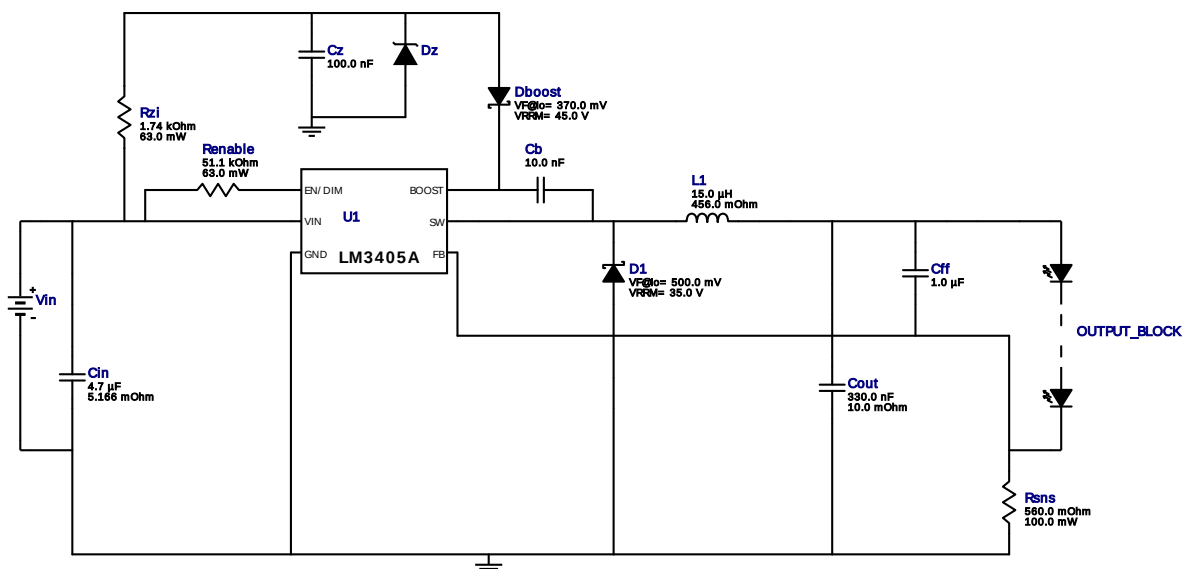
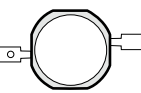


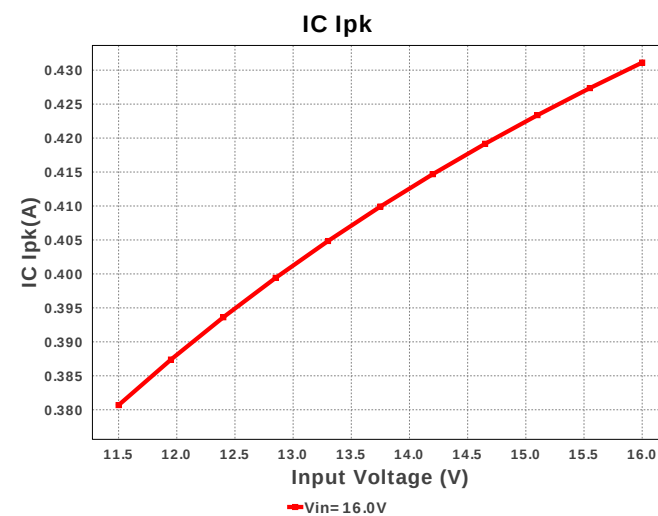
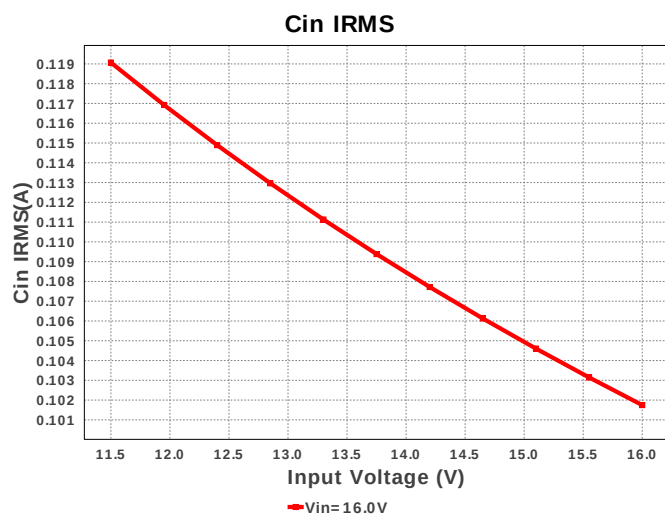
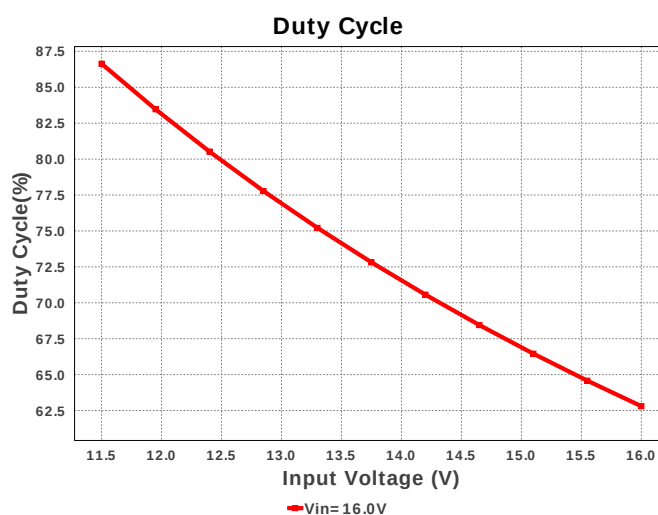
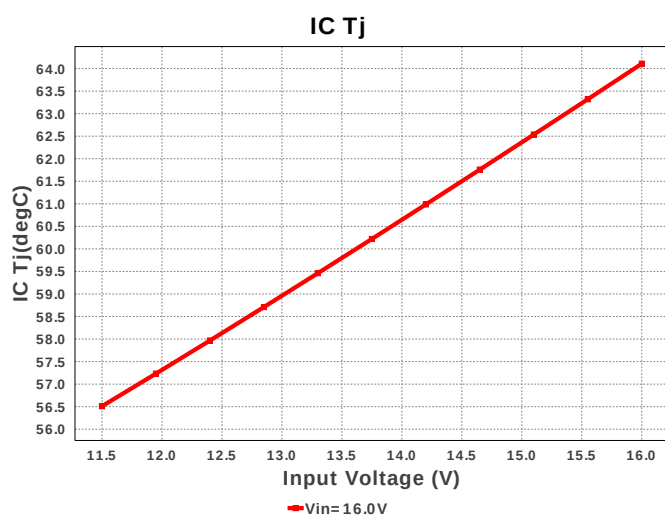
Design : 3496425/18 LM3405AXMKX/NOPB
LM3405AXMKX/NOPB 11.5V-16.0V to 9.80V @ 0.35A

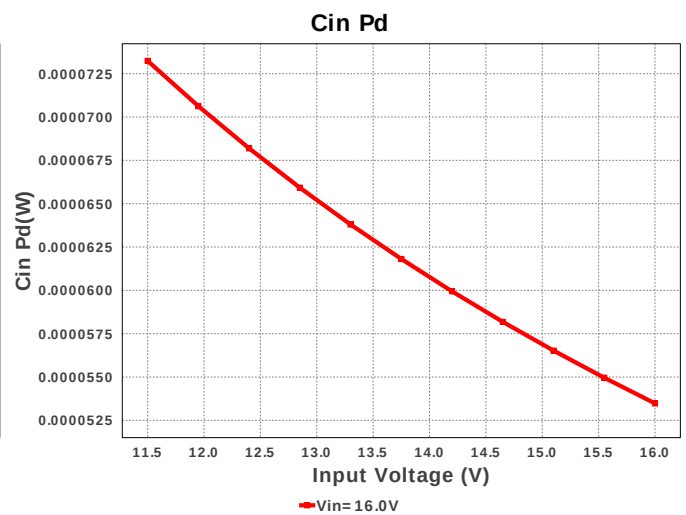
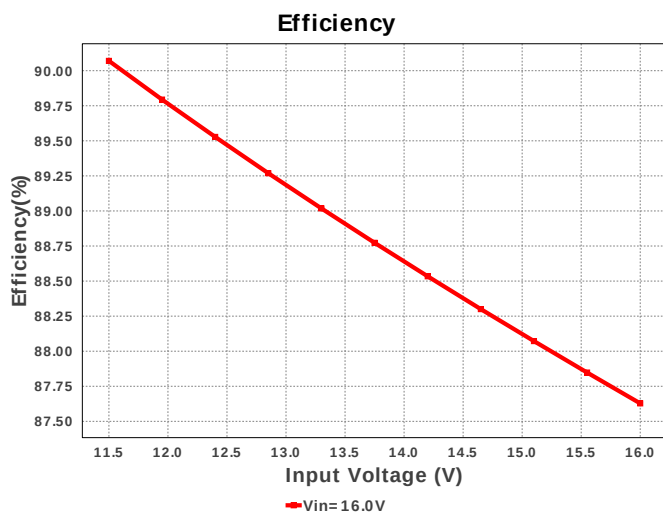
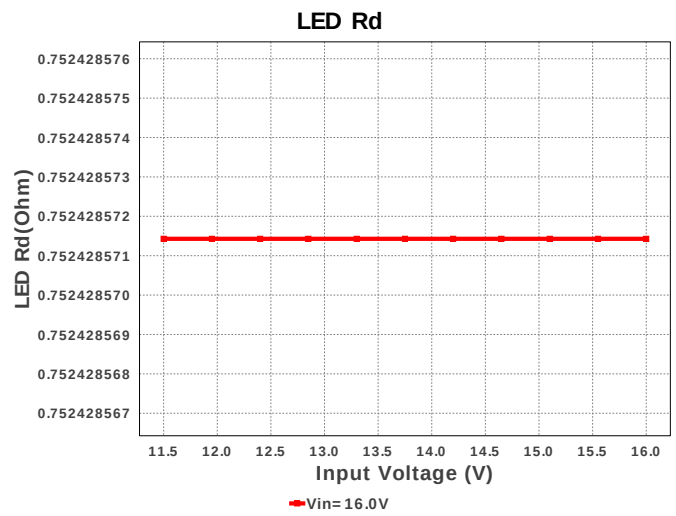
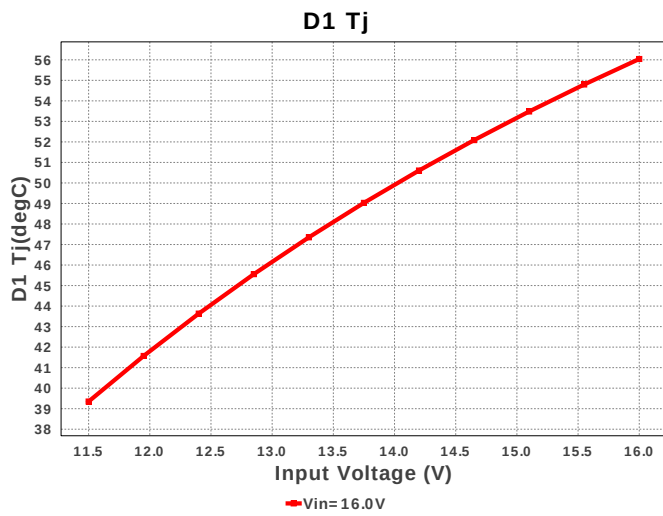
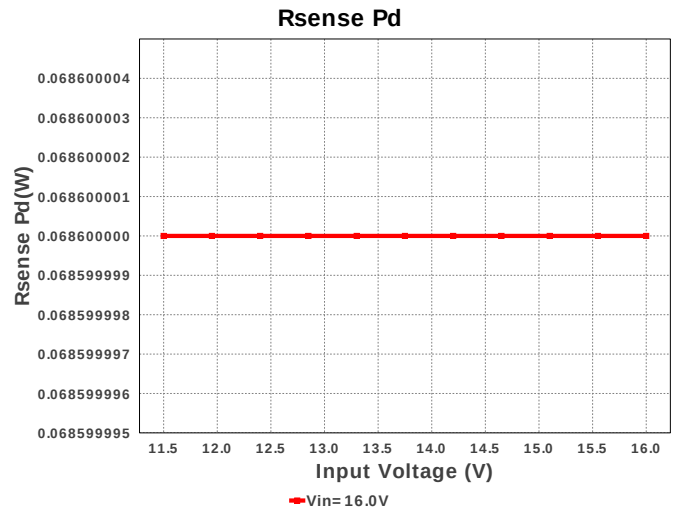
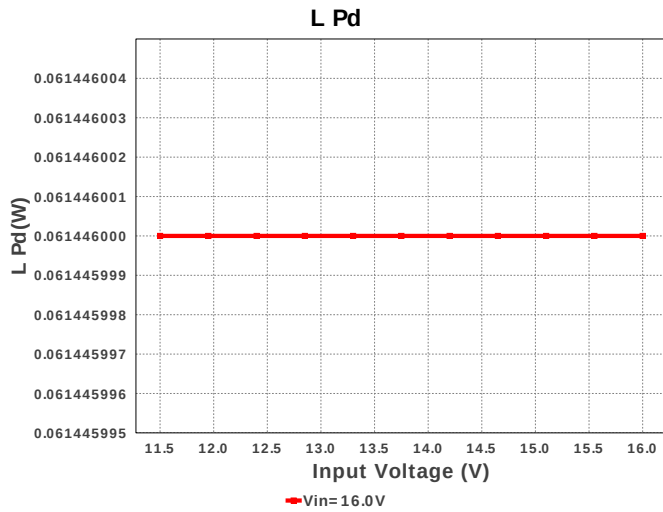


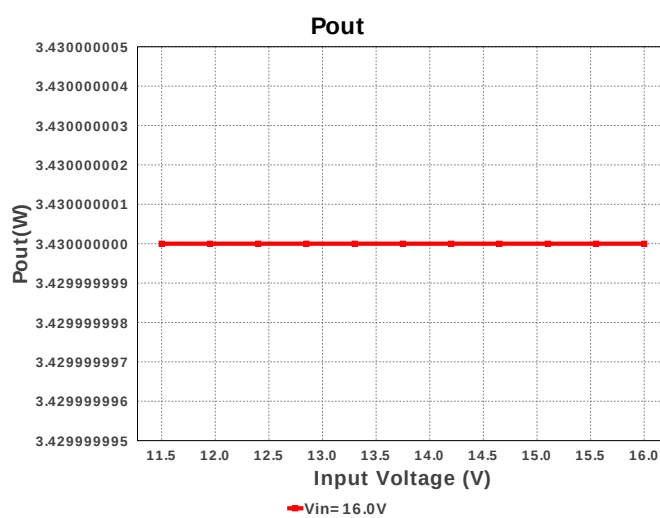
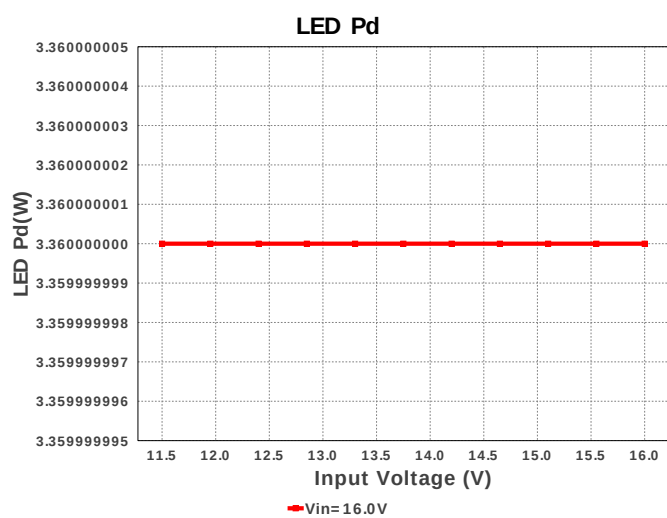
