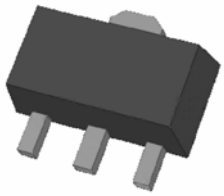
集成電路
IC

# THREE TERMINAL POSITIVE VOLTAGE REGULATORS　三端穩壓器　FH78LXX

| DESCRIPTION & FEATURES　概述及特點 | |
|---|---|
| The FH78LXX series of three terminal positive regulators is available with several fixed output voltages making them useful in a wide range of applications. FH78LXX can use as a zener diode/resistor combination replacement, and lower quiescent current. These devices suitable for a multitude of applications that require a regulated supply of up to 100 mA.The voltages available allow the FH78LXX to be used in logic systems, instrumentation, HiFi, and other solid state electronic equipment. circuit takes over preventing the IC from overheating. | FH78LXX 系列三端穩壓器有效利用幾個固定電壓得到較寬的應用範圍，可替代混合的齊納二極體和電阻時，而且更低的靜態電流。適合 100mA 的各種穩壓要求。FH78LXX 這些電壓可以用在邏輯系統，檢測儀器，HIFI，和其他點子設備。可以替代過熱保護 IC。 |
| Package SOT-89<br>Output voltage tolerances of ±5% over the temperature range<br>Output current of 100mA<br>Internal thermal overload protection<br>Output voltages of 5.0V, 6.0V, 8.0V, 9.0V, 12V, 15V，18V | 封裝：SOT-89<br>輸出電壓精度±5%<br><br>輸出電流 100mA<br>內置過流保護功能<br>輸出電壓5.0V, 6.0V, 8.0V, 9.0V, 12V, 15V，18V |

