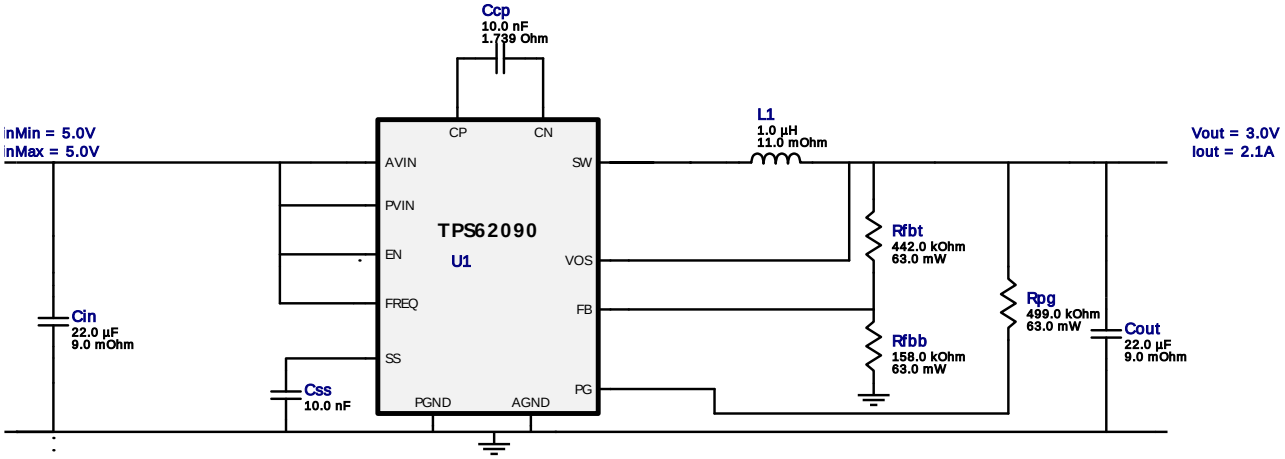
WEBENCH® 设计报告

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

Device = TPS62090RGTR
Topology = Buck
创建 = 5/21/13 6:55:20 AM
BOM成本 = $1.52
Total Pd = 0.42W
大小 = 218.0mm2
BOM 数量 = 9

Design : 3728439/51 TPS62090RGTR
TPS62090RGTR 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.	Ccp	Kemet	C0805C103K5RACTU Series= X7R	Cap= 10.0 nF ESR= 1.739 Ohm VDC= 50.0 V IRMS= 411.0 mA	1	$0.01	0805 13mm2
2.	Cin	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
3.	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
4.	Css	MuRata	GRM155R61A103KA01D Series= X5R	Cap= 10.0 nF VDC= 10.0 V IRMS= 0.0 A	1	$0.01	0402 8mm2
5.	L1	TDK	VLP8040T-1R0N	L= 1.0 µH DCR= 11.0 mOhm	1	$0.22	VLP8040 113mm2
6.	Rfbb	Vishay-Dale	CRCW0402158KFKED Series= CRCW..e3	Res= 158.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8mm2
7.	Rfbt	Vishay-Dale	CRCW0402442KFKED Series= CRCW..e3	Res= 442.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8mm2
8.	Rpg	Vishay-Dale	CRCW0402499KFKED Series= CRCW..e3	Res= 499.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	0402 8mm2
9.	U1	Texas Instruments	TPS62090RGTR	Switcher	1	$1.15	S-PVQFN-N16 36mm2

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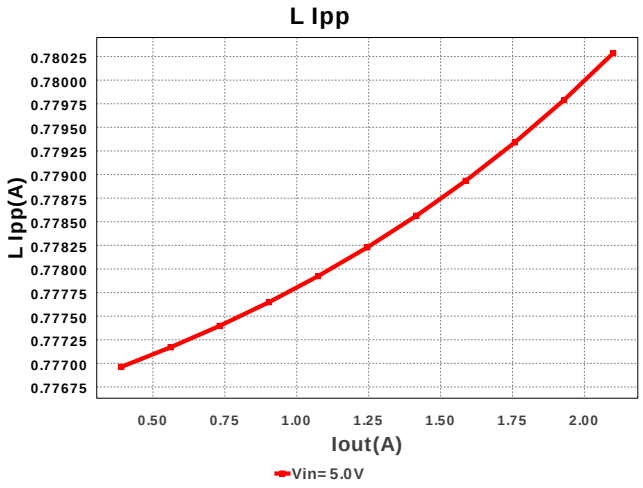

