

/ Descriptions

Precision adjustable shunt regulator in a SOT-23 Plastic Package.

/ Features

Precise reference voltage to 2.495V;guaranteed 0.5%,1% or 2% reference voltage Tolerance; sink current capability,1.0mA~100mA;quick turn-on; adjustable Output voltage, $V_O=V_{ref}\sim 36V$;low operational cathode current,50 μA typical; 0.15 Ω typical output impedance, Qualified to AEC-Q100 Standards for High Reliability, HF Product.

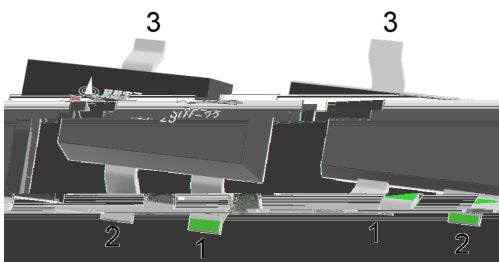
/ Applications

Linear regulators, adjustable power supply, switching power supply, Meet the stringent requirements of automotive applications.

/ Equivalent Circuit



/ Pinning



PIN1 R

PIN 2 K

PIN 3 A

/ Marking

Marking

Q431

/ Absolute Maximum Ratings($T_a=25^\circ\text{C}$)

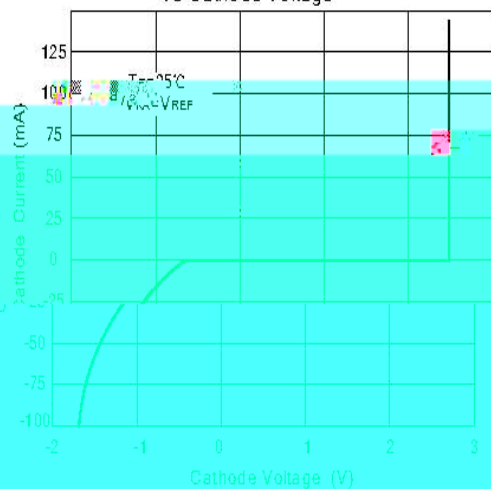
Parameter	Symbol	Rating	Unit
Cathode to Anode Voltage	V_{KA}	37	V
Cathode Current Range, Continuous	I_K	-100~+100	mA
Reference Input Current Range, Continuous	I_{REF}	0.05~+10	mA
Power Dissipation	P_D	370	mW
Operating Ambient Temperature	T_{amb}	-40~125	$^\circ\text{C}$
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65~150	$^\circ\text{C}$

/ Electrical Characteristics($T_a=25^\circ\text{C}$)

