

WEBENCH® Power Architect

Project Report

Project : 3496425/15 : PA_Project_302 (modified from 301)

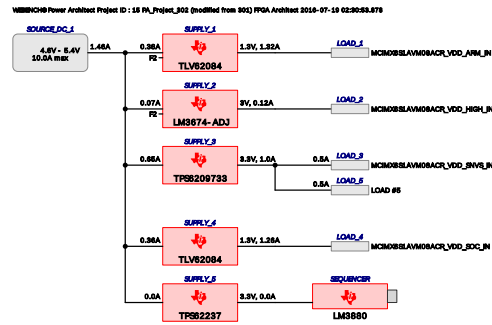
Created : 2016-07-19 02:30:53.878

Optimize project optFactor=3

Project Summary

1. Total System Efficiency	89.054 %
2. Total System BOM Count	35.0
3. Total System Footprint	276.0 mm ²
4. Total System BOM Cost	\$4.75
5. Total System Power Dissipation	864.0 mW

--> Launch WEBENCH Power Architect.



Sequencer Flag Table

Supply	Sequencer Flag	Load	Load Name
SUPPLY_1	2	LOAD_1	MCIMX6S1AVM08ACR_VDD_ARM_IN
SUPPLY_2	2	LOAD_2	MCIMX6S1AVM08ACR_VDD_HIGH_IN
SUPPLY_3	0	LOAD_3	MCIMX6S1AVM08ACR_VDD_SNVS_IN
SUPPLY_3	0	LOAD_5	LOAD #5
SUPPLY_4	1	LOAD_4	MCIMX6S1AVM08ACR_VDD_SOC_IN
SUPPLY_5	NA		
SEQUENCER	NA		

Power Supplies

#	Name	NSID	Description	Vout	Iout	Efficiency	Foot-print	Cost	Design	Page
1.	SUPPLY_1	TLV62084	Switcher : 2.0A High Efficiency	1.3 V	1.32 A	83.4%	45	\$1.06	66	4
2.	SUPPLY_2	LM3674-ADJ	Switcher : 2MHz, 600mA Step-Down DC-DC Converter in SOT 23-5	3 V	0.125 A	95.3%	57	\$0.49	67	9
3.	SUPPLY_3	TPS6209733	Switcher : 2-A High Efficiency Step Down Converter with DCS Control	3.3 V	1.0 A	94.7%	87	\$1.04	68	14
4.	SUPPLY_4	TLV62084	Switcher : 2.0A High Efficiency	1.3 V	1.26 A	83.7%	45	\$1.06	69	19
5.	SUPPLY_5	TPS62237	Switcher : NA	3.3 V	0.001 A	80.2%	23	\$0.62	71	26
6.	SEQUENCER	LM3880	Sequencer : Power Sequencer	3.3 V	0.001 A	0%	19	\$0.48	70	24

Power Loads

#	Name	VLoad	Iload	Description
1.	MCIMX6S1AVM08ACR_VDD_ARM_IN	1.3 V	1.32 A	VoutRipple=10%, Up Sequence Order=1 delay=2.0 mSec, Down Sequence Order=0 delay=2.0 mSec
2.	MCIMX6S1AVM08ACR_VDD_HIGH_IN	3 V	0.125 A	VoutRipple=10%, Up Sequence Order=1 delay=2.0 mSec, Down Sequence Order=0 delay=2.0 mSec
3.	MCIMX6S1AVM08ACR_VDD_SNVS_IN	3.3 V	0.5 A	VoutRipple=10%
4.	LOAD #5	3.3 V	0.5 A	VoutRipple=10%
5.	MCIMX6S1AVM08ACR_VDD_SOC_IN	1.3 V	1.26 A	VoutRipple=10%, Up Sequence Order=0 delay=2.0 mSec, Down Sequence Order=1 delay=2.0 mSec

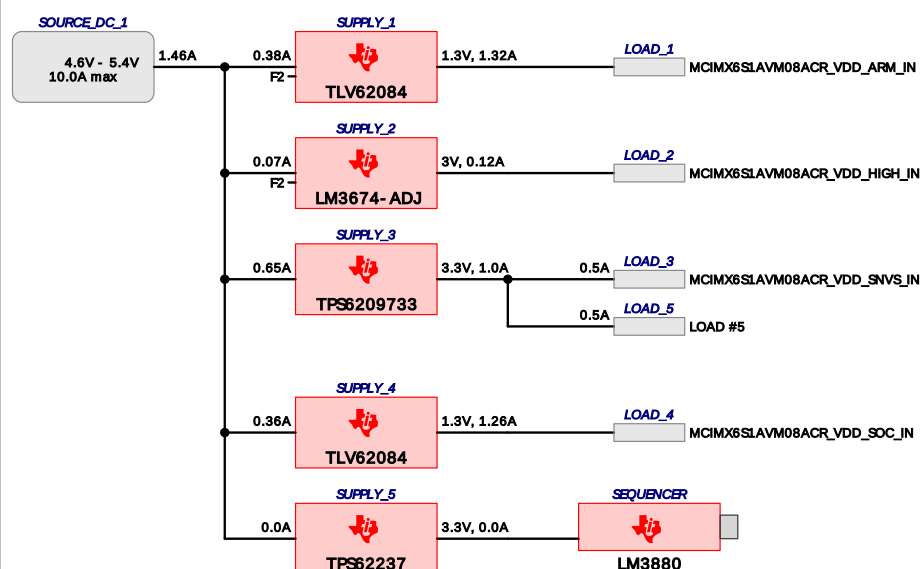
FPGAs, Processors

#	Manufacturer	Part Number	Name	Series	Description
1.	Freescale	MCIMX6S1AVM08ACR	FPGA_1	i.MX6S	FPGA Freescale i.MX6S MCIMX6S1AVM08ACR

http://cache.freescale.com/files/32bit/doc/data_sheet/IMX6SDLAEC.pdf

Project Diagram

WEBENCH® Power Architect Project ID : 15 PA_Project_302 (modified from 301) FPGA Architect 2016-07-19 02:30:53.878



Electrical Procurement BOM

Manufacturer	Part Number	Description	Quantity	Budgetary Price	Footprint (mm ²)
Kemet	C0805C100M4GACTU	0805	1	\$0.01	7
Kemet	C0805C220K3GACTU	0805	1	\$0.01	7
Vishay-Dale	CRCW0402100KFKED	0402	4	\$0.01	12
Vishay-Dale	CRCW0402178KFKED	0402	2	\$0.01	6
Vishay-Dale	CRCW040239K2FKED	0402	2	\$0.01	6
Vishay-Dale	CRCW0402499KFKED	0402	1	\$0.01	3
Vishay-Dale	CRCW040273K2FKED	0402	2	\$0.01	6
MuRata	GRM033R61A103KA01D	0201	1	\$0.01	2
MuRata	GRM188R60J106ME47D	0603	2	\$0.02	9
MuRata	GRM188R60J475KE19D	0603	2	\$0.01	9
MuRata	GRM21BR60J226ME39L	0805	1	\$0.04	7
MuRata	GRM21BR61A475KA73L	0805	1	\$0.03	7
Taiyo Yuden	JMK212BJ106KD-T	0805	2	\$0.03	14
Taiyo Yuden	JMK212BJ226KG-T	0805	2	\$0.13	14
Texas Instruments	LM3674MFX-ADJ/NOPB	MF05A	1	\$0.32	15
Texas Instruments	LM3880MF-1AE/NOPB	R-PDSO- G6	1	\$0.45	10
MuRata	LQM21PN1R0MC0D	0805	1	\$0.10	7
TDK	NLCV32T-2R2M-PFR	NLCV32	1	\$0.10	13
Coilcraft	PFL3215-102MEB	PFL3215	2	\$0.28	28
Bourns	SRN6045-1R0Y	SRN6045	1	\$0.16	64
Texas Instruments	TLV62084DSGR	DSG0008A	2	\$0.59	18
Texas Instruments	TPS6209733RWKR	RWK0011B	1	\$0.81	9
Texas Instruments	TPS62237DRYR	DRY0006A	1	\$0.48	5
Total			35	\$4.75	276.1552

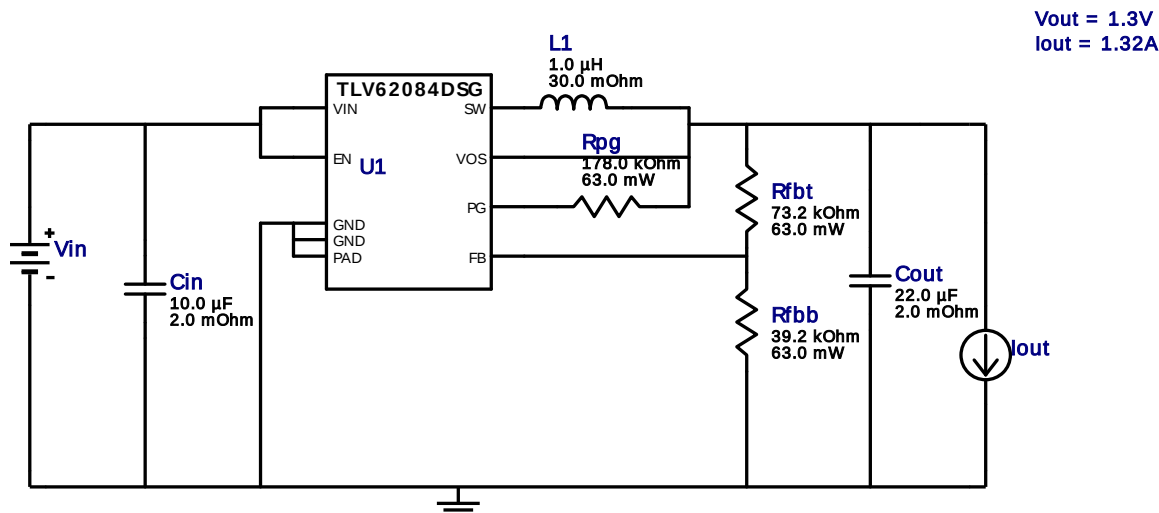


Vout = 1.3V
Iout = 1.32A

Device = TLV62084DSGR
Topology = Buck
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BOM Cost = \$1.06
BOM Count = 7
Total Pd = 0.34W

