



# Negative Three Terminal Voltage Regulators

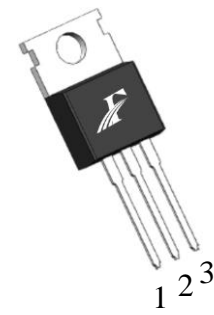
## 负三端稳压管

### FHP79XXA

#### 产品特性 Features

输出电压 <b>Output Voltage</b>	稳压管 Regulators
<b>-5V</b>	<b>FHP7905A</b>
<b>-12V</b>	<b>FHP7912A</b>
<b>-15V</b>	<b>FHP7915A</b>
最大输出电流 <b>Max Output Current</b>	<b>1.5A</b>
过载保护 <b>Internal thermal overload protection</b>	
短路电流限制 <b>Internal short-current limiting</b>	
输出端最大安全工作区域 <b>Output transistor safe-area compensation</b>	
输出电压精度在 4%以内 <b>Output voltage offered in 4% tolerance</b>	

#### 封装形式 Package



1:GND 2:Input 3:Output

#### 功能图 Functional diagram

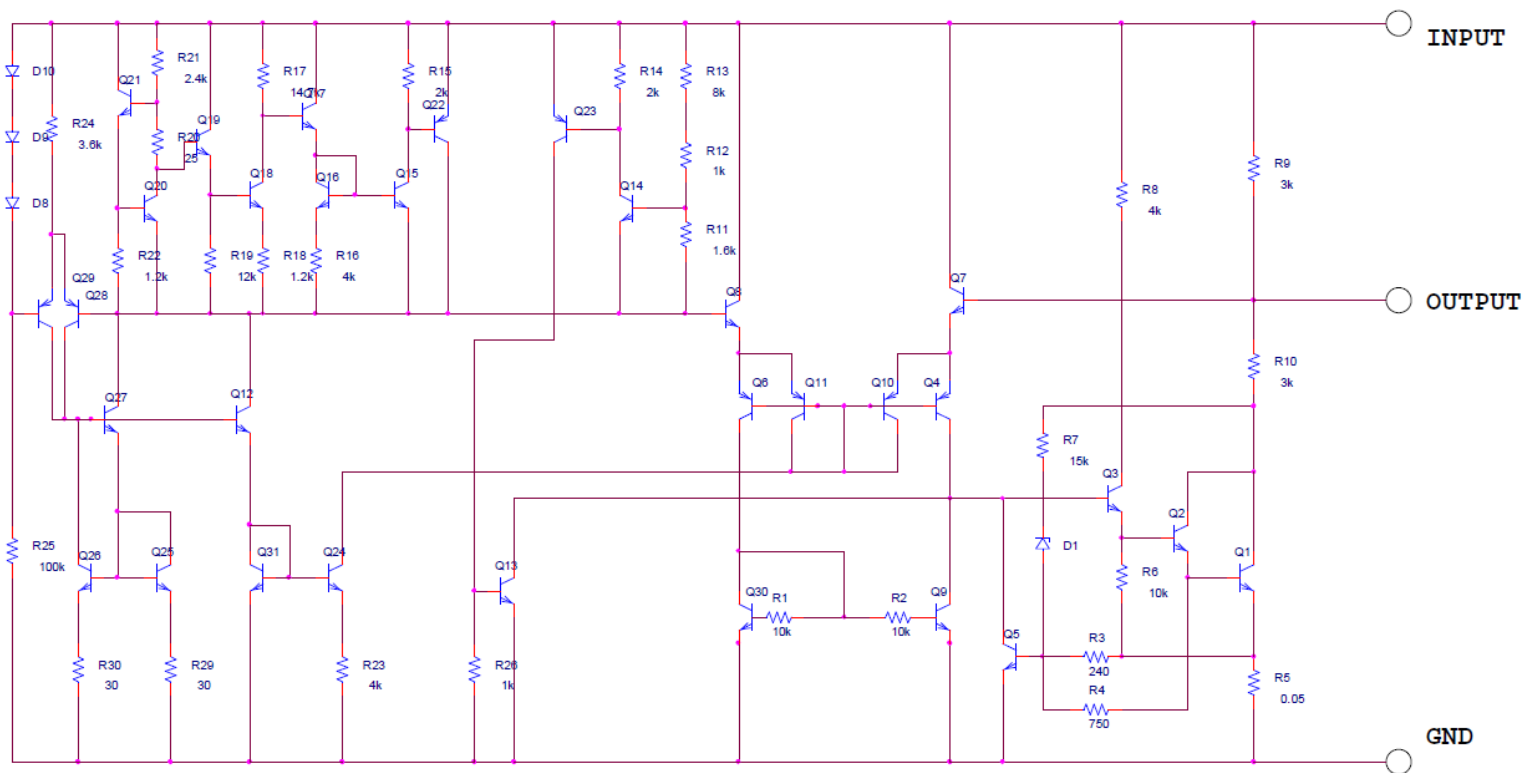
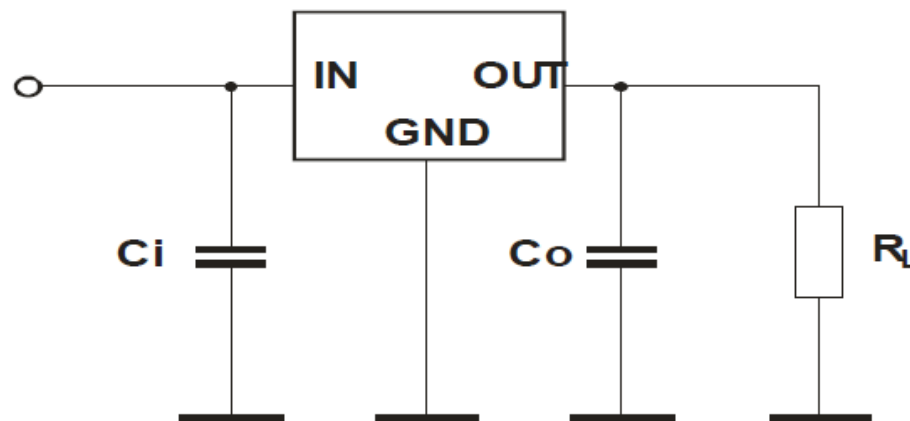


