

■ 概述 DESCRIPTION

FH1117 系列三端稳压器，可以提供最高 1A 的负载电流，有限流及热保护功能，调整参考电压精度达 1%。

The FH1117 series of positive adjustable and fixed regulators is designed to provide 1A for applications requiring high efficiency. The FH1117 offers current limiting and thermal protection. The on chip trimming adjusts the reference voltage accuracy to 1%.

■ 特点 FEATURES

- | | |
|---|--|
| ◆ 输出电流（典型值1A） | ◆ Output current of 1A typical |
| ◆ ADJ,1.5V,1.8V, 2.5V, 2.85V, 3.3V, 5.0V 输出 | ◆ ADJ,1.5V,1.8V, 2.5V, 2.85V, 3.3V, 5.0V outputs |
| ◆ 低压差（典型值 800mV） | ◆ Low dropout of typical 800mV |
| ◆ 内置热保护 | ◆ Thermal protection built in |
| ◆ 线性调整（典型值0.015%） | ◆ Typical 0.015% line regulation |
| ◆ 负载调整（典型值0.01%） | ◆ Typical 0.01% load regulation |

■ 应用 Applications

- | | |
|-------------|--|
| ◆ 电脑主板 | ◆ PC Motherboard |
| ◆ LCD 显示器 | ◆ LCD Monitor |
| ◆ DVD 视频播放器 | ◆ DVD-Video Player |
| ◆ 网络接口卡/开关 | ◆ NIC / Switch |
| ◆ 通讯设备 | ◆ Telecom Equipment |
| ◆ 高效率线性调整器 | ◆ High Efficiency Linear Regulator |
| ◆ 打印机及其它外设 | ◆ Printer and other Peripheral Equipment |
| ◆ 充电器 | ◆ Battery Charger |

■ 引脚说明 Pin assignment



- 1 GND
- 2 OUT
- 3 IN

■ 型号构成 Name rule

基本名称 Name			辅助识别代码 Additional code			
第一部分 Part 1	第二部分 Part 2	第三部分 Part 3	第四部分 Part 4	第五部分 Part 5	第六部分 Part 6	第七部分 Part 7
品牌 Brand	产品类别 Type	产品型号 Model	分档 Value	分隔号 Separatrix	封装代码 Package	附加码 (备用) Extra-code
FH		1117S	ADJ 12 15 18 33 50	“—”	S: SOT-223	E : ROHS

■ 最大额定值 Maximum Ratings (Ta=25°C)

特性参数 CHARACTERISTIC	符号 SYMBOL	额定值 RATING	单位 UNIT
输入电压 Input Voltage	VIN	15	V
最大结温 Maximum Junction Temperature	TJ	150	°C
存储温度 Storage Temperature	Tstg	-65~150	°C

■ 推荐工作条件 Recommended Operating Conditions

参数 Parameter	符号 Symbol	最小 Min	最大 Max	单位 Unit
输入电压 Input Voltage	V_{IN}	2.7	12	V
负载电流 Load Current (with adequate heat sinking)	I_O	5	-	mA
输入电容 Input Capacitor V_{IN} to GND		10	-	μF
输出电容 Output Capacitor with ESR of 10 Ω max		22	-	μF
结温 Junction temperature	T_J	-	125	$^{\circ}C$

■ 电参数 Electrical Characteristics($T_C = 25^{\circ}C$ unless otherwise noted)

FH1117S12-SE

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Output Voltage	V_{OUT}	$V_{IN}=3.2V$ $I_{OUT}=10mA$	1.176	1.2	1.224	V
		$2.7V \leq V_{IN} \leq 8.2V$ $10mA \leq I_{OUT} \leq 1A$	1.152	1.2	1.248	V
Line Regulation	ΔV_{OUT}	$1.5V \leq V_{IN} - V_{OUT} \leq 10V$ $I_{OUT}=10mA$	—	1	6	mV
Load Regulation	ΔV_{OUT}	$10mA \leq I_{OUT} \leq 1A$ $V_{IN} - V_{OUT}=2V$	—	1	10	mV
Dropout Voltage	V_D	$\Delta V_{REF}=1\%$, $I_{OUT}=1A$	—	1.15	1.25	V
Current Limit	I_S	$V_{IN} - V_{OUT}=2V$	1.25	1.35	—	A
Quiescent Current	I_Q	$V_{IN}=V_{OUT}+1.25V$	—	5	10	mA
Temperature Drift	TD	$T_J = 0 \sim 125^{\circ}C$	—	0.5	—	%

