

2SK2130

Silicon N-Channel Power F-MOS FET

■ Features

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

■ Applications

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

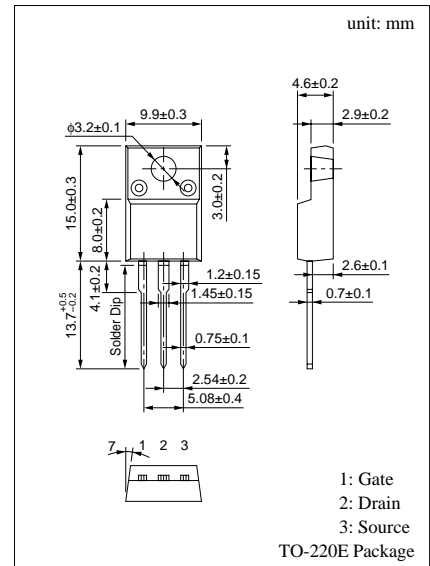
■ Absolute Maximum Ratings ($T_C = 25^\circ\text{C}$)

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

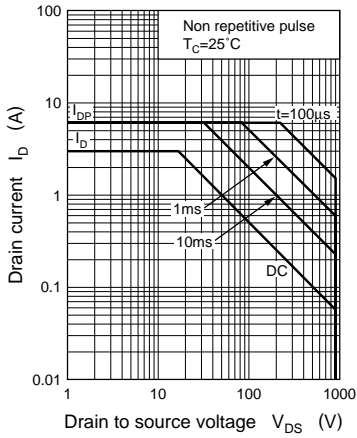
* $L = 5\text{mH}$, $I_L = 2.45\text{A}$, $V_{DD} = 50\text{V}$, 1 pulse

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

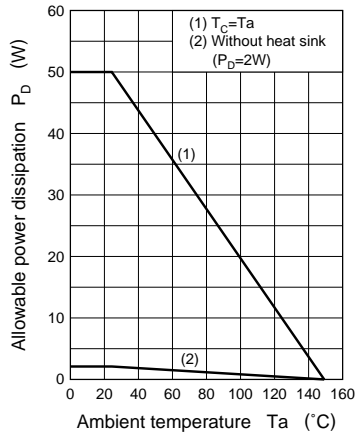
| Parameter | Symbol | Conditions | min | typ | max | Unit | |
|--|----------------|---|-----|-----|---------|--------------------|----|
| Drain to Source cut-off current | I_{DSS} | $V_{DS} = 720\text{V}$, $V_{GS} = 0$ | | | 0.1 | mA | |
| Gate to Source leakage current | I_{GSS} | $V_{GS} = \pm 30\text{V}$,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



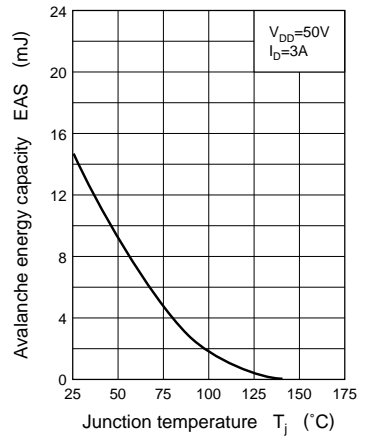
Area of safe operation (ASO)



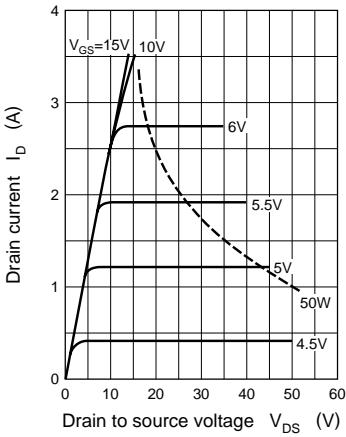
$P_D - T_a$



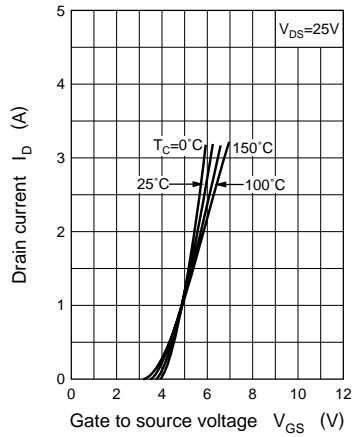
EAS — T_j



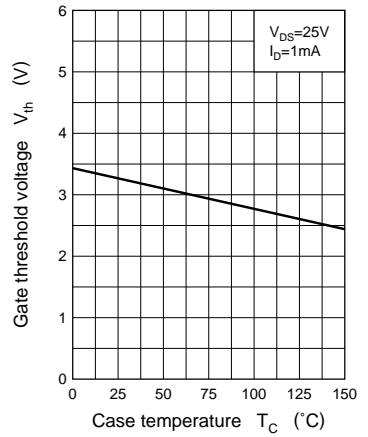
$I_D - V_{DS}$



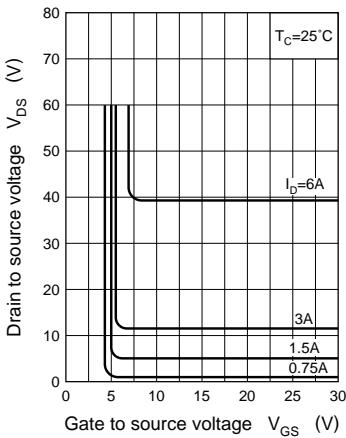
$I_D - V_{GS}$



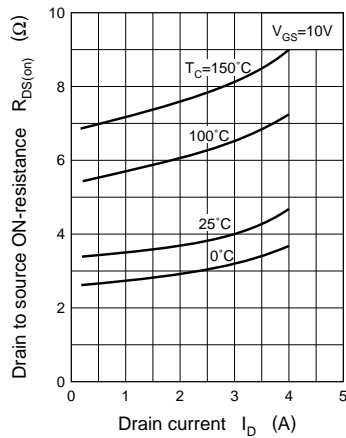
$V_{th} - T_C$



$V_{DS} - V_{GS}$



$R_{DS(on)} - I_D$



$|Y_{fs}| - I_D$

