

# WEBENCH<sup>®</sup> Power Architect

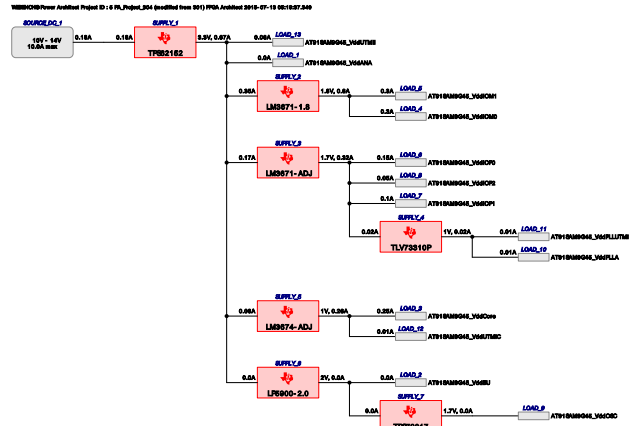
## Project Report

Project : 4425714/5 : PA\_Project\_304 (modified from 301)  
 Created : 2015-07-13 05:19:37.349  
 Optimize project optFactor=3

### Project Summary

1. Total System Efficiency	77.76 %
2. Total System BOM Count	34.0
3. Total System Footprint	225.0 mm <sup>2</sup>
4. Total System BOM Cost	\$3.44
5. Total System Power Dissipation	594.0 mW

--> Launch WEBENCH Power Architect.



## Power Supplies

#	Name	NSID	Description	Vout	Iout	Efficiency	Foot-print	Cost	Design	Page
1.	SUPPLY_1	TPS62152	Switcher : 3V-17V,3.3Vout,1A,Buck,DCS-Control	3.3 V	0.669 A	89.5%	76	\$1.16	28	31
2.	SUPPLY_2	LM3671-1.8	Switcher : 2MHz, 600mA Buck Converter for Ultra Low Voltage Circuits	1.8 V	0.6 A	84.4%	28	\$0.45	22	4
3.	SUPPLY_3	LM3671-ADJ	Switcher : 2MHz, 600mA Buck Converter for Ultra Low Voltage Circuits	1.7 V	0.32 A	89.3%	40	\$0.48	24	13
4.	SUPPLY_4	TLV73310P	LDO : TLV733P Capacitor-Free 300-mA Low-Dropout Regulator	1 V	0.02 A	53.4%	10	\$0.19	23	9
5.	SUPPLY_5	LM3674-ADJ	Switcher : 2MHz, 600mA Step-Down DC-DC Converter in SOT 23-5	1 V	0.26 A	85.3%	46	\$0.52	25	18
6.	SUPPLY_6	LP5900-2.0	LDO : Ultra low noise with no bypass capacitor	2 V	0.003 A	54.5%	11	\$0.22	27	27
7.	SUPPLY_7	TPS72017	LDO : 350mA, Ultra-Low VIN, RF Low-Dropout Linear Regulator with Bias Pin	1.7 V	0.002 A	75.9%	14	\$0.42	26	23

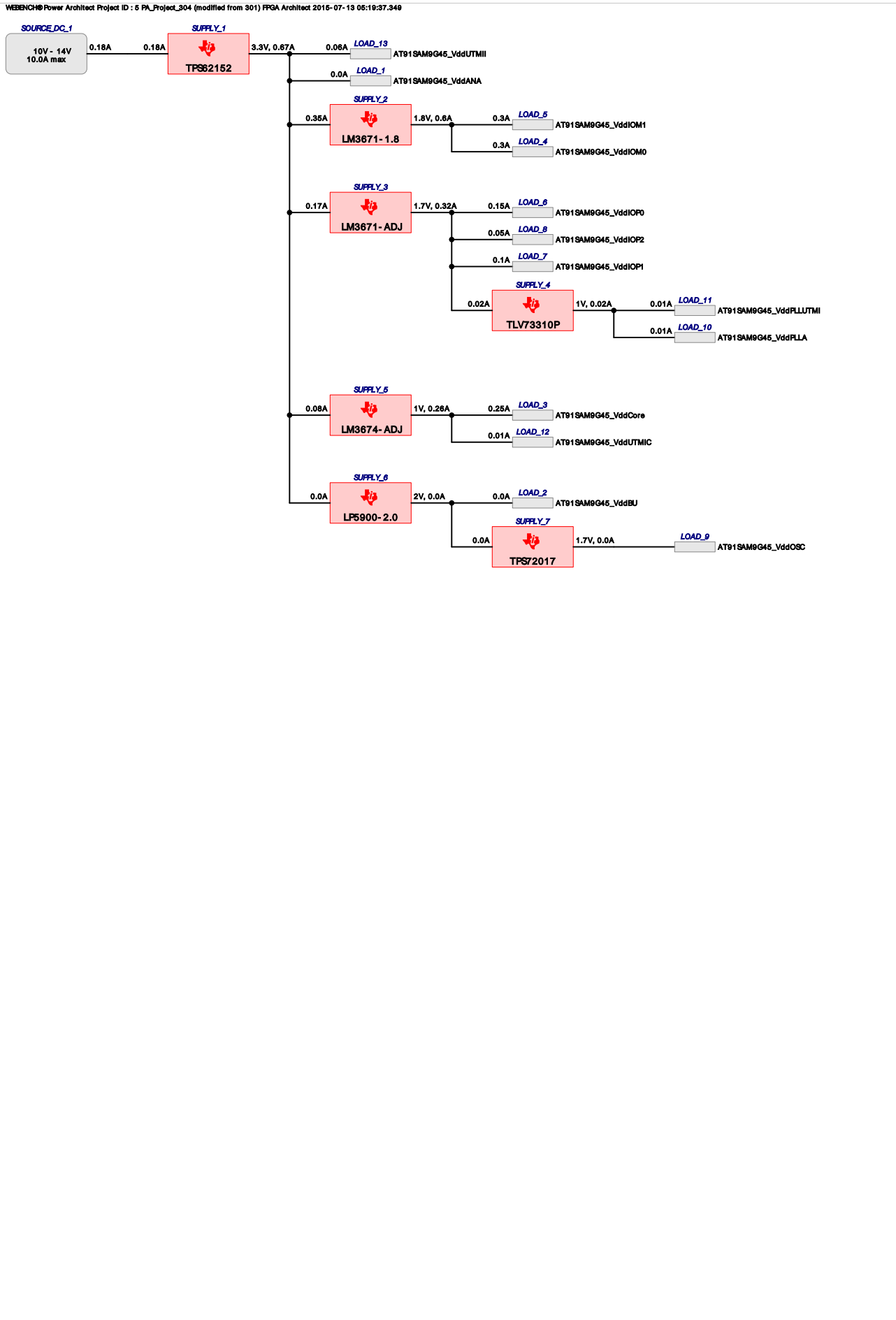
## Power Loads

#	Name	VLoad	Iload	Description
1.	AT91SAM9G45_VddUTMII	3.3 V	0.06 A	VoutRipple=18%
2.	AT91SAM9G45_VddIOM1	1.8 V	0.3 A	VoutRipple=16%
3.	AT91SAM9G45_VddIOM0	1.8 V	0.3 A	VoutRipple=16%
4.	AT91SAM9G45_VddIOP0	1.7 V	0.15 A	VoutRipple=16%
5.	AT91SAM9G45_VddIOP2	1.7 V	0.05 A	VoutRipple=16%
6.	AT91SAM9G45_VddIOP1	1.7 V	0.1 A	VoutRipple=16%
7.	AT91SAM9G45_VddPLLUTMI	1 V	0.01 A	VoutRipple=20%
8.	AT91SAM9G45_VddPLLA	1 V	0.01 A	VoutRipple=20%
9.	AT91SAM9G45_VddCore	1 V	0.25 A	VoutRipple=20%
10.	AT91SAM9G45_VddUTMIC	1 V	0.01 A	VoutRipple=20%
11.	AT91SAM9G45_VddANA	3.3 V	0.001 A	VoutRipple=18%
12.	AT91SAM9G45_VddBU	2 V	0.001 A	VoutRipple=16%
13.	AT91SAM9G45_VddOSC	1.7 V	0.002 A	VoutRipple=16%

## FPGAs, Processors

#	Manufacturer	Part Number	Name	Series	Description
1.	Atmel	AT91SAM9G45	FPGA_1	SAM9	FPGA Atmel SAM9 AT91SAM9G45

Project Diagram



## Electrical Procurement BOM

Manufacturer	Part Number	Description	Quantity	Budgetary Price	Footprint (mm <sup>2</sup> )
Kemet	C0805C180K5GACTU	0805	1	\$0.01	7
TDK	C1005X5R0J104K	0402	1	\$0.01	3
TDK	C1005X5R0J105M	0402	5	\$0.01	15
TDK	C2012X5R0J226M	0805	1	\$0.06	7
Yageo America	CC0805DRNP09BN8R0	0805	1	\$0.01	7
Yageo America	CC0805KRX7R9BB391	0805	1	\$0.01	7
Vishay-Dale	CRCW0402100KFKED	0402	1	\$0.01	3
Vishay-Dale	CRCW0402200KFKED	0402	3	\$0.01	9
Vishay-Dale	CRCW0402475KFKED	0402	1	\$0.01	3
MuRata	GRM188R60J106ME47D	0603	3	\$0.03	14
MuRata	GRM188R60J475KE19D	0603	3	\$0.02	14
MuRata	GRM219R61E106KA12	0805	1	\$0.05	7
Taiyo Yuden	JMK105BJ225MV-F	0402	1	\$0.03	3
Texas Instruments	LM3671TLX-1.875/NOPB	TLA05CBA	1	\$0.30	5
Texas Instruments	LM3671TLX-ADJ/NOPB	TLA05CBA	1	\$0.30	5
Texas Instruments	LM3674MF-ADJ/NOPB	MF05A	1	\$0.32	15
Texas Instruments	LP5900TLX-2.0/NOPB	TLA04BCA	1	\$0.20	5
TDK	MLP2016H2R2MT	MLP2016H-M	1	\$0.12	9
TDK	NLCV32T-2R2M-PF	NLCV32	2	\$0.10	27
Bourns	SDR0403-2R2ML	SDR0403	1	\$0.18	28
Texas Instruments	TLV73310PDQNR	DQN0004A	1	\$0.17	4
Texas Instruments	TPS62152RGTR	S-PVQFN-N16	1	\$0.85	25
Texas Instruments	TPS72017YZUR	YZU0005AEAY	1	\$0.37	5
Total			34	\$3.44	227

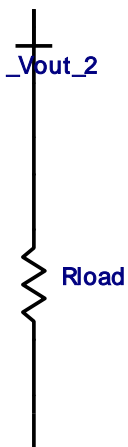
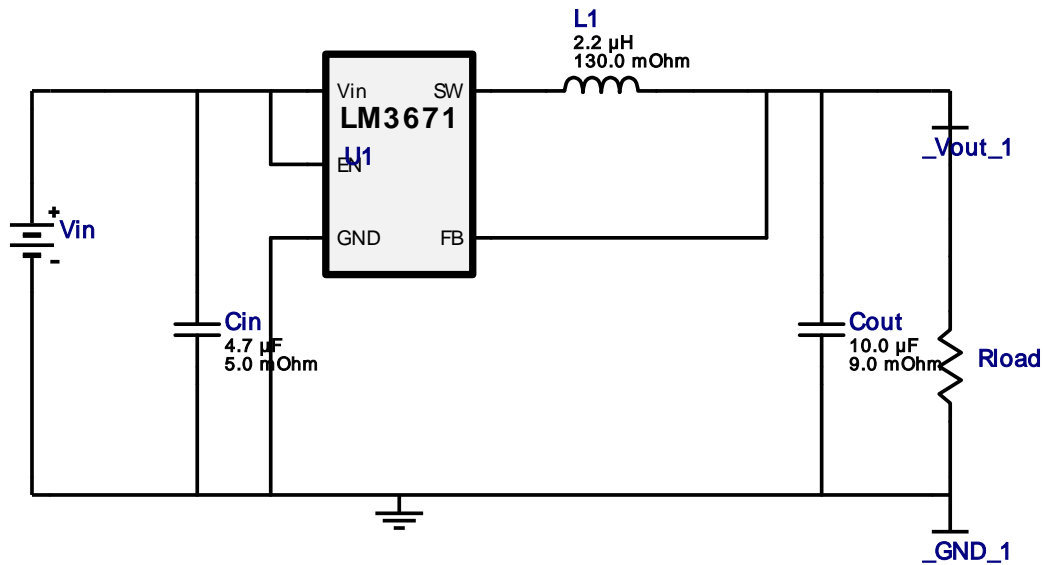


VinMin = 2.97V  
 VinMax = 3.63V  
 Vout = 1.8V  
 Iout = 0.6A

Device = LM3671TLX-1.875/NOPB  
 Topology = Buck  
 Created = 7/13/15 5:19:32 AM  
 BOM Cost = \$0.45  
 Footprint = 28.0 mm<sup>2</sup>  
 BOM Count = 4  
 Total Pd = 0.2W



## WEBENCH® Design Report

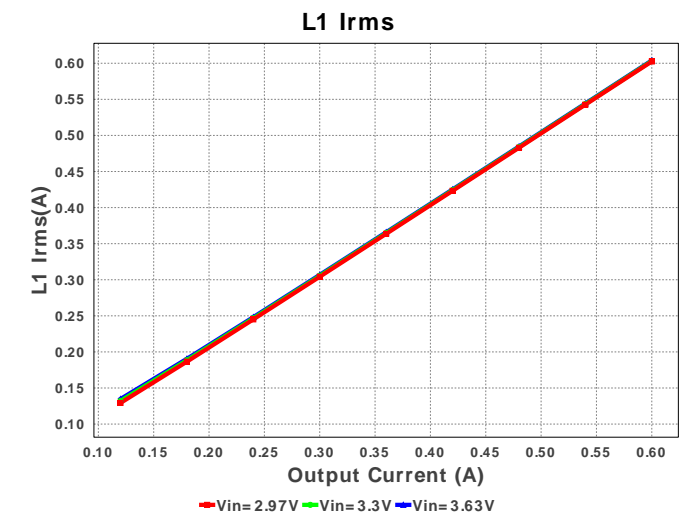
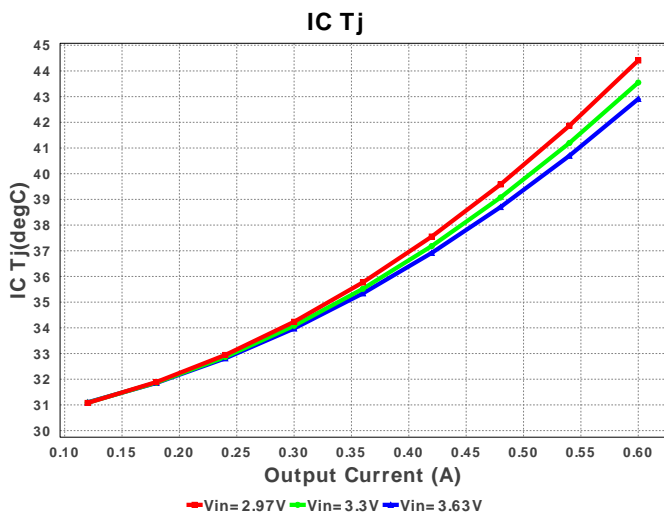
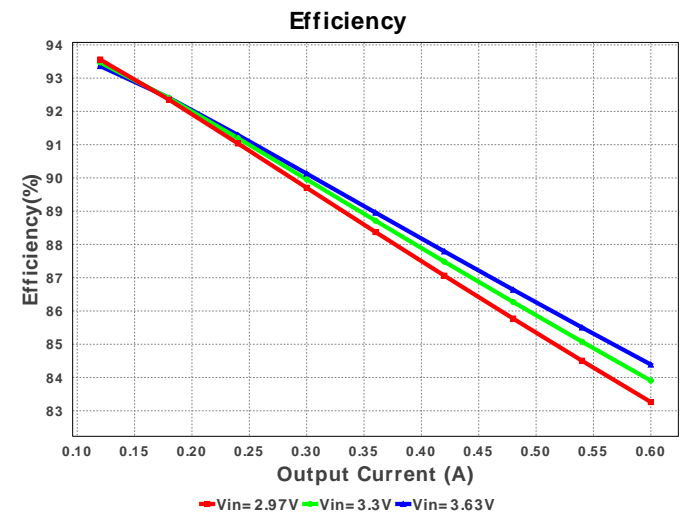
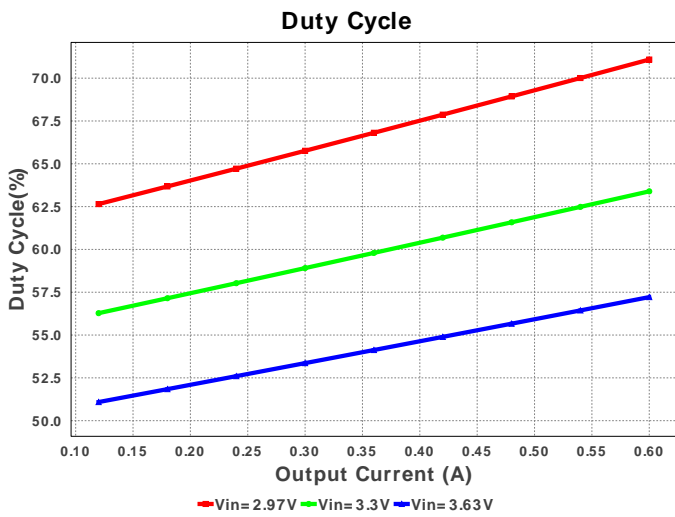
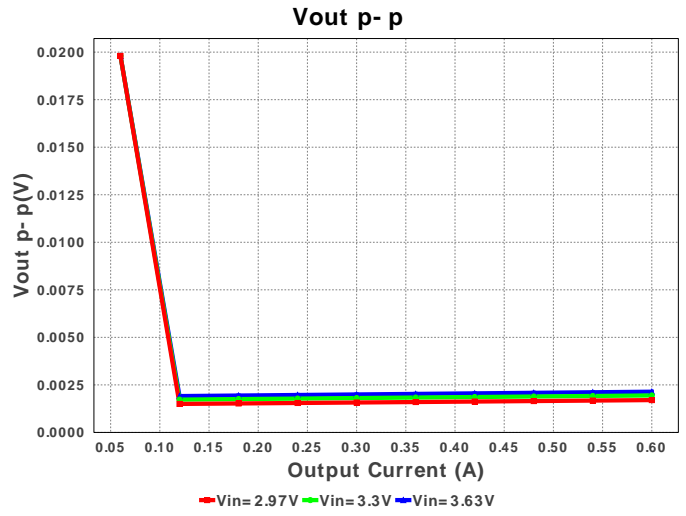
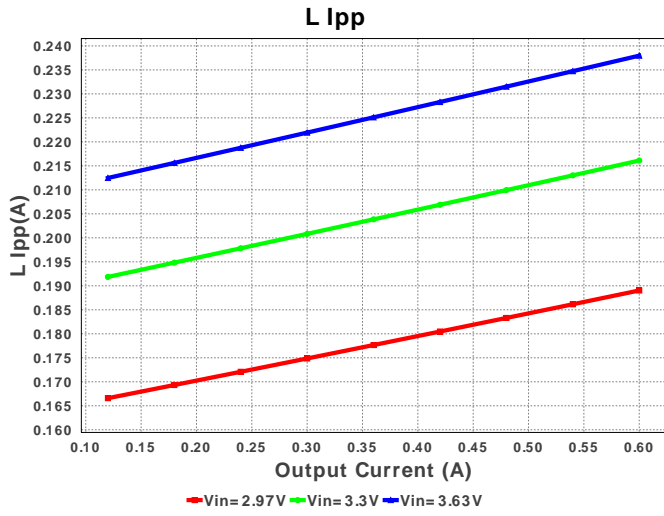
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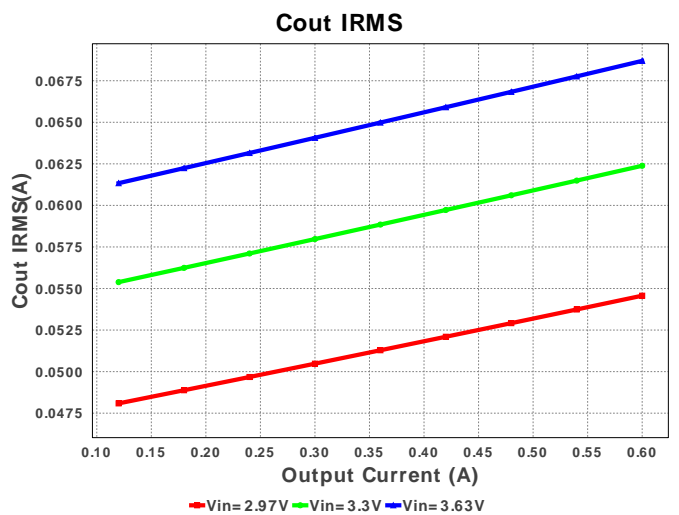
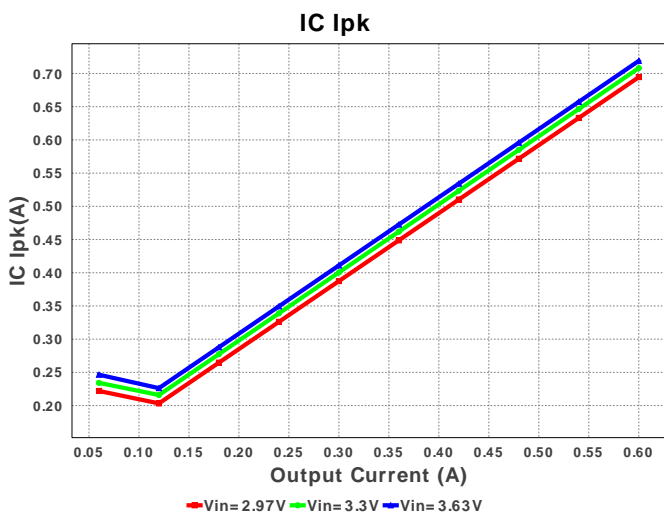
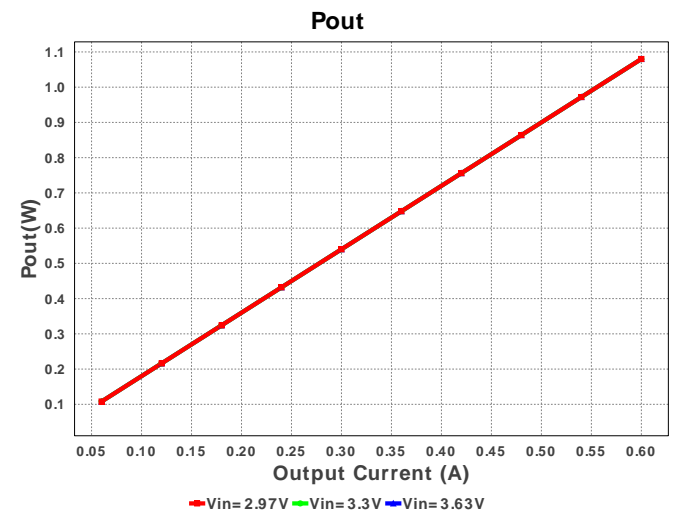
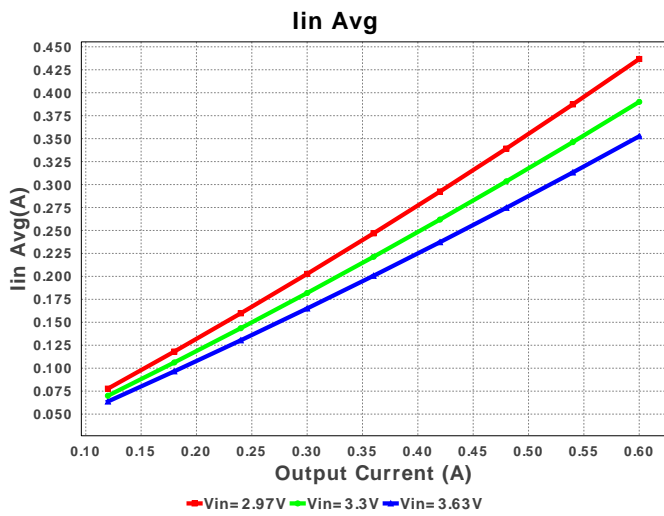
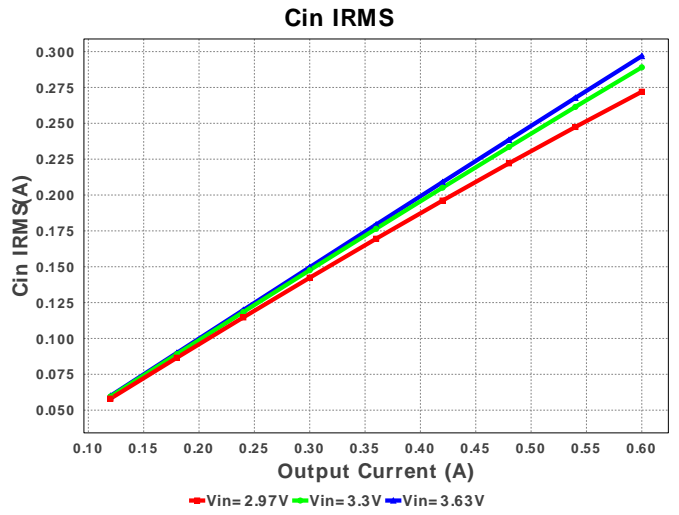
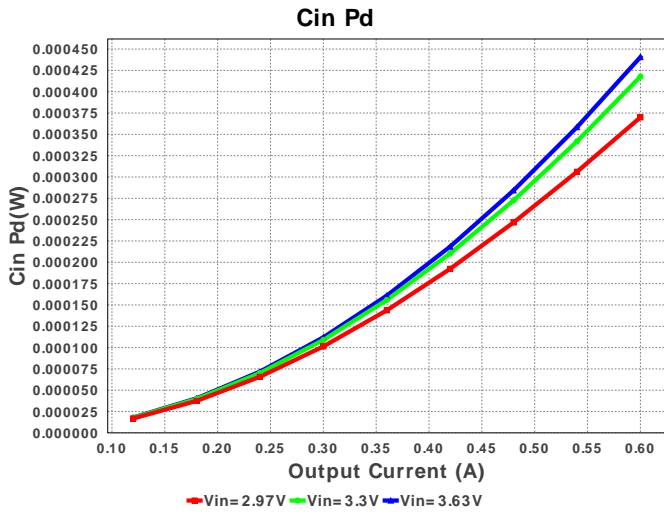


