HT10XX
1.5V Lower Power LDO

Features

- Low power consumption
- Low voltage drop
- Low temperature coefficient
- Wide operating voltage (12V max.)
- TO-92 and SOT-89 package

Applications

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

General Description

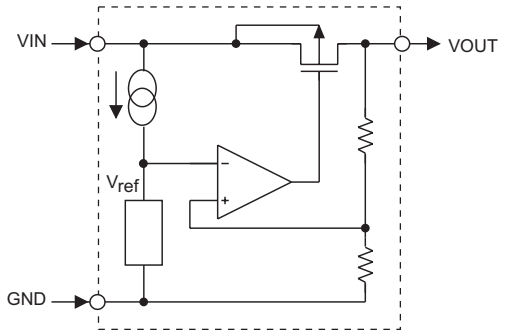
The HT10XX is a set of three-terminal low power voltage regulators implemented in CMOS technology. It is available with a fixed output voltages at 1.5V. CMOS technology ensures low voltage drop and low quiescent current.

Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain variable voltages and currents.

Selection Table

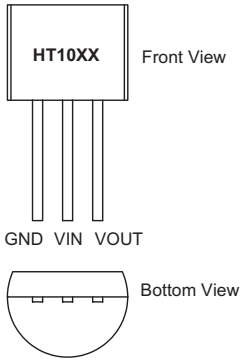
Part No.	Output Voltage	Tolerance
HT1015	1.5V	±5%

Block Diagram

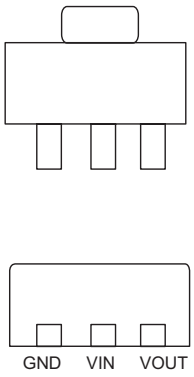


Pin Assignment

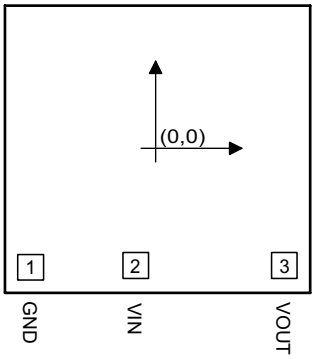
TO-92



SOT-89



Pad Assignment



Chip size: 1524 × 1524 $(\mu m)^2$

* The IC substrate should be connected to VDD in the PCB layout artwork.

Pad Coordinates

Unit: μm

Pad No.	X	Y
1	–544.8	–553
2	–95.2	–555.6
3	575.8	–547.6

Absolute Maximum Ratings

Supply Voltage ..... V_{SS}–0.3V to V_{SS}+13V

Power Consumption 250mW

Storage Temperature ..... –50°C to 125°C

Operating Temperature ..... 0°C to 70°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.

