

## Design 4 - LM2670S-5.0

### Introduction

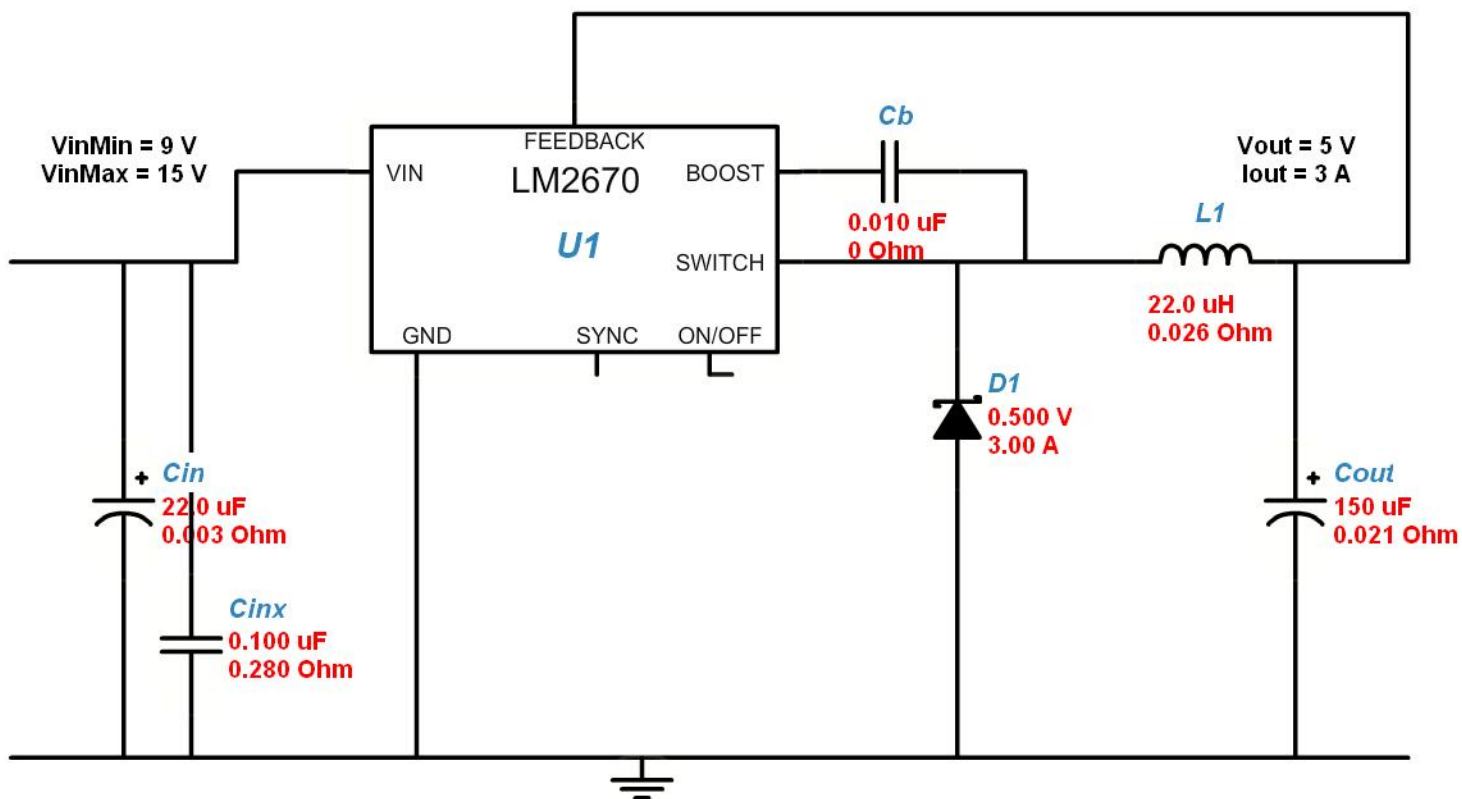
### Design Specifications

IC	LM2670
VinMin	9 V
VinMax	15 V




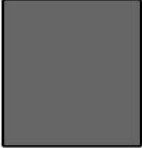
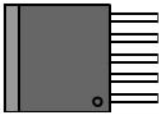

