

FS50KM-2

HIGH-SPEED SWITCHING USE

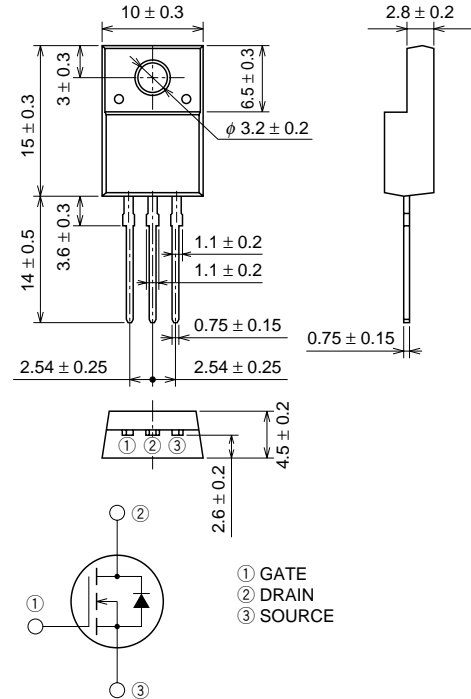
FS50KM-2



- 10V DRIVE
- V_{DS} 100V
- $r_{DS(ON)}$ (MAX) $55m\Omega$
- I_D 50A
- Integrated Fast Recovery Diode (TYP.) 105ns
- V_{iso} 2000V

OUTLINE DRAWING

Dimensions in mm



TO-220FN

APPLICATION

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

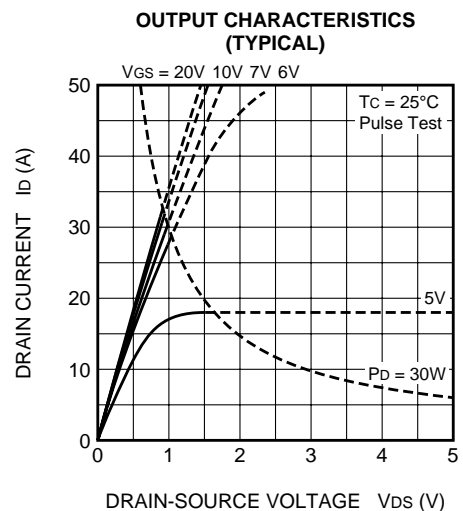
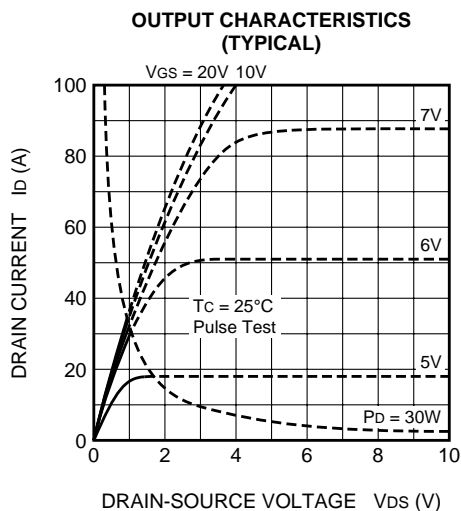
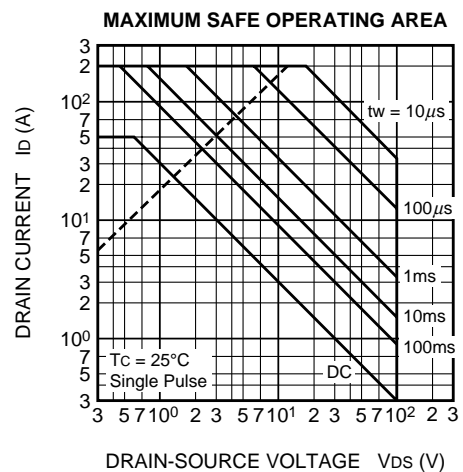
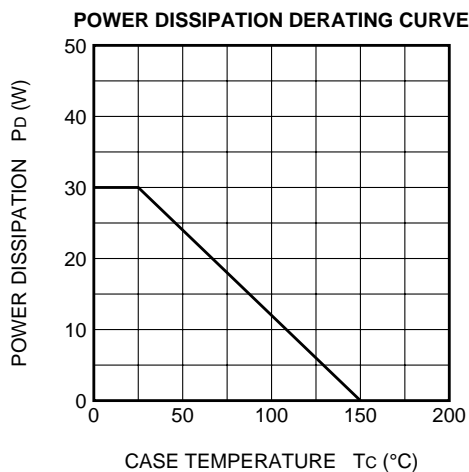
MAXIMUM RATINGS (Tc = 25°C)

