



# PBSS4160DS

60 V, 1 A NPN/NPN low  $V_{CEsat}$  transistor

12 August 2026

Product data sheet

## 1. General description

NPN/NPN low  $V_{CEsat}$  transistor pair in a SOT457 (SC-74) Surface Mounted Device (SMD) plastic package.

PNP/PNP complement: PBSS5160DS

## 2. Features and benefits

- Low collector-emitter saturation voltage  $V_{CEsat}$
- High collector current capability:  $I_C$  and  $I_{CM}$
- High collector current gain ( $h_{FE}$ ) at high  $I_C$
- High efficiency due to less heat generation
- Smaller required Printed-Circuit Board (PCB) area than for conventional transistors

## 3. Applications

- Dual low power switches (e.g. motors, fans)
- Automotive applications

## 4. Quick reference data

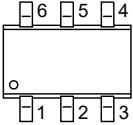
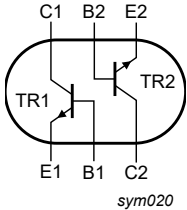
Table 1. Quick reference data

| Symbol         | Parameter                               | Conditions                                                                                          |     | Min | Typ | Max | Unit       |
|----------------|-----------------------------------------|-----------------------------------------------------------------------------------------------------|-----|-----|-----|-----|------------|
| Per transistor |                                         |                                                                                                     |     |     |     |     |            |
| $V_{CEO}$      | collector-emitter voltage               | open base                                                                                           |     | -   | -   | 60  | V          |
| $I_C$          | collector current                       |                                                                                                     | [1] | -   | -   | 1   | A          |
| $I_{CM}$       | peak collector current                  | single pulse; $t_p \leq 1$ ms                                                                       |     | -   | -   | 2   | A          |
| $R_{CEsat}$    | collector-emitter saturation resistance | $I_C = 1$ A; $I_B = 100$ mA; pulsed; $t_p \leq 300$ $\mu$ s; $\delta \leq 0.02$ ; $T_{amb} = 25$ °C |     | -   | 200 | 250 | m $\Omega$ |

[1] Device mounted on a ceramic PCB,  $Al_2O_3$ , standard footprint.

5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description   | Simplified outline                                                                                  | Graphic symbol                                                                                |
|-----|--------|---------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| 1   | E1     | emitter TR1   | <br>TSOP6 (SOT457) | <br>sym020 |
| 2   | B1     | base TR1      |                                                                                                     |                                                                                               |
| 3   | C2     | collector TR2 |                                                                                                     |                                                                                               |
| 4   | E2     | emitter TR2   |                                                                                                     |                                                                                               |
| 5   | B2     | base TR2      |                                                                                                     |                                                                                               |
| 6   | C1     | collector TR1 |                                                                                                     |                                                                                               |

6. Ordering information

Table 3. Ordering information

| Type number                | Package |                                                          |                        |
|----------------------------|---------|----------------------------------------------------------|------------------------|
|                            | Name    | Description                                              | Version                |
| <a href="#">PBSS4160DS</a> | TSOP6   | plastic, surface-mounted package (SC-74; TSOP6); 6 leads | <a href="#">SOT457</a> |

7. Marking

Table 4. Marking codes

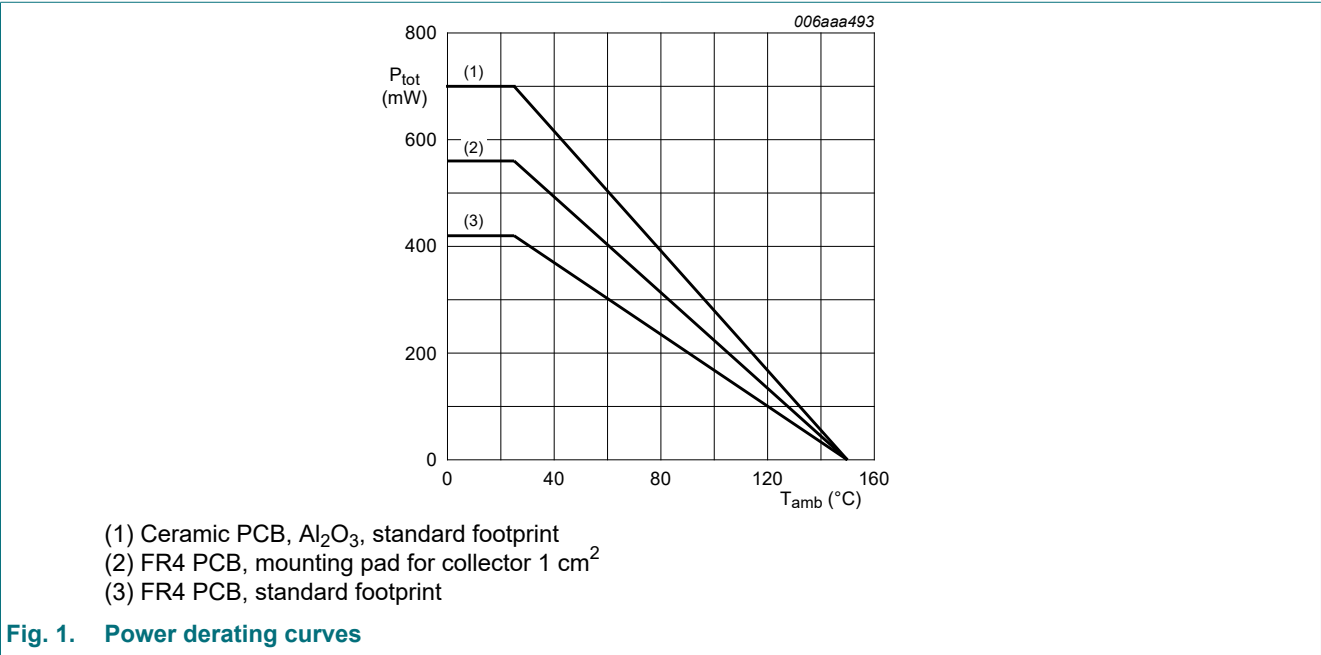
| Type number | Marking code |
|-------------|--------------|
| PBSS4160DS  | B8           |

