/ Descriptions

SOT-23

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

/ Features

2.495V; 0.5%,1% 2%; 1.0mA 100mA; ;
$V_O=V_{ref}$ 36V; (:50μA); (:0.15Ω)

AEC-Q100

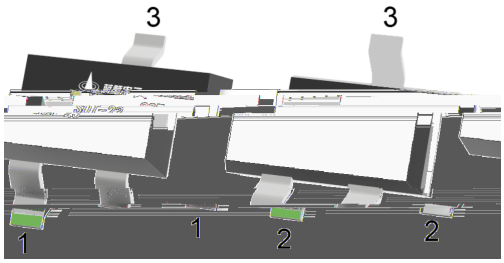
Precise reference voltage to 2.495V;guaranteed 0.5%,1% or 2% reference voltage Tolerance; sink current capability,1.0mA～100mA;quick turn-on; adjustable Output voltage, $V_O=V_{ref}$～36V;low operational cathode current,50 A typical; 0.15 typical output impedance, Qualified to AEC-Q100 Standards for High 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(Ta=25)

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	℃
Junction Temperature	T_j	150	℃
Storage Temperature Range	T_{stg}	-65～150	℃

/ Electrical Characteristics(Ta=25)

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

/ Electrical Characteristic Curve

Fig 1 Cathode Current Vs Cathode Voltage

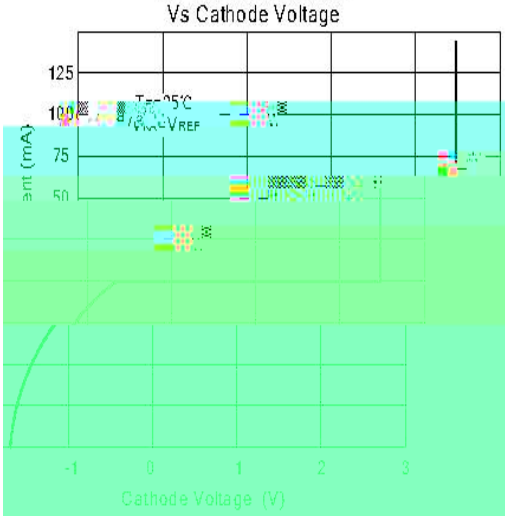


Fig 2 Cathode Current Vs Cahode Voltage

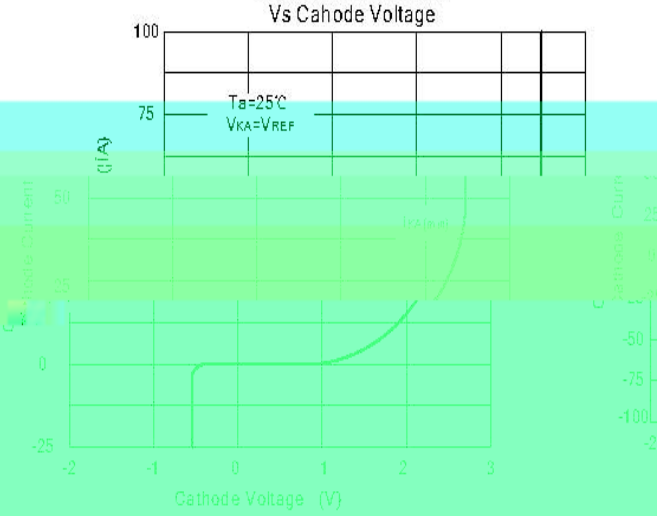


Fig 3 Change in Reference Input Voltage Vs Cathode voltage

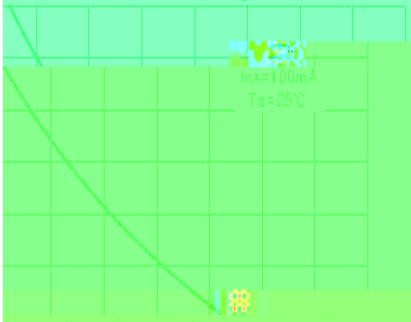
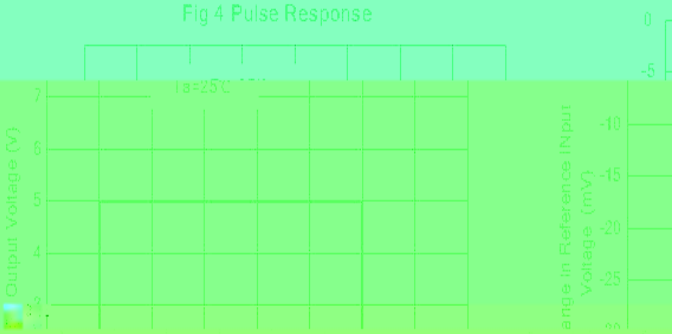
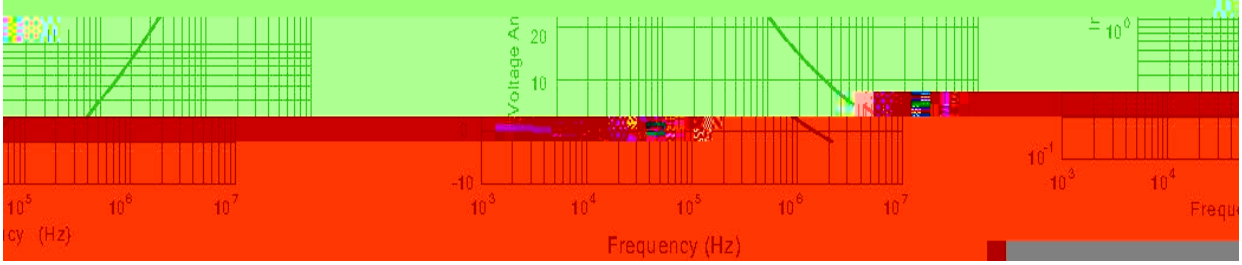


