

MITSUBISHI Nch POWER MOSFET

# FS5KM-16A

HIGH-SPEED SWITCHING USE

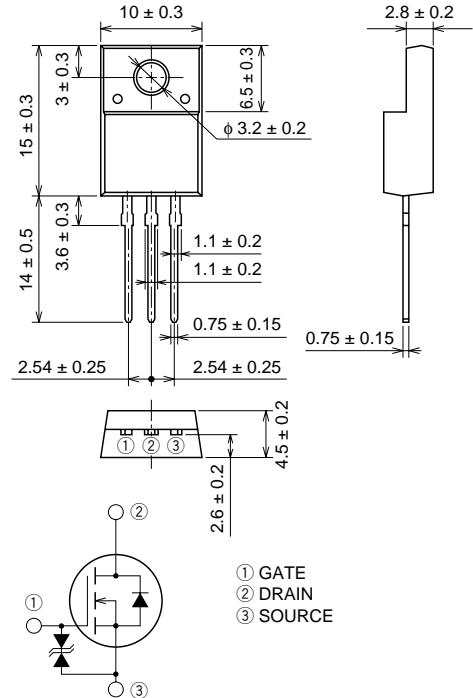
## FS5KM-16A



- V<sub>DSS</sub> ..... 800V
- r<sub>DS (ON)</sub> (MAX) ..... 2.3Ω
- I<sub>D</sub> ..... 5A
- V<sub>iso</sub> ..... 2000V

## OUTLINE DRAWING

Dimensions in mm



TO-220FN

## APPLICATION

SMPS, DC-DC Converter, battery charger, power supply of printer, copier, HDD, FDD, TV, VCR, personal computer 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              | 800        | V                |
| V <sub>GSS</sub> | Gate-source voltage       | V <sub>DS</sub> = 0V              | ±30        | V                |
| I <sub>D</sub>   | Drain current             |                                   | 5          | A                |
| I <sub>DM</sub>  | Drain current (Pulsed)    |                                   | 15         | A                |
| P <sub>D</sub>   | Maximum power dissipation |                                   | 35         | 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 1 minute, Terminal to case | 2000       | V <sub>rms</sub> |
| —                | Weight                    | Typical value                     | 2          | g                |

Feb.1999

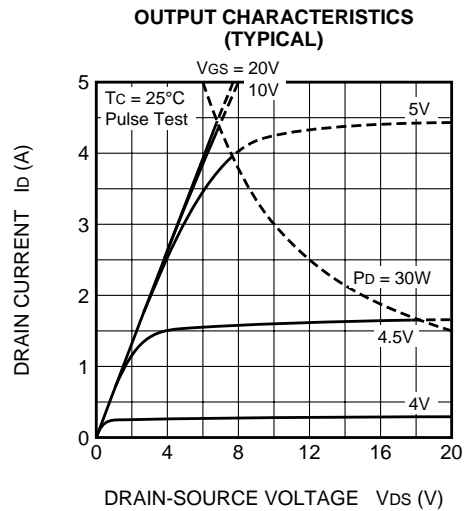
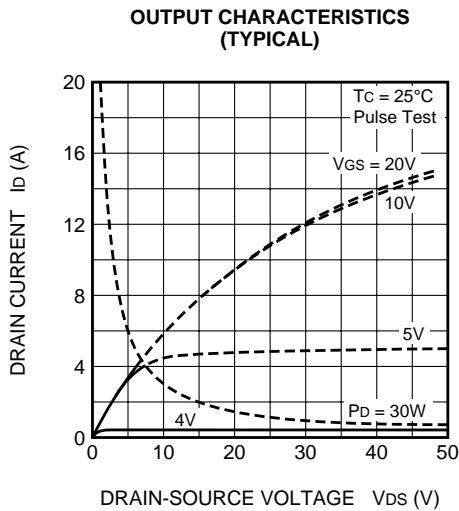
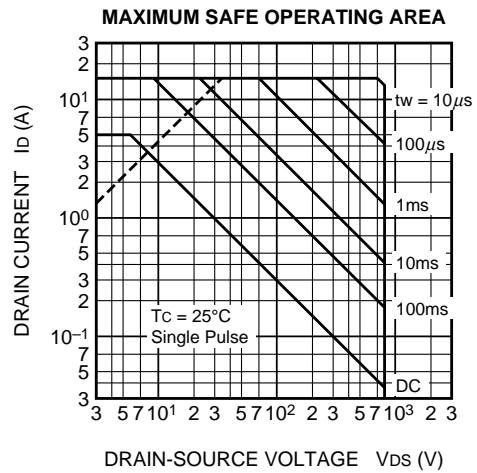
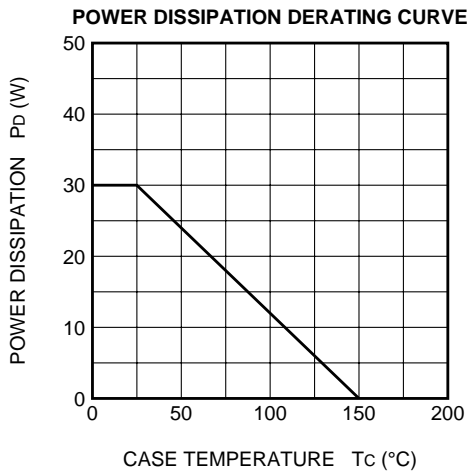
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## ELECTRICAL CHARACTERISTICS (T<sub>ch</sub> = 25°C)

