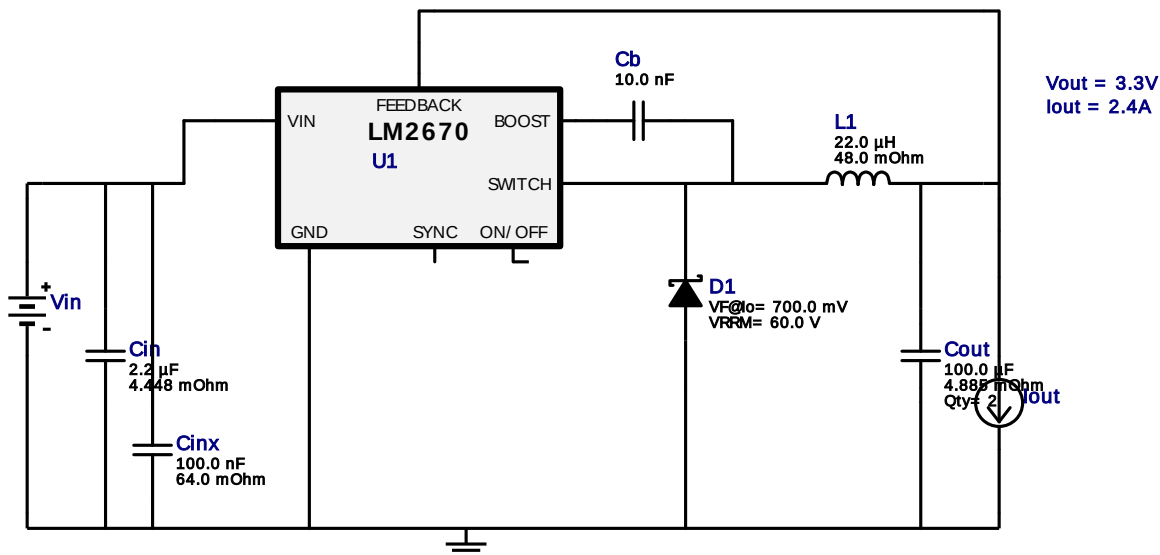


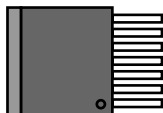
WEBENCH® Design Report

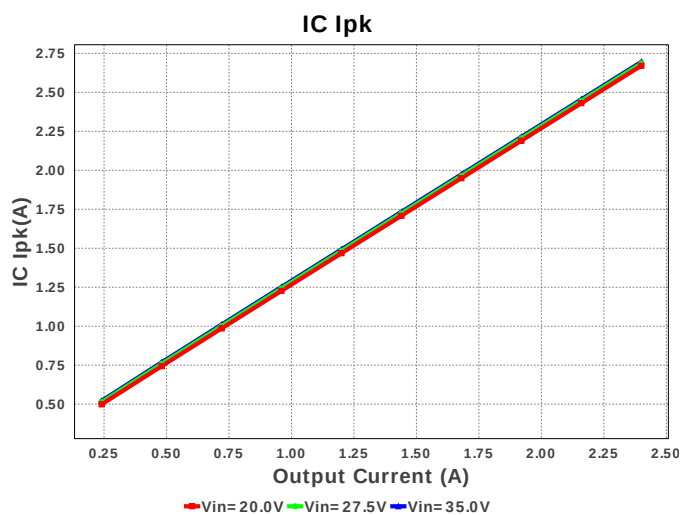
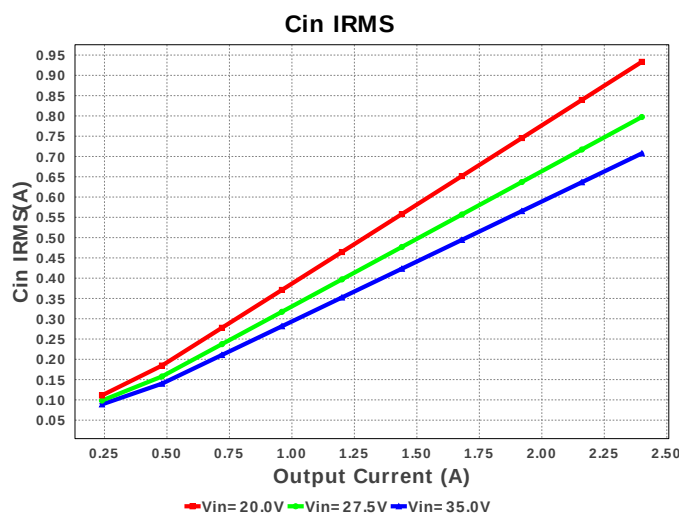
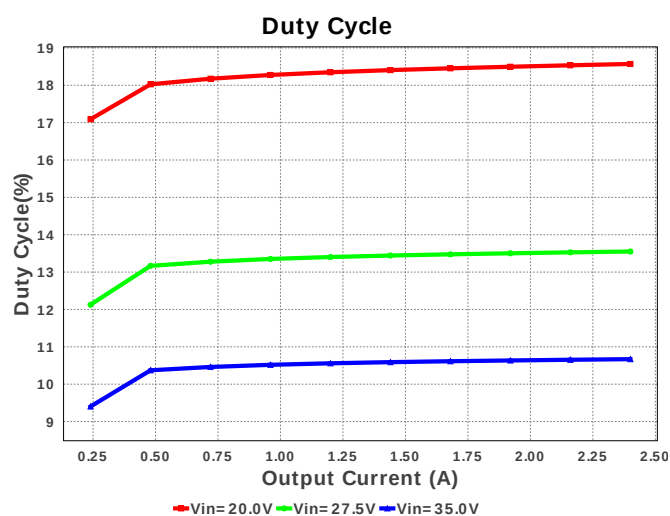
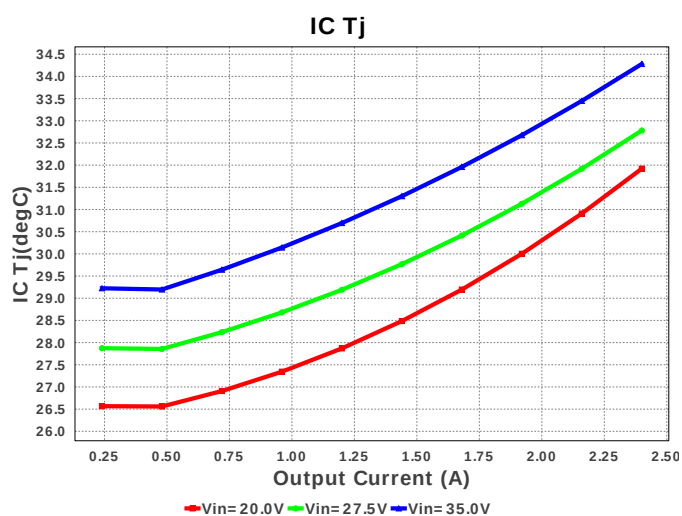
Design : 4774498/18 LM2670SX-3.3/NOPB
LM2670SX-3.3/NOPB 20.0V-35.0V to 3.30V @ 2.4A

