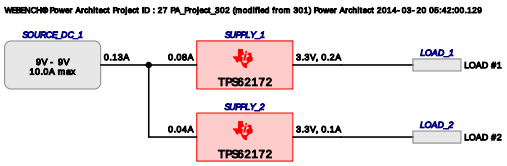
WEBENCH® Power Architect



Project Report

Project : 3710063/27 : PA_Project_302 (modified from 301)
Created : 2014-03-20 05:42:00.129
Optimize project optFactor=3

Project Summary

1.	Total System Efficiency	87.055 %
2.	Total System BOM Count	10.0
3.	Total System Footprint	108.0 mm2
4.	Total System BOM Cost	$2.04
5.	Total System Power Dissipation	147.2 mW

--> Launch WEBENCH Power Architect.

Power Supplies

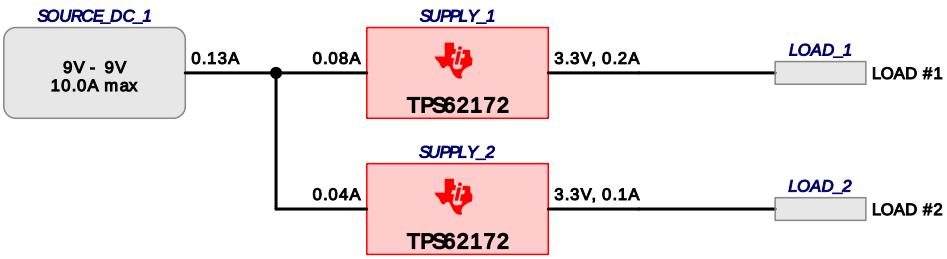
#	Name	NSID	Description	Vout	Iout	Efficiency	Foot-print	Cost	Design	Page
1.	SUPPLY_1	TPS62172	Switcher : 17V,3.3Vout,0.5A,Buck Converter with Power Good	3.3 V	0.2 A	87.2%	54	$1.02	1687	4
2.	SUPPLY_2	TPS62172	Switcher : 17V,3.3Vout,0.5A,Buck Converter with Power Good	3.3 V	0.1 A	86.8%	54	$1.02	1688	9

Power Loads

#	Name	VLoad	ILoad	Description
1.	LOAD #1	3.3 V	0.2 A	VoutRipple=10%, Requires a separate supply
2.	LOAD #2	3.3 V	0.1 A	VoutRipple=10%, Requires a separate supply

Project Diagram

WEBENCH® Power Architect Project ID : 27 PA_Project_302 (modified from 301) Power Architect 2014-03-20 05:42:00.129



Electrical Procurement BOM

Manufacturer	Part Number	Description	Quantity	Budgetary Price	Footprint (mm^2)
TDK	C2012X5R0J226M	0805	2	$0.06	14
Vishay-Dale	CRCW0402100KFKED	0402	2	$0.01	6
MuRata	GRM21BR61C106KE15L	0805	2	$0.05	14
Bourns	SDR0403-2R2ML	SDR0403	2	$0.17	55
Texas Instruments	TPS62172DSGR	S-PWSON-N8	2	$0.73	19
Total			10	$2.04	107

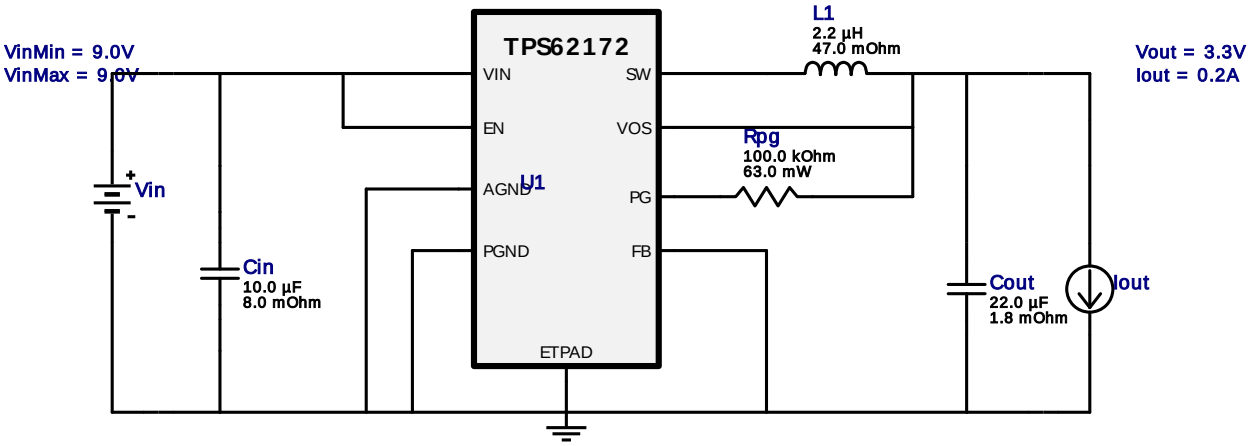
TEXAS INSTRUMENTS

WEBENCH® Design Report

VinMin = 9.0V
VinMax = 9.0V
Vout = 3.3V
Iout = 0.2A

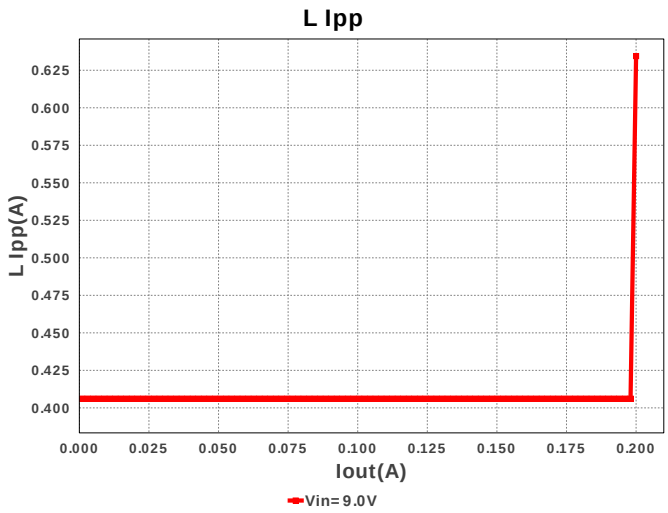
Device = TPS62172DSGR
Topology = Buck
Created = 3/20/14 5:41:52 AM
BOM Cost = $1.02
Footprint = 54.0mm2
BOM Count = 5
Total Pd = 0.1W

