



Adjustable Shunt Regulator

可调节式稳压管

TL431A

产品特性 Features

可编程输出电压到 36V Programmable output voltage to 36V
低输出阻抗 0.2 Ω Low dynamic output impedance 0.2 Ω
输出噪声电压低 Low output noise voltage
响应速度快 Fast turn on response
超过额定温度范围的温度补偿 Temperature compensated for operation over full rated operating temperature range

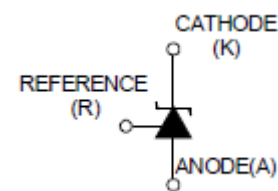
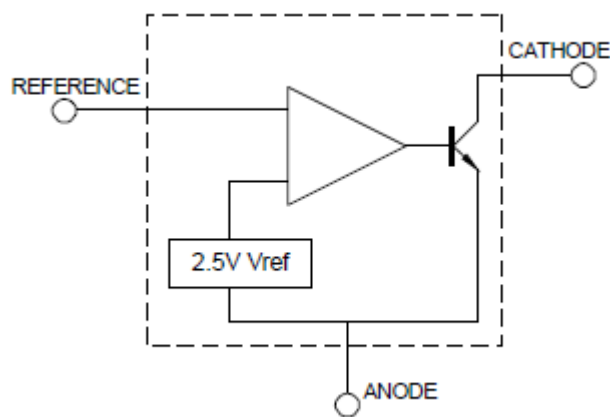
封装形式 Package



1 2 3

1:R 2:A 3:K

方框图 Block diagram



绝对最大额定值 Absolute Maximum Rating ($T_a = 25^\circ\text{C}$ unless otherwise noted)

Parameter 项目	Symbol 符号	Limit 极限值	Unit
输入电压 Input Voltage	V _{KA}	37	V
功率损耗 Power Dissipation	P _D	770	mW
工作温度 Operating Temperature	T _{opr}	-40~+85	°C
存储温度 Storage Temperature Range	T _{STG}	-65~+150	°C
阴极电压 Cathode Voltage	V _{KA}	V _{REF} ~36	V
阴极电流 Cathode Current	I _{KA}	0.5~100	mA

电参数特性 Electrical Characteristics

($T_a=25^{\circ}\text{C}$, unless otherwise specified.)

Parameter 项目	Symbol 符号	Test Condition 测试条件	Min 最小值	Typ 典型值	Max 最大值	Unit 单位	
参考输入电压 Reference Input voltage	V_{REF}	$V_{KA}=V_{REF}, I_{KA}=10\text{mA}$	2.445	2.5	2.55	V	
参考输入电压的温度变化率 Deviation of reference input voltage over temperature	$\Delta V_{REF}/\Delta T$	$V_{KA}=V_{REF}, I_{KA}=10\text{mA}$ $T_{MIN} \leq T_a \leq T_{MAX}$	-	4.5	25	mV	
参考输入电压与阴极电压的变化率 Ratio of change in reference input voltage to the change in cathode voltage	$\Delta V_{REF}/\Delta V_{KA}$	$I_{KA}=10\text{mA}$	$\Delta V_{KA}=10\text{V} \sim V_{REF}$	-	-1.0	-2.7	mV/V
			$\Delta V_{KA}=36\text{V} \sim 10\text{V}$	-	-0.5	-2.0	
参考输入电流 Reference input current	I_{REF}	$I_{KA}=10\text{mA}, R_1=10\text{K}\Omega, R_2=\infty$	--	1	2	μA	
参考输入电流的温度变化率 Deviation of reference input current over full temperature range	$\Delta I_{REF}/\Delta T$	$I_{KA}=10\text{mA}, R_1=10\text{K}\Omega, R_2=\infty,$ $T_a=\text{full Temperature}$	-	0.2	0.4	μA	
最小阴极电流 Minimum cathode current for regulation	$I_{KA}(\text{MIN})$	$V_{KA}=V_{REF}$	-	0.3	0.5	mA	
关态阴极电流 Off-stage cathode current	$I_{KA}(\text{OFF})$	$V_{KA}=36\text{V}, V_{REF}=0$	-	40	-	μV	
动态阻抗 Dynamic impedance	Z_{KA}	$V_{KA}=V_{REF}, I_{KA}=1\text{ to }100\text{mA} \quad f \leq 1\text{kHz}$	-	0.15	0.5	Ω	

