
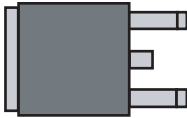
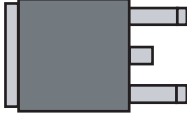












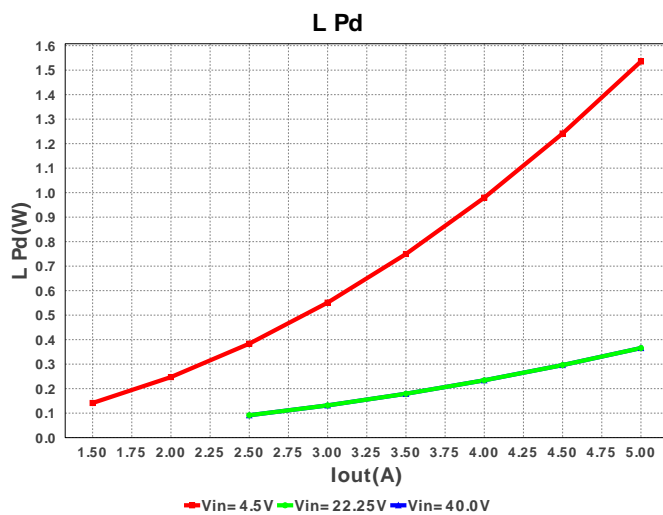
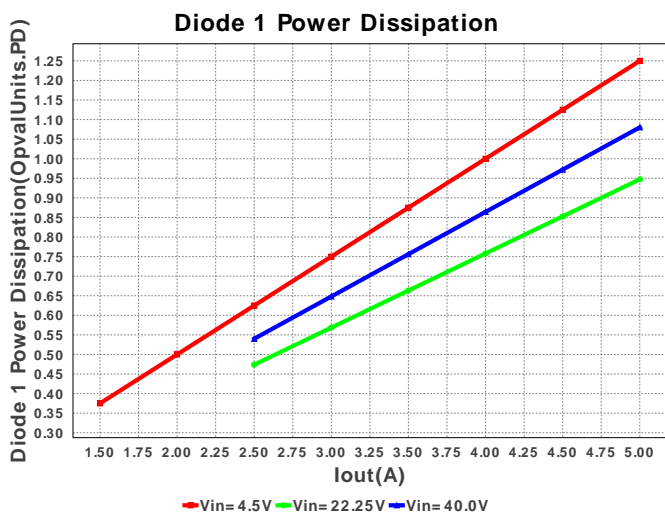
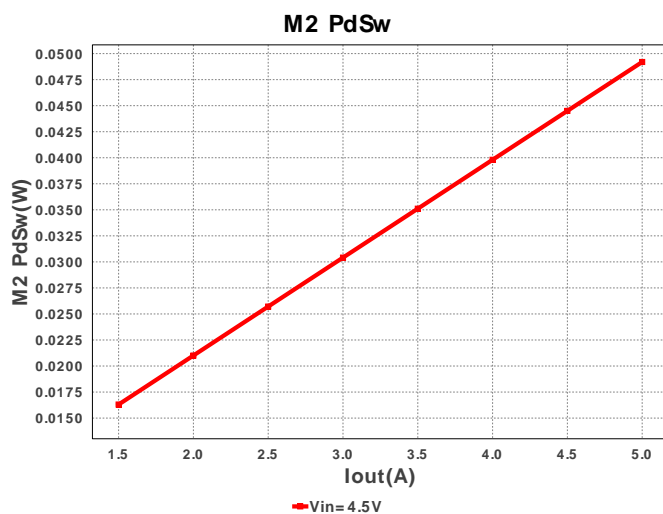
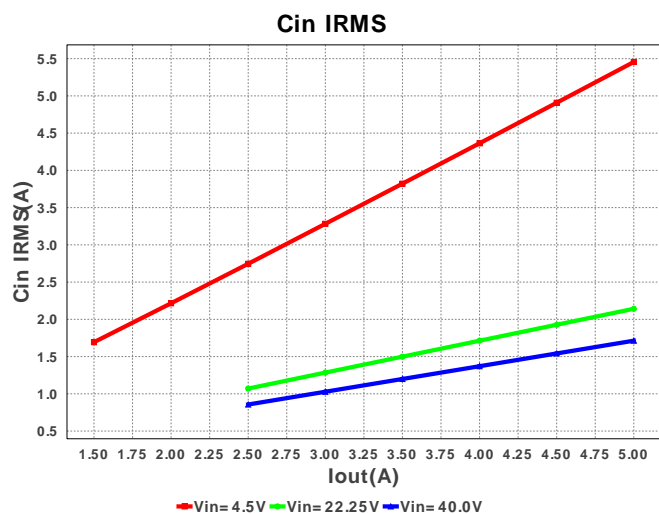
