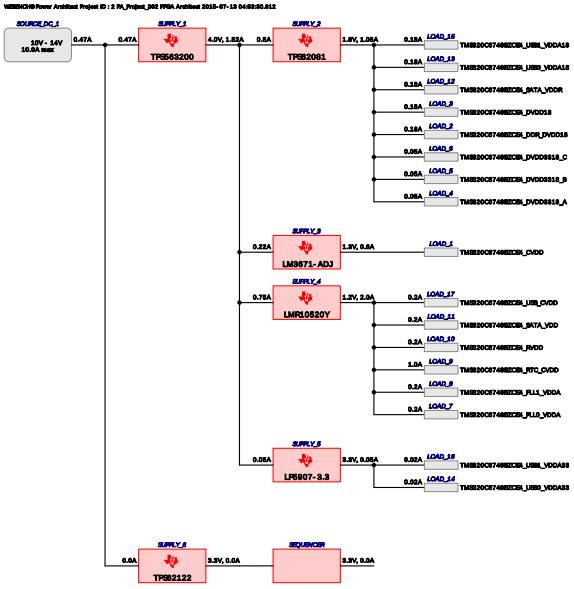
WEBENCH® Power Architect



Project Report

Project : 4425714/2 : PA_Project_302
Created : 2015-07-13 04:53:30.912
Optimize project optFactor=3

Project Summary

1.	Total System Efficiency	73.345 %
2.	Total System BOM Count	42.0
3.	Total System Footprint	453.0 mm2
4.	Total System BOM Cost	$4.81
5.	Total System Power Dissipation	1.9 W

--> Launch WEBENCH Power Architect.

Power Supplies

#	Name	NSID	Description	Vout	Iout	Efficiency	Foot-print	Cost	Design	Page
1.	SUPPLY_1	TPS563200	Switcher : 17V, 3A,6-pin, Low Iq Synchronous buck converter with Advanced Eco-mode	4.0 V	1.519 A	93.2%	149	$1.05	12	13
2.	SUPPLY_2	TPS62081	Switcher : 1.2A High Efficient Step Down Converter in 2x2mm QFN Package	1.8 V	1.05 A	86.1%	40	$1.16	8	25
3.	SUPPLY_3	LM3671-ADJ	Switcher : 2MHz, 600mA Buck Converter for Ultra Low Voltage Circuits	1.3 V	0.6 A	80.9%	40	$0.48	9	30
4.	SUPPLY_4	LMR10520Y	Switcher : High Frequency Buck Regulator	1.2 V	2.0 A	72.4%	151	$0.76	10	4
5.	SUPPLY_5	LP5907-3.3	LDO : Ultra low noise with no bypass capacitor	3.3 V	0.048 A	74.7%	9	$0.16	11	9
6.	SUPPLY_6	TPS62122	Switcher : 2V-15V,75mA, Buck Converter with DCS-Control	3.3 V	0.001 A	75.8%	45	$0.72	14	20
7.	SEQUENCER	LM3880	Sequencer : Power Sequencer	3.3 V	0.001 A	0%	19	$0.48	13	18

Power Loads

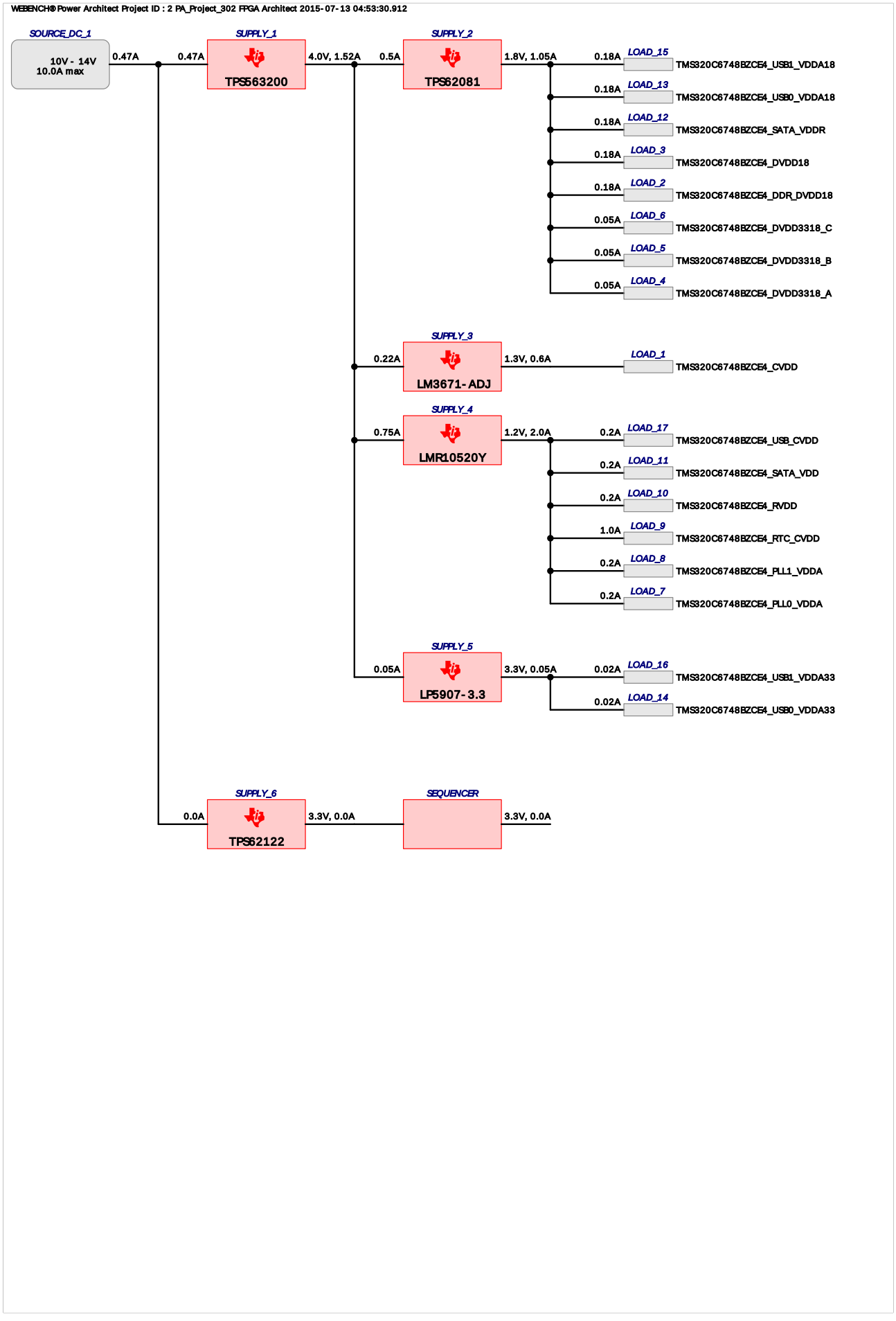
#	Name	VLoad	ILoad	Description
1.	TMS320C6748BZCE4_USB1_VDDA18	1.8 V	0.18 A	VoutRipple=10%, Up Sequence Order=1 delay=2.0 mSec
2.	TMS320C6748BZCE4_USB0_VDDA18	1.8 V	0.18 A	VoutRipple=10%, Up Sequence Order=1 delay=2.0 mSec
3.	TMS320C6748BZCE4_SATA_VDDR	1.8 V	0.18 A	VoutRipple=10%, Up Sequence Order=1 delay=2.0 mSec
4.	TMS320C6748BZCE4_DVDD18	1.8 V	0.18 A	VoutRipple=10%, Up Sequence Order=1 delay=2.0 mSec
5.	TMS320C6748BZCE4_DDR_DVDD18	1.8 V	0.18 A	VoutRipple=10%, Up Sequence Order=1 delay=2.0 mSec
6.	TMS320C6748BZCE4_DVDD3318_C	1.8 V	0.05 A	VoutRipple=10%, Up Sequence Order=1 delay=2.0 mSec
7.	TMS320C6748BZCE4_DVDD3318_B	1.8 V	0.05 A	VoutRipple=10%, Up Sequence Order=1 delay=2.0 mSec
8.	TMS320C6748BZCE4_DVDD3318_A	1.8 V	0.05 A	VoutRipple=10%, Up Sequence Order=1 delay=2.0 mSec
9.	TMS320C6748BZCE4_CVDD	1.3 V	0.6 A	VoutRipple=10%
10.	TMS320C6748BZCE4_USB_CVDD	1.2 V	0.2 A	VoutRipple=10%, Up Sequence Order=0 delay=2.0 mSec
11.	TMS320C6748BZCE4_SATA_VDD	1.2 V	0.2 A	VoutRipple=10%, Up Sequence Order=0 delay=2.0 mSec
12.	TMS320C6748BZCE4_RVDD	1.2 V	0.2 A	VoutRipple=10%, Up Sequence Order=0 delay=2.0 mSec
13.	TMS320C6748BZCE4_RTC_CVDD	1.2 V	1 A	VoutRipple=20%
14.	TMS320C6748BZCE4_PLL1_VDDA	1.2 V	0.2 A	VoutRipple=10%, Up Sequence Order=0 delay=2.0 mSec
15.	TMS320C6748BZCE4_PLL0_VDDA	1.2 V	0.2 A	VoutRipple=10%, Up Sequence Order=0 delay=2.0 mSec
16.	TMS320C6748BZCE4_USB1_VDDA33	3.3 V	0.024 A	VoutRipple=10%, Up Sequence Order=2 delay=2.0 mSec
17.	TMS320C6748BZCE4_USB0_VDDA33	3.3 V	0.024 A	VoutRipple=10%, Up Sequence Order=2 delay=2.0 mSec

FPGAs, Processors

#	Manufacturer	Part Number	Name	Series	Description
1.	Texas Instruments	TMS320C6748BZCE4	FPGA_1	C6000	FPGA Texas Instruments C6000 TMS320C6748BZCE4

http://www.ti.com/product/tms320c6748

Project Diagram



Electrical Procurement BOM

Manufacturer	Part Number	Description	Quantity	Budgetary Price	Footprint (mm^2)
AVX	08053C104KAT2A	0805	1	$0.01	7
Diodes Inc.	B220-13-F	SMB	1	$0.08	44
TDK	C1005X5R0J105M	0402	2	$0.01	6
Taiyo Yuden	CBC2012T220M	CBC2012	1	$0.08	8
Yageo America	CC0805JRNPO9BN120	0805	1	$0.01	7
Samsung Electro-Mechanics	CL21C250JBANNNC	0805	1	$0.01	7
Vishay-Dale	CRCW0402100KFKED	0402	3	$0.01	9
Vishay-Dale	CRCW040210K0FKED	0402	4	$0.01	12
Vishay-Dale	CRCW0402178KFKED	0402	1	$0.01	3
Vishay-Dale	CRCW0402200KFKED	0402	1	$0.01	3
Vishay-Dale	CRCW0402255KFKED	0402	1	$0.01	3
Vishay-Dale	CRCW0402316KFKED	0402	1	$0.01	3
Vishay-Dale	CRCW040243K2FKED	0402	1	$0.01	3
MuRata	GRM188R60J106ME47D	0603	1	$0.03	5
MuRata	GRM188R60J475KE19D	0603	1	$0.02	5
MuRata	GRM188R60J475ME19D	0603	1	$0.02	5
MuRata	GRM188R71C105KA12D	0603	1	$0.01	5
MuRata	GRM219R60J106KE19D	0805	1	$0.02	7
MuRata	GRM21BR60J226ME39L	0805	2	$0.05	7
MuRata	GRM21BR61E475KA12L	0805	1	$0.03	7
MuRata	GRM31CR60J476ME19L	1206	1	$0.12	11
MuRata	GRM32ER61E226KE15L	1210	1	$0.16	15
Taiyo Yuden	JMK212BJ226KG-T	0805	1	$0.13	7
Texas Instruments	LM3671TLX-ADJ/NOPB	TLA05CBA	1	$0.30	5
Texas Instruments	LM3880MF-1AE/NOPB	R-PDSO-G6	1	$0.45	10
Texas Instruments	LMR10520YSD/NOPB	SDE06A	1	$0.38	16
Texas Instruments	LP5907UVX-3.3/NOPB	UVK04AAA	1	$0.14	3
TDK	NLCV32T-2R2M-PF	NLCV32	1	$0.10	13
Coilcraft	PFL3215-102MEB	PFL3215	1	$0.25	14
Susumu Co Ltd	RR1220P-823-D	0805	1	$0.01	7
Bourns	SRN6045-1R0Y	SRN6045	1	$0.16	64
Bourns	SRN8040-2R2Y	SRN8040	1	$0.22	100
Texas Instruments	TPS563200DDCR	DDC0006A	1	$0.52	10
Texas Instruments	TPS62081DSGR	S-PWSON-N8	1	$0.75	10
Texas Instruments	TPS62122DRVR	S-PWSON-N6	1	$0.56	9
Total			42	$4.81	450

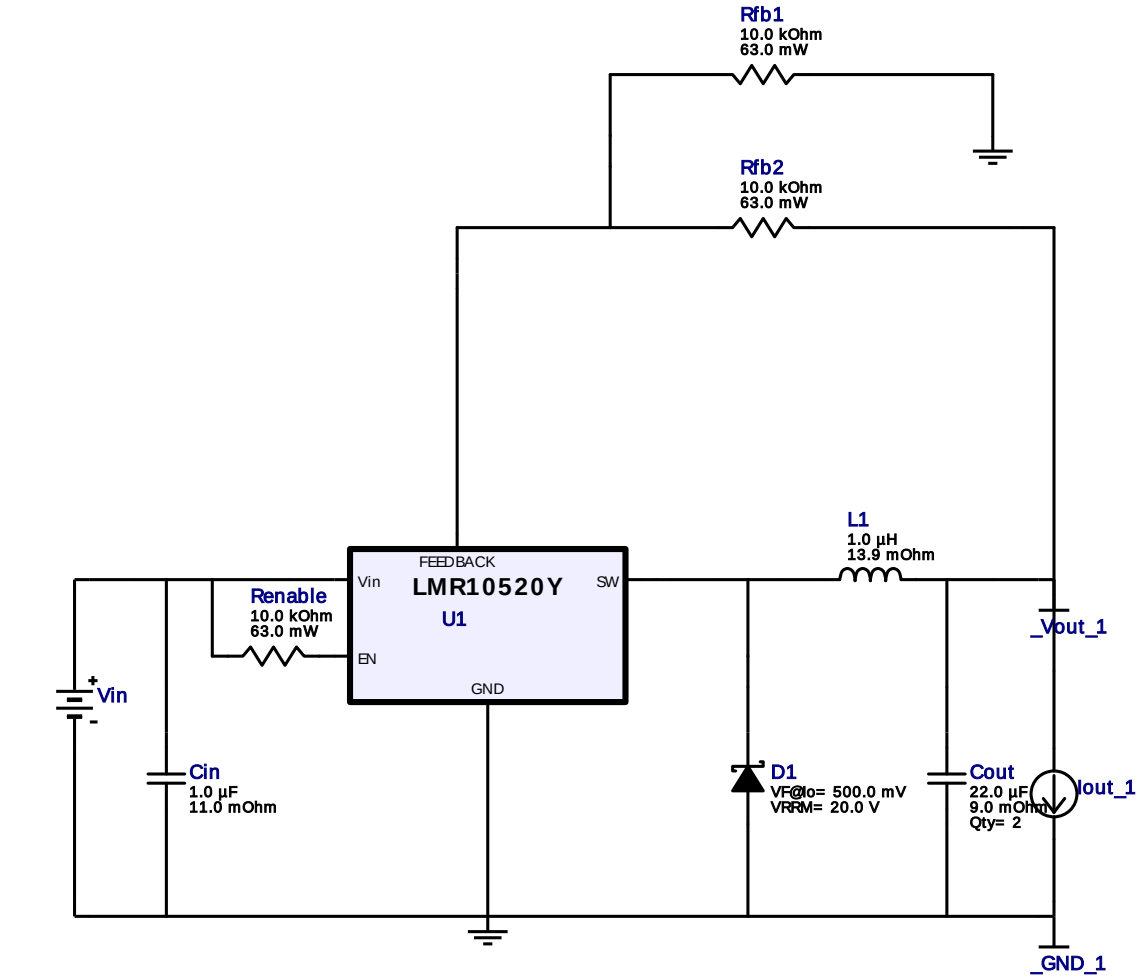
TEXAS INSTRUMENTS

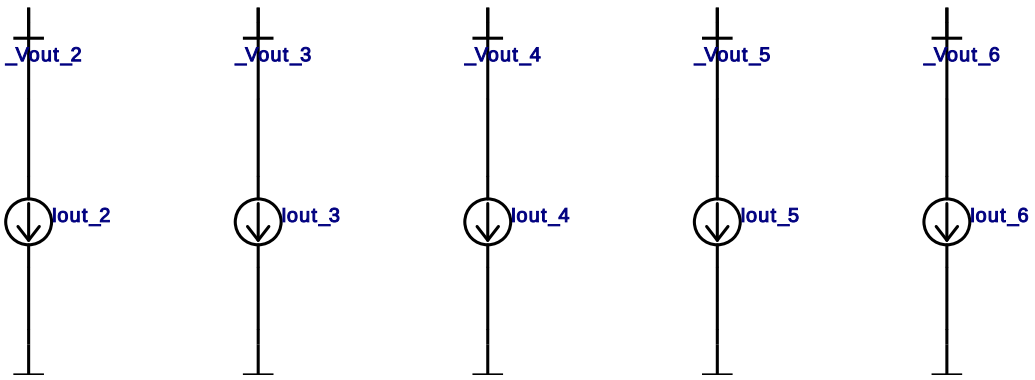
WEBENCH® Design Report

VinMin = 3.6V
VinMax = 4.4V
Vout = 1.2V
Iout = 2.0A

Device = LMR10520YSD/NOPB
Topology = Buck
Created = 7/13/15 4:53:28 AM
BOM Cost = $0.76
Footprint = 151.0 mm^2
BOM Count = 9
Total Pd = 0.92W

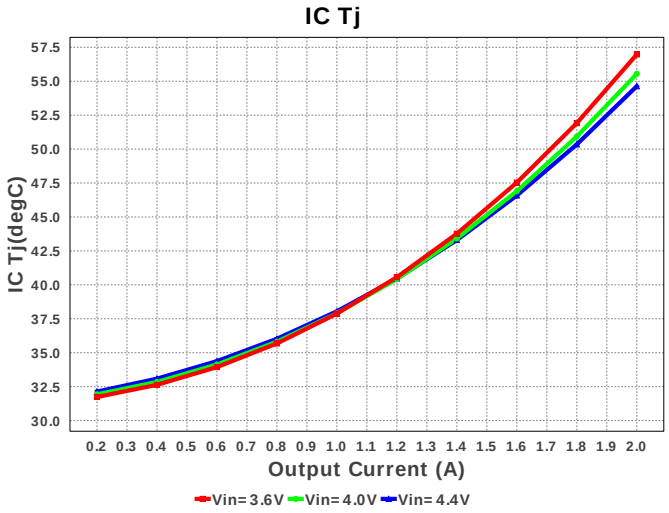
Design : 4425714/10 LMR10520YSD/NOPB
LMR10520YSD/NOPB 3.6V-4.4V to 1.20V @ 2.0A

