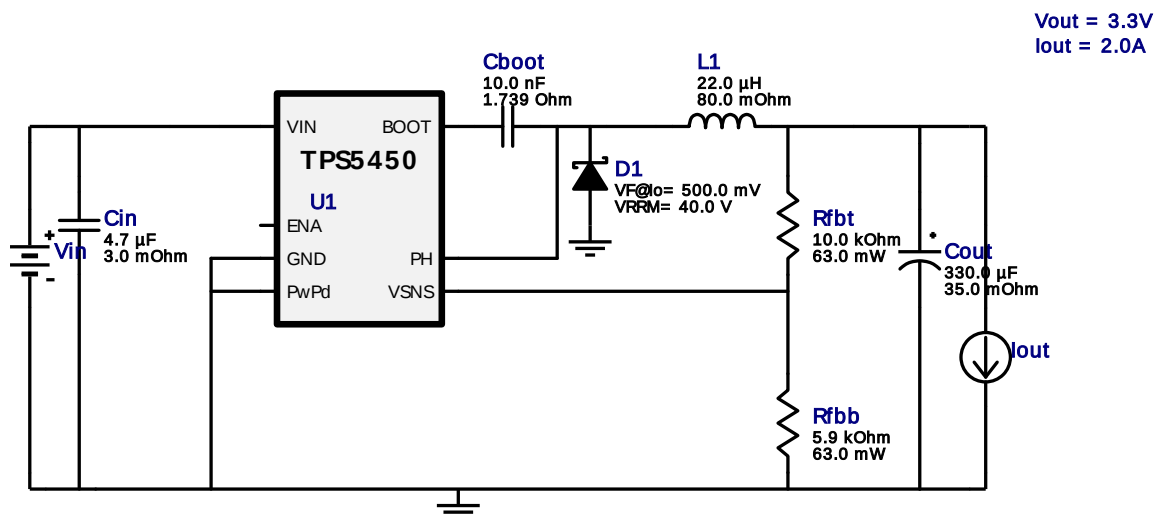
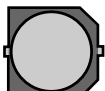


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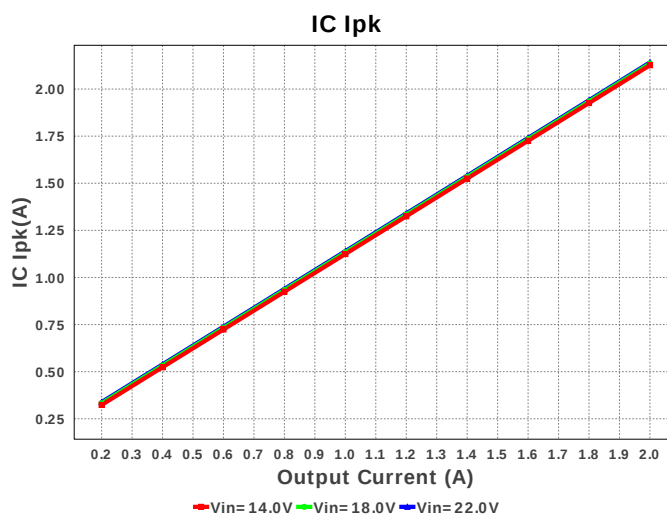
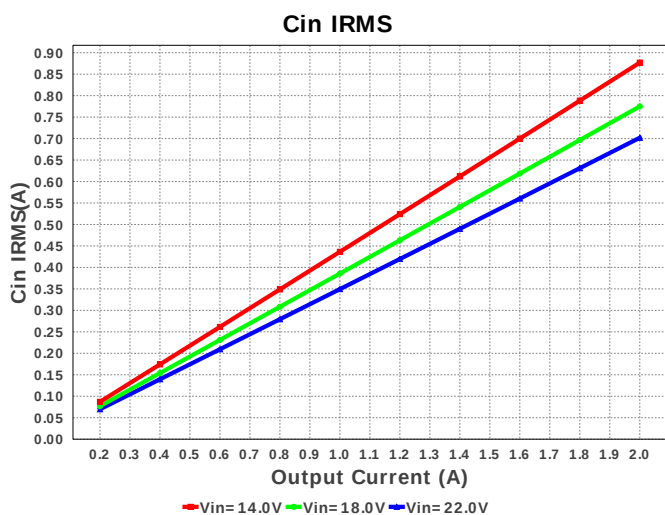
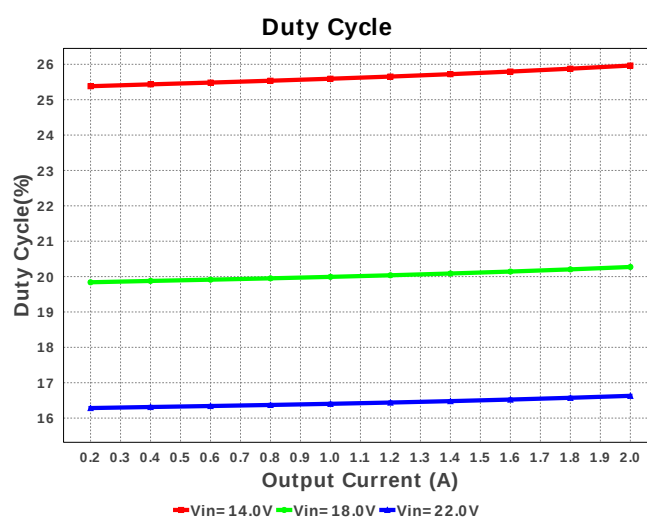
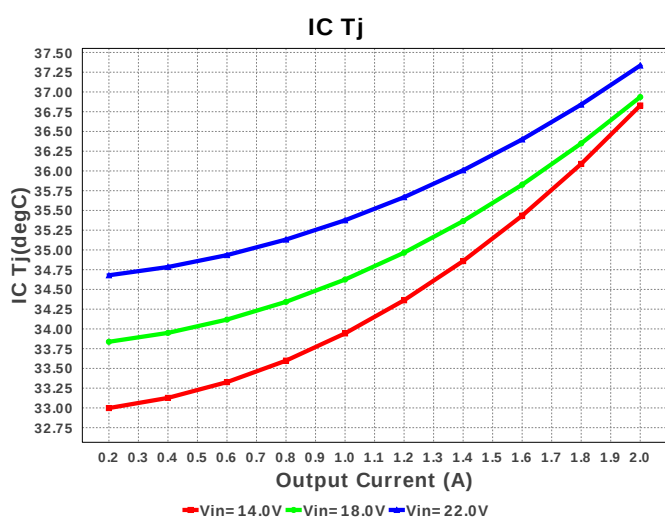
Design : 4737567/77 TPS5450DDAR
TPS5450DDAR 14.0V-22.0V to 3.30V @ 2.0A

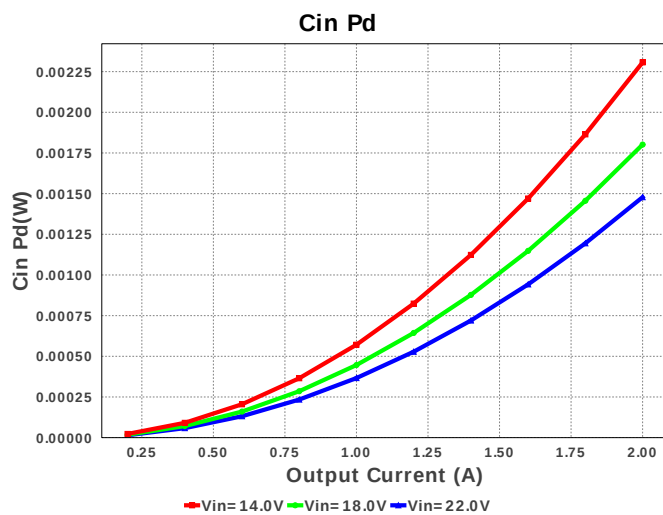
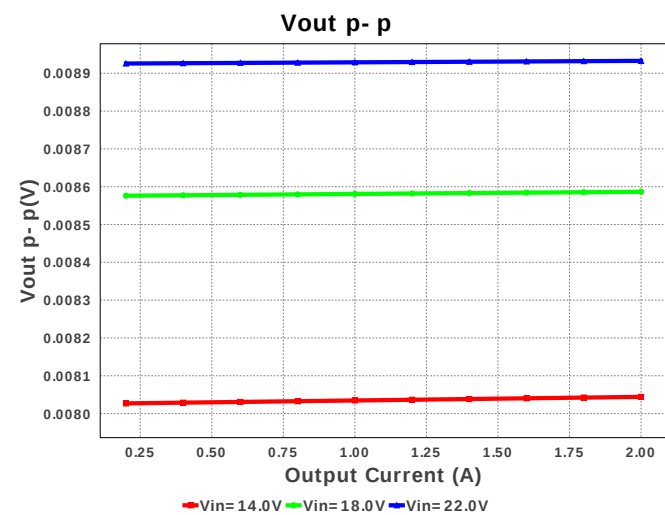
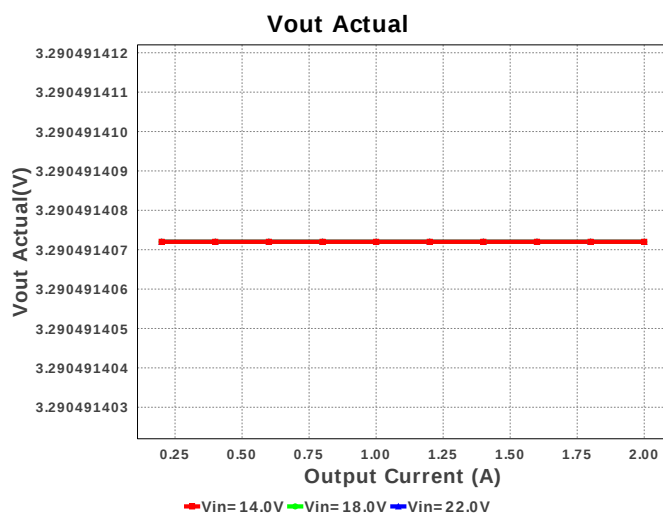
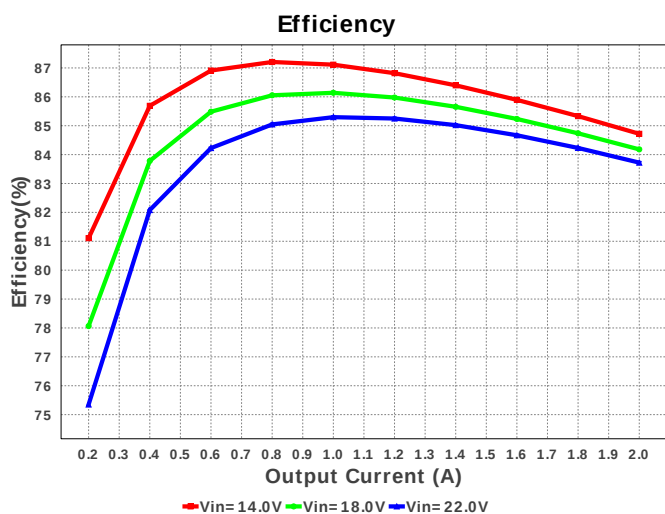
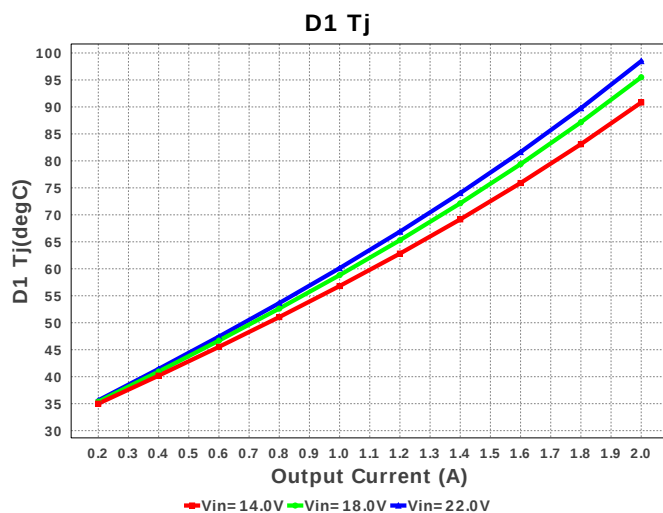
