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 V, I_F = 700 mA
- Low on-resistance: R_{on} = 80 mΩ (V_{GS} = –4.0 V)
- Low short-circuit input capacitance (Common source): C_{iss} = 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_{DSS}	–20	V
	Gate-source surrender voltage	V_{GSS}	±10	V
	Drain current	I_D	–2.0	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	15	V
	Forward current (Average)	$I_{F(AV)}$	700	mA
	Junction temperature	T_j	125	°C
	Storage temperature	T_{stg}	–55 to +125	°C
Overall	Total power dissipation *	P_D	540	mW

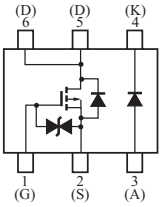
Note) *: Measuring on ceramic substrate at 40 mm × 38 mm × 0.2 mm
Absolute maximum rating without heat sink for P_D is 150 mA

■ Package

- Code
  WSSMini6-F1
- Pin Name
  1: Gate 4: Cathode
  2: Source 5: Drain
  3: Anode 6: Drain

■ Marking Symbol: PK

■ Internal Connection



■ Electrical Characteristics $T_a = 25°C \pm 3°C$

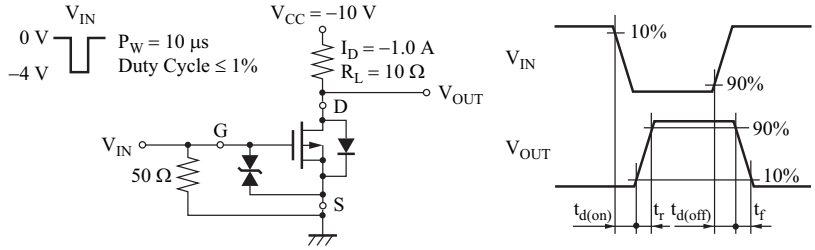
• FET

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-source surrender voltage	V_{DSS}	$I_D = -1.0$ mA, $V_{GS} = 0$	–20			V
Drain-source cutoff current	I_{DSS}	$V_{DS} = -20$ V, $V_{GS} = 0$			–1.0	μA
Gate-source cutoff current	I_{GSS}	$V_{GS} = \pm 8$ V, $V_{DS} = 0$			±10	μA
Gate threshold voltage	V_{TH}	$I_D = -1.0$ mA, $V_{DS} = -10$ V	– 0.4	– 0.75	–1.1	V
Drain-source ON resistance *1	$R_{DS(on)}$	$I_D = -1.0$ A, $V_{GS} = -4.0$ V		80	120	mΩ
		$I_D = -1.0$ A, $V_{GS} = -2.5$ V		100	170	
		$I_D = -0.5$ A, $V_{GS} = -1.8$ V		140	230	
Forward transfer admittance *1	$\lvert Y_{fs} \rvert$	$I_D = -1.0$ A, $V_{DS} = -10$ V, f = 1 MHz	3.0			S
Short-circuit input capacitance (Common source)	C_{iss}	$V_{DS} = -10$ V, $V_{GS} = 0$, f = 1 MHz		300		pF
Short-circuit output capacitance (Common source)	C_{oss}			30		pF
Reverse transfer capacitance (Common source)	C_{rss}			35		pF
Turn-on delay time *2	$t_{d(on)}$	$V_{DD} = -10$ V, $V_{GS} = 0$ V to –4 V, $I_D = -1$ A		6		ns
Rise time *2	t_r			8		ns
Turn-off delay time *2	$t_{d(off)}$	$V_{DD} = -10$ V, $V_{GS} = -4$ V to 0 V, $I_D = -1$ A		57		ns
Fall time *2	t_f			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



