



**2N6027**

**SCR**

**PROGRAMMABLE  
UNIUNCTION TRANSISTOR**

■ **DESCRIPTION**

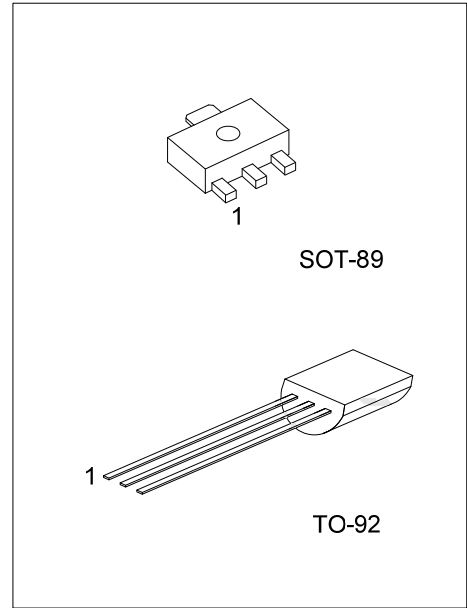
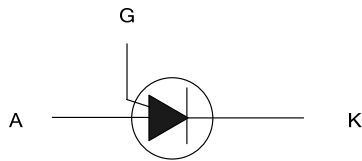
The UTC **2N6027** is a programmable unijunction transistor, it uses UTC's advanced technology to provide customers with low forward voltage, low gate to anode leakage current, low offset voltage and high peak output voltage, etc.

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	
2N6027L-AB3-R	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 specified)

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 $25^\circ\text{C}$		2.67	mA/ $^\circ\text{C}$
DC Gate Current		$I_G$	$\pm 50$	mA
Repetitive Peak Forward Current (Note 2)	Pulse Width=100 $\mu\text{s}$	$I_{TRM}$	1.0	A
	Pulse Width=20 $\mu\text{s}$		2.0	A
Non-Repetitive Peak Forward Current 10 $\mu\text{s}$ Pulse Width		$I_{TSM}$	5.0	A
Anode to Cathode Voltage		$V_{AK}$	$\pm 40$	V
Power Dissipation	SOT-89	$P_D$	280	mW
	TO-92		300	mW
Power Dissipation Derate Above $25^\circ\text{C}$	SOT-89	$1/\theta_{JA}$	4.45	mW/ $^\circ\text{C}$
	TO-92		4.0	mW/ $^\circ\text{C}$
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 DATA

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

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

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	$\mu\text{A}$
		$V_S=10\text{V}$ , $R_G=10\text{k}\Omega$		4.0	5.0	$\mu\text{A}$
Offset Voltage	$V_T$	$V_S=10\text{V}$ , $R_G=1\text{M}\Omega$ ( $T_A=-20\sim 60^\circ\text{C}$ )	0.3	0.4	0.5	V
Valley Voltage	$V_V$	$V_S=10\text{V}$ , $R_G=200\text{k}\Omega$ ( $T_A=-20\sim 60^\circ\text{C}$ )	1.2		3.0	V
Valley Current	$I_V$	$V_S=10\text{V}$ , $R_G=1\text{M}\Omega$		18	50	$\mu\text{A}$
		$V_S=10\text{V}$ , $R_G=10\text{k}\Omega$	70	150		$\mu\text{A}$
		$V_S=10\text{V}$ , $R_G=200\Omega$	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

