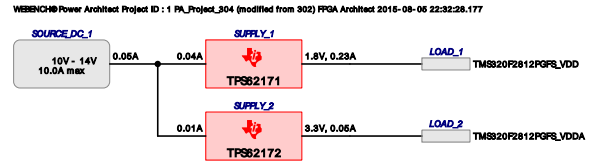


WEBENCH[®] Power Architect



Project Report

Project : 3989908/1 : PA_Project_304 (modified from 302)
 Created : 2015-08-05 22:32:28.177
 Optimize project optFactor=3

Project Summary

- | | |
|-----------------------------------|-----------------------|
| 1. Total System Efficiency | 76.567 % |
| 2. Total System BOM Count | 10.0 |
| 3. Total System Footprint | 116.0 mm ² |
| 4. Total System BOM Cost | \$1.92 |
| 5. Total System Power Dissipation | 177.2 mW |

--> Launch WEBENCH Power Architect.

Power Supplies

#	Name	NSID	Description	Vout	Iout	Efficiency	Foot-print	Cost	Design	Page
1.	SUPPLY_1	TPS62171	Switcher : 3V-17V, 1.8Vout, 0.5A, Buck Converter with Power Good	1.8 V	0.23 A	75.3%	58	\$0.96	23	4
2.	SUPPLY_2	TPS62172	Switcher : 17V, 3.3Vout, 0.5A, Buck Converter with Power Good	3.3 V	0.05 A	80.1%	58	\$0.96	24	9

Power Loads

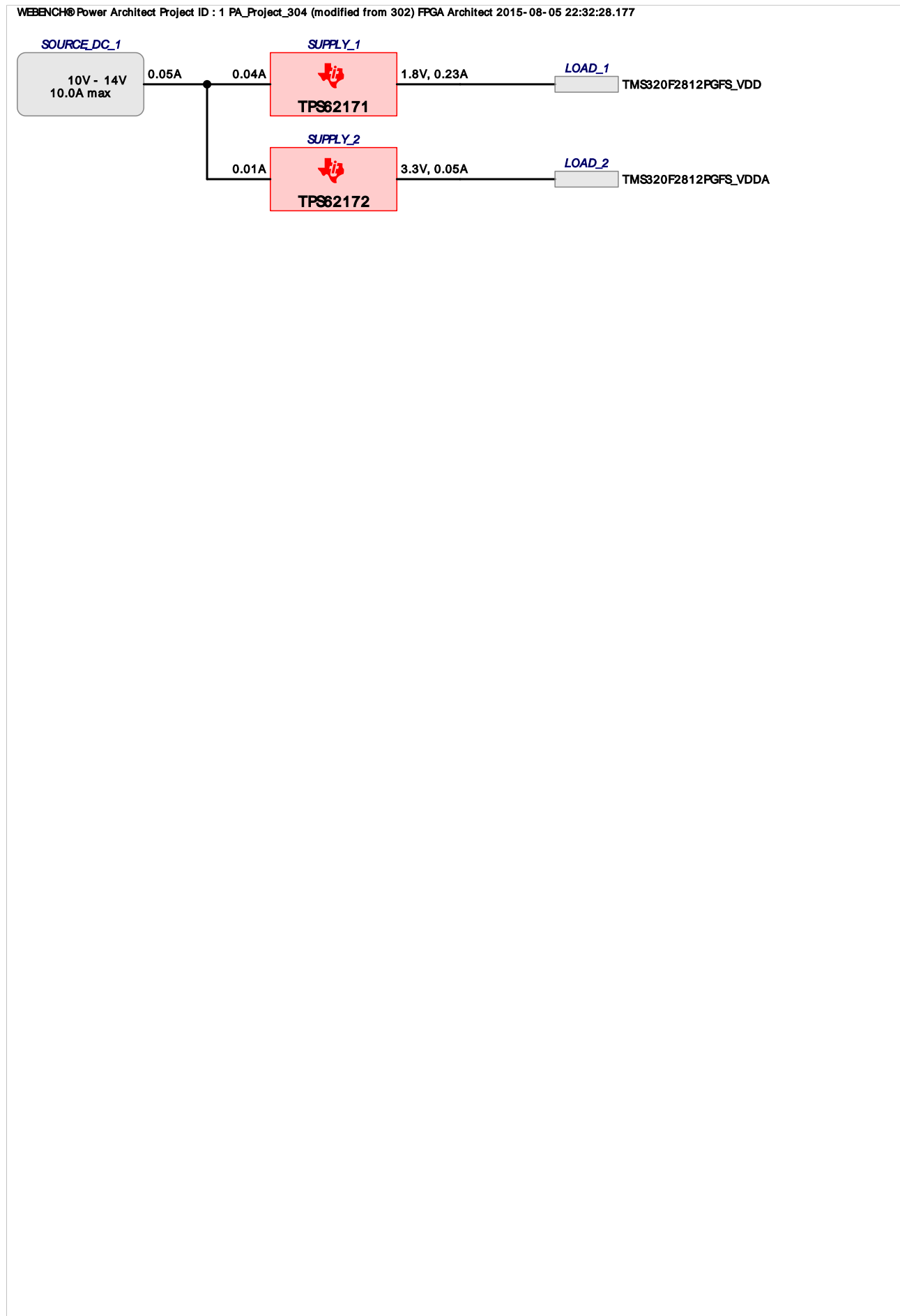
#	Name	VLoad	ILoad	Description
1.	TMS320F2812PGFS_VDD	1.8 V	0.23 A	VoutRipple=5%
2.	TMS320F2812PGFS_VDDA	3.3 V	0.05 A	VoutRipple=5%

FPGAs, Processors

#	Manufacturer	Part Number	Name	Series	Description
1.	Texas Instruments	TMS320F2812PGFS	FPGA_1	TMS320C2000	FPGA Texas Instruments TMS320C2000 TMS320F2812PGFS

<http://focus.ti.com/lit/ds/symlink/tms320f2812.pdf>

Project Diagram



Electrical Procurement BOM

Manufacturer	Part Number	Description	Quantity	Budgetary Price	Footprint (mm ²)
Vishay-Dale	CRCW0402100KFKED	0402	2	\$0.01	6
MuRata	GRM219R61E106KA12	0805	2	\$0.05	14
MuRata	GRM31CR70J226KE19L	1206	2	\$0.12	22
Bourns	SDR0403-2R2ML	SDR0403	2	\$0.18	55
Texas Instruments	TPS62171DSGR	S- PWSON- N8	1	\$0.60	10
Texas Instruments	TPS62172DSGR	S- PWSON- N8	1	\$0.60	10
Total			10	\$1.92	117