Fig.1

#### 典型应用电路 Typical application circuit



$C_i = 0.33\mu\text{F}$ ,  $C_o = 0.1\mu\text{F}$

Fig.2

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

Parameter	Symbol	Limit		Unit
输入电压 Input Voltage	V <sub>in</sub>	for -5V to -12V -15V	-35 -40	V
功率损耗 Power Dissipation	P <sub>D</sub>	Internal Limited		W
结温 Junction Temperature	T <sub>j</sub>	+125		°C
存储温度 Storage Temperature Range	T <sub>STG</sub>	-65~+150		°C
结-壳的热阻 Thermal Resistance -Junction to Case	R <sub>θJC</sub>	5		°C/W
结-环境的热阻 Thermal Resistance -Junction to Ambient	R <sub>θJA</sub>	60		°C/W

## FHP7905A电参数特性 Electrical Characteristics

(V<sub>in</sub> = -10V, I<sub>out</sub> = 500mA, 0°C ≤ T<sub>j</sub> ≤ 125°C, C<sub>in</sub> = 0.33μF, C<sub>out</sub> = 0.1μF; unless otherwise specified.)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
输出电压 Output voltage	V <sub>out</sub>	T <sub>j</sub> = 25°C -7.0V ≤ V <sub>in</sub> ≤ -20V, 5mA ≤ I <sub>out</sub> ≤ 1A, PD ≤ 15W	-4.80 -4.75	-5 -5	-5.20 -5.25	V
线性调节 Line Regulation	REG <sub>line</sub>	T <sub>j</sub> = 25°C	--	8	100	mV
		-7.0V ≤ V <sub>in</sub> ≤ -25V -8V ≤ V <sub>in</sub> ≤ -12V	--	2	50	
负载调节 Load Regulation	REG <sub>load</sub>	T <sub>j</sub> = 25°C	--	35	100	mV
		5mA ≤ I <sub>out</sub> ≤ 1.5A 250mA ≤ I <sub>out</sub> ≤ 750mA	--	10	50	
静态电流 Quiescent Current	I <sub>q</sub>	I <sub>out</sub> = 0, T <sub>j</sub> = 25°C	--	3.2	8	mA
静态电流变化 Quiescent Current Change	ΔI <sub>q</sub>	-7.0V ≤ V <sub>in</sub> ≤ -25V 5mA ≤ I <sub>out</sub> ≤ 1A	--	--	1.3 0.5	
输出电压纹波 Output Noise Voltage	V <sub>n</sub>	10Hz ≤ f ≤ 100KHz, T <sub>j</sub> = 25°C	--	40	--	μV
浪涌衰减 Ripple Rejection Ratio	RR	f = 120Hz, ΔV <sub>i</sub> = 10V	62	74	--	dB
衰减电压 Voltage Drop	V <sub>drop</sub>	I <sub>out</sub> = 1A, T <sub>j</sub> = 25°C	--	2	--	V
短路电流 Output Short Circuit Current	I <sub>os</sub>	T <sub>j</sub> = 25°C	--	200	--	mA
峰值电流 Peak Output Current	I <sub>o peak</sub>	T <sub>j</sub> = 25°C	--	2.2	--	A
输出电压特性 Temperature Coefficient of Output Voltage	ΔV <sub>out</sub> / ΔT <sub>j</sub>	I <sub>out</sub> = 5mA, 0°C ≤ T <sub>j</sub> ≤ 125°C	--	-0.2	--	mV / °C

