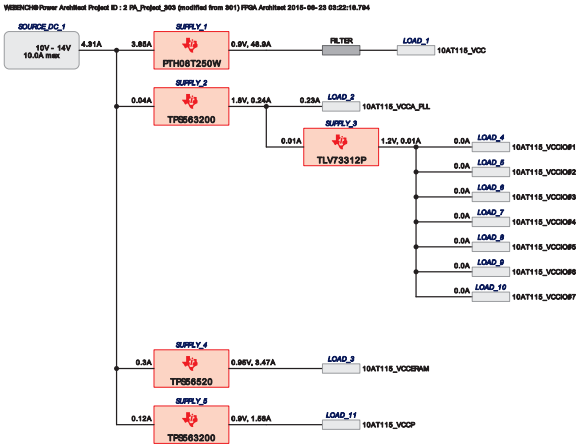
WEBENCH® Power Architect



Project Report

Project : 3612920/2 : PA_Project_303 (modified from 301)
Created : 2015-06-23 03:22:18.794
Optimize project optFactor=3

Project Summary

1.	Total System Efficiency	80.487 %
2.	Total System BOM Count	40.0
3.	Total System Footprint	2.161 kmm2
4.	Total System BOM Cost	$0.00
5.	Total System Power Dissipation	11.91 W

--> Launch WEBENCH Power Architect.

Power Supplies

#	Name	NSID	Description	Vout	Iout	Efficiency	Foot-print	Cost	Design	Page
1.	SUPPLY_1	PTH08T250W	Switcher : 50A, 4.5V to 14V Input,Wide Output, Adjustable Power Module	0.9 V	48.898 A	80.7%	1772	$0.00	26	4
2.	SUPPLY_2	TPS563200	Switcher : 17V, 3A,6-pin, Low Iq Synchronous buck converter with Advanced Eco-mode	1.8 V	0.235 A	85.7%	74	$1.38	28	13
3.	SUPPLY_3	TLV73312P	LDO : TLV733P Capacitor-Free 300-mA Low-Dropout Regulator	1.2 V	0.008 A	60.4%	10	$0.19	27	9
4.	SUPPLY_4	TPS56520	Switcher : 5A Synchronous DCAP2 Step-Down Converter	0.95 V	3.466 A	77.4%	231	$2.07	29	18
5.	SUPPLY_5	TPS563200	Switcher : 17V, 3A,6-pin, Low Iq Synchronous buck converter with Advanced Eco-mode	0.9 V	1.561 A	80.4%	74	$1.58	30	22

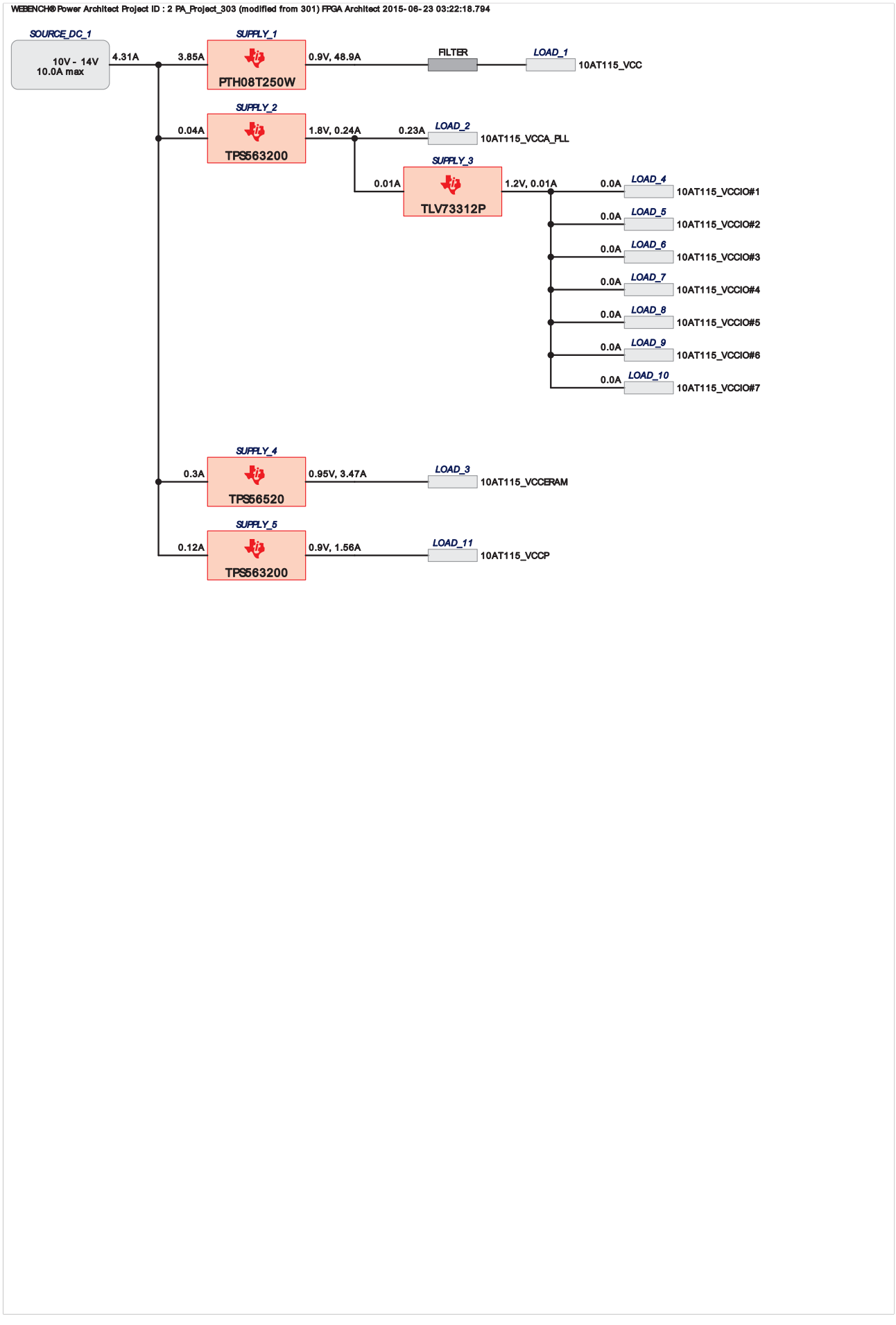
Power Loads

#	Name	VLoad	ILoad	Description
1.	10AT115_VCC	0.9 V	48.898 A	VoutRipple=10%, Filter required
2.	10AT115_VCCA_PLL	1.8 V	0.227 A	VoutRipple=10%
3.	10AT115_VCCIO#1	1.2 V	0.001 A	VoutRipple=10%
4.	10AT115_VCCIO#2	1.2 V	0.001 A	VoutRipple=10%
5.	10AT115_VCCIO#3	1.2 V	0.001 A	VoutRipple=10%
6.	10AT115_VCCIO#4	1.2 V	0.001 A	VoutRipple=10%
7.	10AT115_VCCIO#5	1.2 V	0.002 A	VoutRipple=10%
8.	10AT115_VCCIO#6	1.2 V	0.001 A	VoutRipple=10%
9.	10AT115_VCCIO#7	1.2 V	0.001 A	VoutRipple=10%
10.	10AT115_VCCERAM	0.95 V	3.466 A	VoutRipple=10%
11.	10AT115_VCCP	0.9 V	1.561 A	VoutRipple=10%

FPGAs, Processors

#	Manufacturer	Part Number	Name	Series	Description
1.	Altera http://www.altera.com/literature/hb/arria-10/a10_datasheet.pdf	10AT115	FPGA_1	Arria 10 GT	FPGA Altera Arria 10 GT 10AT115

Project Diagram



Electrical Procurement BOM

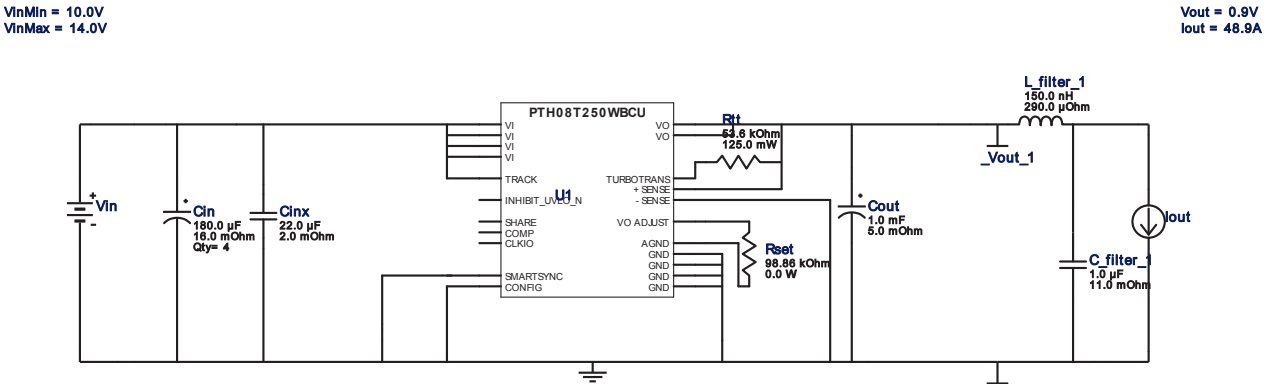
Manufacturer	Part Number	Description	Quantity	Budgetary Price	Footprint (mm^2)
AVX	06033C104KAT2A	0603	1	$0.01	5
AVX	08053C104KAT2A	0805	2	$0.01	14
Panasonic	25SVPF180M	CAPSMT_62_E12	4	$0.61	106
TDK	C1005X5R0J105M	0402	2	$0.01	6
TDK	C3216JB0J686M	1206	1	$0.32	11
Yageo America	CC0805KRX7R9BB472	0805	1	$0.01	7
Vishay-Dale	CRCW040210K0FKED	0402	3	$0.01	9
Vishay-Dale	CRCW040212K7FKED	0402	1	$0.01	3
Vishay-Dale	CRCW040213K7FKED	0402	1	$0.01	3
Vishay-Dale	CRCW04021K00FKED	0402	1	$0.01	3
Vishay-Dale	CRCW04021K82FKED	0402	1	$0.01	3
CUSTOM	CUSTOM	CUSTOM	1	$0.00	0
Panasonic	ERJ-6ENF5362V	0805	1	$0.01	7
Panasonic	ETPF1000M5H	7343-40	1	$1.17	59
Coiltronics	FP1007R3-R15-R	IND_FP1007R3	1	$0.85	124
MuRata	GRM188R61A225KE34D	0603	1	$0.02	5
MuRata	GRM188R71C105KA12D	0603	1	$0.01	5
MuRata	GRM21BR61E475KA12L	0805	1	$0.03	7
MuRata	GRM31CR60J476ME19L	1206	1	$0.12	11
MuRata	GRM32ER61E226KE15L	1210	4	$0.16	59
Taiyo Yuden	JMK212BJ476MG-T	0805	1	$0.18	7
Texas Instruments	PTH08T250WAD	ECT0022A	1	$45.74	1,133
Susumu Co Ltd	RR1220P-223-D	0805	1	$0.01	7
Bourns	SRN8040-2R2Y	SRN8040	1	$0.22	100
Texas Instruments	TLV73312PDQNR	DQN0004A	1	$0.17	4
Texas Instruments	TPS563200DDCR	DDC0006A	2	$0.52	21
Texas Instruments	TPS56520PWPR	PWP0020N	1	$1.40	71
Coilcraft	XFL4020-152MEB	XFL4020	1	$0.55	25
Coilcraft	XFL4020-222MEB	XFL4020	1	$0.55	25
Total			40	$55.60	1,837

WEBENCH® Design Report

VinMin = 10.0V
VinMax = 14.0V
Vout = 0.9V
Iout = 48.9A

Device = PTH08T250WAD
Topology = Buck
Created = 6/23/15 3:22:16 AM
BOM Cost = $0.00
Footprint = 1,772.0 mm²
BOM Count = 11
Total Pd = 10.53W

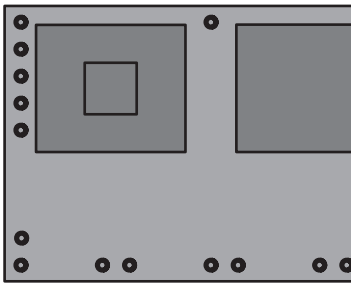
Design : 3612920/26 PTH08T250WAD
PTH08T250WAD 10.0V-14.0V to .90V @ 48.898A



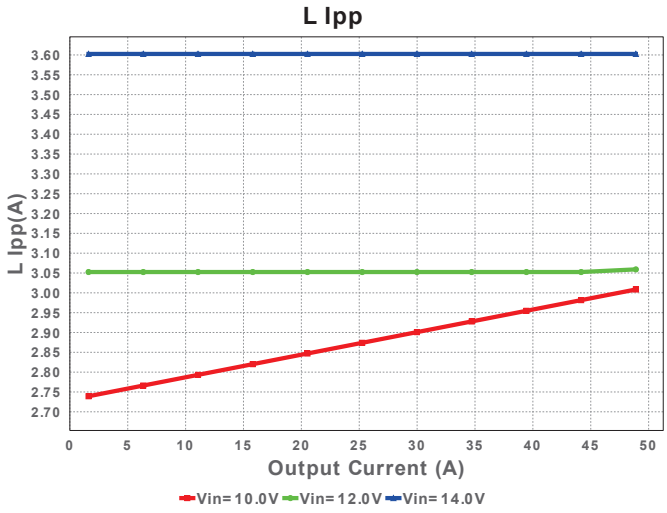
Electrical BOM

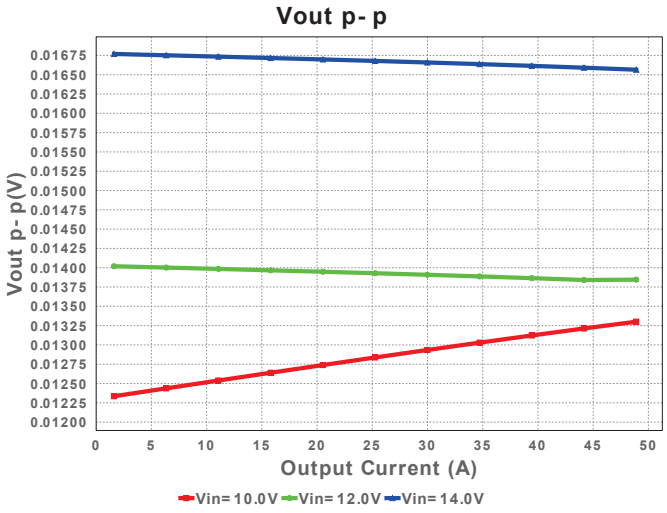
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	C_filter_1	MuRata	GRM188R71C105KA12D Series= X7R	Cap= 1.0 uF ESR= 11.0 mOhm VDC= 16.0 V IRMS= 2.72 A	1	$0.01	0603 5 mm²
2.	Cin	Panasonic	25SVPF180M Series= 1273	Cap= 180.0 uF ESR= 16.0 mOhm VDC= 25.0 V IRMS= 4.65 A	4	$0.61	CAPSMT_62_E12 106 mm²
3.	Cinx	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 mm²
4.	Cout	Panasonic	ETPF1000M5H Series= 1282	Cap= 1.0 mF ESR= 5.0 mOhm VDC= 2.5 V IRMS= 6.1 A	1	$1.17	7343-40 59 mm²
5.	L_filter_1	Coiltronics	FP1007R3-R15-R	L= 150.0 nH DCR= 290.0 µOhm	1	$0.85	IND_FP1007R3 124 mm²
6.	Rset	CUSTOM	CUSTOM Series= ?	Res= 98.86 kOhm Power= 0.0 W Tolerance= 0.0%	1	NA	CUSTOM 0 mm²
7.	Rtt	Panasonic	ERJ-6ENF5362V Series= 225	Res= 53.6 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	0805 7 mm²