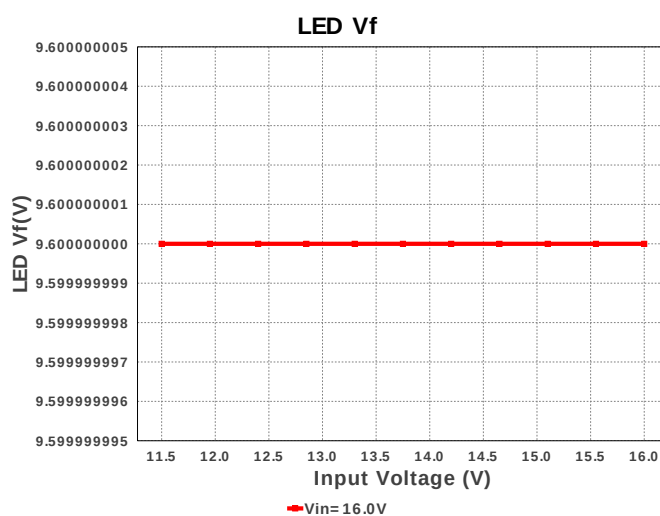
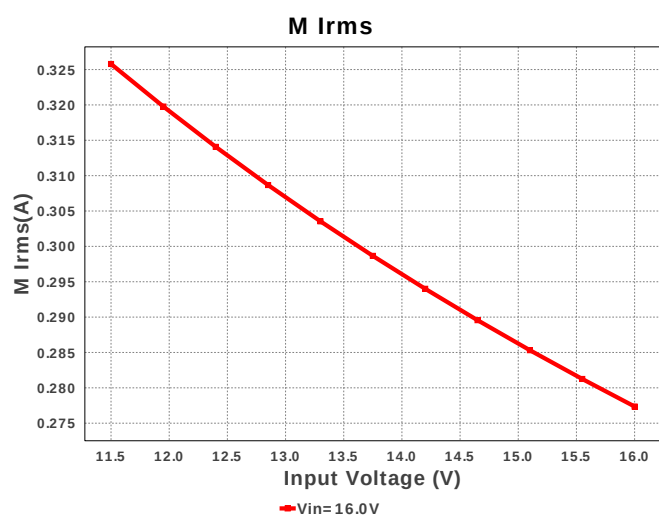
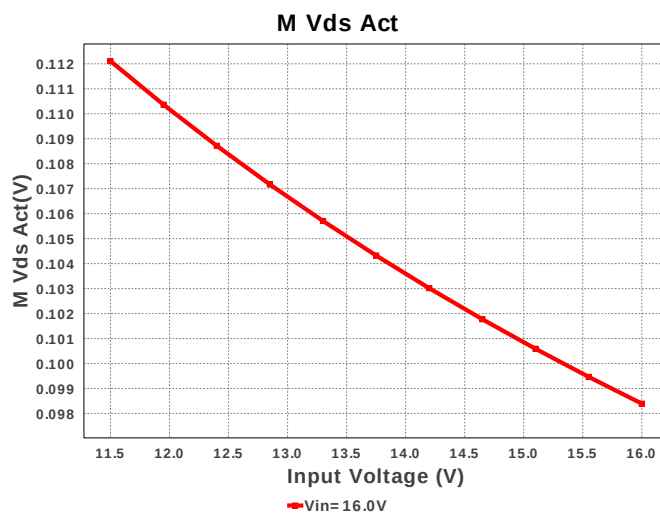
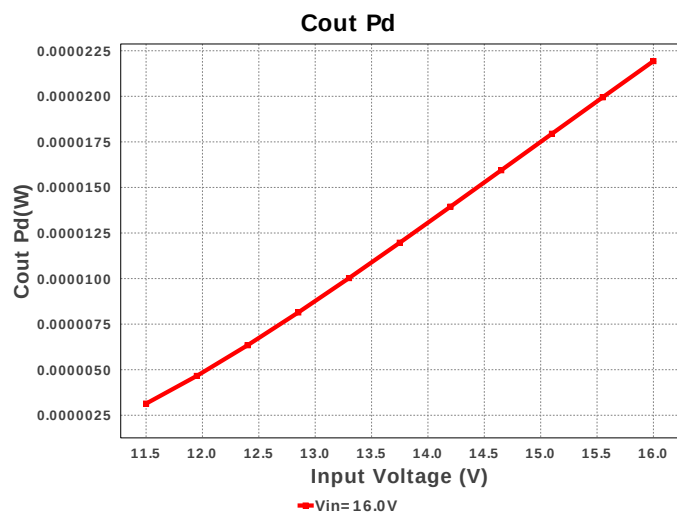
Electrical BOM

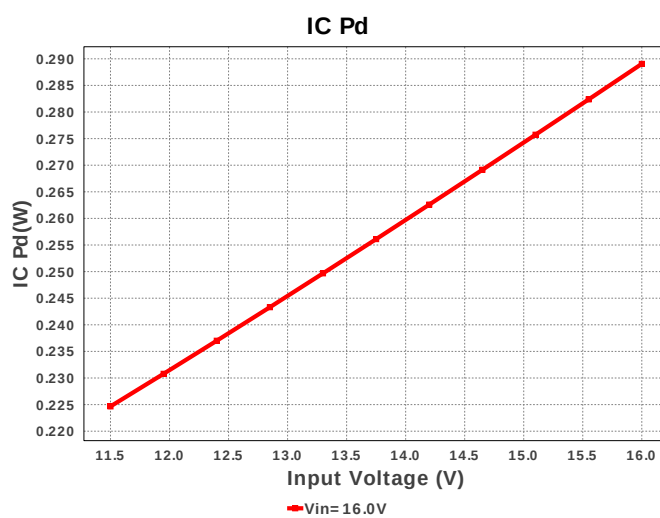
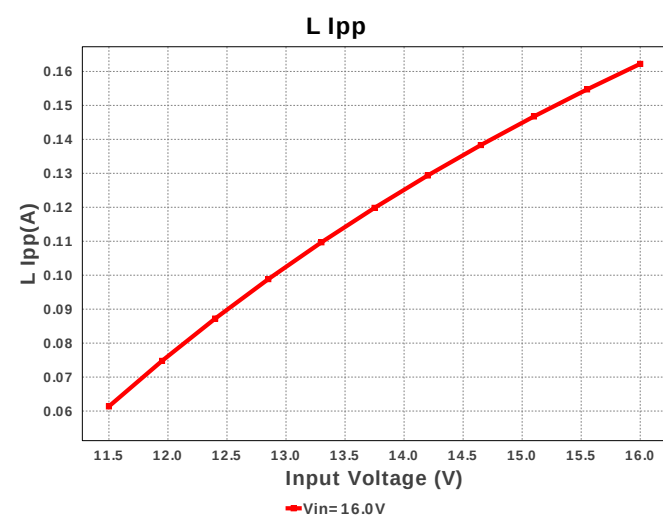
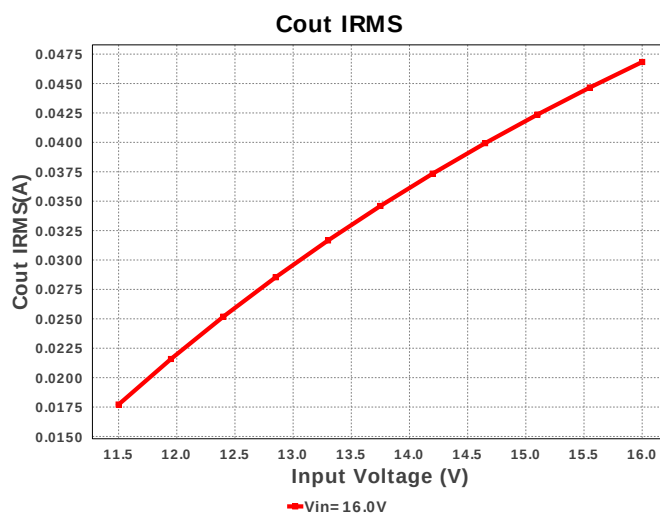
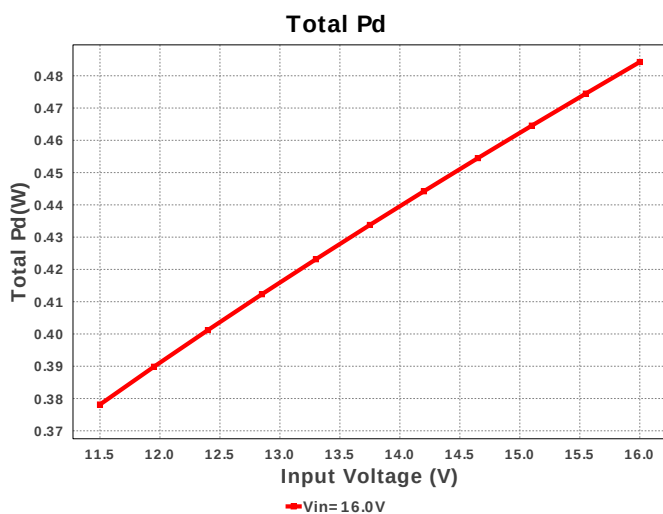
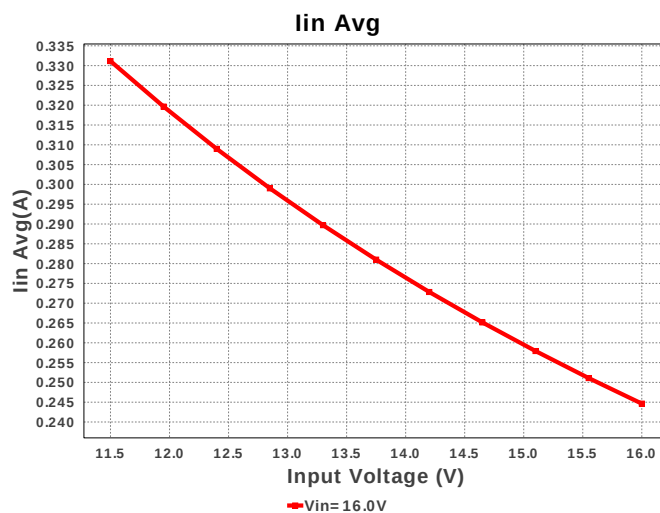
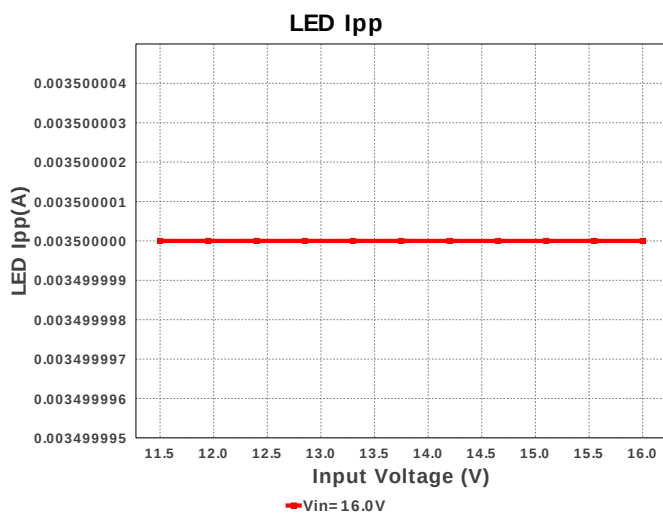
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cb	MuRata	GRM033R60J103KA01D Series= X5R	Cap= 10.0 nF VDC= 6.3 V IRMS= 0.0 A	1	\$0.01	 0201 2 mm ²
2.	Cff	Taiyo Yuden	EMK212B7105KG-T Series= X7R	Cap= 1.0 uF VDC= 16.0 V IRMS= 0.0 A	1	\$0.02	 0805 7 mm ²
