PDTA114T series

PNP resistor-equipped transistors; R1 = 10 kΩ, 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[1]	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

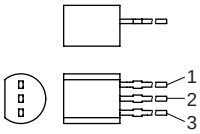
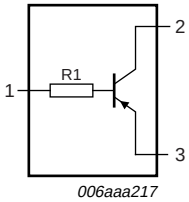
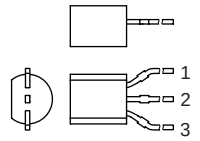
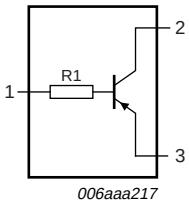
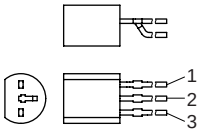
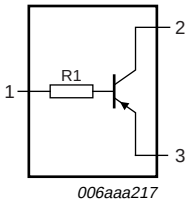
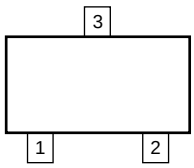
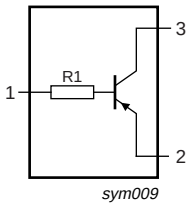
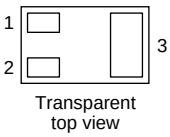
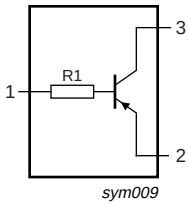
1.4 Quick reference data

Table 2. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{CEO}	collector-emitter voltage	open base	-	-	–50	V
I_O	output current		-	-	–100	mA
R1	bias resistor 1 (input)		7	10	13	kΩ

2. Pinning information

Table 3. Pinning

Pin	Description	Simplified outline	Symbol
SOT54			
1	input (base)	 001aab347	 006aaa217
2	output (collector)		
3	GND (emitter)		
SOT54A			
1	input (base)	 001aab348	 006aaa217
2	output (collector)		
3	GND (emitter)		
SOT54 variant			
1	input (base)	 001aab447	 006aaa217
2	output (collector)		
3	GND (emitter)		
SOT23; SOT323; SOT346; SOT416			
1	input (base)	 006aaa144	 sym009
2	GND (emitter)		
3	output (collector)		
SOT883			
1	input (base)	 Transparent top view	 sym009
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[1]	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[1]
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_{CBO}	collector-base voltage	open emitter		-	–50	V
V_{CEO}	collector-emitter voltage	open base		-	–50	V
V_{EBO}	emitter-base voltage	open collector		-	–5	V
I_O	output current			-	–100	mA
I_{CM}	peak collector current	single pulse; $t_p \leq 1$ ms		-	–100	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °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_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			–65	+150	°C
T_{stg}	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 μm copper strip line, standard footprint.

6. Thermal characteristics

Table 7. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	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.

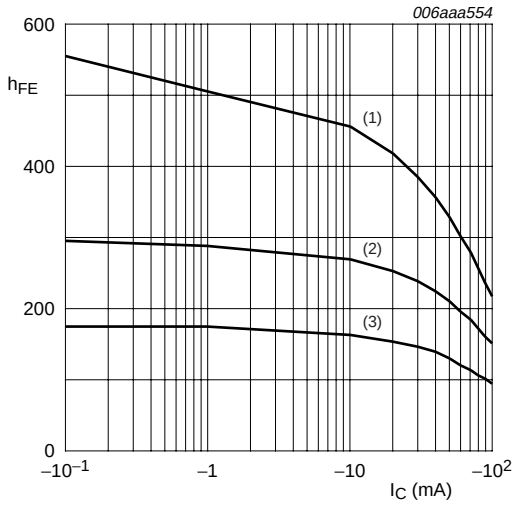
[3] Device mounted on an FR4 PCB with 60 μm copper strip line, standard footprint.

7. Characteristics

Table 8. Characteristics

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_{CBO}	collector-base cut-off current	V_{CB} = –50 V; I_E = 0 A	-	-	–100	nA
I_{CEO}	collector-emitter cut-off current	V_{CE} = –30 V; I_B = 0 A	-	-	–1	µA
		V_{CE} = –30 V; I_B = 0 A; T_j = 150 °C	-	-	–50	µA
I_{EBO}	emitter-base cut-off current	V_{EB} = –5 V; I_C = 0 A	-	-	–100	nA
h_{FE}	DC current gain	V_{CE} = –5 V; I_C = –1 mA	200	-	-	
V_{CEsat}	collector-emitter saturation voltage	I_C = –10 mA; I_B = –0.5 mA	-	-	–150	mV
R1	bias resistor 1 (input)		7	10	13	kΩ
C_c	collector capacitance	V_{CB} = –10 V; I_E = i_e = 0 A; f = 1 MHz	-	-	3	pF



