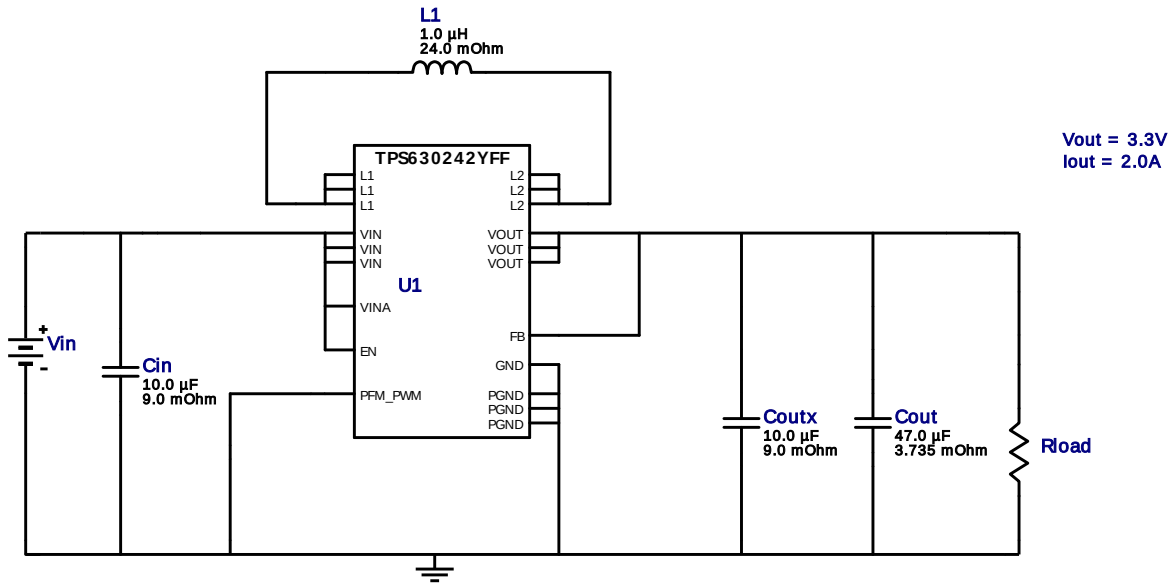
WEBENCH® Design Report

VinMin = 2.7V
VinMax = 4.1V
Vout = 3.3V
Iout = 2.0A

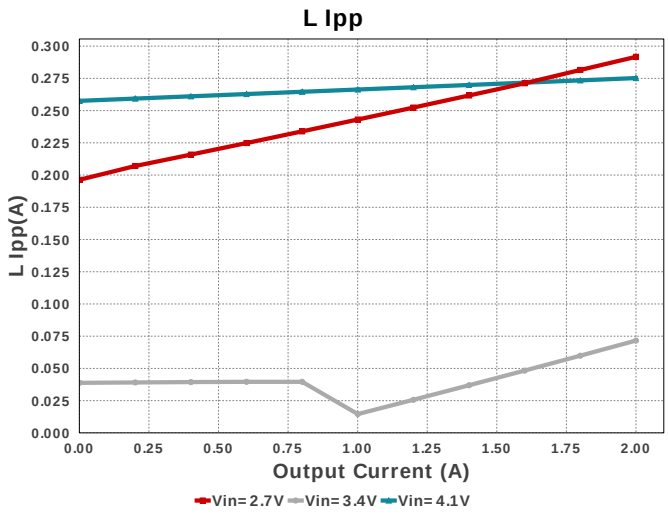
Device = TPS630242YFFR
Topology = Buck_Boost
Created = 2018-02-09 13:36:43.723
BOM Cost = $1.58
BOM Count = 5
Total Pd = 1.14W

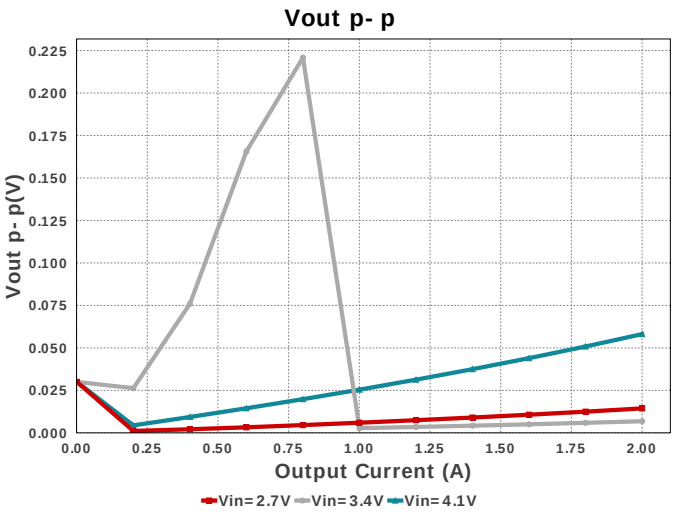
Design : 5175827/5 TPS630242YFFR
TPS630242YFFR 2.7V-4.1V to 3.30V @ 2.0A

