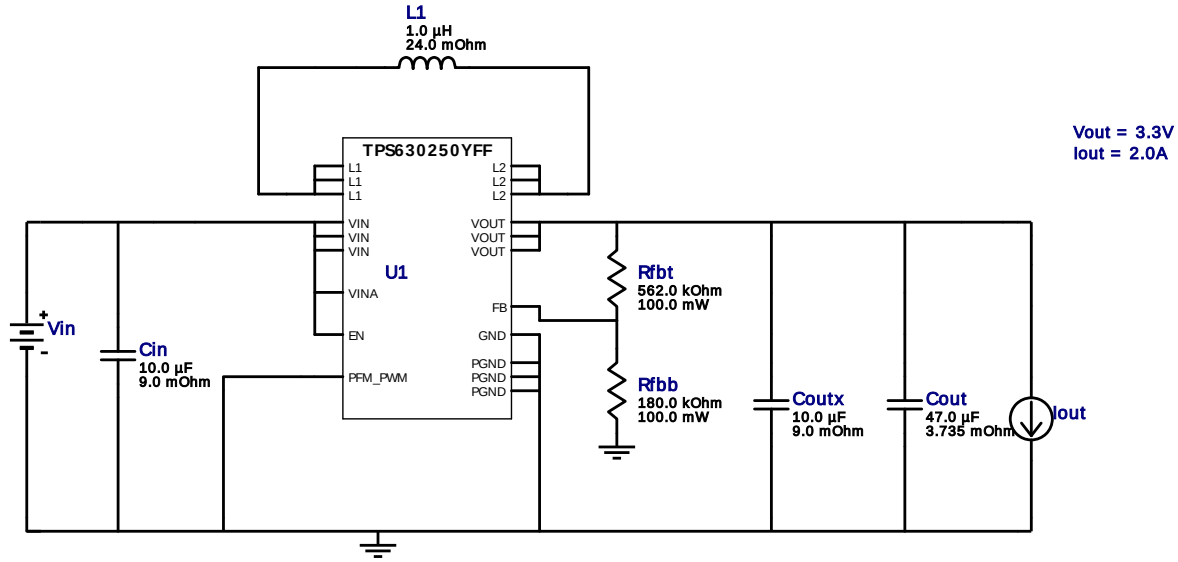
WEBENCH® Design Report

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

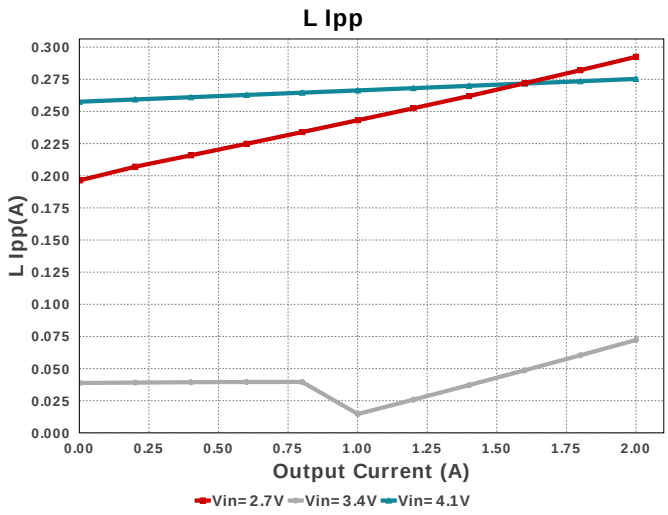
Device = TPS630250YFFR
Topology = Buck_Boost
Created = 2018-02-09 14:16:39.774
BOM Cost = $1.78
BOM Count = 7
Total Pd = 1.15W

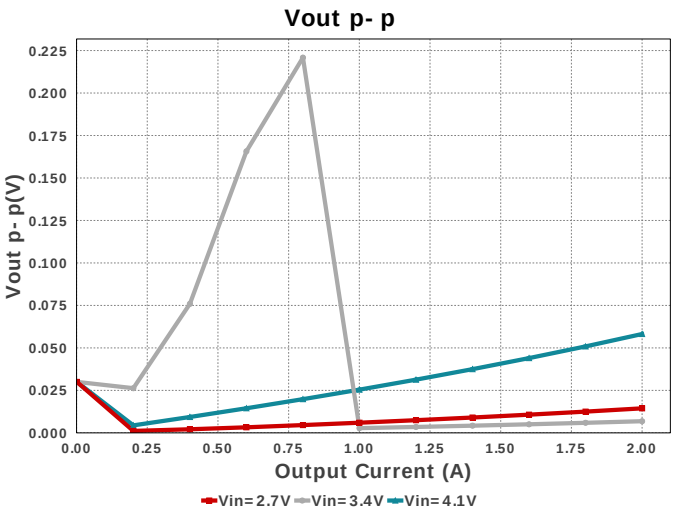
Design : 5175827/7 TPS630250YFFR
TPS630250YFFR 2.7V-4.1V to 3.30V @ 2.0A

