

WEBENCH® Power Architect

Project Report

Project : 3989908/2 : PA_Project_304 (modified from 303)

Created : 2015-08-05 22:42:16.050

Optimize project optFactor=3

Project Summary

1. Total System Efficiency	69.998 %
2. Total System BOM Count	7.0
3. Total System Footprint	45.0 mm ²
4. Total System BOM Cost	\$0.72
5. Total System Power Dissipation	500.0 μW

--> Launch WEBENCH Power Architect.

Power Supplies

#	Name	NSID	Description	Vout	Iout	Efficiency	Foot-print	Cost	Design	Page
1.	SUPPLY_1	TPS62122	Switcher : 2V-15V,75mA, Buck Converter with DCS-Control	3 V	0.0 A	70%	45	\$0.72	25	4

Power Loads

#	Name	VLoad	ILoad	Description
1.	MSP430F5131_VCC	3 V	0.0004 A	VoutRipple=10%

FPGAs, Processors

#	Manufacturer	Part Number	Name	Series	Description
1.	Texas Instruments	MSP430F5131	FPGA_1	MSP430F5xx	FPGA Texas Instruments MSP430F5xx MSP430F5131

<http://www.ti.com/lit/ds/symlink/msp430f5131.pdf>

Project Diagram



Electrical Procurement BOM

Manufacturer	Part Number	Description	Quantity	Budgetary Price	Footprint (mm ²)
Taiyo Yuden	CBC2012T220M	CBC2012	1	\$0.08	8
Samsung Electro-Mechanics	CL21C130JBANNNC	0805	1	\$0.01	7
Vishay-Dale	CRCW0402499KFKED	0402	1	\$0.01	3
MuRata	GRM188R60J475ME19D	0603	1	\$0.02	5
MuRata	GRM21BR61E475KA12L	0805	1	\$0.03	7
Susumu Co Ltd	RR1220P-184-D	0805	1	\$0.01	7
Texas Instruments	TPS62122DRVR	S- PWSO- N6	1	\$0.56	9
Total			7	\$0.72	46

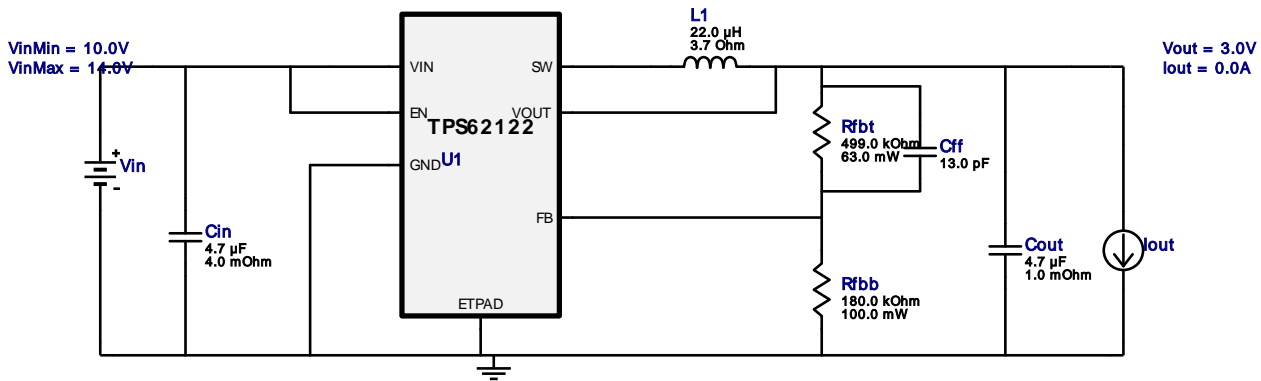


VinMin = 10.0V
 VinMax = 14.0V
 Vout = 3.0V
 Iout = 0.0A

Device = TPS62122DRVR
 Topology = Buck
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 BOM Cost = \$0.72
 Footprint = 45.0 mm²
 BOM Count = 7
 Total Pd = 0.0W

