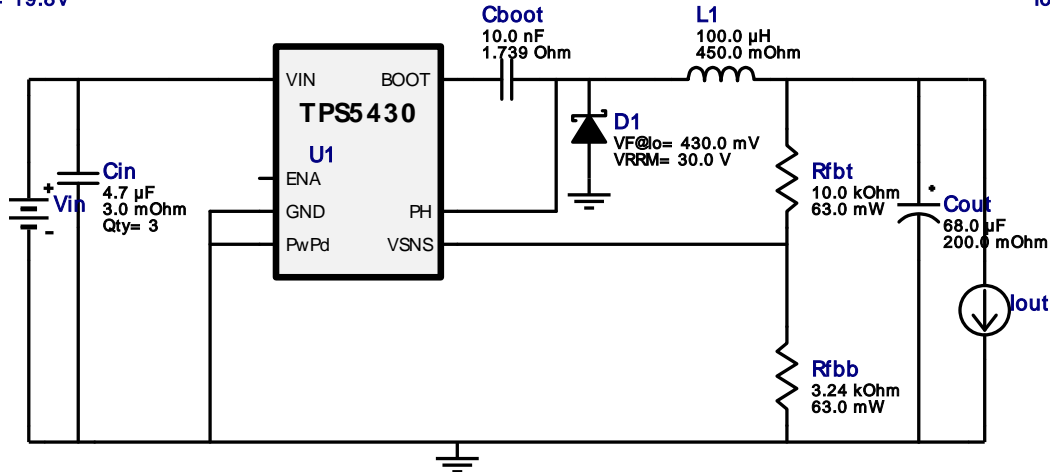







WEBENCH® Design Report

 Design : 1542746/395 TPS5430DDAR
 TPS5430DDAR 10.8V-19.8V to 5.00V @ 0.5A

 VinMin = 10.8V
 VinMax = 19.8V

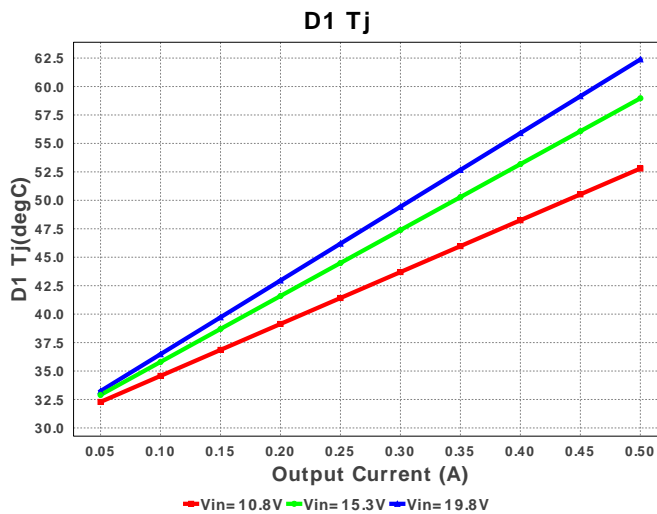
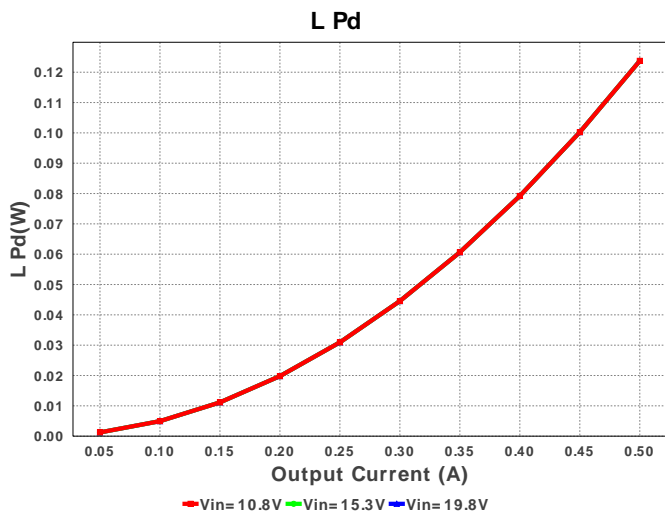
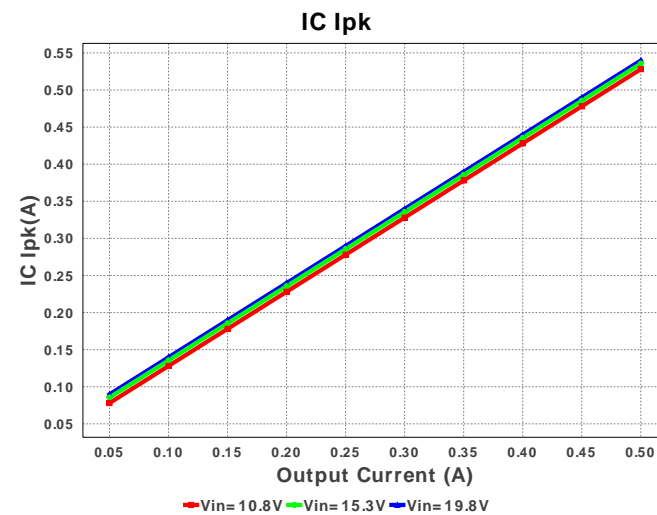
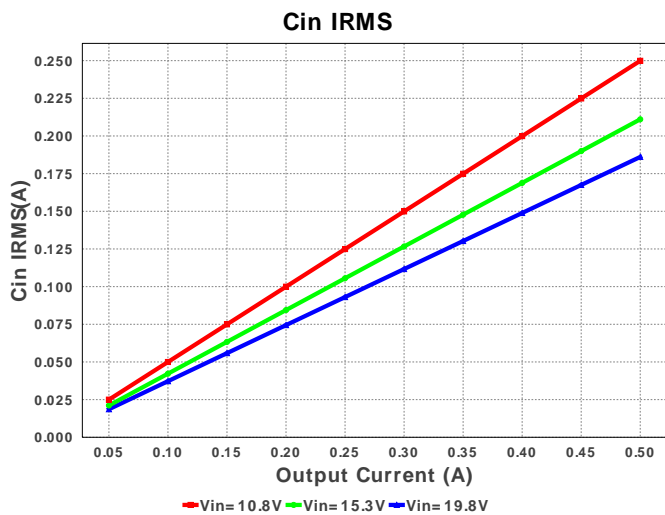
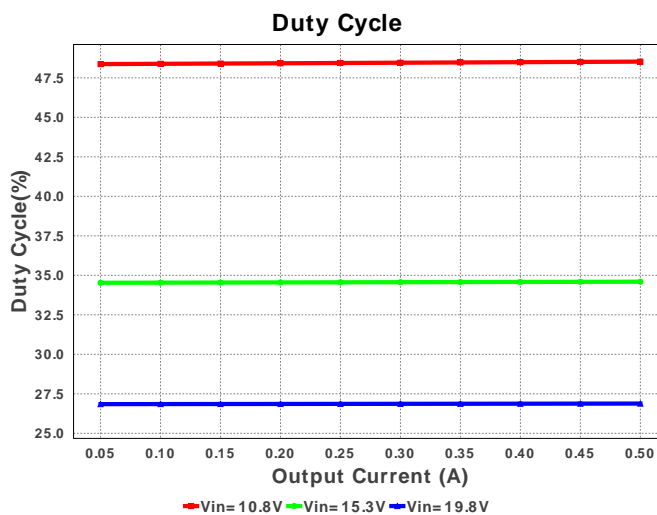
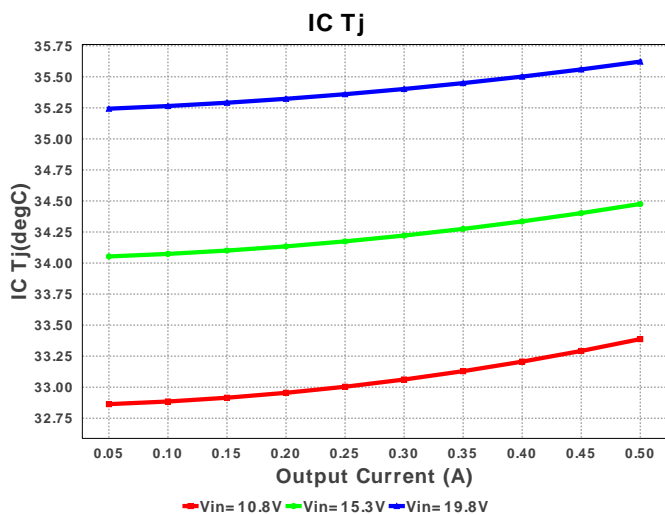
 Vout = 5.0V
 Iout = 0.5A

Electrical BOM

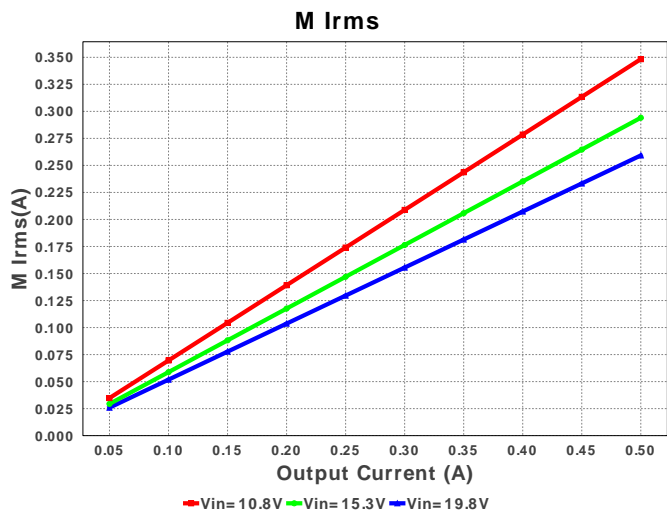
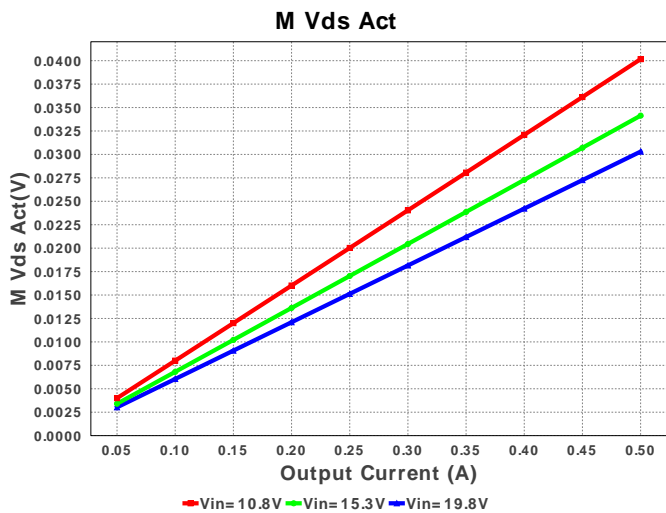
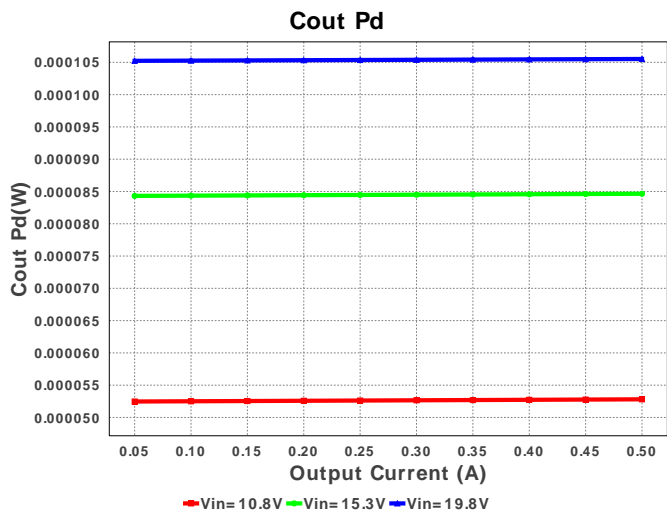
