

2SK2129

Silicon N-Channel Power F-MOS FET

■ Features

- Avalanche energy capacity guaranteed: EAS > 20mJ
- $V_{GSS} = \pm 30V$ guaranteed
- High-speed switching: $t_f = 50ns$
- No secondary breakdown

■ Applications

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

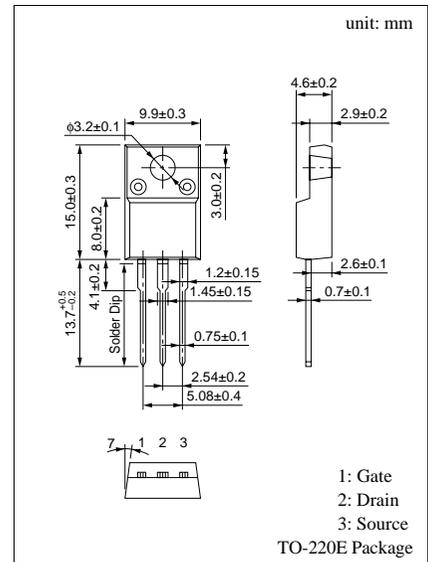
■ Absolute Maximum Ratings ($T_C = 25^\circ C$)

| Parameter | Symbol | Ratings | Unit |
|-----------------------------------|--------------------|-------------|------------|
| Drain to Source breakdown voltage | V_{DSS} | 800 | 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* | 20 | mJ |
| Allowable power dissipation | $T_C = 25^\circ C$ | P_D | 50 |
| | $T_a = 25^\circ C$ | | 2 |
| Channel temperature | T_{ch} | 150 | $^\circ C$ |
| Storage temperature | T_{stg} | -55 to +150 | $^\circ C$ |

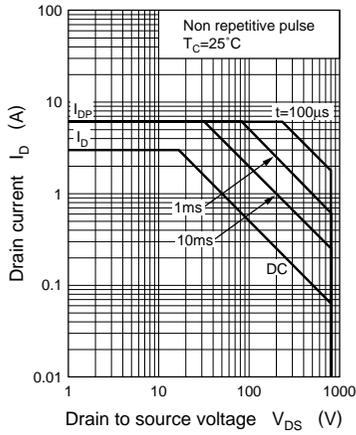
* $L = 4.5mH$, $I_L = 3A$, $V_{DD} = 50V$, 1 pulse

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

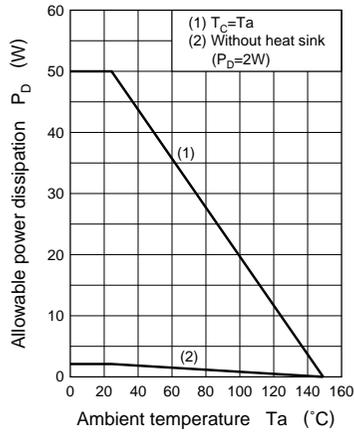
| Parameter | Symbol | Conditions | min | typ | max | Unit |
|--|----------------|--|-----|-----|---------|--------------|
| Drain to Source cut-off current | I_{DSS} | $V_{DS} = 640V$, $V_{GS} = 0$ | | | 0.1 | mA |
| Gate to Source leakage current | I_{GSS} | $V_{GS} = \pm 30V$, $V_{DS} = 0$ | | | ± 1 | μA |
| Drain to Source breakdown voltage | V_{DSS} | $I_D = 1mA$, $V_{GS} = 0$ | 800 | | | V |
| Gate threshold voltage | V_{th} | $V_{DS} = 25V$, $I_D = 1mA$ | 2 | | 5 | V |
| Drain to Source ON-resistance | $R_{DS(on)}$ | $V_{GS} = 10V$, $I_D = 2A$ | | 3.2 | 4 | Ω |
| Forward transfer admittance | $ Y_{fs} $ | $V_{DS} = 25V$, $I_D = 2A$ | 1.5 | 2.4 | | S |
| Diode forward voltage | V_{DSF} | $I_{DR} = 3A$, $V_{GS} = 0$ | | | -1.6 | V |
| Input capacitance (Common Source) | C_{iss} | $V_{DS} = 20V$, $V_{GS} = 0$, $f = 1MHz$ | | 730 | | pF |
| Output capacitance (Common Source) | C_{oss} | | | 90 | | pF |
| Reverse transfer capacitance (Common Source) | C_{rss} | | | 40 | | pF |
| Turn-on time (delay time) | $t_{d(on)}$ | $V_{GS} = 10V$, $I_D = 2A$ $V_{DD} = 200V$, $R_L = 100\Omega$ | | 35 | | ns |
| Rise time | t_r | | | 60 | | ns |
| Fall time | t_f | | | 50 | | ns |
| Turn-off time (delay time) | $t_{d(off)}$ | | | 160 | | ns |
| Thermal resistance between channel and case | $R_{th(ch-c)}$ | | | | 2.5 | $^\circ C/W$ |



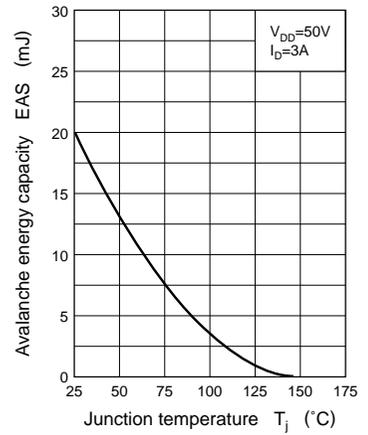
Area of safe operation (ASO)