Vout	5 V
Iout	3 A
ta	30


Optimization Factor	0
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	C4532X7R1E226M	1	0.42	Cap=22uF, ESR=3mOhm, VDC=25V	
Cinx	AVX	08053C104KAT2A	1	0.01	Cap=100nF, ESR=0.28Ohm, VDC=25V	
Cout	Nippon Chemi-Con	APXE100ARA151MF80G	1	0.46	Cap=150uF, ESR=0.021Ohm, VDC=10V	
D1	Diodes Inc.	B340A-13-F	1	0.13	VFatIo=0.5V, Io=3A, VRRM=40V	
L1	Coiltronics	HC9-220-R	1	0.92	L=22uH, DCR=0.026Ohm, IDC=6.3A	
U1	National Semiconductor	LM2670S-5.0	1	1.98		
Csync	MuRata	GRM2165C1H101JA01D	1	0.01	Cap=100pF, ESR=0Ohm,	

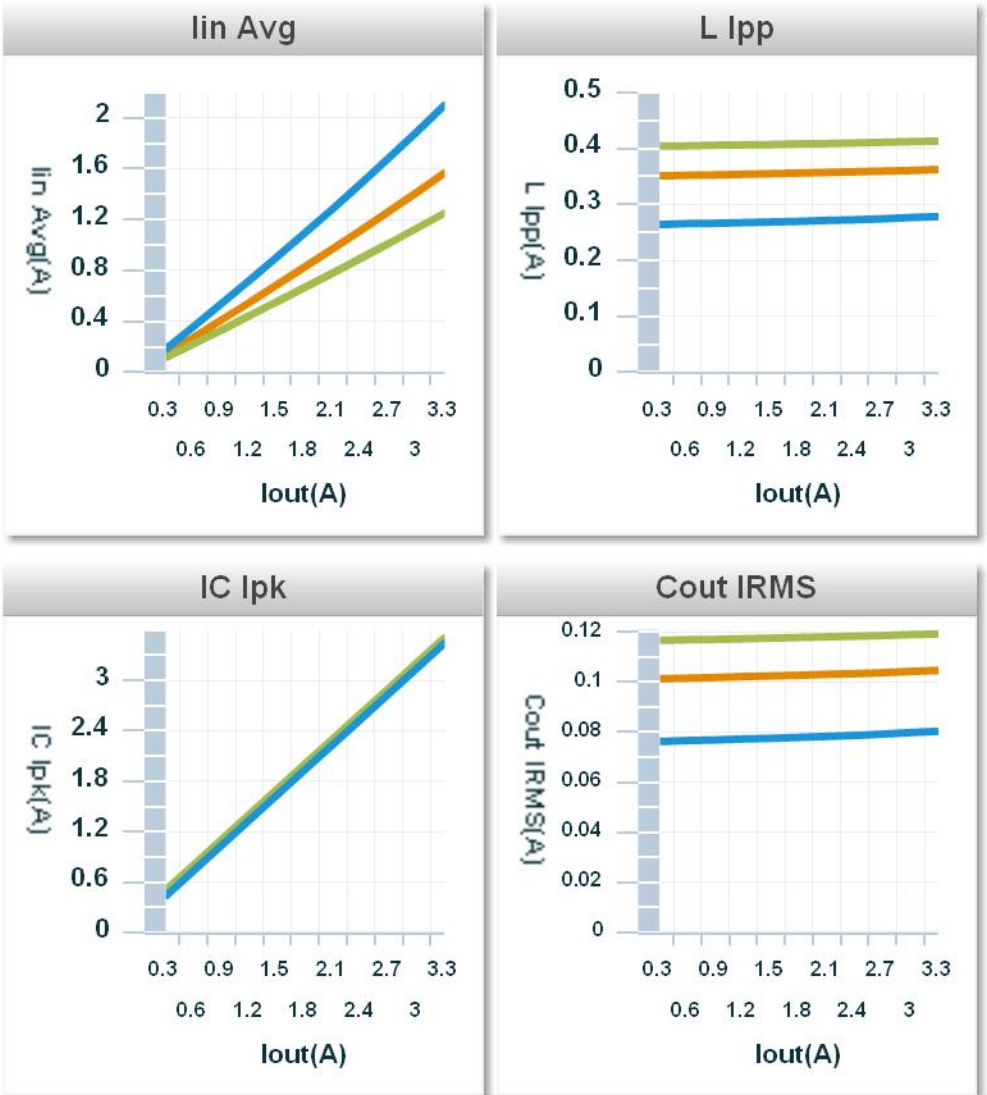
Part	Manufacturer	Part Number	Quant	Price	Attributes	Top View
Rsync	Vishay-Dale	CRCW04021K00FKED	1	0.01	Resistance=1000Ohm, Tolerance=1%, Power=0.063W	

