

# 2SK2130

## Silicon N-Channel Power F-MOS FET

### ■ Features

- Avalanche energy capacity guaranteed: EAS > 15mJ
- $V_{GSS} = \pm 30V$  guaranteed
- High-speed switching:  $t_f = 45ns$
- No secondary breakdown

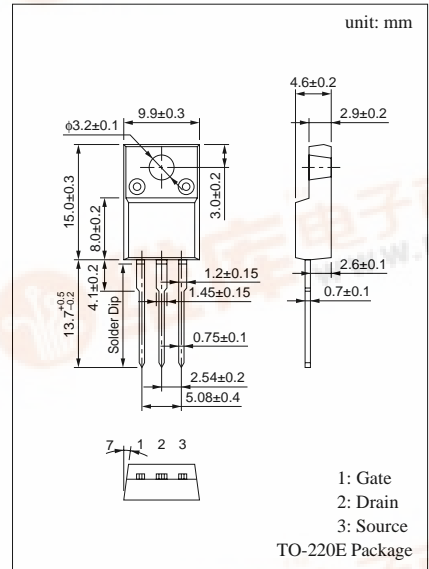
### ■ Applications

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

### ■ Absolute Maximum Ratings ( $T_C = 25^\circ C$ )

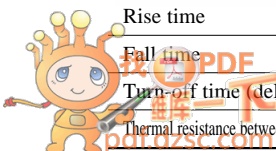
Parameter	Symbol	Rated	Unit
Drain to Source breakdown voltage	$V_{DSS}$	900	V
Gate to Source voltage	$V_{GSS}$	$\pm 30$	V
Drain current	DC	$I_D$	$\pm 3$ A
	Pulse	$I_{DP}$	$\pm 6$ A
Avalanche energy capacity	EAS*	15	mJ
Allowable power dissipation	$T_C = 25^\circ C$	$P_D$	50 W
	$T_a = 25^\circ C$		2 W
Channel temperature	$T_{ch}$	150	$^\circ C$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ C$

\*  $L = 5mH, I_L = 2.45A, V_{DD} = 50V, 1 pulse$

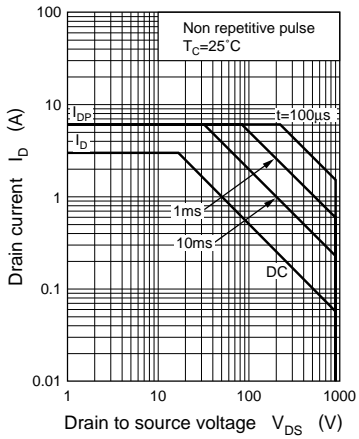


### ■ Electrical Characteristics ( $T_C = 25^\circ C$ )

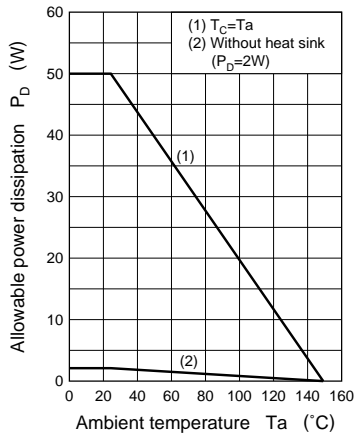
Parameter	Symbol	Conditions	min	typ	max	Unit	
Drain to Source cut-off current	$I_{DSS}$	$V_{DS} = 720V, V_{GS} = 0$			0.1	mA	
Gate to Source leakage current	$I_{GSS}$	$V_{GS} = \pm 30V, V_{DS} = 0$			$\pm 1$	$\mu A$	
Drain to Source breakdown voltage	$V_{DSS}$	$I_D = 1mA, V_{GS} = 0$	900			V	
Gate threshold voltage	$V_{th}$	$V_{DS} = 25V, I_D = 1mA$	2		5	V	
Drain to Source ON-resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 2A$		3.8	5	$\Omega$	
Forward transfer admittance	$ Y_{fs} $	$V_{DS} = 25V, I_D = 2A$	1.5	2.2		S	
Diode forward voltage	$V_{DSF}$	$I_{DR} = 3A, V_{GS} = 0$			-1.6	V	
Input capacitance (Common Source)	$C_{iss}$	$V_{DS} = 20V, V_{GS} = 0, f = 1MHz$		600		pF	
Output capacitance (Common Source)	$C_{oss}$				90		pF
Reverse transfer capacitance (Common Source)	$C_{rss}$				30		pF
Turn-on time (delay time)	$t_{d(on)}$	$V_{GS} = 10V, I_D = 2A$		40		ns	
Rise time	$t_r$			40		ns	
Fall time	$t_f$		$V_{DD} = 200V, R_L = 100\Omega$		45		ns
Turn-off time (delay time)	$t_{d(off)}$				100		ns
Thermal resistance between channel and case	$R_{th(ch-c)}$				2.5	$^\circ C/W$	



