

Design 6 - LM22670MR-5.0

Introduction

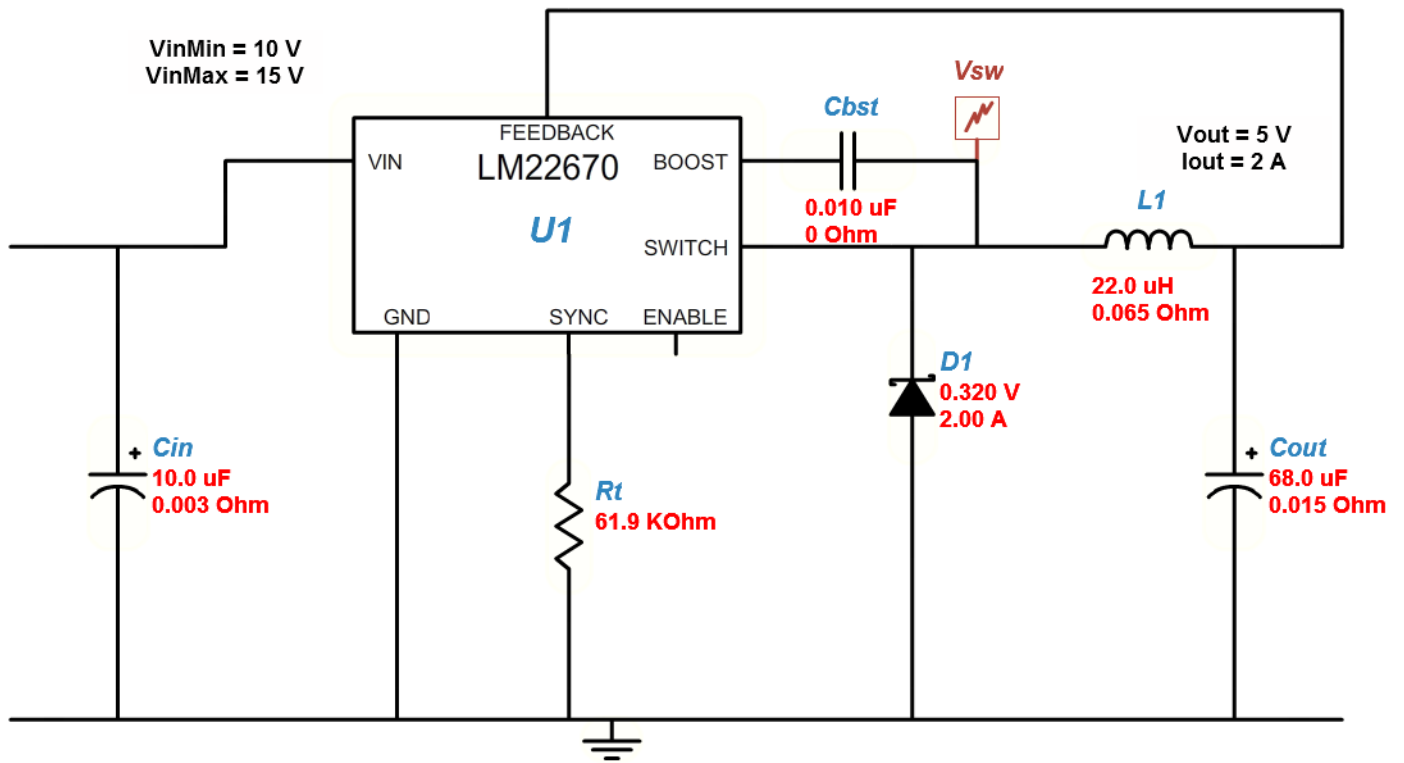
Design Specifications

IC	LM22670
VinMin	10 V
VinMax	15 V
Vout	5 V









Iout	2 A
ta	30
Optimization Factor	3
SoftStart Time	0 mili second

userfsw	600 KHertz
usecustomfsw	N
fsw	600 K

Schematic



Bill of Materials

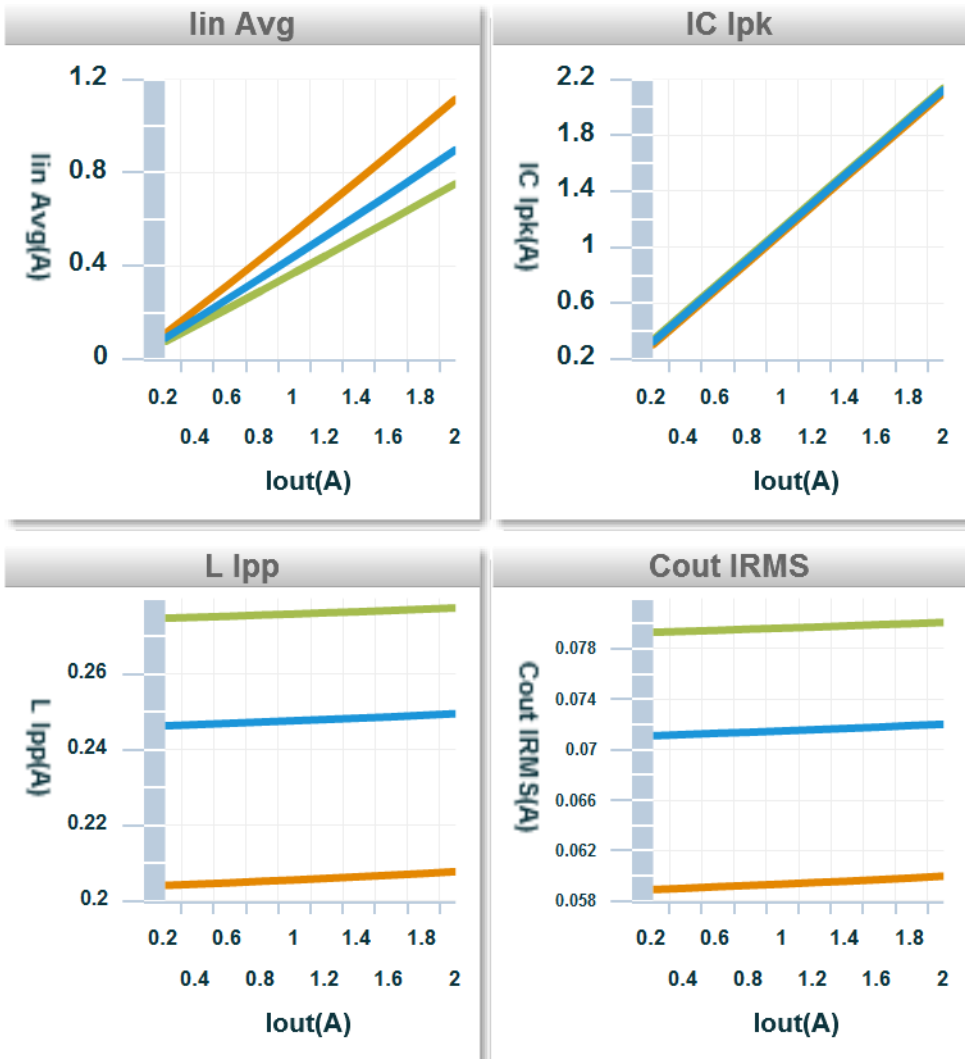
Part	Manufacturer	Part Number	Quan	Price	Attributes	Top View
Cbst	MuRata	GRM216R71H103KA01 D	1	0.01	Cap=10nF, ESR=0Ohm, VDC=50V	
Cin	TDK	C3225X7R1E106M	1	0.41	Cap=10uF, ESR=2.7mOhm, VDC=25V	
Cout	Panasonic	EEF-UD0K680R	1	1.17	Cap=68uF, ESR=0.015Ohm, VDC=8V	
D1	Toshiba	CMS06	1	0.19	VFatIo=0.32V, Io=2A, VRRM=30V	
L1	Coilcraft Inc.	MSS1038-223MLB	1	0.45	L=22uH, DCR=0.065Ohm, IDC=3.35A	
Rt	Vishay-Dale	CRCW040261k9FKED	1	0.02	Resistance=61.9KOhm, Tolerance=1%, Power=0.063W	
U1	National Semiconductor Inc.	LM22670MR-5.0	1	2.74		
Cinx	Taiyo Yuden	TMK212BJ105KG-T	1	0.03	Cap=1uF, ESR=0Ohm,	