| Symbol                 | Parameter                        | Test conditions   | Limits |      |      | Unit |
|------------------------|----------------------------------|---|--------|------|------|------|
|                        |                                  |   | Min.   | Typ. | Max. |      |
| V (BR) DSS             | Drain-source breakdown voltage   | I <sub>D</sub> = 1mA, V <sub>GS</sub> = 0V  | 800    | —    | —    | V    |
| V (BR) GSS             | Gate-source breakdown voltage    | I <sub>GS</sub> = ±100μA, V <sub>DS</sub> = 0V  | ±30    | —    | —    | V    |
| I <sub>GSS</sub>       | Gate-source leakage current      | V <sub>GS</sub> = ±25V, V <sub>DS</sub> = 0V  | —      | —    | ±10  | μA   |
| I <sub>DSS</sub>       | Drain-source leakage current     | V <sub>DS</sub> = 800V, V <sub>GS</sub> = 0V  | —      | —    | 1    | mA   |
| V <sub>GS</sub> (th)   | Gate-source threshold voltage    | I <sub>D</sub> = 1mA, V <sub>DS</sub> = 10V   | 2      | 3    | 4    | V    |
| r <sub>DS</sub> (ON)   | Drain-source on-state resistance | I <sub>D</sub> = 2A, V <sub>GS</sub> = 10V  | —      | 1.76 | 2.30 | Ω    |
| V <sub>DS</sub> (ON)   | Drain-source on-state voltage    | I <sub>D</sub> = 2A, V <sub>GS</sub> = 10V  | —      | 3.52 | 4.60 | V    |
| y <sub>fs</sub>        | Forward transfer admittance      | I <sub>D</sub> = 2A, V <sub>DS</sub> = 10V  | 3.0    | 5.0  | —    | S    |
| C <sub>iss</sub>       | Input capacitance                | V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V, f = 1MHz   | —      | 1050 | —    | pF   |
| C <sub>oss</sub>       | Output capacitance               |   | —      | 100  | —    | pF   |
| C <sub>rss</sub>       | Reverse transfer capacitance     |   | —      | 20   | —    | pF   |
| t <sub>d</sub> (on)    | Turn-on delay time               |   | —      | 20   | —    | ns   |
| t <sub>r</sub>         | Rise time                        | V <sub>DD</sub> = 200V, I <sub>D</sub> = 2A, V <sub>GS</sub> = 10V,<br>R <sub>GEN</sub> = R <sub>GS</sub> = 50Ω | —      | 18   | —    | ns   |
| t <sub>d</sub> (off)   | Turn-off delay time              |   | —      | 110  | —    | ns   |
| t <sub>f</sub>         | Fall time                        |   | —      | 35   | —    | ns   |
| V <sub>SD</sub>        | Source-drain voltage             | I <sub>S</sub> = 2A, V <sub>GS</sub> = 0V   | —      | 1.0  | 1.5  | V    |
| R <sub>th</sub> (ch-c) | Thermal resistance               | Channel to case   | —      | —    | 3.57 | °C/W |

