



PBSS4160PANPS

60 V, 1 A NPN/NPN low V_{CEsat} (BISS) transistor

11 February 2015

Product data sheet

1. General description

NPN/PNP low V_{CEsat} Breakthrough In Small Signal (BISS) transistor in a leadless medium power DFN2020D-6 (SOT1118D) Surface-Mounted Device (SMD) plastic package with visible and solderable side pads.

NPN/NPN complement: PBSS4160PANS. PNP/PNP complement: PBSS5160PAPS.

2. Features and benefits

- Very 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
- Reduced Printed-Circuit Board (PCB) requirements
- Exposed heat sink for excellent thermal and electrical conductivity
- High energy efficiency due to less heat generation
- Suitable for Automatic Optical Inspection (AOI) of solder joints
- AEC-Q101 qualified

3. Applications

- Load switch
- Battery-driven devices
- Power management
- Charging circuits
- LED lighting
- Power switches (e.g. motors, fans)

4. Quick reference data

Table 1. Quick reference data

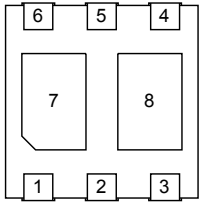
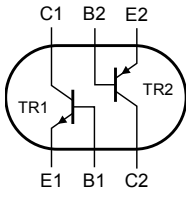
| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--|---------------------------|-------------------------------|-----|-----|-----|------|
| Per transistor; for the PNP transistor with negative polarity | | | | | | |
| V_{CEO} | collector-emitter voltage | open base | - | - | 60 | V |
| I_C | collector current | | - | - | 1 | A |
| I_{CM} | peak collector current | single pulse; $t_p \leq 1$ ms | - | - | 1.5 | A |



| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--------------------|---|--|-----|-----|-----|------|
| TR1 (NPN) | | | | | | |
| R _{CEsat} | collector-emitter saturation resistance | I _C = 0.5 A; I _B = 50 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | - | - | 240 | mΩ |
| TR2 (PNP) | | | | | | |
| R _{CEsat} | collector-emitter saturation resistance | I _C = -0.5 A; I _B = -50 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | - | - | 360 | mΩ |

5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline | Graphic symbol |
|-----|--------|---------------|---|---|
| 1 | E1 | emitter TR1 |  <p>Transparent top view DFN2020D-6 (SOT1118D)</p> |  <p><i>sym139</i></p> |
| 2 | B1 | base TR1 | | |
| 3 | C2 | collector TR2 | | |
| 4 | E2 | emitter TR2 | | |
| 5 | B2 | base TR2 | | |
| 6 | C1 | collector TR1 | | |
| 7 | C1 | collector TR1 | | |
| 8 | C2 | collector TR2 | | |

6. Ordering information

Table 3. Ordering information

| Type number | Package | | |
|---------------|------------|---|----------|
| | Name | Description | Version |
| PBSS4160PANPS | DFN2020D-6 | DFN2020D-6: plastic, thermally enhanced ultra thin and small outline package; no leads; 6 terminals; body 2 x 2 x 0.65 mm | SOT1118D |

7. Marking

Table 4. Marking codes

| Type number | Marking code |
|---------------|--------------|
| PBSS4160PANPS | 3G |

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; for the PNP transistor with negative polarity | | | | | | |
| V _{CBO} | collector-base voltage | open emitter | | - | 60 | V |
| V _{CEO} | collector-emitter voltage | open base | | - | 60 | V |
| V _{EBO} | emitter-base voltage | open collector | | - | 7 | V |
| I _C | collector current | | | - | 1 | A |
| I _{CM} | peak collector current | single pulse; t _p ≤ 1 ms | | - | 1.5 | A |
| I _B | base current | | | - | 0.3 | A |
| I _{BM} | peak base current | single pulse; t _p ≤ 1 ms | | - | 1 | A |
| P _{tot} | total power dissipation | T _{amb} ≤ 25 °C | [1] | - | 370 | mW |
| | | | [2] | - | 570 | mW |
| | | | [3] | - | 530 | mW |
| | | | [4] | - | 700 | mW |
| | | | [5] | - | 450 | mW |
| | | | [6] | - | 760 | mW |
| | | | [7] | - | 700 | mW |
| | | | [8] | - | 1450 | mW |
| Per device | | | | | | |
| P _{tot} | total power dissipation | T _{amb} ≤ 25 °C | [1] | - | 510 | mW |
| | | | [2] | - | 780 | mW |
| | | | [3] | - | 730 | mW |
| | | | [4] | - | 960 | mW |
| | | | [5] | - | 620 | mW |
| | | | [6] | - | 1040 | mW |
| | | | [7] | - | 960 | mW |
| | | | [8] | - | 2000 | mW |
| T _j | junction temperature | | | - | 150 | °C |
| T _{amb} | ambient temperature | | | -55 | 150 | °C |
| T _{stg} | storage temperature | | | -65 | 150 | °C |

[1] Device mounted on an FR4 PCB, single-sided 35 µm copper strip line, tin-plated and standard footprint.

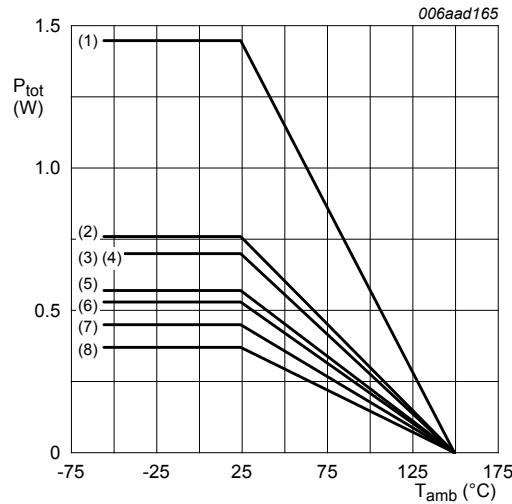
[2] Device mounted on an FR4 PCB, single-sided 35 µm copper strip line, tin-plated, mounting pad for collector 1 cm².

[3] Device mounted on 4-layer PCB 35 µm copper strip line, tin-plated and standard footprint.

[4] Device mounted on 4-layer PCB 35 µm copper strip line, tin-plated, mounting pad for collector 1 cm².

[5] Device mounted on an FR4 PCB, single-sided 70 µm copper strip line, tin-plated and standard footprint.

- [6] Device mounted on an FR4 PCB, single-sided 70 μm copper strip line, tin-plated, mounting pad for collector 1 cm².
- [7] Device mounted on 4-layer PCB 70 μm copper strip line, tin-plated and standard footprint.
- [8] Device mounted on 4-layer PCB 70 μm copper strip line, tin-plated, mounting pad for collector 1 cm².



- (1) 4-layer PCB 70 μm, mounting pad for collector 1 cm²
- (2) FR4 PCB 70 μm, mounting pad for collector 1 cm²
- (3) 4-layer PCB 70 μm, standard footprint
- (4) 4-layer PCB 35 μm, mounting pad for collector 1 cm²
- (5) FR4 PCB 35 μm, mounting pad for collector 1 cm²
- (6) 4-layer PCB 35 μm, standard footprint
- (7) FR4 PCB 70 μm, standard footprint
- (8) FR4 PCB 35 μm, standard footprint

Fig. 1. Per transistor: power derating curves

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] | - | - | 338 | K/W |
| | | | [2] | - | - | 219 | K/W |
| | | | [3] | - | - | 236 | K/W |
| | | | [4] | - | - | 179 | K/W |
| | | | [5] | - | - | 278 | K/W |
| | | | [6] | - | - | 164 | K/W |
| | | | [7] | - | - | 179 | K/W |
| | | | [8] | - | - | 86 | K/W |

| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|-------------------|--|-------------|-----|-----|-----|-----|------|
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point | | | - | - | 30 | K/W |
| Per device | | | | | | | |
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air | [1] | - | - | 245 | K/W |
| | | | [2] | - | - | 160 | K/W |
| | | | [3] | - | - | 171 | K/W |
| | | | [4] | - | - | 130 | K/W |
| | | | [5] | - | - | 202 | K/W |
| | | | [6] | - | - | 120 | K/W |
| | | | [7] | - | - | 130 | K/W |
| | | | [8] | - | - | 63 | K/W |

- [1] Device mounted on an FR4 PCB, single-sided 35 μm copper strip line, tin-plated and standard footprint.
- [2] Device mounted on an FR4 PCB, single-sided 35 μm copper strip line, tin-plated, mounting pad for collector 1 cm^2 .
- [3] Device mounted on 4-layer PCB 35 μm copper strip line, tin-plated and standard footprint.
- [4] Device mounted on 4-layer PCB 35 μm copper strip line, tin-plated, mounting pad for collector 1 cm^2 .
- [5] Device mounted on an FR4 PCB, single-sided 70 μm copper strip line, tin-plated and standard footprint.
- [6] Device mounted on an FR4 PCB, single-sided 70 μm copper strip line, tin-plated, mounting pad for collector 1 cm^2 .
- [7] Device mounted on 4-layer PCB 70 μm copper strip line, tin-plated and standard footprint.
- [8] Device mounted on 4-layer PCB 70 μm copper strip line, tin-plated, mounting pad for collector 1 cm^2 .

