

2SK2339

Silicon N-Channel Power F-MOS

■ Features

- Avalanche energy capability guaranteed
- Low ON-resistance
- No secondary breakdown
- Low-voltage drive

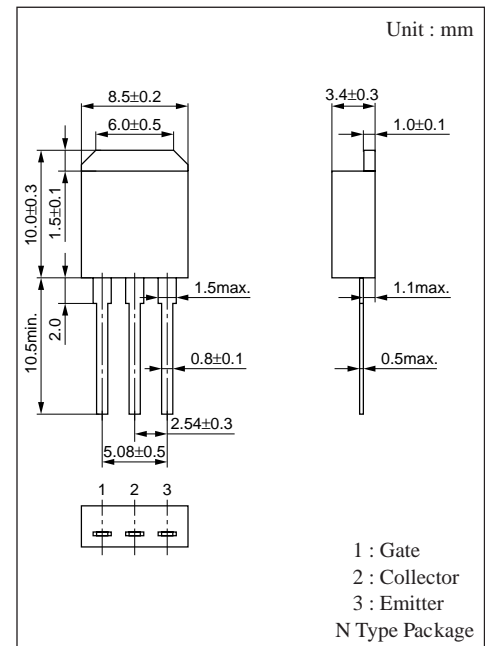
■ Applications

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

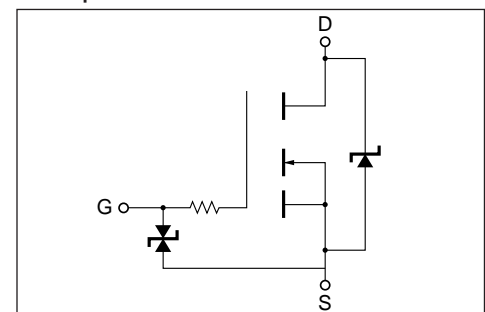
■ Absolute Maximum Ratings (T_c = 25°C)

| Parameter | Symbol | Rating | Unit | |
|--------------------------------|-----------------------|-----------------|------|---|
| Drain-Source breakdown voltage | V _{DSS} | 80±10 | V | |
| Gate-Source voltage | V _{GSS} | ±15 | V | |
| Drain current | DC | I _D | ±10 | A |
| | Pulse | I _{DP} | ±20 | A |
| Avalanche energy capability | EAS * | 62.5 | mJ | |
| Allowable power dissipation | T _c = 25°C | P _D | 30 | W |
| | T _a = 25°C | | 1.3 | |
| Channel temperature | T _{ch} | 150 | °C | |
| Storage temperature | T _{stg} | -55 to +150 | °C | |

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



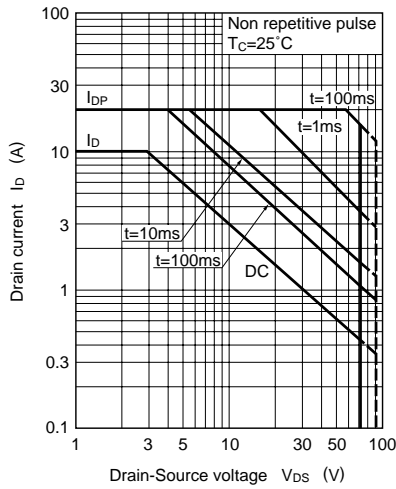
■ Equivalent Circuit



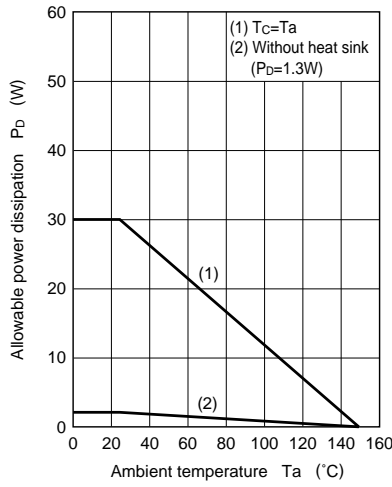
■ Electrical Characteristics (T_c = 25°C)

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|------------------------------------|-----------------------|--|-----|------|------|------|
| Drain-Source cut-off current | I _{DSS} | V _{DS} = 70V, V _{GS} = 0 | | | 10 | μ A |
| Gate-Source leakage current | I _{GSS} | V _{DS} = 0, V _{GS} =15V | | | ±10 | μ A |
| Drain-Source breakdown voltage | V _{DSS} | I _D =1mA, V _{GS} = 0 | 70 | | 90 | V |
| Gate threshold voltage | V _{th} | V _{DS} =10V, I _D =1mA | 1 | | 2.5 | V |
| Drain-Source ON-resistance | R _{DS(on)1} | V _{GS} =10V, I _D = 5A | | 150 | 230 | mΩ |
| | R _{DS(on)2} | V _{GS} = 4V, I _D = 5A | | 230 | 370 | mΩ |
| Forward transadmittance | Y _{fs} | V _{DS} =10V, I _D = 5A | 3 | 5.5 | | S |
| Diode forward voltage | V _{DSF} | I _{DR} =10A, V _{GS} = 0 | | | -1.8 | V |
| Reverse recovery time | t _{rr} | L=230μ H, V _{DD} = 30V, V _{GS} = 0 | | 0.55 | | μ s |
| Reverse recovery charge | Q _{rr} | I _{DR} =10A, di/dt= 80A/μ s | | 2.2 | | μ s |
| Input capacitance | C _{iss} | V _{DS} =10V, V _{GS} = 0, f= 1MHz | | 85 | | pF |
| Output capacitance | C _{oss} | | 250 | | pF | |
| Feedback capacitance | C _{rss} | | 20 | | pF | |
| Turn-on time | t _{on} | | | 0.5 | | μ s |
| Fall time | t _f | V _{DD} = 30V, I _D = 5A | | 0.9 | | μ s |
| Turn-off time (delay time) | t _{d(off)} | V _{GS} =10V, R _L = 6Ω | | 1.9 | | μ s |
| Channel-Case heat resistance | R _{th(ch-c)} | | | | 4.2 | °C/W |
| Channel-Atmosphere heat resistance | R _{th(ch-a)} | | | | 96 | °C/W |

