

30mA Low Power LDO

Features

- Low power consumption
- Low voltage drop
- Low temperature coefficient
- High input voltage (upto 30V)
- Output voltage accuracy: tolerance $\pm 3\%$
- SOT23 and

Applications

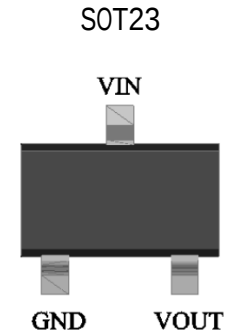
- Battery-powered equipment
- Communication equipment
- Audio/Video equipment

General Description

The HT71xx-1 series is a set of three-terminal low power high voltage regulators implemented in CMOS technology. They allow input voltages as high as 30V.

They are available with several fixed output voltages ranging from 2.1V to 5.0V. 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	Package	Marking
HT7121-1	2.1V	SOT23	71xx-1 (for SOT23) 71xx-1# (for SOT23) 71xx-1+ (for SOT23)
HT7123-1	2.3V		
HT7125-1	2.5V		
HT7127-1	2.7V		
HT7130-1	3.0V		
HT7133-1	3.3V		
HT7136-1	3.6V		
HT7144-1	4.4V		
HT7150-1	5.0V		

Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Value	Unit
Supply Voltage	V_{IN}	- 3 to + 30	V
Power Dissipation	P_{tot}	500	mW
Operating Temperature	T_A	- 40 to + 85	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	- 50 to + 125	$^\circ\text{C}$

Electrical Characteristics

HT7121-1,+2.1VOutputType

Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
V _{OUT}	Output Voltage	4.1V	I _{OUT} =10mA	2.037	2.100	2.163	V
I _{OUT}	Output Current	4.1V	—	20	30	—	mA
ΔV _{OUT}	Load Regulation	4.1V	1mA≤I _{OUT} ≤20mA	—	60	100	mV
V _{DIF}	Voltage Drop (Note)	—	I _{OUT} =1mA, ΔV _{OUT} =2%	—	100	—	mV
I _{SS}	Current Consumption	4.1V	No load	—	2.5	4.0	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	—	3.1V≤V _{IN} ≤24V I _{OUT} =1mA	—	0.2	—	%/V
V _{IN}	Input Voltage	—	—	—	—	28	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	4.1V	I _{OUT} =10mA -40°C<T _a <85°C	—	±0.37	—	mV/°C

Note: Dropout voltage is defined as the input voltage minus the output voltage that produces a 2% change in the output voltage from the value at V_{IN} = V_{OUT}+2V with a fixed load.

HT7123-1,+2.3VOutputType

Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
V _{OUT}	Output Voltage	4.3V	I _{OUT} =10mA	2.231	2.300	2.369	V
I _{OUT}	Output Current	4.3V	—	20	30	—	mA
ΔV _{OUT}	Load Regulation	4.3V	1mA≤I _{OUT} ≤20mA	—	60	100	mV
V _{DIF}	Voltage Drop (Note)	—	I _{OUT} =1mA, ΔV _{OUT} =2%	—	100	—	mV
I _{SS}	Current Consumption	4.3V	No load	—	2.5	4.0	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	—	3.3V≤V _{IN} ≤24V I _{OUT} =1mA	—	0.2	—	%/V
V _{IN}	Input Voltage	—	—	—	—	28	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	4.3V	I _{OUT} =10mA -40°C<T _a <85°C	—	±0.39	—	mV/°C

Note: Dropout voltage is defined as the input voltage minus the output voltage that produces a 2% change in the output voltage from the value at V_{IN} = V_{OUT}+2V with a fixed load.

HT7125-1, +2.5V Output Type

Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
V _{OUT}	Output Voltage	4.5V	I _{OUT} =10mA	2.425	2.500	2.575	V
I _{OUT}	Output Current	4.5V	—	20	30	—	mA
ΔV _{OUT}	Load Regulation	4.5V	1mA≤I _{OUT} ≤20mA	—	60	100	mV
V _{DIF}	Voltage Drop (Note)	—	I _{OUT} =1mA, ΔV _{OUT} =2%	—	100	—	mV
I _{SS}	Current Consumption	4.5V	No load	—	2.5	4.0	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	—	3.5V≤V _{IN} ≤24V I _{OUT} =1mA	—	0.2	—	%/V
V _{IN}	Input Voltage	—	—	—	—	28	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	4.5V	I _{OUT} =10mA -40°C<T _a <85°C	—	±0.41	—	mV/°C

Note: Dropout voltage is defined as the input voltage minus the output voltage that produces a 2% change in the output voltage from the value at V_{IN} = V_{OUT}+2V with a fixed load.