Operating Values

Name	Value	Category	Description
Iin Avg	0.75A	Current	Average input current
IC Ipk	2.14A	Current	Peak switch current in IC
L Ipp	0.27A	Current	Peak-to-peak inductor ripple current
Cout IRMS	0.08A	Current	Output capacitor RMS ripple current
Cin IRMS	0.81A	Current	Input capacitor RMS ripple current
FootPrint	192mm ²	General	Total Foot Print Area of BOM components
Mode	CCM	General	Conduction Mode
Frequency	575KHz	General	Switching frequency
Pout	10W	General	Total output power
Efficiency	88.6%	Op_point	Steady state efficiency
IC Tj	65.4degC	Op_point	IC junction temperature
IOUT_OP	2A	Op_point	Iout operating point
Phase Marg	57.6deg	Op_point	Bode Plot Phase Margin
VIN_OP	15V	Op_point	Vin operating point
Cross Freq	30.9KHz	Op_point	Bode plot crossover frequency, in
Duty Cycle	35.1%	Op_point	Duty cycle
ICThetaJA	60degC/W	Op_point	IC junction-to-ambient thermal resistance
Vout p-p	4.26mV	Op_point	Peak-to-peak output ripple voltage
M_Irms_Act	1.19A	Op_point	Q lavg
M_Vds_Act	0.16V	Op_point	
L Pd	0.28W	Power	Inductor power dissipation
IC Pd	0.59W	Power	IC power dissipation
Cout Pd	96.2uW	Power	Output capacitor power dissipation
Diode Pd	0.41W	Power	Diode power dissipation
Cin Pd	1.81mW	Power	Input capacitor power dissipation

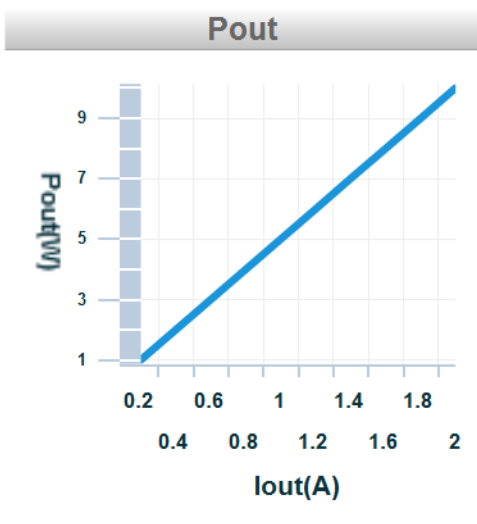
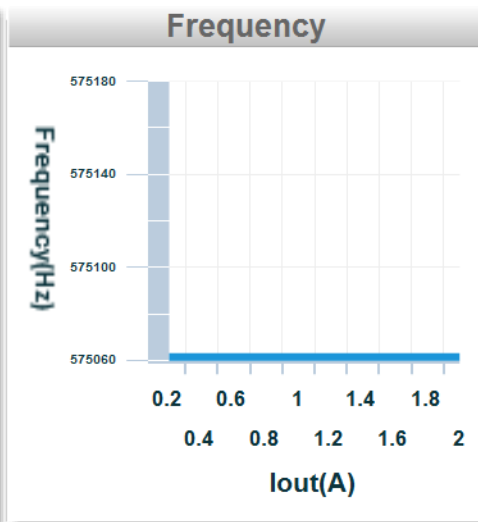
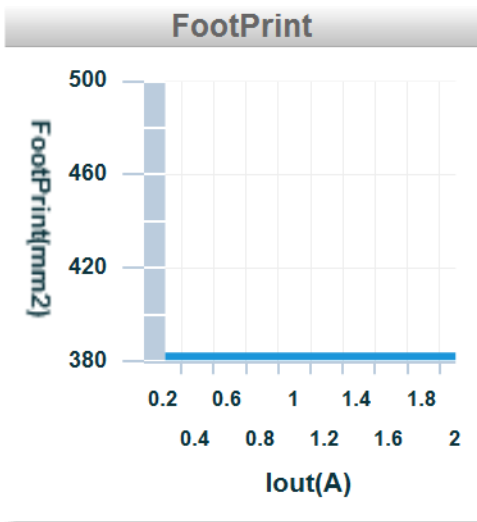
Charts

Current



Charts (Continued)