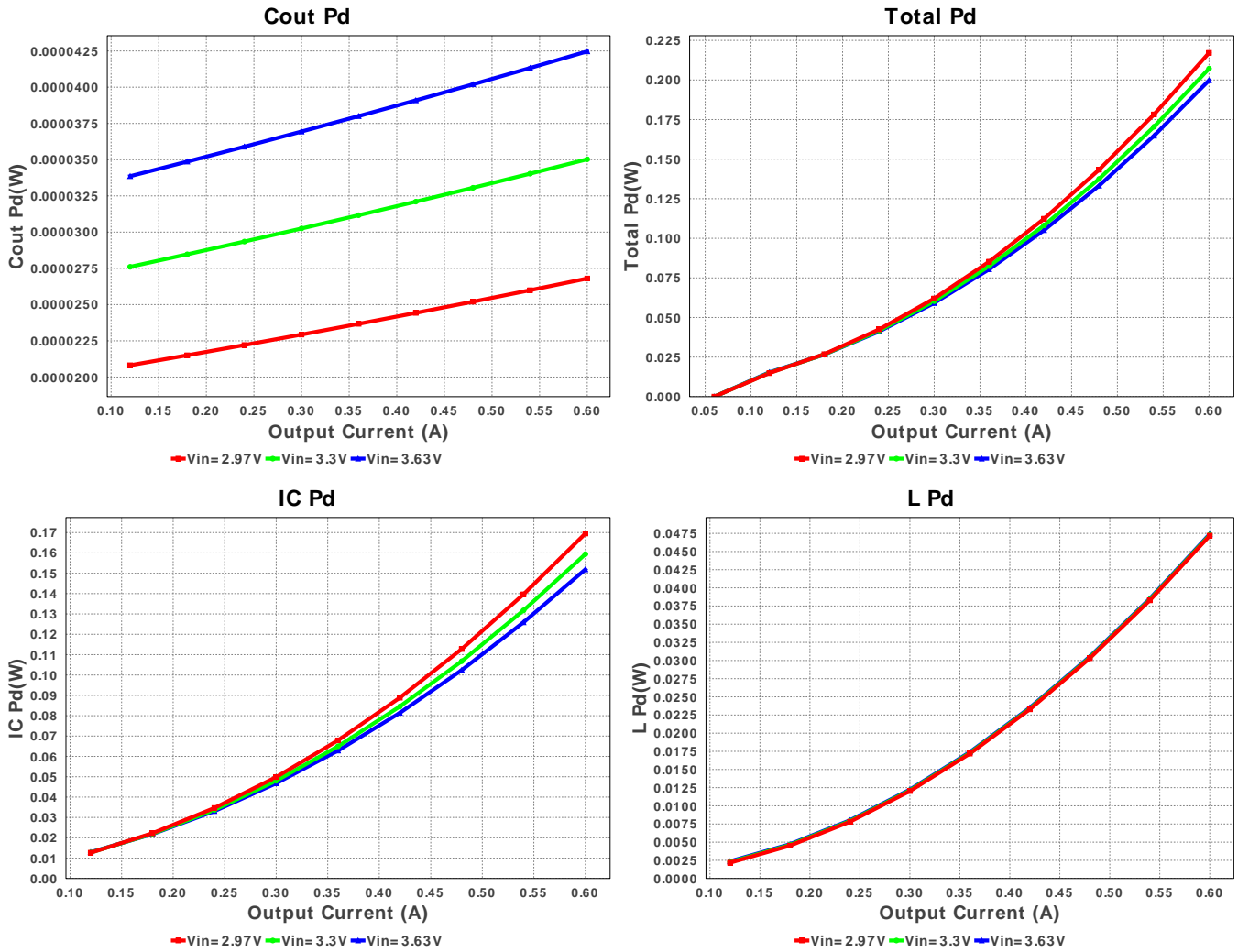
### Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM188R60J475KE19D Series= X5R	Cap= 4.7 uF ESR= 5.0 mOhm VDC= 6.3 V IRMS= 2.0 A	1	\$0.02	0603 5 mm <sup>2</sup>
2.	Cout	MuRata	GRM188R60J106ME47D Series= X5R	Cap= 10.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 2.74 A	1	\$0.03	0603 5 mm <sup>2</sup>

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
3.	L1	TDK	NLCV32T-2R2M-PF	L= 2.2 $\mu$ H DCR= 130.0 mOhm	1	\$0.10	 NLCV32 13 mm <sup>2</sup>
4.	U1	Texas Instruments	LM3671TLX-1.875/NOPB	Switcher	1	\$0.30	 TLA05CBA 5 mm <sup>2</sup>







### Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	296.86 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	68.695 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	718.983 mA	Current	Peak switch current in IC
4.	Iin Avg	352.56 mA	Current	Average input current
5.	L Ipp	237.97 mA	Current	Peak-to-peak inductor ripple current
6.	L1 Irms	603.92 mA	Current	Inductor ripple current
7.	BOM Count	4	General	Total Design BOM count
8.	FootPrint	28.0 mm <sup>2</sup>	General	Total Foot Print Area of BOM components
9.	Frequency	2.0 MHz	General	Switching frequency
10.	IC Tolerance	0.0 V	General	IC Feedback Tolerance
11.	Pout	1.08 W	General	Total output power
12.	Total BOM	\$0.45	General	Total BOM Cost
13.	Duty Cycle	57.216 %	Op_point	Duty cycle
14.	Efficiency	84.39 %	Op_point	Steady state efficiency
15.	IC Tj	42.91 degC	Op_point	IC junction temperature
16.	ICThetaJA	85.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
17.	IOUT_OP	600.0 mA	Op_point	Iout operating point
18.	VIN_OP	3.63 V	Op_point	Vin operating point
19.	Vout p-p	2.142 mV	Op_point	Peak-to-peak output ripple voltage
20.	Cin Pd	440.628 μW	Power	Input capacitor power dissipation
21.	Cout Pd	42.471 μW	Power	Output capacitor power dissipation
22.	IC Pd	151.882 mW	Power	IC power dissipation
23.	L Pd	47.413 mW	Power	Inductor power dissipation
24.	Total Pd	199.776 mW	Power	Total Power Dissipation

### Design Inputs

#	Name	Value	Description
1.	Iout	600.0 m	Maximum Output Current
2.	Iout1	600.0 m	Output Current #1
3.	VinMax	3.63	Maximum input voltage

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#	Name	Value	Description
4.	VinMin	2.97	Minimum input voltage
5.	Vout	1.8	Output Voltage
6.	Vout1	1.8	Output Voltage #1
7.	base_pn	LM3671	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0	Ambient temperature

## Design Assistance

1. LM3671 Product Folder : <http://www.ti.com/product/LM3671> : contains the data sheet and other resources.



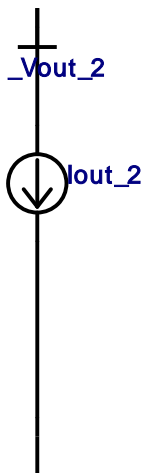
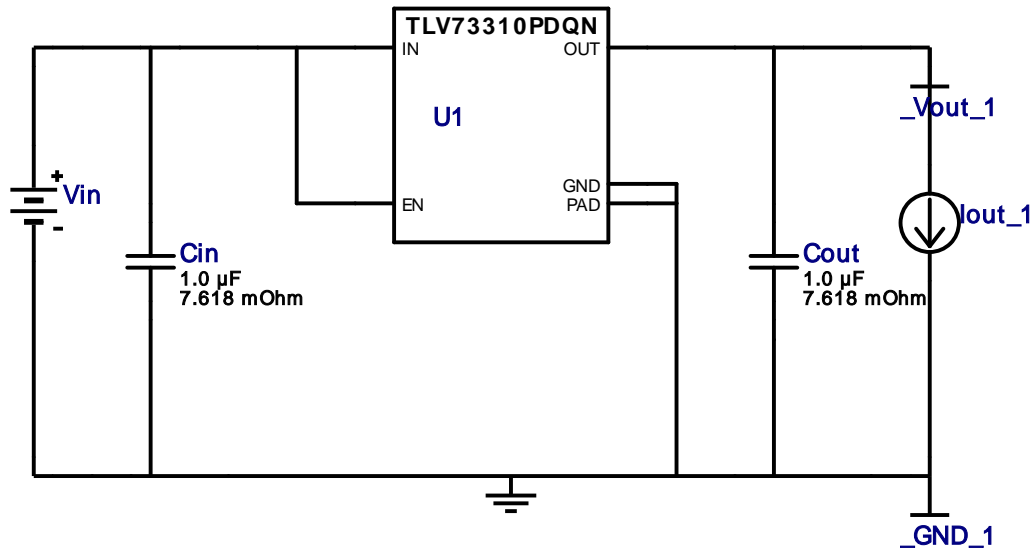


VinMin = 1.53V  
 VinMax = 1.87V  
 Vout = 1.0V  
 Iout = 0.02A

Device = TLV73310PDQNR  
 Topology = LDO  
 Created = 7/13/15 5:19:33 AM  
 BOM Cost = \$0.19  
 Footprint = 10.0 mm<sup>2</sup>  
 BOM Count = 3  
 Total Pd = 0.02W

