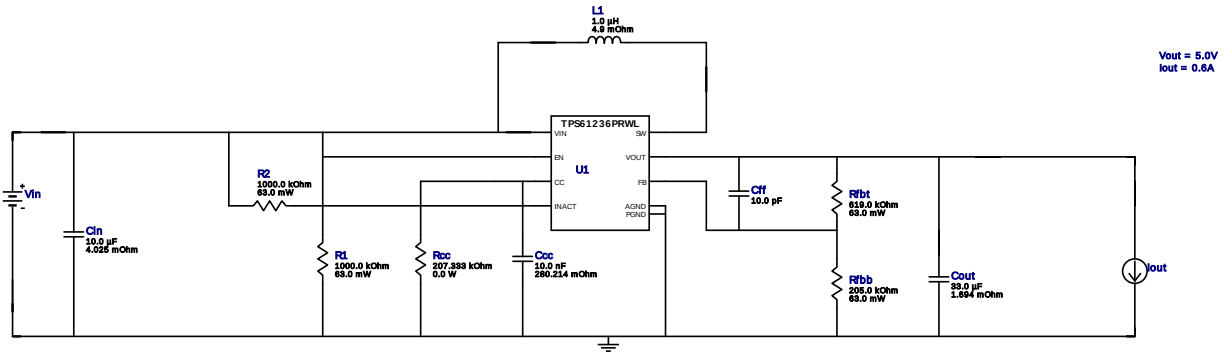
WEBENCH® Design Report

VinMin = 2.75V
VinMax = 4.5V
Vout = 5.0V
Iout = 0.6A

Device = TPS61236PRWLR
Topology = Boost
Created = 2/6/17 10:23:02 AM
BOM Cost = $0.00
BOM Count = 11
Total Pd = 0.07W

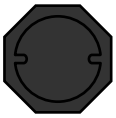
Design : 3918487/142 TPS61236PRWLR
HAT PWR FINAL: TPS61236PRWLR 2.75V-4.5V to 5.00V @ 0.6A



