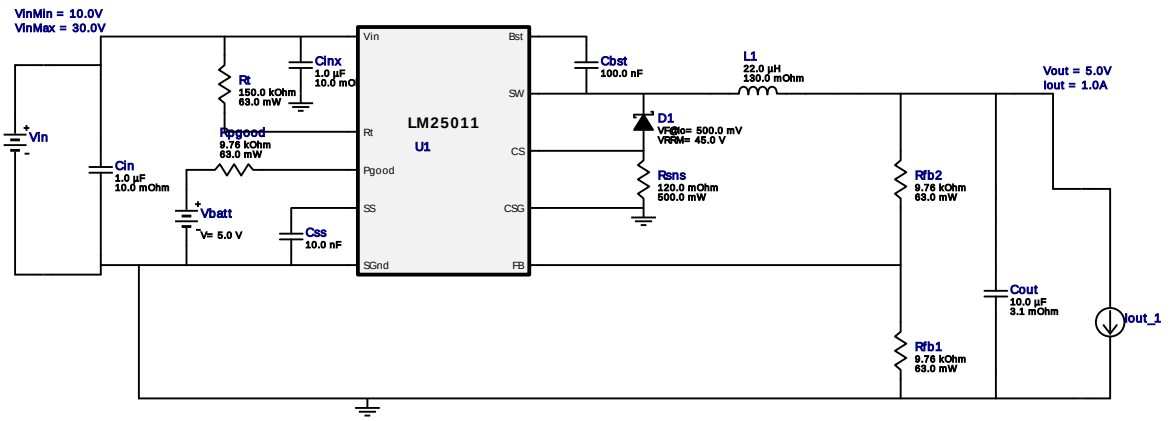
WEBENCH® 设计报告

VinMin = 10.0V
VinMax = 30.0V
Vout = 5.0V
Iout = 1.0A

Device = LM25011MY/NOPB
Topology = Buck
创建 = 5/21/13 7:18:51 PM
BOM成本 = $1.51
Total Pd = 1.21W
大小 = 290.0mm2
BOM 数量 = 14

Design : 3334464/3 LM25011MY/NOPB
LM25011MY/NOPB 10.0V-30.0V to 5.0V @ 1.0A



电气材料清单

#	名称	制造商	零件编号	属性	Qty	Price	大小
1.	Cbst	MuRata	GRM21BR71E104KA01L Series= X7R	Cap= 100.0 nF VDC= 25.0 V IRMS= 0.0 A	1	$0.01	0805 13mm2
2.	Cin	TDK	C3216X7R1H105K Series= X7R	Cap= 1.0 µF ESR= 10.0 mOhm VDC= 50.0 V IRMS= 3.2 A	2	$0.04	1206 19mm2
3.	Cinx	TDK	C3216X7R1H105K Series= X7R	Cap= 1.0 µF ESR= 10.0 mOhm VDC= 50.0 V IRMS= 3.2 A	1	$0.04	1206 19mm2
4.	Cout	TDK	C3216X5R0J106K Series= X5R	Cap= 10.0 µF ESR= 3.1 mOhm VDC= 6.3 V IRMS= 4.1 A	1	$0.04	1206 19mm2
5.	Css	MuRata	GRM216R71H103KA01D Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 13mm2
6.	D1	Vishay-Semiconductor	BYS10-45-E3/TR	VF@Io= 500.0 mV VRRM= 45.0 V	1	$0.10	SMA 37mm2
7.	L1	TDK	VLC6045T-220M	L= 22.0 µH DCR= 130.0 mOhm	1	$0.20	VLC6045 64mm2
8.	Rfb1	Vishay-Dale	CRCW04029K76FKED Series= CRCW..e3	Res= 9.76 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8mm2
9.	Rfb2	Vishay-Dale	CRCW04029K76FKED Series= CRCW..e3	Res= 9.76 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8mm2
10.	Rpgood	Vishay-Dale	CRCW04029K76FKED Series= CRCW..e3	Res= 9.76 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8mm2
11.	Rsns	Rohm	MCR25JZHFLR120 Series= 298	Res= 120.0 mOhm Power= 500.0 mW Tolerance= 1.0%	1	$0.04	1210 23mm2

