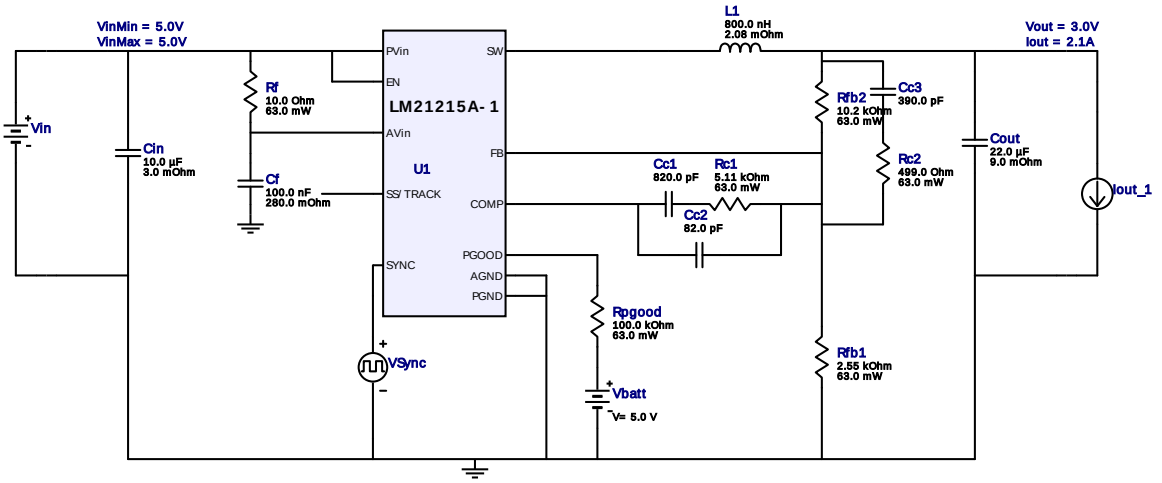
WEBENCH® 设计报告

VinMin = 5.0V
VinMax = 5.0V
Vout = 3.0V
Iout = 2.1A

Device = LM21215AMH-1/NOPB
Topology = Buck
创建 = 5/21/13 6:57:24 AM
BOM成本 = $4.48
Total Pd = 0.13W
大小 = 295.0mm2
BOM 数量 = 15

Design : 3728439/52 LM21215AMH-1/NOPB
LM21215AMH-1/NOPB 5.0V-5.0V to 3.0V @ 2.1A



电气材料清单

#	名称	制造商	零件编号	属性	Qty	Price	大小
1.	Cc1	Yageo America	CC0805KRX7R9BB821 Series= X7R	Cap= 820.0 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 13mm2
2.	Cc2	Yageo America	CC0805JRNP09BN820 Series= C0G/NP0	Cap= 82.0 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 13mm2
3.	Cc3	Yageo America	CC0805KRX7R9BB391 Series= X7R	Cap= 390.0 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 13mm2
4.	Cf	AVX	08053C104KAT2A Series= X7R	Cap= 100.0 nF ESR= 280.0 mOhm VDC= 25.0 V IRMS= 0.0 A	1	$0.01	0805 13mm2
5.	Cin	Kemet	C0805C106K8PACTU Series= X5R	Cap= 10.0 µF ESR= 3.0 mOhm VDC= 10.0 V IRMS= 11.43 A	2	$0.05	0805 13mm2
6.	Cout	MuRata	GRM21BR60J226ME39L Series= X5R	Cap= 22.0 µF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 3.5 A	1	$0.05	0805 13mm2
7.	L1	Coilcraft	XAL7070-801MEB	L= 800.0 nH DCR= 2.08 mOhm	1	$0.68	XAL7070 87mm2
8.	Rc1	Vishay-Dale	CRCW04025K11FKED Series= CRCW..e3	Res= 5.11 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8mm2
9.	Rc2	Vishay-Dale	CRCW0402499RFKED Series= CRCW..e3	Res= 499.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8mm2
10.	Rf	Vishay-Dale	CRCW040210R0FKED Series= CRCW..e3	Res= 10.0 Ohm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8mm2