## Pin Configuration 管腳配置



1.Vout 2.Gnd 3.Vin

## Type Name 型號命名

**FH78L XX - T**

Type 產品型號

Voltage 電壓

| XX | 05/06/08。。。 |
|---|---|

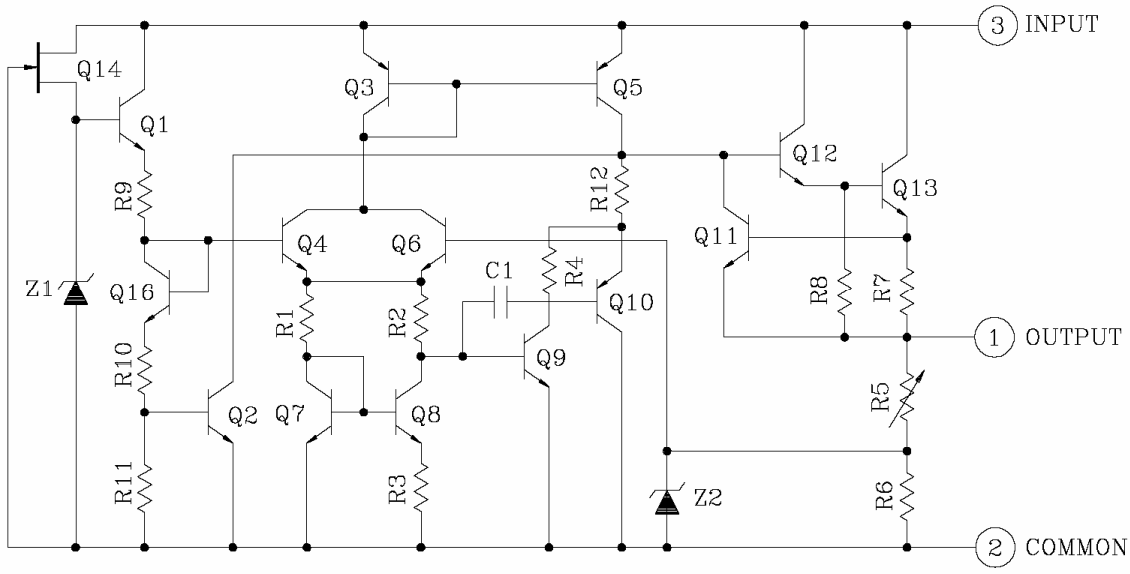
Packing Type 包裝形式 T： Tape 編帶
B： Bulk 散裝

Package 封裝形式 R： SOT-89

| TYPE No. | MARKING | TYPE No. | MARKING | TYPE No. | MARKING |
|---|---|---|---|---|---|
| FH78L05 | 8A | FH78L09 | 8E | FH78L15 | 8I |
| FH78L06 | 8B | FH78L10 | 8F | FH78L18 | 8J |
| FH78L07 | 8C | FH78L12 | 8G | FH78L20 | 8K |
| FH78L08 | 8D | FH78L13 | 8H | FH78L24 | 8L |

## THREE TERMINAL POSITIVE VOLTAGE REGULATORS 三端穩壓器 FH78LXX

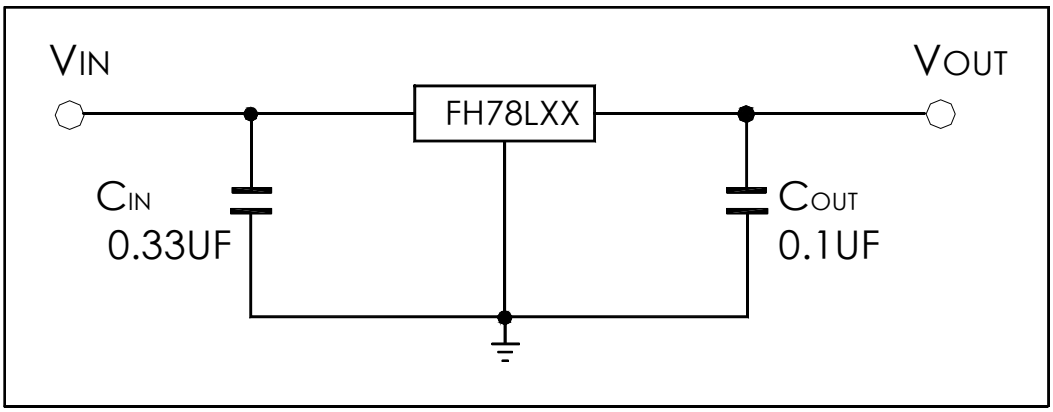
### BLOCK DIAGRAM 功能框圖




| ABSOLUTE MAXIMUM RATINGS ($T_a$=25℃) 最大額定值 (Note ) | | | | |
|---|---|---|---|---|
| Characteristic 特性參數 | Symbol 符號 | Rating 額定值 | | Unit 單位 |
| | | Min 最小 | Max 最大 | |
| Power dissipation | $P_D$ | | 0.5 | W |
| Input Voltage（5~15V）<br>（18~24V） | $V_{IN}$ | | 35<br>40 | V |
| Operating Temperature Range 工作溫度範圍 | Topt | -0 | 125 | °C |
| Storage Temperature Range 儲存溫度範圍 | Tstg | -55 | 150 | °C |

Note：Absolute maximum ratings are threshold limit values that must not e exceeded ever for an instant under any conditions. Moreover, such values for any two items must not be reached simultaneously. Operation above these absolute maximum ratings may cause degradation or permanent damage to the device. These are stress ratings only and do not necessarily imply functional operation below these limits.
注意：絕對最大值是一個極限值,在任何情況下即使極短的時間亦不能被超過。而且，任何兩項的絕對值都不能同時達到極限.任何超越最大值操作,將會引起器件永久損壞。這僅僅是重要的範圍值,但並不意味著所有的功能操作必須在此極限值下去做。

