

## Design 31 - LM2676S-5.0

### Introduction

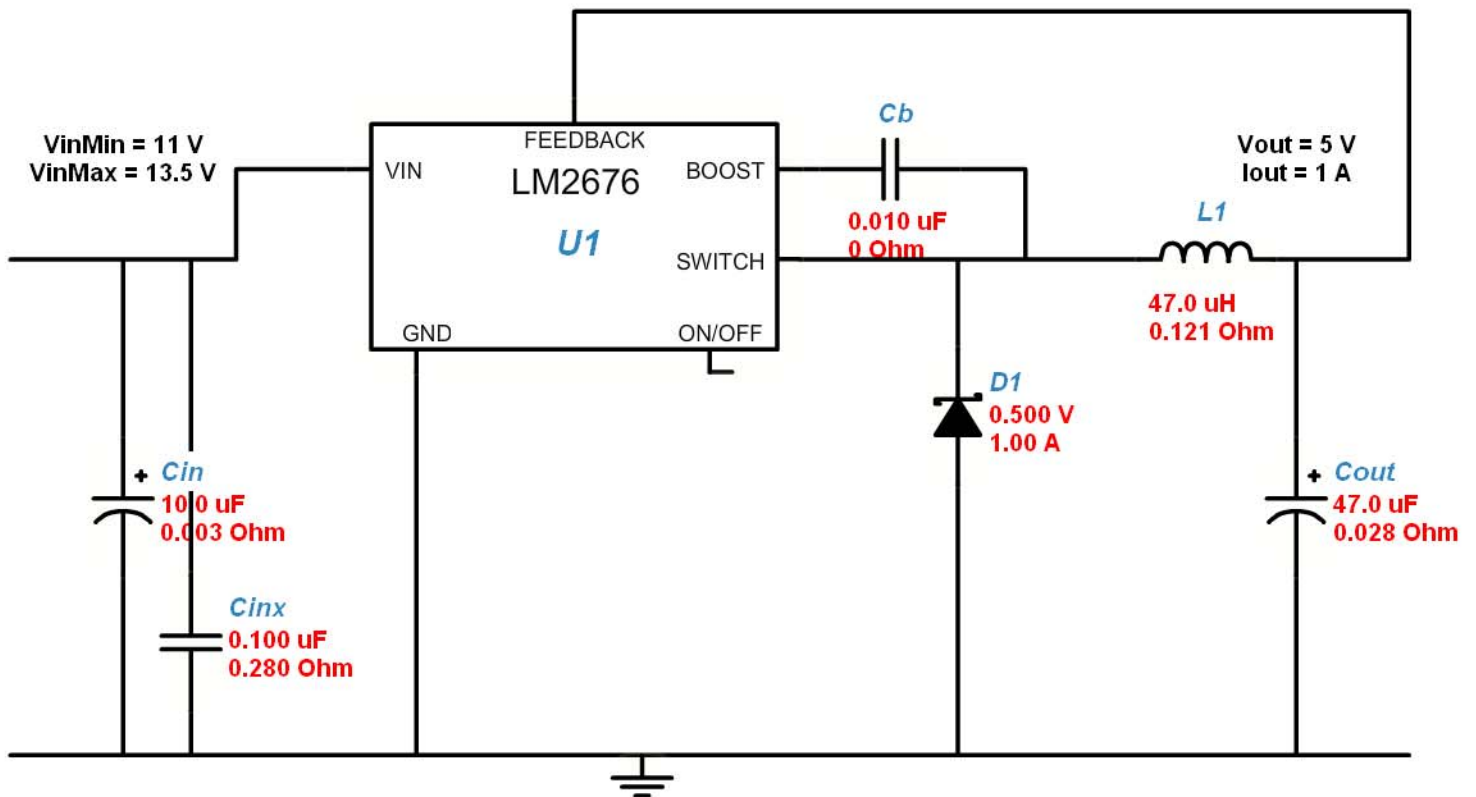
### Design Specifications

IC	LM2676
VinMin	11 V
VinMax	13.5 V

Vout	5 V
Iout	1 A
ta	30

Optimization Factor	3
pricefactor	0
SoftStart Time	0 mili second

### Schematic



# Bill of Materials

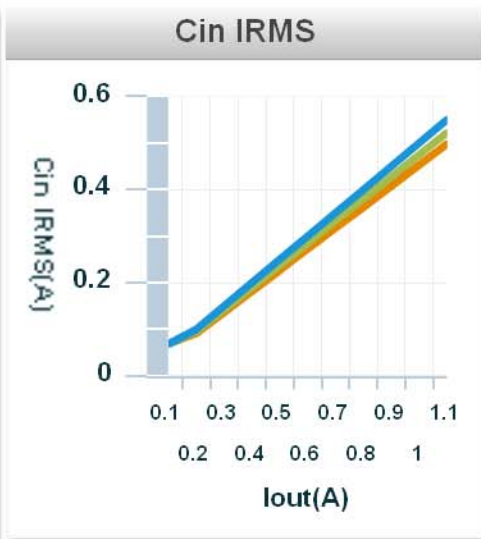
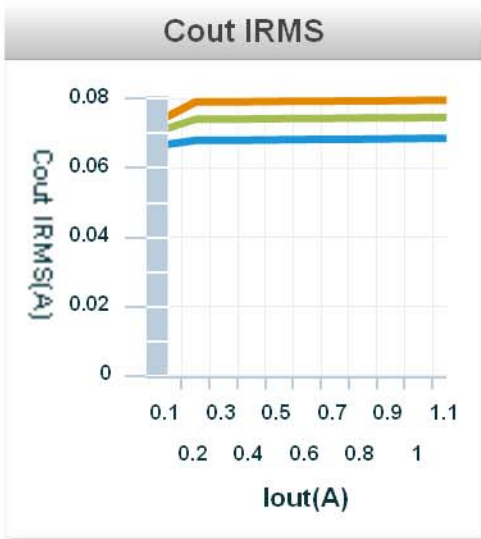
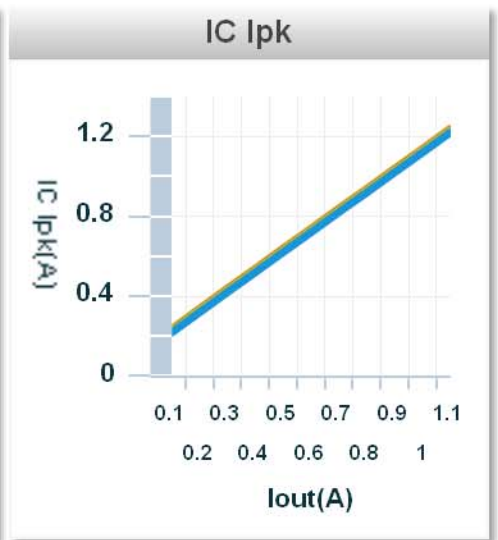
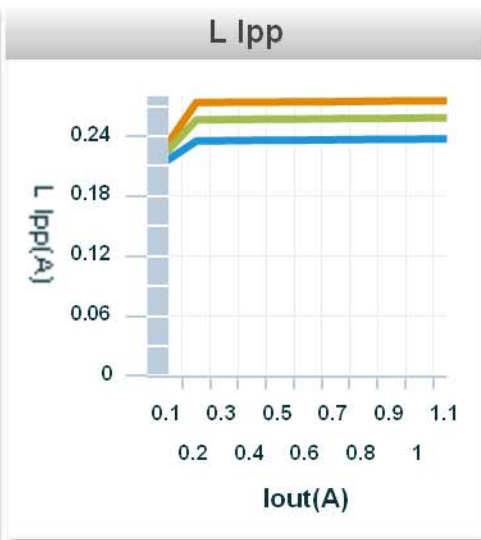
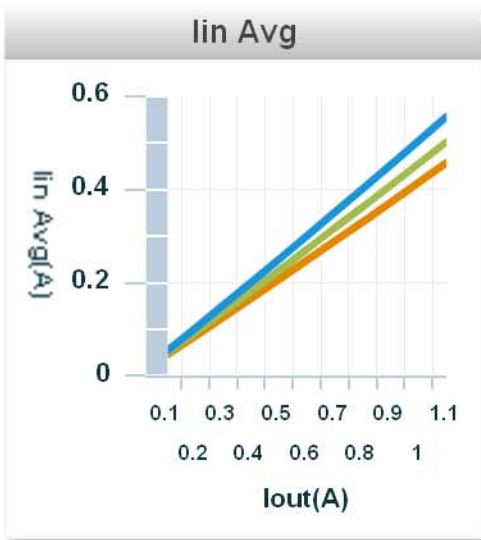
Part	Manufacturer	Part Number	Quant	Price	Attributes	Top View
Cb	MuRata	GRM216R71H103KA01D	1	0.01	Cap=10nF, ESR=0Ohm, VDC=50V	
Cin	TDK	C3225X7R1E106M	1	0.2	Cap=10uF, ESR=2.7mOhm, VDC=25V	
Cinx	AVX	08053C104KAT2A	1	0.01	Cap=100nF, ESR=0.28Ohm,	
Cout	Nippon Chemi-Con	APXE100ARA470ME61G	1	0.38	Cap=47uF, ESR=0.028Ohm, VDC=10V	
D1	Diodes Inc.	B130-13-F	1	0.06	VFatIo=0.5V, Io=1A, VRRM=30V	
L1	Bourns	SRU1038-470Y	1	0.35	L=47uH, DCR=0.121Ohm, IDC=1.65A	
U1	National Semiconductor	LM2676S-5.0	1	1.92		

