

DATA SHEET



BRY56A

Programmable unijunction
transistor

Product specification

1999 May 31

Programmable unijunction transistor

BRY56A

DESCRIPTION

Planar PNP trigger device in a TO-92; SOT54 plastic package.

APPLICATIONS

- Switching applications such as:
 - Motor control
 - Oscillators
 - Relay replacement
 - Timers
 - Pulse shapers, etc.

PINNING

PIN	DESCRIPTION
1	gate
2	anode
3	cathode

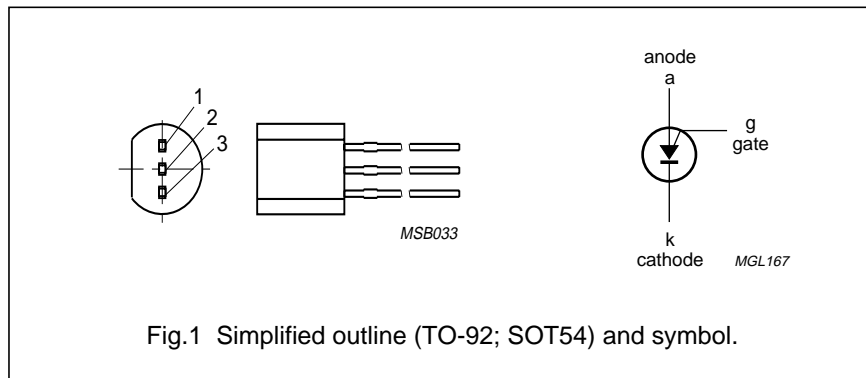


Fig.1 Simplified outline (TO-92; SOT54) and symbol.

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{GA}	gate-anode voltage		–	70	V
$I_{A(AV)}$	average anode current		–	175	mA
I_{ARM}	repetitive peak anode current	$t_p = 10 \mu s; \delta = 0.01$	–	2.5	A
I_{ASM}	non-repetitive peak anode current	$t_p = 10 \mu s$	–	3	A
di_A/dt	rate of rise of anode current	$I_A \leq 2.5 \text{ A}$	–	20	A/ μs
P_{tot}	total power dissipation	$T_{amb} \leq 75 \text{ }^\circ\text{C}$	–	300	mW
T_{stg}	storage temperature		–65	+150	$^\circ\text{C}$
T_j	junction temperature		–	150	$^\circ\text{C}$
T_{amb}	operating ambient temperature		–65	+150	$^\circ\text{C}$

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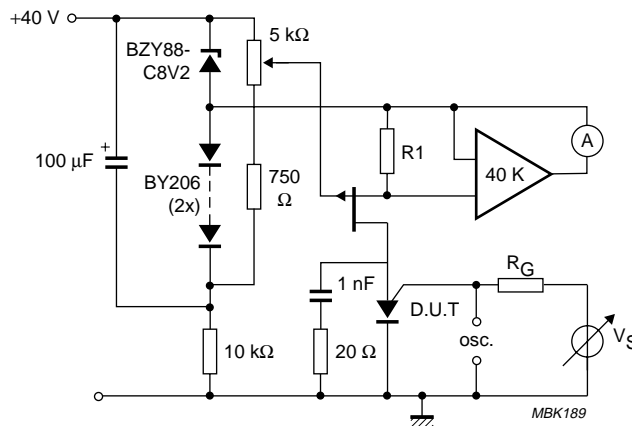
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	in free air	250	K/W

