


MITSUBISHI Nch POWER MOSFET

# FS7VS-14A

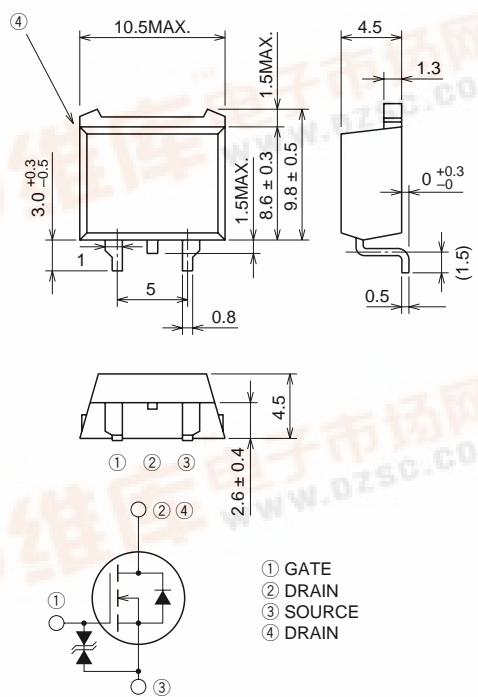
HIGH-SPEED SWITCHING USE

**FS7VS-14A**



- V<sub>DSS</sub> ..... 700V
- r<sub>DS (ON)</sub> (MAX) ..... 1.82Ω
- I<sub>D</sub> ..... 7A

**OUTLINE DRAWING** Dimensions in mm



① GATE  
② DRAIN  
③ SOURCE  
④ DRAIN

**TO-220S**

## 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 | 700        | V    |
| V <sub>GSS</sub> | Gate-source voltage       | V <sub>DS</sub> = 0V | ±30        | V    |
| I <sub>D</sub>   | Drain current             |                      | 7          | A    |
| I <sub>DM</sub>  | Drain current (Pulsed)    |                      | 21         | A    |
| P <sub>D</sub>   | Maximum power dissipation |                      | 125        | W    |
| T <sub>ch</sub>  | Channel temperature       |                      | -55 ~ +150 | °C   |
| T <sub>stg</sub> | Storage temperature       |                      | -55 ~ +150 | °C   |
| —                | Weight                    | Typical value        | 1.2        | g    |



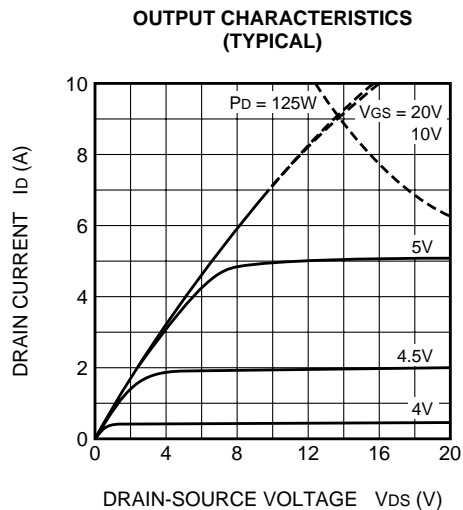
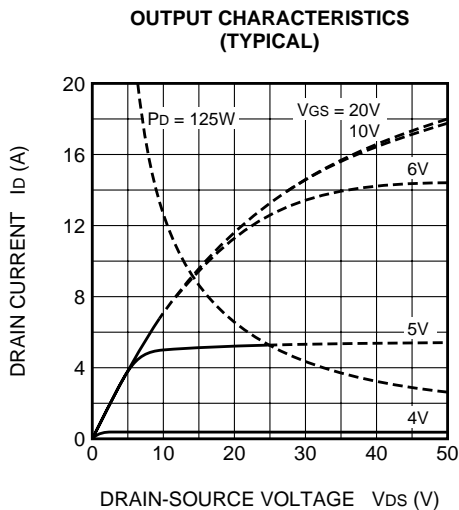
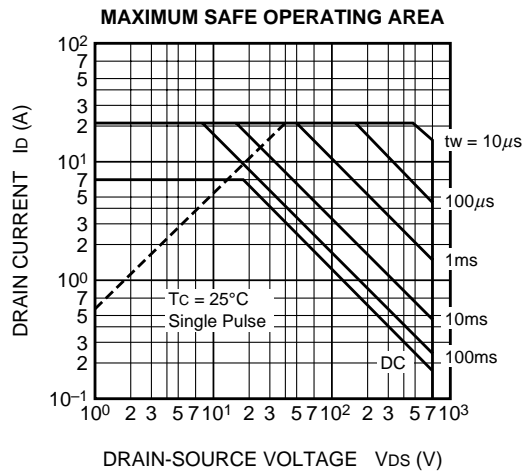
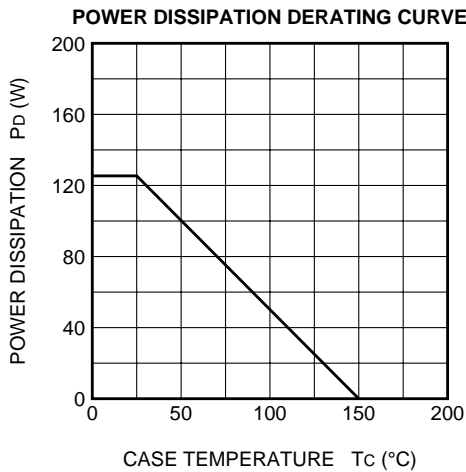
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HIGH-SPEED SWITCHING USE

