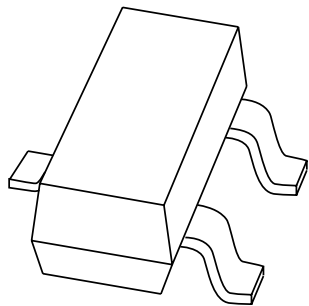


DATA SHEET



PBSS4140T 40 V low V_{CEsat} NPN transistor

Product specification
Supersedes data of 2001 Mar 23

2001 Jul 13

40 V low V_{CEsat} NPN transistor

PBSS4140T

FEATURES

- Low collector-emitter saturation voltage
- High current capabilities.
- Improved device reliability due to reduced heat generation.

APPLICATIONS

- General purpose switching and muting
- LCD backlighting
- Supply line switching circuits
- Battery driven equipment (mobile phones, video cameras and hand-held devices).

DESCRIPTION

NPN low V_{CEsat} transistor in a SOT23 plastic package.
PNP complement: PBSS5140T.

MARKING

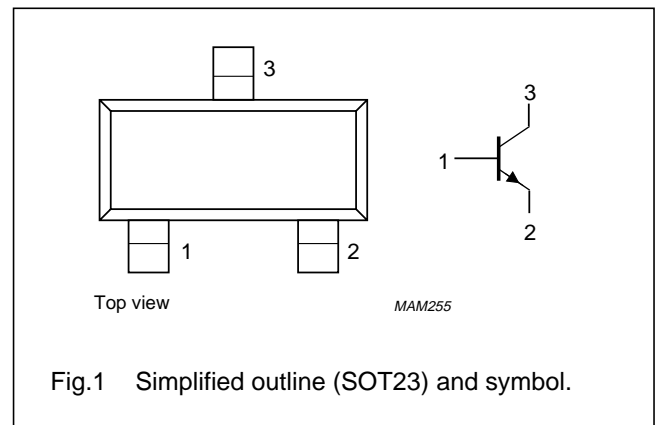
| TYPE NUMBER | MARKING CODE |
|-------------|--------------|
| PBSS4140T | ZTp |

QUICK REFERENCE DATA

| SYMBOL | PARAMETER | MAX. | UNIT |
|-------------|---------------------------|------|------------|
| V_{CEO} | collector-emitter voltage | 40 | V |
| I_{CM} | peak collector current | 2 | A |
| R_{CEsat} | equivalent on-resistance | <500 | m Ω |

PINNING

| PIN | DESCRIPTION |
|-----|-------------|
| 1 | base |
| 2 | emitter |
| 3 | collector |



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 | – | 40 | V |
| V_{CEO} | collector-emitter voltage | open base | – | 40 | V |
| V_{EBO} | emitter-base voltage | open collector | – | 5 | V |
| I_C | collector current (DC) | | – | 1 | A |
| I_{CM} | peak collector current | | – | 2 | A |
| I_{BM} | peak base current | | – | 1 | A |
| P_{tot} | total power dissipation | $T_{amb} \leq 25\text{ }^\circ\text{C}$; note 1 | – | 300 | mW |
| | | $T_{amb} \leq 25\text{ }^\circ\text{C}$; note 2 | – | 450 | 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 | $^\circ\text{C}$ |

Notes

1. Device mounted on a printed-circuit board; single sided copper; tinplated; standard footprint.
2. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 1 cm².

40 V low V_{CEsat} NPN transistor

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THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---------------|---|---------------------|-------|------|
| $R_{th\ j-a}$ | thermal resistance from junction to ambient | in free air; note 1 | 417 | K/W |
| | | in free air; note 2 | 278 | K/W |

Notes

1. Device mounted on a printed-circuit board, single sided copper, tinplated and standard footprint.
2. Device mounted on a printed-circuit board, single sided copper, tinplated, mounting pad for collector 1 cm².

