

# FS30KM-06

HIGH-SPEED SWITCHING USE

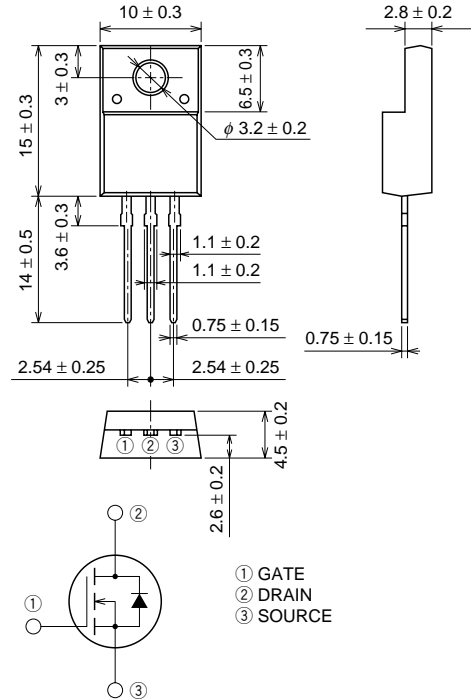
## FS30KM-06



- 10V DRIVE
- $V_{DSS}$  ..... 60V
- $r_{DS(ON)}$  (MAX) ..... 30m $\Omega$
- $I_D$  ..... 30A
- Integrated Fast Recovery Diode (TYP.) ..... 65ns
- $V_{iso}$  ..... 2000V

## OUTLINE DRAWING

Dimensions in mm



TO-220FN

## APPLICATION

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

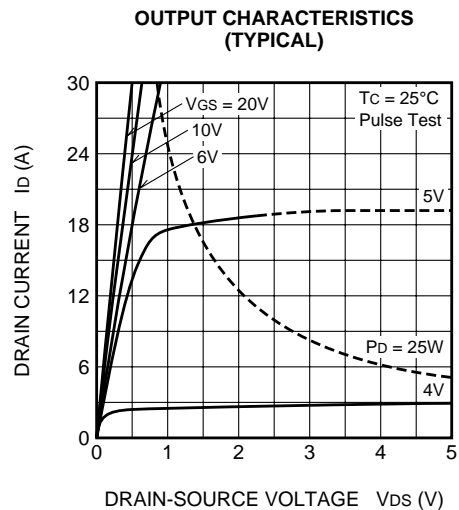
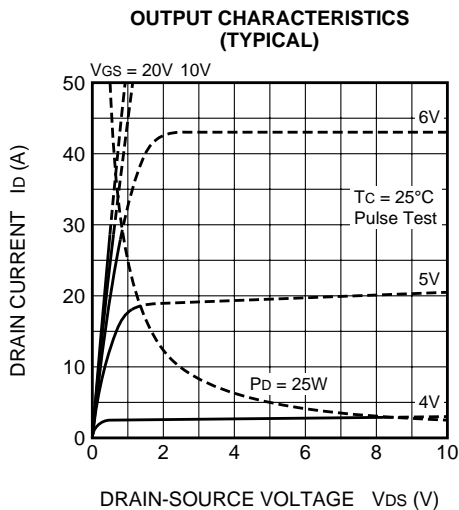
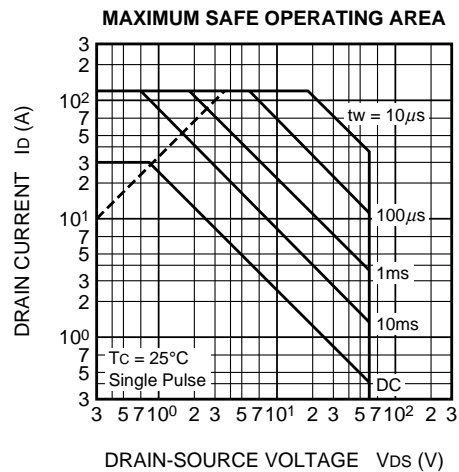
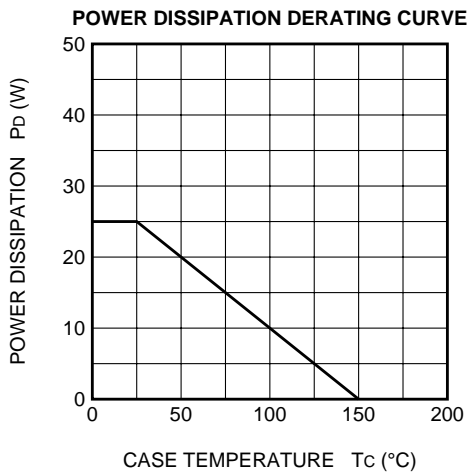
## MAXIMUM RATINGS (Tc = 25°C)