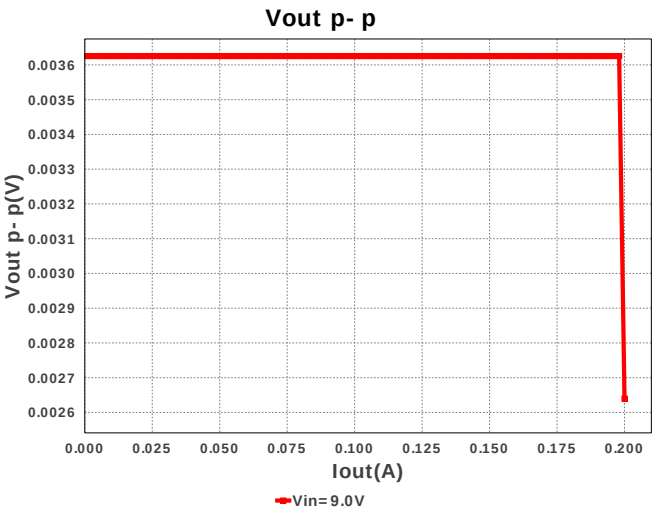
Design : 3710063/1687 TPS62172DSGR
TPS62172DSGR 9.0V-9.0V to 3.3V @ 0.2A

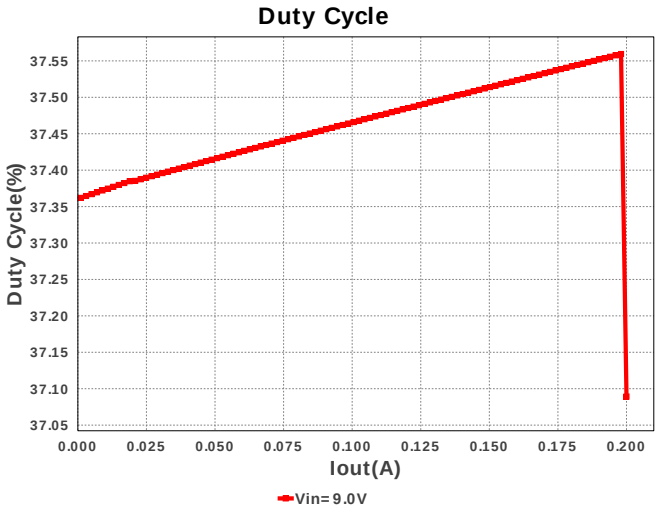


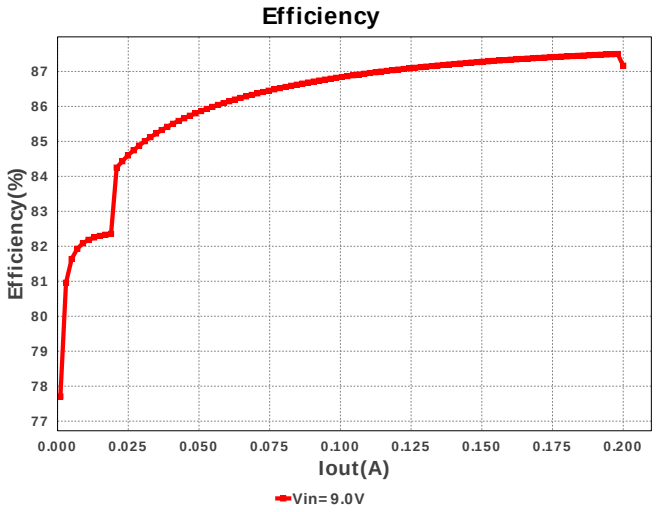
Electrical BOM

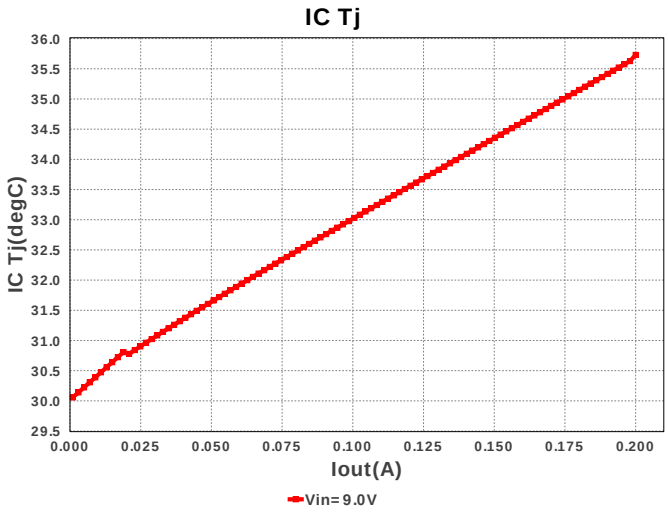
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM21BR61C106KE15L Series= X5R	Cap= 10.0 µF ESR= 8.0 mOhm VDC= 16.0 V IRMS= 0.0 A	1	$0.05	0805 7mm2
2.	Cout	TDK	C2012X5R0J226M Series= X5R	Cap= 22.0 µF ESR= 1.8 mOhm VDC= 6.3 V IRMS= 0.0 A	1	$0.06	0805 7mm2
3.	L1	Bourns	SDR0403-2R2ML	L= 2.2 µH DCR= 47.0 mOhm	1	$0.17	SDR0403 28mm2
4.	Rpg	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3mm2
5.	U1	Texas Instruments	TPS62172DSGR	Switcher	1	$0.73	S-PWSON-N8 10mm2

