

PU7457

Silicon N-Channel Power F-MOS FET (with built-in zener diode)

■ Features

- High avalanche energy capacity
- High electrostatic breakdown voltage
- No secondary breakdown
- High breakdown voltage, large allowable power dissipation
- Allowing Low-voltage drive

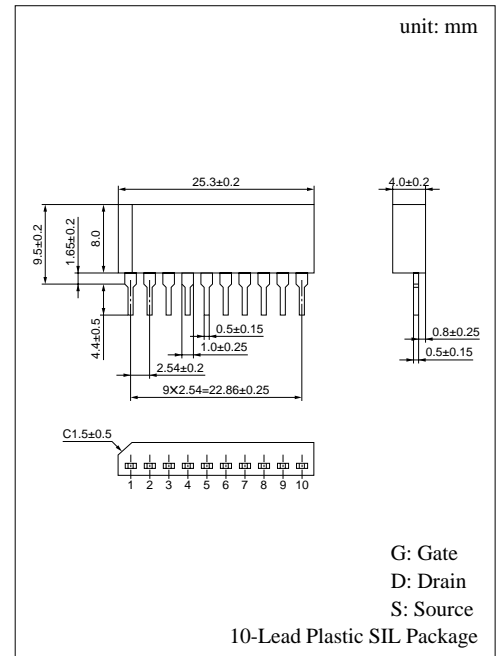
■ Applications

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

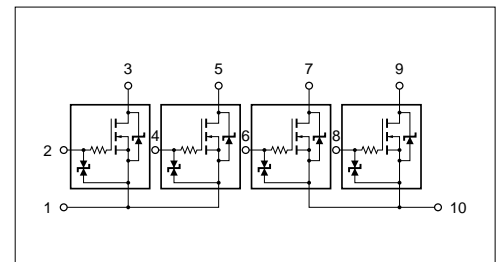
■ Absolute Maximum Ratings ($T_C = 25^\circ\text{C}$)

Parameter	Symbol	Ratings	Unit
Drain to Source breakdown voltage	V_{DSS}	100 ± 15	V
Gate to Source voltage	V_{GSS}	± 20	V
Drain current	DC	I_D	± 3 A
	Pulse	I_{DP}	± 9 A
Avalanche energy capacity	Non repetition	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 W
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



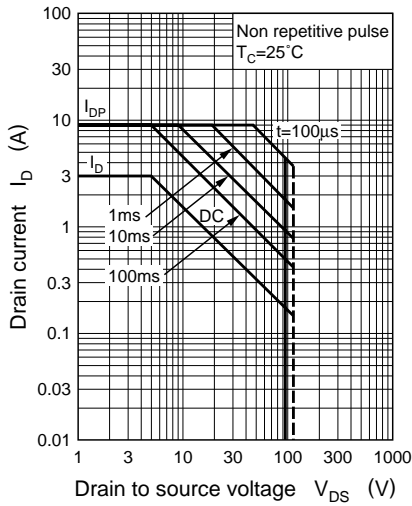
Internal Connection



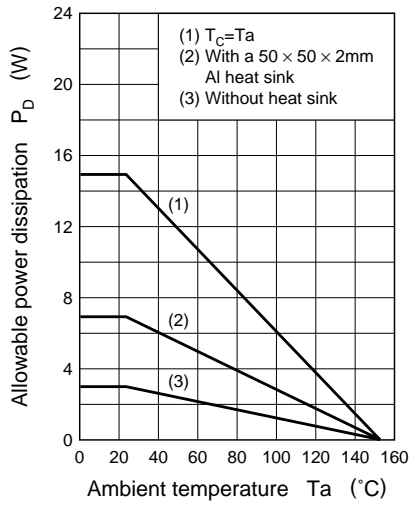
■ Electrical Characteristics ($T_C = 25^\circ\text{C}$)

