

# FS30KMJ-2

HIGH-SPEED SWITCHING USE

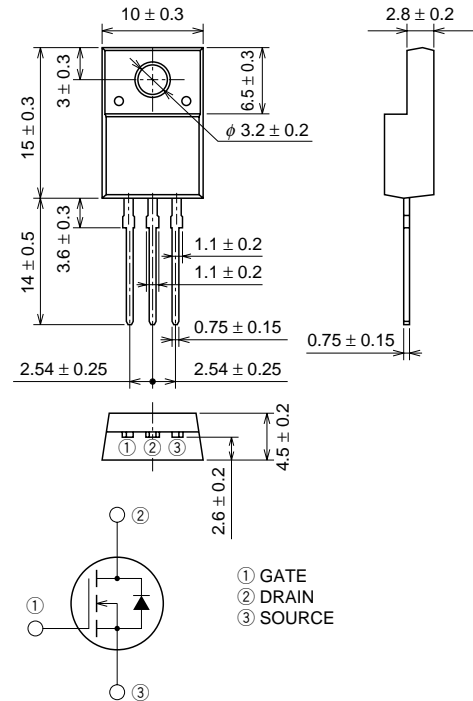
## FS30KMJ-2



- 4V DRIVE
- $V_{DSS}$  ..... 100V
- $r_{DS(ON)}$  (MAX) ..... 84mΩ
- $I_D$  ..... 30A
- Integrated Fast Recovery Diode (TYP.) ..... 80ns
- $V_{iso}$  ..... 2000V

## OUTLINE DRAWING

Dimensions in mm



TO-220FN

## APPLICATION

Motor control, Lamp control, Solenoid control  
DC-DC converter, etc.

## MAXIMUM RATINGS (Tc = 25°C)

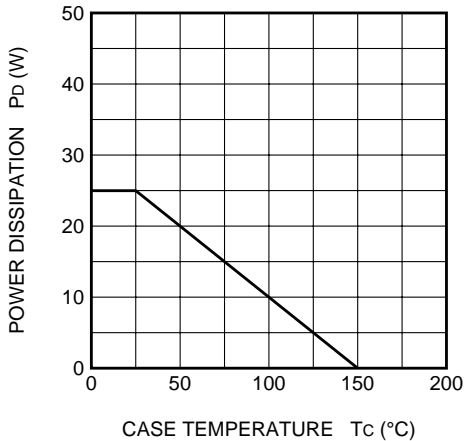
| Symbol    | Parameter                        | Conditions                       | Ratings    | Unit |
|-----------|----------------------------------|----------------------------------|------------|------|
| $V_{DSS}$ | Drain-source voltage             | $V_{GS} = 0V$                    | 100        | V    |
| $V_{GSS}$ | Gate-source voltage              | $V_{DS} = 0V$                    | ±20        | V    |
| $I_D$     | Drain current                    |                                  | 30         | A    |
| $I_{DM}$  | Drain current (Pulsed)           |                                  | 120        | A    |
| $I_{DA}$  | Avalanche drain current (Pulsed) | $L = 100\mu H$                   | 30         | A    |
| $I_S$     | Source current                   |                                  | 30         | A    |
| $I_{SM}$  | Source current (Pulsed)          |                                  | 120        | A    |
| $P_D$     | Maximum power dissipation        |                                  | 25         | W    |
| $T_{ch}$  | Channel temperature              |                                  | -55 ~ +150 | °C   |
| $T_{stg}$ | Storage temperature              |                                  | -55 ~ +150 | °C   |
| $V_{iso}$ | Isolation voltage                | AC for 1minute, Terminal to case | 2000       | V    |
| —         | Weight                           | Typical value                    | 2.0        | g    |

