Three Terminal Voltage Regulators

三端稳压管

FHP78XXA

产品特性 Features

输出电压 **Output Voltage**	稳压管 Regulators
5V	**FHP7805A**
8V	**FHP7808A**
9V	**FHP7809A**
12V	**FHP7812A**
15V	**FHP7815A**
24V	**FHP7824A**
最大输出电流 **Max Output Current**	**1.5A**
过载保护 **Internal thermal overload prection**	
短路电流限制 **Internal short-current limiting**	
输出端最大安全工作区域 **Output transistor safe-area compensation**	
输出电压精度在 **4%**以内 **Output voltage offered in 4% tolerance**	

封装形式 Package

1:Input 2:GND 3:Output

功能图 Functional diagram

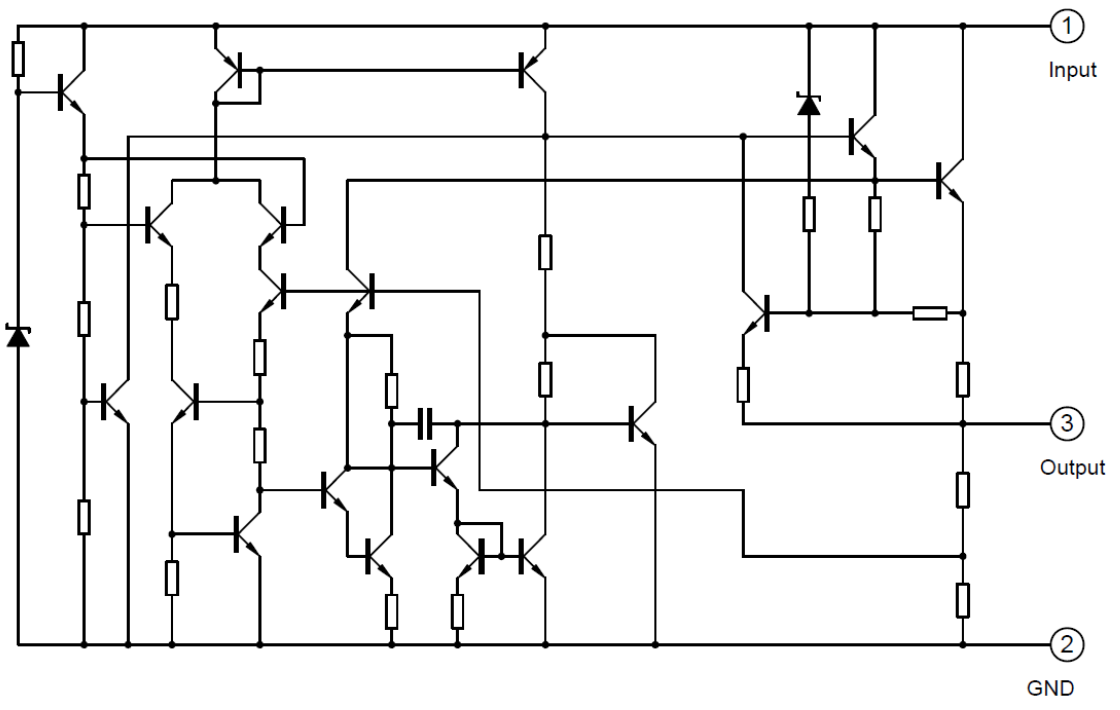


Fig.1

绝对最大额定值 Absolute Maximum Rating (Ta = 25°C unless otherwise noted)

Parameter **项目**	**Symbol** **符号**	**Limit** **极限值**		**Unit**
输入电压 Input Voltage	Vin	for Vo=5V to Vo=18V	35	V
		for Vo=24V	40	
功率损耗 Power Dissipation	P_D	Internal Limited		W
结温 Junction Temperature	Tj	+125		℃
存储温度 Storage Temperature Range	T_{STG}	-65~+150		℃
结-壳的热阻 Thermal Resistance -Junction to Case	$R_{\Theta JC}$	5		℃W
结-环境的热阻 Thermal Resistance -Junction to Ambient	$R_{\Theta JA}$	50		℃/W

FHP7805A 电参数特性 Electrical Characteristics

(Vin= 10V, Iout=500mA, 0°C≤Tj≤125°C, Cin=0.33uF, Cout=0.1uF; unless otherwise specified.)

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
输出电压 Output voltage	Vout	Tj=25℃		4.80	5	5.20	V
		7.5V≤Vin≤20V, 5mA≤Iout≤1A, PD≤15W		4.75	5	5.25	
线性调节 Line Regulation	REGline	Tj=25℃	7.5V≤Vin≤25V	--	4	100	mV
			8V≤Vin≤12V	--	1.6	50	
负载调节 Load Regulation	REGload	Tj=25℃	5mA≤Iout≤1.5A	--	9	100	
			250mA≤Iout≤750mA	--	4	50	
静态电流 Quiescent Current	Iq	Iout=0, Tj=25℃		--	5.0	8	mA
静态电流变化 Quiescent Current Change	ΔIq	8.0V≤Vin≤25V		--	--	0.8	
		5mA≤Iout≤1A		--	--	0.5	
输出电压纹波 Output Noise Voltage	Vn	10Hz≤f≤100KHz, Tj=25℃		--	42	--	μV
浪涌衰减 Ripple Rejection Ratio	RR	f=120Hz, 8V≤Vin≤18V		62	73	--	dB
衰减电压 Voltage Drop	Vdrop	Iout=1A, Tj=25℃		--	2	--	V
短路电流 Output Short Circuit Current	Ios	Tj=25℃		--	230	--	mA
峰值电流 Peak Output Current	Io peak	Tj=25℃		--	2.2	--	A
输出电压特性 Temperature Coefficient of Output Voltage	ΔVout/ ΔTj	Iout=5mA, 0℃≤Tj≤125℃		--	0.8	--	mV/℃
输出端电阻 Output resistance	Ro	f=1KHz		--	15	--	mΩ

FHP7808A 电参数特性 Electrical Characteristics

(Vin= 14V, Iout=500mA, 0°C≤Tj≤125°C, Cin=0.33uF, Cout=0.1uF; unless otherwise specified.)

