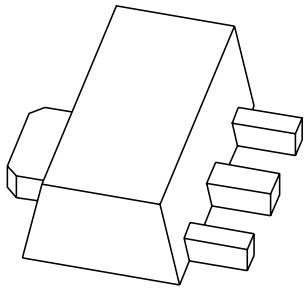


# DATA SHEET



## **PXT2907A** PNP switching transistor

Product data sheet  
Supersedes data of 2002 Mar 20

2004 Dec 09

## PNP switching transistor

## PXT2907A

## FEATURES

- High current (max. 600 mA)
- Low voltage (max. 60 V).

## APPLICATIONS

- Switching and linear amplification.

## DESCRIPTION

PNP switching transistor in a SOT89 plastic package.  
NPN complement: PXT2222A.

## MARKING

| TYPE NUMBER | MARKING CODE <sup>(1)</sup> |
|-------------|-----------------------------|
| PXT2907A    | *2F                         |

## Note

- \* = p: Made in Hong Kong.  
\* = t: Made in Malaysia.  
\* = W: Made in China.

## PINNING

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

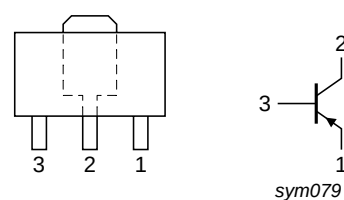


Fig.1 Simplified outline (SOT89) and symbol.

## ORDERING INFORMATION

| TYPE NUMBER | PACKAGE |                                                                                |         |
|-------------|---------|--------------------------------------------------------------------------------|---------|
|             | NAME    | DESCRIPTION                                                                    | VERSION |
| PXT2907A    | SC-62   | plastic surface mounted package; collector pad for good heat transfer; 3 leads | SOT89   |

## PNP switching transistor

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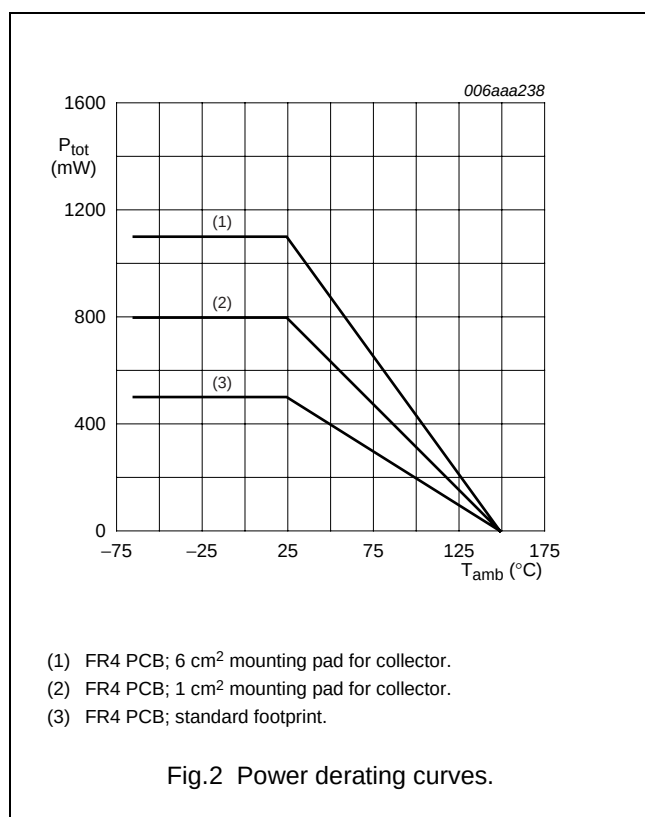
## LIMITING VALUES

