

FS50KM-06

HIGH-SPEED SWITCHING USE

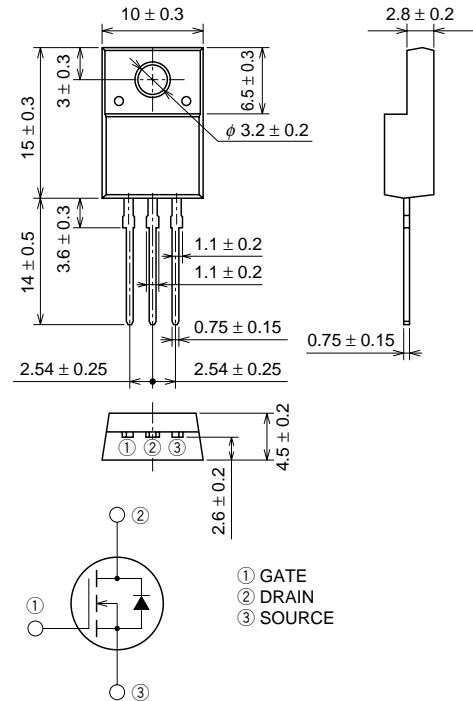
FS50KM-06



- 10V DRIVE
- V_{DSS} 60V
- $r_{DS(ON)}$ (MAX) 22m Ω
- I_D 50A
- Integrated Fast Recovery Diode (TYP.) 65ns
- V_{iso} 2000V

OUTLINE DRAWING

Dimensions in mm



TO-220FN

APPLICATION

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

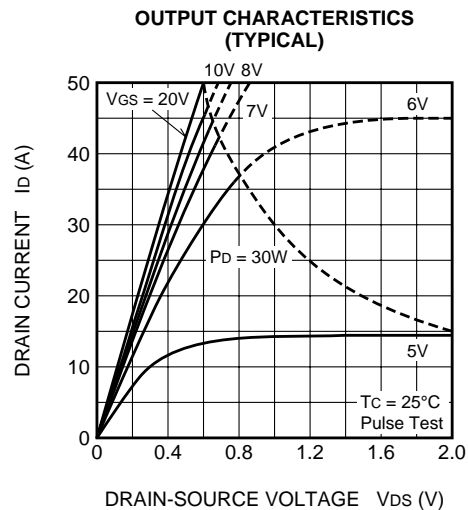
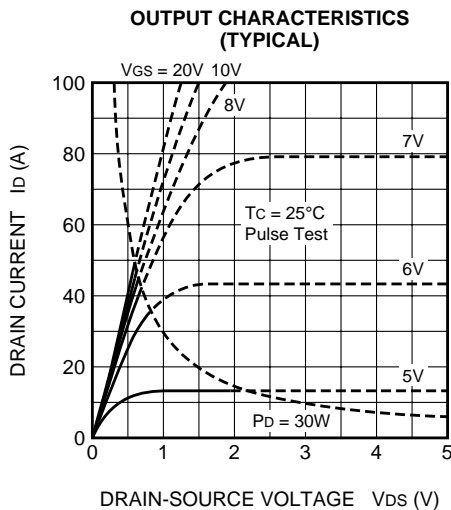
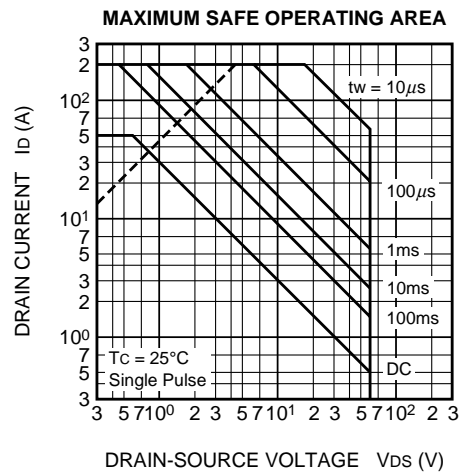
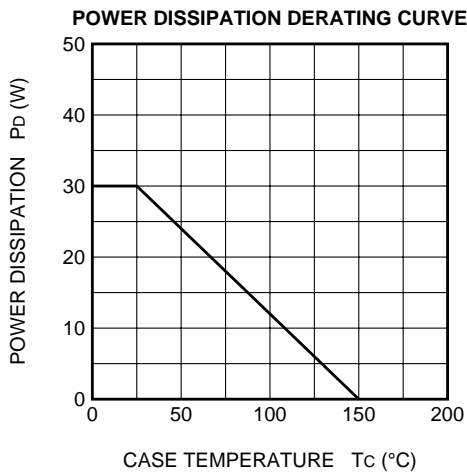
MAXIMUM RATINGS (Tc = 25°C)

