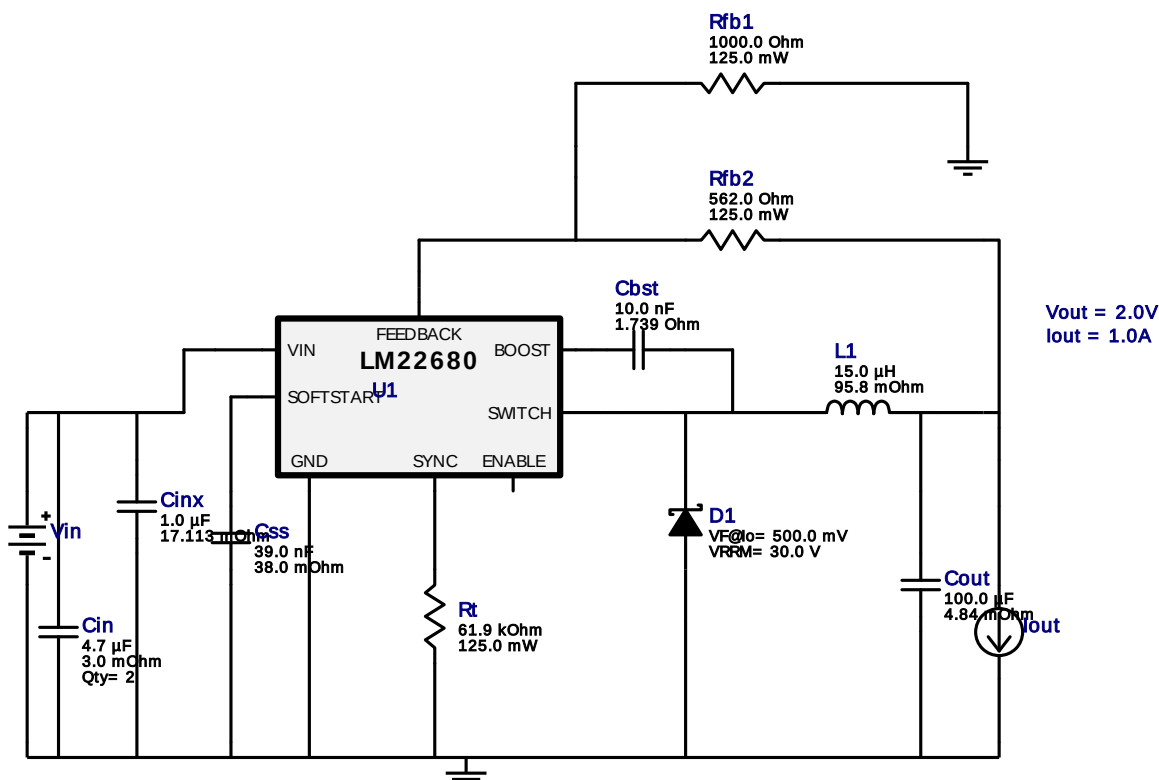


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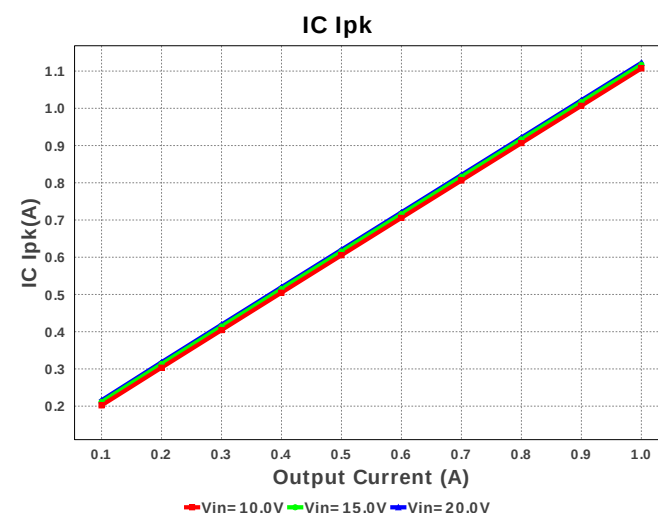
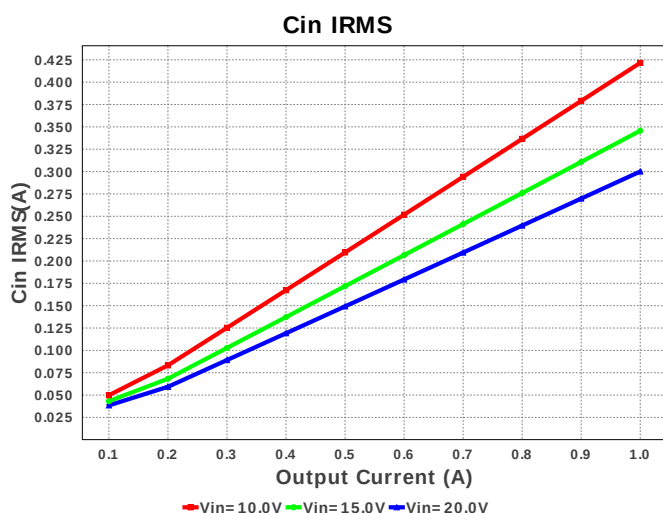
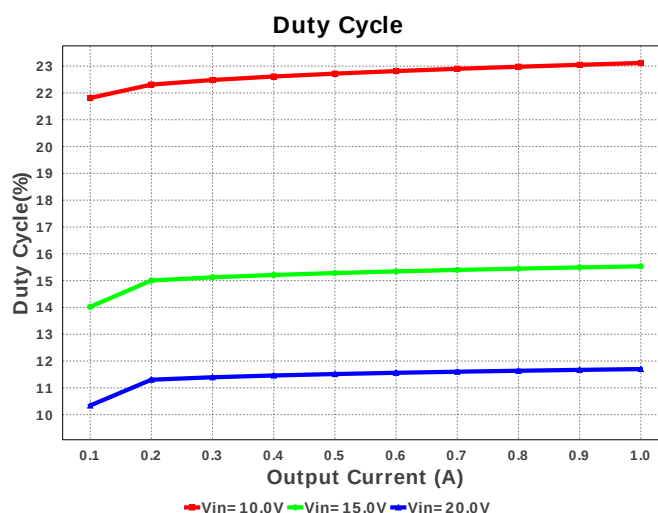
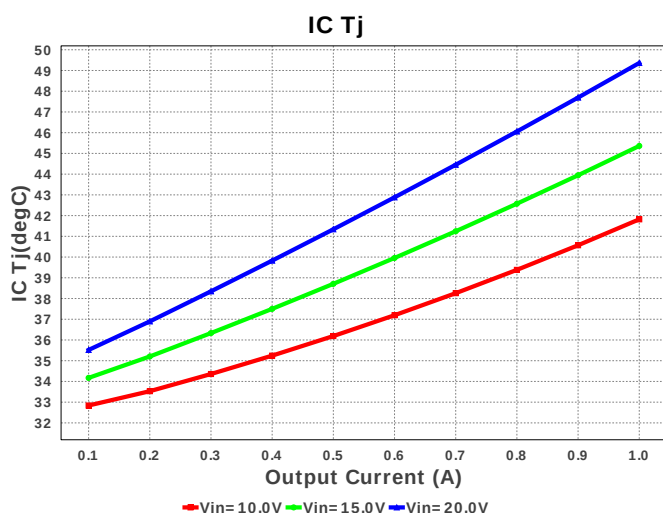
Design : 4728750/13 LM22680MRE-ADJ/NOPB
LM22680MRE-ADJ/NOPB 10.0V-20.0V to 2.00V @ 1.0A

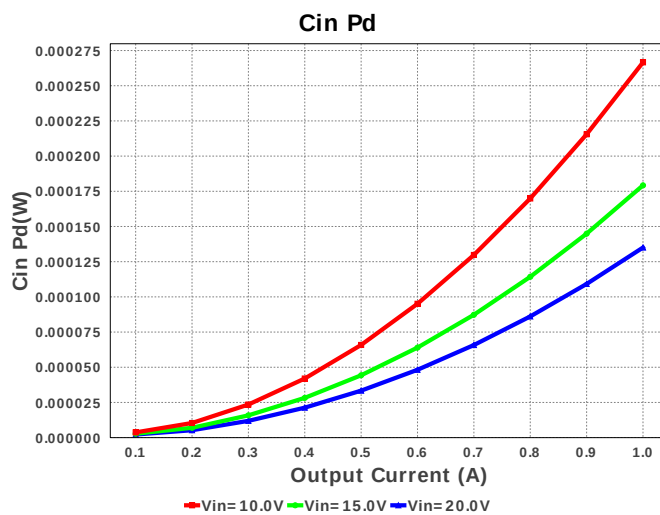
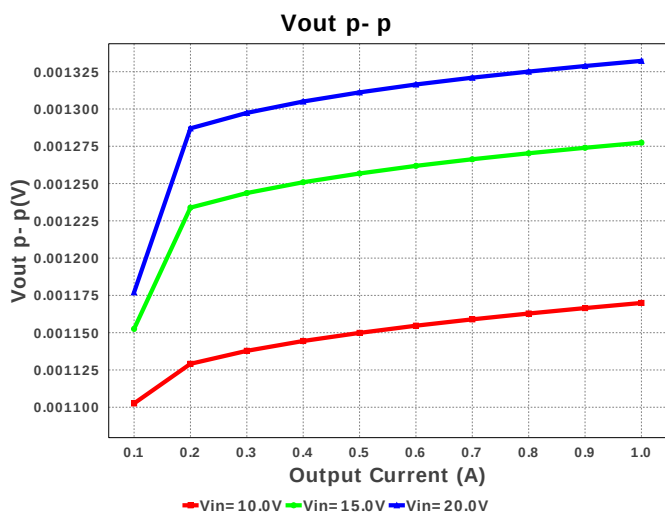
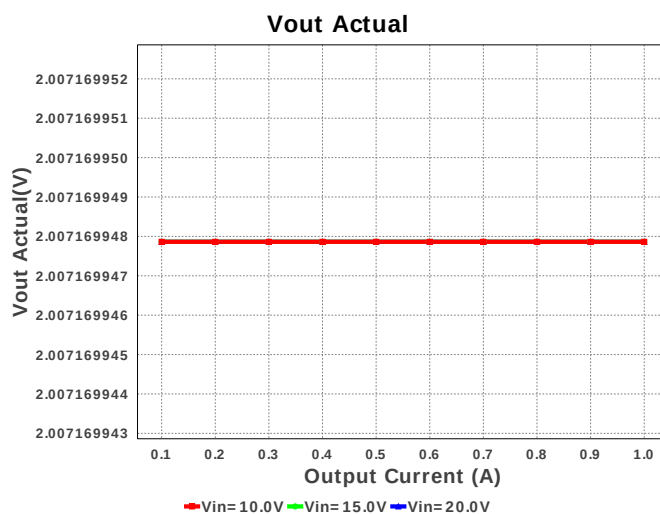
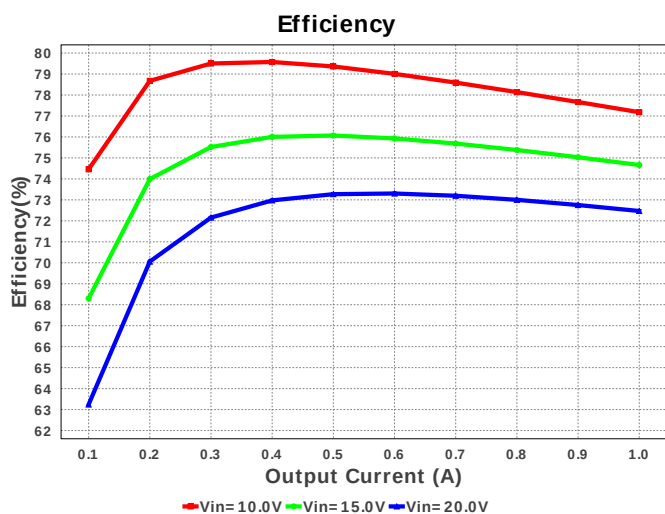
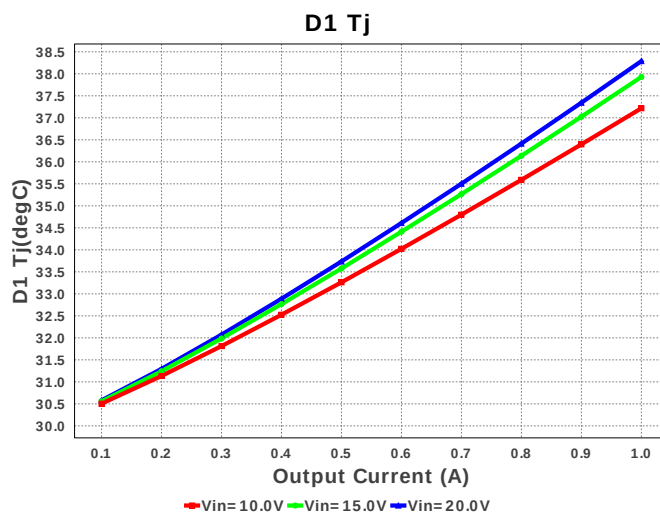
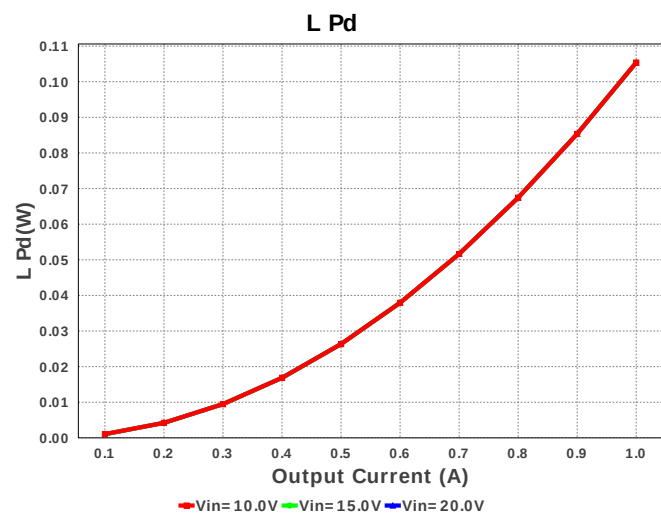


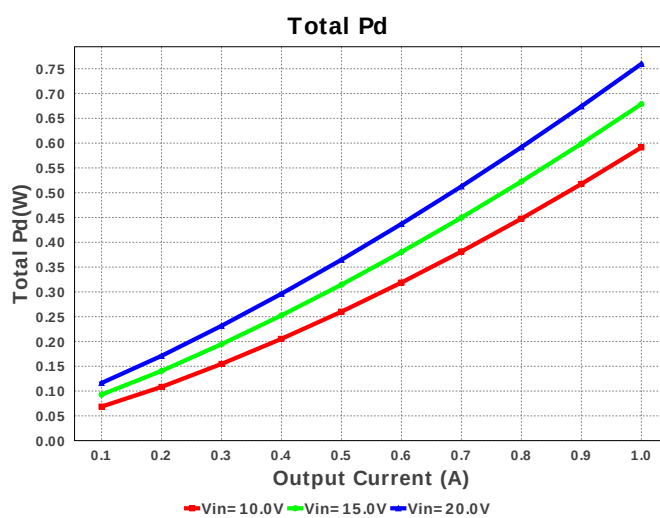