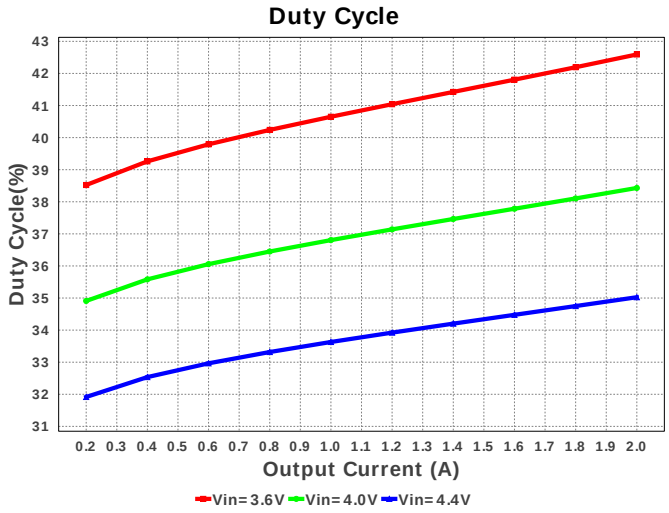


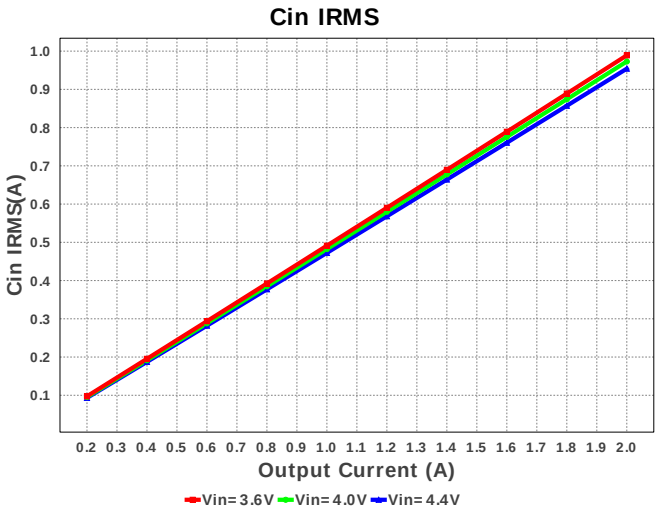


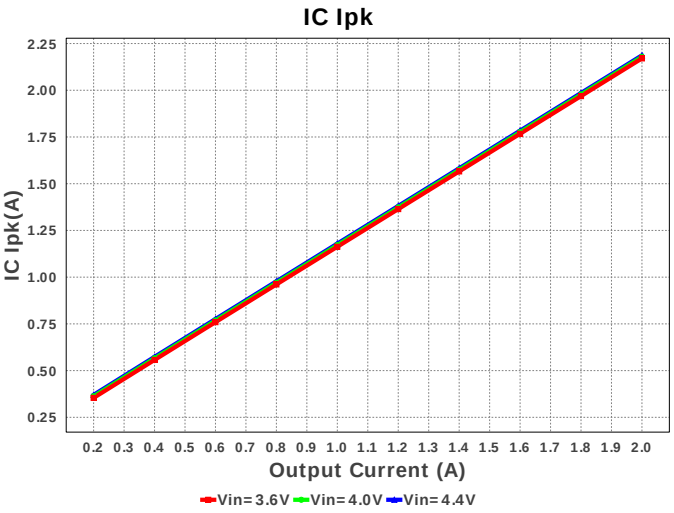
Electrical BOM

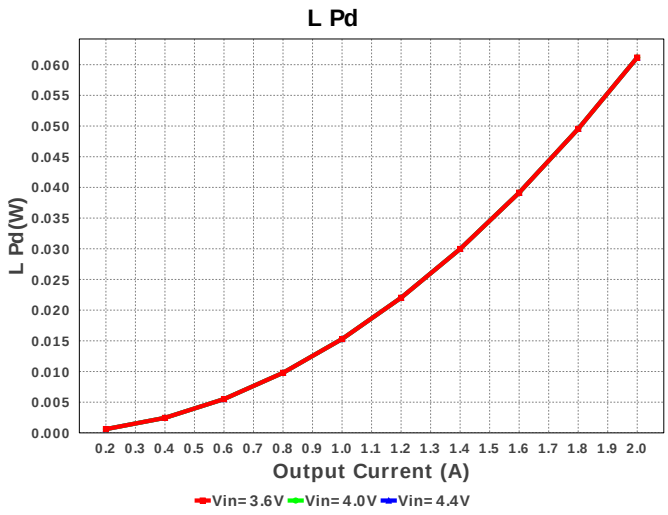
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM188R71C105KA12D Series= X7R	Cap= 1.0 uF ESR= 11.0 mOhm VDC= 16.0 V IRMS= 2.72 A	1	$0.01	0603 5 mm^2
2.	Cout	MuRata	GRM21BR60J226ME39L Series= X5R	Cap= 22.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 3.5 A	2	$0.05	0805 7 mm^2
3.	D1	Diodes Inc.	B220-13-F	VF@Io= 500.0 mV VRRM= 20.0 V	1	$0.08	SMB 44 mm^2
4.	L1	Bourns	SRN6045-1R0Y	L= 1.0 µH DCR= 13.9 mOhm	1	$0.16	SRN6045 64 mm^2
5.	Renable	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
6.	Rfb1	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
7.	Rfb2	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
8.	U1	Texas Instruments	LMR10520YSD/NOPB	Switcher	1	$0.38	SDE06A 16 mm^2

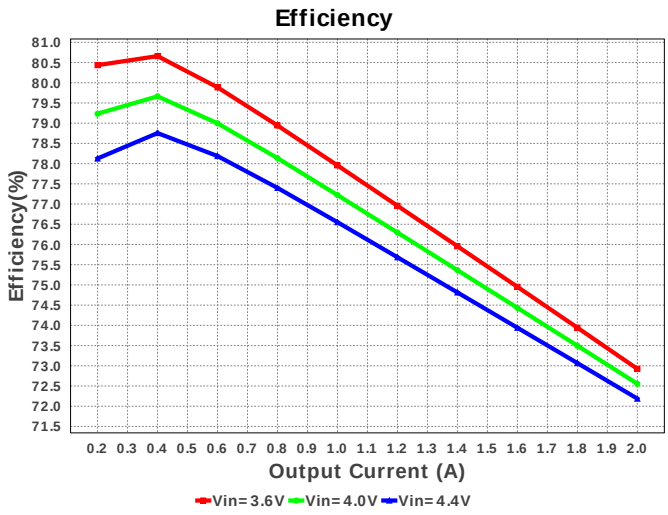


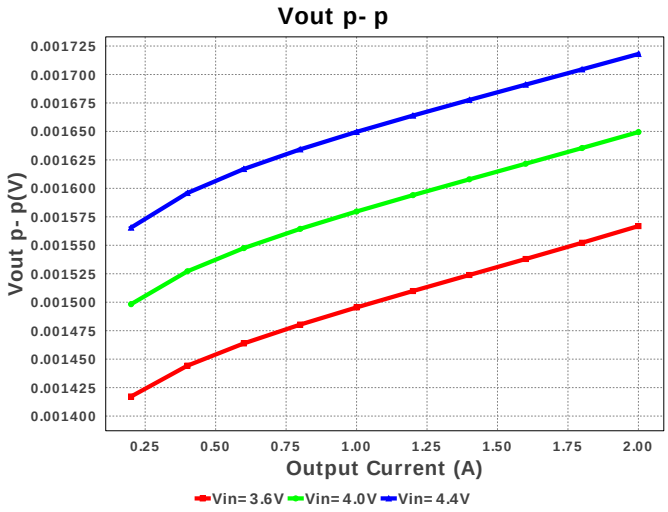


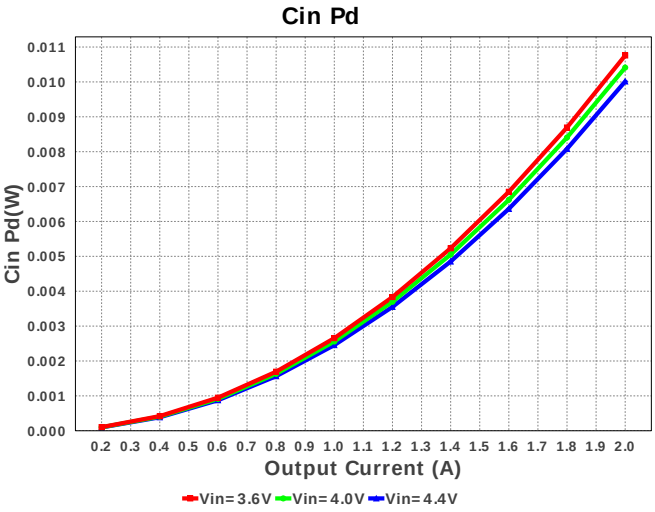


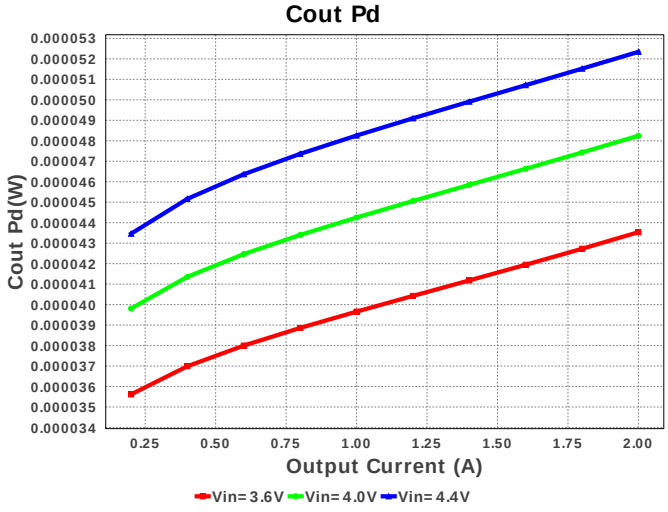


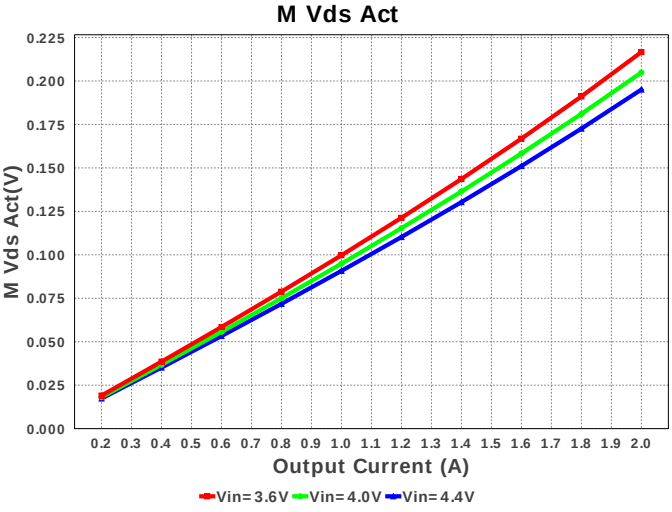


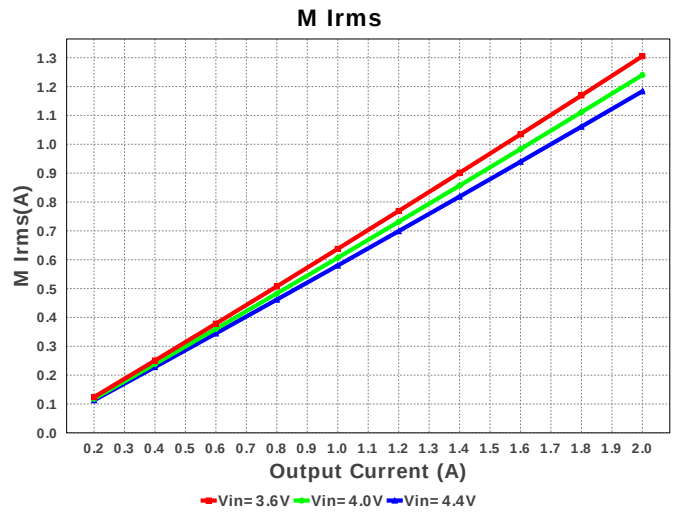


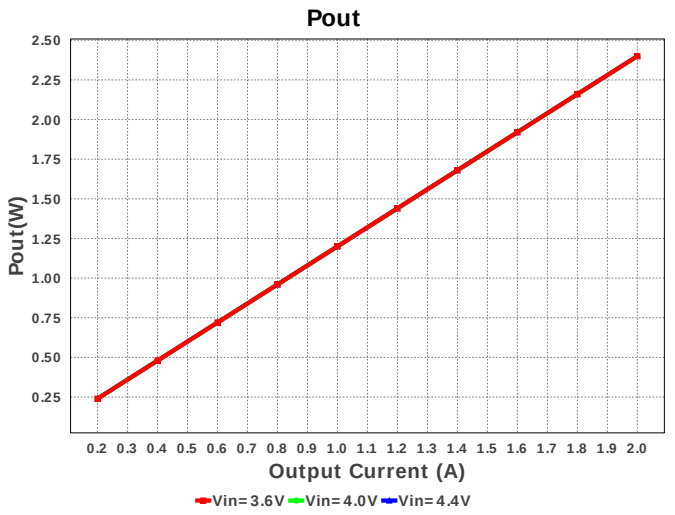


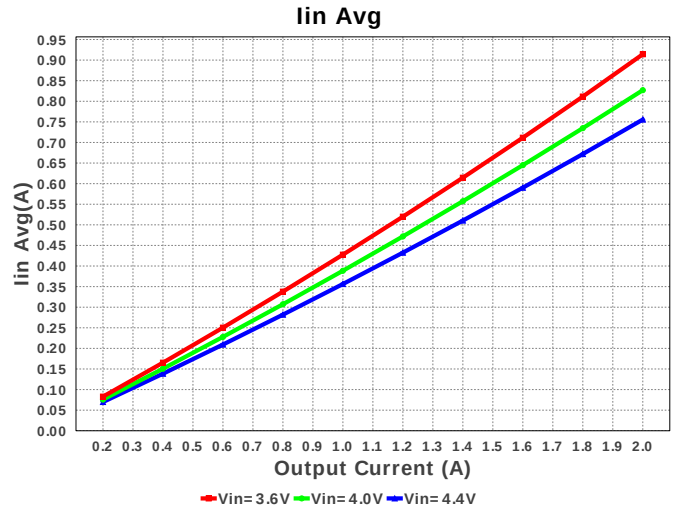


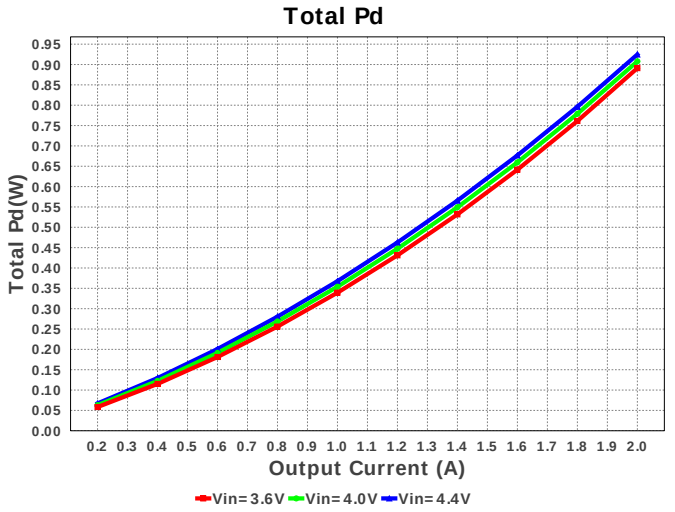


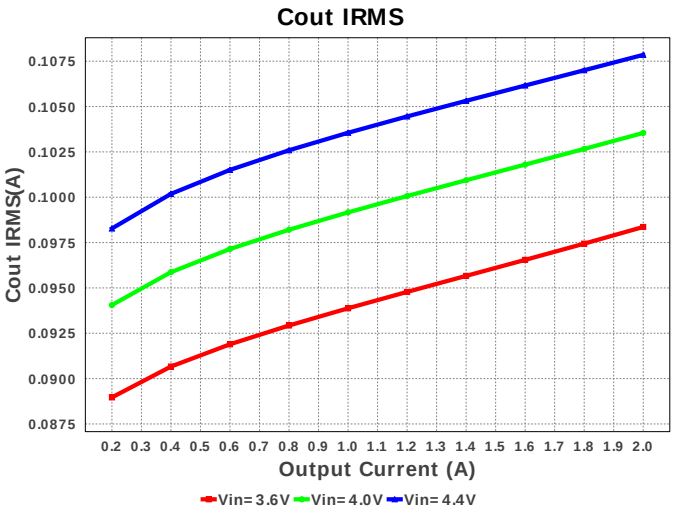


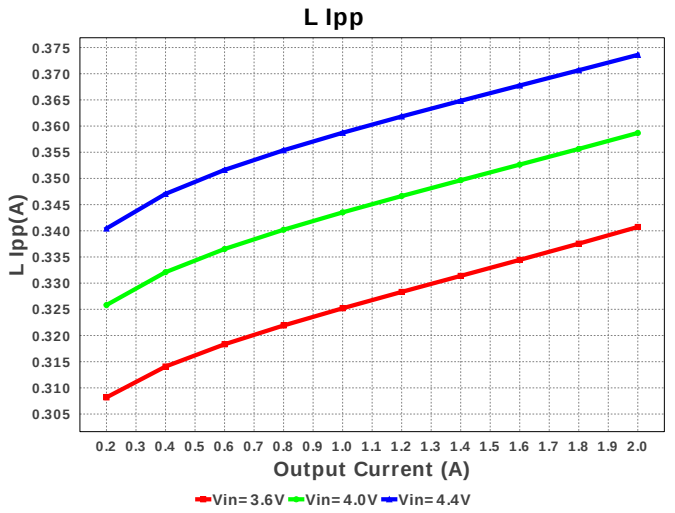


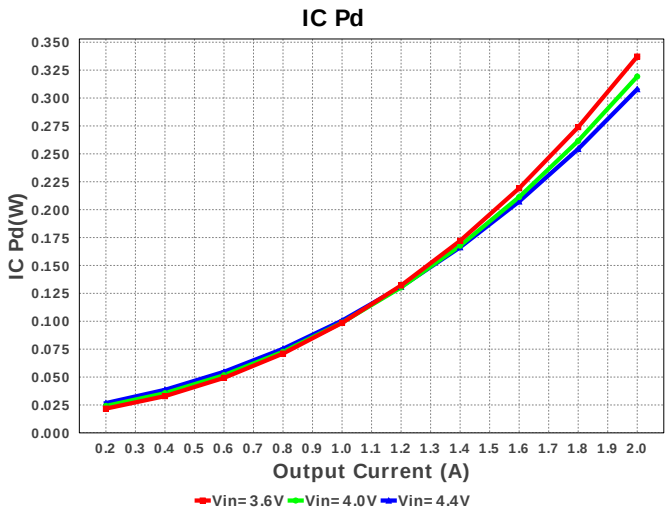


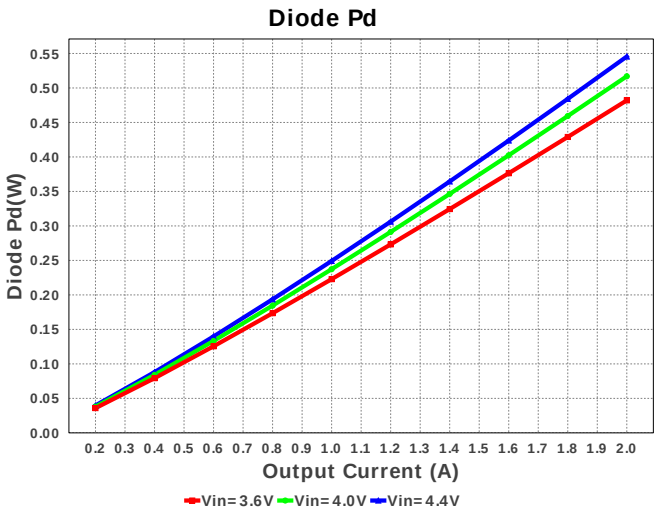












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	953.473 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	107.545 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.186 A	Current	Peak switch current in IC
4.	Iin Avg	753.61 mA	Current	Average input current
5.	L Ipp	372.55 mA	Current	Peak-to-peak inductor ripple current
6.	M Irms	1.182 A	Current	MOSFET RMS current
7.	BOM Count	9	General	Total Design BOM count
8.	FootPrint	151.0 mm^2	General	Total Foot Print Area of BOM components
9.	Frequency	3.0 MHz	General	Switching frequency
10.	IC Tolerance	12.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	194.775 mV	General	
12.	Pout	2.4 W	General	Total output power
13.	Total BOM	$0.76	General	Total BOM Cost
14.	Duty Cycle	34.926 %	Op_point	Duty cycle
15.	Efficiency	72.379 %	Op_point	Steady state efficiency
16.	IC Tj	54.577 degC	Op_point	IC junction temperature
17.	ICThetaJA	80.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
18.	IOUT_OP	2.0 A	Op_point	Iout operating point
19.	VIN_OP	4.4 V	Op_point	Vin operating point
20.	Vout p-p	1.713 mV	Op_point	Peak-to-peak output ripple voltage
21.	Cin Pd	10.0 mW	Power	Input capacitor power dissipation
22.	Cout Pd	52.046 µW	Power	Output capacitor power dissipation
23.	Diode Pd	537.443 mW	Power	Diode power dissipation
24.	IC Pd	307.217 mW	Power	IC power dissipation
25.	L Pd	61.16 mW	Power	Inductor power dissipation
26.	Total Pd	915.88 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	2.0	Maximum Output Current
2.	Iout1	2.0	Output Current #1
3.	VinMax	4.4	Maximum input voltage
4.	VinMin	3.6	Minimum input voltage
5.	Vout	1.2	Output Voltage
6.	Vout1	1.2	Output Voltage #1
7.	base_pn	LMR10520Y	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0	Ambient temperature