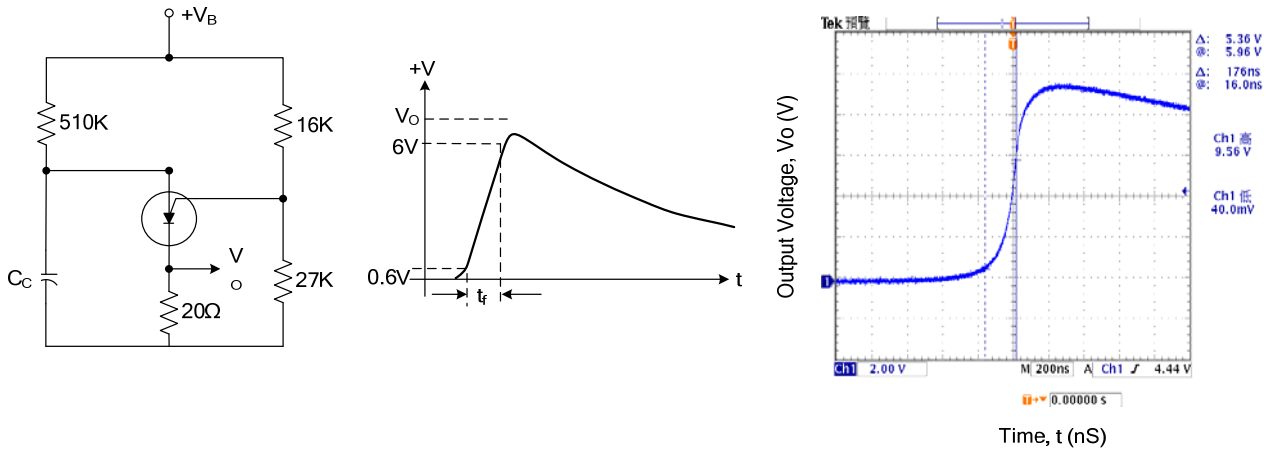
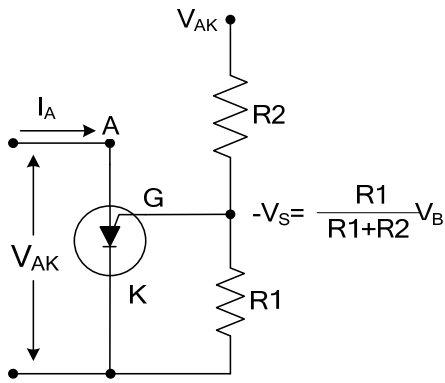
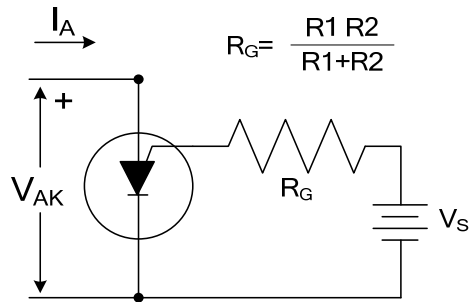


Fig 1. Output Voltage and Rise Time Test Circuit

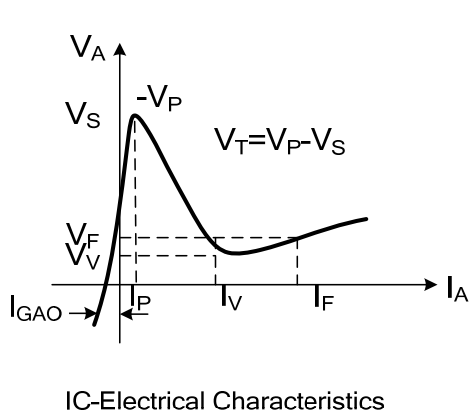


Programmable Unijunction with "Program" Resistors R1 and R2



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

Electrical Characteristics



IC-Electrical Characteristics

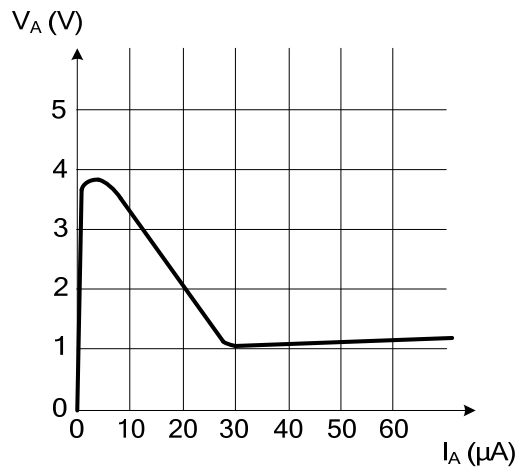


Fig 2. Electrical Characterization

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