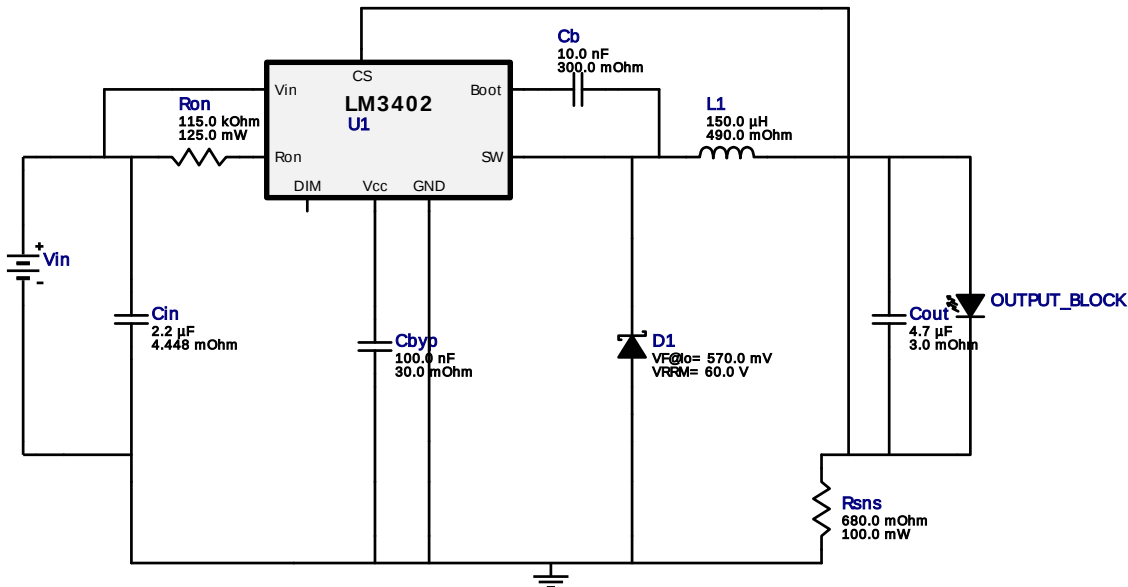


WEBENCH® Design Report

Design : 4765128/1 LM3402MR/NOPB
LM3402MR/NOPB 24.0V-32.0V to 3.70V @ 0.35A

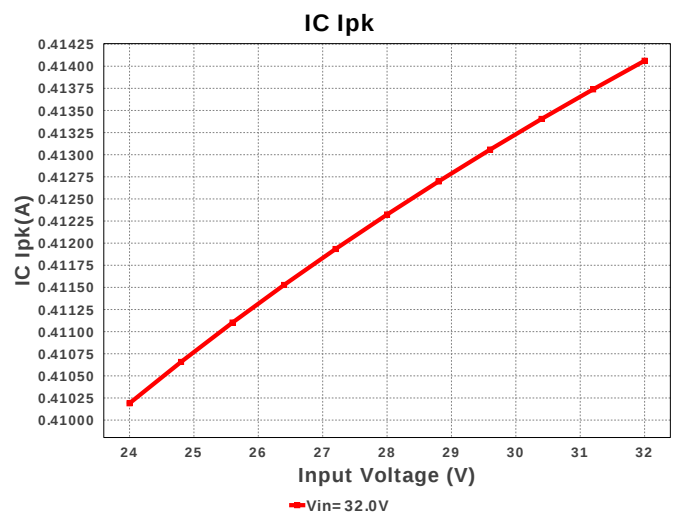
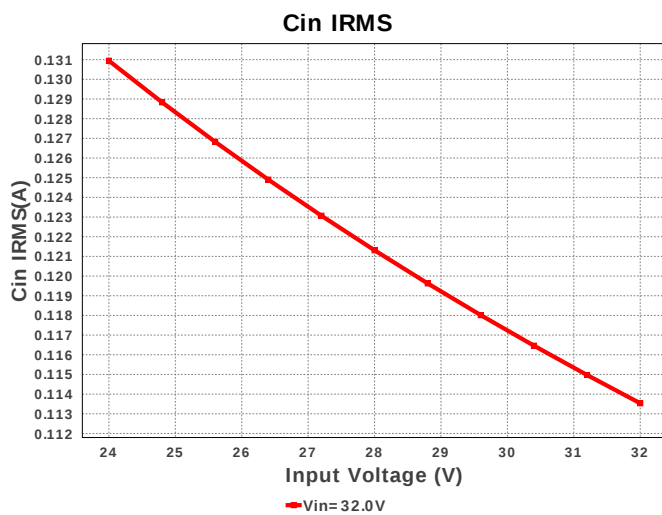
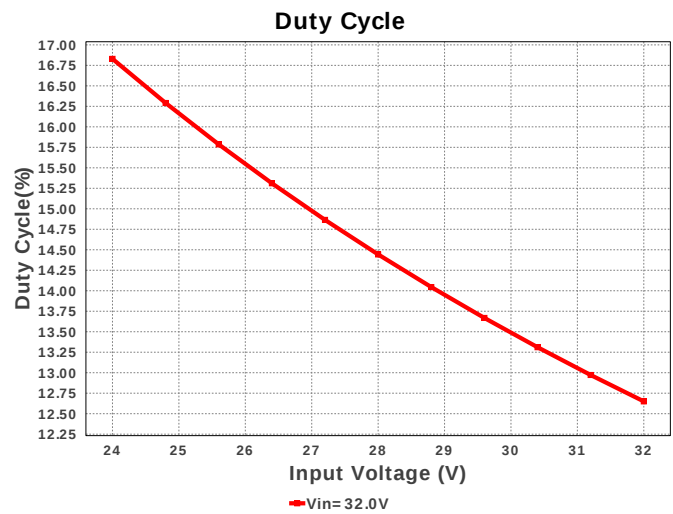
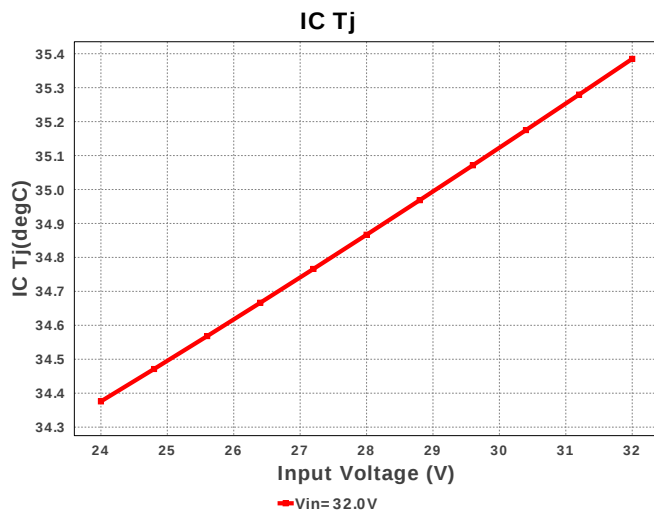
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Iout = 0.35A

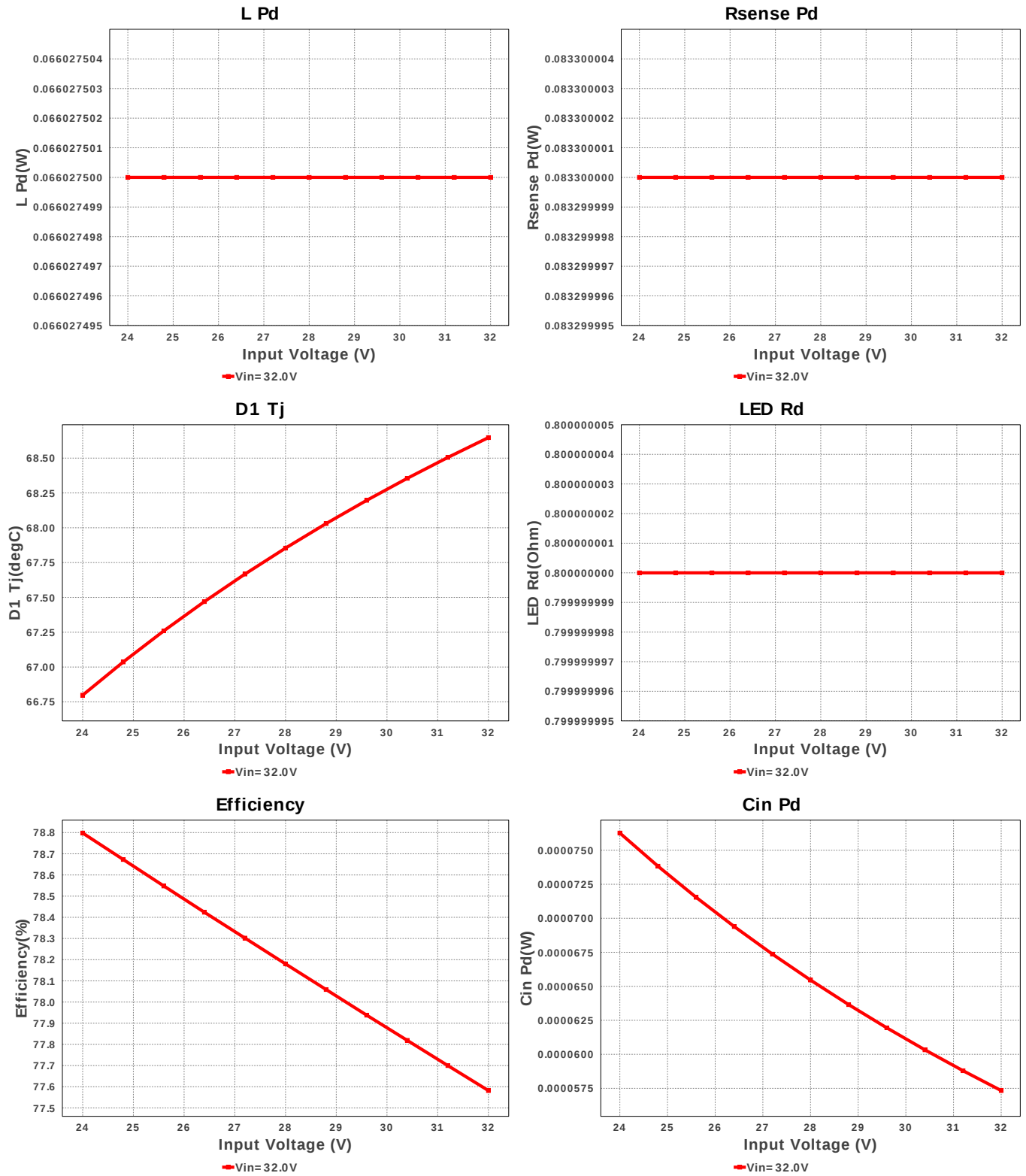


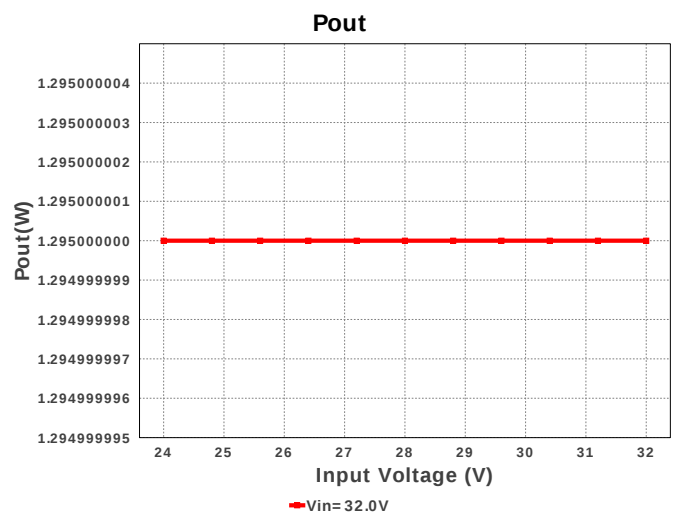
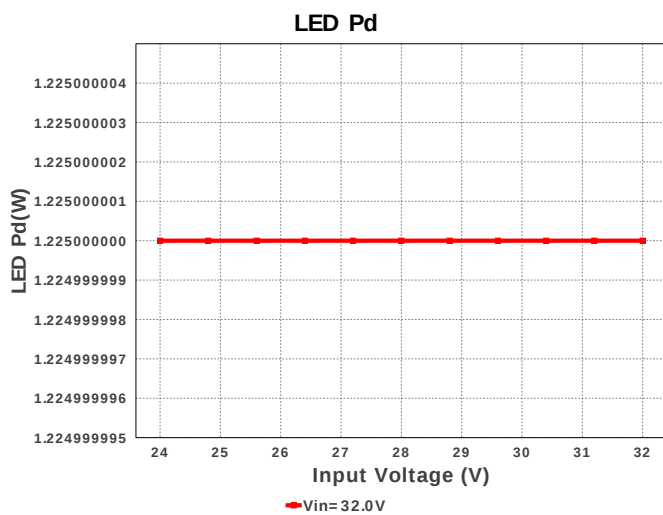
