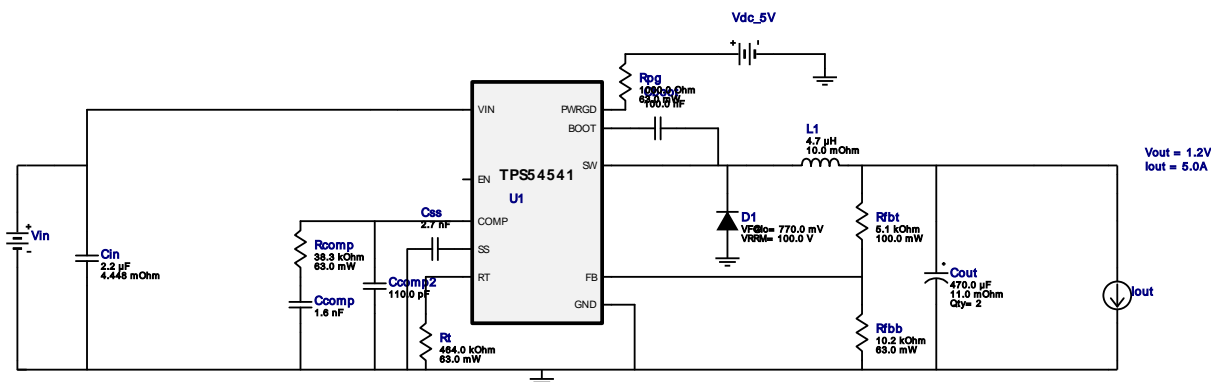


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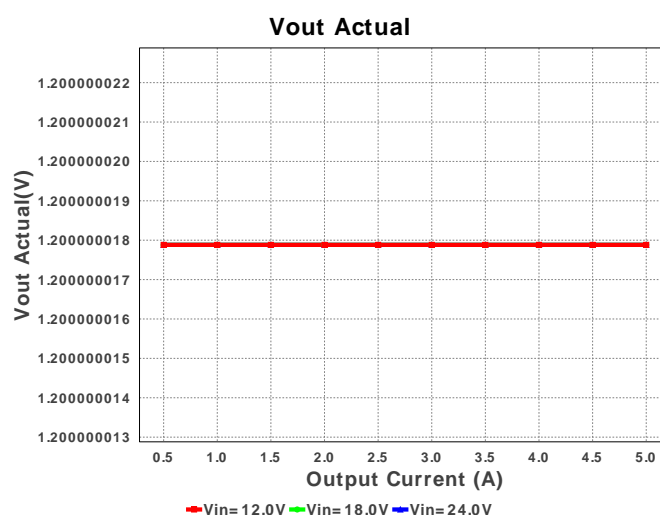
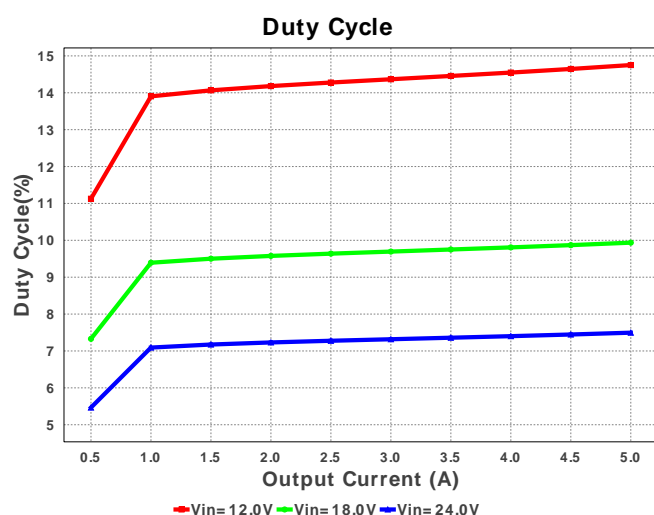
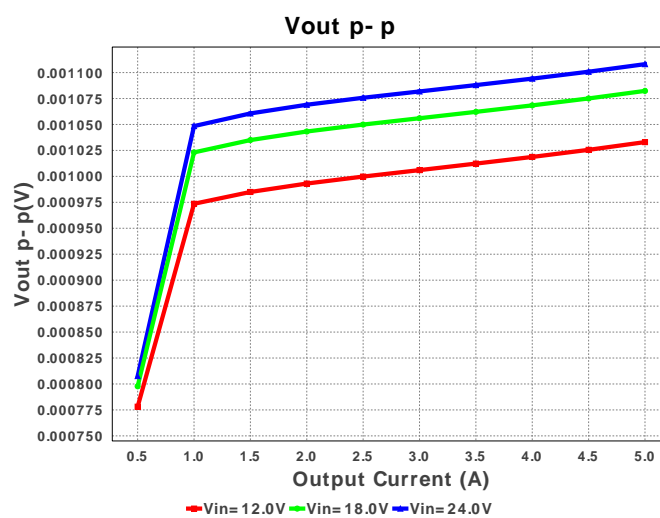
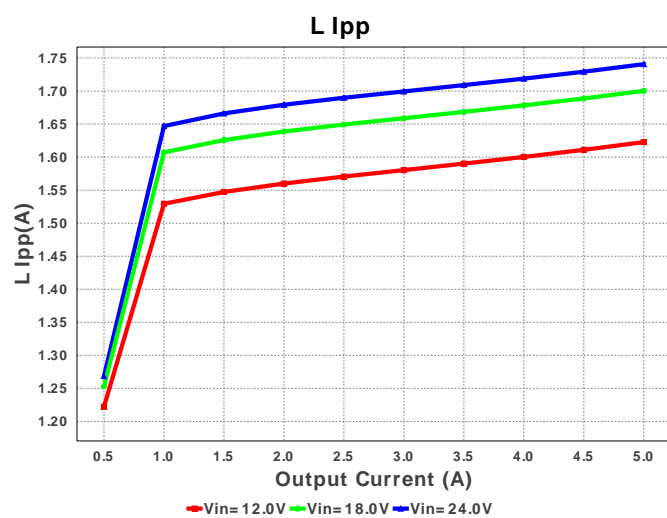
Design : 4466246/71 TPS54541DPRR
TPS54541DPRR 12.0V-24.0V to 1.20V @ 5.0A

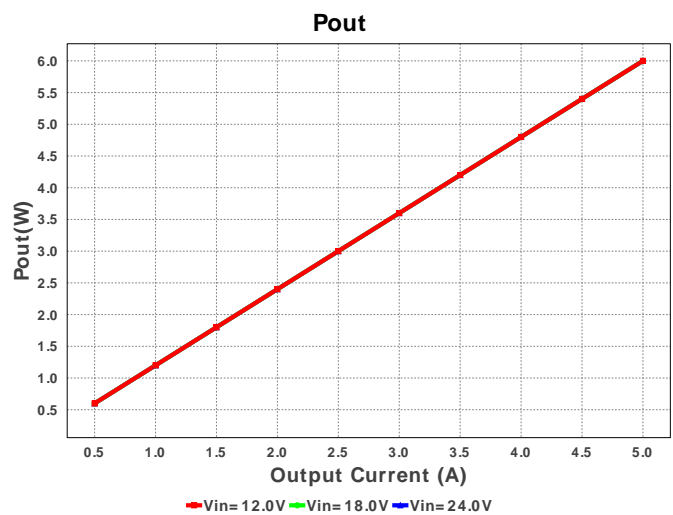
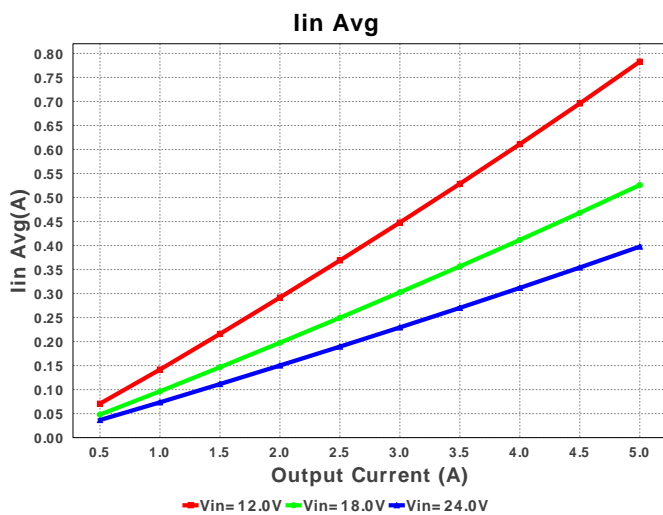
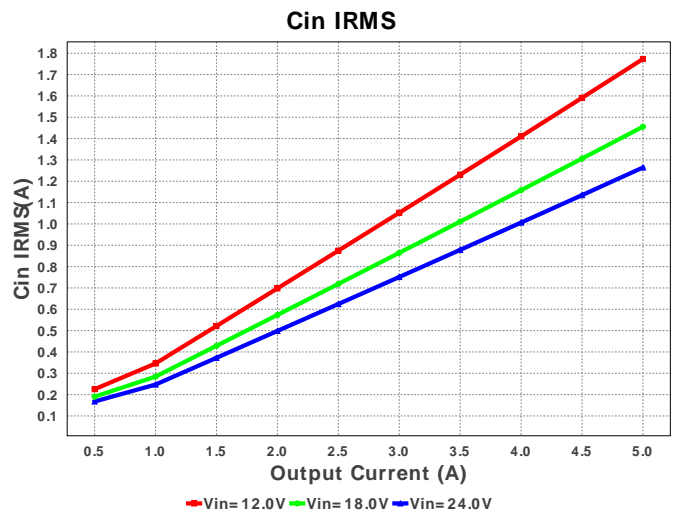
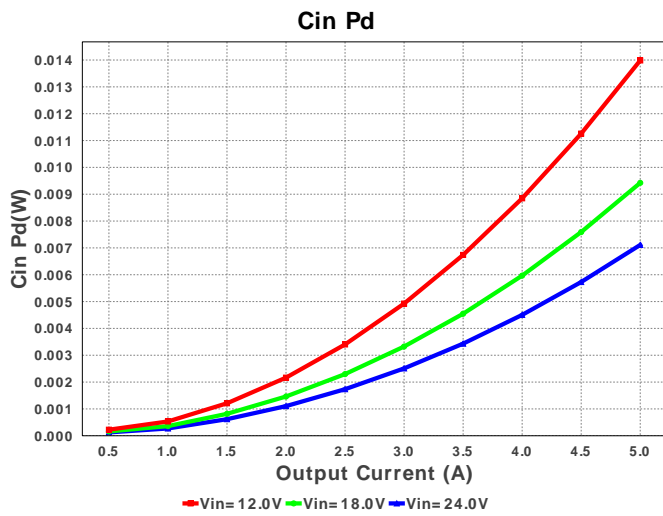
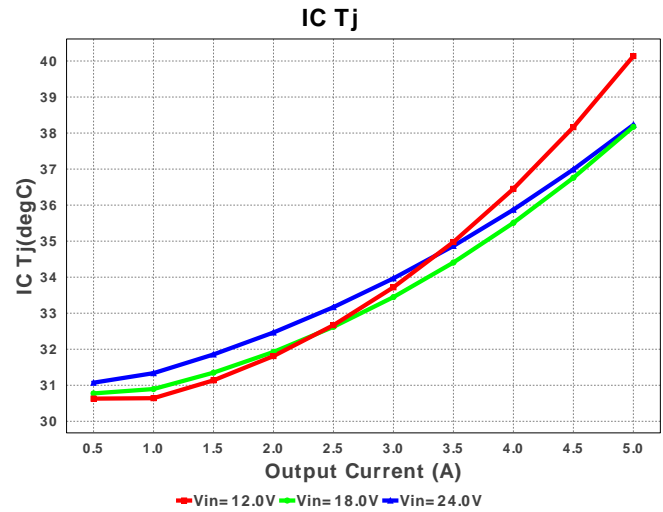
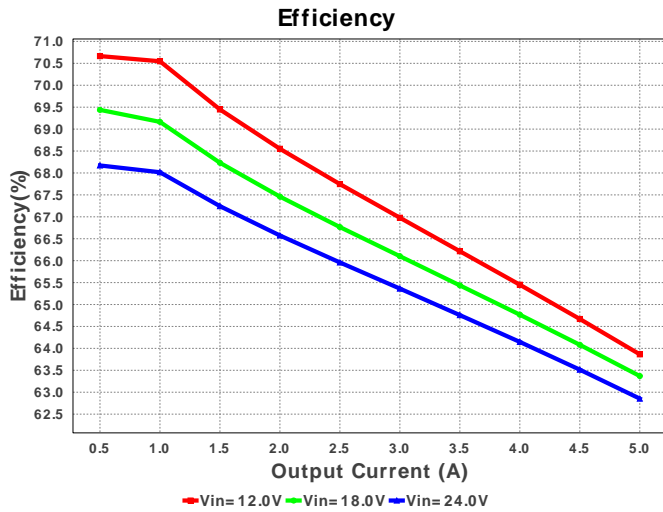


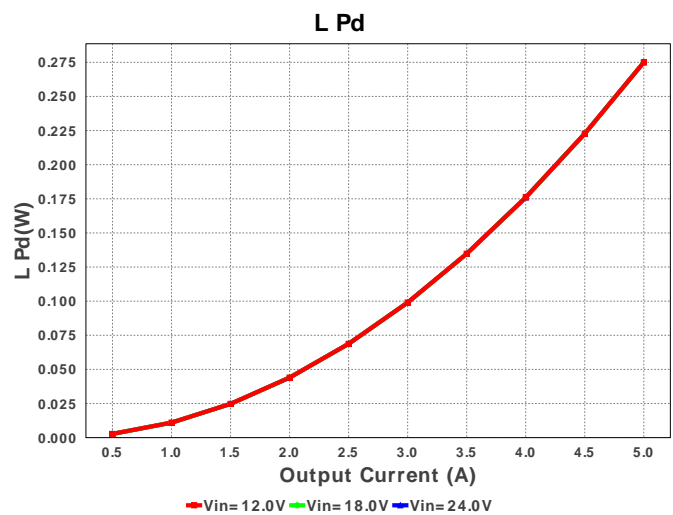
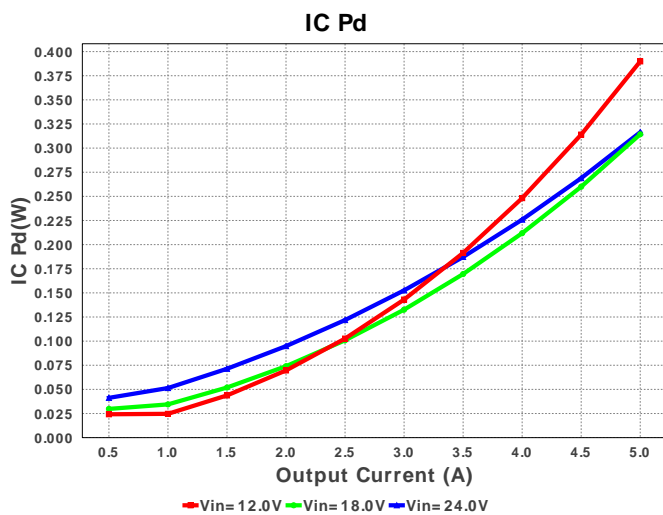
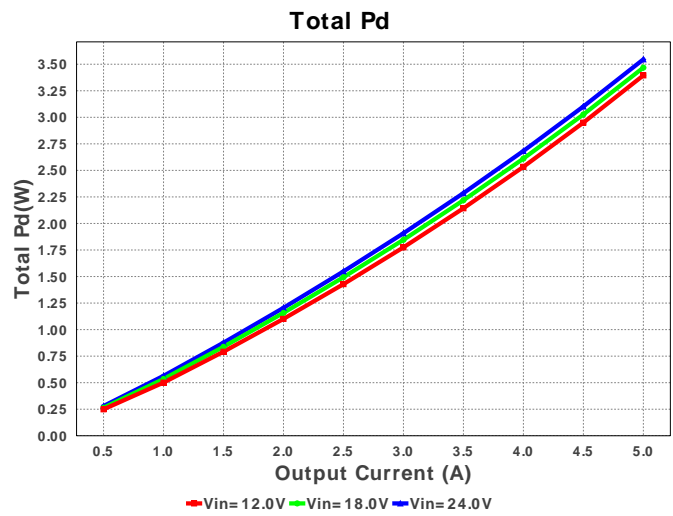