## WEBENCH® Design Report

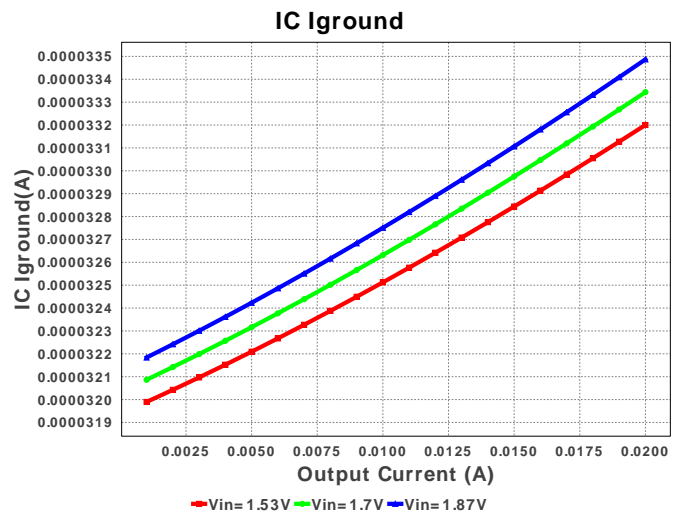
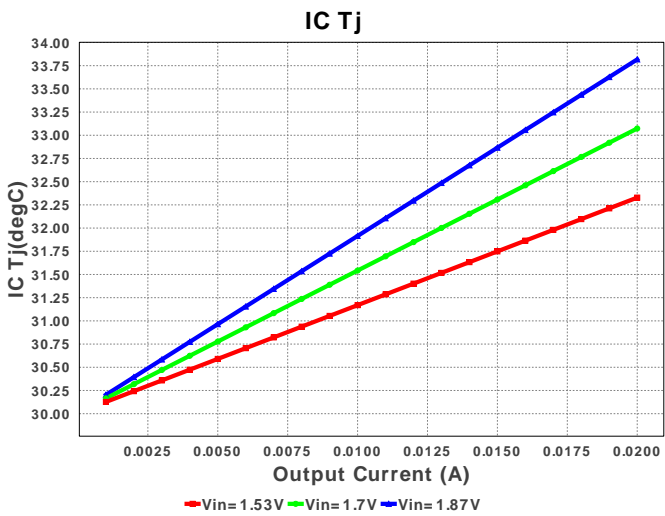
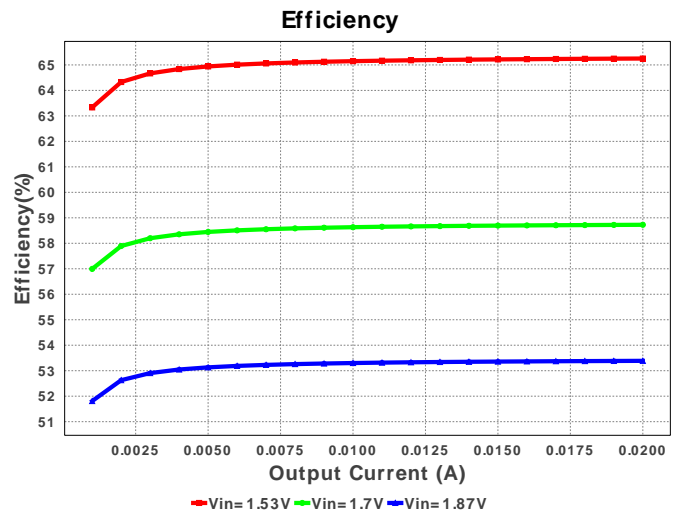
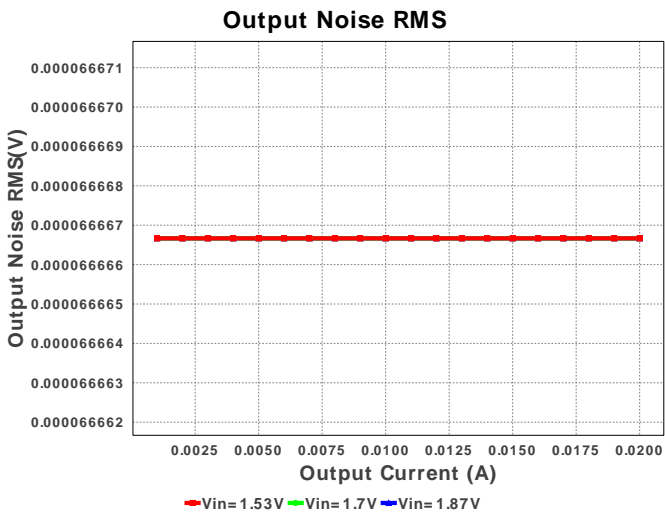
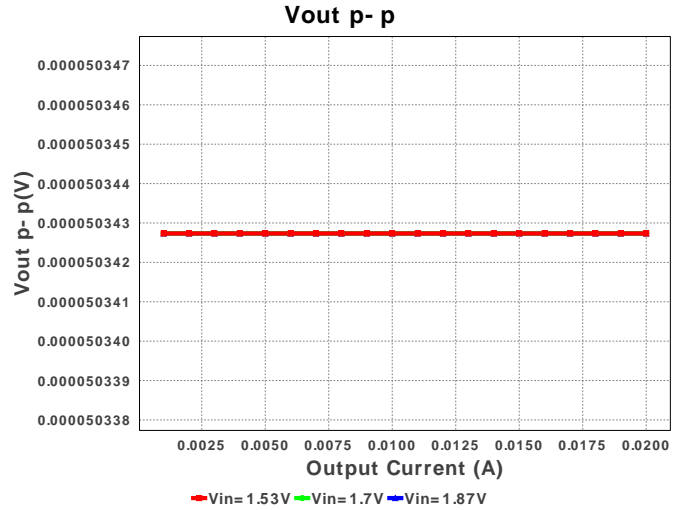
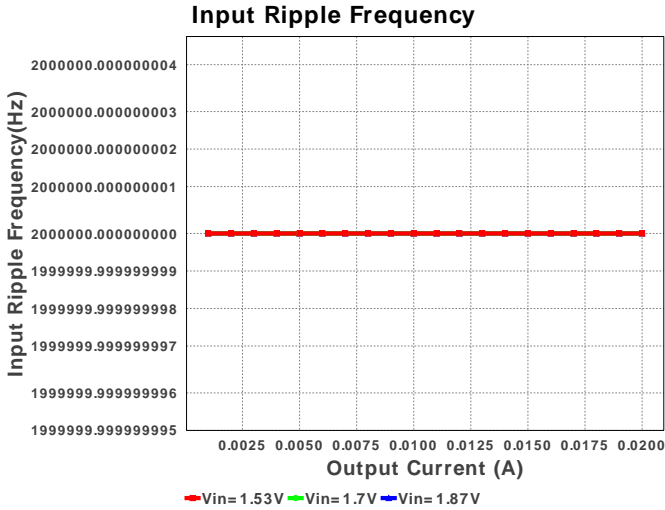
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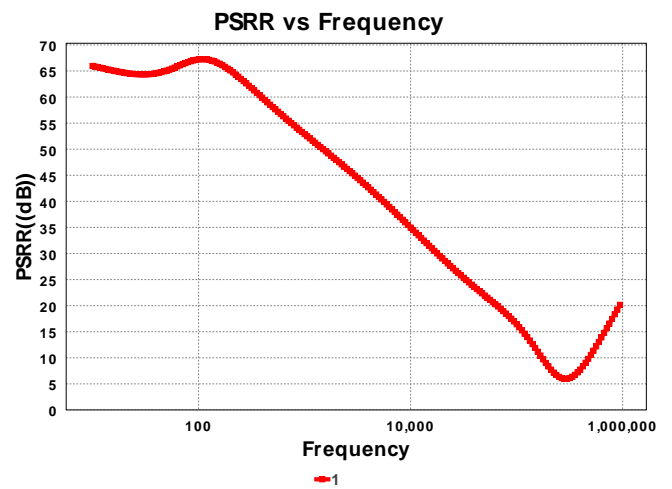
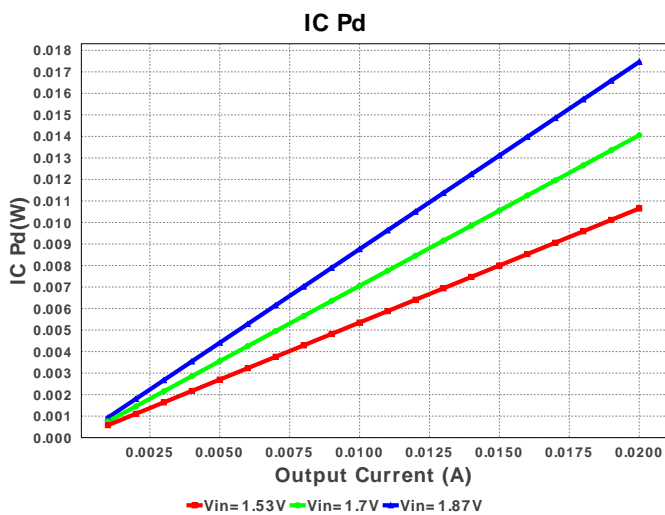
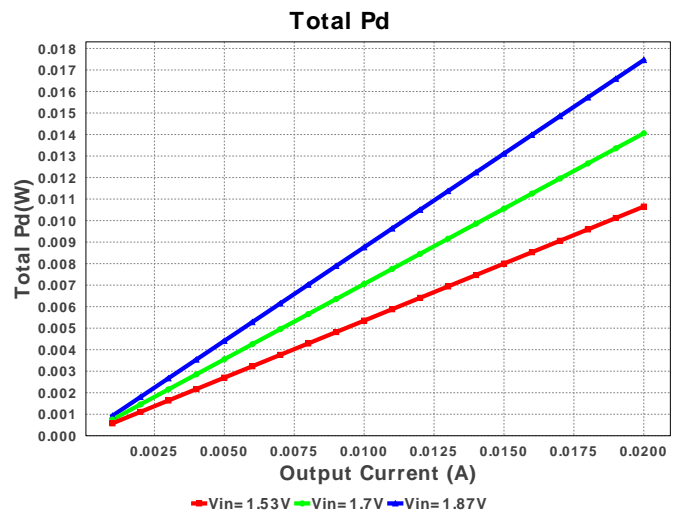
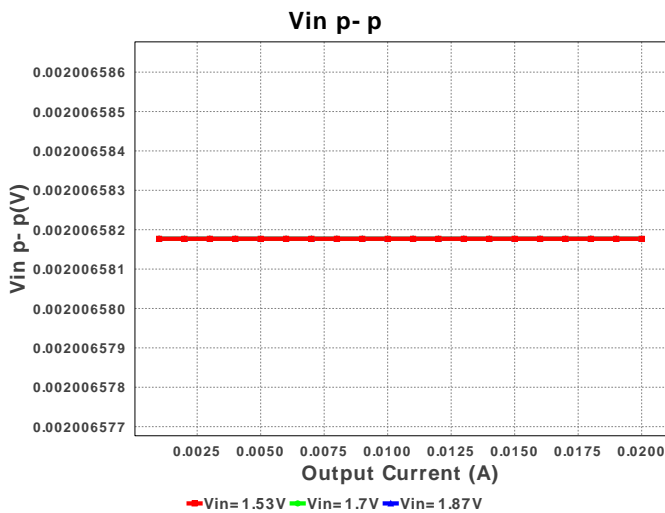
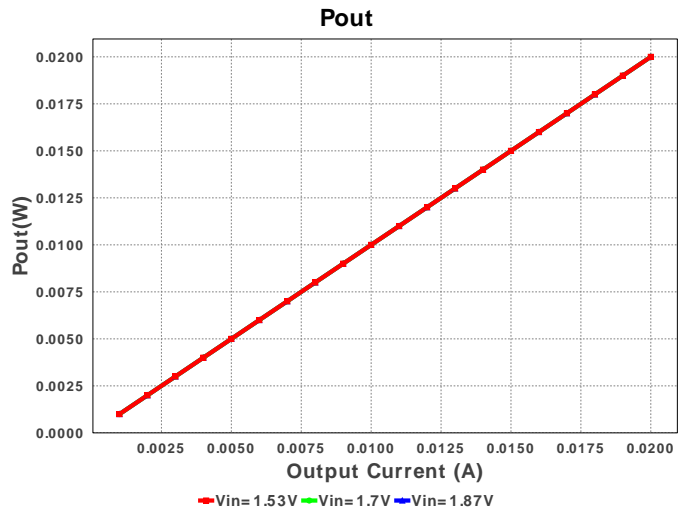
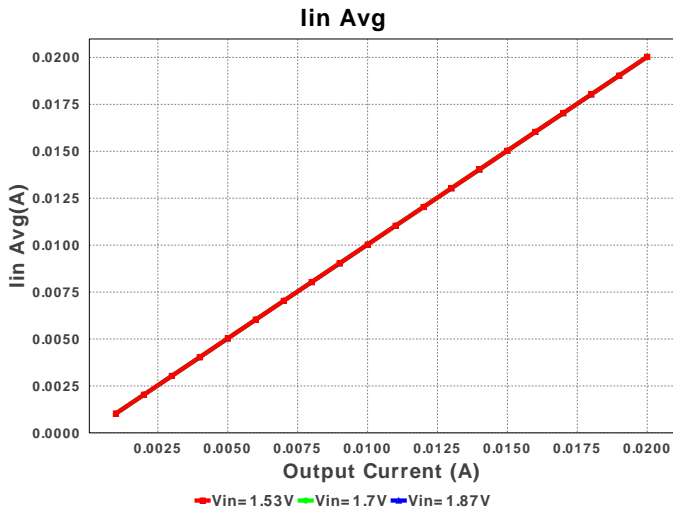


### Electrical BOM

#	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 <sup>2</sup>

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
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 <sup>2</sup>
3.	U1	Texas Instruments	TLV73310PDQNR	Switcher	1	\$0.17	DQN0004A 4 mm <sup>2</sup>





### Operating Values

#	Name	Value	Category	Description
1.	IC Iground	33.487 $\mu$ A	Current	IC ground current
2.	Iin Avg	20.033 mA	Current	Average input current
3.	BOM Count	3	General	Total Design BOM count
4.	FootPrint	10.0 mm <sup>2</sup>	General	Total Foot Print Area of BOM components
5.	IC Tolerance	14.0 mV	General	IC Feedback Tolerance
6.	Output Noise RMS	66.667 $\mu$ V	General	Noise RMS
7.	Pout	20.0 mW	General	Total output power
8.	Total BOM	\$0.19	General	Total BOM Cost
9.	Vin p-p	2.007 mV	Op_Point	Input Source ripple voltage
10.	Vout OP	1.0 V	Op_Point	Operational Output Voltage
11.	Efficiency	53.387 %	Op_point	Steady state efficiency

#	Name	Value	Category	Description
12.	IC Tj	33.817 degC	Op_point	IC junction temperature
13.	ICThetaJA	218.6 degC/W	Op_point	IC junction-to-ambient thermal resistance
14.	IOUT_OP	20.0 mA	Op_point	Iout operating point
15.	Input Ripple Frequency	2.0 MHz	Op_point	Input Source Ripple Frequency for PSRR Calculation
16.	PSRR est.	-32.01 dB	Op_point	Power Supply Rejection Ratio, estimated
17.	VIN_OP	1.87 V	Op_point	Vin operating point
18.	Vout p-p	50.343 µV	Op_point	Peak-to-peak output ripple voltage
19.	IC Pd	17.463 mW	Power	IC power dissipation
20.	Total Pd	17.463 mW	Power	Total Power Dissipation

## Design Inputs

#	Name	Value	Description
1.	Iout	20.0 m	Maximum Output Current
2.	Iout1	20.0 m	Output Current #1
3.	VinMax	1.87	Maximum input voltage
4.	VinMin	1.53	Minimum input voltage
5.	Vout	1.0	Output Voltage
6.	Vout1	1.0	Output Voltage #1
7.	base_pn	TLV73310P	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0	Ambient temperature

## Design Assistance

- 
- TLV73310P Product Folder : <http://www.ti.com/product/TLV733> : contains the data sheet and other resources.

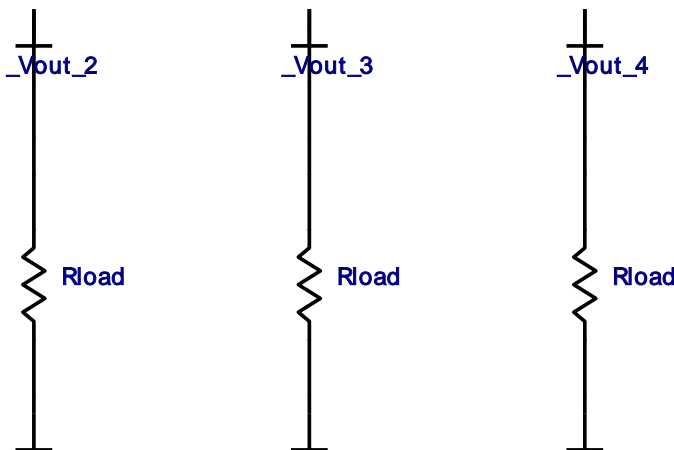
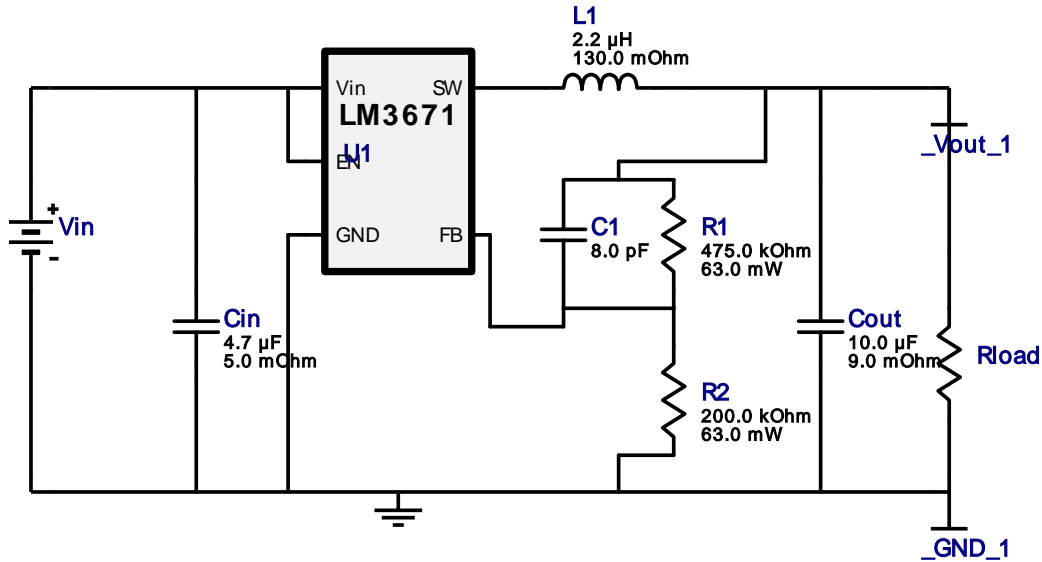


VinMin = 2.97V  
 VinMax = 3.63V  
 Vout = 1.7V  
 Iout = 0.32A

Device = LM3671TLX-ADJ/NOPB  
 Topology = Buck  
 Created = 7/13/15 5:19:34 AM  
 BOM Cost = \$0.48  
 Footprint = 40.0 mm<sup>2</sup>  
 BOM Count = 7  
 Total Pd = 0.07W

WEBENCH® Design Report

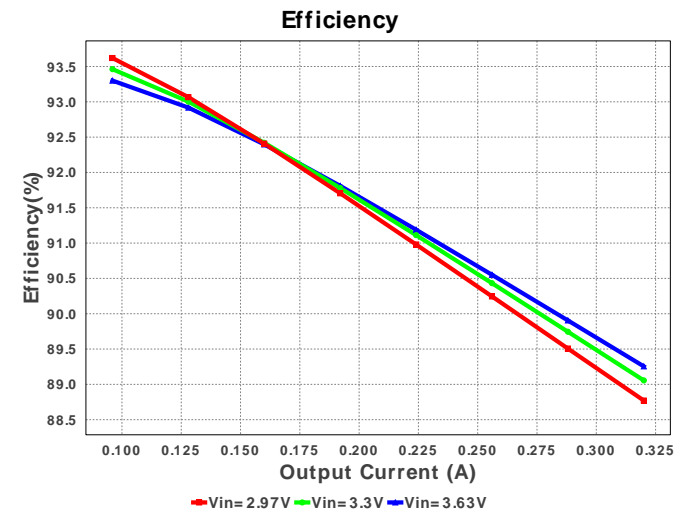
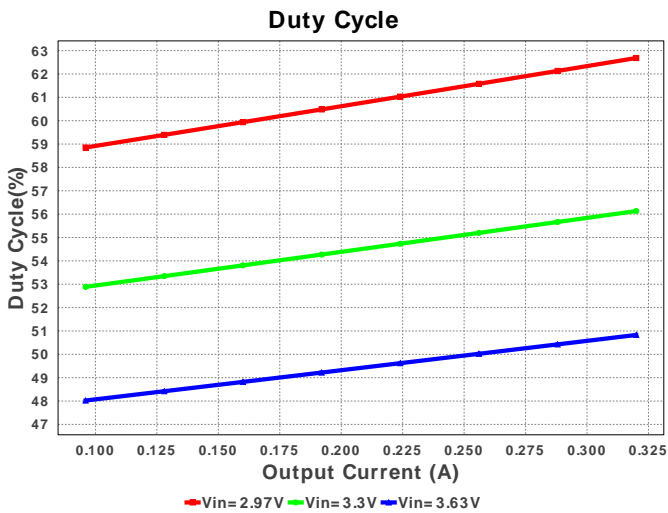
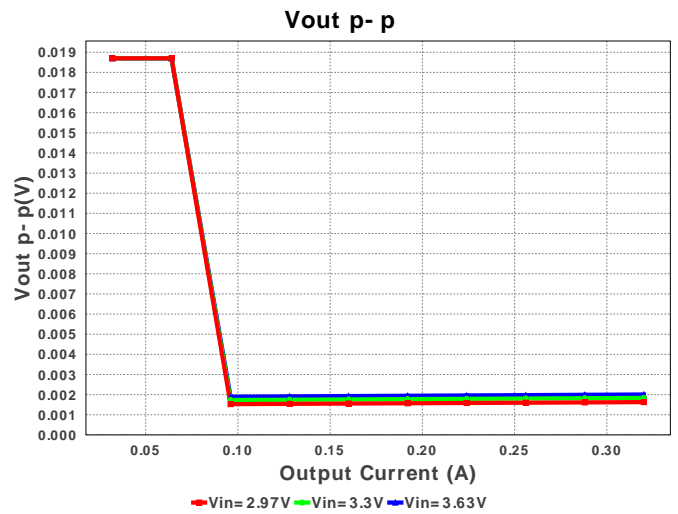
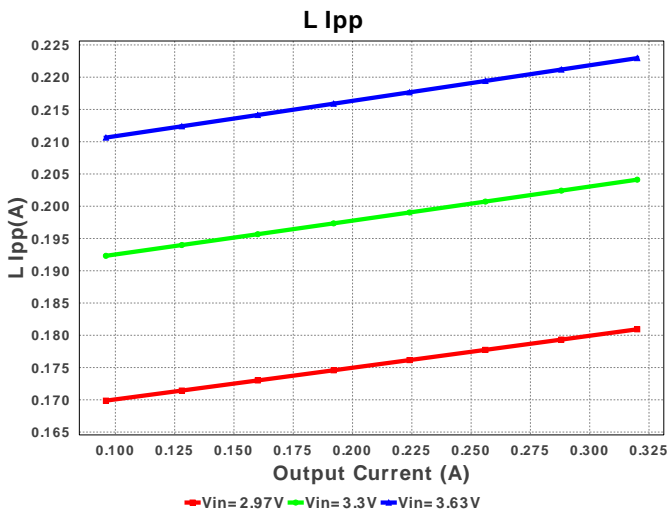
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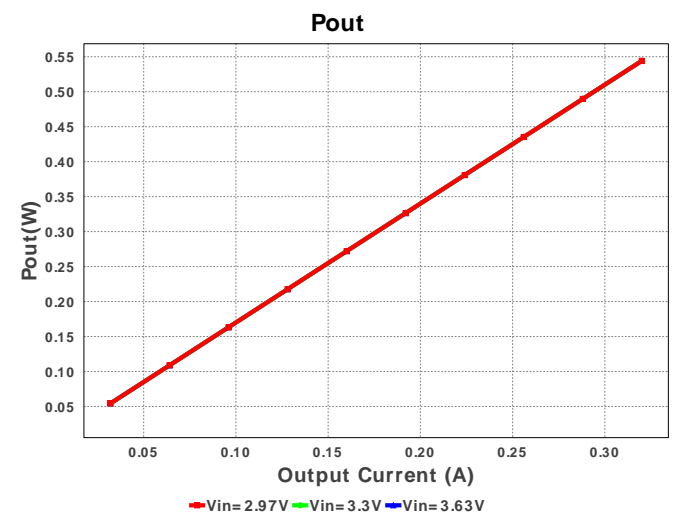
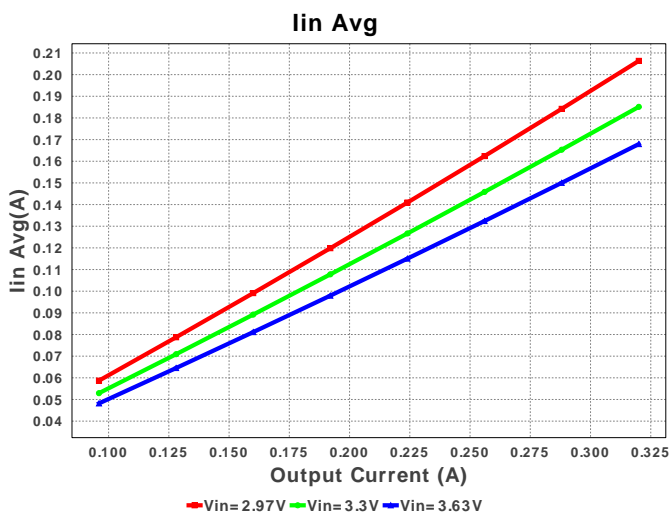
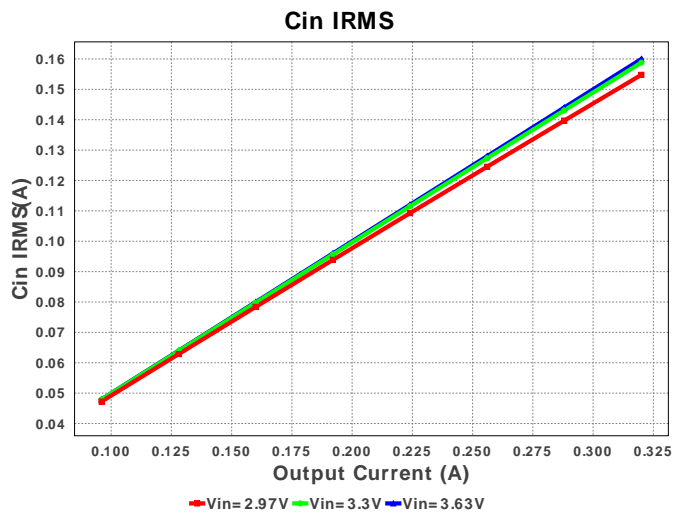
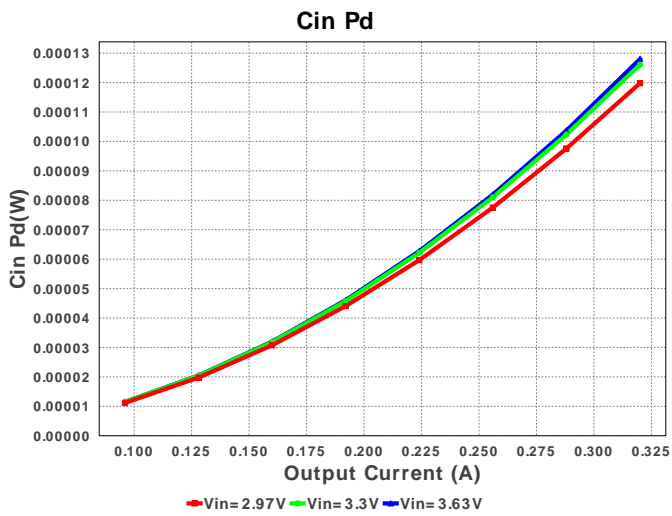
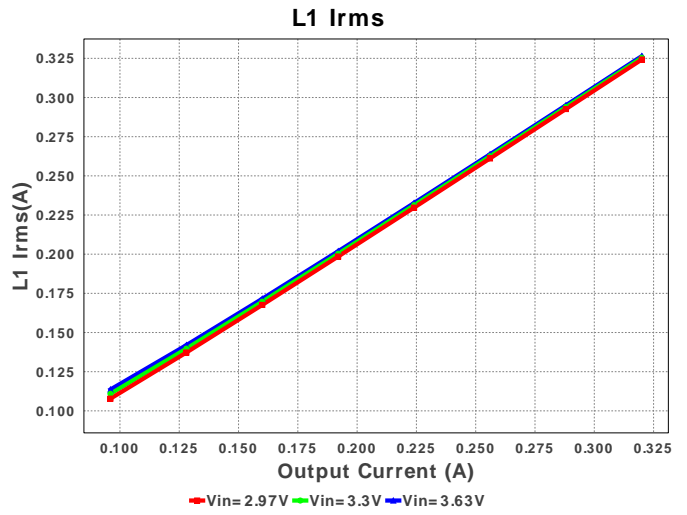
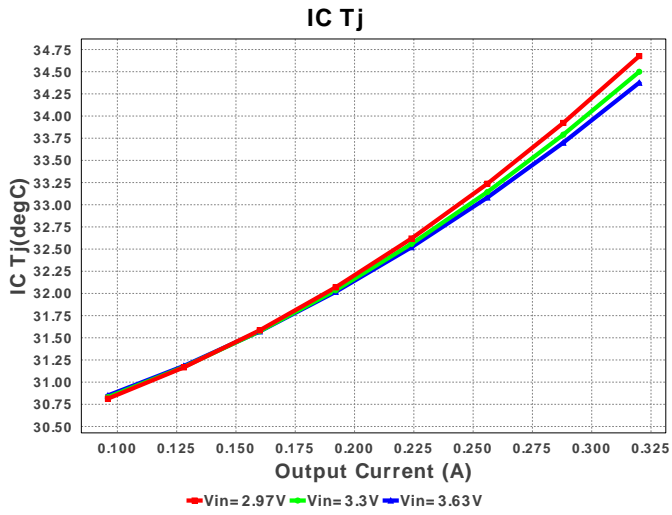


