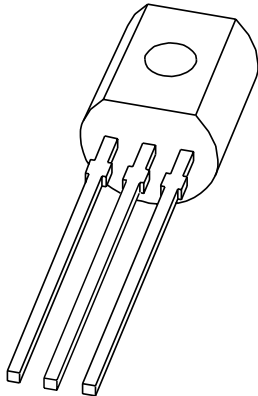


# DATA SHEET



## **PSS9013 series** 20 V NPN general purpose transistors

Product specification  
Supersedes data of 2003 May 15

2004 Aug 10

## 20 V NPN general purpose transistors

## PSS9013 series

### FEATURES

- High power dissipation: 710 mW
- Low collector capacitance
- Low collector-emitter saturation voltage
- High current capability.

### APPLICATIONS

- General purpose switching and amplification.

### DESCRIPTION

NPN general purpose transistor in a SOT54 (TO-92) leaded plastic package. PNP complement: PSS9012 series.

### MARKING

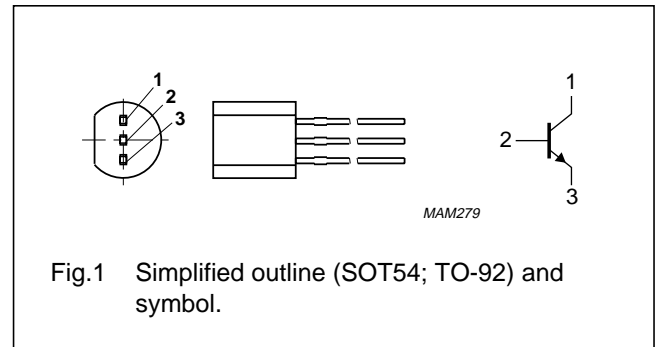
TYPE NUMBER	MARKING CODE
PSS9013G	S9013G
PSS9013H	S9013H

### QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
$V_{CE0}$	collector-emitter voltage	20	V
$I_C$	collector current (DC)	500	mA
$I_{CM}$	peak collector current	1	A

### PINNING

PIN	DESCRIPTION
1	collector
2	base
3	emitter



### LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{CBO}$	collector-base voltage	open emitter	–	40	V
$V_{CEO}$	collector-emitter voltage	open base	–	20	V
$V_{EBO}$	emitter-base voltage	open collector	–	5	V
$I_C$	collector current (DC)		–	500	mA
$I_{CM}$	peak collector current		–	1	A
$I_{BM}$	peak base current		–	100	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ }^\circ\text{C}$ ; note 1	–	710	mW
$T_{stg}$	storage temperature		–65	+150	$^\circ\text{C}$
$T_j$	junction temperature		–	150	$^\circ\text{C}$
$T_{amb}$	operating ambient temperature		–65	+150	$^\circ\text{C}$

### Note

1. Device mounted on a FR4 printed-circuit board, single-sided copper, tinplated and standard footprint.

## 20 V NPN general purpose transistors

## PSS9013 series

## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	in free air; note 1	175	K/W

