



# AP131

## 300mA LOW DROPOUT LINEAR REGULATOR WITH SHUTDOWN

### Features

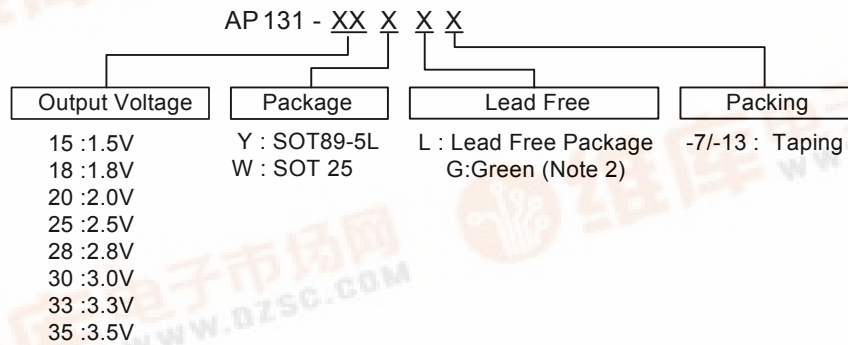
- Input Voltage Range is up to 2.7 to 5.5V
- Dropout Voltage 400mV at 300mA Output Current
- Guaranteed 300mA Output Current
- Internal Ron = 1.5Ω PMOS draws no Base Current
- Low Quiescent Current 50μA
- Output Voltage: 1.5V/1.8V/2.0V/2.5V/2.8V/3.0V/3.3V/3.5V; Accuracy 2%
- Active Low Shutdown Function (EN pin)
- Fast Transient Response
- Good Load Regulation
- Current Limit and Thermal Shutdown Protection
- Short Circuit Current Fold-Back
- **Lead-Free and Green Package:** SOT89-5L is available in Lead-Free only. SOT25 is available in both Lead-Free and Green (Note 1).

### General Description

The AP131 is a 300mA, fixed output voltage, low dropout linear regulator. The Device included pass element, error amplifier, band-gap, current limit and thermal shutdown circuitry. The device is ON when the EN pin is set to logic high level.

The characteristics of low dropout voltage and less quiescent current make it good for some critical current applications, for example, some battery powered devices. The typical quiescent current is approximately 50μA from zero to maximum load. Due to the internal flexible design, it results in extensively fixed output voltage versions and makes it convenient to use for applications. Built-in current-limit and thermal- shutdown functions prevent any fault condition from IC damage. An external capacitor can be connected to the BP pin and reduce the output noise.

### Ordering Information



- Note: 1. RoHS revision 13.2.2003. Glass and High Temperature Solder Exemptions Applied, see *EU Directive Annex Notes 5 and 7*.  
2. Green is only available for SOT 25.

Device	Package Code	Packaging (Note 3)	7" Tape and Reel		13" Tape and Reel	
			Quantity	Part Number Suffix	Quantity	Part Number Suffix
AP131-XXY	Y	SOT89-5L	NA	NA	2500/Tape & Reel	-13
AP131-XXW	W	SOT25	3000/Tape & Reel	-7	NA	NA

- Note: 3. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.