## Operating Values

Name	Value	Category	Description
Iin Avg	1.13A	Current	Average input current
L Ipp	0.63A	Current	Peak-to-peak inductor ripple current
IC Ipk	3.32A	Current	Peak switch current in IC
Cout IRMS	0.18A	Current	Output capacitor RMS ripple current
Cin IRMS	1.14A	Current	Input capacitor RMS ripple current
Total BOM	3.95\$	General	Total BOM price
Pout	15W	General	Total output power
FootPrint	638mm2	General	Total Foot Print Area of BOM components
Mode	CCM	General	Conduction Mode
BOM Count	9	General	Total BOM count
Frequency	260KHz	General	Switching frequency
D1 TJ	126degC	Op_Point	D1 junction temperature
Cross Freq	22.4KHz	Op_point	Bode plot crossover frequency, indication of bandwidth
Duty Cycle	36.2%	Op_point	Duty cycle
IC TJ	48.9degC	Op_point	IC junction temperature
ICThetaJA	26degC/W	Op_point	IC junction-to-ambient thermal resistance
VIN_OP	15V	Op_point	Vin operating point
IOUT_OP	3A	Op_point	Iout operating point
Efficiency	88.5%	Op_point	Steady state efficiency
Phase Marg	60.0deg	Op_point	Bode Plot Phase Margin
M_Irms_Act	1.81A	Op_point	Q lavg
M_Vds_Act	0.32V	Op_point	
Vout p-p	0.01V	Op_point	Peak-to-peak output ripple voltage
Diode Pd	0.95W	Power	Diode power dissipation
IC Pd	0.72W	Power	IC power dissipation
Cout Pd	702uW	Power	Output capacitor power dissipation
Cin Pd	3.92mW	Power	Input capacitor power dissipation
Total Pd	1.94W	Power	Total Power Dissipation
L Pd	0.25W	Power	Inductor power dissipation

