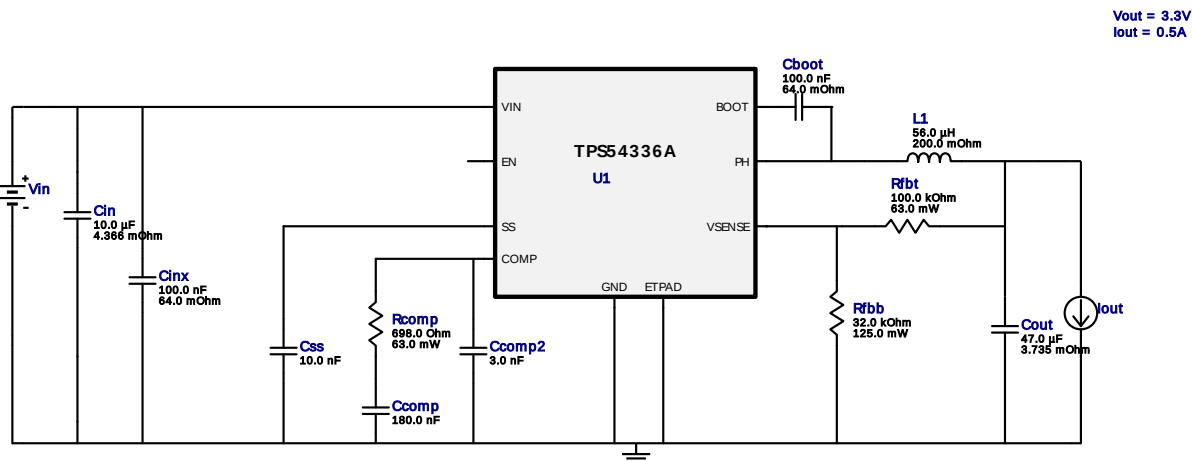


WEBENCH® Design Report

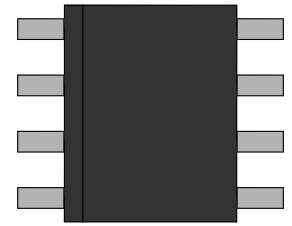
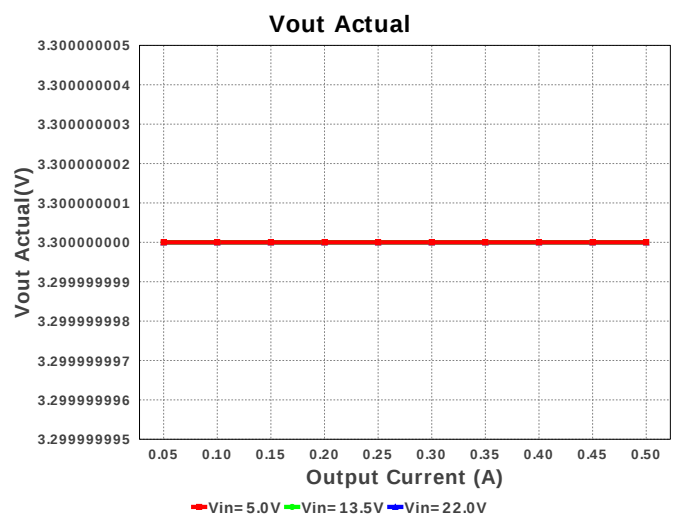
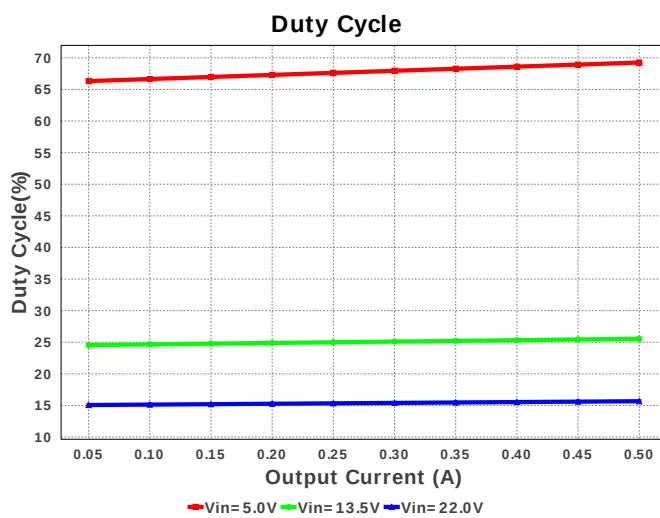
