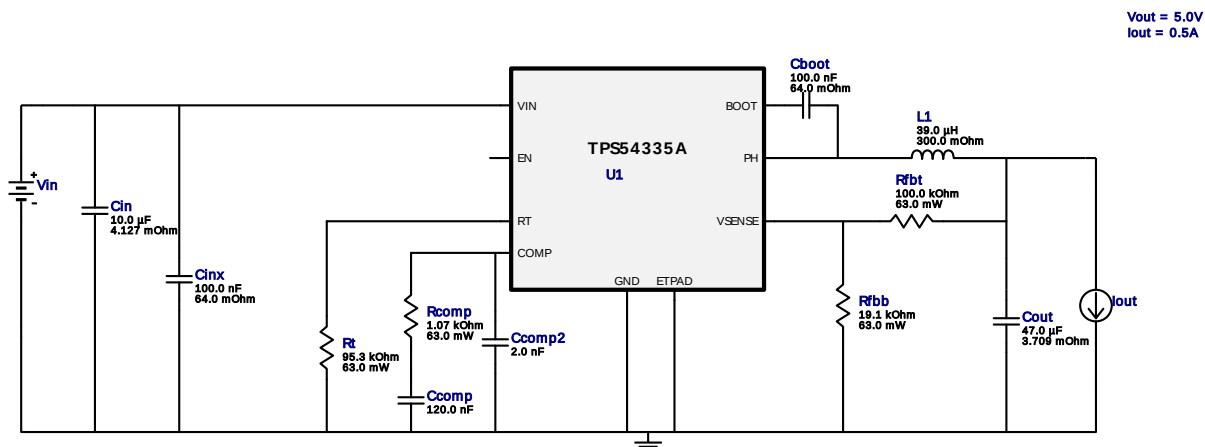


WEBENCH® Design Report

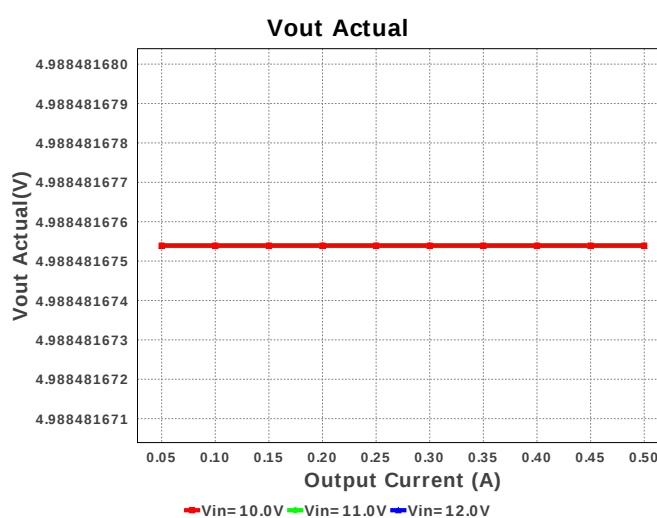
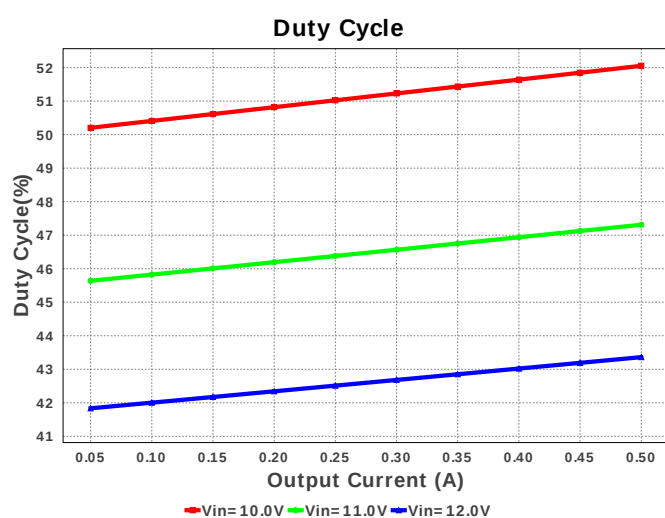
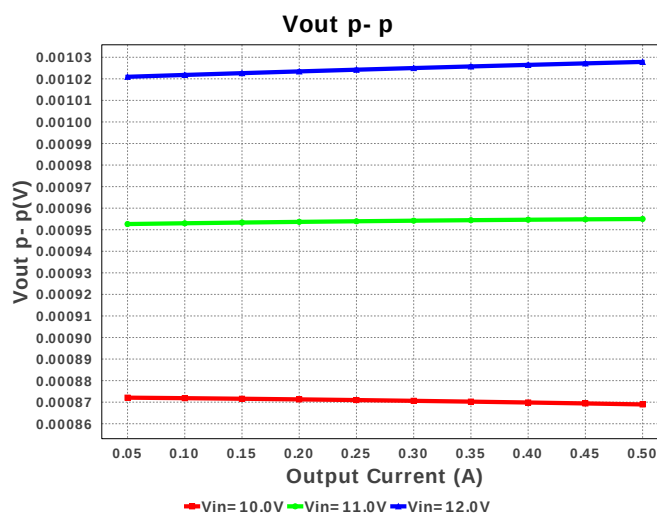
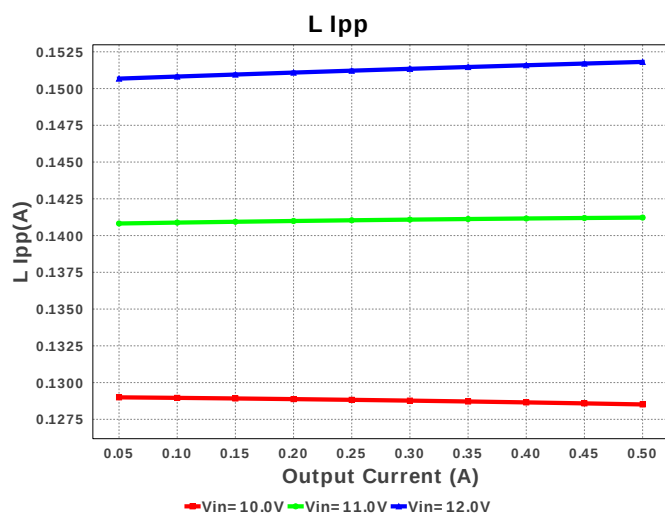
Design : 4742013/218 TPS54335ADDAR
TPS54335ADDAR 10.0V-12.0V to 5.00V @ 0.5A