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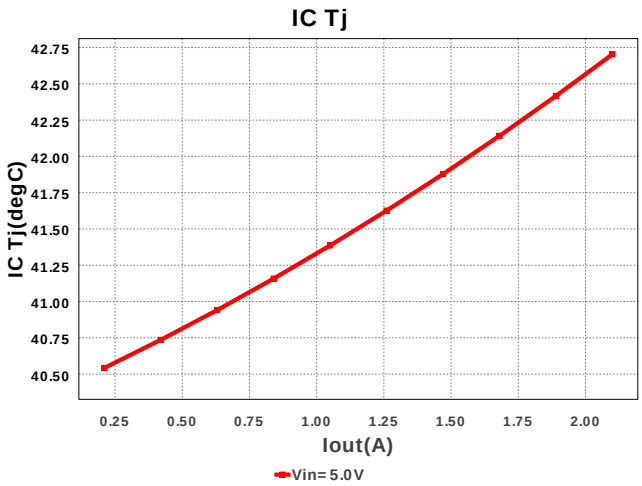
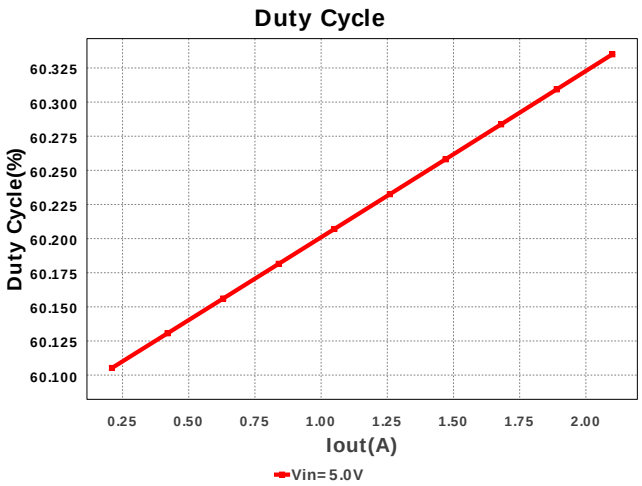
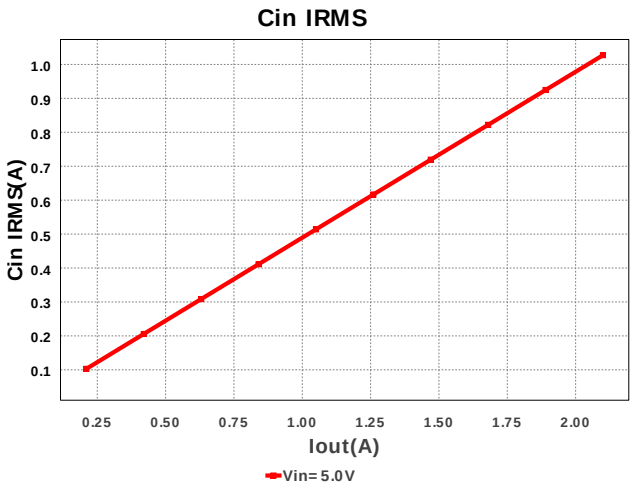
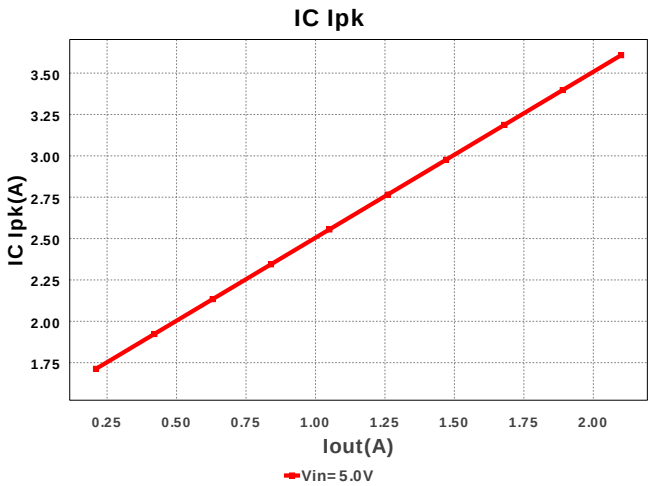
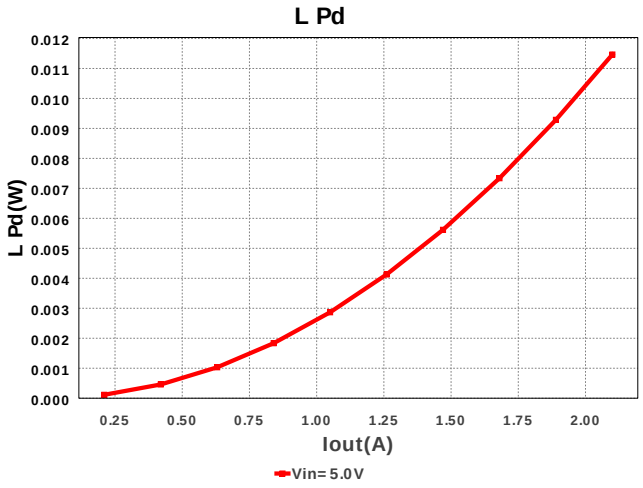
#	名称	制造商	零件编号	属性	Qty	Price	大小
11.	Rfb1	Vishay-Dale	CRCW04022K55FKED Series= CRCW..e3	Res= 2.55 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8mm2
12.	Rfb2	Vishay-Dale	CRCW040210K2FKED Series= CRCW..e3	Res= 10.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8mm2
13.	Rpgood	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8mm2
14.	U1	Texas Instruments	LM21215AMH-1/NOPB	Switcher	1	$3.55	MYB20A 71mm2