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
输出电压 Output voltage	Vout	Tj=25℃		7.7	8.0	8.3	V
		11V≤Vin≤23V, 5mA≤Iout≤1A, PD≤15W		7.6	8.0	8.4	
线性调节 Line Regulation	REGline	Tj=25℃	10.5V≤Vin≤25V	--	5.0	160	mV
			11V≤Vin≤17V	--	2.0	80	
负载调节 Load Regulation	REGload	Tj=25℃	5mA≤Iout≤1.5A	--	10	160	
			250mA≤Iout≤750mA	--	5.0	80	
静态电流 Quiescent Current	Iq	Iout=0, Tj=25℃		--	5.0	8	mA
静态电流变化 Quiescent Current Change	ΔIq	11V≤Vin≤25V		--	--	0.8	
		5mA≤Iout≤1A		--	--	0.5	
输出电压纹波 Output Noise Voltage	Vn	10Hz≤f≤100KHz, Tj=25℃		--	52	--	μV
浪涌衰减 Ripple Rejection Ratio	RR	f=120Hz, 11.5V≤Vin≤21.5V		56	73	--	dB
衰减电压 Voltage Drop	Vdrop	Iout=1A, Tj=25℃		--	2	--	V
短路电流 Output Short Circuit Current	Ios	Tj=25℃		--	230	--	mA
峰值电流 Peak Output Current	Io peak	Tj=25℃		--	2.2	--	A
输出电压特性 Temperature Coefficient of Output Voltage	ΔVout/ ΔTj	Iout=5mA, 0℃≤Tj≤125℃		--	0.8	--	mV/℃
输出端电阻 Output resistance	Ro	f=1KHz		--	17	--	mΩ

FHP7809A 电参数特性 Electrical Characteristics

(Vin= 15V, Iout=500mA, 0°C≤Tj≤125°C, Cin=0.33uF, Cout=0.1uF; unless otherwise specified.)

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
输出电压 Output voltage	Vout	Tj=25℃		8.65	9.0	9.35	V
		11.5V≤Vin≤24V, 5mA≤Iout≤1A, PD≤15W		8.6	9.0	9.4	
线性调节 Line Regulation	REGline	Tj=25℃	11.5V≤Vin≤25V	--	6.0	180	mV
			12V≤Vin≤25V	--	2.0	90	
负载调节 Load Regulation	REGload	Tj=25℃	5mA≤Iout≤1.5A	--	12	180	
			250mA≤Iout≤750mA	--	5.0	90	
静态电流 Quiescent Current	Iq	Iout=0, Tj=25℃		--	5.0	8	mA
静态电流变化 Quiescent Current Change	ΔIq	12V≤Vin≤26V		--	--	0.8	
		5mA≤Iout≤1A		--	--	0.5	
输出电压纹波 Output Noise Voltage	Vn	10Hz≤f≤100KHz, Tj=25℃		--	58	--	μV
浪涌衰减 Ripple Rejection Ratio	RR	f=120Hz, 11.5V≤Vin≤21.5V		56	73	--	dB
衰减电压 Voltage Drop	Vdrop	Iout=1A, Tj=25℃		--	2	--	V
短路电流 Output Short Circuit Current	Ios	Tj=25℃		--	230	--	mA
峰值电流 Peak Output Current	Io peak	Tj=25℃		--	2.2	--	A
输出电压特性 Temperature Coefficient of Output Voltage	ΔVout/ ΔTj	Iout=5mA, 0℃≤Tj≤125℃		--	1.0	--	mV/℃
输出端电阻 Output resistance	Ro	f=1KHz		--	15	--	mΩ

FHP7812A 电参数特性 Electrical Characteristics

(Vin= 19V, Iout=500mA, 0°C≤Tj≤125°C, Cin=0.33uF, Cout=0.1uF; unless otherwise specified.)

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
输出电压 Output voltage	Vout	Tj=25℃		11.5	12.0	12.5	V
		14.5V≤Vin≤27V, 5mA≤Iout≤1A, PD≤15W		11.4	12.0	12.6	
线性调节 Line Regulation	REGline	Tj=25℃	14.5V≤Vin≤30V	--	10	240	mV
			16V≤Vin≤22V	--	3	120	
负载调节 Load Regulation	REGload	Tj=25℃	5mA≤Iout≤1.5A	--	12	240	
			250mA≤Iout≤750mA	--	5.0	120	
静态电流 Quiescent Current	Iq	Iout=0, Tj=25℃		--	5.1	8	mA
静态电流变化 Quiescent Current Change	ΔIq	15V≤Vin≤30V		--	--	0.8	
		5mA≤Iout≤1A		--	--	0.5	
输出电压纹波 Output Noise Voltage	Vn	10Hz≤f≤100KHz, Tj=25℃		--	76	--	μV
浪涌衰减 Ripple Rejection Ratio	RR	f=120Hz, 15V≤Vin≤25V		55	71	--	dB
衰减电压 Voltage Drop	Vdrop	Iout=1A, Tj=25℃		--	2	--	V
短路电流 Output Short Circuit Current	Ios	Tj=25℃		--	230	--	mA
峰值电流 Peak Output Current	Io peak	Tj=25℃		--	2.2	--	A
输出电压特性 Temperature Coefficient of Output Voltage	ΔVout/ ΔTj	Iout=5mA, 0℃≤Tj≤125℃		--	1.0	--	mV/℃
输出端电阻 Output resistance	Ro	f=1KHz		--	18	--	mΩ

