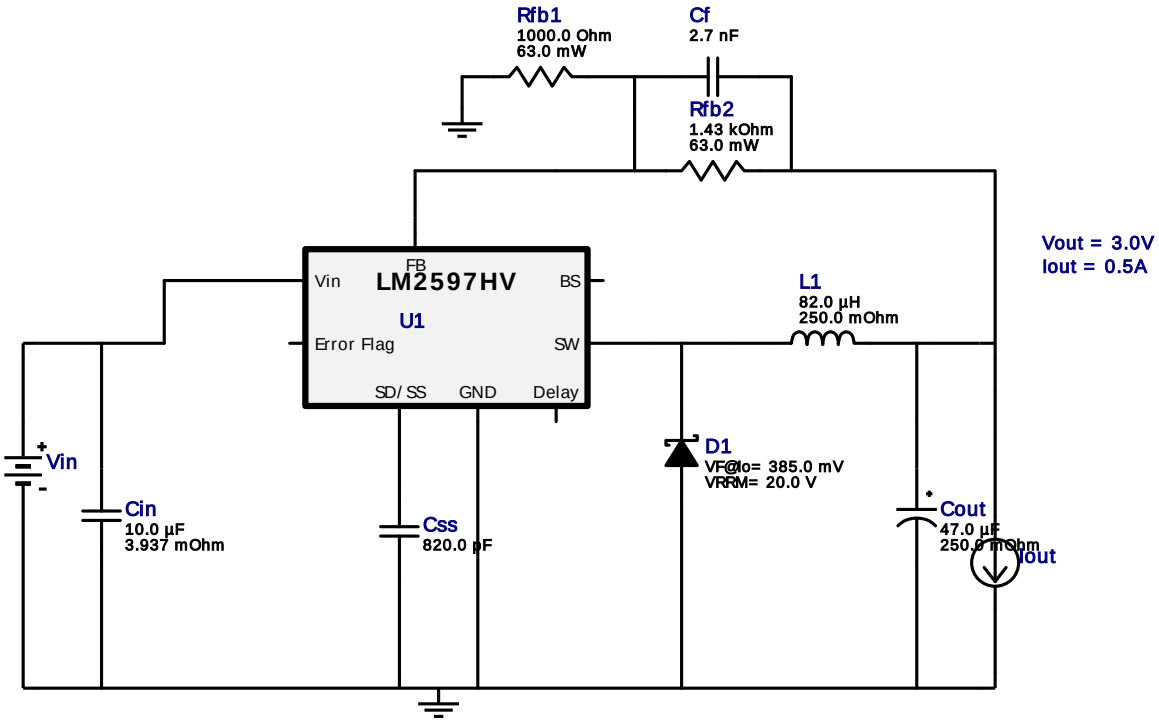
WEBENCH® Design Report

VinMin = 4.5V
VinMax = 5.5V
Vout = 3.0V
Iout = 0.5A

Device = LM2597HVMX-ADJ/NOPB
Topology = Buck
Created = 7/19/16 6:03:03 AM
BOM Cost = $2.49
BOM Count = 9
Total Pd = 0.54W

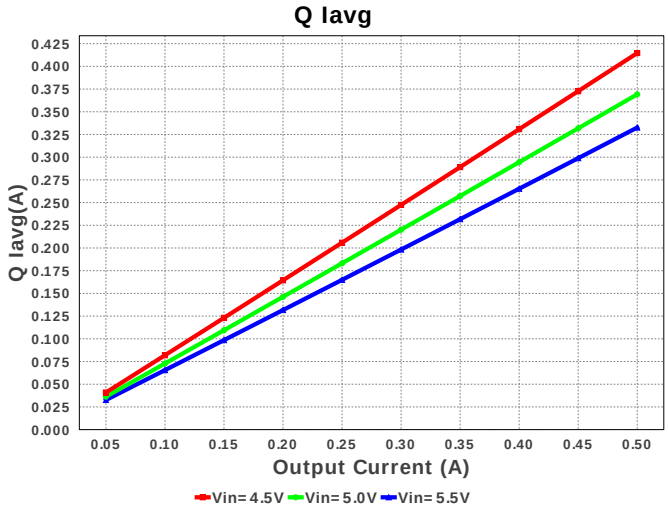
Design : 4742013/178 LM2597HVMX-ADJ/NOPB
LM2597HVMX-ADJ/NOPB 4.5V-5.5V to 3.00V @ 0.5A