## 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                                  | 700               | —    | —    | V    |
| V(BR)GSS  | Gate-source breakdown voltage    | IGS = ±100μA, VDS = 0V                              | ±30               | —    | —    | V    |
| IGSS      | Gate-source leakage current      | VGS = ±25V, VDS = 0V                                | —                 | —    | ±10  | μA   |
| IDSS      | Drain-source leakage current     | VDS = 700V, VGS = 0V                                | —                 | —    | 1    | mA   |
| VGS(th)   | Gate-source threshold voltage    | Id = 1mA, VDS = 10V                                 | 2                 | 3    | 4    | V    |
| rDS(ON)   | Drain-source on-state resistance | Id = 3A, VGS = 10V                                  | —                 | 1.40 | 1.82 | Ω    |
| VDS(ON)   | Drain-source on-state voltage    | Id = 3A, VGS = 10V                                  | —                 | 4.20 | 5.46 | V    |
| yfs       | Forward transfer admittance      | Id = 3A, VDS = 10V                                  | 3.6               | 6.0  | —    | S    |
| Ciss      | Input capacitance                | VDS = 25V, VGS = 0V, f = 1MHz                       | —                 | 1050 | —    | pF   |
| Coss      | Output capacitance               |   | —                 | 100  | —    | pF   |
| Crss      | Reverse transfer capacitance     |   | —                 | 24   | —    | pF   |
| td(on)    | Turn-on delay time               | VDD = 200V, Id = 3A, VGS = 10V,<br>RGEN = RGS = 50Ω | —                 | 20   | —    | ns   |
| tr        | Rise time                        |   | —                 | 22   | —    | ns   |
| td(off)   | Turn-off delay time              |   | —                 | 110  | —    | ns   |
| tf        | Fall time                        |   | —                 | 35   | —    | ns   |
| VSD       | Source-drain voltage             |   | IS = 3A, VGS = 0V | —    | 1.0  | 1.5  |
| Rth(ch-c) | Thermal resistance               | Channel to case                                     | —                 | —    | 1.0  | °C/W |

