

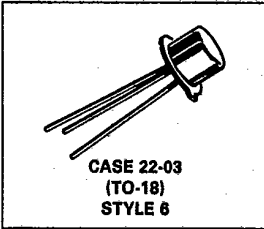
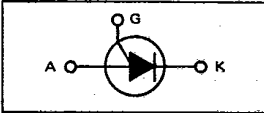
Silicon Programmable Unijunction Transistors

... designed to enable the engineer to "program" unijunction characteristics such as R_{GB} , η , I_V , and I_P by merely selecting two resistor values. Application includes thyristor-trigger, oscillator, pulse and timing circuits. These devices may also be used in special thyristor applications due to the availability of an anode gate.

- Programmable — R_{GB} , η , I_V and I_P
- Hermetic TO-18 Package
- Low On-State Voltage — 1.5 Volts Maximum @ $I_F = 50$ mA
- Low Gate to Anode Leakage Current — 5 nA Maximum
- High Peak Output Voltage — 16 Volts Typical
- Low Offset Voltage — 0.35 Volt Typical ($R_G = 10$ k ohms)

**2N6116
2N6117
2N6118**

**PUTs
40 VOLTS — 250 mW**



3

***MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Repetitive Peak Forward Current 100 μ s Pulse Width, 1% Duty Cycle 20 μ s Pulse Width, 1% Duty Cycle	I_{TRM}	1 2	Amps
Non-Repetitive Peak Forward Current 10 μ s Pulse Width	I_{TSM}	5	Amps
DC Forward Anode Current Derate Above 25°C	I_T	200 2	mA mA/°C
DC Gate Current	I_G	± 20	mA
Gate to Cathode Forward Voltage	V_{GKF}	40	Volts
Gate to Cathode Reverse Voltage	V_{GKR}	5	Volts
Gate to Anode Reverse Voltage	V_{GAR}	40	Volts
Anode to Cathode Voltage	V_{AK}	± 40	Volts
Forward Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate Above 25°C	P_F $1/\theta_{JA}$	250 2.5	mW mW/°C
Operating Junction Temperature Range	T_J	-55 to +125	°C
Storage Temperature Range	T_{stg}	-65 to +200	°C

*Indicates JEDEC Registered Data.

*ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

Characteristic	Fig. No.	Symbol	Min	Typ	Max	Unit
Offset Voltage (V _S = 10 Vdc, R _G = 1 MΩ)	1	V _T	0.2	0.70	1.6	Volts
(V _S = 10 Vdc, R _G = 10 k ohms)			0.2	0.50	0.6	
			0.2	0.40	0.6	
			0.2	0.35	0.6	
Gate to Anode Leakage Current (V _S = 40 Vdc, T _A = 25°C, Cathode Open)	—	I _{GAO}	—	1	5	nAdc
(V _S = 40 Vdc, T _A = 75°C, Cathode Open)			—	30	75	
Gate to Cathode Leakage Current (V _S = 40 Vdc, Anode to Cathode Shorted)	—	I _{GKS}	—	5	50	nAdc
Peak Current (V _S = 10 Vdc, R _G = 1 MΩ)	2,9,14	I _p	—	1.25	2	μA
(V _S = 10 Vdc, R _G = 10 k ohms)			—	0.19	0.3	
			—	0.08	0.15	
			—	4	5	
			—	1.20	2	
			—	0.70	1	
Valley Current (V _S = 10 Vdc, R _G = 1 MΩ)	1,4,5	I _v	—	18	50	μA
(V _S = 10 Vdc, R _G = 10 k ohms)			—	18	25	
			70	270	—	
			50	270	—	
Forward Voltage (I _F = 50 mA Peak)	1,6	V _F	—	0.8	1.5	Volts
Peak Output Voltage (V _B = 20 Vdc, C _C = 0.2 μF)	3,7	V _O	6	16	—	Volts
Pulse Voltage Rise Time (V _B = 20 Vdc, C _C = 0.2 μF)	3	t _r	—	40	80	ns

*Indicates JEDEC Registered Data.

