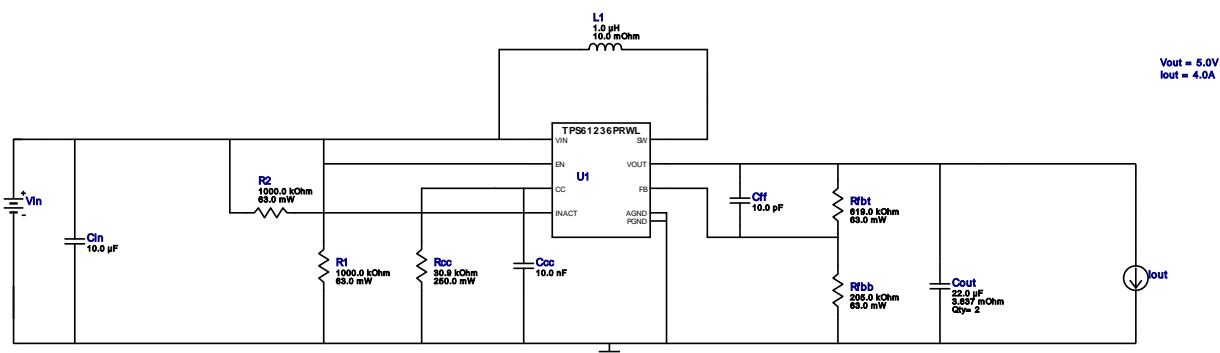



## WEBENCH® Design Report

Design : 3569363/78 TPS61236PRWLR  
TPS61236PRWLR 3.3V-4.2V to 5.00V @ 4.0A

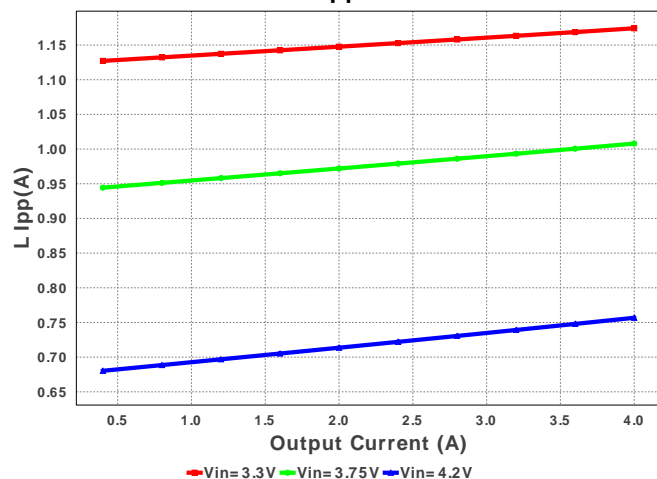


## Electrical BOM

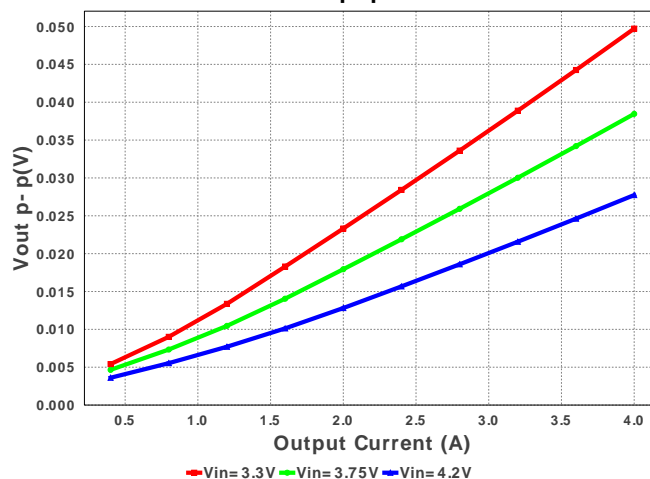
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Ccc	MuRata	GRM033R61A103KA01D Series= X5R	Cap= 10.0 nF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	0201 2 mm <sup>2</sup>
2.	Cff	Kemet	C0805C100M4GACTU Series= C0G/NP0	Cap= 10.0 pF VDC= 16.0 V IRMS= 0.0 A	1	\$0.01	0805 7 mm <sup>2</sup>
3.	Cin	Taiyo Yuden	LMK212BJ106KG-T Series= X5R	Cap= 10.0 uF VDC= 10.0 V IRMS= 0.0 A	1	\$0.02	0805 7 mm <sup>2</sup>
4.	Cout	MuRata	GRM31CR61A226ME19L Series= X5R	Cap= 22.0 uF ESR= 3.637 mOhm VDC= 10.0 V IRMS= 3.56456 A	2	\$0.08	1206_190 11 mm <sup>2</sup>
5.	L1	Bourns	SRN8040-1R0Y	L= 1.0 uH DCR= 10.0 mOhm	1	\$0.22	SRN8040 100 mm <sup>2</sup>
6.	R1	Vishay-Dale	CRCW04021M00FKED Series= CRCW...e3	Res= 1000.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>
7.	R2	Vishay-Dale	CRCW04021M00FKED Series= CRCW...e3	Res= 1000.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>
8.	Rcc	Panasonic	ERJ-8ENF3092V Series= ERJ-8E	Res= 30.9 kOhm Power= 250.0 mW Tolerance= 1.0%	1	\$0.01	1206 11 mm <sup>2</sup>
9.	Rfbb	Vishay-Dale	CRCW0402205KFKED Series= CRCW...e3	Res= 205.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>
10.	Rfbt	Vishay-Dale	CRCW0402619KFKED Series= CRCW...e3	Res= 619.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm <sup>2</sup>