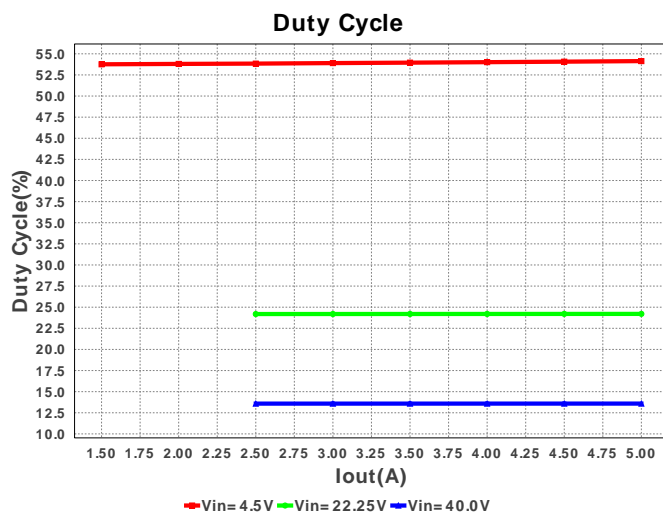
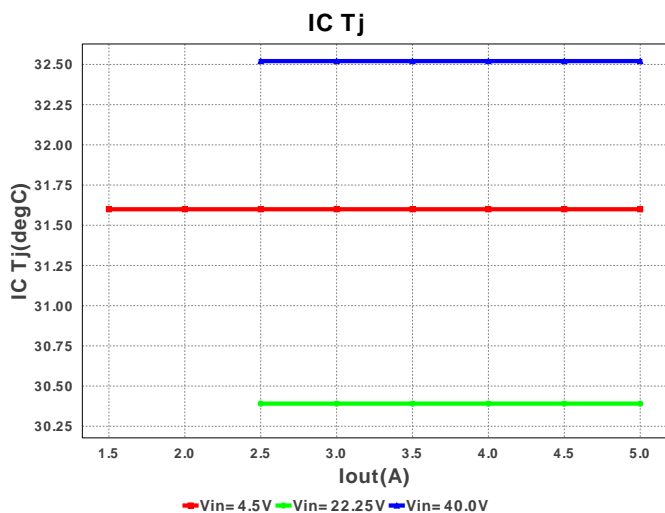
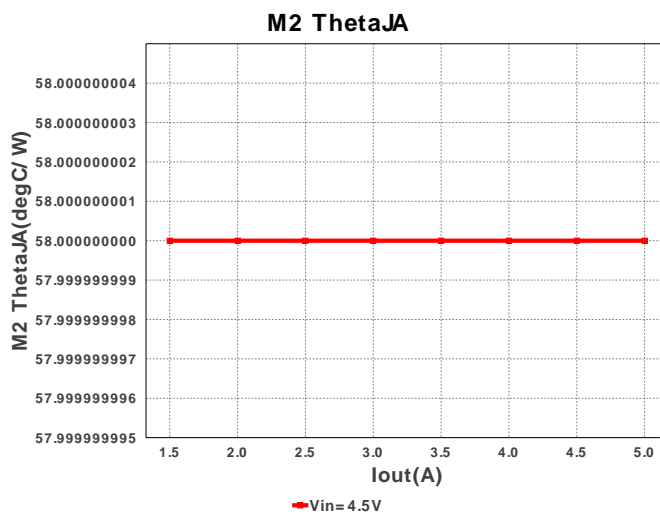
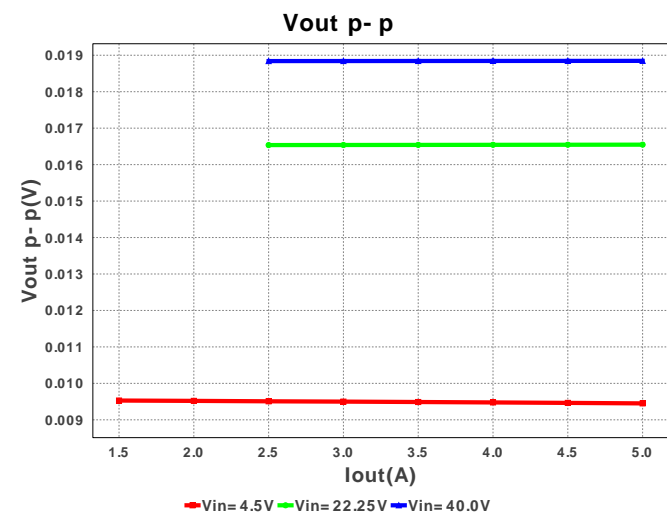
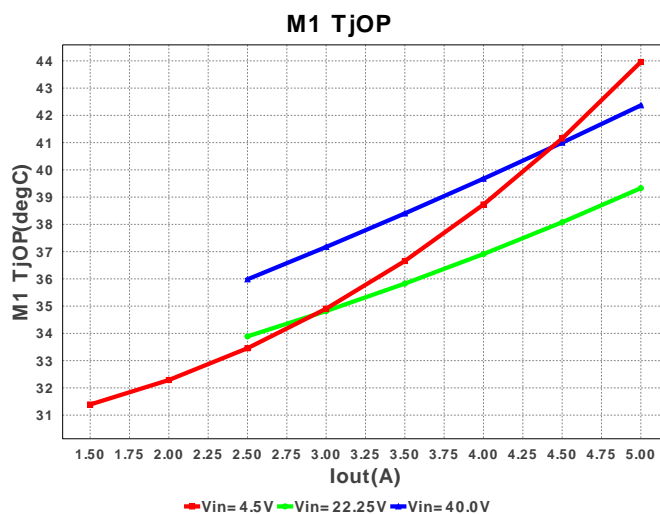
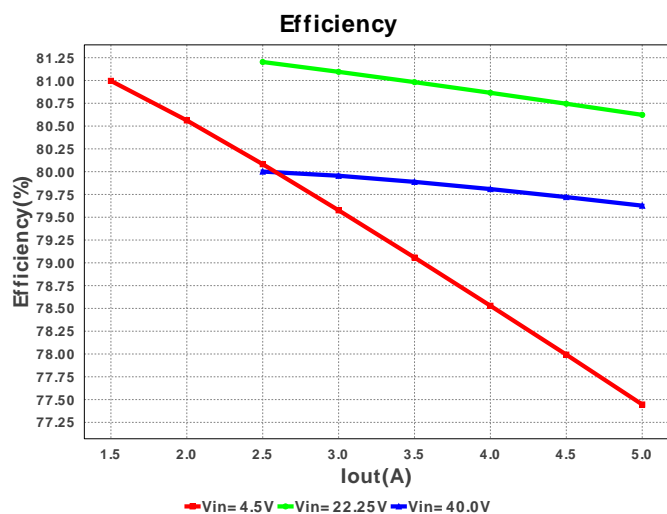
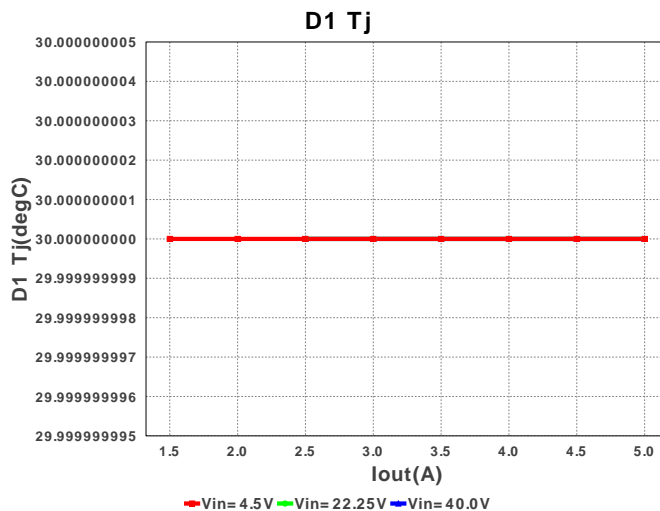


