

### Features

- Low power consumption
- Low voltage drop
- Low temperature coefficient
- Wide operating voltage (12V max.)
- 3-pin SOT89 and 5-pin SOT23 package

### Applications

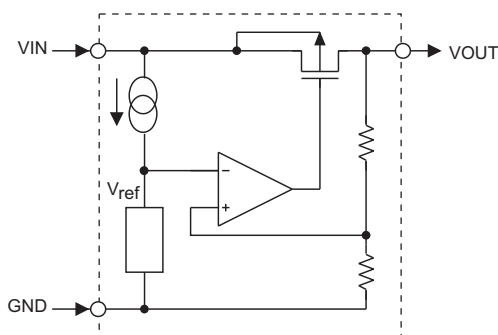
- Battery-powered equipment
- Communication equipment
- Audio/Video equipment

### General Description

The HT1015-1 is a three-terminal low power voltage regulator implemented in CMOS technology. It is available with a fixed output voltage at 1.5V. CMOS technology ensures low voltage drop and low quiescent current.

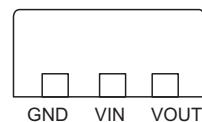
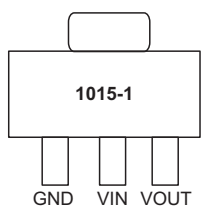
Although designed primarily as a fixed voltage regulator, this device can be used with external components to obtain variable voltages and currents.

### Block Diagram

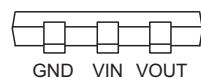
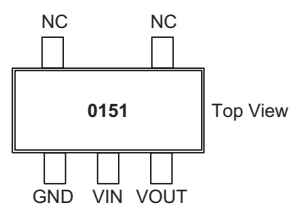


### Pin Assignment

SOT89



SOT23-5



**Absolute Maximum Ratings**

Supply Voltage .....	$V_{SS}-0.3V$ to $V_{SS}+13V$	Storage Temperature .....	$-50^{\circ}C$ to $125^{\circ}C$
Operating Temperature .....	$-40^{\circ}C$ to $85^{\circ}C$	Maximum Junction Temperature.....	$150^{\circ}C$

Note: These are stress ratings only. Stresses exceeding the range specified under "Absolute Maximum Ratings" may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

**Thermal Information**

Symbol	Parameter	Package	Max.	Unit
$\theta_{JA}$	Thermal Resistance (Junction to Ambient) (Assume no ambient airflow, no heat sink)	SOT23-5	500	$^{\circ}C/W$
		SOT89	200	$^{\circ}C/W$
$P_D$	Power Dissipation	SOT23-5	0.20	W
		SOT89	0.50	W

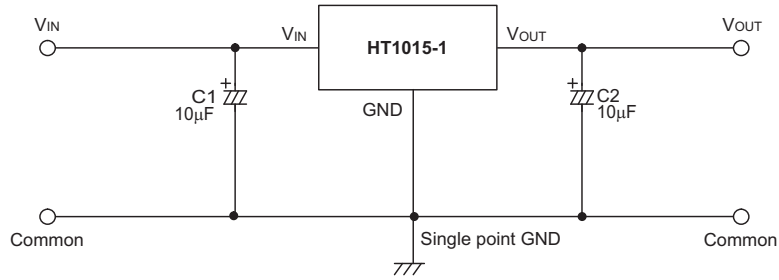
Note:  $P_D$  is measured at  $T_a = 25^{\circ}C$

**Electrical Characteristics**
 $T_a = 25^{\circ}C$ 

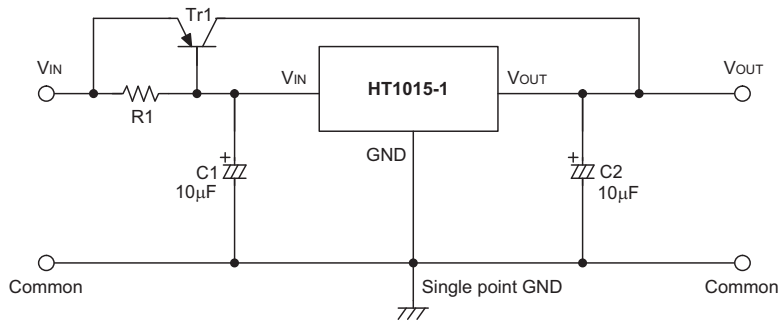
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		$V_{IN}$	Conditions				
$V_{OUT}$	Output Voltage Tolerance	3.5V	$I_{OUT} = 0.5mA$	1.455	1.5	1.545	V
$I_{OUT}$	Output Current	3.5V	—	7.0	18	—	mA
$\Delta V_{OUT}$	Load Regulation	3.5V	$1mA \leq I_{OUT} \leq 7mA$	—	15	—	mV
$V_{DIF}$	Voltage Drop	—	$I_{OUT} = 0.5mA$	—	250	—	mV
$I_{SS}$	Current Consumption	3.5V	No load	—	2.2	5.0	$\mu A$
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	—	$2.5V \leq V_{IN} \leq 12V$ $I_{OUT} = 0.5mA$	—	0.1	—	%/V
$V_{IN}$	Input Voltage	—	—	—	—	12	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	3.5V	$I_{OUT} = 0.5mA$ $-40^{\circ}C \sim 85^{\circ}C$	—	-0.75	—	mV/ $^{\circ}C$