## Note

1. Device mounted on a FR4 printed-circuit board, single-sided copper, tinplated and standard footprint.

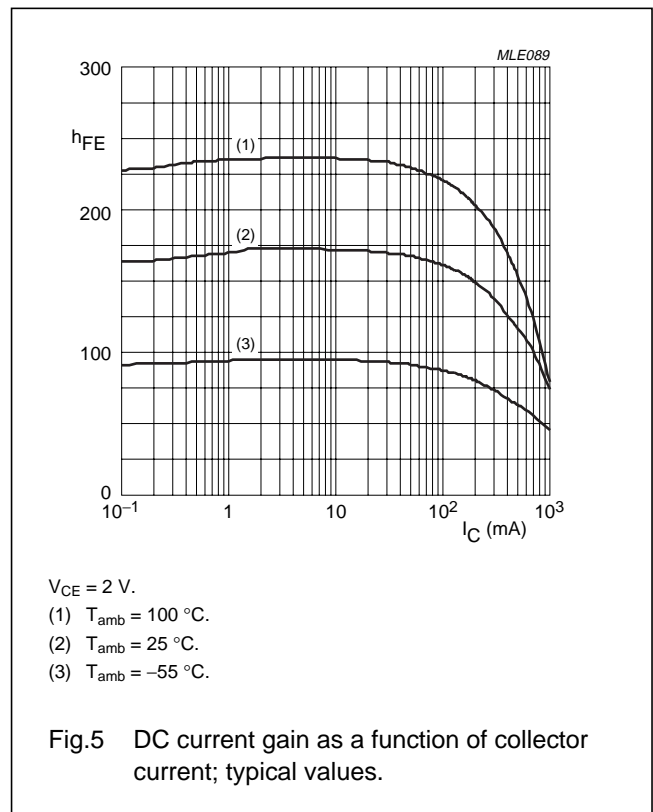
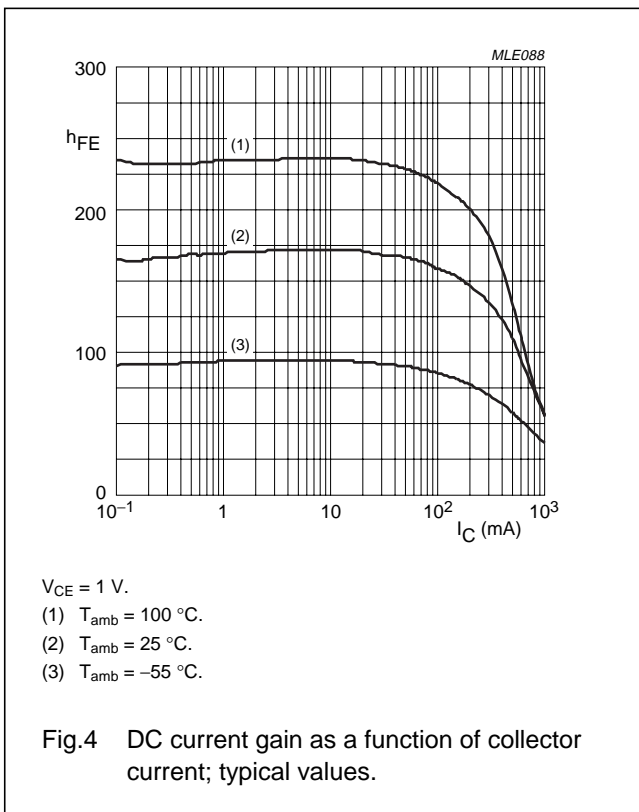
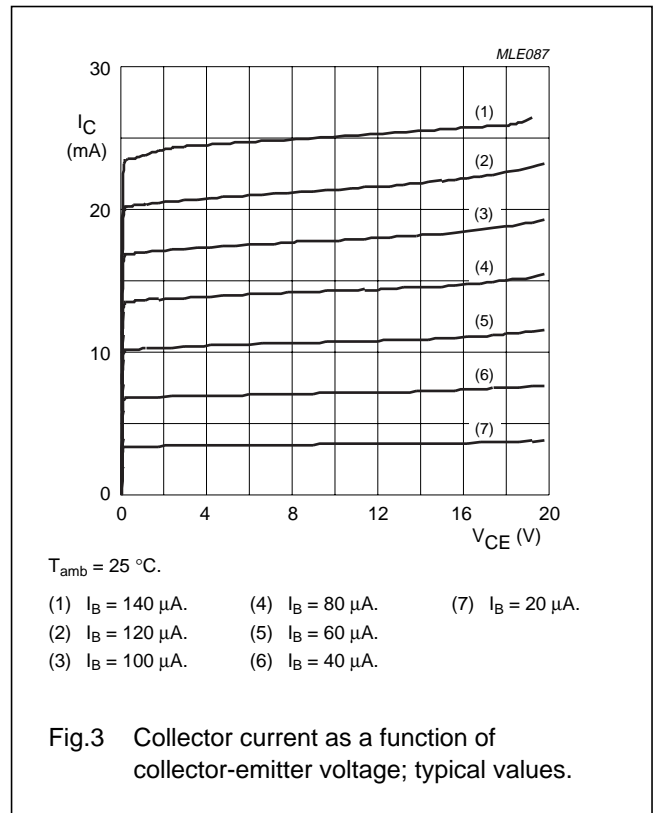
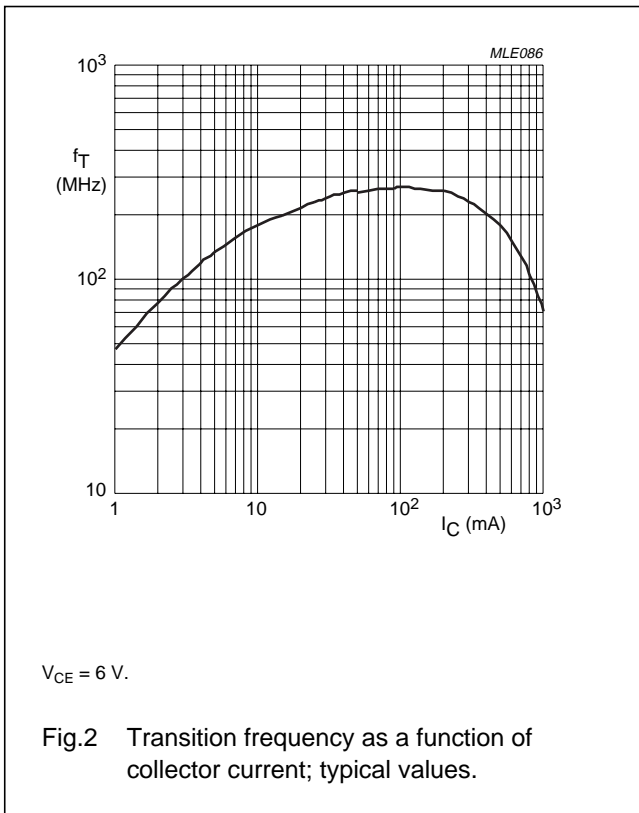
## CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{CBO}$	collector-base cut-off current	$V_{CB} = 35\text{ V}; I_E = 0$	–	–	100	nA
		$V_{CB} = 35\text{ V}; I_E = 0; T_j = 150\text{ °C}$	–	–	50	$\mu\text{A}$
$I_{EBO}$	emitter-base cut-off current	$V_{EB} = 5\text{ V}; I_C = 0$	–	–	100	nA
$h_{FE}$	DC current gain	$V_{CE} = 1\text{ V}; I_C = 500\text{ mA}$	40	–	–	
$h_{FE}$	DC current gain PSS9013G PSS9013H	$V_{CE} = 1\text{ V}; I_C = 50\text{ mA}$	112	–	166	
			144	–	202	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = 100\text{ mA}; I_B = 10\text{ mA}$	–	60	250	mV
		$I_C = 500\text{ mA}; I_B = 50\text{ mA}$	–	250	600	mV
$V_{BEsat}$	base-emitter saturation voltage	$I_C = 500\text{ mA}; I_B = 50\text{ mA}$	–	1	1.2	V
$V_{BEon}$	base-emitter turn on voltage	$V_{CE} = 1\text{ V}; I_C = 100\text{ mA}$	–	760	1000	mV
$C_c$	collector capacitance	$V_{CB} = 6\text{ V}; I_E = I_e = 0; f = 1\text{ MHz}$	–	5	–	pF