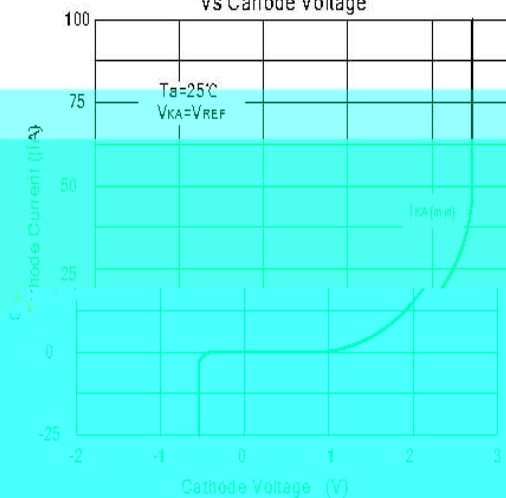
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Reference Input Voltage	V_{REF}	$V_{KA}=V_{REF}$ $I_K=10\text{mA}(A=0.5\%)$	2.483	2.495	2.507	V
		$V_{KA}=V_{REF}$ $I_K=10\text{mA}(B=1\%)$	2.470	2.495	2.520	V
		$V_{KA}=V_{REF}$ $I_K=10\text{mA}(2\%)$	2.445	2.495	2.545	V
Deviation of Reference Input Voltage Over-Temperature	$\Delta V_{REF} / \Delta T$	$V_{KA}=V_{REF}$ $I_K=10\text{mA}$ $T_A=-40\sim 125^\circ\text{C}$		4.5	25	mV
Ratio of Change in Reference Input Voltage to the Change in Cathode Voltage	$\Delta V_{REF} / \Delta V_{KA}$	$I_K=10\text{mA}$, $\Delta V_{KA}=10\text{V to } V_{REF}$		-1	-2.7	mV/V
		$I_K=10\text{mA}$, $\Delta V_{KA}=36\text{V to } 10\text{V}$		-0.5	-2.0	mV/V
Reference Input Current	I_{REF}	$I_K=10\text{mA}$ $R_1=10\text{K}\Omega$ $R_2=\text{open}$		0.8	1.0	μA
Deviation of Reference Input Current Over Full Temperature Range	$\Delta I_{REF} / \Delta T$	$I_K=10\text{mA}$ $R_1=10\text{K}\Omega$ $R_2=\text{open}$ $T_A=-40\sim 125^\circ\text{C}$		0.4	1.2	μA
Minimum Cathode Current for Regulation	$I_{K(\min)}$	$V_{KA}=V_{REF}$		0.05	0.08	mA
Off-state cathode current	$I_{K(\text{off})}$	$V_{KA}=36\text{V}$ $V_{REF}=0\text{V}$		0.05	1.0	μA
Dynamic Impedance	$ Z_{KA} $	$V_{KA}=V_{REF}$ $f \leq 1.0\text{KHz}$ $I_K=1\text{mA to } 100\text{mA}$		0.15	0.5	Ω

/ Electrical Characteristic Curve

**Fig 1 Cathode Current
Vs Cathode Voltage**



**Fig 2 Cathode Current
Vs Cathode Voltage**



**Fig 3 Change in Reference Input Voltage
Vs Cathode voltage**

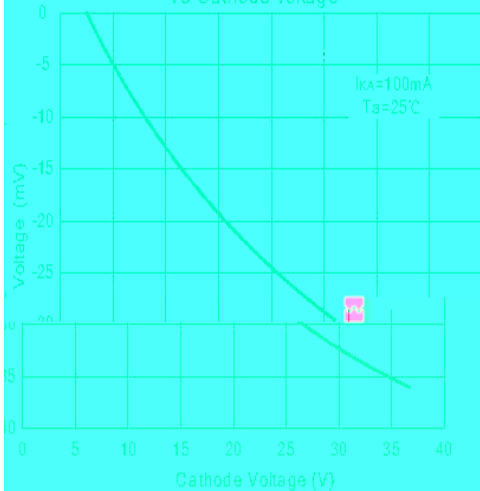
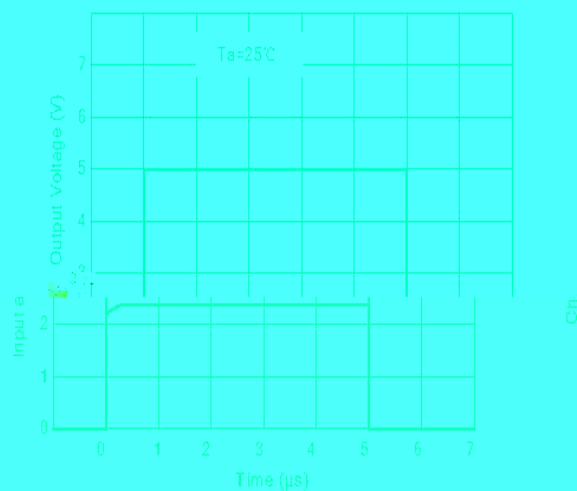
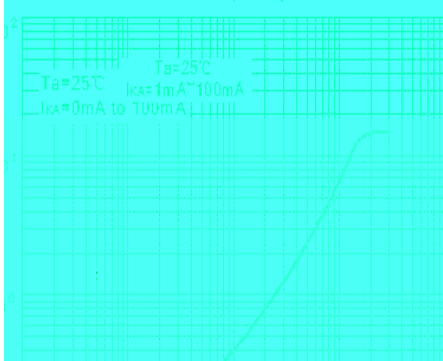


