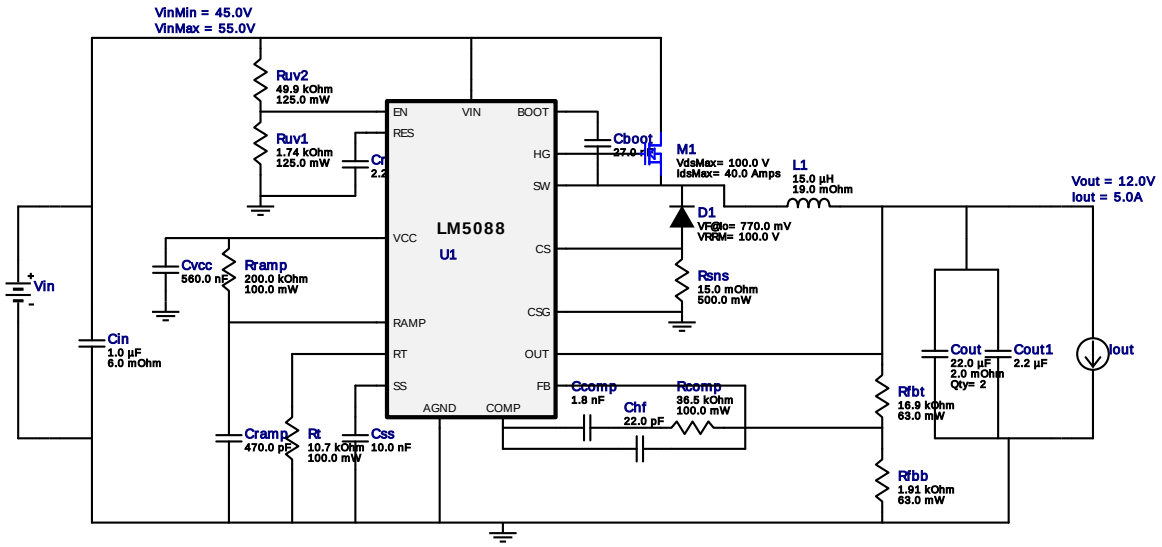
WEBENCH® 设计报告

VinMin = 45.0V
VinMax = 55.0V
Vout = 12.0V
Iout = 5.0A

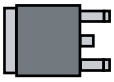
Device = LM5088MH-1/NOPB
Topology = Buck
创建 = 7/23/13 9:29:57 PM
BOM成本 = $4.13
Total Pd = 5.41W
大小 = 662.0mm2
BOM 数量 = 23

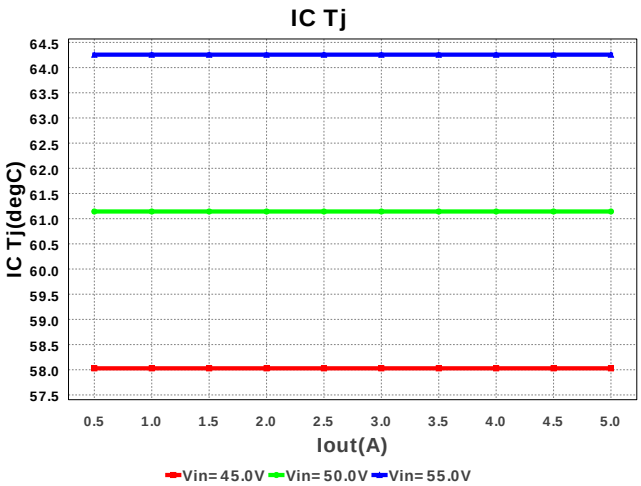
Design : 3686430/67 LM5088MH-1/NOPB
LM5088MH-1/NOPB 45.0V-55.0V to 12.0V @ 5.0A

