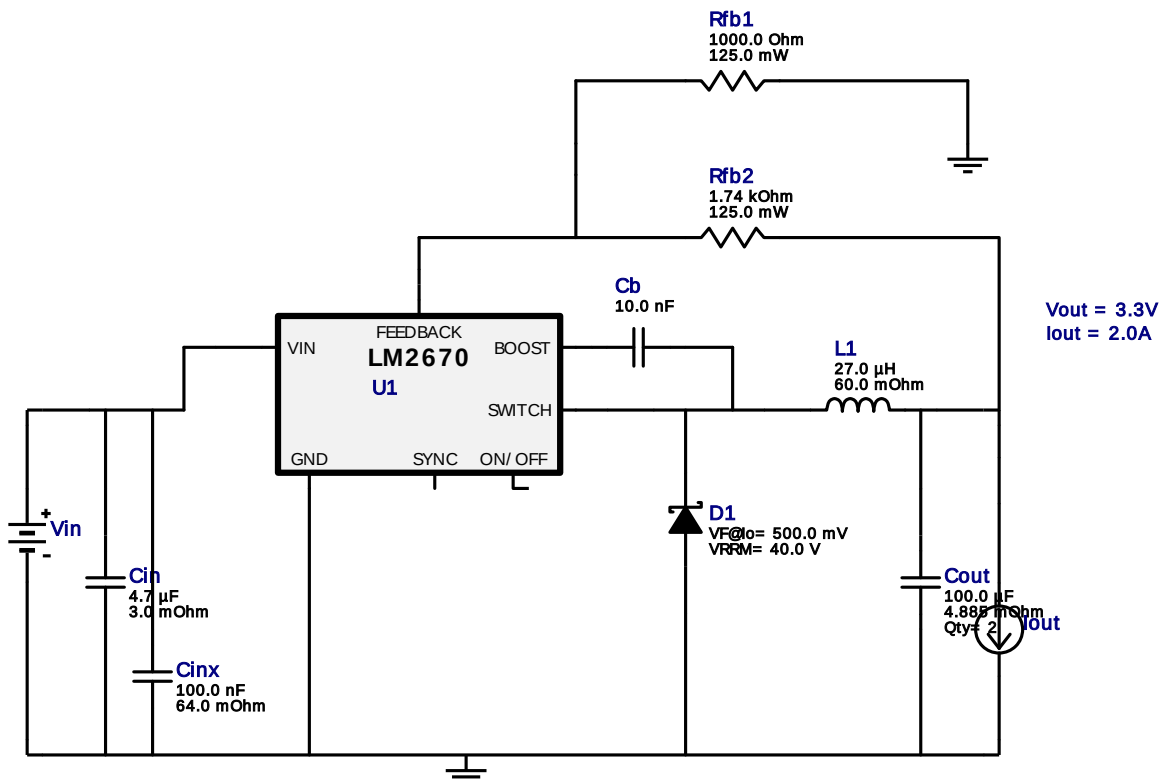


WEBENCH® Design Report

Design : 3893481/20 LM2670SX-ADJ/NOPB
LM2670SX-ADJ/NOPB 14.0V-22.0V to 3.30V @ 2.0A

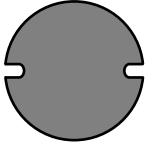
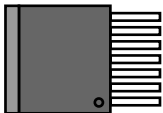


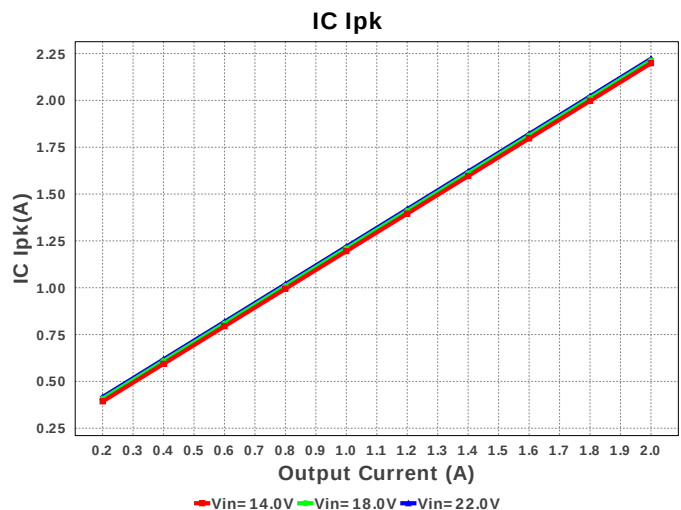
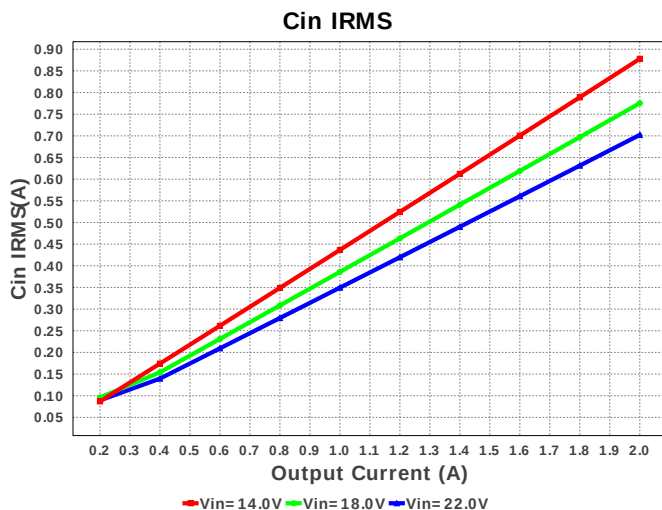
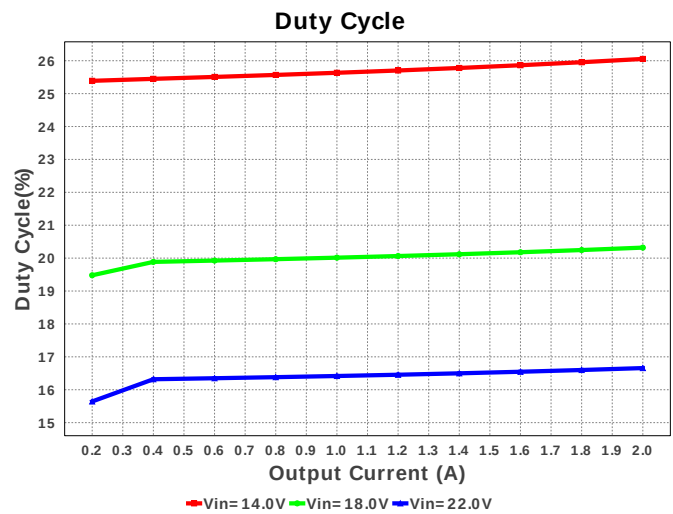
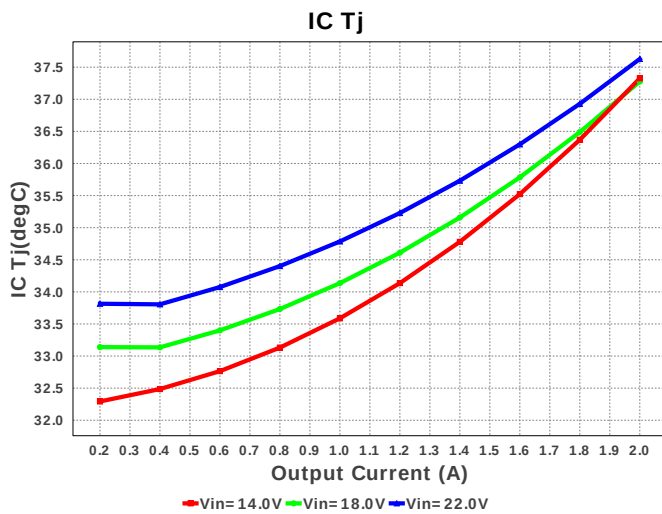
My Comments

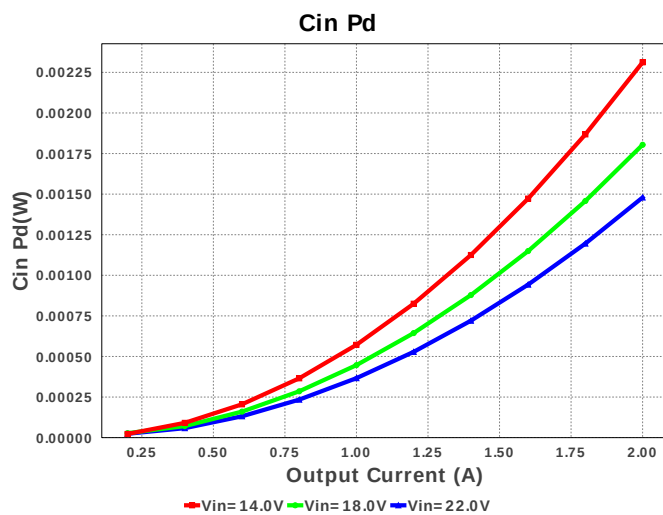
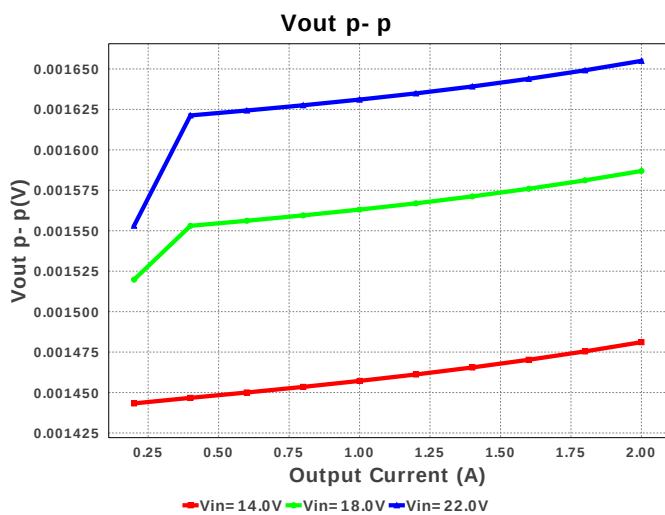
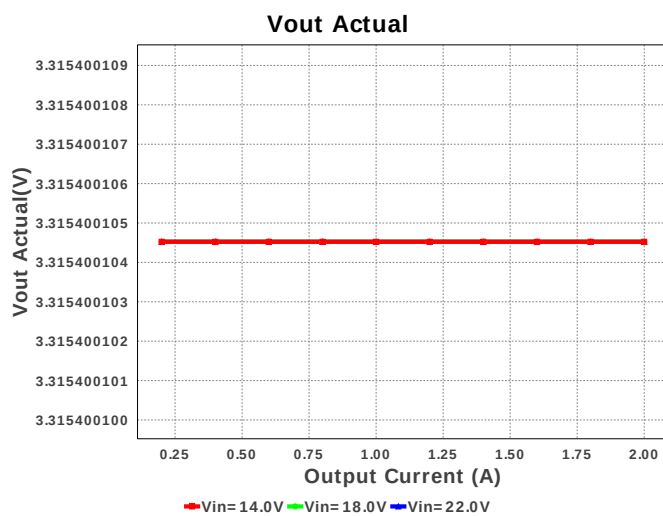
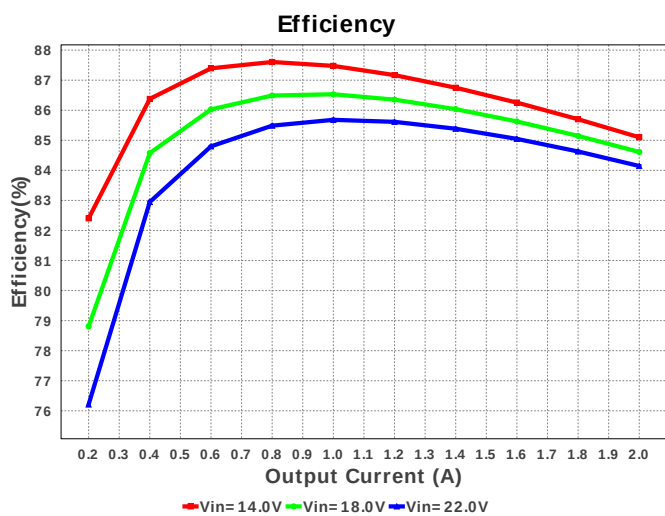
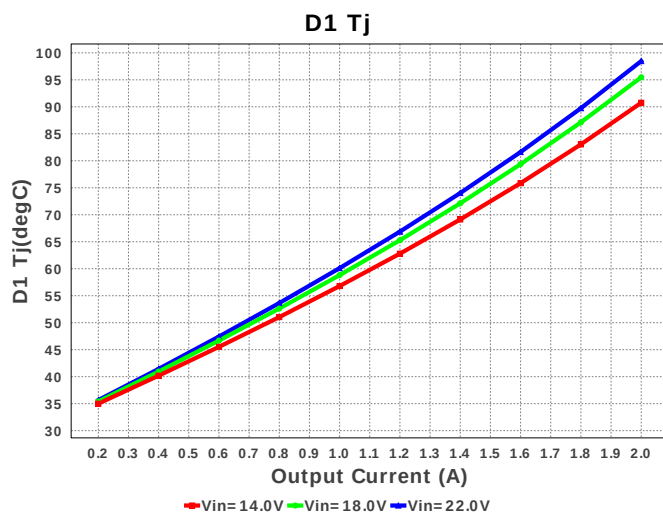