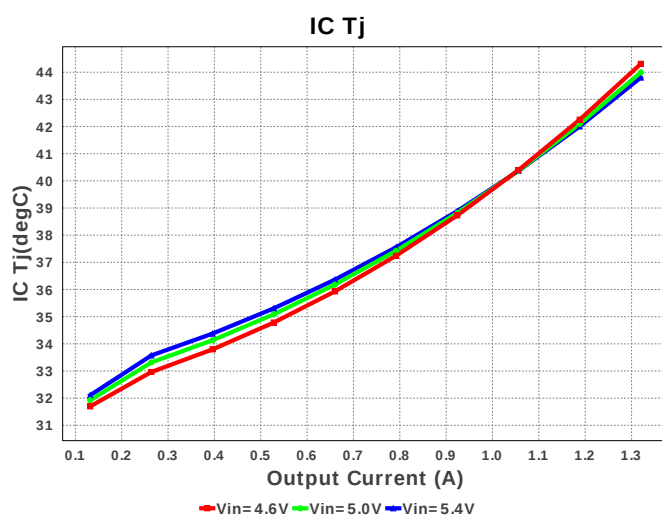
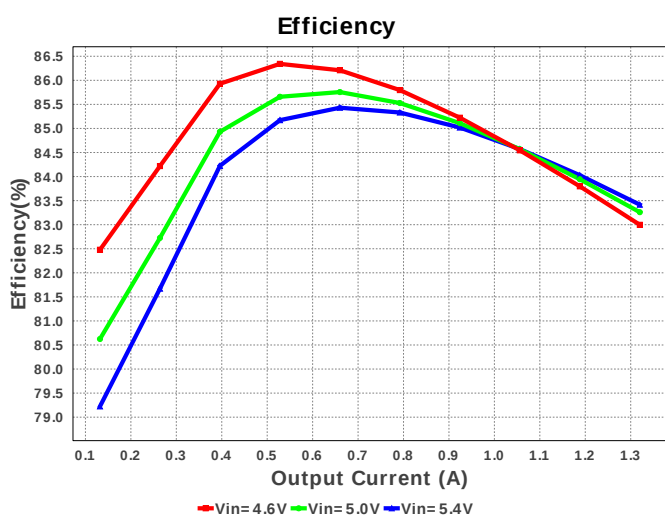
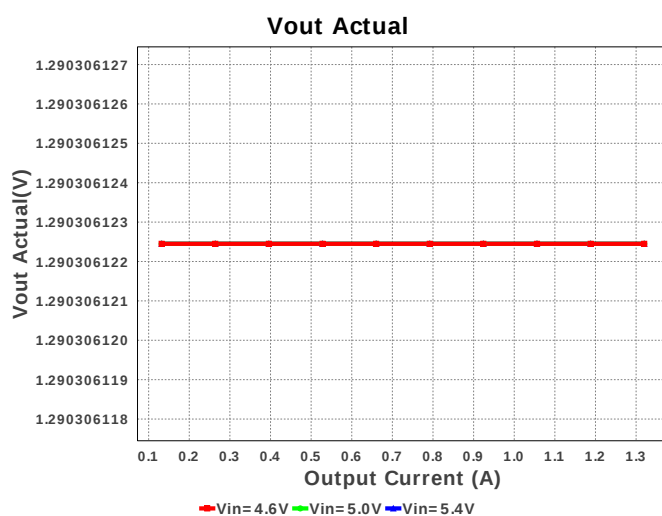
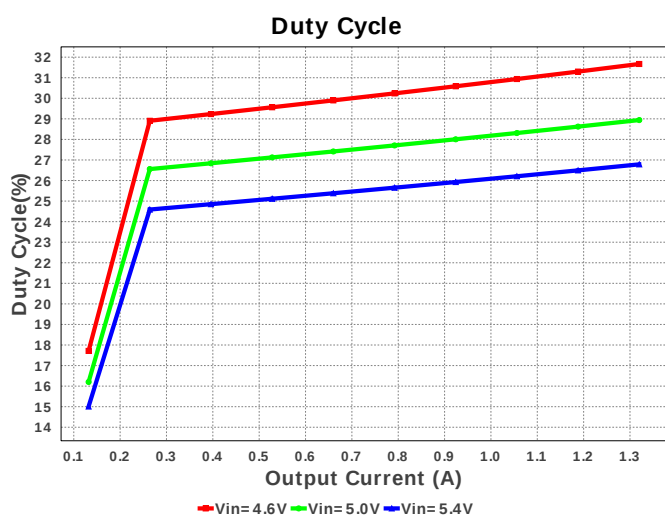
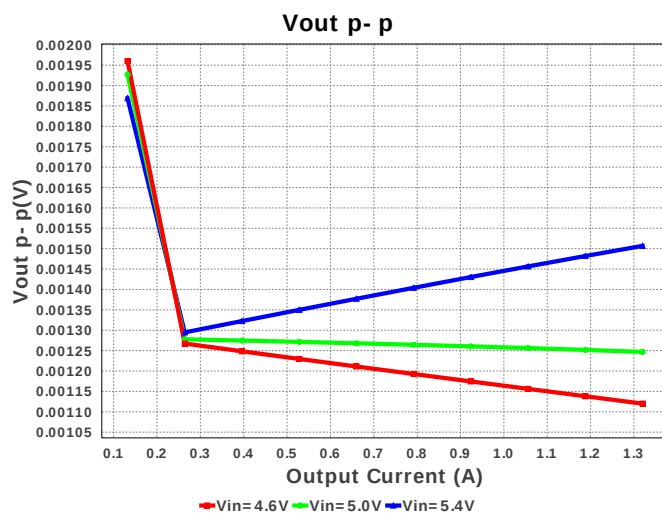
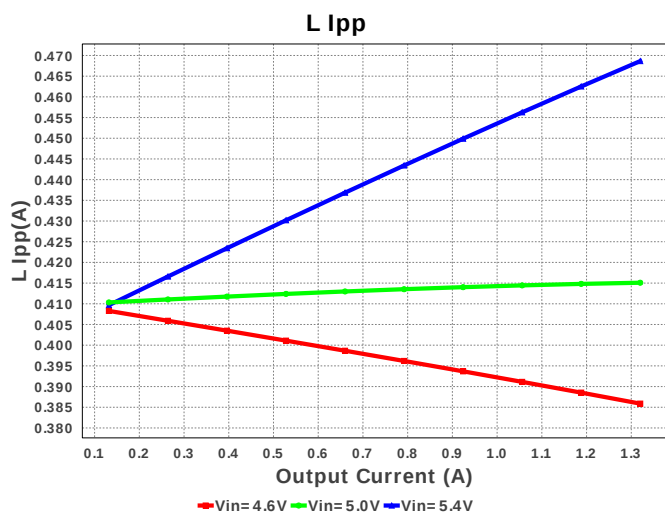
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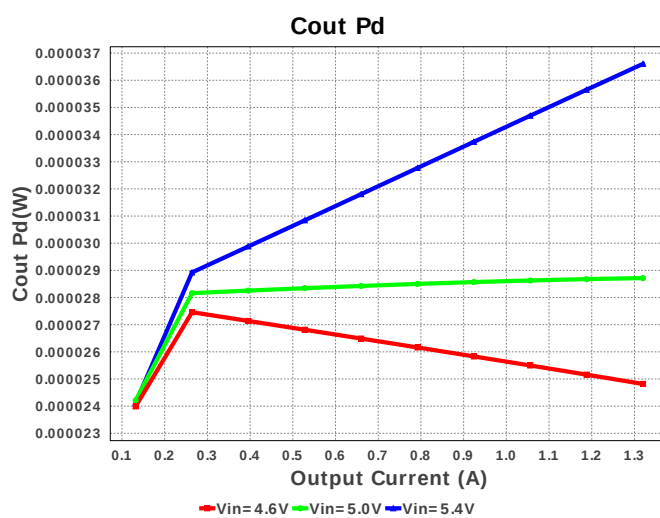
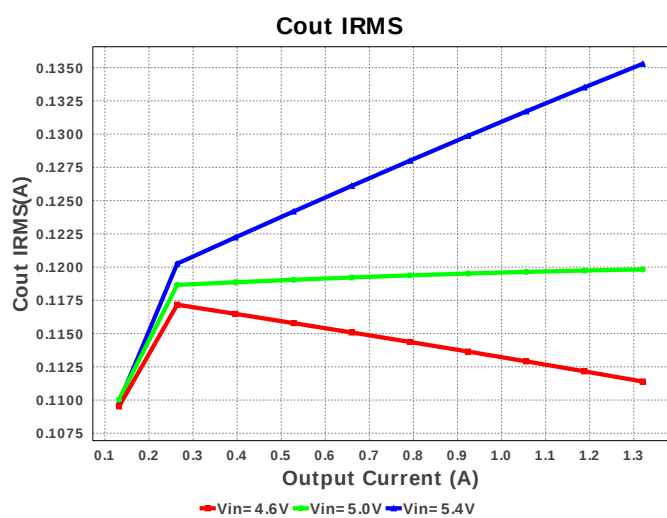
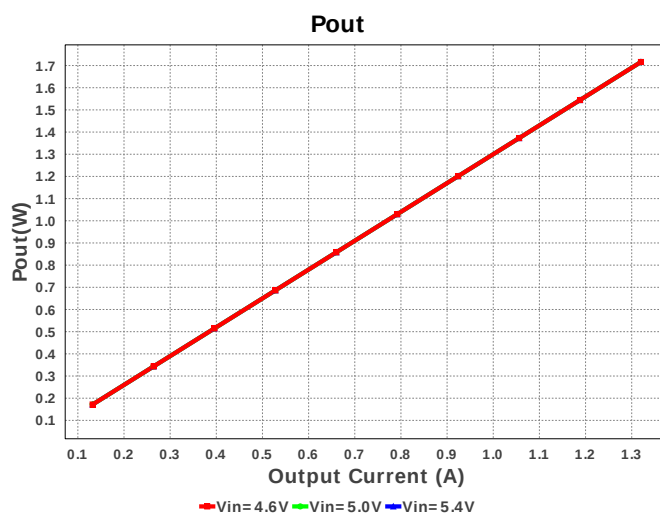
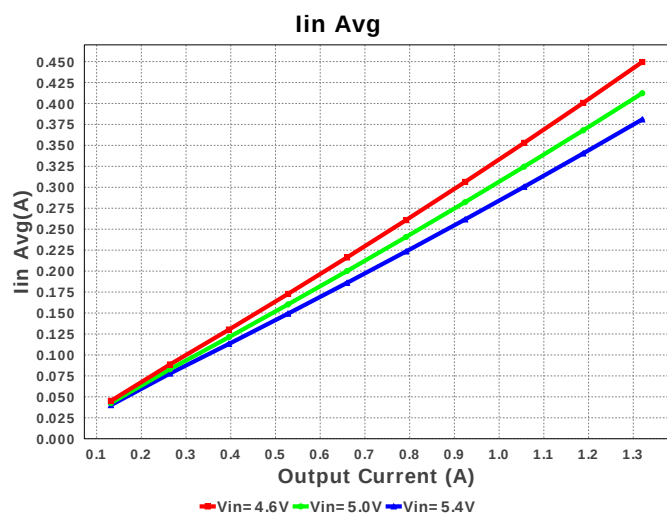
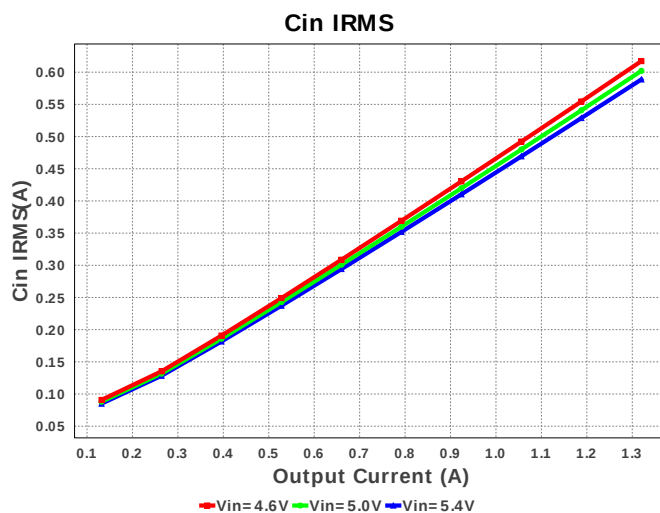
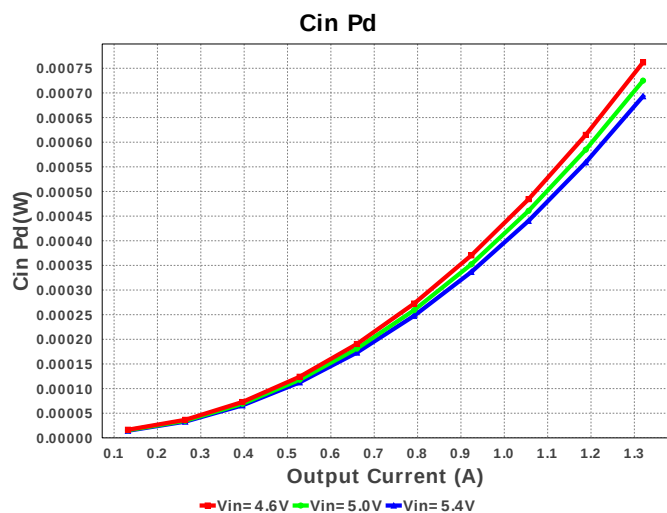
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TLV62084DSGR 4.6V-5.4V to 1.30V @ 1.32A

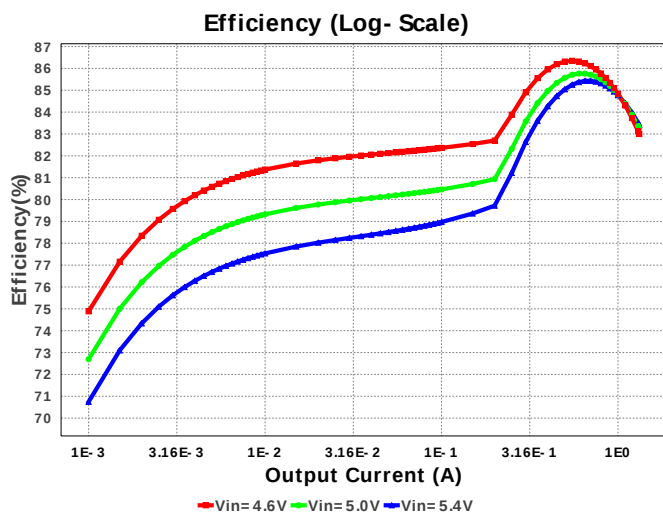
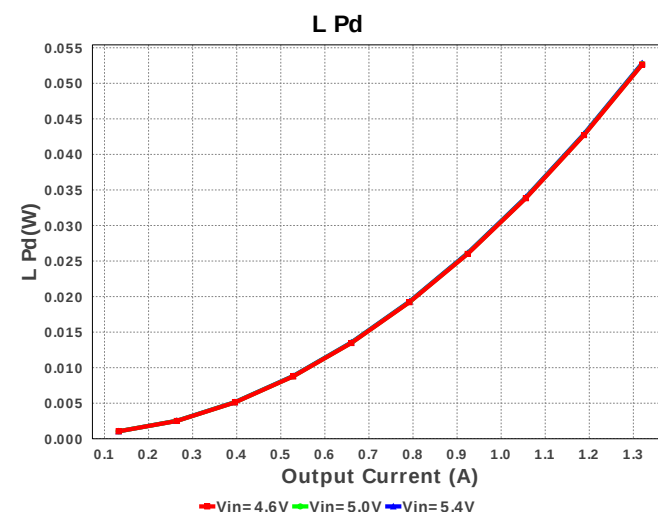
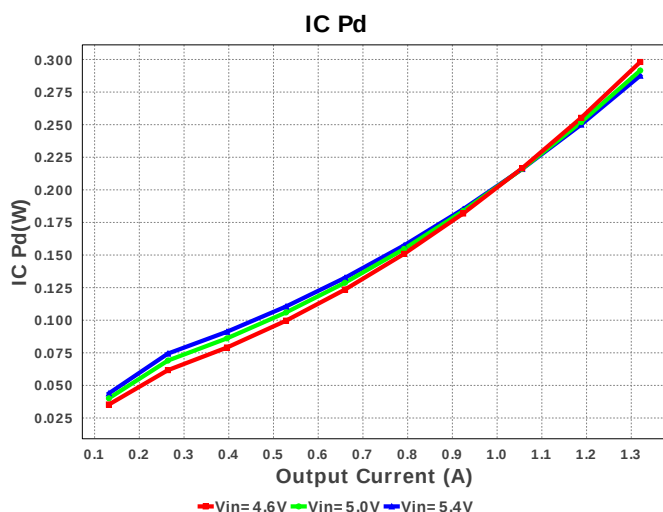
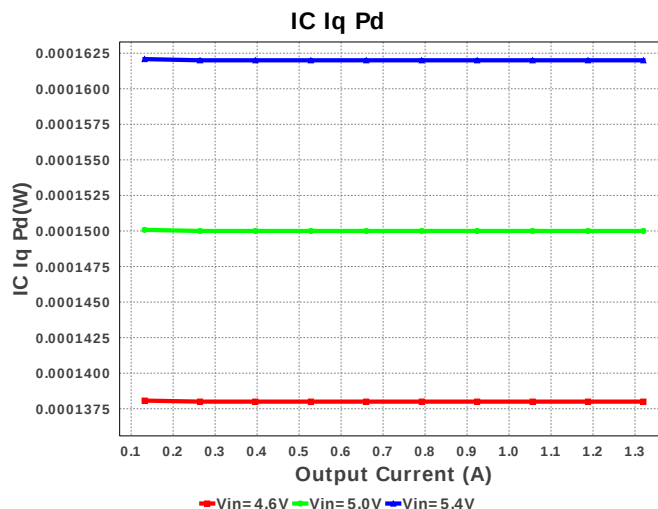
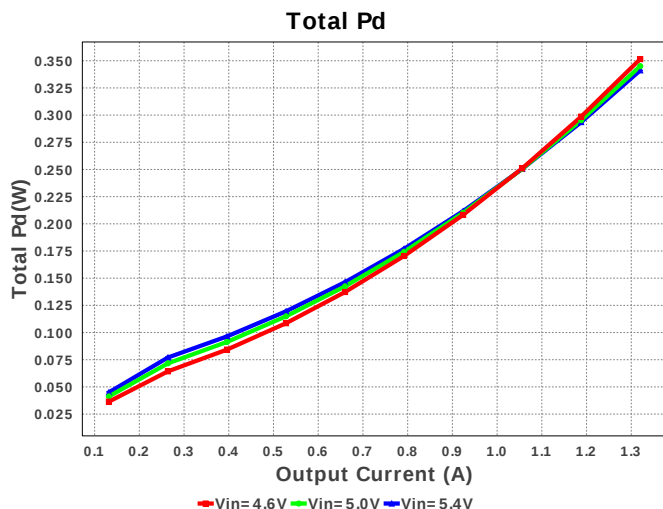


Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	Taiyo Yuden	JMK212BJ106KD-T Series= X5R	Cap= 10.0 uF ESR= 2.0 mOhm VDC= 6.3 V IRMS= 0.0 A	1	\$0.03	0805 7 mm ²
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 mm ²
3.	L1	Coilcraft	PFL3215-102MEB	L= 1.0 µH DCR= 30.0 mOhm	1	\$0.28	PFL3215 14 mm ²
4.	Rfbb	Vishay-Dale	CRCW040239K2FKED Series= CRCW..e3	Res= 39.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
5.	Rfbt	Vishay-Dale	CRCW040273K2FKED Series= CRCW..e3	Res= 73.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
6.	Rpg	Vishay-Dale	CRCW0402178KFKED Series= CRCW..e3	Res= 178.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
7.	U1	Texas Instruments	TLV62084DSGR	Switcher	1	\$0.59	DSG0008A 9 mm ²







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	588.735 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	135.285 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	380.95 mA	Current	Average input current
4.	L Ipp	468.64 mA	Current	Peak-to-peak inductor ripple current
5.	BOM Count	7	General	Total Design BOM count
6.	FootPrint	45.0 mm ²	General	Total Foot Print Area of BOM components
7.	Frequency	2.154 MHz	General	Switching frequency
8.	IC Tolerance	12.0 mV	General	IC Feedback Tolerance
9.	Pout	1.716 W	General	Total output power
10.	Total BOM	\$1.06	General	Total BOM Cost
11.	Vout Actual	1.29 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors

#	Name	Value	Category	Description
12.	Vout OP	1.3 V	Op_Point	Operational Output Voltage
13.	Duty Cycle	26.786 %	Op_point	Duty cycle
14.	Efficiency	83.416 %	Op_point	Steady state efficiency
15.	IC Tj	43.804 degC	Op_point	IC junction temperature
16.	ICThetaJA	48.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
17.	IOUT_OP	1.32 A	Op_point	Iout operating point
18.	VIN_OP	5.4 V	Op_point	Vin operating point
19.	Vout p-p	1.463 mV	Op_point	Peak-to-peak output ripple voltage
20.	Cin Pd	693.219 μ W	Power	Input capacitor power dissipation
21.	Cout Pd	36.604 μ W	Power	Output capacitor power dissipation
22.	IC Iq Pd	162.0 μ W	Power	IC Iq Pd
23.	IC Pd	287.586 mW	Power	IC power dissipation
24.	L Pd	52.821 mW	Power	Inductor power dissipation
25.	Total Pd	341.154 mW	Power	Total Power Dissipation
26.	Vout Tolerance	4.017 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	1.32	Maximum Output Current
2.	VinMax	5.4	Maximum input voltage
3.	VinMin	4.6	Minimum input voltage
4.	Vout	1.3	Output Voltage
5.	base_pn	TLV62084	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	Ambient temperature