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
11.	U1	Texas Instruments	TPS61236PRWLR	Switcher	1	\$1.60	 RWL0009A 12 mm <sup>2</sup>

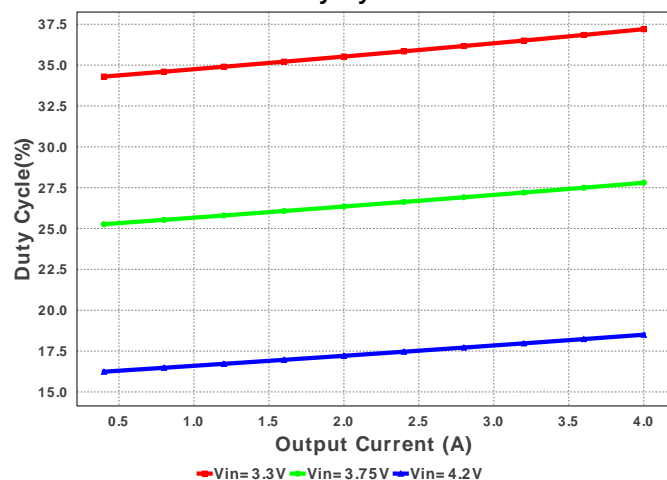
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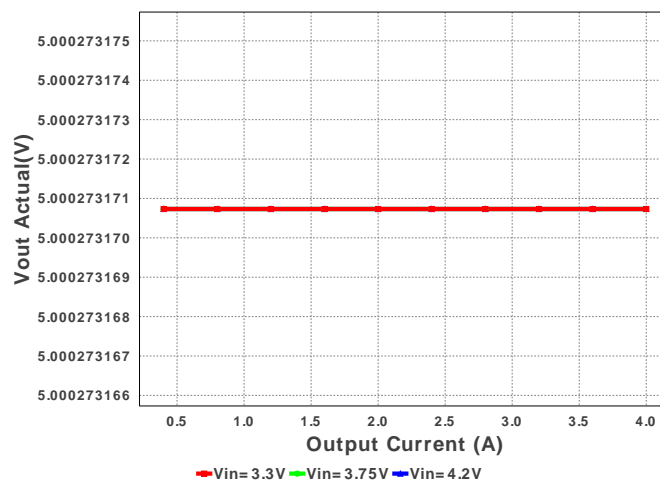
Vout p- p