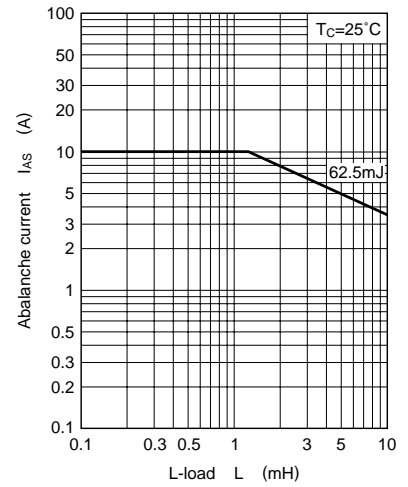
Area of safe operation (ASO)



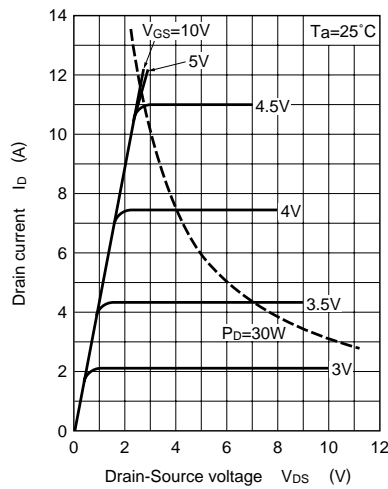
$P_D - T_a$



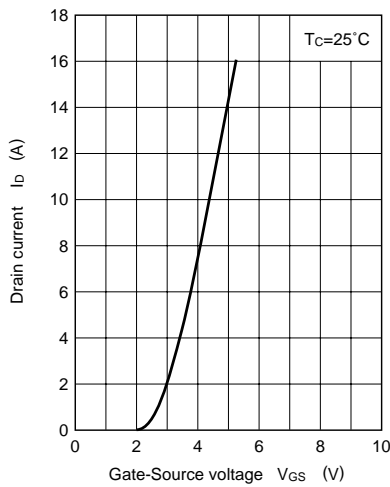
IAS - L-load



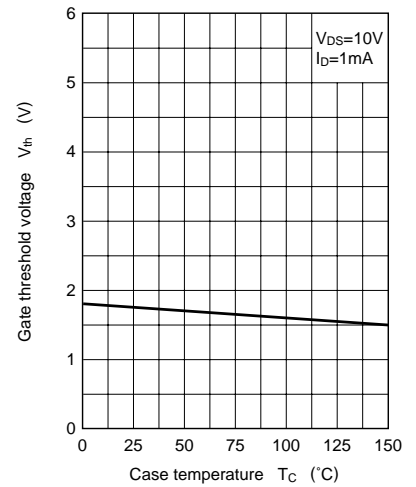
$I_D - V_{DS}$



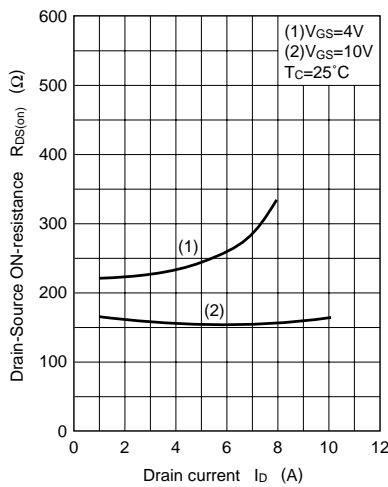
$I_D - V_{GS}$



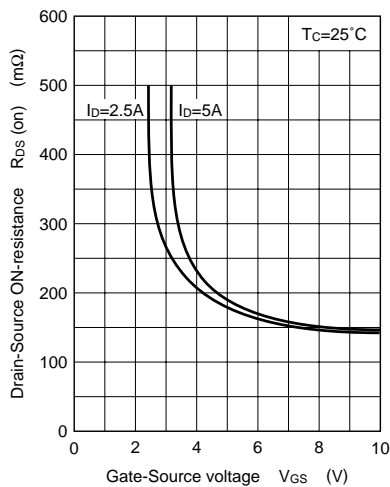
$V_{th} - T_C$



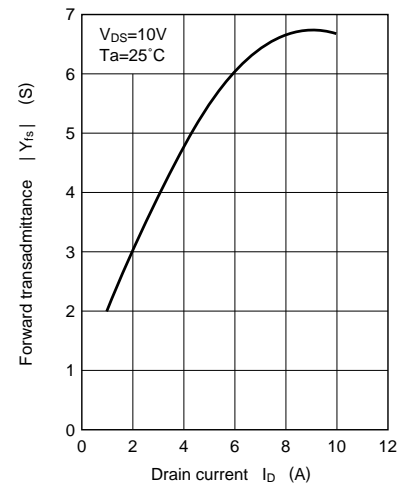
$R_{DS(on)} - I_D$



