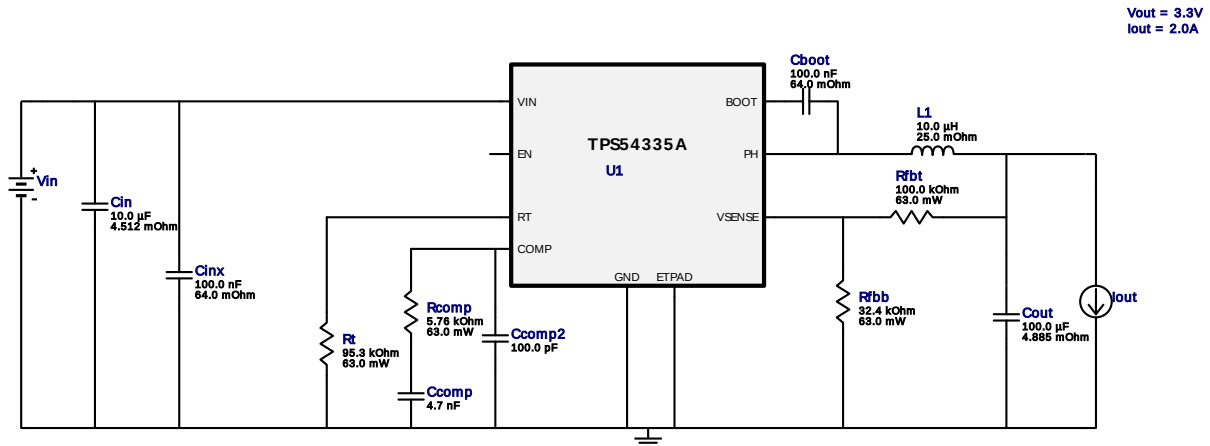


WEBENCH® Design Report

Design : 4748534/1 TPS54335ADDAR
TPS54335ADDAR 6.0V-22.0V to 3.30V @ 2.0A


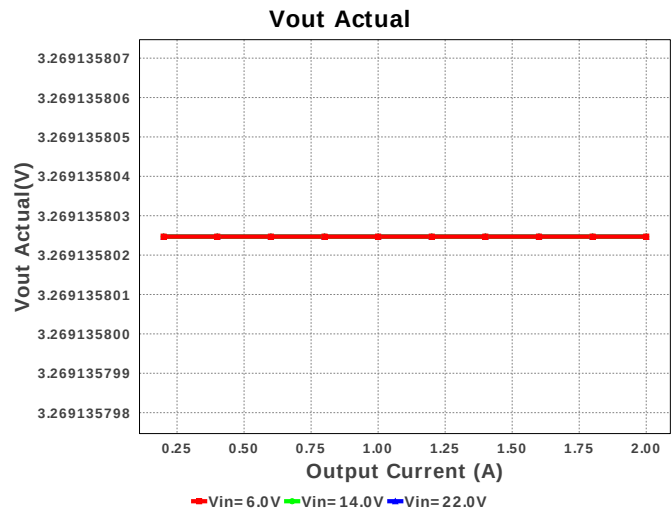
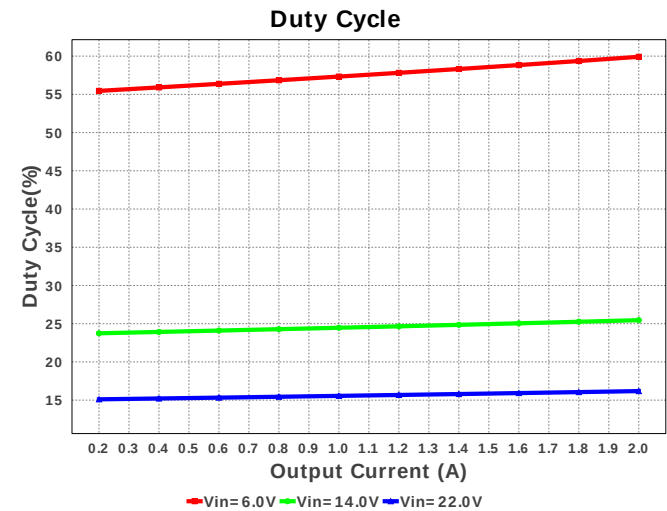
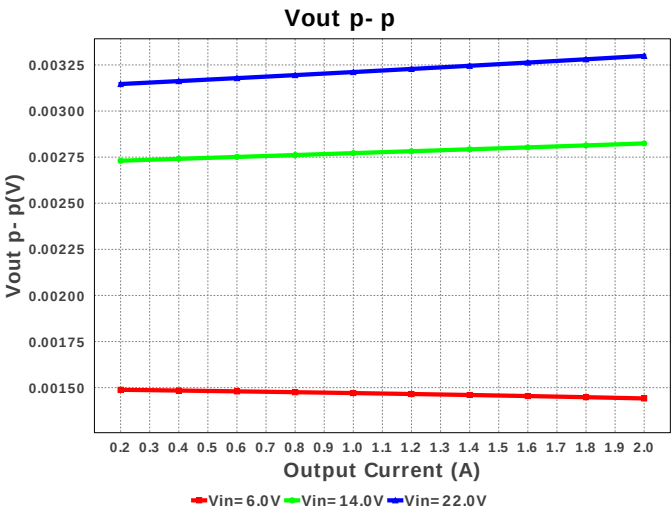
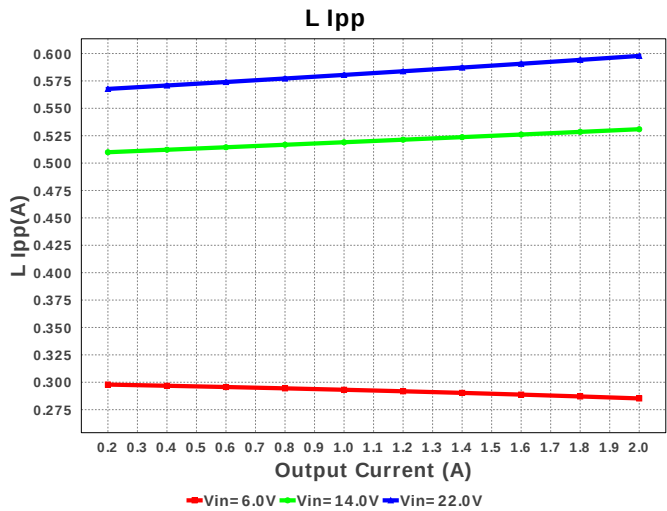
Electrical BOM

#	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	Yageo America	CC0805KRX7R9BB472 Series= X7R	Cap= 4.7 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
3.	Ccomp2	Yageo America	CC0805JRNPO9BN101 Series= C0G/NP0	Cap= 100.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
4.	Cin	MuRata	GRM31CR61E106KA12L Series= X5R	Cap= 10.0 uF ESR= 4.512 mOhm VDC= 25.0 V IRMS= 2.447 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	GRM31CR60J107ME39L Series= X5R	Cap= 100.0 uF ESR= 4.885 mOhm VDC= 6.3 V IRMS= 4.4118 A	1	\$0.14	1206_190 11 mm ²
