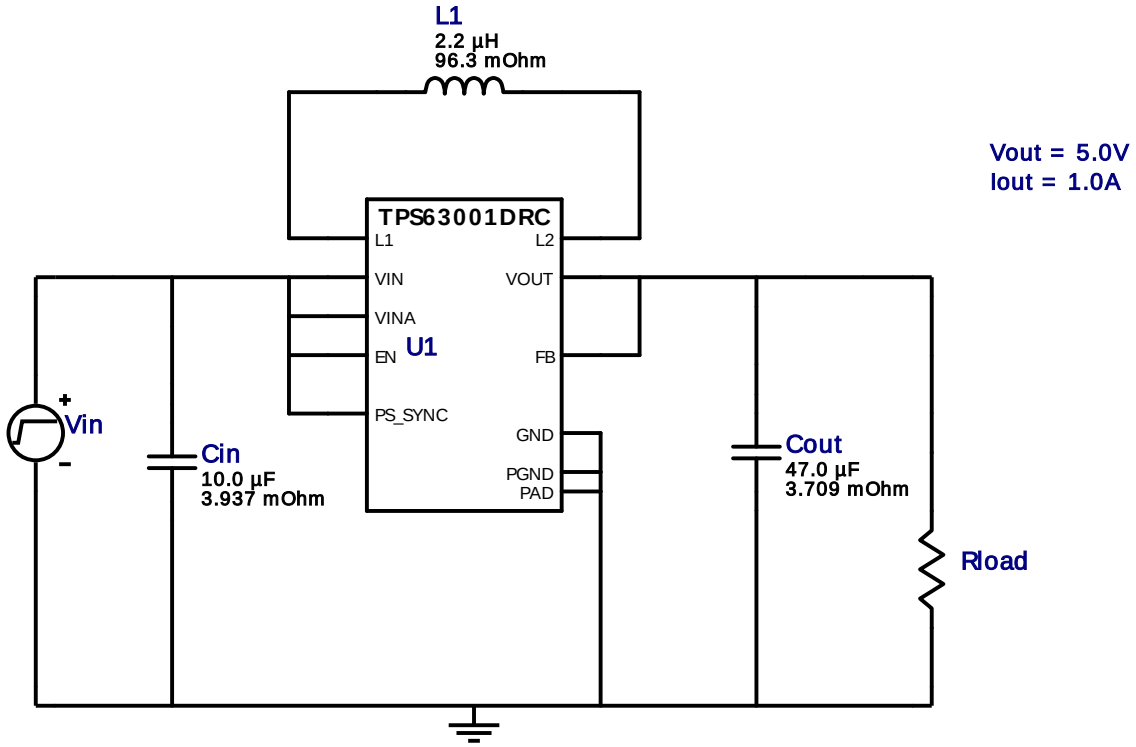
WEBENCH® Design Report

VinMin = 4.0V
VinMax = 6.0V
Vout = 5.0V
Iout = 1.0A

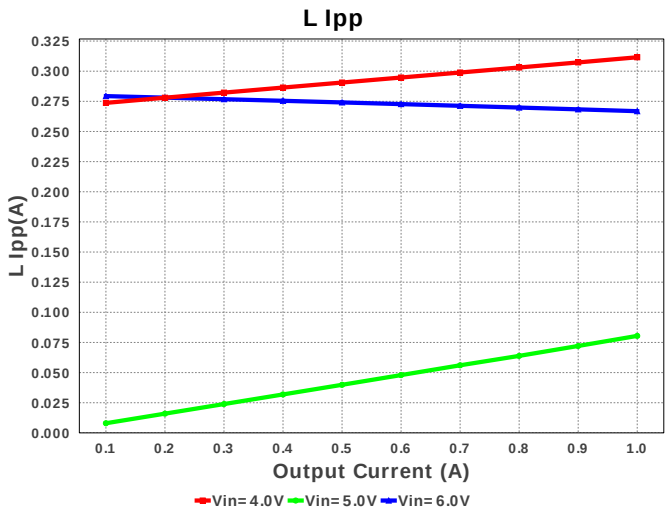
Device = TPS63001DRCR
Topology = Buck_Boost
Created = 7/28/16 11:12:03 PM
BOM Cost = $1.38
BOM Count = 4
Total Pd = 0.78W