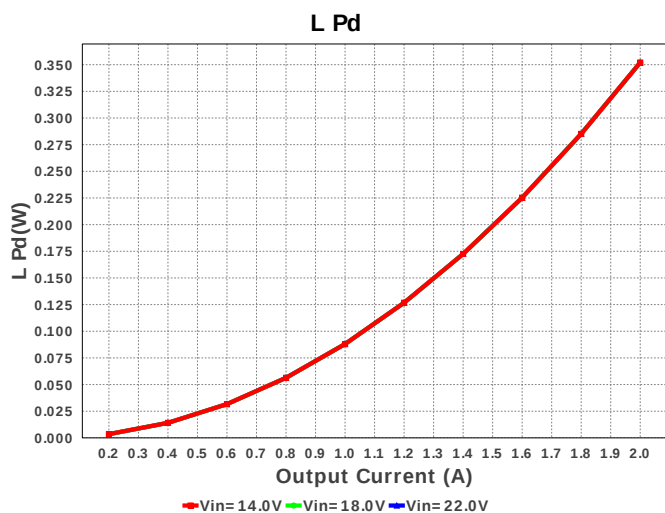


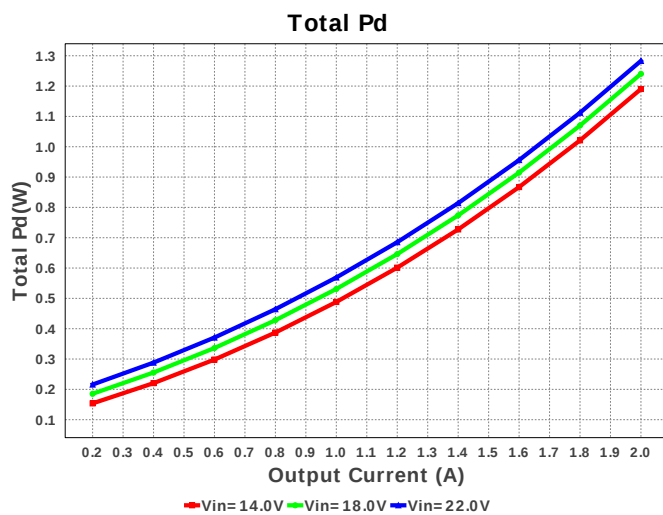
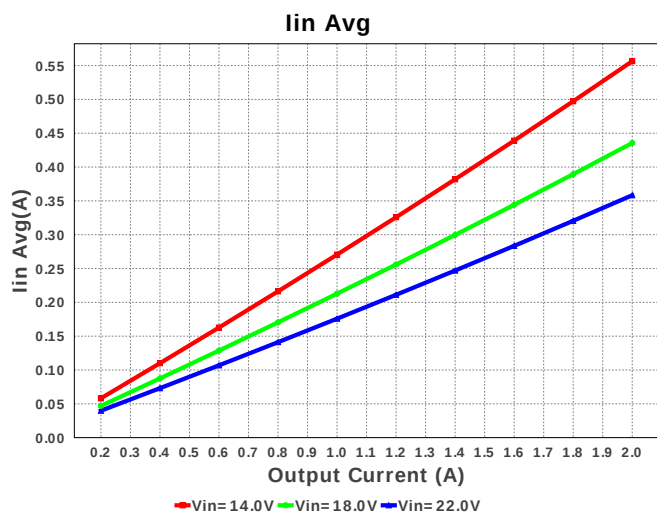
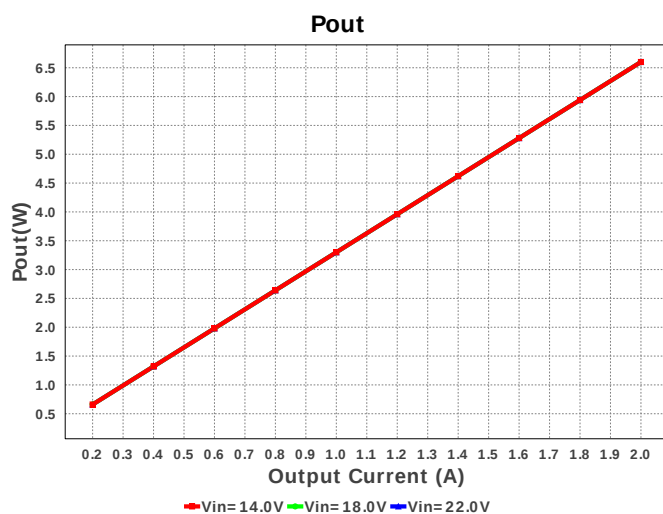
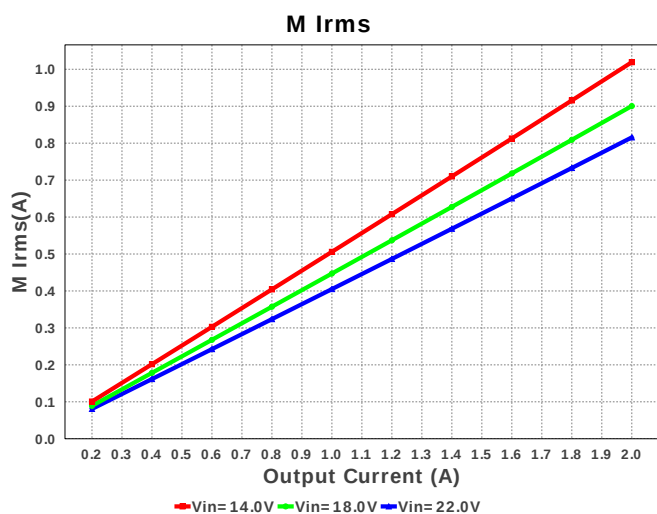
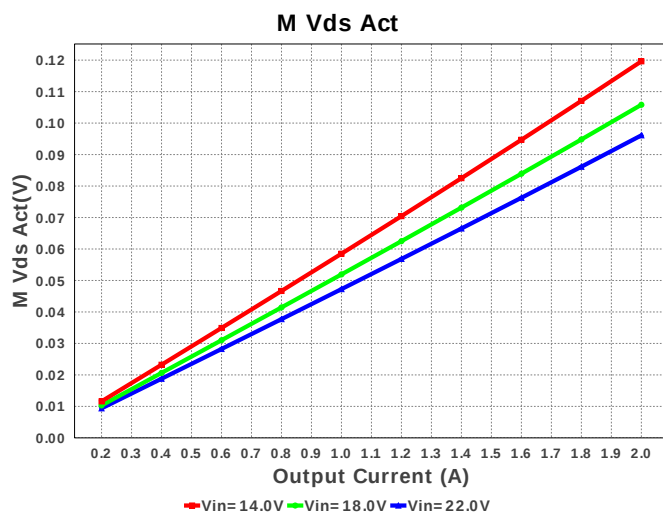
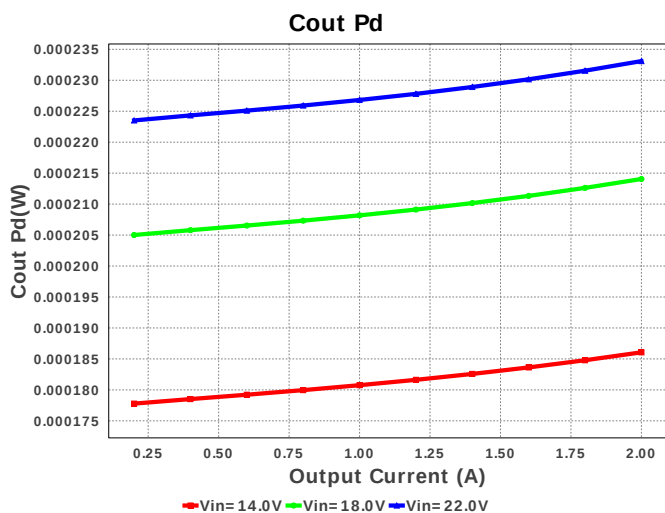
Electrical BOM

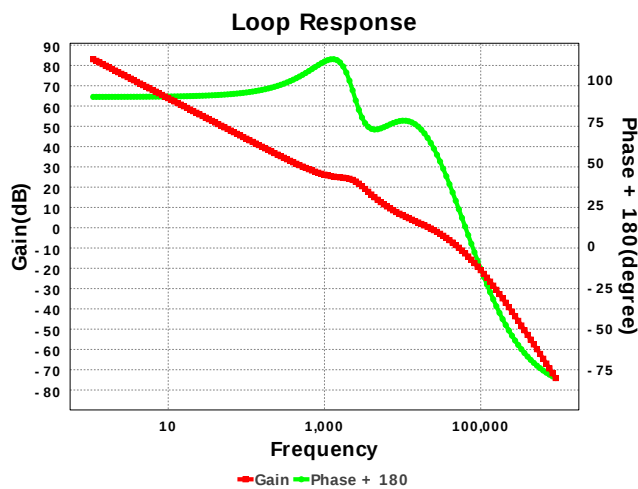
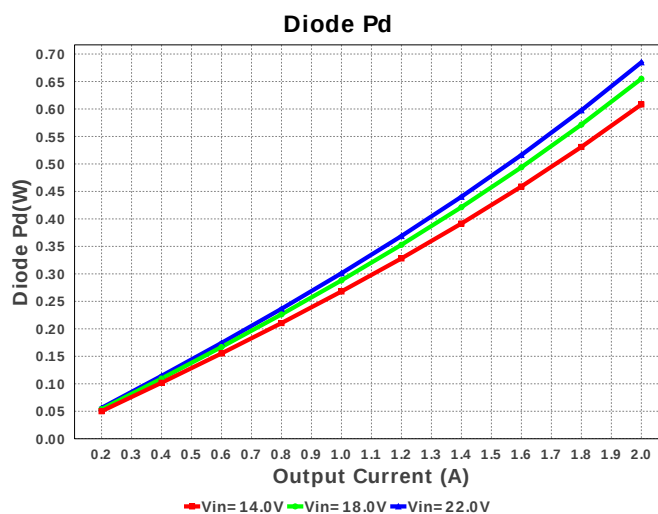
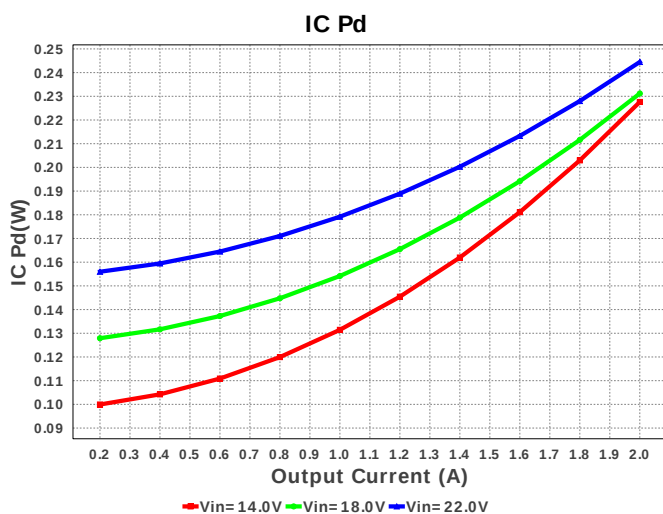
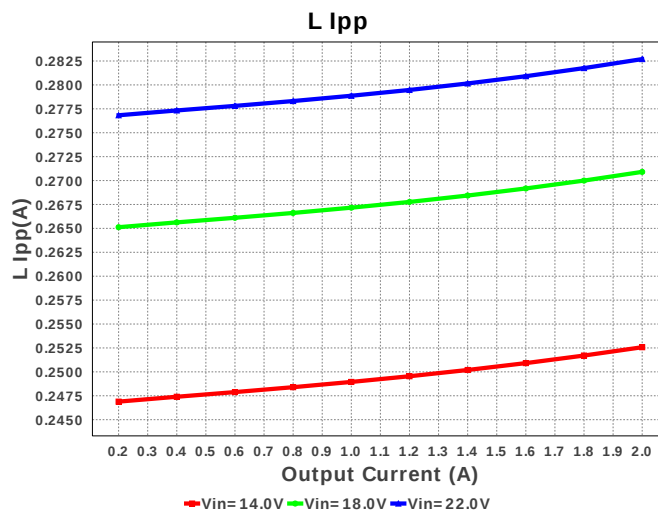
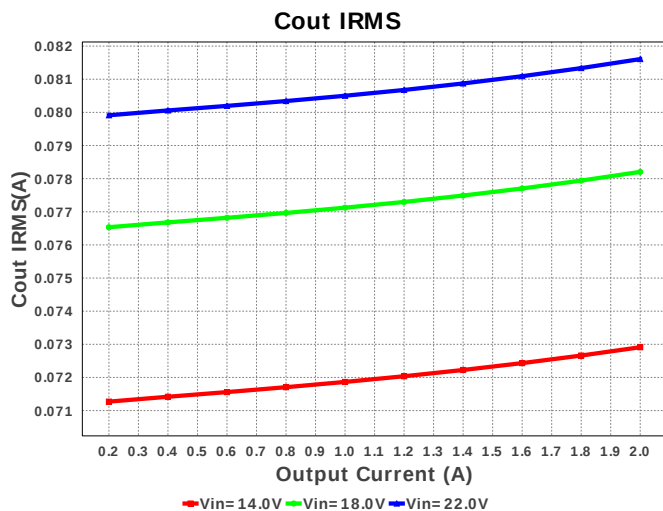
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	Kemet	C0805C103K5RACTU Series= X7R	Cap= 10.0 nF ESR= 1.739 Ohm VDC= 50.0 V IRMS= 411.0 mA	1	\$0.01	 0805 7 mm ²
