



WEBENCH® LED Architect

项目报告

项目 : 3719749/33 : Project ID 33
创建 : 2013-05-23 20:01:54.105
LED Architect with light output=300.0

发布 WEBENCH LED Architect.

项目概览

总 BOM 成本 : \$6.46
整体大小 : 675 mm²
总 BOM 数量 : 11
整体效率 : 25.79%
Total Efficacy : 84.8 lumens / Watt
Total Power Dissipation (loss) : 0.53 Watts

设计输入 :

1. Vin 最大	5.0	最高输入电压
2. Vin 最小	4.0	最低输入电压
3. color	cool white	LED Color
4. 源	DC	输入源类别
5. lightOutput	300.0	Light Output in Lumen
6. maxHeatSinkLength	200.0	Max Heat Sink Length
7. maxHeatSinkWidth	50.0	Max Heat Sink Width
8. maxJunctionTemp	150.0	Max LED Junction Temperature
9. maxLEDStringVout	60.0	Max LED String Voltage
10. optfactor	3	Optimization factor to tune up the design
11. priceFactor	0	Price factor to tune up the design cost
12. 工作环境温度	30.0	环境温度

Regulators

Main Driver NSID : LM3410YMF/NOPB Internal compensation, 525kHz; Driver Efficiency = 85.98%

Drivers Electrical BOM

制造商	零件编号	数量	Budgetary Price	大小 (mm ²)
Diodes Inc.	B220A-13-F	1	\$0.09	37
Kemet	C0805C106K8PACTU	2	\$0.10	26
Vishay-Dale	CRCW0402100KFKED	1	\$0.01	8
Panasonic	ERJ-3RQFR39V	1	\$0.02	10
Texas Instruments	LM3410YMF/NOPB	1	\$1.11	24
Bourns	SRU1038-150Y	1	\$0.33	144
Total		8	\$1.66	249

LED Array Solution BOM = LEDs + Heatsink

制造商	零件编号	数量	Cost	大小 (cm ²)
Cree	XPGWHT-L1-0000-00G51	2	\$3.52	-
Aavid	62000	1	\$1.23	4
Total			\$4.75	4

LED Array Solution

LED Array

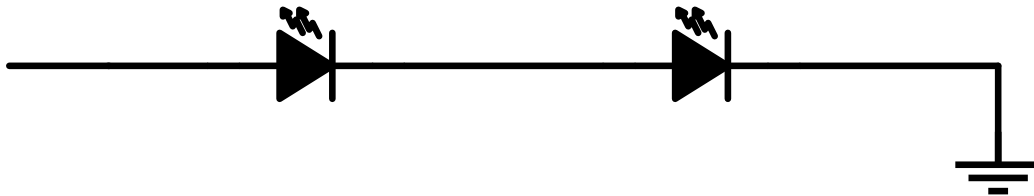
Light Output : 300 lumens
 Color : cool white
 LED quantity : 2系列 = 2Parallel = 1
 Total Vout : 5.9 Volts
 Total Iload : 0.5 Amps
 Total Light Output : 300 lumens
 Flux : 150 lumens
 ThetaSA : 29.66 C / Watt
 Junction Temp : 108 degrees
 Operating Vf : 2.951 Volts
 Operating Io : 0.509 Amps
 效率 : 30%
 Efficacy : 99.9 lumens / Watt
 整体大小 : 413.1 mm2
 Total LED Cost : \$4.75
 Max LED Vout : 60.0 Volts

Selected LED



制造商 : Cree
 零件编号 : XPGWHT-L1-0000-00G51
 Vf : 3.0 V
 Io : 0.35 A
 Angle : 125.0 degree
 PhiV : 130.0
 Color Temperature : 6650.0 K
 Color : cool white
 Tj : 150.0 deg C
 IfMin : 0.1 Amps
 IfMax : 1.5 Amps
 RJC : 6.0 deg C/Ohm
 Isat : 0.0 Amps
 Package mount : SMT
 Footprint : 29.7 mm2

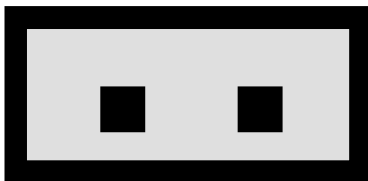
LED Load Array : For each Driver : series = 2, parallel = 1. LED Quantity = 2
Total Driver Quantity = 1 Total LED Quantity = 2



Heatsink

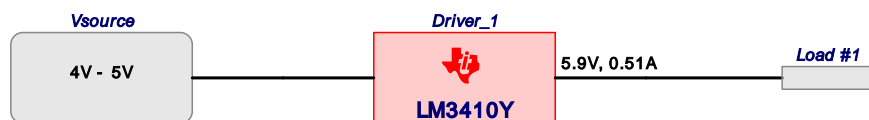
Length : 30.69 mm
 Width : 13.46 mm
 Height : 10.16 mm
 Total Heatsink Footprint : 413 mm2
 Total Heatsink Cost : \$1.23