Design Assistance

1. TLV62084 Product Folder : <http://www.ti.com/product/TLV62084> : contains the data sheet and other resources.

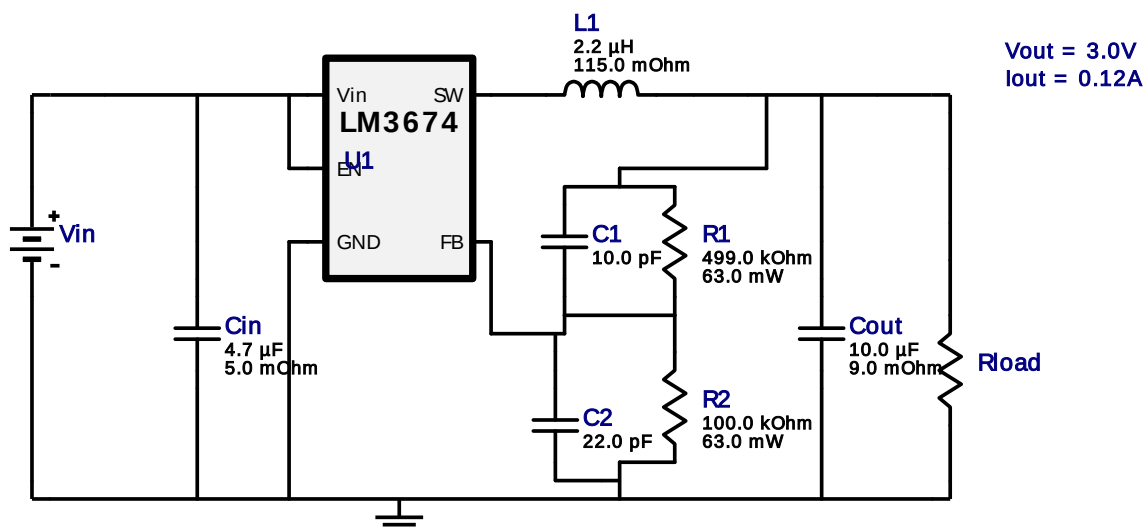


Vout = 3.0V
Iout = 0.12A

Device = LM3674MFX-ADJ/NOPB
Topology = Buck
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BOM Cost = \$0.49
BOM Count = 8
Total Pd = 0.02W

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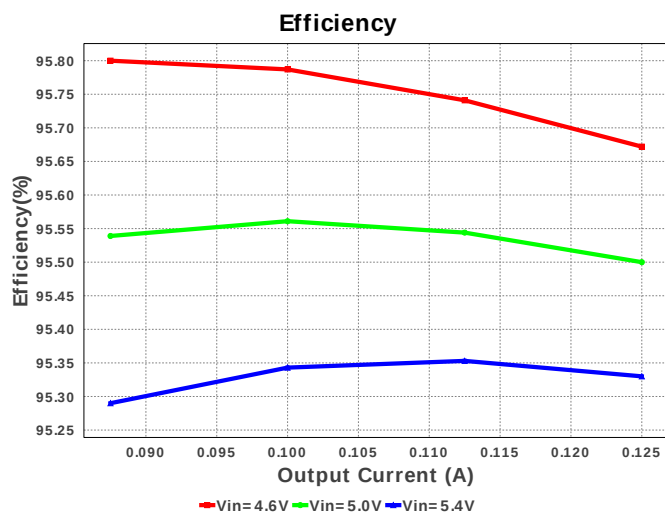
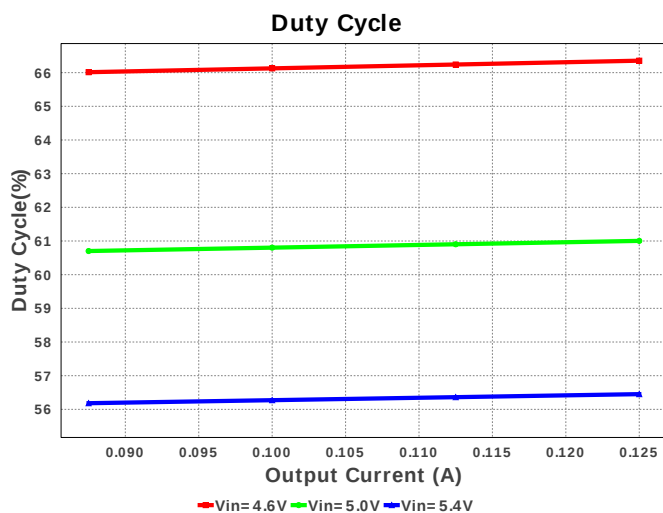
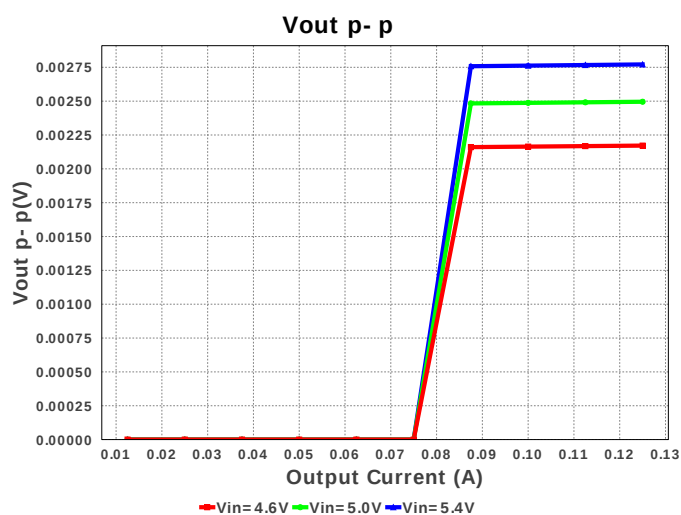
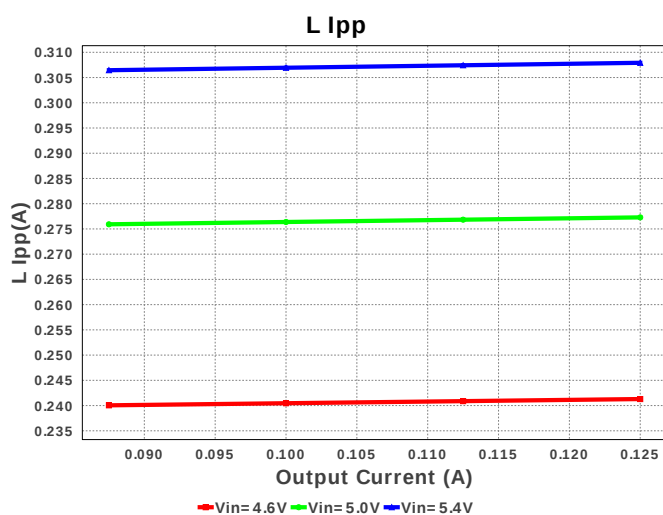
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LM3674MFX-ADJ/NOPB 4.6V-5.4V to 3.00V @ 0.125A

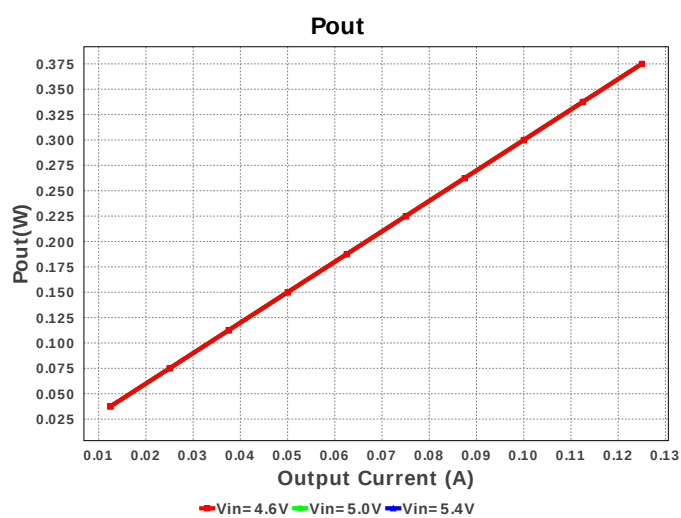
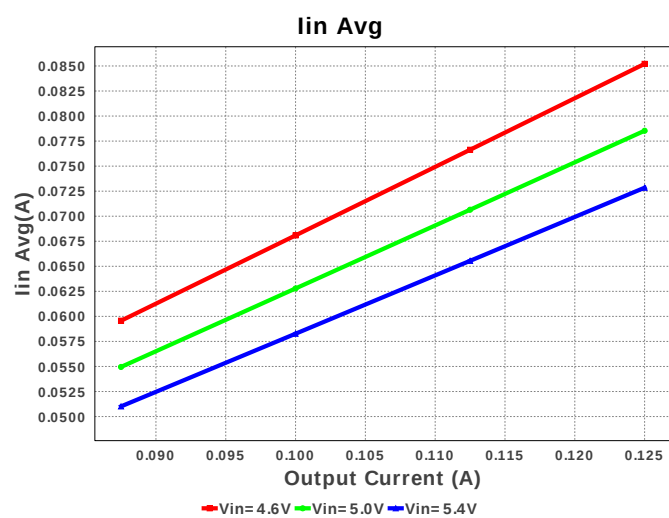
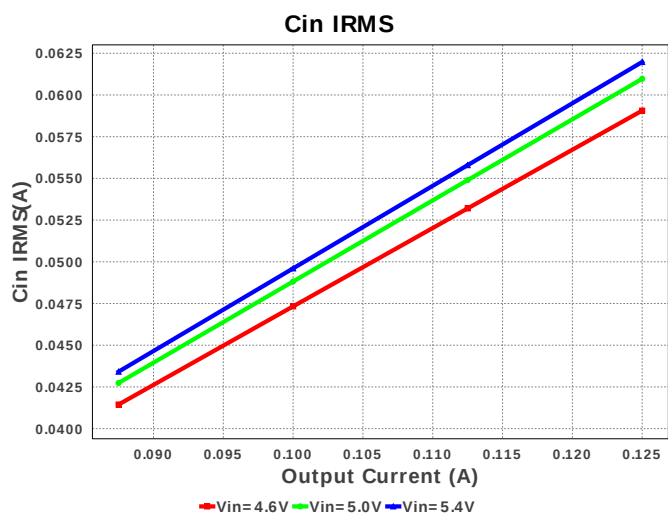
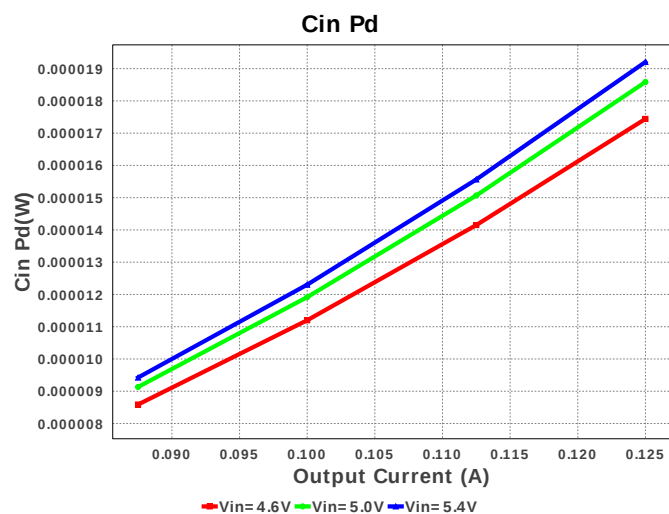
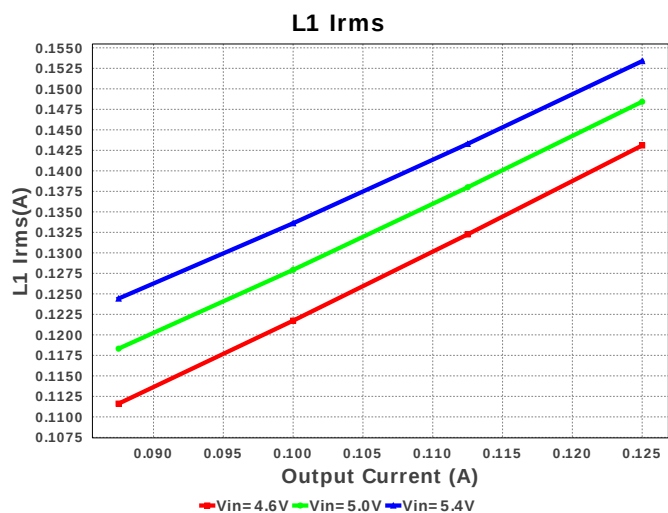
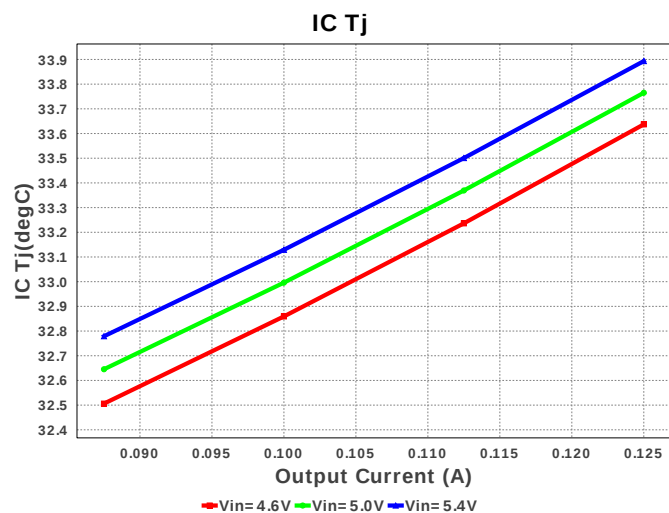


