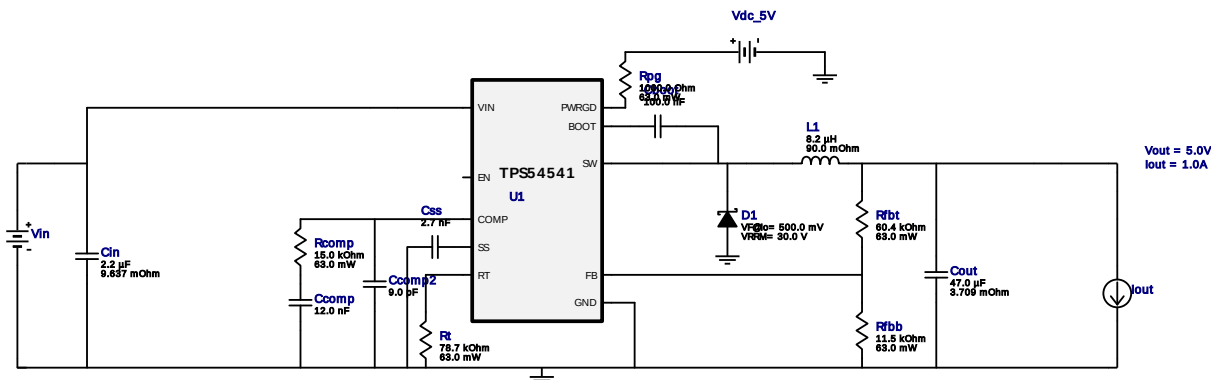


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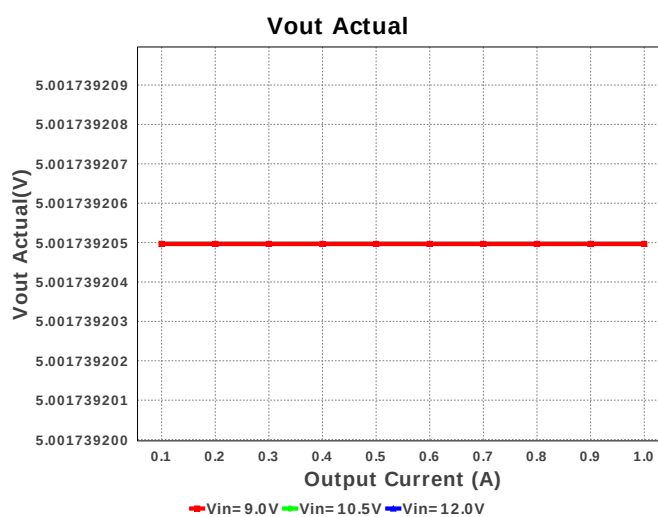
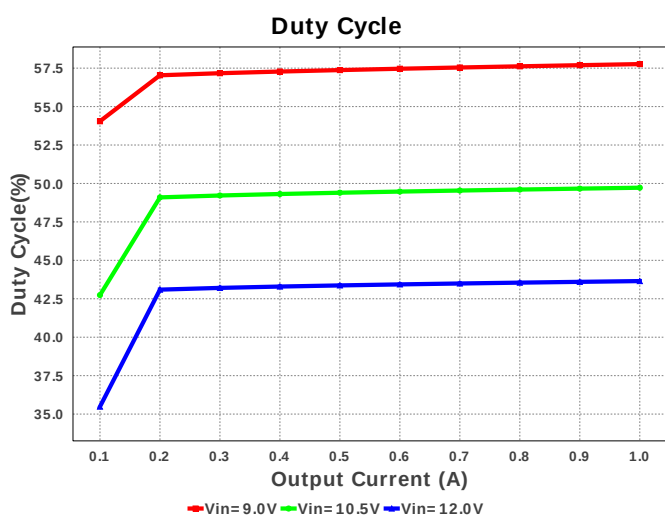
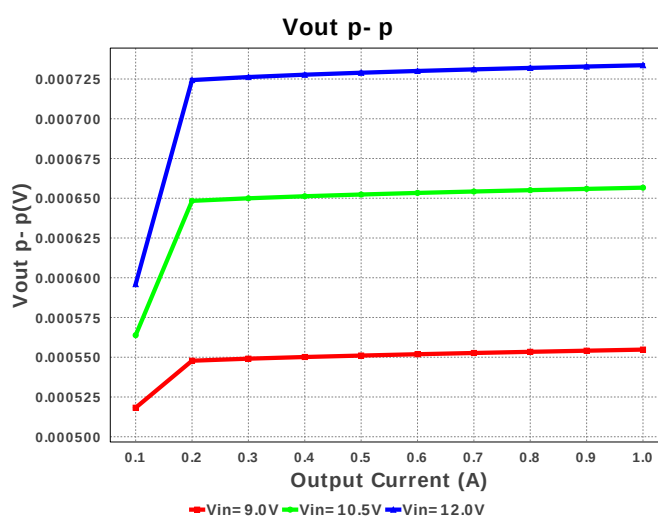
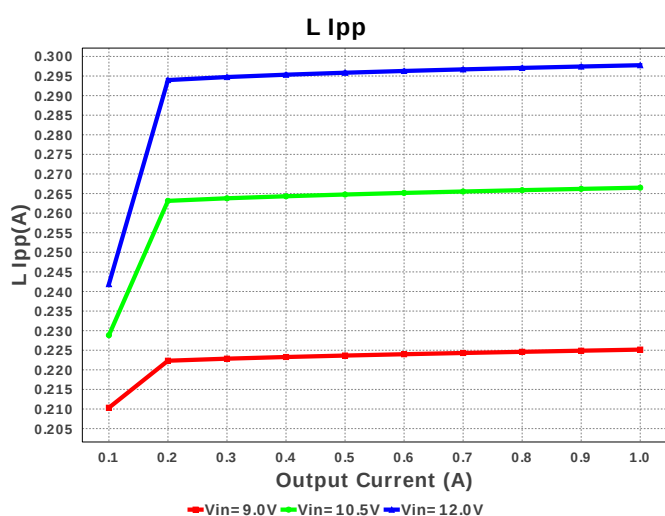
Design : 4372614/39 TPS54541DPRR
TPS54541DPRR 9.0V-12.0V to 5.00V @ 1.0A

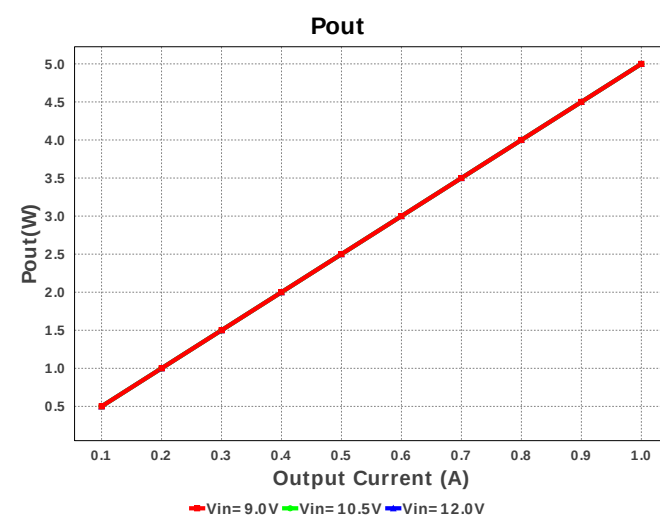
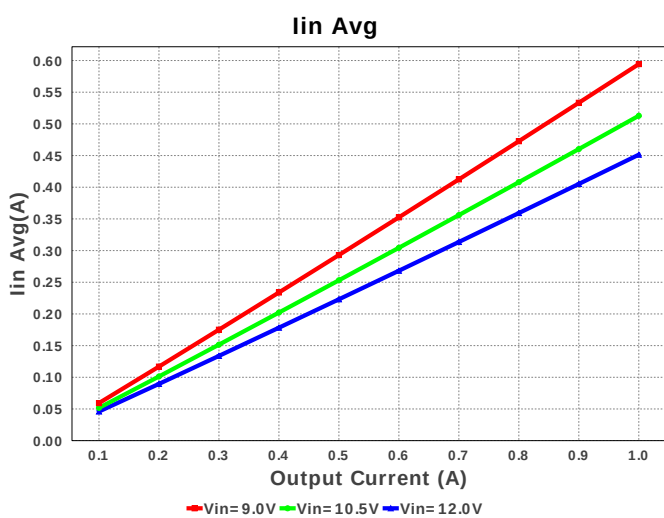
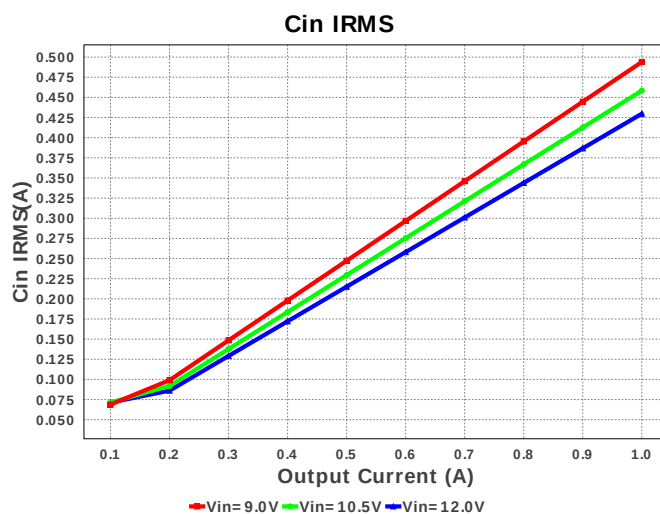
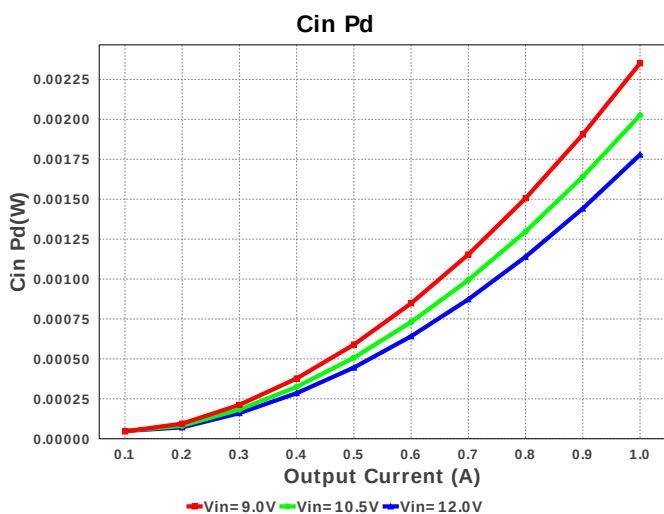
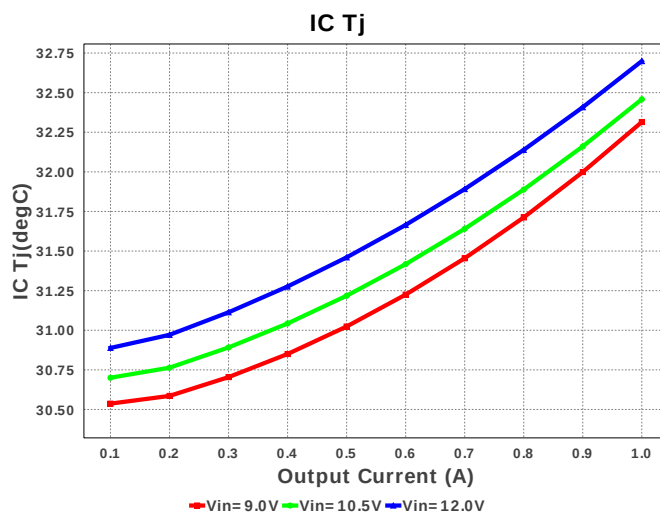
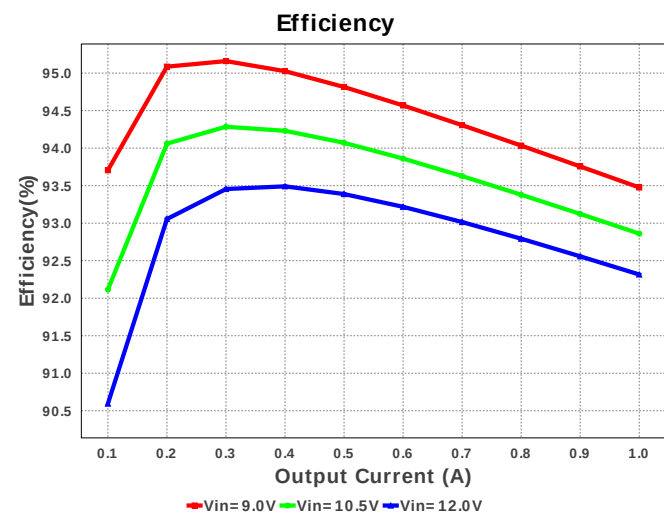


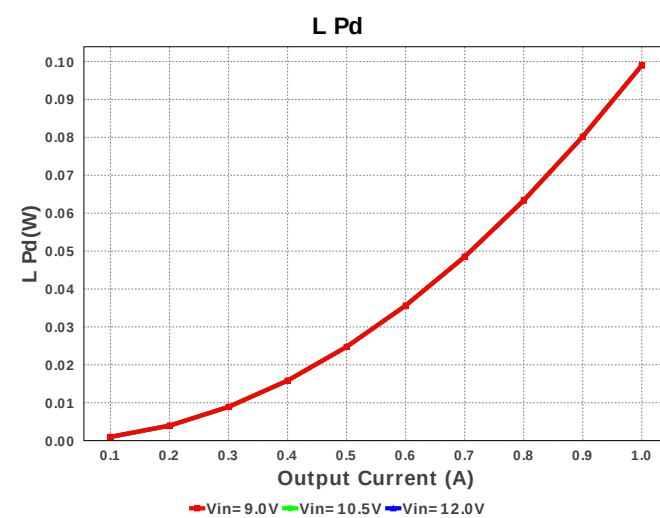
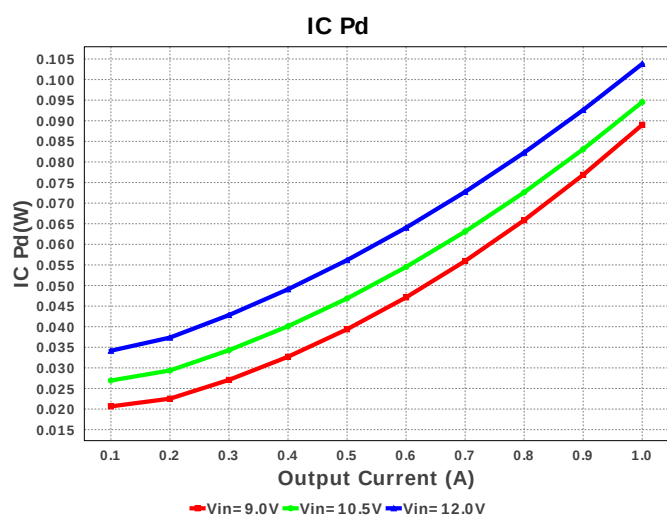
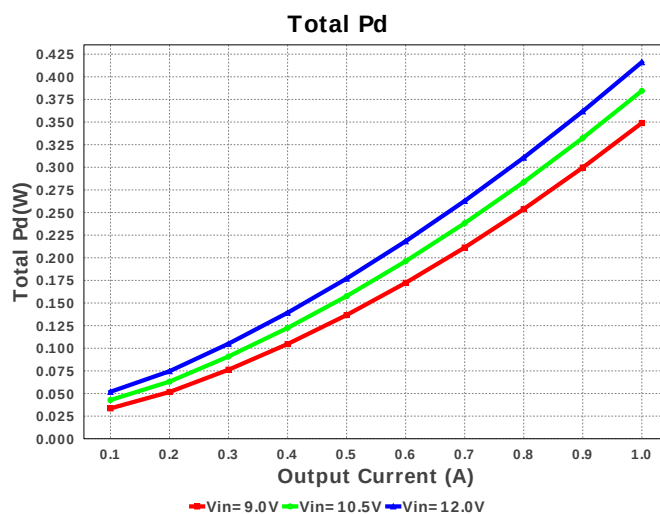
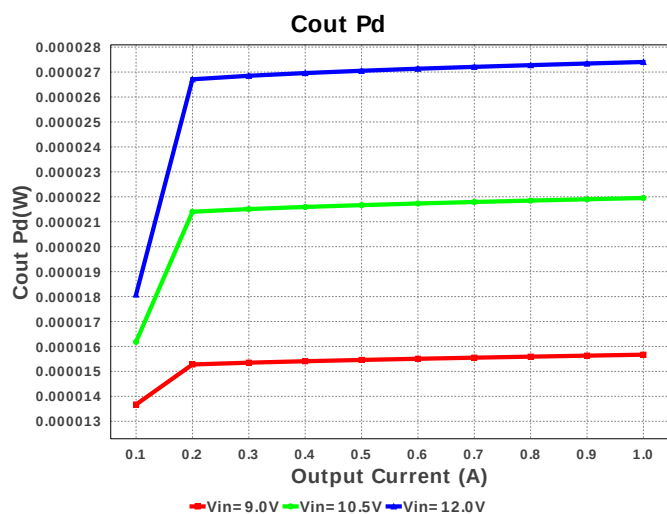