### Typical Applications 典型應用圖例



## THREE TERMINAL POSITIVE VOLTAGE REGULATORS 三端穩壓器 FH78LXX

### ELECTRICAL CHARACTERISTICS

**FH78L05**

Unless otherwise specified, Vin=10V, Iout=40mA, $C_{in}$=0.33uF, $C_{out}$=0.1uF, $T_j$=0℃to125℃

| CHARACTERISTIC | SYMBOL | TEST CONDITION | | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|---|
| Output Voltage | Vout | Tj=25℃ | | 4.75 | 5.0 | 5.25 | V |
| Input Regulation | Reg line | Tj=25℃ | 7.0V ≤Vin≤ 20V | - | 55 | 150 | mV |
| | | | 8.0V ≤Vin≤20V | - | 45 | 100 | |
| Load Regulation | Reg load | Tj=25℃ | 1.0mA≤Iout≤ 100mA | - | 11 | 60 | mV |
| | | | 1.0mA≤Iout≤ 40mA | - | 5.0 | 30 | |
| Output Voltage | $V_{out}$ | 7.0V≤Vin≤20V 1.0mA≤Iout≤40mA | | 4.65 | - | 5.3 | V |
| | | Vin=10V, 1.0mA≤Iout≤70mA | | 4.65 | - | 5.3 | |
| Quiescent Current | IQ | Tj=25℃ | | - | 3.1 | 6.0 | mA |
| | | Tj=125℃ | | - | - | 5.5 | |
| Quiescent Current Change | △IQ | 8.0V≤Vin≤20V | | - | - | 1.5 | mA |
| | | 1.0mA ≤Iout≤40mA | | - | - | 0.1 | |
| Output Noise Voltage | $V_{NO}$ | Ta=25℃, 10Hz ≤f≤100kHz | | - | 40 | - | $uV_{rms}$ |
| Long Term Stability | △Vout/△t | | | - | 12 | - | mV/1.0kHrs |
| Ripple Rejection Ratio | RR | f=120Hz,8.0V≤Vin≤18V, Tj=25℃ | | 41 | 49 | - | dB |
| Dropout Voltage | \|Vin-Vout\| | Tj=25℃ | | | 1.7 | | V |
| Average Temperature Coefficient of Output Voltage | TCvo | Iout=5mA | | - | -0.6 | - | mV/℃ |

## THREE TERMINAL POSITIVE VOLTAGE REGULATORS 三端穩壓器 FH78LXX

### ELECTRICAL CHARACTERISTICS

### FH78L06

Unless otherwise specified ,Vin=11V, Iout=40mA, Cin=0.33uF, Cout=0.1uF , Tj=0℃to125℃

| CHARACTERISTIC | SYMBOL | TEST CONDITION | | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|---|
| Output Voltage | Vout | Tj=25℃ | | 5.7 | 6.0 | 6.3 | V |
| Input Regulation | Reg line | Tj=25℃ | 8.1V≤Vin ≤21V | - | 50 | 150 | mV |
| | | | 9.0V≤Vin≤21V, | - | 45 | 110 | |
| Load Regulation | Reg load | Tj=25℃ | 1.0mA≤Iout≤ 100mA | - | 12 | 70 | mV |
| | | | 1.0mA≤Iout≤ 40mA | - | 5.5 | 35 | |
| Output Voltage | Vout | 8.1V≤Vin ≤21V 1.0mA≤Iout≤40mA | | 5.58 | - | 6.42 | V |
| | | Vin=11V, 1.0mA≤Iout≤70mA | | 5.58 | - | 6.42 | |
| Quiescent Current | IQ | Tj=25℃ | | - | 3.1 | 6.0 | mA |
| | | Tj=125℃ | | - | - | 5.5 | |
| Quiescent Current Change | △IQ | 9.0V≤Vin≤19V, | | - | - | 1.5 | mA |
| | | 1.0mA≤Iout≤40mA | | - | - | 0.1 | |
| Output Noise Voltage | $V_{NO}$ | Ta=25℃, 10Hz ≤f≤100kHz | | - | 40 | - | uVrms |
| Long Term Stability | △Vout/△t | | | - | 14 | - | mV/1.0kHrs |
| Ripple Rejection Ratio | RR | F=120Hz, 9.0V≤Vin≤19V, Tj=25℃ | | 39 | 47 | - | dB |
| Dropout Voltage | \|Vin-Vout\| | Tj=25℃ | | | 1.7 | | V |
| Average Temperature Coefficient of Output Voltage | TCvo | Iout=5mA | | - | -0.7 | - | mV/℃ |