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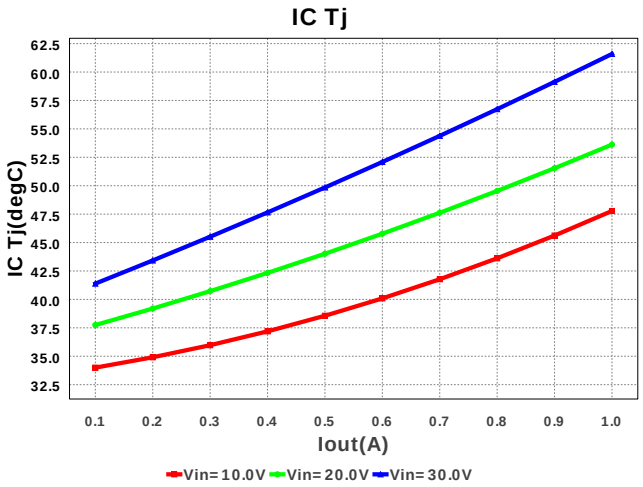
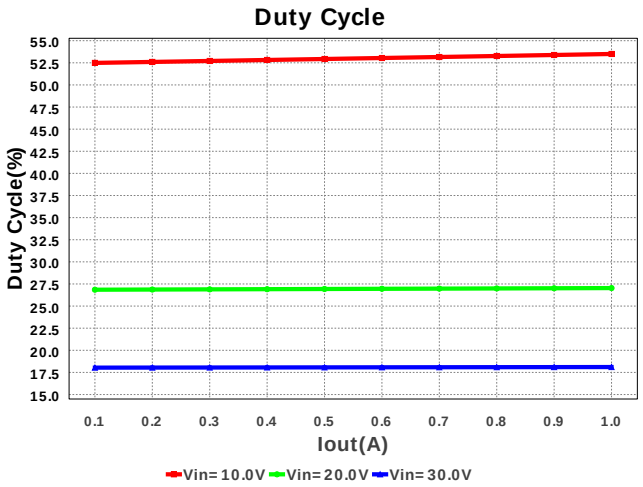
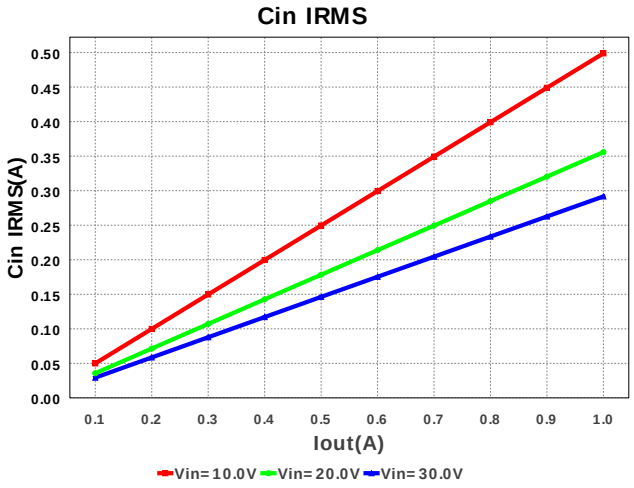
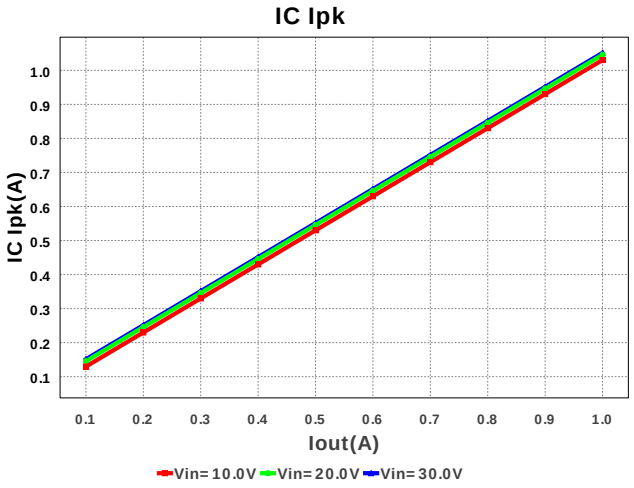
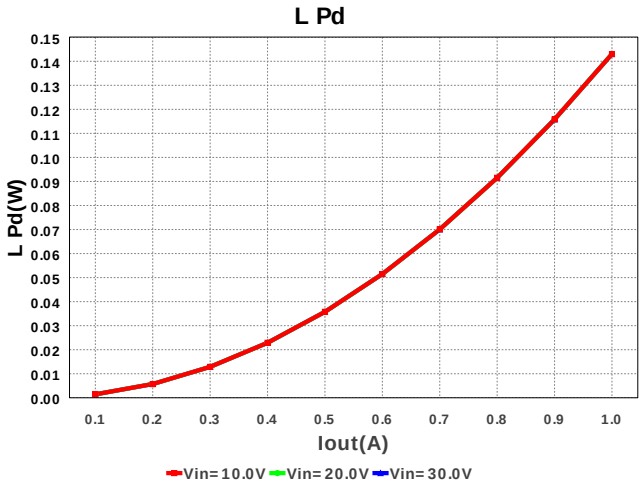
#	名称	制造商	零件编号	属性	Qty	Price	大小
12.	Rt	Vishay-Dale	CRCW0402150KFKED Series= CRCW..e3	Res= 150.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8mm2
13.	U1	Texas Instruments	LM25011MY/NOPB	Switcher	1	$0.95	MUC10A 34mm2