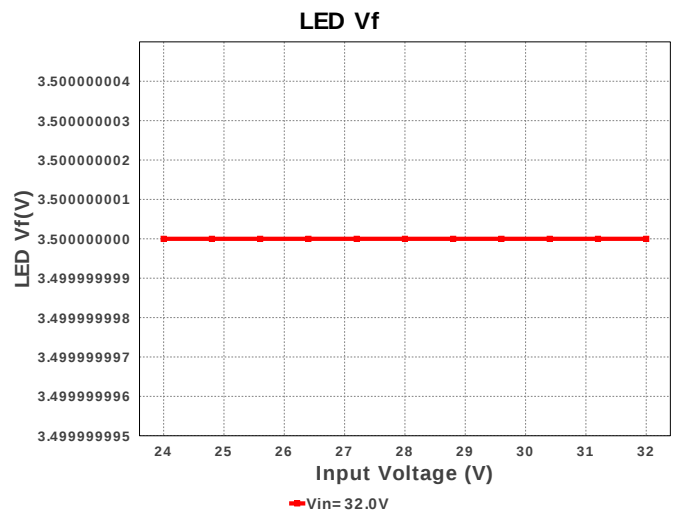
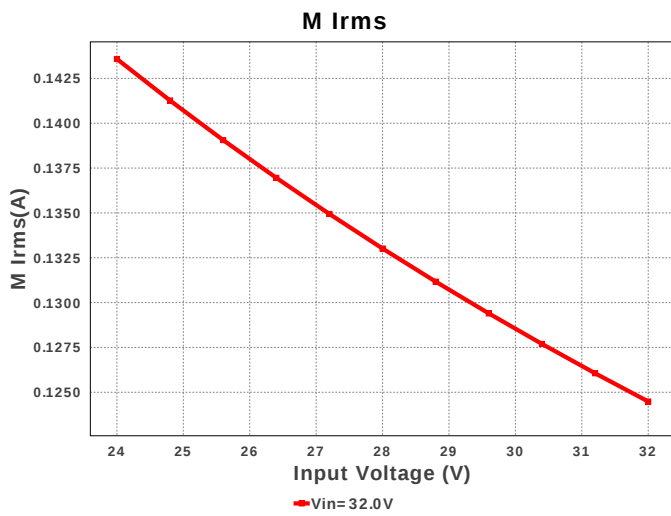
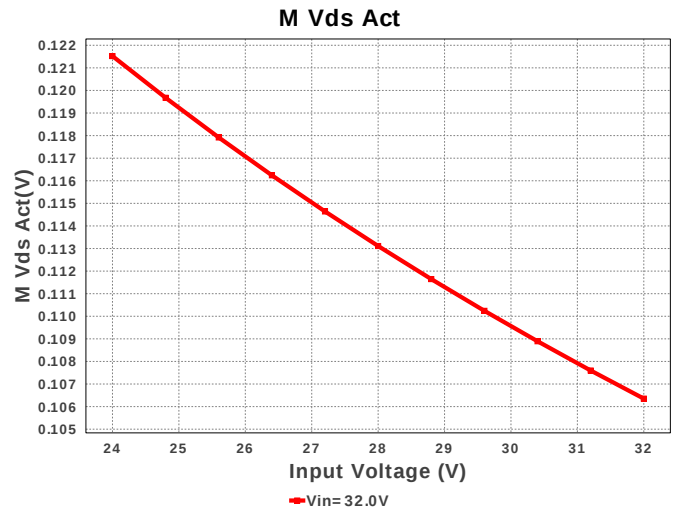
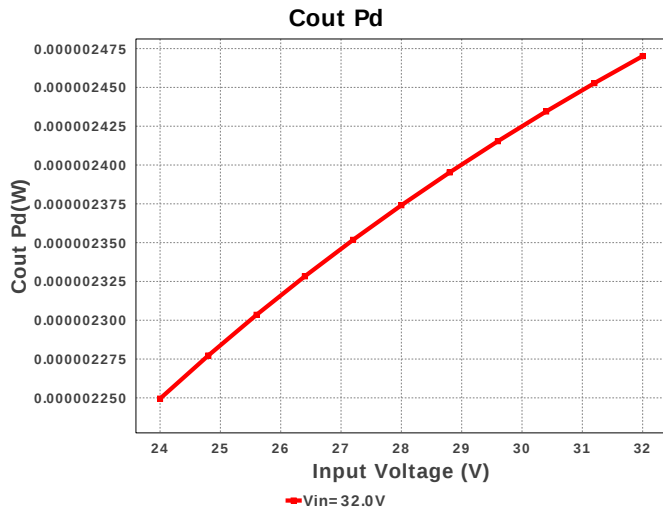
Electrical BOM

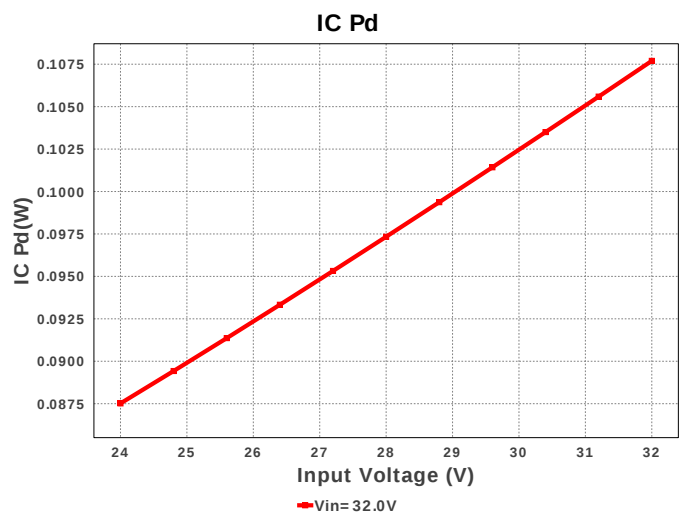
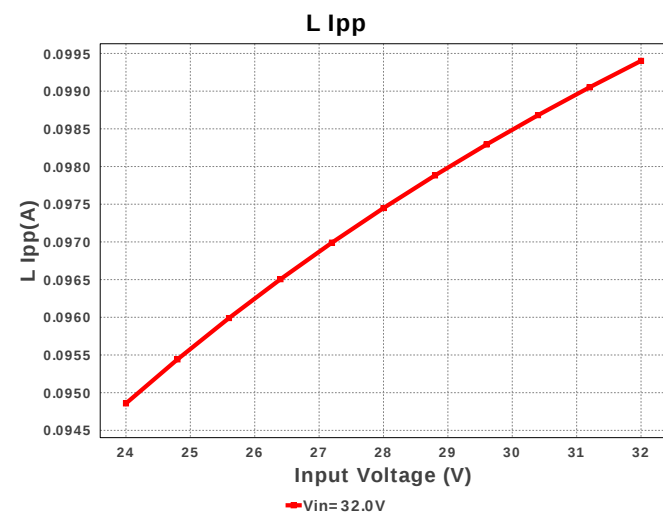
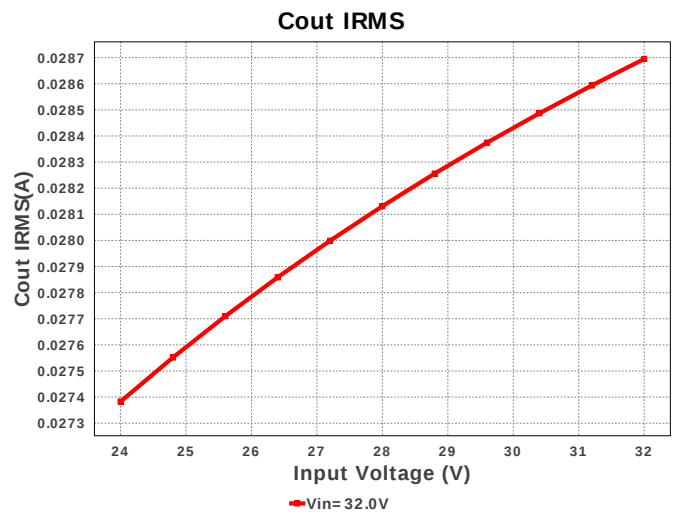
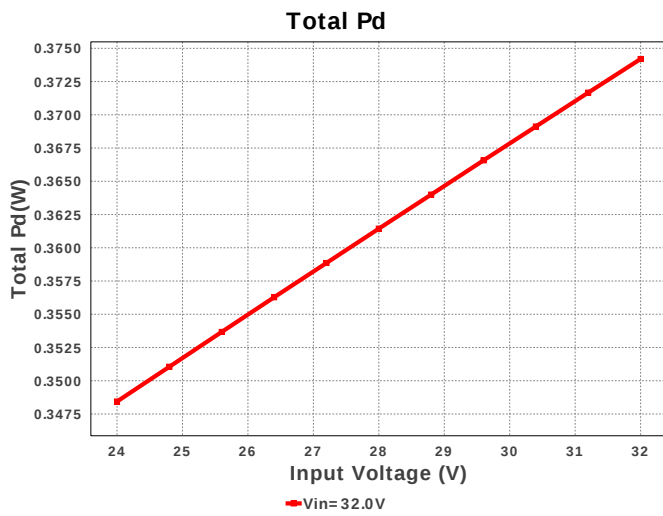
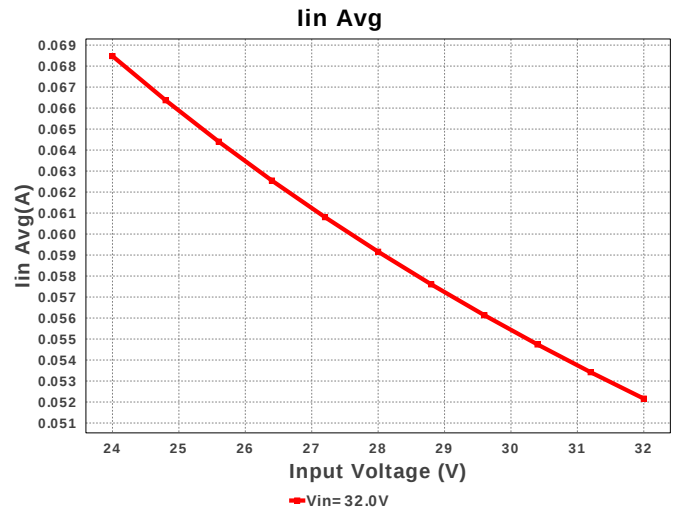
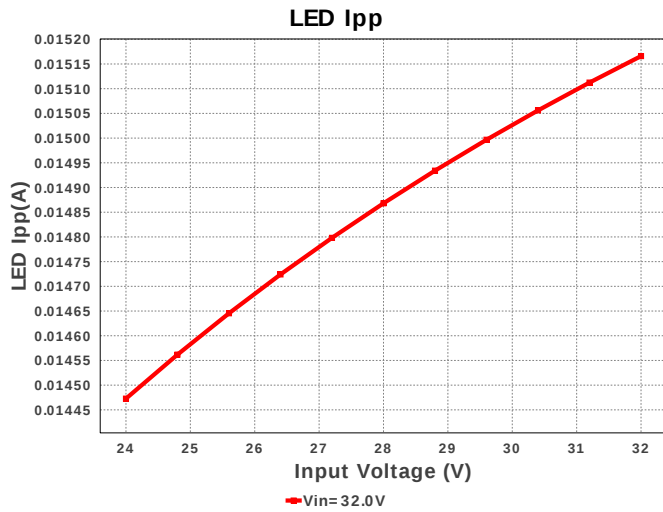
