PUTs

Military, Planar, TO-18, Hermetic

2N6137

T-25-09

FEATURES

- Available as JAN and JANTX types per MIL standard 19500/493
- −55°C to +125°C Temperature Range for Timing and Oscillator Circuits
- $I_P \leq 10\mu A$ at T = −55°C
  $I_V \geq 40\mu A$ at T = +125°C
- Programmable η, R_{BB}, I_P and I_V
- Peak Recurrent Current of 5A
- Low On-State Voltage Drop
- Hermetically Sealed Metal Case and Planar Passivated Construction for Maximum Reliability and Parameter Stability.

DESCRIPTION

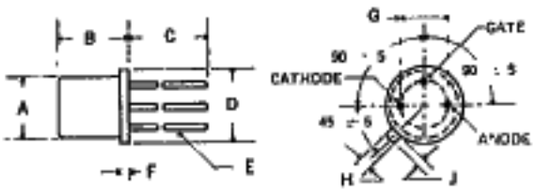
The Programmable Unijunction Transistor is functionally equivalent to a standard unijunction transistor with the advantage that external resistors can be used to program η, R_{BB}, I_P, and I_V, depending upon the designer's needs. The Unitrode device, in addition to allowing programmable versatility, is completely planar passivated and packaged in a TO-18 hermetically sealed package, which offers an order of magnitude improvement in inherent reliability over many similar devices. Applications include pulse and timing circuits, SCR trigger circuits, relaxation oscillators, and sensing circuits. For further application information see Unitrode Application Note U-66.

ABSOLUTE MAXIMUM RATINGS

Anode-to-Cathode Forward Voltage, V_{AK}	40V
Anode-to-Cathode Reverse Voltage, V_{AKR}	40V
Gate-to-Cathode Forward Voltage, V_{GK}	40V
Gate-to-Anode Reverse Voltage, V_{GAR}	40V
Gate-to-Cathode Reverse Voltage, V_{GKR}	5V
Peak Recurrent Forward Current, 10μs 1% Duty Cycle	5A
Peak Gate Current, I_{GM}	250mA
Average Gate Current, $I_{G(AV)}$	50mA
Power Dissipation	
25°C Ambient	300mW
Derating Factor	2.4mW/°C
Storage Temperature Range	−55°C to +125°C
Operating Temperature Range	−55°C to +125°C

MECHANICAL SPECIFICATIONS

2N6137



GATE CONNECTED TO CASE

	INCHES	MILLIMETERS
A	178-195 DIA	4.52-4.95 DIA
B	170-210	4.31-5.33
C	.5 MIN	12.70 MIN
D	.209-230 DIA	5.31-5.84 DIA
E	.017 ± .002 DIA .001 DIA	432 ± .051 .025
F	.020 MAX	.508 MAX
G	.100± .010 DIA	2.54±.254 DIA.
H	.041± .005	1.04± 127
J	.028-.048	.711-1.22