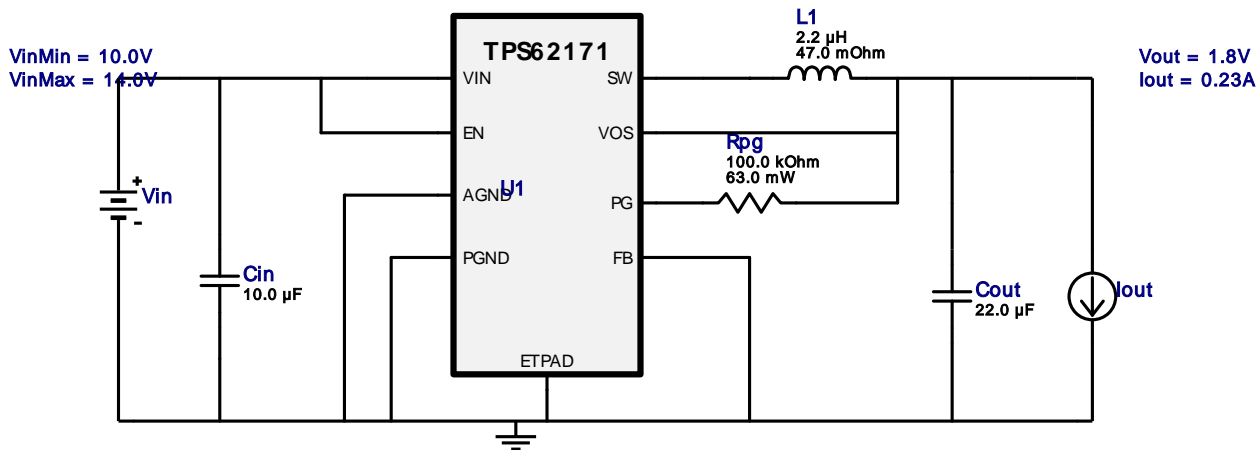


VinMin = 10.0V
 VinMax = 14.0V
 Vout = 1.8V
 Iout = 0.23A






Device = TPS62171DSGR
 Topology = Buck
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 BOM Cost = \$0.96
 Footprint = 58.0 mm²
 BOM Count = 5
 Total Pd = 0.14W

