



## General Description

The NCP114ASN series is a set of low voltage differential (LDO) converters with a wide voltage input range of 2.0V to 6.0V, low voltage differential, low power consumption, and miniaturized packaging. The output voltage range is 1.2-3.3V, and the NCP114ASN has low static current characteristics as low as 70uA. The circuit also has a CE enable control port, which can put the circuit into sleep mode. It is particularly suitable for battery powered and long-term standby system equipment applications, helping to reduce standby power consumption of system equipment, effectively extending standby time and battery life.

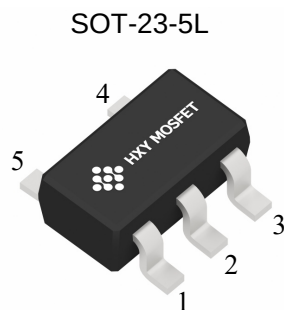
## Features

- Low Power Consumption
- Low Voltage Drop
- 1uA Max IQ in Shutdown Mode
- Withstanding Voltage 6V
- Quiescent Current 70uA
- Output Voltage Accuracy: tolerance  $\pm 2\%$
- High output current: 300mA

## Application

- Battery-powered Equipments
- Communication Equipments
- Audio/Video Equipments

## Pin Configuration And Descriptions



| PIN No.   | Name             | Functions Description |
|-----------|------------------|-----------------------|
| SOT-23-5L |                  |                       |
| 1         | V <sub>IN</sub>  | Input                 |
| 2         | GND              | Ground                |
| 3         | CE               | ON/OFF Control        |
| 4         | NC               | No Connect            |
| 5         | V <sub>OUT</sub> | Output                |

## Order Information

| Orderable Device | Package   | Output Voltage | Packing Option |
|------------------|-----------|----------------|----------------|
| NCP114ASN120T1G  | SOT-23-5L | 1.2V           | 3000/Reel      |
| NCP114ASN150T1G  | SOT-23-5L | 1.5V           | 3000/Reel      |
| NCP114ASN180T1G  | SOT-23-5L | 1.8V           | 3000/Reel      |
| NCP114ASN250T1G  | SOT-23-5L | 2.5V           | 3000/Reel      |
| NCP114ASN280T1G  | SOT-23-5L | 2.8V           | 3000/Reel      |
| NCP114ASN300T1G  | SOT-23-5L | 3.0V           | 3000/Reel      |
| NCP114ASN330T1G  | SOT-23-5L | 3.3V           | 3000/Reel      |



## Absolute Maximum Ratings

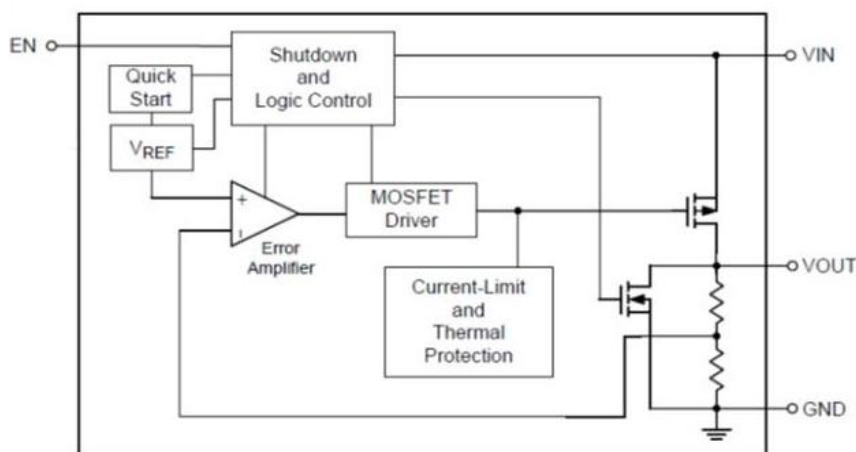
| Description                          | Symbol    | Value Range | Unit |
|--------------------------------------|-----------|-------------|------|
| Limit Power Voltage                  | $V_{IN}$  | -0.3~+7     | V    |
| Storage Temperature Range            | $T_{STG}$ | -50~+125    | °C   |
| Operating Free-air Temperature Range | $T_A$     | -40~+85     | °C   |