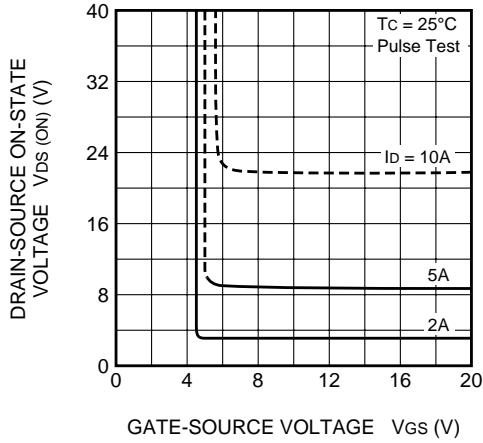
## PERFORMANCE CURVES



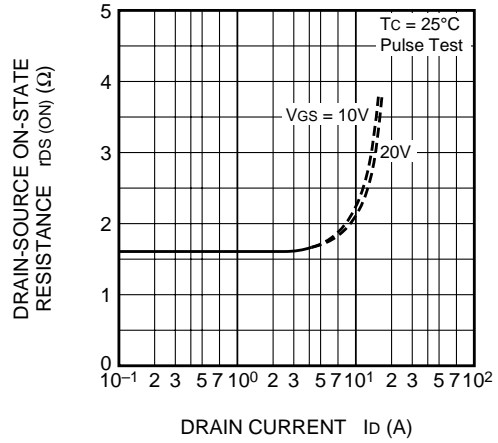
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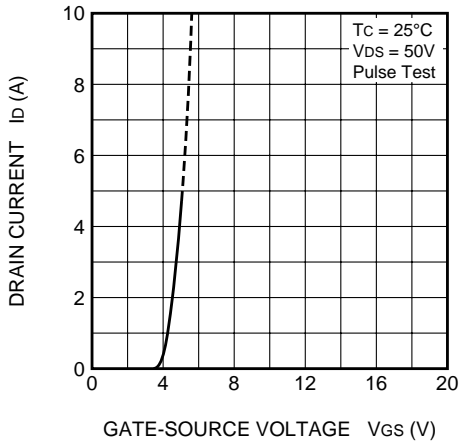
**ON-STATE VOLTAGE VS. GATE-SOURCE VOLTAGE (TYPICAL)**



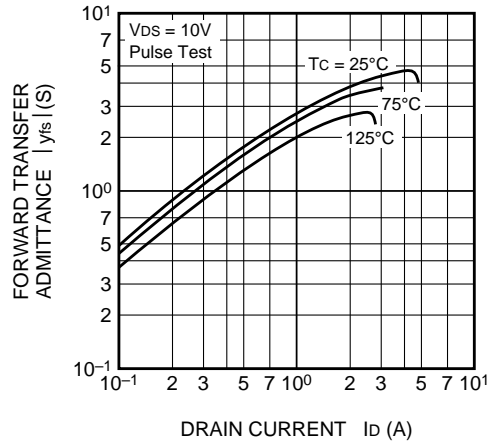
**ON-STATE RESISTANCE VS. DRAIN CURRENT (TYPICAL)**



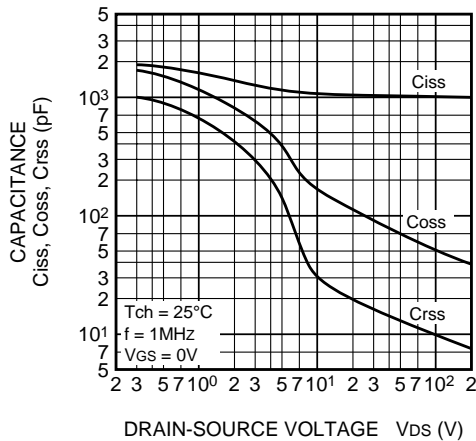
**TRANSFER CHARACTERISTICS (TYPICAL)**



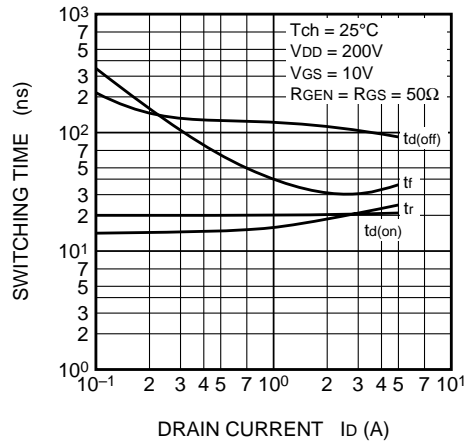
**FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT (TYPICAL)**



