

WEBENCH® Power Architect

Project Report

Project : 1194016/442 : PA_Project_304 (modified from 301)

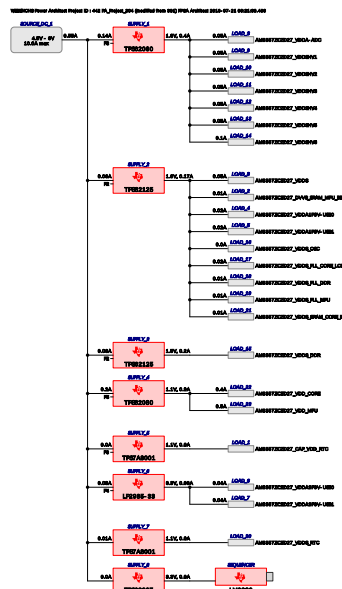
Created : 2016-07-21 06:21:39.466

Optimize project optFactor=3

Project Summary

1. Total System Efficiency	78.773 %
2. Total System BOM Count	64.0
3. Total System Footprint	408.0 mm ²
4. Total System BOM Cost	\$8.17
5. Total System Power Dissipation	694.9 mW

--> Launch WEBENCH Power Architect.



My Comments

No comments

Sequencer Flag Table

Supply	Sequencer Flag	Load	Load Name
SUPPLY_1	3	LOAD_3	AM3357ZCZD27_VDDA-ADC
SUPPLY_1	3	LOAD_9	AM3357ZCZD27_VDDSHV1
SUPPLY_1	3	LOAD_10	AM3357ZCZD27_VDDSHV2
SUPPLY_1	3	LOAD_11	AM3357ZCZD27_VDDSHV3
SUPPLY_1	3	LOAD_12	AM3357ZCZD27_VDDSHV4
SUPPLY_1	3	LOAD_13	AM3357ZCZD27_VDDSHV5
SUPPLY_1	3	LOAD_14	AM3357ZCZD27_VDDSHV6
SUPPLY_2	2	LOAD_8	AM3357ZCZD27_VDDS
SUPPLY_2	2	LOAD_2	AM3357ZCZD27_DVVS_SRAM_MPU_BB
SUPPLY_2	2	LOAD_4	AM3357ZCZD27_VDDA1P8V-USB0
SUPPLY_2	2	LOAD_5	AM3357ZCZD27_VDDA1P8V-USB1
SUPPLY_2	2	LOAD_16	AM3357ZCZD27_VDDS_OSC
SUPPLY_2	2	LOAD_17	AM3357ZCZD27_VDDS_PLL_CORE_LCD
SUPPLY_2	2	LOAD_18	AM3357ZCZD27_VDDS_PLL_DDR
SUPPLY_2	2	LOAD_19	AM3357ZCZD27_VDDS_PLL_MPU
SUPPLY_2	2	LOAD_21	AM3357ZCZD27_VDDS_SRAM_CORE_BG
SUPPLY_3	2	LOAD_15	AM3357ZCZD27_VDDS_DDR
SUPPLY_4	5	LOAD_22	AM3357ZCZD27_VDD_CORE
SUPPLY_4	5	LOAD_23	AM3357ZCZD27_VDD_MPU
SUPPLY_5	6	LOAD_1	AM3357ZCZD27_CAP_VDD_RTC
SUPPLY_6	4	LOAD_6	AM3357ZCZD27_VDDA3P3V-USB0
SUPPLY_6	4	LOAD_7	AM3357ZCZD27_VDDA3P3V-USB1
SUPPLY_7	1	LOAD_20	AM3357ZCZD27_VDDS_RTC
SUPPLY_8	NA		
SEQUENCER	NA		

Power Supplies

#	Name	NSID	Description	Vout	Iout	Efficiency	Foot-print	Cost	Design	Page
1.	SUPPLY_1	TPS62080	Switcher : 1.2A High Efficient Step Down Converter in 2x2mm QFN Package	1.8 V	0.4 A	85%	46	\$1.16	2144	5
2.	SUPPLY_2	TPS62125	Switcher : 3V-17V, 300mA Buck Converter With Adjustable Enable Threshold And Hysteresis	1.8 V	0.165 A	87.4%	68	\$0.72	2145	10
3.	SUPPLY_3	TPS62125	Switcher : 3V-17V, 300mA Buck Converter With Adjustable Enable Threshold And Hysteresis	1.5 V	0.2 A	84.1%	68	\$0.72	2146	16

#	Name	NSID	Description	Vout	Iout	Efficiency	Foot-print	Cost	Design	Page
4.	SUPPLY_4	TPS62080	Switcher : 1.2A High Efficient Step Down Converter in 2x2mm QFN Package	1.1 V	0.9 A	82.3%	46	\$1.16	2147	22
5.	SUPPLY_5	TPS7A8001	LDO : Low-noise, High-bandwidth PSRR, LDO	1.1 V	0.002 A	16.9%	33	\$1.25	2148	27
6.	SUPPLY_6	LP2985-33	LDO : 150mA Low-noise Low-dropout regulator with shutdown	3.3 V	0.08 A	54.6%	28	\$0.21	2149	31
7.	SUPPLY_7	TPS7A8001	LDO : Low-noise, High-bandwidth PSRR, LDO	1.1 V	0.005 A	17.7%	33	\$1.25	2150	35
8.	SUPPLY_8	TPS62237	Switcher : NA	3.3 V	0.001 A	77.7%	21	\$0.61	2152	42
9.	SEQUENCER	LM3880	Sequencer : Power Sequencer	3.3 V	0.001 A	0%	65	\$1.09	2151	39

Power Loads

#	Name	VLoad	ILoad	Description
1.	AM3357ZCZD27_VDDA-ADC	1.8 V	0.05 A	VoutRipple=10%, Up Sequence Order=2 delay=2.0 mSec, Down Sequence Order=3 delay=2.0 mSec
2.	AM3357ZCZD27_VDDSHV1	1.8 V	0.05 A	VoutRipple=10%, Up Sequence Order=2 delay=2.0 mSec, Down Sequence Order=3 delay=2.0 mSec
3.	AM3357ZCZD27_VDDSHV2	1.8 V	0.05 A	VoutRipple=10%, Up Sequence Order=2 delay=2.0 mSec, Down Sequence Order=3 delay=2.0 mSec
4.	AM3357ZCZD27_VDDSHV3	1.8 V	0.05 A	VoutRipple=10%, Up Sequence Order=2 delay=2.0 mSec, Down Sequence Order=3 delay=2.0 mSec
5.	AM3357ZCZD27_VDDSHV4	1.8 V	0.05 A	VoutRipple=10%, Up Sequence Order=2 delay=2.0 mSec, Down Sequence Order=3 delay=2.0 mSec
6.	AM3357ZCZD27_VDDSHV5	1.8 V	0.05 A	VoutRipple=10%, Up Sequence Order=2 delay=2.0 mSec, Down Sequence Order=3 delay=2.0 mSec
7.	AM3357ZCZD27_VDDSHV6	1.8 V	0.1 A	VoutRipple=10%, Up Sequence Order=2 delay=2.0 mSec, Down Sequence Order=3 delay=2.0 mSec
8.	AM3357ZCZD27_VDDS	1.8 V	0.05 A	VoutRipple=10%, Up Sequence Order=1 delay=2.0 mSec, Down Sequence Order=4 delay=2.0 mSec
9.	AM3357ZCZD27_DVVS_SRAM_MPU_BB	1.8 V	0.01 A	VoutRipple=10%, Up Sequence Order=1 delay=2.0 mSec, Down Sequence Order=4 delay=2.0 mSec
10.	AM3357ZCZD27_VDDA1P8V-USB0	1.8 V	0.025 A	VoutRipple=10%, Up Sequence Order=1 delay=2.0 mSec, Down Sequence Order=4 delay=2.0 mSec
11.	AM3357ZCZD27_VDDA1P8V-USB1	1.8 V	0.025 A	VoutRipple=10%, Up Sequence Order=1 delay=2.0 mSec, Down Sequence Order=4 delay=2.0 mSec
12.	AM3357ZCZD27_VDDS_OSC	1.8 V	0.005 A	VoutRipple=10%, Up Sequence Order=1 delay=2.0 mSec, Down Sequence Order=4 delay=2.0 mSec
13.	AM3357ZCZD27_VDDS_PLL_CORE_LCD	1.8 V	0.02 A	VoutRipple=10%, Up Sequence Order=1 delay=2.0 mSec, Down Sequence Order=4 delay=2.0 mSec
14.	AM3357ZCZD27_VDDS_PLL_DDR	1.8 V	0.01 A	VoutRipple=10%, Up Sequence Order=1 delay=2.0 mSec, Down Sequence Order=4 delay=2.0 mSec
15.	AM3357ZCZD27_VDDS_PLL_MPU	1.8 V	0.01 A	VoutRipple=10%, Up Sequence Order=1 delay=2.0 mSec, Down Sequence Order=4 delay=2.0 mSec
16.	AM3357ZCZD27_VDDS_SRAM_CORE_BG	1.8 V	0.01 A	VoutRipple=10%, Up Sequence Order=1 delay=2.0 mSec, Down Sequence Order=4 delay=2.0 mSec
17.	AM3357ZCZD27_VDDS_DDR	1.5 V	0.2 A	VoutRipple=10%, Up Sequence Order=1 delay=2.0 mSec, Down Sequence Order=4 delay=2.0 mSec
18.	AM3357ZCZD27_VDD_CORE	1.1 V	0.4 A	VoutRipple=8%, Up Sequence Order=4 delay=2.0 mSec, Down Sequence Order=1 delay=2.0 mSec
19.	AM3357ZCZD27_VDD_MPU	1.1 V	0.5 A	VoutRipple=8%, Up Sequence Order=4 delay=2.0 mSec, Down Sequence Order=1 delay=2.0 mSec
20.	AM3357ZCZD27_CAP_VDD_RTC	1.1 V	0.002 A	VoutRipple=8%, Up Sequence Order=5 delay=2.0 mSec, Down Sequence Order=0 delay=2.0 mSec
21.	AM3357ZCZD27_VDDA3P3V-USB0	3.3 V	0.04 A	VoutRipple=10%, Up Sequence Order=3 delay=2.0 mSec, Down Sequence Order=2 delay=2.0 mSec
22.	AM3357ZCZD27_VDDA3P3V-USB1	3.3 V	0.04 A	VoutRipple=10%, Up Sequence Order=3 delay=2.0 mSec, Down Sequence Order=2 delay=2.0 mSec
23.	AM3357ZCZD27_VDDS_RTC	1.1 V	0.005 A	VoutRipple=16%, Up Sequence Order=0 delay=2.0 mSec, Down Sequence Order=5 delay=2.0 mSec

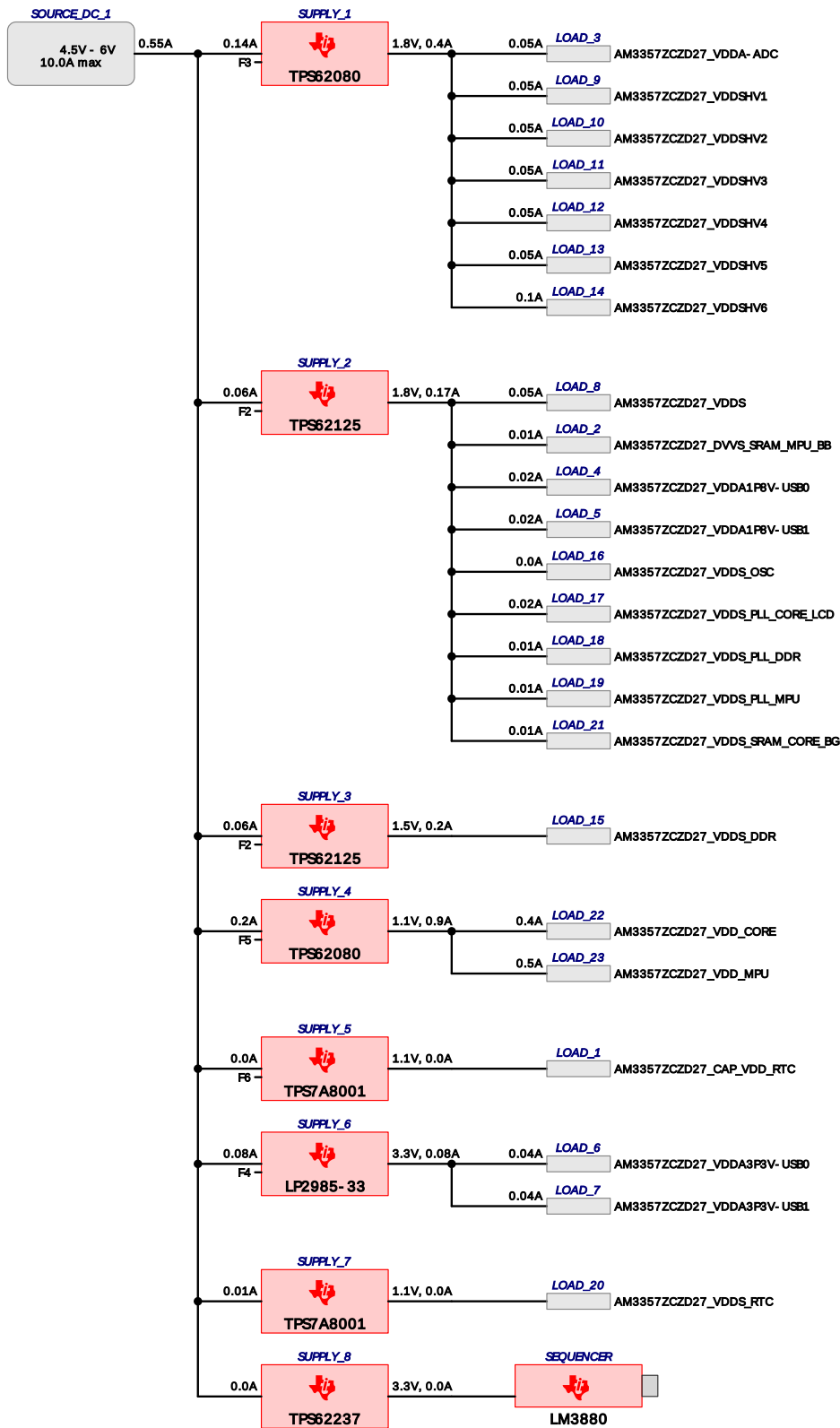
FPGAs, Processors

#	Manufacturer	Part Number	Name	Series	Description
1.	Texas Instruments	AM3357ZCZD27	FPGA_1	Sitara AM335X	FPGA Texas Instruments Sitara AM335X AM3357ZCZD27

<http://www.ti.com/lit/ds/symlink/am3359.pdf>

Project Diagram

WEBENCH® Power Architect Project ID : 442_PA_Project_304 (modified from 301) FPGA Architect 2016-07-21 06:21:39.466

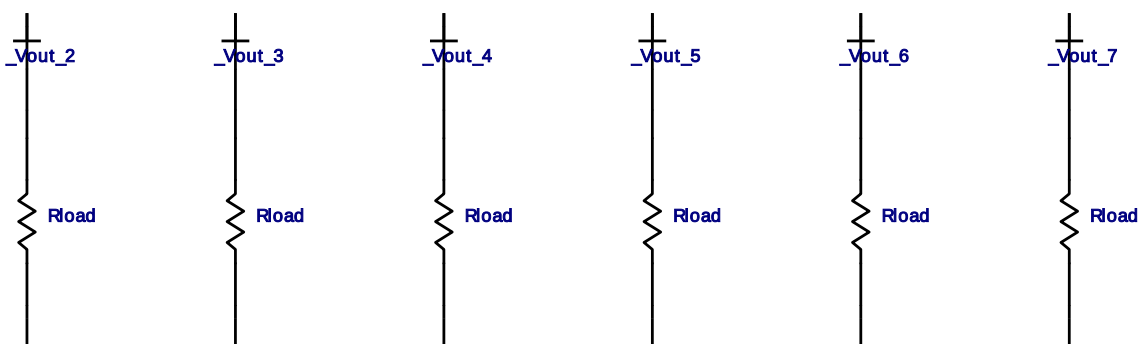
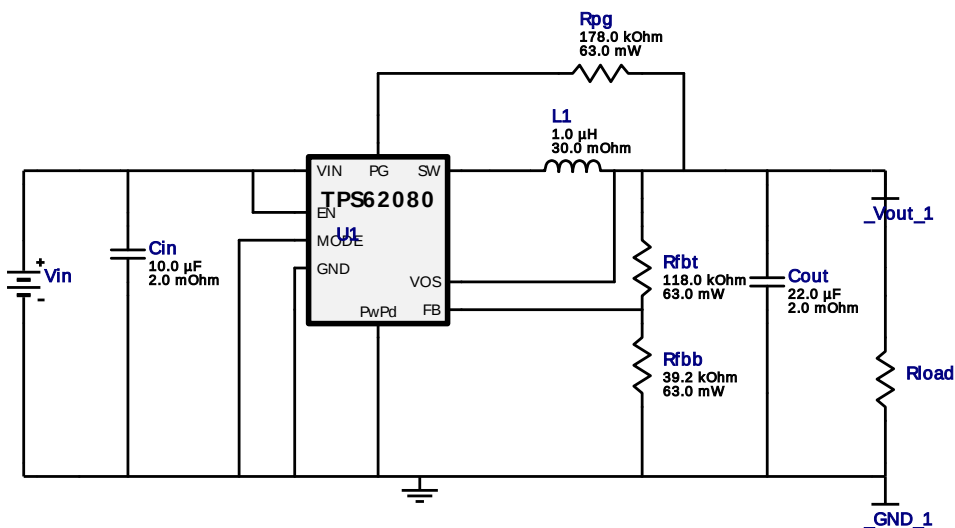


Electrical Procurement BOM

Manufacturer	Part Number	Description	Quantity	Budgetary Price	Footprint (mm ²)
Vishay-Dale	CRCW0402100KFKED	0402	10	\$0.01	30
Vishay-Dale	CRCW040210K0FKED	0402	2	\$0.01	6
Vishay-Dale	CRCW0402118KFKED	0402	1	\$0.01	3
Vishay-Dale	CRCW0402124KFKED	0402	1	\$0.01	3
Vishay-Dale	CRCW0402178KFKED	0402	2	\$0.01	6
Vishay-Dale	CRCW0402200KFKED	0402	2	\$0.01	6
Vishay-Dale	CRCW040239K2FKED	0402	2	\$0.01	6
Vishay-Dale	CRCW04023K74FKED	0402	2	\$0.01	6
Vishay-Dale	CRCW040241K2FKED	0402	2	\$0.01	6
Vishay-Dale	CRCW0402487KFKED	0402	2	\$0.01	6
Vishay-Dale	CRCW040256K2FKED	0402	1	\$0.01	3
Vishay-Dale	CRCW040286K6FKED	0402	1	\$0.01	3
MuRata	GRM033R61A103KA01D	0201	3	\$0.01	6
MuRata	GRM188R60G106ME47D	0603	2	\$0.02	9
MuRata	GRM188R60J106ME47D	0603	2	\$0.02	9
MuRata	GRM188R60J475KE19D	0603	4	\$0.01	19
MuRata	GRM188R61A105KA61D	0603	1	\$0.01	5
MuRata	GRM188R61A225KE34D	0603	1	\$0.02	5
MuRata	GRM188R71C104KA01D	0603	2	\$0.01	9
Taiyo Yuden	JMK212BJ106KD-T	0805	2	\$0.03	14
Taiyo Yuden	JMK212BJ226KG-T	0805	2	\$0.13	14
Texas Instruments	LM3880MF-1AE/NOPB	R-PDSO- G6	2	\$0.45	19
Texas Instruments	LP2985-33DBVRE4	R-PDSO- G5	1	\$0.18	16
MuRata	LQM21PN1R0MC0D	0805	1	\$0.10	7
NIC Components	NPI43C150MTRF	IND_NPI43C	2	\$0.07	61
Coilcraft	PFL3215-102MEB	PFL3215	2	\$0.28	28
Texas Instruments	SN74AHC1G08	SOT-23	1	\$0.06	14
Texas Instruments	SN74AHC1G32	SOT-23	1	\$0.07	14
Texas Instruments	TPS62080DSGR	S- PWSON- N8	2	\$0.69	19
Texas Instruments	TPS62125DSGR	S- PWSON- N8	2	\$0.55	19
Texas Instruments	TPS62237DRYR	DRY0006A	1	\$0.48	5
Texas Instruments	TPS7A8001DRBR	DRB0008A	2	\$1.20	32
Total			64	\$8.17	408.1949

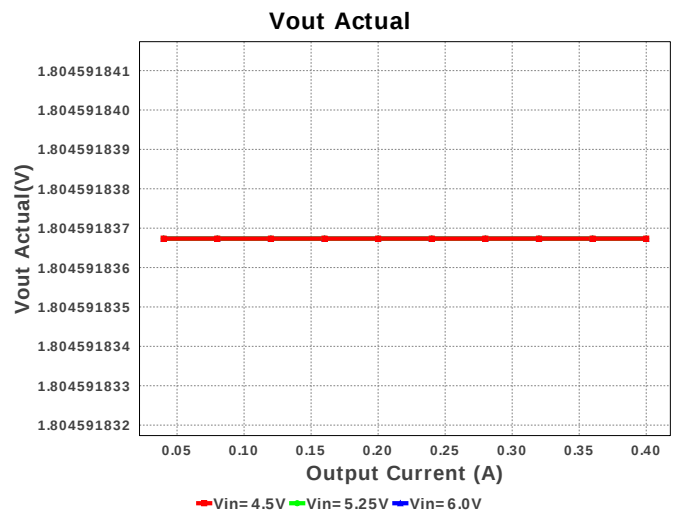
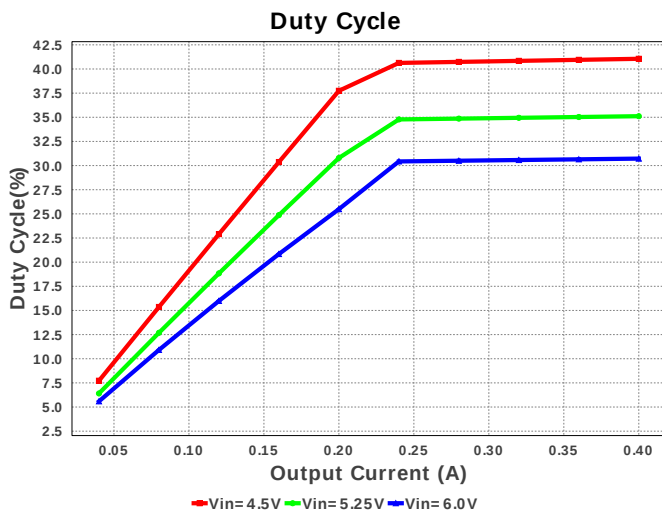
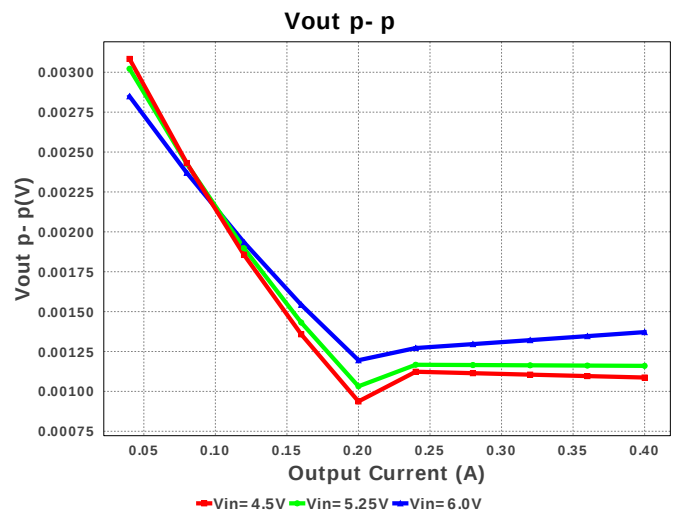
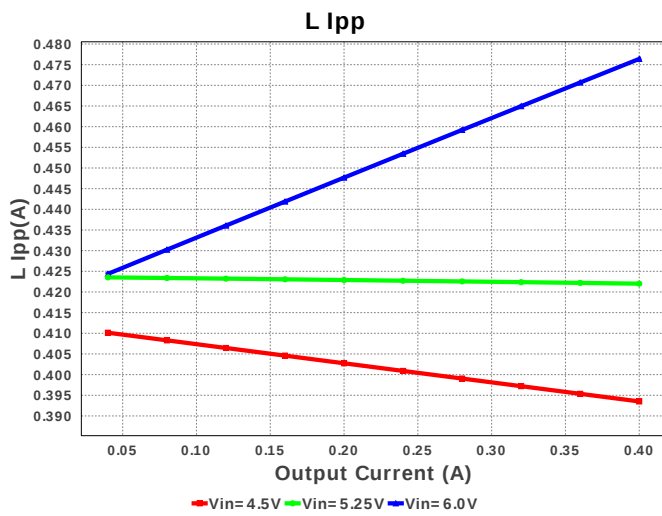
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Topology = Buck
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BOM Count = 7
Total Pd = 0.13W