Note: Stresses greater than those listed under “Absolute Maximum Ratings” 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 Conditions” is 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-23-5L | 500         | °C/W |
| Power dissipation  | $P_W$         | SOT-23-5L | 200         | mW   |

## Block Diagram





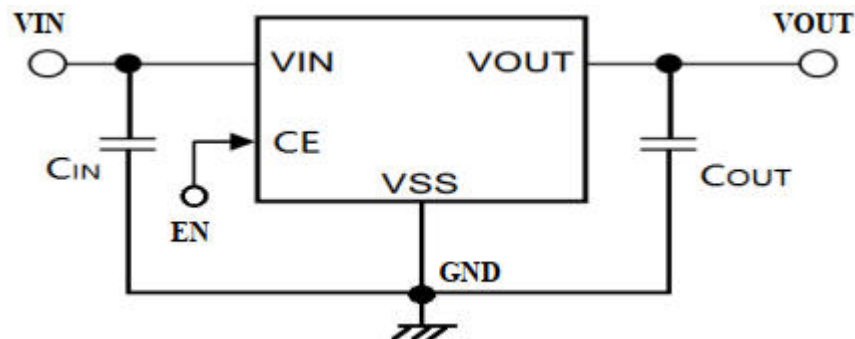
## DC Characteristics (unless otherwise noted $T_A = 25^\circ\text{C}$ )

| Parameter             | Symbol                                               | Test Condition                                                              | Min | Typ  | Max | Unit             |
|-----------------------|------------------------------------------------------|-----------------------------------------------------------------------------|-----|------|-----|------------------|
| Input Voltage         | $V_{IN}$                                             |                                                                             |     |      | 6.0 | V                |
| Output Voltage        | $V_{OUT}$                                            |                                                                             | 1.2 |      | 3.6 | V                |
| Voltage Accuracy      |                                                      | $I_{OUT}=1\text{mA}$                                                        | -2  |      | +2  | %                |
| Output Current        | $I_{OUT}$                                            | $V_{IN}=V_{OUT}+2.0\text{V}$                                                |     | 300  |     | mA               |
| Load Regulation       | $\Delta V_{OUT}$                                     | $V_{IN}=V_{OUT}+2.0\text{V}$<br>$1\text{mA} \leq I_{OUT} \leq 100\text{mA}$ |     | 100  |     | mV               |
| Line Regulation       | $\frac{\Delta V_{OUT}}{V_{OUT} \cdot \Delta V_{IN}}$ | $V_{OUT}+1.0\text{V} \leq V_{IN} \leq 18\text{V}$<br>$I_{OUT}=10\text{mA}$  |     | 0.05 |     | %/V              |
| Voltage Drop          | $V_{DIF}^1$                                          | $I_{OUT}=100\text{mA}, V_{OUT}=3.3\text{V}$                                 |     | 90   |     | mV               |
| Quiescent Current     | $I_{SS}$                                             | $V_{CE}=V_{IN}$                                                             |     | 70   |     | $\mu\text{A}$    |
| Standby Current       | $I_{STANDBY}$                                        | $V_{CE}=V_{SS}$                                                             |     | 1.0  |     | $\mu\text{A}$    |
|                       | $V_{CEH}$                                            |                                                                             | 1.1 |      |     | V                |
|                       | $V_{CEL}$                                            |                                                                             |     |      | 0.4 | V                |
| Short-circuit current | $I_{SHORT}$                                          | $V_{IN}=V_{OUT}+2.0\text{V}$                                                |     | 500  |     | mA               |
| Output noise Resistor | $V_{en}$                                             | $I_{OUT} = 40\text{mA}$ ,<br>300Hz ~ 50kHz                                  |     | 50   |     | $\mu\text{Vrms}$ |

