优尚

YOUSHANG SEMICONDUCTOR

设计研发新型功率器件

各类小信号开关

中低压及高压大电流等场效应管

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企业微信二维码

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Features

- Input Voltage Range: 2.7V to 5.5V
- Dropout Voltage 400mV at 300mA Output Current
- Guaranteed 300mA Output Current
- Internal RON = 1.5Ω PMOS Draws No Base Current
- Low Quiescent Current 50μA
- Output Voltage: 1.5V/1.8V/2.0V/2.5V/2.8V/3.0V/
- 3.3V/3.5; Accuracy 2%
- Fast Transient Response
- Good Load Regulation
- Current Limit and Thermal Shutdown Protection
- Short Circuit Current Fold-Back
- Lead Free Packages: SC59, SC59R, SOT89-3L, and SOT89R-3L
- SC59, SC59R, SOT23, SOT89-3L, and SOT89R-3L: Available in “Green” Molding Compound (No Br, Sb) (Note 9)
- Lead Free Finish/ RoHS Compliant (Note 1)

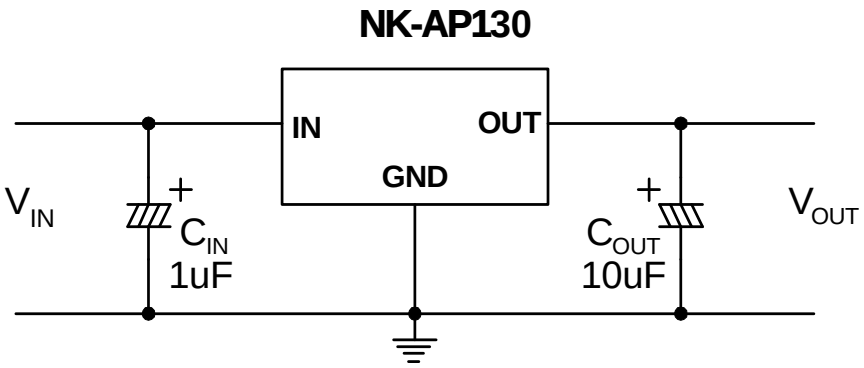
Description

The NK-AP130 is a 300mA, fixed output voltage, low dropout linear regulator. The device includes pass element, error amplifier, band-gap, current-limit and thermal shutdown circuitry. The characteristics of low dropout voltage and less quiescent current make it good for some critical current application, for example, some battery powered devices. The typical quiescent current is approximately 50μA from zero to maximum load. Due to internal flexible design, results in extensively fixed output voltage versions and make it convenient to use for applications. Built-in current-limit and thermal-shutdown functions prevent any fault condition from IC damage.

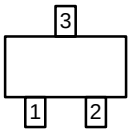
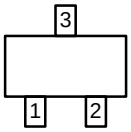
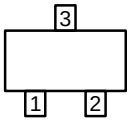
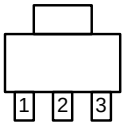
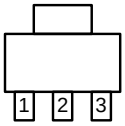
Applications

- Battery Powered Device
- CD-ROM, DVD, and LAN Card
- PC Peripheral
- Wireless Communication

