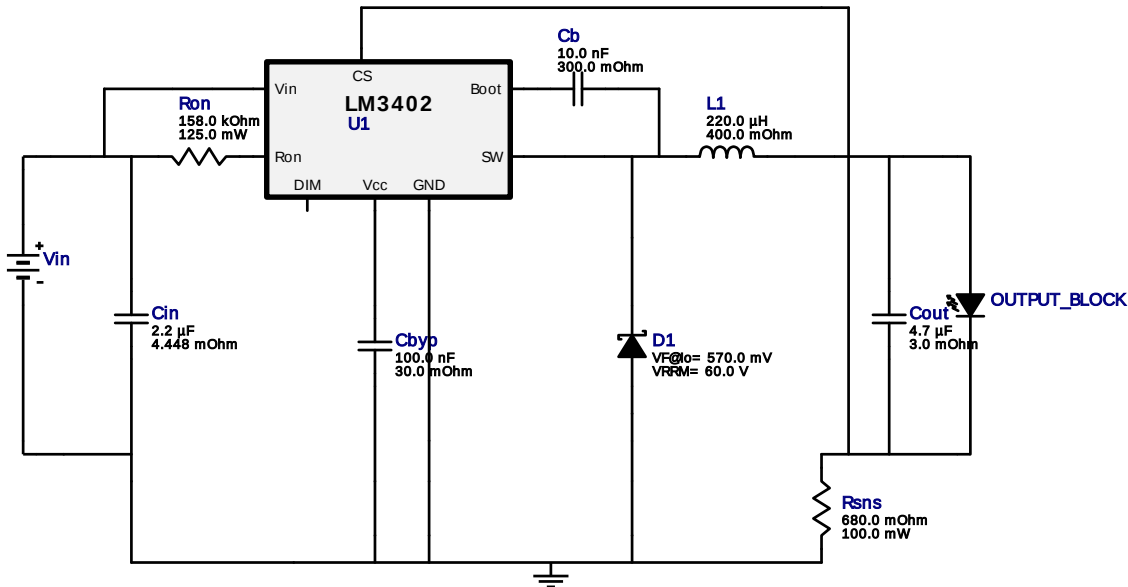


WEBENCH® Design Report

Design : 4740075/1 LM3402MR/NOPB
LM3402MR/NOPB 24.0V-32.0V to 3.35V @ 0.35A

Vout = 3.15V
Iout = 0.35A



