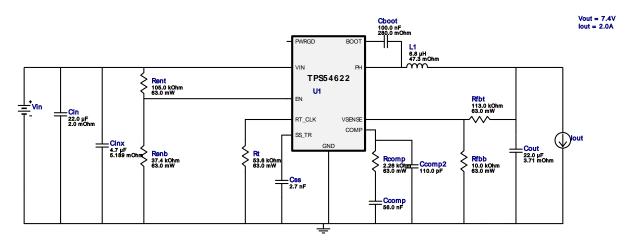


VinMin = 12.0V VinMax = 14.0V Vout = 7.4V lout = 2.0A Device = TPS54622RHLR Topology = Buck Created = 3/27/17 6:11:39 AM BOM Cost = \$2.51 BOM Count = 15 Total Pd = 0.94W

WEBENCH® Design Report

Design: 957852/95 TPS54622RHLR TPS54622RHLR 12.0V-14.0V to 7.40V @ 2.0A



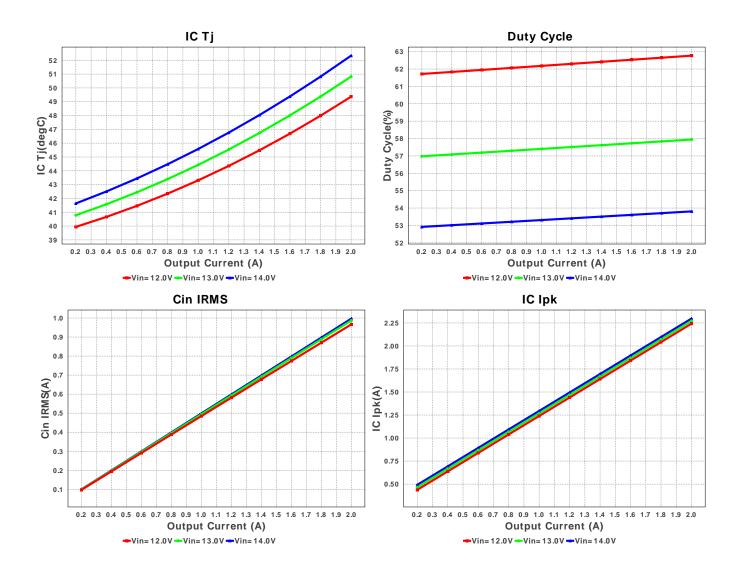
My Comments

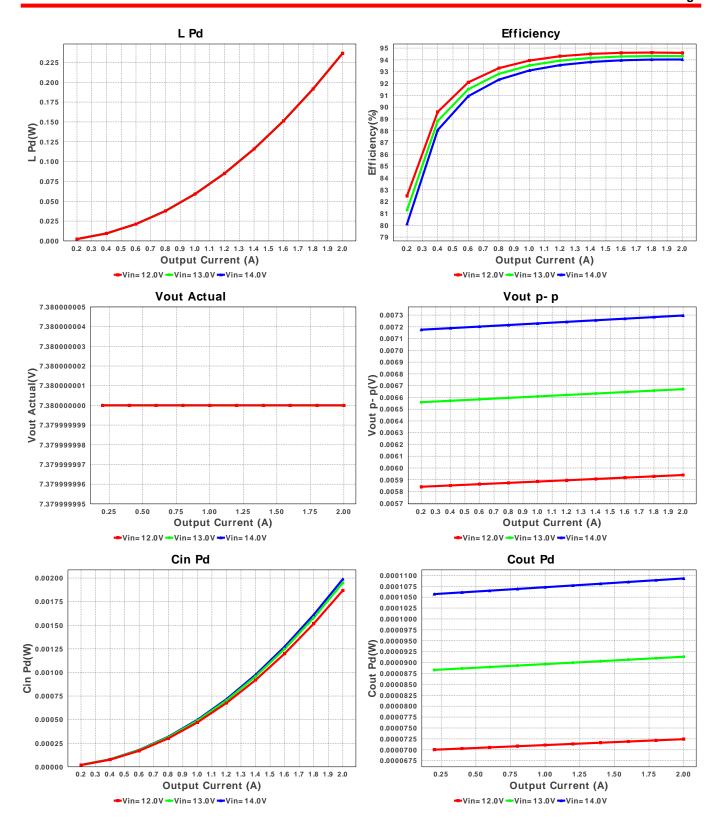
No comments

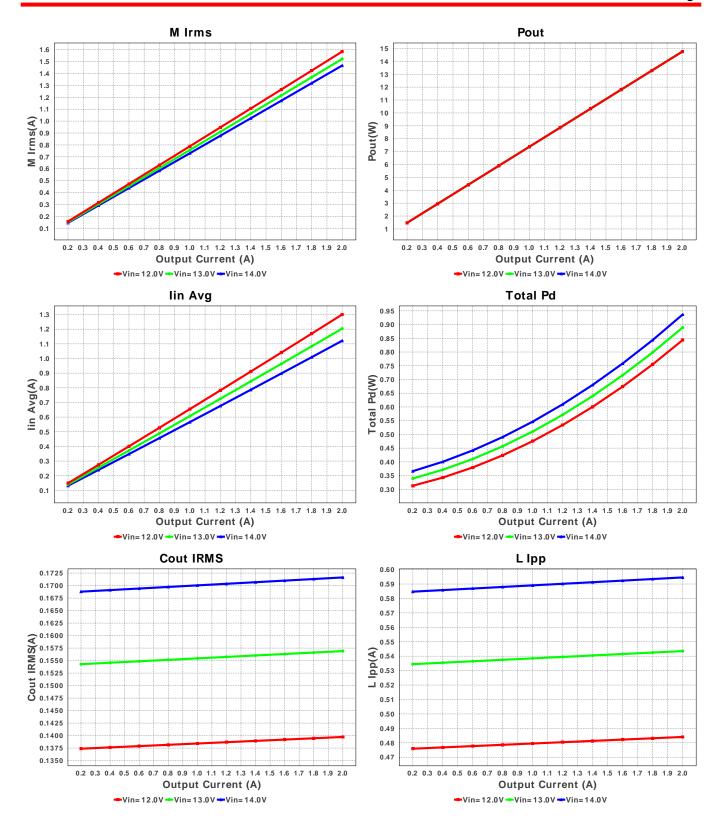
Electrical BOM

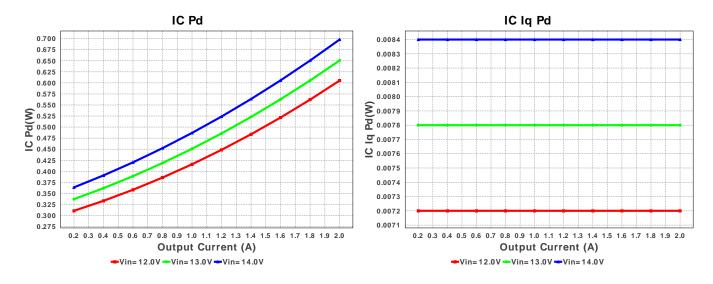
#_	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
	Cboot	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
2.	Ccomp	MuRata	GRM155R61A563KA01D Series= X5R	Cap= 56.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
3.	Ccomp2	Samsung Electro- Mechanics	CL21C111JBANNNC Series= C0G/NP0	Cap= 110.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
	Cin	MuRata	GRM32ER61E226KE15L Series= X5R	Cap= 22.0 uF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 3.67 A	1	\$0.17	1210 15 mm ²
	Cinx	MuRata	GRM21BR61E475KA12L Series= X5R	Cap= 4.7 uF ESR= 5.189 mOhm VDC= 25.0 V IRMS= 2.03531 A	1	\$0.02	0805 7 mm ²