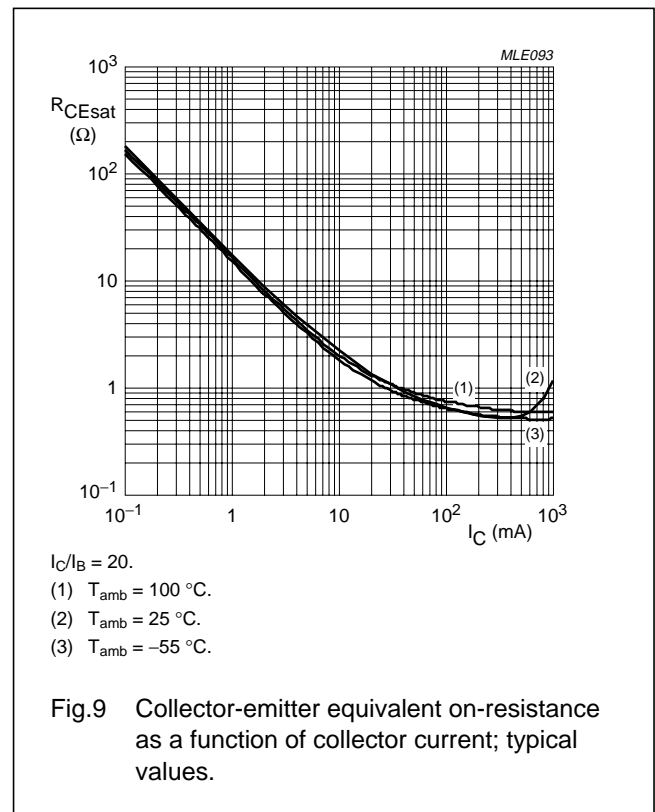
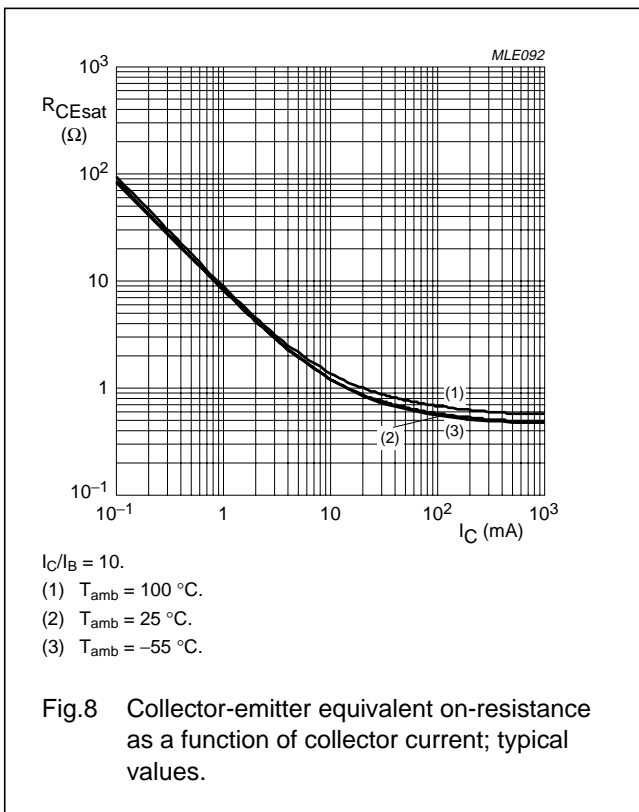
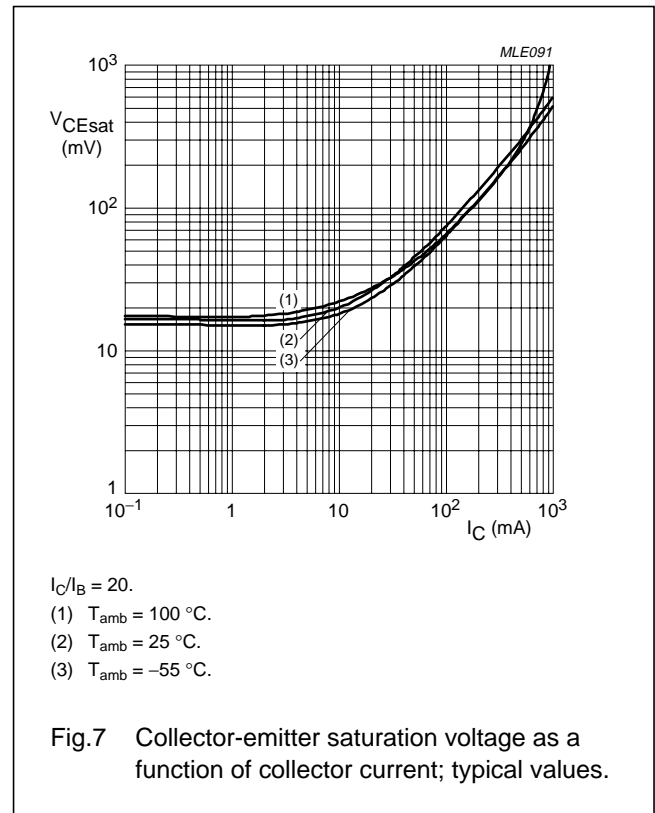
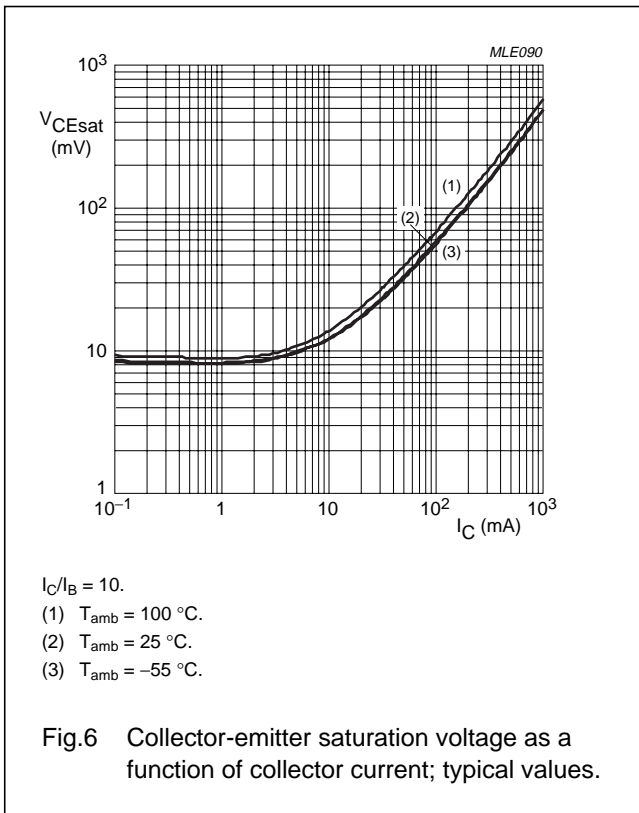
20 V NPN general purpose transistors

