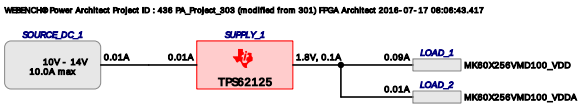


WEBENCH® Power Architect

Project Report

Project : 1194016/436 : PA_Project_303 (modified from 301)
Created : 2016-07-17 08:06:43.417
Optimize project optFactor=3

Project Summary

1.	Total System Efficiency	89.888 %
2.	Total System BOM Count	10.0
3.	Total System Footprint	70.0 mm2
4.	Total System BOM Cost	$0.73
5.	Total System Power Dissipation	20.2 mW

--> Launch WEBENCH Power Architect.

Sequencer Flag Table

Supply	Sequencer Flag	Load	Load Name
SUPPLY_1	0	LOAD_1	MK60X256VMD100_VDD
SUPPLY_1	0	LOAD_2	MK60X256VMD100_VDDA

Power Supplies

#	Name	NSID	Description	Vout	Iout	Efficiency	Foot-print	Cost	Design	Page
1.	SUPPLY_1	TPS62125	Switcher : 3V-17V, 300mA Buck Converter With Adjustable Enable Threshold And Hysteresis	1.8 V	0.1 A	89.9%	70	$0.73	2113	4

Power Loads

#	Name	VLoad	ILoad	Description
1.	MK60X256VMD100_VDD	1.8 V	0.09 A	VoutRipple=10%
2.	MK60X256VMD100_VDDA	1.8 V	0.01 A	VoutRipple=10%

FPGAs, Processors

#	Manufacturer	Part Number	Name	Series	Description
1.	Freescale	MK60X256VMD100	FPGA_1	Kinetis K60	FPGA Freescale Kinetis K60 MK60X256VMD100

http://cache.freescale.com/files/microcontrollers/doc/data_sheet/K60P144M100SF2.pdf

Project Diagram

Electrical Procurement BOM

Manufacturer	Part Number	Description	Quantity	Budgetary Price	Footprint (mm^2)
Vishay-Dale	CRCW0402100KFKED	0402	2	$0.01	6
Vishay-Dale	CRCW0402124KFKED	0402	1	$0.01	3
Vishay-Dale	CRCW04021M33FKED	0402	1	$0.01	3
Vishay-Dale	CRCW0402200KFKED	0402	1	$0.01	3
Vishay-Dale	CRCW040233K2FKED	0402	1	$0.01	3
MuRata	GRM188R60G106ME47D	0603	1	$0.02	5
MuRata	GRM21BR61C106KE15L	0805	1	$0.03	7
NIC Components	NPI43C150MTRF	IND_NPI43C	1	$0.07	31
Texas Instruments	TPS62125DSGR	S-PWSON-N8	1	$0.55	10
Total			10	$0.73	69.78