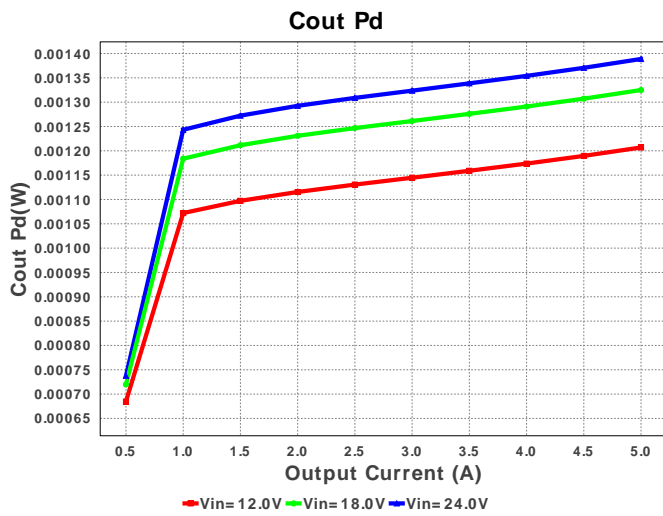
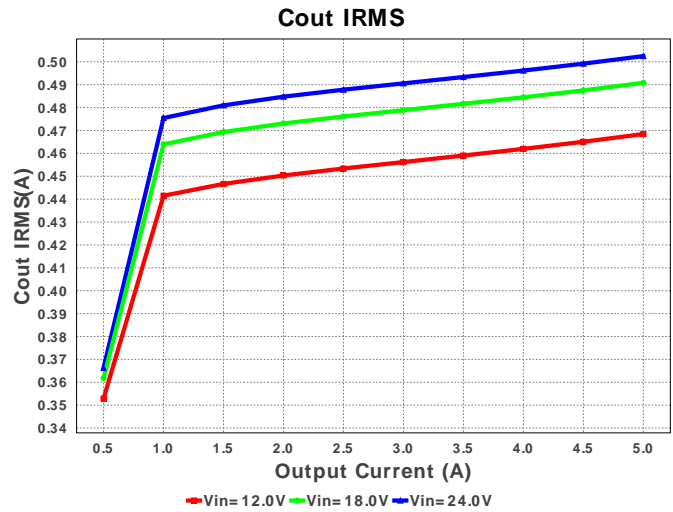
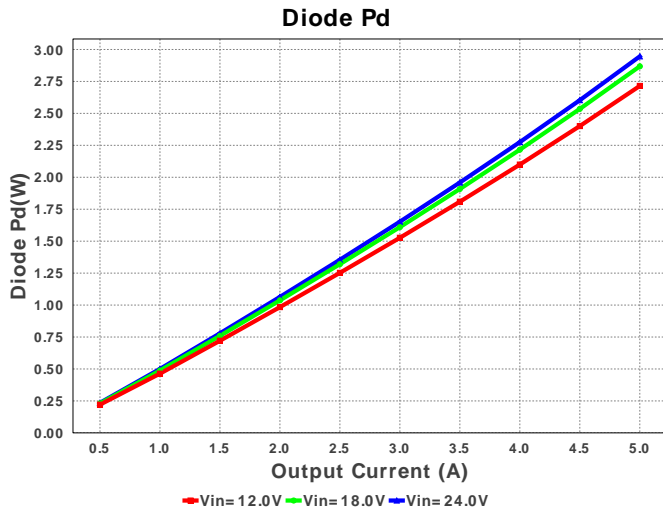
Electrical BOM

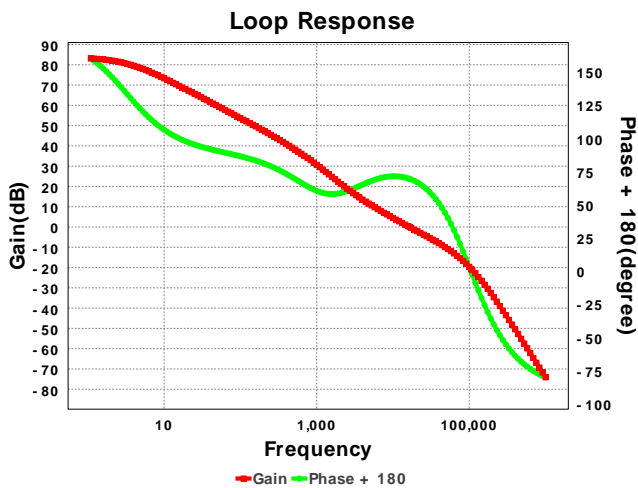
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	MuRata	GRM155R61A104KA01D Series= X5R	Cap= 100.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
2.	Ccomp	MuRata	GRM1885C1H162JA01D Series= C0G/NP0	Cap= 1.6 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0603 5 mm ²
3.	Ccomp2	MuRata	GRM0335C1H111JA01D Series= C0G/NP0	Cap= 110.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0201 2 mm ²
4.	Cin	MuRata	GRM31CR71H225KA88L Series= X7R	Cap= 2.2 uF ESR= 4.448 mOhm VDC= 50.0 V IRMS= 2.2252 A	1	\$0.05	1206_190 11 mm ²
