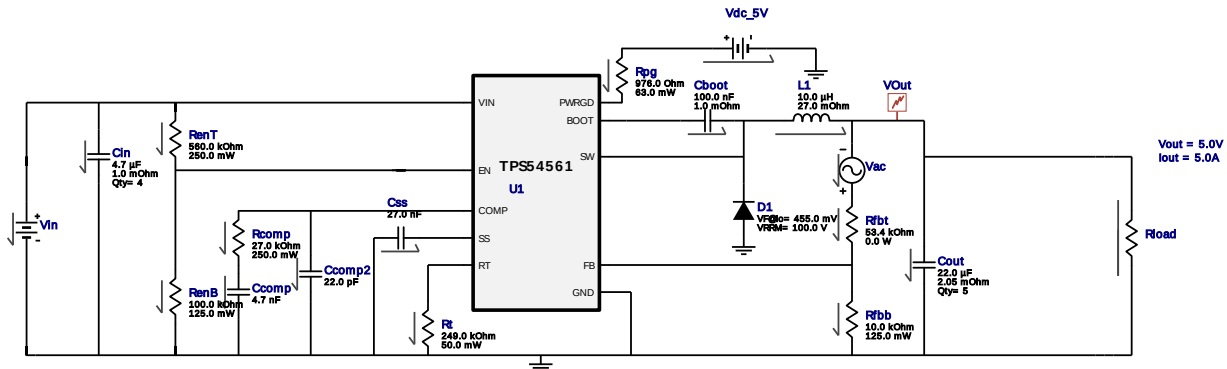


WEBENCH® Electrical Simulation Report



My Comments

No comments

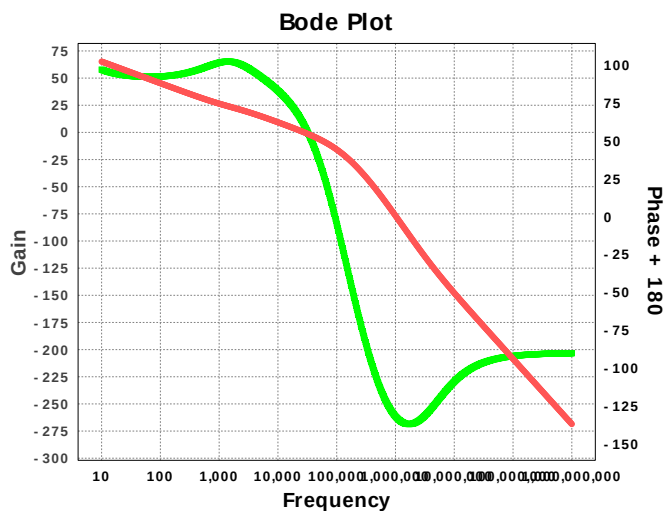
Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	MuRata	GRM155R61C104KA88D Series= X5R	Cap= 100.0 nF ESR= 1.0 mOhm VDC= 16.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
2.	Ccomp	TDK	C1608C0G1H472J080AA Series= C0G/NP0	Cap= 4.7 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.05	0603 5 mm ²
3.	Ccomp2	TDK	C0603C0G1H220K030BA Series= C0G/NP0	Cap= 22.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0201 2 mm ²
4.	Cin	MuRata	GCM32DC72A475KE02L Series= X7S	Cap= 4.7 µF ESR= 1.0 mOhm VDC= 100.0 V IRMS= 6.0 A	4	\$0.68	1210_220 15 mm ²
5.	Cout	TDK	C2012X5R1V226M125AC Series= X5R	Cap= 22.0 µF ESR= 2.05 mOhm VDC= 35.0 V IRMS= 4.556 A	5	\$0.38	0805 7 mm ²
6.	Css	Kemet	C1812C273J5GACTU Series= C0G/NP0	Cap= 27.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.67	1812 23 mm ²
7.	D1	STMicroelectronics	STPS20M100SG-TR	VF@Io= 455.0 mV VRRM= 100.0 V	1	\$1.39	DDPAK 210 mm ²
8.	L1	Coilcraft	XAL6060-103MEB	L= 10.0 µH DCR= 27.0 mOhm	1	\$0.82	XAL6060 72 mm ²
9.	Rcomp	Yageo	RC1206FR-0727KL Series= ?	Res= 27.0 kOhm Power= 250.0 mW Tolerance= 1.0%	1	\$0.01	1206 11 mm ²
10.	RenB	Yageo	RT0805BRD07100KL Series= ?	Res= 100.0 kOhm Power= 125.0 mW Tolerance= 0.1%	1	\$0.05	0805 7 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
11.	RenT	Yageo	RC1206FR-07560KL Series= ?	Res= 560.0 kOhm Power= 250.0 mW Tolerance= 1.0%	1	\$0.01	 1206 11 mm²
12.	Rfbb	Yageo	RT0805DRE0710KL Series= ?	Res= 10.0 kOhm Power= 125.0 mW Tolerance= 0.5%	1	\$0.02	 0805 7 mm²
13.	Rfbt	CUSTOM	CUSTOM Series= ?	Res= 53.4 kOhm Power= 0.0 W Tolerance= 0.0%	1	NA	CUSTOM 0 mm²
14.	Rpg	Vishay-Dale	CRCW0402976RFKED Series= CRCW..e3	Res= 976.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
15.	Rt	Yageo	RC0201FR-07249KL Series= ?	Res= 249.0 kOhm Power= 50.0 mW Tolerance= 1.0%	1	\$0.01	 0201 2 mm²
16.	U1	Texas Instruments	TPS54561DPRR	Switcher	1	\$2.30	 S-PWSON-N10 26 mm²

