# 2SK2210

## Silicon N-Channel Power F-MOS

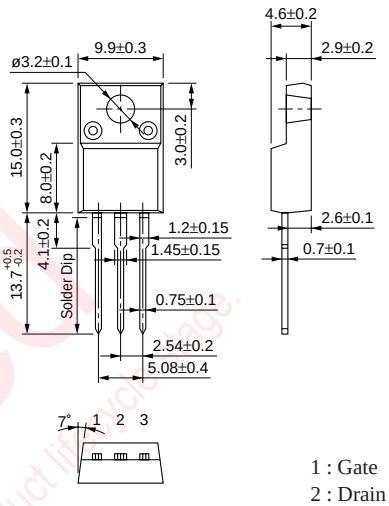
### ■ Features

- Avalanche energy capability guaranteed
- High-speed switching
- Low ON-resistance
- No secondary breakdown

### ■ Applications

- Non-contact relay
- Solenoid drive
- Motor drive
- Control equipment
- Switching mode regulator

Unit : mm




1 : Gate
2 : Drain
3 : Source
TO-220E Package

### ■ Absolute Maximum Ratings (Tc = 25˚C)

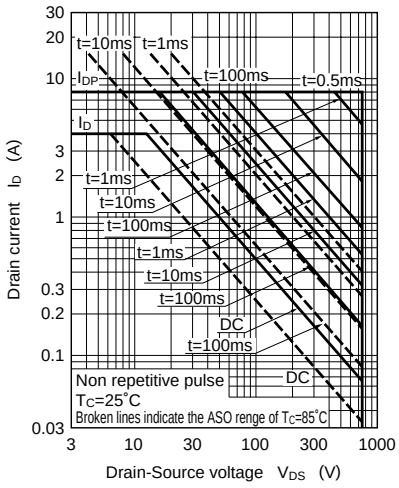
| Parameter | | Symbol | Rating | Unit |
|---|---|---|---|---|
| Drain-Source breakdown voltage | | $V_{DSS}$ | 750 | V |
| Gate-Source voltage | | $V_{GSS}$ | ±30 | V |
| Drain current | DC | $I_D$ | ±4 | A |
| | Pulse | $I_{DP}$ | ±8 | A |
| Avalanche energy capability | | EAS * | 40 | mJ |
| Allowable power dissipation | $T_C$= 25˚C | $P_D$ | 50 | W |
| | Ta= 25˚C | | 2 | |
| Channel temperature | | $T_{ch}$ | 150 | ˚C |
| Storage temperature | | $T_{stg}$ | –55 to +150 | ˚C |

* L= 5mH, $I_L$= 4A, 1 pulse

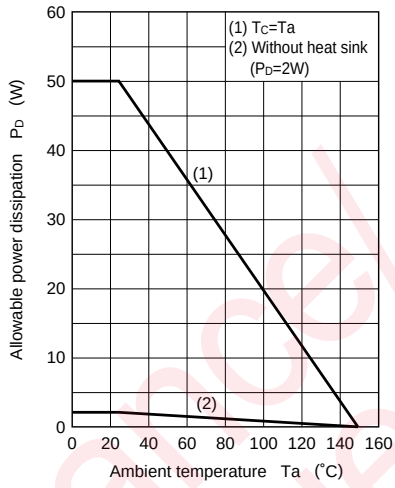
### ■ Electrical Characteristics (Tc = 25˚C)