TO-18

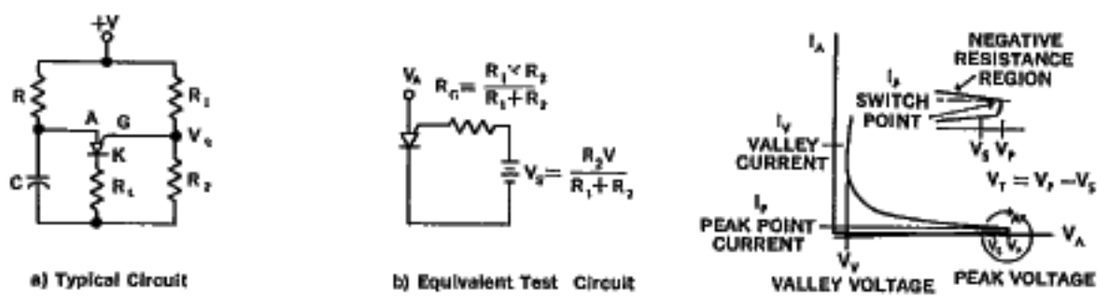
SEMICONDUCTOR PRODUCTS
UNITRODE

ELECTRICAL SPECIFICATIONS (at 25°C unless noted)†

T-25-09

Test	Symbol	Figure	Minimum	Typical	Maximum	Units	Test Conditions
SUBGROUP 1 Visual and Mechanical	—	—	—	—	—	—	
SUBGROUP 2							
Gate-anode blocking current	I_{GAO}	2	—	2	10	nA	V_{GA} = Rating
Gate-cathode blocking current	I_{GKS}	3	—	5	100	nA	V_{GK} = Rating
SUBGROUP 3							
Peak-point anode current	I_P	1	—	1	2	μA	R_G = 1 Meg, V_s = 10V
			—	2.5	5	μA	R_G = 10K, V_s = 10V
Peak-point offset voltage	V_T	1	0.2	0.26	1.6	V	R_G = 1 Meg, V_s = 10V
			0.2	0.35	0.6	V	R_G = 10K, V_s = 10V
Valley-point anode current	I_V	1	—	15	50	μA	R_G = 1 Meg, V_s = 10V
			70	200	—	μA	R_G = 10K, V_s = 10V
			1.5	2	—	mA	R_G = 200Ω, V_s = 10V
SUBGROUP 4							
Forward on-state voltage	V_F	4	—	0.85	1.0	V	I_F = 50mA
Peak pulse voltage	V_O	5	9	12	—	V	
Peak pulse voltage rise time	t_r	5	—	50	80	ns	
SUBGROUP 5							
Gate-anode blocking current (125°C Test)	I_{GAO}	2	—	150	500	nA	V_{GA} = Rating
Valley-point anode current (125°C Test)	I_V	1	40	100	—	μA	R_G = 10K, V_s = 10V
Peak-point anode current (—55°C Test)	I_P	1	—	7.5	10	μA	R_G = 10K, V_s = 10V

† All values in table are JEDEC registered



a) Typical Circuit

b) Equivalent Test Circuit

Figure 1

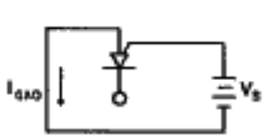


Figure 2

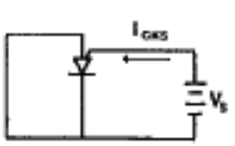


Figure 3

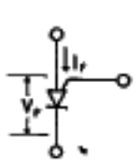


Figure 4

Note: Conditions for oscillation

$$\frac{V_{BB} - V_P}{R} > I_P$$

$$\frac{V_{BB} - V_V}{R} < I_V$$

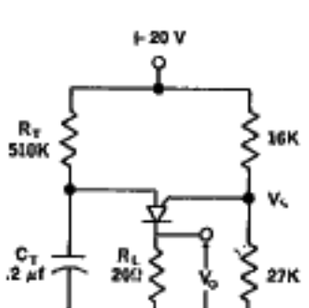
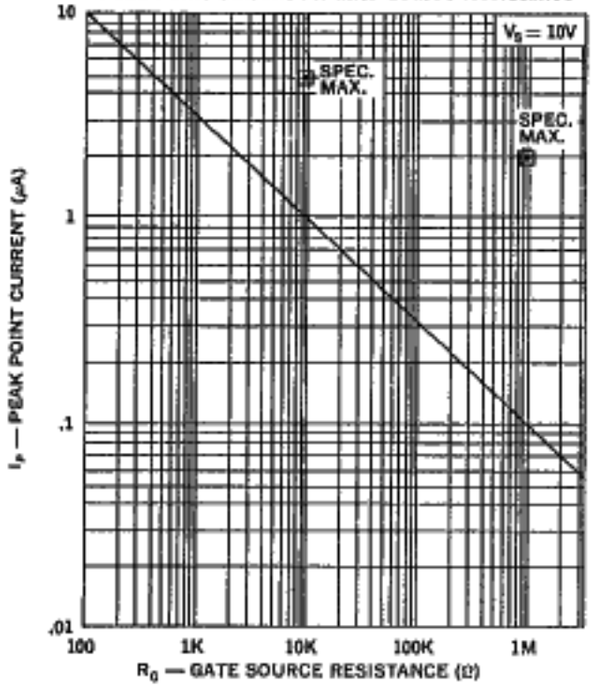
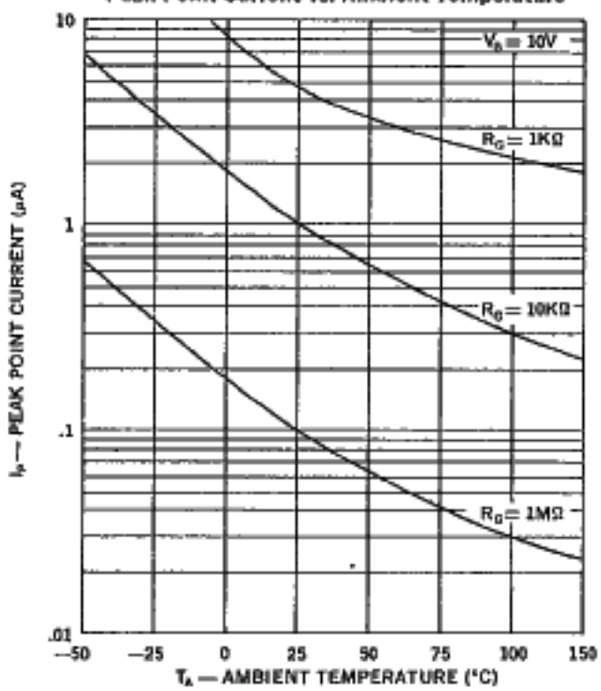