CHARACTERISTICS

$T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_P	peak point current	$V_S = 10\text{ V}; R_G = 10\text{ k}\Omega$; see Fig.7	–	–	200	nA
		$V_S = 10\text{ V}; R_G = 100\text{ k}\Omega$; see Fig.7	–	–	60	nA
I_V	valley point current	$V_S = 10\text{ V}; R_G = 10\text{ k}\Omega$; see Fig.7	2	–	–	μA
		$V_S = 10\text{ V}; R_G = 100\text{ k}\Omega$; see Fig.7	1	–	–	μA
V_{offset}	offset voltage	typical curve; $I_A = 0$; see Fig.7	–	$V_P - V_S$	–	V
I_{GAO}	gate-anode leakage current	$I_K = 0; V_{GA} = 70\text{ V}$; see Fig.5	–	–	10	nA
I_{GKS}	gate-cathode leakage current	$V_{AK} = 0; V_{KG} = 70\text{ V}$; see Fig.6	–	–	100	nA
V_{AK}	anode-cathode voltage	$I_A = 100\text{ mA}$	–	–	1.4	V
V_{OM}	peak output voltage	$V_{AA} = 20\text{ V}; C = 10\text{ nF}$; see Figs 8 and 9	6	–	–	V
t_r	rise time	$V_{AA} = 20\text{ V}; C = 10\text{ nF}$; see Fig.9	–	–	80	ns



I_P and I_V determined by value of R_1 .

$R_1 = \frac{1}{I_A}$; i.e. maximum voltage drop over $R_1 = 1\text{ V}$.

Internal resistance of oscilloscope = $10\text{ M}\Omega$.

Fig.2 Measuring circuit for peak and valley point currents.

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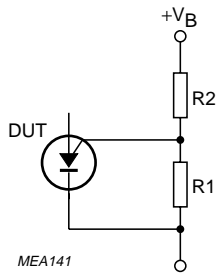


Fig.3 BRY56A with 'program' resistors R1 and R2.

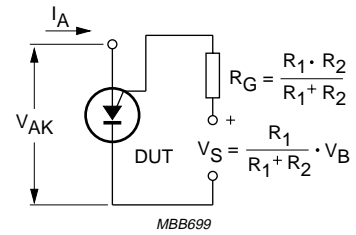


Fig.4 Equivalent test circuit for characteristics testing.

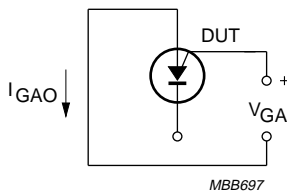


Fig.5 Equivalent test circuit for gate-anode leakage current.

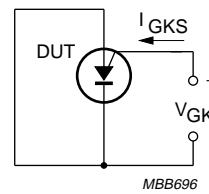


Fig.6 Equivalent test circuit for gate-cathode leakage current.

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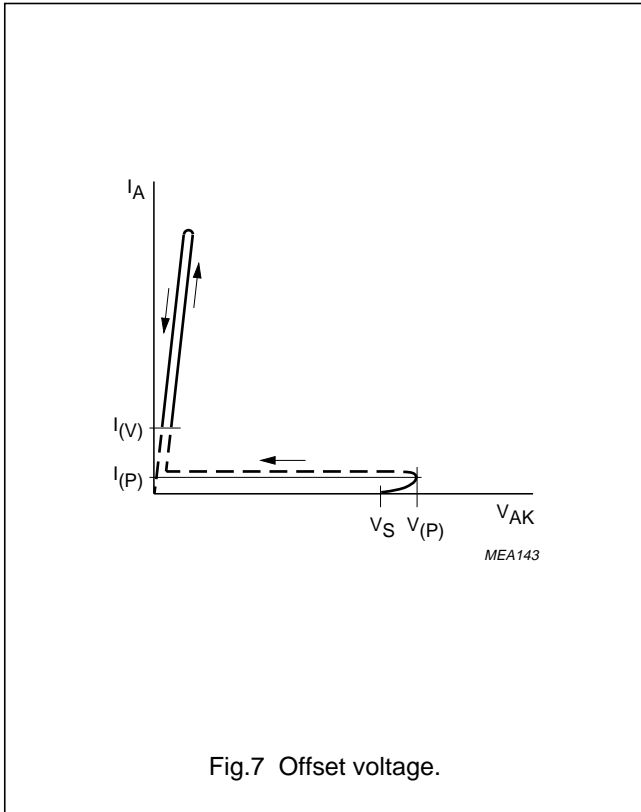


Fig.7 Offset voltage.

