

# FS7KM-14A

HIGH-SPEED SWITCHING USE

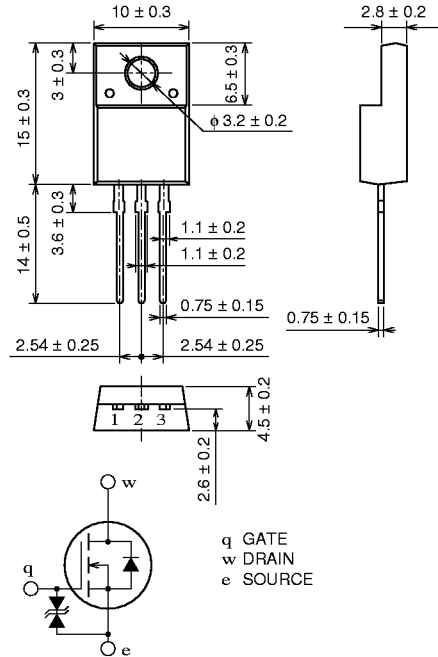
## FS7KM-14A



|                            |              |
|----------------------------|--------------|
| • $V_{DS}$ .....           | 700V         |
| • $r_{DS(ON)}$ (MAX) ..... | $1.82\Omega$ |
| • $I_D$ .....              | 7A           |
| • $V_{iso}$ .....          | 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             |
|-----------|---------------------------|-----------------------------------|------------|------------------|
| $V_{DS}$  | Drain-source voltage      | $V_{GS} = 0V$                     | 700        | V                |
| $V_{GS}$  | Gate-source voltage       | $V_{DS} = 0V$                     | ±30        | V                |
| $I_D$     | Drain current             |                                   | 7          | A                |
| $I_{DM}$  | Drain current (Pulsed)    |                                   | 21         | A                |
| $P_D$     | Maximum power dissipation |                                   | 30         | W                |
| $T_{ch}$  | Channel temperature       |                                   | -55 ~ +150 | °C               |
| $T_{stg}$ | Storage temperature       |                                   | -55 ~ +150 | °C               |
| $V_{iso}$ | Isolation voltage         | AC for 1 minute, Terminal to case | 2000       | V <sub>rms</sub> |
| —         | Weight                    | Typical value                     | 2          | g                |

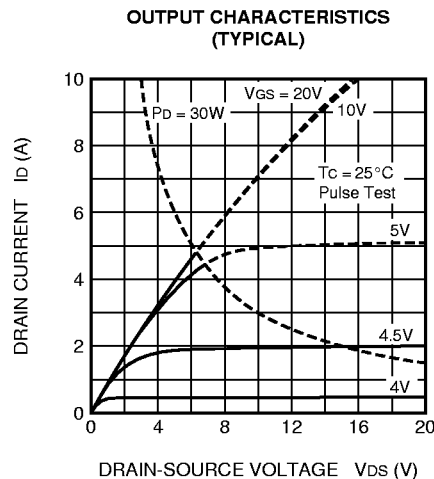
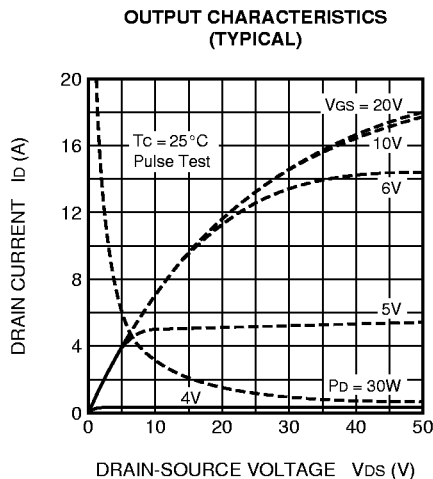
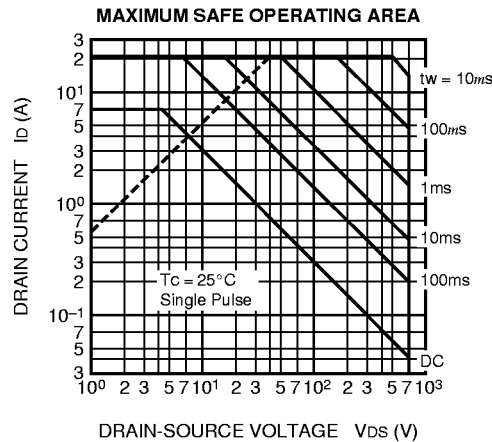
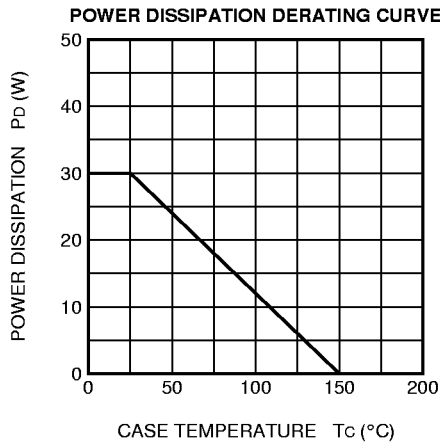
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## HIGH-SPEED SWITCHING USE