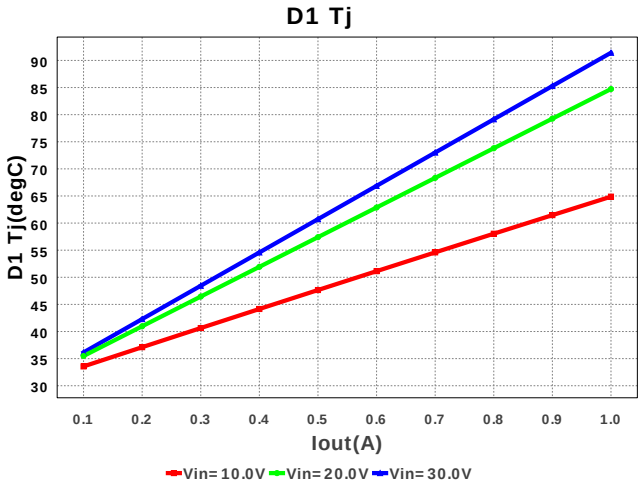












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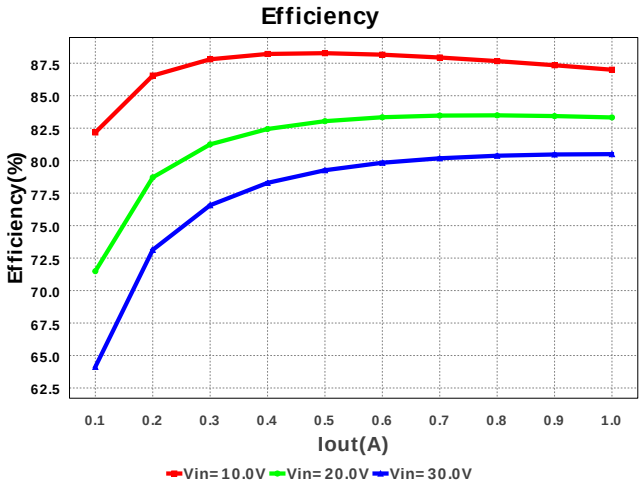