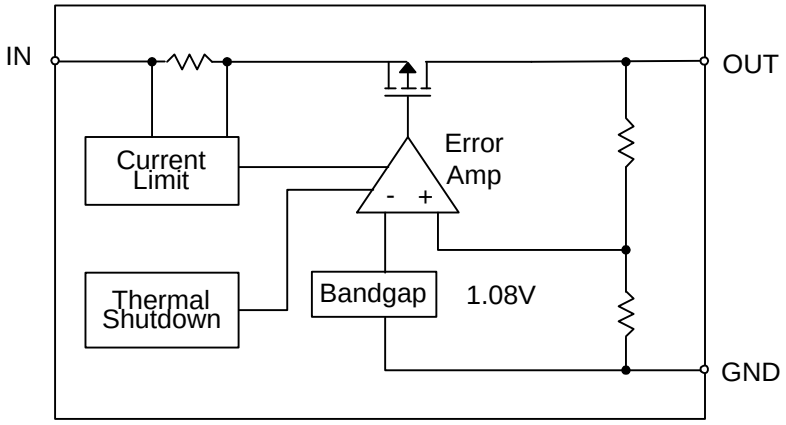
Typical Application Circuit



Pin Assignments

Package		No.	Pin Name	Description
Type	Code			
(Top View)  (SC59)	W	1	IN	IN: Power Input OUT: Output Voltage GND: Ground
		2	OUT	
		3	GND	
(Top View)  (SC59R)	R	1	GND	
		2	OUT	
		3	IN	
(Top View)  (SOT23)	SA	1	IN	
		2	OUT	
		3	GND	
(Top View)  (SOT89-3L)	Y	1	OUT	
		2	GND	
		3	IN	
(Top View)  (SOT89R-3L)	YR	1	GND	
		2	IN	
		3	OUT	

Functional Block Diagram



Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
V_{CC}	Input Voltage	+6	V
T_{OP}	Operating Junction Temperature	-40 to +125	ºC
T_{ST}	Storage Temperature Range	-65 to +150	ºC

Recommended Operating Conditions

Symbol	Parameter	Min	Max	Unit
V_{IN}	Input Voltage	2.7	5.5	V
I_{OUT}	Output Current	0	300	mA
T_A	Operating Ambient Temperature	-40	85	°C

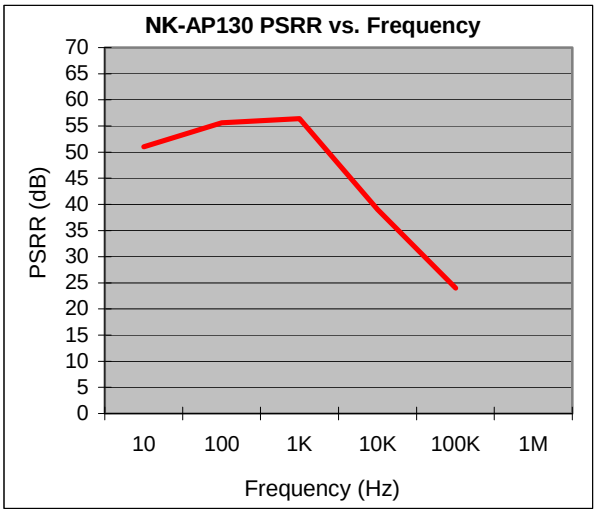
Electrical Characteristics

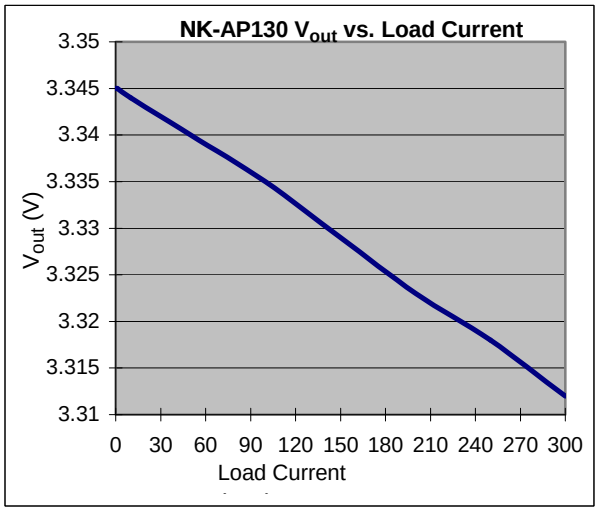
T_A = 25ºC, C_{IN} = 1µF, C_{OUT} = 10µF, unless otherwise specified.