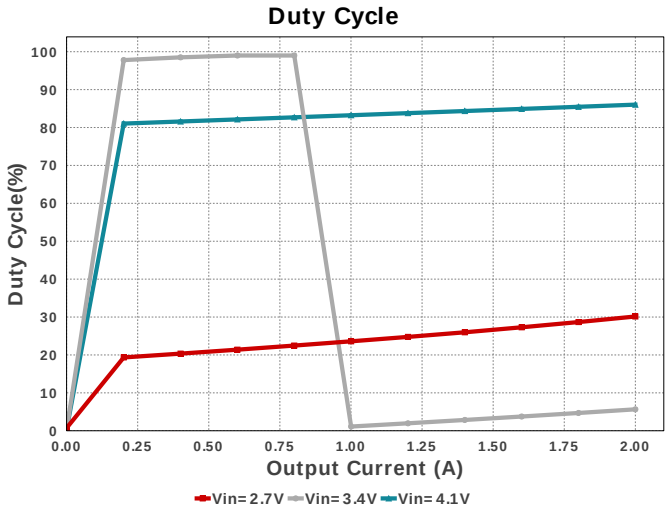


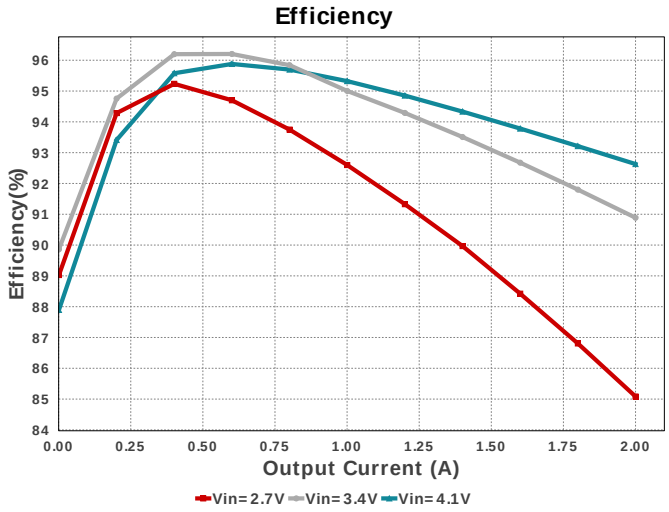
Electrical BOM

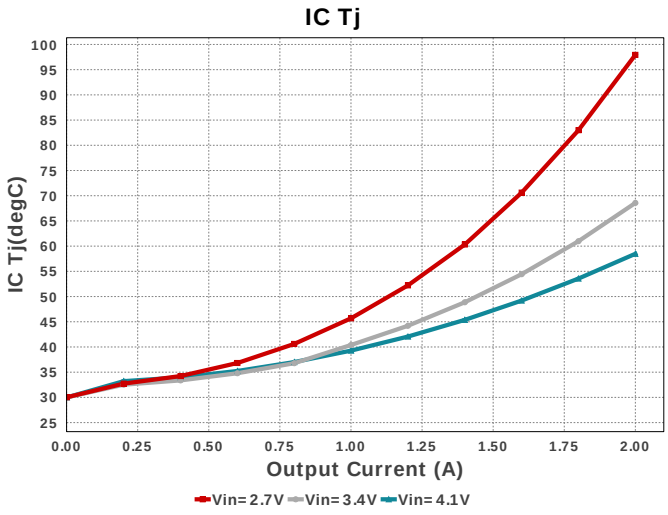
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM188R60J106ME47D Series= X5R	Cap= 10.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 2.74 A	1	$0.02	0603 5 mm²
2.	Cout	MuRata	GRM31CR60J476ME19L Series= X5R	Cap= 47.0 uF ESR= 3.735 mOhm VDC= 6.3 V IRMS= 4.091 A	1	$0.11	1206_190 11 mm²
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.	Rfbb	Yageo America	RC0603FR-07180KL Series= ?	Res= 180.0 kOhm Power= 100.0 mW Tolerance= 1.0%	1	$0.01	0603 5 mm²
6.	Rfbt	Yageo America	RC0603FR-07562KL Series= ?	Res= 562.0 kOhm Power= 100.0 mW Tolerance= 1.0%	1	$0.01	0603 5 mm²
7.	U1	Texas Instruments	TPS630250YFFR	Switcher	1	$1.05	YFF0020AJAF 9 mm²