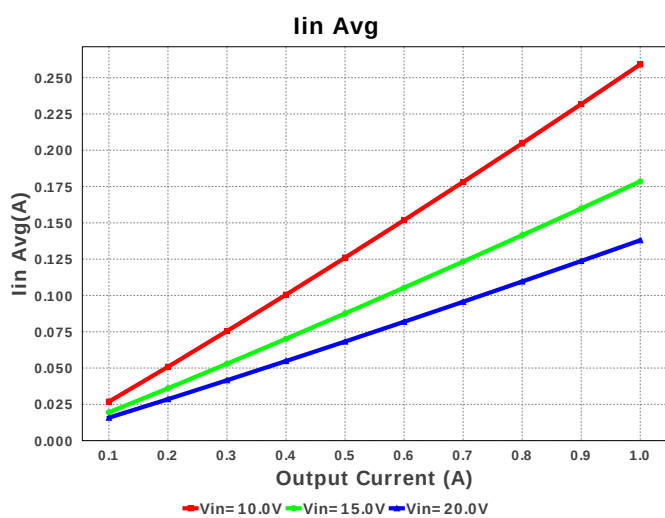
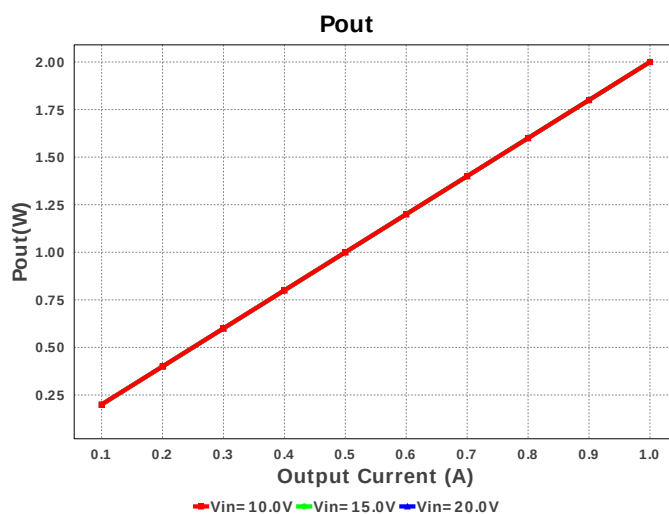
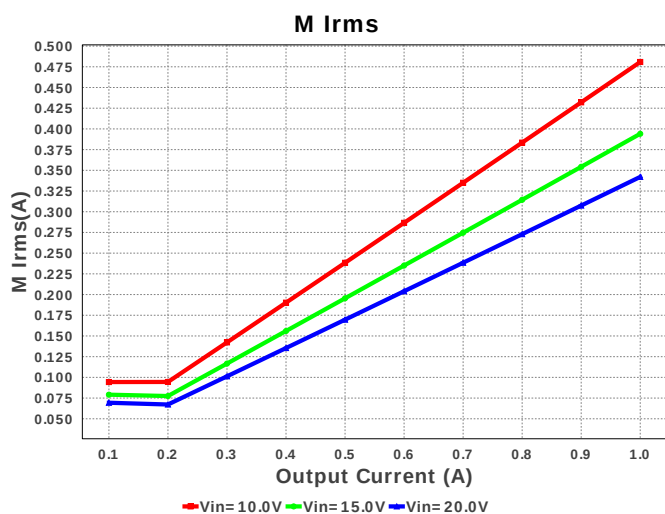
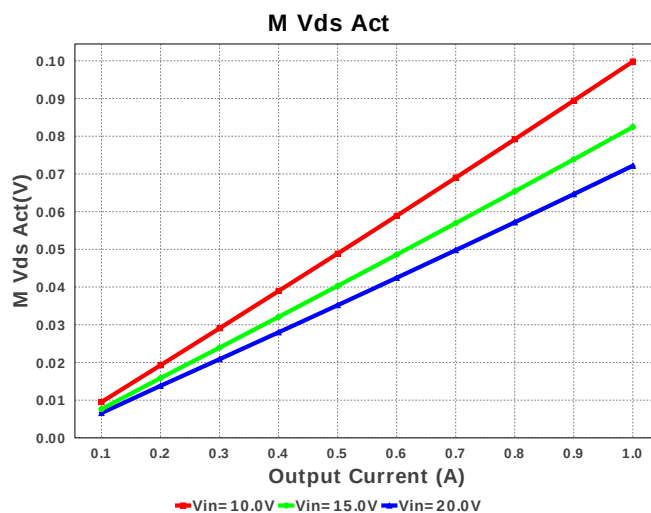
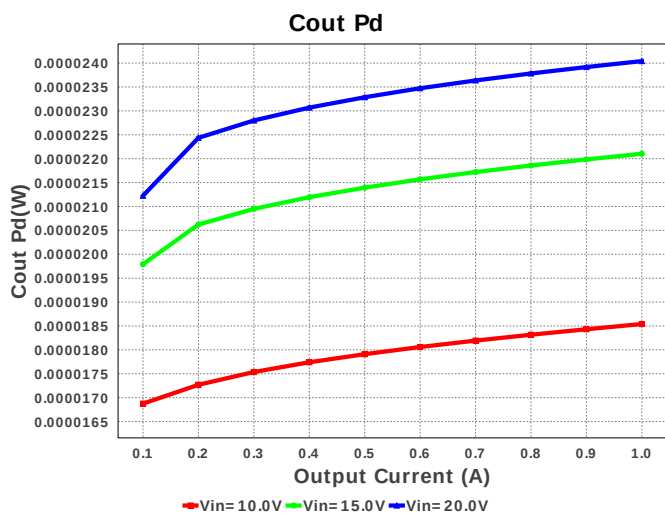
Electrical BOM

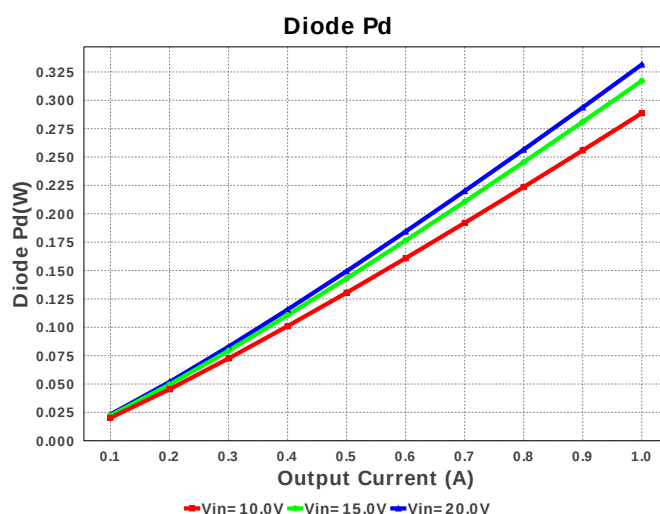
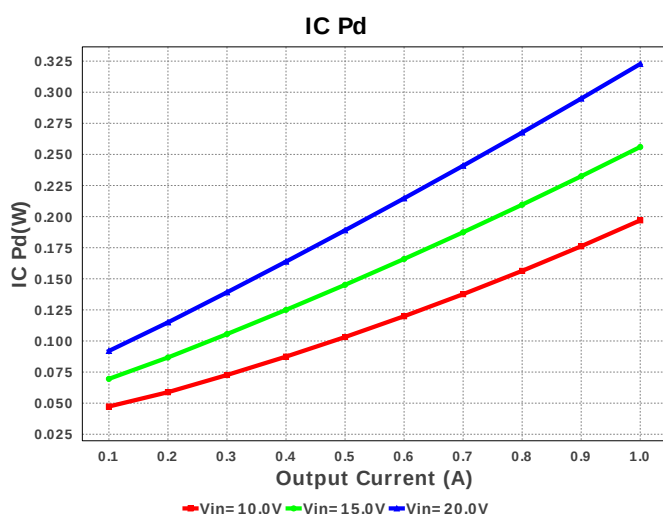
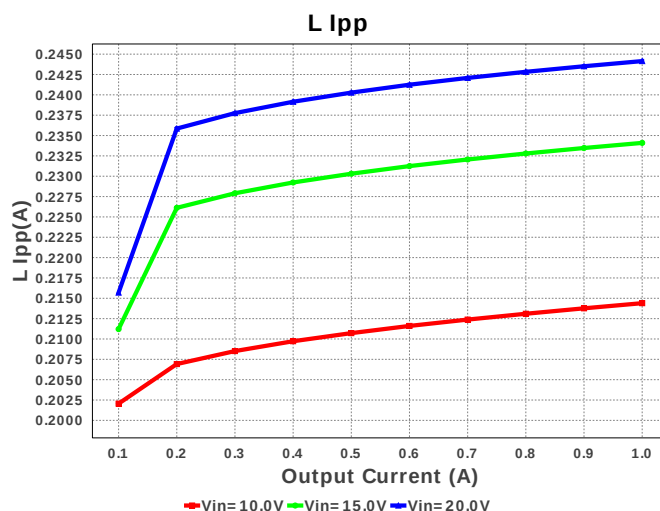
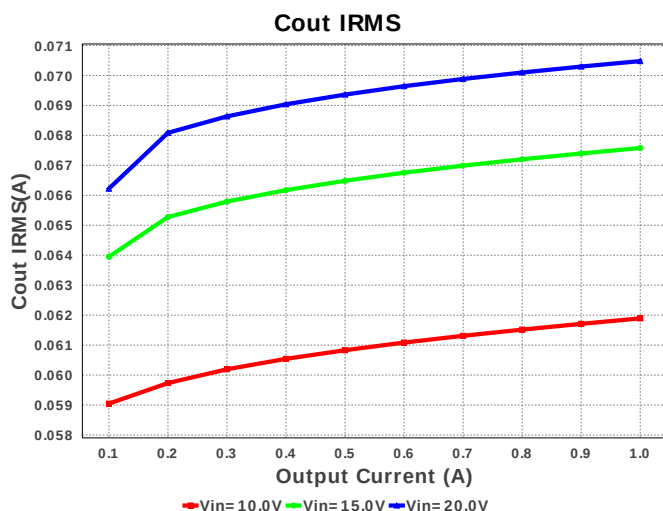
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	Kemet	C0805C103K5RACTU Series= X7R	Cap= 10.0 nF ESR= 1.739 Ohm VDC= 50.0 V IRMS= 411.0 mA	1	\$0.01	0805 7 mm ²
2.	Cin	MuRata	GRM31CR71H475KA12L Series= X7R	Cap= 4.7 uF ESR= 3.0 mOhm VDC= 50.0 V IRMS= 4.98 A	2	\$0.07	1206 11 mm ²
