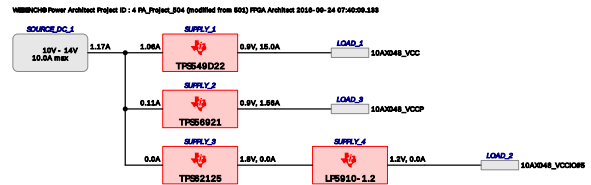


WEBENCH® Power Architect



Project Report

Project : 4790845/4 : PA_Project_504 (modified from 501)

Created : 2016-09-24 07:40:09.133

Optimize project optFactor=5

Project Summary

1. Total System Efficiency	90.753 %
2. Total System BOM Count	57.0
3. Total System Footprint	1.427 kmm2
4. Total System BOM Cost	\$15.93
5. Total System Power Dissipation	1.519 W

--> Launch WEBENCH Power Architect.

Sequencer Flag Table

Supply	Sequencer Flag	Load	Load Name
SUPPLY_1	0	LOAD_1	10AX048_VCC
SUPPLY_2	0	LOAD_3	10AX048_VCCP
SUPPLY_4	0	LOAD_2	10AX048_VCCIO#5
SUPPLY_3	NA		

Power Supplies

#	Name	NSID	Description	Vout	Iout	Efficiency	Foot-print	Cost	Design	Page
1.	SUPPLY_1	TPS549D22	Switcher : High-Performance 40-A Synchronous Buck Converter	0.9 V	15.0 A	91%	565	\$10.09	32	4
2.	SUPPLY_2	TPS56921	Switcher : 4.5V to 17V Input, 9A Synchronous Step Down SWIFT Converter With VID Control	0.9 V	1.561 A	88.5%	780	\$4.60	33	9
3.	SUPPLY_3	TPS62125	Switcher : 3V-17V, 300mA Buck Converter With Adjustable Enable Threshold And Hysteresis	1.8 V	0.002 A	77.6%	73	\$1.08	35	18
4.	SUPPLY_4	LP5910-1.2	LDO : Ultra Low-Noise, 300-mA Linear Regulator for RF/Analog Circuits	1.2 V	0.002 A	58.1%	9	\$0.16	34	15

Power Loads

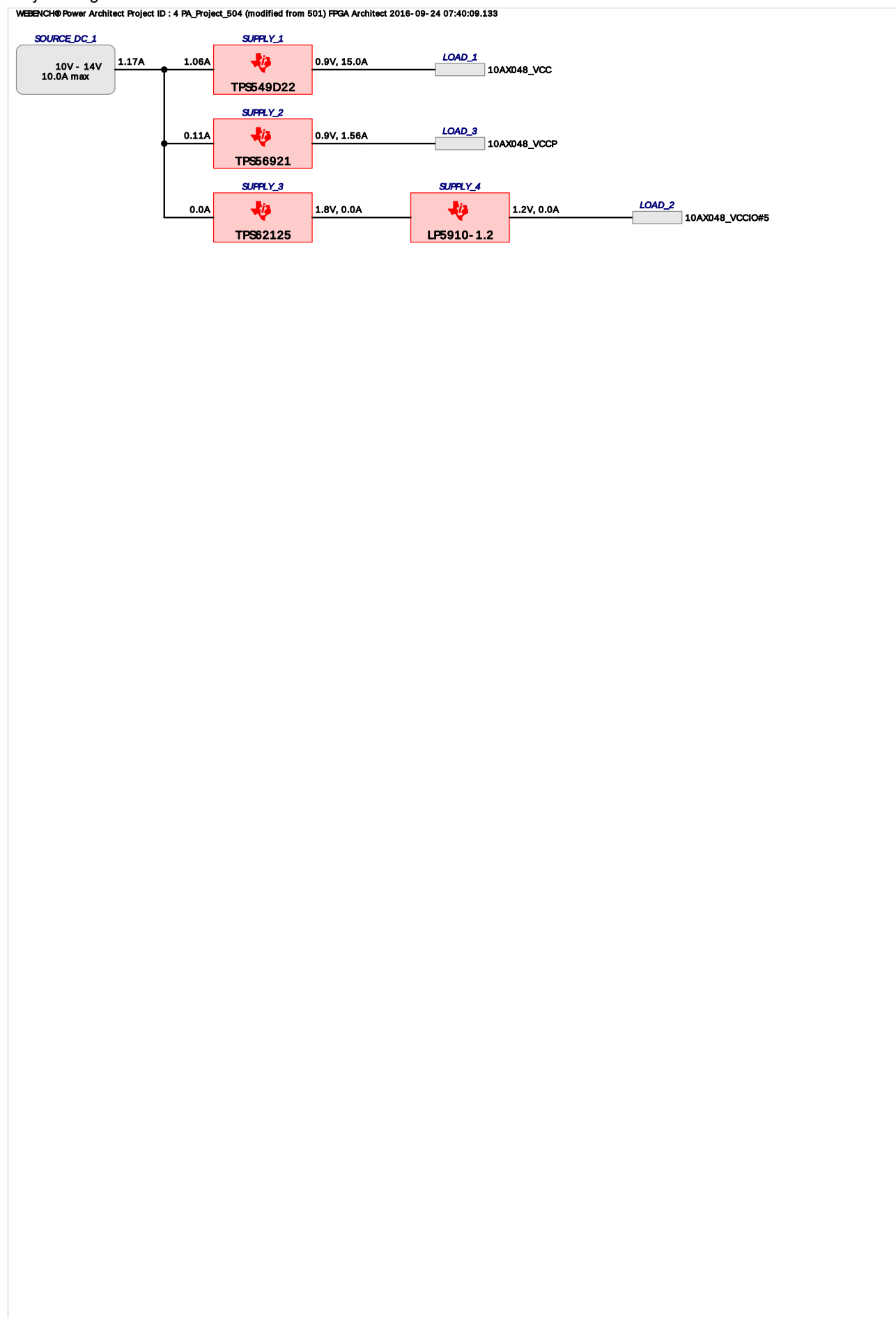
#	Name	VLoad	ILoad	Description
1.	10AX048_VCC	0.9 V	15 A	VoutRipple=5%
2.	10AX048_VCCP	0.9 V	1.561 A	VoutRipple=10%
3.	10AX048_VCCIO#5	1.2 V	0.002 A	VoutRipple=10%

FPGAs, Processors

#	Manufacturer	Part Number	Name	Series	Description
1.	Altera	10AX048	FPGA_1	Arria 10 GX	FPGA Altera Arria 10 GX 10AX048

http://www.altera.com/literature/hb/arria-10/a10_datasheet.pdf

Project Diagram



Electrical Procurement BOM

Manufacturer	Part Number	Description	Quantity	Budgetary Price	Footprint (mm ²)
Würth Elektronik	7443320068	WE- HCC-12X10	1	\$2.53	189
Kemet	C0805C104K5RACTU	0805	1	\$0.01	7
TDK	C1005X5R0J105M	0402	2	\$0.01	6
Vishay-Dale	CRCW0402100KFKED	0402	7	\$0.01	21
Vishay-Dale	CRCW040210K0FKED	0402	1	\$0.01	3
Vishay-Dale	CRCW0402124KFKED	0402	1	\$0.01	3
Vishay-Dale	CRCW04021K78FKED	0402	1	\$0.01	3
Vishay-Dale	CRCW04021M33FKED	0402	1	\$0.01	3
Vishay-Dale	CRCW0402200KFKED	0402	1	\$0.01	3
Vishay-Dale	CRCW0402243KFKED	0402	1	\$0.01	3
Vishay-Dale	CRCW040230K1FKED	0402	1	\$0.01	3
Vishay-Dale	CRCW0402316RFKED	0402	1	\$0.01	3
Vishay-Dale	CRCW040233K2FKED	0402	1	\$0.01	3
Vishay-Dale	CRCW040237K4FKED	0402	1	\$0.01	3
Vishay-Dale	CRCW040242K2FKED	0402	1	\$0.01	3
Vishay-Dale	CRCW04024K64FKED	0402	1	\$0.01	3
Vishay-Dale	CRCW040253K6FKED	0402	1	\$0.01	3
Vishay-Dale	CRCW040280K6FKED	0402	1	\$0.01	3
Panasonic	EEFSX0D221R	7343-20	2	\$0.53	117
MuRata	GRM033R61A562KA01D	0201	1	\$0.01	2
MuRata	GRM033R71A182KA01D	0201	1	\$0.01	2
MuRata	GRM033R71E102KA01D	0201_033	1	\$0.01	2
MuRata	GRM155R60J684KE19D	0402	1	\$0.02	3
MuRata	GRM155R61A104KA01D	0402	1	\$0.01	3
MuRata	GRM155R61E222KA01D	0402	1	\$0.01	3
MuRata	GRM188R60G106ME47D	0603	1	\$0.02	5
MuRata	GRM21BR61C106KE15L	0805	1	\$0.03	7
MuRata	GRM21BR61E225KA12L	0805	1	\$0.04	7
MuRata	GRM21BR61E475KA12L	0805	1	\$0.02	7
MuRata	GRM31CD80G107ME39L	1206_190	8	\$0.14	22
MuRata	GRM32ER61E226KE15L	1210	6	\$0.16	44
Taiyo Yuden	JMK316BJ107ML-T	1206	1	\$0.24	11
Texas Instruments	LP5910-1.2YKAR	YKA0004ACAC	1	\$0.14	3
Coilcraft	LPS5030-153MRB	LPS5030	1	\$0.44	34
Coilcraft	SER2915L-223KL	SER2915L	1	\$1.88	652
Texas Instruments	TPS549D22RVFR	RVF0040A	1	\$4.57	63
Texas Instruments	TPS56921PWPR	PWP0020N	1	\$2.20	71
Texas Instruments	TPS62125DSGR	S- PWSON- N8	1	\$0.53	10
Total			58	\$16339.3009439999998	

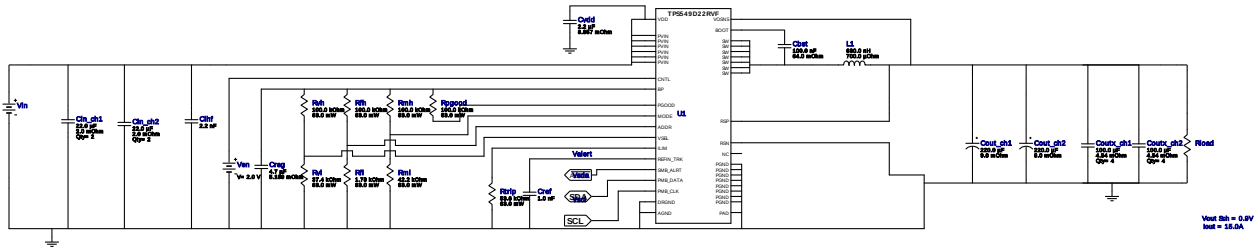


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Iout = 15.0A

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Topology = Buck
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BOM Cost = \$10.09
BOM Count = 29
Total Pd = 1.33W

WEBENCH® Design Report

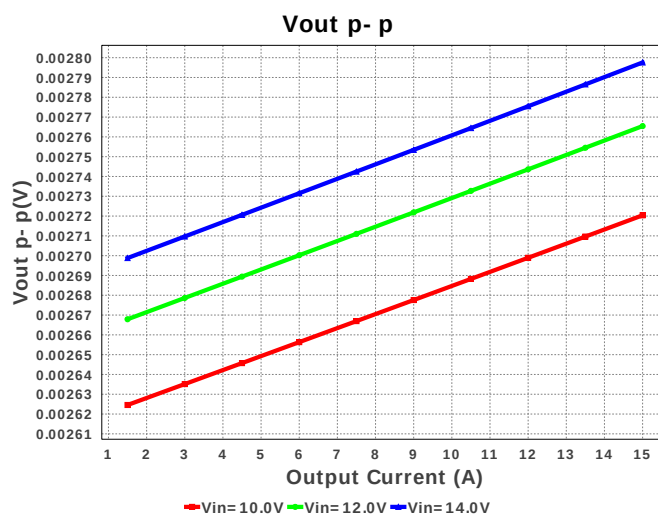
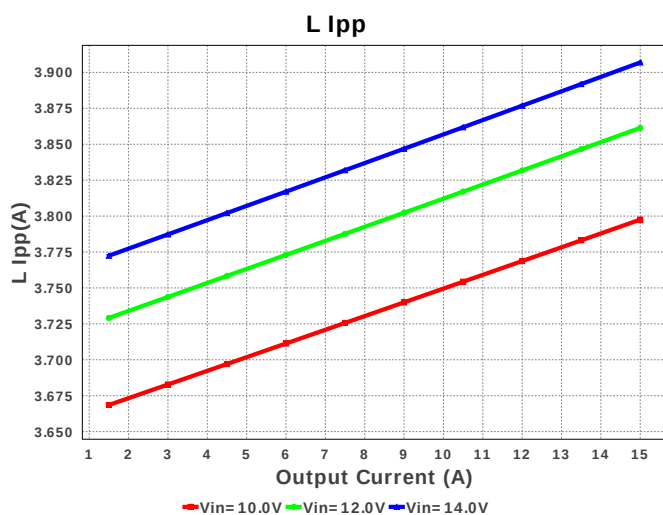
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TPS549D22RVFR 10.0V-14.0V to .90V @ 15.0A

