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

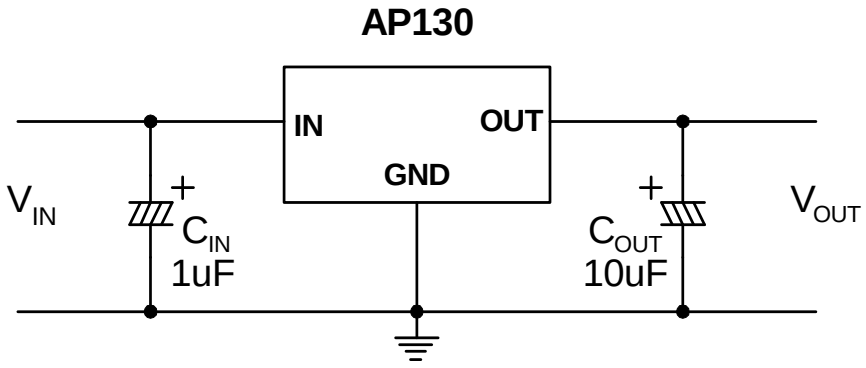
The AP130 is a 300mA, fixed output voltage, low dropout linear regulator. The device includes pass element, error amplifier, band-gap, current-limit and thermal shutdown circuitry. The characteristics of low dropout voltage and less quiescent current make it good for some critical current application, 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.

Notes: 1. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied. Please visit our website at http://www.diodes.com/products/lead_free.html.

Applications

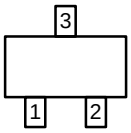
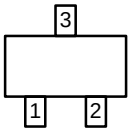
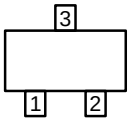
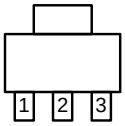
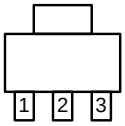
- Battery Powered Device
- CD-ROM, DVD, and LAN Card
- PC Peripheral
- Wireless Communication

Typical Application Circuit



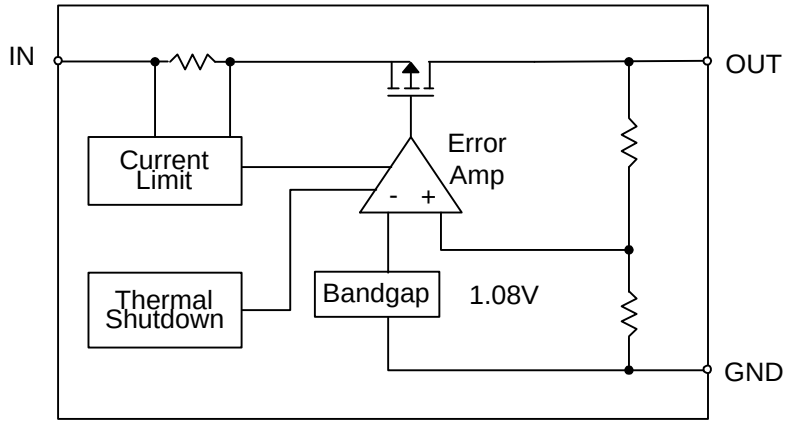
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Pin Assignments

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	

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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

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Electrical Characteristics

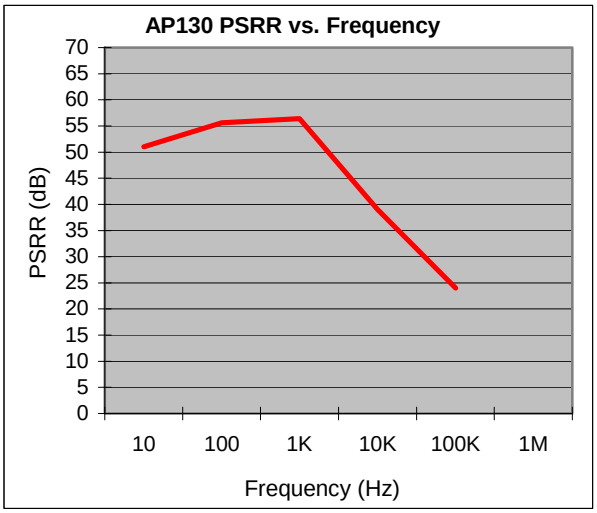
T_A = 25ºC, C_{IN} = 1µF, C_{OUT} = 10µF, unless otherwise specified.

