## / Descriptions

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

## / Features

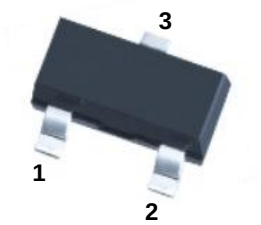
Precise reference voltage to 2.500V;guaranteed 0.4%,0.8%  reference voltage Tolerance; sink current capability,1.0mA  100mA;quick turn-on; adjustable Output voltage, $V_O$=$V_{ref}$  37V;low operational cathode current,400  A typical; 0.15  typical output impedance, Qualified to AEC-Q100 Standards for High Reliability, HF Product.

## / Applications

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

## / Equivalent Circuit

## / Pinning




PIN1  K  PIN 2  R  PIN 3  A

## / Marking

| | |
|---|---|
| Marking | Q431R |

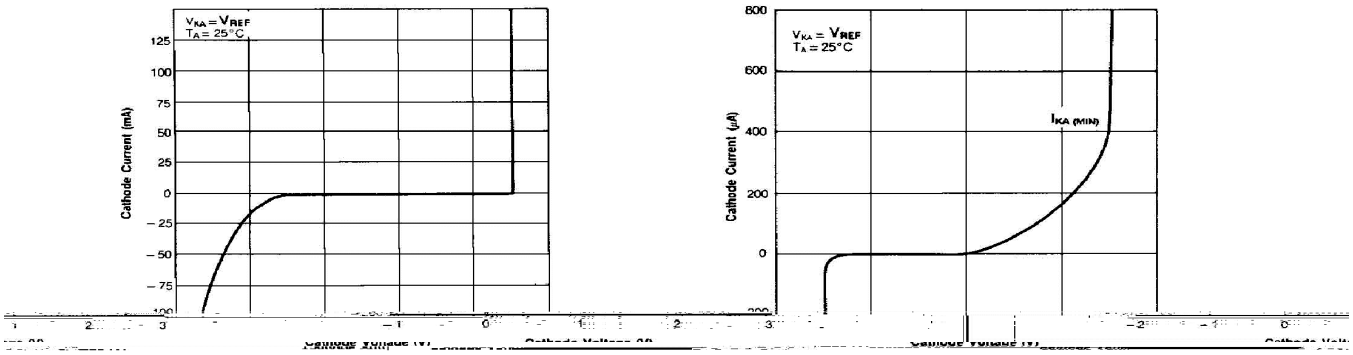
## / Absolute Maximum Ratings(Ta=25 )

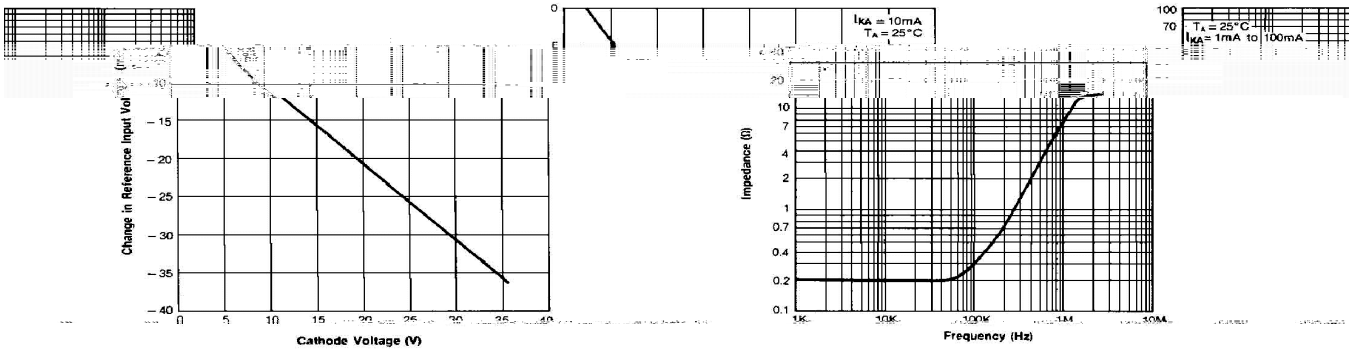
| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Cathode to Anode Voltage | $V_{KA}$ | 37 | V |
| Cathode Current Range, Continuous | $I_K$ | -100 +100 | mA |
| Reference Input Current Range, Continuous | $I_{REF}$ | 0.05 +10 | mA |
| Power Dissipation | $P_D$ | 370 | mW |
| Operating Ambient Temperature | $T_{amb}$ | -40 125 | |
| Junction Temperature | $T_j$ | 160 | |
| Storage Temperature Range | $T_{stg}$ | -65 150 | |

