

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

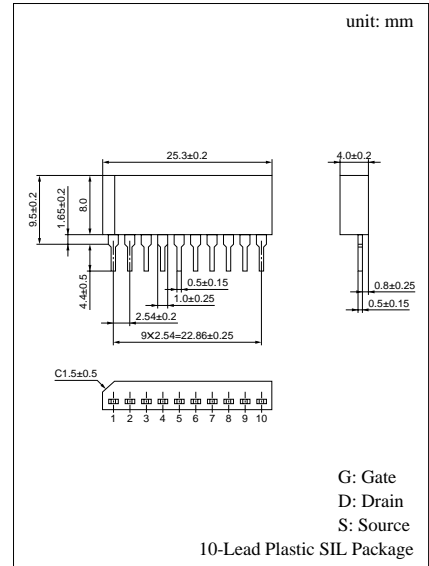
■ Absolute Maximum Ratings ($T_C = 25^\circ\text{C}$)

Parameter	Symbol	Ratings	Unit	
Drain to Source breakdown voltage	V_{DSS}	150	V	
Gate to Source voltage	V_{GSS}	± 20	V	
Drain current	DC	I_D	± 6	A
	Pulse	I_{DP}	± 12	A
Avalanche energy capacity	EAS*	22.5	mJ	
Allowable power dissipation	$T_C = 25^\circ\text{C}$	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	$^\circ\text{C}$	

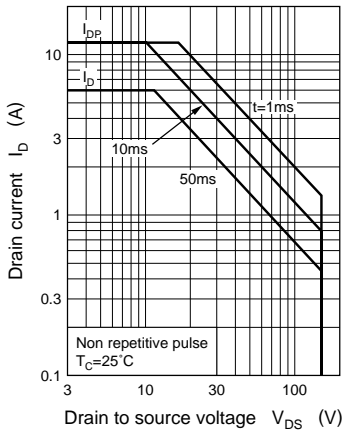
* $L = 5\text{mH}$, $I_L = 3\text{A}$, 1 pulse

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

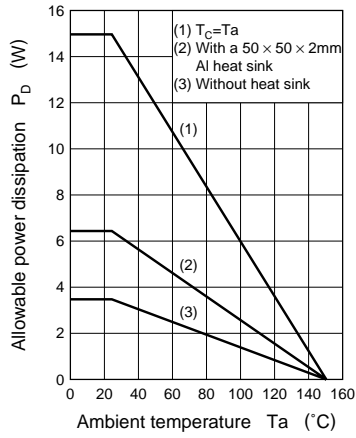
Parameter	Symbol	Conditions	min	typ	max	Unit
Drain to Source cut-off current	I_{DSS}	$V_{DS} = 120\text{V}$, $V_{GS} = 0$			10	μA
Gate to Source leakage current	I_{GSS}	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0$			± 1	μA
Drain to Source breakdown voltage	V_{DSS}	$I_D = 1\text{mA}$, $V_{GS} = 0$	150			V
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	Ω
	$R_{DS(on)2}$	$V_{GS} = 4\text{V}$, $I_D = 3\text{A}$		0.5	0.7	Ω
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



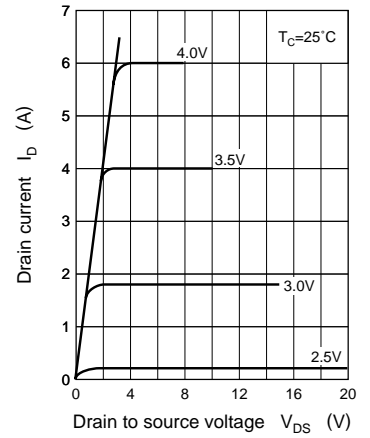
Area of safe operation (ASO)



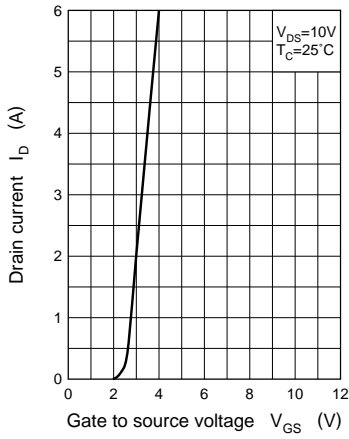
$P_D - T_a$



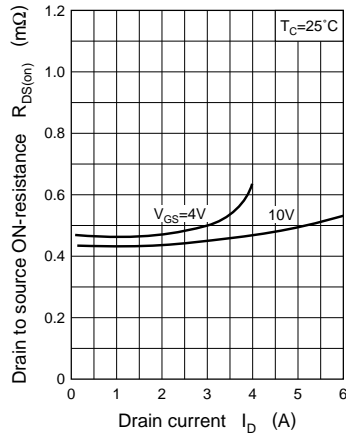
$I_D - V_{DS}$



$I_D - V_{GS}$



$R_{DS(on)} - I_D$



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