## THREE TERMINAL POSITIVE VOLTAGE REGULATORS 三端穩壓器 FH78LXX

### ELECTRICAL CHARACTERISTICS

### FH78L07

Unless otherwise specified ,Vin=12V, Iout=40mA, Cin=0.33uF, Cout=0.1uF , Tj=0℃to125℃

| CHARACTERISTIC | SYMBOL | TEST CONDITION | | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|---|
| Output Voltage | Vout | Tj=25℃ | | 6.72 | 7.0 | 7.28 | V |
| Input Regulation | Reg line | Tj=25℃ | 9.2V≤Vin≤22V, | - | 50 | 160 | mV |
| | | | 10V≤Vin≤22V, | - | 45 | 115 | |
| Load Regulation | Reg load | Tj=25℃ | 1.0mA≤Iout≤100mA | - | 13 | 75 | mV |
| | | | 1.0mA≤Iout≤40mA | - | 6.0 | 40 | |
| Output Voltage | Vout | 9.2V≤Vin≤22V, 1.0mA≤Iout≤40mA | | 6.65 | - | 7.35 | V |
| | | Vin=12V, 1.0mA≤Iout≤70mA | | 6.65 | - | 7.35 | |
| Quiescent Current | IQ | Tj=25℃ | | - | 3.1 | 6.5 | mA |
| | | Tj=125℃ | | - | - | 6.0 | |
| Quiescent Current Change | △IQ | 10V≤Vin≤22V, | | - | - | 1.5 | mA |
| | | 1.0mA≤Iout≤40mA | | - | - | 0.1 | |
| Output Noise Voltage | $V_{NO}$ | Ta=25℃, 10Hz ≤f≤100kHz | | - | 50 | - | uVrms |
| Long Term Stability | △Vout/△t | | | - | 17 | - | mV/1.0kHrs |
| Ripple Rejection Ratio | RR | F=120Hz, 10V≤Vin≤20V, Tj=25℃ | | 37 | 46 | - | dB |
| Dropout Voltage | \|Vin-Vout\| | Tj=25℃ | | | 1.7 | | V |
| Average Temperature Coefficient of Output Voltage | TCvo | Iout=5mA | | | -0.75 | - | mV/℃ |

## THREE TERMINAL POSITIVE VOLTAGE REGULATORS 三端穩壓器 FH78LXX

### ELECTRICAL CHARACTERISTICS

### FH78L08

Unless otherwise specified ,Vin=14V, Iout=40mA, Cin=0.33uF, Cout=0.1uF , Tj=0℃to125℃

| CHARACTERISTIC | SYMBOL | TEST CONDITION | | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|---|
| Output Voltage | Vout | Tj=25℃ | | 7.6 | 8.0 | 8.4 | V |
| Input Regulation | Reg line | Tj=25℃ | 10.5V≤Vin≤23V, | - | 20 | 175 | mV |
| | | | 11V≤Vin≤23V, | - | 12 | 125 | |
| Load Regulation | Reg load | Tj=25℃ | 1.0mA≤Iout≤100mA | - | 15 | 80 | mV |
| | | | 1.0mA≤Iout≤40mA | - | 7.0 | 40 | |
| Output Voltage | Vout | 10.5V≤Vin≤23V, 1.0mA≤Iout≤40mA | | 7.44 | - | 8.56 | V |
| | | Vin=14V, 1.0mA≤Iout≤70mA | | 7.44 | - | 8.56 | |
| Quiescent Current | IQ | Tj=25℃ | | - | 3.1 | 6.5 | mA |
| | | Tj=125℃ | | - | - | 6.0 | |
| Quiescent Current Change | △IQ | 11V≤Vin≤23V, | | - | - | 1.5 | mA |
| | | 1.0mA≤Iout≤40mA | | - | - | 0.1 | |
| Output Noise Voltage | $V_{NO}$ | Ta=25℃, 10Hz ≤f≤100kHz | | - | 60 | - | uVrms |
| Long Term Stability | △Vout/△t | | | - | 20 | - | mV/1.0kHrs |
| Ripple Rejection Ratio | RR | F=120Hz, 12V≤Vin≤23V, Tj=25℃ | | 37 | 45 | - | dB |
| Dropout Voltage | \|Vin-Vout\| | Tj=25℃ | | | 1.7 | | V |
| Average Temperature Coefficient of Output Voltage | TCvo | Iout=5mA | | - | -0.8 | - | mV/℃ |