8. Limiting values

Table 5. Limiting values  
In accordance with the Absolute Maximum Rating System (IEC 60134).

| Symbol           | Parameter                 | Conditions                          |     | Min | Max  | Unit |
|------------------|---------------------------|-------------------------------------|-----|-----|------|------|
| Per transistor   |                           |                                     |     |     |      |      |
| V <sub>CBO</sub> | collector-base voltage    | open emitter                        |     | -   | 80   | V    |
| V <sub>CEO</sub> | collector-emitter voltage | open base                           |     | -   | 60   | V    |
| V <sub>EBO</sub> | emitter-base voltage      | open collector                      |     | -   | 5    | V    |
| I <sub>C</sub>   | collector current         |                                     | [1] | -   | 0.87 | A    |
|                  |                           |                                     | [2] | -   | 1    | A    |
|                  |                           |                                     | [3] | -   | 1    | A    |
| I <sub>CM</sub>  | peak collector current    | single pulse; t <sub>p</sub> ≤ 1 ms |     | -   | 2    | A    |
| I <sub>B</sub>   | base current              |                                     |     | -   | 300  | mA   |
| I <sub>BM</sub>  | peak base current         | single pulse; t <sub>p</sub> ≤ 1 ms |     | -   | 1    | A    |
| P <sub>tot</sub> | total power dissipation   | T <sub>amb</sub> ≤ 25 °C            | [1] | -   | 290  | mW   |
|                  |                           |                                     | [2] | -   | 370  | mW   |
|                  |                           |                                     | [3] | -   | 450  | mW   |
| Per device       |                           |                                     |     |     |      |      |
| P <sub>tot</sub> | total power dissipation   | T <sub>amb</sub> ≤ 25 °C            | [1] | -   | 420  | mW   |
|                  |                           |                                     | [2] | -   | 560  | mW   |
|                  |                           |                                     | [3] | -   | 700  | 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 PCB, single-sided copper, tin-plated and standard footprint.  
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 1 cm<sup>2</sup>.  
[3] Device mounted on a ceramic PCB, Al<sub>2</sub>O<sub>3</sub>, standard footprint.