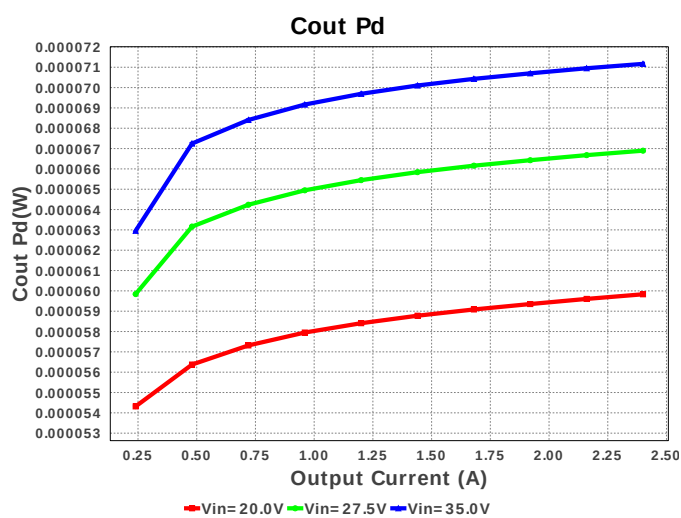
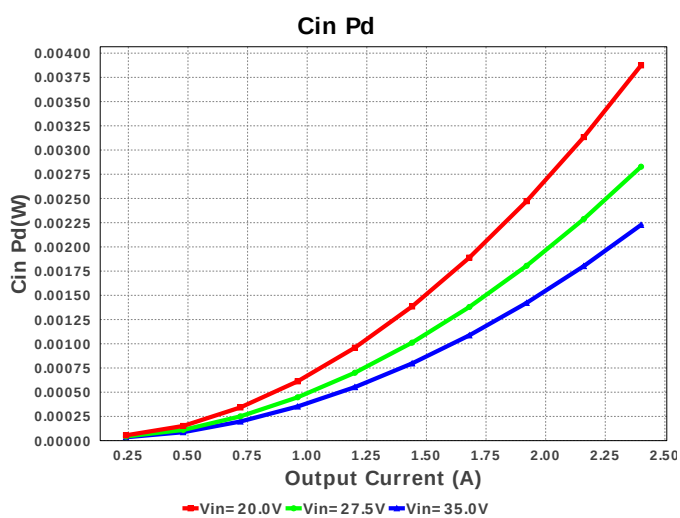
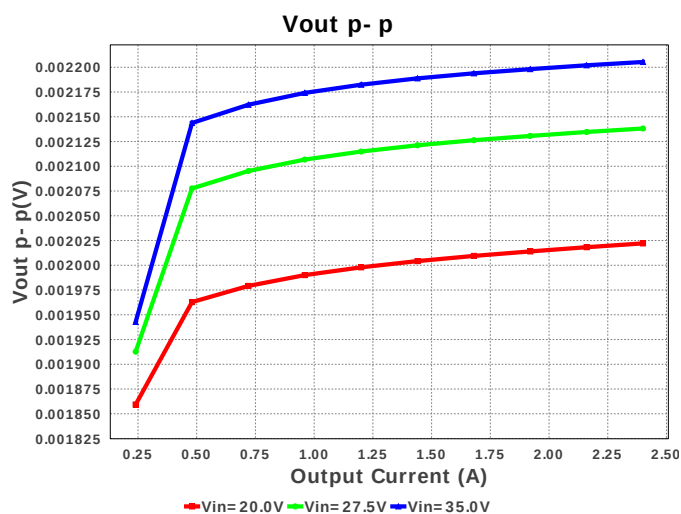