制造商 : Aavid
 零件编号 : 62000
 ThetaSA : 29.66 C/W



Project Diagram

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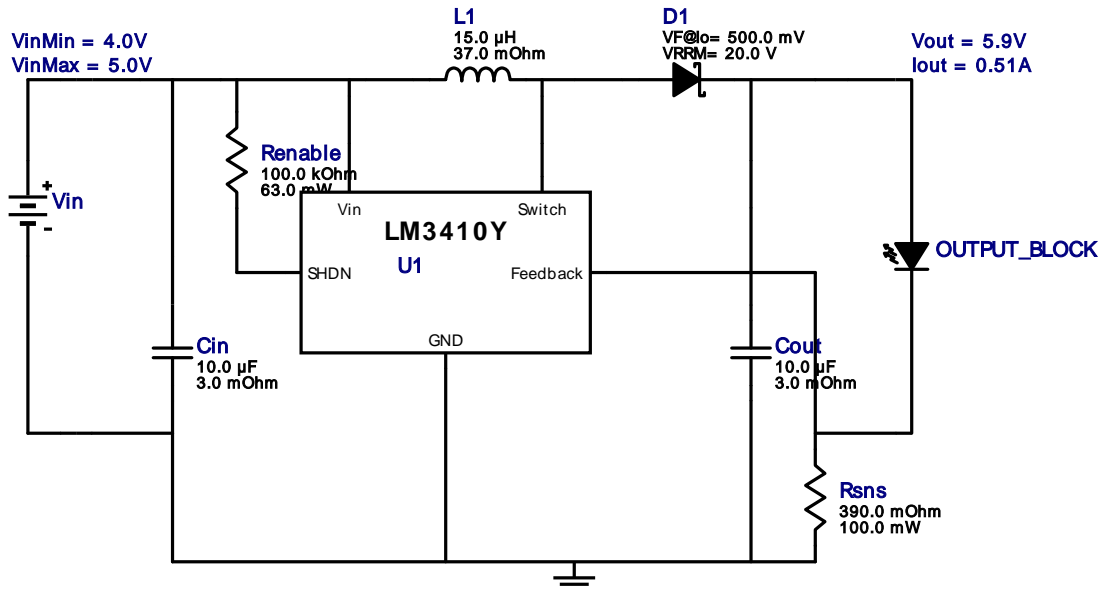


VinMin = 4.0V
VinMax = 5.0V
Vout = 5.9V
Iout = 0.51A









Device = LM3410YMF/NOPB
Topology = Boost
创建 = 5/23/13 8:01:43 PM
BOM成本 = \$1.71
Total Pd = 0.53W
大小 = 262.0mm²
BOM 数量 = 10