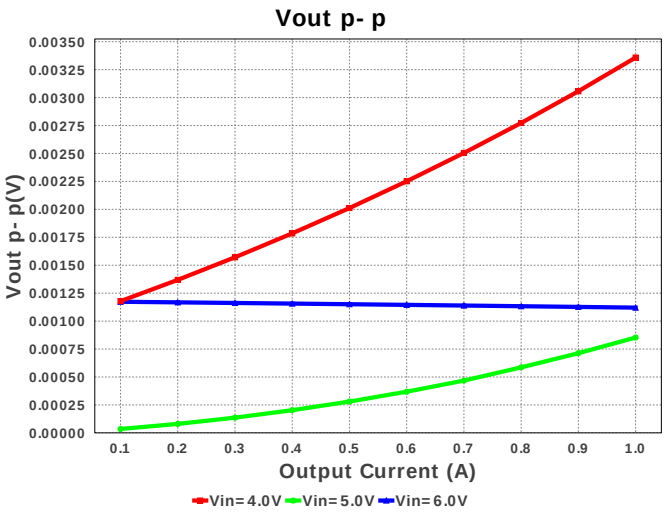
Design : 4681306/5 TPS63001DRCR
TPS63001DRCR 4.0V-6.0V to 5.00V @ 1.0A