Figure 5

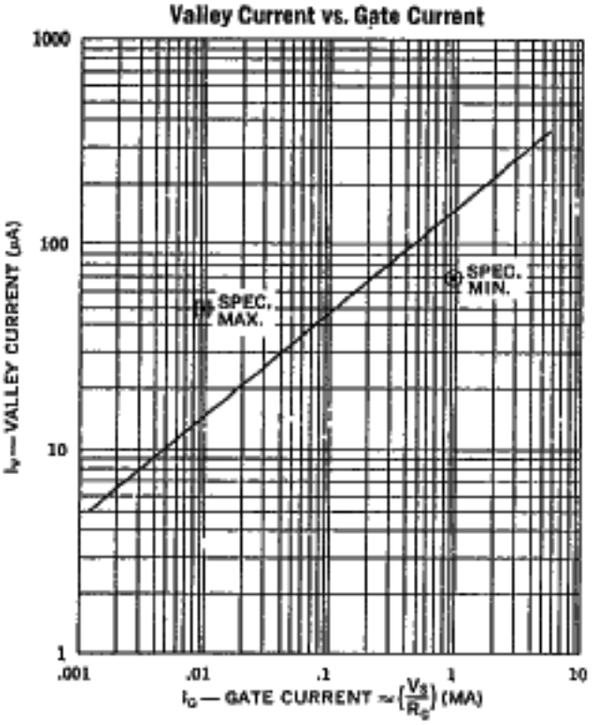
Peak Point Current vs. Gate Source Resistance



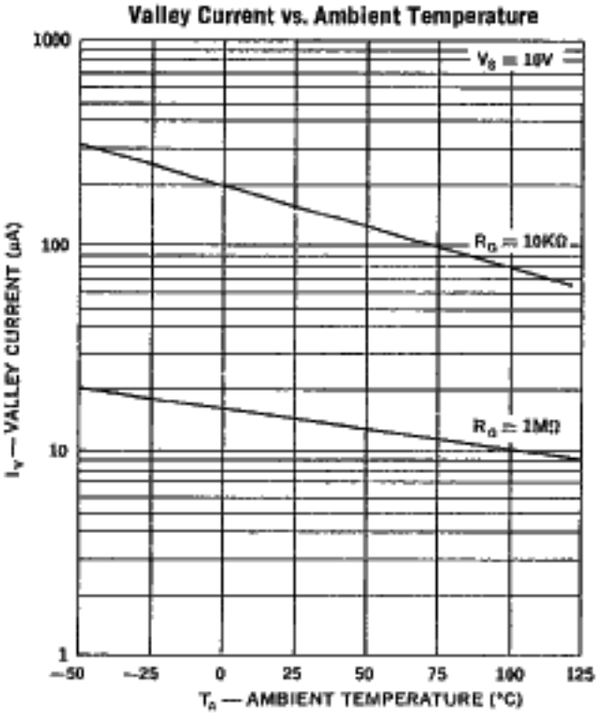
Peak Point Current vs. Ambient Temperature