Electrical Characteristics

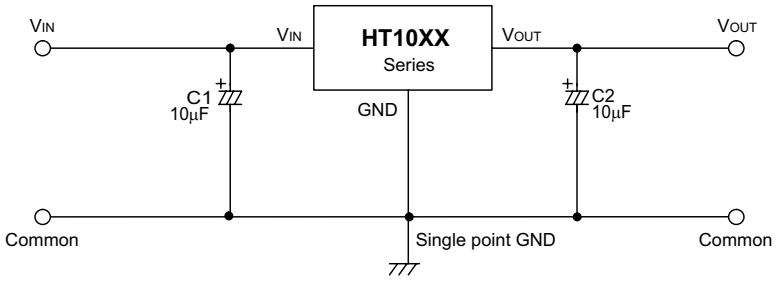
HT1015, +1.5V Output Type

Ta=25°C

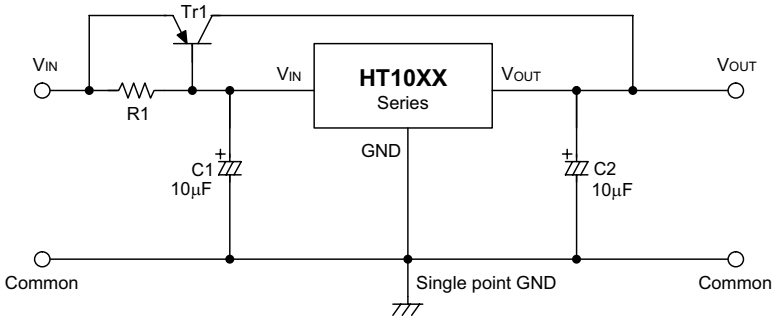
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
V_{OUT}	Output Voltage Tolerance	3.5V	I_{OUT}=0.5mA	1.425	1.5	1.575	V
I_{OUT}	Output Current	3.5V	—	7.0	—	—	mA
ΔV_{OUT}	Load Regulation	3.5V	1mA≤I_{OUT}≤7mA	—	80	—	mV
V_{DIF}	Voltage Drop	—	I_{OUT}=0.5mA	—	300	—	mV
I_{SS}	Current Consumption	3.5V	No load	—	2.2	5.0	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	—	2.5V≤V_{IN}≤12V I_{OUT}=0.5mA	—	0.2	—	%/V
V_{IN}	Input Voltage	—	—	—	—	12	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	3.5V	I_{OUT}=0.5mA 0°C<Ta<70°C	—	±0.25	—	mV/°C

Application Circuits

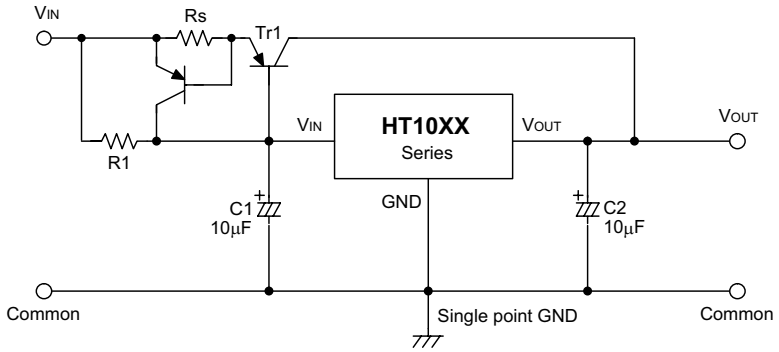
Basic Circuits



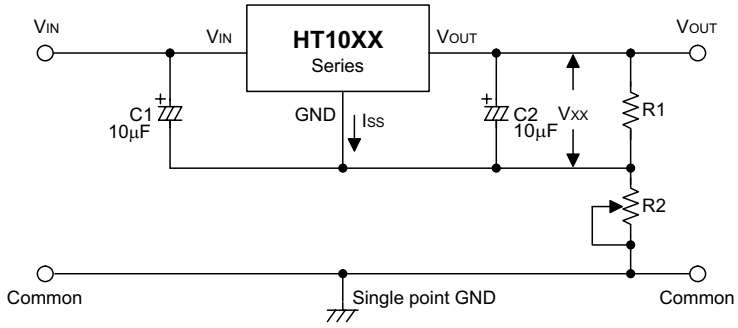
High Output Current Positive Voltage Regulator



Short-Circuit Protection by Tr1

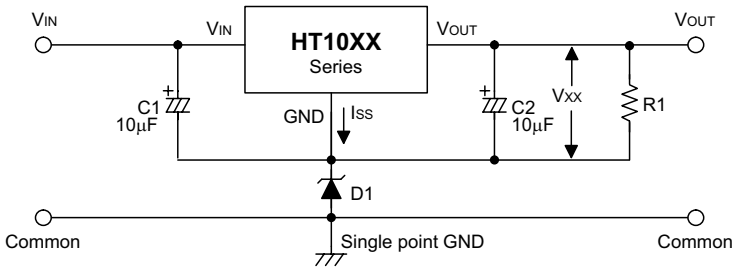


Circuit for Increasing Output Voltage



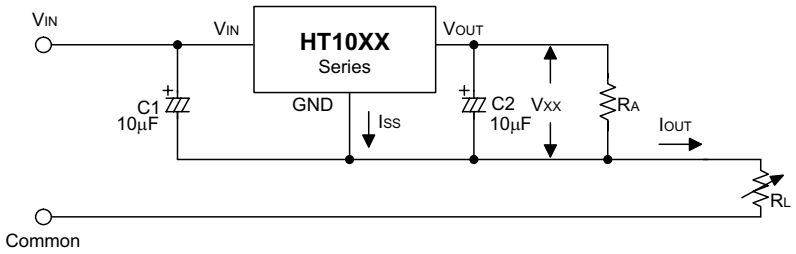
$$V_{OUT} = V_{XX} \left(1 + \frac{R2}{R1}\right) + I_{SS} R2$$