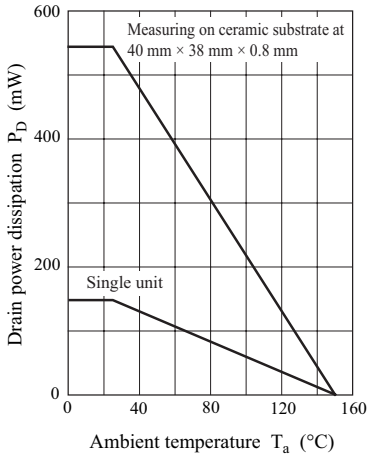
• SBD

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Forward voltage	V_F	$I_F = 500$ mA			0.42	V
		$I_F = 700$ mA			0.45	V
Reverse current	I_R	$V_R = 6$ V			90	μA
		$V_R = 15$ V			250	μA

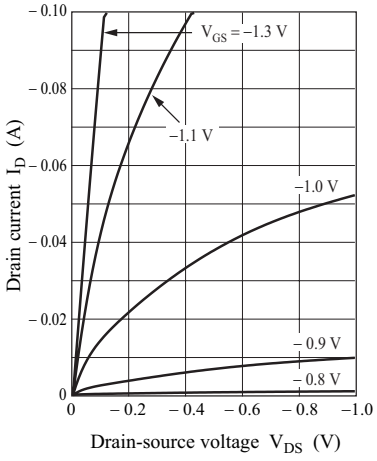
Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7031 measuring methods for diodes.