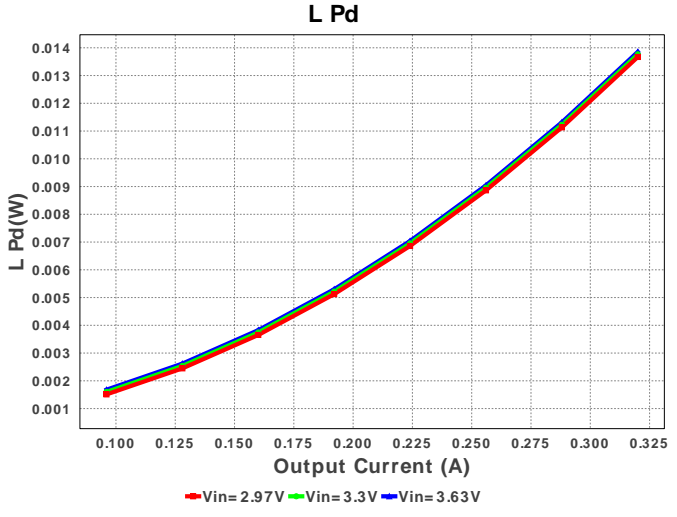
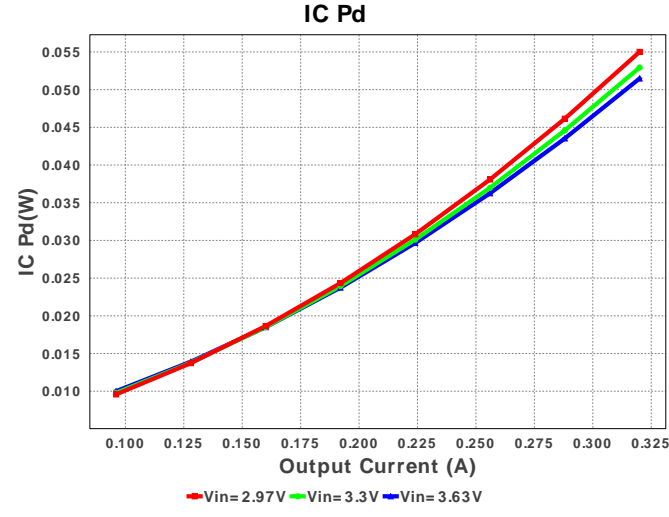
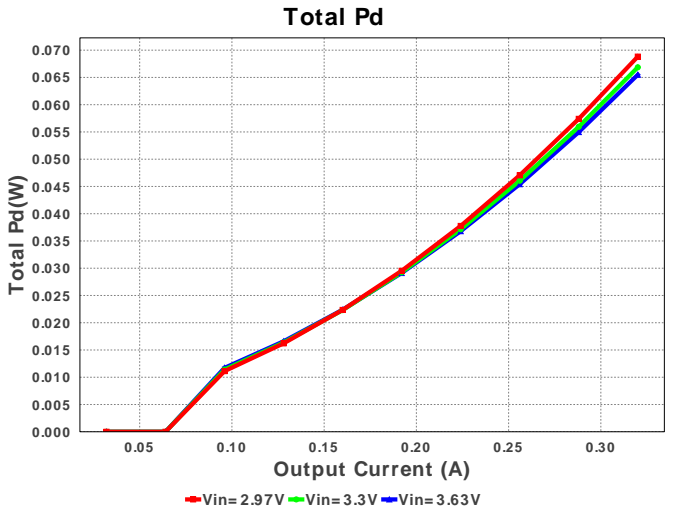
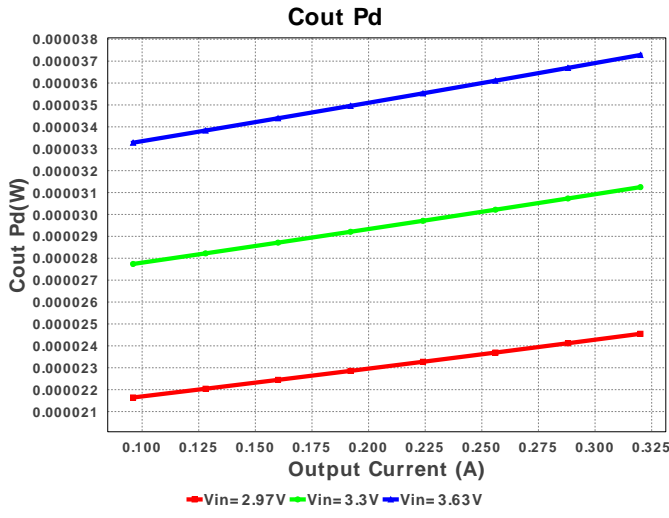
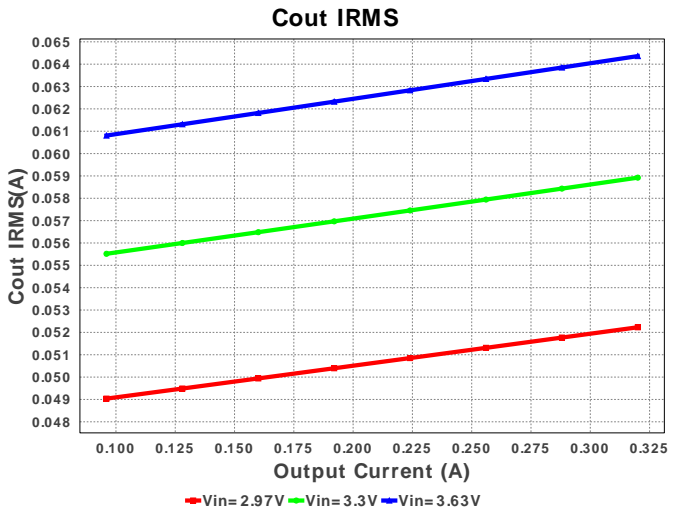
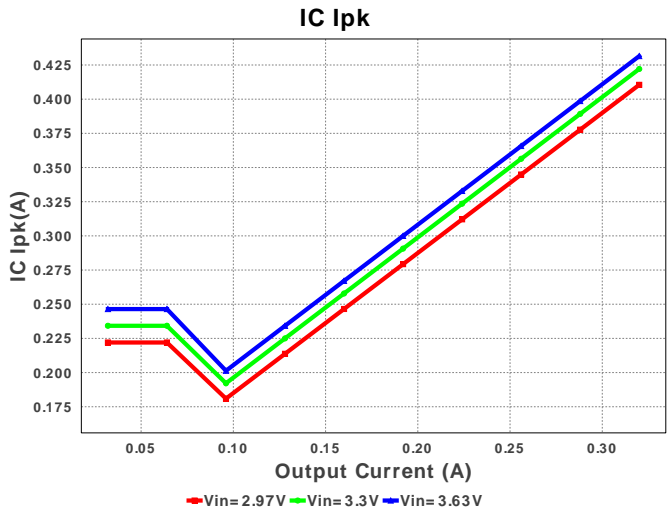
Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	C1	Yageo America	CC0805DRNP09BN8R0 Series= C0G/NP0	Cap= 8.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm <sup>2</sup>
2.	Cin	MuRata	GRM188R60J475KE19D Series= X5R	Cap= 4.7 uF ESR= 5.0 mOhm VDC= 6.3 V IRMS= 2.0 A	1	\$0.02	0603 5 mm <sup>2</sup>

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
3.	Cout	MuRata	GRM188R60J106ME47D Series= X5R	Cap= 10.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 2.74 A	1	\$0.03	0603 5 mm <sup>2</sup>
4.	L1	TDK	NLCV32T-2R2M-PF	L= 2.2 μH DCR= 130.0 mOhm	1	\$0.10	NLCV32 13 mm <sup>2</sup>
5.	R1	Vishay-Dale	CRCW0402475KFKED Series= CRCW..e3	Res= 475.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>
6.	R2	Vishay-Dale	CRCW0402200KFKED Series= CRCW..e3	Res= 200.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>
7.	U1	Texas Instruments	LM3671TLX-ADJ/NOPB	Switcher	1	\$0.30	TLA05CBA 5 mm <sup>2</sup>







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	159.993 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	64.361 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	431.507 mA	Current	Peak switch current in IC
4.	Iin Avg	167.92 mA	Current	Average input current
5.	L Ipp	222.95 mA	Current	Peak-to-peak inductor ripple current
6.	L1 Irms	326.438 mA	Current	Inductor ripple current
7.	BOM Count	7	General	Total Design BOM count
8.	FootPrint	40.0 mm <sup>2</sup>	General	Total Foot Print Area of BOM components
9.	Frequency	2.0 MHz	General	Switching frequency
10.	IC Tolerance	0.0 V	General	IC Feedback Tolerance
11.	Pout	544.051 mW	General	Total output power



#	Name	Value	Category	Description
12.	Total BOM	\$0.48	General	Total BOM Cost
13.	Duty Cycle	50.829 %	Op_point	Duty cycle
14.	Efficiency	89.255 %	Op_point	Steady state efficiency
15.	IC Tj	34.376 degC	Op_point	IC junction temperature
16.	ICThetaJA	85.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
17.	IOUT_OP	320.03 mA	Op_point	Iout operating point
18.	VIN_OP	3.63 V	Op_point	Vin operating point
19.	Vout p-p	2.007 mV	Op_point	Peak-to-peak output ripple voltage
20.	Cin Pd	127.989 $\mu$ W	Power	Input capacitor power dissipation
21.	Cout Pd	37.281 $\mu$ W	Power	Output capacitor power dissipation
22.	IC Pd	51.477 mW	Power	IC power dissipation
23.	L Pd	13.853 mW	Power	Inductor power dissipation
24.	Total Pd	65.496 mW	Power	Total Power Dissipation

## Design Inputs

#	Name	Value	Description
1.	Iout	320.03 m	Maximum Output Current
2.	Iout1	320.03 m	Output Current #1
3.	VinMax	3.63	Maximum input voltage
4.	VinMin	2.97	Minimum input voltage
5.	Vout	1.7	Output Voltage
6.	Vout1	1.7	Output Voltage #1
7.	base_pn	LM3671	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0	Ambient temperature

## Design Assistance

1. LM3671 Product Folder : <http://www.ti.com/product/LM3671> : contains the data sheet and other resources.

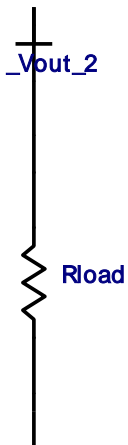
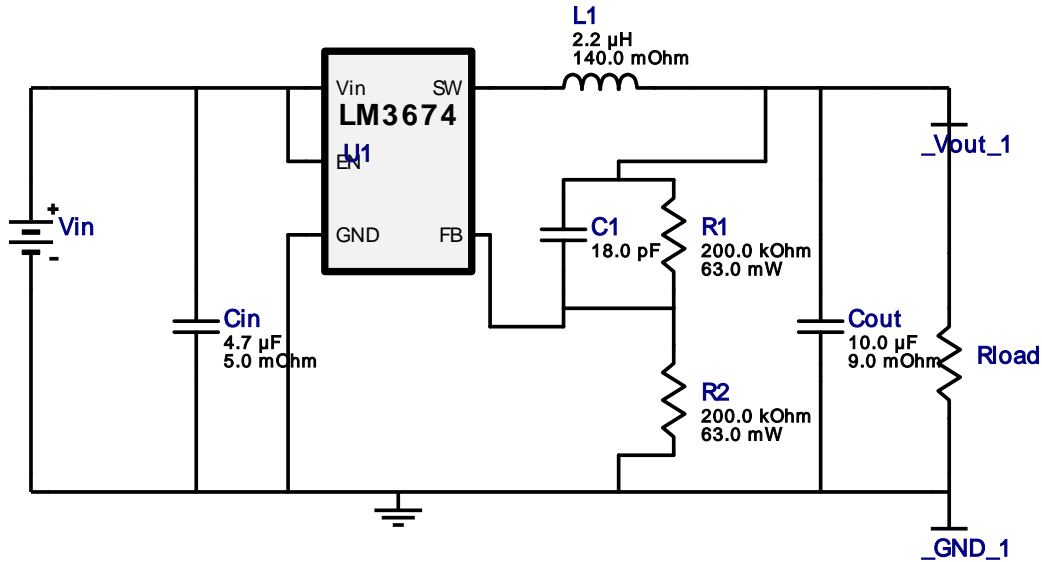


VinMin = 2.97V  
 VinMax = 3.63V  
 Vout = 1.0V  
 Iout = 0.26A

Device = LM3674MF-ADJ/NOPB  
 Topology = Buck  
 Created = 7/13/15 5:19:34 AM  
 BOM Cost = \$0.52  
 Footprint = 46.0 mm<sup>2</sup>  
 BOM Count = 7  
 Total Pd = 0.04W

