## General Description

HMCP1703T series are a set of Low Dropout Linear Regulator ICs implemented in CMOS technology. They can withstand voltage 18V. And they are available with lowvoltage drop and low quiescent current, widely used in audio, video and communication appliances.9V alkaline and one or two cell Li-Ion-powered, audio,video and communication appliances.

## Features

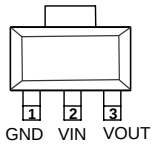
- Low Power Consumption
- Low Voltage Drop
- Low Temperature Coefficient
- Withstanding Voltage 18V
- Quiescent Current 1.8μA
- Output Voltage Accuracy: tolerance ±2%
- High output current: 300mA

## Application

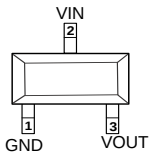
- Battery-powered Equipments
- Communication Equipments
- Audio/Video Equipments
- Smart Battery Packs
- Smoke Detectors
- CO2 DETECTORS

## Pin Configuration And Descriptions

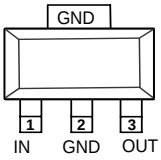
SOT-89




SOT-23




SOT-223




| No. | | Name | Functions Description |
|---|---|---|---|
| SOT-223 | SOT-23/ SOT-89 | | |
| 2 | 1 | GND | Ground |
| 1 | 2 | $V_{IN}$ | Input |
| 3 | 3 | $V_{OUT}$ | Output |

## Order Information

| Orderable Device | Package | Output Voltage | Packing Option |
|---|---|---|---|
| HMCP1703T-xx02E/CB | SOT-23 | 2.5V,2.8V,3.0V,3.3V,5.0V | 3000/Reel |
| HMCP1703T-xx02E/MB | SOT-89 | 2.5V,2.8V,3.0V,3.3V,5.0V | 1000/Reel |
| HMCP1703T-xx02E/DB | SOT-223 | 2.5V,2.8V,3.0V,3.3V,5.0V | 1000/Reel |

Note: xx is 25,28,30,33,50

## Absolute Maximum Ratings

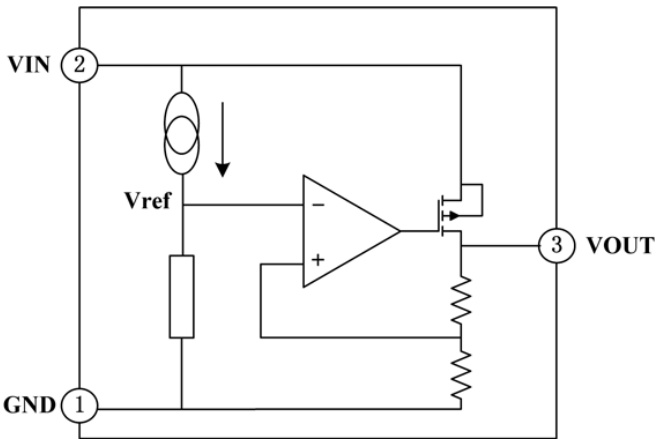
| Description | Symbol | Value Range | Unit |
|---|---|---|---|
| Limit Power Voltage | $V_{IN}$ | -0.3～+20 | V |
| Storage Temperature Range | $T_{STG}$ | -50～+125 | ℃ |
| Operating Free-air Temperature Range | $T_A$ | -40～+85 | ℃ |

Note:Stresses greater than those listed under "Absolute Maximum Ratingsmay" cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditionsis" not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

## Heat Dissipation

| Description | Symbol | Package | Value Range | Unit |
|---|---|---|---|---|
| Thermal resistance | $\theta_{JA}$ | SOT-89 | 200 | °C/W |
| | | SOT-223 | 150 | °C/W |
| | | SOT-23 | 500 | °C/W |
| Power dissipation | $P_W$ | SOT-89 | 500 | mW |
| | | SOT-223 | 600 | mW |
| | | SOT-23 | 200 | mW |

## Block Diagram



## DC Characteristics (unless otherwise noted $T_A$= 25°C)

($V_{IN}$= $V_{OUT}$+1.0V，$C_{IN=}C_L$=10uF，Ta=25°C, unless otherwise noted)