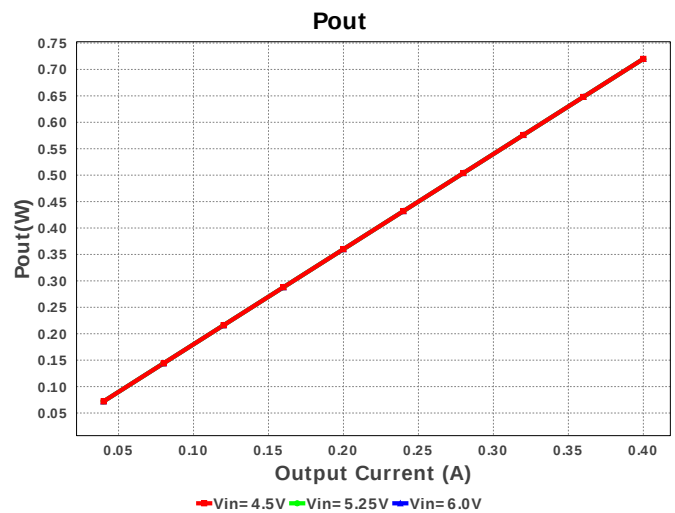
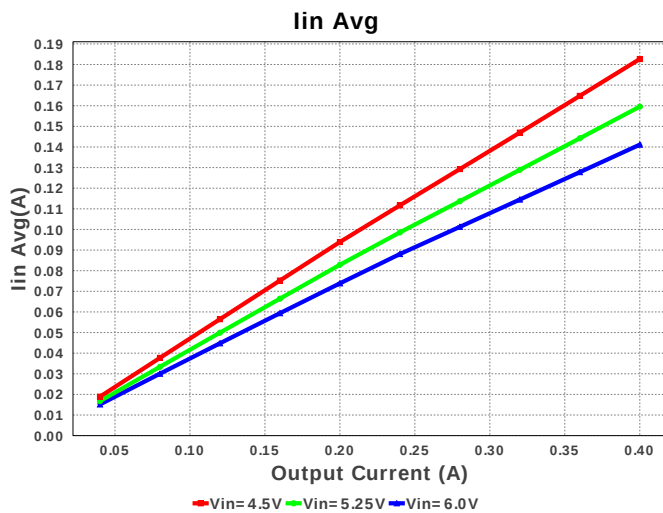
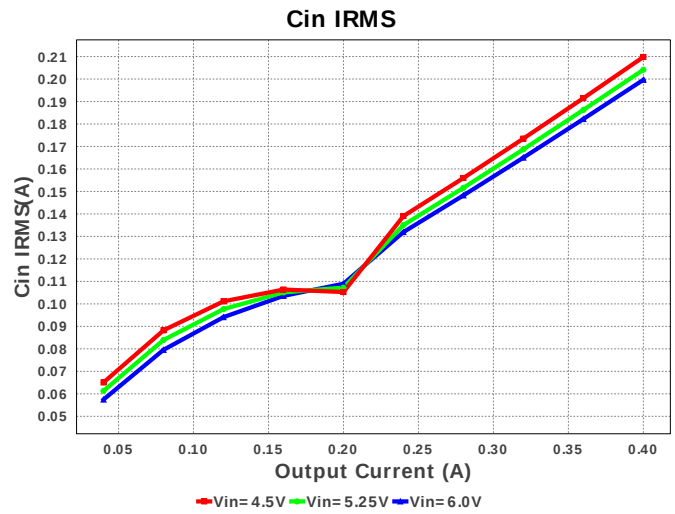
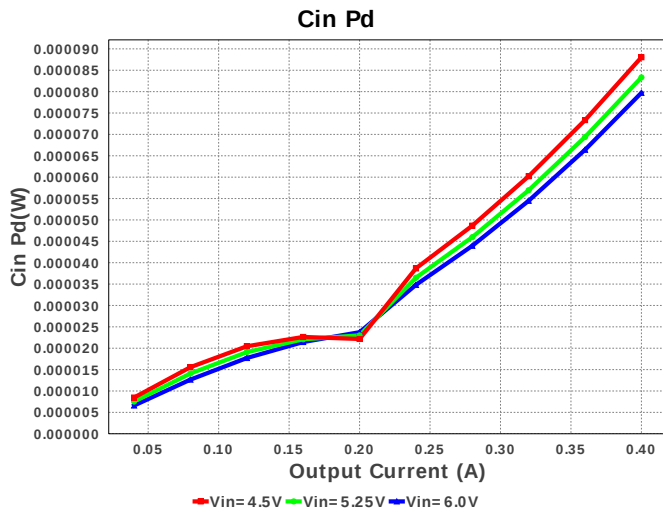
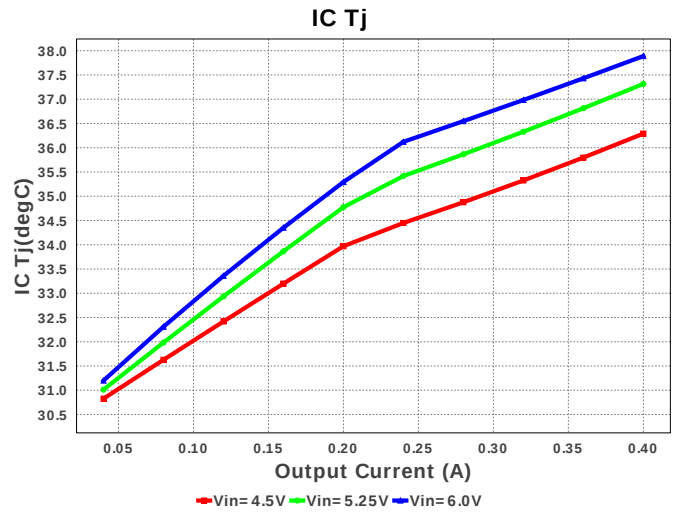
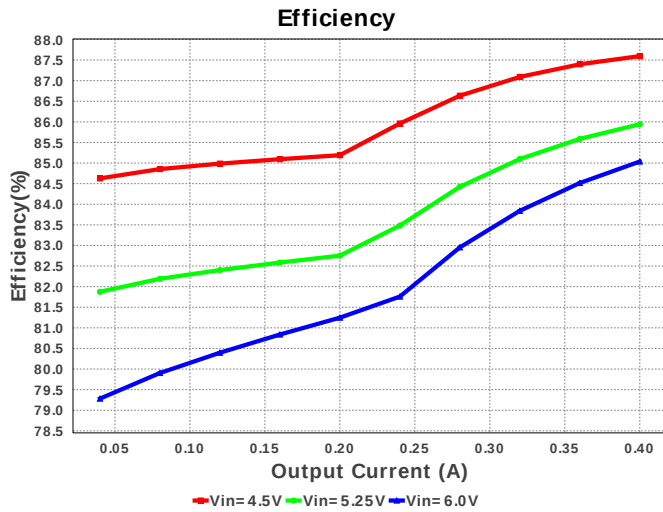
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TPS62080DSGR 4.5V-6.0V to 1.80V @ 0.4A

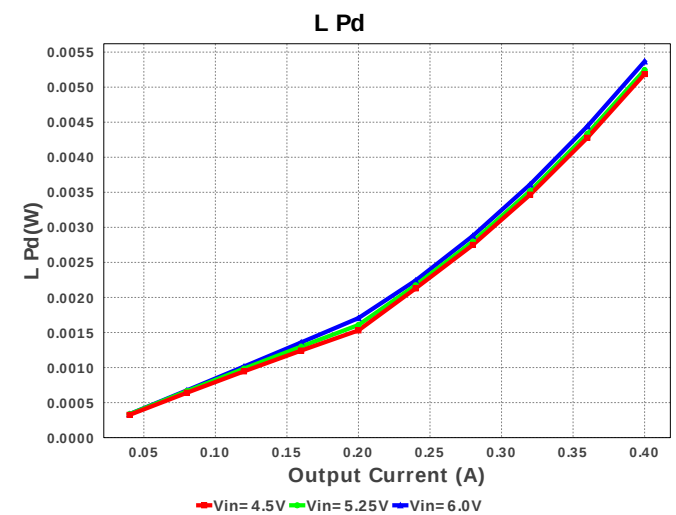
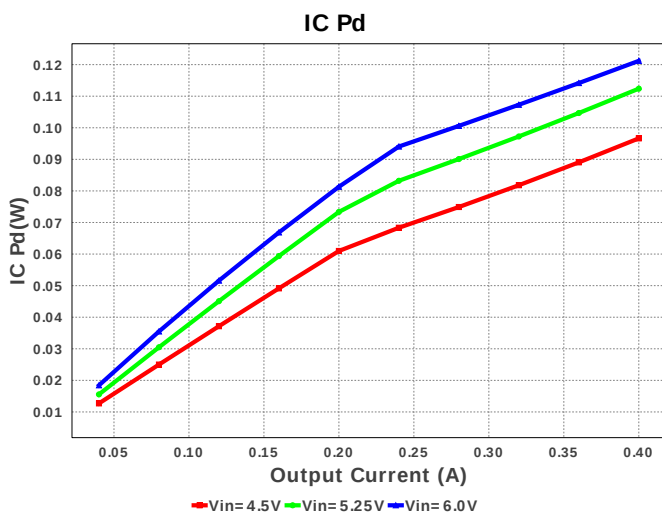
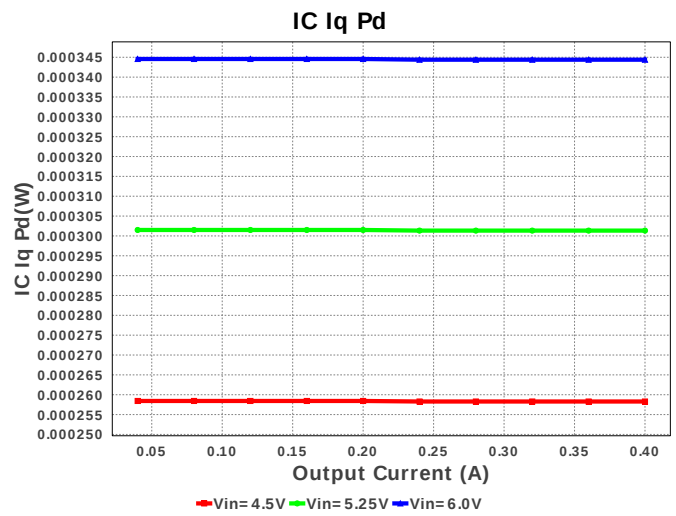
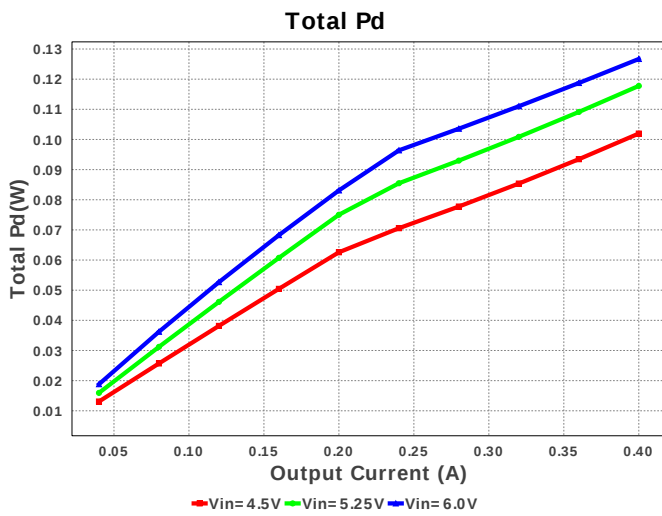
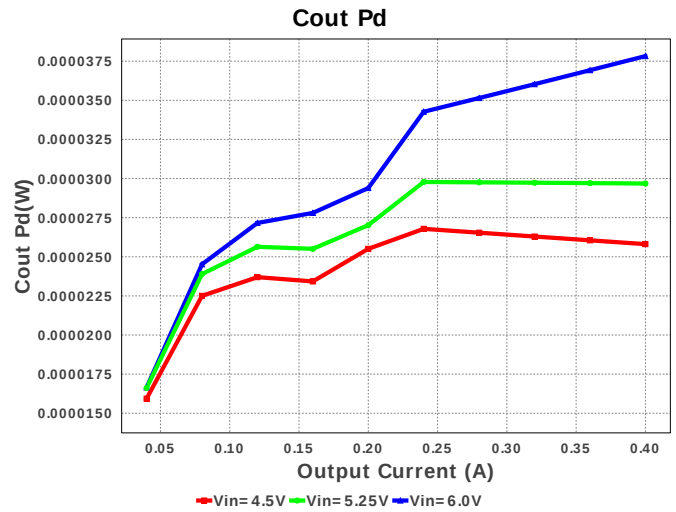
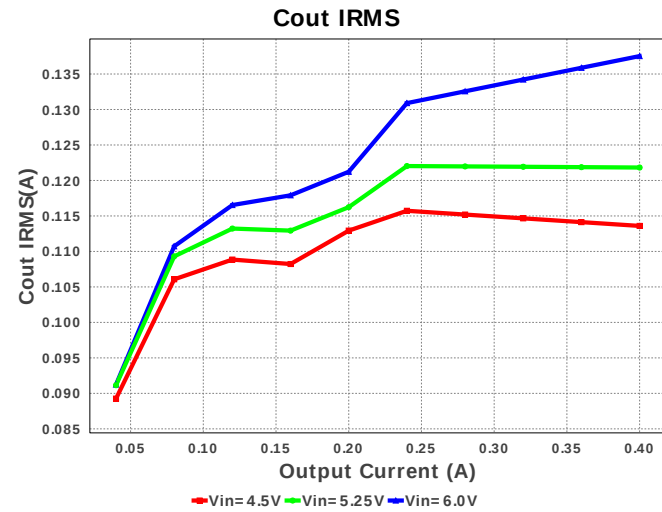


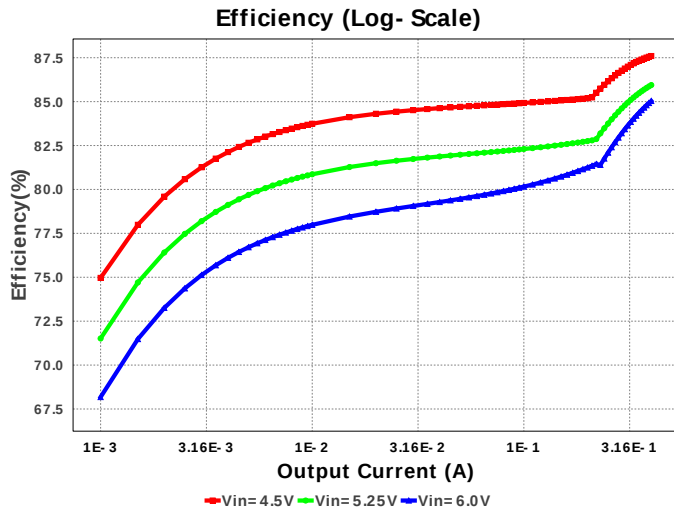
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	Taiyo Yuden	JMK212BJ106KD-T Series= X5R	Cap= 10.0 uF ESR= 2.0 mOhm VDC= 6.3 V IRMS= 0.0 A	1	\$0.03	0805 7 mm²
2.	Cout	Taiyo Yuden	JMK212BJ226KG-T Series= X5R	Cap= 22.0 uF ESR= 2.0 mOhm VDC= 6.3 V IRMS= 0.0 A	1	\$0.13	0805 7 mm²
3.	L1	Coilcraft	PFL3215-102MEB	L= 1.0 µH DCR= 30.0 mOhm	1	\$0.28	PFL3215 14 mm²
4.	Rfbb	Vishay-Dale	CRCW040239K2FKED Series= CRCW..e3	Res= 39.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm²
5.	Rfbt	Vishay-Dale	CRCW0402118KFKED Series= CRCW..e3	Res= 118.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
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	TPS62080DSGR	Switcher	1	\$0.69	S-PWSON-N8 10 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	199.656 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	137.524 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	141.12 mA	Current	Average input current
4.	L Ipp	476.4 mA	Current	Peak-to-peak inductor ripple current
5.	BOM Count	7	General	Total Design BOM count
6.	FootPrint	46.0 mm ²	General	Total Foot Print Area of BOM components
7.	Frequency	2.541 MHz	General	Switching frequency
8.	IC Tolerance	25.0 mV	General	IC Feedback Tolerance
9.	Pout	720.0 mW	General	Total output power
10.	Total BOM	\$1.16	General	Total BOM Cost
11.	Vout Actual	1.805 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
12.	Vout OP	1.8 V	Op_Point	Operational Output Voltage
13.	Duty Cycle	30.72 %	Op_point	Duty cycle
14.	Efficiency	85.037 %	Op_point	Steady state efficiency
15.	IC Tj	37.889 degC	Op_point	IC junction temperature
16.	ICThetaJA	65.1 degC/W	Op_point	IC junction-to-ambient thermal resistance
17.	IOUT_OP	400.0 mA	Op_point	Iout operating point
18.	VIN_OP	6.0 V	Op_point	Vin operating point
19.	Vout p-p	1.315 mV	Op_point	Peak-to-peak output ripple voltage
20.	Cin Pd	79.725 μW	Power	Input capacitor power dissipation
21.	Cout Pd	37.826 μW	Power	Output capacitor power dissipation
22.	IC Iq Pd	344.388 μW	Power	IC Iq Pd
23.	IC Pd	121.188 mW	Power	IC power dissipation
24.	L Pd	5.367 mW	Power	Inductor power dissipation
25.	Total Pd	126.695 mW	Power	Total Power Dissipation
26.	Vout Tolerance	7.156 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	400.0 m	Maximum Output Current
2.	VinMax	6.0	Maximum input voltage
3.	VinMin	4.5	Minimum input voltage
4.	Vout	1.8	Output Voltage
5.	base_pn	TPS62080	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS62080** Product Folder : <http://www.ti.com/product/TPS62080> : contains the data sheet and other resources.

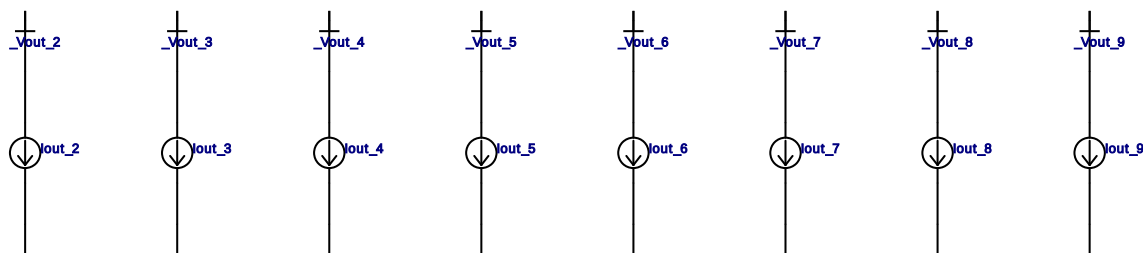
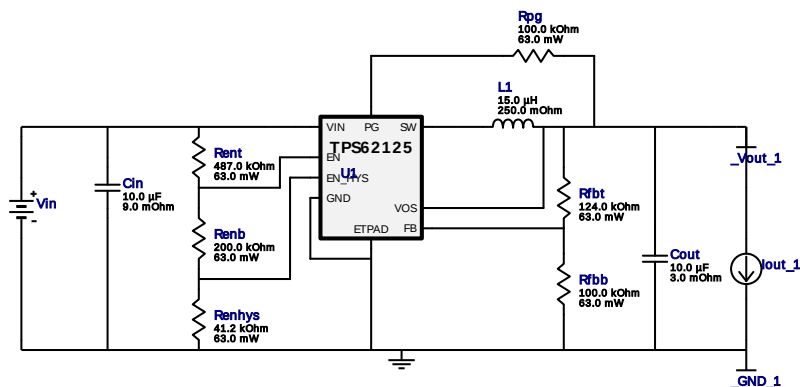


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Iout = 0.16A

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BOM Cost = \$0.72
BOM Count = 10
Total Pd = 0.04W