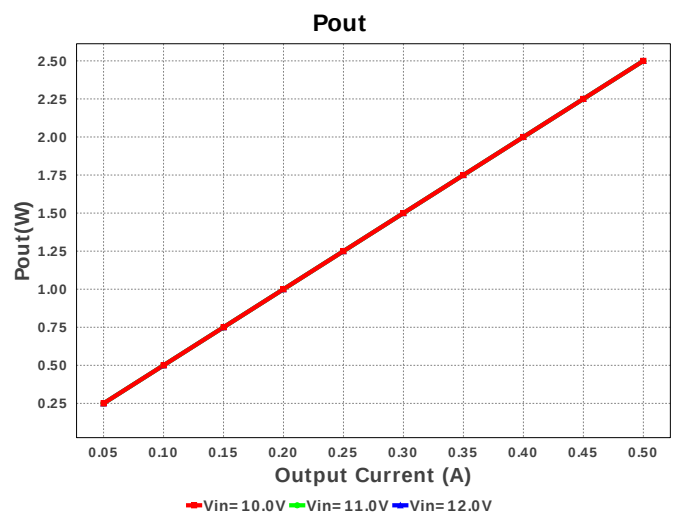
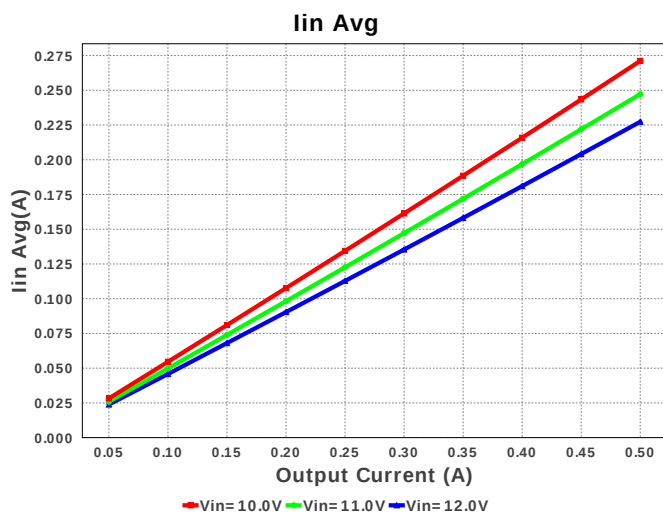
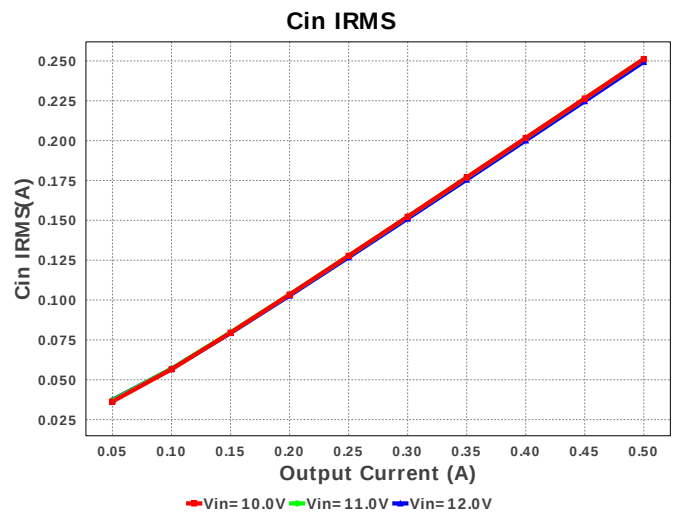