Parameter	Symbol	Conditions	min	typ	max	Unit
Drain to Source cut-off current	I_{DSS}	$V_{DS} = 80\text{V}$, $V_{GS} = 0$			10	μA
Gate to Source leakage current	I_{GSS}	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0$			± 10	μA
Drain to Source breakdown voltage	V_{DSS}	$I_D = 1\text{mA}$, $V_{GS} = 0$	85		115	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	$R_{DS(on)1}$	$V_{GS} = 10\text{V}$, $I_D = 2\text{A}$		300	450	$\text{m}\Omega$
	$R_{DS(on)2}$	$V_{GS} = 4\text{V}$, $I_D = 2\text{A}$		400	600	$\text{m}\Omega$
Forward transfer admittance	$ Y_{fs} $	$V_{DS} = 10\text{V}$, $I_D = 2\text{A}$	2.5	4		S
Diode forward voltage	V_{DSF}	$I_{DR} = 3\text{A}$, $V_{GS} = 0$			-1.6	V
Input capacitance (Common Source)	C_{iss}	$V_{DS} = 10\text{V}$, $V_{GS} = 0$, $f = 1\text{MHz}$		130		pF
Output capacitance (Common Source)	C_{oss}			160		pF
Reverse transfer capacitance (Common Source)	C_{rss}			25		pF
Turn-on time	t_{on}	$V_{GS} = 10\text{V}$, $I_D = 2\text{A}$ $V_{DD} = 50\text{V}$, $R_L = 25\Omega$		0.2		μs
Fall time	t_f			0.3		μs
Turn-off time (delay time)	$t_{d(off)}$			1.5		μs

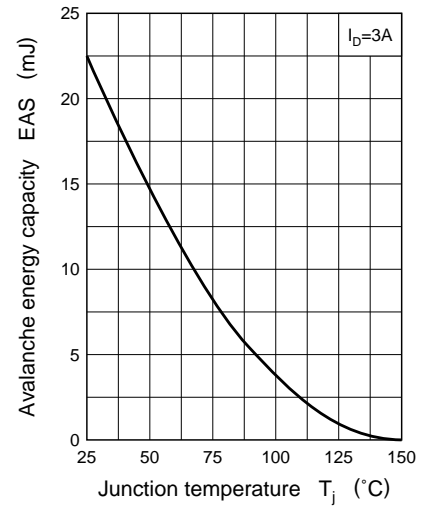
Area of safe operation (ASO)