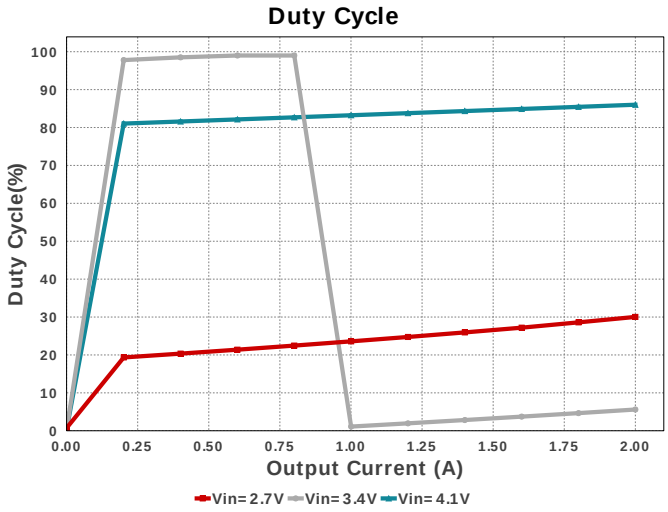


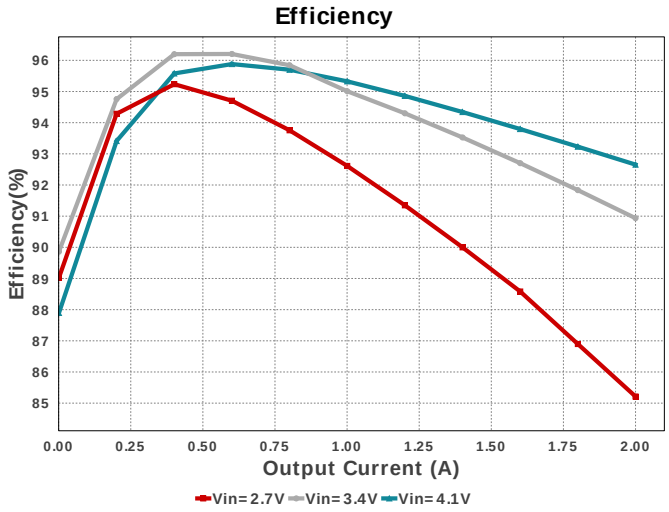
Electrical BOM

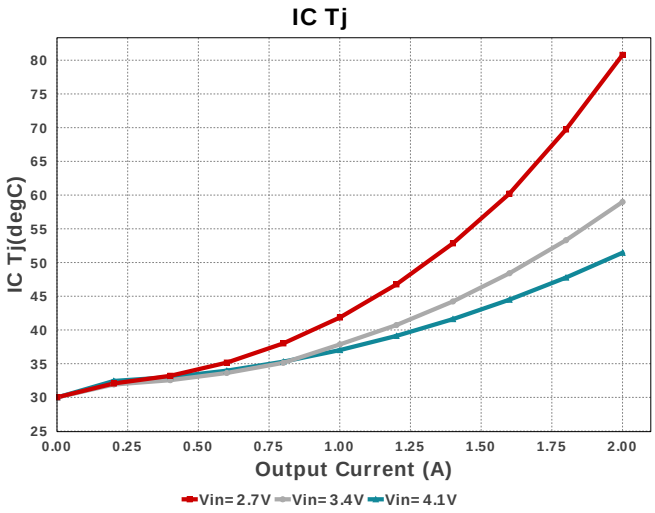
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM188R60J106ME47D Series= X5R	Cap= 10.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 2.74 A	1	$0.02	0603 5 mm²
2.	Cout	MuRata	GRM31CR60J476ME19L Series= X5R	Cap= 47.0 uF ESR= 3.735 mOhm VDC= 6.3 V IRMS= 4.091 A	1	$0.11	1206_190 11 mm²
3.	Coutx	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 mm²
4.	L1	Vishay-Dale	IHLP1212BZER1R0M11	L= 1.0 µH DCR= 24.0 mOhm	1	$0.56	IHLP-1212BZ 19 mm²
5.	U1	Texas Instruments	TPS630242YFFR	Switcher	1	$0.87	YFF0020AEBA 9 mm²

