

WEBENCH® Power Architect

Project Report

Project : 3496425/4 : PA_Project_302 (modified from 301)
 Created : 2016-07-19 01:09:54.019
 Optimize project optFactor=3

Project Summary

1. Total System Efficiency	92.479 %
2. Total System BOM Count	7.0
3. Total System Footprint	113.0 mm2
4. Total System BOM Cost	\$0.89
5. Total System Power Dissipation	609.9 mW

--> Launch WEBENCH Power Architect.

Sequencer Flag Table

Supply	Sequencer Flag	Load	Load Name
SUPPLY_1	0	LOAD_1	LOAD #1

Power Supplies

#	Name	NSID	Description	Vout	Iout	Efficiency	Foot-print	Cost	Design	Page
1.	SUPPLY_1	TPS562200	Switcher : 17V, 2A,6-pin, Low Iq Synchronous buck converter with Advanced Eco-mode	5 V	1.5 A	92.5%	113	\$0.89	30	4

Power Loads

#	Name	VLoad	ILoad	Description
1.	LOAD #1	5 V	1.5 A	VoutRipple=5%, SoftStart delay=50.0 µSec

Project Diagram

WEBENCH® Power Architect Project ID : 4 PA_Project_302 (modified from 301) Power Architect 2016-07-19 01:09:54.019



Electrical Procurement BOM

Manufacturer	Part Number	Description	Quantity	Budgetary Price	Footprint (mm ²)
AVX	08053C104KAT2A	0805	1	\$0.01	7
Vishay-Dale	CRCW040210K0FKED	0402	1	\$0.01	3
Vishay-Dale	CRCW040256K2FKED	0402	1	\$0.01	3
MuRata	GRM31CR61A226KE19L	1206_190	1	\$0.07	11
MuRata	GRM32ER61E226KE15L	1210	1	\$0.16	15
Bourns	SRN6045-4R7Y	SRN6045	1	\$0.16	64
Texas Instruments	TPS562200DDCR	DDC0006A	1	\$0.47	10
Total			7	\$0.89	112.8375

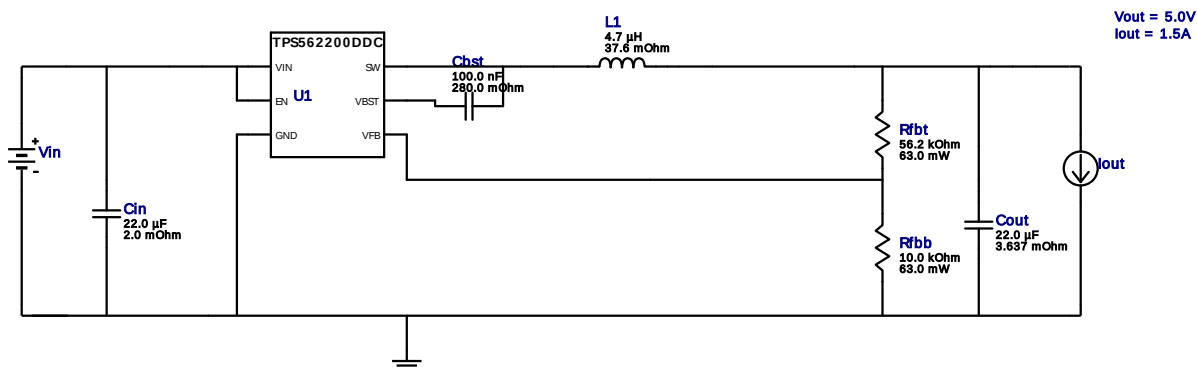


Vout = 5.0V
Iout = 1.5A

Device = TPS562200DDCR
Topology = Buck
Created = 7/19/16 1:09:53 AM
BOM Cost = \$0.89
BOM Count = 7
Total Pd = 0.61W

