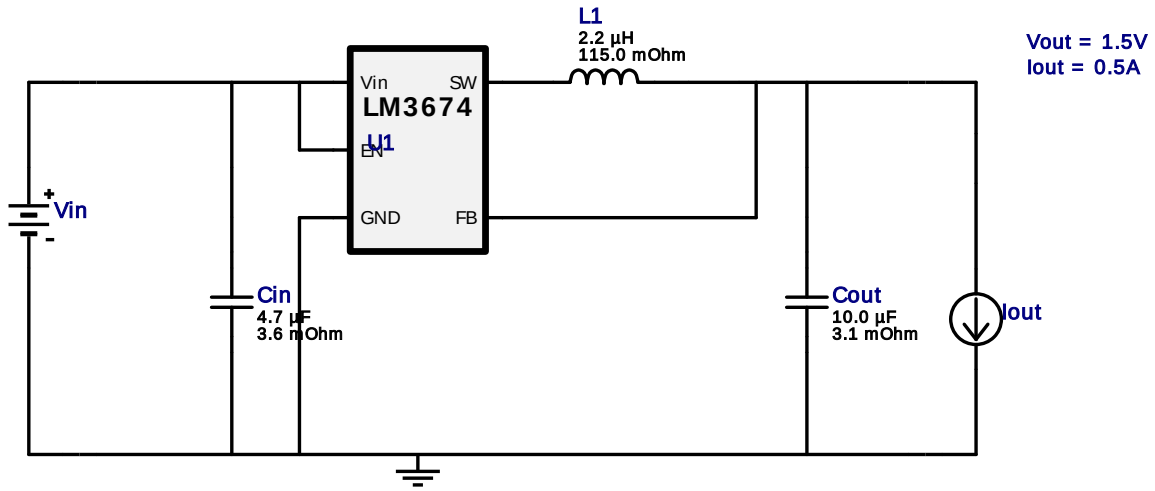
WEBENCH® Design Report

VinMin = 4.0V
VinMax = 5.0V
Vout = 1.5V
Iout = 0.5A

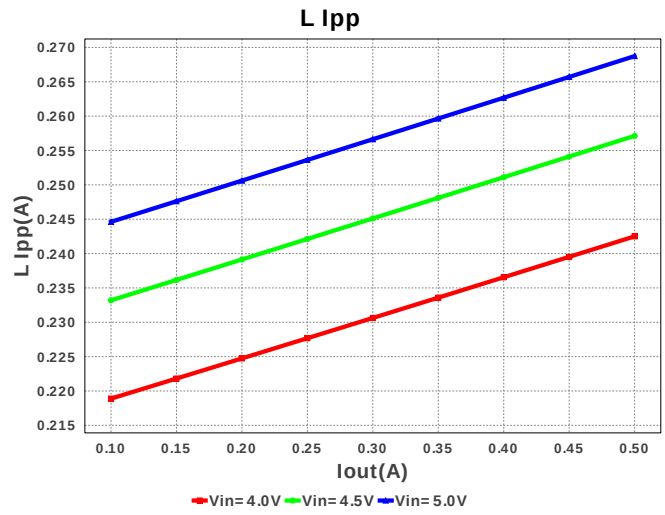
Device = LM3674MF-1.5/NOPB
Topology = Buck
Created = 5/30/13 12:58:34 AM
BOM Cost = $0.67
BOM Count = 4
Total Pd = 0.13W