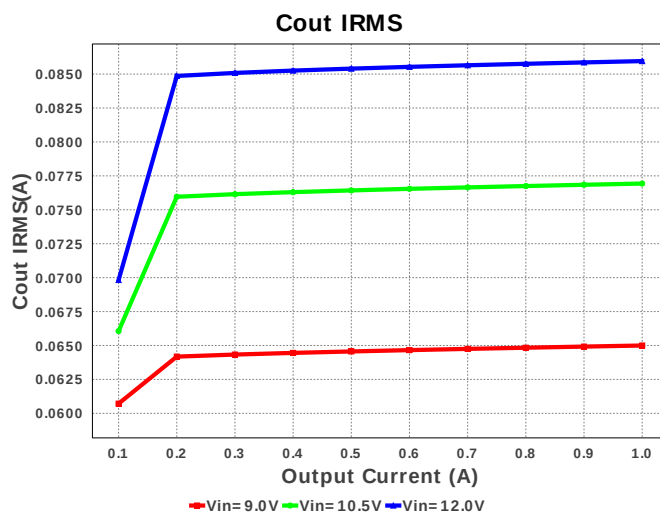
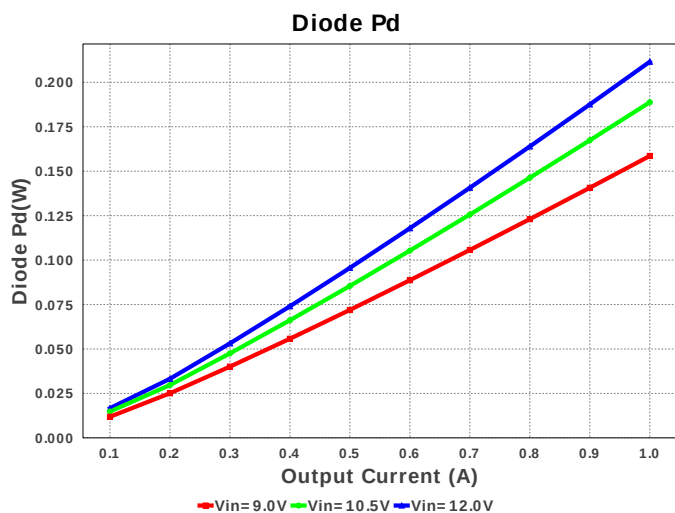
Electrical BOM

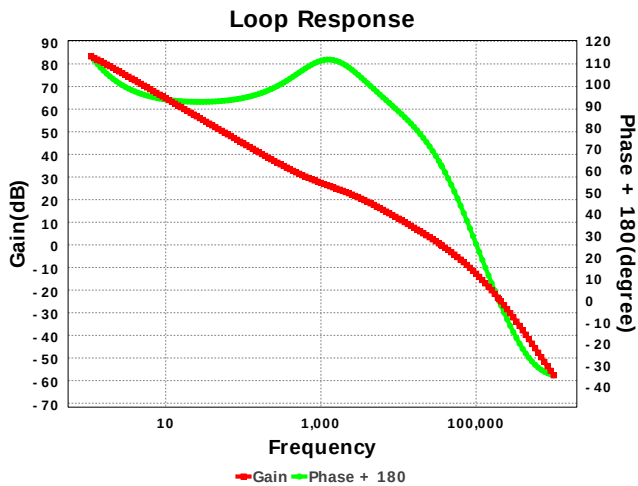
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	MuRata	GRM155R61A104KA01D Series= X5R	Cap= 100.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	 0402 3 mm ²
2.	Ccomp	MuRata	GRM033C80J123KE01D Series= X6S	Cap= 12.0 nF VDC= 6.3 V IRMS= 0.0 A	1	\$0.01	 0201 2 mm ²
3.	Ccomp2	MuRata	GQM2195C2A9R0CB01D Series= C0G/NP0	Cap= 9.0 pF VDC= 100.0 V IRMS= 0.0 A	1	\$0.17	 0805 7 mm ²
4.	Cin	MuRata	GRM188R61C225KE15D Series= X5R	Cap= 2.2 uF ESR= 9.637 mOhm VDC= 16.0 V IRMS= 1.20373 A	1	\$0.02	 0603 5 mm ²
5.	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