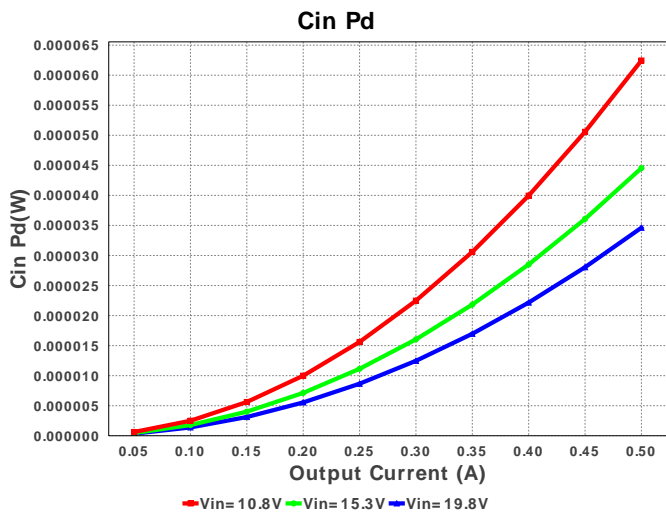
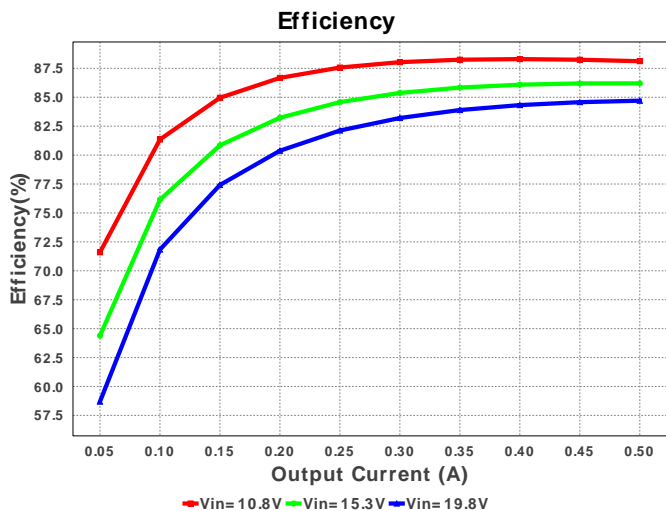
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	Kemet	C0805C103K5RACTU Series= X7R	Cap= 10.0 nF ESR= 1.739 Ohm VDC= 50.0 V IRMS= 411.0 mA	1	\$0.01	 0805 7 mm ²
2.	Cin	MuRata	GRM31CR71H475KA12L Series= X7R	Cap= 4.7 uF ESR= 3.0 mOhm VDC= 50.0 V IRMS= 4.98 A	3	\$0.10	 1206 11 mm ²
3.	Cout	AVX	TPSC686K016R0200 Series= TPS	Cap= 68.0 uF ESR= 200.0 mOhm VDC= 16.0 V IRMS= 667.0 mA	1	\$0.43	 6032-28 42 mm ²
4.	D1	ON Semiconductor	MBR0530T1G	VF@Io= 430.0 mV VRRM= 30.0 V	1	\$0.06	 SOD-123 13 mm ²