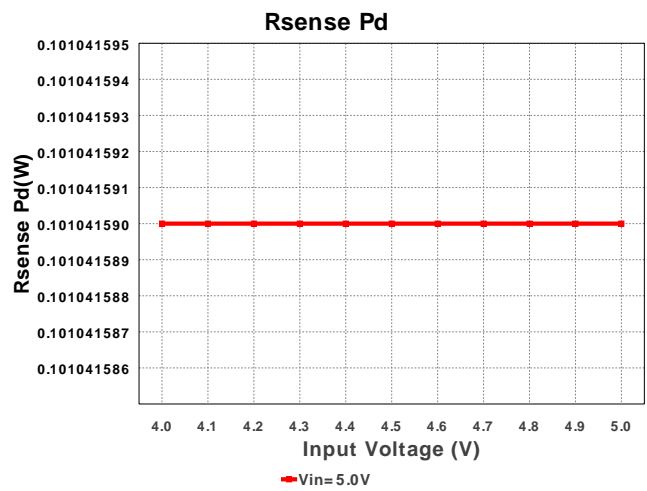
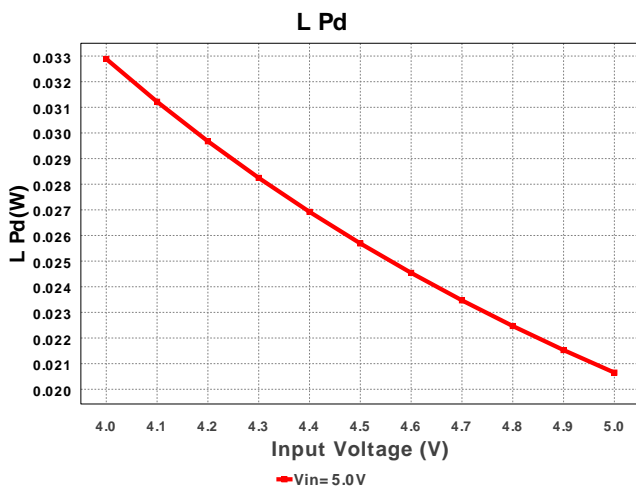
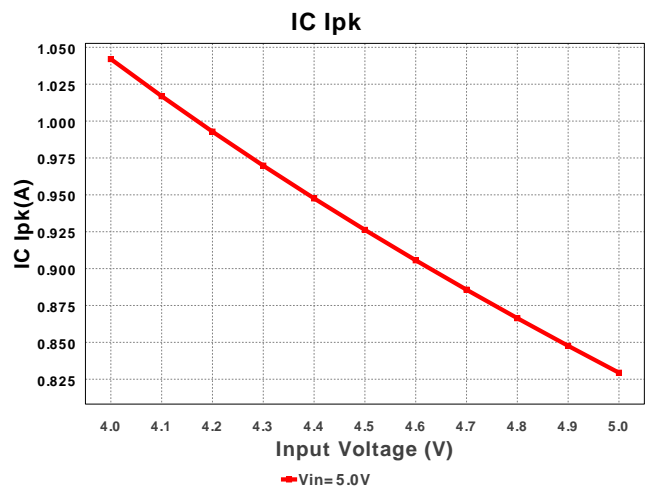
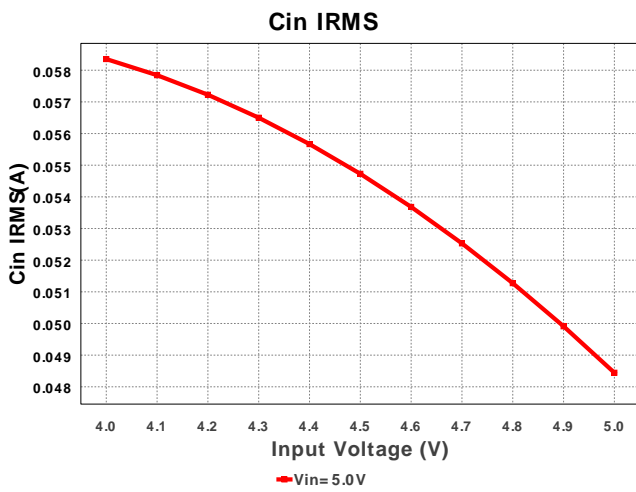
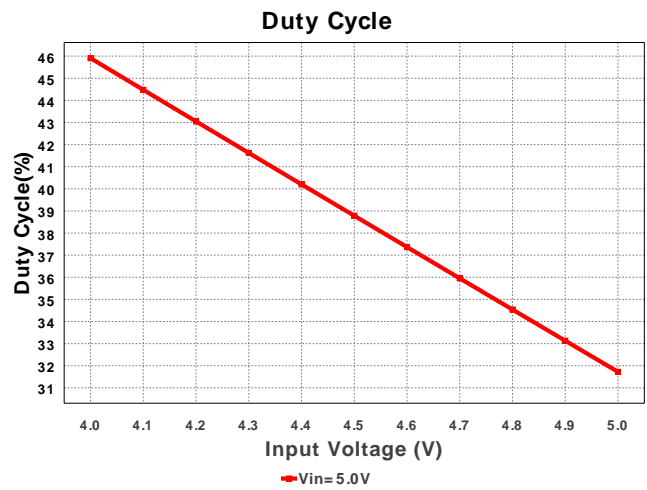
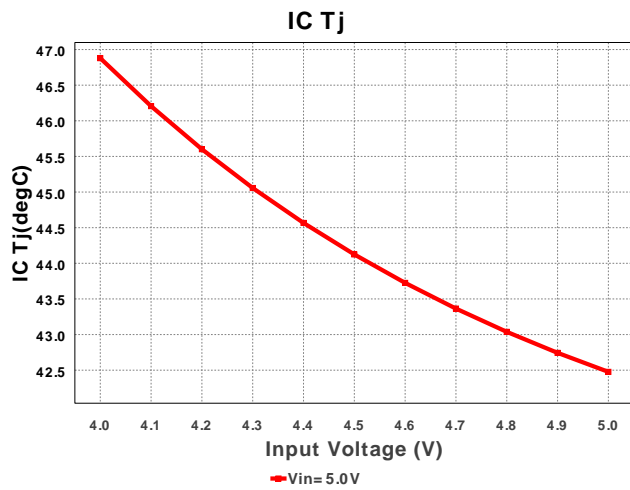
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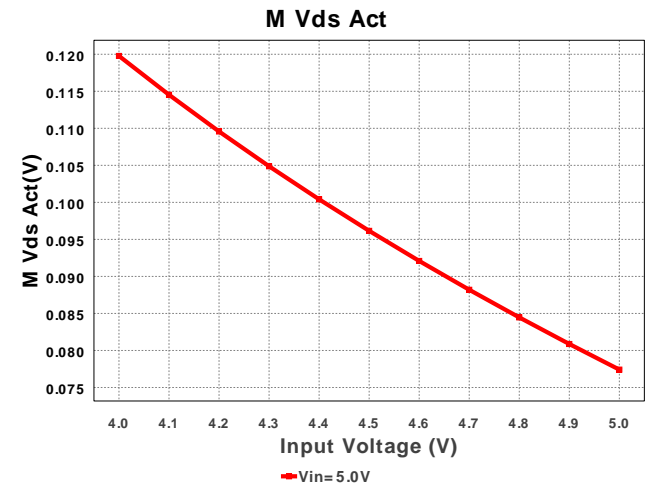