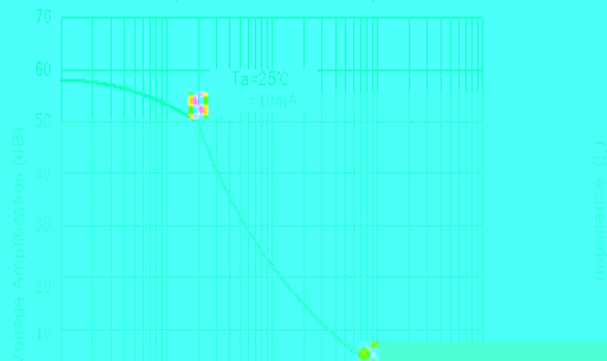
Fig 4 Pulse Response



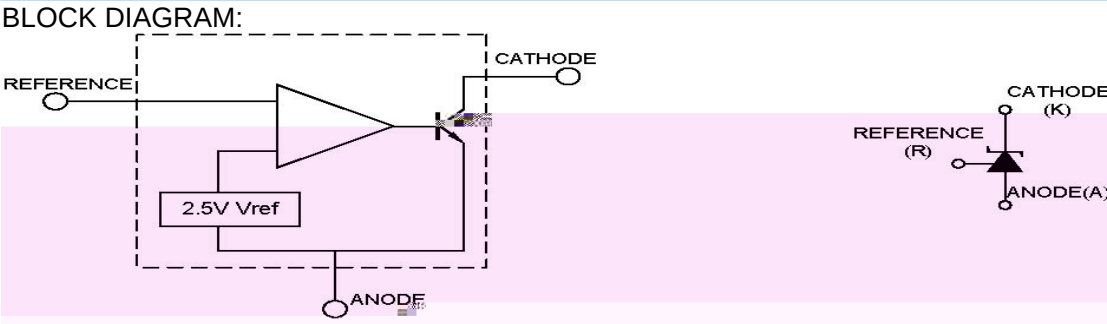
**Fig 5 Dynamic Impedance
Vs Frequency**



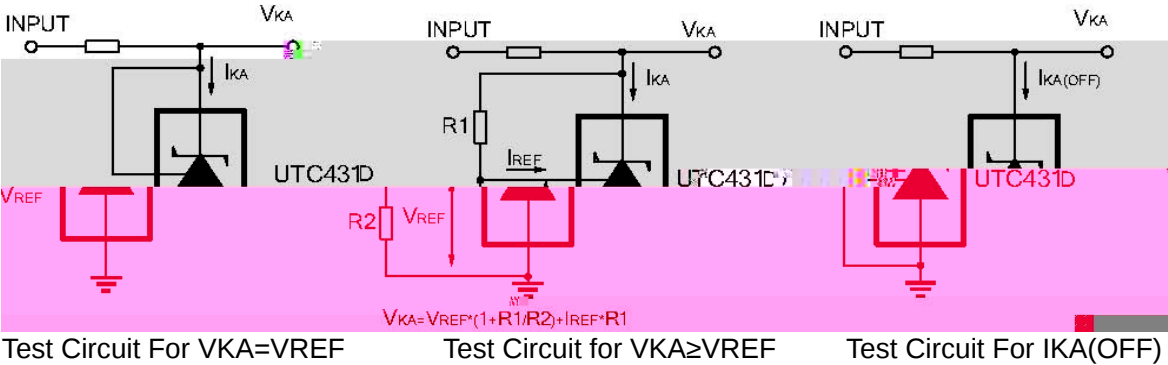
**Fig 6 Small Signal Voltage
Amplification Vs Frequency**