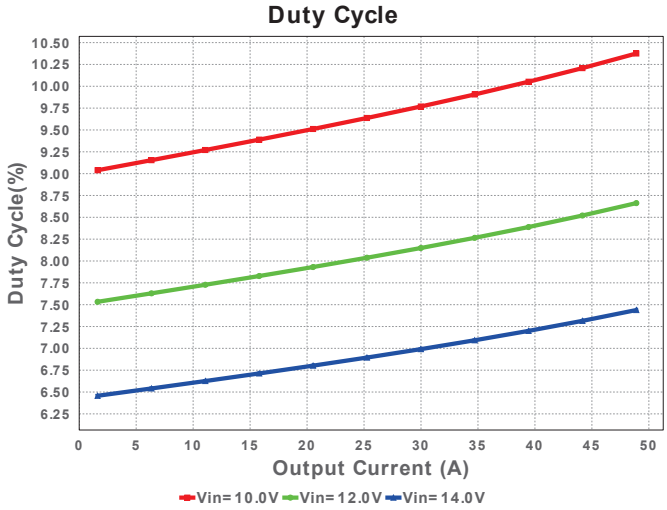
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
8.	U1	Texas Instruments	PTH08T250WAD	Switcher	1	$45.74	

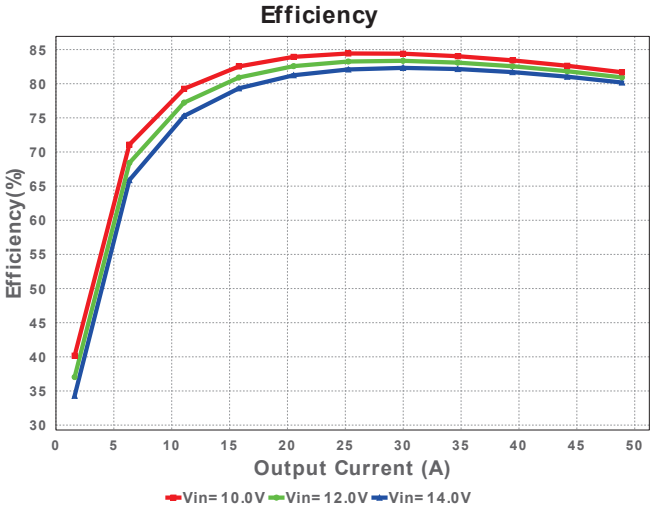


ECT0022A 1133 mm^2

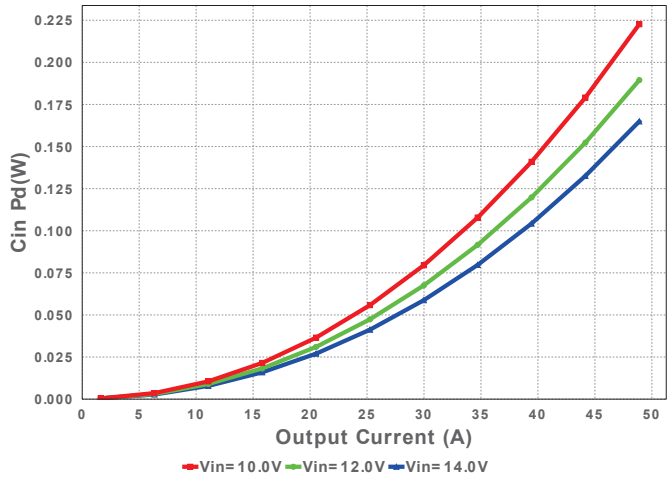




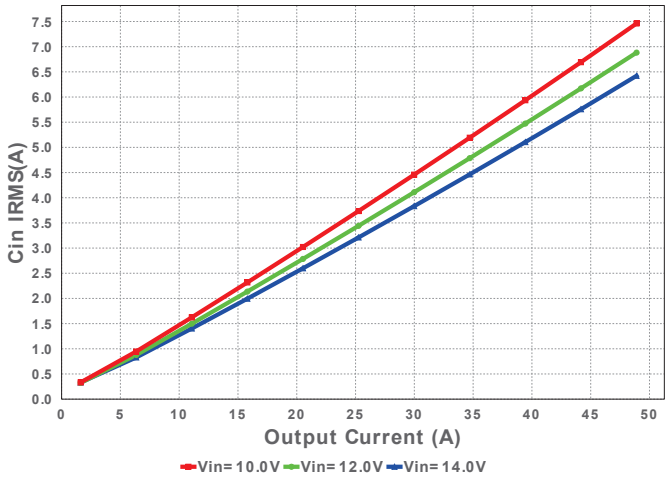




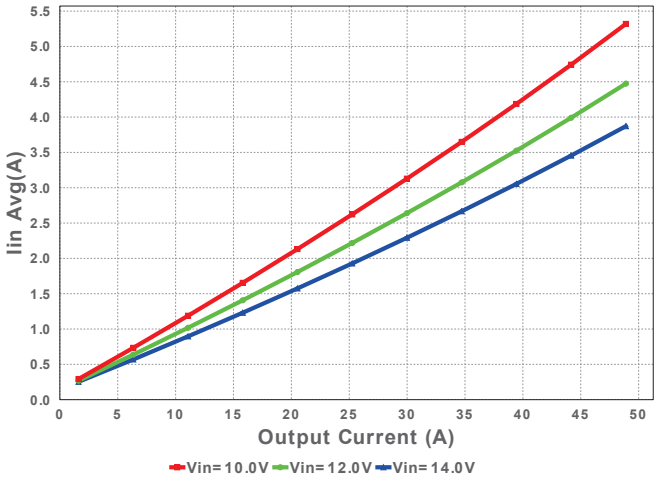
Cin Pd



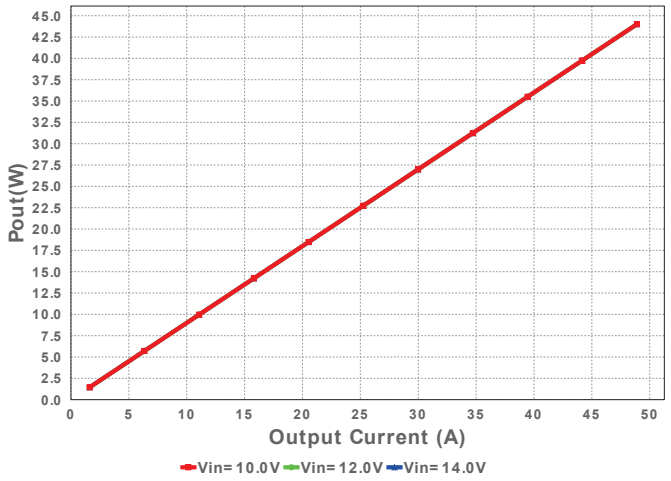
Cin IRMS



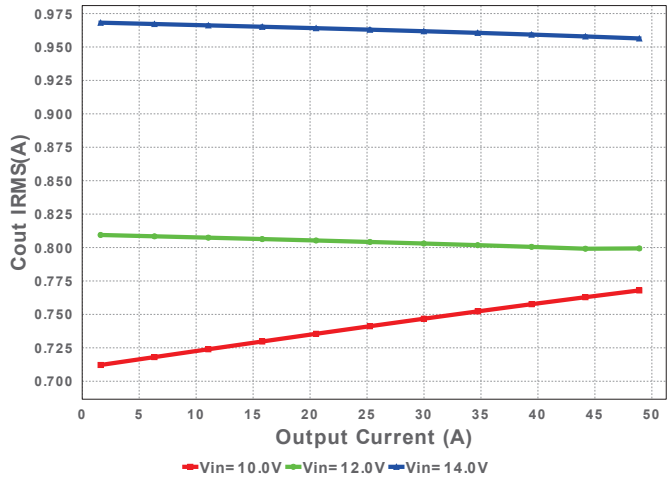
Iin Avg



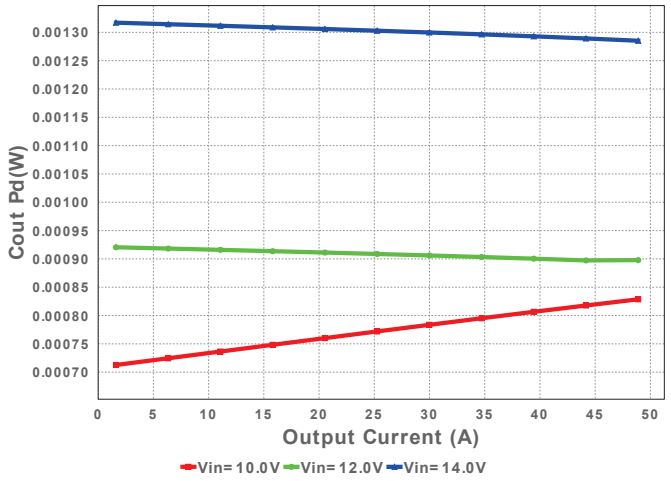
Pout

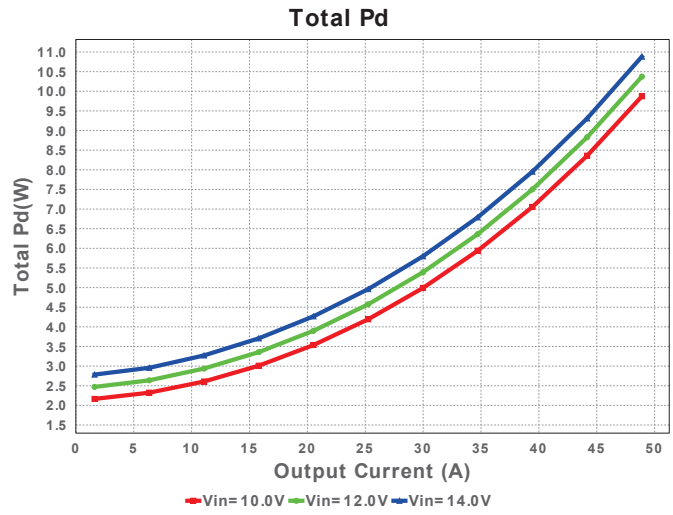


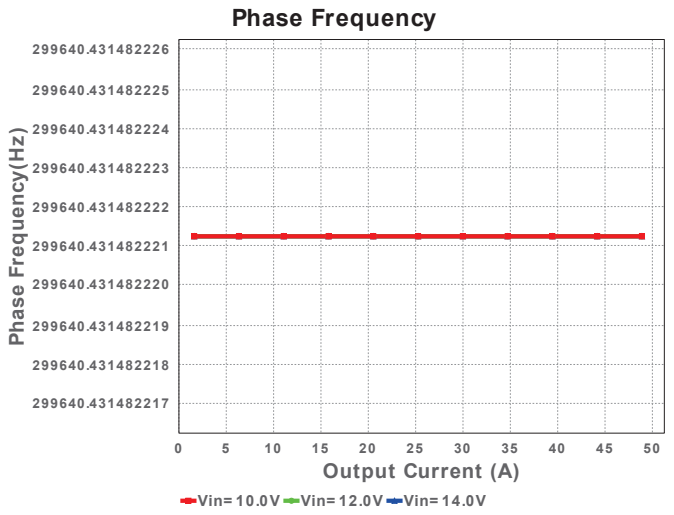
Cout IRMS

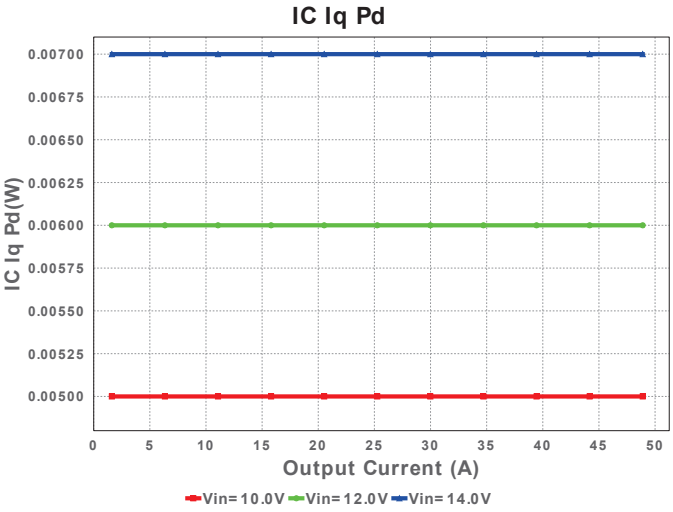


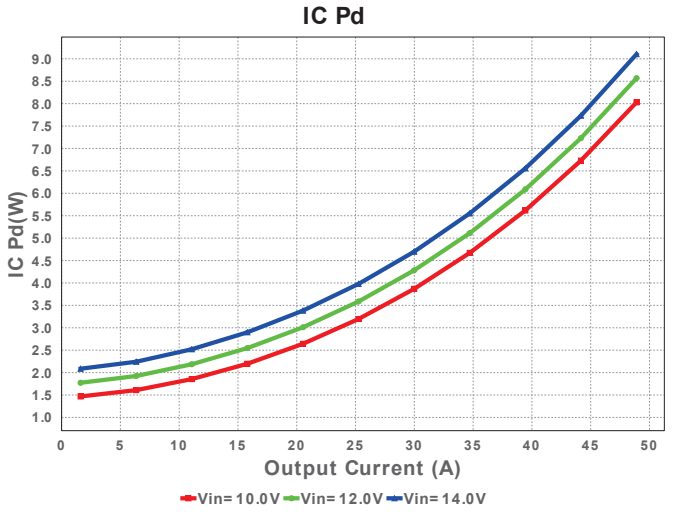
Cout Pd

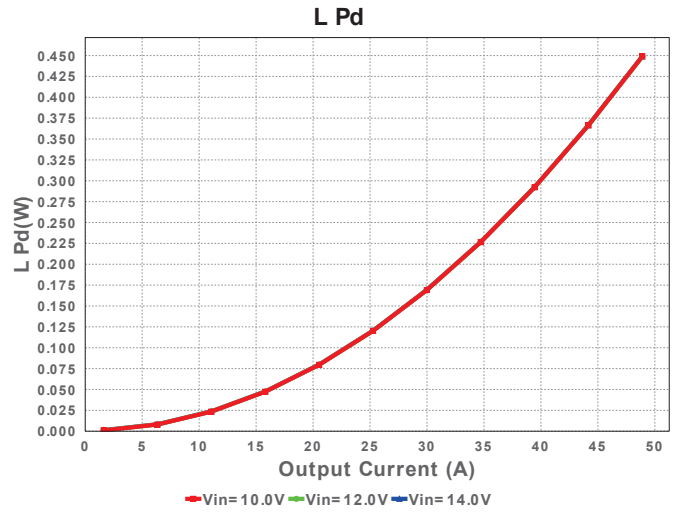












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	6.401 A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	957.002 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	3.846 A	Current	Average input current
4.	L Ipp	3.602 A	Current	Peak-to-peak inductor ripple current
5.	filter_1 attenuation Factor	542.961 m	Filter	Attenuation factor
6.	filter_1 target Vpp	9.0 mV	Filter	Target voltage ripple through filter filter_1
7.	BOM Count	11	General	Total Design BOM count
8.	FootPrint	1.772 k mm^2	General	Total Foot Print Area of BOM components
9.	Frequency	599.281 kHz	General	Switching frequency
10.	IC Tolerance	20.0 mV	General	IC Feedback Tolerance