$$\approx V_{XX} \left(1 + \frac{R2}{R1}\right)$$



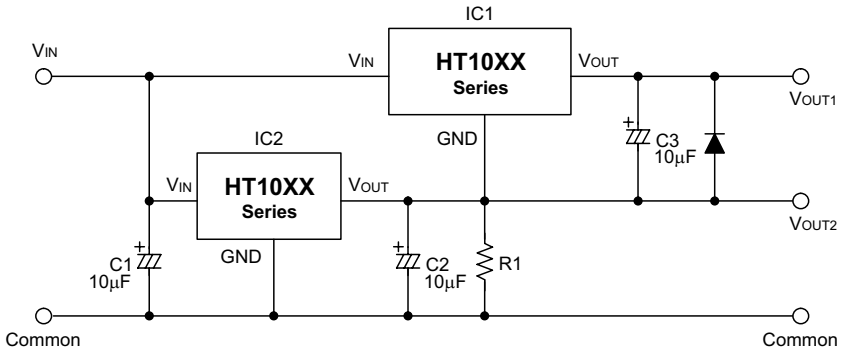
$$V_{OUT} = V_{XX} + V_{D1}$$

Constant Current Regulator



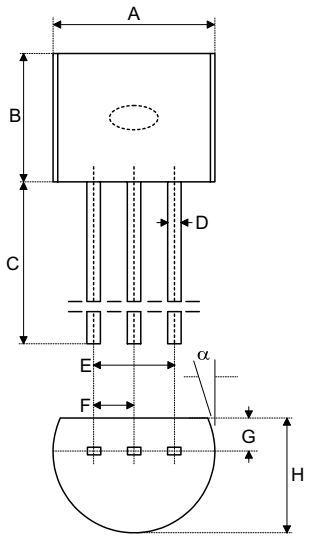
$$I_{OUT} = \frac{V_{XX}}{R_A} + I_{SS}$$

Dual Supply



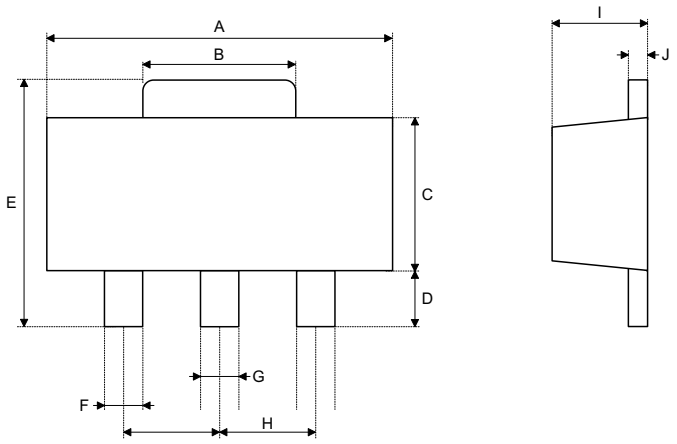
Package Information

3-pin TO-92 Outline Dimensions



Symbol	Dimensions in mil		
	Min.	Nom.	Max.
A	170	—	200
B	170	—	200
C	500	—	—
D	11	—	20
E	90	—	110
F	45	—	55
G	45	—	65
H	130	—	160
I	8	—	18
α	4°	—	6°

