

MTM86727

Silicon N-channel MOS FET (FET)
Silicon epitaxial planar type (SBD)

For DC-DC converter circuits

For switching circuits

■ Overview

MTM86727 is the composite MOS FET (N-channel MOS FET and schottky barrier diode) that is highly suitable for DC-DC converter and other switching circuits.

■ Features

- Built-in schottky barrier diode: $V_R = 20\text{ V}$, $I_F = 800\text{ mA}$
- Low ON resistance: $R_{on} = 80\text{ m}\Omega$ ($V_{GS} = 4.0\text{ V}$)
- Low short-circuit input capacitance (common source): $C_{iss} = 280\text{ pF}$
- Small package: WSSMini6-F1 (1.6 mm × 1.6 mm × 0.5 mm)
- Low drive voltage: 2.5 V drive

■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

| | Parameter | Symbol | Rating | Unit |
|---------|--|-------------|-------------|------|
| FET | Drain-source surrender voltage | V_{DSS} | 20 | V |
| | Gate-source surrender voltage | V_{GSS} | ±10 | V |
| | Drain current | I_D | 2.2 | A |
| | Peak drain current | I_{DP} | 8.0 | A |
| | Channel temperature | T_{ch} | 150 | °C |
| | Storage temperature | T_{stg} | -55 to +150 | °C |
| SBD | Reverse voltage | V_R | 20 | V |
| | Forward current (Average) | $I_{F(AV)}$ | 800 | mA |
| | Non-repetitive peak reverse surge voltage *1 | I_{FSM} | 3 | A |
| | Junction temperature | T_j | 125 | °C |
| | Storage temperature | T_{stg} | -55 to +125 | °C |
| Overall | Total power dissipation *2 | P_D | 540 | mW |

Note) *1: 50 Hz sine wave 1 cycle (Non-repetitive peak current)

*2: Measuring on ceramic substrate at 40 mm × 38 mm × 0.2 mm

P_D absolute maximum rating without a heat sink: 150 mW

■ Package

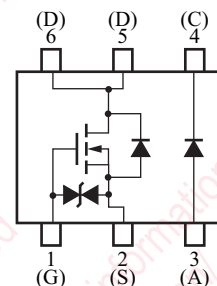
- Code
WSSMini6-F1

• Pin Name

- | | |
|-----------|------------|
| 1. Gate | 4. Cathode |
| 2. Source | 5. Drain |
| 3. Anode | 6. Drain |

■ Marking Symbol: JE

■ Internal Connection



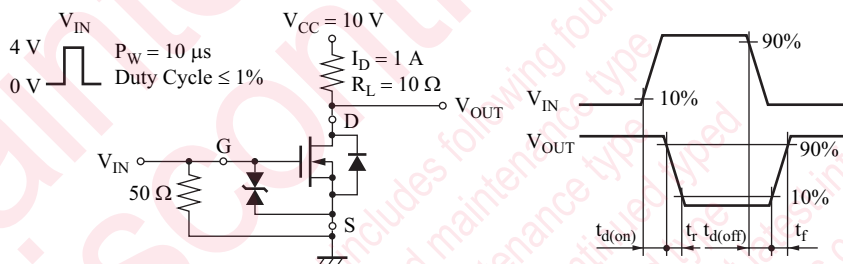
■ Electrical Characteristics $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

• FET

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|--|---------------|--|-----|------|----------|------------------|
| Drain-source surrender voltage | V_{DSS} | $I_D = 1 \text{ mA}, V_{GS} = 0$ | 20 | | | V |
| Drain-source cutoff current | I_{DSS} | $V_{DS} = 20 \text{ V}, V_{GS} = 0$ | | | 1.0 | μA |
| Gate-source cutoff current | I_{GSS} | $V_{GS} = \pm 8 \text{ V}, V_{DS} = 0$ | | | ± 10 | μA |
| Gate threshold voltage | V_{TH} | $I_D = 1.0 \text{ mA}, V_{DS} = 10 \text{ V}$ | 0.4 | 0.85 | 1.3 | V |
| Drain-source ON resistance 1 | $R_{DS(on)1}$ | $I_D = 1 \text{ A}, V_{GS} = 4.0 \text{ V}$ | | 80 | 105 | $\text{m}\Omega$ |
| Drain-source ON resistance 2 | $R_{DS(on)2}$ | $I_D = 0.5 \text{ A}, V_{GS} = 2.5 \text{ V}$ | | 100 | 150 | $\text{m}\Omega$ |
| Forward transfer admittance | $ Y_{fs} $ | $I_D = 1.0 \text{ A}, V_{DS} = 10 \text{ V}$ | 3.0 | | | S |
| Short-circuit input capacitance (Common source) | C_{iss} | $V_{DS} = 10 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$ | | 280 | | pF |
| Short-circuit output capacitance (Common source) | C_{oss} | | | 18 | | pF |
| Reverse transfer capacitance (Common source) | C_{rss} | | | 17 | | pF |
| Turn-on delay time * | $t_{d(on)}$ | $V_{DD} = 10 \text{ V}, V_{GS} = 0 \text{ V to } 4 \text{ V}, I_D = 1 \text{ A}$ | | 5 | | ns |
| Rise time * | t_r | | | 8 | | ns |
| Turn-off delay time * | $t_{d(off)}$ | $V_{DD} = 6 \text{ V}, V_{GS} = 4 \text{ V to } 0 \text{ V}, I_D = 1 \text{ A}$ | | 20 | | ns |
| Fall time * | t_f | | | 18 | | ns |

Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

2. *: Test circuit



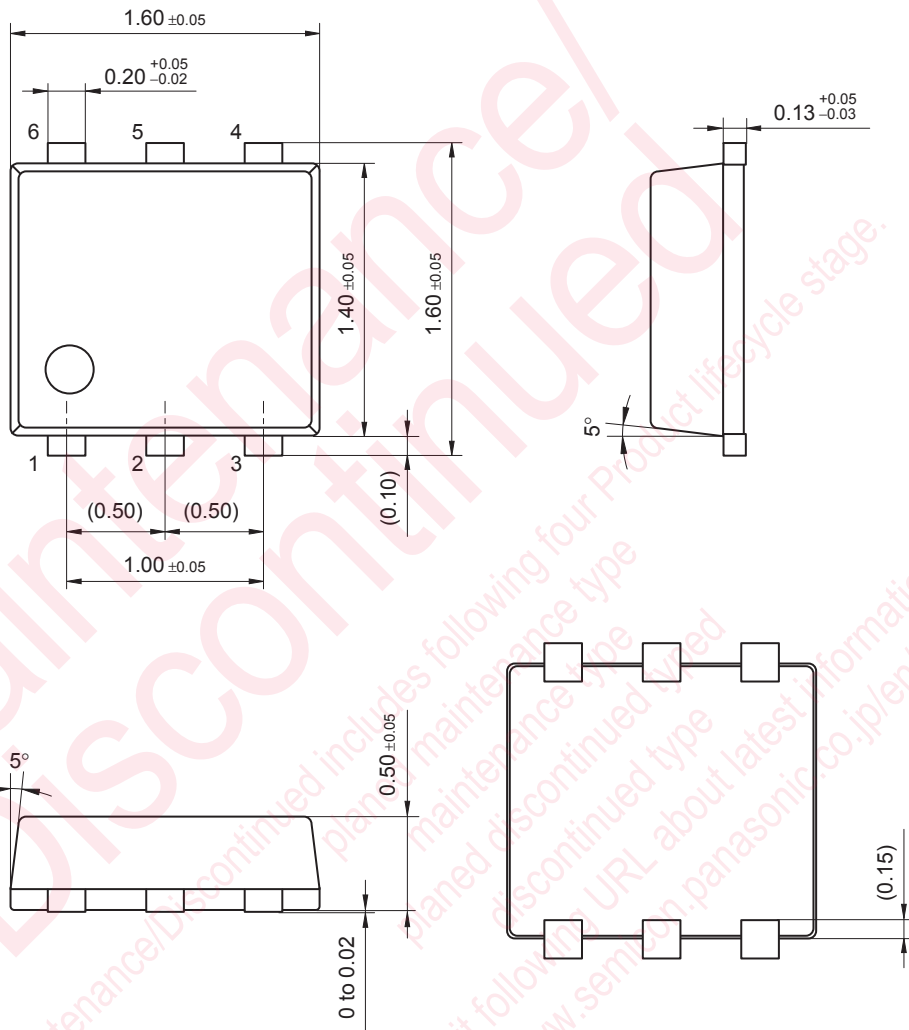
• SBD

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|-----------------|--------|------------------------|-----|-----|------|---------------|
| Forward voltage | V_F | $I_F = 800 \text{ mA}$ | | | 0.47 | V |
| Reverse current | I_R | $V_R = 20 \text{ V}$ | | | 80 | μA |

Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7031 measuring methods for diodes.

WSSMini6-F1

Unit: mm



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