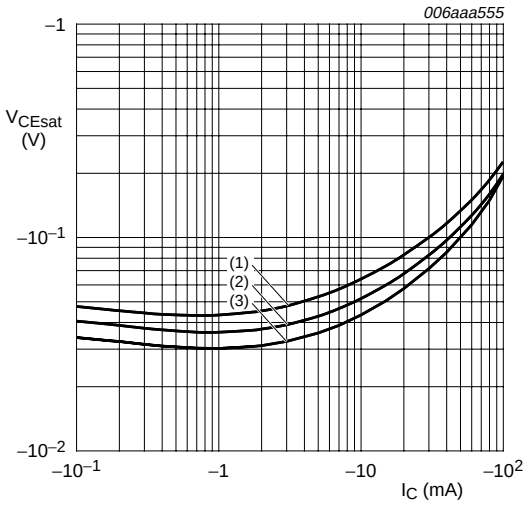
V_{CE} = –5 V

(1) T_{amb} = 150 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = –40 °C

Fig 1. DC current gain as a function of collector current; typical values



I_C/I_B = 20

(1) T_{amb} = 100 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = –40 °C

Fig 2. Collector-emitter saturation voltage as a function of collector current; typical values

8. Package outline

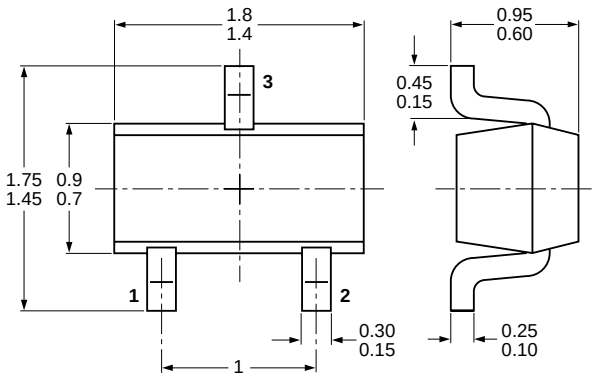


Fig 3. Package outline SOT416 (SC-75)

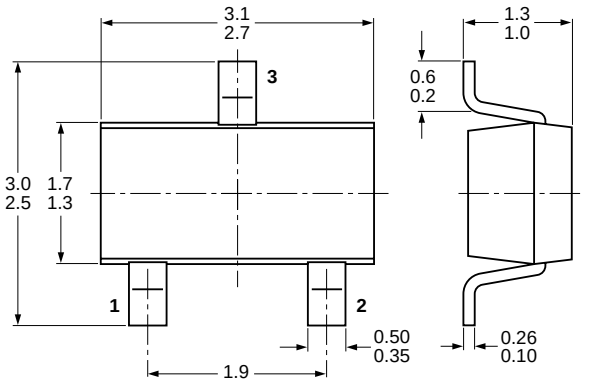


Fig 4. Package outline SOT346 (SC-59A/TO-236)

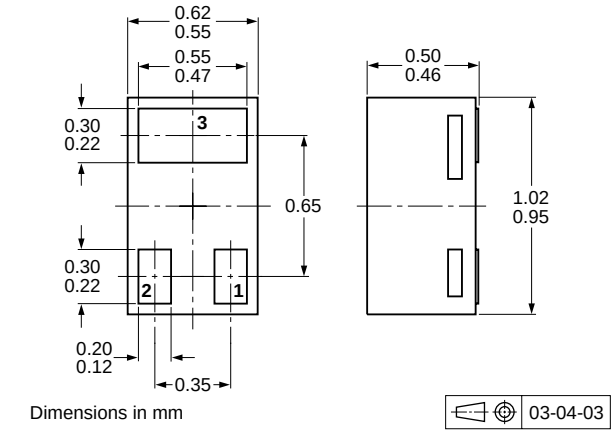


Fig 5. Package outline SOT883 (SC-101)

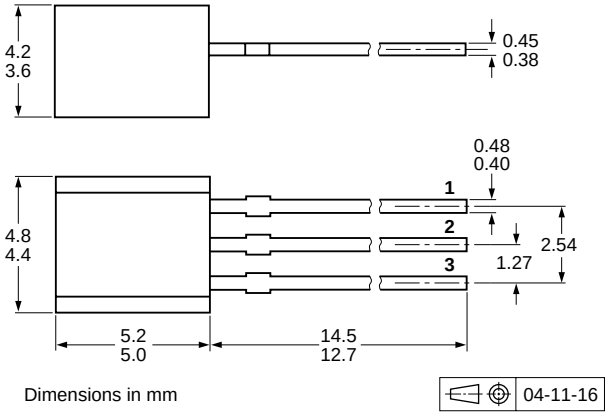


Fig 6. Package outline SOT54 (SC-43A/TO-92)