## THREE TERMINAL POSITIVE VOLTAGE REGULATORS 三端穩壓器 FH78LXX

### ELECTRICAL CHARACTERISTICS

### FH78L09

Unless otherwise specified ,Vin=15V, Iout=40mA, Cin=0.33uF, Cout=0.1uF , Tj=0℃to125℃

| CHARACTERISTIC | SYMBOL | TEST CONDITION | | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|---|
| Output Voltage | Vout | Tj=25℃ | | 8.55 | 9.0 | 9.45 | V |
| Input Regulation | Reg line | Tj=25℃ | 11.4V≤Vin≤24V, | - | 80 | 200 | mV |
| | | | 12V≤Vin≤24V, | - | 20 | 160 | |
| Load Regulation | Reg load | Tj=25℃ | 1.0mA≤Iout≤100mA | - | 17 | 90 | mV |
| | | | 1.0mA≤Iout≤40mA | - | 8.0 | 45 | |
| Output Voltage | Vout | 11.4V≤Vin≤24V, 1.0mA≤Iout≤40mA | | 8.37 | - | 9.63 | V |
| | | Vin=15V, 1.0mA≤Iout≤70mA | | 8.37 | - | 9.63 | |
| Quiescent Current | IQ | Tj=25℃ | | - | 3.2 | 6.5 | mA |
| | | Tj=125℃ | | - | - | 6.0 | |
| Quiescent Current Change | △IQ | 12V≤Vin≤24V, | | - | - | 1.5 | mA |
| | | 1.0mA≤Iout≤40mA | | - | - | 0.1 | |
| Output Noise Voltage | $V_{NO}$ | Ta=25℃, 10Hz ≤f≤100kHz | | - | 65 | - | uVrms |
| Long Term Stability | △Vout/△t | | | - | 21 | - | mV/1.0kHrs |
| Ripple Rejection Ratio | RR | F=120Hz, 12V≤Vin≤24V, Tj=25℃ | | 36 | 44 | - | dB |
| Dropout Voltage | \|Vin-Vout\| | Tj=25℃ | | | 1.7 | | V |
| Average Temperature Coefficient of Output Voltage | TCvo | Iout=5mA | | | 0.85 | - | mV/℃ |

## THREE TERMINAL POSITIVE VOLTAGE REGULATORS 三端穩壓器 FH78LXX

### ELECTRICAL CHARACTERISTICS

### FH78L10

Unless otherwise specified ,Vin=16V, Iout=40mA, Cin=0.33uF, Cout=0.1uF , Tj=0℃to125℃