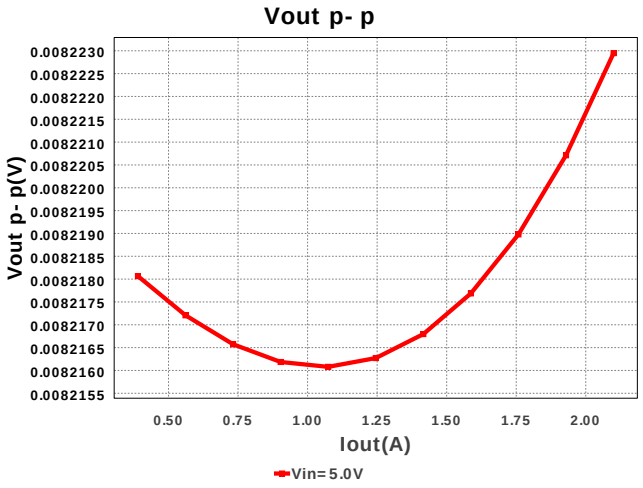

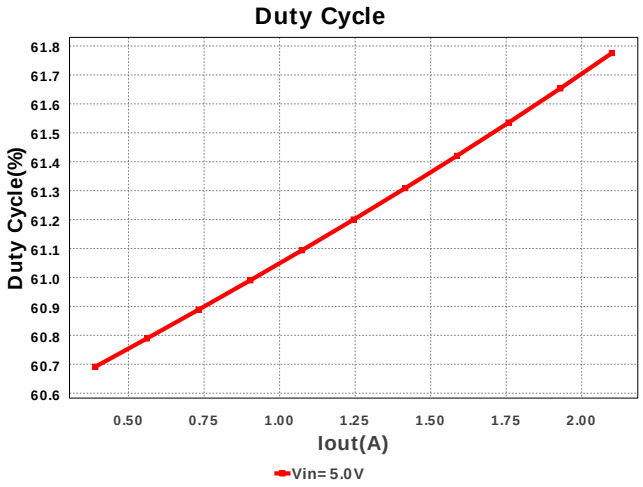

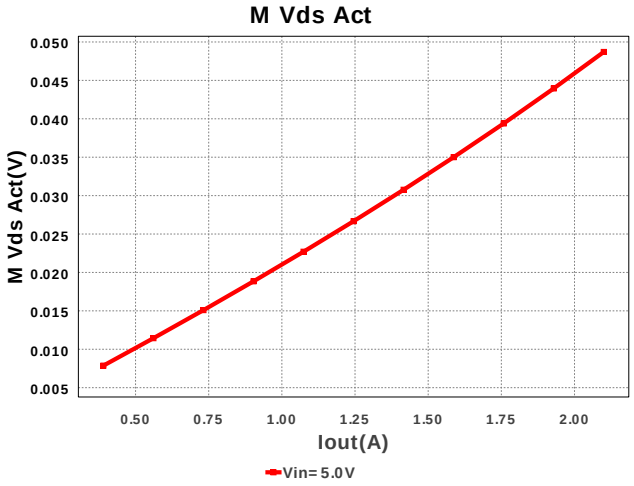

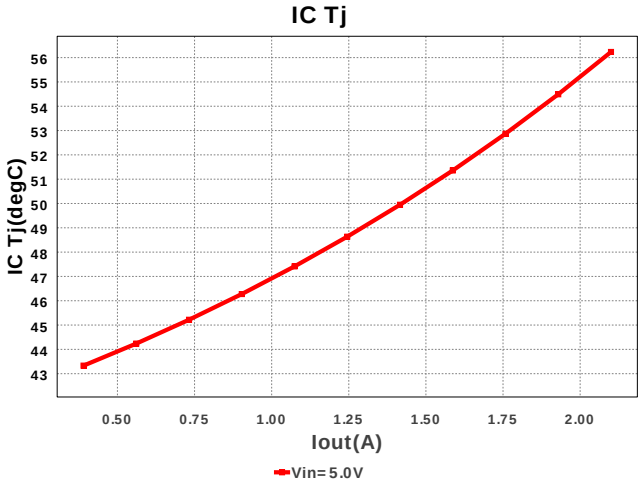

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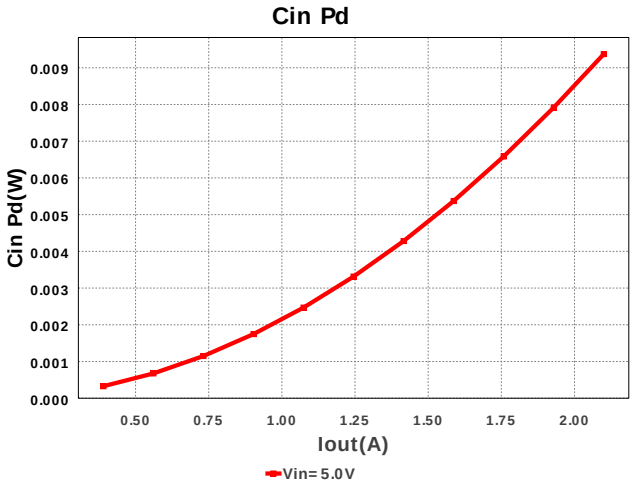