**Note:** 1. When  $V_{IN}=V_{OUT}+2.0\text{V}$ , as the output voltage declined 2%, the  $V_{DIF}=V_{IN}-V_{OUT}$ .

## Application Circuit

### Basic Circuits



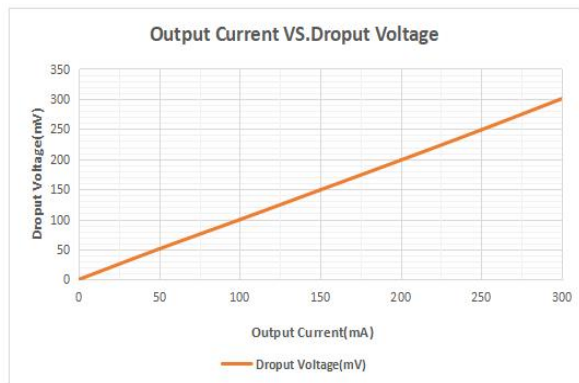
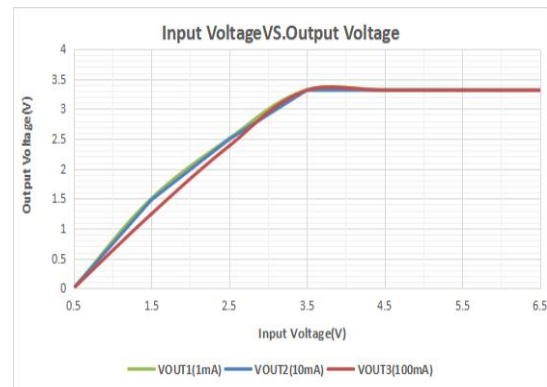
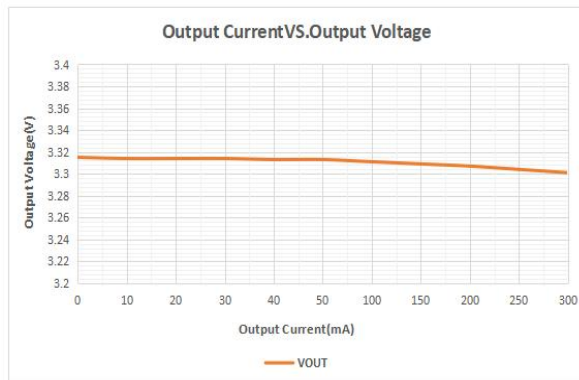
1.  $C_{IN}$  is used to stabilize the input capacitor.
2.  $C_{IN}$  eramic capacitors greater than or equal to 1pF can be used for  $C_{OUT}$ .



