

MITSUBISHI Nch POWER MOSFET

FS10KMH-03

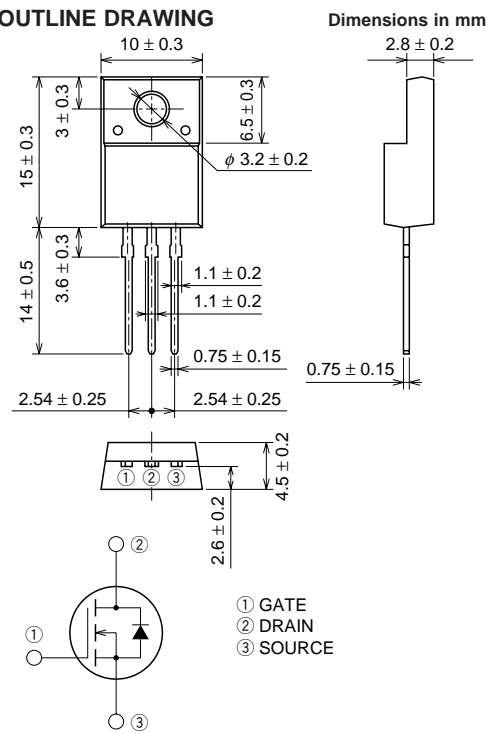
HIGH-SPEED SWITCHING USE

FS10KMH-03



- 2.5V DRIVE
- V_{DSS} 30V
- r_{DS (ON)} (MAX) 92mΩ
- I_D 10A
- Integrated Fast Recovery Diode (TYP.) 35ns
- V_{iso} 2000V

OUTLINE DRAWING



TO-220FN

APPLICATION

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

MAXIMUM RATINGS (T_c = 25°C)

| Symbol | Parameter | Conditions | Ratings | Unit |
|------------------|----------------------------------|----------------------------------|------------|------|
| V _{DSS} | Drain-source voltage | V _{GS} = 0V | 30 | V |
| V _{GSS} | Gate-source voltage | V _{DS} = 0V | ±10 | V |
| I _D | Drain current | | 10 | A |
| I _{DM} | Drain current (Pulsed) | | 40 | A |
| I _{DA} | Avalanche drain current (Pulsed) | L = 30μH | 10 | A |
| I _S | Source current | | 10 | A |
| I _{SM} | Source current (Pulsed) | | 40 | A |
| P _D | Maximum power dissipation | | 15 | W |
| T _{ch} | Channel temperature | | -55 ~ +150 | °C |
| T _{stg} | Storage temperature | | -55 ~ +150 | °C |
| V _{iso} | Isolation voltage | AC for 1minute, Terminal to case | 2000 | V |
| — | Weight | Typical value | 2.0 | g |

Feb.1999

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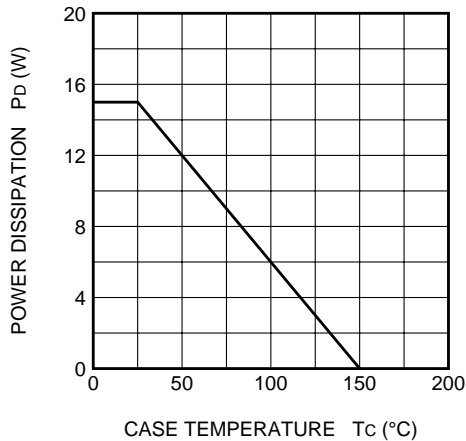
HIGH-SPEED SWITCHING USE

ELECTRICAL CHARACTERISTICS (T_{ch} = 25°C)