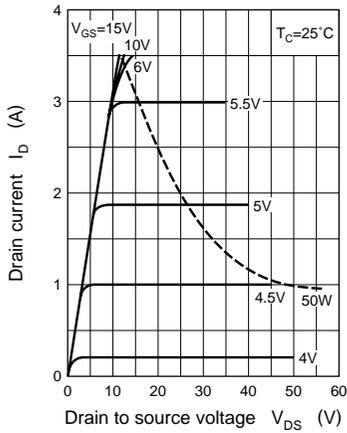
$P_D - T_a$



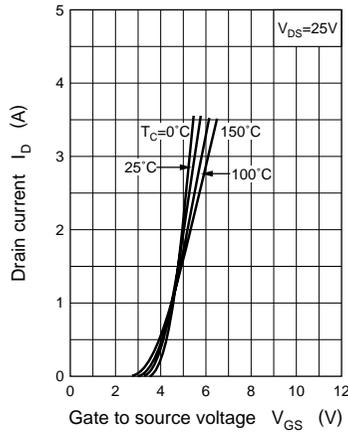
EAS — T_j



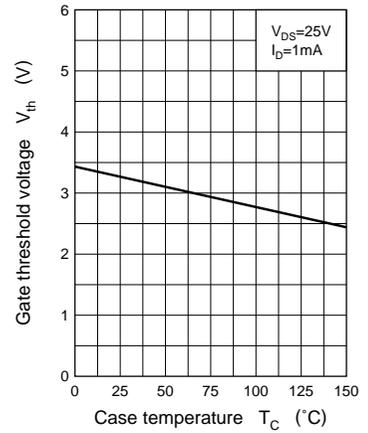
$I_D - V_{DS}$



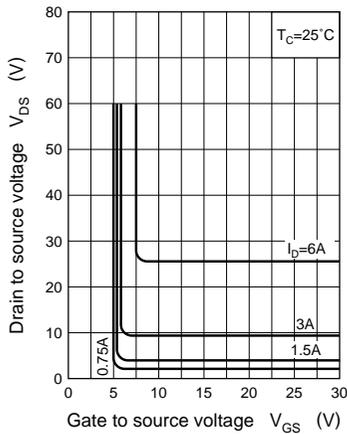
$I_D - V_{GS}$



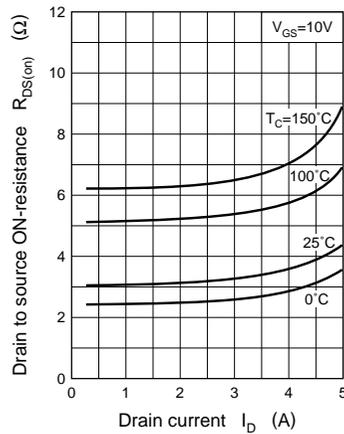
$V_{th} - T_C$



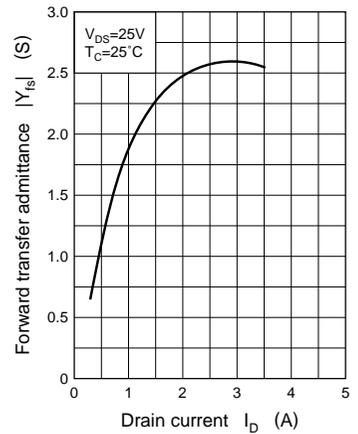
$V_{DS} - V_{GS}$

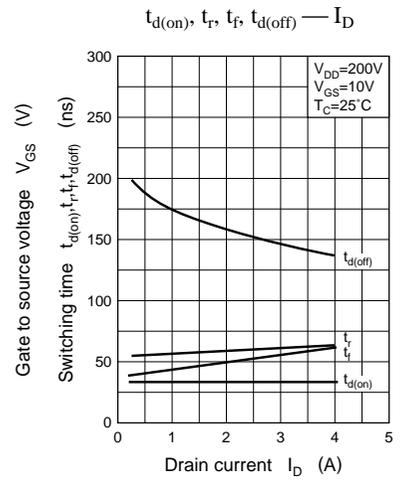
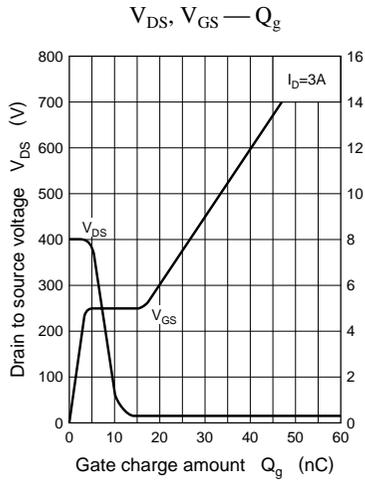
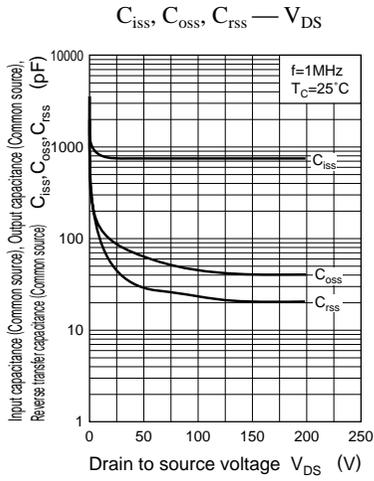


$R_{DS(on)} - I_D$



$|Y_{fs}| - I_D$





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