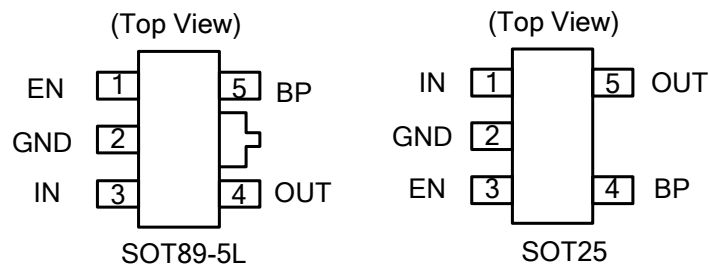
### Applications

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

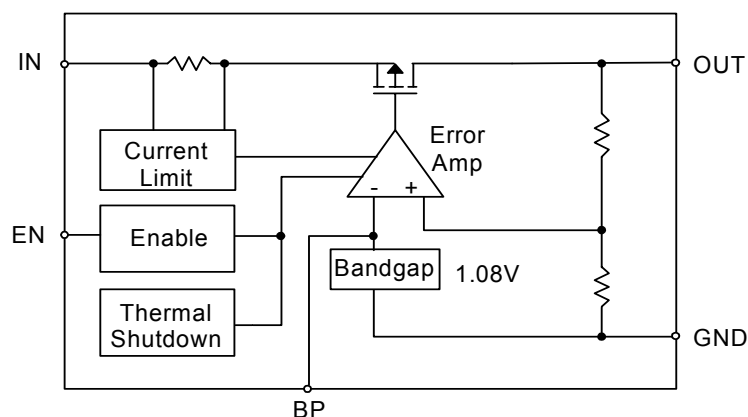
### Pin Description

Name	Description
IN	Input Voltage
GND	Ground
EN	Enable Pin
BP	Band-gap
OUT	Output Voltage

### Pin Assignment



### Block Diagram



### Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
$V_{CC}$	Input Voltage	+6	V
$T_{OP}$	Operating Junction Temperature Range	-40 to +125	°C
$T_{ST}$	Storage Temperature Range	-65 to +150	°C
$P_D$	Power Dissipation, $P_D$ @ $T_A = 25^\circ\text{C}$		
	SOT89-5L	500	mW
	SOT25	250	mW
$\Theta_{JA}$	Package Thermal Resistance		
	SOT89-5L	+100	°C/W
	SOT25	+250	°C/W

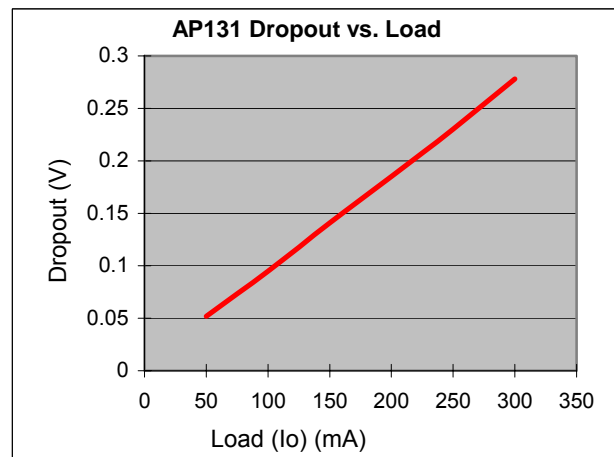
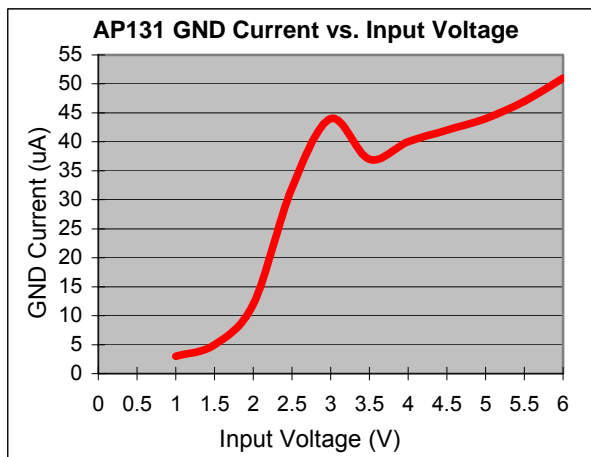
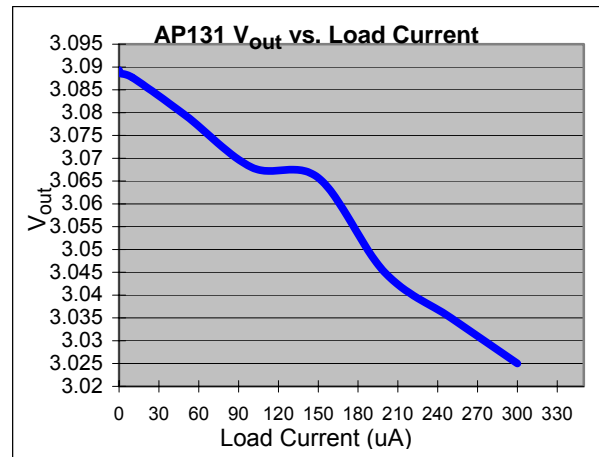
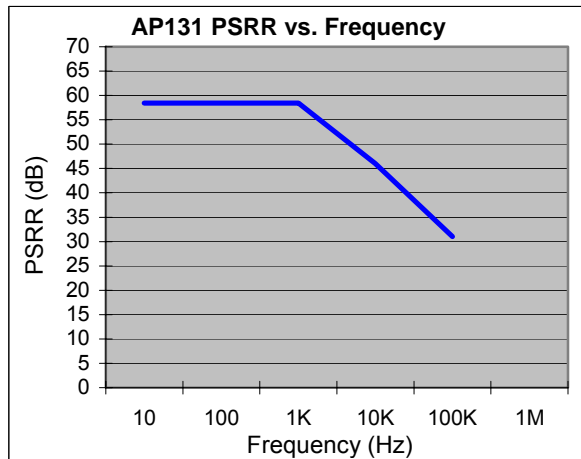
### Electrical Characteristics