WEBENCH® Design Report

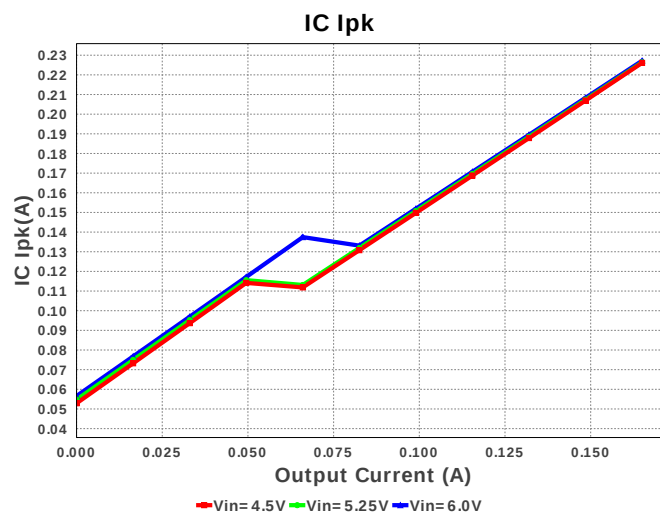
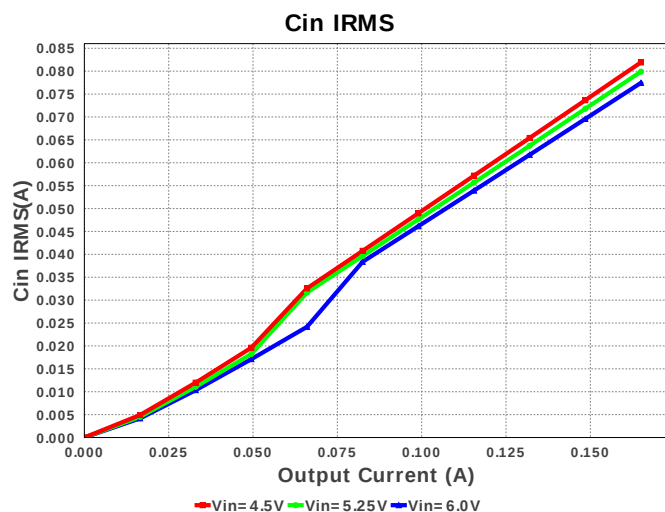
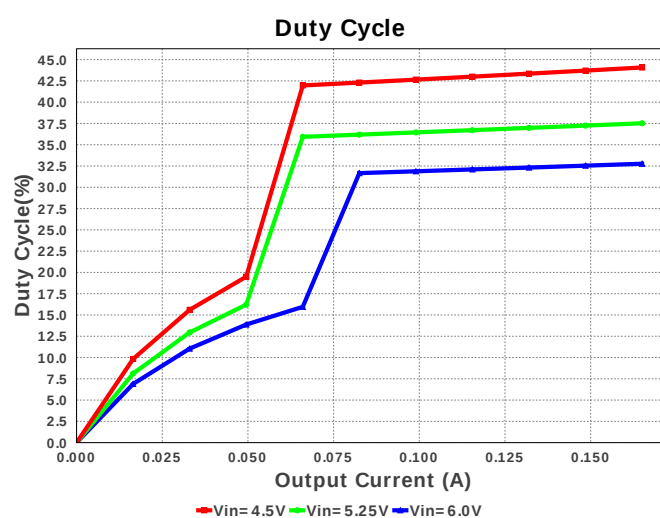
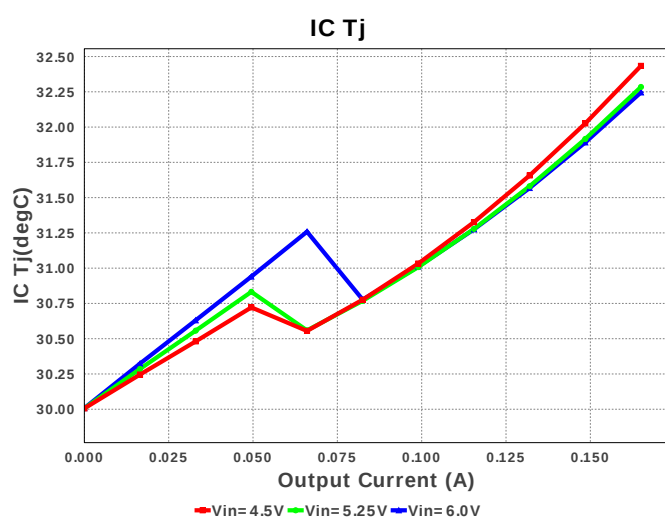
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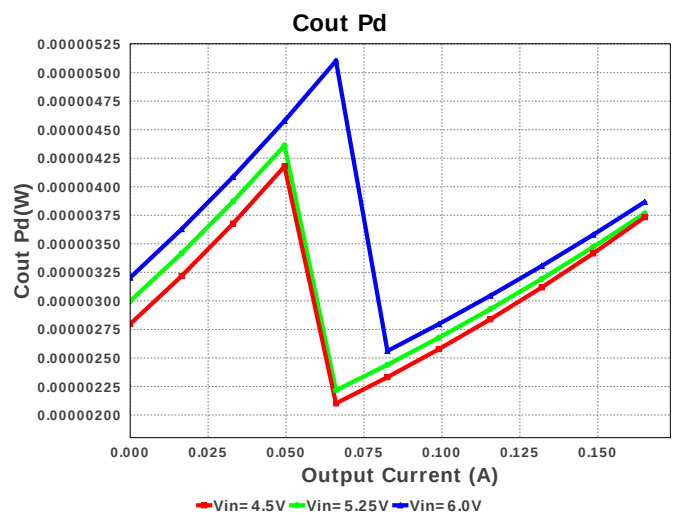
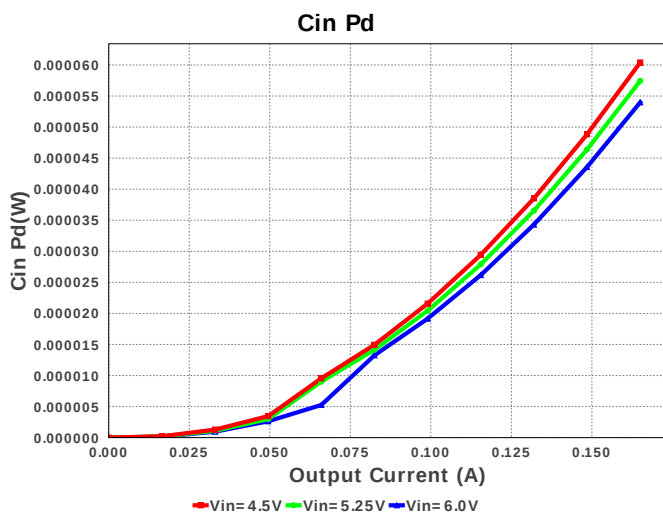
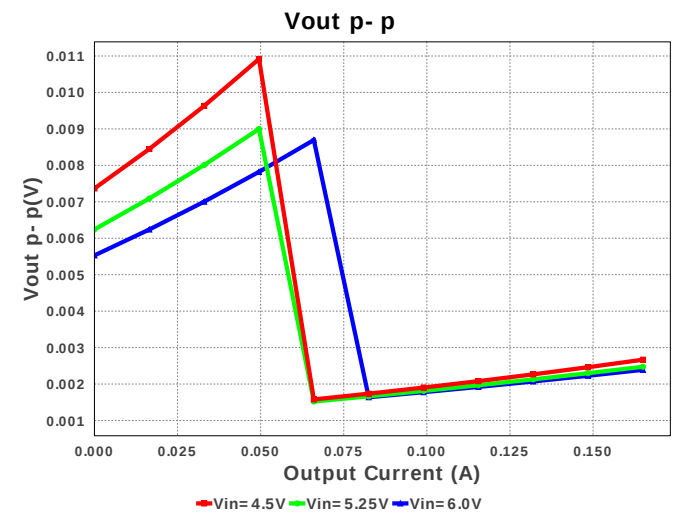
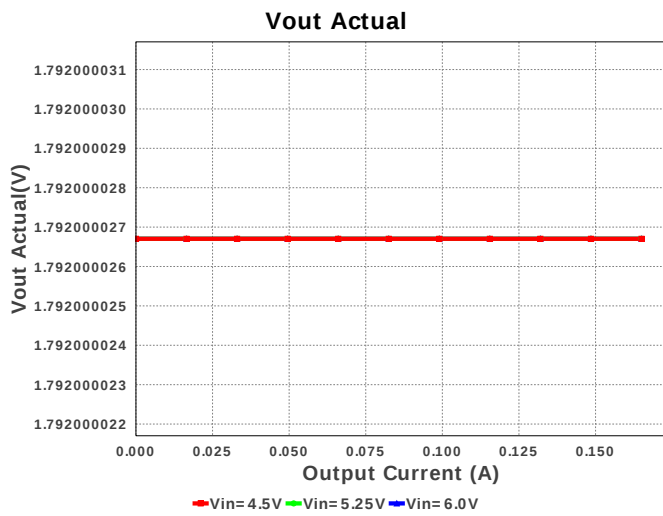
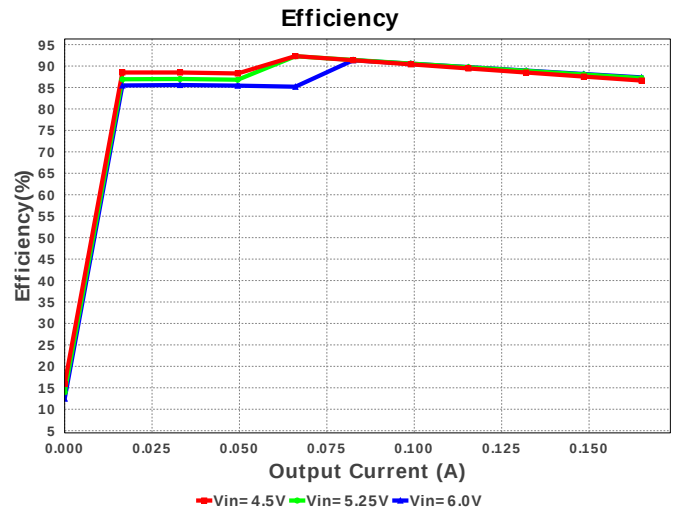
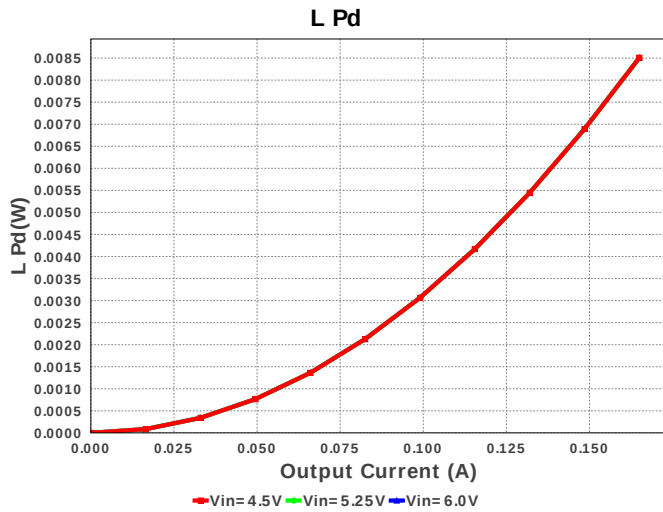


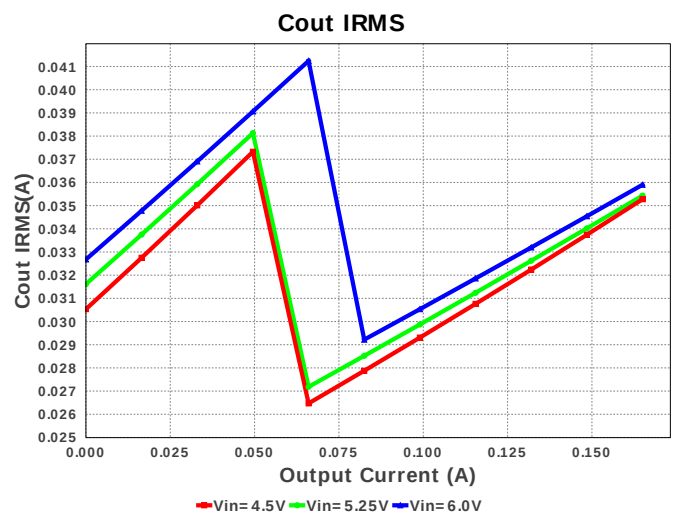
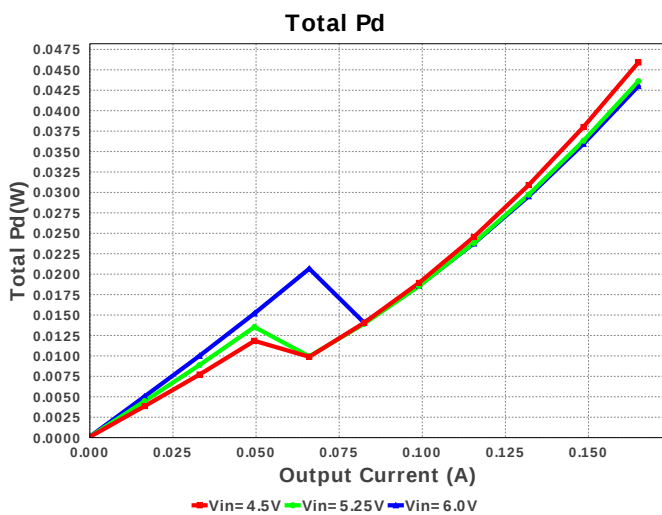
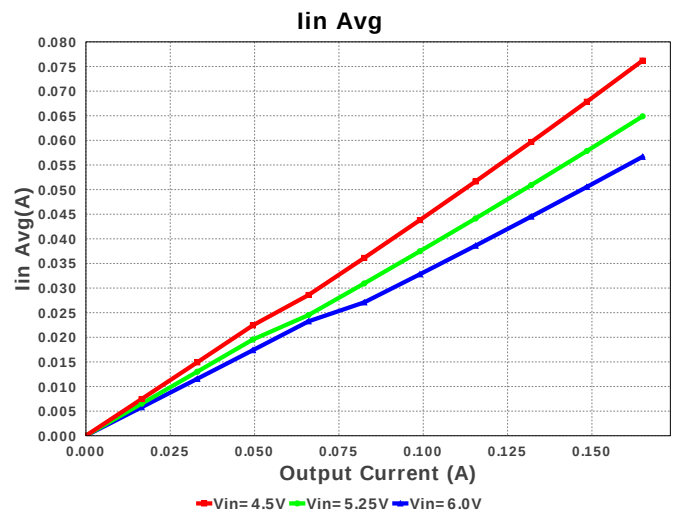
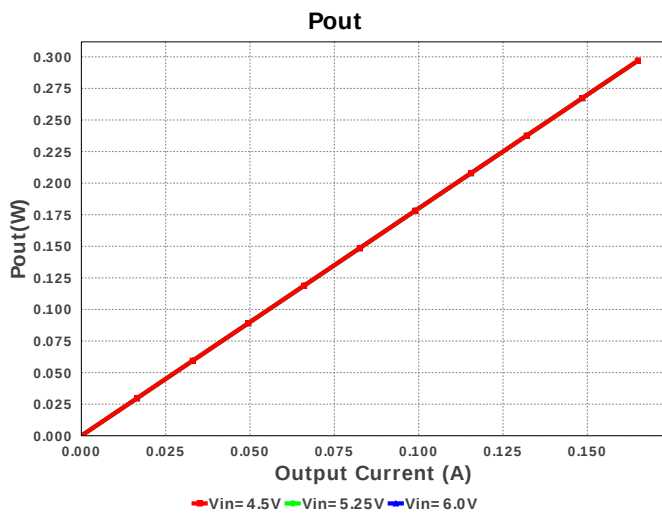
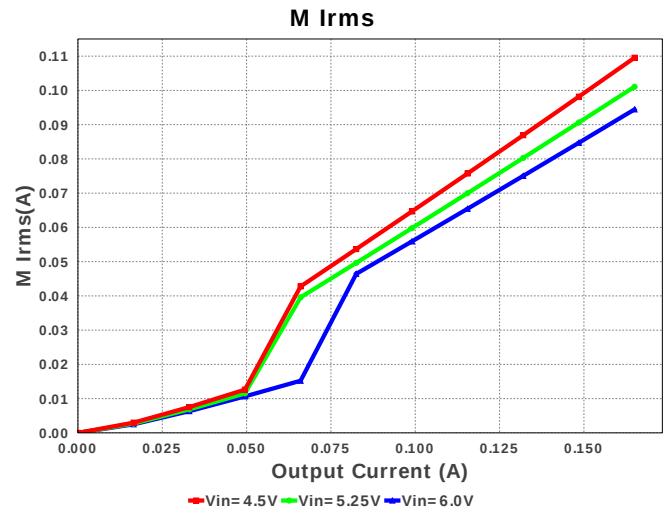
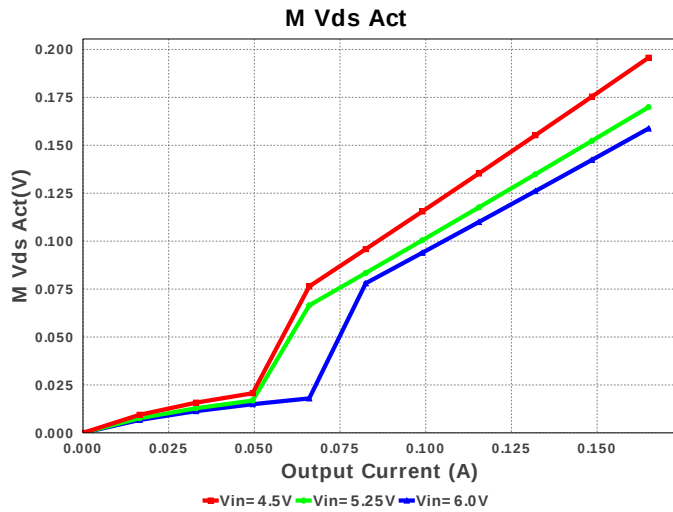
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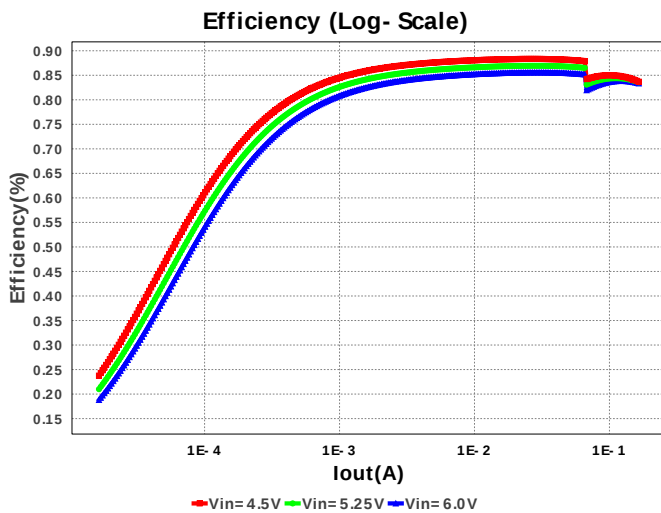
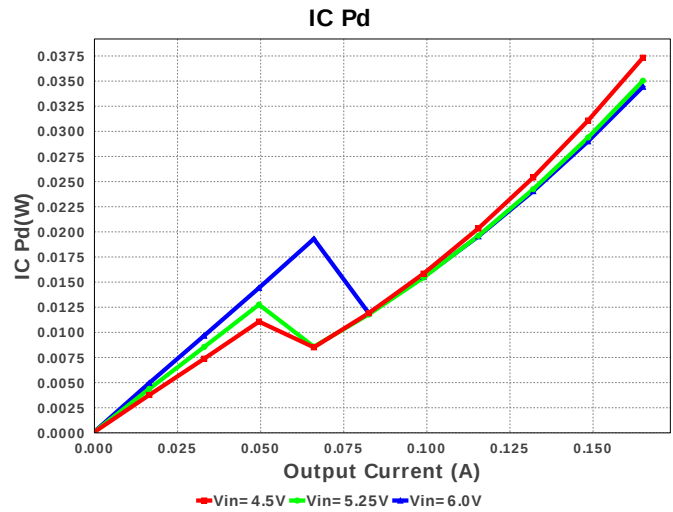
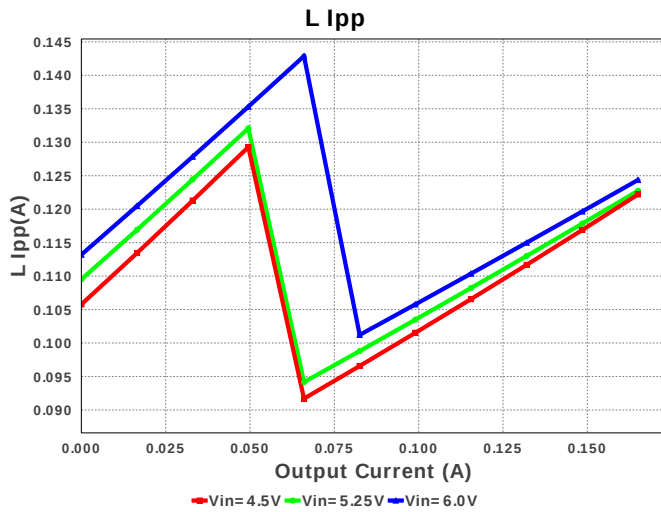
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM188R60J106ME47D Series= X5R	Cap= 10.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 2.74 A	1	\$0.02	0603 5 mm ²
2.	Cout	MuRata	GRM188R60G106ME47D Series= X5R	Cap= 10.0 uF ESR= 3.0 mOhm VDC= 4.0 V IRMS= 3.0 A	1	\$0.02	0603 5 mm ²
3.	L1	NIC Components	NPI43C150MTRF	L= 15.0 uH DCR= 250.0 mOhm	1	\$0.07	IND_NPI43C 31 mm ²
4.	Renb	Vishay-Dale	CRCW0402200KFKED Series= CRCW..e3	Res= 200.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
5.	Renhys	Vishay-Dale	CRCW040241K2FKED Series= CRCW..e3	Res= 41.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
6.	Rent	Vishay-Dale	CRCW0402487KFKED Series= CRCW..e3	Res= 487.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
7.	Rfbb	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
8.	Rfbt	Vishay-Dale	CRCW0402124KFKED Series= CRCW..e3	Res= 124.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
9.	Rpg	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
10.	U1	Texas Instruments	TPS62125DSGR	Switcher	1	\$0.55	S-PWSON-N8 10 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	77.445 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	35.9 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	227.181 mA	Current	Peak switch current in IC
4.	Iin Avg	56.668 mA	Current	Average input current
5.	L Ipp	124.36 mA	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	94.45 mA	Current	Q Iavg
7.	BOM Count	10	General	Total Design BOM count
8.	FootPrint	68.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	737.748 kHz	General	Switching frequency
10.	IC Tolerance	20.2 mV	General	IC Feedback Tolerance
11.	M Vds Act	158.747 mV	General	Voltage drop across the MosFET
12.	Pout	297.0 mW	General	Total output power
13.	Total BOM	\$0.72	General	Total BOM Cost
14.	Vout Actual	1.792 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
15.	Vout OP	1.8 V	Op_Point	Operational Output Voltage
16.	Duty Cycle	32.767 %	Op_point	Duty cycle
17.	Efficiency	87.351 %	Op_point	Steady state efficiency
18.	IC Tj	32.246 degC	Op_point	IC junction temperature
19.	ICThetaJA	65.2 degC/W	Op_point	IC junction-to-ambient thermal resistance
20.	IOUT_OP	165.0 mA	Op_point	Iout operating point
21.	VIN_OP	6.0 V	Op_point	Vin operating point
22.	Vout p-p	2.389 mV	Op_point	Peak-to-peak output ripple voltage
23.	Cin Pd	53.98 μW	Power	Input capacitor power dissipation
24.	Cout Pd	3.866 μW	Power	Output capacitor power dissipation
25.	IC Pd	34.442 mW	Power	IC power dissipation
26.	L Pd	8.508 mW	Power	Inductor power dissipation
27.	Total Pd	43.008 mW	Power	Total Power Dissipation
28.	Vout Tolerance	3.672 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	165.0 m	Maximum Output Current
2.	VinMax	6.0	Maximum input voltage
3.	VinMin	4.5	Minimum input voltage
4.	Vout	1.8	Output Voltage
5.	base_pn	TPS62125	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS62125** Product Folder : <http://www.ti.com/product/TPS62125> : contains the data sheet and other resources.