WEBENCH® Design Report

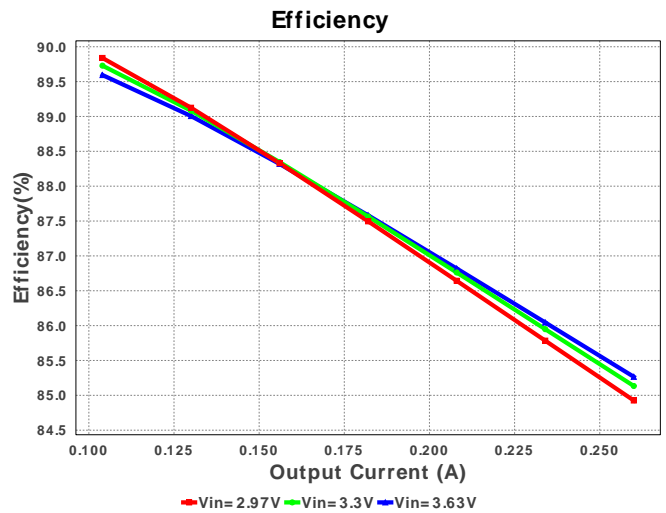
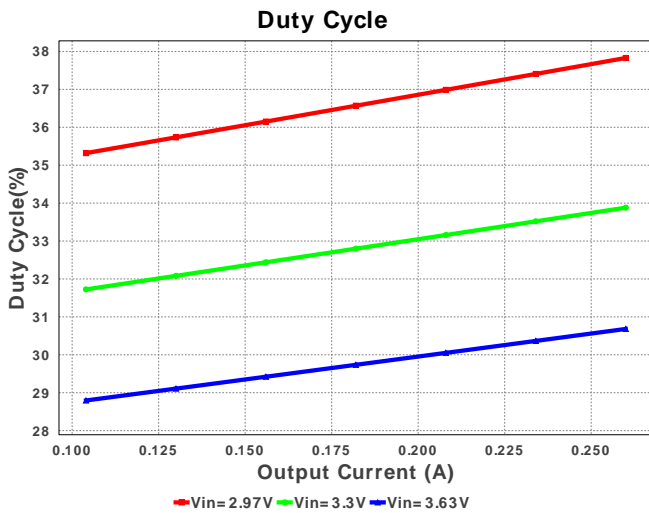
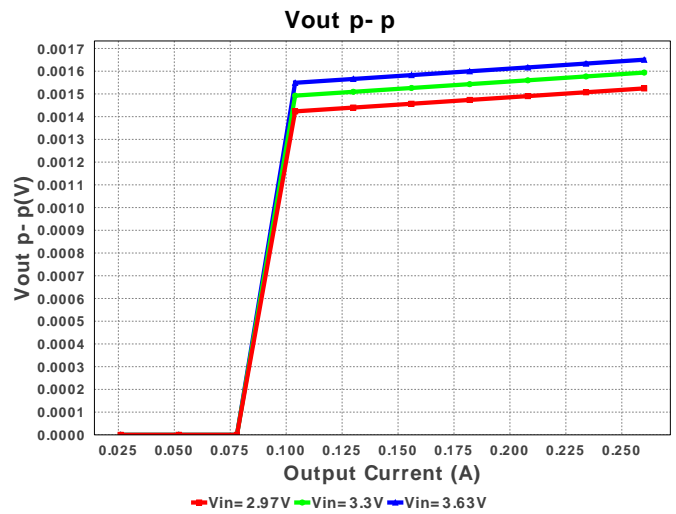
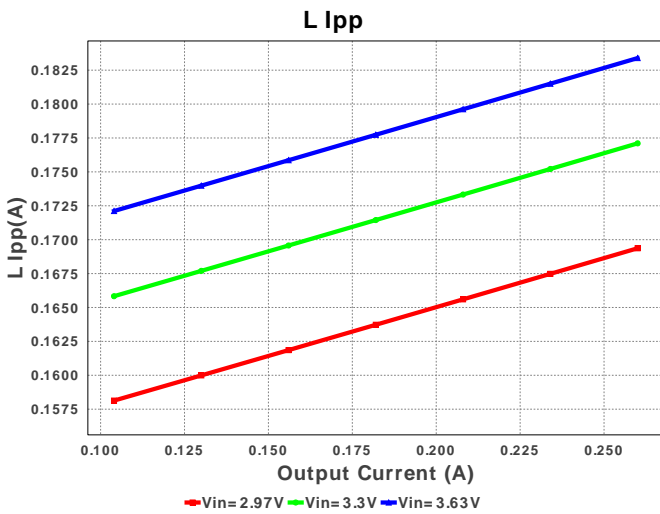
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 LM3674MF-ADJ/NOPB 2.97V-3.63V to 1.00V @ 0.26A

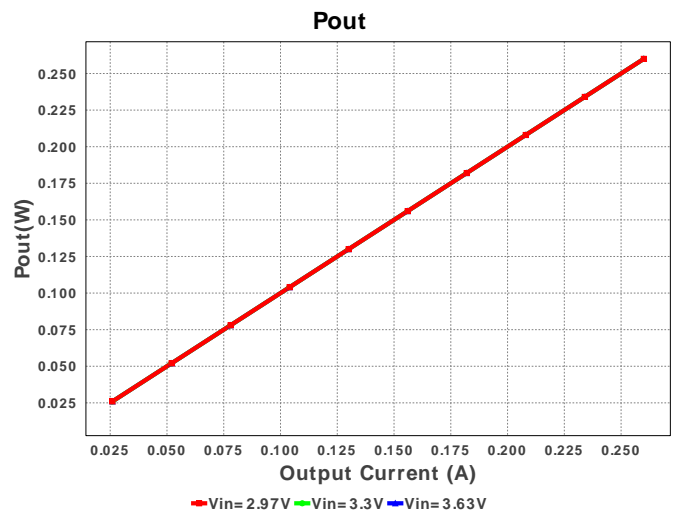
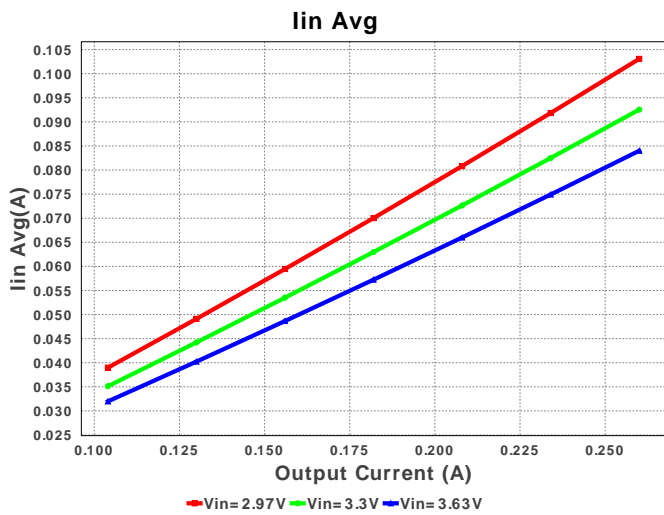
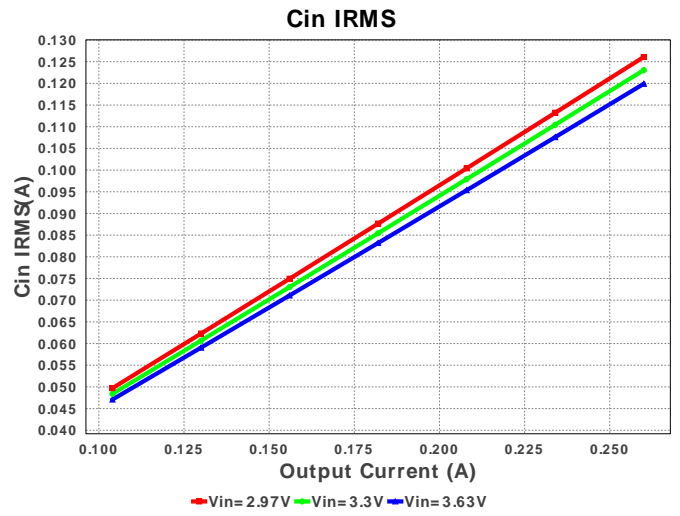
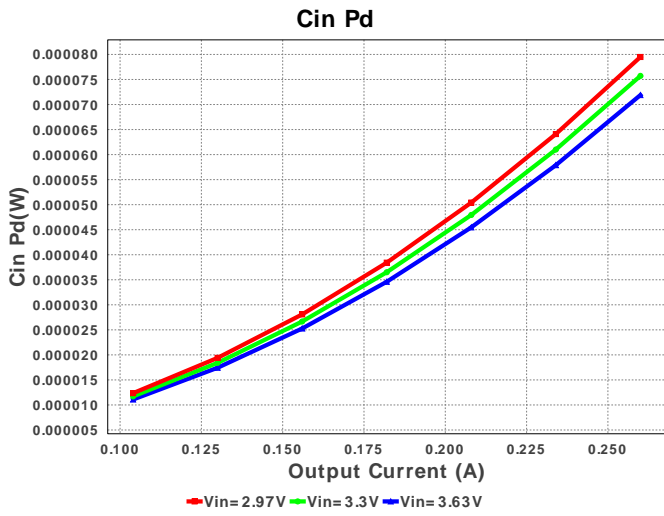
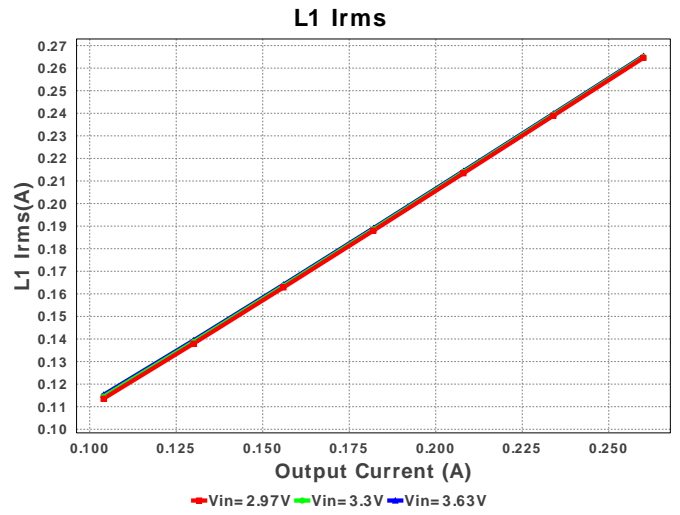
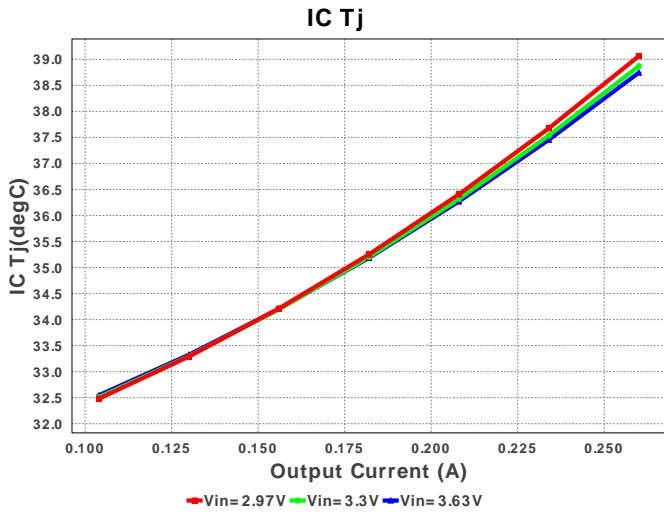


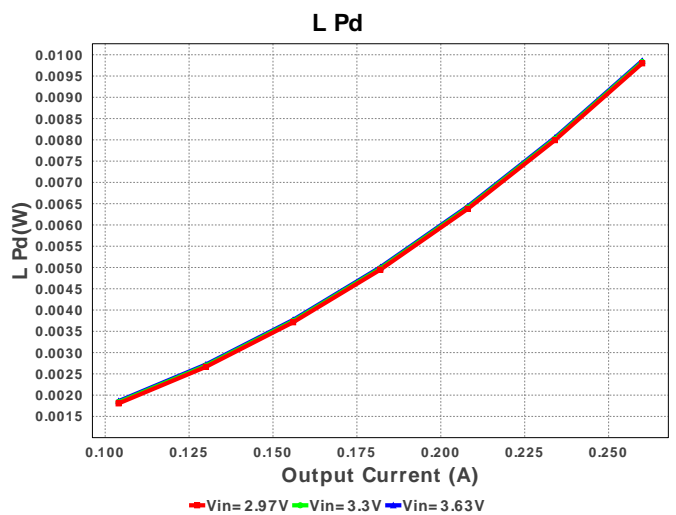
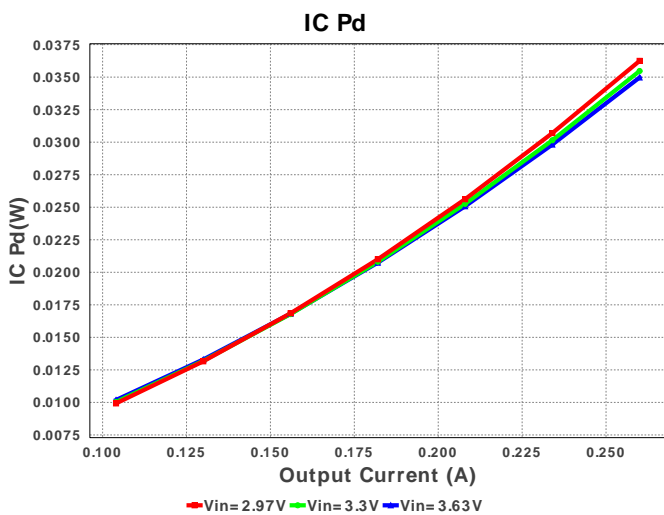
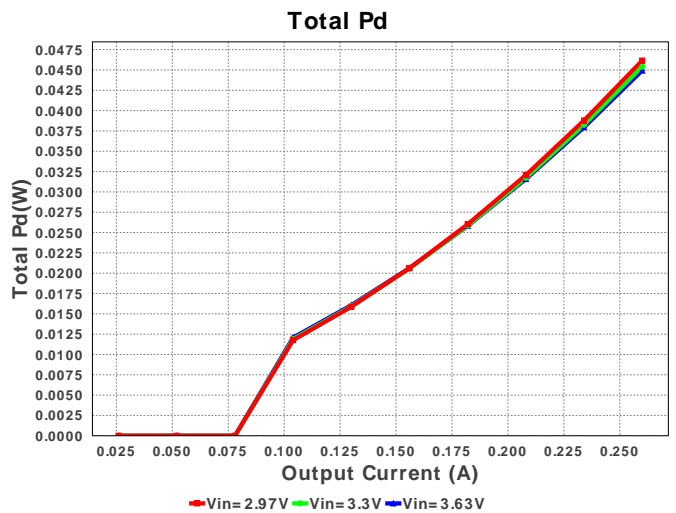
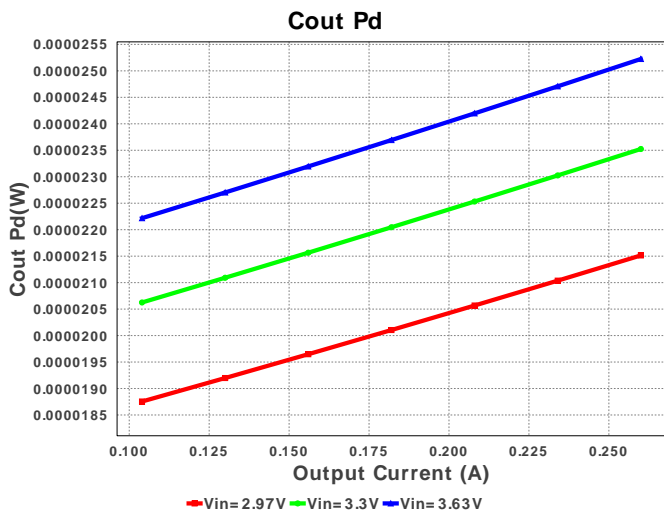
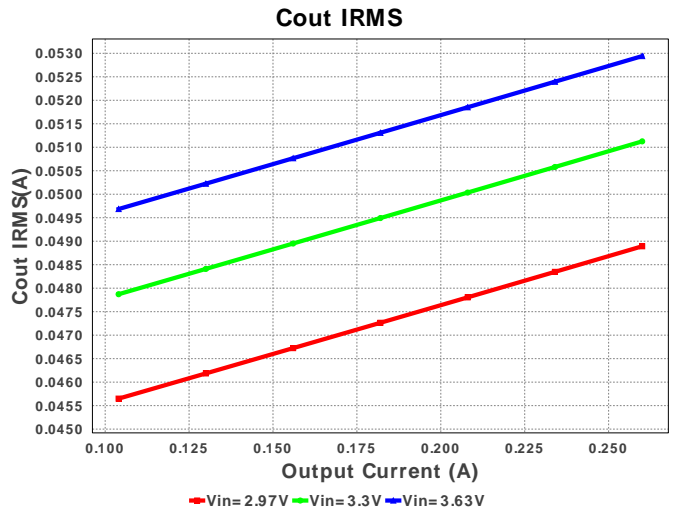
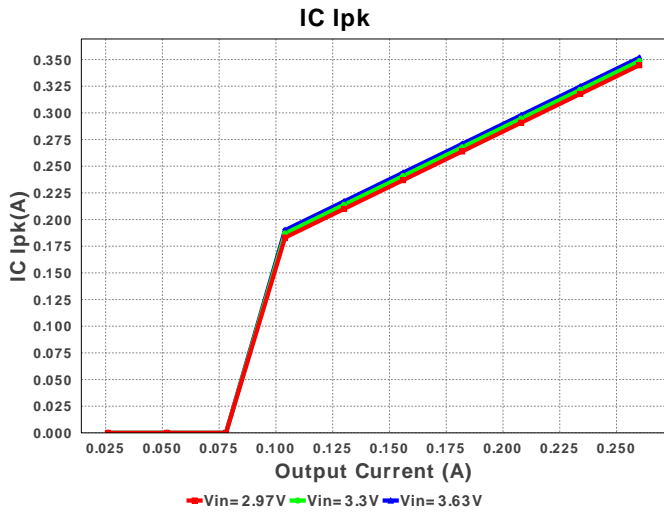
Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	C1	Kemet	C0805C180K5GACTU Series= C0G/NP0	Cap= 18.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm <sup>2</sup>
2.	Cin	MuRata	GRM188R60J475KE19D Series= X5R	Cap= 4.7 uF ESR= 5.0 mOhm VDC= 6.3 V IRMS= 2.0 A	1	\$0.02	0603 5 mm <sup>2</sup>

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
3.	Cout	MuRata	GRM188R60J106ME47D Series= X5R	Cap= 10.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 2.74 A	1	\$0.03	0603 5 mm <sup>2</sup>
4.	L1	TDK	MLP2016H2R2MT	L= 2.2 uH DCR= 140.0 mOhm	1	\$0.12	MLP2016H-M 9 mm <sup>2</sup>
5.	R1	Vishay-Dale	CRCW0402200KFKED Series= CRCW..e3	Res= 200.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>
6.	R2	Vishay-Dale	CRCW0402200KFKED Series= CRCW..e3	Res= 200.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>
7.	U1	Texas Instruments	LM3674MF-ADJ/NOPB	Switcher	1	\$0.32	MF05A 15 mm <sup>2</sup>







### Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	119.905 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	52.941 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	351.696 mA	Current	Peak switch current in IC
4.	Iin Avg	84.002 mA	Current	Average input current
5.	L Ipp	183.39 mA	Current	Peak-to-peak inductor ripple current
6.	L1 Irms	265.335 mA	Current	Inductor ripple current
7.	BOM Count	7	General	Total Design BOM count
8.	FootPrint	46.0 mm <sup>2</sup>	General	Total Foot Print Area of BOM components
9.	Frequency	2.0 MHz	General	Switching frequency
10.	IC Tolerance	0.0 V	General	IC Feedback Tolerance
11.	Pout	260.0 mW	General	Total output power

#	Name	Value	Category	Description
12.	Total BOM	\$0.52	General	Total BOM Cost
13.	Duty Cycle	30.682 %	Op_point	Duty cycle
14.	Efficiency	85.266 %	Op_point	Steady state efficiency
15.	IC Tj	38.743 degC	Op_point	IC junction temperature
16.	ICThetaJA	250.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
17.	IOUT_OP	260.0 mA	Op_point	Iout operating point
18.	VIN_OP	3.63 V	Op_point	Vin operating point
19.	Vout p-p	1.651 mV	Op_point	Peak-to-peak output ripple voltage
20.	Cin Pd	71.886 $\mu$ W	Power	Input capacitor power dissipation
21.	Cout Pd	25.224 $\mu$ W	Power	Output capacitor power dissipation
22.	IC Pd	34.974 mW	Power	IC power dissipation
23.	L Pd	9.856 mW	Power	Inductor power dissipation
24.	Total Pd	44.928 mW	Power	Total Power Dissipation

## Design Inputs

#	Name	Value	Description
1.	Iout	260.0 m	Maximum Output Current
2.	Iout1	260.0 m	Output Current #1
3.	VinMax	3.63	Maximum input voltage
4.	VinMin	2.97	Minimum input voltage
5.	Vout	1.0	Output Voltage
6.	Vout1	1.0	Output Voltage #1
7.	base_pn	LM3674	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0	Ambient temperature

## Design Assistance

1. LM3674 Product Folder : <http://www.ti.com/product/LM3674> : contains the data sheet and other resources.

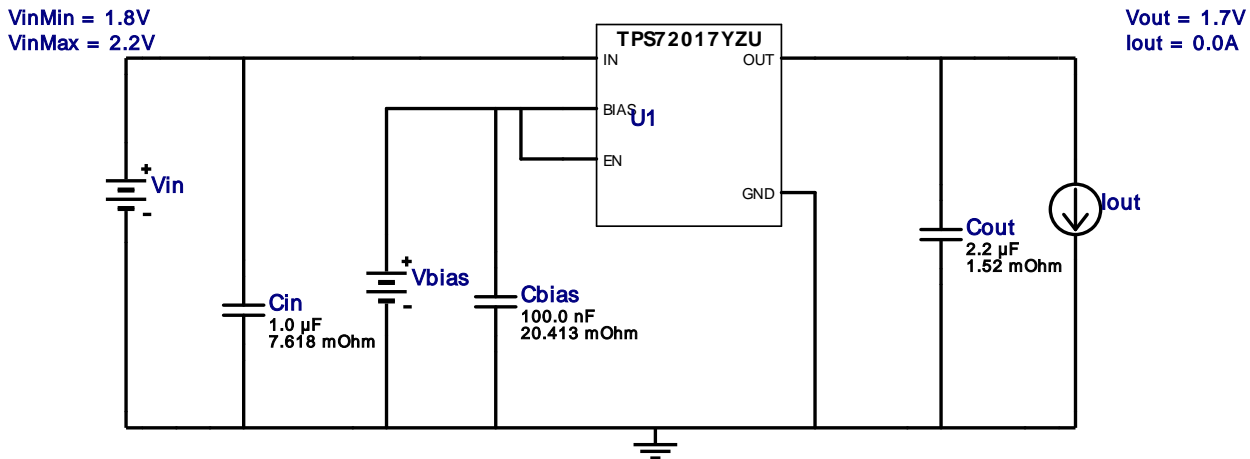


VinMin = 1.8V  
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 Vout = 1.7V  
 Iout = 0.0A