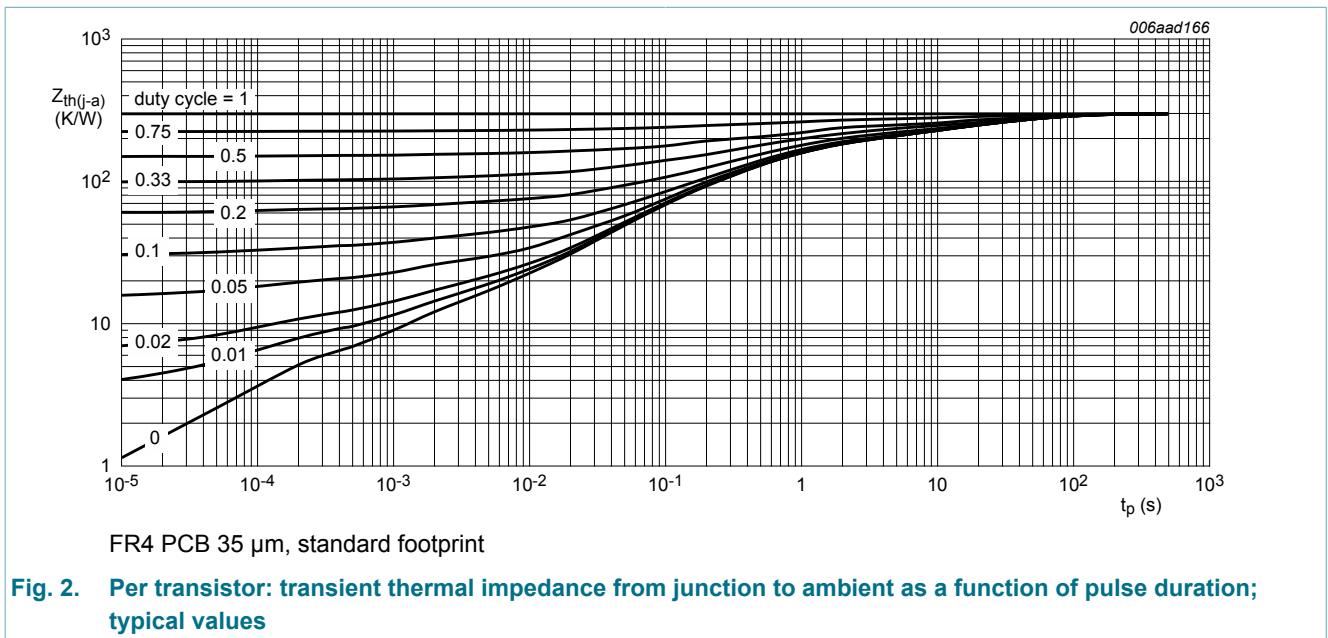
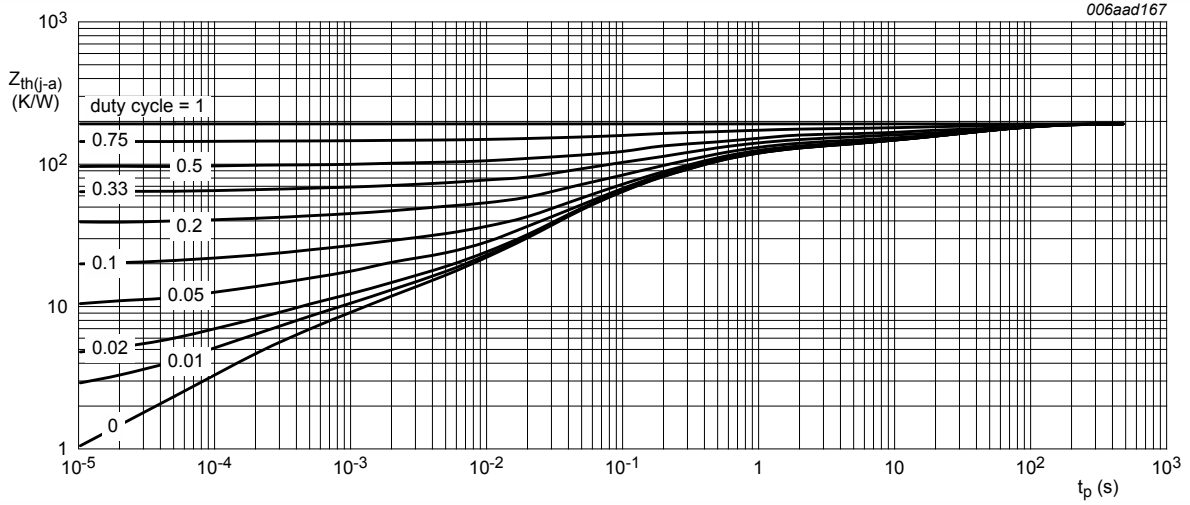
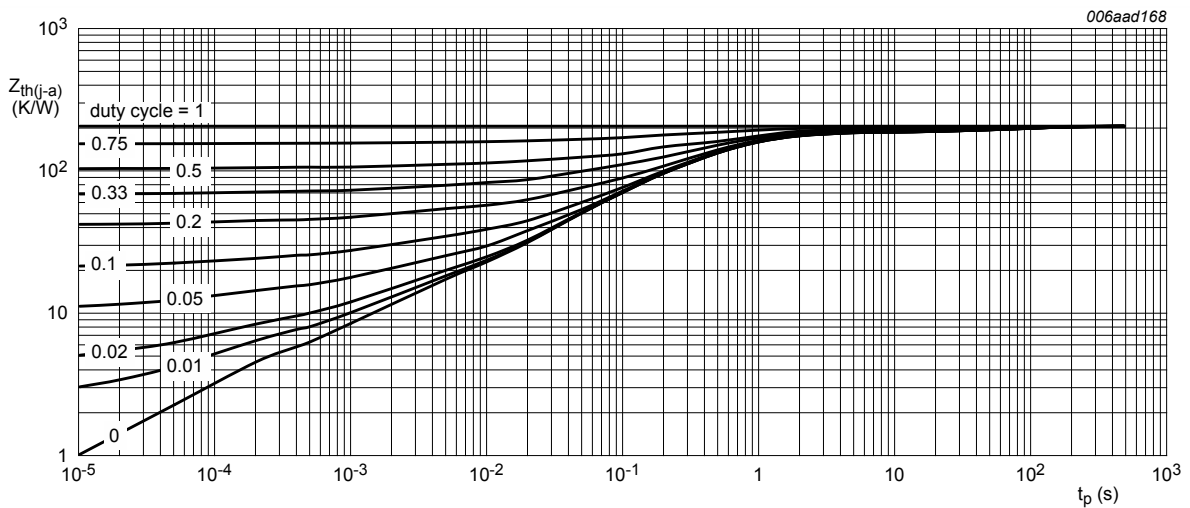


Fig. 2. Per transistor: transient thermal impedance from junction to ambient as a function of pulse duration; typical values



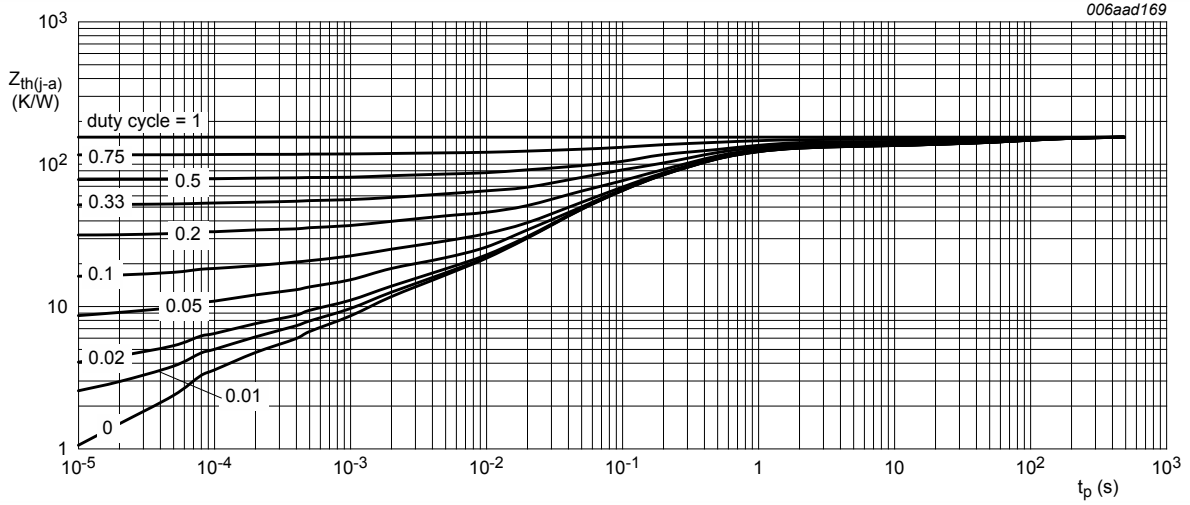
FR4 PCB 35 μ m, mounting pad for collector 1 cm²

