

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

MITSUBISHI Pch POWER MOSFET

# FX20ASJ-06

HIGH-SPEED SWITCHING USE

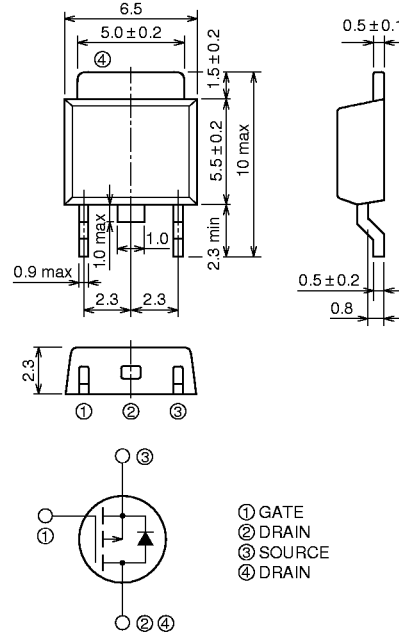
## FX20ASJ-06



- 4V DRIVE
- V<sub>DSS</sub> ..... -60V
- r<sub>DS (ON)</sub> (MAX) ..... 97mΩ
- I<sub>D</sub> ..... -20A
- Integrated Fast Recovery Diode (TYP.) ..... 50ns

## OUTLINE DRAWING

Dimensions in mm



MP-3

## APPLICATION

Motor control, Lamp control, Solenoid control  
 DC-DC converter, 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 | -60        | V    |
| V <sub>GSS</sub> | Gate-source voltage              | V <sub>DS</sub> = 0V | ±20        | V    |
| I <sub>D</sub>   | Drain current                    |                      | -20        | A    |
| I <sub>DM</sub>  | Drain current (Pulsed)           |                      | -80        | A    |
| I <sub>DA</sub>  | Avalanche drain current (Pulsed) | L = 100μH            | -20        | A    |
| I <sub>S</sub>   | Source current                   |                      | -20        | A    |
| I <sub>SM</sub>  | Source current (Pulsed)          |                      | -80        | 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   |
| —                | Weight                           | Typical value        | 0.26       | g    |

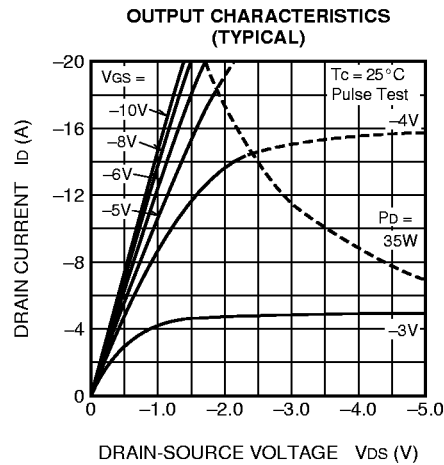
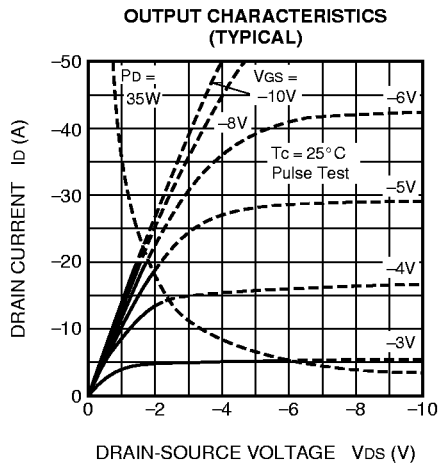
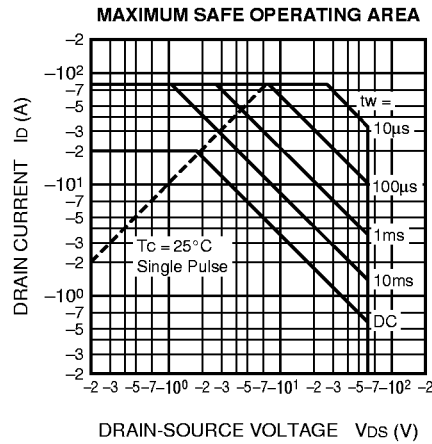
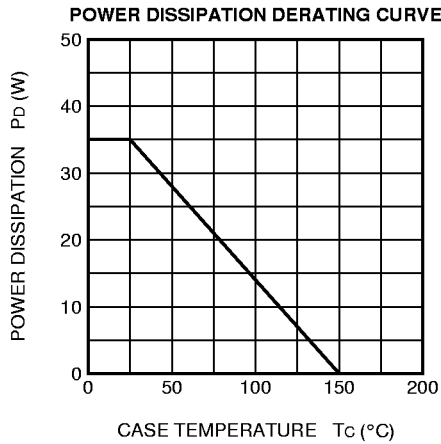
Jan.1999

