



Features

- Low power consumption
- Low voltage drop
- Low temperature coefficient
- Wide operating voltage (12V max.)
- TO92, SOT89 and SOT23-5 package

Applications

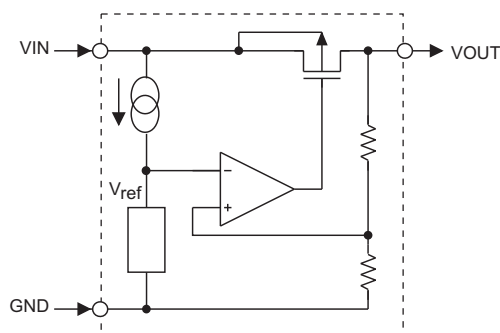
- Battery-powered equipment
- Communication equipment
- Audio/Video equipment

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.

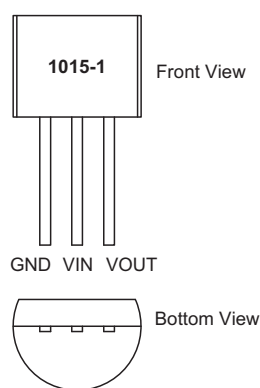
Although designed primarily as a fixed voltage regulator, this device can be used with external components to obtain variable voltages and currents.

Block Diagram

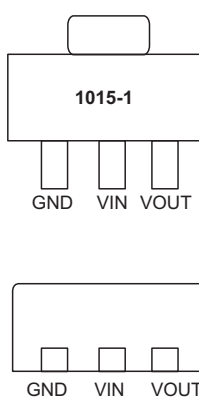


Pin Assignment

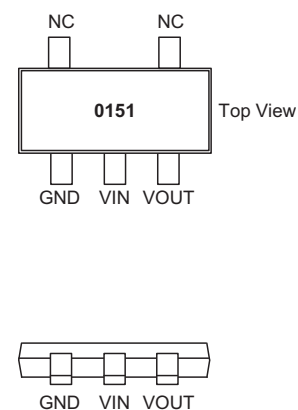
TO92



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 $85^{\circ}C$

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
θ_{JA}	Thermal Resistance (Junction to Ambient) (Assume no ambient airflow, no heat sink)	SOT23-5	500	$^{\circ}C/W$
		SOT89	200	$^{\circ}C/W$
		TO92	200	$^{\circ}C/W$
P_D	Power Dissipation	SOT23-5	0.20	W
		SOT89	0.50	W
		TO92	0.50	W

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

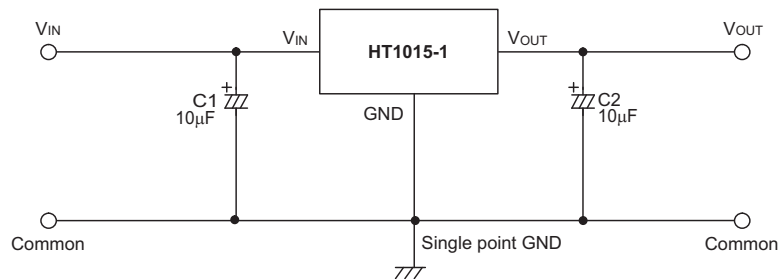
Electrical Characteristics

$T_a = 25^{\circ}C$

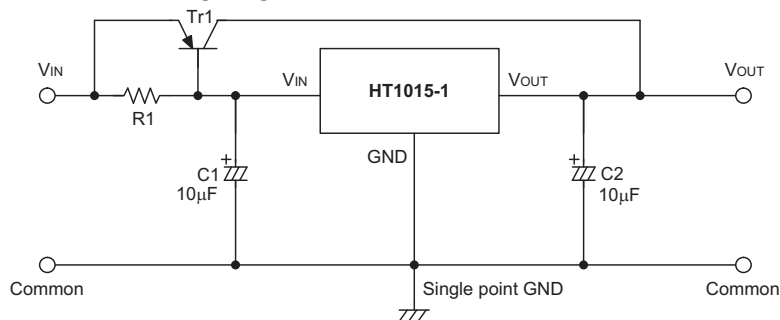
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
V_{OUT}	Output Voltage Tolerance	3.5V	$I_{OUT}=0.5mA$	1.455	1.5	1.545	V
I_{OUT}	Output Current	3.5V	—	7.0	18	—	mA
ΔV_{OUT}	Load Regulation	3.5V	$1mA \leq I_{OUT} \leq 7mA$	—	15	—	mV
V_{DIF}	Voltage Drop	—	$I_{OUT}=0.5mA$	—	250	—	mV
I_{SS}	Current Consumption	3.5V	No load	—	2.2	5.0	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	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

