

## Design 29 - LM2676S-5.0

### Introduction

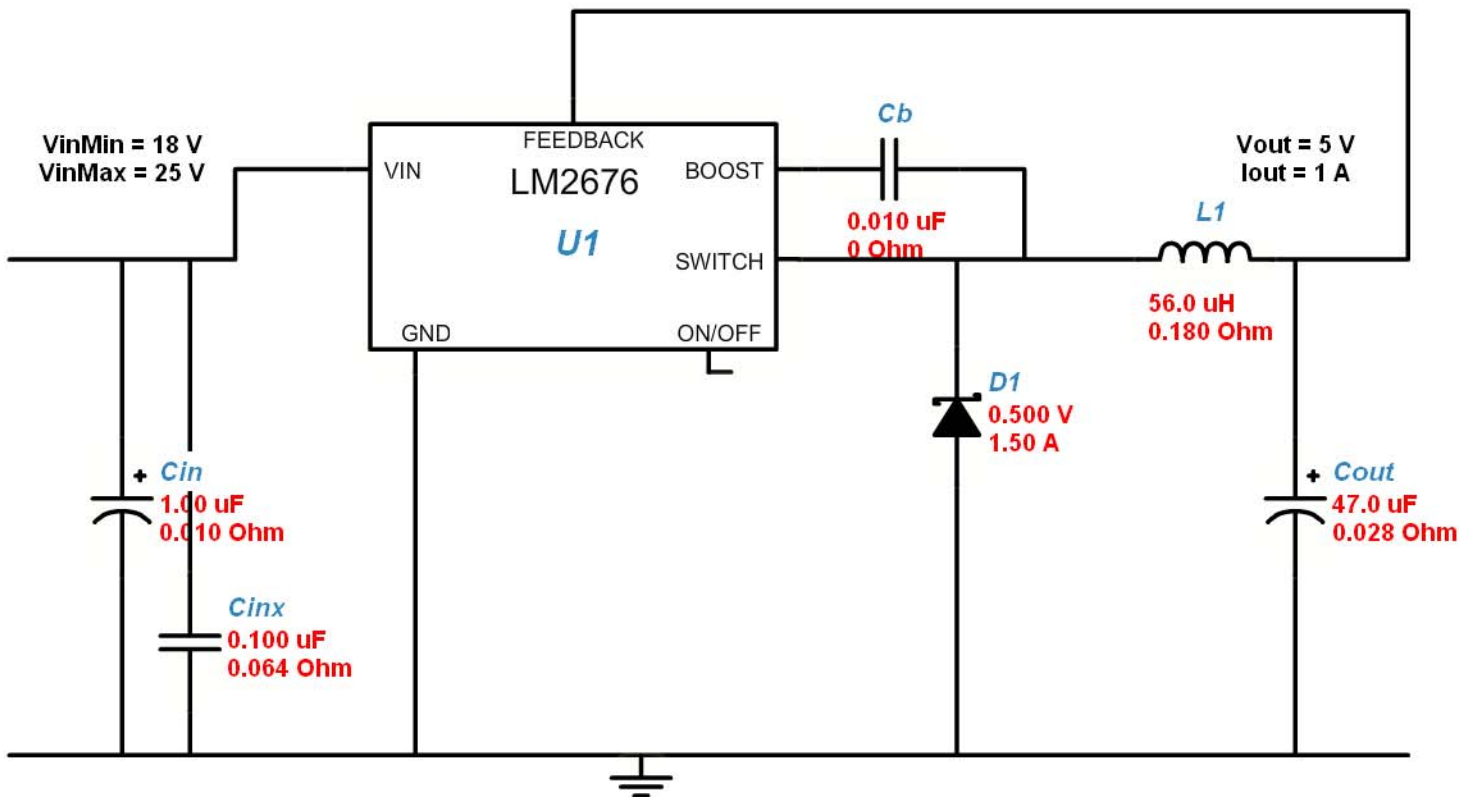
### Design Specifications

IC	LM2676
VinMin	18 V
VinMax	25 V







Vout	5 V
Iout	1 A
ta	30

Optimization Factor	3
pricefactor	0
SoftStart Time	0 mili second

### Schematic



## Bill of Materials

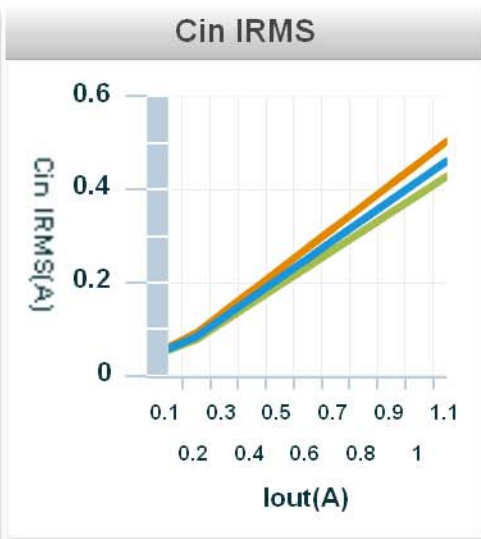
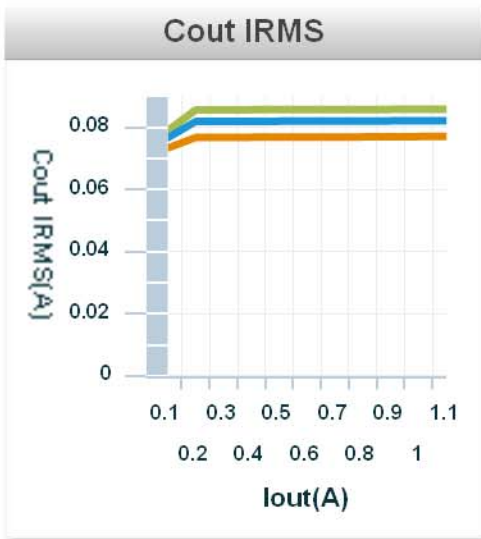
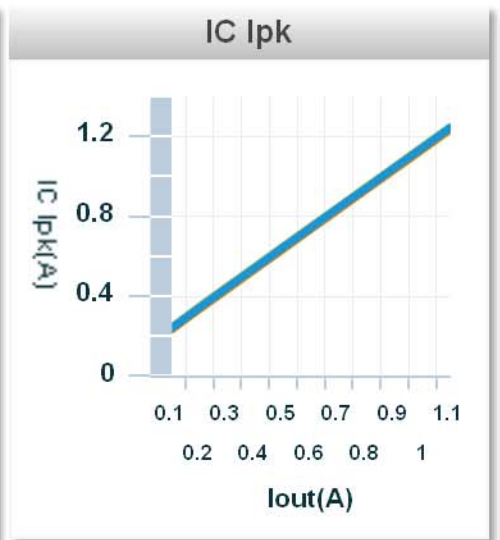
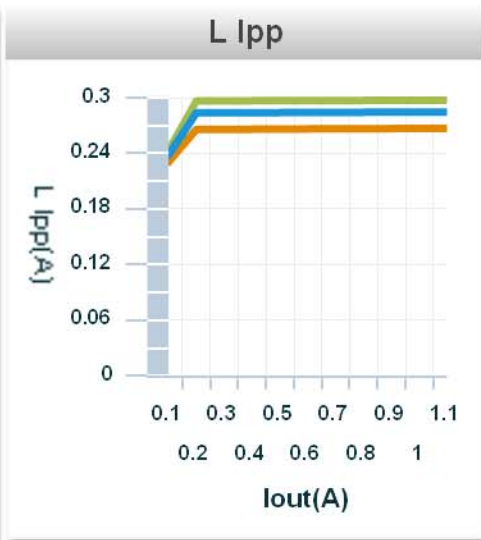
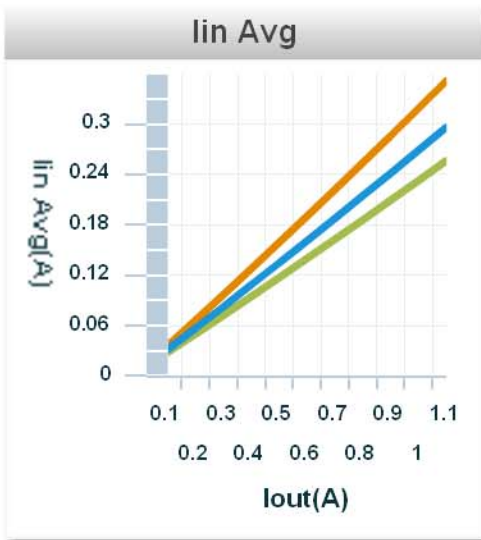
Part	Manufacturer	Part Number	Quant	Price	Attributes	Top View
Cb	MuRata	GRM216R71H103KA01D	1	0.01	Cap=10nF, ESR=0Ohm, VDC=50V	
Cin	TDK	C3216X7R1H105K	2	0.05	Cap=1uF, ESR=0.010Ohm,	
Cinx	Kemet	C0805C104K5RACTU	1	0.01	Cap=100nF, ESR=0.064Ohm, VDC=50V	
Cout	Nippon Chemi-Con	APXE100ARA470ME61G	1	0.38	Cap=47uF, ESR=0.028Ohm, VDC=10V	
D1	Vishay-Semiconductor	BYS10-45-E3/TR	1	0.097	Vf@Io=0.5V, Io=1.5A, VRRM=45V	
L1	Coilcraft	MSS1038-563MLB	1	0.48	L=56uH, DCR=0.18Ohm, IDC=1.85A	