## Function Description

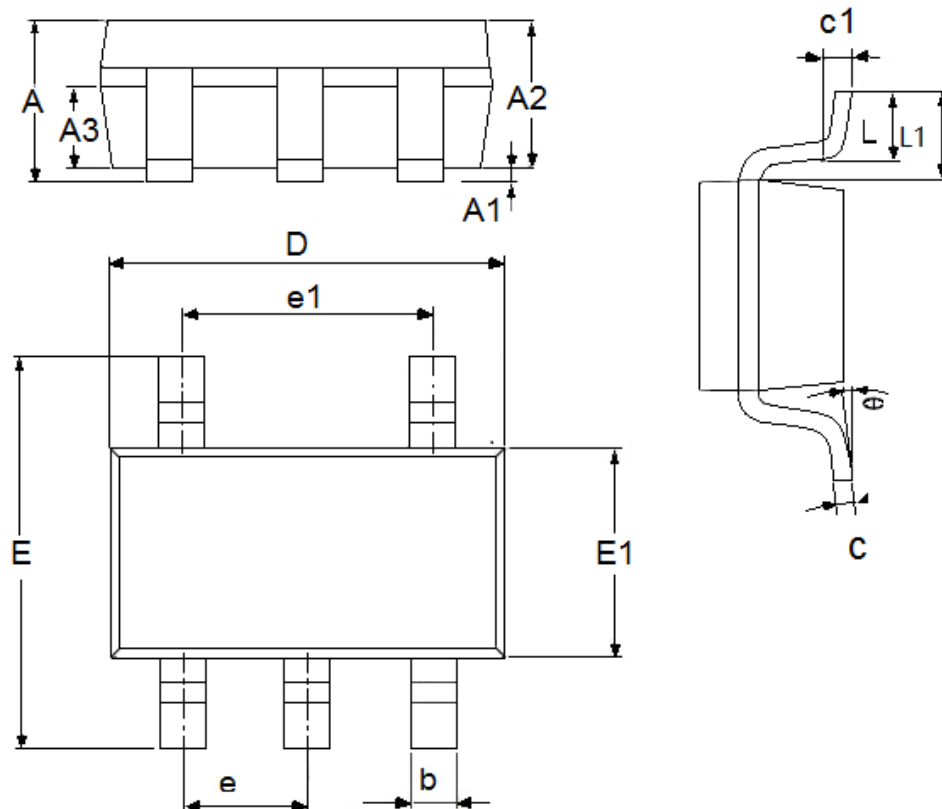
NCP114ASN series are linear voltage regulator ICs withstanding 6.0V voltage. The series IC consists of a voltage reference, an error amplifier, a current limiter and a phase compensation circuit plus a driver transistor. The output stabilization capacitor is also compatible with low ESR ceramic capacitors. The over current protection circuit and the over voltage protection circuit are built-in. The protection circuit will operate when the output current or input voltage reaches limit level.

## Typical Characteristics





Package Outline Dimensions  
SOT-23-5L



| Symbol | Dimensions in Millimeters |      | Dimensions In Inches |        |
|--------|---------------------------|------|----------------------|--------|
|        | Min                       | Max  | Min                  | Max    |
| A      | 1.05                      | 1.45 | 0.0413               | 0.0571 |
| A1     | 0                         | 0.15 | 0.0000               | 0.0059 |
| A2     | 0.9                       | 1.3  | 0.0354               | 0.0512 |
| A3     | 0.6                       | 0.7  | 0.0236               | 0.0276 |
| b      | 0.25                      | 0.5  | 0.0098               | 0.0197 |
| c      | 0.1                       | 0.23 | 0.0039               | 0.0091 |
| D      | 2.82                      | 3.05 | 0.1110               | 0.1201 |
| e1     | 1.9(TYP)                  |      | 0.0748(TYP)          |        |
| E      | 2.6                       | 3.05 | 0.1024               | 0.1201 |
| E1     | 1.5                       | 1.75 | 0.0512               | 0.0689 |
| e      | 0.95(TYP)                 |      | 0.0374(TYP)          |        |
| L      | 0.25                      | 0.6  | 0.0098               | 0.0236 |
| L1     | 0.59(TYP)                 |      | 0.0232(TYP)          |        |
| θ      | 0                         | 8°   | 0.0000               | 8°     |
| c1     | 0.2(TYP)                  |      | 0.0079(TYP)          |        |



### **Attention**

- Any and all HUA XUAN YANG ELECTRONICS products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your HUA XUAN YANG ELECTRONICS representative nearest you before using any HUA XUAN YANG ELECTRONICS products described or contained herein in such applications.
- HUA XUAN YANG ELECTRONICS assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein.
- Specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.
- HUA XUAN YANG ELECTRONICS CO.,LTD. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.
- In the event that any or all HUA XUAN YANG ELECTRONICS products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.
- No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of HUA XUAN YANG ELECTRONICS CO.,LTD.
- Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. HUA XUAN YANG ELECTRONICS believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.
- Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the HUA XUAN YANG ELECTRONICS product that you intend to use.