#	Name	Value	Category	Description
11.	Phase Frequency	299.64 kHz	General	Frequency per phase
12.	Pout	44.008 W	General	Total output power
13.	Total BOM	$0.0	General	Total BOM Cost
14.	Vout OP	900.0 mV	Op_Point	Operational Output Voltage
15.	filter_1 cut-off freq	410.936 kHz	Op_Point	Filter cut off frequency filter_1
16.	filter_1 voltage drop	14.18 mV	Op_Point	Voltage drop through filter filter_1
17.	Duty Cycle	7.387 %	Op_point	Duty cycle
18.	Efficiency	80.693 %	Op_point	Steady state efficiency
19.	IOUT_OP	48.898 A	Op_point	Iout operating point
20.	VIN_OP	14.0 V	Op_point	Vin operating point
21.	Vout p-p	16.576 mV	Op_point	Peak-to-peak output ripple voltage
22.	Cin Pd	163.899 mW	Power	Input capacitor power dissipation
23.	Cout Pd	1.287 mW	Power	Output capacitor power dissipation
24.	IC Iq Pd	7.0 mW	Power	IC Iq Pd
25.	IC Pd	8.752 W	Power	IC power dissipation
26.	L Pd	449.126 mW	Power	Inductor power dissipation
27.	Total Pd	10.53 W	Power	Total Power Dissipation
28.	filter_1_Pd	693.395 mW	Power	Filter Power Loss filter_1

Design Inputs

#	Name	Value	Description
1.	Iout	48.898	Maximum Output Current
2.	Iout1	48.898	Output Current #1
3.	VinMax	14.0	Maximum input voltage
4.	VinMin	10.0	Minimum input voltage
5.	Vout	900.0 m	Output Voltage
6.	Vout1	900.0 m	Output Voltage #1
7.	base_pn	PTH08T250W	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0	Ambient temperature

Design Assistance

1. PTH08T250W Product Folder : http://www.ti.com/product/PTH08T250W : contains the data sheet and other resources.

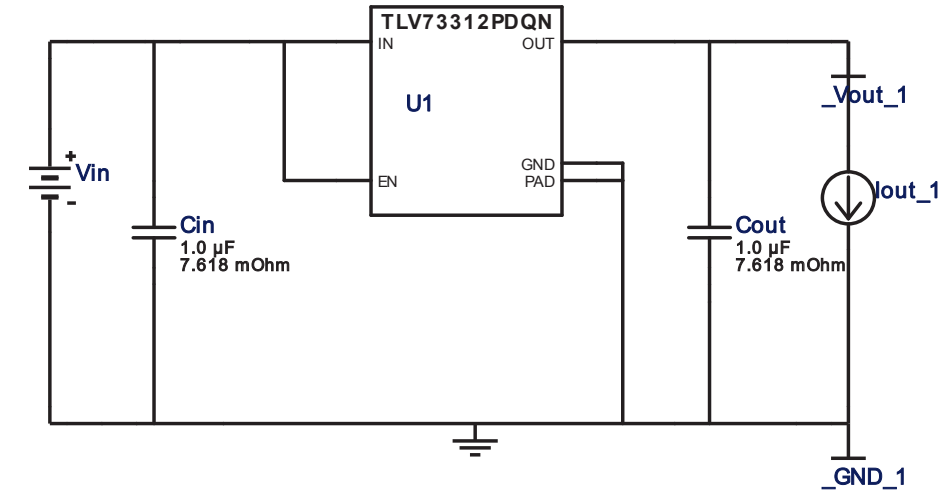
TEXAS INSTRUMENTS

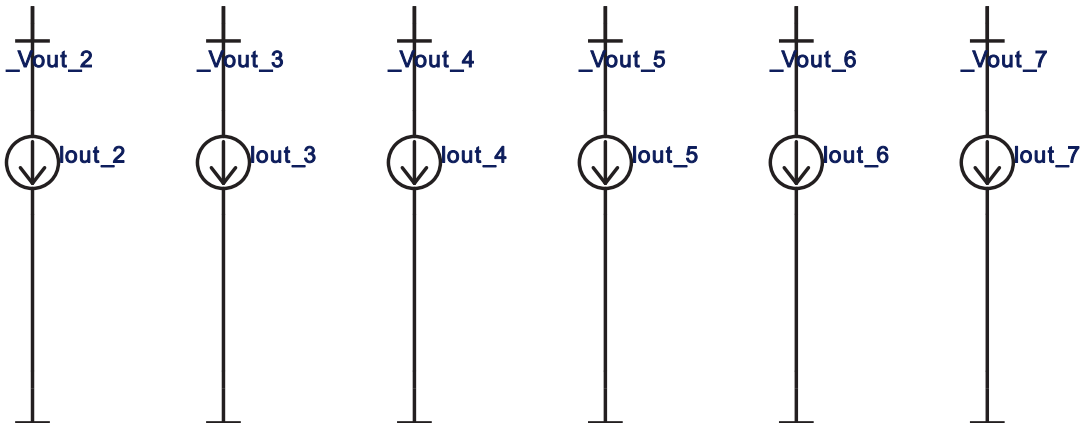
WEBENCH® Design Report

Design : 3612920/27 TLV73312PDQNR
TLV73312PDQNR 1.62V-1.98V to 1.20V @ 0.008A

VinMin = 1.62V
VinMax = 1.98V
Vout = 1.2V
Iout = 0.01A

Device = TLV73312PDQNR
Topology = LDO
Created = 6/23/15 3:22:16 AM
BOM Cost = $0.19
Footprint = 10.0 mm^2
BOM Count = 3
Total Pd = 0.01W

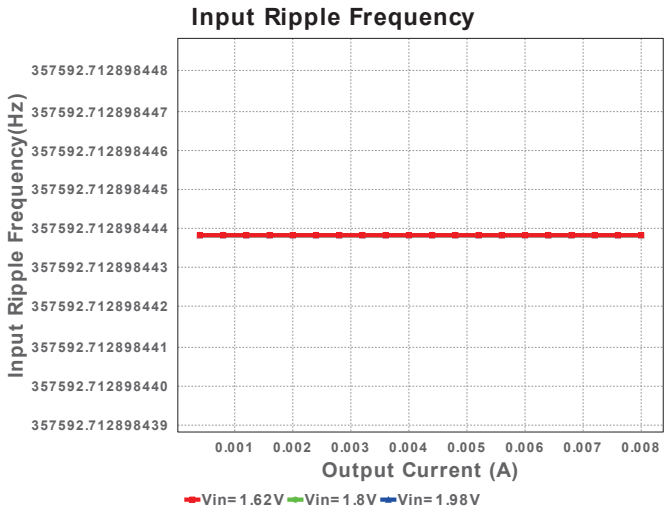


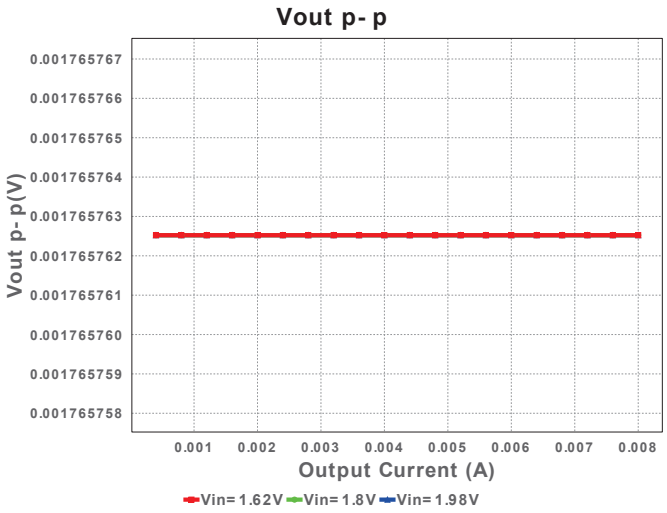


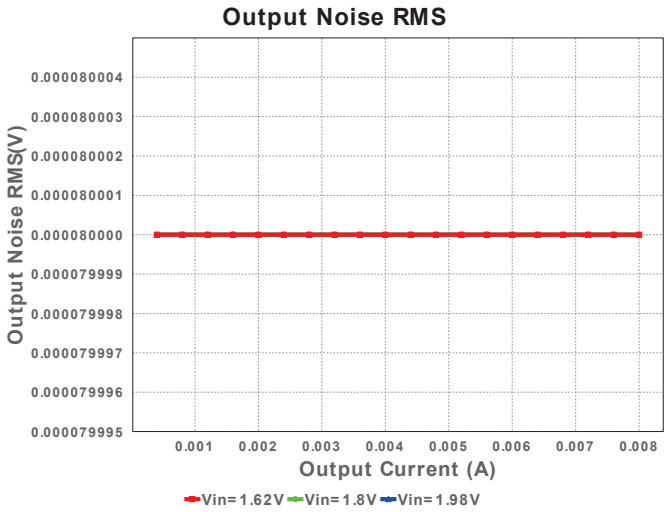
Electrical BOM

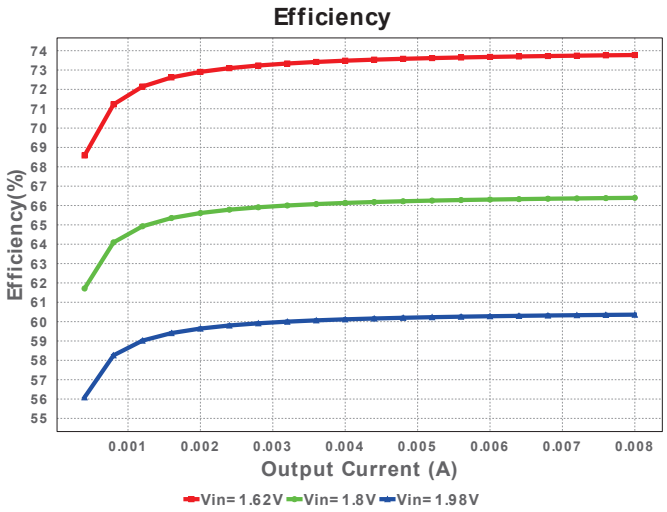
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	TDK	C1005X5R0J105M Series= X5R	Cap= 1.0 uF ESR= 7.618 mOhm VDC= 6.3 V IRMS= 0.0 A	1	$0.01	0402 3 mm^2
2.	Cout	TDK	C1005X5R0J105M Series= X5R	Cap= 1.0 uF ESR= 7.618 mOhm VDC= 6.3 V IRMS= 0.0 A	1	$0.01	0402 3 mm^2

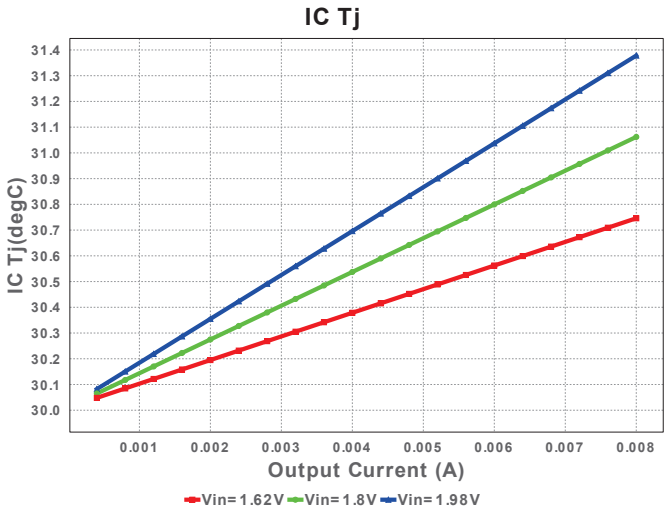
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
3.	U1	Texas Instruments	TLV73312PDQNR	Switcher	1	$0.17	DQN0004A 4 mm²