Design Assistance

1. LMR10520Y Product Folder : http://www.ti.com/product/LMR10520 : contains the data sheet and other resources.

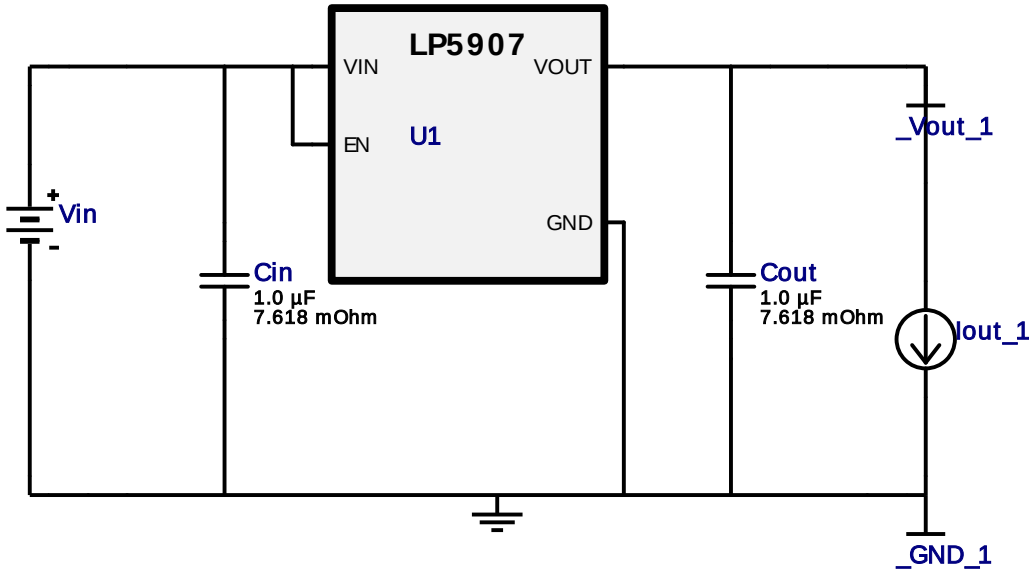
TEXAS INSTRUMENTS

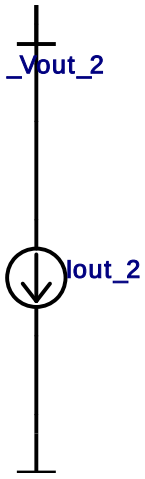
WEBENCH® Design Report

VinMin = 3.6V
VinMax = 4.4V
Vout = 3.3V
Iout = 0.05A

Device = LP5907UVX-3.3/NOPB
Topology = LDO
Created = 7/13/15 4:53:28 AM
BOM Cost = $0.16
Footprint = 9.0 mm^2
BOM Count = 3
Total Pd = 0.05W

Design : 4425714/11 LP5907UVX-3.3/NOPB
LP5907UVX-3.3/NOPB 3.6V-4.4V to 3.30V @ 0.048A

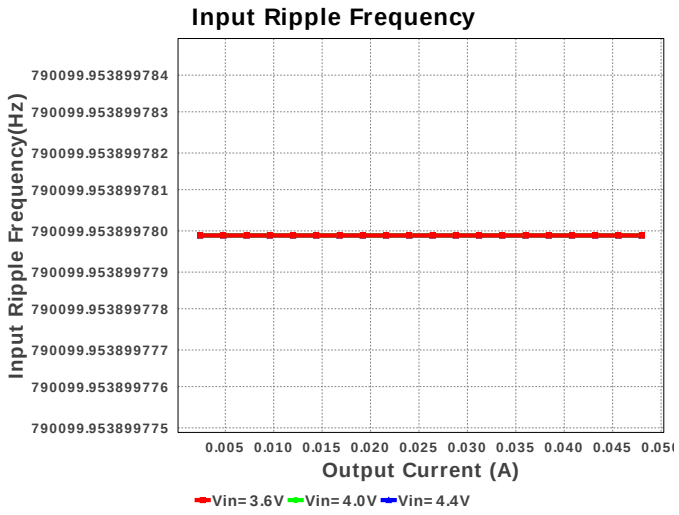


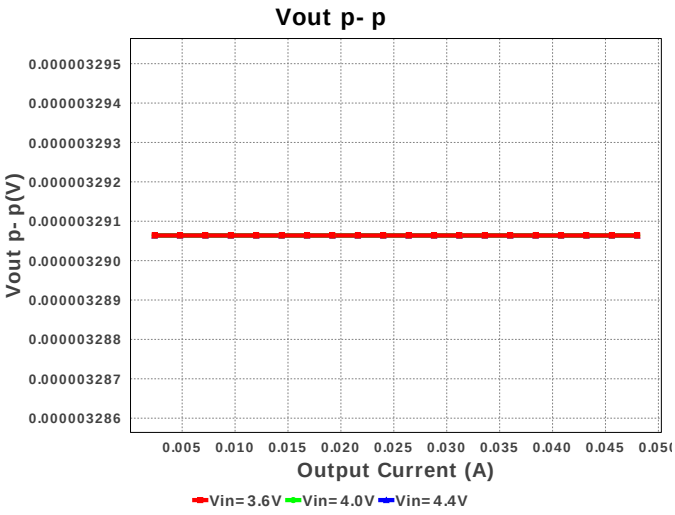


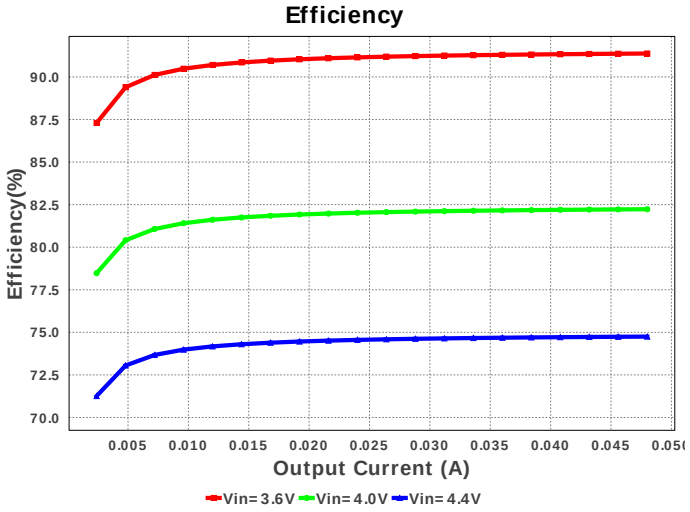
Electrical BOM

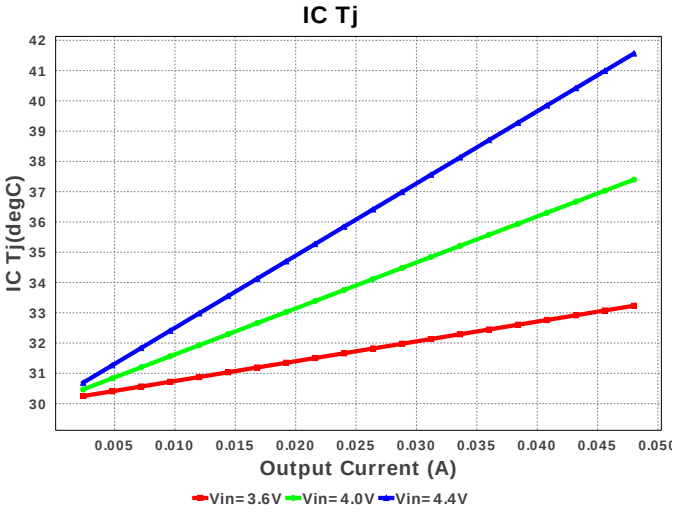
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	TDK	C1005X5R0J105M Series= X5R	Cap= 1.0 uF ESR= 7.618 mOhm VDC= 6.3 V IRMS= 0.0 A	1	$0.01	0402 3 mm^2

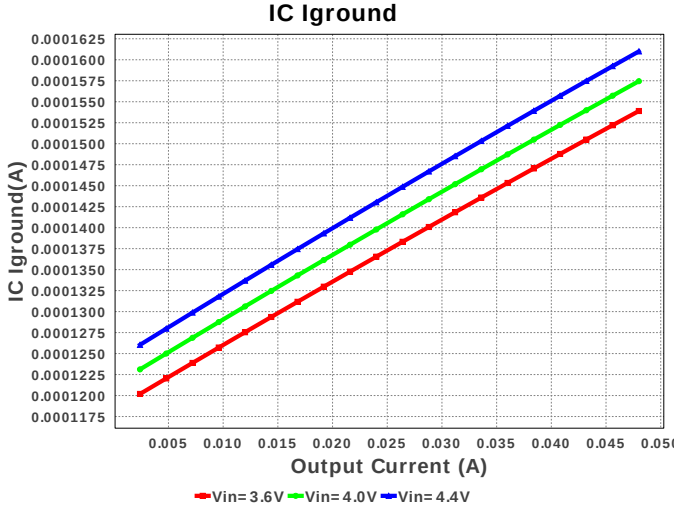
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
2.	Cout	TDK	C1005X5R0J105M Series= X5R	Cap= 1.0 uF ESR= 7.618 mOhm VDC= 6.3 V IRMS= 0.0 A	1	$0.01	0402 3 mm^2
3.	U1	Texas Instruments	LP5907UVX-3.3/NOPB	Switcher	1	$0.14	UVK04AAA 3 mm^2

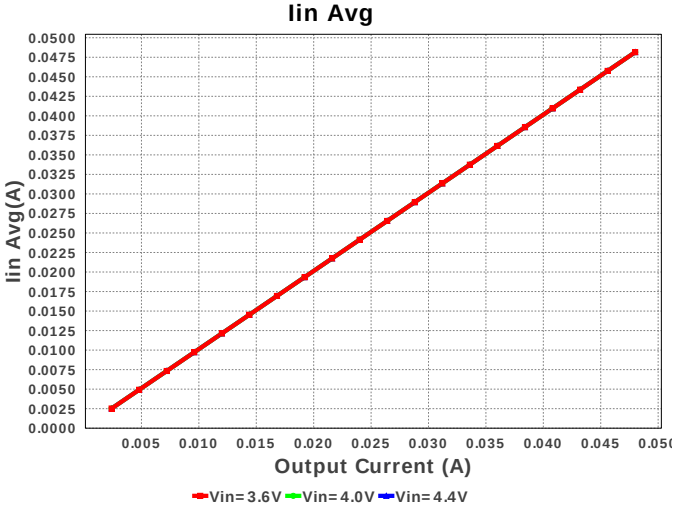


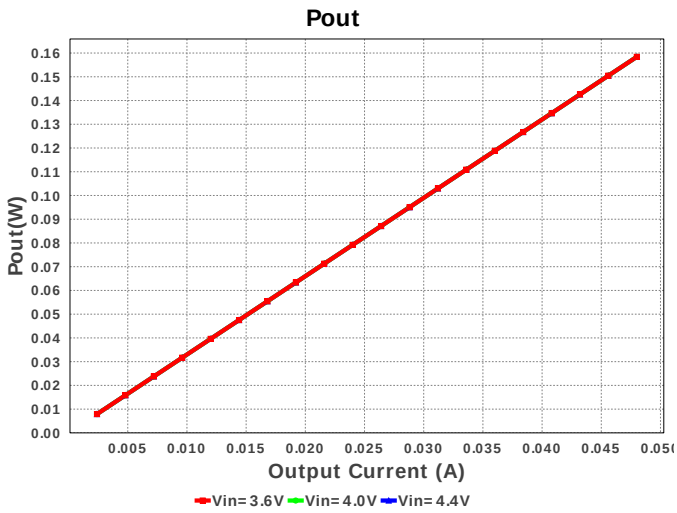


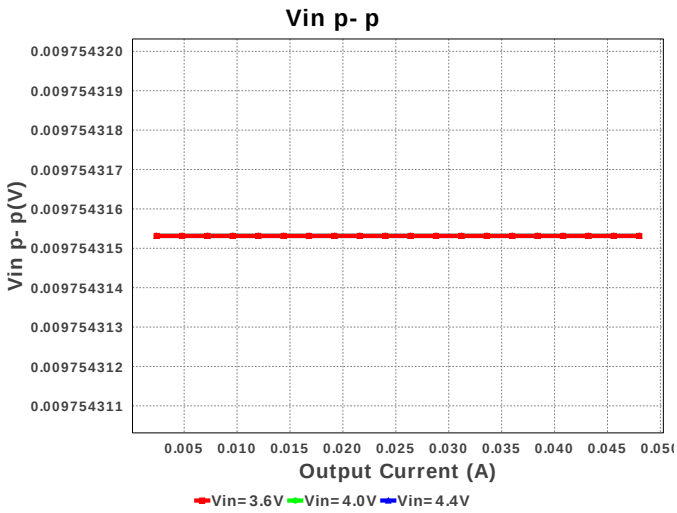


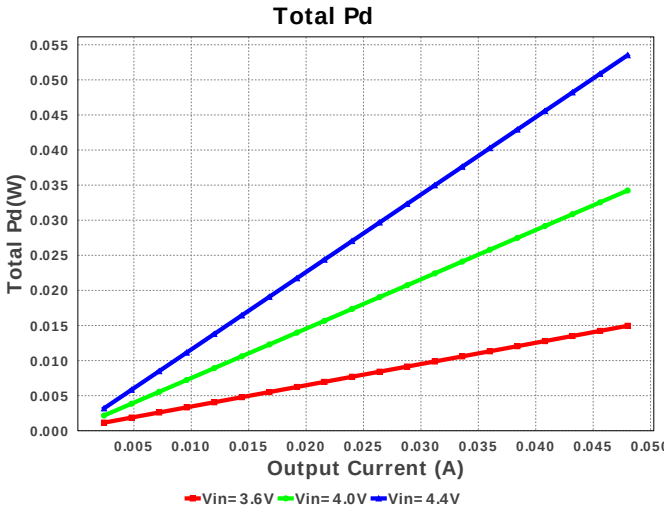


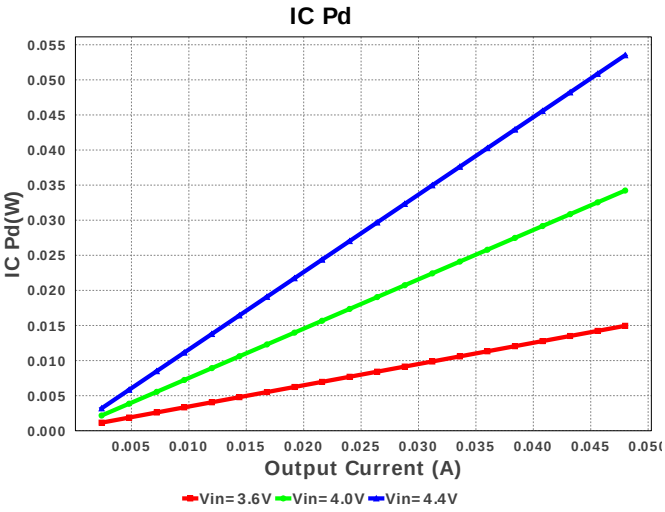


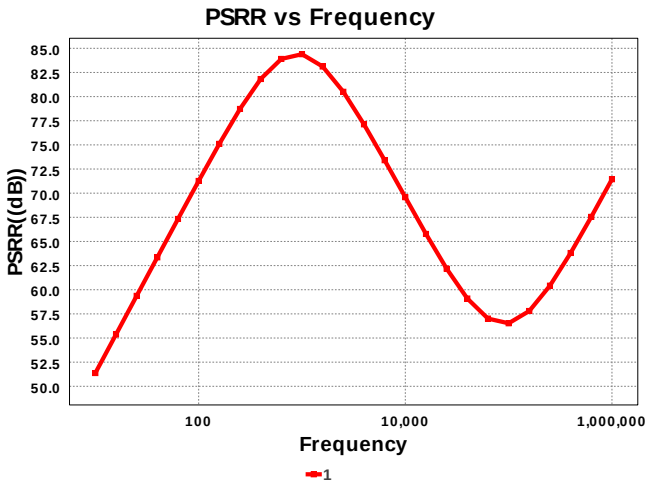












Operating Values

#	Name	Value	Category	Description
1.	IC Iground	160.995 µA	Current	IC ground current
2.	Iin Avg	48.161 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	66.0 mV	General	IC Feedback Tolerance
6.	Pout	158.4 mW	General	Total output power
7.	Total BOM	$0.16	General	Total BOM Cost
8.	Vin p-p	9.754 mV	Op_Point	Input Source ripple voltage
9.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
10.	Efficiency	74.749 %	Op_point	Steady state efficiency
11.	IC Tj	36.4 degC	Op_point	IC junction temperature

#	Name	Value	Category	Description
12.	ICThetaJA	119.6 degC/W	Op_point	IC junction-to-ambient thermal resistance
13.	IOUT_OP	48.0 mA	Op_point	Iout operating point
14.	Input Ripple Frequency	790.1 kHz	Op_point	Input Source Ripple Frequency for PSRR Calculation
15.	PSRR est.	-69.438 dB	Op_point	Power Supply Rejection Ratio, estimated
16.	VIN_OP	4.4 V	Op_point	Vin operating point
17.	Vout p-p	3.291 µV	Op_point	Peak-to-peak output ripple voltage
18.	IC Pd	53.508 mW	Power	IC power dissipation
19.	Total Pd	53.508 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	48.0 m	Maximum Output Current
2.	Iout1	48.0 m	Output Current #1
3.	VinMax	4.4	Maximum input voltage
4.	VinMin	3.6	Minimum input voltage
5.	Vout	3.3	Output Voltage
6.	Vout1	3.3	Output Voltage #1
7.	base_pn	LP5907	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0	Ambient temperature

Design Assistance

1.