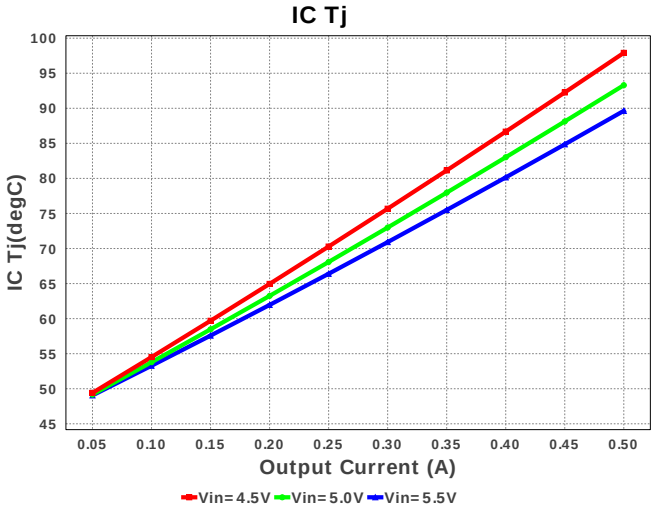


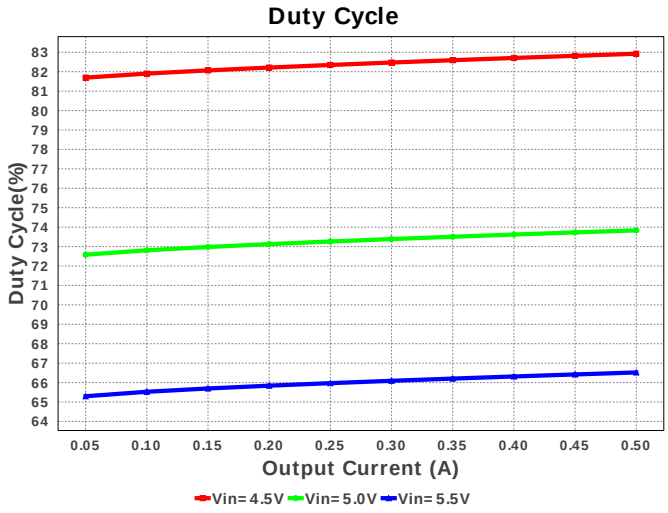
Electrical BOM

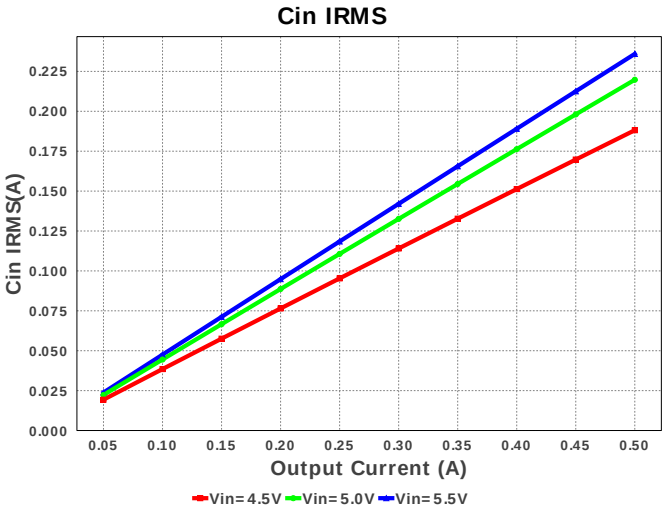
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cf	Yageo America	CC0805KRX7R9BB272 Series= X7R	Cap= 2.7 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
2.	Cin	MuRata	GRM219R61A106KE44D Series= X5R	Cap= 10.0 uF ESR= 3.937 mOhm VDC= 10.0 V IRMS= 2.7713 A	1	$0.03	0805 7 mm²
3.	Cout	AVX	TPSB476K006R0250 Series= TPS	Cap= 47.0 uF ESR= 250.0 mOhm VDC= 6.3 V IRMS= 525.0 mA	1	$0.35	3528-21 17 mm²
4.	Css	Yageo America	CC0805KRX7R9BB821 Series= X7R	Cap= 820.0 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7 mm²
5.	D1	ON Semiconductor	MBR0520LT1G	VF@Io= 385.0 mV VRRM= 20.0 V	1	$0.06	SOD-123 13 mm²
6.	L1	NIC Components	NPI105C820MTRF	L= 82.0 µH DCR= 250.0 mOhm	1	$0.11	IND_NPI105C 141 mm²
7.	Rfb1	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	Res= 1000.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm²