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cb	MuRata	GRM188R71E103KA01D Series= X7R	Cap= 10.0 nF ESR= 300.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	\$0.01	0603 5 mm ²
2.	Cbyp	MuRata	GRM188R71E104KA01D Series= X7R	Cap= 100.0 nF ESR= 30.0 mOhm VDC= 25.0 V IRMS= 1.51 A	1	\$0.01	0603 5 mm ²
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	CUSTOM	CUSTOM	LED	1	NA	CUSTOM 0 mm ²
7.	L1	TDK	VLP8040T-151M	L= 150.0 uH DCR= 490.0 mOhm	1	\$0.22	VLP8040 113 mm ²
8.	Ron	Panasonic	ERJ-6ENF1153V Series= ERJ-6E	Res= 115.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	0805 7 mm ²

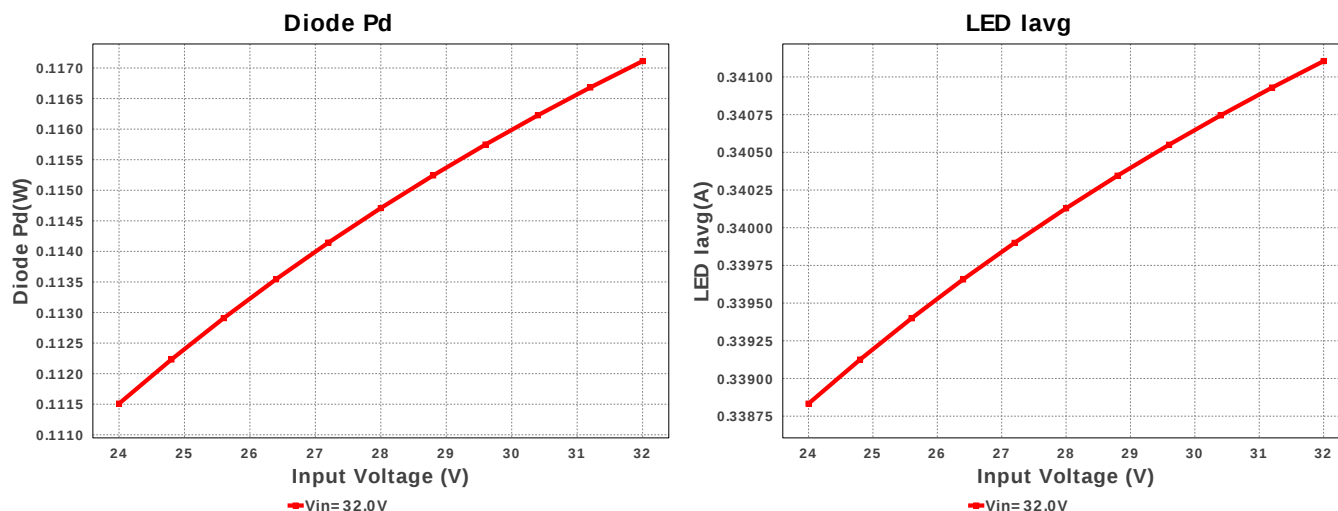
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
9.	Rsns	Panasonic	ERJ-3RQFR68V Series= ERJ-3R	Res= 680.0 mOhm Power= 100.0 mW Tolerance= 1.0%	1	\$0.02	0603 5 mm ²
10.	U1	Texas Instruments	LM3402MR/NOPB	Switcher	1	\$0.96	MRA08B 56 mm ²











Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	113.535 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	28.695 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	414.062 mA	Current	Peak switch current in IC