2.	Cin	MuRata	GRM31CR71H475KA12L Series= X7R	Cap= 4.7 uF ESR= 3.0 mOhm VDC= 50.0 V IRMS= 4.98 A	1	\$0.07	 1206 11 mm ²
3.	Cout	Panasonic	4SVP330M Series= SVP	Cap= 330.0 uF ESR= 35.0 mOhm VDC= 4.0 V IRMS= 2.56 A	1	\$0.49	 SM_RADIAL_8MM 113 mm ²
4.	D1	Diodes Inc.	B340A-13-F	VF@Io= 500.0 mV VRRM= 40.0 V	1	\$0.11	 SMA 37 mm ²
5.	L1	Bourns	SDR1105-220ML	L= 22.0 µH DCR= 80.0 mOhm	1	\$0.29	 SDR1105 157 mm ²
6.	Rfbb	Vishay-Dale	CRCW04025K90FKED Series= CRCW..e3	Res= 5.9 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
7.	Rfbb	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
8.	U1	Texas Instruments	TPS5450DDAR	Switcher	1	\$2.25	

R-PDSO-G8 57 mm²







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	701.955 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	81.608 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.141 A	Current	Peak switch current in IC
4.	Iin Avg	358.32 mA	Current	Average input current
5.	L Ipp	282.7 mA	Current	Peak-to-peak inductor ripple current
6.	M Irms	815.581 mA	Current	MOSFET RMS current
7.	BOM Count	8	General	Total Design BOM count
