



**THE DATASHEET OF  
PDTA114TK,135**



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Kind regards,

Team Nexperia

# PDTA114T series

PNP resistor-equipped transistors; R1 = 10 k $\Omega$ , R2 = open

Rev. 07 — 20 April 2007

Product data sheet

## 1. Product profile

### 1.1 General description

PNP Resistor-Equipped Transistors (RET) family in small plastic packages.

Table 1. Product overview

Type number	Package			NPN complement
	NXP	JEITA	JEDEC	
PDTA114TE	SOT416	SC-75	-	PDTC114TE
PDTA114TK	SOT346	SC-59A	TO-236	PDTC114TK
PDTA114TM	SOT883	SC-101	-	PDTC114TM
PDTA114TS <sup>[1]</sup>	SOT54	SC-43A	TO-92	PDTC114TS
PDTA114TT	SOT23	-	TO-236AB	PDTC114TT
PDTA114TU	SOT323	SC-70	-	PDTC114TU

[1] Also available in SOT54A and SOT54 variant packages (see [Section 2](#)).

### 1.2 Features

- 100 mA output current capability
- Built-in bias resistors
- Simplifies circuit design
- Reduces component count
- Reduces pick and place costs

### 1.3 Applications

- Digital applications
- Control of IC inputs
- Cost-saving alternative to BC857 series in digital applications
- Low current peripheral driver

### 1.4 Quick reference data

Table 2. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V <sub>CEO</sub>	collector-emitter voltage	open base	-	-	-50	V
I <sub>O</sub>	output current		-	-	-100	mA
R1	bias resistor 1 (input)		7	10	13	k $\Omega$

**2. Pinning information**

**Table 3. Pinning**

Pin	Description	Simplified outline	Symbol
<b>SOT54</b>			
1	input (base)		
2	output (collector)		
3	GND (emitter)		
<b>SOT54A</b>			
1	input (base)		
2	output (collector)		
3	GND (emitter)		
<b>SOT54 variant</b>			
1	input (base)		
2	output (collector)		
3	GND (emitter)		
<b>SOT23; SOT323; SOT346; SOT416</b>			
1	input (base)		
2	GND (emitter)		
3	output (collector)		
<b>SOT883</b>			
1	input (base)		
2	GND (emitter)		
3	output (collector)		

### 3. Ordering information

Table 4. Ordering information

Type number	Package		
	Name	Description	Version
PDTA114TE	SC-75	plastic surface-mounted package; 3 leads	SOT416
PDTA114TK	SC-59A	plastic surface-mounted package; 3 leads	SOT346
PDTA114TM	SC-101	leadless ultra small plastic package; 3 solder lands; body 1.0 × 0.6 × 0.5 mm	SOT883
PDTA114TS <sup>[1]</sup>	SC-43A	plastic single-ended leaded (through hole) package; 3 leads	SOT54
PDTA114TT	-	plastic surface-mounted package; 3 leads	SOT23
PDTA114TU	SC-70	plastic surface-mounted package; 3 leads	SOT323

[1] Also available in SOT54A and SOT54 variant packages (see [Section 2](#) and [Section 9](#)).

### 4. Marking

Table 5. Marking codes

Type number	Marking code <sup>[1]</sup>
PDTA114TE	11
PDTA114TK	23
PDTA114TM	DE
PDTA114TS	TA114T
PDTA114TT	*11
PDTA114TU	*23

[1] \* = -: made in Hong Kong  
 \* = p: made in Hong Kong  
 \* = t: made in Malaysia  
 \* = W: made in China

## 5. Limiting values

**Table 6. Limiting values**

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

Symbol	Parameter	Conditions	Min	Max	Unit	
V <sub>CBO</sub>	collector-base voltage	open emitter	-	-50	V	
V <sub>CEO</sub>	collector-emitter voltage	open base	-	-50	V	
V <sub>EBO</sub>	emitter-base voltage	open collector	-	-5	V	
I <sub>O</sub>	output current		-	-100	mA	
I <sub>CM</sub>	peak collector current	single pulse; t <sub>p</sub> ≤ 1 ms	-	-100	mA	
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C				
	PDTA114TE		[1]	-	150	mW
	PDTA114TK		[1]	-	250	mW
	PDTA114TM		[2][3]	-	250	mW
	PDTA114TS		[1]	-	500	mW
	PDTA114TT		[1]	-	250	mW
	PDTA114TU		[1]	-	200	mW
T <sub>j</sub>	junction temperature		-	150	°C	
T <sub>amb</sub>	ambient temperature		-65	+150	°C	
T <sub>stg</sub>	storage temperature		-65	+150	°C	

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

[2] Reflow soldering is the only recommended soldering method.

