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DATA SHEET

2PD601; 2PD601A NPN general purpose transistors

Product specification
Supersedes data of March 1993
File under Discrete Semiconductors, SC04

November 1994

Philips Semiconductors



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NPN general purpose transistors

2PD601; 2PD601A

FEATURES

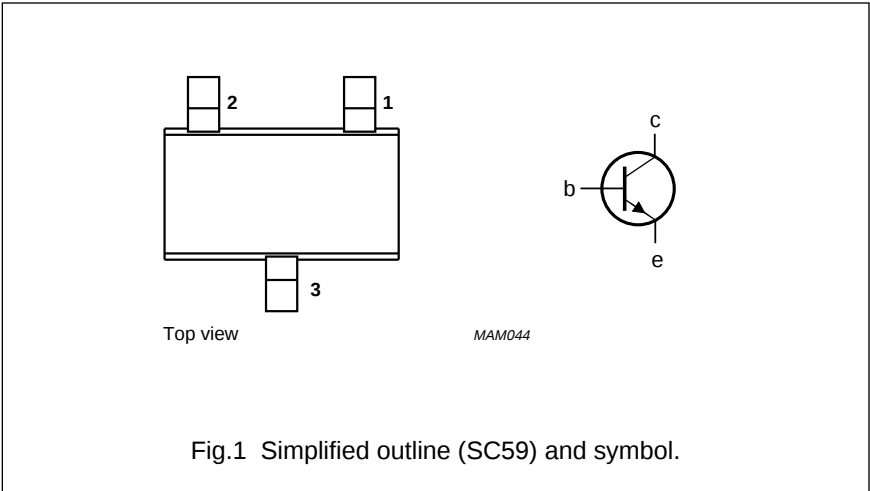
- High DC current gain
- Low collector-emitter saturation voltage
- S-mini package.

APPLICATIONS

Intended for general amplification.

DESCRIPTION

NPN transistor in a plastic SC59 package. Complementary pairs are 2PB709 and 2PB709A respectively.



MARKING

TYPE NUMBER	MARKING CODE
2PD601Q	YQ
2PD601R	YR
2PD601S	YS
2PD601AQ	ZQ
2PD601AR	ZR
2PD601AS	ZS

PINNING SC59

PIN	DESCRIPTION
1	base
2	emitter
3	collector

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter			
	2PD601		–	30	V
	2PD601A		–	60	V
V_{CEO}	collector-emitter voltage	open base			
	2PD601		–	25	V
	2PD601A		–	50	V
I_{CM}	peak collector current		–	200	mA
P_{tot}	total power dissipation	up to $T_{amb} = 25\text{ }^{\circ}\text{C}$	–	250	mW
h_{FE}	DC current gain	$I_C = 2\text{ mA};$ $V_{CE} = 10\text{ V}$	160	460	
f_T	transition frequency	$I_E = -2\text{ mA};$ $V_{CB} = 10\text{ V}$			
	2PD601S		140	–	MHz
	2PD601AS		140	–	MHz

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LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter			
	2PD601		–	30	V
	2PD601A		–	60	V
V_{CEO}	collector-emitter voltage	open base			
	2PD601		–	25	V
	2PD601A		–	50	V
V_{EBO}	emitter-base voltage	open collector	–	6	V
I_C	collector current (DC)		–	100	mA
I_{CM}	peak collector current		–	200	mA
P_{tot}	total power dissipation	up to $T_{amb} = 25\text{ °C}$; note 1	–	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
$R_{th\ j-a}$	thermal resistance from junction to ambient	in free air; note 1	500	K/W

Note to the “Limiting values” and “Thermal characteristics”

1. Refer to SC59 standard mounting conditions.

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{(BR)CBO}$	collector-base breakdown voltage 2PD601 2PD601A	open emitter; $I_C = 10\text{ }\mu\text{A}$; $I_E = 0$	30	—	V
			60	—	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage 2PD601 2PD601A	open base; $I_C = 2\text{ mA}$; $I_B = 0$; note 1	25	—	V
			50	—	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	open collector; $I_E = -10\text{ }\mu\text{A}$; $I_C = 0$	6	—	V
V_{CEsat}	collector-emitter saturation voltage	$I_C = 100\text{ mA}$; $I_B = 10\text{ mA}$; note 1	—	500	mV
I_{CBO}	collector cut-off current	$V_{CB} = 20\text{ V}$; $I_E = 0$	—	100	nA
		$V_{CB} = 20\text{ V}$; $I_E = 0$; $T_j = 150\text{ }^{\circ}\text{C}$	—	5	μA
I_{EBO}	emitter cut-off current	$V_{EB} = 5\text{ V}$; $I_C = 0$	—	100	nA
h_{FE}	DC current gain	$V_{CE} = 2\text{ V}$; $I_C = 100\text{ mA}$; note 1	90	—	
h_{FE}	DC current gain 2PD601Q; 2PD601AQ 2PD601R; 2PD601AR 2PD601S; 2PD601AS	$V_{CE} = 10\text{ V}$; $I_C = 2\text{ mA}$; note 1	160	260	
			210	340	
			290	460	
f_T	transition frequency 2PD601Q; 2PD601AQ 2PD601R; 2PD601AR 2PD601S; 2PD601AS	$V_{CB} = 10\text{ V}$; $I_E = -2\text{ mA}$; $f = 100\text{ MHz}$	100	—	MHz
			120	—	MHz
			140	—	MHz
C_c	collector capacitance	$V_{CB} = 10\text{ V}$; $I_E = I_{E0} = 0$; $f = 1\text{ MHz}$	—	3.5	pF

Note

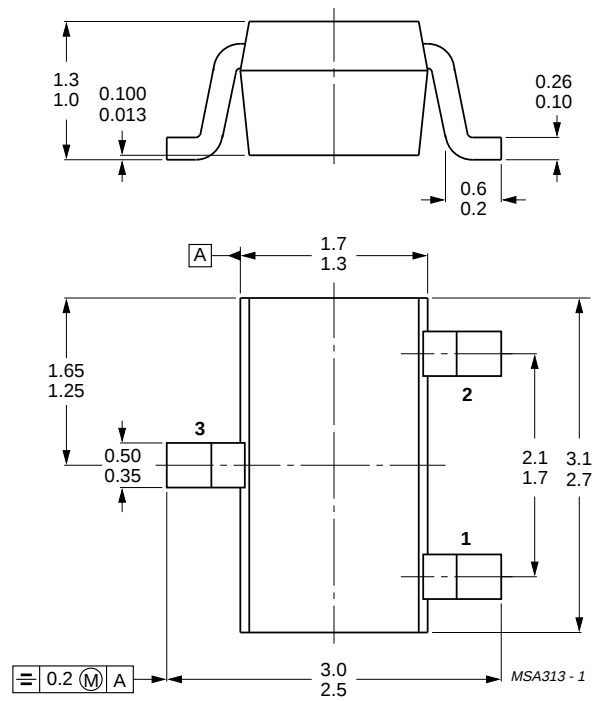
1. Pulse test: $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$.

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PACKAGE OUTLINE



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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.	

LIFE SUPPORT APPLICATIONS

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