$T_A = 25^\circ\text{C}$ ,  $C_{IN} = 1\mu\text{F}$ ,  $C_{OUT} = 10\mu\text{F}$ , unless otherwise specified.

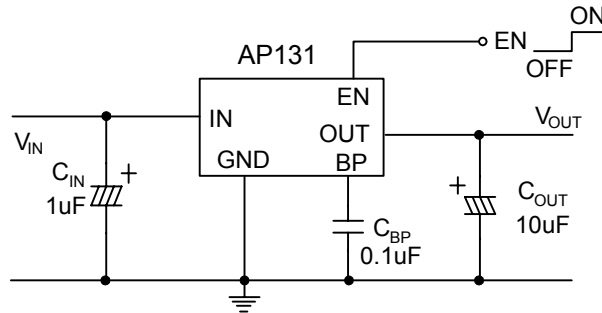
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{DROP}$	Dropout Voltage (Note 4)	$I_L = 300\text{mA}$	-	400	500	mV
$I_{LIMIT}$	Current Limit (Note 5)	$V_{IN} = 5\text{V}$ , $V_{OUT} = 0\text{V}$	350	450	-	mA
$I_{short}$	Short Circuit Current	$V_{OUT} < 1.05\text{V}$	-	150	300	mA
$\Delta V_{LINE}$	Line Regulation	$I_{OUT} = 1\text{mA}$ , $V_{IN} = (V_{OUT} + 1\text{V})$ to 5.5V	-	0.1	0.3	%/V
$\Delta V_{LOAD}$	Load Regulation (Note 6)	$I_L = 1\sim 300\text{mA}$ , $V_{IN} = 5\text{V}$	-	30	35	mV
$\Delta V_{OUT}$	Output Voltage Accuracy	$I_L = 1\text{mA}$ , $V_{IN} = 5\text{V}$	-2	-	+2	%
	Output Voltage Temperature Coefficient (Note 7)		-	50	150	PPM/°C
PSRR	Ripple Rejection	$F = 100\text{Hz}$ , $C_{IN} = 1\mu\text{F}$ , $C_O = 10\mu\text{F}$ , $I_L = 100\text{mA}$	-	60	-	dB
$I_{SB}$	Standby Current	$I_L = 0\text{mA}$ , $V_{IN} = 5\text{V}$ , $EN = 0\text{V}$	-	-	5	μA
$I_Q$	Quiescent Current	$I_L = 0\text{mA}$ , $V_{IN} = 5\text{V}$ , $EN = 5\text{V}$	-	50	100	μA
$I_{EN}$	Enable Pin Current		-	-	< 0.1	μA
$V_{ENON}$	Enable Pin Voltage	Output ON	1.5	-	$V_{IN}$	V
$V_{ENOFF}$		Output OFF	0	-	0.8	V
$T_{DELAY}$	Enable Delay Time	$C_{BP} = 0.1\mu\text{F}$ , $C_{OUT} = 1\mu\text{F}$ , $I_{OUT} = 30\text{mA}$	-	8	-	μS

Note: 4. 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  $\pm 2\%$ . This test is skipped at the condition of  $V_{IN} < 3\text{V}$ .  
 5. Current limit is measured at constant junction temperature by using pulsed testing with a low ON time.  
 6. Regulation is measured at constant junction temperature by using pulsed testing with a low ON time.  
 7. Guaranteed by design.

