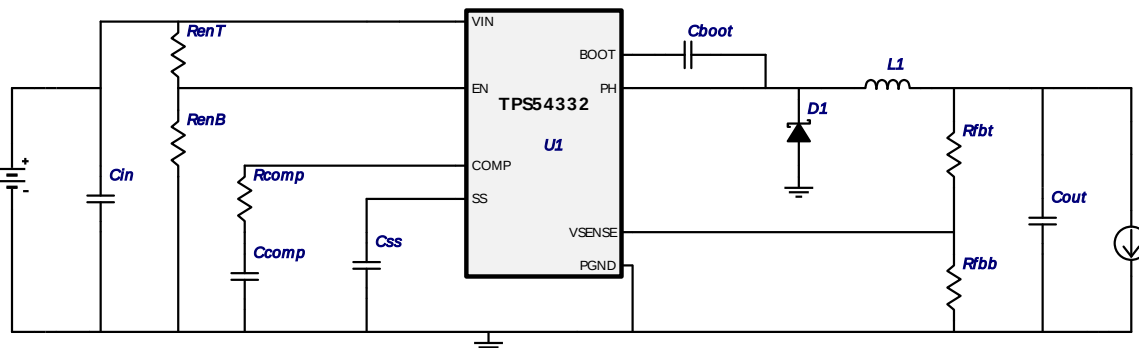


WEBENCH® Design Report

Design : 1246334/1 TPS54332DDA
TPS54332DDA 18.0V-20.0V to 5.0V @ 3.0A



Electrical BOM

#	Name	Manufacturer	Part Number	Quantity	Price	Properties	Footprint
1.	Cboot	MuRata	GRM155R61A224KE19D Series= X5R	1	\$0.01	Cap= 220.0 nF ESR= 0.0 Ohm VDC= 10.0 V IRMS= 0.0 A	0402 8mm2
2.	Ccomp	Yageo America	CC0805KRX7R9BB681 Series= X7R	1	\$0.01	Cap= 680.0 pF ESR= 0.0 Ohm VDC= 50.0 V IRMS= 0.0 A	0805 13mm2
3.	Cin	TDK	C5750X7R1H106M Series= X7R	1	\$0.68	Cap= 10.0 µF ESR= 3.0 mOhm VDC= 50.0 V IRMS= 5.5 A	2220 60mm2
4.	Cout	Kemet	C0805C106K8PACTU Series= X5R	2	\$0.05	Cap= 10.0 µF ESR= 3.0 mOhm VDC= 10.0 V IRMS= 11.43 A	0805 13mm2
5.	Css	MuRata	GRM155R71E822KA01D Series= X7R	1	\$0.01	Cap= 8.2 nF ESR= 0.0 Ohm VDC= 25.0 V IRMS= 0.0 A	0402 8mm2
6.	D1	Diodes Inc.	B340LB-13-F	1	\$0.14	VF@Io= 450.0 mV VRRM= 40.0 V	SMB 44mm2
7.	L1	Coilcraft	MSS1048-472NLB	1	\$0.47	L= 4.7 µH DCR= 10.0 mOhm	MSS1048 146mm2
8.	Rcomp	Vishay-Dale	CRCW040243K2FKED Series= CRCW..e3	1	\$0.01	Res= 43.2 kOhm Power= 63.0 mW Tolerance= 1.0%	0402 8mm2
9.	RenB	Vishay-Dale	CRCW04028K87FKED Series= CRCW..e3	1	\$0.01	Res= 8.87 kOhm Power= 63.0 mW Tolerance= 1.0%	0402 8mm2
10.	RenT	Vishay-Dale	CRCW0402105KFKED Series= CRCW..e3	1	\$0.01	Res= 105.0 kOhm Power= 63.0 mW Tolerance= 1.0%	0402 8mm2

#	Name	Manufacturer	Part Number	Quantity	Price	Properties	Footprint
11.	Rfbb	Vishay-Dale	CRCW080511K8FKEA Series= CRCW..e3	1	\$0.01	Res= 11.8 kOhm Power= 125.0 mW Tolerance= 1.0%	 0805 13mm2
12.	Rfbt	Susumu Co Ltd	RR1220P-623-D Series= 264	1	\$0.01	Res= 62.0 kOhm Power= 100.0 mW Tolerance= 0.5%	 0805 13mm2
13.	U1	Texas Instruments	TPS54332DDA	1	\$1.70	Switcher	 R-PDSO-G8 57mm2

Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	1.303 A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	247.479 m A	Current	Output capacitor RMS ripple current
3.	IC Ipk	3.429 A	Current	Peak switch current in IC
4.	Iin Avg	851.2 m A	Current	Average input current
5.	L Ipp	857.293 m A	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	1.555 A	Current	Q lavg
7.	BOM Count	14.0	General	Total Design BOM count
8.	FootPrint	410.0 mm2	General	Total Foot Print Area of BOM components
9.	Frequency	1000.0 k Hz	General	Switching frequency
10.	IC Tolerance	28.0 m V	General	IC Feedback Tolerance
11.	M Vds Act	161.009 m V	General	
12.	Mode	CCM	General	Conduction Mode
13.	Pout	15.0 W	General	Total output power
14.	Total BOM	\$3.17	General	Total BOM Cost
15.	D1 Tj	118.863 degC	Op_Point	D1 junction temperature
16.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
17.	Duty Cycle	26.862 %	Op_point	Duty cycle
18.	Efficiency	88.11 %	Op_point	Steady state efficiency
19.	IC Tj	76.627 degC	Op_point	IC junction temperature
20.	ICThetaJA	50.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
21.	IOUT_OP	3.0 A	Op_point	Iout operating point
22.	VIN_OP	20.0 V	Op_point	Vin operating point
23.	Vout p-p	5.51 m V	Op_point	Peak-to-peak output ripple voltage
24.	Cin Pd	5.091 m W	Power	Input capacitor power dissipation
25.	Cout Pd	91.869 μ W	Power	Output capacitor power dissipation
26.	Diode Pd	987.365 m W	Power	Diode power dissipation
27.	IC Pd	932.546 m W	Power	IC power dissipation
28.	L Pd	99.0 m W	Power	Inductor power dissipation
29.	Total Pd	2.024 W	Power	Total Power Dissipation
30.	Input Load Capacitance	10.0 μ F	Unknown	Input load capacitance seen by upstream circuit

Design Inputs

#	Name	Value	Description
1.	Iout	3.0 A	Maximum Output Current
2.	Iout1	3.0 Amps	Output Current #1
3.	SoftStart	3.0 ms	Soft Start Time (ms)
4.	VinMax	20.0 V	Maximum input voltage
5.	VinMin	18.0 V	Minimum input voltage
6.	Vout	5.0 V	Output Voltage
7.	Vout1	5.0 Volt	Output Voltage #1
8.	base_pn	TPS54332	National Based Product Number
9.	Ta	30.0 degC	Ambient temperature

Design Assistance

1. **TPS54332** Product Folder : <http://www.national.com/pfhttp://www.ti.com/product/tps54332> : contains the data sheet and other resources.

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