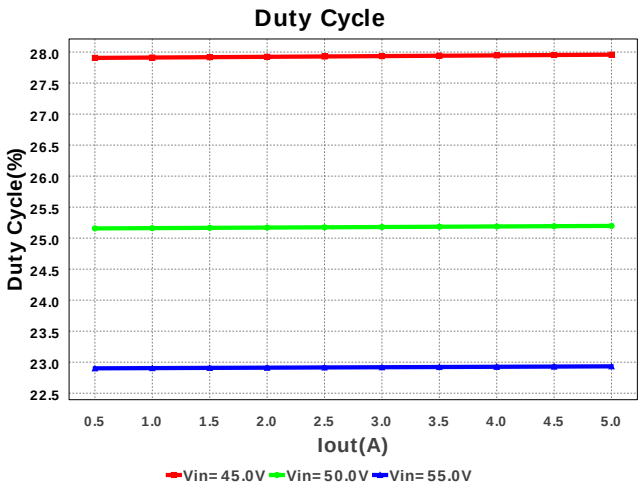


电气材料清单

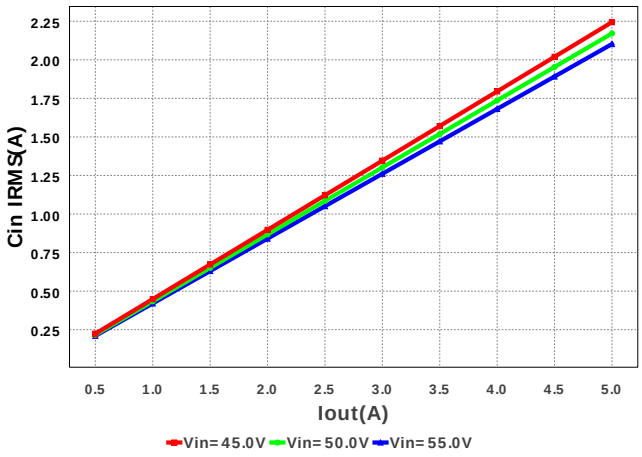
#	名称	制造商	零件编号	属性	Qty	Price	大小
1.	Cboot	Yageo America	CC0805KRX7R9BB273 Series= X7R	Cap= 27.0 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0805 13mm2
2.	Ccomp	MuRata	GRM188R71H182KA01D Series= X7R	Cap= 1.8 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0603 10mm2
3.	Chf	Kemet	C0603C220J5GACTU Series= C0G/NP0	Cap= 22.0 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0603 10mm2
4.	Cin	TDK	C3216X7R2A105M Series= 285	Cap= 1.0 µF ESR= 6.0 mOhm VDC= 100.0 V IRMS= 4.5 A	1	$0.11	1206 19mm2
5.	Cout	TDK	C3225X5R1C226M Series= X5R	Cap= 22.0 µF ESR= 2.0 mOhm VDC= 16.0 V IRMS= 3.5 A	2	$0.20	1210 23mm2
6.	Cout1	Taiyo Yuden	EMK212B7225KG-T Series= X7R	Cap= 2.2 µF VDC= 16.0 V IRMS= 0.0 A	1	$0.03	0805 13mm2
7.	Cramp	Kemet	C0603C471K5RACTU Series= X7R	Cap= 470.0 pF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0603 10mm2
8.	Crst	Kemet	C0603C225K9PACTU Series= X5R	Cap= 2.2 µF VDC= 6.3 V IRMS= 0.0 A	1	$0.02	0603 10mm2
9.	Css	Kemet	C0603C103J5RACTU Series= X7R	Cap= 10.0 nF VDC= 50.0 V IRMS= 0.0 A	1	$0.01	0603 10mm2
10.	Cvcc	MuRata	GRM188R71A564KA61D Series= X7R	Cap= 560.0 nF VDC= 10.0 V IRMS= 0.0 A	1	$0.02	0603 10mm2