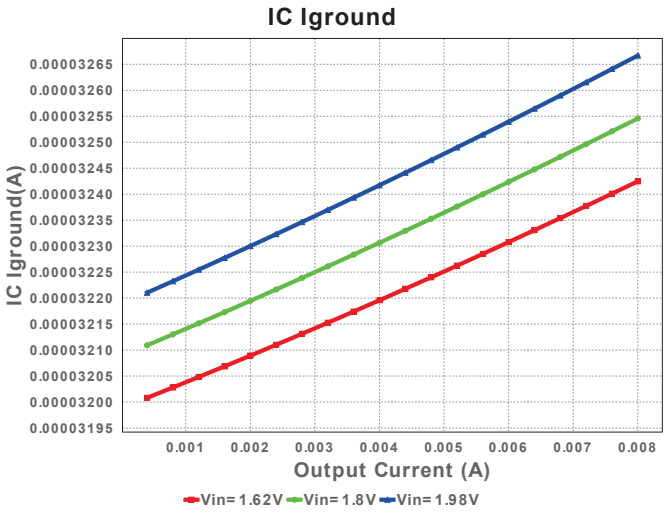


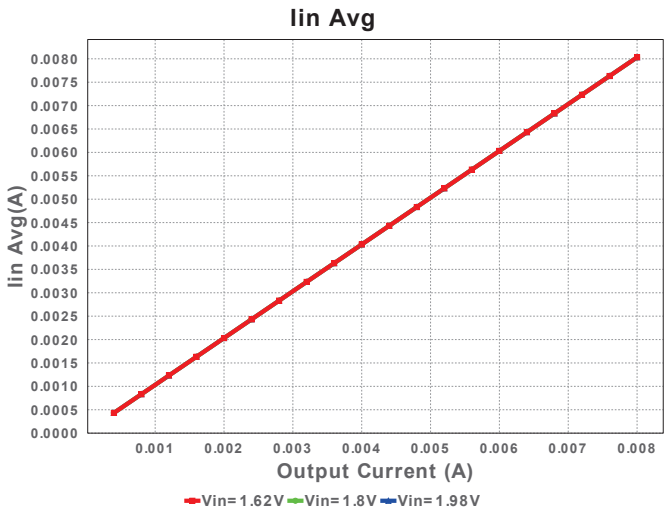


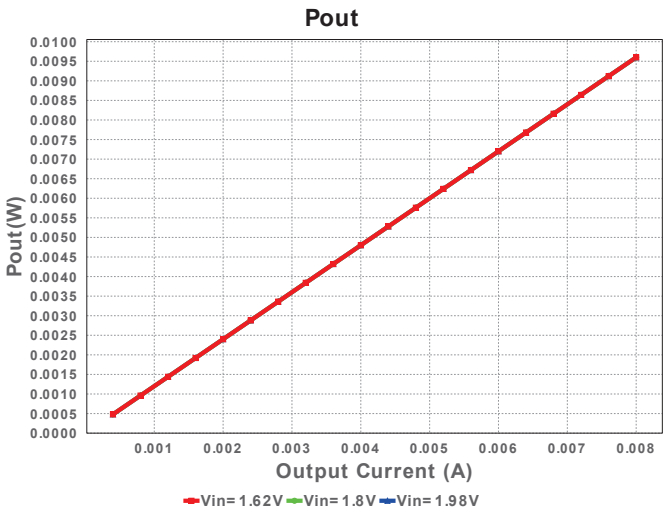


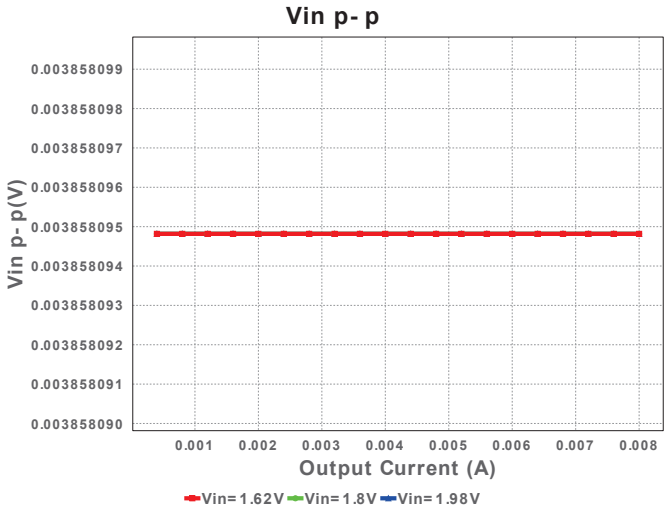


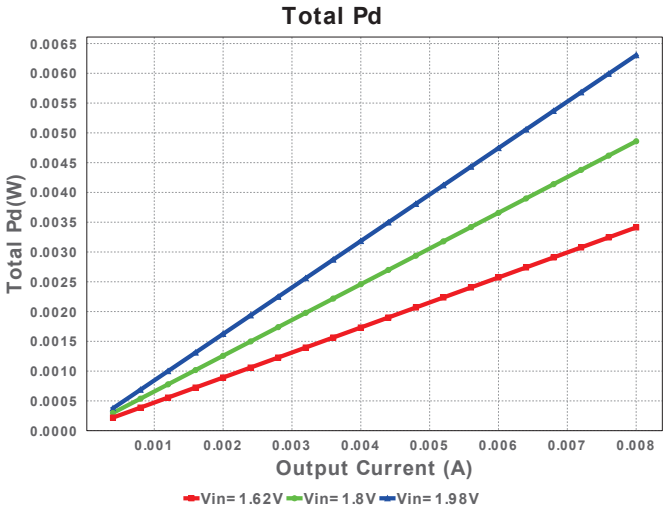


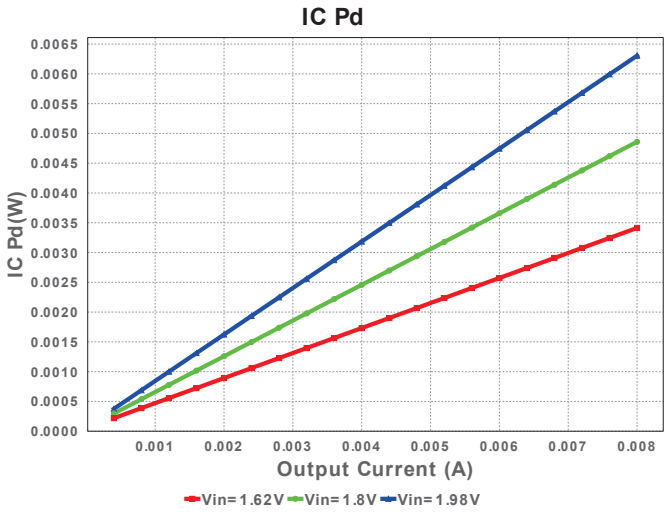


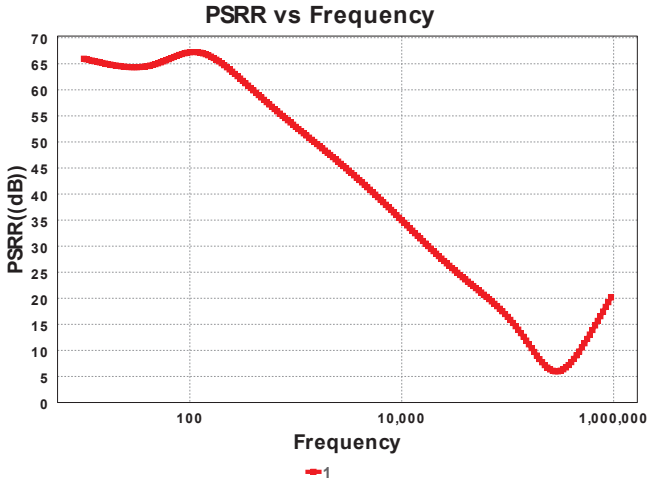












Operating Values

#	Name	Value	Category	Description
1.	IC Iground	32.667 µA	Current	IC ground current
2.	Iin Avg	8.033 mA	Current	Average input current
3.	BOM Count	3	General	Total Design BOM count
4.	FootPrint	10.0 mm^2	General	Total Foot Print Area of BOM components
5.	IC Tolerance	16.8 mV	General	IC Feedback Tolerance
6.	Output Noise RMS	80.0 µV	General	Noise RMS
7.	Pout	9.6 mW	General	Total output power
8.	Total BOM	$0.19	General	Total BOM Cost
9.	Vin p-p	3.858 mV	Op_Point	Input Source ripple voltage
10.	Efficiency	60.36 %	Op_point	Steady state efficiency
11.	IC Tj	31.378 degC	Op_point	IC junction temperature

#	Name	Value	Category	Description
12.	ICThetaJA	218.6 degC/W	Op_point	IC junction-to-ambient thermal resistance
13.	IOUT_OP	8.0 mA	Op_point	Iout operating point
14.	Input Ripple Frequency	357.593 kHz	Op_point	Input Source Ripple Frequency for PSRR Calculation
15.	PSRR est.	-6.789 dB	Op_point	Power Supply Rejection Ratio, estimated
16.	VIN_OP	1.98 V	Op_point	Vin operating point
17.	Vout p-p	1.766 mV	Op_point	Peak-to-peak output ripple voltage
18.	IC Pd	6.305 mW	Power	IC power dissipation
19.	Total Pd	6.305 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	8.0 m	Maximum Output Current
2.	Iout1	8.0 m	Output Current #1
3.	VinMax	1.98	Maximum input voltage
4.	VinMin	1.62	Minimum input voltage
5.	Vout	1.2	Output Voltage
6.	Vout1	1.2	Output Voltage #1
7.	base_pn	TLV73312P	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0	Ambient temperature

Design Assistance

1.

2. TLV73312P Product Folder : http://www.ti.com/product/TLV733 : contains the data sheet and other resources.

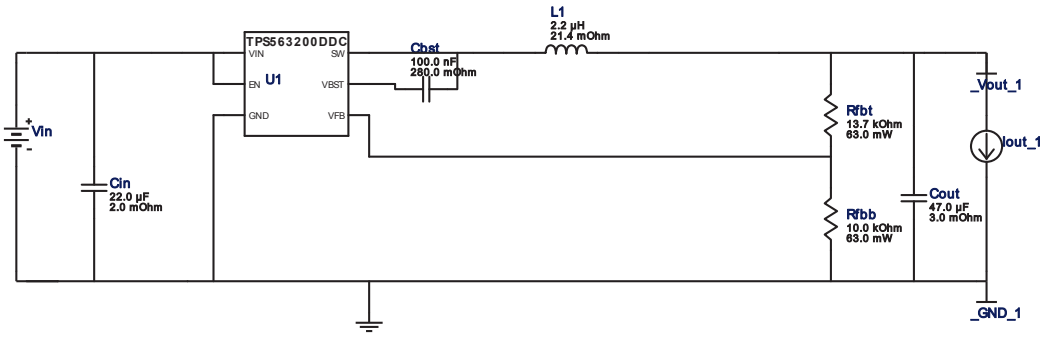
TEXAS INSTRUMENTS

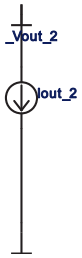
WEBENCH® Design Report

VinMin = 10.0V
VinMax = 14.0V
Vout = 1.8V
Iout = 0.24A

Device = TPS563200DDCR
Topology = Buck
Created = 6/23/15 3:22:17 AM
BOM Cost = $1.38
Footprint = 74.0 mm^2
BOM Count = 7
Total Pd = 0.07W

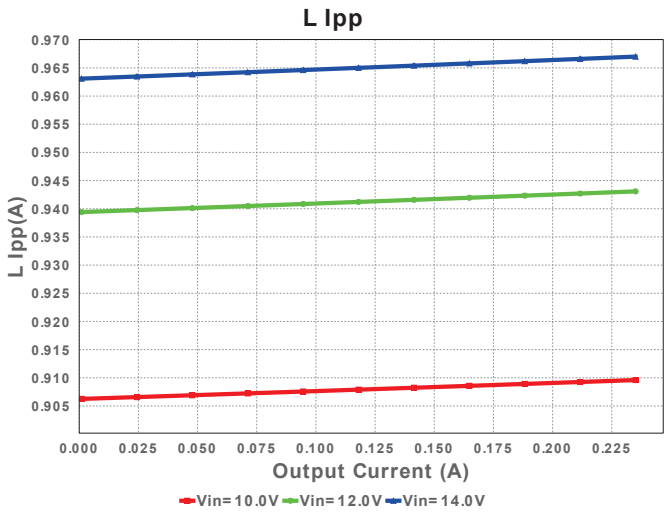
Design : 3612920/28 TPS563200DDCR
TPS563200DDCR 10.0V-14.0V to 1.80V @ 0.23503A

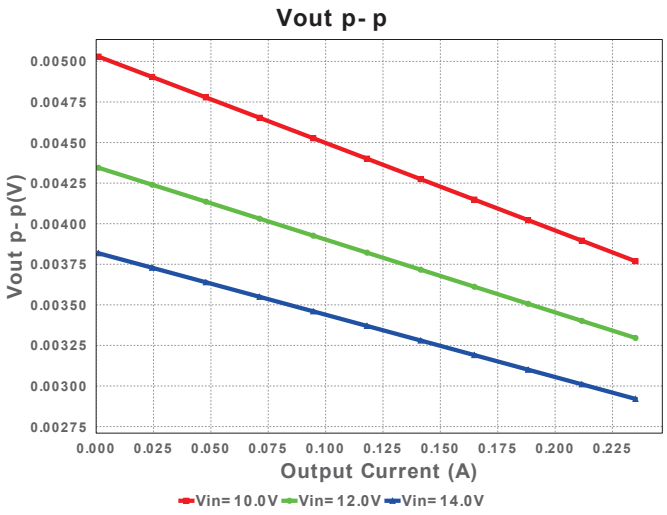


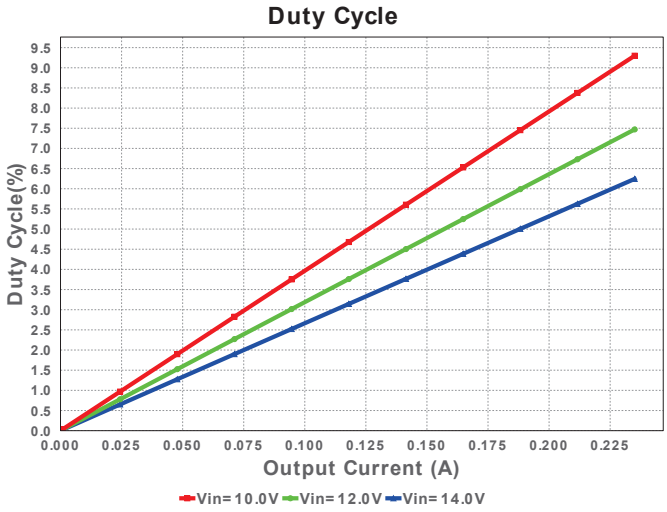


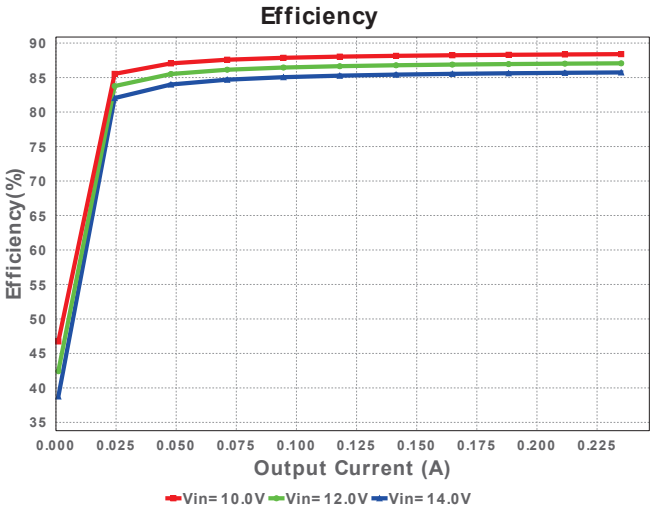
Electrical BOM

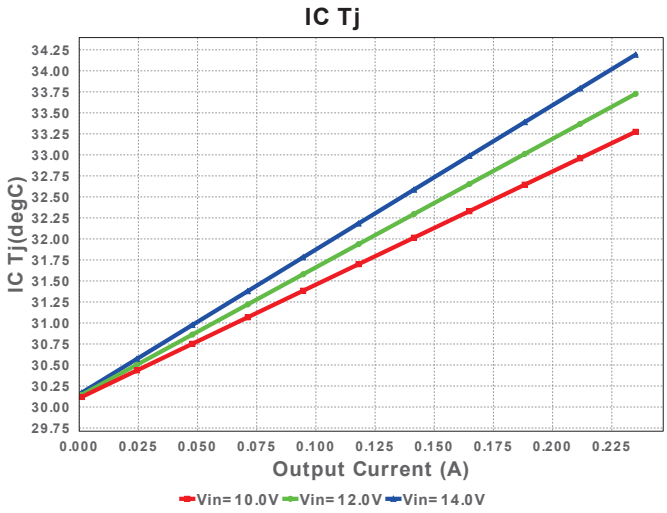
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm^2
2.	Cin	MuRata	GRM32ER61E226KE15L Series= X5R	Cap= 22.0 uF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 3.67 A	1	$0.16	1210 15 mm^2
3.	Cout	MuRata	GRM31CR60J476ME19L Series= X5R	Cap= 47.0 uF ESR= 3.0 mOhm VDC= 6.3 V IRMS= 0.0 A	1	$0.12	1206 11 mm^2
4.	L1	Coilcraft	XFL4020-222MEB	L= 2.2 µH DCR= 21.4 mOhm	1	$0.55	XFL4020 25 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.	Rfbt	Vishay-Dale	CRCW040213K7FKED Series= CRCW..e3	Res= 13.7 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
7.	U1	Texas Instruments	TPS563200DDCR	Switcher	1	$0.52	DDC0006A 10 mm^2

