

## 1. Product profile

### 1.1 General description

N-channel enhancement mode Field-Effect Transistor (FET) in a small SOT23 (TO-236AB) Surface-Mounted Device (SMD) plastic package using Trench MOSFET technology.

### 1.2 Features and benefits

- Logic-level compatible
- Very fast switching
- Trench MOSFET technology

### 1.3 Applications

- Relay driver
- High-speed line driver
- Low-side load switch
- Switching circuits

### 1.4 Quick reference data

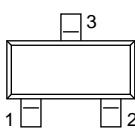
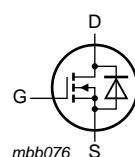
**Table 1. Quick reference data**

| Symbol                        | Parameter                        | Conditions   | Min | Typ | Max | Unit             |
|-------------------------------|----------------------------------|--|-----|-----|-----|------------------|
| $V_{DS}$                      | drain-source voltage             | $T_j = 25^\circ\text{C}$   | -   | -   | 30  | V                |
| $V_{GS}$                      | gate-source voltage              |  | -20 | -   | 20  | V                |
| $I_D$                         | drain current                    | $V_{GS} = 10 \text{ V}; T_{amb} = 25^\circ\text{C}$                  | [1] | -   | -   | 3.1 A            |
| <b>Static characteristics</b> |                                  |  |     |     |     |                  |
| $R_{DSon}$                    | drain-source on-state resistance | $V_{GS} = 10 \text{ V}; I_D = 3.1 \text{ A}; T_j = 25^\circ\text{C}$ | -   | 28  | 36  | $\text{m}\Omega$ |

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated, mounting pad for drain 6 cm<sup>2</sup>.

## 2. Pinning information

**Table 2. Pinning information**

| Pin | Symbol | Description | Simplified outline   | Graphic symbol  |
|-----|--------|-------------|--|---|
| 1   | G      | gate        |  |   |
| 2   | S      | source      |  |   |
| 3   | D      | drain       | <br><b>SOT23 (TO-236AB)</b> | <br>mbb076 |

### 3. Ordering information

**Table 3.** Ordering information

| Type number | Package  |  |         |
|-------------|----------|--|---------|
|             | Name     | Description                              | Version |
| PMV37EN     | TO-236AB | plastic surface-mounted package; 3 leads | SOT23   |

### 4. Marking

**Table 4.** Marking codes

| Type number | Marking code <sup>[1]</sup> |
|-------------|-----------------------------|
| PMV37EN     | KX%                         |

[1] % = placeholder for manufacturing site code

### 5. Limiting values

**Table 5.** Limiting values

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

| Symbol                    | Parameter               | Conditions  | Min            | Max  | Unit             |
|---------------------------|-------------------------|---|----------------|------|------------------|
| $V_{DS}$                  | drain-source voltage    | $T_j = 25 \text{ }^\circ\text{C}$   | -              | 30   | V                |
| $V_{GS}$                  | gate-source voltage     |   | -20            | 20   | V                |
| $I_D$                     | drain current           | $V_{GS} = 10 \text{ V}; T_{amb} = 25 \text{ }^\circ\text{C}$                    | <sup>[1]</sup> | -    | 3.1 A            |
|                           |                         | $V_{GS} = 10 \text{ V}; T_{amb} = 100 \text{ }^\circ\text{C}$                   | <sup>[1]</sup> | -    | 1.9 A            |
| $I_{DM}$                  | peak drain current      | $T_{amb} = 25 \text{ }^\circ\text{C}$ ; single pulse; $t_p \leq 10 \mu\text{s}$ | -              | 12.4 | A                |
| $P_{tot}$                 | total power dissipation | $T_{amb} = 25 \text{ }^\circ\text{C}$   | <sup>[2]</sup> | -    | mW               |
|                           |                         | $T_{sp} = 25 \text{ }^\circ\text{C}$  | <sup>[1]</sup> | -    | 520 mW           |
|                           |                         |   | -              | 1800 | mW               |
| $T_j$                     | junction temperature    |   | -55            | 150  | $^\circ\text{C}$ |
| $T_{amb}$                 | ambient temperature     |   | -55            | 150  | $^\circ\text{C}$ |
| $T_{stg}$                 | storage temperature     |   | -65            | 150  | $^\circ\text{C}$ |
| <b>Source-drain diode</b> |                         |   |                |      |                  |
| $I_S$                     | source current          | $T_{amb} = 25 \text{ }^\circ\text{C}$   | <sup>[1]</sup> | -    | 0.6 A            |

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated, mounting pad for drain 6 cm<sup>2</sup>.

[2] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

## 6. Characteristics

Table 6. Characteristics

| Symbol                         | Parameter                        | Conditions   | Min | Typ  | Max | Unit      |
|--------------------------------|----------------------------------|--|-----|------|-----|-----------|
| <b>Static characteristics</b>  |                                  |  |     |      |     |           |
| $V_{(BR)DSS}$                  | drain-source breakdown voltage   | $I_D = 250 \mu A; V_{GS} = 0 V; T_j = 25^\circ C$                                  | 30  | -    | -   | V         |
| $V_{GSth}$                     | gate-source threshold voltage    | $I_D = 250 \mu A; V_{DS} = V_{GS}; T_j = 25^\circ C$                               | 1   | 1.5  | 2.5 | V         |
| $I_{DSS}$                      | drain leakage current            | $V_{DS} = 30 V; V_{GS} = 0 V; T_j = 25^\circ C$                                    | -   | -    | 1   | $\mu A$   |
|                                |                                  | $V_{DS} = 30 V; V_{GS} = 0 V; T_j = 150^\circ C$                                   | -   | -    | 10  | $\mu A$   |
| $I_{GSS}$                      | gate leakage current             | $V_{GS} = 20 V; V_{DS} = 0 V; T_j = 25^\circ C$                                    | -   | -    | 100 | nA        |
|                                |                                  | $V_{GS} = -20 V; V_{DS} = 0 V; T_j = 25^\circ C$                                   | -   | -    | 100 | nA        |
| $R_{DSon}$                     | drain-source on-state resistance | $V_{GS} = 10 V; I_D = 3.1 A; T_j = 25^\circ C$                                     | -   | 28   | 36  | $m\Omega$ |
|                                |                                  | $V_{GS} = 10 V; I_D = 3.1 A; T_j = 150^\circ C$                                    | -   | 45   | 55  | $m\Omega$ |
|                                |                                  | $V_{GS} = 4.5 V; I_D = 2.7 A; T_j = 25^\circ C$                                    | -   | 37   | 47  | $m\Omega$ |
| $g_{fs}$                       | forward transconductance         | $V_{DS} = 5 V; I_D = 3 A; T_j = 25^\circ C$  | -   | 10   | -   | S         |
| <b>Dynamic characteristics</b> |                                  |  |     |      |     |           |
| $Q_{G(tot)}$                   | total gate charge                | $V_{DS} = 15 V; I_D = 3 A; V_{GS} = 10 V; T_j = 25^\circ C$                        | -   | 6.5  | 10  | nC        |
| $Q_{GS}$                       | gate-source charge               |  | -   | 1    | -   | nC        |
| $Q_{GD}$                       | gate-drain charge                |  | -   | 1    | -   | nC        |
| $C_{iss}$                      | input capacitance                | $V_{DS} = 15 V; f = 1 MHz; V_{GS} = 0 V; T_j = 25^\circ C$                         | -   | 330  | -   | pF        |
| $C_{oss}$                      | output capacitance               |  | -   | 76   | -   | pF        |
| $C_{rss}$                      | reverse transfer capacitance     |  | -   | 36   | -   | pF        |
| $t_{d(on)}$                    | turn-on delay time               | $V_{DS} = 15 V; V_{GS} = 10 V; R_{G(ext)} = 6 \Omega; T_j = 25^\circ C; I_D = 3 A$ | -   | 4    | -   | ns        |
| $t_r$                          | rise time                        |  | -   | 14   | -   | ns        |
| $t_{d(off)}$                   | turn-off delay time              |  | -   | 55   | -   | ns        |
| $t_f$                          | fall time                        |  | -   | 23   | -   | ns        |
| <b>Source-drain diode</b>      |                                  |  |     |      |     |           |
| $V_{SD}$                       | source-drain voltage             | $I_S = 0.6 A; V_{GS} = 0 V; T_j = 25^\circ C$                                      | -   | 0.75 | 1.2 | V         |