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Output Voltage | $V_{OUT}$ | $V_{IN}$=$V_{OUT}$+1.0V， $I_{OUT}$=10mA | 2.5 | | 5.0 | V |
| Output Current | $I_{OUT}$ | V $_{IN}$=$V_{OUT}$+1.0V | 300 | | | mA |
| Load Regulation | △ $V_{OUT}$ | $V_{IN}$=$V_{OUT}$+1.0V<br>1mA≤$I_{OUT}$≤300mA | | 37 | 100 | mV |
| Voltage Drop | $V_{DIF}$ | $I_{OUT}$=100mA，△$V_{OUT}$=2% | | 195 | 300 | mV |
| Quiescent Current | $I_{SS}$ | | | 1.8 | 3.0 | uA |
| Line Regulation | △ $V_{OUT}$/ $V_{OUT}$* △$V_{IN}$ | $V_{OUT}$+1.0V≤$V_{IN}$≤6V，<br>$I_{OUT}$=1mA | | | 0.2 | %/V |
| Input Voltage | $V_{IN}$ | | | | 18 | V |
| Temperature Coefficient | △ $V_{OUT}$/ △ $T_A$*$V_{OUT}$ | $V_{IN}$=$V_{OUT}$+1.0V，$I_{OUT}$=10mA，-40℃≤$T_A$≤85℃ | | ±100 | | ppm/℃ |
| Output Short Circuit Current | $I_{lim}$ | $V_{OUT}$=0V | | 400 | | mA |

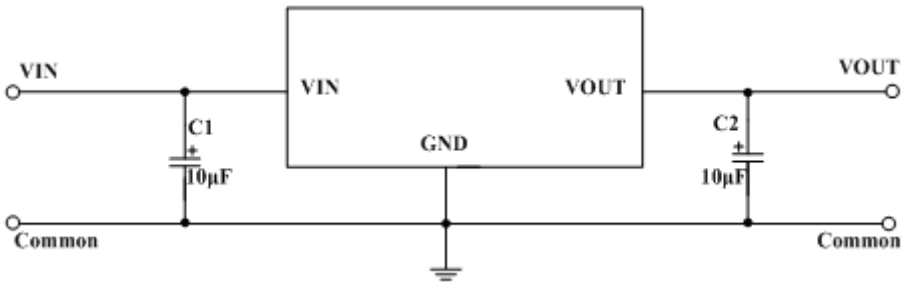
Note: When $V_{IN}$=$V_{OUT}$+1.0V,as the output voltage declined 2%,the $V_{DIF}$=$V_{IN}$-$V_{OUT}$.

## Function Description

HMCP1703T series are linear voltage regulator ICs withstanding 20V voltage. The series IC consists of a voltage reference, an error amplifier, a current limiter and a phase compensation circuit plus a driver transistor. The output stabilization capacitor is also compatible with low ESR ceramic capacitors.The over current protection circuit and the over voltage protection circuit are built-in. The protection circuit will operate wheb the output current or input voltage reaches limit level.

