



2N6027

SCR

**PROGRAMMABLE
UNIUNCTION TRANSISTOR**

■ **DESCRIPTION**

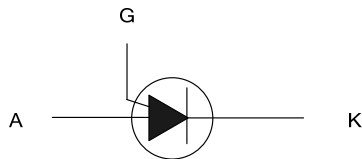
The UTC **2N6027** is a programmable unijunction transistor, it uses UTC's advanced technology to provide customers with low forward voltage, low gate to anode leakage current, low offset voltage and high peak output voltage, etc.

The UTC **2N6027** is suitable for timing, thyristor-trigger, oscillator and pulse circuits, etc.

■ **FEATURES**

- * Low Forward Voltage
- * Low Offset Voltage
- * Low Gate to Anode Leakage Current
- * High Peak Output Voltage

■ **SYMBOL**



■ **ORDERING INFORMATION**

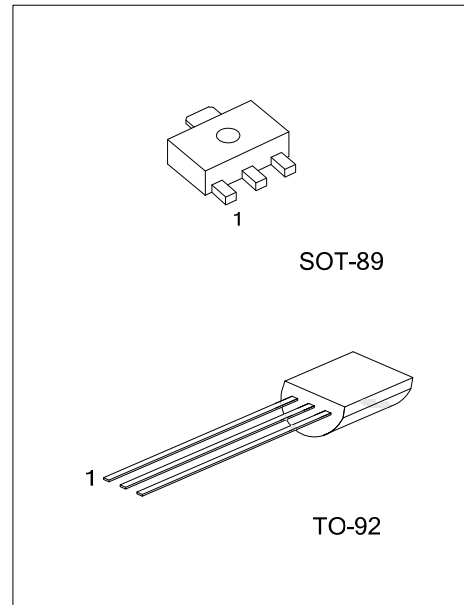
| Ordering Number | | Package | Pin Assignment | | | Packing |
|-----------------|---------------|---------|----------------|---|---|-----------|
| Lead Free | Halogen Free | | 1 | 2 | 3 | |
| - | 2N6027G-AB3-R | SOT-89 | A | G | K | Tape Reel |
| 2N6027L-T92-B | 2N6027G-T92-B | TO-92 | A | G | K | Tape Box |
| 2N6027L-T92-K | 2N6027G-T92-K | TO-92 | A | G | K | Bulk |

Note: Pin Assignment: A: Anode G: Gate K: Cathode

| | |
|--|---|
| <p>2N6027G-AB3-R</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p> | <p>(1) R: Tape Reel, B: Tape Box, K: Bulk (2) AB3: SOT-89, T92: TO-92 (3) G: Halogen Free and Lead Free, L: Lead Free</p> |
|--|---|

■ **MARKING**

| SOT-89 | TO-92 |
|--------|-------|
| | |



■ ABSOLUTE MAXIMUM RATINGS ($T_J=25^\circ\text{C}$, unless otherwise noted)

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|--|---------------------------------|-----------------|------------|----------------------|
| Gate to Cathode Forward Voltage | | V_{GKF} | 40 | V |
| Gate to Cathode Reverse Voltage | | V_{GKR} | -5.0 | V |
| Gate to Anode Reverse Voltage | | V_{GAR} | 40 | V |
| DC Forward Anode Current | $T_J=25^\circ\text{C}$ | I_T | 150 | mA |
| | Derate Above 25°C | | 2.67 | mA/ $^\circ\text{C}$ |
| DC Gate Current | | I_G | ± 50 | mA |
| Repetitive Peak Forward Current (Note 2) | Pulse Width=100 μs | I_{TRM} | 1.0 | A |
| | Pulse Width=20 μs | | 2.0 | A |
| Non-Repetitive Peak Forward Current 10 μs Pulse Width | | I_{TSM} | 5.0 | A |
| Anode to Cathode Voltage | | V_{AK} | ± 40 | V |
| Power Dissipation | SOT-89 | P_D | 280 | mW |
| | TO-92 | | 300 | |
| Power Dissipation Derate Above 25°C | SOT-89 | $1/\theta_{JA}$ | 4.45 | mW/ $^\circ\text{C}$ |
| | TO-92 | | 4.0 | |
| Operating Junction Temperature Range | | T_J | -50 ~ +100 | $^\circ\text{C}$ |
| Storage Temperature Range | | T_{STG} | -55 ~ +150 | $^\circ\text{C}$ |