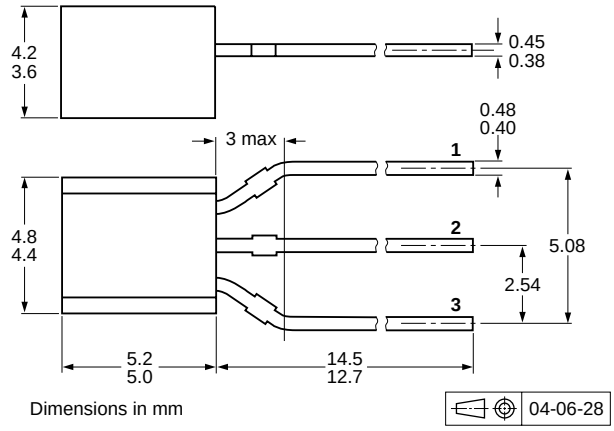


Fig 7. Package outline SOT54A

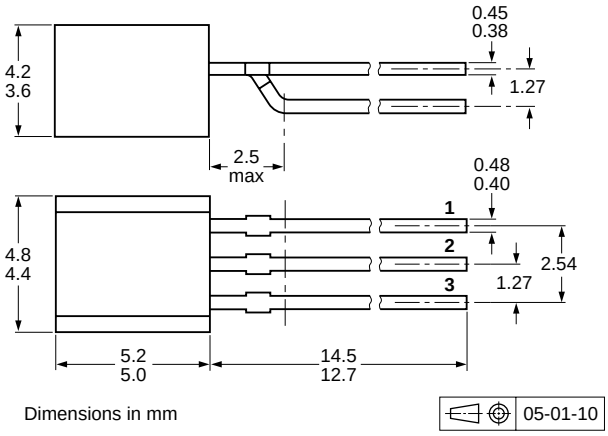


Fig 8. Package outline SOT54 variant

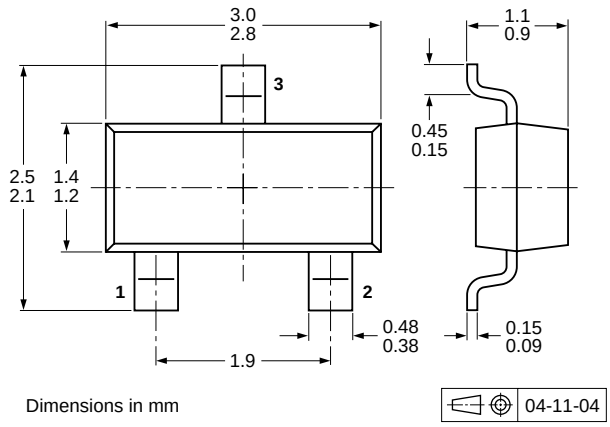


Fig 9. Package outline SOT23 (TO-236AB)

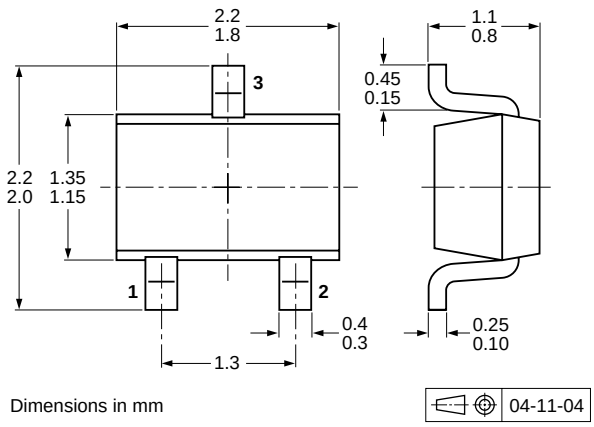


Fig 10. Package outline SOT323 (SC-70)

9. Packing information

Table 9. Packing methods

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

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:	• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors. • Legal texts have been adapted to the new company name where appropriate. • Type number PDTA114TEF removed • Section 1.2 “Features”: amended • Section 1.3 “Applications”: amended • Table 4 “Ordering information”: added • Table 5 “Marking codes”: enhanced table note section • Table 6 “Limiting values”: I_{CM} peak collector current conditions added • Figure 1, 2, 7 and 8: added • Figure 3, 4, 5, 6, 9 and 10: superseded by minimized package outline drawings • Section 9 “Packing information”: added • Section 11 “Legal information”: updated			
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[1][2]	Product status[3]	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".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nxp.com.

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