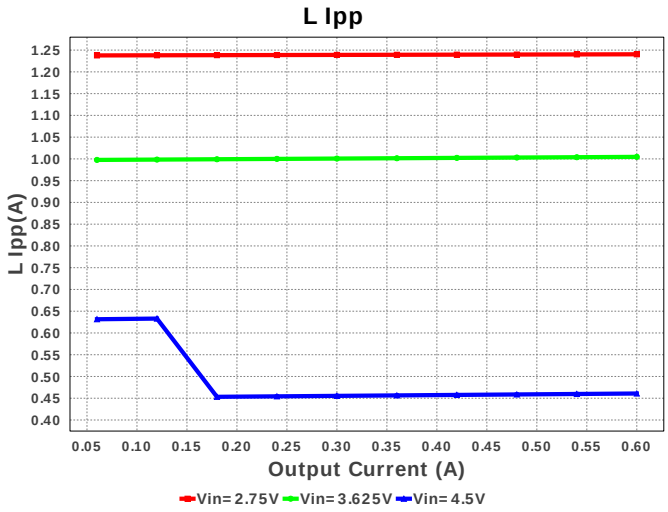
My Comments

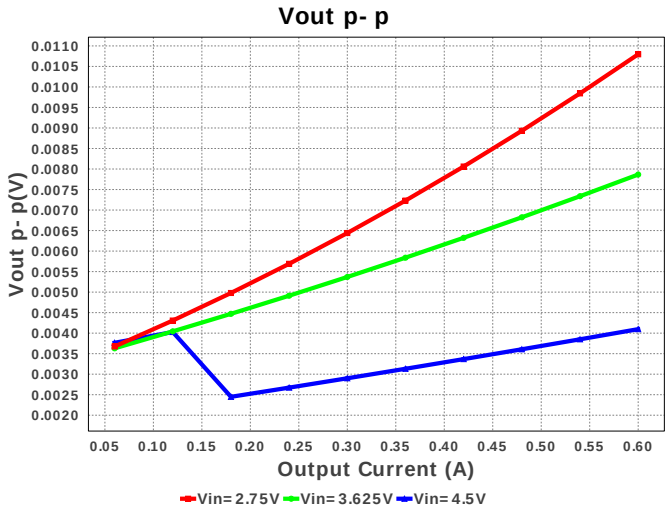
No comments

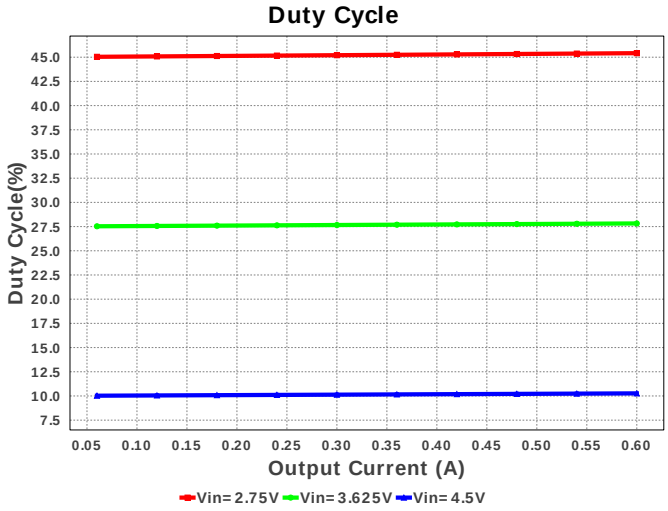
Electrical BOM

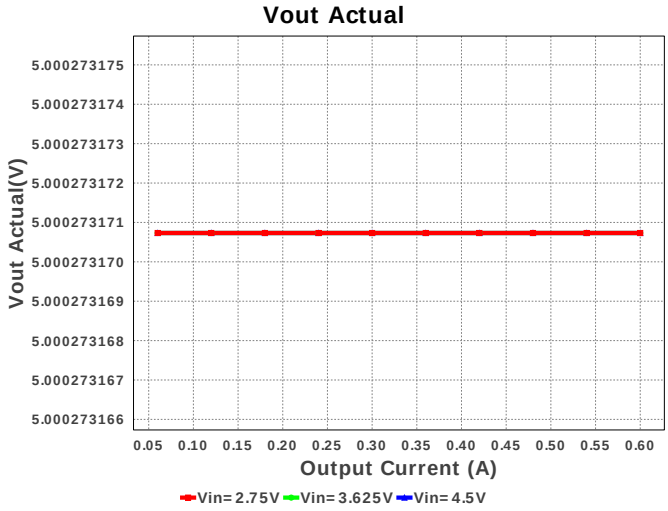
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Ccc	TDK	CGA1A2X7R1A103K030BA Series= X7R	Cap= 10.0 nF ESR= 280.21 mOhm VDC= 10.0 V IRMS= 245.72 mA	1	$0.01	0201_033 2 mm²
2.	Cff	Samsung Electro-Mechanics	CL02C100JO2ANNC Series= C0G/NP0	Cap= 10.0 pF VDC= 16.0 V IRMS= 0.0 A	1	$0.01	01005 2 mm²
3.	Cin	MuRata	GRM21BR61A106KE19L Series= X5R	Cap= 10.0 uF ESR= 4.025 mOhm VDC= 10.0 V IRMS= 2.445 A	1	$0.03	0805 7 mm²
4.	Cout	TDK	C2012X5R1A336M125AC Series= X5R	Cap= 33.0 uF ESR= 1.694 mOhm VDC= 10.0 V IRMS= 5.0128 A	1	$0.29	0805 7 mm²
5.	L1	Bourns	SRU1028-1R0Y	L= 1.0 µH DCR= 4.9 mOhm	1	$0.33	 SRU1028 144 mm²
6.	R1	Vishay-Dale	CRCW04021M00FKED Series= CRCW..e3	Res= 1000.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
7.	R2	Vishay-Dale	CRCW04021M00FKED Series= CRCW..e3	Res= 1000.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
8.	Rcc	CUSTOM	CUSTOM Series= ?	Res= 207.333 kOhm Power= 0.0 W Tolerance= 0.0%	1	NA	CUSTOM 0 mm²
9.	Rfbb	Vishay-Dale	CRCW0402205KFKED Series= CRCW..e3	Res= 205.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
10.	Rfbt	Vishay-Dale	CRCW0402619KFKED Series= CRCW..e3	Res= 619.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
11.	U1	Texas Instruments	TPS61236PRWLR	Switcher	1	$0.78	RWL0009A 12 mm^2