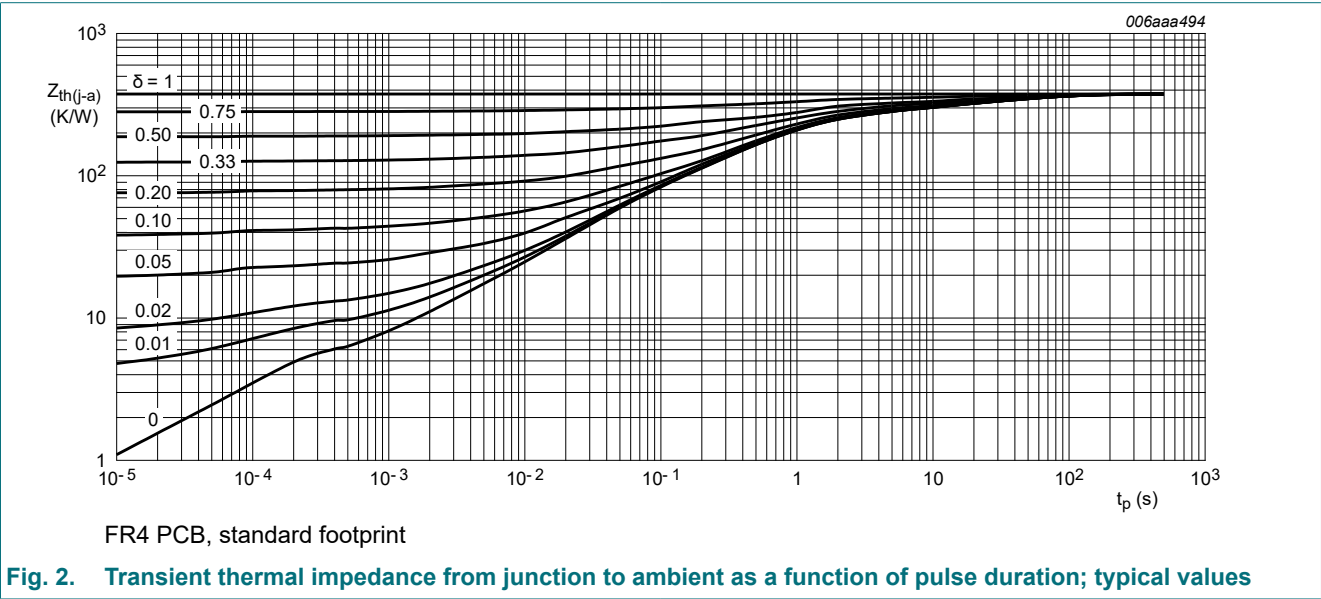


9. Thermal characteristics

Table 6. Thermal characteristics

| Symbol         | Parameter                                        | Conditions  |     | Min | Typ | Max | Unit |
|----------------|--------------------------------------------------|-------------|-----|-----|-----|-----|------|
| Per transistor |                                                  |             |     |     |     |     |      |
| $R_{th(j-a)}$  | thermal resistance from junction to ambient      | in free air | [1] | -   | -   | 431 | K/W  |
|                |                                                  |             | [2] | -   | -   | 338 | K/W  |
|                |                                                  |             | [3] | -   | -   | 278 | K/W  |
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point |             |     | -   | -   | 105 | K/W  |
| Per device     |                                                  |             |     |     |     |     |      |
| $R_{th(j-a)}$  | thermal resistance from junction to ambient      | in free air | [1] | -   | -   | 298 | K/W  |
|                |                                                  |             | [2] | -   | -   | 223 | K/W  |
|                |                                                  |             | [3] | -   | -   | 179 | K/W  |

- [1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.  
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 1 cm<sup>2</sup>.  
[3] Device mounted on a ceramic PCB, Al<sub>2</sub>O<sub>3</sub>, standard footprint.