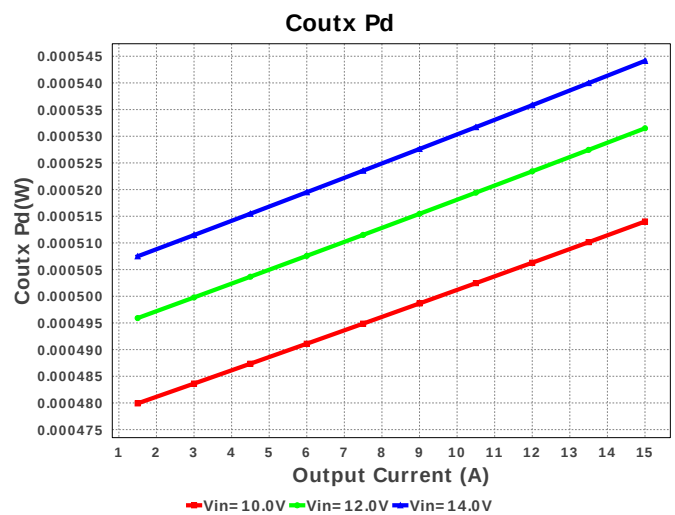
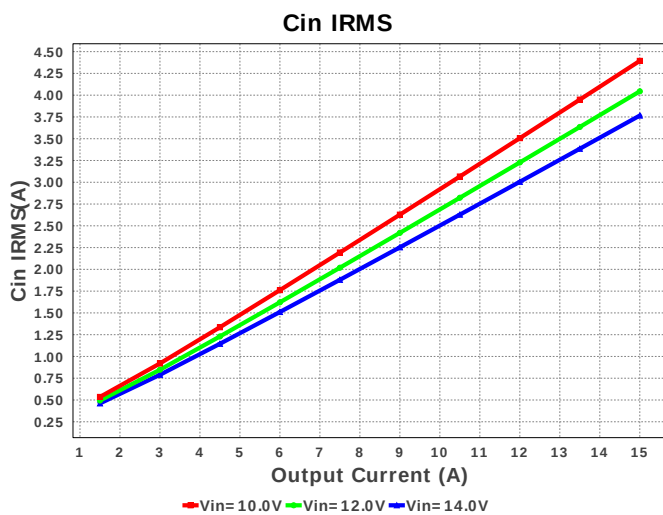
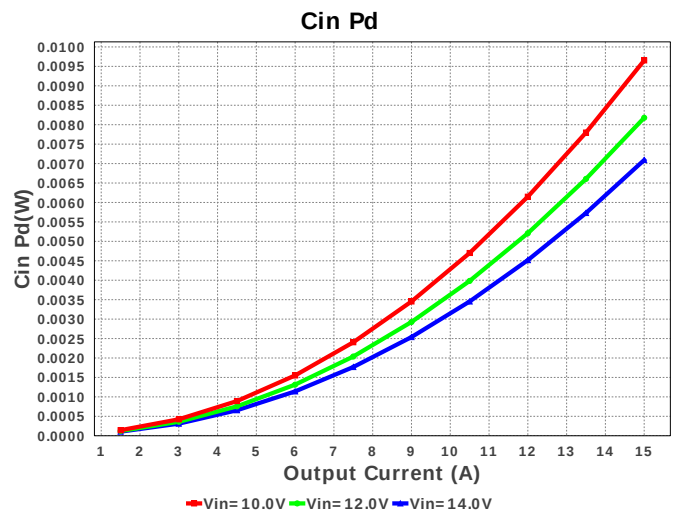
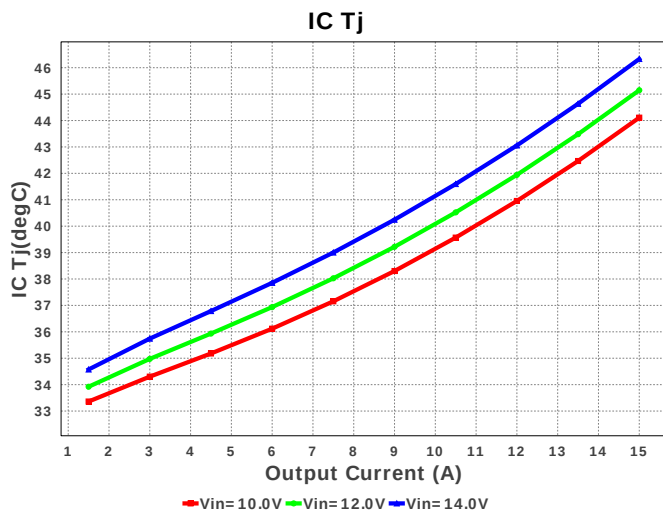
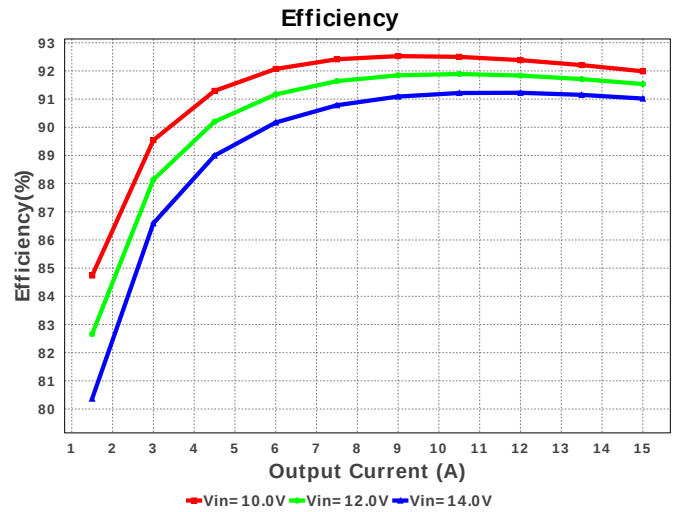
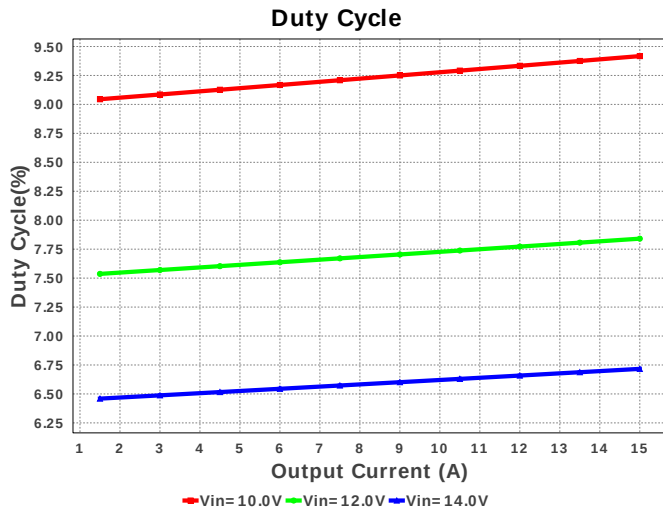


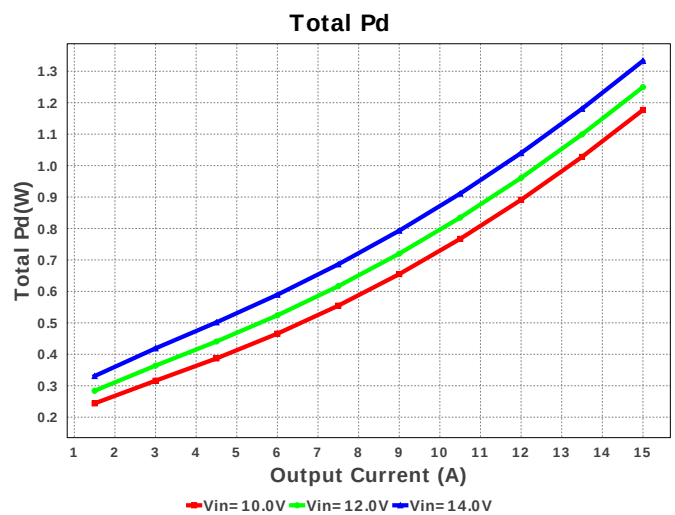
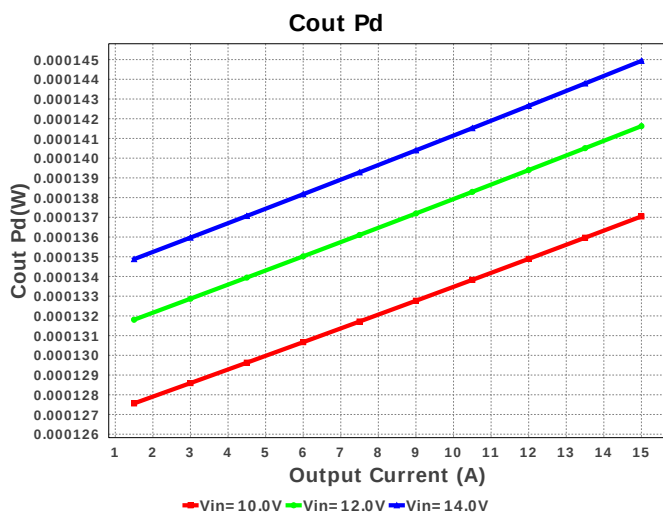
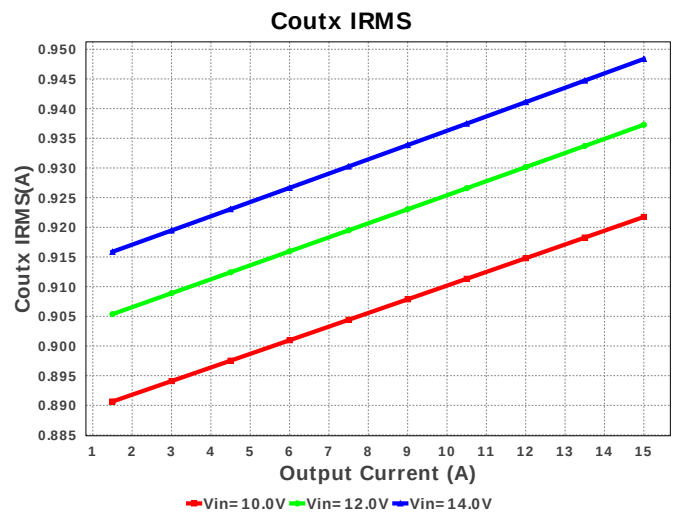
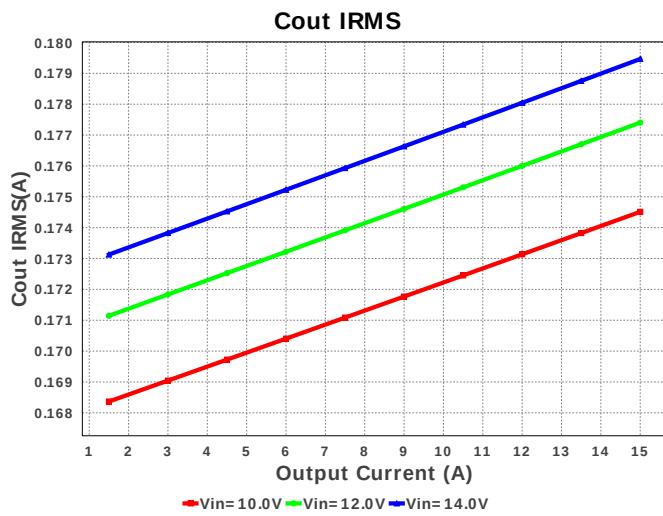
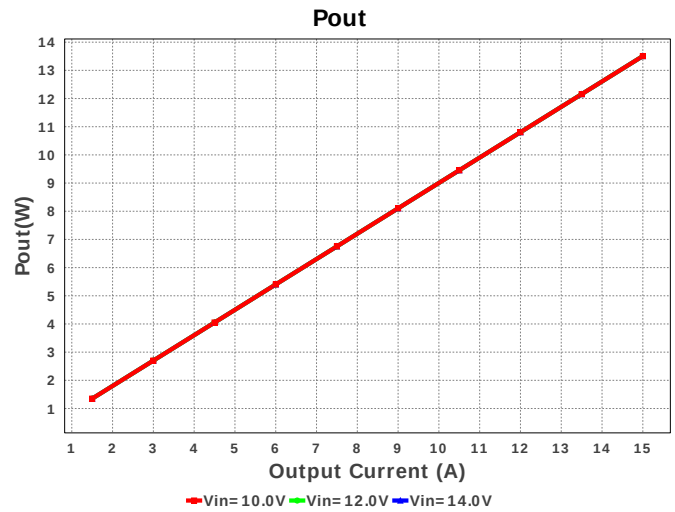
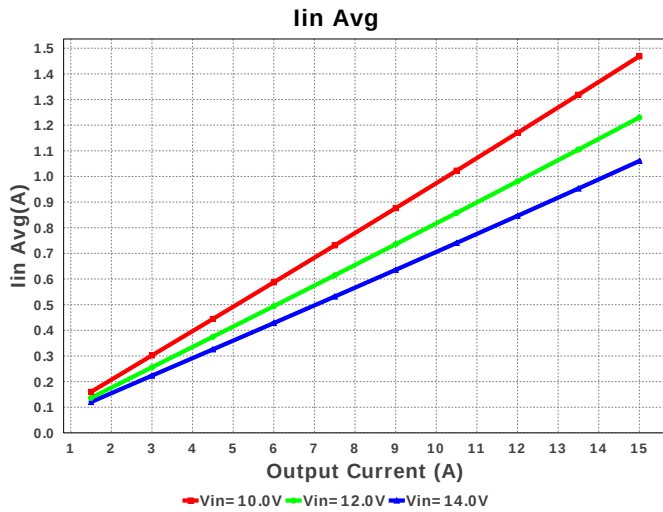
Electrical BOM