## Operating Values

Name	Value	Category	Description
Iin Avg	0.23A	Current	Average input current
L Ipp	0.29A	Current	Peak-to-peak inductor ripple current
IC Ipk	1.15A	Current	Peak switch current in IC
Cout IRMS	0.08A	Current	Output capacitor RMS ripple current
Cin IRMS	0.39A	Current	Input capacitor RMS ripple current
Total BOM	3\$	General	Total BOM price
Pout	5W	General	Total output power
FootPrint	504mm <sup>2</sup>	General	Total Foot Print Area of BOM components
Mode	CCM	General	Conduction Mode
BOM Count	7	General	Total BOM count
Frequency	260KHz	General	Switching frequency
D1 Tj	88.8degC	Op_Point	D1 junction temperature
Cross Freq	29.2KHz	Op_point	Bode plot crossover frequency, indication of bandwidth
Duty Cycle	21.6%	Op_point	Duty cycle
IC Tj	35.8degC	Op_point	IC junction temperature
ICThetaJA	26degC/W	Op_point	IC junction-to-ambient thermal resistance
VIN_OP	25V	Op_point	Vin operating point
IOUT_OP	1A	Op_point	Iout operating point
Efficiency	86%	Op_point	Steady state efficiency
Phase Marg	52.1deg	Op_point	Bode Plot Phase Margin
M_Irms_Act	0.46A	Op_point	Q Iavg
M_Vds_Act	0.07V	Op_point	
Vout p-p	8.86mV	Op_point	Peak-to-peak output ripple voltage
Diode Pd	0.39W	Power	Diode power dissipation
IC Pd	0.22W	Power	IC power dissipation
Cout Pd	206uW	Power	Output capacitor power dissipation
Cin Pd	759uW	Power	Input capacitor power dissipation
Total Pd	0.81W	Power	Total Power Dissipation
L Pd	0.19W	Power	Inductor power dissipation