Fig. 3. Per transistor: transient thermal impedance from junction to ambient as a function of pulse duration; typical values



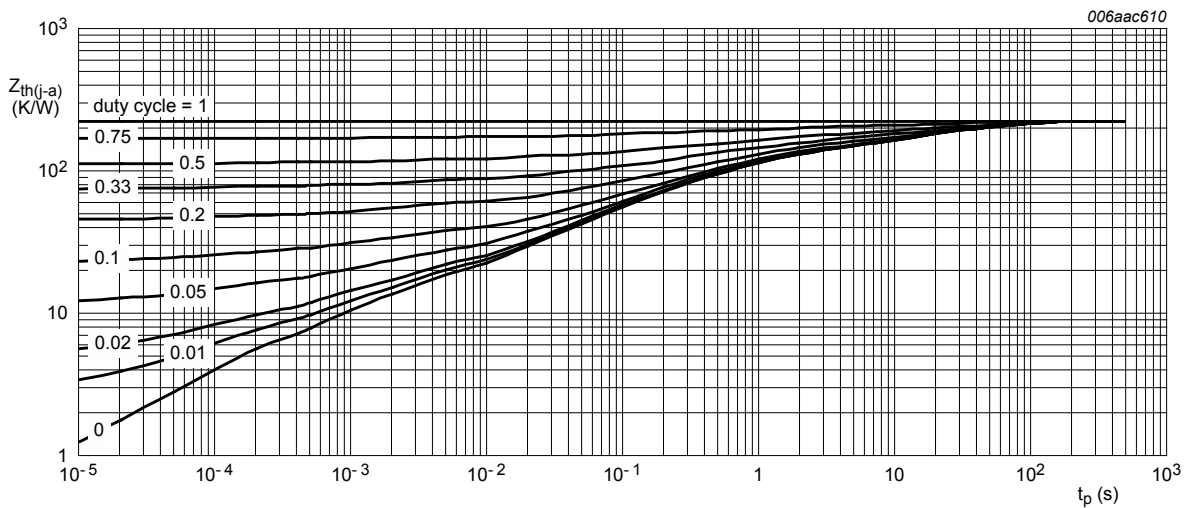
4-layer PCB 35 μ m, standard footprint

Fig. 4. Per transistor: transient thermal impedance from junction to ambient as a function of pulse duration; typical values



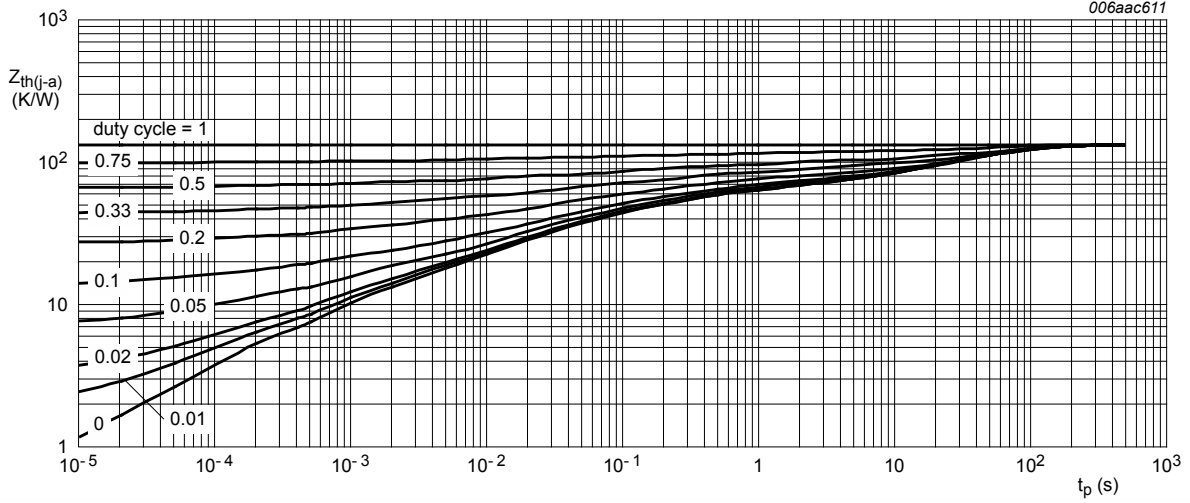
4-layer PCB 35 μm , mounting pad for collector 1 cm^2

Fig. 5. Per transistor: transient thermal impedance from junction to ambient as a function of pulse duration; typical values



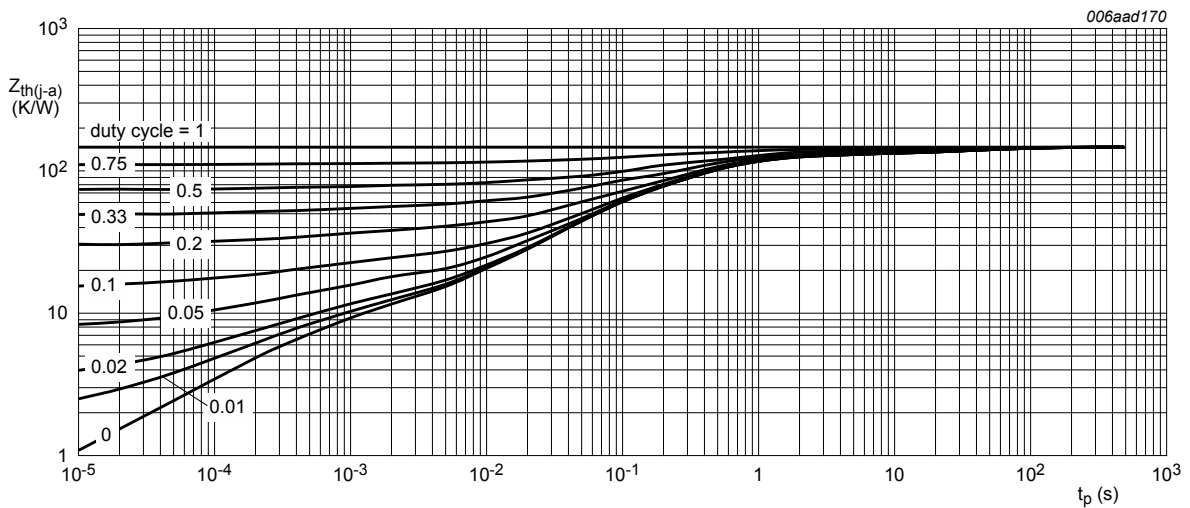
FR4 PCB 70 μm , standard footprint

Fig. 6. Per transistor: transient thermal impedance from junction to ambient as a function of pulse duration; typical values



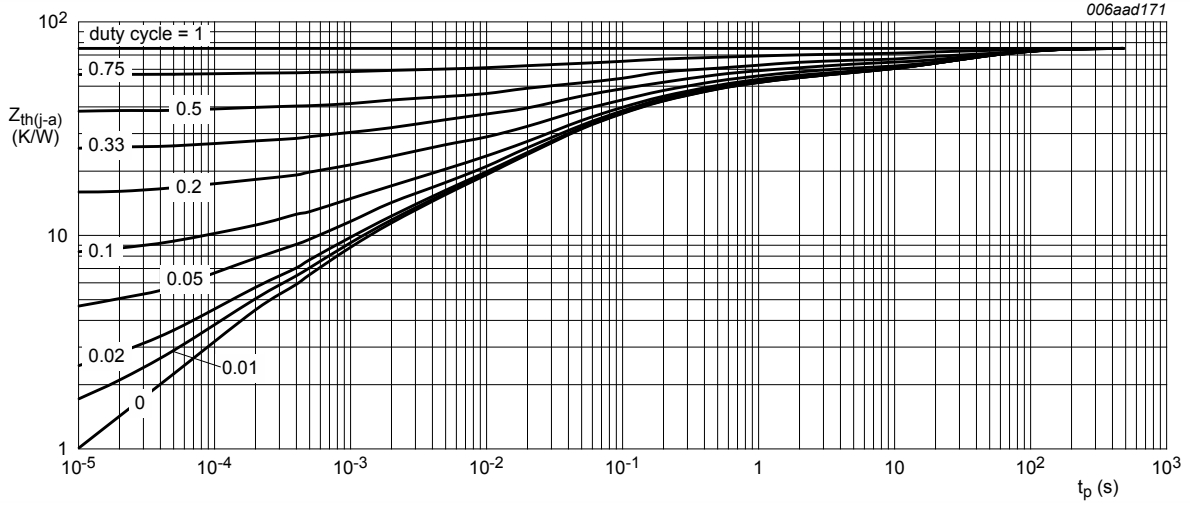
FR4 PCB 70 μm , mounting pad for collector 1 cm^2