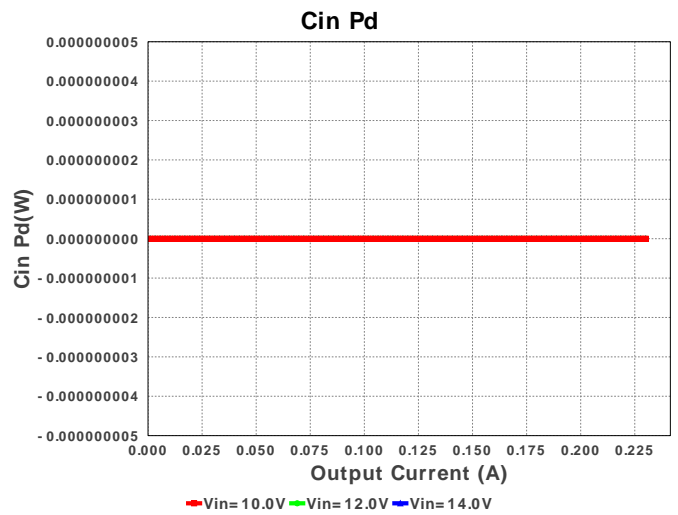
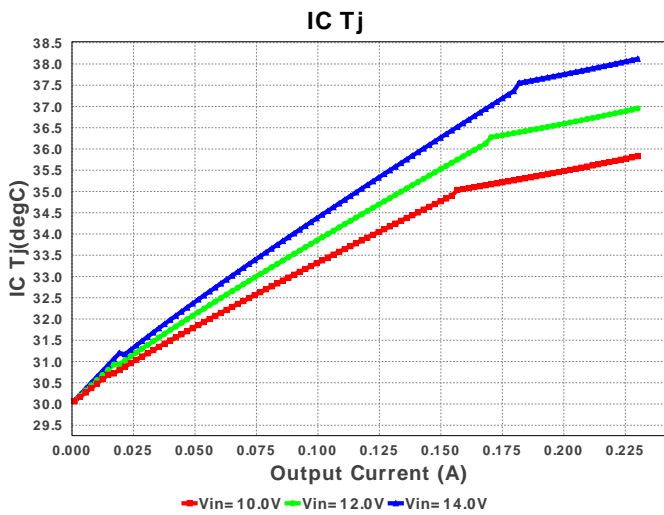
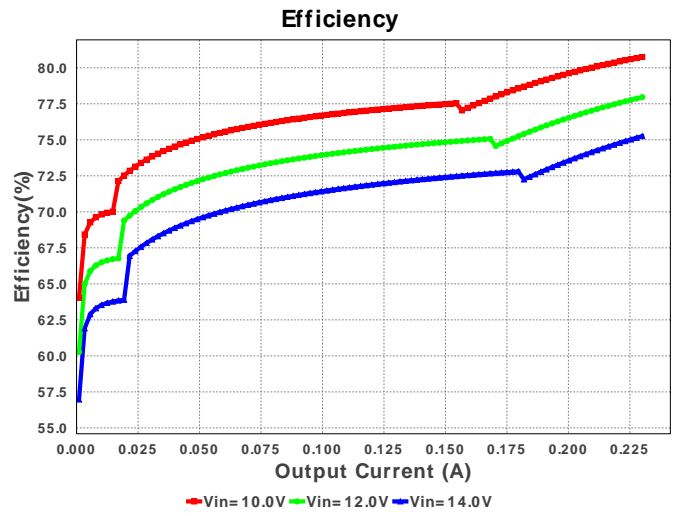
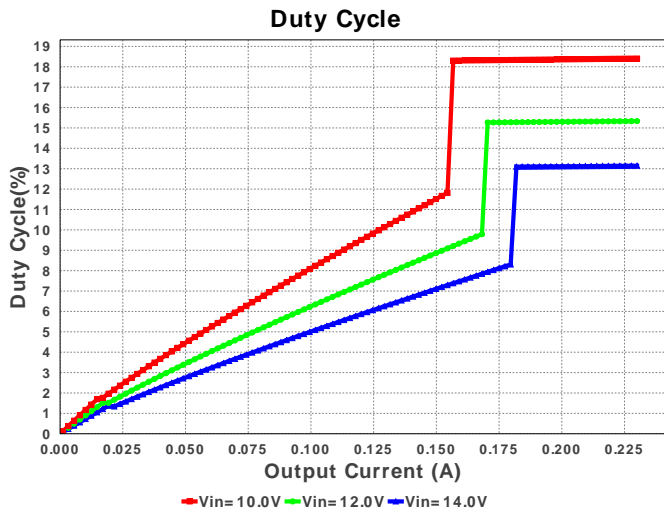
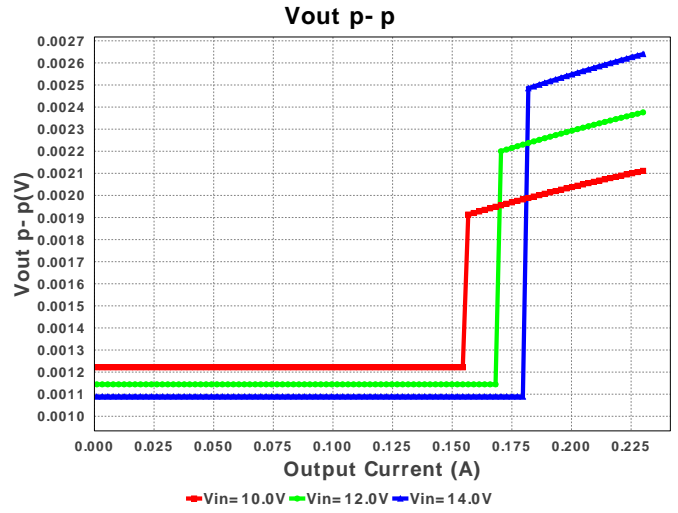
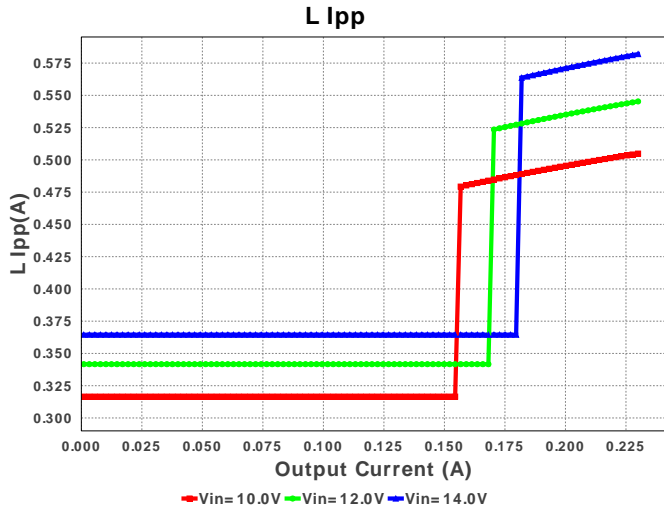
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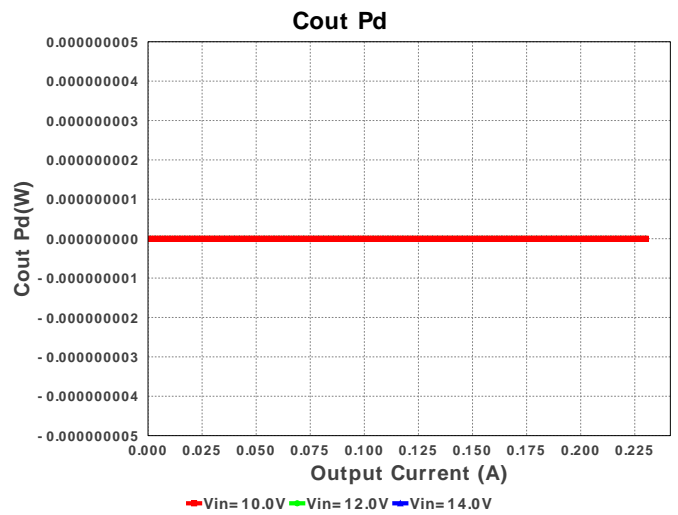
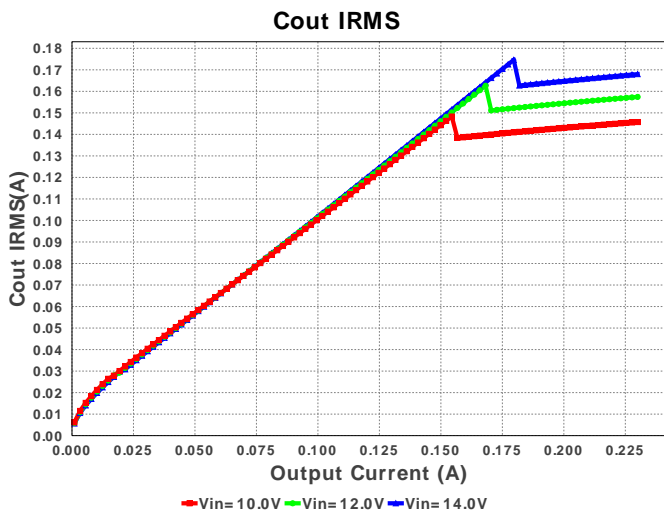
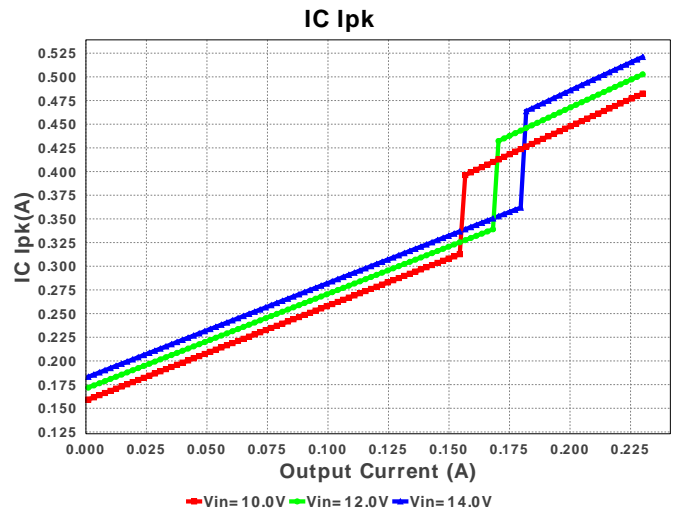
