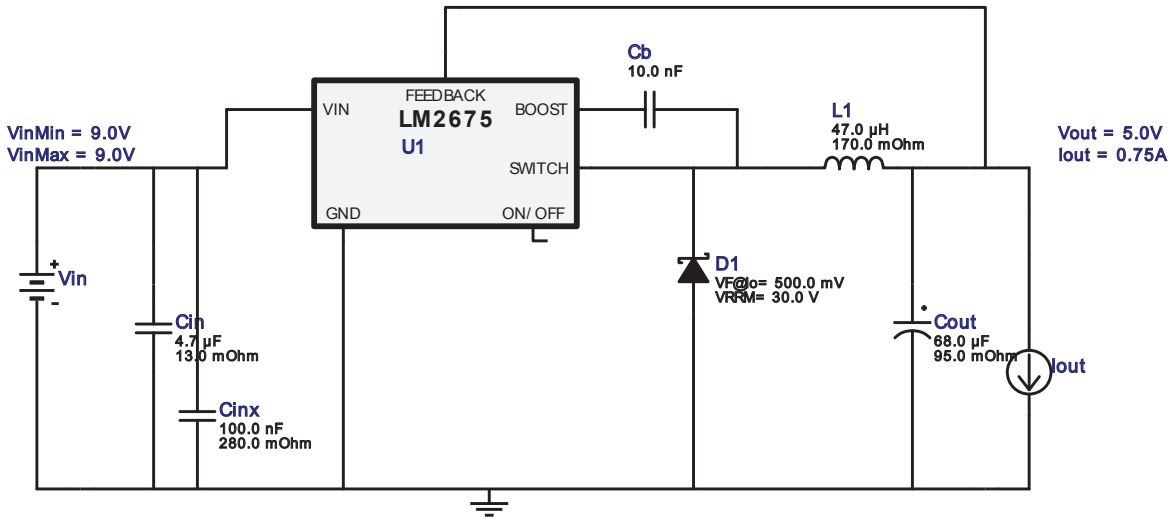
WEBENCH® Design Report

VinMin = 9.0V
VinMax = 9.0V
Vout = 5.0V
Iout = 0.75A

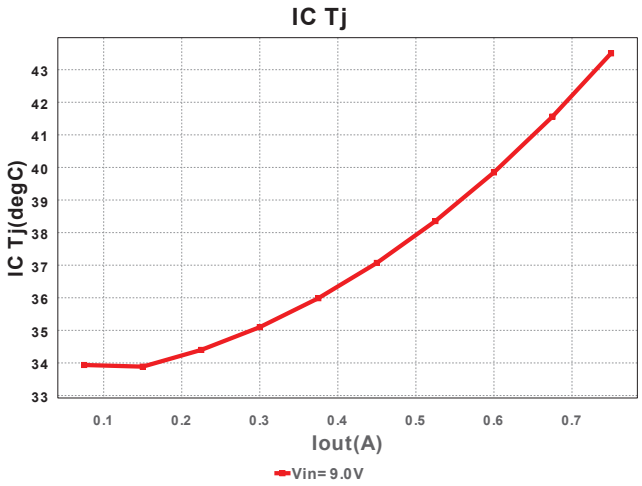
Device = LM2675M-5.0/NOPB
Topology = Buck
Created = 10/14/13 11:25:40 AM
BOM Cost = $2.98
Total Pd = 0.39W
Footprint = 324.0mm2
BOM Count = 7

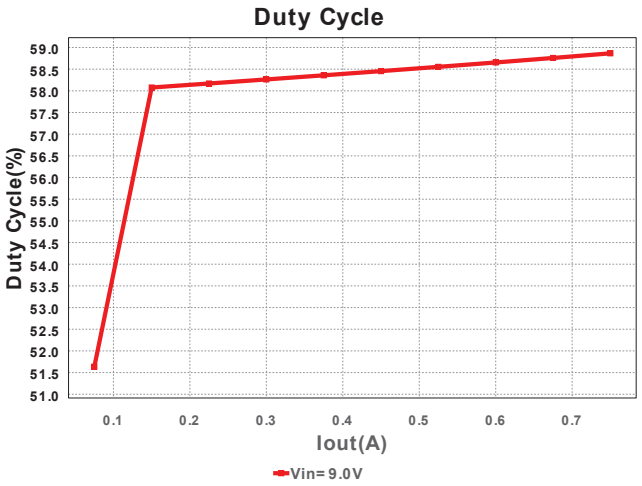
Design : 3867961/15 LM2675M-5.0/NOPB
LM2675M-5.0/NOPB 9.0V-9.0V to 5.0V @ 0.75A

