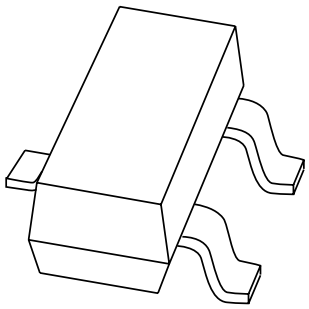
DATA SHEET



BRY61
Programmable unijunction transistor

Product specification
Supersedes data of 1997 Jul 21

1999 Apr 27

Philips
Semiconductors

PHILIPS

Programmable unijunction transistor BRY61

DESCRIPTION

Planar PNPN trigger device in a SOT23 plastic package.

APPLICATIONS

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

MARKING

TYPE NUMBER	MARKING CODE(1)
BRY61	A5∗

Note

1. ∗ = p : Made in Hong Kong.
   ∗ = t : Made in Malaysia.

PINNING

PIN	DESCRIPTION
1	anode
2	cathode
3	gate

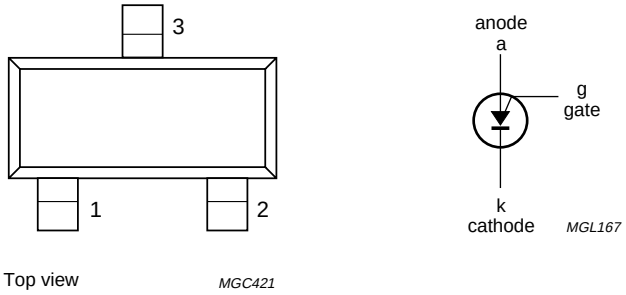


Fig.1 Simplified outline SOT23 and symbol.

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 µs; δ = 0.01	–	2.5	A
I_{ASM}	non-repetitive peak anode current	t_p = 10 µs	–	3	A
dI_A/dt	rate of rise of anode current	$1_A \leq 2.5$ A	–	20	A/µs
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

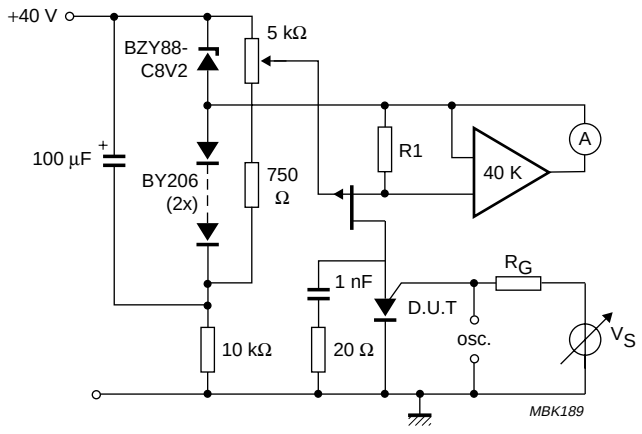
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	in free air	500	K/W

CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_P	peak point current	V_S = 10 V; R_G = 10 kΩ; (see Fig.7)	–	–	0.2	μA
		V_S = 10 V; R_G = 100 kΩ; (see Fig.7)	–	–	0.06	μA
I_V	valley point current	V_S = 10 V; R_G = 10 kΩ; (see Fig.7)	2	–	–	μA
		V_S = 10 V; R_G = 100 kΩ; (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 V; (see Fig.5)	–	–	10	nA
I_{GKS}	gate-cathode leakage current	V_{AK} = 0; V_{KG} = 70 V; (see Fig.6)	–	–	100	nA
V_{AK}	anode-cathode voltage	I_A = 100 mA	–	–	1.4	V
V_{OM}	peak output voltage	V_{AA} = 20 V; C = 10 nF; (see Figs 8 and 9)	6	–	–	V
t_r	rise time	V_{AA} = 20 V; C = 10 nF; (see Fig.9)	–	–	80	ns



I_P and I_V determined by value of R1.

$R1 = \frac{1}{I_A}$; i.e. maximum voltage drop over R1 = 1 V.

Internal resistance of oscilloscope = 10 MΩ.

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

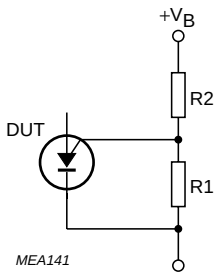


Fig.3 BRY61 with 'program' resistors R1 and R2.

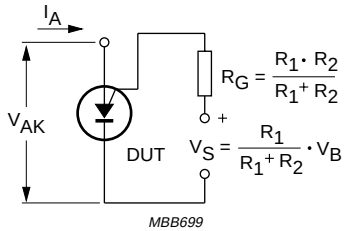


Fig.4 Equivalent test circuit for characteristics testing.

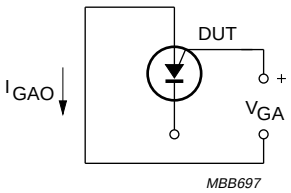


Fig.5 Equivalent test circuit for gate-anode leakage current.

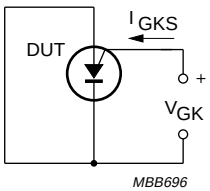


Fig.6 Equivalent test circuit for gate-cathode leakage current.

