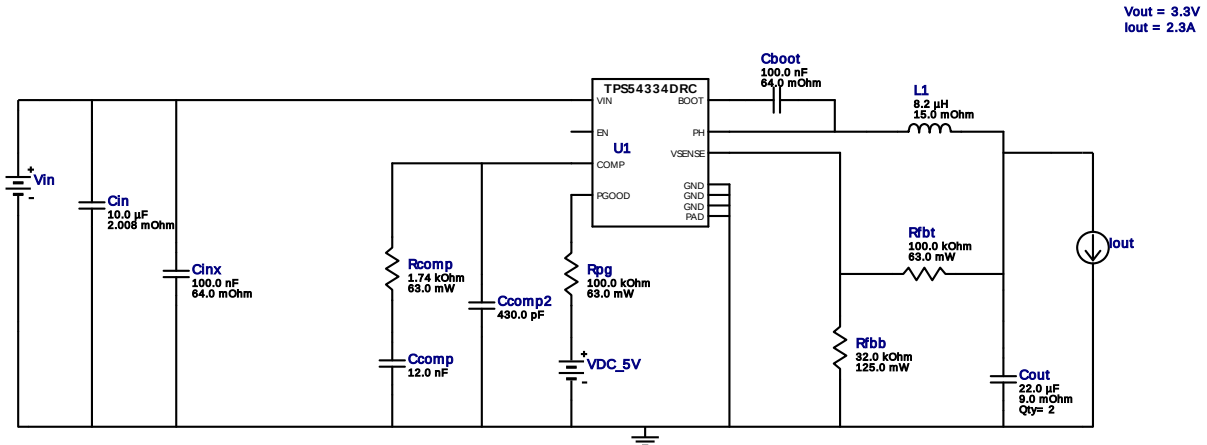


WEBENCH® Design Report

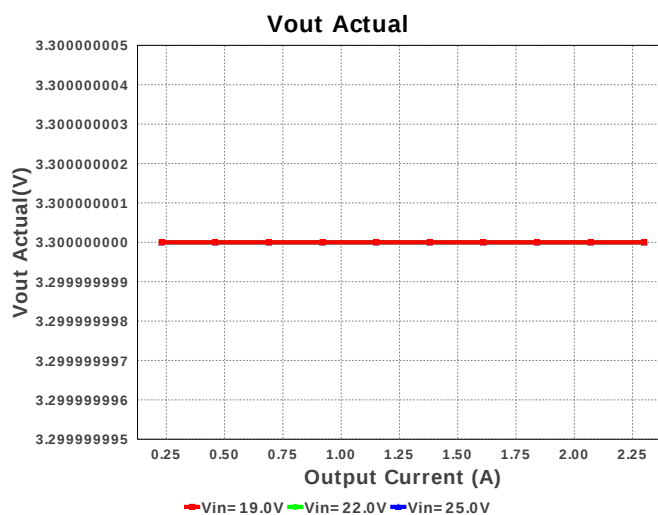
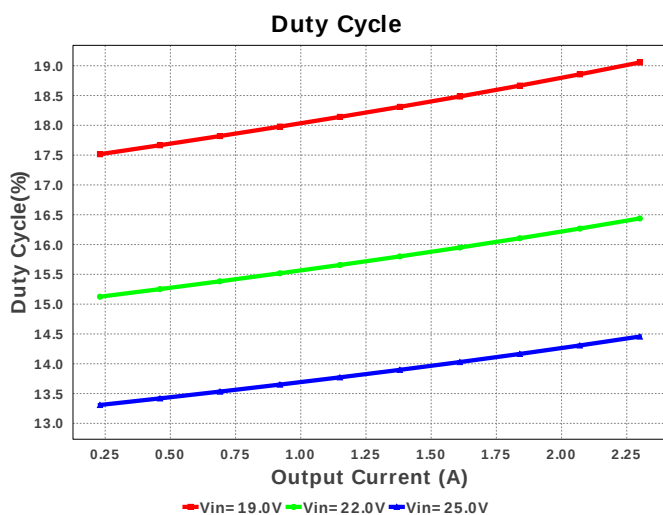
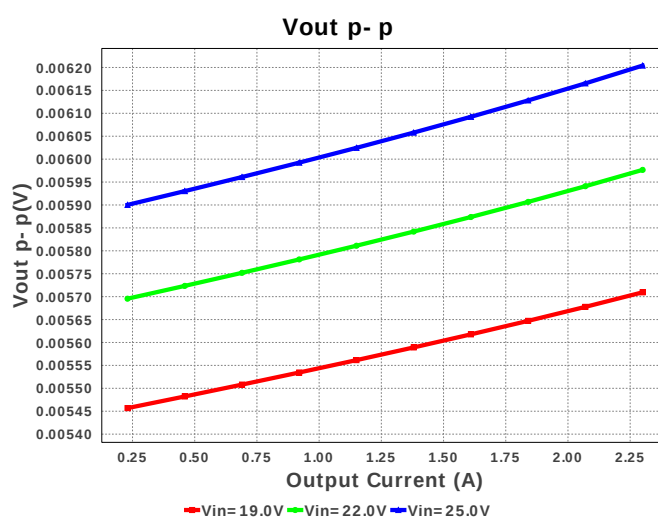
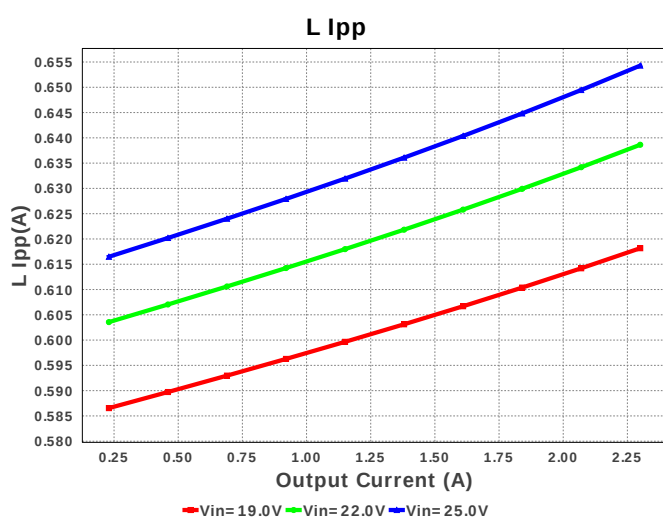
Design : 4774498/7 TPS54334DRCR
TPS54334DRCR 19.0V-25.0V to 3.30V @ 2.3A

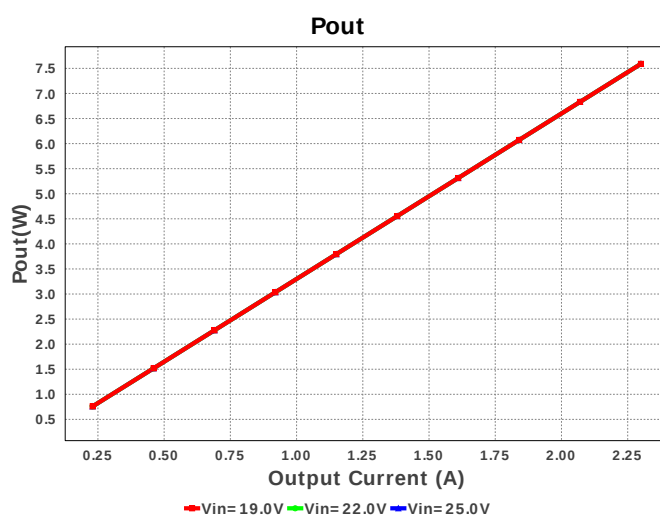
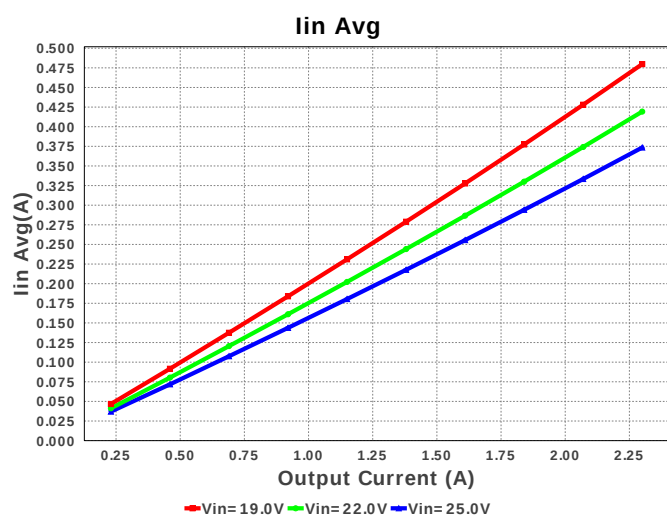
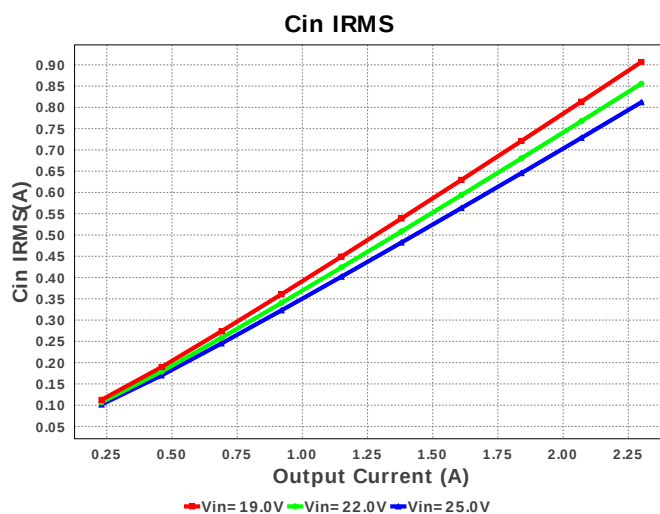
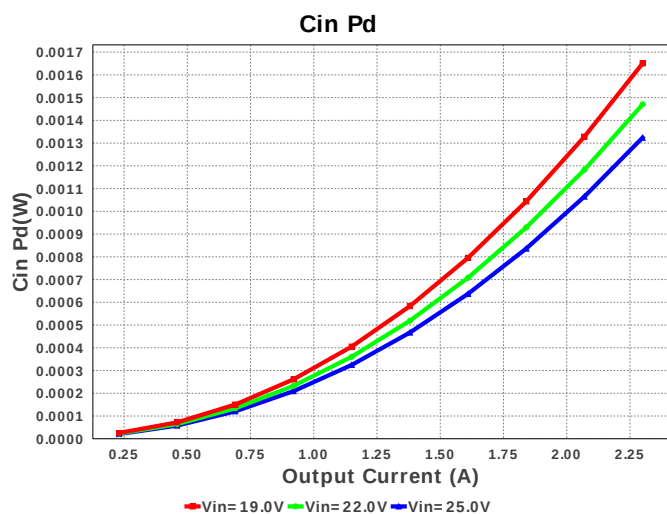
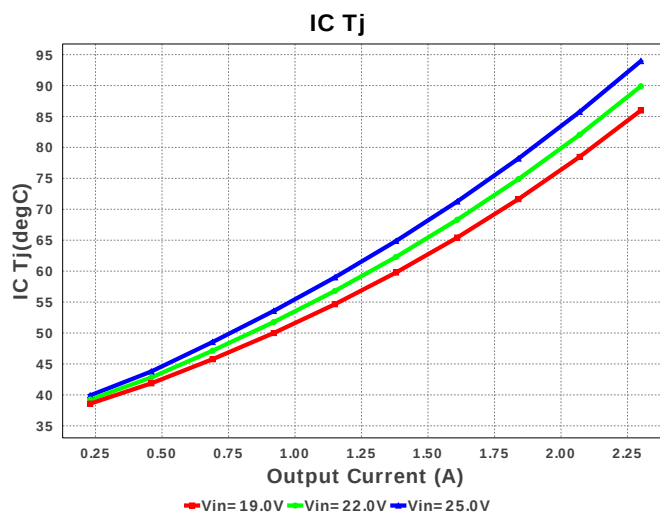
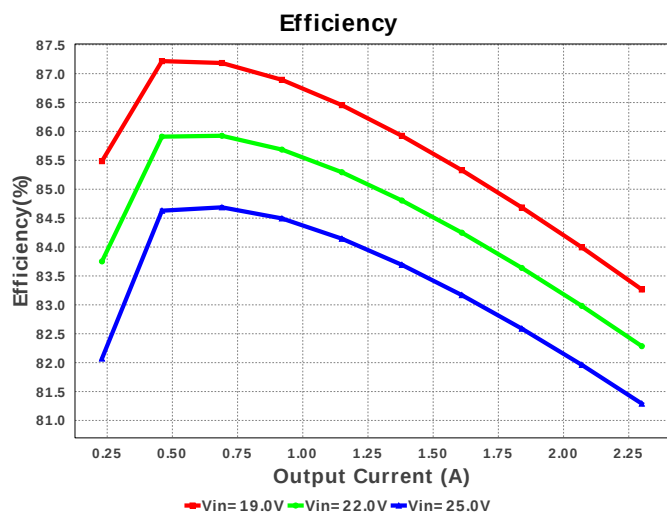


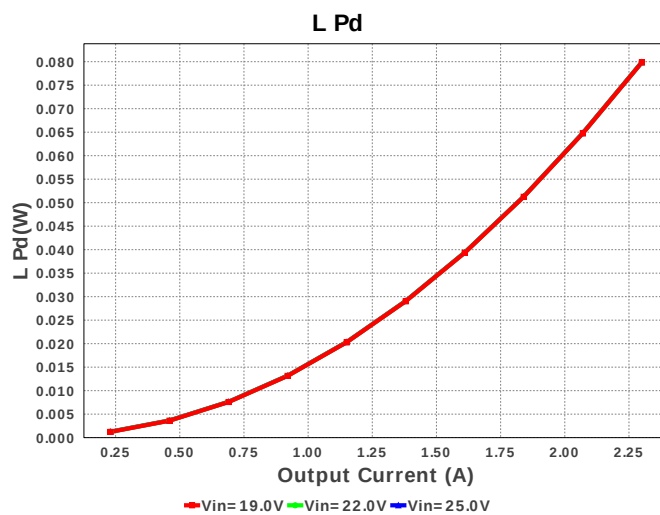
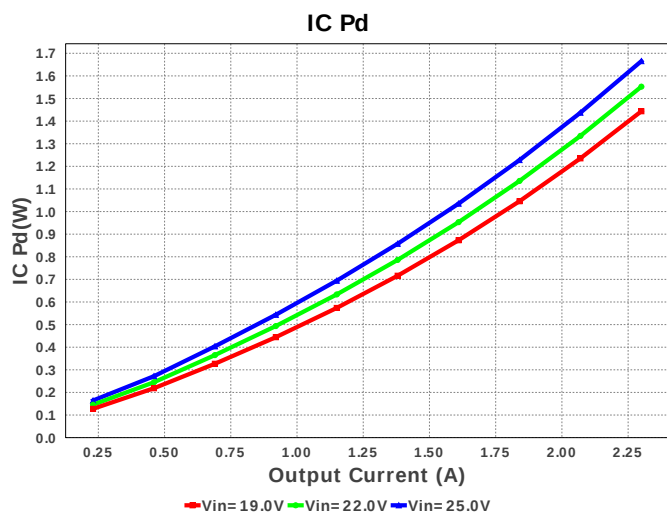
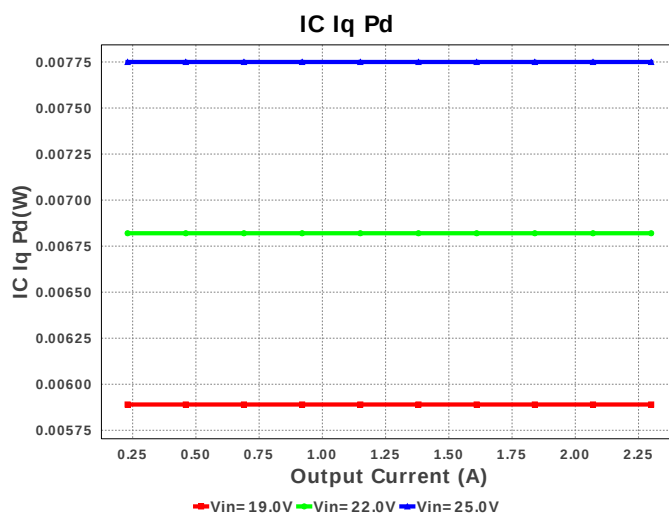