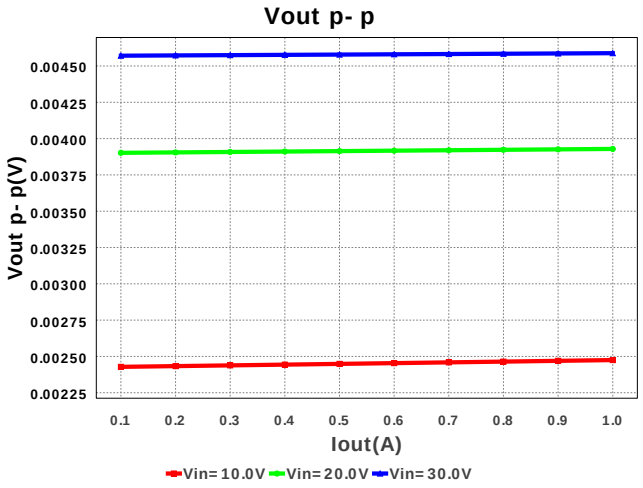

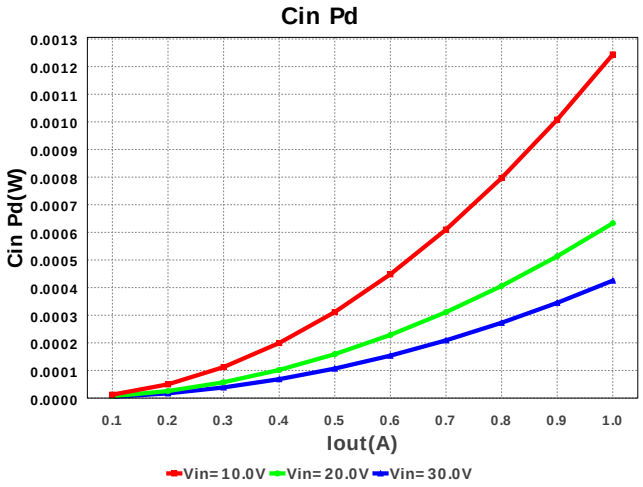

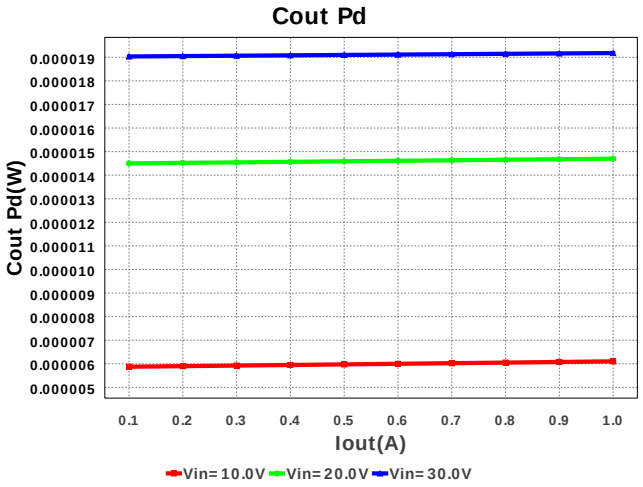

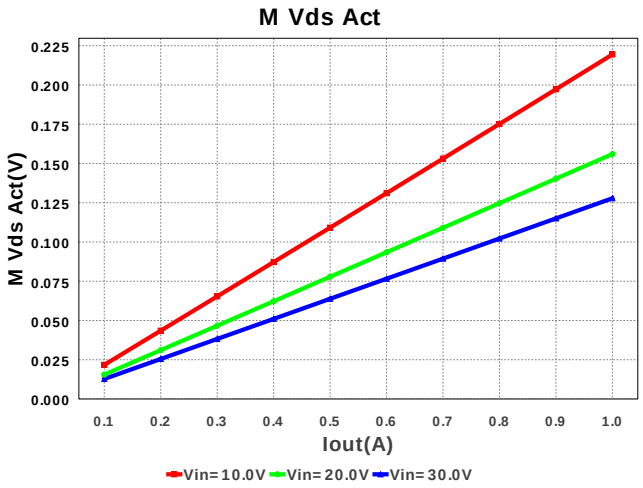