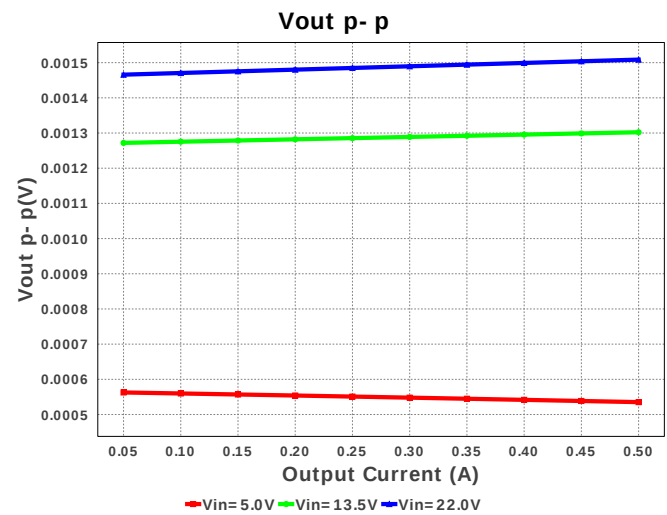
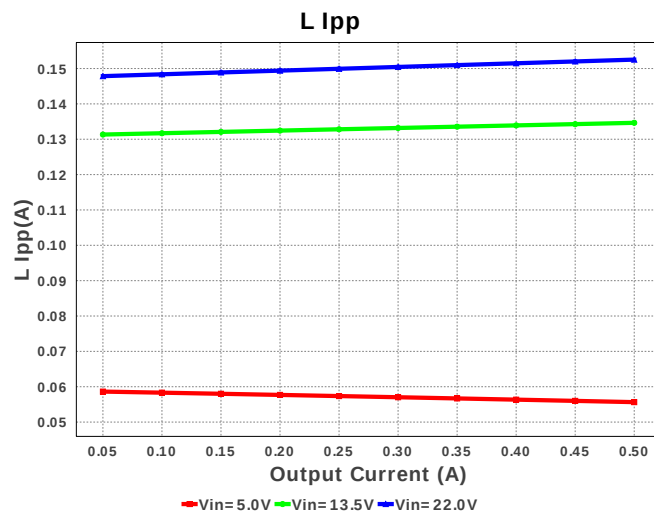
Design : 2425056/59 TPS54336ADDAR
TPS54336ADDAR 5.0V-22.0V to 3.30V @ 0.5A