FIGURE 1 - ELECTRICAL CHARACTERIZATION

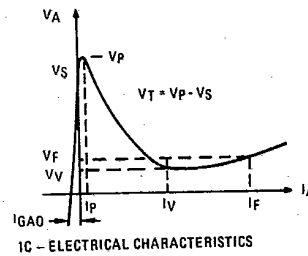
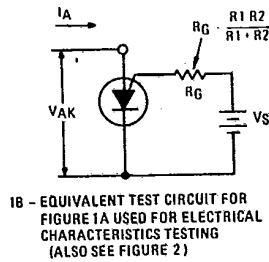
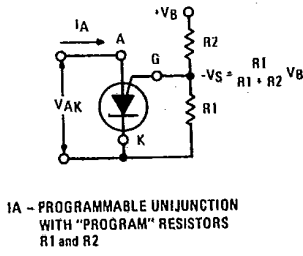


FIGURE 2 - PEAK CURRENT (I_p) TEST CIRCUIT

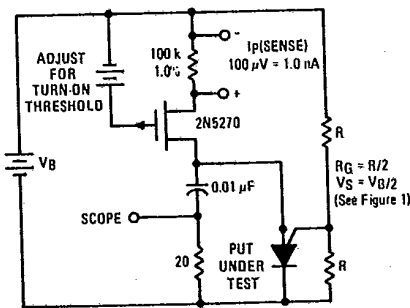
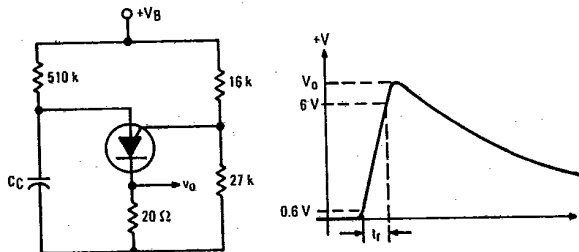


FIGURE 3 - V_O AND t_r TEST CIRCUIT



TYPICAL VALLEY CURRENT BEHAVIOR

FIGURE 4 - EFFECT OF SUPPLY VOLTAGE

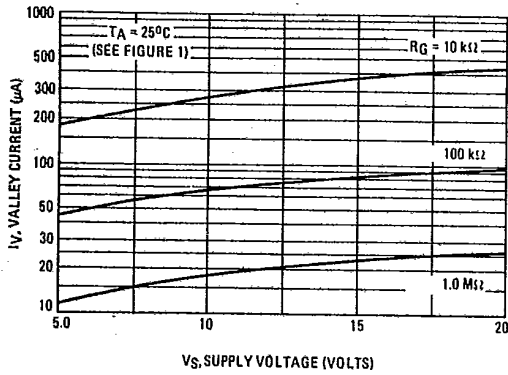


FIGURE 5 - EFFECT OF TEMPERATURE

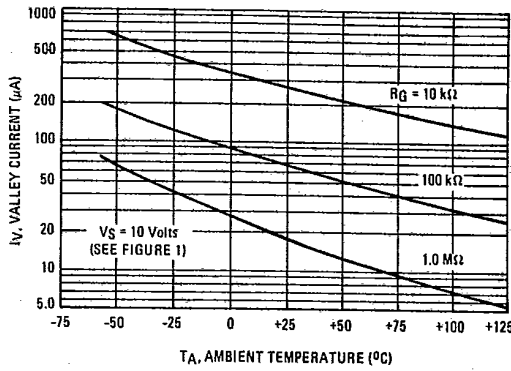


FIGURE 6 - FORWARD VOLTAGE

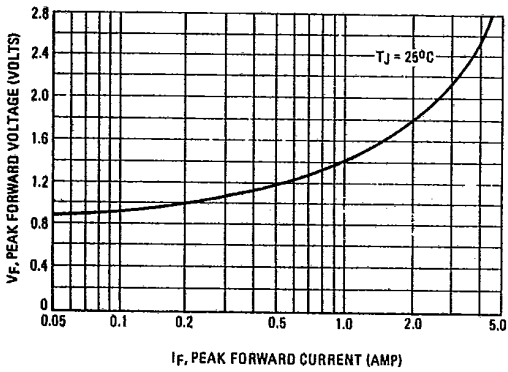


FIGURE 7 - PEAK OUTPUT VOLTAGE

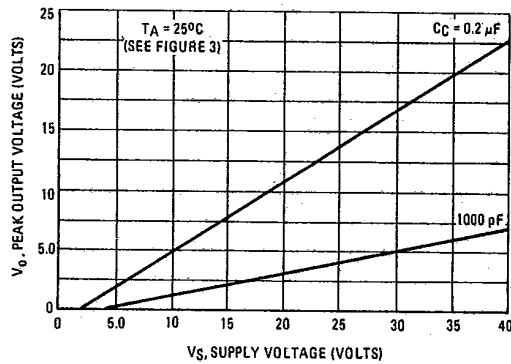
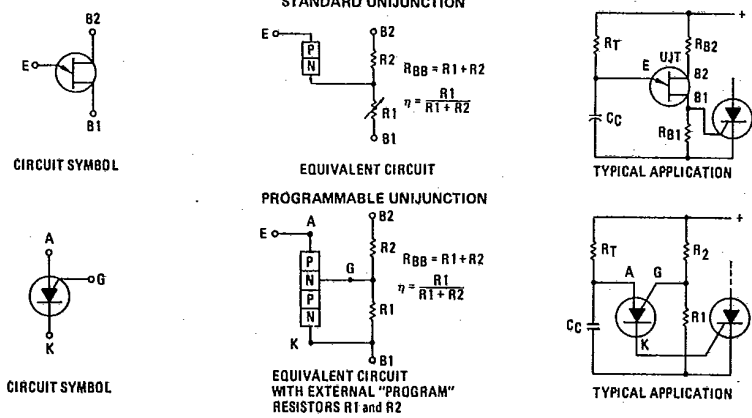