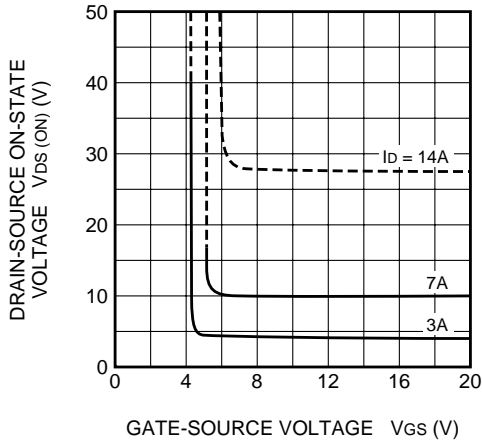
## PERFORMANCE CURVES



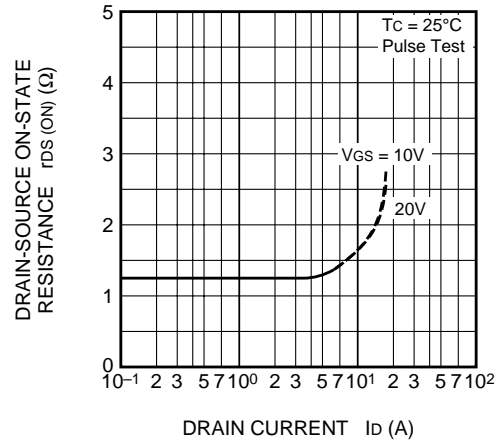
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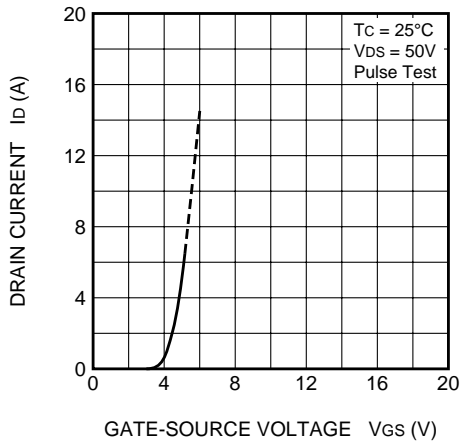
**ON-STATE VOLTAGE VS. GATE-SOURCE VOLTAGE (TYPICAL)**



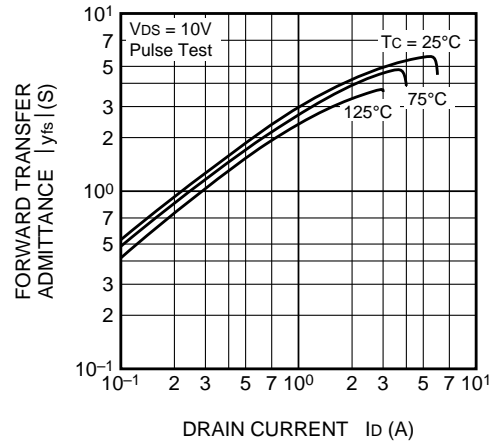
**ON-STATE RESISTANCE VS. DRAIN CURRENT (TYPICAL)**



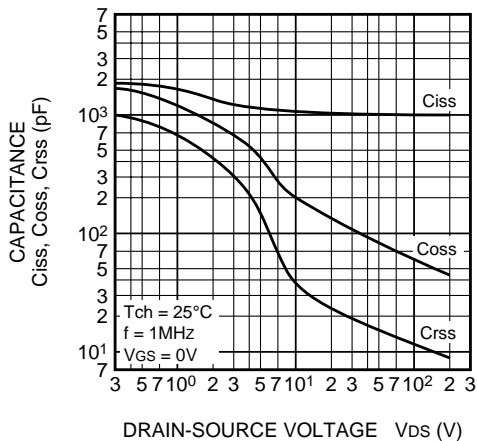
**TRANSFER CHARACTERISTICS (TYPICAL)**



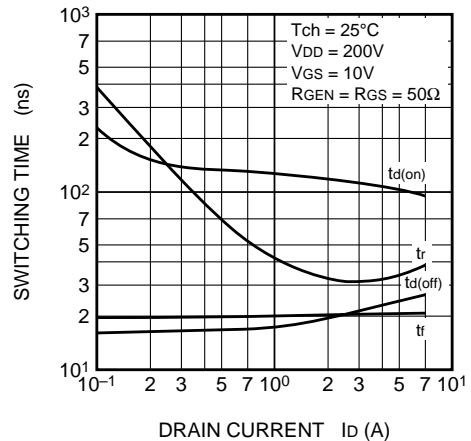
**FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT (TYPICAL)**