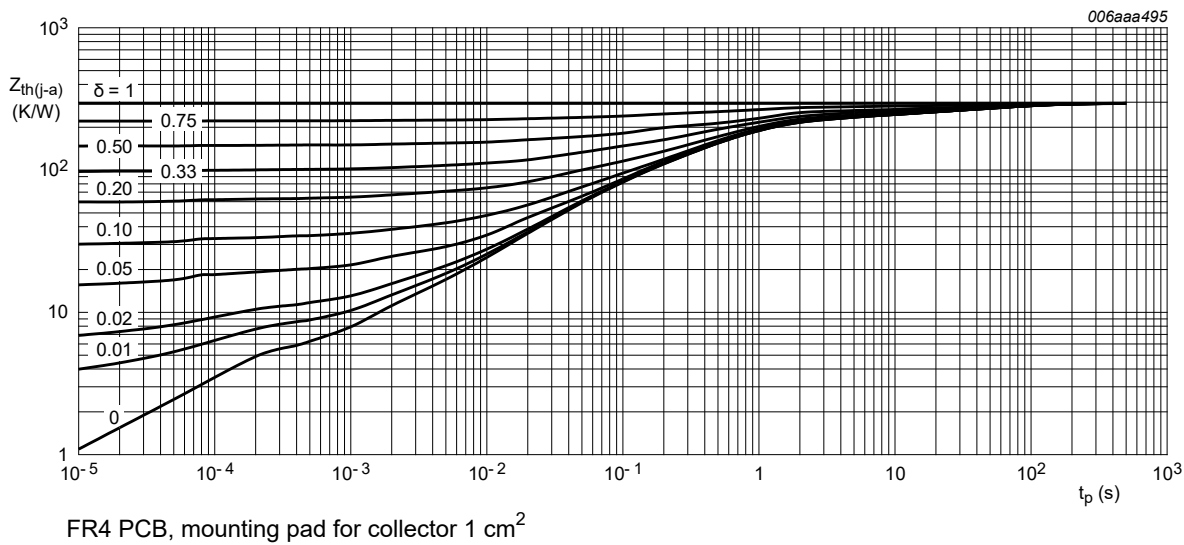


Fig. 3. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

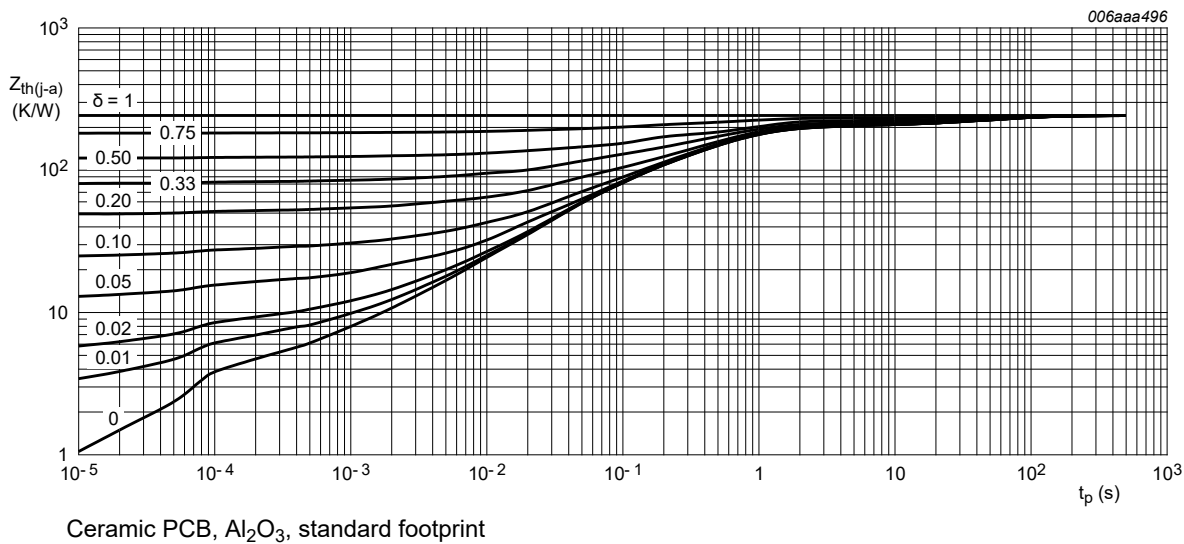


Fig. 4. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

10. Characteristics

Table 7. Characteristics

| Symbol             | Parameter                               | Conditions                                                                                                           |  | Min | Typ  | Max | Unit |
|--------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------|--|-----|------|-----|------|
| Per transistor     |                                         |                                                                                                                      |  |     |      |     |      |
| I <sub>CBO</sub>   | collector-base cut-off current          | V <sub>CB</sub> = 60 V; I <sub>E</sub> = 0 A; T <sub>amb</sub> = 25 °C                                               |  | -   | -    | 100 | nA   |
|                    |                                         | V <sub>CB</sub> = 60 V; I <sub>E</sub> = 0 A; T <sub>j</sub> = 150 °C                                                |  | -   | -    | 50  | μA   |
| I <sub>CES</sub>   | collector-emitter cut-off current       | V <sub>CE</sub> = 60 V; V <sub>BE</sub> = 0 V; T <sub>amb</sub> = 25 °C                                              |  | -   | -    | 100 | nA   |
| I <sub>EBO</sub>   | emitter-base cut-off current            | V <sub>EB</sub> = 5 V; I <sub>C</sub> = 0 A; T <sub>amb</sub> = 25 °C                                                |  | -   | -    | 100 | nA   |
| h <sub>FE</sub>    | DC current gain                         | V <sub>CE</sub> = 5 V; I <sub>C</sub> = 1 mA; T <sub>amb</sub> = 25 °C                                               |  | 250 | 500  | -   |      |
|                    |                                         | V <sub>CE</sub> = 5 V; I <sub>C</sub> = 500 mA; pulsed; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C  |  | 200 | 420  | -   |      |
|                    |                                         | V <sub>CE</sub> = 5 V; I <sub>C</sub> = 1 A; pulsed; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C     |  | 100 | 180  | -   |      |
| V <sub>CEsat</sub> | collector-emitter saturation voltage    | I <sub>C</sub> = 100 mA; I <sub>B</sub> = 1 mA; T <sub>amb</sub> = 25 °C                                             |  | -   | 90   | 110 | mV   |
|                    |                                         | I <sub>C</sub> = 500 mA; I <sub>B</sub> = 50 mA; pulsed; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C |  | -   | 115  | 140 | mV   |
|                    |                                         | I <sub>C</sub> = 1 A; I <sub>B</sub> = 100 mA; pulsed; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C   |  | -   | 200  | 250 | mV   |
| R <sub>CEsat</sub> | collector-emitter saturation resistance |                                                                                                                      |  | -   | 200  | 250 | mΩ   |
| V <sub>BEsat</sub> | base-emitter saturation voltage         | I <sub>C</sub> = 1 A; I <sub>B</sub> = 50 mA; pulsed; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C    |  | -   | 0.95 | 1.1 | V    |
| V <sub>BEon</sub>  | base-emitter turn-on voltage            | V <sub>CE</sub> = 5 V; I <sub>C</sub> = 1 A; pulsed; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C     |  | -   | 0.82 | 0.9 | V    |
| t <sub>d</sub>     | delay time                              | I <sub>C</sub> = 0.5 A; I <sub>Bon</sub> = 25 mA; I <sub>Boff</sub> = -25 mA; T <sub>amb</sub> = 25 °C               |  | -   | 11   | -   | ns   |
| t <sub>r</sub>     | rise time                               |                                                                                                                      |  | -   | 78   | -   | ns   |
| t <sub>on</sub>    | turn-on time                            |                                                                                                                      |  | -   | 90   | -   | ns   |
| t <sub>s</sub>     | storage time                            |                                                                                                                      |  | -   | 340  | -   | ns   |
| t <sub>f</sub>     | fall time                               |                                                                                                                      |  | -   | 160  | -   | ns   |
| t <sub>off</sub>   | turn-off time                           |                                                                                                                      |  | -   | 500  | -   | ns   |
| f <sub>T</sub>     | transition frequency                    | V <sub>CE</sub> = 10 V; I <sub>C</sub> = 50 mA; f = 100 MHz; T <sub>amb</sub> = 25 °C                                |  | 150 | 220  | -   | MHz  |
| C <sub>c</sub>     | collector capacitance                   | V <sub>CB</sub> = 10 V; I <sub>E</sub> = 0 A; i <sub>e</sub> = 0 A; f = 1 MHz; T <sub>amb</sub> = 25 °C              |  | -   | 5.5  | 10  | pF   |

