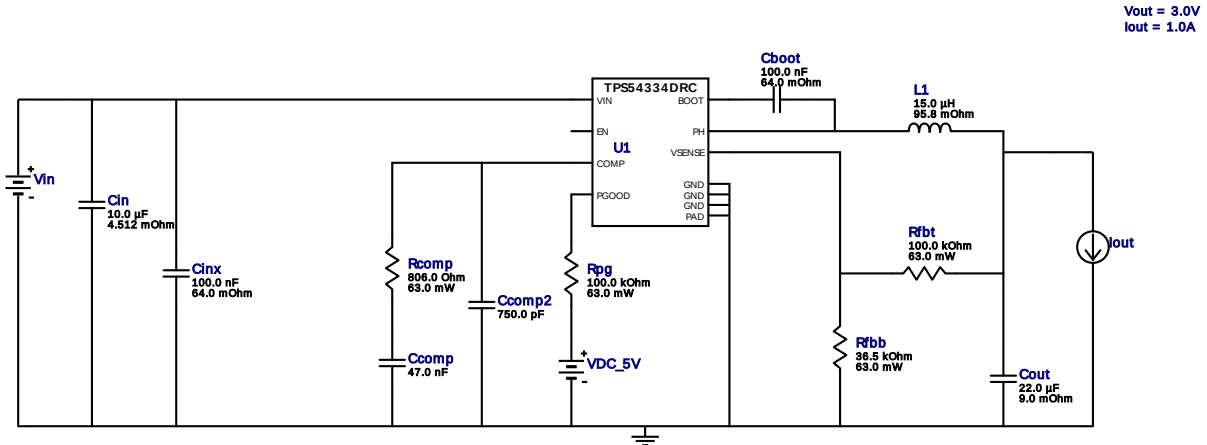


WEBENCH® Design Report

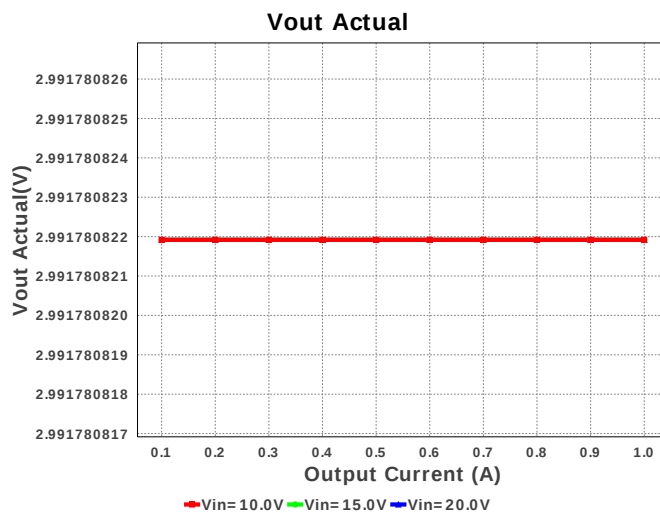
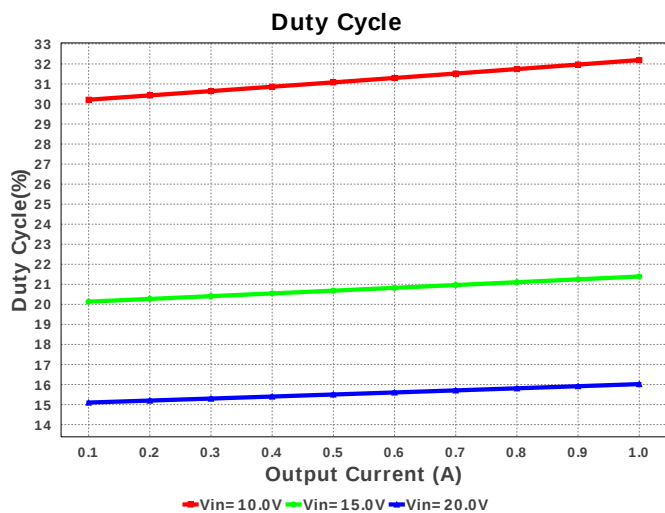
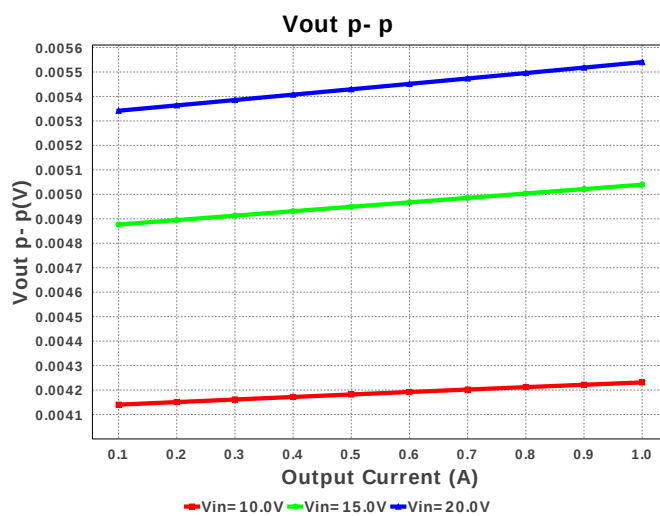
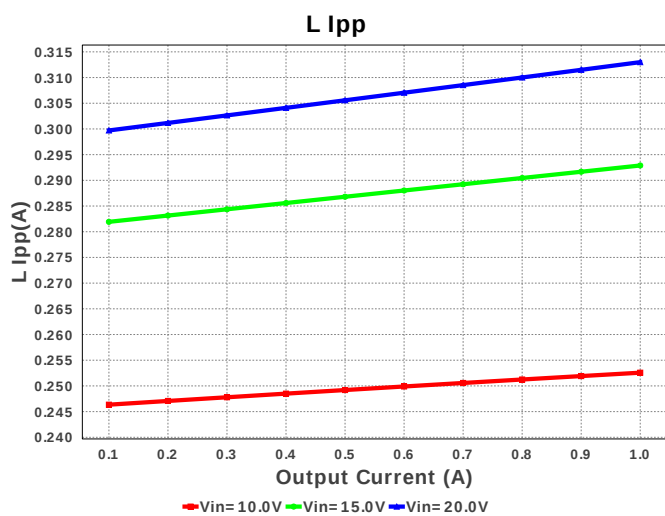
Design : 4728729/3 TPS54334DRCR
TPS54334DRCR 10.0V-20.0V to 3.00V @ 1.0A

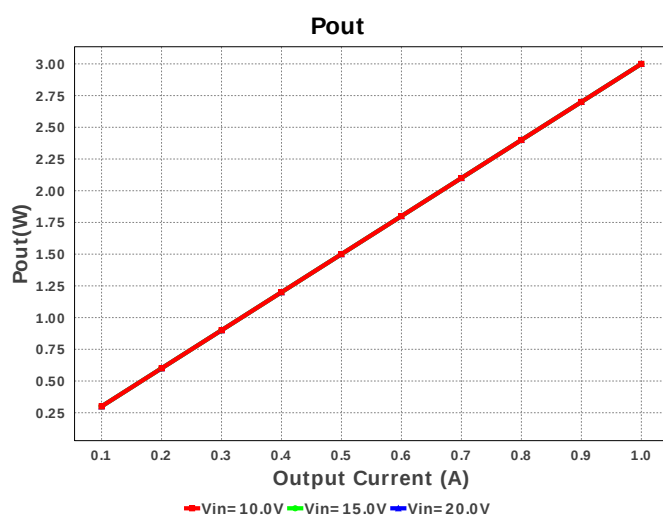
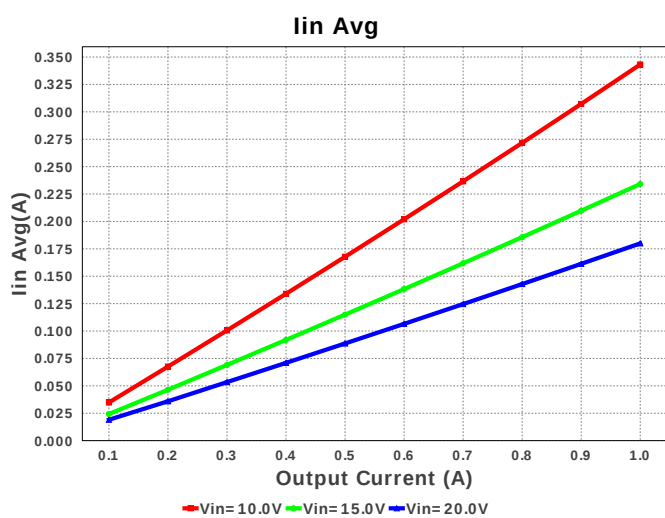
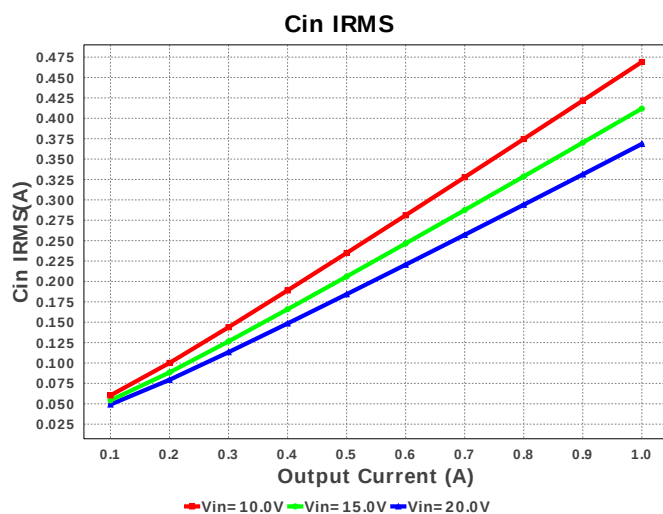
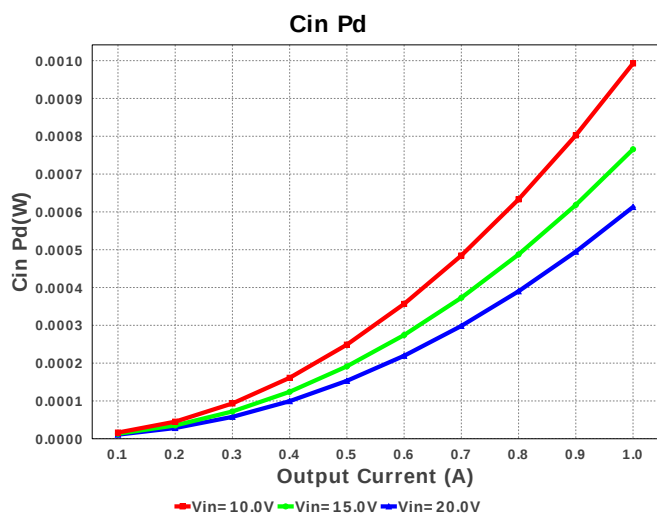
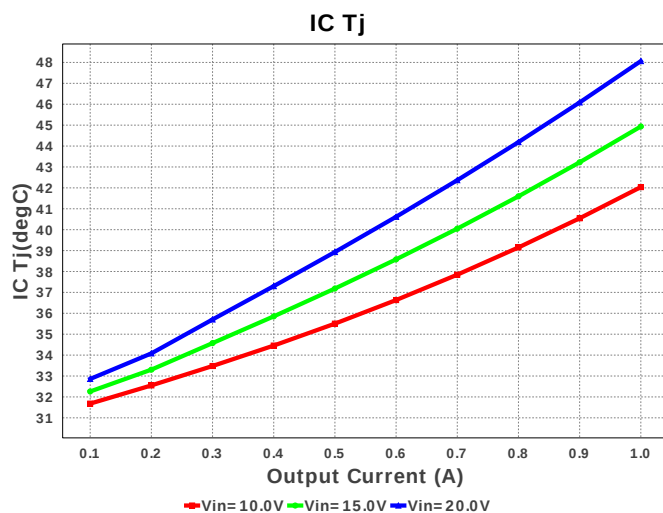
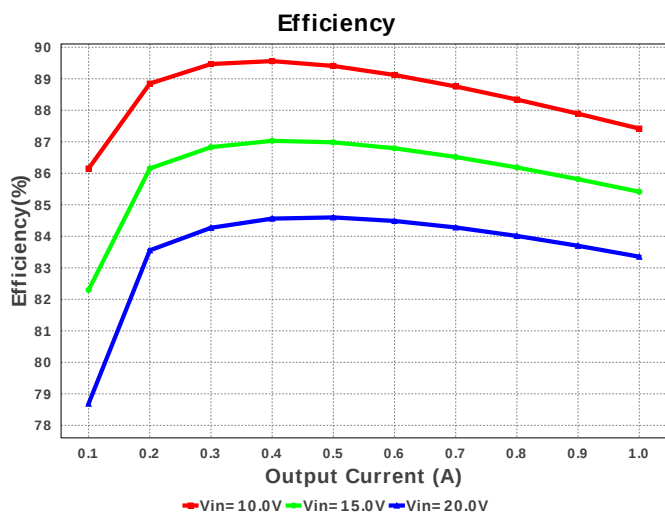


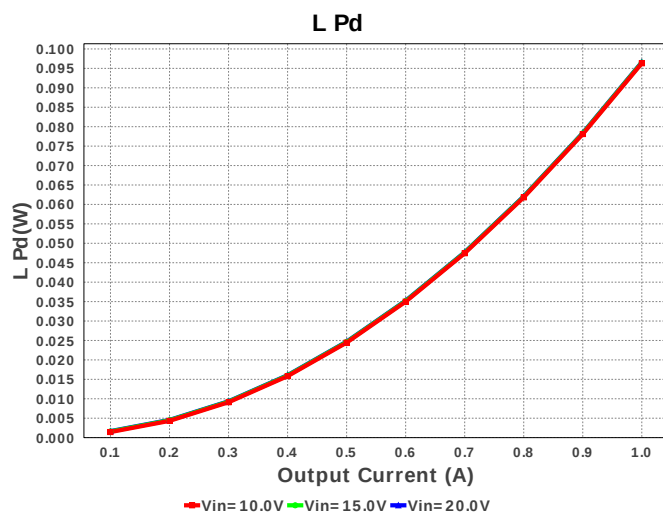
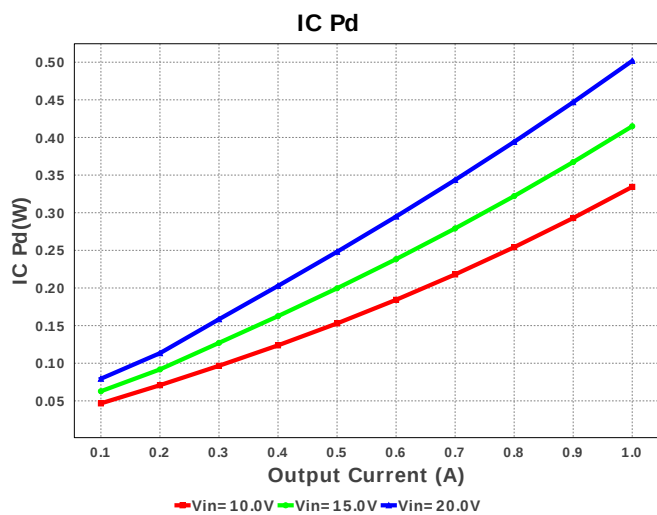