| CHARACTERISTIC | SYMBOL | TEST CONDITION | | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|---|
| Output Voltage | Vout | Tj=25℃ | | 9.5 | 10 | 10.5 | V |
| Input Regulation | Reg line | Tj=25℃ | 12.5V≤Vin≤25V, | - | 80 | 230 | mV |
| | | | 13V≤Vin≤25V, | - | 30 | 170 | |
| Load Regulation | Reg load | Tj=25℃ | 1.0mA≤Iout≤ 100mA | - | 18 | 90 | mV |
| | | | 1.0mA≤Iout≤ 40mA | - | 8.5 | 45 | |
| Output Voltage | Vout | 12.5V≤Vin≤25V, 1.0mA≤Iout ≤40mA | | 9.3 | - | 10.7 | V |
| | | Vin=16V, 1.0mA≤Iout≤70mA | | 9.3 | - | 10.7 | |
| Quiescent Current | IQ | Tj=25℃ | | - | 3.2 | 6.5 | mA |
| | | Tj=125℃ | | - | - | 6.0 | |
| Quiescent Current Change | △IQ | 13V≤Vin≤25V, | | - | - | 1.5 | mA |
| | | 1.0mA≤Iout≤40mA | | - | - | 0.1 | |
| Output Noise Voltage | $V_{NO}$ | Ta=25℃, 10Hz ≤f≤100kHz | | - | 70 | - | uVrms |
| Long Term Stability | △Vout/△t | | | - | 22 | - | mV/1.0kHrs |
| Ripple Rejection Ratio | RR | F=120Hz, 13V≤Vin≤24V, Tj=25℃ | | 37 | 43 | - | dB |
| Dropout Voltage | \|Vin-Vout\| | Tj=25℃ | | | 1.7 | | V |
| Average Temperature Coefficient of Output Voltage | TCvo | Iout=5mA | | - | -0.9 | - | mV/℃ |

## THREE TERMINAL POSITIVE VOLTAGE REGULATORS 三端穩壓器 FH78LXX

### ELECTRICAL CHARACTERISTICS

### FH78L12

Unless otherwise specified ,Vin=19V, Iout=40mA, Cin=0.33uF, Cout=0.1uF , Tj=0℃to125℃

| CHARACTERISTIC | SYMBOL | TEST CONDITION | | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|---|
| Output Voltage | Vout | Tj=25℃ | | 11.4 | 12 | 12.6 | V |
| Input Regulation | Reg line | Tj=25℃ | 14.5V≤Vin≤27V, | - | 120 | 250 | mV |
| | | | 16V≤Vin≤27V, | - | 100 | 200 | |
| Load Regulation | Reg load | Tj=25℃ | 1.0mA≤Iout≤ 100mA | - | 20 | 100 | mV |
| | | | 1.0mA≤Iout≤ 40mA | - | 10 | 50 | |
| Output Voltage | Vout | 14.5V≤Vin≤27V 1.0mA≤Iout ≤40mA | | 11.16 | - | 12.84 | V |
| | | Vin=19V, 1.0mA≤Iout≤70mA | | 11.16 | - | 12.84 | |
| Quiescent Current | IQ | Tj=25℃ | | - | 3.2 | 6.5 | mA |
| | | Tj=125℃ | | - | - | 6.0 | |
| Quiescent Current Change | △IQ | 16V≤Vin≤27V, | | - | - | 1.5 | mA |
| | | 1.0mA≤Iout≤40mA | | - | - | 0.1 | |
| Output Noise Voltage | $V_{NO}$ | Ta=25℃, 10Hz ≤f≤100kHz | | - | 80 | - | uVrms |
| Long Term Stability | △Vout/△t | | | - | 24 | - | mV/1.0kHrs |
| Ripple Rejection Ratio | RR | F=120Hz, 15V≤Vin≤25V,, Tj=25℃ | | 36 | 41 | - | dB |
| Dropout Voltage | \|Vin-Vout\| | Tj=25℃ | | | 1.7 | | V |
| Average Temperature Coefficient of Output Voltage | TCvo | Iout=5mA | | - | -1.0 | - | mV/℃ |

## THREE TERMINAL POSITIVE VOLTAGE REGULATORS 三端穩壓器 FH78LXX

### ELECTRICAL CHARACTERISTICS

### FH78L15

Unless otherwise specified ,Vin=23V, Iout=40mA, Cin=0.33uF, Cout=0.1uF , Tj=0℃to125℃