[3] Device mounted on an FR4 PCB with 60  $\mu$ m copper strip line, standard footprint.

## 6. Thermal characteristics

**Table 7. Thermal characteristics**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
R <sub>th(j-a)</sub>	thermal resistance from junction to ambient	in free air					
	PDTA114TE		[1]	-	-	833	K/W
	PDTA114TK		[1]	-	-	500	K/W
	PDTA114TM		[2][3]	-	-	500	K/W
	PDTA114TS		[1]	-	-	250	K/W
	PDTA114TT		[1]	-	-	500	K/W
	PDTA114TU		[1]	-	-	625	K/W

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

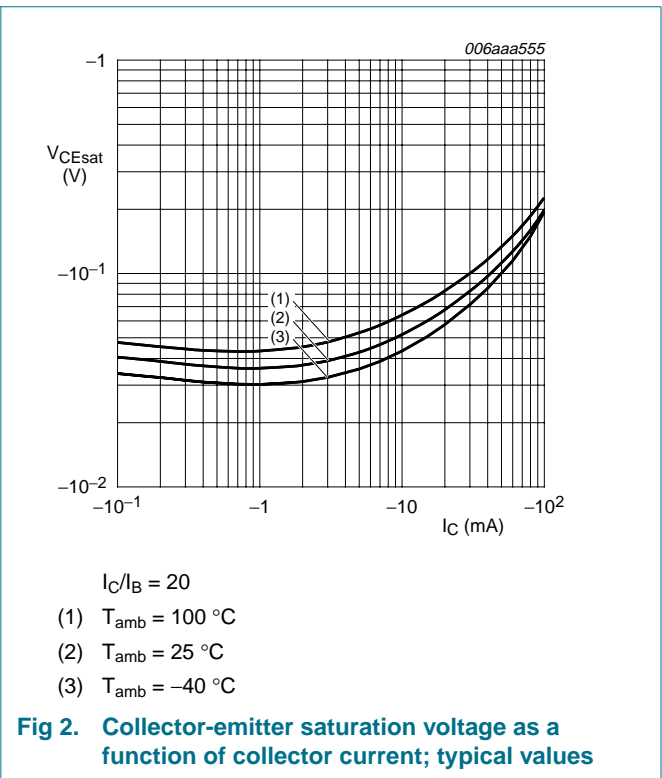
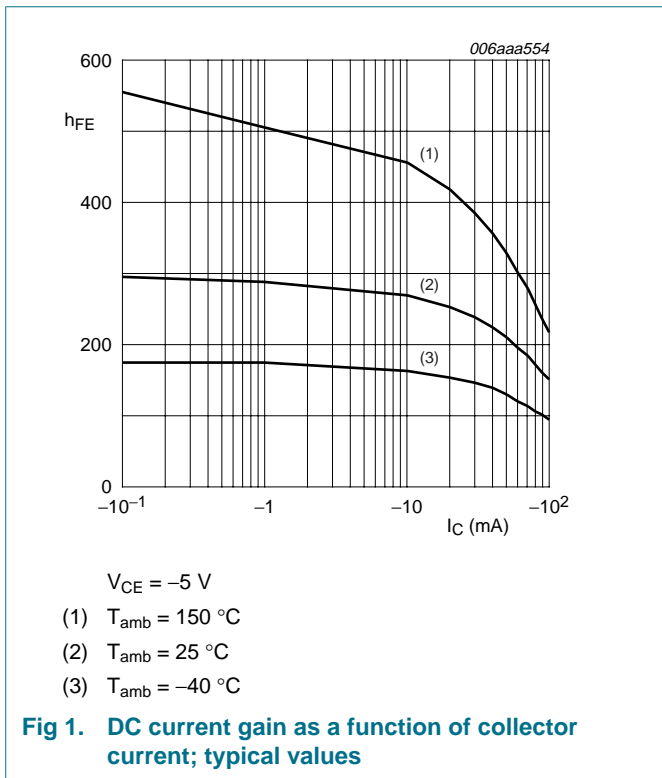
[2] Reflow soldering is the only recommended soldering method.

[3] Device mounted on an FR4 PCB with 60  $\mu$ m copper strip line, standard footprint.