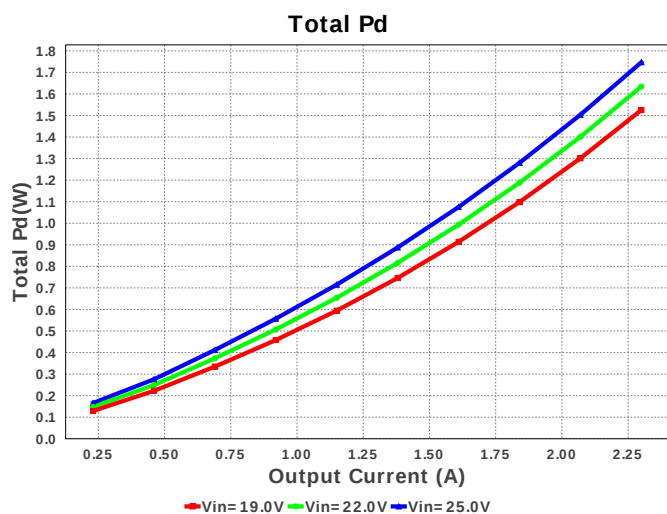
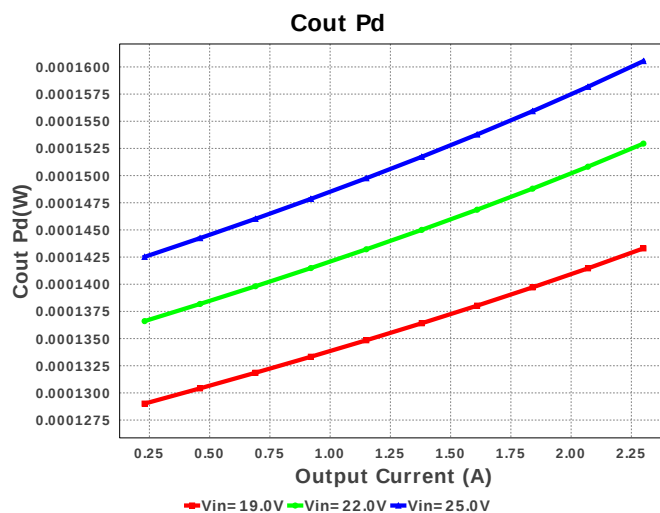
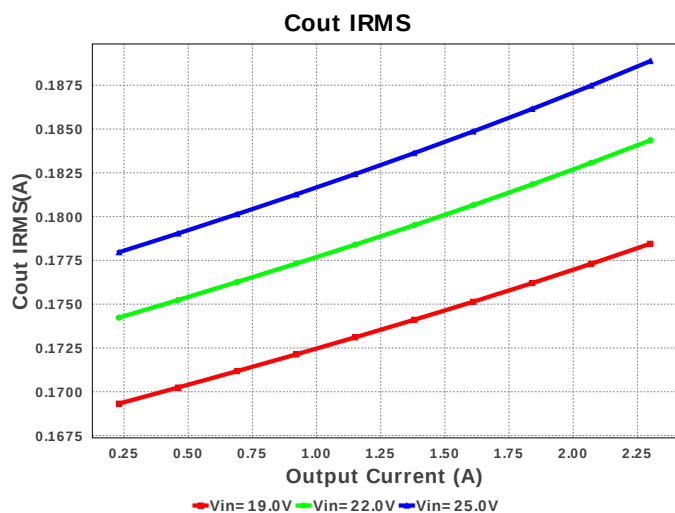
Electrical BOM

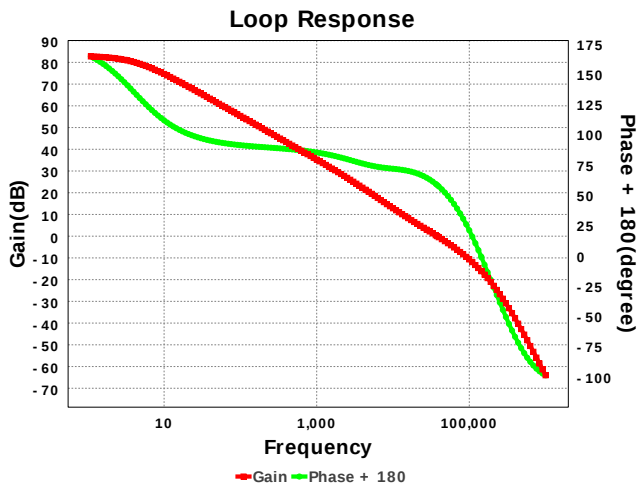
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	Kemet	C0805C104K5RACTU Series= X7R	Cap= 100.0 nF ESR= 64.0 mOhm VDC= 50.0 V IRMS= 1.64 A	1	\$0.01	0805 7 mm ²
2.	Ccomp	MuRata	GRM033C80J123KE01D Series= X6S	Cap= 12.0 nF VDC= 6.3 V IRMS= 0.0 A	1	\$0.01	0201 2 mm ²
3.	Ccomp2	MuRata	GRM1555C1E431JA01D Series= C0G/NP0	Cap= 430.0 pF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
4.	Cin	MuRata	GRM32ER7YA106KA12L Series= X7R	Cap= 10.0 uF ESR= 2.008 mOhm VDC= 35.0 V IRMS= 4.6772 A	1	\$0.22	1210_280 15 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	GRM21BR60J226ME39L Series= X5R	Cap= 22.