Data sheet	
status	Product specification
date of issue	September 1994

BRY39
Programmable unijunction transistor

DESCRIPTION

A planar pnpn trigger device in a TO-72 metal package, intended for use in switching applications such as motor control, oscillators, relay replacement, timers, pulse shapers, etc.

PINNING

Anode gate (ag) connected to case.

PIN	DESCRIPTION
1	cathode
2	cathode gate
3	anode gate
4	anode

ACCESSORIES

56246 (distance disc).

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{GA}	gate-anode voltage		–	70	V
I_A	anode current	DC value up to T_{amb} = 25 °C	–	175	mA
T_j	operating junction temperature		–	150	°C
$I_{(P)}$	peak point current	V_S = 10 V R_G = 10 kΩ	–	0.2	µA

PIN CONFIGURATION

Fig.1 Simplified outline and symbol.

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LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{GA}	gate-anode voltage		–	70	V
I_A	anode current	average value up to T_{amb} = 25 °C	–	175	mA
I_{ARM}	repetitive peak anode current	t_p = 10 µs δ = 0.01	–	2.5	A
I_{ASM}	non-repetitive peak anode current	t_p = 10 µs T_j = 150 °C	–	3	A
dI_A/dt	rate of rise of anode current	up to I_A = 2.5 A	–	20	A/µs
P_{tot}	total power dissipation	up to T_{amb} = 25 °C	–	275	mW
T_{stg}	storage temperature range		−65	200	°C
T_j	junction temperature		–	150	°C
T_{amb}	ambient operating temperature range		−65	150	°C

THERMAL RESISTANCE

SYMBOL	PARAMETER	MAX.	UNIT
$R_{th\ j\text{-}a}$	from junction to ambient in free air	450	K/W

EXPLANATION OF SYMBOLS

For application of the BRY39 as a programmable unijunction transistor, only the anode gate is used. To simplify the symbols, the term gate, instead of anode gate, will be used (see Fig.2).

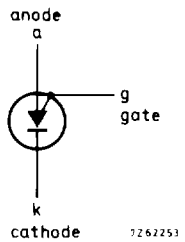

Fig.2 Explanation of symbols.

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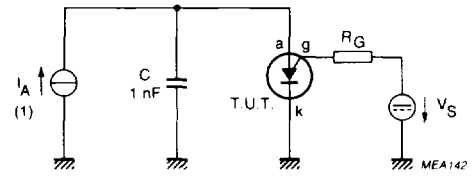
CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{(P)}$	peak point current (see Figs 3 and 8)	V_S = 10 V R_G = 10 kΩ	–	–	0.2	μA
		V_S = 10 V R_G = 100 kΩ	–	–	0.06	μA
$I_{(V)}$	valley point current (see Figs 3 and 8)	V_S = 10 V R_G = 10 kΩ	–	–	2	μA
		V_S = 10 V R_G = 100 kΩ	–	–	1	μA
V_{offset}	offset voltage (for V_P and V_S, see Fig.8)	typical curve I_A = 0	–	V_P–V_S	–	V
I_{GAO}	gate-anode leakage current	I_K = 0 V_{GA} = 70 V	–	–	10	nA
I_{GKS}	gate-cathode leakage current	V_{AK} = 0 V_{KG} = 70 V	–	–	100	nA
V_{AK}	anode-cathode voltage	I_A = 100 mA	–	–	1.4	V
V_{OM}	peak output voltage (see Figs 9 and 10)	V_{AA} = 20 V C = 10 nF	6	–	–	V
t_r	rise time (see Fig.10)	V_{AA} = 20 V C = 10 nF	–	–	80	ns



(1) Controllable current source.

Fig.3 Test circuit for peak and valley point currents.

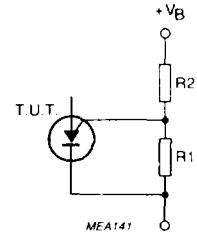


Fig.4 BRY39 with 'program' resistors R1 and R2.

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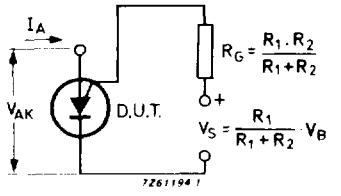

Fig.5 Equivalent test circuit for characteristics testing.

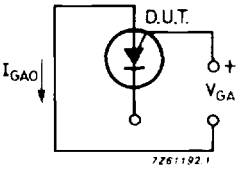

Fig.6 Equivalent test circuit for gate-anode leakage current.

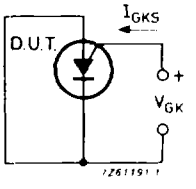

Fig.7 Equivalent test circuit for gate-cathode leakage current.

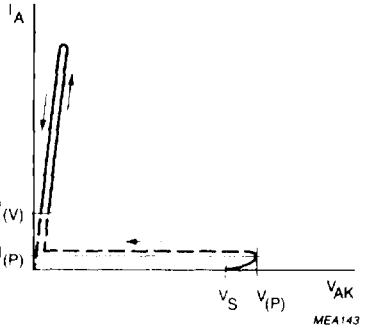

Fig.8 Offset voltage.

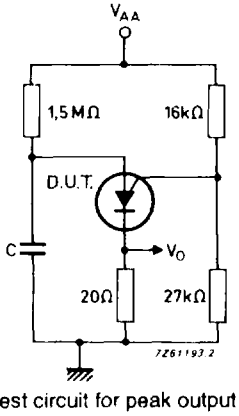

Fig.9 Test circuit for peak output voltage.

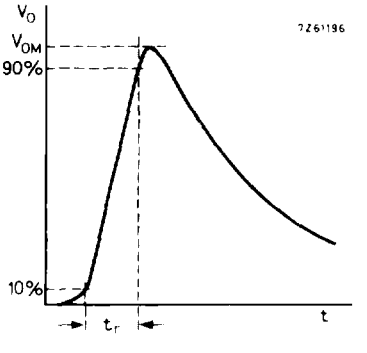

Fig.10 Peak output voltage.

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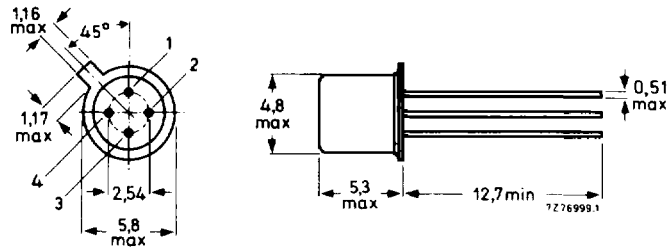
PACKAGE OUTLINE



Dimensions in mm.

Fig.11 TO-72.