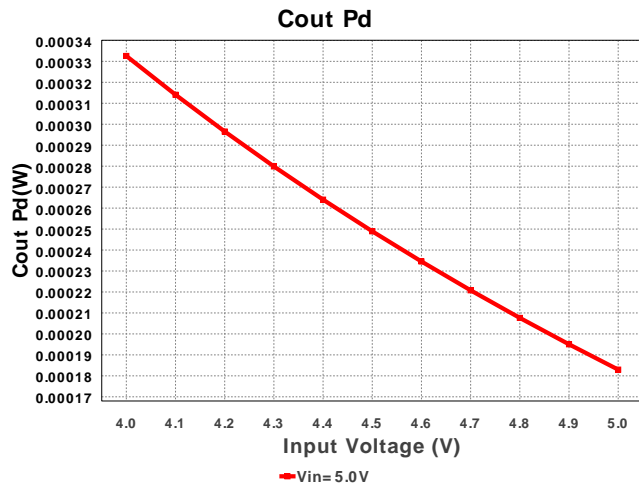
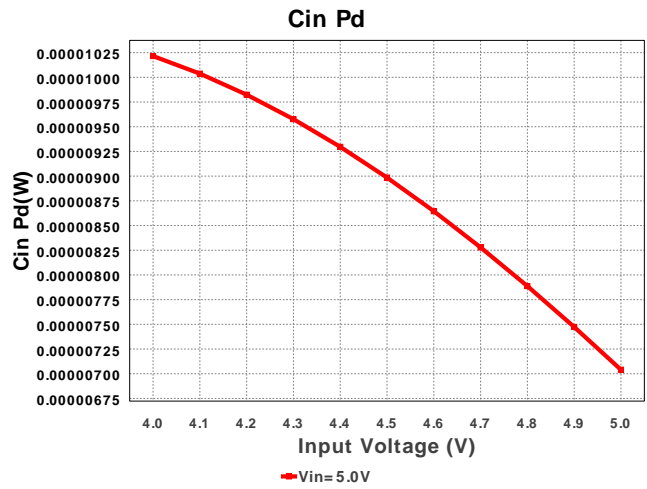
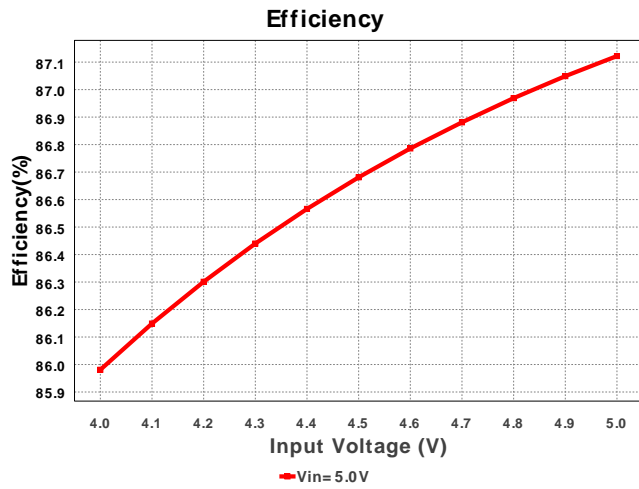
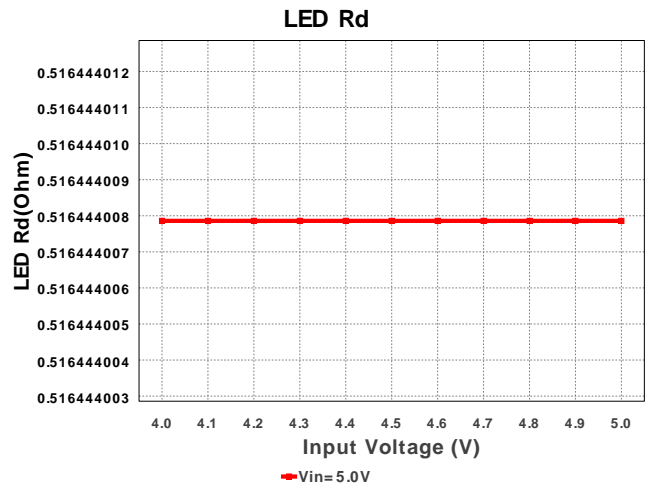
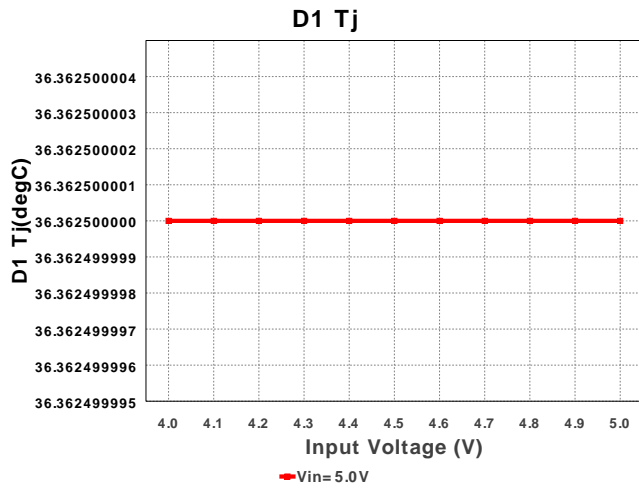
Design : 3719749/102 LM3410YMF/NOPB
LM3410YMF/NOPB 4.0V-5.0V to 6.408V @ 0.509A

