MTM86128

Silicon P-channel MOS FET

For DC-DC converter circuits
For switching circuits

■ Overview

MTM86128 is the P-channel MOS FET that is highly suitable for DC-DC converter and other switching circuits.

■ Features

- Low ON resistance: R_{on} = 300 mΩ (typ.) (V_{GS} = 4.0 V)
- Low short-circuit input capacitance (common source): C_{iss} = 80 pF (typ.)
- Small surface mounting halogen-free package: WSSMini6-F1 (1.6 mm × 1.6 mm × 0.5 mm)

■ Packaging

Embossed type (Thermo-compression sealing): 10000 pcs / reel (standard)

■ Absolute Maximum Ratings T_a = 25°C

Parameter	Symbol	Rating	Unit
Drain-source surrender voltage	V_{DSS}	–20	V
Gate-source surrender voltage	V_{GSS}	±12	V
Drain current	I_D	–1.0	A
Peak drain current *1	I_{DP}	–4.0	A
Power dissipation	P_{D1} *2	540	mW
	P_{D2} *3	150	mW
Channel temperature	T_{ch}	150	°C
Storage temperature	T_{stg}	–55 to +150	°C

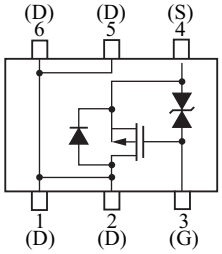
Note) *1: t ≤ 10 μs, Duty cycle ≤ 1%
*2: Glass epoxy substrate (25.4 × 25.4 × t 0.8 mm) coated with copper foil (more than 300 mm²)
*3: Stand-alone (without the board)

■ Package

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

■ Marking Symbol: ML

■ Internal Connection



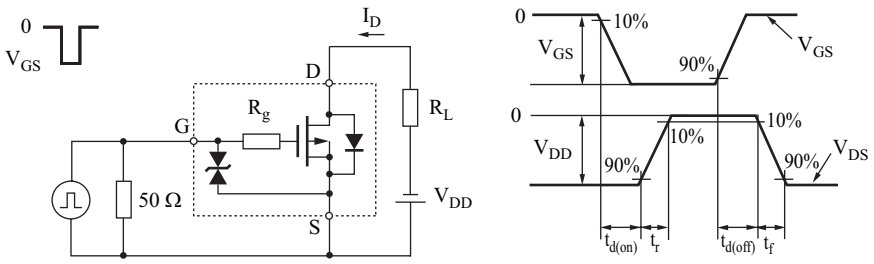
■ Electrical Characteristics T_a = 25°C±3°C

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} = ±10 V, V_{DS} = 0			±10	μA
Gate threshold voltage	V_{TH}	I_D = –1.0 mA, V_{DS} = –10 V	– 0.45	– 1.0	–1.5	V
Drain-source ON resistance	$R_{DS(on)}1$	I_D = – 0.5 A, V_{GS} = –4.0 V		300	420	mΩ
	$R_{DS(on)}2$	I_D = – 0.5 A, V_{GS} = –2.5 V		420	560	mΩ
Forward transfer admittance *1	$\|Y_{fs}\|$	I_D = – 0.5 A, V_{DS} = –10 V	1.0	2.0		S
Short-circuit input capacitance (Common source)	C_{iss}	V_{DS} = –10 V, V_{GS} = 0, f = 1 MHz		80		pF
Short-circuit output capacitance (Common source)	C_{oss}			12		pF
Reverse transfer capacitance (Common source)	C_{rss}			12		pF
Turn-on delay time *1, 2	$t_{d(on)}$	V_{DD} = –15 V, V_{GS} = –4.0 V, I_D = – 0.5 A, R_L = 30 Ω		12		ns
Rise time *1, 2	t_r			6		ns
Turn-off delay time *1, 2	$t_{d(off)}$			17		ns
Fall time *1, 2	t_f			10		ns

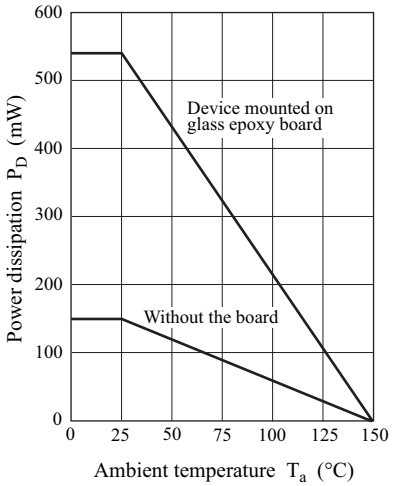
Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