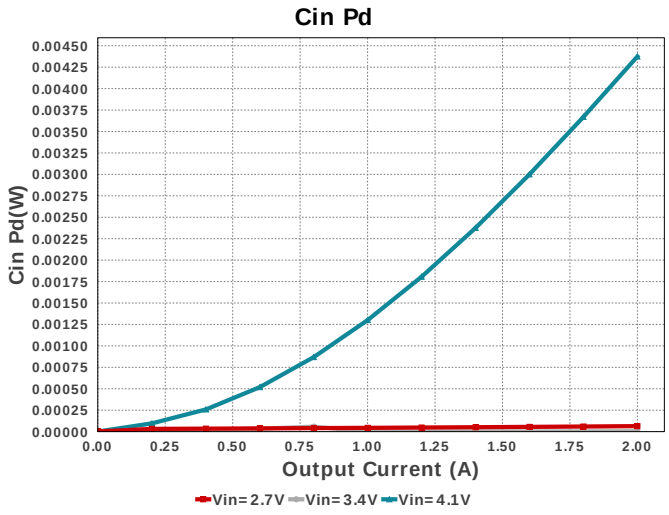


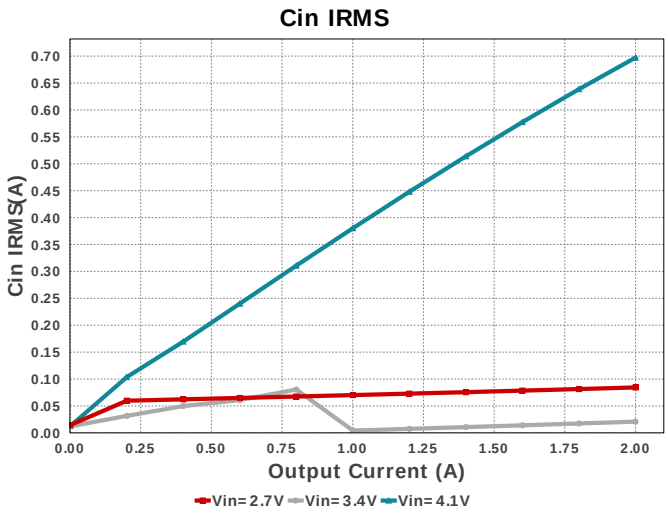


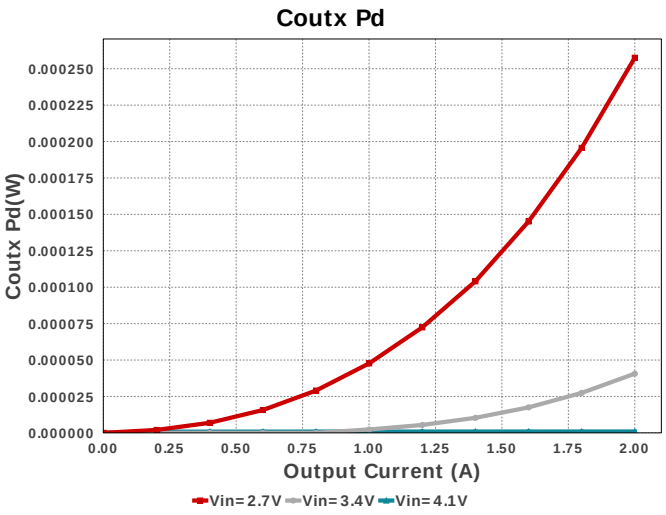


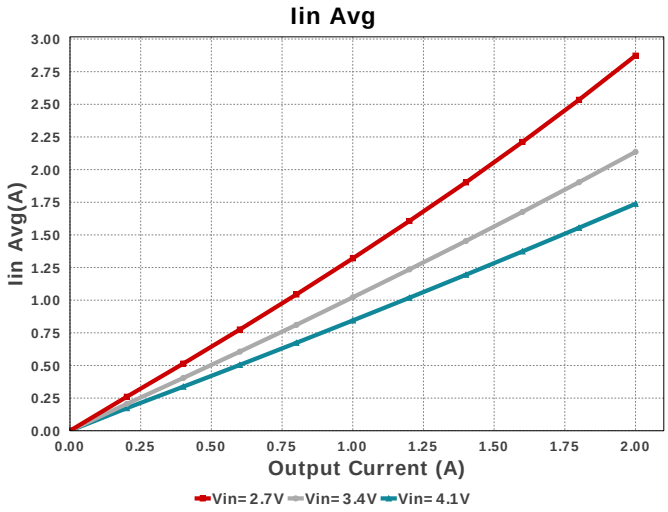


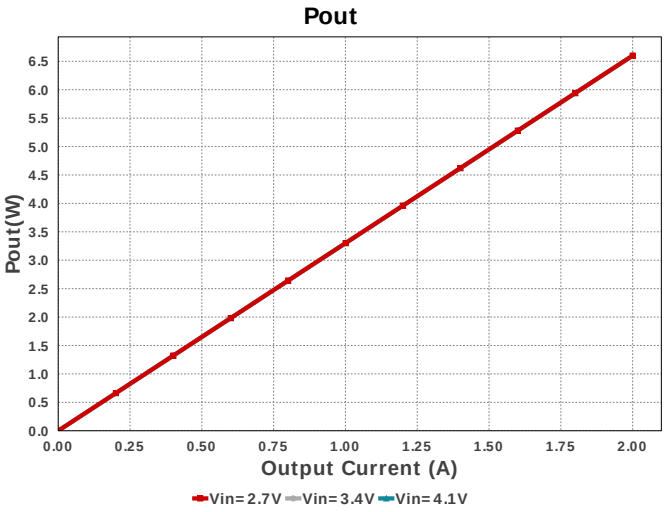


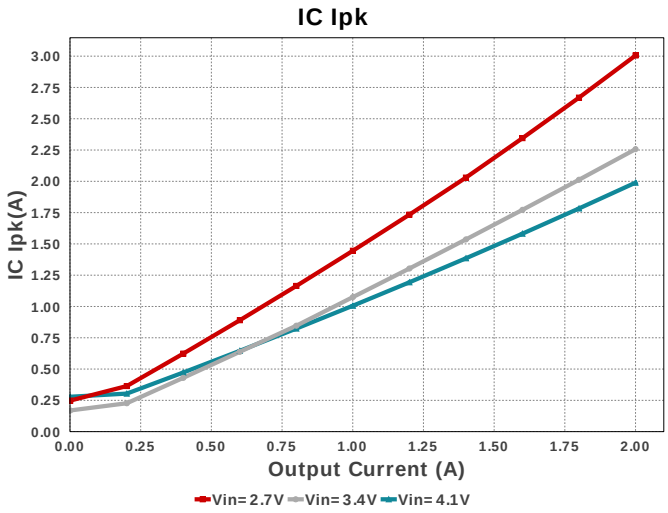


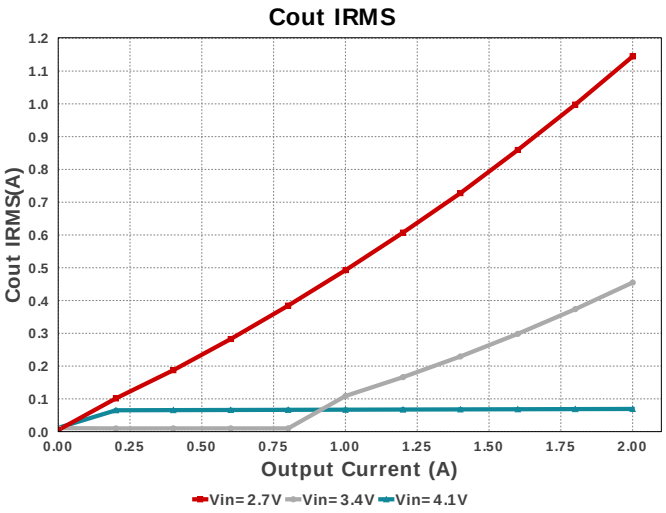


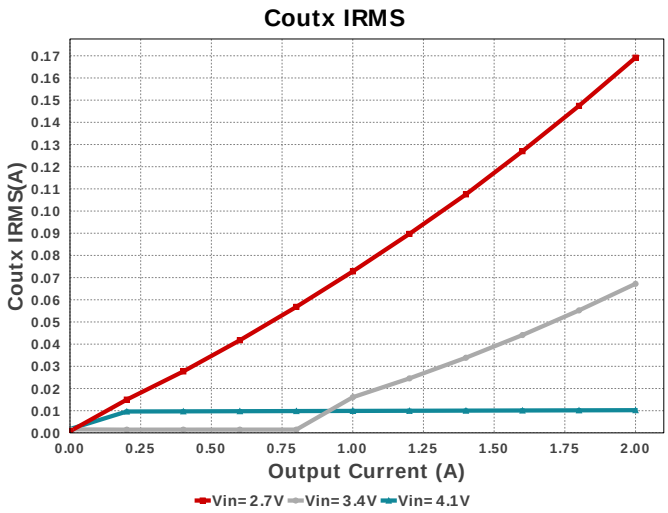


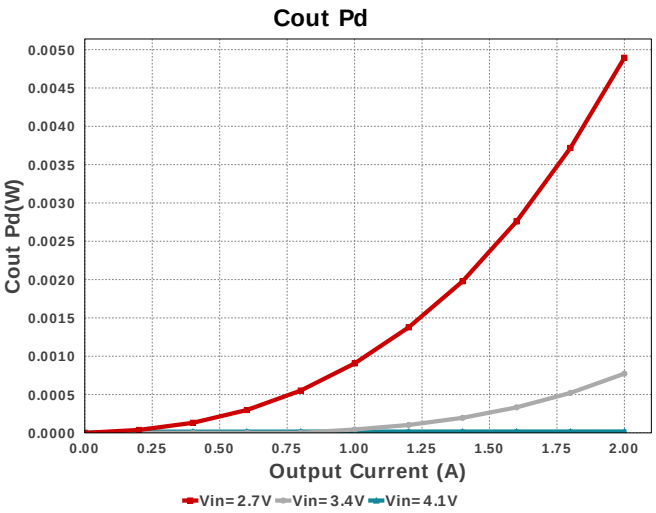


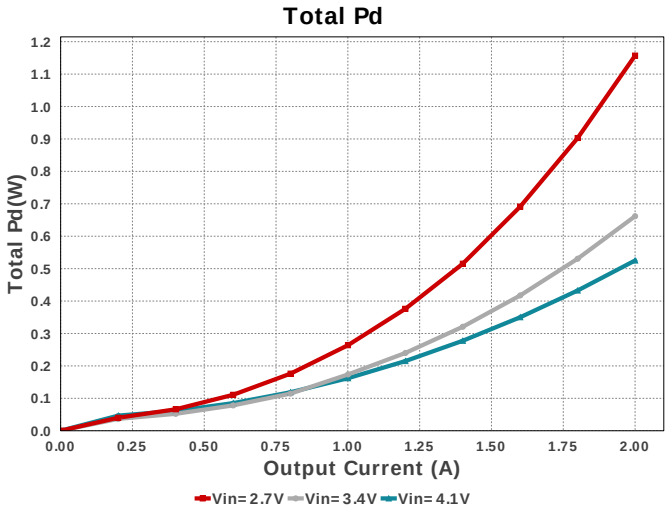


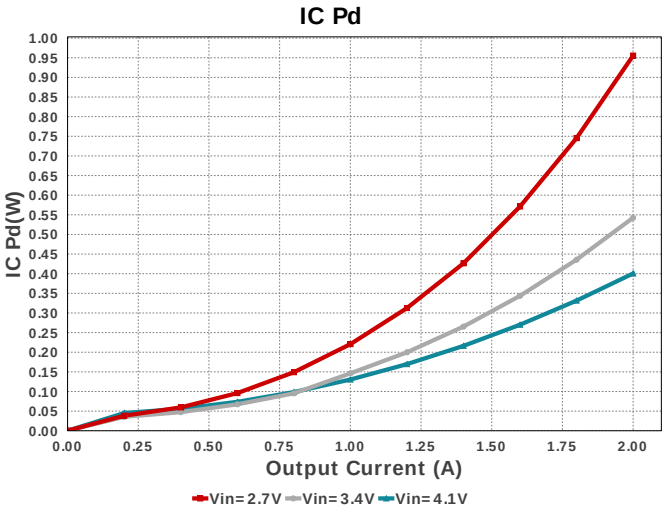


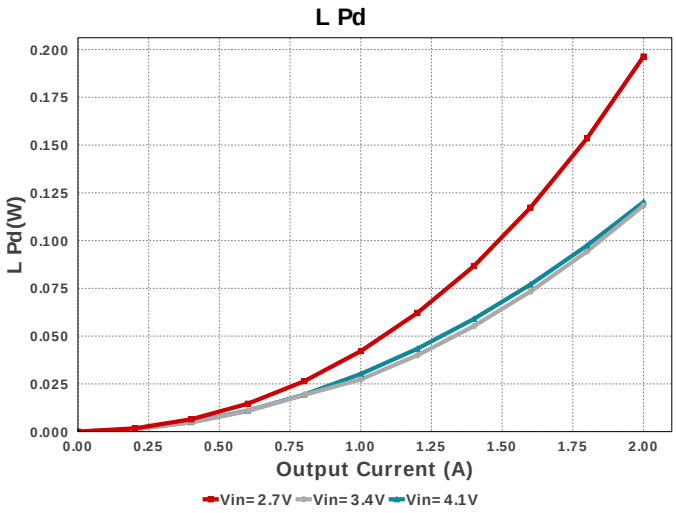


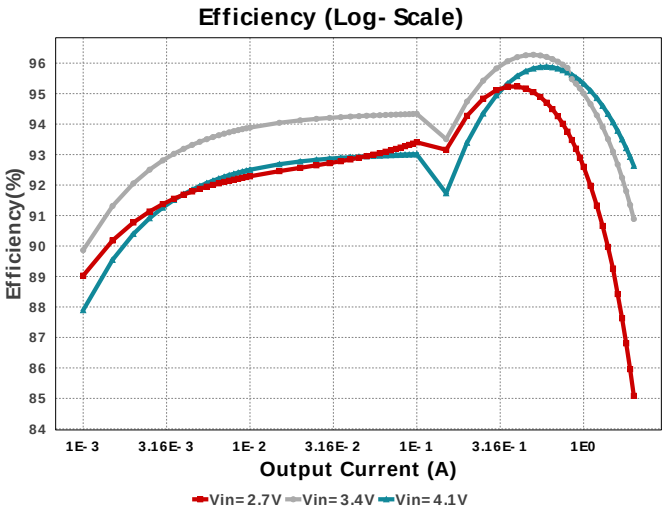