8.	FootPrint	389.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	500.0 kHz	General	Switching frequency
10.	IC Tolerance	18.315 mV	General	IC Feedback Tolerance
11.	M Vds Act	96.105 mV	General	Voltage drop across the MosFET

#	Name	Value	Category	Description
12.	Pout	6.6 W	General	Total output power
13.	Total BOM	\$3.24	General	Total BOM Cost
14.	D1 Tj	98.493 degC	Op_Point	D1 junction temperature
15.	Vout Actual	3.29 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
16.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
17.	Cross Freq	21.929 kHz	Op_point	Bode plot crossover frequency
18.	Duty Cycle	16.629 %	Op_point	Duty cycle
19.	Efficiency	83.723 %	Op_point	Steady state efficiency
20.	IC Tj	37.334 degC	Op_point	IC junction temperature
21.	ICThetaJA	30.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
22.	IOUT_OP	2.0 A	Op_point	Iout operating point
23.	Phase Marg	63.77 deg	Op_point	Bode Plot Phase Margin
24.	VIN_OP	22.0 V	Op_point	Vin operating point
25.	Vout p-p	9.897 mV	Op_point	Peak-to-peak output ripple voltage
26.	Cin Pd	1.478 mW	Power	Input capacitor power dissipation
27.	Cout Pd	233.095 µW	Power	Output capacitor power dissipation
28.	Diode Pd	684.934 mW	Power	Diode power dissipation
29.	IC Pd	244.481 mW	Power	IC power dissipation
30.	L Pd	352.0 mW	Power	Inductor power dissipation
31.	Total Pd	1.283 W	Power	Total Power Dissipation
32.	Vout Tolerance	2.79 %		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	TPS5450	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	Ambient temperature

Design Assistance

1. Feature Highlights: 5A, 500kHz Fixed Switching Frequency, Internal Compensation
2. TPS5450 Product Folder : <http://www.ti.com/product/TPS5450> : contains the data sheet and other resources.

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