# MTM86627

## Silicon P-channel MOS FET (FET) Silicon epitaxial planar type (SBD)

For DC-DC converter For switching circuits

#### Overview

MTM86627 is the composite MOS FET (P-channel MOS FET and Schttoky Barrier Diode) that is highly suitable for DC-DC converter and other switching circuits.

#### ■ Features

• Built-in schottky barrier diode:  $V_R = 15 \text{ V}$ ,  $I_F = 700 \text{ mA}$ 

• Low on-resistance:  $R_{on} = 80 \text{ m}\Omega \text{ } (V_{GS} = -4.0 \text{ V})$ 

• Low short-circuit input capacitance (Common source): C<sub>iss</sub> = 300 pF

• Small package: WSSMini6-F1 (1.6 mm × 1.6 mm × 0.5 mm)

• Low drive Voltage: 1.8 V drive

## ■ Absolute Maximum Ratings $T_a = 25$ °C

	Parameter	Symbol	Rating	Unit	
FET	Drain-source surrender voltage	$V_{ m DSS}$	-20	V	
	Gate-source surrender voltage	$V_{GSS}$	±10	V	
	Drain current	$I_{\mathrm{D}}$	-2.0	S A	
	Peak drain current	$I_{DP}$	-8.0	A	
	Channel temperature	T <sub>ch</sub>	150	°C	
	Storage temperature	T <sub>stg</sub>	-55 to +150	°C	
SBD	Reverse voltage	$V_R$	15	V	
	Forward current (Average)	$I_{F(AV)}$	700	mA	
	Junction temperature	$T_j$	125	°C	
	Storage temperature	T <sub>stg</sub>	-55 to +125	°C	
Overall	Total power dissipation *	$P_{\mathrm{D}}$	540	mW	

Note) \*: Measuring on ceramic substrate at 40 mm  $\times$  38 mm  $\times$  0.2 mm Absolute maximum rating without heat sink for P<sub>D</sub> is 150 mA

#### ■ Package

• Code

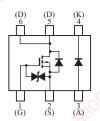
WSSMini6-F1

Pin Name

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

■ Marking Symbol: PK

## ■ Internal Connection



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## ■ Electrical Characteristics $T_a = 25$ °C±3°C

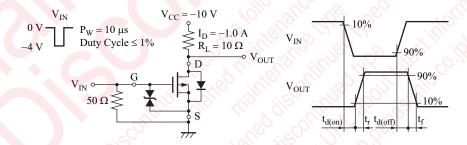
## • FET

Parameter	Symbol	Conditions	Min	Тур	Max	Unit
Drain-source surrender voltage	V <sub>DSS</sub>	$I_D = -1.0 \text{ mA}, V_{GS} = 0$	-20			V
Drain-source cutoff current	$I_{DSS}$	$V_{DS} = -20 \text{ V}, V_{GS} = 0$			-1.0	μΑ
Gate-source cutoff current	$I_{GSS}$	$V_{GS} = \pm 8 \text{ V}, V_{DS} = 0$			±10	μΑ
Gate threshold voltage	V <sub>TH</sub>	$I_D = -1.0 \text{ mA}, V_{DS} = -10 \text{ V}$	-0.4	- 0.75	-1.1	V
	R <sub>DS(on)</sub>	$I_D = -1.0 \text{ A}, V_{GS} = -4.0 \text{ V}$		80	120	mΩ
Drain-source ON resistance *1		$I_D = -1.0 \text{ A}, V_{GS} = -2.5 \text{ V}$		100	170	
		$I_D = -0.5 \text{ A}, V_{GS} = -1.8 \text{ V}$		140	230	
Forward transfer admittance *1	Y <sub>fs</sub>	$I_D = -1.0 \text{ A}, V_{DS} = -10 \text{ V}, f = 1 \text{ MHz}$	3.0			S
Short-circuit input capacitance (Common source)	C <sub>iss</sub>			300	δ.	pF
Short-circuit output capacitance (Common source)	C <sub>oss</sub>	$V_{DS} = -10 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$		30		pF
Reverse transfer capacitance (Common source)	C <sub>rss</sub>			35		pF
Turn-on delay time *2	t <sub>d(on)</sub>	$\frac{t_{d(on)}}{t_r}$ $V_{DD} = -10 \text{ V}, V_{GS} = 0 \text{ V to } -4 \text{ V}, I_D = -1 \text{ A}$		6		ns
Rise time *2	t <sub>r</sub>			8		ns
Turn-off delay time *2	t <sub>d(off)</sub>	W 10MM 4M 0MM 11		57		ns
Fall time *2	$t_{ m f}$	$V_{DD} = -10 \text{ V}, V_{GS} = -4 \text{ V to } 0 \text{ V}, I_D = -1 \text{ A}$		55		ns