## 电气材料清单

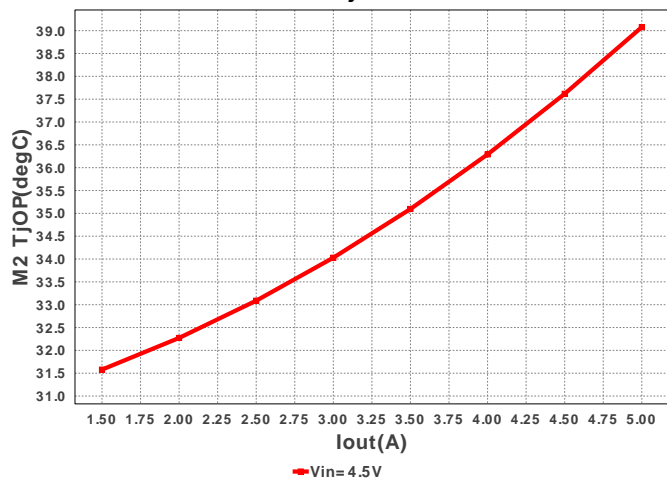
#	名称	制造商	零件编号	属性	Qty	Price	大小
1.	Cboot	MuRata	GRM21BR71H104KA01L Series= X7R	Cap= 100.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7mm2
2.	Ccomp	Yageo America	CC0805KRX7R9BB471 Series= X7R	Cap= 470.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7mm2
3.	Ccomp2	Yageo America	CC0805KRX7R9BB392 Series= X7R	Cap= 3.9 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7mm2
4.	Cin	TDK	C5750X7S2A106M Series= 479	Cap= 10.0 µF ESR= 5.0 mOhm VDC= 100.0 V IRMS= 6.45 A	2	\$0.84	 2220 60mm2
5.	Cinx	Kemet	C0805C104K5RACTU Series= X7R	Cap= 100.0 nF ESR= 64.0 mOhm VDC= 50.0 V IRMS= 1.64 A	1	\$0.01	 0805 7mm2
6.	Cout	Panasonic	6SVP820M Series= 261	Cap= 820.0 µF ESR= 12.0 mOhm VDC= 6.3 V IRMS= 5.44 A	3	\$0.72	 SM_RADIAL_10AMM 160mm2
7.	Cramp	Yageo America	CC0805KRX7R9BB471 Series= X7R	Cap= 470.0 pF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7mm2
8.	Css	Yageo America	CC0805KRX7R9BB223 Series= X7R	Cap= 22.0 nF VDC= 50.0 V IRMS= 0.0 A	1	\$0.01	 0805 7mm2
9.	Cvcc	MuRata	GRM155R61A105KE15D Series= X5R	Cap= 1.0 µF VDC= 10.0 V IRMS= 0.0 A	1	\$0.01	 0402 3mm2

#	名称	制造商	零件编号	属性	Qty	Price	大小
10.	Cvccx	TDK	C1005X5R0J105M Series= 285	Cap= 1.0 $\mu$ F ESR= 7.618 mOhm VDC= 6.3 V IRMS= 0.0 A	1	\$0.01	 1005 3mm2
11.	D1	CUSTOM	CUSTOM	VF@Io= 500.0 mV VRRM= 50.0 V	1	NA	CUSTOM 0mm2
12.	D2	Vishay-Semiconductor	MBRB745PBF	VF@Io= 700.0 mV VRRM= 45.0 V	1	\$0.69	 DDPAK 210mm2
13.	D3	CUSTOM	CUSTOM	VF@Io= 500.0 mV VRRM= 50.0 V	1	NA	CUSTOM 0mm2
14.	D4	Vishay-Semiconductor	MBRB745PBF	VF@Io= 700.0 mV VRRM= 45.0 V	1	\$0.69	 DDPAK 210mm2
15.	L1	Coilcraft	XAL1010-822MEB	L= 8.2 $\mu$ H DCR= 11.7 mOhm	1	\$1.08	 XAL1010 160mm2
16.	M1	Texas Instruments	CSD18563Q5A	VdsMax= 60.0 V IdsMax= 100.0 Amps	1	\$0.68	 TRANS_NexFET_Q5A 55mm2
17.	M2	Texas Instruments	CSD16340Q3	VdsMax= 25.0 V IdsMax= 60.0 Amps	1	\$0.44	 TRANS_NexFET_Q3 19mm2
18.	Rcomp	Vishay-Dale	CRCW040243K2FKED Series= CRCW..e3	Res= 43.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
19.	Renale	Vishay-Dale	CRCW04021M00FKED Series= CRCW..e3	Res= 1000.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
20.	Rfbb	Vishay-Dale	CRCW04021K00FKED Series= CRCW..e3	Res= 1,000 Ohm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
21.	Rfbt	Vishay-Dale	CRCW04023K09FKED Series= CRCW..e3	Res= 3.09 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
22.	Rsense	Bourns	CRA2512-FZ-R010ELF Series= 385	Res= 10.0 mOhm Power= 3.0 W Tolerance= 1.0%	1	\$0.17	 2512 43mm2
23.	Rt	Vishay-Dale	CRCW040248K7FKED Series= CRCW..e3	Res= 48.7 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
24.	Ruv1	Vishay-Dale	CRCW040243K2FKED Series= CRCW..e3	Res= 43.2 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
25.	Ruv2	Vishay-Dale	CRCW040221K0FKED Series= CRCW..e3	Res= 21.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	 0402 3mm2
26.	U1	Texas Instruments	LM25118MHX/NOPB	Switcher	1	\$2.00	 MXA20A 71mm2