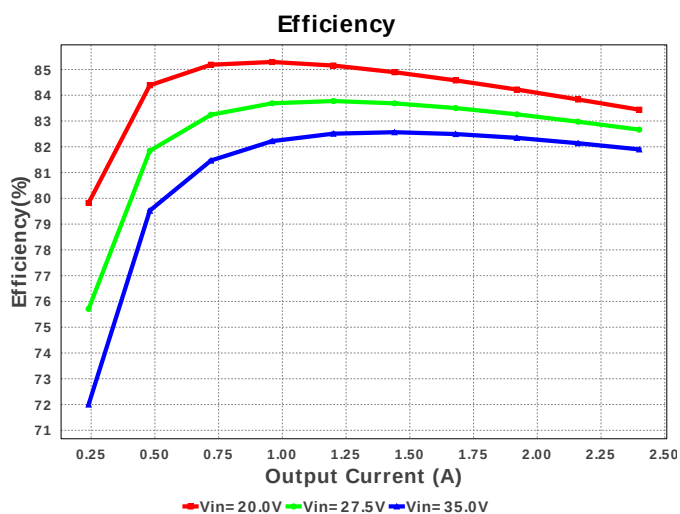
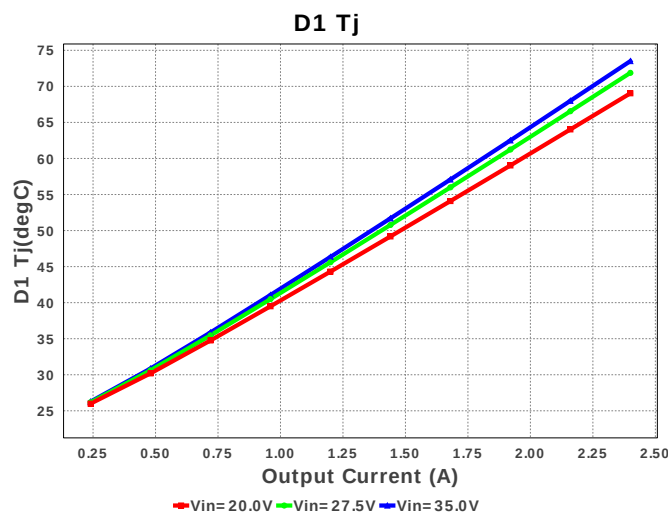
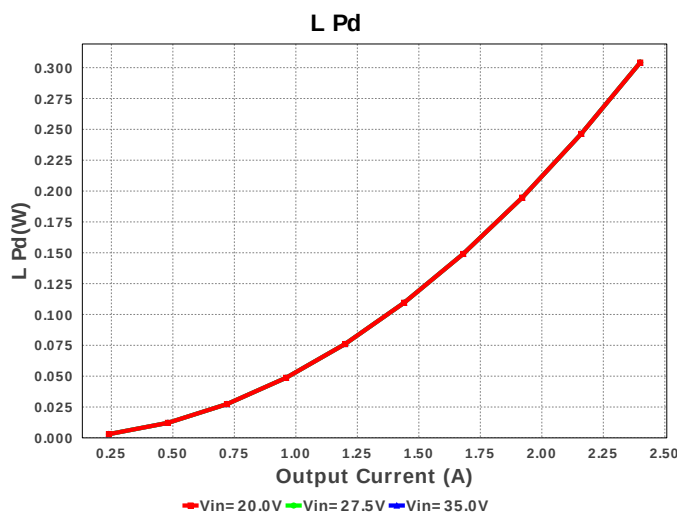