7.	L1	Bourns	SRU1038-100Y	L= 10.0 uH DCR= 25.0 mOhm	1	\$0.33	SRU1038 144 mm ²
8.	Rcomp	Vishay-Dale	CRCW04025K76FKED Series= CRCW..e3	Res= 5.76 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
9.	Rfbb	Vishay-Dale	CRCW040232K4FKED Series= CRCW..e3	Res= 32.4 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
10.	Rfht	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

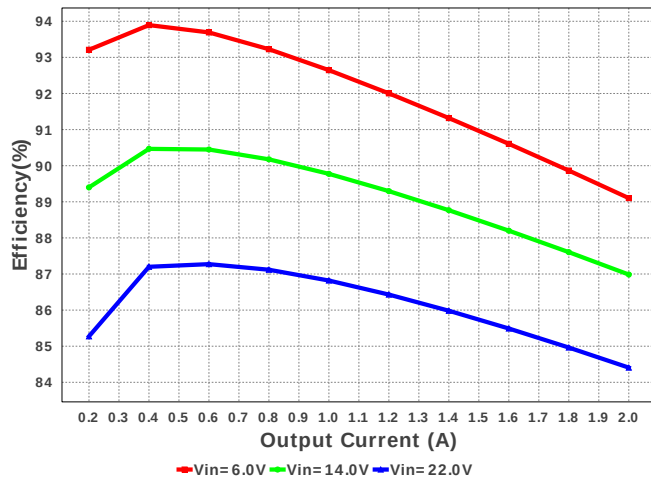
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
11.	Rt	Vishay-Dale	CRCW040295K3FKED Series= CRCW..e3	Res= 95.3 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
12.	U1	Texas Instruments	TPS54335ADDAR	Switcher	1	\$0.90	