2. LP5907 Product Folder : http://www.ti.com/product/lp5907 : contains the data sheet and other resources.

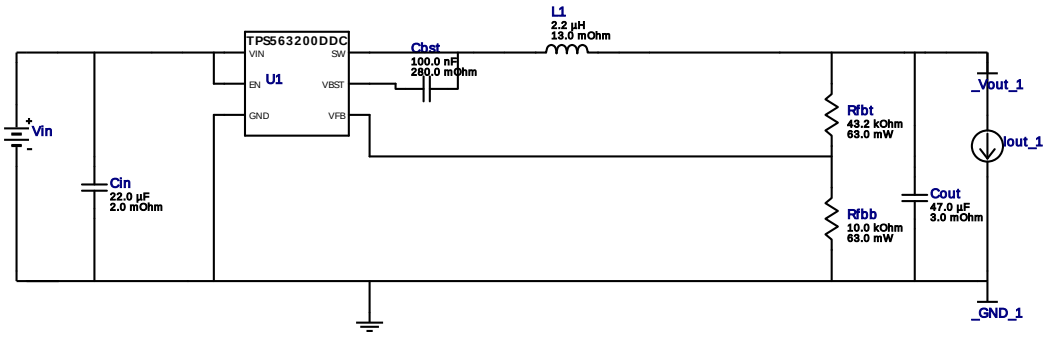
TEXAS INSTRUMENTS

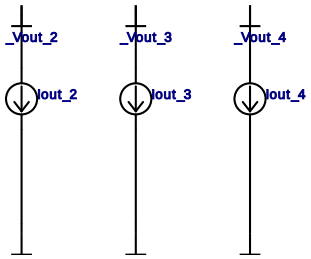
WEBENCH® Design Report

VinMin = 10.0V
VinMax = 14.0V
Vout = 4.0V
Iout = 1.52A

Device = TPS563200DDCR
Topology = Buck
Created = 7/13/15 4:53:29 AM
BOM Cost = $1.05
Footprint = 149.0 mm^2
BOM Count = 7
Total Pd = 0.44W

Design : 4425714/12 TPS563200DDCR
TPS563200DDCR 10.0V-14.0V to 4.00V @ 1.51943A

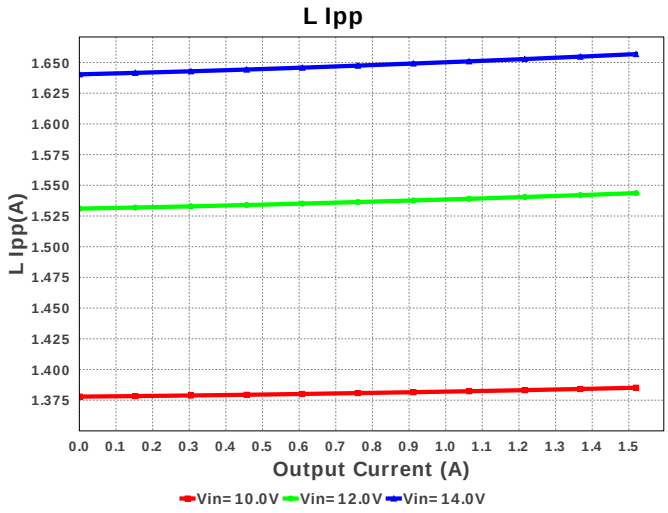


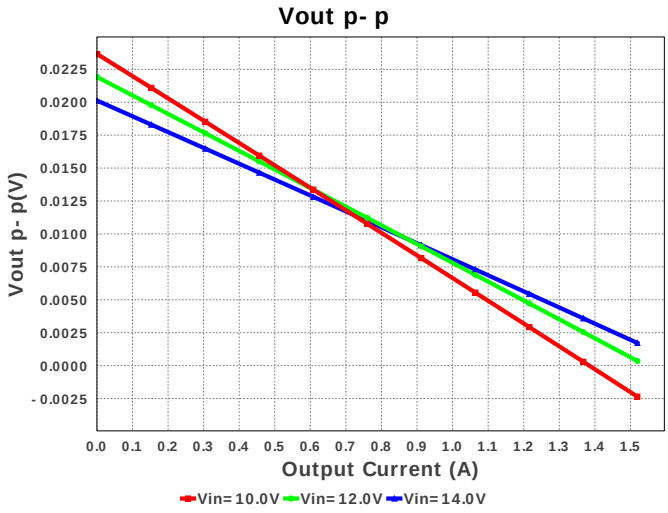


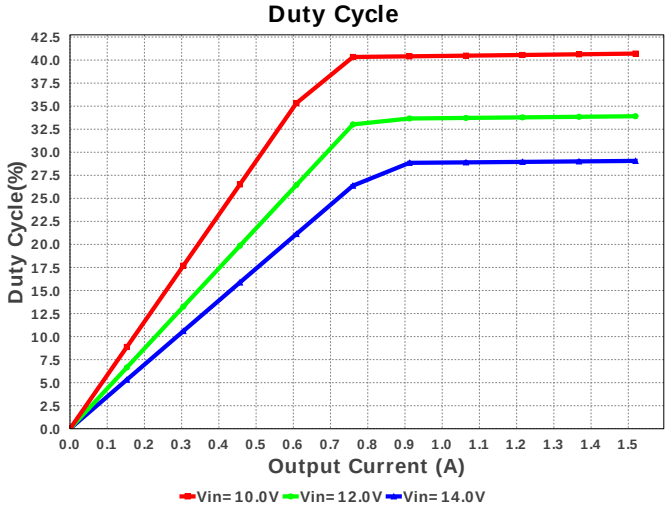
Electrical BOM

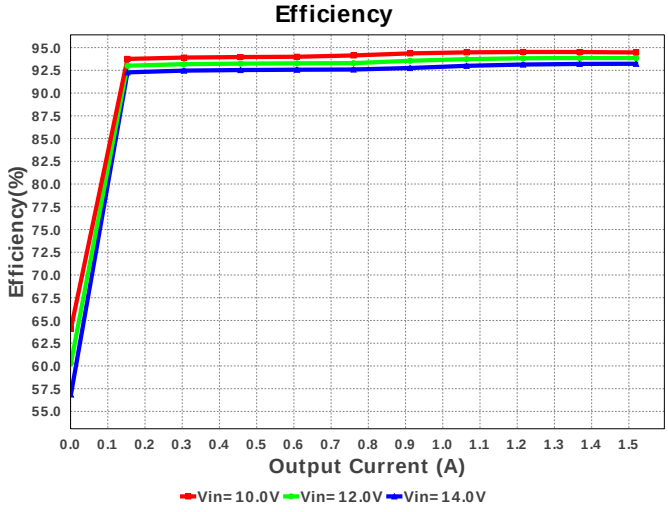
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbst	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm^2
2.	Cin	MuRata	GRM32ER61E226KE15L Series= X5R	Cap= 22.0 uF ESR= 2.0 mOhm VDC= 25.0 V IRMS= 3.67 A	1	$0.16	1210 15 mm^2
3.	Cout	MuRata	GRM31CR60J476ME19L Series= X5R	Cap= 47.0 uF ESR= 3.0 mOhm VDC= 6.3 V IRMS= 0.0 A	1	$0.12	1206 11 mm^2
4.	L1	Bourns	SRN8040-2R2Y	L= 2.2 µH DCR= 13.0 mOhm	1	$0.22	SRN8040 100 mm^2
5.	Rfbb	Vishay-Dale	CRCW040210K0FKED Series= CRCW..e3	Res= 10.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
6.	Rfbt	Vishay-Dale	CRCW040243K2FKED Series= CRCW..e3	Res= 43.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2

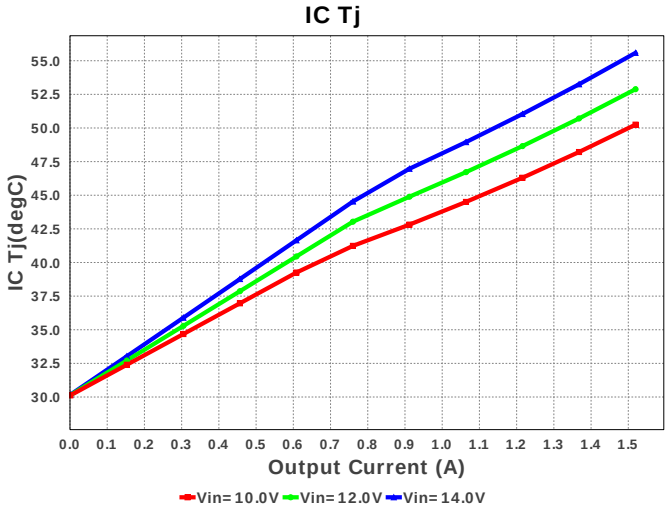
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
7.	U1	Texas Instruments	TPS563200DDCR	Switcher	1	$0.52	DDC0006A 10 mm^2

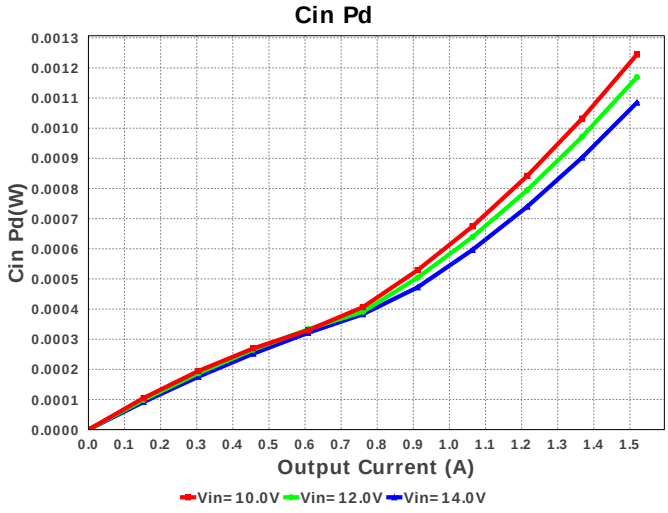




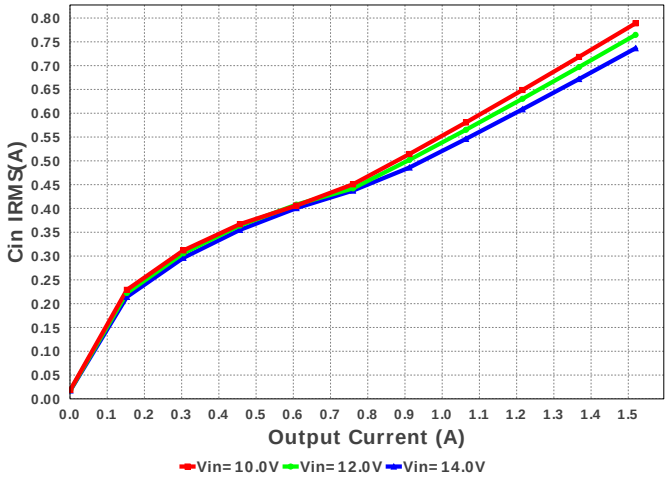




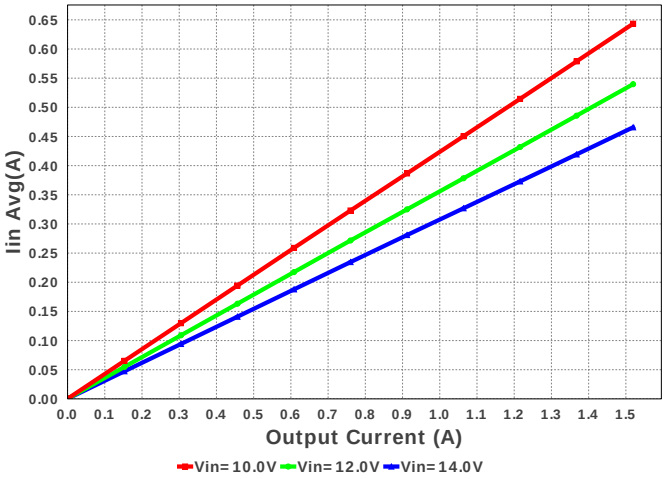




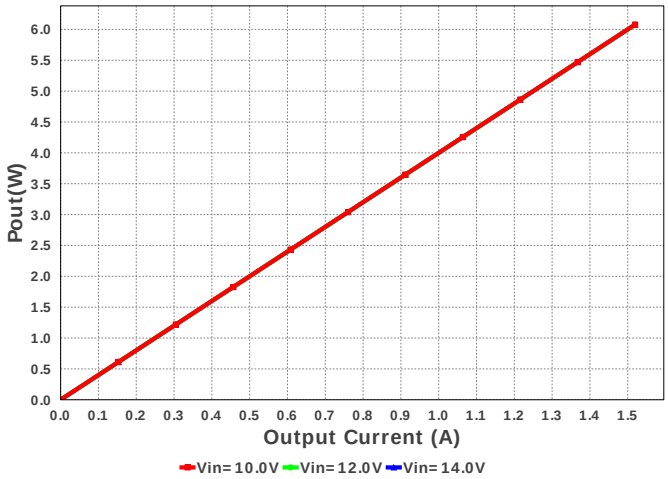
Cin IRMS



Iin Avg



Pout



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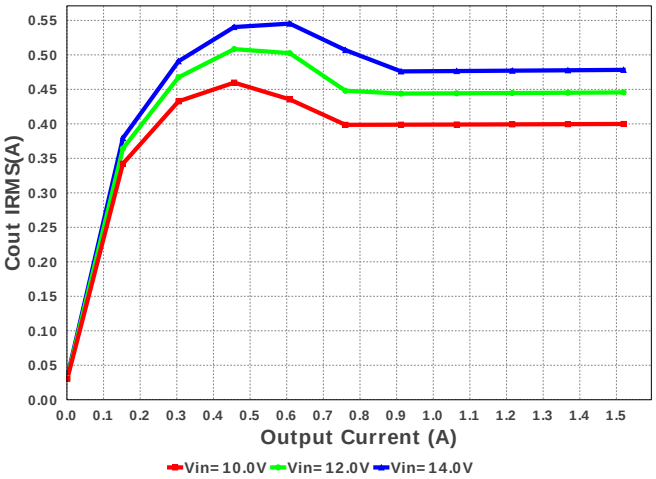
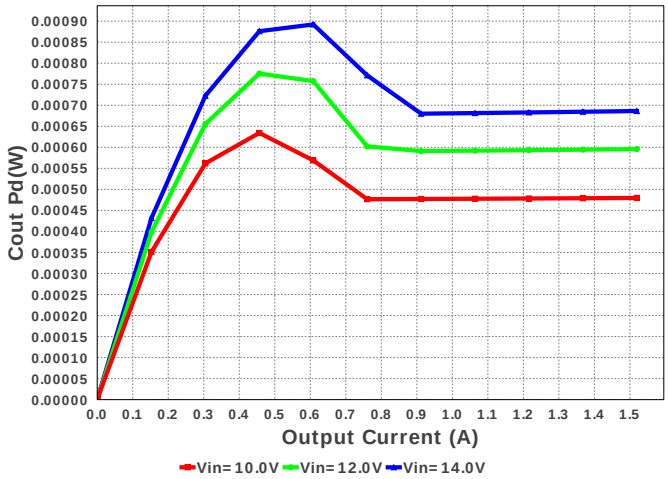
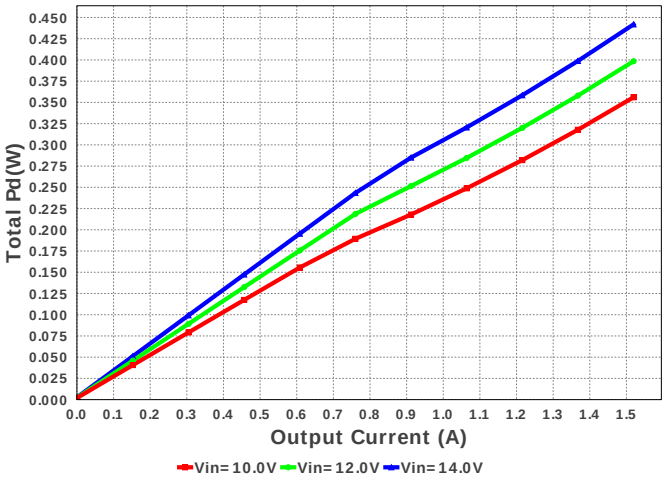
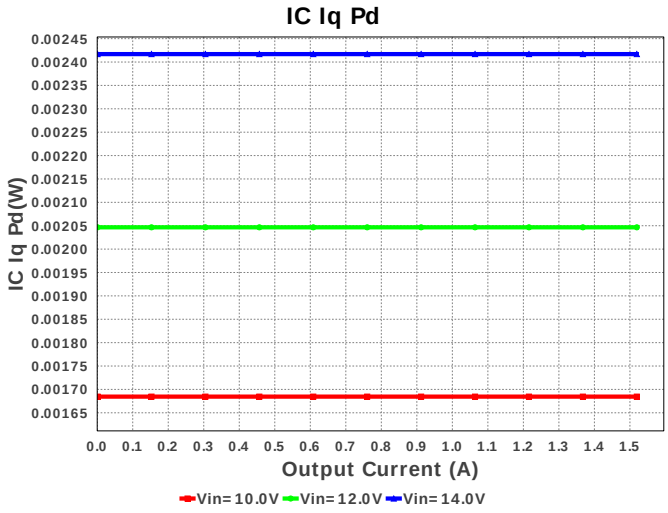


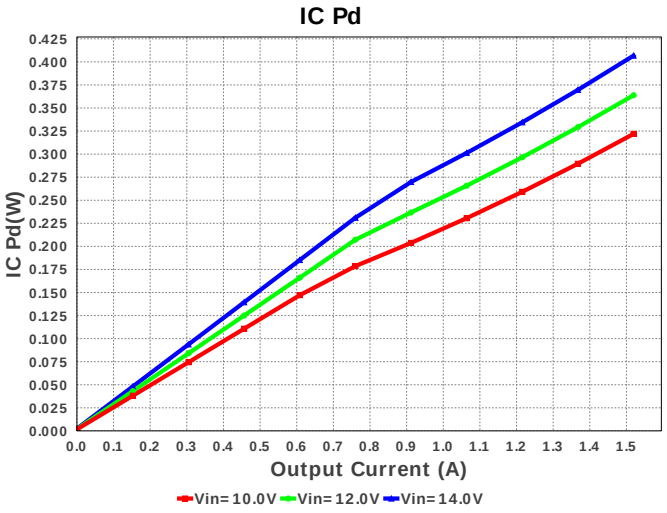
Cout Pd

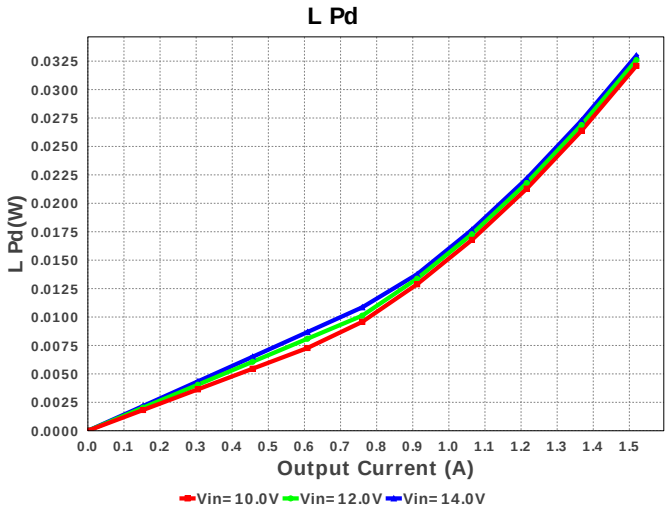


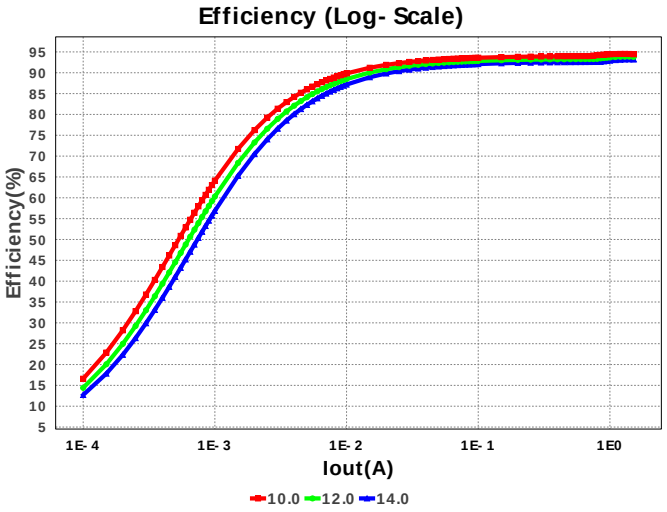
Total Pd











Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	736.509 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	478.294 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	465.68 mA	Current	Average input current
4.	L Ipp	1.657 A	Current	Peak-to-peak inductor ripple current
5.	BOM Count	7	General	Total Design BOM count
6.	FootPrint	149.0 mm^2	General	Total Foot Print Area of BOM components
7.	Frequency	790.1 kHz	General	Switching frequency
8.	Pout	6.078 W	General	Total output power
9.	Total BOM	$1.05	General	Total BOM Cost
10.	Vout OP	4.0 V	Op_Point	Operational Output Voltage
11.	Duty Cycle	29.063 %	Op_point	Duty cycle
12.	Efficiency	93.223 %	Op_point	Steady state efficiency
13.	IC Tj	55.585 degC	Op_point	IC junction temperature
14.	ICThetaJA	62.9 degC/W	Op_point	IC junction-to-ambient thermal resistance
15.	IOUT_OP	1.519 A	Op_point	Iout operating point
16.	VIN_OP	14.0 V	Op_point	Vin operating point
17.	Vout p-p	9.754 mV	Op_point	Peak-to-peak output ripple voltage
18.	Cin Pd	1.085 mW	Power	Input capacitor power dissipation
19.	Cout Pd	686.295 µW	Power	Output capacitor power dissipation
20.	IC Iq Pd	2.417 mW	Power	IC Iq Pd
21.	IC Pd	406.761 mW	Power	IC power dissipation
22.	L Pd	32.987 mW	Power	Inductor power dissipation
23.	Total Pd	441.828 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	1.519	Maximum Output Current
2.	Iout1	1.519	Output Current #1
3.	VinMax	14.0	Maximum input voltage
4.	VinMin	10.0	Minimum input voltage