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

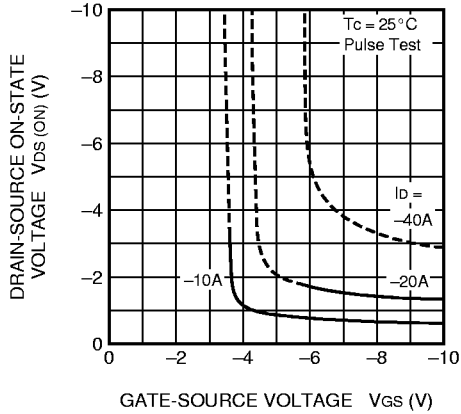
| Symbol    | Parameter                        | Test conditions   | Limits |       |           | Unit          |
|-----------|----------------------------------|---|--------|-------|-----------|---------------|
|           |                                  |   | Min.   | Typ.  | Max.      |               |
| V(BR)DSS  | Drain-source breakdown voltage   | $I_D = -1mA, V_{GS} = 0V$   | -60    | —     | —         | V             |
| IGSS      | Gate-source leakage current      | $V_{GS} = \pm 20V, V_{DS} = 0V$   | —      | —     | $\pm 0.1$ | $\mu A$       |
| IDSS      | Drain-source leakage current     | $V_{DS} = -60V, V_{GS} = 0V$  | —      | —     | -0.1      | mA            |
| VGS(th)   | Gate-source threshold voltage    | $I_D = -1mA, V_{DS} = -10V$   | -1.3   | -1.8  | -2.3      | V             |
| rDS(ON)   | Drain-source on-state resistance | $I_D = -10A, V_{GS} = -10V$   | —      | 73    | 97        | m $\Omega$    |
| rDS(ON)   | Drain-source on-state resistance | $I_D = -10A, V_{GS} = -4V$  | —      | 119   | 166       | m $\Omega$    |
| VDS(ON)   | Drain-source on-state voltage    | $I_D = -10A, V_{GS} = -10V$   | —      | -0.73 | -0.97     | V             |
| yfs       | Forward transfer admittance      | $I_D = -10A, V_{DS} = -10V$   | —      | 10.9  | —         | S             |
| Ciss      | Input capacitance                | $V_{DS} = -10V, V_{GS} = 0V, f = 1MHz$                                  | —      | 2370  | —         | pF            |
| Coss      | Output capacitance               |   | —      | 306   | —         | pF            |
| Crss      | Reverse transfer capacitance     |   | —      | 147   | —         | pF            |
| td(on)    | Turn-on delay time               | $V_{DD} = -30V, I_D = -10A, V_{GS} = -10V, R_{GEN} = R_{GS} = 50\Omega$ | —      | 15    | —         | ns            |
| tr        | Rise time                        |   | —      | 37    | —         | ns            |
| td(off)   | Turn-off delay time              |   | —      | 131   | —         | ns            |
| tf        | Fall time                        |   | —      | 72    | —         | ns            |
| VSD       | Source-drain voltage             | $I_S = -10A, V_{GS} = 0V$   | —      | -1.0  | -1.5      | V             |
| Rth(ch-c) | Thermal resistance               | Channel to case   | —      | —     | 3.57      | $^{\circ}C/W$ |
| trr       | Reverse recovery time            | $I_S = -20A, dis/dt = 100A/\mu s$                                       | —      | 50    | —         | ns            |

**PERFORMANCE CURVES**

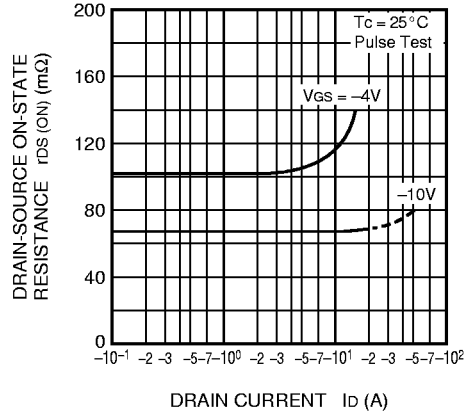


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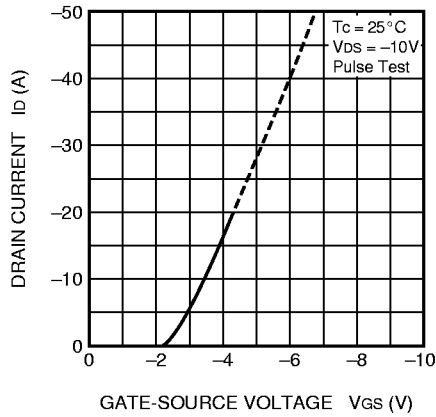
**ON-STATE VOLTAGE VS. GATE-SOURCE VOLTAGE (TYPICAL)**



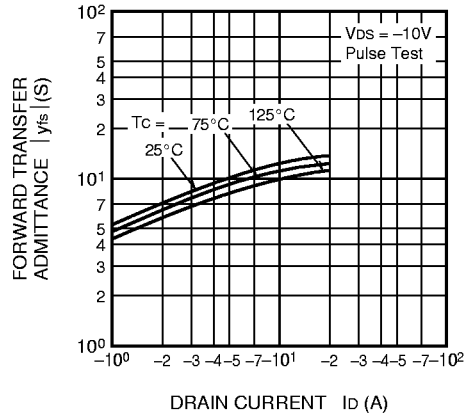
**ON-STATE RESISTANCE VS. DRAIN CURRENT (TYPICAL)**