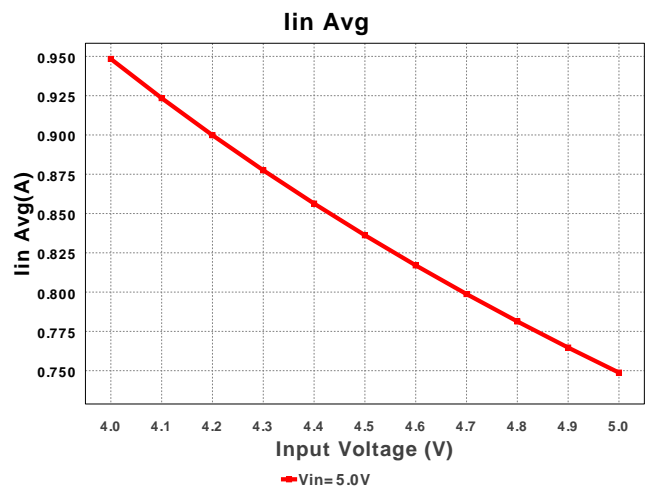
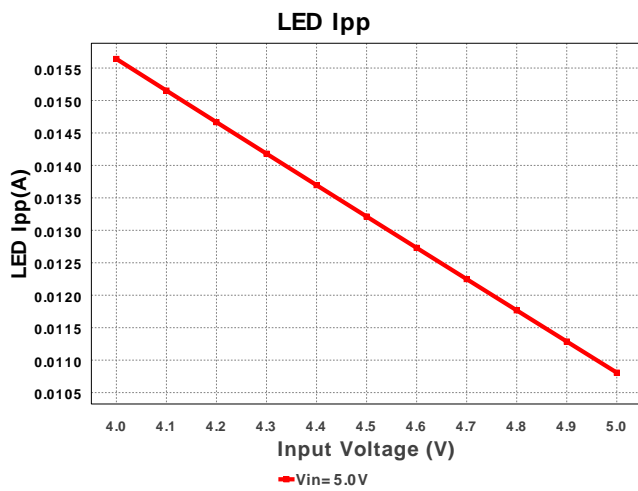
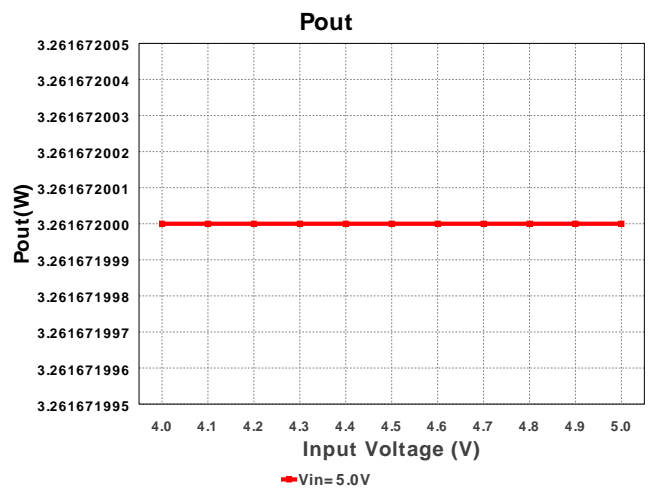
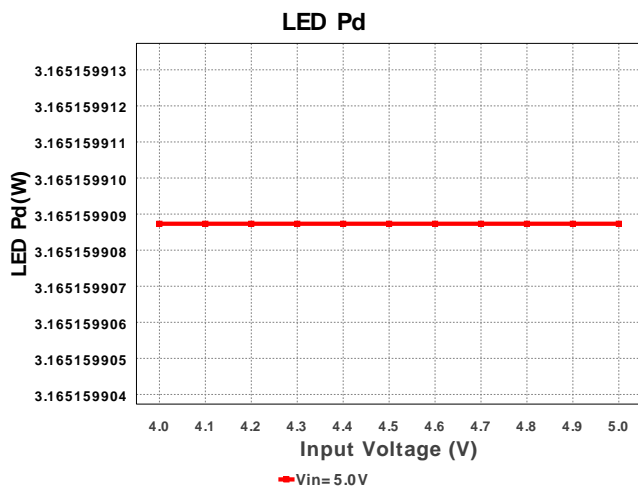
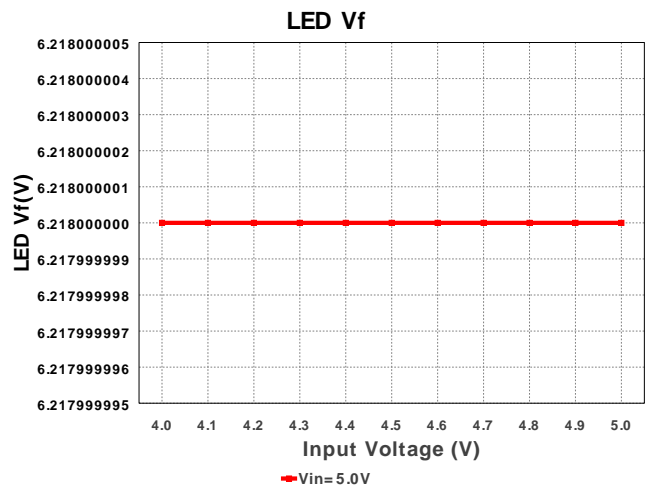
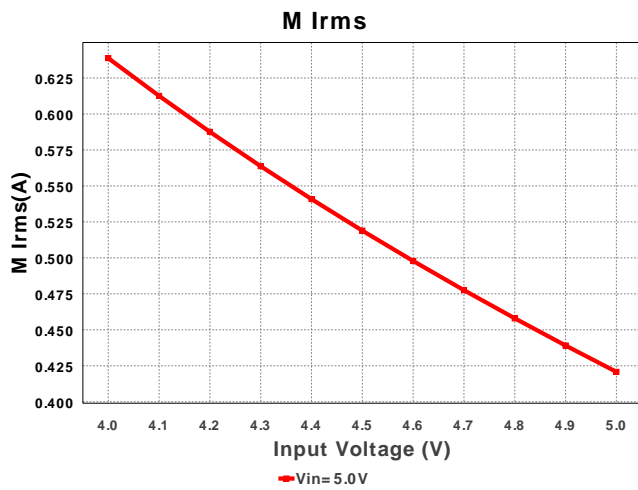