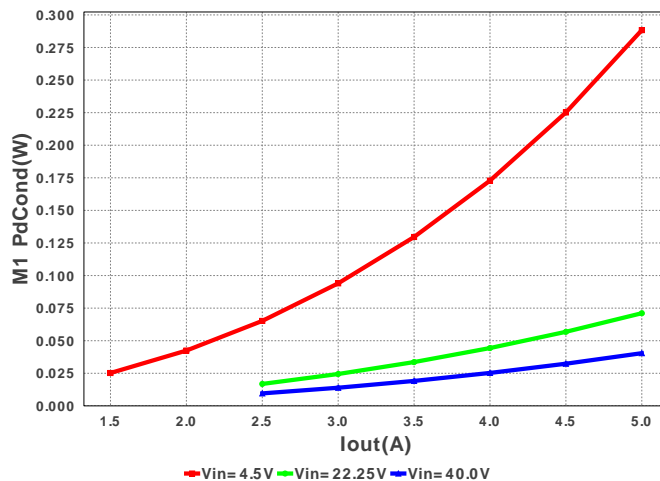




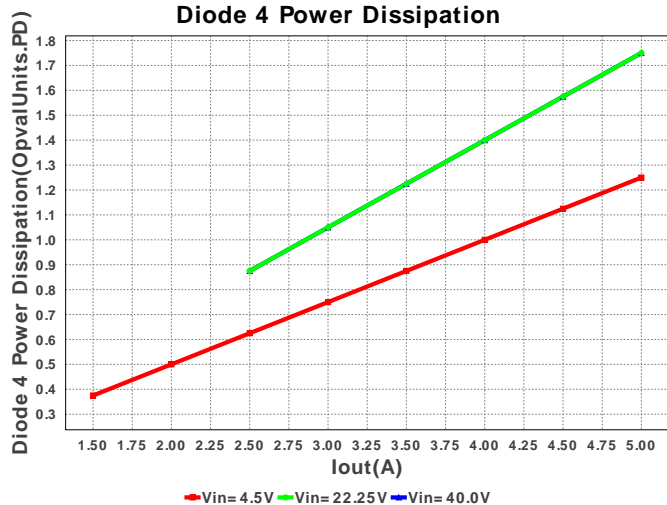
M2 TjOP



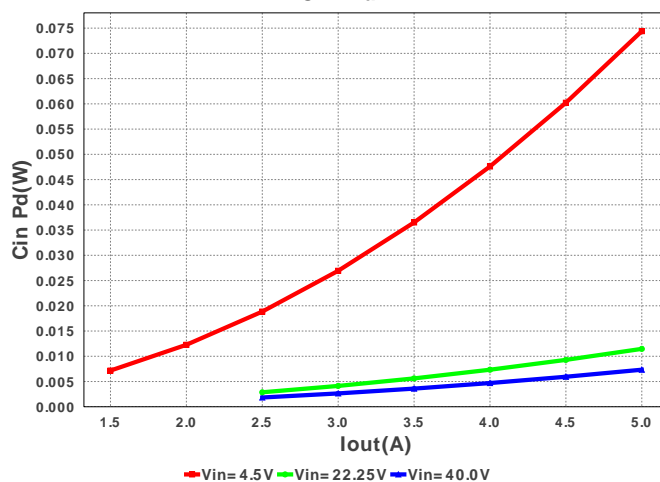
M1 PdCond



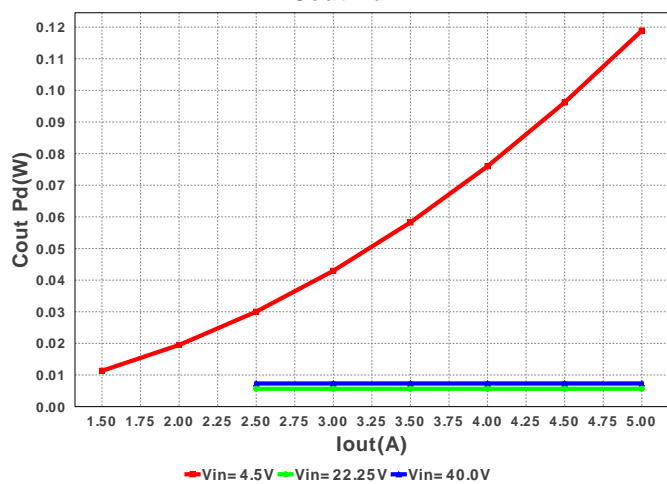
Diode 4 Power Dissipation



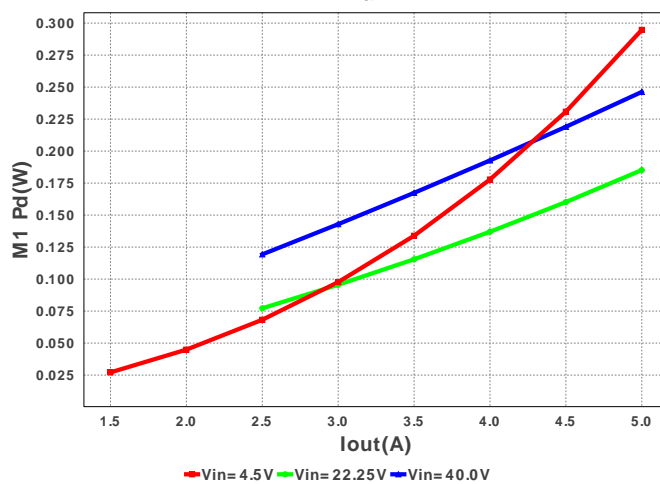