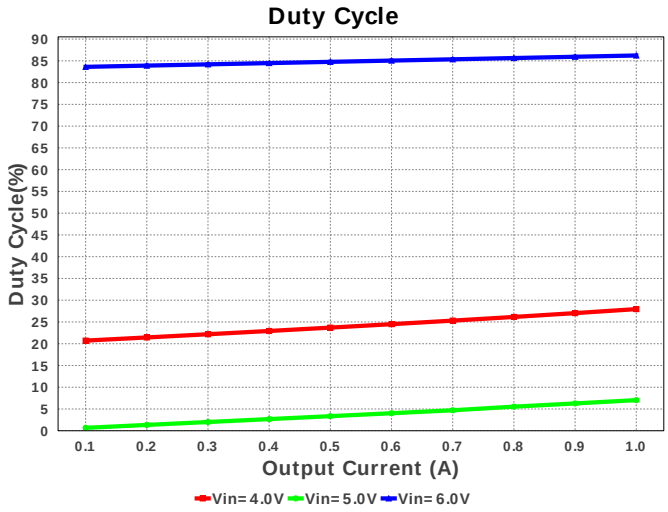


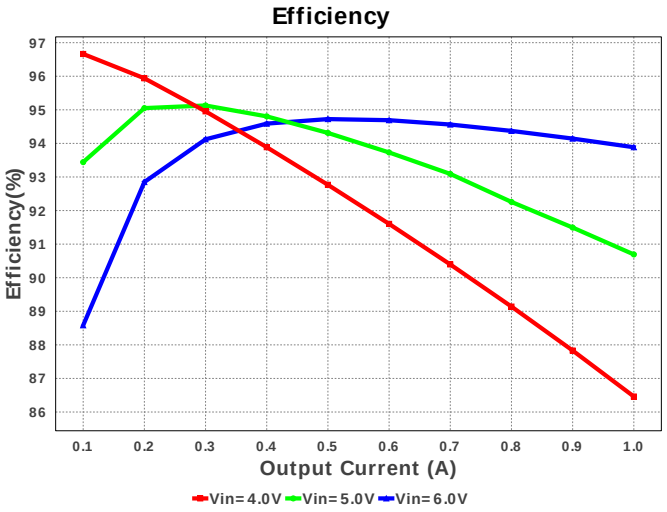
Electrical BOM

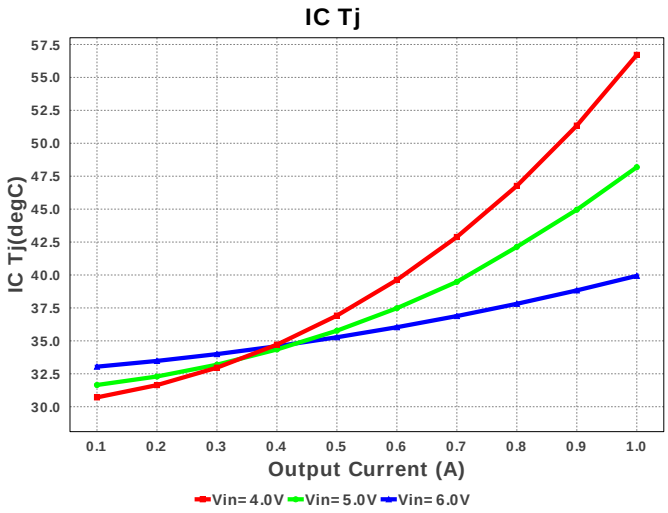
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM219R61A106KE44D Series= X5R	Cap= 10.0 uF ESR= 3.937 mOhm VDC= 10.0 V IRMS= 2.7713 A	1	$0.03	0805 7 mm²
2.	Cout	MuRata	GRM31CR61A476KE15L Series= X5R	Cap= 47.0 uF ESR= 3.709 mOhm VDC= 10.0 V IRMS= 4.2862 A	1	$0.15	1206_190 11 mm²
3.	L1	Coilcraft	ME3215-222MLB	L= 2.2 µH DCR= 96.3 mOhm	1	$0.25	ME3215 15 mm²
4.	U1	Texas Instruments	TPS63001DRCR	Switcher	1	$0.95	DRC0010J 16 mm²

