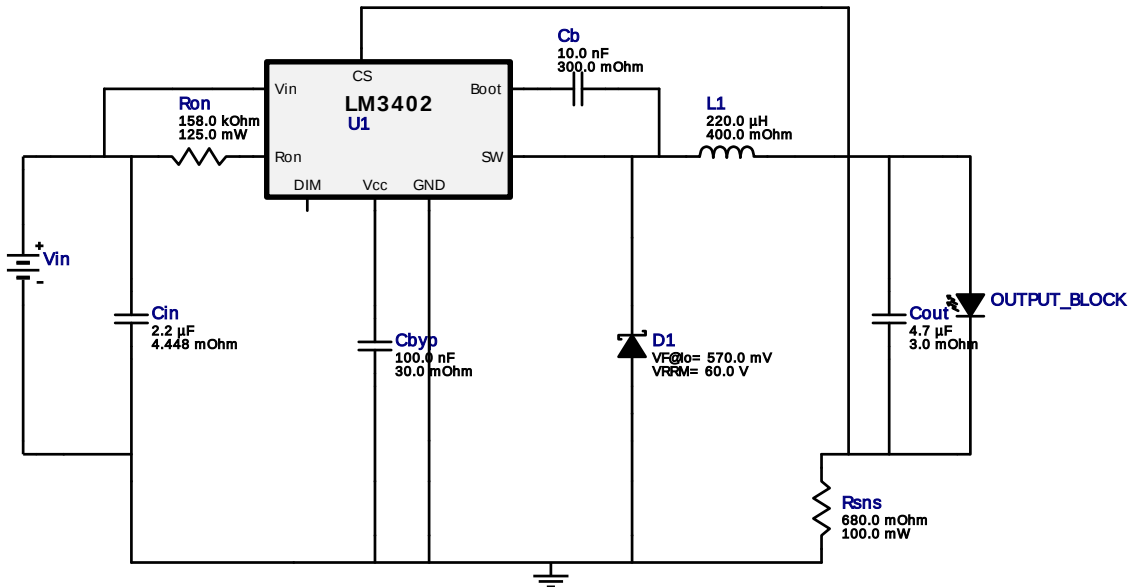


WEBENCH® Design Report

Design : 4740075/3 LM3402MR/NOPB
LM3402MR/NOPB 24.0V-32.0V to 3.35V @ 0.35A

Vout = 3.15V
Iout = 0.35A