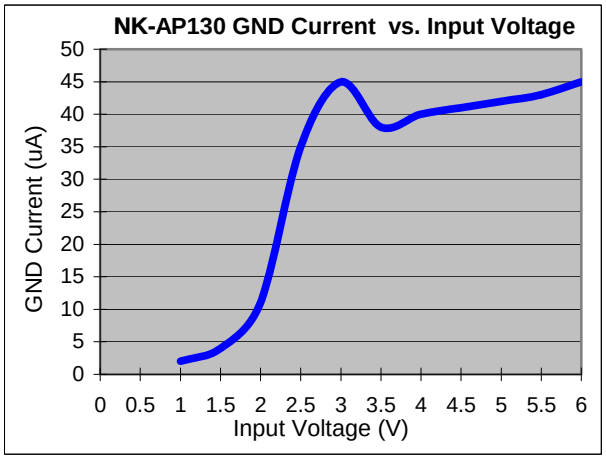
Symbol	Parameter	Conditions	Min	Typ.	Max	Unit
V_{DROP}	Dropout Voltage (Note 2)	I_L = 300mA	-	400	500	mV
I_{LIMIT}	Current Limit (Note 3)	V_{IN} = 5V, V_{OUT} = 0V	350	450	-	mA
I_{short}	Short Circuit Current	V_{OUT} < 1.05V	-	150	300	mA
ΔV_{LINE}	Line Regulation	I_{OUT} = 1mA, V_{IN} = (V_{OUT}+1V) to 5.5V	-	0.1	0.3	%/V
PSRR	Ripple Rejection	F = 100Hz, C_{IN} = 1µF, C_O = 10uF, I_L = 100mA	-	58	-	dB
ΔV_{LOAD}	Load Regulation (Note 4)	I_L = 1~300mA, V_{IN} = 5V	-	30	40	mV
ΔV_{OUT}	Output Voltage Accuracy	I_L = 1mA, V_{IN} = 5V	-2	-	+2	%
	Output Voltage Temperature Coefficient (Note 5)		-	50	150	PPM/ºC
I_Q	Quiescent Current	I_L = 0mA, V_{IN} = 5V	-	50	100	µA
θ_{JA}	Thermal Resistance Junction-to-Ambient	SC59/SC59R (Note 6)	-	250	-	ºC/W
		SOT23 (Note 7)	-	200	-	
		SOT89-3L/SOT89R-3L (Note 8)	-	100	-	
θ_{JC}	Thermal Resistance Junction-to-Case	SC59/SC59R (Note 6)	-	79	-	ºC/W
		SOT23 (Note 7)	-	43	-	
		SOT89-3L/SOT89R-3L (Note 8)	-	23	-	

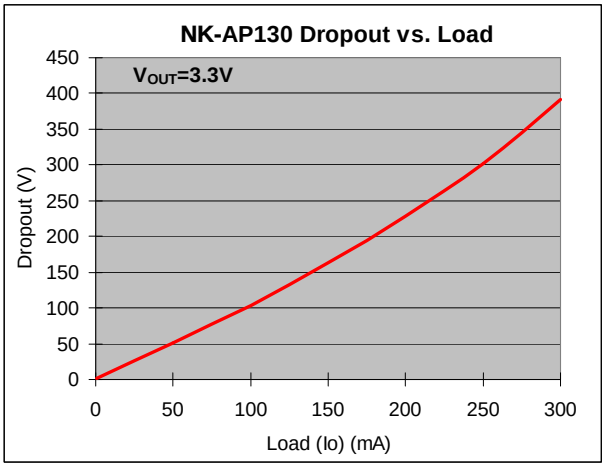
Notes:
2. Dropout voltage is defined as the input to output differential voltage. Dropout is measured at constant junction temperature by using pulsed on time, and the criterion is V_{OUT} inside target value ±2%. This test is skipped at the condition of V_{IN}<3V.
3. Current limit is measured at constant junction temperature by using pulsed testing with a low ON time.
4. Regulation is measured at constant junction temperature by using pulsed testing with a low ON time.
5. Guaranteed by design.
6. Test condition for SC59/SC59R: Devices mounted on FR-4 PC board, 1*MRP, 2oz copper, single sided, calibrate at T_J=125ºC, T_A=25ºC, with minimum recommended pad layout.
7. Test condition for SOT23: Devices mounted on FR-4 PC board, 1*MRP, calibrate at T_J=85ºC, T_A=29ºC.
8. Test condition for SOT89-3L/SOT89R-3L: No Heat Sink, no air flow.