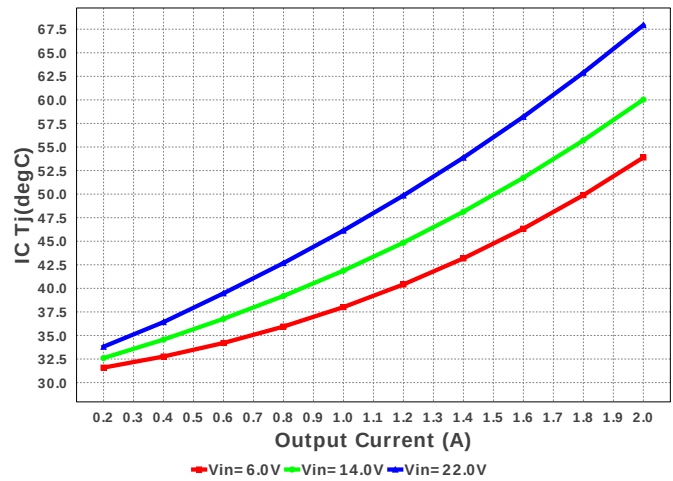
R-PDSO-G8 57 mm²



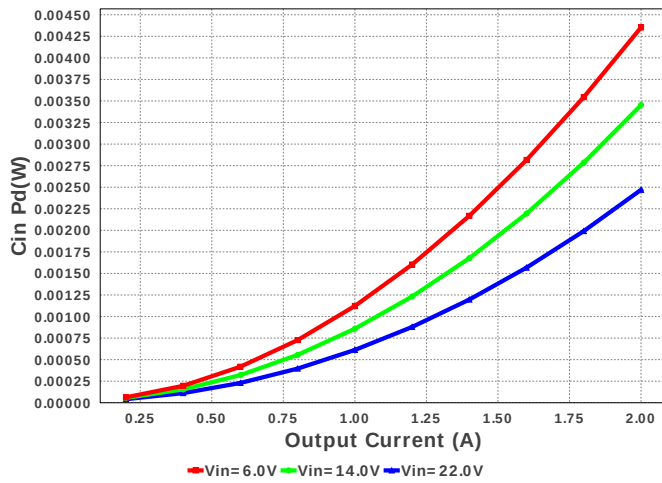
Efficiency



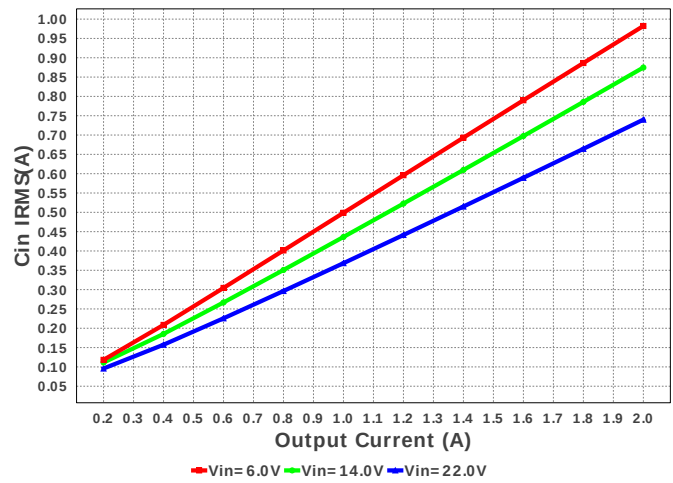
IC Tj