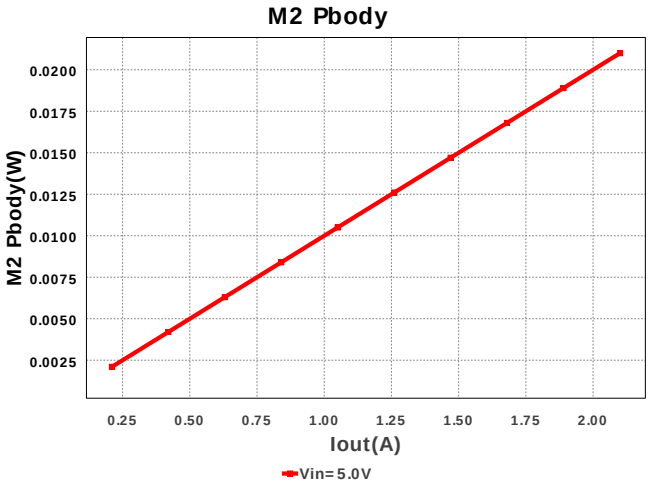


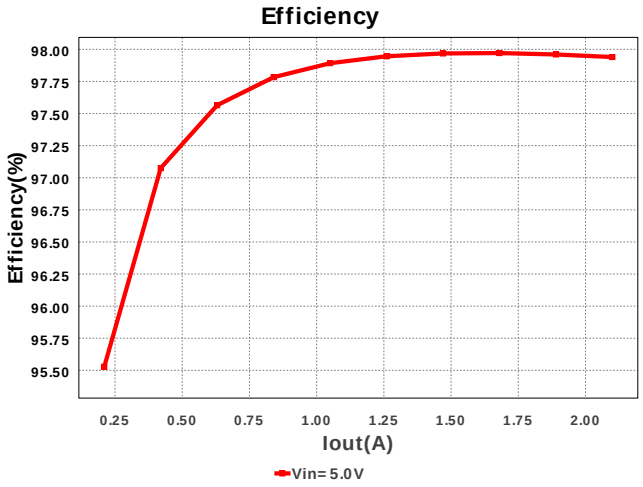


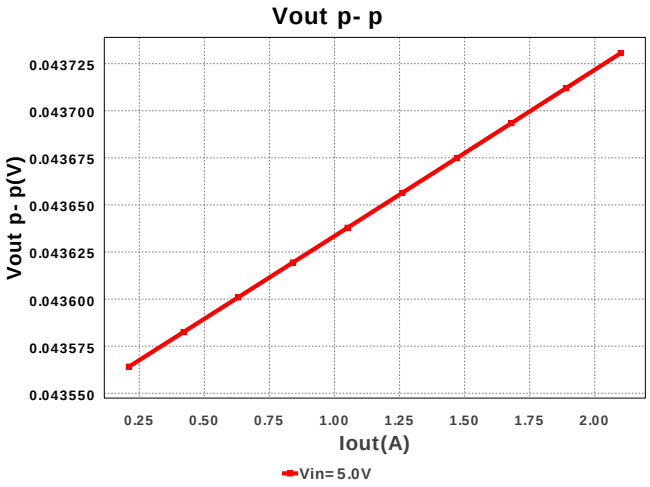


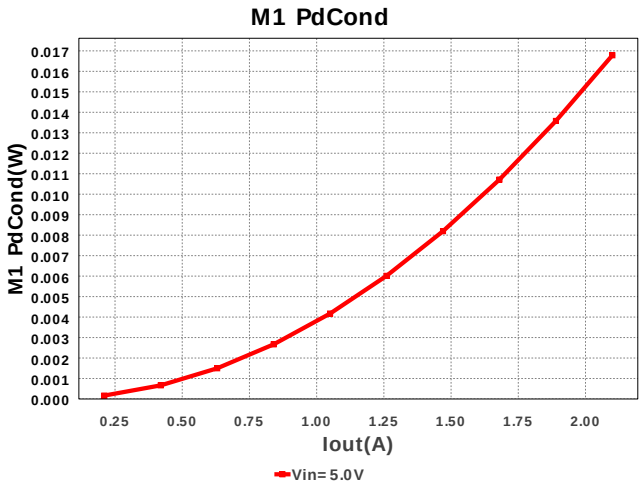