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

2. \*1: Pulse measurement

 $*2: t_{on}$ ,  $t_{off}$  measurement circuit



### • SBD

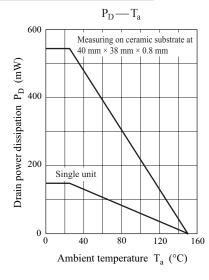
Parameter	Symbol	Conditions	Min	Тур	Max	Unit
Forward voltage	$V_{\mathrm{F}}$	I <sub>F</sub> = 500 mA			0.42	V
Forward voltage		$I_F = 700 \text{ mA}$			0.45	V
Parama aumont		$V_R = 6 V$			90	μΑ
Reverse current	I <sub>R</sub>	$V_R = 15 \text{ V}$			250	μΑ

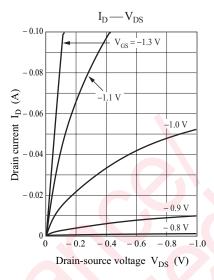
 $Note)\ Measuring\ methods\ are\ based\ on\ JAPANESE\ INDUSTRIAL\ STANDARD\ JIS\ C\ 7031\ measuring\ methods\ for\ diodes.$ 

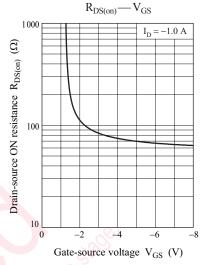
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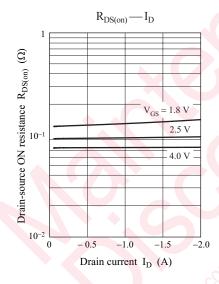
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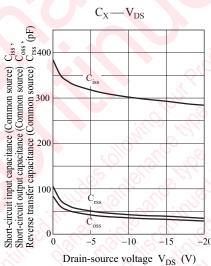
## Characteristics charts of FET



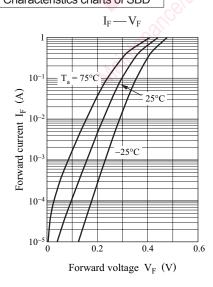


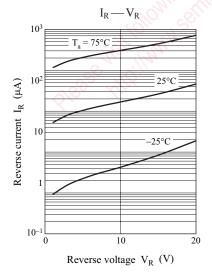


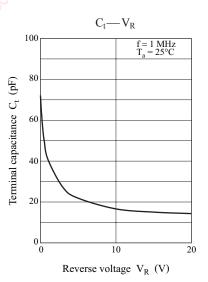




## Characteristics charts of SBD



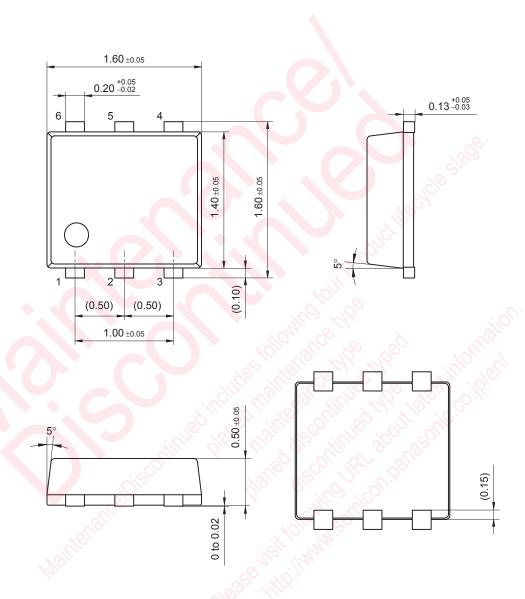




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## WSSMini6-F1

Unit: mm



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