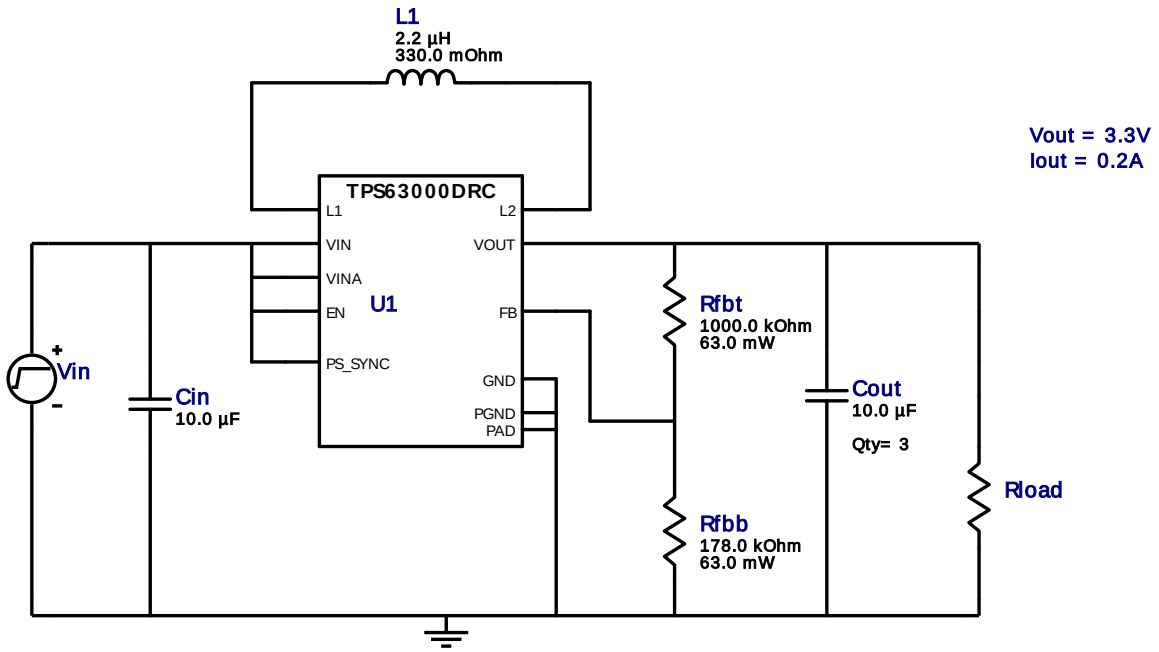
WEBENCH® Design Report

VinMin = 3.0V
VinMax = 5.0V
Vout = 3.3V
Iout = 0.2A

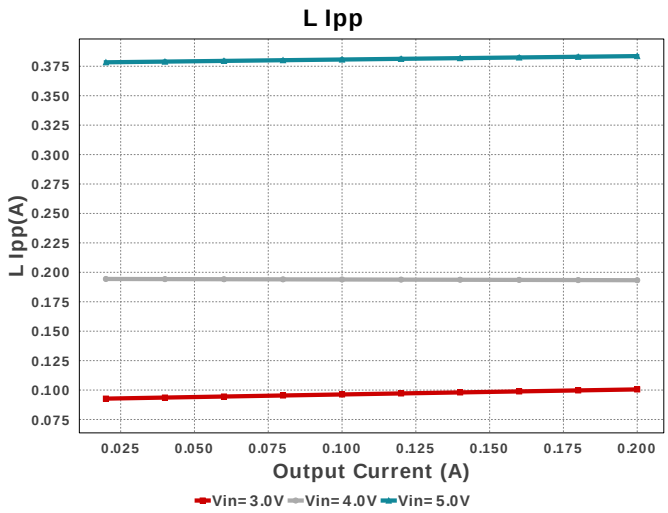
Device = TPS63000DRCR
Topology = Buck_Boost
Created = 2020-06-12 01:12:24.557
BOM Cost = $1.21
BOM Count = 8
Total Pd = 0.06W