Fig. 7. Per transistor: transient thermal impedance from junction to ambient as a function of pulse duration; typical values



4-layer PCB 70 μm , standard footprint

Fig. 8. Per transistor: transient thermal impedance from junction to ambient as a function of pulse duration; typical values



4-layer PCB 70 μm , mounting pad for collector 1 cm^2

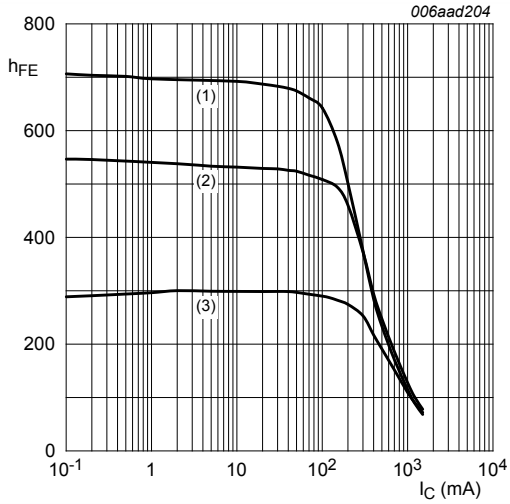
Fig. 9. Per transistor: transient thermal impedance from junction to ambient as a function of pulse duration; typical values

10. Characteristics

Table 7. Characteristics

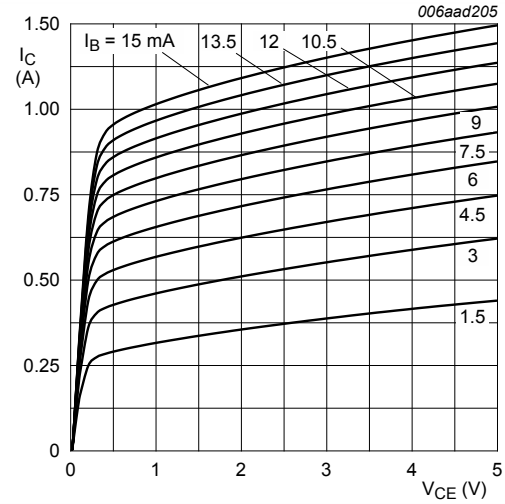
| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--------------------|---|--|---|-----|-----|------|
| TR1 (NPN) | | | | | | |
| I _{CBO} | collector-base cut-off current | V _{CB} = 48 V; I _E = 0 A; T _{amb} = 25 °C | - | - | 100 | nA |
| | | V _{CB} = 48 V; I _E = 0 A; T _j = 150 °C | - | - | 50 | μA |
| I _{EBO} | emitter-base cut-off current | V _{EB} = 5 V; I _C = 0 A; T _{amb} = 25 °C | - | - | 100 | nA |
| h _{FE} | DC current gain | V _{CE} = 2 V; I _C = 100 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | 290 | 430 | - | |
| | | V _{CE} = 2 V; I _C = 500 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | 150 | 220 | - | |
| | | V _{CE} = 2 V; I _C = 1 A; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | 70 | 110 | - | |
| V _{CEsat} | collector-emitter saturation voltage | I _C = 500 mA; I _B = 50 mA; T _{amb} = 25 °C | - | 90 | 120 | mV |
| | | I _C = 1 A; I _B = 50 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | - | 185 | 240 | mV |
| | | I _C = 1 A; I _B = 100 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | - | 175 | 220 | mV |
| R _{CEsat} | collector-emitter saturation resistance | I _C = 0.5 A; I _B = 50 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | - | - | 240 | mΩ |
| V _{BEsat} | base-emitter saturation voltage | I _C = 500 mA; I _B = 50 mA; T _{amb} = 25 °C | - | - | 1 | V |
| | | I _C = 1 A; I _B = 50 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | - | - | 1.1 | V |
| | | I _C = 1 A; I _B = 100 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | - | - | 1.1 | V |
| V _{BEon} | base-emitter turn-on voltage | V _{CE} = 2 V; I _C = 0.5 A; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | - | - | 0.9 | V |
| t _d | delay time | V _{CC} = 10 V; I _C = 0.5 A; I _{Bon} = 25 mA; I _{Boff} = -25 mA; T _{amb} = 25 °C | - | 15 | - | ns |
| t _r | rise time | | - | 90 | - | ns |
| t _{on} | turn-on time | | - | 105 | - | ns |
| t _s | storage time | | - | 410 | - | ns |
| t _f | fall time | | - | 130 | - | ns |
| t _{off} | turn-off time | | - | 540 | - | ns |
| f _T | transition frequency | | V _{CE} = 10 V; I _C = 50 mA; f = 100 MHz; T _{amb} = 25 °C | 90 | 175 | - |
| C _c | collector capacitance | V _{CB} = 10 V; I _E = 0 A; i _e = 0 A; f = 1 MHz; T _{amb} = 25 °C | - | 4 | 6 | pF |

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--------------------|---|--|---|------|------|------|
| TR2 (PNP) | | | | | | |
| I _{CBO} | collector-base cut-off current | V _{CB} = -48 V; I _E = 0 A | - | - | -100 | nA |
| | | V _{CB} = -48 V; I _E = 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} = -2 V; I _C = -100 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | 170 | 245 | - | |
| | | V _{CE} = -2 V; I _C = -500 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | 120 | 170 | - | |
| | | V _{CE} = -2 V; I _C = -1 A; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | 70 | 100 | - | |
| V _{CEsat} | collector-emitter saturation voltage | I _C = -500 mA; I _B = -50 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | - | -125 | -180 | mV |
| | | I _C = -1 A; I _B = -50 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | - | -390 | -550 | mV |
| | | I _C = -1 A; I _B = -100 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | - | -240 | -340 | mV |
| R _{CEsat} | collector-emitter saturation resistance | I _C = -0.5 A; I _B = -50 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | - | - | 360 | mΩ |
| V _{BEsat} | base-emitter saturation voltage | I _C = -500 mA; I _B = -50 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | - | - | -1 | V |
| | | I _C = -1 A; I _B = -50 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | - | - | -1 | V |
| | | I _C = -1 A; I _B = -100 mA; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | - | - | -1.1 | V |
| V _{BEon} | base-emitter turn-on voltage | V _{CE} = -2 V; I _C = -0.5 A; pulsed; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C | - | - | -0.9 | V |
| t _d | delay time | V _{CC} = -10 V; I _C = -0.5 A; I _{Bon} = -25 mA; I _{Boff} = 25 mA; T _{amb} = 25 °C | - | 15 | - | ns |
| t _r | rise time | | - | 40 | - | ns |
| t _{on} | turn-on time | | - | 55 | - | ns |
| t _s | storage time | | - | 95 | - | ns |
| t _f | fall time | | - | 40 | - | ns |
| t _{off} | turn-off time | | - | 135 | - | ns |
| f _T | transition frequency | | V _{CE} = -10 V; I _C = -50 mA; f = 100 MHz; T _{amb} = 25 °C | 65 | 125 | - |
| C _c | collector capacitance | V _{CB} = -10 V; I _E = 0 A; i _e = 0 A; f = 1 MHz; T _{amb} = 25 °C | - | 9.5 | 13 | pF |



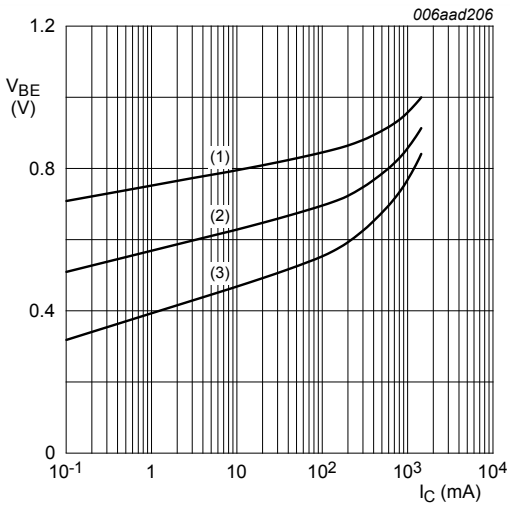
$V_{CE} = 2\text{ V}$
 (1) $T_{amb} = 100\text{ }^\circ\text{C}$
 (2) $T_{amb} = 25\text{ }^\circ\text{C}$
 (3) $T_{amb} = -55\text{ }^\circ\text{C}$

