

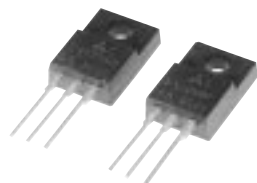
**PRELIMINARY**  
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 Some parametric limits are subject to change.

MITSUBISHI Nch POWER MOSFET

# FS10KMA-4A

HIGH-SPEED SWITCHING USE

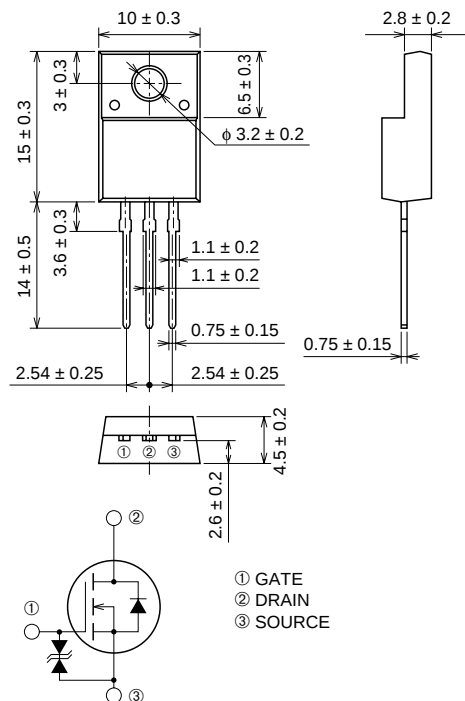
## FS10KMA-4A



- 10V DRIVE
- $V_{DS}$  ..... 200V
- $r_{DS(ON)}$  (MAX) .....  $0.52\Omega$
- $I_D$  ..... 10A

## OUTLINE DRAWING

Dimensions in mm



TO-220FN

## APPLICATION

Cs Switch for CRT Display monitor, Switch mode power supply, etc.

## MAXIMUM RATINGS (Tc = 25°C)

| Symbol    | Parameter                        | Conditions                       | Ratings         | Unit |
|-----------|----------------------------------|----------------------------------|-----------------|------|
| $V_{DS}$  | Drain-source voltage             | $V_{GS} = 0V$                    | 200             | V    |
| $V_{GS}$  | Gate-source voltage              | $V_{DS} = 0V$                    | $\pm 20$        | V    |
| $I_D$     | Drain current                    |                                  | 10              | A    |
| $I_{DM}$  | Drain current (Pulsed)           |                                  | 30              | A    |
| $I_{DA}$  | Avalanche drain current (Pulsed) | $L = 200\mu H$                   | 10              | A    |
| $P_D$     | Maximum power dissipation        |                                  | 32              | W    |
| $T_{ch}$  | Channel temperature              |                                  | $-55 \sim +150$ | °C   |
| $T_{stg}$ | Storage temperature              |                                  | $-55 \sim +150$ | °C   |
| $V_{iso}$ | Isolation voltage                | AC for 1minute, Terminal to case | 2000            | V    |
| —         | Weight                           | Typical value                    | 2.0             | g    |

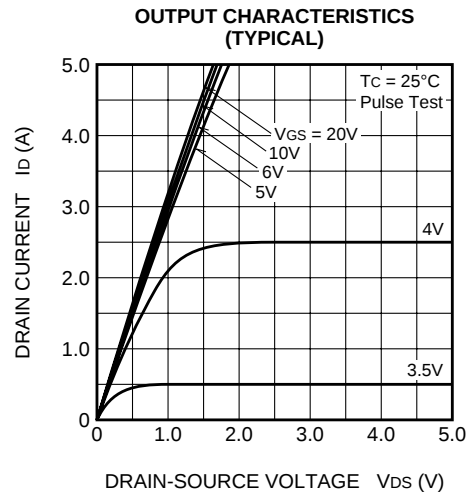
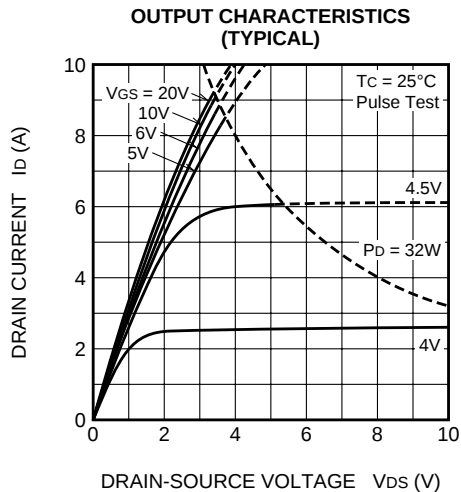
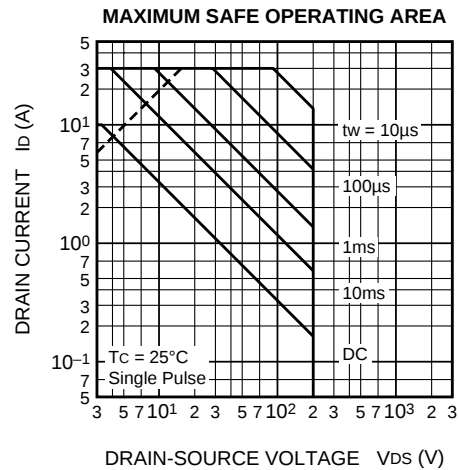
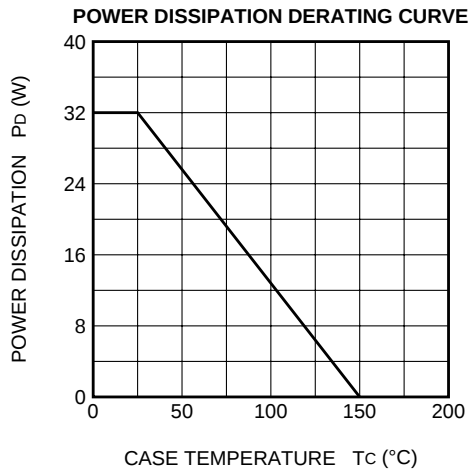
Sep.1998