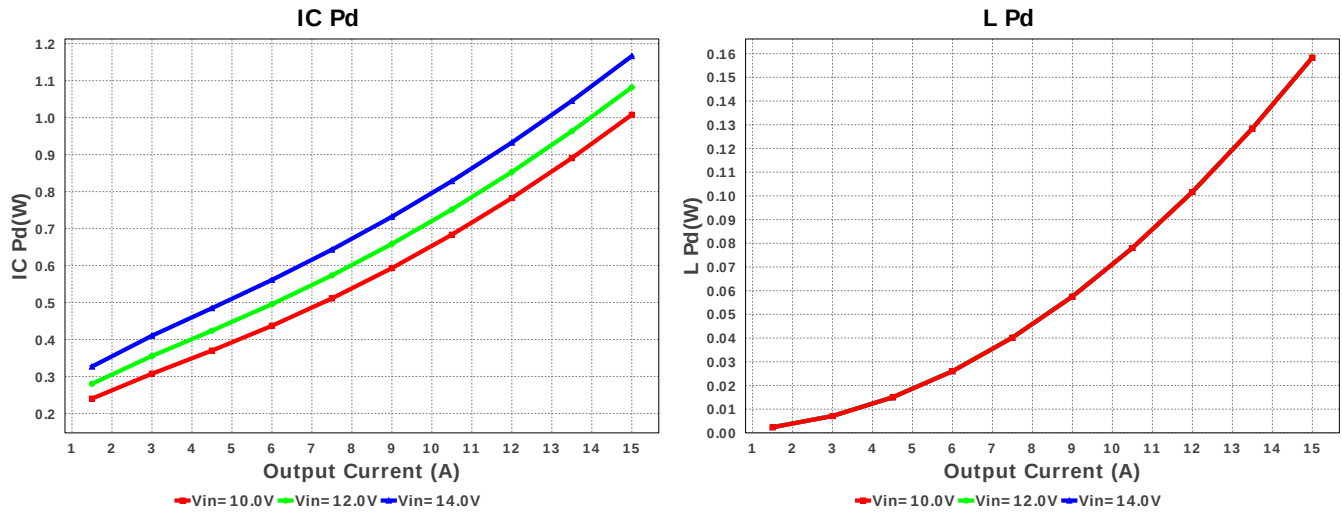
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	Kemet	C0805C104K5RACTU Series= X7R	Cap= 100.0 nF ESR= 64.0 mOhm VDC= 50.0 V IRMS= 1.64 A	1	\$0.01	0805 7 mm ²
2.	Cihf	MuRata	GRM155R61E222KA01D Series= X5R	Cap= 2.2 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
3.	Cin_ch1	MuRata	GRM32ER61E226KE15L Series= X5R	Cap= 22.0 uF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 3.67 A	2	\$0.16	1210 15 mm ²
4.	Cin_ch2	MuRata	GRM32ER61E226KE15L Series= X5R	Cap= 22.0 uF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 3.67 A	2	\$0.16	1210 15 mm ²
5.	Cout_ch1	Panasonic	EEFSX0D221R Series= SX	Cap= 220.0 uF ESR= 9.0 mOhm VDC= 2.0 V IRMS= 3.0 A	1	\$0.53	7343-20 59 mm ²
6.	Cout_ch2	Panasonic	EEFSX0D221R Series= SX	Cap= 220.0 uF ESR= 9.0 mOhm VDC= 2.0 V IRMS= 3.0 A	1	\$0.53	7343-20 59 mm ²
7.	Coutx_ch1	MuRata	GRM31CD80G107ME39L Series= X6T	Cap= 100.0 uF ESR= 4.84 mOhm VDC= 4.0 V IRMS= 4.3381 A	4	\$0.14	1206_190 11 mm ²
8.	Coutx_ch2	MuRata	GRM31CD80G107ME39L Series= X6T	Cap= 100.0 uF ESR= 4.84 mOhm VDC= 4.0 V IRMS= 4.3381 A	4	\$0.14	1206_190 11 mm ²
9.	Cref	MuRata	GRM033R71E102KA01D Series= X7R	Cap= 1.0 nF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0201_033 2 mm ²
10.	Creg	MuRata	GRM21BR61E475KA12L Series= X5R	Cap= 4.7 uF ESR= 5.189 mOhm VDC= 25.0 V IRMS= 2.03531 A	1	\$0.02	0805 7 mm ²
11.	Cvdd	MuRata	GRM21BR61E225KA12L Series= X5R	Cap= 2.2 uF ESR= 8.857 mOhm VDC= 25.0 V IRMS= 1.3111 A	1	\$0.04	0805 7 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
12.	L1	Würth Elektronik	7443320068	L= 680.0 nH DCR= 700.0 µOhm	1	\$2.53	 WE-HCC-12X10 189 mm²
13.	Rfh	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
14.	Rfl	Vishay-Dale	CRCW04021K78FKED Series= CRCW..e3	Res= 1.78 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
15.	Rmh	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
16.	Rml	Vishay-Dale	CRCW040242K2FKED Series= CRCW..e3	Res= 42.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
17.	Rpgood	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
18.	Rtrip	Vishay-Dale	CRCW040253K6FKED Series= CRCW..e3	Res= 53.6 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
19.	Rvh	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
20.	Rvl	Vishay-Dale	CRCW040237K4FKED Series= CRCW..e3	Res= 37.4 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm²
21.	U1	Texas Instruments	TPS549D22RVFR	Switcher	1	\$4.57	 RVF0040A 63 mm²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	3.766 A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	179.465 mA	Current	Output capacitor RMS ripple current
3.	Coutx IRMS	948.363 mA	Current	Output capacitor_x RMS ripple current
4.	Iin Avg	1.06 A	Current	Average input current
5.	L Ipp	3.907 A	Current	Peak-to-peak inductor ripple current
6.	BOM Count	29	General	Total Design BOM count
7.	FootPrint	565.0 mm ²	General	Total Foot Print Area of BOM components
8.	Frequency	328.862 kHz	General	Switching frequency
9.	Mode	CCM	General	Conduction Mode
10.	Pout	13.506 W	General	Total output power
11.	Total BOM	\$10.09	General	Total BOM Cost
12.	ICThetaJA Effective	14.0 degC/W	Op_Point	Effective IC Junction-to-Ambient Thermal Resistance
13.	Vout OP	900.391 mV	Op_Point	Operational Output Voltage
14.	Duty Cycle	6.716 %	Op_point	Duty cycle
15.	Efficiency	91.019 %	Op_point	Steady state efficiency
16.	IC Tj	46.33 degC	Op_point	IC junction temperature
17.	IOUT_OP	15.0 A	Op_point	Iout operating point
18.	VIN_OP	14.0 V	Op_point	Vin operating point
19.	Vout p-p	2.798 mV	Op_point	Peak-to-peak output ripple voltage
20.	PMBus_Vout_Command	461.0	PMBus	PMBus Vout Command
21.	Cin Pd	7.091 mW	Power	Input capacitor power dissipation
22.	Cout Pd	144.935 μW	Power	Output capacitor power dissipation
23.	Coutx Pd	544.133 μW	Power	Output capacitor_x power loss
24.	IC Pd	1.166 W	Power	IC power dissipation
25.	L Pd	158.39 mW	Power	Inductor power dissipation
26.	Total Pd	1.333 W	Power	Total Power Dissipation
27.	Vout Tolerance	499.78 m%		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	15.0	Maximum Output Current
2.	VinMax	14.0	Maximum input voltage
3.	VinMin	10.0	Minimum input voltage
4.	Vout	900.0 m	Output Voltage
5.	base_pn	TPS549D22	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	Ambient temperature

Design Assistance

1. TPS549D22 Product Folder : <http://www.ti.com/product/TPS549D22> : contains the data sheet and other resources.

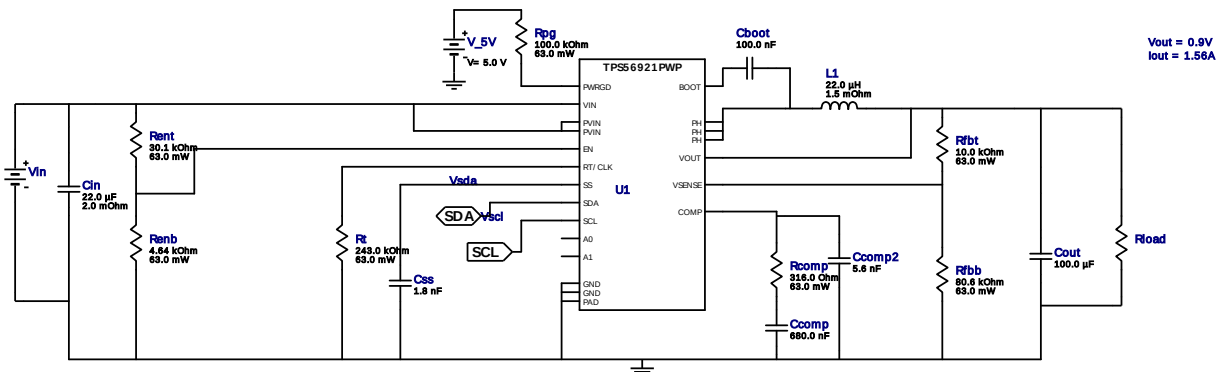


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Iout = 1.56A

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BOM Count = 15
Total Pd = 0.18W