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	84.411 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	1.144 A	Current	Output capacitor RMS ripple current
3.	Coutx IRMS	169.006 mA	Current	Output capacitor_x RMS ripple current
4.	IC Ipk	3.003 A	Current	Peak switch current in IC
5.	Iin Avg	2.87 A	Current	Average input current
6.	L Ipp	292.41 mA	Current	Peak-to-peak inductor ripple current
7.	BOM Count	7	General	Total Design BOM count
8.	FootPrint	57.0 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	$1.78	General	Total BOM Cost
13.	Vout Actual	3.298 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
14.	Duty Cycle	30.135 %	Op_point	Duty cycle
15.	Efficiency	85.161 %	Op_point	Steady state efficiency
16.	IC Tj	97.823 degC	Op_point	IC junction temperature
17.	ICThetaJA	71.1 degC/W	Op_point	IC junction-to-ambient thermal resistance
18.	IOUT_OP	2.0 A	Op_point	Iout operating point
19.	VIN_OP	2.7 V	Op_point	Vin operating point
20.	Vout p-p	7.264 mV	Op_point	Peak-to-peak output ripple voltage
21.	Cin Pd	64.127 µW	Power	Input capacitor power dissipation
22.	Cout Pd	0.0 W	Power	Output capacitor power dissipation
23.	Coutx Pd	0.0 W	Power	Output capacitor_x power loss
24.	IC Pd	953.904 mW	Power	IC power dissipation
25.	L Pd	196.043 mW	Power	Inductor power dissipation
26.	Total Pd	1.15 W	Power	Total Power Dissipation
27.	Vout Tolerance	1.53 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

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	TPS630250	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS630250** Product Folder : http://www.ti.com/product/TPS630250 : contains the data sheet and other resources.