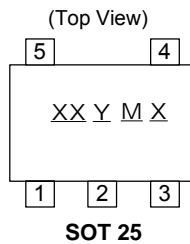
## Typical Characteristics



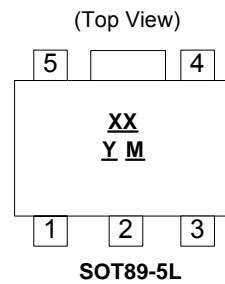
### Typical Application Circuit



### Marking Information



XX : Identification code  
 Y : Year 0~9  
 M : Month A~L  
 X : Blank : Lead Free Package  
 G : Green Package

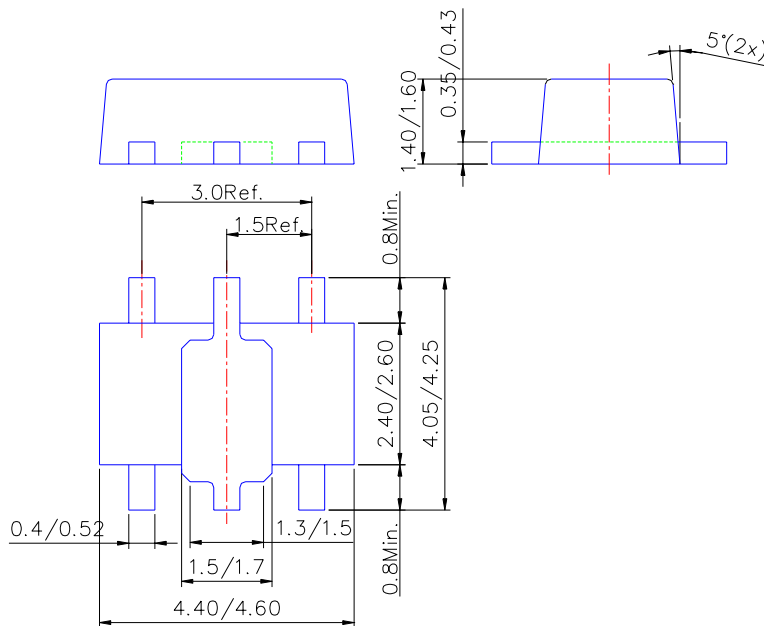


XX : Identification code  
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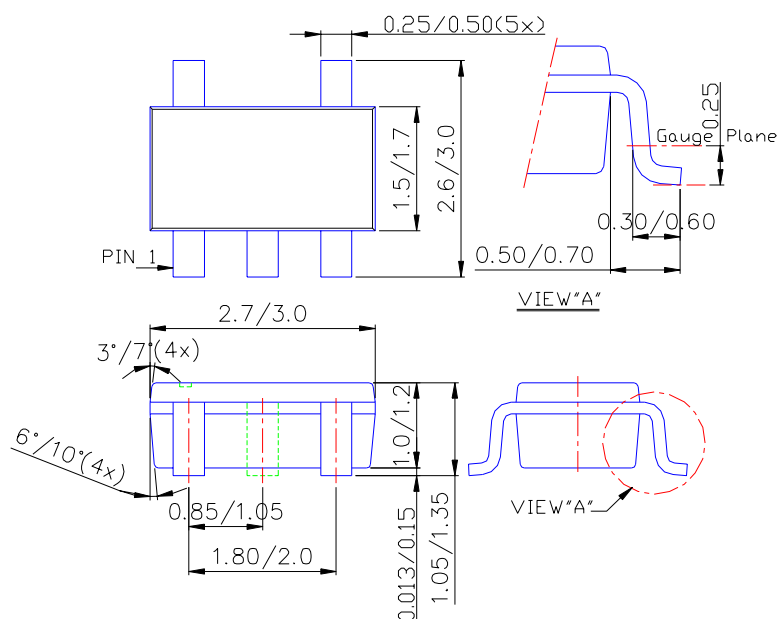
Part Number		Identification Code
SOT25	SOT89-5	
AP131-15W	AP131-15Y	DA
AP131-18W	AP131-18Y	DD
AP131-20W	AP131-20Y	DF
AP131-25W	AP131-25Y	DK
AP131-28W	AP131-28Y	DN
AP131-30W	AP131-30Y	DP
AP131-33W	AP131-33Y	DS
AP131-35W	AP131-35Y	DU

**Package Information** (unit: mm)

**(1) Package Type: SOT89-5L**



**(2) Package Type: SOT25**





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