

MITSUBISHI Nch POWER MOSFET

# FY7BFH-02E

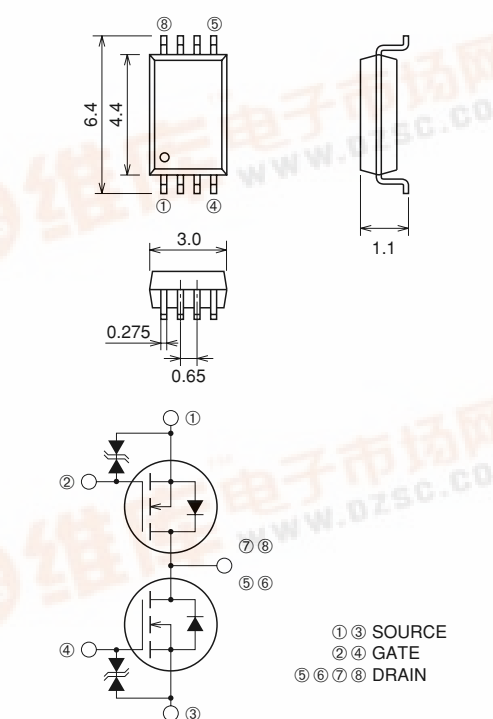
HIGH-SPEED SWITCHING USE

**FY7BFH-02E**



- 2.5V DRIVE
- V<sub>DSS</sub> ..... 20V
- r<sub>D(S)</sub> (ON) (MAX) ..... 30mΩ
- I<sub>D</sub> ..... 7A

**OUTLINE DRAWING** Dimensions in mm



**TSSOP8**

## APPLICATION

Li - ion battery, 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 | 20         | V    |
| V <sub>GSS</sub> | Gate-source voltage        | V <sub>DS</sub> = 0V | ±10        | V    |
| I <sub>D</sub>   | Drain current              |                      | 7          | A    |
| I <sub>DM</sub>  | Drain current (Pulsed)     |                      | 49         | A    |
| I <sub>DA</sub>  | Avalanche current (Pulsed) | L = 10μH             | 7          | A    |
| I <sub>S</sub>   | Source current             |                      | 1.8        | A    |
| I <sub>SM</sub>  | Source current (Pulsed)    |                      | 7.2        | A    |
| P <sub>D</sub>   | Maximum power dissipation  |                      | 1.6        | W    |
| T <sub>ch</sub>  | Channel temperature        |                      | -55 ~ +150 | °C   |
| T <sub>stg</sub> | Storage temperature        |                      | -55 ~ +150 | °C   |
| —                | Weight                     | Typical value        | 0.035      | g    |



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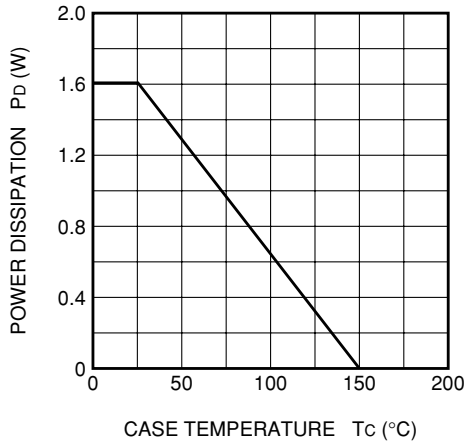
**HIGH-SPEED SWITCHING USE**