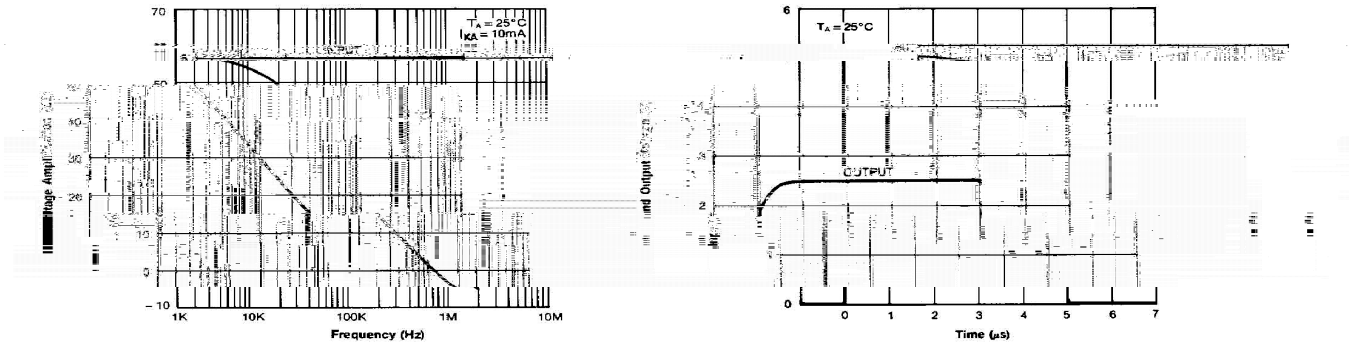
## / Electrical Characteristics(Ta=25 )

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Reference Input voltage | $V_{REF}$ | $V_{KA}=V_{REF}$<br>$I_K$=10mA(A=0.4%) | 2.490 | 2.500 | 2.510 | V |
| | | $V_{KA}=V_{REF}$<br>$I_K$=10mA(B=0.8%) | 2.480 | 2.500 | 2.520 | V |
| Deviation of Reference Input Voltage Over-Temperature | $V_{REF}$/T | $V_{KA}=V_{REF}$<br>$I_K$=10mA<br>$T_A$=-25 85 | | 4.5 | 17 | mV |
| Ratio of Change in Reference Input Voltage to the Change in Cathode Voltage | $V_{REF}$/ $V_{KA}$ | $I_K$=10mA<br>$V_{KA}$ =10V to $V_{REF}$ | | -1 | -2.7 | mV/V |
| | | $I_K$=10mA<br>$V_{KA}$ =36V to 10V | | -0.45 | -2.0 | mV/V |
| Reference Input current | $I_{REF}$ | $I_K$=10mA $R_1$=10<br>$R_2$=open | | 1.0 | 4.0 | A |
| Deviation of Reference Input Current Over Full Temperature Range | $I_{REF}$/T | $I_K$=10mA<br>$R_1$=10K ,<br>$R_2$=open<br>$T_A$=-40 125 | | 0.4 | 1.2 | A |
| Minimum Cathode Current for Regulation | $I_{K(min)}$ | $V_{KA}=V_{REF}$ | | 0.4 | 1 | mA |
| Off-state cathode current | $I_{K(off)}$ | $V_{KA}$=36V<br>$V_{REF}$=0V | | 0.05 | 1.0 | A |
| Dynamic impedance | $\|Z_{KA}\|$ | $V_{KA}=V_{REF}$<br>$I_K$=1mA to 100mA<br>f 1.0KHz | | 0.15 | 0.5 | |