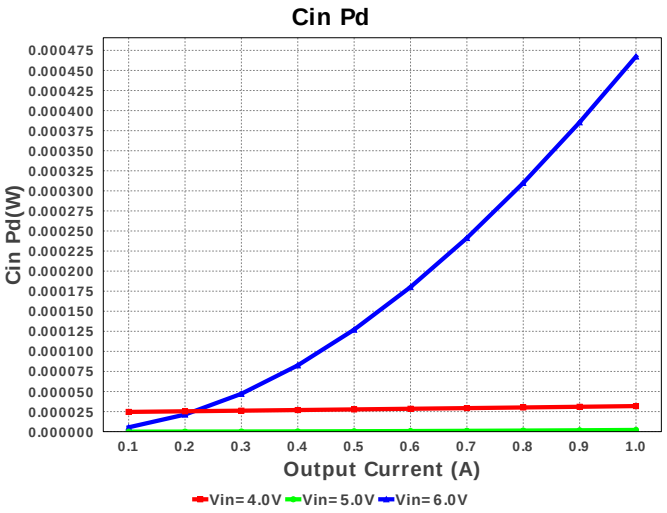


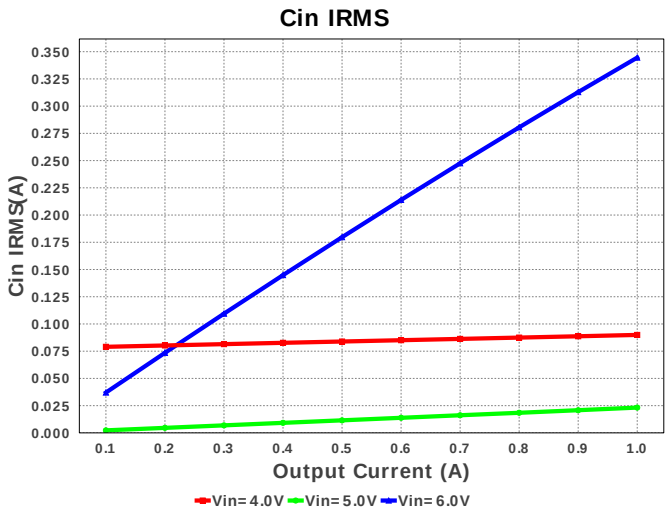


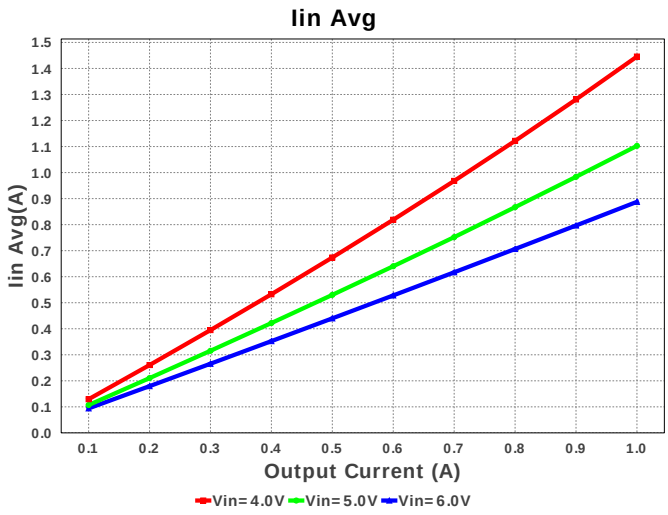


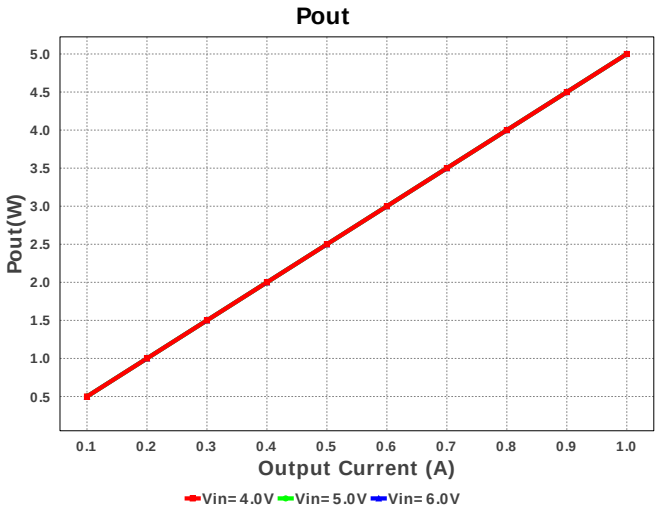


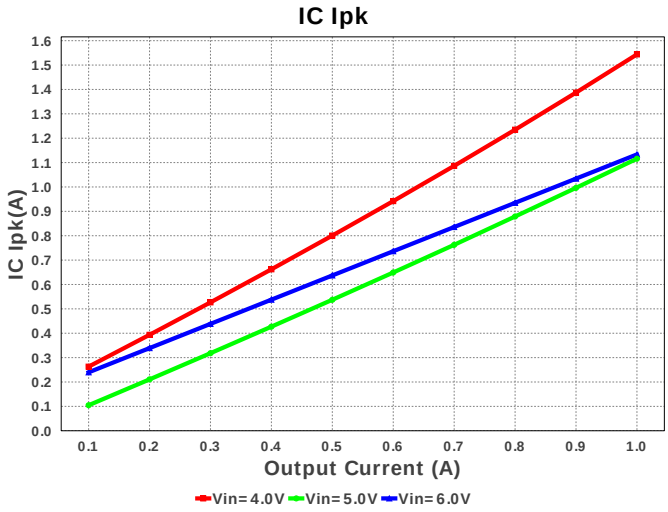


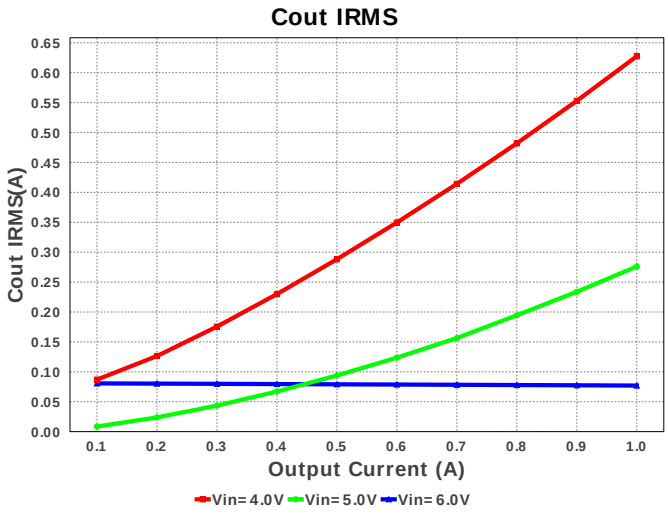


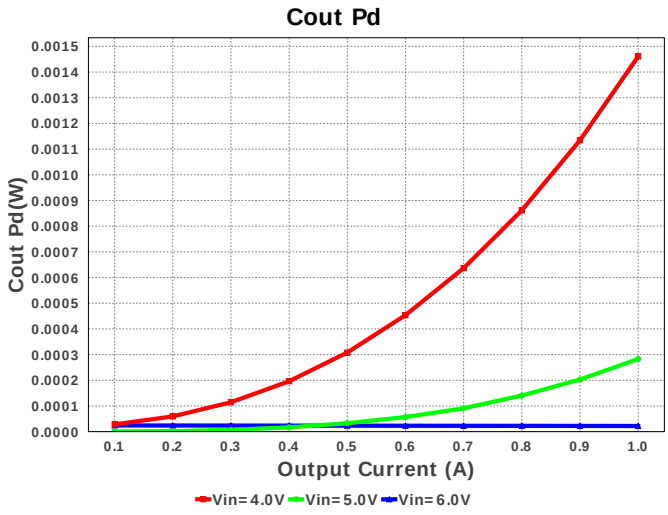


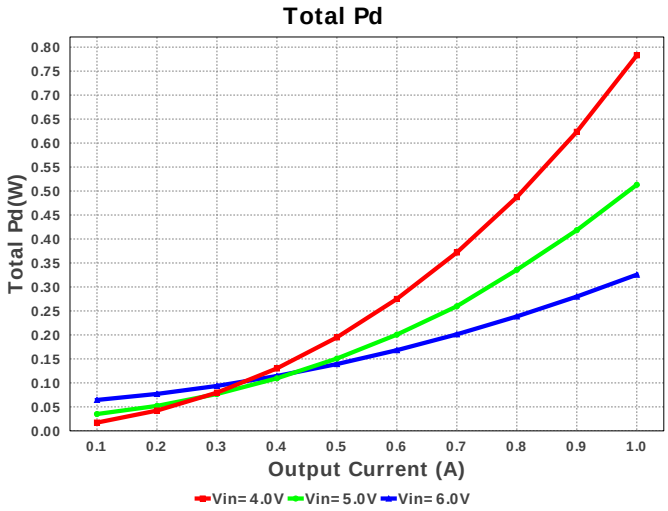


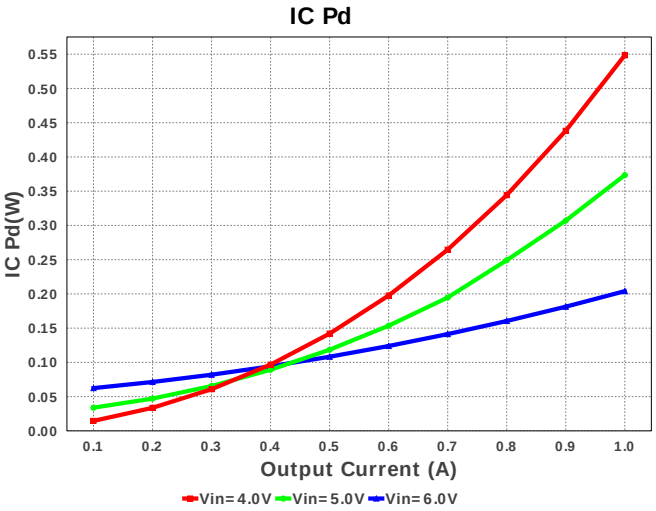


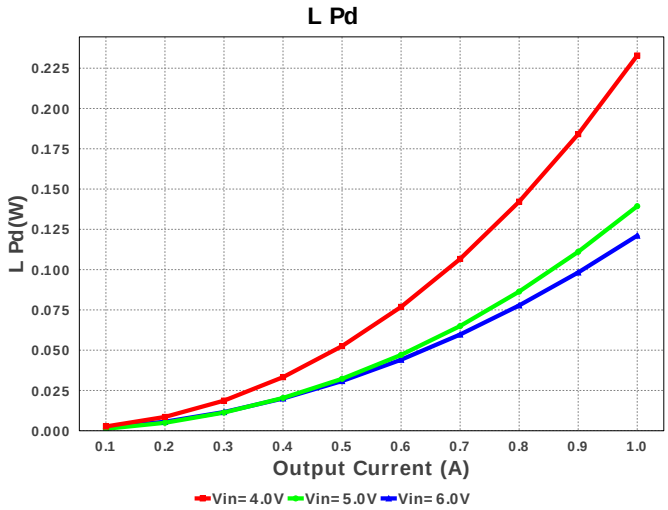












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	89.935 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	627.536 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	1.544 A	Current	Peak switch current in IC
4.	Iin Avg	1.446 A	Current	Average input current
5.	L Ipp	311.54 mA	Current	Peak-to-peak inductor ripple current