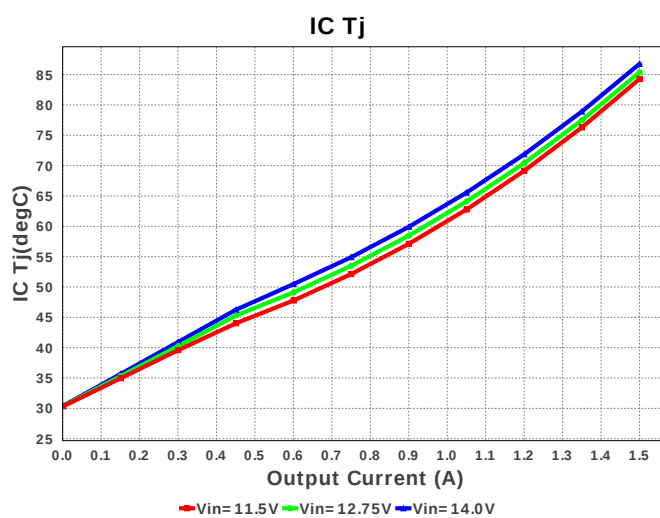
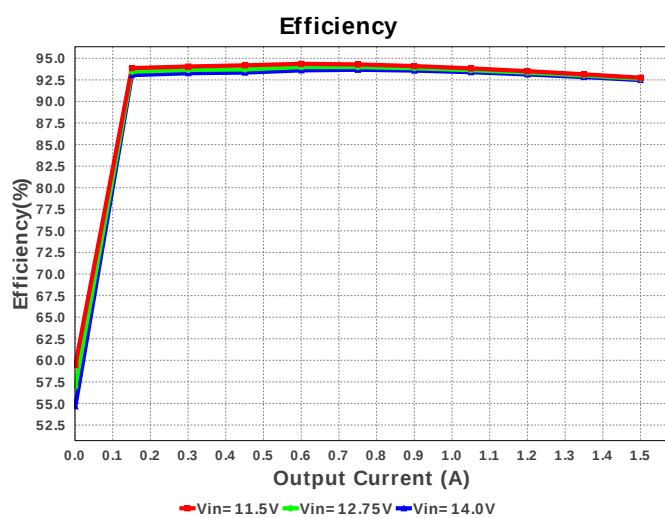
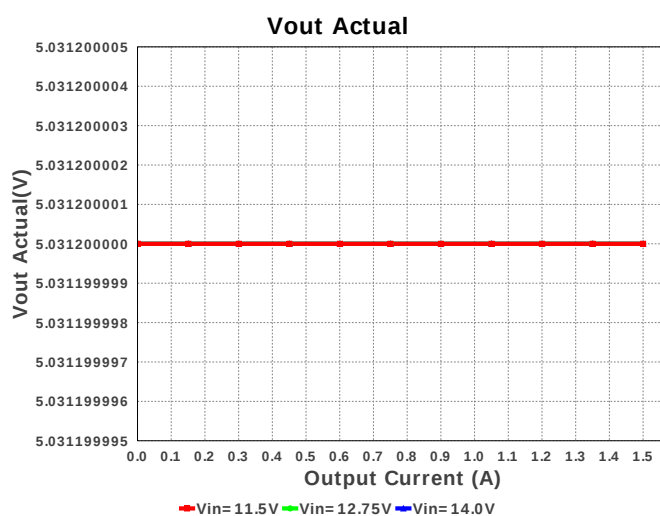
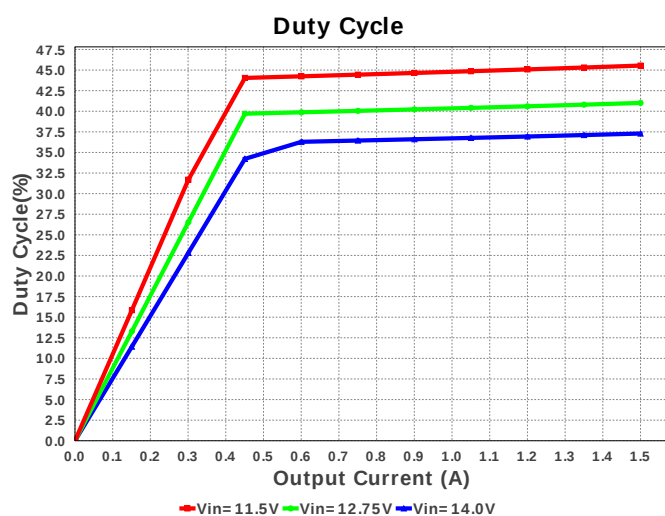
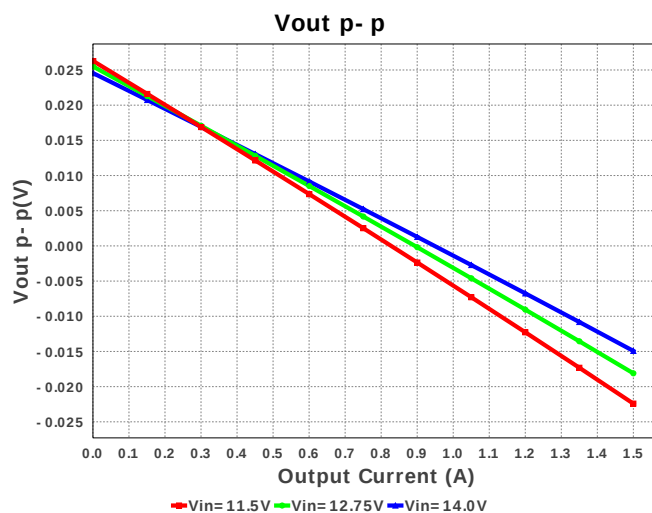
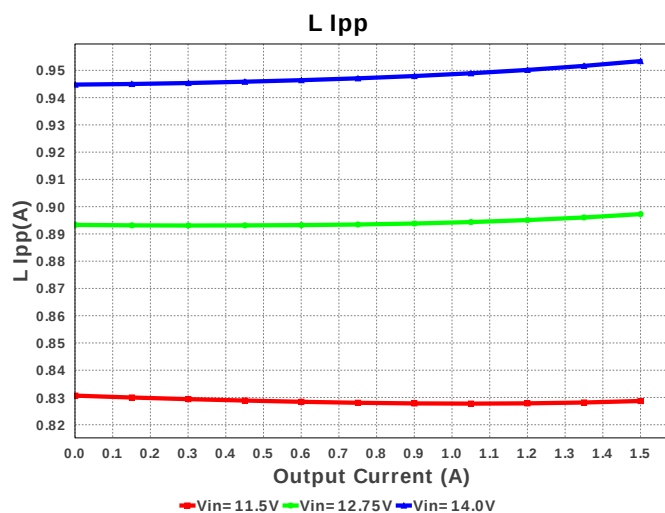
WEBENCH® Design Report