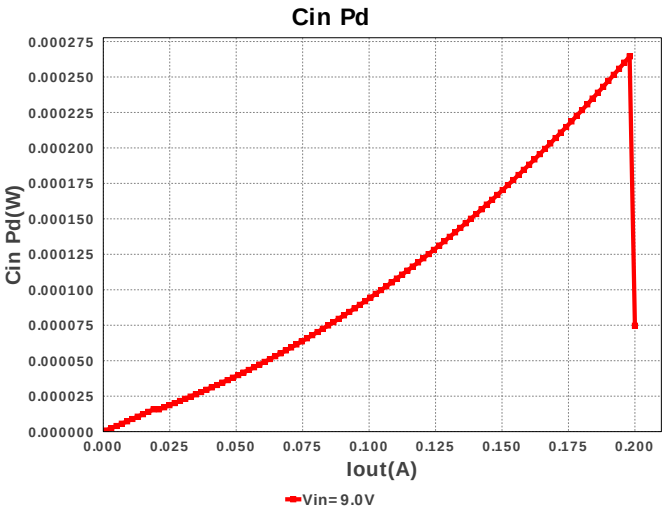


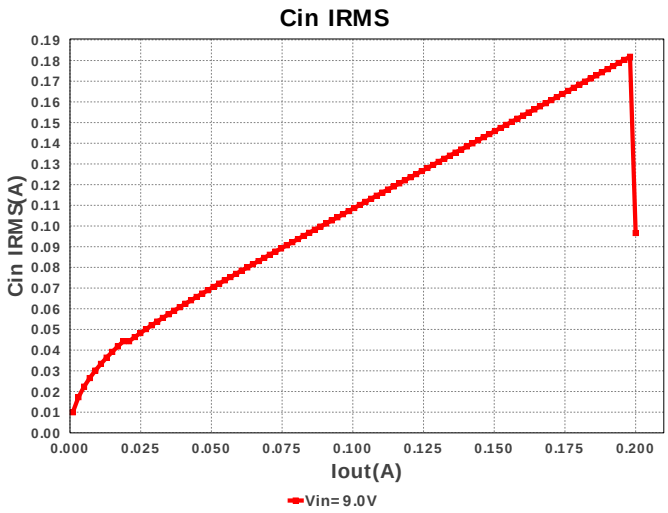


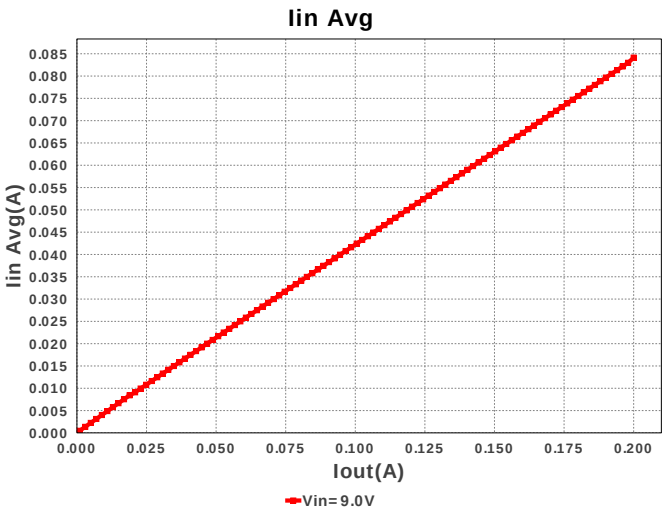


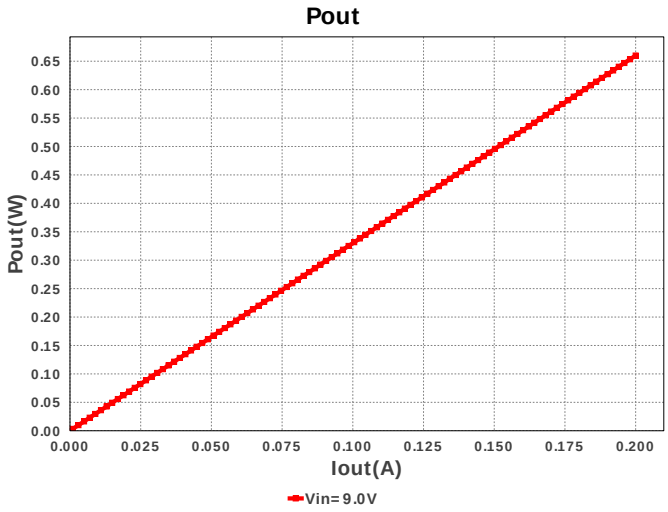


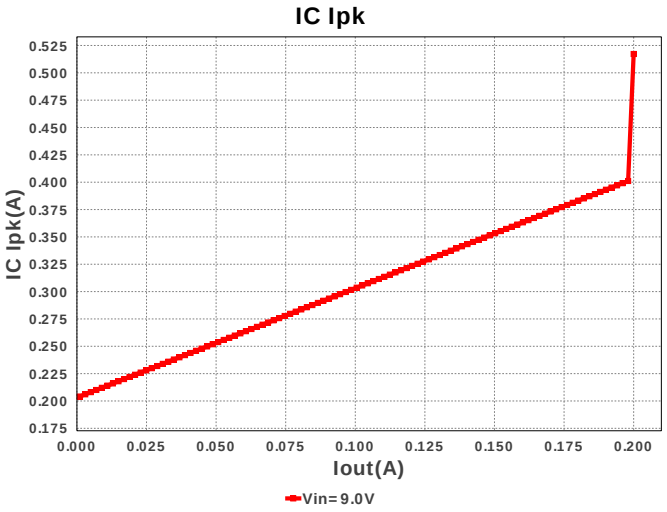


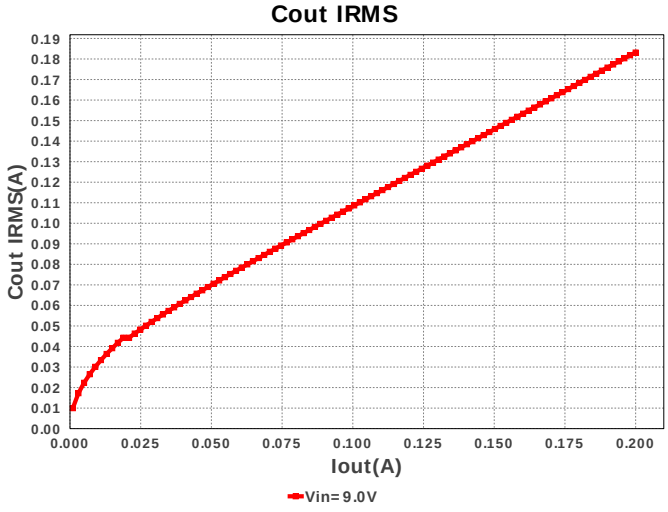


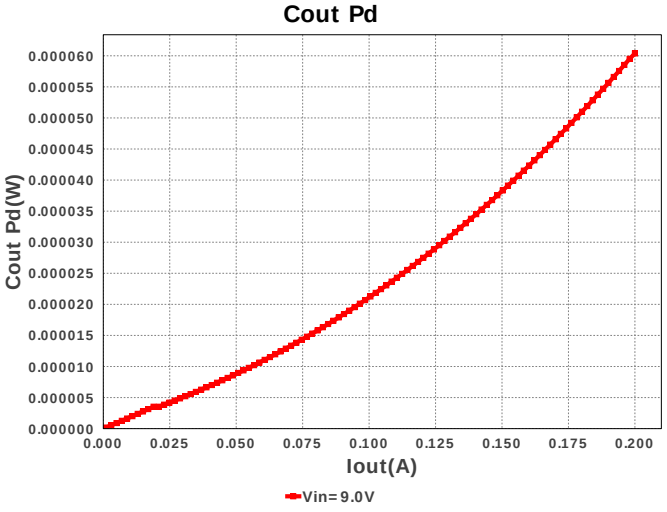


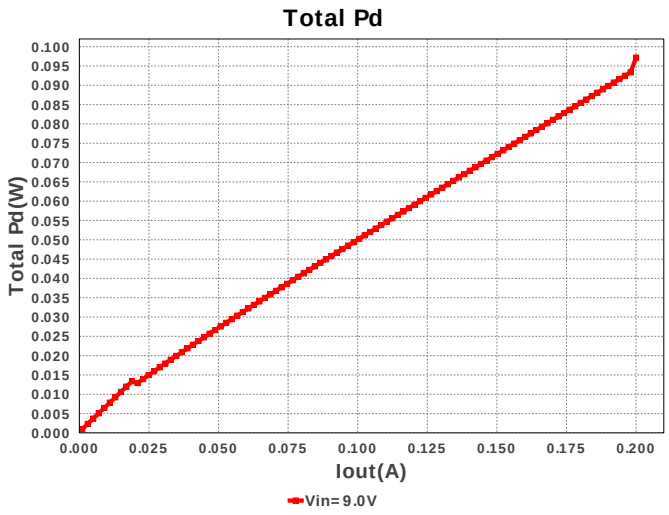


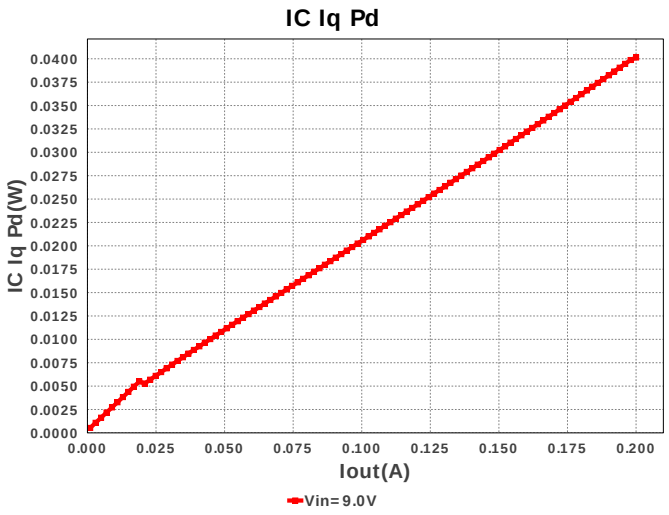


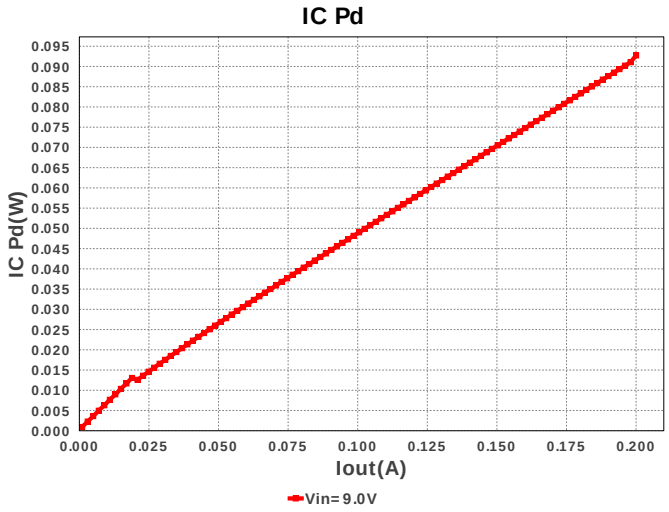


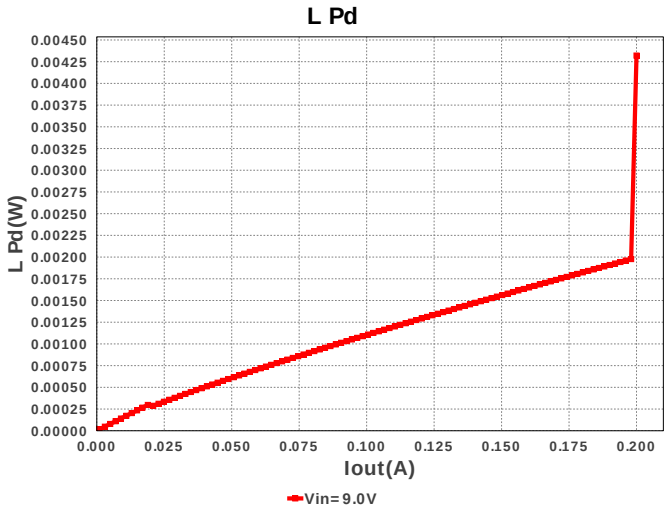












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	96.609 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	183.148 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	517.221 mA	Current	Peak switch current in IC
4.	Iin Avg	84.131 mA	Current	Average input current
5.	L Ipp	634.443 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	5	General	Total Design BOM count
7.	FootPrint	54.0 mm2	General	Total Foot Print Area of BOM components
8.	Frequency	2.367 MHz	General	Switching frequency
9.	Pout	660.0 mW	General	Total output power
10.	Total BOM	$1.02	General	Total BOM Cost
11.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
12.	Duty Cycle	37.089 %	Op_point	Duty cycle
13.	Efficiency	87.165 %	Op_point	Steady state efficiency
14.	IC Tj	35.73 degC	Op_point	IC junction temperature
15.	ICThetaJA	61.8 degC/W	Op_point	IC junction-to-ambient thermal resistance
16.	IOUT_OP	200.0 mA	Op_point	Iout operating point
17.	VIN_OP	9.0 V	Op_point	Vin operating point
18.	Vout p-p	2.64 mV	Op_point	Peak-to-peak output ripple voltage
19.	Cin Pd	74.666 µW	Power	Input capacitor power dissipation
20.	Cout Pd	60.378 µW	Power	Output capacitor power dissipation
21.	IC Iq Pd	40.138 mW	Power	IC Iq Pd
22.	IC Pd	92.726 mW	Power	IC power dissipation
23.	L Pd	4.321 mW	Power	Inductor power dissipation
24.	Total Pd	97.184 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	200.0 mA	Maximum Output Current
2.	Iout1	200.0 mAmps	Output Current #1