#	名称	制造商	零件编号	属性	Qty	Price	大小
11.	D1	Vishay-Semiconductor	50WQ10FNPBF	VF@Io= 770.0 mV VRRM= 100.0 V	1	$0.41	 DPAK 102mm2
12.	L1	Coilcraft	MSS1210-153MEB	L= 15.0 µH DCR= 19.0 mOhm	1	$0.81	 MSS1210 204mm2
13.	M1	Infineon Technologies	BSC265N10LSF G	VdsMax= 100.0 V IdsMax= 40.0 Amps	1	$0.63	 PG-TDSON-8 55mm2
14.	Rcomp	Vishay-Dale	CRCW060336K5FKEA Series= CRCW..e3	Res= 36.5 kOhm Power= 100.0 mW Tolerance= 1.0%	1	$0.01	 0603 10mm2
15.	Rfbb	Vishay-Dale	CRCW04021K91FKED Series= CRCW..e3	Res= 1.91 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 8mm2
16.	Rfbt	Vishay-Dale	CRCW040216K9FKED Series= CRCW..e3	Res= 16.9 kOhm Power= 63.0 mW Tolerance= 1.0%	1	$0.01	 0402 8mm2
17.	Rramp	Vishay-Dale	CRCW0603200KFKEA Series= CRCW..e3	Res= 200.0 kOhm Power= 100.0 mW Tolerance= 1.0%	1	$0.01	 0603 10mm2
18.	Rsns	Stackpole Electronics Inc	CSR1206FK15L0 Series= ?	Res= 15.0 mOhm Power= 500.0 mW Tolerance= 1.0%	1	$0.11	 1206 19mm2
19.	Rt	Vishay-Dale	CRCW060310K7FKEA Series= CRCW..e3	Res= 10.7 kOhm Power= 100.0 mW Tolerance= 1.0%	1	$0.01	 0603 10mm2
20.	Ruv1	Vishay-Dale	CRCW08051K74FKEA Series= CRCW..e3	Res= 1.74 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	 0805 13mm2
21.	Ruv2	Vishay-Dale	CRCW080549K9FKEA Series= CRCW..e3	Res= 49.9 kOhm Power= 125.0 mW Tolerance= 1.0%	1	$0.01	 0805 13mm2
22.	U1	Texas Instruments	LM5088MH-1/NOPB	Switcher	1	$1.47	 MXA16A 59mm2