FH117S15-SE

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Output Voltage	V _{OUT}	V _{IN} =3.5V I _{OUT} =10mA	1.485	1.5	1.515	V
		3.0V≤V _{IN} ≤10V 10mA≤I _{OUT} ≤1A	1.470	1.5	1.530	V
Line Regulation	ΔV _{OUT}	1.5V≤V _{IN} - V _{OUT} ≤10V I _{OUT} =10mA	—	1	6	mV
Load Regulation	ΔV _{OUT}	10mA≤I _{OUT} ≤1A V _{IN} - V _{OUT} =2V	—	1	10	mV
Dropout Voltage	V _D	ΔV _{REF} = 1%, I _{OUT} = 1A	—	1.15	1.25	V
Current Limit	I _S	V _{IN} - V _{OUT} =2V	1.25	1.35	—	A
Quiescent Current	I _Q	V _{IN} =V _{OUT} +1.25V	—	5	10	mA
Temperature Drift	T _D	T _J = 0~125℃	—	0.5	—	%

FH117S18-SE

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Output Voltage	V _{OUT}	V _{IN} = 3.8V , I _O = 10mA	1.78	1.80	1.82	V
		3.2V≤ V _{IN} ≤10V 10mA≤ I _O ≤1A	1.76	1.80	1.84	V
Line Regulation	ΔV _{OUT}	1.5V≤ V _{IN} -V _O ≤10V , I _O =10mA	-	-	6	mV
Load Regulation	ΔV _{OUT}	V _{IN} -V _O = 2V , 10mA ≤ I _O ≤1A	-	-	10	mV
Dropout Voltage	V _D	ΔV _{REF} = 1%, I _O = 1A	-	1	1.4	V
Current Limit	I _S	V _{IN} - V _O = 2V	1.2	-	-	A
Quiescent Current	I _Q	V _{IN} - V _O = 1.25V	-	5	10	mA
Temperature Drift	T _D	T _J = 0~125℃	-	0.5	-	%

FH117S25-SE

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Output Voltage	V_{OUT}	$V_{IN} = 4.5V, I_O = 10mA$	2.475	2.500	2.525	V
		$3.9V \leq V_{IN} \leq 10V$ $10mA \leq I_O \leq 1A$	2.450	2.500	2.550	V
Line Regulation	ΔV_{OUT}	$1.5V \leq V_{IN} - V_O \leq 10V,$ $I_O = 10mA$	-	-	6	mV
Load Regulation	ΔV_{OUT}	$V_{IN} - V_O = 2V, 10mA \leq I_O \leq 1A$	-	-	10	mV
Dropout Voltage	V_D	$\Delta V_{REF} = 1\%, I_O = 1A$	-	1	1.4	V
Current Limit	I_S	$V_{IN} - V_O = 2V$	1.2	-	-	A
Quiescent Current	I_Q	$V_{IN} - V_O = 1.25V$	-	5	10	mA
Temperature Drift	T_D	$T_J = 0 \sim 125^\circ C$	-	0.5	-	%