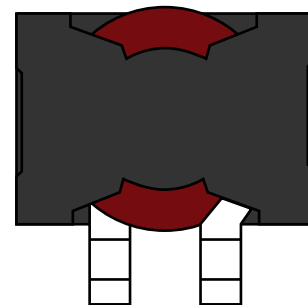
WEBENCH® Design Report

Design : 4790845/33 TPS56921PWPR
TPS56921PWPR 10.0V-14.0V to .90V @ 1.561A

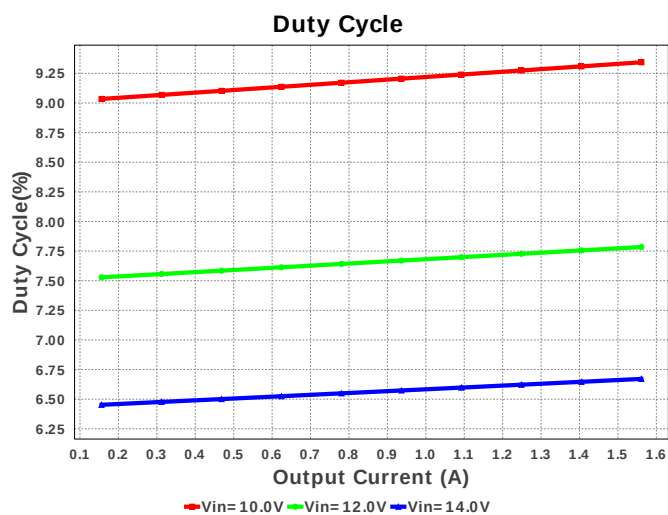
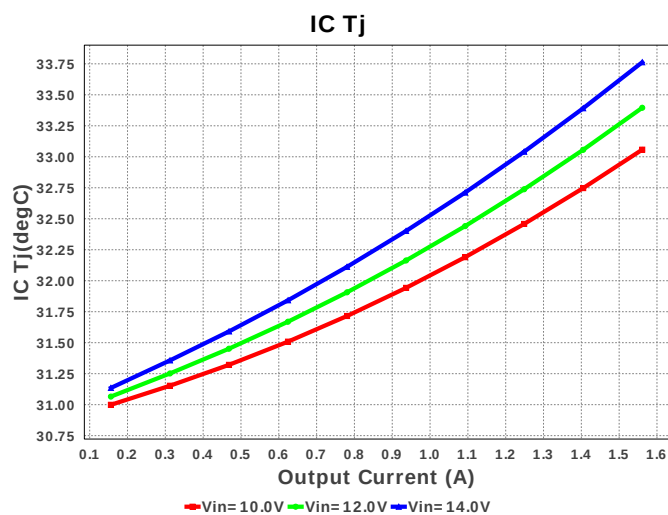


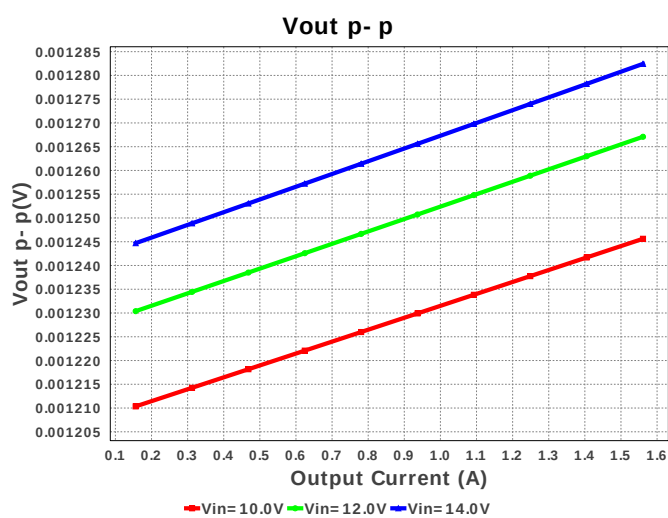
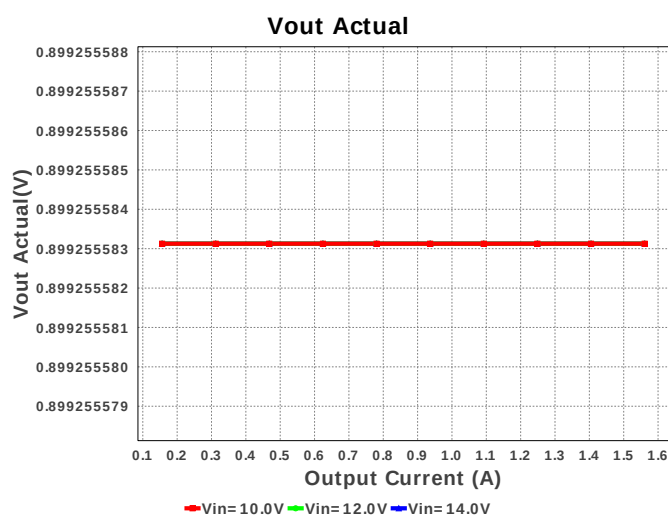
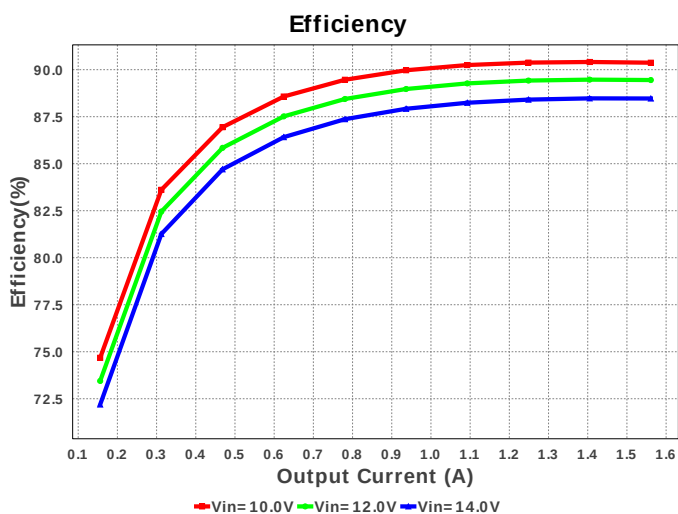
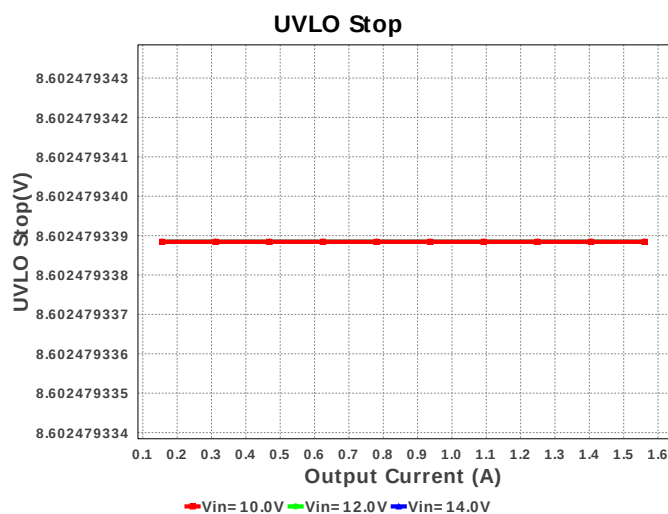
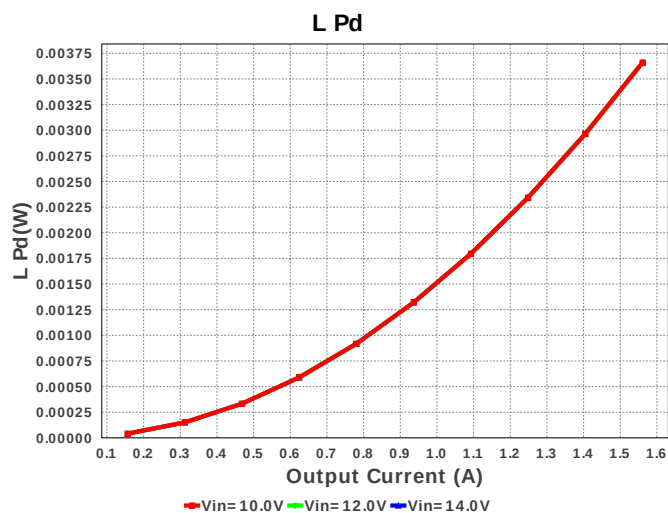
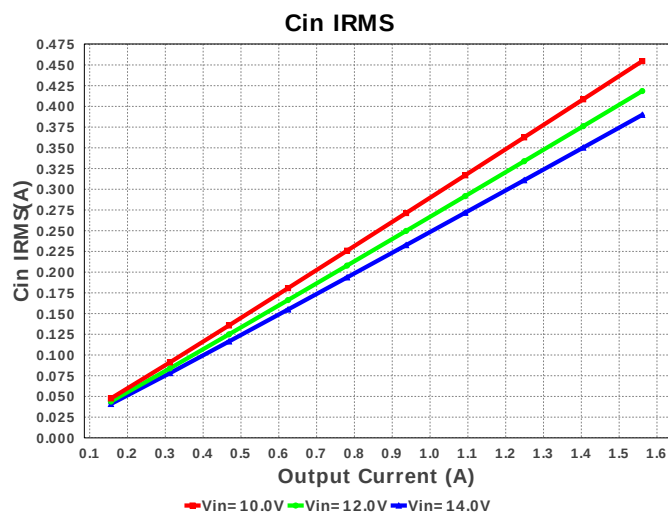
Electrical BOM

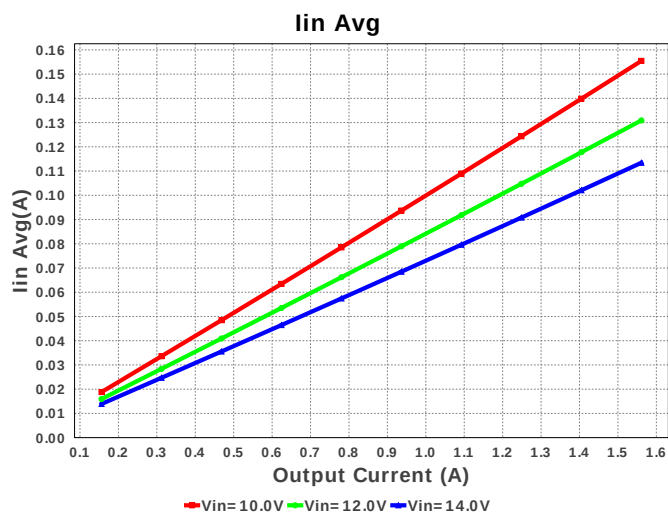
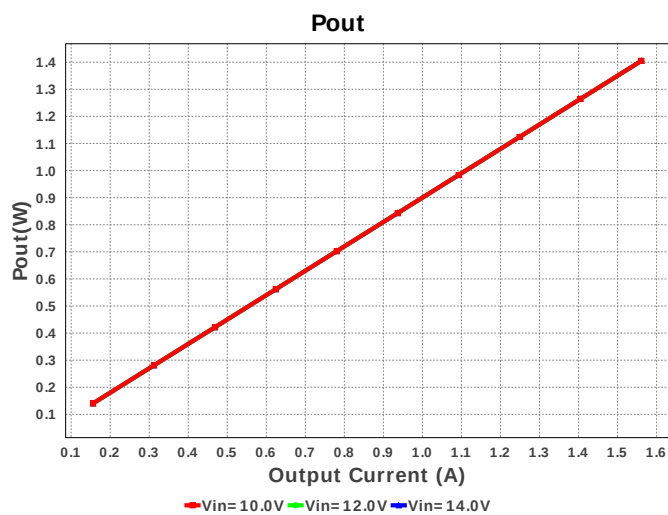
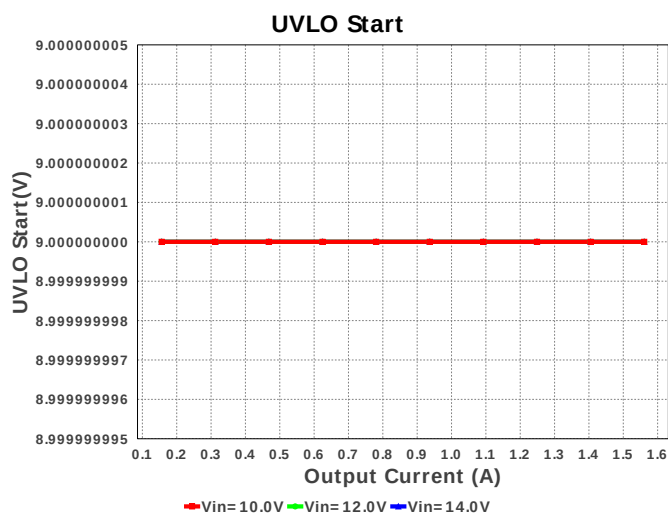
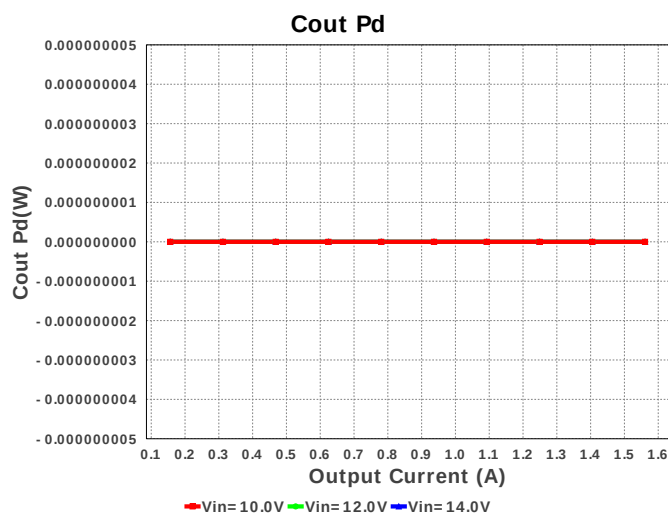
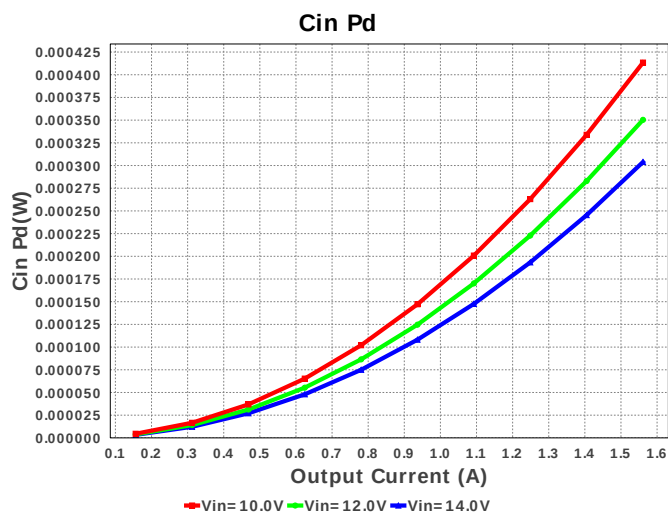
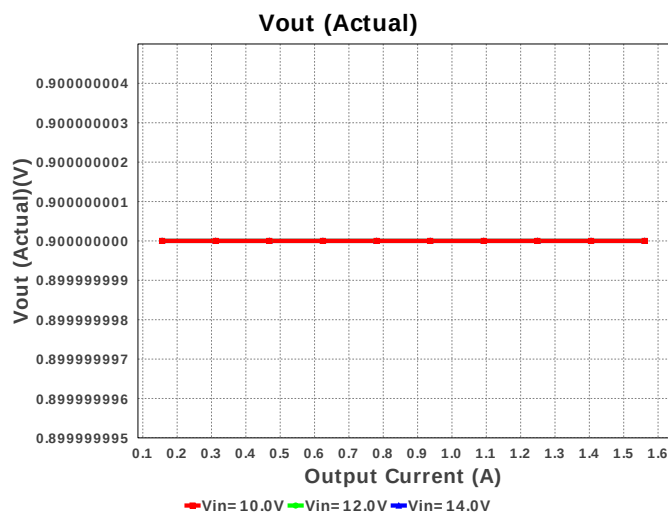
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1.	Cboot	MuRata	GRM155R61A104KA01D Series= X5R	Cap= 100.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	0402 3 mm ²
2.	Ccomp	MuRata	GRM155R60J684KE19D Series= X5R	Cap= 680.0 nF VDC= 6.3 V IRMS= 0.0 A	1	\$0.02	0402 3 mm ²
3.	Ccomp2	MuRata	GRM033R61A562KA01D Series= X5R	Cap= 5.6 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	0201 2 mm ²
4.	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
5.	Cout	Taiyo Yuden	JMK316BJ107ML-T Series= X5R	Cap= 100.0 uF VDC= 6.3 V IRMS= 0.0 A	1	\$0.24	1206 11 mm ²
6.	Css	MuRata	GRM033R71A182KA01D Series= X7R	Cap= 1.8 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	0201 2 mm ²
7.	L1	Coilcraft	SER2915L-223KL	L= 22.0 µH DCR= 1.5 mOhm	1	\$1.88	SER2915L 652 mm ²
8.	Rcomp	Vishay-Dale	CRCW0402316RFKED Series= CRCW..e3	Res= 316.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