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. Duty Cycle $\leq 1\%$

3. Anode positive, $R_{GA}=1000$ ohms

Anode negative, $R_{GA}=\text{Open}$

■ THERMAL CHARACTERISTICS

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|---------------------|--------|---------------|---------|---------------------------|
| Junction to Ambient | SOT-89 | θ_{JA} | 220 | $^\circ\text{C}/\text{W}$ |
| | TO-92 | | 200 | |
| Junction to Case | SOT-89 | θ_{JC} | 80 | $^\circ\text{C}/\text{W}$ |
| | TO-92 | | 75 | |

■ ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$ unless otherwise noted)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---------------------------------|-----------|---|-----|------|-----|---------------|
| Peak Current | I_P | $V_S=10\text{V}$, $R_G=1\text{M}\Omega$ | | 1.25 | 2.0 | μA |
| | | $V_S=10\text{V}$, $R_G=10\text{k}\Omega$ | | 4.0 | 5.0 | μA |
| Offset Voltage | V_T | $V_S=10\text{V}$, $R_G=1\text{M}\Omega$ | 0.2 | 0.70 | 1.6 | V |
| Valley Current | I_V | $V_S=10\text{V}$, $R_G=1\text{M}\Omega$ | | 18 | 50 | μA |
| | | $V_S=10\text{V}$, $R_G=10\text{k}\Omega$ | 70 | 150 | | μA |
| | | $V_S=10\text{V}$, $R_G=200\Omega$ | 1.5 | | | mA |
| Gate to Anode Leakage Current | I_{GAO} | $V_S=40\text{V}$, $T_A=25^\circ\text{C}$, Cathode Open | | 1.0 | 10 | nA |
| | | $V_S=40\text{V}$, $T_A=75^\circ\text{C}$, Cathode Open) | | 3.0 | | nA |
| Gate to Cathode Leakage Current | I_{GKS} | $V_S=40\text{V}$, Anode to Cathode Shorted | | 5.0 | 50 | nA |
| Forward Voltage (Note) | V_F | $I_F=50\text{mA}$ Peak | | 0.8 | 1.5 | V |
| Peak Output Voltage | V_O | $V_G=20\text{V}$, $C_C=0.2\mu\text{F}$ | 6 | 11 | | V |
| Pulse Voltage Rise Time | t_r | $V_B=20\text{V}$, $C_C=0.2\mu\text{F}$ | | 40 | 80 | ns |

