

# DATA SHEET

## **2PD601A series**

**NPN general purpose transistors;  
50 V, 100 mA**

Product data sheet  
Supersedes data of 2002 Jun 26

2004 Feb 12

# NPN general purpose transistors; 50 V, 100 mA

## 2PD601A series

### FEATURES

- Available in SOT323 (SC-70) and SOT346 (SC-59) packages
- Available in three different DC current gain versions (Q, R, S).

### APPLICATIONS

- General purpose switching and amplification.

### DESCRIPTION

NPN general purpose transistors (see “Simplified outline, symbol and pinning” for package details).

### QUICK REFERENCE DATA

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
$V_{CE0}$	collector-emitter voltage	–	50	V
$I_C$	collector current (DC)	–	100	mA
$h_{FE}$	DC current gain			
	group Q	160	260	
	group R	210	340	
	group S	290	460	

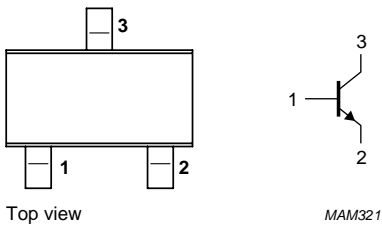
### PRODUCT OVERVIEW

TYPE NUMBER	PACKAGE		MARKING CODE	$h_{FE}$ GROUP
	PHILIPS	EIAJ		
2PD601AQ	SOT346	SC-59	ZQ	Q
2PD601AR	SOT346	SC-59	ZR	R
2PD601AS	SOT346	SC-59	ZS	S
2PD601AQW	SOT323	SC-70	*6D	Q
2PD601ARW	SOT323	SC-70	*6E	R
2PD601ASW	SOT323	SC-70	*6F	S

### Note

- \* = p: Made in Hong Kong.  
\* = t: Made in Malaysia.  
\* = W: Made in China.

### SIMPLIFIED OUTLINE, SYMBOL AND PINNING

TYPE NUMBER	SIMPLIFIED OUTLINE AND SYMBOL	PINNING	
		PIN	DESCRIPTION
2PD601AQ 2PD601AR 2PD601AS 2PD601AQW 2PD601ARW 2PD601ASW	 <p>Top view</p> <p>MAM321</p>	1 2 3	base emitter collector

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### ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
2PD601AQ	–	plastic surface mounted package; 3 leads	SOT346
2PD601AR			
2PD601AS			
2PD601AQW	–	plastic surface mounted package; 3 leads	SOT323
2PD601ARW			
2PD601ASW			

### LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{CBO}$	collector-base voltage	open emitter	–	60	V
$V_{CEO}$	collector-emitter voltage	open base	–	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	$T_{amb} \leq 25\text{ °C}$ ; note 1			
	SOT346		–	250	mW
	SOT323		–	200	mW
$T_{stg}$	storage temperature		–65	+150	°C
$T_j$	junction temperature		–	150	°C
$T_{amb}$	operating ambient temperature		–65	+150	°C

#### Note

1. Refer to SOT346 (SC-59) and SOT323 (SC-70) standard mounting conditions.

### THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th(j-a)}$	thermal resistance from junction to ambient	note 1		
	SOT346		500	K/W
	SOT323		625	K/W

#### Note

1. Refer to SOT346 (SC-59) and SOT323 (SC-70) standard mounting conditions.

### Soldering

Reflow soldering is the only recommended soldering method.

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### CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_{CBO}$	collector-base cut-off current	$I_E = 0$ ; $V_{CB} = 60\text{ V}$	–	10	nA
		$I_E = 0$ ; $V_{CB} = 60\text{ V}$ ; $T_j = 150\text{ °C}$	–	5	$\mu\text{A}$
$I_{EBO}$	emitter-base cut-off current	$I_C = 0$ ; $V_{EB} = 5\text{ V}$	–	10	nA
$h_{FE}$	DC current gain	$I_C = 100\text{ mA}$ ; $V_{CE} = 2\text{ V}$ ; note 1	90	–	
$h_{FE}$	DC current gain	$I_C = 2\text{ mA}$ ; $V_{CE} = 10\text{ V}$			
	group Q		160	260	
	group R		210	340	
	group S		290	460	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = 100\text{ mA}$ ; $I_B = 10\text{ mA}$ ; note 1	–	250	mV
$C_c$	collector capacitance	$I_E = i_e = 0$ ; $V_{CB} = 10\text{ V}$ ; $f = 1\text{ MHz}$	–	3	pF
$f_T$	transition frequency	$I_C = 2\text{ mA}$ ; $V_{CE} = 10\text{ V}$ ; $f = 100\text{ MHz}$	100	–	MHz

### Note

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

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PACKAGE OUTLINES

Plastic surface-mounted package; 3 leads

SOT346

Technical drawing of the SOT346 package showing top, bottom, and side views with dimensions labeled A, A1, bp, c, D, E, e, e1, HE, Lp, Q, v, w.