Simulation Parameters

#	Name	Parameter Name	Description	Values
1.	Cinj	C	Cap injection	10000000 F
2.	Linj	L	no description	10000000 H
3.	Vinj	AC	AC injection	1 V
4.	Cout	IC	no description	no values
5.	Rload	R	Load Resistance	1.0 ohm



Design Inputs

#	Name	Value	Description
1.	Iout	5.0 A	Maximum Output Current
2.	SoftStart	10.0 ms	Soft Start Time (ms)
3.	VinMax	36.0 V	Maximum input voltage
4.	VinMin	9.0 V	Minimum input voltage
5.	Vout	5.0 V	Output Voltage
6.	acFrequency	0.0 Hz	AC Frequency
7.	base_pn	TPS54561	Base Product Number
8.	source	DC	Input Source Type
9.	Ta	30.0 degC	Ambient temperature
10.	UserFsw	400.0 kHz	Customer Selected Frequency

Operating Values

#	Name	Value	Category	Description
1.	BOM Count	23		Total Design BOM count
2.	Total BOM	\$0.0		Total BOM Cost
3.	Cin IRMS	1.242 A	Current	Input capacitor RMS ripple current
4.	Cout IRMS	343.977 mA	Current	Output capacitor RMS ripple current
5.	IC Ipk	0.0 A	Current	Peak switch current in IC
6.	Iin Avg	798.75 mA	Current	Average input current
7.	L Ipp	1.192 A	Current	Peak-to-peak inductor ripple current
8.	FootPrint	478.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	391.449 kHz	General	Switching frequency
10.	Mode	CCM	General	Conduction Mode
11.	Pout	25.0 W	General	Total output power
12.	Cross Freq	28.822 kHz	Op Point	Bode plot crossover frequency
13.	Duty Cycle	15.046 %	Op Point	Duty cycle
14.	Efficiency	86.941 %	Op Point	Steady state efficiency
15.	Gain Marg	-14.549 dB	Op Point	Bode Plot Gain Margin
16.	IC Tj	55.221 degC	Op Point	IC junction temperature
17.	ICThetaJA Effective	26.0 degC/W	Op Point	Effective IC Junction-to-Ambient Thermal Resistance
18.	IOUT_OP	5.0 A	Op Point	Iout operating point
19.	Low Freq Gain	80.618 dB	Op Point	Gain at 1Hz
20.	Phase Marg	62.256 deg	Op Point	Bode Plot Phase Margin
21.	VIN_OP	36.0 V	Op Point	Vin operating point
22.	Vout Actual	5.072 V	Op Point	Vout Actual calculated based on selected voltage divider resistors
23.	Vout OP	5.0 V	Op Point	Operational Output Voltage
24.	Vout Tolerance	1.427 %	Op Point	Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable
25.	Vout p-p	4.065 mV	Op Point	Peak-to-peak output ripple voltage
26.	Cin Pd	385.909 μW	Power	Input capacitor power dissipation
27.	Cout Pd	48.511 μW	Power	Output capacitor power dissipation
28.	Diode Pd	2.042 W	Power	Diode power dissipation
29.	IC Pd	970.047 mW	Power	IC power dissipation
30.	L Pd	742.5 mW	Power	Inductor power dissipation
31.	Total Pd	3.755 W	Power	Total Power Dissipation

Design Assistance

1. **TPS54561** Product Folder : <http://www.ti.com/product/TPS54561> : contains the data sheet and other resources.

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