Fig. 10. TR1 (NPN): DC current gain as a function of collector current; typical values



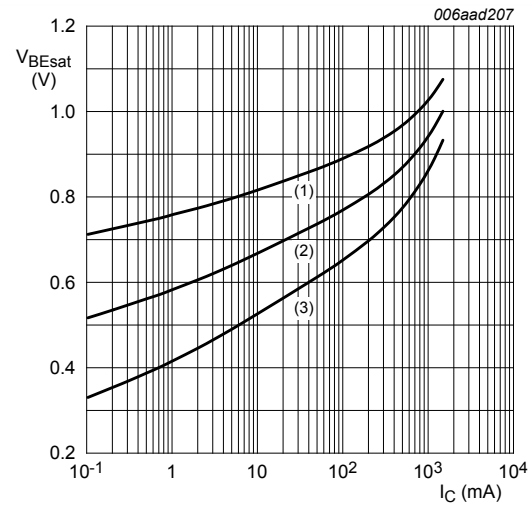
$T_{amb} = 25\text{ }^\circ\text{C}$

Fig. 11. TR1 (NPN): Collector current as a function of collector-emitter voltage; typical values



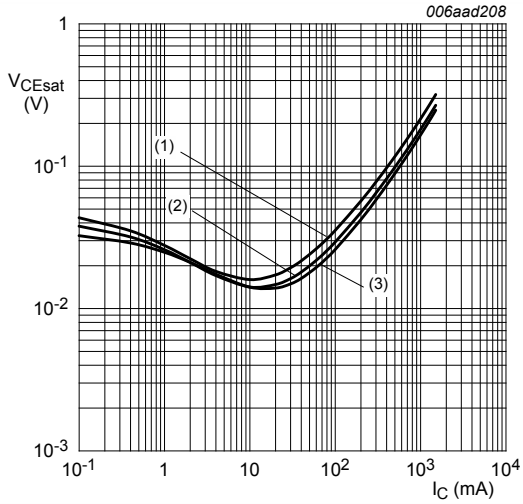
$V_{CE} = 2\text{ V}$
 (1) $T_{amb} = -55\text{ }^\circ\text{C}$
 (2) $T_{amb} = 25\text{ }^\circ\text{C}$
 (3) $T_{amb} = 100\text{ }^\circ\text{C}$

Fig. 12. TR1 (NPN): Base-emitter voltage as a function of collector current; typical values



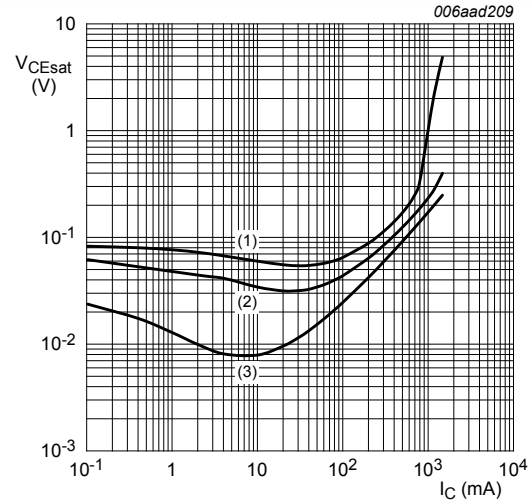
$I_C/I_B = 20$
 (1) $T_{amb} = -55\text{ }^\circ\text{C}$
 (2) $T_{amb} = 25\text{ }^\circ\text{C}$
 (3) $T_{amb} = 100\text{ }^\circ\text{C}$

Fig. 13. TR1 (NPN): Base-emitter saturation voltage as a function of collector current; typical values



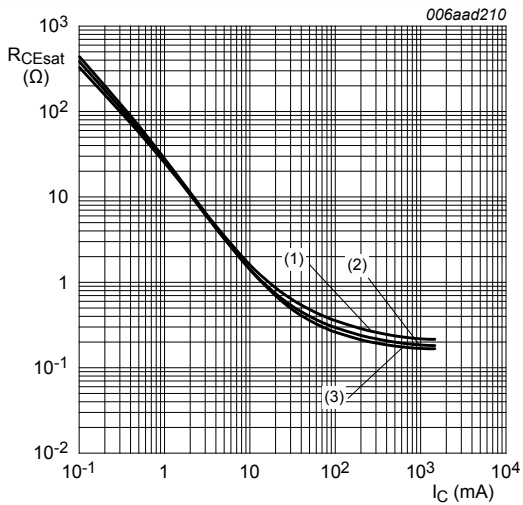
$I_C/I_B = 20$
 (1) $T_{amb} = 100\text{ °C}$
 (2) $T_{amb} = 25\text{ °C}$
 (3) $T_{amb} = -55\text{ °C}$

Fig. 14. TR1 (NPN): Collector-emitter saturation voltage as a function of collector current; typical values



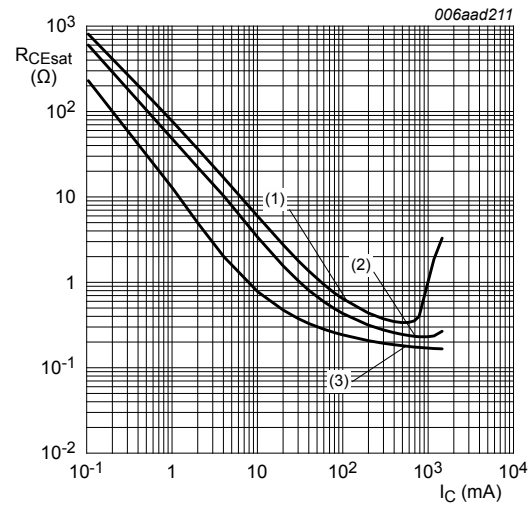
$T_{amb} = 25\text{ °C}$
 (1) $I_C/I_B = 100$
 (2) $I_C/I_B = 50$
 (3) $I_C/I_B = 10$

Fig. 15. TR1 (NPN): Collector-emitter saturation voltage as a function of collector current; typical values



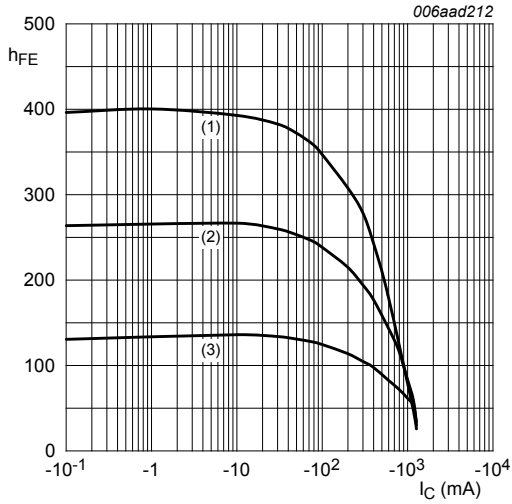
$I_C/I_B = 20$
 (1) $T_{amb} = 100\text{ °C}$
 (2) $T_{amb} = 25\text{ °C}$
 (3) $T_{amb} = -55\text{ °C}$

Fig. 16. TR1 (NPN): Collector-emitter saturation resistance as a function of collector current; typical values



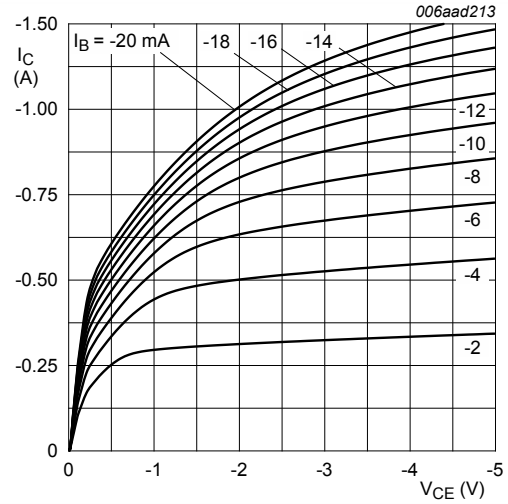
$T_{amb} = 25\text{ °C}$
 (1) $I_C/I_B = 100$
 (2) $I_C/I_B = 50$
 (3) $I_C/I_B = 10$

Fig. 17. TR1 (NPN): Collector-emitter saturation resistance as a function of collector current; typical values