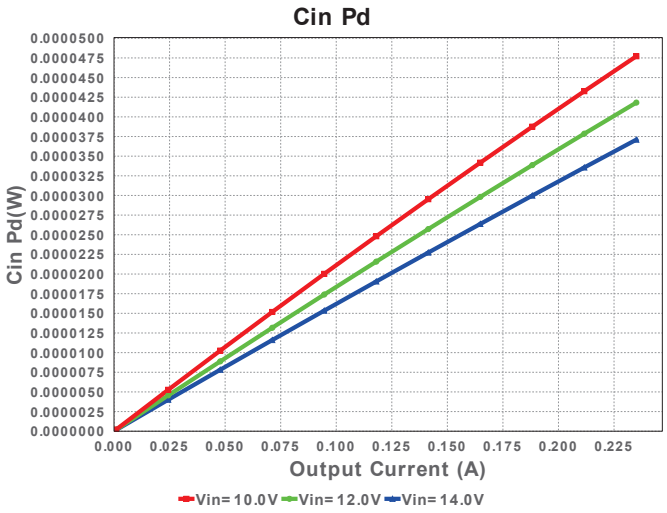




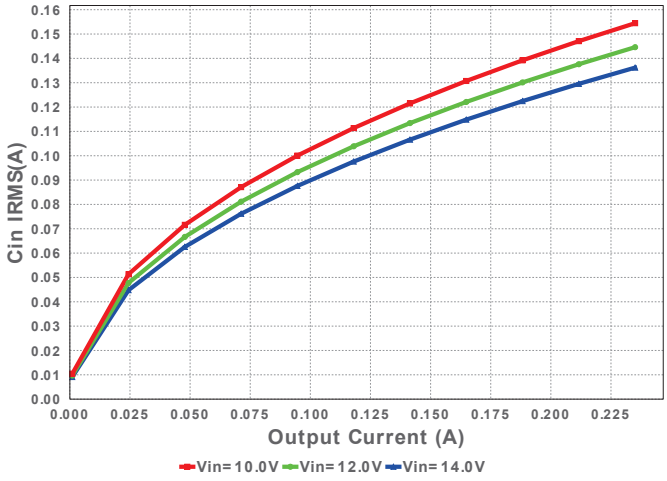




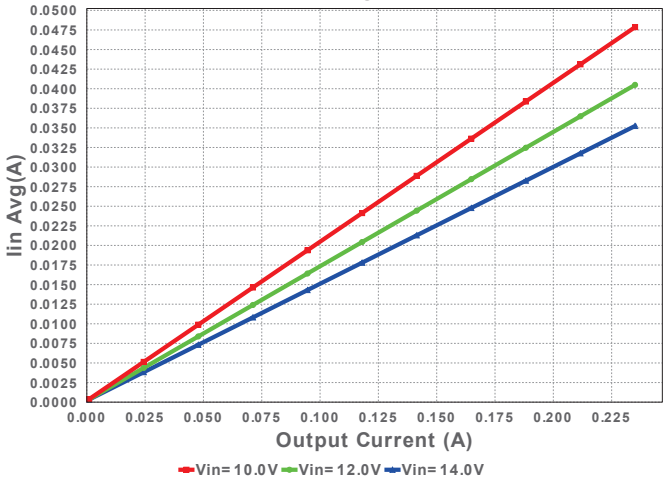




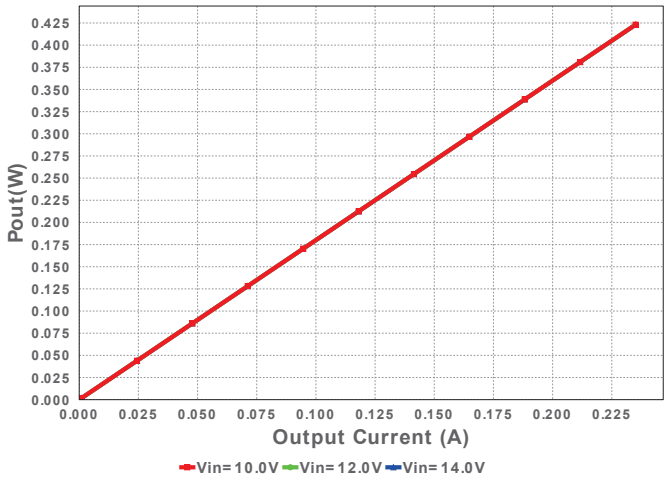
Cin IRMS



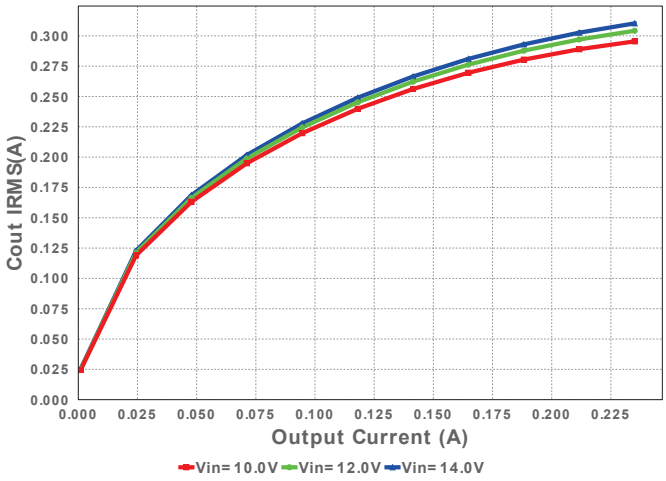
Iin Avg



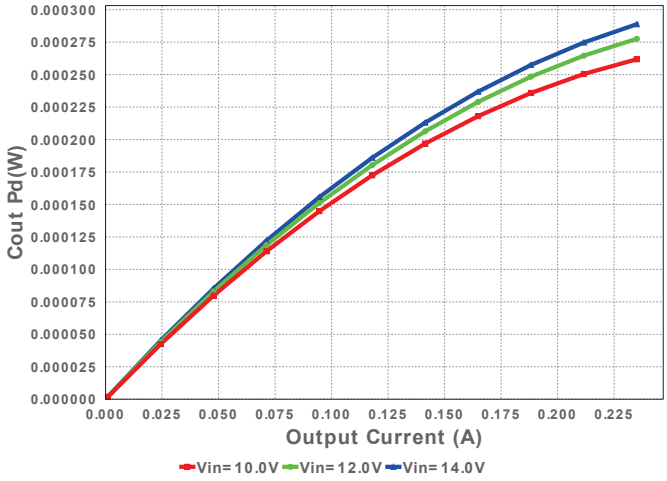
Pout



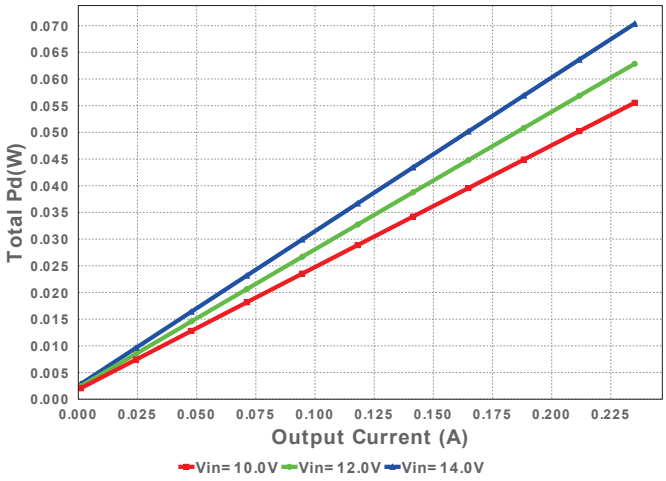
Cout IRMS

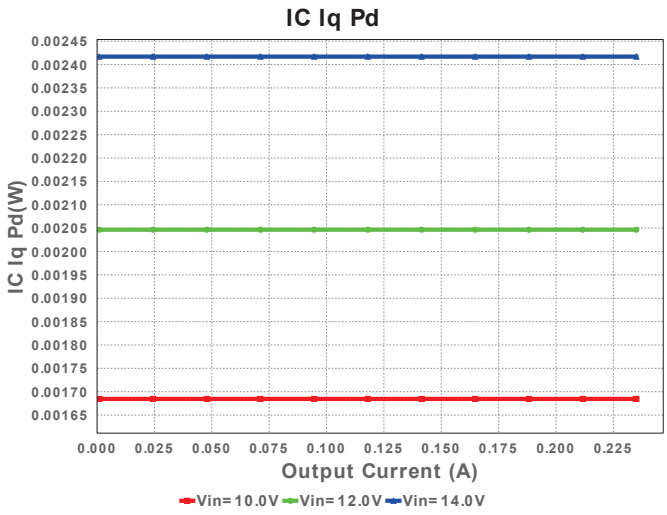


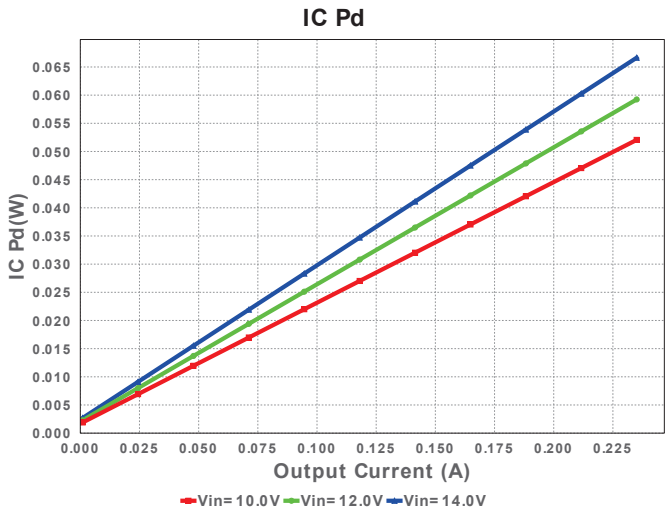
Cout Pd

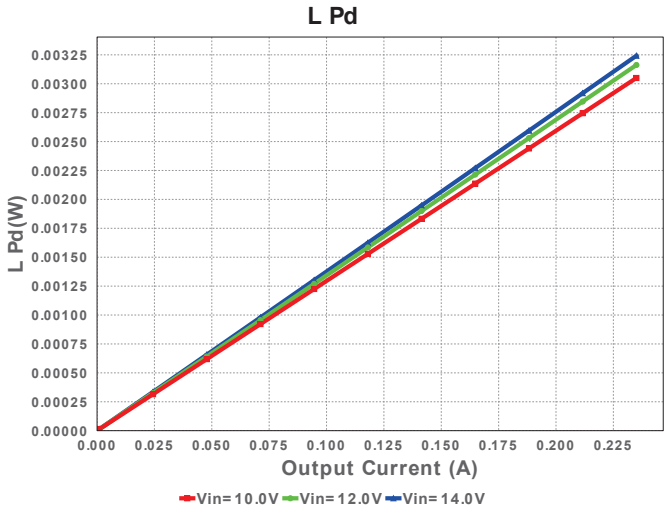


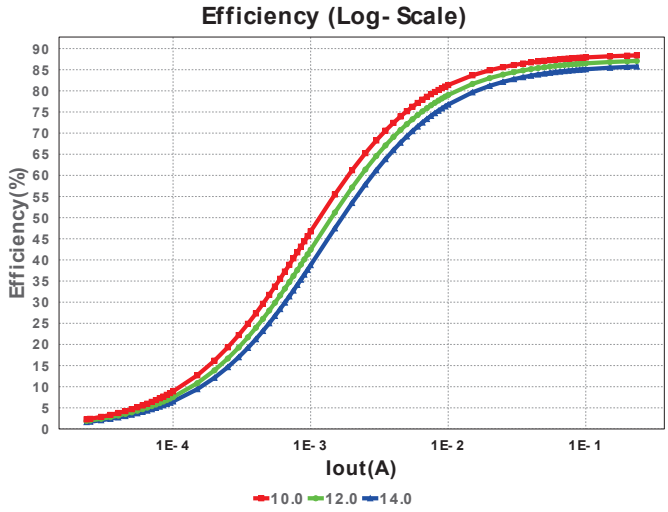
Total Pd











Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	136.199 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	310.285 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	35.243 mA	Current	Average input current
4.	L Ipp	967.0 mA	Current	Peak-to-peak inductor ripple current
5.	BOM Count	7	General	Total Design BOM count
6.	FootPrint	74.0 mm^2	General	Total Foot Print Area of BOM components
7.	Frequency	357.593 kHz	General	Switching frequency
8.	Pout	423.054 mW	General	Total output power
9.	Total BOM	$1.38	General	Total BOM Cost
10.	Vout OP	1.8 V	Op_Point	Operational Output Voltage
11.	Duty Cycle	6.244 %	Op_point	Duty cycle
12.	Efficiency	85.743 %	Op_point	Steady state efficiency
13.	IC Tj	34.192 degC	Op_point	IC junction temperature
14.	ICThetaJA	62.9 degC/W	Op_point	IC junction-to-ambient thermal resistance
15.	IOUT_OP	235.03 mA	Op_point	Iout operating point
16.	VIN_OP	14.0 V	Op_point	Vin operating point
17.	Vout p-p	3.858 mV	Op_point	Peak-to-peak output ripple voltage
18.	Cin Pd	37.101 µW	Power	Input capacitor power dissipation
19.	Cout Pd	288.831 µW	Power	Output capacitor power dissipation
20.	IC Iq Pd	2.417 mW	Power	IC Iq Pd
21.	IC Pd	66.641 mW	Power	IC power dissipation
22.	L Pd	3.242 mW	Power	Inductor power dissipation
23.	Total Pd	70.344 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	235.03 m	Maximum Output Current
2.	Iout1	235.03 m	Output Current #1
3.	VinMax	14.0	Maximum input voltage
4.	VinMin	10.0	Minimum input voltage