CHARACTERISTICS

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

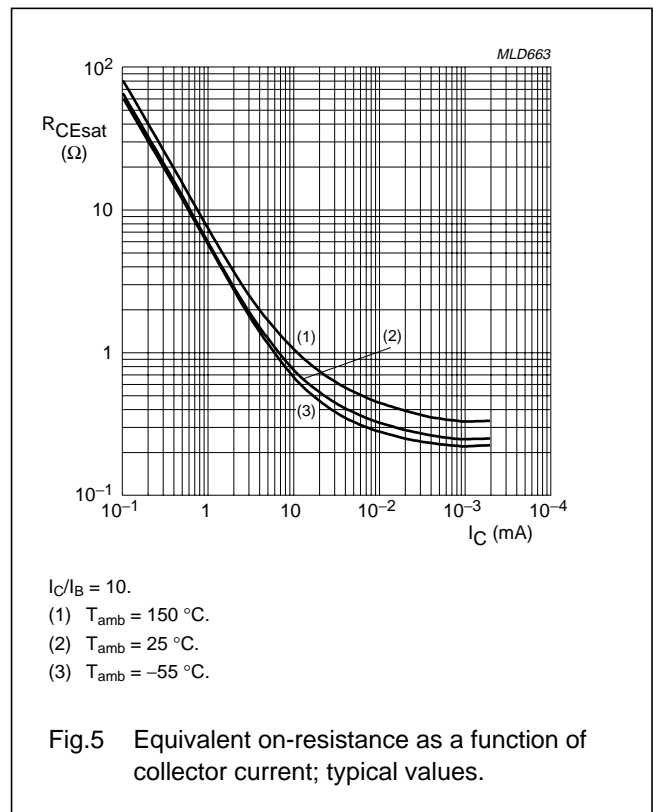
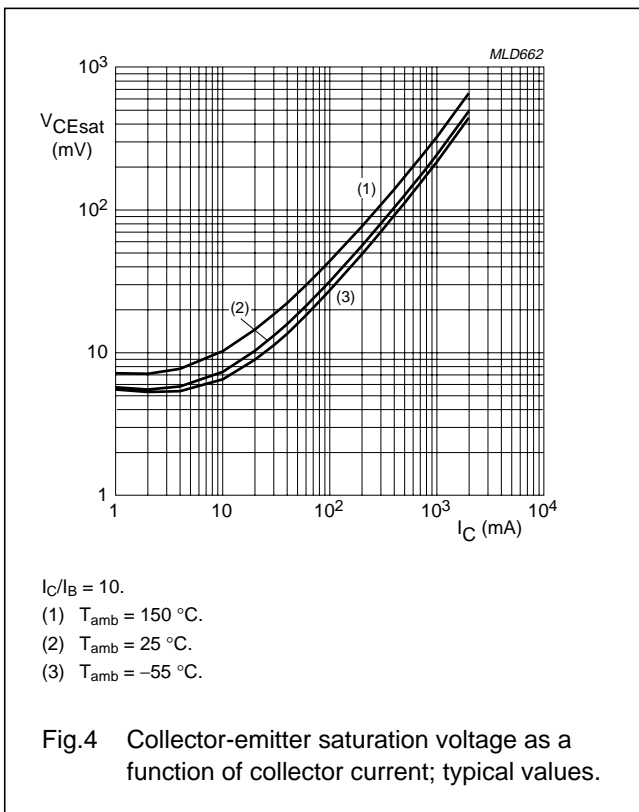
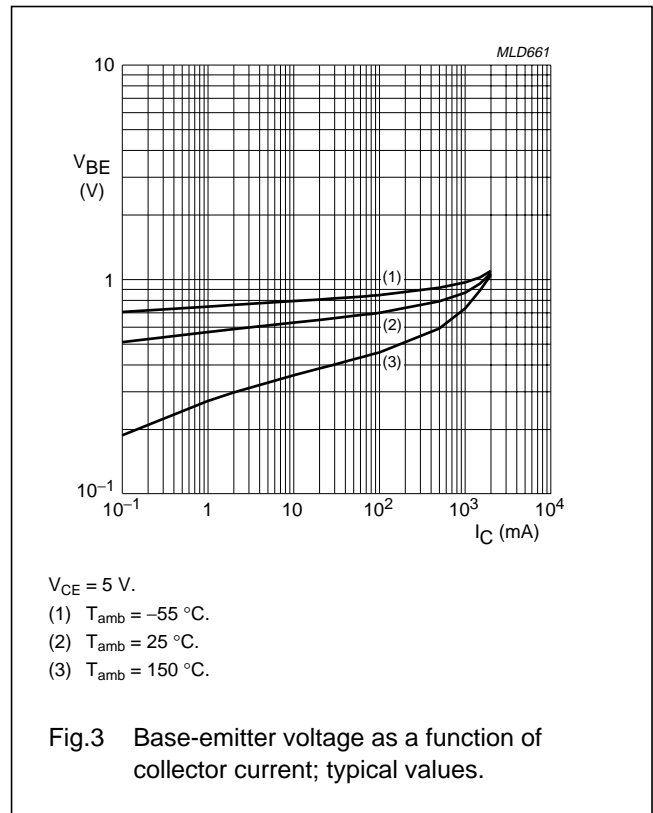
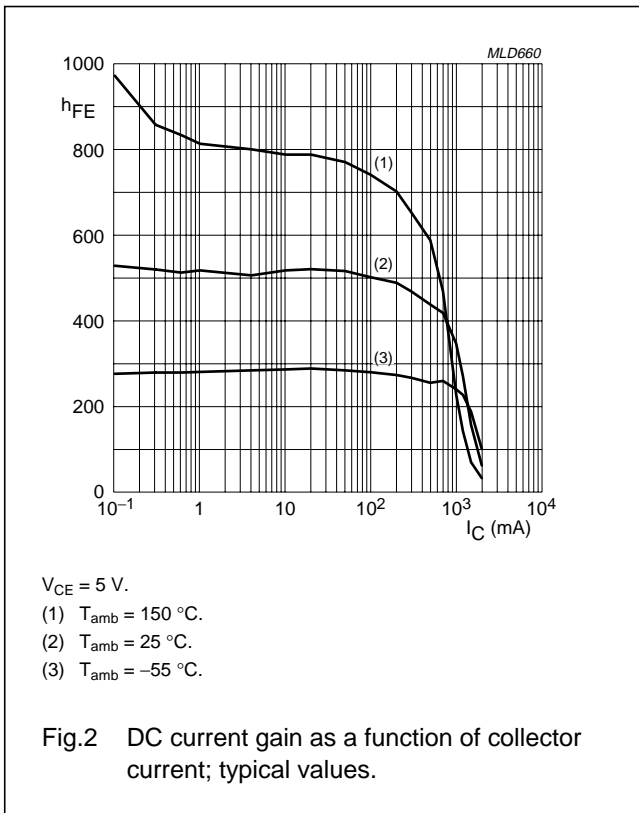
| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-------------|--------------------------------------|--|------|------|------|---------------|
| I_{CBO} | collector-base cut-off current | $V_{CB} = 40\text{ V}; I_C = 0$ | – | – | 100 | nA |
| | | $V_{CB} = 40\text{ V}; I_C = 0; T_{amb} = 150\text{ °C}$ | – | – | 50 | μA |
| I_{CEO} | collector-emitter cut-off current | $V_{CE} = 30\text{ V}; I_B = 0$ | – | – | 100 | nA |
| I_{EBO} | emitter-base cut-off current | $V_{EB} = 5\text{ V}; I_C = 0$ | – | – | 100 | nA |
| h_{FE} | DC current gain | $V_{CE} = 5\text{ V}; I_C = 1\text{ mA}$ | 300 | – | – | |
| | | $V_{CE} = 5\text{ V}; I_C = 500\text{ mA}$ | 300 | – | 900 | |