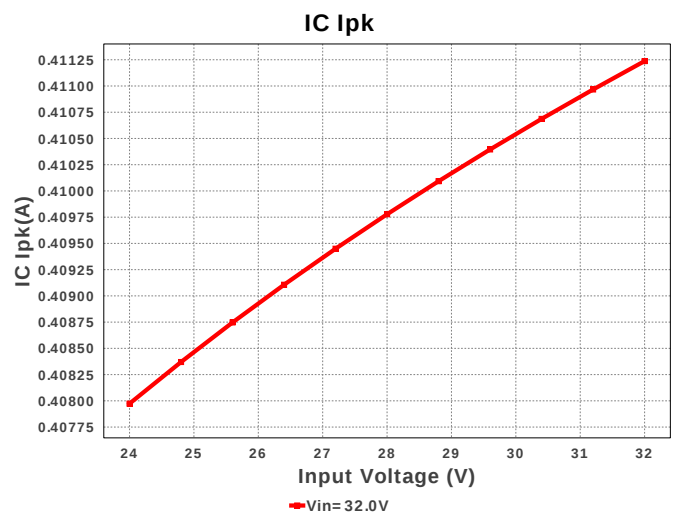
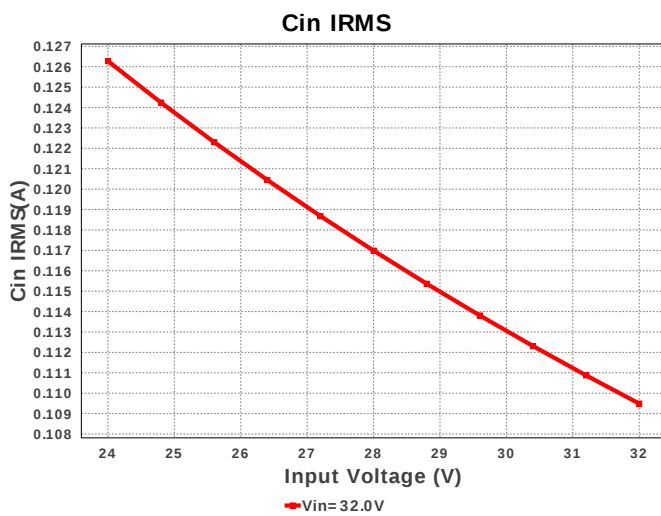
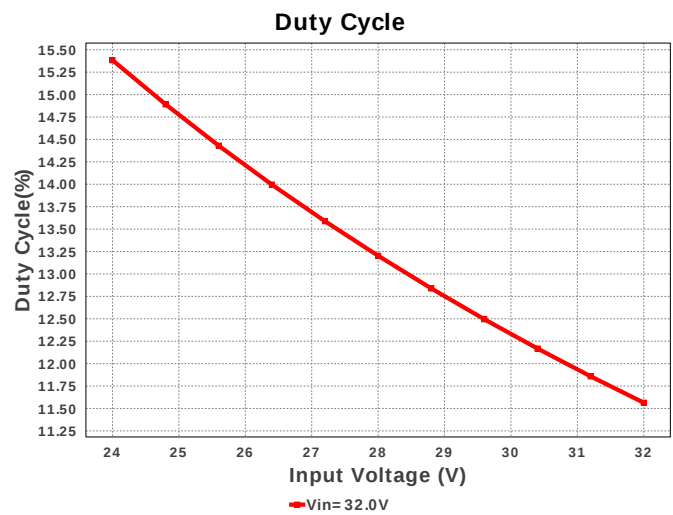
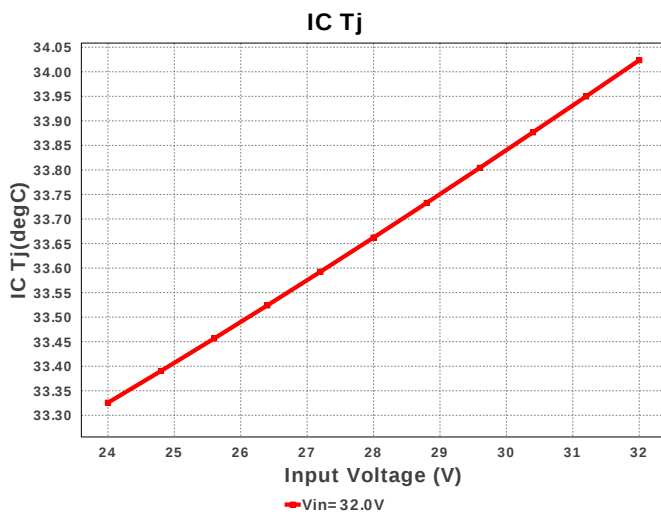
My Comments