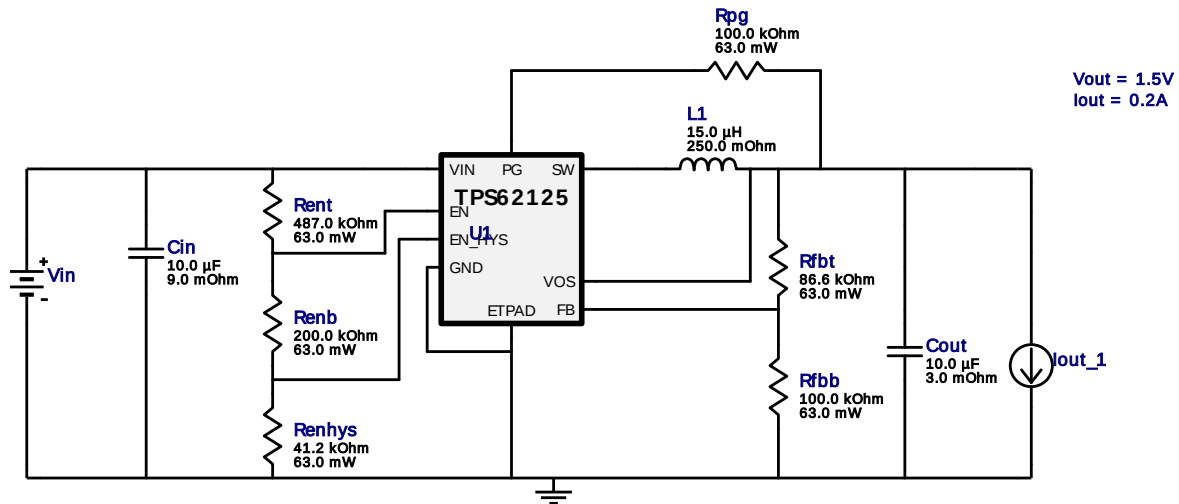


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WEBENCH® Design Report

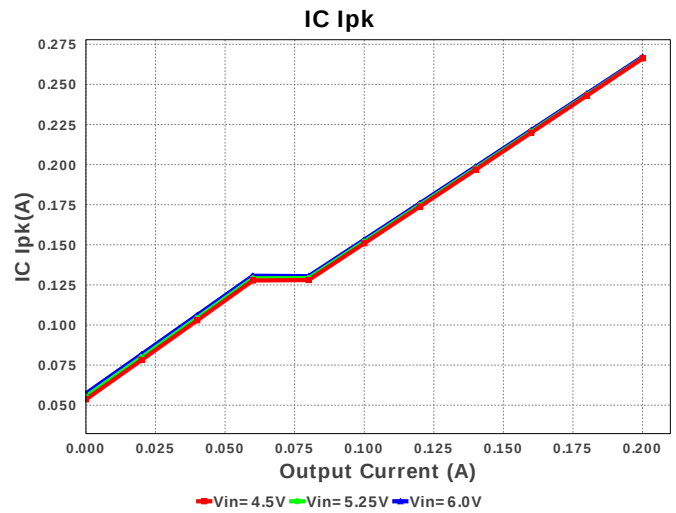
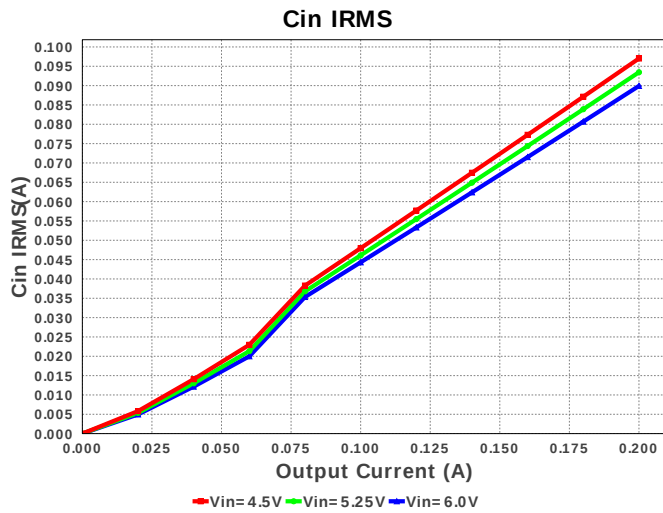
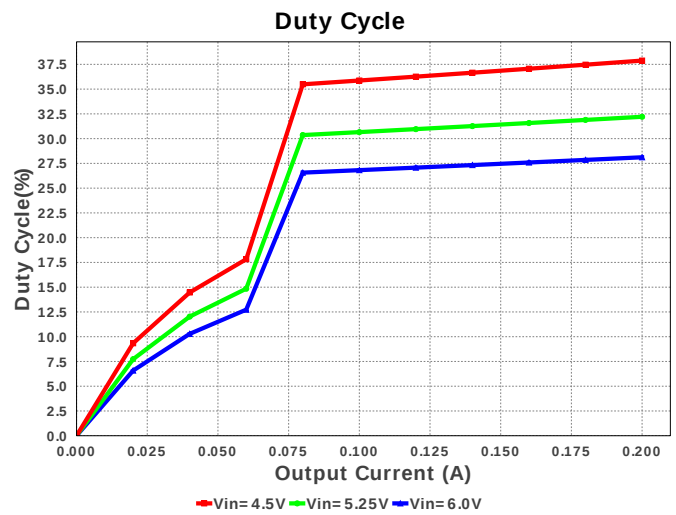
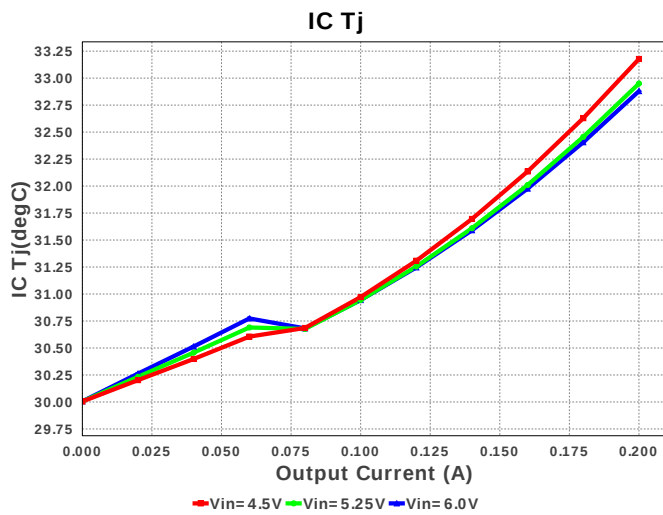
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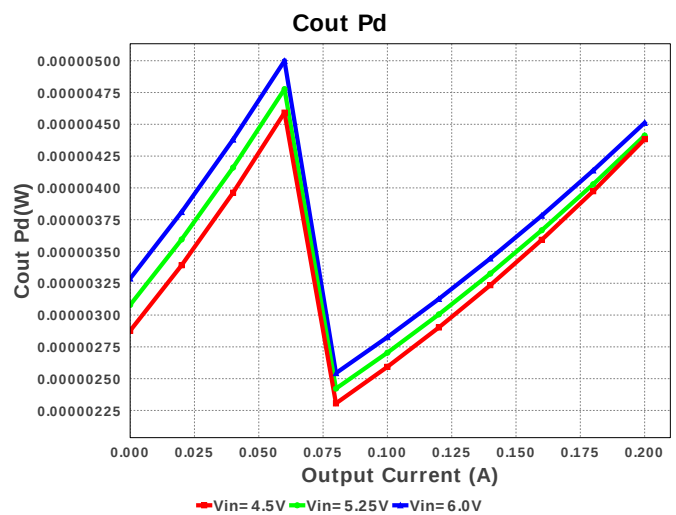
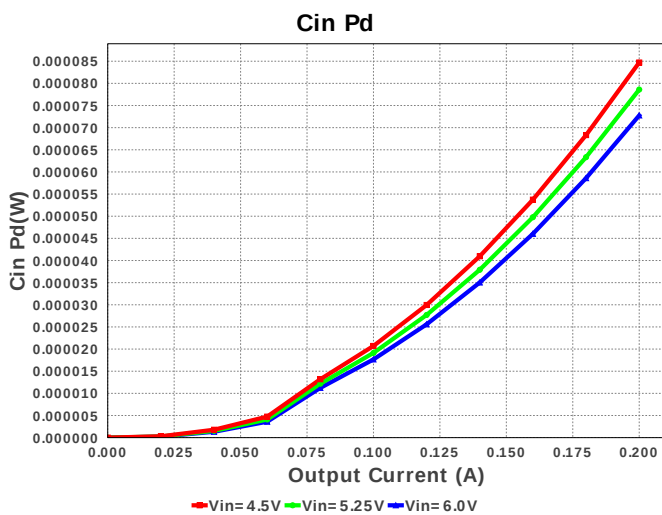
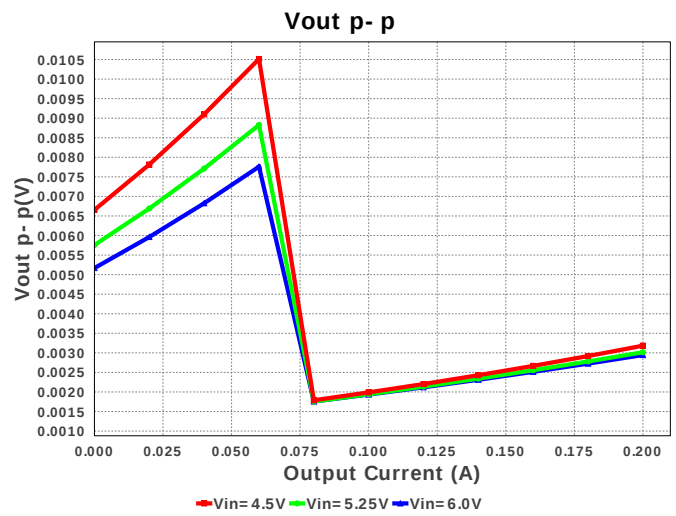
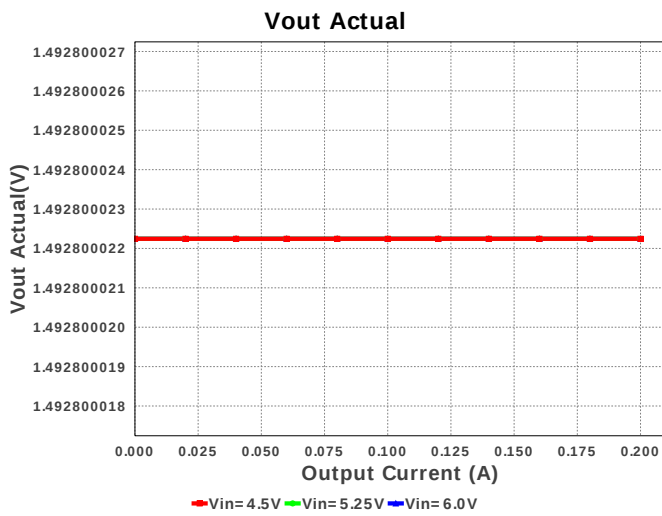
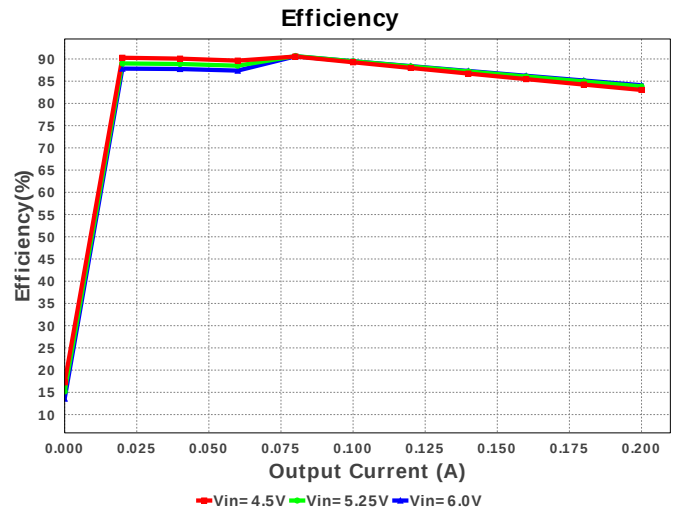
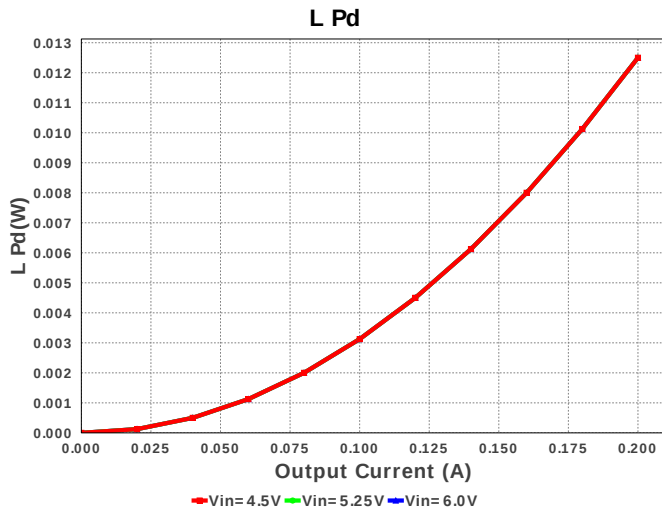


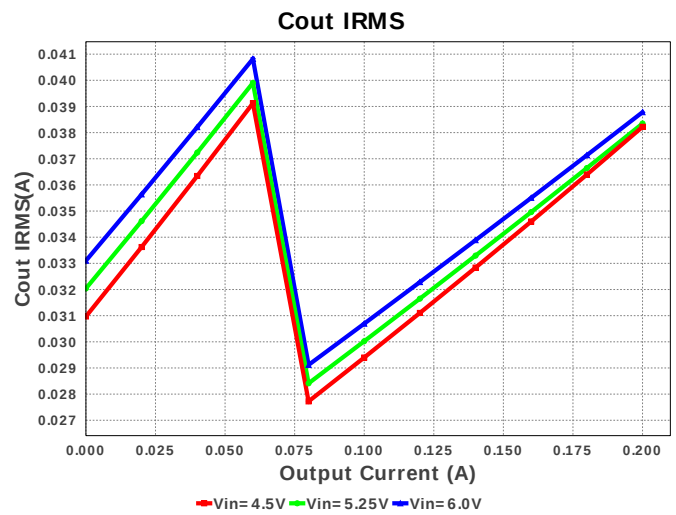
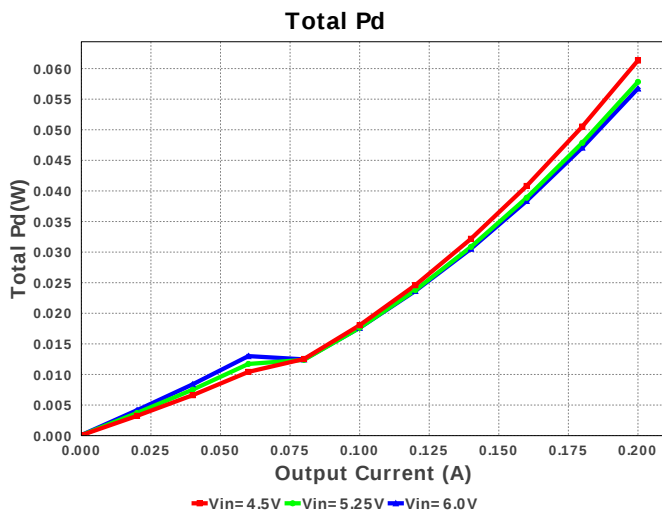
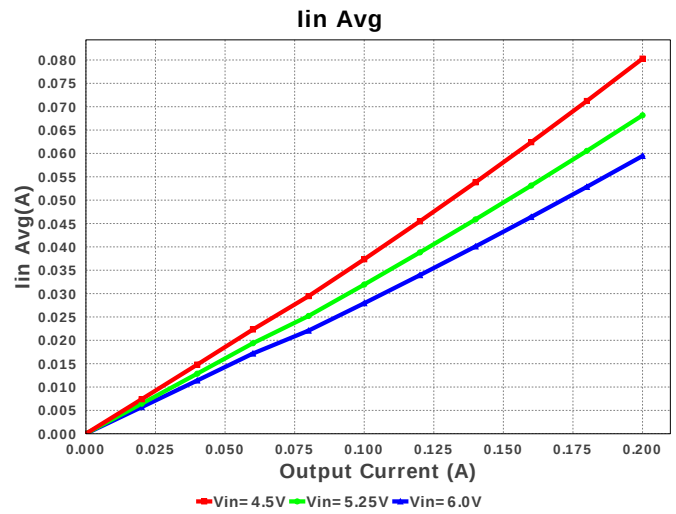
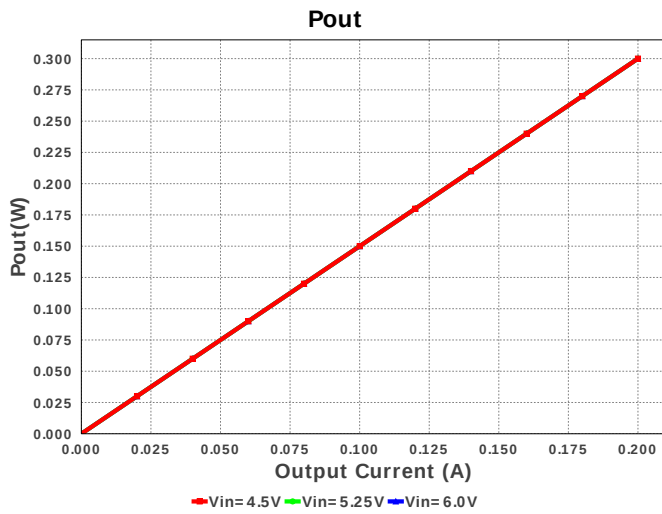
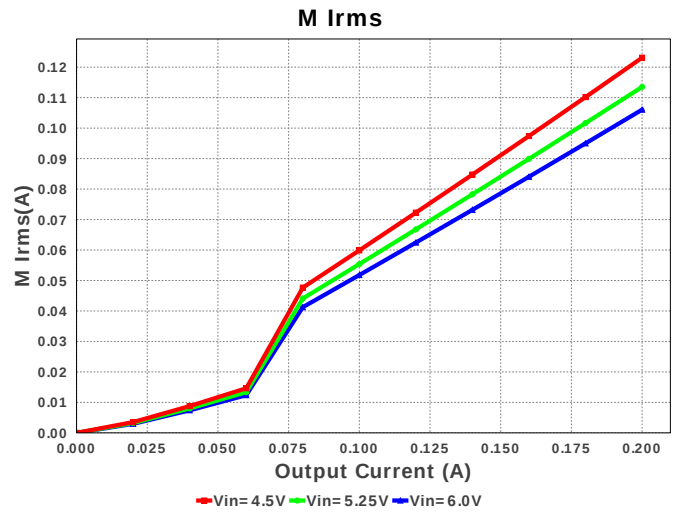
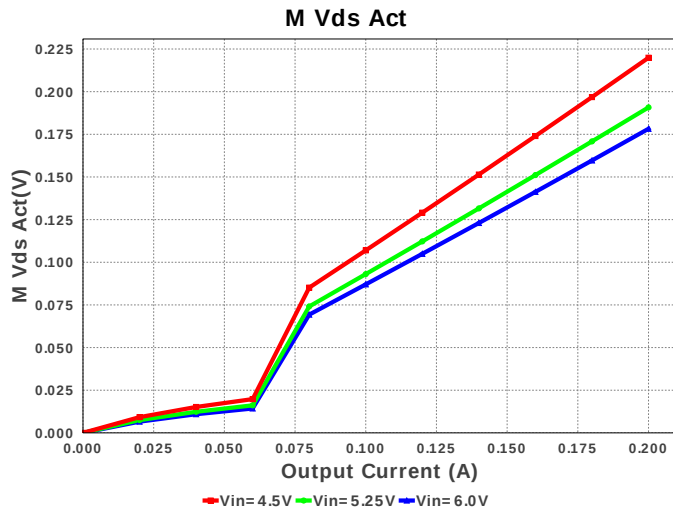
Electrical BOM

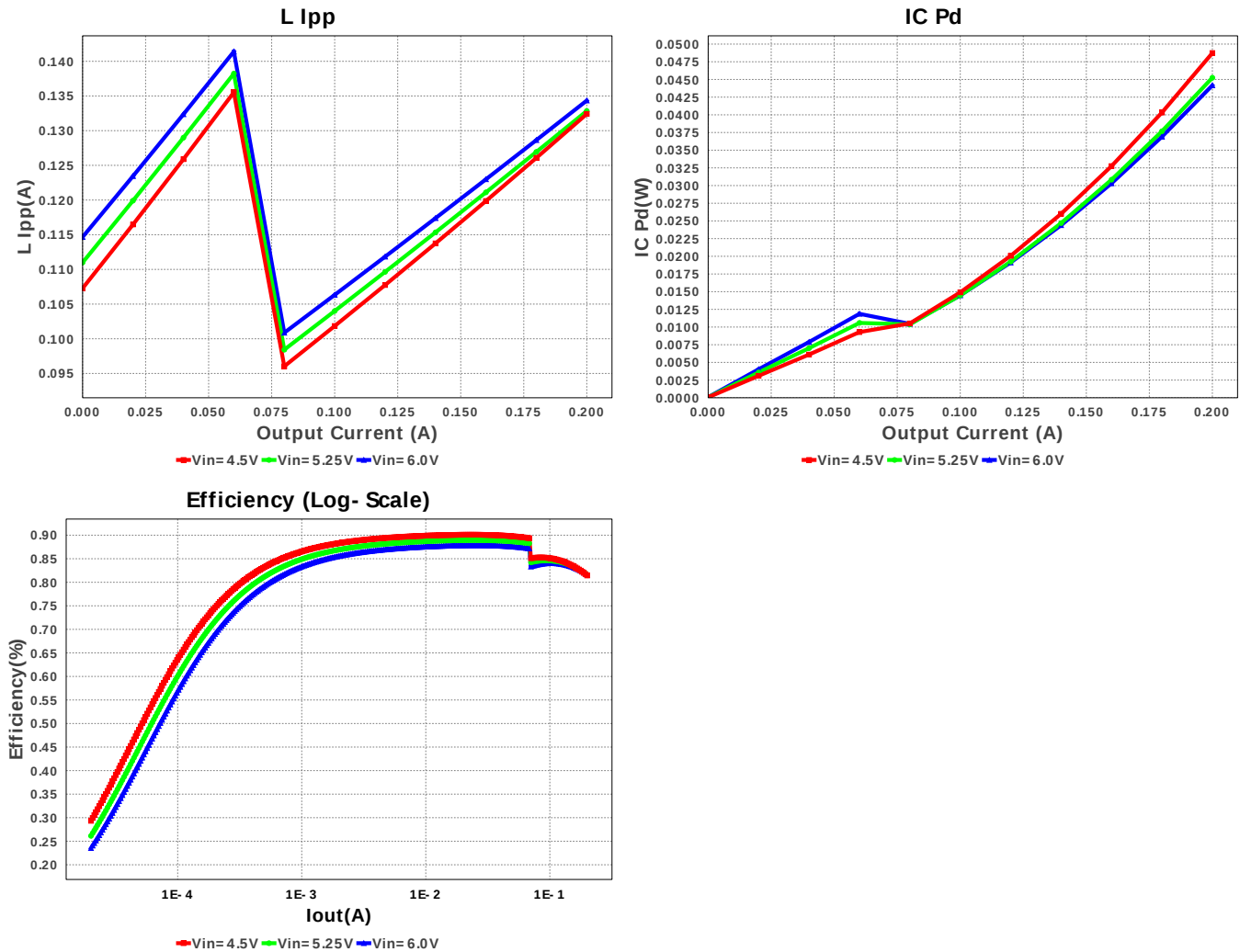
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM188R60J106ME47D Series= X5R	Cap= 10.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 2.74 A	1	\$0.02	0603 5 mm ²
2.	Cout	MuRata	GRM188R60G106ME47D Series= X5R	Cap= 10.0 uF ESR= 3.0 mOhm VDC= 4.0 V IRMS= 3.0 A	1	\$0.02	0603 5 mm ²
3.	L1	NIC Components	NPI43C150MTRF	L= 15.0 uH DCR= 250.0 mOhm	1	\$0.07	IND_NPI43C 31 mm ²
4.	Renb	Vishay-Dale	CRCW0402200KFKED Series= CRCW..e3	Res= 200.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
5.	Renhys	Vishay-Dale	CRCW040241K2FKED Series= CRCW..e3	Res= 41.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
6.	Rent	Vishay-Dale	CRCW0402487KFKED Series= CRCW..e3	Res= 487.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
7.	Rfbb	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
8.	Rfbb	Vishay-Dale	CRCW040286K6FKED Series= CRCW..e3	Res= 86.6 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
9.	Rpg	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	U1	Texas Instruments	TPS62125DSGR	Switcher	1	\$0.55	 S-PWSON-N8 10 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	89.913 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	38.781 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	267.171 mA	Current	Peak switch current in IC
4.	Iin Avg	59.457 mA	Current	Average input current
5.	L Ipp	134.34 mA	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	106.048 mA	Current	Q Iavg
7.	BOM Count	10	General	Total Design BOM count
8.	FootPrint	68.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	627.854 kHz	General	Switching frequency
10.	IC Tolerance	20.2 mV	General	IC Feedback Tolerance
11.	M Vds Act	178.242 mV	General	Voltage drop across the MosFET
12.	Pout	300.0 mW	General	Total output power
13.	Total BOM	\$0.72	General	Total BOM Cost
14.	Vout Actual	1.493 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
15.	Vout OP	1.5 V	Op_Point	Operational Output Voltage
16.	Duty Cycle	28.116 %	Op_point	Duty cycle
17.	Efficiency	84.094 %	Op_point	Steady state efficiency
18.	IC Tj	32.88 degC	Op_point	IC junction temperature
19.	ICThetaJA	65.2 degC/W	Op_point	IC junction-to-ambient thermal resistance
20.	IOUT_OP	200.0 mA	Op_point	Iout operating point
21.	VIN_OP	6.0 V	Op_point	Vin operating point
22.	Vout p-p	2.944 mV	Op_point	Peak-to-peak output ripple voltage
23.	Cin Pd	72.759 μW	Power	Input capacitor power dissipation
24.	Cout Pd	4.512 μW	Power	Output capacitor power dissipation
25.	IC Pd	44.166 mW	Power	IC power dissipation
26.	L Pd	12.5 mW	Power	Inductor power dissipation
27.	Total Pd	56.743 mW	Power	Total Power Dissipation
28.	Vout Tolerance	3.486 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

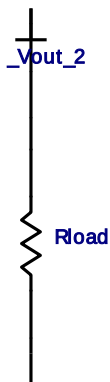
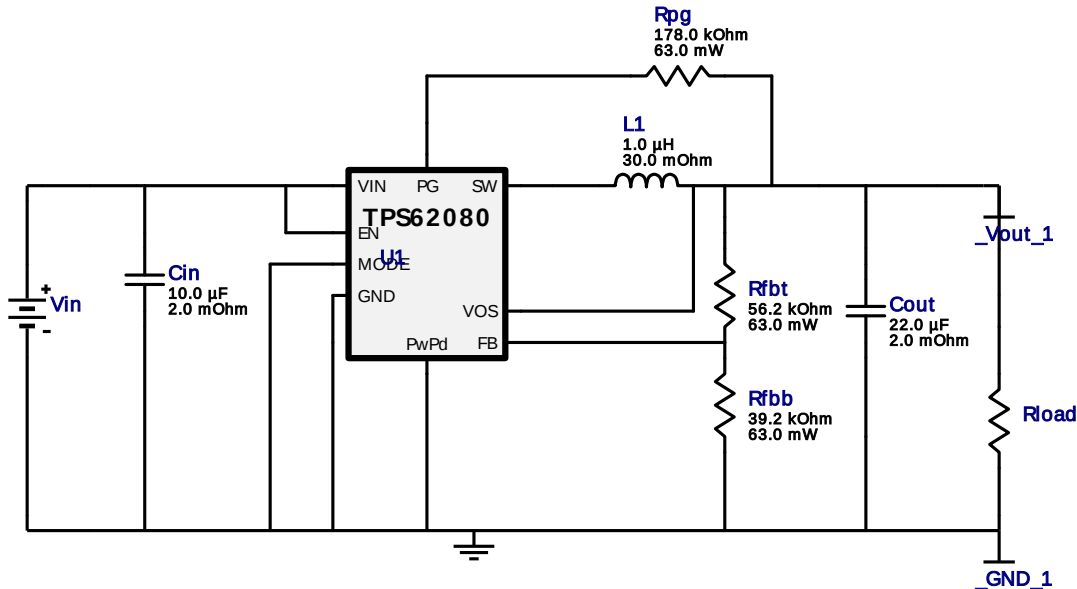
#	Name	Value	Description
1.	Iout	200.0 m	Maximum Output Current
2.	VinMax	6.0	Maximum input voltage
3.	VinMin	4.5	Minimum input voltage
4.	Vout	1.5	Output Voltage
5.	base_pn	TPS62125	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS62125** Product Folder : <http://www.ti.com/product/TPS62125> : contains the data sheet and other resources.