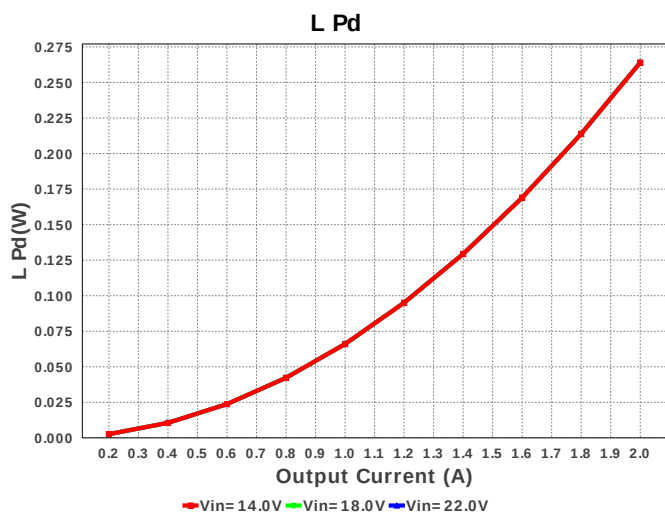
23

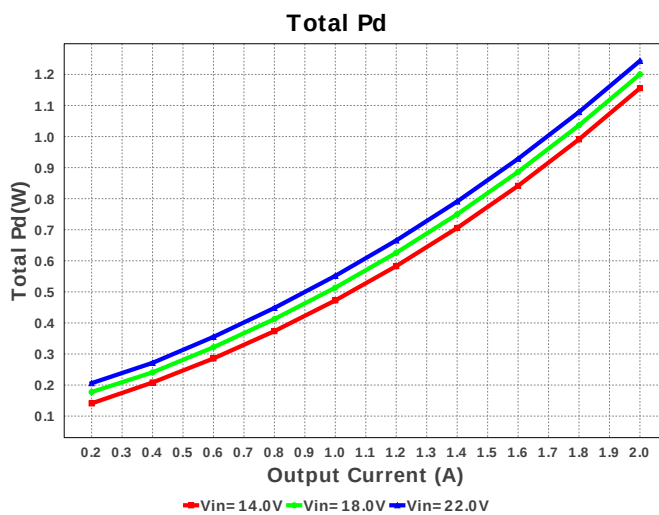
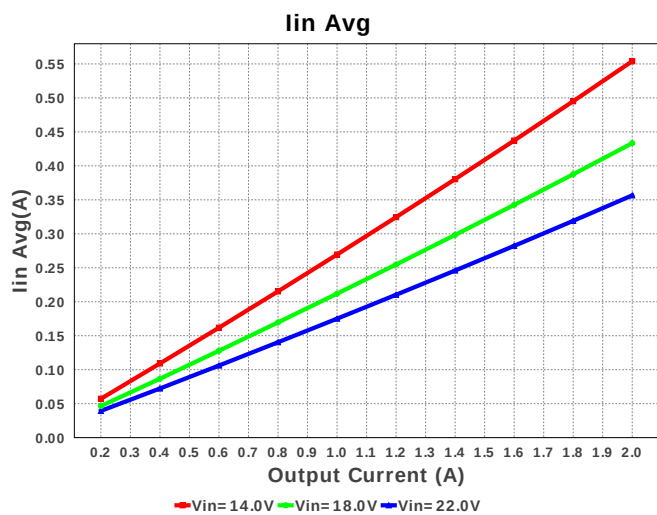
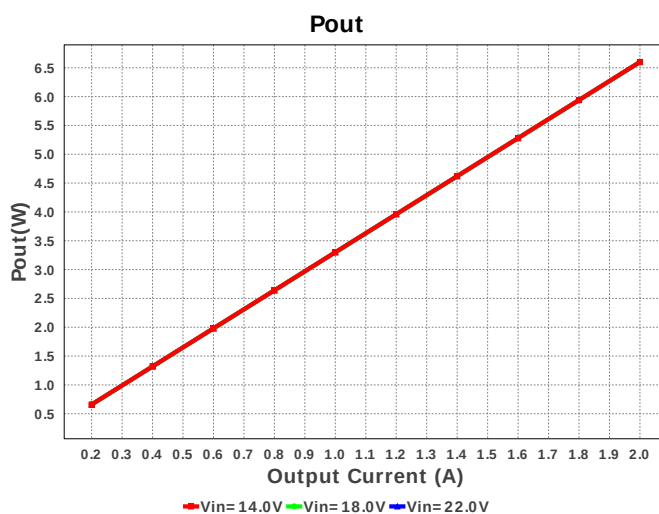
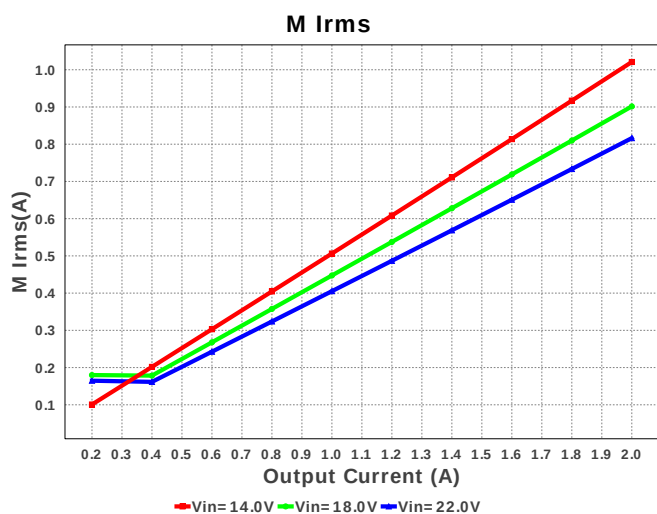
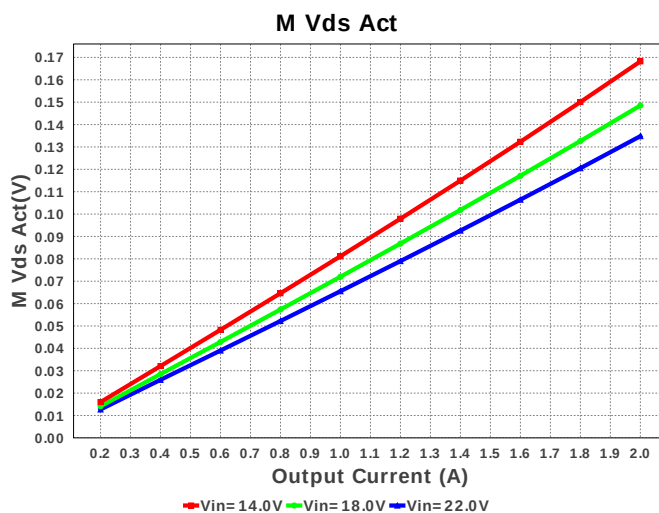
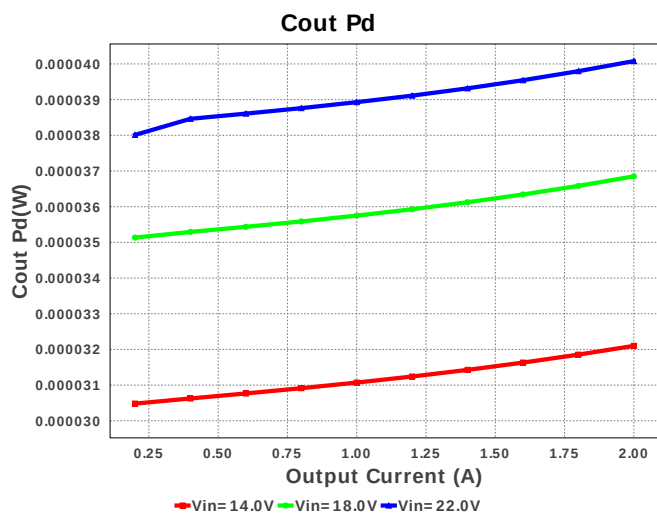
Electrical BOM

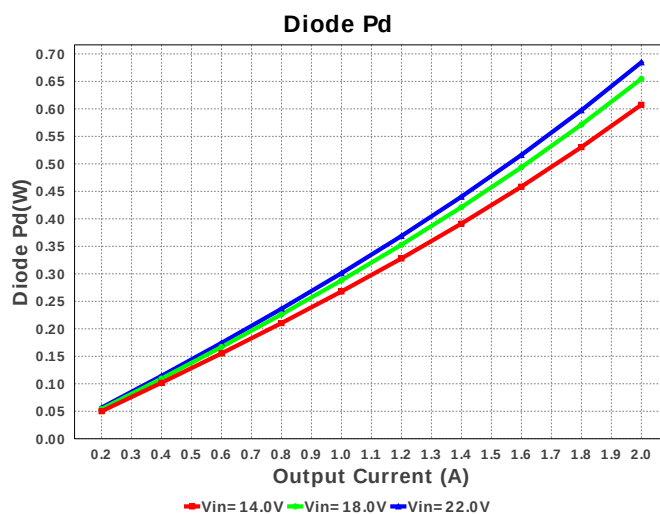
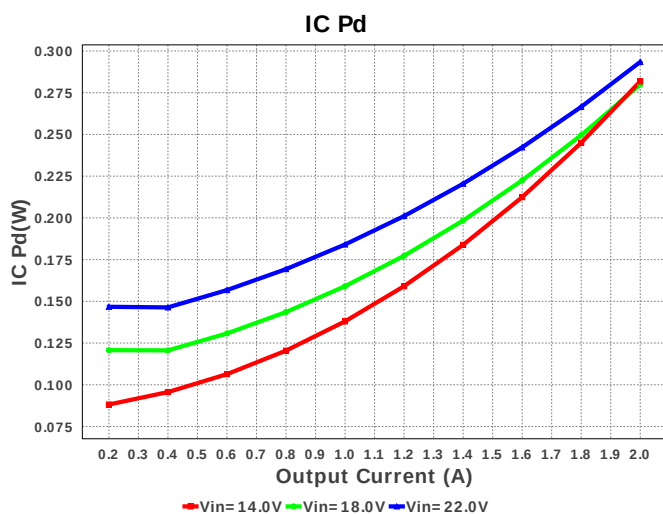
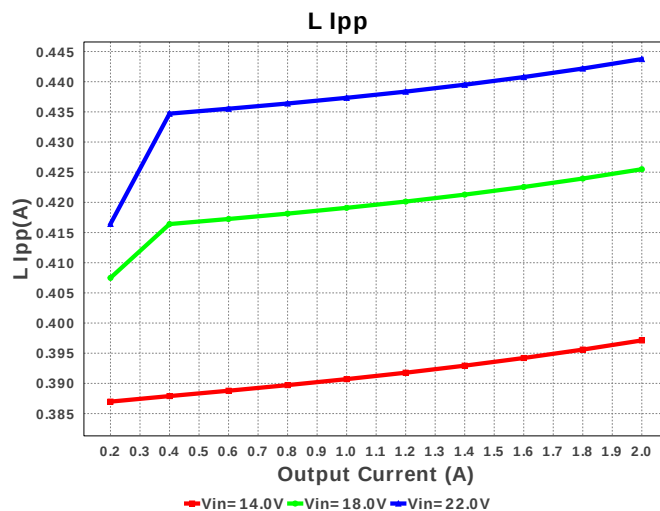
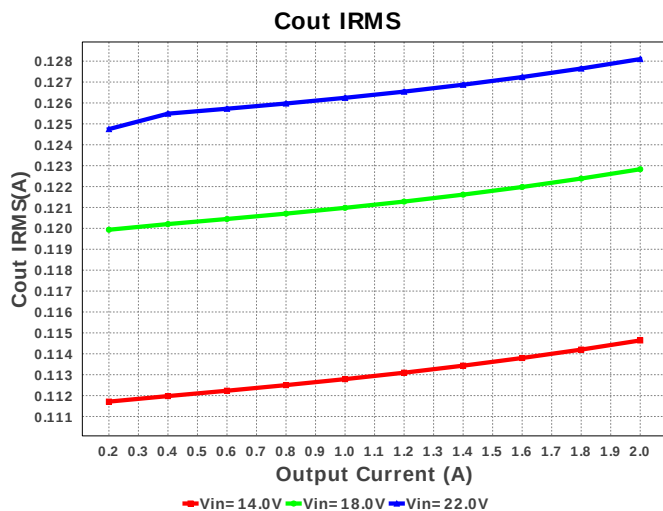
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cb	MuRata	GRM216R71H103KA01D Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