Valley Current vs. Gate Current

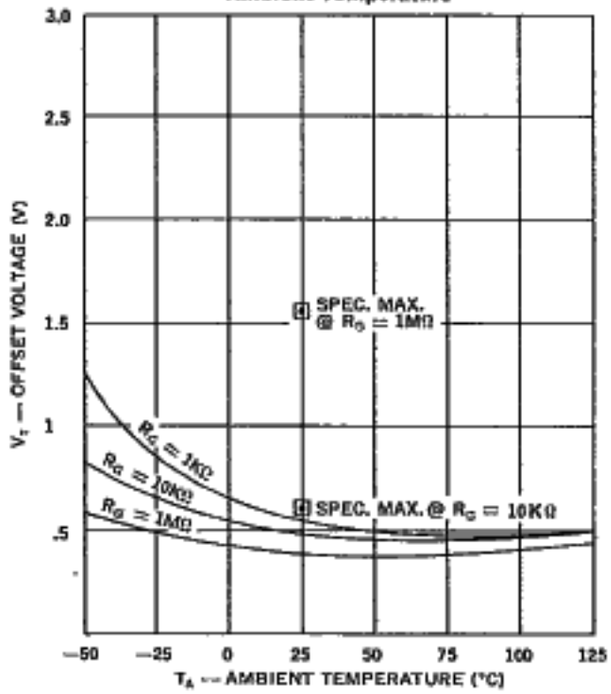


Valley Current vs. Ambient Temperature

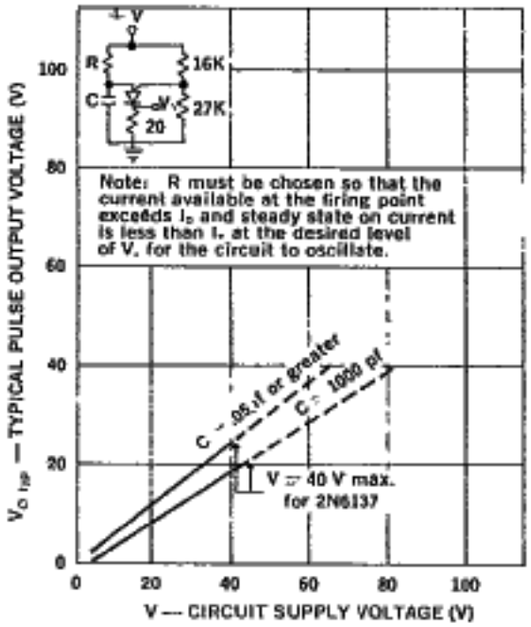


T-25-09

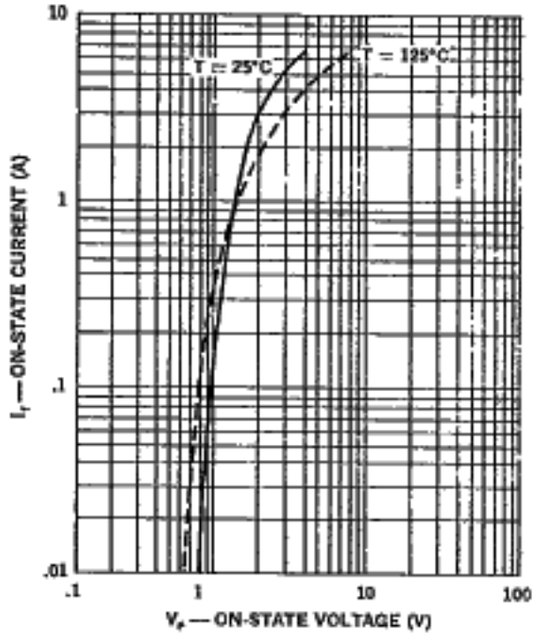
Offset Voltage vs. Ambient Temperature



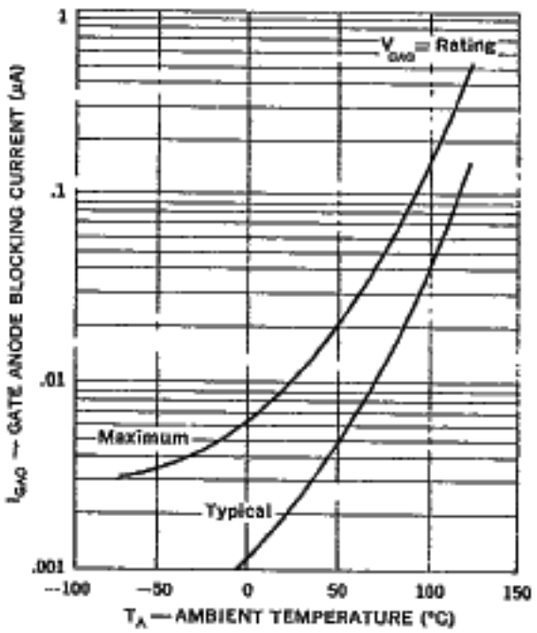
Typical Pulse Output Voltage vs. Circuit Supply Voltage



Typical Current vs. On-State Voltage



Gate-Anode Blocking Current vs. Ambient Temperature



9

UNITRODE • SEMICONDUCTOR PRODUCTS
580 PLEASANT STREET • WATERTOWN, MA 02172
TEL. (617) 926 0404 • FAX (617) 924-1235