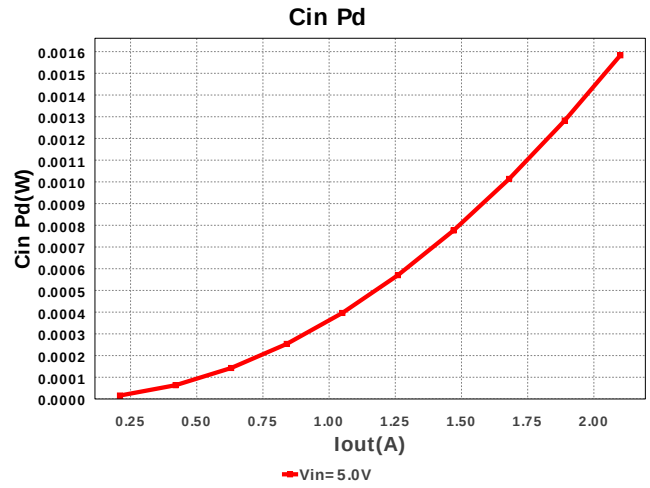












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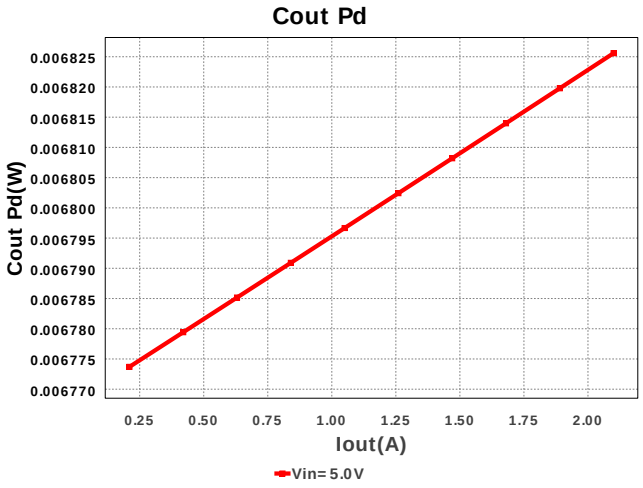