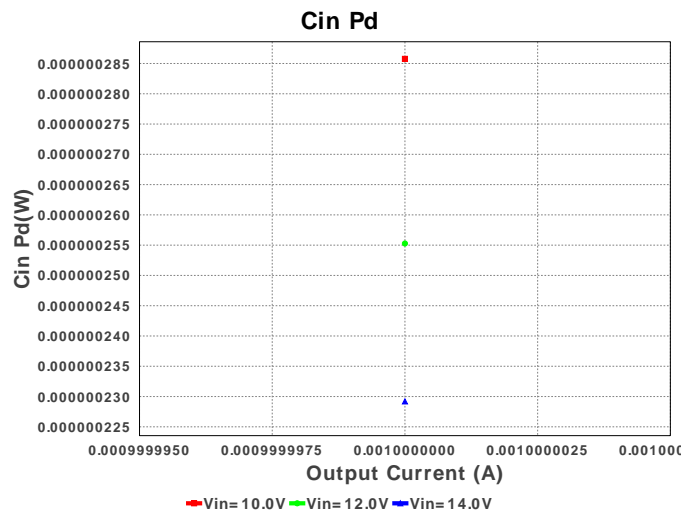
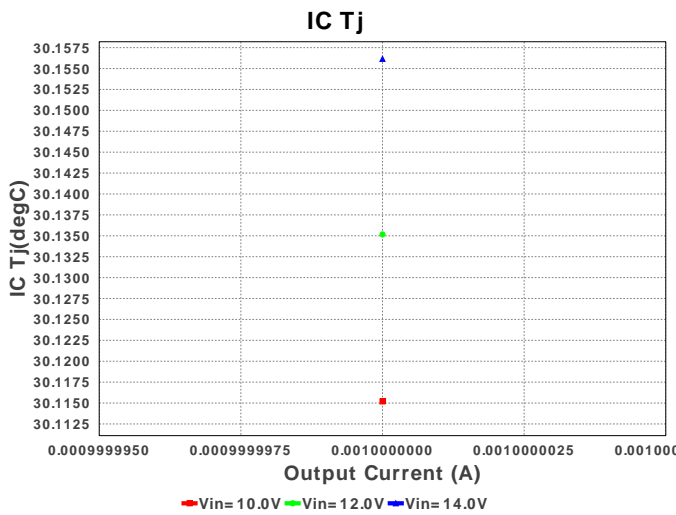
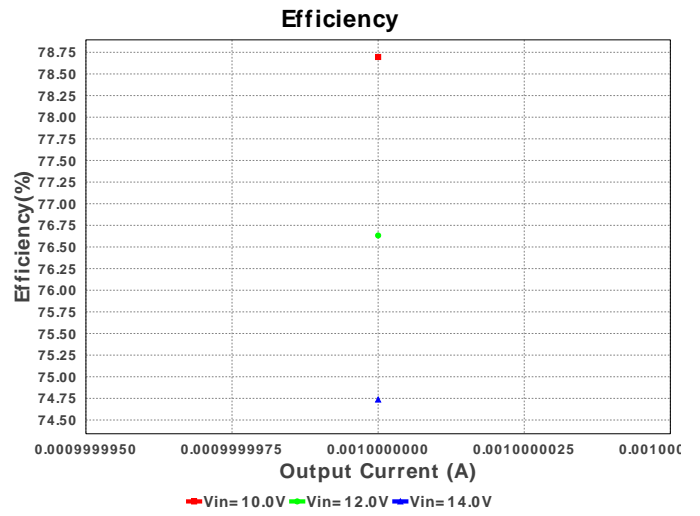
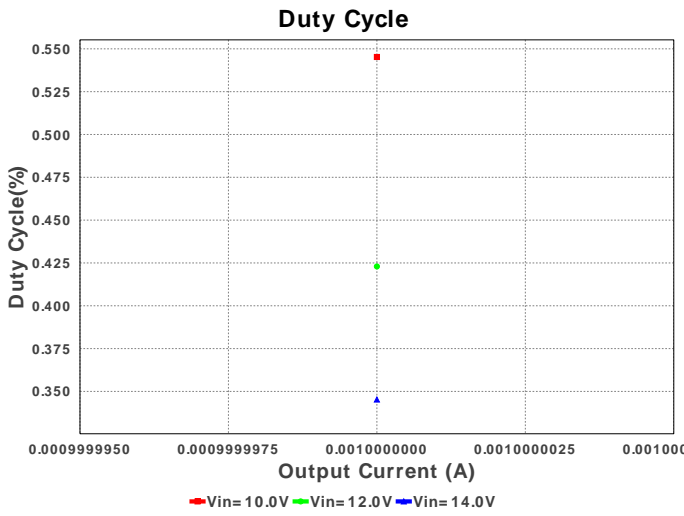
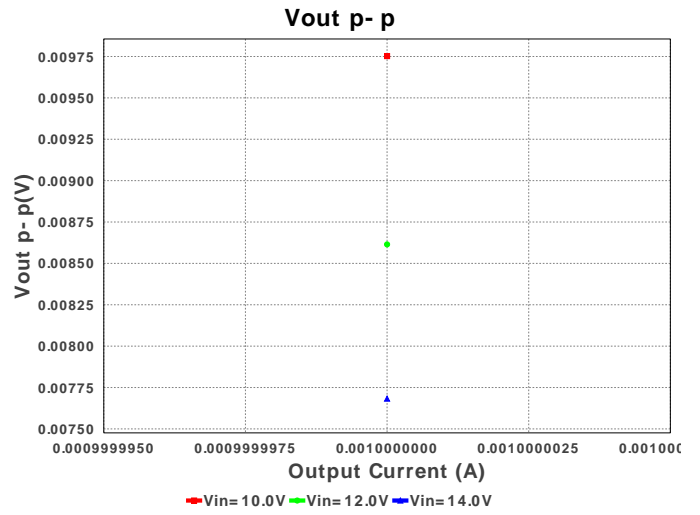
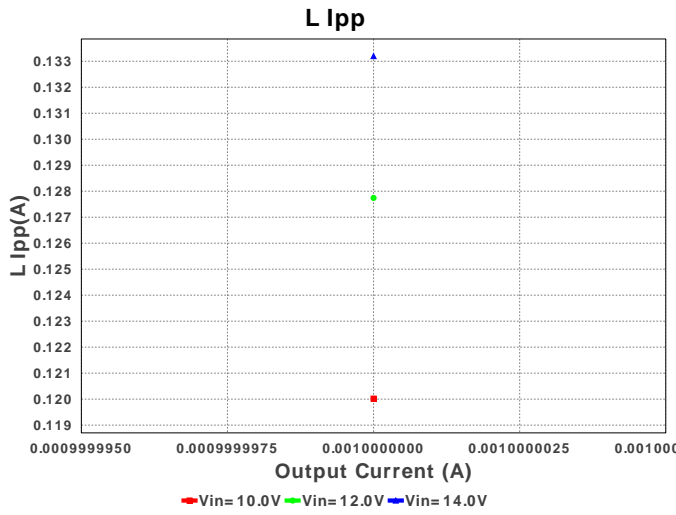
WEBENCH® Design Report