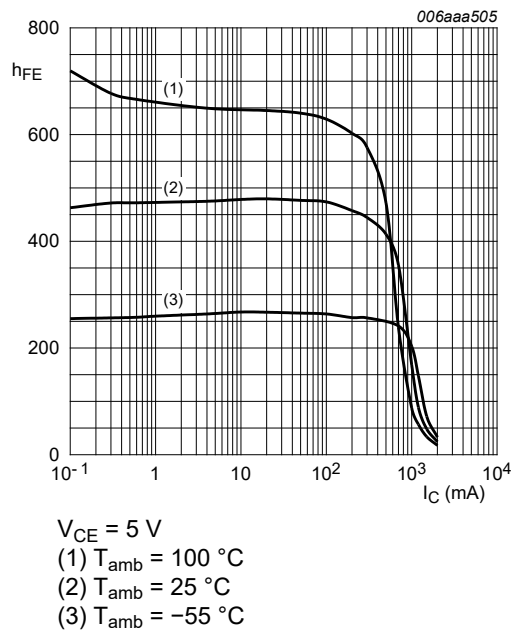


Fig. 5. DC current gain as a function of collector current; typical values

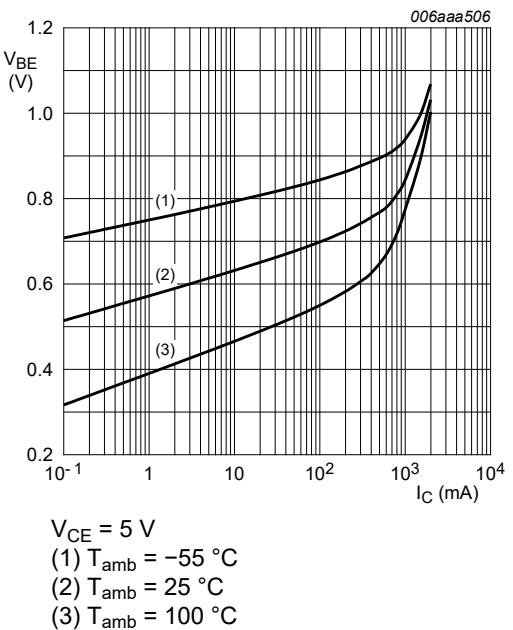


Fig. 6. Base-emitter voltage as a function of collector current; typical values

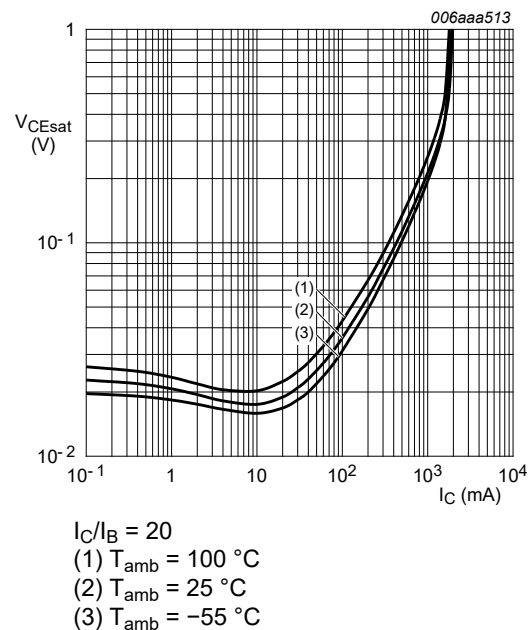


Fig. 7. Collector-emitter saturation voltage as a function of collector current; typical values

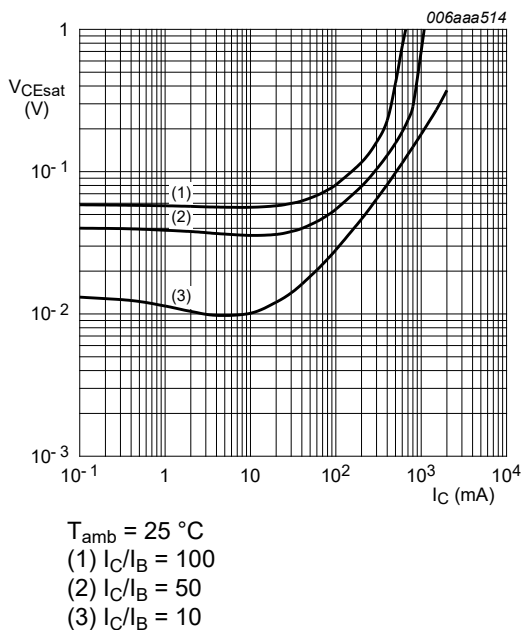


Fig. 8. Collector-emitter saturation voltage as a function of collector current; typical values

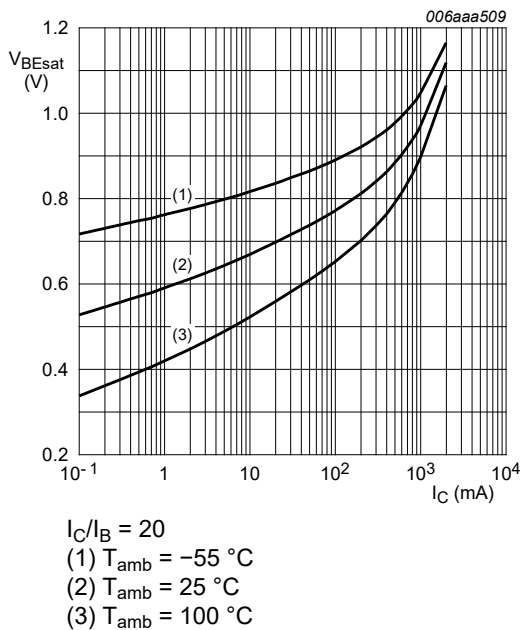


Fig. 9. Base-emitter saturation voltage as a function of collector current; typical values

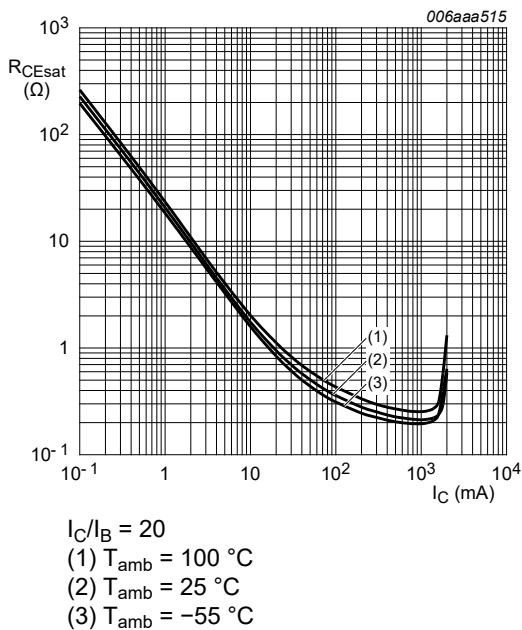


Fig. 10. Collector-emitter saturation resistance as a function of collector current; typical values