**Application Circuits**

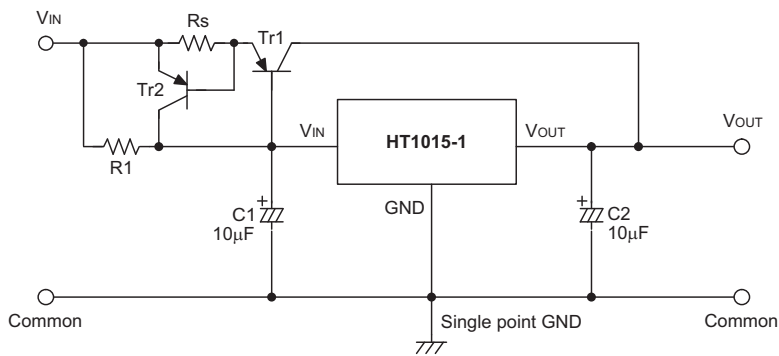
**Basic Circuit**



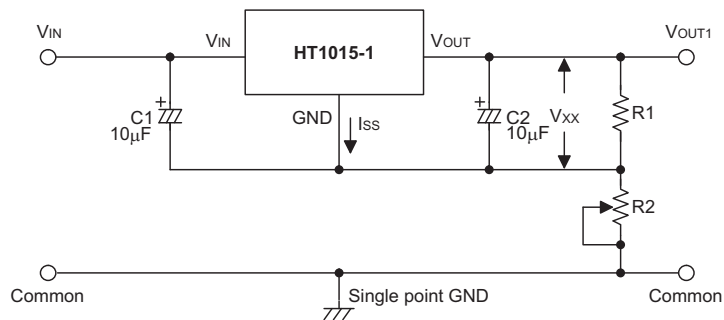
**High Output Current Positive Voltage Regulator**



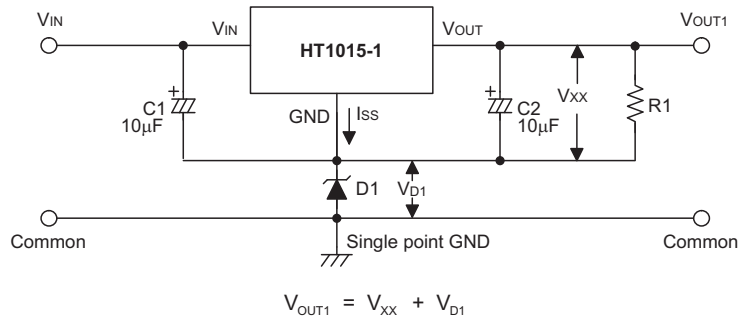
**Short-Circuit Protection Using External Transistors**



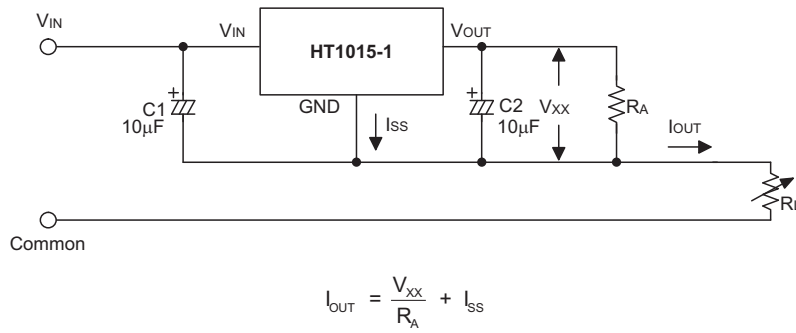
**Increased Output Voltage Circuits**



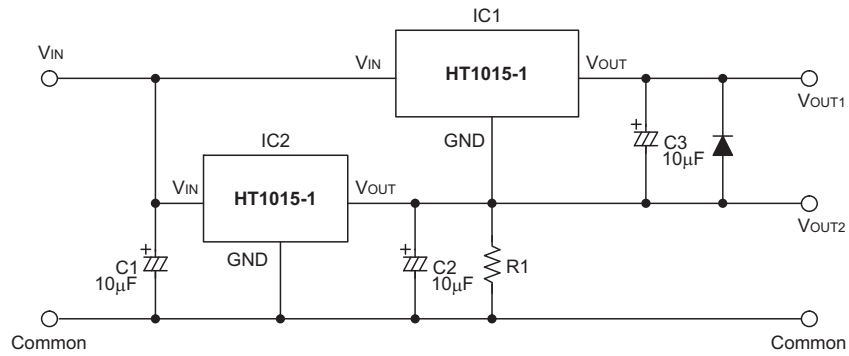
$$V_{OUT1} = V_{xx} \left( 1 + \frac{R2}{R1} \right) + I_{SS} R2$$