典型特性曲线 Typical performance characteristics

Fig 1 Cathode Current Vs Cathode Voltage

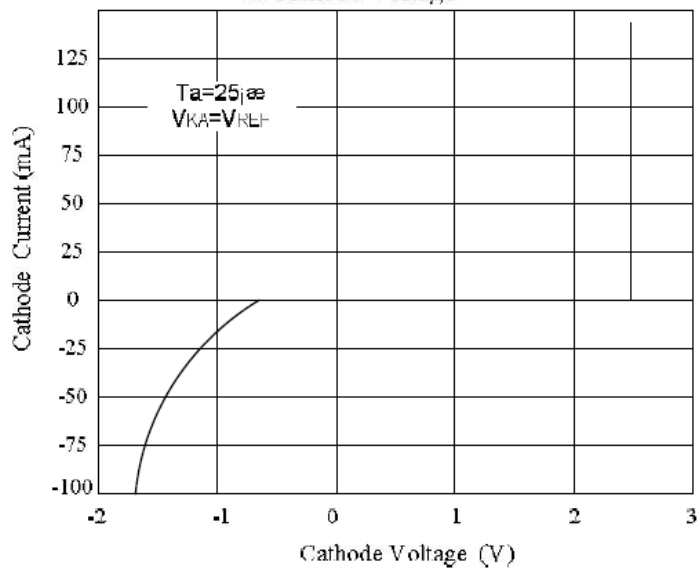


Fig 2 Cathode Current Vs Cathode Voltage