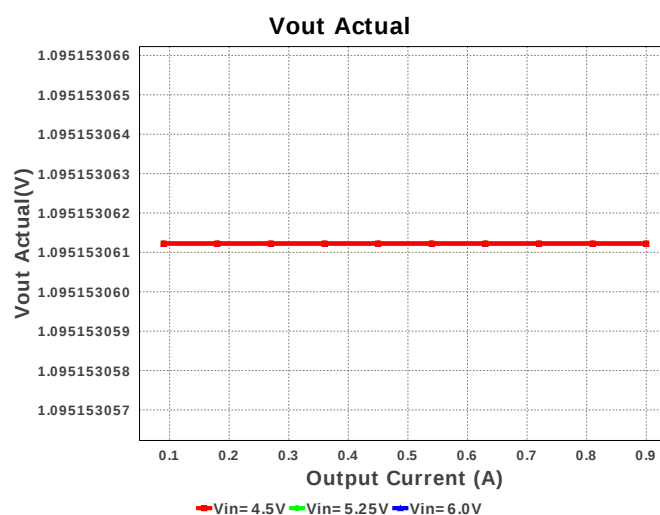
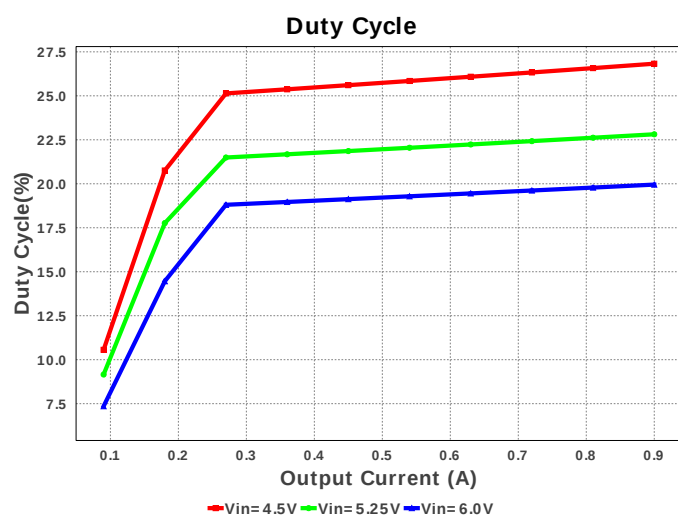
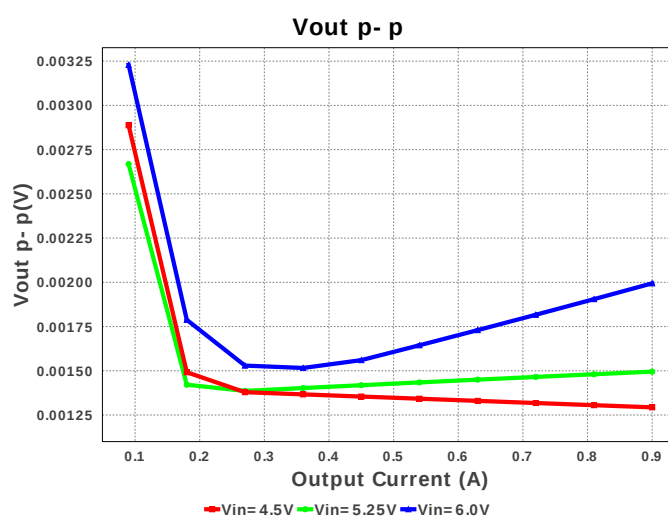
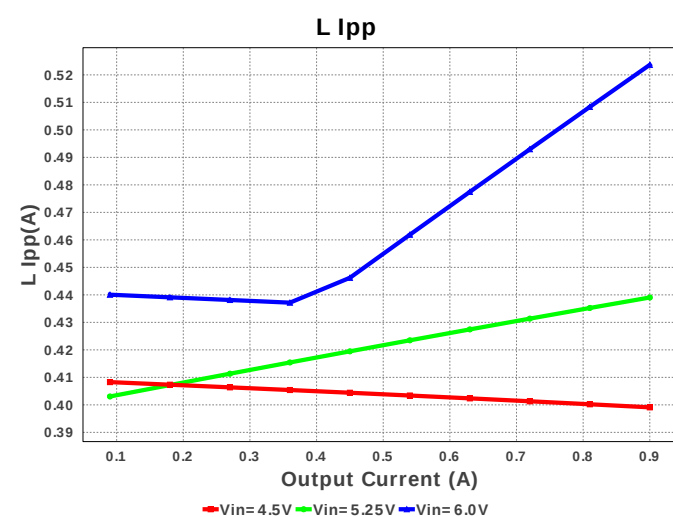
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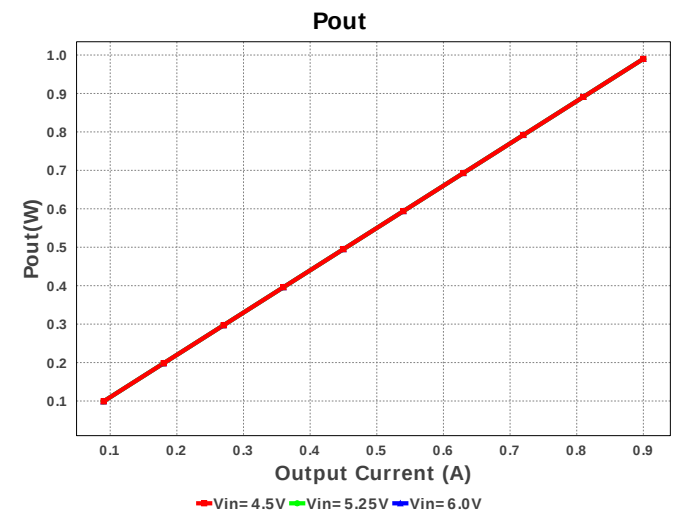
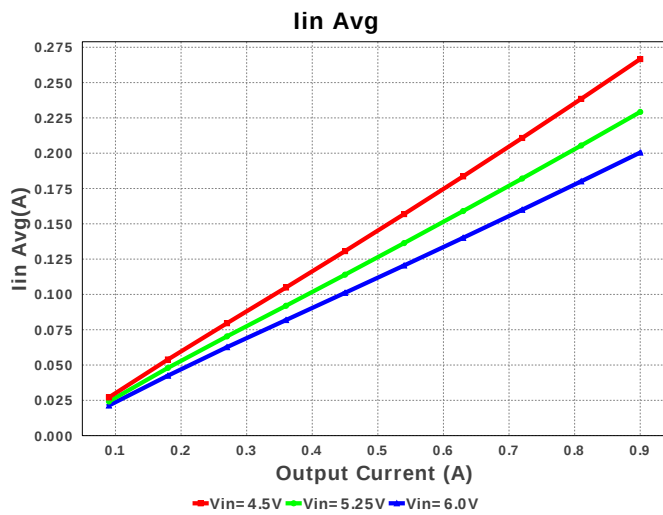
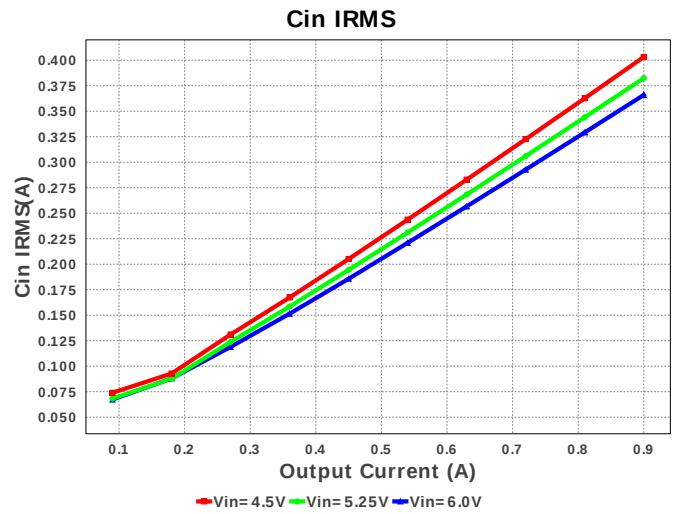
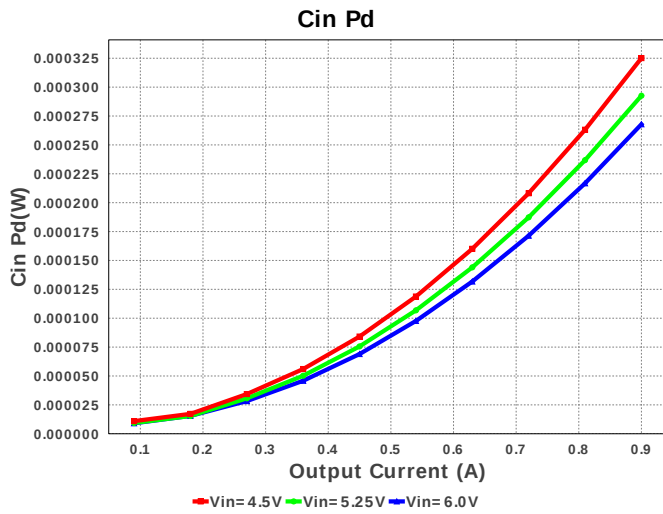
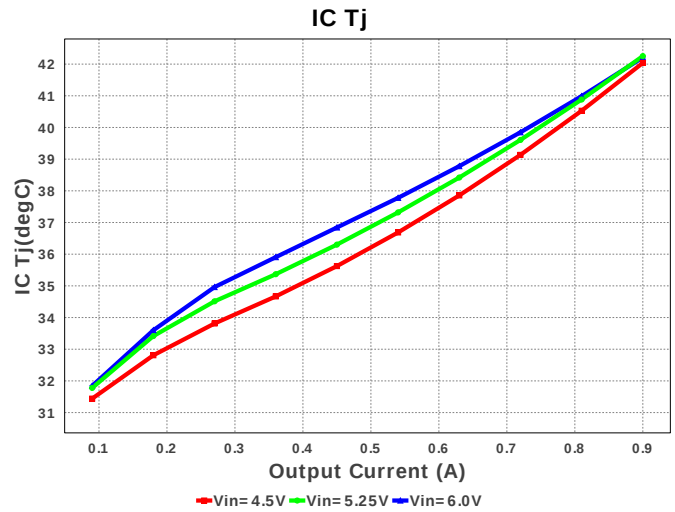
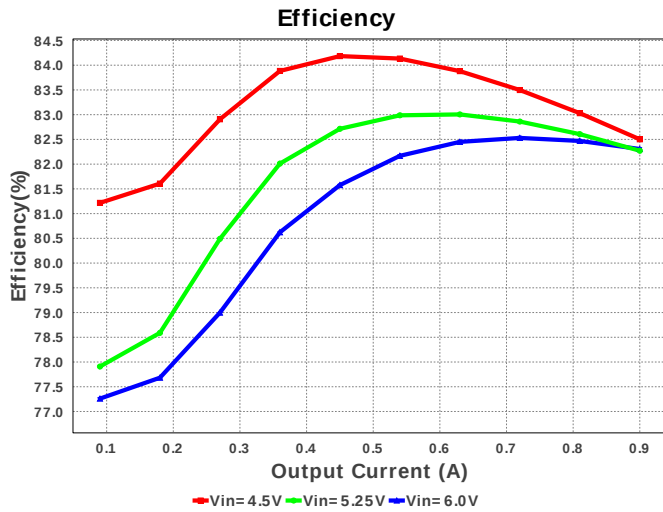
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TPS62080DSGR 4.5V-6.0V to 1.10V @ 0.9A

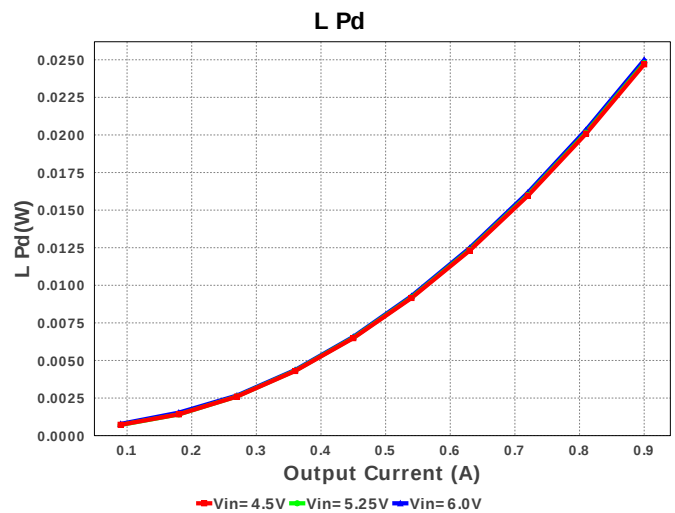
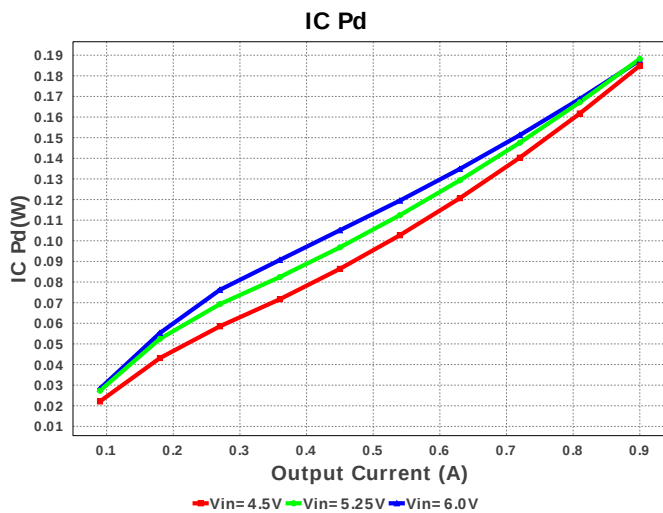
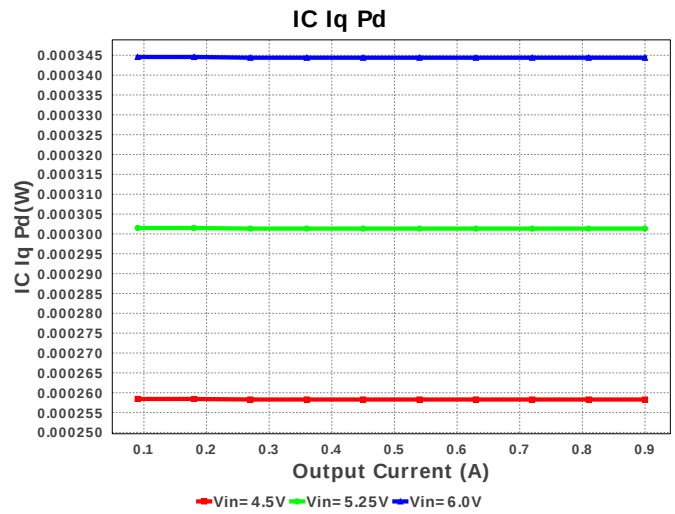
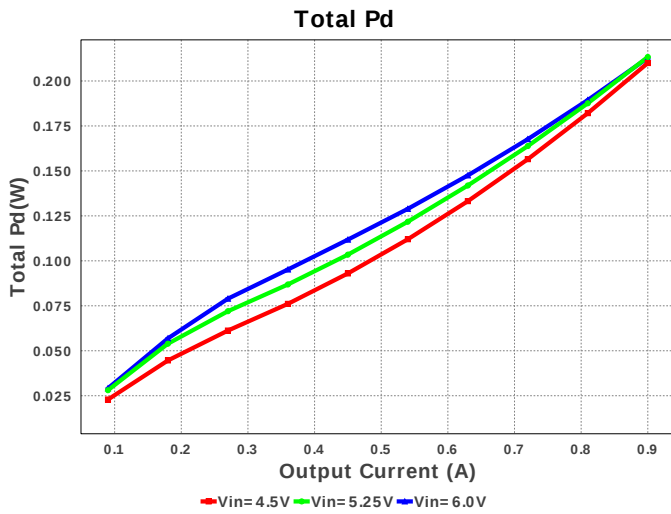
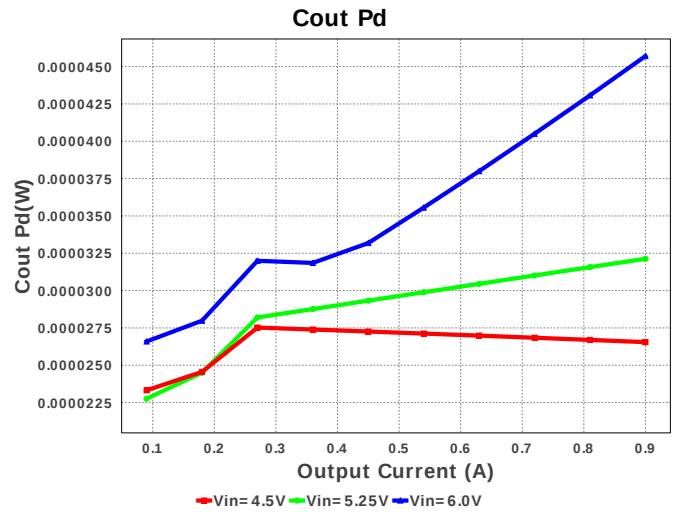
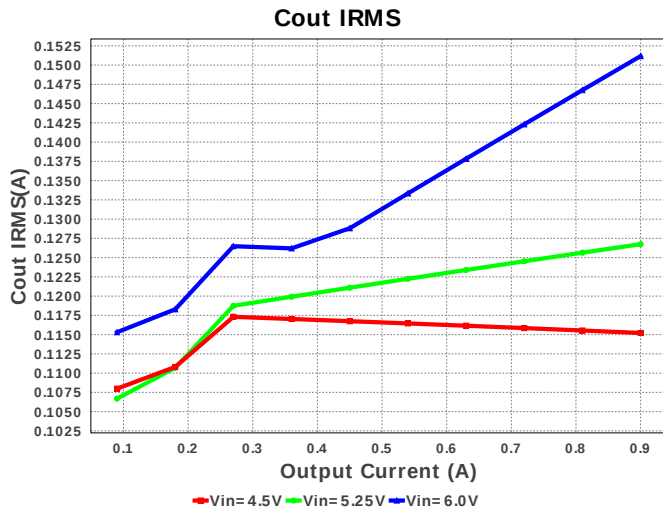


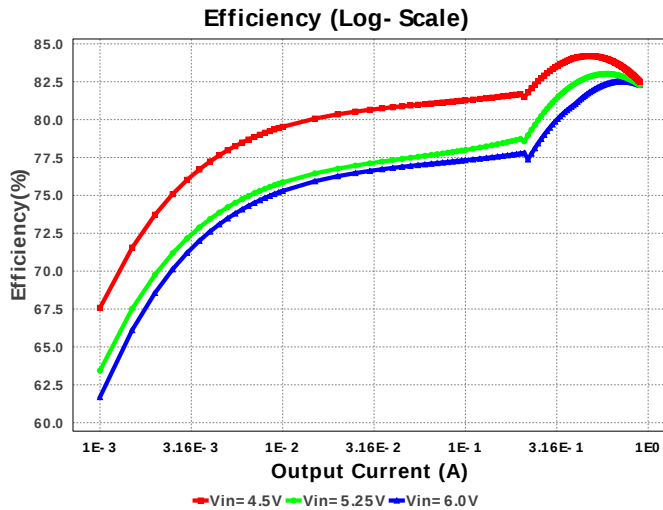
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1.	Cin	Taiyo Yuden	JMK212BJ106KD-T Series= X5R	Cap= 10.0 uF ESR= 2.0 mOhm VDC= 6.3 V IRMS= 0.0 A	1	\$0.03	0805 7 mm²
2.	Cout	Taiyo Yuden	JMK212BJ226KG-T Series= X5R	Cap= 22.0 uF ESR= 2.0 mOhm VDC= 6.3 V IRMS= 0.0 A	1	\$0.13	0805 7 mm²
3.	L1	Coilcraft	PFL3215-102MEB	L= 1.0 µH DCR= 30.0 mOhm	1	\$0.28	PFL3215 14 mm²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
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.	Rfbb	Vishay-Dale	CRCW040256K2FKED Series= CRCW..e3	Res= 56.2 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	TPS62080DSGR	Switcher	1	\$0.69	S-PWSON-N8 10 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	365.965 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	151.167 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	200.47 mA	Current	Average input current
4.	L Ipp	523.66 mA	Current	Peak-to-peak inductor ripple current
5.	BOM Count	7	General	Total Design BOM count
6.	FootPrint	46.0 mm ²	General	Total Foot Print Area of BOM components
7.	Frequency	1.761 MHz	General	Switching frequency
8.	IC Tolerance	25.0 mV	General	IC Feedback Tolerance
9.	Pout	990.0 mW	General	Total output power
10.	Total BOM	\$1.16	General	Total BOM Cost
11.	Vout Actual	1.095 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
12.	Vout OP	1.1 V	Op_Point	Operational Output Voltage
13.	Duty Cycle	19.953 %	Op_point	Duty cycle
14.	Efficiency	82.306 %	Op_point	Steady state efficiency
15.	IC Tj	42.208 degC	Op_point	IC junction temperature
16.	ICThetaJA	65.1 degC/W	Op_point	IC junction-to-ambient thermal resistance
17.	IOUT_OP	900.0 mA	Op_point	Iout operating point
18.	VIN_OP	6.0 V	Op_point	Vin operating point
19.	Vout p-p	1.944 mV	Op_point	Peak-to-peak output ripple voltage
20.	Cin Pd	267.861 μ W	Power	Input capacitor power dissipation
21.	Cout Pd	45.703 μ W	Power	Output capacitor power dissipation
22.	IC Iq Pd	344.388 μ W	Power	IC Iq Pd
23.	IC Pd	187.522 mW	Power	IC power dissipation
24.	L Pd	24.986 mW	Power	Inductor power dissipation
25.	Total Pd	212.827 mW	Power	Total Power Dissipation
26.	Vout Tolerance	6.812 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	900.0 m	Maximum Output Current
2.	VinMax	6.0	Maximum input voltage
3.	VinMin	4.5	Minimum input voltage
4.	Vout	1.1	Output Voltage
5.	base_pn	TPS62080	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS62080** Product Folder : <http://www.ti.com/product/TPS62080> : contains the data sheet and other resources.