**Constant Current Regulator**



**Dual Supply**



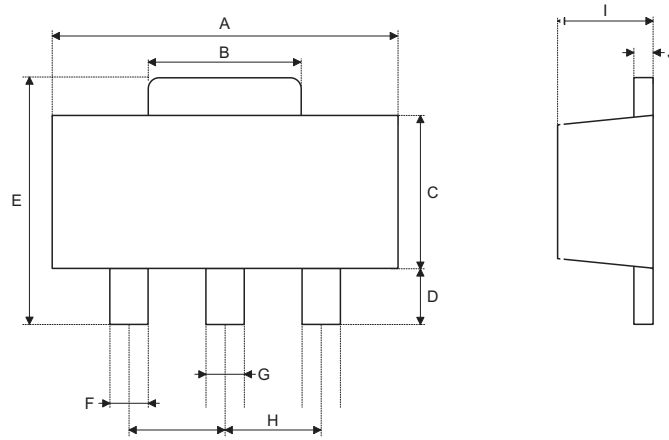
**Package Information**

Note that the package information provided here is for consultation purposes only. As this information may be updated at regular intervals users are reminded to consult the [Holtek website](#) for the latest version of the [package information](#).

Additional supplementary information with regard to packaging is listed below. Click on the relevant section to be transferred to the relevant website page.

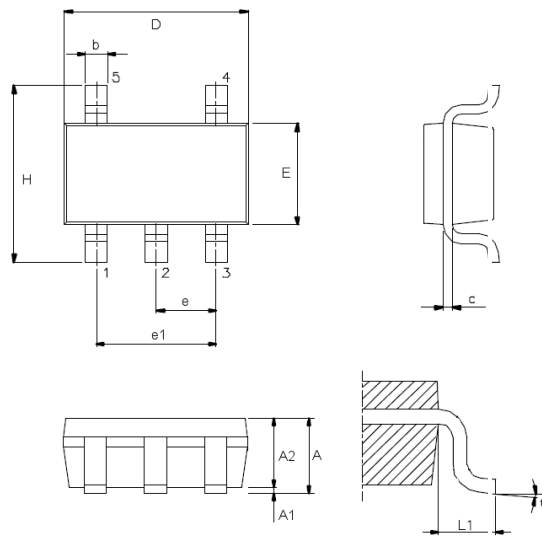
- [Further Package Information \(include Outline Dimensions, Product Tape and Reel Specifications\)](#)
- [Packing Materials Information](#)
- [Carton Information](#)

**3-pin SOT89 Outline Dimensions**



Symbol	Dimensions in inch		
	Min.	Nom.	Max.
A	0.173	—	0.181
B	0.053	—	0.072
C	0.090	—	0.102
D	0.035	—	0.047
E	0.155	—	0.167
F	0.014	—	0.019
G	0.017	—	0.022
H	—	0.059 BSC	—
I	0.055	—	0.063
J	0.014	—	0.017

Symbol	Dimensions in mm		
	Min.	Nom.	Max.
A	4.40	—	4.60
B	1.35	—	1.83
C	2.29	—	2.60
D	0.89	—	1.20
E	3.94	—	4.25
F	0.36	—	0.48
G	0.44	—	0.56
H	—	1.50 BSC	—
I	1.40	—	1.60
J	0.35	—	0.44

**5-pin SOT23 Outline Dimensions**


Symbol	Dimensions in inch		
	Min.	Nom.	Max.
A	—	—	0.057
A1	—	—	0.006
A2	0.035	0.045	0.051
b	0.012	—	0.020
C	0.003	—	0.009
D	—	0.114 BSC	—
E	—	0.063 BSC	—
e	—	0.037 BSC	—
H	—	0.075 BSC	—
L	—	0.110 BSC	—
L1	—	0.024 BSC	—
θ	0°	—	8°

Symbol	Dimensions in mm		
	Min.	Nom.	Max.
A	—	—	1.45
A1	—	—	0.15
A2	0.90	1.15	1.30
b	0.30	—	0.50
C	0.08	—	0.22
D	—	2.90 BSC	—
E	—	1.60 BSC	—
e	—	0.95 BSC	—
H	—	1.90 BSC	—
L	—	2.80 BSC	—
L1	—	0.60 BSC	—
θ	0°	—	8°

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