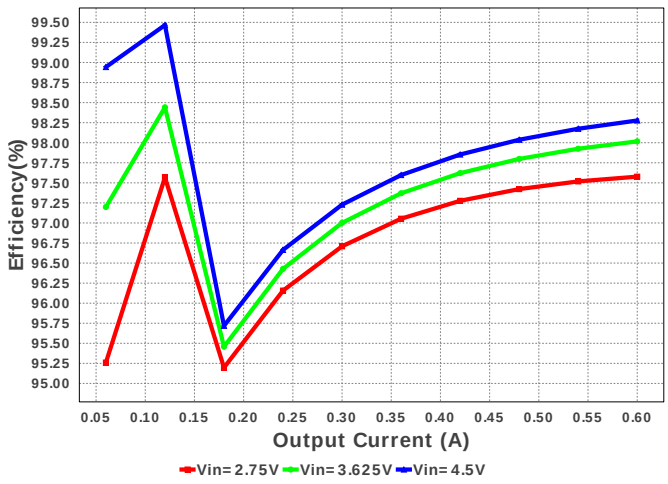




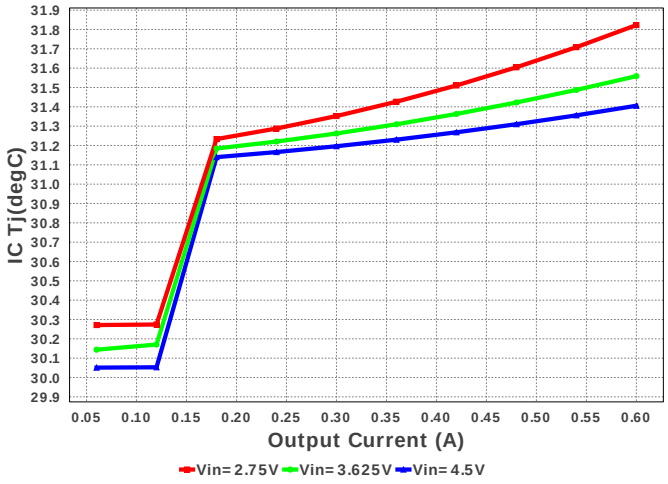




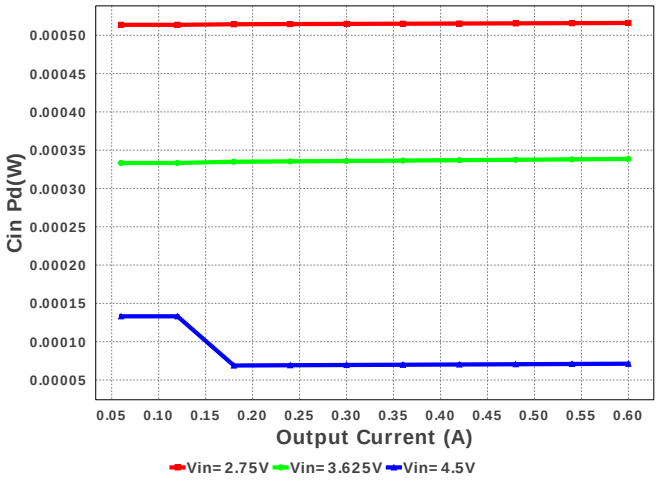
Efficiency



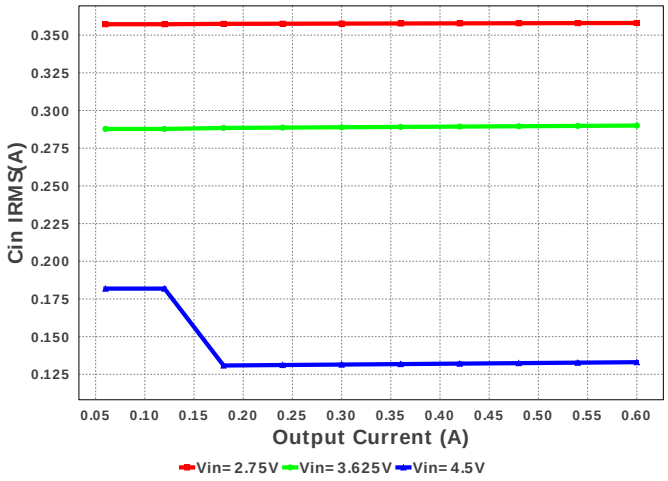
IC Tj



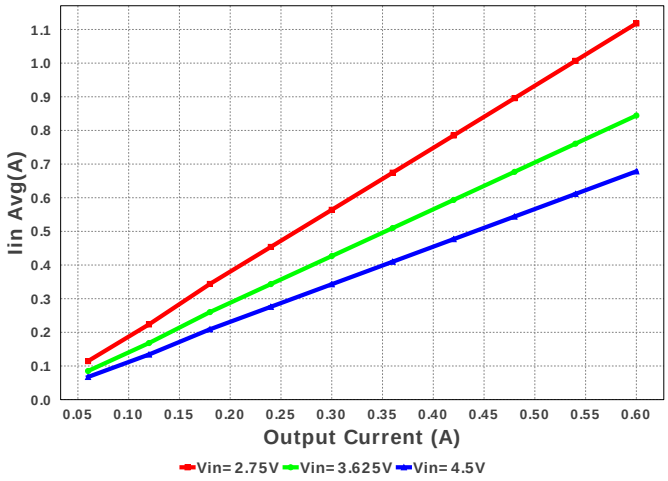
Cin Pd



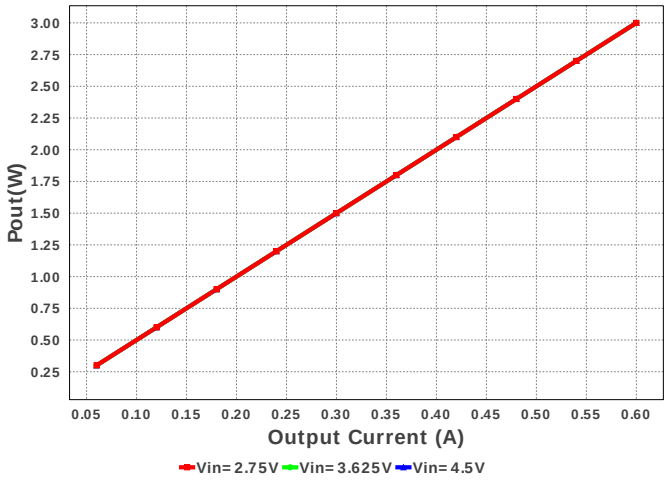
Cin IRMS

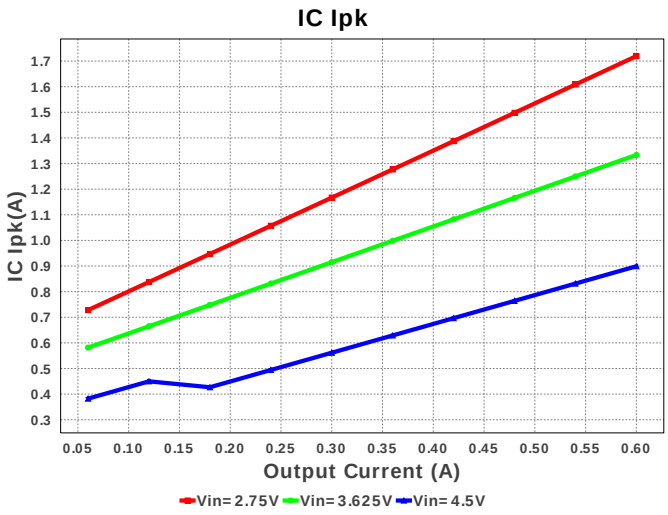


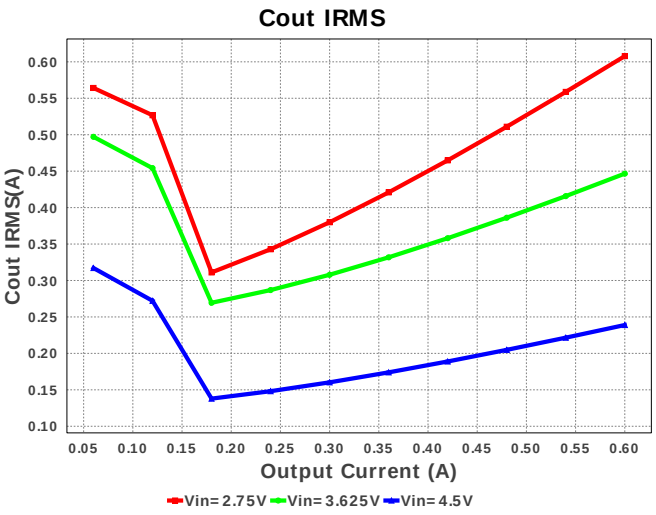
Iin Avg

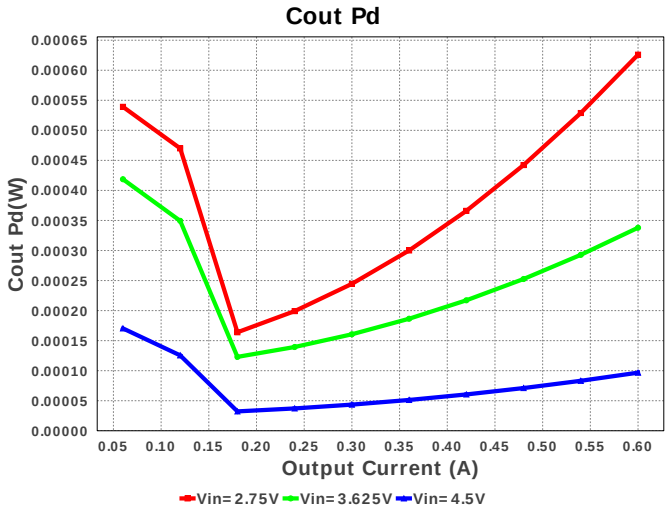


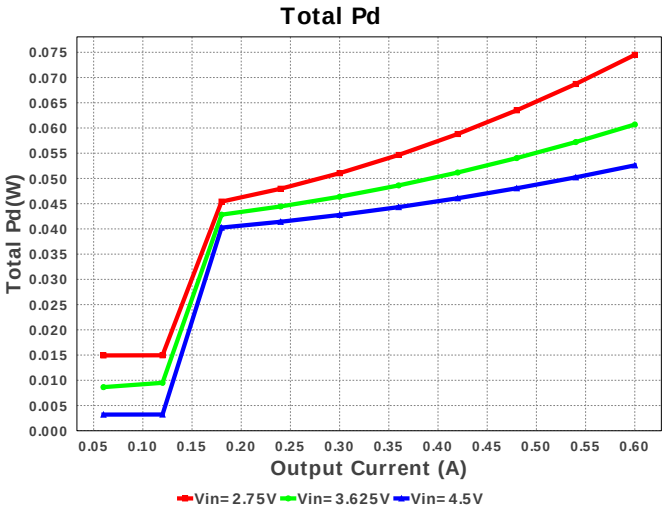
Pout

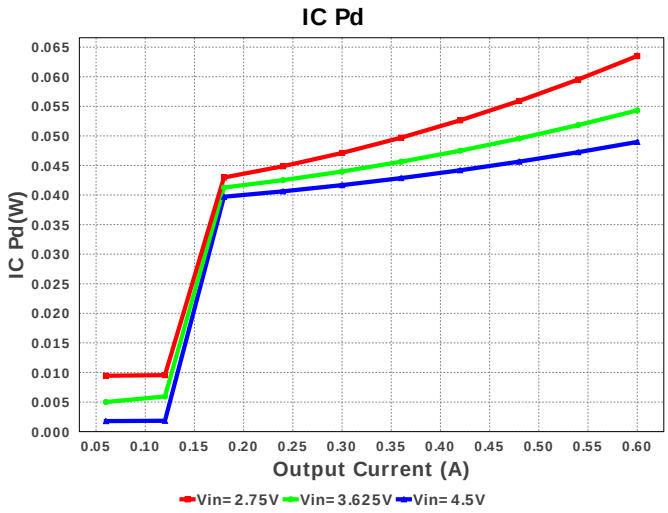


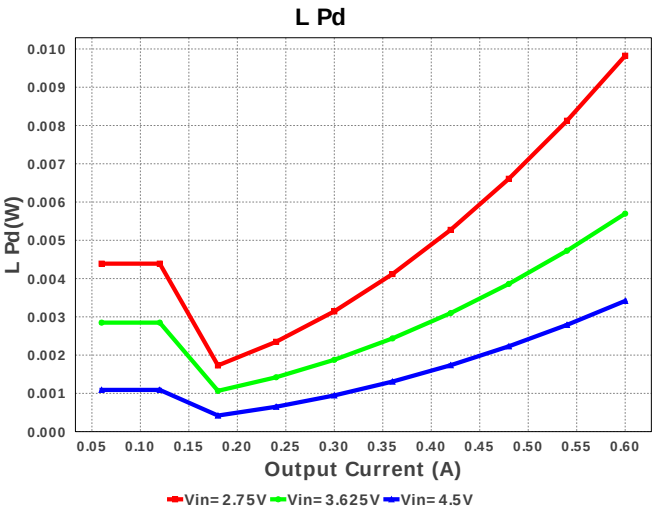