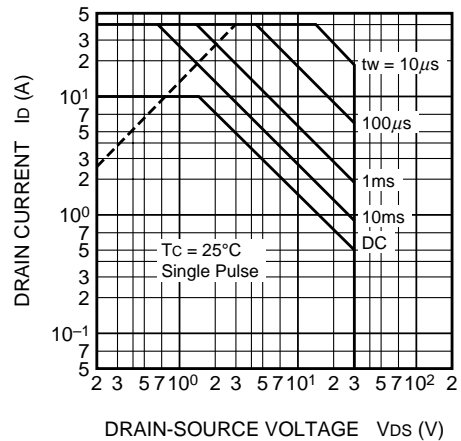
| Symbol | Parameter | Test conditions | Limits | | | Unit |
|------------------------|----------------------------------|--|--------|------|------|------|
| | | | Min. | Typ. | Max. | |
| V (BR) DSS | Drain-source breakdown voltage | I _D = 1mA, V _{GS} = 0V | 30 | — | — | V |
| I _{GSS} | Gate-source leakage current | V _{GS} = ±10V, V _{DS} = 0V | — | — | ±0.1 | μA |
| I _{DSS} | Drain-source leakage current | V _{DS} = 30V, V _{GS} = 0V | — | — | 0.1 | mA |
| V _{GS} (th) | Gate-source threshold voltage | I _D = 1mA, V _{DS} = 10V | 0.6 | 0.9 | 1.2 | V |
| r _{DS} (ON) | Drain-source on-state resistance | I _D = 5A, V _{GS} = 4V | — | 68 | 92 | mΩ |
| r _{DS} (ON) | Drain-source on-state resistance | I _D = 5A, V _{GS} = 2.5V | — | 88 | 141 | mΩ |
| V _{DS} (ON) | Drain-source on-state voltage | I _D = 5A, V _{GS} = 4V | — | 0.34 | 0.46 | V |
| y _{fs} | Forward transfer admittance | I _D = 5A, V _{DS} = 5V | — | 12 | — | S |
| C _{iss} | Input capacitance | V _{DS} = 10V, V _{GS} = 0V, f = 1MHz | — | 540 | — | pF |
| C _{oss} | Output capacitance | | — | 160 | — | pF |
| C _{rss} | Reverse transfer capacitance | | — | 55 | — | pF |
| t _d (on) | Turn-on delay time | V _{DD} = 15V, I _D = 5A, V _{GS} = 4V, R _{GEN} = R _{GS} = 50Ω | — | 12 | — | ns |
| t _r | Rise time | | — | 35 | — | ns |
| t _d (off) | Turn-off delay time | | — | 45 | — | ns |
| t _f | Fall time | | — | 40 | — | ns |
| V _{SD} | Source-drain voltage | I _S = 5A, V _{GS} = 0V | — | 1.0 | 1.5 | V |
| R _{th} (ch-c) | Thermal resistance | Channel to case | — | — | 8.3 | °C/W |
| t _{rr} | Reverse recovery time | I _S = 5A, di _s /dt = -50A/μs | — | 35 | — | ns |

PERFORMANCE CURVES

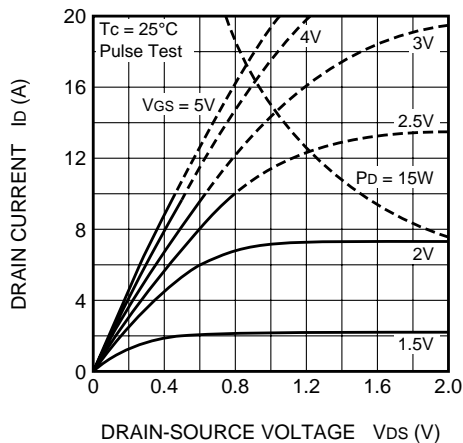
POWER DISSIPATION DERATING CURVE



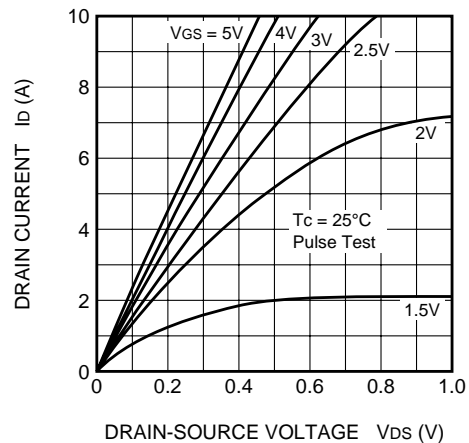
MAXIMUM SAFE OPERATING AREA



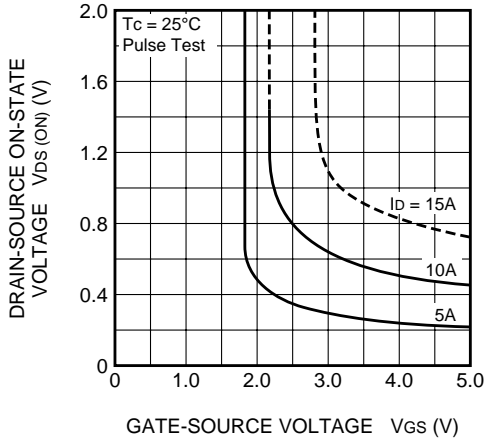
OUTPUT CHARACTERISTICS (TYPICAL)