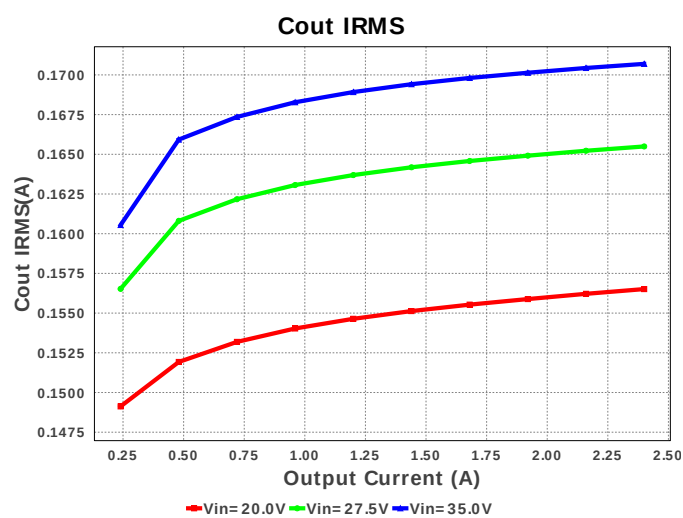
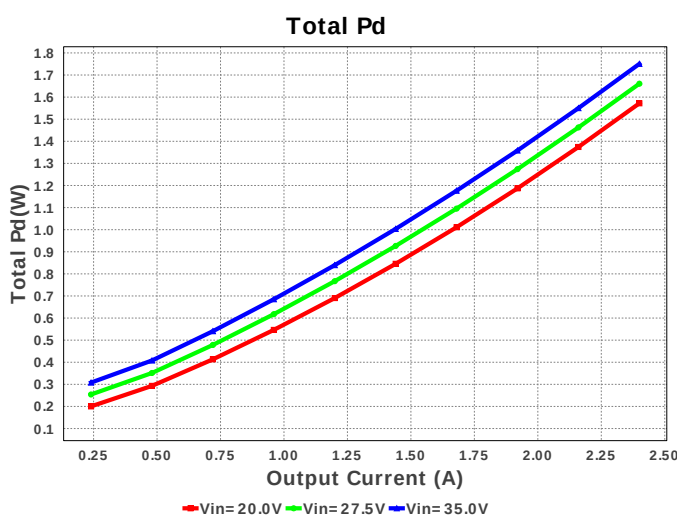
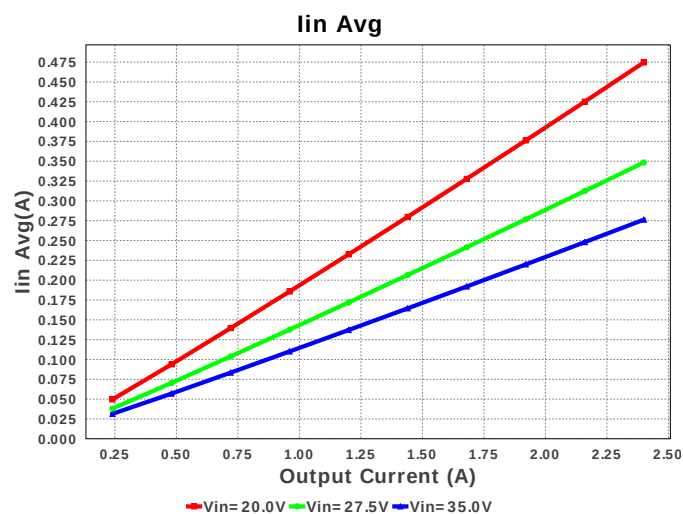