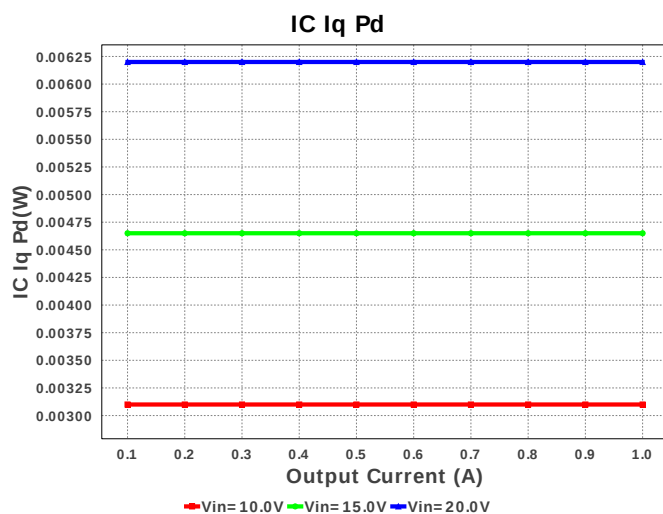
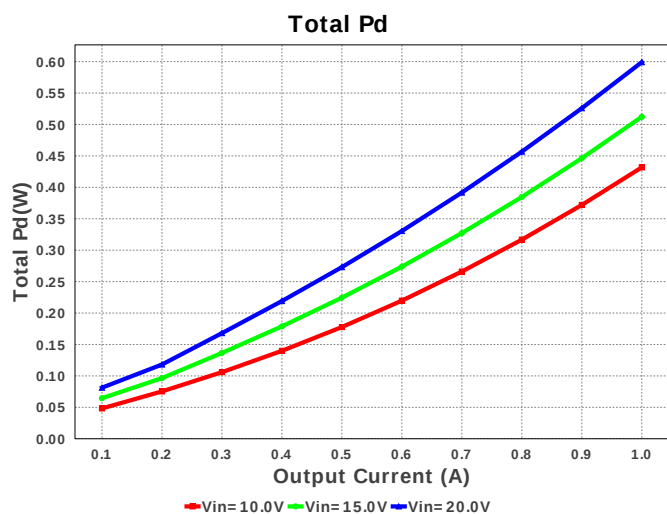
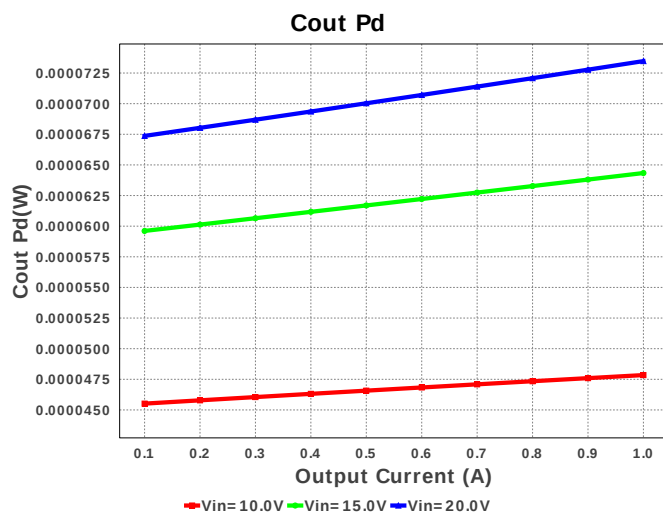
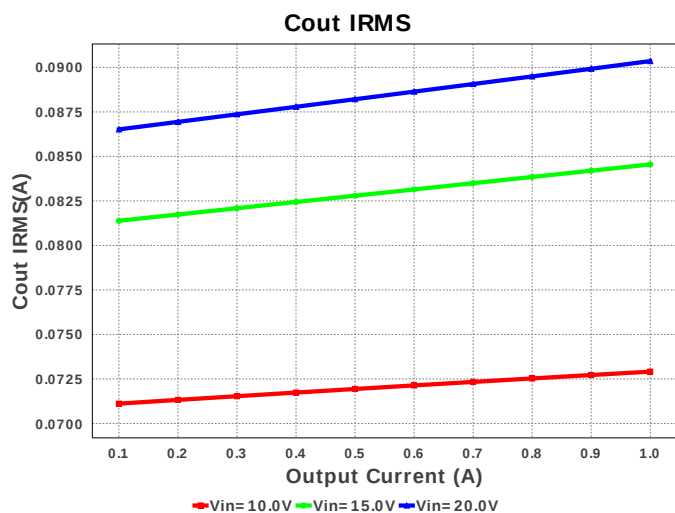
Electrical BOM

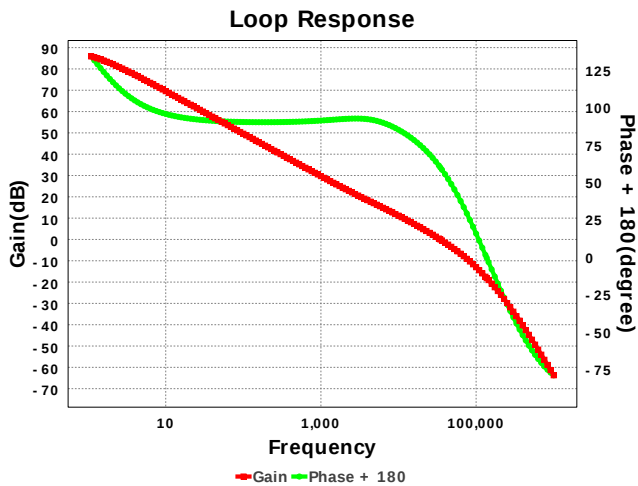
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	Kemet	C0805C104K5RACTU Series= X7R	Cap= 100.0 nF ESR= 64.0 mOhm VDC= 50.0 V IRMS= 1.64 A	1	\$0.01	0805 7 mm ²
2.	Ccomp	Taiyo Yuden	TMK212B7473KD-T Series= X7R	Cap= 47.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
3.	Ccomp2	Samsung Electro-Mechanics	CL21C751JBCNNNC Series= C0G/NP0	Cap= 750.