6.	Css	Yageo America	CC0805KRX7R9BB272 Series= X7R	Cap= 2.7 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
7.	D1	Diodes Inc.	B230A-13-F	VF@Io= 500.0 mV VRRM= 30.0 V	1	\$0.09	 SMA 37 mm ²
8.	L1	Bourns	SDR0604-8R2ML	L= 8.2 uH DCR= 90.0 mOhm	1	\$0.18	 SDR0604 61 mm ²
9.	Rcomp	Vishay-Dale	CRCW040215K0FKED Series= CRCW..e3	Res= 15.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
10.	Rfbb	Vishay-Dale	CRCW040211K5FKED Series= CRCW..e3	Res= 11.5 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
11.	Rfbt	Vishay-Dale	CRCW040260K4FKED Series= CRCW..e3	Res= 60.4 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
12.	Rpg	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	Res= 1000.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
13.	Rt	Vishay-Dale	CRCW040278K7FKED Series= CRCW..e3	Res= 78.7 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
14.	U1	Texas Instruments	TPS54541DPRR	Switcher	1	\$2.30	 DPR0010A 25 mm²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	429.646 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	86.096 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	452.06 mA	Current	Average input current
4.	L Ipp	298.25 mA	Current	Peak-to-peak inductor ripple current
5.	BOM Count	14	General	Total Design BOM count
6.	FootPrint	172.0 mm ²	General	Total Foot Print Area of BOM components
7.	Frequency	1.251 MHz	General	Switching frequency
8.	Pout	5.0 W	General	Total output power
9.	Total BOM	\$2.99	General	Total BOM Cost