**ELECTRICAL CHARACTERISTICS** (Tch = 25°C)

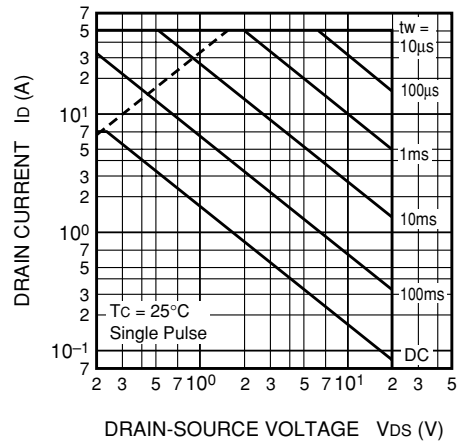
| Symbol     | Parameter                        | Test conditions                                  | Limits              |       |       | Unit |
|------------|----------------------------------|--|---------------------|-------|-------|------|
|            |                                  |  | Min.                | Typ.  | Max.  |      |
| V (BR) DSS | Drain-source breakdown voltage   | ID = 1mA, VGS = 0V                               | 20                  | —     | —     | V    |
| V (BR) GSS | Gate-source breakdown voltage    | IG = ±100μA, VDS = 0V                            | ±10                 | —     | —     | V    |
| IGSS       | Gate-source leakage current      | VGS = ±10V, VDS = 0V                             | —                   | —     | ±10   | μA   |
| IDSS       | Drain-source leakage current     | VDS = 20V, VGS = 0V                              | —                   | —     | 0.1   | mA   |
| VGS (th)   | Gate-source threshold voltage    | ID = 1mA, VDS = 10V                              | 0.5                 | 0.9   | 1.3   | V    |
| rDS (ON)   | Drain-source on-state resistance | ID = 7A, VGS = 4V                                | —                   | 23    | 30    | mΩ   |
| rDS (ON)   | Drain-source on-state resistance | ID = 3.5A, VGS = 2.5V                            | —                   | 30    | 40    | mΩ   |
| VDS (ON)   | Drain-source on-state voltage    | ID = 7A, VGS = 4V                                | —                   | 0.161 | 0.210 | V    |
| yfs        | Forward transfer admittance      | ID = 7A, VDS = 10V                               | —                   | 16    | —     | S    |
| Ciss       | Input capacitance                | VDS = 10V, VGS = 0V, f = 1MHz                    | —                   | 1400  | —     | pF   |
| Coss       | Output capacitance               |  | —                   | 520   | —     | pF   |
| Crss       | Reverse transfer capacitance     |  | —                   | 400   | —     | pF   |
| td (on)    | Turn-on delay time               | VDD = 10V, ID = 3.5A, VGS = 4V, RGEN = RGS = 50Ω | —                   | 30    | —     | ns   |
| tr         | Rise time                        |  | —                   | 100   | —     | ns   |
| td (off)   | Turn-off delay time              |  | —                   | 190   | —     | ns   |
| tf         | Fall time                        |  | —                   | 190   | —     | ns   |
| VSD        | Source-drain voltage             |  | IS = 1.8A, VGS = 0V | —     | 0.85  | 1.1  |
| Rth (ch-a) | Thermal resistance               | Channel to ambient                               | —                   | —     | 78.1  | °C/W |
| trr        | Reverse recovery time            | IS = 1.8A, dis/dt = -50A/μs                      | —                   | 50    | —     | ns   |

