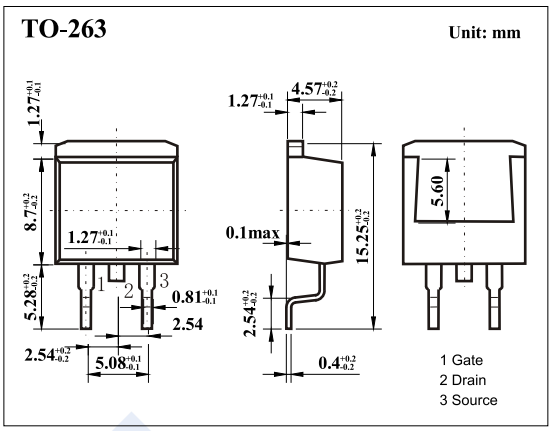
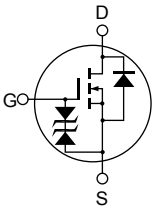
# N-Channel MOSFET
# 2SK2869-ZJ




## ■ Features

- $V_{DS\ (V)}$ = 60V
- $I_D$ = 20 A ($V_{GS}$ = 10V)
- $R_{DS(ON)}$ < 45mΩ ($V_{GS}$ = 10V)
- $R_{DS(ON)}$ < 70mΩ ($V_{GS}$ = 4V)
- High speed switching




## ■ Absolute Maximum Ratings Ta = 25℃

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 60 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | |
| Continuous Drain Current | $I_D$ | 20 | A |
| Pulsed Drain Current (Note.1) | $I_{DM}$ | 80 | |
| Body to Drain Diode Reverse Drain Current | $I_{DR}$ | 20 | |
| Avalanche Current (Note.2) | $I_{AR}$ | 20 | |
| Power Dissipation (Note.3) | $P_D$ | 30 | W |
| Avalanche Energy (Note.2) | $E_{AR}$ | 34 | mJ |
| Junction Temperature | $T_J$ | 150 | ℃ |
| Storage Temperature Range | $T_{stg}$ | -55 to 150 | |

Note.1: PW ≤ 10us, duty cycle ≤ 1 %

Note.2: Value at Tch = 25°C, Rg ≥ 50 Ω

Note.3: Value at Tc = 25°C

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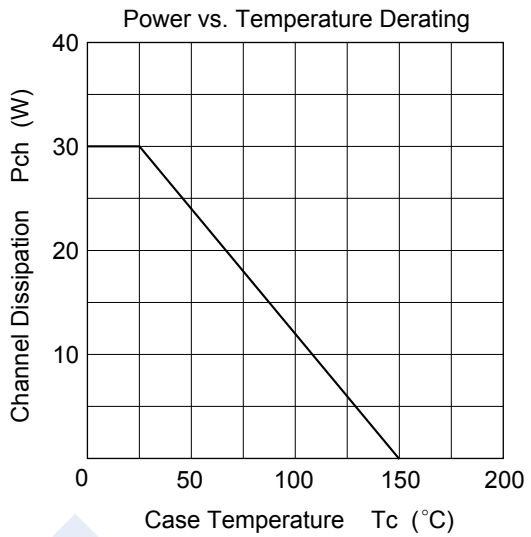
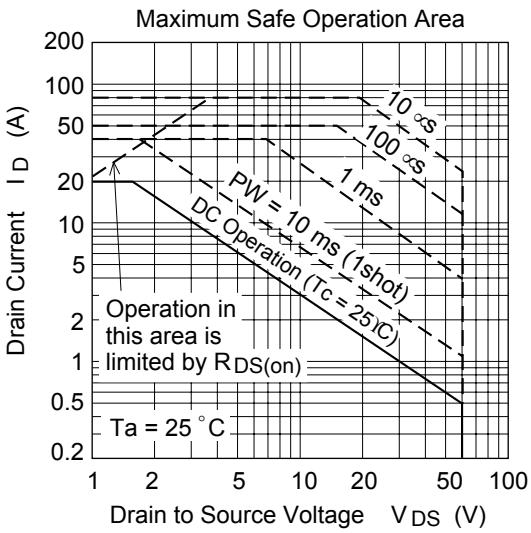
■ Electrical Characteristics Ta = 25℃