## Operating Values

Name	Value	Category	Description
Iin Avg	0.41A	Current	Average input current
L Ipp	0.27A	Current	Peak-to-peak inductor ripple current
IC Ipk	1.14A	Current	Peak switch current in IC
Cout IRMS	0.07A	Current	Output capacitor RMS ripple current
Cin IRMS	0.45A	Current	Input capacitor RMS ripple current
Total BOM	2.93\$	General	Total BOM price
Pout	5W	General	Total output power
FootPrint	483mm <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	106degC	Op_Point	D1 junction temperature
Cross Freq	29.4KHz	Op_point	Bode plot crossover frequency, indication of bandwidth
Duty Cycle	39.6%	Op_point	Duty cycle
IC Tj	34.2degC	Op_point	IC junction temperature
ICThetaJA	26degC/W	Op_point	IC junction-to-ambient thermal resistance
VIN_OP	13.5V	Op_point	Vin operating point
IOUT_OP	1A	Op_point	Iout operating point
Efficiency	89.4%	Op_point	Steady state efficiency
Phase Marg	47.9deg	Op_point	Bode Plot Phase Margin
M_Irms_Act	0.62A	Op_point	Q Iavg
M_Vds_Act	0.10V	Op_point	
Vout p-p	8.21mV	Op_point	Peak-to-peak output ripple voltage
Diode Pd	0.30W	Power	Diode power dissipation
IC Pd	0.16W	Power	IC power dissipation
Cout Pd	177uW	Power	Output capacitor power dissipation
Cin Pd	553uW	Power	Input capacitor power dissipation
Total Pd	0.59W	Power	Total Power Dissipation
L Pd	0.13W	Power	Inductor power dissipation