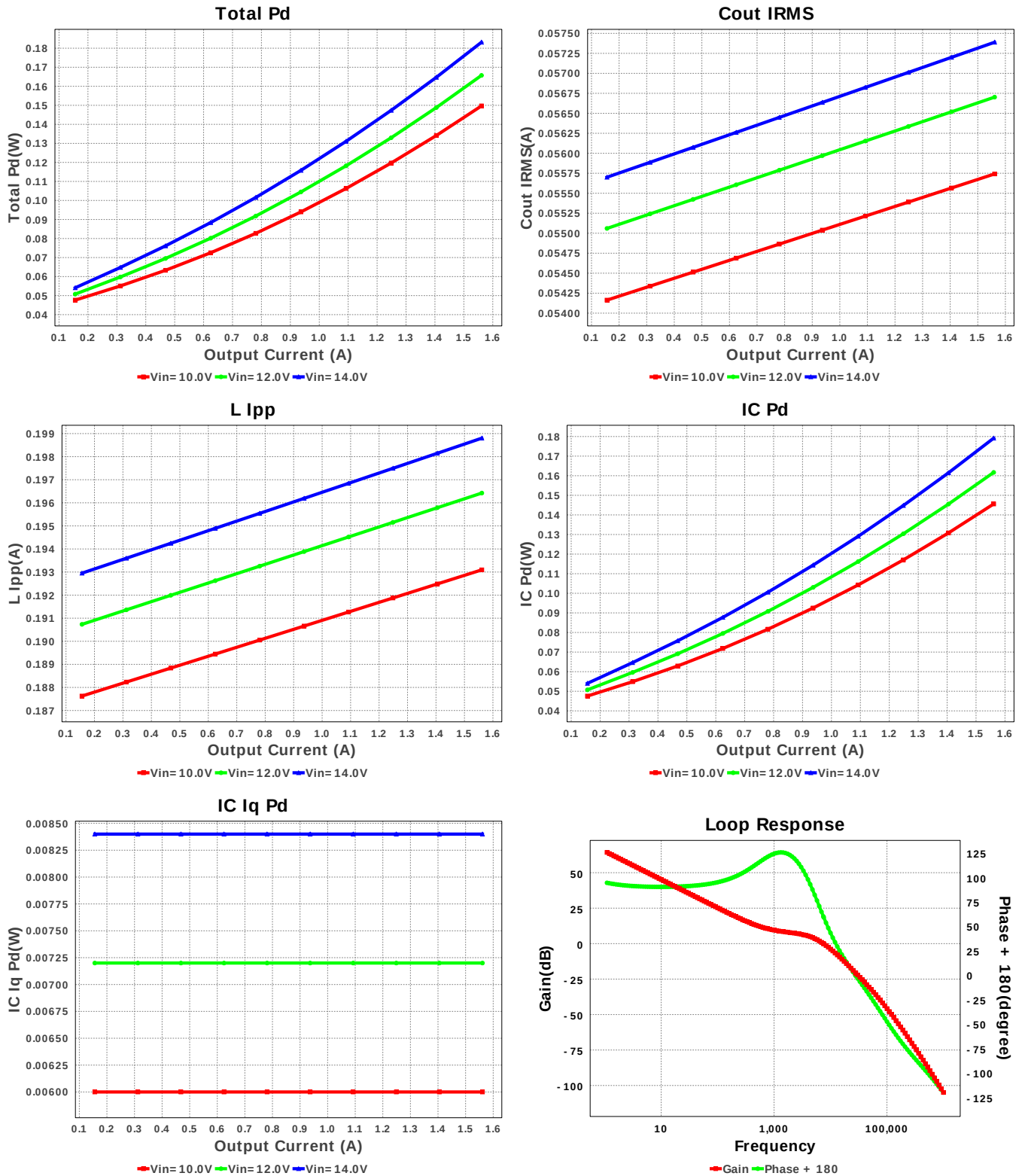


#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
9.	Renb	Vishay-Dale	CRCW04024K64FKED Series= CRCW..e3	Res= 4.64 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
10.	Rent	Vishay-Dale	CRCW040230K1FKED Series= CRCW..e3	Res= 30.1 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
11.	Rfbb	Vishay-Dale	CRCW040280K6FKED Series= CRCW..e3	Res= 80.6 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
12.	Rfbt	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
13.	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
14.	Rt	Vishay-Dale	CRCW0402243KFKED Series= CRCW..e3	Res= 243.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
15.	U1	Texas Instruments	TPS56921PWPR	Switcher	1	\$2.20	 PWP0020N 71 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	389.786 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	57.389 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	113.43 mA	Current	Average input current
4.	L Ipp	198.8 mA	Current	Peak-to-peak inductor ripple current
5.	BOM Count	15	General	Total Design BOM count
6.	FootPrint	780.0 mm ²	General	Total Foot Print Area of BOM components
7.	Frequency	199.055 kHz	General	Switching frequency
8.	IC Tolerance	20.0 mV	General	IC Feedback Tolerance
9.	Mode	CCM	General	Conduction Mode
10.	Pout	1.405 W	General	Total output power
11.	Total BOM	\$4.6	General	Total BOM Cost

#	Name	Value	Category	Description
12.	UVLO Start	9.0 V	General	UVLO Start Threshold
13.	UVLO Stop	8.602 V	General	UVLO Stop Threshold
14.	Vout Actual	505.831 mV	Op_Point	Vout Actual calculated based on selected voltage divider resistors
15.	Vout OP	900.0 mV	Op_Point	Operational Output Voltage
16.	Cross Freq	7.481 kHz	Op_point	Bode plot crossover frequency
17.	Duty Cycle	6.671 %	Op_point	Duty cycle
18.	Efficiency	88.467 %	Op_point	Steady state efficiency
19.	IC Tj	33.762 degC	Op_point	IC junction temperature
20.	ICThetaJA	21.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
21.	IOUT_OP	1.561 A	Op_point	Iout operating point
22.	Phase Marg	60.843 deg	Op_point	Bode Plot Phase Margin
23.	VIN_OP	14.0 V	Op_point	Vin operating point
24.	Vout p-p	1.282 mV	Op_point	Peak-to-peak output ripple voltage
25.	Cin Pd	303.867 µW	Power	Input capacitor power dissipation
26.	Cout Pd	0.0 W	Power	Output capacitor power dissipation
27.	IC Iq Pd	8.4 mW	Power	IC Iq Pd
28.	IC Pd	179.165 mW	Power	IC power dissipation
29.	L Pd	3.66 mW	Power	Inductor power dissipation
30.	Total Pd	183.146 mW	Power	Total Power Dissipation
31.	Vout (Actual)	900.0 mV		Actual Vout set from I2C command. Used for Bode and efficiency calculations.
32.	Vout Tolerance	4.677 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	1.561	Maximum Output Current
2.	VinMax	14.0	Maximum input voltage
3.	VinMin	10.0	Minimum input voltage
4.	Vout	900.0 m	Output Voltage
5.	base_pn	TPS56921	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	Ambient temperature

Design Assistance

1. TPS56921 Product Folder : <http://www.ti.com/product/TPS56921> : contains the data sheet and other resources.

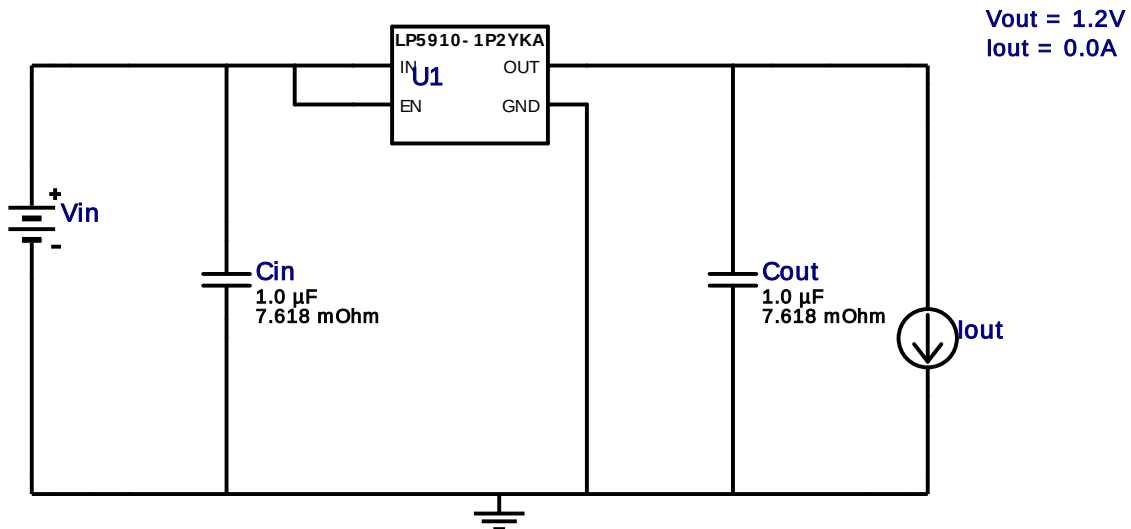


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Iout = 0.0A

Device = LP5910-1.2YKAR
Topology = LDO
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BOM Cost = \$0.16
BOM Count = 3
Total Pd = 0.0W