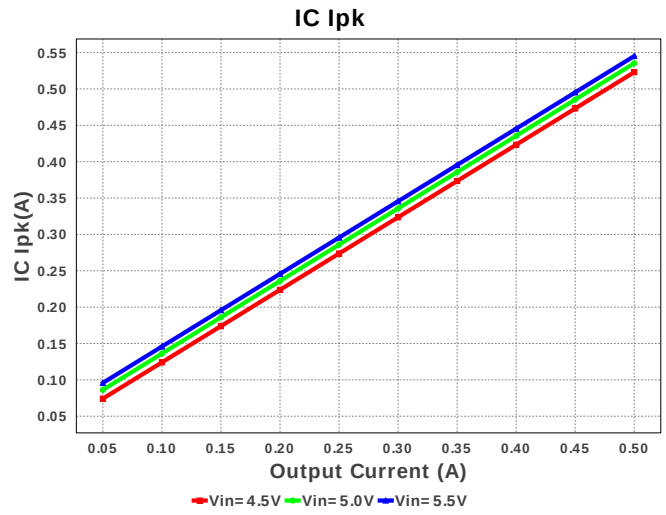
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
8.	Rfb2	Vishay-Dale	CRCW04021K43FKED Series= CRCW..e3	Res= 1.43 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 3 mm^2
9.	U1	Texas Instruments	LM2597HVMX-ADJ/NOPB	Switcher	1	$1.90	 M08A 55 mm^2