FH117S33-SE

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Output Voltage	V_{OUT}	$V_{IN} = 5V, I_{OUT} = 10mA$	3.267	3.300	3.333	V
		$4.8V \leq V_{IN} \leq 7V$ $10mA \leq I_{OUT} \leq 1A$	3.234	3.300	3.366	V
Line Regulation	ΔV_{OUT}	$4.8V \leq V_{IN} \leq 7V, I_{OUT} = 10mA$	—	0.165	6.6	mV
Load Regulation	ΔV_{OUT}	$10mA \leq I_{OUT} \leq 1A$ $V_{IN} = 5.3V$	—	1.65	16.5	mV
Dropout Voltage	V_D	$\Delta V_{out} = 1\%, I_{OUT} = 1A$	—	1.1	1.4	V
Current Limit	I_S	$V_{IN} = 5.3V$	1.1	1.5	—	A
Quiescent Current	I_Q	$V_{IN} = 4.55V$	—	6	13	mA
Temperature Stability	T_D	$T_J = 0 \sim 125^\circ C$	—	0.5	—	%

FH1117S50-SE

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Output Voltage	VOUT	$6.5V \leq V_{IN} \leq 12V$	4.900	5.000	5.100	V
Line Regulation	ΔV_{OUT}	$6.5V \leq V_{IN} \leq 12V, I_{OUT} = 10mA$	—	0.005	0.200	%
Load Regulation	ΔV_{OUT}	$V_{IN} = 7V, 10mA \leq I_{OUT} \leq 1A$	—	0.05	0.5	%
Dropout Voltage	VD	$I_{OUT} = 1A,$ $\Delta V_{OUT} = 0.1\% V_{OUT}$	—	1.3	1.4	V
Current Limit	IS	$V_{IN} = 7V$	1.10	1.50	—	A
Quiescent Current	IQ	$V_{IN} = 7V$	—	4.00	13.00	mA
Temperature Drift	TD	$T_J = 0 \sim 125^\circ C$	—	0.500	—	%
Output Voltage	VOUT	$6.5V \leq V_{IN} \leq 12V$	4.900	5.000	5.100	V

FH1117SADJ-SE

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Reference Voltage	VREF	VIN - VO= 2V IO= 10mA	1.238	1.250	1.262	V
		1.4V ≤ VIN - VO ≤ 10V 10mA ≤ IO ≤ 1A	1.225	1.250	1.270	V
Line Regulation	ΔVOUT	1.5V ≤ VIN - VO ≤ 13.75V, IO= 10mA	—	—	0.2	%
Load Regulation	ΔVOUT	VIN - VO= 3V, 10mA ≤ IO ≤ 1A	—	—	0.4	%
Dropout Voltage	VD	ΔVREF= 1%, IO= 0.1A	—	1	1.1	V
		ΔVREF= 1%, IO= 0.5A	—	1.08	1.18	
		ΔVREF= 1%, IO= 1A	—	1.15	1.25	
Current Limit	IS	VIN - VO= 5V	1.1	—	1.5	A
Minimum Load Current	IL	1.4V ≤ VIN - VO ≤ 10V	—	—	5	mA
Quiescent Current	IQ	VIN - VO= 1.25V	—	5	10	mA
Adjust Pin Current	IADJ	1.4V ≤ VIN - VO ≤ 10V, IO= 10mA	—	60	120	uA
Adjust Pin Current Change	ΔIADJ	1.4V ≤ VIN - VO ≤ 10V, 10mA ≤ IO ≤ 1A	—	0.5	5	uA