#	Name	Value	Description
5.	Vout	1.8	Output Voltage
6.	Vout1	1.8	Output Voltage #1
7.	base_pn	TPS563200	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0	Ambient temperature

Design Assistance

1. TPS563200 Product Folder : http://www.ti.com/product/TPS563200 : contains the data sheet and other resources.

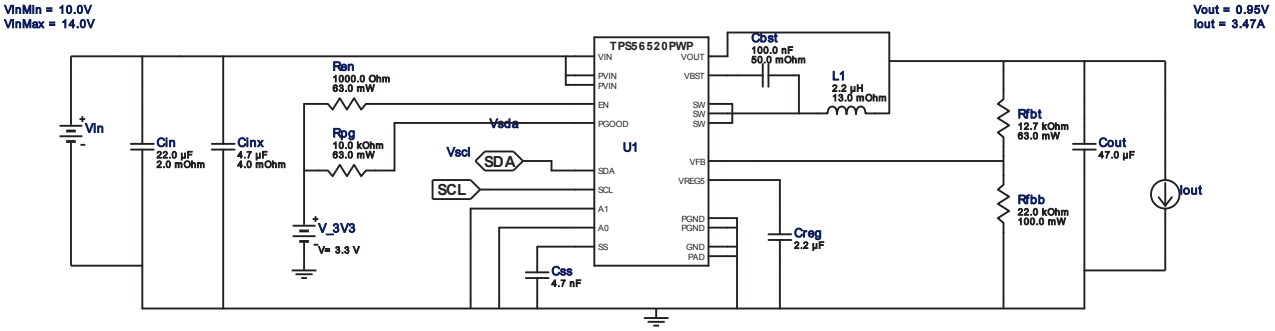
TEXAS INSTRUMENTS

WEBENCH® Design Report

VinMin = 10.0V
VinMax = 14.0V
Vout = 0.95V
Iout = 3.47A

Device = TPS56520PWPR
Topology = Buck
Created = 6/23/15 3:22:17 AM
BOM Cost = $2.07
Footprint = 231.0 mm^2
BOM Count = 12
Total Pd = 0.96W

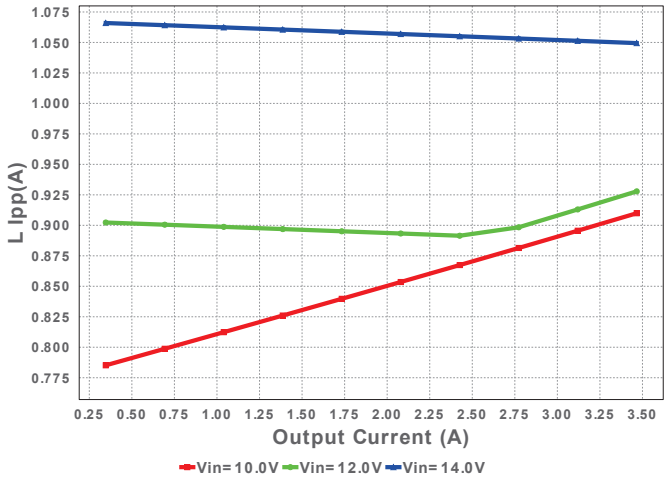
Design : 3612920/29 TPS56520PWPR
TPS56520PWPR 10.0V-14.0V to .95V @ 3.466A

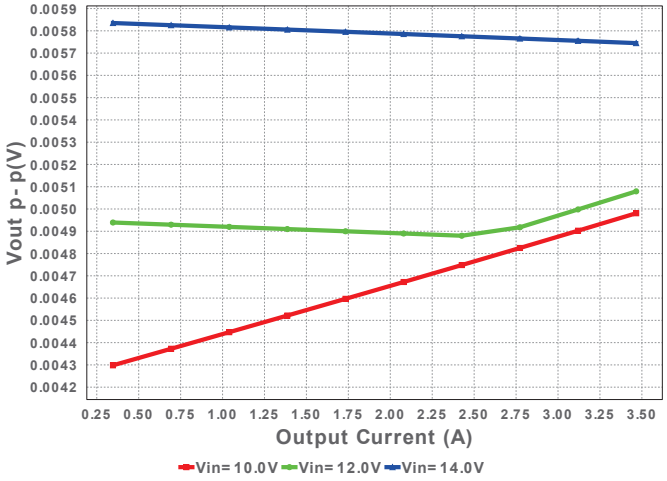


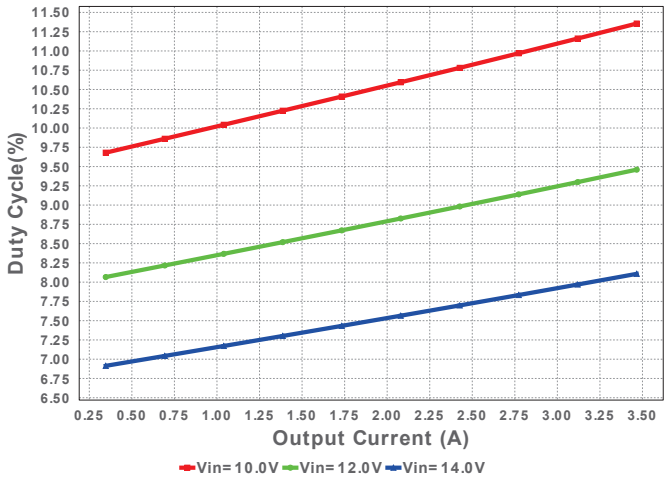
Electrical BOM

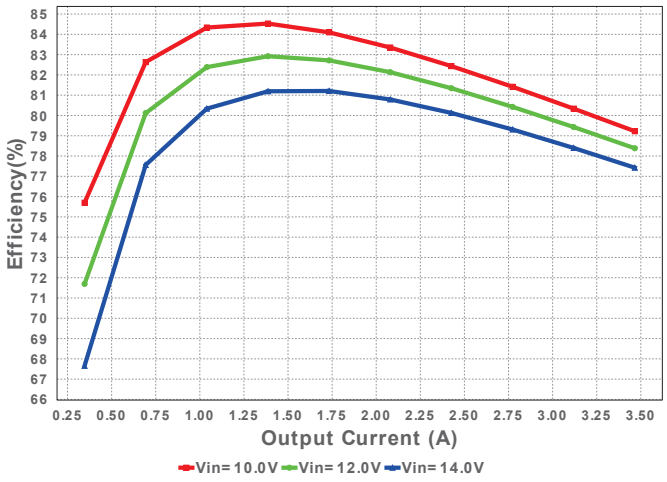
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	AVX	06033C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 50.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	$0.01	0603 5 mm^2
2.	Cin	MuRata	GRM32ER61E226KE15L Series= X5R	Cap= 22.0 uF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 3.67 A	1	$0.16	1210 15 mm^2
3.	Cinx	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
4.	Cout	Taiyo Yuden	JMK212BJ476MG-T Series= X5R	Cap= 47.0 uF VDC= 6.3 V IRMS= 0.0 A	1	$0.18	0805 7 mm^2
5.	Creg	MuRata	GRM188R61A225KE34D Series= X5R	Cap= 2.2 uF VDC= 10.0 V IRMS= 0.0 A	1	$0.02	0603 5 mm^2
6.	Css	Yageo America	CC0805KRX7R9BB472 Series= X7R	Cap= 4.7 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm^2
7.	L1	Bourns	SRN8040-2R2Y	L= 2.2 µH DCR= 13.0 mOhm	1	$0.22	SRN8040 100 mm^2
8.	Ren	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	Res= 1000.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
9.	Rfbb	Susumu Co Ltd	RR1220P-223-D Series= 264	Res= 22.0 kOhm Power= 100.0 mW Tolerance= 0.5%	1	$0.01	0805 7 mm^2
10.	Rfbt	Vishay-Dale	CRCW040212K7FKED Series= CRCW..e3	Res= 12.7 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
11.	Rpg	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2

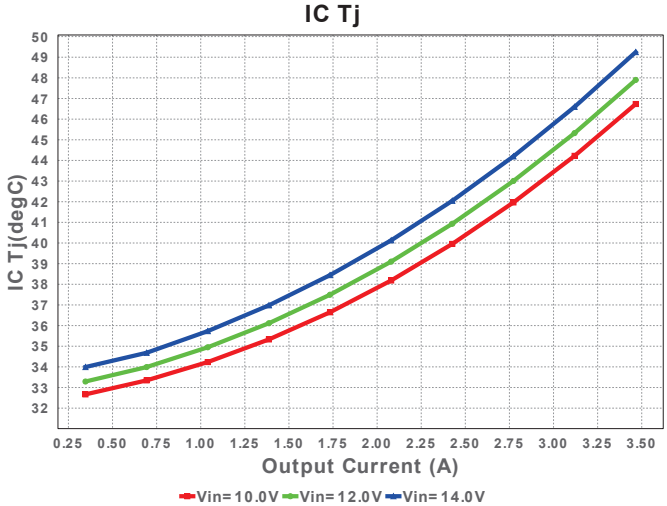
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
12.	U1	Texas Instruments	TPS56520PWPR	Switcher	1	$1.40	 PWP0020N 71 mm^2