| Symbol | Parameter | Conditions | Ratings | Unit |
|-----------|----------------------------------|----------------------------------|-----------------|------|
| V_{DS} | Drain-source voltage | $V_{GS} = 0V$ | 100 | V |
| V_{GS} | Gate-source voltage | $V_{DS} = 0V$ | ± 20 | V |
| I_D | Drain current | | 50 | A |
| I_{DM} | Drain current (Pulsed) | | 200 | A |
| I_{DA} | Avalanche drain current (Pulsed) | $L = 50\mu H$ | 50 | A |
| I_S | Source current | | 50 | A |
| I_{SM} | Source current (Pulsed) | | 200 | A |
| P_D | Maximum power dissipation | | 30 | W |
| T_{ch} | Channel temperature | | $-55 \sim +150$ | °C |
| T_{stg} | Storage temperature | | $-55 \sim +150$ | °C |
| V_{iso} | Isolation voltage | AC for 1minute, Terminal to case | 2000 | V |
| — | Weight | Typical value | 2.0 | g |

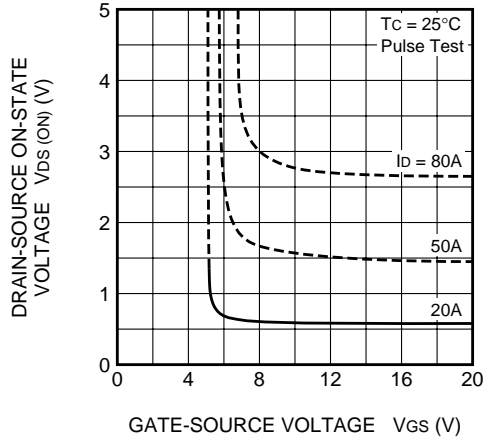
ELECTRICAL CHARACTERISTICS (T_{ch} = 25°C)

| Symbol | Parameter | Test conditions | Limits | | | Unit |
|-----------------------|----------------------------------|--|--------|------|------|------|
| | | | Min. | Typ. | Max. | |
| V _{(BR)DSS} | Drain-source breakdown voltage | I _D = 1mA, V _{GS} = 0V | 100 | — | — | V |
| I _{GSS} | Gate-source leakage current | V _{GS} = ±20V, V _{DS} = 0V | — | — | ±0.1 | μA |
| I _{DSS} | Drain-source leakage current | V _{DS} = 100V, V _{GS} = 0V | — | — | 0.1 | mA |
| V _{GS(th)} | Gate-source threshold voltage | I _D = 1mA, V _{DS} = 10V | 2.0 | 3.0 | 4.0 | V |
| r _{DS(on)} | Drain-source on-state resistance | I _D = 25A, V _{GS} = 10V | — | 39 | 55 | mΩ |
| V _{DS(on)} | Drain-source on-state voltage | I _D = 25A, V _{GS} = 10V | — | 0.98 | 1.38 | V |
| y _{fs} | Forward transfer admittance | I _D = 25A, V _{DS} = 10V | — | 33 | — | S |
| C _{iss} | Input capacitance | V _{DS} = 10V, V _{GS} = 0V, f = 1MHz | — | 2300 | — | pF |
| C _{oss} | Output capacitance | | — | 410 | — | pF |
| C _{rss} | Reverse transfer capacitance | | — | 185 | — | pF |
| t _{d(on)} | Turn-on delay time | V _{DD} = 50V, I _D = 25A, V _{GS} = 10V, R _{GEN} = R _{GS} = 50Ω | — | 35 | — | ns |
| t _r | Rise time | | — | 86 | — | ns |
| t _{d(off)} | Turn-off delay time | | — | 100 | — | ns |
| t _f | Fall time | | — | 80 | — | ns |
| V _{SD} | Source-drain voltage | I _S = 25A, V _{GS} = 0V | — | 1.0 | 1.5 | V |
| R _{th(ch-c)} | Thermal resistance | Channel to case | — | — | 4.17 | °C/W |
| t _{rr} | Reverse recovery time | I _S = 50A, di _s /dt = -100A/μs | — | 105 | — | ns |