■ 典型特性 Typical Performance Characteristics

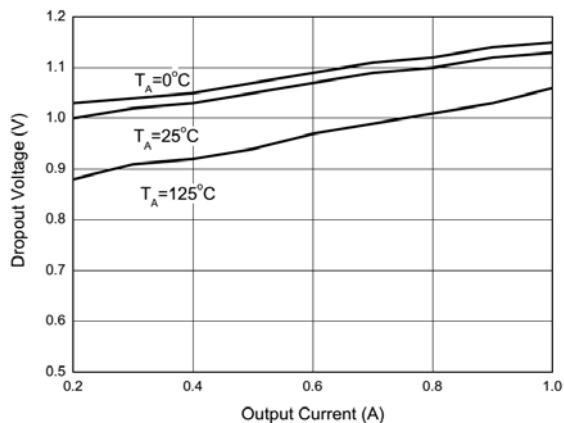


Figure 1. Dropout Voltage vs. Output Current

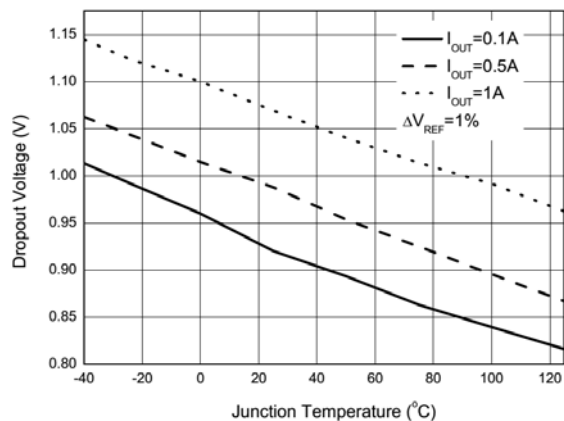


Figure 2. Dropout Voltage vs. Junction Temperature

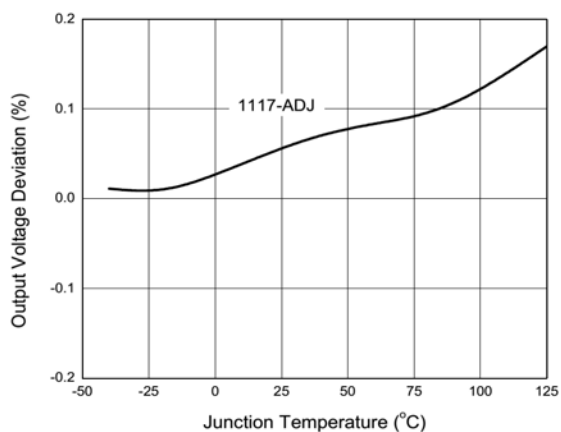


Figure 3. Load Regulation vs. Junction Temperature

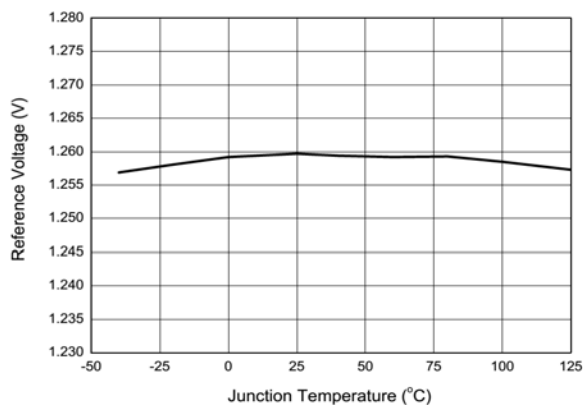


