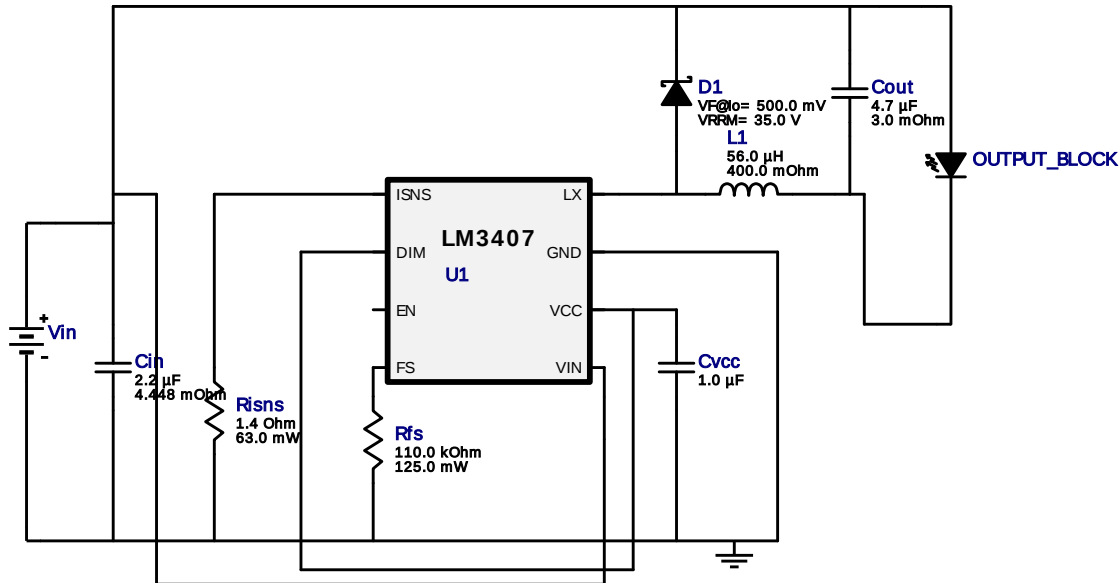


WEBENCH® Design Report

Design : 4740075/2 LM3407MY/NOPB
LM3407MY/NOPB 12.0V-24.0V to 2.15V @ 0.14A



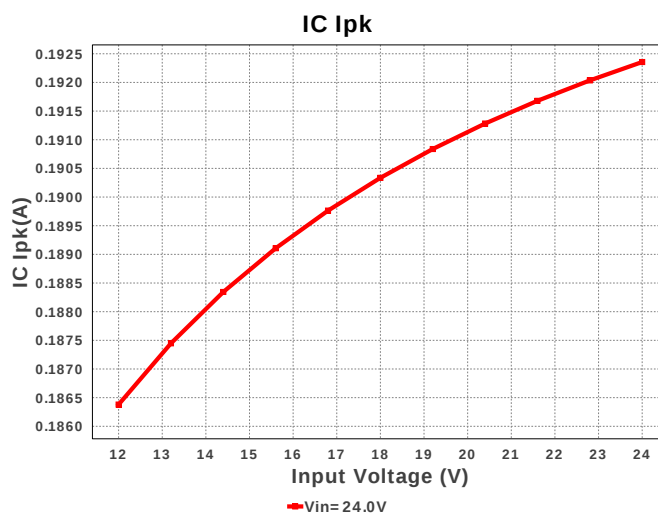
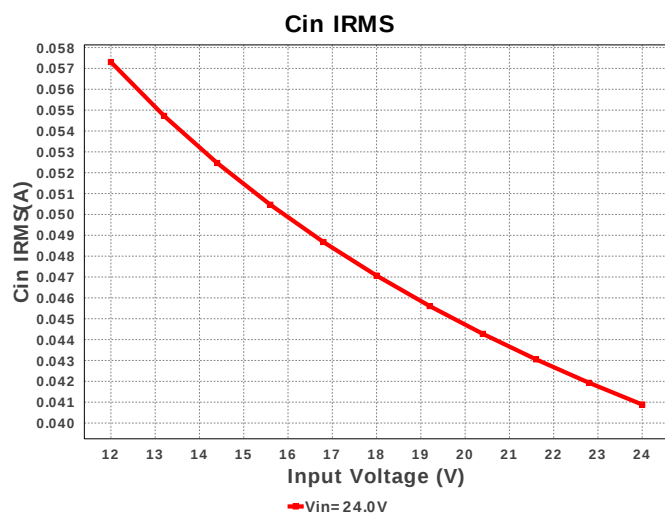
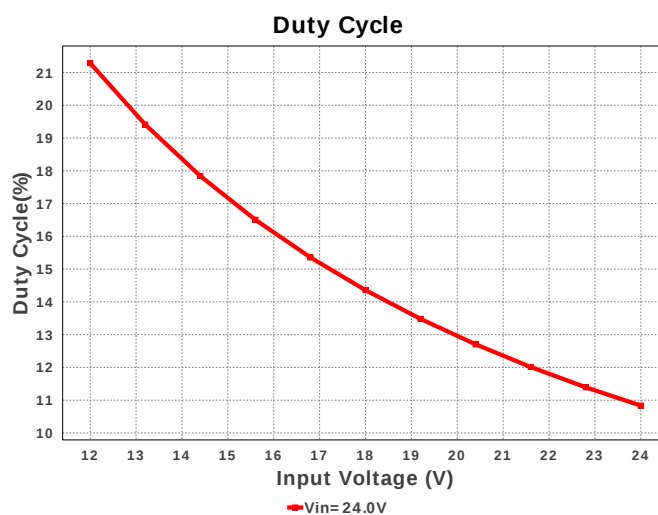
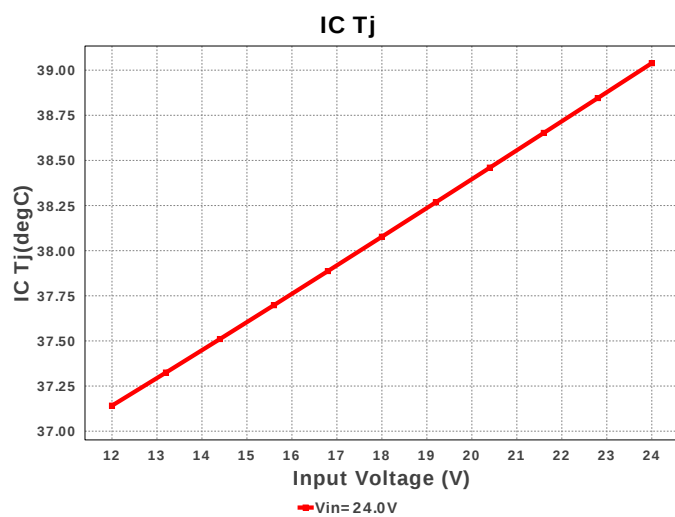
My Comments

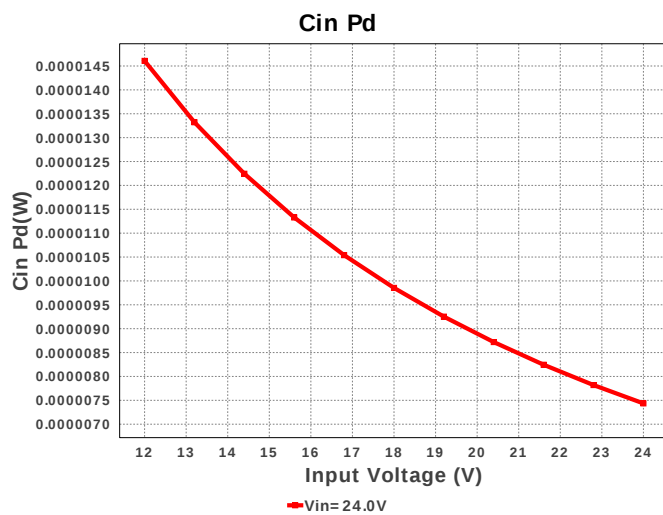
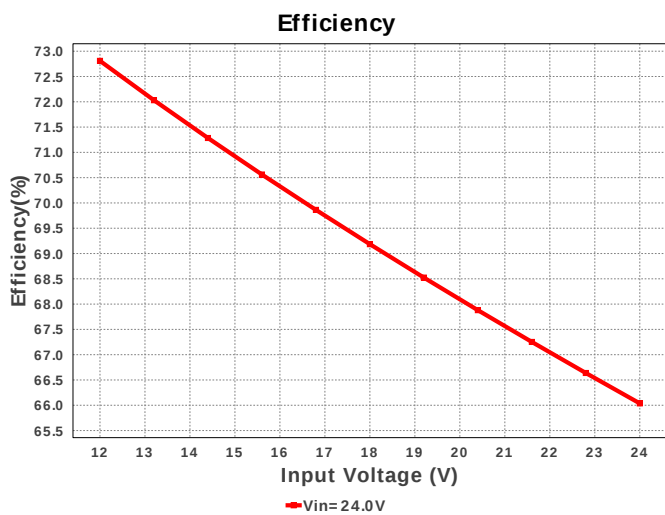
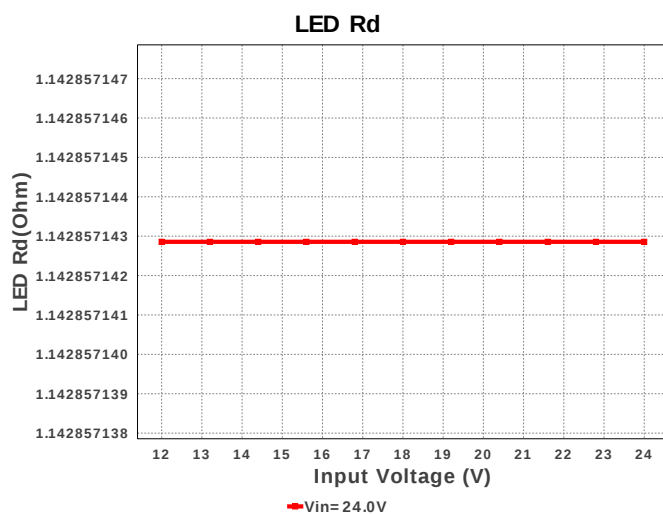
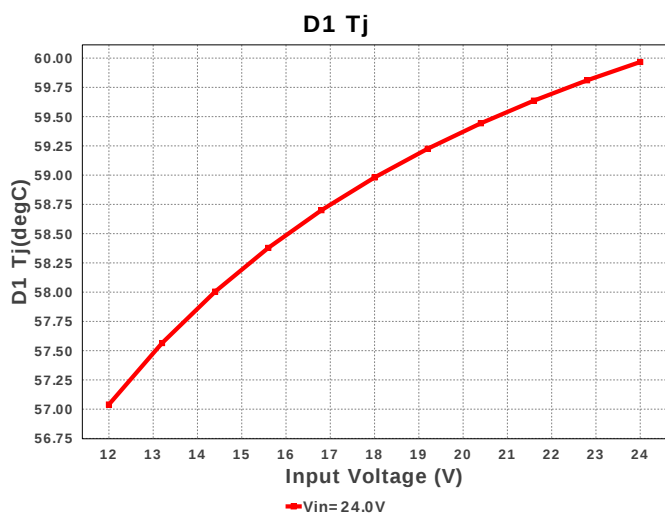
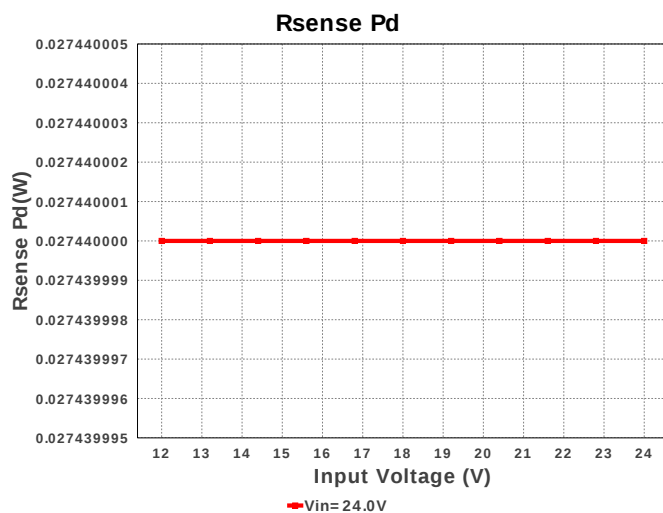
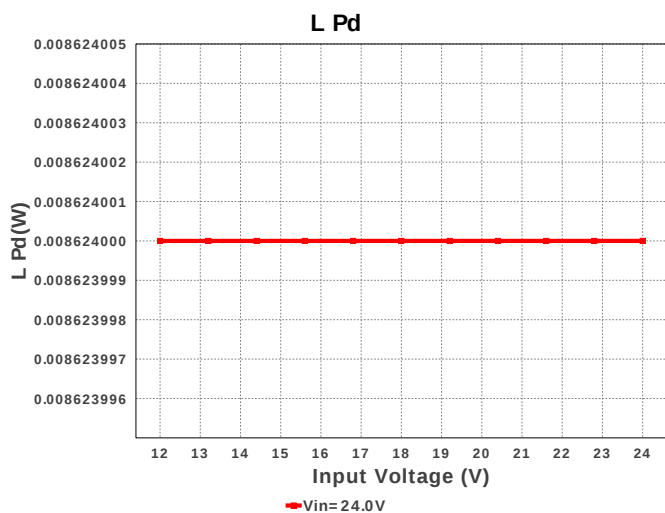
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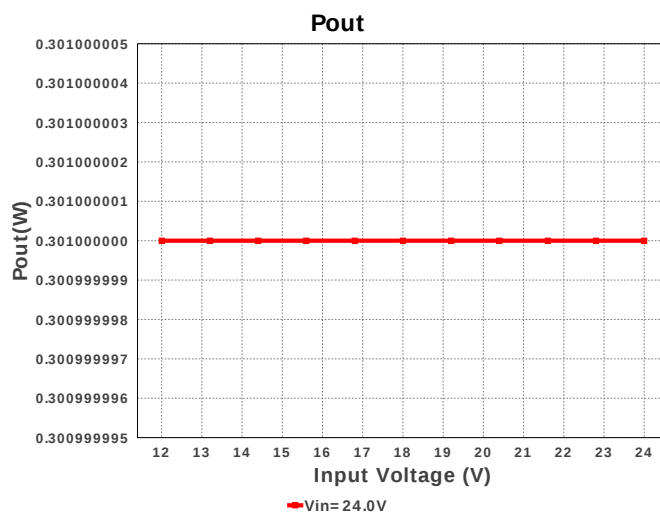
