Panasonic

PUB4701

Silicon N-Channel Power F-MOS FET

■ Features
- ● Avalanche energy capacity guaranteed
- ● High-speed switching
- ● Low ON-resistance
- ● No secondary breakdown
- ● Low-voltage drive

■ Applications
- ● Contactless relay
- ● Diving circuit for a solenoid
- ● Driving circuit for a motor
- ● Control equipment
- ● Switching power supply

unit: mm

G: Gate
D: Drain
S: Source
10-Lead Plastic SIL Package
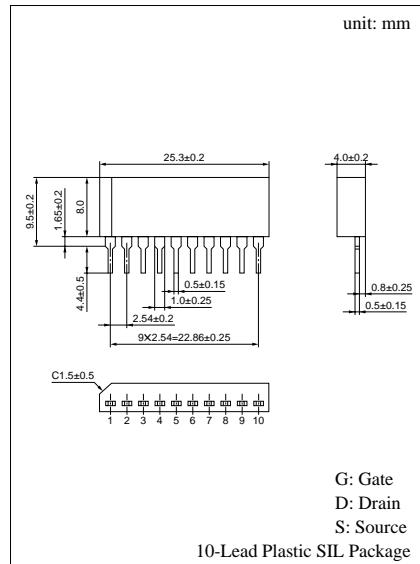
■ Absolute Maximum Ratings ($T_C = 25°C$)

Parameter		Symbol	Ratings	Unit
Drain to Source breakdown voltage		V_{DSS}	150	V
Gate to Source voltage		V_{GSS}	±20	V
Drain current	DC	I_D	±6	A
	Pulse	I_{DP}	±12	A
Avalanche energy capacity		EAS^*	22.5	mJ
Allowable power dissipation	$T_C = 25°C$	P_D	15	W
	$Ta = 25°C$		3.5	
Channel temperature		T_{ch}	150	°C
Storage temperature		T_{stg}	−55 to +150	°C
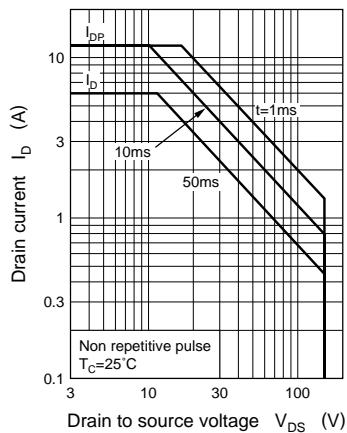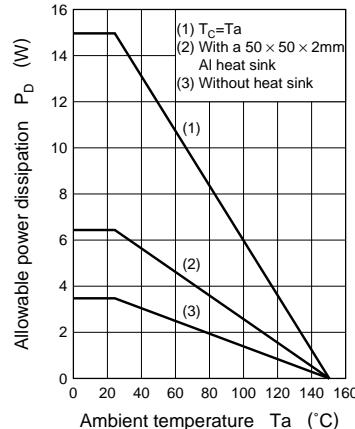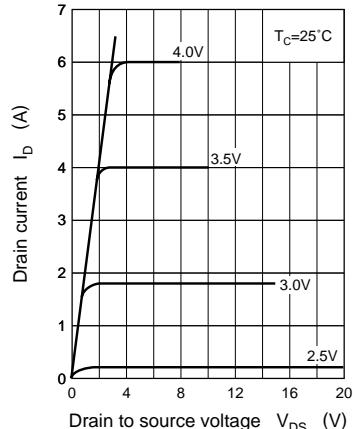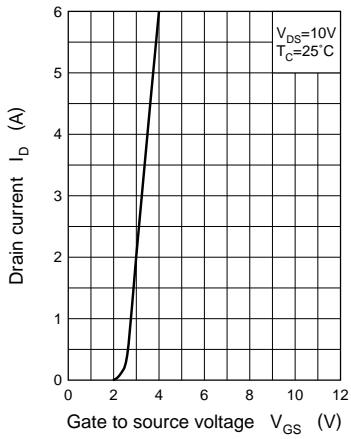
* $L = 5mH$, $I_L = 3A$, 1 pulse

■ Electrical Characteristics ($T_C = 25°C$)

Parameter	Symbol	Conditions	min	typ	max	Unit
Drain to Source cut-off current	I_{DSS}	$V_{DS} = 120V$, $V_{GS} = 0$			10	μA
Gate to Source leakage current	I_{GSS}	$V_{GS} = ±20V$, $V_{DS} = 0$			±1	μA
Drain to Source breakdown voltage	V_{DSS}	$I_D = 1mA$, $V_{GS} = 0$	150			V
Gate threshold voltage	V_{th}	$V_{DS} = 10V$, $I_D = 1mA$	1		2.5	V
Drain to Source ON-resistance	$R_{DS(on)1}$	$V_{GS} = 10V$, $I_D = 3A$		0.42	0.6	Ω
	$R_{DS(on)2}$	$V_{GS} = 4V$, $I_D = 3A$		0.5	0.7	Ω
Forward transfer admittance	$|Y_{fs}|$	$V_{DS} = 10V$, $I_D = 3A$	3	5.3		S
Diode forward voltage	V_{DSF}	$I_{DR} = 3A$, $V_{GS} = 0$			−1.7	V
Input capacitance (Common Source)	C_{iss}	$V_{DS} = 10V$, $V_{GS} = 0$, f = 1MHz		620		pF
Output capacitance (Common Source)	C_{oss}			120		pF
Reverse transfer capacitance (Common Source)	C_{rss}			35		pF
Turn-on time (delay time)	$t_{d(on)}$	$V_{GS} = 10V$, $I_D = 3A$ $V_{DD} = 100V$, $R_L = 33.3Ω$		10		ns
Rise time	t_r			30		ns
Fall time	t_f			85		ns
Turn-off time (delay time)	$t_{d(off)}$			290		ns

Area of safe operation (ASO)

Non repetitive pulse
$T_C=25°C$

t=1ms
10ms
50ms

Drain current I_D (A)

Drain to source voltage V_{DS} (V)

$P_D — Ta$

(1) $T_C=Ta$
(2) With a $50 \times 50 \times 2mm$ Al heat sink
(3) Without heat sink

Allowable power dissipation P_D (W)

Ambient temperature Ta (°C)

$I_D — V_{DS}$

$T_C=25°C$

4.0V
3.5V
3.0V
2.5V

Drain current I_D (A)

Drain to source voltage V_{DS} (V)

$I_D — V_{GS}$

$V_{DS}=10V$
$T_C=25°C$

Drain current I_D (A)

Gate to source voltage V_{GS} (V)

$R_{DS(on)} — I_D$

$T_C=25°C$

$V_{GS}=4V$
10V

Drain to source ON-resistance $R_{DS(on)}$ (mΩ)

Drain current I_D (A)