PSS9013 series



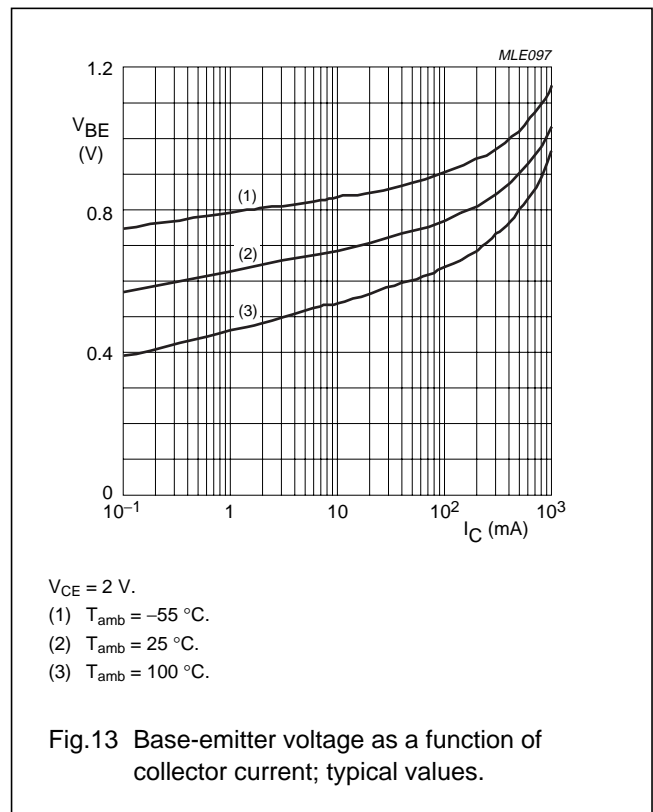
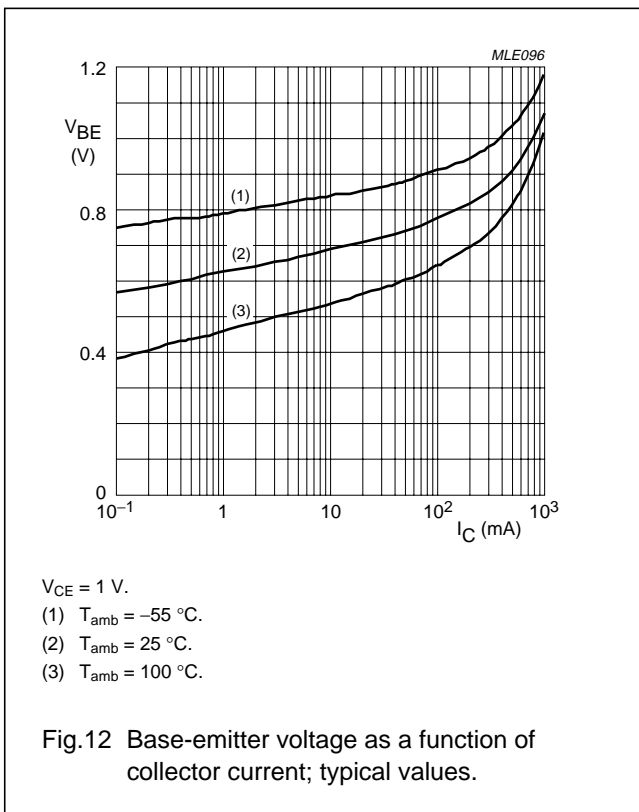