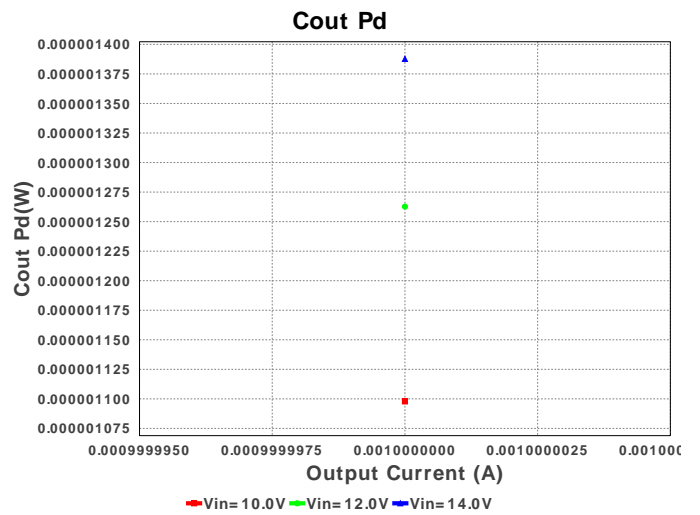
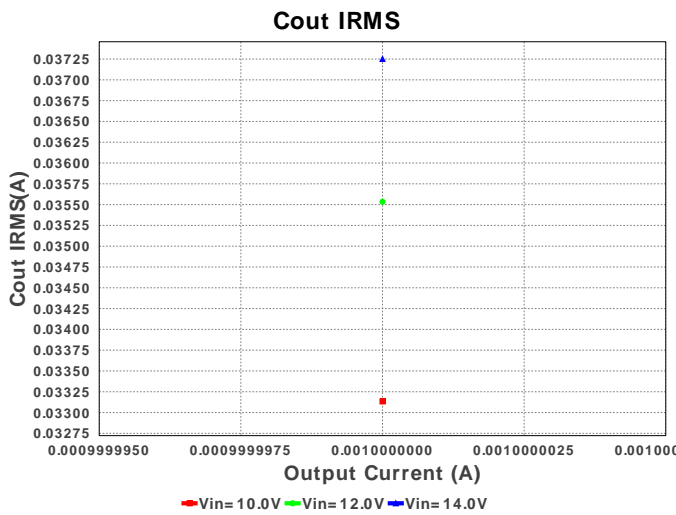
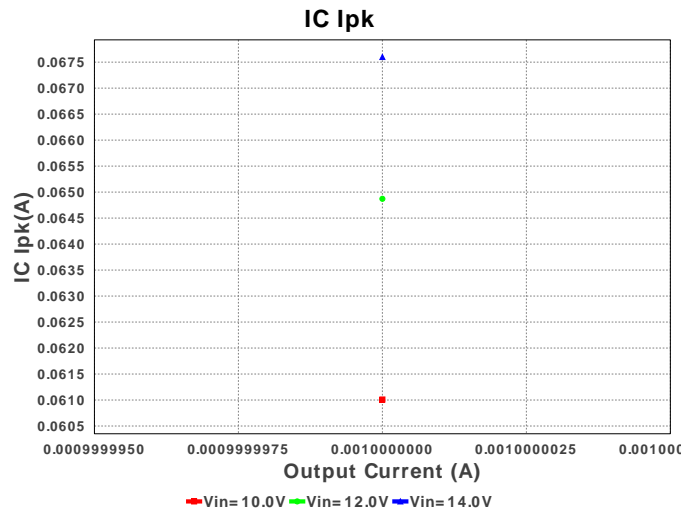
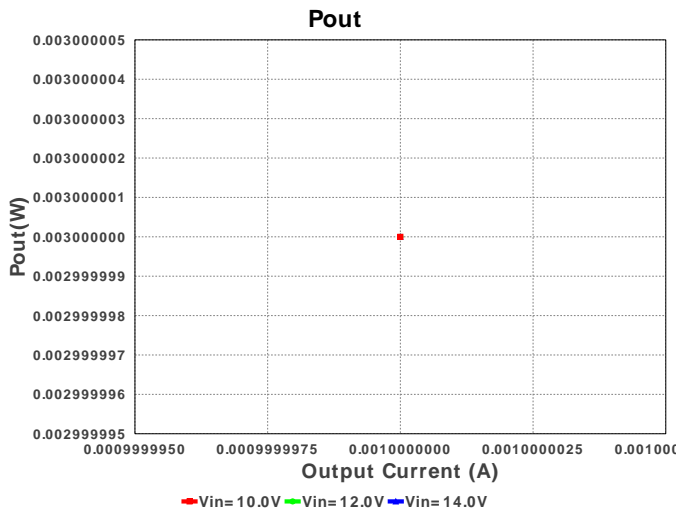