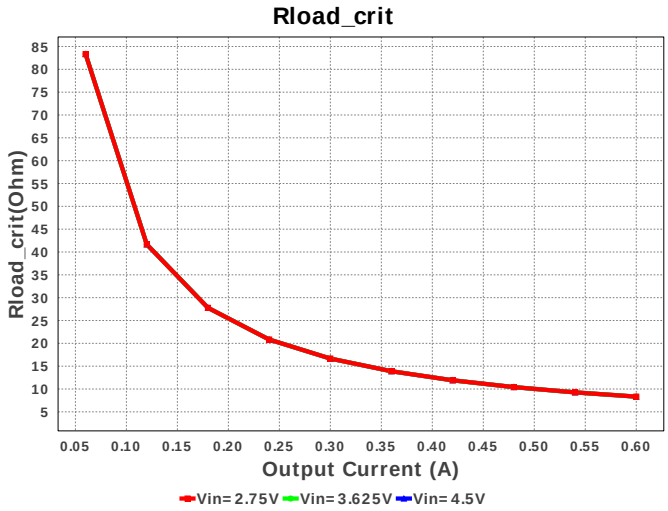












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	358.065 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	607.858 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	1.719 A	Current	Peak switch current in IC
4.	Iin Avg	1.118 A	Current	Average input current
5.	L Ipp	1.24 A	Current	Peak-to-peak inductor ripple current
6.	BOM Count	11	General	Total Design BOM count
7.	FootPrint	191.0 mm^2	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	3.0 W	General	Total output power
11.	Total BOM	$0.0	General	Total BOM Cost