#	Name	Value	Description
3.	VinMax	9.0 V	Maximum input voltage
4.	VinMin	9.0 V	Minimum input voltage
5.	Vout	3.3 V	Output Voltage
6.	Vout1	3.3 Volt	Output Voltage #1
7.	base_pn	TPS62172	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0 degC	Ambient temperature

Design Assistance

1. Feature Highlights: DCS-Control(TM) Architecture with upto 0.5A output current, 3V to 17V Input Voltage Range, 3.3V Fixed Output voltage, Seamless Power Save Mode for Light Load Efficiency, Power Good Output, 100% Duty Cycle mode, Short Circuit Protection, Thermal Shutdown

2. TPS62172 Product Folder : http://www.ti.com/product/tps62172 : contains the data sheet and other resources.

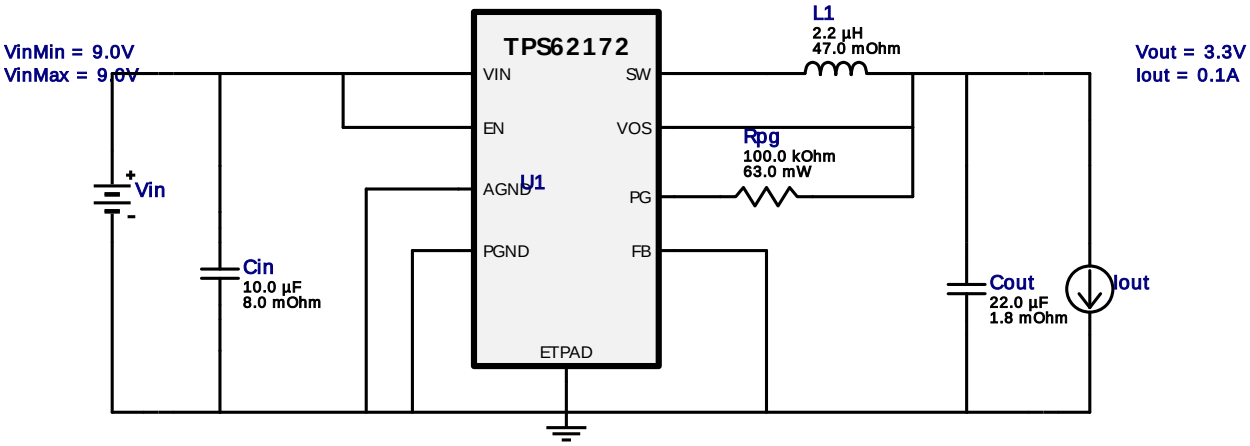
TEXAS INSTRUMENTS

WEBENCH® Design Report

VinMin = 9.0V
VinMax = 9.0V
Vout = 3.3V
Iout = 0.1A

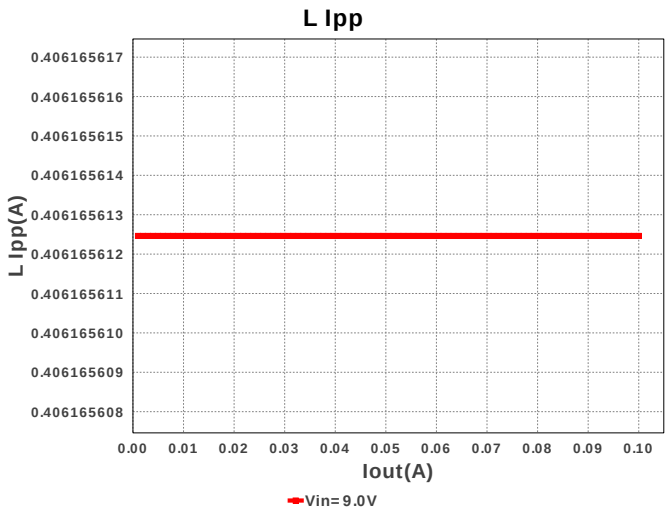
Device = TPS62172DSGR
Topology = Buck
Created = 3/20/14 5:41:55 AM
BOM Cost = $1.02
Footprint = 54.0mm2
BOM Count = 5
Total Pd = 0.05W

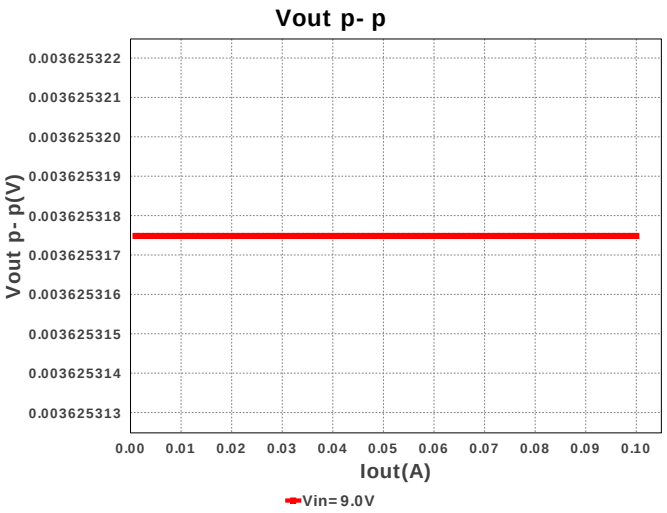
Design : 3710063/1688 TPS62172DSGR
TPS62172DSGR 9.0V-9.0V to 3.3V @ 0.1A