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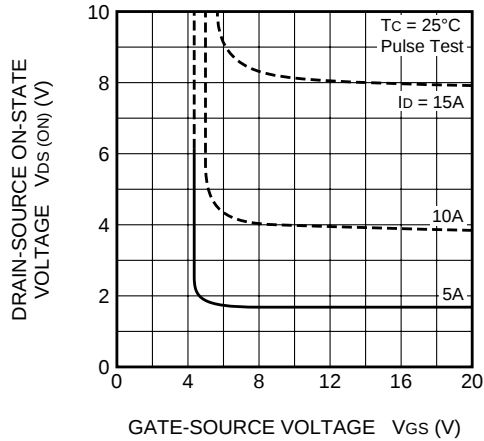
**ELECTRICAL CHARACTERISTICS** ( $T_{ch} = 25^{\circ}\text{C}$ )

| Symbol         | Parameter                        | Test conditions                                                                                    | Limits   |      |          | Unit                 |
|----------------|----------------------------------|----------------------------------------------------------------------------------------------------|----------|------|----------|----------------------|
|                |                                  |                                                                                                    | Min.     | Typ. | Max.     |                      |
| $V_{(BR)DSS}$  | Drain-source breakdown voltage   | $I_D = 1\text{mA}$ , $V_{GS} = 0\text{V}$                                                          | 200      | —    | —        | V                    |
| $V_{(BR)GSS}$  | Gate-source breakdown voltage    | $I_{GS} = \pm 10\mu\text{A}$ , $V_{DS} = 0\text{V}$                                                | $\pm 20$ | —    | —        | V                    |
| $I_{GSS}$      | Gate-source leakage current      | $V_{GS} = \pm 20\text{V}$ , $V_{DS} = 0\text{V}$                                                   | —        | —    | $\pm 10$ | $\mu\text{A}$        |
| $I_{DSS}$      | Drain-source leakage current     | $V_{DS} = 200\text{V}$ , $V_{GS} = 0\text{V}$                                                      | —        | —    | 1        | mA                   |
| $V_{GS(th)}$   | Gate-source threshold voltage    | $I_D = 1\text{mA}$ , $V_{DS} = 10\text{V}$                                                         | 2.0      | 3.0  | 4.0      | V                    |
| $r_{DS(on)}$   | Drain-source on-state resistance | $I_D = 5\text{A}$ , $V_{GS} = 10\text{V}$                                                          | —        | 0.40 | 0.52     | $\Omega$             |
| $V_{DS(on)}$   | Drain-source on-state voltage    | $I_D = 5\text{A}$ , $V_{GS} = 10\text{V}$                                                          | —        | 2.00 | 2.60     | V                    |
| $ y_{fs} $     | Forward transfer admittance      | $I_D = 5\text{A}$ , $V_{DS} = 10\text{V}$                                                          | —        | 7.0  | —        | S                    |
| $C_{iss}$      | Input capacitance                | $V_{DS} = 25\text{V}$ , $V_{GS} = 0\text{V}$ , $f = 1\text{MHz}$                                   | —        | 650  | —        | pF                   |
| $C_{oss}$      | Output capacitance               |                                                                                                    | —        | 80   | —        | pF                   |
| $C_{rss}$      | Reverse transfer capacitance     |                                                                                                    | —        | 25   | —        | pF                   |
| $t_d(on)$      | Turn-on delay time               | $V_{DD} = 100\text{V}$ , $I_D = 5\text{A}$ , $V_{GS} = 10\text{V}$ , $R_{GEN} = R_{GS} = 50\Omega$ | —        | 15   | —        | ns                   |
| $t_r$          | Rise time                        |                                                                                                    | —        | 20   | —        | ns                   |
| $t_d(off)$     | Turn-off delay time              |                                                                                                    | —        | 80   | —        | ns                   |
| $t_f$          | Fall time                        |                                                                                                    | —        | 25   | —        | ns                   |
| $V_{SD}$       | Source-drain voltage             | $I_S = 5\text{A}$ , $V_{GS} = 0\text{V}$                                                           | —        | 0.95 | —        | V                    |
| $R_{th(ch-c)}$ | Thermal resistance               | Channel to case                                                                                    | —        | —    | 3.91     | $^{\circ}\text{C/W}$ |