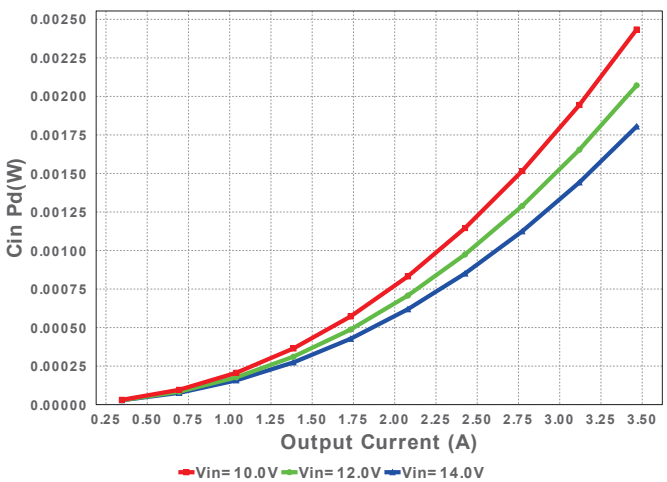




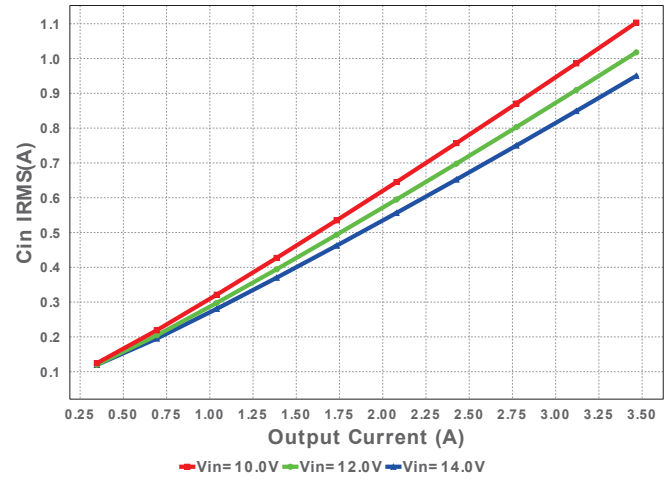




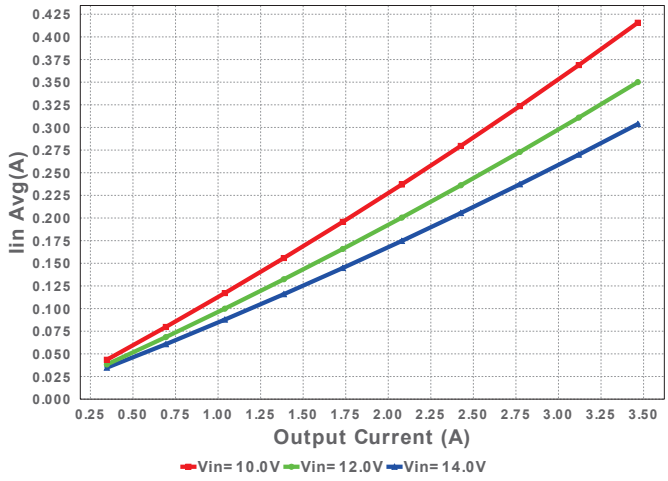




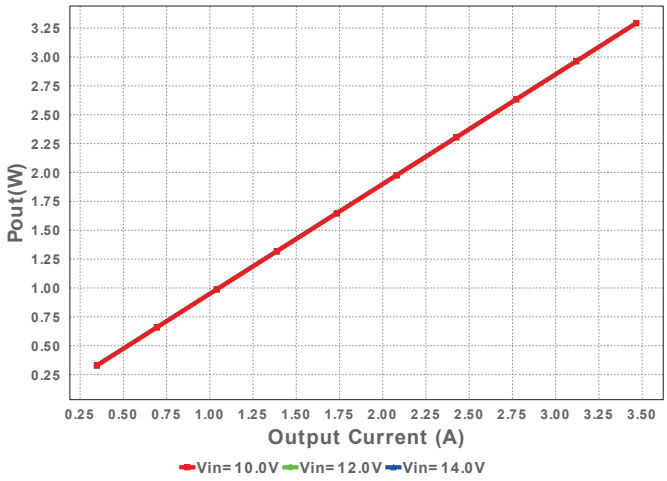
Cin IRMS



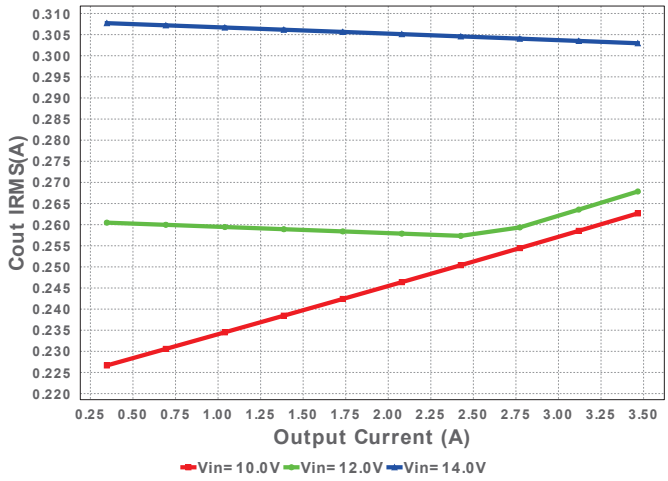
Iin Avg



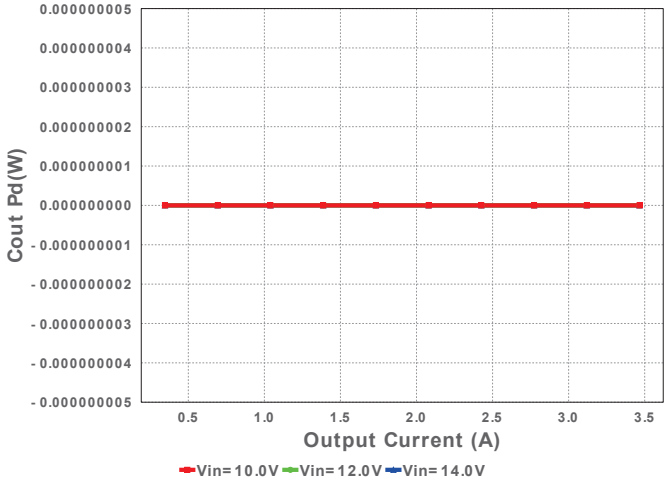
Pout



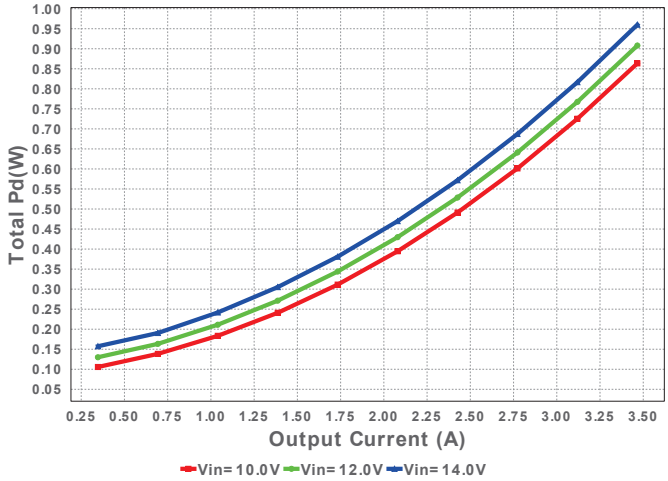
Cout IRMS

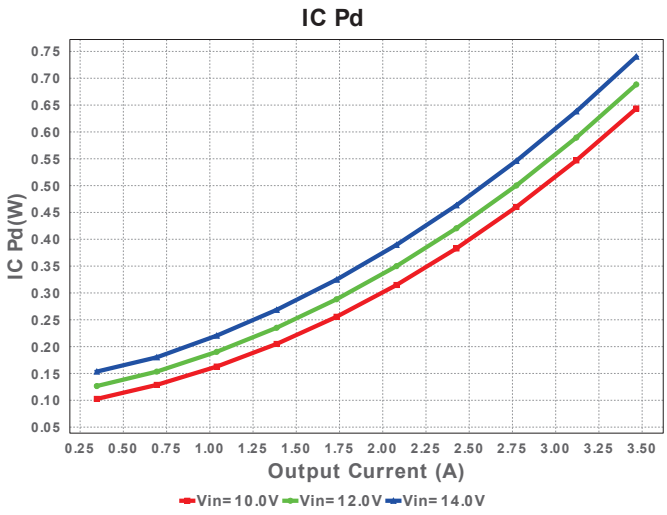


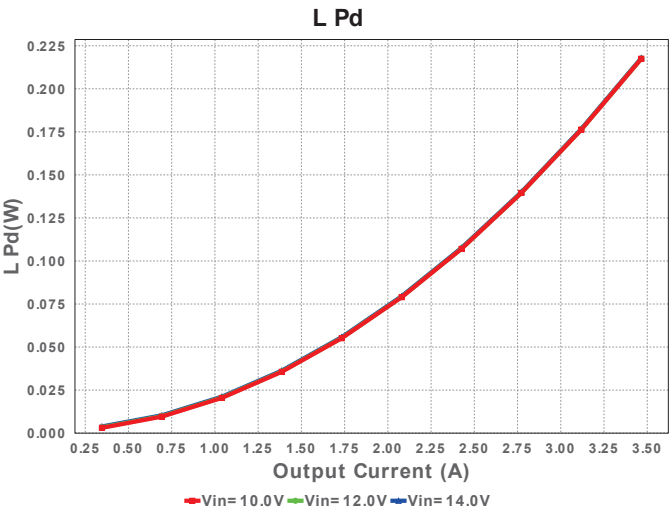
Cout Pd



Total Pd







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	949.98 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	302.952 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	303.77 mA	Current	Average input current
4.	L Ipp	1.05 A	Current	Peak-to-peak inductor ripple current
5.	BOM Count	12	General	Total Design BOM count
6.	FootPrint	231.0 mm^2	General	Total Foot Print Area of BOM components
7.	Frequency	500.0 kHz	General	Switching frequency
8.	Pout	3.293 W	General	Total output power
9.	Total BOM	$2.07	General	Total BOM Cost
10.	Vout OP	950.0 mV	Op_Point	Operational Output Voltage
11.	Duty Cycle	8.108 %	Op_point	Duty cycle
12.	Efficiency	77.425 %	Op_point	Steady state efficiency
13.	IC Tj	49.248 degC	Op_point	IC junction temperature
14.	ICThetaJA	26.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
15.	IOUT_OP	3.466 A	Op_point	Iout operating point
16.	VIN_OP	14.0 V	Op_point	Vin operating point
17.	Vout p-p	5.745 mV	Op_point	Peak-to-peak output ripple voltage
18.	Cin Pd	1.805 mW	Power	Input capacitor power dissipation
19.	Cout Pd	0.0 W	Power	Output capacitor power dissipation
20.	IC Pd	740.322 mW	Power	IC power dissipation
21.	L Pd	217.889 mW	Power	Inductor power dissipation
22.	Total Pd	960.065 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	3.466	Maximum Output Current
2.	Iout1	3.466	Output Current #1
3.	VinMax	14.0	Maximum input voltage
4.	VinMin	10.0	Minimum input voltage
5.	Vout	950.0 m	Output Voltage
6.	Vout1	950.0 m	Output Voltage #1
7.	base_pn	TPS56520	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0	Ambient temperature

Design Assistance

1. TPS56520 Product Folder : http://www.ti.com/product/TPS56520 : contains the data sheet and other resources.

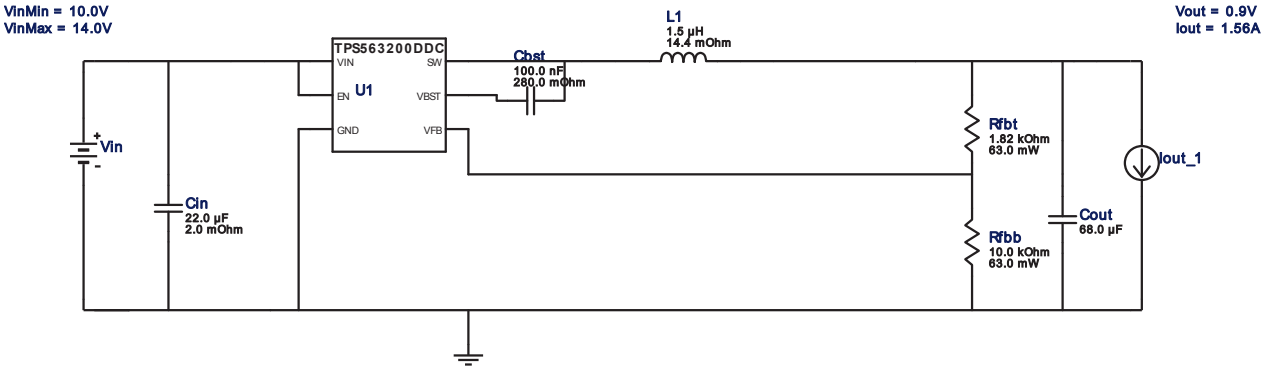
TEXAS INSTRUMENTS

WEBENCH® Design Report

Design : 3612920/30 TPS563200DDCR
TPS563200DDCR 10.0V-14.0V to .90V @ 1.561A

VinMin = 10.0V
VinMax = 14.0V
Vout = 0.9V
Iout = 1.56A

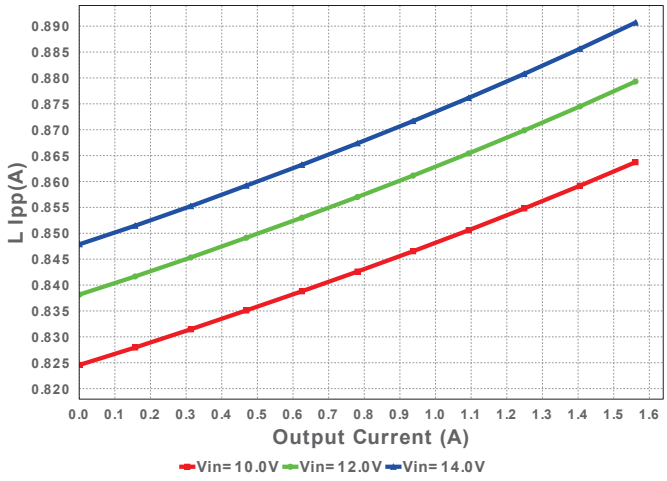
Device = TPS563200DDCR
Topology = Buck
Created = 6/23/15 3:22:18 AM
BOM Cost = $1.58
Footprint = 74.0 mm^2
BOM Count = 7
Total Pd = 0.34W



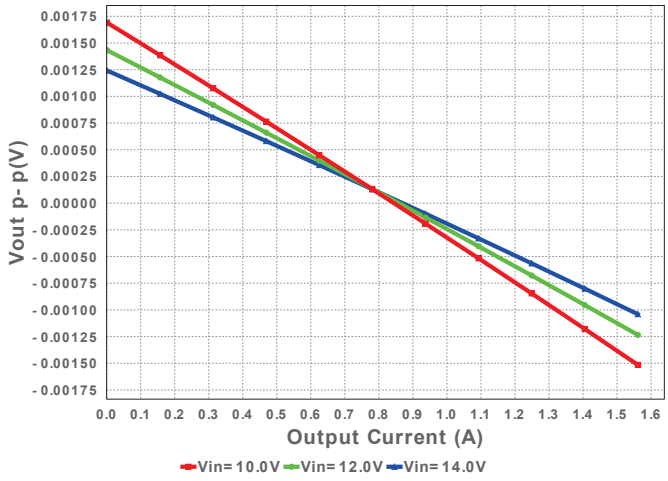
Electrical BOM

#	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	TDK	C3216JB0J686M Series= 274	Cap= 68.0 uF VDC= 6.3 V IRMS= 0.0 A	1	$0.32	1206 11 mm^2
4.	L1	Coilcraft	XFL4020-152MEB	L= 1.5 µH DCR= 14.4 mOhm	1	$0.55	XFL4020 25 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.	Rfbt	Vishay-Dale	CRCW04021K82FKED Series= CRCW..e3	Res= 1.82 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
7.	U1	Texas Instruments	TPS563200DDCR	Switcher	1	$0.52	DDC0006A 10 mm^2