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

| Symbol                 | Parameter                        | Test conditions                                                                                                 | Limits |      |      | Unit |
|------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------------------|--------|------|------|------|
|                        |                                  |                                                                                                                 | Min.   | Typ. | Max. |      |
| V <sub>(BR) DSS</sub>  | Drain-source breakdown voltage   | I <sub>D</sub> = 1mA, V <sub>GS</sub> = 0V                                                                      | 700    | —    | —    | V    |
| V <sub>(BR) GSS</sub>  | 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> = 700V, 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> = 3A, V <sub>GS</sub> = 10V                                                                      | —      | 1.40 | 1.82 | Ω    |
| V <sub>DS</sub> (ON)   | Drain-source on-state voltage    | I <sub>D</sub> = 3A, V <sub>GS</sub> = 10V                                                                      | —      | 4.20 | 5.46 | V    |
| y <sub>fs</sub>        | Forward transfer admittance      | I <sub>D</sub> = 3A, V <sub>DS</sub> = 10V                                                                      | 3.6    | 6.0  | —    | 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     |                                                                                                                 | —      | 24   | —    | pF   |
| t <sub>d</sub> (on)    | Turn-on delay time               | V <sub>DD</sub> = 200V, I <sub>D</sub> = 3A, V <sub>GS</sub> = 10V,<br>R <sub>GEN</sub> = R <sub>GS</sub> = 50Ω | —      | 20   | —    | ns   |
| t <sub>r</sub>         | Rise time                        |                                                                                                                 | —      | 22   | —    | 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> = 3A, V <sub>GS</sub> = 0V                                                                       | —      | 1.0  | 1.5  | V    |
| R <sub>th</sub> (ch-c) | Thermal resistance               | Channel to case                                                                                                 | —      | —    | 4.17 | °C/W |

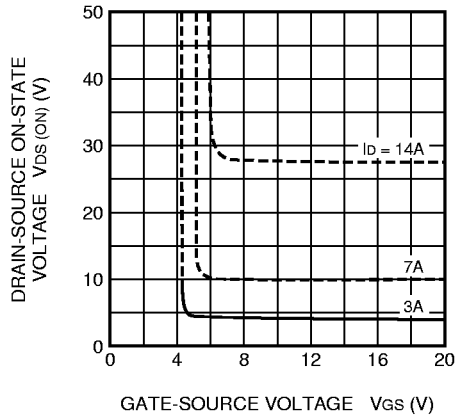
## PERFORMANCE CURVES



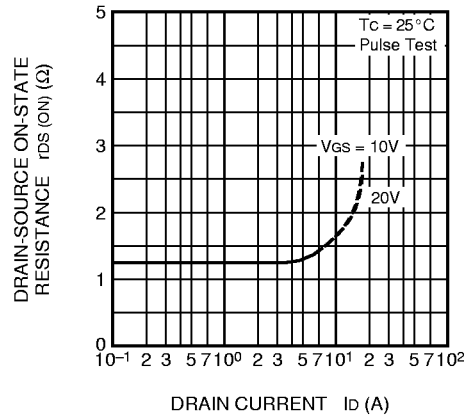
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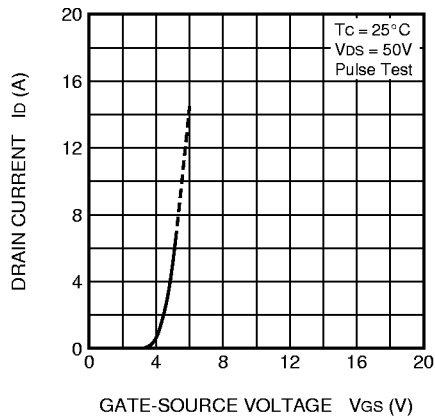
ON-STATE VOLTAGE VS.  
GATE-SOURCE VOLTAGE  
(TYPICAL)



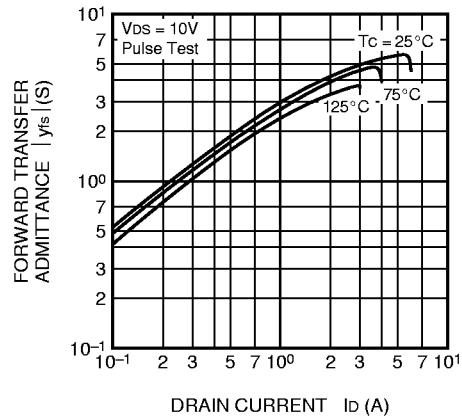
ON-STATE RESISTANCE VS.  
DRAIN CURRENT  
(TYPICAL)