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

| SYMBOL    | PARAMETER                 | CONDITIONS                                                | MIN.        | MAX.              | UNIT        |
|-----------|---------------------------|-----------------------------------------------------------|-------------|-------------------|-------------|
| $V_{CBO}$ | collector-base voltage    | open emitter                                              | —           | −60               | V           |
| $V_{CEO}$ | collector-emitter voltage | open base                                                 | —           | −60               | V           |
| $V_{EBO}$ | emitter-base voltage      | open collector                                            | —           | −5                | V           |
| $I_C$     | collector current (DC)    |                                                           | —           | −600              | mA          |
| $I_{CM}$  | peak collector current    |                                                           | —           | −800              | mA          |
| $I_{BM}$  | peak base current         |                                                           | —           | −200              | mA          |
| $P_{tot}$ | total power dissipation   | $T_{amb} \leq 25\text{ °C}$<br>note 1<br>note 2<br>note 3 | —<br>—<br>— | 0.5<br>0.8<br>1.1 | W<br>W<br>W |
| $T_{stg}$ | storage temperature       |                                                           | −65         | +150              | °C          |
| $T_j$     | junction temperature      |                                                           | —           | 150               | °C          |
| $T_{amb}$ | ambient temperature       |                                                           | −65         | +150              | °C          |

## Notes

1. Device mounted on a printed-circuit board, single-sided copper, tin-plated and standard footprint.
2. Device mounted on a printed-circuit board, single-sided copper, tin-plated and mounting pad for collector 1 cm<sup>2</sup>.
3. Device mounted on a printed-circuit board, single-sided copper, tin-plated and mounting pad for collector 6 cm<sup>2</sup>.



PNP switching transistor

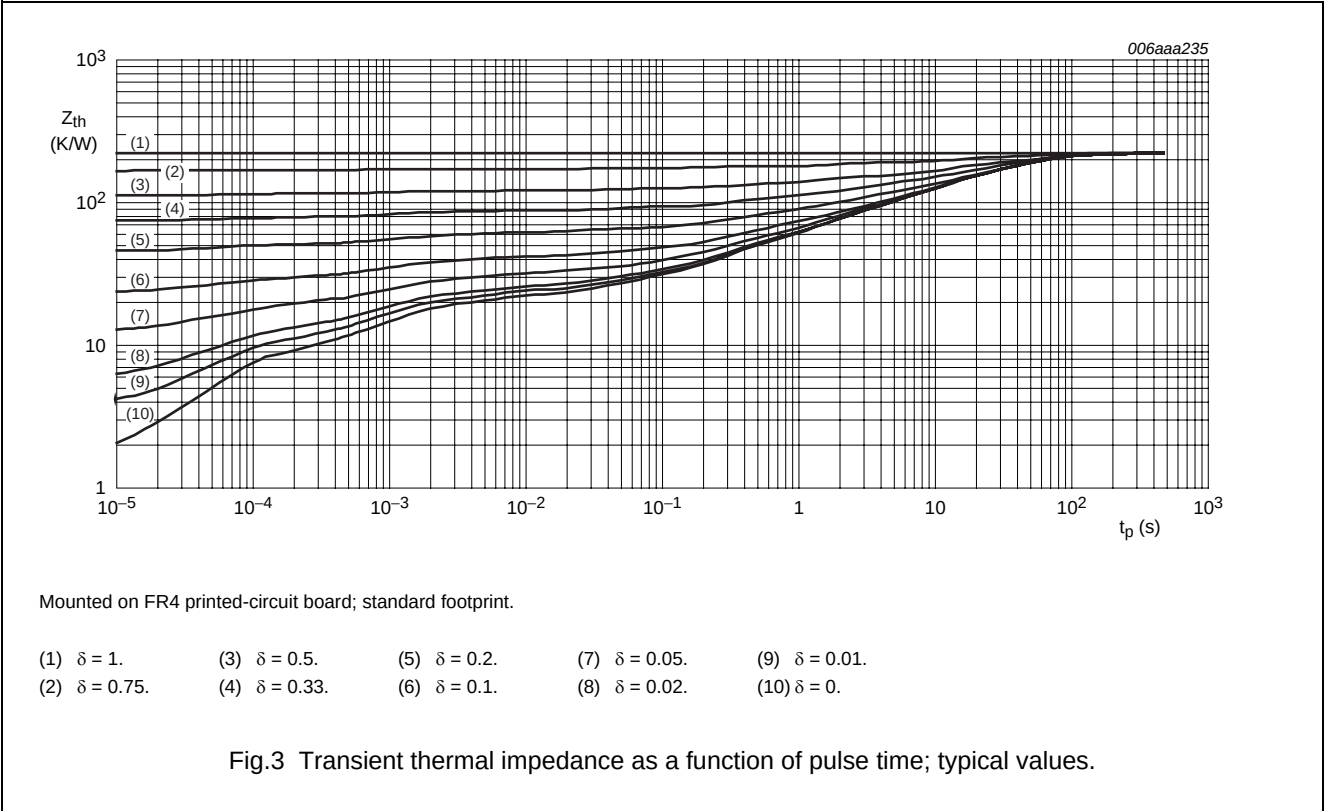
PXT2907A

THERMAL CHARACTERISTICS

| SYMBOL        | PARAMETER                                           | CONDITIONS  | VALUE | UNIT |
|---------------|-----------------------------------------------------|-------------|-------|------|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient         | in free air |       |      |
|               |                                                     | note 1      | 250   | K/W  |
|               |                                                     | note 2      | 156   | K/W  |
|               |                                                     | note 3      | 113   | K/W  |
| $R_{th(j-s)}$ | thermal resistance from junction to soldering point |             | 30    | K/W  |

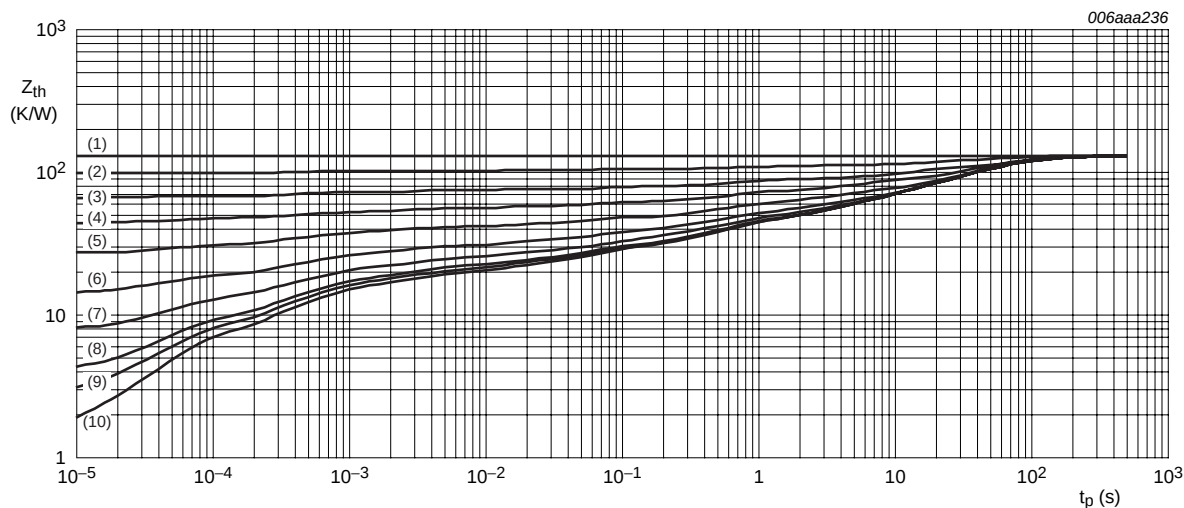
Notes

1. Device mounted on a printed-circuit board, single-sided copper, tin-plated and standard footprint.
2. Device mounted on a printed-circuit board, single-sided copper, tin-plated and mounting pad for collector 1 cm<sup>2</sup>.
3. Device mounted on a printed-circuit board, single-sided copper, tin-plated and mounting pad for collector 6 cm<sup>2</sup>.



## PNP switching transistor

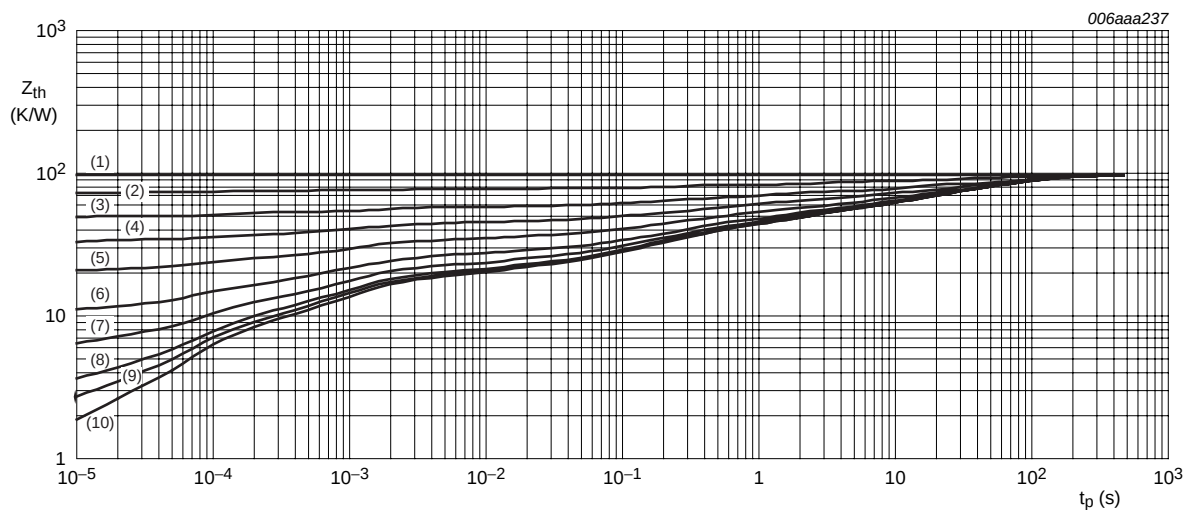
PXT2907A



Mounted on FR4 printed-circuit board; mounting pad for collector 1 cm<sup>2</sup>.

- |                      |                      |                     |                      |                      |
|----------------------|----------------------|---------------------|----------------------|----------------------|
| (1) $\delta = 1.$    | (3) $\delta = 0.5.$  | (5) $\delta = 0.2.$ | (7) $\delta = 0.05.$ | (9) $\delta = 0.01.$ |
| (2) $\delta = 0.75.$ | (4) $\delta = 0.33.$ | (6) $\delta = 0.1.$ | (8) $\delta = 0.02.$ | (10) $\delta = 0.$   |

Fig.4 Transient thermal impedance as a function of pulse time; typical values.



Mounted on FR4 printed-circuit board; mounting pad for collector 6 cm<sup>2</sup>.

- |                      |                      |                     |                      |                      |
|----------------------|----------------------|---------------------|----------------------|----------------------|
| (1) $\delta = 1.$    | (3) $\delta = 0.5.$  | (5) $\delta = 0.2.$ | (7) $\delta = 0.05.$ | (9) $\delta = 0.01.$ |
| (2) $\delta = 0.75.$ | (4) $\delta = 0.33.$ | (6) $\delta = 0.1.$ | (8) $\delta = 0.02.$ | (10) $\delta = 0.$   |

Fig.5 Transient thermal impedance as a function of pulse time; typical values.

## PNP switching transistor

## PXT2907A

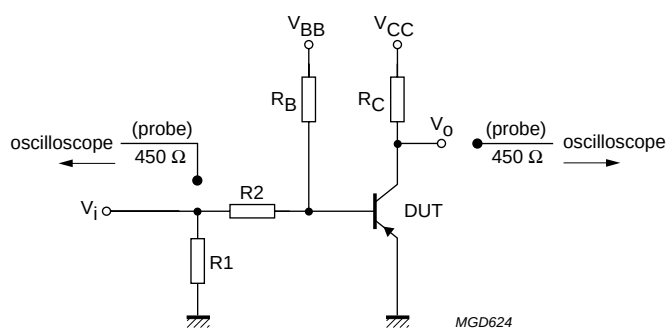
## CHARACTERISTICS

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

| SYMBOL                                                           | PARAMETER                            | CONDITIONS                                                                                              | MIN. | MAX. | UNIT          |
|------------------------------------------------------------------|--------------------------------------|---------------------------------------------------------------------------------------------------------|------|------|---------------|
| $I_{\text{CBO}}$                                                 | collector-base cut-off current       | $I_{\text{E}} = 0\text{ A}; V_{\text{CB}} = -50\text{ V}$                                               | –    | –10  | nA            |
|                                                                  |                                      | $I_{\text{E}} = 0\text{ A}; V_{\text{CB}} = -50\text{ V}; T_{\text{amb}} = 125\text{ }^{\circ}\text{C}$ | –    | –10  | $\mu\text{A}$ |
| $I_{\text{EBO}}$                                                 | emitter-base cut-off current         | $I_{\text{C}} = 0\text{ A}; V_{\text{EB}} = -5\text{ V}$                                                | –    | –50  | nA            |
| $h_{\text{FE}}$                                                  | DC current gain                      | $I_{\text{C}} = -0.1\text{ mA}; V_{\text{CE}} = -1\text{ V}$                                            | 75   | –    |               |
|                                                                  |                                      | $I_{\text{C}} = -1\text{ mA}; V_{\text{CE}} = -1\text{ V}$                                              | 100  | –    |               |
|                                                                  |                                      | $I_{\text{C}} = -10\text{ mA}; V_{\text{CE}} = -1\text{ V}$                                             | 100  | –    |               |
|                                                                  |                                      | $I_{\text{C}} = -150\text{ mA}; V_{\text{CE}} = -2\text{ V}$                                            | 100  | 300  |               |
|                                                                  |                                      | $I_{\text{C}} = -500\text{ mA}; V_{\text{CE}} = -10\text{ V}$                                           | 50   | –    |               |
| $V_{\text{CEsat}}$                                               | collector-emitter saturation voltage | $I_{\text{C}} = -150\text{ mA}; I_{\text{B}} = -15\text{ mA}$                                           | –    | –400 | mV            |
|                                                                  |                                      | $I_{\text{C}} = -500\text{ mA}; I_{\text{B}} = -50\text{ mA}$                                           | –    | –1.6 | V             |
| $V_{\text{BEsat}}$                                               | base-emitter saturation voltage      | $I_{\text{C}} = -150\text{ mA}; I_{\text{B}} = -15\text{ mA}$                                           | –    | –1.3 | V             |
|                                                                  |                                      | $I_{\text{C}} = -500\text{ mA}; I_{\text{B}} = -50\text{ mA}$                                           | –    | –2.6 | V             |
| $C_{\text{c}}$                                                   | collector capacitance                | $I_{\text{E}} = i_{\text{e}} = 0\text{ A}; V_{\text{CB}} = -10\text{ V}; f = 1\text{ MHz}$              | –    | 8    | pF            |
| $C_{\text{e}}$                                                   | emitter capacitance                  | $I_{\text{C}} = i_{\text{c}} = 0\text{ A}; V_{\text{EB}} = -500\text{ mV}; f = 1\text{ MHz}$            | –    | 35   | pF            |
| $f_{\text{T}}$                                                   | transition frequency                 | $I_{\text{C}} = -20\text{ mA}; V_{\text{CE}} = -10\text{ V}; f = 100\text{ MHz}$                        | 200  | –    | MHz           |
| <b>Switching times (between 10% and 90% levels); (see Fig.6)</b> |                                      |                                                                                                         |      |      |               |
| $t_{\text{on}}$                                                  | turn-on time                         | $I_{\text{Con}} = -150\text{ mA}; I_{\text{Bon}} = -15\text{ mA}; I_{\text{Boff}} = 15\text{ mA}$       | –    | 40   | ns            |
| $t_{\text{d}}$                                                   | delay time                           |                                                                                                         | –    | 12   | ns            |
| $t_{\text{r}}$                                                   | rise time                            |                                                                                                         | –    | 30   | ns            |
| $t_{\text{off}}$                                                 | turn-off time                        |                                                                                                         | –    | 365  | ns            |
| $t_{\text{s}}$                                                   | storage time                         |                                                                                                         | –    | 300  | ns            |
| $t_{\text{f}}$                                                   | fall time                            |                                                                                                         | –    | 65   | ns            |

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$V_i = -9.5 \text{ V}$ ;  $T = 500 \text{ } \mu\text{s}$ ;  $t_p = 10 \text{ } \mu\text{s}$ ;  $t_r = t_f \leq 3 \text{ ns}$ .  
 $R_1 = 68 \text{ } \Omega$ ;  $R_2 = 325 \text{ } \Omega$ ;  $R_B = 325 \text{ } \Omega$ ;  $R_C = 160 \text{ } \Omega$ .  
 $V_{BB} = 3.5 \text{ V}$ ;  $V_{CC} = -29.5 \text{ V}$ .  
 Oscilloscope input impedance  $Z_i = 50 \text{ } \Omega$ .

Fig.6 Test circuit for switching times.