2.	Cin	MuRata	GRM31CR71H475KA12L Series= X7R	Cap= 4.7 uF ESR= 3.0 mOhm VDC= 50.0 V IRMS= 4.98 A	1	\$0.07	 1206 11 mm ²
3.	Cinx	Kemet	C0805C104K5RACTU Series= X7R	Cap= 100.0 nF ESR= 64.0 mOhm VDC= 50.0 V IRMS= 1.64 A	1	\$0.01	 0805 7 mm ²
4.	Cout	MuRata	GRM31CR60J107ME39L Series= X5R	Cap= 100.0 uF ESR= 4.885 mOhm VDC= 6.3 V IRMS= 4.4118 A	2	\$0.14	 1206_190 11 mm ²
5.	D1	Diodes Inc.	B340A-13-F	VF@Io= 500.0 mV VRRM= 40.0 V	1	\$0.11	 SMA 37 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
6.	L1	Bourns	SDR1307-270ML	L= 27.0 μ H DCR= 60.0 mOhm	1	\$0.35	 SDR1307 227 mm ²
7.	Rfb1	Panasonic	ERJ-6ENF1001V Series= ERJ-6E	Res= 1000.0 Ohm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
8.	Rfb2	Panasonic	ERJ-6ENF1741V Series= ERJ-6E	Res= 1.74 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
9.	U1	Texas Instruments	LM2670SX-ADJ/NOPB	Switcher	1	\$1.85	 TS7B 199 mm ²









Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	702.231 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	128.098 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.222 A	Current	Peak switch current in IC
4.	Iin Avg	356.53 mA	Current	Average input current
5.	L Ipp	443.74 mA	Current	Peak-to-peak inductor ripple current
6.	M Irms	816.289 mA	Current	MOSFET RMS current
7.	BOM Count	10	General	Total Design BOM count