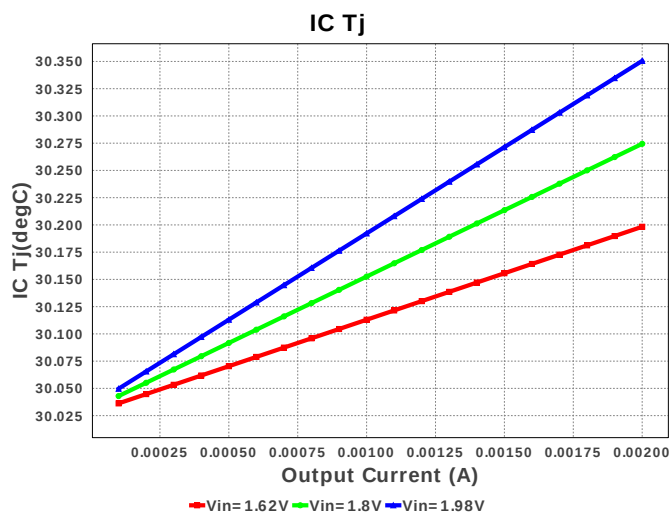
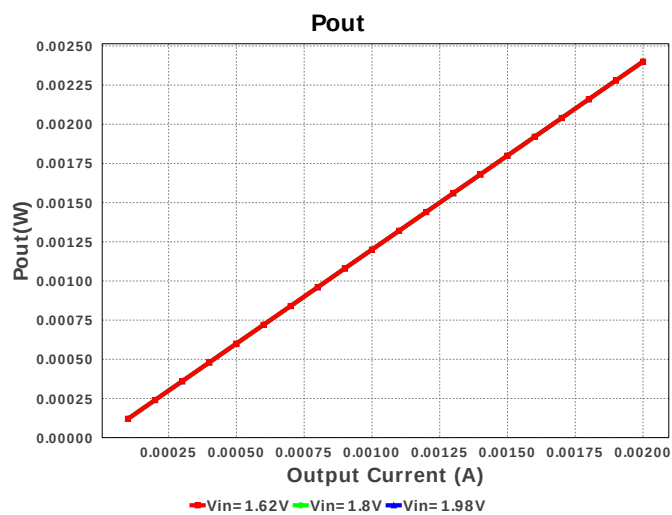
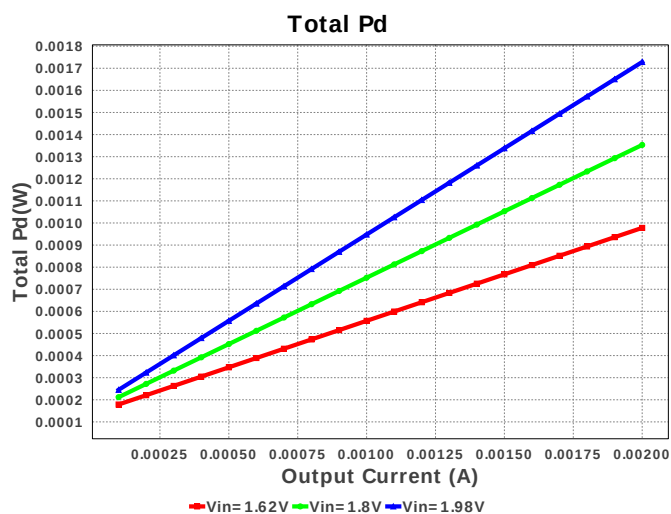
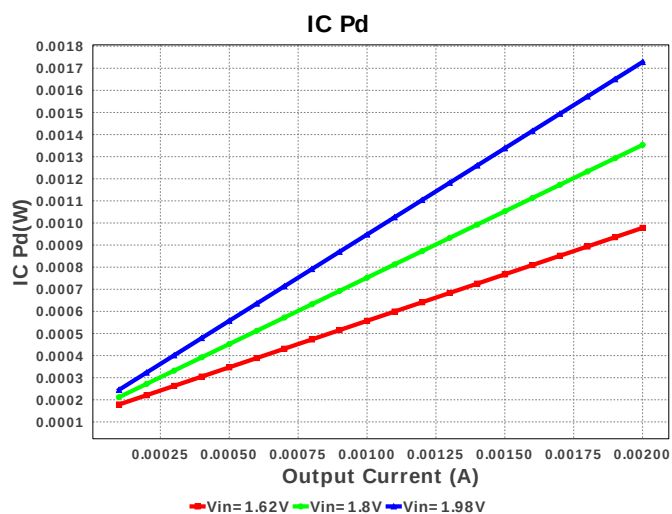
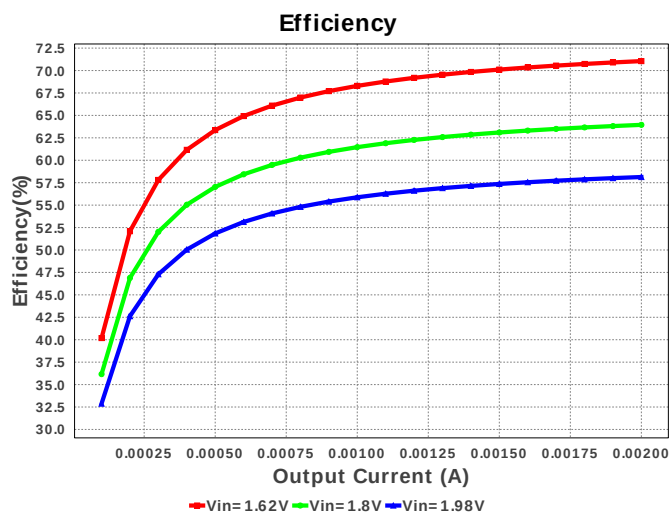
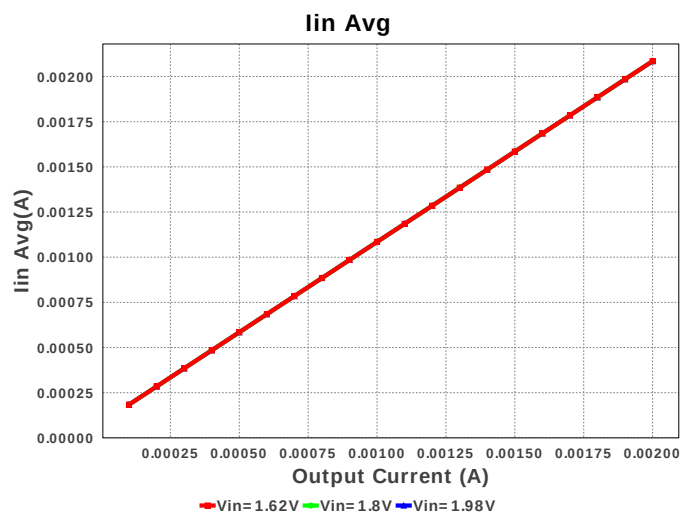
WEBENCH® Design Report

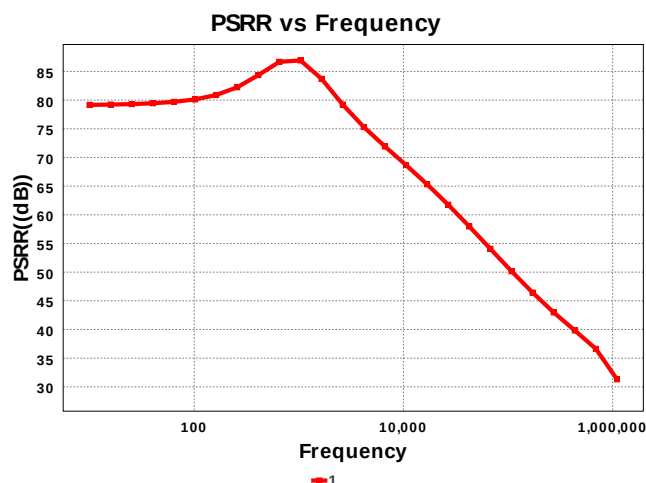
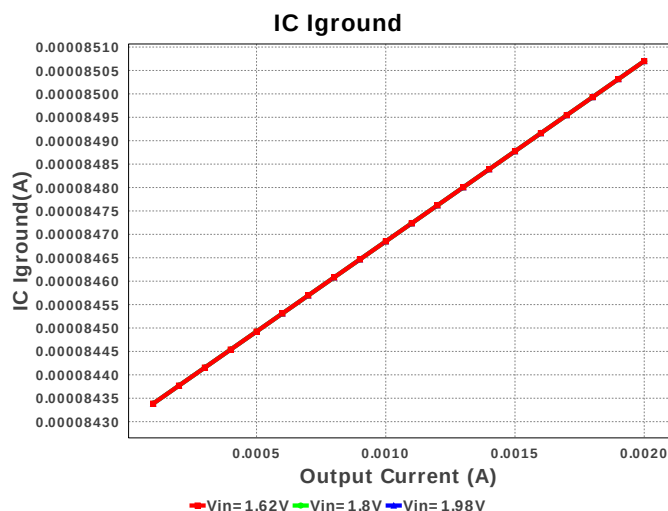
Design : 4790845/34 LP5910-1.2YKAR
LP5910-1.2YKAR 1.62V-1.98V to 1.20V @ 0.002A



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
3.	U1	Texas Instruments	LP5910-1.2YKAR	Switcher	1	\$0.14	YKA0004ACAC 3 mm ²





Operating Values

#	Name	Value	Category	Description
1.	IC Iground	85.07 μ A	Current	IC ground current
2.	Iin Avg	2.085 mA	Current	Average input current
3.	BOM Count	3	General	Total Design BOM count
4.	FootPrint	9.0 mm ²	General	Total Foot Print Area of BOM components
5.	IC Tolerance	24.0 mV	General	IC Feedback Tolerance
6.	Output Noise RMS	12.0 μ V	General	Noise RMS
7.	Pout	2.4 mW	General	Total output power
8.	Total BOM	\$0.16	General	Total BOM Cost
9.	Vin p-p	3.711 mV	Op_Point	Input Source ripple voltage
10.	Vout OP	0.0 V	Op_Point	Operational Output Voltage
11.	Efficiency	58.133 %	Op_point	Steady state efficiency
12.	IC Tj	30.351 degC	Op_point	IC junction temperature
13.	ICThetaJA	202.8 degC/W	Op_point	IC junction-to-ambient thermal resistance
14.	IOUT_OP	2.0 mA	Op_point	Iout operating point
15.	Input Ripple Frequency	19.001 kHz	Op_point	Input Source Ripple Frequency for PSRR Calculation
16.	PSRR est.	-64.42 dB	Op_point	Power Supply Rejection Ratio, estimated
17.	VIN_OP	1.98 V	Op_point	Vin operating point
18.	Vout p-p	2.231 μ V	Op_point	Peak-to-peak output ripple voltage
19.	IC Pd	1.728 mW	Power	IC power dissipation
20.	Total Pd	1.728 mW	Power	Total Power Dissipation
21.	Vout Tolerance	2.0 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	2.0 m	Maximum Output Current
2.	VinMax	1.98	Maximum input voltage
3.	VinMin	1.62	Minimum input voltage
4.	Vout	1.2	Output Voltage
5.	base_pn	LP5910-1.2	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	Ambient temperature

Design Assistance

-
- LP5910-1.2 Product Folder : <http://www.ti.com/product/LP5910> : contains the data sheet and other resources.