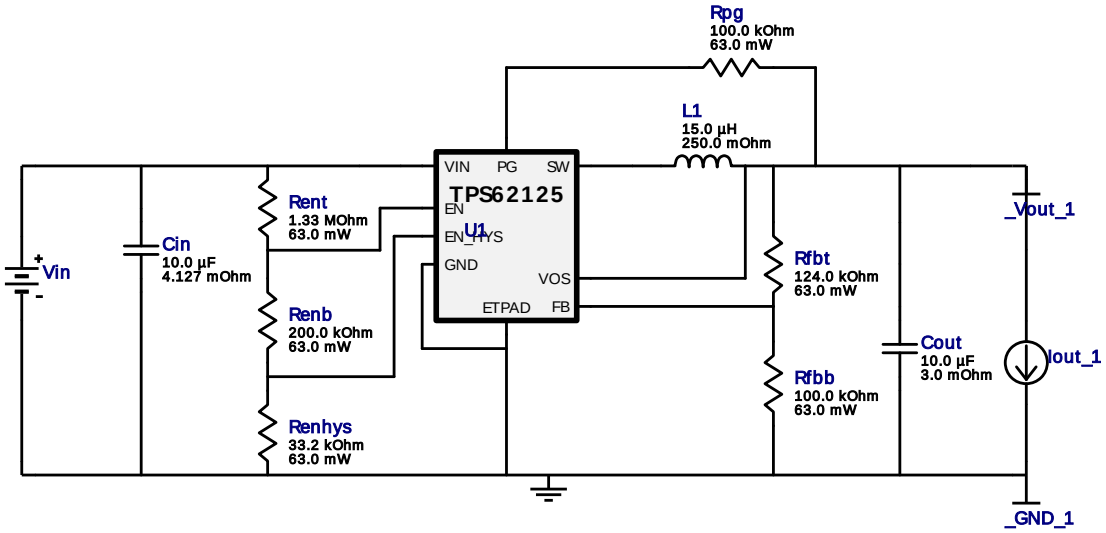
TEXAS INSTRUMENTS

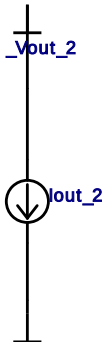
WEBENCH® Design Report

Vout = 1.8V
Iout = 0.1A

Device = TPS62125DSGR
Topology = Buck
Created = 7/17/16 8:06:42 AM
BOM Cost = $0.73
BOM Count = 10
Total Pd = 0.02W