5.	Cout	Panasonic	2TPE470MAJGB Series= ?	Cap= 470.0 uF ESR= 11.0 mOhm VDC= 2.0 V IRMS= 2.3 A	2	\$0.70	CAPSMT_6_B2S 17 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	Vishay-Semiconductor	50WQ10FNPBF	VF@Io= 770.0 mV VRRM= 100.0 V	1	\$0.74	DPAK 102 mm ²
8.	L1	Bourns	SDR1307-4R7ML	L= 4.7 uH DCR= 10.0 mOhm	1	\$0.35	SDR1307 227 mm ²
9.	Rcomp	Vishay-Dale	CRCW040238K3FKED Series= CRCW..e3	Res= 38.3 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
10.	Rfbb	Vishay-Dale	CRCW040210K2FKED Series= CRCW..e3	Res= 10.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
11.	Rfbt	Yageo America	RC0603FR-075K1L Series= ?	Res= 5.1 kOhm Power= 100.0 mW Tolerance= 1.0%	1	\$0.01	0603 5 mm ²
12.	Rpg	Vishay-Dale	CRCW04021K00FKED Series= CRCW...e3	Res= 1000.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
13.	Rt	Vishay-Dale	CRCW0402464KFKED Series= CRCW...e3	Res= 464.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
14.	U1	Texas Instruments	TPS54541DPRR	Switcher	1	\$2.30	DPR0010A 25 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	1.264 A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	502.492 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	397.75 mA	Current	Average input current
4.	L Ipp	1.741 A	Current	Peak-to-peak inductor ripple current
5.	BOM Count	15	General	Total Design BOM count
6.	FootPrint	432.0 mm ²	General	Total Foot Print Area of BOM components
7.	Frequency	208.893 kHz	General	Switching frequency
8.	Pout	6.0 W	General	Total output power