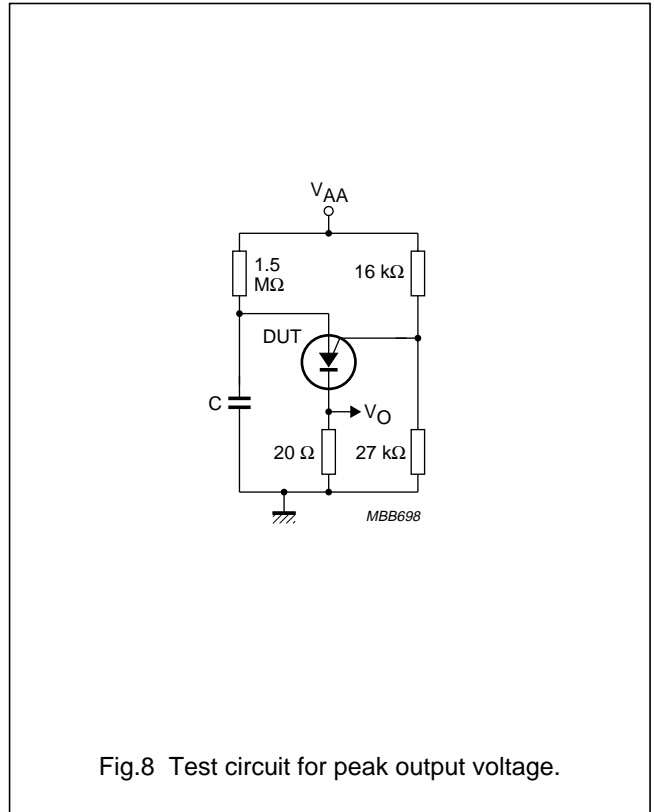


Fig.8 Test circuit for peak output voltage.

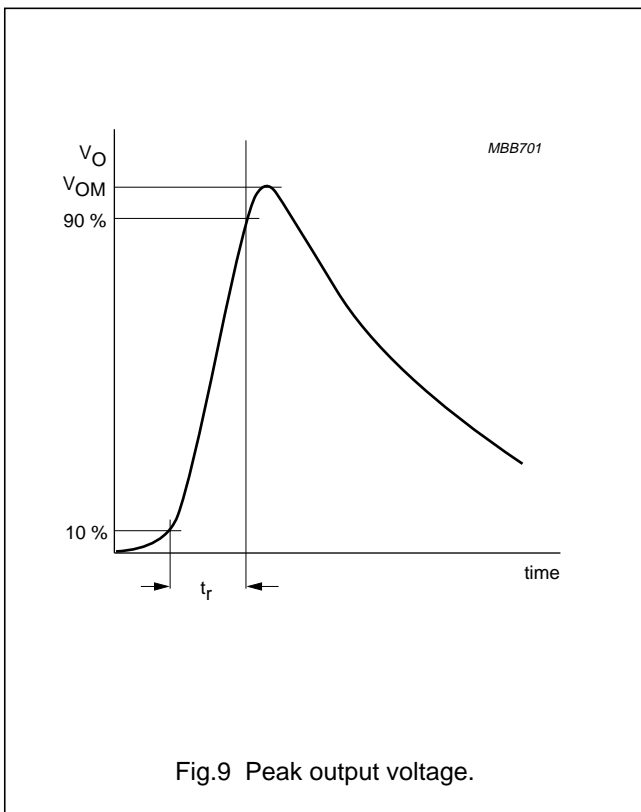


Fig.9 Peak output voltage.