8.	FootPrint	522.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	260.0 kHz	General	Switching frequency
10.	IC Tolerance	24.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	134.814 mV	General	Voltage drop across the MosFET
12.	Pout	6.6 W	General	Total output power
13.	Total BOM	\$2.7	General	Total BOM Cost
14.	D1 Tj	98.47 degC	Op_Point	D1 junction temperature
15.	Vout Actual	3.315 V	Op_Point	Vout Actual calculated based on selected voltage divider resistors
16.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
17.	Cross Freq	20.475 kHz	Op_point	Bode plot crossover frequency
18.	Duty Cycle	16.658 %	Op_point	Duty cycle
19.	Efficiency	84.145 %	Op_point	Steady state efficiency
20.	IC Tj	37.629 degC	Op_point	IC junction temperature
21.	ICThetaJA	26.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
22.	IOUT_OP	2.0 A	Op_point	Iout operating point
23.	Phase Marg	42.717 deg	Op_point	Bode Plot Phase Margin
24.	VIN_OP	22.0 V	Op_point	Vin operating point
25.	Vout p-p	1.655 mV	Op_point	Peak-to-peak output ripple voltage
26.	Cin Pd	1.479 mW	Power	Input capacitor power dissipation
27.	Cout Pd	40.079 μ W	Power	Output capacitor power dissipation
28.	Diode Pd	684.696 mW	Power	Diode power dissipation
29.	IC Pd	293.408 mW	Power	IC power dissipation
30.	L Pd	264.0 mW	Power	Inductor power dissipation
31.	Total Pd	1.244 W	Power	Total Power Dissipation

#	Name	Value	Category	Description
32.	Vout Tolerance	3.292 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	2.0	Maximum Output Current
2.	VinMax	22.0	Maximum input voltage
3.	VinMin	14.0	Minimum input voltage
4.	Vout	3.3	Output Voltage
5.	base_pn	LM2670	Texas Instruments Base Part Number
6.	source	DC	Input Source Type
7.	ta	30.0	Ambient temperature

Design Assistance

1. LM2670 Product Folder : <http://www.ti.com/product/LM2670> : contains the data sheet and other resources.

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