12.	Vout Actual	5.0 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
13.	Duty Cycle	45.416 %	Op_point	Duty cycle
14.	Efficiency	97.577 %	Op_point	Steady state efficiency
15.	IC Tj	31.823 degC	Op_point	IC junction temperature
16.	ICThetaJA	28.7 degC/W	Op_point	IC junction-to-ambient thermal resistance
17.	IOUT_OP	600.0 mA	Op_point	Iout operating point
18.	VIN_OP	2.75 V	Op_point	Vin operating point
19.	Vout p-p	10.796 mV	Op_point	Peak-to-peak output ripple voltage
20.	Cin Pd	516.047 µW	Power	Input capacitor power dissipation
21.	Cout Pd	625.919 µW	Power	Output capacitor power dissipation
22.	IC Pd	63.507 mW	Power	IC power dissipation
23.	L Pd	9.823 mW	Power	Inductor power dissipation
24.	Total Pd	74.495 mW	Power	Total Power Dissipation
25.	Rload_crit	8.333 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	600.0 m	Maximum Output Current
2.	VinMax	4.5	Maximum input voltage
3.	VinMin	2.75	Minimum input voltage
4.	VinTyp	3.7	Typical input voltage
5.	Vout	5.0	Output Voltage
6.	base_pn	TPS61236P	Base Product Number
7.	source	DC	Input Source Type
8.	Ta	30.0	Ambient temperature

Design Assistance

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