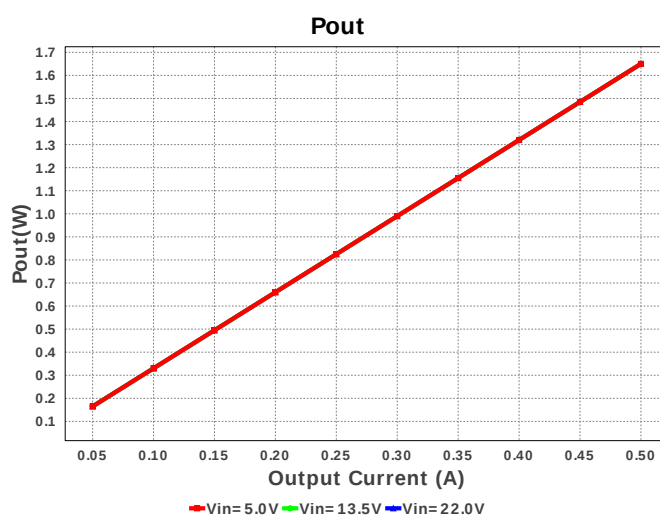
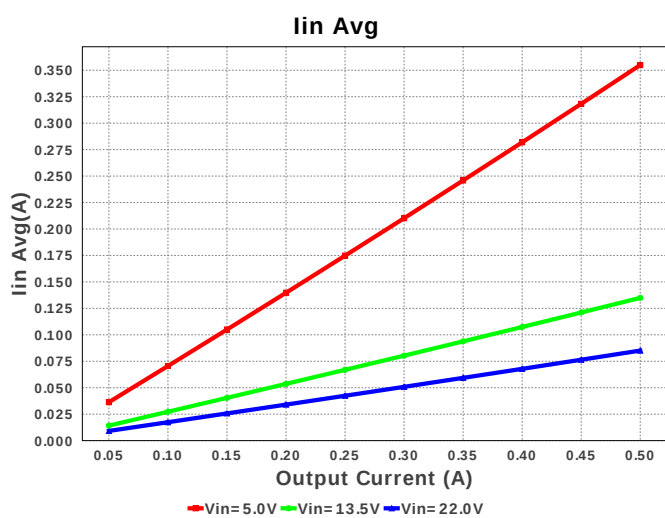
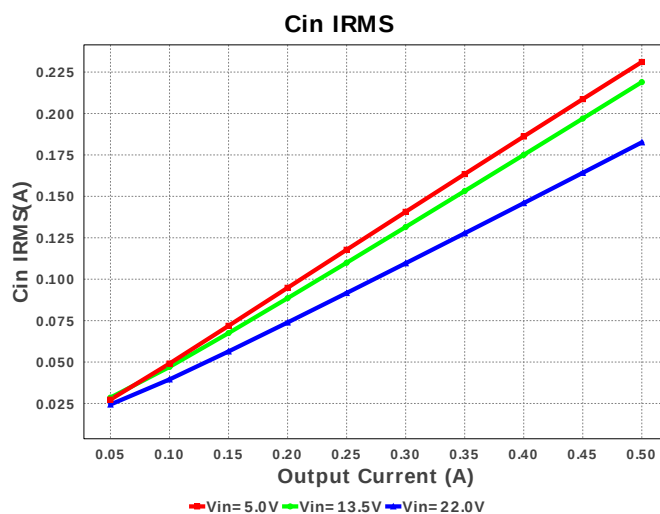
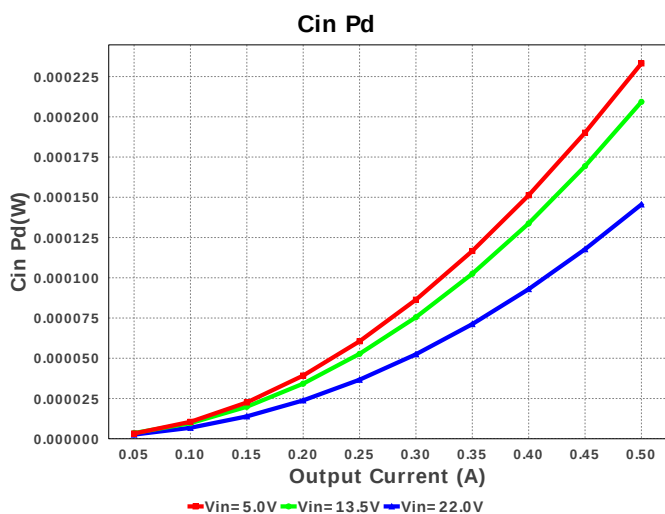
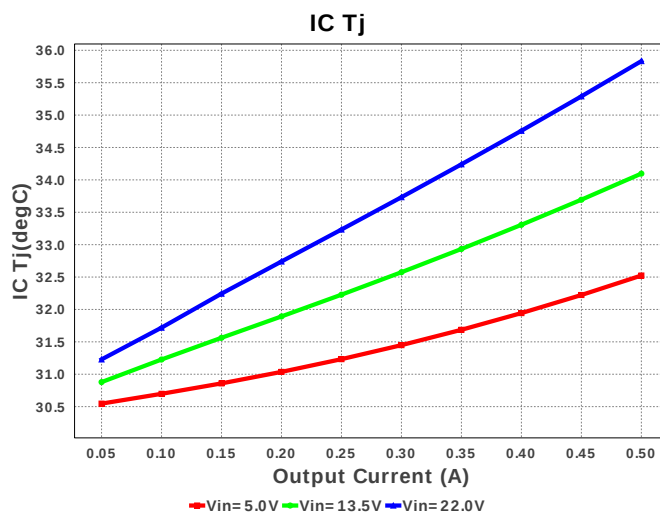
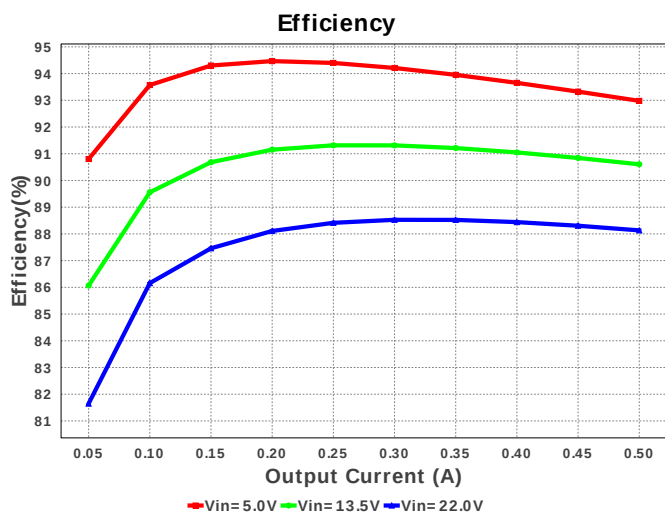