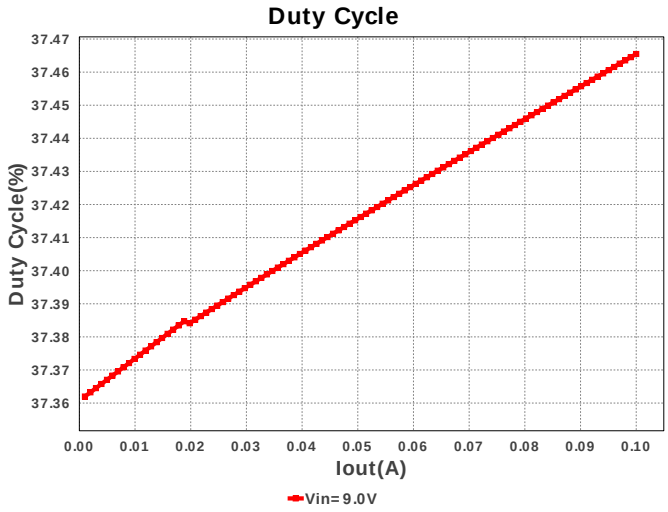


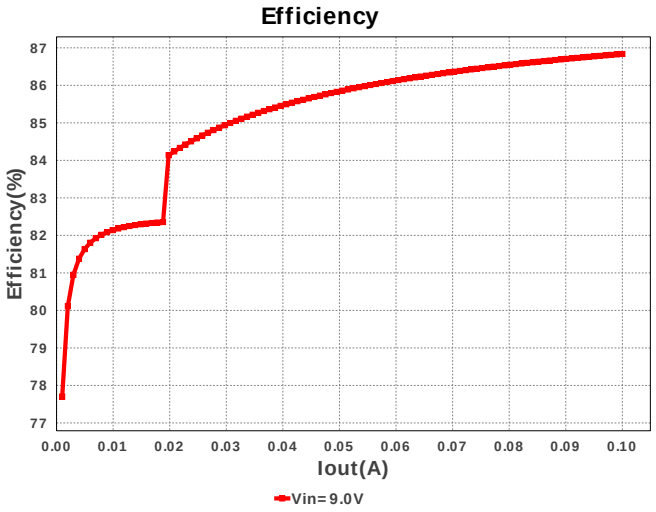
Electrical BOM

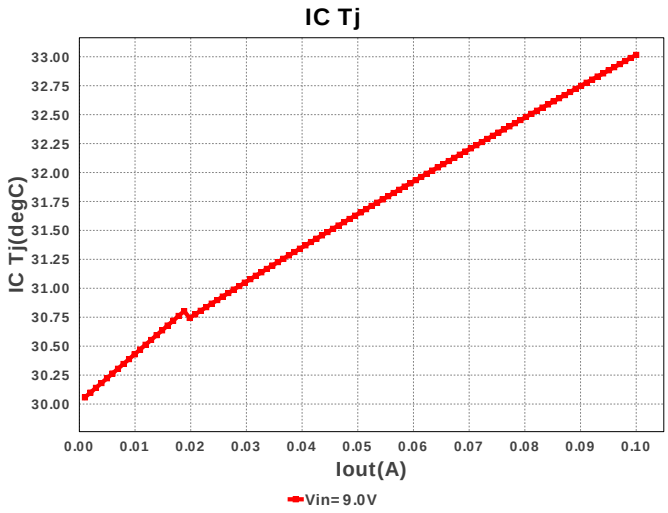
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM21BR61C106KE15L Series= X5R	Cap= 10.0 µF ESR= 8.0 mOhm VDC= 16.0 V IRMS= 0.0 A	1	$0.05	0805 7mm2
2.	Cout	TDK	C2012X5R0J226M Series= X5R	Cap= 22.0 µF ESR= 1.8 mOhm VDC= 6.3 V IRMS= 0.0 A	1	$0.06	0805 7mm2
3.	L1	Bourns	SDR0403-2R2ML	L= 2.2 µH DCR= 47.0 mOhm	1	$0.17	SDR0403 28mm2
4.	Rpg	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3mm2
5.	U1	Texas Instruments	TPS62172DSGR	Switcher	1	$0.73	S-PWSON-N8 10mm2