3.	Cin	MuRata	GRM21BC81E475KA12L Series= X6S	Cap= 4.7 uF ESR= 5.166 mOhm VDC= 25.0 V IRMS= 2.03531 A	1	\$0.02	 0805 7 mm ²
4.	Cout	MuRata	GRM188R71C334KA01D Series= X7R	Cap= 330.0 nF ESR= 10.0 mOhm VDC= 16.0 V IRMS= 1.83 A	1	\$0.02	 0603 5 mm ²
5.	Cz	MuRata	GRM155R60J104KA01D Series= X5R	Cap= 100.0 nF VDC= 6.3 V IRMS= 0.0 A	1	\$0.01	 0402 3 mm ²
6.	D1	Bourns	CD0603-B0230	VF@Io= 500.0 mV VRRM= 35.0 V	1	\$0.09	 Diode_0603 5 mm ²
7.	D_LED	Avago	ASMT-AN31-NUV00	LED	3	\$2.77	 asmt_1 88 mm ²
8.	Dboost	Bourns	CD0603-B00340	VF@Io= 370.0 mV VRRM= 45.0 V	1	\$0.07	 Diode_0603 5 mm ²
9.	Dz	ON Semiconductor	BZX84C5V1LT1G	Zener	1	\$0.02	 SOT-23 14 mm ²