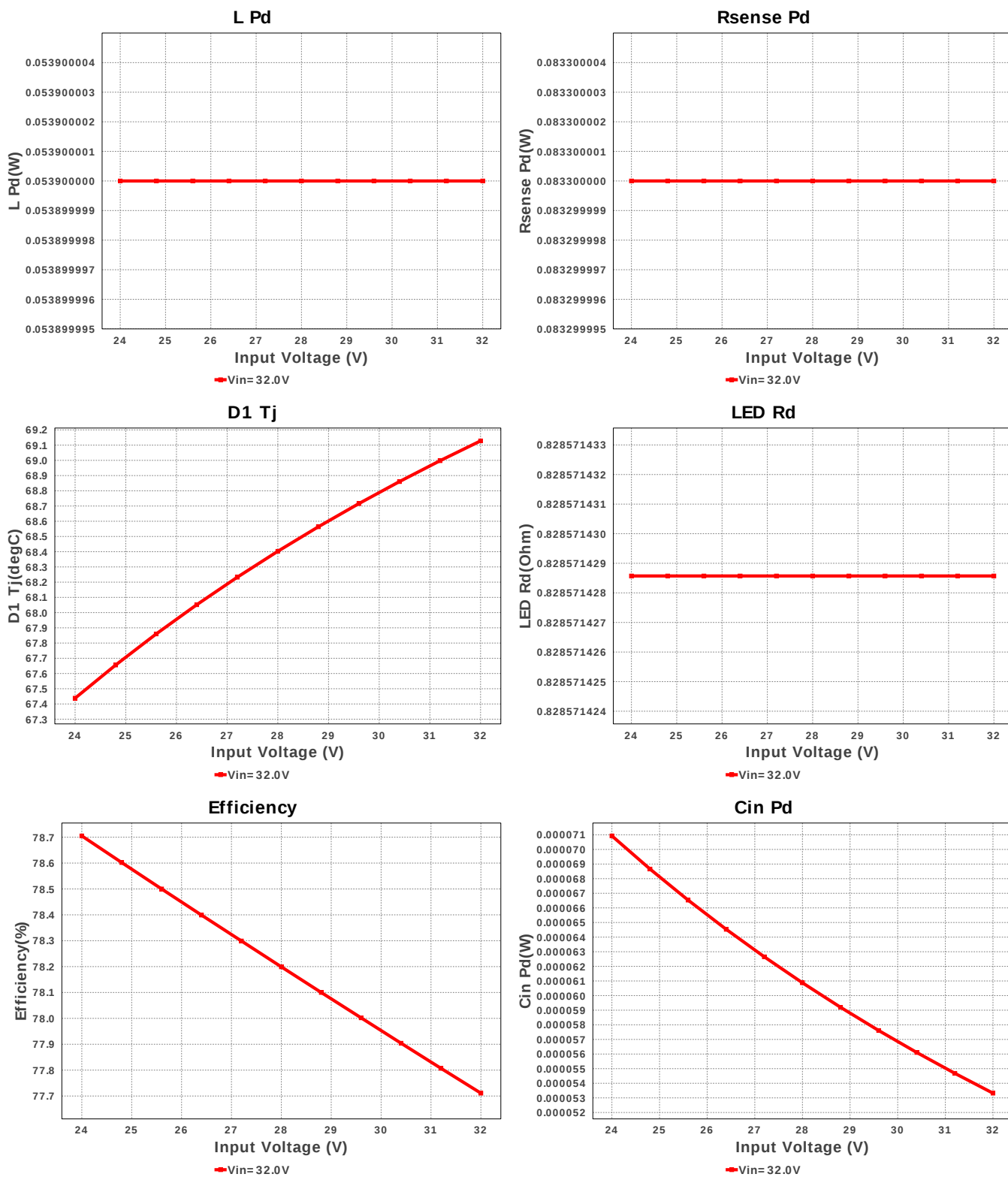
No comments

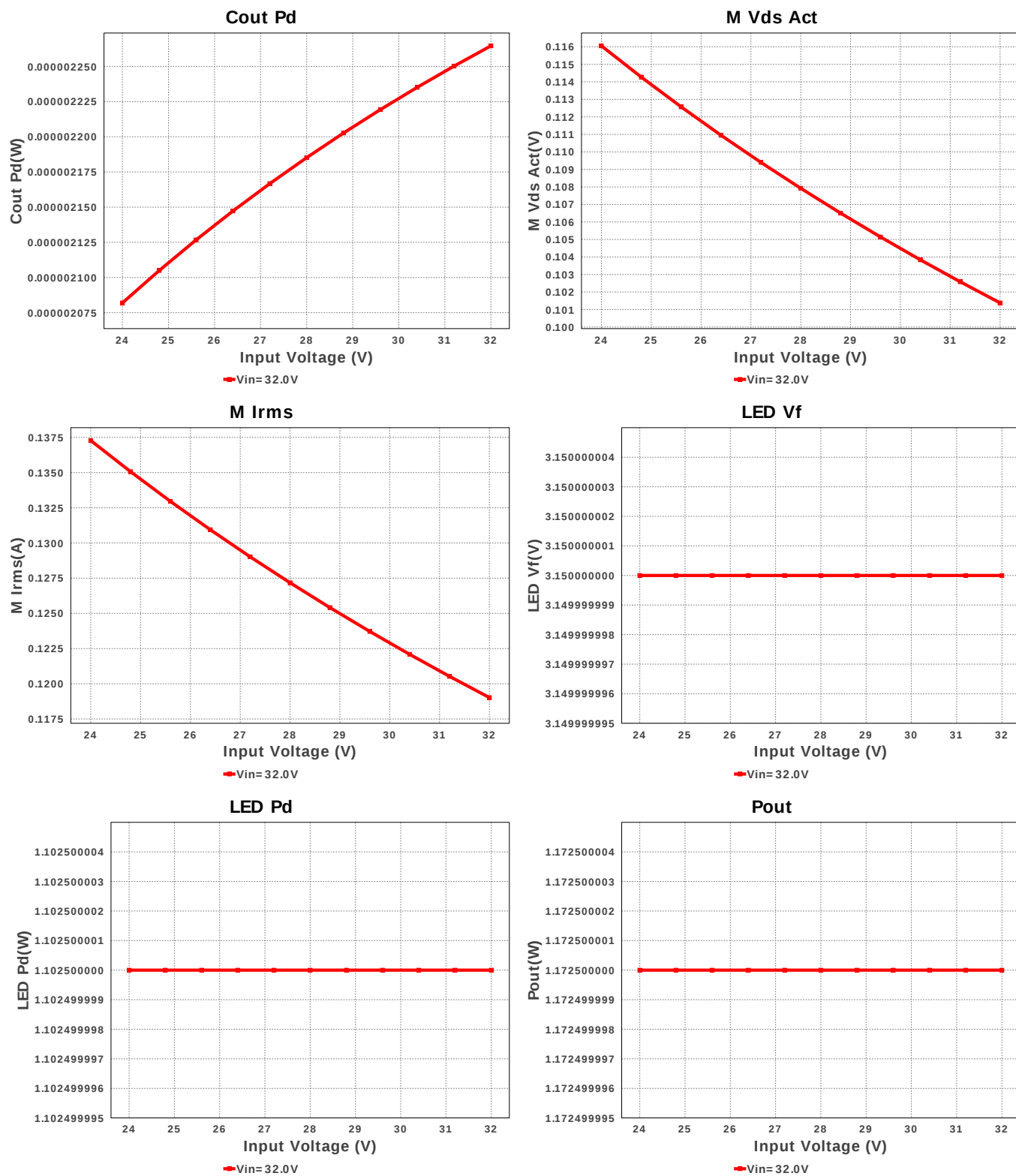
Electrical BOM

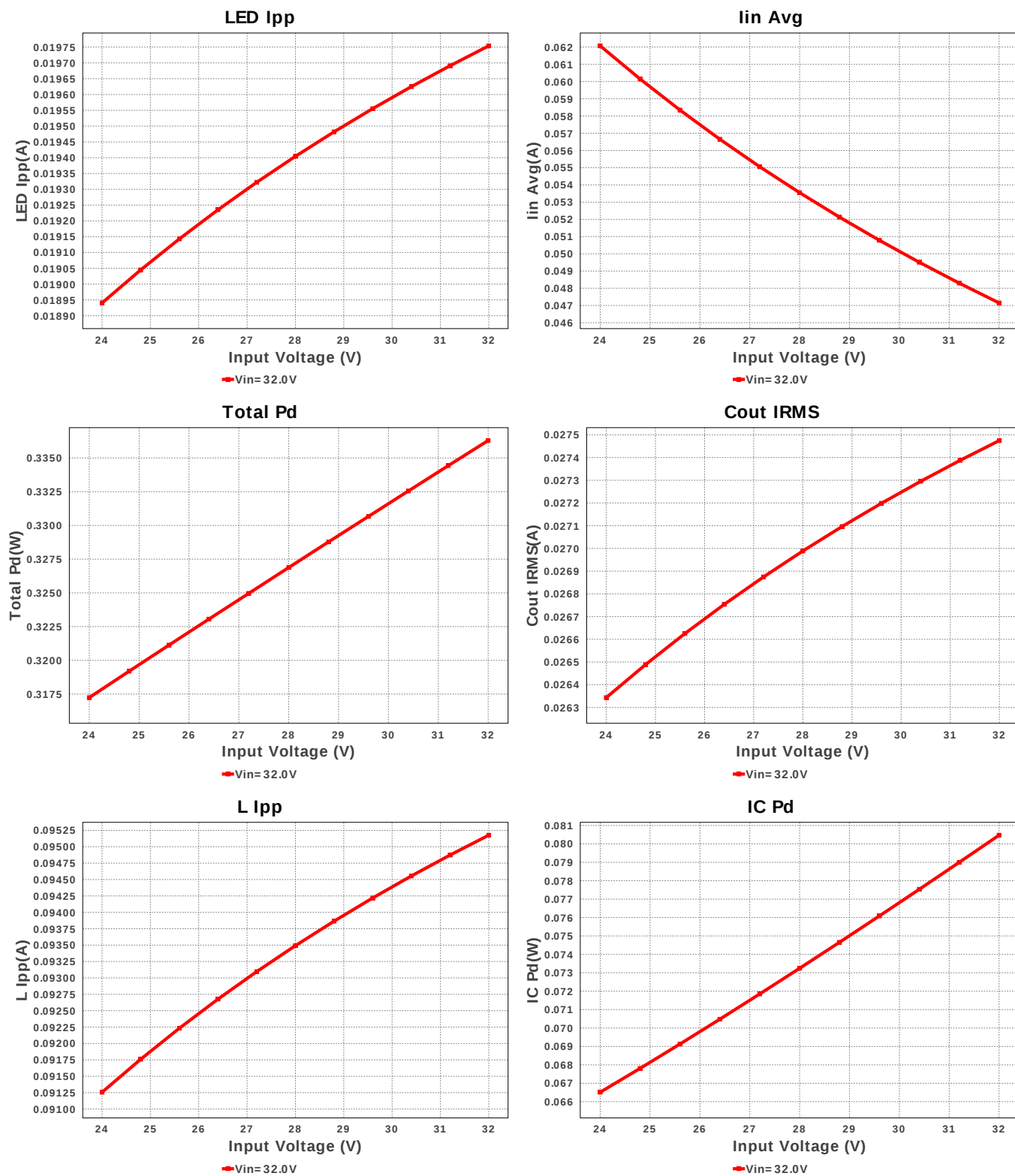
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cb	MuRata	GRM188R71E103KA01D Series= X7R	Cap= 10.0 nF ESR= 300.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0603 5 mm ²
2.	Cbyp	MuRata	GRM188R71E104KA01D Series= X7R	Cap= 100.0 nF ESR= 30.0 mOhm VDC= 25.0 V IRMS= 1.51 A	1	\$0.01	 0603 5 mm ²