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Drain-Source cut-off current | $I_{DSS}$ | $V_{DS}$= 600V, $V_{GS}$= 0 | | | 10 | μ A |
| Gate-Source leakage current | $I_{GSS}$ | $V_{GS}$= ±30V, $V_{DS}$= 0 | | | ±1 | μ A |
| Drain-Source breakdown voltage | $V_{DSS}$ | $I_D$=1mA, $V_{GS}$= 0 | 750 | | | V |
| Gate threshold voltage | $V_{th}$ | $V_{DS}$= 25V, $I_D$=1mA | 2 | | 4 | V |
| Drain-Source ON-resistance | $R_{DS(on)}$ | $V_{GS}$=10V, $I_D$= 2A | | 1.8 | 2.4 | Ω |
| Forward transadmittance | $\|Y_{fs}\|$ | $V_{DS}$= 25V, $I_D$= 2A | 1.3 | 2.2 | | S |
| Diode forward voltage | $V_{DSF}$ | $I_{DR}$=4A, $V_{GS}$= 0 | | | –1.6 | V |
| Input capacitance | $C_{iss}$ | $V_{DS}$= 20V, $V_{GS}$= 0, f=1MHz | | 600 | | pF |
| Output capacitance | $C_{oss}$ | | | 105 | | pF |
| Feedback capacitance | $C_{rss}$ | | | 45 | | pF |
| Turn-on time (delay time) | $t_{d(on)}$ | $V_{DD}$= 200V, $I_D$= 2A<br>$V_{GS}$=10V, $R_L$=100Ω | | 25 | | ns |
| Rise time | $t_r$ | | | 50 | | ns |
| Fall time | $t_f$ | | | 65 | | ns |
| Turn-off time (delay time) | $t_{d(off)}$ | | | 170 | | ns |
| Channel-Case heat resistance | $R_{th(ch-c)}$ | | | | 2.5 | ˚C/W |
| Channel-Atmosphere heat resistance | $R_{th(ch-a)}$ | | | | 62.5 | ˚C/W |

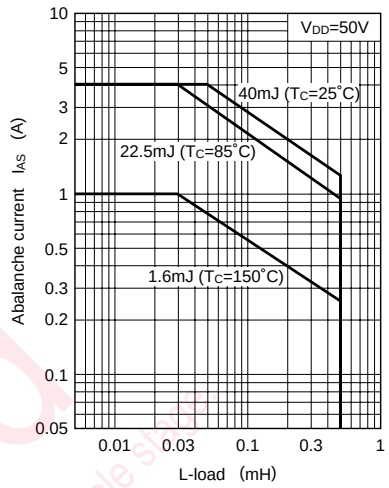
Area of safe operation (ASO)