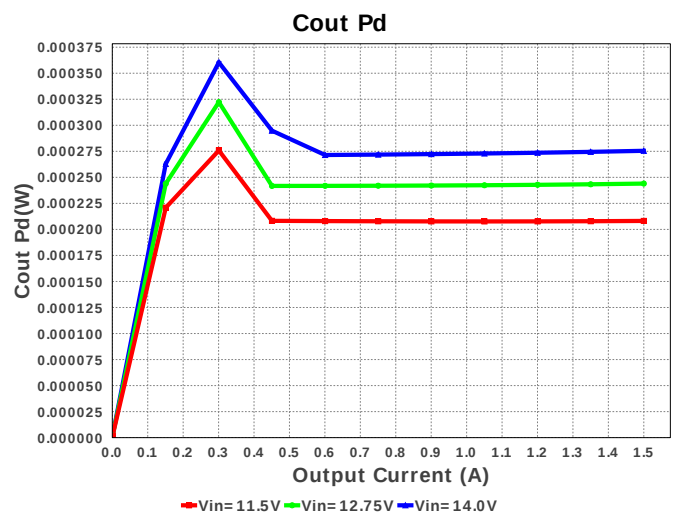
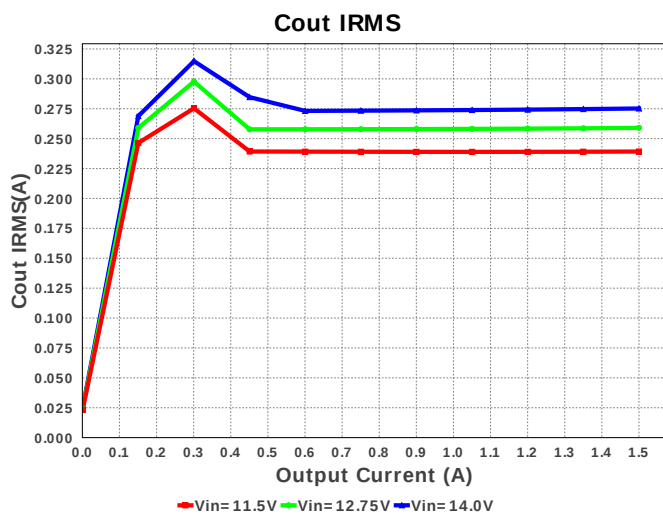
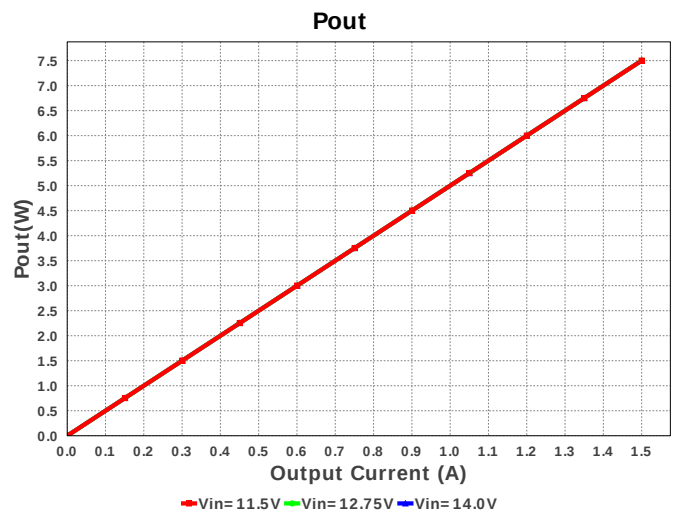
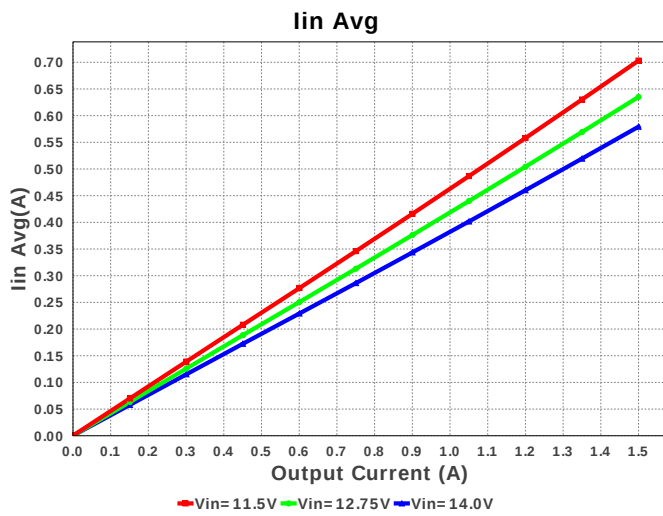