FHP7815A 电参数特性 Electrical Characteristics

(Vin= 23V, Iout=500mA, 0°C≤Tj≤125°C, Cin=0.33uF, Cout=0.1uF; unless otherwise specified.)

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
输出电压 Output voltage	Vout	Tj=25℃		14.4	15.0	15.6	V
		17.5V≤Vin≤30V, 5mA≤Iout≤1A, PD≤15W		14.25	15.0	15.75	
线性调节 Line Regulation	REGline	Tj=25℃	17.5V≤Vin≤30V	--	11	300	mV
			20V≤Vin≤26V	--	3	150	
负载调节 Load Regulation	REGload	Tj=25℃	5mA≤Iout≤1.5A	--	12	300	
			250mA≤Iout≤750mA	--	5.0	150	
静态电流 Quiescent Current	Iq	Iout=0, Tj=25℃		--	5.2	8	mA
静态电流变化 Quiescent Current Change	ΔIq	18V≤Vin≤30.5V		--	--	0.8	
		5mA≤Iout≤1A		--	--	0.5	
输出电压纹波 Output Noise Voltage	Vn	10Hz≤f≤100KHz, Tj=25℃		--	90	--	μV
浪涌衰减 Ripple Rejection Ratio	RR	f=120Hz, 18.5V≤Vin≤28.5V		54	70	--	dB
衰减电压 Voltage Drop	Vdrop	Iout=1A, Tj=25℃		--	2	--	V
短路电流 Output Short Circuit Current	Ios	Tj=25℃		--	230	--	mA
峰值电流 Peak Output Current	Io peak	Tj=25℃		--	2.2	--	A
输出电压特性 Temperature Coefficient of Output Voltage	ΔVout/ ΔTj	Iout=5mA, 0℃≤Tj≤125℃		--	1.0	--	mV/℃
输出端电阻 Output resistance	Ro	f=1KHz		--	19	--	mΩ

FHP7824A 电参数特性 Electrical Characteristics

(Vin= 33V, Iout=500mA, 0°C≤Tj≤125°C, Cin=0.33uF, Cout=0.1uF; unless otherwise specified.)

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
输出电压 Output voltage	Vout	Tj=25℃		23	24	25	V
		27V≤Vin≤38V, 5mA≤Iout≤1A, PD≤15W		22.8	24	25.2	
线性调节 Line Regulation	REGline	Tj=25℃	27V≤Vin≤38V	--	17	480	mV
			30V≤Vin≤36V	--	6	240	
负载调节 Load Regulation	REGload	Tj=25℃	5mA≤Iout≤1.5A	--	15	480	
			250mA≤Iout≤750mA	--	5.0	240	
静态电流 Quiescent Current	Iq	Iout=0, Tj=25℃		--	5.2	8	mA
静态电流变化 Quiescent Current Change	ΔIq	27V≤Vin≤38V		--	--	1.0	
		5mA≤Iout≤1A		--	--	0.5	
输出电压纹波 Output Noise Voltage	Vn	10Hz≤f≤100KHz, Tj=25℃		--	160	--	μV
浪涌衰减 Ripple Rejection Ratio	RR	f=120Hz, 28V≤Vin≤38V		50	67	--	dB
衰减电压 Voltage Drop	Vdrop	Iout=1A, Tj=25℃		--	2	--	V
短路电流 Output Short Circuit Current	Ios	Tj=25℃		--	230	--	mA
峰值电流 Peak Output Current	Io peak	Tj=25℃		--	2.2	--	A
输出电压特性 Temperature Coefficient of Output Voltage	ΔVout/ ΔTj	Iout=5mA, 0℃≤Tj≤125℃		--	1.0	--	mV/℃
输出端电阻 Output resistance	Ro	f=1KHz		--	28	--	mΩ