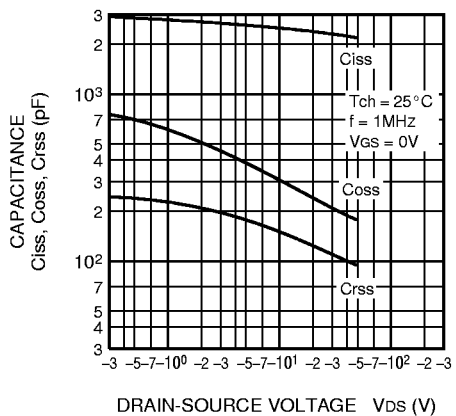
**TRANSFER CHARACTERISTICS (TYPICAL)**



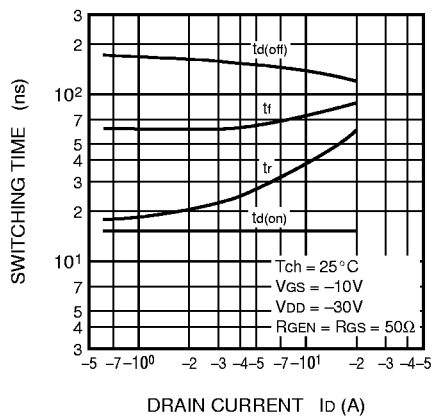
**FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT (TYPICAL)**



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

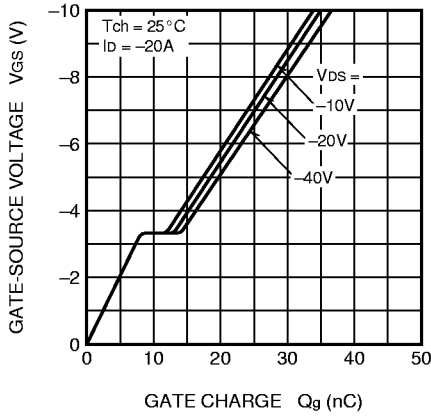


**SWITCHING CHARACTERISTICS (TYPICAL)**

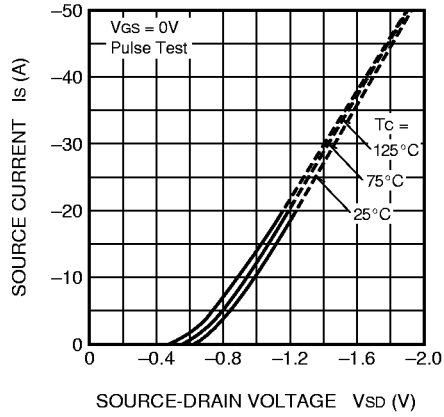


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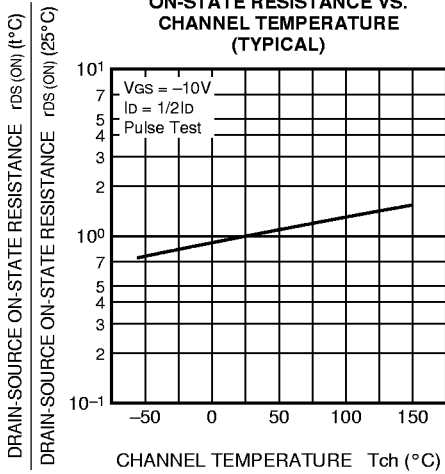
**GATE-SOURCE VOLTAGE VS. GATE CHARGE (TYPICAL)**



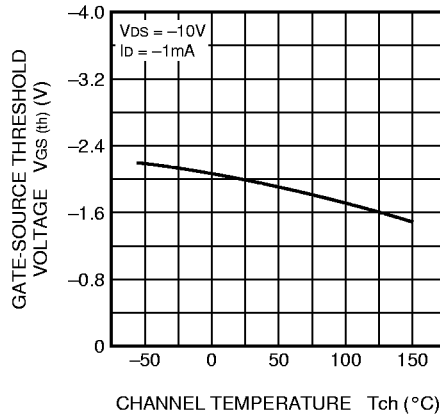
**SOURCE-DRAIN DIODE FORWARD CHARACTERISTICS (TYPICAL)**



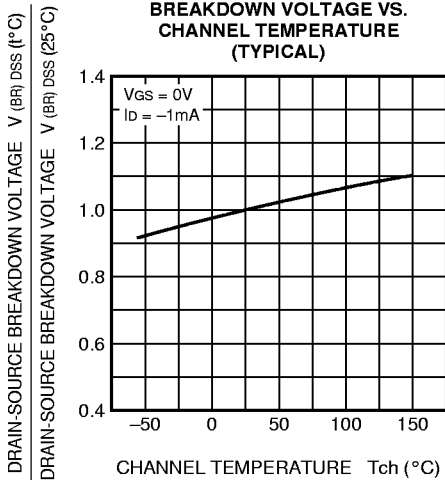
**ON-STATE RESISTANCE VS. CHANNEL TEMPERATURE (TYPICAL)**



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



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



**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS**