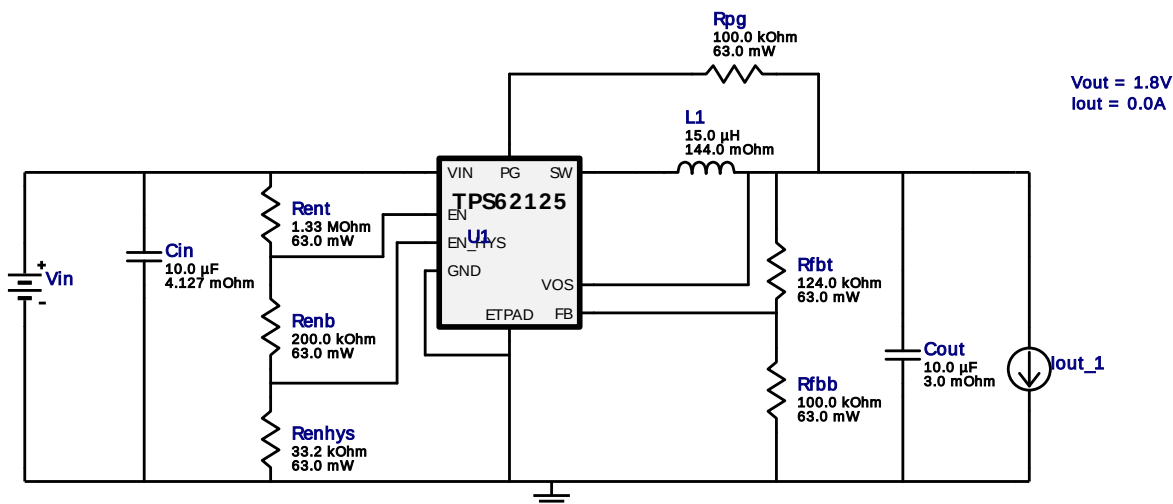


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Iout = 0.0A

Device = TPS62125DSGR
Topology = Buck
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BOM Cost = \$1.08
BOM Count = 10
Total Pd = 0.0W

WEBENCH® Design Report

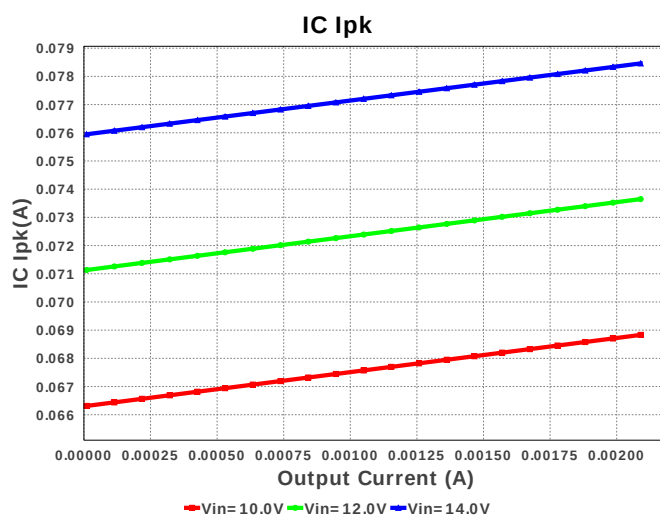
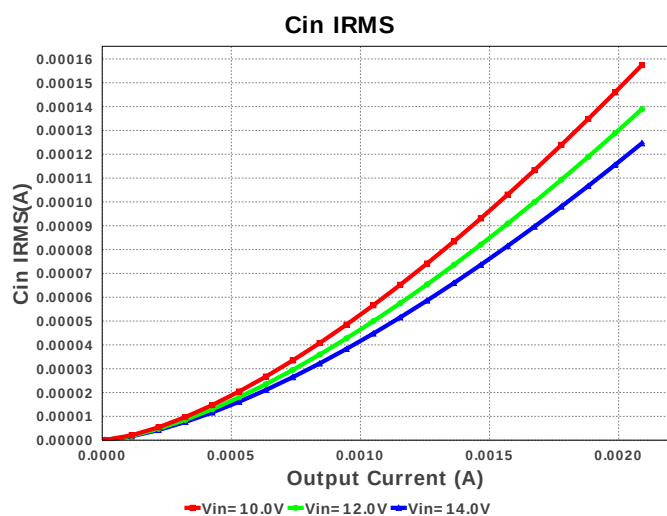
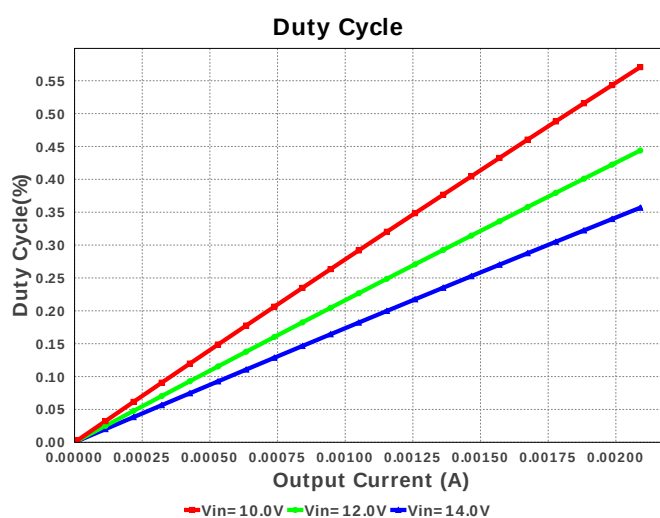
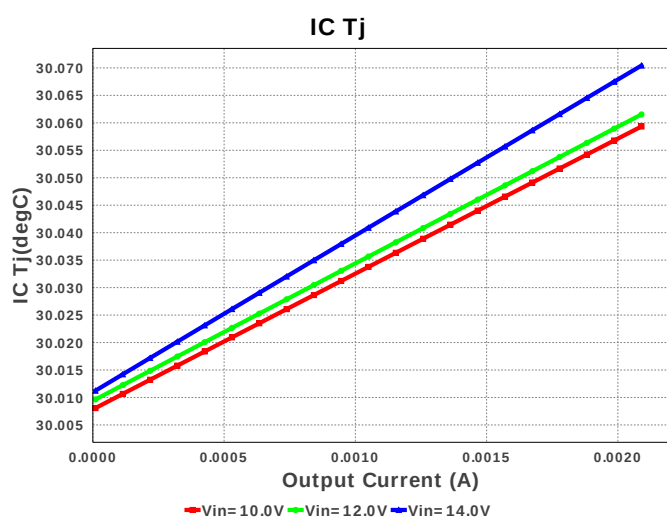
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TPS62125DSGR 10.0V-14.0V to 1.80V @ 0.00209A

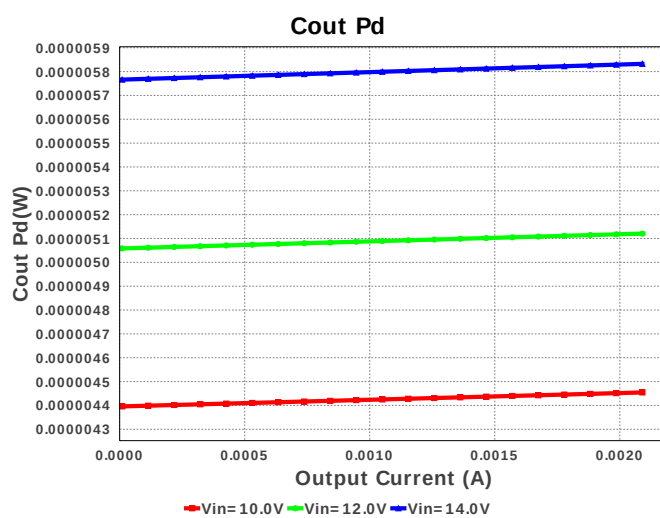
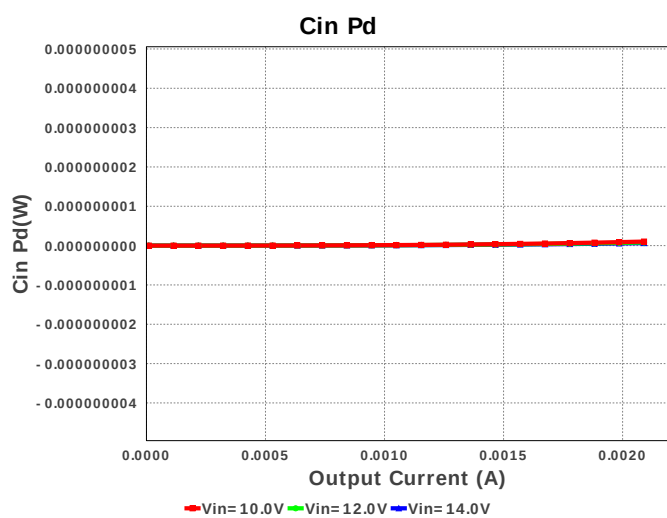
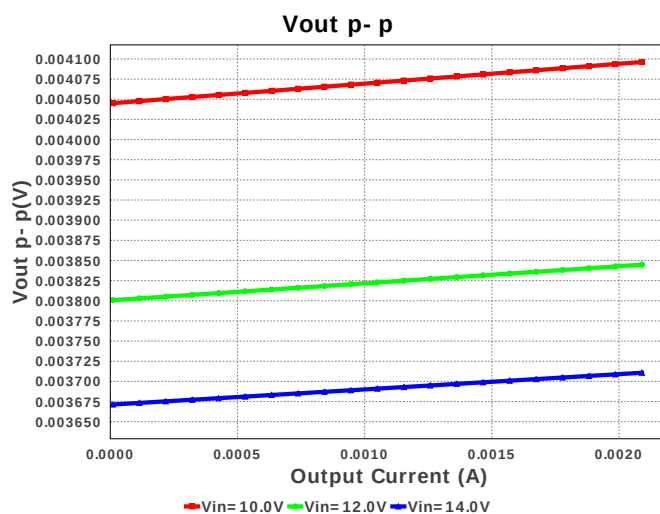
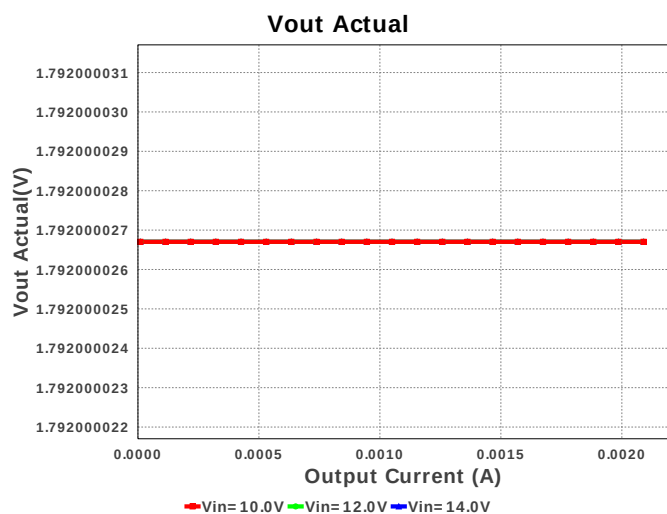
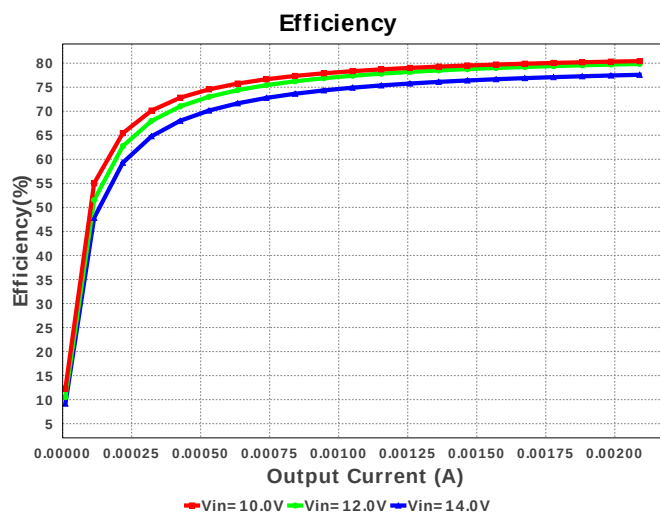
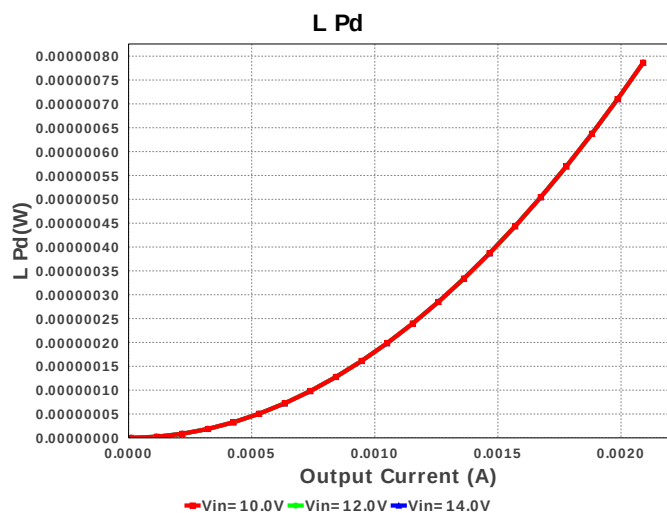