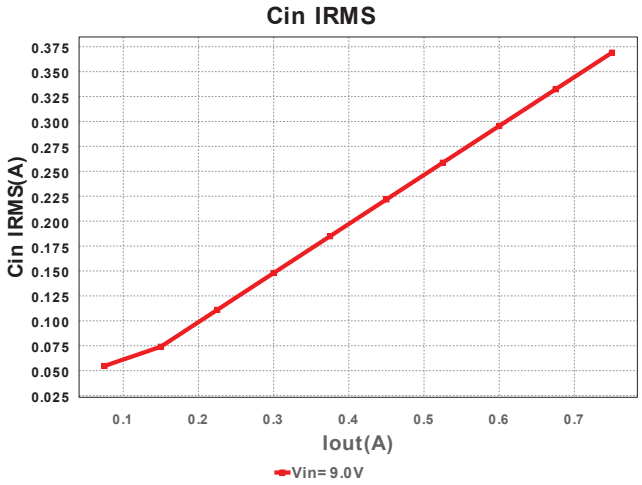


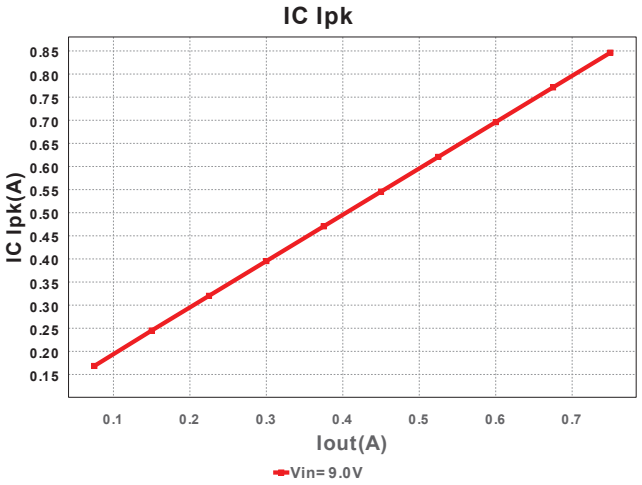
Electrical BOM

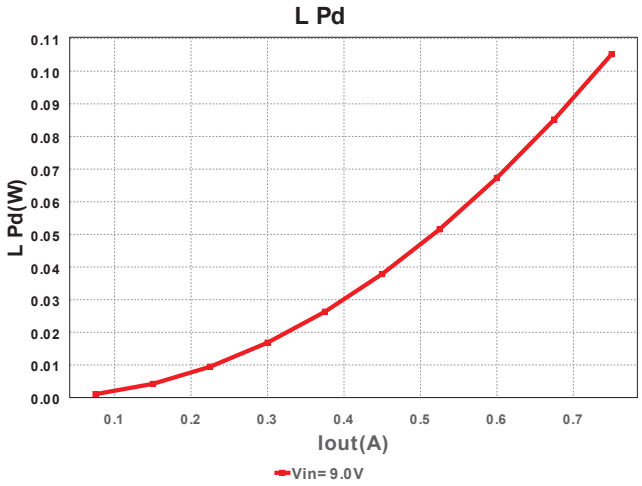
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cb	MuRata	GRM216R71H103KA01D Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 7mm2
2.	Cin	Kemet	C1206C475K4PACTU Series= X5R	Cap= 4.7 µF ESR= 13.0 mOhm VDC= 16.0 V IRMS= 4.9 A	1	$0.04	1206 11mm2
3.	Cinx	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	$0.01	0805 7mm2
4.	Cout	Vishay-Sprague	594D686X0010C2T Series= 594D	Cap= 68.0 µF ESR= 95.0 mOhm VDC= 10.0 V IRMS= 1.05 A	1	$0.99	CC_CASEC 47mm2
5.	D1	Diodes Inc.	B130-13-F	VF@Io= 500.0 mV VRRM= 30.0 V	1	$0.06	SMA 37mm2
6.	L1	Bourns	SDR1006-470KL	L= 47.0 µH DCR= 170.0 mOhm	1	$0.27	SDR1006 139mm2
7.	U1	Texas Instruments	LM2675M-5.0/NOPB	Switcher	1	$1.60	M08A 55mm2