## / Electrical Characteristic Curve

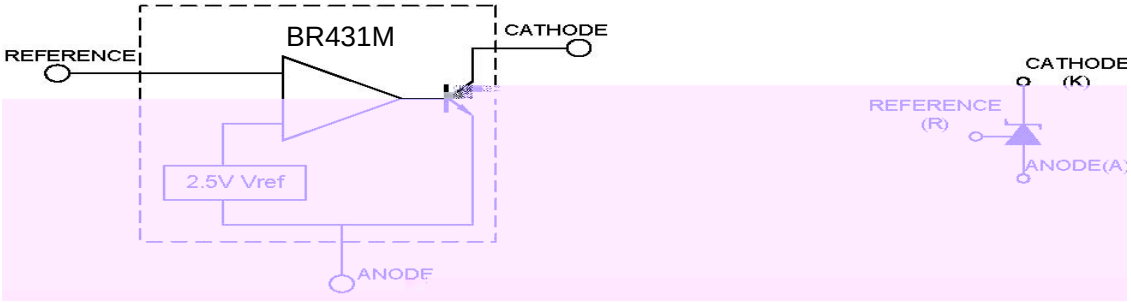


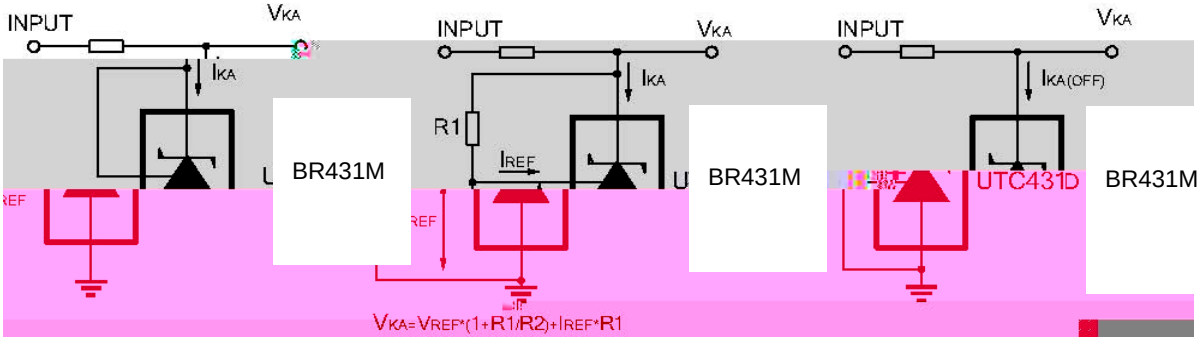



## & Test circuits&Typical Application

BLOCK DIAGRAM:




TEST CIRCUITS:



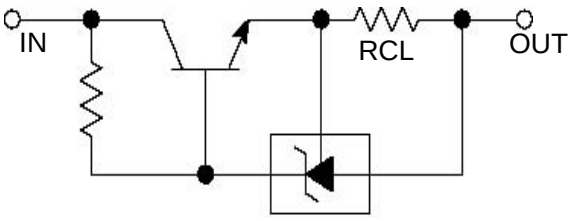

Test Circuit For VKA=VREF Test Circuit for VKA VREF Test Circuit For IKA(OFF)

TYPICAL APPLICATION:

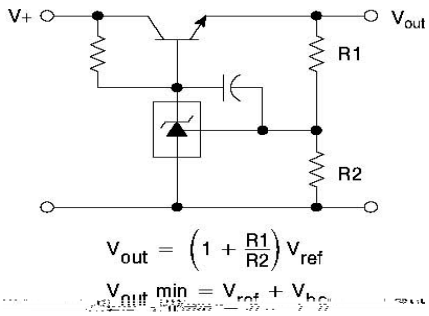


Shutdown Regulator Higher-current Shunt

$Io=V_{REF}/RCL+I_{KA}$



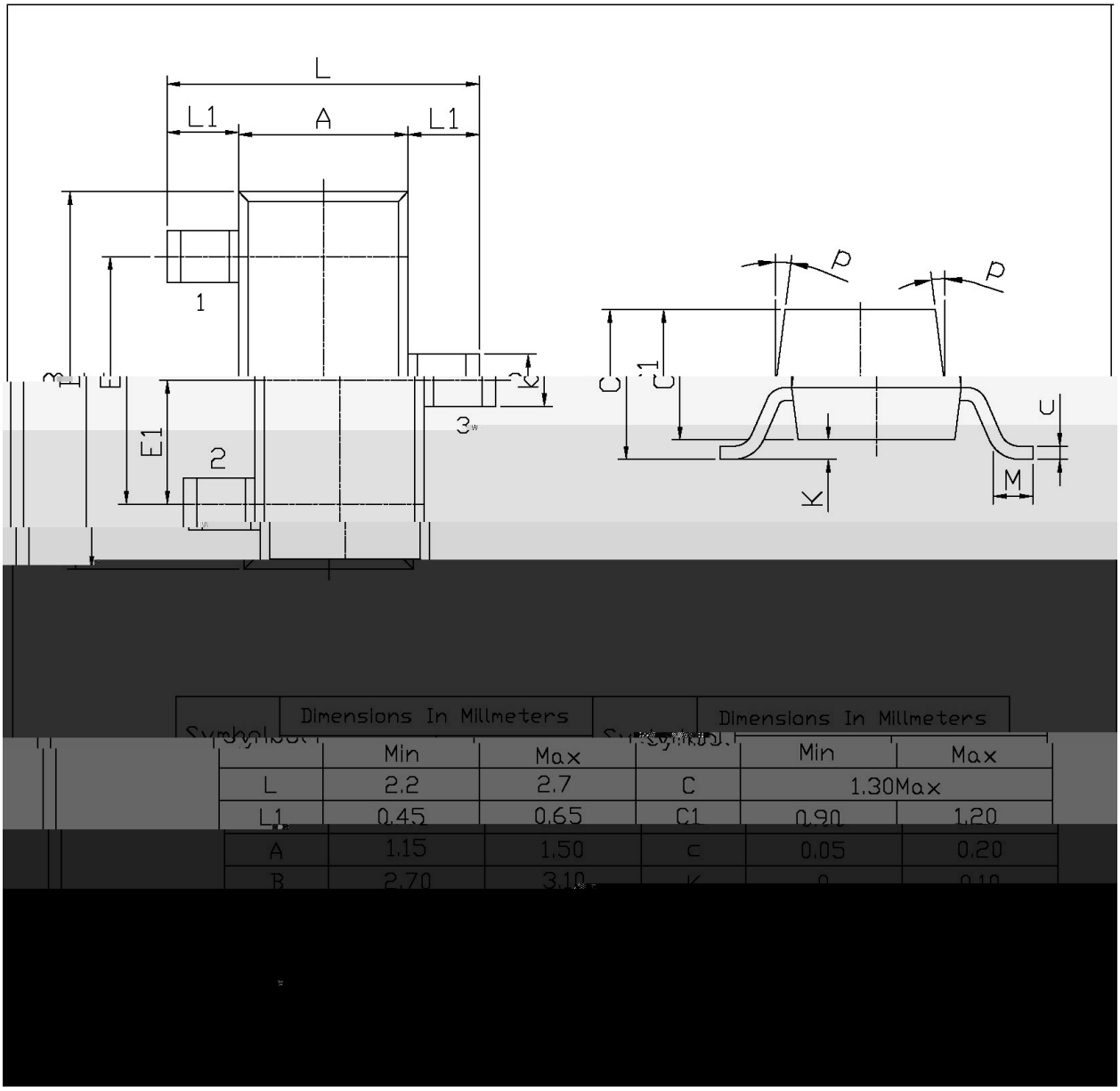

Constant Current Source BR431M




Series Pass Regulator

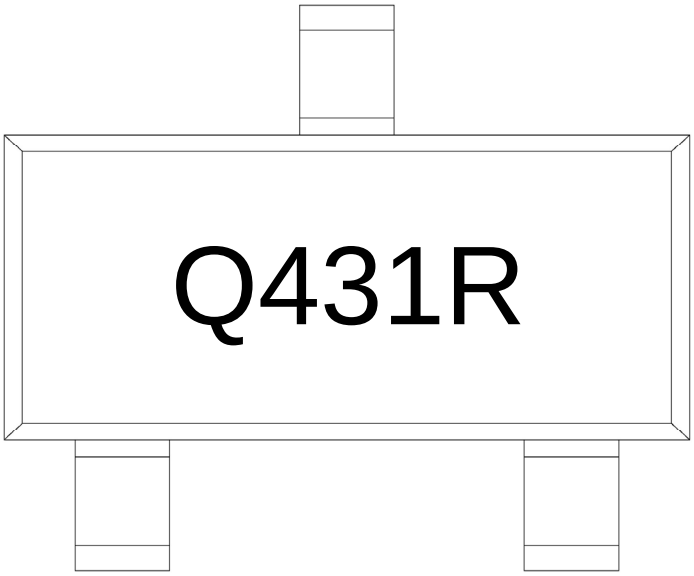
## / Package Dimensions

SOT-23 单位：mm




| Symbol | Dimensions In Millmeters | | Symbol | Dimensions In Millmeters | |
|---|---|---|---|---|---|
| | Min | Max | | Min | Max |
| L | 2.2 | 2.7 | C | 1.30Max | |