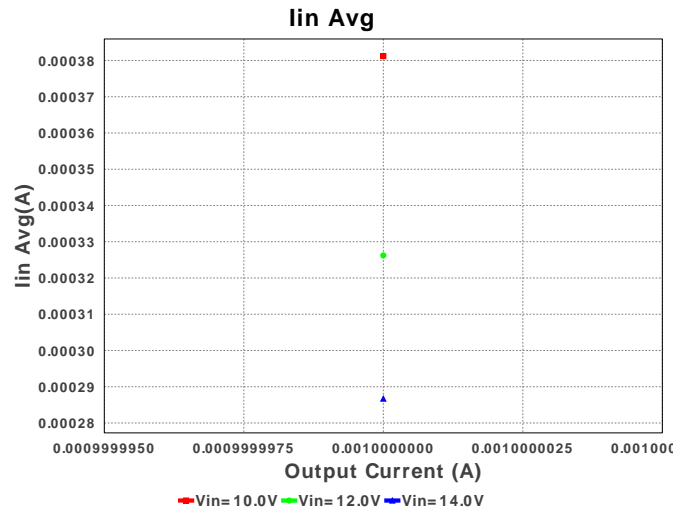
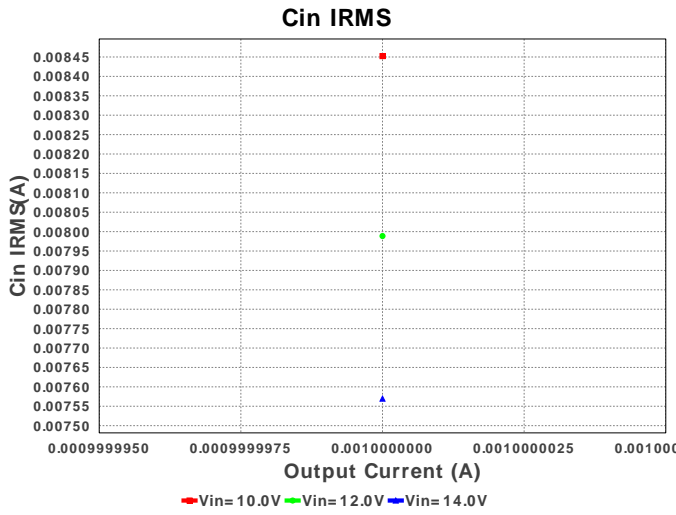
Design : 3989908/25 TPS62122DRVR
 TPS62122DRVR 10.0V-14.0V to 3.00V @ 4.0E-4A