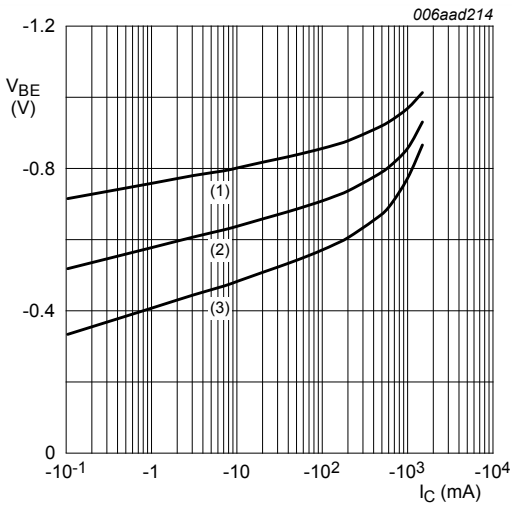
$V_{CE} = -2\text{ V}$
 (1) $T_{amb} = 100\text{ }^{\circ}\text{C}$
 (2) $T_{amb} = 25\text{ }^{\circ}\text{C}$
 (3) $T_{amb} = -55\text{ }^{\circ}\text{C}$

Fig. 18. TR2 (PNP): DC current gain as a function of collector current; typical values



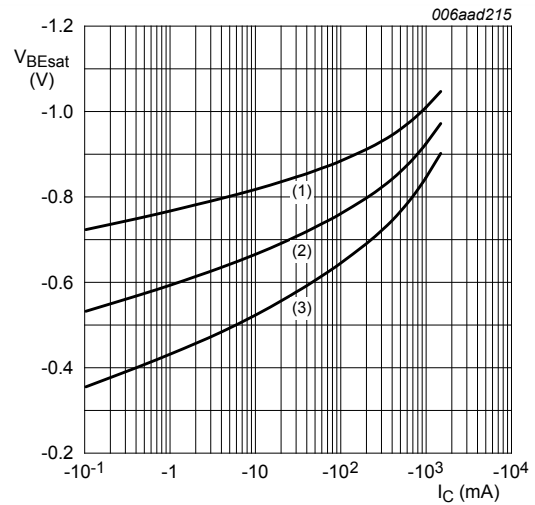
$T_{amb} = 25\text{ }^{\circ}\text{C}$

Fig. 19. TR2 (PNP): Collector current as a function of collector-emitter voltage; typical values



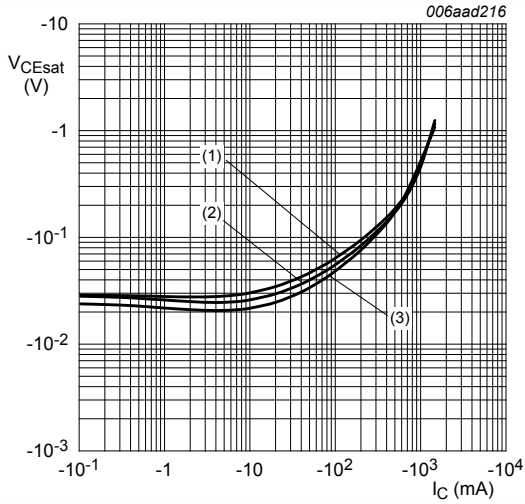
$V_{CE} = -2\text{ V}$
 (1) $T_{amb} = -55\text{ }^{\circ}\text{C}$
 (2) $T_{amb} = 25\text{ }^{\circ}\text{C}$
 (3) $T_{amb} = 100\text{ }^{\circ}\text{C}$

Fig. 20. TR2 (PNP): Base-emitter voltage as a function of collector current; typical values



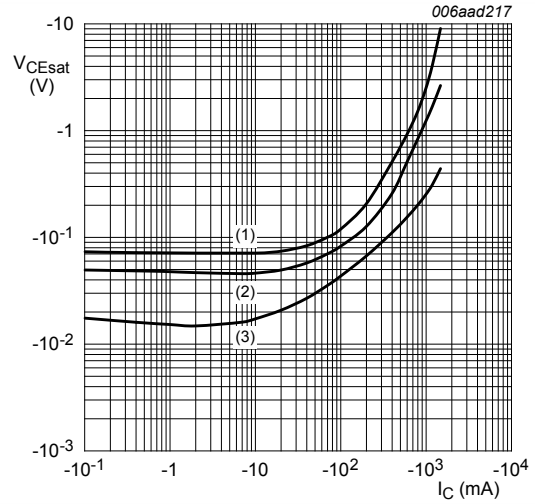
$I_C/I_B = 20$
 (1) $T_{amb} = -55\text{ }^{\circ}\text{C}$
 (2) $T_{amb} = 25\text{ }^{\circ}\text{C}$
 (3) $T_{amb} = 100\text{ }^{\circ}\text{C}$

Fig. 21. TR2 (PNP): Base-emitter saturation voltage as a function of collector current; typical values



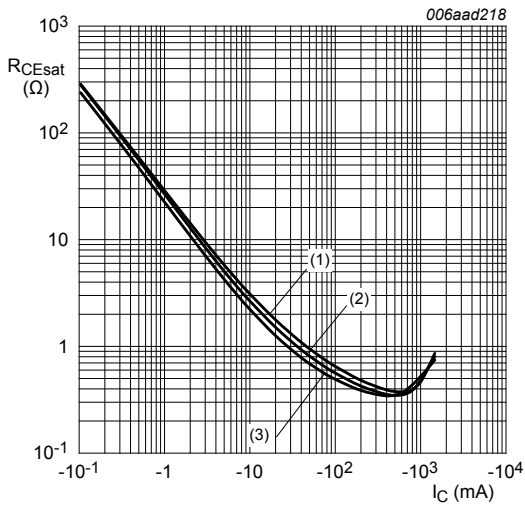
$I_C/I_B = 20$
 (1) $T_{amb} = 100\text{ °C}$
 (2) $T_{amb} = 25\text{ °C}$
 (3) $T_{amb} = -55\text{ °C}$

Fig. 22. TR2 (PNP): Collector-emitter saturation voltage as a function of collector current; typical values



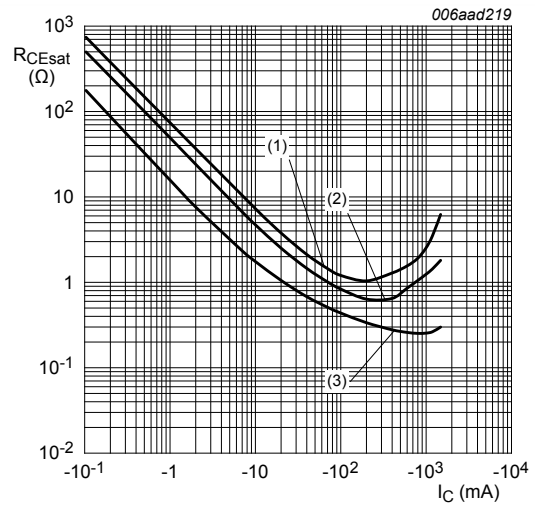
$T_{amb} = 25\text{ °C}$
 (1) $I_C/I_B = 100$
 (2) $I_C/I_B = 50$
 (3) $I_C/I_B = 10$

Fig. 23. TR2 (PNP): Collector-emitter saturation voltage as a function of collector current; typical values



$I_C/I_B = 20$
 (1) $T_{amb} = 100\text{ °C}$
 (2) $T_{amb} = 25\text{ °C}$
 (3) $T_{amb} = -55\text{ °C}$

Fig. 24. TR2 (PNP): Collector-emitter saturation resistance as a function of collector current; typical values



$T_{amb} = 25\text{ °C}$
 (1) $I_C/I_B = 100$
 (2) $I_C/I_B = 50$
 (3) $I_C/I_B = 10$

Fig. 25. TR2 (PNP): Collector-emitter saturation resistance as a function of collector current; typical values