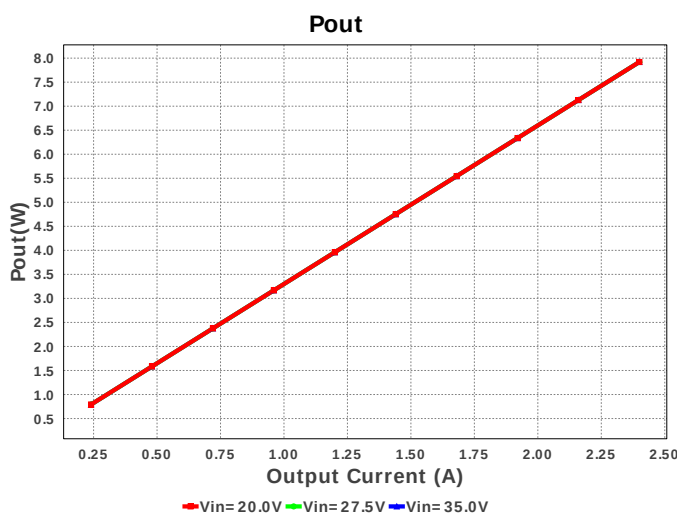
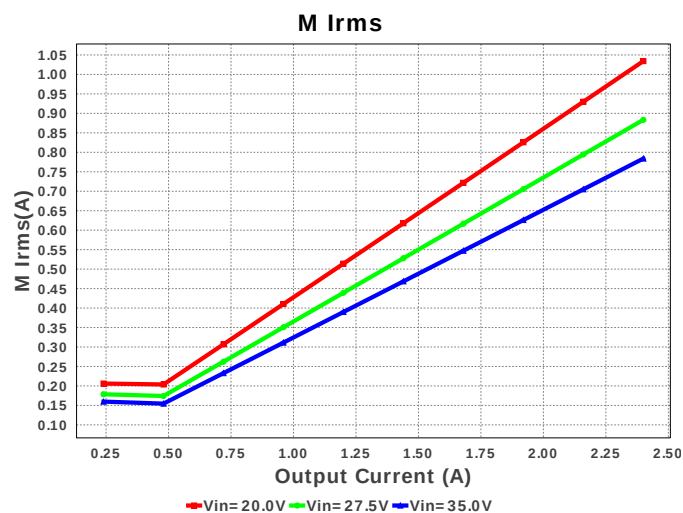
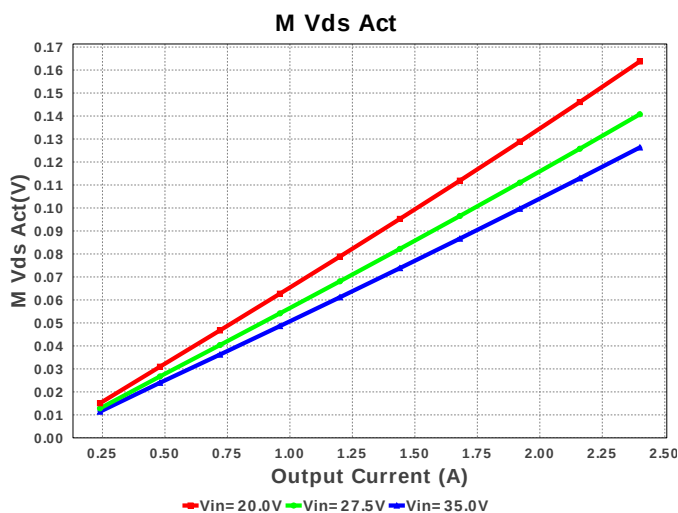
Electrical BOM