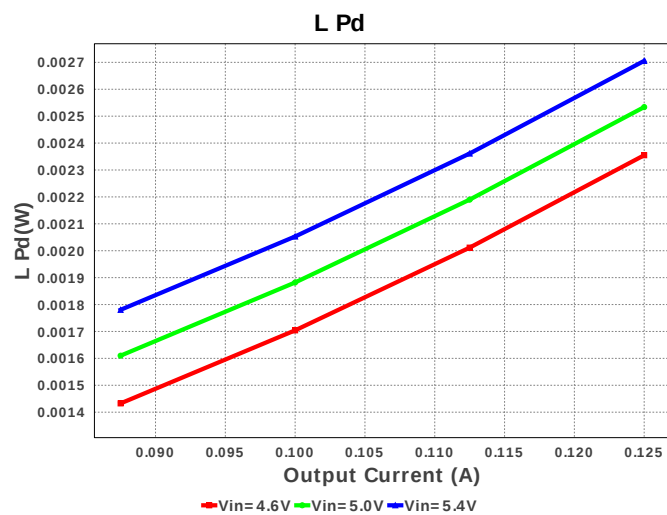
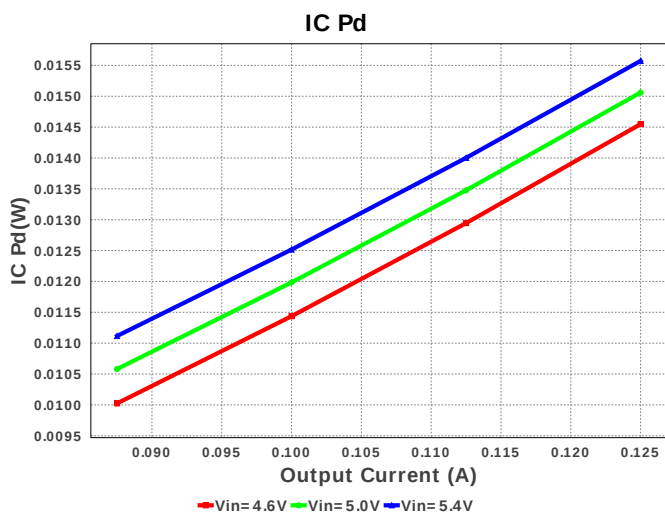
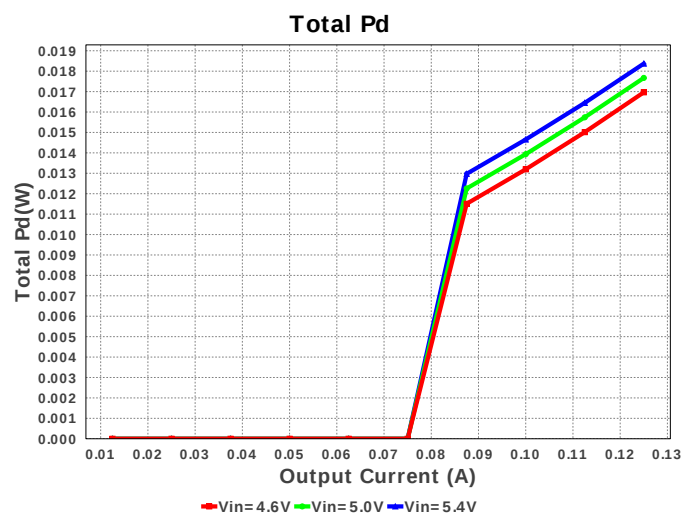
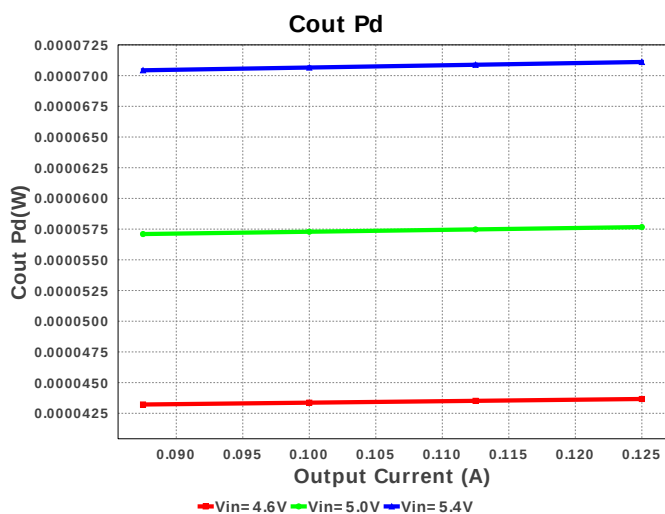
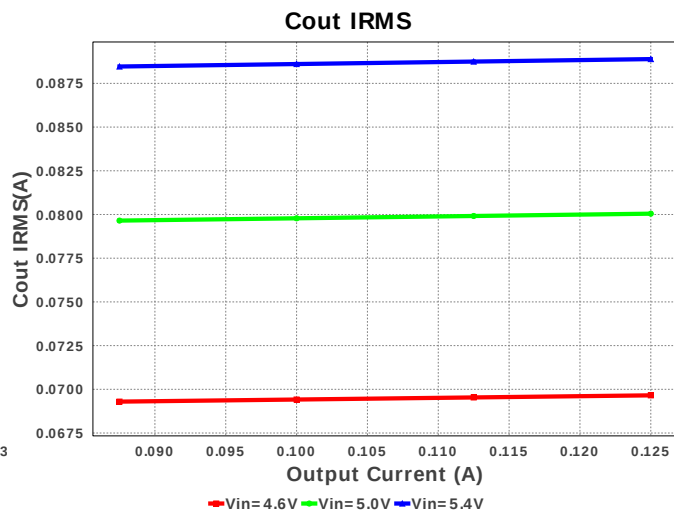
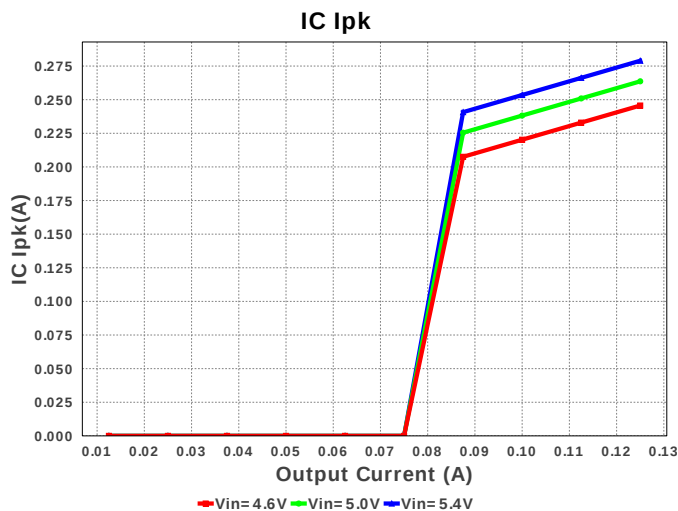
Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	C1	Kemet	C0805C100M4GACTU Series= C0G/NP0	Cap= 10.0 pF VDC= 16.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
2.	C2	Kemet	C0805C220K3GACTU Series= C0G/NP0	Cap= 22.0 pF VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm ²
3.	Cin	MuRata	GRM188R60J475KE19D Series= X5R	Cap= 4.7 uF ESR= 5.0 mOhm VDC= 6.3 V IRMS= 2.0 A	1	\$0.01	0603 5 mm ²
4.	Cout	MuRata	GRM188R60J106ME47D Series= X5R	Cap= 10.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 2.74 A	1	\$0.02	0603 5 mm ²
5.	L1	TDK	NLCV32T-2R2M-PFR	L= 2.2 uH DCR= 115.0 mOhm	1	\$0.10	NLCV32 13 mm ²
6.	R1	Vishay-Dale	CRCW0402499KFKED Series= CRCW...e3	Res= 499.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
7.	R2	Vishay-Dale	CRCW0402100KFKED Series= CRCW...e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
8.	U1	Texas Instruments	LM3674MFX-ADJ/NOPB	Switcher	1	\$0.32	 MF05A 15 mm ²







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	61.977 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	88.889 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	278.959 mA	Current	Peak switch current in IC
4.	Iin Avg	72.846 mA	Current	Average input current
5.	L Ipp	307.92 mA	Current	Peak-to-peak inductor ripple current
6.	L1 Irms	153.382 mA	Current	Inductor ripple current
7.	BOM Count	8	General	Total Design BOM count
8.	FootPrint	57.0 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	375.0 mW	General	Total output power

#	Name	Value	Category	Description
12.	Total BOM	\$0.49	General	Total BOM Cost
13.	Duty Cycle	56.452 %	Op_point	Duty cycle
14.	Efficiency	95.33 %	Op_point	Steady state efficiency
15.	IC Tj	33.893 degC	Op_point	IC junction temperature
16.	ICThetaJA	250.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
17.	IOUT_OP	125.0 mA	Op_point	Iout operating point
18.	VIN_OP	5.4 V	Op_point	Vin operating point
19.	Vout p-p	2.771 mV	Op_point	Peak-to-peak output ripple voltage
20.	Cin Pd	19.206 μ W	Power	Input capacitor power dissipation
21.	Cout Pd	71.111 μ W	Power	Output capacitor power dissipation
22.	IC Pd	15.573 mW	Power	IC power dissipation
23.	L Pd	2.706 mW	Power	Inductor power dissipation
24.	Total Pd	18.37 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	125.0 m	Maximum Output Current
2.	VinMax	5.4	Maximum input voltage
3.	VinMin	4.6	Minimum input voltage
4.	Vout	3.0	Output Voltage
5.	base_pn	LM3674	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	Ambient temperature

Design Assistance

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

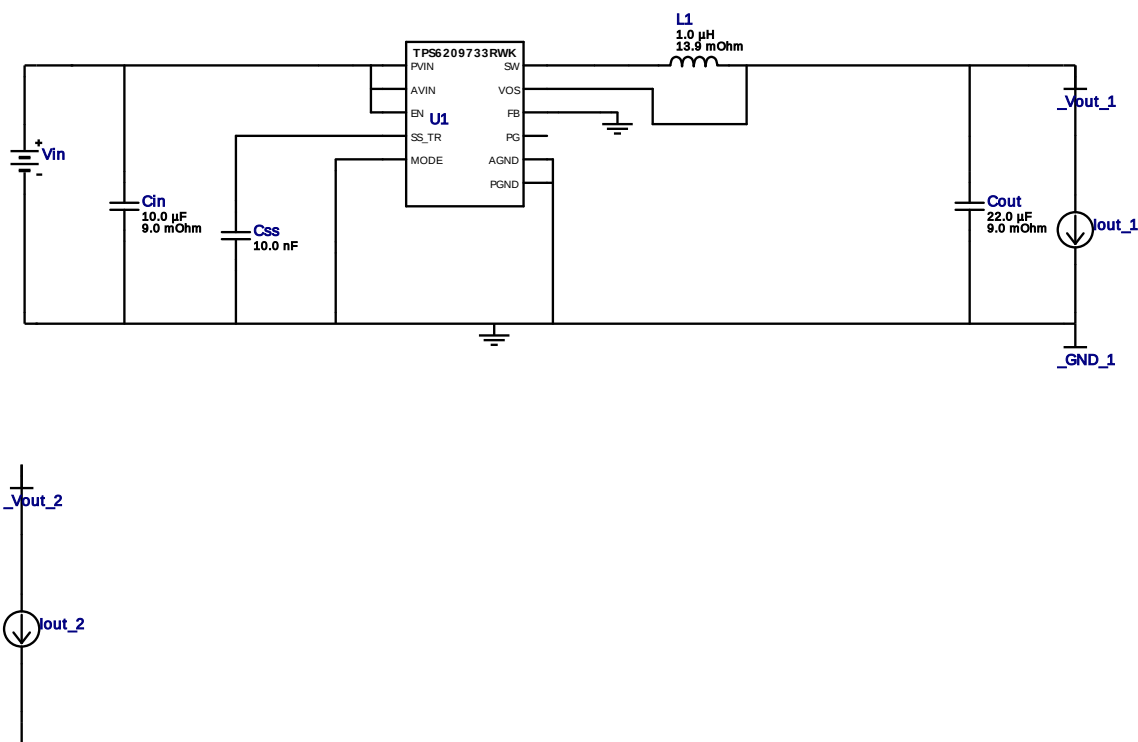


Vout = 3.3V
Iout = 1.0A

Device = TPS6209733RWKR
Topology = Buck
Created = 7/19/16 2:30:51 AM
BOM Cost = \$1.04
BOM Count = 5
Total Pd = 0.18W