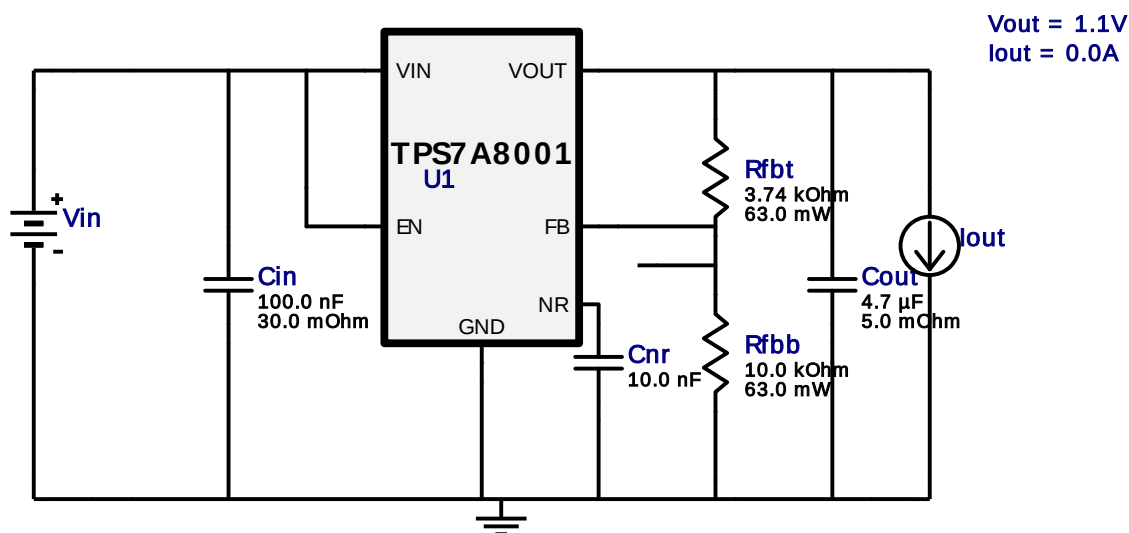


Vout = 1.1V
Iout = 0.0A

Device = TPS7A8001DRBR
Topology = LDO
Created = 7/21/16 6:21:36 AM
BOM Cost = \$1.25
BOM Count = 6
Total Pd = 0.01W

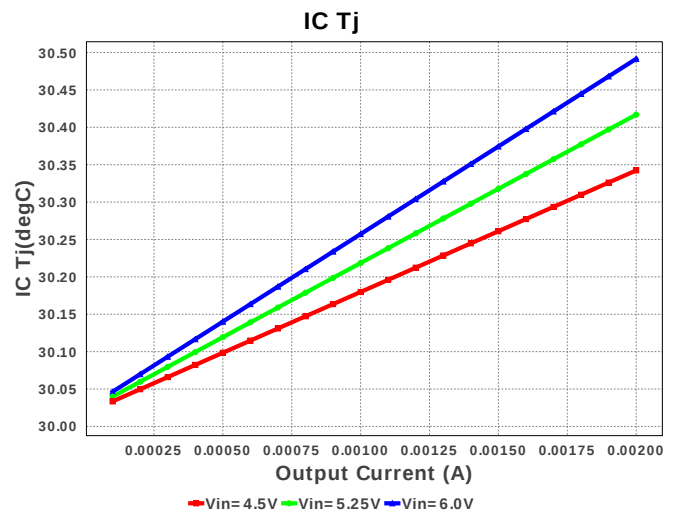
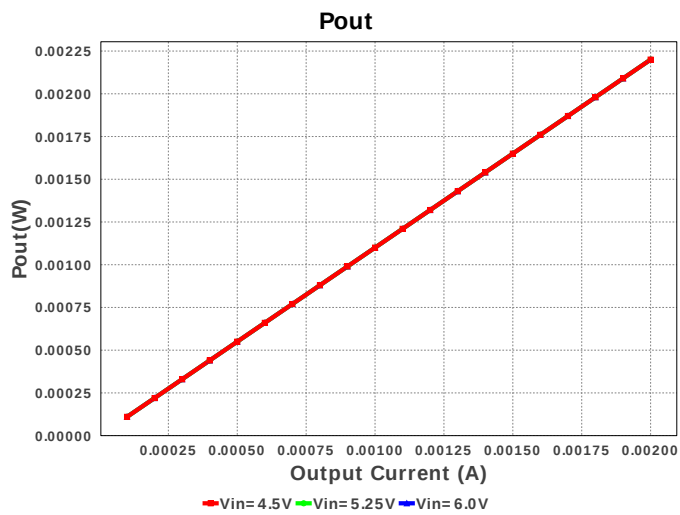
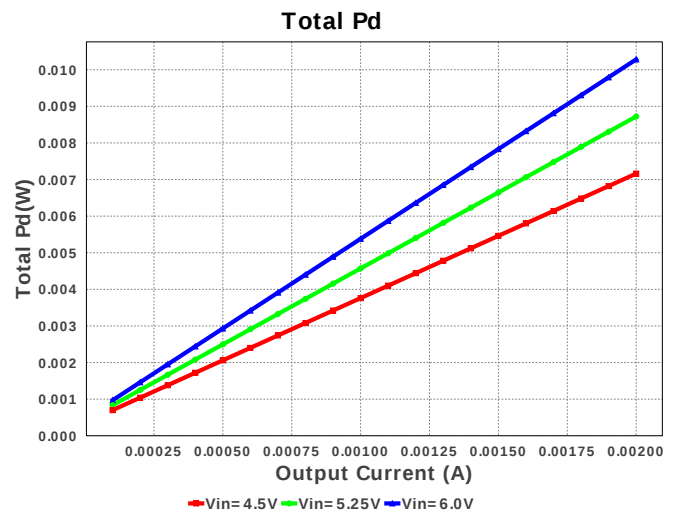
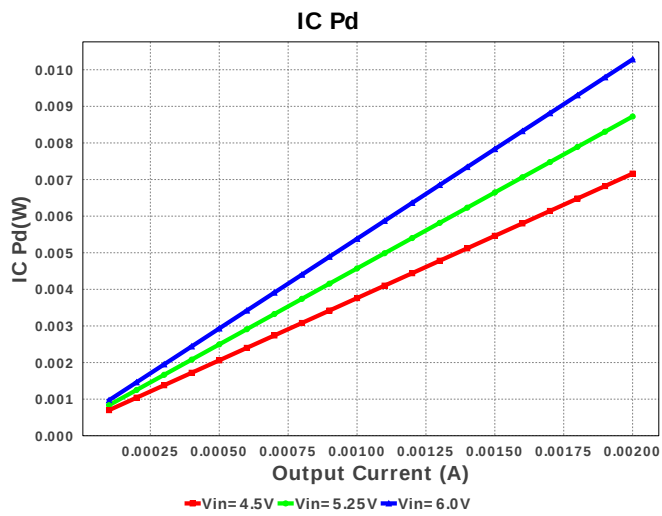
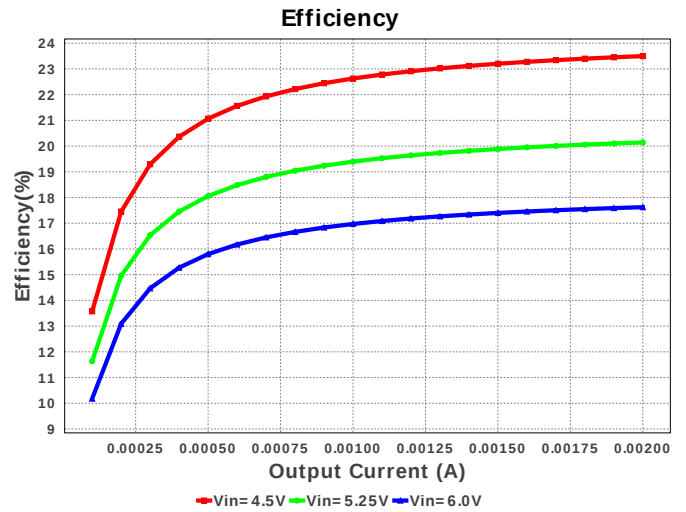
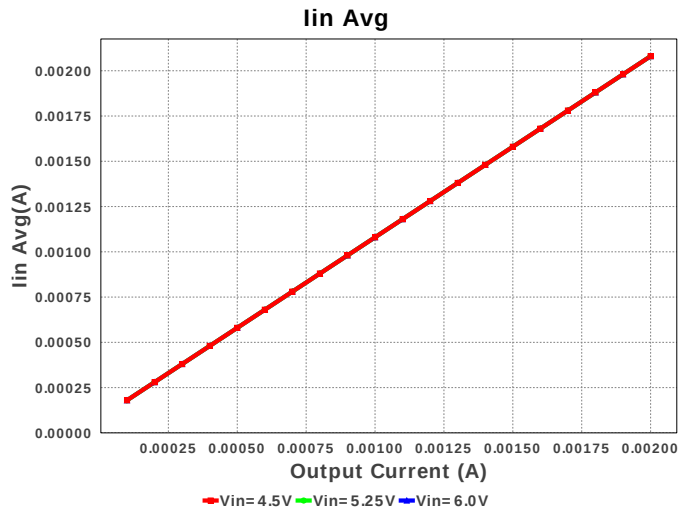
WEBENCH® Design Report

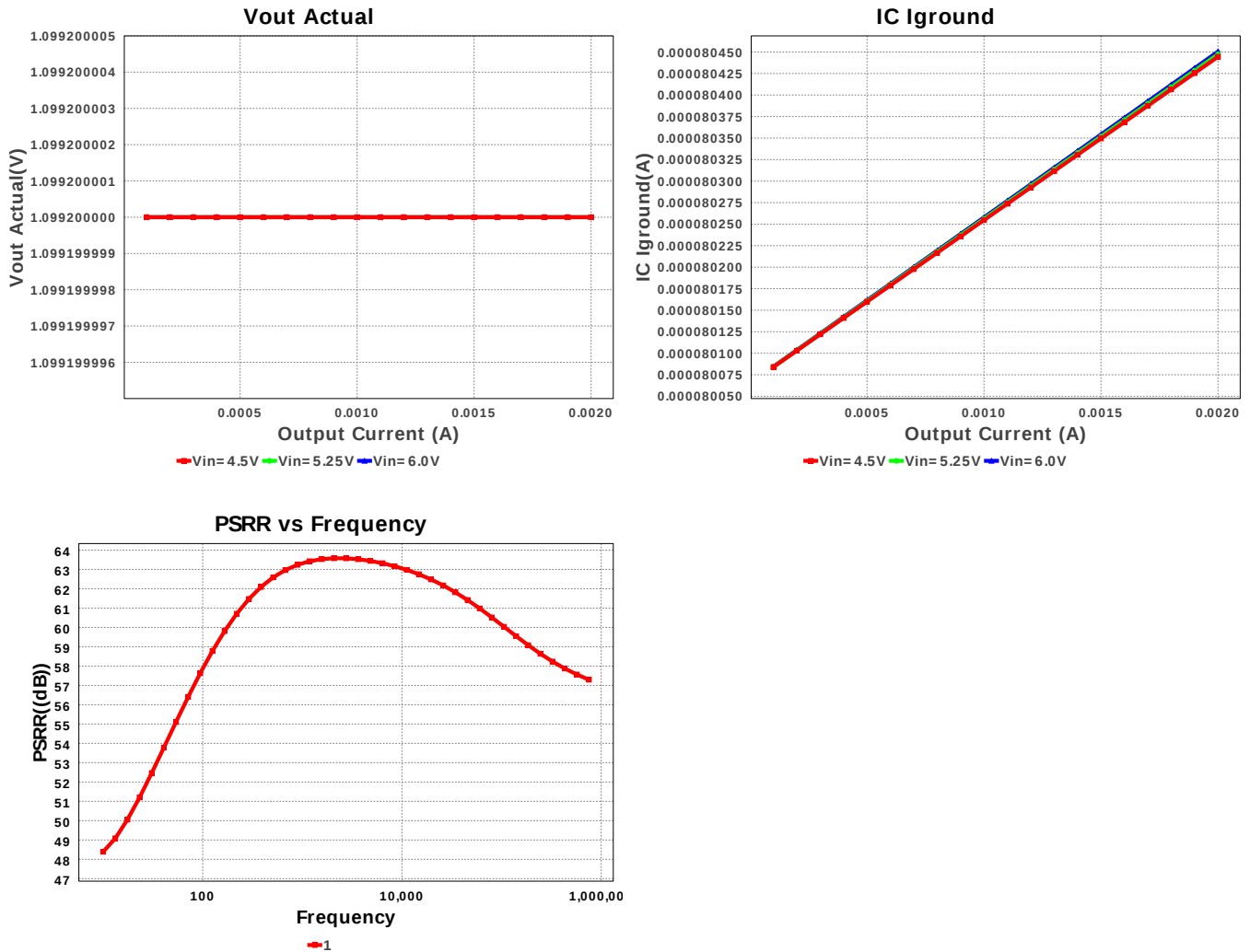
Design : 1194016/2148 TPS7A8001DRBR
TPS7A8001DRBR 4.5V-6.0V to 1.10V @ 0.002A



Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM188R71C104KA01D Series= X7R	Cap= 100.0 nF ESR= 30.0 mOhm VDC= 16.0 V IRMS= 1.7 A	1	\$0.01	0603 5 mm ²
2.	Cnr	MuRata	GRM033R61A103KA01D Series= X5R	Cap= 10.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	0201 2 mm ²
3.	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
4.	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
5.	Rfbb	Vishay-Dale	CRCW04023K74FKED Series= CRCW..e3	Res= 3.74 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
6.	U1	Texas Instruments	TPS7A8001DRBR	Switcher	1	\$1.20	DRB0008A 16 mm ²





Operating Values

#	Name	Value	Category	Description
1.	IC Igground	80.467 μ A	Current	IC ground current
2.	Iin Avg	2.08 mA	Current	Average input current
3.	BOM Count	6	General	Total Design BOM count
4.	FootPrint	33.0 mm ²	General	Total Foot Print Area of BOM components
5.	IC Tolerance	24.0 mV	General	IC Feedback Tolerance
6.	Output Noise RMS	25.132 μ V	General	Noise RMS
7.	Pout	2.2 mW	General	Total output power
8.	Total BOM	\$1.25	General	Total BOM Cost
9.	Vin p-p	60.0 mV	Op_Point	Input Source ripple voltage
10.	Vout Actual	1.099 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
11.	Vout OP	1.1 V	Op_Point	Operational Output Voltage
12.	Efficiency	16.909 %	Op_point	Steady state efficiency
13.	IC Tj	30.492 degC	Op_point	IC junction temperature
14.	ICThetaJA	47.8 degC/W	Op_point	IC junction-to-ambient thermal resistance
15.	IOUT_OP	2.0 mA	Op_point	Iout operating point
16.	Input Ripple Frequency	100.0 kHz	Op_point	Input Source Ripple Frequency for PSRR Calculation
17.	PSRR est.	-60.132 dB	Op_point	Power Supply Rejection Ratio estimated
18.	VIN_OP	6.0 V	Op_point	Vin operating point
19.	Vout p-p	59.095 μ V	Op_point	Peak-to-peak output ripple voltage
20.	IC Pd	10.283 mW	Power	IC power dissipation
21.	Total Pd	10.283 mW	Power	Total Power Dissipation
22.	Vout Tolerance	3.566 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	2.0 m	Maximum Output Current
2.	VinMax	6.0	Maximum input voltage
3.	VinMin	4.5	Minimum input voltage
4.	Vout	1.1	Output Voltage

#	Name	Value	Description
5.	base_pn	TPS7A8001	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS7A8001** Product Folder : <http://www.ti.com/product/tps7a8001> : contains the data sheet and other resources.

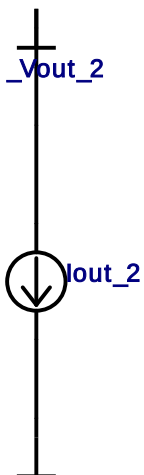
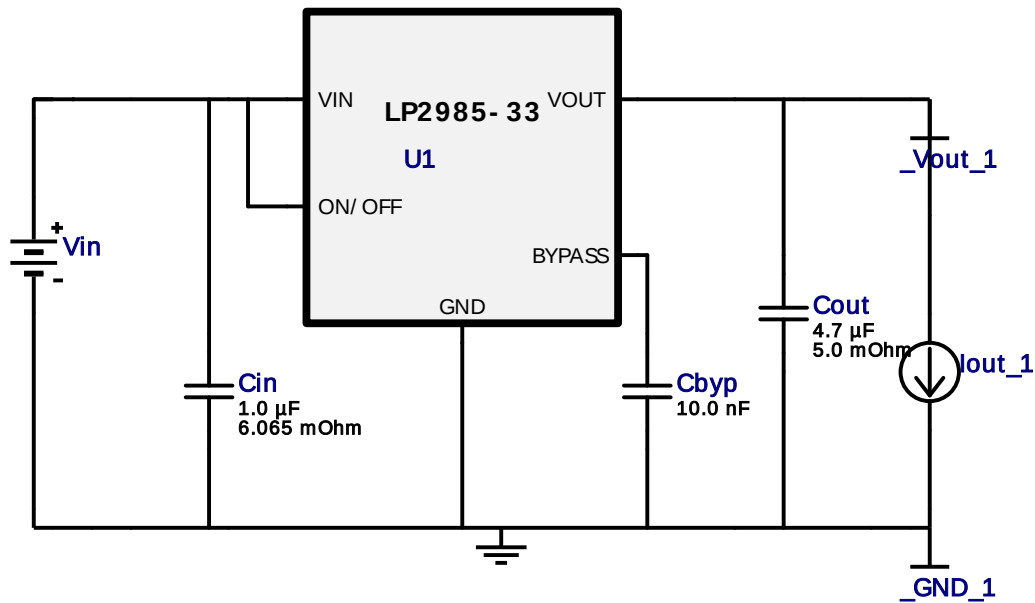


Vout = 3.3V
Iout = 0.08A

Device = LP2985-33DBVRE4
Topology = LDO
Created = 7/21/16 6:21:37 AM
BOM Cost = \$0.21
BOM Count = 4
Total Pd = 0.22W

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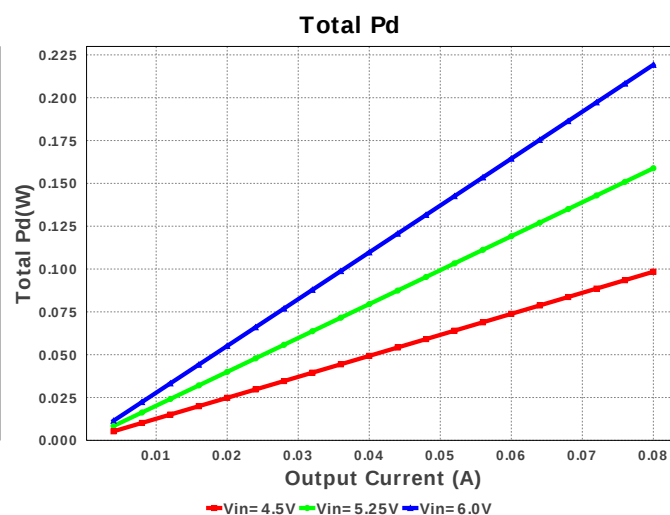
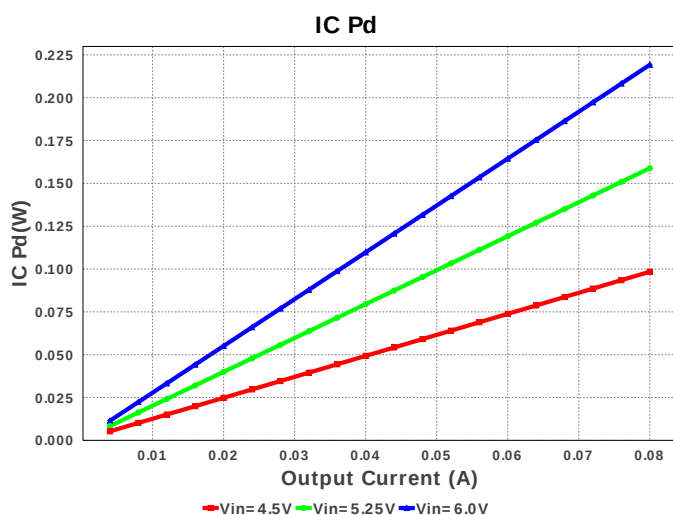
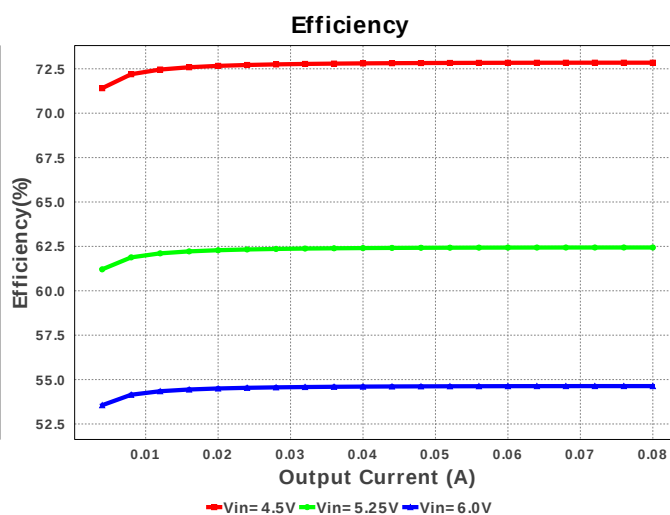
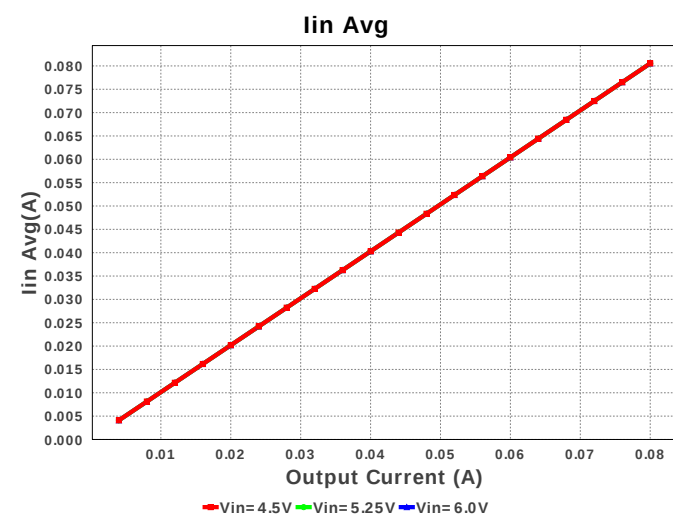
Design : 1194016/2149 LP2985-33DBVRE4
LP2985-33DBVRE4 4.5V-6.0V to 3.30V @ 0.08A