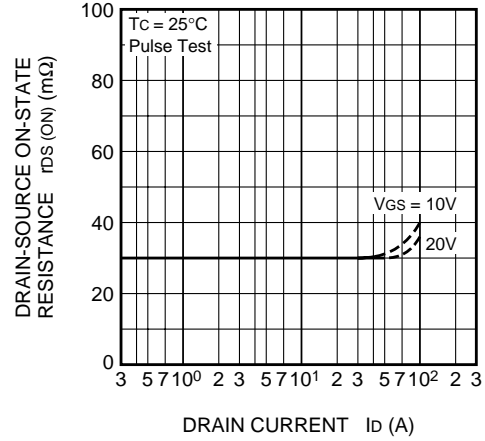
PERFORMANCE CURVES



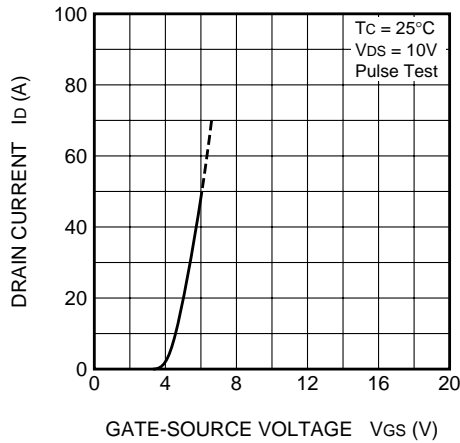
ON-STATE VOLTAGE VS.
GATE-SOURCE VOLTAGE
(TYPICAL)



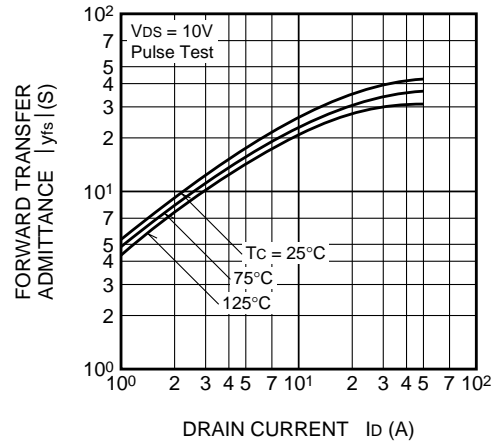
ON-STATE RESISTANCE VS.
DRAIN CURRENT
(TYPICAL)



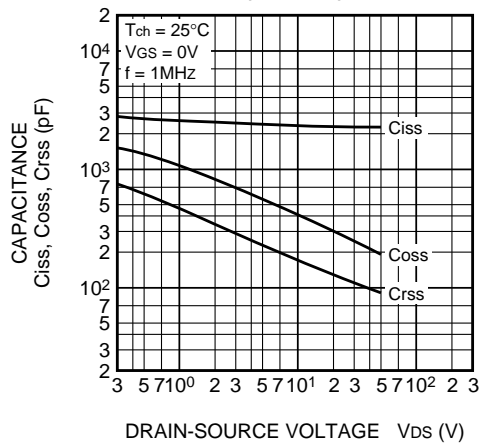
TRANSFER CHARACTERISTICS
(TYPICAL)



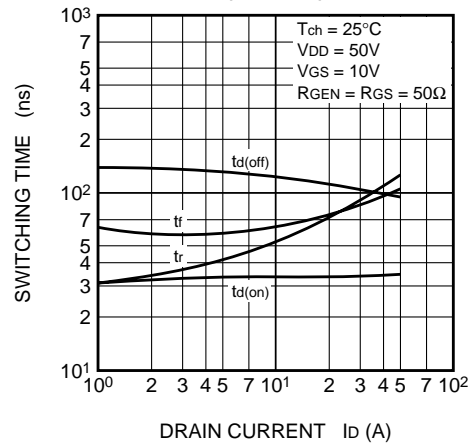
FORWARD TRANSFER ADMITTANCE
VS. DRAIN CURRENT
(TYPICAL)