Characteristics charts of FET

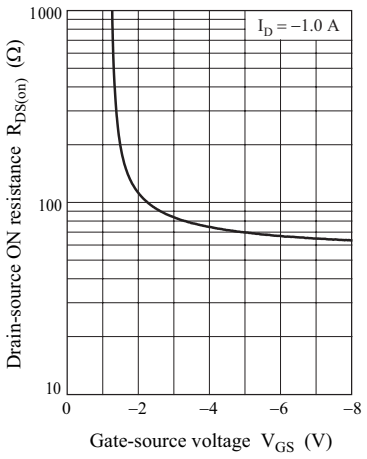
P_D — T_a



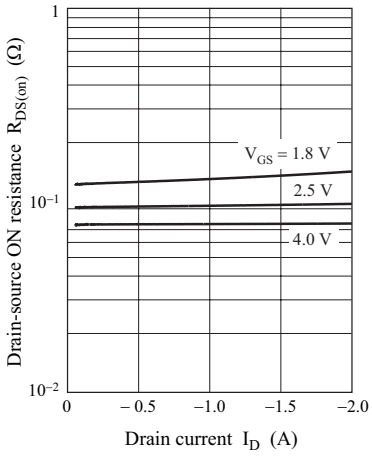
I_D — V_{DS}



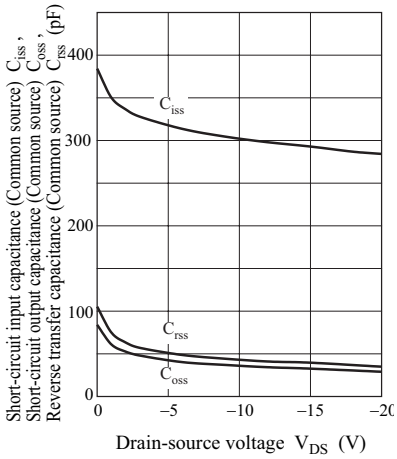
$R_{DS(on)}$ — V_{GS}



$R_{DS(on)}$ — I_D

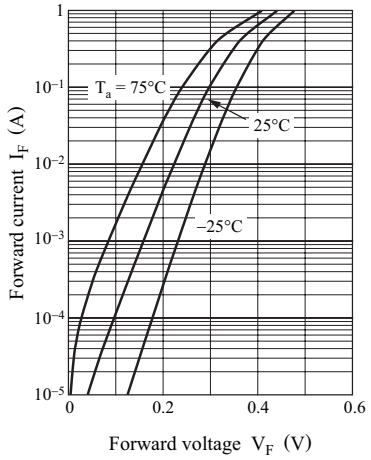


C_X — V_{DS}

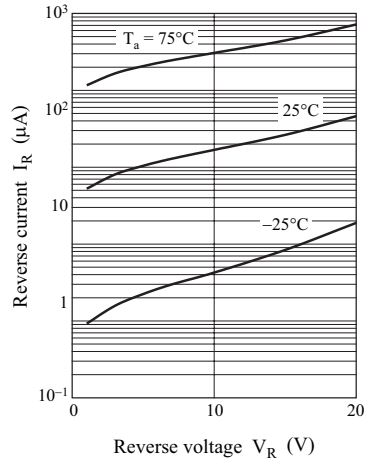


Characteristics charts of SBD

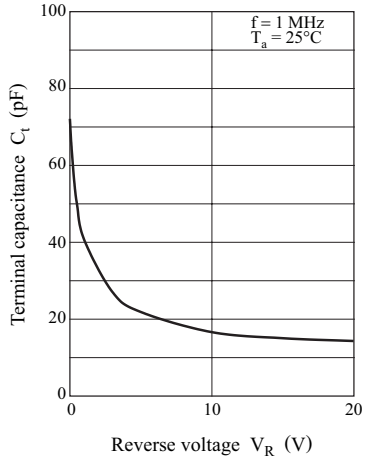
I_F — V_F



I_R — V_R

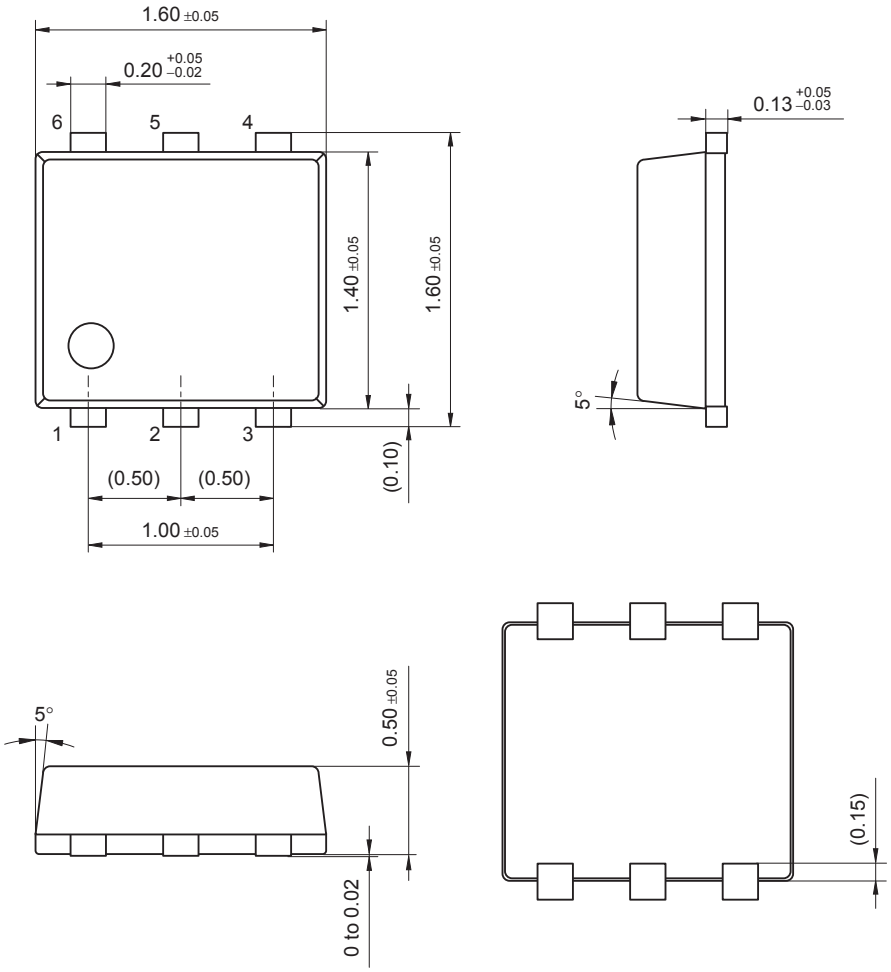


C_t — V_R



WSSMini6-F1

Unit: mm



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