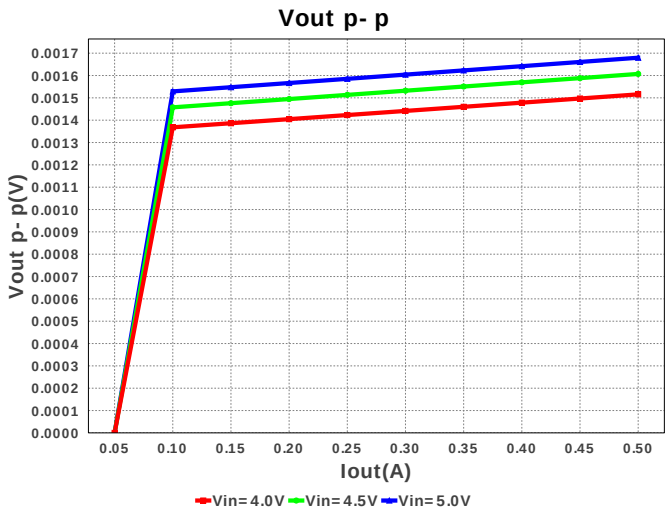
Design : 906020/5 LM3674MF-1.5/NOPB
LM3674MF-1.5/NOPB 4.0V-5.0V to 1.5V @ 0.5A

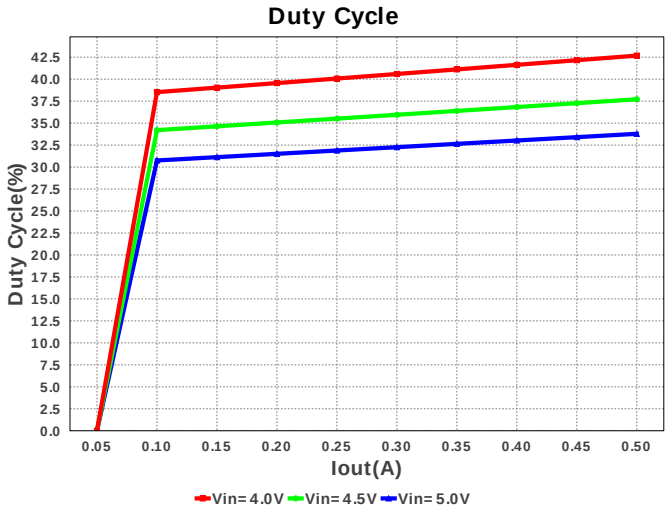


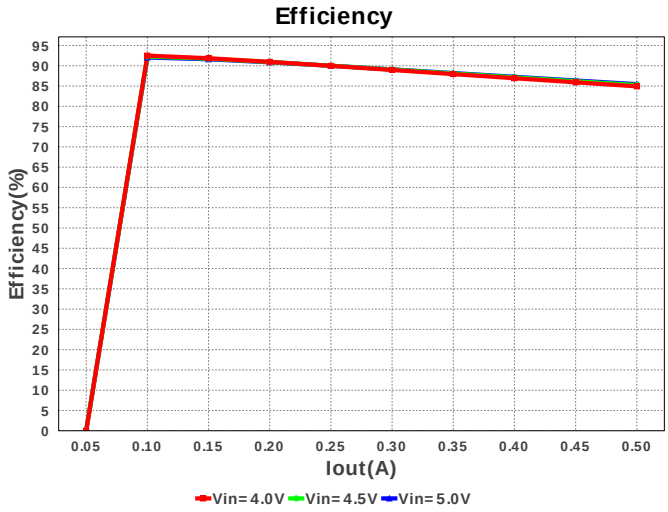
Electrical BOM

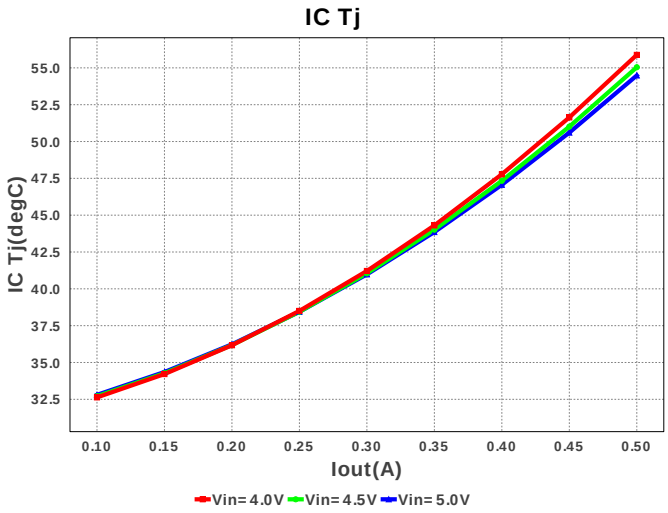
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	TDK	C1608X5R0J475M Series= X5R	Cap= 4.7 uF ESR= 3.6 mOhm VDC= 6.3 V IRMS= 1.6 A	1	$0.03	0603 10 mm²
2.	Cout	TDK	C3216X5R0J106K Series= X5R	Cap= 10.0 uF ESR= 3.1 mOhm VDC= 6.3 V IRMS= 4.1 A	1	$0.04	1206 19 mm²
3.	L1	TDK	NLCV32T-2R2M-PFR	L= 2.2 µH DCR= 115.0 mOhm	1	$0.10	NLCV32 22 mm²
4.	U1	Texas Instruments	LM3674MF-1.5/NOPB	Switcher	1	$0.50	MF05A 24 mm²