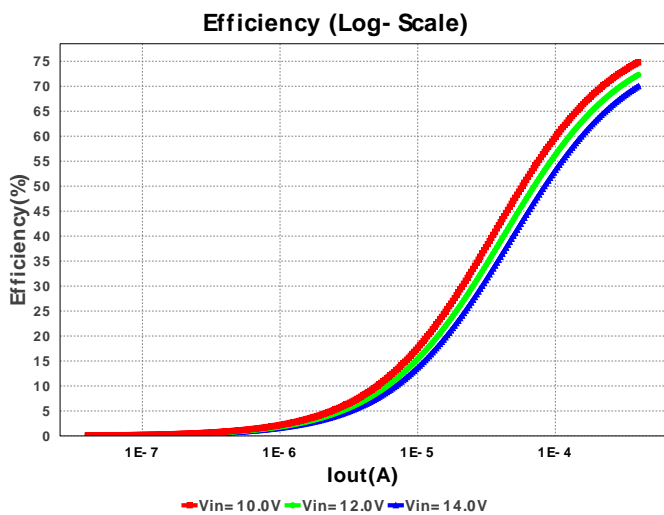
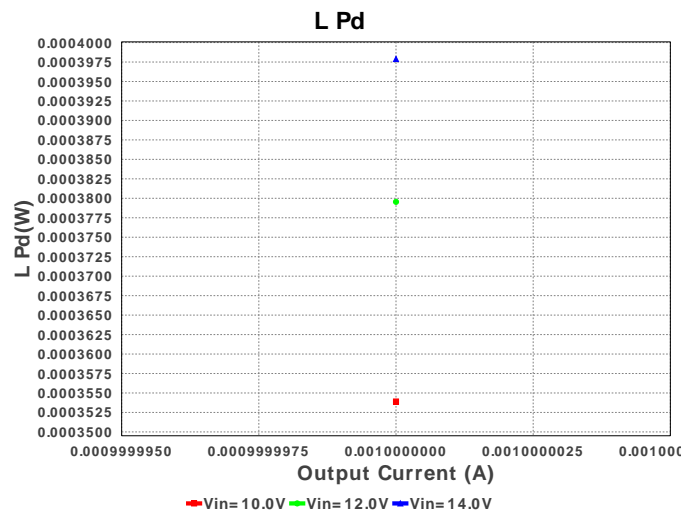
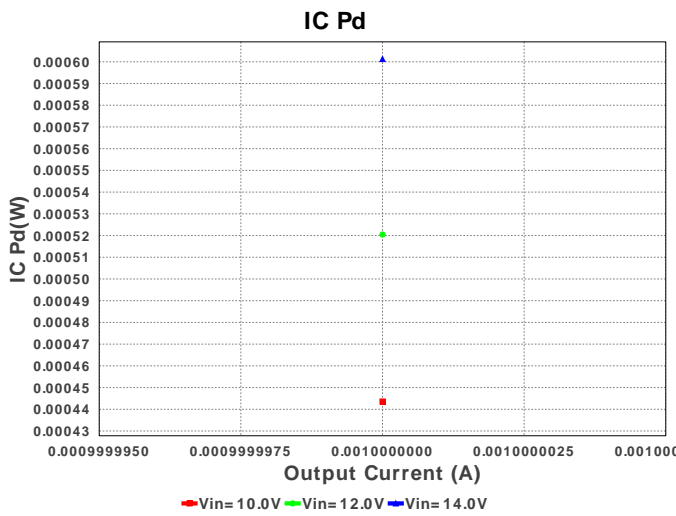
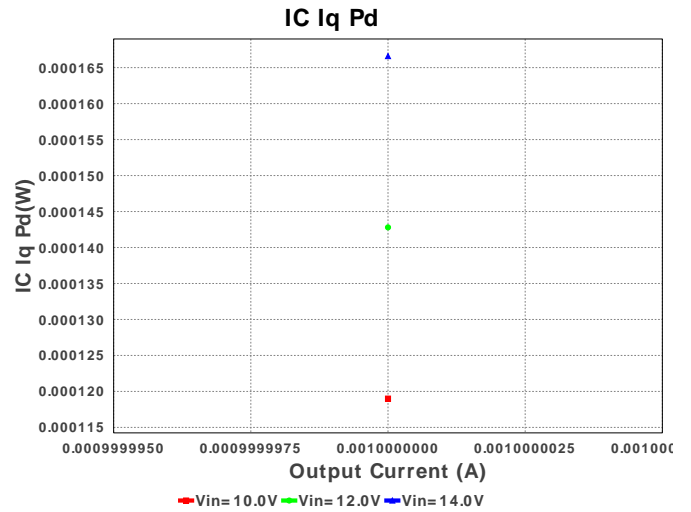
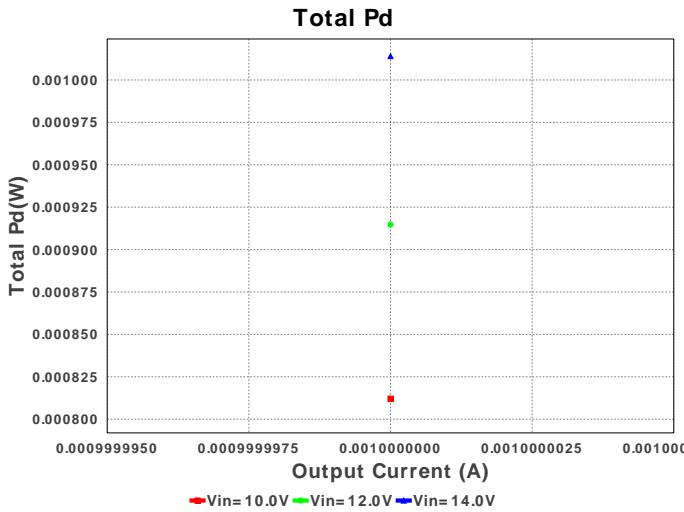


Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cff	Samsung Electro-Mechanics	CL21C130JBANNNC Series= C0G/NP0	Cap= 13.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
2.	Cin	MuRata	GRM21BR61E475KA12L Series= X5R	Cap= 4.7 uF ESR= 4.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.03	0805 7 mm ²
3.	Cout	MuRata	GRM188R60J475ME19D Series= X5R	Cap= 4.7 uF ESR= 1.0 mOhm VDC= 6.3 V IRMS= 0.0 A	1	\$0.02	0603 5 mm ²
4.	L1	Taiyo Yuden	CBC2012T220M	L= 22.0 µH DCR= 3.7 Ohm	1	\$0.08	CBC2012 8 mm ²
5.	Rfbb	Susumu Co Ltd	RR1220P-184-D Series= RR12	Res= 180.0 kOhm Power= 100.0 mW Tolerance= 0.5%	1	\$0.01	0805 7 mm ²
6.	Rfht	Vishay-Dale	CRCW0402499KFKED Series= CRCW..e3	Res= 499.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
7.	U1	Texas Instruments	TPS62122DRVR	Switcher	1	\$0.56	S-PWSON-N6 9 mm ²







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	4.792 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	37.263 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	66.999 mA	Current	Peak switch current in IC
4.	Iin Avg	122.45 μ A	Current	Average input current
5.	L Ipp	133.2 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	7	General	Total Design BOM count
7.	FootPrint	45.0 mm ²	General	Total Foot Print Area of BOM components
8.	Frequency	5.181 kHz	General	Switching frequency
9.	Pout	1.2 mW	General	Total output power
10.	Total BOM	\$0.72	General	Total BOM Cost
11.	Vout OP	3.0 V	Op_Point	Operational Output Voltage