## FHP7912A电参数特性 Electrical Characteristics

( $V_{in} = -19V$ ,  $I_{out} = 500mA$ ,  $0^{\circ}C \leq T_j \leq 125^{\circ}C$ ,  $C_{in} = 0.33\mu F$ ,  $C_{out} = 0.1\mu F$ ; unless otherwise specified.)

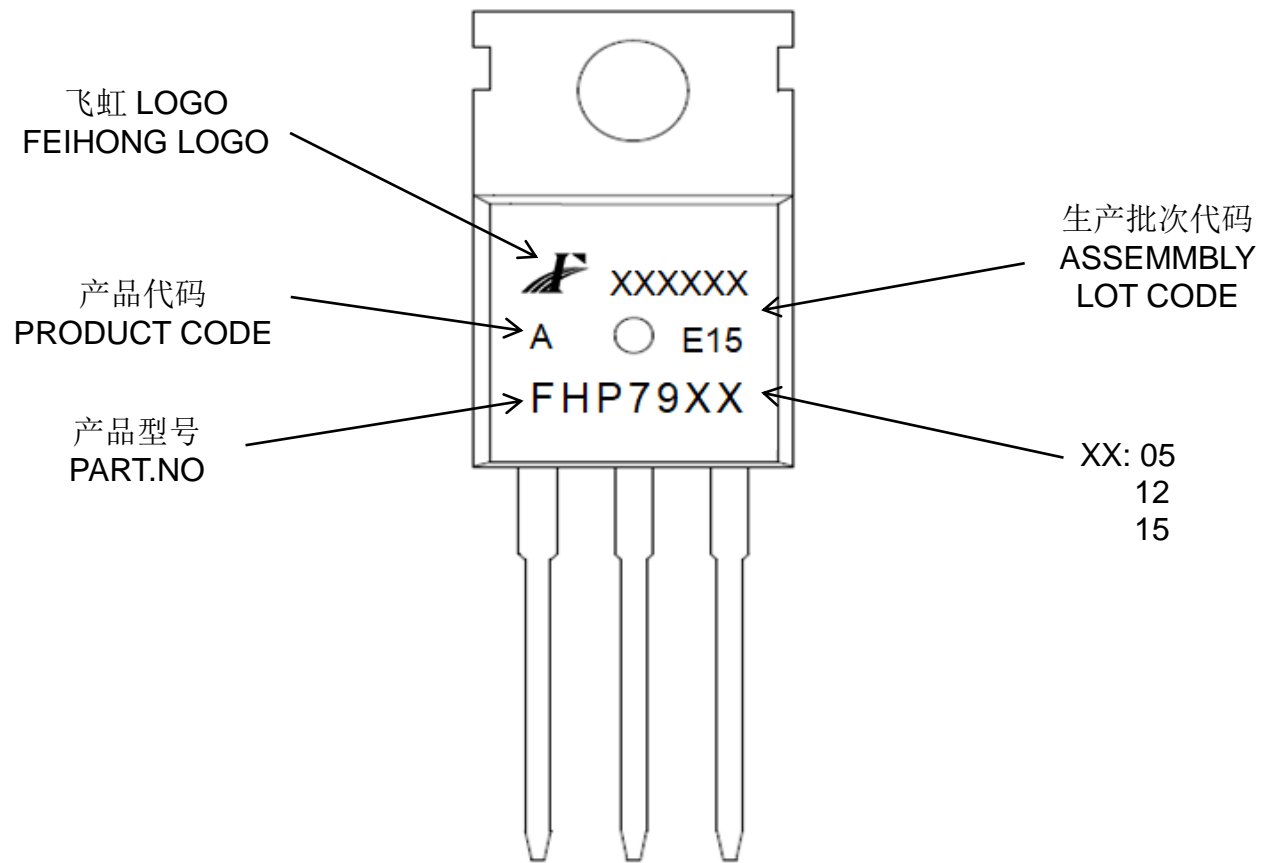
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit	
输出电压 Output voltage	Vout	$T_j = 25^{\circ}C$	-11.5	-12	-12.5	V	
		$-15.5V \leq V_{in} \leq -27V$ , $5mA \leq I_{out} \leq 1A$ , $PD \leq 15W$	-11.4	-12	-12.6		
线性调节 Line Regulation	REGline	$T_j = 25^{\circ}C$	$-14.5V \leq V_{in} \leq -30V$	--	14	240	mV
			$-16V \leq V_{in} \leq -22V$	--	5	120	
负载调节 Load Regulation	REGload	$T_j = 25^{\circ}C$	$5mA \leq I_{out} \leq 1.5A$	--	40	240	mV
			$250mA \leq I_{out} \leq 750mA$	--	10	100	
静态电流 Quiescent Current	Iq	$I_{out} = 0$ , $T_j = 25^{\circ}C$	--	3.2	8	mA	
静态电流变化 Quiescent Current Change	$\Delta Iq$	$-14.5V \leq V_{in} \leq -30V$	--	--	1.3		
		$5mA \leq I_{out} \leq 1A$	--	--	0.5		
输出电压纹波 Output Noise Voltage	Vn	$10Hz \leq f \leq 100KHz$ , $T_j = 25^{\circ}C$	--	40	--	$\mu V$	
浪涌衰减 Ripple Rejection Ratio	RR	$f = 120Hz$ , $\Delta V_i = 10V$	62	74	--	dB	
衰减电压 Voltage Drop	Vdrop	$I_{out} = 1A$ , $T_j = 25^{\circ}C$	--	2	--	V	
短路电流 Output Short Circuit Current	Ios	$T_j = 25^{\circ}C$	--	200	--	mA	
峰值电流 Peak Output Current	I <sub>o peak</sub>	$T_j = 25^{\circ}C$	--	2.2	--	A	
输出电压特性 Temperature Coefficient of Output Voltage	$\Delta V_{out} / \Delta T_j$	$I_{out} = 5mA$ , $0^{\circ}C \leq T_j \leq 125^{\circ}C$	--	-0.2	--	mV/ $^{\circ}C$	