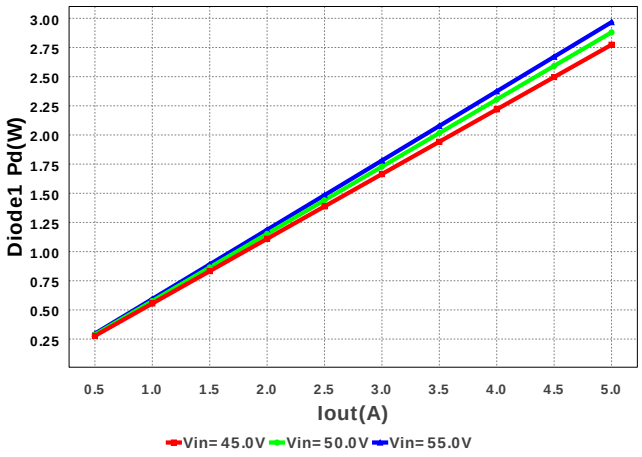




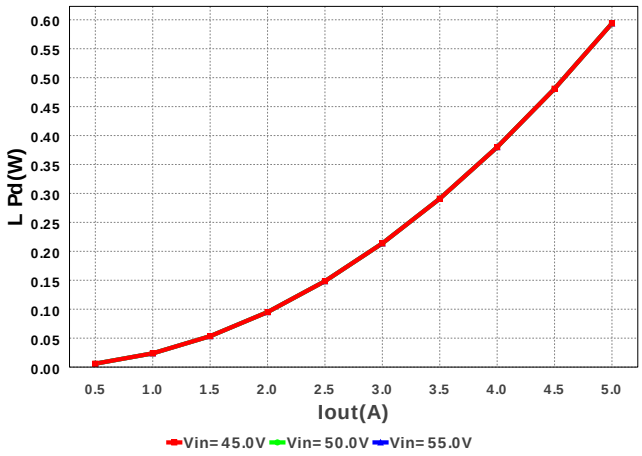
Cin IRMS



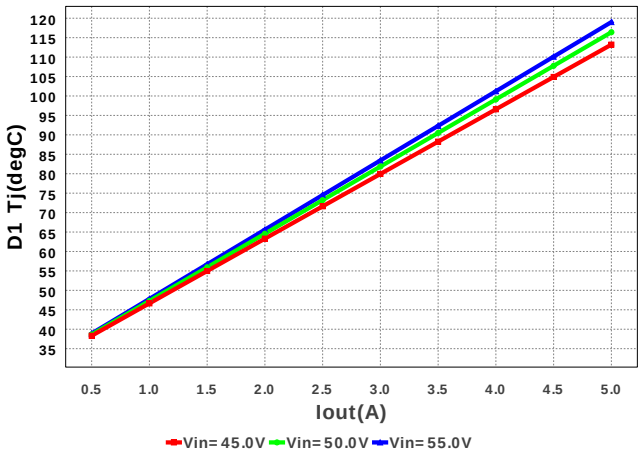
Diode1 Pd



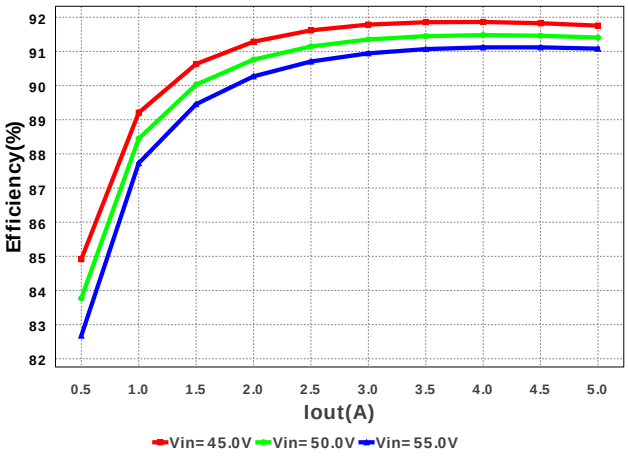
L Pd



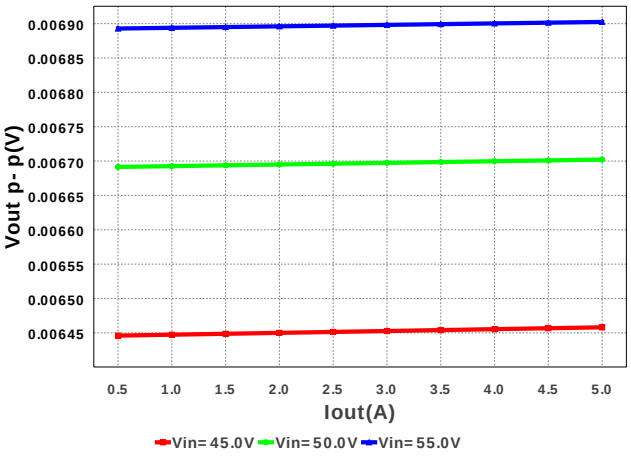
D1 Tj



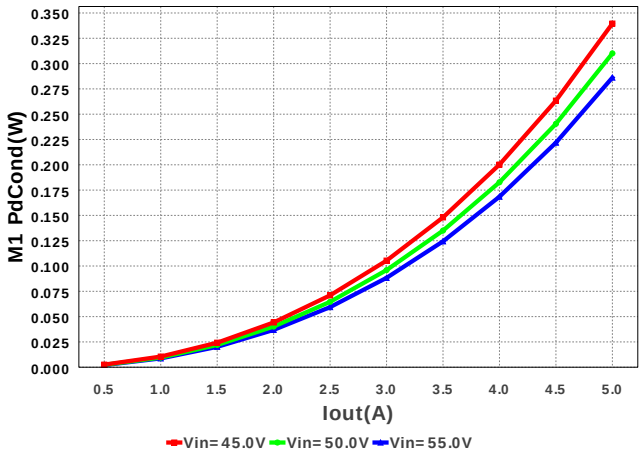
Efficiency



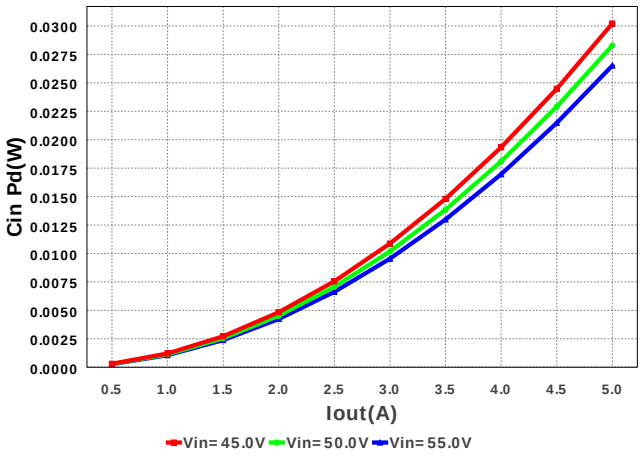
Vout p- p



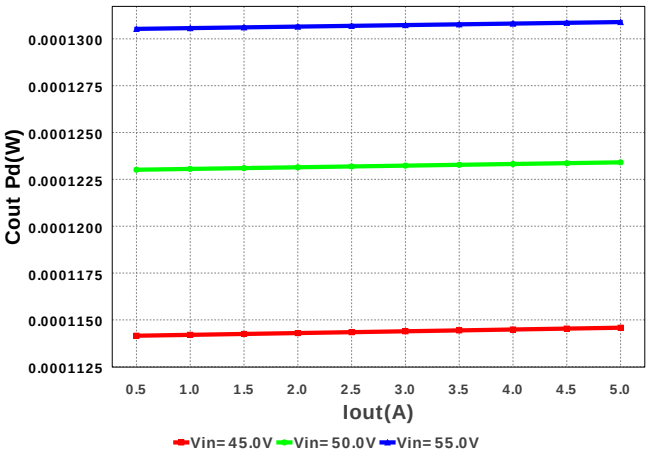
M1 PdCond



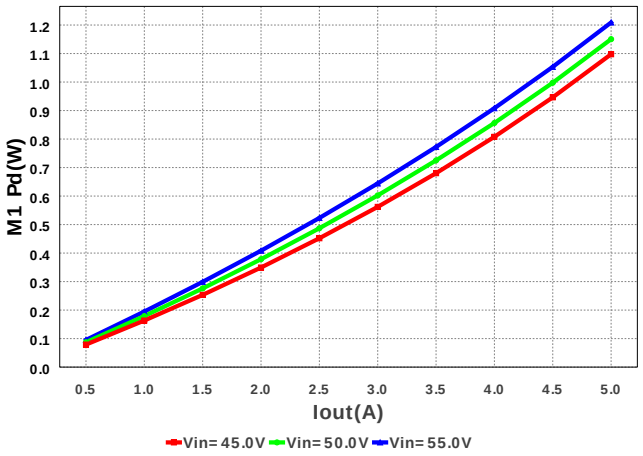
Cin Pd



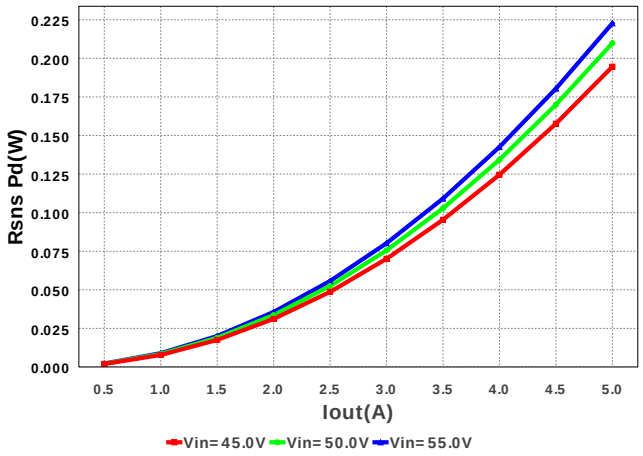