	Cout	TDK	C1608X5R1A226M080AC Series= X5R	Cap= 22.0 uF ESR= 3.71 mOhm VDC= 10.0 V IRMS= 2.69936 A	1	\$0.11	0603 5 mm ²
	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
i.	L1	Bourns	SRN6045-6R8Y	L= 6.8 μH DCR= 47.3 mOhm	1	\$0.16	SRN6045 64 mm ²
9.	Rcomp	Vishay-Dale	CRCW04022K26FKED Series= CRCWe3	Res= 2.26 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

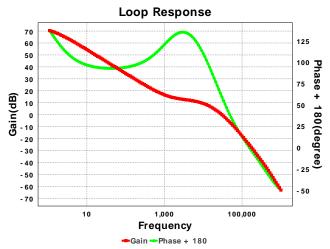
# Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10. Renb	Vishay-Dale	CRCW040237K4FKED Series= CRCWe3	Res= 37.4 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
11. Rent	Vishay-Dale	CRCW0402105KFKED Series= CRCWe3	Res= 105.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
12. Rfbb	Vishay-Dale	CRCW040210K0FKED Series= CRCWe3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
13. Rfbt	Vishay-Dale	CRCW0402113KFKED Series= CRCWe3	Res= 113.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
14. Rt	Vishay-Dale	CRCW040253K6FKED Series= CRCWe3	Res= 53.6 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
15. U1	Texas Instruments	TPS54622RHLR	Switcher	1	\$1.95	S-PVQFN-N14 22 mm ²