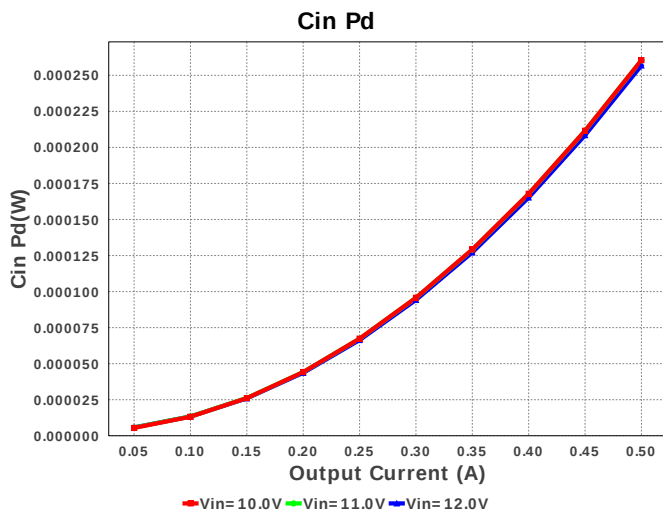
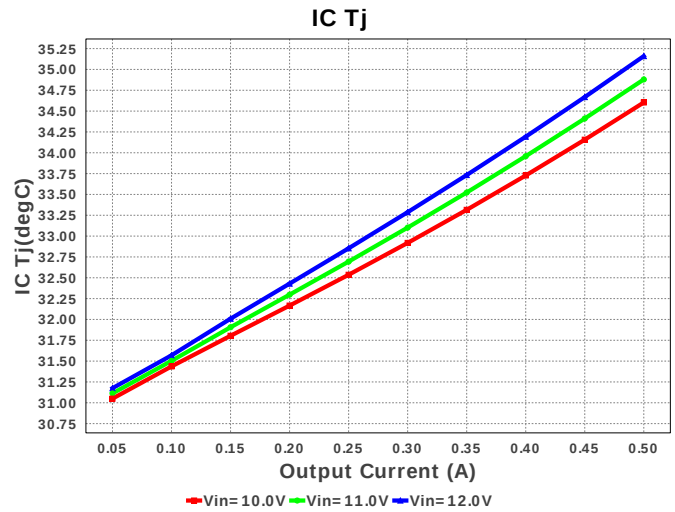
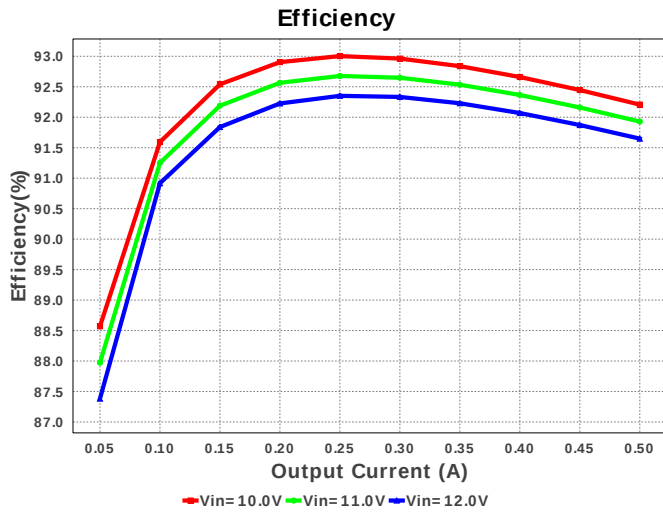