#	Name	Value	Description
5.	Vout	4.0	Output Voltage
6.	Vout1	4.0	Output Voltage #1
7.	base_pn	TPS563200	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0	Ambient temperature

Design Assistance

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

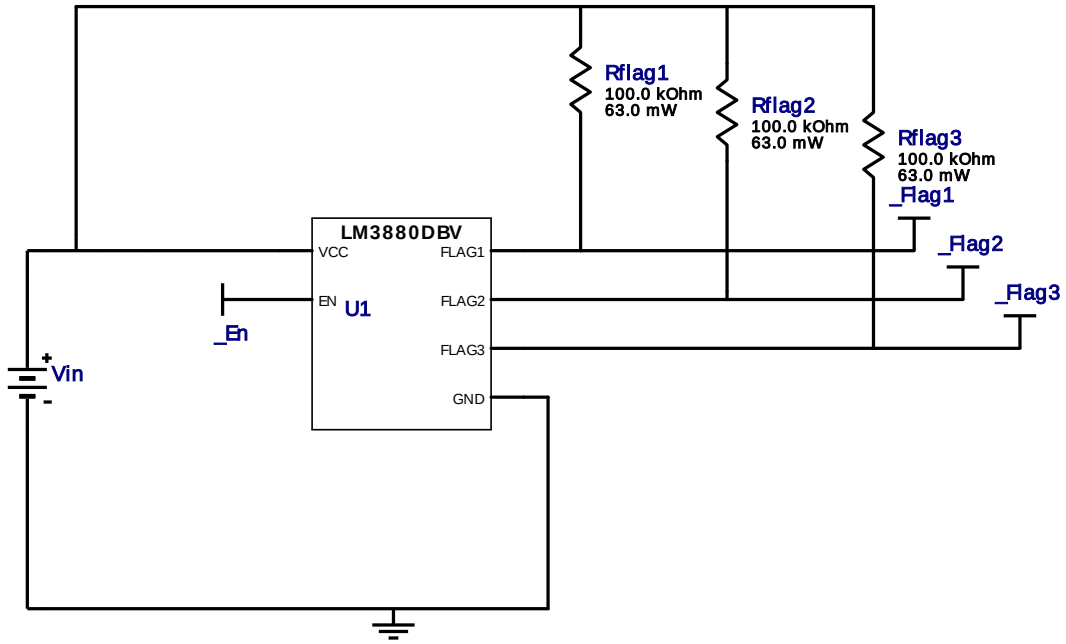
TEXAS INSTRUMENTS

WEBENCH® Design Report

VinMin = 3.3V
VinMax = 3.3V
Vout = 3.3V
Iout = 0.0A

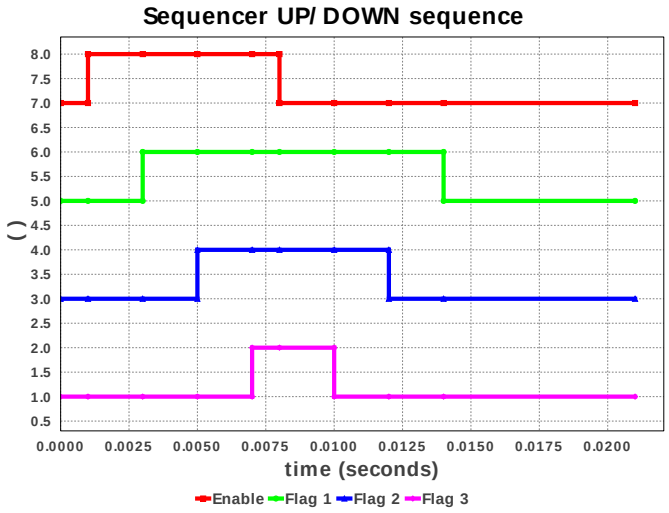
Device = LM3880MF-1AE/NOPB
Topology = SEQUENCER
Created = 7/13/15 4:53:29 AM
BOM Cost = $0.48
Footprint = 19.0 mm^2
BOM Count = 4
Total Pd = 0.0W

Design : 4425714/13 LM3880MF-1AE/NOPB
Design 13 - LM3880MF-1AE/NOPB



Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Rflag1	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
2.	Rflag2	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
3.	Rflag3	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
4.	U1	Texas Instruments	LM3880MF-1AE/NOPB	Switcher	1	$0.45	R-PDSO-G6 10 mm^2



Operating Values

#	Name	Value	Category	Description
1.	BOM Count	4	General	Total Design BOM count
2.	FootPrint	19.0 mm^2	General	Total Foot Print Area of BOM components
3.	Total BOM	$0.48	General	Total BOM Cost
4.	Total Pd	82.5 µW	Power	Total Power Dissipation
5.	Flag Voltage	3.3 V	Unknown	Flag Voltage
6.	Flag1 Down delay (From EN high to low)	6.0 ms	Unknown	Flag Delay
7.	Flag1 Up delay (From EN low to high)	2.0 ms	Unknown	Flag Delay
8.	Flag2 Down delay (From EN high to low)	4.0 ms	Unknown	Flag Delay
9.	Flag2 Up delay (From EN low to high)	4.0 ms	Unknown	Flag Delay
10.	Flag3 Down delay (From EN high to low)	2.0 ms	Unknown	Flag Delay
11.	Flag3 Up delay (From EN low to high)	6.0 ms	Unknown	Flag Delay
12.	Flags Used	3.0	Unknown	Flags Used
13.	Total Flags	3.0	Unknown	Total Flags
14.	Vcc	3.3 V	Unknown	Vcc

Design Inputs

#	Name	Value	Description
1.	Iout	1.0 µ	Maximum Output Current
2.	Iout1	1.0 µ	Output Current #1
3.	VinMax	3.3	Maximum input voltage
4.	VinMin	3.3	Minimum input voltage
5.	Vout	3.3	Output Voltage
6.	Vout1	3.3	Output Voltage #1
7.	base_pn	LM3880	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0	Ambient temperature

Design Assistance

1. LM3880 Product Folder : http://www.ti.com/product/LM3880 : contains the data sheet and other resources.

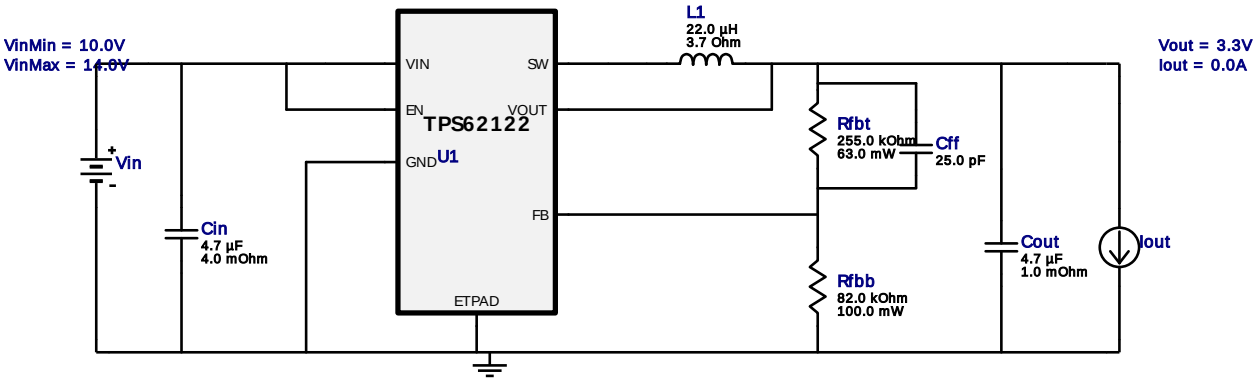
TEXAS INSTRUMENTS

WEBENCH® Design Report

VinMin = 10.0V
VinMax = 14.0V
Vout = 3.3V
Iout = 0.0A

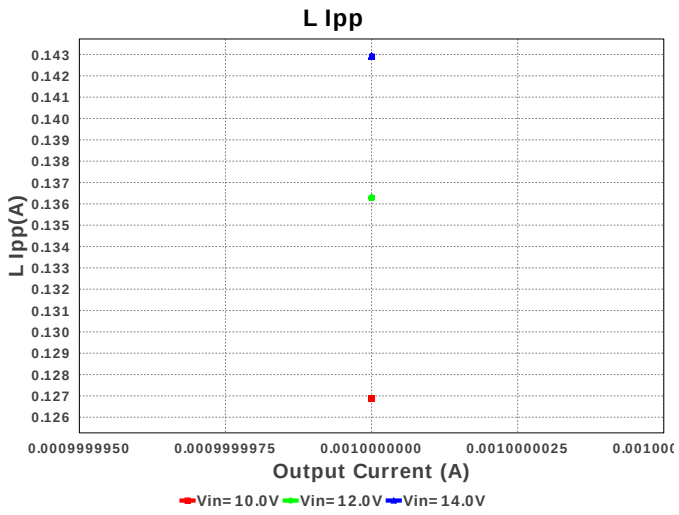
Device = TPS62122DRVR
Topology = Buck
Created = 7/13/15 4:53:29 AM
BOM Cost = $0.72
Footprint = 45.0 mm²
BOM Count = 7
Total Pd = 0.0W

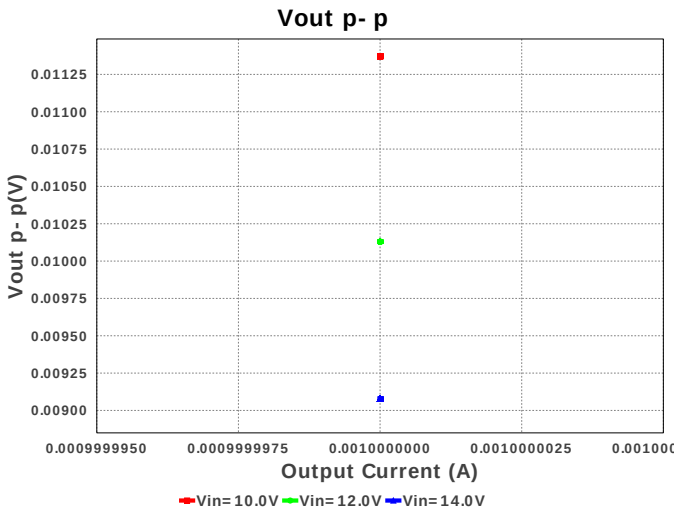
Design : 4425714/14 TPS62122DRVR
TPS62122DRVR 10.0V-14.0V to 3.30V @ 0.001A

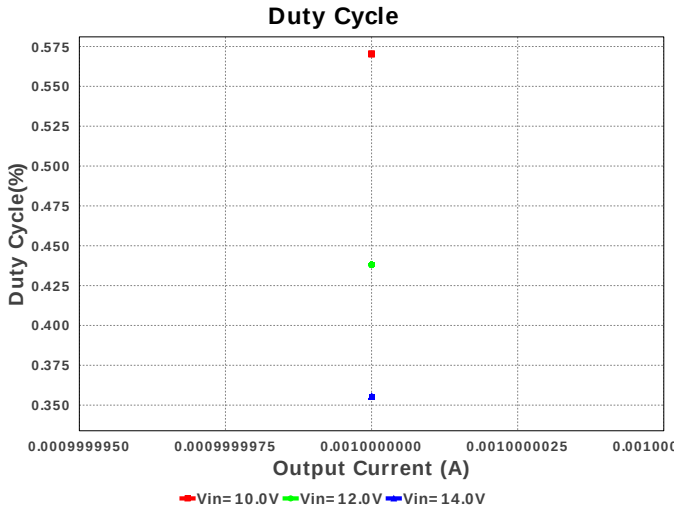


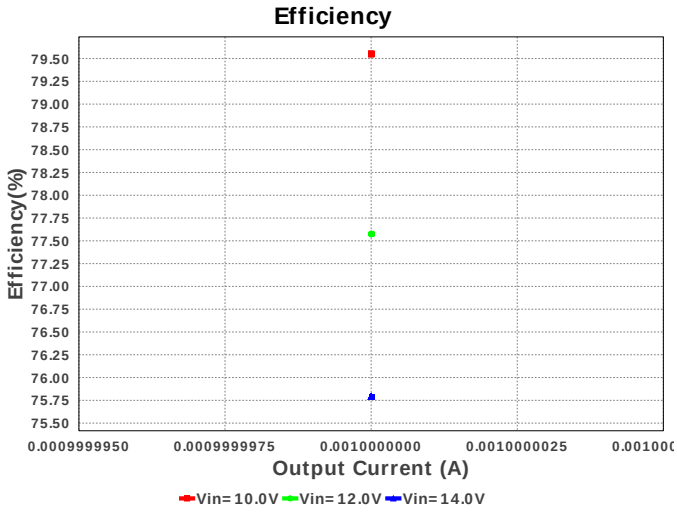
Electrical BOM

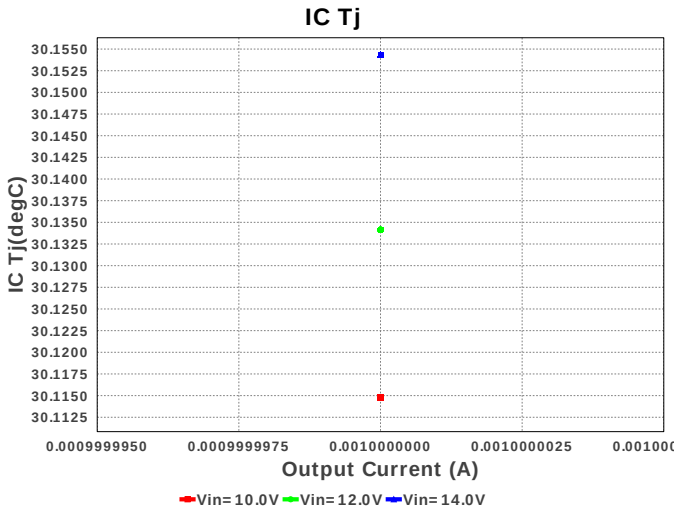
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cff	Samsung Electro-Mechanics	CL21C250JBANNNC Series= C0G/NP0	Cap= 25.0 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
2.	Cin	MuRata	GRM21BR61E475KA12L Series= X5R	Cap= 4.7 uF ESR= 4.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	$0.03	0805 7 mm²
3.	Cout	MuRata	GRM188R60J475ME19D Series= X5R	Cap= 4.7 uF ESR= 1.0 mOhm VDC= 6.3 V IRMS= 0.0 A	1	$0.02	0603 5 mm²
4.	L1	Taiyo Yuden	CBC2012T220M	L= 22.0 µH DCR= 3.7 Ohm	1	$0.08	CBC2012 8 mm²
5.	Rfbb	Susumu Co Ltd	RR1220P-823-D Series= RR12	Res= 82.0 kOhm Power= 100.0 mW Tolerance= 0.5%	1	$0.01	0805 7 mm²
6.	Rfbt	Vishay-Dale	CRCW0402255KFKED Series= CRCW..e3	Res= 255.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
7.	U1	Texas Instruments	TPS62122DRVR	Switcher	1	$0.56	S-PWSON-N6 9 mm²

