

MITSUBISHI Nch POWER MOSFET

# FS50KM-06

HIGH-SPEED SWITCHING USE

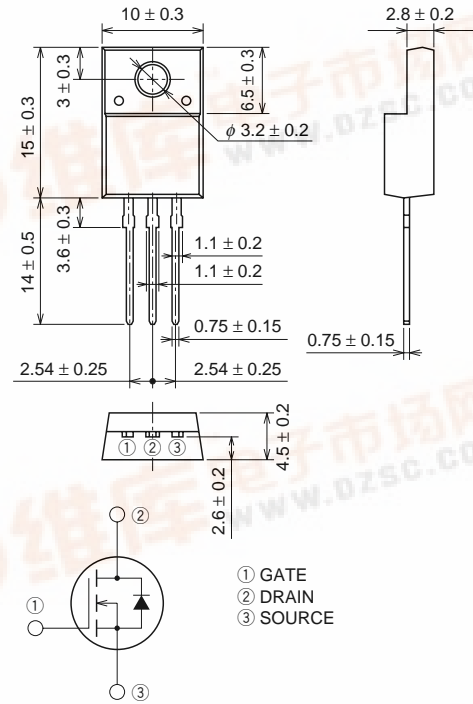
## FS50KM-06



- 10V DRIVE
- V<sub>DSS</sub> ..... 60V
- r<sub>DS (ON)</sub> (MAX) ..... 22mΩ
- I<sub>D</sub> ..... 50A
- Integrated Fast Recovery Diode (TYP.) ..... 65ns
- V<sub>iso</sub> ..... 2000V

## OUTLINE DRAWING

Dimensions in mm



## APPLICATION

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

## MAXIMUM RATINGS (T<sub>c</sub> = 25°C)

| Symbol           | Parameter                        | Conditions                       | Ratings    | Unit |
|------------------|----------------------------------|----------------------------------|------------|------|
| V <sub>DSS</sub> | Drain-source voltage             | V <sub>GS</sub> = 0V             | 60         | V    |
| V <sub>GSS</sub> | Gate-source voltage              | V <sub>DS</sub> = 0V             | ±20        | V    |
| I <sub>D</sub>   | Drain current                    |                                  | 50         | A    |
| I <sub>DM</sub>  | Drain current (Pulsed)           |                                  | 200        | A    |
| I <sub>DA</sub>  | Avalanche drain current (Pulsed) | L = 100μH                        | 50         | A    |
| I <sub>S</sub>   | Source current                   |                                  | 50         | A    |
| I <sub>SM</sub>  | Source current (Pulsed)          |                                  | 200        | A    |
| P <sub>D</sub>   | Maximum power dissipation        |                                  | 30         | W    |
| T <sub>ch</sub>  | Channel temperature              |                                  | -55 ~ +150 | °C   |
| T <sub>stg</sub> | Storage temperature              |                                  | -55 ~ +150 | °C   |
| V <sub>iso</sub> | Isolation voltage                | AC for 1minute, Terminal to case | 2000       | V    |
| —                | Weight                           | Typical value                    | 2.0        | g    |