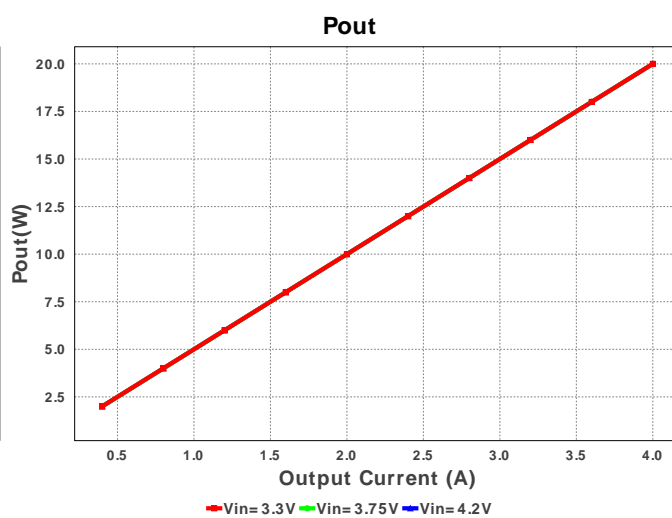
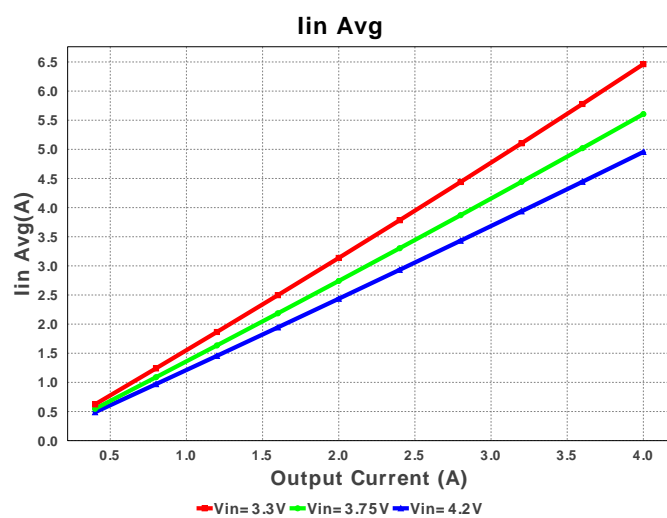
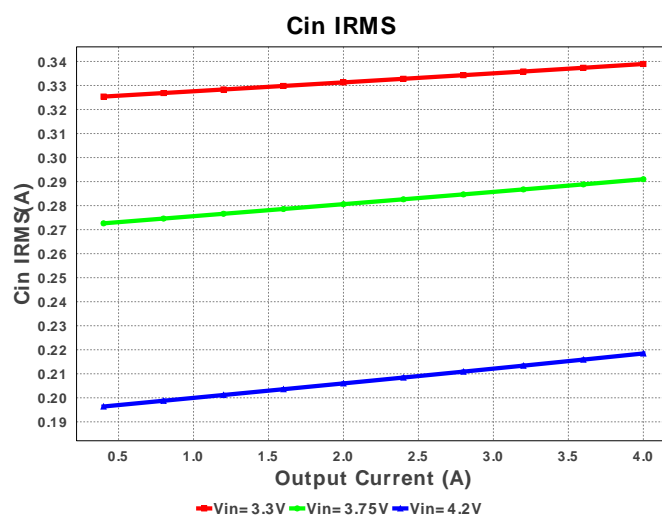
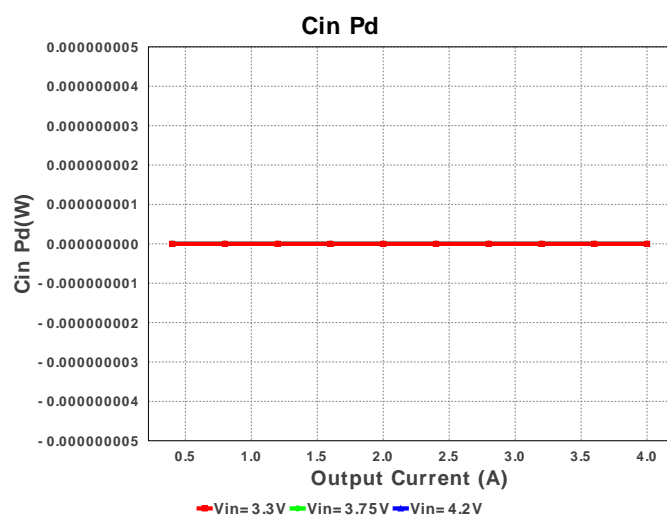
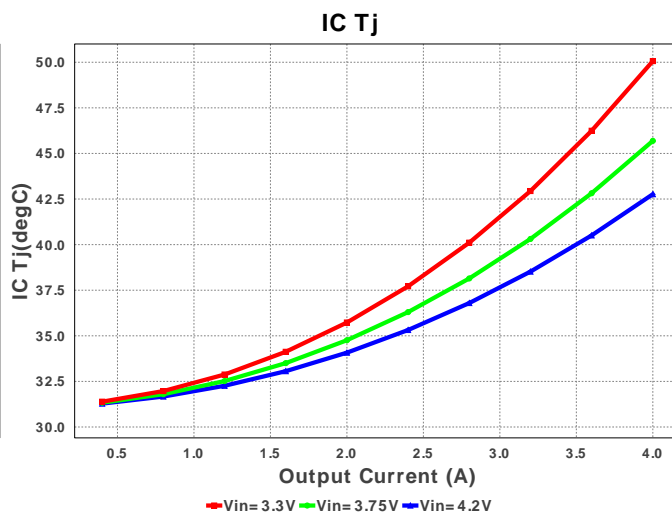
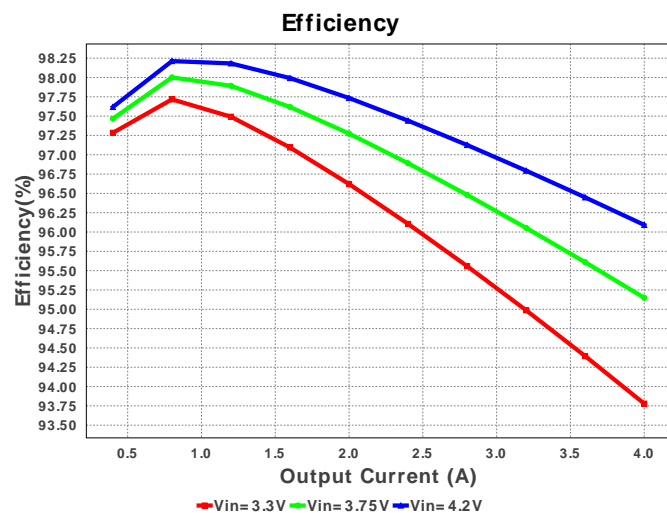