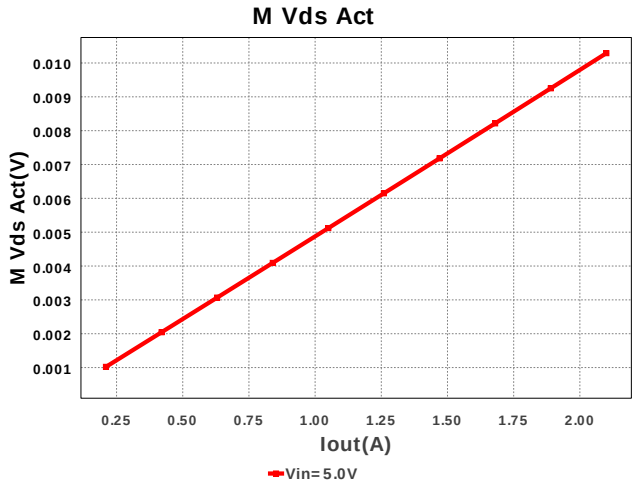

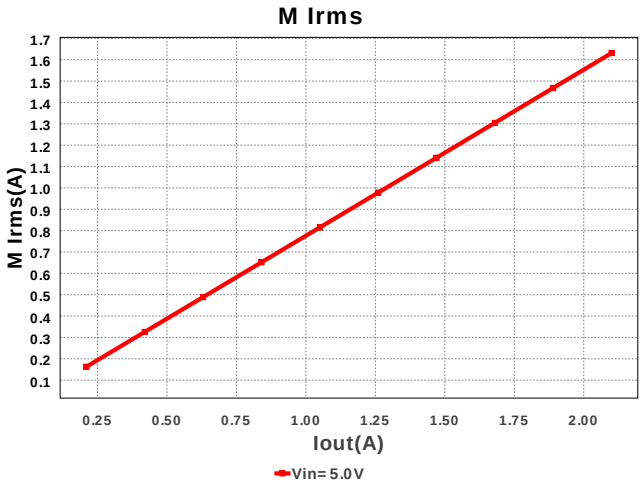

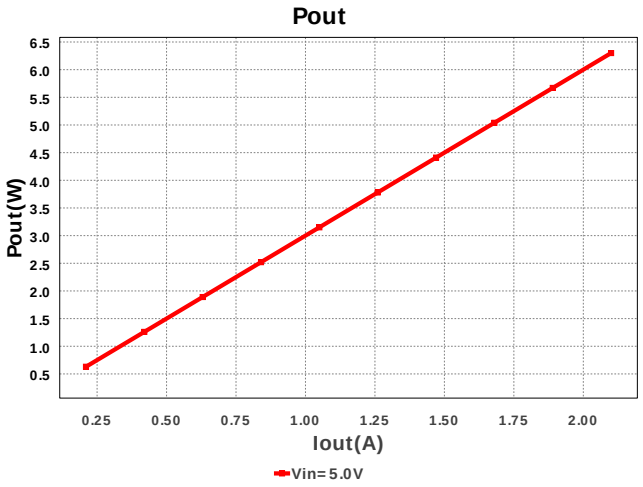

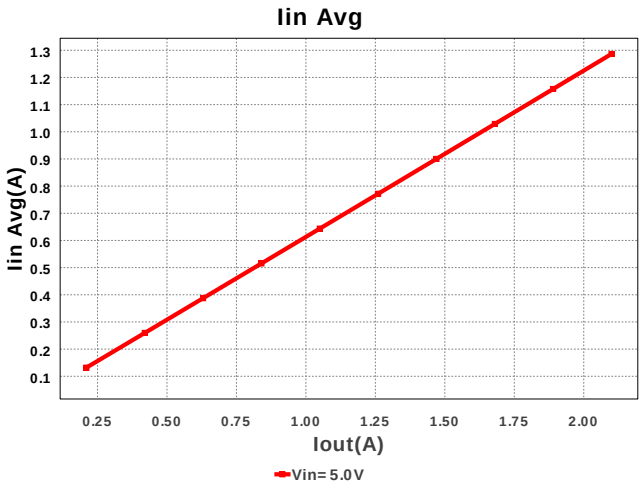