**PERFORMANCE CURVES**

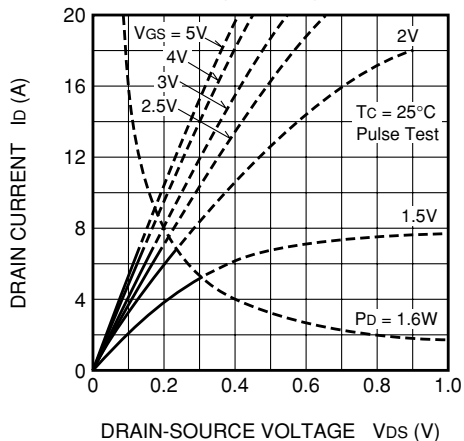
**POWER DISSIPATION DERATING CURVE**



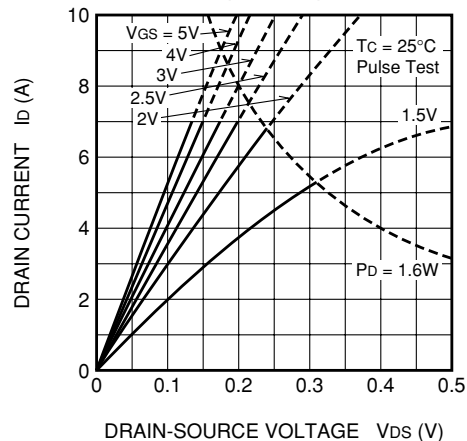
**MAXIMUM SAFE OPERATING AREA**



**OUTPUT CHARACTERISTICS (TYPICAL)**



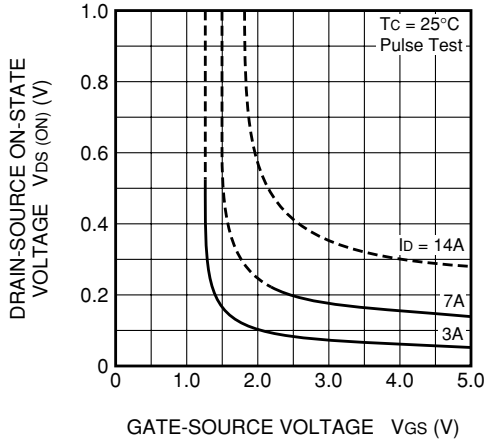
**OUTPUT CHARACTERISTICS (TYPICAL)**



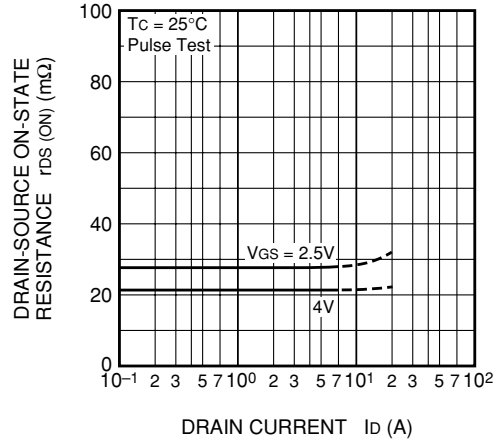
**FY7BFH-02E**

**HIGH-SPEED SWITCHING USE**

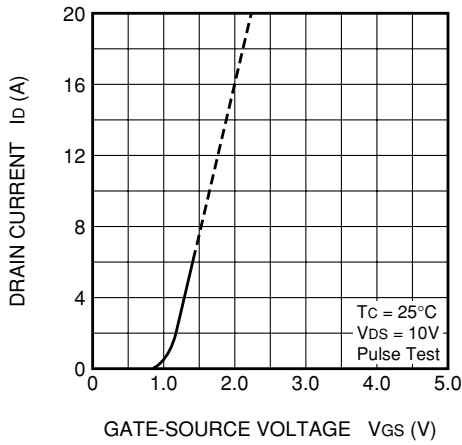
**ON-STATE VOLTAGE VS. GATE-SOURCE VOLTAGE (TYPICAL)**



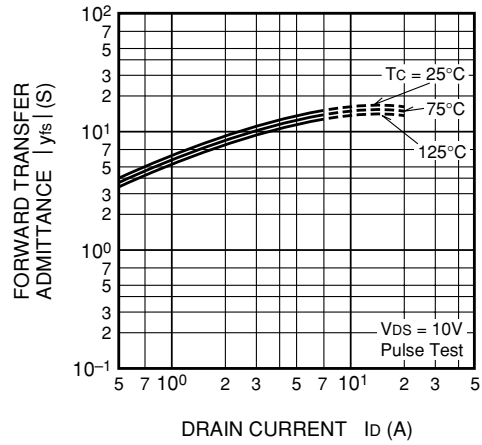
**ON-STATE RESISTANCE VS. DRAIN CURRENT (TYPICAL)**



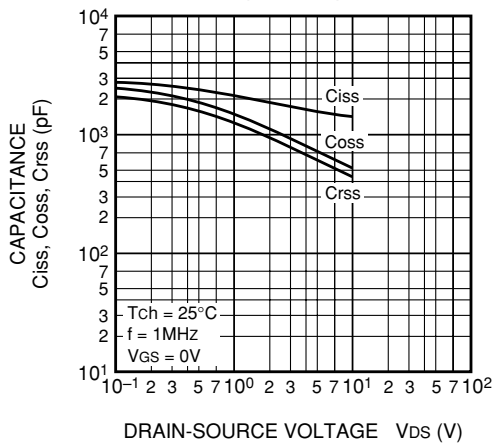
**TRANSFER CHARACTERISTICS (TYPICAL)**



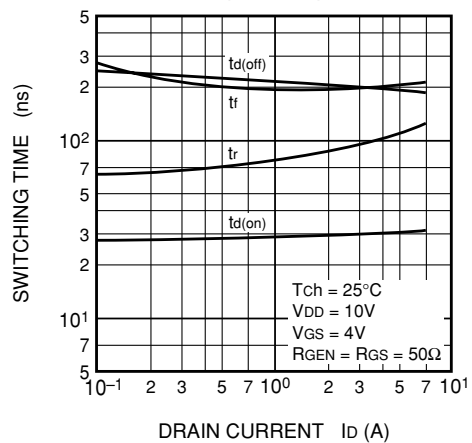
**FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT (TYPICAL)**