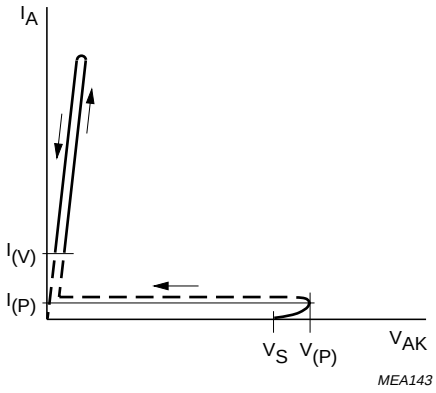


Fig.7 Offset voltage.

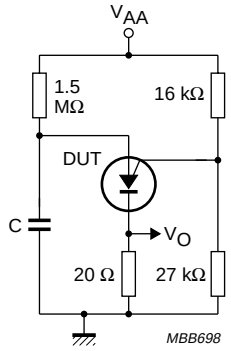


Fig.8 Test circuit for peak output voltage.

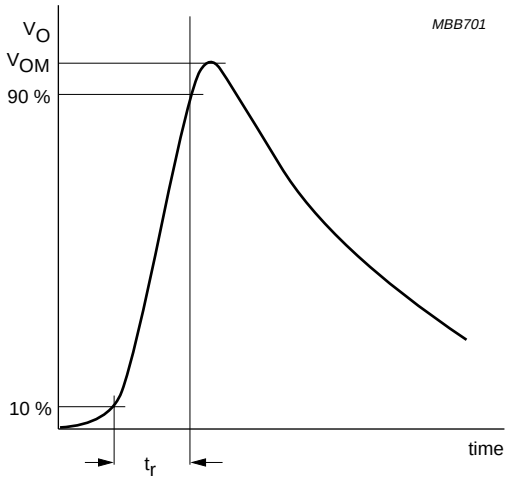
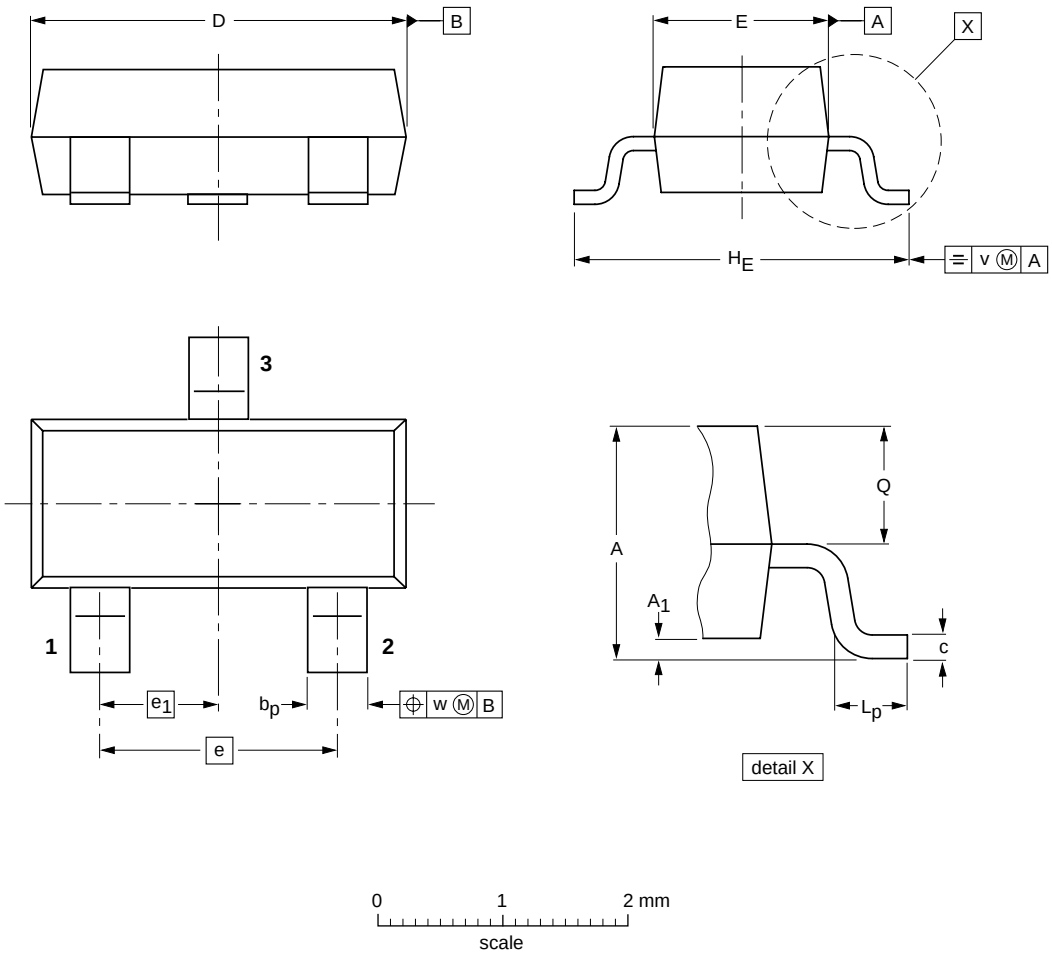


Fig.9 Peak output voltage.

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads **SOT23**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max.	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w
mm	1.1 0.9	0.1	0.48 0.38	0.15 0.09	3.0 2.8	1.4 1.2	1.9	0.95	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT23						97-02-28

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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