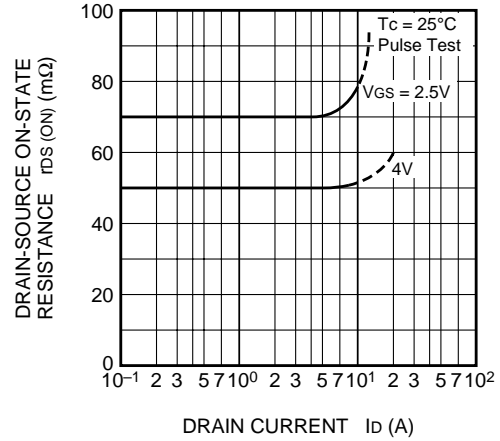
OUTPUT CHARACTERISTICS (TYPICAL)



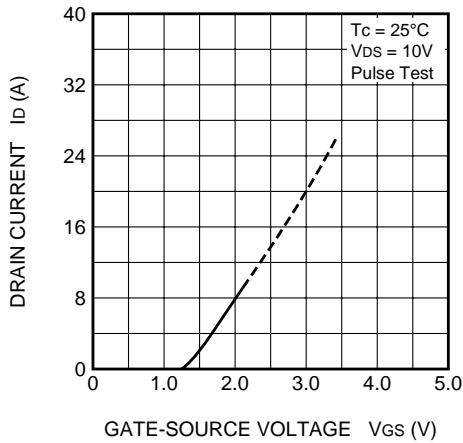
ON-STATE VOLTAGE VS. GATE-SOURCE VOLTAGE (TYPICAL)



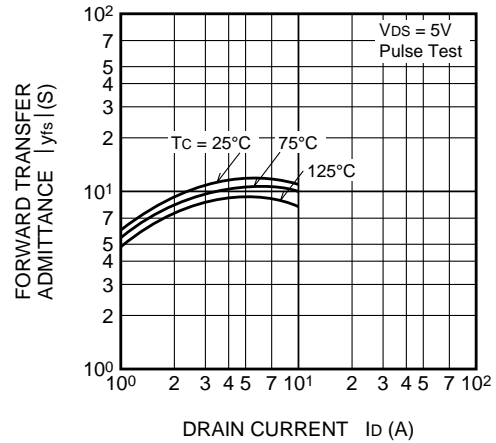
ON-STATE RESISTANCE VS. DRAIN CURRENT (TYPICAL)



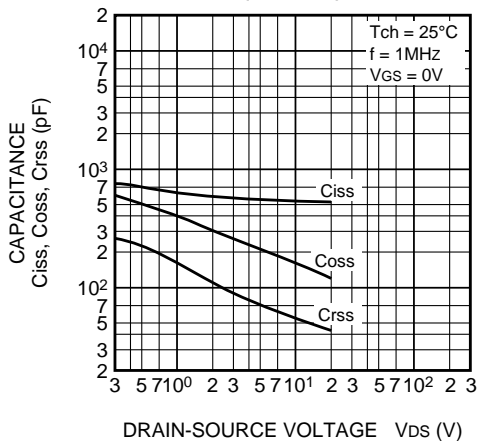
TRANSFER CHARACTERISTICS (TYPICAL)



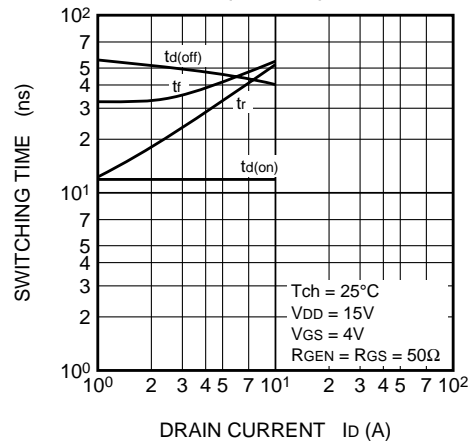
FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT (TYPICAL)



