ELECTRONICS, INC.
44 FARRAND STREET
BLOOMFIELD, NJ 07003
(973) 748–5089
http://www.nteinc.com

NTE6402
Programmable Unijunction Transistor (PUT)

Description:

The NTE6402 is a 3–terminal silicon planer passivated PNP device available in the standard plastic low cost TO98 and TO92 type packages. The terminals are designated as anode, anode gate, and cathode.

This device has been characterized as a Programmable Unijunction Transistor (PUT), designed to enable the engineer to “program” unijunction characteristics such as R_{BB}, η, I_V, and I_P by merely selecting two resistor values. Applications include 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.

Features:

- Programmable – R_{BB}, η, I_V, and I_P
- Low On–State Voltage – 1.5V Max @ I_F = 50mA
- Low Gate to Anode Leakage Current – 10nA Max
- High Peak Output Voltage – 11V Typ
- Low Offset Voltage – 0.35V Typ (R_G = 10kΩ)

Absolute Maximum Ratings: (T_J = +25°C unless otherwise specified)

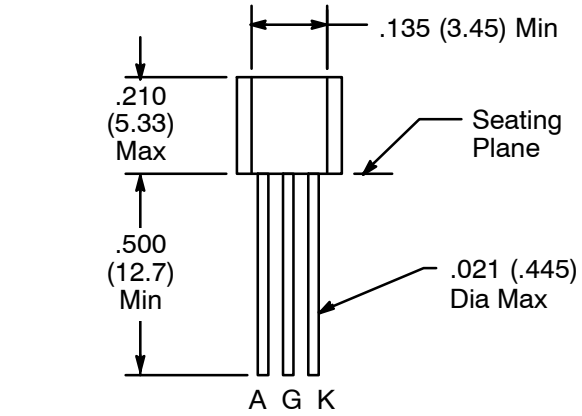
Power Dissipation, P_F 300mW
Derate Above +25°C . . . . . 4mW/°C
DC Forward Anode Current, I_T 150mA
Derate Above +25°C . . . . . 2.67mA/°C
DC Gate Current, I_G . . . . . ±50V
Repetitive Peak Forward Current, I_{TRM}
Pulse Width = 100μs, Duty Cycle = 1% 1A
Pulse Width = 20μs, Duty Cycle = 1% 2A
Non–Repetitive Peak Forward Current (Pulse Width = 10μs), I_{TSM} 5A
Gate–to–Cathode Forward Voltage, V_{GKF} . . . . . +40V
Gate–to–Cathode Reverse Voltage, V_{GKR} . . . . . –5V
Gate–to–Anode Reverse Voltage, V_{GAR} . . . . . +40V
Anode–to–Cathode Voltage (Note 1), V_{AK} . . . . . ±40V
Operating Junction Temperature Range, T_J . . . . . –50° to +100°C
Storage Temperature Range, T_{stg} . . . . . –55° to +150°C
Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 75°C/W
Thermal Resistance, Junction–to–Ambient, R_{thJA} . . . . . 200°C/W
Lead Temperature (During Soldering, 1/16” from case, 10sec max.), T_L . . . . . +260°C

Note 1. Anode positive, R_{GA} = 100Ω
Anode negative, R_{GA} = Open

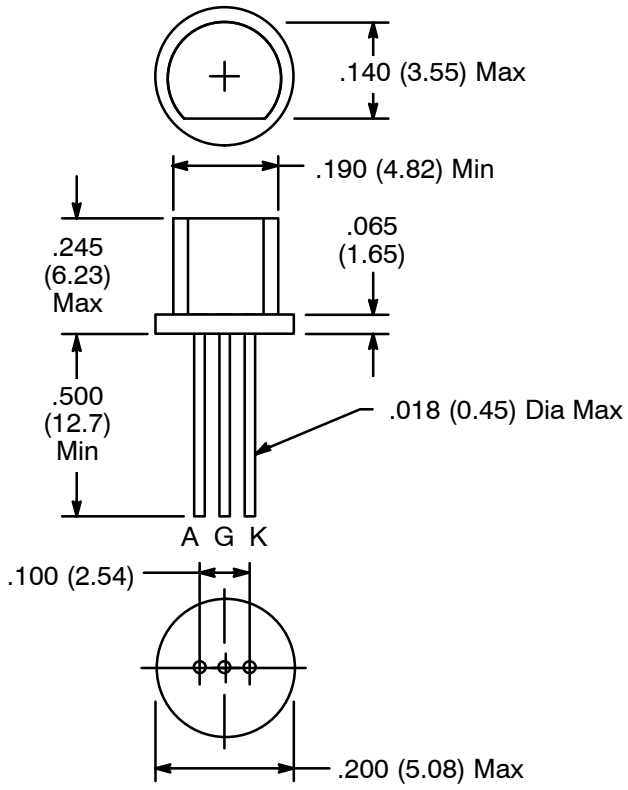
Electrical Characteristics: (T_C = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Peak Current	I_P	V_S = 10V, R_G = 1MΩ	–	1.25	2.0	μA
		V_S = 10V, R_G = 10kΩ	–	4.0	5.0	μA
Offset Voltage	V_T	V_S = 10V, R_G = 1MΩ	0.2	0.7	1.6	V
		V_S = 10V, R_G = 10kΩ	0.2	0.35	0.6	V
Valley Current	I_V	V_S = 10V, R_G = 1MΩ	–	18	50	μA
		V_S = 10V, R_G = 10kΩ	70	150	–	μA
		V_S = 10V, R_G = 200Ω	1.5	–	–	mA
Gate–to–Anode Leakage Current	I_{GAO}	V_S = 40V, T_A = +25°C, Cathode Open	–	1.0	10	nA
		V_S = 40V, T_A = +75°C, Cathode Open	–	3.0	–	nA
Gate–to–Cathode Leakage Current	I_{GKS}	V_S = 40V, Anode–Cathode Short	–	5.0	50	nA
Forward Voltage	V_F	I_F = 50mA Peak, Note 2	–	0.8	1.5	V
Peak Output Voltage	V_O	V_G = 20V, C_C = 0.2μF	6.0	11.0	–	V
Pulse Voltage Rate of Rise	t_r	V_B = 20V, C_C = 0.2μF	–	40	80	ns

Note 2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.



TO92



TO98