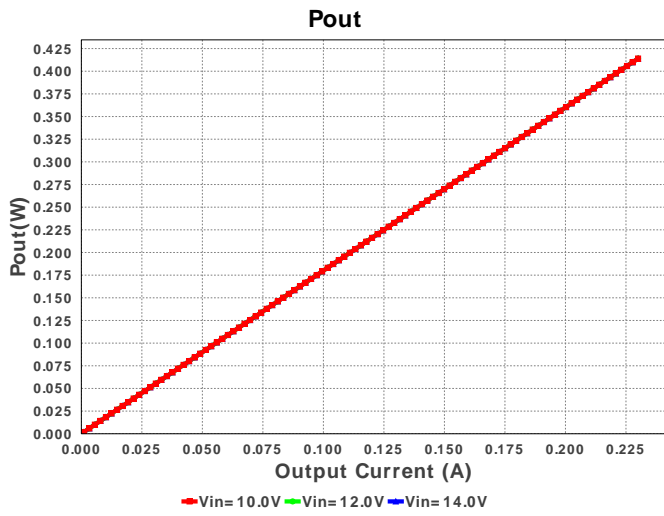
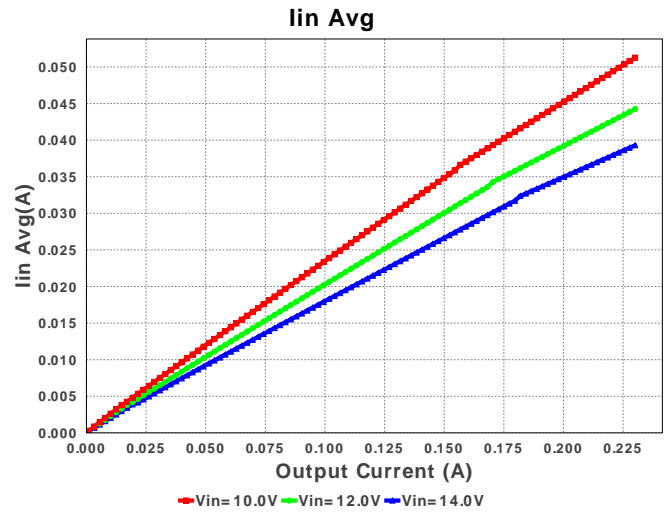
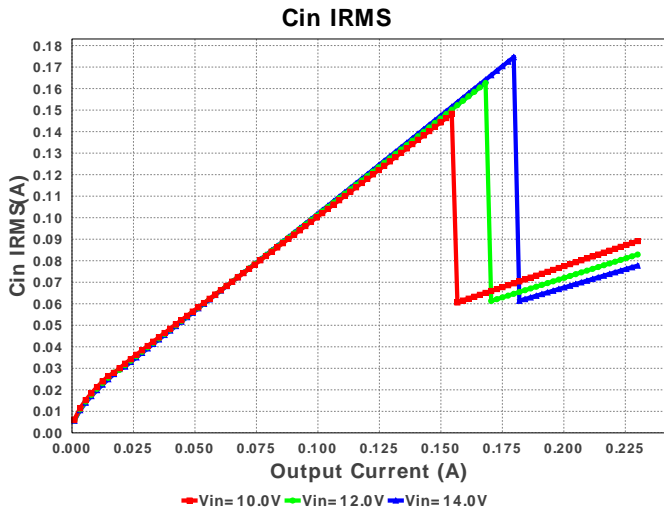
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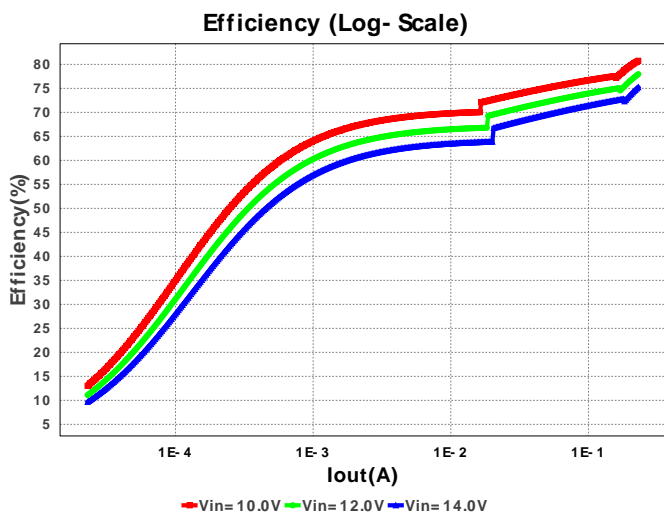
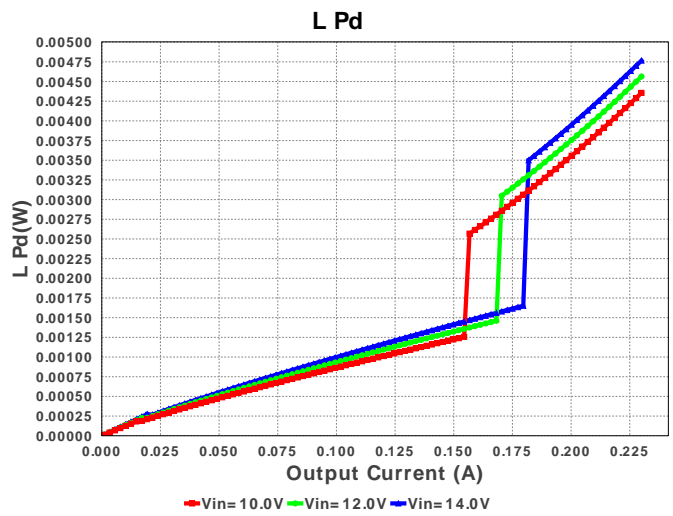
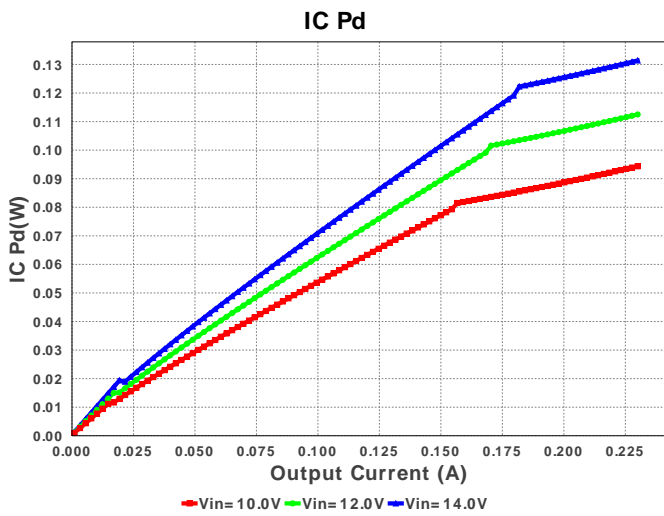
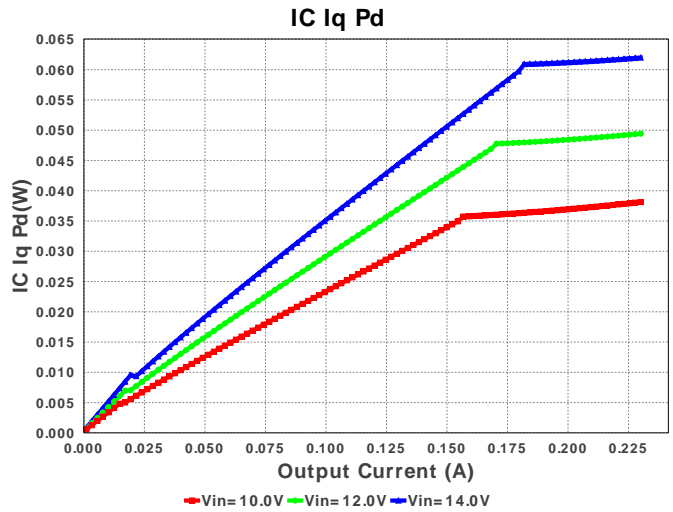
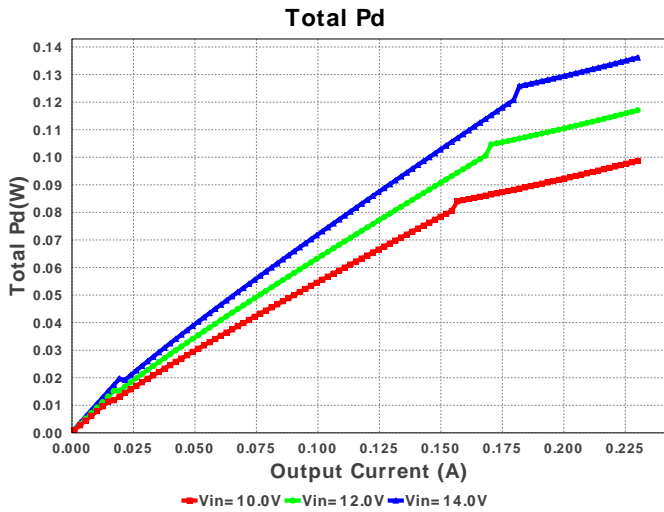


Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM219R61E106KA12 Series= X5R	Cap= 10.0 uF VDC= 25.0 V IRMS= 0.0 A	1	\$0.05	 0805 7 mm ²
2.	Cout	MuRata	GRM31CR70J226KE19L Series= X7R	Cap= 22.0 uF VDC= 6.3 V IRMS= 0.0 A	1	\$0.12	 1206 11 mm ²
3.	L1	Bourns	SDR0403-2R2ML	L= 2.2 uH DCR= 47.0 mOhm	1	\$0.18	 SDR0403 28 mm ²
4.	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
5.	U1	Texas Instruments	TPS62171DSGR	Switcher	1	\$0.60	 S-PWSON-N8 10 mm ²







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	77.716 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	168.001 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	520.986 mA	Current	Peak switch current in IC
4.	Iin Avg	39.297 mA	Current	Average input current
5.	L Ipp	581.97 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	5	General	Total Design BOM count
7.	FootPrint	58.0 mm ²	General	Total Foot Print Area of BOM components
8.	Frequency	1.996 MHz	General	Switching frequency
9.	Pout	414.0 mW	General	Total output power
10.	Total BOM	\$0.96	General	Total BOM Cost
11.	Vout OP	1.8 V	Op_Point	Operational Output Voltage

#	Name	Value	Category	Description
12.	Duty Cycle	13.145 %	Op_point	Duty cycle
13.	Efficiency	75.251 %	Op_point	Steady state efficiency
14.	IC Tj	38.12 degC	Op_point	IC junction temperature
15.	ICThetaJA	61.8 degC/W	Op_point	IC junction-to-ambient thermal resistance
16.	IOUT_OP	230.0 mA	Op_point	Iout operating point
17.	VIN_OP	14.0 V	Op_point	Vin operating point
18.	Vout p-p	2.64 mV	Op_point	Peak-to-peak output ripple voltage
19.	Cin Pd	0.0 W	Power	Input capacitor power dissipation
20.	Cout Pd	0.0 W	Power	Output capacitor power dissipation
21.	IC Iq Pd	61.997 mW	Power	IC Iq Pd
22.	IC Pd	131.393 mW	Power	IC power dissipation
23.	L Pd	4.766 mW	Power	Inductor power dissipation
24.	Total Pd	136.159 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	230.0 m	Maximum Output Current
2.	Iout1	230.0 m	Output Current #1
3.	VinMax	14.0	Maximum input voltage
4.	VinMin	10.0	Minimum input voltage
5.	Vout	1.8	Output Voltage
6.	Vout1	1.8	Output Voltage #1
7.	base_pn	TPS62171	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0	Ambient temperature

Design Assistance

1. Feature Highlights: DCS-Control(TM) Architecture with upto 0.5A output current, 3V to 17V Input Voltage Range, 1.8V Fixed Output voltage, Seamless Power Save Mode for Light Load Efficiency, Power Good Output, 100% Duty Cycle mode, Short Circuit Protection, Thermal Shutdown