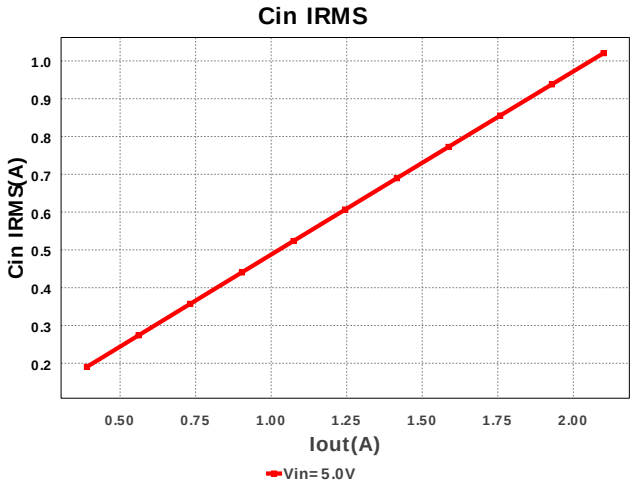

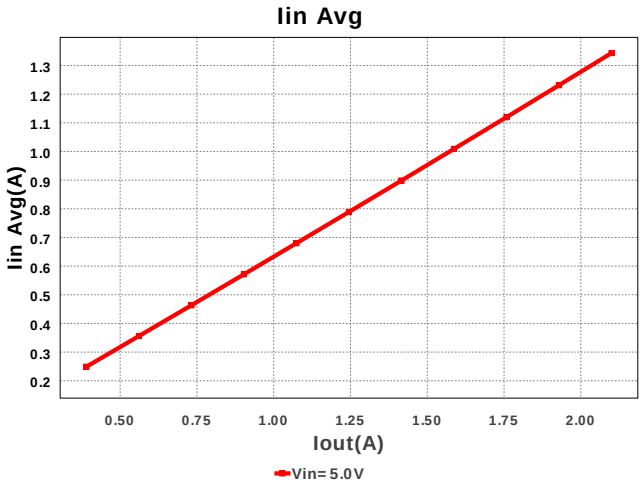

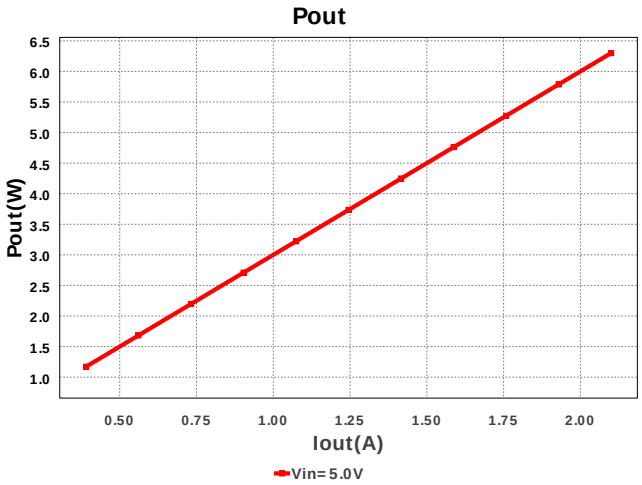

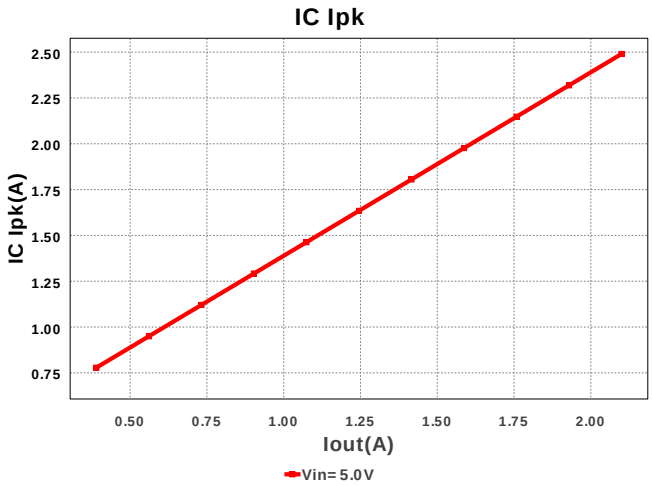