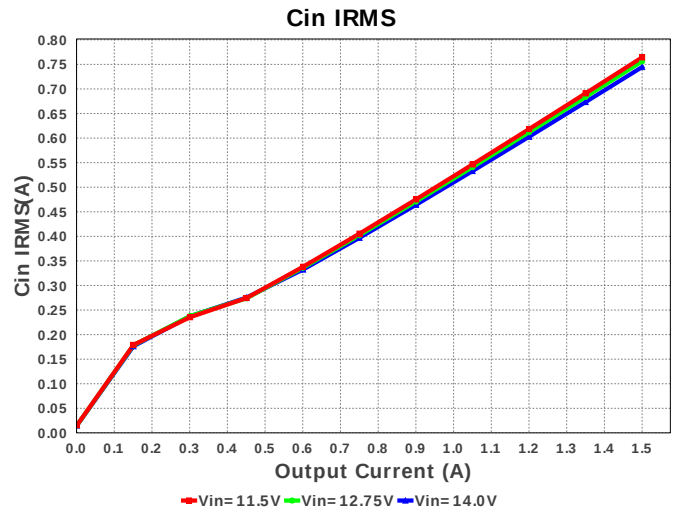
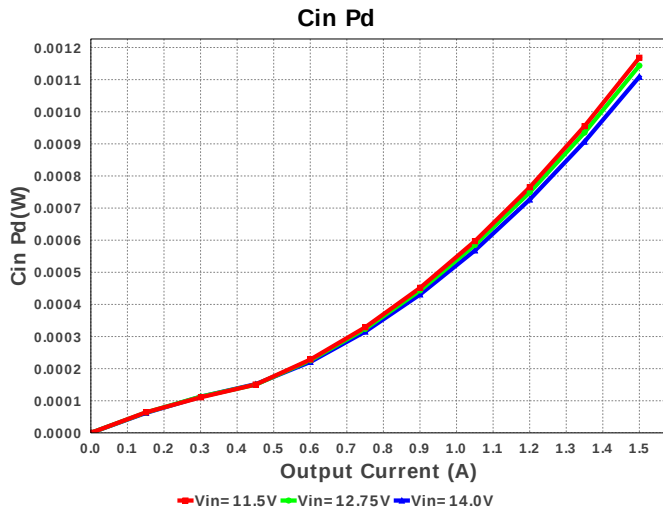
Design : 3496425/30 TPS562200DDCR
TPS562200DDCR 11.5V-14.0V to 5.00V @ 1.5A