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $V_{DSS}$ | $I_D$=10mA, $V_{GS}$=0V | 60 | | | V |
| Gate-Source Breakdown Voltage | $V_{GSS}$ | $I_D$=±100uA, $V_{DS}$=0V | ±20 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=60V, $V_{GS}$=0V | | | 10 | uA |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{DS}$=0V, $V_{GS}$=±16V | | | ±10 | uA |
| Gate to Source Cutoff Voltage | $V_{GS(off)}$ | $V_{DS}$=10V, $I_D$=1mA | 1.5 | | 2.5 | V |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}$=10V, $I_D$=10A | | | 45 | mΩ |
| | | $V_{GS}$=4V, $I_D$=10A | | | 70 | |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$=10V, $I_D$=10A | 10 | 16 | | S |
| Input Capacitance | $C_{iss}$ | $V_{GS}$=0V, $V_{DS}$=10V, f=1MHz | | 740 | | pF |
| Output Capacitance | $C_{oss}$ | | | 380 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 140 | | |
| Turn-On DelayTime | $t_{d(on)}$ | $V_{GS}$=10V, $I_D$=10A, $R_L$=3Ω | | 10 | | ns |
| Turn-On Rise Time | $t_r$ | | | 110 | | |
| Turn-Off DelayTime | $t_{d(off)}$ | | | 105 | | |
| Turn-Off Fall Time | $t_f$ | | | 120 | | |
| Body Diode Reverse Recovery Time | $t_{rr}$ | $I_F$= 20A, $V_{GS}$=0, $di/dt$= 50 A/μs | | 40 | | |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=20A,$V_{GS}$=0V | | 1 | | V |

■ Typical Characterisitics



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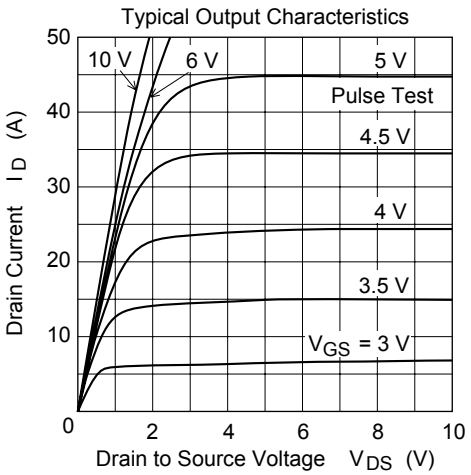