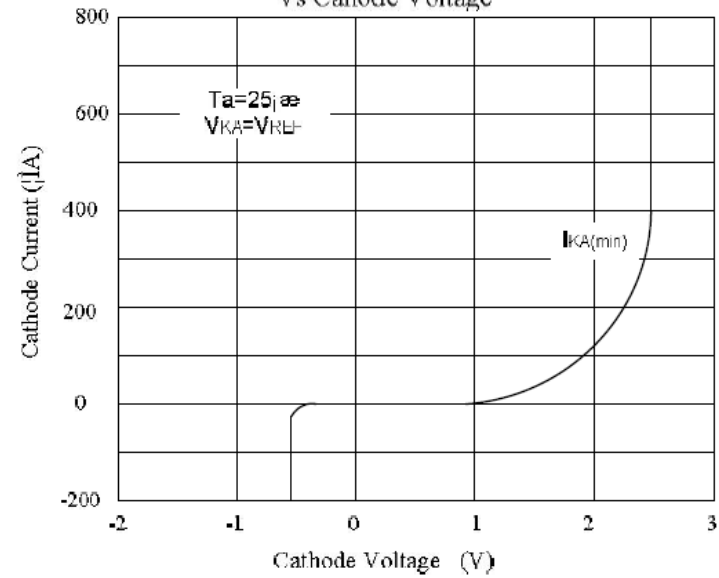


Fig 3 Change in Reference Input Voltage Vs Cathode voltage

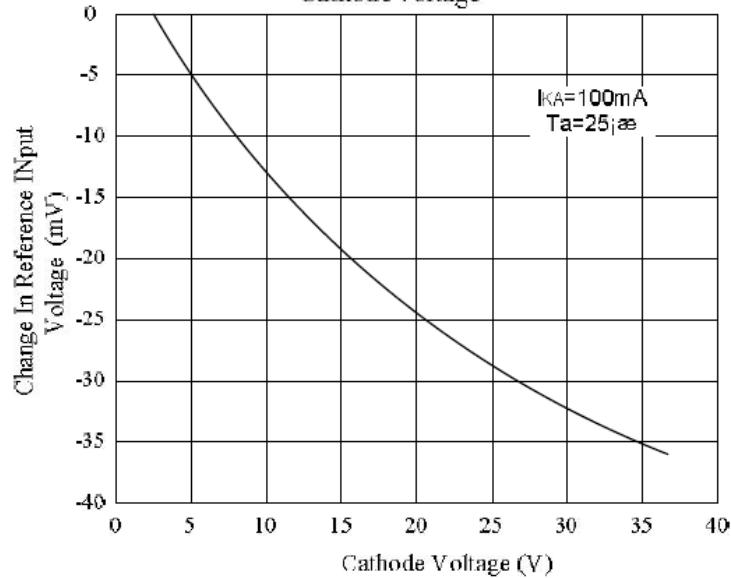
