TYPES A5T6116, A5T6117, A5T6118
P-N-P-N SILICON PROGRAMMABLE UNIJUNCTION TRANSISTORS

BULLETIN NO DL-S 7311984, MARCH 1973

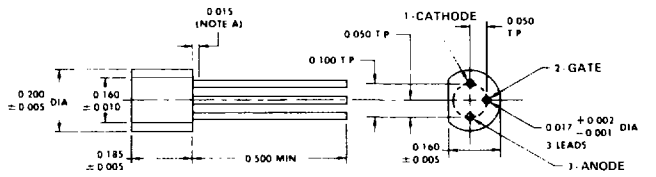
SILECT† TRANSISTORS‡ FOR USE IN PULSE, TIMING, SWEEP, TRIGGER, AND OSCILLATOR CIRCUITS

- **Rugged One-Piece Construction with Standard TO-18 100-mil Pin-Circle Configuration**
- **Low Peak-Point Current and Low Forward Voltage**
- **Programmable η, r_{BB}, I_P, and I_V**

mechanical data

These transistors are encapsulated in a plastic compound specifically designed for this purpose, using a highly mechanized process developed by Texas Instruments. The case will withstand soldering temperatures without deformation. These devices exhibit stable characteristics under high-humidity conditions and are capable of meeting MIL-STD-202C, Method 106B. The transistors are insensitive to light.

THE GATE IS CONNECTED TO AN N REGION



NOTES: A. Lead diameter is not controlled in this area.
B. Leads having maximum diameter (0.019) shall be within 0.007 of their true positions measured in the gaging plane 0.054 below the seating plane of the device relative to a maximum-diameter package.
C. All dimensions are in inches.

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absolute maximum ratings at 25°C free-air temperature (unless otherwise noted)

Anode-Cathode Voltage	±40 V
Gate-Anode Voltage	40 V
Gate-Cathode Voltage: (Positive Limit)	40 V
(Negative Limit)	−5 V
Continuous Anode Current	200 mA
Repetitive Peak Anode Current: (t_w = 100 μs, Duty Cycle ⩽ 1%)	1 A
(t_w = 20 μs, Duty Cycle ⩽ 1%)	2 A
Nonrepetitive Peak Anode Current: (t_w = 10 μs, Duty Cycle = 0)	5 A
Continuous Gate Current	±20 mA
Continuous Device Dissipation at (or below) 25°C Free-Air Temperature (See Note 1)	300 mW
Storage Temperature Range	−65°C to 150°C
Lead Temperature 1/16 Inch from Case for 60 Seconds	260°C

electrical characteristics at 25°C free-air temperature (unless otherwise noted)

PARAMETER		TEST CONDITIONS	A5T6116		A5T6117		A5T6118		UNIT
			MIN	MAX	MIN	MAX	MIN	MAX	
I_{GAO}	Gate Reverse Current	V_{GA} = 40 V, I_K = 0		5		5		5	nA
		V_{GA} = 40 V, I_K = 0, T_A = 75°C		75		75		75	
I_{GKS}	Gate Reverse Current	V_{GK} = 40 V, V_{AK} = 0		50		50		50	nA
V_P-V_S	Offset Voltage	V_S = 10 V, R_G = 10 kΩ	0.2	0.6	0.2	0.6	0.2	0.6	V
		V_S = 10 V, R_G = 1 MΩ	0.2	1.6	0.2	0.6	0.2	0.6	
I_P	Peak-Point Current	V_S = 10 V, R_G = 10 kΩ		5		2		1	μA
		V_S = 10 V, R_G = 1 MΩ		2		0.3		0.15	
I_V	Valley-Point Current	V_S = 10 V, R_G = 10 kΩ	70		50		50		μA
		V_S = 10 V, R_G = 1 MΩ		50		50		25	
V_F	Anode-Cathode On-State Voltage	V_S = 10 V, R_G = 10 kΩ, I_F = 50 mA		1.5		1.5		1.5	V

NOTE 1: Derate linearly to 125°C free-air temperature at the rate of 3 mW/°C.
†Trademark of Texas Instruments
‡U.S. Patent No. 3,439,238

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operating characteristics at 25°C free-air temperature

PARAMETER		TEST CONDITIONS	A5T6116		A5T6117		A5T6118		UNIT
			MIN	MAX	MIN	MAX	MIN	MAX	
V_{OM}	Peak Output Voltage	V_{AA} = 20 V, C1 = 0.2 μF, See Figure 4	6		6		6		V
t_r	Output Pulse Rise Time			80		80		80	ns

PARAMETER MEASUREMENT INFORMATION

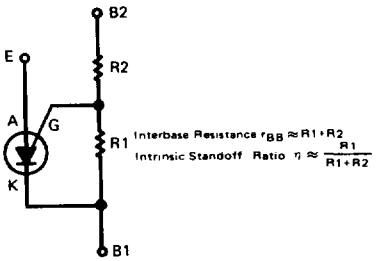


FIGURE 1–PROGRAMMABLE UNIJUNCTION CIRCUIT

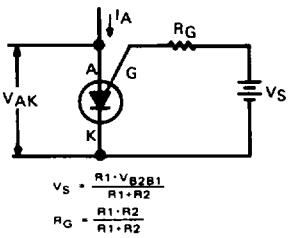


FIGURE 2–EQUIVALENT CIRCUIT USED FOR TESTING

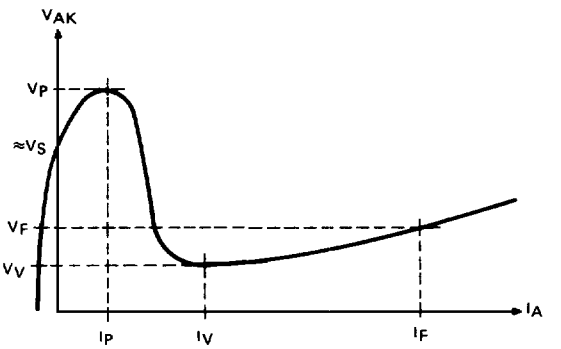
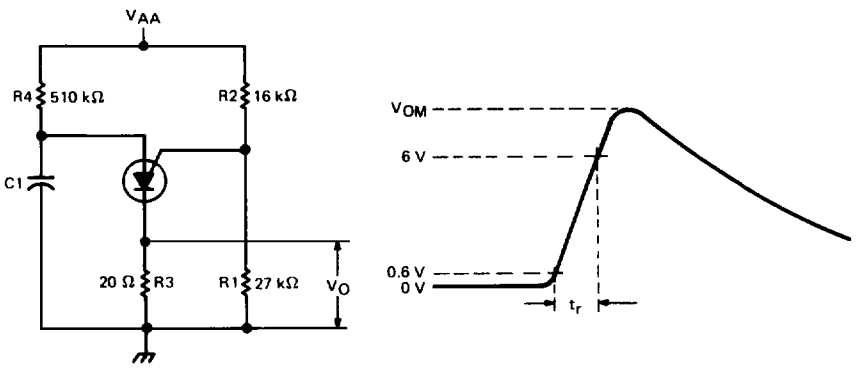


FIGURE 3–GENERAL ANODE CHARACTERISTICS



TEST CIRCUIT

OUTPUT VOLTAGE WAVEFORM

FIGURE 4–TESTING OPERATING CHARACTERISTICS

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