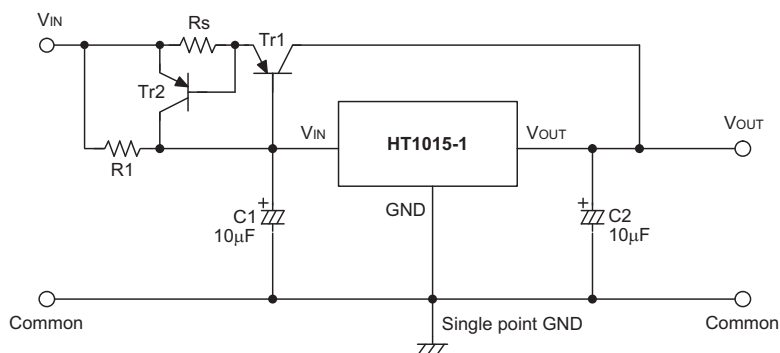
Basic Circuit



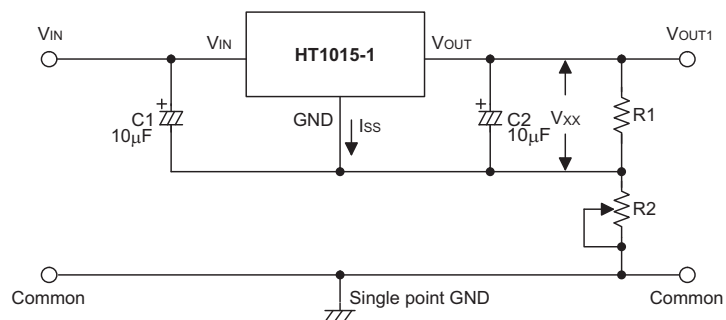
High Output Current Positive Voltage Regulator



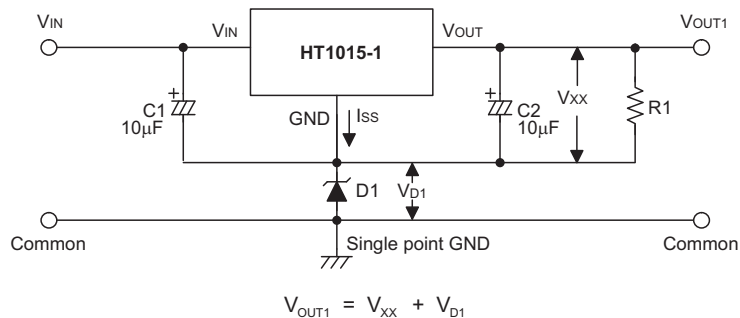
Short-Circuit Protection Using External Transistors



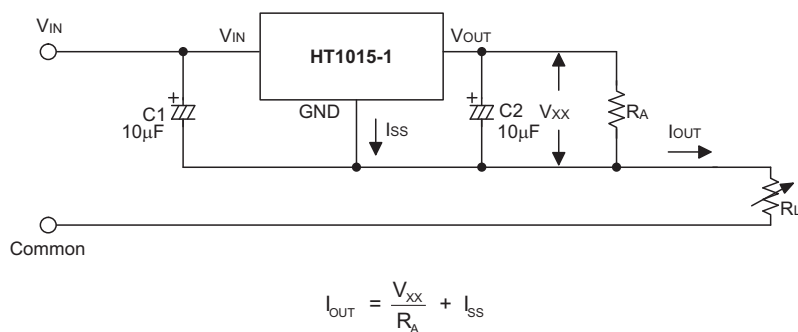
Increased Output Voltage Circuits



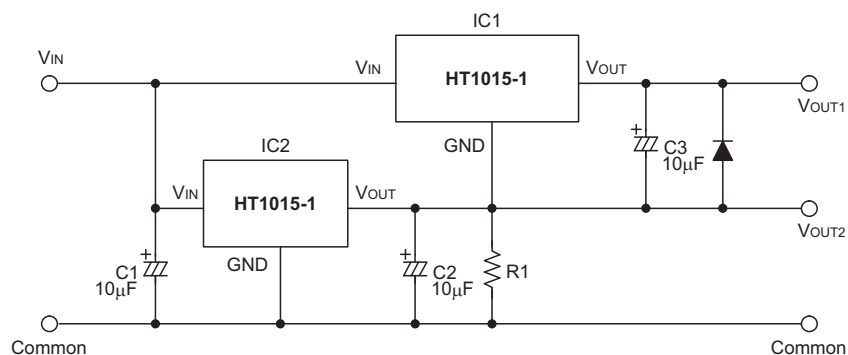
$$V_{OUT1} = V_{xx} \left(1 + \frac{R2}{R1} \right) + I_{SS} R2$$



