


PRELIMINARY
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 Some parametric limits are subject to change.

MITSUBISHI Pch POWER MOSFET

FX20VSJ-3

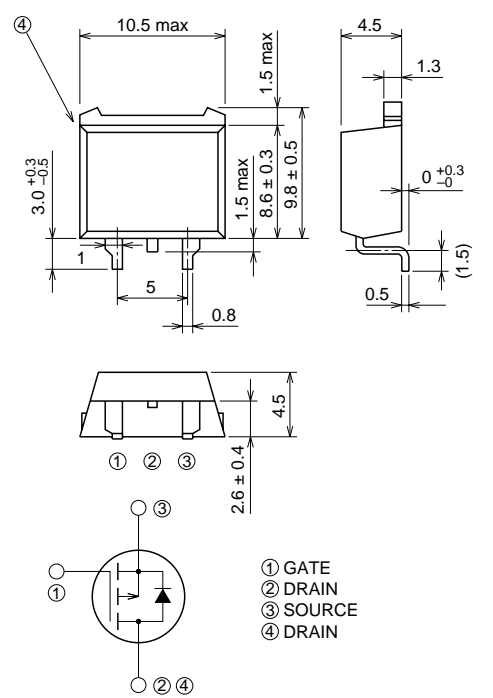
HIGH-SPEED SWITCHING USE

FX20VSJ-3



- 4V DRIVE
- V_{DSS} -150V
- $r_{DS(ON)}$ (MAX) 0.29Ω
- I_D -20A
- Integrated Fast Recovery Diode (TYP.) 100ns

OUTLINE DRAWING Dimensions in mm



① GATE
 ② DRAIN
 ③ SOURCE
 ④ DRAIN

TO-220S

APPLICATION

Motor control, Lamp control, Solenoid control
 DC-DC converter, etc.

MAXIMUM RATINGS (Tc = 25°C)

| Symbol | Parameter | Conditions | Ratings | Unit |
|-----------|----------------------------------|---------------|------------|------|
| V_{DSS} | Drain-source voltage | $V_{GS} = 0V$ | -150 | V |
| V_{GSS} | Gate-source voltage | $V_{DS} = 0V$ | ± 20 | V |
| I_D | Drain current | | -20 | A |
| I_{DM} | Drain current (Pulsed) | | -80 | A |
| I_{DA} | Avalanche drain current (Pulsed) | $L = 30\mu H$ | -20 | A |
| I_S | Source current | | -20 | A |
| I_{SM} | Source current (Pulsed) | | -80 | A |
| P_D | Maximum power dissipation | | 70 | W |
| T_{ch} | Channel temperature | | -55 ~ +150 | °C |
| T_{stg} | Storage temperature | | -55 ~ +150 | °C |
| — | Weight | Typical value | 1.2 | g |

Jan.1999



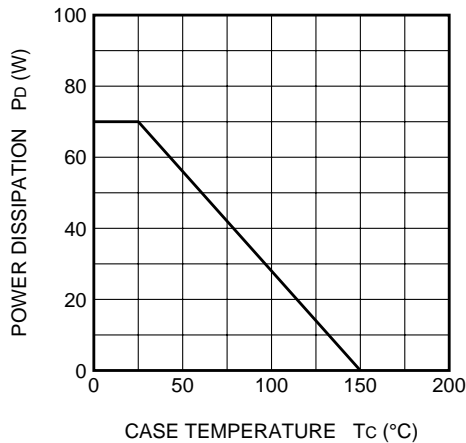
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ELECTRICAL CHARACTERISTICS (Tch = 25°C)