Cin Pd

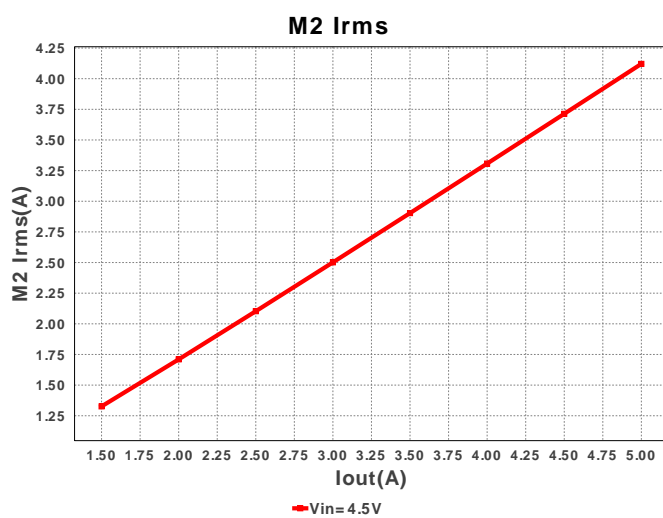
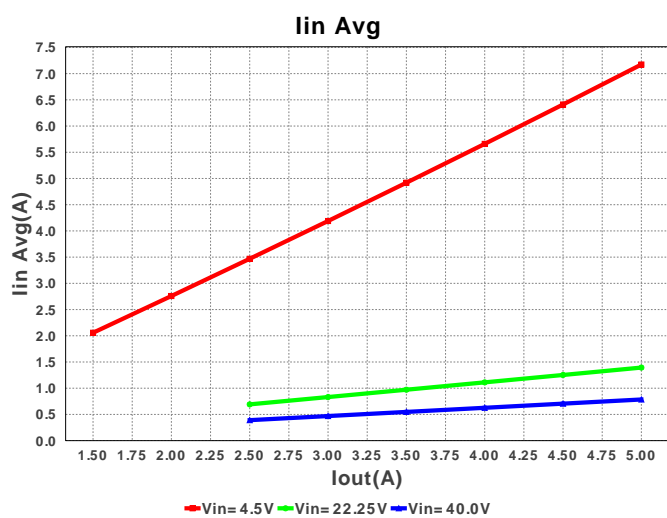
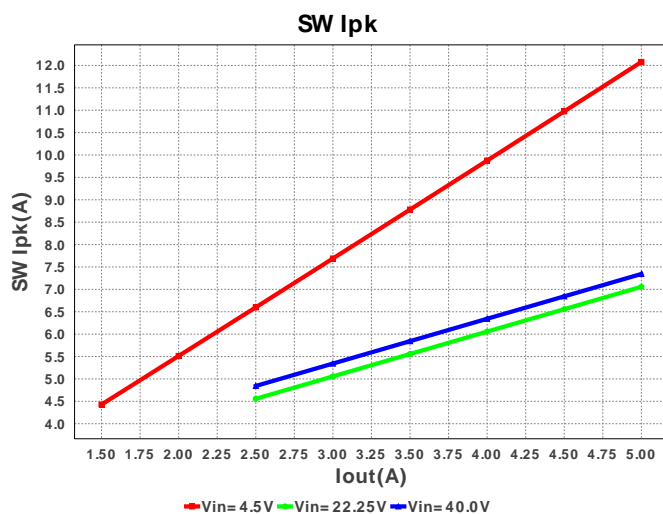
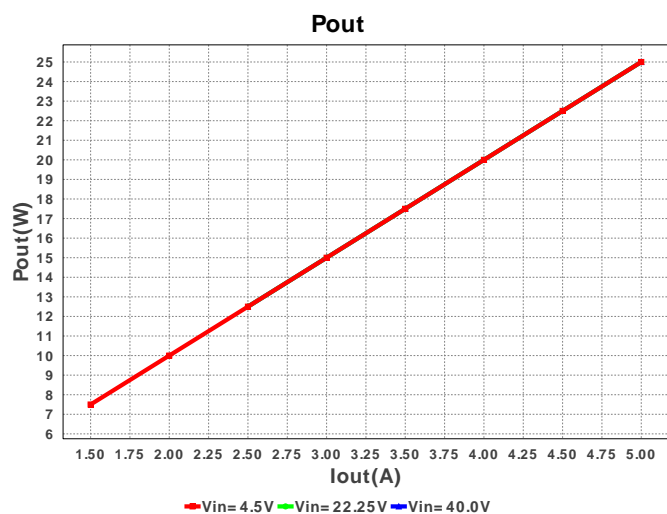
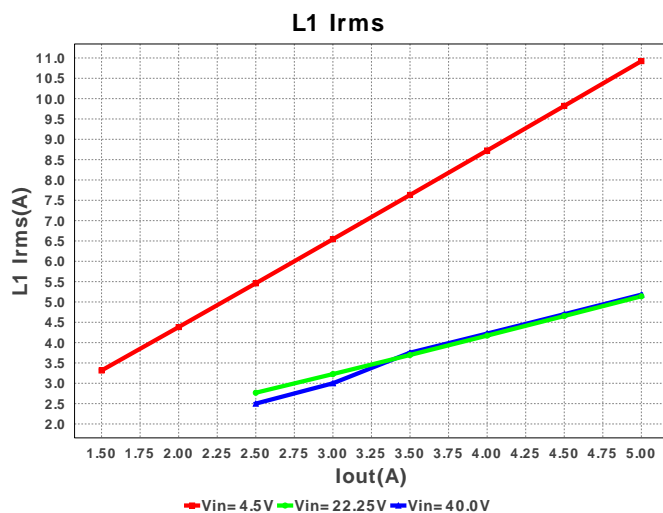
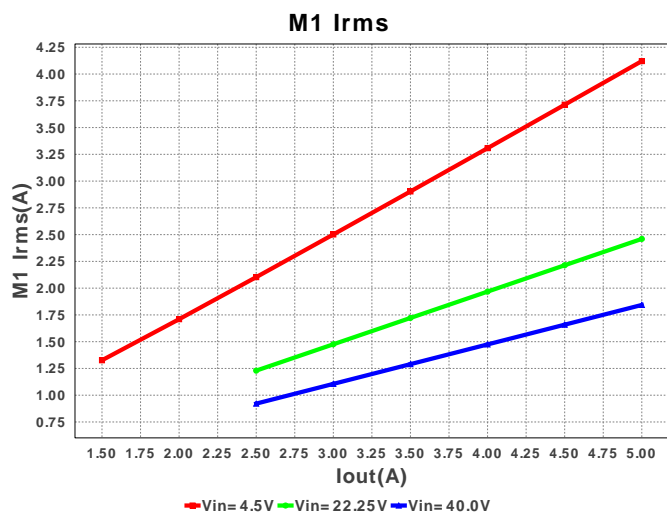