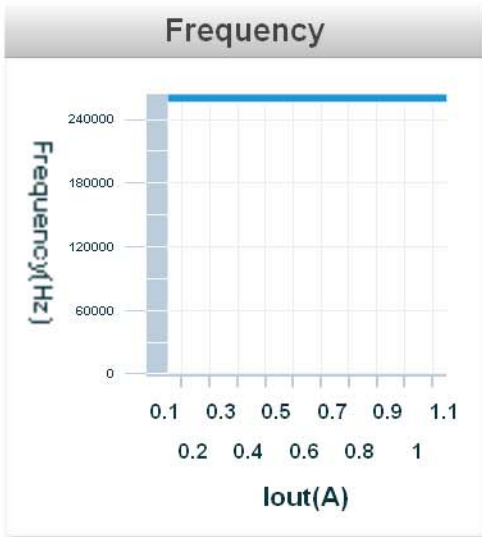
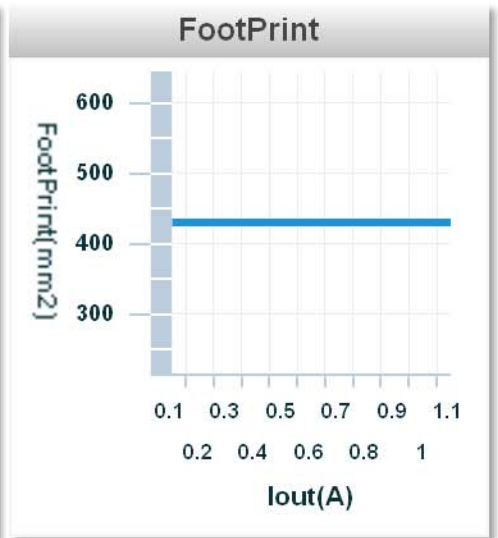
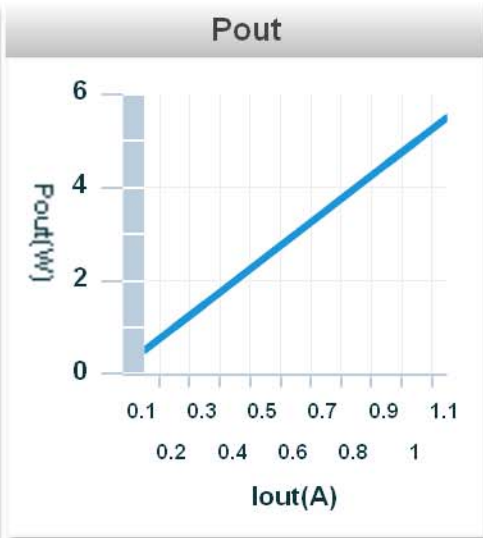
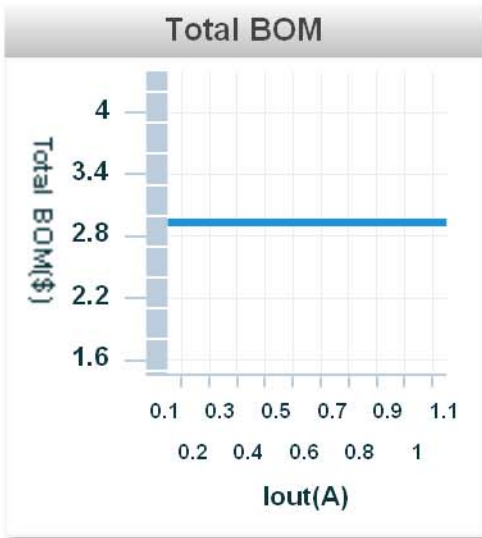
# Charts

## Current



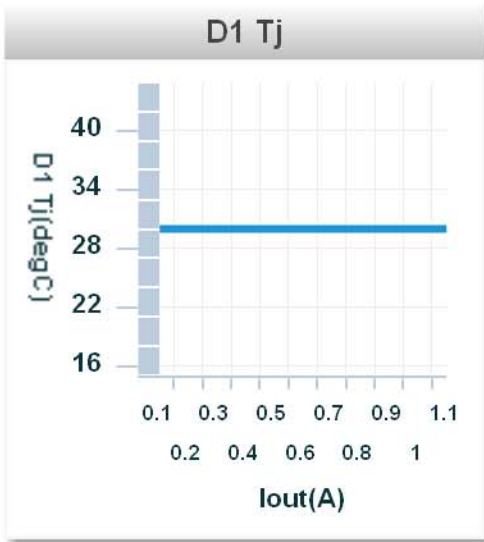
# Charts (Continued)