#	Name	Value	Category	Description
12.	Duty Cycle	138.023 m%	Op_point	Duty cycle
13.	Efficiency	69.998 %	Op_point	Steady state efficiency
14.	IC Tj	30.088 degC	Op_point	IC junction temperature
15.	ICThetaJA	259.7 degC/W	Op_point	IC junction-to-ambient thermal resistance
16.	IOUT_OP	400.0 µA	Op_point	Iout operating point
17.	VIN_OP	14.0 V	Op_point	Vin operating point
18.	Vout p-p	7.683 mV	Op_point	Peak-to-peak output ripple voltage
19.	Cin Pd	91.865 nW	Power	Input capacitor power dissipation
20.	Cout Pd	1.389 µW	Power	Output capacitor power dissipation
21.	IC Iq Pd	166.6 µW	Power	IC Iq Pd
22.	IC Pd	340.385 µW	Power	IC power dissipation
23.	L Pd	159.202 µW	Power	Inductor power dissipation
24.	Total Pd	514.324 µW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	400.0 µ	Maximum Output Current
2.	Iout1	400.0 µ	Output Current #1
3.	VinMax	14.0	Maximum input voltage
4.	VinMin	10.0	Minimum input voltage
5.	Vout	3.0	Output Voltage
6.	Vout1	3.0	Output Voltage #1
7.	base_pn	TPS62122	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0	Ambient temperature

Design Assistance

1. TPS62122 Product Folder : <http://www.ti.com/product/TPS62122> : contains the data sheet and other resources.

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