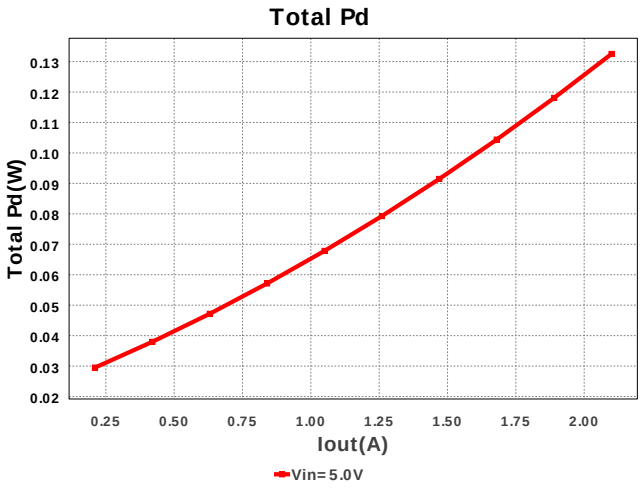

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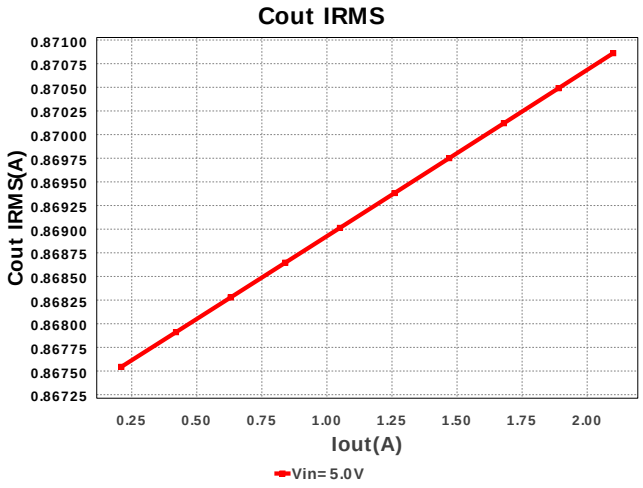