Electrical BOM

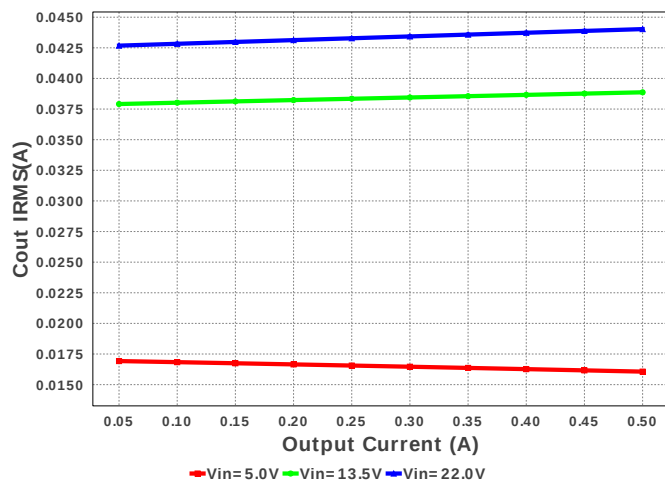
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	Kemet	C0805C104K5RACTU Series= X7R	Cap= 100.0 nF ESR= 64.0 mOhm VDC= 50.0 V IRMS= 1.64 A	1	\$0.01	 0805 7 mm ²
2.	Ccomp	MuRata	GRM155R61A184KE19D Series= X5R	Cap= 180.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.02	 0402 3 mm ²
3.	Ccomp2	MuRata	GRM2165C1H302JA01D Series= C0G/NP0	Cap= 3.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.04	 0805 7 mm ²
4.	Cin	MuRata	GRM31CR71E106KA12L Series= X7R	Cap= 10.0 uF ESR= 4.366 mOhm VDC= 25.0 V IRMS= 2.8022 A	1	\$0.05	 1206_190 11 mm ²
5.	Cinx	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 mm ²
6.	Cout	MuRata	GRM31CC80J476KE18L Series= X6S	Cap= 47.0 uF ESR= 3.735 mOhm VDC= 6.3 V IRMS= 4.0522 A	1	\$0.10	 1206_190 11 mm ²
7.	Css	MuRata	GRM033R61A103KA01D Series= X5R	Cap= 10.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	 0201 2 mm ²
8.	L1	Bourns	SRR6038-560Y	L= 56.0 uH DCR= 200.0 mOhm	1	\$0.26	 SRR6038 77 mm ²
9.	Rcomp	Vishay-Dale	CRCW0402698RFKED Series= CRCW.e3	Res= 698.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
10.	Rfbb	Yageo America	RT0805BRD0732KL Series= ?	Res= 32.0 kOhm Power= 125.0 mW Tolerance= 0.1%	1	\$0.05	 0805 7 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
11.	Rfbt	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
12.	U1	Texas Instruments	TPS54336ADDAR	Switcher	1	\$0.90	