Electrical BOM

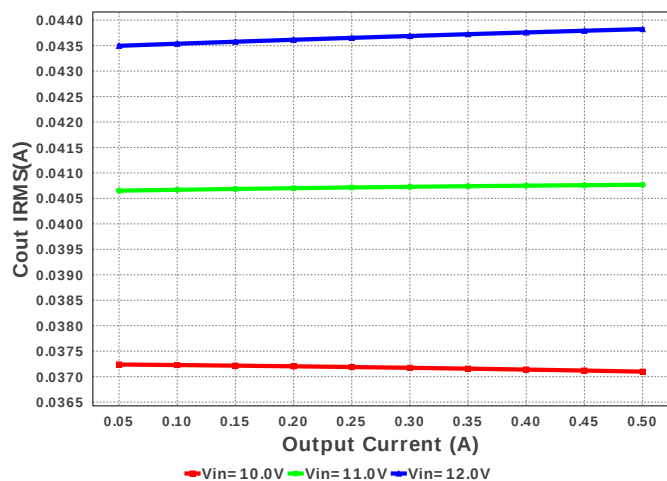
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	Kemet	C0805C104K5RACTU Series= X7R	Cap= 100.0 nF ESR= 64.0 mOhm VDC= 50.0 V IRMS= 1.64 A	1	\$0.01	0805 7 mm ²
2.	Ccomp	MuRata	GRM155C80J124KE01D Series= X6S	Cap= 120.0 nF VDC= 6.3 V IRMS= 0.0 A	1	\$0.02	0402 3 mm ²
3.	Ccomp2	MuRata	GRM1885C1H202JA01D Series= C0G/NP0	Cap= 2.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0603 5 mm ²
4.	Cin	MuRata	GRM21BR61C106KE15L Series= X5R	Cap= 10.0 uF ESR= 4.127 mOhm VDC= 16.0 V IRMS= 2.46634 A	1	\$0.03	0805 7 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	GRM31CR61A476KE15L Series= X5R	Cap= 47.0 uF ESR= 3.709 mOhm VDC= 10.0 V IRMS= 4.2862 A	1	\$0.15	1206_190 11 mm ²
7.	L1	NIC Components	NPI54C390KTRF	L= 39.0 uH DCR= 300.0 mOhm	1	\$0.09	IND_NPI54C 61 mm ²
8.	Rcomp	Vishay-Dale	CRCW04021K07FKED Series= CRCW..e3	Res= 1.07 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
9.	Rfbb	Vishay-Dale	CRCW040219K1FKED Series= CRCW..e3	Res= 19.1 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
10.	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