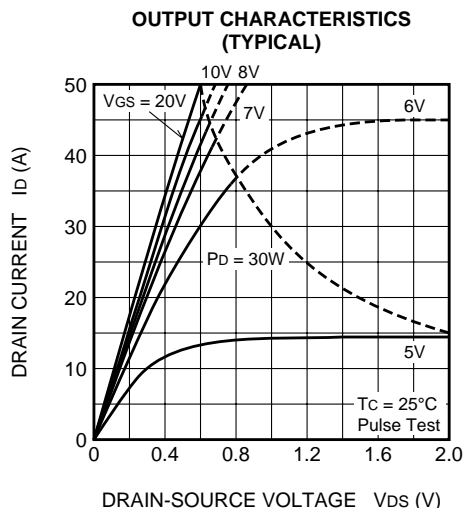
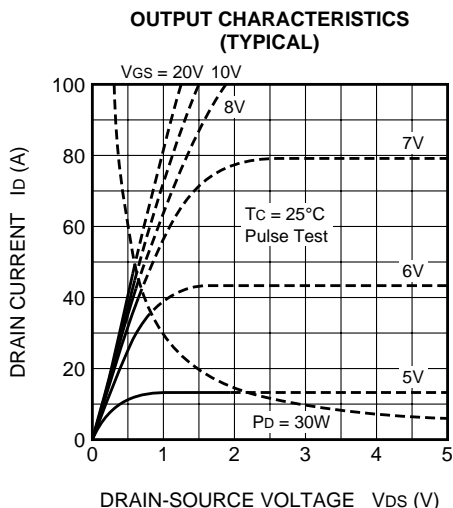
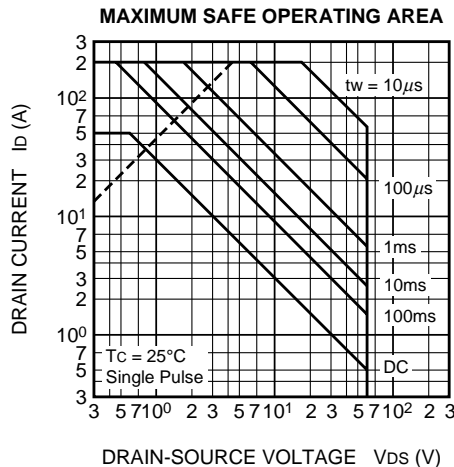
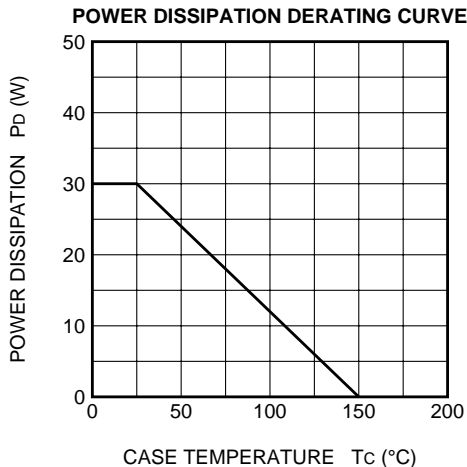
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## ELECTRICAL CHARACTERISTICS (Tch = 25°C)