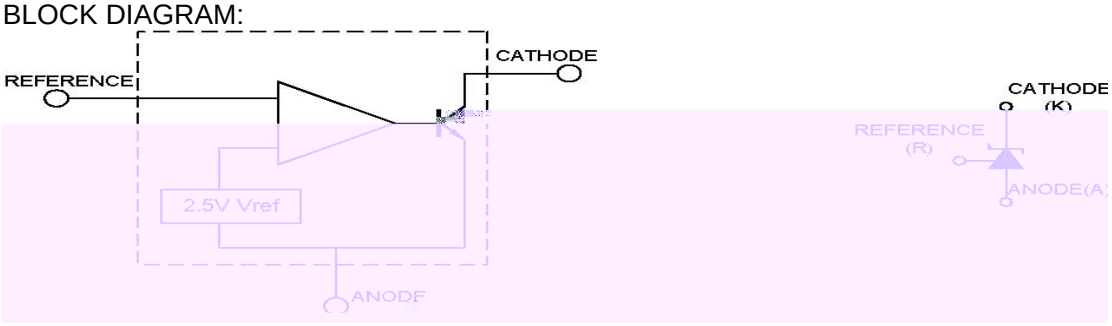
Fig 4 Pulse Response



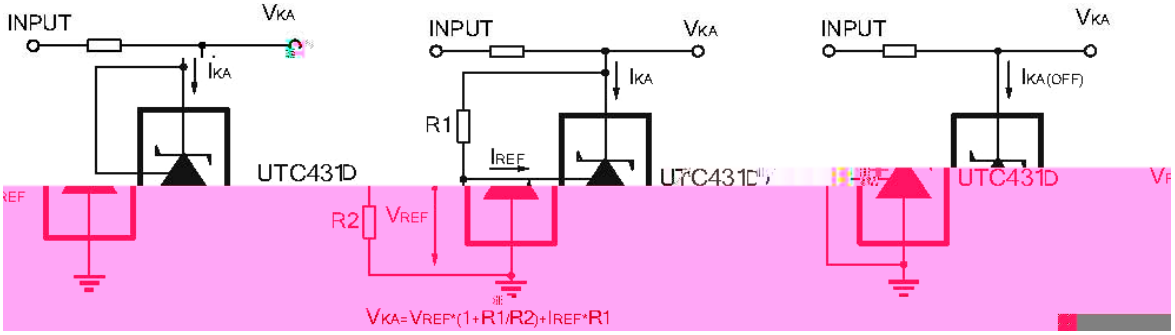


& Test circuits&Typical Application

BLOCK DIAGRAM:



TEST CIRCUITS:



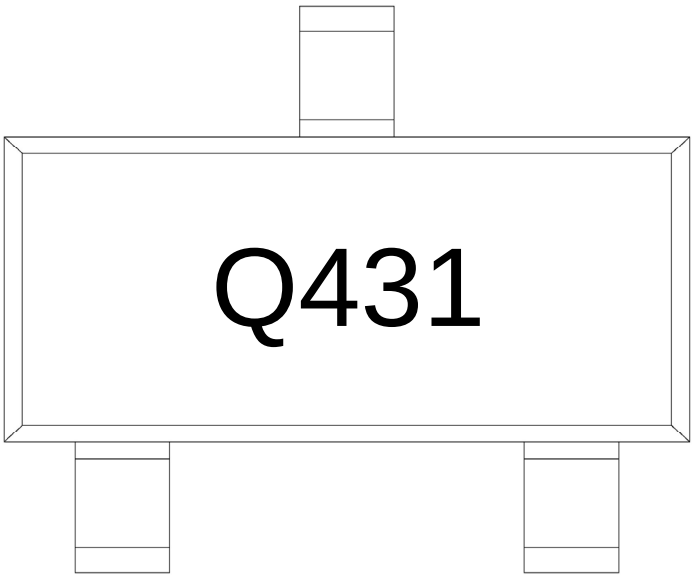
Test Circuit For VKA=VREF Test Circuit for VKA VREF Test Circuit For IKA(OFF)