0 1 2 mm  
scale

**DIMENSIONS (mm are the original dimensions)**

UNIT	A	A1	bp	c	D	E	e	e1	HE	Lp	Q	v	w
mm	1.3 1.0	0.1 0.013	0.50 0.35	0.26 0.10	3.1 2.7	1.7 1.3	1.9	0.95	3.0 2.5	0.6 0.2	0.33 0.23	0.2	0.2

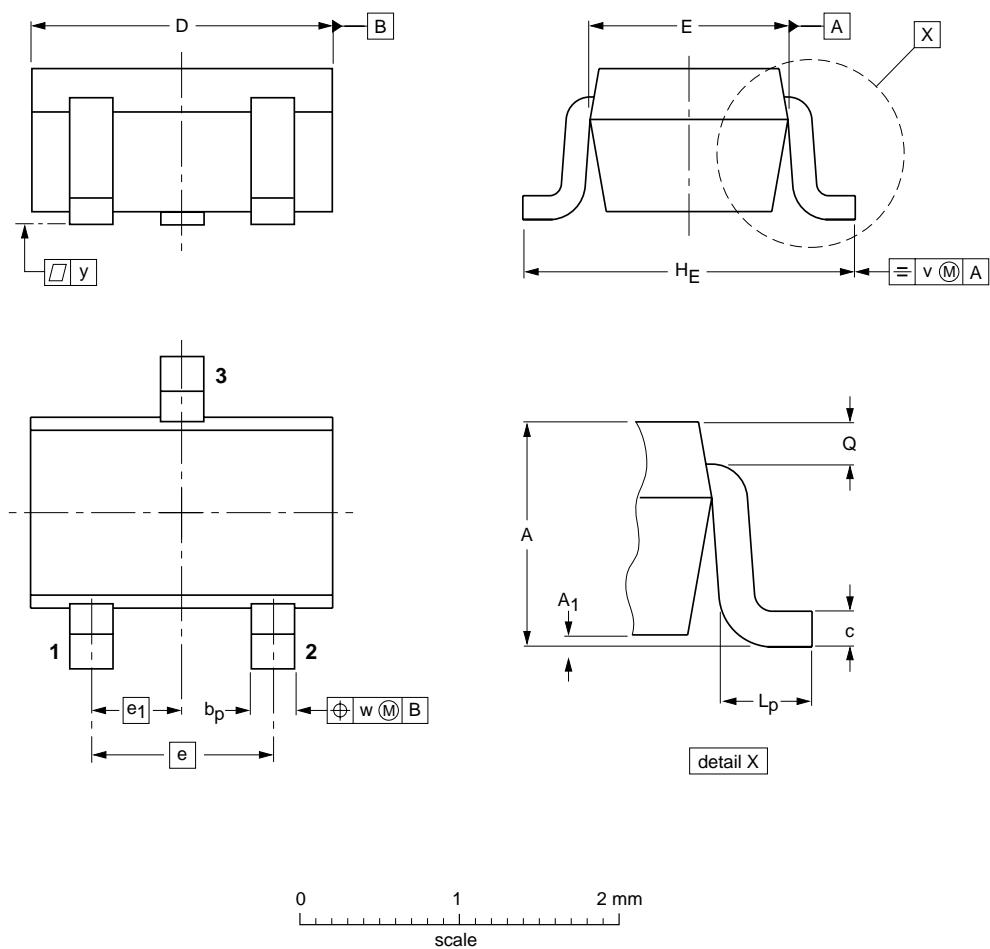
OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT346		TO-236	SC-59A			04-11-11 06-03-16

NPN general purpose transistors; 50 V,  
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Plastic surface-mounted package; 3 leads

SOT323



DIMENSIONS (mm are the original dimensions)

UNIT	A	A1 max	bp	c	D	E	e	e1	HE	Lp	Q	v	w
mm	1.1 0.8	0.1	0.4 0.3	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.23 0.13	0.2	0.2

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT323			SC-70			<del>04-11-04</del> 06-03-16

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### DATA SHEET STATUS

DOCUMENT STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

### Notes

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# ***NXP Semiconductors***

## **Customer notification**

This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content, except for package outline drawings which were updated to the latest version.

## **Contact information**

For additional information please visit: **<http://www.nxp.com>**

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