测试电路 Test Circuits

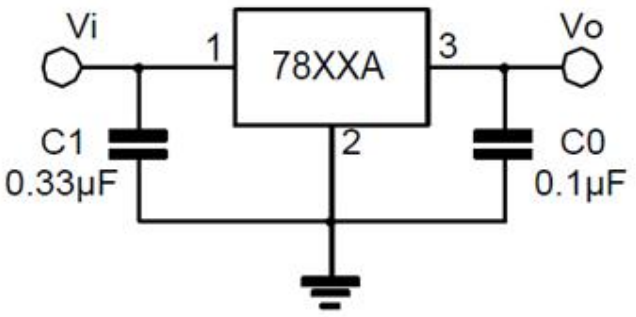


FIG.2 DC PARAMETERS

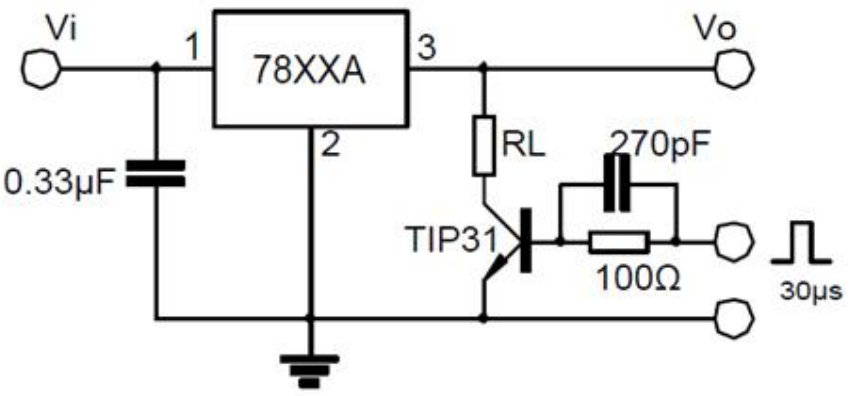


FIG.3 LOAD REGULATION

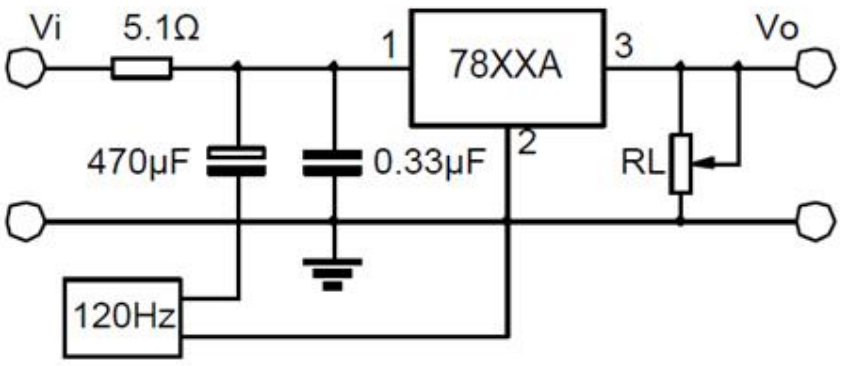


FIG.4 RIPPLE REJECTION

典型应用电路 Typical application circuit

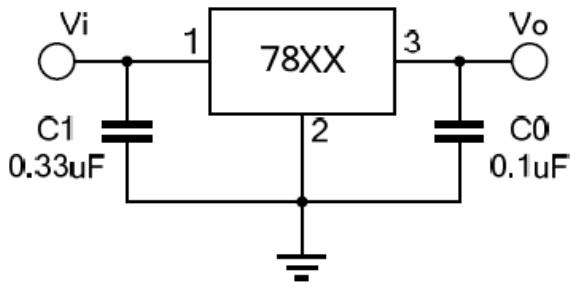


Fig.5 Fi xed output regulator

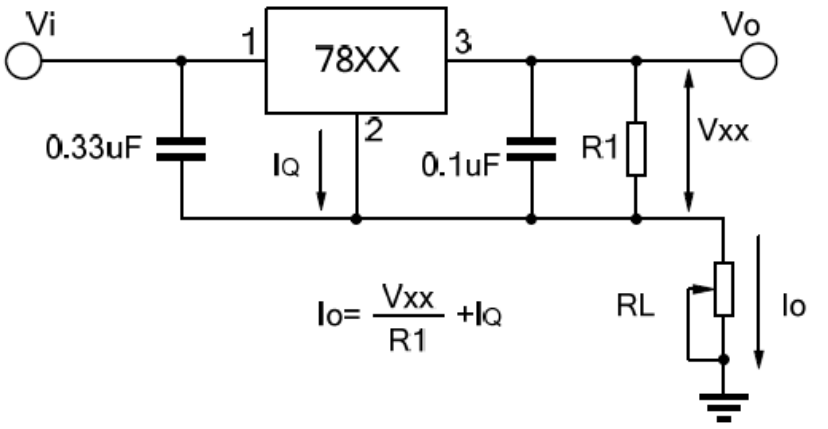
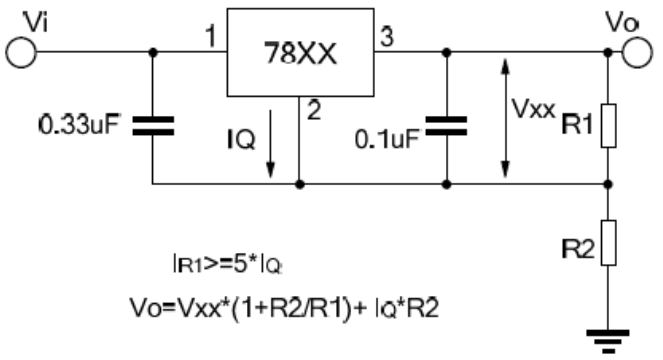


Fig.6 Constant current regulator



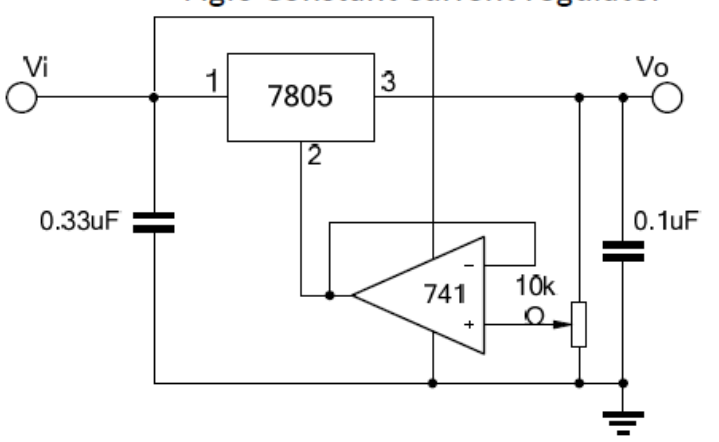


Fig.7 Circuit for increasing Regulator output voltage

Fig.8 Ad justable output

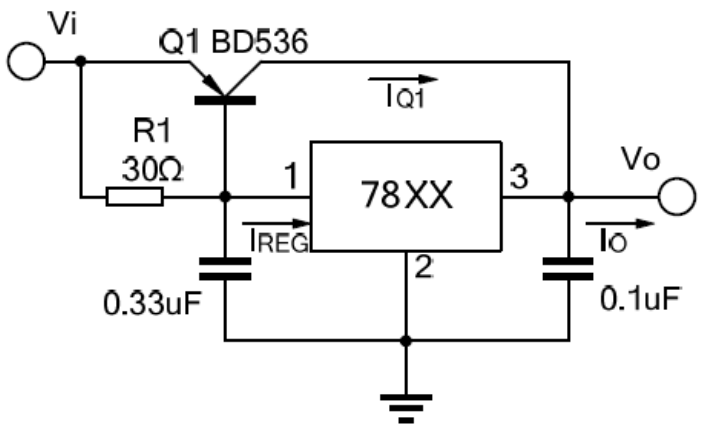


Fig.9.1 High current with voltage regulator

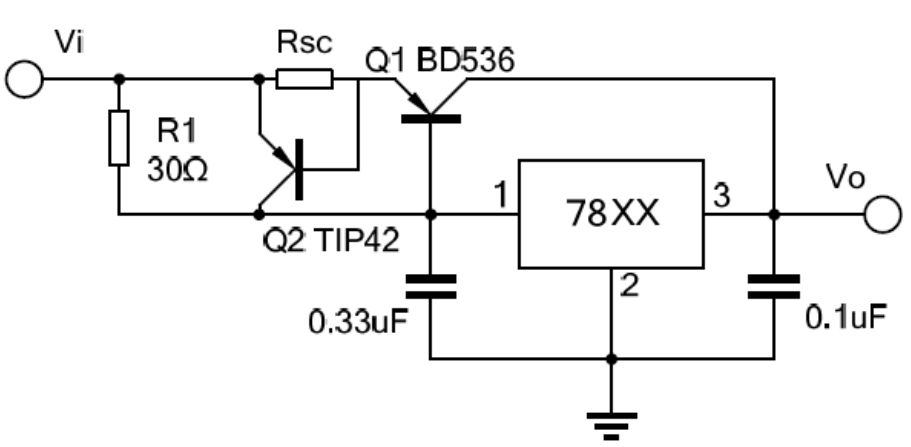


Fig.9.2 High output curent short circuit protection

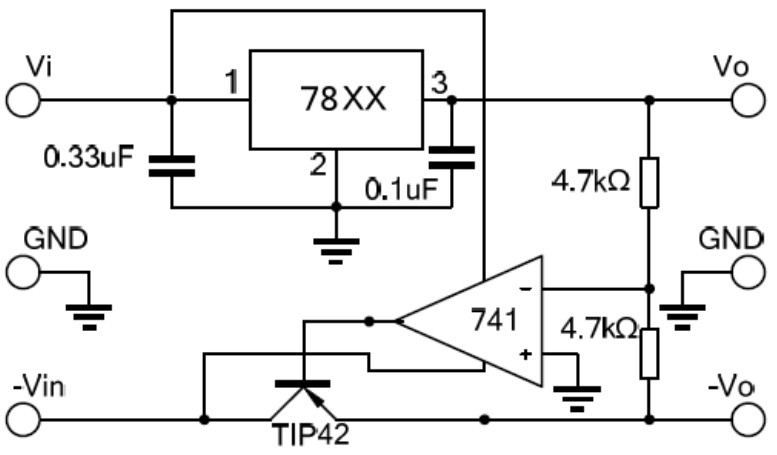


Fig.10 Tracking voltage regulator

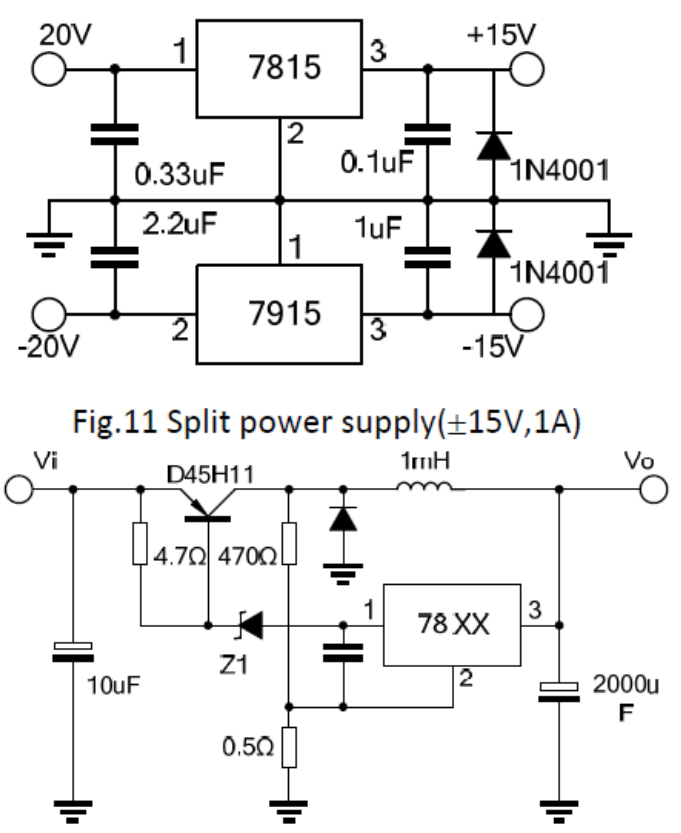


Fig.11 Split power supply(±15V,1A)