HT7127-1, +2.7V Output Type

Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
V _{OUT}	Output Voltage	4.7V	I _{OUT} =10mA	2.619	2.700	2.781	V
I _{OUT}	Output Current	4.7V	—	20	30	—	mA
ΔV _{OUT}	Load Regulation	4.7V	1mA≤I _{OUT} ≤20mA	—	60	100	mV
V _{DIF}	Voltage Drop (Note)	—	I _{OUT} =1mA, ΔV _{OUT} =2%	—	100	—	mV
I _{SS}	Current Consumption	4.7V	No load	—	2.5	4.0	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	—	3.7V≤V _{IN} ≤24V I _{OUT} =1mA	—	0.2	—	%/V
V _{IN}	Input Voltage	—	—	—	—	28	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	4.7V	I _{OUT} =10mA -40°C<T _a <85°C	—	±0.43	—	mV/°C

Note: Dropout voltage is defined as the input voltage minus the output voltage that produces a 2% change in the output voltage from the value at V_{IN} = V_{OUT}+2V with a fixed load.

HT7130-1, +3.0V Output Type

Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
V _{OUT}	Output Voltage	5V	I _{OUT} =10mA	2.91	3.00	3.09	V
I _{OUT}	Output Current	5V	—	20	30	—	mA
ΔV _{OUT}	Load Regulation	5V	1mA≤I _{OUT} ≤20mA	—	60	100	mV
V _{DIF}	Voltage Drop (Note)	—	I _{OUT} =1mA, ΔV _{OUT} =2%	—	100	—	mV
I _{SS}	Current Consumption	5V	No load	—	2.5	4.0	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	—	4V≤V _{IN} ≤24V I _{OUT} =1mA	—	0.2	—	%/V
V _{IN}	Input Voltage	—	—	—	—	28	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	5V	I _{OUT} =10mA -40°C<T _a <85°C	—	±0.45	—	mV/°C

Note: Dropout voltage is defined as the input voltage minus the output voltage that produces a 2% change in the output voltage from the value at V_{IN} = V_{OUT}+2V with a fixed load.

HT7133-1, +3.3V Output Type

Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
V _{OUT}	Output Voltage	5.5V	I _{OUT} =10mA	3.201	3.300	3.399	V
I _{OUT}	Output Current	5.5V	—	20	30	—	mA
ΔV _{OUT}	Load Regulation	5.5V	1mA≤I _{OUT} ≤30mA	—	60	100	mV
V _{DIF}	Voltage Drop (Note)	—	I _{OUT} =1mA, ΔV _{OUT} =2%	—	100	—	mV
I _{SS}	Current Consumption	5.5V	No load	—	2.5	4.0	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	—	4.5V≤V _{IN} ≤24V I _{OUT} =1mA	—	0.2	—	%/V
V _{IN}	Input Voltage	—	—	—	—	28	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	5.5V	I _{OUT} =10mA -40°C<T _a <85°C	—	±0.5	—	mV/°C

Note: Dropout voltage is defined as the input voltage minus the output voltage that produces a 2% change in the output voltage from the value at V_{IN} = V_{OUT}+2V with a fixed load.

HT7136-1, +3.6V Output Type

Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
V _{OUT}	Output Voltage	5.6V	I _{OUT} =10mA	3.492	3.600	3.708	V
I _{OUT}	Output Current	5.6V	—	20	30	—	mA
ΔV _{OUT}	Load Regulation	5.6V	1mA ≤ I _{OUT} ≤ 30mA	—	60	100	mV
V _{DIF}	Voltage Drop (Note)	—	I _{OUT} =1mA, ΔV _{OUT} =2%	—	60	—	mV
I _{SS}	Current Consumption	5.6V	No load	—	2.5	4.0	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	—	4.6V ≤ V _{IN} ≤ 24V I _{OUT} =1mA	—	0.2	—	%/V
V _{IN}	Input Voltage	—	—	—	—	28	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	5.6V	I _{OUT} =10mA -40°C < T _a < 85°C	—	±0.6	—	mV/°C

Note: Dropout voltage is defined as the input voltage minus the output voltage that produces a 2% change in the output voltage from the value at V_{IN} = V_{OUT}+2V with a fixed load.