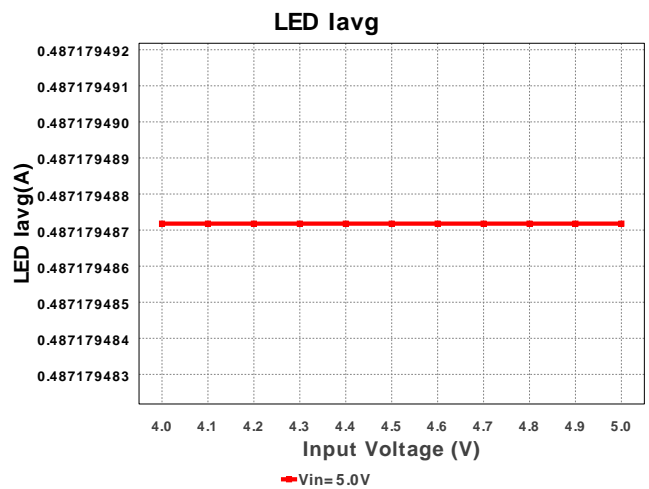
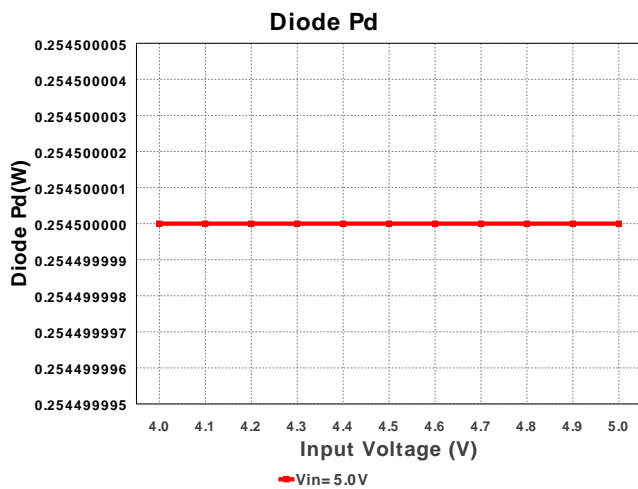
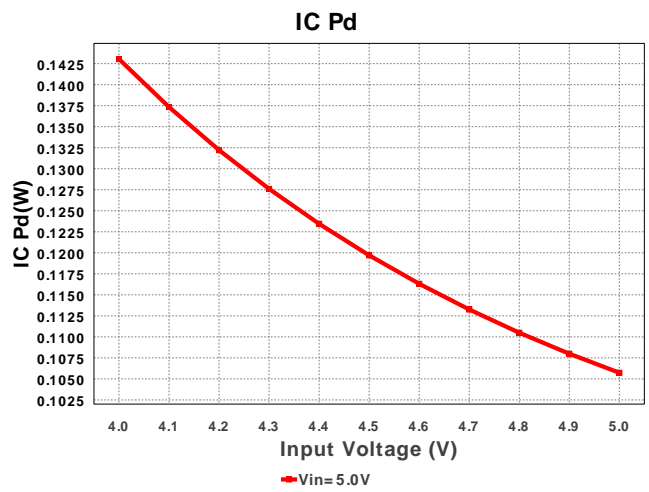
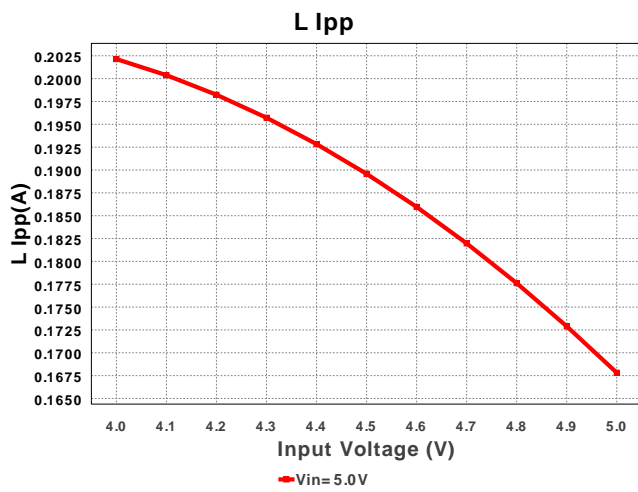
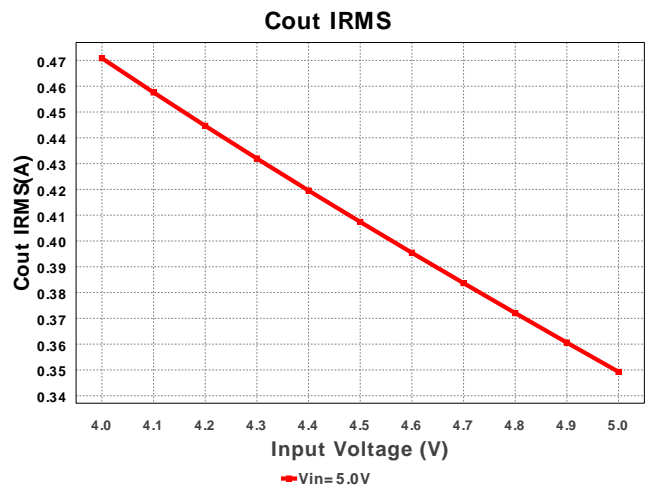
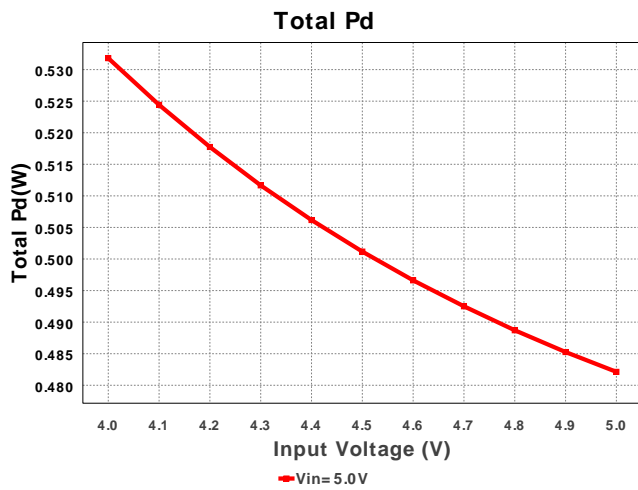
电气材料清单

