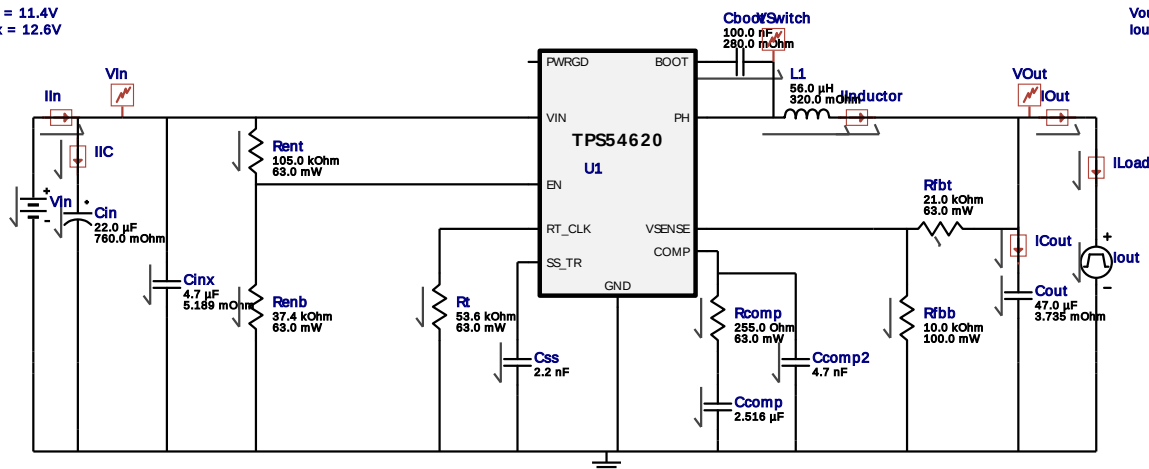


WEBENCH® Electrical Simulation Report

VinMin = 11.4V
VinMax = 12.6V

Vout = 2.5V
Iout = 0.3A



My Comments

No comments

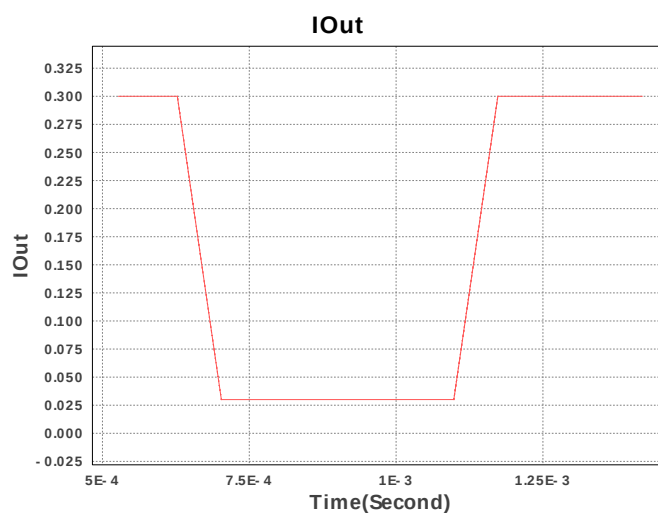
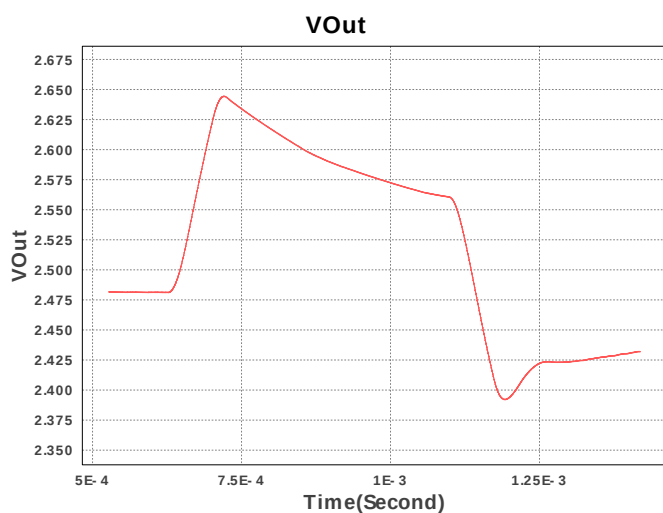
Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cboot	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
2.	Ccomp	CUSTOM	CUSTOM Series= ?	Cap= 2.516 uF VDC= 0.0 V IRMS= 0.0 A	1	NA	CUSTOM 0 mm ²
3.	Ccomp2	TDK	C2012C0G1H472J060AA Series= COG/NPO	Cap= 4.7 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.04	0805 7 mm ²
4.	Cin	Nichicon	UUD1V220MCL1GS Series= uD	Cap= 22.0 uF ESR= 760.0 mOhm VDC= 35.0 V IRMS= 150.0 mA	1	\$0.10	SM_RADIAL_5MM 58 mm ²
5.	Cinx	MuRata	GRM21BR61E475KA12L Series= X5R	Cap= 4.7 uF ESR= 5.189 mOhm VDC= 25.0 V IRMS= 2.035 A	1	\$0.03	0805 7 mm ²
6.	Cout	MuRata	GRM31CR60J476KE19L Series= X5R	Cap= 47.0 uF ESR= 3.735 mOhm VDC= 6.3 V IRMS= 4.091 A	1	\$0.11	1206_190 11 mm ²
7.	Css	MuRata	GRM1885C1H222JA01J Series= COG/NPO	Cap= 2.2 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0603 5 mm ²
8.	L1	Bourns	SRR4028-560Y	L= 56.0 uH DCR= 320.0 mOhm	1	\$0.29	SRR4028 34 mm ²
9.	Rcomp	Vishay-Dale	CRCW0402255RKFED Series= CRCW..e3	Res= 255.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
10.	Renb	Vishay-Dale	CRCW040237K4FKED Series= CRCW..e3	Res= 37.4 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
11.	Rent	Vishay-Dale	CRCW0402105KFKED Series= CRCW..e3	Res= 105.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
12.	Rfbb	Susumu Co Ltd	RR1220P-103-D Series= RR12	Res= 10.0 kOhm Power= 100.0 mW Tolerance= 0.5%	1	\$0.01	0805 7 mm ²
13.	Rfbt	Vishay-Dale	CRCW040221K0FKED Series= CRCW..e3	Res= 21.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
14.	Rt	Vishay-Dale	CRCW040253K6FKED Series= CRCW..e3	Res= 53.6 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
15.	U1	Texas Instruments	TPS54620RHLR	Switcher	1	\$1.99	S-PVQFN-N14 22 mm ²

Simulation Parameters

#	Name	Parameter Name	Description	Values
1.	Cboot	IC	Initial Voltage	12.0 V
2.	Cout	IC	Initial Voltage	2.5 V
3.	Css	IC	Initial Voltage	1.5 V
4.	L1	IC	Initial Current	0.3 A
5.	Iout	signal_type	Signal Type	PULSE
		I1	Initial Current	0.3 A
		I2	Peak Current	0.03 A
		Td	Initial Delay Time	6.274825939535225E-4 Sec
		Tr	Rise Time	75u Sec
		Tf	Fall Time	75u Sec
		Pw	Pulse Width	3.957665813238802E-4 Sec



Design Inputs

#	Name	Value	Description
1.	Iout	300.0 mA	Maximum Output Current
2.	VinMax	12.6 V	Maximum input voltage
3.	VinMin	11.4 V	Minimum input voltage
4.	Vout	2.5 V	Output Voltage
5.	base_pn	TPS54620	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0 degC	Ambient temperature

Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	121.87 mA	Current	Input capacitor RMS ripple current

#	Name	Value	Category	Description
2.	Cout IRMS	12.321 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	321.34 mA	Current	Peak switch current in IC
4.	Iin Avg	90.09 mA	Current	Average input current
5.	L Ipp	42.681 mA	Current	Peak-to-peak inductor ripple current
6.	M Irms	136.984 mA	Current	MOSFET RMS current
7.	BOM Count	15	General	Total Design BOM count
8.	FootPrint	176.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	881.052 kHz	General	Switching frequency
10.	IC Tolerance	8.0 mV	General	IC Feedback Tolerance
11.	Mode	CCM	General	Conduction Mode
12.	Pout	750.0 mW	General	Total output power
13.	Total BOM	\$0.0	General	Total BOM Cost
14.	Cross Freq	5.598 kHz	Op Point	Bode plot crossover frequency
15.	Duty Cycle	20.85 %	Op Point	Duty cycle
16.	Efficiency	66.071 %	Op Point	Steady state efficiency
17.	Gain Marg	-27.54 dB	Op Point	Bode Plot Gain Margin
18.	IC Tj	40.811 degC	Op Point	IC junction temperature
19.	ICThetaJA	32.0 degC/W	Op Point	IC junction-to-ambient thermal resistance
20.	IOUT_OP	300.0 mA	Op Point	Iout operating point
21.	Low Freq Gain	52.993 dB	Op Point	Gain at 1Hz
22.	Phase Marg	60.704 deg	Op Point	Bode Plot Phase Margin
23.	VIN_OP	12.6 V	Op Point	Vin operating point
24.	Vout Actual	2.48 V	Op Point	Vout Actual calculated based on selected voltage divider resistors
25.	Vout OP	2.5 V	Op Point	Operational Output Voltage
26.	Vout Tolerance	2.031 %	Op Point	Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable
27.	Vout p-p	350.389 μ V	Op Point	Peak-to-peak output ripple voltage
28.	Cin Pd	11.288 mW	Power	Input capacitor power dissipation
29.	Cout Pd	566.982 nW	Power	Output capacitor power dissipation
30.	IC Iq Pd	7.56 mW	Power	IC Iq Pd
31.	IC Pd	337.85 mW	Power	IC power dissipation
32.	L Pd	36.0 mW	Power	Inductor power dissipation
33.	Total Pd	385.14 mW	Power	Total Power Dissipation

Design Assistance

1. TPS54620 Product Folder : <http://www.ti.com/product/TPS54620> : contains the data sheet and other resources.

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