Design : 1194016/2113 TPS62125DSGR
TPS62125DSGR 10.0V-14.0V to 1.80V @ 0.1A

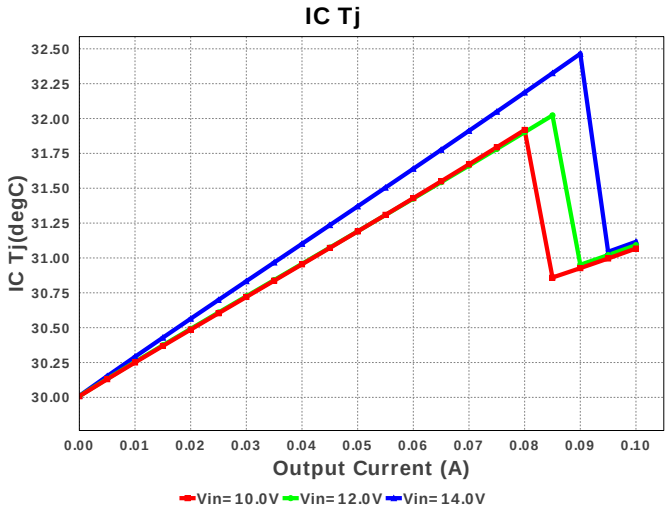


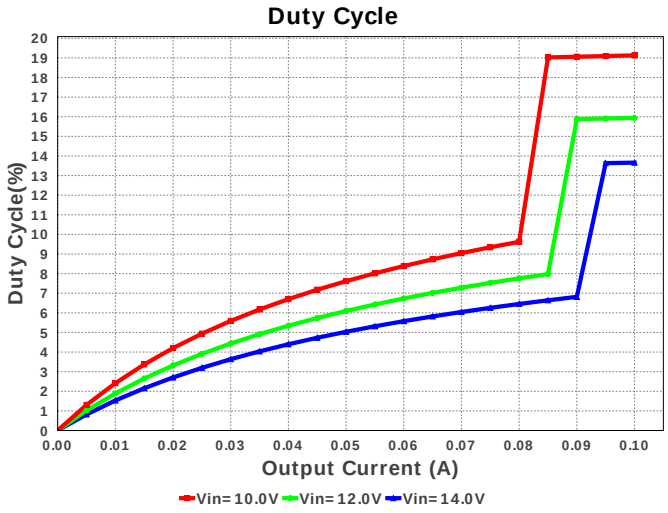


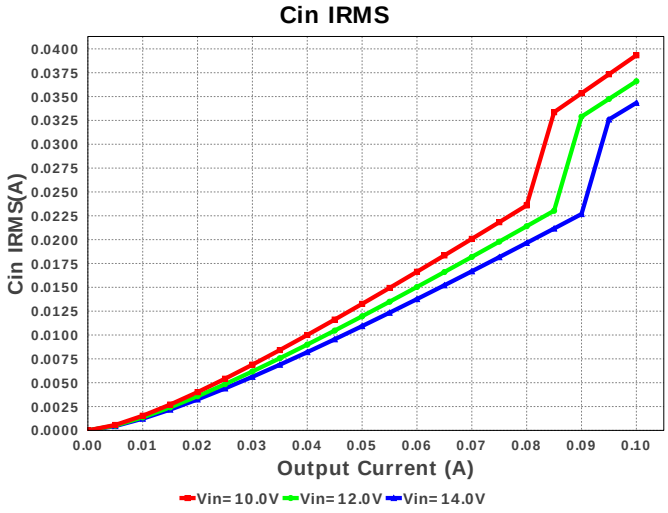
Electrical BOM

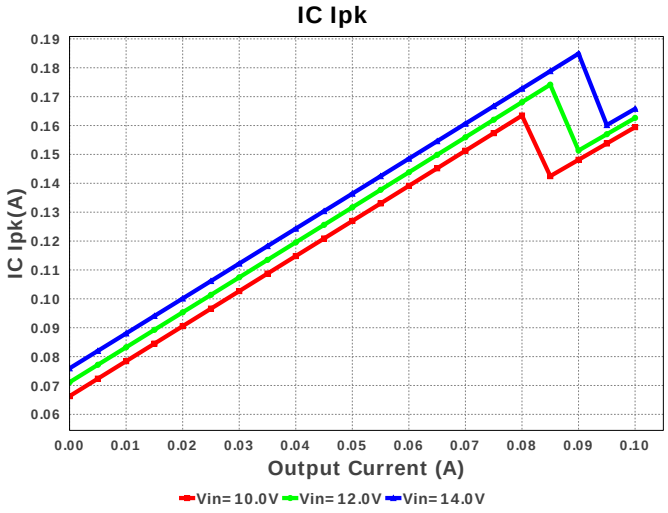
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM21BR61C106KE15L Series= X5R	Cap= 10.0 uF ESR= 4.127 mOhm VDC= 16.0 V IRMS= 2.46634 A	1	$0.03	0805 7 mm²
2.	Cout	MuRata	GRM188R60G106ME47D Series= X5R	Cap= 10.0 uF ESR= 3.0 mOhm VDC= 4.0 V IRMS= 3.0 A	1	$0.02	0603 5 mm²
3.	L1	NIC Components	NPI43C150MTRF	L= 15.0 µH DCR= 250.0 mOhm	1	$0.07	IND_NPI43C 31 mm²
4.	Renb	Vishay-Dale	CRCW0402200KFKED Series= CRCW..e3	Res= 200.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²

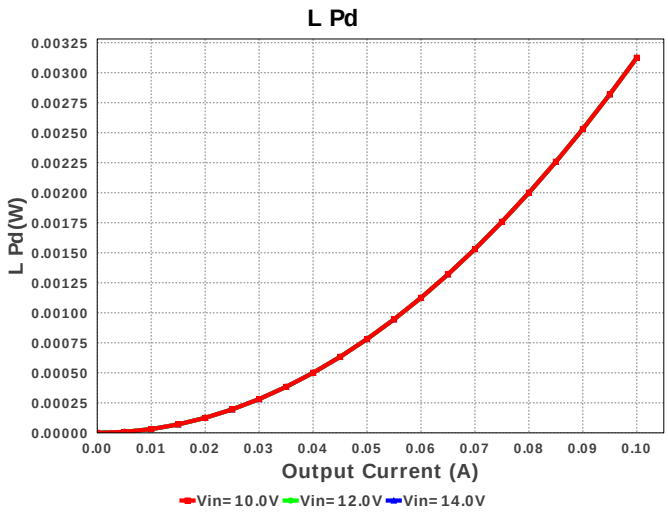
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
5.	Renhys	Vishay-Dale	CRCW040233K2FKED Series= CRCW..e3	Res= 33.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
6.	Rent	Vishay-Dale	CRCW04021M33FKED Series= CRCW..e3	Res= 1.33 MOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
7.	Rfbb	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
8.	Rfbt	Vishay-Dale	CRCW0402124KFKED Series= CRCW..e3	Res= 124.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
9.	Rpg	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
10.	U1	Texas Instruments	TPS62125DSGR	Switcher	1	$0.55	S-PWSON-N8 10 mm^2