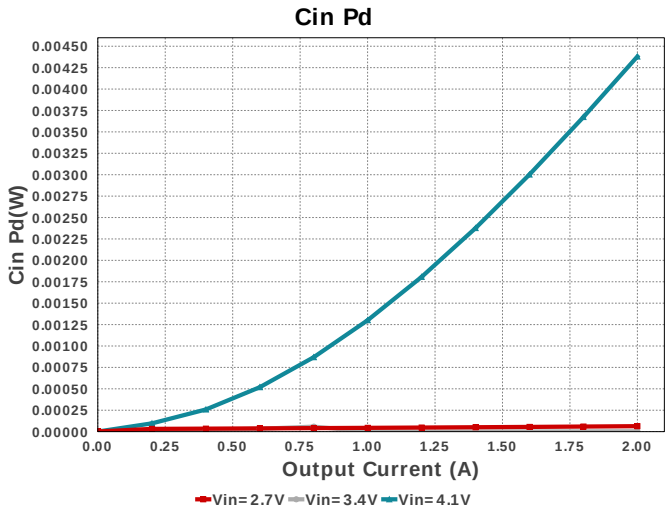


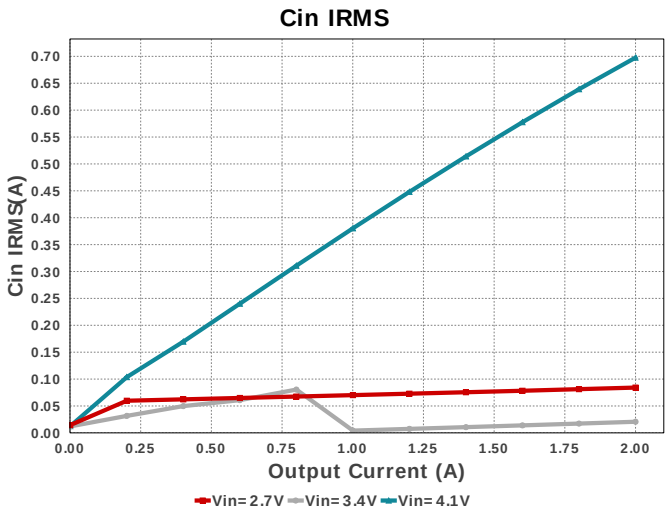


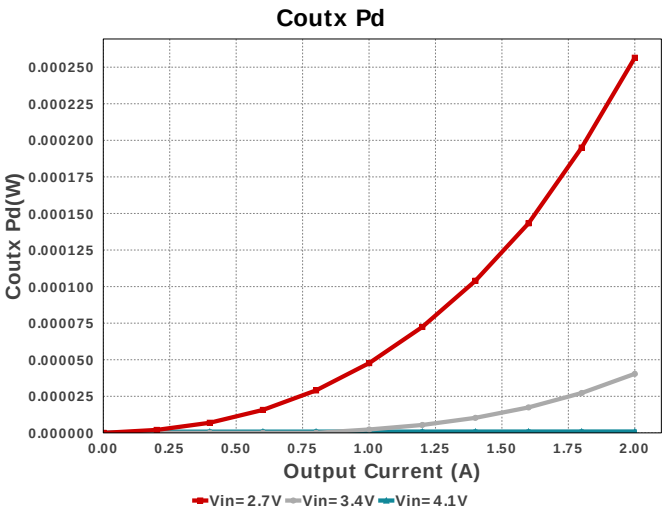


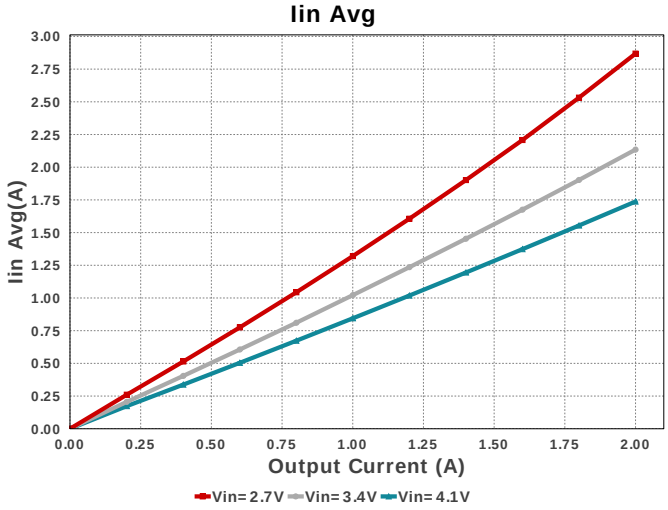


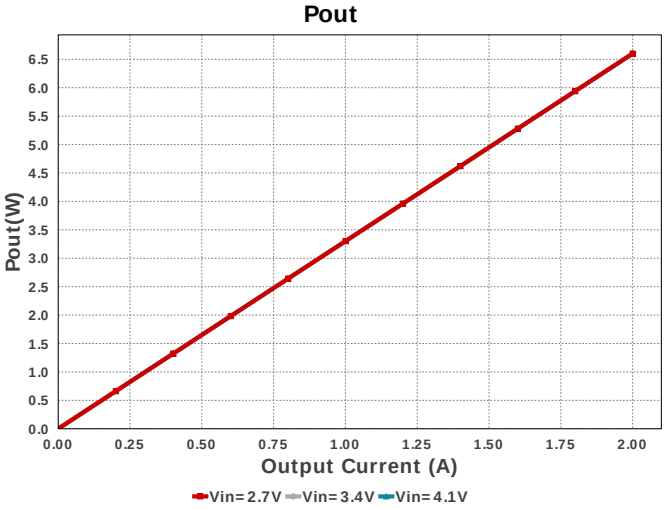


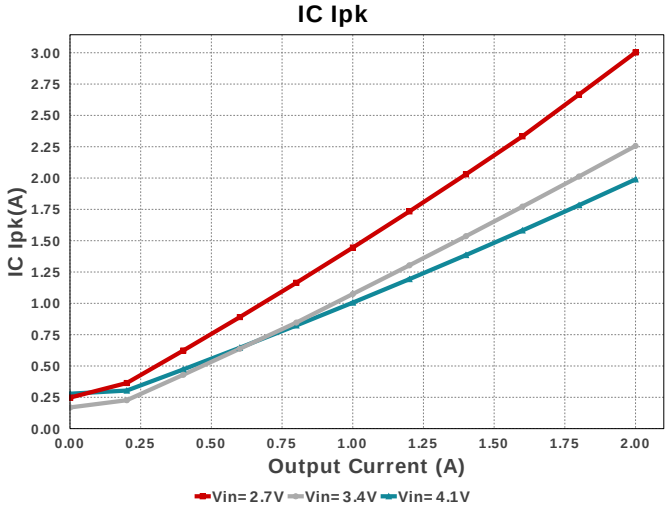


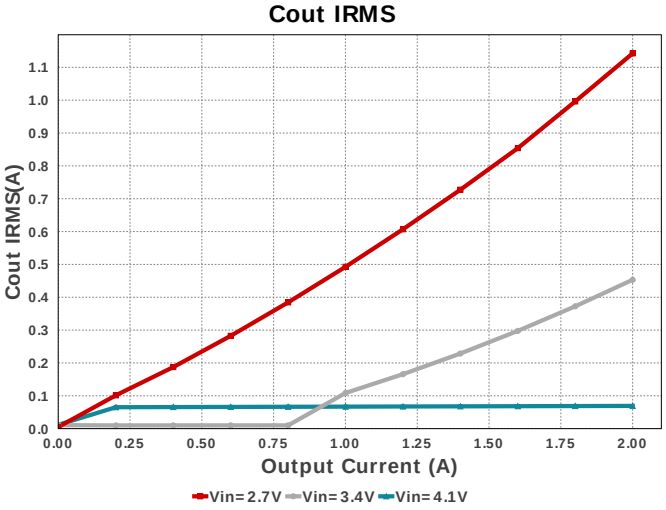


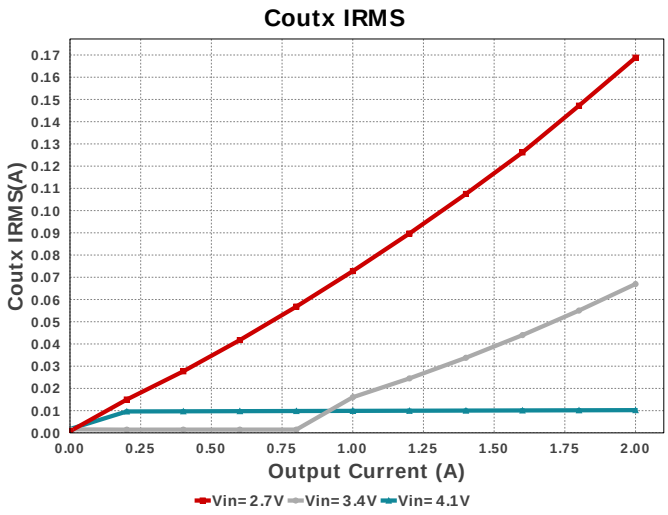


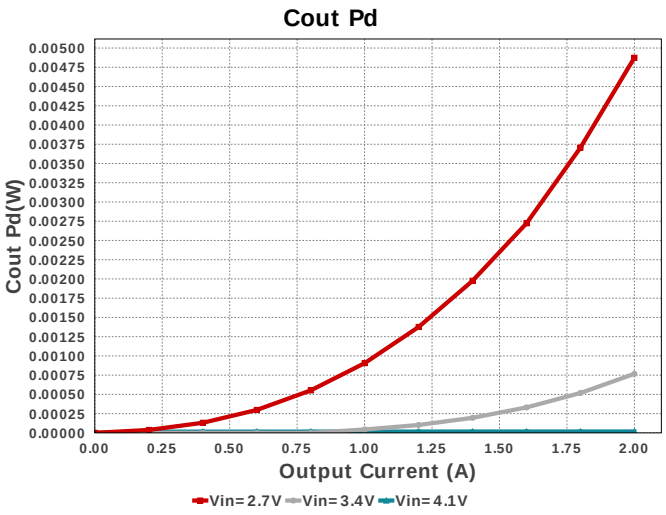


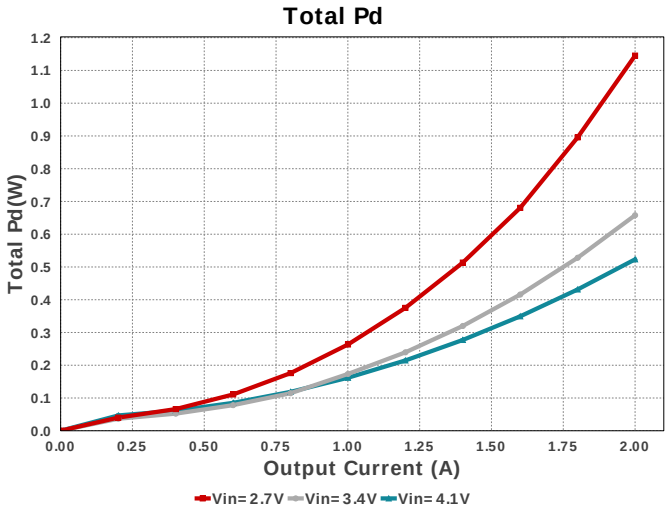


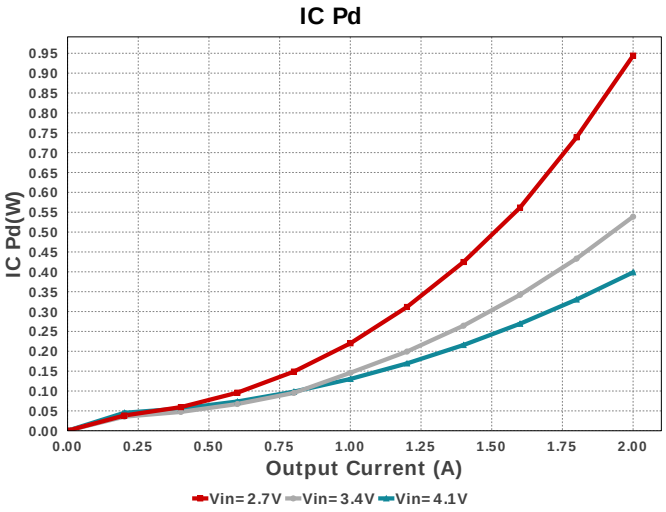


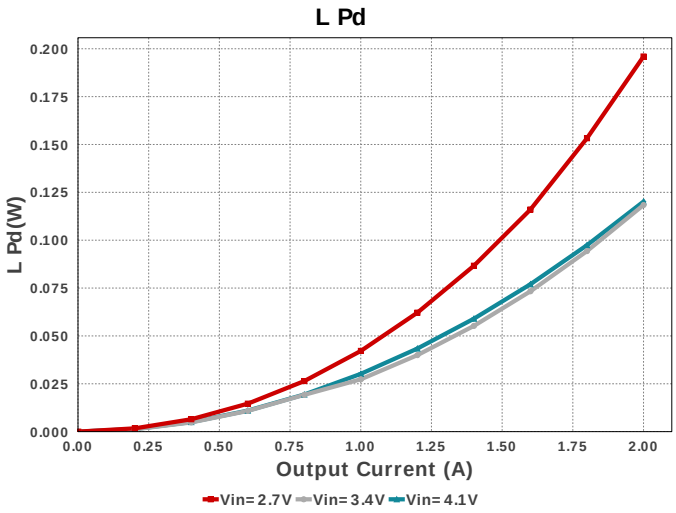


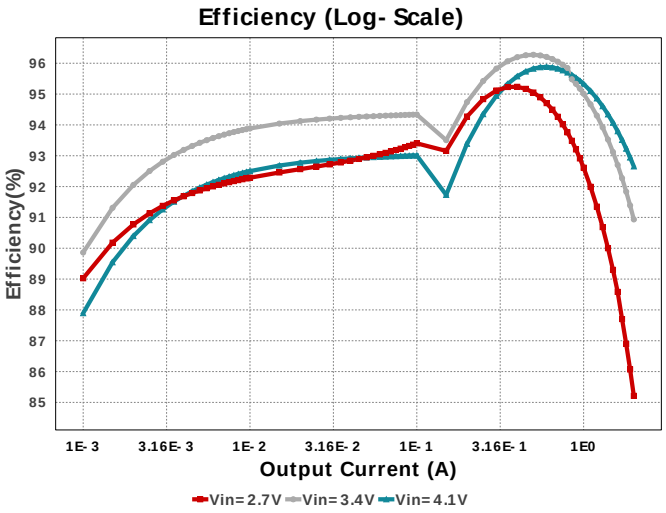