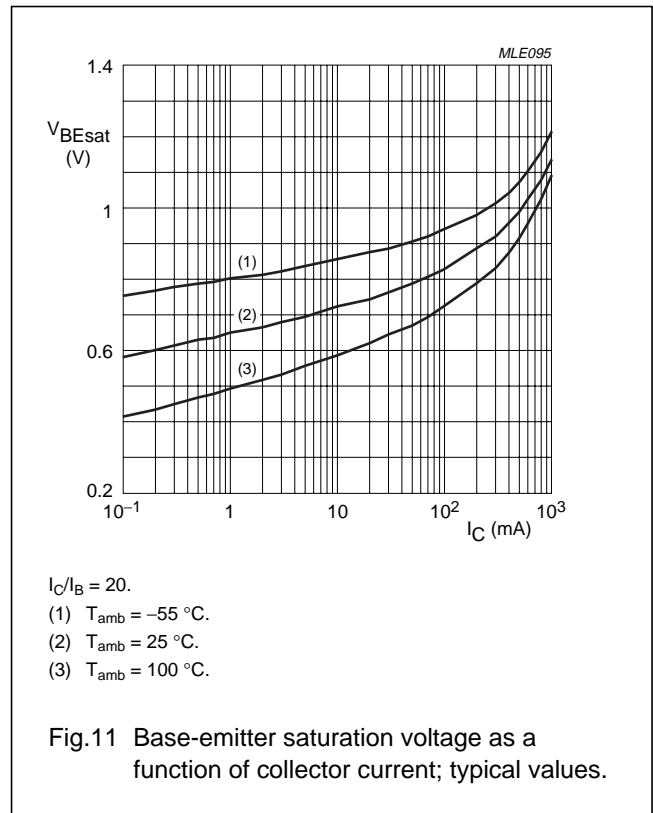
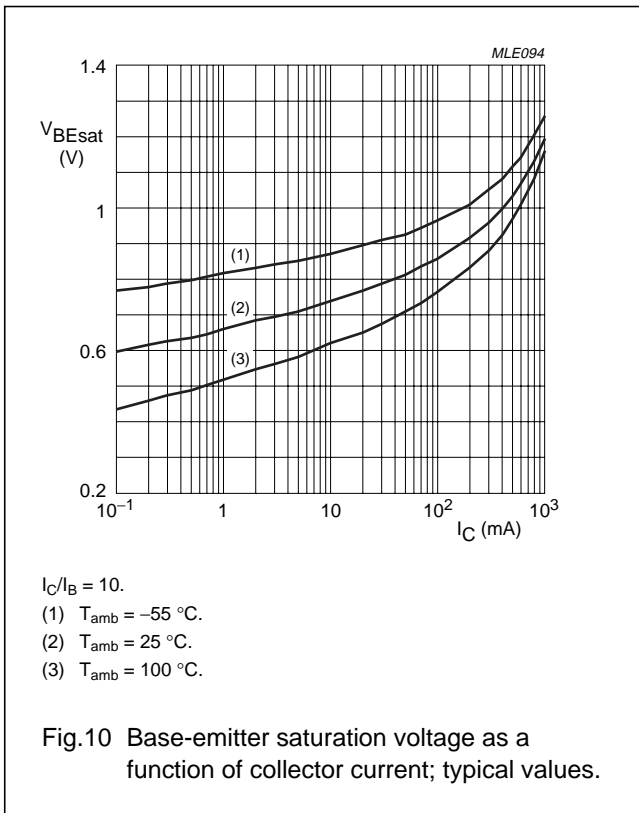
20 V NPN general purpose transistors