| CHARACTERISTIC | SYMBOL | TEST CONDITION | | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|---|
| Output Voltage | Vout | Tj=25℃ | | 14.25 | 15 | 15.75 | V |
| Input Regulation | Reg line | Tj=25℃ | 17.5V≤Vin≤30V, | - | 130 | 300 | mV |
| | | | 20V≤Vin≤30V, | - | 110 | 250 | |
| Load Regulation | Reg load | Tj=25℃ | 1.0mA≤Iout≤100mA | - | 25 | 150 | mV |
| | | | 1.0mA≤Iout≤40mA | - | 12 | 75 | |
| Output Voltage | Vout | 17.5V≤Vin≤30V, 1.0mA≤Iout≤40mA | | 13.95 | - | 16.05 | V |
| | | Vin=23V, 1.0mA≤Iout≤70mA | | 13.95 | - | 16.05 | |
| Quiescent Current | IQ | Tj=25℃ | | - | 3.3 | 6.5 | mA |
| | | Tj=125℃ | | - | - | 6.0 | |
| Quiescent Current Change | △IQ | 20V≤Vin≤30V, | | - | - | 1.5 | mA |
| | | 1.0mA≤Iout≤40mA | | - | - | 0.1 | |
| Output Noise Voltage | $V_{NO}$ | Ta=25℃, 10Hz ≤f≤100kHz | | - | 90 | - | uVrms |
| Long Term Stability | △Vout/△t | | | - | 30 | - | mV/1.0kHrs |
| Ripple Rejection Ratio | RR | F=120Hz, 18.5V≤Vin≤28.5V, Tj=25℃ | | 34 | 40 | - | dB |
| Dropout Voltage | \|Vin-Vout\| | Tj=25℃ | | | 1.7 | | V |
| Average Temperature Coefficient of Output Voltage | TCvo | Iout=5mA | | - | -1.3 | - | mV/℃ |

## THREE TERMINAL POSITIVE VOLTAGE REGULATORS 三端穩壓器 FH78LXX

### ELECTRICAL CHARACTERISTICS

### FH78L18

Unless otherwise specified ,Vin=27V, Iout=40mA, Cin=0.33uF, Cout=0.1uF , Tj=0℃to125℃

| CHARACTERISTIC | SYMBOL | TEST CONDITION | | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|---|
| Output Voltage | Vout | Tj=25℃ | | 17.1 | 18 | 18.9 | V |
| Input Regulation | Reg line | Tj=25℃ | 21.4V≤Vin≤33V, | - | 32 | 325 | mV |
| | | | 22V≤Vin≤33V, | - | 27 | 275 | |
| Load Regulation | Reg load | Tj=25℃ | 1.0mA≤Iout≤ 100mA | - | 30 | 170 | mV |
| | | | 1.0mA≤Iout≤ 40mA | - | 15 | 75 | |
| Output Voltage | Vout | 21.4V≤Vin≤33V, 1.0mA≤Iout≤40mA | | 16.74 | - | 19.26 | V |
| | | Vin=27V, 1.0mA≤Iout≤70mA | | 16.74 | - | 19.26 | |
| Quiescent Current | IQ | Tj=25℃ | | - | 3.3 | 6.5 | mA |
| | | Tj=125℃ | | - | - | 6.0 | |
| Quiescent Current Change | △IQ | 22V≤Vin≤33V, | | - | - | 1.5 | mA |
| | | 1.0mA≤Iout≤40mA | | - | - | 0.1 | |
| Output Noise Voltage | $V_{NO}$ | Ta=25℃, 10Hz ≤f≤100kHz | | - | 150 | - | uVrms |
| Long Term Stability | △Vout/△t | | | - | 45 | - | mV/1.0kHrs |
| Ripple Rejection Ratio | RR | F=120Hz, 23V≤Vin≤33V, Tj=25℃ | | 32 | 38 | - | dB |
| Dropout Voltage | \|Vin-Vout\| | Tj=25℃ | | | 1.7 | | V |
| Average Temperature Coefficient of Output Voltage | TCvo | Iout=5mA | | - | -1.5 | - | mV/℃ |