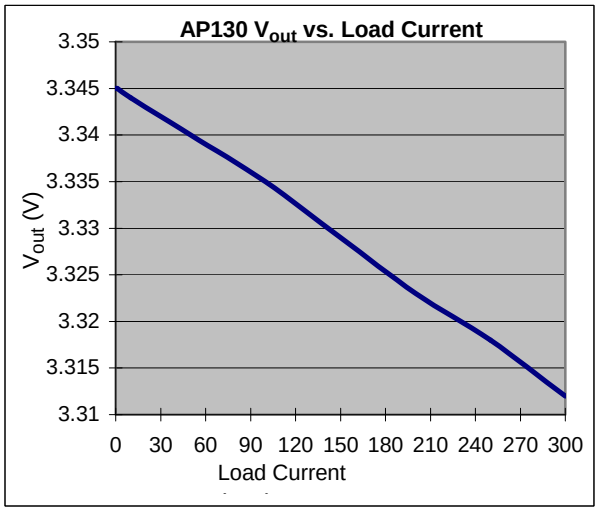
Symbol	Parameter	Conditions	Min	Typ.	Max	Unit
V_{DROP}	Dropout Voltage (Note 2)	I_L = 300mA	-	400	500	mV
I_{LIMIT}	Current Limit (Note 3)	V_{IN} = 5V, V_{OUT} = 0V	350	450	-	mA
I_{short}	Short Circuit Current	V_{OUT} < 1.05V	-	150	300	mA
ΔV_{LINE}	Line Regulation	I_{OUT} = 1mA, V_{IN} = (V_{OUT}+1V) 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	-	

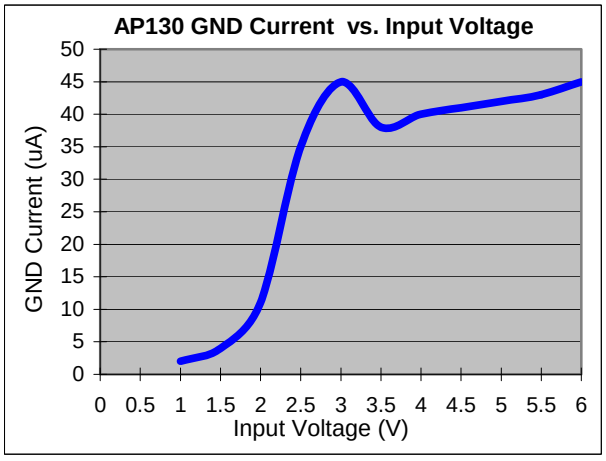
Notes:
2. Dropout voltage is defined as the input to output differential voltage. Dropout is measured at constant junction temperature by using pulsed on time, and the criterion is V_{OUT} inside target value ±2%. This test is skipped at the condition of V_{IN}<3V.
3. Current limit is measured at constant 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.

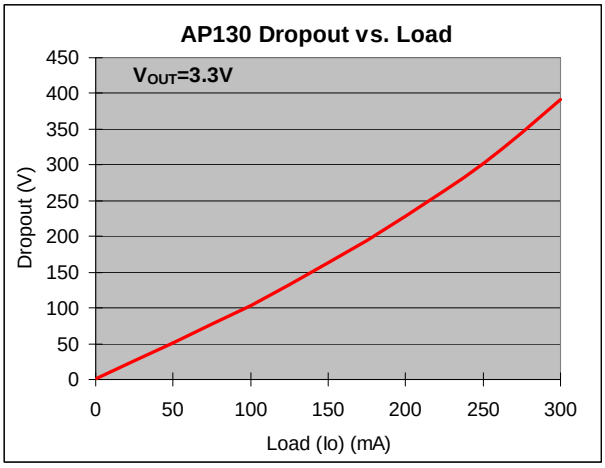
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Typical Performance Characteristics









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.

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Ordering Information

AP 130 - XX XX X - X

Output Voltage	Package	Lead Free	Packing
15 : 1.5V	W : SC59	L : Lead Free	7/13 : Tape & Reel
18 : 1.8V	R : SC59R	G : Green (Note 9)	
20 : 2.0V	SA : SOT23		
25 : 2.5V	Y : SOT89-3L		
28 : 2.8V	YR : SOT89R-3L		
30 : 3.0V			
33 : 3.3V			
35 : 3.5V			

Device	Package Code	Packaging (Note 10)	7"/13" Tape and Reel	
			Quantity	Part Number Suffix
AP130-XXWL-7	W	SC59	3000/Tape & Reel	-7
AP130-XXWG-7	W	SC59	3000/Tape & Reel	-7
AP130-XXRL-7	R	SC59R	3000/Tape & Reel	-7
AP130-XXRG-7	R	SC59R	3000/Tape & Reel	-7
AP130-XXSAG-7	SA	SOT23	3000/Tape & Reel	-7
AP130-XXYL-13	Y	SOT89-3L	2500/Tape & Reel	-13
AP130-XXYG-13	Y	SOT89-3L	2500/Tape & Reel	-13
AP130-XXYRL-13	YR	SOT89R-3L	2500/Tape & Reel	-13
AP130-XXYRG-13	YR	SOT89R-3L	2500/Tape & Reel	-13

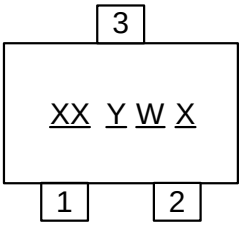
Notes: 9. SOT23 is available in "Green" product only.
10. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf.