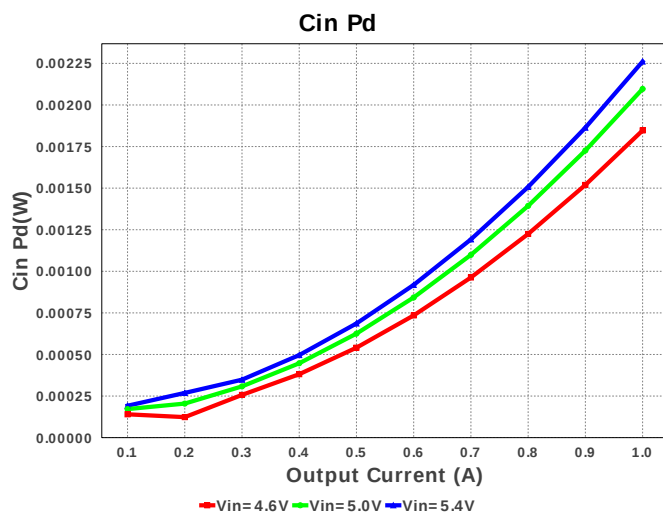
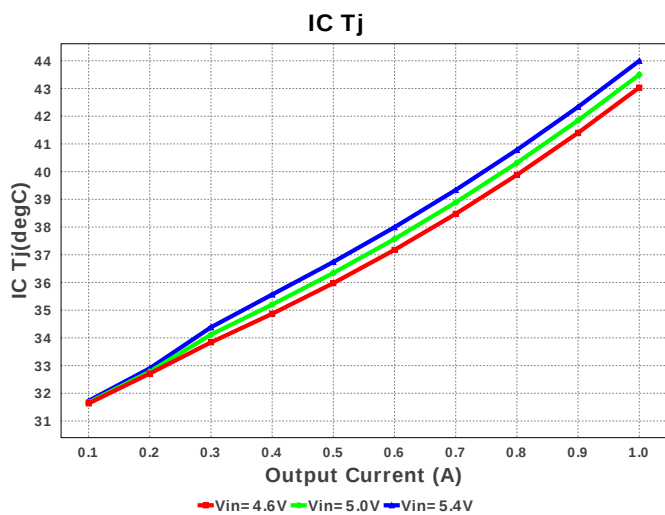
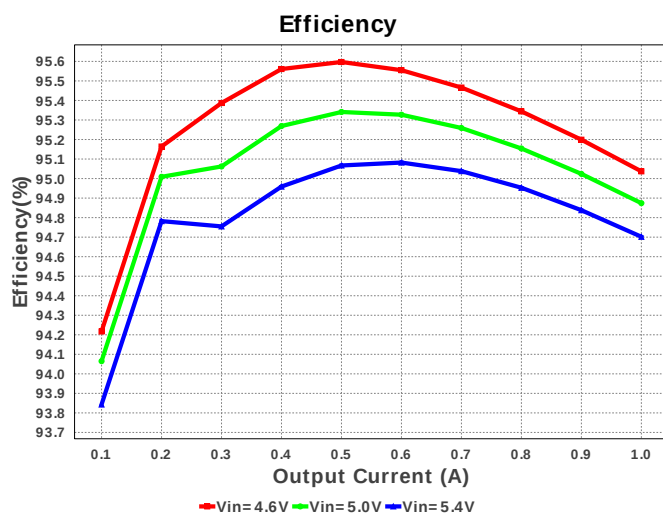
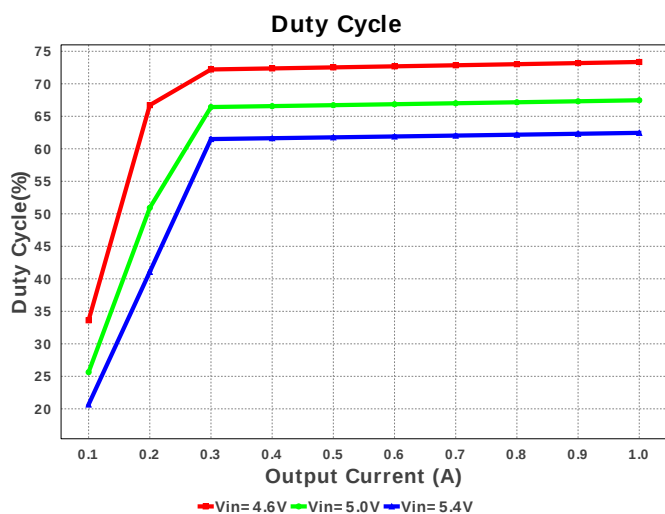
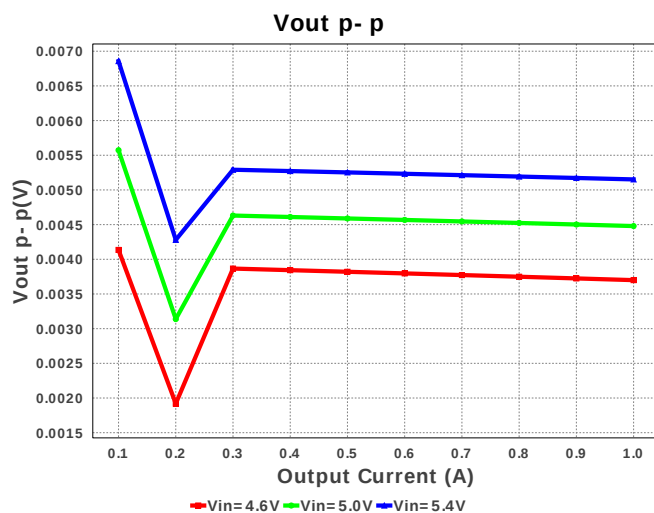
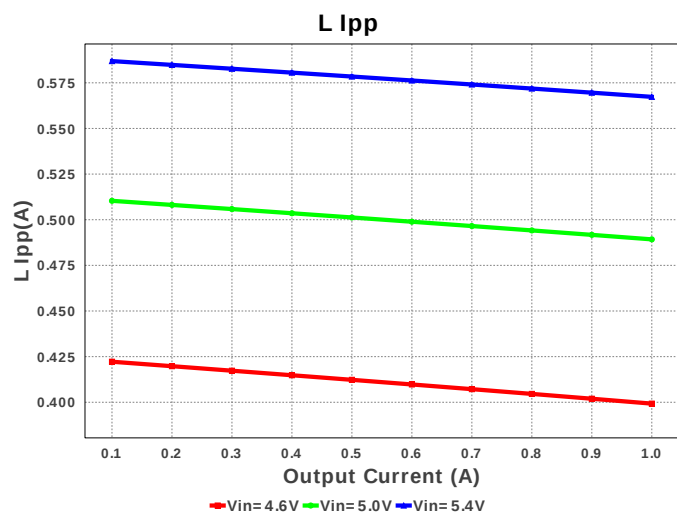
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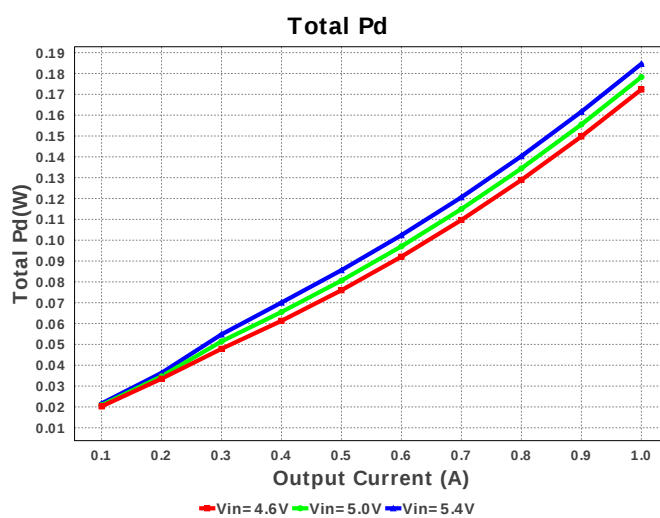
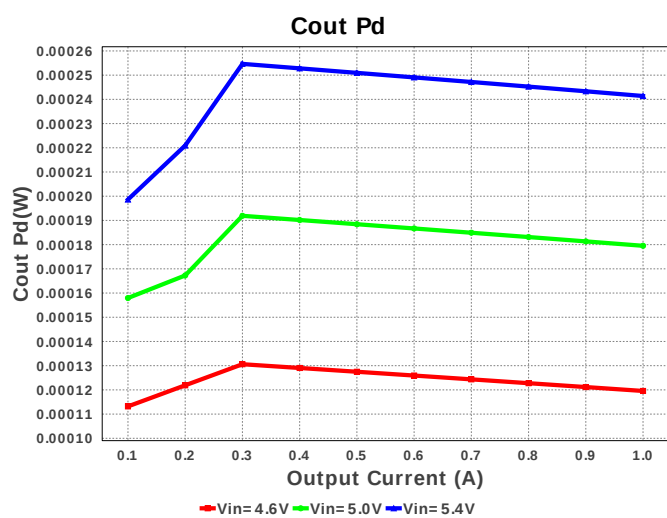
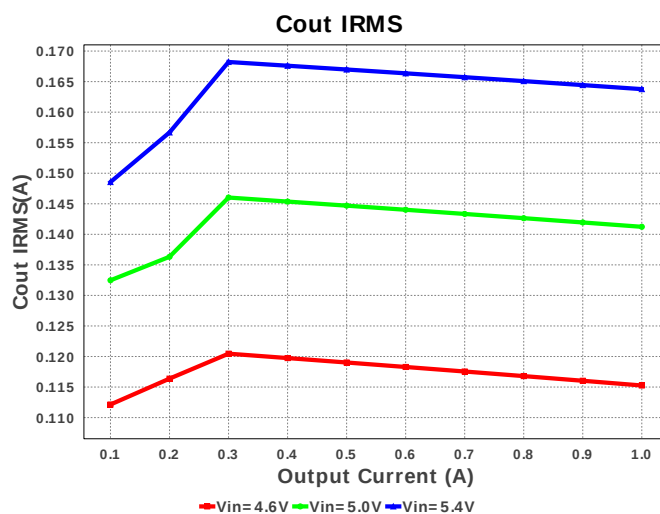
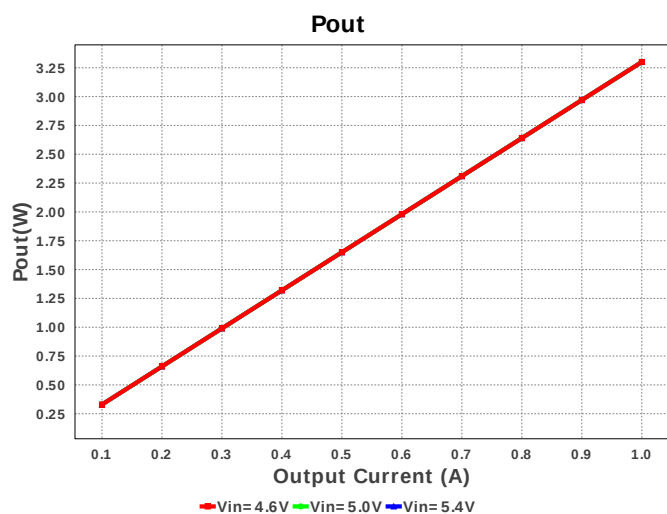
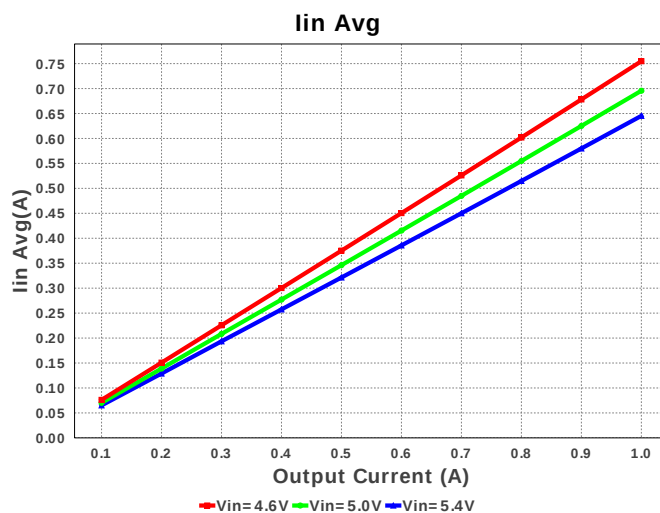
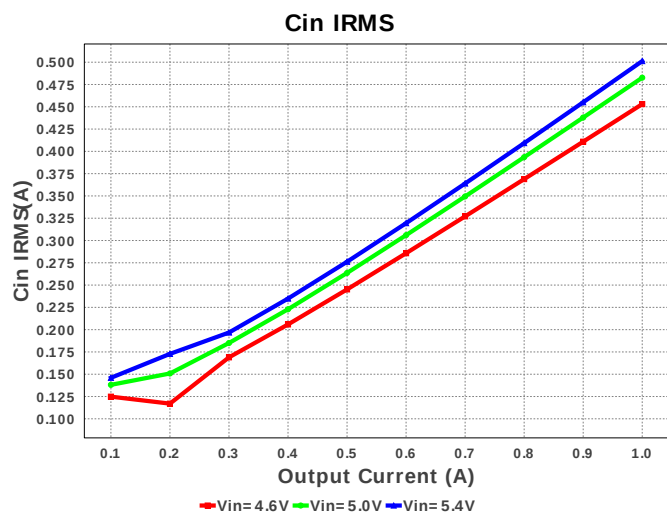
Design : 3496425/68 TPS6209733RWKR
TPS6209733RWKR 4.6V-5.4V to 3.30V @ 1.0A

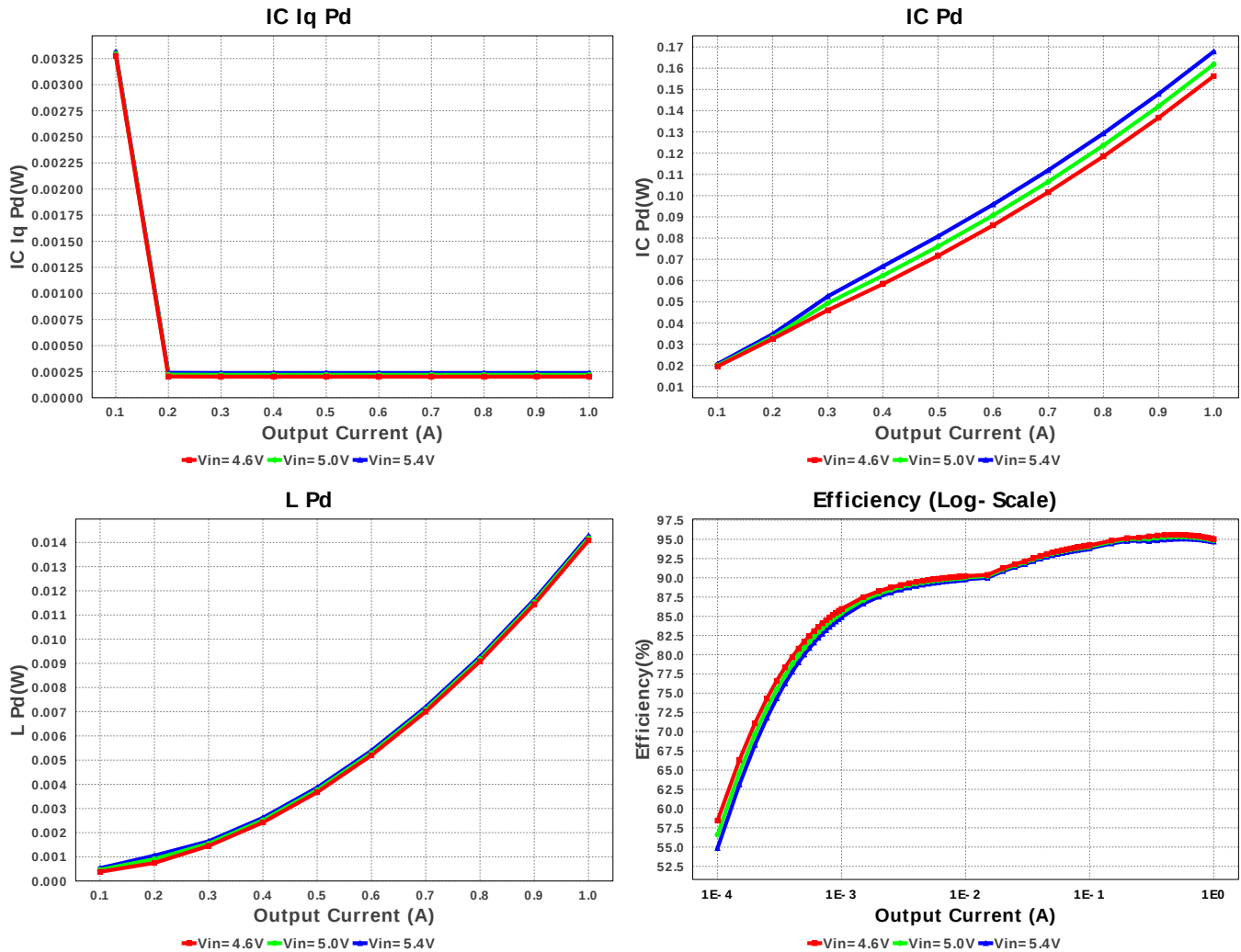


Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM188R60J106ME47D Series= X5R	Cap= 10.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 2.74 A	1	\$0.02	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	1	\$0.04	0805 7 mm ²
3.	Css	MuRata	GRM033R61A103KA01D Series= X5R	Cap= 10.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	0201 2 mm ²
4.	L1	Bourns	SRN6045-1R0Y	L= 1.0 µH DCR= 13.9 mOhm	1	\$0.16	SRN6045 64 mm ²
5.	U1	Texas Instruments	TPS6209733RWKR	Switcher	1	\$0.81	RWK0011B 9 mm ²







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	501.242 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	163.769 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	645.3 mA	Current	Average input current
4.	L Ipp	567.31 mA	Current	Peak-to-peak inductor ripple current
5.	BOM Count	5	General	Total Design BOM count
6.	FootPrint	87.0 mm ²	General	Total Foot Print Area of BOM components
7.	Frequency	2.158 MHz	General	Switching frequency
8.	IC Tolerance	69.3 mV	General	IC Feedback Tolerance
9.	Pout	3.3 W	General	Total output power
10.	Total BOM	\$1.04	General	Total BOM Cost
11.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
12.	Duty Cycle	62.453 %	Op_point	Duty cycle
13.	Efficiency	94.702 %	Op_point	Steady state efficiency
14.	IC Tj	43.998 degC	Op_point	IC junction temperature
15.	ICThetaJA	83.4 degC/W	Op_point	IC junction-to-ambient thermal resistance
16.	IOUT_OP	1.0 A	Op_point	Iout operating point
17.	VIN_OP	5.4 V	Op_point	Vin operating point
18.	Vout p-p	5.152 mV	Op_point	Peak-to-peak output ripple voltage
19.	Cin Pd	2.261 mW	Power	Input capacitor power dissipation
20.	Cout Pd	241.382 μW	Power	Output capacitor power dissipation
21.	IC Iq Pd	237.6 μW	Power	IC Iq Pd
22.	IC Pd	167.837 mW	Power	IC power dissipation
23.	L Pd	14.273 mW	Power	Inductor power dissipation
24.	Total Pd	184.615 mW	Power	Total Power Dissipation
25.	Vout Tolerance	2.1 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	1.0	Maximum Output Current

#	Name	Value	Description
2.	VinMax	5.4	Maximum input voltage
3.	VinMin	4.6	Minimum input voltage
4.	Vout	3.3	Output Voltage
5.	base_pn	TPS6209733	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	Ambient temperature

Design Assistance

1. TPS6209733 Product Folder : <http://www.ti.com/product/TPS62097> : contains the data sheet and other resources.

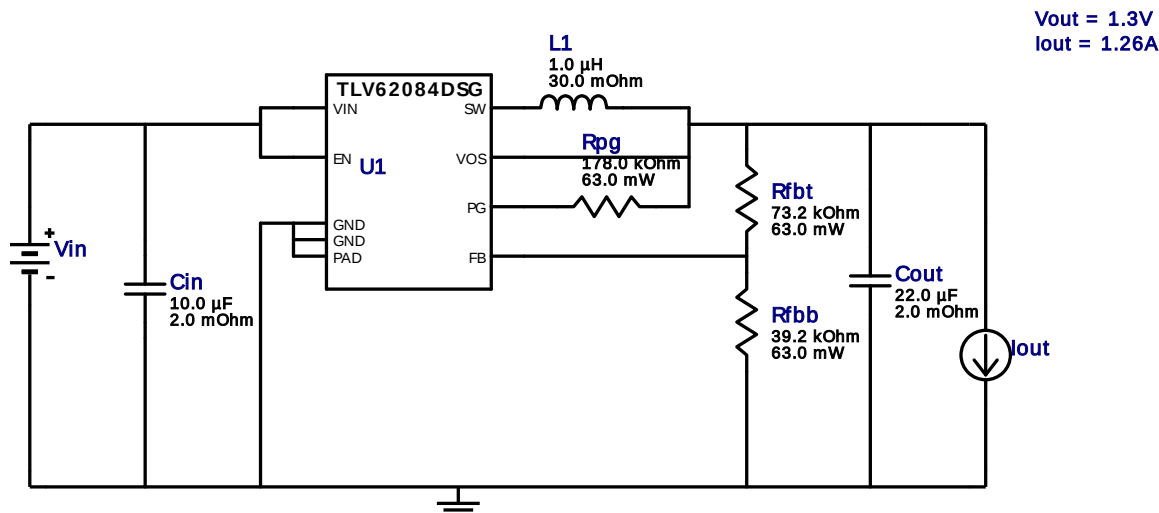


Vout = 1.3V
Iout = 1.26A

Device = TLV62084DSGR
Topology = Buck
Created = 7/19/16 2:30:52 AM
BOM Cost = \$1.06
BOM Count = 7
Total Pd = 0.32W