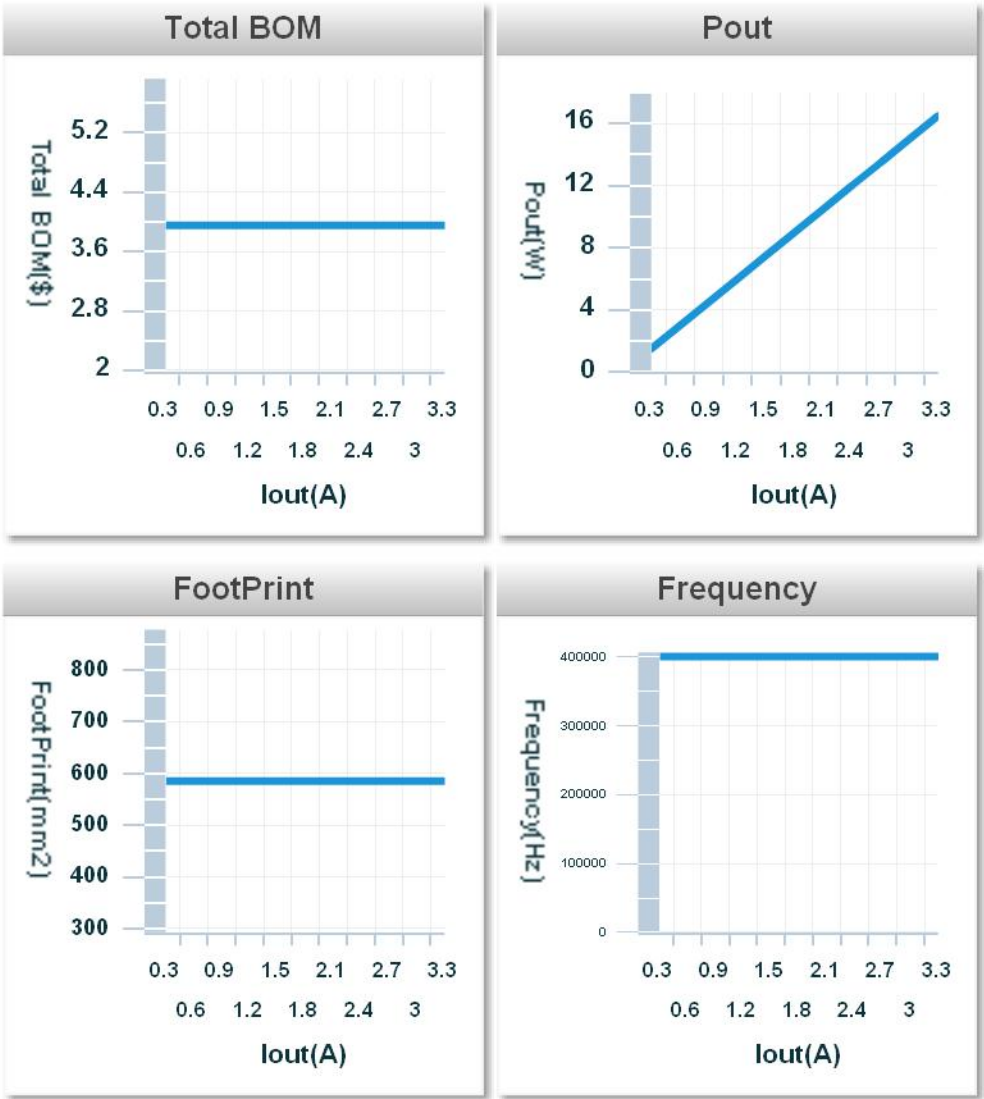
Charts

Current



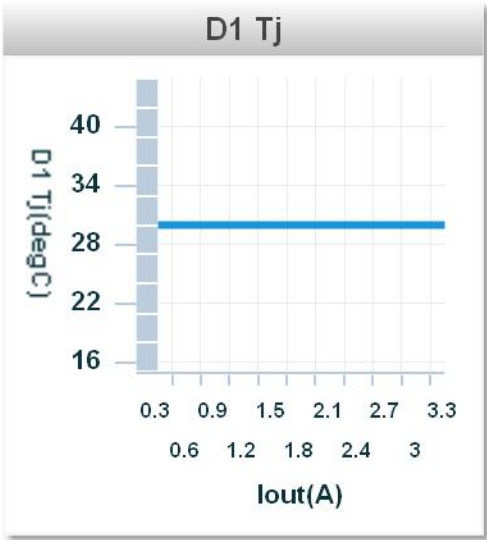
# Charts (Continued)

## General



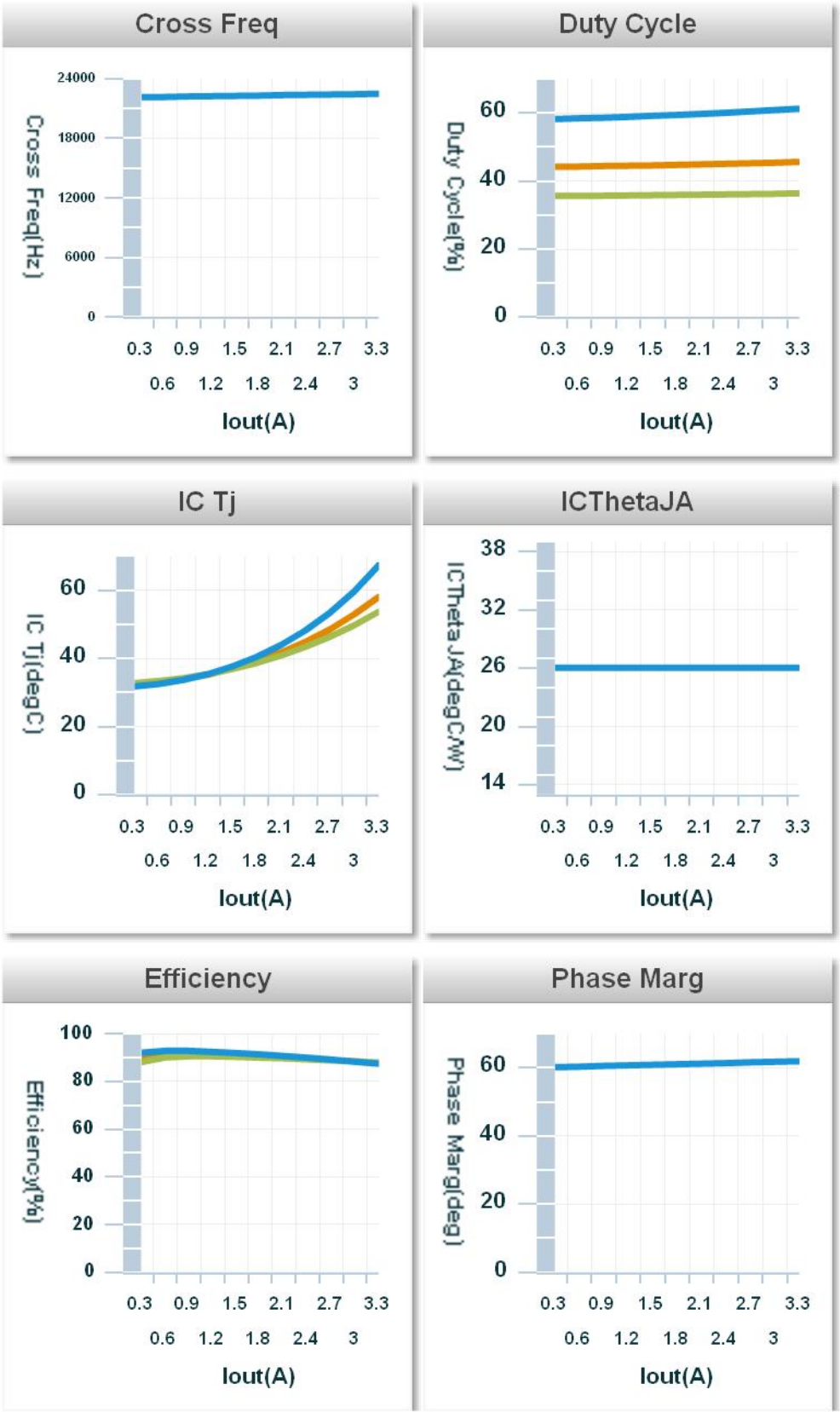
Charts (Continued)

Op\_Point



Charts (Continued)

Op\_point



■  $V_{in}=12.00V$  ■  $V_{in}=15.00V$  ■  $V_{in}=9.00V$