

## 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

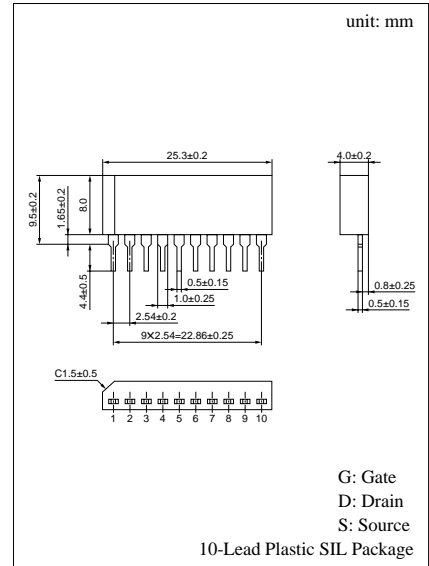
■ Absolute Maximum Ratings ( $T_C = 25^\circ\text{C}$ )

Parameter	Symbol	Ratings	Unit	
Drain to Source breakdown voltage	$V_{DSS}$	150	V	
Gate to Source voltage	$V_{GSS}$	$\pm 20$	V	
Drain current	DC	$I_D$	$\pm 6$	A
	Pulse	$I_{DP}$	$\pm 12$	A
Avalanche energy capacity	EAS*	22.5	mJ	
Allowable power dissipation	$T_C = 25^\circ\text{C}$	$P_D$	15	W
	$T_a = 25^\circ\text{C}$		3.5	
Channel temperature	$T_{ch}$	150	$^\circ\text{C}$	
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$	

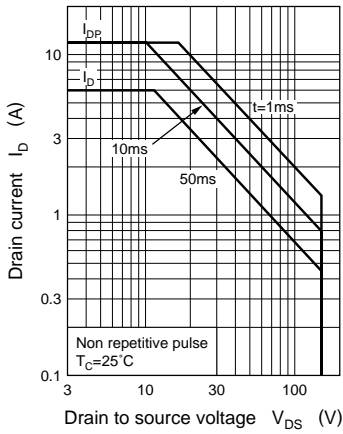
\*  $L = 5\text{mH}$ ,  $I_L = 3\text{A}$ , 1 pulse

■ Electrical Characteristics ( $T_C = 25^\circ\text{C}$ )

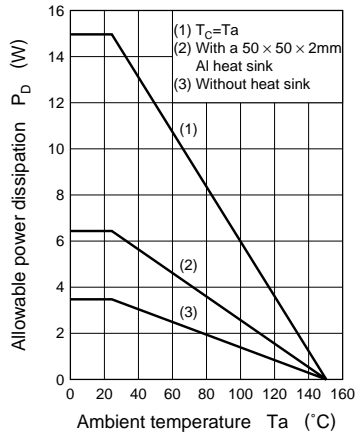
Parameter	Symbol	Conditions	min	typ	max	Unit
Drain to Source cut-off current	$I_{DSS}$	$V_{DS} = 120\text{V}$ , $V_{GS} = 0$			10	$\mu\text{A}$
Gate to Source leakage current	$I_{GSS}$	$V_{GS} = \pm 20\text{V}$ , $V_{DS} = 0$			$\pm 1$	$\mu\text{A}$
Drain to Source breakdown voltage	$V_{DSS}$	$I_D =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



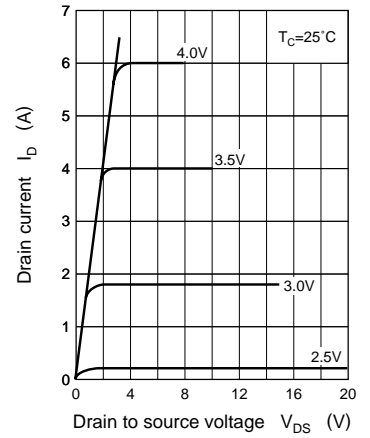
Area of safe operation (ASO)



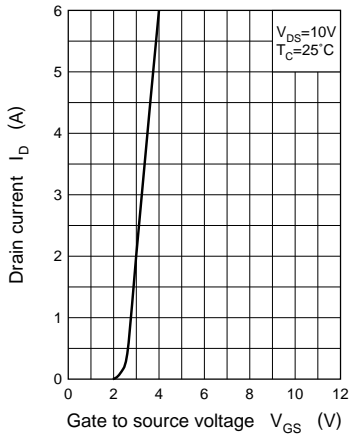
$P_D - T_a$



$I_D - V_{DS}$



$I_D - V_{GS}$



$R_{DS(on)} - I_D$