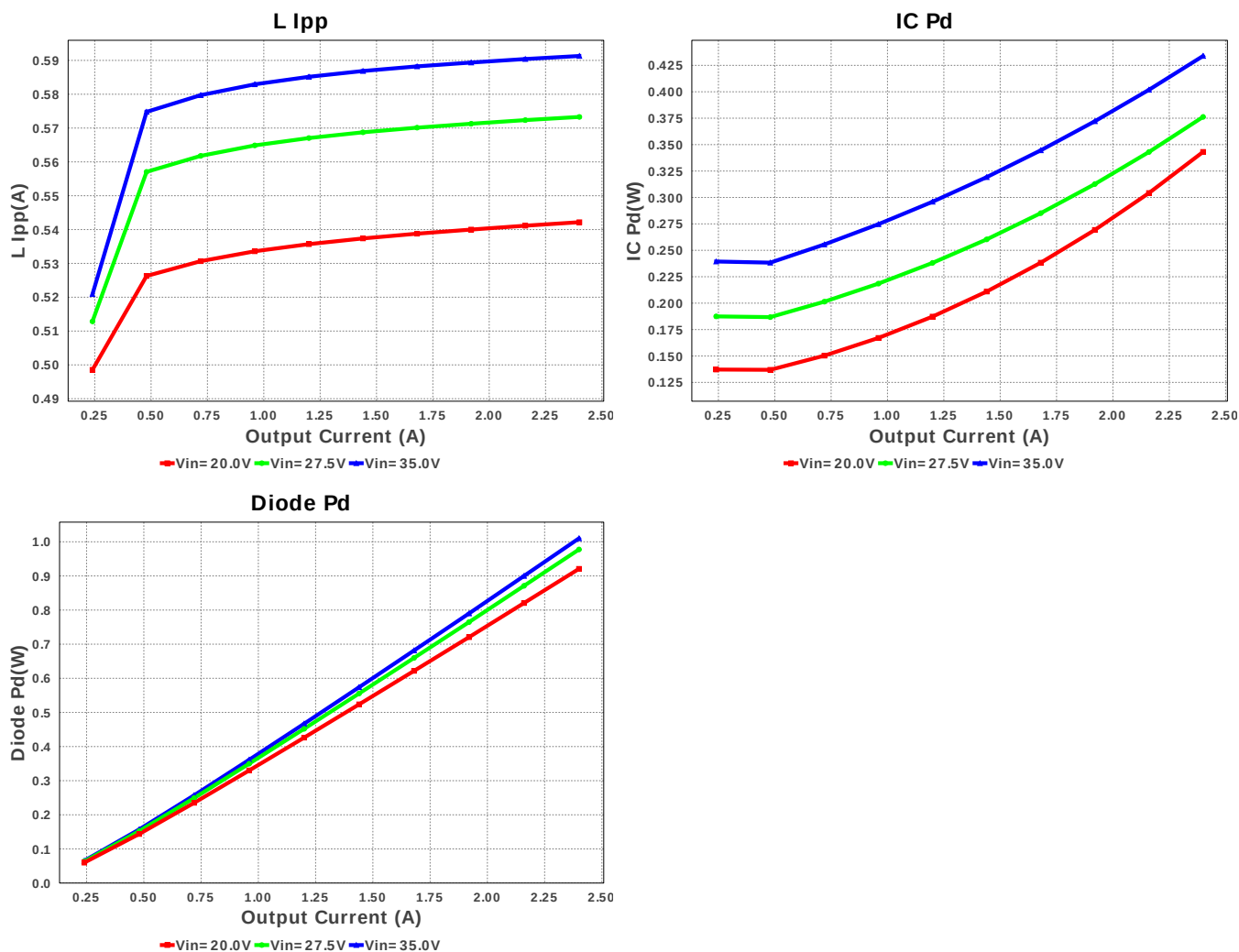
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cb	MuRata	GRM216R71H103KA01D Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7 mm ²
2.	Cin	MuRata	GRM31CR71H225KA88L Series= X7R	Cap= 2.2 uF ESR= 4.448 mOhm VDC= 50.0 V IRMS= 2.2252 A	1	\$0.05	 1206_190 11 mm ²
3.	Cinx	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.	B560C-13-F	VF@Io= 700.0 mV VRRM= 60.0 V	1	\$0.17	 SMC 83 mm ²
6.	L1	Bourns	SRR1208-220ML	L= 22.0 µH DCR= 48.0 mOhm	1	\$0.37	 SRR1208 216 mm ²