Figure 4. Reference Voltage vs. Junction Temperature

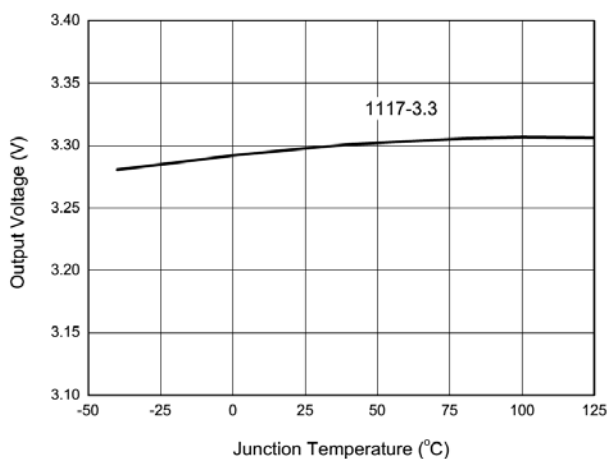


Figure 5. Output Voltage vs. Junction Temperature

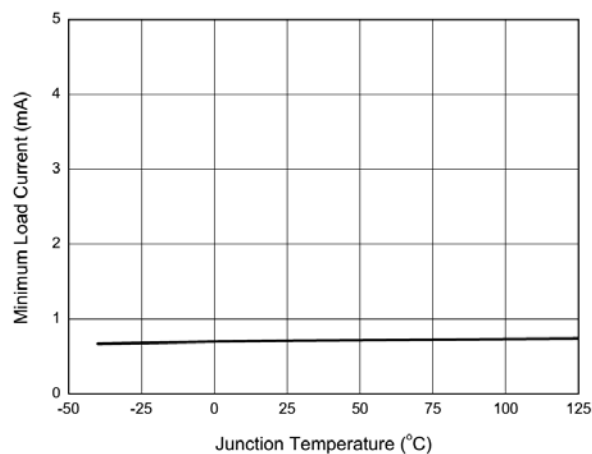


Figure 6. Minimum Load Current vs. Junction Temperature

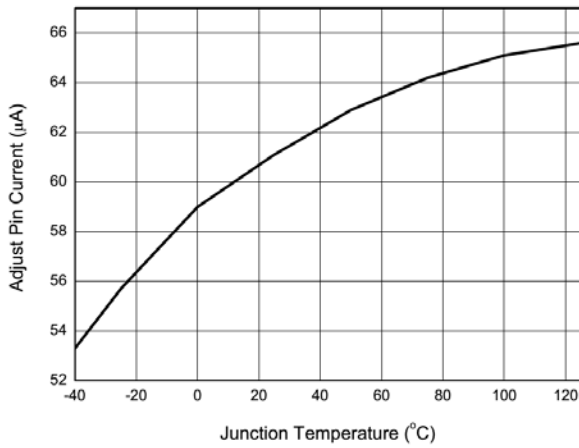


Figure 7. Adjust Pin Current vs. Junction Temperature

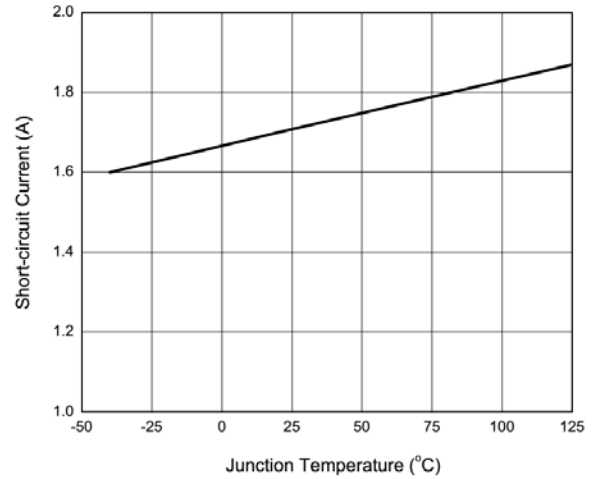