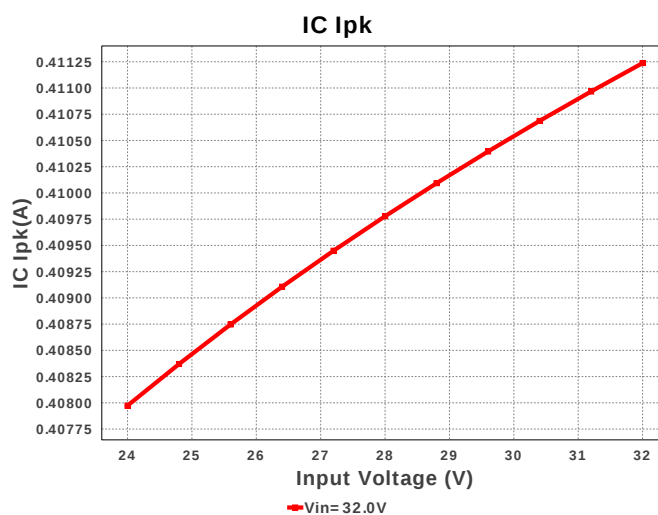
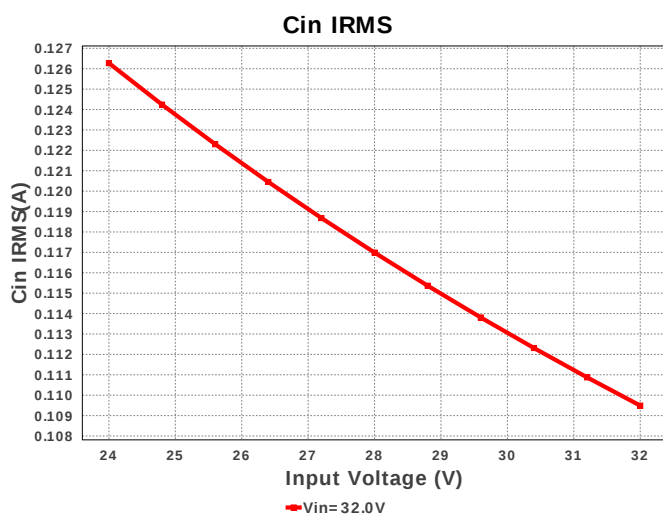
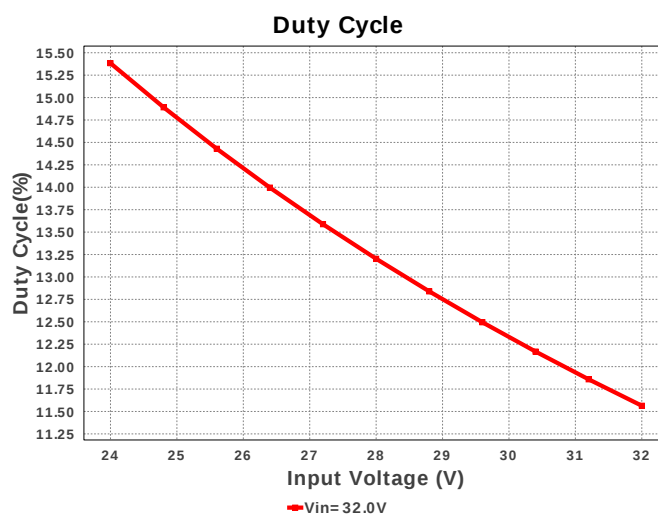
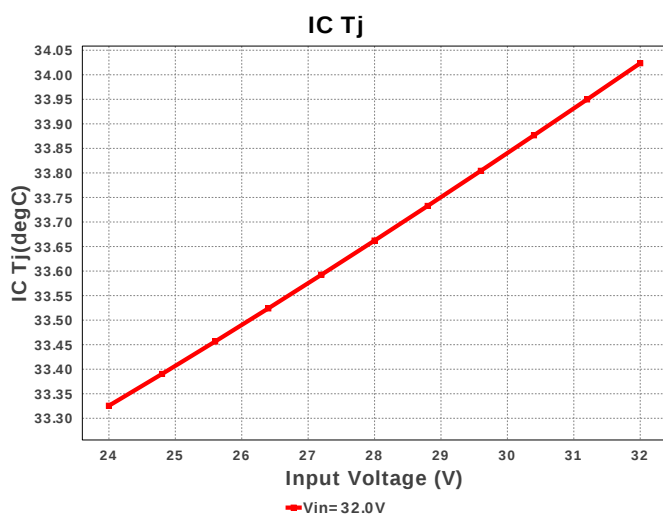
My Comments