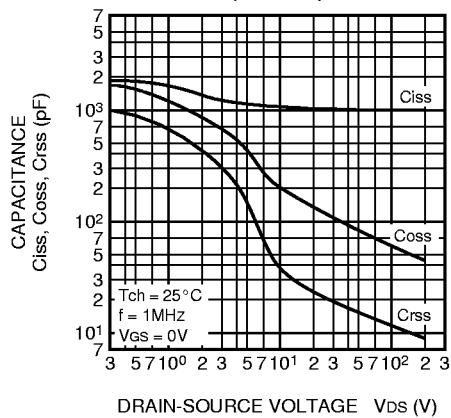
TRANSFER CHARACTERISTICS  
(TYPICAL)



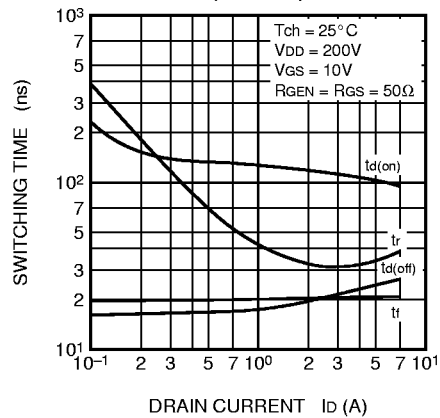
FORWARD TRANSFER ADMITTANCE  
VS. DRAIN CURRENT  
(TYPICAL)



CAPACITANCE VS.  
DRAIN-SOURCE VOLTAGE  
(TYPICAL)



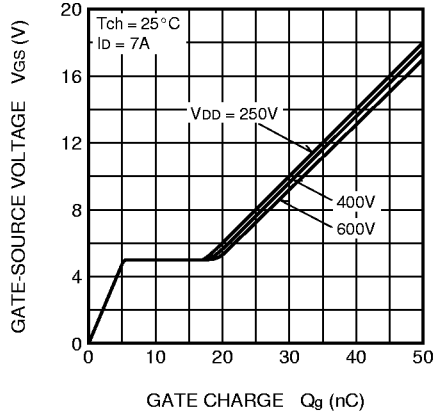
SWITCHING CHARACTERISTICS  
(TYPICAL)



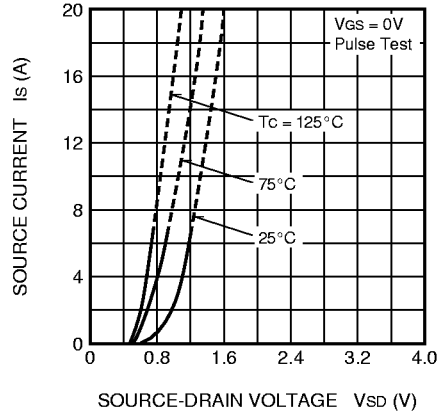
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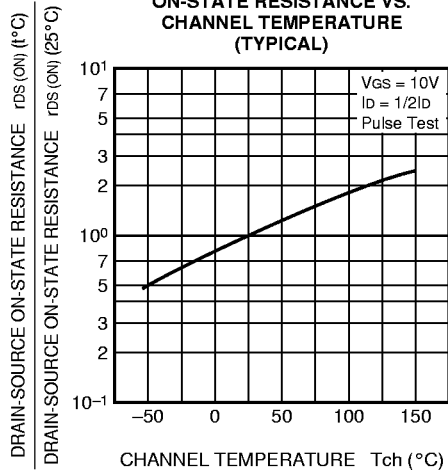
**GATE-SOURCE VOLTAGE  
VS. GATE CHARGE  
(TYPICAL)**



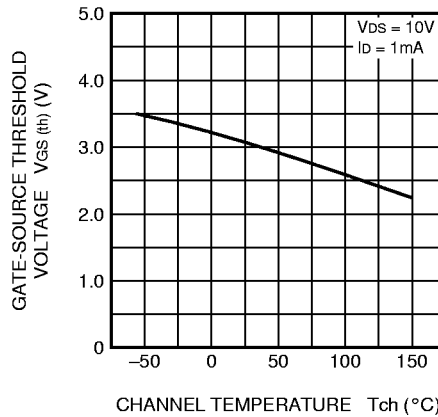
**SOURCE-DRAIN DIODE  
FORWARD CHARACTERISTICS  
(TYPICAL)**



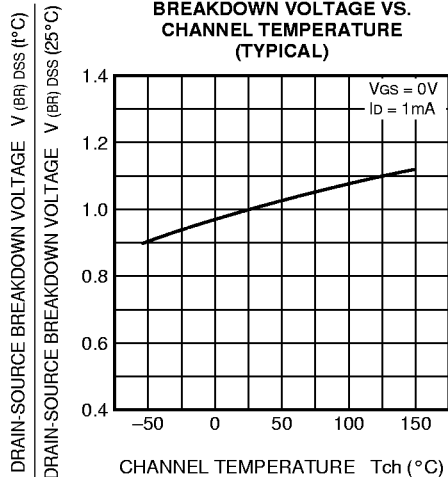
**ON-STATE RESISTANCE VS.  
CHANNEL TEMPERATURE  
(TYPICAL)**



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



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



**TRANSIENT THERMAL IMPEDANCE  
CHARACTERISTICS**