Figure 8. Short-circuit Current vs. Junction Temperature

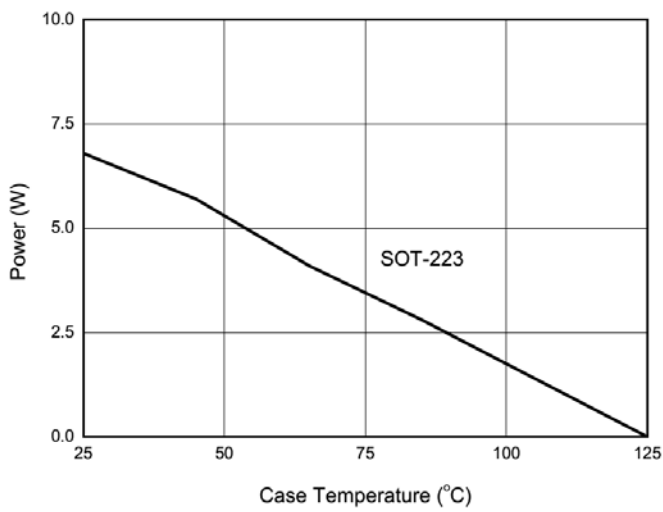


Figure 9. Maximum Power Dissipation

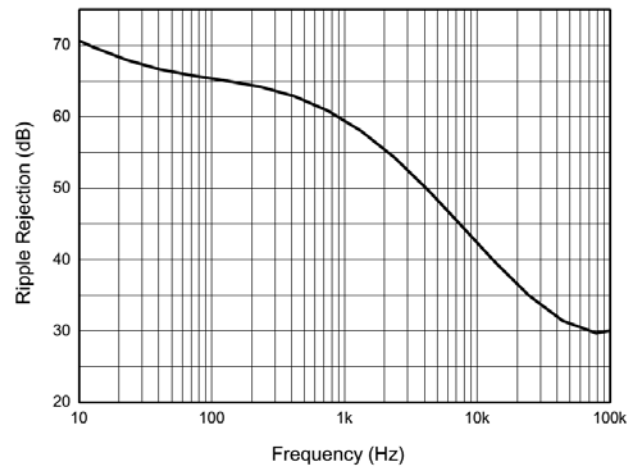


Figure 10. Ripple Rejection vs. Frequency

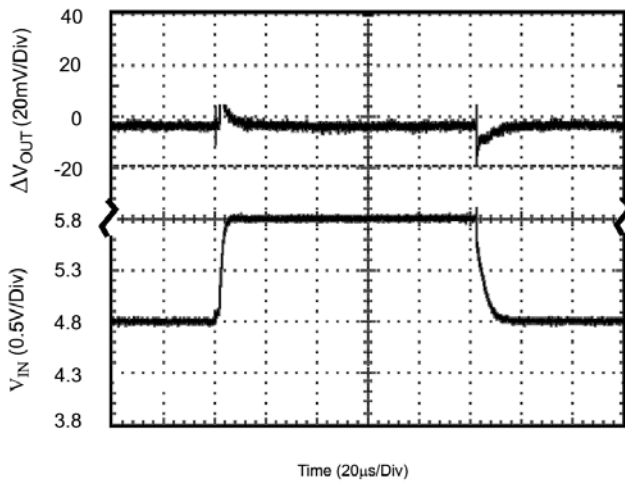


Figure 11. Line Transient Response
(Conditions: $V_{IN}=4.8$ to $5.8V$, $V_{OUT}=3.33V$,
 $I_{OUT}=0.1A$, $C_{IN}=1\mu F$, $C_{OUT}=10\mu F$)