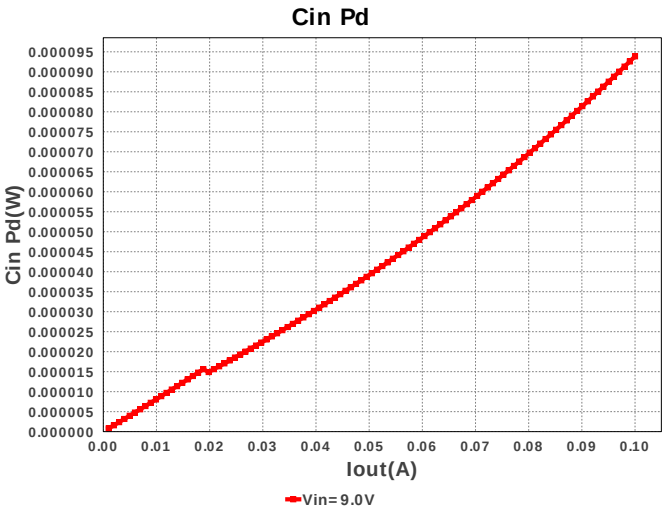




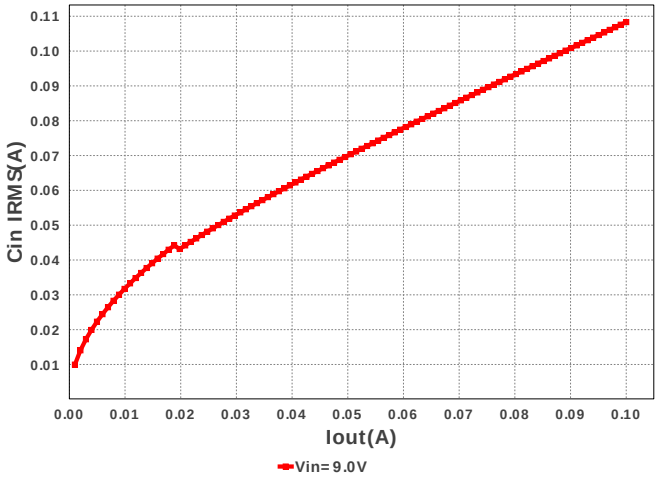




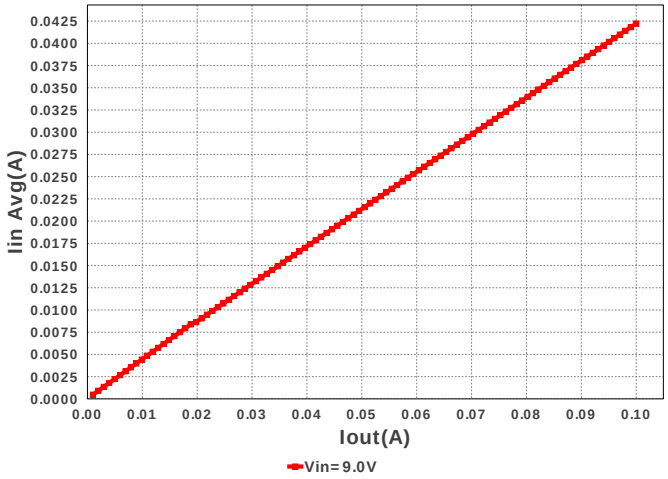




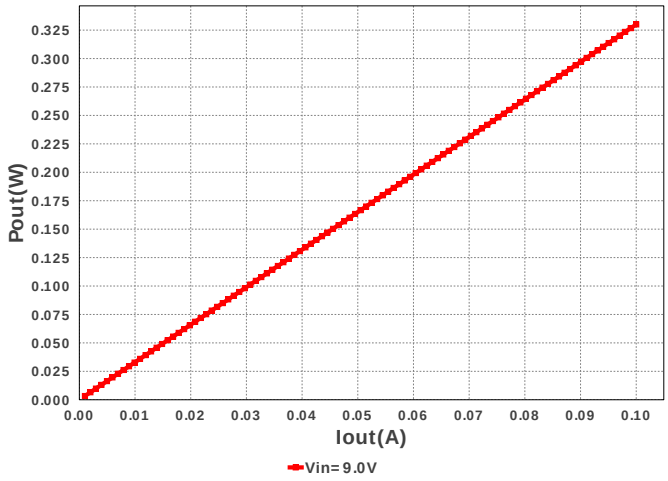
Cin IRMS



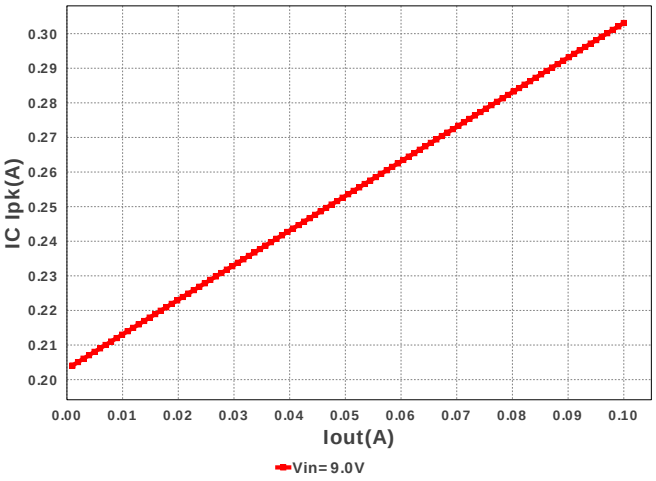
Iin Avg



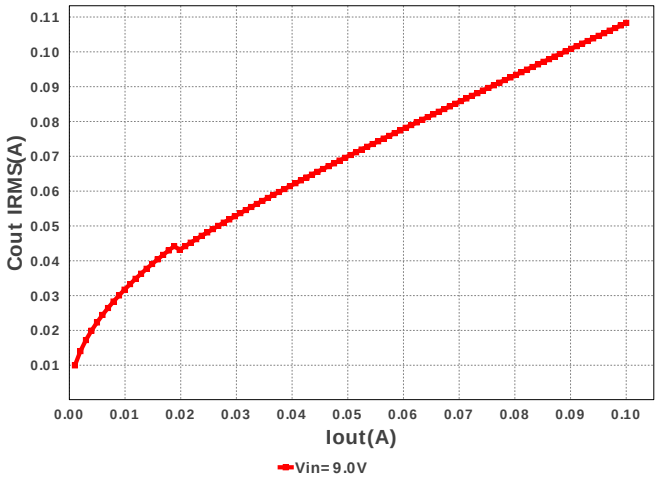
Pout



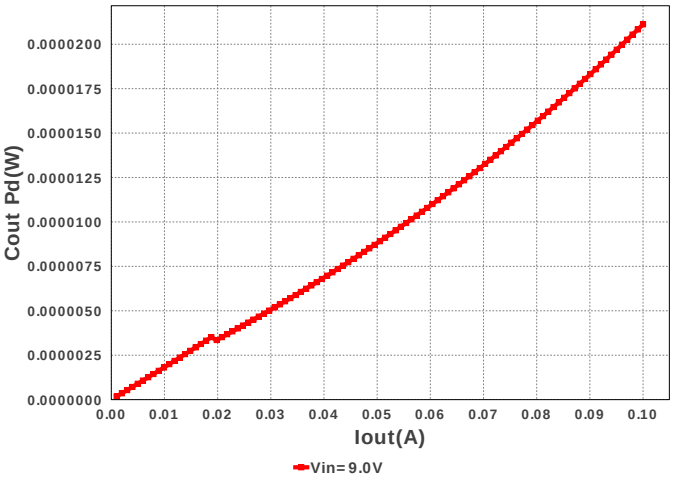
IC Ipk

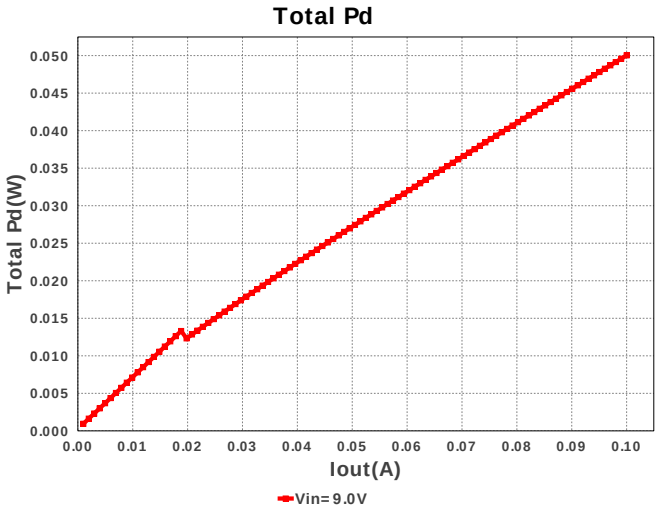


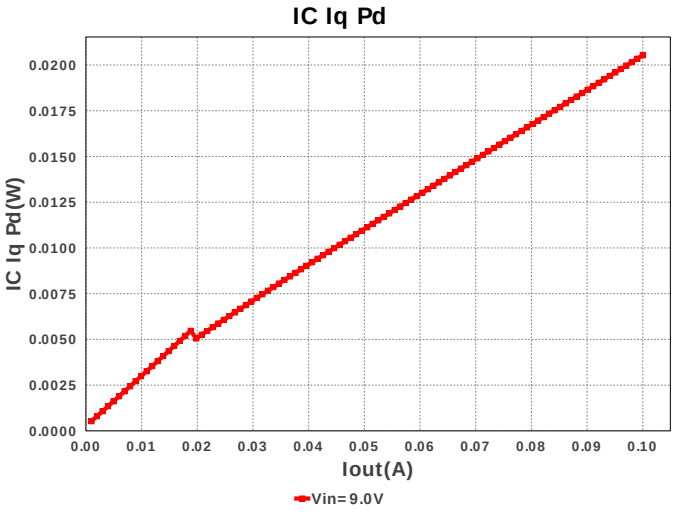
Cout IRMS

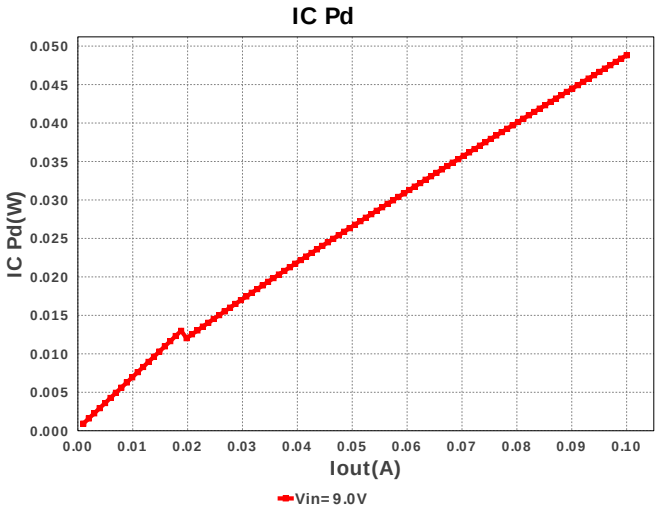


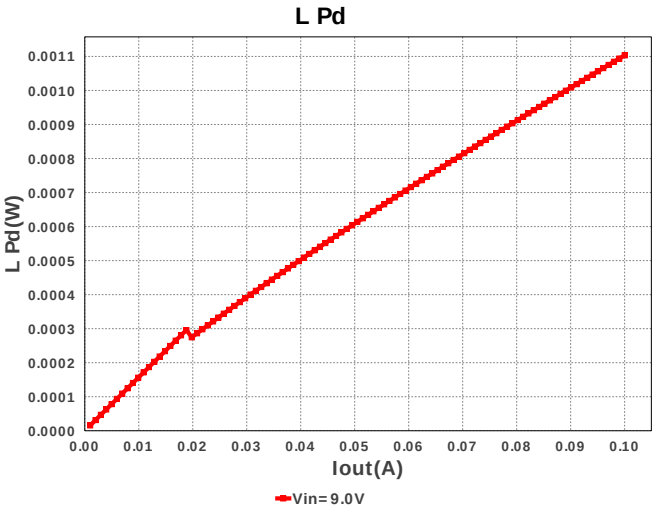
Cout Pd











Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	108.319 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	108.319 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	303.083 mA	Current	Peak switch current in IC
4.	Iin Avg	42.225 mA	Current	Average input current
5.	L Ipp	406.166 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	5	General	Total Design BOM count
7.	FootPrint	54.0 mm2	General	Total Foot Print Area of BOM components
8.	Frequency	1.18 MHz	General	Switching frequency
9.	Pout	330.0 mW	General	Total output power
10.	Total BOM	$1.02	General	Total BOM Cost
11.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
12.	Duty Cycle	37.465 %	Op_point	Duty cycle
13.	Efficiency	86.836 %	Op_point	Steady state efficiency
14.	IC Tj	33.016 degC	Op_point	IC junction temperature