## General



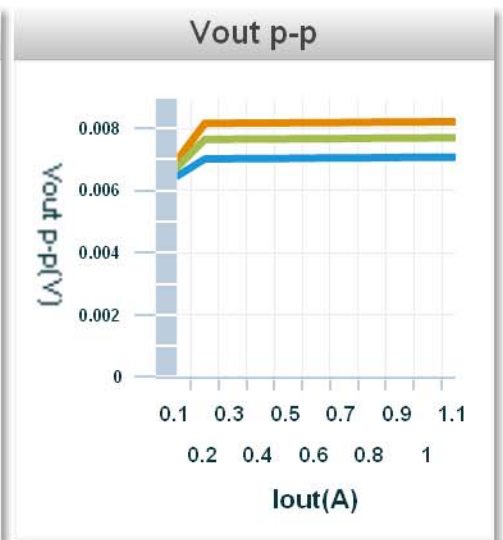
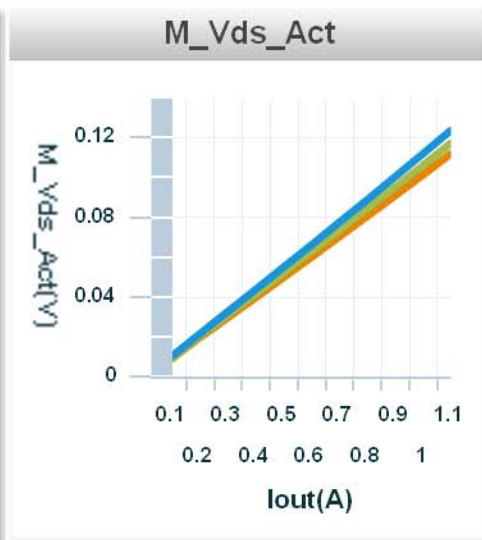
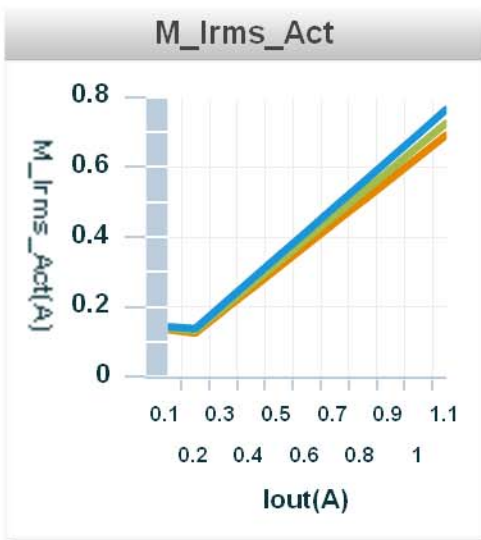
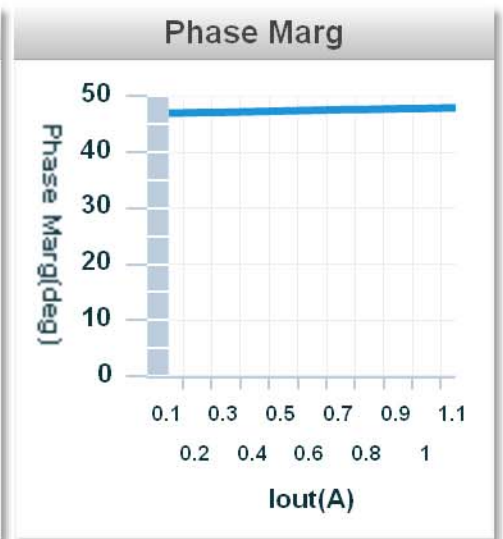
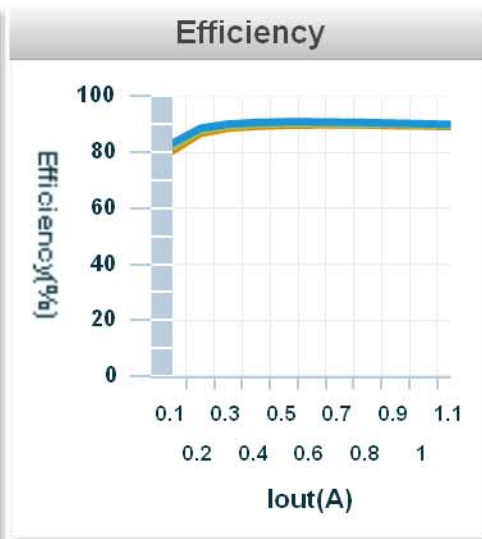
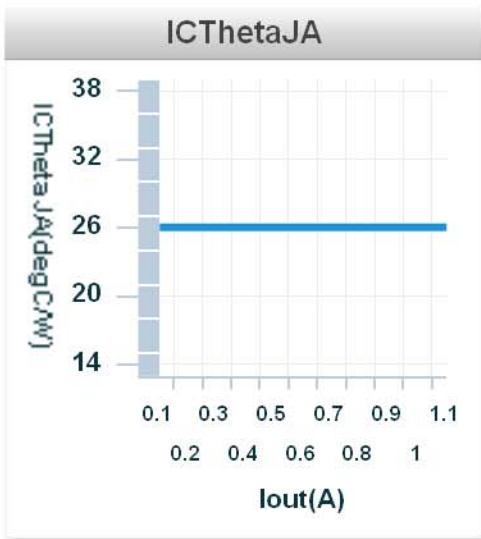