2. ∗1: t = 10 μs, Duty cycle < 1%

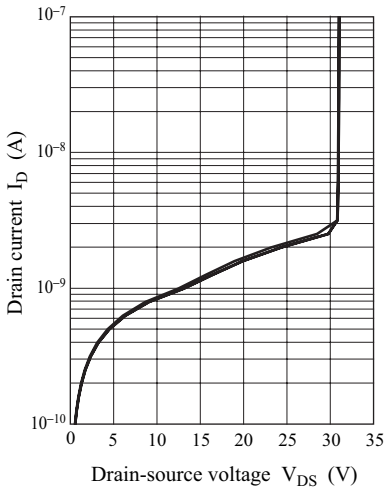
∗2: Measurement circuit



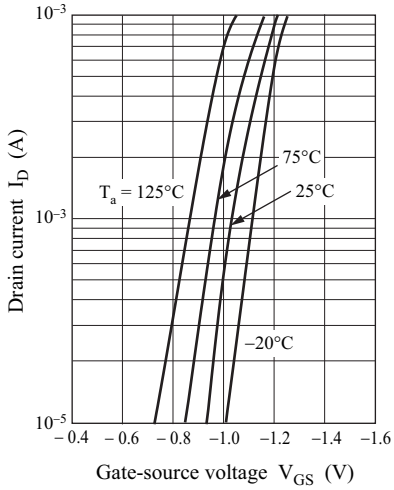
P_D — T_a



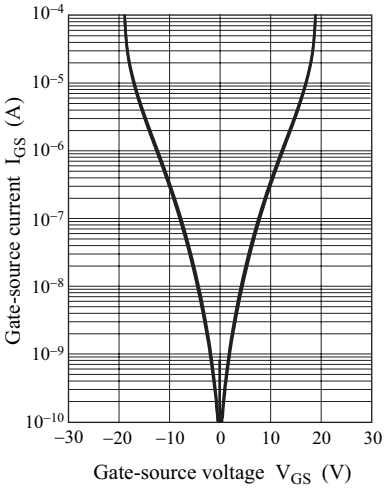
I_D — V_{DS}



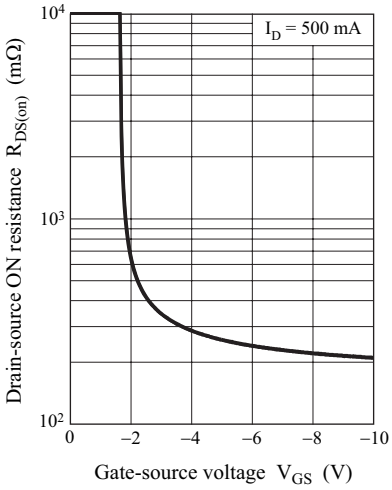
I_D — V_{GS}



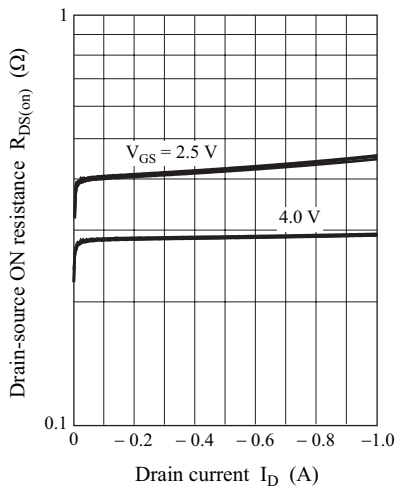
I_{GS} — V_{GS}



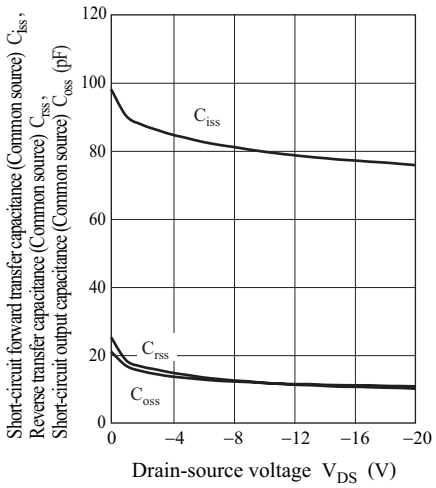
$R_{DS(on)}$ — V_{GS}



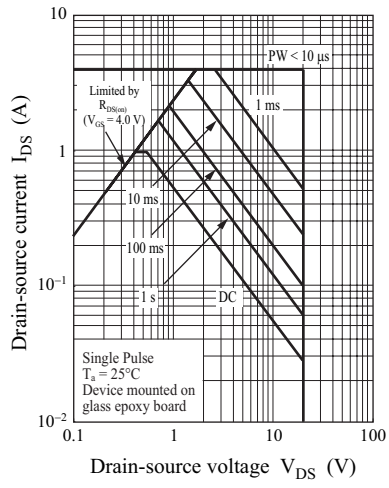
$R_{DS(on)}$ — I_D



C_{iss} , C_{rss} , C_{oss} — V_D



Safe operation area



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