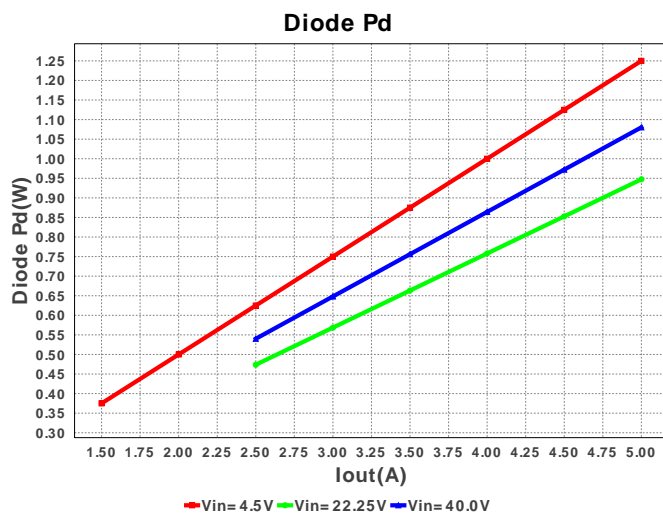
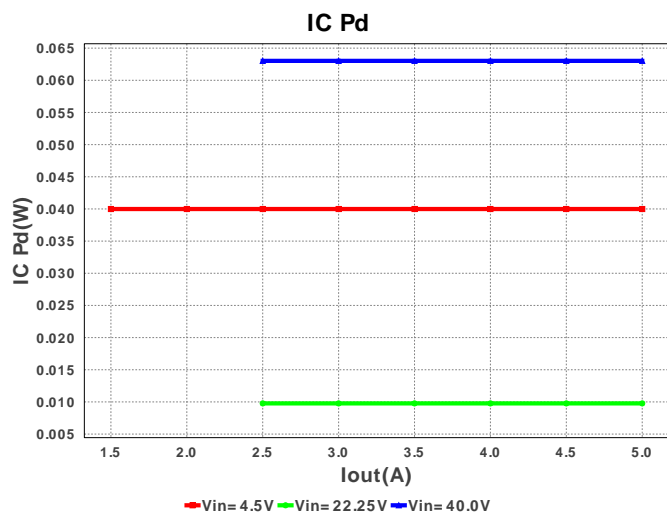
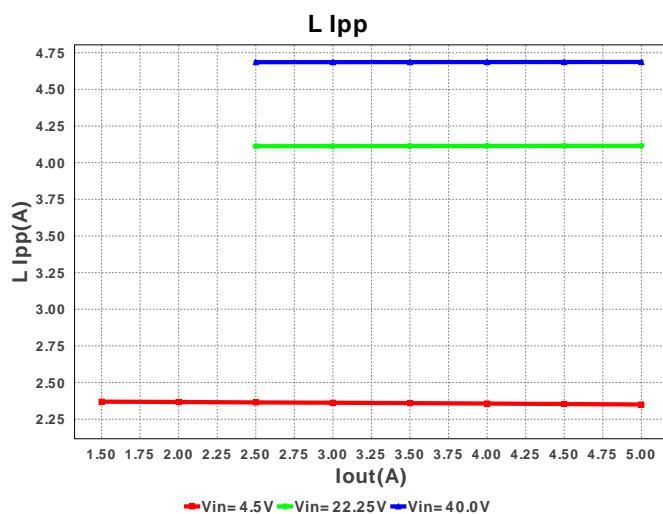
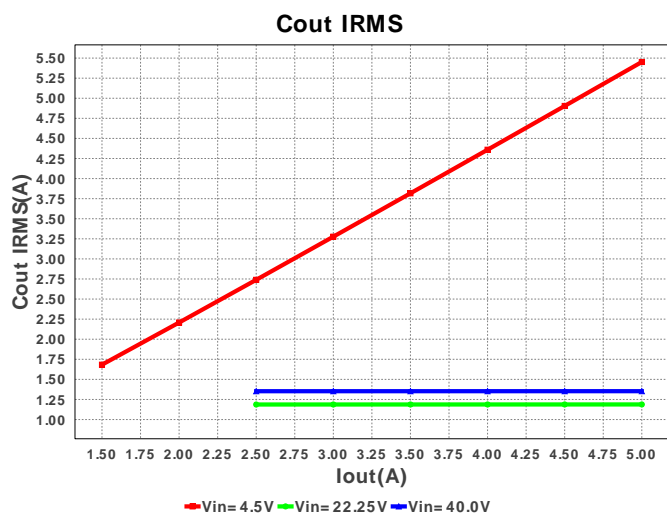
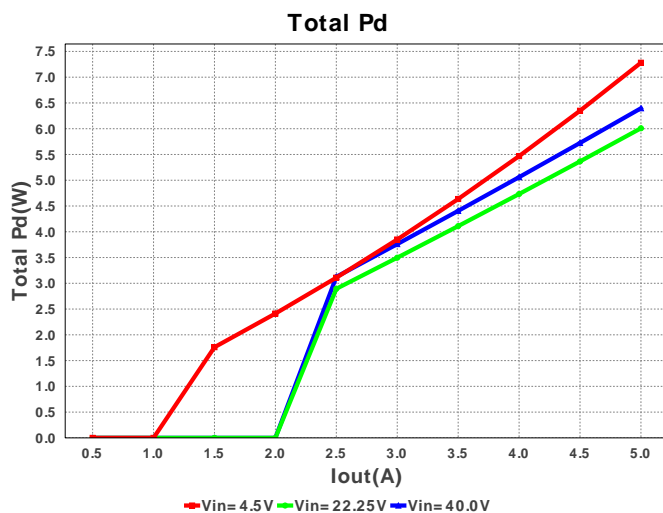
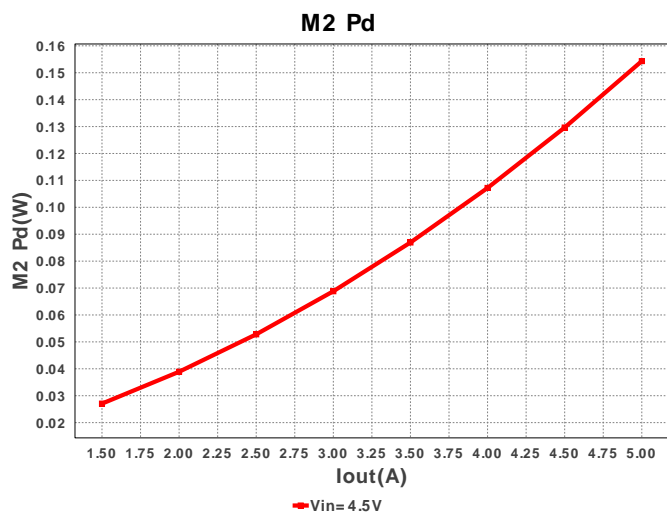
Cout Pd