| Symbol | Parameter | Conditions | Ratings | Unit |
|-----------|----------------------------------|----------------------------------|------------|------|
| V_{DSS} | Drain-source voltage | $V_{GS} = 0V$ | 60 | V |
| V_{GSS} | 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) | $L = 100\mu H$ | 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 ~ +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 |

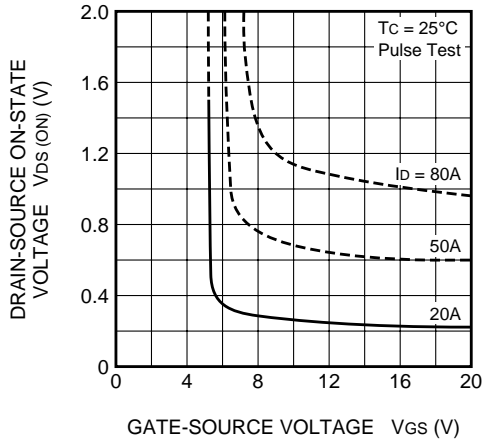
ELECTRICAL CHARACTERISTICS (Tch = 25°C)

| Symbol | Parameter | Test conditions | Limits | | | Unit |
|-----------|----------------------------------|--|--------|------|------|------|
| | | | Min. | Typ. | Max. | |
| V(BR)DSS | Drain-source breakdown voltage | ID = 1mA, VGS = 0V | 60 | — | — | V |
| IGSS | Gate-source leakage current | VGS = ±20V, VDS = 0V | — | — | ±0.1 | μA |
| IDSS | Drain-source leakage current | VDS = 60V, VGS = 0V | — | — | 0.1 | mA |
| VGS(th) | Gate-source threshold voltage | ID = 1mA, VDS = 10V | 2.0 | 3.0 | 4.0 | V |
| rDS(ON) | Drain-source on-state resistance | ID = 25A, VGS = 10V | — | 17 | 22 | mΩ |
| VDS(ON) | Drain-source on-state voltage | ID = 25A, VGS = 10V | — | 0.43 | 0.55 | V |
| yfs | Forward transfer admittance | ID = 25A, VDS = 10V | — | 32 | — | S |
| Ciss | Input capacitance | VDS = 10V, VGS = 0V, f = 1MHz | — | 2300 | — | pF |
| Coss | Output capacitance | | — | 570 | — | pF |
| Crss | Reverse transfer capacitance | | — | 280 | — | pF |
| td(on) | Turn-on delay time | VDD = 30V, ID = 25A, VGS = 10V, RGEN = RGS = 50Ω | — | 35 | — | ns |
| tr | Rise time | | — | 95 | — | ns |
| td(off) | Turn-off delay time | | — | 95 | — | ns |
| tf | Fall time | | — | 80 | — | ns |
| VSD | Source-drain voltage | IS = 25A, VGS = 0V | — | 1.0 | 1.5 | V |
| Rth(ch-c) | Thermal resistance | Channel to case | — | — | 4.17 | °C/W |
| trr | Reverse recovery time | IS = 50A, dis/dt = -100A/μs | — | 65 | — | ns |