11. Test information

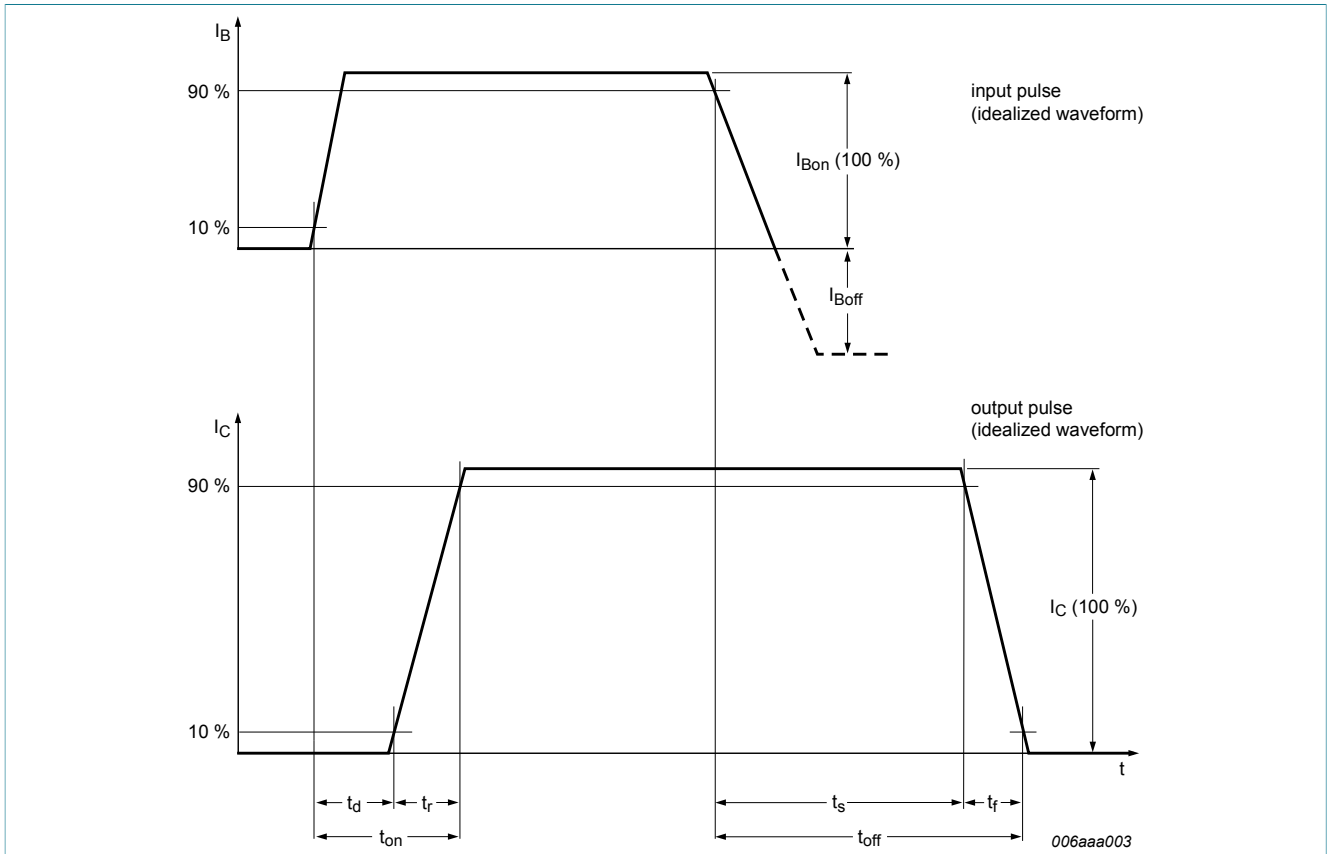


Fig. 26. TR1 (NPN): BISS transistor switching time definition

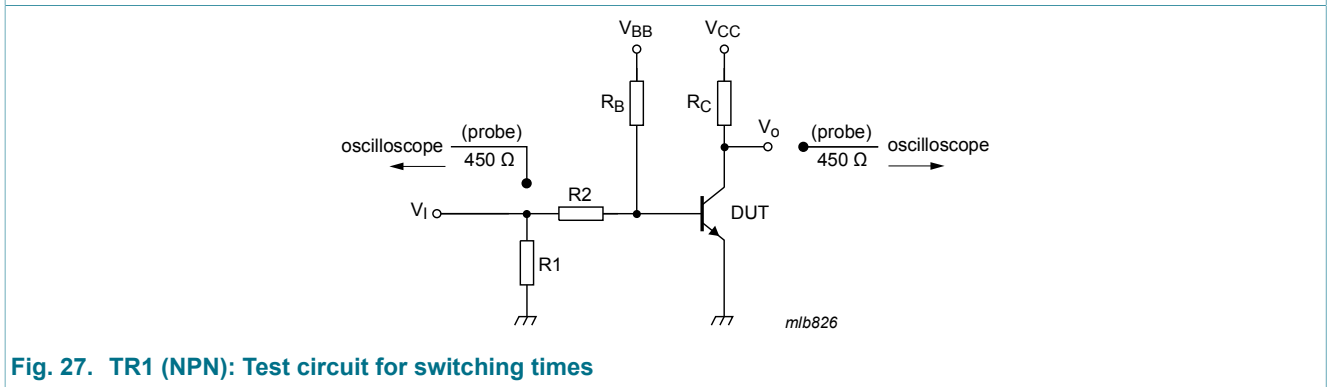


Fig. 27. TR1 (NPN): Test circuit for switching times

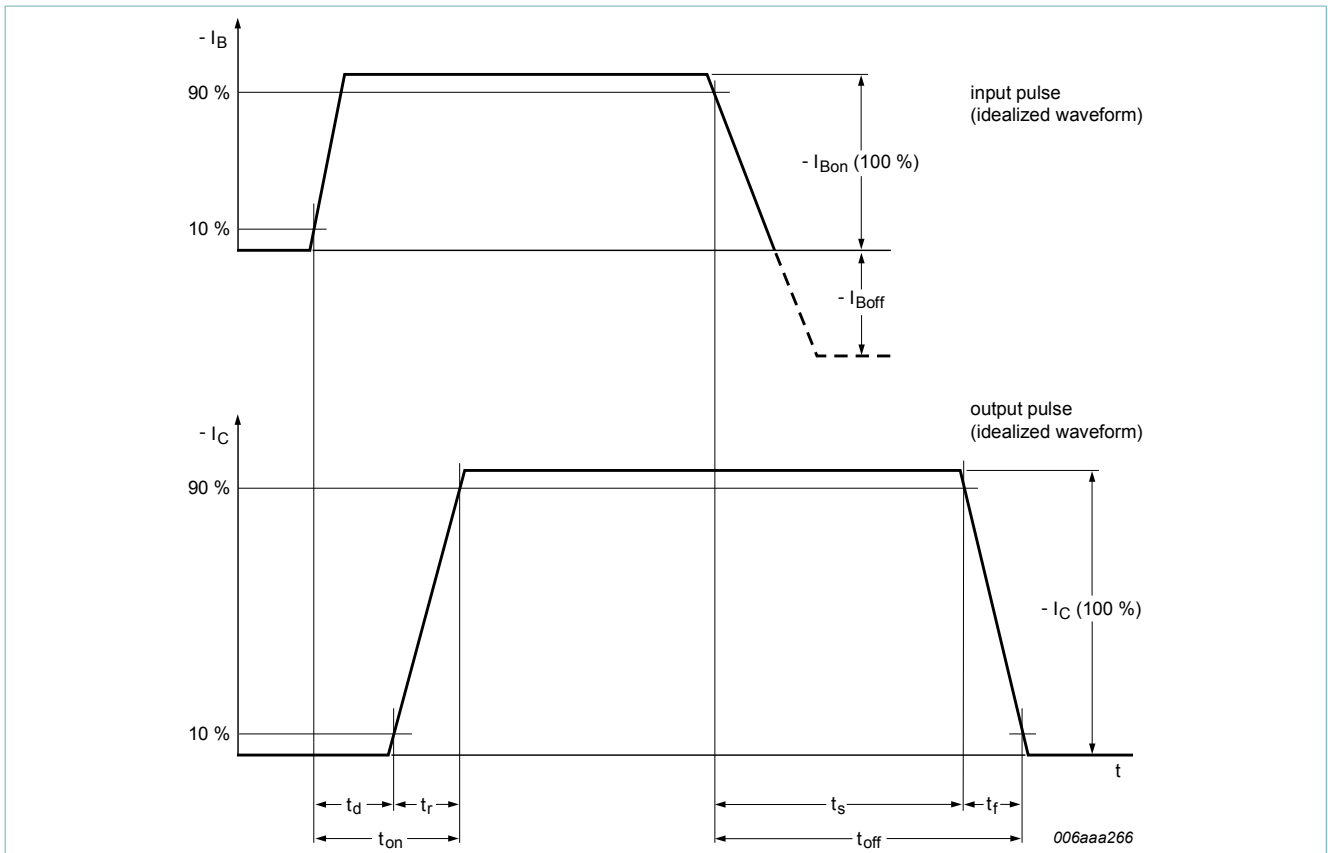


Fig. 28. TR2 (PNP): BISS transistor switching time definition

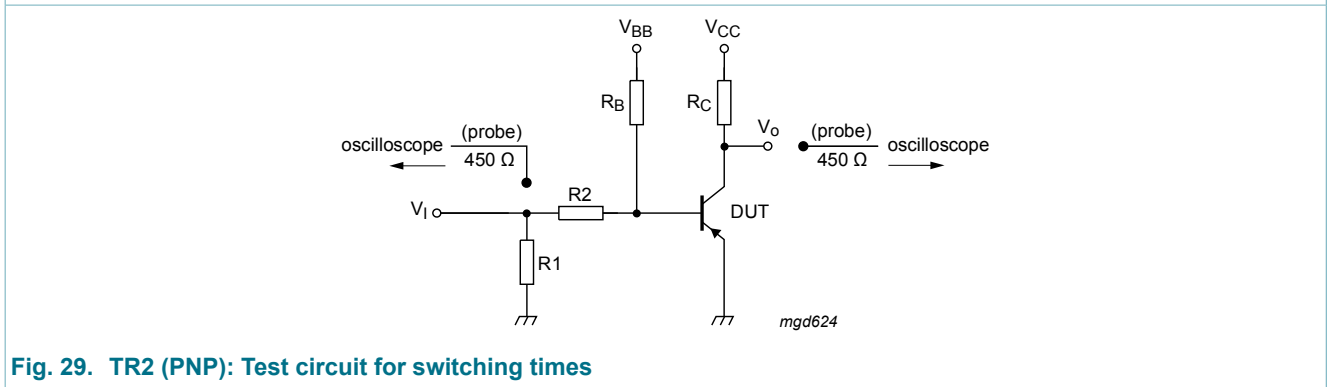


Fig. 29. TR2 (PNP): Test circuit for switching times

11.1 Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - *Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