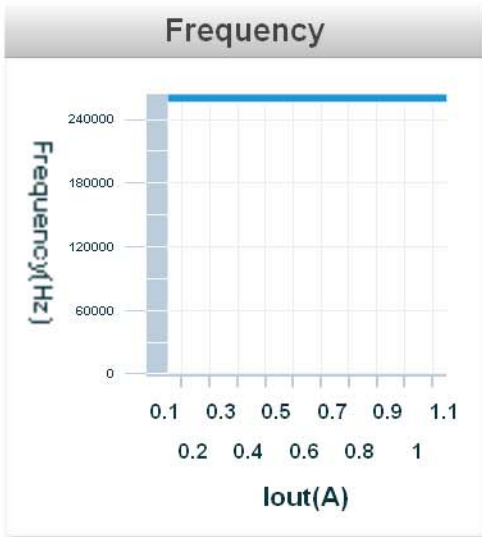
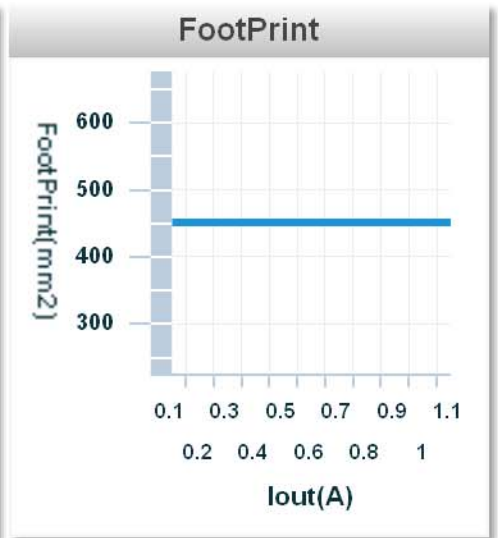
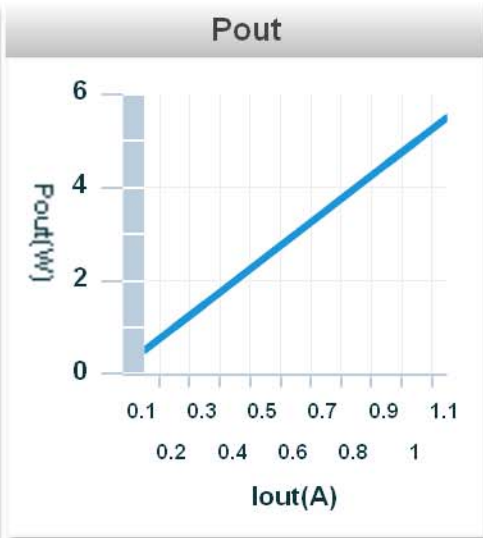
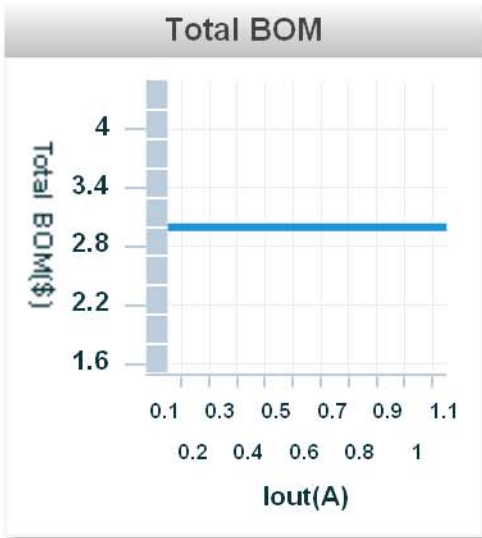
# Charts

## Current



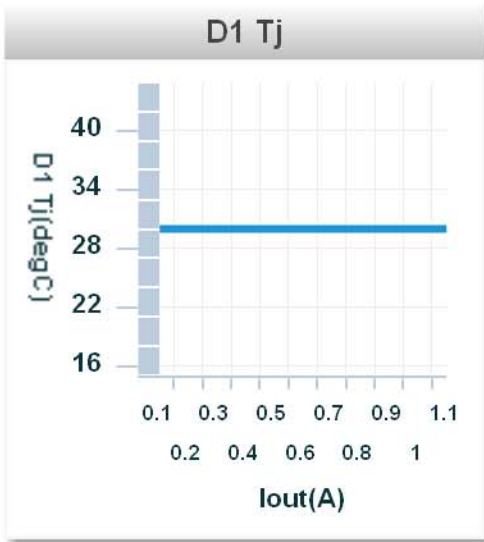
# Charts (Continued)