TYPICAL APPLICATION:

BRTL431MQ

Rev.A May.-2023

/ Marking Instructions



Q

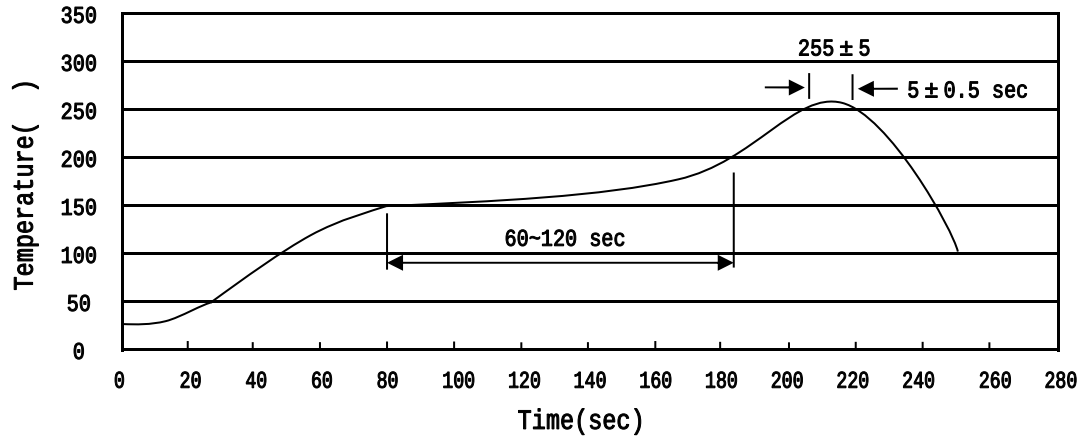
431

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 mm³)
SOT-23	3,000	10	30,000	6	180,000	7″ ×8	180×120×180	390×385×205

/ Notices