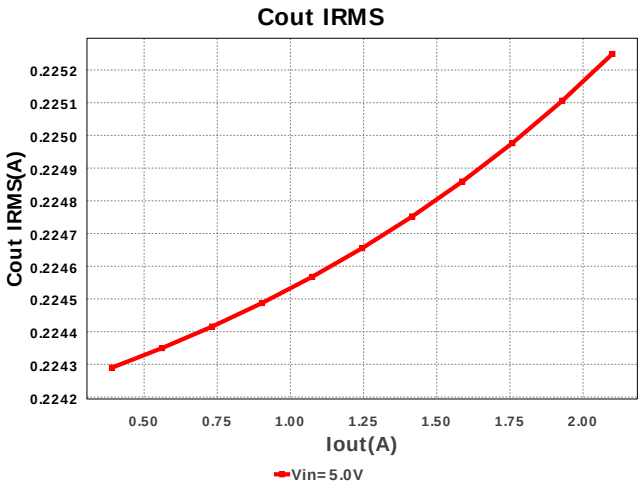

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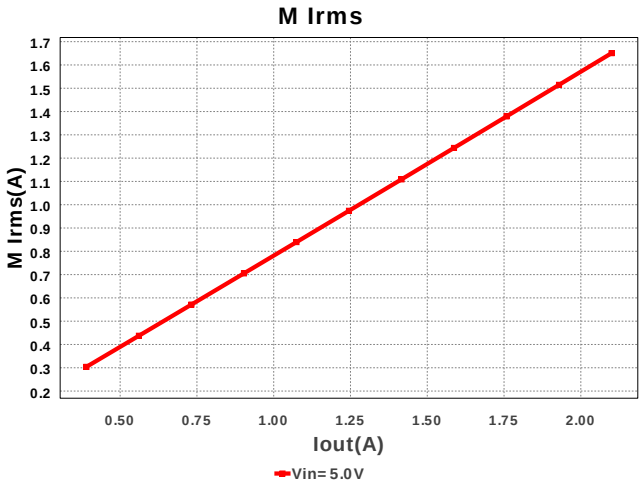