| | | $V_{CE} = 5\text{ V}; I_C = 1\text{ A}$ | 200 | – | – | |
| V_{CEsat} | collector-emitter saturation voltage | $I_C = 100\text{ mA}; I_B = 1\text{ mA}$ | – | – | 200 | mV |
| | | $I_C = 500\text{ mA}; I_B = 50\text{ mA}$ | – | – | 250 | mV |
| | | $I_C = 1\text{ A}; I_B = 100\text{ mA}$ | – | – | 500 | mV |
| R_{CEsat} | equivalent on-resistance | $I_C = 500\text{ mA}; I_B = 50\text{ mA}; \text{note 1}$ | – | 260 | <500 | m Ω |
| V_{BEsat} | base-emitter saturation voltage | $I_C = 1\text{ A}; I_B = 100\text{ mA}$ | – | – | 1.2 | V |
| V_{BEon} | base-emitter turn-on voltage | $V_{CE} = 5\text{ V}; I_C = 1\text{ A}$ | – | – | 1.1 | V |
| f_T | transition frequency | $I_C = 50\text{ mA}; V_{CE} = 10\text{ V}; f = 100\text{ MHz}$ | 150 | – | – | MHz |
| C_c | collector capacitance | $V_{CB} = 10\text{ V}; I_E = I_e = 0; f = 1\text{ MHz}$ | – | – | 10 | pF |