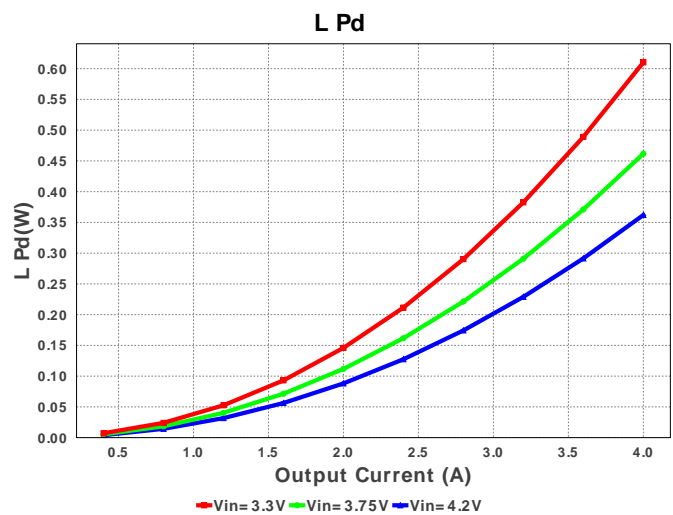
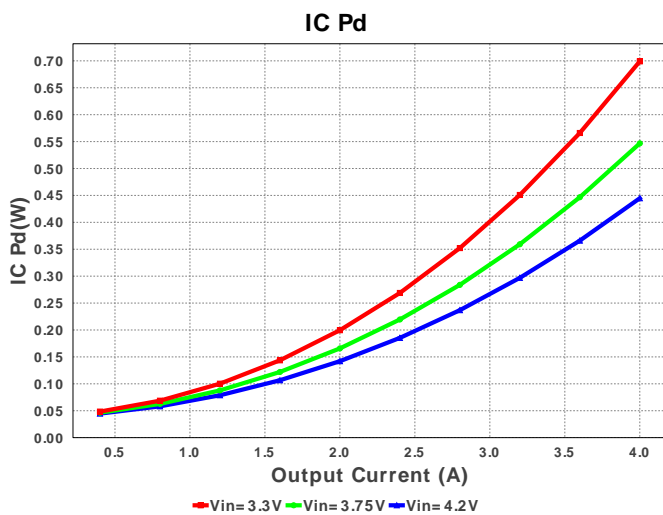
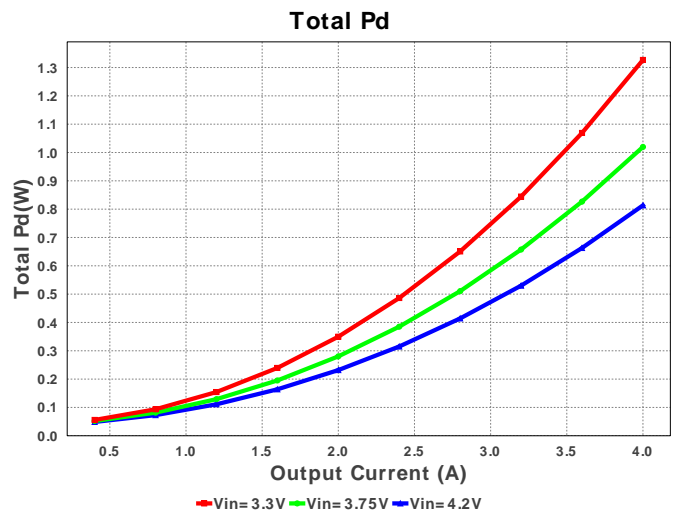