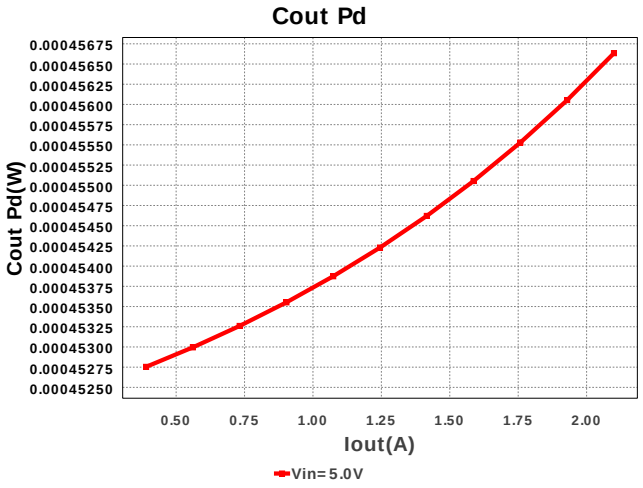

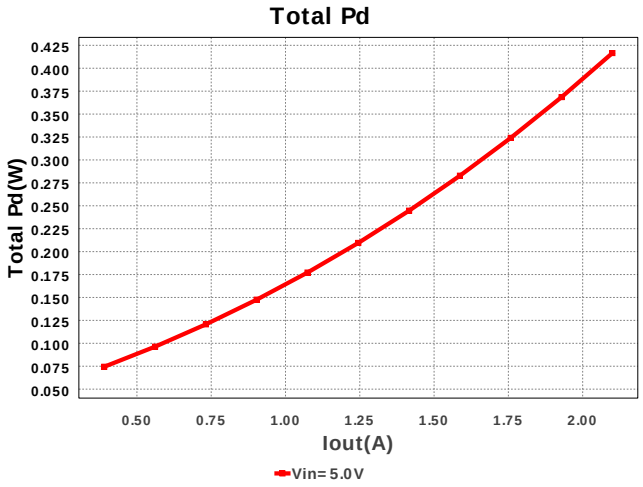

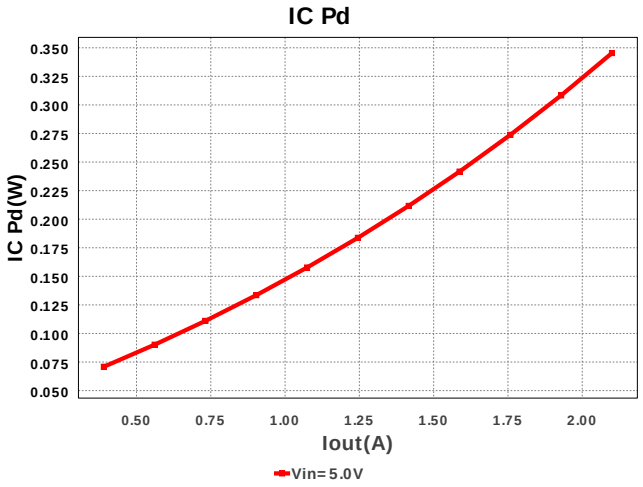

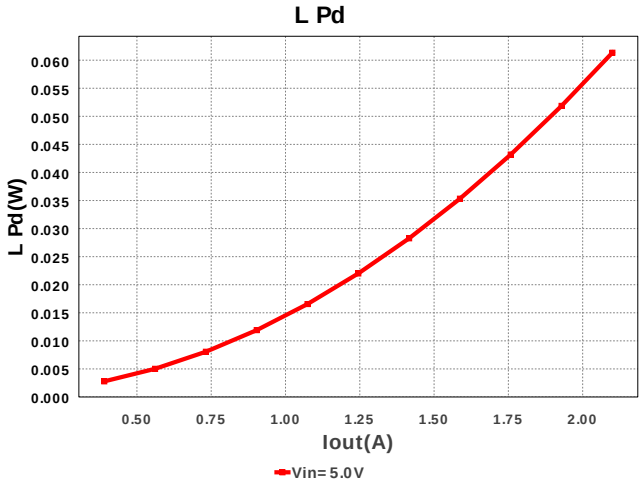

工作数值

#	名称	数值	类别	说明
1.	Cin IRMS	1.02 A	Current	输入电容器均方根纹波电流
2.	Cout IRMS	225.249 mA	Current	输出电容器均方根纹波电流
3.	IC Ipk	2.49 A	Current	电路内的峰值开关电流
4.	Iin Avg	1.343 A	Current	平均输入电流
5.	L Ipp	780.286 mA	Current	峰值到峰值电感器纹波电流
6.	M1 Irms	1.651 A	Current	Q Iavg
7.	BOM 数量	9	General	Total Design BOM count
8.	大小	218.0 mm2	General	BOM组件的总所占面积
9.	频率	1.583 MHz	General	开关频率
10.	IC Tolerance	16.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	48.702 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	$1.52	General	Total BOM Cost
15.	Vout OP	3.0 V	Op_Point	Operational Output Voltage
16.	占空比	61.776 %	Op_point	占空比
17.	效率	93.798 %	Op_point	稳态效率
18.	IC Tj	56.233 degC	Op_point	电路接点温度
19.	ICThetaJA	47.0 degC/W	Op_point	电路接点到环境热敏电阻
20.	IOUT_OP	2.1 A	Op_point	Iout 操作点
21.	VIN_OP	5.0 V	Op_point	Vin操作点
22.	Vout p-p	8.223 mV	Op_point	峰值到峰值输出纹波电压
23.	Cin Pd	9.372 mW	Power	输入电容器功率耗散
24.	Cout Pd	456.634 µW	Power	输出电容器功率耗散
25.	IC Pd	345.381 mW	Power	电路功率耗散
26.	L Pd	61.335 mW	Power	电感器功率耗散
27.	整体 Pd	416.557 mW	Power	总功率耗散

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	TPS62090	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. TPS62090 Product Folder : http://www.ti.com/product/tps62090 : contains the data sheet and other resources.

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