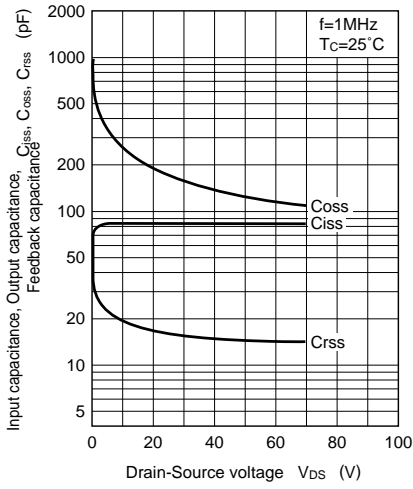
$R_{DS(on)} - V_{GS}$



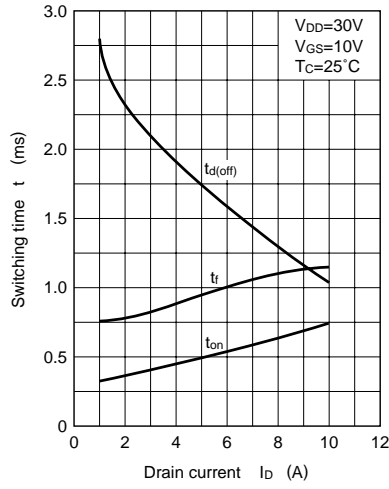
$|Y_{fs}| - I_D$



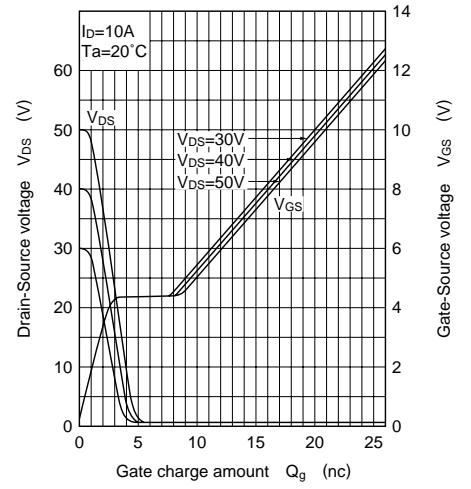
$C_{iss}, C_{oss}, C_{rss} - V_{DS}$



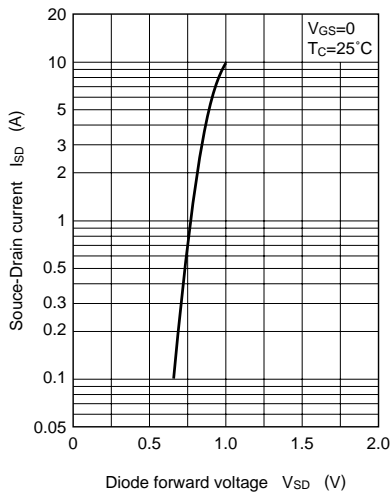
$t_{d(off)}, t_r, t_{on} - I_D$



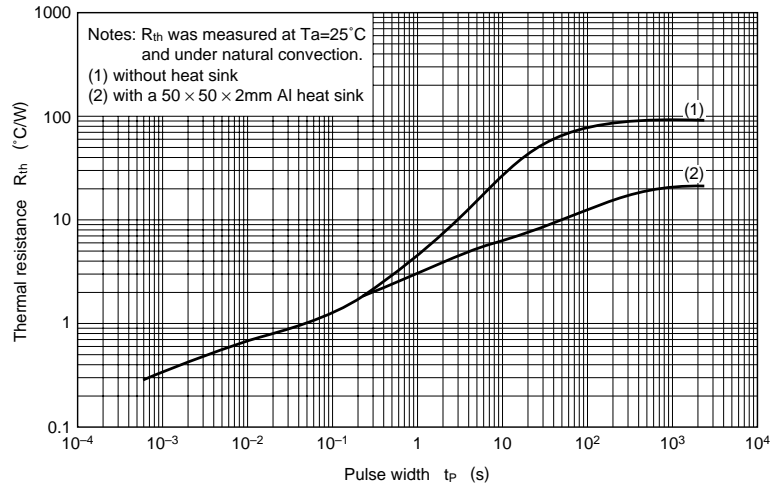
$V_{DS}, V_{GS} - Q_g$



$I_{SD} - V_{SD}$



$R_{th} - t_p$



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