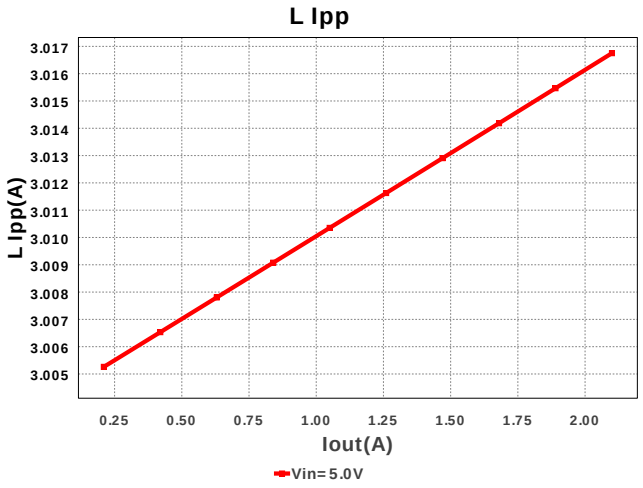

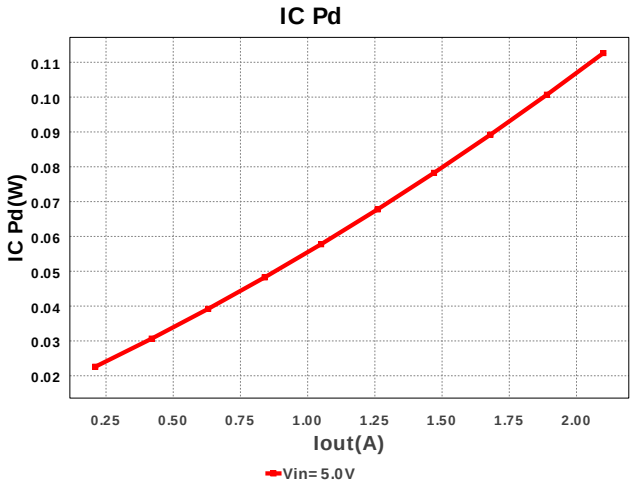

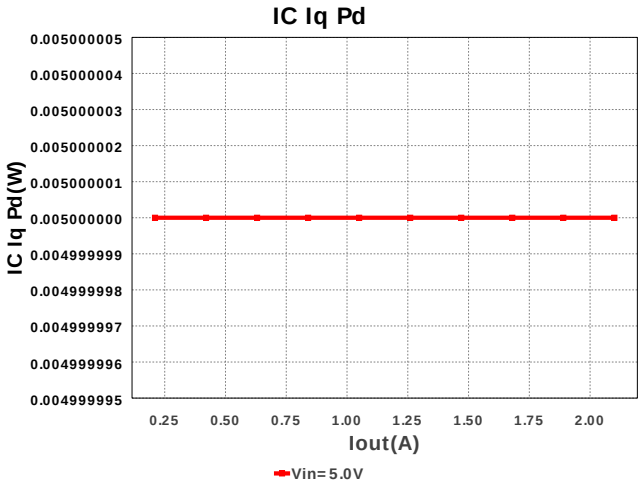

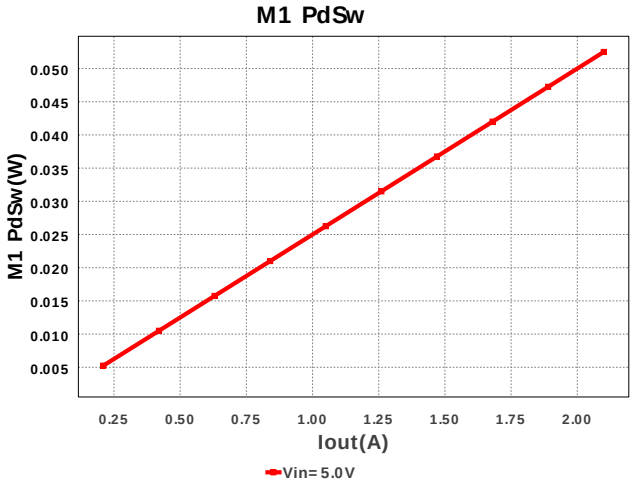

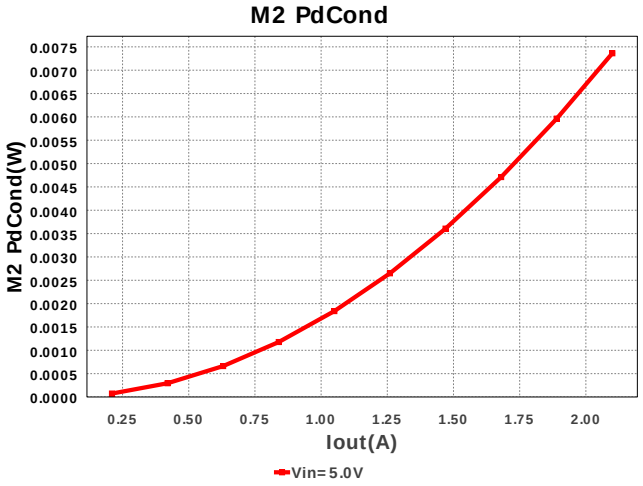

工作数值

#	名称	数值	类别	说明
1.	Cin IRMS	1.027 A	Current	输入电容器均方根纹波电流
2.	Cout IRMS	870.861 mA	Current	输出电容器均方根纹波电流
3.	IC Ipk	3.608 A	Current	电路内的峰值开关电流
4.	Iin Avg	1.286 A	Current	平均输入电流
5.	L Ipp	3.017 A	Current	峰值到峰值电感器纹波电流
6.	M1 Irms	1.631 A	Current	Q Iavg
7.	BOM 数量	15	General	Total Design BOM count
8.	大小	295.0 mm2	General	BOM组件的总所占面积
9.	频率	500.0 kHz	General	开关频率
10.	IC Tolerance	6.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	10.29 mV	General	Voltage drop across the MosFET

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#	名称	数值	类别	说明
12.	模式	CCM	General	传导模式
13.	Pout	6.3 W	General	总输出功率
14.	总 BOM	$4.48	General	Total BOM Cost
15.	Vout OP	3.0 V	Op_Point	Operational Output Voltage
16.	交叉频率	83.975 kHz	Op_point	波特图交叉频率
17.	占空比	60.335 %	Op_point	占空比
18.	效率	97.94 %	Op_point	稳态效率
19.	IC Tj	42.704 degC	Op_point	电路接点温度
20.	ICThetaJA	24.0 degC/W	Op_point	电路接点到环境热敏电阻
21.	IOUT_OP	2.1 A	Op_point	Iout 操作点
22.	相位裕度	37.149 deg	Op_point	波特图相位裕度
23.	VIN_OP	5.0 V	Op_point	Vin操作点
24.	Vout p-p	43.731 mV	Op_point	峰值到峰值输出纹波电压
25.	Cin Pd	1.583 mW	Power	输入电容器功率耗散