Cout Pd



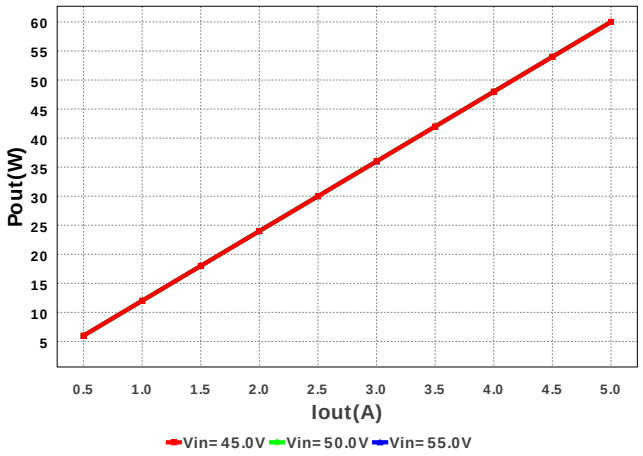
M1 Pd

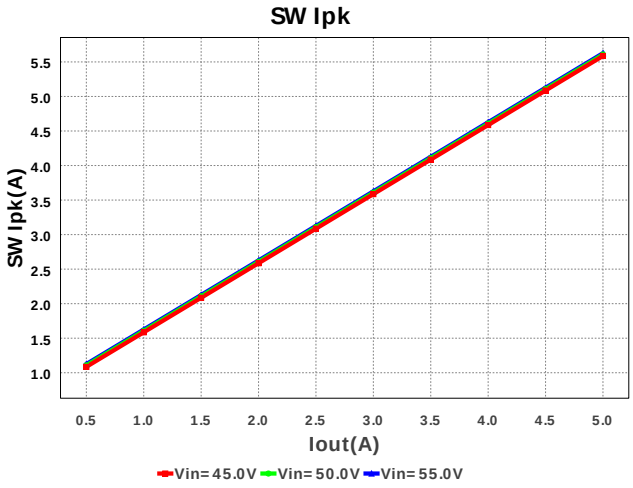


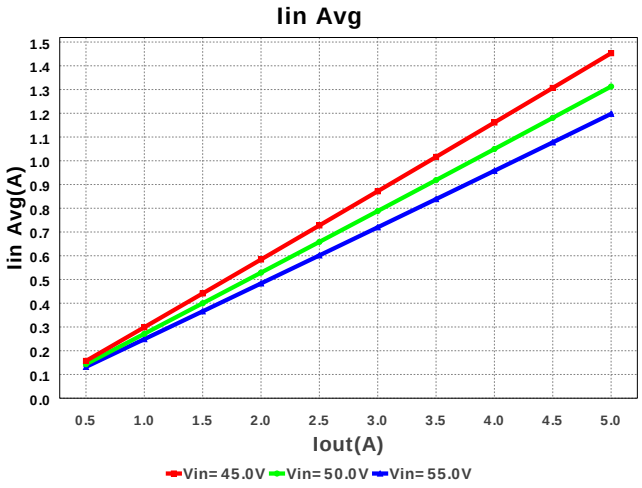
Rsns Pd

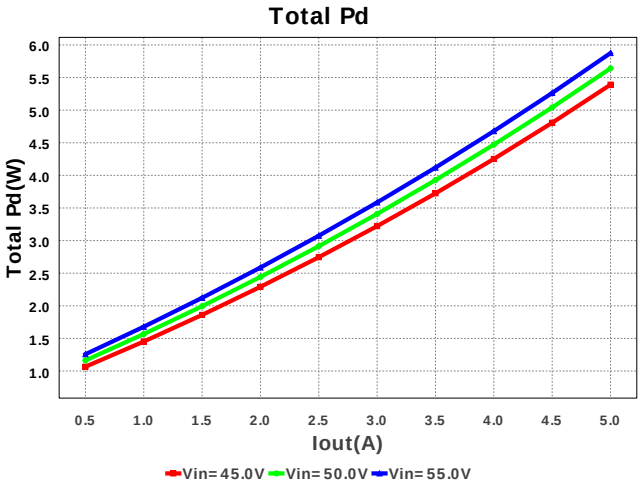


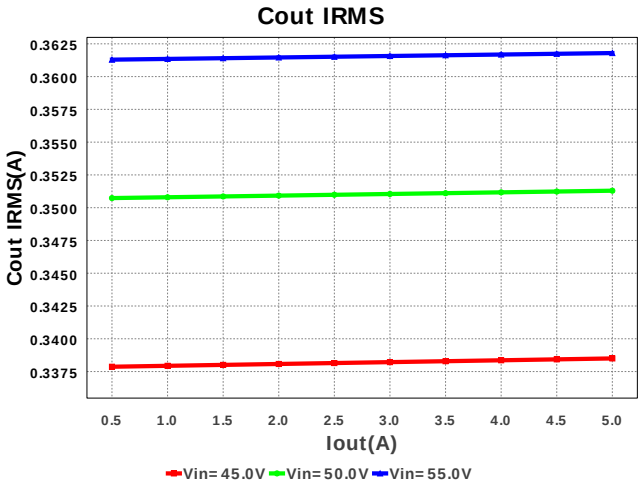
Pout

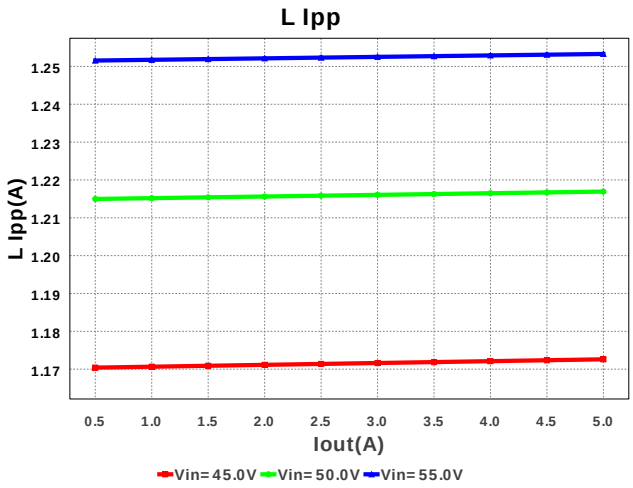


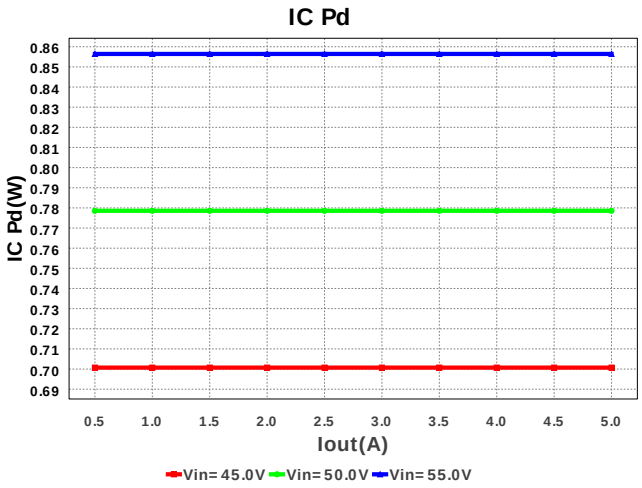


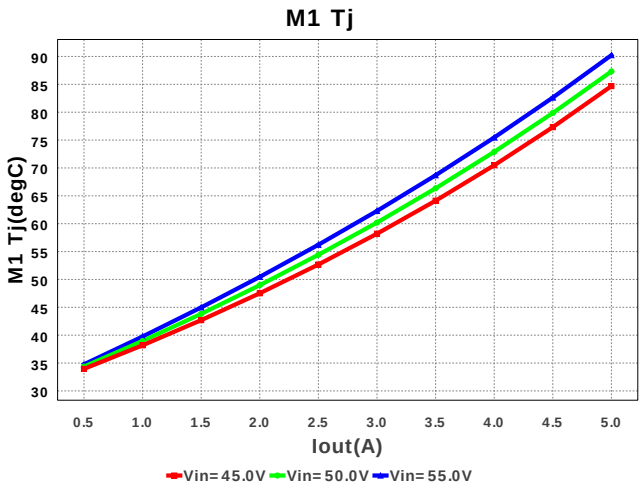


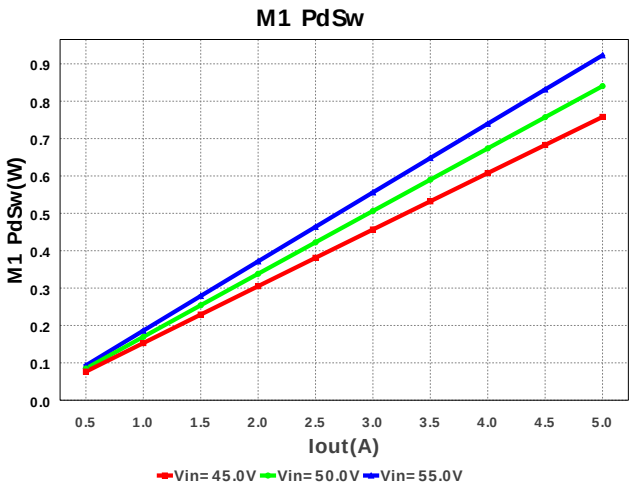


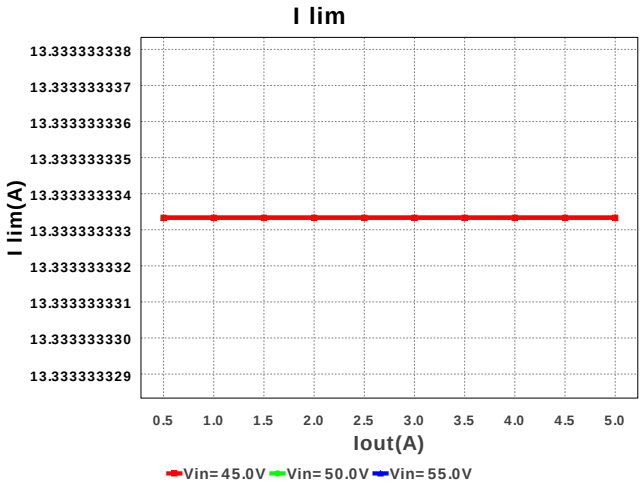












工作数值