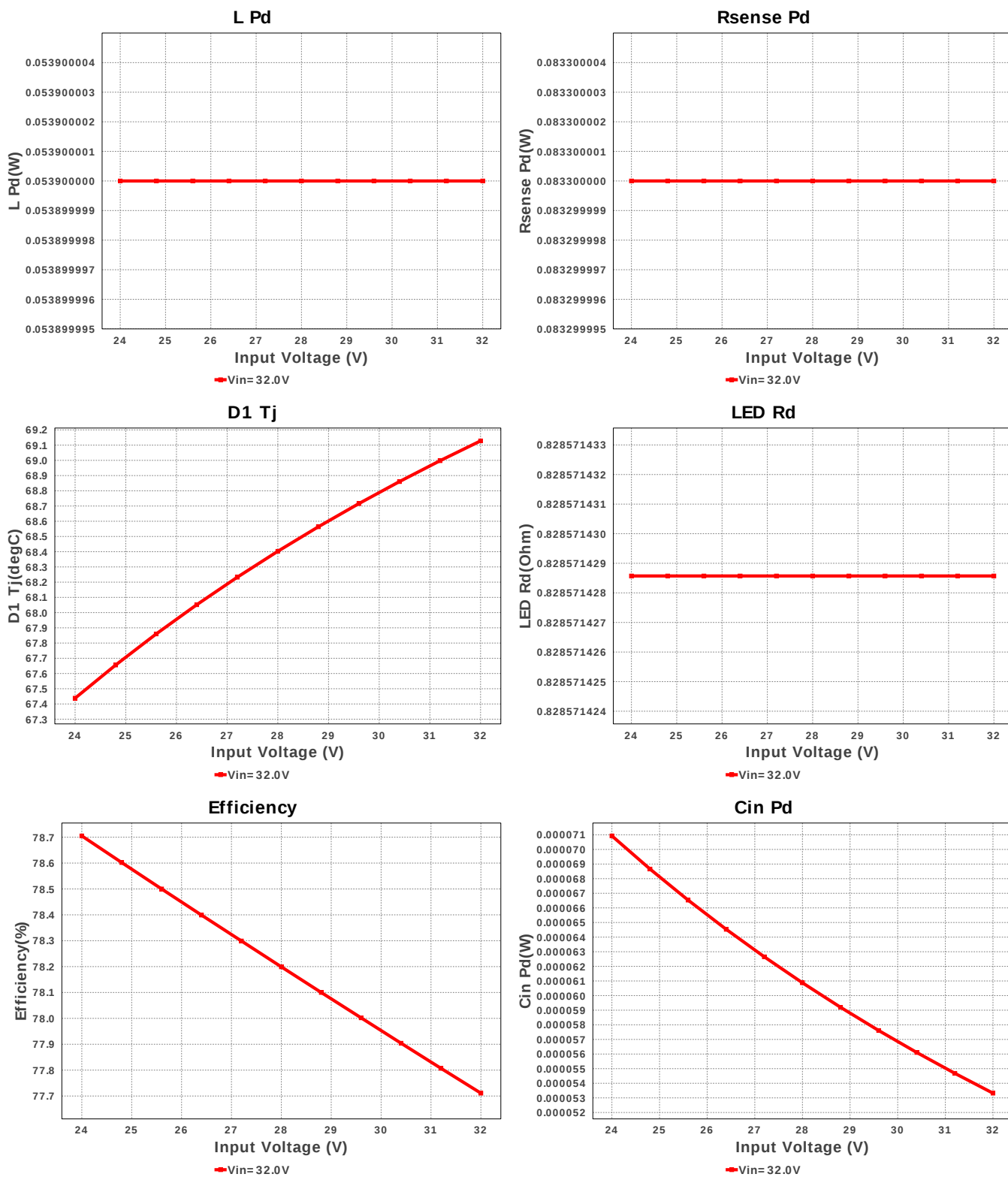
No comments

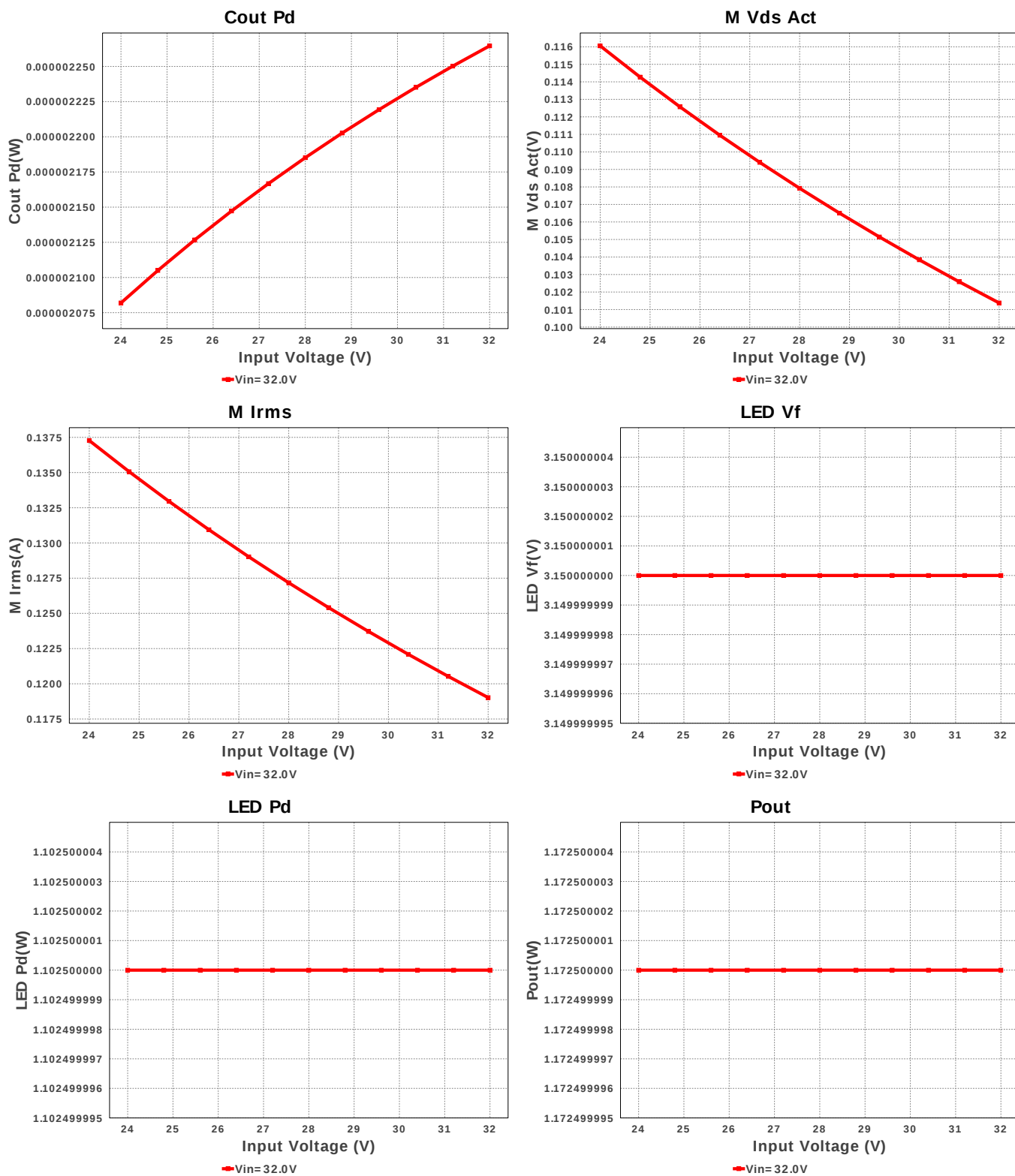
Electrical BOM

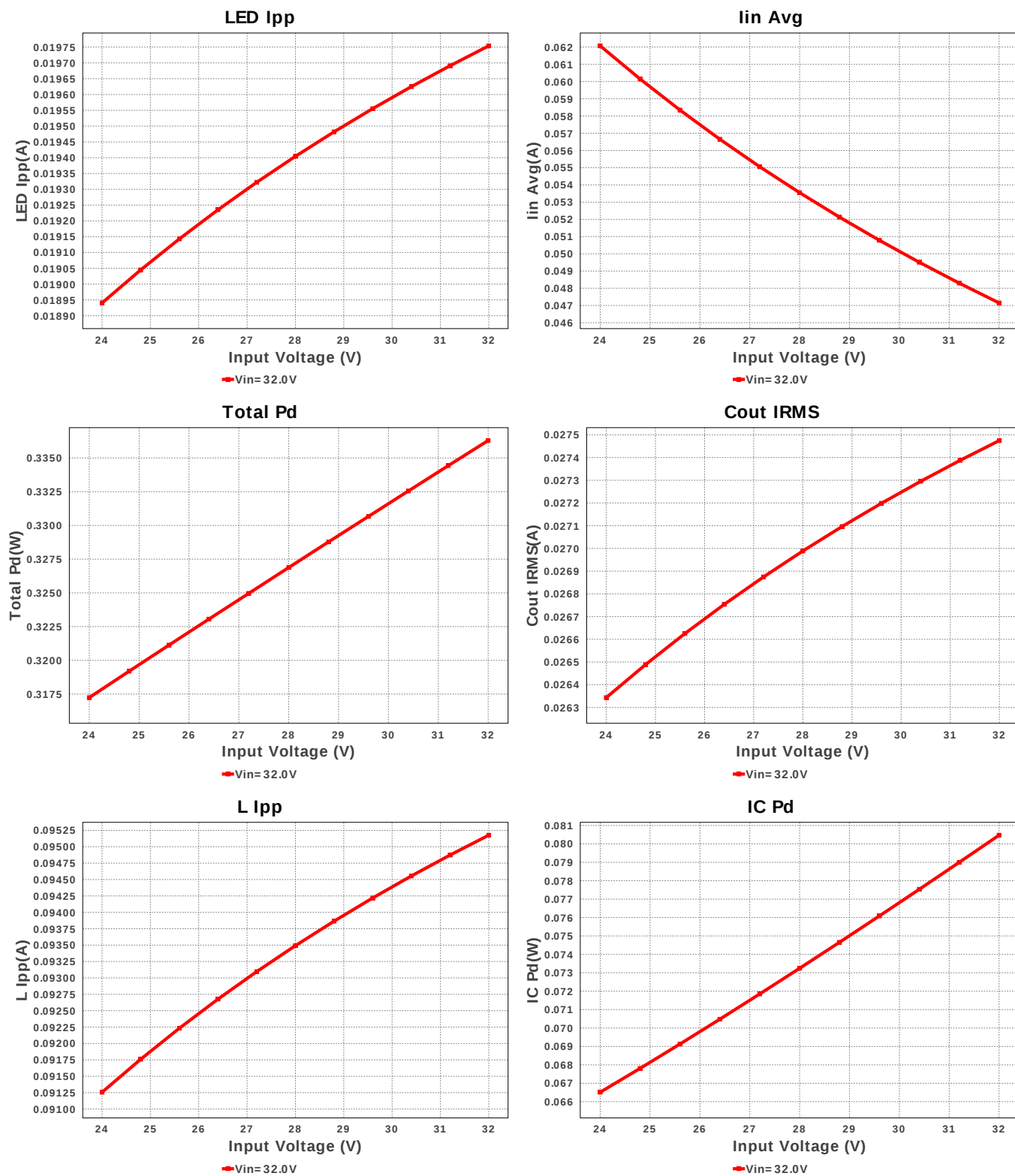
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cb	MuRata	GRM188R71E103KA01D Series= X7R	Cap= 10.0 nF ESR= 300.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	 0603 5 mm ²
2.	Cbyp	MuRata	GRM188R71E104KA01D Series= X7R	Cap= 100.0 nF ESR= 30.0 mOhm VDC= 25.0 V IRMS= 1.51 A	1	\$0.01	 0603 5 mm 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