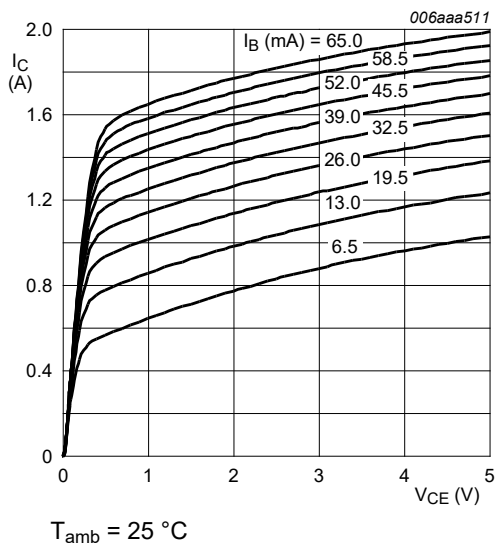


Fig. 11. Collector current as a function of collector-emitter voltage; typical values

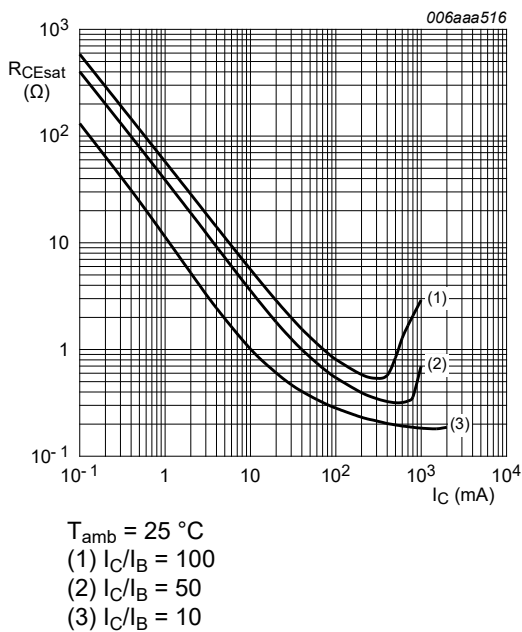


Fig. 12. Collector-emitter saturation resistance as a function of collector current; typical values