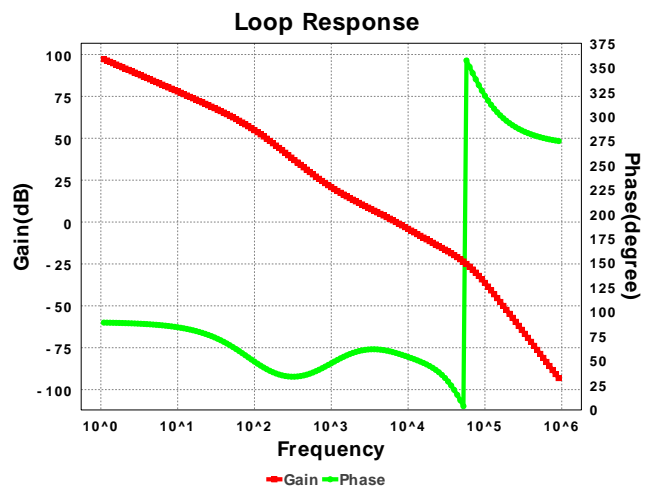
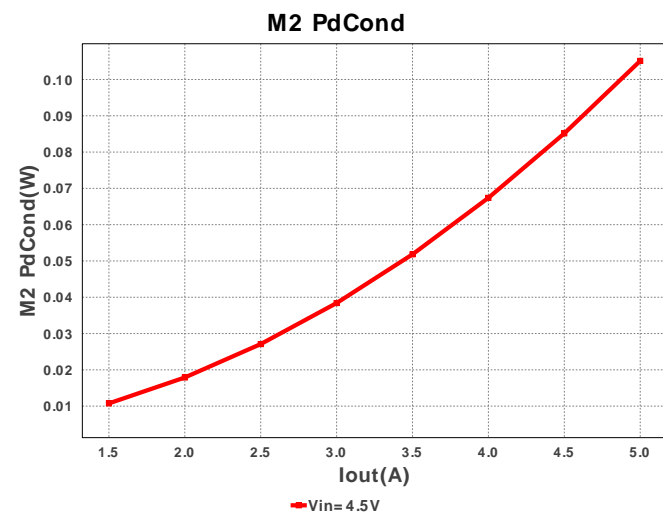
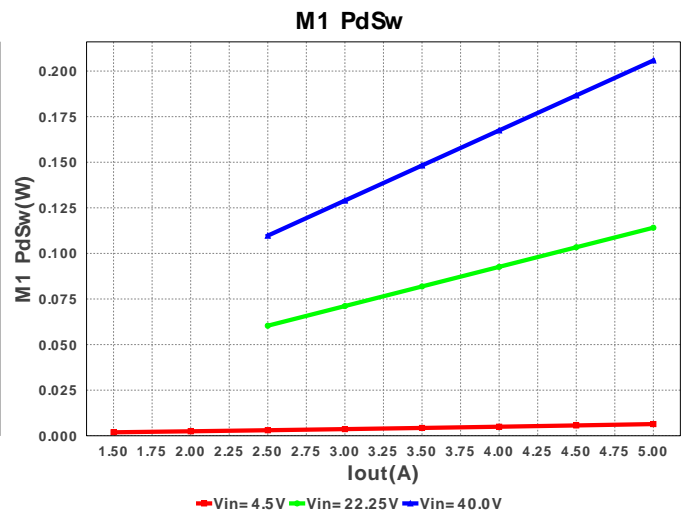
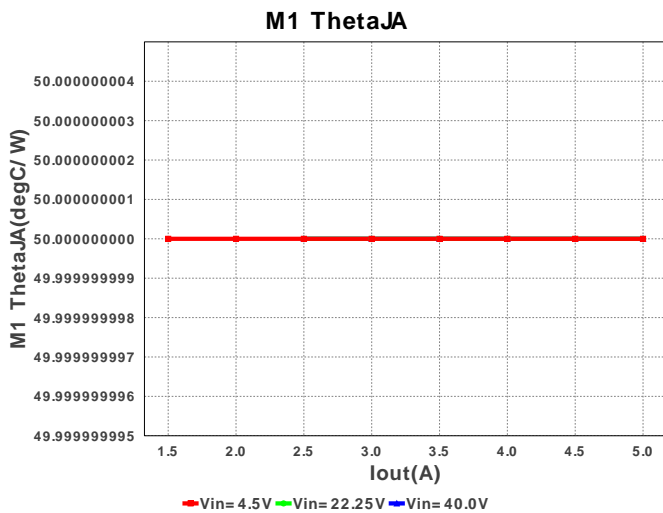
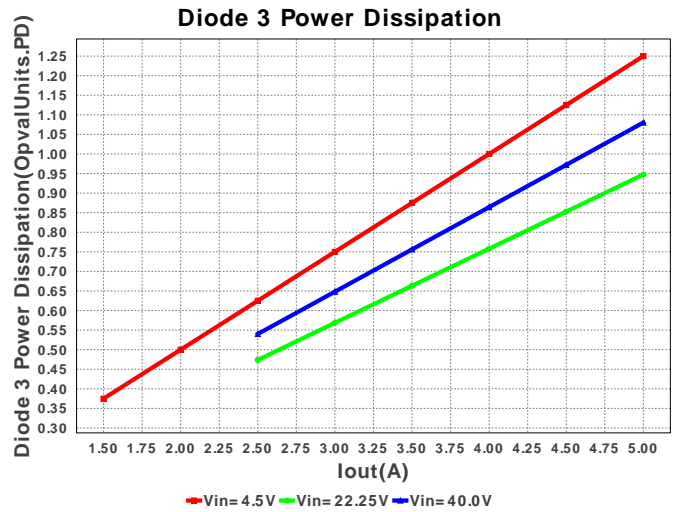
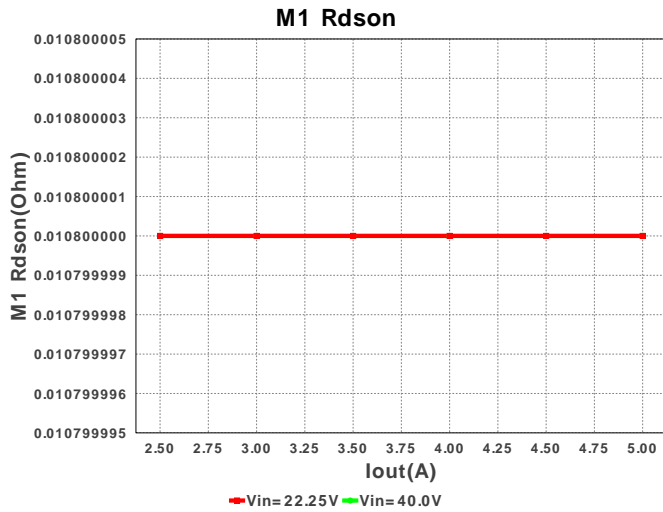
M1 Pd