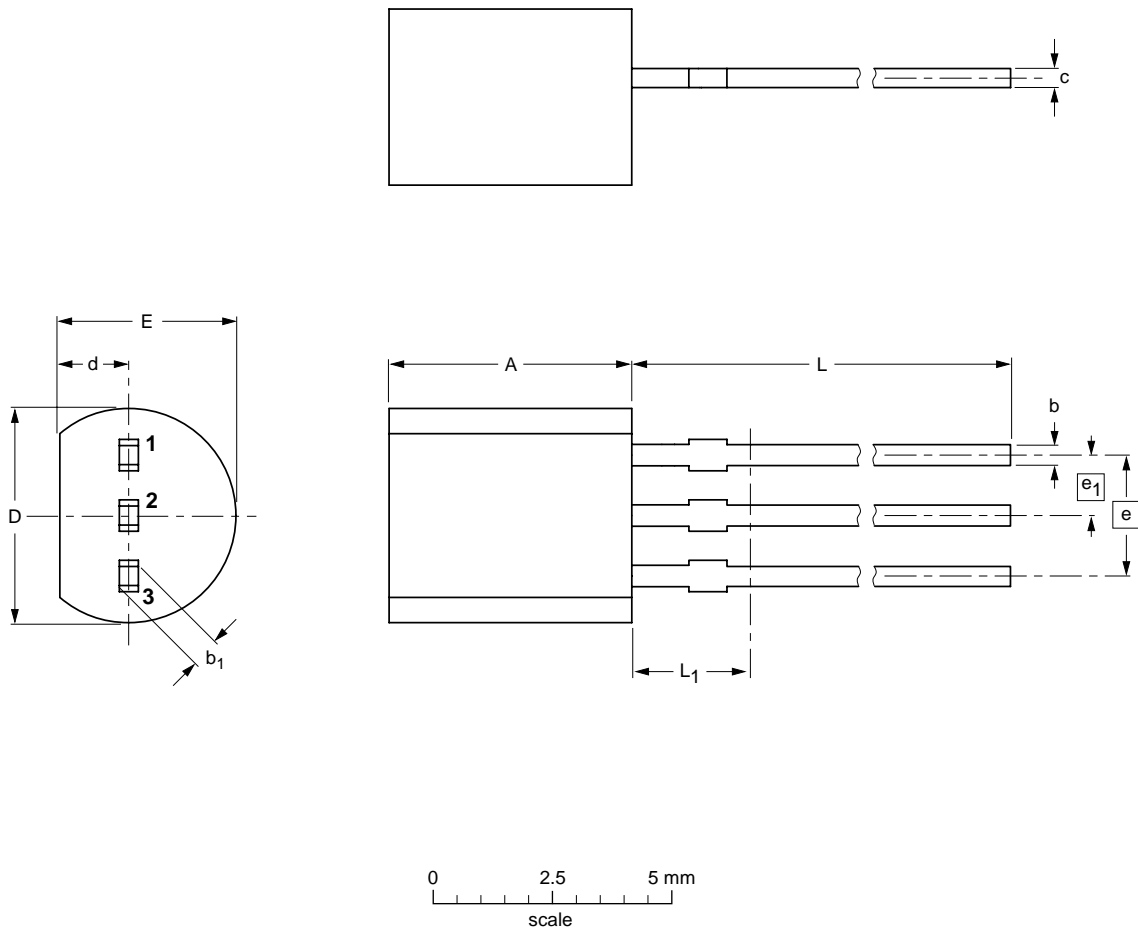
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PACKAGE OUTLINE

Plastic single-ended leaded (through hole) package; 3 leads

SOT54



DIMENSIONS (mm are the original dimensions)

UNIT	A	b	b ₁	c	D	d	E	e	e ₁	L	L ₁ ⁽¹⁾
mm	5.2 5.0	0.48 0.40	0.66 0.56	0.45 0.40	4.8 4.4	1.7 1.4	4.2 3.6	2.54	1.27	14.5 12.7	2.5

Note

1. Terminal dimensions within this zone are uncontrolled to allow for flow of plastic and terminal irregularities.

OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ		
SOT54		TO-92	SC-43		97-02-28

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BRY56A**DEFINITIONS**

Data Sheet Status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

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