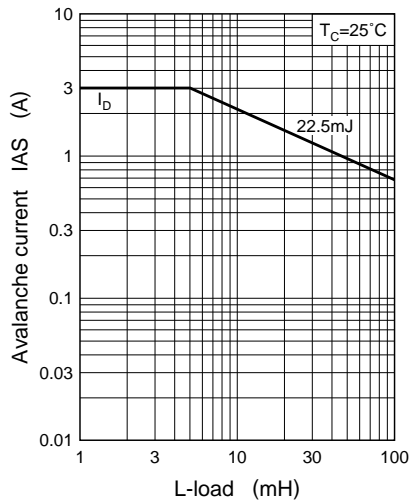
P_D — T_a



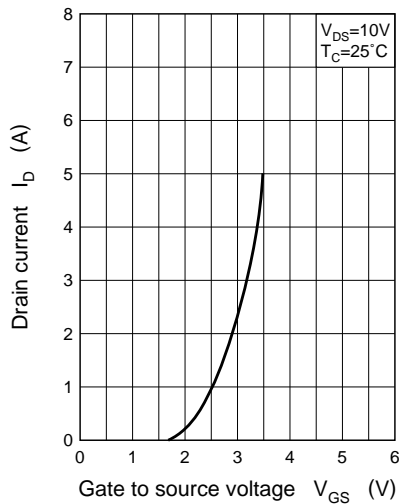
EAS — T_j



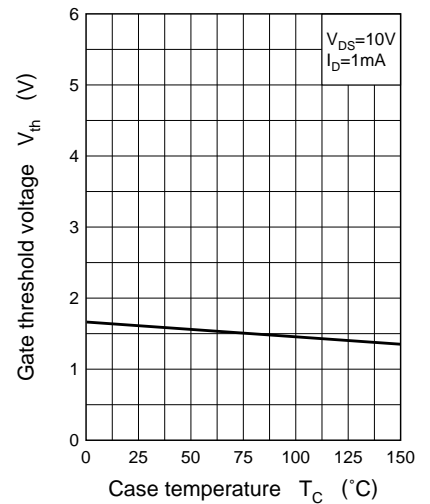
IAS — L-load



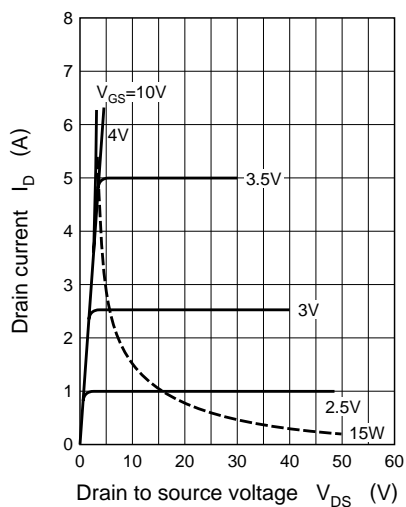
I_D — V_{GS}



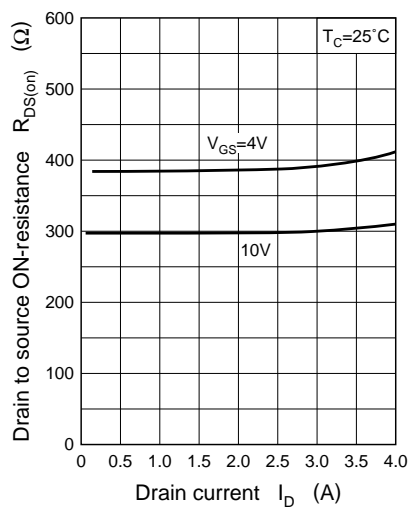
V_{th} — T_C



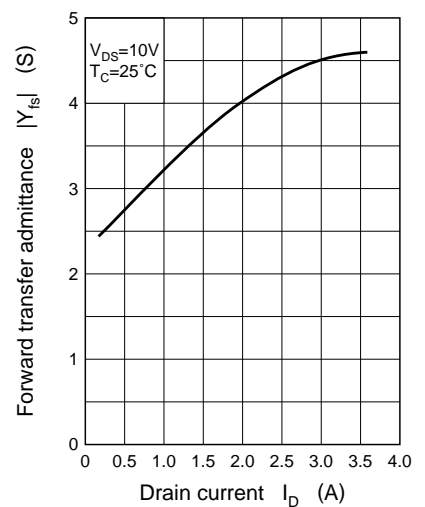
I_D — V_{DS}



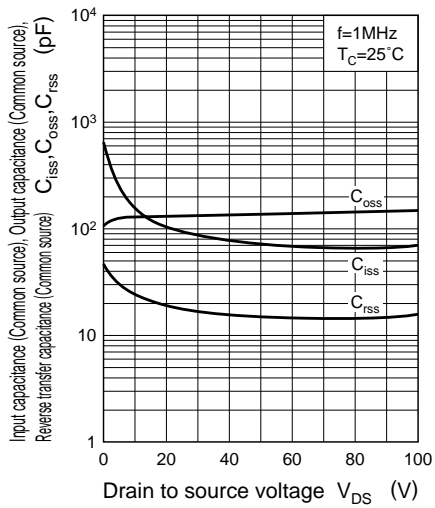
$R_{DS(on)}$ — I_D



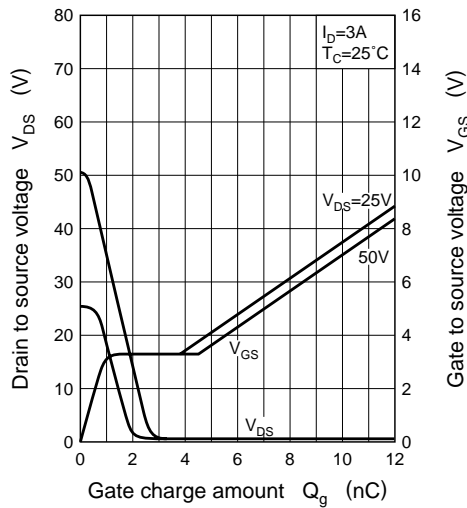
$|Y_{fs}|$ — I_D



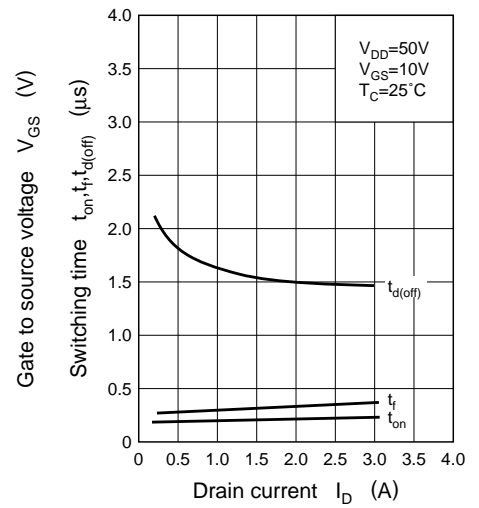
$C_{iss}, C_{oss}, C_{rss} - V_{DS}$



$V_{DS}, V_{GS} - Q_g$



$t_{on}, t_f, t_{d(off)} - I_D$



$P_{ZSM} - t_p$