Constant Current Regulator



Dual Supply

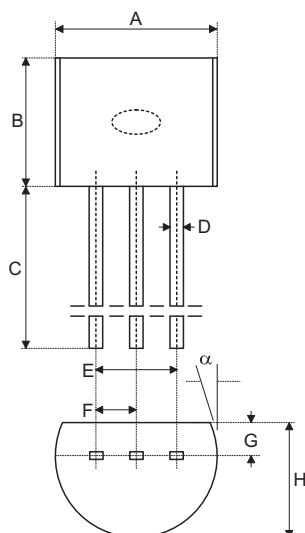


Package Information

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](#).

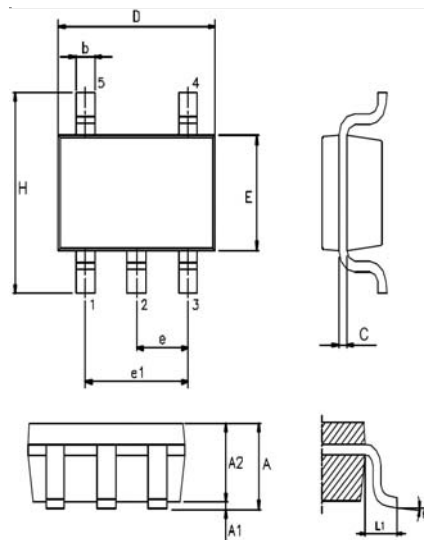
Additional supplementary information with regard to packaging is listed below. Click on the relevant section to be transferred to the relevant website page.

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

3-pin TO92 Outline Dimensions


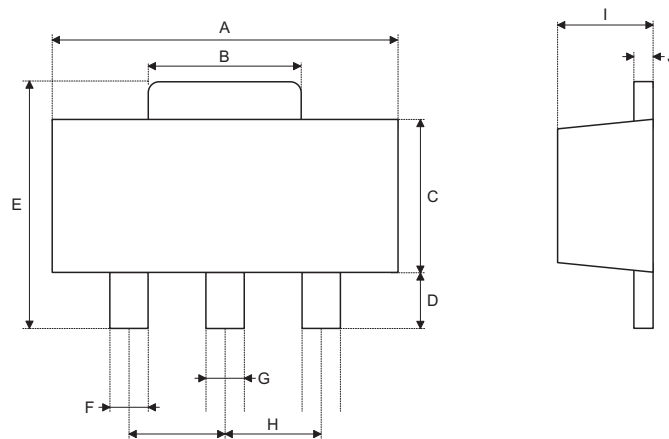
Symbol	Dimensions in inch		
	Min.	Nom.	Max.
A	0.173	0.180	0.205
B	0.170	—	0.210
C	0.500	0.580	—
D	—	0.015 Typ	—
E	—	0.010 Typ	—
F	—	0.050 Typ	—
G	—	0.035 Typ	—
H	0.125	0.142	0.165

Symbol	Dimensions in mm		
	Min.	Nom.	Max.
A	4.39	4.57	5.21
B	4.32	—	5.33
C	12.70	14.73	—
D	—	0.38 Typ	—
E	—	2.54 Typ	—
F	—	1.27 Typ	—
G	—	0.89 Typ	—
H	3.18	3.61	4.19

5-pin SOT23-5 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°

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

Copyright © 2016 by HOLTEK SEMICONDUCTOR INC.

The information appearing in this Data Sheet is believed to be accurate at the time of publication. However, Holtek assumes no responsibility arising from the use of the specifications described. The applications mentioned herein are used solely for the purpose of illustration and Holtek makes no warranty or representation that such applications will be suitable without further modification, nor recommends the use of its products for application that may present a risk to human life due to malfunction or otherwise. Holtek's products are not authorized for use as critical components in life support devices or systems. Holtek reserves the right to alter its products without prior notification. For the most up-to-date information, please visit our web site at <http://www.holtek.com.tw>.