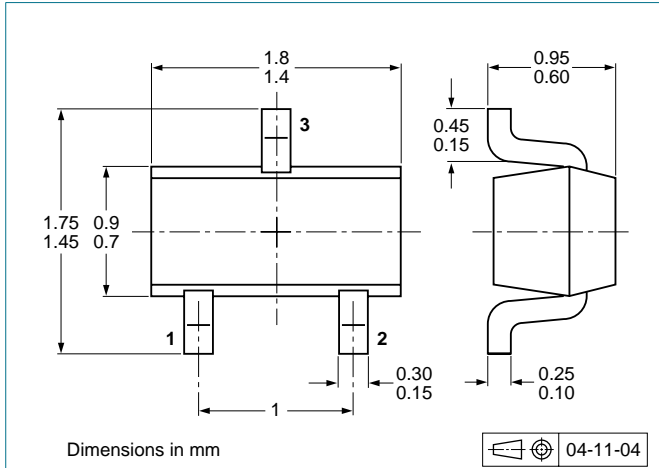
**7. Characteristics**

**Table 8. Characteristics**  
*T<sub>amb</sub> = 25 °C unless otherwise specified.*

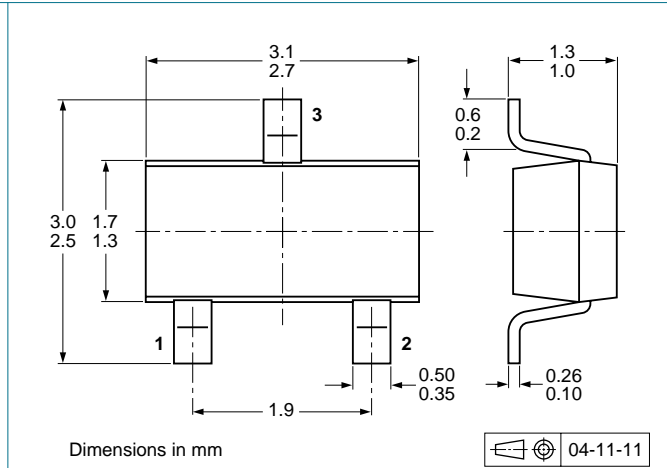
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I <sub>CBO</sub>	collector-base cut-off current	V <sub>CB</sub> = -50 V; I <sub>E</sub> = 0 A	-	-	-100	nA
I <sub>CEO</sub>	collector-emitter cut-off current	V <sub>CE</sub> = -30 V; I <sub>B</sub> = 0 A	-	-	-1	μA
		V <sub>CE</sub> = -30 V; I <sub>B</sub> = 0 A; T <sub>j</sub> = 150 °C	-	-	-50	μA
I <sub>EBO</sub>	emitter-base cut-off current	V <sub>EB</sub> = -5 V; I <sub>C</sub> = 0 A	-	-	-100	nA
h <sub>FE</sub>	DC current gain	V <sub>CE</sub> = -5 V; I <sub>C</sub> = -1 mA	200	-	-	
V <sub>CEsat</sub>	collector-emitter saturation voltage	I <sub>C</sub> = -10 mA; I <sub>B</sub> = -0.5 mA	-	-	-150	mV
R1	bias resistor 1 (input)		7	10	13	kΩ
C <sub>c</sub>	collector capacitance	V <sub>CB</sub> = -10 V; I <sub>E</sub> = i <sub>e</sub> = 0 A; f = 1 MHz	-	-	3	pF