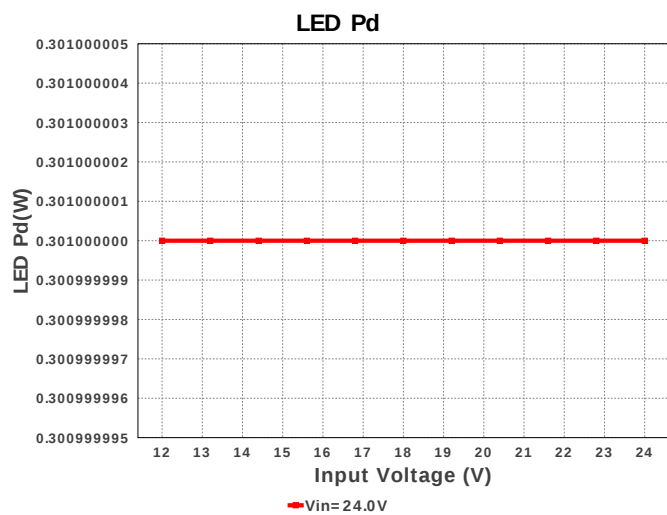
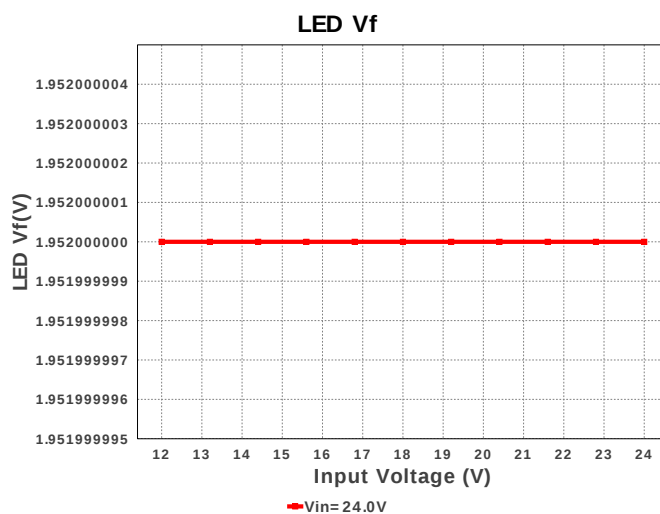
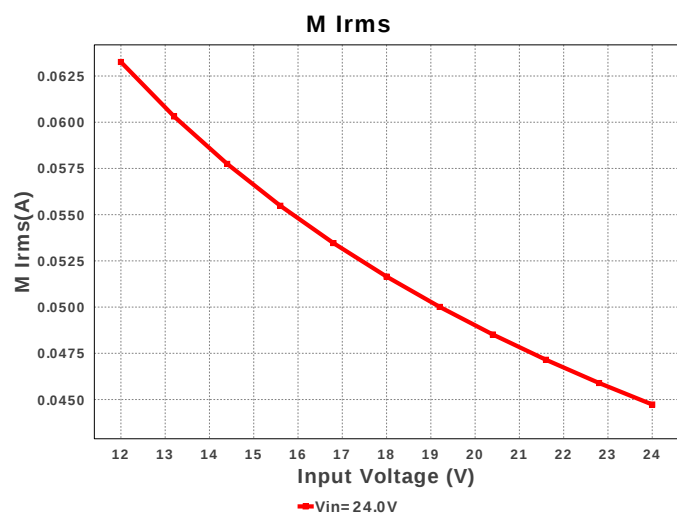
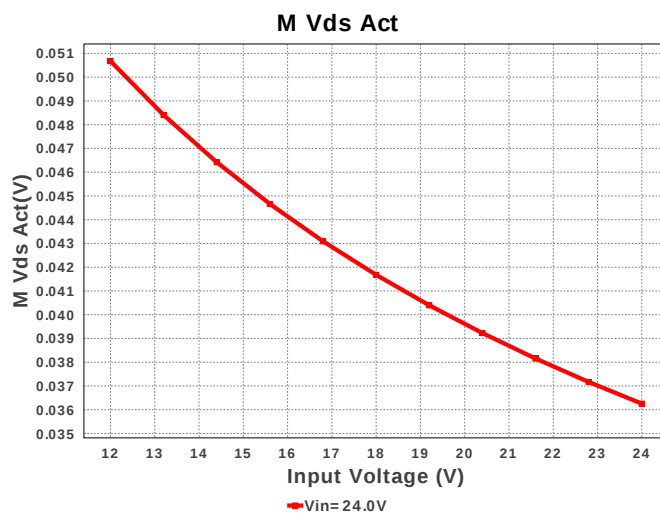
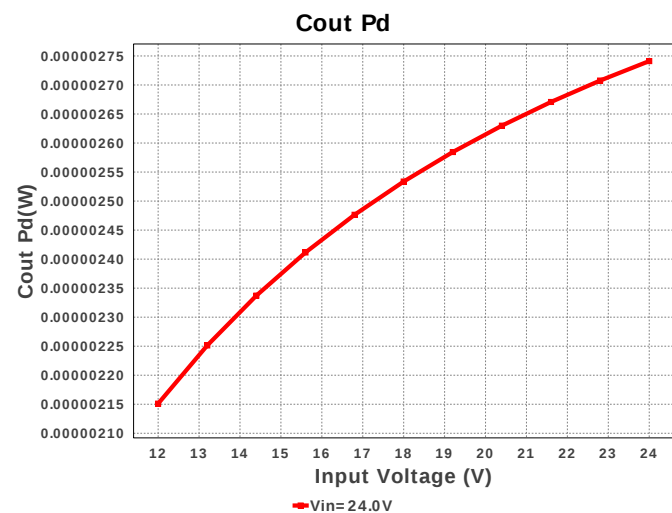
Electrical BOM

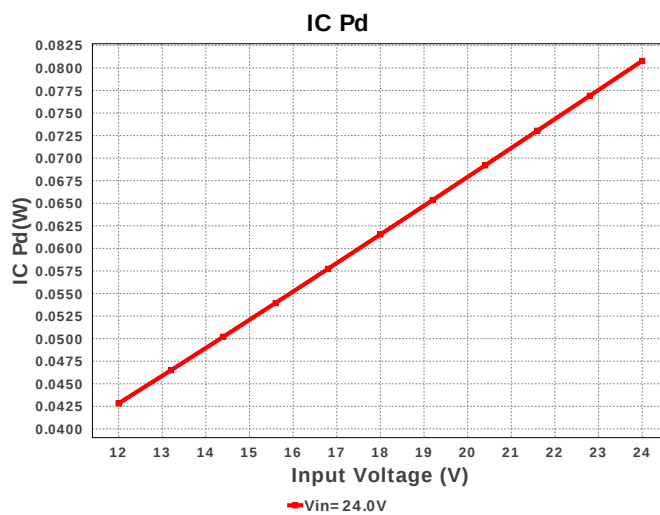
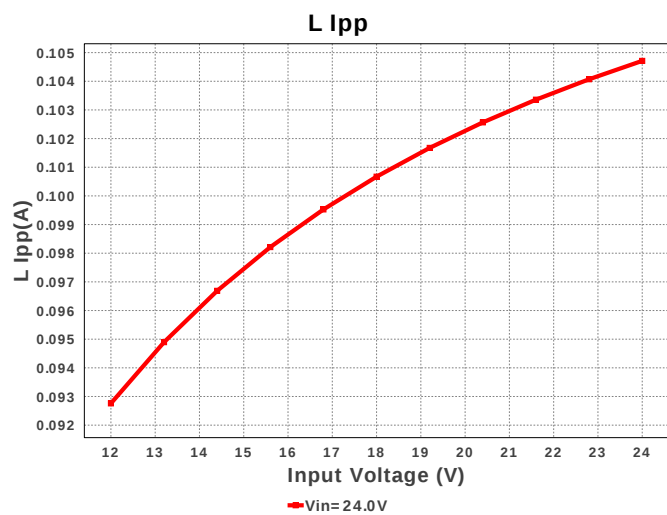
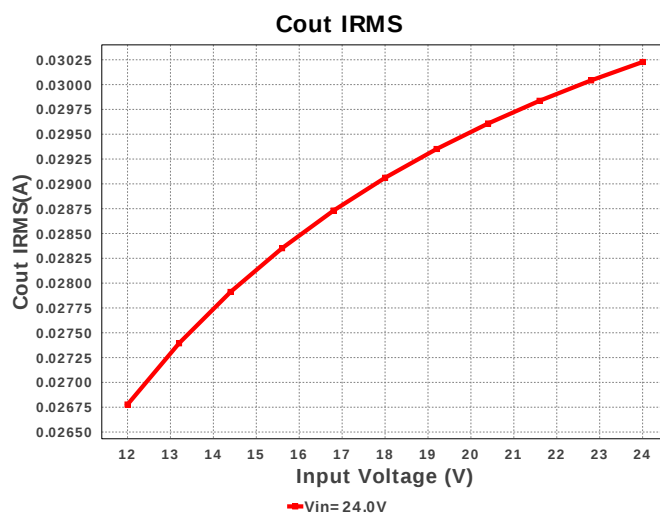
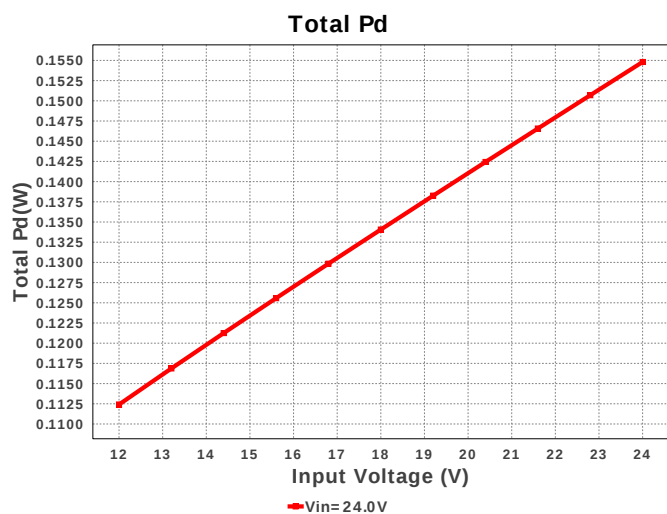
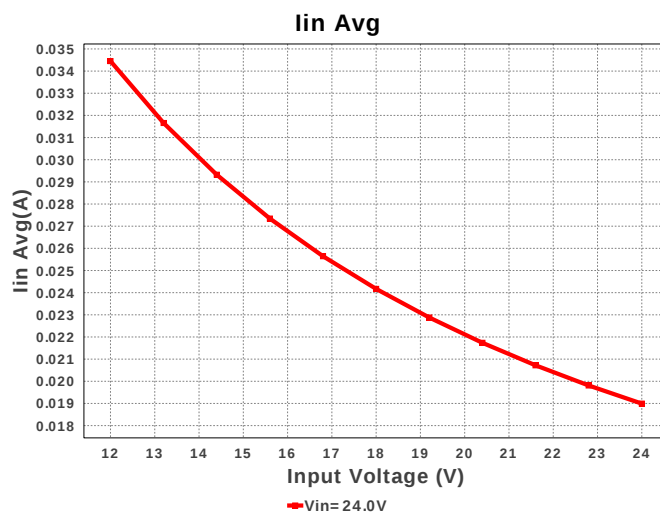
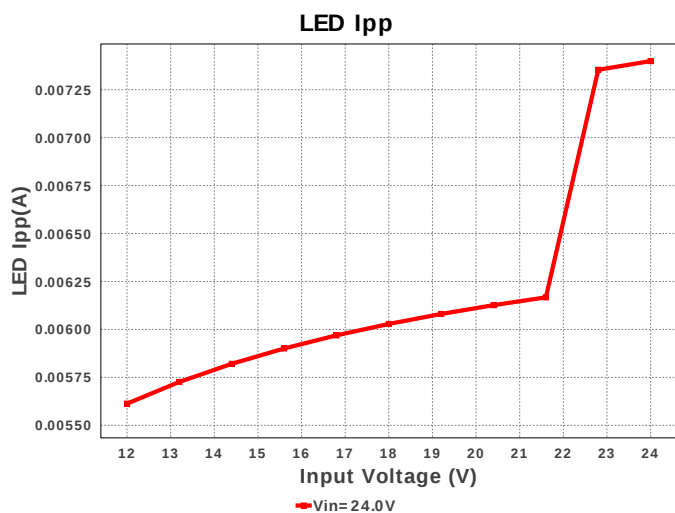
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM31CR71H225KA88L Series= X7R	Cap= 2.2 uF ESR= 4.448 mOhm VDC= 50.0 V IRMS= 2.2252 A	1	\$0.05	 1206_190 11 mm ²