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 3.5 A	2	\$0.04	0805 7 mm ²
7.	L1	Bourns	SRU1048-8R2Y	L= 8.2 uH DCR= 15.0 mOhm	1	\$0.33	SRU1048 144 mm ²
8.	Rcomp	Vishay-Dale	CRCW04021K74FKED Series= CRCW..e3	Res= 1.74 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
9.	Rfbb	Yageo America	RT0805BRD0732KL Series= ?	Res= 32.0 kOhm Power= 125.0 mW Tolerance= 0.1%	1	\$0.05	0805 7 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.	Rpg	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	TPS54334DRCR	Switcher	1	\$0.95	 DRC0010J 16 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	812.003 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	188.878 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	373.47 mA	Current	Average input current
4.	L Ipp	654.29 mA	Current	Peak-to-peak inductor ripple current
5.	BOM Count	13	General	Total Design BOM count
6.	FootPrint	223.0 mm ²	General	Total Foot Print Area of BOM components
7.	Frequency	570.0 kHz	General	Switching frequency
8.	IC Tolerance	10.0 mV	General	IC Feedback Tolerance
9.	Mode	CCM	General	Conduction Mode
10.	Pout	7.59 W	General	Total output power
11.	Total BOM	\$1.7	General	Total BOM Cost
12.	ICThetaJA Effective	36.0 degC/W	Op_Point	Effective IC Junction-to-Ambient Thermal Resistance