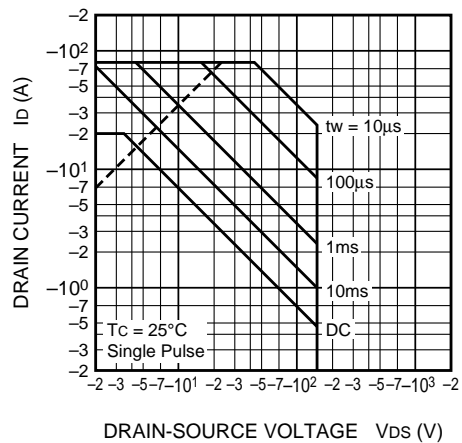
| Symbol | Parameter | Test conditions | Limits | | | Unit |
|-----------|----------------------------------|---|---------------------|------|------|------|
| | | | Min. | Typ. | Max. | |
| V(BR)DSS | Drain-source breakdown voltage | ID = -1mA, VGS = 0V | -150 | — | — | V |
| IGSS | Gate-source leakage current | VGS = ±20V, VDS = 0V | — | — | ±0.1 | μA |
| IDSS | Drain-source leakage current | VDS = -150V, VGS = 0V | — | — | -0.1 | mA |
| VGS(th) | Gate-source threshold voltage | ID = -1mA, VDS = -10V | -1.0 | -1.5 | -2.0 | V |
| rDS(ON) | Drain-source on-state resistance | ID = -10A, VGS = -10V | — | 0.23 | 0.29 | Ω |
| rDS(ON) | Drain-source on-state resistance | ID = -10A, VGS = -4V | — | 0.25 | 0.32 | Ω |
| VDS(ON) | Drain-source on-state voltage | ID = -10A, VGS = -10V | — | -2.3 | -2.9 | V |
| yfs | Forward transfer admittance | ID = -10A, VDS = -10V | — | 17.5 | — | S |
| Ciss | Input capacitance | VDS = -10V, VGS = 0V, f = 1MHz | — | 4470 | — | pF |
| Coss | Output capacitance | | — | 248 | — | pF |
| Crss | Reverse transfer capacitance | | — | 115 | — | pF |
| td(on) | Turn-on delay time | | — | 15 | — | ns |
| tr | Rise time | VDD = -80V, ID = -10A, VGS = -10V, RGEN = RGS = 50Ω | — | 42 | — | ns |
| td(off) | Turn-off delay time | | — | 273 | — | ns |
| tf | Fall time | | — | 114 | — | ns |
| VSD | Source-drain voltage | | IS = -10A, VGS = 0V | — | -1.0 | -1.5 |
| Rth(ch-c) | Thermal resistance | Channel to case | — | — | 1.79 | °C/W |
| trr | Reverse recovery time | IS = -20A, dis/dt = 100A/μs | — | 100 | — | ns |

PERFORMANCE CURVES

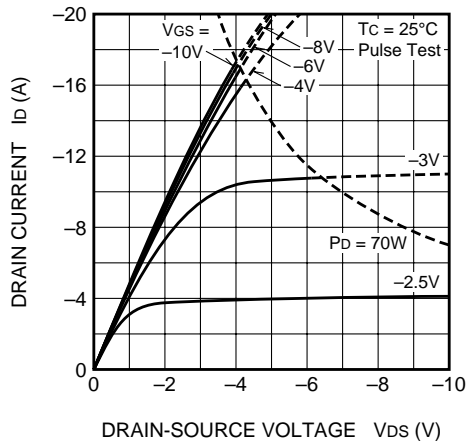
POWER DISSIPATION DERATING CURVE



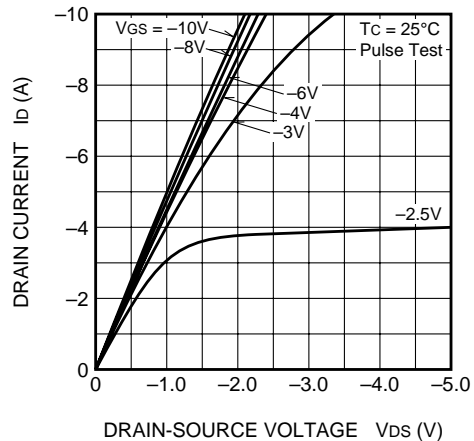
MAXIMUM SAFE OPERATING AREA



OUTPUT CHARACTERISTICS (TYPICAL)

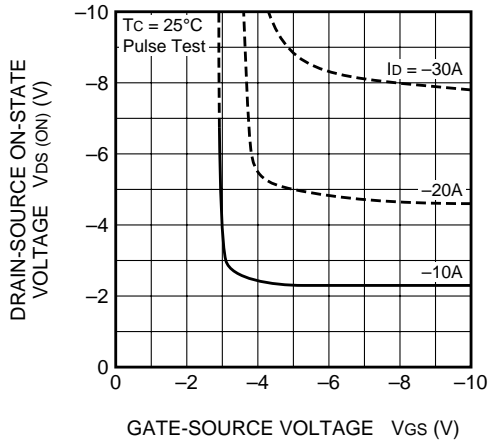


OUTPUT CHARACTERISTICS (TYPICAL)