3.	Cinx	MuRata	GRM188R61E105KA12D Series= X5R	Cap= 1.0 uF ESR= 17.113 mOhm VDC= 25.0 V IRMS= 979.39 mA	1	\$0.01	0603 5 mm ²
4.	Cout	MuRata	GRM31CD80G107ME39L Series= X6T	Cap= 100.0 uF ESR= 4.84 mOhm VDC= 4.0 V IRMS= 4.3381 A	1	\$0.14	1206_190 11 mm ²
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 7 mm ²
6.	D1	Diodes Inc.	B230A-13-F	VF@Io= 500.0 mV VRRM= 30.0 V	1	\$0.09	SMA 37 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
7.	L1	Bourns	SRN6045-150M	L= 15.0 μ H DCR= 95.8 mOhm	1	\$0.16	 SRN6045 64 mm ²
8.	Rfb1	Panasonic	ERJ-6ENF1001V Series= ERJ-6E	Res= 1000.0 Ohm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
9.	Rfb2	Vishay-Dale	CRCW0805562RFKEA Series= CRCW..e3	Res= 562.0 Ohm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
10.	Rt	Panasonic	ERJ-6ENF6192V Series= ERJ-6E	Res= 61.9 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
11.	U1	Texas Instruments	LM22680MRE-ADJ/NOPB	Switcher	1	\$1.96	 MRA08B 56 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	300.041 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	70.479 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	1.122 A	Current	Peak switch current in IC
4.	Iin Avg	137.99 mA	Current	Average input current