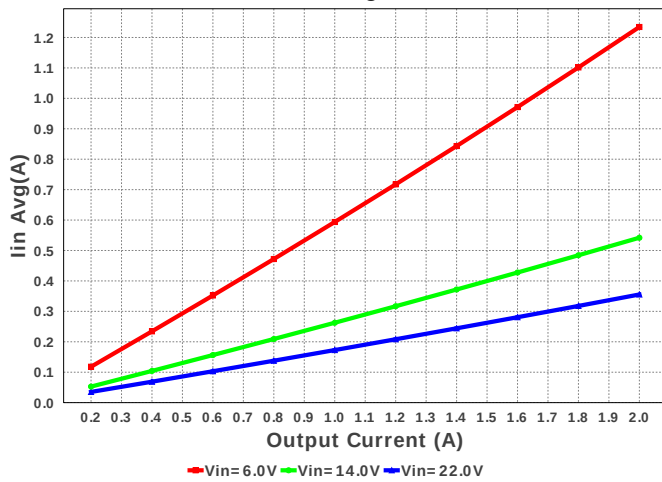
Cin Pd



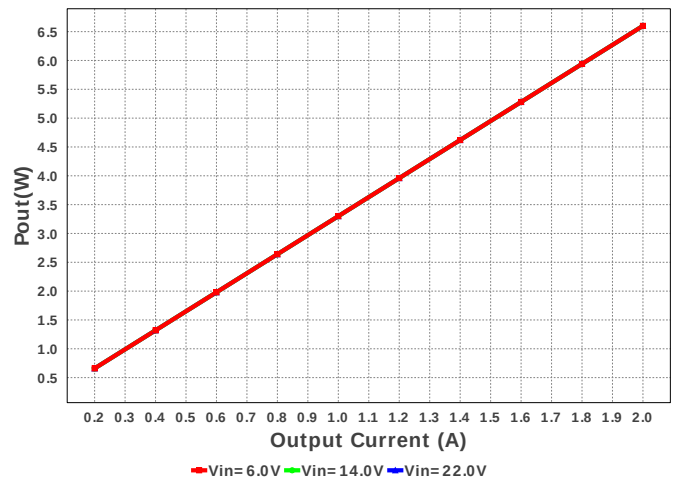
Cin IRMS

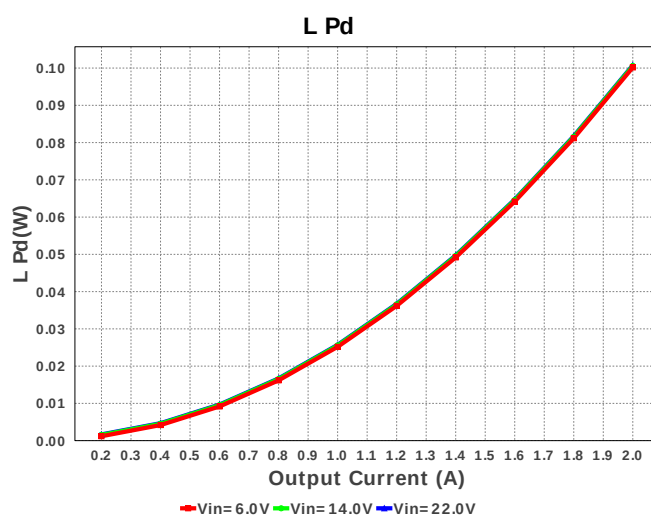
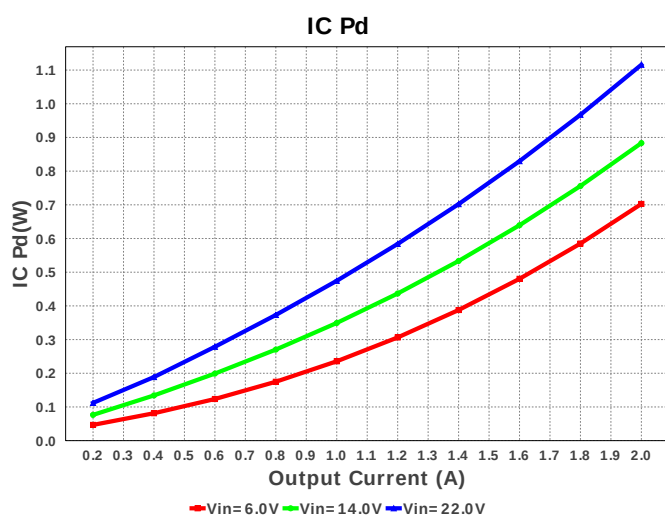