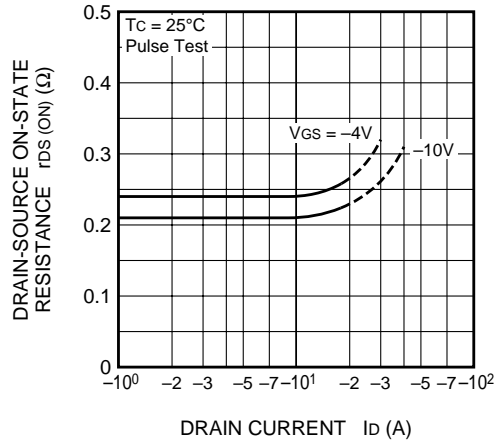


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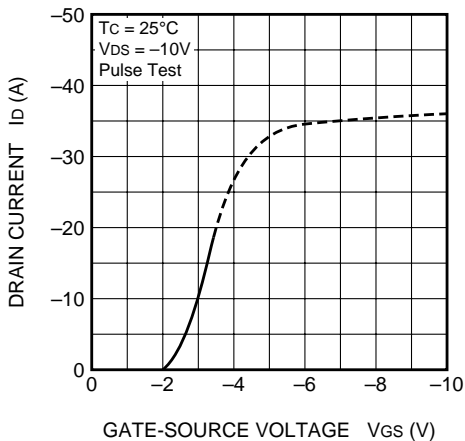
ON-STATE VOLTAGE VS. GATE-SOURCE VOLTAGE (TYPICAL)



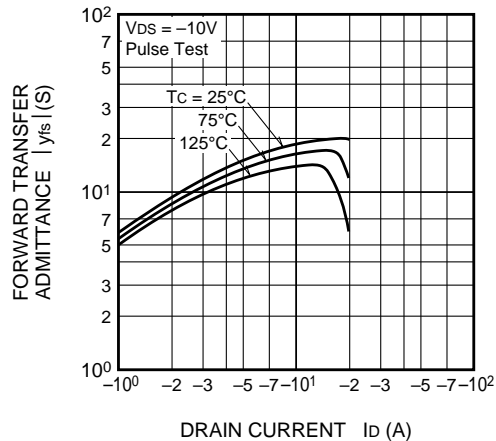
ON-STATE RESISTANCE VS. DRAIN CURRENT (TYPICAL)



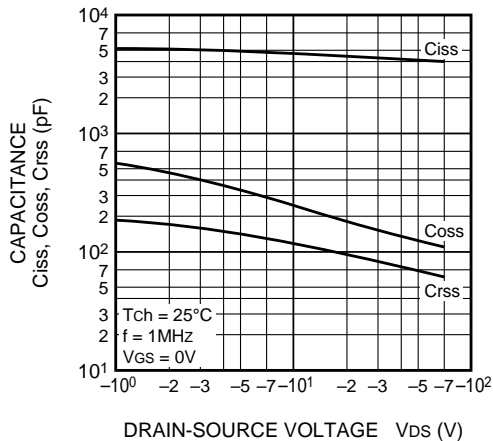
TRANSFER CHARACTERISTICS (TYPICAL)



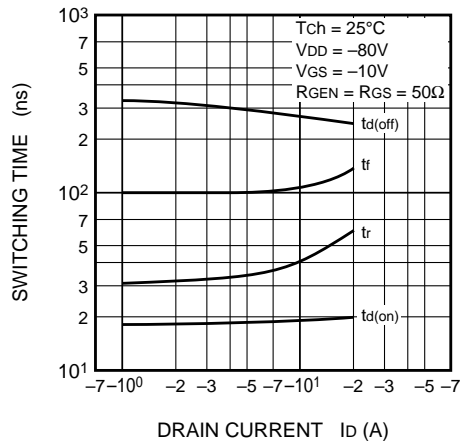
FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT (TYPICAL)



CAPACITANCE VS. DRAIN-SOURCE VOLTAGE (TYPICAL)



SWITCHING CHARACTERISTICS (TYPICAL)



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