2.	Cout	MuRata	GRM31CR71H475KA12L Series= X7R	Cap= 4.7 uF ESR= 3.0 mOhm VDC= 50.0 V IRMS= 4.98 A	1	\$0.07	 1206 11 mm ²
3.	Cvcc	AVX	08055C105KAT2A Series= X7R	Cap= 1.0 uF VDC= 50.0 V IRMS= 0.0 A	1	\$0.45	 0805 7 mm ²
4.	D1	Bourns	CD0603-B0230	Vf@Io= 500.0 mV VRRM= 35.0 V	1	\$0.09	 Diode_0603 5 mm ²
5.	D_LED	OSRAM	LA CN5MFBGB	LED	1	NA	 oslon 17 mm ²
6.	L1	NIC Components	NPI54C560KTRF	L= 56.0 uH DCR= 400.0 mOhm	1	\$0.09	 IND_NPI54C 61 mm ²
7.	Rfs	Panasonic	ERJ-6ENF1103V Series= ERJ-6E	Res= 110.0 kOhm Power= 125.0 mW Tolerance= 1.0%	1	\$0.01	 0805 7 mm ²
8.	Risns	Vishay-Dale	CRCW04021R40FKED Series= CRCW..e3	Res= 1.4 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²

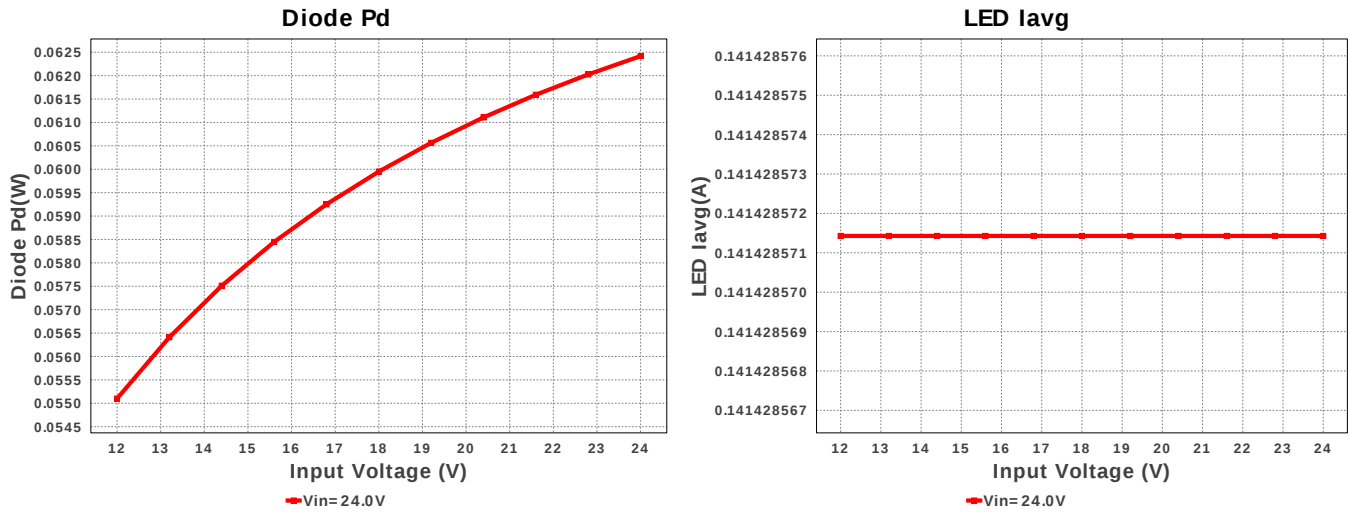