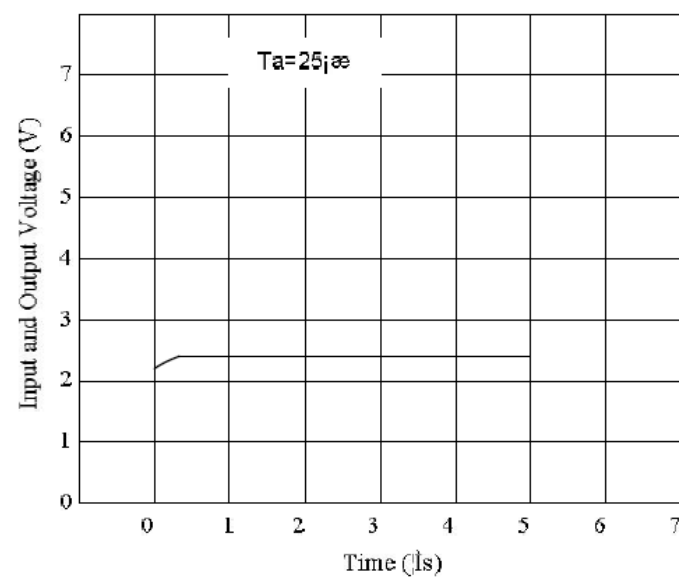
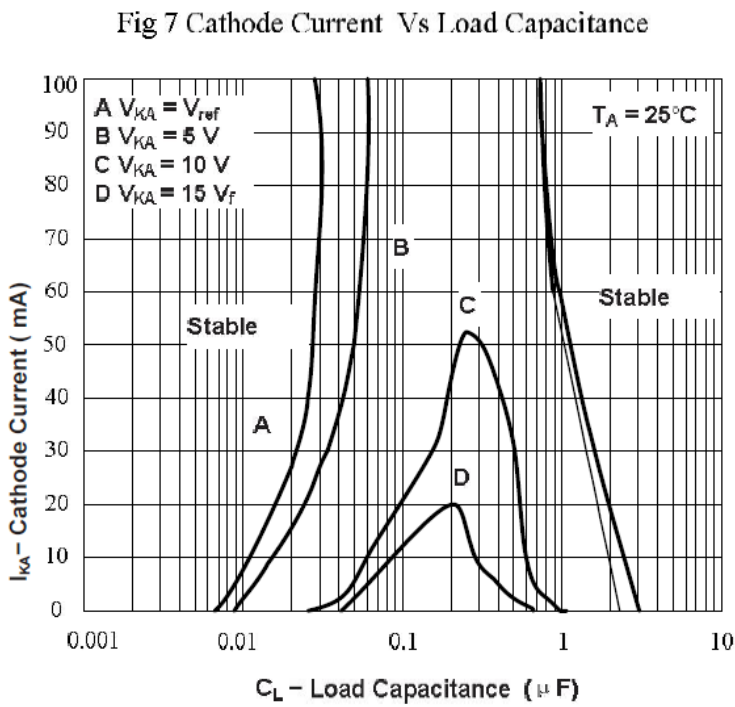
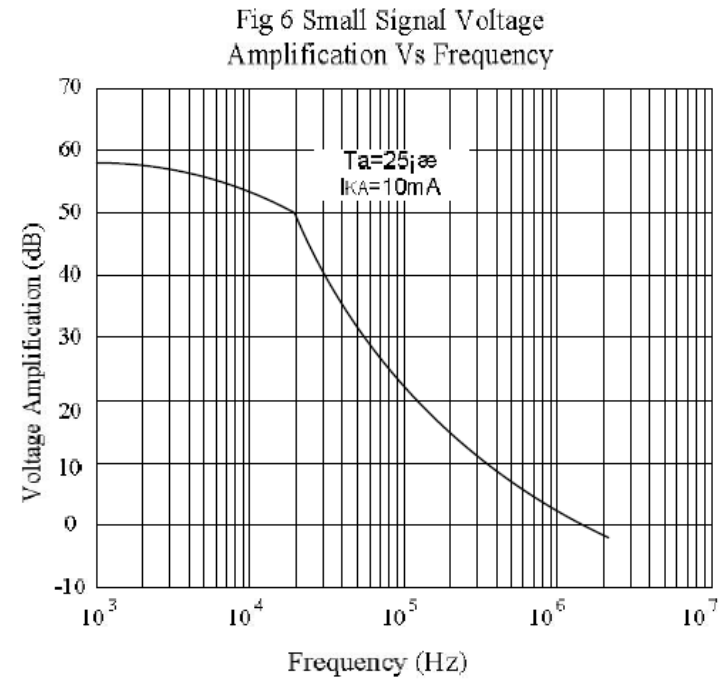
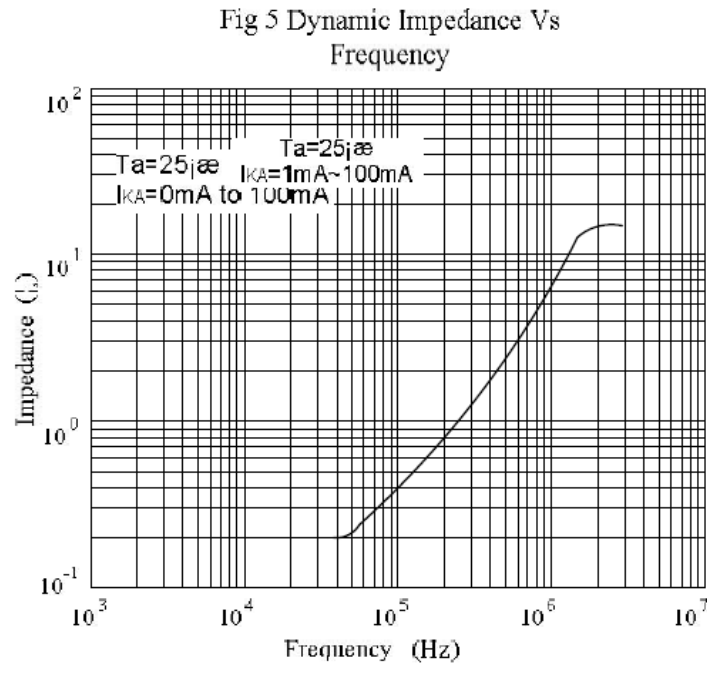