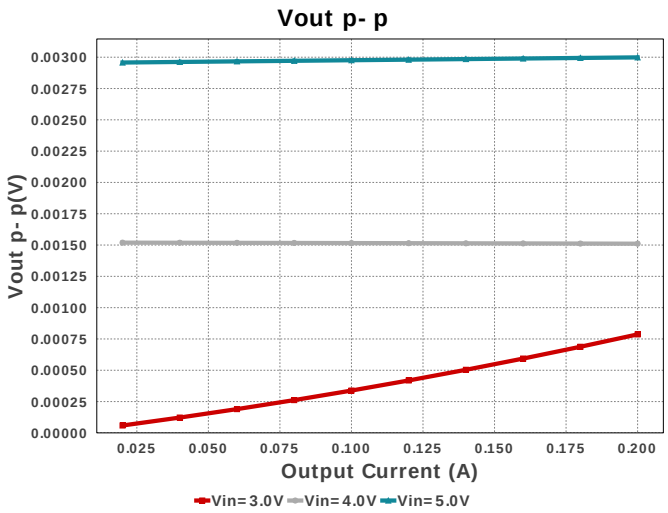
TPS63000DRCR 3V-5V to 3.30V @ 0.2A

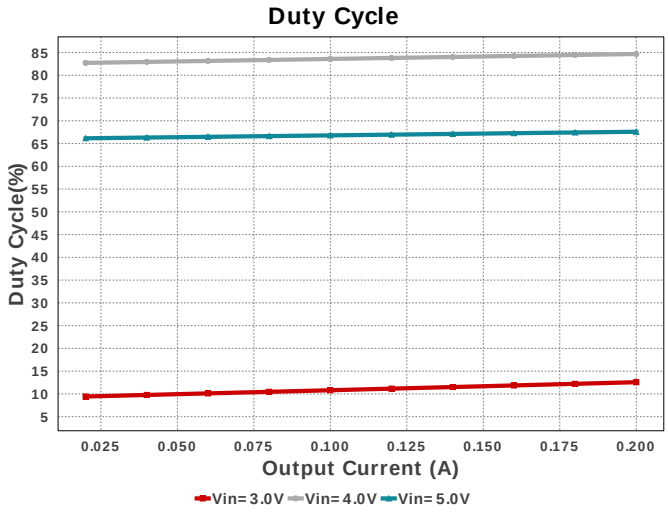


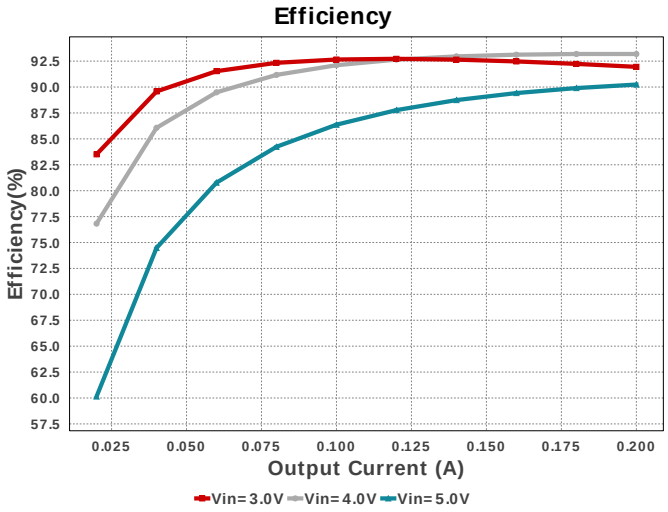
Electrical BOM

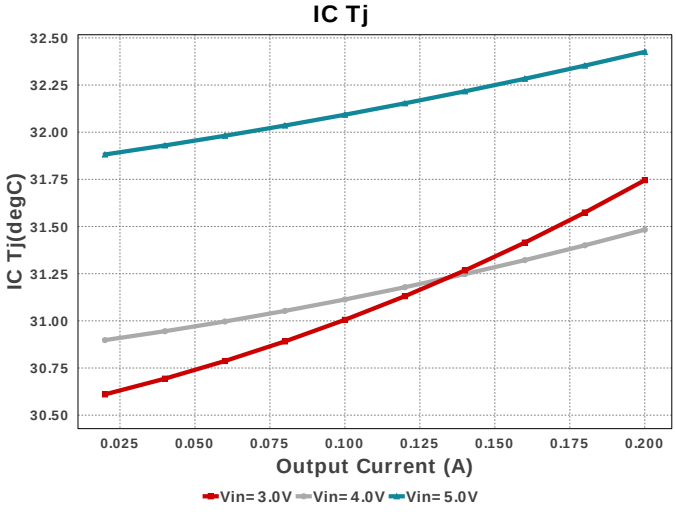
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	TDK	C1608X5R1A106M080AC Series= X5R	Cap= 10.0 uF VDC= 10.0 V IRMS= 0.0 A	1	$0.09	0603 5 mm²
2.	Cout	TDK	C1608X5R1A106M080AC Series= X5R	Cap= 10.0 uF VDC= 10.0 V IRMS= 0.0 A	3	$0.09	0603 5 mm²
3.	L1	Taiyo Yuden	CBC2012T2R2M	L= 2.2 µH DCR= 330.0 mOhm	1	$0.08	CBC2012 8 mm²
4.	Rfbb	Vishay-Dale	CRCW0402178KFKED Series= CRCW..e3	Res= 178000.0Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
5.	Rfbt	Vishay-Dale	CRCW04021M00FKED Series= CRCW..e3	Res= 1000000.0Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²
6.	U1	Texas Instruments	TPS63000DRCR	Switcher	1	$0.75	DRC0010J 16 mm²