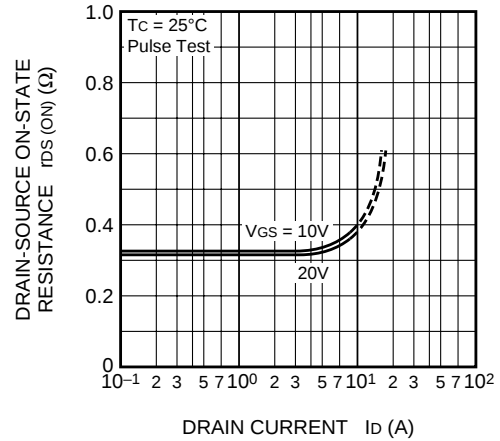
**PERFORMANCE CURVES**



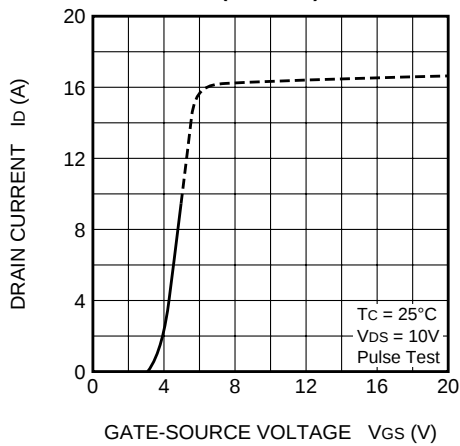
**ON-STATE VOLTAGE VS.  
GATE-SOURCE VOLTAGE  
(TYPICAL)**



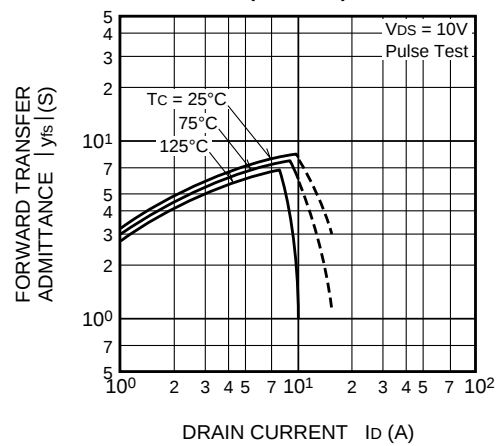
**ON-STATE RESISTANCE VS.  
DRAIN CURRENT  
(TYPICAL)**



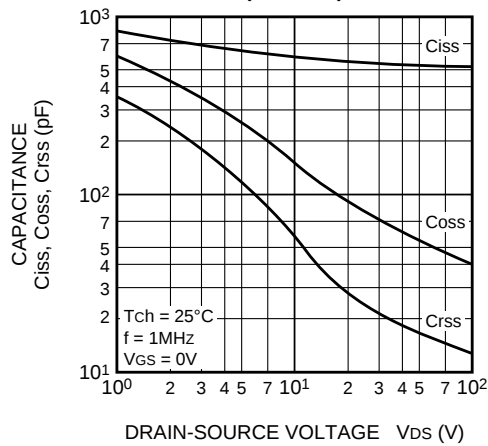
**TRANSFER CHARACTERISTICS  
(TYPICAL)**



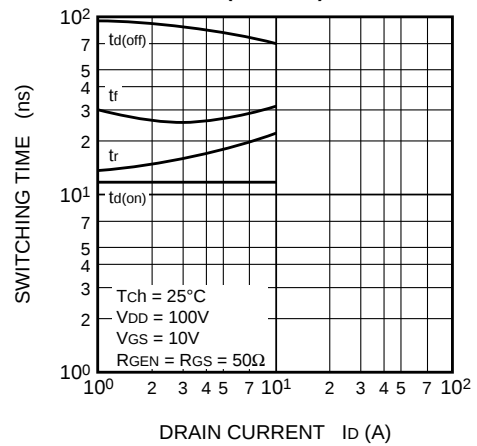
**FORWARD TRANSFER ADMITTANCE  
VS. DRAIN CURRENT  
(TYPICAL)**



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



**SWITCHING CHARACTERISTICS  
(TYPICAL)**



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