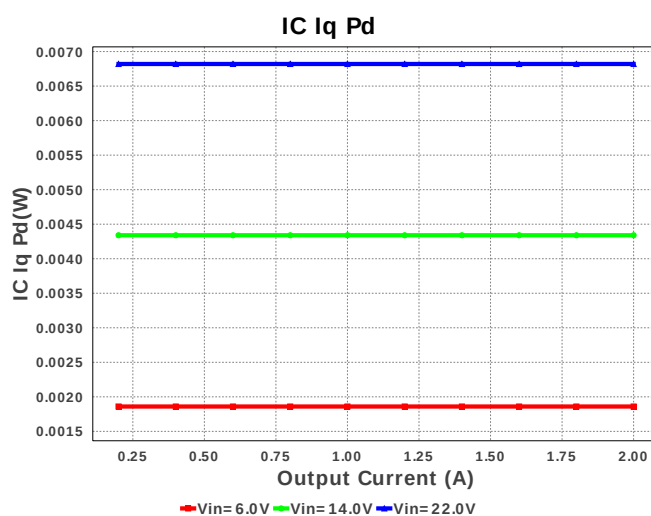
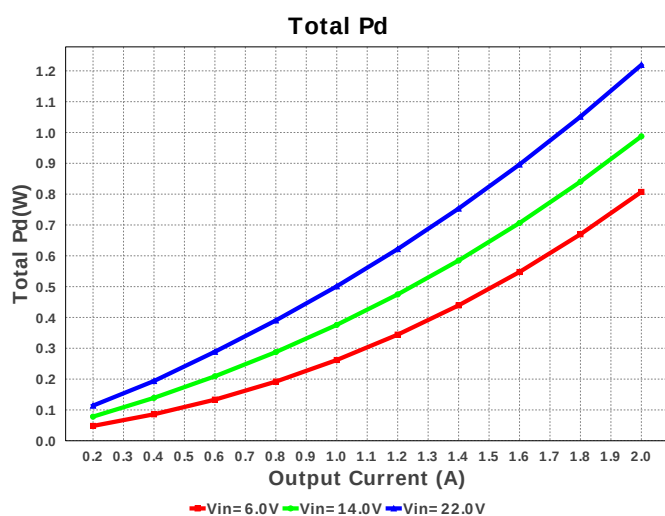
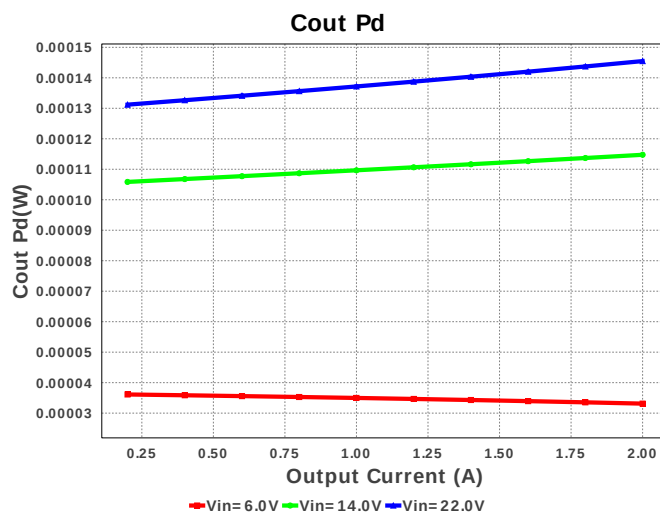
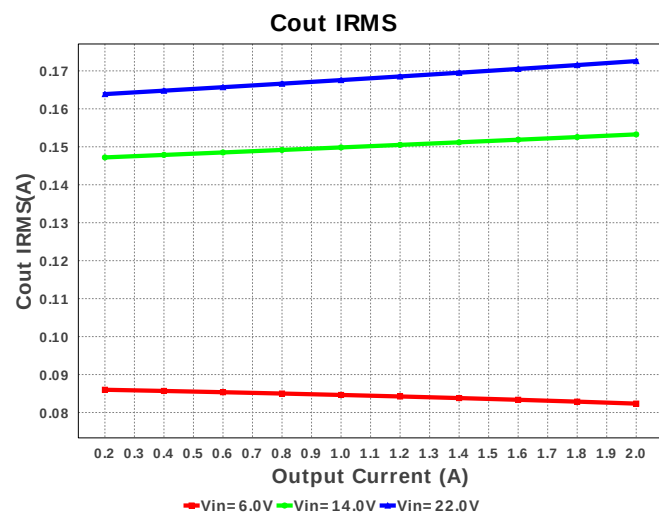