## THREE TERMINAL POSITIVE VOLTAGE REGULATORS 三端穩壓器 FH78LXX

### ELECTRICAL CHARACTERISTICS

### FH78L20

Unless otherwise specified ,Vin=29V, Iout=40mA, Cin=0.33uF, Cout=0.1uF , Tj=0℃to125℃

| CHARACTERISTIC | SYMBOL | TEST CONDITION | | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|---|
| Output Voltage | Vout | Tj=25℃ | | 19.0 | 20 | 21.0 | V |
| Input Regulation | Reg line | Tj=25℃ | 23.5V≤Vin≤35V, | - | 33 | 330 | mV |
| | | | 24V≤Vin≤35V, | - | 28 | 285 | |
| Load Regulation | Reg load | Tj=25℃ | 1.0mA≤Iout≤100mA | - | 33 | 180 | mV |
| | | | 1.0mA≤Iout≤40mA | - | 17 | 90 | |
| Output Voltage | Vout | 23.5V≤Vin≤35V, 1.0mA≤Iout≤40mA | | 18.6 | - | 21.4 | V |
| | | Vin=29V, 1.0mA≤Iout≤70mA | | 18.6 | - | 21.4 | |
| Quiescent Current | IQ | Tj=25℃ | | - | 3.3 | 6.5 | mA |
| | | Tj=125℃ | | - | - | 6.0 | |
| Quiescent Current Change | △IQ | 24V≤Vin≤35V, | | - | - | 1.5 | mA |
| | | 1.0mA≤Iout≤40mA | | - | - | 0.1 | |
| Output Noise Voltage | $V_{NO}$ | Ta=25℃, 10Hz ≤f≤100kHz | | - | 170 | - | uVrms |
| Long Term Stability | △Vout/△t | | | - | 49 | - | mV/1.0kHrs |
| Ripple Rejection Ratio | RR | F=120Hz, 25V≤Vin≤35V, Tj=25℃ | | 31 | 37 | - | dB |
| Dropout Voltage | \|Vin-Vout\| | Tj=25℃ | | | 1.7 | | V |
| Average Temperature Coefficient of Output Voltage | TCvo | Iout=5mA | | - | -1.7 | - | mV/℃ |

## THREE TERMINAL POSITIVE VOLTAGE REGULATORS 三端穩壓器 FH78LXX

### ELECTRICAL CHARACTERISTICS

### FH78L24

Unless otherwise specified ,Vin=33V, Iout=40mA, Cin=0.33uF, Cout=0.1uF , Tj=0℃to125℃

| CHARACTERISTIC | SYMBOL | TEST CONDITION | | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|---|
| Output Voltage | Vout | Tj=25℃ | | 22.8 | 24 | 25.2 | V |
| Input Regulation | Reg line | Tj=25℃ | 27.5V≤Vin≤38V, | - | 35 | 350 | mV |
| | | | 28V≤Vin≤38V, | - | 30 | 300 | |
| Load Regulation | Reg load | Tj=25℃ | 1.0mA≤Iout≤100mA | - | 40 | 200 | mV |
| | | | 1.0mA≤Iout≤40mA | - | 20 | 100 | |
| Output Voltage | Vout | 27.5V≤Vin≤38V, 1.0mA≤Iout≤40mA | | 22.32 | - | 25.68 | V |
| | | Vin=33V, 1.0mA≤Iout≤70mA | | 22.32 | - | 25.68 | |
| Quiescent Current | IQ | Tj=25℃ | | - | 3.5 | 6.5 | mA |
| | | Tj=125℃ | | - | - | 6.0 | |
| Quiescent Current Change | △IQ | 28V≤Vin≤38V, | | - | - | 1.5 | mA |
| | | 1.0mA≤Iout≤40mA | | - | - | 0.1 | |
| Output Noise Voltage | $V_{NO}$ | Ta=25℃, 10Hz ≤f≤100kHz | | - | 200 | - | uVrms |
| Long Term Stability | △Vout/△t | | | - | 56 | - | mV/1.0kHrs |
| Ripple Rejection Ratio | RR | F=120Hz, 29V≤Vin≤39V, Tj=25℃ | | 31 | 35 | - | dB |
| Dropout Voltage | \|Vin-Vout\| | Tj=25℃ | | | 1.7 | | V |
| Average Temperature Coefficient of Output Voltage | TCvo | Iout=5mA | | - | -2.0 | - | mV/℃ |