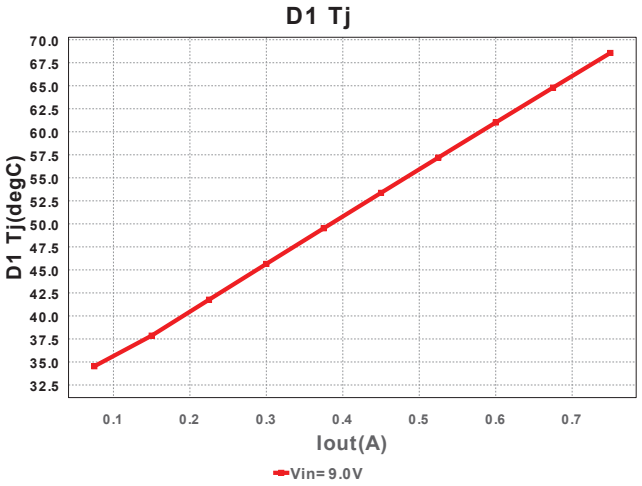




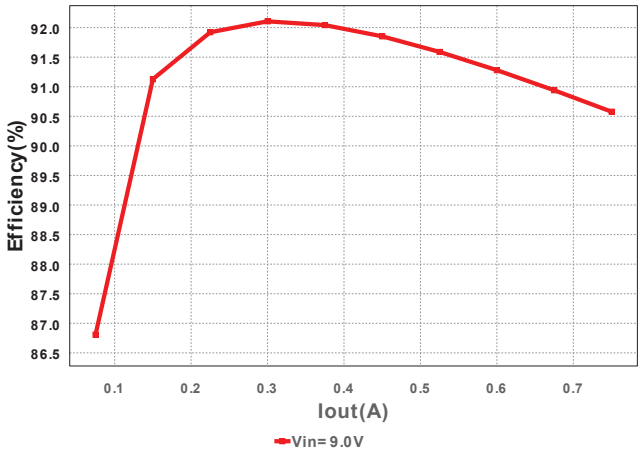




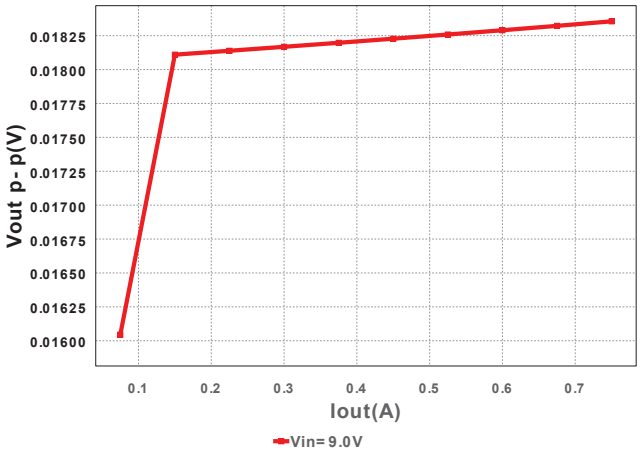




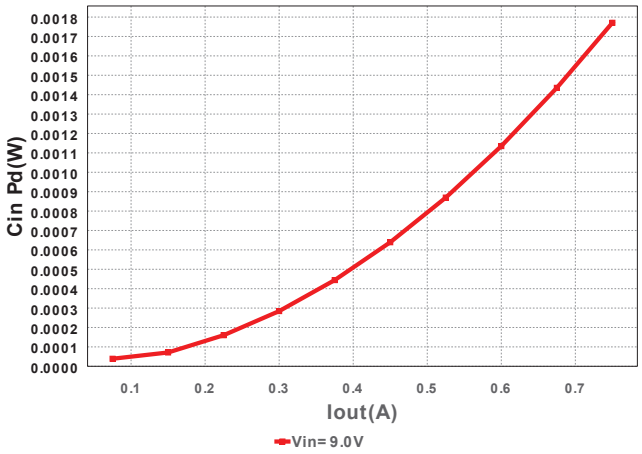
Efficiency



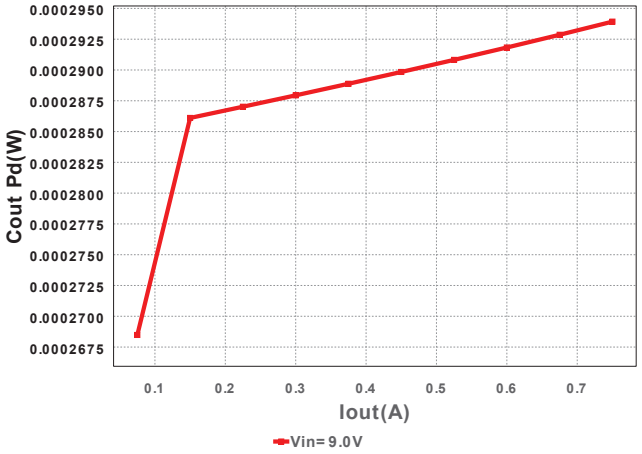
Vout p-p



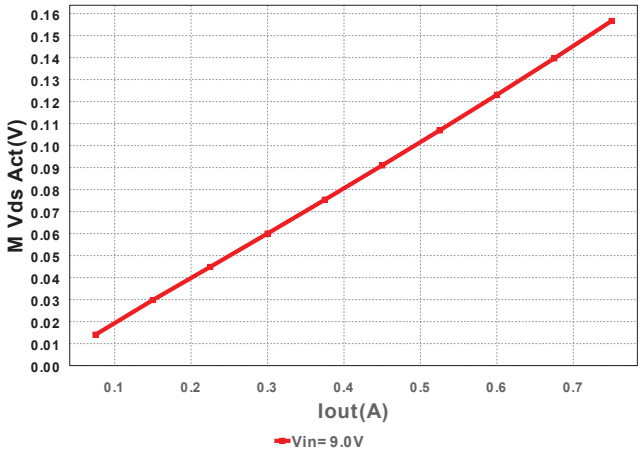
Cin Pd



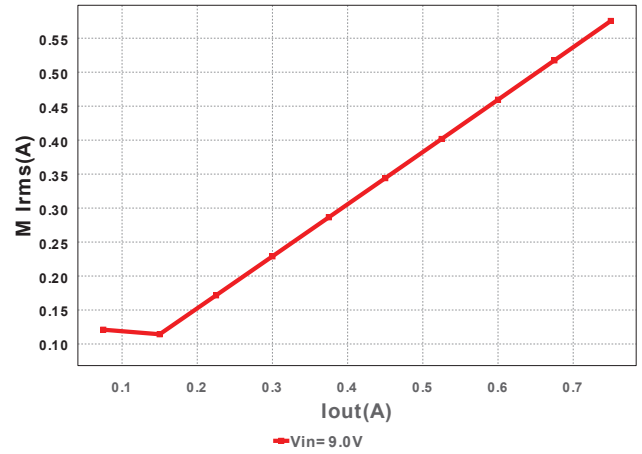
Cout Pd



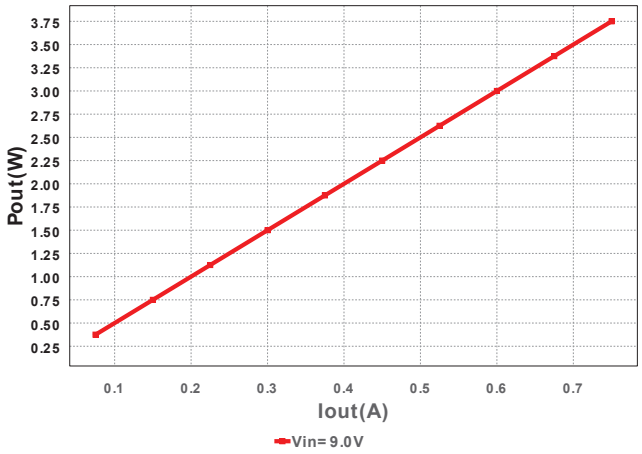
M Vds Act



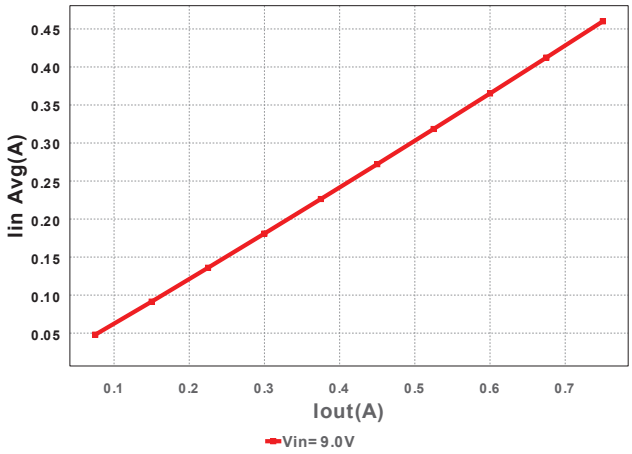
M Irms



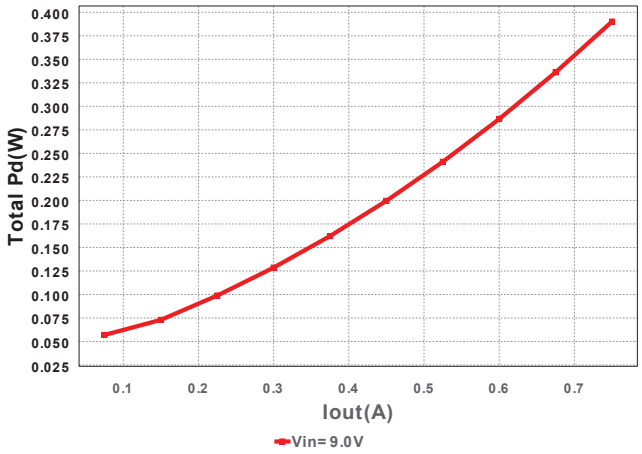
Pout



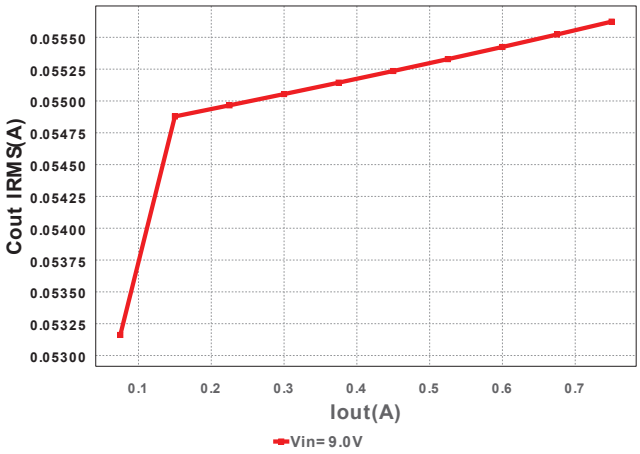
Iin Avg



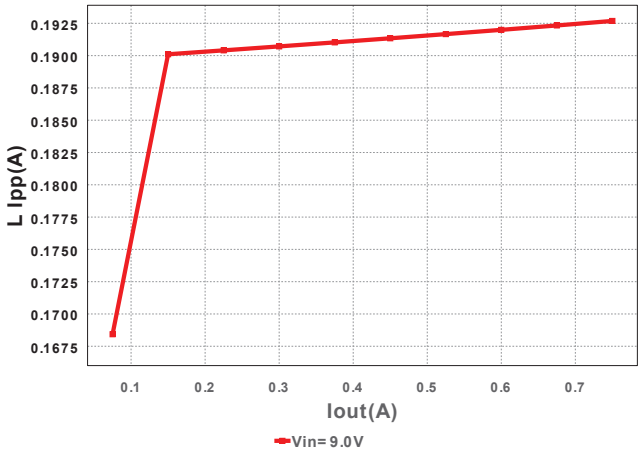
Total Pd



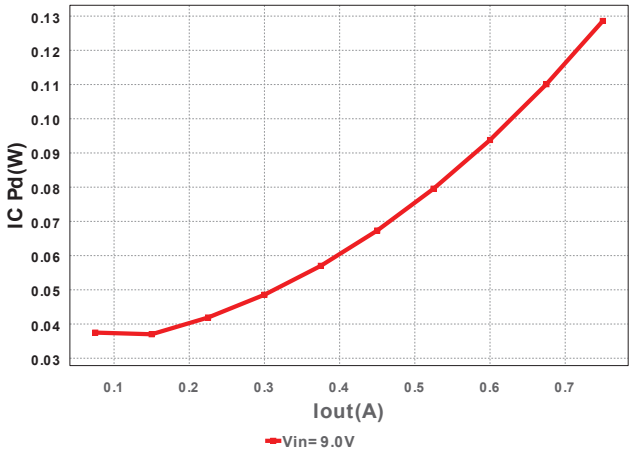
Cout IRMS

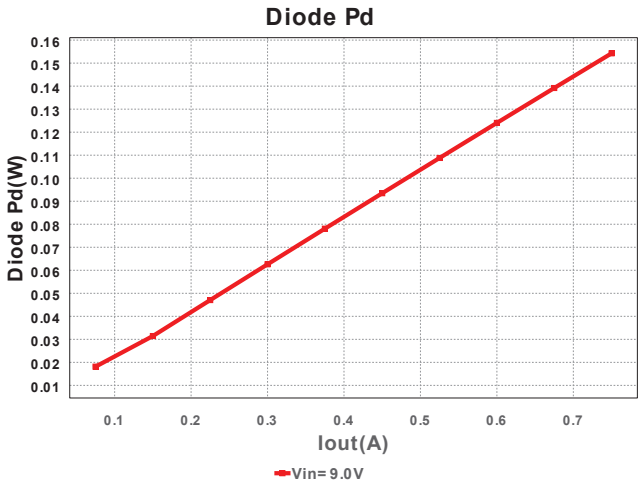


L Ipp



IC Pd