## FHP7915A电参数特性 Electrical Characteristics

( $V_{in} = -23V$ ,  $I_{out} = 500mA$ ,  $0^{\circ}C \leq T_j \leq 125^{\circ}C$ ,  $C_{in} = 0.33\mu F$ ,  $C_{out} = 0.1\mu F$ ; unless otherwise specified.)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit	
输出电压 Output voltage	Vout	$T_j = 25^{\circ}C$	-14.4	-15	-15.6	V	
		$-18V \leq V_{in} \leq -30V$ , $5mA \leq I_{out} \leq 1A$ , $PD \leq 15W$	-14.25	-15	-15.75		
线性调节 Line Regulation	REGline	$T_j = 25^{\circ}C$	$-17.5V \leq V_{in} \leq -30V$	--	15	300	mV
			$-20V \leq V_{in} \leq -26V$	--	5	150	
负载调节 Load Regulation	REGload	$T_j = 25^{\circ}C$	$5mA \leq I_{out} \leq 1.5A$	--	50	300	mV
			$250mA \leq I_{out} \leq 750mA$	--	10	150	
静态电流 Quiescent Current	Iq	$I_{out} = 0$ , $T_j = 25^{\circ}C$	--	3.2	8	mA	
静态电流变化 Quiescent Current Change	$\Delta Iq$	$-7.0V \leq V_{in} \leq -25V$	--	--	1.3		
		$5mA \leq I_{out} \leq 1A$	--	--	0.5		
输出电压纹波 Output Noise Voltage	Vn	$10Hz \leq f \leq 100KHz$ , $T_j = 25^{\circ}C$	--	40	--	$\mu V$	
浪涌衰减 Ripple Rejection Ratio	RR	$f = 120Hz$ , $\Delta V_i = 10V$	62	74	--	dB	
衰减电压 Voltage Drop	Vdrop	$I_{out} = 1A$ , $T_j = 25^{\circ}C$	--	2	--	V	
短路电流 Output Short Circuit Current	Ios	$T_j = 25^{\circ}C$	--	200	--	mA	
峰值电流 Peak Output Current	I <sub>o peak</sub>	$T_j = 25^{\circ}C$	--	2.2	--	A	
输出电压特性 Temperature Coefficient of Output Voltage	$\Delta V_{out} / \Delta T_j$	$I_{out} = 5mA$ , $0^{\circ}C \leq T_j \leq 125^{\circ}C$	--	-0.2	--	mV/ $^{\circ}C$	