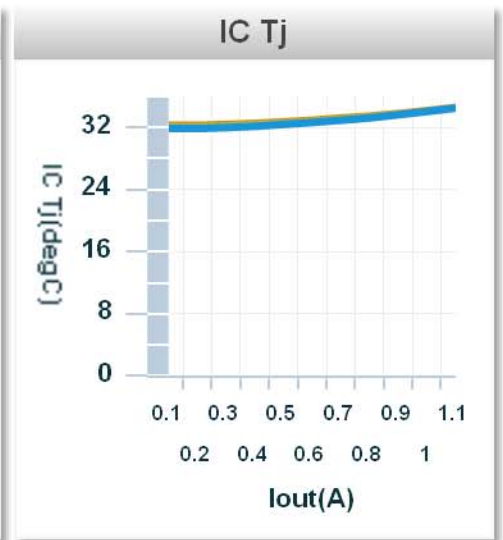
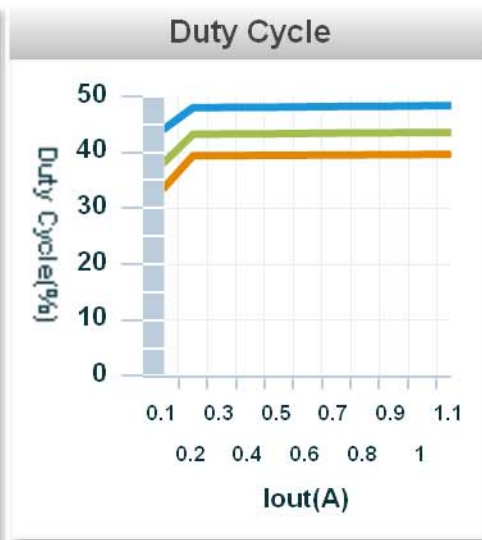
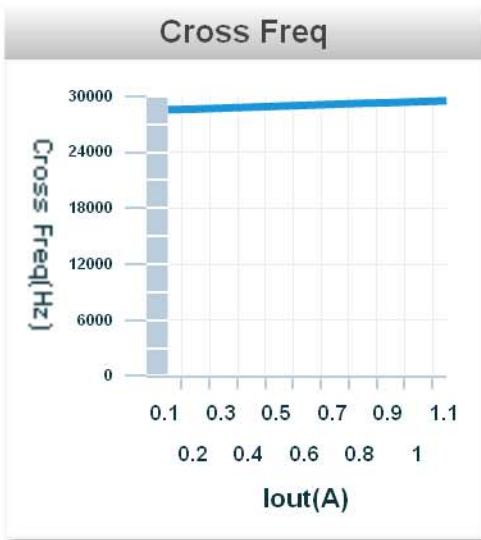
## Charts (Continued)

Op\_Point



# Charts (Continued)

Op\_point



■ Vin=13.50V    ■ Vin=12.25V    ■ Vin=11.00V