Device = TPS72017YZUR  
 Topology = LDO  
 Created = 7/13/15 5:19:35 AM  
 BOM Cost = \$0.42  
 Footprint = 14.0 mm<sup>2</sup>  
 BOM Count = 4  
 Total Pd = 0.0W

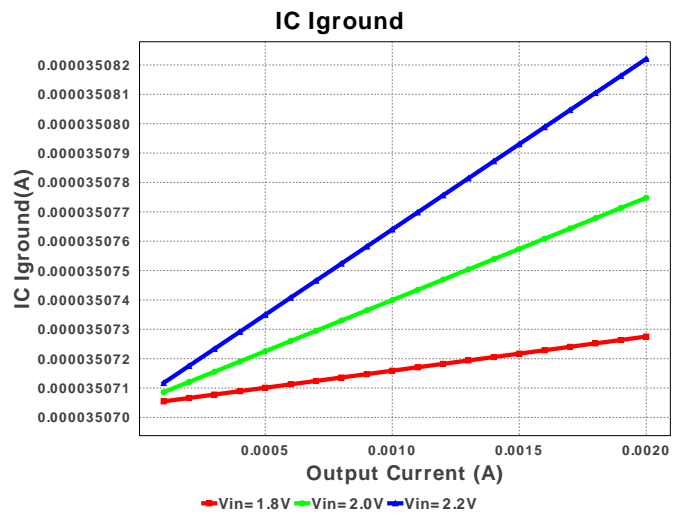
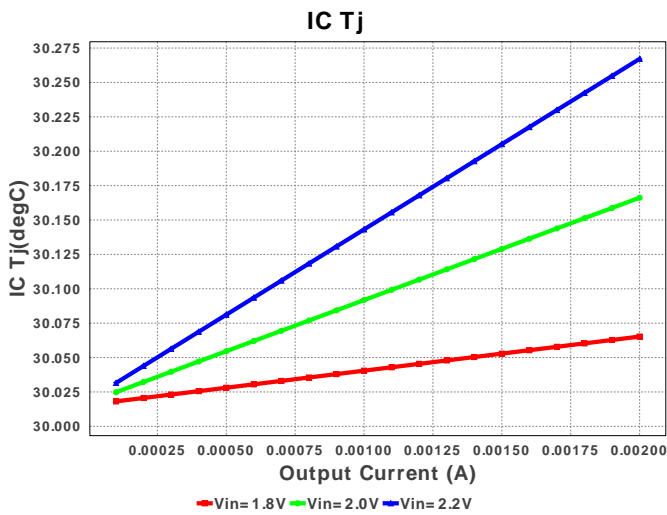
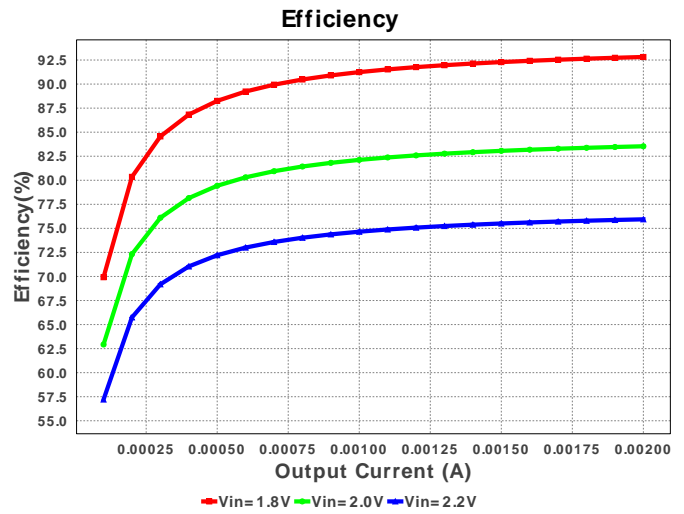
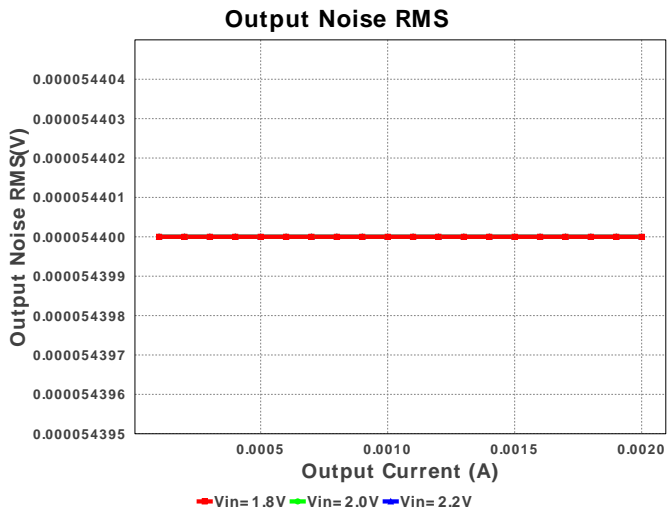
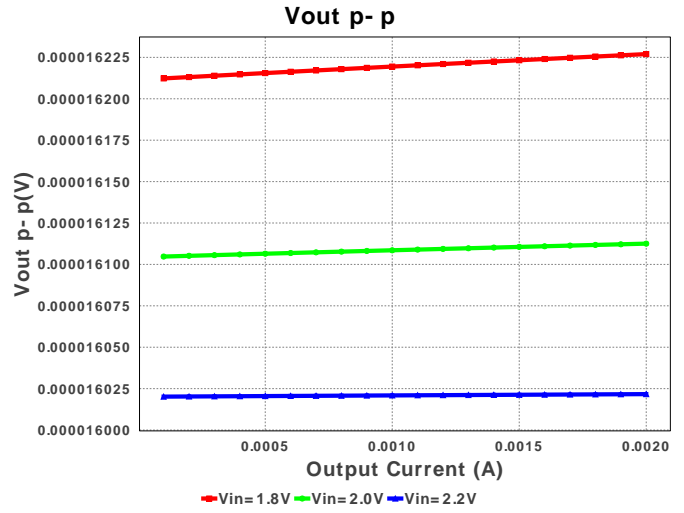
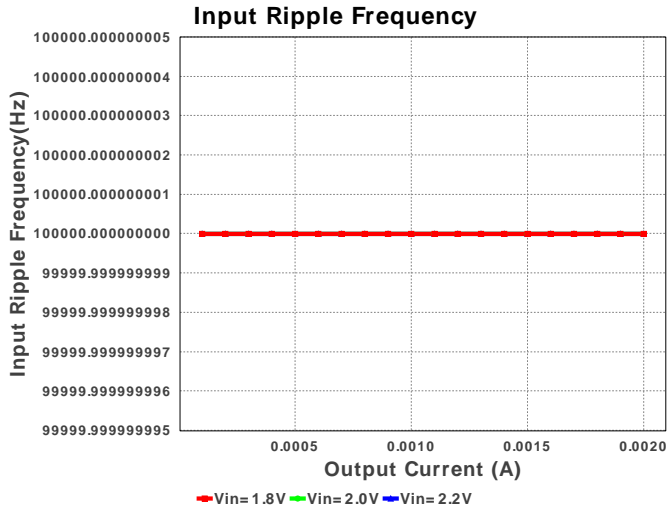
## WEBENCH® Design Report

Design : 4425714/26 TPS72017YZUR  
 TPS72017YZUR 1.8V-2.2V to 1.70V @ 0.002A

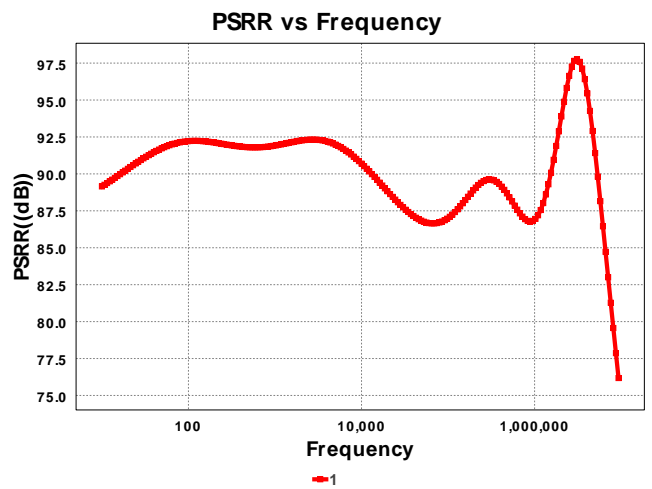
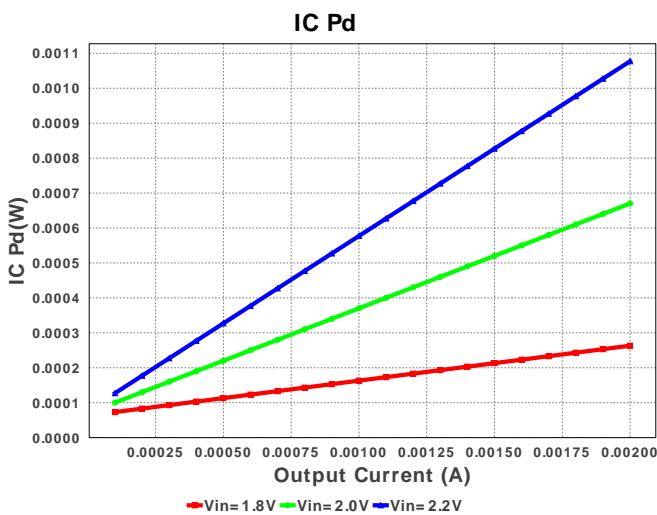
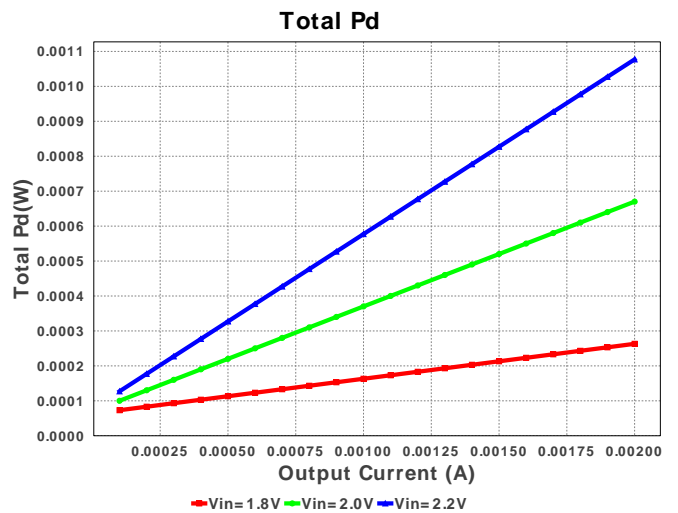
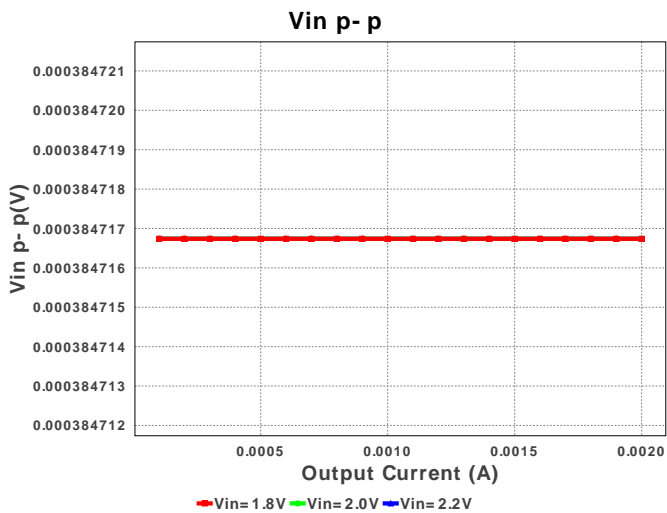
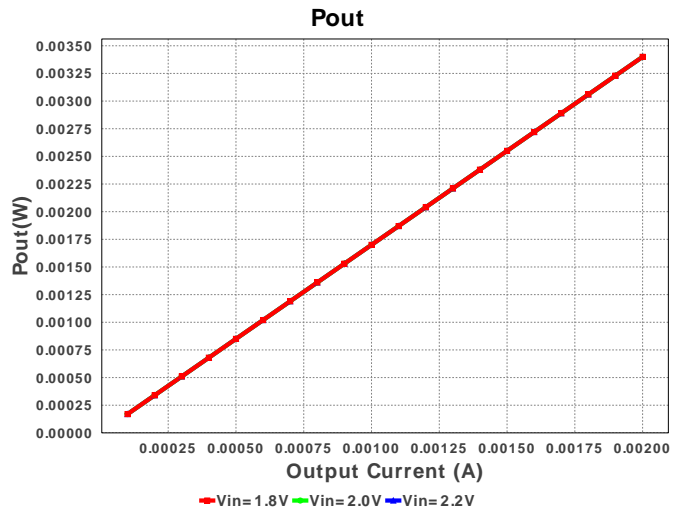
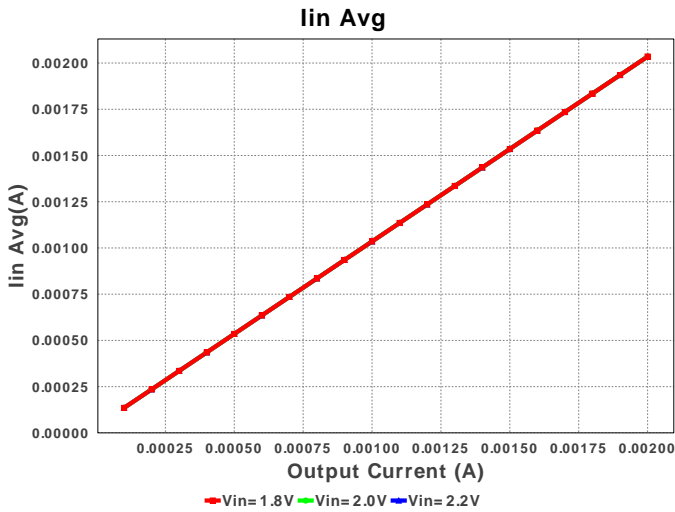


### Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbias	TDK	C1005X5R0J104K Series= X5R	Cap= 100.0 nF ESR= 20.413 mOhm VDC= 6.3 V IRMS= 0.0 A	1	\$0.01	0402 3 mm <sup>2</sup>
2.	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 <sup>2</sup>
3.	Cout	Taiyo Yuden	JMK105BJ225MV-F Series= X5R	Cap= 2.2 uF ESR= 1.52 mOhm VDC= 6.3 V IRMS= 0.0 A	1	\$0.03	0402 3 mm <sup>2</sup>
4.	U1	Texas Instruments	TPS72017YZUR	Switcher	1	\$0.37	YZU0005AEAY 5 mm <sup>2</sup>







### Operating Values

#	Name	Value	Category	Description
1.	IC Iground	35.082 µA	Current	IC ground current
2.	Iin Avg	2.035 mA	Current	Average input current
3.	BOM Count	4	General	Total Design BOM count
4.	FootPrint	14.0 mm <sup>2</sup>	General	Total Foot Print Area of BOM components
5.	IC Tolerance	17.0 mV	General	IC Feedback Tolerance
6.	Output Noise RMS	54.4 µV	General	Noise RMS
7.	Pout	3.4 mW	General	Total output power
8.	Total BOM	\$0.42	General	Total BOM Cost
9.	Vin p-p	384.717 µV	Op_Point	Input Source ripple voltage
10.	Vout OP	1.7 V	Op_Point	Operational Output Voltage
11.	Efficiency	75.941 %	Op_point	Steady state efficiency

#	Name	Value	Category	Description
12.	IC Tj	30.267 degC	Op_point	IC junction temperature
13.	ICThetaJA	248.0 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	100.0 kHz	Op_point	Input Source Ripple Frequency for PSRR Calculation
16.	PSRR est.	-87.009 dB	Op_point	Power Supply Rejection Ratio, estimated
17.	VIN_OP	2.2 V	Op_point	Vin operating point
18.	Vout p-p	16.022 $\mu$ V	Op_point	Peak-to-peak output ripple voltage
19.	IC Pd	1.077 mW	Power	IC power dissipation
20.	Total Pd	1.077 mW	Power	Total Power Dissipation

## Design Inputs

#	Name	Value	Description
1.	Iout	2.0 m	Maximum Output Current
2.	Iout1	2.0 m	Output Current #1
3.	VinMax	2.2	Maximum input voltage
4.	VinMin	1.8	Minimum input voltage
5.	Vout	1.7	Output Voltage
6.	Vout1	1.7	Output Voltage #1
7.	base_pn	TPS72017	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0	Ambient temperature

## Design Assistance

- 
- TPS72017 Product Folder : <http://www.ti.com/product/tps720> : contains the data sheet and other resources.