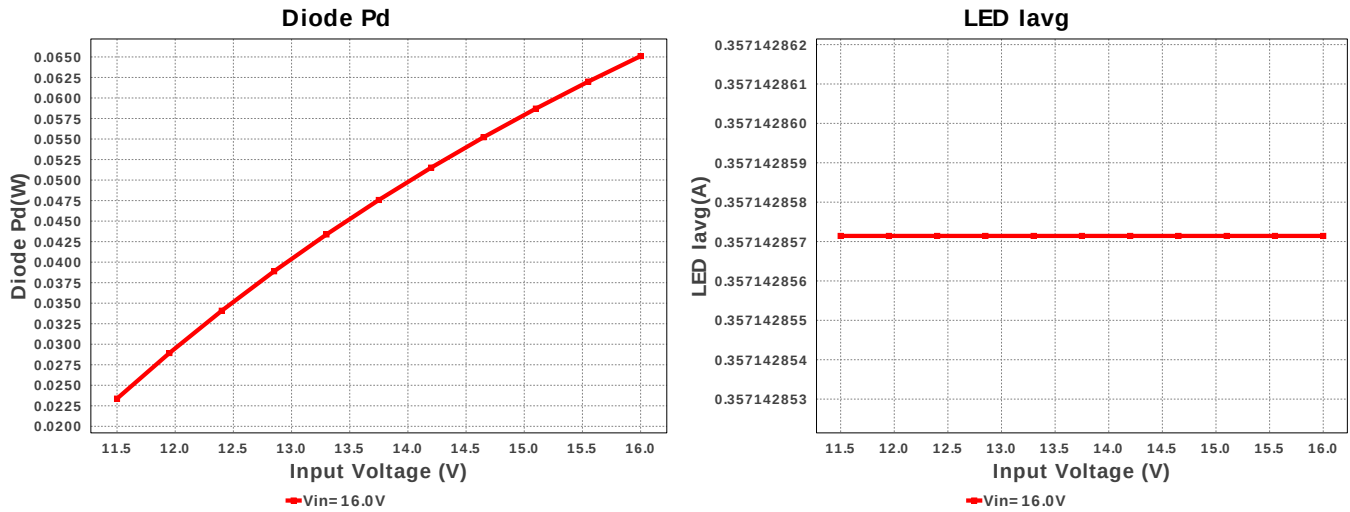
#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
10.	L1	TDK	VLS3015ET-150M	L= 15.0 μ H DCR= 456.0 mOhm	1	\$0.15	 VLS3015ET 17 mm ²
11.	Renable	Vishay-Dale	CRCW040251K1FKED Series= CRCW..e3	Res= 51.1 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
12.	Rsns	Panasonic	ERJ-3RQFR56V Series= ERJ-3R	Res= 560.0 mOhm Power= 100.0 mW Tolerance= 1.0%	1	\$0.02	 0603 5 mm ²
13.	Rzi	Vishay-Dale	CRCW04021K74FKED Series= CRCW..e3	Res= 1.74 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3 mm ²
14.	U1	Texas Instruments	LM3405AXMKX/NOPB	Switcher	1	\$0.50	 MK06A 11 mm ²











Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	101.746 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	46.832 mA	Current	Output capacitor RMS ripple current
3.	IC Ipk	431.115 mA	Current	Peak switch current in IC
4.	Iin Avg	244.64 mA	Current	Average input current
5.	L Ipp	162.23 mA	Current	Peak-to-peak inductor ripple current
6.	LED Iavg	357.143 mA	Current	LED Average Current
7.	LED Ipp	3.5 mA	Current	LED Ripple Current
8.	M1 Irms	277.36 mA	Current	Q Iavg
9.	BOM Count	16	General	Total Design BOM count
10.	FootPrint	351.0 mm ²	General	Total Foot Print Area of BOM components
11.	Frequency	1.6 MHz	General	Switching frequency
12.	IC Tolerance	17.0 mV	General	IC Feedback Tolerance
13.	M Vds Act	98.394 mV	General	Voltage drop across the MosFET
14.	Pout	3.43 W	General	Total output power
15.	Total BOM	\$9.26	General	Total BOM Cost
16.	D1 Tj	56.041 degC	Op_Point	D1 junction temperature
17.	Vout OP	9.8 V	Op_Point	Operational Output Voltage
18.	Cross Freq	27.585 kHz	Op_point	Bode plot crossover frequency
19.	Duty Cycle	62.799 %	Op_point	Duty cycle
20.	Efficiency	87.628 %	Op_point	Steady state efficiency
21.	IC Tj	64.108 degC	Op_point	IC junction temperature
22.	ICThetaJA	118.0 degC/W	Op_point	IC junction-to-ambient thermal resistance
23.	IOUT_OP	350.0 mA	Op_point	Iout operating point
24.	LED Rd	752.429 mOhm	Op_point	LED DynamicResistance