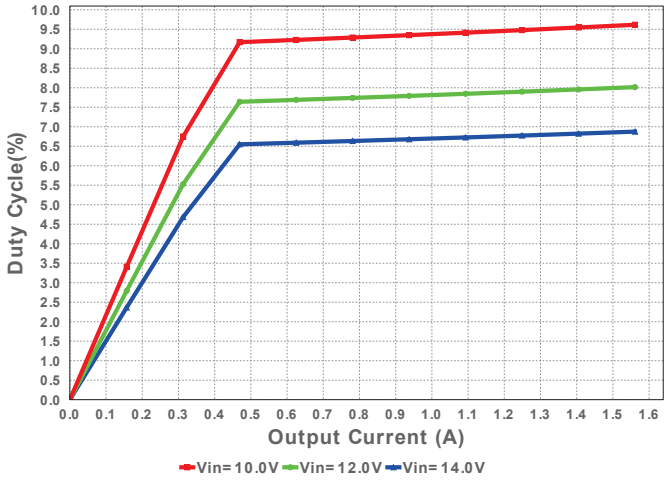
L Ipp



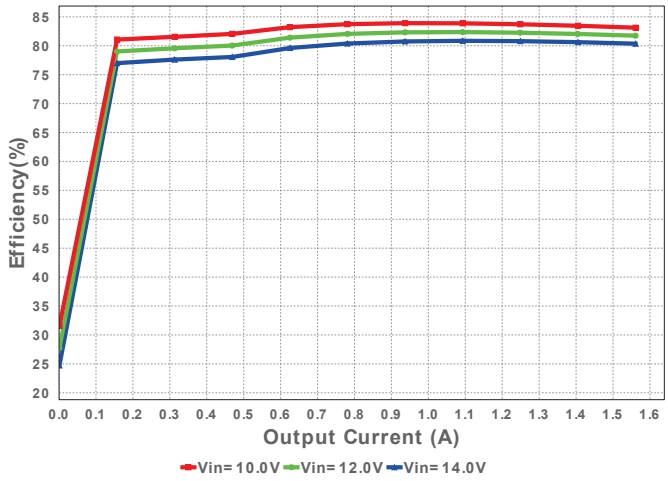
Vout p-p



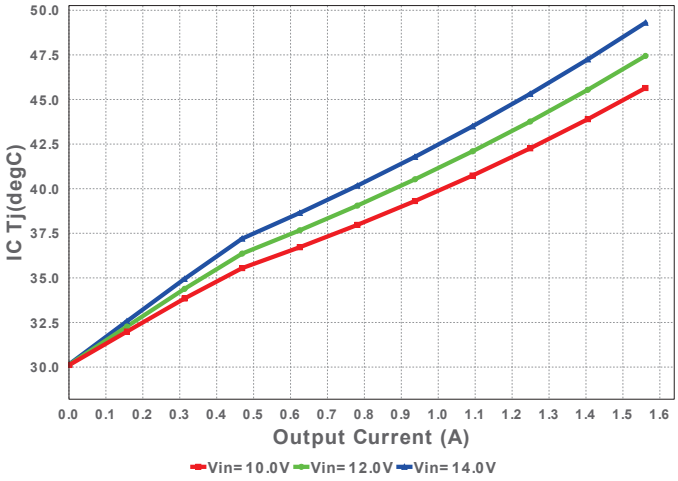
Duty Cycle



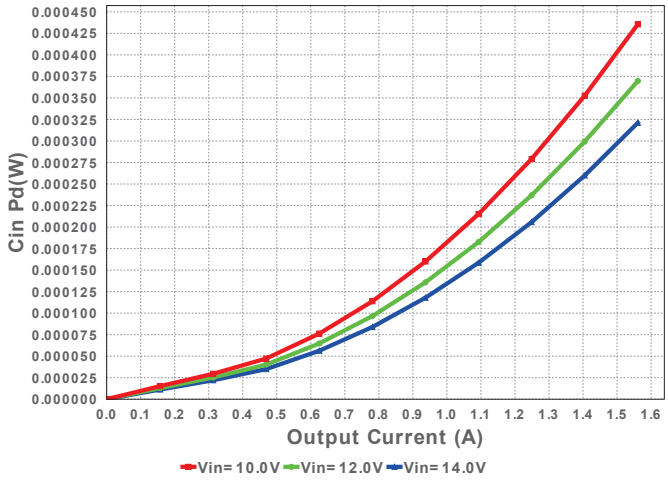
Efficiency



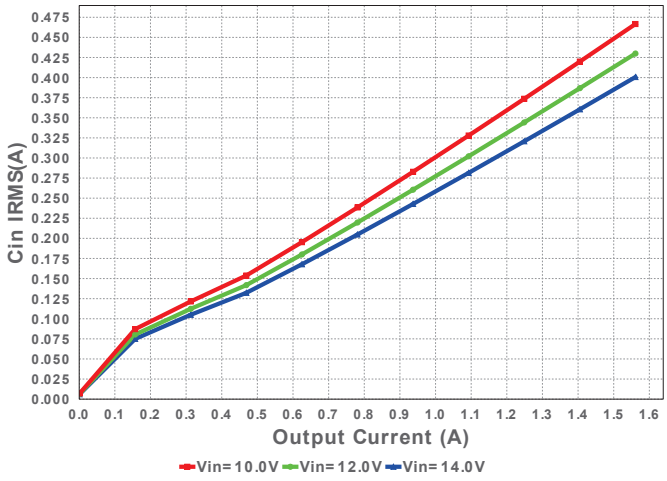
IC Tj



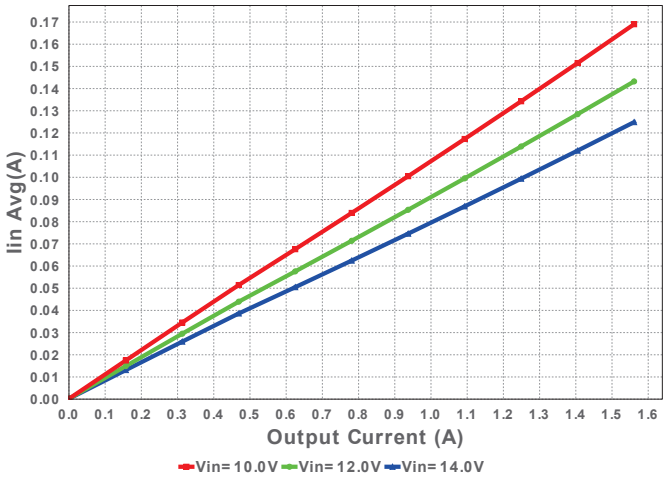
Cin Pd



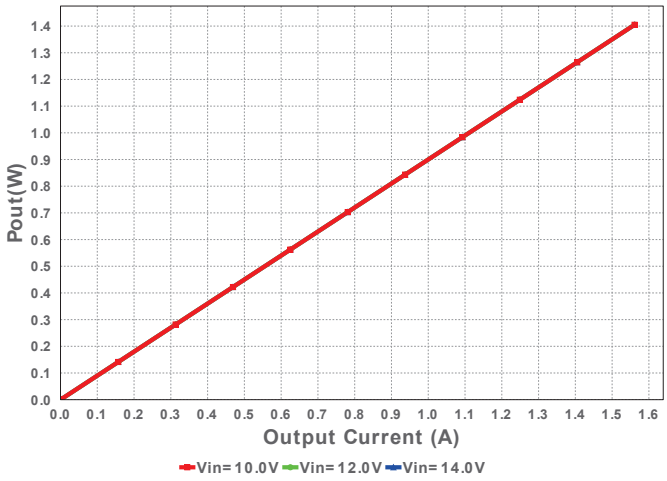
Cin IRMS



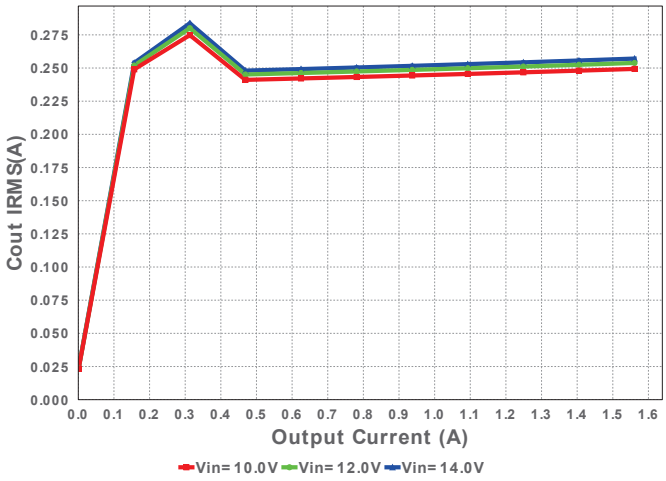
Iin Avg



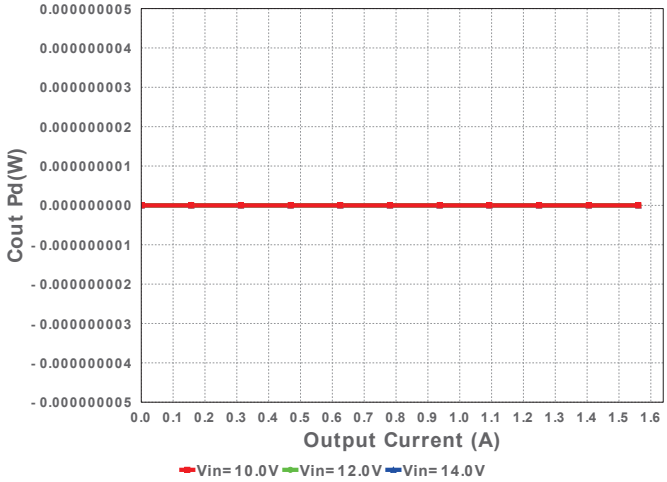
Pout



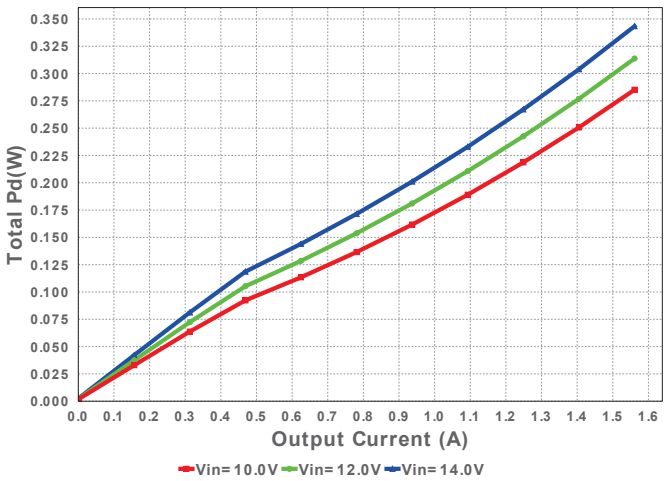
Cout IRMS

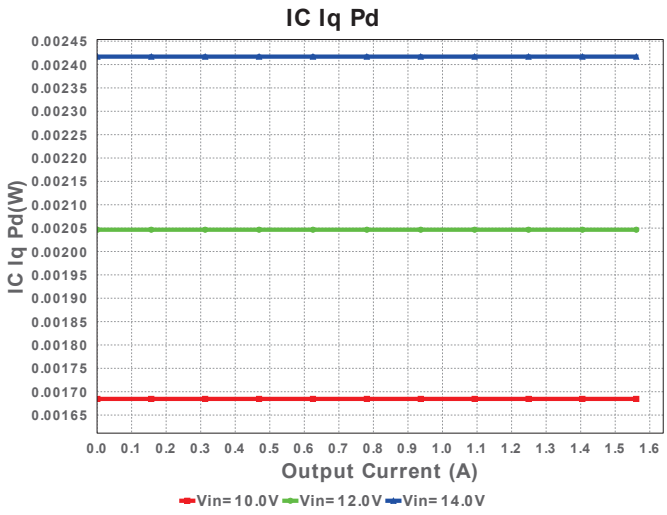


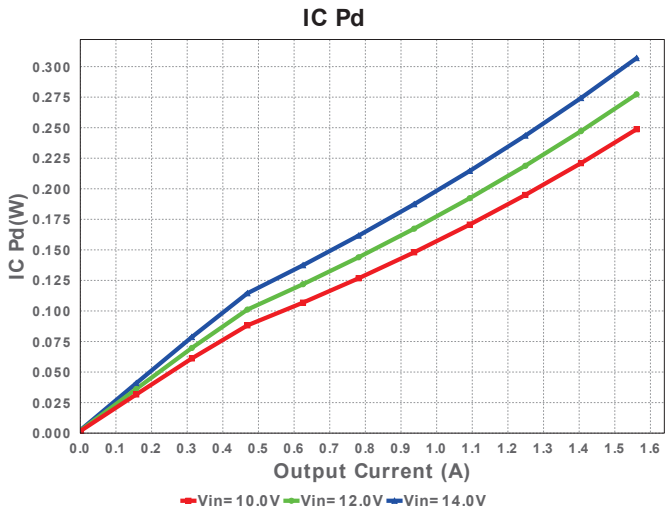
Cout Pd

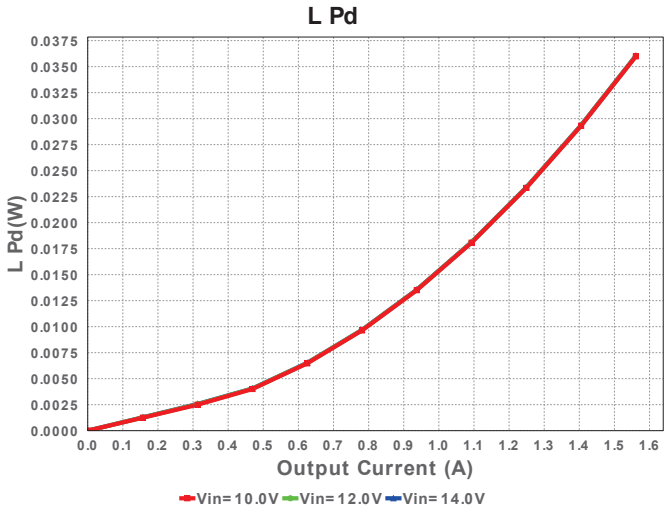


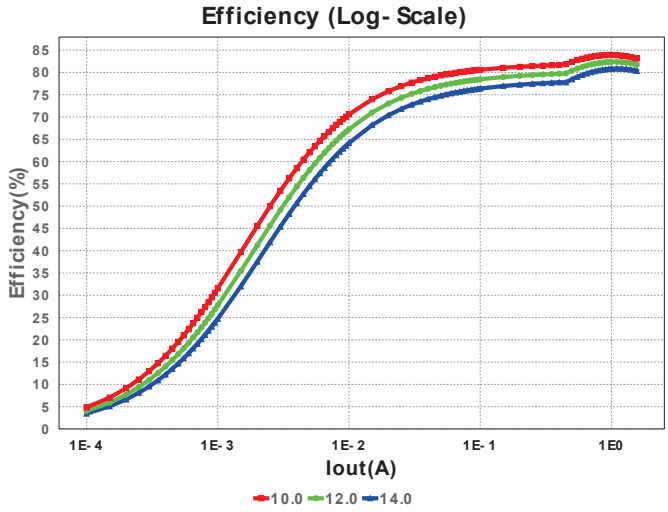
Total Pd











Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	400.695 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	257.118 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	124.87 mA	Current	Average input current
4.	L Ipp	890.68 mA	Current	Peak-to-peak inductor ripple current
5.	BOM Count	7	General	Total Design BOM count
6.	FootPrint	74.0 mm^2	General	Total Foot Print Area of BOM components
7.	Frequency	669.236 kHz	General	Switching frequency
8.	Pout	1.405 W	General	Total output power
9.	Total BOM	$1.58	General	Total BOM Cost
10.	Vout OP	900.0 mV	Op_Point	Operational Output Voltage
11.	Duty Cycle	6.875 %	Op_point	Duty cycle
12.	Efficiency	80.36 %	Op_point	Steady state efficiency
13.	IC Tj	49.305 degC	Op_point	IC junction temperature
14.	ICThetaJA	62.9 degC/W	Op_point	IC junction-to-ambient thermal resistance
15.	IOUT_OP	1.561 A	Op_point	Iout operating point
16.	VIN_OP	14.0 V	Op_point	Vin operating point
17.	Vout p-p	2.513 mV	Op_point	Peak-to-peak output ripple voltage
18.	Cin Pd	321.113 µW	Power	Input capacitor power dissipation
19.	Cout Pd	0.0 W	Power	Output capacitor power dissipation
20.	IC Iq Pd	2.417 mW	Power	IC Iq Pd
21.	IC Pd	306.919 mW	Power	IC power dissipation
22.	L Pd	36.041 mW	Power	Inductor power dissipation
23.	Total Pd	343.343 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	1.561	Maximum Output Current
2.	Iout1	1.561	Output Current #1
3.	VinMax	14.0	Maximum input voltage
4.	VinMin	10.0	Minimum input voltage

#	Name	Value	Description
5.	Vout	900.0 m	Output Voltage
6.	Vout1	900.0 m	Output Voltage #1
7.	base_pn	TPS563200	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0	Ambient temperature

Design Assistance

1. TPS563200 Product Folder : http://www.ti.com/product/TPS563200 : contains the data sheet and other resources.