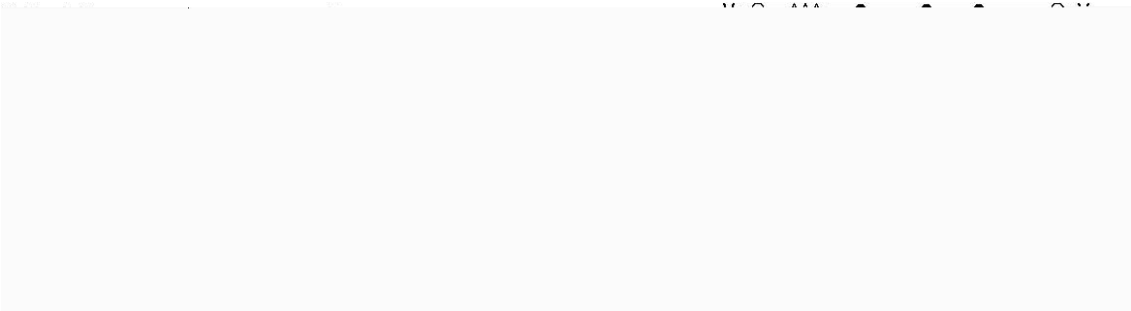
& Test circuits&Typical Application



TEST CIRCUITS:



TYPICAL APPLICATION:



Shutdown R Tw.()Tj 10633.5 2.9()-2177 500.0.00FF)

/ **Marking Instructions**



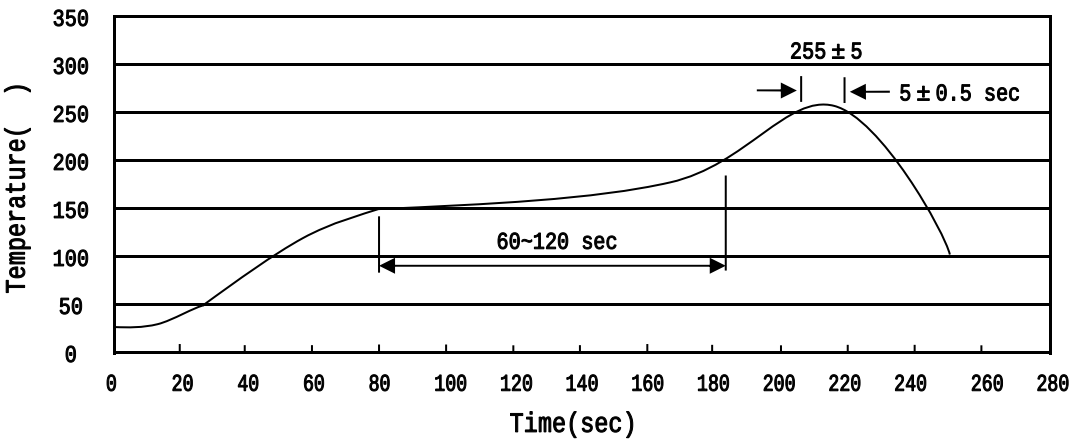
Q

Note:

Q: Automobile halogen-free product Code

431: Product Type

() / Temperature Profile for IR Reflow Soldering(Pb-Free)



Note:

- 1

150 200

60 120sec;

1.Preheating:150~200 , Time:60~120sec.
- 2

255 5

5 0.5sec;

2.Peak Temp.:255 5 , Duration:5 0.5sec.
- 3

2 10 /sec.

3. Cooling Speed: 2~10 /sec.

/ Resistance to Soldering Heat Test Conditions

260 5 10 1 sec. Temp.:260±5 Time:10±1 sec

/ Packaging SPEC.

/ REEL

Package Type	Units					Dimension (unit mm ³)		
	Units/Reel	Reels/Inner Box	Units/Inner Box	Inner Boxes/Outer Box	Units/Outer Box	Reel	Inner Box	Outer Box
SOT-23	3,000	10	30,000	6	180,000	7" ×8	180×120×180	390×385×205

/ Notices