PSS9013 series



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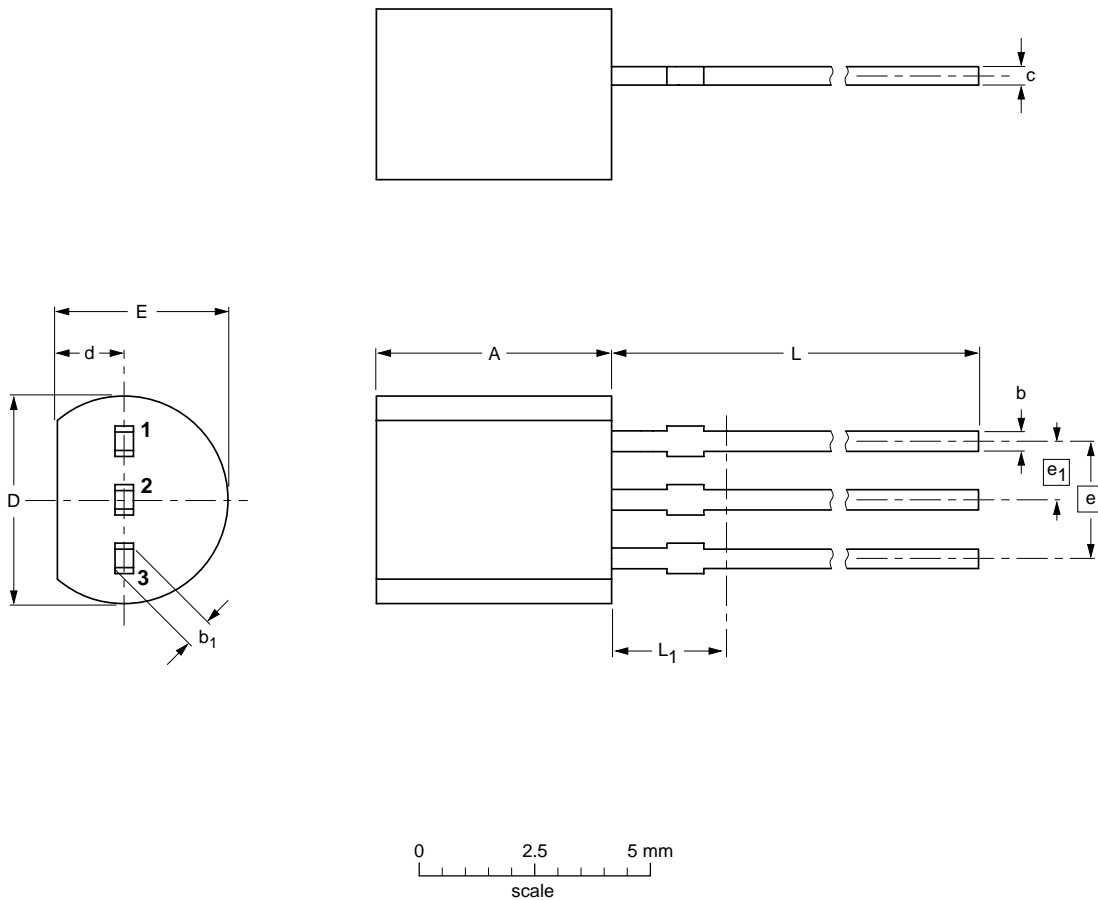
20 V NPN general purpose transistors

PSS9013 series

PACKAGE OUTLINE

Plastic single-ended leaded (through hole) package; 3 leads

SOT54



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

UNIT	A	b	b <sub>1</sub>	c	D	d	E	e	e <sub>1</sub>	L	L <sub>1</sub> <sup>(1)</sup> max.
mm	5.2 5.0	0.48 0.40	0.66 0.55	0.45 0.38	4.8 4.4	1.7 1.4	4.2 3.6	2.54	1.27	14.5 12.7	2.5

**Note**

1. Terminal dimensions within this zone are uncontrolled to allow for flow of plastic and terminal irregularities.

OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
SOT54		TO-92	SC-43A		-97-02-28 04-06-28

## 20 V NPN general purpose transistors

## PSS9013 series

## DATA SHEET STATUS

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