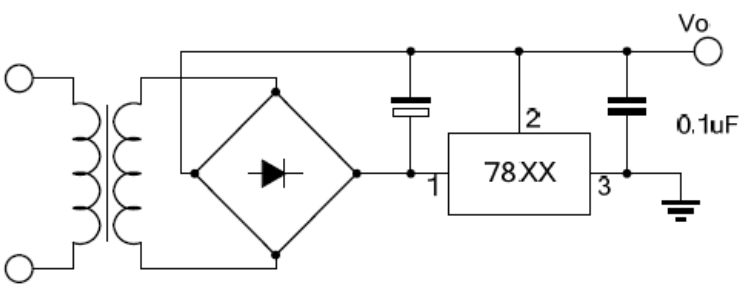


Fig.12 Negative output voltage ciruit

Fig.13 switching regulator

典型特性曲线 Typical performance characteristics

Fig.14 Quiescent current

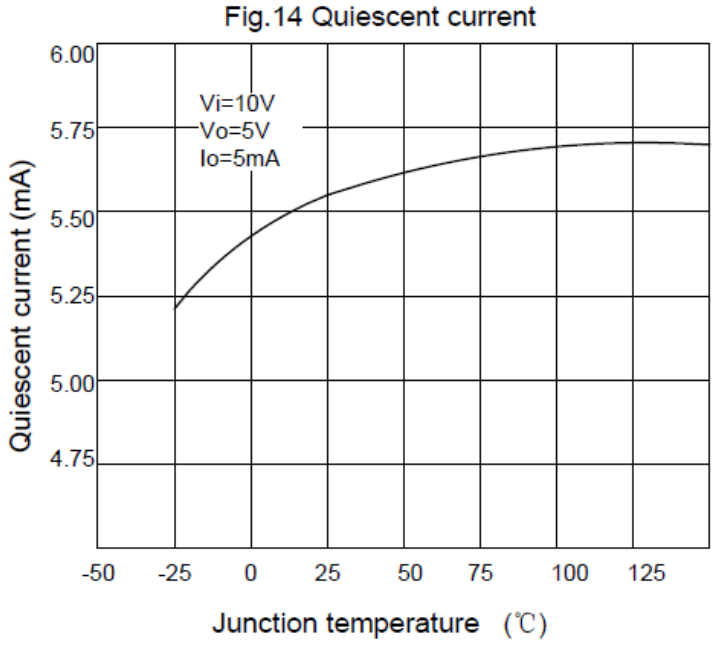


Fig.15 Output voltage

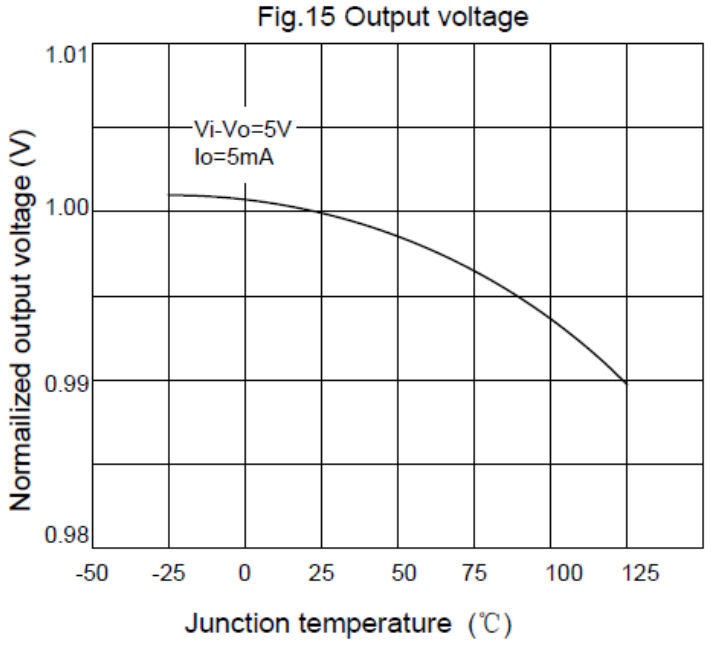


Fig.16 Peak output current

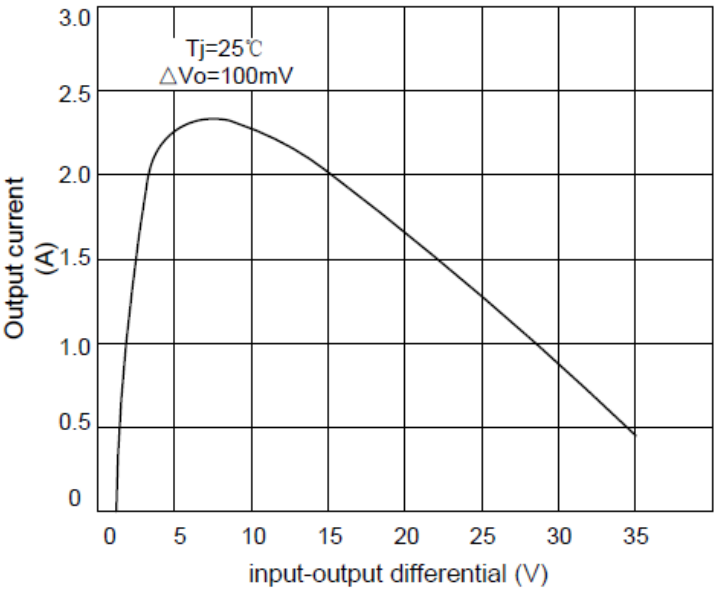
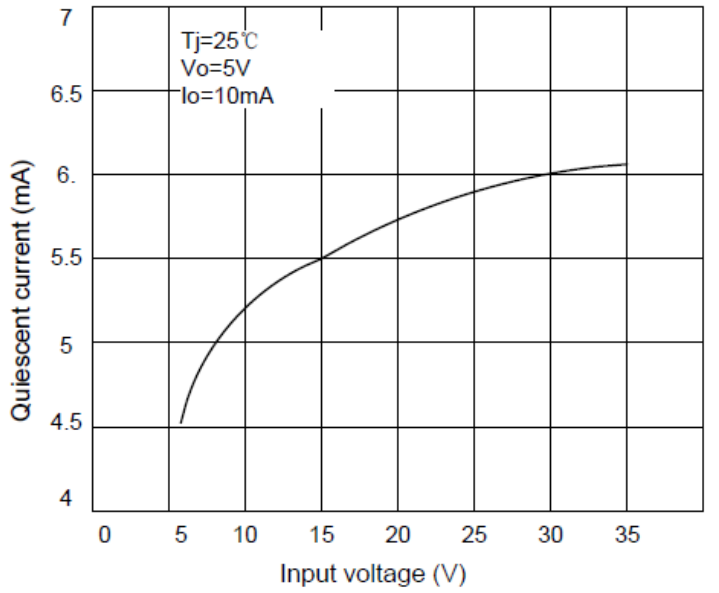