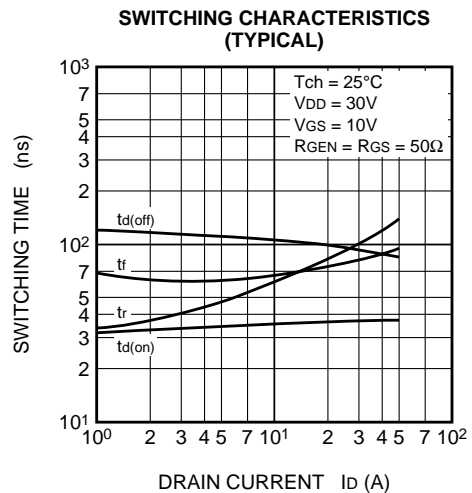
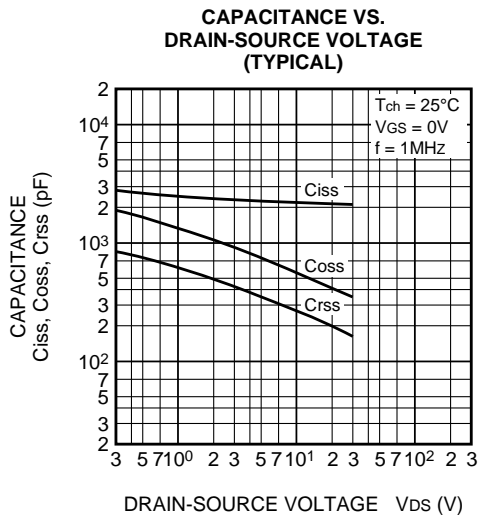
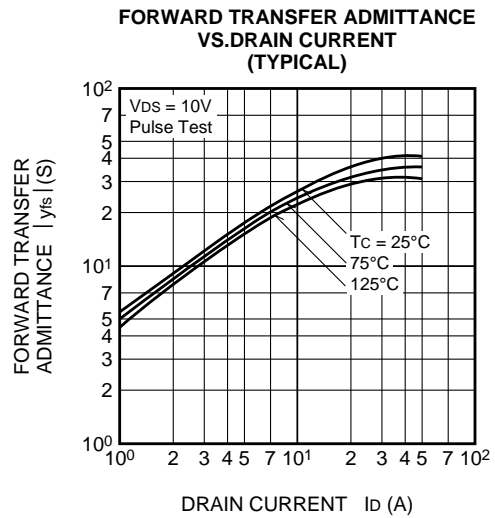
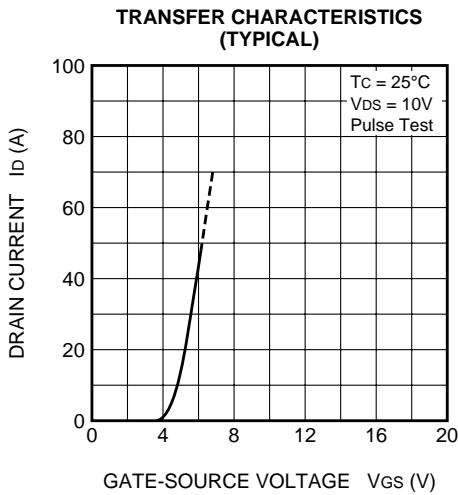
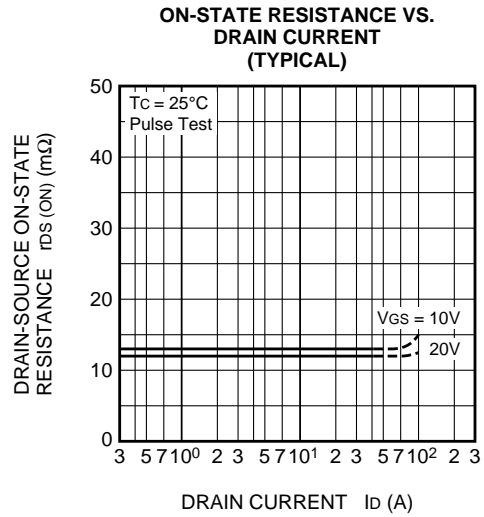
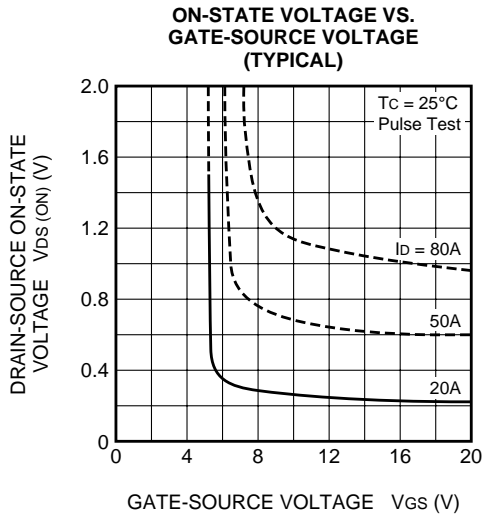
| Symbol    | Parameter                        | Test conditions                                  | Limits |      |      | Unit |
|-----------|----------------------------------|--|--------|------|------|------|
|           |                                  |  | Min.   | Typ. | Max. |      |
| V(BR)DSS  | 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 = 25A, VGS = 10V                              | —      | 17   | 22   | mΩ   |
| VDS(ON)   | Drain-source on-state voltage    | ID = 25A, VGS = 10V                              | —      | 0.43 | 0.55 | V    |
| yfs       | Forward transfer admittance      | ID = 25A, VDS = 10V                              | —      | 32   | —    | S    |
| Ciss      | Input capacitance                | Vbs = 10V, VGS = 0V, f = 1MHz                    | —      | 2300 | —    | pF   |
| Coss      | Output capacitance               |  | —      | 570  | —    | pF   |
| Crss      | Reverse transfer capacitance     |  | —      | 280  | —    | pF   |
| td(on)    | Turn-on delay time               | VDD = 30V, ID = 25A, VGS = 10V, RGEN = RGS = 50Ω | —      | 35   | —    | ns   |
| tr        | Rise time                        |  | —      | 95   | —    | ns   |
| td(off)   | Turn-off delay time              |  | —      | 95   | —    | ns   |
| tf        | Fall time                        |  | —      | 80   | —    | ns   |
| VSD       | Source-drain voltage             | IS = 25A, VGS = 0V                               | —      | 1.0  | 1.5  | V    |
| Rth(ch-c) | Thermal resistance               | Channel to case                                  | —      | —    | 4.17 | °C/W |
| trr       | Reverse recovery time            | IS = 50A, dis/dt = -100A/μs                      | —      | 65   | —    | ns   |