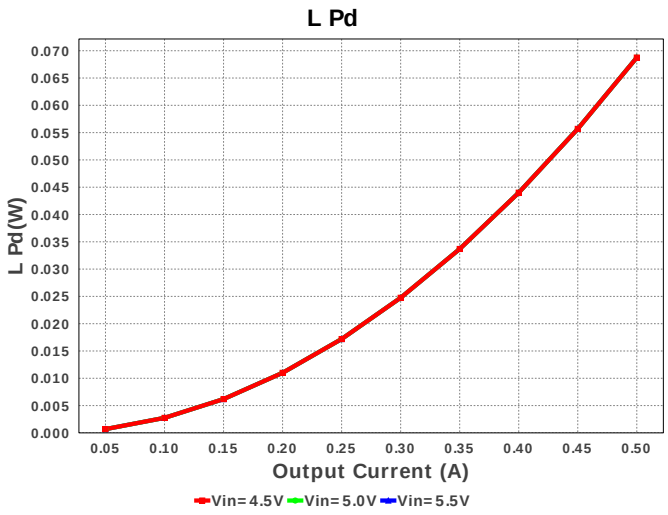


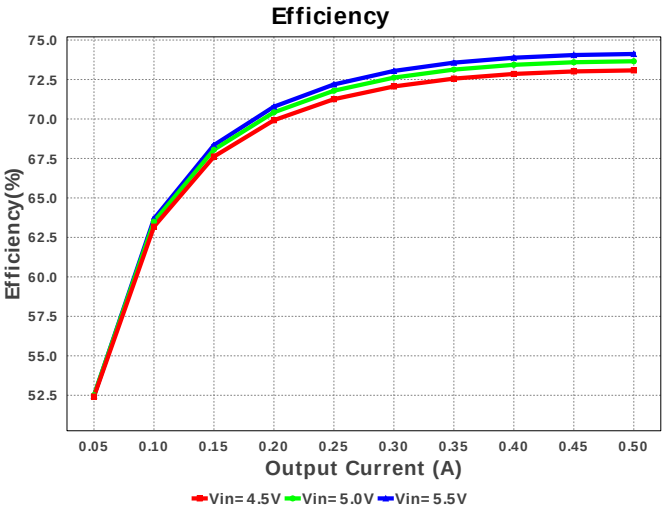


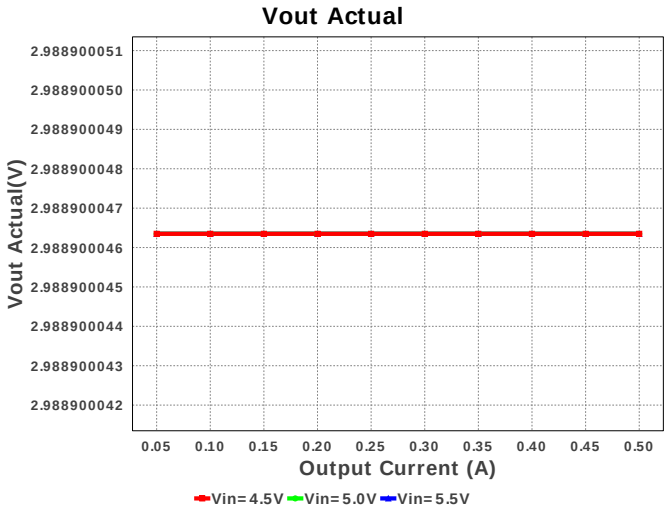


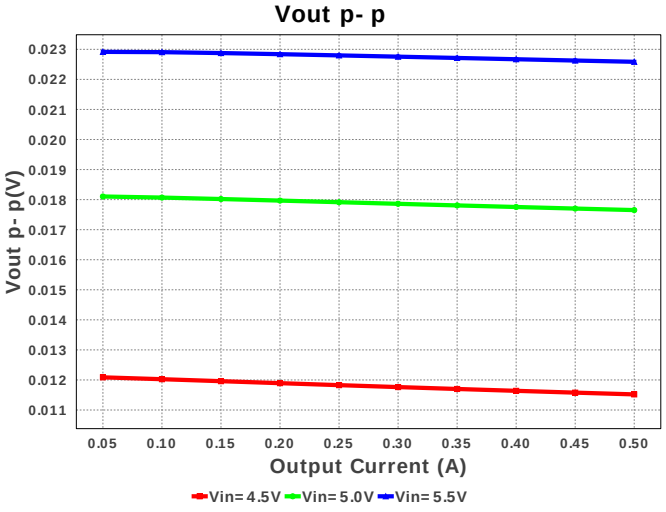


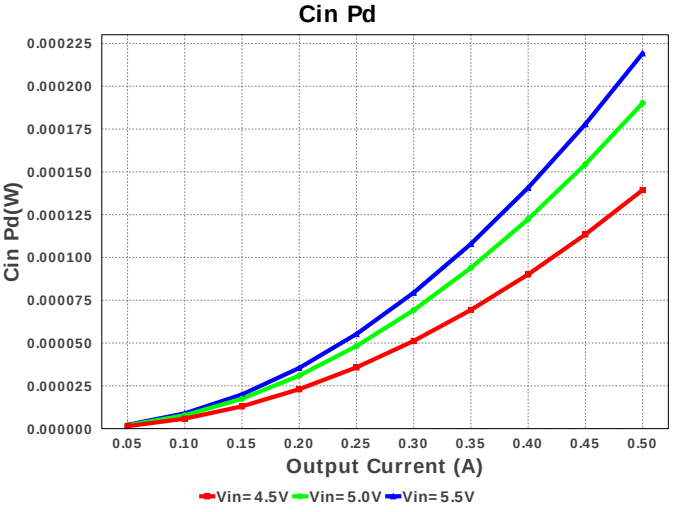


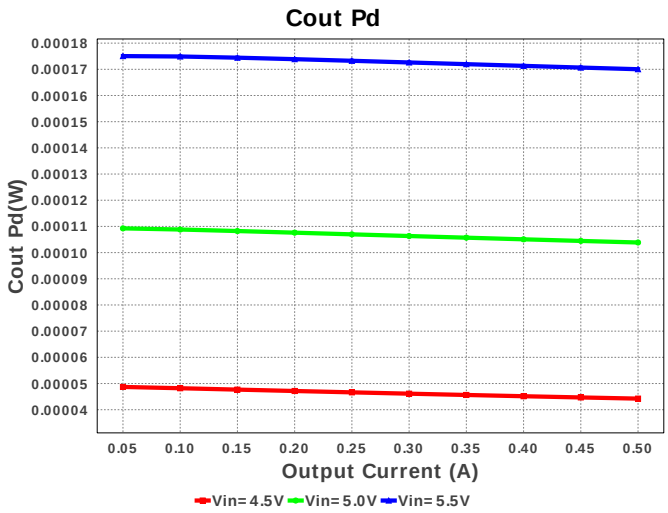


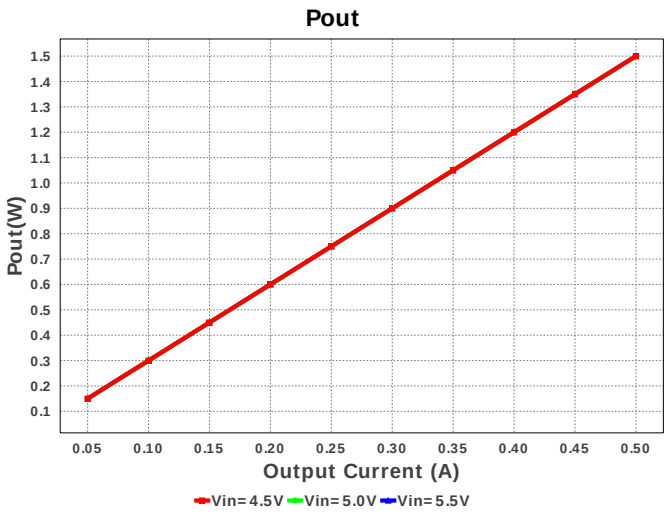


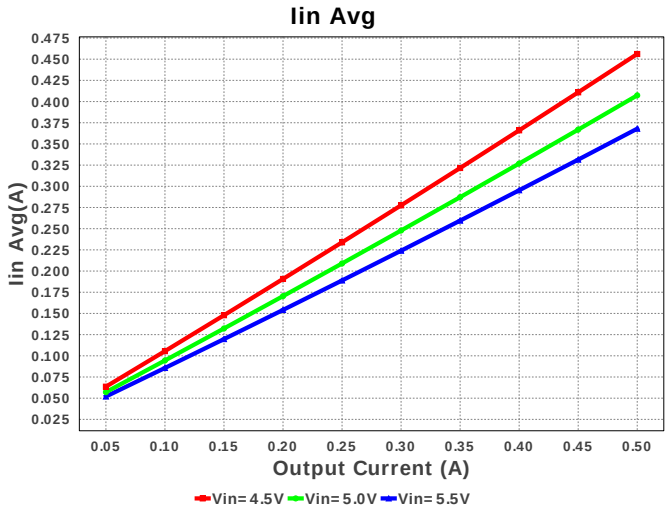


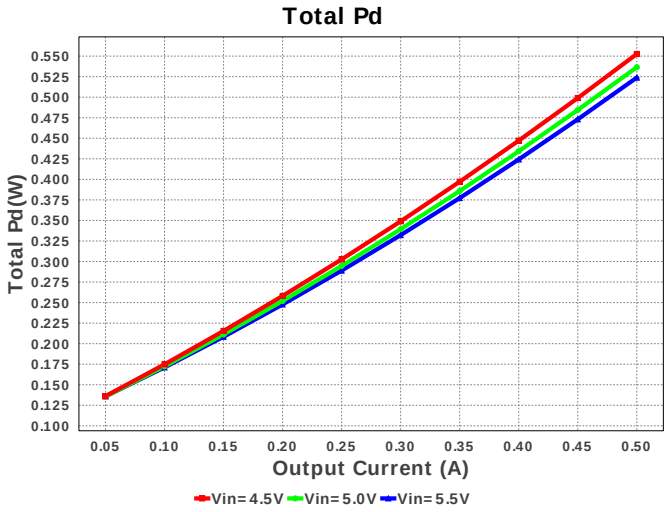


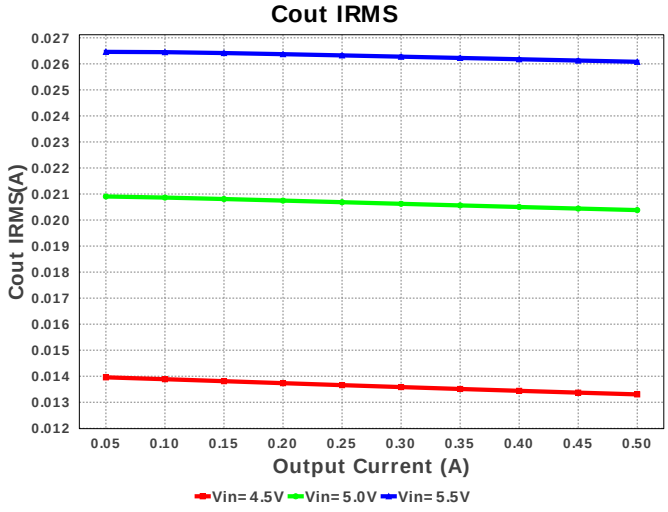


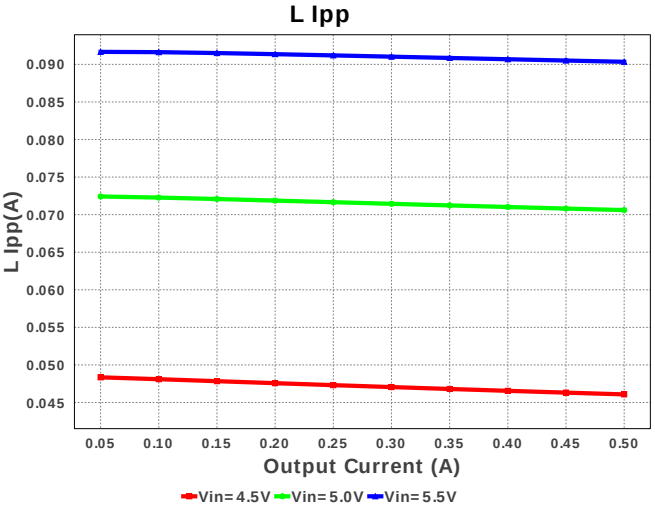


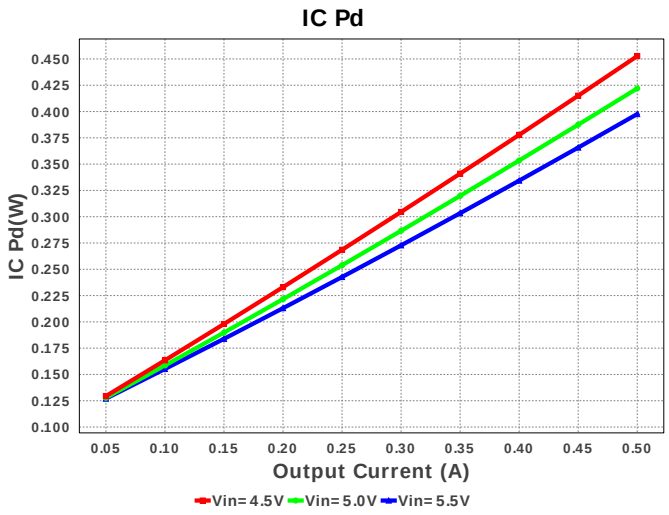


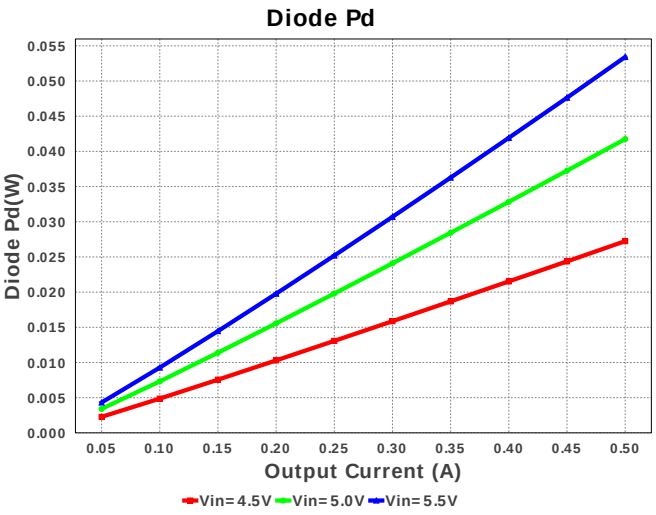


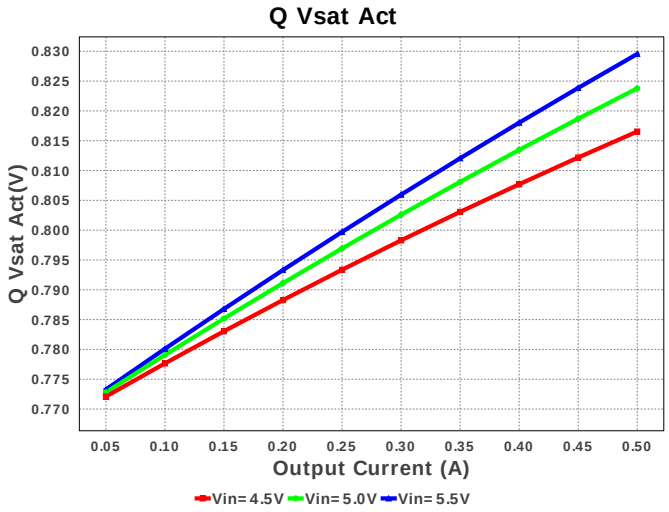












Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	235.2 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	26.258 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	545.48 mA	Current	Peak switch current in IC
4.	Iin Avg	370.19 mA	Current	Average input current
5.	L Ipp	90.959 mA	Current	Peak-to-peak inductor ripple current
6.	Q Iavg	334.742 mA	Current	Q Iavg
7.	BOM Count	9	General	Total Design BOM count
8.	FootPrint	253.0 mm^2	General	Total Foot Print Area of BOM components
9.	Frequency	150.0 kHz	General	Switching frequency
10.	IC Tolerance	0.0 V	General	IC Feedback Tolerance
11.	Pout	1.5 W	General	Total output power
12.	Q Vsat Act	828.86 mV	General	Q Vsat
13.	Total BOM	$2.49	General	Total BOM Cost
14.	Vout Actual	2.989 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
15.	Cross Freq	9.12 kHz	Op_point	Bode plot crossover frequency
16.	Duty Cycle	66.948 %	Op_point	Duty cycle
17.	Efficiency	73.671 %	Op_point	Steady state efficiency
18.	IC Tj	89.94 degC	Op_point	IC junction temperature
19.	ICThetaJA	150.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
20.	IOUT_OP	500.0 mA	Op_point	Iout operating point
21.	Phase Marg	46.266 deg	Op_point	Bode Plot Phase Margin
22.	VIN_OP	5.5 V	Op_point	Vin operating point
23.	Vout p-p	22.74 mV	Op_point	Peak-to-peak output ripple voltage
24.	Cin Pd	217.79 µW	Power	Input capacitor power dissipation
25.	Cout Pd	172.367 µW	Power	Output capacitor power dissipation
26.	Diode Pd	63.625 mW	Power	Diode power dissipation
27.	IC Pd	399.597 mW	Power	IC power dissipation
28.	L Pd	68.75 mW	Power	Inductor power dissipation
29.	Total Pd	536.07 mW	Power	Total Power Dissipation
30.	Vout Tolerance	1.189 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	500.0 m	Maximum Output Current
2.	VinMax	5.5	Maximum input voltage
3.	VinMin	4.5	Minimum input voltage
4.	Vout	3.0	Output Voltage
5.	base_pn	LM2597HV	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. **LM2597HV** Product Folder : http://www.ti.com/product/LM2597HV : contains the data sheet and other resources.