| Symbol    | Parameter                        | Conditions                       | Ratings    | Unit |
|-----------|----------------------------------|----------------------------------|------------|------|
| $V_{DSS}$ | Drain-source voltage             | $V_{GS} = 0V$                    | 60         | V    |
| $V_{GSS}$ | Gate-source voltage              | $V_{DS} = 0V$                    | $\pm 20$   | 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    |

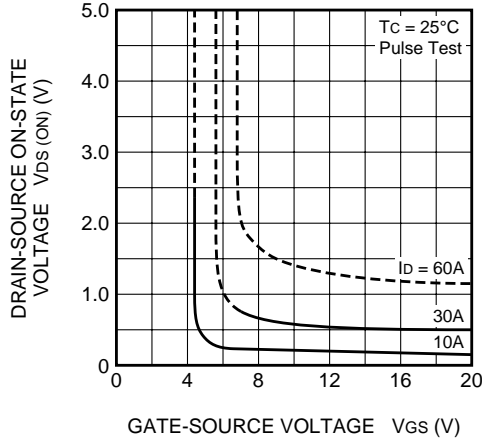
**ELECTRICAL CHARACTERISTICS** (Tch = 25°C)

| Symbol    | Parameter                        | Test conditions                                  | Limits |       |       | Unit |
|-----------|----------------------------------|--|--------|-------|-------|------|
|           |                                  |  | Min.   | Typ.  | Max.  |      |
| V(BR)DSS  | Drain-source breakdown voltage   | ID = 1mA, VGS = 0V                               | 60     | —     | —     | V    |
| IGSS      | Gate-source leakage current      | VGS = ±20V, VDS = 0V                             | —      | —     | ±0.1  | μA   |
| IDSS      | Drain-source leakage current     | VDS = 60V, VGS = 0V                              | —      | —     | 0.1   | mA   |
| VGS(th)   | Gate-source threshold voltage    | ID = 1mA, VDS = 10V                              | 2.0    | 3.0   | 4.0   | V    |
| rDS(ON)   | Drain-source on-state resistance | ID = 15A, VGS = 10V                              | —      | 23    | 30    | mΩ   |
| VDS(ON)   | Drain-source on-state voltage    | ID = 15A, VGS = 10V                              | —      | 0.345 | 0.450 | V    |
| yfs       | Forward transfer admittance      | ID = 15A, VDS = 10V                              | 14     | 20    | —     | S    |
| Ciss      | Input capacitance                | VDS = 10V, VGS = 0V, f = 1MHz                    | —      | 1250  | —     | pF   |
| Coss      | Output capacitance               |  | —      | 310   | —     | pF   |
| Crss      | Reverse transfer capacitance     |  | —      | 150   | —     | pF   |
| td(on)    | Turn-on delay time               | VDD = 30V, ID = 15A, VGS = 10V, RGEN = RGS = 50Ω | —      | 20    | —     | ns   |
| tr        | Rise time                        |  | —      | 50    | —     | ns   |
| td(off)   | Turn-off delay time              |  | —      | 60    | —     | ns   |
| tf        | Fall time                        |  | —      | 60    | —     | 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                      | —      | 65    | —     | ns   |