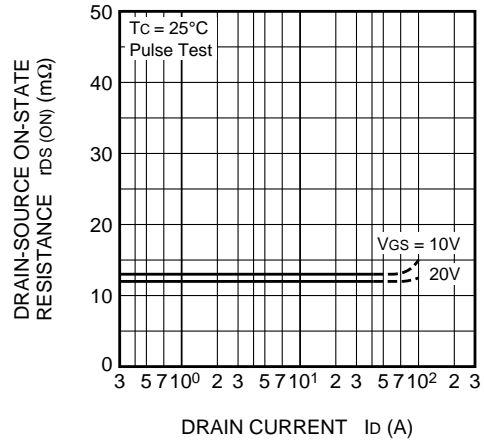
PERFORMANCE CURVES



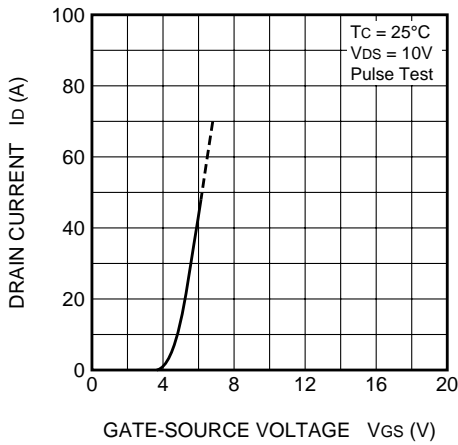
ON-STATE VOLTAGE VS. GATE-SOURCE VOLTAGE (TYPICAL)



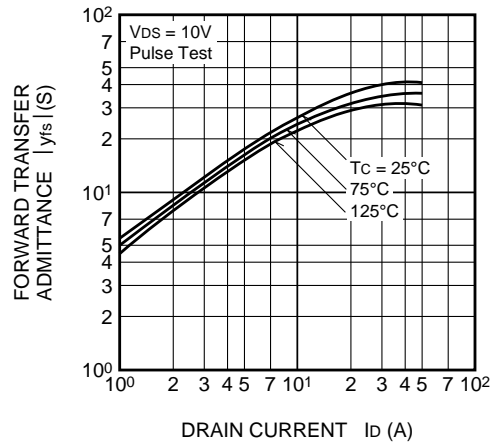
ON-STATE RESISTANCE VS. DRAIN CURRENT (TYPICAL)



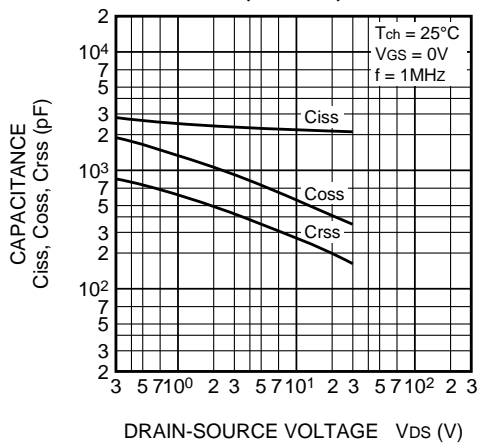
TRANSFER CHARACTERISTICS (TYPICAL)



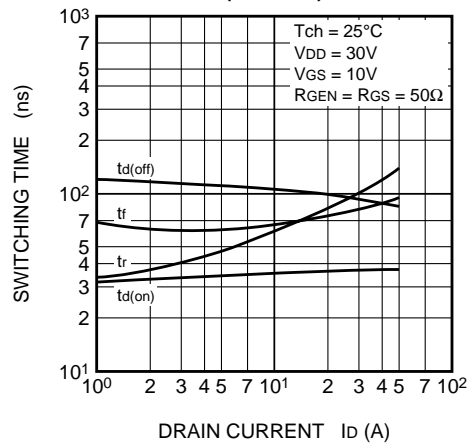
FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT (TYPICAL)