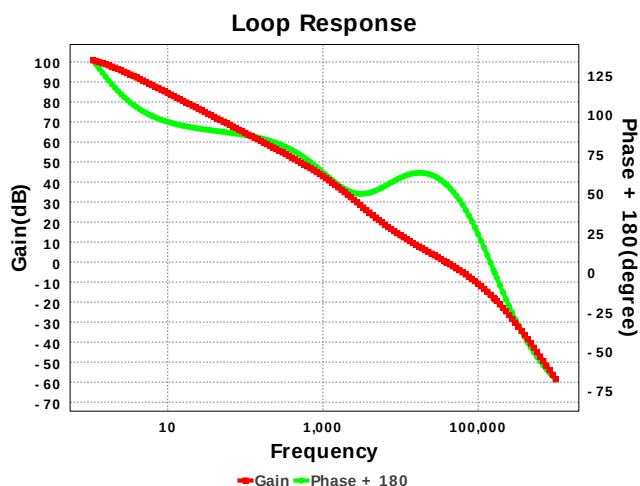
Iin Avg



Pout







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	739.877 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	172.573 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	355.42 mA	Current	Average input current
4.	L Ipp	597.81 mA	Current	Peak-to-peak inductor ripple current
5.	BOM Count	12	General	Total Design BOM count
6.	FootPrint	262.0 mm ²	General	Total Foot Print Area of BOM components
7.	Frequency	496.814 kHz	General	Switching frequency
8.	IC Tolerance	12.0 mV	General	IC Feedback Tolerance
9.	Pout	6.6 W	General	Total output power
10.	Total BOM	\$1.5	General	Total BOM Cost
11.	ICThetaJA Effective	34.0 degC/W	Op_Point	Effective IC Junction-to-Ambient Thermal Resistance
12.	Low Freq Gain	100.743 dB	Op_Point	Gain at 10Hz
13.	Vout Actual	3.269 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
14.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
15.	Cross Freq	38.81 kHz	Op_point	Bode plot crossover frequency
16.	Duty Cycle	16.184 %	Op_point	Duty cycle
17.	Efficiency	84.407 %	Op_point	Steady state efficiency
18.	Gain Marg	-18.499 dB	Op_point	Bode Plot Gain Margin
19.	IC Tj	67.937 degC	Op_point	IC junction temperature
20.	IOUT_OP	2.0 A	Op_point	Iout operating point
21.	Phase Marg	56.318 deg	Op_point	Bode Plot Phase Margin
22.	VIN_OP	22.0 V	Op_point	Vin operating point
23.	Vout p-p	3.299 mV	Op_point	Peak-to-peak output ripple voltage
24.	Cin Pd	2.47 mW	Power	Input capacitor power dissipation
25.	Cout Pd	145.482 μ W	Power	Output capacitor power dissipation
26.	IC Iq Pd	6.82 mW	Power	IC Iq Pd
27.	IC Pd	1.116 W	Power	IC power dissipation
28.	L Pd	100.745 mW	Power	Inductor power dissipation
29.	Total Pd	1.219 W	Power	Total Power Dissipation
30.	Vout Tolerance	3.049 %		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	6.0	Minimum input voltage
4.	Vout	3.3	Output Voltage
5.	base_pn	TPS54335A	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS54335A** Product Folder : <http://www.ti.com/product/TPS54335A> : contains the data sheet and other resources.

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