Fig 4 Pulse Response





测试电路 Test Circuits

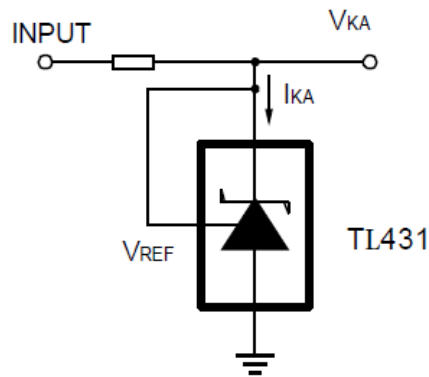


Fig 8 Test Circuit For $V_{KA}=V_{REF}$

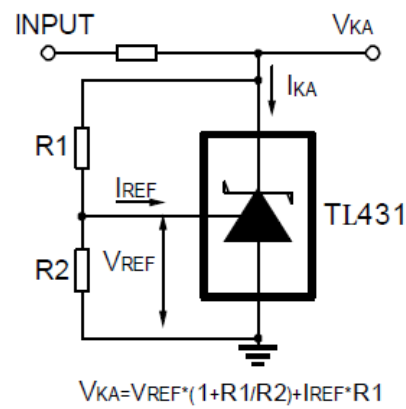


Fig 9 Test Circuit for $V_{KA} \geq V_{REF}$

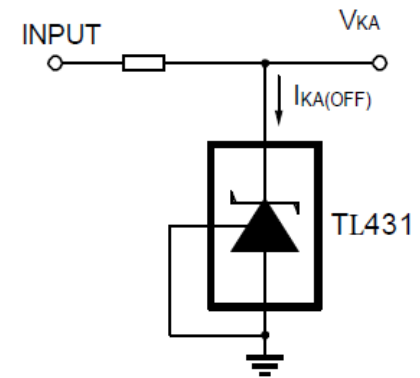
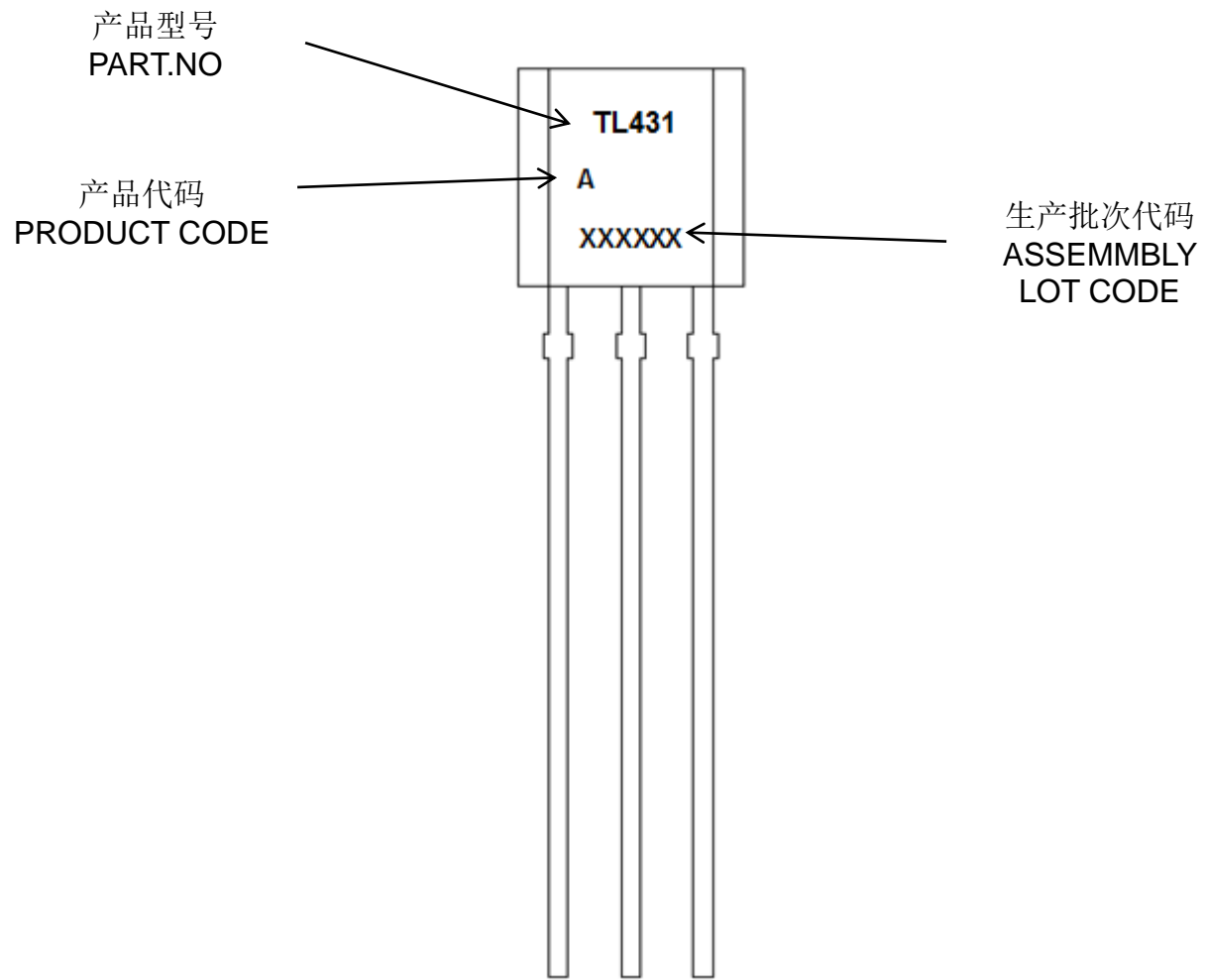