15.	ICThetaJA	61.8 degC/W	Op_point	IC junction-to-ambient thermal resistance
16.	IOUT_OP	100.0 mA	Op_point	Iout operating point
17.	VIN_OP	9.0 V	Op_point	Vin operating point
18.	Vout p-p	3.625 mV	Op_point	Peak-to-peak output ripple voltage
19.	Cin Pd	93.865 µW	Power	Input capacitor power dissipation
20.	Cout Pd	21.12 µW	Power	Output capacitor power dissipation
21.	IC Iq Pd	20.532 mW	Power	IC Iq Pd
22.	IC Pd	48.807 mW	Power	IC power dissipation
23.	L Pd	1.103 mW	Power	Inductor power dissipation
24.	Total Pd	50.026 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	100.0 mA	Maximum Output Current
2.	Iout1	100.0 mAmps	Output Current #1

#	Name	Value	Description
3.	VinMax	9.0 V	Maximum input voltage
4.	VinMin	9.0 V	Minimum input voltage
5.	Vout	3.3 V	Output Voltage
6.	Vout1	3.3 Volt	Output Voltage #1
7.	base_pn	TPS62172	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0 degC	Ambient temperature

Design Assistance

1. Feature Highlights: DCS-Control(TM) Architecture with upto 0.5A output current, 3V to 17V Input Voltage Range, 3.3V Fixed Output voltage, Seamless Power Save Mode for Light Load Efficiency, Power Good Output, 100% Duty Cycle mode, Short Circuit Protection, Thermal Shutdown

2. TPS62172 Product Folder : http://www.ti.com/product/tps62172 : contains the data sheet and other resources.