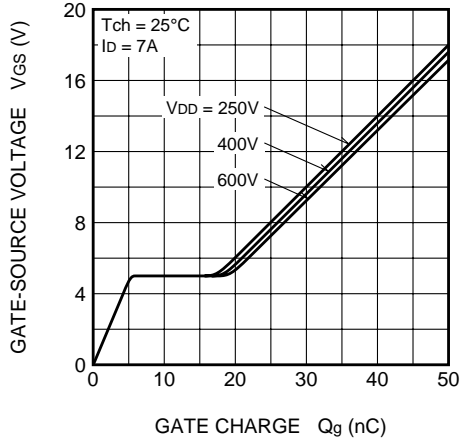
**CAPACITANCE VS. DRAIN-SOURCE VOLTAGE (TYPICAL)**



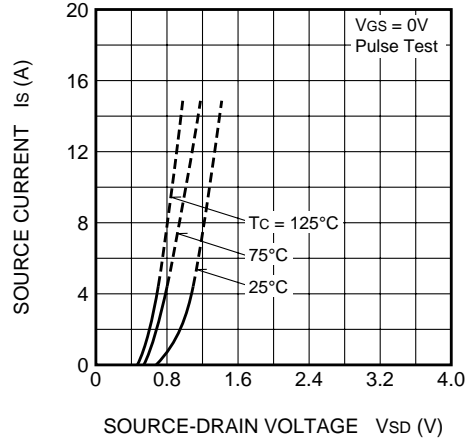
**SWITCHING CHARACTERISTICS (TYPICAL)**



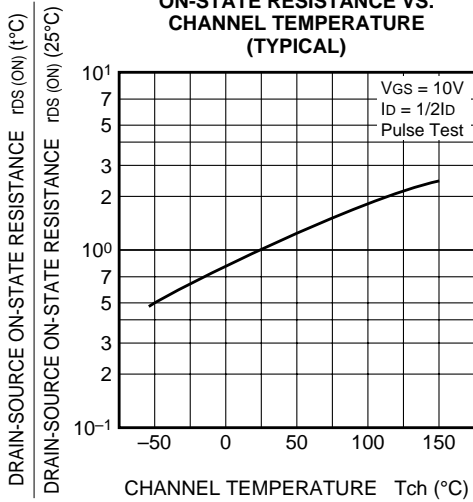
GATE-SOURCE VOLTAGE VS. GATE CHARGE (TYPICAL)



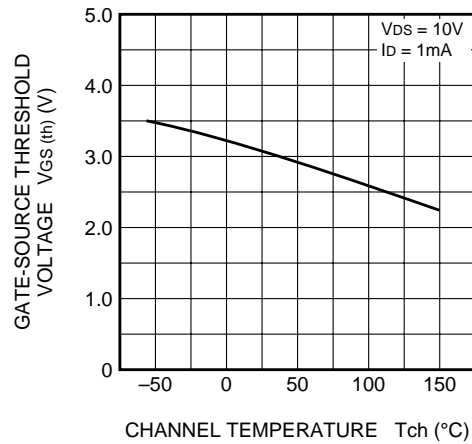
SOURCE-DRAIN DIODE FORWARD CHARACTERISTICS (TYPICAL)



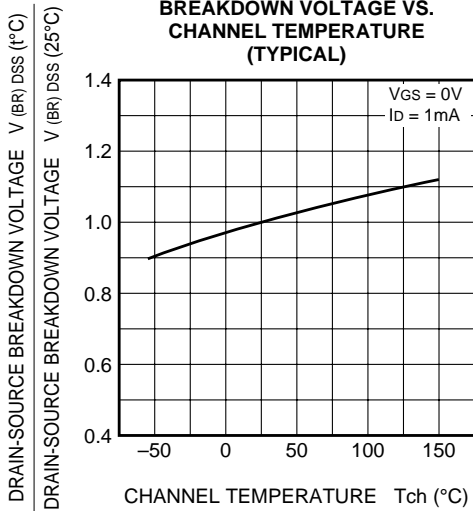
ON-STATE RESISTANCE VS. CHANNEL TEMPERATURE (TYPICAL)



THRESHOLD VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



BREAKDOWN VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS