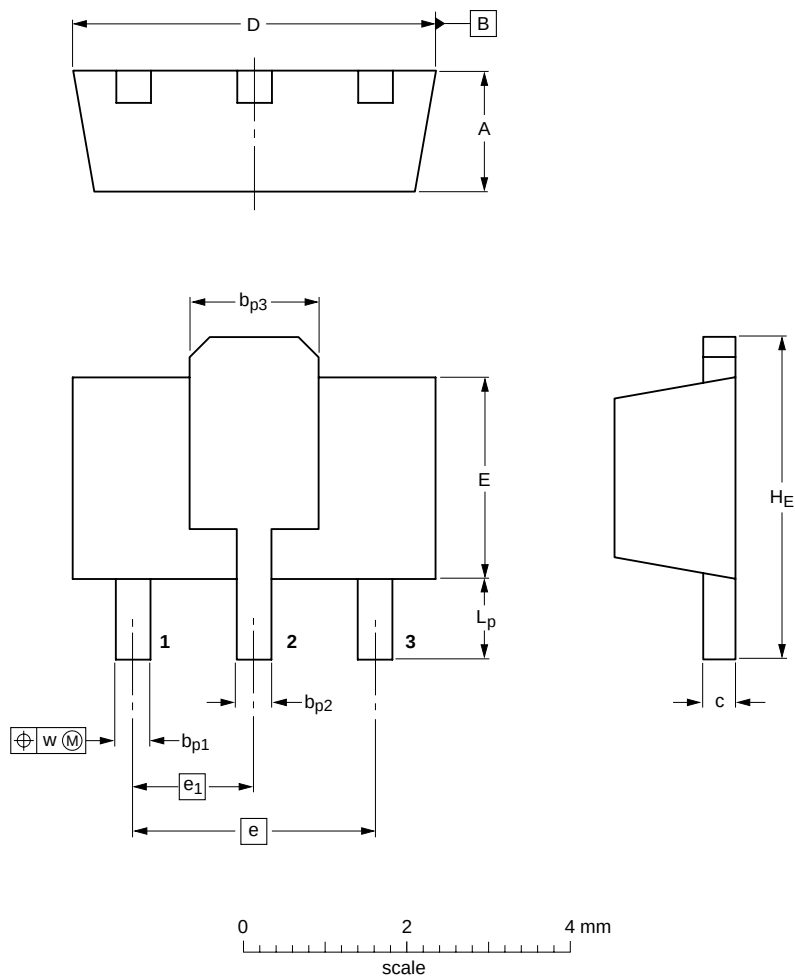
PNP switching transistor

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PACKAGE OUTLINE

Plastic surface-mounted package; collector pad for good heat transfer; 3 leads

SOT89



DIMENSIONS (mm are the original dimensions)

| UNIT | A          | bp1          | bp2          | bp3        | c            | D          | E          | e   | e1  | HE           | Lp         | w    |
|------|------------|--------------|--------------|------------|--------------|------------|------------|-----|-----|--------------|------------|------|
| mm   | 1.6<br>1.4 | 0.48<br>0.35 | 0.53<br>0.40 | 1.8<br>1.4 | 0.44<br>0.23 | 4.6<br>4.4 | 2.6<br>2.4 | 3.0 | 1.5 | 4.25<br>3.75 | 1.2<br>0.8 | 0.13 |

| OUTLINE<br>VERSION | REFERENCES |        |       |  | EUROPEAN<br>PROJECTION                                                                | ISSUE DATE           |
|--------------------|------------|--------|-------|--|---------------------------------------------------------------------------------------|----------------------|
|                    | IEC        | JEDEC  | JEITA |  |                                                                                       |                      |
| SOT89              |            | TO-243 | SC-62 |  |  | 04-08-03<br>06-03-16 |



## PNP switching transistor

PXT2907A

## DATA SHEET STATUS

| DOCUMENT STATUS <sup>(1)</sup> | PRODUCT STATUS <sup>(2)</sup> | DEFINITION                                                                            |
|--------------------------------|-------------------------------|---------------------------------------------------------------------------------------|
| Objective data sheet           | Development                   | This document contains data from the objective specification for product development. |
| Preliminary data sheet         | Qualification                 | This document contains data from the preliminary specification.                       |
| Product data sheet             | Production                    | This document contains the product specification.                                     |

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