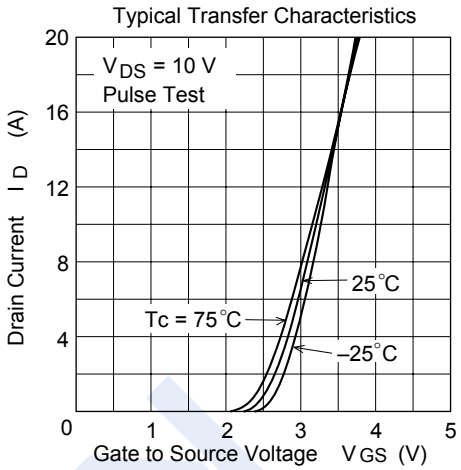


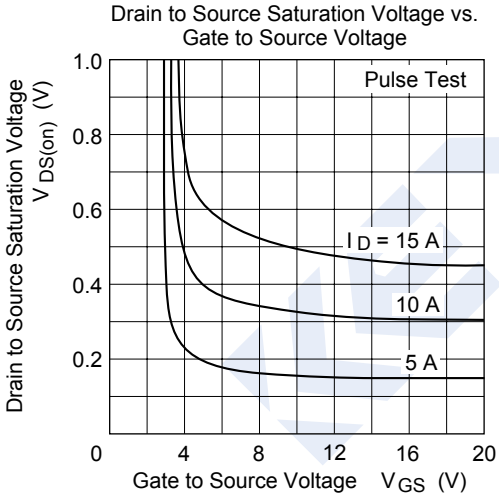


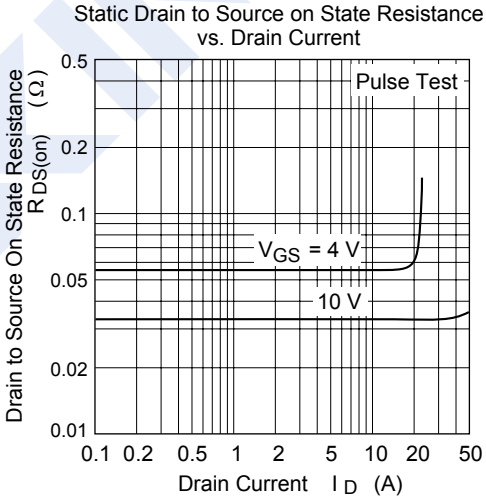


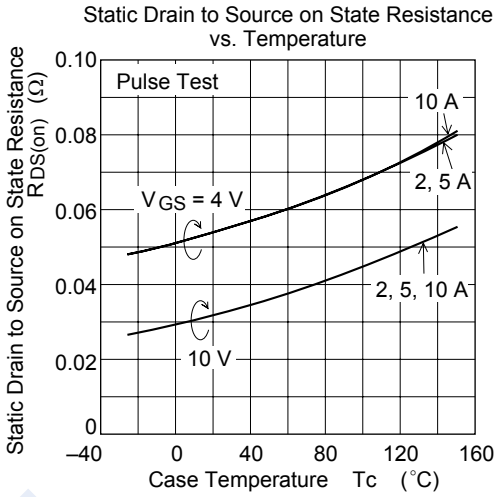


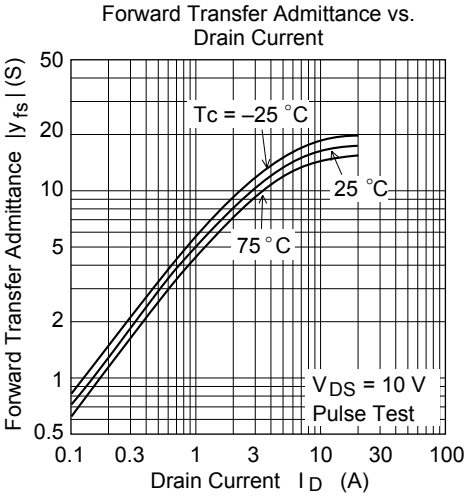

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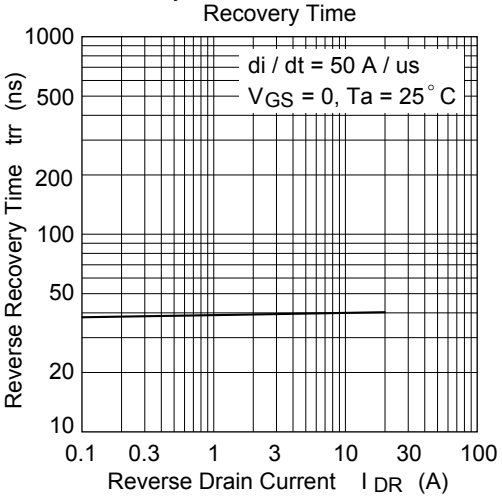
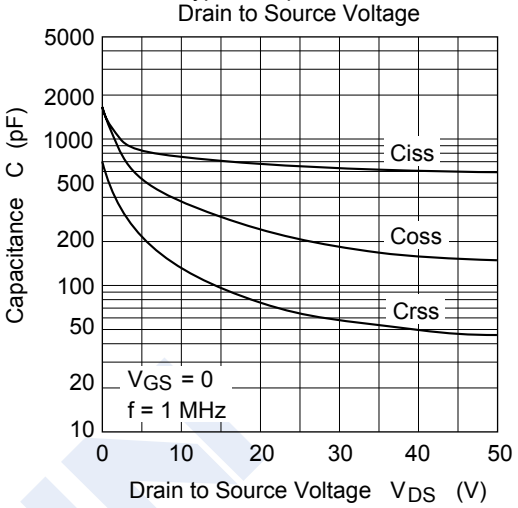
■ Typical Characterisitics

