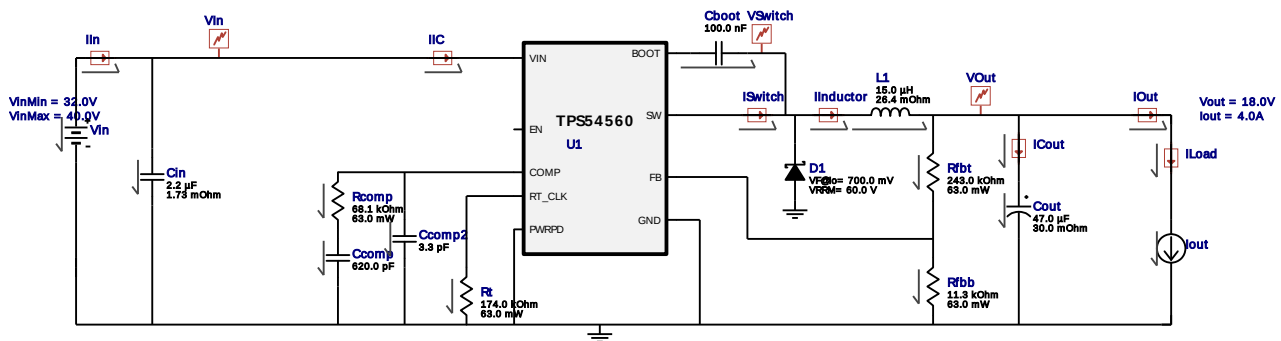


WEBENCH® Electrical Simulation Report



My Comments

No comments

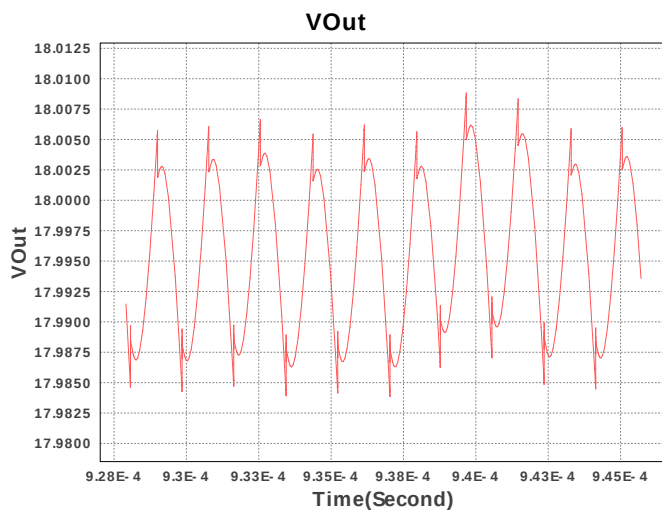
Electrical BOM

#	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	Samsung Electro-Mechanics	CL21C621JBCNNNC Series= C0G/NP0	Cap= 620.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
3.	Ccomp2	MuRata	GRM1555C1E3R3CA01D Series= C0G/NP0	Cap= 3.3 pF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
4.	Cin	TDK	C3225X7R2A225K230AB Series= X7R	Cap= 2.2 µF ESR= 1.73 mOhm VDC= 100.0 V IRMS= 5.593 A	1	\$0.20	1210_250 15 mm ²
5.	Cout	Panasonic	25SVPF47M Series= SVPF	Cap= 47.0 µF ESR= 30.0 mOhm VDC= 25.0 V IRMS= 2.8 A	1	\$0.43	CAPSMT_62_F61 74 mm ²
6.	D1	Diodes Inc.	B560C-13-F	VF@Io= 700.0 mV VRRM= 60.0 V	1	\$0.19	SMC 83 mm ²
7.	L1	Sumida	CDRH127/LDNP-150MC	L= 15.0 µH DCR= 26.4 mOhm	1	\$0.61	CDRH127 196 mm ²
8.	Rcomp	Vishay-Dale	CRCW040268K1FKED Series= CRCW..e3	Res= 68.1 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
9.	Rfbb	Vishay-Dale	CRCW040211K3FKED Series= CRCW..e3	Res= 11.3 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
10.	Rfbt	Vishay-Dale	CRCW0402243KFKED Series= CRCW..e3	Res= 243.0 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	CRCW0402174KFKED Series= CRCW..e3	Res= 174.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
12.	U1	Texas Instruments	TPS54560DDAR	Switcher	1	\$2.10	 R-PDSO-G8 55 mm²

Simulation Parameters

#	Name	Parameter Name	Description	Values
1.	Cboot	IC	Initial Condition	4
2.	L1	IC	Initial Condition	IND_IC A
3.	Iout	I	Load Current	4.0 A



Design Inputs

#	Name	Value	Description
1.	Iout	4.0 A	Maximum Output Current
2.	VinMax	40.0 V	Maximum input voltage
3.	VinMin	32.0 V	Minimum input voltage
4.	Vout	18.0 V	Output Voltage
5.	base_pn	TPS54560	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	55.0 degC	Ambient temperature

Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	1.768 A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	349.404 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	4.605 A	Current	Peak switch current in IC
4.	Iin Avg	1.9 A	Current	Average input current
5.	L Ipp	1.21 A	Current	Peak-to-peak inductor ripple current
6.	BOM Count	12	General	Total Design BOM count
7.	FootPrint	448.0 mm²	General	Total Foot Print Area of BOM components
8.	Frequency	561.986 kHz	General	Switching frequency
9.	Mode	CCM	General	Conduction Mode
10.	Pout	72.0 W	General	Total output power
11.	Total BOM	\$3.6	General	Total BOM Cost
12.	ICThetaJA Effective	26.0 degC/W	Op_Point	Effective IC Junction-to-Ambient Thermal Resistance
13.	Low Freq Gain	85.059 dB	Op_Point	Gain at 10Hz
14.	Vout Actual	18.004 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
15.	Vout OP	18.0 V	Op_Point	Operational Output Voltage
16.	Cross Freq	49.163 kHz	Op_point	Bode plot crossover frequency
17.	Duty Cycle	46.378 %	Op_point	Duty cycle
18.	Efficiency	94.752 %	Op_point	Steady state efficiency
19.	Gain Marg	-24.067 dB	Op_point	Bode Plot Gain Margin
20.	IC Tj	103.7 degC	Op_point	IC junction temperature

#	Name	Value	Category	Description
21.	IOUT_OP	4.0 A	Op_point	Iout operating point
22.	Phase Marg	51.371 deg	Op_point	Bode Plot Phase Margin
23.	VIN_OP	40.0 V	Op_point	Vin operating point
24.	Vout p-p	36.311 mV	Op_point	Peak-to-peak output ripple voltage
25.	Cin Pd	5.41 mW	Power	Input capacitor power dissipation
26.	Cout Pd	3.662 mW	Power	Output capacitor power dissipation
27.	Diode Pd	1.641 W	Power	Diode power dissipation
28.	IC Pd	1.873 W	Power	IC power dissipation
29.	L Pd	464.64 mW	Power	Inductor power dissipation
30.	Total Pd	3.988 W	Power	Total Power Dissipation
31.	Vout Tolerance	2.95 %	Unknown	Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Assistance

1. **TPS54560** Product Folder : <http://www.ti.com/product/TPS54560> : contains the data sheet and other resources.

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