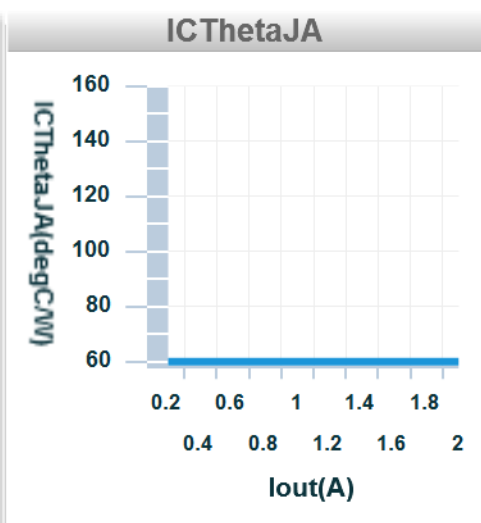
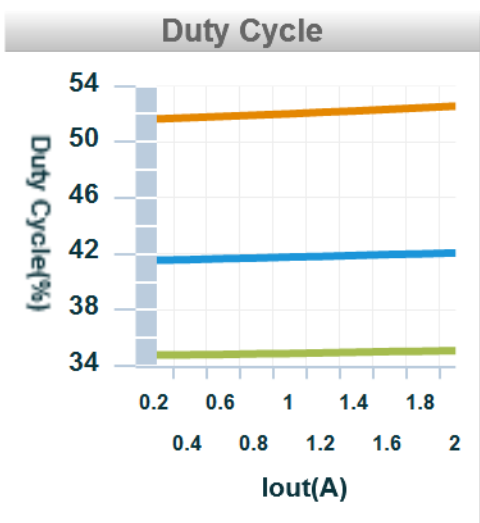
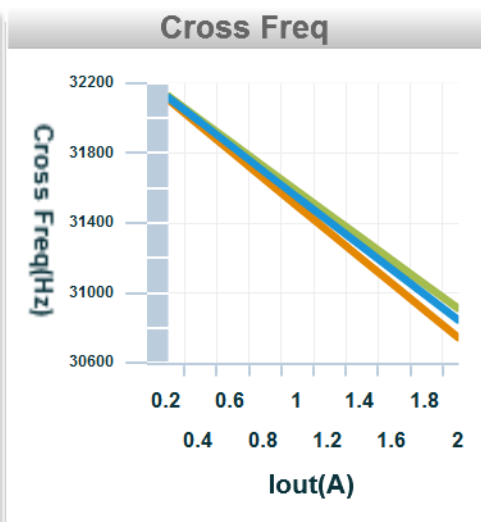
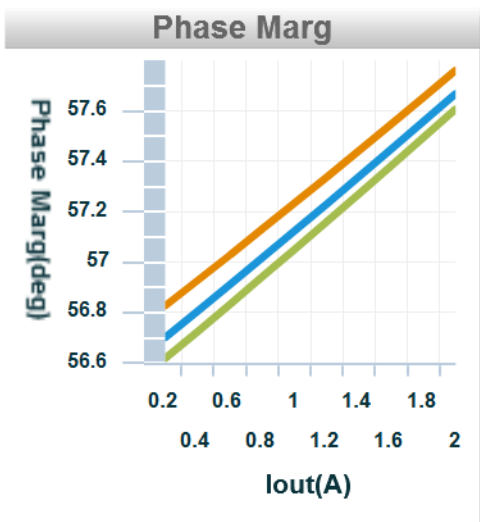
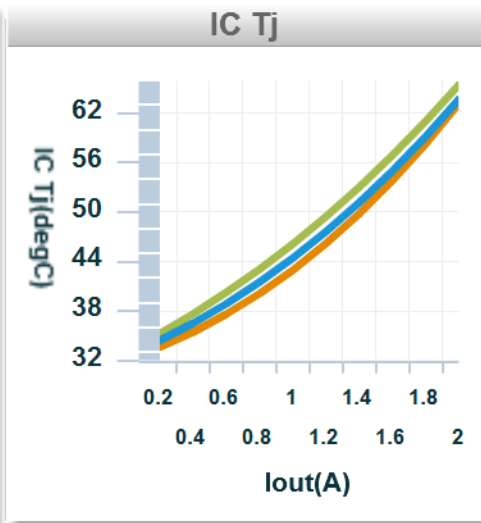
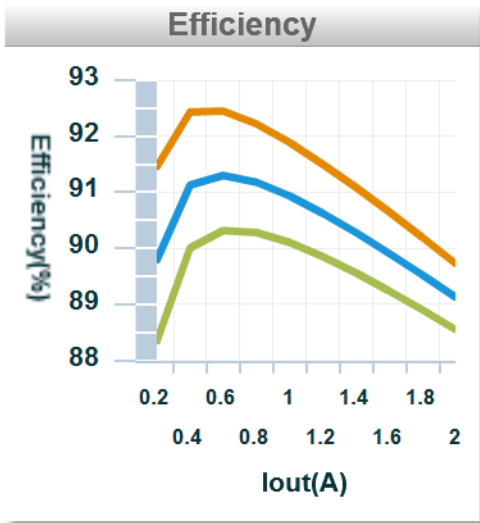
General



Charts (Continued)

Op_point

■ Vin=10.00V ■ Vin=15.00V ■ Vin=12.50V



Charts (Continued)

Power