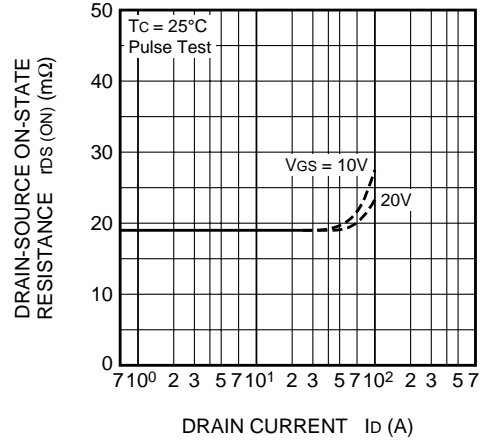
**PERFORMANCE CURVES**



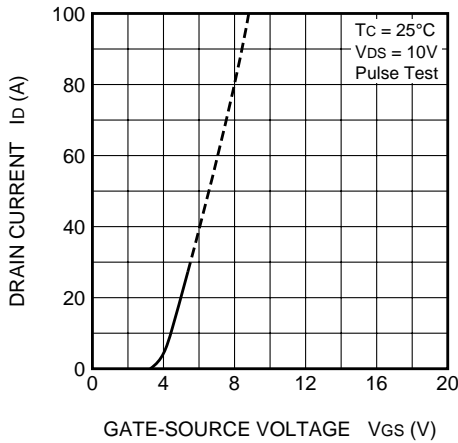
ON-STATE VOLTAGE VS. GATE-SOURCE VOLTAGE (TYPICAL)



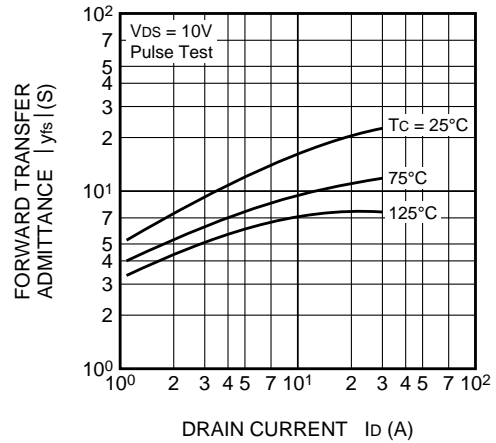
ON-STATE RESISTANCE VS. DRAIN CURRENT (TYPICAL)



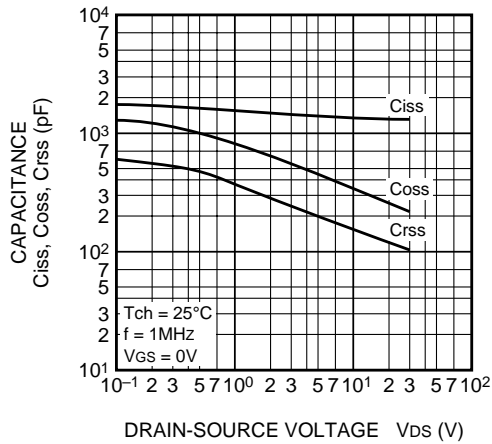
TRANSFER CHARACTERISTICS (TYPICAL)



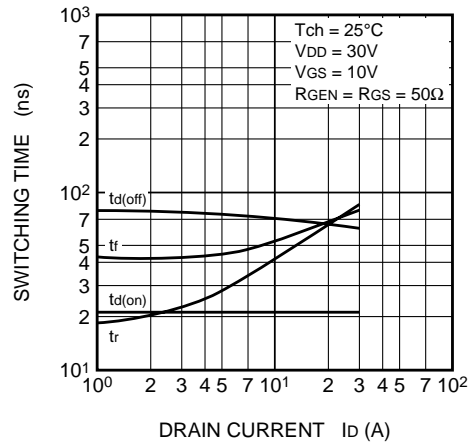
FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT (TYPICAL)