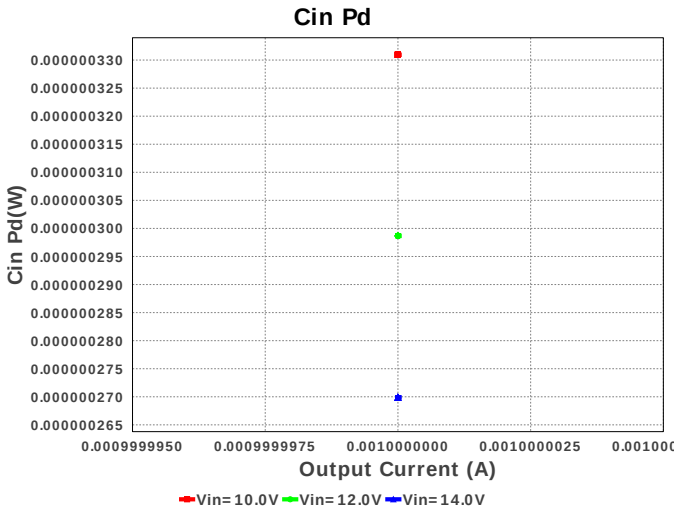


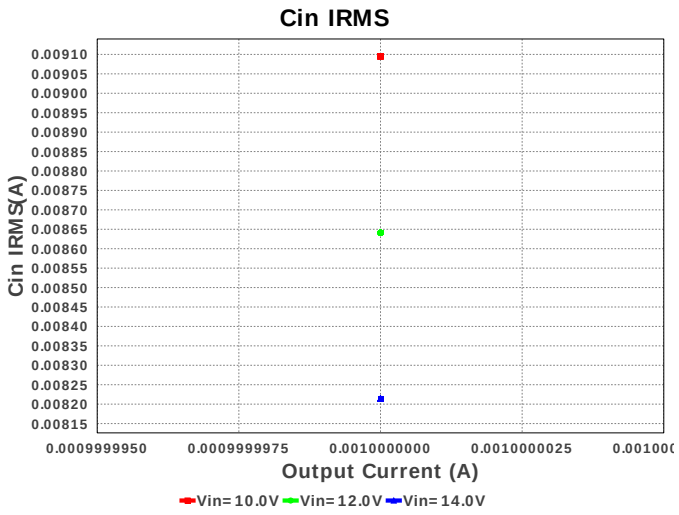


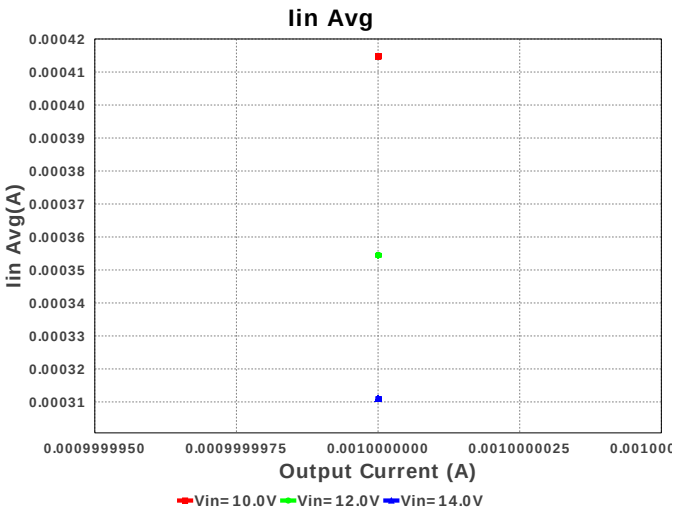


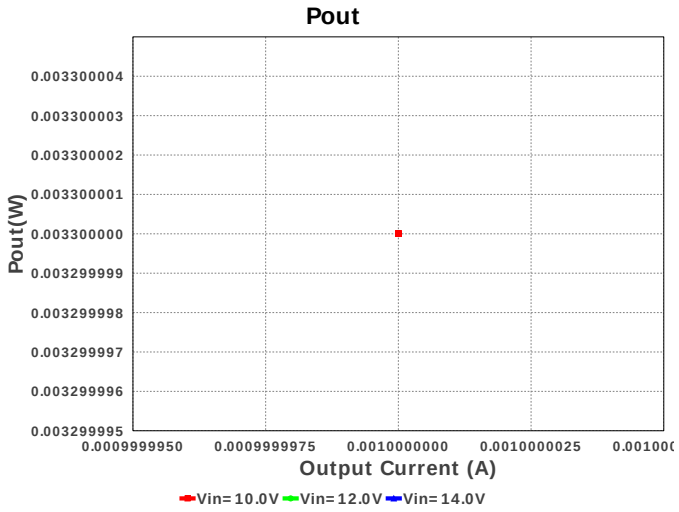


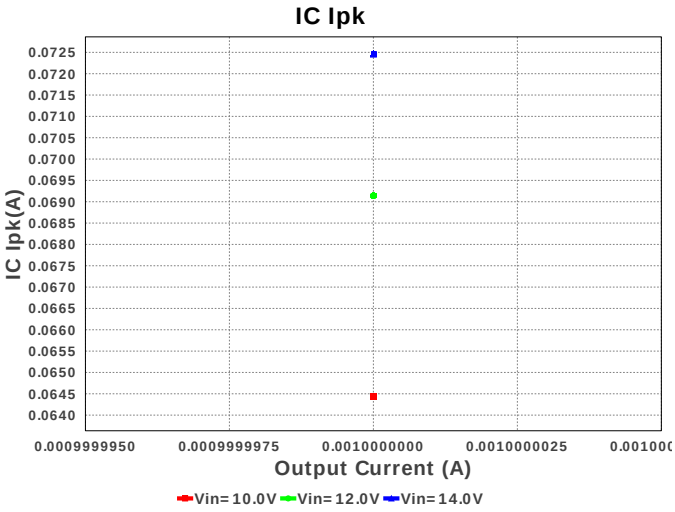


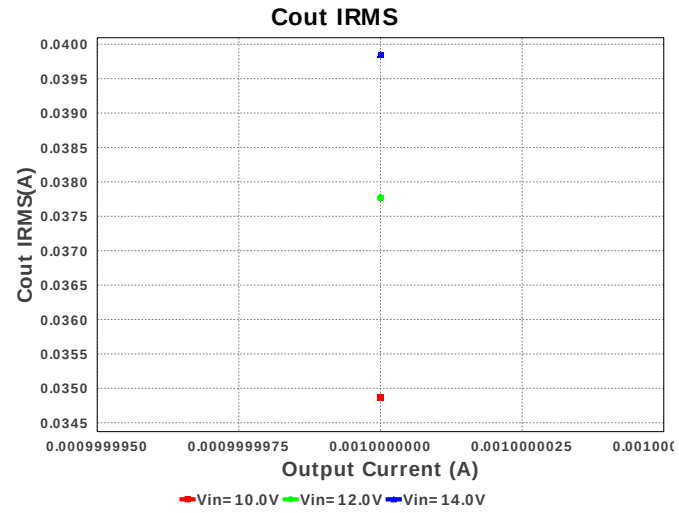


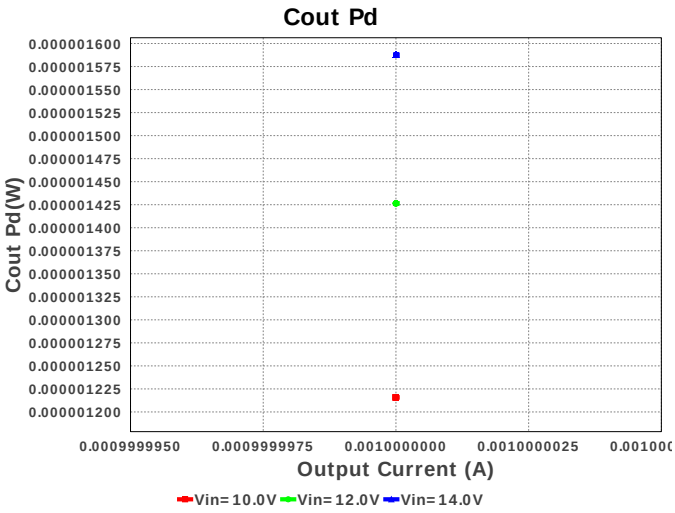


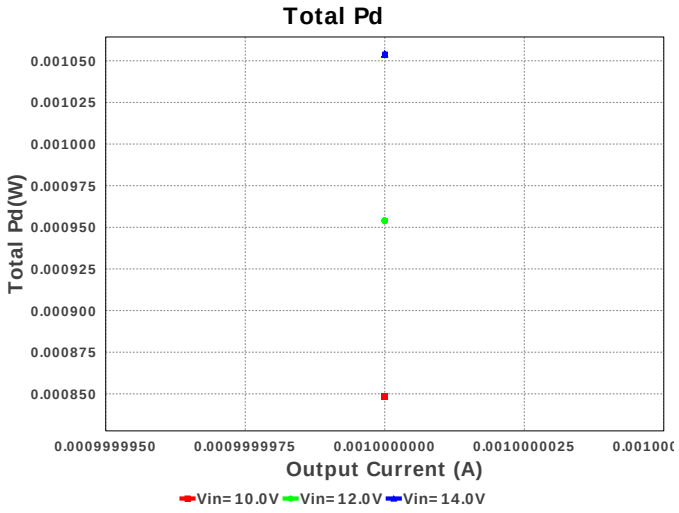


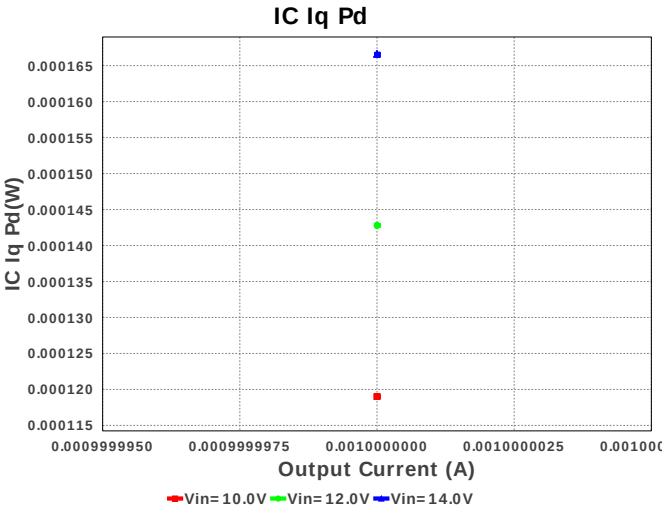


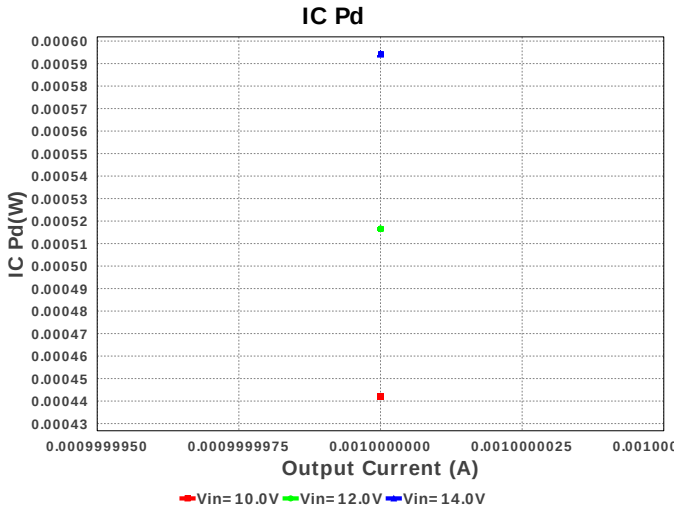


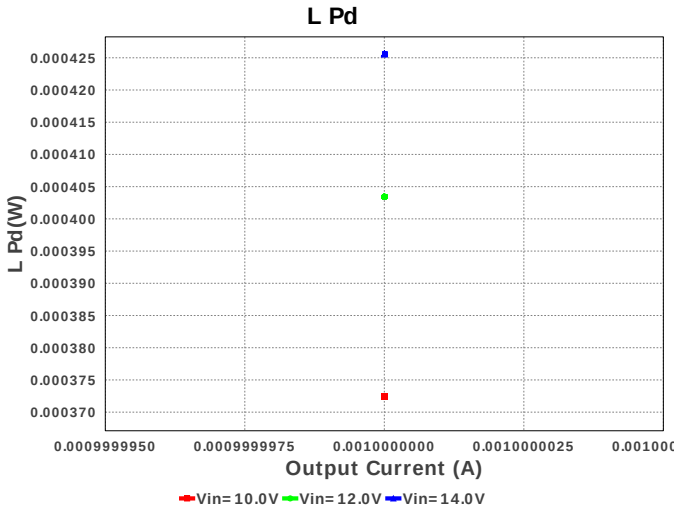


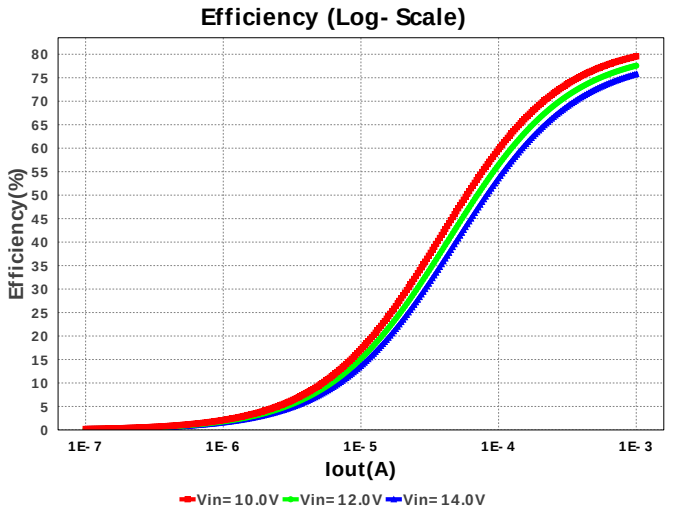












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	8.214 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	39.845 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	72.462 mA	Current	Peak switch current in IC
4.	Iin Avg	311.0 µA	Current	Average input current
5.	L Ipp	142.92 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	7	General	Total Design BOM count
7.	FootPrint	45.0 mm^2	General	Total Foot Print Area of BOM components
8.	Frequency	12.095 kHz	General	Switching frequency
9.	Pout	3.3 mW	General	Total output power
10.	Total BOM	$0.72	General	Total BOM Cost
11.	Vout OP	3.3 V	Op_Point	Operational Output Voltage

#	Name	Value	Category	Description
12.	Duty Cycle	355.416 m%	Op_point	Duty cycle
13.	Efficiency	75.792 %	Op_point	Steady state efficiency
14.	IC Tj	30.154 degC	Op_point	IC junction temperature
15.	ICThetaJA	259.7 degC/W	Op_point	IC junction-to-ambient thermal resistance
16.	IOUT_OP	1.0 mA	Op_point	Iout operating point
17.	VIN_OP	14.0 V	Op_point	Vin operating point
18.	Vout p-p	9.079 mV	Op_point	Peak-to-peak output ripple voltage
19.	Cin Pd	269.892 nW	Power	Input capacitor power dissipation
20.	Cout Pd	1.588 µW	Power	Output capacitor power dissipation
21.	IC Iq Pd	166.6 µW	Power	IC Iq Pd
22.	IC Pd	594.262 µW	Power	IC power dissipation
23.	L Pd	425.589 µW	Power	Inductor power dissipation
24.	Total Pd	1.054 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	1.0 m	Maximum Output Current
2.	Iout1	1.0 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	TPS62122	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0	Ambient temperature

Design Assistance

1. TPS62122 Product Folder : http://www.ti.com/product/TPS62122 : contains the data sheet and other resources.

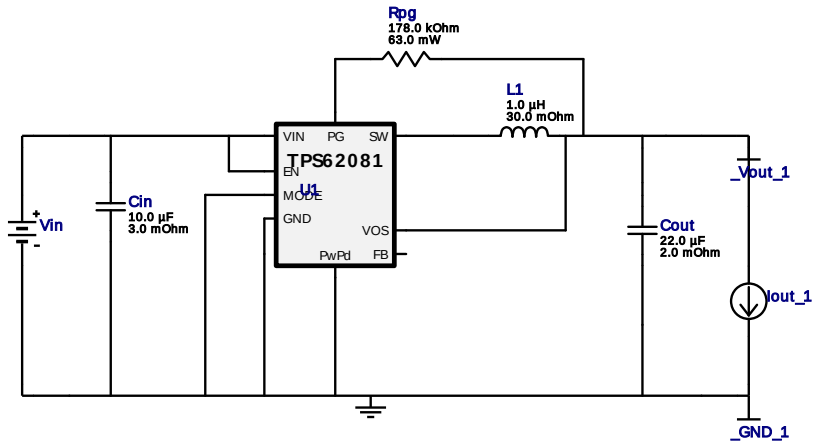
TEXAS INSTRUMENTS

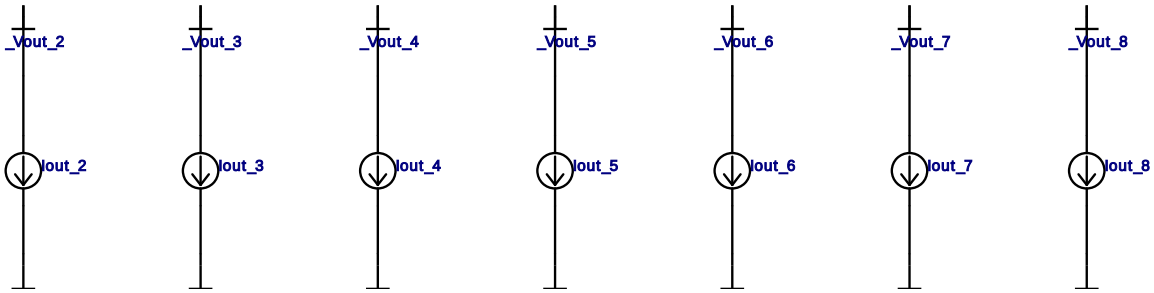
WEBENCH® Design Report

VinMin = 3.6V
VinMax = 4.4V
Vout = 1.8V
Iout = 1.05A

Device = TPS62081DSGR
Topology = Buck
Created = 7/13/15 4:53:27 AM
BOM Cost = $1.16
Footprint = 40.0 mm²
BOM Count = 5
Total Pd = 0.3W

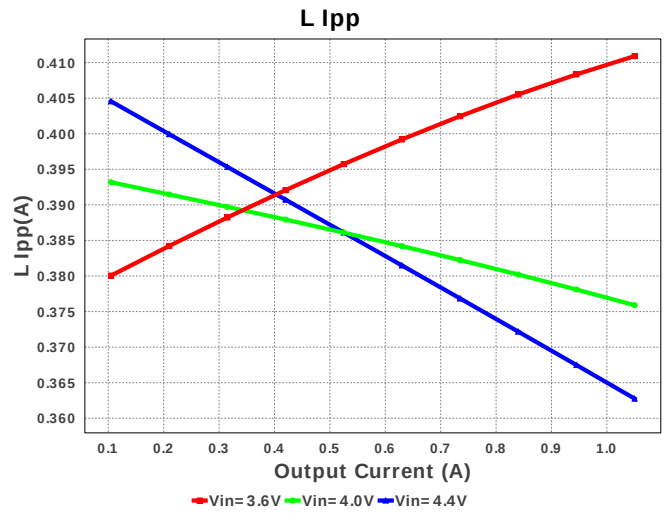
Design : 4425714/8 TPS62081DSGR
TPS62081DSGR 3.6V-4.4V to 1.80V @ 1.05A

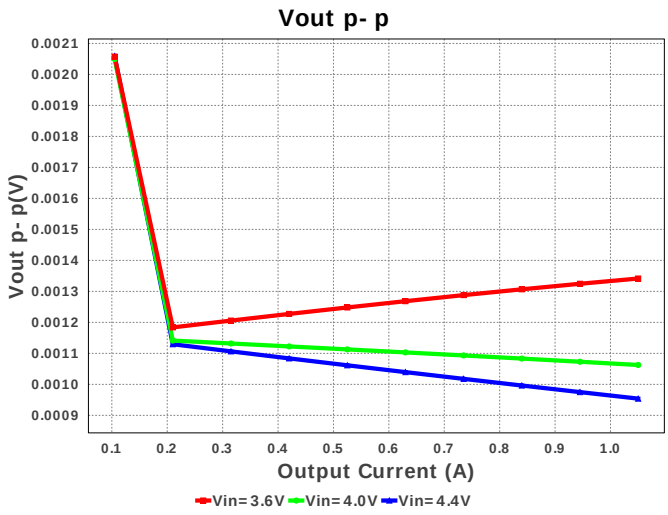


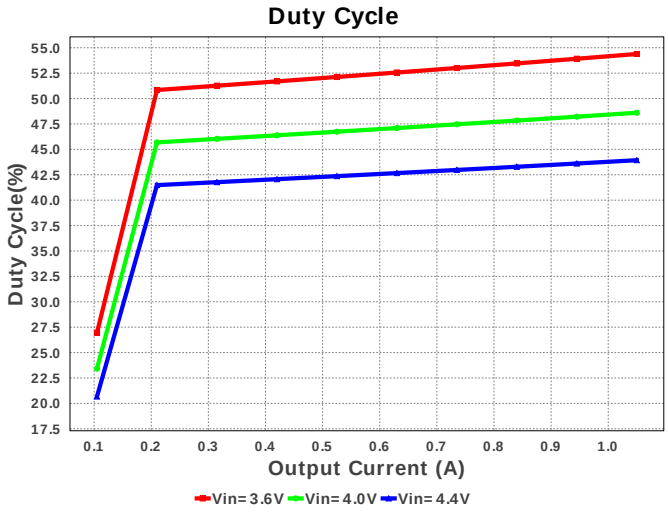


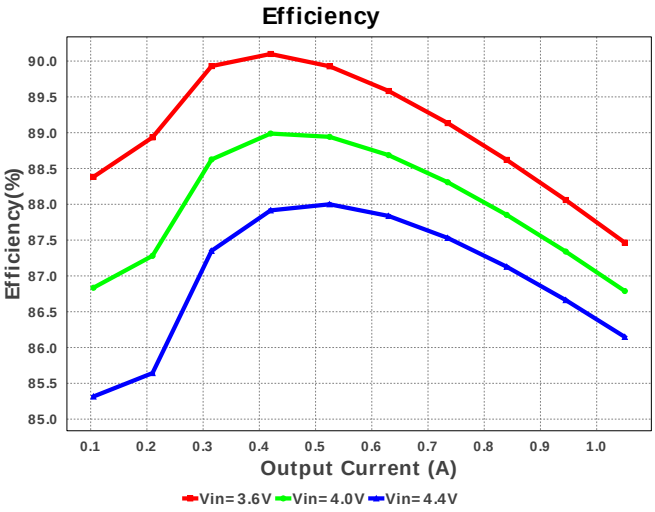
Electrical BOM

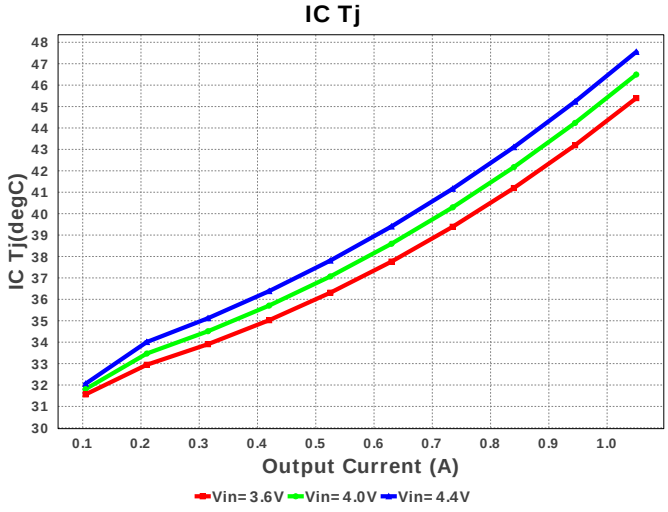
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM219R60J106KE19D Series= X5R	Cap= 10.0 uF ESR= 3.0 mOhm VDC= 6.3 V IRMS= 0.0 A	1	$0.02	0805 7 mm²
2.	Cout	Taiyo Yuden	JMK212BJ226KG-T Series= X5R	Cap= 22.0 uF ESR= 2.0 mOhm VDC= 6.3 V IRMS= 0.0 A	1	$0.13	0805 7 mm²
3.	L1	Coilcraft	PFL3215-102MEB	L= 1.0 µH DCR= 30.0 mOhm	1	$0.25	PFL3215 14 mm²
4.	Rpg	Vishay-Dale	CRCW0402178KFKED Series= CRCW..e3	Res= 178.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
5.	U1	Texas Instruments	TPS62081DSGR	Switcher	1	$0.75	S-PWSON-N8 10 mm²