5.	L1	Bourns	SDR0805-101KL	L= 100.0 uH DCR= 450.0 mOhm	1	\$0.22	 SDR0805 96 mm ²
6.	Rfb	Vishay-Dale	CRCW04023K24FKED Series= CRCW..e3	Res= 3.24 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
7.	Rfbt	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²

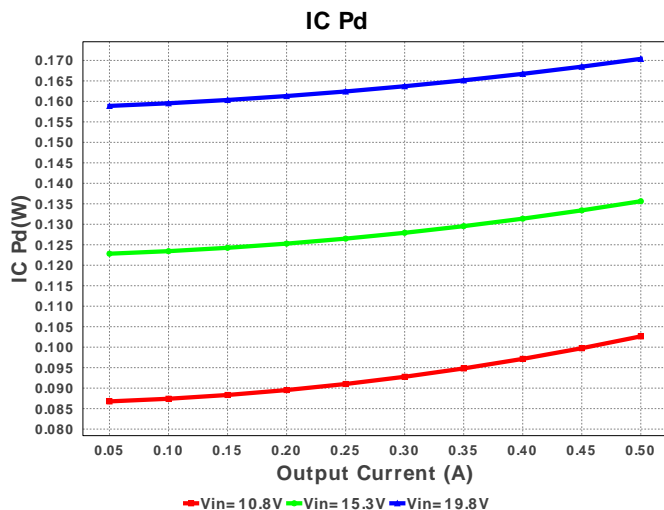
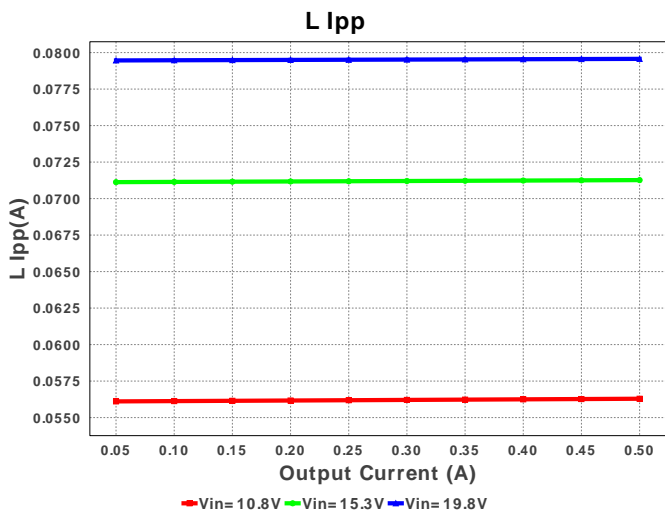
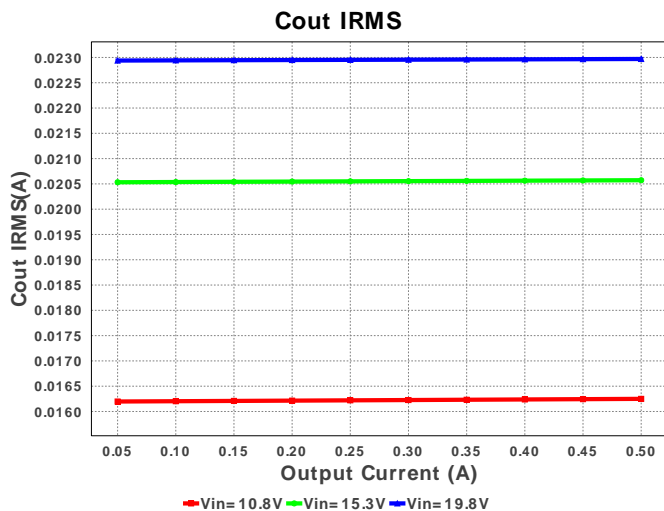
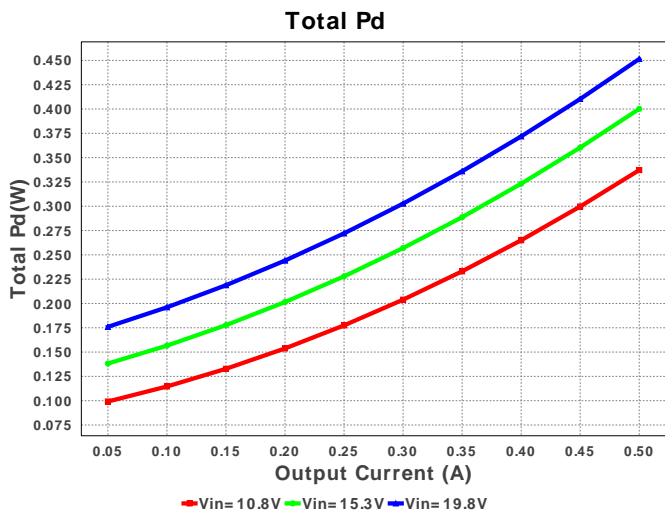
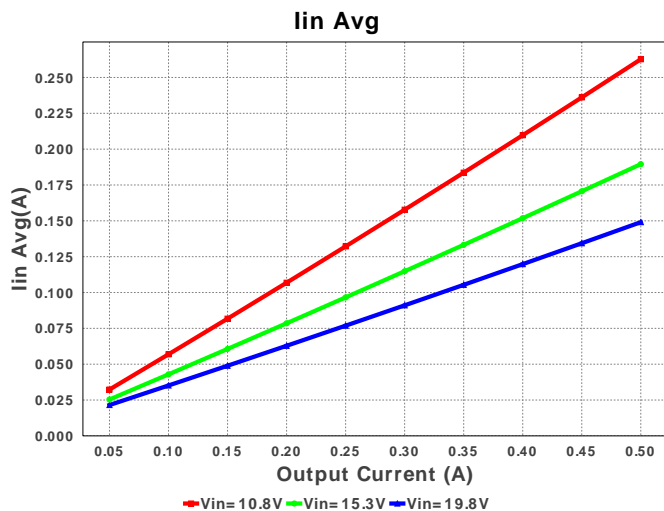
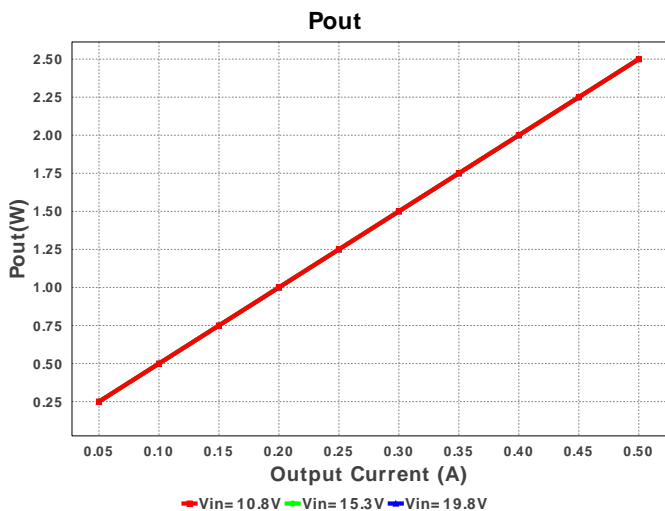
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