Fig.17 Quiescent current



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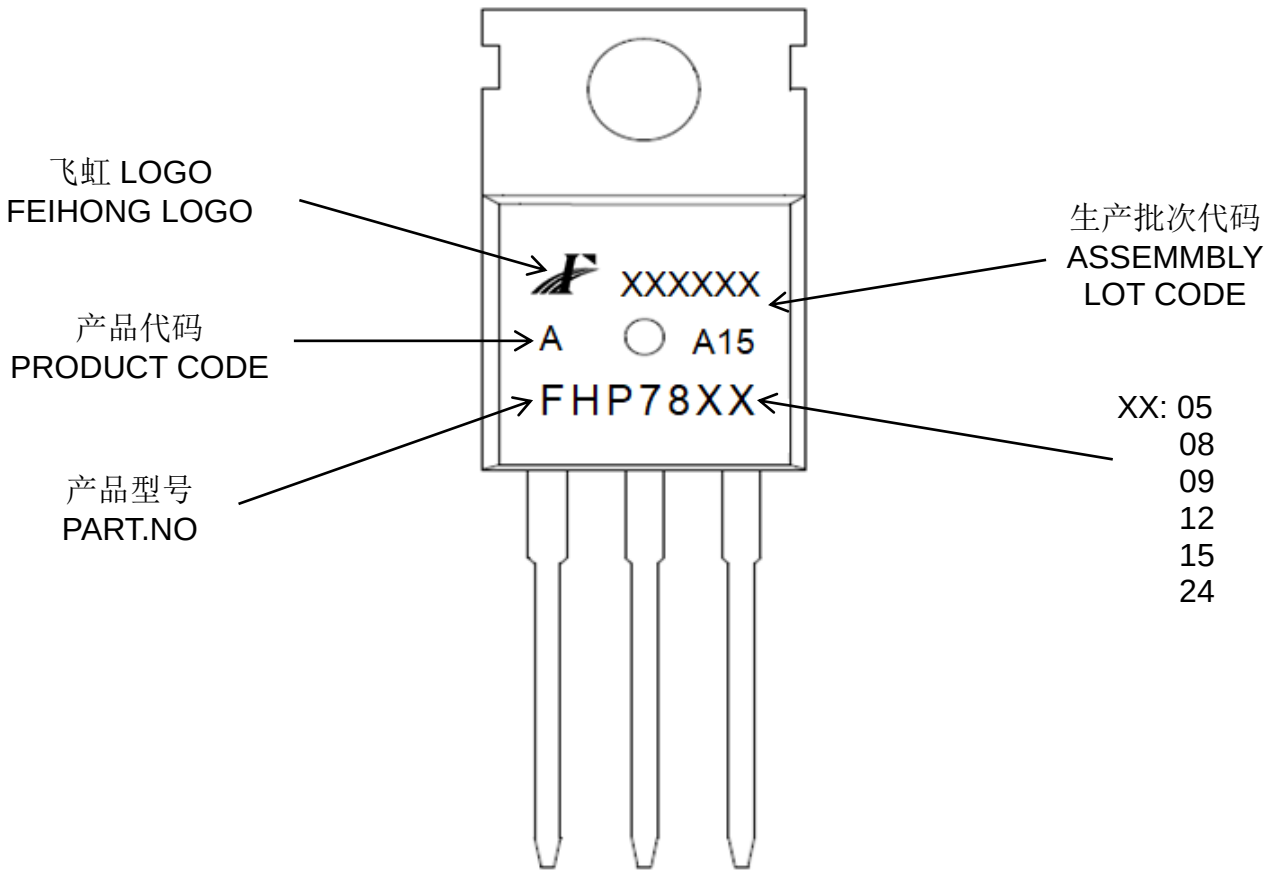
飞虹 LOGO
FEIHONG LOGO
产品代码
PRODUCT CODE
产品型号
PART.NO
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A
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FHP78XX
生产批次代码
ASSEMMBLY
LOT CODE
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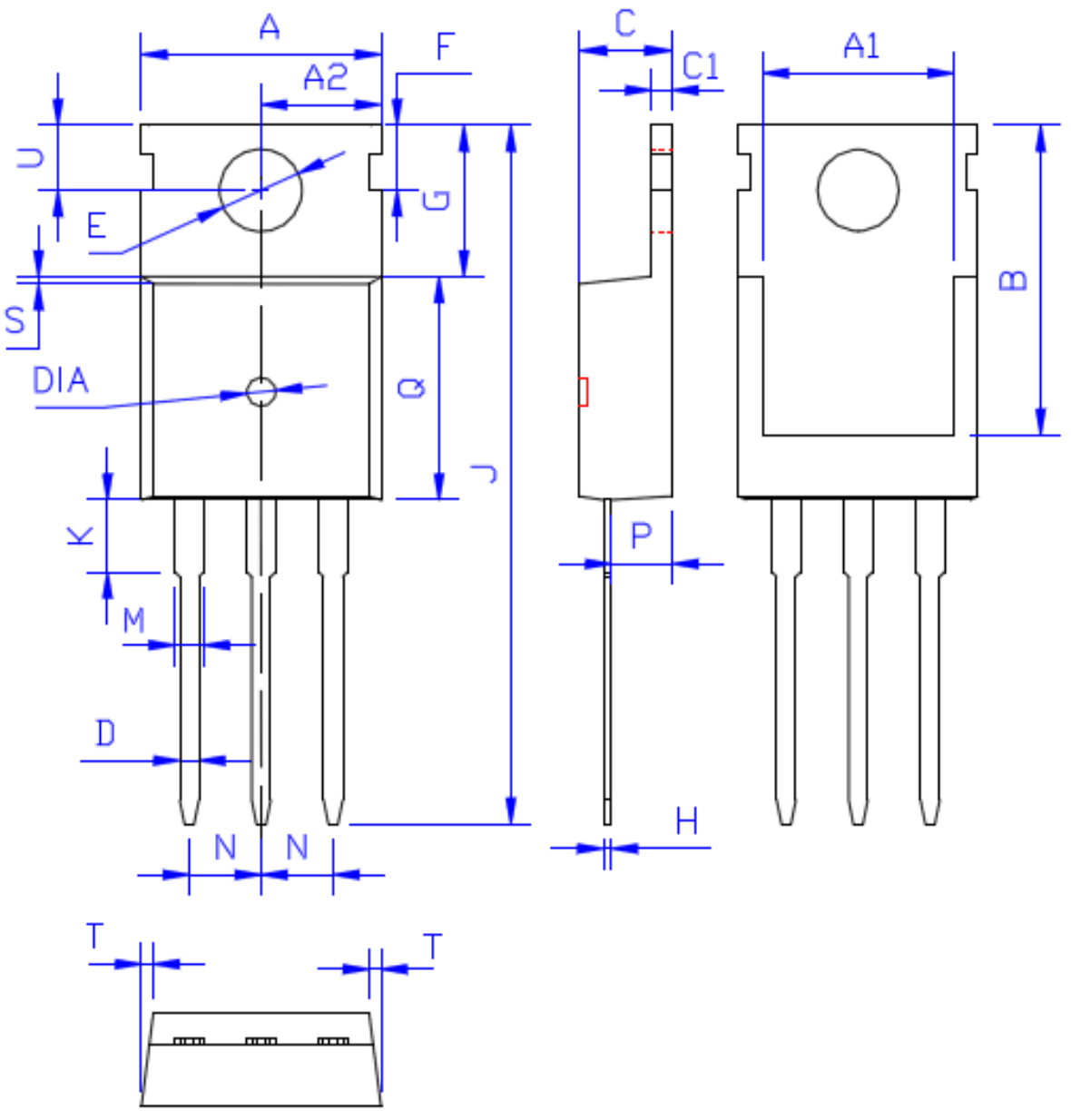
外形尺寸：

Package Dimension：

TO-220



DIM	MILLIMETERS
A	10.00±0.30
A1	8.00±0.30
A2	5.00±0.30
B	13.20±0.40
C	4.50±0.20
C1	1.30±0.20
D	0.80±0.20
E	3.60±0.20
F	3.00±0.30
G	6.60±0.40
H	0.50±0.20
J	28.88±0.50
K	3.00±0.30
M	1.30±0.30
N	Typical 2.54
P	2.40±0.40
Q	9.20±0.40
S	0.25±0.15
T	0.25±0.15
U	2.80±0.30
DIA	宽 1.50±0.10 深 0.50 MAX

（Unit：mm）