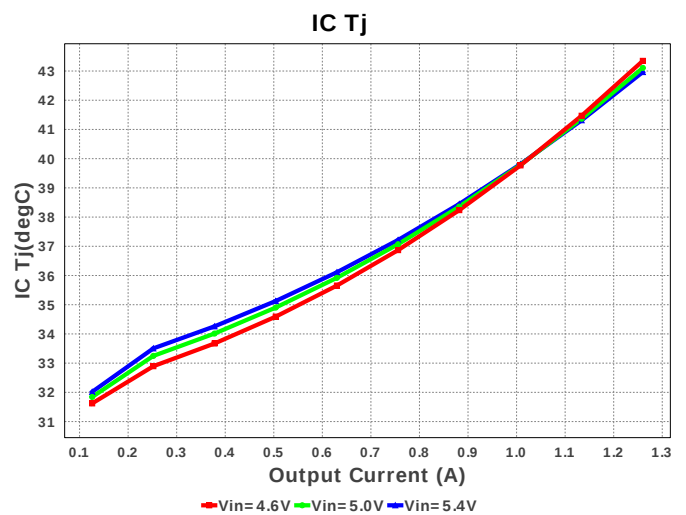
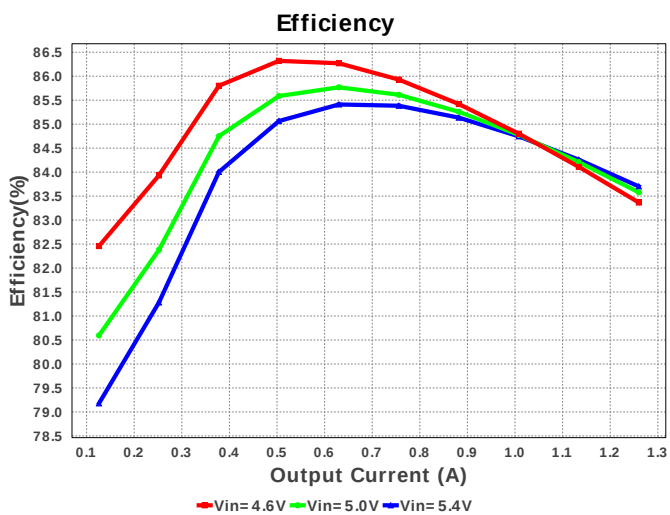
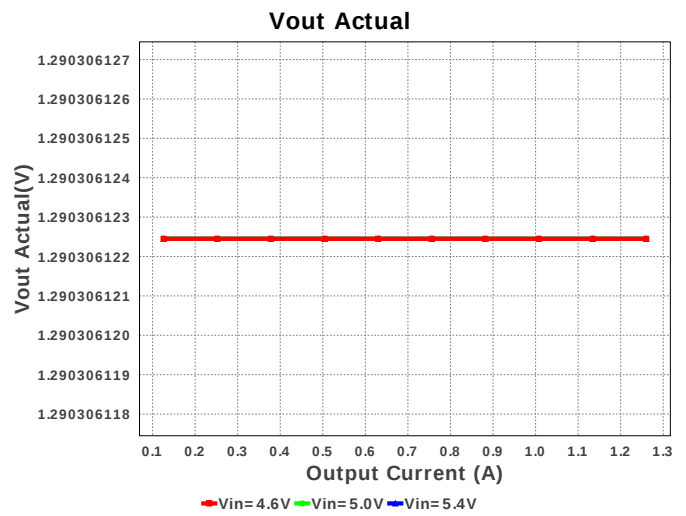
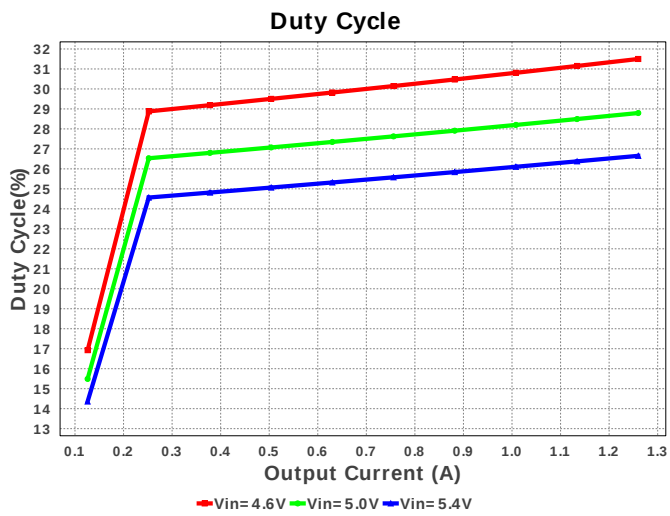
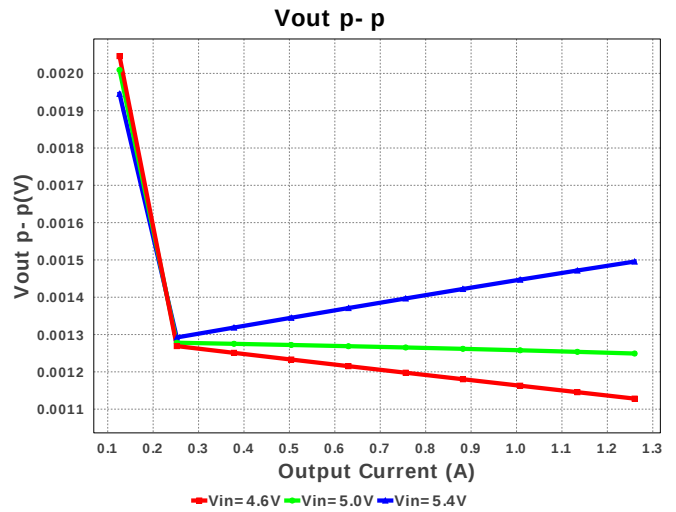
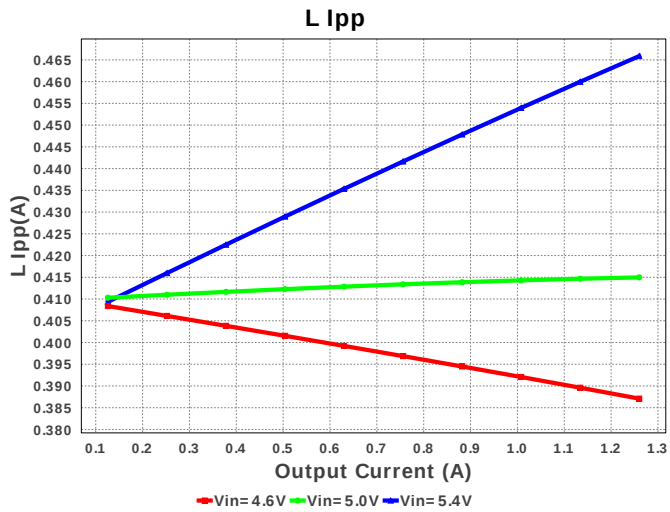
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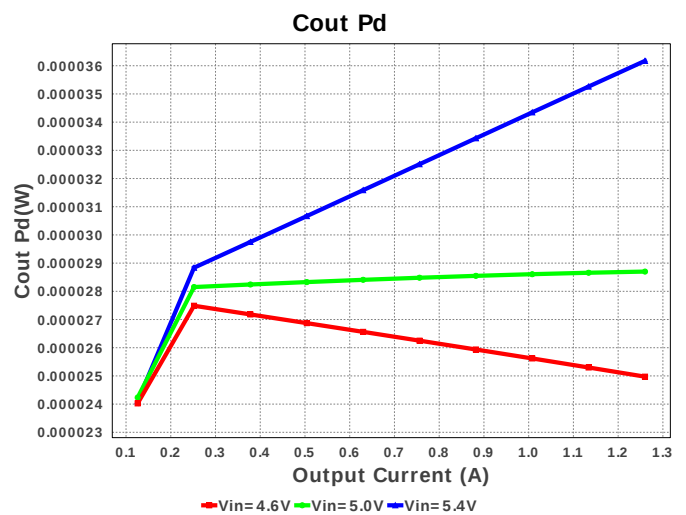
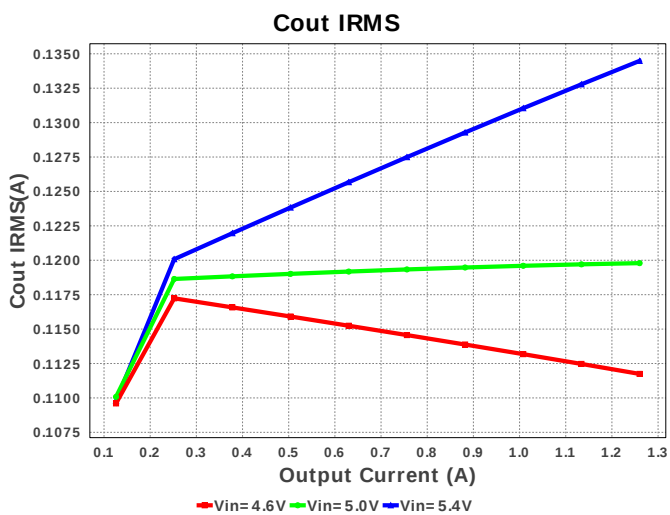
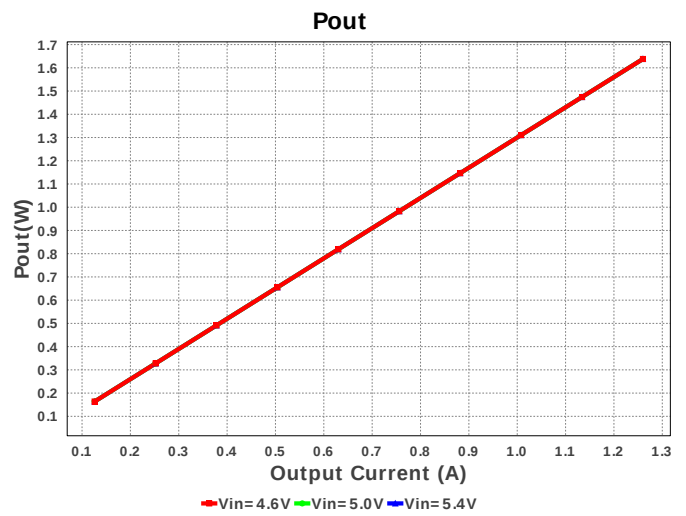
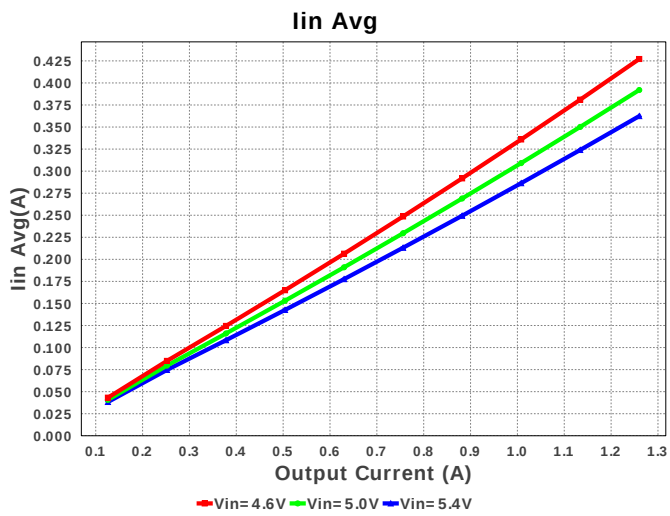
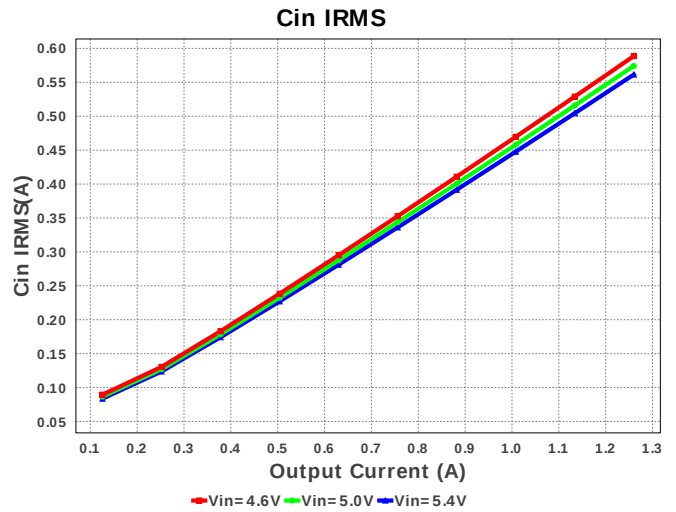
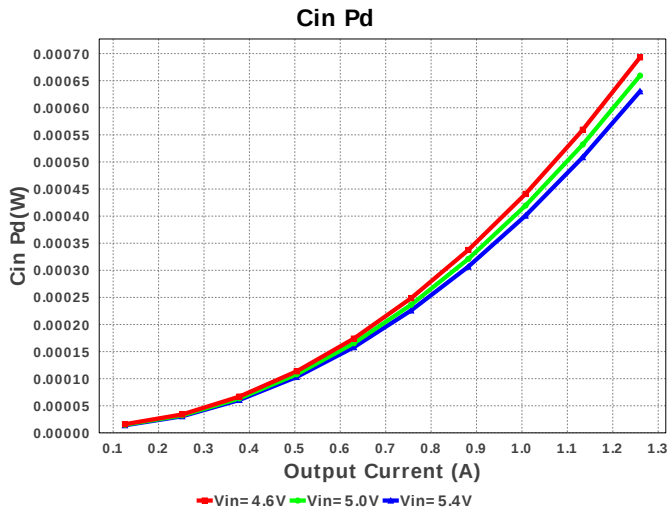
Design : 3496425/69 TLV62084DSGR
TLV62084DSGR 4.6V-5.4V to 1.30V @ 1.26A

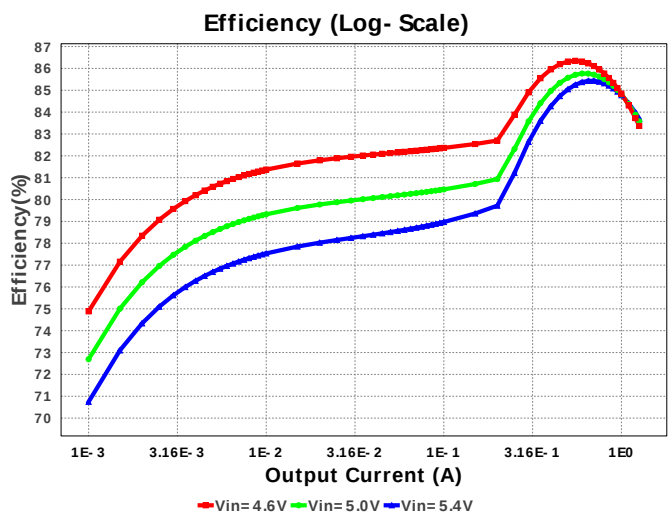
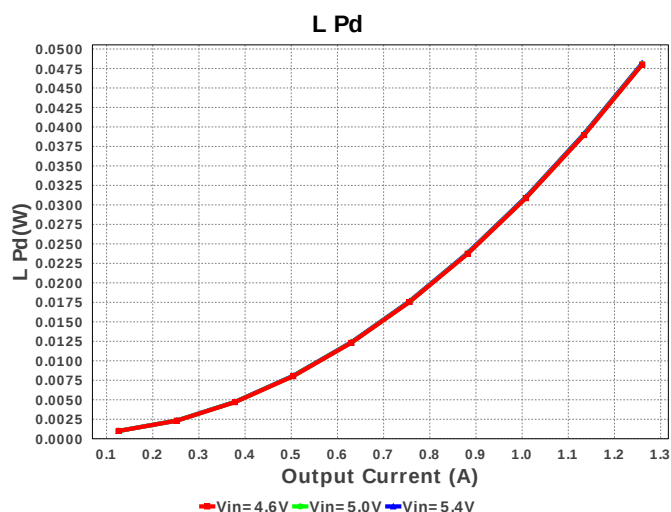
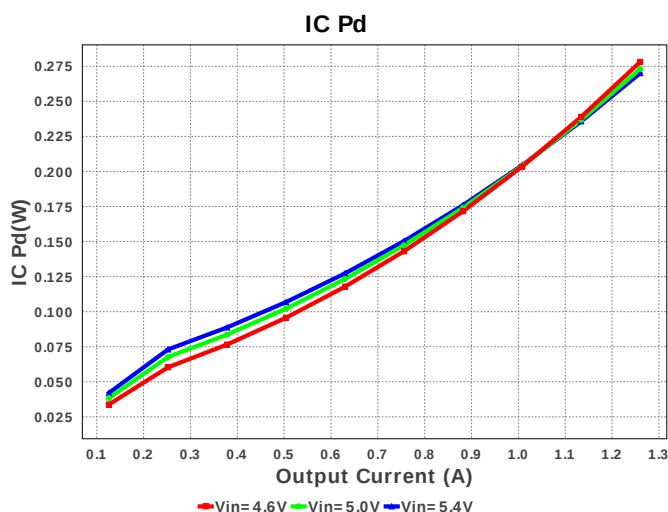
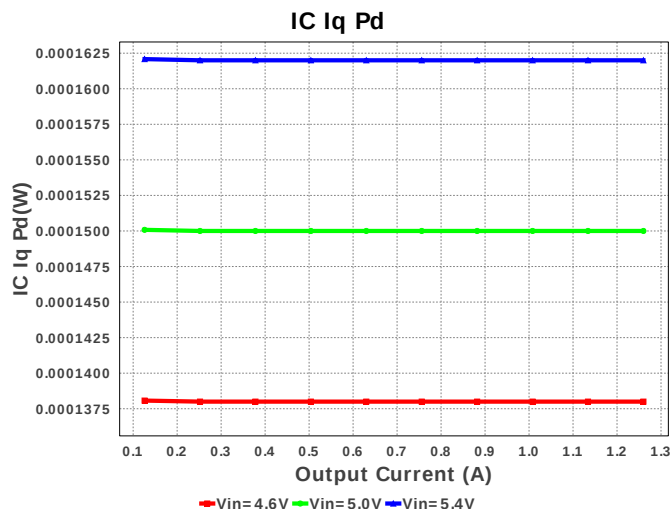
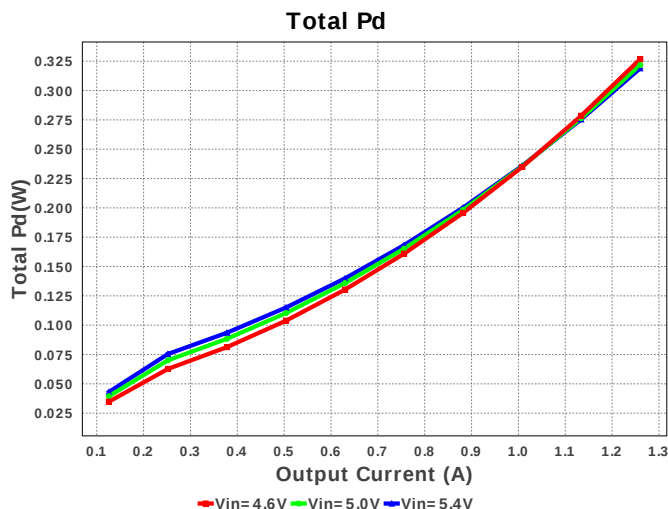


Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	Taiyo Yuden	JMK212BJ106KD-T Series= X5R	Cap= 10.0 uF ESR= 2.0 mOhm VDC= 6.3 V IRMS= 0.0 A	1	\$0.03	0805 7 mm ²
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 mm ²
3.	L1	Coilcraft	PFL3215-102MEB	L= 1.0 µH DCR= 30.0 mOhm	1	\$0.28	PFL3215 14 mm ²
4.	Rfbb	Vishay-Dale	CRCW040239K2FKED Series= CRCW..e3	Res= 39.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
5.	Rfbt	Vishay-Dale	CRCW040273K2FKED Series= CRCW..e3	Res= 73.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
6.	Rpg	Vishay-Dale	CRCW0402178KFKED Series= CRCW..e3	Res= 178.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
7.	U1	Texas Instruments	TLV62084DSGR	Switcher	1	\$0.59	DSG0008A 9 mm ²







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	561.408 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	134.485 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	362.4 mA	Current	Average input current
4.	L Ipp	465.87 mA	Current	Peak-to-peak inductor ripple current
5.	BOM Count	7	General	Total Design BOM count
6.	FootPrint	45.0 mm ²	General	Total Foot Print Area of BOM components
7.	Frequency	2.16 MHz	General	Switching frequency
8.	IC Tolerance	12.0 mV	General	IC Feedback Tolerance
9.	Pout	1.638 W	General	Total output power
10.	Total BOM	\$1.06	General	Total BOM Cost
11.	Vout Actual	1.29 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors

#	Name	Value	Category	Description
12.	Vout OP	1.3 V	Op_Point	Operational Output Voltage
13.	Duty Cycle	26.652 %	Op_point	Duty cycle
14.	Efficiency	83.702 %	Op_point	Steady state efficiency
15.	IC Tj	42.965 degC	Op_point	IC junction temperature
16.	ICThetaJA	48.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
17.	IOUT_OP	1.26 A	Op_point	Iout operating point
18.	VIN_OP	5.4 V	Op_point	Vin operating point
19.	Vout p-p	1.452 mV	Op_point	Peak-to-peak output ripple voltage
20.	Cin Pd	630.357 μ W	Power	Input capacitor power dissipation
21.	Cout Pd	36.173 μ W	Power	Output capacitor power dissipation
22.	IC Iq Pd	162.0 μ W	Power	IC Iq Pd
23.	IC Pd	270.098 mW	Power	IC power dissipation
24.	L Pd	48.171 mW	Power	Inductor power dissipation
25.	Total Pd	318.945 mW	Power	Total Power Dissipation
26.	Vout Tolerance	4.017 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

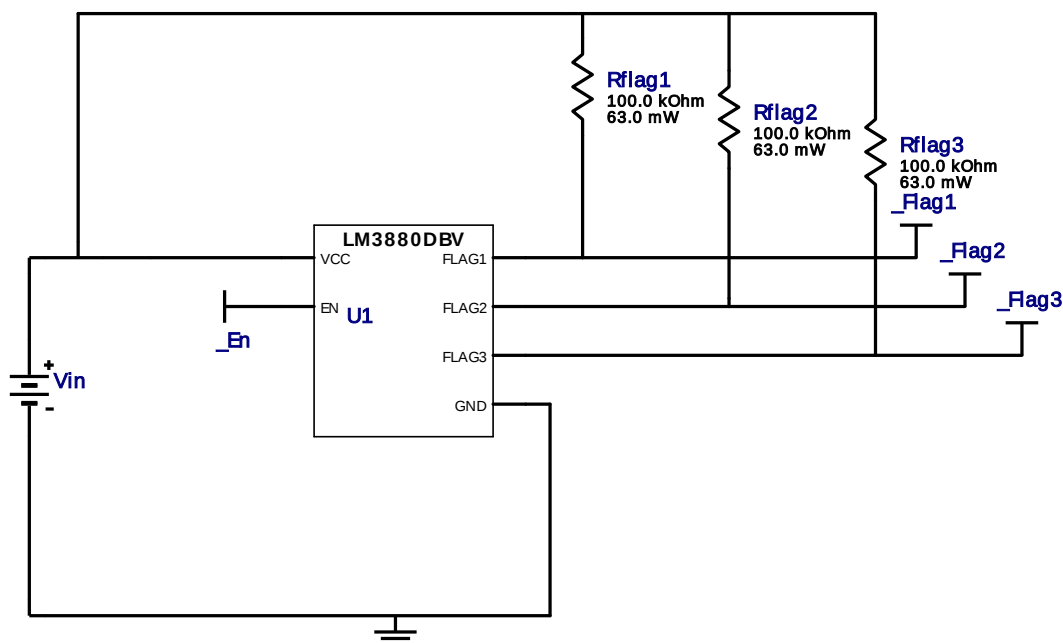
#	Name	Value	Description
1.	Iout	1.26	Maximum Output Current
2.	VinMax	5.4	Maximum input voltage
3.	VinMin	4.6	Minimum input voltage
4.	Vout	1.3	Output Voltage
5.	base_pn	TLV62084	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	Ambient temperature

Design Assistance

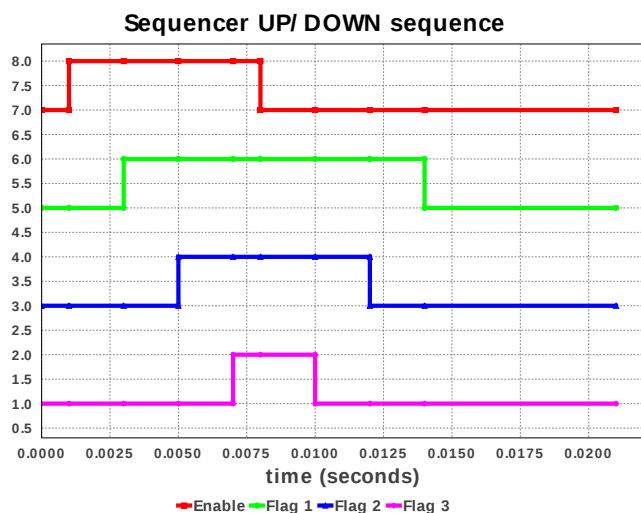
1. TLV62084 Product Folder : <http://www.ti.com/product/TLV62084> : contains the data sheet and other resources.

Device = LM3880MF-1AE/NOPB
Topology = SEQUENCER
Created = 7/19/16 2:30:52 AM
BOM Cost = \$0.48
BOM Count = 4
Total Pd = 0.0W

Design : 3496425/70 LM3880MF-1AE/NOPB
Design 70 - LM3880MF-1AE/NOPB



#	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 μ W	Power	Total Power Dissipation
5.	Flag Voltage	3.3 V		Flag Voltage
6.	Flag1 Down delay (From EN high to low)	6.0 ms		Flag Delay
7.	Flag1 Up delay (From EN low to high)	2.0 ms		Flag Delay
8.	Flag2 Down delay (From EN high to low)	4.0 ms		Flag Delay
9.	Flag2 Up delay (From EN low to high)	4.0 ms		Flag Delay
10.	Flag3 Down delay (From EN high to low)	2.0 ms		Flag Delay
11.	Flag3 Up delay (From EN low to high)	6.0 ms		Flag Delay
12.	Flags Used	2.0		Flags Used
13.	Total Flags	3.0		Total Flags
14.	Vcc	3.3 V		Vcc

Design Inputs

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

Design Assistance

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

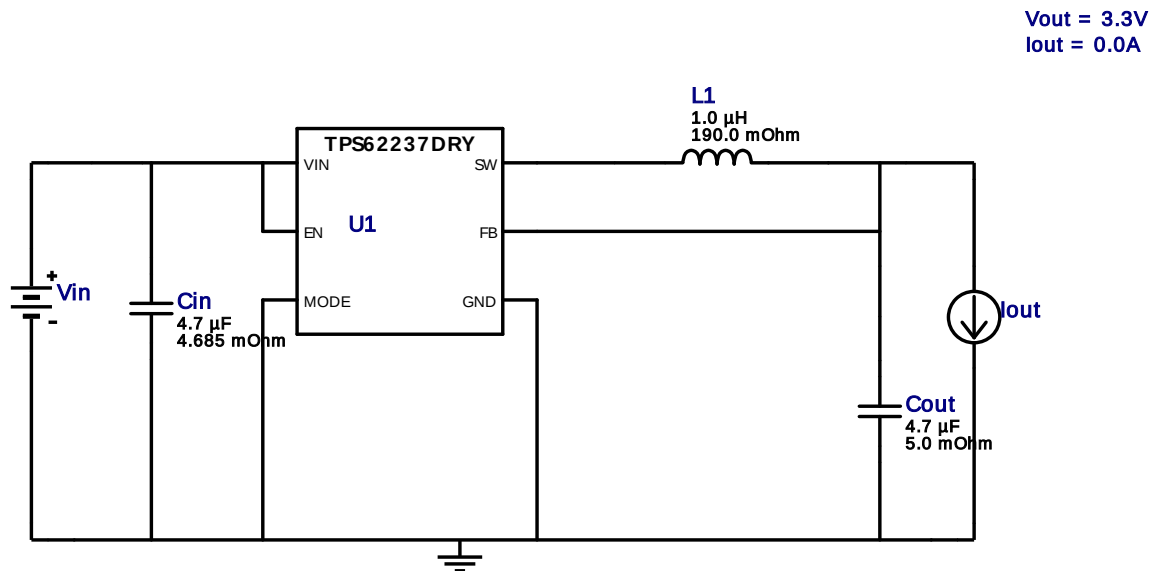


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Iout = 0.0A

Device = TPS62237DRYR
Topology = Buck
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BOM Cost = \$0.62
BOM Count = 4
Total Pd = 0.0W