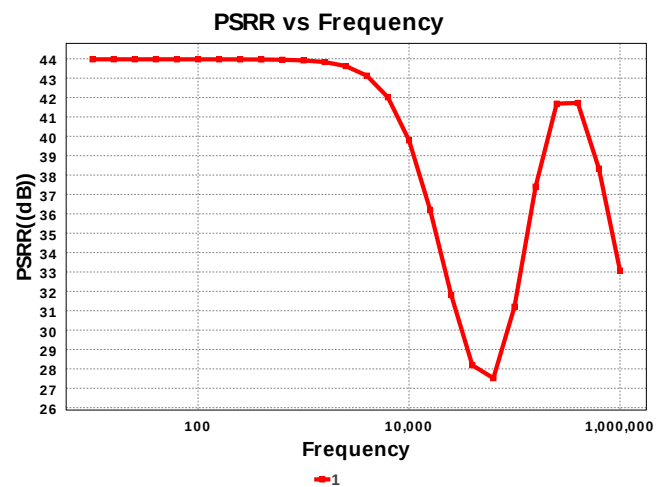
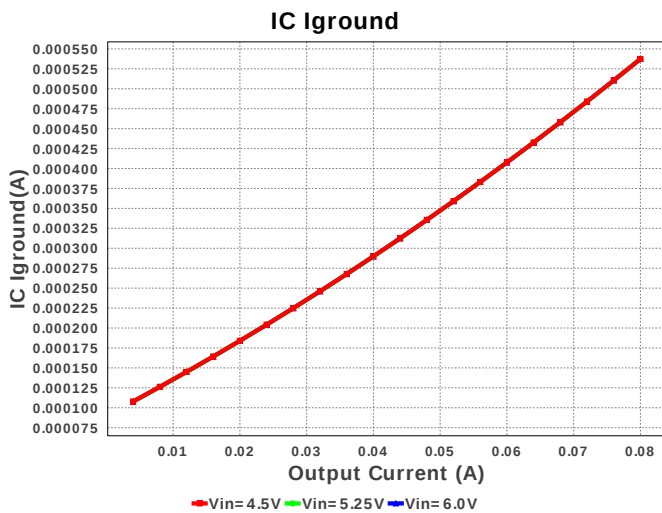
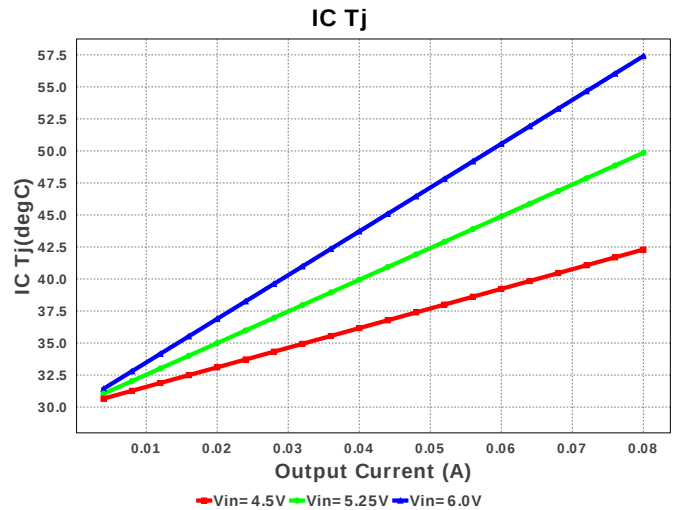
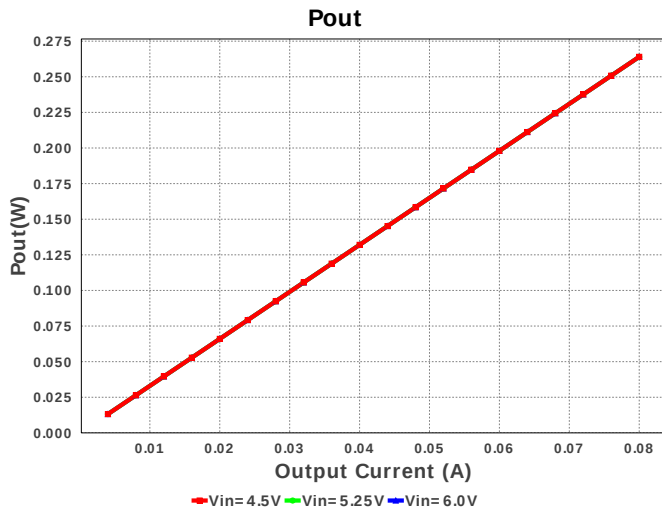


Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cbyp	MuRata	GRM033R61A103KA01D Series= X5R	Cap= 10.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	0201 2 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
2.	Cin	MuRata	GRM188R61A105KA61D Series= X5R	Cap= 1.0 uF ESR= 6.065 mOhm VDC= 10.0 V IRMS= 1.30675 A	1	\$0.01	0603 5 mm ²
3.	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
4.	U1	Texas Instruments	LP2985-33DBVRE4	Switcher	1	\$0.18	R-PDSO-G5 16 mm ²





Operating Values

#	Name	Value	Category	Description
1.	IC Ignd	537.36 μ A	Current	IC ground current
2.	Iin Avg	80.537 mA	Current	Average input current
3.	BOM Count	4	General	Total Design BOM count
4.	FootPrint	28.0 mm ²	General	Total Foot Print Area of BOM components
5.	IC Tolerance	132.0 mV	General	IC Feedback Tolerance
6.	Pout	264.0 mW	General	Total output power
7.	Total BOM	\$0.21	General	Total BOM Cost
8.	Vin p-p	60.0 mV	Op_point	Input Source ripple voltage
9.	Vout OP	3.3 V	Op_point	Operational Output Voltage
10.	Efficiency	54.633 %	Op_point	Steady state efficiency
11.	IC Tj	57.403 degC	Op_point	IC junction temperature
12.	ICThetaJA	125.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
13.	IOUT_OP	80.0 mA	Op_point	Iout operating point
14.	Input Ripple Frequency	100.0 kHz	Op_point	Input Source Ripple Frequency for PSRR Calculation
15.	PSRR est.	-31.208 dB	Op_point	Power Supply Rejection Ratio estimated
16.	VIN_OP	6.0 V	Op_point	Vin operating point
17.	Vout p-p	1.651 mV	Op_point	Peak-to-peak output ripple voltage
18.	IC Pd	219.224 mW	Power	IC power dissipation
19.	Total Pd	219.224 mW	Power	Total Power Dissipation
20.	Vout Tolerance	4.0 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	80.0 m	Maximum Output Current
2.	VinMax	6.0	Maximum input voltage
3.	VinMin	4.5	Minimum input voltage
4.	Vout	3.3	Output Voltage
5.	base_pn	LP2985-33	Base Product Number
6.	source	DC	Input Source Type

#	Name	Value	Description
7.	Ta	30.0	Ambient temperature

Design Assistance

1.

2. **LP2985-33** Product Folder : <http://www.ti.com/product/lp2985-18> : contains the data sheet and other resources.

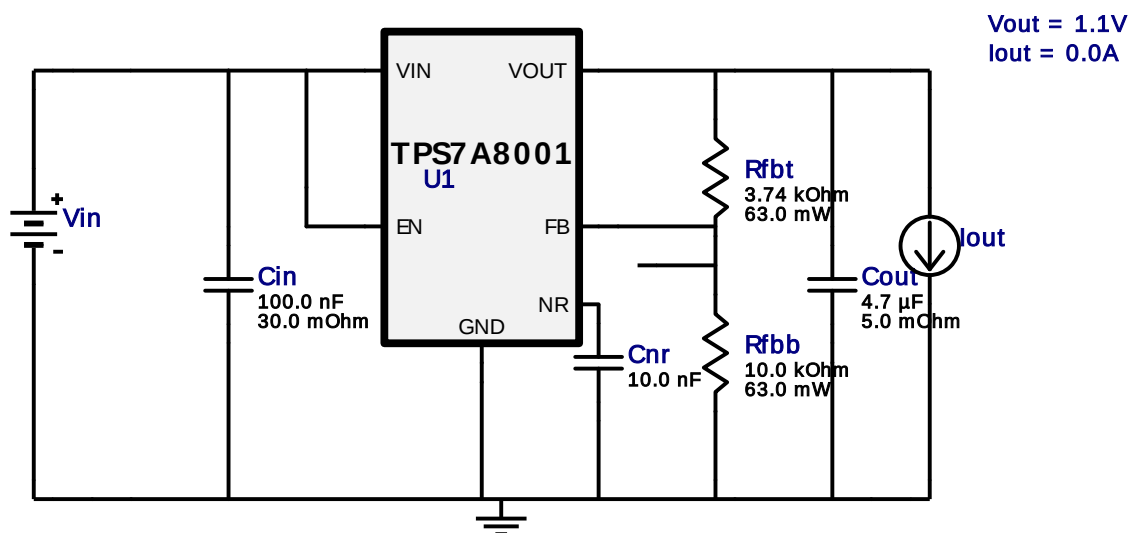


Vout = 1.1V
Iout = 0.0A

Device = TPS7A8001DRBR
Topology = LDO
Created = 7/21/16 6:21:37 AM
BOM Cost = \$1.25
BOM Count = 6
Total Pd = 0.02W

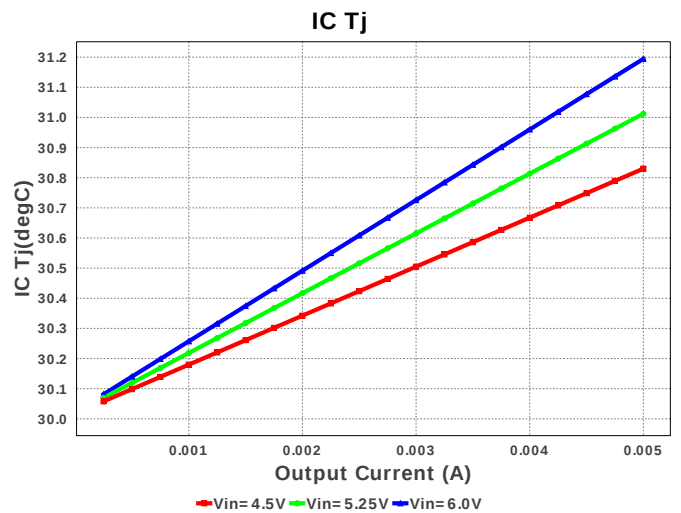
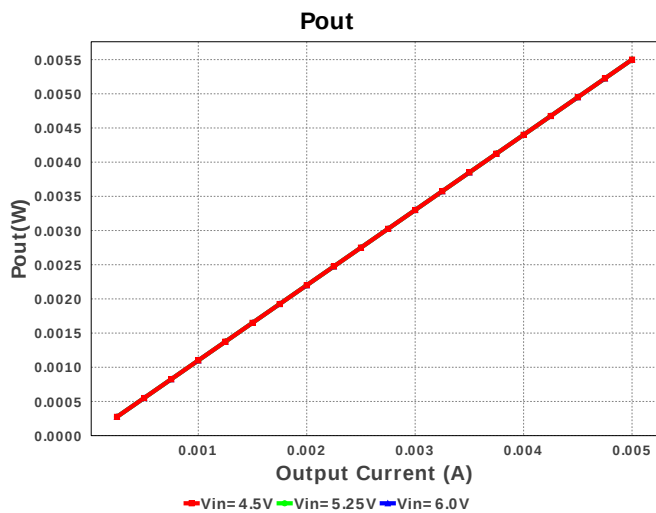
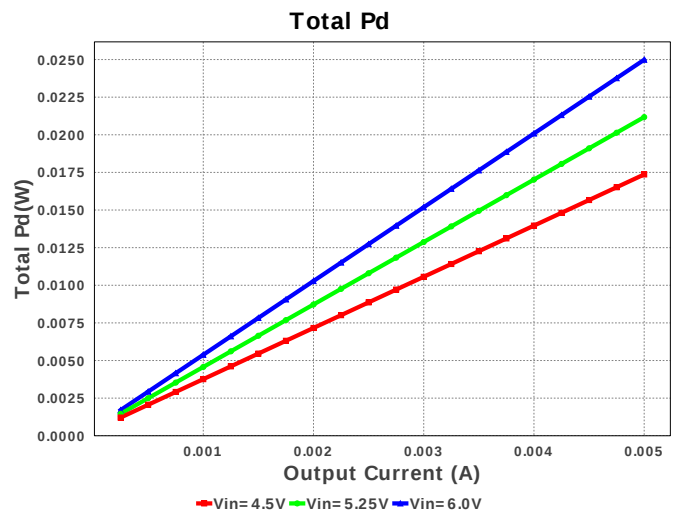
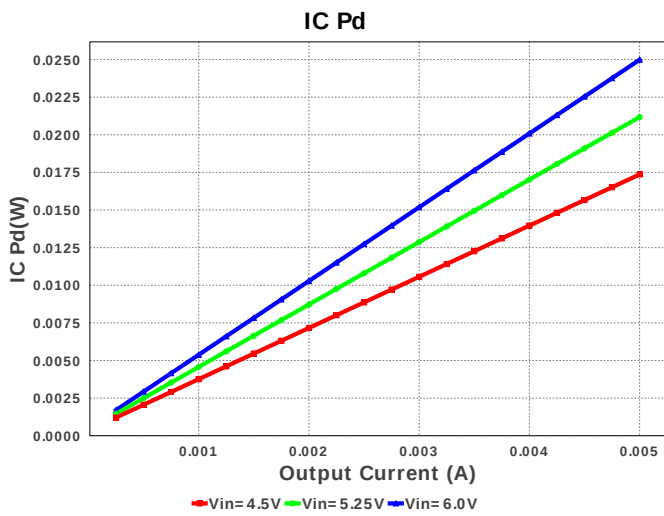
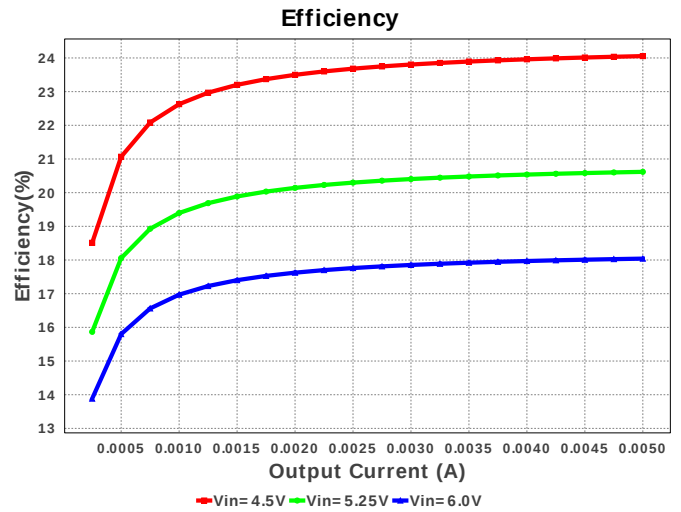
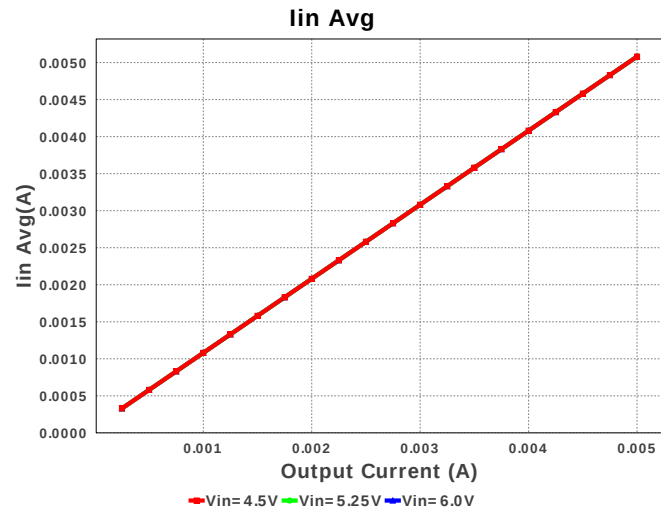
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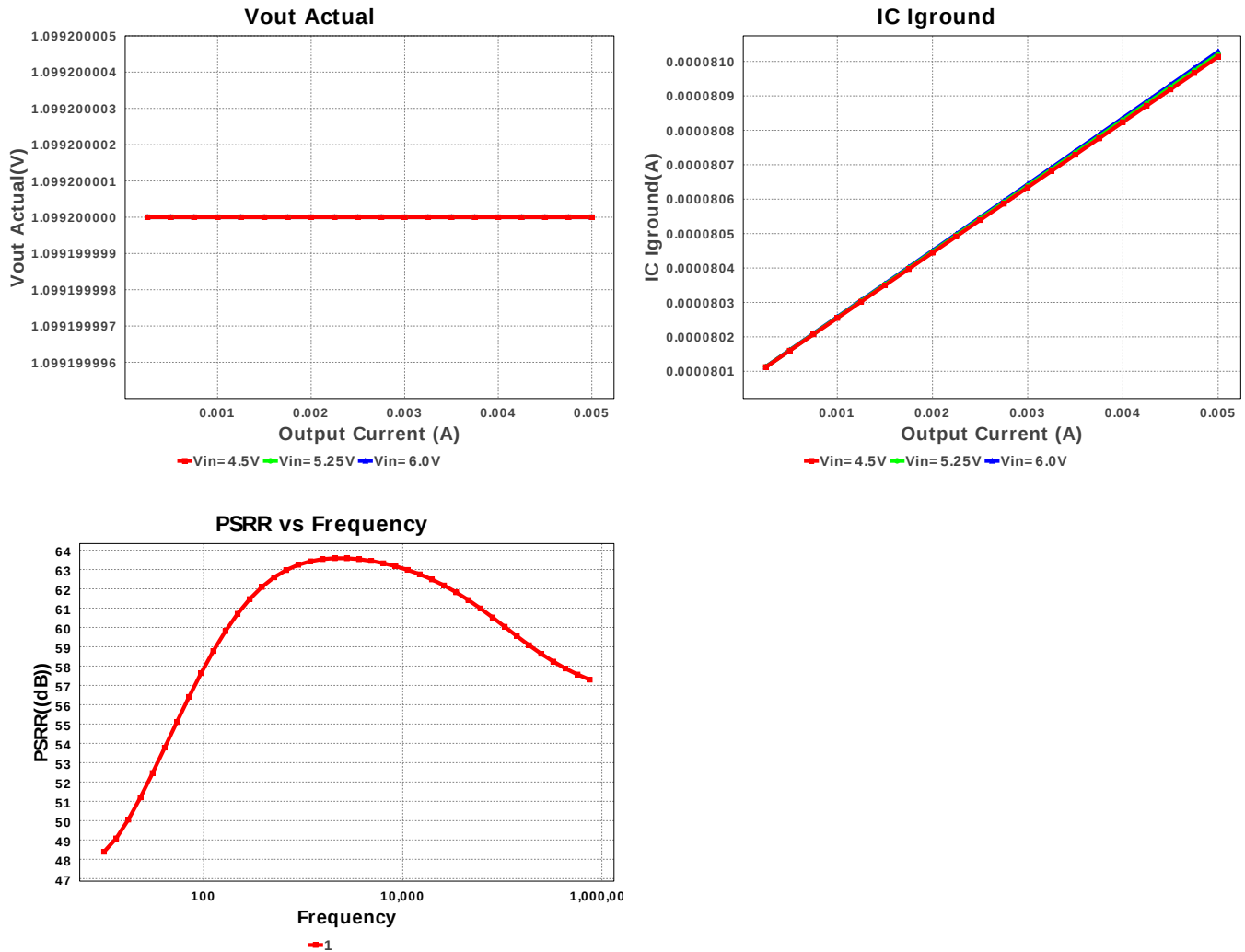
Design : 1194016/2150 TPS7A8001DRBR
TPS7A8001DRBR 4.5V-6.0V to 1.10V @ 0.005A



Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM188R71C104KA01D Series= X7R	Cap= 100.0 nF ESR= 30.0 mOhm VDC= 16.0 V IRMS= 1.7 A	1	\$0.01	0603 5 mm ²
2.	Cnr	MuRata	GRM033R61A103KA01D Series= X5R	Cap= 10.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	0201 2 mm ²
3.	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
4.	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
5.	Rfbb	Vishay-Dale	CRCW04023K74FKED Series= CRCW..e3	Res= 3.74 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
6.	U1	Texas Instruments	TPS7A8001DRBR	Switcher	1	\$1.20	DRB0008A 16 mm ²





Operating Values

#	Name	Value	Category	Description
1.	IC Igroud	81.045 μ A	Current	IC ground current
2.	Iin Avg	5.081 mA	Current	Average input current
3.	BOM Count	6	General	Total Design BOM count
4.	FootPrint	33.0 mm ²	General	Total Foot Print Area of BOM components
5.	IC Tolerance	24.0 mV	General	IC Feedback Tolerance
6.	Output Noise RMS	25.132 μ V	General	Noise RMS
7.	Pout	5.5 mW	General	Total output power
8.	Total BOM	\$1.25	General	Total BOM Cost
9.	Vin p-p	60.0 mV	Op_Point	Input Source ripple voltage
10.	Vout Actual	1.099 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
11.	Vout OP	1.1 V	Op_Point	Operational Output Voltage
12.	Efficiency	17.734 %	Op_point	Steady state efficiency
13.	IC Tj	31.194 degC	Op_point	IC junction temperature
14.	ICThetaJA	47.8 degC/W	Op_point	IC junction-to-ambient thermal resistance
15.	IOUT_OP	5.0 mA	Op_point	Iout operating point
16.	Input Ripple Frequency	100.0 kHz	Op_point	Input Source Ripple Frequency for PSRR Calculation
17.	PSRR est.	-60.132 dB	Op_point	Power Supply Rejection Ratio estimated
18.	VIN_OP	6.0 V	Op_point	Vin operating point
19.	Vout p-p	59.095 μ V	Op_point	Peak-to-peak output ripple voltage
20.	IC Pd	24.986 mW	Power	IC power dissipation
21.	Total Pd	24.986 mW	Power	Total Power Dissipation
22.	Vout Tolerance	3.566 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	5.0 m	Maximum Output Current
2.	VinMax	6.0	Maximum input voltage
3.	VinMin	4.5	Minimum input voltage
4.	Vout	1.1	Output Voltage

#	Name	Value	Description
5.	base_pn	TPS7A8001	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS7A8001** Product Folder : <http://www.ti.com/product/tps7a8001> : contains the data sheet and other resources.

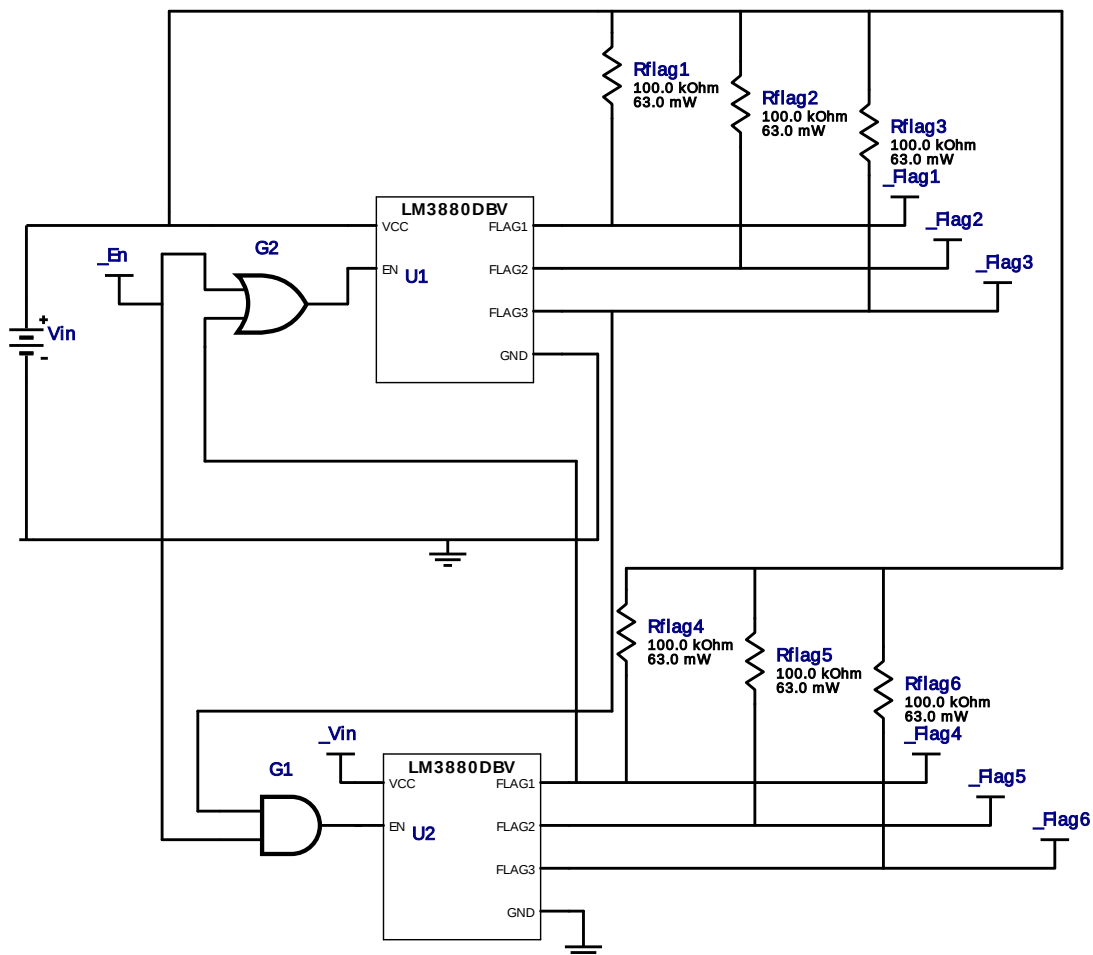


Vout = 3.3V
Iout = 0.0A

Device = LM3880MF-1AE/NOPB
Topology = SEQUENCER
Created = 7/21/16 6:21:37 AM
BOM Cost = \$1.09
BOM Count = 10
Total Pd = 0.0W

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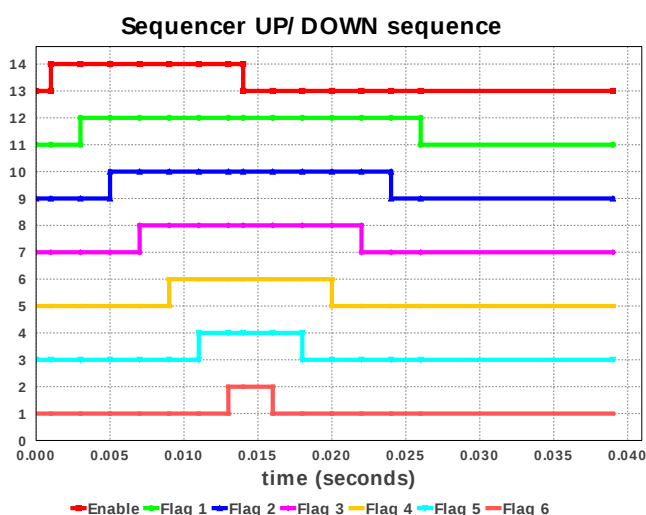
Design : 1194016/2151 LM3880MF-1AE/NOPB
Design 2151 - LM3880MF-1AE/NOPB



Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	G1	Texas Instruments	SN74AHC1G08	LogicGate	1	\$0.06	SOT-23 14 mm ²
2.	G2	Texas Instruments	SN74AHC1G32	LogicGate	1	\$0.07	SOT-23 14 mm ²
3.	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
4.	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
5.	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

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
6.	Rflag4	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
7.	Rflag5	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
8.	Rflag6	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
9.	U1	Texas Instruments	LM3880MF-1AE/NOPB	Switcher	1	\$0.45	 R-PDSO-G6 10 mm ²
10.	U2	Texas Instruments	LM3880MF-1AE/NOPB	Switcher	1	\$0.45	 R-PDSO-G6 10 mm ²



Operating Values

#	Name	Value	Category	Description
1.	BOM Count	10	General	Total Design BOM count
2.	FootPrint	65.0 mm ²	General	Total Foot Print Area of BOM components
3.	Total BOM	\$1.09	General	Total BOM Cost
4.	Total Pd	165.0 μ W	Power	Total Power Dissipation
5.	Flag Voltage	3.3 V		Flag Voltage
6.	Flag1 Down delay (From EN high to low)	12.0 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)	10.0 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)	8.0 ms		Flag Delay
11.	Flag3 Up delay (From EN low to high)	6.0 ms		Flag Delay
12.	Flag4 Down delay (From EN high to low)	6.0 ms		Flag Delay
13.	Flag4 Up delay (From EN low to high)	8.0 ms		Flag Delay

#	Name	Value	Category	Description
14.	Flag5 Down delay (From EN high to low)	4.0 ms		Flag Delay
15.	Flag5 Up delay (From EN low to high)	10.0 ms		Flag Delay
16.	Flag6 Down delay (From EN high to low)	2.0 ms		Flag Delay
17.	Flag6 Up delay (From EN low to high)	12.0 ms		Flag Delay
18.	Flags Used	6.0		Flags Used
19.	Total Flags	6.0		Total Flags
20.	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	Base Product 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.