5.	L Ipp	244.15 mA	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	342.051 mA	Current	Q lavg
7.	BOM Count	12	General	Total Design BOM count
8.	FootPrint	228.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	575.061 kHz	General	Switching frequency
10.	IC Tolerance	19.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	72.16 mV	General	Voltage drop across the MosFET
12.	Pout	2.0 W	General	Total output power
13.	Total BOM	\$2.56	General	Total BOM Cost
14.	D1 Tj	38.289 degC	Op_Point	D1 junction temperature
15.	Vout Actual	2.007 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
16.	Vout OP	2.0 V	Op_Point	Operational Output Voltage
17.	Cross Freq	40.561 kHz	Op_point	Bode plot crossover frequency
18.	Duty Cycle	11.7 %	Op_point	Duty cycle
19.	Efficiency	72.469 %	Op_point	Steady state efficiency
20.	IC Tj	49.362 degC	Op_point	IC junction temperature
21.	ICThetaJA	60.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
22.	IOUT_OP	1.0 A	Op_point	Iout operating point
23.	Phase Marg	52.871 deg	Op_point	Bode Plot Phase Margin
24.	VIN_OP	20.0 V	Op_point	Vin operating point
25.	Vout p-p	1.332 mV	Op_point	Peak-to-peak output ripple voltage
26.	Cin Pd	135.037 μW	Power	Input capacitor power dissipation
27.	Cout Pd	24.042 μW	Power	Output capacitor power dissipation
28.	Diode Pd	331.54 mW	Power	Diode power dissipation
29.	IC Pd	322.707 mW	Power	IC power dissipation
30.	L Pd	105.38 mW	Power	Inductor power dissipation
31.	Total Pd	759.801 mW	Power	Total Power Dissipation

#	Name	Value	Category	Description
32.	Vout Tolerance	2.216 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	1.0	Maximum Output Current
2.	VinMax	20.0	Maximum input voltage
3.	VinMin	10.0	Minimum input voltage
4.	Vout	2.0	Output Voltage
5.	base_pn	LM22680	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	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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