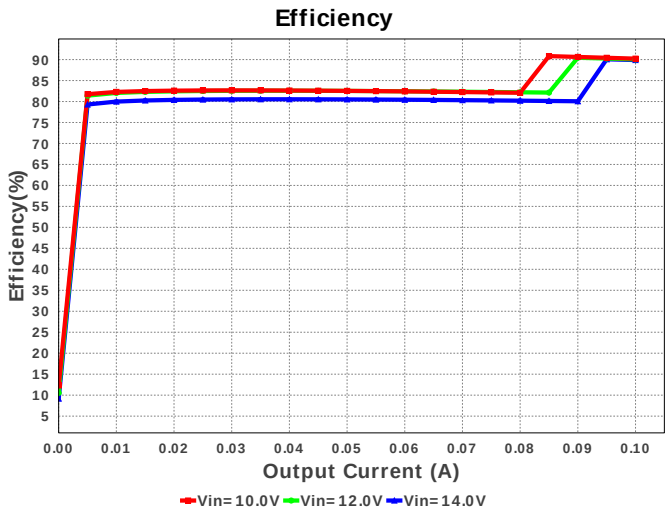


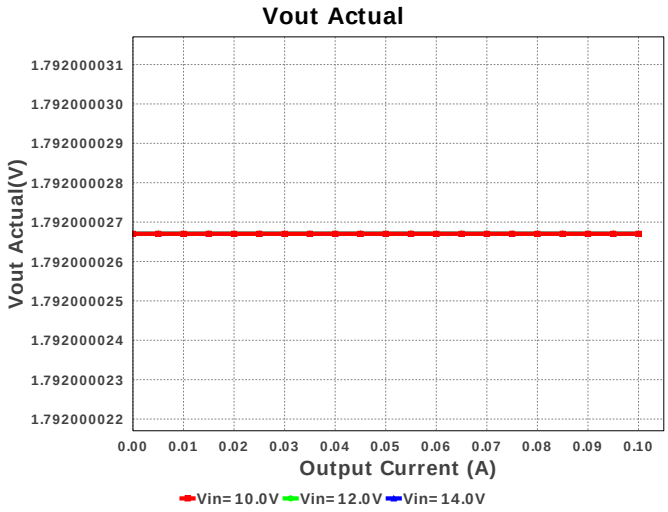


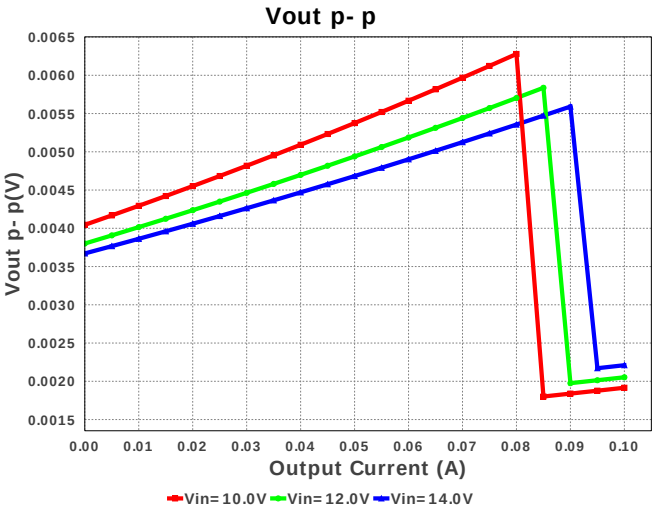


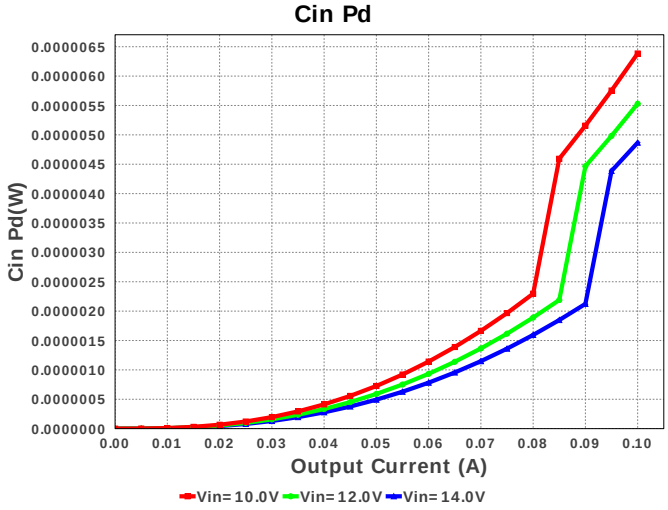


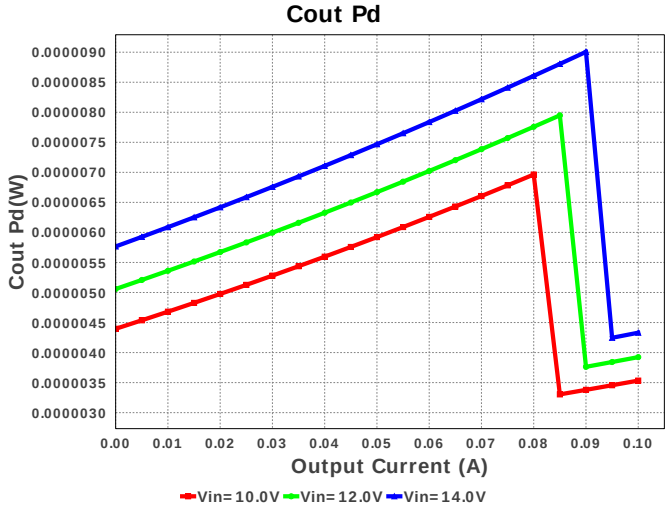


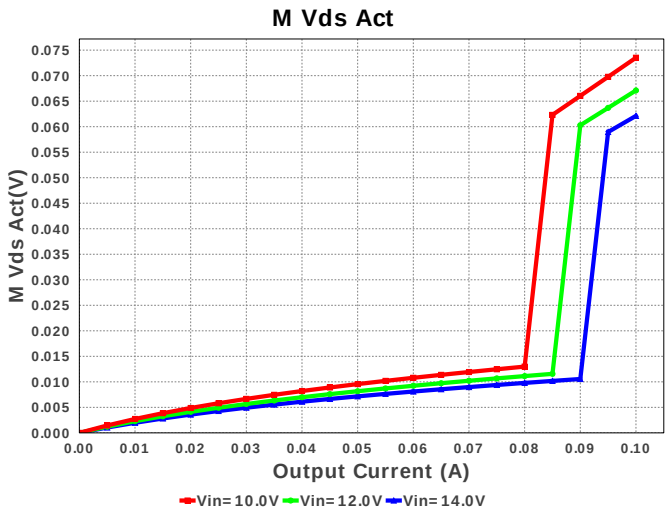


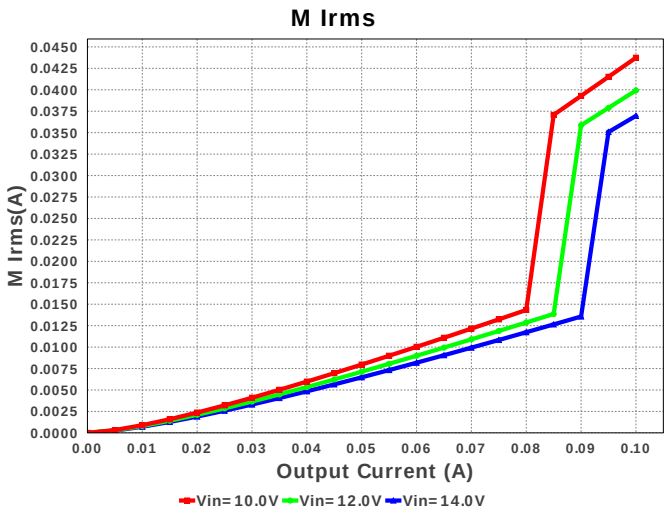


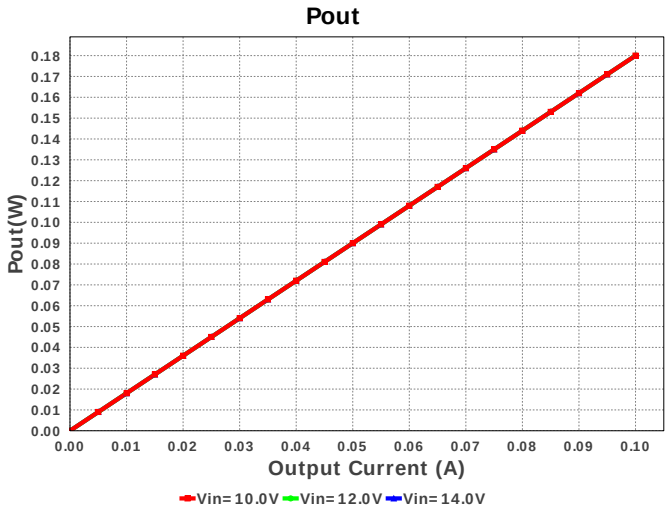


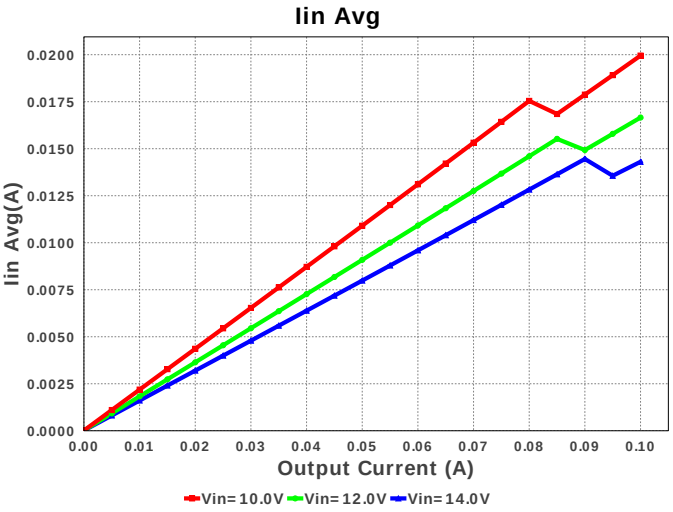


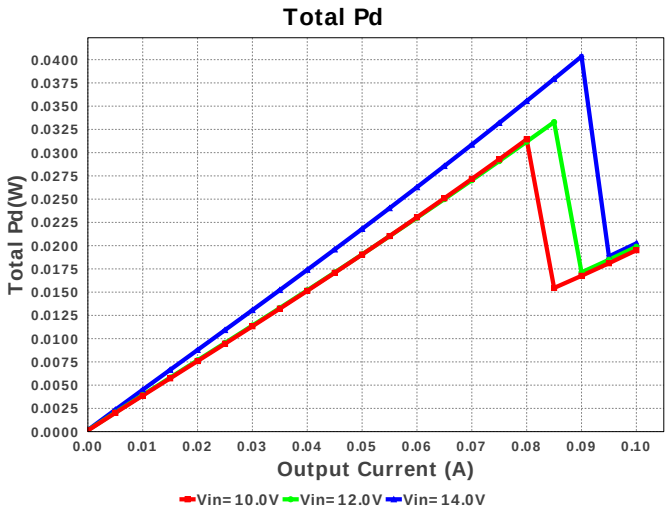


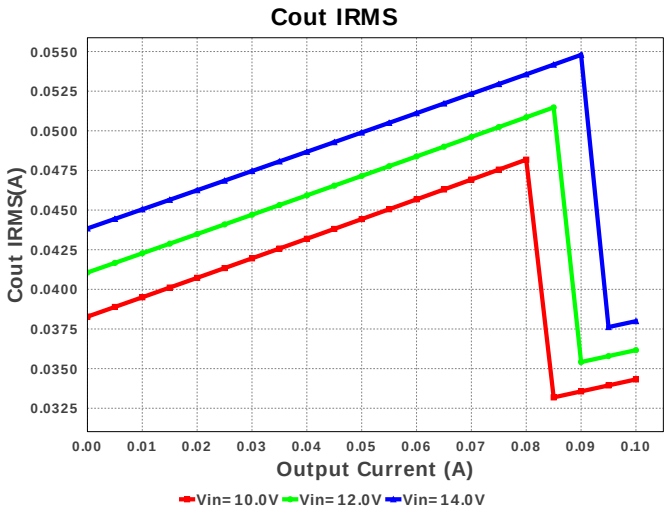


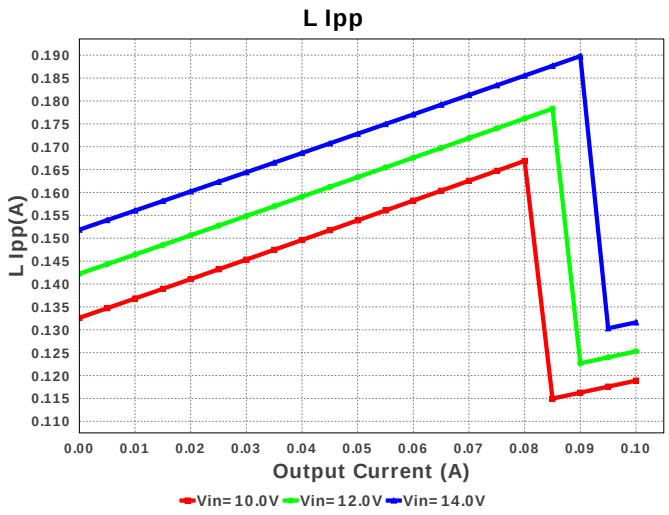


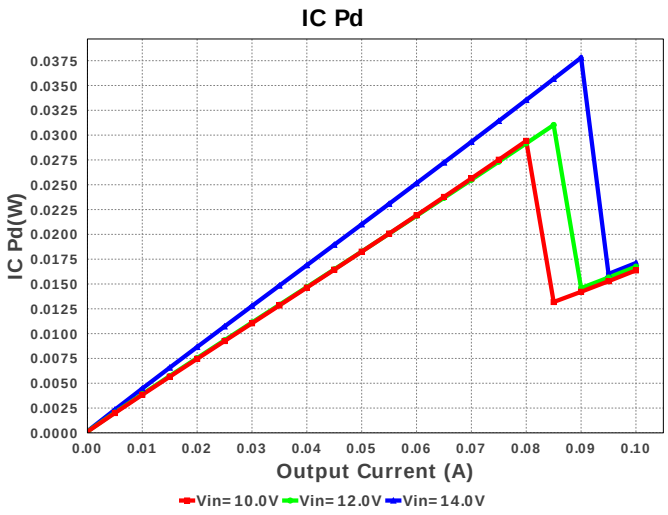


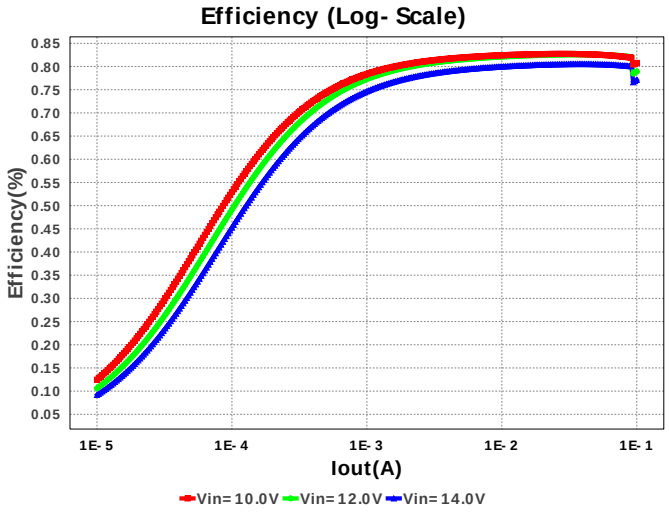