12. Package outline

DFN2020D-6: plastic, thermally enhanced ultra thin and small outline package; no leads; 6 terminals; body 2 x 2 x 0.65 mm

SOT1118D

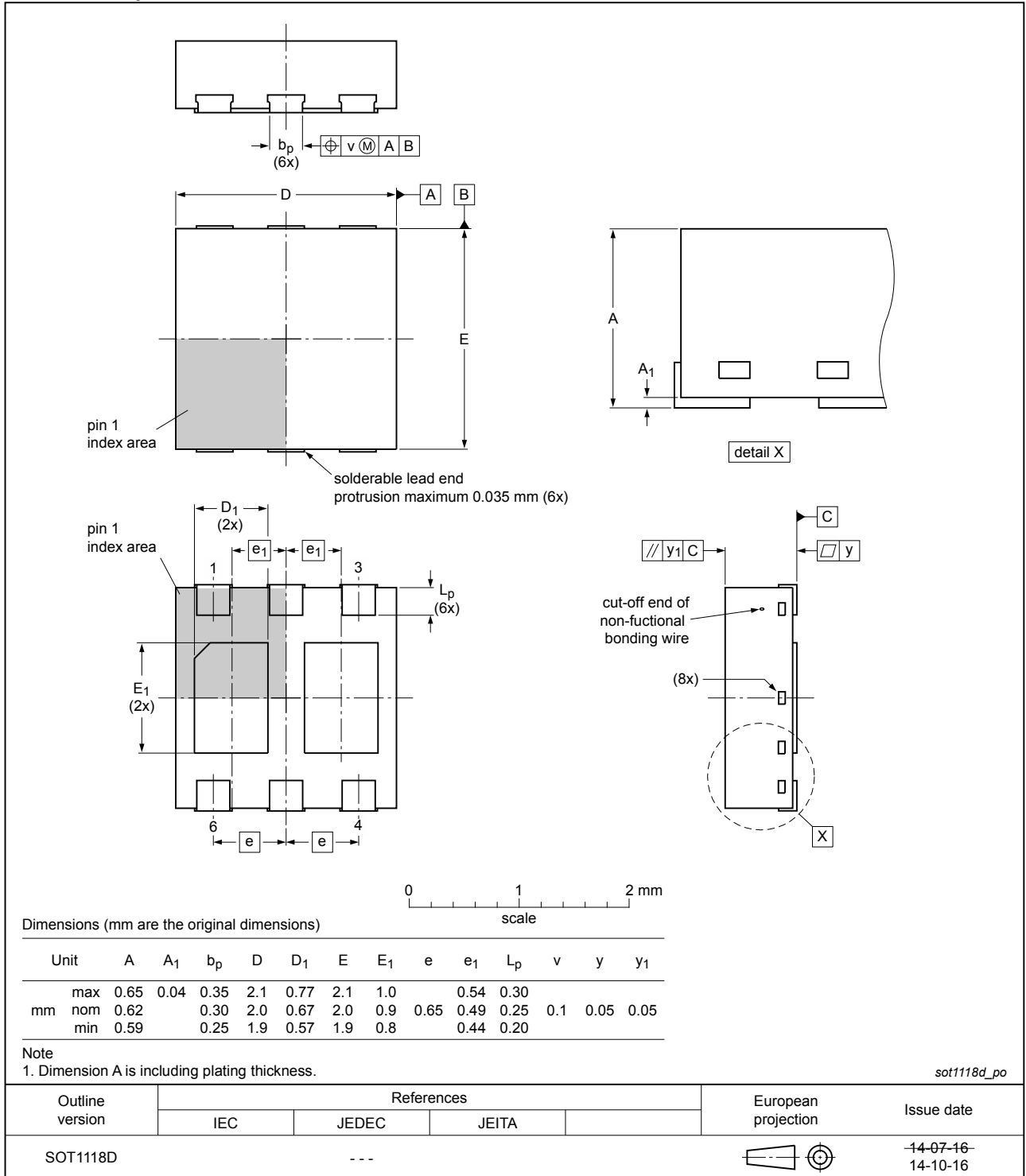


Fig. 30. Package outline DFN2020D-6 (SOT1118D)

13. Soldering

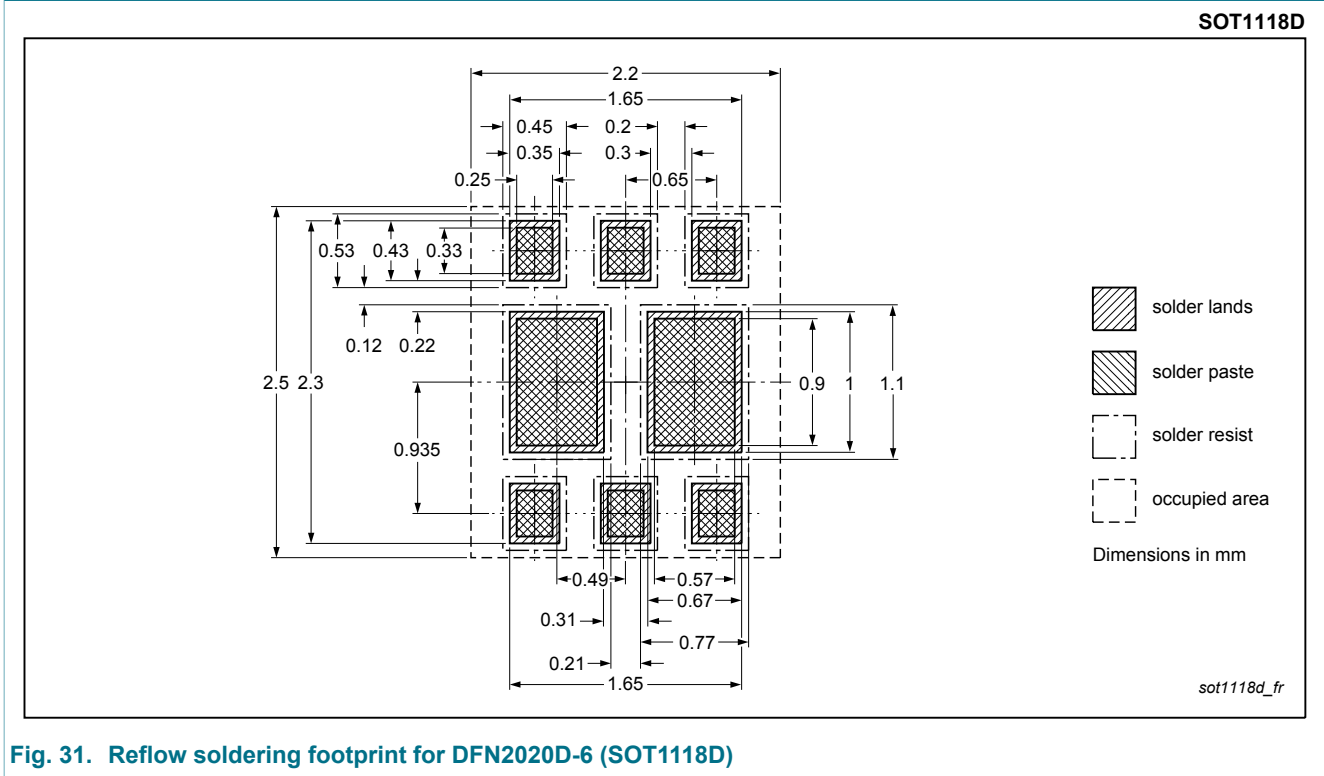


Fig. 31. Reflow soldering footprint for DFN2020D-6 (SOT1118D)

14. Revision history

Table 8. Revision history

| Data sheet ID | Release date | Data sheet status | Change notice | Supersedes |
|-------------------|--------------|--------------------|---------------|------------|
| PBSS4160PANPS v.1 | 20150211 | Product data sheet | - | - |

15. Legal information

15.1 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".
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