#	名称	制造商	零件编号	属性	Qty	Price	大小
1.	Cin	Kemet	C0805C106K8PACTU Series= X5R	Cap= 10.0 µF ESR= 3.0 mOhm VDC= 10.0 V IRMS= 11.43 A	1	\$0.05	 0805 13mm ²
2.	Cout	Kemet	C0805C106K8PACTU Series= X5R	Cap= 10.0 µF ESR= 3.0 mOhm VDC= 10.0 V IRMS= 11.43 A	2	\$0.05	 0805 13mm ²
3.	D1	Diodes Inc.	B220A-13-F	VF@Io= 500.0 mV VRRM= 20.0 V	1	\$0.09	 SMA 37mm ²
4.	D_LED	Cree	XPGWHT-L1-0000-00G51	LED	2	\$1.76	 xlampxpg 30mm ²
5.	L1	Bourns	SRU1038-150Y	L= 15.0 µH DCR= 37.0 mOhm	1	\$0.33	 SRU1038 144mm ²
6.	Renable	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 8mm ²
7.	Rsns	Panasonic	ERJ-3RQFR39V Series= 227	Res= 390.0 mOhm Power= 100.0 mW Tolerance= 1.0%	1	\$0.02	 0603 10mm ²
8.	U1	Texas Instruments	LM3410YMF/NOPB	Switcher	1	\$1.11	 MF05A 24mm ²