9.	Total BOM	\$4.93	General	Total BOM Cost
10.	ICThetaJA Effective	26.0 degC/W	Op_Point	Effective IC Junction-to-Ambient Thermal Resistance
11.	Low Freq Gain	83.124 dB	Op_Point	Gain at 10Hz
12.	Vout Actual	1.2 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
13.	Vout OP	1.2 V	Op_Point	Operational Output Voltage
14.	Cross Freq	16.514 kHz	Op_point	Bode plot crossover frequency
15.	Duty Cycle	7.496 %	Op_point	Duty cycle
16.	Efficiency	62.854 %	Op_point	Steady state efficiency
17.	Gain Marg	-20.669 dB	Op_point	Bode Plot Gain Margin
18.	IC Tj	38.227 degC	Op_point	IC junction temperature
19.	IOUT_OP	5.0 A	Op_point	Iout operating point
20.	Phase Marg	70.377 deg	Op_point	Bode Plot Phase Margin
21.	VIN_OP	24.0 V	Op_point	Vin operating point
22.	Vout p-p	1.108 mV	Op_point	Peak-to-peak output ripple voltage
23.	Cin Pd	7.111 mW	Power	Input capacitor power dissipation
24.	Cout Pd	1.389 mW	Power	Output capacitor power dissipation
25.	Diode Pd	2.946 W	Power	Diode power dissipation
26.	IC Pd	316.433 mW	Power	IC power dissipation
27.	L Pd	275.0 mW	Power	Inductor power dissipation
28.	Total Pd	3.546 W	Power	Total Power Dissipation
29.	Vout Tolerance	1.68 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	5.0	Maximum Output Current
2.	VinMax	24.0	Maximum input voltage
3.	VinMin	12.0	Minimum input voltage
4.	Vout	1.2	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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