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	84.188 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	1.141 A	Current	Output capacitor RMS ripple current
3.	Coutx IRMS	168.654 mA	Current	Output capacitor_x RMS ripple current
4.	IC Ipk	3.0 A	Current	Peak switch current in IC
5.	Iin Avg	2.866 A	Current	Average input current
6.	L Ipp	291.64 mA	Current	Peak-to-peak inductor ripple current
7.	BOM Count	5	General	Total Design BOM count
8.	FootPrint	48.0 mm^2	General	Total Foot Print Area of BOM components
9.	Frequency	2.5 MHz	General	Switching frequency
10.	Mode	BOOST PWM CCM	General	PWM/PFM Mode
11.	Pout	6.6 W	General	Total output power

#	Name	Value	Category	Description
12.	Total BOM	$1.58	General	Total BOM Cost
13.	Duty Cycle	30.023 %	Op_point	Duty cycle
14.	Efficiency	85.29 %	Op_point	Steady state efficiency
15.	IC Tj	80.712 degC	Op_point	IC junction temperature
16.	ICThetaJA	53.8 degC/W	Op_point	IC junction-to-ambient thermal resistance
17.	IOUT_OP	2.0 A	Op_point	Iout operating point
18.	VIN_OP	2.7 V	Op_point	Vin operating point
19.	Vout p-p	7.237 mV	Op_point	Peak-to-peak output ripple voltage
20.	Cin Pd	63.789 µW	Power	Input capacitor power dissipation
21.	Cout Pd	0.0 W	Power	Output capacitor power dissipation
22.	Coutx Pd	0.0 W	Power	Output capacitor_x power loss
23.	IC Pd	942.594 mW	Power	IC power dissipation
24.	L Pd	195.64 mW	Power	Inductor power dissipation
25.	Total Pd	1.138 W	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	2.0	Maximum Output Current
2.	VinMax	4.1	Maximum input voltage
3.	VinMin	2.7	Minimum input voltage
4.	Vout	3.3	Output Voltage
5.	base_pn	TPS630242	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS630242** Product Folder : http://www.ti.com/product/TPS630242 : contains the data sheet and other resources.