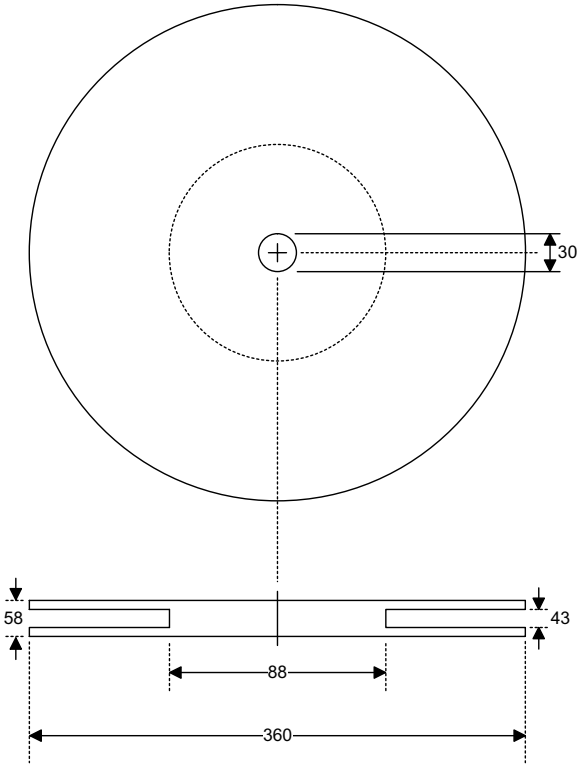
3-pin SOT-89 Outline Dimensions

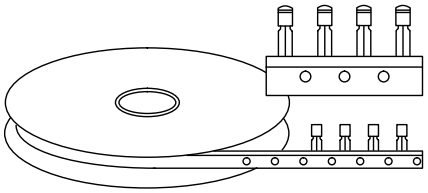


Symbol	Dimensions in mil		
	Min.	Nom.	Max.
A	173	—	181
B	64	—	72
C	90	—	102
D	35	—	47
E	155	—	167
F	14	—	19
G	17	—	22
H	—	59	—
I	55	—	63
J	14	—	17

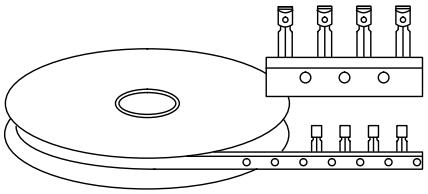
Product Tape and Reel Specifications

TO-92 Reel Dimensions (Unit: mm)