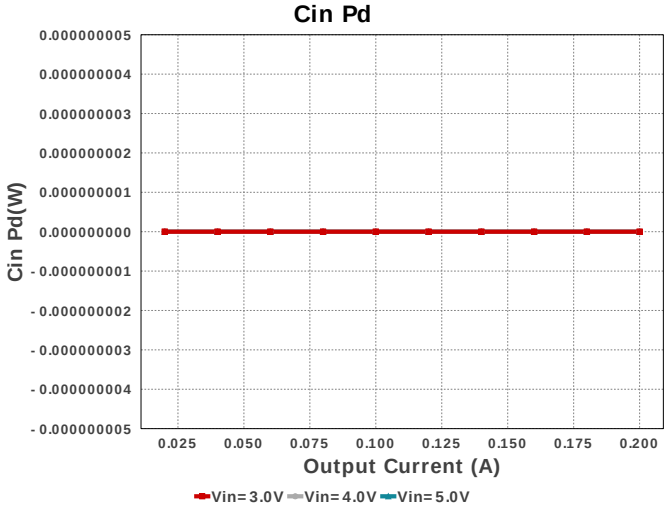


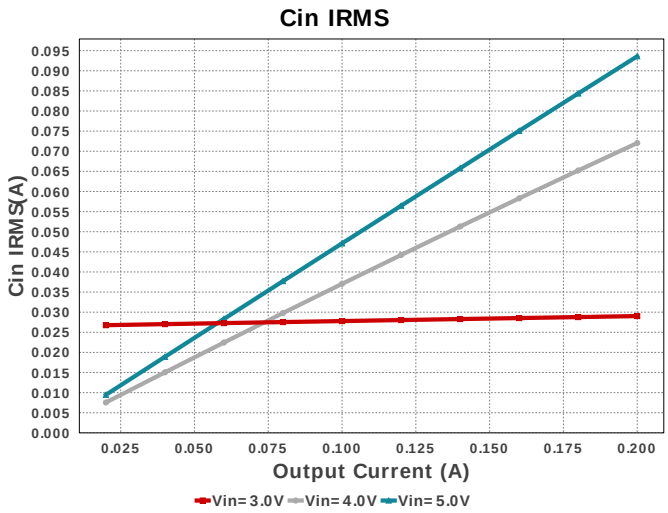


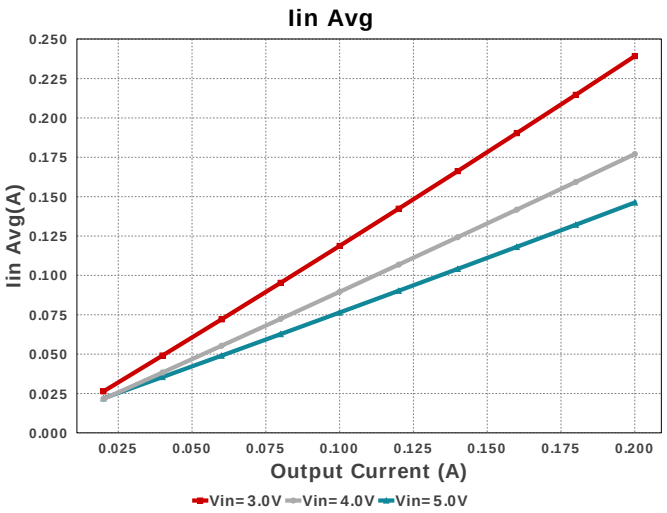


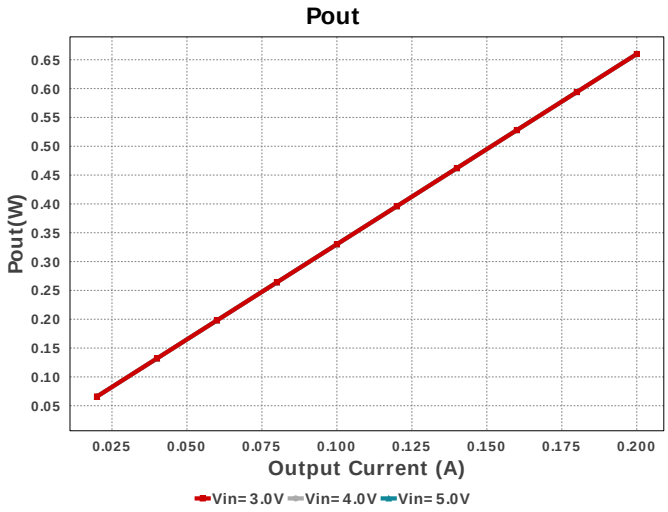


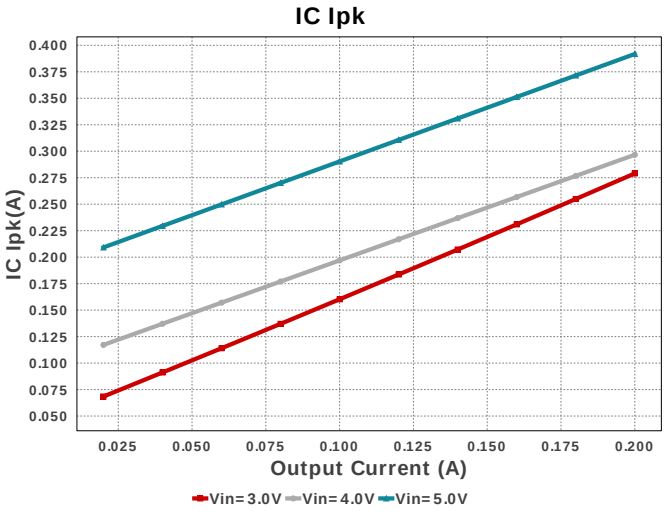


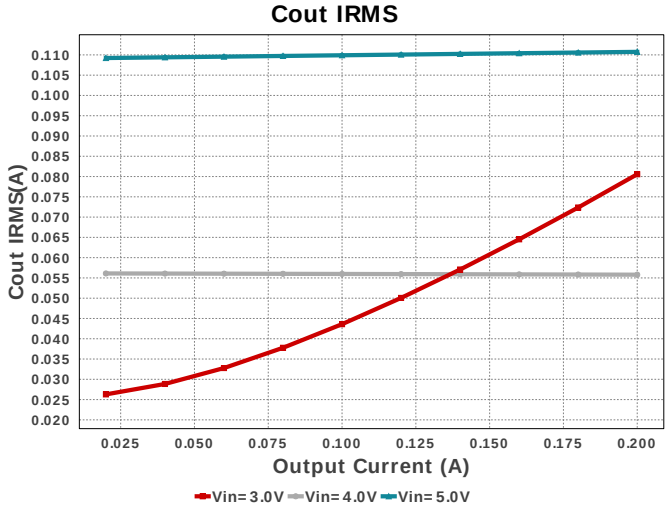


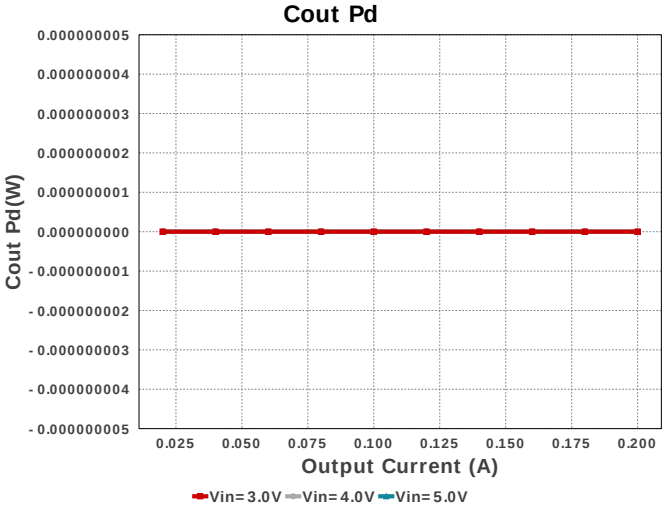


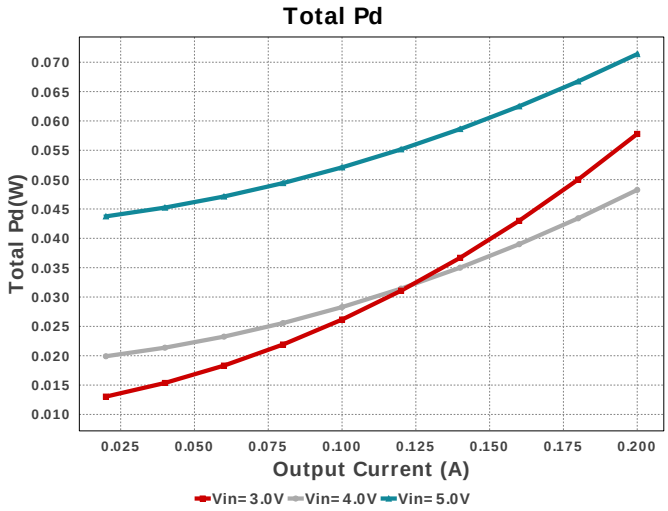


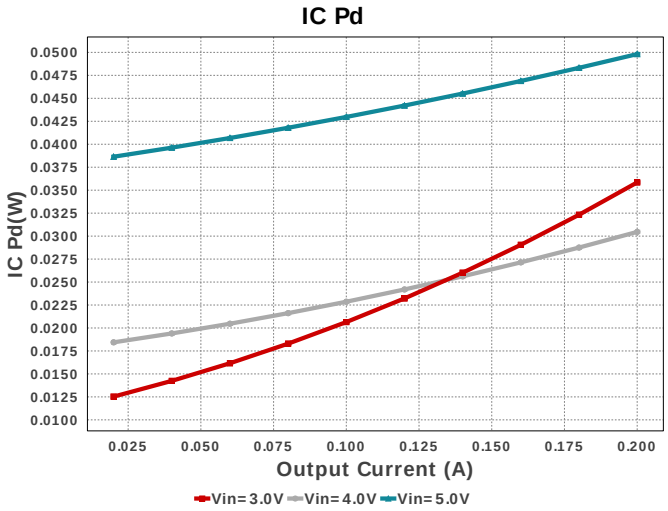


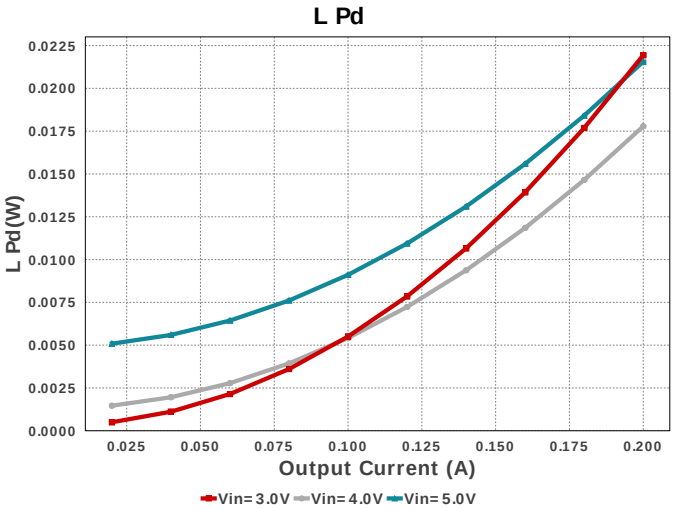












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	29.026 mA	Capacitor	Input capacitor RMS ripple current
2.	Cin Pd	0.0 W	Capacitor	Input capacitor power dissipation
3.	Cout IRMS	80.565 mA	Capacitor	Output capacitor RMS ripple current
4.	Cout Pd	0.0 W	Capacitor	Output capacitor power dissipation