6.	BOM Count	4	General	Total Design BOM count
7.	FootPrint	48.0 mm^2	General	Total Foot Print Area of BOM components
8.	Frequency	1.35 MHz	General	Switching frequency
9.	IC Tolerance	5.0 mV	General	IC Feedback Tolerance
10.	Pout	5.0 W	General	Total output power
11.	Total BOM	$1.38	General	Total BOM Cost
12.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
13.	Duty Cycle	27.953 %	Op_point	Duty cycle
14.	Efficiency	86.462 %	Op_point	Steady state efficiency
15.	IC Tj	56.711 degC	Op_point	IC junction temperature
16.	ICThetaJA	48.7 degC/W	Op_point	IC junction-to-ambient thermal resistance
17.	IOUT_OP	1.0 A	Op_point	Iout operating point
18.	VIN_OP	4.0 V	Op_point	Vin operating point
19.	Vout p-p	3.358 mV	Op_point	Peak-to-peak output ripple voltage
20.	Cin Pd	31.844 µW	Power	Input capacitor power dissipation
21.	Cout Pd	1.461 mW	Power	Output capacitor power dissipation
22.	IC Pd	548.49 mW	Power	IC power dissipation
23.	L Pd	232.873 mW	Power	Inductor power dissipation
24.	Total Pd	782.875 mW	Power	Total Power Dissipation
25.	Vout Tolerance	100.0 m%		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	1.0	Maximum Output Current

#	Name	Value	Description
2.	VinMax	6.0	Maximum input voltage
3.	VinMin	4.0	Minimum input voltage
4.	Vout	5.0	Output Voltage
5.	base_pn	TPS63001	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **TPS63001** Product Folder : http://www.ti.com/product/TPS63001 : contains the data sheet and other resources.