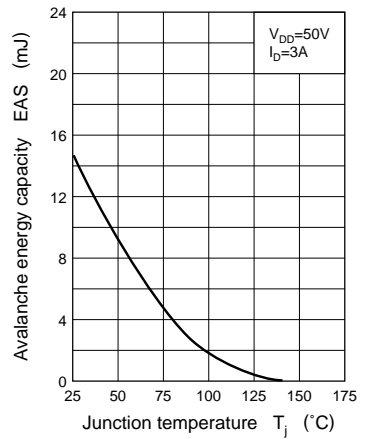
Area of safe operation (ASO)



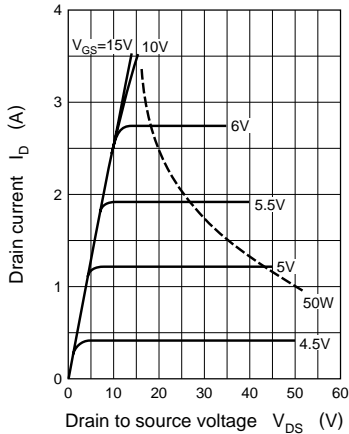
$P_D - T_a$



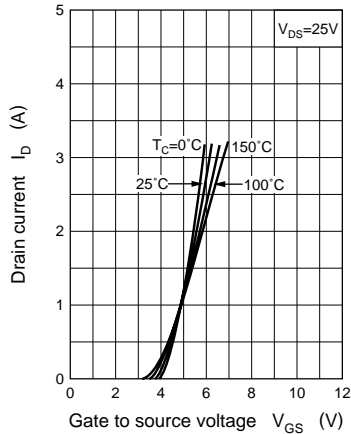
EAS —  $T_j$



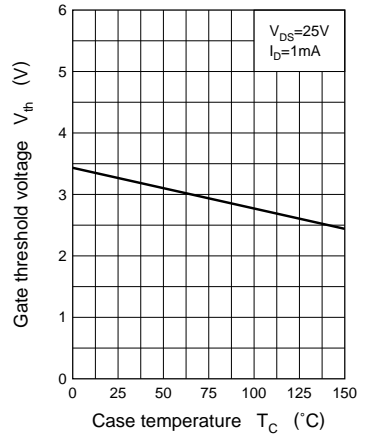
$I_D - V_{DS}$



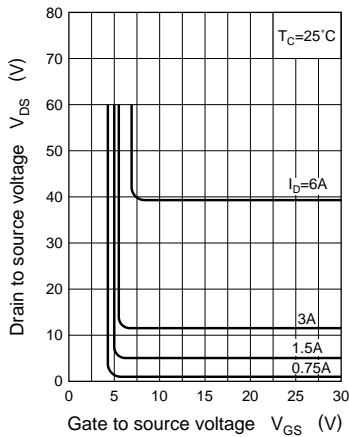
$I_D - V_{GS}$



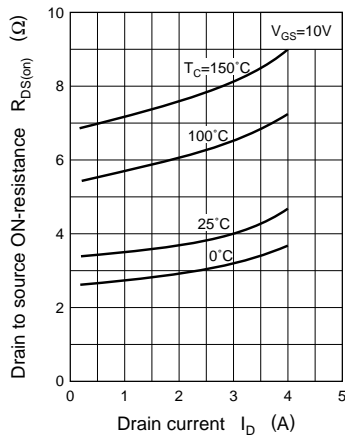
$V_{th} - T_C$



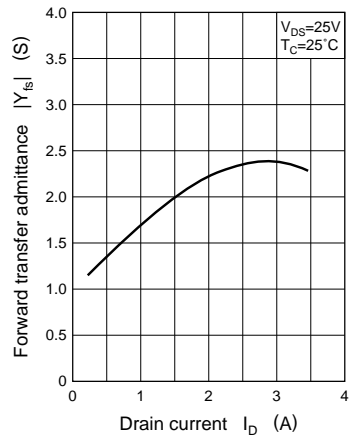
$V_{DS} - V_{GS}$



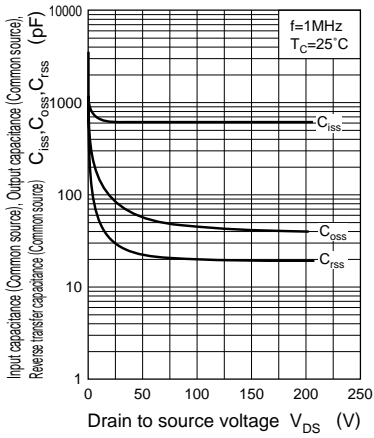
$R_{DS(on)} - I_D$



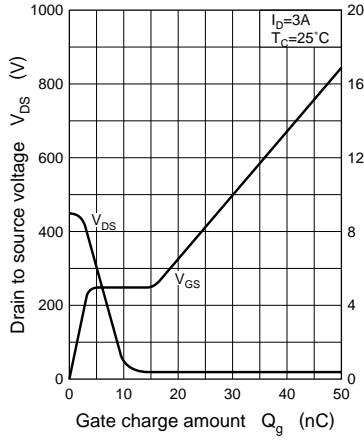
$|Y_{fs}| - I_D$



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



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



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