4.	Iin Avg	52.162 mA	Current	Average input current
5.	L Ipp	99.402 mA	Current	Peak-to-peak inductor ripple current
6.	LED Iavg	341.105 mA	Current	LED Average Current
7.	LED Ipp	15.166 mA	Current	LED Ripple Current
8.	M1 Irms	124.485 mA	Current	Q Iavg
9.	BOM Count	10	General	Total Design BOM count
10.	FootPrint	223.0 mm ²	General	Total Foot Print Area of BOM components
11.	Frequency	240.104 kHz	General	Switching frequency
12.	IC Tolerance	6.0 mV	General	IC Feedback Tolerance
13.	M Vds Act	106.353 mV	General	Voltage drop across the MosFET
14.	Mode	CCM	General	Conduction Mode
15.	Pout	1.295 W	General	Total output power
16.	Total BOM	\$0.0	General	Total BOM Cost
17.	D1 Tj	68.647 degC	Op_Point	D1 junction temperature
18.	Vout OP	3.7 V	Op_Point	Operational Output Voltage
19.	Duty Cycle	12.65 %	Op_point	Duty cycle
20.	Efficiency	77.582 %	Op_point	Steady state efficiency
21.	IC Tj	35.385 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	800.0 mOhm	Op_point	LED DynamicResistance
25.	LED Vf	3.5 V	Op_point	Total LED Forward Calculated Voltage
26.	VIN_OP	32.0 V	Op_point	Vin operating point
27.	Cin Pd	57.335 μW	Power	Input capacitor power dissipation
28.	Cout Pd	2.47 μW	Power	Output capacitor power dissipation
29.	Diode Pd	117.113 mW	Power	Diode power dissipation
30.	IC Pd	107.697 mW	Power	IC power dissipation
31.	L Pd	66.027 mW	Power	Inductor power dissipation
32.	LED Pd	1.225 W	Power	LED Power Dissipation
33.	Rsense Pd	83.3 mW	Power	LED Power Dissipation
34.	Total Pd	374.198 mW	Power	Total Power Dissipation
35.	Vout Tolerance	162.16 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	3.5	Output Voltage
5.	application	LED_DRIVER	LED Application
6.	base_pn	LM3402	Base Product Number
7.	LED_Architect	N	LED Architect Project
8.	ledparallel	1.0	Number of LED in parallel
9.	ledpartnumber	Custom	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.

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