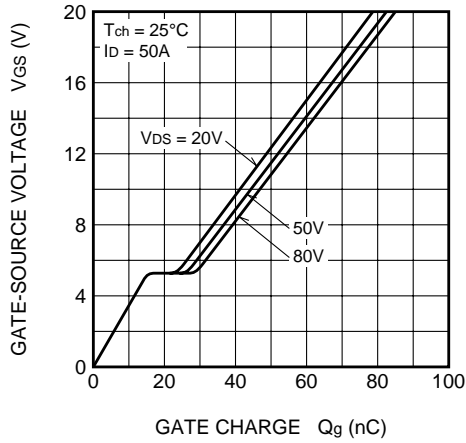
CAPACITANCE VS.
DRAIN-SOURCE VOLTAGE
(TYPICAL)



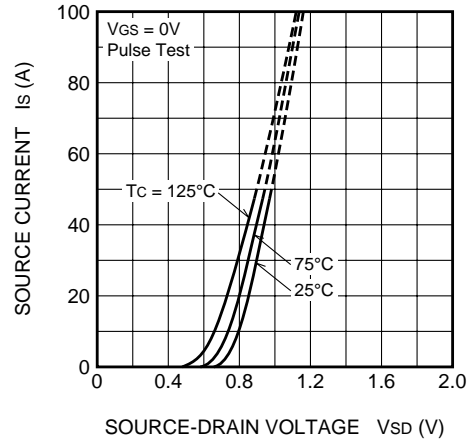
SWITCHING CHARACTERISTICS
(TYPICAL)



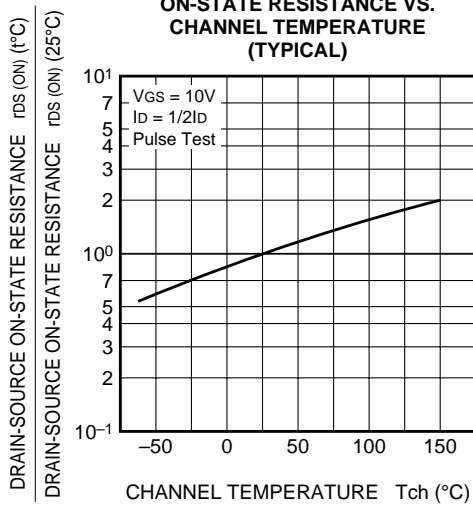
GATE-SOURCE VOLTAGE
VS. GATE CHARGE
(TYPICAL)



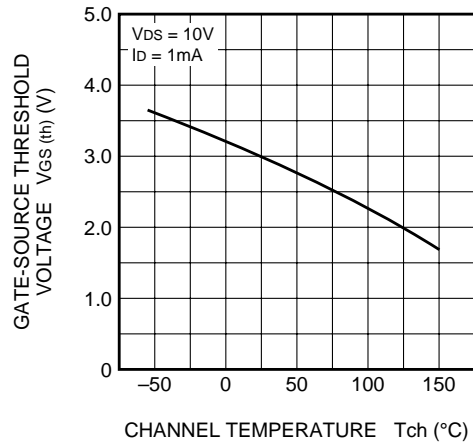
SOURCE-DRAIN DIODE
FORWARD CHARACTERISTICS
(TYPICAL)



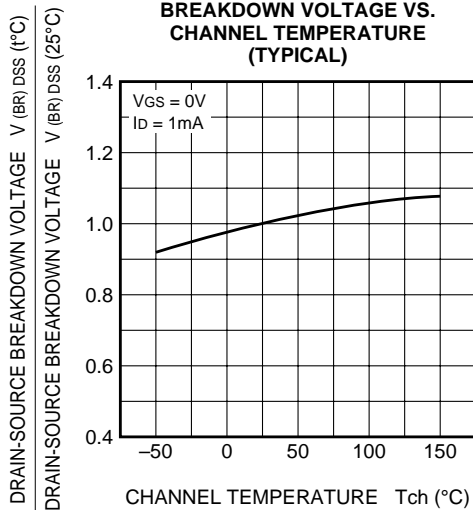
ON-STATE RESISTANCE VS.
CHANNEL TEMPERATURE
(TYPICAL)



THRESHOLD VOLTAGE VS.
CHANNEL TEMPERATURE
(TYPICAL)



BREAKDOWN VOLTAGE VS.
CHANNEL TEMPERATURE
(TYPICAL)



TRANSIENT THERMAL IMPEDANCE
CHARACTERISTICS