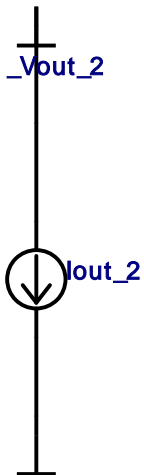
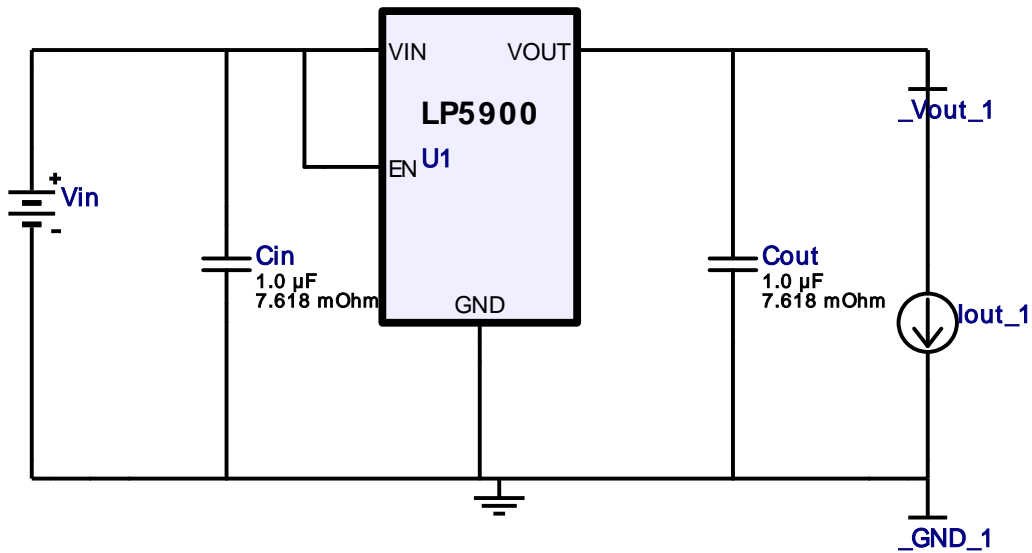


VinMin = 2.97V  
 VinMax = 3.63V  
 Vout = 2.0V  
 Iout = 0.0A

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 Topology = LDO  
 Created = 7/13/15 5:19:35 AM  
 BOM Cost = \$0.22  
 Footprint = 11.0 mm<sup>2</sup>  
 BOM Count = 3  
 Total Pd = 0.01W

## WEBENCH® Design Report

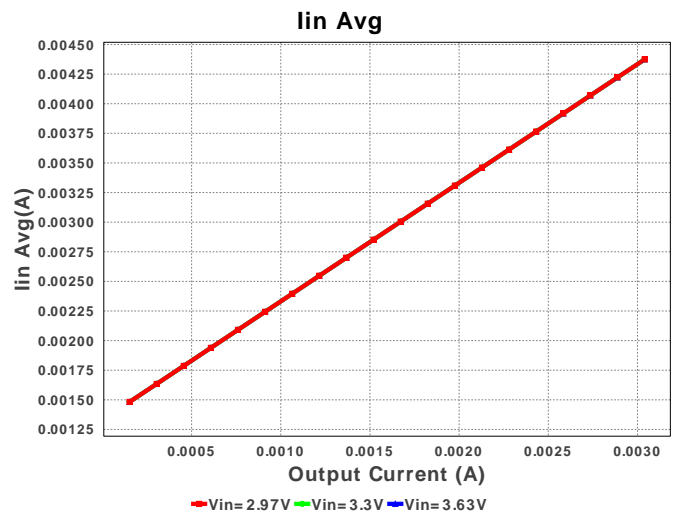
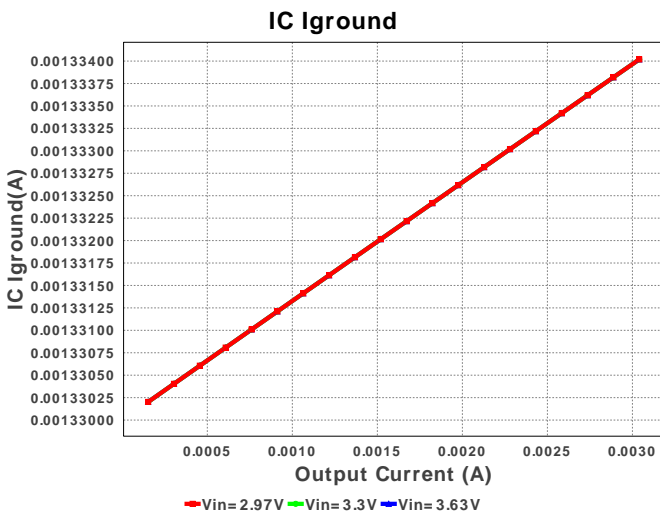
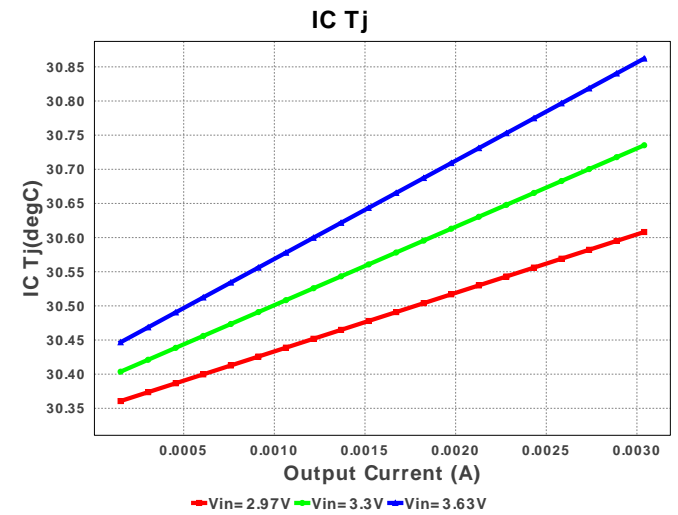
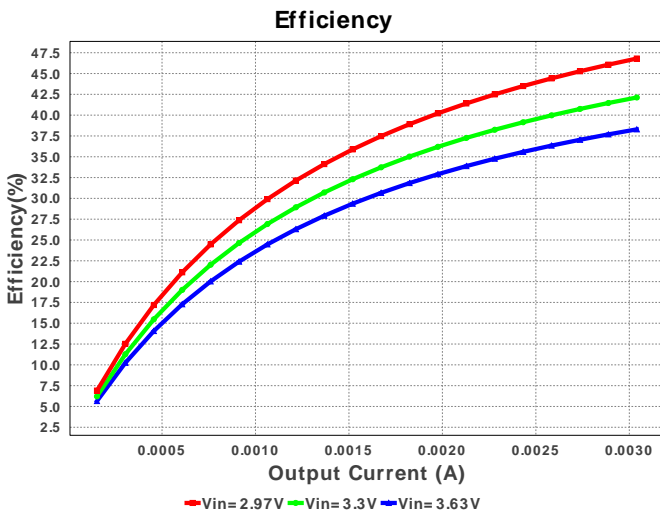
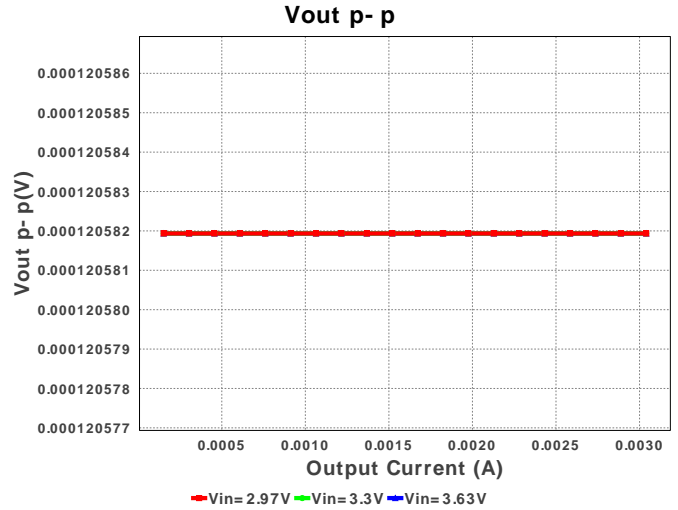
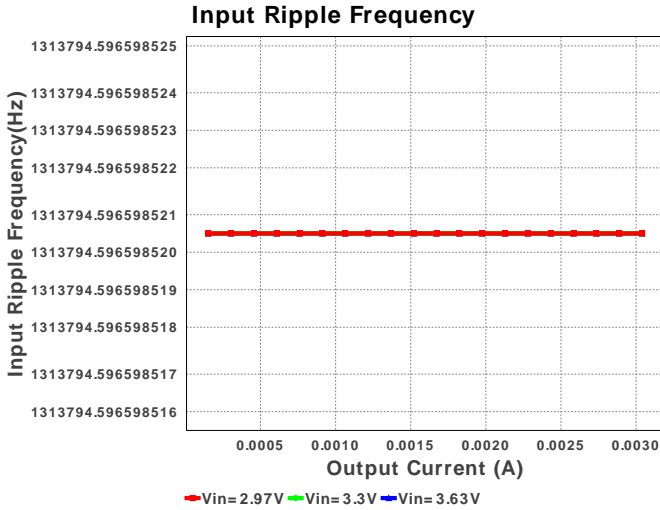
Design : 4425714/27 LP5900TLX-2.0/NOPB  
 LP5900TLX-2.0/NOPB 2.97V-3.63V to 2.00V @ 0.00304A

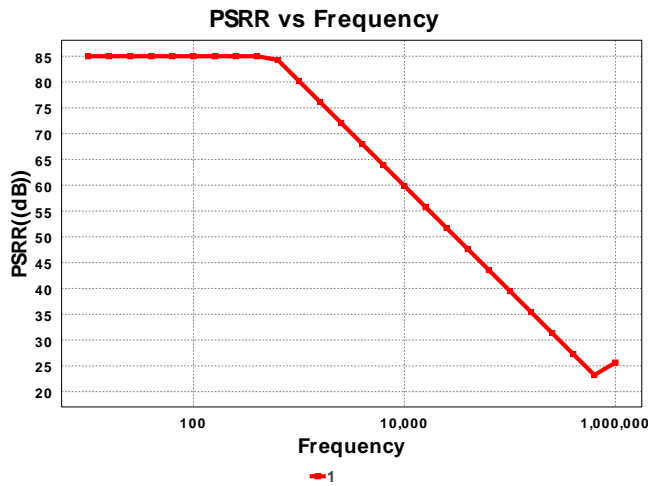
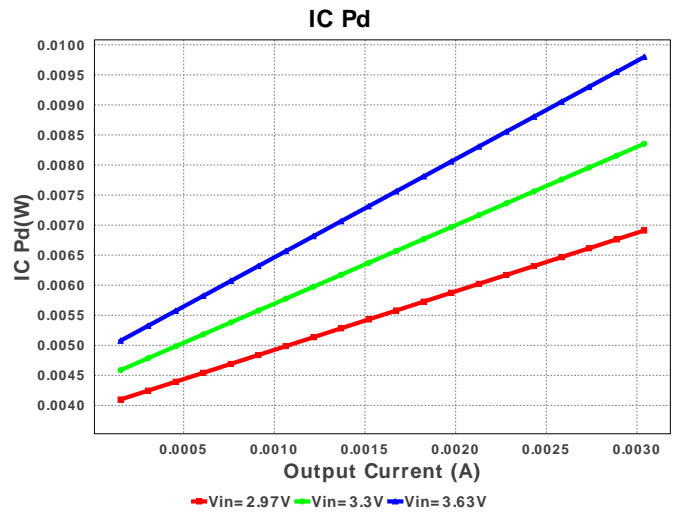
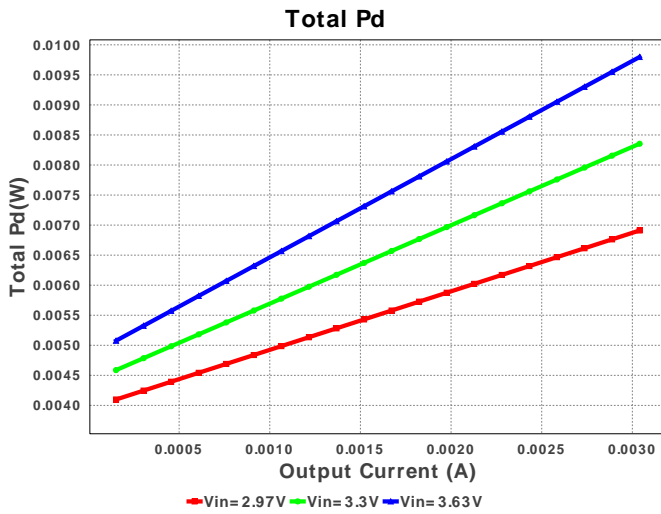
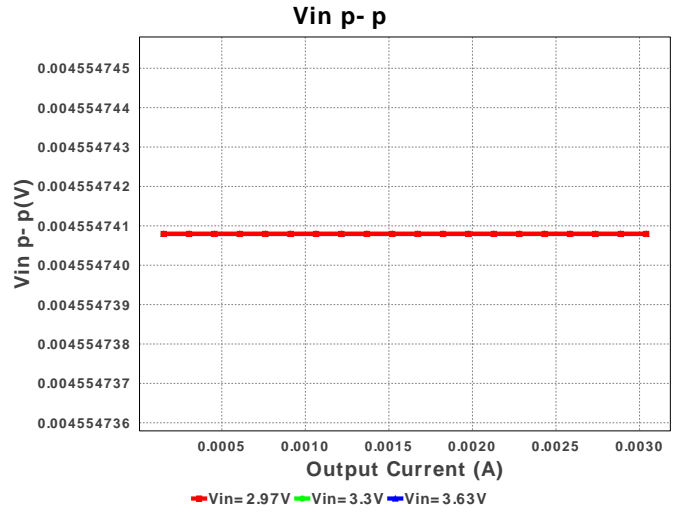
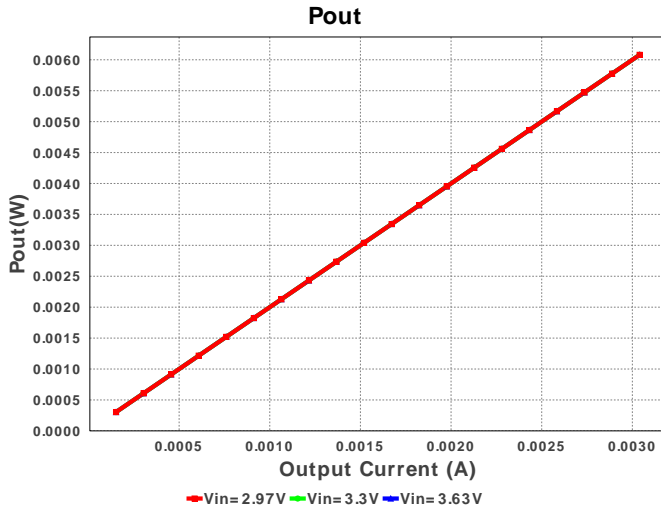


### Electrical BOM

#	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 <sup>2</sup>

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
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 <sup>2</sup>
3.	U1	Texas Instruments	LP5900TLX-2.0/NOPB	Switcher	1	\$0.20	TLA04BCA 5 mm <sup>2</sup>





### Operating Values

#	Name	Value	Category	Description
1.	IC Iground	34.019 $\mu$ A	Current	IC ground current
2.	Iin Avg	3.074 mA	Current	Average input current
3.	BOM Count	3	General	Total Design BOM count
4.	FootPrint	11.0 mm <sup>2</sup>	General	Total Foot Print Area of BOM components
5.	IC Tolerance	40.0 mV	General	IC Feedback Tolerance
6.	Pout	6.08 mW	General	Total output power
7.	Total BOM	\$0.22	General	Total BOM Cost
8.	Vin p-p	4.555 mV	Op_Point	Input Source ripple voltage
9.	Vout OP	2.0 V	Op_Point	Operational Output Voltage
10.	Efficiency	54.487 %	Op_point	Steady state efficiency
11.	IC Tj	30.447 degC	Op_point	IC junction temperature

#	Name	Value	Category	Description
12.	ICThetaJA	88.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
13.	IOUT_OP	3.04 mA	Op_point	Iout operating point
14.	Input Ripple Frequency	1.314 MHz	Op_point	Input Source Ripple Frequency for PSRR Calculation
15.	PSRR est.	-31.544 dB	Op_point	Power Supply Rejection Ratio, estimated
16.	VIN_OP	3.63 V	Op_point	Vin operating point
17.	Vout p-p	120.582 $\mu$ V	Op_point	Peak-to-peak output ripple voltage
18.	IC Pd	5.079 mW	Power	IC power dissipation
19.	Total Pd	5.079 mW	Power	Total Power Dissipation

## Design Inputs

#	Name	Value	Description
1.	Iout	3.04 m	Maximum Output Current
2.	Iout1	3.04 m	Output Current #1
3.	VinMax	3.63	Maximum input voltage
4.	VinMin	2.97	Minimum input voltage
5.	Vout	2.0	Output Voltage
6.	Vout1	2.0	Output Voltage #1
7.	base_pn	LP5900	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0	Ambient temperature

## Design Assistance

- 1.
2. LP5900 Product Folder : <http://www.ti.com/product/lp5900> : contains the data sheet and other resources.

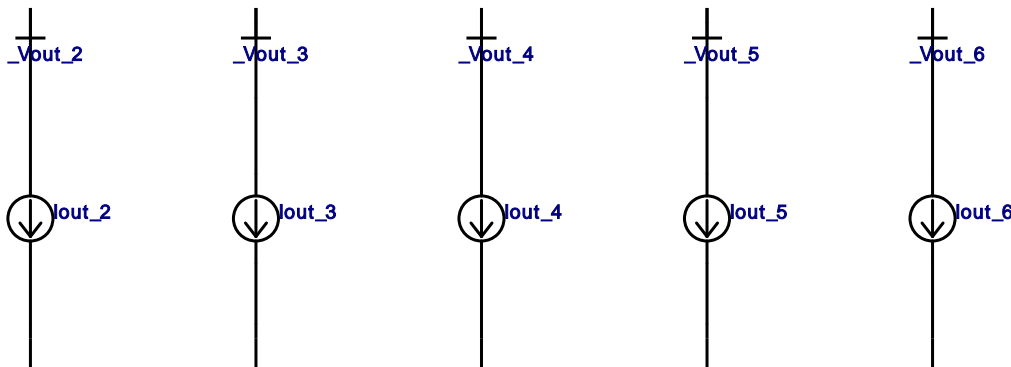
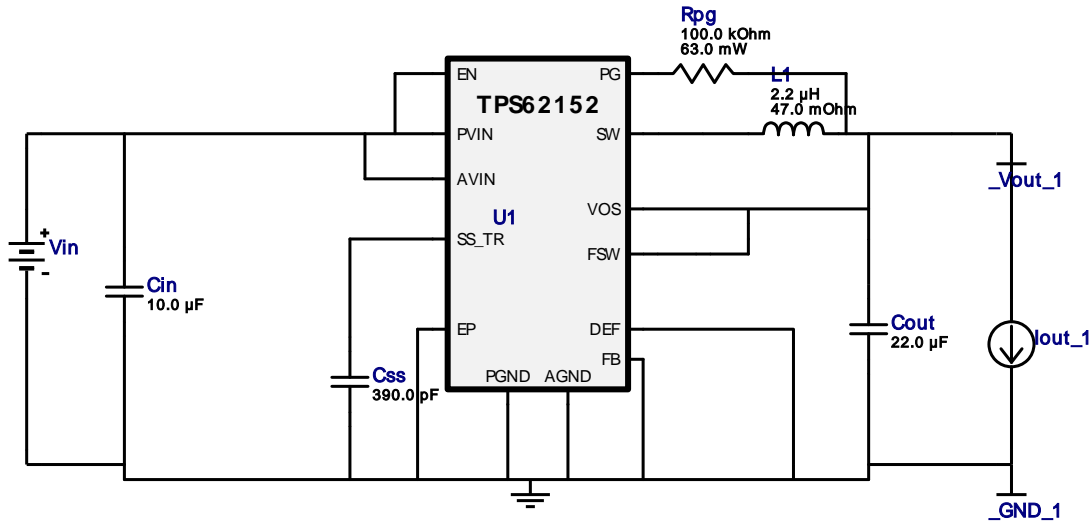


VinMin = 10.0V  
 VinMax = 14.0V  
 Vout = 3.3V  
 Iout = 0.67A

Device = TPS62152RGTR  
 Topology = Buck  
 Created = 7/13/15 5:19:35 AM  
 BOM Cost = \$1.16  
 Footprint = 76.0 mm<sup>2</sup>  
 BOM Count = 6  
 Total Pd = 0.26W