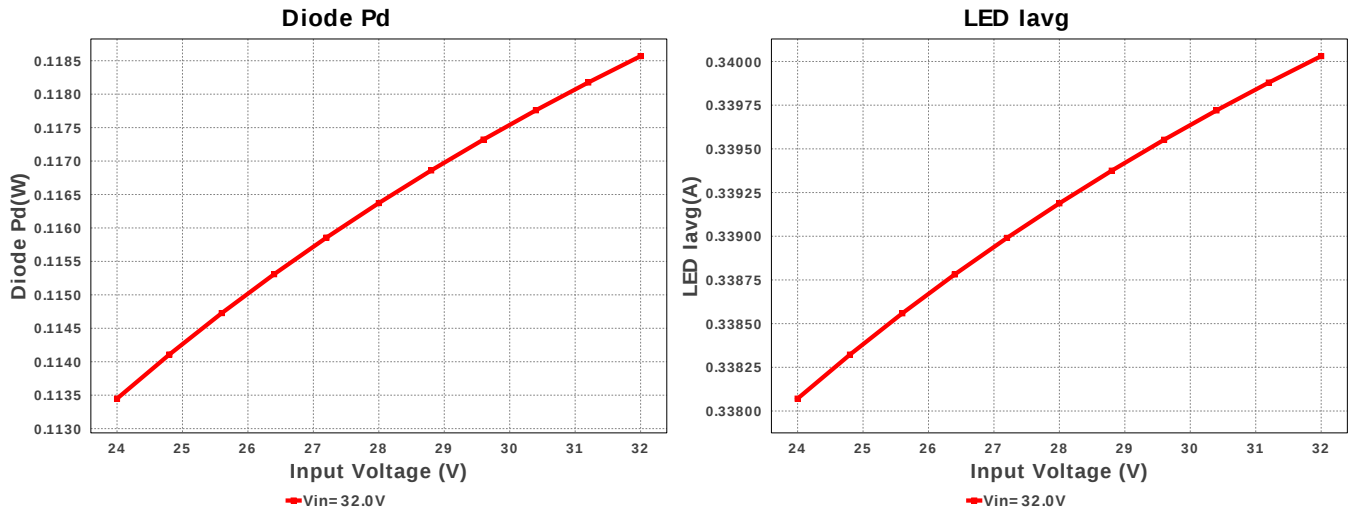
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
7.	L1	Sumida	CDRH125NP-221MC	L= 220.0 μ H DCR= 400.0 mOhm	1	\$0.61	 CDRH125 204 mm ²
8.	Ron	Panasonic	ERJ-6ENF1583V Series= ERJ-6E	Res= 158.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
9.	Rsns	Panasonic	ERJ-3RQFR68V Series= 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.	Pout	1.172 W	General	Total output power
15.	Total BOM	\$0.0	General	Total BOM Cost
16.	D1 Tj	69.128 degC	Op_Point	D1 junction temperature
17.	Vout OP	3.35 V	Op_Point	Operational Output Voltage
18.	Duty Cycle	11.564 %	Op_point	Duty cycle
19.	Efficiency	77.711 %	Op_point	Steady state efficiency
20.	IC Tj	34.024 degC	Op_point	IC junction temperature
21.	ICThetaJA	50.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
22.	IOUT_OP	350.0 mA	Op_point	Iout operating point
23.	LED Rd	828.571 mOhm	Op_point	LED DynamicResistance
24.	LED Vf	3.15 V	Op_point	Total LED Forward Calculated Voltage
25.	VIN_OP	32.0 V	Op_point	Vin operating point
26.	Cin Pd	53.323 μW	Power	Input capacitor power dissipation
27.	Cout Pd	2.265 μW	Power	Output capacitor power dissipation
28.	Diode Pd	118.569 mW	Power	Diode power dissipation
29.	IC Pd	80.472 mW	Power	IC power dissipation
30.	L Pd	53.9 mW	Power	Inductor power dissipation
31.	LED Pd	1.102 W	Power	LED Power Dissipation
32.	Rsense Pd	83.3 mW	Power	LED Power Dissipation
33.	Total Pd	336.296 mW	Power	Total Power Dissipation
34.	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
13.	ta	30.0	Ambient temperature

#	Name	Value	Description
14.	userfsw	158.228 k	Customer Selected Frequency

Design Assistance

1. LM3402 Product Folder : <http://www.ti.com/product/LM3402> : contains the data sheet and other resources.

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