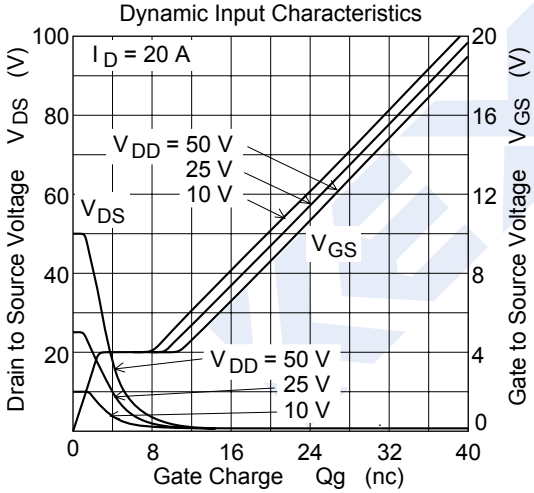
Body to Drain Diode Reverse Recovery Time



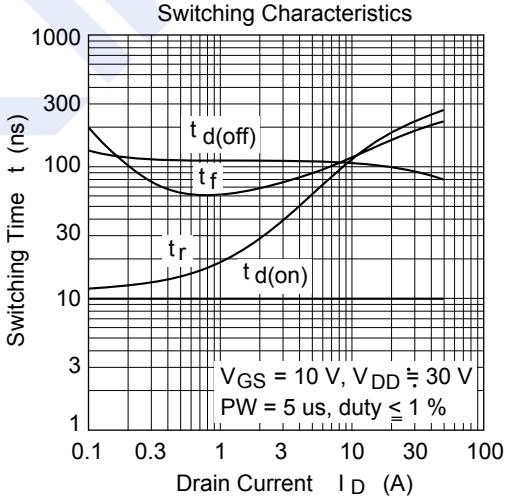

Typical Capacitance vs. Drain to Source Voltage



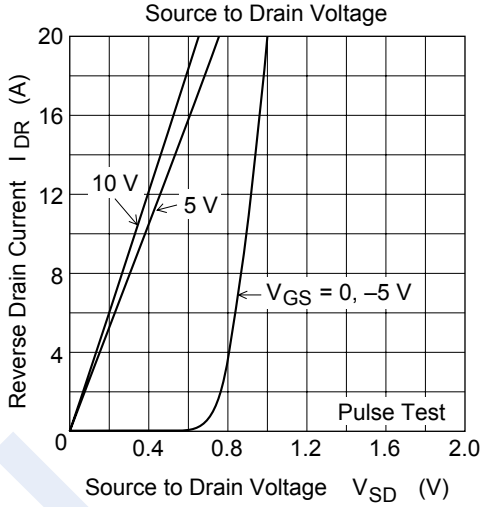

Dynamic Input Characteristics



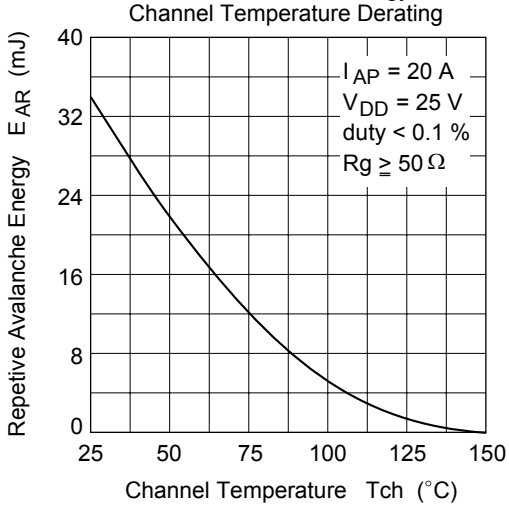

Switching Characteristics




Reverse Drain Current vs. Source to Drain Voltage




Maximun Avalanche Energy vs. Channel Temperature Derating