## General



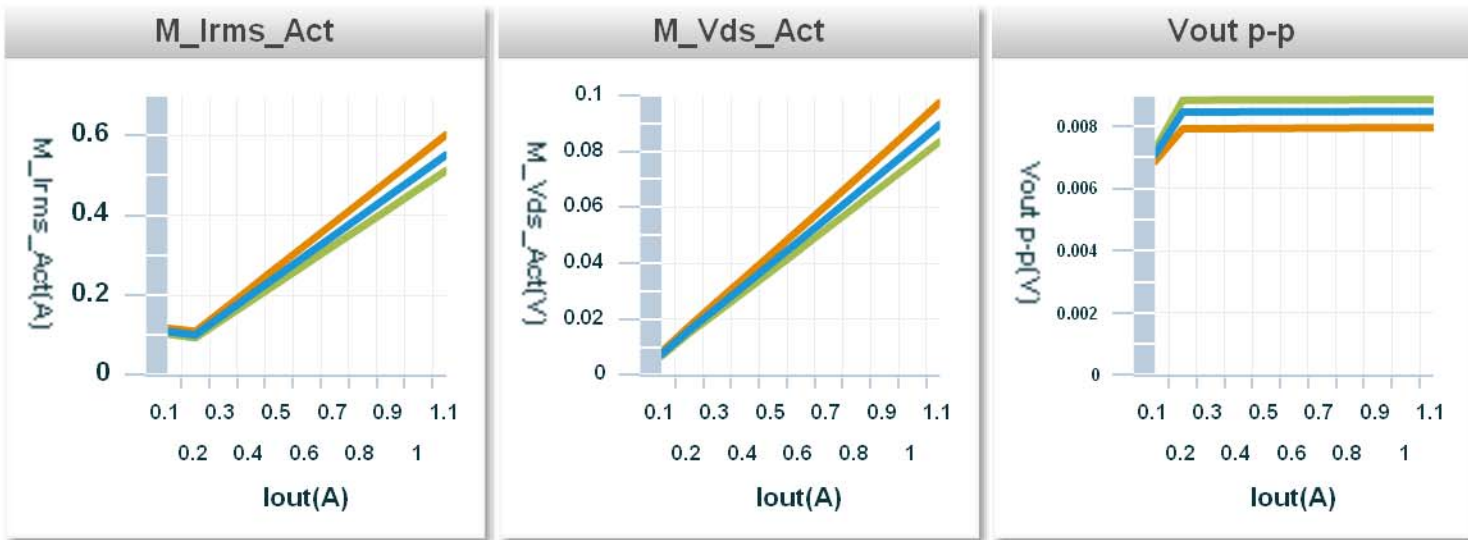
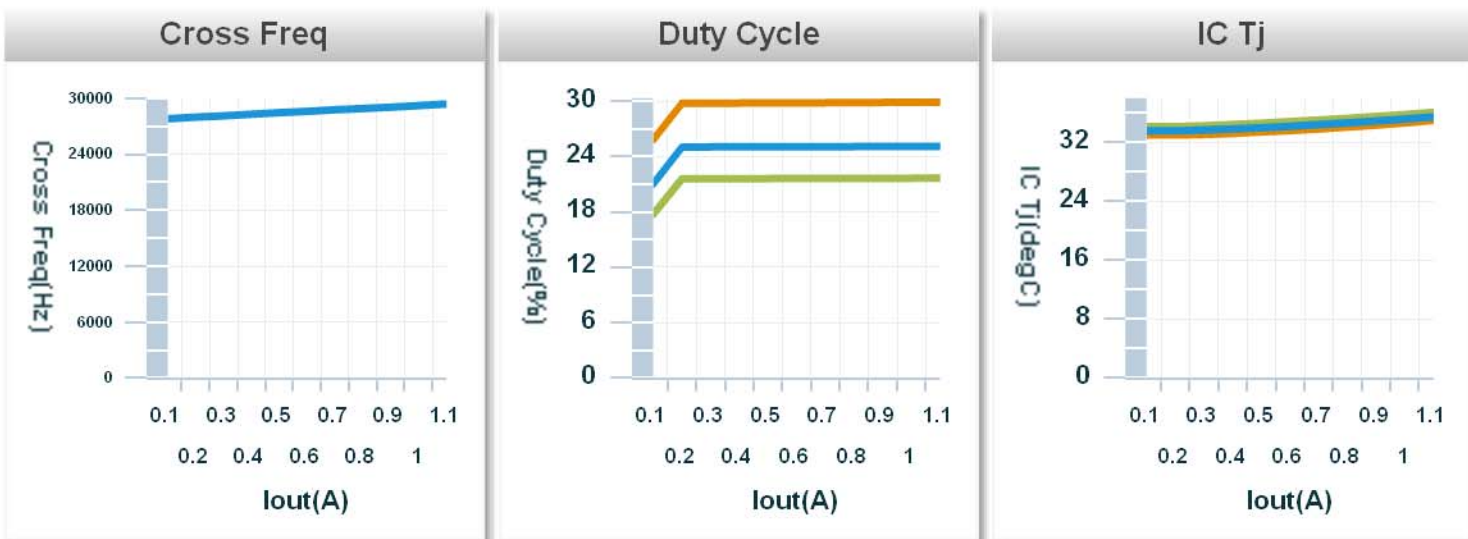
## Charts (Continued)

Op\_Point



# Charts (Continued)

Op\_point



■ Vin=18.00V    
 ■ Vin=25.00V    
 ■ Vin=21.50V