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.03	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	GRM21BR60J226ME39L Series= X5R	Cap= 22.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 3.5 A	1	\$0.04	0805 7 mm ²
7.	L1	Bourns	SRN6045-150M	L= 15.0 uH DCR= 95.8 mOhm	1	\$0.16	SRN6045 64 mm ²
8.	Rcomp	Vishay-Dale	CRCW0402806RFKED Series= CRCW..e3	Res= 806.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
9.	Rfbb	Vishay-Dale	CRCW040236K5FKED Series= CRCW..e3	Res= 36.5 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
10.	Rfbb	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	368.569 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	90.354 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	179.96 mA	Current	Average input current
4.	L Ipp	312.99 mA	Current	Peak-to-peak inductor ripple current
5.	BOM Count	12	General	Total Design BOM count
6.	FootPrint	137.0 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.	Pout	3.0 W	General	Total output power
10.	Total BOM	\$1.3	General	Total BOM Cost
11.	ICThetaJA Effective	36.0 degC/W	Op_Point	Effective IC Junction-to-Ambient Thermal Resistance
12.	Low Freq Gain	85.858 dB	Op_Point	Gain at 10Hz
13.	Vout Actual	2.992 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
14.	Vout OP	3.0 V	Op_Point	Operational Output Voltage
15.	Cross Freq	34.609 kHz	Op_point	Bode plot crossover frequency
16.	Duty Cycle	16.02 %	Op_point	Duty cycle
17.	Efficiency	83.354 %	Op_point	Steady state efficiency
18.	Gain Marg	-18.128 dB	Op_point	Bode Plot Gain Margin
19.	IC Tj	48.064 degC	Op_point	IC junction temperature
20.	IOUT_OP	1.0 A	Op_point	Iout operating point
21.	Phase Marg	60.379 deg	Op_point	Bode Plot Phase Margin
22.	VIN_OP	20.0 V	Op_point	Vin operating point
23.	Vout p-p	5.54 mV	Op_point	Peak-to-peak output ripple voltage
24.	Cin Pd	612.923 μ W	Power	Input capacitor power dissipation
25.	Cout Pd	73.474 μ W	Power	Output capacitor power dissipation
26.	IC Iq Pd	6.2 mW	Power	IC Iq Pd
27.	IC Pd	501.774 mW	Power	IC power dissipation
28.	L Pd	96.582 mW	Power	Inductor power dissipation
29.	Total Pd	599.123 mW	Power	Total Power Dissipation
30.	Vout Tolerance	2.749 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	1.0	Maximum Output Current
2.	VinMax	20.0	Maximum input voltage
3.	VinMin	10.0	Minimum input voltage
4.	Vout	3.0	Output Voltage
5.	base_pn	TPS54334	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	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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