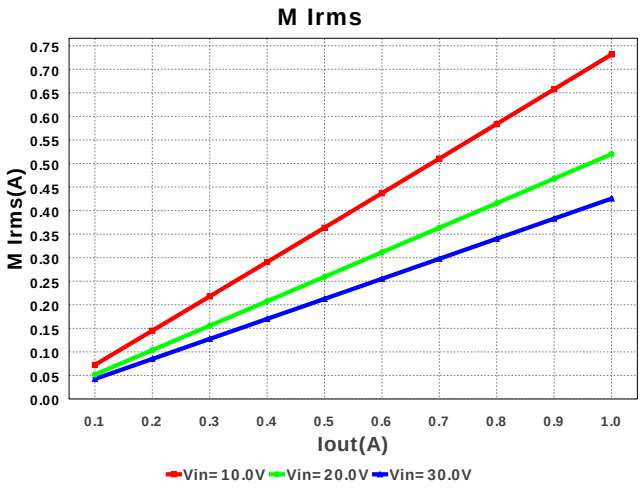

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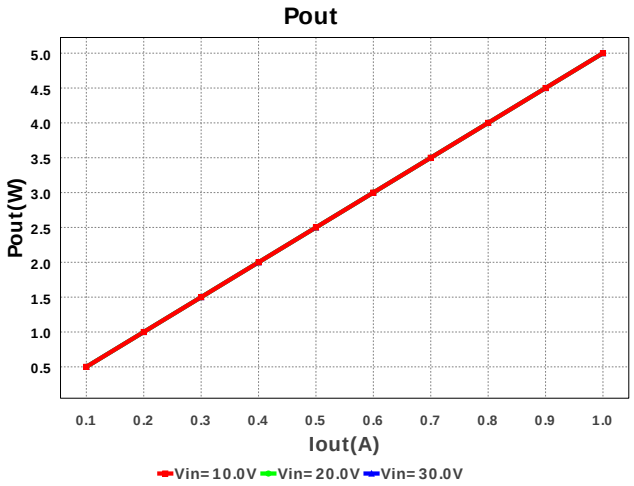