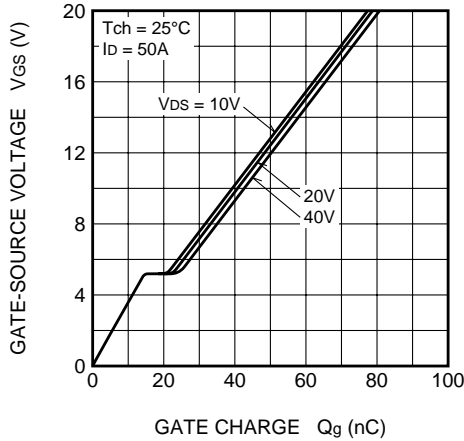
CAPACITANCE VS. DRAIN-SOURCE VOLTAGE (TYPICAL)



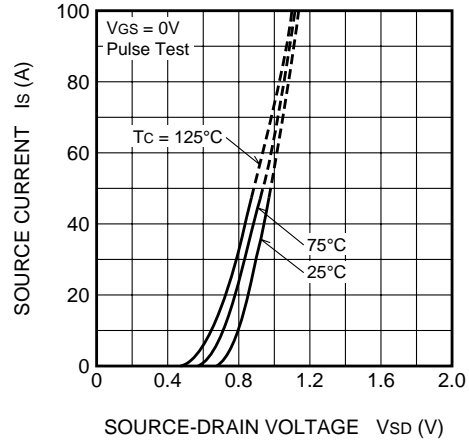
SWITCHING CHARACTERISTICS (TYPICAL)



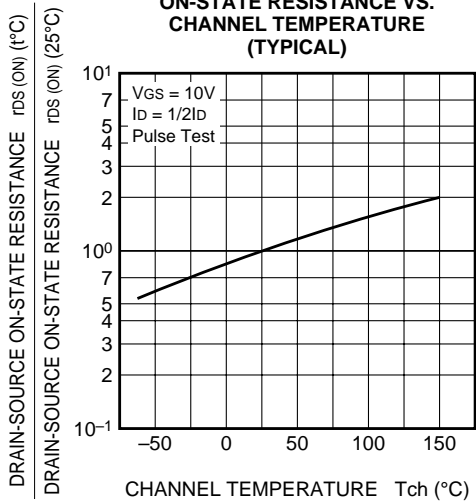
GATE-SOURCE VOLTAGE VS. GATE CHARGE (TYPICAL)



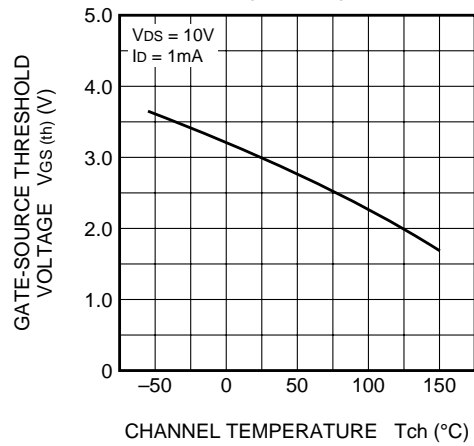
SOURCE-DRAIN DIODE FORWARD CHARACTERISTICS (TYPICAL)



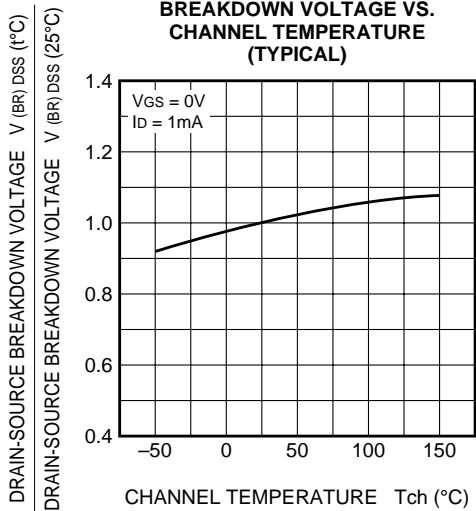
ON-STATE RESISTANCE VS. CHANNEL TEMPERATURE (TYPICAL)



THRESHOLD VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



BREAKDOWN VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS