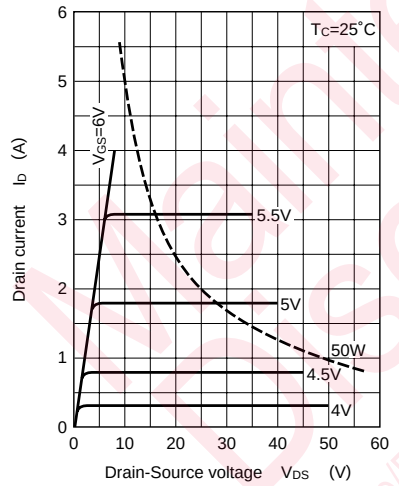

$P_D$ – Ta



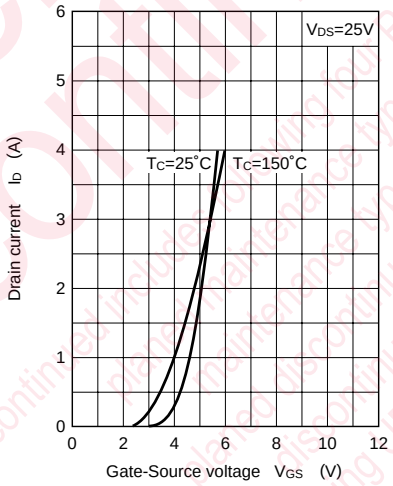

IAS – L-load



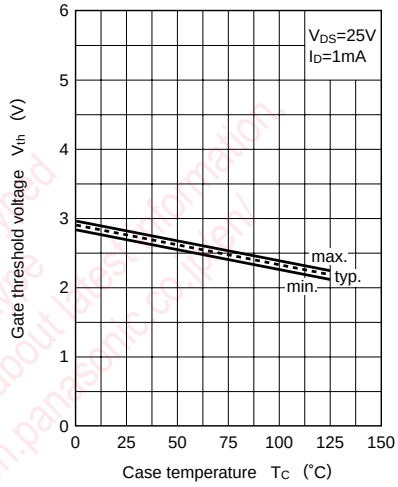

$I_D$ – $V_{DS}$



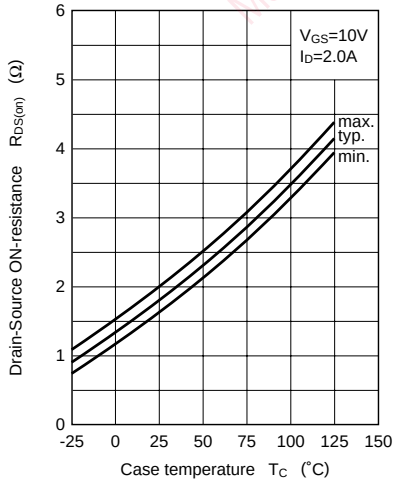

$I_D$ – $V_{GS}$



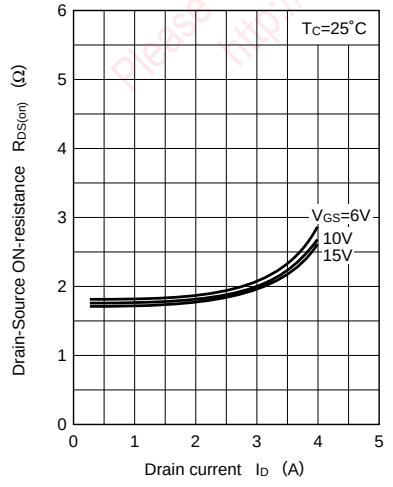

$V_{th}$ – $T_C$



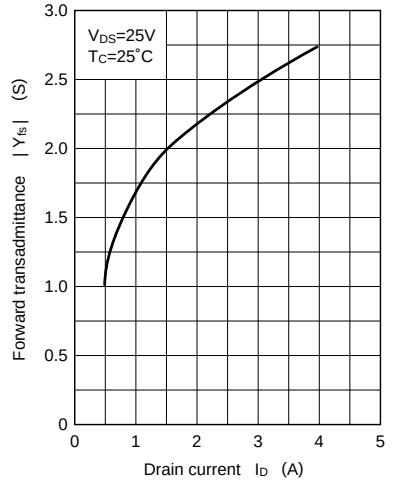

$R_{DS(on)}$ – $I_D$



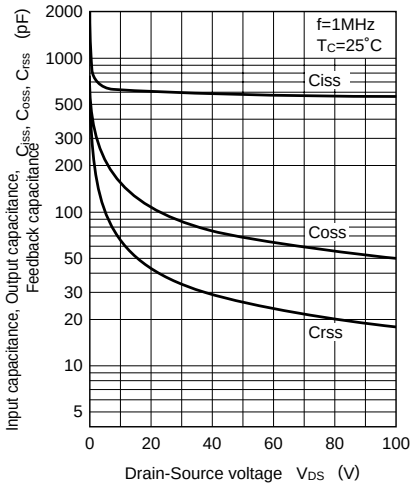

$R_{DS(on)}$ – $T_C$



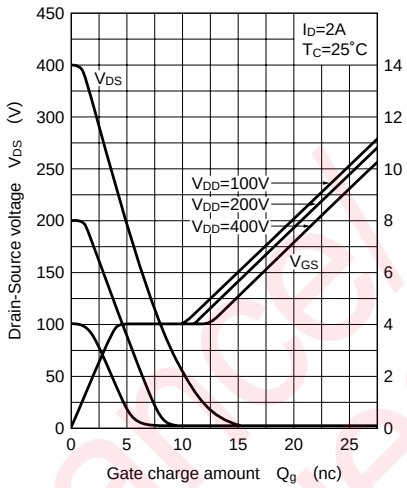

$|Y_{fs}|$ – $I_D$



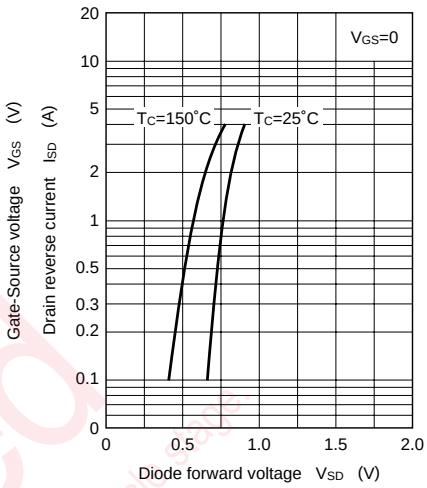
$C_{iss}, C_{oss}, C_{rss} - V_{DS}$




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




$I_{SD} - V_{SD}$



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