#	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	

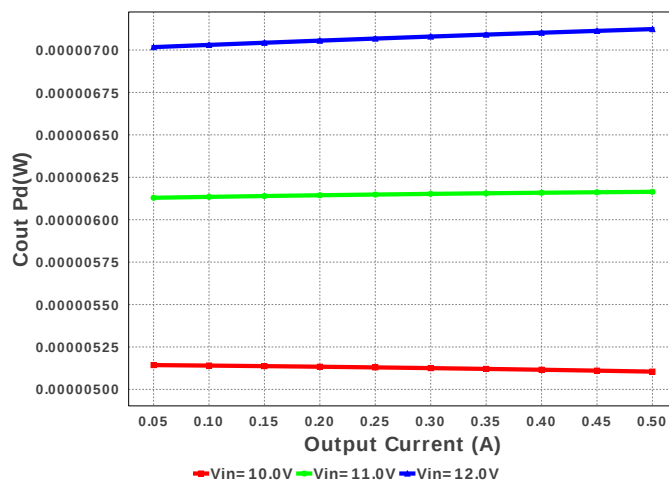
R-PDSO-G8 57 mm²



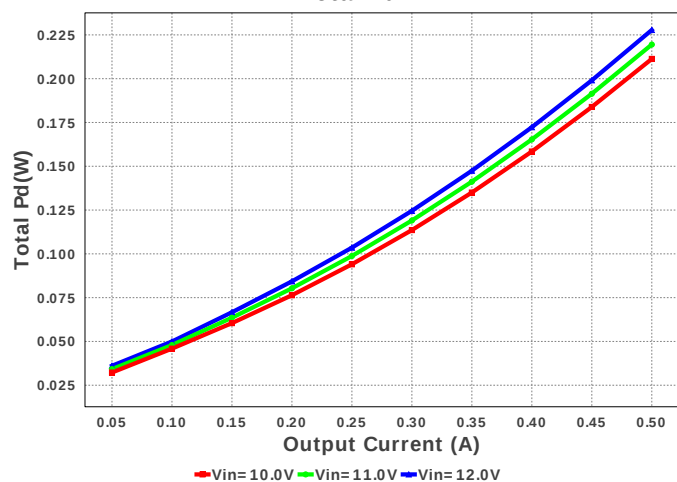
Cout IRMS



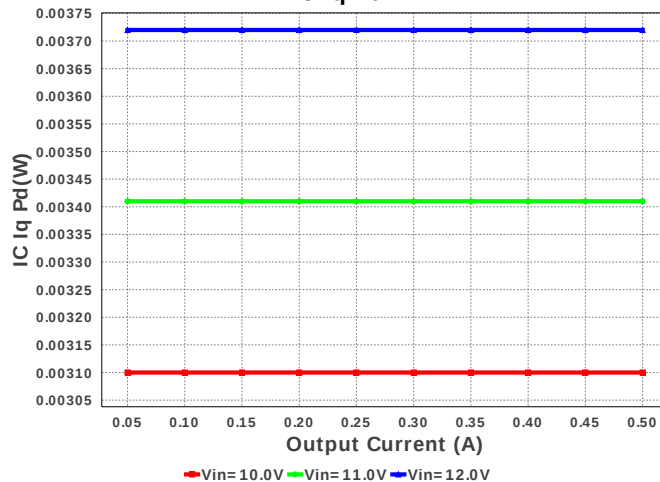
Cout Pd



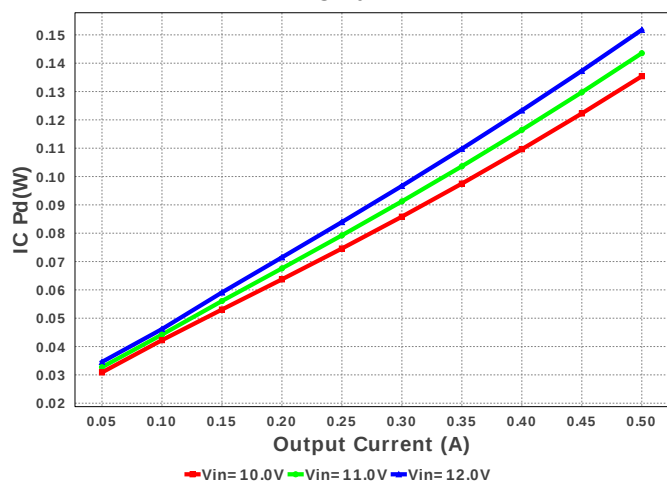
Total Pd



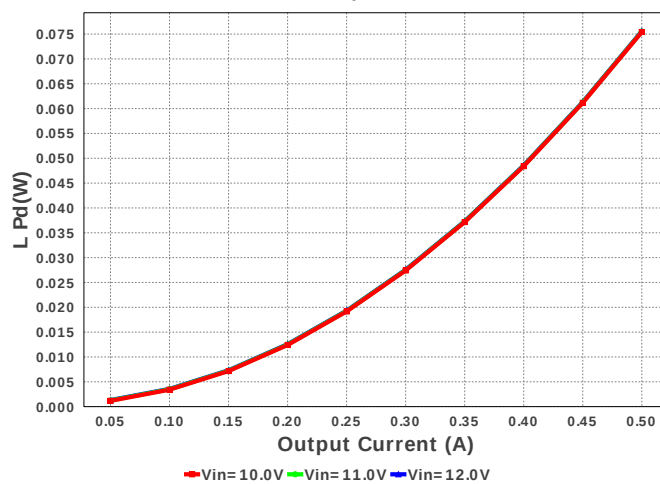
IC Iq Pd

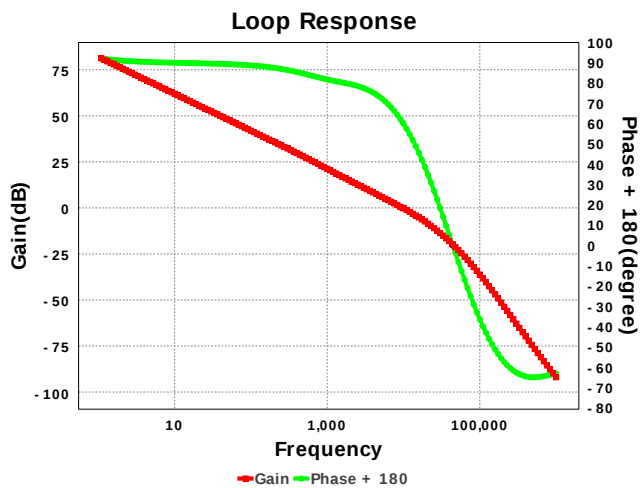


IC Pd



L Pd





Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	249.462 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	43.824 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	227.32 mA	Current	Average input current
4.	L Ipp	151.81 mA	Current	Peak-to-peak inductor ripple current
5.	BOM Count	12	General	Total Design BOM count
6.	FootPrint	169.0 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	2.5 W	General	Total output power
10.	Total BOM	\$1.26	General	Total BOM Cost
11.	ICThetaJA Effective	34.0 degC/W	Op_Point	Effective IC Junction-to-Ambient Thermal Resistance
12.	Low Freq Gain	81.164 dB	Op_Point	Gain at 10Hz
13.	Vout Actual	4.988 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