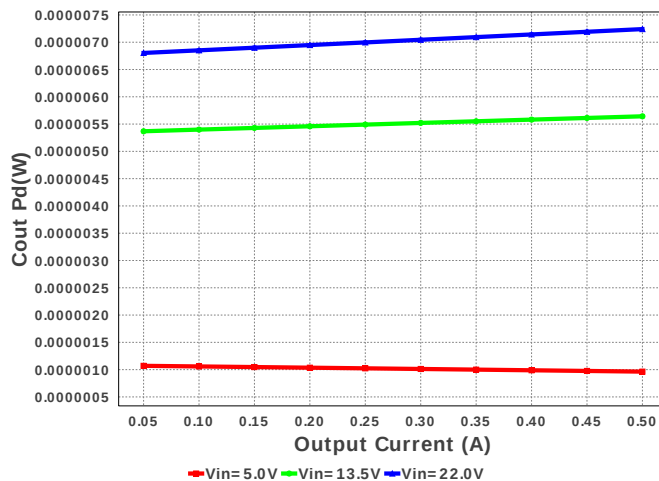
R-PDSO-G8 55 mm²



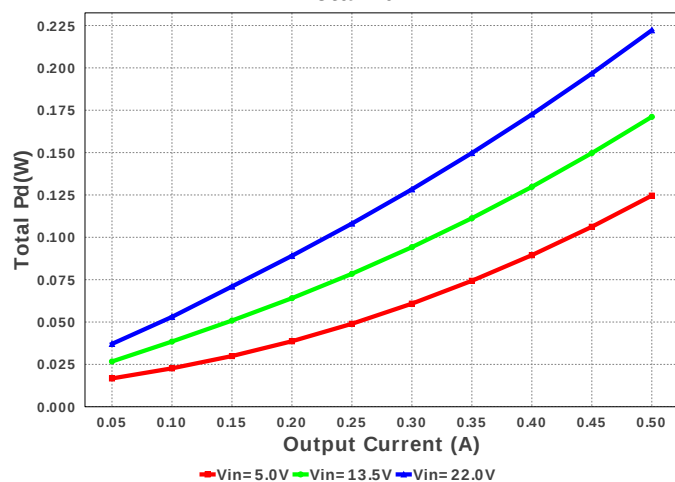
Cout IRMS



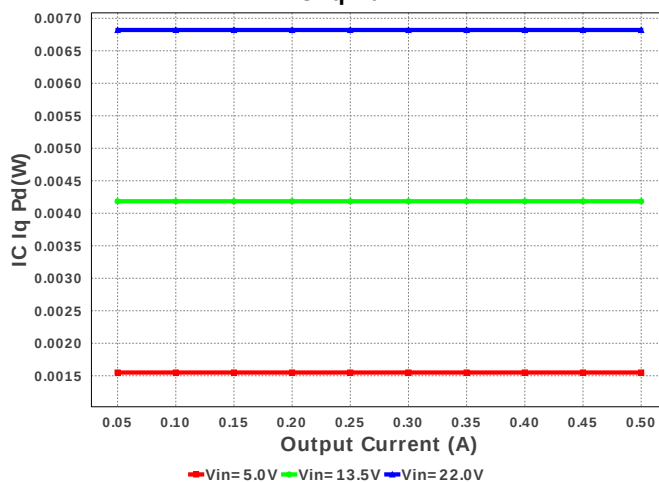
Cout Pd



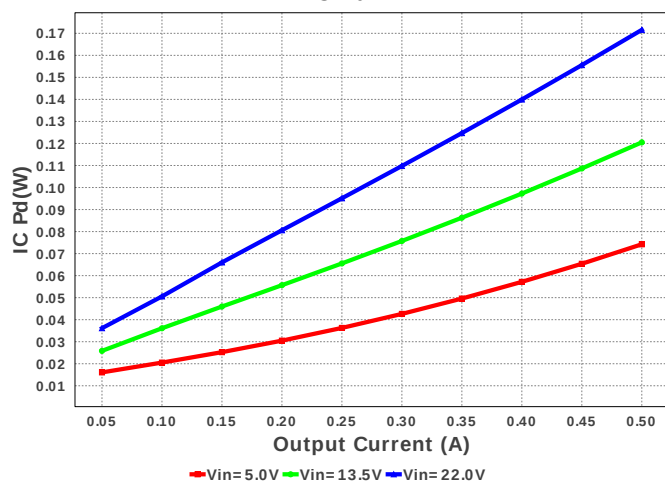
Total Pd



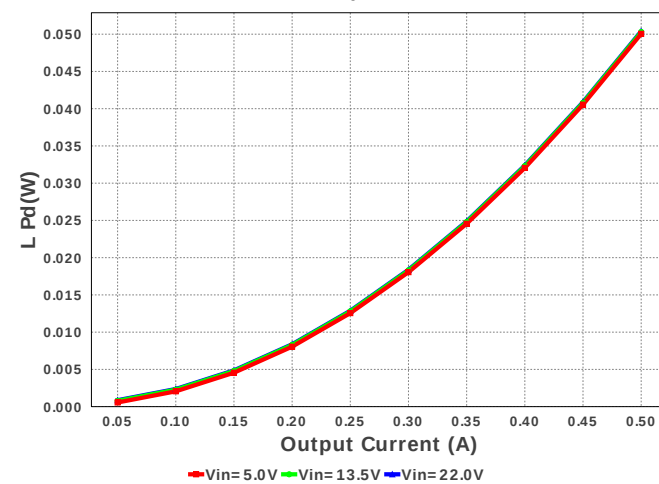
IC Iq Pd

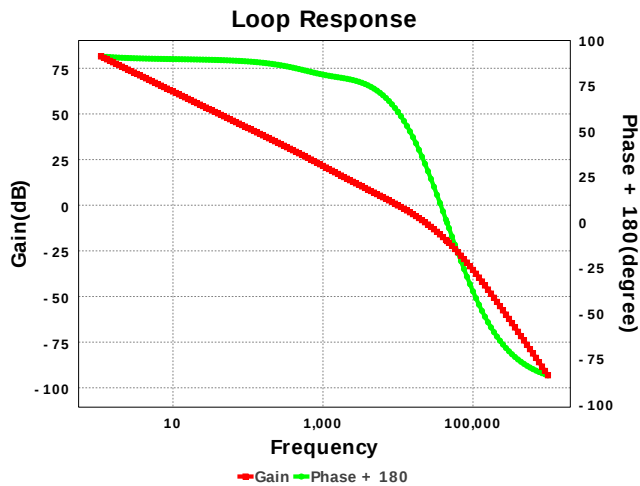


IC Pd



L Pd





Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	182.588 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	44.029 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	85.1 mA	Current	Average input current
4.	L Ipp	152.52 mA	Current	Peak-to-peak inductor ripple current
5.	BOM Count	12	General	Total Design BOM count
6.	FootPrint	193.0 mm ²	General	Total Foot Print Area of BOM components
7.	Frequency	340.0 kHz	General	Switching frequency
8.	IC Tolerance	12.0 mV	General	IC Feedback Tolerance
9.	Mode	CCM	General	Conduction Mode
10.	Pout	1.65 W	General	Total output power
11.	Total BOM	\$1.47	General	Total BOM Cost
12.	ICThetaJA Effective	34.0 degC/W	Op_Point	Effective IC Junction-to-Ambient Thermal Resistance
13.	Low Freq Gain	81.491 dB	Op_Point	Gain at 10Hz
14.	Vout Actual	3.3 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
15.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