HT7144-1, +4.4V Output Type

Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
V _{OUT}	Output Voltage	6.4V	I _{OUT} =10mA	4.268	4.400	4.532	V
I _{OUT}	Output Current	6.4V	—	20	30	—	mA
ΔV _{OUT}	Load Regulation	6.4V	1mA ≤ I _{OUT} ≤ 30mA	—	60	100	mV
V _{DIF}	Voltage Drop (Note)	—	I _{OUT} =1mA, ΔV _{OUT} =2%	—	100	—	mV
I _{SS}	Current Consumption	6.4V	No load	—	2.5	4.0	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	—	5.4V ≤ V _{IN} ≤ 24V I _{OUT} =1mA	—	0.2	—	%/V
V _{IN}	Input Voltage	—	—	—	—	28	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	6.4V	I _{OUT} =10mA -40°C < T _a < 85°C	—	±0.7	—	mV/°C

Note: Dropout voltage is defined as the input voltage minus the output voltage that produces a 2% change in the output voltage from the value at V_{IN} = V_{OUT}+2V with a fixed load.

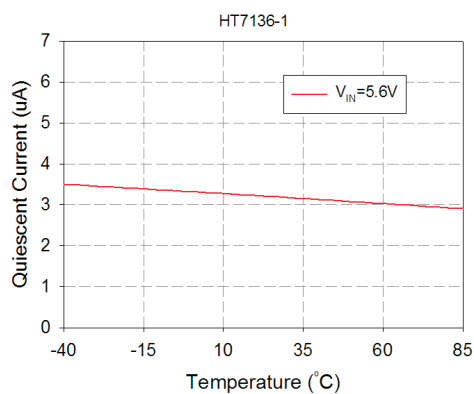
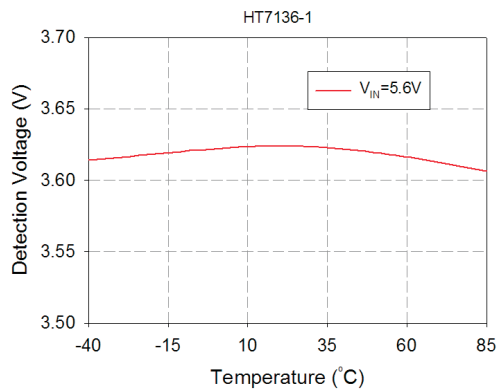
HT7150-1, +5.0V Output Type

Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
V _{OUT}	Output Voltage	7V	I _{OUT} =10mA	4.85	5.00	5.15	V
I _{OUT}	Output Current	7V	—	20	30	—	mA
ΔV _{OUT}	Load Regulation	7V	1mA ≤ I _{OUT} ≤ 30mA	—	60	100	mV
V _{DIF}	Voltage Drop (Note)	—	I _{OUT} =1mA, ΔV _{OUT} =2%	—	100	—	mV
I _{SS}	Current Consumption	7V	No load	—	2.5	4.0	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	—	6V ≤ V _{IN} ≤ 24V I _{OUT} =1mA	—	0.2	—	%/V
V _{IN}	Input Voltage	—	—	—	—	28	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	7V	I _{OUT} =10mA -40°C < T _a < 85°C	—	±0.75	—	mV/°C

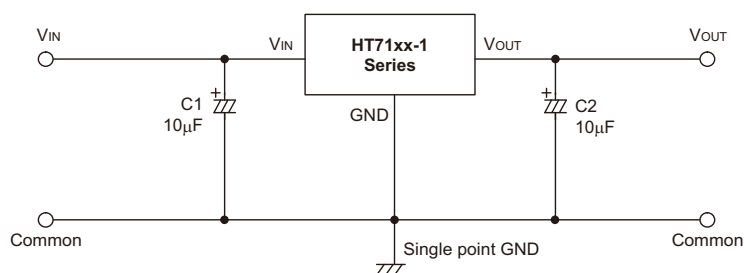
Note: Dropout voltage is defined as the input voltage minus the output voltage that produces a 2% change in the