工作数值

#	名称	数值	类别	说明
1.	Cin IRMS	58.353 mA	Current	输入电容器均方根纹波电流
2.	Cout IRMS	470.869 mA	Current	输出电容器均方根纹波电流
3.	IC Ipk	1.042 A	Current	电路内的峰值开关电流
4.	Iin Avg	948.37 mA	Current	平均输入电流
5.	L Ipp	202.14 mA	Current	峰值到峰值电感器纹波电流
6.	LED Iavg	487.179 mA	Current	LED 平均电流
7.	LED Ipp	15.64 mA	Current	LED 纹波电流
8.	M1 Irms	638.782 mA	Current	Q Iavg
9.	BOM 数量	10	General	Total Design BOM count
10.	大小	262.0 mm2	General	BOM组件的总所占面积
11.	频率	525.0 kHz	General	开关频率

#	名称	数值	类别	说明
12.	IC Tolerance	12.0 mV	General	IC Feedback Tolerance
13.	M Vds Act	119.774 mV	General	Voltage drop across the MosFET
14.	模式	CCM	General	传导模式
15.	Pout	3.262 W	General	总输出功率
16.	总 BOM	\$1.71	General	Total BOM Cost
17.	D1 Tj	36.362 degC	Op_Point	D1接点温度
18.	Vout OP	6.408 V	Op_Point	Operational Output Voltage
19.	交叉频率	16.58 kHz	Op_point	波特图交叉频率
20.	占空比	45.907 %	Op_point	占空比
21.	效率	85.981 %	Op_point	稳态效率
22.	IC Tj	46.879 degC	Op_point	电路接点温度
23.	ICThetaJA	118.0 degC/W	Op_point	电路接点到环境热敏电阻
24.	IOUT_OP	509.0 mA	Op_point	Iout 操作点
25.	LED Rd	516.444 mOhm	Op_point	LED 动态电阻
26.	LED Vf	6.218 V	Op_point	总 LED 正激计算电压
27.	相位裕度	41.555 deg	Op_point	波特图相位裕度
28.	VIN_OP	4.0 V	Op_point	Vin操作点
29.	Cin Pd	10.215 μW	Power	输入电容器功率耗散
30.	Cout Pd	332.577 μW	Power	输出电容器功率耗散
31.	二极管 Pd	254.5 mW	Power	二极管功率耗散
32.	IC Pd	143.042 mW	Power	电路功率耗散
33.	L Pd	32.887 mW	Power	电感器功率耗散
34.	LED Pd	3.165 W	Power	LED 功率耗散
35.	Rsense Pd	101.042 mW	Power	LED 电流 Rsns 功率耗散
36.	整体 Pd	531.808 mW	Power	总功率耗散

设计输入

#	名称	数值	说明
1.	输出电流	509.0 mA	最大输出电流
2.	Iout1	509.0 mAmps	Output Current #1
3.	Vin 最大	5.0 V	最高输入电压
4.	Vin 最小	4.0 V	最低输入电压
5.	输出电压:	5.902 V	输出电压
6.	Vout1	5.902 Volt	Output Voltage #1
7.	应用	LED_DRIVER	LED 应用
8.	base_pn	LM3410Y	美国国家半导体的产品编号
9.	LED_Architect	Y	LED Architect Project
10.	ledparallel	1.0	并联的LED数量
11.	LED 零件编号	XPGWHT-L1-0000-00G51	LED 零件编号
12.	ledseries	2.0	串联的LED数量
13.	line_fsw	NaN	交流线路频率
14.	源	DC	输入源类别
15.	工作环境温度	30.0 degC	环境温度

设计协助

1. LM3410Y Product Folder : <http://www.ti.com/product/lm3410> : contains the data sheet and other resources.

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