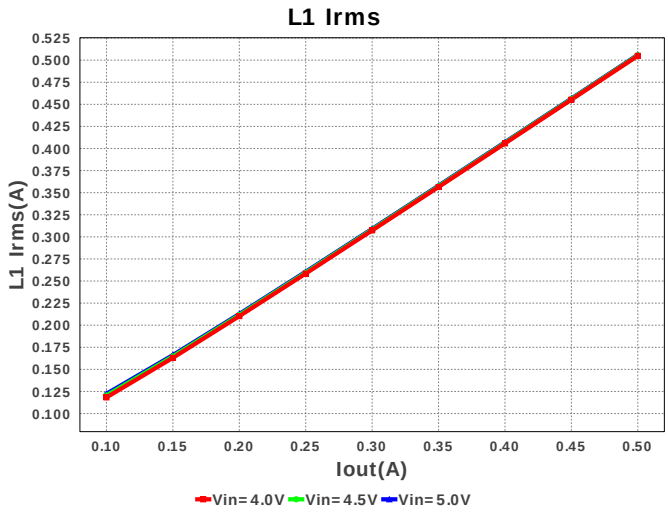


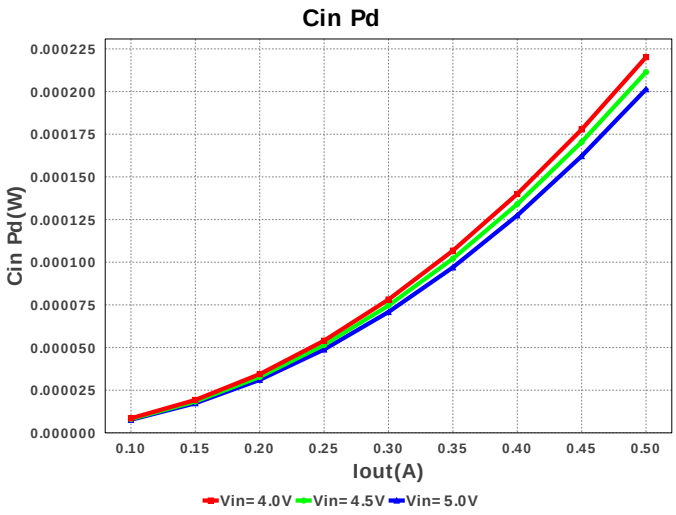


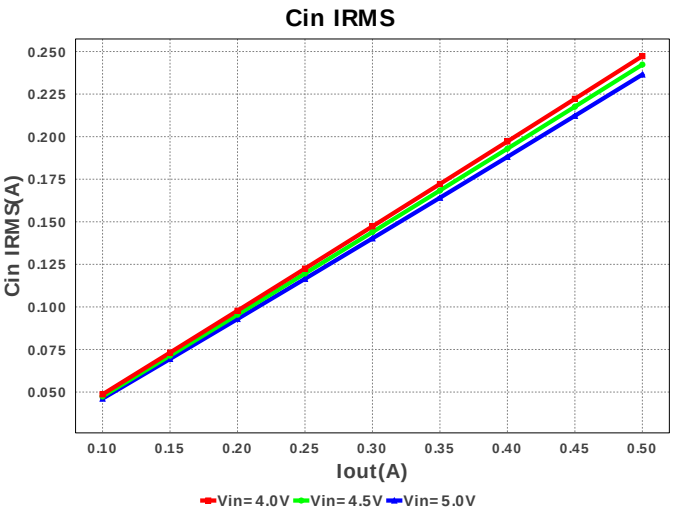


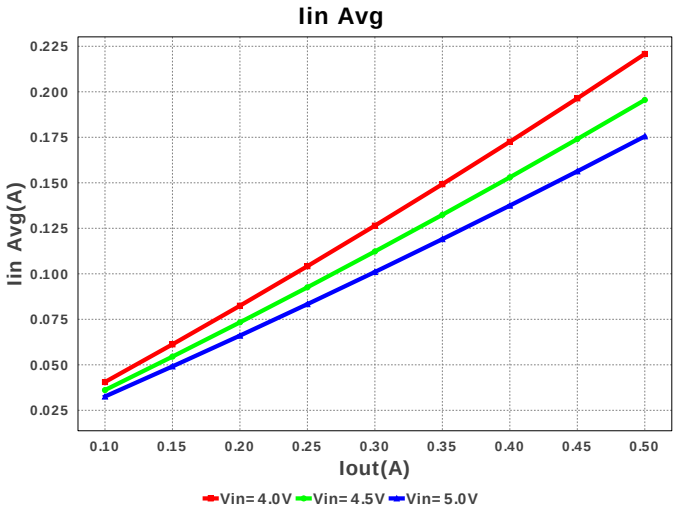


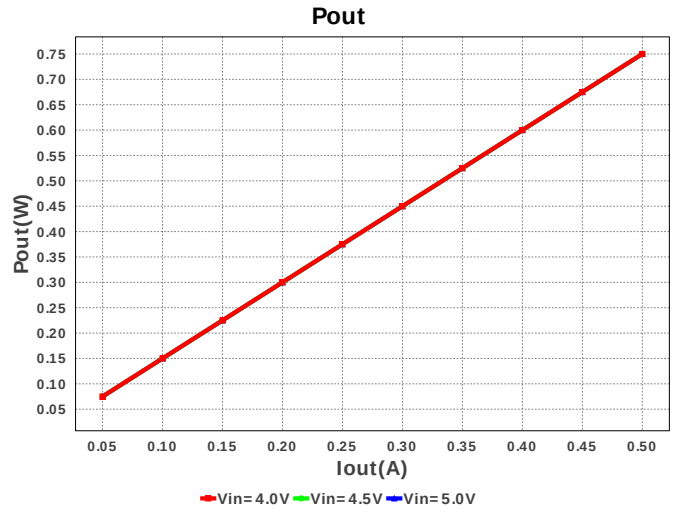


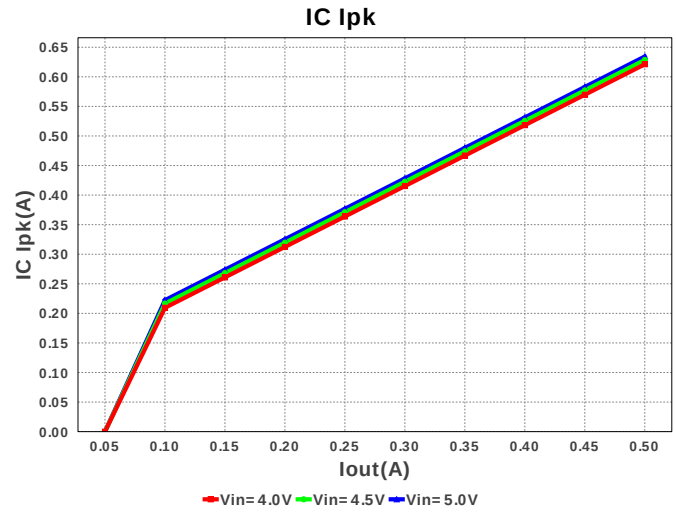


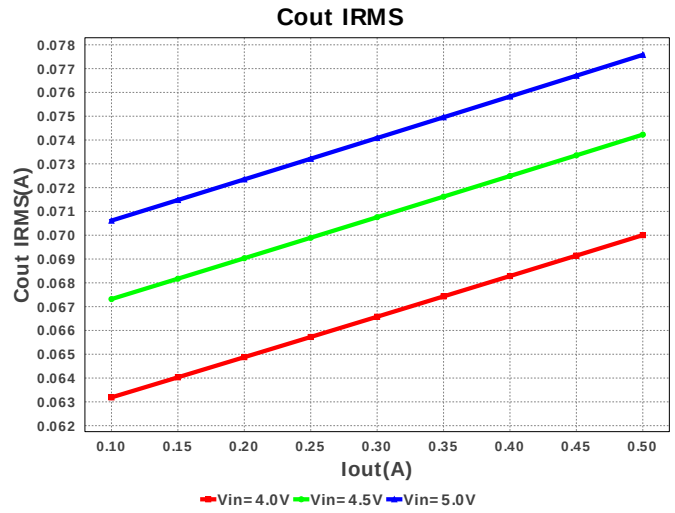


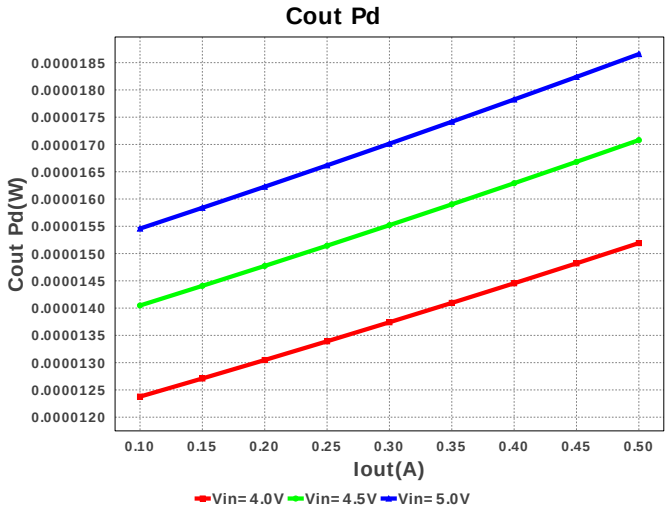


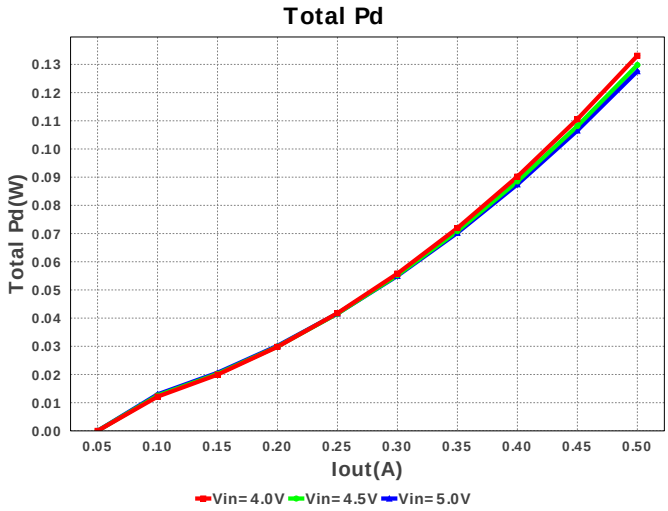


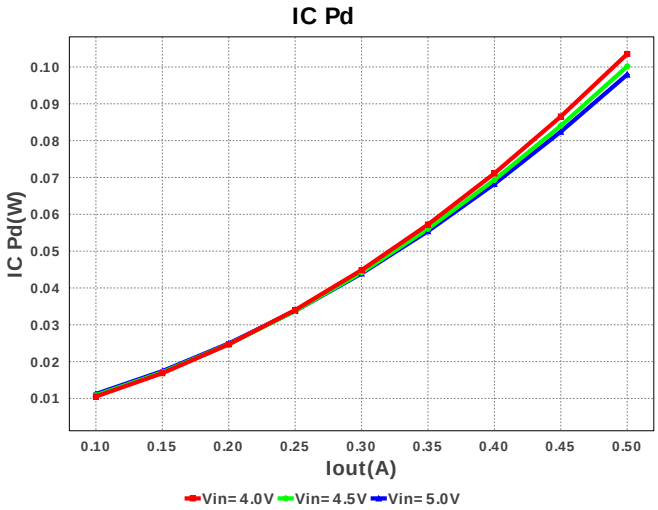


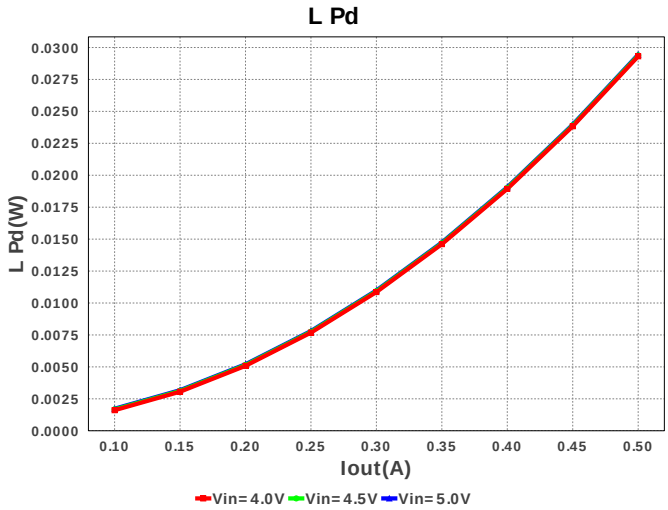












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	236.487 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	