10.	ICThetaJA Effective	26.0 degC/W	Op_Point	Effective IC Junction-to-Ambient Thermal Resistance
11.	Low Freq Gain	83.304 dB	Op_Point	Gain at 10Hz
12.	Vout Actual	5.002 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
13.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
14.	Cross Freq	35.352 kHz	Op_point	Bode plot crossover frequency
15.	Duty Cycle	43.721 %	Op_point	Duty cycle
16.	Efficiency	92.17 %	Op_point	Steady state efficiency
17.	Gain Marg	-23.944 dB	Op_point	Bode Plot Gain Margin
18.	IC Tj	32.701 degC	Op_point	IC junction temperature
19.	IOUT_OP	1.0 A	Op_point	Iout operating point
20.	Phase Marg	62.797 deg	Op_point	Bode Plot Phase Margin
21.	VIN_OP	12.0 V	Op_point	Vin operating point
22.	Vout p-p	734.876 μ V	Op_point	Peak-to-peak output ripple voltage
23.	Cin Pd	1.779 mW	Power	Input capacitor power dissipation
24.	Cout Pd	27.493 μ W	Power	Output capacitor power dissipation
25.	Diode Pd	220.065 mW	Power	Diode power dissipation
26.	IC Pd	103.88 mW	Power	IC power dissipation
27.	L Pd	99.0 mW	Power	Inductor power dissipation
28.	Total Pd	424.756 mW	Power	Total Power Dissipation
29.	Vout Tolerance	2.714 %		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	12.0	Maximum input voltage
3.	VinMin	9.0	Minimum input voltage
4.	Vout	5.0	Output Voltage
5.	base_pn	TPS54541	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS54541** Product Folder : <http://www.ti.com/product/TPS54541> : contains the data sheet and other resources.

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