## PERFORMANCE CURVES



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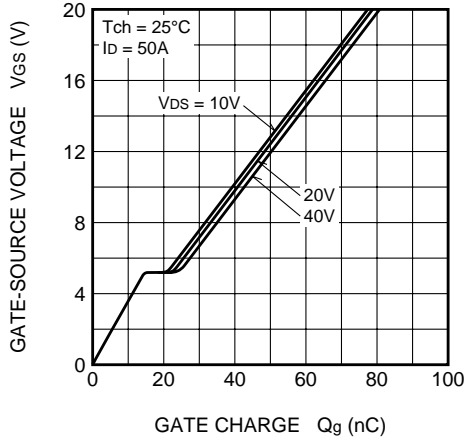
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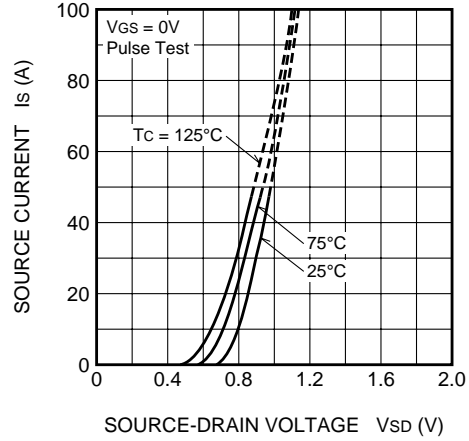
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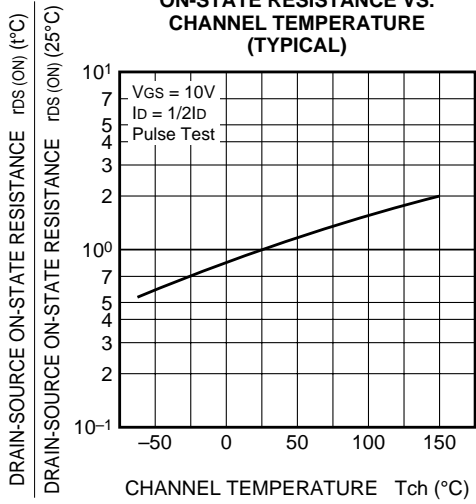
GATE-SOURCE VOLTAGE VS. GATE CHARGE (TYPICAL)



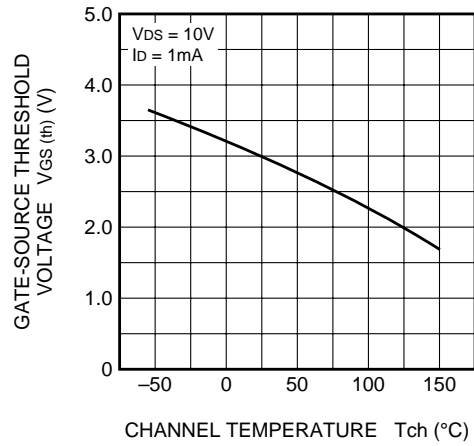
SOURCE-DRAIN DIODE FORWARD CHARACTERISTICS (TYPICAL)



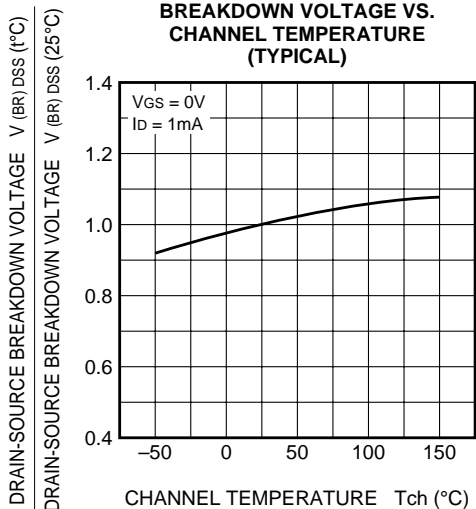
ON-STATE RESISTANCE VS. CHANNEL TEMPERATURE (TYPICAL)



THRESHOLD VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



BREAKDOWN VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS

