

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

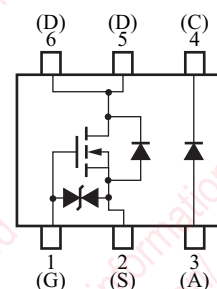
- Code
WSSMini6-F1

- Pin Name

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

Marking Symbol: JE

Internal Connection



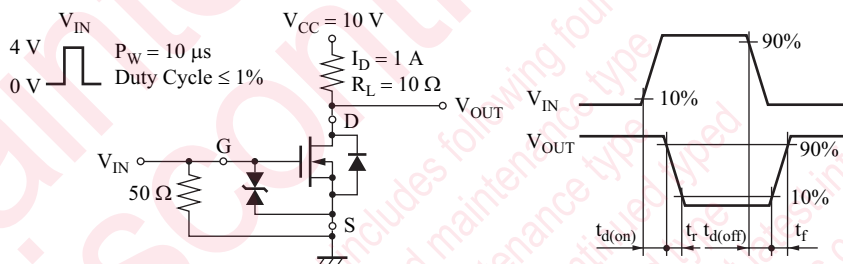
■ Electrical Characteristics $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

• 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



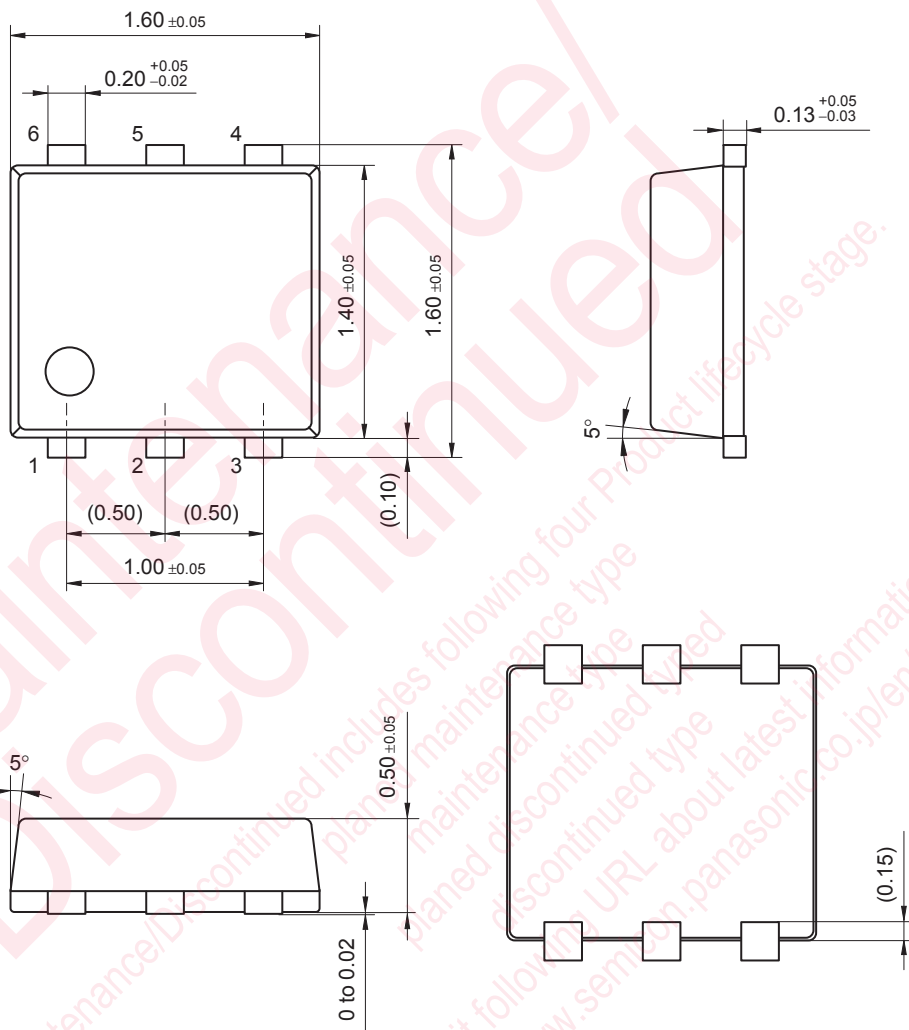
• SBD

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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