5.	IC Ipk	279.046 mA	IC	Peak switch current in IC
6.	IC Pd	35.845 mW	IC	IC power dissipation
7.	IC Tj	31.746 degC	IC	IC junction temperature
8.	IC Tolerance	5.0 mV	IC	IC Feedback Tolerance
9.	ICThetaJA	48.7 degC/W	IC	IC junction-to-ambient thermal resistance
10.	Iin Avg	239.26 mA	IC	Average input current
11.	L Ipp	100.55 mA	Inductor	Peak-to-peak inductor ripple current
12.	L Pd	21.936 mW	Inductor	Inductor power dissipation
13.	Cin Pd	0.0 W	Power	Input capacitor power dissipation
14.	Cout Pd	0.0 W	Power	Output capacitor power dissipation
15.	IC Pd	35.845 mW	Power	IC power dissipation
16.	L Pd	21.936 mW	Power	Inductor power dissipation
17.	Total Pd	57.788 mW	Power	Total Power Dissipation
18.	BOM Count	8	System Information	Total Design BOM count
19.	Duty Cycle	12.576 %	System Information	Duty cycle
20.	Efficiency	91.949 %	System Information	Steady state efficiency
21.	FootPrint	49.0 mm^2	System Information	Total Foot Print Area of BOM components
22.	Frequency	1.35 MHz	System Information	Switching frequency
23.	Iout	200.0 mA	System Information	Iout operating point
24.	Mode	PWM	System Information	PWM/PFM Mode

#	Name	Value	Category	Description
25.	Pout	660.0 mW	System Information	Total output power
26.	Total BOM	$1.21	System Information	Total BOM Cost
27.	Vin	3.0 V	System Information	Vin operating point
28.	Vout	3.309 V	System Information	Operational Output Voltage
29.	Vout Actual	3.309 V	System Information	Vout Actual calculated based on selected voltage divider resistors
30.	Vout Tolerance	2.732 %	System Information	Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable
31.	Vout p-p	786.421 µV	System Information	Peak-to-peak output ripple voltage

Design Inputs

#	Name	Value	Description
1.	Iout	200.0 m	Maximum Output Current
2.	VinMax	5.0	Maximum input voltage
3.	VinMin	3.0	Minimum input voltage
4.	Vout	3.3	Output Voltage
5.	acFrequency	60.0	AC Frequency
6.	base_pn	TPS63000	Base Product Number
7.	source	DC	Input Source Type
8.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS63000** Product Folder : http://www.ti.com/product/TPS63000 : contains the data sheet and other resources.