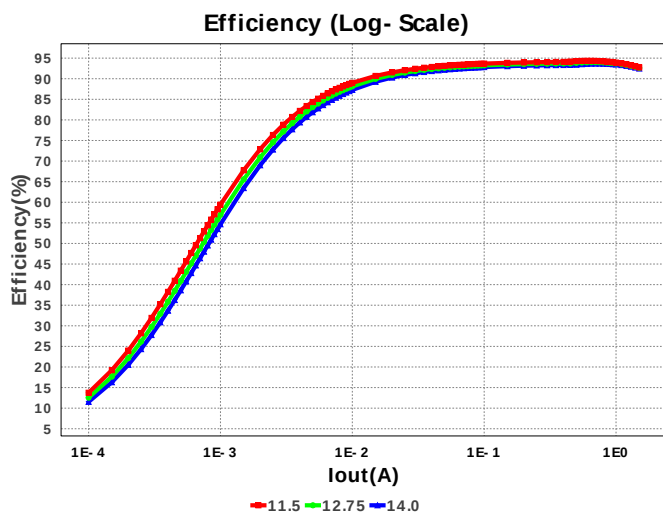
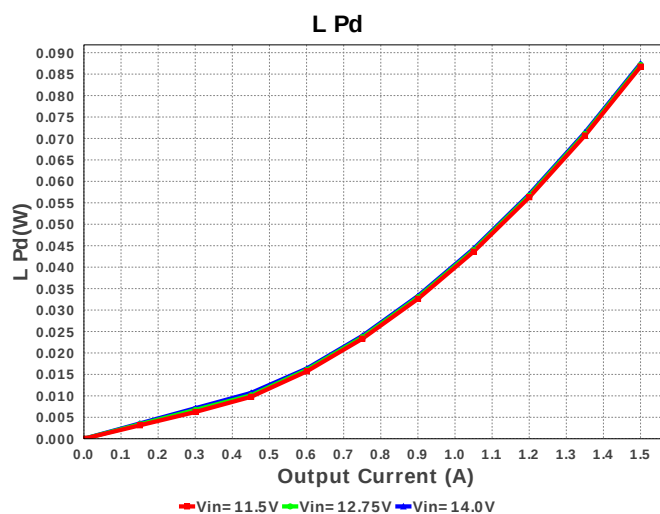
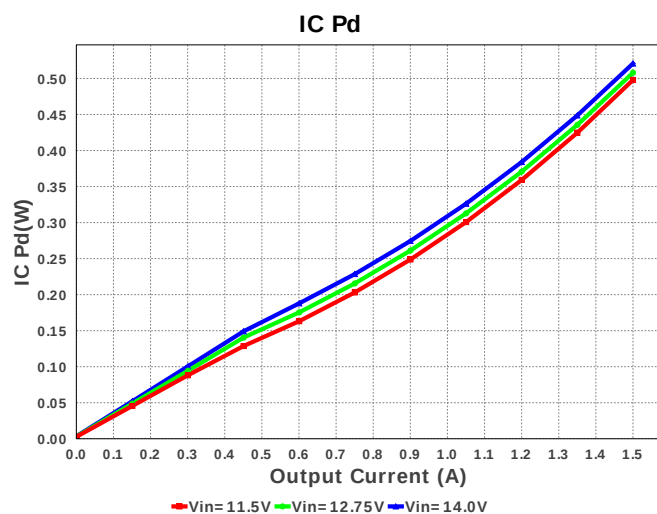
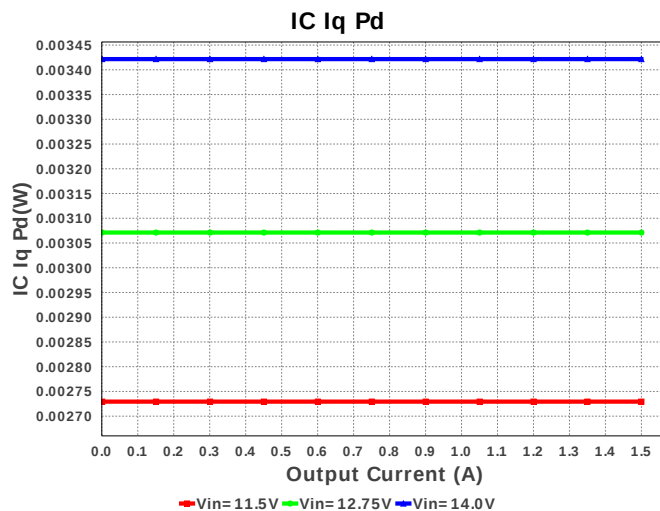
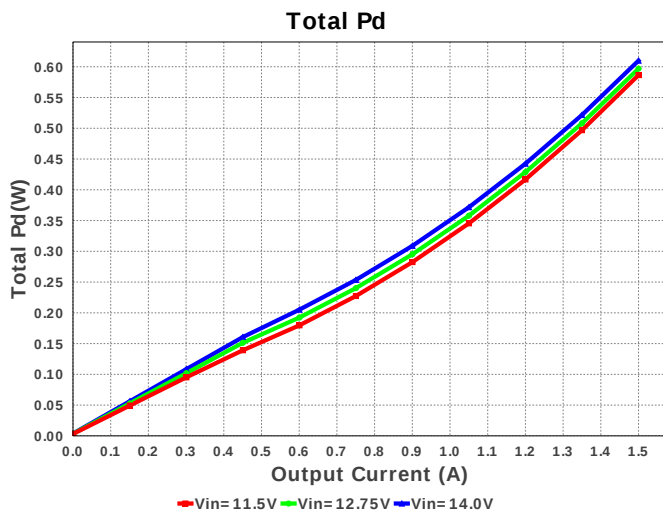


Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	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.	Cin	MuRata	GRM32ER61E226KE15L Series= X5R	Cap= 22.0 uF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 3.67 A	1	\$0.16	1210 15 mm ²
3.	Cout	MuRata	GRM31CR61A226KE19L Series= X5R	Cap= 22.0 uF ESR= 3.637 mOhm VDC= 10.0 V IRMS= 3.56456 A	1	\$0.07	1206_190 11 mm ²
4.	L1	Bourns	SRN6045-4R7Y	L= 4.7 uH DCR= 37.6 mOhm	1	\$0.16	SRN6045 64 mm ²
5.	Rfbb	Vishay-Dale	CRCW040210K0FKED Series= CRCW...e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
6.	Rfht	Vishay-Dale	CRCW040256K2FKED Series= CRCW...e3	Res= 56.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
7.	U1	Texas Instruments	TPS562200DDCR	Switcher	1	\$0.47	DDC0006A 10 mm ²







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	744.604 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	275.222 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	579.28 mA	Current	Average input current
4.	L Ipp	953.4 mA	Current	Peak-to-peak inductor ripple current
5.	BOM Count	7	General	Total Design BOM count
6.	FootPrint	113.0 mm ²	General	Total Foot Print Area of BOM components
7.	Frequency	719.739 kHz	General	Switching frequency
8.	Pout	7.5 W	General	Total output power
9.	Total BOM	\$0.89	General	Total BOM Cost
10.	Vout Actual	5.031 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
11.	Vout OP	5.0 V	Op_Point	Operational Output Voltage

#	Name	Value	Category	Description
12.	Duty Cycle	37.295 %	Op_point	Duty cycle
13.	Efficiency	92.479 %	Op_point	Steady state efficiency
14.	IC Tj	86.763 degC	Op_point	IC junction temperature
15.	ICThetaJA	109.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
16.	IOUT_OP	1.5 A	Op_point	Iout operating point
17.	VIN_OP	14.0 V	Op_point	Vin operating point
18.	Vout p-p	9.094 mV	Op_point	Peak-to-peak output ripple voltage
19.	Cin Pd	1.109 mW	Power	Input capacitor power dissipation
20.	Cout Pd	275.493 µW	Power	Output capacitor power dissipation
21.	IC Iq Pd	3.422 mW	Power	IC Iq Pd
22.	IC Pd	520.766 mW	Power	IC power dissipation
23.	L Pd	87.448 mW	Power	Inductor power dissipation
24.	Total Pd	609.947 mW	Power	Total Power Dissipation
25.	Vout Tolerance	3.053 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	1.5	Maximum Output Current
2.	SoftStart	0.05 ms	Soft Start Time (ms)
3.	VinMax	14.0	Maximum input voltage
4.	VinMin	11.5	Minimum input voltage
5.	Vout	5.0	Output Voltage
6.	base_pn	TPS562200	Texas Instruments Base Part Number
7.	source	DC	Input Source Type
8.	ta	30.0	Ambient temperature

Design Assistance

1. TPS562200 Product Folder : <http://www.ti.com/product/TPS562200> : contains the data sheet and other resources.

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