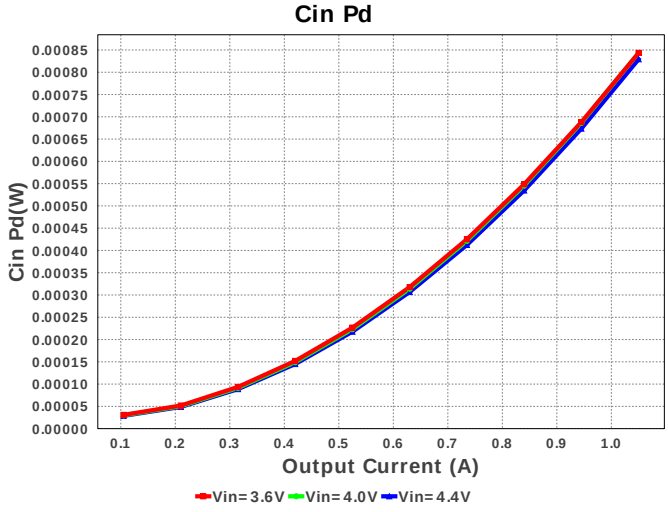


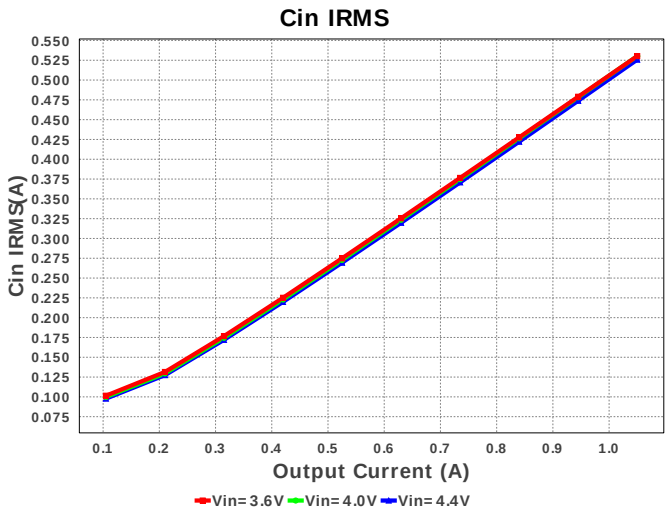


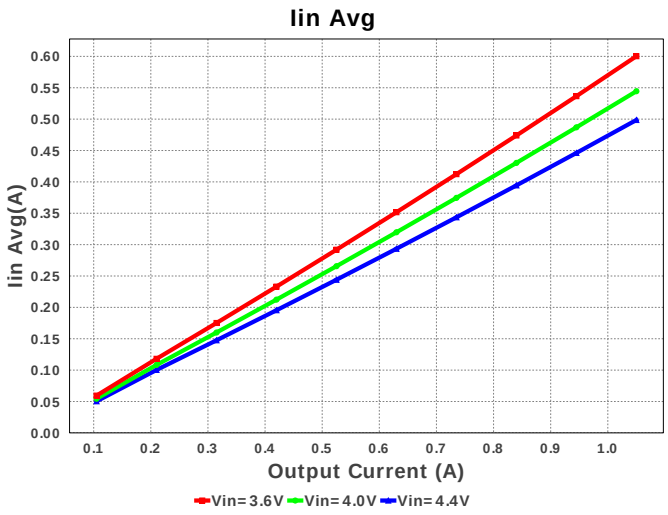


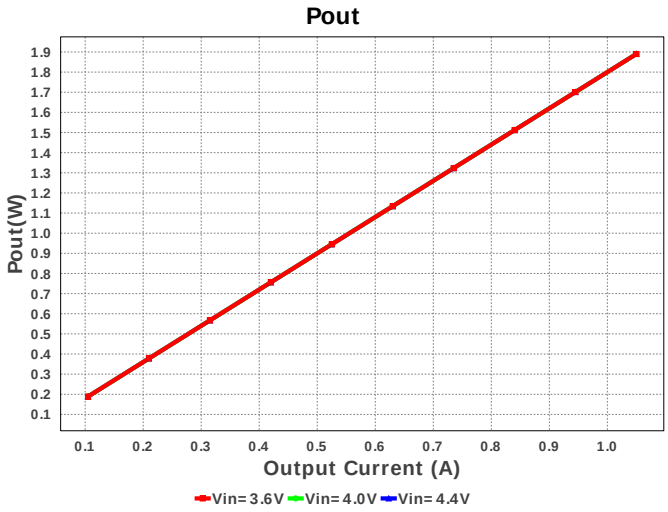


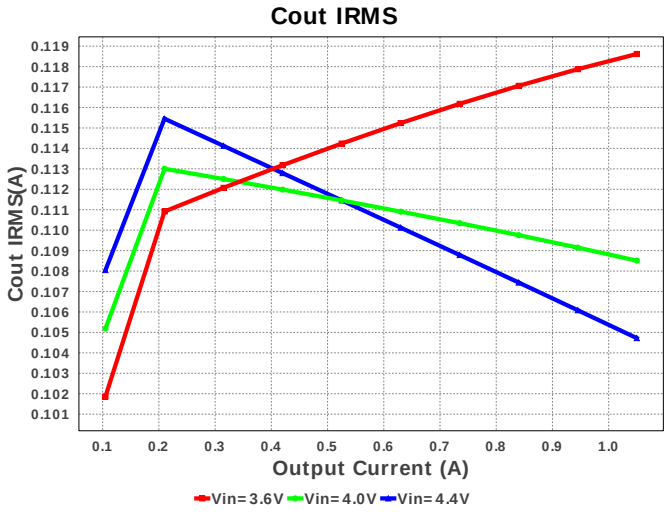


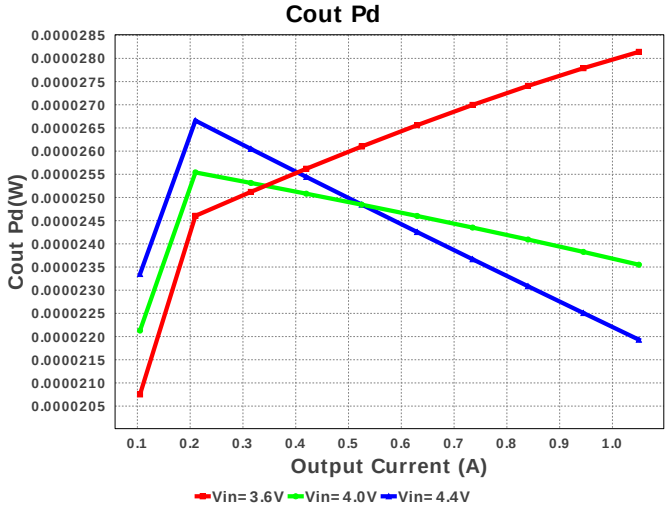


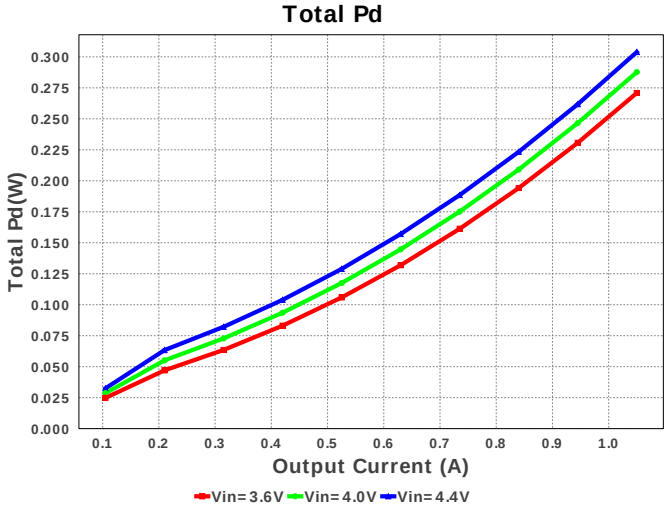


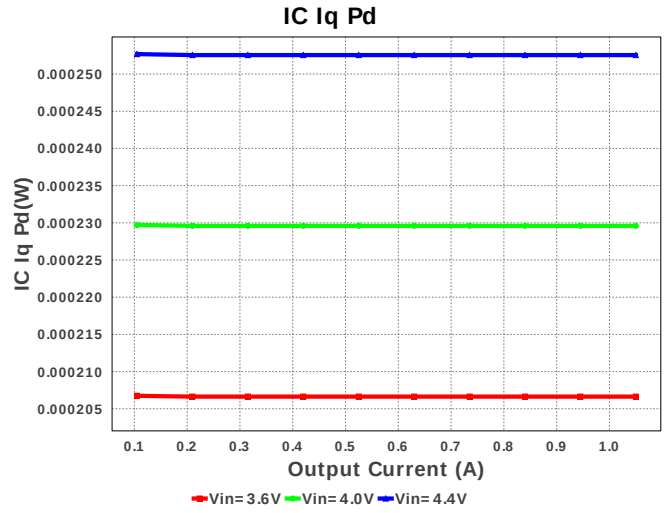


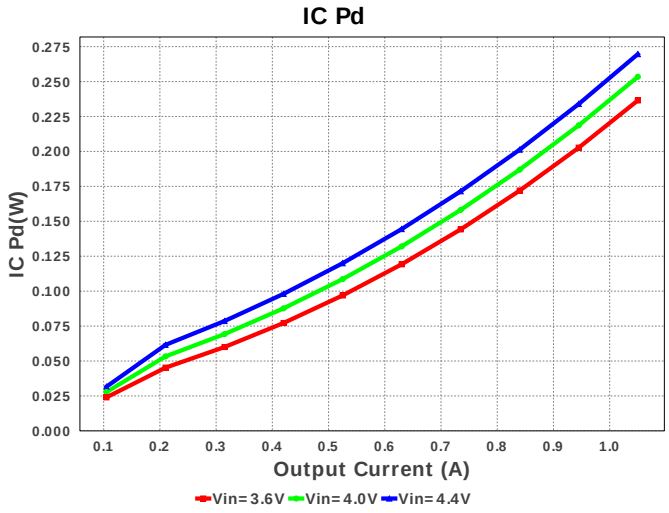


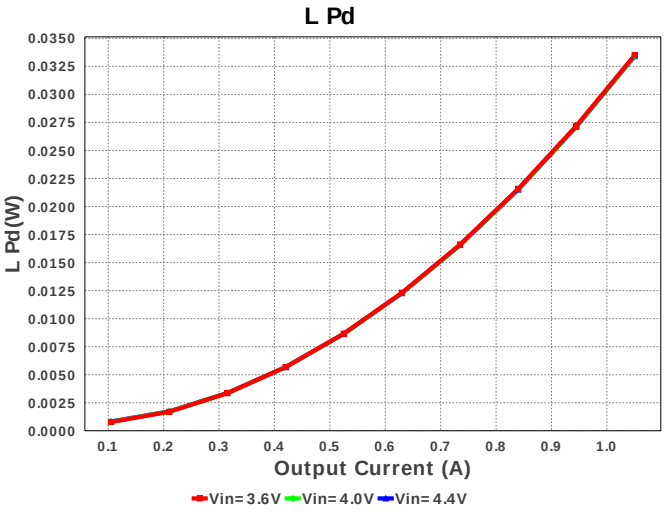


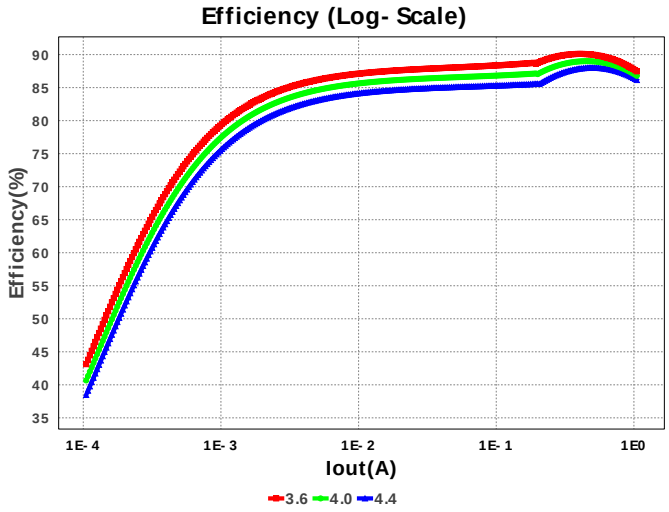












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	525.723 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	104.721 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	498.61 mA	Current	Average input current
4.	L Ipp	362.76 mA	Current	Peak-to-peak inductor ripple current
5.	BOM Count	5	General	Total Design BOM count
6.	FootPrint	40.0 mm^2	General	Total Foot Print Area of BOM components
7.	Frequency	2.808 MHz	General	Switching frequency
8.	IC Tolerance	25.0 mV	General	IC Feedback Tolerance
9.	Pout	1.89 W	General	Total output power
10.	Total BOM	$1.16	General	Total BOM Cost
11.	Vout OP	1.8 V	Op_Point	Operational Output Voltage
12.	Duty Cycle	43.933 %	Op_point	Duty cycle
13.	Efficiency	86.148 %	Op_point	Steady state efficiency
14.	IC Tj	47.553 degC	Op_point	IC junction temperature
15.	ICThetaJA	65.1 degC/W	Op_point	IC junction-to-ambient thermal resistance
16.	IOUT_OP	1.05 A	Op_point	Iout operating point
17.	VIN_OP	4.4 V	Op_point	Vin operating point
18.	Vout p-p	915.956 µV	Op_point	Peak-to-peak output ripple voltage
19.	Cin Pd	829.152 µW	Power	Input capacitor power dissipation
20.	Cout Pd	21.933 µW	Power	Output capacitor power dissipation
21.	IC Iq Pd	252.551 µW	Power	IC Iq Pd
22.	IC Pd	269.633 mW	Power	IC power dissipation
23.	L Pd	33.404 mW	Power	Inductor power dissipation
24.	Total Pd	303.897 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	1.05	Maximum Output Current
2.	Iout1	1.05	Output Current #1
3.	VinMax	4.4	Maximum input voltage

#	Name	Value	Description
4.	VinMin	3.6	Minimum input voltage
5.	Vout	1.8	Output Voltage
6.	Vout1	1.8	Output Voltage #1
7.	base_pn	TPS62081	Texas Instruments Base Part Number
8.	source	DC	Input Source Type
9.	ta	30.0	Ambient temperature

Design Assistance

1. TPS62081 Product Folder : http://www.ti.com/product/TPS62081 : contains the data sheet and other resources.

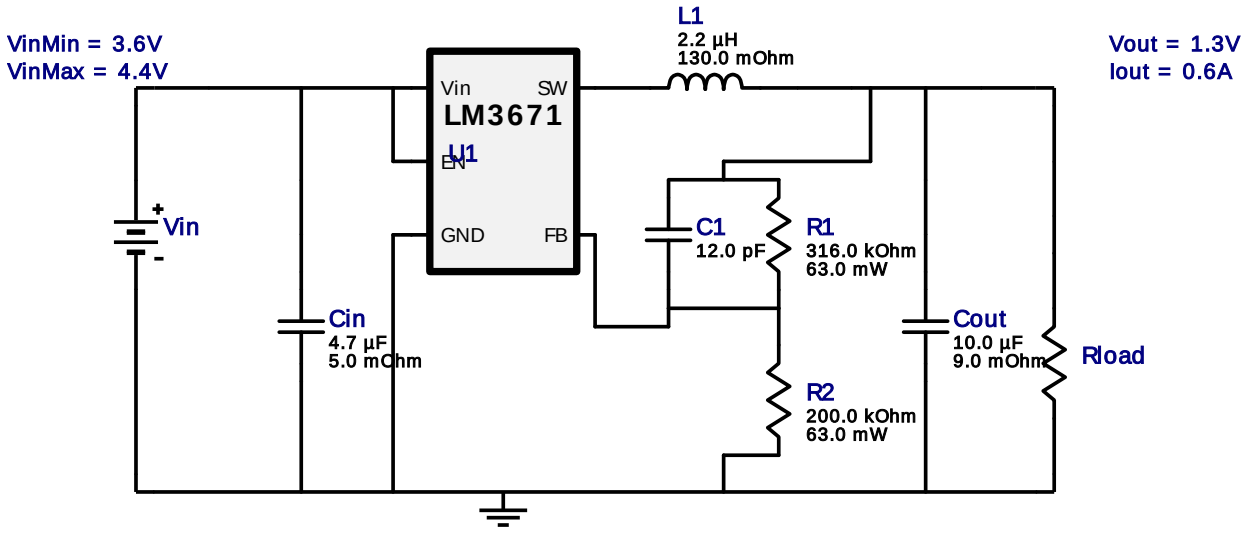
TEXAS INSTRUMENTS

WEBENCH® Design Report

VinMin = 3.6V
VinMax = 4.4V
Vout = 1.3V
Iout = 0.6A

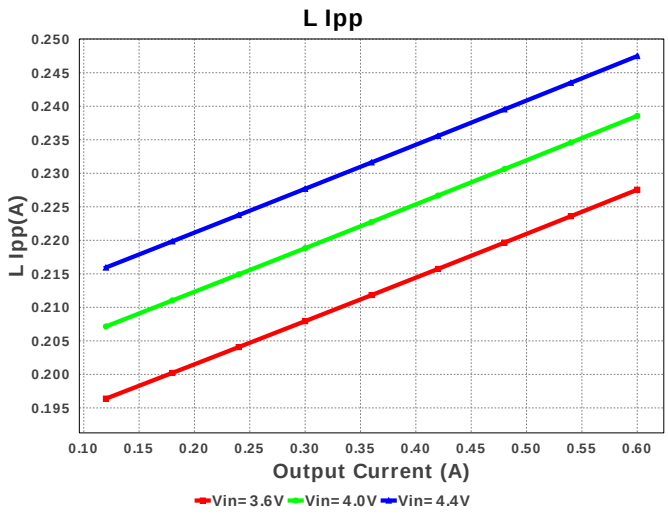
Device = LM3671TLX-ADJ/NOPB
Topology = Buck
Created = 7/13/15 4:53:27 AM
BOM Cost = $0.48
Footprint = 40.0 mm²
BOM Count = 7
Total Pd = 0.18W