11. Test information

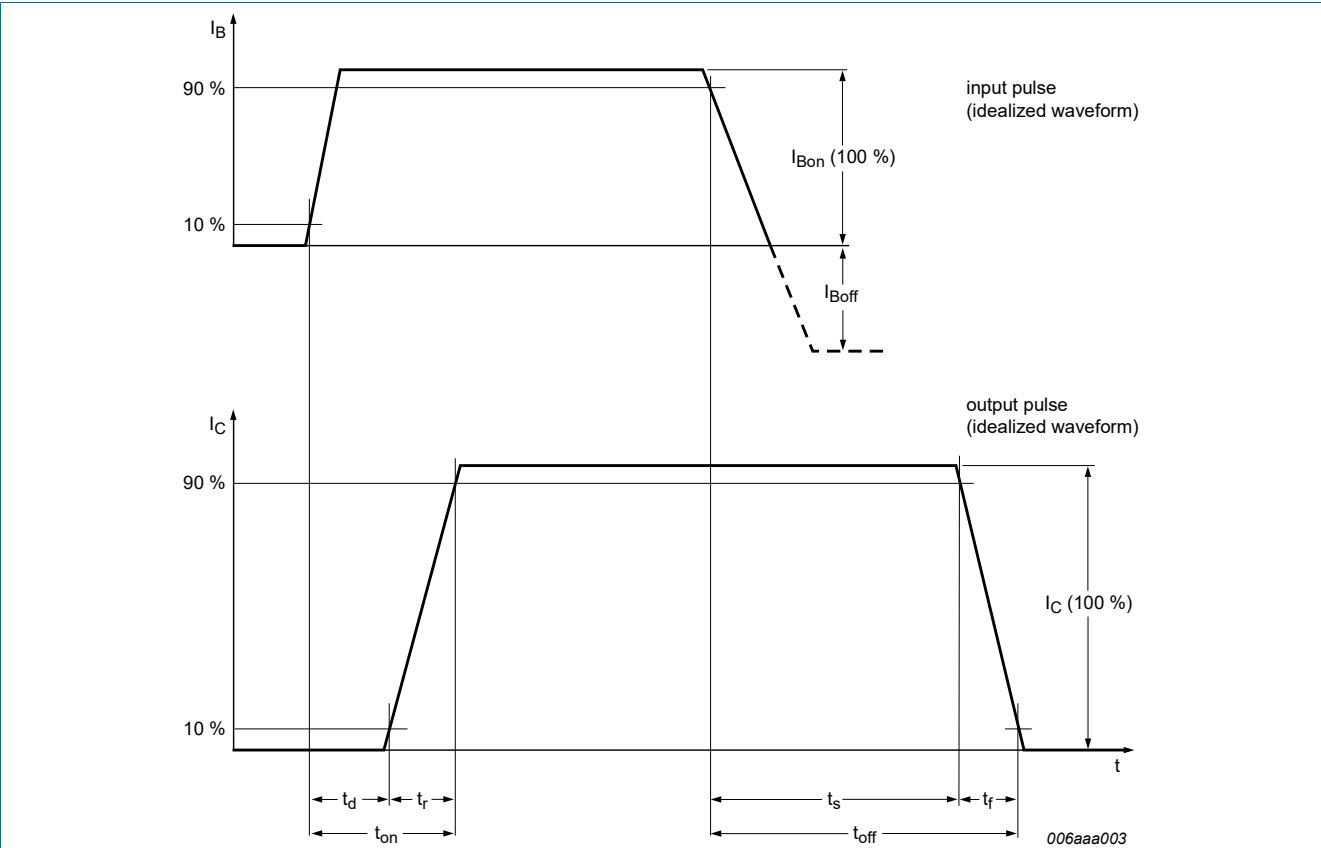


Fig. 13. Transistor switching time definition

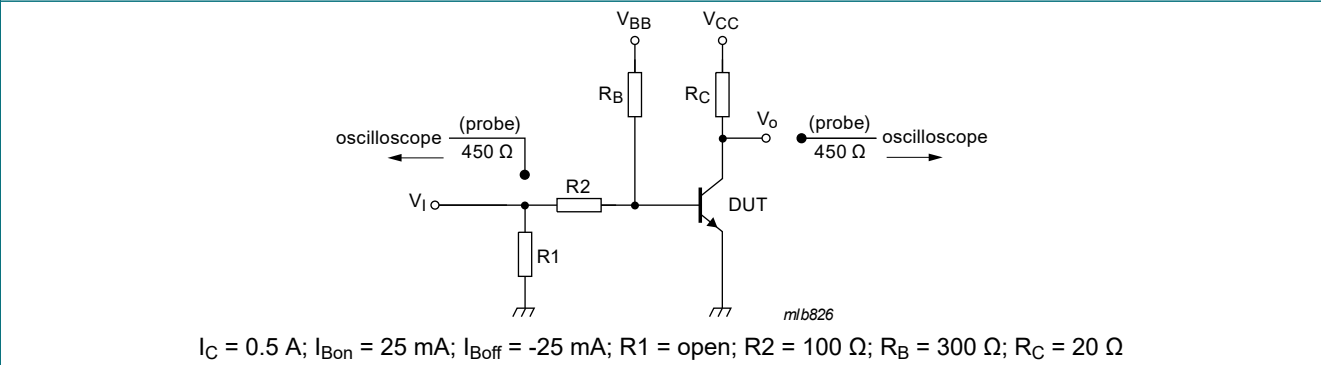
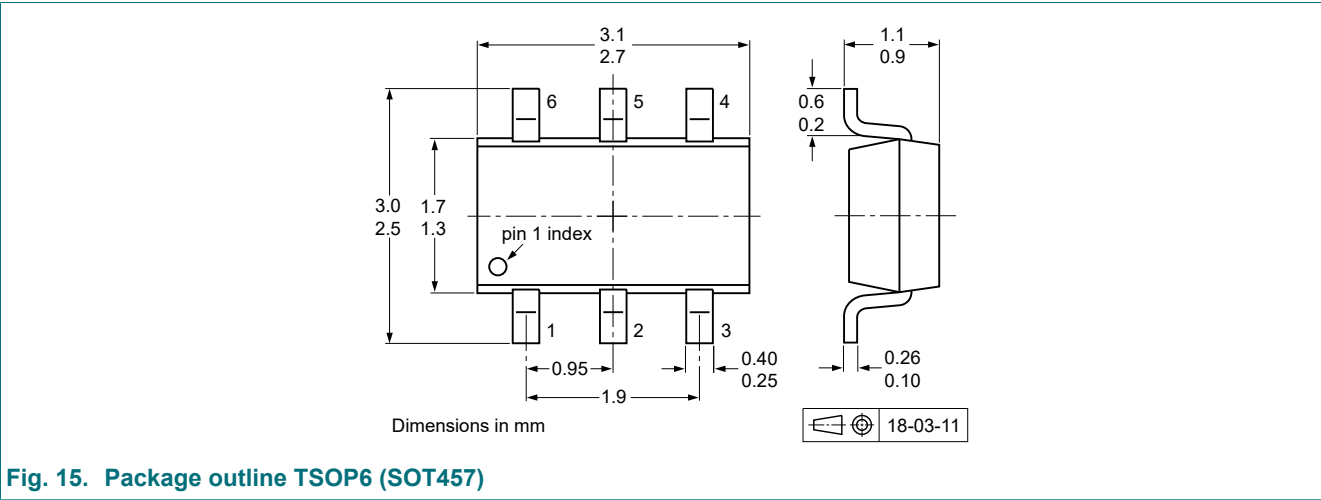
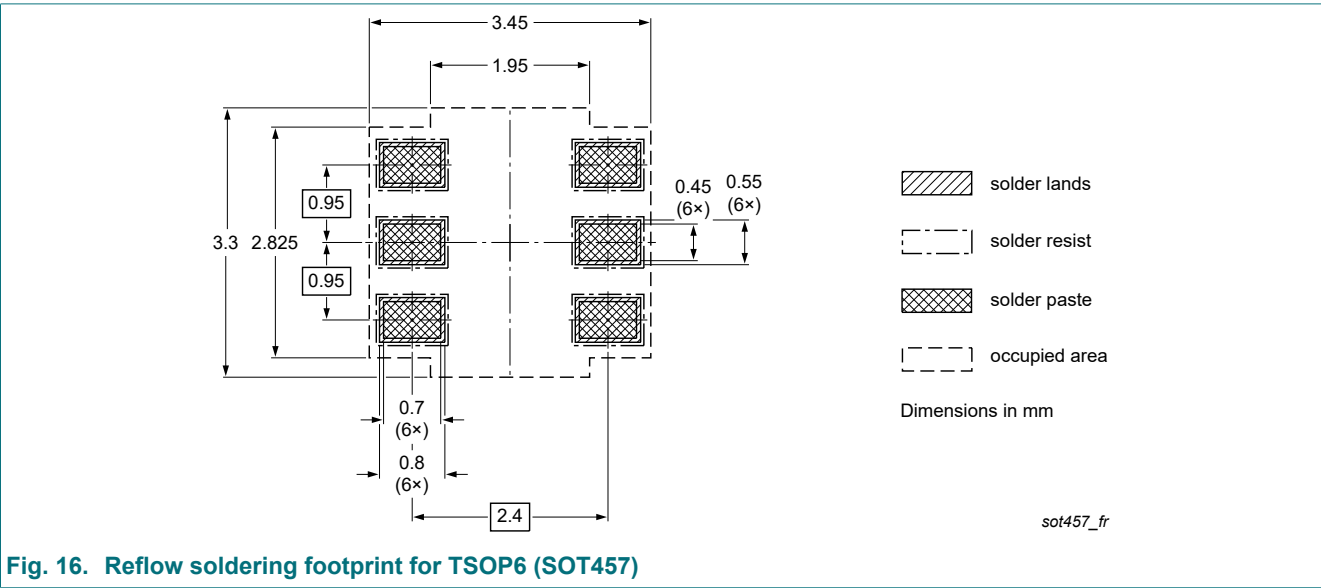