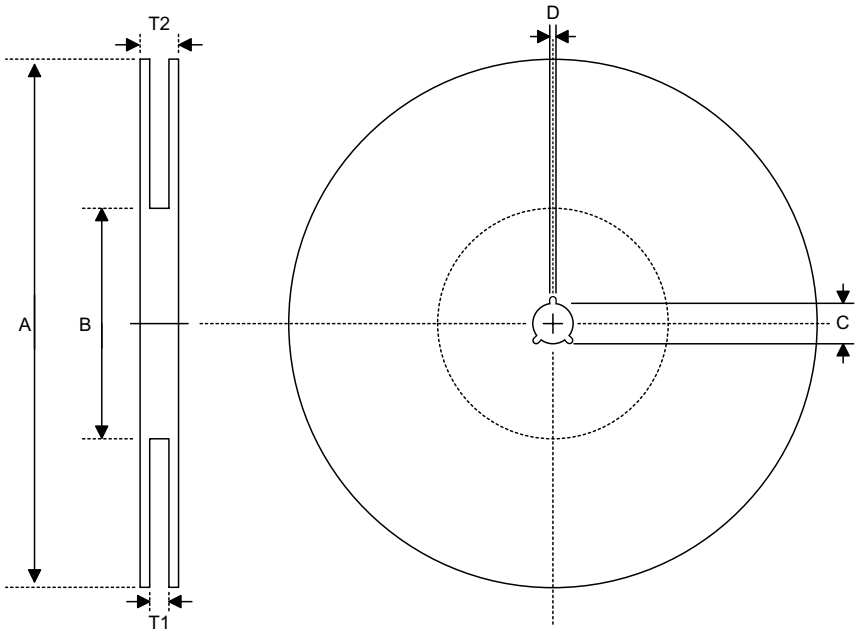


Package Up, Flat Side Up



Package Up, Flat Side Down

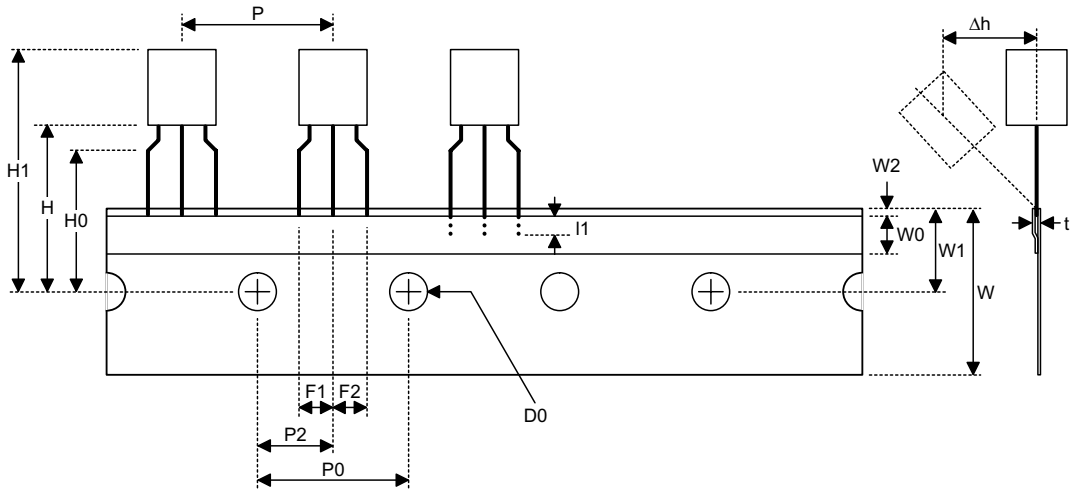
Reel Dimensions



SOT-89

Symbol	Description	Dimensions in mm
A	Reel Outer Diameter	180±1.0
B	Reel Inner Diameter	62±1.5
C	Spindle Hole Diameter	12.75+0.15
D	Key Slit Width	1.9±0.15
T1	Space Between Flange	12.4+0.2
T2	Reel Thickness	17−0.4

Carrier Tape Dimensions



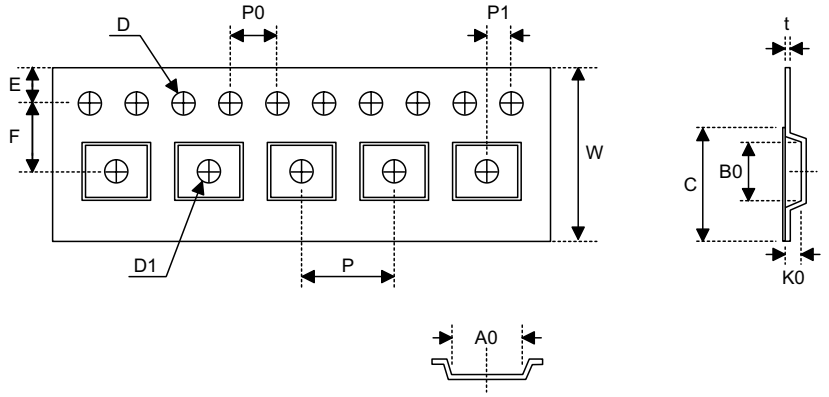
TO-92

Symbol	Description	Dimensions in mm
I1	Taped Lead Length	(2.5)
P	Component Pitch	12.7±1.0
P0	Perforation Pitch	12.7±0.3
P2	Component to Perforation (Length Direction)	6.35±0.4
F1	Lead Spread	2.5+0.4 −0.1
F2	Lead Spread	2.5+0.4 −0.1
Δh	Component Alignment	0±0.1
W	Carrier Tape Width	18.0+1.0 −0.5
W0	Hold-down Tape Width	6.0±0.5
W1	Perforation Position	9.0±0.5
W2	Hold-down Tape Position	(0.5)
H0	Lead Clinch Height	16.0±0.5
H1	Component Height	Less than 24.7
D0	Perforation Diameter	4.0±0.2
t	Taped Lead Thickness	0.7±0.2
H	Component Base Height	19.0±0.5

Note: Thickness less than 0.38±0.05mm~0.5mm

P0 Accumulated pitch tolerance: ±1mm/20pitches.

( ) Bracketed figures are for consultation only



SOT-89

Symbol	Description	Dimensions in mm
W	Carrier Tape Width	12.0+0.3 −0.1
P	Cavity Pitch	8.0±0.1
E	Perforation Position	1.75±0.1
F	Cavity to Perforation (Width Direction)	5.5±0.05
D	Perforation Diameter	1.5+0.1
D1	Cavity Hole Diameter	1.5+0.1
P0	Perforation Pitch	4.0±0.1
P1	Cavity to Perforation (Length Direction)	2.0±0.10
A0	Cavity Length	4.8±0.1
B0	Cavity Width	4.5±0.1
K0	Cavity Depth	1.8±0.1
t	Carrier Tape Thickness	0.30±0.013
C	Cover Tape Width	9.3

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