14.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
15.	Cross Freq	9.741 kHz	Op_point	Bode plot crossover frequency
16.	Duty Cycle	43.362 %	Op_point	Duty cycle
17.	Efficiency	91.649 %	Op_point	Steady state efficiency
18.	Gain Marg	-19.928 dB	Op_point	Bode Plot Gain Margin
19.	IC Tj	35.16 degC	Op_point	IC junction temperature
20.	IOUT_OP	500.0 mA	Op_point	Iout operating point
21.	Phase Marg	60.739 deg	Op_point	Bode Plot Phase Margin
22.	VIN_OP	12.0 V	Op_point	Vin operating point
23.	Vout p-p	1.028 mV	Op_point	Peak-to-peak output ripple voltage
24.	Cin Pd	256.828 μ W	Power	Input capacitor power dissipation
25.	Cout Pd	7.123 μ W	Power	Output capacitor power dissipation
26.	IC Iq Pd	3.72 mW	Power	IC Iq Pd
27.	IC Pd	151.763 mW	Power	IC power dissipation
28.	L Pd	75.576 mW	Power	Inductor power dissipation
29.	Total Pd	227.802 mW	Power	Total Power Dissipation
30.	Vout Tolerance	3.222 %		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	12.0	Maximum input voltage
3.	VinMin	10.0	Minimum input voltage
4.	Vout	5.0	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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