| L1 | 0.45 | 0.65 | C1 | 0.90 | 1.20 |
| A | 1.15 | 1.50 | c | 0.05 | 0.20 |
| B | 2.70 | 3.10 | K | 0 | 0.10 |

## / Marking Instructions




Q

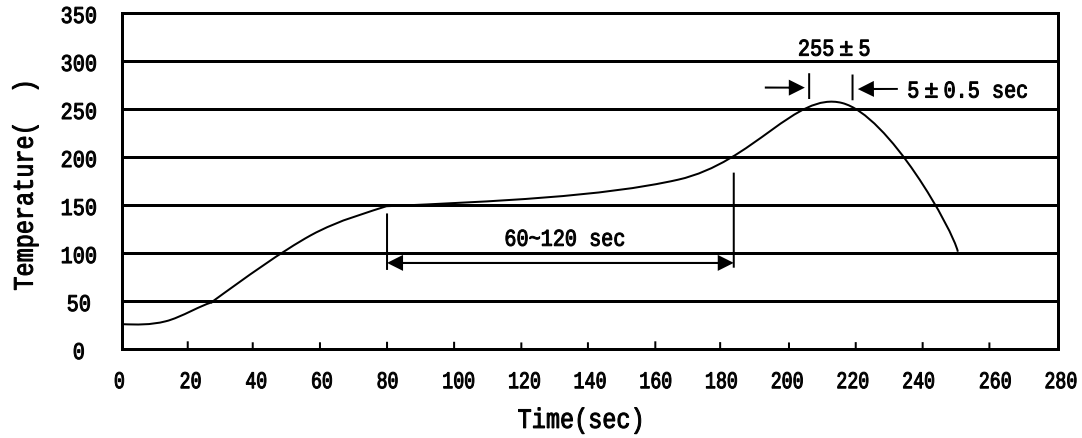
Note:

Q: Automobile halogen-free product Code

431: Product Type

R: It represents the opposite arrangement of R and K to BR431M

## ( ) / 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) |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |

## / Notices