



2N6027

SCR

**PROGRAMMABLE
UNI-JUNCTION TRANSISTOR**

■ **DESCRIPTION**

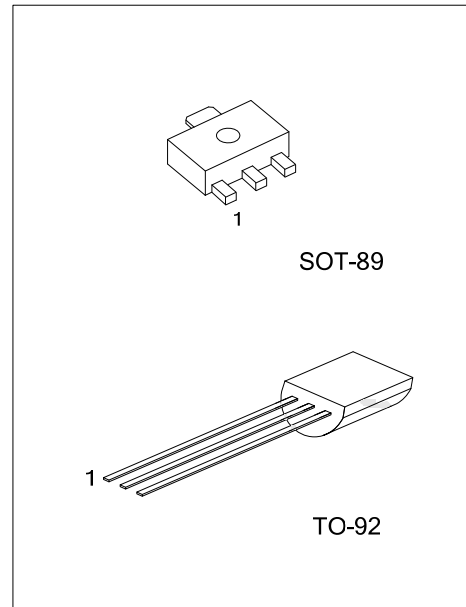
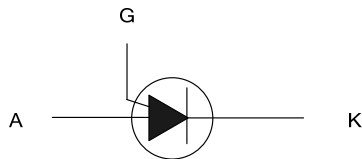
The UTC **2N6027** is a programmable unijunction transistor, it uses UTC's advanced technology to provide customers with low forward voltage, low gate to anode leakage current, low offset voltage and high peak output voltage, etc.

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) R: Tape Reel, B: Tape Box, K: Bulk</p> <p>(2) AB3: SOT-89, T92: TO-92</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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■ **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

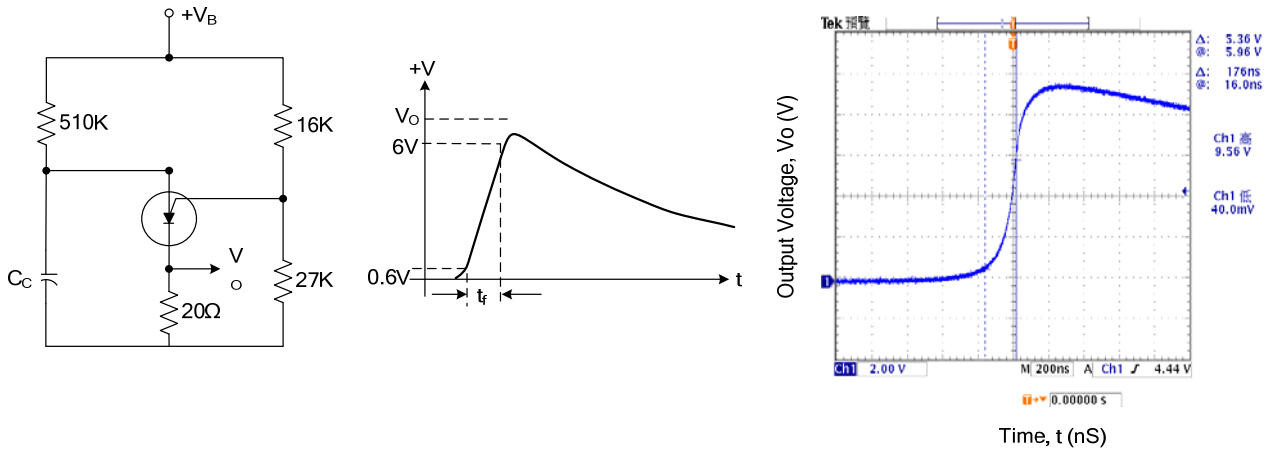
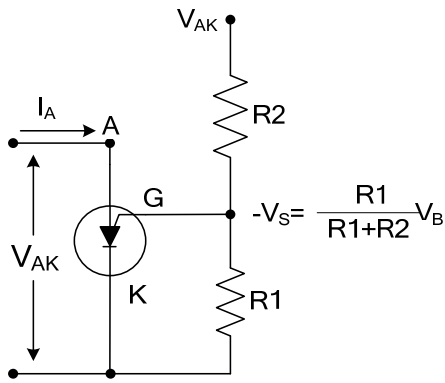
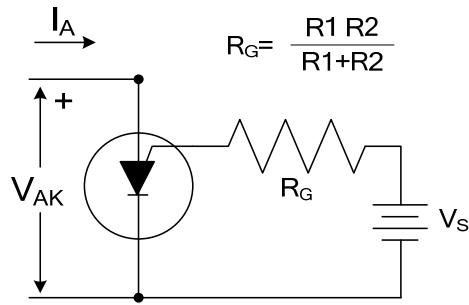


Fig 1. Output Voltage and Rise Time Test Circuit

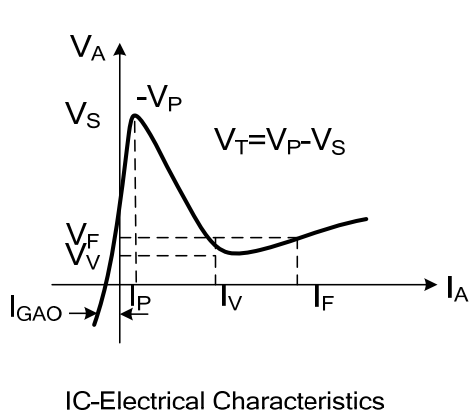


Programmable Unijunction with "Program" Resistors R1 and R2



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

Electrical Characteristics



IC-Electrical Characteristics

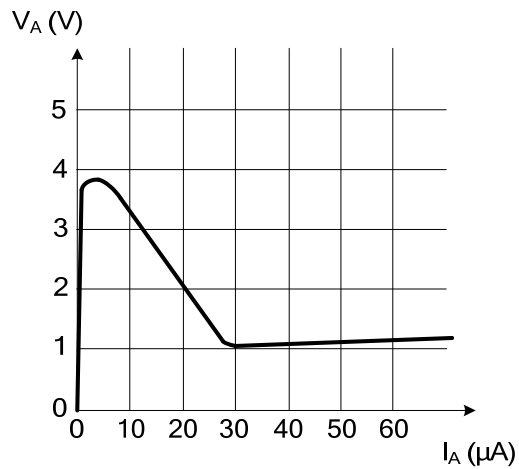


Fig 2. Electrical Characterization

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