26.	Cout Pd	6.826 mW	Power	输出电容器功率耗散
27.	电路静态电流功率耗散	5.0 mW	Power	电路静态电流功率耗散
28.	IC Pd	112.647 mW	Power	电路功率耗散
29.	L Pd	11.466 mW	Power	电感器功率耗散
30.	M1 PdCond	16.784 mW	Power	M1 MOSFET 开关损耗
31.	M1 PdSw	52.5 mW	Power	M1 MOSFET 开关损耗
32.	M1 PdCond	7.362 mW	Power	M2 MOSFET 开关损耗
33.	整体 Pd	132.51 mW	Power	总功率耗散
34.	M2 Pbody	21.0 mW	Unknown	较低功率FET的功率耗散

设计输入

#	名称	数值	说明
1.	输出电流	2.1 A	最大输出电流
2.	Iout1	2.1 Amps	Output Current #1
3.	Vin 最大	5.0 V	最高输入电压
4.	Vin 最小	5.0 V	最低输入电压
5.	输出电压:	3.0 V	输出电压
6.	Vout1	3.0 Volt	Output Voltage #1
7.	base_pn	LM21215A-1	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	40.0 degC	环境温度

设计协助

1. The LM21K series has simple to use low voltage and high current voltage regulators. The LM21215A-1 is a synchronisable part. To synchronise the device to an frequency you need to provide an external clock signal as shown in the schematic. To simulate with the external frequency, enter the desired frequency in the 'Advanced User Inputs' section and click on 'Update'. If the 'Sync' pin is left open, it defaults to a fixed internal frequency.

2. LM21215A-1 Product Folder : http://www.ti.com/product/lm21215a : contains the data sheet and other resources.

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