2. TPS62171 Product Folder : <http://www.ti.com/product/TPS62171> : contains the data sheet and other resources.

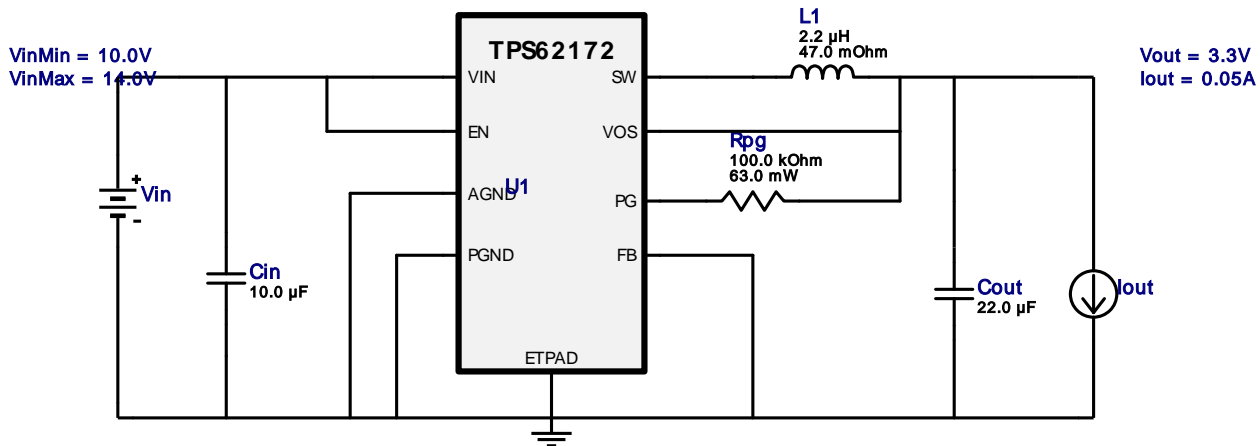


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 Vout = 3.3V
 Iout = 0.05A






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 Total Pd = 0.04W

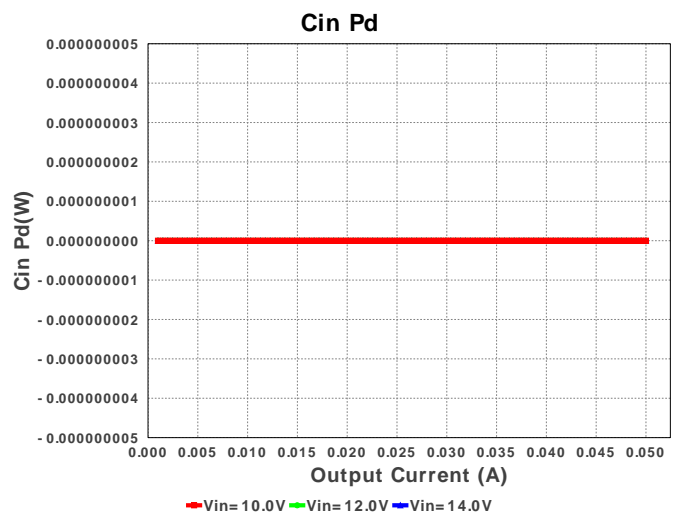
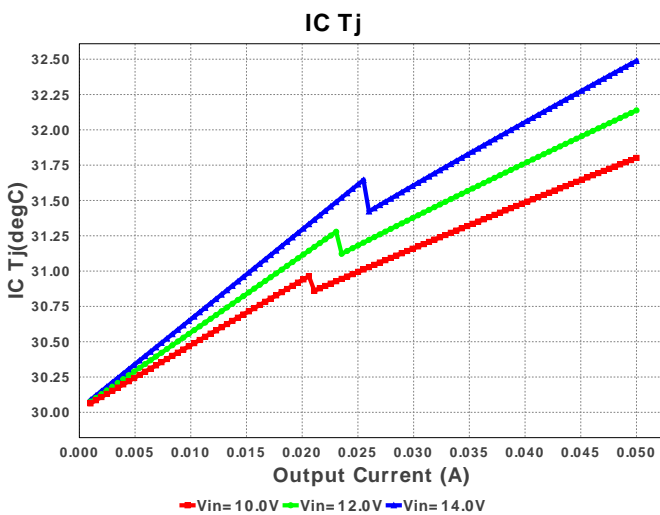
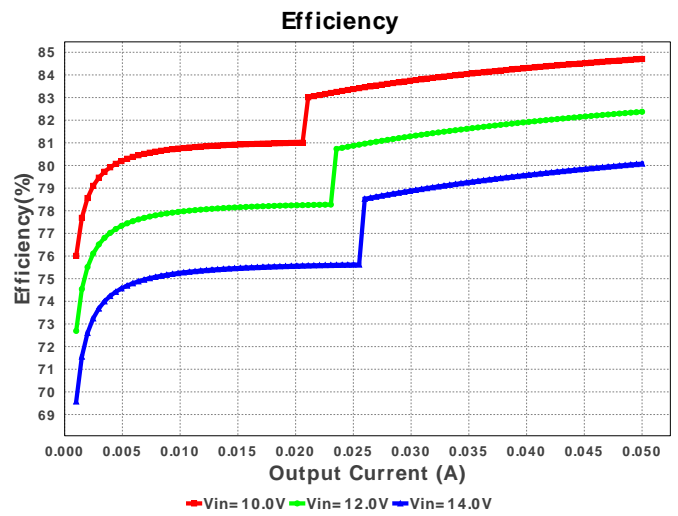
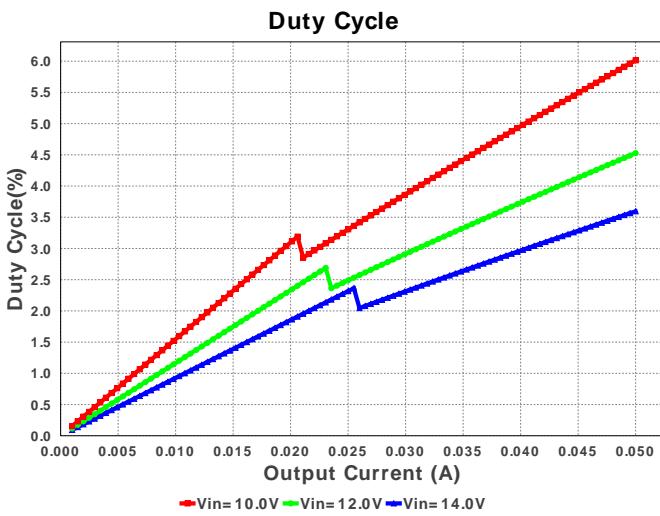
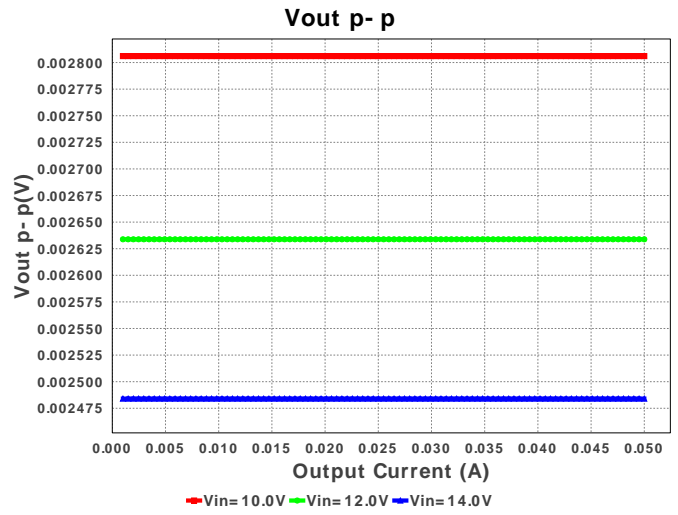
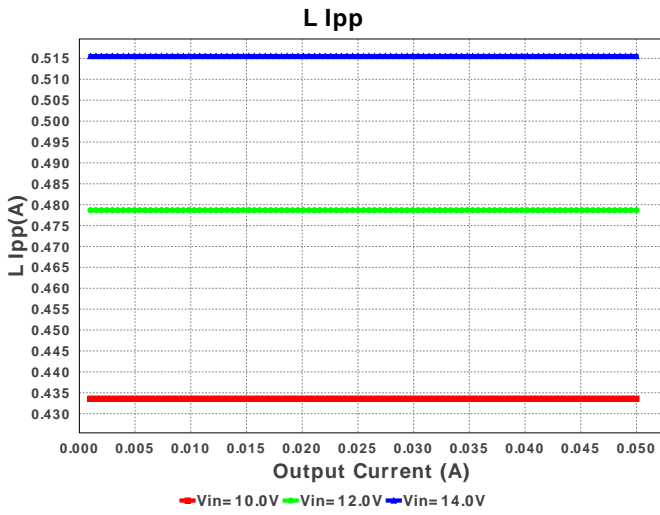