13.	Low Freq Gain	82.732 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	37.88 kHz	Op_point	Bode plot crossover frequency
17.	Duty Cycle	14.456 %	Op_point	Duty cycle
18.	Efficiency	81.291 %	Op_point	Steady state efficiency
19.	Gain Marg	-15.971 dB	Op_point	Bode Plot Gain Margin
20.	IC Tj	93.953 degC	Op_point	IC junction temperature
21.	IOUT_OP	2.3 A	Op_point	Iout operating point
22.	Phase Marg	59.029 deg	Op_point	Bode Plot Phase Margin
23.	VIN_OP	25.0 V	Op_point	Vin operating point
24.	Vout p-p	6.204 mV	Op_point	Peak-to-peak output ripple voltage
25.	Cin Pd	1.324 mW	Power	Input capacitor power dissipation
26.	Cout Pd	160.537 μ W	Power	Output capacitor power dissipation
27.	IC Iq Pd	7.75 mW	Power	IC Iq Pd
28.	IC Pd	1.665 W	Power	IC power dissipation
29.	L Pd	79.885 mW	Power	Inductor power dissipation
30.	Total Pd	1.747 W	Power	Total Power Dissipation
31.	Vout Tolerance	2.095 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	2.3	Maximum Output Current
2.	VinMax	25.0	Maximum input voltage
3.	VinMin	19.0	Minimum input voltage
4.	Vout	3.3	Output Voltage
5.	base_pn	TPS54334	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	34.0	Ambient temperature

Design Assistance

1. **TPS54334** Product Folder : <http://www.ti.com/product/TPS54334> : contains the data sheet and other resources.

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