#	名称	数值	类别	说明
1.	Cin IRMS	2.102 A	Current	输入电容器均方根纹波电流
2.	Cout IRMS	361.484 mA	Current	输出电容器均方根纹波电流
3.	I lim	13.333 A	Current	电流限幅阈值
4.	Iin Avg	1.189 A	Current	平均输入电流
5.	L Ipp	1.252 A	Current	峰值到峰值电感器纹波电流
6.	SW Ipk	5.626 A	Current	峰值开关电流
7.	BOM 数量	23	General	Total Design BOM count
8.	大小	662.0 mm2	General	BOM组件的总所占面积
9.	频率	525.0 kHz	General	开关频率
10.	IC Tolerance	18.0 mV	General	IC Feedback Tolerance
11.	模式	CCM	General	传导模式
12.	Pout	60.0 W	General	总输出功率
13.	总 BOM	$4.13	General	Total BOM Cost
14.	D1 Tj	119.012 degC	Op_Point	D1接点温度
15.	占空比	22.933 %	Op_point	占空比
16.	效率	91.729 %	Op_point	稳态效率
17.	IC Tj	64.276 degC	Op_point	电路接点温度
18.	IOUT_OP	5.0 A	Op_point	Iout 操作点
19.	M1 Tj	66.969 degC	Op_point	M1 MOSFET 接点温度
20.	VIN_OP	55.0 V	Op_point	Vin操作点
21.	Vout p-p	6.891 mV	Op_point	峰值到峰值输出纹波电压
22.	Cin Pd	26.511 mW	Power	输入电容器功率耗散
23.	Cout Pd	130.671 µW	Power	输出电容器功率耗散
24.	二极管1 Pd	2.967 W	Power	二极管1功率耗散
25.	IC Pd	856.9 mW	Power	电路功率耗散
26.	L Pd	593.75 mW	Power	电感器功率耗散
27.	M1 Pd	742.767 mW	Power	M1 MOSFET 总功率耗散
28.	M1 PdCond	258.296 mW	Power	M1 MOSFET 传导损耗
29.	M1 PdSw	484.471 mW	Power	M1 MOSFET 开关损耗
30.	Rsns Pd	222.724 mW	Power	电流限幅传感电阻器功率耗散
31.	整体 Pd	5.41 W	Power	总功率耗散

设计输入

#	名称	数值	说明
1.	输出电流	5.0 A	最大输出电流
2.	Iout1	5.0 Amps	Output Current #1
3.	Vin 最大	55.0 V	最高输入电压
4.	Vin 最小	45.0 V	最低输入电压
5.	输出电压:	12.0 V	输出电压
6.	Vout1	12.0 Volt	Output Voltage #1
7.	base_pn	LM5088	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. LM5088 Product Folder : http://www.ti.com/product/lm5088 : contains the data sheet and other resources.