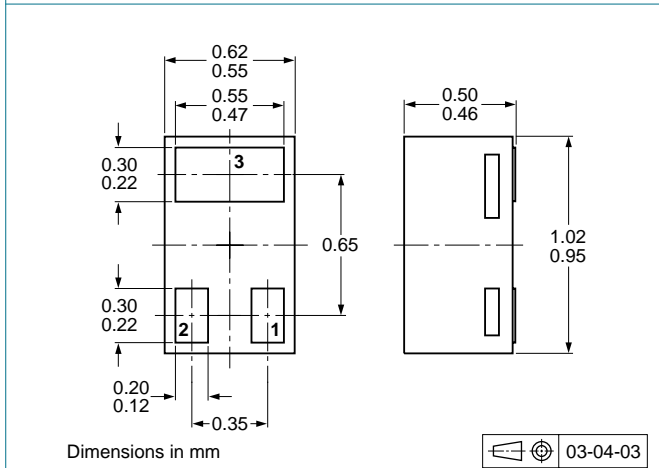
**8. Package outline**



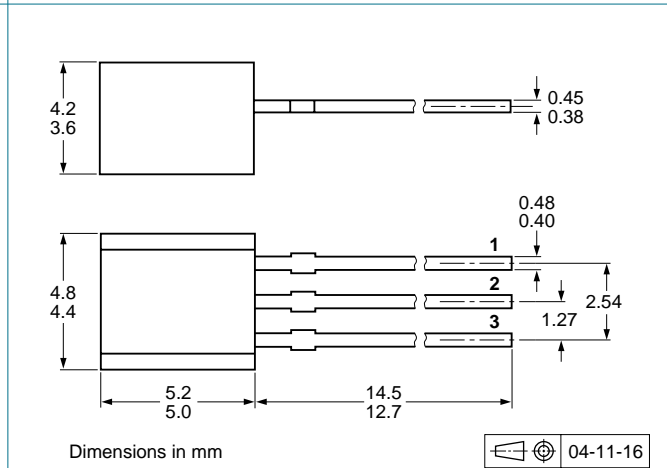
**Fig 3. Package outline SOT416 (SC-75)**



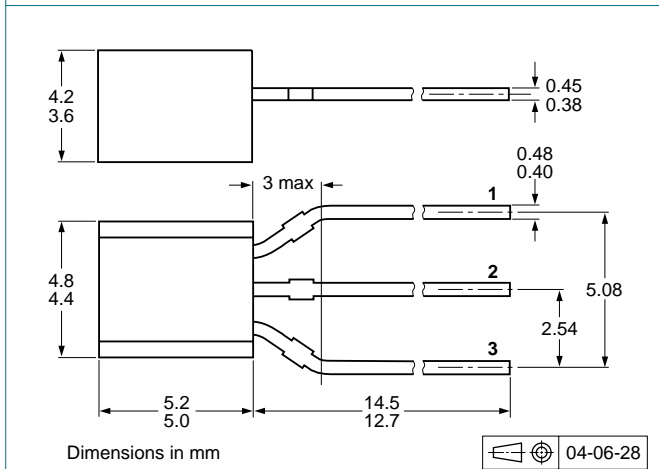
**Fig 4. Package outline SOT346 (SC-59A/TO-236)**



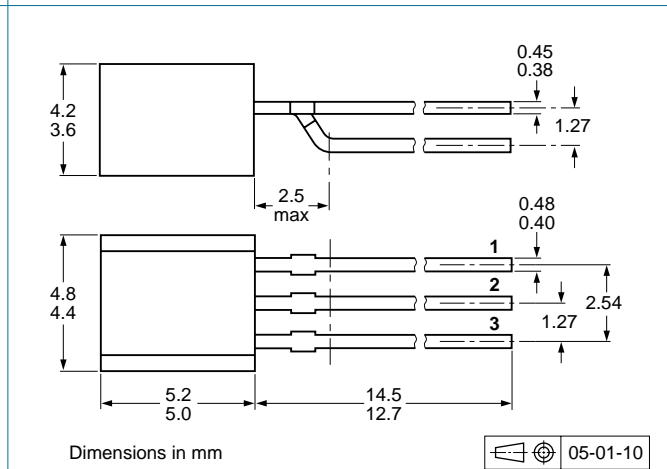
**Fig 5. Package outline SOT883 (SC-101)**