Operating Values

#	Name	Value	Category	Description
1.	BOM Count	7		Total Design BOM count
2.	Total BOM	$2.976		Total BOM Cost
3.	Cin IRMS	369.058 mA	Current	Input capacitor RMS ripple current
4.	Cout IRMS	55.623 mA	Current	Output capacitor RMS ripple current
5.	IC Ipk	846.343 mA	Current	Peak switch current in IC
6.	Iin Avg	460.01 mA	Current	Average input current
7.	L Ipp	192.685 mA	Current	Peak-to-peak inductor ripple current
8.	M1 Irms	575.428 mA	Current	Q Iavg
9.	FootPrint	324.0 mm2	General	Total Foot Print Area of BOM components
10.	Frequency	260.0 kHz	General	Switching frequency
11.	IC Tolerance	0.0 V	General	IC Feedback Tolerance
12.	M Vds Act	156.633 mV	General	Voltage drop across the MosFET
13.	Pout	3.75 W	General	Total output power
14.	D1 Tj	68.564 degC	Op_Point	D1 junction temperature
15.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
16.	Cross Freq	32.088 kHz	Op_point	Bode plot crossover frequency
17.	Duty Cycle	58.865 %	Op_point	Duty cycle
18.	Efficiency	90.578 %	Op_point	Steady state efficiency
19.	IC Tj	43.502 degC	Op_point	IC junction temperature
20.	ICThetaJA	105.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
21.	IOUT_OP	750.0 mA	Op_point	Iout operating point
22.	Phase Marg	80.631 deg	Op_point	Bode Plot Phase Margin
23.	VIN_OP	9.0 V	Op_point	Vin operating point
24.	Vout p-p	18.356 mV	Op_point	Peak-to-peak output ripple voltage
25.	Cin Pd	1.771 mW	Power	Input capacitor power dissipation
26.	Cout Pd	293.926 µW	Power	Output capacitor power dissipation
27.	Diode Pd	154.255 mW	Power	Diode power dissipation
28.	IC Pd	128.59 mW	Power	IC power dissipation
29.	L Pd	105.188 mW	Power	Inductor power dissipation
30.	Total Pd	390.079 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	750.0 mA	Maximum Output Current
2.	Iout1	750.0 mAmps	Output Current #1
3.	VinMax	9.0 V	Maximum input voltage
4.	VinMin	9.0 V	Minimum input voltage
5.	Vout	5.0 V	Output Voltage
6.	Vout1	5.0 Volt	Output Voltage #1
7.	base_pn	LM2675	Base Product Number
8.	source	DC	Input Source Type
9.	Ta	30.0 degC	Ambient temperature

Design Assistance

1. **LM2675** Product Folder : http://www.ti.com/product/lm2675 : contains the data sheet and other resources.