Fig. 14. Test circuit for switching times

12. Package outline



13. Soldering



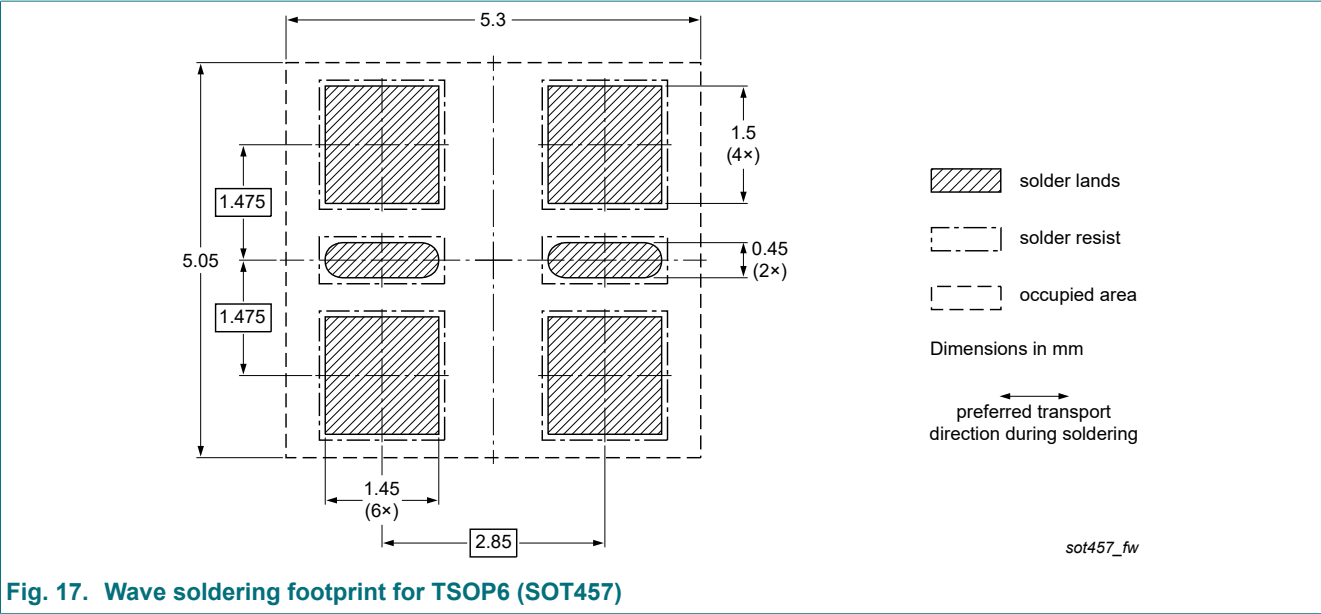


Fig. 17. Wave soldering footprint for TSOP6 (SOT457)

14. Revision history

Table 8. Revision history

| Data sheet ID  | Release date                                                                                                                                                                 | Data sheet status    | Change notice | Supersedes     |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------------|----------------|
| PBSS4160DS v.6 | 20260812                                                                                                                                                                     | Product data sheet   | -             | PBSS4160DS v.5 |
| Modifications: | <ul style="list-style-type: none"><li>Product(s) changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s).</li></ul> |                      |               |                |
| PBSS4160DS v.5 | 20230921                                                                                                                                                                     | Product data sheet   | -             | PBSS4160DS_4   |
| PBSS4160DS_4   | 20091211                                                                                                                                                                     | Product data sheet   | -             | PBSS4160DS_3   |
| PBSS4160DS_3   | 20060209                                                                                                                                                                     | Product data sheet   | -             | PBSS4160DS_2   |
| PBSS4160DS_2   | 20050627                                                                                                                                                                     | Product data sheet   | -             | PBSS4160DS_1   |
| PBSS4160DS_1   | 20040426                                                                                                                                                                     | Objective data sheet | -             | -              |

15. Legal information

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".
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