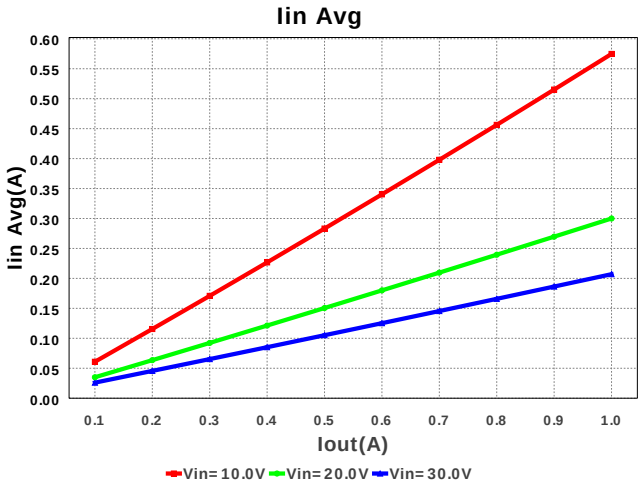

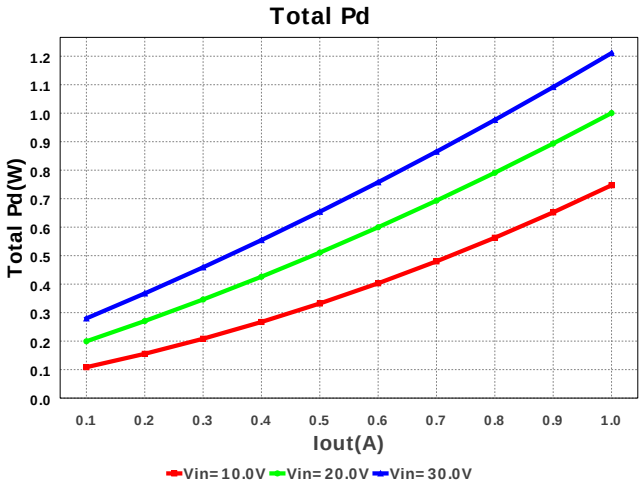

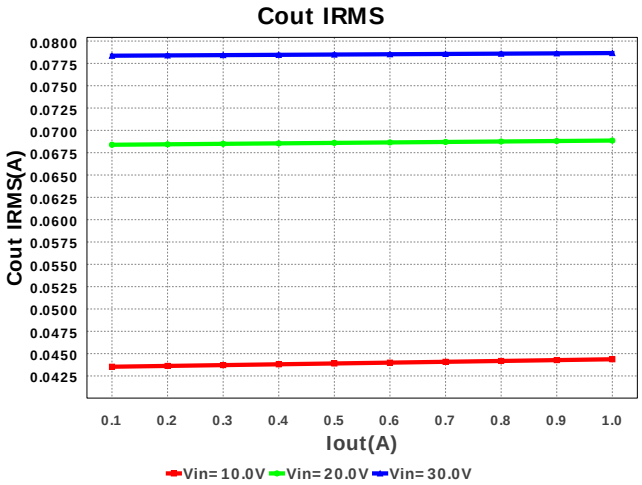

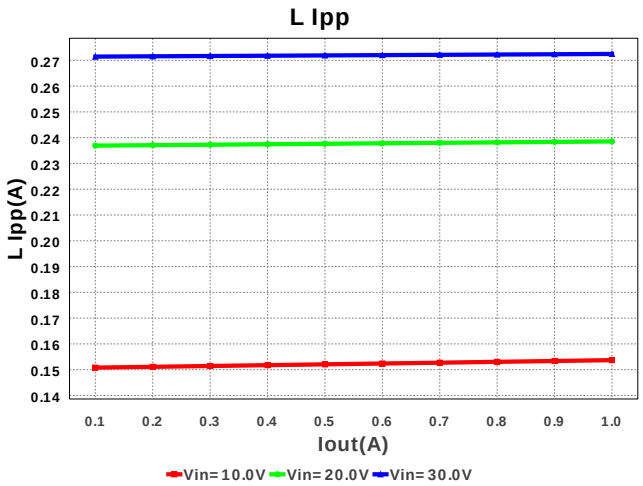

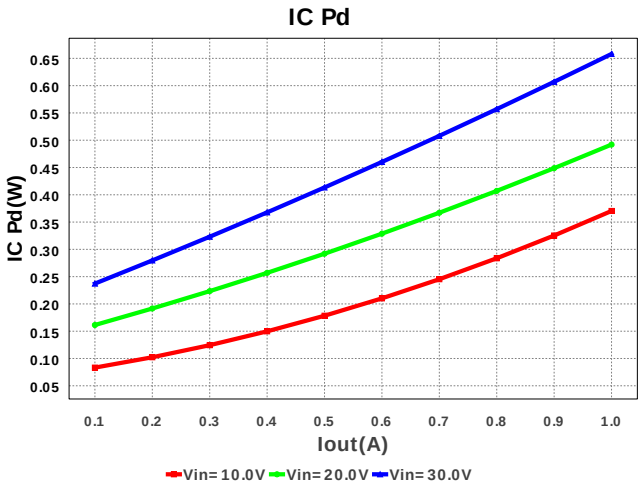

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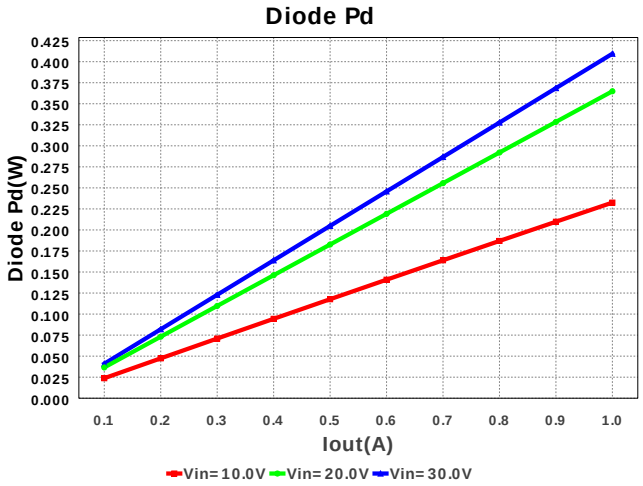

工作数值

#	名称	数值	类别	说明
1.	Cin IRMS	291.655 mA	Current	输入电容器均方根纹波电流
2.	Cout IRMS	78.656 mA	Current	输出电容器均方根纹波电流
3.	IC Ipk	1.136 A	Current	电路内的峰值开关电流
4.	Iin Avg	207.03 mA	Current	平均输入电流
5.	L Ipp	272.474 mA	Current	峰值到峰值电感器纹波电流
6.	M1 Irms	425.543 mA	Current	Q Iavg
7.	BOM 数量	14	General	Total Design BOM count
8.	大小	290.0 mm2	General	BOM组件的总所占面积
9.	频率	755.23 kHz	General	开关频率
10.	IC Tolerance	50.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	127.84 mV	General	Voltage drop across the MosFET
12.	模式	CCM	General	传导模式
13.	Pout	5.0 W	General	总输出功率
14.	总 BOM	$1.51	General	Total BOM Cost
15.	D1 Tj	91.418 degC	Op_Point	D1接点温度