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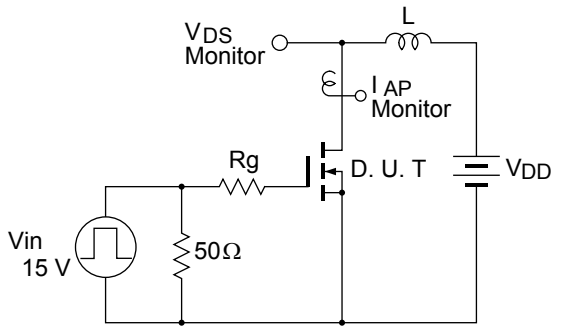
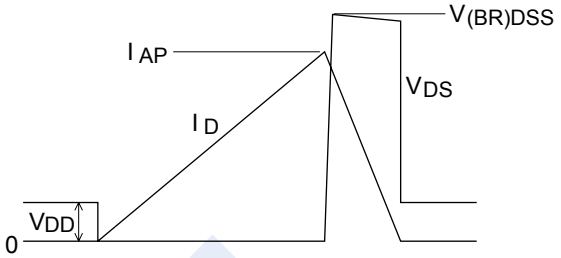
■ Typical Characterisitics

Avalanche Test Circuit

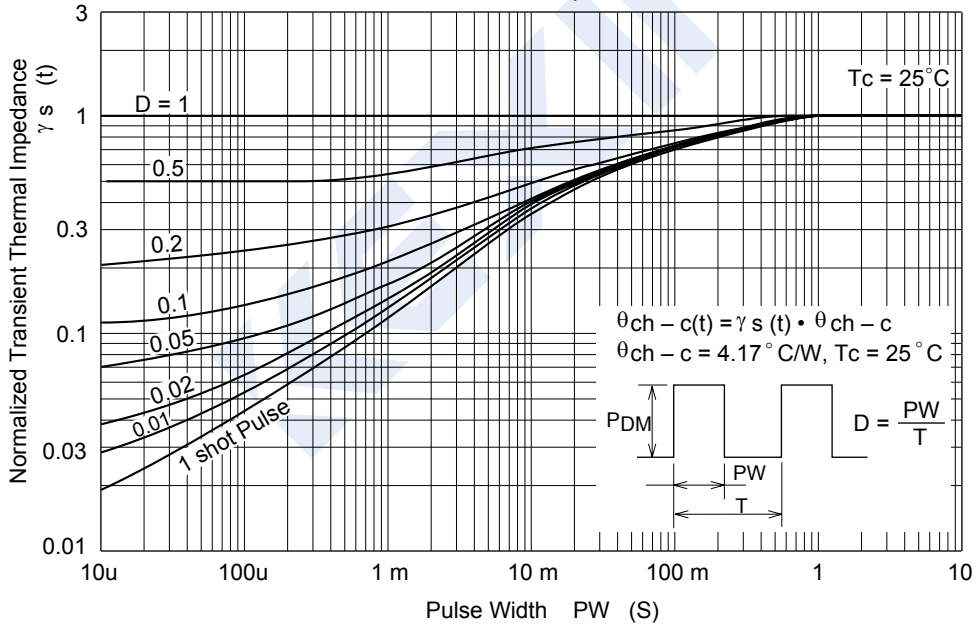



Avalanche Waveform

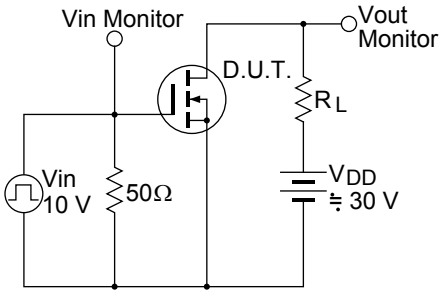
$$E_{AR} = \frac{1}{2} \cdot L \cdot I_{AP}^2 \cdot \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$




Normalized Transient Thermal Impedance vs. Pulse Width




Switching Time Test Circuit




Waveform