25.	LED Vf	9.6 V	Op_point	Total LED Forward Calculated Voltage
26.	Phase Marg	88.033 deg	Op_point	Bode Plot Phase Margin
27.	VIN_OP	16.0 V	Op_point	Vin operating point
28.	Cin Pd	53.48 μW	Power	Input capacitor power dissipation
29.	Cout Pd	21.932 μW	Power	Output capacitor power dissipation
30.	Diode Pd	65.102 mW	Power	Diode power dissipation
31.	IC Pd	289.05 mW	Power	IC power dissipation
32.	L Pd	61.446 mW	Power	Inductor power dissipation
33.	LED Pd	3.36 W	Power	LED Power Dissipation
34.	Rsense Pd	68.6 mW	Power	LED Current Rsns Power Dissipation
35.	Total Pd	484.27 mW	Power	Total Power Dissipation
36.	Vout Tolerance	173.469 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	16.0	Maximum input voltage
3.	VinMin	11.5	Minimum input voltage
4.	Vout	9.6	Output Voltage
5.	application	LED_DRIVER	LED Application
6.	base_pn	LM3405A	Base Product Number
7.	LED_Architect	N	LED Architect Project
8.	ledparallel	1.0	Number of LED in parallel
9.	ledpartnumber	ASMT-AN31-NUV00	LED Part number
10.	ledseries	3.0	Number of LED in series
11.	line_fsw	60.0	AC Line Frequency

#	Name	Value	Description
12.	source	DC	Input Source Type
13.	Ta	30.0	Ambient temperature

Design Assistance

1. **LM3405A** Product Folder : <http://www.ti.com/product/LM3405A> : contains the data sheet and other resources.

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