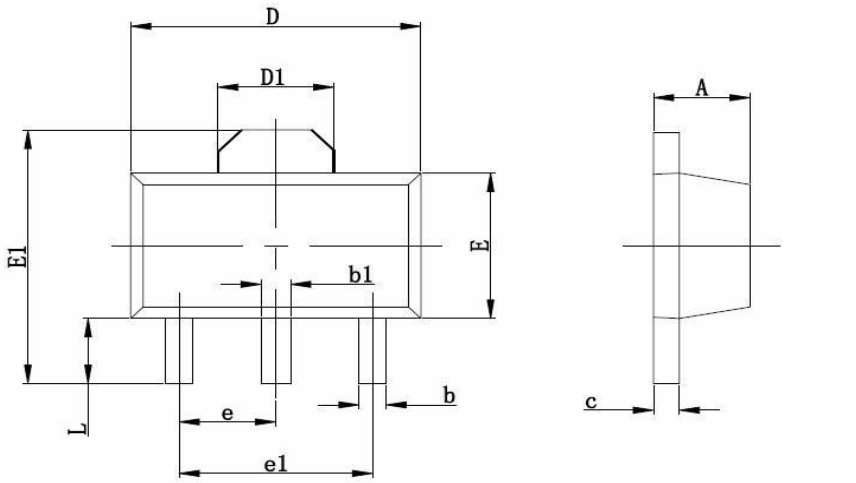
## Application Circuit

Basic Circuits



**Package Dimensions**

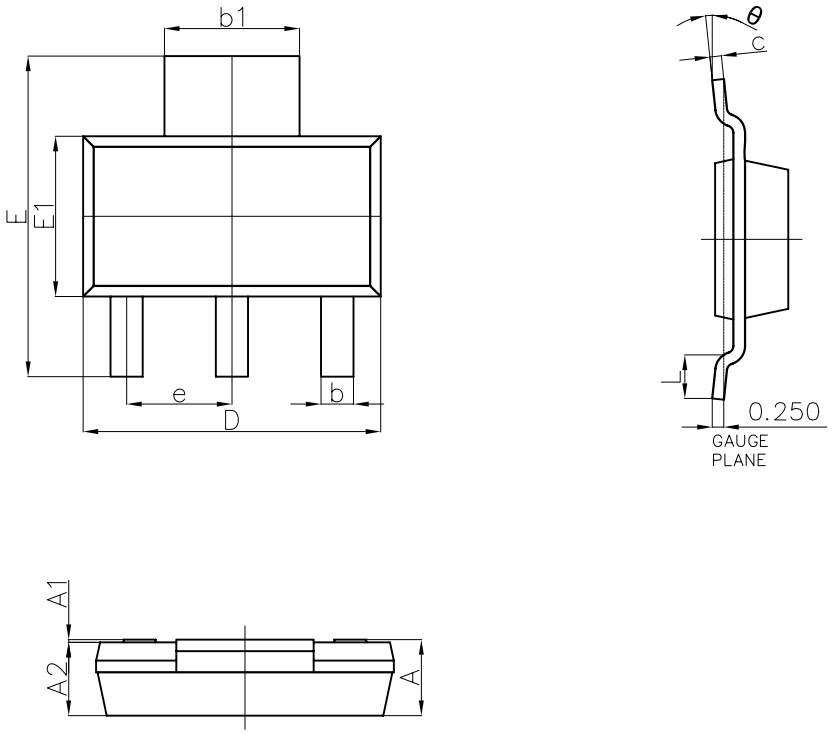
**SOT-89**




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 1.400 | 1.600 | 0.055 | 0.063 |
| b | 0.320 | 0.520 | 0.013 | 0.020 |
| b1 | 0.400 | 0.580 | 0.016 | 0.023 |
| c | 0.350 | 0.440 | 0.014 | 0.017 |
| D | 4.400 | 4.600 | 0.173 | 0.181 |
| D1 | 1.550 REF. | | 0.061 REF. | |
| E | 2.300 | 2.600 | 0.091 | 0.102 |
| E1 | 3.940 | 4.250 | 0.155 | 0.167 |
| e | 1.500 TYP. | | 0.060 TYP. | |
| e1 | 3.000 TYP. | | 0.118 TYP. | |
| L | 0.900 | 1.200 | 0.035 | 0.047 |

**Package Dimensions**

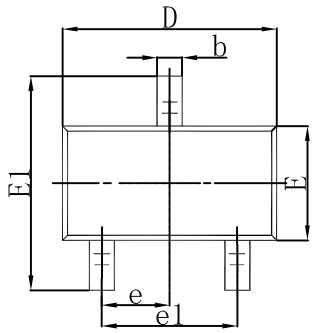
**SOT-223**

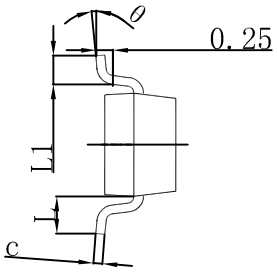


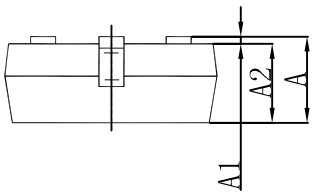

| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | —— | 1.800 | —— | 0.071 |
| A1 | 0.020 | 0.100 | 0.001 | 0.004 |
| A2 | 1.500 | 1.700 | 0.059 | 0.067 |
| b | 0.660 | 0.840 | 0.026 | 0.033 |
| b1 | 2.900 | 3.100 | 0.114 | 0.122 |
| c | 0.230 | 0.350 | 0.009 | 0.014 |
| D | 6.300 | 6.700 | 0.248 | 0.264 |
| E | 6.700 | 7.300 | 0.264 | 0.287 |
| E1 | 3.300 | 3.700 | 0.130 | 0.146 |
| e | 2.300(BSC) | | 0.091(BSC) | |
| L | 0.750 | —— | 0.030 | —— |
| θ | 0° | 10° | 0° | 10° |

## Package Dimensions

### SOT-23

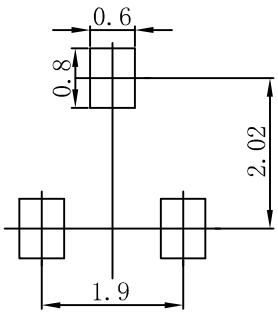



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 0.900 | 1.150 | 0.035 | 0.045 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.050 | 0.035 | 0.041 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| E | 1.200 | 1.400 | 0.047 | 0.055 |
| E1 | 2.250 | 2.550 | 0.089 | 0.100 |
| e | 0.950 TYP | | 0.037 TYP | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.550 REF | | 0.022 REF | |
| L1 | 0.300 | 0.500 | 0.012 | 0.020 |
| θ | 0° | 8° | 0° | 8° |

## Suggested Pad Layout




Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

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