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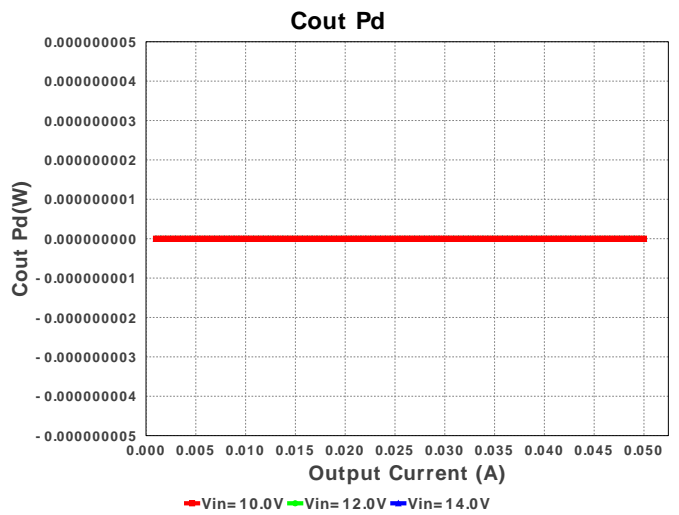
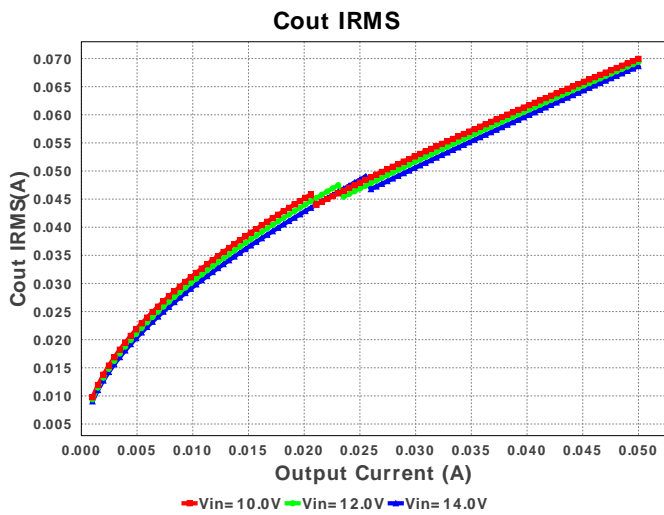
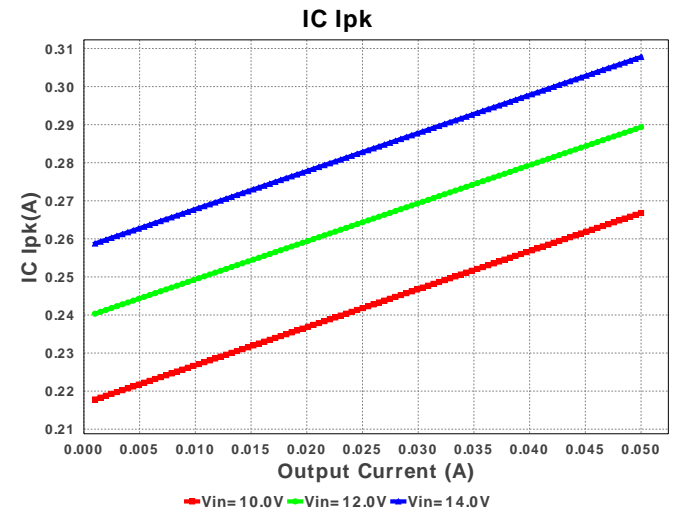
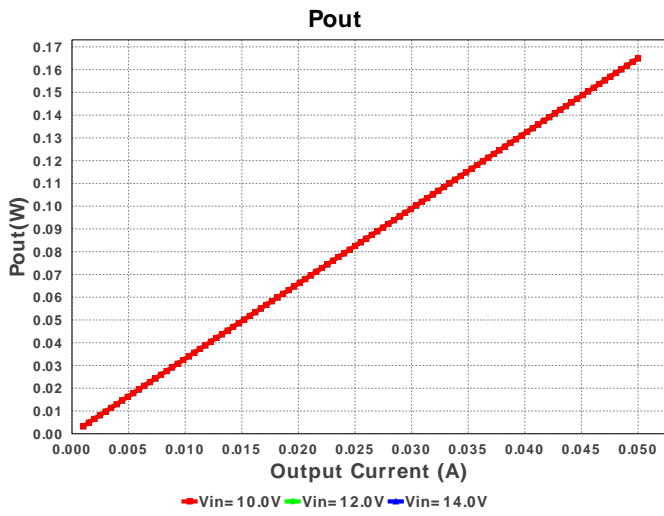
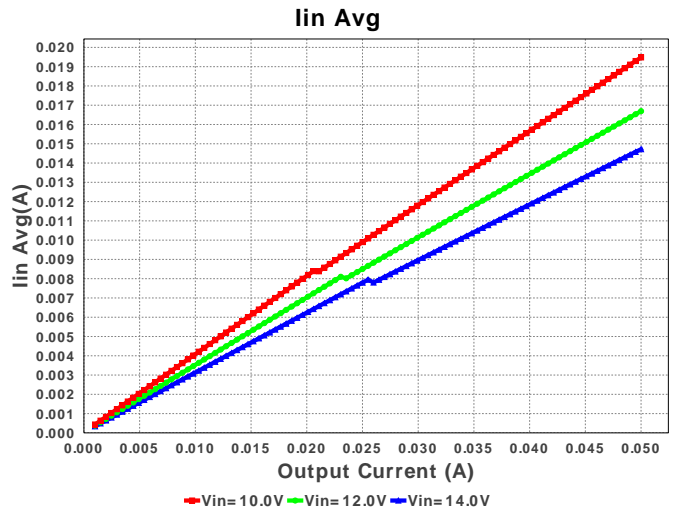
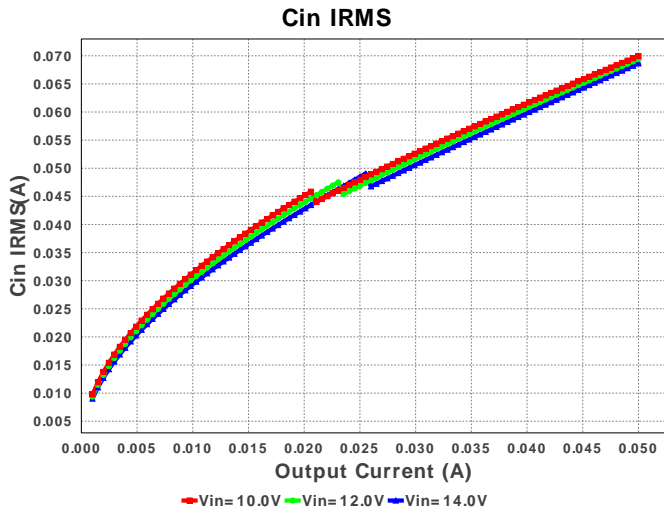
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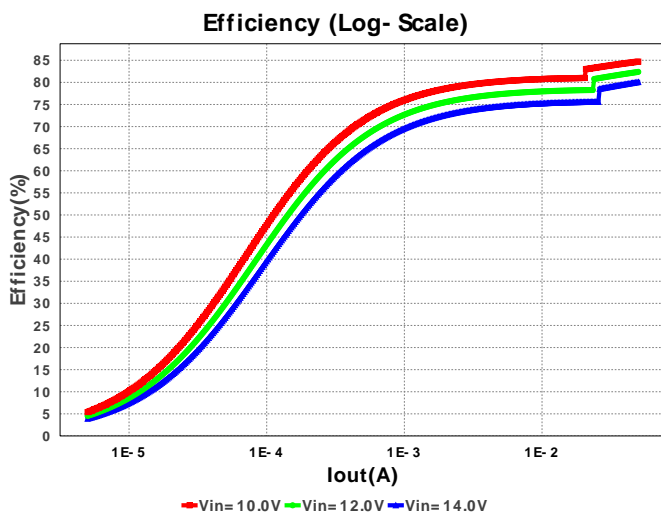
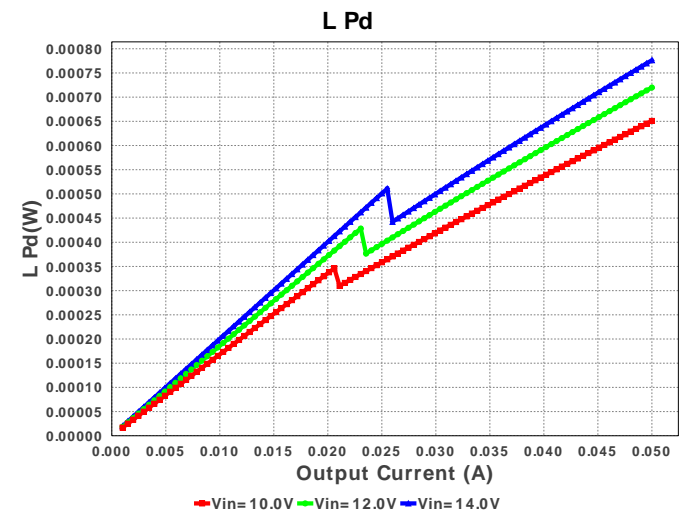
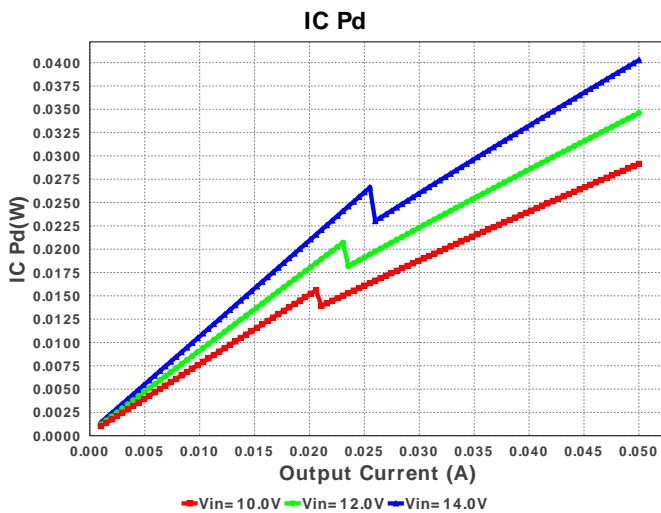
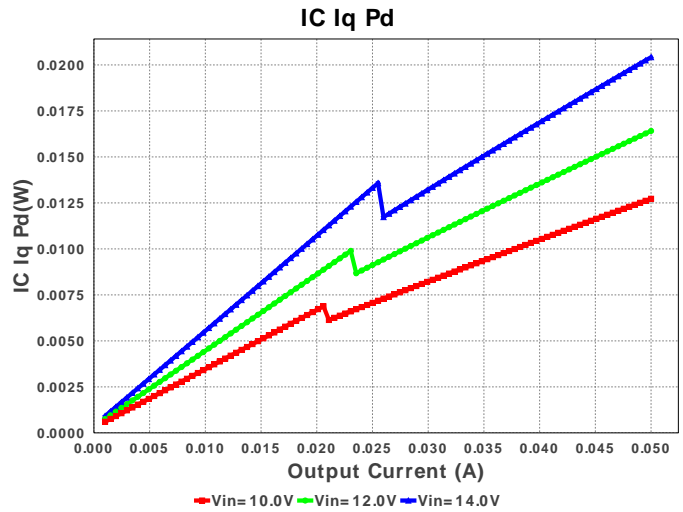
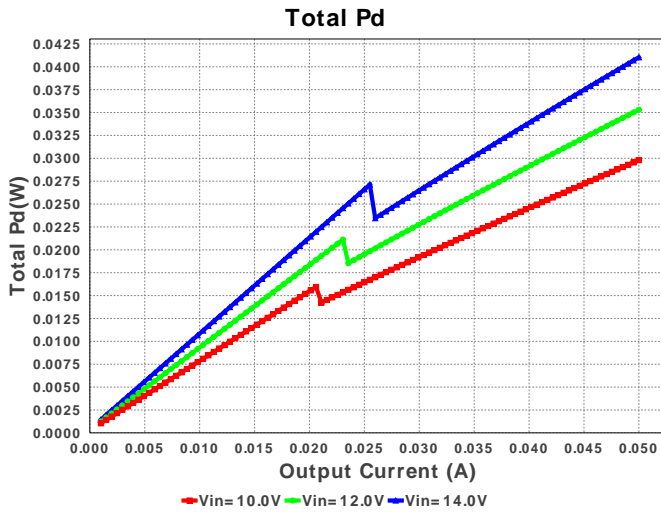


Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM219R61E106KA12 Series= X5R	Cap= 10.0 uF VDC= 25.0 V IRMS= 0.0 A	1	\$0.05	 0805 7 mm ²
2.	Cout	MuRata	GRM31CR70J226KE19L Series= X7R	Cap= 22.0 uF VDC= 6.3 V IRMS= 0.0 A	1	\$0.12	 1206 11 mm ²
3.	L1	Bourns	SDR0403-2R2ML	L= 2.2 µH DCR= 47.0 mOhm	1	\$0.18	 SDR0403 28 mm ²
4.	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
5.	U1	Texas Instruments	TPS62172DSGR	Switcher	1	\$0.60	 S-PWSON-N8 10 mm ²







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	68.65 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	68.65 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	307.777 mA	Current	Peak switch current in IC
4.	Iin Avg	14.717 mA	Current	Average input current
5.	L Ipp	515.55 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	5	General	Total Design BOM count
7.	FootPrint	58.0 mm ²	General	Total Foot Print Area of BOM components
8.	Frequency	437.391 kHz	General	Switching frequency
9.	Pout	165.0 mW	General	Total output power
10.	Total BOM	\$0.96	General	Total BOM Cost
11.	Vout OP	3.3 V	Op_Point	Operational Output Voltage

#	Name	Value	Category	Description
12.	Duty Cycle	3.595 %	Op_point	Duty cycle
13.	Efficiency	80.082 %	Op_point	Steady state efficiency
14.	IC Tj	32.488 degC	Op_point	IC junction temperature
15.	ICThetaJA	61.8 degC/W	Op_point	IC junction-to-ambient thermal resistance
16.	IOUT_OP	50.0 mA	Op_point	Iout operating point
17.	VIN_OP	14.0 V	Op_point	Vin operating point
18.	Vout p-p	2.484 mV	Op_point	Peak-to-peak output ripple voltage
19.	Cin Pd	0.0 W	Power	Input capacitor power dissipation
20.	Cout Pd	0.0 W	Power	Output capacitor power dissipation
21.	IC Iq Pd	20.42 mW	Power	IC Iq Pd
22.	IC Pd	40.263 mW	Power	IC power dissipation
23.	L Pd	776.306 µW	Power	Inductor power dissipation
24.	Total Pd	41.039 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	50.0 m	Maximum Output Current
2.	Iout1	50.0 m	Output Current #1
3.	VinMax	14.0	Maximum input voltage
4.	VinMin	10.0	Minimum input voltage
5.	Vout	3.3	Output Voltage
6.	Vout1	3.3	Output Voltage #1
7.	base_pn	TPS62172	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0	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.

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