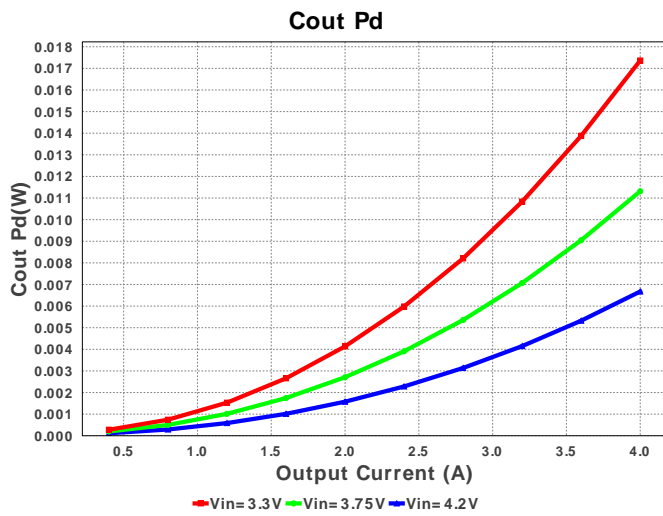
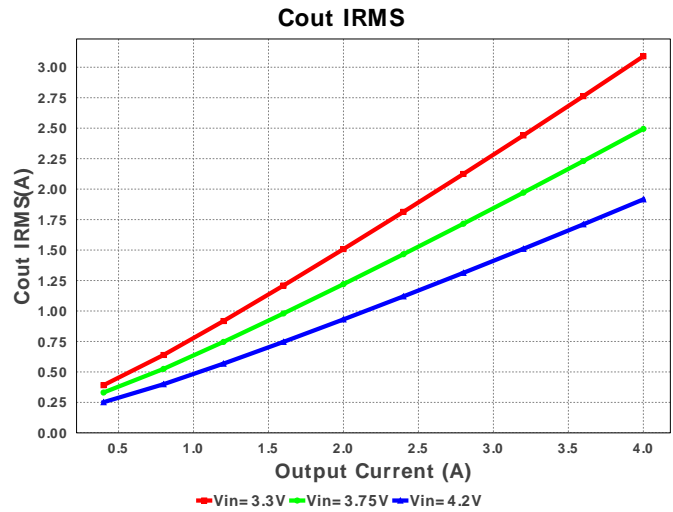
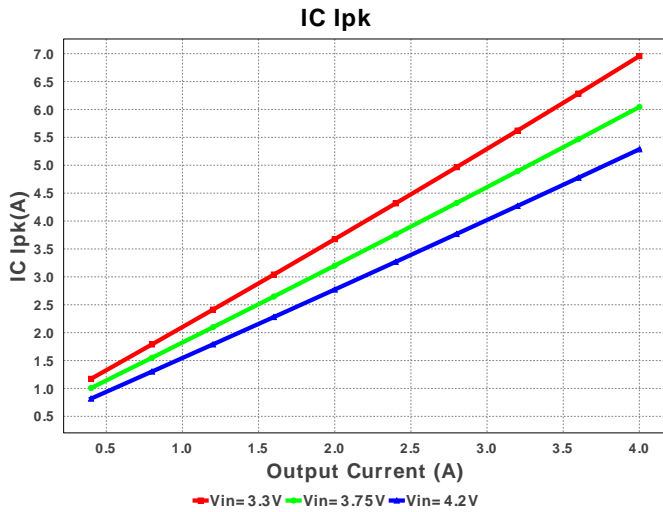
Duty Cycle