8.	U1	Texas Instruments	TPS5430DDAR	Switcher	1	\$1.85	

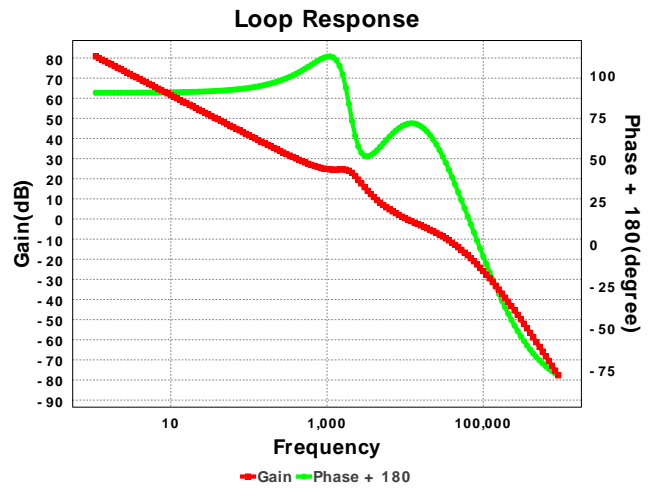
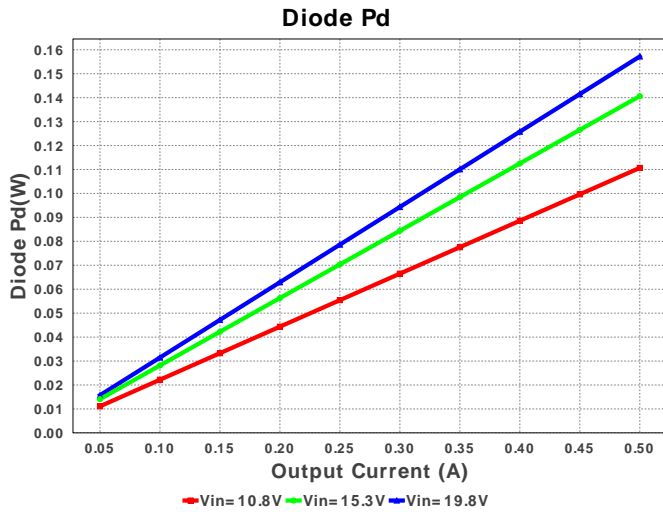


R-PDSO-G8 57 mm²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	186.068 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	22.97 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	539.785 mA	Current	Peak switch current in IC
4.	Iin Avg	149.06 mA	Current	Average input current
5.	L Ipp	79.57 mA	Current	Peak-to-peak inductor ripple current
6.	M Irms	259.237 mA	Current	MOSFET RMS current
7.	BOM Count	10	General	Total Design BOM count