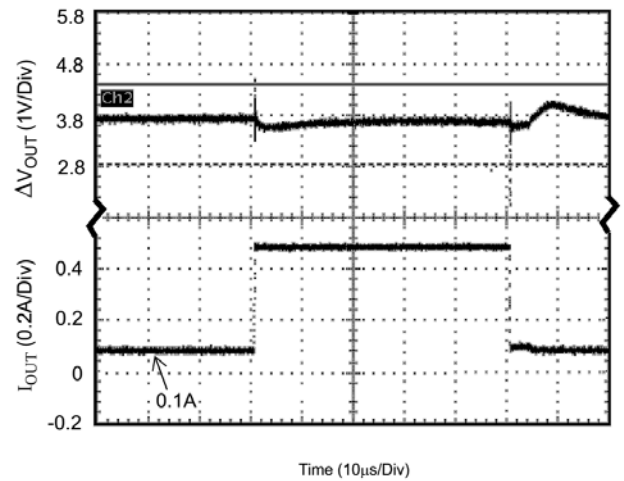
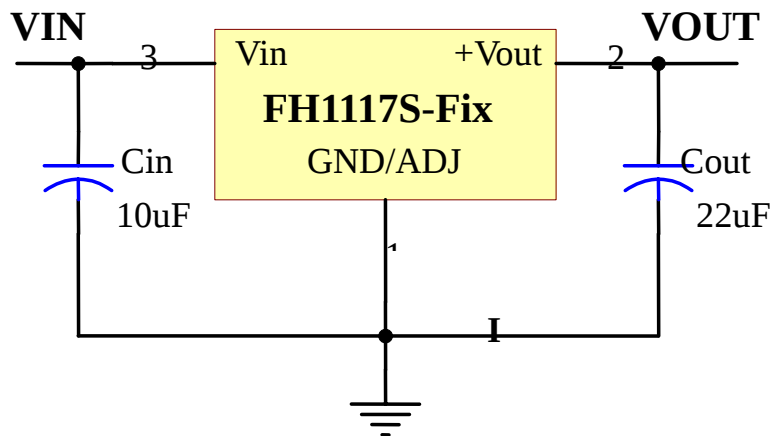
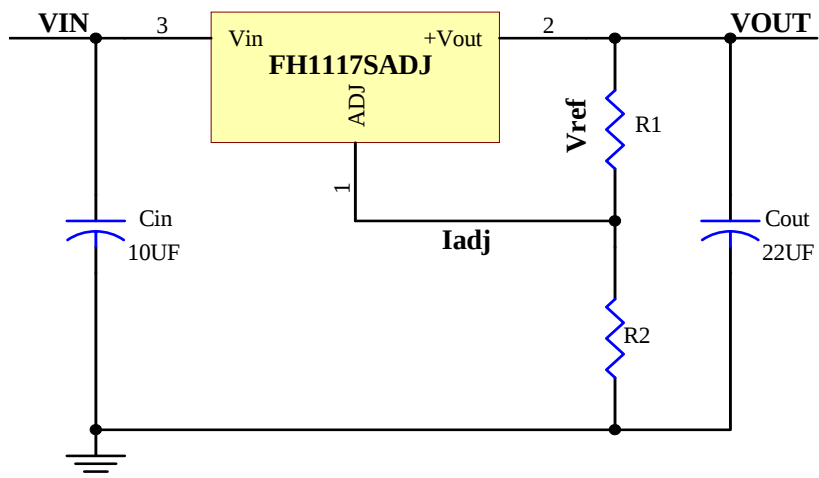
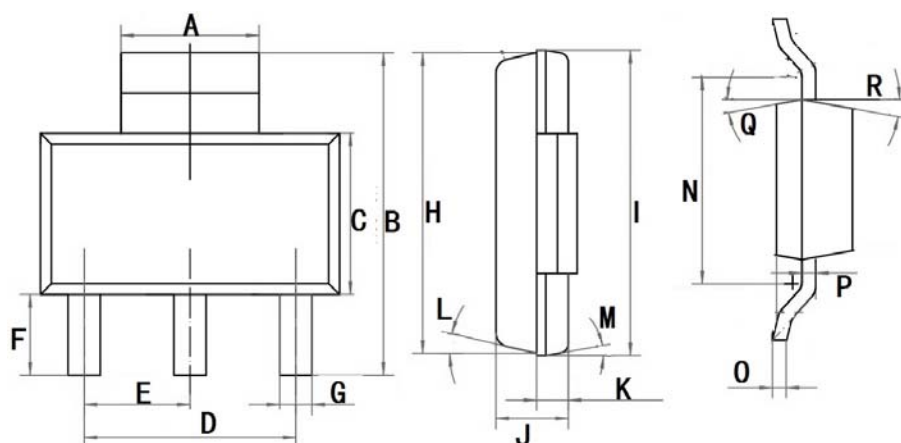


Figure 12. Load Transient Response
(Conditions: $V_{IN}=4.8V$, $V_{OUT}=3.33V$,
 $I_{OUT}=0.1$ to $0.5A$, $C_{IN}=C_{OUT}=10\mu F$)

■ 典型应用 Typical Application



■ SOT223 尺寸图 Dimension



A	3.0±0.10	F	1.75±0.10	K	0.70±0.1	P	0.30
B	7.00±0.20	G	0.700±0.1	L	13°	Q	13°
C	3.50±0.1	H	6.40±0.1	M	13°	R	13°
D	4.600 REF	I	6.60±0.20	N	4.63		
E	2.300±0.050	J	1.60±0.2	O	0.305		