FIGURE 8 - STANDARD UNI-JUNCTION COMPARED TO PROGRAMMABLE UNI-JUNCTION



2N6116 • 2N6117 • 2N6118

T-25-09

TYPICAL PEAK CURRENT BEHAVIOR

2N6116

FIGURE 9 - EFFECT OF SUPPLY VOLTAGE AND R_G

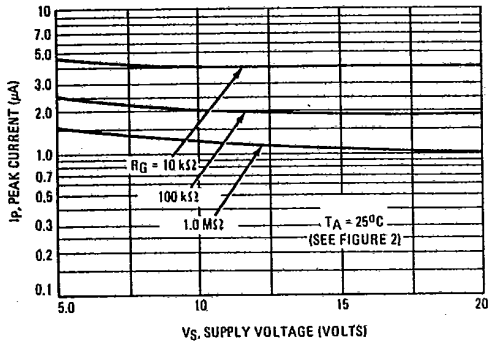
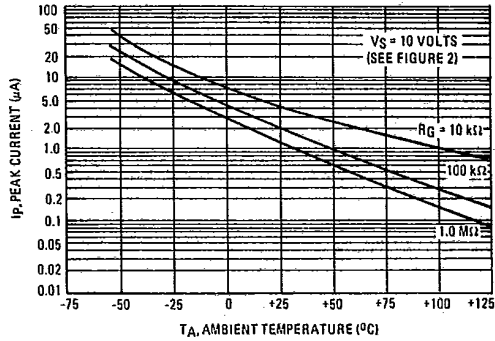


FIGURE 10 - EFFECT OF TEMPERATURE AND R_G



2N6117

FIGURE 11 - EFFECT OF SUPPLY VOLTAGE AND R_G

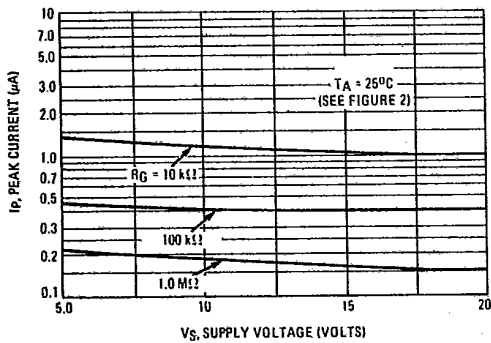
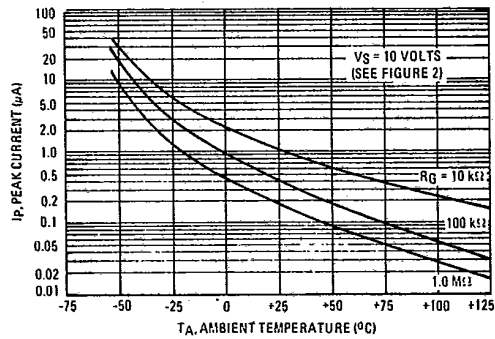


FIGURE 12 - EFFECT OF TEMPERATURE AND R_G



3

2N6118

FIGURE 13 - EFFECT OF SUPPLY VOLTAGE AND R_G

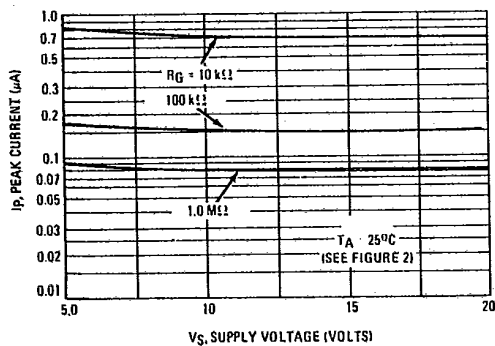


FIGURE 14 - EFFECT OF TEMPERATURE AND R_G