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	34.341 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	37.994 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	165.808 mA	Current	Peak switch current in IC
4.	Iin Avg	14.304 mA	Current	Average input current
5.	L Ipp	131.62 mA	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	36.958 mA	Current	Q Iavg
7.	BOM Count	10	General	Total Design BOM count
8.	FootPrint	70.0 mm^2	General	Total Foot Print Area of BOM components
9.	Frequency	844.046 kHz	General	Switching frequency
10.	IC Tolerance	20.2 mV	General	IC Feedback Tolerance
11.	M Vds Act	62.116 mV	General	Voltage drop across the MosFET
12.	Pout	180.0 mW	General	Total output power
13.	Total BOM	$0.73	General	Total BOM Cost
14.	Vout Actual	1.792 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
15.	Vout OP	1.8 V	Op_Point	Operational Output Voltage
16.	Duty Cycle	13.659 %	Op_point	Duty cycle
17.	Efficiency	89.888 %	Op_point	Steady state efficiency
18.	IC Tj	31.116 degC	Op_point	IC junction temperature
19.	ICThetaJA	65.2 degC/W	Op_point	IC junction-to-ambient thermal resistance
20.	IOUT_OP	100.0 mA	Op_point	Iout operating point
21.	VIN_OP	14.0 V	Op_point	Vin operating point
22.	Vout p-p	2.21 mV	Op_point	Peak-to-peak output ripple voltage
23.	Cin Pd	4.867 µW	Power	Input capacitor power dissipation
24.	Cout Pd	4.331 µW	Power	Output capacitor power dissipation
25.	IC Pd	17.116 mW	Power	IC power dissipation
26.	L Pd	3.125 mW	Power	Inductor power dissipation
27.	Total Pd	20.25 mW	Power	Total Power Dissipation
28.	Vout Tolerance	3.672 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	100.0 m	Maximum Output Current
2.	VinMax	14.0	Maximum input voltage
3.	VinMin	10.0	Minimum input voltage
4.	Vout	1.8	Output Voltage
5.	base_pn	TPS62125	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS62125** Product Folder : http://www.ti.com/product/TPS62125 : contains the data sheet and other resources.