**ELECTRICAL CHARACTERISTICS** (Tch = 25°C)

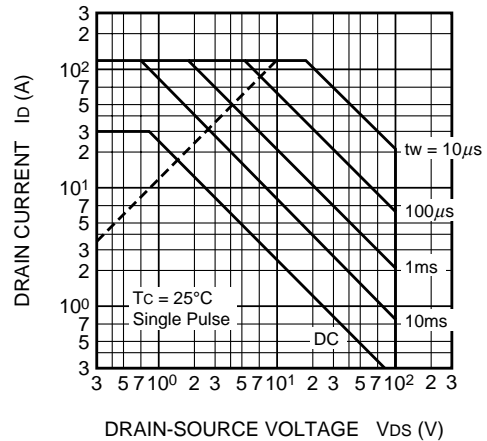
| Symbol    | Parameter                        | Test conditions                                  | Limits |      |      | Unit |
|-----------|----------------------------------|--|--------|------|------|------|
|           |                                  |  | Min.   | Typ. | Max. |      |
| V(BR)DSS  | Drain-source breakdown voltage   | ID = 1mA, VGS = 0V                               | 100    | —    | —    | V    |
| IGSS      | Gate-source leakage current      | VGS = ±20V, VDS = 0V                             | —      | —    | ±0.1 | μA   |
| IDSS      | Drain-source leakage current     | VDS = 100V, VGS = 0V                             | —      | —    | 0.1  | mA   |
| VGS(th)   | Gate-source threshold voltage    | ID = 1mA, VDS = 10V                              | 1.0    | 1.5  | 2.0  | V    |
| rDS(ON)   | Drain-source on-state resistance | ID = 15A, VGS = 10V                              | —      | 65   | 84   | mΩ   |
| rDS(ON)   | Drain-source on-state resistance | ID = 15A, VGS = 4V                               | —      | 70   | 91   | mΩ   |
| VDS(ON)   | Drain-source on-state voltage    | ID = 15A, VGS = 10V                              | —      | 0.98 | 1.26 | V    |
| yfs       | Forward transfer admittance      | ID = 15A, VDS = 10V                              | —      | 23   | —    | S    |
| Ciss      | Input capacitance                | VDS = 10V, VGS = 0V, f = 1MHz                    | —      | 1800 | —    | pF   |
| Coss      | Output capacitance               |  | —      | 230  | —    | pF   |
| Crss      | Reverse transfer capacitance     |  | —      | 120  | —    | pF   |
| td(on)    | Turn-on delay time               | VDD = 50V, ID = 15A, VGS = 10V, RGEN = RGS = 50Ω | —      | 17   | —    | ns   |
| tr        | Rise time                        |  | —      | 46   | —    | ns   |
| td(off)   | Turn-off delay time              |  | —      | 135  | —    | ns   |
| tf        | Fall time                        |  | —      | 95   | —    | ns   |
| VSD       | Source-drain voltage             | IS = 15A, VGS = 0V                               | —      | 1.0  | 1.5  | V    |
| Rth(ch-c) | Thermal resistance               | Channel to case                                  | —      | —    | 5.00 | °C/W |
| trr       | Reverse recovery time            | IS = 30A, dis/dt = -100A/μs                      | —      | 80   | —    | ns   |