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
7.	U1	Texas Instruments	LM2670SX-3.3/NOPB	Switcher	1	\$1.85	

TS7B 199 mm²







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	707.567 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	170.695 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	2.696 A	Current	Peak switch current in IC
4.	Iin Avg	276.3 mA	Current	Average input current
5.	L Ipp	591.3 mA	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	783.944 mA	Current	Q lavg
7.	BOM Count	8	General	Total Design BOM count
8.	FootPrint	544.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	260.0 kHz	General	Switching frequency
10.	IC Tolerance	66.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	126.322 mV	General	Voltage drop across the MosFET
12.	Mode	CCM	General	Conduction Mode
13.	Pout	7.92 W	General	Total output power
14.	Total BOM	\$2.74	General	Total BOM Cost
15.	D1 Tj	73.506 degC	Op_Point	D1 junction temperature
16.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
17.	Cross Freq	24.274 kHz	Op_point	Bode plot crossover frequency
18.	Duty Cycle	10.67 %	Op_point	Duty cycle
19.	Efficiency	81.899 %	Op_point	Steady state efficiency
20.	IC Tj	34.281 degC	Op_point	IC junction temperature
21.	ICThetaJA	26.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
22.	IOUT_OP	2.4 A	Op_point	Iout operating point
23.	Phase Marg	44.761 deg	Op_point	Bode Plot Phase Margin
24.	VIN_OP	35.0 V	Op_point	Vin operating point
25.	Vout p-p	2.205 mV	Op_point	Peak-to-peak output ripple voltage
26.	Cin Pd	2.227 mW	Power	Input capacitor power dissipation
27.	Cout Pd	71.166 μW	Power	Output capacitor power dissipation
28.	Diode Pd	1.01 W	Power	Diode power dissipation
29.	IC Pd	433.873 mW	Power	IC power dissipation
30.	L Pd	304.128 mW	Power	Inductor power dissipation
31.	Total Pd	1.75 W	Power	Total Power Dissipation

#	Name	Value	Category	Description
32.	Vout Tolerance	2.0 %		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	2.4	Maximum Output Current
2.	VinMax	35.0	Maximum input voltage
3.	VinMin	20.0	Minimum input voltage
4.	Vout	3.3	Output Voltage
5.	base_pn	LM2670	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	23.0	Ambient temperature

Design Assistance

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

Texas Instruments' WEBENCH simulation tools attempt to recreate the performance of a substantially equivalent physical implementation of the design. Simulations are created using Texas Instruments' published specifications as well as the published specifications of other device manufacturers. While Texas Instruments does update this information periodically, this information may not be current at the time the simulation is built. Texas Instruments does not warrant the accuracy or completeness of the specifications or any information contained therein. Texas Instruments does not warrant that any designs or recommended parts will meet the specifications you entered, will be suitable for your application or fit for any particular purpose, or will operate as shown in the simulation in a physical implementation. Texas Instruments does not warrant that the designs are production worthy.

You should completely validate and test your design implementation to confirm the system functionality for your application prior to production.

Use of Texas Instruments' WEBENCH simulation tools is subject to [Texas Instruments' Site Terms and Conditions of Use](#). Prototype boards based on WEBENCH created designs are provided AS IS without warranty of any kind for evaluation and testing purposes and are subject to the terms of the [Evaluation License Agreement](#).