8.	FootPrint	254.0 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	30.3 mV	General	Voltage drop across the MosFET
12.	Pout	2.5 W	General	Total output power
13.	Total BOM	\$2.88	General	Total BOM Cost
14.	D1 Tj	62.384 degC	Op_Point	D1 junction temperature
15.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
16.	Cross Freq	10.518 kHz	Op_point	Bode plot crossover frequency
17.	Duty Cycle	26.882 %	Op_point	Duty cycle
18.	Efficiency	84.703 %	Op_point	Steady state efficiency
19.	IC Tj	35.623 degC	Op_point	IC junction temperature
20.	ICThetaJA	33.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
21.	IOUT_OP	500.0 mA	Op_point	Iout operating point
22.	Phase Marg	71.488 deg	Op_point	Bode Plot Phase Margin
23.	VIN_OP	19.8 V	Op_point	Vin operating point
24.	Vout p-p	15.917 mV	Op_point	Peak-to-peak output ripple voltage
25.	Cin Pd	34.621 μW	Power	Input capacitor power dissipation
26.	Cout Pd	105.522 μW	Power	Output capacitor power dissipation
27.	Diode Pd	157.205 mW	Power	Diode power dissipation
28.	IC Pd	170.38 mW	Power	IC power dissipation
29.	L Pd	123.75 mW	Power	Inductor power dissipation
30.	Total Pd	451.474 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	500.0 m	Maximum Output Current
2.	Iout1	500.0 m	Output Current #1
3.	VinMax	19.8	Maximum input voltage
4.	VinMin	10.8	Minimum input voltage
5.	Vout	5.0	Output Voltage
6.	Vout1	5.0	Output Voltage #1
7.	base_pn	TPS5430	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0	Ambient temperature

Design Assistance

1. Feature Highlights: 3A, 500kHz Fixed Switching Frequency, Internal Compensation
2. TPS5430 Product Folder : <http://www.ti.com/product/tps5430> : contains the data sheet and other resources.

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