16.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
17.	占空比	18.109 %	Op_point	占空比
18.	效率	80.502 %	Op_point	稳态效率
19.	IC Tj	61.588 degC	Op_point	电路接点温度
20.	ICThetaJA	48.0 degC/W	Op_point	电路接点到环境热敏电阻
21.	IOUT_OP	1.0 A	Op_point	Iout 操作点
22.	VIN_OP	30.0 V	Op_point	Vin操作点
23.	Vout p-p	4.588 mV	Op_point	峰值到峰值输出纹波电压
24.	Cin Pd	425.314 µW	Power	输入电容器功率耗散
25.	Cout Pd	19.179 µW	Power	输出电容器功率耗散
26.	二极管 Pd	409.457 mW	Power	二极管功率耗散
27.	IC Pd	658.092 mW	Power	电路功率耗散
28.	L Pd	143.0 mW	Power	电感器功率耗散
29.	整体 Pd	1.211 W	Power	总功率耗散

设计输入

#	名称	数值	说明
1.	输出电流	1.0 A	最大输出电流
2.	Iout1	1.0 Amps	Output Current #1
3.	Vin 最大	30.0 V	最高输入电压
4.	Vin 最小	10.0 V	最低输入电压
5.	输出电压:	5.0 V	输出电压
6.	Vout1	5.0 Volt	Output Voltage #1
7.	base_pn	LM25011	美国国家半导体的产品编号
8.	源	DC	输入源类别
9.	工作环境温度	30.0 degC	环境温度

设计协助

1. LM25011 Product Folder : http://www.ti.com/product/lm25011 : contains the data sheet and other resources.

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