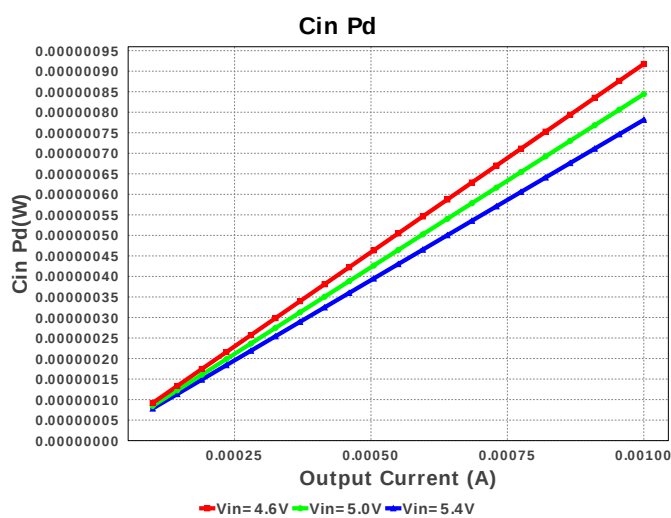
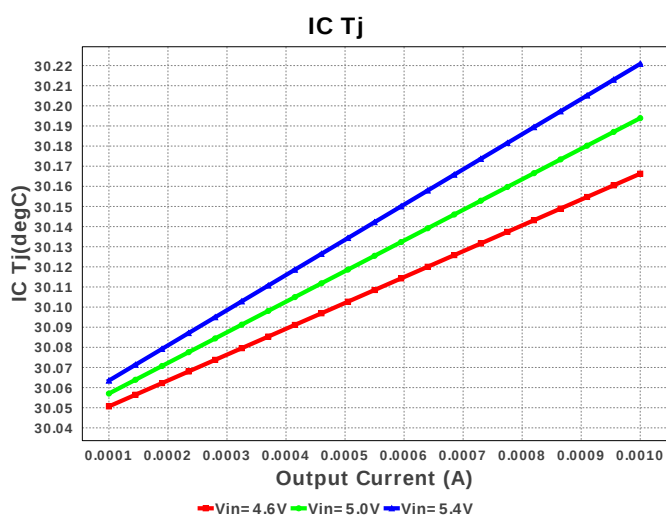
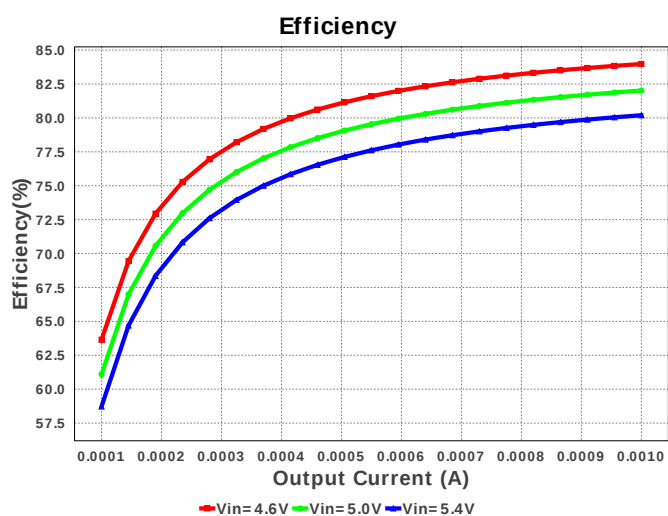
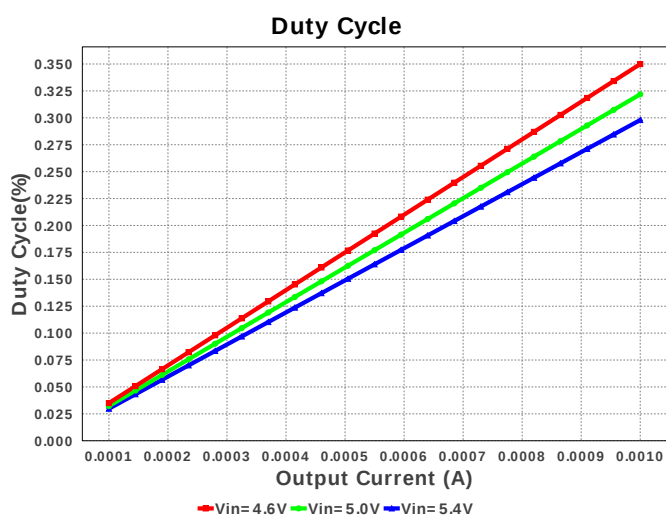
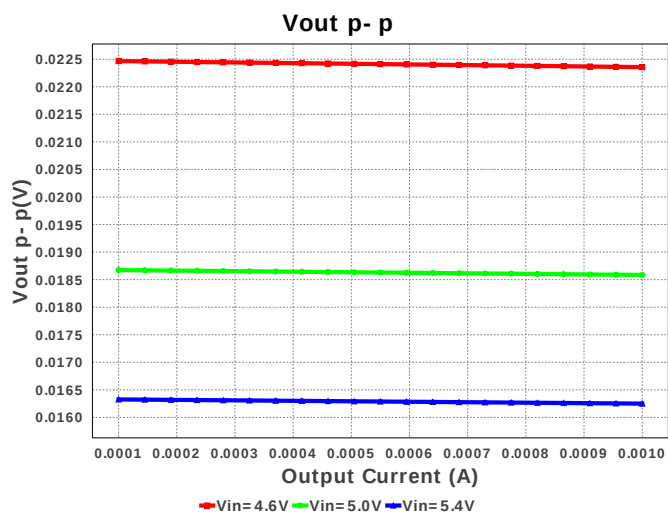
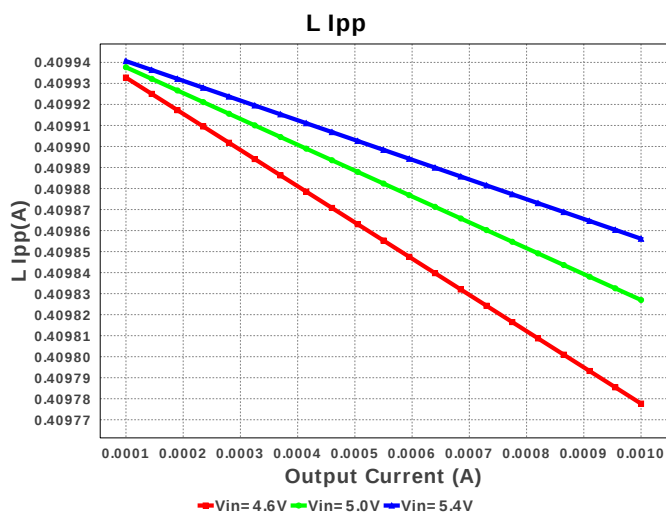
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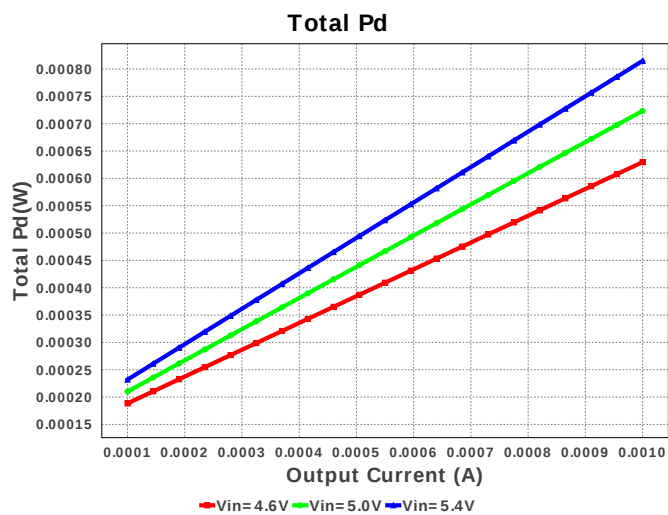
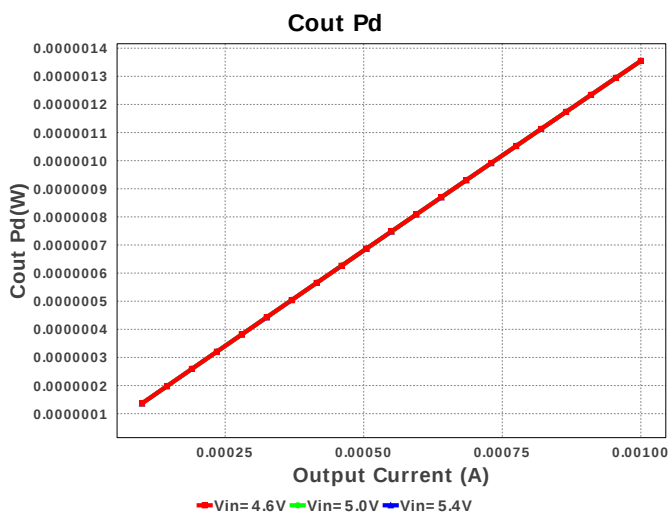
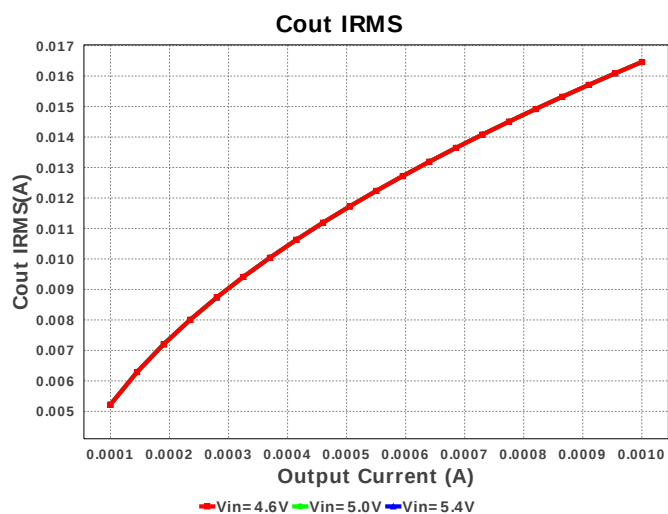
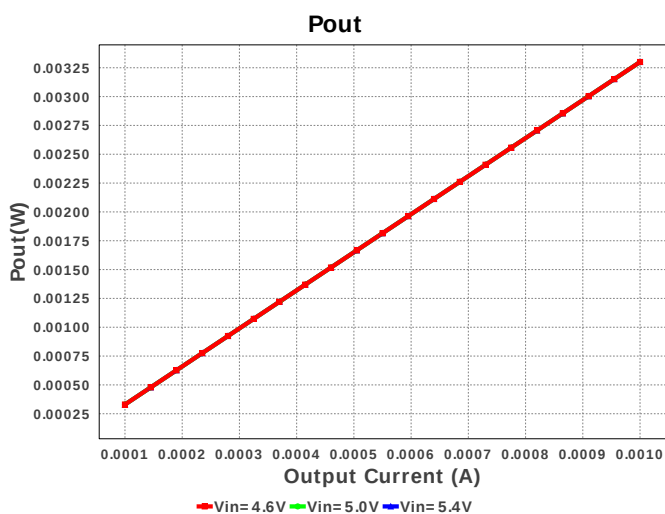
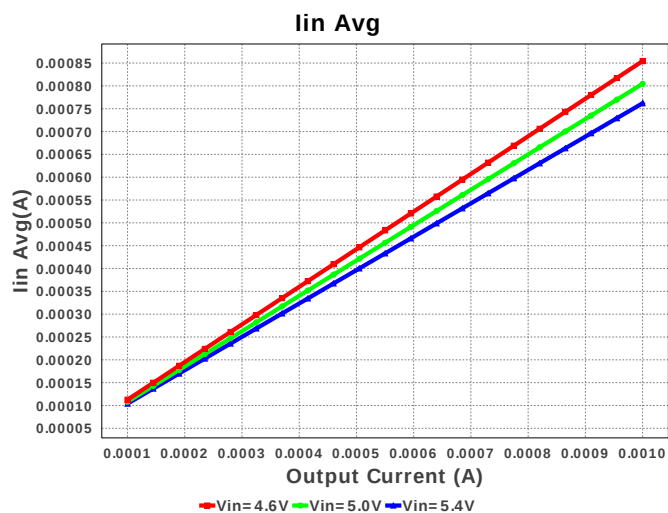
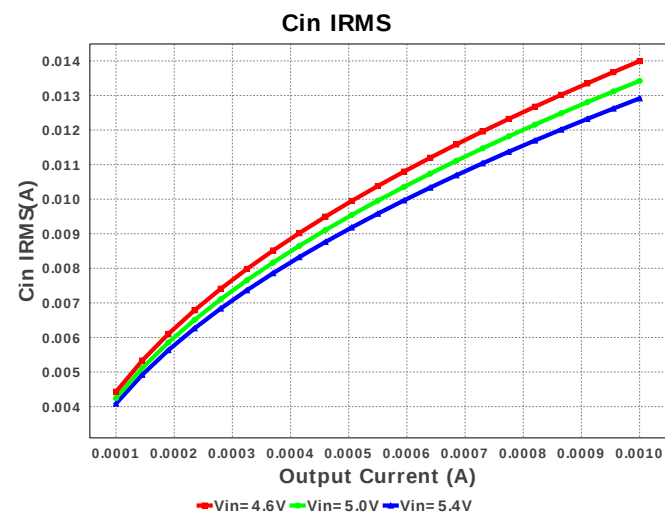
Design : 3496425/71 TPS62237DRYR
TPS62237DRYR 4.6V-5.4V to 3.30V @ 0.001A

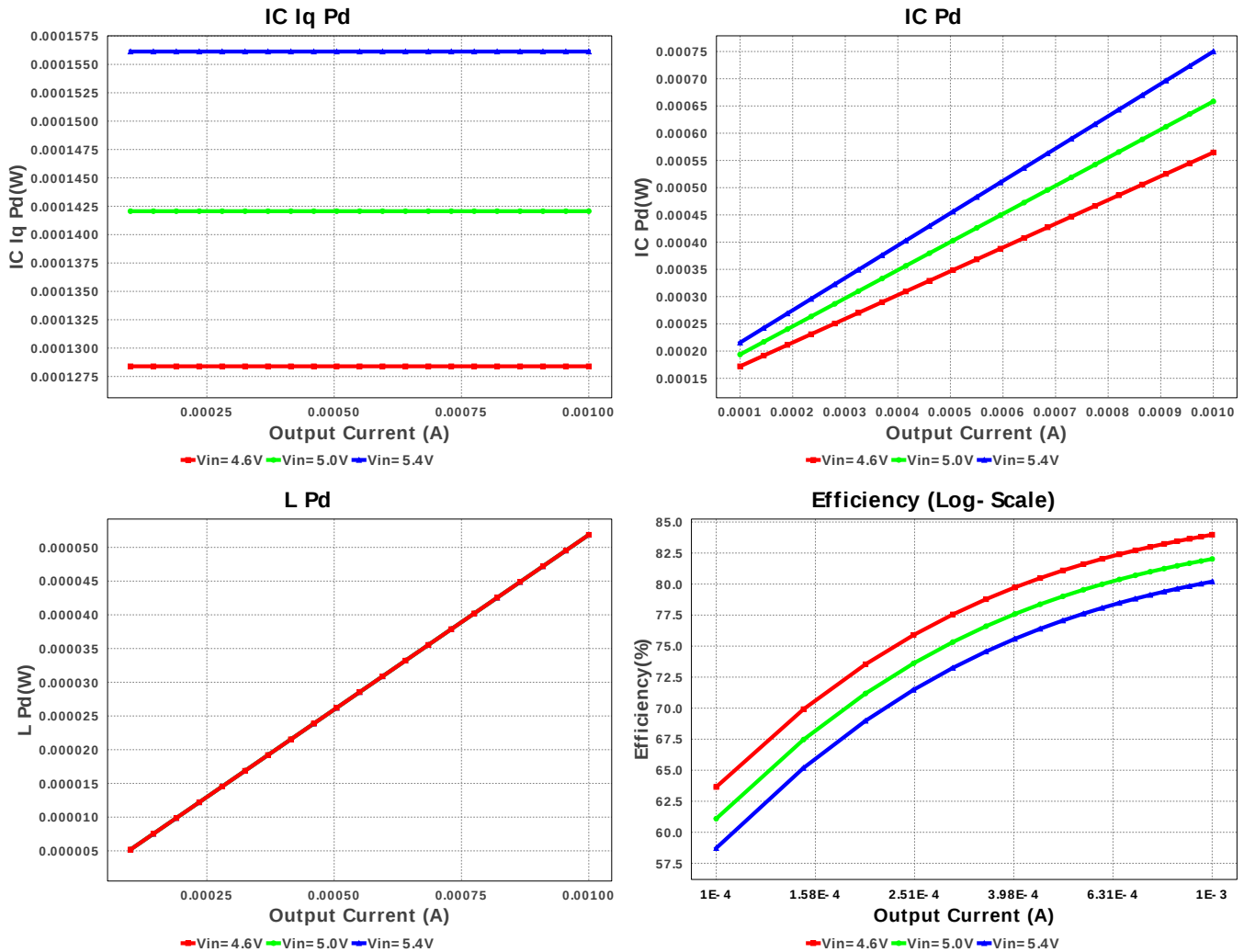


Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM21BR61A475KA73L Series= X5R	Cap= 4.7 uF ESR= 4.685 mOhm VDC= 10.0 V IRMS= 1.84175 A	1	\$0.03	0805 7 mm ²
2.	Cout	MuRata	GRM188R60J475KE19D Series= X5R	Cap= 4.7 uF ESR= 5.0 mOhm VDC= 6.3 V IRMS= 2.0 A	1	\$0.01	0603 5 mm ²
3.	L1	MuRata	LQM21PN1R0MC0D	L= 1.0 µH DCR= 190.0 mOhm	1	\$0.10	0805 7 mm ²
4.	U1	Texas Instruments	TPS62237DRYR	Switcher	1	\$0.48	DRY0006A 5 mm ²







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	12.916 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	16.461 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	762.02 μ A	Current	Average input current
4.	L Ipp	409.86 mA	Current	Peak-to-peak inductor ripple current
5.	BOM Count	4	General	Total Design BOM count
6.	FootPrint	23.0 mm ²	General	Total Foot Print Area of BOM components
7.	Frequency	15.262 kHz	General	Switching frequency
8.	Pout	3.3 mW	General	Total output power
9.	Total BOM	\$0.62	General	Total BOM Cost
10.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
11.	Duty Cycle	297.931 m%	Op_point	Duty cycle
12.	Efficiency	80.196 %	Op_point	Steady state efficiency
13.	IC Tj	30.221 degC	Op_point	IC junction temperature
14.	ICThetaJA	294.5 degC/W	Op_point	IC junction-to-ambient thermal resistance
15.	IOUT_OP	1.0 mA	Op_point	Iout operating point
16.	VIN_OP	5.4 V	Op_point	Vin operating point
17.	Vout p-p	16.25 mV	Op_point	Peak-to-peak output ripple voltage
18.	Cin Pd	781.551 nW	Power	Input capacitor power dissipation
19.	Cout Pd	1.355 μ W	Power	Output capacitor power dissipation
20.	IC Iq Pd	156.132 μ W	Power	IC Iq Pd
21.	IC Pd	749.905 μ W	Power	IC power dissipation
22.	L Pd	51.863 μ W	Power	Inductor power dissipation
23.	Total Pd	814.916 μ W	Power	Total Power Dissipation
24.	Vout Tolerance	303.03 m%		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	1.0 m	Maximum Output Current
2.	VinMax	5.4	Maximum input voltage

#	Name	Value	Description
3.	VinMin	4.6	Minimum input voltage
4.	Vout	3.3	Output Voltage
5.	base_pn	TPS62237	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	Ambient temperature

Design Assistance

1. TPS62237 Product Folder : <http://www.ti.com/product/TPS62237> : contains the data sheet and other resources.

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