Operating Values

Ope	Operating values					
#	Name	Value	Category	Description		
1.	Cin IRMS	996.873 mA	Current	Input capacitor RMS ripple current		
2.	Cout IRMS	171.571 mA	Current	Output capacitor RMS ripple current		
3.	IC lpk	2.297 A	Current	Peak switch current in IC		
4.	lin Avg	1.124 A	Current	Average input current		
5.	L lpp	594.34 mA	Current	Peak-to-peak inductor ripple current		
6.	M1 Irms	1.469 A	Current	Q lavg		
7.	BOM Count	15	General	Total Design BOM count		
8.	FootPrint	153.0 mm ²	General	Total Foot Print Area of BOM components		
9.	Frequency	881.052 kHz	General	Switching frequency		
10.	IC Tolerance	10.0 mV	General	IC Feedback Tolerance		
11.	Mode	CCM	General	Conduction Mode		
12.	Pout	14.8 W	General	Total output power		
13.	Total BOM	\$2.51	General	Total BOM Cost		
14.	Low Freq Gain	70.322 dB	Op_Point	Gain at 10Hz		
15.	Vout Actual	7.38 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors		
16.	Vout OP	7.4 V	Op_Point	Operational Output Voltage		
17.	Cross Freq	30.142 kHz	Op_point	Bode plot crossover frequency		
18.	Duty Cycle	53.951 %	Op_point	Duty cycle		
19.	Efficiency	94.048 %	Op_point	Steady state efficiency		
20.	Gain Marg	-25.613 dB	Op_point	Bode Plot Gain Margin		
21.	IC Tj	52.337 degC	Op_point	IC junction temperature		
22.	ICThetaJA	32.0 degC/W	Op_point	IC junction-to-ambient thermal resistance		
23.	IOUT_OP	2.0 A	Op_point	lout operating point		
24.	Phase Marg	59.978 deg	Op_point	Bode Plot Phase Margin		
25.	VIN_OP	14.0 V	Op_point	Vin operating point		
26.	Vout p-p	7.301 mV	Op_point	Peak-to-peak output ripple voltage		
27.	Cin Pd	1.988 mW	Power	Input capacitor power dissipation		
28.	Cout Pd	109.21 μW	Power	Output capacitor power dissipation		
29.	•	8.4 mW	Power	IC Iq Pd		
30.	IC Pd	698.019 mW	Power	IC power dissipation		
31.	L Pd	236.5 mW	Power	Inductor power dissipation		

#	Name	Value	Category	Description
32.	Total Pd	936.607 mW	Power	Total Power Dissipation
33.	Vout Tolerance	3.554 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	lout	2.0	Maximum Output Current
2.	VinMax	14.0	Maximum input voltage
3.	VinMin	12.0	Minimum input voltage
4.	Vout	7.4	Output Voltage
5.	base_pn	TPS54622	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. TPS54622 Product Folder: http://www.ti.com/product/TPS54622: contains the data sheet and other resources.

Texas Instruments' WEBENCH simulation tools attempt to recreate the performance of a substantially equivalent physical implementation of the design. Simulations are created using Texas Instruments' published specifications as well as the published specifications of other device manufacturers. While Texas Instruments does update this information periodically, this information may not be current at the time the simulation is built. Texas Instruments does not warrant the accuracy or completeness of the specifications or any information contained therein. Texas Instruments does not warrant that any designs or recommended parts will meet the specifications you entered, will be suitable for your application or fit for any particular purpose, or will operate as shown in the simulation in a physical implementation. Texas Instruments does not warrant that the designs are production worthy.

You should completely validate and test your design implementation to confirm the system functionality for your application prior to production.

Use of Texas Instruments' WEBENCH simulation tools is subject to Texas Instruments' Site Terms and Conditions of Use. Prototype boards based on WEBENCH created designs are provided AS IS without warranty of any kind for evaluation and testing purposes and are subject to the terms of the Evaluation License Agreement.