3.	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
4.	Cout	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
5.	D1	NXP Semiconductor	PMEG6010CEH,115	Vf@Io= 570.0 mV VRRM= 60.0 V	1	\$0.04	 SOD-123F 12 mm ²
6.	D_LED	Philips Lumileds	LXML-PB01-0030	LED	1	NA	 luxeon_rebel 23 mm ²

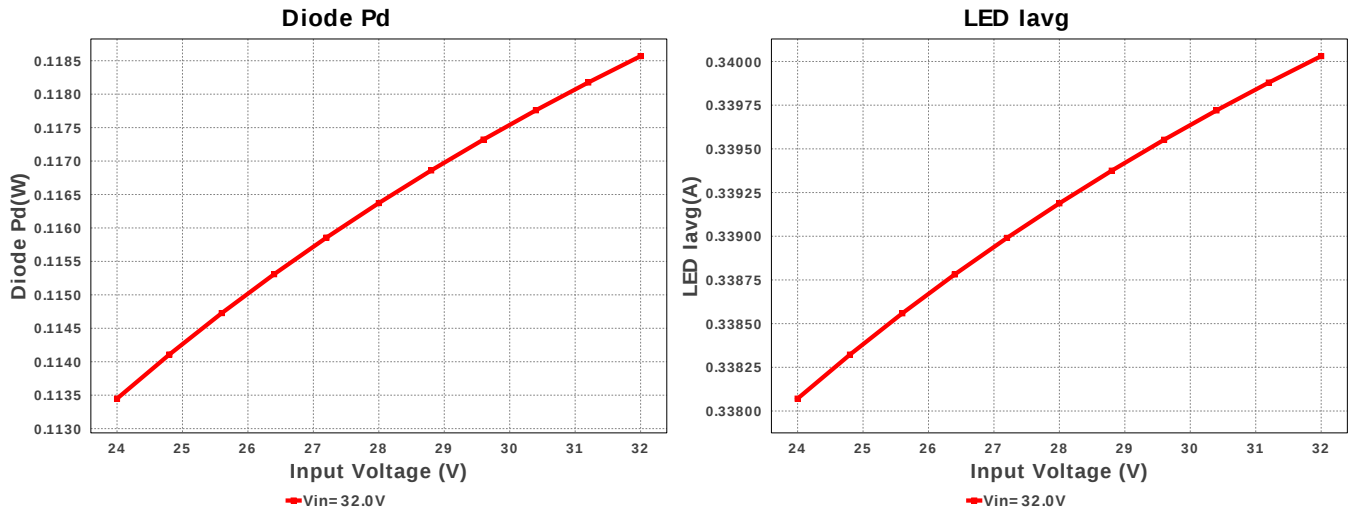
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
7.	L1	Sumida	CDRH125NP-221MC	L= 220.0 μ H DCR= 400.0 mOhm	1	\$0.61	 CDRH125 204 mm ²
8.	Ron	Panasonic	ERJ-6ENF1583V Series= ERJ-6E	Res= 158.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
9.	Rsns	Panasonic	ERJ-3RQFR68V Series= ERJ-3R	Res= 680.0 mOhm Power= 100.0 mW Tolerance= 1.0%	1	\$0.02	 0603 5 mm ²
10.	U1	Texas Instruments	LM3402MR/NOPB	Switcher	1	\$0.96	 MRA08B 56 mm ²











Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	109.49 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	27.475 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	411.237 mA	Current	Peak switch current in IC
4.	Iin Avg	47.15 mA	Current	Average input current
5.	L Ipp	95.176 mA	Current	Peak-to-peak inductor ripple current
6.	LED Iavg	340.031 mA	Current	LED Average Current
7.	LED Ipp	19.754 mA	Current	LED Ripple Current
8.	M Irms	119.021 mA	Current	MOSFET RMS current
9.	BOM Count	10	General	Total Design BOM count
10.	FootPrint	338.0 mm ²	General	Total Foot Print Area of BOM components
11.	Frequency	158.228 kHz	General	Switching frequency
12.	IC Tolerance	6.0 mV	General	IC Feedback Tolerance
13.	M Vds Act	101.379 mV	General	Voltage drop across the MosFET
14.	Mode	CCM	General	Conduction Mode
15.	Pout	1.172 W	General	Total output power
16.	Total BOM	\$0.0	General	Total BOM Cost
17.	D1 Tj	69.128 degC	Op_Point	D1 junction temperature
18.	Vout OP	3.35 V	Op_Point	Operational Output Voltage
19.	Duty Cycle	11.564 %	Op_point	Duty cycle
20.	Efficiency	77.711 %	Op_point	Steady state efficiency
21.	IC Tj	34.024 degC	Op_point	IC junction temperature
22.	ICThetaJA	50.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
23.	IOUT_OP	350.0 mA	Op_point	Iout operating point
24.	LED Rd	828.571 mOhm	Op_point	LED DynamicResistance
25.	LED Vf	3.15 V	Op_point	Total LED Forward Calculated Voltage
26.	VIN_OP	32.0 V	Op_point	Vin operating point
27.	Cin Pd	53.323 μW	Power	Input capacitor power dissipation
28.	Cout Pd	2.265 μW	Power	Output capacitor power dissipation
29.	Diode Pd	118.569 mW	Power	Diode power dissipation
30.	IC Pd	80.472 mW	Power	IC power dissipation
31.	L Pd	53.9 mW	Power	Inductor power dissipation
32.	LED Pd	1.102 W	Power	LED Power Dissipation
33.	Rsense Pd	83.3 mW	Power	LED Power Dissipation
34.	Total Pd	336.296 mW	Power	Total Power Dissipation
35.	Vout Tolerance	179.1 m%		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	350.0 m	Maximum Output Current
2.	VinMax	32.0	Maximum input voltage
3.	VinMin	24.0	Minimum input voltage
4.	Vout	3.15	Output Voltage
5.	application	LED_DRIVER	LED Application
6.	base_pn	LM3402	Texas Instruments Base Part Number
7.	isLEDArchitect	N	LED Architect Project
8.	ledparallel	1.0	Number of LED in parallel
9.	ledpartnumber	LXML-PB01-0030	LED Part number
10.	ledseries	1.0	Number of LED in series
11.	line_fsw	60.0	AC Line Frequency
12.	source	DC	Input Source Type

#	Name	Value	Description
13.	ta	30.0	Ambient temperature

Design Assistance

1. LM3402 Product Folder : <http://www.ti.com/product/LM3402> : 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](#).