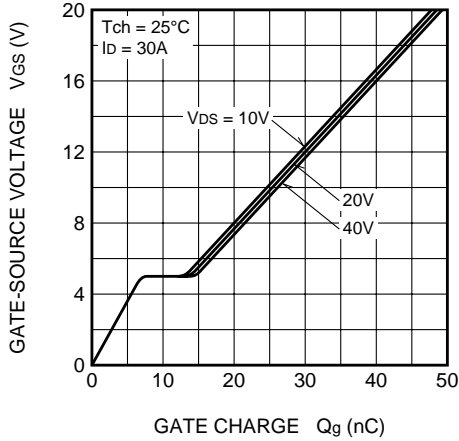
CAPACITANCE VS. DRAIN-SOURCE VOLTAGE (TYPICAL)



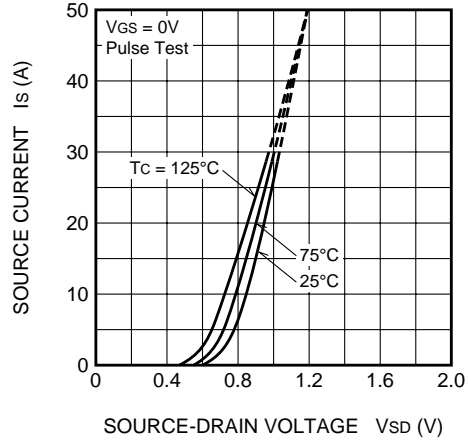
SWITCHING CHARACTERISTICS (TYPICAL)



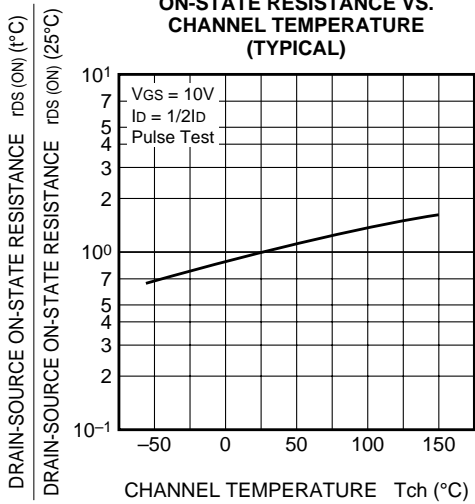
GATE-SOURCE VOLTAGE VS. GATE CHARGE (TYPICAL)



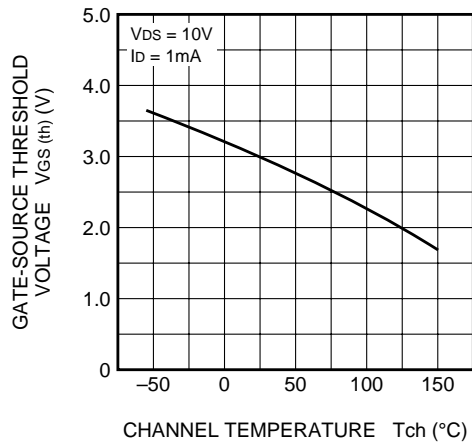
SOURCE-DRAIN DIODE FORWARD CHARACTERISTICS (TYPICAL)



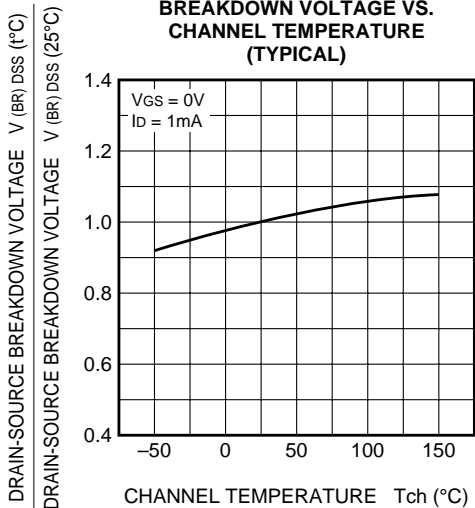
ON-STATE RESISTANCE VS. CHANNEL TEMPERATURE (TYPICAL)



THRESHOLD VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



BREAKDOWN VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS