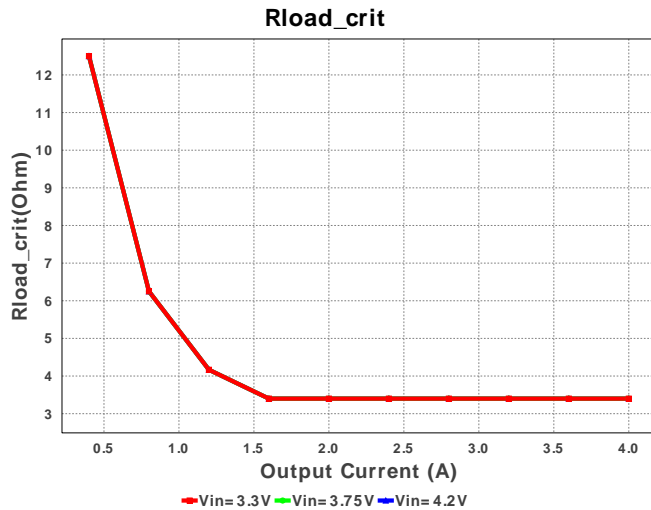


Vout Actual









## Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	338.95 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	3.09 A	Current	Output capacitor RMS ripple current
3.	IC Ipk	6.956 A	Current	Peak switch current in IC
4.	Iin Avg	6.463 A	Current	Average input current
5.	L Ipp	1.174 A	Current	Peak-to-peak inductor ripple current
6.	BOM Count	12	General	Total Design BOM count
7.	FootPrint	173.0 mm <sup>2</sup>	General	Total Foot Print Area of BOM components
8.	Frequency	1000.0 kHz	General	Switching frequency
9.	Mode	BOOST PWM CCM	General	PWM/PFM Mode
10.	Pout	20.0 W	General	Total output power
11.	Total BOM	\$2.07	General	Total BOM Cost
12.	Vout Actual	5.0 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
13.	Duty Cycle	37.198 %	Op_point	Duty cycle
14.	Efficiency	93.779 %	Op_point	Steady state efficiency
15.	IC Tj	50.063 degC	Op_point	IC junction temperature
16.	ICThetaJA	28.7 degC/W	Op_point	IC junction-to-ambient thermal resistance
17.	IOUT_OP	4.0 A	Op_point	Iout operating point
18.	VIN_OP	3.3 V	Op_point	Vin operating point
19.	Vout p-p	49.721 mV	Op_point	Peak-to-peak output ripple voltage
20.	Cin Pd	0.0 W	Power	Input capacitor power dissipation
21.	Cout Pd	17.364 mW	Power	Output capacitor power dissipation
22.	IC Pd	699.065 mW	Power	IC power dissipation
23.	L Pd	610.226 mW	Power	Inductor power dissipation
24.	Total Pd	1.327 W	Power	Total Power Dissipation
25.	Rload_crit	3.4 Ohm		Minimum Rload required during Start up
26.	Vout Tolerance	3.15 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

## Design Inputs

#	Name	Value	Description
1.	Iout	4.0	Maximum Output Current
2.	VinMax	4.2	Maximum input voltage
3.	VinMin	3.3	Minimum input voltage
4.	Vout	5.0	Output Voltage
5.	base_pn	TPS61236P	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

## Design Assistance

1. **TPS61236P** Product Folder : <http://www.ti.com/product/TPS61236> : contains the data sheet and other resources.

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