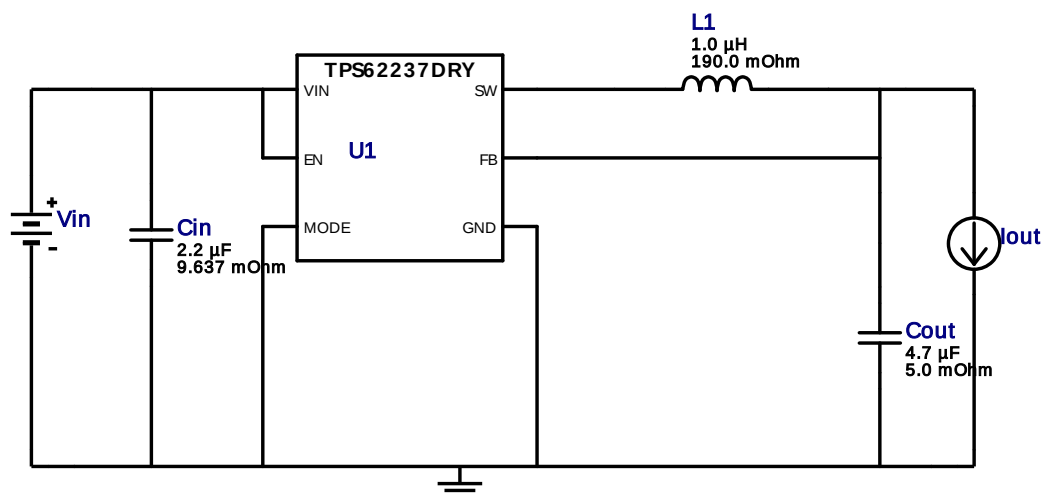
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Device = TPS62237DRYR
Topology = Buck
Created = 7/21/16 6:21:37 AM
BOM Cost = \$0.61
BOM Count = 4
Total Pd = 0.0W

WEBENCH® Design Report

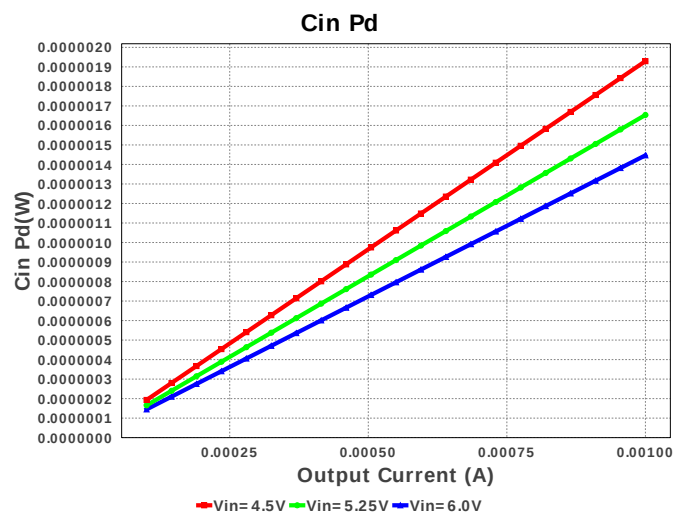
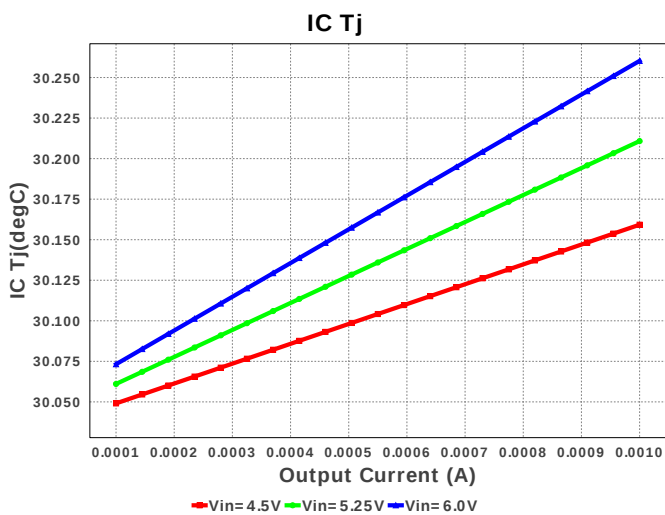
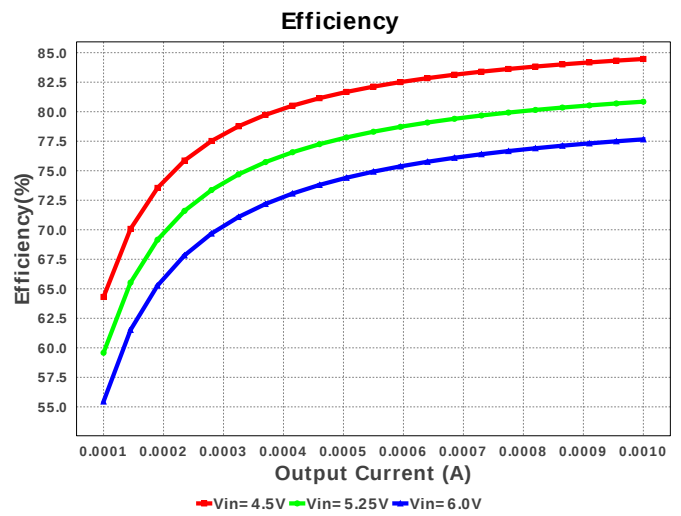
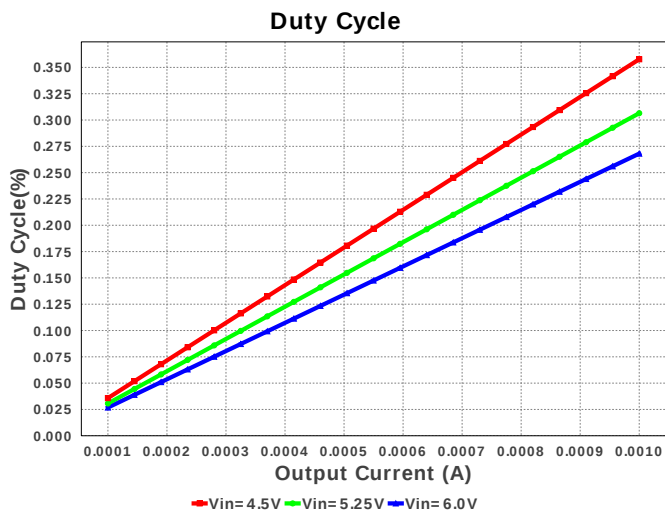
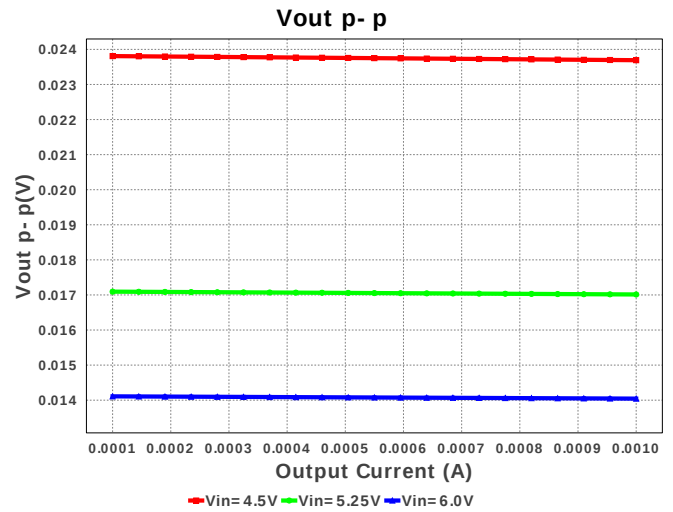
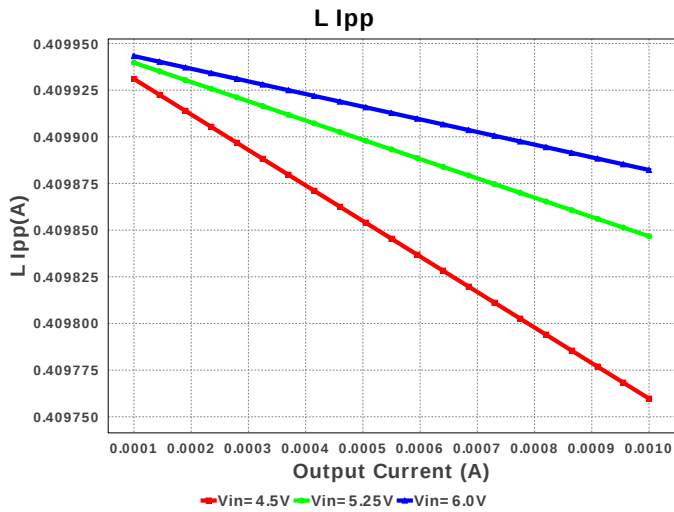
Design : 1194016/2152 TPS62237DRYR
TPS62237DRYR 4.5V-6.0V to 3.30V @ 0.001A

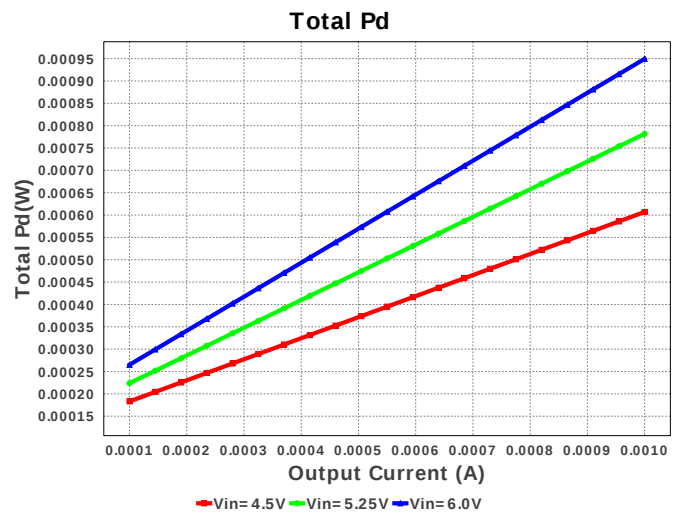
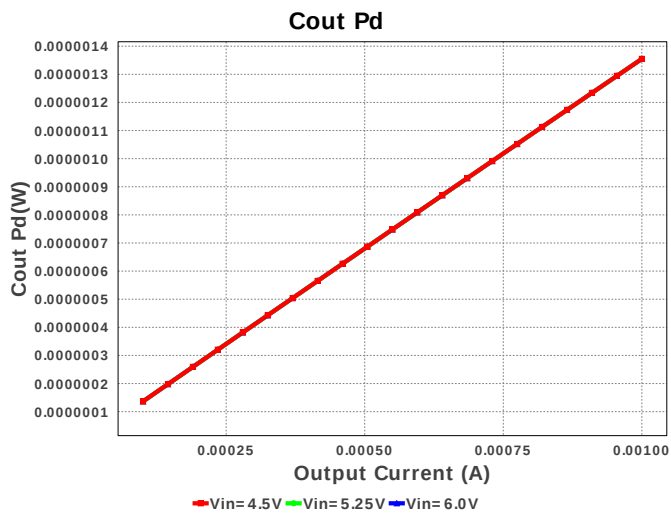
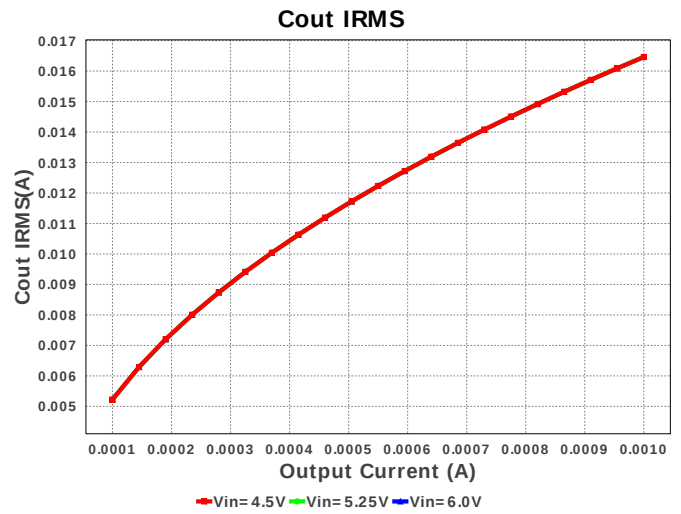
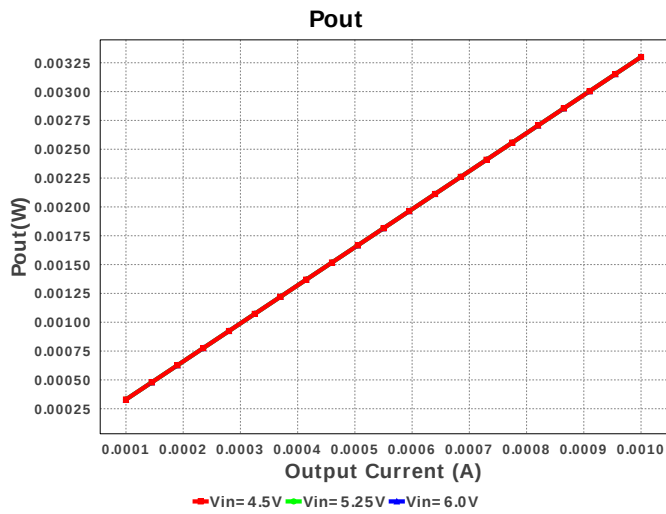
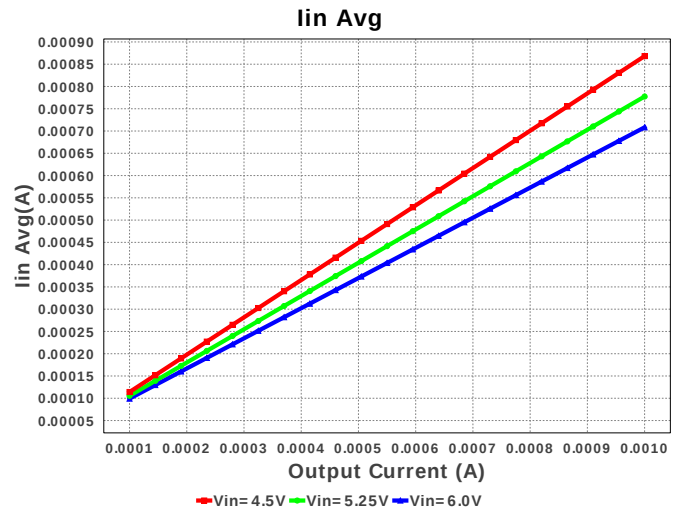
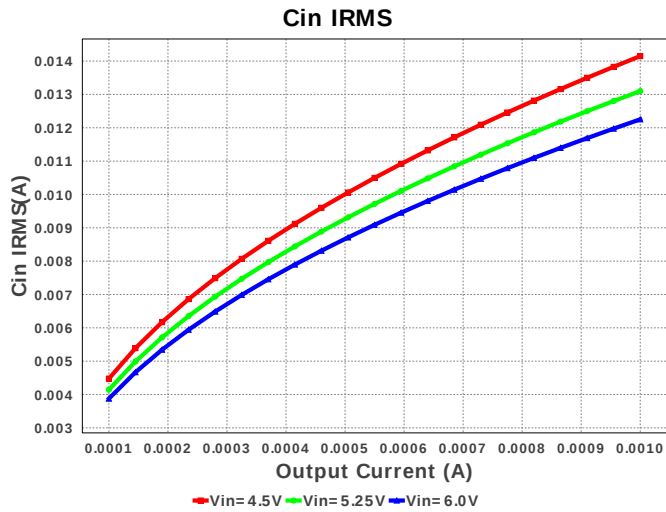
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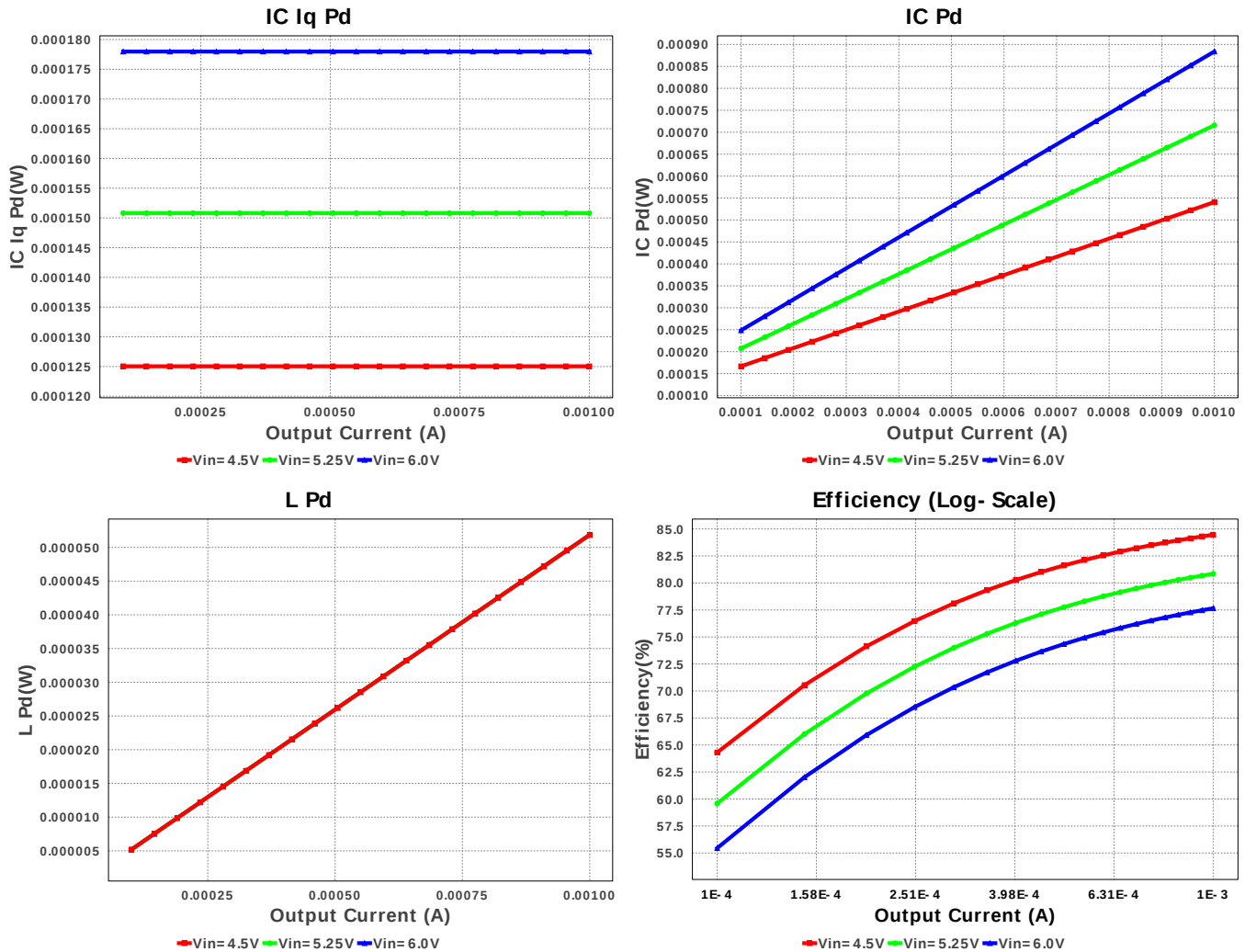


Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM188R61A225KE34D Series= X5R	Cap= 2.2 uF ESR= 9.637 mOhm VDC= 10.0 V IRMS= 1.24283 A	1	\$0.02	0603 5 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	12.252 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	16.46 mA	Current	Output capacitor RMS ripple current
3.	Iin Avg	708.24 μ A	Current	Average input current
4.	L Ipp	409.88 mA	Current	Peak-to-peak inductor ripple current
5.	BOM Count	4	General	Total Design BOM count
6.	FootPrint	21.0 mm ²	General	Total Foot Print Area of BOM components
7.	Frequency	17.656 kHz	General	Switching frequency
8.	Pout	3.3 mW	General	Total output power
9.	Total BOM	\$0.61	General	Total BOM Cost
10.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
11.	Duty Cycle	268.074 m%	Op_point	Duty cycle
12.	Efficiency	77.657 %	Op_point	Steady state efficiency
13.	IC Tj	30.26 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	6.0 V	Op_point	Vin operating point
17.	Vout p-p	14.045 mV	Op_point	Peak-to-peak output ripple voltage
18.	Cin Pd	1.447 μ W	Power	Input capacitor power dissipation
19.	Cout Pd	1.355 μ W	Power	Output capacitor power dissipation
20.	IC Iq Pd	177.985 μ W	Power	IC Iq Pd
21.	IC Pd	883.777 μ W	Power	IC power dissipation
22.	L Pd	51.858 μ W	Power	Inductor power dissipation
23.	Total Pd	949.452 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	6.0	Maximum input voltage

#	Name	Value	Description
3.	VinMin	4.5	Minimum input voltage
4.	Vout	3.3	Output Voltage
5.	base_pn	TPS62237	Base Product 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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