16.	Cross Freq	9.959 kHz	Op_point	Bode plot crossover frequency
17.	Duty Cycle	15.669 %	Op_point	Duty cycle
18.	Efficiency	88.132 %	Op_point	Steady state efficiency
19.	Gain Marg	-19.626 dB	Op_point	Bode Plot Gain Margin
20.	IC Tj	35.833 degC	Op_point	IC junction temperature
21.	IOUT_OP	500.0 mA	Op_point	Iout operating point
22.	Phase Marg	61.063 deg	Op_point	Bode Plot Phase Margin
23.	VIN_OP	22.0 V	Op_point	Vin operating point
24.	Vout p-p	1.509 mV	Op_point	Peak-to-peak output ripple voltage
25.	Cin Pd	145.555 μ W	Power	Input capacitor power dissipation
26.	Cout Pd	7.24 μ W	Power	Output capacitor power dissipation
27.	IC Iq Pd	6.82 mW	Power	IC Iq Pd
28.	IC Pd	171.571 mW	Power	IC power dissipation
29.	L Pd	50.388 mW	Power	Inductor power dissipation
30.	Total Pd	222.193 mW	Power	Total Power Dissipation
31.	Vout Tolerance	2.347 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	500.0 m	Maximum Output Current
2.	VinMax	22.0	Maximum input voltage
3.	VinMin	5.0	Minimum input voltage
4.	Vout	3.3	Output Voltage
5.	base_pn	TPS54336A	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS54336A** Product Folder : <http://www.ti.com/product/TPS54336A> : contains the data sheet and other resources.

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