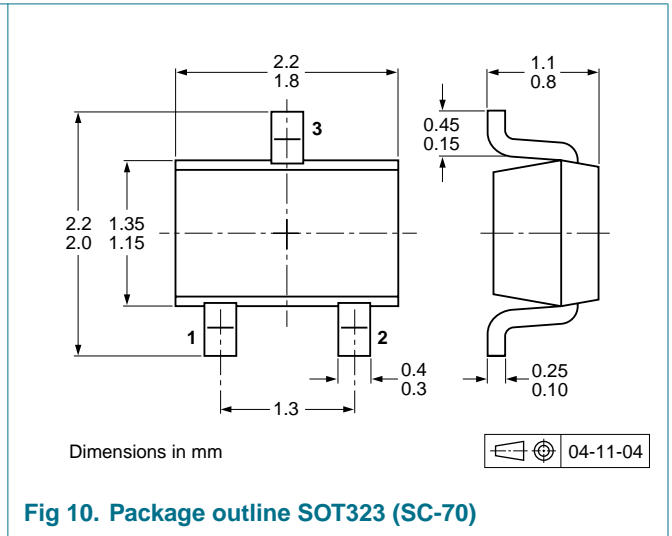
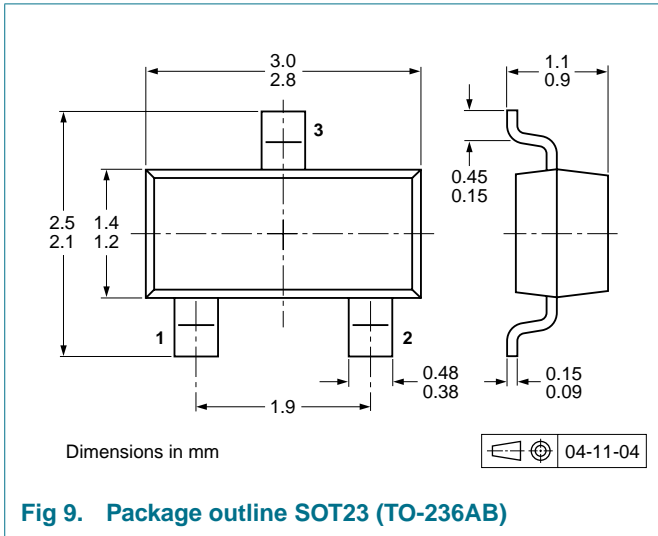
**Fig 6. Package outline SOT54 (SC-43A/TO-92)**



**Fig 7. Package outline SOT54A**



**Fig 8. Package outline SOT54 variant**



## 9. Packing information

**Table 9. Packing methods**

The indicated -xxx are the last three digits of the 12NC ordering code.<sup>[1]</sup>

Type number	Package	Description	Packing quantity		
			3000	5000	10000
PDTA114TE	SOT416	4 mm pitch, 8 mm tape and reel	-115	-	-135
PDTA114TK	SOT346	4 mm pitch, 8 mm tape and reel	-115	-	-135
PDTA114TM	SOT883	2 mm pitch, 8 mm tape and reel	-	-	-315
PDTA114TS	SOT54	bulk, straight leads	-	-412	-
	SOT54A	tape and reel, wide pitch	-	-	-116
		tape ammopack, wide pitch	-	-	-126
	SOT54 variant	bulk, delta pinning	-	-112	-
PDTA114TT	SOT23	4 mm pitch, 8 mm tape and reel	-215	-	-235
PDTA114TU	SOT323	4 mm pitch, 8 mm tape and reel	-115	-	-135

[1] For further information and the availability of packing methods, see [Section 12](#).

## 10. Revision history

**Table 10. Revision history**

Document ID	Release date	Data sheet status	Change notice	Supersedes
PDTA114T_SER_7	20070420	Product data sheet	-	PDTA114T_SERIES_6
Modifications:		<ul style="list-style-type: none"> <li>The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.</li> <li>Legal texts have been adapted to the new company name where appropriate.</li> <li>Type number PDTA114TEF removed</li> <li><a href="#">Section 1.2 "Features"</a>: amended</li> <li><a href="#">Section 1.3 "Applications"</a>: amended</li> <li><a href="#">Table 4 "Ordering information"</a>: added</li> <li><a href="#">Table 5 "Marking codes"</a>: enhanced table note section</li> <li><a href="#">Table 6 "Limiting values"</a>: I<sub>CM</sub> peak collector current conditions added</li> <li><a href="#">Figure 1, 2, 7 and 8</a>: added</li> <li><a href="#">Figure 3, 4, 5, 6, 9 and 10</a>: superseded by minimized package outline drawings</li> <li><a href="#">Section 9 "Packing information"</a>: added</li> <li><a href="#">Section 11 "Legal information"</a>: updated</li> </ul>		
PDTA114T_SERIES_6	20040802	Product specification	-	PDTA114T_SERIES_5
PDTA114T_SERIES_5	20030909	Product specification	-	PDTA114T_SERIES_4
PDTA114T_SERIES_4	20030410	Product specification	-	PDTA114TE_2 PDTA114TK_3 PDTA114TS_2 PDTA114TT_3 PDTA114TU_3
PDTA114TE_2	19980723	Preliminary specification	-	PDTA114TE_1
PDTA114TK_3	19980515	Product specification	-	PDTA114TK_2
PDTA114TS_2	19980515	Product specification	-	PDTA114TS_1
PDTA114TT_3	19990413	Objective specification	-	PDTA114TT_2
PDTA114TU_3	19990413	Product specification	-	PDTA114TU_2

## 11. Legal information

### 11.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

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