77.578 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	634.368 mA	Current	Peak switch current in IC
4.	Iin Avg	175.52 mA	Current	Average input current
5.	L Ipp	268.736 mA	Current	Peak-to-peak inductor ripple current
6.	L1 Irms	505.982 mA	Current	Inductor ripple current
7.	BOM Count	4	General	Total Design BOM count
8.	FootPrint	74.0 mm^2	General	Total Foot Print Area of BOM components
9.	Frequency	2.0 MHz	General	Switching frequency
10.	IC Tolerance	0.0 V	General	IC Feedback Tolerance
11.	Pout	750.0 mW	General	Total output power
12.	Total BOM	$0.67	General	Total BOM Cost
13.	Duty Cycle	33.784 %	Op_point	Duty cycle
14.	Efficiency	85.461 %	Op_point	Steady state efficiency
15.	IC Tj	54.484 degC	Op_point	IC junction temperature
16.	ICThetaJA	250.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
17.	IOUT_OP	500.0 mA	Op_point	Iout operating point
18.	VIN_OP	5.0 V	Op_point	Vin operating point
19.	Vout p-p	1.68 mV	Op_point	Peak-to-peak output ripple voltage
20.	Cin Pd	201.334 µW	Power	Input capacitor power dissipation
21.	Cout Pd	18.657 µW	Power	Output capacitor power dissipation
22.	IC Pd	97.935 mW	Power	IC power dissipation
23.	L Pd	29.442 mW	Power	Inductor power dissipation
24.	Total Pd	127.594 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	500.0 m	Maximum Output Current
2.	Iout1	500.0 m	Output Current #1
3.	VinMax	5.0	Maximum input voltage

#	Name	Value	Description
4.	VinMin	4.0	Minimum input voltage
5.	Vout	1.5	Output Voltage
6.	Vout1	1.5	Output Voltage #1
7.	base_pn	LM3674	Base Product Number
8.	source	DC	Input Source Type
9.	Ta	30.0	Ambient temperature

Design Assistance

1. **LM3674** Product Folder : http://www.ti.com/product/lm3674 : contains the data sheet and other resources.