**PERFORMANCE CURVES**

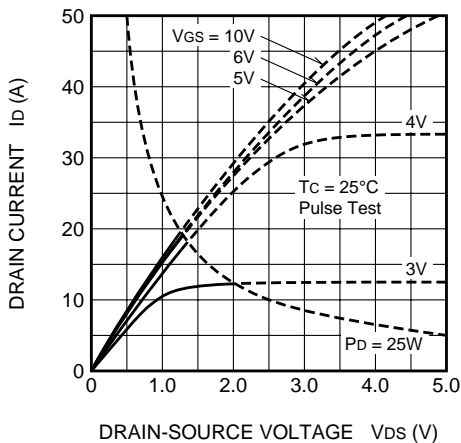
**POWER DISSIPATION DERATING CURVE**



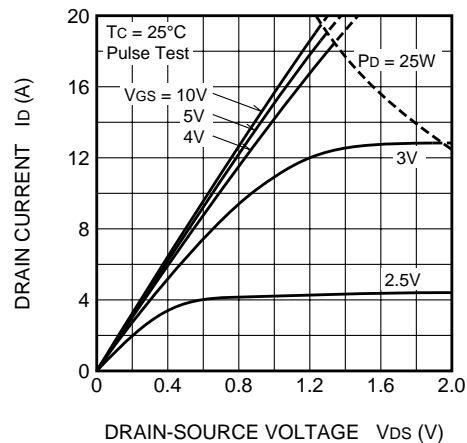
**MAXIMUM SAFE OPERATING AREA**



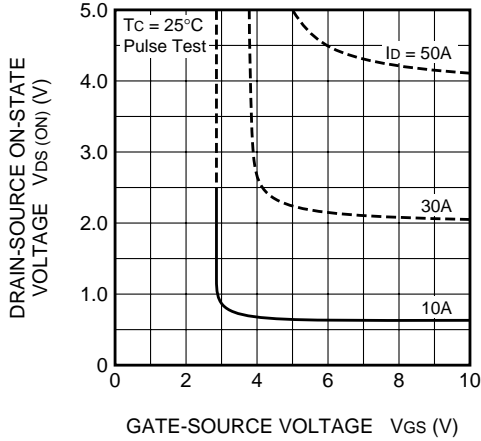
**OUTPUT CHARACTERISTICS (TYPICAL)**



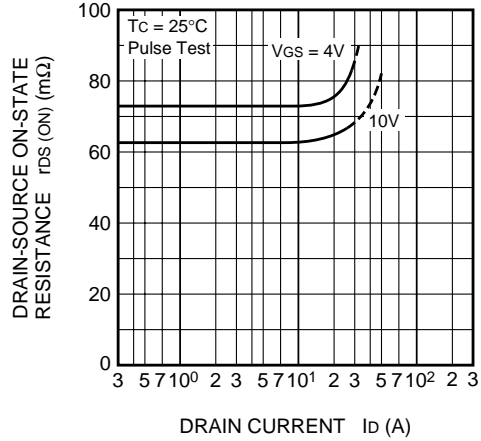
**OUTPUT CHARACTERISTICS (TYPICAL)**



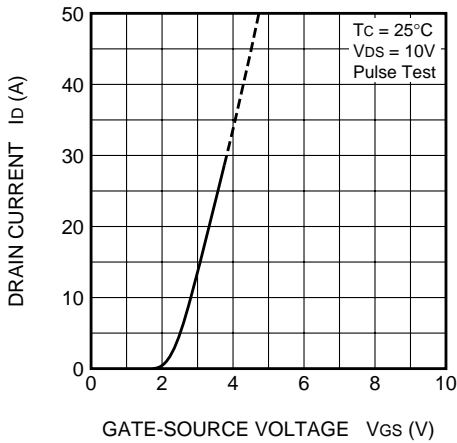
ON-STATE VOLTAGE VS. GATE-SOURCE VOLTAGE (TYPICAL)



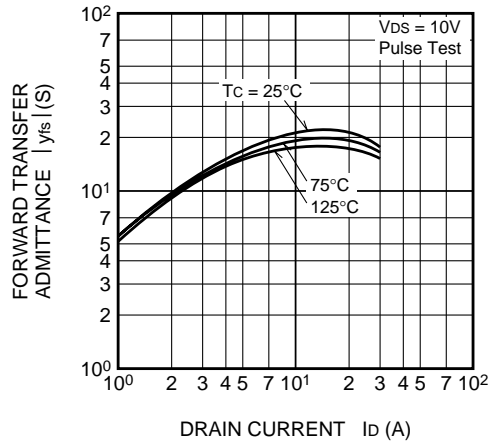
ON-STATE RESISTANCE VS. DRAIN CURRENT (TYPICAL)



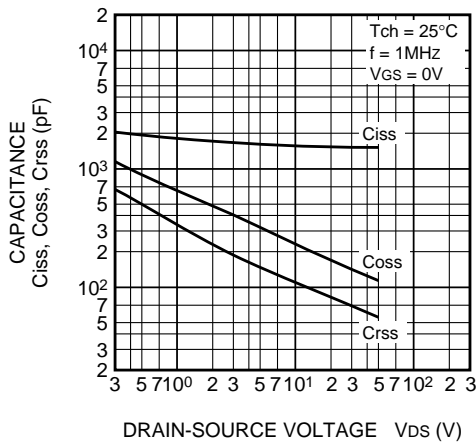
TRANSFER CHARACTERISTICS (TYPICAL)



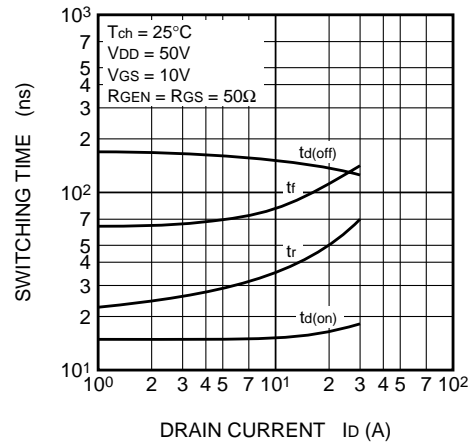
FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT (TYPICAL)