## 工作数值

#	名称	数值	类别	说明
1.	Cin IRMS	1.713 A	Current	输入电容器均方根纹波电流
2.	Cout IRMS	1.34 A	Current	输出电容器均方根纹波电流
3.	Iin Avg	785.44 mA	Current	平均输入电流
4.	L Ipp	4.641 A	Current	峰值到峰值电感器纹波电流
5.	L1 Irms	5.176 A	Current	电感器纹波电流
6.	M1 Irms	1.843 A	Current	MOSFET RMS 纹波电流
7.	SW Ipk	7.32 A	Current	峰值开关电流
8.	BOM 数量	29	General	Total Design BOM count
9.	大小	1.635 kmm2	General	BOM组件的总所占面积
10.	频率	125.0 kHz	General	开关频率
11.	IC Tolerance	18.0 mV	General	IC Feedback Tolerance



#	名称	数值	类别	说明
12.	M1 Rdson	10.8 mOhm	General	漏源导通电阻
13.	M1 ThetaJA	50.0 degC/W	General	MOSFET 接点到环境热敏电阻
14.	Pout	25.0 W	General	总输出功率
15.	总 BOM	\$0.0	General	Total BOM Cost
16.	D1 Tj	30.0 degC	Op_Point	D1接点温度
17.	Vout OP	5.0 V	Op_Point	Operational Output Voltage
18.	交叉频率	6.945 kHz	Op_point	波特图交叉频率
19.	占空比	13.591 %	Op_point	占空比
20.	效率	79.573 %	Op_point	稳态效率
21.	IC Tj	32.522 degC	Op_point	电路接点温度
22.	ICThetaJA	40.0 degC/W	Op_point	电路接点到环境热敏电阻
23.	IOUT_OP	5.0 A	Op_point	Iout 操作点
24.	M1 TjOP	42.469 degC	Op_point	MOSFET 接点温度
25.	相位裕度	58.423 deg	Op_point	波特图相位裕度
26.	VIN_OP	40.0 V	Op_point	Vin操作点
27.	Vout p-p	18.659 mV	Op_point	峰值到峰值输出纹波电压
28.	Cin Pd	7.34 mW	Power	输入电容器功率耗散
29.	Cout Pd	7.179 mW	Power	输出电容器功率耗散
30.	二极管 Pd	1.08 W	Power	二极管功率耗散
31.	IC Pd	63.051 mW	Power	电路功率耗散
32.	L Pd	365.625 mW	Power	电感器功率耗散
33.	M1 Pd	267.617 mW	Power	MOSFET 功率耗散
34.	M1 PdCond	59.812 mW	Power	M1 MOSFET 传导损耗
35.	M1 PdSw	207.805 mW	Power	M1 MOSFET 开关损耗
36.	整体 Pd	6.418 W	Power	总功率耗散
37.	Diode 1 Power Dissipation	1.08 OpvalUnits.PD	Unknown	Power dissipation in the diode
38.	Diode 2 Power Dissipation	1.75 OpvalUnits.PD	Unknown	Power dissipation in the diode
39.	Diode 3 Power Dissipation	1.08 OpvalUnits.PD	Unknown	Power dissipation in the diode
40.	Diode 4 Power Dissipation	1.75 OpvalUnits.PD	Unknown	Power dissipation in the diode

## 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	40.0 V	最高输入电压
4.	Vin 最小	4.5 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	LM25118	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. The LM5118 is a wide range buck-boost controller which is operable in an ultra wide input range of 3 to 75V. A buck-boost regulator can maintain regulation for input voltages either higher or lower than the output voltage. The challenge is that buck-boost power converters are not as efficient as buck regulators. The LM5118 has been designed as a dual mode controller whereby the power converter acts as a buck regulator while the input voltage is above the output. As the input voltage approaches the output voltage, a gradual transition to the buck-boost mode occurs. This gradual transition between modes eliminates disturbances at the output during transitions.

2. LM25118 Product Folder : <http://www.ti.com/product/lm25118> : contains the data sheet and other resources.

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**You should completely validate and test your design implementation to confirm the system functionality for your application prior to production.**

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