Typical Performance Characteristics

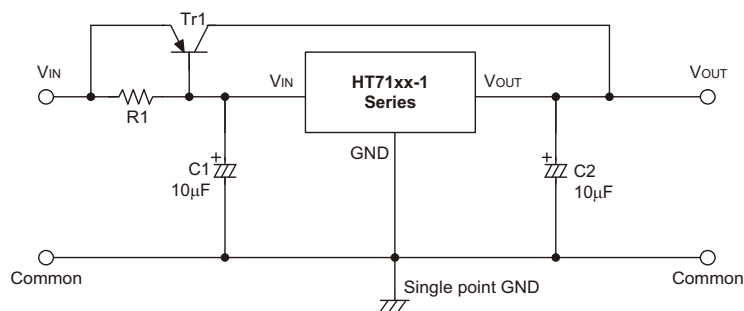


Application Circuits

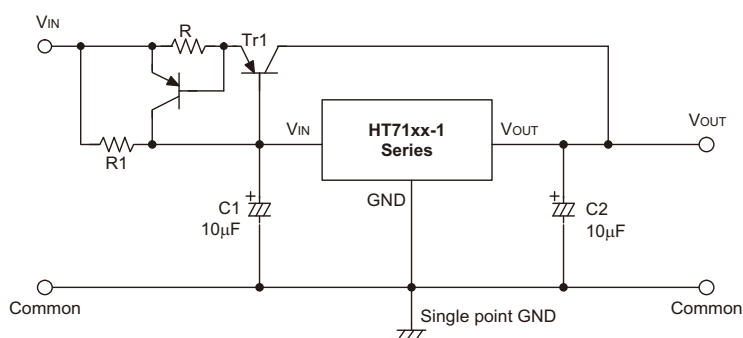
Basic Circuits



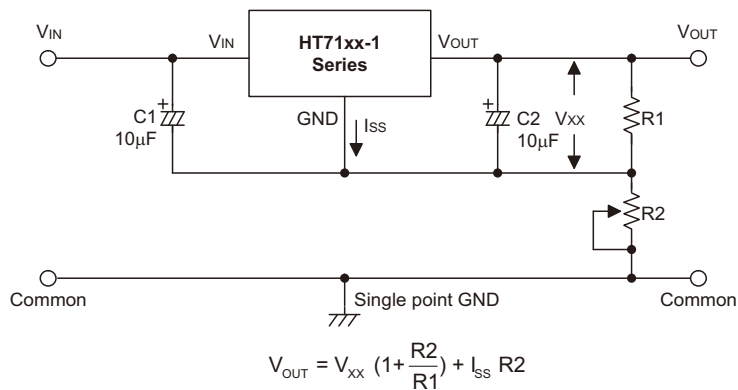
High Output Current Positive Voltage Regulator



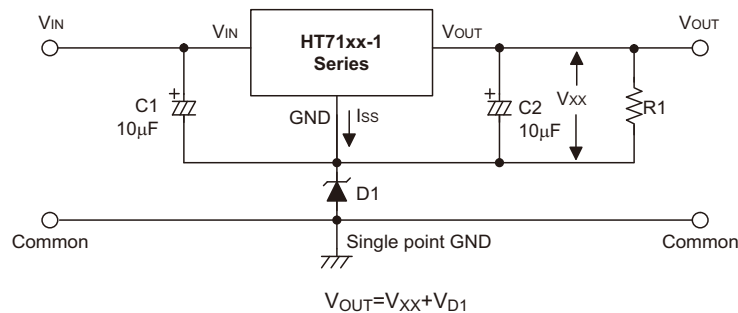
Short-Circuit Protection by Tr1



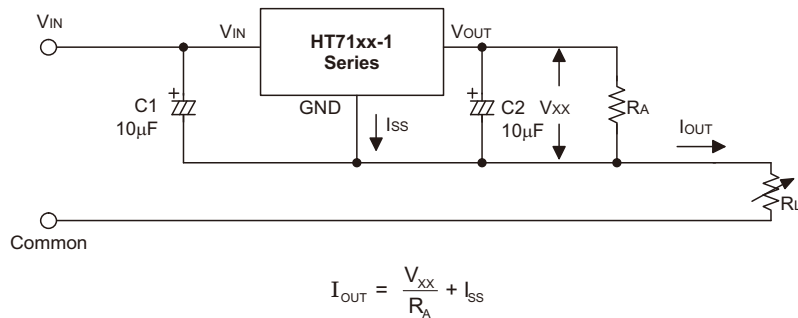
Circuit for Increasing Output Voltage



Circuit for Increasing Output Voltage



Constant Current Regulator



Dual Supply