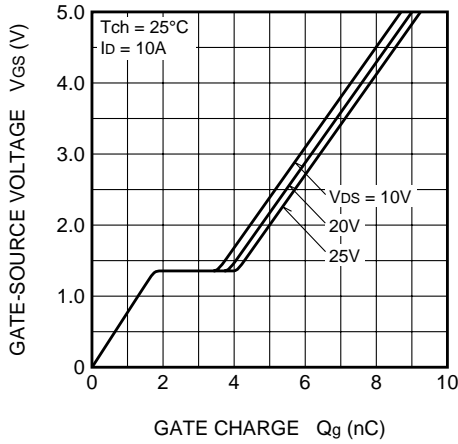
CAPACITANCE VS. DRAIN-SOURCE VOLTAGE (TYPICAL)



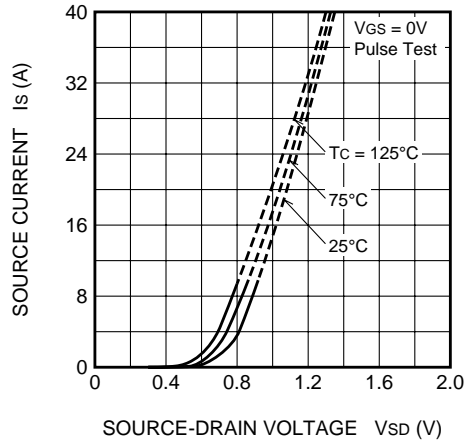
SWITCHING CHARACTERISTICS (TYPICAL)



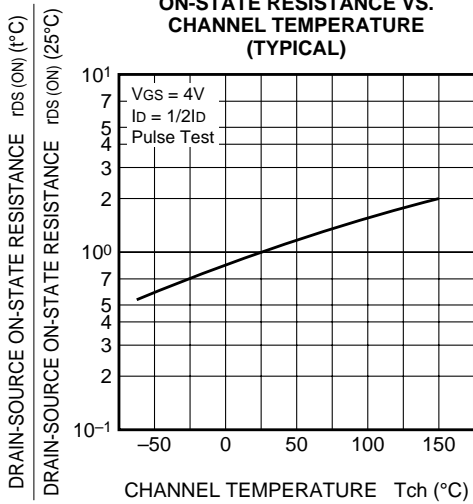
GATE-SOURCE VOLTAGE VS. GATE CHARGE (TYPICAL)



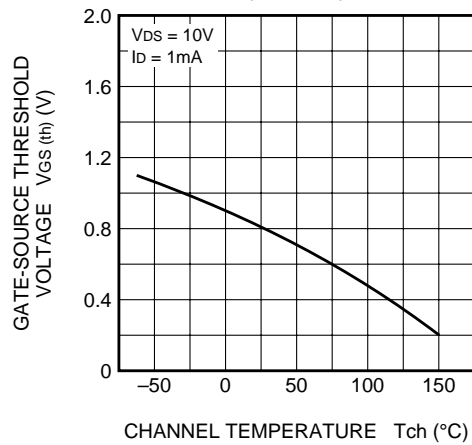
SOURCE-DRAIN DIODE FORWARD CHARACTERISTICS (TYPICAL)



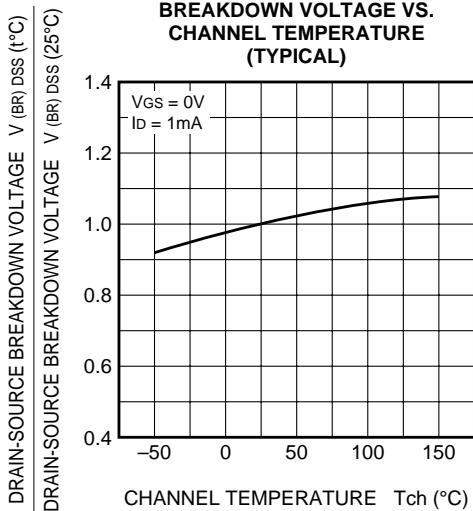
ON-STATE RESISTANCE VS. CHANNEL TEMPERATURE (TYPICAL)



THRESHOLD VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



BREAKDOWN VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS