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
9.	U1	Texas Instruments	LM3407MY/NOPB	Switcher	1	\$0.55	 MUY08A 24 mm ²











Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	40.887 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	30.228 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	192.356 mA	Current	Peak switch current in IC
4.	Iin Avg	20.011 mA	Current	Average input current
5.	L Ipp	104.71 mA	Current	Peak-to-peak inductor ripple current
6.	LED Iavg	141.429 mA	Current	LED Average Current
7.	LED Ipp	7.399 mA	Current	LED Ripple Current
8.	M Irms	46.078 mA	Current	MOSFET RMS current
9.	BOM Count	9	General	Total Design BOM count
10.	FootPrint	145.0 mm ²	General	Total Foot Print Area of BOM components
11.	Frequency	403.636 kHz	General	Switching frequency
12.	IC Tolerance	0.0 V	General	IC Feedback Tolerance
13.	M Vds Act	36.272 mV	General	Voltage drop across the MosFET
14.	Pout	301.0 mW	General	Total output power
15.	Total BOM	\$0.0	General	Total BOM Cost
16.	D1 Tj	59.967 degC	Op_Point	D1 junction temperature
17.	Vout OP	2.15 V	Op_Point	Operational Output Voltage
18.	Duty Cycle	10.832 %	Op_point	Duty cycle
19.	Efficiency	62.673 %	Op_point	Steady state efficiency
20.	IC Tj	39.039 degC	Op_point	IC junction temperature
21.	ICThetaJA	50.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
22.	IOUT_OP	140.0 mA	Op_point	Iout operating point
23.	LED Rd	1.143 Ohm	Op_point	LED DynamicResistance
24.	LED Vf	1.952 V	Op_point	Total LED Forward Calculated Voltage
25.	VIN_OP	24.0 V	Op_point	Vin operating point
26.	Cin Pd	7.436 μW	Power	Input capacitor power dissipation
27.	Cout Pd	2.741 μW	Power	Output capacitor power dissipation
28.	Diode Pd	62.417 mW	Power	Diode power dissipation
29.	IC Pd	80.78 mW	Power	IC power dissipation
30.	L Pd	8.624 mW	Power	Inductor power dissipation
31.	LED Pd	301.0 mW	Power	LED Power Dissipation
32.	Rsense Pd	27.44 mW	Power	LED Power Dissipation
33.	Total Pd	179.268 mW	Power	Total Power Dissipation

Design Inputs

#	Name	Value	Description
1.	Iout	140.0 m	Maximum Output Current
2.	VinMax	24.0	Maximum input voltage
3.	VinMin	12.0	Minimum input voltage
4.	Vout	2.15	Output Voltage
5.	application	LED_DRIVER	LED Application
6.	base_pn	LM3407	Texas Instruments Base Part Number
7.	isLEDArchitect	N	LED Architect Project
8.	ledparallel	1.0	Number of LED in parallel
9.	ledpartnumber	LA CN5MFBGB	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	35.0	Ambient temperature

Design Assistance

1. The LM3407 uses a floating buck configuration to supply a constant output current of 350mA to a series of LEDs. This device features: an integrated power N-MOSFET switch, allowing for a simple compact power solution, adjustable switching frequency, via an external resistor, PWM dimming ability to control the LED brightness, and Input Under Voltage Lock Out (UVLO). An integrated power N-MOSFET switch allows for a simple compact solution. The switching frequency can be adjusted, via an external resistor. PWM dimming allows the LED brightness to be controlled. Input Under Voltage Lock Out (UVLO) will keep the device disabled when the input voltage falls below the Low-Out Low threshold, typically 3.4V.

2. LM3407 Product Folder : <http://www.ti.com/product/LM3407> : contains the data sheet and other resources.

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

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