Note

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

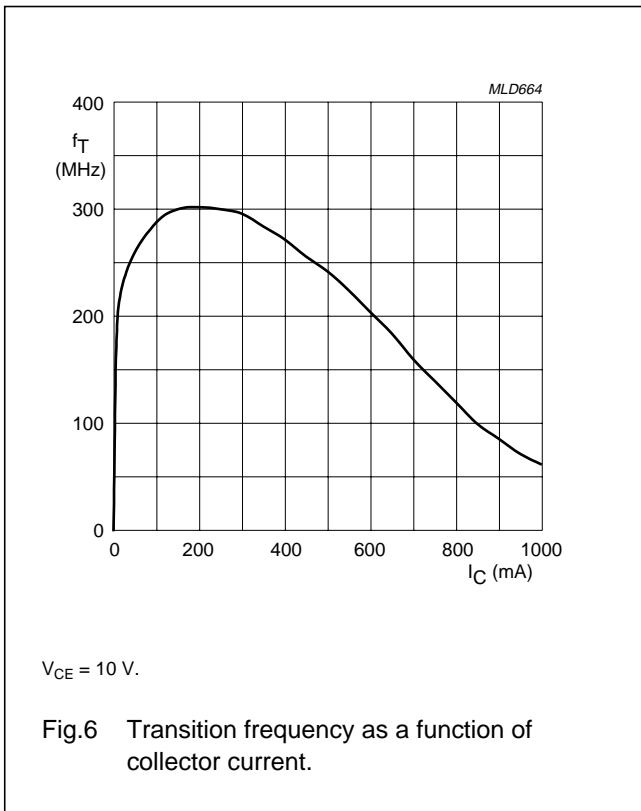
40 V low V_{CEsat} NPN transistor

PBSS4140T



40 V low V_{CEsat} NPN transistor

PBSS4140T



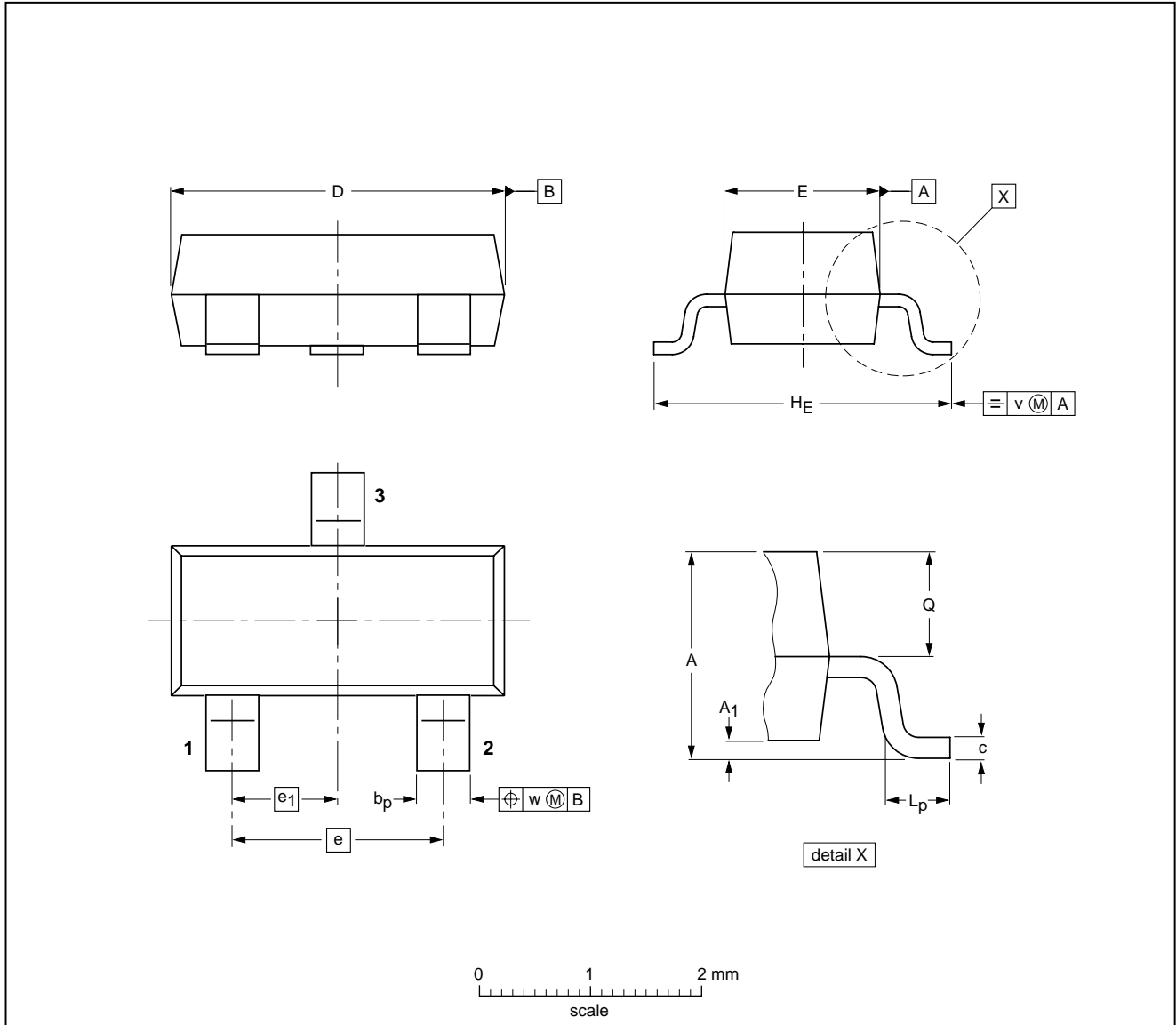
40 V low V_{CEsat} NPN transistor

PBSS4140T

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23



DIMENSIONS (mm are the original dimensions)

| UNIT | A | A ₁ max. | b _p | c | D | E | e | e ₁ | H _E | L _p | Q | v | w |
|------|------------|---------------------|----------------|--------------|------------|------------|-----|----------------|----------------|----------------|--------------|-----|-----|
| mm | 1.1 0.9 | 0.1 | 0.48 0.38 | 0.15 0.09 | 3.0 2.8 | 1.4 1.2 | 1.9 | 0.95 | 2.5 2.1 | 0.45 0.15 | 0.55 0.45 | 0.2 | 0.1 |

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|-----------------|------------|----------|------|--|---------------------|----------------------|
| | IEC | JEDEC | EIAJ | | | |
| SOT23 | | TO-236AB | | | | 97-02-28 99-09-13 |

40 V low V_{CEsat} NPN transistor

PBSS4140T

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Printed in The Netherlands

613514/02/pp8

Date of release: 2001 Jul 13

Document order number: 9397 750 08428

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