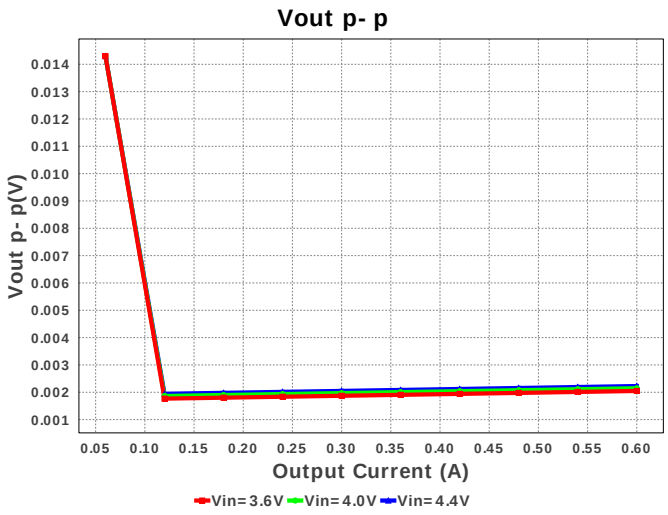
Design : 4425714/9 LM3671TLX-ADJ/NOPB
LM3671TLX-ADJ/NOPB 3.6V-4.4V to 1.30V @ 0.6A

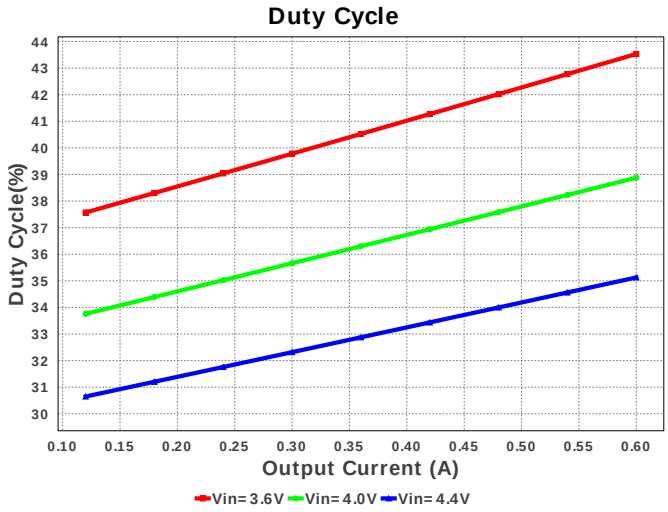


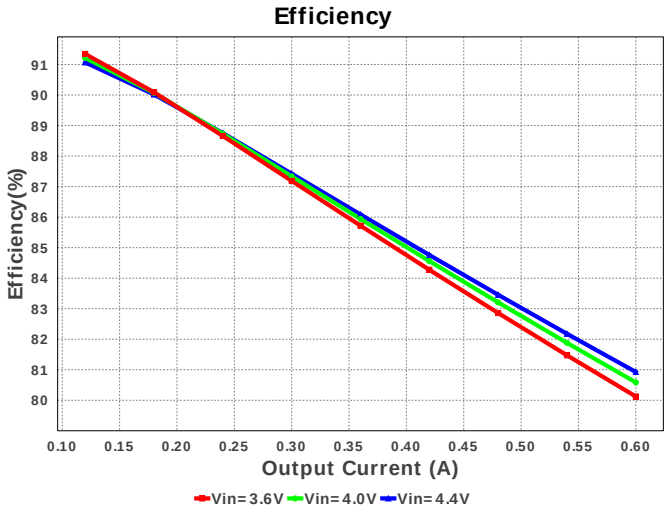
Electrical BOM

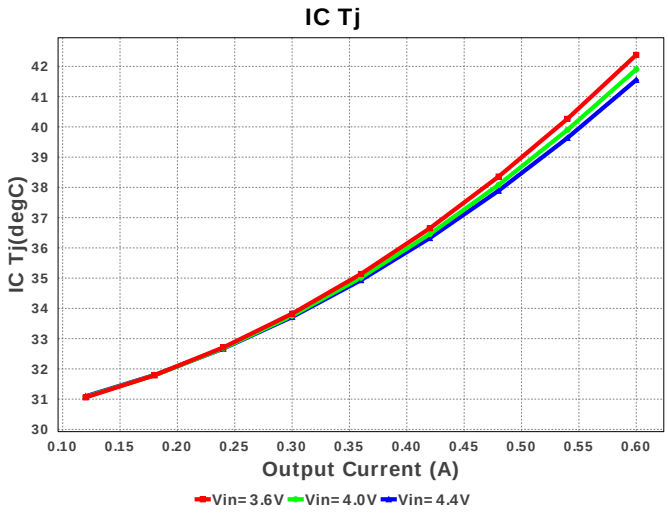
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	C1	Yageo America	CC0805JRNPO9BN120 Series= C0G/NP0	Cap= 12.0 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
2.	Cin	MuRata	GRM188R60J475KE19D Series= X5R	Cap= 4.7 uF ESR= 5.0 mOhm VDC= 6.3 V IRMS= 2.0 A	1	$0.02	0603 5 mm²
3.	Cout	MuRata	GRM188R60J106ME47D Series= X5R	Cap= 10.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 2.74 A	1	$0.03	0603 5 mm²
4.	L1	TDK	NLCV32T-2R2M-PF	L= 2.2 µH DCR= 130.0 mOhm	1	$0.10	NLCV32 13 mm²
5.	R1	Vishay-Dale	CRCW0402316KFKED Series= CRCW..e3	Res= 316.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
6.	R2	Vishay-Dale	CRCW0402200KFKED Series= CRCW..e3	Res= 200.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
7.	U1	Texas Instruments	LM3671TLX-ADJ/NOPB	Switcher	1	$0.30	TLA05CBA 5 mm²

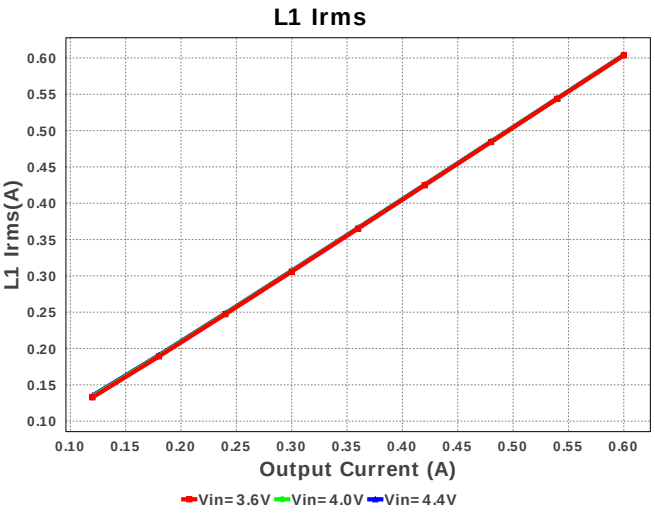


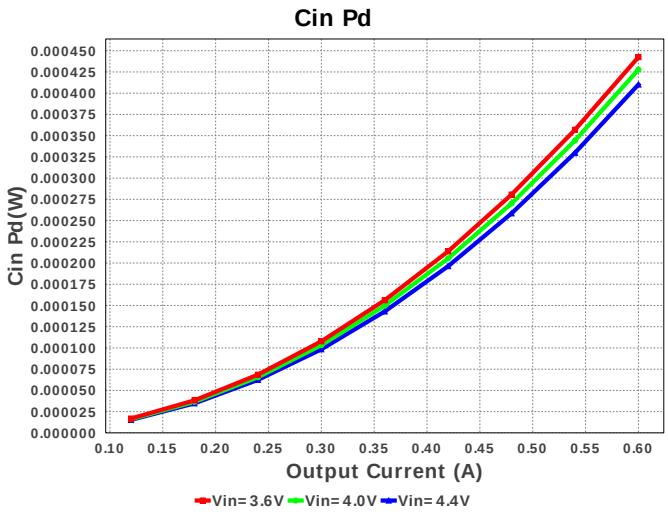


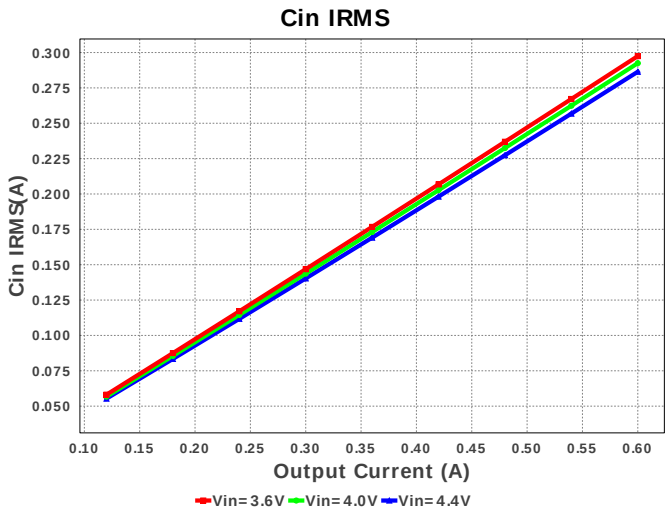


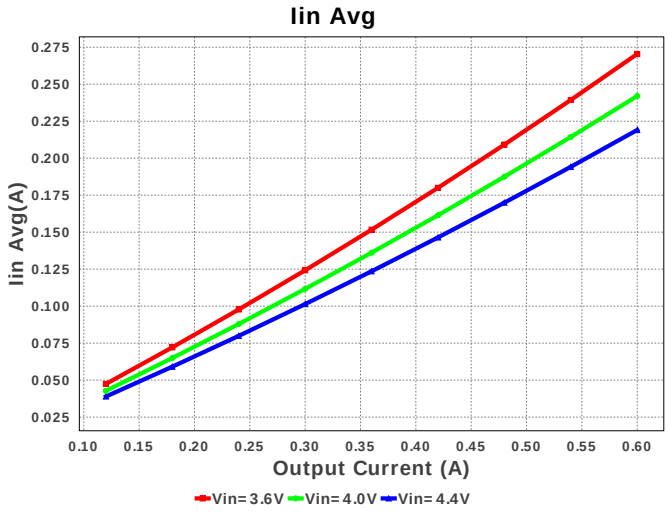


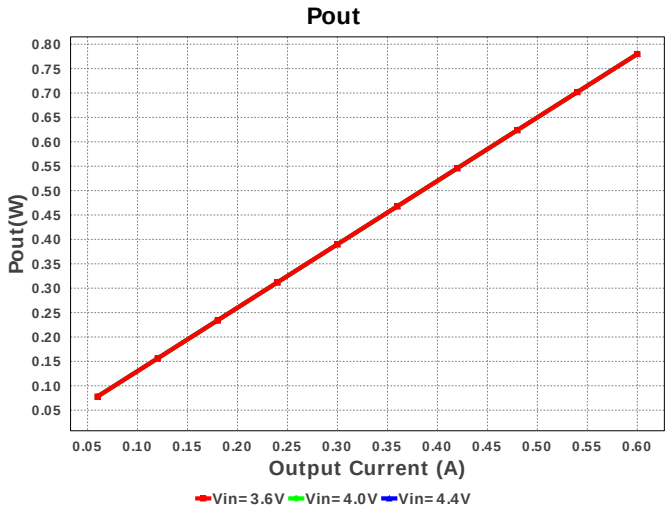


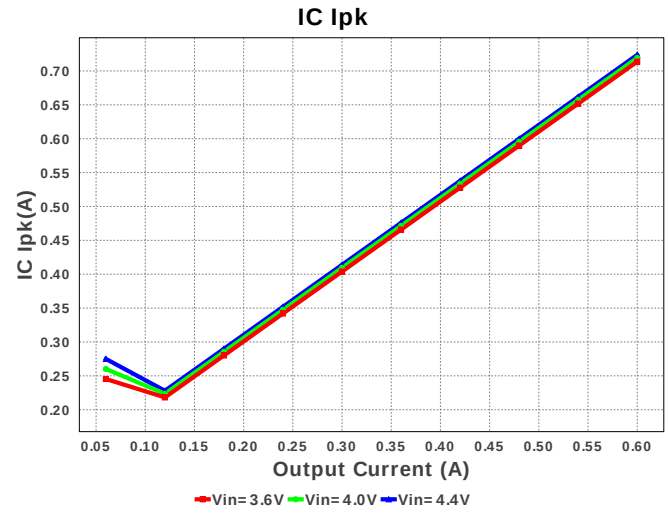


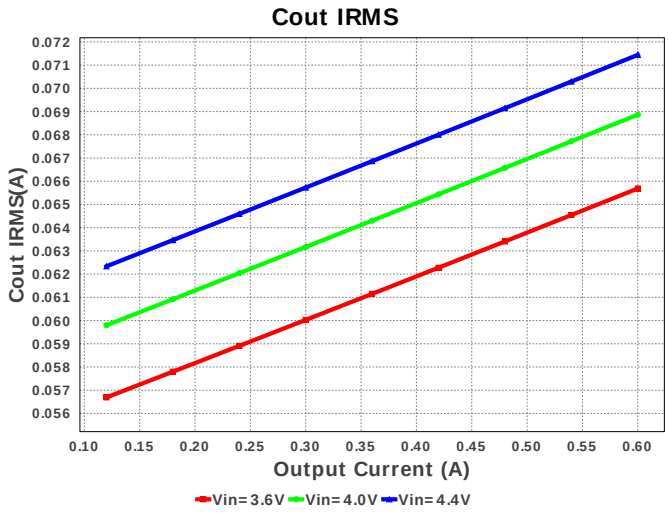


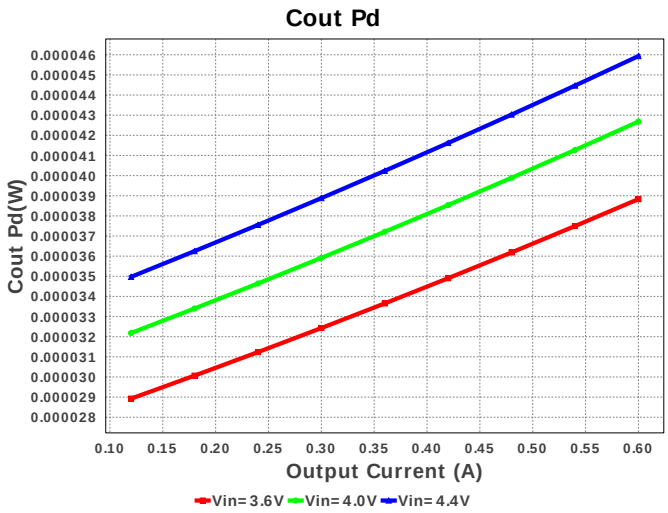


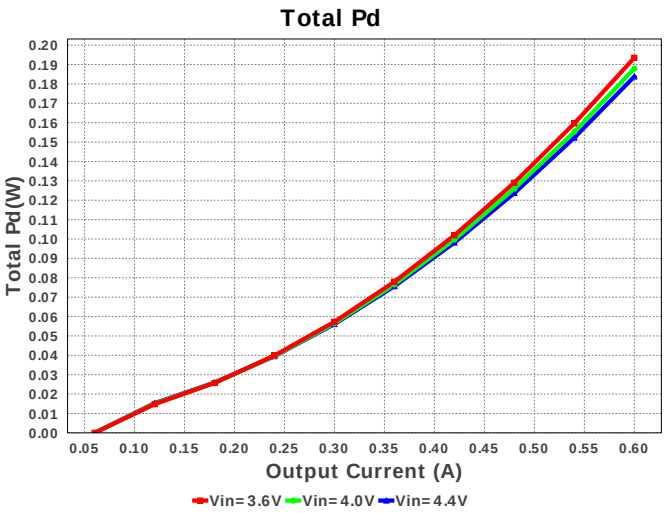


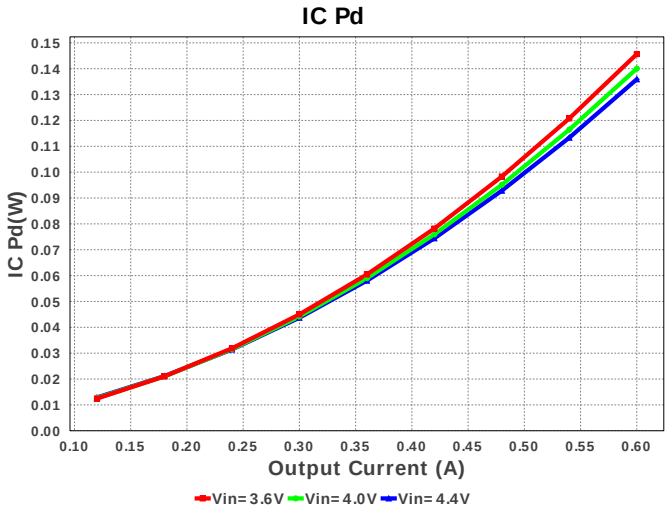


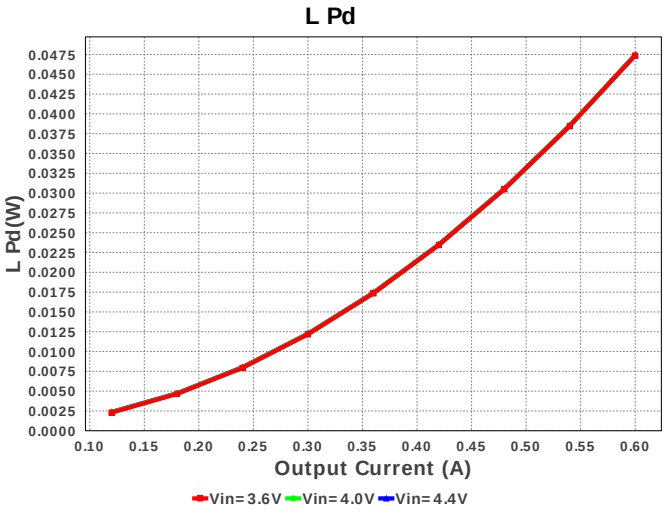












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	286.419 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	71.441 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	723.74 mA	Current	Peak switch current in IC
4.	Iin Avg	219.05 mA	Current	Average input current
5.	L Ipp	247.48 mA	Current	Peak-to-peak inductor ripple current
6.	L1 Irms	604.238 mA	Current	Inductor ripple current
7.	BOM Count	7	General	Total Design BOM count
8.	FootPrint	40.0 mm^2	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	780.0 mW	General	Total output power
12.	Total BOM	$0.48	General	Total BOM Cost
13.	Duty Cycle	35.126 %	Op_point	Duty cycle
14.	Efficiency	80.927 %	Op_point	Steady state efficiency
15.	IC Tj	41.553 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	4.4 V	Op_point	Vin operating point
19.	Vout p-p	2.227 mV	Op_point	Peak-to-peak output ripple voltage
20.	Cin Pd	410.178 µW	Power	Input capacitor power dissipation
21.	Cout Pd	45.935 µW	Power	Output capacitor power dissipation
22.	IC Pd	135.916 mW	Power	IC power dissipation
23.	L Pd	47.464 mW	Power	Inductor power dissipation
24.	Total Pd	183.829 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	4.4	Maximum input voltage

#	Name	Value	Description
4.	VinMin	3.6	Minimum input voltage
5.	Vout	1.3	Output Voltage
6.	Vout1	1.3	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.