Typical Performance Characteristics







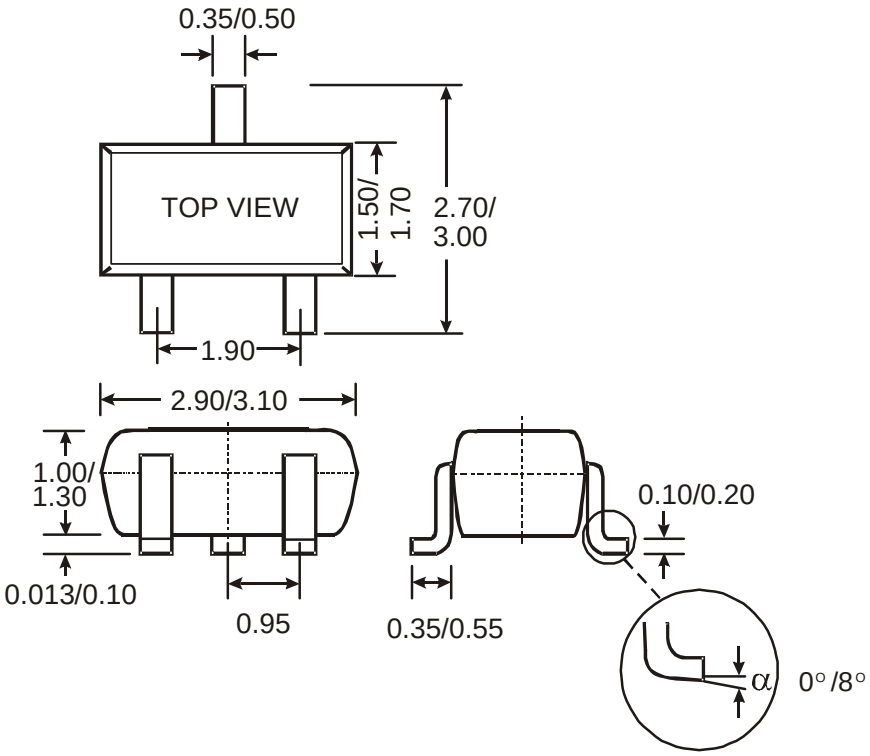


Functional Descriptions

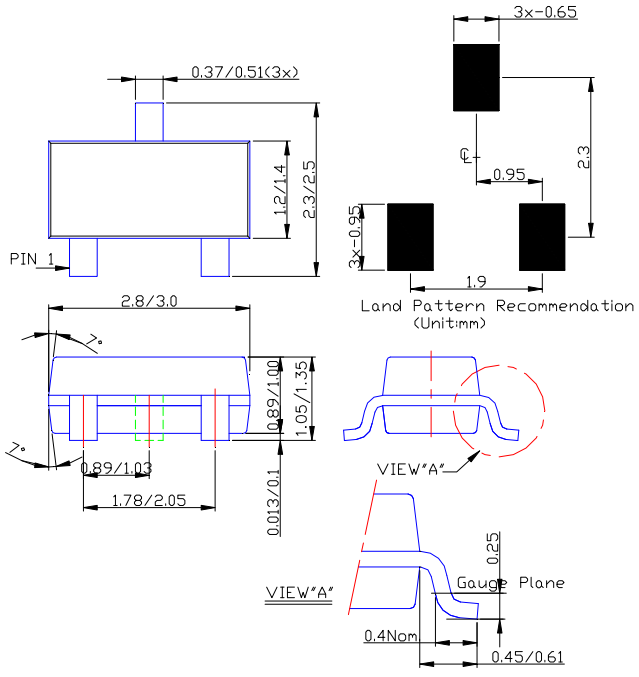
A minimum of 10μF capacitor must be connected from OUT to ground to insure stability. Typically a large storage capacitor is connected from V_{IN} to ground to ensure that the input voltage does not sag below the minimum dropout voltage during the load transient response.

Package Outline Dimensions (All Dimensions in mm)

(1) Package Type: SC59 and SC59R



(2) Package Type: SOT23



Package Outline Dimensions (cont.)

(3) Package Type: SOT89-3L and SOT89R-3L