



PMBFJ108; PMBFJ109; PMBFJ110

N-channel junction FETs

Rev. 03 — 4 August 2004

Product data sheet

1. Product profile

1.1 General description

Symmetrical N-channel junction FETs in a SOT23 package.

1.2 Features

- High-speed switching
- Interchangeability of drain and source connections
- Low R_{Dson} at zero gate voltage ($< 8 \Omega$ for PMBFJ108).

1.3 Applications

- Analog switches
- Choppers and commutators
- Audio amplifiers.

2. Pinning information

Table 1: Pinning

| Pin | Description [1] | Simplified outline | Symbol |
|-----|-----------------|--------------------|------------|
| 1 | drain | SOT23 | sym053 |
| 2 | source | | |
| 3 | gate | | |

[1] Drain and source are interchangeable.

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3. Ordering information

Table 2: Ordering information

| Type number | Package | | Version |
|-------------|---------|--|---------|
| | Name | Description | |
| PMBFJ108 | - | plastic surface mounted package; 3 leads | SOT23 |
| PMBFJ109 | | | |
| PMBFJ110 | | | |

4. Marking

Table 3: Marking

| Type number | Marking code [1] |
|-------------|------------------|
| PMBFJ108 | 38* |
| PMBFJ109 | 39* |
| PMBFJ110 | 40* |

[1] * = p: Made in Hong Kong

* = t: Made in Malaysia

* = W: Made in China

5. Limiting values

Table 4: Limiting values

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

| Symbol | Parameter | Conditions | Min | Max | Unit |
|-----------|---------------------------|--------------------------|-----|------|------|
| V_{DS} | drain-source voltage (DC) | | - | ±25 | V |
| V_{GSO} | gate-source voltage | | - | -25 | V |
| V_{GDO} | gate-drain voltage | | - | -25 | V |
| I_G | forward gate current (DC) | | - | 50 | mA |
| P_{tot} | total power dissipation | $T_{amb} = 25\text{ °C}$ | [1] | 250 | mW |
| T_{stg} | storage temperature | | -65 | +150 | °C |
| T_j | junction temperature | | - | 150 | °C |

[1] Mounted on an FR4 printed-circuit board.

6. Thermal characteristics

Table 5: Thermal characteristics

| Symbol | Parameter | Conditions | Typ | Unit |
|---------------|---|------------|---------|------|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | | [1] 500 | K/W |

[1] Mounted on an FR4 printed-circuit board.

7. Static characteristics

Table 6: Static characteristics

$T_j = 25\text{ }^\circ\text{C}$.

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---------------|----------------------------------|--|-----|-----|------|----------|
| I_{GSS} | gate-source leakage current | $V_{GS} = -15\text{ V}; V_{DS} = 0\text{ V}$ | - | - | -3 | nA |
| I_{DSX} | drain-source cut-off current | $V_{GS} = -10\text{ V}; V_{DS} = 5\text{ V}$ | - | - | 3 | nA |
| I_{DSS} | drain-source leakage current | | | | | |
| | PMBFJ108 | $V_{GS} = 0\text{ V}; V_{DS} = 15\text{ V}$ | 80 | - | - | mA |
| | PMBFJ109 | $V_{GS} = 0\text{ V}; V_{DS} = 15\text{ V}$ | 40 | - | - | mA |
| | PMBFJ110 | $V_{GS} = 0\text{ V}; V_{DS} = 15\text{ V}$ | 10 | - | - | mA |
| $V_{(BR)GSS}$ | gate-source breakdown voltage | $I_G = -1\text{ }\mu\text{A}; V_{DS} = 0\text{ V}$ | - | - | -25 | V |
| V_{GSoff} | gate-source cut-off voltage | | | | | |
| | PMBFJ108 | $I_D = 1\text{ }\mu\text{A}; V_{DS} = 5\text{ V}$ | -10 | - | -3 | V |
| | PMBFJ109 | $I_D = 1\text{ }\mu\text{A}; V_{DS} = 5\text{ V}$ | -6 | - | -2 | V |
| | PMBFJ110 | $I_D = 1\text{ }\mu\text{A}; V_{DS} = 5\text{ V}$ | -4 | - | -0.5 | V |
| R_{DSon} | drain-source on-state resistance | | | | | |
| | PMBFJ108 | $V_{GS} = 0\text{ V}; V_{DS} = 0.1\text{ V}$ | - | - | 8 | Ω |
| | PMBFJ109 | $V_{GS} = 0\text{ V}; V_{DS} = 0.1\text{ V}$ | - | - | 12 | Ω |
| | PMBFJ110 | $V_{GS} = 0\text{ V}; V_{DS} = 0.1\text{ V}$ | - | - | 18 | Ω |

8. Dynamic characteristics

Table 7: Dynamic characteristics

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

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|-----------|----------------------|--|-----|-----|-----|------|
| C_{iss} | input capacitance | $V_{DS} = 0\text{ V}; V_{GS} = -10\text{ V}; f = 1\text{ MHz}$ | - | 15 | 30 | pF |
| | | $V_{DS} = 0\text{ V}; V_{GS} = 0\text{ V}; f = 1\text{ MHz}; T_{amb} = 25\text{ }^\circ\text{C}$ | - | 50 | 85 | pF |
| C_{rss} | feedback capacitance | $V_{DS} = 0\text{ V}; V_{GS} = -10\text{ V}; f = 1\text{ MHz}$ | - | 8 | 15 | pF |

Switching times (see [Figure 2](#))

| | | | | | | |
|-----------|---------------|-----|---|---|---|----|
| t_d | delay time | [1] | - | 2 | - | ns |
| t_{on} | turn-on time | [1] | - | 4 | - | ns |
| t_s | storage time | [1] | - | 4 | - | ns |
| t_{off} | turn-off time | [1] | - | 6 | - | ns |

[1] Test conditions for switching times are as follows:

$V_{DD} = 1.5\text{ V}, V_{GS} = 0\text{ V}$ to V_{GSoff} (all types);

$V_{GSoff} = -12\text{ V}, R_L = 100\text{ }\Omega$ (PMBFJ108);

$V_{GSoff} = -7\text{ V}, R_L = 100\text{ }\Omega$ (PMBFJ109);

$V_{GSoff} = -5\text{ V}, R_L = 100\text{ }\Omega$ (PMBFJ110).

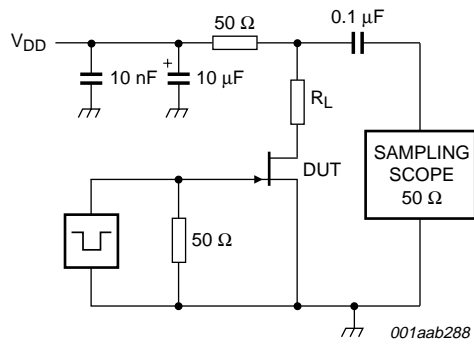


Fig 1. Switching circuit.

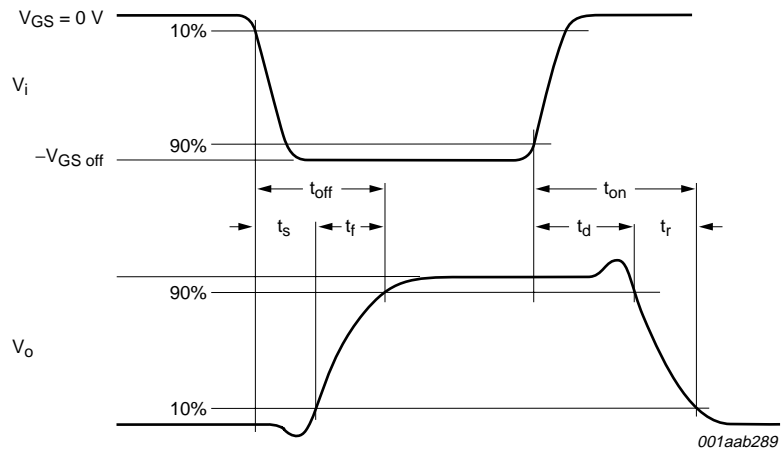


Fig 2. Input and output waveforms.

9. Package outline

Plastic surface mounted package; 3 leads

SOT23

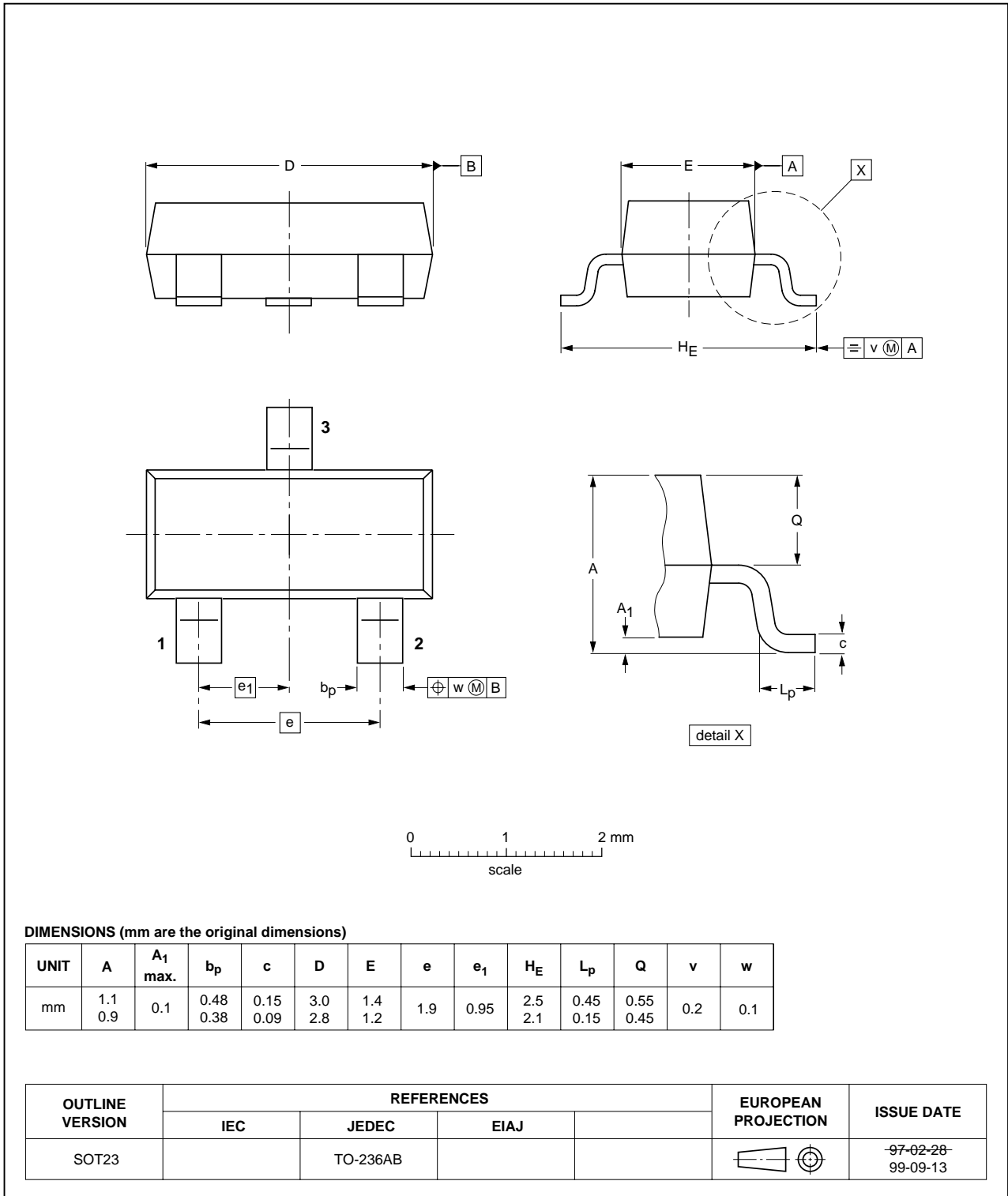


Fig 3. Package outline.

10. Revision history

Table 8: Revision history

| Document ID | Release date | Data sheet status | Change notice | Order number | Supersedes |
|------------------------|--------------|-----------------------|---------------|----------------|--|
| PMBFJ108_109_110_3 | 20040804 | Product data sheet | - | 9397 750 13401 | PMBFJ108_109_110_CNV_2 |
| Modifications: | | | | | |
| | | | | | <ul style="list-style-type: none">The format of this data sheet has been redesigned to comply with the new presentation and information standard of Philips Semiconductors.Table 3 "Marking": Added new marking code. |
| PMBFJ108_109_110_CNV_2 | 19971201 | Product specification | - | not applicable | - |

11. Data sheet status

| Level | Data sheet status ^[1] | Product status ^[2] ^[3] | Definition |
|-------|----------------------------------|--|--|
| I | Objective data | Development | This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice. |
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[3] For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

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Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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