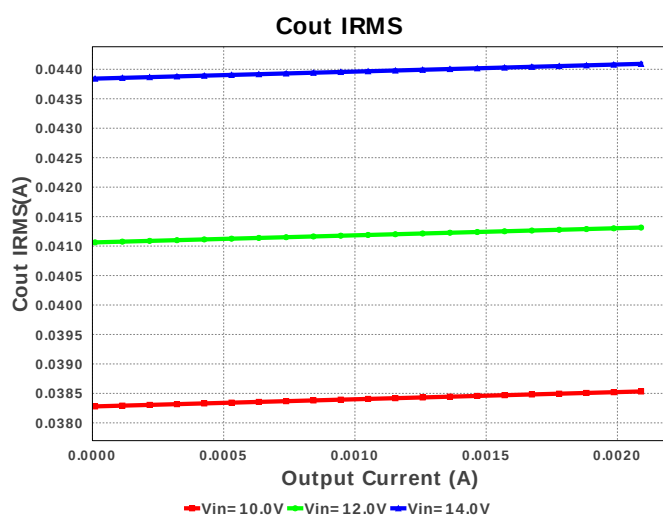
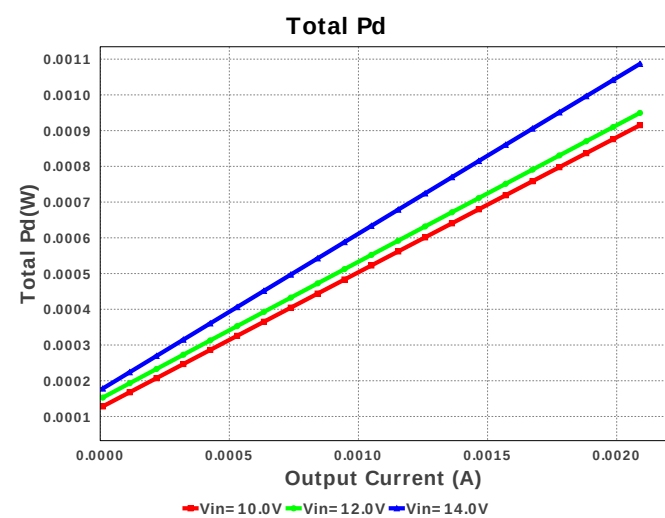
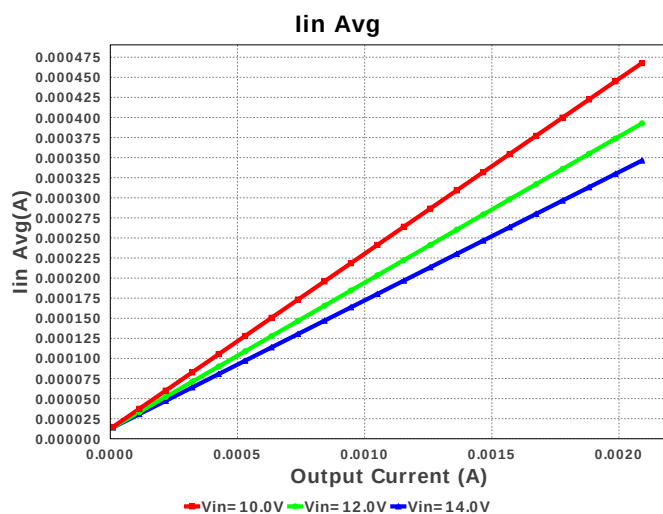
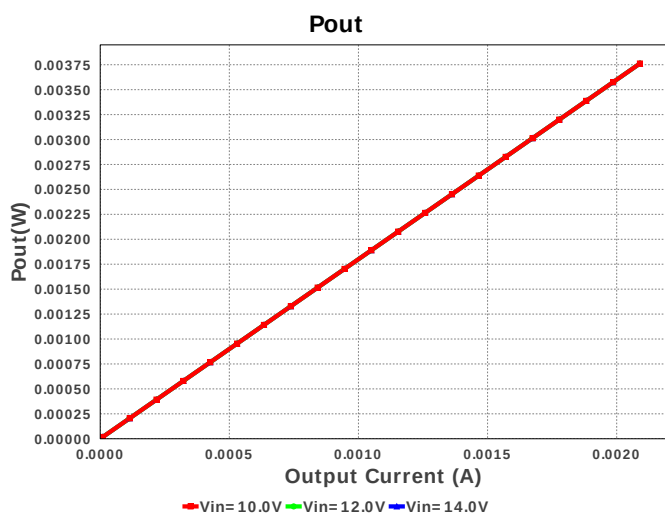
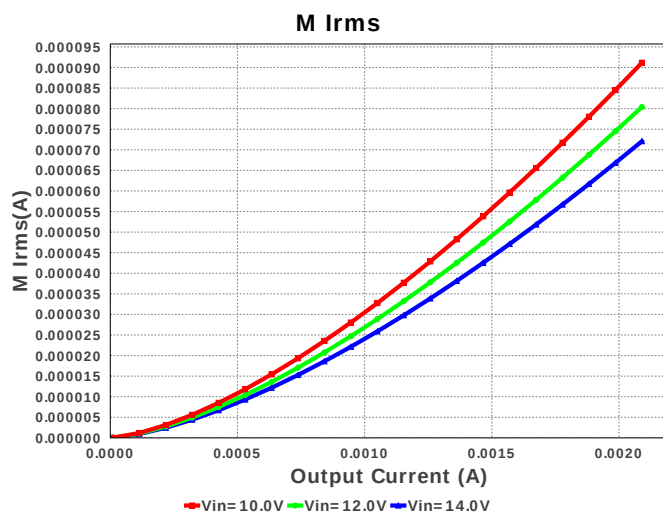
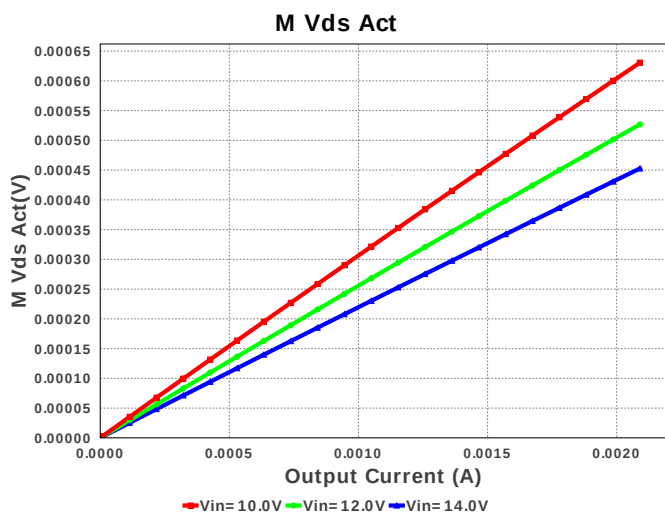
Electrical BOM

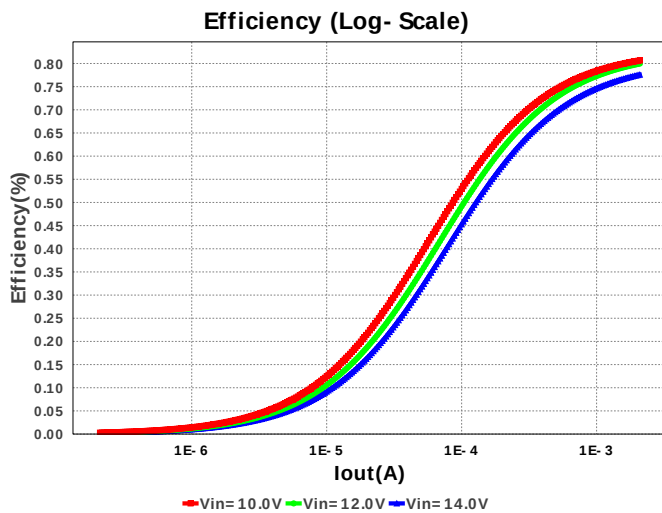
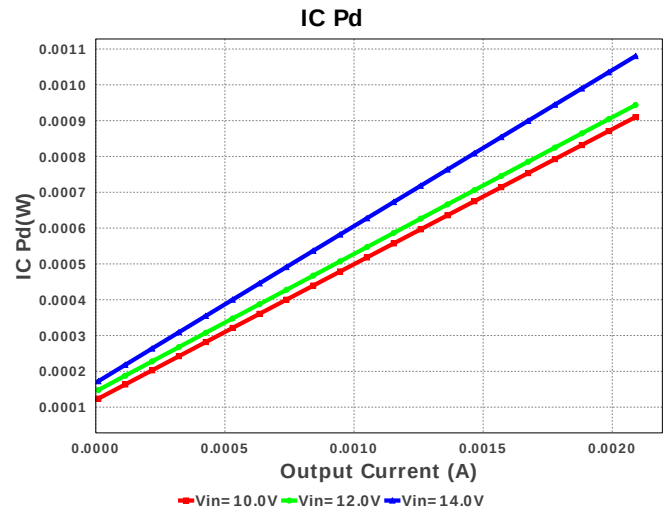
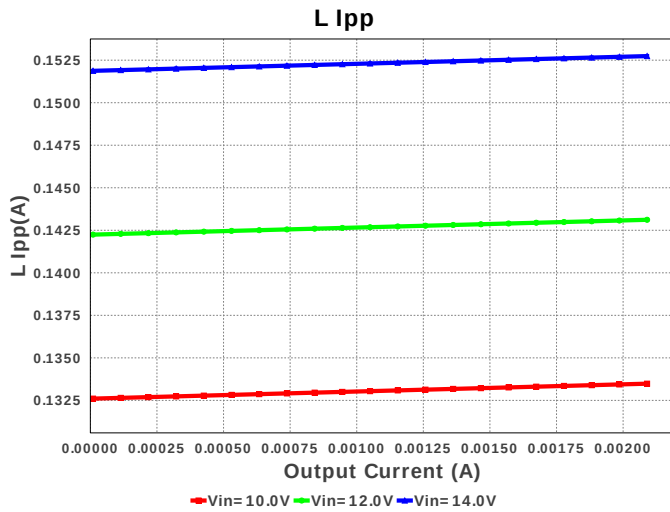
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM21BR61C106KE15L Series= X5R	Cap= 10.0 uF ESR= 4.127 mOhm VDC= 16.0 V IRMS= 2.46634 A	1	\$0.03	0805 7 mm ²
2.	Cout	MuRata	GRM188R60G106ME47D Series= X5R	Cap= 10.0 uF ESR= 3.0 mOhm VDC= 4.0 V IRMS= 3.0 A	1	\$0.02	0603 5 mm ²
3.	L1	Coilcraft	LPS5030-153MRB	L= 15.0 uH DCR= 144.0 mOhm	1	\$0.44	LPS5030 34 mm ²
4.	Renb	Vishay-Dale	CRCW0402200KFKED Series= CRCW..e3	Res= 200.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
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

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	U1	Texas Instruments	TPS62125DSGR	Switcher	1	\$0.53	 S-PWSON-N8 10 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	124.624 μ A	Current	Input capacitor RMS ripple current
2.	Cout IRMS	44.092 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	78.46 mA	Current	Peak switch current in IC
4.	Iin Avg	346.34 μ A	Current	Average input current
5.	L Ipp	152.74 mA	Current	Peak-to-peak inductor ripple current
6.	M Irms	72.081 μ A	Current	MOSFET RMS current
7.	BOM Count	10	General	Total Design BOM count
8.	FootPrint	73.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	19.001 kHz	General	Switching frequency
10.	IC Tolerance	20.2 mV	General	IC Feedback Tolerance
11.	M Vds Act	452.707 μ V	General	Voltage drop across the MosFET
12.	Mode	DCM	General	Conduction Mode
13.	Pout	3.762 mW	General	Total output power
14.	Total BOM	\$1.08	General	Total BOM Cost
15.	Vout Actual	1.792 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
16.	Vout OP	1.8 V	Op_Point	Operational Output Voltage
17.	Duty Cycle	356.833 m%	Op_point	Duty cycle
18.	Efficiency	77.586 %	Op_point	Steady state efficiency
19.	IC Tj	30.07 degC	Op_point	IC junction temperature
20.	ICThetaJA	65.2 degC/W	Op_point	IC junction-to-ambient thermal resistance
21.	IOUT_OP	2.09 mA	Op_point	Iout operating point
22.	VIN_OP	14.0 V	Op_point	Vin operating point
23.	Vout p-p	3.711 mV	Op_point	Peak-to-peak output ripple voltage
24.	Cin Pd	64.097 μ W	Power	Input capacitor power dissipation
25.	Cout Pd	5.832 μ W	Power	Output capacitor power dissipation
26.	IC Pd	1.08 mW	Power	IC power dissipation
27.	L Pd	786.258 nW	Power	Inductor power dissipation
28.	Total Pd	1.087 mW	Power	Total Power Dissipation
29.	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	2.09 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	Texas Instruments Base Part 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.

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