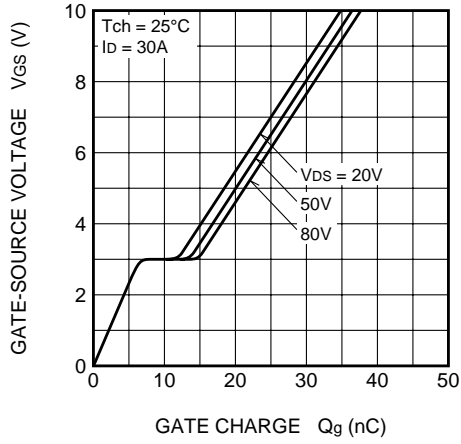
CAPACITANCE VS. DRAIN-SOURCE VOLTAGE (TYPICAL)



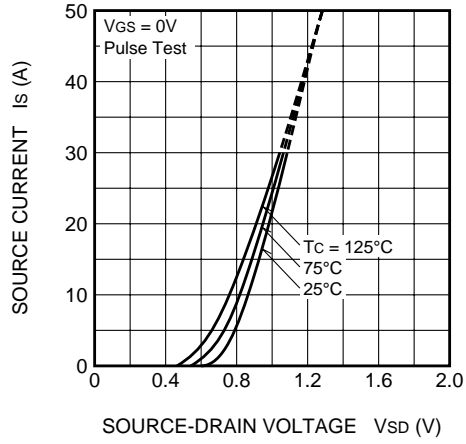
SWITCHING CHARACTERISTICS (TYPICAL)



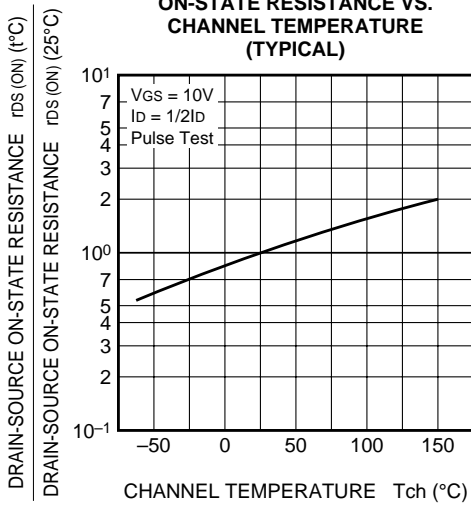
**GATE-SOURCE VOLTAGE VS. GATE CHARGE (TYPICAL)**



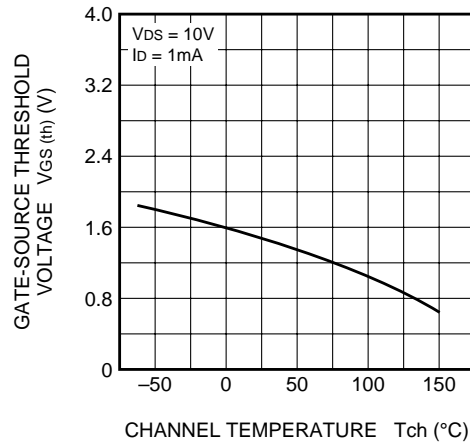
**SOURCE-DRAIN DIODE FORWARD CHARACTERISTICS (TYPICAL)**



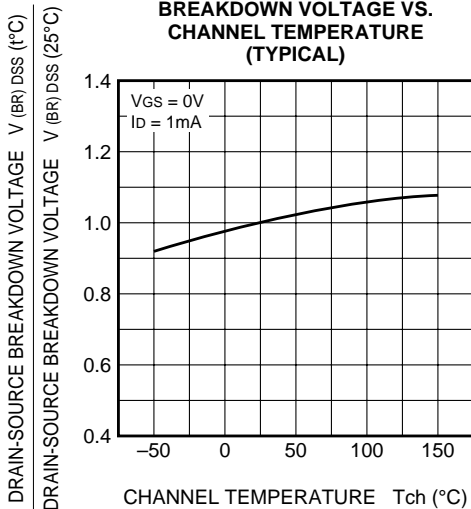
**ON-STATE RESISTANCE VS. CHANNEL TEMPERATURE (TYPICAL)**



**THRESHOLD VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)**



**BREAKDOWN VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)**



**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS**