Note: Pulse Test: Pulse Width $\leq 300\mu\text{sec}$, Duty Cycle $\leq 2\%$

■ TEST CIRCUITS AND TYPICAL CHARACTERISTICS

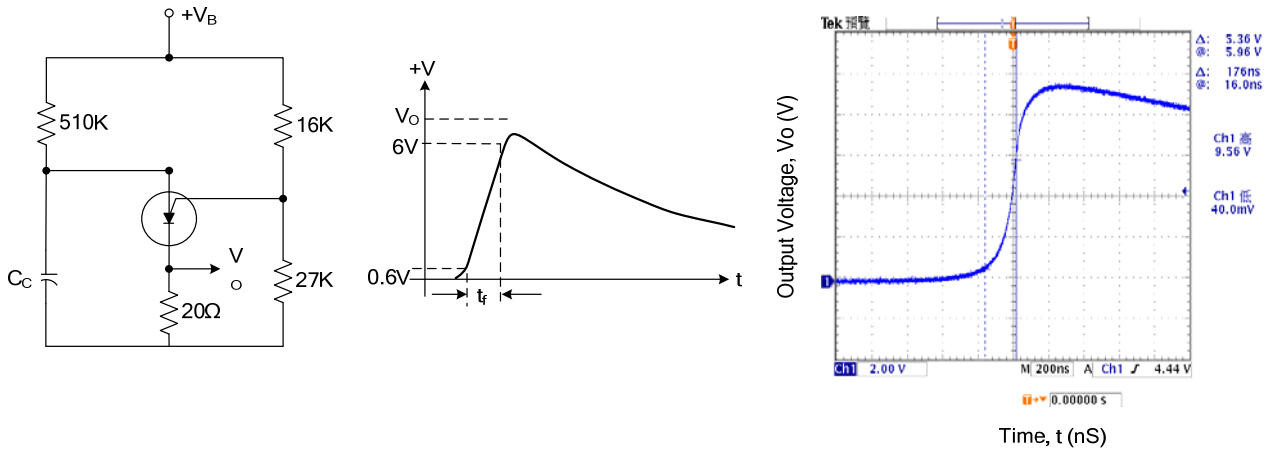
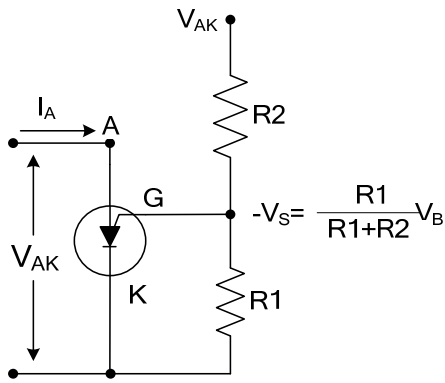
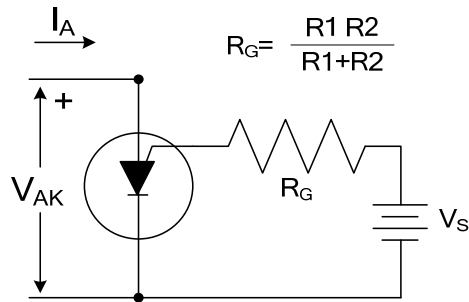


Fig 1. Output Voltage and Rise Time Test Circuit

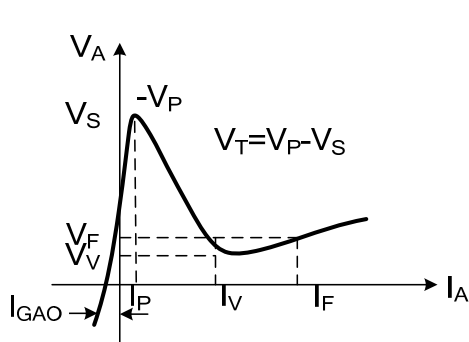


Programmable Unijunction with "Program" Resistors R1 and R2



Equivalent Test Circuit for Figure 1A used for electrical characteristics testing

Electrical Characteristics



IC-Electrical Characteristics

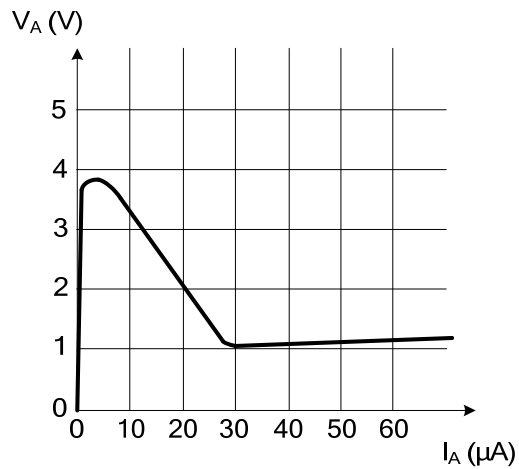


Fig 2. Electrical Characterization

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