Fig 10 Test Circuit For $I_{KA(OFF)}$

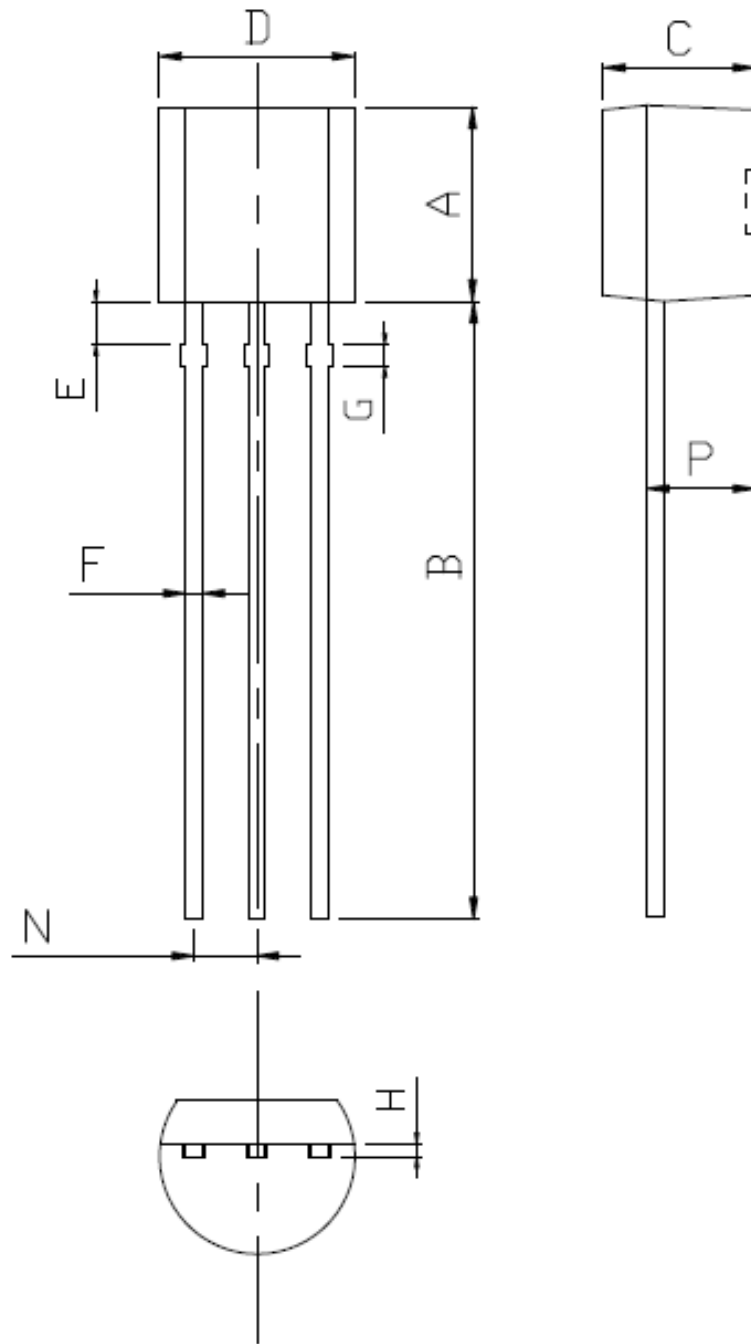
印记 Marking:



外形尺寸:

Package Dimension:

TO-92



DIM	MILLIMETERS
A	4.55+0.20
B	14.50±0.30
C	3.54±0.20
D	4.56±0.20
E	1.30±0.20
F	0.46±0.20
G	0.50±0.10
H	0.32±0.10
N	1.30±0.20
P	2.52±0.20

(Unit: mm)