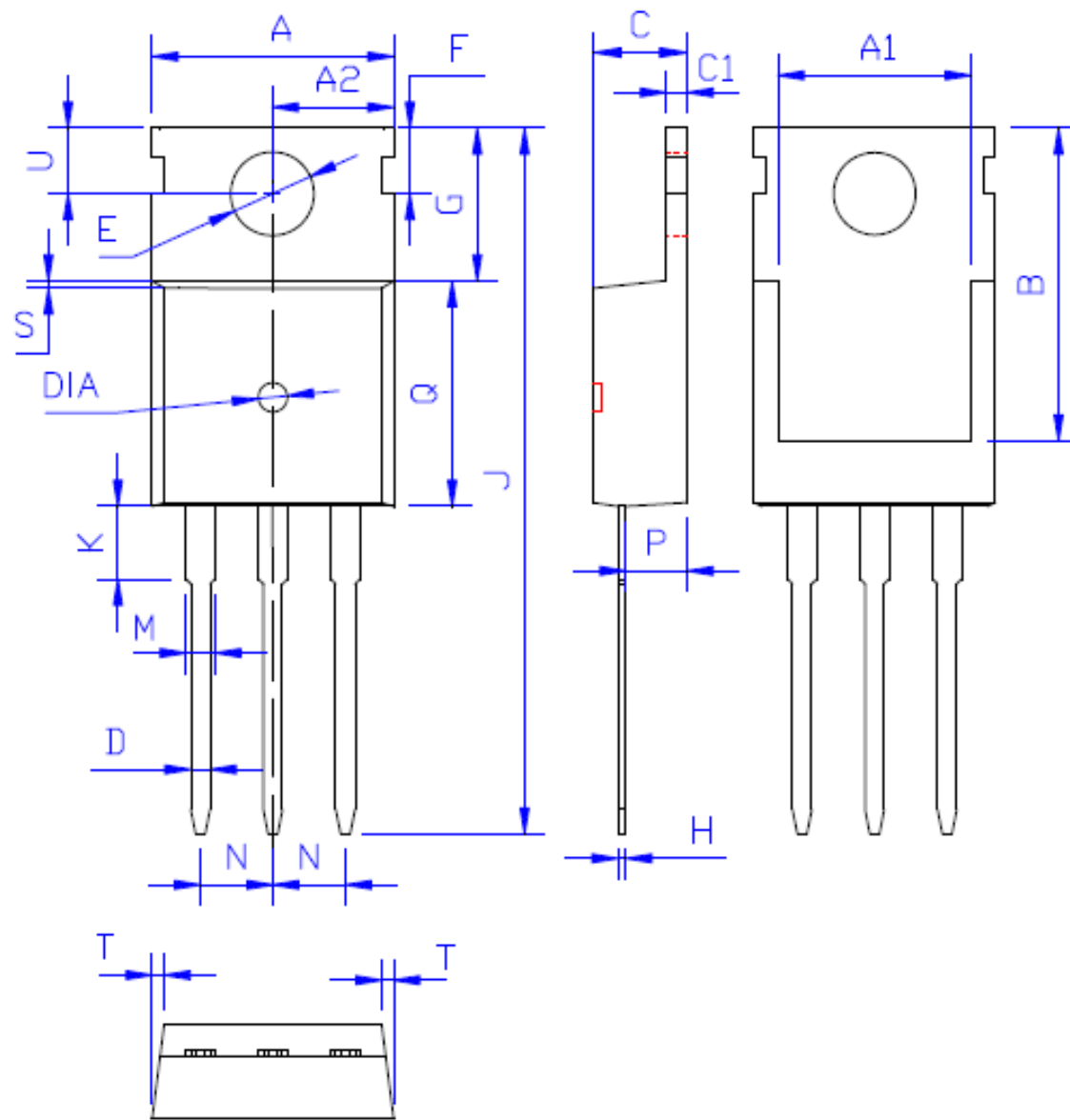
印记 Marking:



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)