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



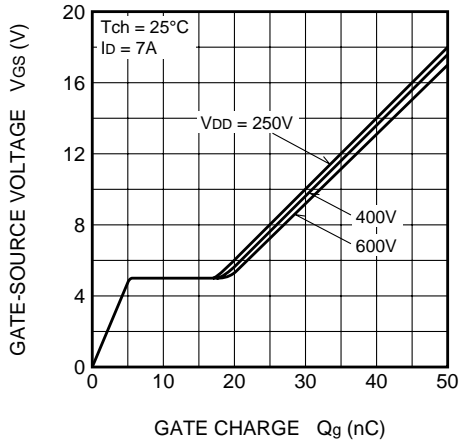
**SWITCHING CHARACTERISTICS (TYPICAL)**



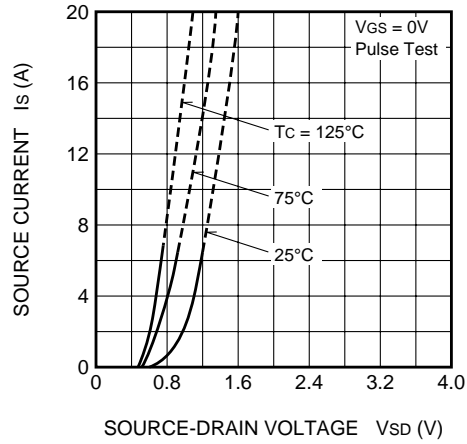
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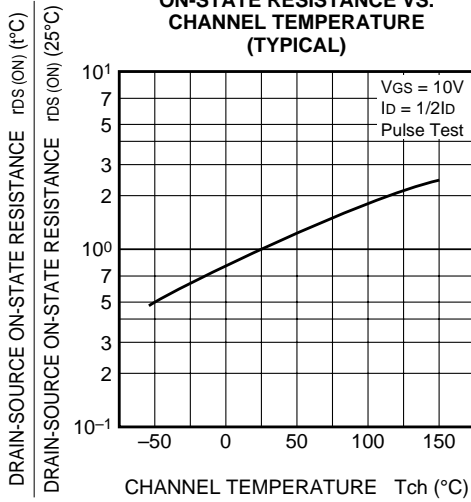
GATE-SOURCE VOLTAGE VS. GATE CHARGE (TYPICAL)



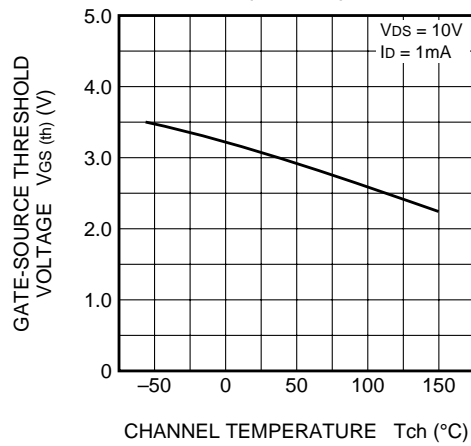
SOURCE-DRAIN DIODE FORWARD CHARACTERISTICS (TYPICAL)



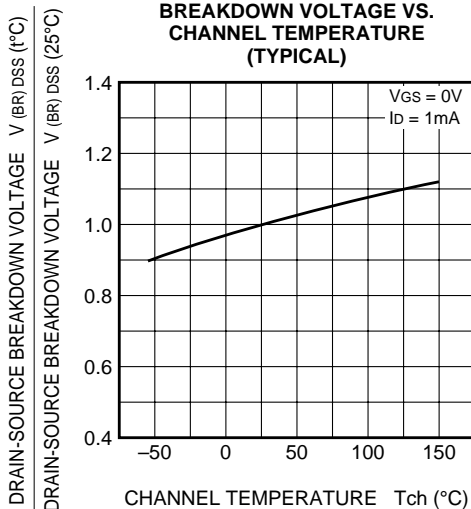
ON-STATE RESISTANCE VS. CHANNEL TEMPERATURE (TYPICAL)



THRESHOLD VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



BREAKDOWN VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS

