



## New Product Announcement

### AP431S AS431H

## Expanded 2.495V Shunt Regulator Families plus Extremely Low Minimum Operating Current

Diodes has expanded its shunt regulator family with the AS431H and the AP431S.

The AS431H is a 2.495V version of its popular AS431 (2.5V  $V_{ref}$ ) shunt regulator.

The AP431S is an extremely low, minimum cathode, current shunt regulator, available in both 2.495V and 2.5V reference voltages.

The AP431S has the same electrical specifications as the industry standard '431, however its typical minimum cathode current is only 50 $\mu$ A (1/8 of the TL431), making it ideal for applications such as offline power supplies, adapters and other adjustable regulators that require very low power consumption.

AP431S and AS431H are offered in two initial voltage tolerance grades of 0.5% and 1%.



### The Diodes Advantage

#### The AP431S Provides a Cost-effective Solution for Low Standby Power Consumption "Green" Applications.

- **SOT23 and TO92 packages**  
Industry standard packages and pin outs (SOT23 in TL431 and TL432 pinouts)
- **Both 2.5V and 2.495V (H) reference voltage options**  
Provide true direct replacement for '431 type shunt regulators with minimal component change
- **AP431S has low minimum operating current ( $I_{Kmin}$ )**  
Minimizes operating current, reducing power consumption, especially during light or no loads
- **Better deviation of reference voltage over full temperature range**  
Low output variation over temperature

### Applications

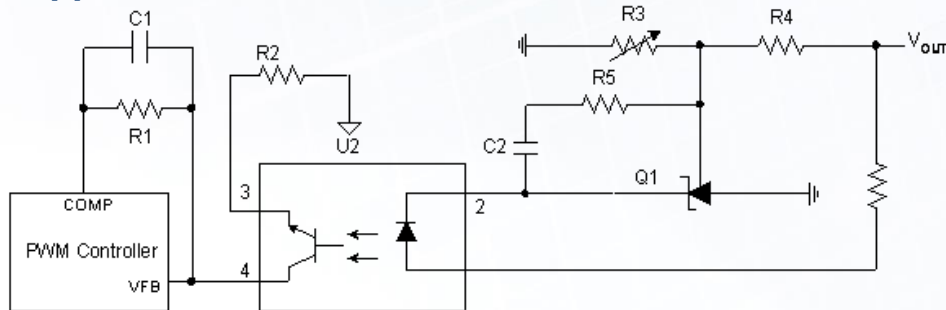
- Adapters
- Chargers
- Precision voltage references
- Isolated Power supplies



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## AP431S AS431H

### Typical Application Schematic: SMPS



### Focus Shunt Regulators

Part Number	Reference Voltage (V)	Accuracy (%)	Maximum Input Voltage (V)	Sink Current (mA)	Minimum Cathode Current for Regulation Typ ( $\mu$ A)	Maximum Slope Resistance ( $\Omega$ )	Operating Ambient Temperature Range ( $^{\circ}$ C)	Package Outlines
AP431S	2.5	0.5; 1	36	0.1 to 100	50	0.3	-40 to 125	SOT23; SOT89; TO92
AP431SH	2.495							
AS431	2.5	0.5; 1	36	1 to 100	400	0.5	-40 to 125	SOT23; SOT25; SOT89; TO92
AS431H	2.495							SOT23; TO92
ZTL431Q/2Q	2.5	0.5; 1	20	1 to 100	400	0.5	-40 to 125	SOT23; SOT23F; SOT25
AZ431L	1.24	0.5; 1	18	0.1 to 100	55	0.15	-40 to 125	SOT23; SOT25; SOT89; TO92
TLV431Q	1.24	0.5; 1	18	0.1 to 15	55	0.4	-40 to 125	SOT23; SOT25

ZTL431Q, ZTL432Q and TLV431Q are Automotive Compliant supporting PPAP documentation.

### AP431S and AS431H Ordering Information

Part Number	V <sub>REF</sub>	V <sub>REF</sub> Tolerance	Min I <sub>k</sub> (Typ)	Package	SOT23 Pinout	Temperature Range ( $^{\circ}$ C)	Marking ID	Packing	
AP431SANTR-G1	2.5V	0.5%	50 $\mu$ A	SOT23	"TL432"	-40 to +125	GCA	3000/Tape & Reel	
AP431SBNTR-G1		1.0%					GCB		
AP431SAN1TR-G1		0.5%			"TL431"		GCC		
AP431SBN1TR-G1		1.0%					GCF		
AP431SARTR-G1		0.5%		TO92	N/A	-40 to +125	G33M	1000/Tape & Reel	
AP431SBRTR-G1		1.0%					G33R		
AP431SAZTR-G1		0.5%					AP431SAZ-G1 AP431SBZ-G1		2000/Ammo
AP431SBZTR-G1		1.0%							
AP431SHANTR-G1	2.495V	0.5%	400 $\mu$ A	SOT23	"TL432"	-40 to +125	GCD	3000/Tape & Reel	
AP431SHBNTR-G1		1.0%					GCG		
AP431SHAN1TR-G1		0.5%			"TL431"		GCE		
AP431SHBN1TR-G1		1.0%					GCH		
AP431SHARTR-G1		0.5%		TO92	N/A	-40 to +125	G37M	1000/Tape & Reel	
AP431SHBRTR-G1		1.0%					G33S		
AP431SHAZTR-G1		0.5%					AP431SHAZ-G1 AP431SHBZ-G1		2000/Ammo
AP431SHBZTR-G1		1.0%							
AS431HANTR-G1	2.495V	0.5%	400 $\mu$ A	SOT23	"TL432"	-40 to +125	GJA	3000/Tape & Reel	
AS431HBNTR-G1		1.0%					GJB		
AS431HMANTR-G1		0.5%					"TL431"		GM5
AS431HMBNTR-G1		1.0%							GM6
AS431HAZTR-G1		0.5%		TO92	N/A	-40 to +125	431HAZ-G1 431HBZ-G1	2000/Ammo	
AS431HBZTR-G1									1.0%