd	475.604 mW	Power	Diode power dissipation
28.	IC Pd	659.24 mW	Power	IC power dissipation
29.	L Pd	198.0 mW	Power	Inductor power dissipation
30.	Total Pd	1.336 W	Power	Total Power Dissipation

## Design Inputs

#	Name	Value	Description
1.	Iout	2.0 A	Maximum Output Current
2.	Iout1	2.0 Amps	Output Current #1
3.	VinMax	8.4 V	Maximum input voltage
4.	VinMin	6.0 V	Minimum input voltage
5.	Vout	4.0 V	Output Voltage
6.	Vout1	4.0 Volt	Output Voltage #1
7.	base_pn	LM22680	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0 degC	Ambient temperature

## Design Assistance

1. Part Description The LM22680 is a monolithic integrated circuit that provides all of the active functions for a step-down (buck) switching regulator capable of driving up to 2.0A loads with excellent line and load regulation characteristics. High efficiency (>90%) is obtained through the use of a low ON-resistance N-channel MOSFET.

2. LM22680 Product Folder : <http://www.ti.com/product/lm22680> : contains the data sheet and other resources.

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**You should completely validate and test your design implementation to confirm the system functionality for your application prior to production.**

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