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Marking Information

(1) SC59, SC59R and SOT23

(Top View)



XX : Identification code
Y : Year 0~9
W : Week : A~Z : 1~26 week;
a~z : 27~52 week; z represents
52 and 53 week
X : A~Z : Green
a~z : Lead Free

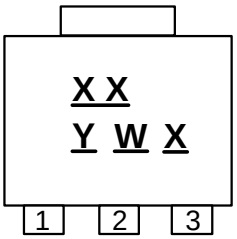
Device	Package (Note 11)	Identification Code
AP130-15W	SC59W	CA
AP130-18W	SC59W	CD
AP130-20W	SC59W	CF
AP130-25W	SC59W	CK
AP130-28W	SC59W	CN
AP130-30W	SC59W	CP
AP130-33W	SC59W	CS
AP130-35W	SC59W	CU
AP130-15R	SC59R	GO
AP130-18R	SC59R	GR
AP130-20R	SC59R	GT
AP130-25R	SC59R	GY
AP130-28R	SC59R	H1
AP130-30R	SC59R	H3
AP130-33R	SC59R	H9
AP130-35R	SC59R	HB
AP130-15SA	SOT23	U2
AP130-18SA	SOT23	U3
AP130-20SA	SOT23	U4
AP130-25SA	SOT23	U5
AP130-28SA	SOT23	U6
AP130-30SA	SOT23	U7
AP130-33SA	SOT23	U8
AP130-35SA	SOT23	U9

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Marking Information (cont.)

(2) SOT89-3L and SOT89R-3L

(Top View)



XX : Identification code
Y : Year : 0~9
W : Week : A~Z : 1~26 week;
a~z : 27~52 week;
z represents 52 and 53 week
X : Internal code
A~Z : Green
a~z : Lead Free

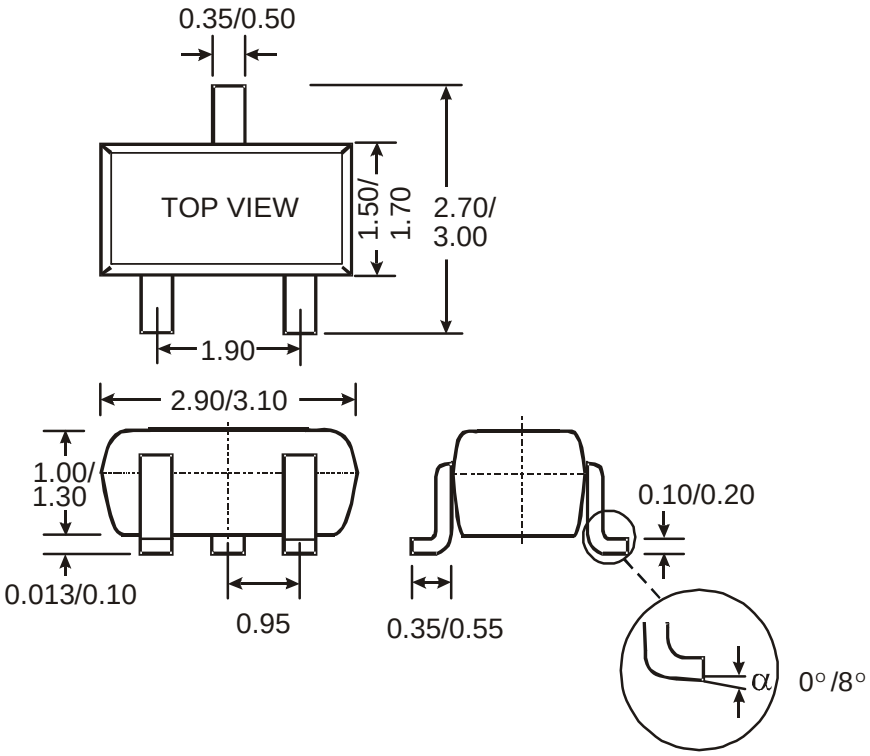
Device	Package (Note 11)	Identification Code
AP130-15Y	SOT89-3L	CA
AP130-18Y	SOT89-3L	CD
AP130-20Y	SOT89-3L	CF
AP130-25Y	SOT89-3L	CK
AP130-28Y	SOT89-3L	CN
AP130-30Y	SOT89-3L	CP
AP130-33Y	SOT89-3L	CS
AP130-35Y	SOT89-3L	CU
AP130-15YR	SOT89R-3L	GO
AP130-18YR	SOT89R-3L	GR
AP130-20YR	SOT89R-3L	GT
AP130-25YR	SOT89R-3L	GY
AP130-28YR	SOT89R-3L	H1
AP130-30YR	SOT89R-3L	H3
AP130-33YR	SOT89R-3L	H9
AP130-35YR	SOT89R-3L	HB

Notes: 11. For Packaging Details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

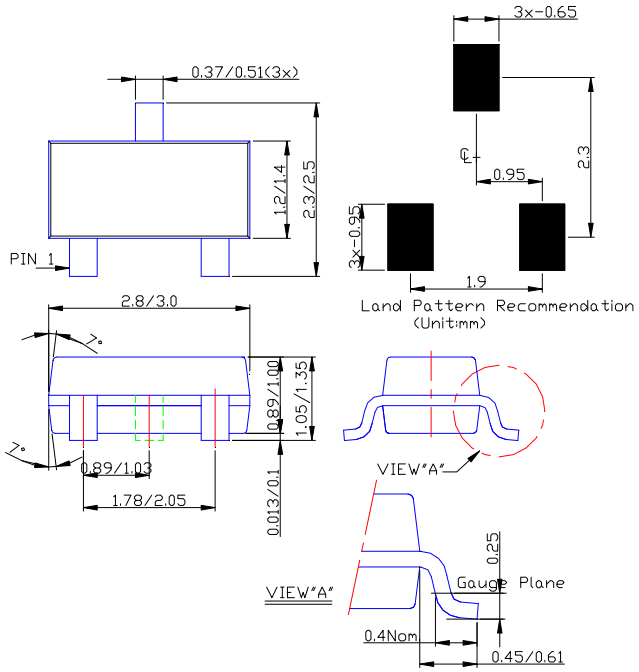
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Package Outline Dimensions (All Dimensions in mm)

(1) Package Type: SC59 and SC59R



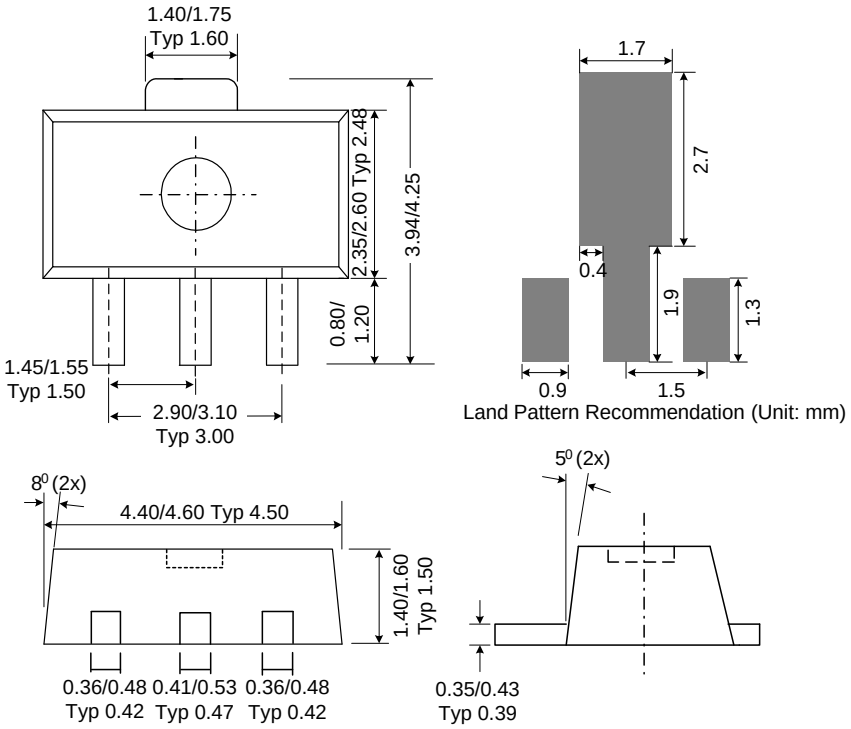
(2) Package Type: SOT23



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Package Outline Dimensions (cont.)

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



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