## WEBENCH® Design Report

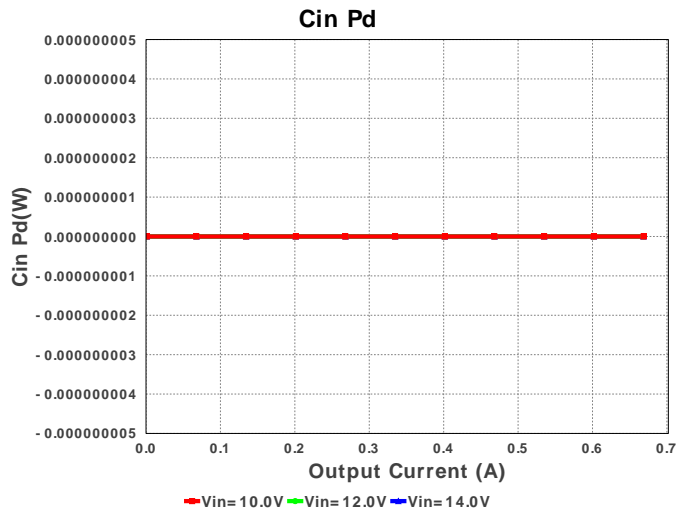
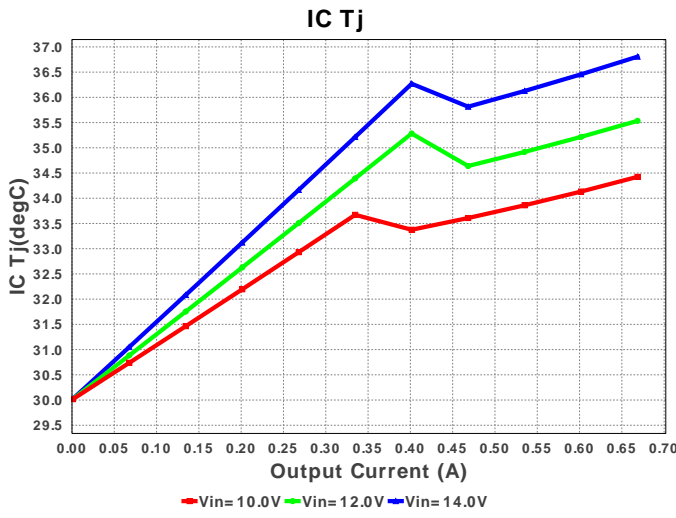
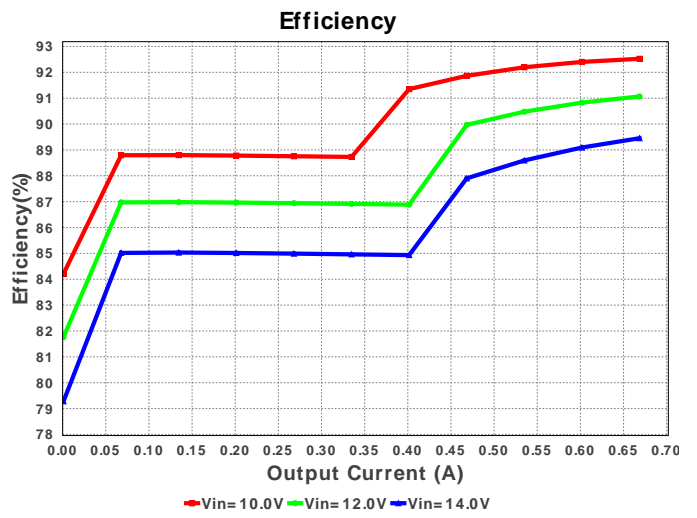
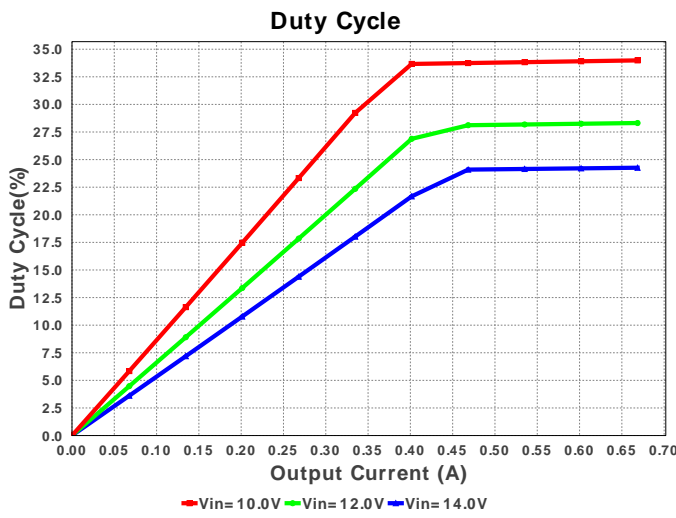
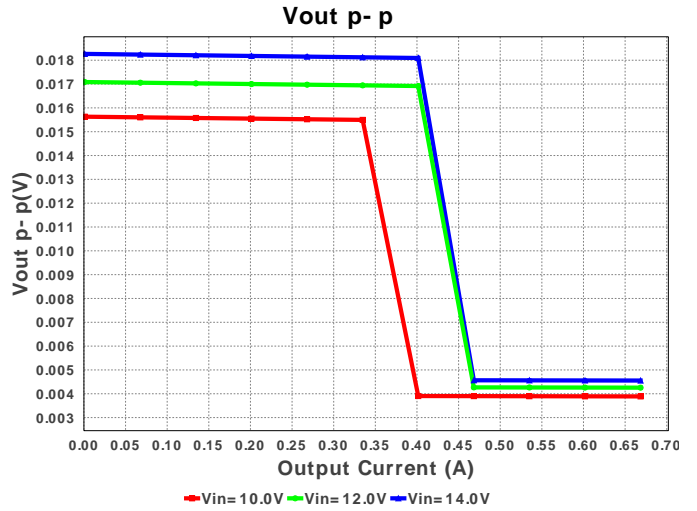
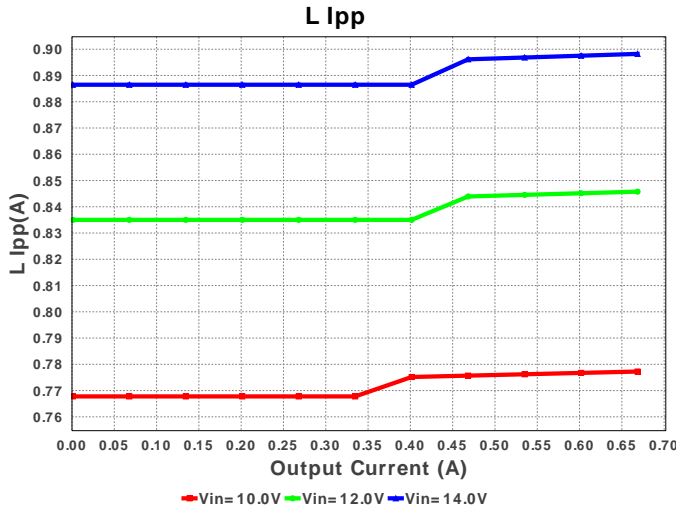
Design : 4425714/28 TPS62152RGTR  
 TPS62152RGTR 10.0V-14.0V to 3.30V @ 0.66856A



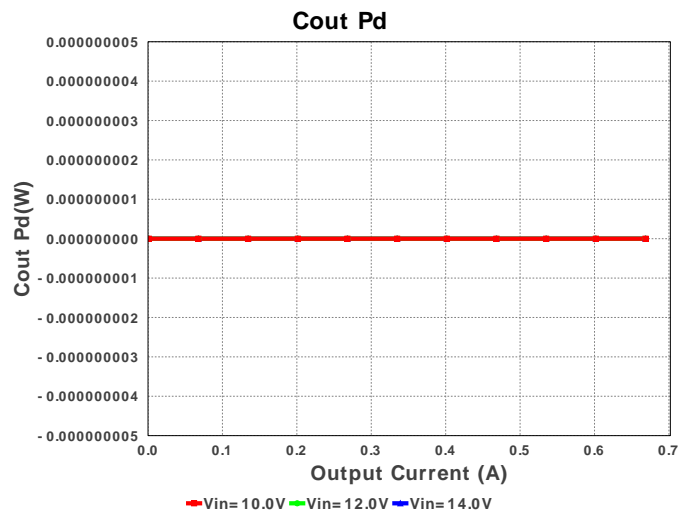
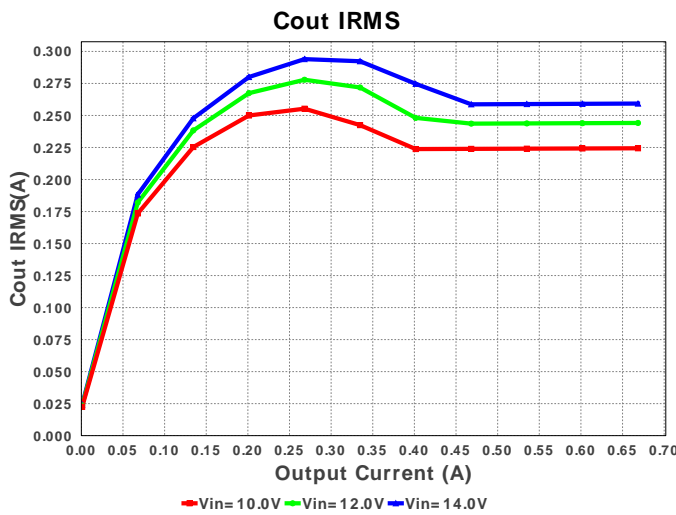
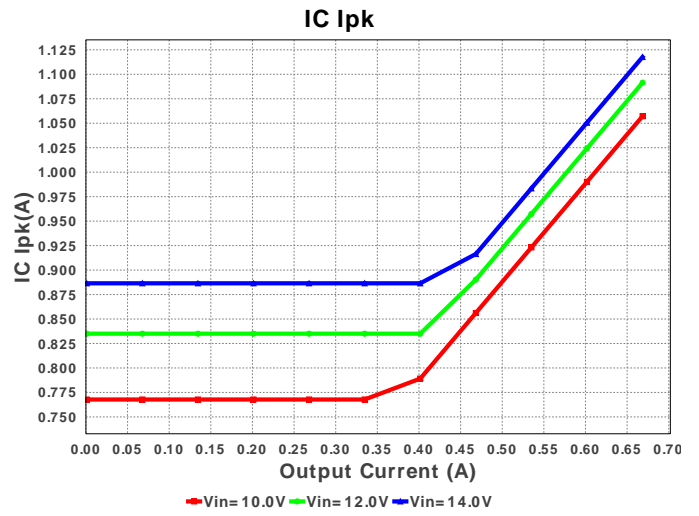
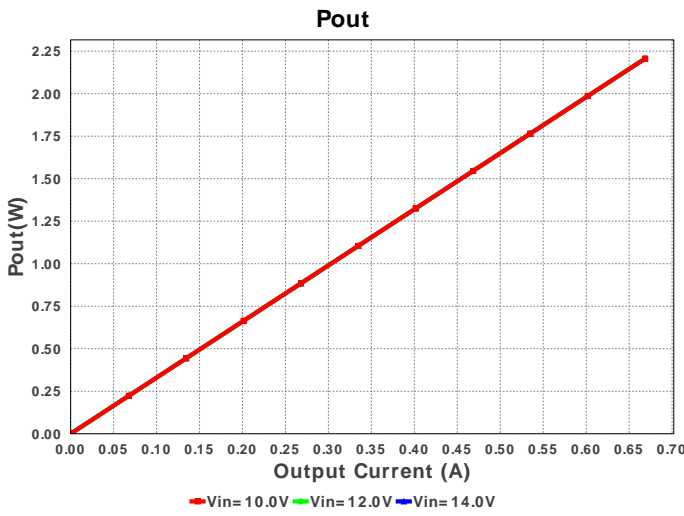
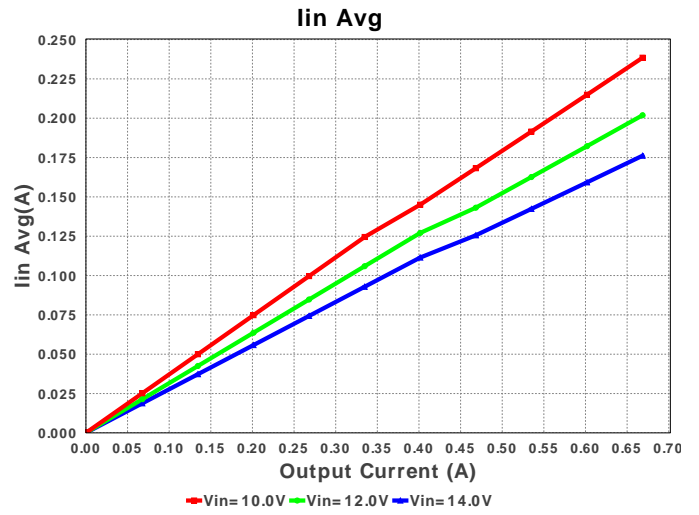
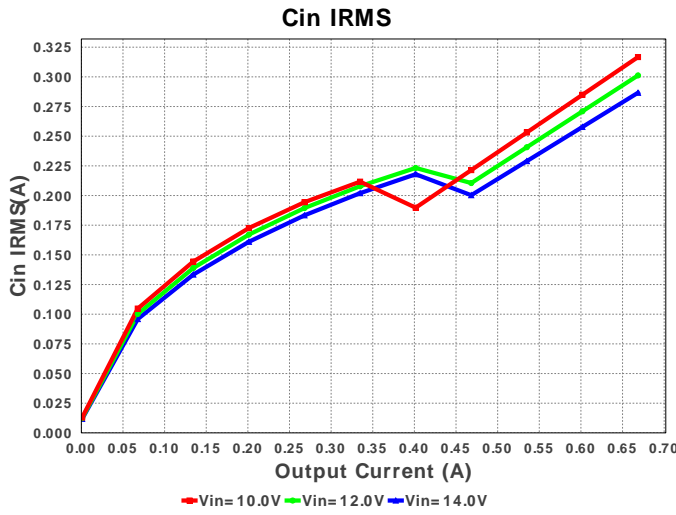
### Electrical BOM

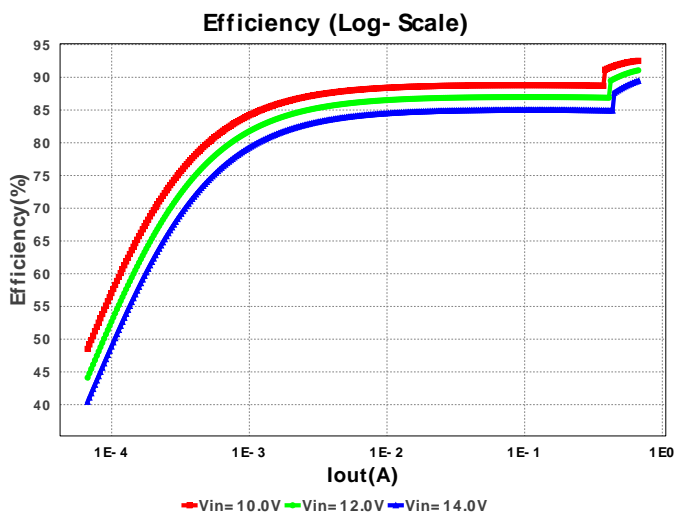
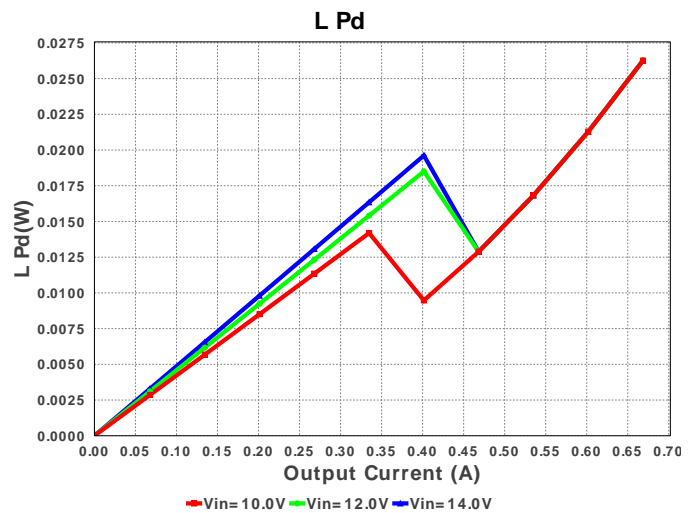
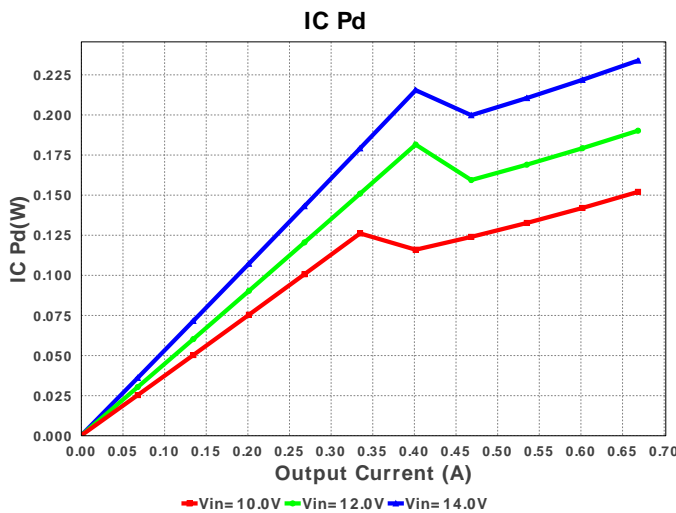
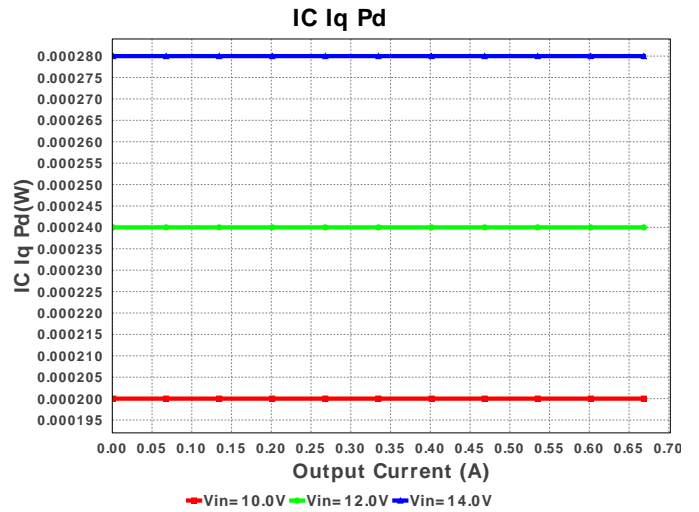
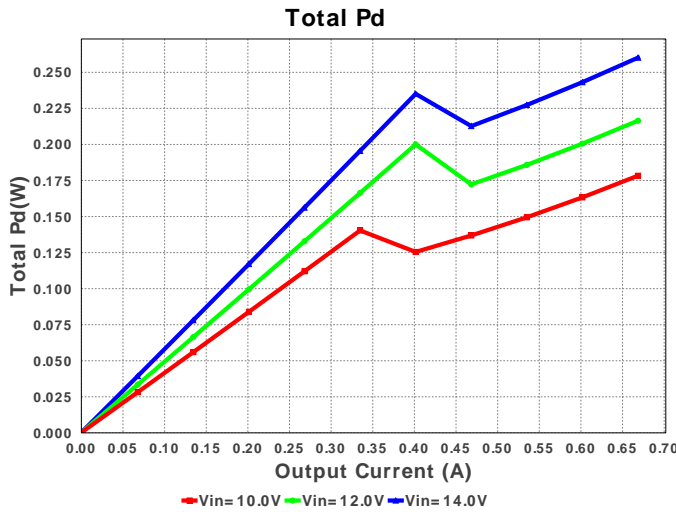
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM219R61E106KA12 Series= X5R	Cap= 10.0 uF VDC= 25.0 V IRMS= 0.0 A	1	\$0.05	0805 7 mm <sup>2</sup>
2.	Cout	TDK	C2012X5R0J226M Series= X5R	Cap= 22.0 uF VDC= 6.3 V IRMS= 0.0 A	1	\$0.06	0805 7 mm <sup>2</sup>
3.	Css	Yageo America	CC0805KRX7R9BB391 Series= X7R	Cap= 390.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm <sup>2</sup>
4.	L1	Bourns	SDR0403-2R2ML	L= 2.2 uH DCR= 47.0 mOhm	1	\$0.18	SDR0403 28 mm <sup>2</sup>
5.	Rpg	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
6.	U1	Texas Instruments	TPS62152RGTR	Switcher	1	\$0.85	 S-PVQFN-N16 25 mm <sup>2</sup>









### Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	286.595 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	259.294 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	1.118 A	Current	Peak switch current in IC
4.	Iin Avg	176.17 mA	Current	Average input current
5.	L Ipp	898.22 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	6	General	Total Design BOM count
7.	FootPrint	76.0 mm <sup>2</sup>	General	Total Foot Print Area of BOM components
8.	Frequency	1.314 MHz	General	Switching frequency
9.	Pout	2.206 W	General	Total output power
10.	Total BOM	\$1.16	General	Total BOM Cost
11.	Vout OP	3.3 V	Op_Point	Operational Output Voltage

#	Name	Value	Category	Description
12.	Duty Cycle	24.263 %	Op_point	Duty cycle
13.	Efficiency	89.452 %	Op_point	Steady state efficiency
14.	IC Tj	36.807 degC	Op_point	IC junction temperature
15.	ICThetaJA	29.1 degC/W	Op_point	IC junction-to-ambient thermal resistance
16.	IOUT_OP	668.56 mA	Op_point	Iout operating point
17.	VIN_OP	14.0 V	Op_point	Vin operating point
18.	Vout p-p	4.555 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	280.0 µW	Power	IC Iq Pd
22.	IC Pd	233.902 mW	Power	IC power dissipation
23.	L Pd	26.26 mW	Power	Inductor power dissipation
24.	Total Pd	260.154 mW	Power	Total Power Dissipation

## Design Inputs

#	Name	Value	Description
1.	Iout	668.56 m	Maximum Output Current
2.	Iout1	668.56 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	TPS62152	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 1A output current, 3V to 17V Input Voltage Range, 3.3V Fixed Output voltage>Selectable operating frequency, Optional Softstart Capacitor for slow startup, Tracking,Pin selectable output voltage (nominal, +5%) Seamless Power Save Mode for Light Load Efficiency, Power Good Output, 100% Duty Cycle mode, Short Circuit Protection, Thermal Shutdown

2. TPS62152 Product Folder : <http://www.ti.com/product/TPS62152> : contains the data sheet and other resources.

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