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



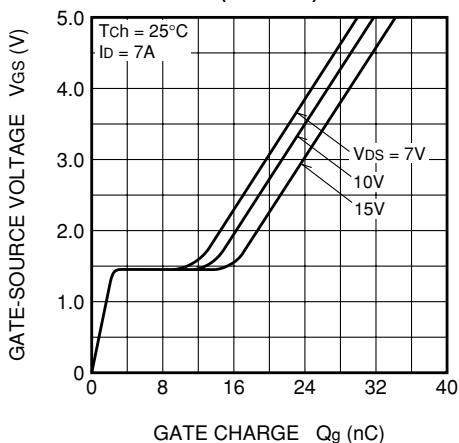
**SWITCHING CHARACTERISTICS (TYPICAL)**



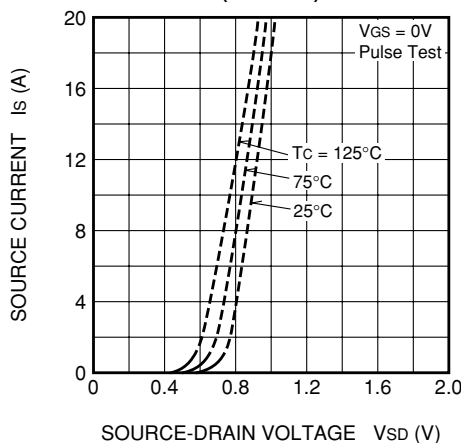
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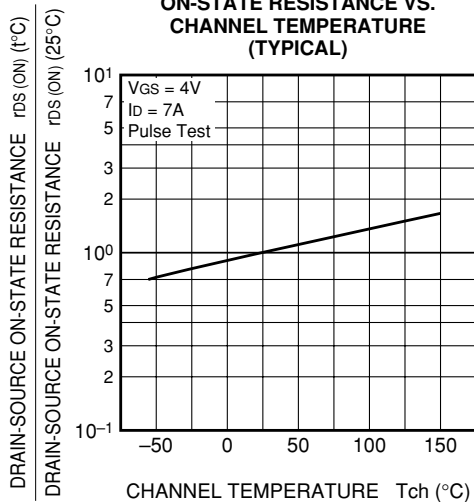
**GATE-SOURCE VOLTAGE VS. GATE CHARGE (TYPICAL)**



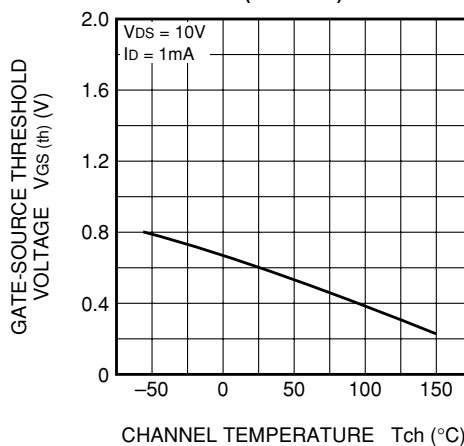
**SOURCE-DRAIN DIODE FORWARD CHARACTERISTICS (TYPICAL)**



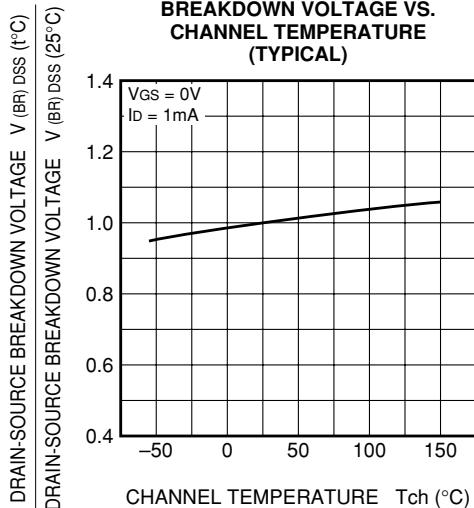
**ON-STATE RESISTANCE VS. CHANNEL TEMPERATURE (TYPICAL)**



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



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



**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS**

